

01.00 GENERAL

01.01 DEFINITIONS

1. **ACCELERATED EROSION** – Any increase over the rate of natural erosion as a result of land disturbing activity.
2. **AGENT** – An individual designated by the Developer as the primary source of contact between the Developer, the Contractor, and the City of Monroe.
3. **ARCHITECT** – An individual duly licensed in accordance with Chapter 83A of the N.C. General Statutes.
4. **AS-BUILT DRAWING** – A construction drawing completed by means of field survey that shows the location of existing or constructed items such as drainage structures, utilities, ponds, roadways, sidewalk, curb & gutter, etc.
5. **BUILT DRAINAGE STRUCTURE** – A drainage structure that is constructed on-site by block, brick, or concrete.
6. **CITY ENGINEER** – The Engineering Director of the City of Monroe, an engineer, or other representative duly authorized by the Engineering Director.
7. **COMMON PLAN OF DEVELOPMENT** - means a contiguous area where multiple separate and distinct land disturbing activities may be taking place at different times and on different schedules under one common plan. The “common plan” of development or sale is broadly defined as any announcement or piece of documentation indicating construction activities are planned to occur on a specific plot regardless of ownership of the parcels.
8. **CONTRACT** – The agreement between the Contractor and the City of Monroe or the Contractor and a Developer.
9. **CONTRACTOR** – The corporation, partnership, individual or other legal entity having a Contract with the City of Monroe or a Developer to perform the work.
10. **DEVELOPER** – The corporation, partnership, individual or other legal entity proposing to develop land in accordance with the Monroe City Code of Ordinances and applicable State and Federal laws governing their activity.

11. **EASEMENT** – A property right to use or control real property of another for a specific purpose and use by the public, a corporation, or other entity.
12. **ENGINEER** – An individual duly licensed in accordance with Chapter 89C of the N.C. General Statutes.
13. **EROSION CONTROL** – The practice of preventing or controlling the wearing away of the land surfaces (soil, rocks, sand) from natural processes (water, wind, gravity).
14. **INSPECTOR** – The City of Monroe Construction Inspector or other representative duly authorized by the Engineering Director.
15. **INVERT** – The lowest point in the internal cross section of a pipe or other culvert.
16. **PRE-CAST DRAINAGE STRUCTURE** – A drainage structure that is constructed at another location and transported to the construction site.
17. **PROFESSIONAL OF RECORD** – A surveyor, Landscape Architect, or Engineer duly registered in accordance with Chapter 89C of the N.C. General Statutes and is responsible for preparing the design drawings approved by the City of Monroe
18. **LAND SURVEYOR** - An individual duly licensed in accordance with Chapter 89C of the N.C. General Statutes.
19. **QUALITY ASSURANCE** – The means of inspection by the City of Monroe or other governmental agency that verifies the tests and inspections of the quality control program established by the Developer and/or Contractor are in compliance with the approved construction drawings and requirements established by this manual.
20. **QUALITY CONTROL PROGRAM** – The Developer and/or Contractor program that details the methods and procedures that ensures the materials and completed construction being incorporated into a project conform to the approved plans and specifications and the City of Monroe Standard Specifications and Detail Manual.
21. **RIGHT OF WAY** – The land area dedicated for public use and reserved for vehicular access.
22. **ROADWAY** – The portion of a street reserved for vehicular travel.
23. **ROADWAY CONSTRUCTION** - Any work on new roadway improvements including but not limited to undercut, embankment, storm drain, storm drain structures and pavement construction.

24. **SINGLE FAMILY** - Includes any form of single, detached family housing development. All forms of single family attached structures are excluded from this definition and are considered to be multi family structures for the purposes of this manual.
25. **SPECIFICATIONS** – The general term comprising all the directions, provisions, and requirements contained or referred to in this book entitled "City of Monroe Standard Specifications and Detail Manual" and in any subsequent revisions or additions to this book.
26. **STORM DRAIN** – Conduit and appurtenances intended for the conveyance of storm water runoff.
27. **STREET** – A public right-of-way for vehicular travel which 1) has been constructed and then dedicated to and accepted by the City of Monroe or the North Carolina Department of Transportation for public use, or 2) has been otherwise obtained by such agencies for such use, or 3) is proposed to be constructed and then dedicated to and accepted by such agencies as a public right-of-way for vehicular traffic for public use. Street classifications are defined in Standard 02.01.01.
28. **SUBDIVIDER** – A person who owns a property and divides that property into smaller properties in accordance with the Monroe City Code.
29. **SUBDIVISION ADMINISTRATOR** – The Planning Director of the City of Monroe or his designee who is authorized to approve final plat recordation.
30. **SUBGRADE** – That portion of the roadbed prepared as a foundation for the pavement structure.
31. **WORK** – That which is proposed to be constructed or done under the Contract.

