CITY OF MONROE
PUBLIC ENTERPRISE COMMITTEE
300 W. CROWELL STREET, MONROE, NC 28112
TUESDAY, MAY 6, 2025 - 4:00 PM
AGENDA
www.monroenc.org

1. Minutes Public Enterprise Committee April 1, 2025
2. Request for Sidewalk Waiver at 3301 W Roosevelt Blvd
3. Critical Intersection Analysis - Bragg Street and Lancaster Avenue
4. Critical Intersection Analysis - Johnson St. and Franklin St.
5. Updates to Engineering Standard Specifications and Detail Manual
6. Electric Service Policy Updates
7. Marshville Natural Gas Feasibility Update
8. Engineering Contract for Design of Filter #4 at the John Glenn Water Treatment Plant
9. Engineering Contract for Design of Chemical Storage Upgrades at the John Glenn Water Treatment Plant
10. Annual Bid Award for WTP Chemicals
11. Outside City Service Request 2208 White Store Road
12. Outside City Service Request 1371 N. Rocky River Road
13. WWTP Chlorine Contact Basin Rehab
14. Cleaning and Lining Downtown Water Mains - Informational Only
15. Wastewater Treatment Plant Expansion Update - Informational Only

Public Enterprise Committee Minutes
April 1, 2025
City Hall Conference Room
4:00 p.m.

Members Present: Council Member James Kerr (Chair), Council Member Franco McGee

Staff: Mark Watson, Terry Sholar, Richard Long, Rob Miller, Lisa Hollowell, Jeff Wells, Bonnie Fisher, Deanna Graham, Angela Duncan and Sandra Slifer

Council Member James Kerr called the April 1, 2025 Public Enterprise Committee meeting to order at 4:06 p.m.

Item #1: Adoption of Minutes of the March 4, 2025 Meeting

Recommendation:
Council Member James Kerr asked if anyone had any questions or concerns about the minutes, if not, if anyone would like to make a motion that the minutes of the March 4, 2025 Public Enterprise Committee be approved.

Motion:	Adopt March 4, 2025 meeting minutes
Motion made by:	Council Member Franco McGee
Second:	Council Member James Kerr
Voting:	**In Favor** – Council Member James Kerr, Council Member Franco McGee **Opposed** – None
Action:	Motion approved

Item #2: Updates to City Ordinance Chapter 58-Stormwater Utility

Recommendation:
The staff recommends approval of the Text Amendments to Chapter 58: Stormwater Utility. If Public Enterprise Committee agrees, this item will be placed on the consent agenda for consideration by the City Council at the next meeting on April 8, 2025. The Ordinance is proposed to become effective July 1, 2025 with the new fiscal year.

Presentation and Discussion:

Bonnie Fisher, Stormwater Engineering Manager, stated that since the establishment of the Stormwater Utility in November 2008, there have been no significant reviews of the corresponding ordinance section. The Stormwater staff has conducted a comprehensive review and proposed a revision. The Proposed revisions include definitions updates, text changes for

clarification, and reclassification of the billing categories for residential properties. The purpose of the reclassification is to simplify billing and to better capture the actual impervious areas created by multifamily and townhome communities. The proposed billing tier structure changes in the Fee Schedule were initially presented to Council at the Budget workshop held on March 3, 2025 and will be adopted as part of the Fiscal Year 2025 budget process.

Motion:	Approval to Amend City of Monroe Code of Ordinances Title V: Public Works Chapter 58: Stormwater Utility O-2025-10
Motion made by:	Council Member Franco McGee
Second:	Council Member James Kerr
Voting:	**In Favor** – Council Member James Kerr, Council Member Franco McGee **Opposed** – None
Action:	Motion approved

Item #3: Updates to City Ordinance Chapter 159:Stormwater Management and Creation of Chapter 155: Stormwater Illicit Discharge Elimination Ordinance- O2025-11

Recommendation:
Stormwater Staff recommends updates to the City of Monroe Code of Ordinances Chapter 159: Stormwater Management by deleting Section 159.701 "Illicit Discharges and Connections" and incorporating those regulations with modifications into a proposed new Chapter 155: Stormwater Illicit Discharge Elimination Ordinance.

Presentation and Discussion:
Bonnie Fisher, Stormwater Engineering Manager, presented a comprehensive review of Chapter 159: Stormwater Management that was conducted by the Stormwater staff. The Section 159.701 prohibits illicit discharges, connections and spills, but the penalties for violations are considered ineffectual to address the consequences of a stream pollution event. Proposed revision were provided showing Section 159.701 being deleted in its entirety and incorporated with modifications into a proposed Chapter 155: Stormwater Illicit Discharge Elimination Ordinance.

The purpose of the new Ordinance is to strengthen the City's ability to meet the requirements of the NPDES (National Pollutant Discharge Elimination System) MS4 (municipal separate storm sewer system) Permit by clarifying the objectives of the Ordinance and providing a more robust civil penalty structure for violators. The Ordinance gives the City authority to assess swift and appropriate penalties and to recover cleanup costs that may be incurred after an illicit discharge.

Motion:	Approval of the Ordinance Amendment O-2025-11 and placement items on the consent agenda for consideration by City Council at the next meeting on April 8, 2025.
Motion made by:	Council Member Franco McGee
Second:	Council Member James Kerr
Voting:	**In Favor** – Council Member James Kerr, Council Member Franco McGee **Opposed** – None
Action:	Motion approved

Item #4: Pinedell Avenue Culvert Replacement/Road Widening

Recommendation:
Stormwater Engineering staff is requesting to consider information related to award of the construction contract for the Pinedell Avenue Culvert Replacement and Road Widening Project.

Presentation and Discussion:
Sam Starnes, Stormwater Civil Engineering I, presented Project SUI 1701 that was created in Fiscal Year 2017 due to identified need to replace the Pinedell Avenue culvert in the Stormwater Management Master Plan completed in 2013. The box culvert under Pinedell Avenue is predicted to overtop during the 2-year storm event, which has a 50 percent chance of occurring within any given year. The size of the box culvert in the Pinedell Avenue is currently 8.3 feet (w) x (6.7 feet (h). To meet the City of Monroe's current standards, the proposed culvert was designed for the 25- year storm even that has a 4-percentage chance of occurrence in any given year. The Final design requires that the existing culvert be replaced with a double precast concrete box culvert. One barrel will be 10' (w) x 7' (h) and the other will be 10' (w) x 9' (h). As part of the improvement, the single-lane crossing will also be widened to allow for two-lane travel across the tributary with extended guard railing, improving public safety. All new right-of-way, temporary and permanent easement as well as all necessary permits have been acquired.

In December 2016, the Stormwater Department initiated a contract with Camper Dresser & McKee (now CDM Smith) to begin the engineering and design for the Pinedell Avenue culvert replacement for $ 110,000.00. Change Orders were approved May of 2019 and January 2023 revising the total contract cost to $191,000.00. The purpose of these change orders was to expand the scope of work to provide for complete utility relocation construction drawing and additional environmental permitting required for this project. CDM Smith provided complete, sealed drawings on February 11, 2025.

The Engineer's Estimate for this project was $911,984.70 and a formal bid process was followed to solicit bids for 21 days, closing on March 18, 2025. Staff held a formal bid opening on March 18, 2025 at 10:00 A.M. Three bids were received and the results are below.

Contractor	Bid Amount	DBE %	Comment
United of Carolinas, Inc.	$1,318,530.40	10%	Recommend Award
TruRock Construction, LLC	$1,493,448.07	10%	
NJR Group, Inc	$1,592,090.50	10%	

A 10% contingency is included in the bid to cover possible change orders during the course of the work. Construction inspections and project oversight/management will be provided by the Engineering Department. The project included a 10% goal for minority business participation which was met by the low bidder. The contract period is 180 days with liquidated damages occurring at a rate of $800.00 per day thereafter.

The project account SU1701 currently has $464,244.67 of available funds, which falls significantly short of funding the project, originally intended to be constructed in FY19. Engineering is proposing to transfer funds from SU1601 in the amount of $80,000. SU1601 was created for the Sweeper Wash Down Facility in FY16, currently nearing completion of construction. The remaining $80,000 are unencumbered funds as the project account balance exceeded the contract amount to construct. Staff recommends transferring an additional $840,000 from the Stormwater Fund Balance to fund the remainder of the project. There will be an initial surplus of $65,714.27 in the project account following these transfers. The surplus balance will be used to fund contracts for geotechnical testing and potential construction support from the design engineer, should the need arise. Any funds remaining after completion of all construction will be rolled into the fund balance upon closing the project account. Allocating these funds from the fund balance will allow for less delay in other proposed projects anticipated starting construction this calendar year, such as the Winchester Avenue culvert replacement.

Motion:	Award of the Pinedell Avenue Culvert Replacement contract to United of Carolinas, Inc. for $ 1,318,530.40, authorization of the City Manager to execute the documents including future change orders, and the Approval of the Budget Ordinance (BO-2025-09) and placement on the April 8, 2025 consent agenda for consideration.
Motion made by:	Council Member Franco McGee
Second:	Council Member James Kerr
Voting:	**In Favor** – Council Member James Kerr, Council Member Franco McGee **Opposed** – None
Action:	Motion approved

Item #5: Purchase of Compact Track Loader and Mulching Head

Recommendation:
Energy Service Staff request the Public Enterprise Committee to consider approving the purchase of a Kubota SVL97-2 HFC Compact Track Loader and Loftness 61Battle Ax S-Series Mulching Head for the Energy Services Department – Natural Gas Division.

Presentation and Discussion:
Robert Miller, General Manager of Energy Services and Water Resources, has identified the need to purchase equipment to clear vegetation from the City's natural gas pipeline right-of-ways. Maintaining the distribution pipeline right-of-ways will allow safe and reliable operation of the pipelines and improve accessibility to the infrastructure on the side of roads and highways. Maintained right-of-ways also allow increased visibility of our pipelines due to pipeline markers being more obvious.

A bid has been received for a skid steer and mulching head that meets all of the needs for the Natural Gas Division through Sourcewell. Sourcewell is a purchasing cooperative that collectively bids specified equipment providing competitive pricing as well as meeting statutory requirements. Municipalities and various educational institutions are allowed to utilize

Sourcewell through membership to the cooperative. The City has been a member since 2010 and utilizing these contracts save the time and expense of processing formal bids.

Brooks Sales, Inc. provided a quote to the City of Monroe for a Kubota SVL97-2HFC Compact Track Loader and Loftness 61 Battle Ax S-Series Mulching Head for $116,974.90 that meets the requirements of Sourcewell. Therefore, it is recommended to purchase the equipment through Sourcewell's Cooperative Purchasing Program from Brooks Sales, Inc. in the amount of $116.974.90.

Motion:	To approve sending the request to City Council to award the purchase of a Kubota SVL97-2HFC Compact Track Loader and Loftness 61 Battle Ax S- Series Mulching Head to Brook Sales, Inc. for $116,974.90 through Sourcewell's Cooperative Purchasing Program and to be placed on the City Council consent agenda to authorized the City Manager to execute the necessary documents.
Motion made by:	Council Member Franco McGee
Second:	Council Member James Kerr
Voting:	**In Favor** – Council Member James Kerr, Council Member Franco McGee **Opposed** – None
Action:	Motion approved

Item #6: Outside City Service Requests

Recommendation:
Public Enterprise Committee (PEC) is requested to consider an outside City service request for JLS Masory at 1371 N. Rocky River Road.

Presentation and Discussion:
Robert Miller, General Manager of Energy Services and Water Resources presented the request for outside City services. The request is for JLS Masonry at 1371 N. Rocky River Rd.

Robert Miller stated that all outside City services requests require both City Council approval, and Union County Board of Commissioners (UCBC) approval pursuant to City Ordinances and the Water and Sewer Master Agreement with Union County. The UCBC approved this request at their February 18, 2025 meeting.

As a matter of policy, outside City water and sewer customers pay double tap fees and double monthly customer base charges on their City accounts.

Motion:	Approve the request for outside City water service to 1371 N. Rocky River Road PIN 09-372-005-90
Motion made by:	Council Member Franco McGee
Second:	Council Member James Kerr
Voting:	**In Favor** – Council Member James Kerr, Council Member Franco McGee **Opposed** – None
Action:	Motion approved

There being no further business, the meeting is adjourned at 4:30 p.m.

_____

James Kerr, Chair

Next Meeting- May 6, 2025.

STAFF REPORT

TO: Public Enterprise Committee

VIA: Mark Watson, City Manager

DATE: May 6, 2025

FROM: Sarah McAllister, P.E., Engineering Director

PREPARED BY: Chad Splawn, Engineering Associate

SUBJECT: Request for Sidewalk Waiver at 3301 W Roosevelt Blvd

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SUMMARY STATEMENT

The Public Enterprise Committee is requested to consider a request from Kelly Benton, with Ross and Associates Real Estate, Inc, to waive the sidewalk requirements along John Moore Road and W Hwy 74. The requirements consist of an eight-foot wide sidewalk along John Moore Road as well as a ten-foot concrete multi-use path (MUP) along W Hwy 74 associated with the proposed change of use/site development at 3301 W Hwy 74.

REVIEW

The City of Monroe *Standard Specifications and Detail Manual*, Section 02.02.06 Sidewalk Requirements, requires sidewalk to be provided along existing arterial and collector streets as a development requirement based on a list of streets identified in section 02.02.06 B as well as by definitions in Section 02.01.01. Development Requirements of the Manual. This section requires the ten-foot multi use path along W Hwy 74 and the eight-foot sidewalk along John Moore Road along the property frontage. An email is attached from Kelly Benton, with Ross and Associates Real Estate, Inc, requesting a waiver of the sidewalk requirements along John Moore Road and W Hwy 74. Reasons for the deviation request cite existing above-ground utility poles and cabinet conflicts, the potential for the future NCDOT project to damage the newly installed sidewalk and lack of current pedestrian traffic. The proposed site development consists of paving an existing gravel lot to accommodate 25 new parking spaces, perimeter landscaping buffers and upfitting the existing building for a proposed retail space.

The future widening of Hwy 74 (NCDOT Project U-5764) will install a ten-foot multi use path along the project from east of Secrest Shortcut Road to the east side of John Moore Road. Parcels 09298068 and 09298068E to the west are currently under review for a retail development and would bring the ten-foot multi use path to within 185 feet from the property line at 3301 W Hwy 74, the property requesting the deviation.

As proposed, the site development requires approximately 210 linear feet of eight-foot wide sidewalk along John Moore Road and 175 linear feet of ten-foot multi use path along US Hwy 74. The intent of the sidewalk policy outlined in the Detail Manual is to allow new development to share in the placement of sidewalk along major arterial and collector streets, providing for an alternative means of transportation other than motor vehicle. Over time, this process will allow sections to be completed. Pedestrian friendliness correlates to the livability of the community.

The inclusion of pedestrian facilities meets the NCDOT Complete Streets Policy to consider and incorporate several modes of transportation when building new projects or making improvements to existing infrastructure. Existing pedestrian facilities are taken into consideration during the development of State Transportation Improvement Program Projects and decreases the costs to the City for their completion.

A copy of the email from Kelly Benton requesting the waiver is attached along with the site and paving plan for 3301 W Hwy 74.

RECOMMENDATION

The Public Enterprise Committee is requested to consider the request for a waiver from the City's *Standard Specifications and Detail Manual* regarding the sidewalk requirements along the property frontage on John Moore Road and W Hwy 74 for the proposed project located at 3301 W Hwy 74.

Attachments:
Email of Request for Sidewalk
Waiver dated March 26, 2025
from Kelly Benton
3301 W Hwy 74 Site Plan

Sarah McAllister

From: Kelly Benton <kellyrossbenton@gmail.com>
Sent: Wednesday, March 26, 2025 2:07 PM
To: Chad Splawn; Sarah McAllister; William D. Auret
Subject: Fwd: 3301 W Roosevelt

This Message Is From an External Sender
This message came from outside your organization.
Report Suspicious

Hi All,

I sent the message below with attachments and it kicked back as undeliverable. I am forwarding it to you again. Please confirm receipt. This is for a request to waive the sidewalk requirement at the above mentioned property. I can send the pictures again if you did not receive them.

---------- Forwarded message ---------
From: **Kelly Benton** <kellyrossbenton@gmail.com>
Date: Wed, Mar 26, 2025 at 1:59 PM
Subject: Re: 3301 W Roosevelt
To: Chad Splawn <csplawn@monroenc.org>
CC: William D. Auret <wauret@monroenc.org>, Sarah McAllister <smcallister@monroenc.org>

Chad,

Thank you for all of your help thus far. I'm replying as instructed to each of you regarding sidewalks at the intersection of Highway 74 and John Moore Road.

When the owner purchased this property, they were made aware of a plan to widen the road at some point. The owners have a great concern that money invested in sidewalks could be a loss if the road is widened.

The owners have yet to see pedestrians in this area, and they have been working on this property for two years now. It is a high traffic location with a large ravine and a very narrow strip of ground area along 74. I would not attempt to walk in this location with speeding traffic and a ravine beside me. Beyond this business, there is a long stretch of nothing but woods and vacant land heading west on 74. The AutoZone, strip mall across the street and dealership make up businesses on the neighboring corners of the intersection. None of these businesses have sidewalks nor are there sidewalks in the general area.

As you turn the corner on John Moore Road there is a congregation of various utilities, powerlines, power poles, electric boxes, water, and other that cause this corner to be congested. Once more, I nor the owner have yet to observe foot traffic on this road. It is a pass-through street for traffic from Old Charlotte Highway and residential neighborhoods. Walkers and pedestrians do not go out to 74 for exercise in this area. It is too dangerous. A sidewalk could be placed away from the congested utility area at the corner and pass the entrance off of John Moore for the property to the back corner of the property. The owner is unsure what purpose this would serve to the public, and it would be costly for them with no real purpose or benefit.

The owners are working on a budget and the expense of paving and meeting all requirements for buffers, etc is adding up to a large amount. They are asking for the city to take into account the things they have observed and respectfully consider a waiver for the sidewalks.

Please see attached pictures for reference. Thank you all!

Kelly Ross Benton
Ross and Associates Real Estate, Inc
Serving Union, Mecklenburg, and surrounding counties since 1994
704-291-0888 cell
704-289-3694 office
704-292-1710 fax

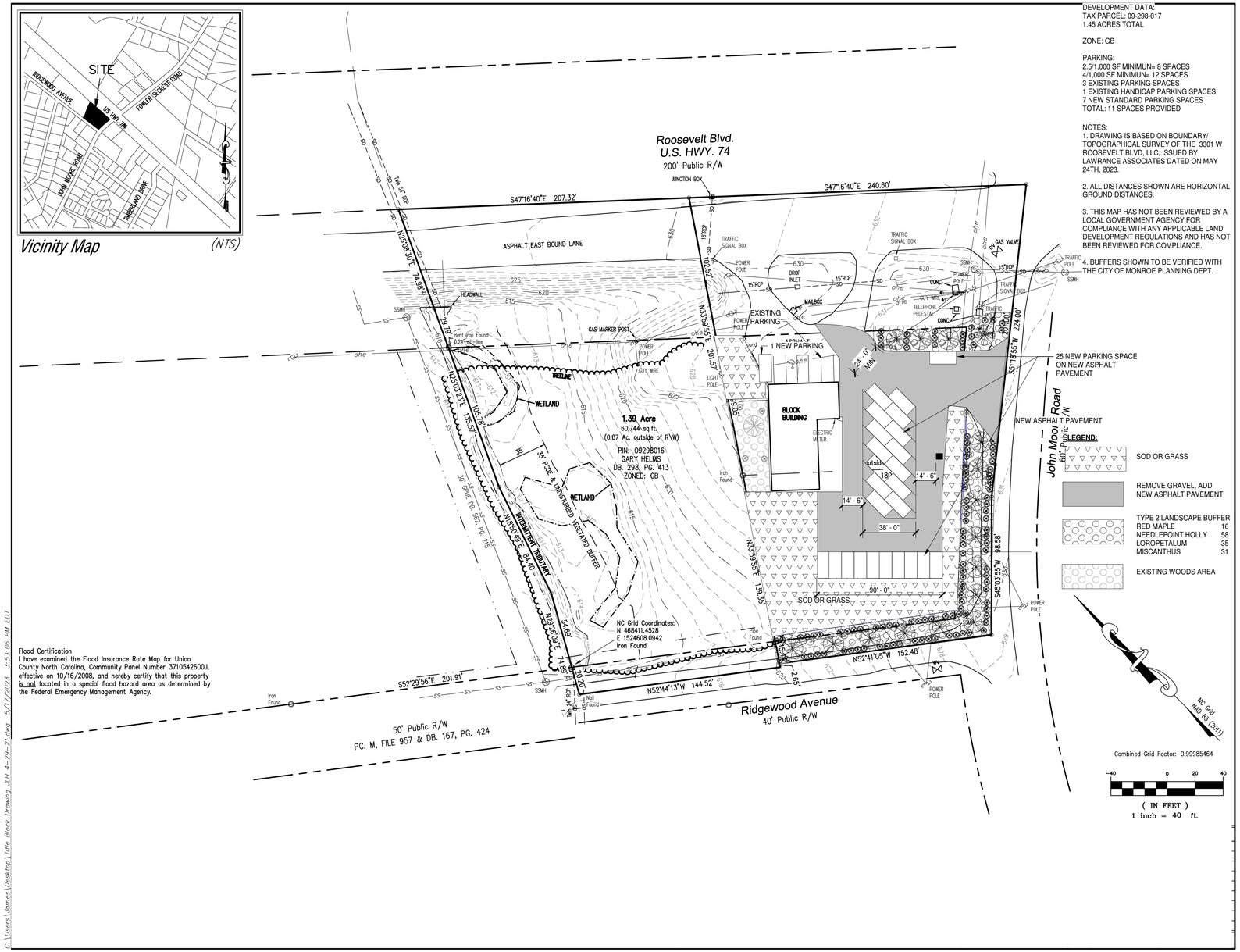
On Fri, Mar 21, 2025 at 4:16 PM Chad Splawn <csplawn@monroenc.org> wrote:

> Kelly,
>
> The request for deviation from the sidewalk requirements can be a simple email to myself and those copied here.
>
> Your request should include any sidewalk you wish to not install and any reasons explaining why you are requesting the deviation. This will be taken before a council committee prior to going to council for a vote. You are welcome to attend both meetings.
>
> I was mistaken about the NCDOT project installing 10' sidewalk on W Hwy 74. They are proposing the sidewalk to stop on the east side of John Moore Rd.
>
> Let me know if you have any questions.
>
> Thanks,
>
> **Chad Splawn**






WRONG
WAY



DEVELOPMENT DATA:
TAX PARCEL: 09-298-017
1.45 ACRES TOTAL

ZONE: GB

PARKING:
2.5/1,000 SF MINIMUN= 8 SPACES
4/1,000 SF MINIMUN= 12 SPACES
3 EXISTING PARKING SPACES
1 EXISTING HANDICAP PARKING SPACES
7 NEW STANDARD PARKING SPACES
TOTAL: 11 SPACES PROVIDED

NOTES:
1. DRAWING IS BASED ON BOUNDARY/ TOPOGRAPHICAL SURVEY OF THE 3301 W ROOSEVELT BLVD, LLC, ISSUED BY LAWRANCE ASSOCIATES DATED ON MAY 24TH, 2023.

2. ALL DISTANCES SHOWN ARE HORIZONTAL GROUND DISTANCES.

3. THIS MAP HAS NOT BEEN REVIEWED BY A LOCAL GOVERNMENT AGENCY FOR COMPLIANCE WITH ANY APPLICABLE LAND DEVELOPMENT REGULATIONS AND HAS NOT BEEN REVIEWED FOR COMPLIANCE.

4. BUFFERS SHOWN TO BE VERIFIED WITH THE CITY OF MONROE PLANNING DEPT.

LEGEND:

- SOD OR GRASS
- REMOVE GRAVEL, ADD NEW ASPHALT PAVEMENT
- TYPE 2 LANDSCAPE BUFFER
  - RED MAPLE 16
  - NEEDLEPOINT HOLLY 58
  - LOROPETALUM 35
  - MISCANTHUS 31
- EXISTING WOODS AREA

Flood Certification
I have examined the Flood Insurance Rate Map for Union County North Carolina, Community Panel Number 3710542600J, effective on 10/16/2008, and hereby certify that this property is not located in a special flood hazard area as determined by the Federal Emergency Management Agency.

C:\Users\James\Desktop\Title Block Drawing JH 4-29-21.dwg 5/17/2023 3:53:08 PM EDT

LLT Engineering, PLLC

No.	Description	Date

3301 W ROOSEVELT BLVD
, LLC

CITY OF MONROE,
UNION COUNTY, NORTH CAROLINA

PARKING SPACE SKETCH PLAN

Project number	LLT202408
Date	12/18/2024
Drawn by	FL
Checked by	FL

C101

Scale 1" = 40'-0"

2/14/2025 12:29:49 AM

STAFF REPORT

TO: Public Enterprise Committee

VIA: Mark Watson, City Manager

DATE: May 6, 2025

FROM: Sarah McAllister, P.E., Engineering Director

PREPARED BY: Will Auret, P.E. – Land Development Engineering Manager

SUBJECT: Critical Intersection Analysis – Bragg Street and Lancaster Avenue

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SUMMARY STATEMENT

The Public Enterprise Committee is requested to consider recommending City Council enter into an Interlocal Agreement with Union County for another critical intersection analysis of the Bragg Street and Lancaster Avenue intersection.

REVIEW

Engineering Staff has been working with Bjorn Hansen, Transportation Planner with Union County, along with representatives from the North Carolina Department of Transportation (NCDOT) and staff from other municipalities within Union County on another Union County Critical Intersection Analysis. The intent is to identify locations throughout the county that have experienced congestion and safety issues, provide a further evaluation based on existing data, and narrow the list to those that would be most competitive for funding through the NCDOT and/or the Charlotte Regional Transportation Planning Organization (CRTPO). Union County has been awarded a grant in the amount of $160,000 with a required local government match of $40,000. The City's portion of the local match would be $4,000 with the County contributing $24,000 and the rest being provided from other municipalities.

Similar processes took place in 2016, 2019, 2023 and 2024 in which several intersections within Monroe were identified. The Williams Road intersection with Old Charlotte Highway was identified in the 2016 list and later qualified for spot safety funds through NCDOT. Construction of a traffic signal with turn lanes is under construction. The Poplin Road and Unionville-Indian

Trail Road intersection was identified in the 2019 list, later received funding and a four-way stop was installed. The Sutherland Avenue and Walkup Avenue intersection was identified in the 2023 list and was submitted as a project to CRTPO in the fall of 2023.

City Council approved the inclusion of the Bragg Street and Lancaster Avenue intersection for this round of analysis on September 10, 2024. Union County has provided an Interlocal Agreement for this project which includes the City's $4,000 participation toward the required match for the grant. A copy of the Interlocal Agreement is provided along with a Resolution supporting the agreement. Funds have been requested in the Engineering Department's operating accounts as part of the FY26 budget process to cover the $4,000 required match.

RECOMMENDATION

Staff recommends approval of the Resolution (R-2025-03) endorsing the Interlocal Agreement with Union County and authorization of the City Manager to execute the agreement. If the Public Enterprise is in agreement, the Resolution (R-2025-03) endorsing the Interlocal Agreement and authorization of the City Manager will be placed on the May 13th consent agenda for approval.

Attachment:
Resolution Endorsing Interlocal Agreement
Interlocal Agreement with Union County

RESOLUTION ENDORSING INTERLOCAL AGREEMENT FOR CRITICAL INTERSECTION ANALYSIS OF THE BRAGG STREET AND LANCASTER AVENUE INTERSECTION R-2025-03

WHEREAS, Union County was awarded a grant from the Charlotte Regional Transportation Planning Organization (CRTPO) for a critical intersection analysis that will study the intersection of Bragg Street, a municipal street and Lancaster Avenue, a State secondary road (SR3515), within the corporate limits of Monroe along with other locations around the County in order to consider future intersection improvements; and,

WHEREAS, CRTPO has committed to provide the County One Hundred Sixty Thousand Dollars ($160,000) in reimbursed costs under the grant, with an additional Forty Thousand Dollars ($40,000) required under the grant as a local government required match for a total project cost of $200,000; and,

WHEREAS, Union County has agreed to contribute at least Twenty-Four Thousand Dollars ($24,000) toward the required match for the analysis of four intersections with each municipality responsible for providing a 10% match for the intersection(s) located within their jurisdiction; and,

WHEREAS, the City of Monroe has agreed to contribute Four Thousand Dollars ($4,000) toward the required match for one intersection; and,

WHEREAS, the remaining local match will be met by other municipalities within Union County where the four other intersections are located; and,

WHEREAS, the project will provide recommended improvements to increase safety and mobility at the Bragg Street and Lancaster Avenue intersection along with a cost estimate for construction of said improvements in an effort to be competitive for funding through the NCDOT and/or the Charlotte Regional Transportation Planning Organization (CRTPO).

NOW, THEREFORE BE IT RESOLVED that the City Council of Monroe endorses the Interlocal Agreement with Union County for the Critical Intersection Analysis of the Bragg Street and Lancaster Avenue intersection and authorizes the City Manager to execute the agreement.

Adopted this 13th day of May, 2025.

Attest: Mayor Robert Burns

Bridgette Robinson, City Clerk

STATE OF NORTH CAROLINA

AGREEMENT

COUNTY OF UNION

THIS AGREEMENT, is made and entered into this _____, by and between Union County (the "County") and the City of Monroe (the "Municipality") (hereinafter collectively referred to as the "Parties").

W I T N E S S E T H:

WHEREAS, the County was awarded a grant from the Charlotte Regional Transportation Planning Organization ("CRTPO") for a critical intersection analysis study that will study certain traffic intersections in Union County, including certain intersection(s) in the Municipality, in order to consider implementing future intersection improvements (the "Grant"); and

WHEREAS, the Grant will allow for County to select and engage a consultant (the "Consultant") to perform the critical intersection analysis study and produce a subsequent report (the "Study"); and

WHEREAS, under the Grant CRTPO will reimburse the County for its costs for the Study in the amount of One Hundred Sixty Thousand Dollars ($160,000), with an additional Forty Thousand Dollars ($40,000) required under the Grant as a local government match (the "Match"); and

WHEREAS, the County will contribute at least Twenty-Four Thousand Dollars ($24,000) toward the Match; and

WHEREAS, the Municipality has agreed to contribute Four Thousand Dollars ($4,000) toward the Match due to the Study including intersection(s) within the Municipality's limits (the "Municipality Contribution"); and

WHEREAS, this Agreement is made under the authority of N.C. Gen. Stat. § 160A-460 et seq and all other applicable law.

NOW, THEREFORE, for and in consideration of the mutual covenants and agreements hereinafter set forth, the parties hereto do each contract and agree with the other as follows:

1. The term of this Agreement shall begin on mutual execution and shall continue until December 31, 2026. This Agreement may only be terminated upon expiration of the aforementioned term without an amendment extending the term executed by both parties to this Agreement. Notwithstanding the foregoing, the Parties may, by mutual written consent, terminate this Agreement at any time and for any reason.

2. After 50% of the work for the Study is complete, as reasonably determined by the County, the County will invoice the Municipality for the Municipality Contribution. Within thirty (30) days of receipt of such invoice, the Municipality shall pay the Municipality Contribution.

3. The County shall directly select and engage the Consultant to perform the Study. The Parties agree to work collaboratively with the Consultant to provide any reasonably requested information and assistance needed for the Study. Upon completion, and County's receipt, of the Study, the County will ensure that the Municipality receives a copy of the Study.

4. This Agreement may be amended at any time by mutual, written consent of the parties.

5. This Agreement may be signed in counterparts, each of which shall be an original, with the same effect as if the signatures thereto and hereto were upon the same instrument. The Parties hereto confirm that any facsimile copy or photocopy of another party's executed counterpart of this Agreement (or its signature page thereof) will be deemed to be an executed original thereof.

IN WITNESS WHEREOF, the Parties hereto have caused this instrument to be executed the day and year above written.

UNION COUNTY:

Attest: _____ By: _____
Lynn West, Clerk to the Board
Brian W. Matthews,
County Manager

CITY OF MONROE:

Attest: _____ By: _____
Bridgette Robinson, Clerk
Mark Watson, City Manager

This instrument has been pre-audited for the City of Monroe in the manner required by the Local Government Budget and Fiscal Control Act.

_____
Finance Officer

City of Monroe
Where Heartland Meets High Tech

STAFF REPORT

TO: Public Enterprise Committee

VIA: Mark Watson, City Manager

DATE: May 6, 2025

FROM: Sarah McAllister, P.E. – Engineering Director

PREPARED BY: Will Auret, P.E. – Land Development Engineering Manager

SUBJECT: Critical Intersection Analysis – Johnson St. and Franklin St.

SUMMARY STATEMENT

The Public Enterprise Committee is provided information regarding an update to the 2023 Union County Critical Intersection Analysis and is requested to consider two alternative design concepts for the intersection of Johnson St. and Franklin St. for recommendation to City Council.

REVIEW

Engineering Staff has been working with Bjorn Hansen, Transportation Planner with Union County, along with representatives from the North Carolina Department of Transportation (NCDOT) and staff from other municipalities within Union County on the 2024 Union County Critical Intersection Analysis. The intent was to identify locations throughout the county that have experienced congestion and safety issues, provide a further evaluation based on existing data, and narrow the list to those that would be most competitive for funding through the NCDOT and/or the Charlotte Regional Transportation Planning Organization (CRTPO).

The County applied for and received planning funds through CRTPO for six intersections in 2024 that were identified through the 2024 Critical Intersection Analysis process. The intersection of Johnson St. and Franklin St. was one of the six intersections selected for further study. The County has since entered into a contract with RK&K to provide an analysis of each intersection. The City entered into an Interlocal Agreement with the County on April 2, 2024 which included the City's $4,000 participation towards the required match for the grant received through CRTPO.

RK&K has developed three alternative conceptual designs for the intersection of Johnson St and Franklin St. Each alternative is outlined in the bullet points below:

- Alternate 1A – Proposed Traffic Signal with Concrete Median Island
- Alternate 1B – Proposed Traffic Signal with Landscaped Median Island
- Alternate 2 – Proposed Traffic Signal with Painted Median Island

In addition to the traffic signal, each alternate would include resurfacing and minimal sidewalk, curb and gutter, and curb ramp repairs. Please see the attached illustrations, which were provided during the public comment period in March 2025 that illustrates all three designs and provides a comparison.

There were 22 responses received for this intersection during the public comment period and those are attached. 45% of respondents chose option 1B – Proposed Signal with Landscaped Median. Most comments for those in favor of the landscaped median believed it would maintain the neighborhood characteristics and be visually appealing. Comments against the median/island were concerned with access to side roads.

The recommendation on which design alternative is preferred by the City of Monroe is solicited from the Public Enterprise Committee. Staff recommends Alternate 1B – Proposed Traffic Signal with Landscaped Median since it provides for decreased delays and reduced total crashes. Once selected, the recommendation would go on to Council for their approval and would be included in the final report issued for the 2024 Critical Intersection Analysis. The recommended design could be submitted to CRTPO to compete for funding during a future call for discretionary projects.

RECOMMENDATION

Staff will be prepared to discuss the proposed alternative designs at the meeting on May 6, 2025.

Attachments:
Public Involvement Website Information
Public Comments Received

Union County
Critical Intersections Phase III – Public Involvement Summary

Public Involvement Approach

The Union County Critical Intersection Program – Phase III public involvement approach included:

- Demographic research to identify Limited English Proficiency (LEP) and other traditionally underserved populations for potential language access services and targeted outreach;
- Development of a GIS storymap containing a program overview and individual project tabs with conceptual alternative designs, visualizations, cost estimates, a comparison of benefits and impacts, and a Survey 123 for stakeholders to provide information and input on their design preferences, existing conditions and concerns;
- Postcards distributed to intersection project stakeholders announcing the virtual public meetings and providing links to Union County's Critical Intersection website; and,
- Five virtual public meetings conducted via Zoom including a presentation of the program and the focus intersection and a Q&A forum for attendee stakeholders to ask written questions. Panelists responded to questions verbally and with written responses. The chat box was used to share links/info.

  Town of Fairview - 3/5/25
  City of Monroe - 3/6/25
  Village of Wesley Chapel - 3/11/25
  Town of Indian Trail - 3/13/25
  Village of Marvin - 3/27/25

Summary

1. Overall stakeholder input vs. Town specific input
2. Comments/concerns regarding conceptual designs
3. Do stakeholder conceptual design preferences align with the most effective/lower cost options?

Franklin St. at Johnson St. (Monroe)

Comments, questions and concerns pertained to environmental impacts, right of way impacts, reducing the width of the median to avoid and minimize impacts, traffic operations, the desire for a traffic signal, medians and access impacts, the desire for the landscaped median/aesthetic enhancements consistent with the community's character, potential for impacts to historic resources, impacts to EMS access and response time, construction related impacts, the inclusion of sidewalks and pedestrian signals in the project design, traffic calming, bike/ped safety, and acknowledgement of the higher cost of the chosen alterative. Some respondents were not in favor of the project. **Most survey respondents and public meeting attendees favored Alternate 1B, the highest cost option** ($4.1 mil), although other alternates and the no action option received support. Two thirds of respondents favor the extension of the median for the full corridor from North West Street to west of North Charlotte Avenue.