01.02**ABBREVIATIONS**

AASHTO	American Association of State Highway and Transportation Officials
A.D.A.	Americans with Disabilities Act
ADT	Average Daily Traffic
A.F.F.	Above Finished Floor
ANSI	American National Standards Institute

ASTM	American Society of Testing and Materials
CCTV	Closed Circuit Television
FFE	Finished Floor Elevation
ft.	foot
HDPE	High Density Polyethylene Pipe
ID	Internal Diameter
Lbs.	Pounds
MSL	Mean Sea Level
MUTCD	Manual on Uniform Traffic Control Devices
NASSCO	National Association of Sewer Service Companies
NCDENR	North Carolina Department of Environment and Natural Resources
NCDOT	North Carolina Department of Transportation
NCOSHA	North Carolina Occupational Safety and Health Association (a Division of N.C. Department of Labor)
NCPE	North Carolina Professional Engineer
NCPLS	North Carolina Professional Land Surveyor
NCSCC	North Carolina Sedimentation Control Commission.
N.E.C.	National Electric Code
NRCS	Natural Resources Conservation Service
OD	Outside Diameter
OSHA	Occupational Safety and Health Association
P. C.	Point of Curvature
PE	Professional Engineer

PLS	Professional Land Surveyor
PROWAG	Public Right-of-Way Accessibility Guidelines
psi	pounds per square inch
P .T.	Point of Tangency
PVC	Polyvinyl Chloride
P .V. C.	Point of Curvature on Vertical Curve
P .V. T.	Point of Tangency on Vertical Curve
Qmax	Maximum Discharge
Qmin	Minimum Discharge
RCP	Reinforced Concrete Pipe
sec.	Second
s. f.	Square Feet
Sq. Yds.	Square Yards

01.03**APPLICABLE SECTIONS, DIVISIONS, AND STANDARDS OF THIS MANUAL**

1. The following divisions and/or standards shall apply to ALL development including but not limited to residential, non-residential, commercial, and industrial single project development, and residential, non-residential, commercial, and industrial subdivision development:

A.	01.01	Definitions
	01.02	Abbreviations
	01.03	Applicable Sections of This Manual
	01.04	General Notes
	01.05.01	Developer and Contractor Requirements
	01.06	Safety
	01.13	Submittal Requirements

B.	02.01.04	NCDOT Driveway Permit and Encroachment
	02.01.05	City of Monroe Driveway Permit and Other Driveway Information
	02.02.05	Off-Street Parking

- C. Division 03 Erosion and Sedimentation Control
- D. Division 04 Storm Drainage Collection Facilities
- E. 07.01 Permit Contact Information
07.06.01 Erosion Control Financial Responsibility Form
07.06.02 Erosion Control Plan Checklist
07.07 Driveway Permit
07.14 Permit to Open Cut Utility Trenches City Maintained Street Right of Way

2. The following divisions and/or standards shall apply to residential, commercial, and industrial subdivision development:

- A. 01.05.02 New Road Construction
01.07 Roadway and Storm Drainage Construction Plan Requirements
01.07 Construction Inspections
01.09 Post Construction Inspections
01.10 Warranty
01.11 As-Built Drawing Requirements
01.12 Survey Control Monuments
- B. 02.01.01 Street Classifications
02.01.02 Street Names
02.01.03 Traffic Studies
02.02.01 Design Criteria
02.02.02 Superelevation
02.02.03 Storm Drainage
02.02.04 Subdivision Entrance Signs, Markers, and Landscaped Areas
02.02.06 Sidewalk Requirements
02.02.07 Street Name Identification Signs
02.02.08 Construction Plans
02.02.09 Requirements for Street Improvements
02.02.10 Exemption for Required Street Improvements
02.03 Construction
- C. Division 06 Landscaping
- D. 07.02.01 Development Review & Planning Procedure Checklist for Subdivisions
07.03 Subdivision Plat Checklist
07.05 Pre-Construction Meeting Agenda

07.07	Certification Forms
	Certification Form 1-01
	Certification Form 1-02
	Certification Form 1-03
	Certification Form 1-05
	Certification Form 1-06
07.09	Notification Requirements
07.10	Final Inspection and Acceptance
07.11	Post-Construction Checklist
07.13	As-Built Drawing Checklist

3. The following divisions and/or standards shall apply to single lot multi-family residential, commercial and industrial development:
 - A. 01.11 As-Built Drawings
 - B. 02.01.03 Traffic Studies
02.01.05 City of Monroe Driveway Permit
02.02.05 Off-Street Parking
02.02.06 Sidewalk Requirements
 - C. Division 05 Stormwater Management
 - D. 07.04 Stormwater Maintenance Agreement
07.08 Certification Forms
 Certification Form 1-01
 Certification Form 1-04
 Certification Form 1-05
 Certification Form 1-06
07.12 Watershed Post-Construction Checklist for
 Stormwater Control Measures
07.13 As-Built Drawing Checklist

01.04**GENERAL DEVELOPMENT NOTES**

1. A designer of the types of development described within this document must be a Professional Engineer, a Professional Land Surveyor, or a Professional Landscape Architect and may only perform design work to the extent the North Carolina General Statutes allows for each respective profession.
2. Each designer should be aware that site specific conditions, City of Monroe Ordinances, and state and federal laws may necessitate additional information, analysis, or other obligations beyond the minimum requirements found within this document.
3. The City of Monroe is not responsible for the accuracy or adequacy of a design, dimensions and elevations on reviewed construction plans.
4. Approval of a development plan by the City of Monroe does not relieve the Developer, his Agent, Engineer, or Contractor of their responsibility to ensure proper design and construction of the planned development, nor does it impose responsibility on the City of Monroe for the design and construction methods of the development.

5. For subdivision development, the City of Monroe shall not be liable for the maintenance of proposed streets until acceptance of the right-of-ways. Until acceptance, the right-of-ways shall remain private in perpetuity.
6. Any construction design change following plan approvals shall be submitted by the Professional of Record through the Permit Center for review and approval.

01.05 DEVELOPER AND CONTRACTOR REQUIREMENTS

01.05.01 ALL DEVELOPMENT

1. All civil construction plans and designs shall be prepared and properly certified by a professional registered in the State of North Carolina, as defined in Standard 01.04, Note 1.
2. The Developer is required to designate a single party who will serve as his agent and be responsible for all Contractor operations and all communications with the City of Monroe. This single party will provide an email address.
3. Except where otherwise noted or defined, plan scales shall be, 1" =10', 1"=20', 1"=30', 1"=40', 1'=50', 1"=60', or 1"=100'. Variations other than those listed must be pre-approved by the Engineering Director.
4. Plan sheets shall be limited to 24"x 36".
5. A Pre-Construction meeting is required for all new road construction, refer to section 01.05.02. A Pre-Construction meeting is required for all development that has an approved Erosion Control Plan and/or Stormwater Management Plan.

01.05.02 NEW ROAD CONSTRUCTION

1. All street and utility construction work must be performed by contractors who are properly licensed in accordance with Chapter 87, General Statutes of North Carolina or by City of Monroe forces when approved by City Council and/or the City Manager.
2. The Developer's Engineer or Surveyor is required to provide the City of Monroe a digital copy of the plans for the proposed subdivision upon final construction plan approval. All control points shall be tied to the U.S. State Plane coordinates in accordance with Chapter 89C of the General Statutes.
3. At no expense to the City of Monroe, a professional, as defined in Standard 01.04, Note 1, registered in the State of North Carolina shall be

employed by the Developer to inspect the installation of water, sewer, drainage, streets, erosion control measures, and best management practices. Inspections shall be of the amount and degree required for the Developer and his Engineer to complete project certifications to the City of Monroe and state agencies. Inspection reports shall be provided to the City of Monroe Construction Inspector.