Survey 123 Summary

- Respondents – 22
- Alternate 1A: Proposed Signal with Concrete Median Island - 13.64%
  Alternate 1B: Proposed Signal with Landscaped Median Island - 45.45%
  Alternate 2: Proposed Signal with Painted Median Island - 18.18%
  All of the Alternates - 13.64%
  None of the Alternates - 9.09%

- A concrete or landscaped median would provide maximum safety and benefit by forcing drivers to follow the new configuration.
- We need a light there. This would improve my daily commute as well as the commute of other citizens of Monroe.
- Was a roundabout considered for this location? Also, median construction east of Johnson St. to Charlotte Ave. would limit access to some properties and could cause issues for cyclists and emergency vehicles.
- Franklin is a residential street and often the first view of Monroe for visitors. A landscaped median would help maintain the neighborhood characteristics. A concrete median would sorely detract from its historic charm. Drivers often treat Franklin as a highway due to its width. Restoring a landscaped median would help this issue.
- Include pedestrian crossing signals and buttons at the new intersection.
- The best option is to have a middle turn lane so all of these side roads can be accessed from either direction otherwise there will be people doing U-turns constantly and causing more accidents.
- I don't like the median idea and feel a whole turn lane would be best for the use of the multiple side roads.
- Landscape medians are ok when maintained but too often they're overgrown and can impede visibility.
- Considering safety, cost weighed against increased concrete infrastructure. Landscaping will add to the visual appeal while not increasing costs dramatically. I think it is worth the investment.
- Please consider reducing the width of the median so that residents' yards are not impacted. We may be giving up the ability to turn left on Bragg during slow times of the day. Please leave our property as intact as possible.
- I live on W. Jefferson. Why can't something be done to ELIMINATE truck traffic on W. Jefferson. It is a "NO TRUCKS" street but because of the MESS at N. Charlotte Ave./W. Franklin/W. Jefferson trucks ignore the No Truck signs and use W. Jefferson. NOTHING has, is, or will be done without somebody actually doing something.

Public Meeting Summary

- Attendees – 11
- Would a 'right turn only' from Johnson St. and W. Franklin St. along with a landscaped median accomplish the same safety and function as a signaled intersection?
- Everyone on W Franklin St. is excited about the landscaped median being reinstalled from Charlotte Ave to Bragg St., could that median width be reduced to 8' to avoid any road widening? We have 4 national register historically designated houses from 400-1000 W. Franklin.
- Does option 1B maintain sidewalks in front of all houses?
- Would there be signal buttons for pedestrian crossing?
- With the median will there be room for EMS vehicles that frequently use the road?
- Could dense bushes such as box woods be planted in the median to help reduce noise?

Summary prepared by:

Tristram Ford

Tristram Ford
Public Involvement Lead
RK&K

cc: Project File

Union County Critical Intersections - Phase III



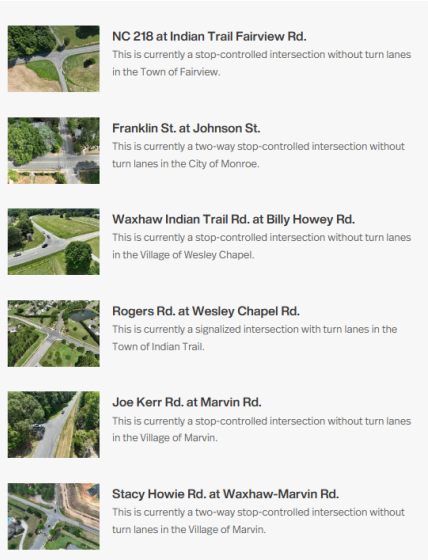
UNION COUNTY
north carolina

Johnson Street at Franklin Street

RK&K

Program Background

- Six intersections included in the Phase III study effort
- Overall Study Goals:
  - Review existing safety and operational issues for each site
  - Perform traffic/safety analysis and concept design of multiple options
  - Develop costs for each, as well as relative benefits
  - Present two alternates to the public
  - Gather feedback and identify the preferred local design
- Submit preferred alternate for funding through NCDOT or CRTPO



NC 218 at Indian Trail Fairview Rd.
This is currently a stop-controlled intersection without turn lanes in the Town of Fairview.

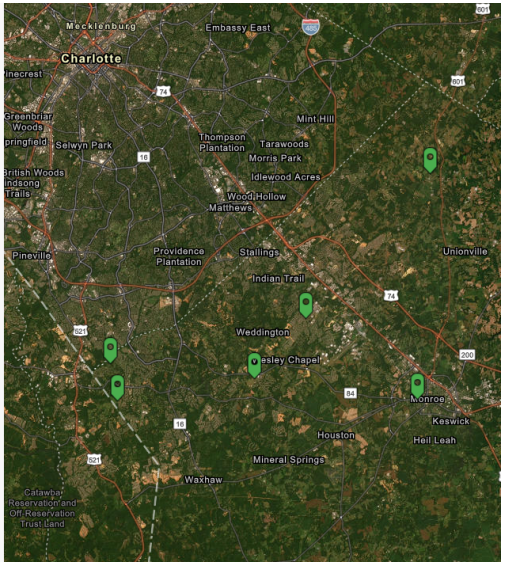
Franklin St. at Johnson St.
This is currently a two-way stop-controlled intersection without turn lanes in the City of Monroe.

Waxhaw Indian Trail Rd. at Billy Howey Rd.
This is currently a stop-controlled intersection without turn lanes in the Village of Wesley Chapel.

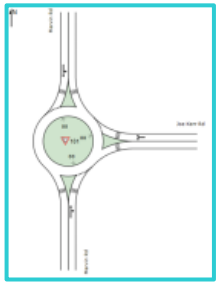
Rogers Rd. at Wesley Chapel Rd.
This is currently a signalized intersection with turn lanes in the Town of Indian Trail.

Joe Kerr Rd. at Marvin Rd.
This is currently a stop-controlled intersection without turn lanes in the Village of Marvin.

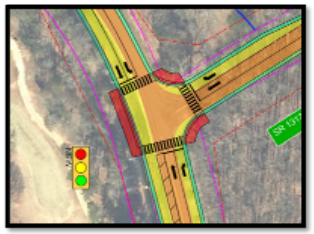
Stacy Howie Rd. at Waxhaw-Marvin Rd.
This is currently a two-way stop-controlled intersection without turn lanes in the Village of Marvin.



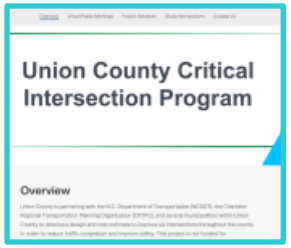
Process Overview



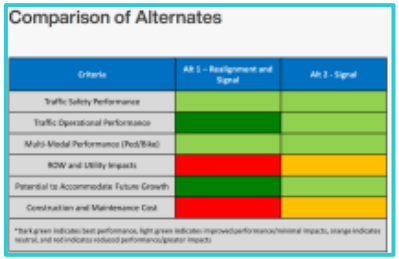
Data Collection & Traffic and Safety Analysis



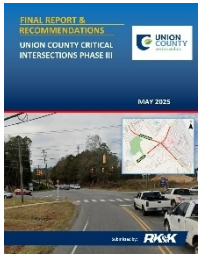
Develop and Refine Alternates & Estimates



Public Outreach



Preferred Alternate Selection



Final Report & Recommendations

COMMITTEE MEETINGS:
MUNICIPAL REPRESENTATIVES
UNION COUNTY
NCDOT
CRTPO
DESIGN TEAM



Traffic Analysis

Traffic Analysis & Improvement Development

- Traffic count data collected - 2024
- Developed appropriate traffic growth rates
- Design Year – 2050
  - Assuming construction by 2030
- Crash History Review
- Signal Warrant Analysis
- Site Specific Improvement Analysis
  - Expected crash reductions
  - Expected delays and queue lengths





Approach	2024 Existing	
	AM Peak	PM Peak
EB	B	A
WB	B	A
NB	F	F
SB	F	F
Overall	C	C

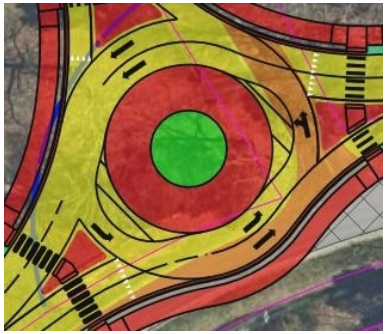
Option	Modification	CMF	Crash Types
1 – Unsignalized Intersection with Safety Enhancements	Rumble Strips	1.118	All
		0.903	K,A,B,C Crash Types
		0.798	Crash that involved vehicles running stop sign
	Large Stop Sign	0.81	All
	Other Warning Devices	0.917	All
	Left Turn Lane	0.51	All
2 – Single-lane Roundabout	Single-lane Roundabout	0.63	All
		0.28	Injury Crashes

Concept Design

Concept Design Development

- Design layouts based on traffic analysis
- Conceptual Design Layout
  - Based on LiDAR Data
  - Future design phase would include detailed survey
  - Limits of construction will likely change in the detailed design phase
- Conceptual layouts serve as a guide to determine which alternate is the best fit





Public Outreach

- Online GIS Story Map
  - Program overview
  - Conceptual designs
  - 3D renderings
  - Cost estimates
  - Comparison of benefits and impacts
  - Survey for public to provide input on their design preferences
- Postcards distributed with links to virtual public meetings and providing Union County's site
- Virtual Public Meeting held for each site
- Surveys closed March 31st
- Meeting held with municipalities and County to review survey results and public meetings.



Next Steps

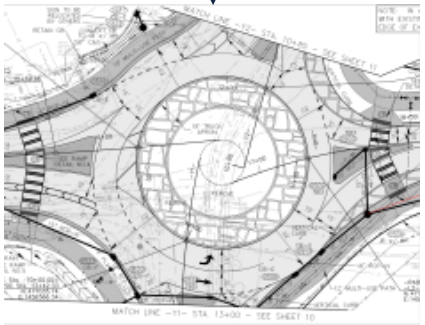
- Municipalities confirm preferred alternate
- Union County to adopt preferred alternates in June
- Apply for funding NCDOT and CRTPO
  - Possibly Fall 2025
  - Local match requirements very by funding source
- Generally 2 to 3 years from funding award to construction
  - Detailed design
  - ROW & Easement acquisition
  - Utility relocations
  - Federal permitting requirements



ALTERNATE SELECTION & ADOPTION



FUNDING APPLICATION



DETAILED SURVEY & DESIGN

UTILITIES, ROW & PERMITTING



CONSTRUCTION

Existing Conditions

Existing Conditions

- High frequency of angle crashes
- Significant delays expected for the NB/SB minor street movements in 2050
- Difficult pedestrian crossings



Design Options

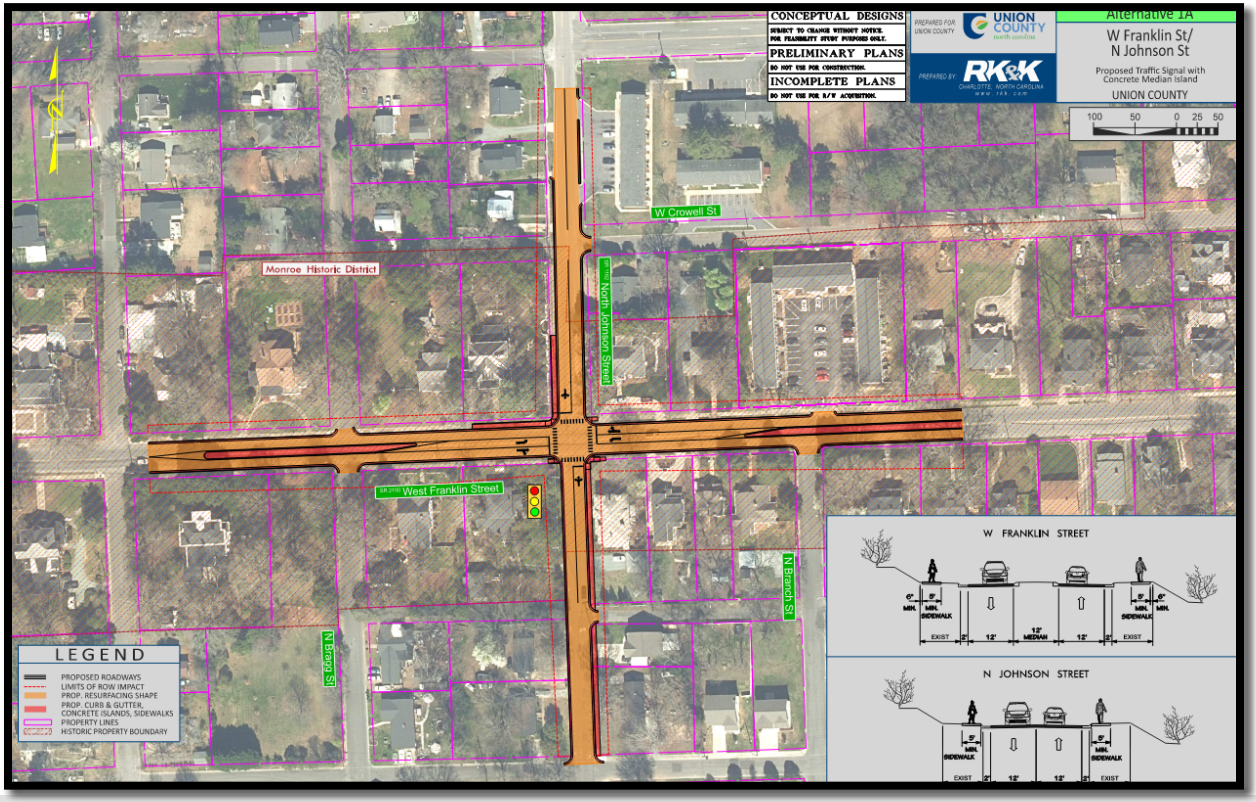
- Final designs presented to public
  - Signal with Concrete Median
  - Signal with Painted Median

- Other options considered and eliminated
  - Roundabout – The footprint of a potential roundabout would be too large for the intersection; The roundabout would have significant property impacts
  - Mini Roundabout – This idea was discarded due to the percentage of trucks that use this road and the difficulty of a truck navigating a mini roundabout
  - All-Way Stop – Delays on the main road would be too high due to the volume of traffic on the main road versus the minor road

Design Options

Alternative 01A – Signal with Concrete Median

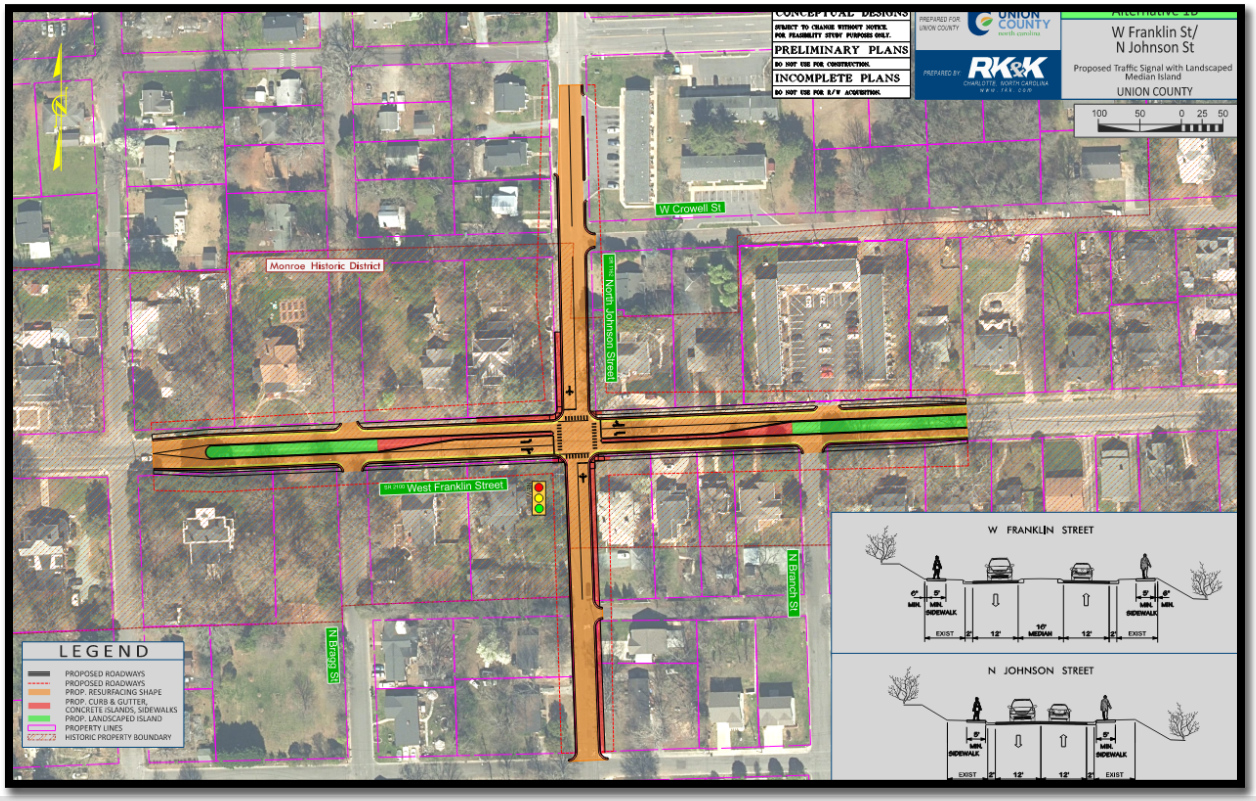
- Traffic Signal
- Left-Turn Lanes along Franklin Street
- Median added to control cross-traffic



Design Options

Alternative 01B – Signal with Full Concrete Median

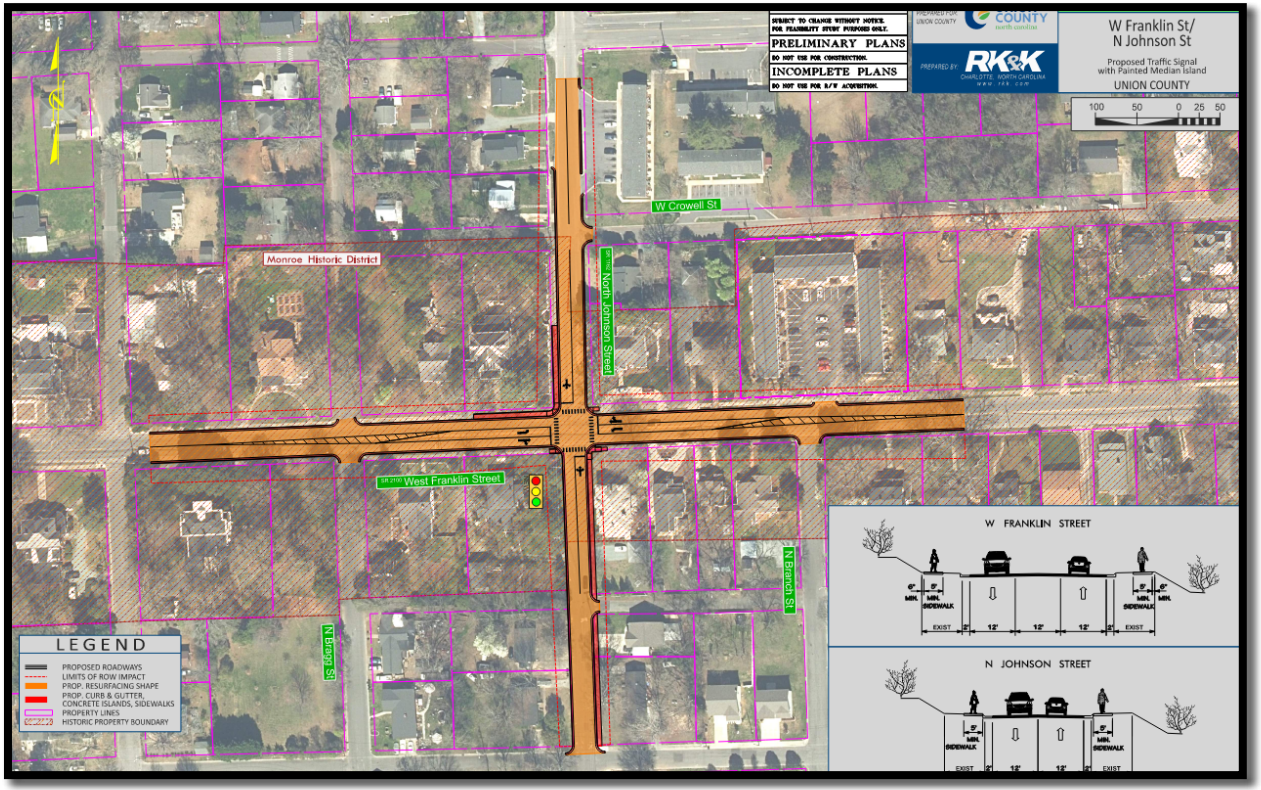
- Improvements similar to Alternative 1A
- Wider medians that extend to the intersection
- Median areas could include landscaping for a “Gateway” entrance to the City



Design Options

Alternative 02 – Signal with Painted Median

- Traffic Signal
- Left-Turn Lanes along Franklin Street
- Painted median to reduce cost and impact



Design Options

Possible full corridor median installation

- This figure shows a potential extension of the median installation along Franklin St.
- This extension would further improve traffic safety and operation for the corridor.
- It would also improve safety for pedestrians crossing Franklin St. with a pedestrian refuge in the middle



Comparison Summary

ALTERNATE COMPARISON	
Existing Conditions: High frequency of angle crashes Significant delays expected for the NB/SB minor street movements in 2050 Difficult pedestrian crossings	
ALTERNATE 01A/B: SIGNAL W/CONCRETE MEDIAN	**ALTERNATE 02: SIGNAL W/PAINTED MEDIAN**
Both options will improve traffic flow and safety	
> Signalized intersection > Left-Turn Lanes along Franklin Street > Median added to control cross-traffic and accommodate pedestrian crossings	> Signalized intersection > Left-Turn Lanes along Franklin Street > Painted median to reduce cost and impact
Expected reduction in total crashes by 30%	Expected reduction in total crashes by 20%
Significantly reduced delays (over 80% for minor street approaches) and improved traffic operations in all directions	Significantly reduced delays (over 80% for minor street approaches) and improved traffic operations in all directions
Improved access control and pedestrian corossings for improved overall corridor safety	

Cost Estimates

ALTERNATE 01A: SIGNAL W/ MINIMIZED CONCRETE MEDIAN
ALTERNATE 01B: SIGNAL W/ FULL CONCRETE MEDIAN (GATEWAY)
ALTERNATE 02: SIGNAL W/PAINTED MEDIAN

CONCEPT LEVEL PROJECT COST SUMMARY									
ALTERNATE	BASE CONSTR. COST	ENGINEERING / ENVIRON.	CEI	RIGHT-OF-WAY	UTILITY RELOCATION	CONTINGENCY (ALL CATEGORIES)	NCDOT ADMIN (ALL CATEGORIES)	TOTAL PROJECT COST 2025	TOTAL PROJECT COST 2030
		25%	20%			40%	10%		
1A	$1,377,900	$344,500	$275,600	$6,400	$75,000	$831,800	$291,100	$3,202,300	$3,712,343
1B	$1,725,700	$431,400	$345,100	$64,200	$337,500	$1,161,600	$406,600	$4,472,100	$5,184,390
2	$1,309,600	$327,400	$261,900	$6,400	$75,000	$792,100	$277,200	$3,049,600	$3,535,322

CONTINGENCY - Applied to conceptual design projects to account for preliminary nature of design - applied to all categories
ENGINEERING / ENVIRON. - Detailed Survey, Design and Environmental Permitting
NCDOT ADMIN - NCDOT costs to manage and adminster the project
>NCDOT makes every effort to reduce admin costs to the project
CEI - Construction Engineering and Inspection
RIGHT-OF-WAY - Cost of acquiring easements and right-of-way
UTILITY RELOCATION - Cost of relocating utilites by utility owners
TOTAL PROJECT COST (2025) - Total project cost in the current year
TOTAL PROJECT COST (2030) - Total project cost at the anticipated construction year (2030)

Overall Comparison Chart

Criteria	Alt 1A – Signal with Concrete Median	Alt 1B – Signal with Landscaped Median	Alt 2 – Signal with Painted Median
Traffic Safety Performance			
Traffic Operational Performance			
Multi-Modal Performance (Ped/Bike)			
ROW and Utility Impacts			
Potential to Accommodate Future Growth			
Construction and Maintenance Cost			

*Dark green indicates best performance, light green indicates improved performance/minimal impacts, orange indicates neutral, and red indicates reduced performance/greater impacts

Survey Results

Survey 123 Summary

Alternate 1A: Proposed Signal with Concrete Median Island - 13.64%

Alternate 1B: Proposed Signal with Landscaped Median Island - 45.45%

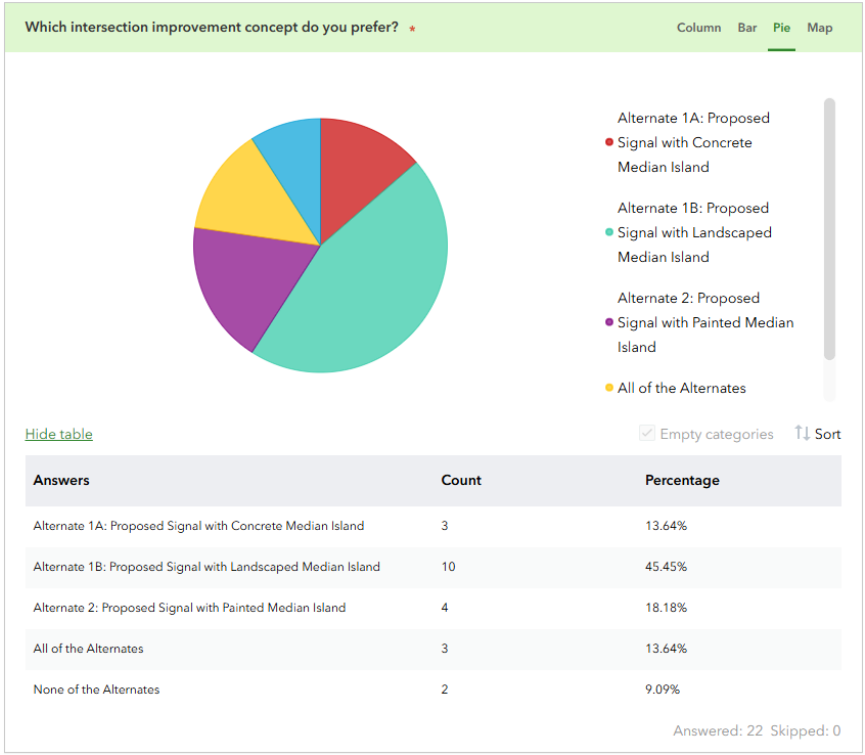
Alternate 2: Proposed Signal with Painted Median Island - 18.18%

All of the Alternates - 13.64%

None of the Alternates - 9.09%

Two thirds of respondents favor the extension of the median for the full corridor from North West Street to west of North Charlotte Avenue

Answers	Count	Percentage
Yes	14	63.64%
No	7	31.82%



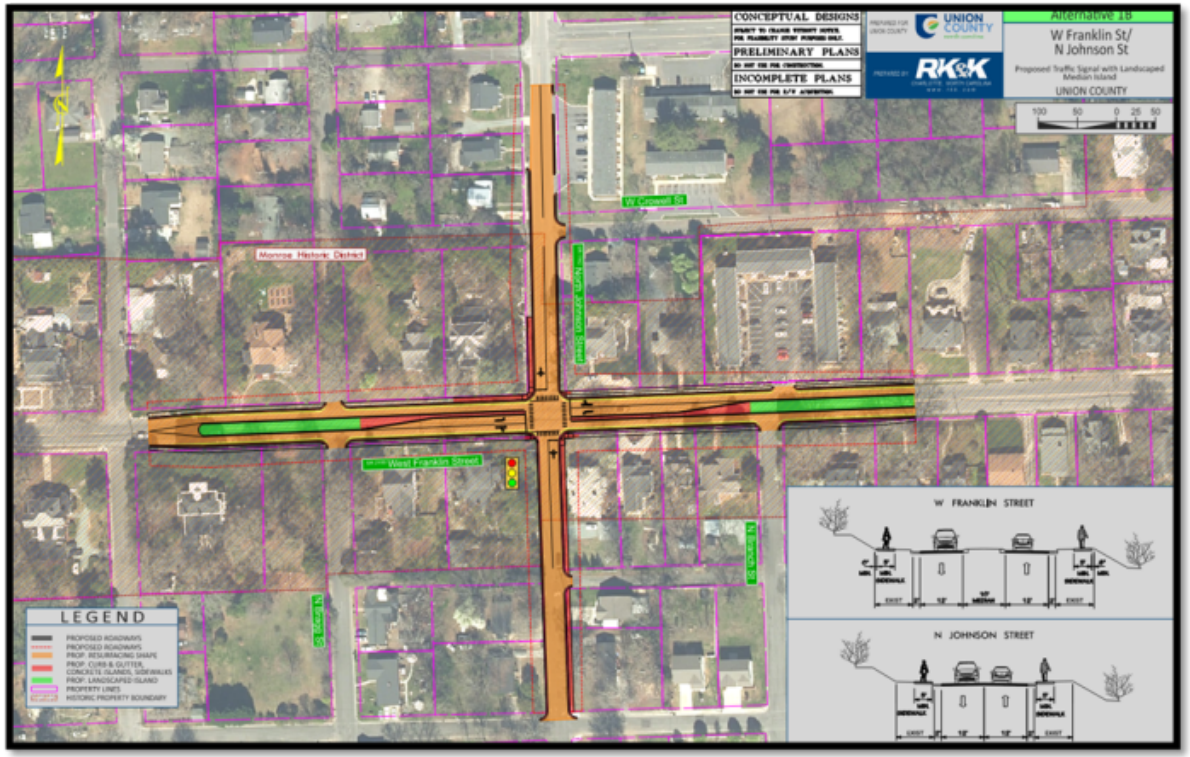
Answers	Count	Percentage
Alternate 1A: Proposed Signal with Concrete Median Island	3	13.64%
Alternate 1B: Proposed Signal with Landscaped Median Island	10	45.45%
Alternate 2: Proposed Signal with Painted Median Island	4	18.18%
All of the Alternates	3	13.64%
None of the Alternates	2	9.09%

Answered: 22 Skipped: 0

Preferred Alternate

Preferred Alternate – #01B
Signal with Full Concrete Median

- Report to be finalized in May
- Union County to adopt preferred alternates in June



STAFF REPORT

TO: Public Enterprise Committee

VIA: Mark Watson, City Manager

DATE: May 6, 2025

FROM: Sarah McAllister, P.E., Engineering Director

PREPARED BY: Bonnie Fisher, P.E. – Stormwater Engineering Manager

SUBJECT: Updates to Engineering Standard Specifications and Detail Manual

SUMMARY STATEMENT

The Public Enterprise Committee is requested to consider recommended updates to the City of Monroe Engineering Standard Specifications and Detail Manual.

REVIEW

A comprehensive review of the Engineering Standards Sections 01.00 through 08.00 was conducted by Engineering staff. A Bluebeam review session was created to invite all technical staff to make comments and recommendations on a common PDF document. A committee of senior staff then reviewed the common document section by section and collaborated to make the final recommended changes to the Manual.

The updates focused on ensuring that references to ordinances, design standards, policies, processes, and staff contact information were accurate and current. Additionally, new standards and significant revisions made are noted below:

1. Section 01.08 – Add new standards for post-installation inspections for storm drainage pipe, requiring Closed Circuit Television inspections (CCTV). New policies for specific requirements were adapted from other local municipalities to support the new standards (see the attached "*City of Monroe Post-Installation Inspection of Storm Drainage Pipes and Culverts*" and "*City of Monroe Third-Party Inspection for Pipe Installations*").

2. Section 02.03.05 #15 - Remove reference to sand seal to require surface course asphalt placed on any bituminous asphalt base or intermediate course within one year of placement or when parcels are 80% built out, whichever occurs first.

3. Standard Detail updates – Sidewalks and accessible ramp details were modified to meet the PROWAG (Public Right-of-Way Accessibility Guideline) standards that were adopted by the Federal General Services Administration in July 2024.

4. Section 02.02.06B – Remove specific arterial/collector roads list and replace with sidewalk required along the property frontage for <u>any</u> non-single family lot development and new residential and commercial subdivisions.

RECOMMENDATION

Staff recommends approval of the recommended changes to the Standard Specifications and Detail Manual Sections 01.00 through 08.00. If the Public Enterprise Committee is in agreement, this item will be placed on the consent agenda for consideration by City Council at the next meeting on May 13, 2025.

Attachments: Ordinance Amendment O-2025-05

Updated Engineering Standard Specifications and Detail Manual Sections 01.00 through 08.00 with Cover

Engineering Standard Specifications and Detail Manual Sections 01.00 through 08.00 with tracked changes

City of Monroe Post-Installation Inspection of Storm Drainage Pipes and Culverts (NEW)

City of Monroe Third-Party Inspection for Pipe Installations (NEW)

AN ORDINANCE TO AMEND CITY OF MONROE
STANDARD SPECIFICATIONS AND DETAIL MANUAL
O-2025-05

BE IT ORDAINED by the City Council of the City of Monroe that the City of Monroe Standard Specifications and Detail Manual be amended as follows:

Section 1. Amend REVISION LOG to add:

Rev. No.	Date Adopted by City Council	Summary
17.	May 13, 2025	Revised per Ordinance O-2025-05

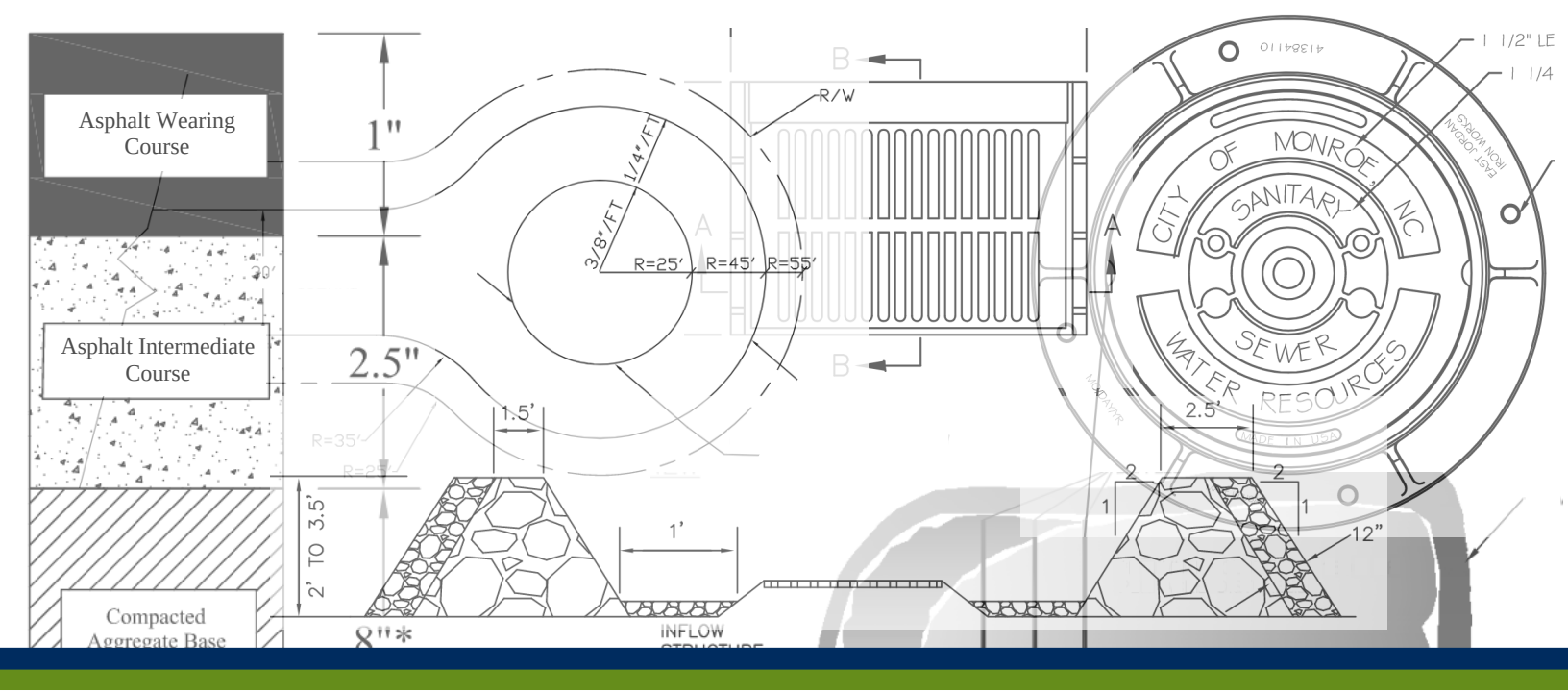
Section 2. Amend COVER, PREFACE, TABLE OF CONTENTS, and DIVISIONS 01.00, 02.00, 03.00, 04.00, 05.00, 06.00, 07.00, and 08.00 as shown by the attached documents.

Section 3. This Ordinance shall be effective upon adoption.

Adopted this 13th day of May, 2025.