4. The Development Review and Procedure Checklist contained herein shall be used as a guide for informational purposes only and is used by the Planning Department for the plan approval process. All items must be marked on the checklist as being properly addressed by the Engineer/Surveyor prior to review by the City.
5. The Developer, his Agent, and his Contractor are required to utilize the Construction Checklist, the Post-Construction Checklist and the subsequent Certification Forms contained herein. All items must be properly completed prior to scheduling a final walk-through.
6. The Developer, his Agent, and his Contractor are required to contact the City of Monroe Energy Services Department and the telephone and cable utilities prior to curb placement for conduit locations under the roadway.
7. Prior to the start of any construction activity, approvals and permits for the development (erosion control, environmental, roadway, driveway permits, etc.) must be obtained by the Developer.
8. A Pre-Construction Conference will be held prior to the start of any construction activity. Refer to standard 07.05 for the Pre-Construction Agenda. The Developer is responsible for contacting the City of Monroe Engineering Department to arrange the meeting once he has obtained all required approvals and is ready to begin construction.
9. The City of Monroe will schedule the meeting and contact staff for each of the following areas:
 - City of Monroe Engineering Department;
 - City of Monroe Planning and Development Department;
 - City of Monroe Water Resources Department;
 - City of Monroe Energy Services Department;
 - NCDOT (if connecting to NCDOT maintained roadway);
 - Developer.

The Developer shall be responsible for contacting his Agent, Engineer, Builder, Contractor, telephone utility, fiber utility, any non-Monroe electric utility and having representatives present at the Pre-Construction Conference.

01.06 SAFETY**01.06.01 OSHA STANDARDS**

1. All contractors and their employees must comply with all federal and North Carolina OSHA standards.
2. If a violation of any federal or North Carolina OSHA standard is observed and not corrected, the appropriate agency shall be contacted immediately for enforcement.

01.06.02 HEALTH AND SAFETY HAZARDS

1. The operations of all contractors performing work shall not expose their employees or City of Monroe workers to occupational safety and health hazards.
2. This shall include but not be limited to the following exposures:

<u>Task</u>	<u>Appropriate Standard</u>
Confined Space Entry	Confined Space OSHA 1910.146
Use of Explosives	Explosives and OSHA 1910.109 Blasting Agents
Setup & use of scaffolding	Scaffolding OSHA 1926.0451
Setup & use of fall protection	Fall Protection OSHA 1926.0501
Trenching & excavation	Excavations OSHA 1926.0651
Setup & use of ladders	Ladders OSHA 1926.1053
Electrical design & protection	Electrical OSHA 1926.0404
Hazardous chemicals brought on site	HazCom OSHA 1926.0059
Storage of flammables & combustibles	National Fire 30, 58 & 395 Protection Agency
Setting up Work Zones on roadways	Uniform Traffic Control (MUTCD)

3. Contractors that anticipate the use or storage of any hazardous materials at the project are required to notify the Fire Department of the City of Monroe prior to any on-site use or storage.

01.07 ROADWAY AND STORM DRAINAGE CONSTRUCTION PLAN REQUIREMENTS

THIS STANDARD SHALL BE SUPPLEMENTAL TO DIVISIONS 02.00 STREETS AND 04.00 STORM DRAINAGE COLLECTION FACILITIES.

1. Each sheet of plans shall have the seal, signature, and date of the professional, as defined in Standard 01.04, Note 1, registered in the State of North Carolina, under whose supervision the plans were prepared.

2. Show a north arrow
3. Show a vicinity map
4. Plan sheets shall be 24" x 36"
5. Each page shall have consecutive sheet numbers, beginning with cover sheet. Lettered and decimal number sections are acceptable but the digital plan sheet numbers must also be included in whole numerical numbers. For example, Sheet C-3.2 or page 9 of 88.
6. Show all benchmarks and their assumed elevations.
7. Show locations of proposed concrete monuments.
8. Show adjacent properties with name, deed book reference, and tax map parcel number, property boundary, iron pins, right-of-way lines, and easements. Right-of-way lines shall be dimensioned and distinguishable. Easement areas shall be clearly labeled with type and dimension.
9. The minimum scale shall be 1" = 50' for roadway plans. The minimum scale shall be 1" = 100' for preliminary plats.
10. Show a title block on every sheet of the plan set that includes Developer's and his Engineer's name, address, and telephone number, name of the development, original date of the plans, scale indication, sheet number, and revision columns.
11. Show existing and proposed paved areas, buildings, structures, and utilities.
12. Show all proposed and existing roadways including, but not limited to pavement, curbing, sidewalk, ramps, storm drainage, and erosion control measures.
13. Show all proposed and existing utilities including, but not limited to water lines, valves, hydrants, sanitary sewer lines, manholes, gas lines, valves, telephone, cable television, and electric lines, and poles.
14. Show stationing on each proposed roadway. Stationing shall be based on the centerline of roadways and shall be labeled from the intersection of centerlines of intersecting roadways to the roadway ending intersection, the center of a cul-de-sac, or the end of the roadway.
15. Show stationing for each drainage way. Stationing shall be based on the flow line of the drainage way.