Attest: Robert A. Burns, Mayor

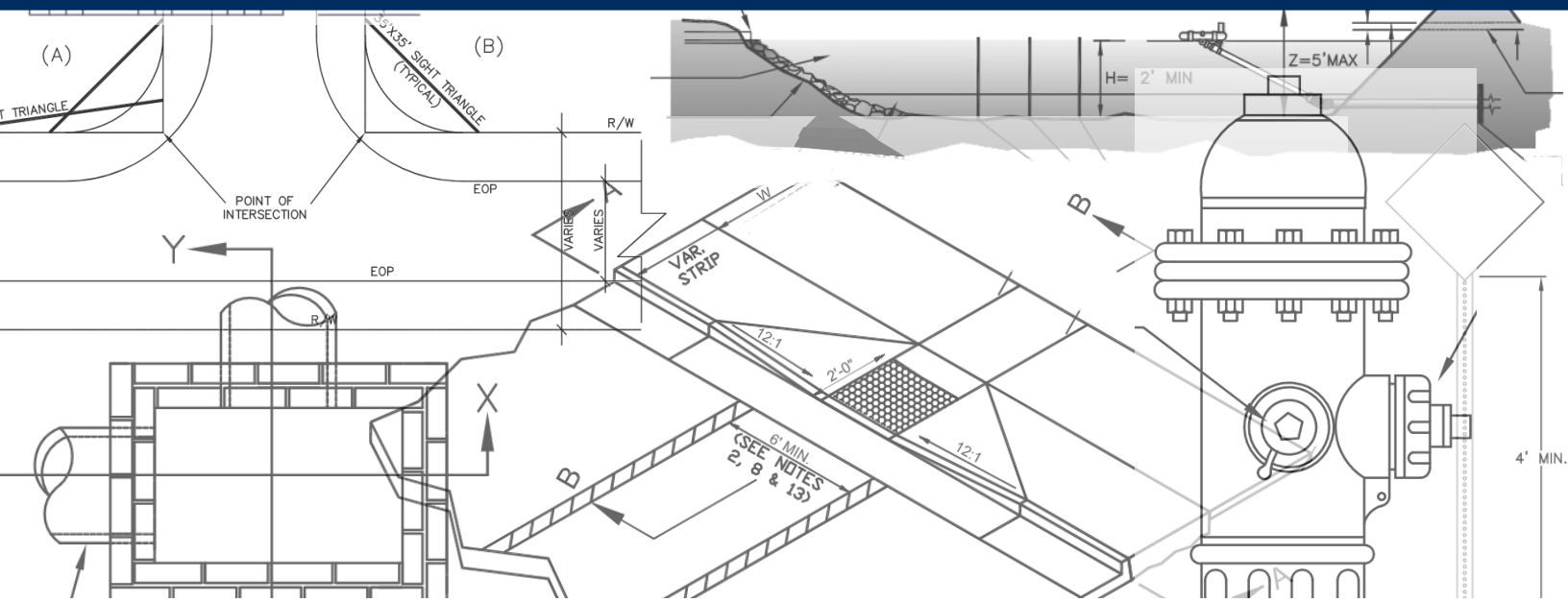
Bridgette H. Robinson, City Clerk



City of Monroe

Standard Specifications and Detail Manual

Revised January 2025



monroenc.org/170/Standard-Specifications

Monroe
North Carolina

PREFACE

This manual, entitled City of Monroe Standard Specifications and Detail Manual, sets forth the minimum acceptable criteria for public and private roadway facilities, storm drainage structures, stormwater control structures, water mains, and sewer mains within the City of Monroe. Deviations from these standards may be considered; however, it shall be the responsibility of the applicant to demonstrate to the satisfaction of the City's Engineering Director or the City's Water Resources Director that the proposed deviation meets or exceeds the minimum acceptable criteria. Any proposed waiver of a standard provision may only be made according to the procedures set forth in this manual. Policies and technical criteria not specifically addressed in this document shall follow the provisions of the latest editions of the American Association of State Highway and Transportation Officials' "A Policy on Geometric Design of Highways and Streets "Standard Specifications for Roads and Structures" of the North Carolina Department of Transportation, the NCDOT- Guidelines for Drainage Studies and Hydraulic Design, and the NCDEQ Stormwater Design Manual.

REVISION LOG

Rev. No.	Date Adopted by City Council	Summary
	August 21, 2001	City of Monroe Standard Specifications and Detail Manual Adopted. Ordinance O-2001-32
1.	September 4, 2001	Added: Section 02.02.06 Sidewalk Requirements, Detail 02.01.08 Residential Cul-de-sacs, Detail 02.01.09 Commercial Cul-de-sacs Ordinance O-2001-39
2.	April 2, 2002	Section 03.00 Erosion and Sedimentation Control: Effective Date July 1, 2002 Updated Pages: ii, 03-1, 07-13 Ordinance O-2002-24
3.	July 16, 2002	Section 02.02.06 Sidewalk Requirements Added: M. L. King, Jr. Boulevard to Sub-section B.1.and added Sub-Section B. 2. Updated Pages: Table of Contents, ii, 02-9 through 02-15; Ordinance O-2002-37
4.	April 20, 2004	Revised per Ordinance 0-2004-12
5.	October 5, 2004	Revised per Ordinance O-2004-35
6.	December 7, 2004	Revised per Ordinance O-2004-47
7.	January 18, 2005	Revised per Ordinance O-2005-03
8.	July 15, 2008	Revised per Ordinance O-2008-18
9.	September 16, 2008	Revised per Ordinance O-2008-37
10.	November 4, 2008	Revised per Ordinance O-2008-48
11.	April 5, 2011	Revised per Ordinance O-2011-02
12.	April 21, 2015	Revised per Ordinance O-2015-01
13.	March 6, 2018	Revised per Ordinance O-2018-04
13.	September 4, 2018	Revised per Ordinance O-2018-27
14.	May 7, 2019	Revised per Ordinance O-2019-29
15.	October 11, 2022	Revised per Ordinance O-2022-67
16.	October 10, 2023	Revised per Ordinance O-2023-55
17.	May 13, 2025	Revised per Ordinance O-2025-05

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A8 SAMPLE CALCULATION FOR DETERMINING REQUIRED PIPE SIZE
A9 RATIONAL METHOD PIPE DESIGN FOR INLET CONTROL SAMPLE CALCULATION
A10 DENSITY TEST WORKSHEET

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 to 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:

Task	Appropriate Standard	
Confined Space Entry	Confined Space	OSHA 1910.146
Use of Explosives	Explosives and Blasting Agents	OSHA 1910.109
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 Protection Agency	30, 58 & 395
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 Engineering Department Document "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.**

Post-Installation Inspection of Storm Drainage Pipes and Culverts

The City of Monroe (City) is requiring a post installation inspection of storm drainage pipes and culverts installed through the Land Development process. This inspection, performed at the expense of the developer, shall assess the internal condition of the pipes using Closed Circuit Television Inspection (CCTV) and/or confined space entry (CSE) to verify compliance with the installation standards referenced in the current version of the Monroe Standard Specifications and Detail Manual.

The conditions and requirements of this document apply to any system (regardless of constructed material) subject to the subdivision ordinance, Unified Development Ordinance (UDO) and/or any system installed and/or modified by a developer that conveys runoff from a public right of way.

Prior to requesting acceptance of a street(s) or associated map phase(s) developer will submit to the City a complete post installation inspection report of the associated storm drainage system. Defects, if observed, shall be assessed for severity and if necessary repaired in accordance with appropriate repair methods indicated by the pipe manufacturer. Re-inspections of the drainage system will be required to verify that repairs have been properly completed. Upon satisfactory completion of repairs, the City will provide written notice of acceptance.

General Guidelines for Post Installation Inspections:

- Post installation inspections are to be completed before placing the final lift of pavement (where applicable), but no sooner than 30 days after backfill placement.
- Pipes must be clean of all debris and obstructions at the time of inspection to allow for a continuous complete inspection, partial inspections are not allowed.
- For flexible pipes, deflection testing must be performed in accordance with the City of Monroe ***Third-Party Inspection for Pipe Installation*** Document.

Closed Circuit Television Inspection Requirements (CCTV):

Applies to all pipes up to 48" in diameter or a vertical rise up to 48" in non-circular applications.

- All pipe inspections must be completed by a National Association of Sewer Service Companies (NAASCO) Pipeline Assessment Certification Program (PACP) certified professional.
    - All defects must be coded in accordance with the most recent version of the PACP.
    - Each pipe run must have a separate video and report.
- Video and associated report and infrastructure map shall identify and include the following:
    - Project and/or Street Name
    - Upstream and Downstream structures, labeled consistently with approved development plans.
    - Direction of Video
    - Pipe size and material, both to be field verified by operator.
- Camera shall be centered within the pipe, both vertically and horizontally and shall have a full unobstructed view of the entire pipe.
- Lighting shall be sufficient to produce a clear image of the entire periphery of the pipe interior.
- Video image shall be clear, focused and relatively free of distortion that would prevent the reviewer from evaluating the condition of the pipe.
- Operator shall not exceed a speed of 30 ft/min.
- Operator shall stop and complete a 360-degree assessment of each pipe joint.

Confined Space Entry Inspection Requirements (CSE):
Applies to all pipes 54" in diameter or greater or pipes with a vertical rise of 54" or greater in non-circular applications.

- Entrants/Inspection staff must conduct inspections according to OSHA requirements for confined space entry where applicable.
- Camera, Video and Lighting shall be sufficient to produce a clear image of the entire periphery of the pipe interior.
- Provide images or video of all defects. Use an appropriate measuring tool to document severity of defect.
- For Flexible Pipes, provide deflection testing at 10' intervals along pipe alignment. Provide measurements at each location in both the horizontal and vertical directions.

Post Installation Inspection Report Requirements:
A Post Installation Inspection Report (Report) summarizing the inspection results shall be submitted to the City for review. City Staff will review the report for completeness and accuracy. If staff determine that additional repairs are needed outside of what was recommended, additional video and reporting will be required. The report shall include the following:

- Project Name – Example: The Forest at Monroe
- CityView Number – Example: PREN2025-00001
- Pipe Installation Contractor – Example: ABC Development
- Plat, map or drawing identifying each pipe segment assessed/proposed for acceptance with all structure nodes labeled consistent with the approved development plans.
- Inspection Results – per pipe run
    - For pipes inspected by CCTV, standard software reporting is acceptable.
    - For pipes inspected by CSE, pipe inspection logs are required.
- Repairs
    - Where repairs were completed prior to the submission of the report to the City, provide documentation and photographs to support repair was completed satisfactorily.
- Where repairs have not yet been made, provide a remediation method for each observed defect. R emediation must be consistent with NCDOT repair recommendations and/or pipe manufacture and industry standards for each respective defect and must have a design life equal to or greater than the pipe being repaired.

The City reserves the right to randomly or at its discretion monitor, evaluate, and review videos and reports submitted by the owner 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.

Third-Party Inspection for Pipe Installations

The City of Monroe (City) is approving the use of third-party inspection firms for inspection of certain pipe installations based on the conditions and requirements of this document. There is not an alternative option for City staff to perform these inspections.

The conditions and requirements of this document apply to any portion of the storm drainage system placed within and/or conveying runoff from the public right of way Testing and inspections must be structure to structure, no partial inspections are allowed.

A professional engineer licensed in the state of North Carolina will be responsible for the completion of the Post Installation Certification Statement found in **Exhibit 1**, certifying the conditions and requirements within this document have been met prior to street acceptance and bond release. The certifier should note that some of the checklist items herein pertain to certification of items and require inspections prior to, during, and after construction.

Definitions:

Flexible Pipe: High Density Polyethylene, Polypropylene, Corrugated Aluminized Steel and Corrugated Aluminum Alloy Pipes Arches and/or Plate.

Non-Standard Pipe: Reinforced Concrete Box Culverts, Reinforced Concrete Arch Culverts.

Third Party Inspection Requirements:

- Inspections shall be performed by a licensed, competent third-party inspection firm and the inspections shall be directed or performed by a North Carolina Professional Engineer.
- The third-party inspection firm shall have no ownership or financial interest in the development other than that created by being retained as a third-party inspector and/or Engineer of Record.
- All pipe materials that are subject to Third-Party inspection, as defined within this document, must be inspected and approved by a third-party inspector prior to installation. At a minimum the following information will be required:
  - ☐ AASHTO or ASTM Designation
  - ☐ Pipe class and type of wall (concrete products)
  - ☐ The date of manufacture
  - ☐ Name or trademark of the manufacturer

- All backfill material shall be approved by the third-party inspector prior to placement of the material within the trench. See Section 1.08 of the Standard Specifications and Detail Manual.
- The third-party inspector must be present during the backfilling operations of all pipe subject to the conditions and requirements of this document. The inspector shall be present during the final trench preparation, backfilling of the haunch, soil lifts, compaction of soils up to the finished grade, and to verify that adequate cover over the pipe has been provided prior to heavy equipment being allowed to operate over the pipe.
- The engineer overseeing the inspection activities is responsible for specifying the rate and type of physical testing of soils and compaction that is to be performed by the third-party to verify the conditions of this document have been met.

- Inspections and reports must Meet the additional conditions found in **Appendix A** of this document.
- Provide to the City an engineer's report prior to requesting a final inspection. The report shall include:
    - Documentation
        - Inspection reports and delivery tickets
        - Mandrel, laser profile, or direct measurement results
        - PACP compliant pipe video and pipe video inspection reports
            - pipe video and video inspection reports should be included on a single flash drive
    - Post Installation certification statement

Exhibit 1 – Post-Installation Certification Statement

Post-Installation Certification Statement

I do hereby certify that the pipe and backfill materials have been inspected, installed, and repaired per the requirements herein and in the Standard Specifications and Detail Manual. I have reported all defects, and repairs have been made to address all defects.

_____ _____

Professional Engineer's Signature **Date**

Project Name: _____

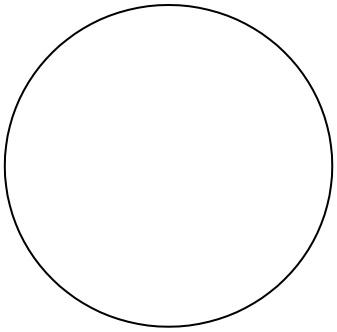
City of Monroe Project Number: _____

Project Address: _____

Owner's Name: _____

Owner's Address: _____

Date of Compliance Verification: _____



(Professional seal)

Appendix A – Third-Party Inspection Requirements

1. Third-party inspectors are charged with performing required inspections associated with the City of Monroe's "Third Party Inspection for Pipe Installation" document. Any inspection report with the term "observe" in-lieu of "inspection" for the third-party inspections will be rejected and required to be revised for City acceptance.
2. Installation of pipes/culverts associated within this document is subject to the City of Monroe *Post Installation Inspection of Storm Drainage Pipes and Culverts*.
3. The third-party inspector/engineer will be responsible for documenting the visual observations of the pipes installed condition, determine if/when rehabilitation needs to be made on the pipe segment and specify the appropriate renewal or repair method per Industry Standards. All NASSCO-PACP defect codes and grades will require recommendations from the Engineer of Record for rehabilitation, or replacement (if warranted).
4. The Engineer's recommendations must be reviewed and approved by City staff before starting rehabilitation or replacement. Any defects of the pipe identified by the video process will be repaired by the owner prior to acceptance of the roadway. Additional pipe video and deflection testing of repairs may be required by the City staff prior to roadway acceptance.
5. Inspection reports should include:
    i. Development name
    ii. City of Monroe project number
    iii. Date and time of inspection and weather
    iv. Inspector name
    v. Location of inspection based on the construction plans
    vi. Report summary of:
        1. work activities
        2. methods
        3. machinery used
        4. materials used
        5. loading / unloading practices
        6. testing
    vii. Photos of work activities
    viii. PACP compliant pipe video and pipe video inspection reports
    ix. Report on corrective actions requested and actions taken by the owner to comply with the request
    x. Photos or copies of any product and material tickets available
        1. Verify that all pipes are sourced through an NCDOT approved producer/supplier and they must participate in the NCDOT QA/QC program for each respective pipe material.

City staff may request additional information regarding specific sections of interest, observations made in the report, or their own observations on the site.

6. All storm drainage installation utilizing flexible pipe shall also require a post installation deformation evaluation. Test the polypropylene pipe for up to 3% and HDPE, Aluminum/Aluminized pipe for up to 5% deformation. Any pipe that exceeds 3%-5% respective

deformation shall be replaced/reinstalled by the owner, immediately upon receiving test findings. No exceptions to the 3%-5% testing requirement will be allowed.

i. Thirty (30) days or later after backfilling the pipe, deflection testing shall be performed.
ii. Round pipe - Certified Mean Pipe Diameter - The certified mean pipe diameter shall be the nominal diameter shown on the plans. AASHTO inside diameter tolerances shall not be used for ranges in assuming the provided pipe's diameter for deflection comparisons. Allowable exceptions in defining the certified mean pipe diameter are:
    1. The owner may submit the certified mean pipe diameter that is supplied by the manufacturer at the time of shipment to the third-party inspector. This diameter may then be used as the certified mean pipe diameter in deflection comparisons.
    2. Prior to pipe installation, the third-party inspector may perform direct measurements of the pipe at a section on the pipe with no defects or out of roundness. Measurements shall be taken to the nearest hundredth of a foot. This diameter may then be used as the certified mean pipe diameter in deflection comparisons.
iii. The third-party inspector shall utilize one of the following methods through the entire length of each flexible pipe installed:
    1. Mandrel testing:
        a. To ensure measurements, the owner shall clean the lines prior to testing.
        b. The owner shall supply a mandrel and proving ring for each pipe size installed.
            i. Mandrel requirements:
                1. Rigid, nonadjustable, with pulling rings on each end.
                    a. Manufactured from steel or aluminum and able to withstand 200psi without being deformed.
                2. Engraved with the nominal pipe size and mandrel outside diameter at a location other than on a runner.
                3. Outer diameter equal to 97% of the certified mean pipe diameter of the pipe for polypropylene pipe and 95% for HDPE pipe
                    a. Statistical or other "tolerance packages" shall not be considered in mandrel sizing.
                4. Odd number of equally spaced fins (9 minimum) with a length not less than 7/16 of the outside diameter of the mandrel.
            ii. Proving Ring requirements:
                1. Manufactured of steel or aluminum.

2. Inner diameter 0.02” larger than the mandrel outside diameter that is engraved on the mandrel.
3. An exception for use of the proving ring may be allowed where the mandrel manufacturer’s documentation provides an acceptable method to the City’s inspector for validating the mandrel size within 0.1-inch of the size that is engraved on the mandrel.

c. Verify each mandrel size with their respective proving ring.
d. Pull the properly sized mandrel through each pipe. No mechanical equipment shall be used in the deflection testing. If the properly sized mandrel successfully is pulled through the entire length of the pipe without resistance, the pipe passes. Otherwise, the pipe fails.
e. Report Requirements:
    i. Provide a table with identifiable IDs for each pipe with a pass/fail designation from the mandrel test.

2. Laser profile testing:
    a. The inspector shall be NASSCO PACP certified.
    b. To ensure measurements, the owner shall clean the lines prior to testing.
    c. No flow or standing water shall be allowed in the pipe during laser profile testing.
    d. Laser profile requirements
        i. The deflection measurement equipment shall be able to measure deflection/ovality to the nearest 0.5%.
            1. Equipment shall have a certified accuracy of 0.5% or better and a repeatability of 0.12% or better.
        ii. The inspection company shall provide the City with the manufacturer’s user manual and specifications for the laser profile test equipment. Any deviation from the recommended inspection calibration, allowable pipe sizes/ shapes/ material, inspection practices, or requirements shall be cause for rejection of the inspection.
        iii. Calibrate the laser deflection measuring tool according to manufacturer’s specifications.
            1. The calibration process shall be recorded and provided with the report.
        iv. Show time and distance in the video image, so that the speed of the inspection can be verified at intermittent points throughout the video. Under no circumstances shall the rate of inspection exceed the manufacturer’s recommendations or 30 feet per minute, whichever is more restrictive.

v. Deflection shall be measured at 0.1-foot intervals along the pipe.

e. Report Requirements:
   i. Provide a report that documents the certified mean pipe diameter versus any pipe deformation measurements of 3% or greater for polypropylene pipe and 5% for HDPE and aluminum/aluminized pipe, with the respective 3%-5% deflection limit clearly delineated.
   ii. Any locations where the respective 3%-5% deflection limit has been exceeded, the measurement should be highlighted and marked with the word "Fail".
   iii. Provide a table with identifiable IDs for each pipe with a pass/fail designation from the Laser profile testing.
   iv. Quantified measurements of flattening, creasing, buckling, asymmetrical sections, peaking, non-uniform curvature, reverse curvature, or other deformation concerns should be integrated into the final PACP inspection report.
f. Mandrel testing or manned entry inspection, at the owner's expense, will be required where the measurements in the laser profile testing are called into question by the Engineer.

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^{o}. Intersections may be allowed to have a minimum angle of 75^{o} 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

03.00 EROSION AND SEDIMENTATION CONTROL

03.01 GENERAL

03.01.01 REQUIREMENTS

1. General requirements are listed in the City of Monroe Erosion and Sedimentation Control Ordinance, Chapter 158 of the City Code.

2. In cases where a subdivision developer will also be constructing on individual lots within the subdivision, the Erosion and Sedimentation Control Plan Review and Approval may be completed simultaneously. It is the property owner's ultimate responsibility to ensure that all land-disturbing activities are properly permitted and maintained in accordance with all local state, and federal requirements. (A separate ESC Plan is required for property owner's building within an approved subdivision under construction by a separate developer.)

3. If property changes ownership at any time during the course of land-disturbing activity or before permanent erosion control measures are established, the new property owner must submit a revised Installation & Maintenance Agreement or Financial Responsibility Form for the property.

4. The Erosion and Sedimentation Control Ordinance requires erosion and sedimentation control measures to be installed in areas of land-disturbing activity to prevent accelerated erosion and movement of soil from the project location. Any activities which transport soil, mud or dust onto the public right-of-way or adjacent private properties will cause the person conducting the land-disturbing activity to be in violation of the Erosion and Sedimentation Control Ordinance and subject to applicable penalties.

5. Effort should be made not to uncover more than 20 acres at any one time. If more than 20 acres are to be uncovered at any one time, the plan shall contain the following:

    a. The method of limiting the time of exposure and amount of exposed area to achieve the objectives of this chapter
    b. A cut/fill analysis that shows where soil will be moved from one area of the tract to another as ground elevation is changed.
    c. Construction sequence and construction phasing to justify the time and amount of exposure.
    d. Techniques to be used to prevent sedimentation associated with larger disturbed area.
    e. Additional erosion control measures, structures, and devices to prevent sedimentation.

6. A lien agent is required in accordance with North Carolina Statute 44A-11.1 for improvements to real property at the time the original building permit is issued if the costs of the improvements are $30,000 or more. Per North Carolina General Statute 87-14, a building permit will not be issued until lien agent verification has been obtained through the City of Monroe Permit Department.

03.01.02 COMPUTATIONS

1. All computations and assumptions used to formulate an erosion control plan shall be in accordance with the City of Monroe's Stormwater Ordinance and the City of Monroe's Erosion and Sedimentation Control Ordinance and shall be reviewed by the City of Monroe Engineering Department.

2. Erosion and sedimentation control measures, structures, and devices shall be planned, designed, and constructed to control the calculated peak runoff from a 10-year frequency storm.

3. Runoff rates shall be calculated using the USDA Soil Conservation Service Method, the Rational Method, or other acceptable calculation procedures as approved by the Engineering Director.

4. Runoff computations shall be based on rainfall data published by the National Weather Service for the Monroe, NC station. The National Weather Service website is http://www.nws.noaa.gov/.

03.01.03 SCHEDULING

1. Temporary and permanent erosion control measures shall be provided for all land disturbing work in accordance with an erosion control plan reviewed and approved by the City of Monroe Engineering Department.

2. A grading permit shall be obtained from the City of Monroe Engineering Department prior to beginning site work.

3. Erosion Control measures shall be installed by the Developer and inspected by the City of Monroe Engineering Department for compliance prior to any land disturbing activity.

4. All permanent erosion control measures shall be incorporated into the work at the earliest practical time.

5. All temporary measures shall be maintained until the permanent measures have taken effect or are approved for removal by the City of Monroe Engineering Department.

6. Temporary and permanent measures shall be coordinated to provide effective and continuous erosion control throughout the construction and

post-construction period to minimize siltation of streams, lakes, reservoirs, and other impoundments, ground surfaces, and other property.

7. Temporary measures shall remain in place until the Engineering Director approves Certification Form 1-07 Final Erosion Control Acceptance Form.

03.01.04 CONSTRUCTION SEQUENCE

1. Obtain Approval Letter for Erosion Control and schedule pre-construction meeting on-site with the City of Monroe Engineering Department Erosion Control Specialist. All approved plans and required permits will be issued at the meeting prior to any land disturbing activity.

2. Install all erosion control measures as shown on Approved Plan.

3. Submit Certification Form 1-01, Primary Erosion Control Inspection Form, to the Erosion Control Specialist during the inspection of installed erosion control measures.

4. Proceed with grading.

5. Clean sediment basins when one-half full. Check after every rain event. Maintain rain gauge and record keeping per NPDES permitting requirements.

6. Seed and mulch denuded area immediately after finished grades are established.

7. Maintain soil erosion control measures until a permanent ground cover is established.

8. Additional measures may be required based upon actual site conditions.

9. Submit Certification Form 1-07, Final Erosion Control Acceptance Form, to the Erosion Control Specialist to schedule a final on-site inspection.

10. Remove soil erosion control measures and stabilize these areas upon approval of Certification Form 1-07.

11. Submit Certification Form 1-06 when there is an intermediary removal of erosion control measures.

12. If compost blankets are to be installed for temporary erosion/sediment control, installation and maintenance shall be in accordance with Section 6.18 Compost Blanket in the North Carolina Erosion and Sediment Control Planning and Design Manual. Construction Specifications from Section 6.18 Compost Blanket shall be included in the construction sequence of the erosion and sedimentation control plan.

03.02 DESIGN

All erosion control designs shall be in accordance with the NCDENR Erosion and Sedimentation Control Planning and Design Manual, latest edition, unless otherwise stated by this manual.

03.02.01 TEMPORARY MEASURES

1. Silt Fence shall be installed in accordance with the details at the toe of all fill slopes and any other necessary locations.

2. Diversion Ditches shall be installed in accordance with the details at the top of cut and fill slopes and any other necessary locations.

3. Construction Entrances shall be installed at all points of access to construction sites in accordance with the details. Any access point which does not have a construction entrance shall be barricaded to prevent its use.

4. Sediment Traps or Filter Basins shall be installed in accordance with the appropriate details at all points where accumulated runoff is released to natural drainage channels, and any other necessary locations. Sediment traps and basins must provide a minimum of three (3) porous baffles. Basins less than 20' in length may use two (2) baffles. The minimum sediment storage volume for sediment traps is 3600 cubic feet per acre of the disturbed area. The minimum sediment storage volume for sediment basins is 1800 cubic feet per acre of disturbed area. Skimmer dewatering time of 2-5 days is required.

5. Temporary Seeding is the use of rapid growing annual grasses, small grains or legumes to provide initial, temporary cover for erosion control on disturbed areas for less than 12 months. Seed bed preparations and soil amendments shall be in accordance with the method described under "Seeding and Mulching".

6. Seeding and Mulching shall be done immediately following construction. All disturbed areas shall be dressed to a depth of 8 inches. The top 3 inches shall be pulverized to provide a uniform seedbed. Agricultural lime shall be applied at the rate of 95 lbs./1000 sq. ft. immediately before plowing. Grass seed shall be applied at the rates outlined in the City of Monroe Detail 03.07.01, Seedbed Preparation and Temporary Seeding.

7. On projects that will be maintained by the City of Monroe, verification of soil amendments and seeding rates may be required, and changes to these rates may be requested by the City of Monroe during the plan review process. Reuse of topsoil and/or other measures to assure final soil conditions are conducive to rapid establishment of vegetation cover is required.

8. 10-10-10 fertilizer shall be applied to all disturbed areas at 700-1000 lbs/acre, and mulching shall consist of small grain straw applied at a rate of 70 lbs./1000 sq. ft. Mulched areas shall be tacked with asphalt at a rate of 200 to 400 gallons per acre, or other approved method sufficient to hold the straw in place.

9. . Slopes left exposed will, within 14 calendar days in any phase of grading, be planted or otherwise provided with temporary or permanent ground cover, devices, or structures sufficient to restrain erosion.

10. Compost blankets shall be installed per details shown in the North Carolina Erosion and Sediment Control Planning and Design Manual at the top of the cut and fill slopes and any other necessary locations.

11. For any land-disturbing activity, stabilize the site in accordance with the following, per NPDES General Permit NC010000:

GROUND STABILIZATION TIMEFRAMES		
Site Area Description	Stabilization	Timeframe Exceptions
Perimeter dikes, swales and slopes	7 Days	None
High Quality Water (HQW) Zones	7 Days	None
Slopes Steeper than 3:1	7 Days	If slopes are 10’ or less in length and are not steeper than 2:1, 14 days are allowed
Slopes 4:1 or flatter	14 Days	7 days for slopes greater than 50’ in length 7 days for perimeter dikes, swales, ditches, perimeter slopes, and HQW Zones
All other areas with slopes flatter than 4:1	14 Days	7 days for perimeter dikes, swales, ditches, perimeter slopes, and HQW Zones

12. Seeding and soil stabilization of disturbed riparian areas shall be in accordance with Sections 6.24 Riparian Area Seeding of the North Carolina Erosion and Sediment Control Planning and Design Manual.

13. The use of compost sock shall be in accordance with Section 6.66 Compost Sock of the North Carolina Erosion and Sediment Control Planning and Design Manual. Uses include but are not limited to site perimeters, above graded slopes to serve as a diversion berm, check dams, drainage inlets, on paved surfaces, etc.

03.02.02 PERMANENT MEASURES

1. Permanent Ground Cover is the establishment of perennial vegetation cover for periods longer than 12 months. All disturbed areas shall receive a permanent ground cover. Permanent ground cover shall be applied within 15 working days or 60 calendar days, whichever is sooner. Permanent seeding and temporary seeding differ only in the type of seed to be used (i.e. annual versus perennial). Seed bed preparations and soil amendments shall be in accordance with Standard 03.02.01, number 6, “Seeding and Mulching”. As a part of permanent seeding, maintenance

may be required to maintain vegetation for 12 months. This maintenance shall be considered a part of establishing permanent ground cover.

2. Riprap Dissipation Pads and Riprap Protection - All stormwater release points shall be protected by riprap dissipation pads designed to reduce discharge velocities to non-erosive levels. Dissipation pads shall be designed and constructed with an engineering fabric or washed stone barrier between the pad and the natural ground. Calculations shall be furnished to indicate the sufficiency of the dissipation pads specified. Riprap pad design shall be in accordance with NYDOT or NRCS methods found in the North Carolina Erosion and Sedimentation Control Planning and Design Manual. Filter fabric, or a washed stone liner, shall be used on all sediment basins, riprap dissipaters, and channels.

03.03 CONSTRUCTION

03.03.01 CONSTRUCTION NOTES

1. Erosion control measures shall be installed prior to clearing operations. No land disturbing activity, except that which is required to install erosion control measures, may commence prior to approval of Certification Form 1-01 by the Engineering Director.

2. Any failure to maintain erosion control measures will result in appropriate enforcement actions in accordance with the City of Monroe Erosion and Sedimentation Control Ordinance, the North Carolina Sedimentation Pollution Control Act of 1973 (NCGS Chapter 113A, Article 4), and the North Carolina Administrative Code Title 15A, Department of Environment and Natural Resources Chapter 4.

3. If failures to maintain erosion control measures are not corrected, the City of Monroe will initiate enforcement action as authorized by the City Code of Ordinances.

4. Any existing streets that are affected by mud, debris, or sediment shall be cleaned within 24 hours of notice. If the streets are not cleaned within 24 hours of notice, the City will initiate cleaning and bill the developer in the amount of current policies. For a new subdivision, the City of Monroe shall not accept the right-of-way for maintenance until all outstanding bills are paid in full.

5. Sites disturbing one acre or more or any land-disturbing activity within a common plan of development one acre or more in size are subject to requirements of NPDES General Permit NCG0010000. Non-compliance of this permit will be subject to enforcement by the Division of Water Quality for any violations.

04.00 STORM DRAINAGE COLLECTION FACILITIES

04.01 GENERAL

1. Adequate storm drainage shall be provided throughout the development by means of storm drainage pipe; box, elliptical, or arch culverts; or properly graded channels.

2. Storm drainage pipe shall be placed at all low points in street grade to transmit storm water transversely across the street with catch basins being constructed on both sides of the street at the low point.

3. A comprehensive storm drainage system shall be planned and implemented for each subdivision in accordance with the general standards and requirements of this Division. The general storm drainage plan shall be shown on the preliminary plan. Detail plans where required shall be submitted as part of the construction plan requirement. Where easements are required, they shall be noted on the final plan and plat.

4. Storm drainage plans shall be considered on an individual basis depending upon the situation within a given subdivision. Generally the following standards shall apply:

   A. Types of drainage ways requiring treatment.

      1) Those draining one acre of land or more.
      2) Those carrying storm water runoff from public streets either existing or proposed.
      3) Those carrying storm water runoff from large impervious surfaces other than streets.

   B. Design storms.

      1) Open drainage channels shall be designed to carry the 25-year design storm with minimum 6” freeboard.
      2) Collection system pipes that convey stormwater along a proposed street shall be designed for non-pressure conditions based upon Manning’s equation for the 10-year design storm.
      3) Cross drainage pipes (culverts) that convey the natural flow of water from one side of a street to the other side shall be designed for the 25-year design storm.
      4) Roadways crossing within the special flood hazard areas (SFHA) designated under the National Flood Insurance Program shall be designed in conformance with the City’s Flood Damage Prevention Ordinance and shall be reviewed and approved by the City’s Floodplain Administrator.

C. Types of treatment.

1) Enclosed subsurface drains;
2) Open, improved channel;
3) Open channel with flood plain and open space dedicated to the City of Monroe. This option shall not be available except in cases where the City Council agrees in principle to accept such dedication prior to final plat approval. After considering such proposed dedications, the City Council shall consider, among others, the following characteristics of the proposal: size and shape; physical condition; suitability as open space; ease of maintenance; access; relationship to surrounding property; and relationship to open space in the vicinity.

D. Easements.

1) Maintenance easements shall be required dependent upon the size of the drainage area and the maintenance responsibility as determined by the City Engineer. See Section 04.02.01.5.
2) In any case whether maintenance is to be the responsibility of the property owner, the City may require a right to enter for maintenance purposes where the City Council determines that the public health, safety, or general welfare constitutes a public necessity for such maintenance.

04.02 DESIGN

04.02.01 DESIGN CRITERIA

1. The following criteria shall be used for drainage collection facilities within rights-of-way and permanent easements to be accepted by the City:

A. Pipe shall be 15” – 60” diameter RCP Class III, or other material as approved. See Section 04.03.04.

B. Greater than 60” pipe (or arch equivalent) may be aluminum or aluminized pipe subject to approval from the City Engineer.

C. Drainage pipe for driveways shall be a 12” minimum diameter.

D. Refer to NCDOT Pipe Material Selection Guide for allowable pipe fill heights and specifications. For fill heights less than 2’ (measured from top of pipe to bottom of pavement structure) Class IV/Class V Reinforced Concrete Pipe (RCP) will be required. Designs outside of the selection guide will be approved at the discretion of the City Engineer.

E. The minimum allowable slope for pipes shall be 1.0 percent, and the maximum grade for pipes shall be 5%.

F. The minimum angle of entry for a pipe into a "built" structure shall be 75 degrees.

G. The minimum angle of entry for a pipe into a "pre-cast" structure shall be 90 degrees or other subject to approval by the City Engineer.

H. The minimum grade for open channels shall be 1.0% unless otherwise approved by the City Engineer.

I. Positive drainage and fall shall be provided along all channels.

J. Ditches shall be properly stabilized with positive fall prior to acceptance by the City of Monroe.

K. The maximum side slope for open ditches shall be 2H:1V, with 3H:1V preferred.

L. Where applicable, storm drain pipe shall be extended to the rear of the building set back line or to the edge of the buffer, whichever comes first.

2. Culverts shall be analyzed for both inlet control and outlet control conditions. Where inlet control governs conveyance, headwater depth is also limited to the ratio of headwater depth divided by pipe diameter (rise for arches) equal to 1.2 or 1.5 feet below the shoulder point (at the sag in vertical alignment), whichever results in the lower headwater depth. Where outlet control governs conveyance, the allowable Head (H) shall be limited to 2 feet maximum and provide 1.5 feet freeboard below the shoulder point.

3. Culverts must be long enough to accommodate the proposed typical roadway section with a 2:1 fill slope from shoulder point, or flatter. Handrails may be required at the direction of the City Engineer.

4. Headwalls are recommended on the inlet end of culverts 36-inch and larger. Maximum height of headwalls shall be one foot above pipe structure. Neither Mechanically Stabilized Earth (MSE) nor Modular Block walls shall be allowed for culvert headwall applications.

5. Public storm drainage easements shall be required on all open storm drainage channels and storm drainage pipes outside the street right- of-way as follows:

Open channels	0-45 Acres = 20' min. easement required
	>45 Acres = As directed by the City Engineer

Storm drainage pipe	15", 18", 24" = 15' min. easement required 30", 36", 42" or 48" = 20' min. easement required 54" Plus = 30' min. easement required

Plantings other than grass stabilization within the drainage easements must be approved by the City Engineer.

6. Not more than one-half acre or 2 cfs of runoff based on a storm of the 10-year return period may drain into the street at a single point discharge. i.e. roof drains, driveway connections, etc.

7. Any low-point that occurs in a superelevated section shall only be required to have one catch basin on the low side. However, to ensure water does not flow across the street, a catch basin will be required within 20 feet prior to the transition from normal crown.

8. No storm drainage trunk line shall extend longitudinally more than 500 feet without access to a drainage structure provided. Catch basins shall be placed on both sides of the street at the upstream end of the longitudinally placed storm drain, and connected transversely to convey Stormwater to the nearest low point in the street grade.

9. If storm drainage pipe does not extend a minimum of 10 feet beyond the back of sidewalk with a 3:1 slope or flatter (depending on depth of cover, height of fill, etc.), a hand rail may be required by PROWAG.

10. Inlets shall be spaced in such a manner that the design curb gutter flow does not exceed the spread limitations, based on a detailed study of inlet locations, capacities, and gutter spread. Design parameters are as follows:

    A. Standard rainfall intensity of 4.0 inches per hour.

    B. Inlet capacity in sags shall allow for debris blockage by providing twice the required computed opening.

    C. Maximum spread of 6 feet from lip of gutter into a travel lane based on a rainfall intensity of 4 inches per hour.

    D. Maximum spacing between inlets or drainage structures shall not exceed a maximum interval of 500 feet.

    E. Ponding at yard inlets outside the roadway shall be limited to a maximum of 6” above a grated inlet for the 10-year storm.

    F. Double catch basins shall be required where more than 2 acres of runoff along a given length of street is to be collected at a single given point except where deviations are allowed by this Detail Manual.

G. Single catch basins may be allowed if an adequate design can limit the stormwater spread in the flow line of the street to 6 feet from the lip of gutter into the travel lane.

11. Relief by curb overflow shall be provided at all sags or a sufficient number of catch basins shall be provided to limit ponding over top of basins to 6 inches for a storm of the 25-year return period. Drainage pipes within the sag shall be designed to meet this requirement.

04.02.02 HYDROLOGIC ANALYSIS

1. For drainage areas consisting of less than or equal to 200 total acres, the Engineer shall provide calculations by use of the Rational Method, NRCS Method, HEC-HMS, or method by which the Design Engineer is most familiar and can support with calculations, subject to approval by the City Engineer.

2. For drainage areas consisting of greater than 200 total acres, the Engineer shall provide calculations by use of the NRCS Method (TR-55), HEC-HMS, or method by which the Engineer is most familiar, subject to approval by the City Engineer.

3. All storm water conveyances shall be designed based on fully developed land use conditions as shown on current County and City Land Use Plans and Zoning Maps or existing land use, whichever generates the higher runoff rate.

4. Rainfall data for stormwater management design calculations shall be the most current available and shall be obtained from the National Oceanic and Atmospheric (NOAA) Precipitation Frequency Data Server website for the Monroe NC Station.

   Design nomographs, charts, tables, and a sample calculation for pipe sizing utilizing the Rational Method are provided in Appendix A. The engineer should use good engineering judgment in applying these design aids and should make appropriate adjustments when specific site characteristics dictate that these adjustments are appropriate.

5. The Engineer shall submit a copy of all storm drainage calculations with the plans to the City of Monroe Engineering Department for review.

04.02.03 CONSTRUCTION PLANS

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

04.02.04 25 + 1 FLOOD ANALYSIS

1. For streams located outside of the mapped FEMA SFHA (Special Flood Hazard Area) limits and which serve a drainage area of 10 acres or more, the Engineer shall provide a flood analysis utilizing the 25-year design storm to establish finish floor elevations. Finish floor shall be established at least one foot above the 25-year storm elevation.

2. Runoff coefficients shall be based on assumption of full development of drainage area per current zoning.

3. Proposed calculated Flood Protection Elevations (FPE) shall be labeled on the site and grading plans for each lot. FPE shall also be shown for each lot on the Final Plat.

4. Show and label the calculated 25+1 flood elevation flood line on site plan and grading plan.

5. Show and label or describe on plan the location and elevation (ref. vertical datum, i.e. (NAVD 88) of permanent benchmark used in channel survey. All topographic information shown on grading plan shall also be referenced to this benchmark.

6. Provide a copy of all channel analysis input and output files with plan submittal.

04.03 CONSTRUCTION

04.03.01 STANDARD SPECIFICATIONS AND DETAIL 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 govern.

2. All pipe materials referenced herein shall be installed in accordance with Section 300 of the current version of the NCDOT Standard Specifications for Roads and Structures, Pipe installation and the NCDOT Roadway Standard Drawings for method of pipe installation.

04.03.02 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 and Standard 1.09 POST-CONSTRUCTION INSPECTIONS of this manual.

04.03.03 INSPECTIONS BY CITY

1. The City shall designate a construction inspector for each subdivision. The inspector shall make visits to the job-site as required 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 Standards 01.08 and 1.09 of this manual.

04.03.04 MATERIALS

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

2. HDPE pipe material is only approved for use when located outside the public right of way.

3. A complete materials list of all items proposed to be furnished and installed shall be included in a Stormwater Materials Table in the construction plans.

04.03.05 STORMWATER CHECKLISTS AND CONSTRUCTION NOTES

1. A completed copy of the Stormwater Gateway Checklist shall be submitted with all first plan reviews or the submittal shall be considered incomplete. A copy of the Gateway checklist may be found on the City Stormwater webpage.

2. A completed copy of the Stormwater Checklist found in Section 07.06.03 shall accompany all plan submittals.

3. Construction Notes found in Section 07.06.03 of the Stormwater checklist shall be included on all construction plans.

05.00 STORMWATER MANAGEMENT

05.01 GENERAL

05.01.01 STORMWATER MANAGEMENT PRACTICES

1. Stormwater Management practices shall be utilized in accordance with Chapter 159 Stormwater Management Ordinance of the City Code.

2. The Developer and his Engineer shall be responsible for meeting the requirements of the City of Monroe Stormwater Management Ordinance for stormwater control and ensure that the proposed development does not cause off-site flooding, drainage, or erosion problems.

05.01.02 EXEMPTIONS

1. Certain activities are exempt from this division in accordance with the requirements of Chapter 159 Stormwater Management Ordinance of the City Code.

05.01.03 RIGHT OF ENTRY

1. The City Engineer or their designee shall have right-of-entry to the property of any person in accordance with the requirements of the City of Monroe Stormwater Management Ordinance and any permit/document issued under said Ordinance.

05.01.04 STORMWATER MANAGEMENT PLAN REQUIREMENTS

1. A stormwater management plan and separate stormwater maintenance agreement in accordance with the requirements of the City of Monroe Stormwater Management Ordinance shall be submitted to the City of Monroe Engineering Department.

2. A professional, as defined in Standard 01.04, Note 1, licensed in the State of North Carolina, shall sign and seal any structural stormwater management improvement required by the City of Monroe Stormwater Management Ordinance.

3. The following information shall be included on all plans:

   A. Indicate the name of Watershed (i.e., Stewarts Creek, Richardson Creek or Bearskin Creek) if applicable, for the proposed site development;

   B. Show the existing impervious coverage, if any, and note the square footage;

C. Show the proposed impervious coverage, and note the square footage;

D. Area(s) to be disturbed or denuded and note the acreage;

E. List the NRCS soil types and characteristics;

F. Show existing and proposed stormwater collection facilities (pipes, channels, swales, catch basins, etc.) proposed layouts, connections to existing systems, and applicable easements;

G. Label stormwater structure attributes (pipe size, channel / swale dimensions, materials, inverts and rim elevations, slopes and structure types (grate inlet, manhole, etc.);

H. Label the amount of drainage area and runoff quantities that discharge onto site;

I. If the site was previously approved or part of a subdivision that was previously approved by the City of Monroe for stormwater management provide the name of the plan and the date that the plan was approved;

J. Show the location of all streams and drainage ways that require buffers;

K. Show buffers and where measured from (that is, top of bank, top of steep slopes adjacent to stream, or edge of wetlands);

L. Label the dimensions and restrictions within the buffer (that is, to remain undisturbed, % impervious allowed, vegetated, etc.);

M. Show the location of jurisdictional waters and wetlands;

N. Indicate proposed location of stream crossing(s) showing the proposed grading and overall stream impact (includes culvert and outlet protection length);

O. Show and note FEMA-regulated floodway or non-encroachment area on property, and show and note the 100-year flood limits, if applicable;

P. For sites located within FEMA Special Flood Hazard Areas:

1) Note the finished floor/flood proofing elevations of all structures;
2) Note that no encroachment/development into FEMA-regulated floodway is permitted except as specifically listed in the Flood Damage Prevention Ordinance;

3) If a FEMA-designated floodway or non-encroachment area does not exist on the property/parcel, note the nearest distance to a FEMA-designated floodway, if within 2,000 feet.

05.01.05 STORMWATER MANAGEMENT IMPROVEMENTS AND MAINTENANCE

1. The City may withhold issuance of a building certificate of occupancy until the satisfactory completion of any and all required and approved structural stormwater management improvements, as allowed by the Stormwater Management Ordinance.

2. No release of bond guaranteeing the improvements shall be allowed prior to completion of any and all required and approved structural stormwater management improvements.

3. No streets shall be accepted for public maintenance prior to completion of any and all required and approved structural stormwater management improvements.

4. Any and all access and/or maintenance easements shall be in accordance with the City of Monroe Stormwater Management Ordinance.

5. The Developer shall submit as-built drawings that include all permanent stormwater management practices associated with and constructed in the development. Refer to Standard 07.13 AS-BUILT DRAWING CHECKLIST.

6. Prior to acceptance of a permanent stormwater management facility, the applicant must submit an Operation and Maintenance Plan Agreement. An example of this agreement may be found on the City's website. Official Operation and Maintenance Plan Agreement forms shall be obtained by the Developer from the City of Monroe Engineering Department.

05.02 STORMWATER CONTROL MEASURES (SCMs)

05.02.01 DESIGN CRITERIA

1. Stormwater SCMs shall be designed and installed in accordance with the NCDEQ Stormwater Manual. Minor modifications to the details may be acceptable to accommodate individual site conditions, with details placed on the plan and reviewed for approval by the Engineering Department as part of the plan approval process.

2. Stormwater SCMs for water quality shall be designed in accordance with NCDEQ Stormwater Design Manual, latest edition which is available for downloading at the following website: https://www.deq.nc.gov

3. Stormwater SCM(s) for flood control shall be designed utilizing the NRCS method, TR-55 method, or other standard practice methods, subject to approval from the City Engineer, and must demonstrate that post-development stormwater discharge rate is less than or equal to the pre-existing discharge rate in accordance with the standards of of the Stormwater Management Ordinance.

05.02.02 CONSTRUCTION PROJECT PROVISIONS FOR SCM STRUCTURES

1. Construction of the SCM(s) shall be completed in strict compliance with the approved plans unless otherwise approved by the Professional of Record and the City Engineering Department. Approval of the drawings indicate that the Professional of Record has demonstrated to the City Engineering Department that the proposed construction is in accordance with the Monroe Stormwater Management Ordinance and the NCDEQ guidelines for primary and secondary SCM design. Deviations from the approved stormwater SCM design plan cannot be altered in the field without prior approval.

2. Prior to the start of construction, an on-site Pre-Construction Meeting must be held with the Professional of Record and the City Construction Inspector. The contractor is responsible for arranging this meeting. Contact the City of Monroe Engineering Department at 704-282-4515.

3. Periodic inspections of the construction will be performed by the City Engineering Department. The City's Construction Inspector is to be contacted a minimum of 48 hours prior to the start of construction.

4. The owner and his contractor are responsible for insuring all methods of construction are in accordance with standard practice of the industry.

5. Dam and Embankment Construction.

   A. The stormwater SCM and dam area shall be cleared, grubbed and stripped of all vegetative material and topsoil prior to dam construction. The disposal of trees, stumps, construction debris, vegetative material, etc., shall not be permitted in the dam or pool area of the pond. When blasting is used to remove rock from the pool area, the blasted area shall be over-excavated to a depth of at least two feet (2') below finish grade and brought back to finish grade with clean, relative impervious soil material compacted in place. The use of a liner is strongly recommended for all pond construction or other BMPs impounding water as part of their design due to prior problems with pond construction and leakage.

B. Soil materials used for earth fill which are highly permeable or which exhibit significant shrink/swell or dispersion shall not be used in the embankment unless specific detailed design report from a soil's engineer is submitted as part of the plan approval.

C. A cutoff trench (core trench) shall be provided with a minimum width of four feet (4'). The centerline of the cutoff trench shall be aligned with the centerline of the dam. The cutoff trench shall be carefully backfilled with highly impermeable material and compacted at least 95% of standard proctor density.

D. Slopes shall not be steeper than 3:1 (three horizontal to one vertical) on the dam or embankments around the pond.

E. Embankments shall be properly compacted to 95% of the standard proctor density.

F. All disturbed areas and embankments surrounding the ~~pond~~ stormwater BMP shall be mechanically stabilized or have permanent ground cover established upon completion of construction.

G. The outlet control structure and outlet pipe shall be constructed to maintain water tightness at all joints.

6. Final acceptance of the stormwater SCM construction by the City Engineer will be contingent upon the following:

A. All items as listed in Section 07.12, "Post-Construction Checklist for Stormwater SCM" have been satisfactorily completed.

B. A certification has been received from the Professional of Record that the stormwater BMP construction has been completed in accordance with the approved plans and specifications.

C. The Construction Inspector has verified that the stormwater SCM(s) has been constructed in accordance with the approved plans and specifications.

D. Deviations from the approved plans or deficiencies in construction must be addressed prior to the final inspection of the stormwater BMP and outlet structure by the City Engineering Department.

E. Prior to release of the certificate of occupancy, the applicant must present an as-built survey of the property prepared and sealed by a Professional Land Surveyor, Professional Engineer, or Architect licensed by the State of North Carolina. Such as-built survey shall show the location and dimension of all impervious coverage and

the total amount of impervious coverage built as a percentage of the total site. The as-built survey shall also verify stormwater BMP construction, including but not limited to permanent pool elevation, spillway elevation, top of bank elevation, depth, and surface area. The certificate of occupancy shall not be released if the impervious coverage of the site exceeds that allowed by the permit issued.

7. Revisions to the approved drawings due to field conditions are to be initiated by the owner and his contractor through the Professional of Record and will require approval from the City Engineer. 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.

05.03 STREAM PROTECTION AND BUFFER ZONES

1. Perennial streams may not be channelized or piped, except as approved by the City of Monroe in accordance with Chapter 159 of the Stormwater Management Ordinance. All applicable federal and state permits and certifications must be obtained prior to approval by the City.

2. Buffer zones and widths shall be in accordance with Chapter 159 of the Stormwater Management Ordinance.

05.04 OTHER PRACTICES

1. In lieu of installing primary SCMs, the Engineer may opt to combine various secondary SCMs to achieve the same required treatment capacity as the primary SCM, in accordance with the NCDEQ Stormwater Design Manual, latest edition, subject to approval from the City. All SCM(s) must meet all local, state, and federal watershed and stormwater management regulations.

2. Any proposed proprietary SCMs shall be designed and installed according to the manufacturer’s guidelines and may be approved by the City Engineer on a case by case basis.

06.00 LANDSCAPING

06.01 GENERAL

1. All planting of street trees shall be in accordance with the American Standard for Nursery Stock, latest edition and shall be positioned in accordance with Details 02.01.03, 02.01.04 and 02.01.07.

2. Refer to Details 06.01.01, 06.01.02 and 06.02.01 for additional tree planting standards.

06.02 ACCEPTED TREES FOR STREET TREE PLANTINGS

1. The following trees are acceptable for street tree plantings:

Small Maturing Trees (Up to 25' H)		
Common Name	**Scientific Name**	**Notes**
American Holly	Ilex opaca	Tree-form only
Carolina Silverbell	Halesia carolina	
Crape Myrtle	Lagerstroemia indica	
Eastern Redbud	Cercis canadensis	
Flowering Dogwood	Cornus florida	
Hybrid Dogwood	Cornus x rutgersensis	Fruitless varieties such as 'Constellation'
Japanese Tree Lilac	Syringa reticulata	
Magnolia, ‘Little Gem’	Magnolia grandiflora ‘Little Gem’	
Magnolia, 'Merrill'	Magnolia X loebneri 'Merrill'	
Magnolia, Saucer	Magnolia X soulangiana	
Magnolia, Star	Magnolia stellata	
Maple, Amur 'Flame'	Acer tataricum ginnala 'Flame'	
Maple, Japanese	Acer palmatum	Variety must be approved by City Engineer
Maple, Purplebow/Shantung	Acer truncatum	
Paperbark Maple	Acer griseum	
Serviceberry	Amelanchier canadensis	Tree-form only
White Fringetree	Chionanthus virginicus	Tree-form only

Medium Maturing Trees (30-50' H)		
Common Name	**Scientific Name**	**Notes**
American Hornbeam	Carpinus caroliniana	Columnar shape
Chalkbark Maple	Acer leucoderme	
Chinese Pistache	Pistacia chinensis	Male clones only such as 'Keith Davey'
Golden Raintree	Koelreuteria paniculata	
Hedge Maple	Acer campestre	
Honey Locust	Gleditsia tricanthos ‘inermis’	"Skyline' or 'Shademaster'
Lacebark Elm	Ulmus parvifolia	‘Allee' or 'Bosque'
Osage Orange	Maclura pomifera	Fruitless and thornless varieties such as 'White Shield' or 'Wichita'
Persian Ironwood	Parrotia persica	
Trident Maple	Acer buergeranum	

07.00 PERMITS, CHECKLISTS, AND FORMS

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07.00 PERMITS, CHECKLISTS, AND FORMS

07.01 PERMIT CONTACT INFORMATION

The following is contact information for typical permits and approvals associated with development. Some permits or approvals may not apply and other permits or approvals may be required. It is the Developer/Contractor's ultimate responsibility to secure all applicable permits and approvals prior to the start of construction.

1. Erosion Control Certificate of Approval

   Engineering Associate (Plan Review)
   City of Monroe
   Planning and Development Department
   PO Box 69; Monroe, NC 28111-0069
   300 W. Crowell Street; Monroe, NC 28112
   Phone: (704) 282-4533

2. Erosion Control Permit

   Permit Technician
   City of Monroe
   Planning and Development Department
   PO Box 69; Monroe, NC 28111-0069
   300 W. Crowell Street; Monroe, NC 28112
   Phone: (704) 282-4524

3. Storm Drainage, and Flood Control Review

   Stormwater Engineering Manager
   City of Monroe
   PO Box 69; Monroe, NC 28111-0069
   300 W. Crowell Street; Monroe, NC 28112
   Phone: (704) 282-4537

4. Water Supply System and Gravity Sewer Permit

   Water Resources Engineer
   City of Monroe
   Water Resources Department
   PO Box 69; Monroe, NC 28111-0069
   2401 Walkup Avenue; Monroe, NC 28110
   Phone: (704) 282-4600

5. Pump Stations, and Force Main Permit

North Carolina Department of Environment Quality
Division of Environmental Health; Non-Discharge Permitting Unit
1617 Mail Service Center; Raleigh, NC 27699-1617
512 N. Salisbury St., Suite 1219; Raleigh, NC 27604
Phone: (919) 707-3654

6. North Carolina Department of Transportation Encroachment Agreement (if required)

District Engineer
North Carolina Department of Transportation
Monroe District Office
130 S. Sutherland Avenue
Monroe, NC 28112
Phone: (704) 218-5100

7. North Carolina Department of Transportation Driveway Permit (if required)

District Engineer
North Carolina Department of Transportation
Monroe District Office
130 S. Sutherland Avenue
Monroe, NC 28112
Phone: (704) 218-5100

8. North Carolina Department of Environmental Quality
401 & Buffer Permitting Unit- Mooresville Regional Office

Mooresville Regional Office
610 East Center Avenue
Mooresville, NC 28115
(Courier 09-08-06)
Phone: (704) 235-2100

9. North Carolina Department of Environmental Quality

Raleigh Office
Dam Safety Program
1612 Mail Service Center
Raleigh, NC 27699
Phone: 919-707-9200

10. Army Corp of Engineers Wetlands Permit

    Wilmington District
    USAED, Wilmington
    69 Darlington Avenue
    Wilmington, NC 28403
    Phone: (910) 251-4625 ext.26

    Asheville Regulatory Field Office
    US Army Corp of Engineers
    151 Patton Avenue, Room 208
    Asheville, NC 28801
    Phone: (828) 271-7980

11. North Carolina Forest Service

    Union County – District 12
    1933 Mountain Island Highway
    Mount Holly, NC 28120
    Phone: (704) 827-7576

07.02.01 DEVELOPMENT REVIEW & PROCEDURE CHECKLIST FOR SUBDIVISIONS

_____ Submit a digital copy of construction plans (civil drawings), Erosion Control application, checklist, and fee to the City of Monroe Permitting Department

_____ Pre-construction meeting is scheduled with the City of Monroe Engineering Department (704-282-4515) following approval of the construction plans (civil drawings). Developers, designers or surveyors shall provide a digital copy of the plans in AUTOCAD format at the meeting.

_____ Proceed with subdivision construction (refer to construction checklist). In order to record the final plat, the subdivision improvements must be completed or guaranteed with a financial instrument that can be converted into cash. ***Follow these steps for the option of guaranteeing subdivision improvements in order to apply for building permits:***

- _____ Submit complete Subdivision Bond Estimate form to the Department of Planning and Development (this form will be reviewed by the Engineering Department, and the Water Resources Department to determine the costs of project completion).
- _____ Receive a letter from the Department of Planning and Development stating the amount for which a letter of credit or other acceptable financial guarantee must be submitted (110% of the estimated cost of improvements).
- _____ Submit letter of credit or other acceptable financial guarantee to the Department of Planning and Development for review.

_____ Submit Final Plat to the Department of Planning and Development digital copy (PDF) for review. (This can be submitted along with the completed bond estimate form). Plat is then routed to all applicable departments and reviewed by the Planning Department.

_____ After all comments are returned, submit revised final plat for review if necessary.

_____ Submit copies of the final plat to be recorded (2 mylars) along with the appropriate subdivision and recording fees to the Department of Planning and Development. (See City of Monroe Fee Schedule for subdivision fees) The Union County Register of Deeds requires 1 copy, and The City of Monroe requires 1 copy of the final plat. ***The procedure to record the plat is as follows:***

- Planner reviews mylar copies to make sure all corrections were made, and all appropriate signatures were included.
- Plat is signed by the City of Monroe Subdivision Administrator.
- Plat is signed by the Union County Review Officer.
- Plat is recorded at the Union County Register of Deeds office.

_____ Provide a digital copy of plat to the City of Monroe Engineering Department for roadway updates. (This should be submitted at the same time as the mylars)

07.02.02 CITY OF MONROE SITE PLAN AND LEGISLATIVE REZONING REVIEW REQUIREMENTS

Project Name: _____
Permit No.: _____
Address/Intersection _____
Date Reviewed: _____
Reviewer: _____

GENERAL SUBMITTAL REQUIREMENTS
All plans shall include at a minimum;

_____ North Arrow & Vicinity Map
_____ Plan sheet shall be 24" x 36"
_____ Plan sheets shall have the seal, signature, and date of the professional registered in the State of North Carolina under whose supervision the plans were prepared
_____ Show a title block on every sheet of the plan set that includes Developer's and his consultant's name, address, and telephone number, name of the development, original date of the plans, scale indication, sheet number and revision columns
_____ Adjacent properties along with name, deed book reference and tax map reference
_____ Existing and proposed paved areas, buildings, structures & utilities
_____ Typical sections for streets and divided entrances, if applicable (Public and Private)
_____ Typical sections for parking areas if applicable
_____ Sidewalk in accordance with Section 02.02.06 Sidewalk Requirements.
_____ Existing and proposed contours
_____ All right-of-ways and easements, existing and proposed
_____ Street Names
_____ Sight Triangles (Detail 02.01.10)
_____ Roadway alignments shall be in conformance with Section 02.02.01 of the General Roadway Design Criteria (150 feet minimum centerline radius with 100 feet minimum between reverse curves)
_____ Dead end streets do not exceed 1200 ft. in length
_____ Identify all drainage features including but not limited to wetlands, perennial streams, intermittent streams, existing and proposed drainage systems
_____ Show and label 35' undisturbed vegetative buffers along perennial and intermittent streams
_____ Indicate setback for streams outside the designated floodplains - 5 times width of stream at top of bank or 35 feet on each side, whichever is greater
_____ 100 year floodplain (old and, if needed, new) and base flood elevation
_____ Location of stormwater management facilities if required for site development
_____ Impervious Coverage
Existing _____Parcel Area _____
Proposed _____% Coverage _____

_____ Show off-street parking for non-residential in accordance with Table 02-01.

_____ General Notes (to be placed on plan sheet)

A. 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.

B. Deviations from the City of Monroe Standard Specifications and Detail Manual must be clearly noted on the plan and listed below. *(The Developer must request any deviation from the Detail Manual in writing along with justification for review and recommendation by Staff.)*

Additional Submittal Requirements:

_____ Traffic Impact Studies in accordance with Section 02.01.03 Traffic Studies.

_____ NCDOT Driveway Permit and/or City of Monroe Driveway Permit

_____ Copies of written approvals from USACOE and/or NC Dept. of Quality Approvals

07.03 SUBDIVISION PLAT CHECKLIST

City of Monroe
SUBDIVISION PLAT CHECKLIST

Name of Subdivision		Date:
Name of Subdivider		Contact Phone No:
Name of Preparer		

City Department E=Engineering P=Planning	Item #	Item Description	When Required F=Final, S=Sketch P=Preliminary	Preparers check here if complete	Office use only
		TITLE BLOCK INFORMATION			
	1	Title Block is shown containing:			
P		A. Name of development	S,P,F		
P		B. Name of map or plan (sketch plan, preliminary plan, or Final Plat)	S,P,F		
P		C. Owner's name with address and daytime phone number	S,P,F		
P		D. Location, including address, city, township, county, & state,	S,P,F		
P		E. Date(s) map(s) prepared or revised	S,P,F		
P		F. Scale of drawing in feet per inch – drawing scale shall not be less than 1" equals 200'	S,P,F		
P		G. Name, address, and telephone number of preparer of map	S,P,F		
P		H. Developer's name, address and daytime phone number, if different from owner's	S,P,F		
		ZONING AND LAND USES			
P	2	Zoning district(s) within the property and adjacent properties are shown	S,P,F		
P	3	Existing land uses within the property and adjacent properties are noted	S,P		
P	4	Dimensions, location, and use of all existing buildings; distances between buildings measured at the closest point; distance from buildings to closest property lines; buildings to remain on final plat	S,P,F		
		STREETS			
	5	Street data is shown illustrating:			
P		A. Existing and proposed rights-of-way within and adjacent to property are shown	S,P,F		
P		1. Total right-of-way width dimensions are shown	S,P,F		
E		2. Cite Book & Page where right-of-way is recorded	P,F		
		3. Dimension from centerline of existing pavement to all corners are shown	P,F		
P		4. Cul-de-sac right-of-way radius from center point are shown	S,P		
P		B. Pavement or curb lines are shown	P		
P		C. Pavement width dimensions are shown	P		
P		D. Cul-de-sac pavement radius from center point are shown	P		
E	6	All existing streets and proposed streets are named and approved by E-911	F		
P		MAP INFORMATION AND DESCRIPTION			
P	7	Bar Graph Scale is shown	S,P,F		
P	8	(Deed or Record) Book references to subject property	P,F		
P	9	Names of adjoining property owners (Deed or Record) Book reference are shown	P,F		
P	10	Tax block and parcel(s) number(s) are shown	S,P,F		
P	11	A vicinity map, at a scale of 1" = 2000', is shown	S,P,F		
P	12	All jurisdiction lines which adjoin or cross the tract are shown	S,P,F		
P	13	North arrow and orientation (oriented towards top of map where practicable)	S,P,F		
	14	Boundaries of the tract to be subdivided are shown as follows:			

City Department E=Engineering P=Planning	Item #	**Item Description**	**When Required** F=Final, S=Sketch P=Preliminary	**Preparers check here if complete**	Office use only
E		A. At least one corner is tied to: (1) N.C. Grid and provide grid coordinates where at least one of two control monuments needed are within 2000' of the boundary and show the combined grid factor or (2) tie to the nearest street intersection	F		
P		B. All locations of intersecting boundary lines of adjoining properties are shown	P,F		
P		C. Distinctly and accurately represent and show all distances; show bearings and distances on final; show bearings and distances and curve data on outside boundaries and street centerlines on preliminary with street centerline tied to boundary	S,P,F		
P	15	Location and descriptions of all monuments, markers, and control corners is shown on plat	F		
P	16	Existing "old" property lines on tract to be subdivided are shown as dashed lines and are labeled as "old property lines"	S,P,F		
P	17	Existing and proposed topography of tract and 100 feet beyond property showing existing contour intervals of no greater than 5 feet (2 feet where available) and labeling at least two contours per map and all others at 10 foot intervals from sea level	P		
		ENVIRONMENTAL AND NATURAL FEATURES			
P	18	Existing and proposed topography of tract	P		
P	19	Marshes, swamps, and other wetlands are shown	S,P,F		
P	20	Water courses, ponds, lakes, and streams are shown	S,P,F		
P	21	Undisturbed, vegetative buffers along perennial streams are shown	S,P,F		
P	22	Railroad lines and rights-of-way are shown	S,P,F		
P	23	Areas to be dedicated or reserved for public use are shown	S,P,F		
P	24	The name and location of any property or building on the National Register of Historic Places or locally designated historic property is shown	P,F		
P	25	Areas designated as a common area or open space under control of a Developer's or Homeowner's Association are shown	S,P,F		
		FLOOD IMPACT AREAS			
P,E	26	The location of floodway and floodway fringe areas (where applicable) are shown referenced from FEMA Flood Hazard Boundary Maps and/or approved Engineering Flood studies Flood Protection Elevation (FPE) for all lots adjacent to regulated floodplain	P,F		
		SITE DATA			
	27	Site calculations are shown including:			
P		A. Acreage in total tract	S,P,F		
P		B. Acreage in public greenways and other open space	P,F		
P		C. Total number of lots proposed	S,P,F		
P		D. Linear feet in streets	P,F		
P		E. Area in newly dedicated right-of-way	P,F		
P		F. General location of the boundaries of any residual lot (> 10 acres)	S,P		
P	28	Proposed lot lines and dimensions, with bearing and distances shown	S,P,F		
P	29	Area in square footage of all proposed lots under one (1) acre in size; area in acres is shown for all lots one acre or more in size; smallest lot is indicated	P,F		
P	30	Lots shown are sequenced or numbered consecutively	P,F		
		EASEMENT AND UTILITIES			
P	31	Location, dimension, and type of all easements (existing and proposed) are shown	P,F		
E	32	General Public Utility Easements are tied to the property lines	P,F		
E	33	Public Storm Drainage Easements are shown centered over the creeks, ditches, and/or structures. Ties to property lines are not required.	P,F		
P	34	Plat contains a utility layout plan for water, sewer, storm sewer, natural gas, electric, and cable TV	P		

City Department E=Engineering P=Planning	Item #	**Item Description**	**When Required** F=Final, S=Sketch P=Preliminary	**Preparers check here if complete**	Office use only
		NOTES AND STATEMENTS			
P	35	Plat contains *NCDOT Construction Standards Certification* (where applicable)	P,F		
P	36	Plat contains an *On-Site Water and/or Sewer Note* (where applicable)	P,F		
P	37	Plat contains a *Special Flood Hazard Area Note*	P,F		
P	38	Plat contains a *Notary Certificate of Owners Signature*	F		
P	39	Plat contains a *Certificate of Ownership and Dedication*	F		
P	40	Plat contains a *Subdivision Administrator Approval Certificate*	F		
E	41	Plat contains a *Certification of Survey and Accuracy*	F		
E	42	Plat contains a *Union County Review Officer's Statement*	F		
E	43	Plat contains *Storm Drainage Note* (where applicable)	P,F		
E	44	*Complete Stormwater Operation and Maintenance Agreement for Recordation Attached*	F		
E	45	*The following notation shall appear on all final plats of major subdivisions with new private streets:* *ROAD MAINTENANCE DISCLOSURE STATEMENT* *This subdivision contains private streets and storm drainage that were designed and constructed or financially guaranteed in accordance with the City of Monroe's Standard Specifications and Detail Manual. Maintenance of these improvements shall be the responsibility of the developer(s) or the property owner(s) until accepted and maintenance responsibilities are assumed by a homeowners or property owners' association established by the collective lot owners. Neither NCDOT nor the City of Monroe are responsible for any maintenance associated with these improvements or enforcement of the responsibilities noted within this statement. (Note: This statement shall not serve as a substitute for any other statutory disclosure requirement.)*	P,F		
E	46	*The following notation shall appear on all final plats of major subdivisions with new public streets:* *ROAD MAINTENANCE DISCLOSURE STATEMENT* *The street and storm drainage system in this subdivision were designed and constructed or financially guaranteed in accordance with the City of Monroe's Standard Specifications and Detail Manual. Property owners should be aware the City of Monroe is not responsible for any maintenance associated with these improvements until the street right-of-ways have been completed by the developer and accepted by the City of Monroe. Maintenance of these improvements shall be the responsibility of the developer(s) or the property owner(s) until the City of Monroe has accepted maintenance responsibilities. The city is not responsible for any maintenance associated with these improvements or enforcement of the responsibilities noted within this statement. (Note: This statement shall not serve as a substitute for any other statutory disclosure requirement.)*	P,F		

NOTE: This checklist is intended for the use of the public in order to comply with the City of Monroe Subdivision mapping standards. Specifics are addressed in the City of Monroe subdivision Ordinance.

07.04 STORM WATER MAINTENANCE AGREEMENT

Prior to the conveyance or transfer of any lot or building site to be served by a structural SCM, and prior to issuance of any permit for development or redevelopment requiring a structural SCM, the applicant or owner of the site must execute an operation and maintenance agreement that shall be binding on all subsequent owners of the site, portions of the site, and lots or parcels served by the structural SCM. The operation and maintenance agreement shall require the owner or owners to maintain, repair and, if necessary, reconstruct the structural SCM, and shall state the terms, conditions, access conditions, and schedule of maintenance for the structural SCM. The operation and maintenance agreement must be approved by the Stormwater Administrator prior to plan approval and shall be recorded with the County Register of Deeds.

A copy of the standard form Operation and Maintenance Agreement may be found on the City's Stormwater webpage.

07.05 PRE-CONSTRUCTION MEETING AGENDA

The following items will be discussed at all Pre-Construction meetings for proposed developments. Refer to Standard 01.05.00 regarding the Pre-Construction Conferences. This agenda shall be modified to suit site conditions for each proposed development and distributed at the meeting.

AGENDA
PRE-CONSTRUCTION CONFERENCE
DEVELOPMENT NAME
TIME; DATE
LOCATION

I. Introduction of Attendees

II. Emergency Contacts

III. Erosion Control

IV. Clearing & Grubbing

V. Undercuts & Embankments

VI. Storm Drains & On- and Off-Site Drainage

VII. Curb

VIII. Subgrade

IX. Stone Base

X. Asphalt Base & Asphalt Surface

XI. Shoulders

XII. Landscaping

XIII. Utilities within Proposed Street Right-of-Way

XIV. Checklists and Certification Forms

XV. Safety

XVI. Inspections by City & Developer

XVII. Post Construction Stormwater Requirements

XVIII. Maintenance of Roadways and Right of Ways Prior to Acceptance

XIX. Final Inspection

XX. Other

07.06 EROSION CONTROL FORMS AND CHECKLISTS

07.06.01 EROSION CONTROL FINANCIAL RESPONSIBILITY FORM

No person may initiate any land-disturbing activity as defined in Chapter 158 of the Monroe City Code prior to completion of this form, and an applicable and acceptable erosion and sedimentation control plan has been approved by the City of Monroe Engineering Department. (Please type or print)

Part I

1. Name of Project_____

2. Will there be any public funds allocated to this project? The allocation of public funds to a project requires the Erosion and Sedimentation Control plans to be reviewed and approved by the North Carolina Department of Environmental Quality. _____

3. Address where land disturbing activity will take place_____

   _____

4. Latitude (decimal degrees)_____ Longitude (decimal degrees)_____

5. Approximate date disturbing activity will commence _____/_____/_____

6. Purpose of development (residential, commercial, industrial, etc.)_____

7. Total acreage of land to be disturbed or uncovered, (include off site roadway improvements, utilities and borrow/waste areas) _____

8. Amount of fee enclosed (fee will be in accordance with current policy found in the City of Monroe Fee Schedule Ordinance, Chapter VII. Engineering/Public Works, Article A, Section 4. Charges and Fees. ____
   _____

9. North Carolina Registered Agent to contact should sediment control issues arise during land disturbing activity

   Name_____ Phone_____

   Email_____

10. Landowner(s) of Record (use blank page to list additional owners)

    If the landowner(s) of record is not the person(s) or firm(s) financially responsible as listed in Part II.B., a separate signed letter of consent to initiate land disturbing activity from the landowner(s) of record or their authorized agent will be required prior to approval of the Erosion Control Plans.

Name_____	Name_____
Mailing Address_____	Mailing Address_____
_____	_____
Street Address_____	Street Address_____
_____	_____
Phone_____	Phone_____
Email_____	Email_____

11. Indicate Book and Page where deed of the property where land disturbing activity will take place is recorded (use blank page to list additional owners)

Book_____ Book_____

Page_____ Page_____

12. Tax Map Parcel Number where land disturbing activity will take place _____--_____--_____

_____--_____--_____

_____--_____--_____

Part II

1. Person(s) or firm(s) who are financially responsible for this land disturbing activity (use blank page to list additional owners)

Name_____ Name_____

Mailing Address_____ Mailing Address_____

_____ _____

Street Address_____ Street Address_____

_____ _____

Phone_____ Phone_____

Email_____ Email_____

2. A) If the Financially Responsible Party is not a resident of North Carolina, give name and address of a North Carolina Agent

B) If the Financially Responsible Party is a Partnership or other person engaging in business under an assumed name, **attach a copy of the Certificate of Assumed Name**. If the Financially Responsible Party is a Corporation, give the name and street address of the North Carolina Registered Agent:

_____

Name of Registered Agent Email Address

_____

Current Mailing Address Current Street Address

_____

City State Zip City State Zip

Phone _____ Email_____

3. The above information is true and correct to the best of my knowledge and belief and was provided by me under oath. I agree to provide corrected information should there be any change in the information provided herein. (This form must be signed by the financially responsible person if an individual or his attorney in fact, or if not an individual, by an officer, director, partner, or registered agent with authority to execute instruments for the financially responsible person)

Type or Print Name_____ **Title**_____

Signature_____ **Date** _____/_____/_____

I, _____, a Notary Public of the County of _____, State of North Carolina, hereby certify that _____ appeared personally before me this day and being duly sworn acknowledged that the above form was executed by him.