16. Show station and critical elevation (channel flow line, invert in and out of pipe and/or rim elevation) of all utility or storm drainage appurtenances, existing and proposed.
17. Show sheet flow direction at intersections.
18. Show match lines with connecting sheet numbers.
19. Show existing and proposed contours (4' max).
20. Cite all applicable details proposed for use during construction of the project.
21. The plans shall include adequate details of special structures not covered by the City of Monroe Standard Specifications and Detail Manual, latest edition, or the North Carolina Department of Transportation Roadway Standard Drawings, latest edition.
22. Show proposed sight triangles including 10' X 70' and 35' X 35' at main entrances and a 35' X 35' sight triangle for all interior streets per detail 02.01.10.
23. Dimension the radius of each curve in the roadway and intersection radii.
24. All profiles shall include, but not be limited to the original ground (dashed), design grade (bold and continuous), proposed pipes (bold and continuous), proposed structures (bold and continuous), distance, slope (percentage), and type and size of pipe (if required) between grade breaks and structures, critical elevation (flow line, invert of pipe, rim elevation, etc.) labels, grid (light, continuous), grid elevation labels, grid station labels, and other existing and proposed structures and appropriate labels.
25. The Developer must obtain the written permission of the adjacent property owner(s) for any off-site grading or construction prior to construction drawing approval.
26. The following are required notes that shall appear on every plan submitted to the City of Monroe prior to approval.
 - A. The City of Monroe plan review is only for general conformance with the City of Monroe design criteria and the City Code of Ordinances. The City of Monroe is not responsible for the accuracy and adequacy of the design, dimensions, and elevations, which shall be confirmed and correlated at the job site. The City of Monroe, through the approval of this document assumes no

responsibility for the completeness and/or accuracy of this document.

- B. All roadway and storm drainage construction shall be by the City of Monroe Standard Specifications and Detail Manual, latest edition. Where a construction item is not covered by this manual, the North Carolina Department of Transportation Roadway Standard Drawings, latest edition, shall apply.
- C. All water distribution construction shall be in accordance with the City of Monroe Standard Specifications and Detail Manual.
- D. All sanitary sewer construction shall be in accordance with the City of Monroe Standard Specifications and Detail Manual.
- E. All materials and workmanship shall be subject to inspection by the City of Monroe. The City of Monroe reserves the right to accept or reject any materials and workmanship that does not conform to the City of Monroe Standard Specifications and Detail Manual, latest edition, and the North Carolina Department of Transportation Standard Specifications for Roads and Structures, latest edition.
- F. Location and elevations of existing utilities shall be verified by the Contractor prior to actual construction.
- G. The Contractor shall call North Carolina One Call at 1-800-632-4949 or 811 at least three business days prior to any digging. The Contractor shall also be responsible for contacting Union County Public Works and Union Power Cooperative.
- H. The Contractor shall have one set of signed and sealed plans, reviewed by the City of Monroe, one copy of City of Monroe Standard Specifications and Detail Manual, latest edition, one copy of the North Carolina Department of Transportation Standard Specifications for Roads and Structures, latest edition, and a copy of any permits, encroachments or easement agreements on the site at all times.
- I. The Developer's Engineer is responsible for accurately showing existing conditions, both on-site, and off-site, on the construction plans. Any modifications required due to conflicts, omissions, or changed conditions either on-site or off-site that arise in the field will be entirely the Developer's responsibility to resolve. The cost to rectify any adverse situation to meet the City of Monroe Standard Specifications and Detail Manual and City of Monroe

Ordinances shall be borne solely by the Developer, the Engineer, or Contractor as legally required.

- J. The Developer and his Contractor will be required to provide positive drainage and fall along all ditches.
- K. The Developer and his Contractor shall ensure all ditches are stabilized prior to final acceptance of the development by the City of Monroe.