Witness my hand and notarial seal, this _____ day of _____, _____.

SEAL

_____
(Notary)

My commission expires _____

07.06.02 EROSION CONTROL PLAN CHECKLIST

This Erosion Control Plan Checklist shall accompany all plan submittals or the submittal shall be considered incomplete. Items not applicable should be marked "N.A." Refer to City Of Monroe "Standard Specifications and Detail Manual", City Of Monroe Land Use Ordinance, Title XV, Chapter 158, and NCDEQ Design Manual, latest edition. Prior to Erosion and Sedimentation Control Plan approval, all applicable plan submittals and approvals from the Engineering Department shall be obtained, including but not limited to, roadway, City and State driveway permits and encroachments. All plans must be submitted concurrently with the erosion control plans.

_____Detailed cover letter stating the purpose of the submission

_____Maximum plan sheet size is 24"x 36".

_____Show a north arrow and vicinity map on the erosion control plan.

_____Show a final grading plan, if different from the erosion control plan.

_____The maximum scale is 1" = 50'.

_____Show all property lines and right-of-ways.

_____Show sidewalks in accordance with Section 02.02.06 - Sidewalk Requirements.

_____Show a legend. Call out each measure on the plan. The legend symbols and plan should match.

_____Show water and sewer erosion control measures on erosion control plan. Show the size and location of existing and proposed storm and sewer structures.

_____Show existing and proposed *(*2 foot or 1 foot*)* contours.

_____Show limits of disturbed area (provide acreage total, delineate limits, and label). Be sure to include all access to measures, lots that will be disturbed, offsite borrow/waste areas and utilities/roadway improvements that may extend offsite.

_____Show planned and existing buildings locations and FFE.

_____Show planned and existing roads locations, elevations and profiles.

_____Show lot and/or building numbers.

_____Show seeps, springs, or wetland limits.

_____Show all easement lines.

_____Show boundaries of the total tract of land where disturbing activity will take place.

_____Show borrow, waste areas, and stockpiled soil locations.

_____Show existing and planned drainage areas including off-site areas that drain through the project area.

_____Indicate the size of drainage areas above drainage structures.

_____Show soil type(s) and special characteristics.

_____Show design calculations for peak discharges of runoff.

_____Show a watershed plan.

_____Show a storm drainage plan.

_____Show design calculations per Section 04.00 of the City Of Monroe Standard Specifications and Detail Manual and construction details for storm and sewer structures.

_____Show design calculations per Section 04.00 of the City Of Monroe Standard Specifications and Detail Manual, cross-sections and method of stabilization of existing and planned channels per the NCDEQ Design Manual, latest edition.

_____Show design and construction details of energy dissipators below storm outlets including the size of stone used for rip rap per the NCDEQ Design Manual, latest edition.

_____Show design calculations and construction details to control groundwater per the NC DENR Design Manual, latest edition.

_____NCDOT Driveway Permit and/or City of Monroe Driveway Permit/Encroachments

_____Approved, signed documentation from USACOE and/or NC Dept. of Environmental Quality, Floodplain Development Permit and other applicable approvals.

_____Show all perennial and intermittent stream buffers and show widths. Add note requiring orange net fencing along all stream buffers.

_____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.

_____Show the name of the first watercourse into which storm water leaving the site is tributary.

_____Show the location of all temporary and permanent erosion and sedimentation control measures.

_____Show construction detail drawings for all temporary and permanent erosion and sedimentation control measures per the City of Monroe Detail Manual.

_____Show all design calculations for sediment basins and sediment traps per the NCDEQ Design Manual, latest edition. Note: Minimum of 3 coir fiber baffles per the NCDEQ Design Manual.

_____ Label basin contours. Tie into existing contours. Show basin dimensions and weir lengths on the plans.

_____ Show wetland protection measures (Orange net fence).

_____Show temporary stream crossings (work along streams, lakes, ponds and wetlands) and details of how each will be stabilized.

_____Show maintenance requirements of temporary erosion and sedimentation control measures during construction.

_____Indicate the name and phone number of the person who is responsible for maintenance of temporary measures during construction on the plans.

_____Show maintenance requirements of permanent erosion and sedimentation control measures following construction.

_____Indicate the name and phone number of the person who is responsible for maintenance of permanent measures following construction on the plans.

_____Show all areas and acreage to be vegetatively stabilized.

_____Drainage area maps clearly and legibly depicts on-site and off-site areas (colored coded maps encouraged). All drainage area maps indicate project limits and are at a legible scale.

_____Show planned vegetation with details of plants, seed, mulch, and fertilizer. Include Seeding Requirement 03.07.01from the City Of Monroe Standard Specifications and Detail Manual.

_____Show specifications for permanent and temporary vegetation. Include the method of soil preparation prior to seeding.

_____Include NCG010000 Notes Sheets for Ground Stabilization and Materials Handling

_____Include NCG010000 Notes for Self-Inspection, Record Keeping and Reporting

_____Attach the Financial Responsibility Form from Standard 07.07.01 of the City of Monroe Standard Specifications and Detail Manual.

_____Attach bond estimate for all erosion and sedimentation control measures.

_____Indicate setback for streams outside the designated floodplains - 5 times width of top of bank or 35 feet on each side, whichever is greater, as measured from the top of bank.

_____100-year flood plain and base flood elevation.

_____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.

_____ Deviations from the City of Monroe Standard Specifications and Detail Manual must be clearly noted on the plan. *(The Developer must request any deviation from the Detail Manual in writing along with justification for review and recommendation by Staff and/or City Council prior to plan review).*

_____The following notes will be included on all plan sets:

1. If disturbing less than 1 acre, add this note: Disturbances of less than one acre that are a part of a "Common Plan of Development", as defined in Section 01.01 of this manual are to be covered under the General Stormwater Permit NCG010000 and requires compliance with all conditions of this general permit under the NPDES.

2. No land disturbing activity, except that which is required to install erosion control measures, may commence prior to approval by the City Engineer of Certification Form 1-01.

3. Additional erosion control measures may be required based upon specific site conditions.

4. Contact the City of Monroe Engineering Department for a pre-construction meeting prior to any land disturbing activity.

5. Remove all temporary erosion control devices and structures only after site is fully stabilized and approval has been obtained from the City of Monroe Engineering Department.

6. All erosion control designs shall be in accordance with the City of Monroe Standard Specifications and Detail Manual, and the NCDEQ Erosion and Sedimentation Control Planning and Design Manual, latest edition.

7. For phased erosion control plans, the Contractor shall meet with the Erosion Control Inspector prior to commencing each phase of erosion control measures.

8. Site grading is to be covered under the General Stormwater Permit NCG010000. Any land disturbing activity > 1 acre requires compliance with all conditions of this general permit under the NPDES. Any noncompliance is a violation of the Clean Water Act and may require enforcement by NCDEQ.

9. Contractor is to keep street clear of mud and other debris per the City of Monroe Mud Ordinance, Title VII, paragraph 71.20.

10. The Professional Engineer registered with the State of North Carolina who prepared the Erosion Control Plan is solely responsible for identification and location of all environmental wetlands, perennial and intermittent streams and buffers shown on the plans.

11. 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.

12. Silt sacks will be placed in basins/inlets along roadways after initial asphalt surface work is completed.

13. The financially responsible party/agent or the landowner/agent of a land disturbing activity > one acre is required to self-inspect the project. A self inspection, as well as documentation of a project after each phase of the project, is required.

_____ Include Scheduling Notes 03.01.03, and Construction Notes 03.03.01 as well as all pertinent Division 08.00 Erosion Control Details from the City of Monroe Standard Specifications and Detail Manual on all plan sheets.

_____ Provide Construction Sequence 03.01.04 notes 1 through 11 as well as any additional notes necessary to describe the basic sequence of events on the site. Include site specific sequencing for individual phases.

_____ Erosion Control Review Fee.

_____ Bond Amount in the form of certified check, cash, or irrevocable letter of credit. The person(s) or firm(s) posting the bond and listed as the financial responsible party must be registered with the North Carolina Secretary of State.

07.06.03 STORMWATER CHECKLIST

This Stormwater Checklist shall accompany all plan submittals or the submittal shall be considered incomplete. Items not applicable should be marked "N.A." Refer to the City of Monroe "Standard Specifications and Detail Manual".

_____Show impervious areas/runoff coefficients per the City of Monroe Standard Specifications and Detail Manual, Appendix A, Rational Method.

_____Show stormwater runoff controls

_____ wet detention pond	_____extended dry detention pond	_____ grassed swales
_____ sand filters	_____ stormwater wetlands	_____ bio-retention
_____ proprietary systems	_____ infiltration devices	_____ filter strips
_____ stream buffers	_____permeable pavement	____ other

_____Show soil types.

_____Provide boring/test pits, infiltration tests, groundwater impacts for infiltration structures.

_____Provide calculations of pre- and post-development peak runoff rates, volumes and velocities. The same hydrologic procedure shall be used to determine pre and post-developed hydrology.

_____Provide copy of the 404 Permit from the US Army Corp of Engineers (wetlands) and 401 permit from the North Carolina Department of Environmental Quality.

_____Show the water body that the SCM is discharging into, if applicable.

_____Provide a map and certified reports that includes locations of all perennial and intermittent streams, wetlands, 100-year floodplain boundaries, and other natural features as determined by survey.

_____Show time of concentration calculations for all hydrographs.

_____Show curve number calculations for both pre-developed and post-developed conditions for hydrographs.

_____Provide 2 drainage area maps, one for pre-development and one for post-development, that shows the dividing lines and direction of flow for each drainage area contributing to the project site.

_____Delineate sub-watershed areas on the plan for both pre- and post-development conditions. Clearly show and label the "Tc" path, slope and soil types in each sub watershed; provide the areas in acres.

_____Show a maintenance plan and schedule for all permanent Stormwater Control Measures.

_____Provide inlet and outlet invert elevations for all drainage structures.

_____Provide profiles for all outfall pipes 15” and larger and channels located within recorded public easements. Include the Hydraulic Grade Line (HGL) profile for the Ten Year Return Period.

_____Provide cross sections for diversions, ditches, ponds, swales, infiltration structures, etc.

_____Provide a name of the person responsible for longtime maintenance of stormwater management facilities.

_____Show natural and manmade features at the site, including wetlands, watercourses, floodplains and developments (roads, buildings, and other structures).

_____Design criteria for drainage collection facilities within the right-of-ways must follow Standard Specifications and Detail Manual, Section 04.02.01.

_____The following construction notes shall be included on the plans:

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 when otherwise noted.

2. All storm drain pipes shall be placed to proper grade and alignment per approved plans.

3. No cracked or broken pipes shall be placed or accepted in construction of the project.

4. All catch basins 3’-6” deep or more shall have steps placed at 1’-2” on center.

5. Erosion control measures shall be placed around drainage inlets and catch basins.

6. All pipes in storm drainage structures shall be cut off flush with the inside wall.

7. All structures shall be smooth inside and outside of the structure using mortar mixed to manufacturer’s specifications to avoid debris build-up obstructing flow.

8. All tail ditches shall have positive drainage with a minimum 1.0% slope.

9. The Developer shall obtain any off-site drainage easement from adjacent property owners required to complete the improvements or provide positive drainage flow prior to construction plan approval.

10. All concrete for drainage structures shall be a minimum of 3,600 psi except where otherwise noted or required.

11. All precast storm drainage structures must be certified to adequately carry H20 loading.

12. Pre-cast storm drainage structure shall not be cut or altered without a Professional Engineer's Certification of adequate load bearing strength following the alteration of the structure, except where designated "knock-out" panels are provided.

13. Under no circumstances shall water be permitted to rise in un-backfilled trenches after the pipe has been placed.

14. The laying of pipe in the finished trench shall be started at the lowest point and laid upgrade. The bell shall be laid upgrade.

15. Survey staking and proposed grades shall be consistent with plans and field conditions.

16. No construction activities are allowed to take place beyond the floodplain line or the stream buffer line, whichever is greater, without a permit issued by the U.S. Army Corps of Engineers, the North Carolina Department of Environmental Quality, and/or the City of Monroe.

Clearly delineate the following on the site and grading plans:
_____ Proposed FEMA floodplain line
_____Existing FEMA floodplain line (to be shown until FEMA approval of proposed line)
_____ Existing FEMA floodway line
_____ Floodway cross-sections (stream station, location, existing and future flood elevations)
_____ Undisturbed vegetated stream buffer lines (35' intermittent and perennial streams, 50' for Legislative Rezoning, measured from the top of bank)
_____ Building setback for streams outside designated floodplains (5 times the stream width at the top of bank or 35' each side, whichever is greater)

25+1 Flood Analysis

For streams located outside of FEMA regulated waters and FEMA regulated "A" zones which serve a drainage area of 10 acres or more, perform a flood analysis utilizing the 25-year storm to establish finish floor elevations. Finish floor shall be established at least one foot above the 25-year storm elevation.

_____Runoff coefficients shall be based on assumption of full development of parcels per current zoning
_____ Proposed elevations shall be labeled on the site and grading plans for each lot
_____ Show and label 25+1 flood elevation flood line on site and grading plan
_____Show and label or describe on plan the location and elevation (ref. vertical datum, i.e. NAVD 88) of permanent benchmark used in channel survey. All topographic information shown on grading plan shall also be referenced to this benchmark.
_____Provide a hard copy of all channel analysis input and output files along with plan submittal.

07.07 DRIVEWAY PERMIT

Property Owner/ Lessee: _____
Property Address: _____
City, State & Zip code: _____

Driveway location by address: _____

Type of usage: Residential _____ Business _____ Industrial _____
(Select one)

Driveway is located on the _____ side of _____,
(Direction N, E, S, W) (Street Name)
_____ feet _____ of the centerline of _____.
(distance) (Direction N,E,S,W) (Street Name)

(Sketch driveway plan of back or attach sketch plan to permit.
For multiple driveways attach sketch plan to permit.)

Driveways are to be paved in accordance with Chapter 8.4.3, B of the City of Monroe Unified Development Ordinance

Driveway width: _____

Type of driveway pavement: Asphalt _____ Concrete_____
(Select one)

Type of Approach:
(Select one)

_____ Concrete ramp with no pipe.
_____ Concrete ramp with _____ _____ Pipe.
(12" minimum size) (material)
_____ City Standard Concrete ramp through curb and gutter section.
_____ Asphalt ramp with no pipe.
_____ Asphalt ramp with _____ _____ Pipe.
(12" minimum size) (material)
_____ Street type entrance for shopping centers only.

Existing Sidewalk? Yes _____ No _____
(Select one)

Approved by: _____ _____
Engineering Department Date

07.08 CERTIFICATION FORMS

1. The following forms shall be utilized in accordance with Standards 07.05.00 and 07.06.00.

2. Table 07-01 gives a description of the following Certification Forms contained in this document.

Table 07-01

Certification No.	Description	Notarization Required
1-01	Primary Erosion Control Inspection Form	No
1-02	Intermittent Subdivision Construction Form	Yes
1-03	Final Subdivision Construction Form	Yes
1-04A	Pre-Construction Certification Form – Post Construction Stormwater Control Measures	Yes
1-04B	Final Certification Form – Post Construction Stormwater Control Measures	Yes
1-04C	Engineer's Certification	No
1-05	Re-Inspection Form	No
1-06	Intermediary Erosion Control Acceptance Form	No
1-07	Final Erosion Control Acceptance Form	No

3. No construction activities other than installation of erosion control measures shall begin prior to the City Engineer's approval of Certification Form 1-01.

4. The Developer or his contractor shall not remove any Temporary Erosion Control Measure prior to approval of Certification Form 1-06 by the City Engineer.

CITY OF MONROE
Certification Form 1-01

Primary Erosion Control Inspection Form

Project Name _____ Date _____

Developer _____ Contractor _____

1. The City of Monroe Erosion Control Permit Number for this project is _____

2. All approved erosion control measures have been installed per approved plans.

3. I understand that any failure to maintain these erosion control measures will result in appropriate enforcement actions in accordance with the City of Monroe Erosion and Sedimentation Control Ordinance, the North Carolina Sedimentation Pollution Control Act of 1973 (NCGS Chapter 113A, Article 4), and the North Carolina Administrative Code Title 15A, Department of Environmental Quality Chapter 4.

4. Additional erosion control measures may be required based upon specific site conditions.

I, _____ of _____
(Responsible Agent) (Development Company)
hereby certify that the information contained herein is true and correct to the best of my knowledge and belief and was provided by me under oath.

_____ _____
(Developer Agent Signature) (Date) (Contractor Agent Signature) (Date)

_____
(Project Engineer Signature) (Date)

ACCEPTANCE BY CITY OF MONROE:

_____ _____
(Erosion Control Inspector Signature) (Date) (City Engineer Signature) (Date)

CITY OF MONROE
Certification Form 1-02

Intermittent Subdivision Construction Form

Project Name _____ Date _____

Developer _____ Contractor _____

1. All approved rough grading operations have been completed per approved plans.
2. All approved sanitary sewer system components have been installed per approved plans and in accordance with the City of Monroe Standard Specifications and Detail Manual.
3. All approved storm drainage system components have been installed per approved plans, and all construction was completed in accordance with the City of Monroe Standard Specifications and Detail Manual.
4. All curb has been installed, each section of curb was backfilled within 3 to 5 days of placement, and all construction was completed in accordance with the City of Monroe Standard Specifications and Detail Manual.
5. All approved water line system components have been installed per approved plans, and all work has been completed in accordance with the City of Monroe Standard Specifications and Detail Manual.
6. Attached are all geotechnical reports not previously submitted for roadway fill material and utility trench construction. Deviations from minimum testing requirements stipulated by Section 01.08 INSPECTIONS are documented and noted in the final report prepared by the independent testing firm.
7. The City of Monroe Energy Services Department, telephone, and television/cable utility service organizations have been contacted for utility service installation and sleeve/conduit installations for proposed curb crossings.
8. Upon receipt, the City of Monroe Engineering Department will issue costs for street sign installation.

I, _____ of _____
(Responsible Agent) (Development Company)
hereby certify that the information contained herein is true and correct to the best of my knowledge and belief and was provided by me under oath.

_____ _____
(Developer Agent Signature) (Date) (Contractor Agent Signature) (Date)

_____
(Project/Geotechnical Engineer Signature) (Date)

I, _____, a Notary Public of the County of _____, State of North Carolina, hereby certify that _____ appeared personally before me this day and being duly sworn acknowledged that the above form was executed by him.

Witness my hand and notarial seal, this _____ day of _____, _____

SEAL

_____
(Notary)

My commission expires _____

- Notary is for the Responsible Agent Signature

ACCEPTANCE BY CITY OF MONROE:

_____ _____
(Construction Inspector Signature) (Date) (City Engineer) (Date)

CITY OF MONROE
Certification Form 1-03

Final Subdivision Construction Form

Project Name _____ Date _____

Developer _____ Contractor _____

1. The asphalt or stone base course for this project has been installed, and all construction was completed in accordance with the City of Monroe Standard Specifications and Detail Manual.
2. Post installation inspection reports for storm drainage pipe have been provided as required by Standard 1.08 INSPECTIONS, including identification of any defects with an assessment for severity and recommendations for repairs of lines inside right of way and public easements.
3. Post installation re-inspection reports for storm drainage pipe have been provided as required by Standard 1.08 INSPECTIONS verifying that recommended remediation of identified defects have been properly completed and all requirements of the City's *Post-Installation Inspection of Storm Drainage Pipes and Culverts Policy* have been met.
4. The asphalt roadway surface course for this project has been installed, and all construction was completed in accordance with the City of Monroe Standard Specifications and Detail Manual.
5. All sidewalk has been installed, each section of curb was backfilled within 3 to 5 days of placement, and all construction was completed in accordance with the City of Monroe Standard Specifications and Design Manual.
6. Attached are all geotechnical reports not previously submitted for roadway construction. Deviations from minimum testing requirements stipulated by Section 01.08 INSPECTIONS are documented and noted in the final report prepared by the independent testing firm.
7. All punch list items contained on the Post-Construction Checklist, Standard 07.11.00 are completed.
8. I have read items 1-11 within Standard 07.10.00 and understand that by requesting the final walk-through, the City of Monroe expects that all major items are completed to the fullest extent possible.
9. I further understand that any evident misrepresentation will incur a re-inspection fee in the amount of current policies and that no re-inspection will be scheduled until all fees are paid.
10. The completed Post-Construction Checklist is attached to this form.
11. The warranty period will initiate upon final acceptance by the City of Monroe.

I, _____ of _____
(Responsible Agent) (Development Company)
hereby certify that the information contained herein is true and correct to the best of my knowledge and belief and was provided by me under oath.

_____ _____
(Developer Agent Signature) (Date) (Contractor Agent Signature) (Date)

_____
(Project/Geotechnical Engineer Signature) (Date) (Project Engineer SEAL)

I, _____, a Notary Public of the County of _____, State of North Carolina, hereby certify that _____ appeared personally before me this day and being duly sworn acknowledged that the above form was executed by him.

Witness my hand and notarial seal, this _____ day of _____, _____

SEAL

_____
(Notary)

- Notary is for the Responsible Agent Signature

My commission expires _____

ACCEPTANCE BY CITY OF MONROE:

_____ _____
(Construction Inspector Signature) (Date) (City Engineer) (Date)

CITY OF MONROE
Certification Form 1-04 A

Erosion Control BMP to Post-Construction Stormwater Control Measure (SCM) Conversion Form

Project Name _____ Date _____

Developer _____ Contractor _____

1. The contributing drainage area for the SCM structure is sufficiently stable to allow construction to begin or
2. Erosion and Sedimentation Control BMPs are in place to protect any proposed SCM during construction.
3. I understand that failure to protect any SCM from sedimentation during construction may result in a delay of final acceptance.
4. I further understand that the SCM must be fully functional with all features, vegetation, and controls installed before final acceptance.

I, _____ of _____
(Responsible Agent) (Development Company)
hereby certify that the information contained herein is true and correct to the best of my knowledge and belief and was provided by me under oath.

_____ _____
(Developer Agent Signature) (Date) (Contractor Agent Signature) (Date)

_____
(Project Engineer Signature) (Date) (Project Engineer SEAL)

I, _____, a Notary Public of the County of _____, State of North Carolina, hereby certify that _____ appeared personally before me this day and being duly sworn acknowledged that the above form was executed by him.

Witness my hand and notarial seal, this _____ day of _____, _____

SEAL

_____
(Notary)

My commission expires _____

- Notary is for Responsible Agent Signature

ACCEPTANCE BY CITY OF MONROE:

_____ _____
(Construction Inspector Signature) (Date) (City Engineer) (Date)

CITY OF MONROE
Certification Form 1-04B

Final Inspection Form- Post-Construction Stormwater Control Measures (SCMs)

Project Name _____ Date _____

Developer _____ Contractor _____

1. All SCMs and related construction is completed and the SCM is fully functional with all features, vegetation, and controls installed.
2. A City of Monroe Stormwater Maintenance Agreement has been submitted along with the current recording fee and site sketch, as-built drawing of the SCM (s), and engineer of record's certification.
3. A copy of the Post-Construction Checklist for Post-Construction SCMs s 07.12 is attached and all applicable items have been verified and checked.
4. I have read items 1-6 within Standard 07.12 and understand that by requesting the final walk-through, the City of Monroe expects that all major items are completed to the fullest extent.
5. I further understand that any evident misrepresentation on the Checklist will incur a re-inspection fee in the amount of current policies and completion of Form 1-05 and that no re-inspection will be scheduled until all fees are paid and Form 1-05 is complete.

_____
(Project Engineer Signature) (Date) (Project Engineer SEAL

I, _____ of _____
(Responsible Agent) (Development Company)
hereby certify that the information contained herein is true and correct to the best of my knowledge and belief and was provided by me under oath.

_____ _____
(Developer Agent Signature) (Date)

I, _____, a Notary Public of the County of _____, State of North Carolina, hereby certify that _____ appeared personally before me this day and being duly sworn acknowledged that the above form was executed by him.

Witness my hand and notarial seal, this _____ day of _____, _____

SEAL

_____
(Notary)

My commission expires _____

- Notary is for Responsible Agent Signature

ACCEPTANCE BY CITY OF MONROE:

_____ _____
(Construction Inspector Signature) (Date) (City Engineer) (Date)

CITY OF MONROE

Certification Form 1-04C

Professional Engineer's Certification of
Engineered Stormwater Control Measure(s) and Associated Infrastructure

Project Name _____ SW Permit # _____

SCM Type _____ Name/No. per Plans* _____

I, _____ as a duly licensed Professional Engineer, do hereby certify that the Engineered Stormwater Control Measure listed above has been constructed within substantial compliance and intent of the approved construction plans, drawings, and specifications and that the associated infrastructure has been installed in compliance with the approved construction plans, drawings, and specifications. This statement is based upon reference and reviews of the as-built drawings and as-built calculations prepared for this site and upon periodic field inspections and project reviews completed during the construction of the referenced Engineered Stormwater Control Measure, including a final inspection of the measure made within 30-days prior to the signature dated below.

_____
(Project Engineer Signature) (Date) (Project Engineer SEAL)

*Complete a separate form for each SCM.

ACCEPTANCE BY CITY OF MONROE:

_____ _____
(Construction Inspector Signature) (Date) (City Engineer) (Date)

CITY OF MONROE
Certification Form 1-05

Re-Inspection Form

Project Name _____ Date _____

Developer _____ Contractor _____

1. On _____ (Date) an inspection was performed and the following items were found to be incomplete:

To be completed by Construction Inspector

2. All items listed above are now completed.
3. All re-inspection fees have been paid in full and a receipt is attached.

I, _____ of _____
(Responsible Agent) (Development Company)
hereby certify that the information contained herein is true and correct to the best of my knowledge and belief and was provided by me under oath.

_____ _____
(Developer Agent Signature) (Date) (Contractor Agent Signature) (Date)

Form can be returned at the Re-Inspection along with a check made payable to the City of Monroe. Alternatively, the fee can be paid and a receipt received at the City of Monroe Customer Service Center located at 201 E Windsor St. Monroe. NC 28112. Receipt shall be presented at Re-Inspection.

_____
(Project/Geotechnical Engineer Signature) (Date) (Project Engineer SEAL)

ACCEPTANCE BY CITY OF MONROE:

_____ _____
(Construction Inspector Signature) (Date) (City Engineer) (Date)

CITY OF MONROE
Certification Form 1-06

Intermediary Erosion Control Acceptance Form

Project Name _____ Date _____

Developer _____ Contractor _____

1. The City of Monroe Erosion Control Number for this project is _____.

2. The following temporary measures are no longer required for sedimentation and erosion control for the development site and removal is requested:

Measure/ Plan ID	Location	Comment

3. Upon removal, the area is to be seeded and permanent stabilization provided within 30 calendar days; or for residential developments, temporary measures in accordance with the ESC Installation and Maintenance Agreement Form are to be installed and maintained.

4. Certification Form 1-07 Final Erosion Control Acceptance will be submitted after all associated construction activities are completed.

I, _____ of _____
(Responsible Agent) (Development Company)
hereby certify that the information contained herein is true and correct to the best of my knowledge and belief and was provided by me under oath.

_____ _____
(Developer Agent Signature) (Date) (Contractor Agent Signature) (Date)

_____
(Engineer Signature) (Date)

Project Engineer Seal

ACCEPTANCE BY CITY OF MONROE:

_____ _____
(Erosion Control Specialist Signature) (Date) (City Engineer) (Date)

CITY OF MONROE
Certification Form 1-07

Final Erosion Control Acceptance Form

Project Name _____ Date _____

Developer _____ Contractor _____

1. The City of Monroe Erosion Control Number for this project is _____

2. This project is substantially complete and the site is sufficiently stabilized to allow removal of erosion control measures.

I, _____ of _____
(Responsible Agent) (Development Company)
hereby certify that the information contained herein is true and correct to the best of my knowledge and belief and was provided by me under oath.

_____ _____
(Developer Agent Signature) (Date) (Contractor Agent Signature) (Date)

_____
(Project Engineer Signature) (Date) (Project Engineer SEAL)

ACCEPTANCE BY CITY OF MONROE:

_____ _____
(Erosion Control Specialist Signature) (Date) (City Engineer) (Date)

07.09 NOTIFICATION REQUIREMENTS

_____All plan approvals required for this development must be completed and authorization received to proceed prior to the start of construction.

_____Contact Erosion Control Inspector to schedule a preconstruction meeting prior to any land disturbing activity. Third party testing is required for all utility and storm drain installation as well as roadway construction activities.

_____Install temporary erosion control devices per Erosion Control Certificate of Approval and approved plans. No land disturbing activity, except that which is required to install erosion control measures, may commence prior to approval by the City Engineer of Certification Form 1-01.

_____Contact the Erosion Control Inspector via email following installation of erosion control devices to schedule primary erosion control inspection.

_____Submit completed Certification Form 1-01 to the Erosion Control Specialist.

_____Contact Construction Inspector via email prior to beginning Sewer and/or Storm Drain Installation.

_____Prior to curb and gutter installation, contact the City of Monroe Energy Services Department (for gas and electric), Telephone, and Cable Companies for utility service installation and for locations to place sleeves/conduit under the proposed curb line.

_____Contact Construction Inspector 48 hours in advance to schedule a proof roll for curb. Contractor/Developer is responsible for scheduling third party geotechnical representative.

_____Contact construction inspector, via email, 48 hours in advance to schedule a proof roll for roadway subgrade. Contractor/Developer is responsible for scheduling third party geo tech representative.

_____Submit completed and notarized Certification Form 1-02 to Construction Inspector. Certification has provisions for sanitary sewer, storm drainage, water system, curb installation, and contacting utilities outside the contractor's scope of work. Submit all geotechnical reports not previously submitted with Certification Form 1-02.

_____Contact the Construction Inspector, via email, 48 hours in advance to schedule a proof roll for the constructed roadway stone base material. Contractor/Developer is responsible for scheduling third party geo tech representative.

_____Submit CCTV footage report and repair recommendations in accordance with the City's "Post-Installation Inspection of Storm Drainage Pipes and Culverts" policy.

_____Contact the City of Monroe Engineering Department for the cost and to schedule the installation of street signs. Decorative Street Signs installed by the developer must meet the requirements in City of Monroe Standard Detail 02.01.12B

AFTER ALL ITEMS HAVE BEEN CHECKED, REFER TO STANDARD 07.11

07.10 FINAL INSPECTION AND ACCEPTANCE OF SUBDIVISION CONSTRUCTION

1. No final inspection shall be scheduled until Certification 1-03 is approved by the City Engineer.

2. The Developer, his Agent and the Contractor are responsible for utilizing the Post-Construction Checklist to generate the punch list for this project. The City of Monroe may generate a punch list for additional items not contained in the Post-Construction Checklist as well as prepare the Certificate Form 1-05.

3. Any item checked on the Post-Construction Checklist that is found during the walk-through to be an evident misrepresentation shall incur a re-inspection fee in the amount of current policies per each occurrence.

4. The City of Monroe will not accept the street right-of-ways for maintenance until every item on the Post-Construction Checklist and any punch list item is completed to the Construction Inspector's satisfaction, and all outstanding balances have been paid in full.

5. The Developer must submit the As-Built Drawings as required in Standard 01.10, and the City of Monroe must approve the drawings prior to acceptance of the street right-of-ways for maintenance by the City.

6. The developer is responsible for coordinating the installation of all private and public underground utilities including but not limited to telephone, natural gas, cable, and electric prior to acceptance of streets, storm drainage, sewer and water by the City of Monroe. Developer shall be responsible for notifying and keeping the builders and buyers within the development apprised of the acceptance status of municipal services.

7. Final air test of public and private sewer mains and service laterals along with final certification will not be accepted until all utilities are installed. The developer has the option to expedite the acceptance process prior to the installation of all utilities by agreeing to perform closed circuit television (CCTV) inspection at the conclusion of construction and to repair problems identified by the CCTV to the sewer mains and service laterals. Acceptance of the sewer certification will enable the City of Monroe to accept final certification of water, streets, and storm drainage. All testing, air test or CCTV, shall be performed to the requirements as set forth by the Water Resources Department.

8. The developer and/or owner shall submit a written request for acceptance to the Engineering Department outlining the street names(s) and the length in miles.

9. The developer is required to provide a one year written warranty utilizing Warranty Form 07.16 The subdivider shall be responsible for completing all street repairs resulting from defects in materials and workmanship. A final inspection shall be completed by the Engineering Department prior to conclusion of the warranty period.

07.11 POST-CONSTRUCTION CHECKLIST

_____All necessary erosion control measures are in place, sediment basins are clean and in working order.

_____Streets, curb and gutter, and sidewalks are clear of debris and dirt.

_____All storm drain lines are in proper alignment and have straight and positive grade.

_____All storm drain lines are free of dirt, rocks, and debris.

_____All pipes are cut flush with the inside wall of catch basins and other drainage structures.

_____All inside walls of drainage structures are grouted and troweled smooth.

_____All steps in drainage structures are in placed at proper location (if needed).

_____All catch basins have the proper throat area as designed.

_____All inverts of drainage structures are troweled smooth and sloped toward the outlet pipe.

_____All grates are the proper type for the slope (type “E”, “F”, or “G”).

_____All double boxes have either a steel I-beam or two 4” X 4” X $^{3}/_{8}$” angle irons supporting the middle of the frames & grates.

_____All ditches have proper grade and side slopes for positive drainage.

_____All ditches have proper permanent erosion control measures in place.

_____All offsite drainage maintains positive flow from the proposed subdivision to adjacent properties.

_____All curb & gutter has proper alignment and grades specified by the approved plans.

_____Any ponding in the flow line of the gutter is within tolerances per Standard 02.03.06.

_____All accessibility ramps and sidewalks are constructed in accordance with the PROWAG current specifications.

_____All roadway sections are constructed with proper cross-sectional slope.

_____There is no prolonged ponding in roadway areas.

_____All manholes, valves, and grates are set flush with pavement and follow the grade of the street.

_____All sidewalks are placed at proper alignment and grade with proper expansion joint material and contraction joints placed at the correct locations per the plans and/or Standard Detail 02.03.01.

_____Asphalt pavement is free of subgrade failure (settlement), and free of failures in the asphalt (cracking).

_____Any asphalt surface repairs are within tolerances per Standard 02.03.06 and the City of Monroe Street Cut Pavement Repair Standards

_____All broken and cracked curb, sidewalk, accessibility ramps, are within tolerances per Standard 02.03.06.

_____All shoulders are compacted and graded per the typical sections.

_____The shoulders are graded to proper slope, seeded, mulched, and free of large rocks and debris to the back of the utility easement.

_____The right-of-way is clear of all obstructions other than those permitted by existing policies.

_____Street trees, including root protection, are installed per the plans and viable.

1. This Checklist shall be considered the Punch List for the proposed subdivision development.

2. The City of Monroe does not generate a Punch List for the items contained within this Checklist.

3. The City of Monroe may generate a Punch List for additional items not listed on this Checklist as well as prepare Certificate Form 1-05.

4. The Developer and his Contractor shall have full quality control of the development, which includes these Punch List items.

5. After all items have been checked, submit completed and notarized Certification Form 1-03 to the construction inspector to schedule a final walk-through.

6. Any item checked that is found during the final walk-through to be an evident misrepresentation shall incur a re-inspection fee in the amount of current policies per each occurrence.

7. In the event a re-inspection is required, submit Certification Form 1-05 to the Construction Inspector. A re-inspection will not be scheduled until the required fees are paid in full.

8. After the City has approved all checked items in this standard and any punch list items that may have been generated, submit Certification Form 1-06 to the Construction Inspector for authorization to remove all Temporary Erosion Control Measures.

07.12 POST-CONSTRUCTION CHECKLIST FOR STORMWATER CONTROL MEASURES (SCM)

_____The SCM area including barrel, riser, and emergency spillway, if applicable are all free of debris, trash, and other obstructions.

_____The SCM including pond, barrel, riser, embankment and emergency spillway, if applicable are free of holes, leaks, and slides.

_____All bare earth areas have been properly stabilized.

_____All forebay areas are free of sediment (if applicable).

_____The SCM is at the permanent pool elevation and functioning without leakage (if applicable).

_____All disturbed areas within the contributing drainage area and the immediate vicinity of the pond have been properly stabilized.

_____All horizontal alignments and vertical elevations are in accordance with the approved plans.

_____Pipe ends have stabilized outlet per approved plans.

_____Filter surfaces are stable and are not clogged (if applicable).

_____A copy of the soil report on soil media used was submitted and accepted (Applicable for Sand Filters, infiltration and Bioretention SCM's only).

_____Sediment within the SCM has been removed (if SCM has been used as a sediment Basin throughout construction).

_____The Engineer's Certification Form 1-04C and As-built survey from the Professional of Record are attached.

_____ All required vegetation for hydrologic zones has been installed per approved plan.

_____ Stormwater Maintenance Agreement, plat recording fee, and Site Sketch Map are attached.

_____Certification Form 1-04B has been submitted and accepted.

1. This Checklist shall be considered the Punch List for the proposed SCM.

2. The City of Monroe does not generate a Punch List for the items contained within this Checklist.

3. The City of Monroe may generate a Punch List for items not listed on this Checklist.

4. The Developer and his Contractor shall have full quality control of the SCM construction, which includes these Punch List items.

5. Any item checked that is found during the final walk-through to be an evident misrepresentation shall incur a reinspection fee in the amount of current policies per each occurrence.

6. In the event a reinspection is required, all fees are required to be paid by the Developer and verified by the City prior to scheduling the reinspection.

07.13 AS-BUILT DRAWING CHECKLIST

1. AS-BUILT INFORMATION

Submitted by_____

Phone # _____

CHECK ONE

- ❑ (Please check) Blue Line For Review Only
- ❑ Mylar or Vellum (Final)

Transmittal Date _____

2. GENERAL AS-BUILT INFORMATION

_____ A. Copy of recorded plat or deed of easements, indicating easements and right of way
_____ B. Boundary of tract by courses and distance with references
_____ C. Tie to N.C. grid coordinate system
_____ D. Vicinity map
_____ E. Scale of drawings and bar scale
_____ F. North arrow
_____ G. Location of benchmark with M.S.L. elevations
_____ H. Seal and signature of North Carolina registered P.E. or P.L.S. that generated as-built drawings on each sheet per NCBELS Board Rule – 21 NCAC 56 .1103
_____ I. All easements identified and dimensioned
_____ J. Statement designating drawings are "as-built" on each sheet
_____ K. Digital copy of the Final As-built PDF signed and sealed
_____ L. Summary Information File in an ASCII file format that contains the following items:
  1) Project Name,
  2) Name of Firm that prepared the data,
  3) Date the data was prepared,
  4) Specification of two or more survey control monuments established and/or used for the project
  5) A statement that indicates the horizontal and vertical datum of the control monuments.
_____ M. AutoCad (DWG or DXF format) drawing files submitted in conformance with Section 01.11 AS-BUILT DRAWING REQUIREMENTS.

3. STREETS

_____ A. Horizontal alignment with radii, P.C.'s, and P.T.'s of all curves
_____ B. Vertical alignment with centerline grades, vertical curve lengths and station and elevation of all PVC's and PVT's and centerline profile
_____ C. Dimensioned right of way and street widths
_____ D. Pavement section
_____ E. Typical cross section
_____ F. Horizontal and vertical sight lines
_____ G. Delineation of landscaping limits and materials

4. STORM DRAINAGE SYSTEMS

_____ A. Electronic (PDF) copy of as-built plans of constructed structures, pipes, channels, and drainage easements.
_____ B. Supplemental digital file for City records in AutoCAD format meeting the City's current standards
_____ C. Cover Sheet with Professional Engineer and Registered Surveyor Certifications.
_____ D. Site Plan or Grading Plan with all storm system structures identified to match the approved Plans.
_____ E. 100- year flood plain boundary shown and labeled, if applicable.
_____ F. Easement dedication for storm drainage extensions outside right of way shown with bearings and distances.
_____ G. Pipe material per the approved plans.
_____ H. Pipe size, slope, and length (design values text struck-through and constructed values labeled).
_____ I. Structure rim elevations (center of grate at lip) and invert elevations.
_____ J. Grate elevations for grated yard inlets, throat opening dimensions and inverts for "slab type" yard inlets. Provide sufficient spot elevations for finished grade around inlet to confirm that the required sump has been provided.
_____ K. Size and depth of riprap dissipation pad
_____ L. Minimum 2 feet of cover provided in Public Rights of way or provide verification that Class IV Reinforced Concrete Pipe or another approved pipe was installed.
_____ M. Statement of stormwater velocity and discharge at all outlets.
_____ N. Professionally sealed as-built pipe profiles with plotted hydraulic grade line (HGL) to confirm constructed system meets intent of the approved plans.
_____ O. Provide ditch/channel cross-sections to define the ditch section and slope as shown by the approved plans, plotted to scale at 100 feet maximum intervals with minimum of 2 cross sections per ditch with adequate spot elevations. Label distances between spot elevations on the cross sections (Receiving one acre or more of drainage area),

_____ P. Show and label ditch/channel cross sections on the plan view.

Note: Any new or revised storm drainage systems or easements shown on as-built plans may require a review of revised subdivision plans, engineering calculations, and drainage area maps.

5. STORMWATER CONTROL MEASURES (SCM)

_____ A. Show and label the 100-year flood plain boundary, if applicable

_____ B. Pipe material, diameter, slope, and length (design values text struck-through and constructed values labeled)

_____ C. Show structure orifice and/or weir dimensions and elevation(s) (design and constructed)

_____ D. Show structure invert and top elevations (design and constructed)

_____ E. Dimensions and depth of riprap dissipation pad

_____ F. Show limits of permanent SCM(s) in Plan view

_____ G. Show and label limits of filter media (soil or sand), if applicable

_____ H. Water Quality Storage Volume (design and constructed volumes)

_____ I. Water Quantity Storage Volume (design and constructed volumes), if applicable

_____ J. Contour elevations at 1-foot intervals

_____ K. Permanent easement around SCM(s)

_____ L. Clean out and underdrain system, if applicable

_____ M. Show location and dimensions of all impervious coverage and show the total amount of impervious coverage built as a percentage of the total site in a summary table.

_____ N. Permanent pool elevation, spillway elevation, top of bank elevation, depth, and surface area.

City of Monroe Use Only

As-Builts Reviewed by_____ Date _____

CHECK ONE

- ❑ Approved _____ Date _____
- ❑ Returned _____ Date _____

07.14 PERMIT TO OPEN CUT UTILITY TRENCHES CITY MAINTAINED STREET RIGHT OF WAY

PROJECT:_____
LOCATION:_____
STREET_____MH_____TO MH_____
SHEET_____OF CONTRACT_____

REQUEST TO OPEN CUT IS DUE TO THE FOLLOWING:_____
_____
_____
_____
_____
_____
_____

BY APPLICATION, THE UNDERSIGNED CONTRACTOR AGREES TO ADHERE TO THE SPECIAL PROVISIONS REQUIRED FOR ALL OPEN CUTS WITHIN CITY MAINTAINED RIGHT OF WAY.

_____
SIGNATURE OF CONTRACTOR

NAME OF CONTRACTOR:_____
ADDRESS: _____
_____
CONTACT PERSON:_____
PHONE NO.:_____

RECOMMENDED BY PROJECT INSPECTOR:_____DATE:_____

ENGINEERING DEPARTMENT APPROVAL
BY:_____DATE:_____

FINAL ACCEPTANCE OF WORK

FINAL INSPECTION REQUESTED BY CONTRACTOR ON
DATE:_____
ACCEPTED BY PROJECT INSPECTOR
BY:_____ DATE:_____
ACCEPTED BY ENGINEERING DEPARTMENT
BY:_____ DATE:_____

CC: UTILITY DIRECTOR
CONTRACTOR
PROJECT ENGINEER

PERMIT TO OPEN CUT UTILITY TRENCHES
SPECIAL PROVISIONS

1. Contact the engineering department at 704-282-4515, at least 24 hours prior to construction. The engineering department must be notified in writing upon completion so an inspection can be made.
2. Traffic shall be maintained through the work area at all times. Only one lane may be closed at any given time unless otherwise approved.
3. Approval for road closure must be obtained by City of Monroe and/or NCDOT. City of Monroe approval requires a temporary use permit through the permit center.
4. Non-emergency union county communications shall be notified at 704-289-1591 24 hours in advance of a road closure by the contractor.
5. Proper traffic control devices, signs, etc. In accordance with the Manual on Uniform Traffic Control Devices shall be installed to ensure public safety.
6. All materials and workmanship shall conform to the City of Monroe Standard Specifications and Detail Manual. Trench backfill material shall meet NCDOT material requirements.
7. The area disturbed at each site shall be left in a neat and satisfactory condition.
8. No trenches are to be open overnight.
9. Contractor is responsible for providing adequate shoring in all trenches to prevent collapse during construction.
10. Manholes will be adjusted to correct elevation making them level with existing ground.
11. Open cut is to be patched in accordance with standard detail 02.06.01 and the City of Monroe street cut pavement repair standards.
12. Patching is to be performed the same day the cut is made. Plating per details 02.06.02 and 02.06.03 are required.
13. Pavement is to be saw cut. (cuts shall be perpendicular to EOP)
14. Pavement repair should match existing roadway elevation with no dips or raises.
15. Backfill of trenches within the road right of way shall be backfilled in layers not to exceed six (6) inches and thoroughly tamped (each successive layer).
16. (A) Unless otherwise directed by the City Engineering Department, all material from the bottom of the trench to within twelve (12) inches of the subgrade shall be 95% maximum density of standard proctor.
    (B) All material within twelve (12) inches of the subgrade level shall be 100% maximum density of standard proctor.

THE CITY ENGINEERING DEPARTMENT RESERVES THE RIGHT TO REQUIRE THE CONTRACTOR TO EMPLOY THE SERVICES OF A GEOTECHNICAL FIRM TO RUN DENSITY TESTS AND TO CERTIFY THE COMPACTION OF THE BACKFILL MATERIAL.

07.15 WARRANTY

North Carolina
Union County

Date: _____

RE: _____
(Name of Subdivision)

That Whereas, the undersigned subdivider of _____ has requested
(Name of Subdivision)
approval by the City of Monroe of the final plat and/or acceptance by the City of any improvements in said subdivision; and,

Whereas Chapter 02.02.11-6of the City of Monroe Detail Manual provides that prior to said approval and/or acceptance of improvements the subdivider shall furnish to the City a written warranty against defects which shall guarantee the material and workmanship in said subdivision for a period of not less than **twelve (12)** months from the date of such acceptance;

Now, Therefore in consideration of the provisions of said section, which are incorporated herein by reference, and the granting of final plat approval and/or acceptance of improvements by the City, the undersigned subdivider does hereby guarantee to the City of Monroe, its successors and assigns, the material and workmanship of said subdivision against any defects for a period of twelve (12) months from the date of acceptance, which said date is set out herein below, provided however, that until successful performance is obtained as determined by the Subdivision Administrator, this warranty shall not expire.

_____
(Date of Acceptance)

_____ _____
(Signature of Subdivider) (Print Name of Subdivider)

North Carolina
Union County

I, _____, a Notary Public in and aforesaid State and _____County, do hereby certify that _____ subdivider(s), personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

WITNESS my Hand and Notarial Seal, this the _____ day of _____, 200____

_____
Notary Public

My Commission Expires:

07.16 GUARANTEEING SUBDIVISION IMPROVEMENTS

In lieu of requiring the completion, installation, and inspection of all or any part of required subdivision improvements (as described in Section 156.60 of the City Code of Ordinances) prior to final plat approval, the City permits subdividers to deposit with the City cash, an irrevocable letter of credit, or other instrument readily convertible into cash at face value. Such financial guarantees shall be in an amount equal to 110% of the estimated cost of completing the required improvements. The duration of the guarantee shall be of a reasonable period to allow for completion and acceptance of the improvements. All subdivisions for which improvements have not been completed and accepted by the appropriate governmental agency at least thirty (30) days prior to the expiration of the guarantee shall be considered to be in default. The City may at this time use the financial guarantee to complete all necessary improvements unless an extension is granted.

The following is a discussion of the process required for acceptance by the City of a financial guarantee.

Step 1: The subdivider must submit to the Subdivision Administrator an itemized list showing cost estimates signed by his contractor for all required improvements not completed in the subdivision. *Note: As a minimum, for each work item the quantity of work along with the unit price and total cost must be provided. If this list is incomplete or doesn't provide sufficient detail for independent analysis, the request cannot be reviewed by the City.*

Step 2: The cost estimates are reviewed by the City's Engineering Department and Water Resources Department for accuracy and completeness. Comments are forwarded to the Subdivision Administrator.

Step 3: The subdivider is given a letter by the Subdivision Administrator showing the amount for which a letter of credit or other acceptable form of guarantee must be submitted.

Step 4: If a letter of credit or other acceptable legal instrument is submitted by the subdivider, the Subdivision Administrator, Finance Director, and City Attorney will review the instrument to determine its sufficiency. If it is found to be insufficient the subdivider will be notified and given the chance to resubmit a guarantee. If it is found to be sufficient, the subdivider will be notified that the final plant can be recorded as soon as recordable copies (2 mylars) have been filed with the Planning and Development Department and all fees are paid.

Step 5: The subdivider may request a one-time reduction in the financial guarantee not to exceed 50% of the original amount of the guarantee once at least 50% of the required improvements have been made. Steps 1, 2, and 3 of the process outlined above are repeated for this process.

All subdividers are encouraged to work closely with City staff to ensure that unexpected delays are prevented whenever possible. City staff may require as many as ten (10) working days to review a request for financial guarantee, so please submit your requests and required information as soon as possible. The actual time required for review and approval of the requests will vary depending upon staff workload and the completeness of the request.

07.17 SUBDIVISION BOND ESTIMATE FORM

Typical listing of items for roadway, storm drainage, water, and sewer improvements

DATE: _____ **BY:** _____

ITEM	QUANTITY	UNIT COST	AMOUNT
ROADWAY & STORM DRAINAGE CONSTRUCTION			
Mobilization	Lump Sum		
Clearing & Grubbing	Lump Sum		
Unclassified Excavation	C.Y.		
Borrow	C.Y.		
Curb & Gutter	L.F.		
CABC	Ton		
Asphalt Base B25.0	Ton		
Intermediate Course I19.0	Ton		
Asphalt Surface Course Type S9.5	Ton		
Asphalt Cement	Ton		
4" Concrete Walk	S.Y.		
6" Concrete Drive	S.Y.		
Accessible Ramp with Detectable Warning Strip	Each		
Drainage Structure	Each		
Drainage Structure Frame & Grate	Each		
Manholes	Each		
Manhole Frame & Cover	Each		
Adjusting Street Structures	Each		
Reinforced Concrete Pipe - _____ inch	L.F.		
Reinforced Concrete Pipe - _____ inch	L.F.		
Reinforced Concrete Pipe - _____ inch	L.F.		
Reinforced Concrete Pipe - _____ inch	L.F.		
Foundation Condition Material	Ton		
Flared End Section	Each		
End Wall/Head Wall	C.Y.		

ITEM	QUANTITY	UNIT COST	AMOUNT
Street Trees	Each		
Street Tree Root Protection (Both Sides)	LF		
Seeding	S.Y.		
Concrete Steps	C.Y.		
Reset Fence	L.F.		
Rip-Rap	S.Y.		
Pavement Sawing (Unclassified Excavation)	L.F.		
Tree Removal (Unclassified Excavation)	Lump Sum		
Other:			
SUB-TOTAL			
WATER MAIN CONSTRUCTION			
Mobilization	Lump Sum		
Water Distribution Pipe			
12" Water Main	L.F.		
10" Water Main	L.F.		
8" Water Main	L.F.		
6" Water Main	L.F.		
2" Water Main	L.F.		
Gate Valves			
12"	Each		
10"	Each		
8"	Each		
6"	Each		
2"	Each		
Fire Hydrant Assemblies with 6" Gate Valve	Each		
Fire Hydrant Extensions 0 > 1	V.F.		
Fire Hydrant Extensions 1<	V.F.		

ITEM	QUANTITY	UNIT COST	AMOUNT
Fittings			
Tapping Sleeve and Valve - 12"	Each		
Tapping Sleeve and Valve - 8"	Each		
Tapping Sleeve and Valve - 6"	Each		
3/4" Water Services			
Services on Same Side as Water Main	Each		
Services involving a Road Crossing	Each		
Testing of Water Mains	L.F.		
Other:			
SUB-TOTAL			
SEWER MAIN CONSTRUCTION			
Mobilization	Lump Sum		
Sanitary Sewer Pipe - 12" Sanitary Sewer Main			
0' - 6' Depth	L.F.		
6' - 8' Depth	L.F.		
8' - 10' Depth	L.F.		
10' - 12' Depth	L.F.		
12' and Deeper	L.F.		
Sanitary Sewer Pipe - 10" Sanitary Sewer Main			
0' - 6' Depth	L.F.		
6' - 8' Depth	L.F.		
8' - 10' Depth	L.F.		
10' - 12' Depth	L.F.		
12' and Deeper	L.F.		
Sanitary Sewer Pipe - 8" Sanitary Sewer Main			
0' - 6' Depth	L.F.		
6' - 8' Depth	L.F.		
8' - 10' Depth	L.F.		
10' - 12' Depth	L.F.		
12' and Deeper	L.F.		

ITEM	QUANTITY	UNIT COST	AMOUNT
Substituting Ductile Iron Pipe			
12" DIP	L.F.		
10" DIP	L.F.		
8" DIP	L.F.		
4' Diameter Manholes (0' - 6')			
Grouted in Place	Each		
Bolted Down Frame and Cover	Each		
Extra Depth Manholes	V.F.		
4" Sanitary Sewer Service Laterals	Each		
Connections to Existing Sanitary Sewer Main	Each		
Solid Rock Excavation	C.Y.		
Testing for Exfiltration	L.F.		
Other:			
Sub-Total Sanitary Sewer			
TOTAL SUBDIVISION BOND ESTIMATE (Roadway, Storm Drainage, Water and Sewer Improvements)			

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

Any citizen, business, institution, or other entity wishing to request that the City of Monroe abandon a publicly dedicated street or alley must submit the following information to the Engineering Department. City consideration will be based on the procedure outlined below.

1. Preliminary Review Requirements – complete the following:
   - A. Petitioner to acquire the signature of all adjoining property owners, along the street or alley that is requested abandoned, indicating the owners support to the street abandonment. (per table below)
   - B. Petitioner submits letter of request along with a drawing showing the area to be abandoned for review by staff, the appropriate council committee for review.
     1) Engineering Technician responds back to Petitioner with additional needs from the various committees.
     2) Regardless of the recommendation for or against the abandonment of the petitioned street, the petitioner may fulfill the requirements for City Council as outlined below. Any discrepancies between the original description and the finished plat for City Council may require additional review by the previous committees.

2. City Council Review Requirements – Complete the following
   - A. Petitioners submit the nonrefundable fee in accordance with the City of Monroe fee schedule.
   - B. A list of all current property owners adjoining the street of alley as shown on Union County tax records (including addresses and tax identification numbers) and a mailing label for each.
   - C. A written description of the street to be abandoned is submitted along with a map showing the area to be abandoned. Map may be a recorded subdivision plat or tax map with the area to be abandoned clearly defined. In cases where a new plat is required to define the area, plat must meet requirements of GS 47-30 mapping standards and prepared by a Registered Land Surveyor. The written description must be provided in digital format accepted by the City of Monroe.
   - D. Petition **will not** be placed on the City Council agenda without a map or completed plat, written description or payment of applicable fees.

TAX ID#	OWNER'S MAILING ADDRESS (including Company Name)	NAME (signers name printed legibly)	SIGNATURE	AGAINST CLOSING	FOR CLOSING

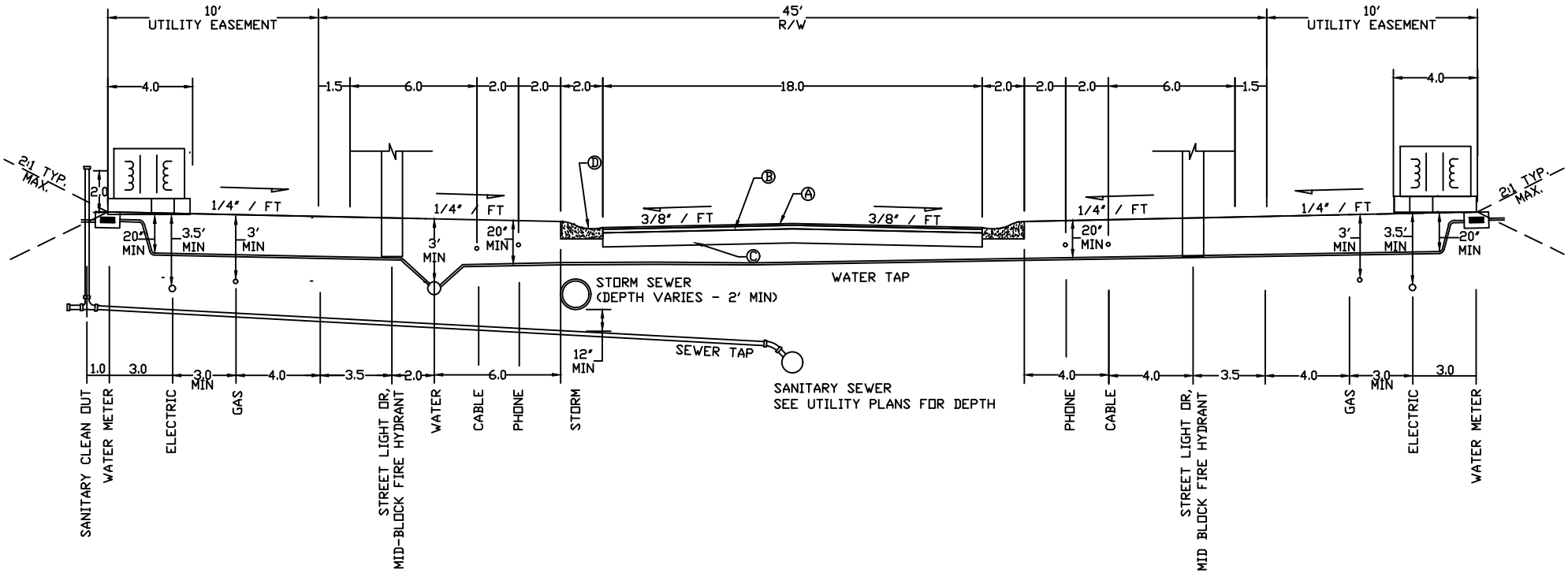
*i.e. an exhibit referencing existing city and/or state maintained intersections at both ends of the street to be closed, along with a tax parcel numbers, north arrow and drawing scale

PAVEMENT SCHEDULE*

- Ⓐ 1 in. BIT. CONC., SURFACE COURSE, TYPE S9.5
- Ⓑ 2.5 in. BIT. CONC. BINDER COURSE, TYPE I 19.0C
- Ⓒ 4 in. BIT. CONC. BASE COURSE, TYPE B 25.0C OR 8 in. COMPACTED AGGREGATE BASE COURSE
- Ⓓ 2 ft. 0 in. VALLEY & GUTTER

NOTES

1. UTILITY LOCATIONS SHOWN ARE FOR ALL UTILITIES AND SHALL NOT BE DEVIATED FROM WITHOUT CITY OF MONROE APPROVAL
2. DEPTHS SHOWN ARE MINIMUM DEPTHS
3. STREET LIGHTS WILL BE ON ONE SIDE OF ROAD DEPENDING ON SUBDIVISION LAYOUT
4. FIRE HYDRANT/STREET LIGHTS SHALL BE ALIGNED WITH COMMON LOT LINE OF PARCELS
5. MAINTAIN AT LEAST ONE SURVEY STAKE FOR THE BACK OF CURB AND THE BACK OF THE UTILITY EASEMENT PER LOT.
6. FINAL SURFACE ASPHALT TO BE PLACED ONCE PARCEL(S) ARE 80% DEVELOPED OR ONE YEAR FOLLOWING INTERMEDIATE COURSE PLACEMENT, WHICHEVER OCCURS FIRST.
7. TACK COAT TO BE APPLIED BETWEEN EACH LAYER OF ASPHALT, EVEN WHEN LAYERS ARE PLACED ON THE SAME DAY.



REVISIONS		
NO.	DATE	DESCRIPTION
1	04/20/04	MODIFIED FOR SUPERPAVE
2	05/2008	UTIL EASEMENT 1/4"/FT PHONE CABLE SPACING ADD PLAN VIEW, PAVEMENT SCHEDULE "B"
3	10/2022	RELOCATE SANITARY SEWER CLEAN OUT & WATER METER BOX. ADDED NOTE 5.
4	03/2025	ADD NOTES 6 AND 7. CHANGE ASPHALT TYPES. DELETE ITEMS

Monroe North Carolina

LOCAL RESIDENTIAL STREET FOR 45' R/W

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: JAM | DATE: 08-07-01
CHECKED BY: JNL | SCALE: N.T.S.

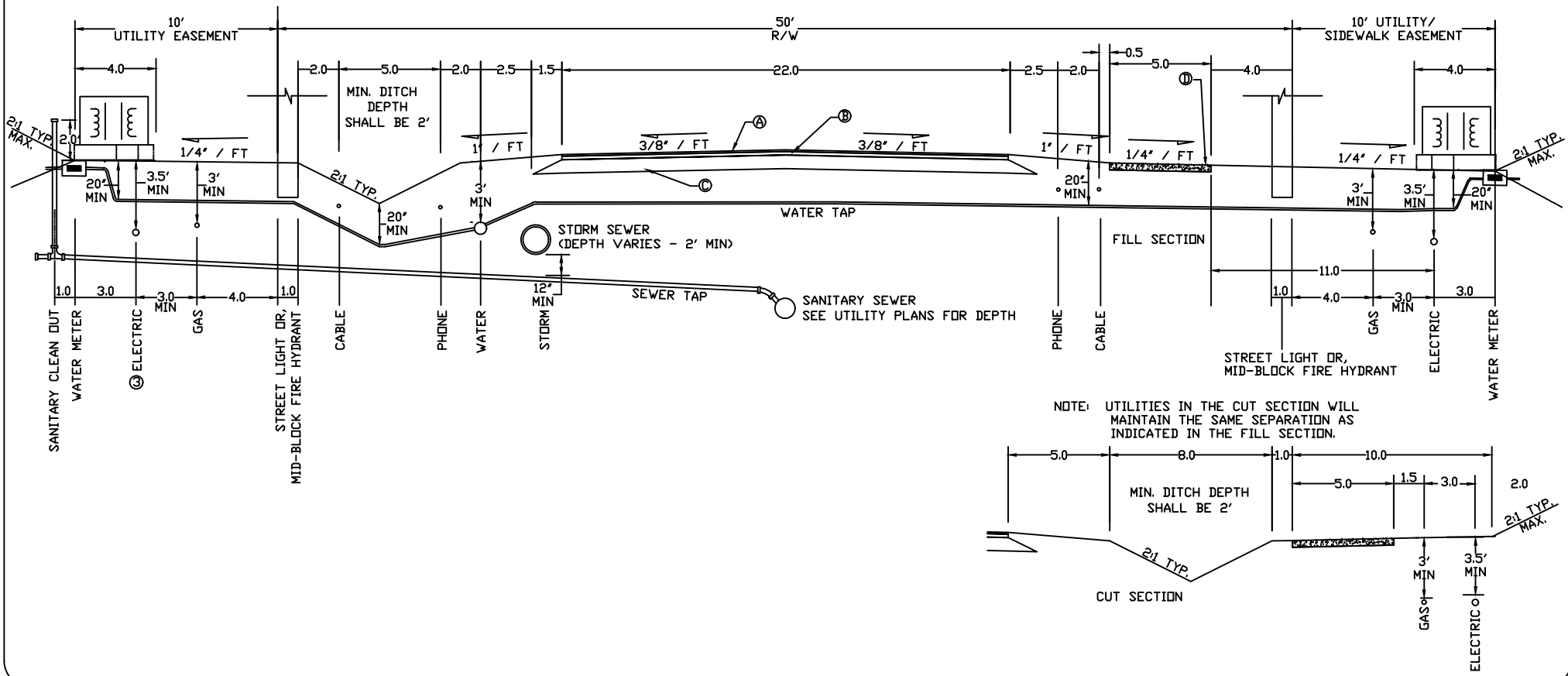
DETAIL 02.01.01

PAVEMENT SCHEDULE*

- Ⓐ 1 in. BIT. CONC., SURFACE COURSE, TYPE S9.5
- Ⓑ 2.5 in. BIT. CONC. BINDER COURSE, TYPE I 19.0C
- Ⓒ 4 in. BIT. CONC. BASE COURSE, TYPE B 25.0C OR 8 in. COMPACTED AGGREGATE BASE COURSE
- Ⓓ 4 in. CONCRETE SIDEWALK; 5 ft. WIDTH

NOTES

1. UTILITY LOCATIONS SHOWN ARE FOR ALL UTILITIES AND SHALL NOT BE DEVIATED FROM WITHOUT CITY OF MONROE APPROVAL
2. DEPTHS SHOWN ARE MINIMUM DEPTHS
3. STREET LIGHTS WILL BE ON ONE SIDE OF ROAD DEPENDING ON SUBDIVISION LAYOUT
4. FIRE HYDRANT/STREET LIGHTS SHALL BE ALIGNED WITH COMMON LOT LINE OF PARCELS
5. MAINTAIN AT LEAST ONE SURVEY STAKE FOR THE BACK OF CURB AND THE BACK OF THE UTILITY EASEMENT PER LOT.
6. FINAL SURFACE ASPHALT TO BE PLACED ONCE PARCEL(S) ARE 80% DEVELOPED OR ONE YEAR FOLLOWING INTERMEDIATE COURSE PLACEMENT, WHICHEVER OCCURS FIRST.
7. TACK COAT TO BE APPLIED BETWEEN EACH LAYER OF ASPHALT, EVEN WHEN LAYERS ARE PLACED ON THE SAME DAY.



NOTE: UTILITIES IN THE CUT SECTION WILL MAINTAIN THE SAME SEPARATION AS INDICATED IN THE FILL SECTION.

REVISIONS		
NO.	DATE	DESCRIPTION
1	4/20/04	MODIFIED FOR SUPERPAVE
2	05/2008	UTIL EASEMENT 1/4"/FT RELOCATE CABLE/PHONE PAVEMENT SCHEDULE "B"
3	01/2015	RELOCATE UTILITIES
4	10/2022	RELOCATE SANITARY SEWER CLEAN OUT & WATER METER BOX. ADDED NOTE 5.
5	03/2025	ADD NOTES 6 AND 7. CHANGE ASPHALT TYPES, DELETE ITEMS

Monroe North Carolina

RESIDENTIAL STREET WITH DITCHES FOR 50' R/W

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: JAM | DATE: 08-07-01
CHECKED BY: JNL | SCALE: N.T.S.

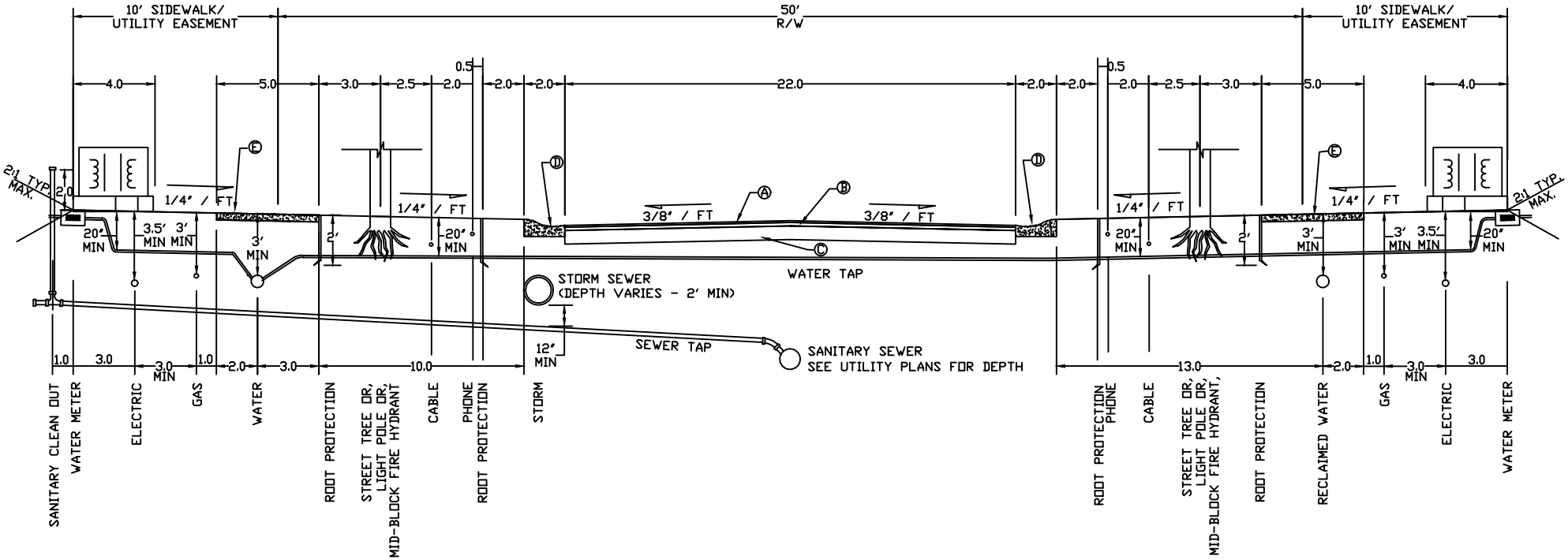
DETAIL 02.01.02

PAVEMENT SCHEDULE*

- Ⓐ 1 in. BIT. CONC., SURFACE COURSE, TYPE S9.5
- Ⓑ 2.5 in. BIT. CONC. BINDER COURSE, TYPE I 19.0C
- Ⓒ 4 in. BIT. CONC. BASE COURSE, TYPE B 25.0C OR 8 in. COMPACTED AGGREGATE BASE COURSE
- Ⓓ 2 ft. 0 in. VALLEY & GUTTER
- Ⓔ 4 in. CONCRETE SIDEWALK; 5 ft. WIDTH

NOTES

1. UTILITY LOCATIONS SHOWN ARE FOR ALL UTILITIES AND SHALL NOT BE DEVIATED FROM WITHOUT CITY OF MONROE APPROVAL
2. DEPTHS SHOWN ARE MINIMUM DEPTHS
3. STREET LIGHTS WILL BE ON ONE SIDE OF ROAD DEPENDING ON SUBDIVISION LAYOUT
4. FIRE HYDRANT/STREET LIGHTS SHALL BE ALIGNED WITH COMMON LOT LINE OF PARCELS
5. MAINTAIN AT LEAST ONE SURVEY STAKE FOR THE BACK OF CURB AND THE BACK OF THE EASEMENT PER LOT.
6. FINAL SURFACE ASPHALT TO BE PLACED ONCE PERCEL(S) ARE 80% DEVELOPED OR ONE YEAR FOLLOWING INTERMEDIATE COURSE PLACEMENT, WHICHEVER OCCURS FIRST.
7. TACK COAT TO BE APPLIED BETWEEN EACH LAYER OF ASPHALT, EVEN WHEN LAYERS ARE PLACED ON THE SAME DAY.
8. ROOT BARRIER SHALL BE A MINIMUM OF TWO FEET DEEP FROM FINAL SUB GRADE AND EXTEND THREE FEET PAST THE CANOPY ON EACH SIDE OF THE TREE.



REVISIONS		
NO.	DATE	DESCRIPTION
1	4/20/04	WAS 02.01.03
2	4/20/04	MODIFIED FOR SUPERPAVE
3	05/2008	UTIL EASEMENT 1/4"/FT RELOCATE PHONE/CABLE PAVEMENT SCHEDULE "B"
4	10/2022	RELOCATE SANITARY SEWER CLEAN OUT & WATER METER BOX. ADDED TREE ROOT PROTECTION DEPTH. ADDED NOTE 5.
5	03/2025	ADD NOTES 6, 7 AND 8; CHANGE ASPHALT TYPES. DELETE ITEMS

Monroe North Carolina

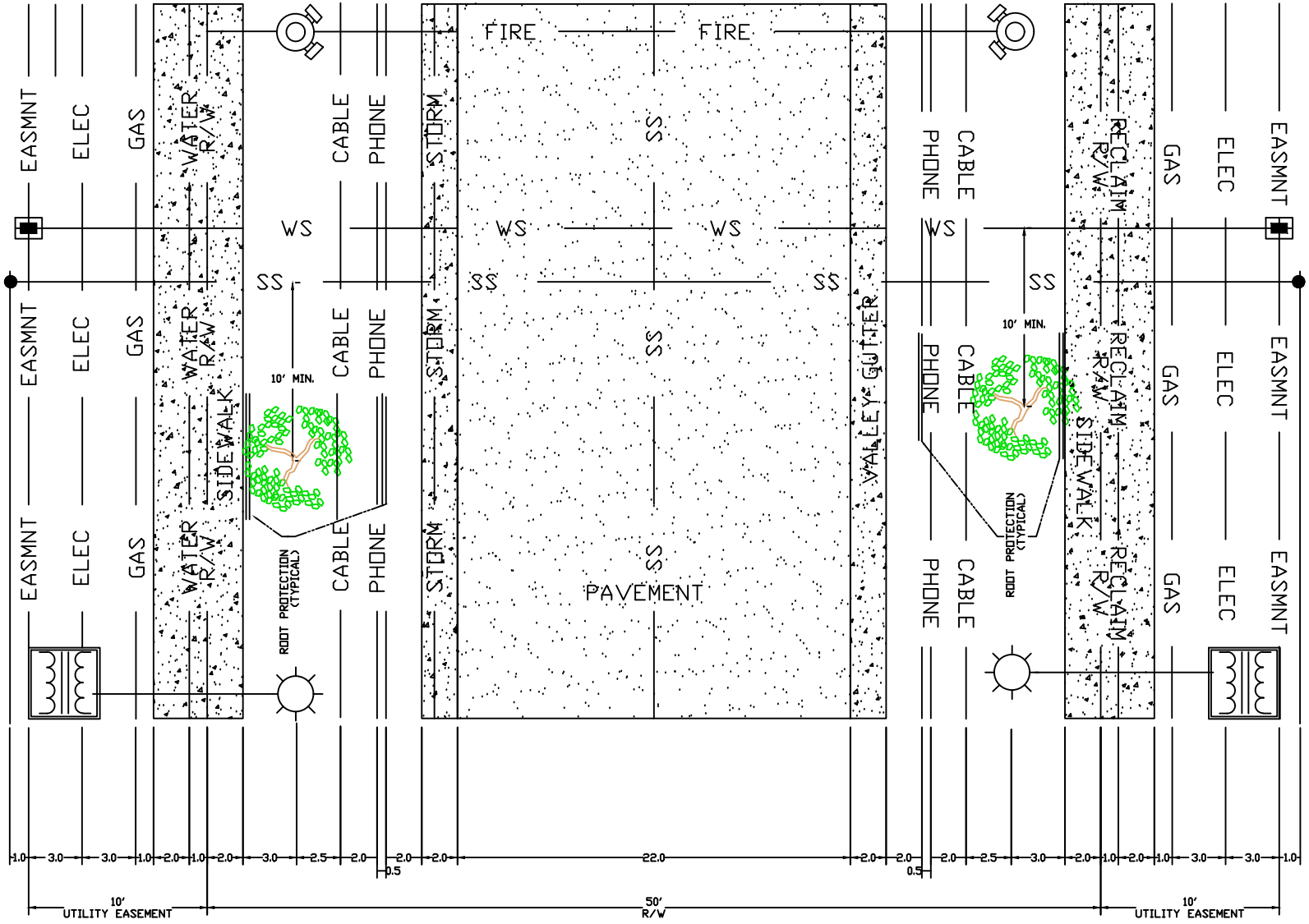
RESIDENTIAL STREET WITH STREET TREES FOR 50' R/W (1 of 2)

CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: JAM | DATE: 08-07-01
CHECKED BY: JNL | SCALE: N.T.S.