01.08**CONSTRUCTION INSPECTIONS**

- 1. The Engineering Department shall designate a construction inspector for each subdivision.
- 2. The construction inspector does not have the authority to approve revisions or waive requirements identified by the approved plans or City of Monroe Standard Specifications and Detail Manual.
- 3. The Developer and his Contractor shall make all aspects of the development construction readily available to the construction inspector. The City of Monroe will not accept any subdivision that has not met these requirements.
- 4. The Engineering Department and the City's construction inspector shall be responsible for Quality Assurance inspection only. The Developer, his Engineer, and the Contractor are responsible for performing all Quality Control inspection associated with the proposed development.
- 5. Revisions to the approved drawings due to field conditions are to be initiated by the Developer and his Contractor through the Professional of Record and will require approval from the Engineering Department. The Construction Inspector does not have the authority to approve revisions or waive requirements identified by the approved plans or the City of Monroe Standard Specifications and Detail Manual.
- 6. Quality Assurance and Quality Control geotechnical testing shall be required for all system improvements - water, sanitary sewer, storm drainage and streets to ensure proper materials and workmanship. The Developer shall be responsible for retaining a qualified geotechnical firm for the purpose of performing the required testing.

Cost Participation

Costs for the performance of the required tests by the independent testing firm shall be paid by the Developer. The City of Monroe

shall incur no costs for tests including additional testing required by the Construction Inspector to ensure the quality of questionable work or materials.

The cost of re-testing or work necessary to bring deficient areas into compliance shall be performed at no cost to the City of Monroe. The Engineering Department will be copied on all test results.

Testing Requirements

Testing of material and workmanship incorporated into the job shall be performed by an independent testing firm approved by the City of Monroe Engineering Department. Testing shall be of the type and frequency required to ensure that the materials and workmanship meet the requirements of the City of Monroe. All test results must be certified by an engineer registered in the State of North Carolina. The testing agency shall submit one copy of the testing report directly to the City of Monroe Engineering Department Construction Inspector within seven days of completed testing.

Tests shall be performed in accordance with ASTM Standards and be appropriate to the material type.

Minimum testing and density shall be required as follows:

UTILITY TRENCHES - INCLUDING BUT NOT LIMITED TO WATER, SEWER, STORM, TELEPHONE, NATURAL GAS, CABLE, AND ELECTRIC.

Material shall be deposited and spread in uniform layers not to exceed 8 inches in depth. Density tests shall be taken after the second foot and then every third foot thereafter with the final test at subgrade.

Within the roadway, existing or proposed, density tests shall be taken at intervals of not more than 200 feet and at all intersection crossings.

Within the right of way, outside of the roadway, density tests shall be taken at intervals of not more than 500 feet and at all intersection crossings.

Within open areas outside the street right of way, density tests shall be taken at intervals of not more than 1000 feet. In case of failing test, the Engineering Director has

authority to require re-testing at 500 feet intervals within the failed area.

Utility trenches within the roadway, existing or proposed, shall be compacted from the bottom of the utility trench to within 12 inches of subgrade to a density equal to at least 95% of Standard Proctor maximum dry density. All material within 12 inches of subgrade shall be compacted to a density equal to at least 100% of Standard Proctor maximum dry density.

Utility trenches outside the roadway and within open areas outside the street right of way shall be compacted to a density equal to at least 95% of Standard Proctor maximum dry density.

ROADWAYS

Material placed for roadway embankments shall be placed in uniform layers not to exceed 10 inches in depth. Density tests shall be taken after the second layer and then every third layer thereafter with the final test at subgrade. Linear frequency of density test shall be at random but no greater than 300 feet apart. In all cases, vertical curves requiring embankment shall be tested.

Roadway embankment material shall be compacted to a density equal to at least 95% of Standard Proctor maximum dry density. All material to a depth of 12 inches below the finished surface of subgrade shall be compacted to a density equal to at least 100% of Standard Proctor maximum dry density.

Density tests for stone base shall be at random but no greater than 300 feet apart. When streets are less than 600 feet in length, a minimum of three tests shall be taken.

Each layer of stone base shall be compacted to a density equal to at least 100% of Modified Proctor AASHTO T-180 maximum dry density.

7. Quality Assurance and Quality Control testing and inspections shall be required for all storm drainage system installation associated with the subdivision ordinance, unified development ordinance, and/or any system conveying stormwater runoff into or from a public right of way to ensure proper materials and workmanship. Costs for the performance of the required tests and inspections shall be paid by the Developer.