DETAIL 02.01.03A



REVISIONS		
NO.	DATE	DESCRIPTION
1	4/20/04	WAS 02.01.04
2	05/2008	RELOCATE PHONE/CABLE
3	10/2022	RELOCATE SANITARY SEWER CLEAN OUT & WATER METER BOX

Monroe North Carolina

RESIDENTIAL STREET WITH STREET TREES FOR 50' R/W; PLAN VIEW (2 of 2)

CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: JAM | DATE: 08-07-01
CHECKED BY: JNL | SCALE: N.T.S.

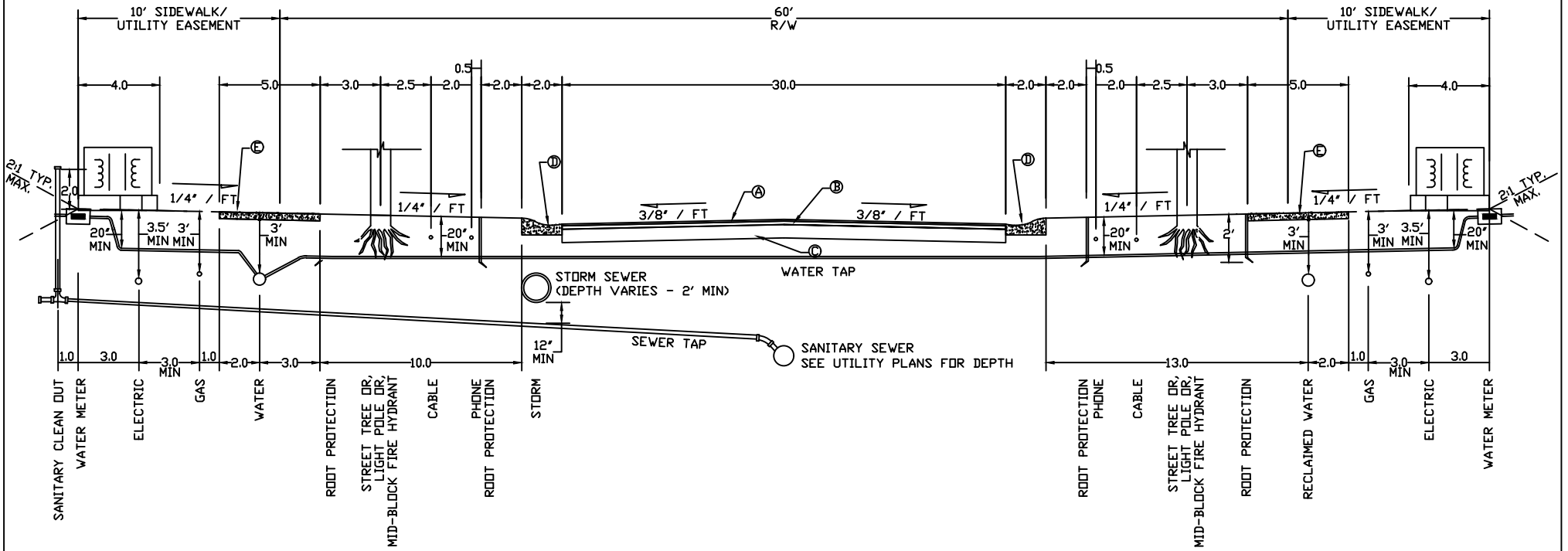
DETAIL 02.01.03B

PAVEMENT SCHEDULE*

- Ⓐ 2" BIT. CONC., SURFACE COURSE, TYPE S9.5
- Ⓑ 2.5" BIT. CONC. BINDER COURSE, TYPE I 19.0C Ⓘ
- Ⓒ 10" COMPACTED AGGREGATE BASE COURSE
- Ⓓ 2'-0" VALLEY & GUTTER
- Ⓔ 4"CONCRETE SIDEWALKS, 5' WIDTH

NOTES

1. UTILITY LOCATIONS SHOWN ARE FOR ALL UTILITIES AND SHALL NOT BE DEVIATED FROM WITHOUT CITY OF MONROE APPROVAL
2. DEPTHS SHOWN ARE MINIMUM DEPTHS
3. STREET LIGHTS WILL BE ON ONE SIDE OF ROAD DEPENDING ON SUBDIVISION LAYOUT
4. FIRE HYDRANT/STREET LIGHTS SHALL BE ALIGNED WITH COMMON LOT LINE OF PARCELS
5. MAINTAIN AT LEAST ONE SURVEY STAKE FOR THE BACK OF CURB AND THE BACK OF THE UTILITY EASEMENT PER LOT.
6. SURFACE ASPHALT TO BE PLACED ONCE PARCEL(S) ORE 80% DEVELOPED OR ONE YEAR FOLLOWING INTERMEDIATE COURSE PLACEMENT, WHICHEVER OCCURS FIRST.
7. TACK COAT TO BE APPLIED BETWEEN EACH LAYER OF ASPHALT, EVEN WHEN LAYERS ARE PLACED ON THE SAME DAY.
8. 2" ASPHALT SURFACE MAY BE APPLIED IN TWO LIFTS. FIRST SURFACE LIFT APPLIED IMMEDIATELY FOLLOWING INTERMEDIATE PLACEMENT.
9. ROOT BARRIER SHALL BE A MINIMUM OF TWO FEET DEEP FROM FINAL SUB GRADE AND EXTEND THREE FEET PAST THE CANOPY ON EACH SIDE OF THE TREE



REVISIONS		
NO.	DATE	DESCRIPTION
1	05/2008	ADD"B"TO 19.0 & UTIL 1/4"/FT, RELOCATE PHONE/CABLE, PAVEMENT SCHEDULE "B"
2	10/2022	RELOCATE SANITARY SEWER CLEAN OUT & WATER METER BOX. ADDED TREE ROOT PROTECTION DEPTH. ADDED NOTE 5.
3	03/2025	ADD NOTES 6 - 9, DELETE ITEMS

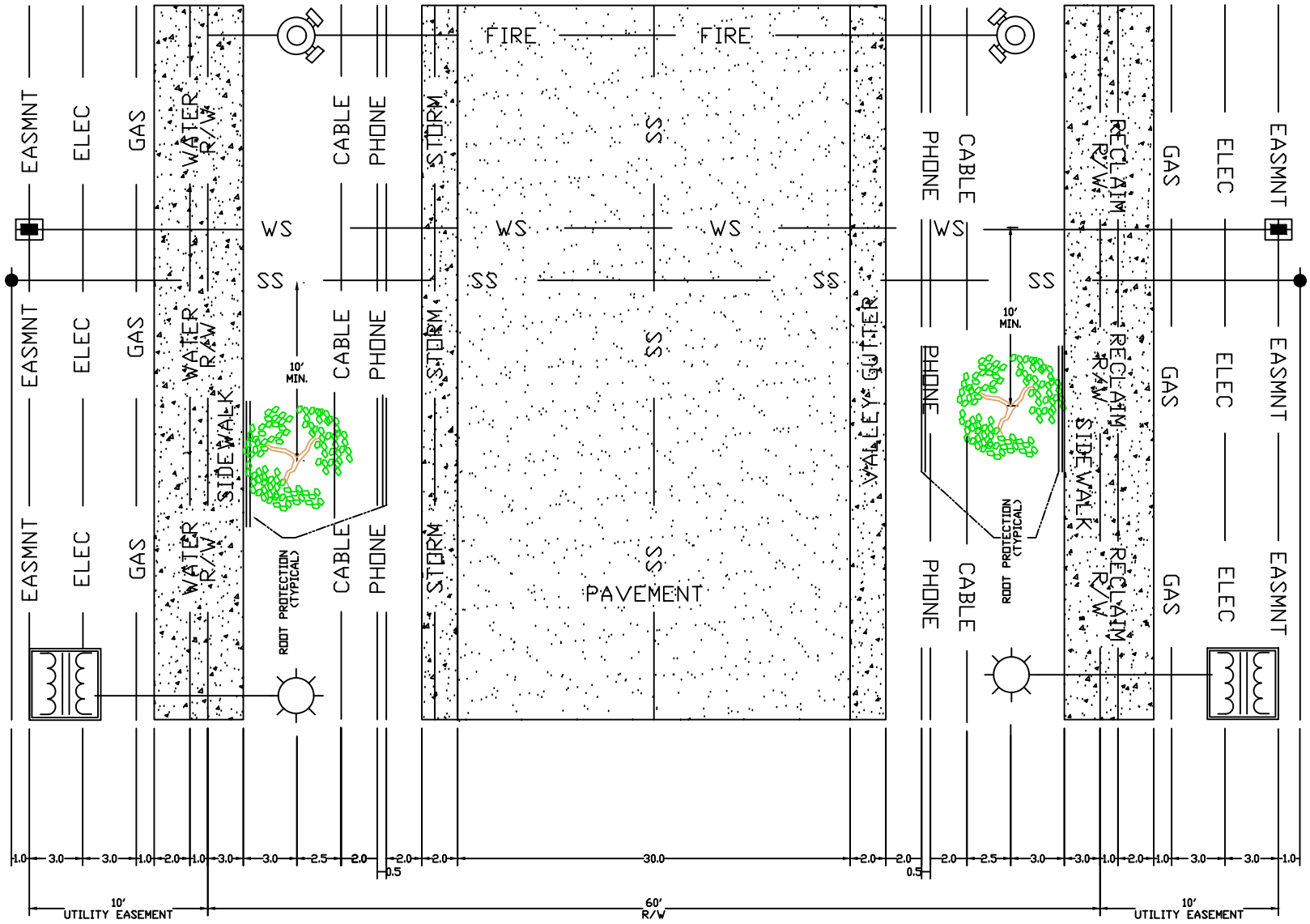
RESIDENTIAL COLLECTOR STREET WITH STREET TREES FOR 60' R/W (1 of 2)

CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: CJO | DATE: 4-20-04
CHECKED BY: JNL | SCALE: N.T.S.

DETAIL 02.01.04A



REVISIONS		
NO.	DATE	DESCRIPTION
1	05/2008	RELOCATE PHONE/CABLE
2	10/2022	RELOCATE SANITARY SEWER CLEAN OUT & WATER METER BOX.

Monroe North Carolina

RESIDENTIAL COLLECTOR STREET WITH STREET TREES FOR 60' R/W; PLAN VIEW (2 of 2)

CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: CJO | DATE: 4-20-04
CHECKED BY: JNL | SCALE: N.T.S.

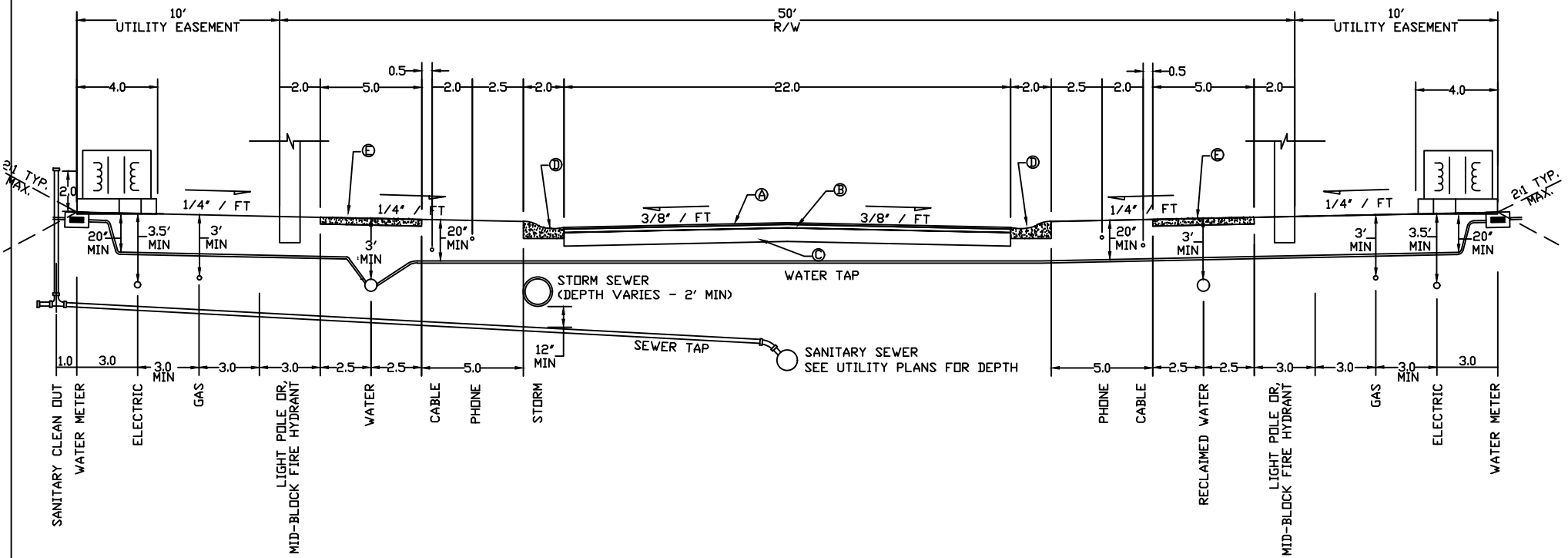
DETAIL 02.01.04B

PAVEMENT SCHEDULE*

- Ⓐ 1 in. BIT. CONC., SURFACE COURSE, TYPE S9.5
- Ⓑ 2.5 in. BIT. CONC. BINDER COURSE, TYPE I 19.0C
- Ⓒ 4 in. BIT. CONC. BASE COURSE, TYPE B 25.0C OR 8 in. COMPACTED AGGREGATE BASE COURSE
- Ⓓ 2 ft. 0 in. VALLEY & GUTTER
- Ⓔ 4 in. CONCRETE SIDEWALK; 5 ft. WIDTH

NOTES

1. UTILITY LOCATIONS SHOWN ARE FOR ALL UTILITIES AND SHALL NOT BE DEVIATED FROM WITHOUT CITY OF MONROE APPROVAL
2. DEPTHS SHOWN ARE MINIMUM DEPTHS
3. STREET LIGHTS WILL BE ON ONE SIDE OF ROAD DEPENDING ON SUBDIVISION LAYOUT
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5. MAINTAIN AT LEAST ONE SURVEY STAKE FOR THE BACK OF CURB AND THE BACK OF THE UTILITY EASEMENT PER LOT
6. FINAL SURFACE ASPHALT TO BE PLACED ONCE PARCEL(S) ARE 80% DEVELOPED OR ONE YEAR FOLLOWING INTERMEDIATE COURSE PLACEMENT, WHICHEVER OCCURS FIRST
7. TACK COAT TO BE APPLIED BETWEEN EACH LAYER OF ASPHALT, EVEN WHEN LAYER ARE PLACED ON THE SAME DAY



REVISIONS		
NO.	DATE	DESCRIPTION
1	4/20/04	MODIFIED FOR SUPERPAVE
2	05/2008	UTIL EASEMENT 1/4"/FT, RELOCATE PHONE/CABLE, PAVEMENT SCHEDULE "B"
3	10/2022	RELOCATE SANITARY SEWER CLEAN OUT & WATER METER BOX. ADDED NOTE 5.
4	03/2025	ADD NOTES 6 AND 7, CHANGE ASPHALT TYPES, DELETE ITEMS

Monroe North Carolina

RESIDENTIAL STREET WITHOUT STREET TREES FOR 50' R/W

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: JAM | DATE: 08-07-01
CHECKED BY: JNL | SCALE: N.T.S.

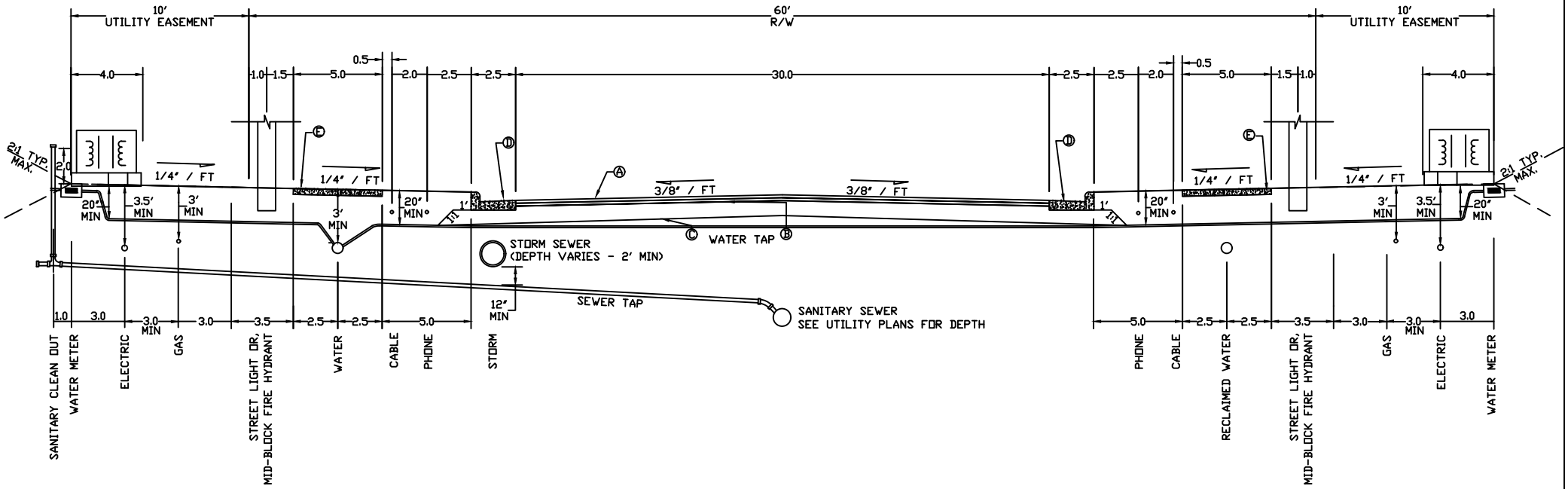
DETAIL 02.01.05

PAVEMENT SCHEDULE *

- Ⓐ 2.5 in. BIT. CONC., SURFACE COURSE, TYPE S9.5
- Ⓑ 2.5 in. BIT. CONC., BASE COURSE, TYPE I 19.0C
- Ⓒ 10 in. AGGREGATE BASE COURSE **
- Ⓓ 2 ft. 6 in. CURB & GUTTER
- Ⓔ 4 in. CONCRETE SIDEWALK, 5 ft. WIDTH

NOTES

1. UTILITY LOCATIONS SHOWN ARE FOR ALL UTILITIES AND SHALL NOT BE DEVIATED FROM WITHOUT CITY OF MONROE APPROVAL
2. DEPTHS SHOWN ARE MINIMUM DEPTHS
3. STREET LIGHTS WILL BE ON ONE SIDE OF ROAD DEPENDING ON SUDIVISION LAYOUT
4. FIRE HYDRANT/STREET LIGHTS SHALL BE ALIGNED WITH COMMON LOT LINE OF PARCELS
5. MAINTAIN AT LEAST ONE SURVEY STAKE FOR THE BACK OF CURB AND THE BACK OF THE UTILITY EASEMENT EVERY 100 FT
6. FINAL SURFACE ASPHALT TO BE PLACED ONCE PARCEL(S) ARE 80% DEVELOPED OR ONE YEAR FOLLOWING INTERMEDIATE COURSE PLACEMENT, WHICHEVER OCCURS FIRST
7. TACK COAT TO BE APPLIED BETWEEN EACH LAYER OF ASPHALT, EVEN WHEN LAYERS ARE PLACED ON THE SAME DAY



REVISIONS		
NO.	DATE	DESCRIPTION
1	4/20/04	UPDATE NOTES
2	05/2008	UTIL EASEMENT 1/4" /FT, RELOCATE PHONE/CABLE PAVEMENT SCHEDULE A & B
3	10/2022	RELOCATE SANITARY SEWER CLEAN OUT & WATER METER BOX. ADDED NOTE 5.
4	03/2025	ADDED NOTES 6 AND 7, CHANGED ASPHALT TYPES, DELETED ITEMS

Monroe North Carolina

COLLECTOR/COMMERCIAL/INDUSTRIAL STREET FOR 60' R/W

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: JAM | DATE: 08-07-01
CHECKED BY: JNL | SCALE: N.T.S.

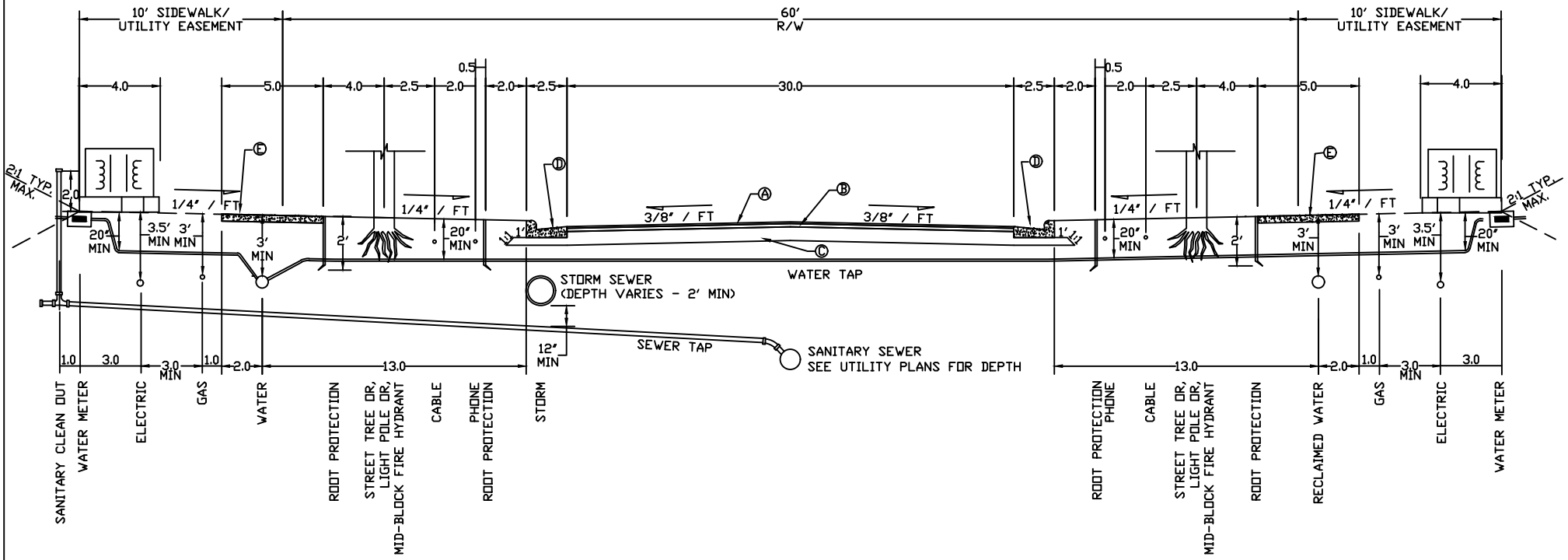
DETAIL 02.01.06

PAVEMENT SCHEDULE*

- Ⓐ 2.5 in. BIT. CONC., SURFACE COURSE, TYPE S9.5
- Ⓑ 2.5 in. BIT. CONC. BINDER COURSE, TYPE I 19.0C
- Ⓒ 10 in. COMPACTED AGGREGATE BASE COURSE
- Ⓓ 2 ft. 6 in. CURB & GUTTER
- Ⓔ 4 in. CONCRETE SIDEWALKS, 5 ft. WIDTH

NOTES

1. UTILITY LOCATIONS SHOWN ARE FOR ALL UTILITIES AND SHALL NOT BE DEVIATED FROM WITHOUT CITY OF MONROE APPROVAL
2. DEPTHS SHOWN ARE MINIMUM DEPTHS
3. STREET LIGHTS WILL BE ON ONE SIDE OF ROAD DEPENDING ON SUBDIVISION LAYOUT
4. FIRE HYDRANT/STREET LIGHTS SHALL BE ALIGNED WITH COMMON LOT LINE OF PARCELS
5. MAINTAIN AT LEAST ONE SURVEY STAKE FOR THE BACK OF CURB AND THE BACK OF THE UTILITY EASEMENT EVERY 100 FT
6. FINAL SURFACE ASPHALT TO BE PLACED ONCE PARCEL(S) ARE 80% DEVELOPED OR ONE YEAR FOLLOWING INTERMEDIATE COURSE PLACEMENT, WHICHEVER OCCURS FIRST
7. TACK COAT TO BE APPLIED BETWEEN EACH LAYER OF ASPHALT, EVEN WHEN LAYERS ARE PLACE ON THE SAME DAY
8. ROOT BARRIER SHALL BE A MINIMUM OF TWO FEET DEEP FROM FINAL SUB GRADE AND EXTEND THREE FEET PAST THE CONOPY ON EACH SIDE OF THE TREE



REVISIONS		
NO.	DATE	DESCRIPTION
1	05/2008	UTIL EASEMENT 1/4" /FT, RELOCATE PHONE/CABLE PAVEMENT SCHEDULE A & B
2	10/2022	RELOCATE SANITARY SEWER CLEAN OUT & WATER METER BOX. ADDED TREE ROOT PROTECTION DEPTH. ADDED NOTE 5.
3	03/2025	ADD NOTE 6, 7 AND 8, CHANGE ASPHALT TYPES, DELETE ITEMS

Monroe North Carolina

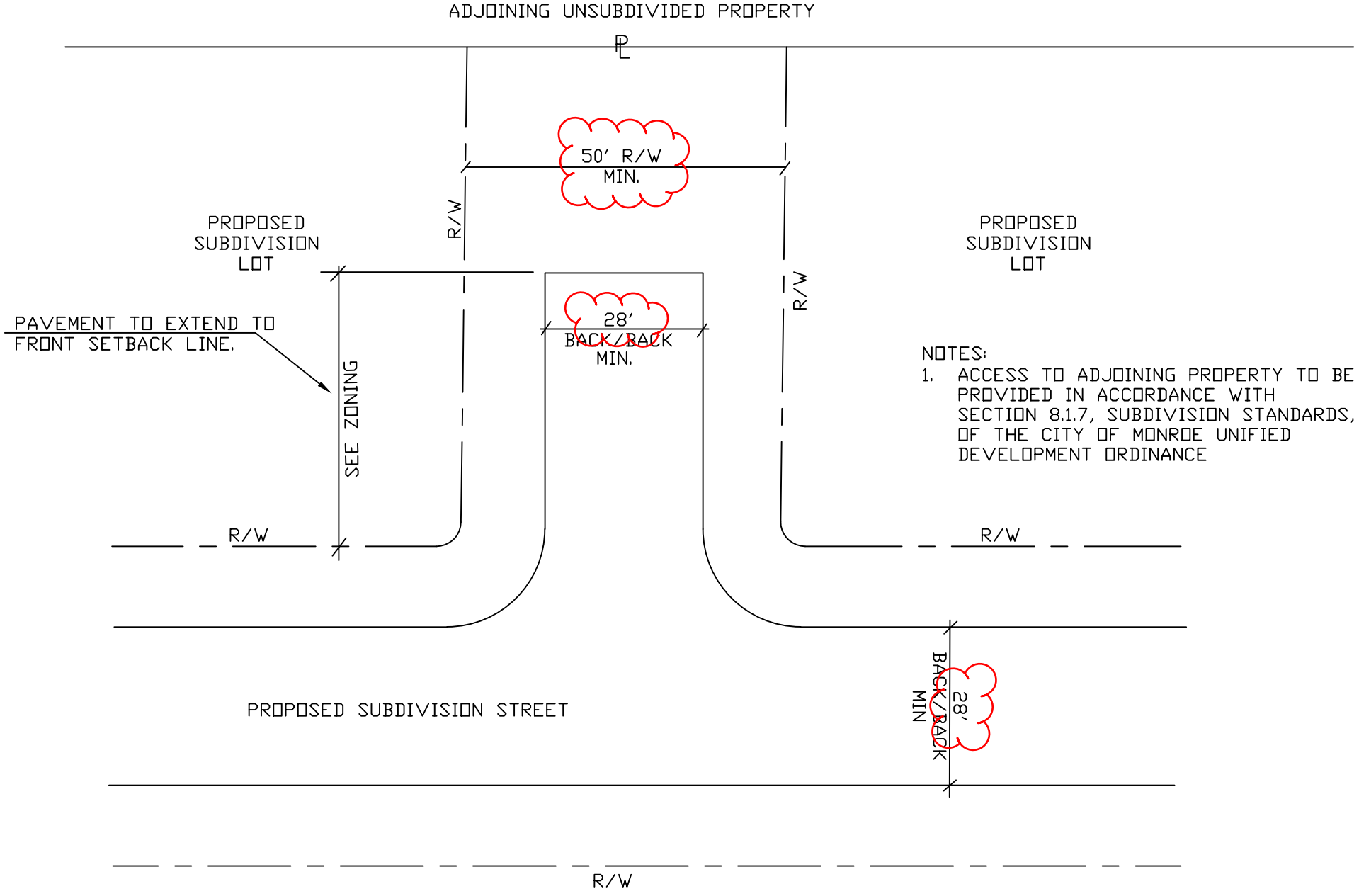
COLLECTOR/COMMERCIAL/INDUSTRIAL STREET WITH STREET TREES FOR 60' R/W

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: DKO | DATE: 04-20-04
CHECKED BY: JNL | SCALE: N.T.S.

DETAIL 02.01.07



REVISIONS		
NO.	DATE	DESCRIPTION
1	03/2025	CHANGE ORDINANCE REF

Monroe North Carolina

ACCESS TO ADJOINING UNSUBDIVIDED PROPERTY

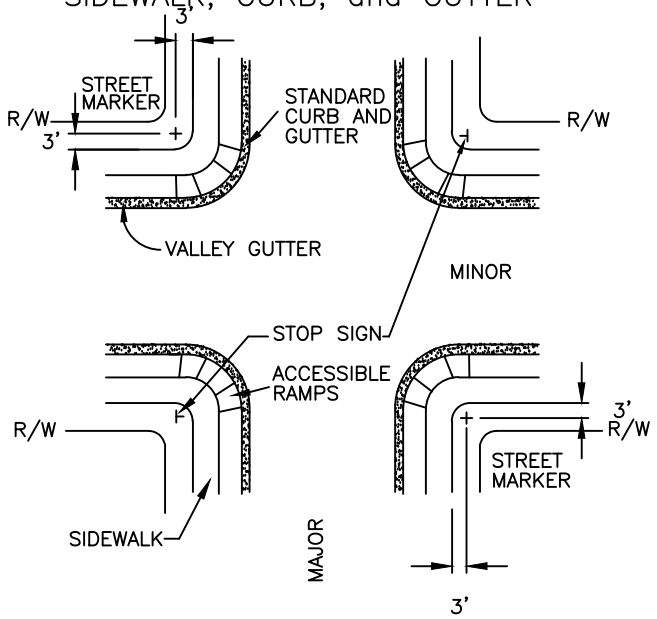
CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

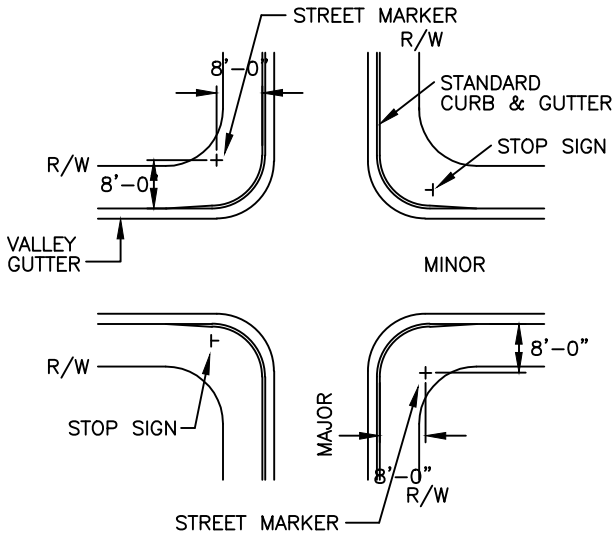
FILE: I:/Maps-Details/Detail Manual/Details	
DRAWN BY: JAM	DATE: 08-07-01
CHECKED BY: JNL	SCALE: N.T.S.

DETAIL 02.01.11

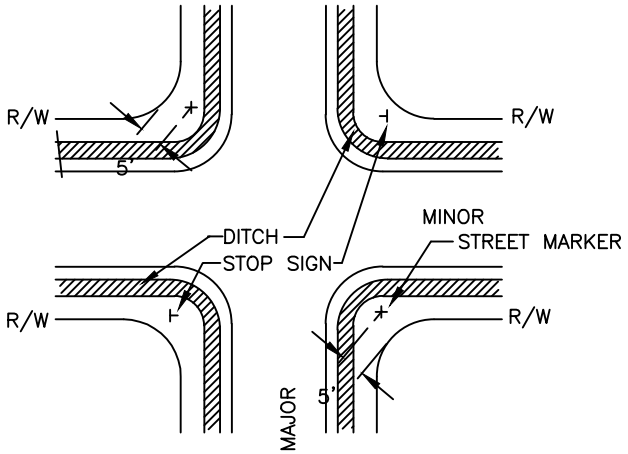
INTERSECTION with SIDEWALK, CURB, and GUTTER



INTERSECTION with CURB and GUTTER



INTERSECTION with DITCHES, and NO CURB and GUTTER



NOTE:
THE DEVELOPER IS REQUIRED TO CONTACT THE CITY OF MONROE ENGINEERING DEPARTMENT FOR SIGN INSTALLATION IN ACCORDANCE WITH SECTION 02.02.07.

①

REVISIONS		
NO.	DATE	DESCRIPTION
1	05/08	WAS 02.02.06
2	04/25	WAS 02.01.12

Monroe North Carolina

STREET NAME SIGN INSTALLATION LOCATIONS (1 OF 2)

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: JAM | DATE: 08-07-01
CHECKED BY: JNL | SCALE: N.T.S.

DETAIL 02.01.12A

NOTES

- All traffic signs and other traffic control devices placed on the municipal street system must conform to the appearance criteria of the Manual on Uniform Traffic Control Devices. Reference is made to North Carolina General Statute 136–30.
- All decorative posts shall be of a suitable breakaway or yielding design.
- All signs shall have high intensity prismatic reflective sheeting.
- All signs shall be installed with a minimum vertical distance from the edge of pavement to the bottom of the sign of 7 feet.
- The standard size for stop signs is 30 x 30 inches.
- The standard size for speed limit signs is 24 x 30 inches.
- Street identification signs shall be placed on the corner opposite the stop signs and shall be 9–inch blade in width. The signs shall have a green background with white lettering. Lettering shall be composed of initial upper–case letter 6–inches in height and lower–case letters 4.5 inches in height.
- Costs associated with the installation of the decorative posts and signs are the developer's responsibility. Placement of the signs in the field shall be coordinated with the City's construction inspector. If the decorative posts should become damaged or in need of repair and/or maintenance, it will be the Homeowners Association's responsibility to correct at their costs. The City reserves the right to re–install any sign with a galvanized post until replacement decorative post(s) can be installed by the Homeowners Association.
- Installation of the decorative sign posts will indicate acceptance of the above requirements and that the developer is accepting the future maintenance responsibility on behalf of the Homeowners Association.

REVISIONS		
NO.	DATE	DESCRIPTION

Monroe North Carolina

STREET NAME SIGN INSTALLATION LOCATIONS (2 OF 2)

CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details	
DRAWN BY: KMM	DATE: 04-07-25
CHECKED BY: SAM	SCALE: N.T.S.

DETAIL 02.01.12B

THE SUBGRADE AND STONE BASE IN PAVED AREAS SHALL BE PROOF–ROLLED WITH A LOADED DUMP TRUCK OR SIMILAR PNEUMATIC TIRED VEHICLE WITH A LOADED WEIGHT OF AT LEAST 20 TONS. ANY IDENTIFIED UNSTABLE AREAS SHALL BE REPAIRED BEFORE PLACEMENT OF THE NEXT SUCCESSIVE LIFT.