All flexible pipe, reinforced concrete box culverts, and arch culvert installations will require third-party inspection. All inspections shall be performed by a licensed, competent third-party inspection firm, and the inspections shall be directed by a North Carolina Professional Engineer. Inspections shall be completed as described in the most recent version of the City of Monroe's "Third-Party Inspection for Pipe Installation".

01.09**POST-CONSTRUCTION INSPECTIONS**

The Developer shall be responsible for retaining a National Association of Sewer Service Companies (NASSCO) Pipe Assessment Certification Program (PACP) certified professional for the purpose of performing the required post-installation inspections. Closed-Circuit Television (CCTV) and/or Confined Space Entry (CSE) inspections shall be required to verify infrastructure was installed to City Standards. This inspection shall occur after backfilling is completed to final grade but prior to completion of the paving operations. See City of Monroe "Post Installation Inspection and Repair of Storm Drainage Pipes and Culverts" for additional information.

Prior to requesting acceptance of a street(s) or associated map phase(s) the developer will submit to the City a complete post installation inspection report of the associated storm drainage system. The report shall identify any defects with an assessment for the severity and recommendations for any needed repairs in accordance with appropriate repair methods indicated by the pipe manufacturer. Re-inspections of the drainage systems will be required to verify that repairs have been properly completed. Upon satisfactory completion of repairs and receipt of a certified report, the City will provide written notice of acceptance of the storm drainage system.

The City reserves the right to randomly or at its discretion monitor, evaluate, and review videos and reports submitted by the Developer or certified consultants as a quality assurance/quality control (QA/QC) practice. Any discrepancies between the report and the City review may constitute non-acceptance of the approval.

01.10**WARRANTY – PUBLIC STREETS**

1. Prior to acceptance by the City of Monroe of any improvements in any subdivision, the subdivider shall furnish to the City of Monroe a written warranty against defects which shall guarantee the material and workmanship for a period of not less than 12 months from the date of such

acceptance. See Standard 02.03.06 for Roadway Construction Tolerances within the warranty period.

2. Upon successful performance of the improvements, as determined by the Engineering Director, for the 12-month period, the warranty shall expire. Upon the failure of an improvement to perform within the generally accepted standards for the type improvement as determined by the Engineering Director, the subdivider shall be notified and given a reasonable period of time to correct the defects. Should the subdivider fail to act, fail to act in a timely manner, or otherwise fail to correct the defect(s), the Engineering Director shall find the subdivider in default and shall institute appropriate action to obtain compliance. Until successful performance is obtained as determined by the Engineering Director, the warranty shall not expire.
3. See standards 07.10 Final Inspection and Acceptance of Subdivision Construction and 07.16 Warranty.

01.11 AS-BUILT DRAWING REQUIREMENTS

1. The Developer is required to submit a certified as-built set of construction drawings, signed and sealed by NCPE and/or NCPLS, following construction in accordance with the As-Built Drawing Checklist in Standard 07.13.
2. **The Developer must submit as-builts prior to acceptance of the improvements for maintenance by the City of Monroe.**
3. The As-Built Drawing Checklist in Standard 07.13 must be attached to each set of as-built drawings submitted for approval.
4. Each blank must be initialed by the applicant as being included on the as-built drawings or marked "N/A" if not applicable to the project.
5. The Developer is required to submit plan sheets, 24" X 36" mylar or vellum, and a digital copy in a software version format readable by current technology the City of Monroe is utilizing. Please contact the Engineering Department for information on the current operated technology.
6. All applicable information listed on the As-Built Drawing Checklist in Standard 07.13 must be included on all as-built drawings.

01.12 SURVEY CONTROL MONUMENTS

Platted surveys shall comply with North Carolina General Statute 47-30.

01.13 SUBMITTAL REQUIREMENTS

All plan submittals shall be submitted to the Permitting Center which will route the plans to the various Departments. Please visit Permit Center's website at:

<https://www.monroenc.org/240/Permit-Center>

or use the following link to submit for permits online through CityView:

<https://cvportal.monroenc.org/portal>

Sealed design calculations for street drainage, stormwater management facilities and erosion control shall be submitted.

For final approval, submit only plans applicable to the approval being requested as follows::

City of Monroe Driveway Permit: a copy of the site plan plus completed permit

NC DOT Driveway Permit: submit to NCDOT

Note: Water and sewer system improvements are submitted directly to the Water Resources Department. **One copy of the water plans and one copy of the sewer plans and profiles are to be submitted to Engineering via the Permitting Center.**