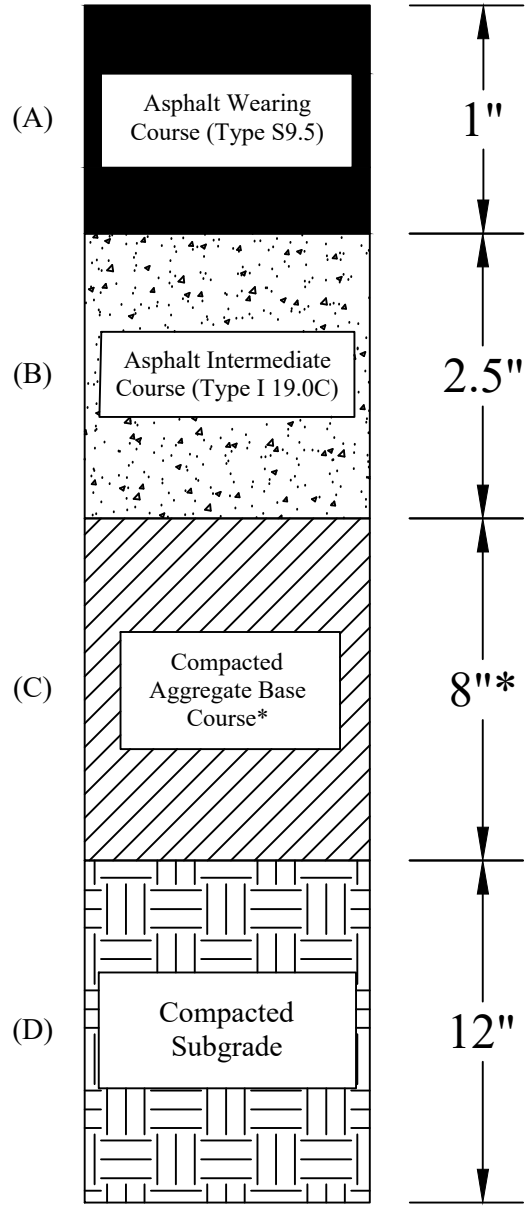
AREAS THAT RUT OR PUMP SHALL BE UNDERCUT TO STABLE SOILS OR AN EVALUATION MADE BY THE DEVELOPER'S ENGINEER OR QUALIFIED GEOTECHNICAL FIRM TO DETERMINE IF SOME OTHER METHOD OF SUBGRADE STABILIZATION IS APPROPRIATE.

APPROVED METHODS OF STABILIZATION SHALL INCLUDE LIME STABILIZATION OF HIGH PLASTICITY CLAYS OR EXCESSIVELY WET SOILS, SOIL CEMENT STABILIZATION, THE USE OF GEOSYNTHETIC OR GEOGRID MATERIAL, OR OTHER STABILIZATION METHODS AS APPROVED BY THE ENGINEERING DIRECTOR.

PAVEMENT STRUCTURE IS FOR LOW–VOLUME RESIDENTIAL ROADWAYS. ROADWAYS WITH TRAFFIC GREATER THAN 4,000 VEHICLES PER DAY (VPD) REQURE A PAVEMENT DESIGN.

EXPOSED LAYERS OF I19.0C MUST BE PAVED WITH LAYER "A" OR SEALED IN ACCORDANCE WITH SECTION 660 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

* TACK COAT TO BE APPLIED BETWEEN EACH LAYER OF ASPHALT, EVEN WHEN LAYERS ARE PLACED ON THE SAME DAY



COMPACTION REQUIREMENTS:

(A) 92% MAX. SPEC. GRAVITY (AASHTO T209)

(B) 92% MAX. SPEC. GRAVITY (AASHTO T209)

(C) 100% MAX. DRY DENSITY (AASHTO T180)

(D) 100% MAX. DRY DENSITY (AASHTO T99)

ROADBED BELOW (D) SHALL BE PROOF–ROLLED AND UNSTABLE AREAS REMOVED BEFORE PLACEMENT OF FILL. OR BEFORE BEGINNING ALTERNATIVE, APPROVED METHODS OF ROADWAY STABILIZATION ROADWAY EMBANKMENT MATERIAL SHALL BE COMPACTED TO A DENSITY OF AT LEAST 95% OF THE MAX. DRY DENSITY (AASHTO T99) EXCEPT FOR THE FINAL 12" AS DEFINED BY (D)

PROPER EVALUATION OF SOILS WITHIN A DEVELOPMENT IS RECOMMENDED TO DETERMINE IF THE MINIMUM REQUIRED PAVEMENT STRUCTURE IS ACCEPTABLE FOR THE SOILS AND USES PLANNED. REDUCTION IN PAVEMENT STRUCTURE WILL BE ALLOWED PURSUANT TO CBR TESTING OF THE SOILS AND SUBMITTED PAVEMENT DESIGN, BUT IN NO CASE WILL A PAVEMENT STRUCTURE LESS THAN 8" OF COMPACTED AGGREGATE BASE COURSE (OR 4" ASPHALT BASE COURSE, TYPE B 25.0C) AND 1.5" ASPHALT SURFACE COURSE, TYPE S9.5 BE ACCEPTED.

* 4" OF ASPHALT BASE, TYPE B 25.0C, MAY BE USED IN LIEU OF LAYER "C."

REVISIONS		
NO.	DATE	DESCRIPTION
1	4/20/04	MODIFIED TO SUPERPAVE
2	05/2008	CLARIFICATION OF SPECIFICATIONS
3	03/2025	CHANGED ASPHALT TYPES, EDITED SOME NOTES

Monroe North Carolina

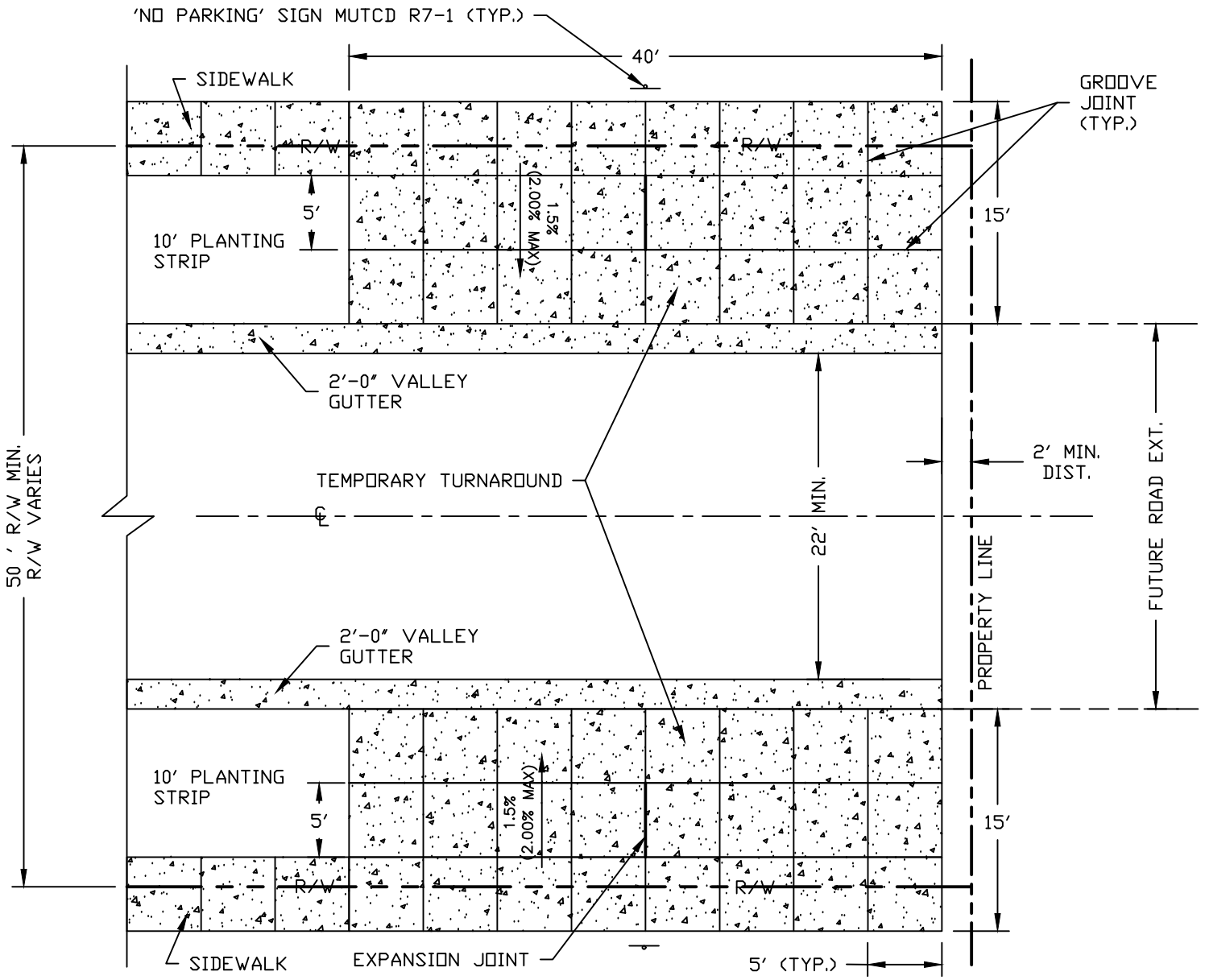
RESIDENTIAL STREET PAVEMENT STRUCTURE

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: JAM | DATE: 08-07-01
CHECKED BY: JNL | SCALE: N.T.S.

DETAIL 02.01.13



NOTES

1. TEMPORARY TURNAROUND MATERIAL SHALL BE MIN. 3600 PSI CONCRETE, 6" THICK.

2. TEMPORARY INSTALLATION ONLY - TO BE REMOVED WHEN FUTURE DEVELOPMENT CONNECTS TO STREET. "SIDEWALK" PORTION OF TURNAROUND MAY BE LEFT IN PLACE IF NOT DAMAGED.

3. NOT TO BE USED AS A PRIVATE DRIVEWAY.

4. END OF ROADWAY MARKERS TO BE INSTALLED ACCORDING TO CITY OF MONROE STANDARD DETAIL 02.07.01

REVISIONS		
NO.	DATE	DESCRIPTION
1	03/2025	ADJUSTED SCALING

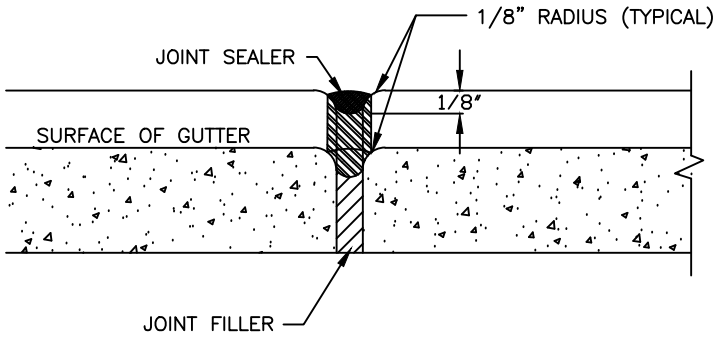
VALLEY CURB "T" TURNAROUND TEMPORARY

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details	
DRAWN BY: KMM	DATE: 05/2022
CHECKED BY: SAM	SCALE: N.T.S.

DETAIL 02.01.15B



TRANSVERSE EXPANSION JOINT

NOTES:

1. CONTRACTION JOINTS SHALL BE SPACED AT 10–FOOT INTERVALS. FOR VALLEY GUTTER, A 15–FOOT SPACING MAY BE USED WHEN A MACHINE IS USED. JOINT SPACING MAY BE ALTERED BY THE ENGINEER TO PREVENT UNCONTROLLED CRACKING.
2. CONTRACTION JOINTS MAY BE INSTALLED BY THE USE OF TEMPLATES OR FORMED BY OTHER APPROVED METHODS. WHERE SUCH JOINTS ARE NOT FORMED BY TEMPLATES, A MINIMUM DEPTH OF 1 1/2" SHALL BE OBTAINED.
3. ALL EXPANSION JOINTS SHALL BE SPACED AT 90 FOOT INTERVALS, AND ADJACENT TO ALL RIGID OBJECTS. JOINTS SHALL MATCH LOCATIONS WITH JOINTS IN ABUTTING SIDEWALK.
4. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3600 P.S.I. IN 28 DAYS.
5. CURB SHALL BE DEPRESSED TO MEET ALL CURRENT ADA STANDARDS AT INTERSECTIONS TO PROVIDE FOR FUTURE ACCESSIBLE RAMPS IF RAMPS ARE NOT PART OF PROJECT.
6. TOP 12" OF SUBGRADE BENEATH THE CURB AND GUTTER SHALL BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.
7. THE SUBGRADE SHALL BE PROOF ROLLED PRIOR TO PLACING FORMS.
8. ALL EXPANSION JOINT FOR CONCRETE TO 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 (NOT BLACK).

APPROVED DATE _____

REVISIONS		
NO.	DATE	DESCRIPTION
1	03/2025	ADDED JOINT SEALER REFS

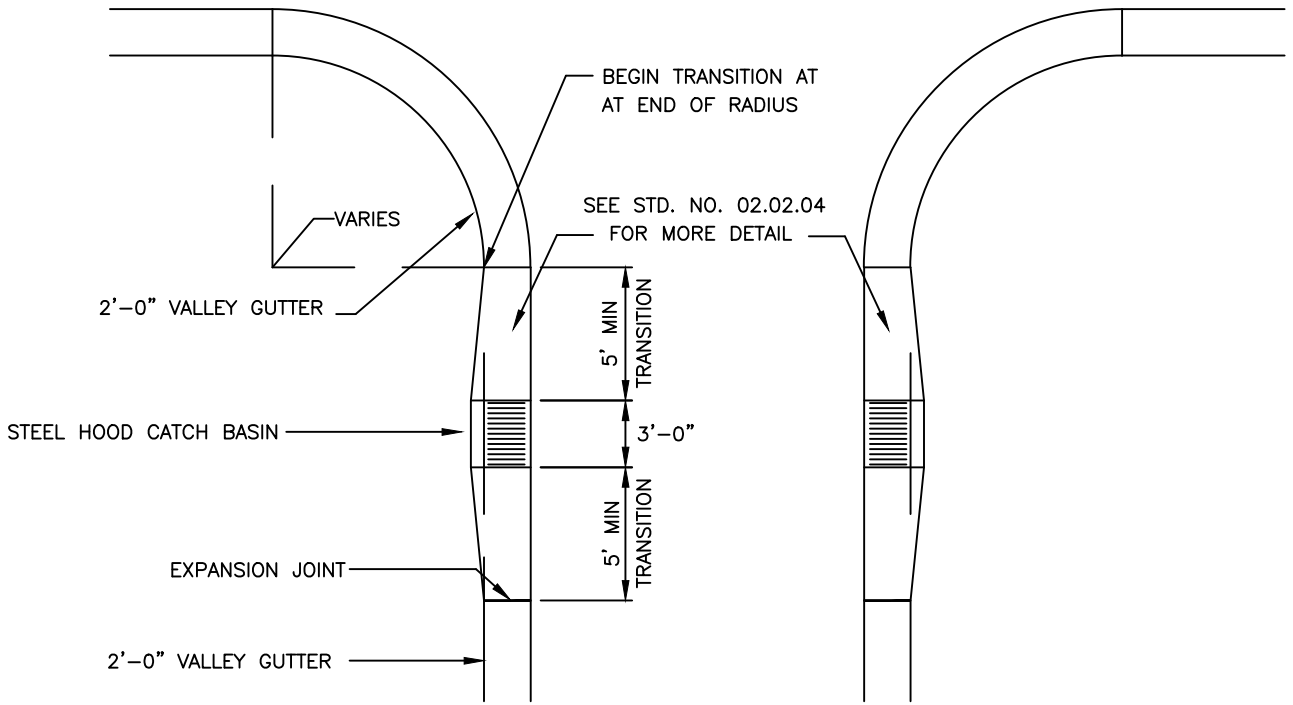
Monroe North Carolina

CURB AND GUTTER
(3 of 3)

CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details	
DRAWN BY: JAM	DATE: 08-07-01
CHECKED BY: JNL	SCALE: N.T.S.
DETAIL	02.02.03



PLAN

NOTE:
1. WHERE 2'–6" CURB AND GUTTER IS USED, CATCH BASINS MAY BE LOCATED AT END OF RADIUS.
2. RADIUS AT INTERSECTION MAY VARY.

APPROVED DATE _____

REVISIONS		
NO.	DATE	DESCRIPTION
1	03/2025	CHANGED TRANSITION LENGTH

Monroe North Carolina

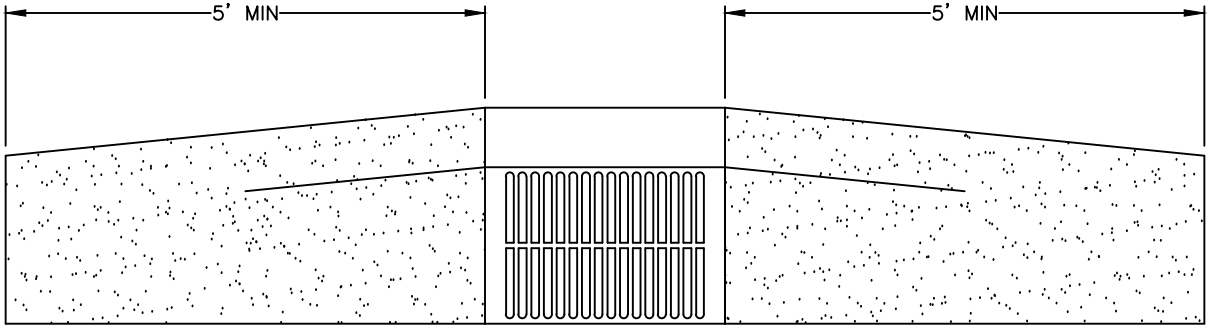
CATCH BASIN PLACEMENT AT INTERSECTION

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details	
DRAWN BY: JAM	DATE: 08-07-01
CHECKED BY: JNL	SCALE: N.T.S.

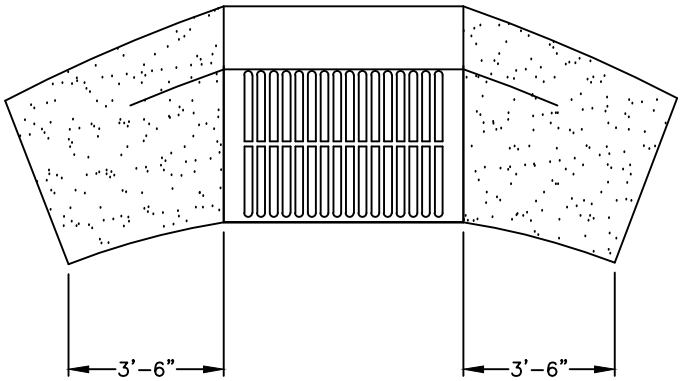
DETAIL 02.02.05



PLAN FOR TANGENT SECTION

NOTE:

TRANSITION FROM VALLEY GUTTER TO 2'-6" SECTION TO BE MADE PER STD. 02.02.04 ①



PLAN FOR RESIDENTIAL CUL-DE-SAC

APPROVED DATE _____

REVISIONS		
NO.	DATE	DESCRIPTION
1	05/08	WAS 10-19
2	03/25	CHANGED TRANSITION LENGTH

Monroe North Carolina

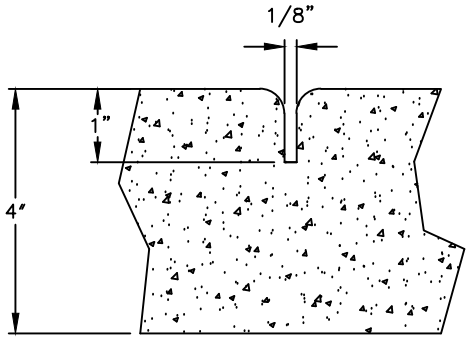
CATCH BASIN FRAME IN VALLEY GUTTER

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

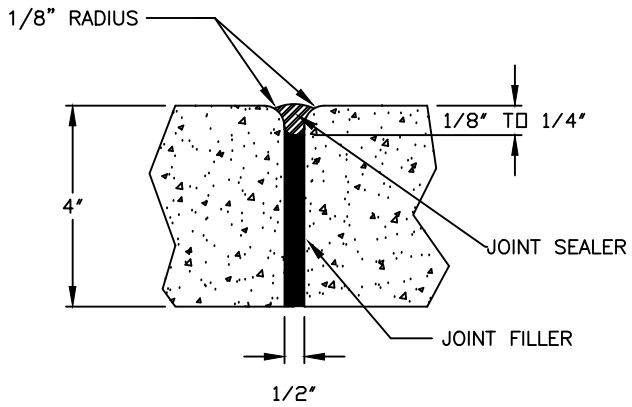
PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: JAM | DATE: 08-07-01
CHECKED BY: JNL | SCALE: N.T.S.

DETAIL 02.02.06



GROOVE JOINT IN SIDEWALK



TRANSVERSE EXPANSION JOINT IN SIDEWALK

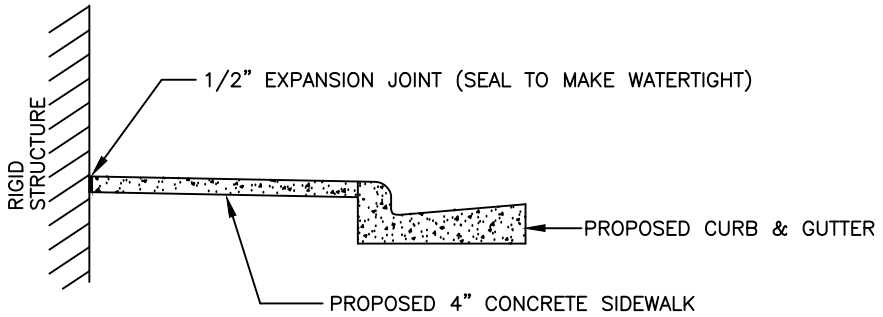
GENERAL NOTES:

1. A GROOVE JOINT 1" DEEP WITH 1/8" RADII SHALL BE REQUIRED IN THE CONCRETE SIDEWALK AT 5' INTERVALS. ONE 1/2" EXPANSION JOINT WILL BE REQUIRED AT 45' INTERVALS NOT TO EXCEED 50' AND MATCHING EXPANSION/CONSTRUCTION JOINT IN ADJACENT CURB. A SEALED 1/2" EXPANSION JOINT WILL BE REQUIRED WHERE THE SIDEWALK JOINS ANY RIGID STRUCTURE.
2. SIDEWALK AT DRIVEWAY ENTRANCES TO BE 6" THICK.
3. WIDTH OF NEW SIDEWALK ON ALL STREETS SHALL BE A MINIMUM OF 5'.
4. SIDEWALK TO BE POURED TO END OF RADIUS AT INTERSECTING STREETS.
5. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3600 PSI. IN 28 DAYS.
6. IN NEW DRIVE CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING EXISTING SIDEWALK, COMPACTING SUBGRADE, AND REPLACING WITH THE APPROPRIATE THICKNESS.
7. ALL NEW SIDEWALK SHALL MEET OR EXCEED ADA REGULATIONS.

① 8. CURING COMPOUND MEMBRANE IS REQUIRED ON ALL CONCRETE CONSTRUCTION.

② 9. ALL SIDEWALK TO HAVE LIGHT BROOMED FINISH. (SEE SECTION 02.03.05 NOTE #24)

③ 10. ALL EXPANSION JOINTS FOR CONCRETE TO 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 (NOT BLACK)



DETAILS SHOWING EXPANSION JOINTS IN CONCRETE SIDEWALK

APPROVED DATE _____

REVISIONS		
NO.	DATE	DESCRIPTION
1	05/08	ADD NOTE #8
2	01/15	ADD NOTE #9
3	03/25	ADD NOTE #10

Monroe North Carolina

CONCRETE SIDEWALKS

CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details	
DRAWN BY: JAM	DATE: 08-07-01
CHECKED BY: JNL	SCALE: N.T.S.

DETAIL 02.03.01

WARRANTS

STANDARD SAFETY RAIL (STD. 02.03.04) SHALL BE INSTALLED UNDER ANY OF THE FOLLOWING CIRCUMSTANCES IN BOTH NEW CONSTRUCTION AND IN RETROFITTING OR RECONSTRUCTION OF EXISTING ROADWAYS OR SITES:

1. WHEN THE CULVERT CROSSING DETAIL (02.03.05) APPLIES.
2. IF THERE IS A TWO FOOT OR GREATER DROPOFF WITHIN 2 FEET OF THE EDGE OF THE SIDEWALK (SEE DIAGRAM A).
3. IF THERE IS A 1–FOOT OR LARGER DROPOFF DIRECTLY ADJACENT TO THE SIDEWALK EDGE (SEE DIAGRAM B).
4. AT THE TOP OF ANY DROPOFF WITHIN THE PEDESTRIAN CLEAR ZONE OR WHERE PEDESTRIANS CAN REASONABLY BE EXPECTED IN THE VICINITY.
5. AT THE DIRECTION OF CITY TRANSPORTATION OR ENGINEERING STAFF BASED ON FIELD CONDITIONS.

DEFINITIONS

- DROPOFF –– A SLOPE OF 2:1 OR STEEPER. EXAMPLES INCLUDE HEADWALLS, RETAINING WALLS, AND CULVERTS.
- PEDESTRIAN CLEAR ZONE –– 10 FEET OF ANY COMBINATION OF SIDEWALK, SLOPE, AND SHOULDER SLOPED AT 6:1 OR FLATTER. SIDEWALK DOES NOT NEED TO BE PRESENT
- SIDEWALK –– FOR PURPOSES OF THIS STANDARD, THE TERM "SIDEWALK" IS USED GENERICALLY AND SHALL MEAN ANY PATH OR SURFACE TO BE USED FOR BICYCLE AND/OR PEDESTRIAN TRANSPORTATION. EXAMPLES INCLUDE, BUT ARE NOT LIMITED TO, SIDEWALKS, BIKE PATHS, SHARED–USE PATHS, PEDESTRIAN PATHS, AND GREENWAYS.

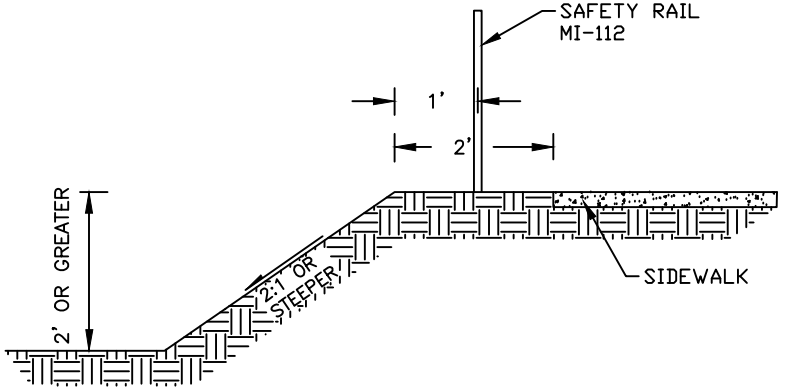


DIAGRAM A

SLOPED DROPOFF AT BACK OF SIDEWALK

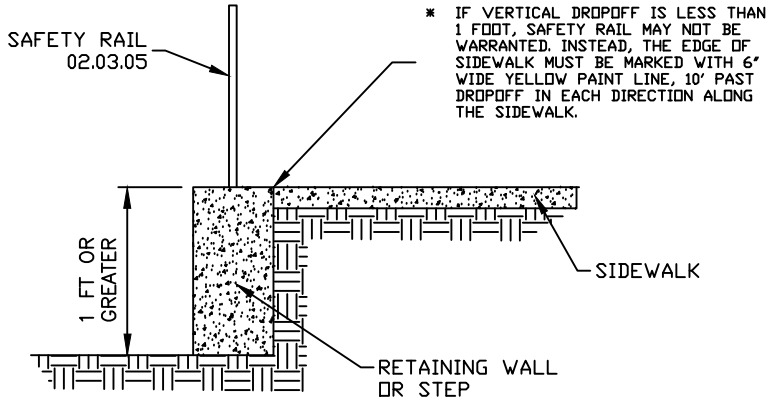


DIAGRAM B

VERTICAL DROPOFF AT BACK OF SIDEWALK

REVISIONS		
NO.	DATE	DESCRIPTION

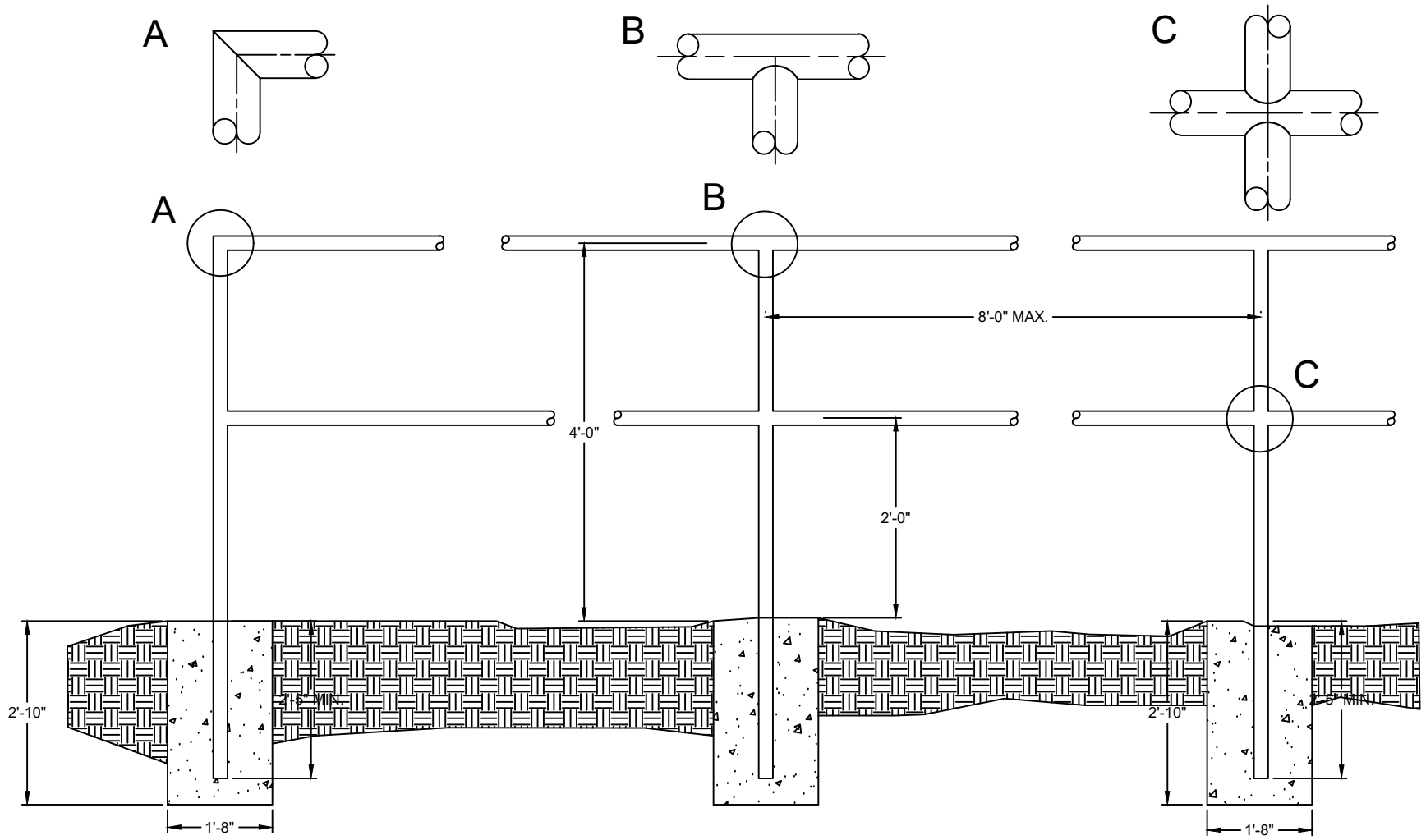
SAFETY RAIL & WARRANTS (1 OF 2)

CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: KMM | DATE: 03-28-25
CHECKED BY: SAM | SCALE: N.T.S.

DETAIL 02.03.03



NOTES:

1. ALL CONCRETE TO BE 3600 P.S.I. COMPRESSIVE STRENGTH.
2. TYPE OF PIPE TO BE USED IS 1–5/8" MAX. O.D. BLACK IRON, LOW CARBON PIPE OR GALVANIZED.
3. ALL JOINTS TO HAVE A 1/2" FILLET WELD AT ALL JOINTS.
4. PAINT ASSEMBLY AFTER INSTALLATION WITH BLACK ALL WEATHER ENAMEL.
5. SEE STD. 02.03.03 FOR WARRANTS.

REVISIONS		
NO.	DATE	DESCRIPTION

Monroe North Carolina

SAFETY RAIL & WARRANTS (2 OF 2)

CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details

DRAWN BY: KMM	DATE: 03-28-25
CHECKED BY: SAM	SCALE: N.T.S.

DETAIL 02.03.04

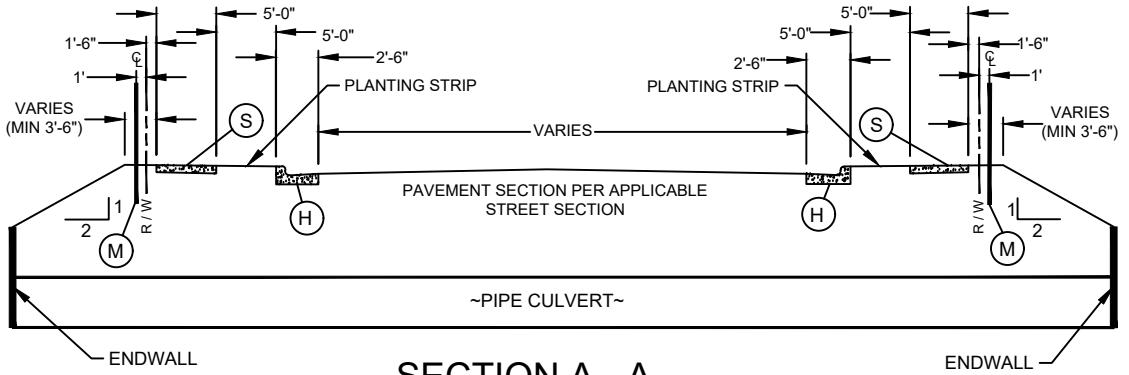
(H) 2'-6" CURB AND GUTTER, STD 02.02.01

(M) SAFETY RAIL, STD 02.03.03 & 02.03.04

(S) 5'-0" SIDEWALK, STD 02.03.01, NOTE 3

(H1) 2'-0" VALLEY GUTTER, STD 02.02.01

(H2) CURB TRANSITION 2'-6" CURB AND GUTTER TO 2'-0" VALLEY CUTTER, STD 02.02.04



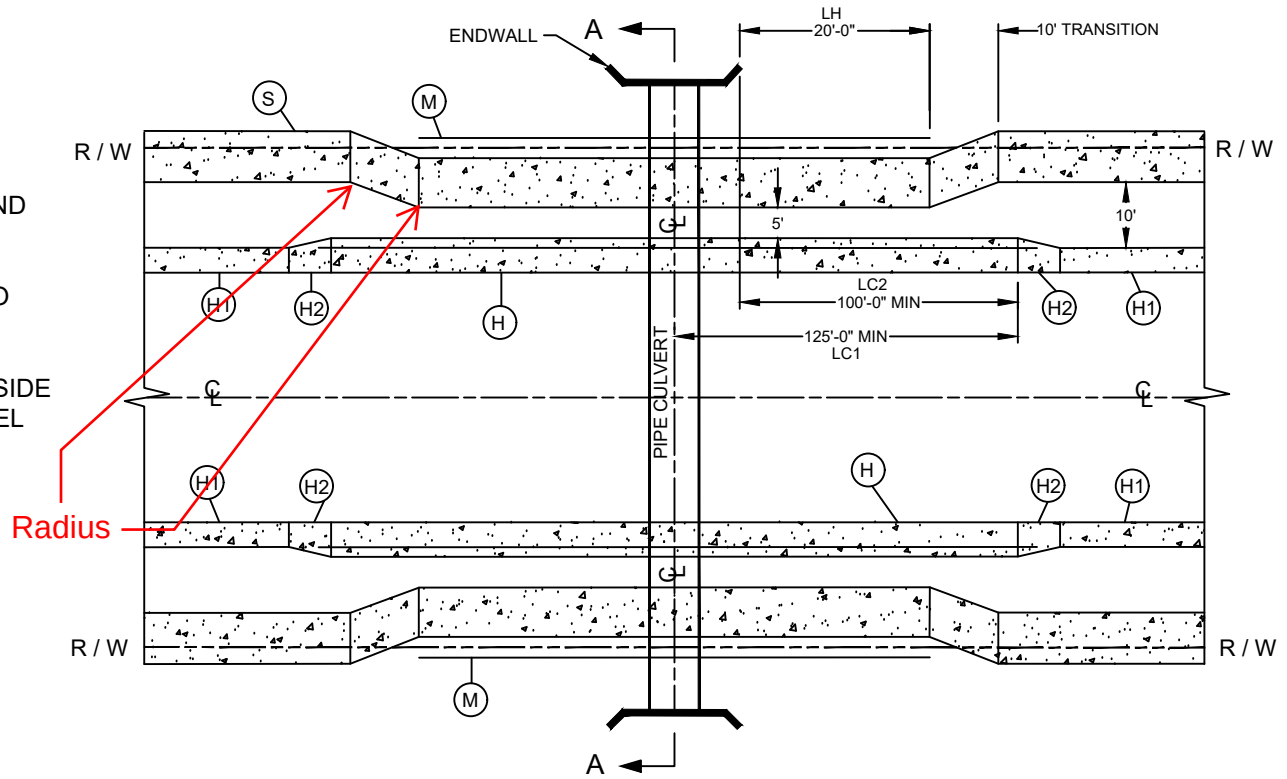
SECTION A - A

LH* = DISTANCE FROM END OF WINGWALL TO END OF SAFETY RAIN

LC1 = DISTANCE FROM C/L OF CULVERT TO END OF 2'-6" CURB AND GUTTER GUTTER

LC2* = DISTANCE FROM END OF WINGWALL TO END OF 2'-6" CURB AND GUTTER

* LH AND LC2 TO BE MEASURED FROM THE OUTSIDE OF THE NEAREST WALL OF THE CULVERT BARREL



REVISIONS		
NO.	DATE	DESCRIPTION

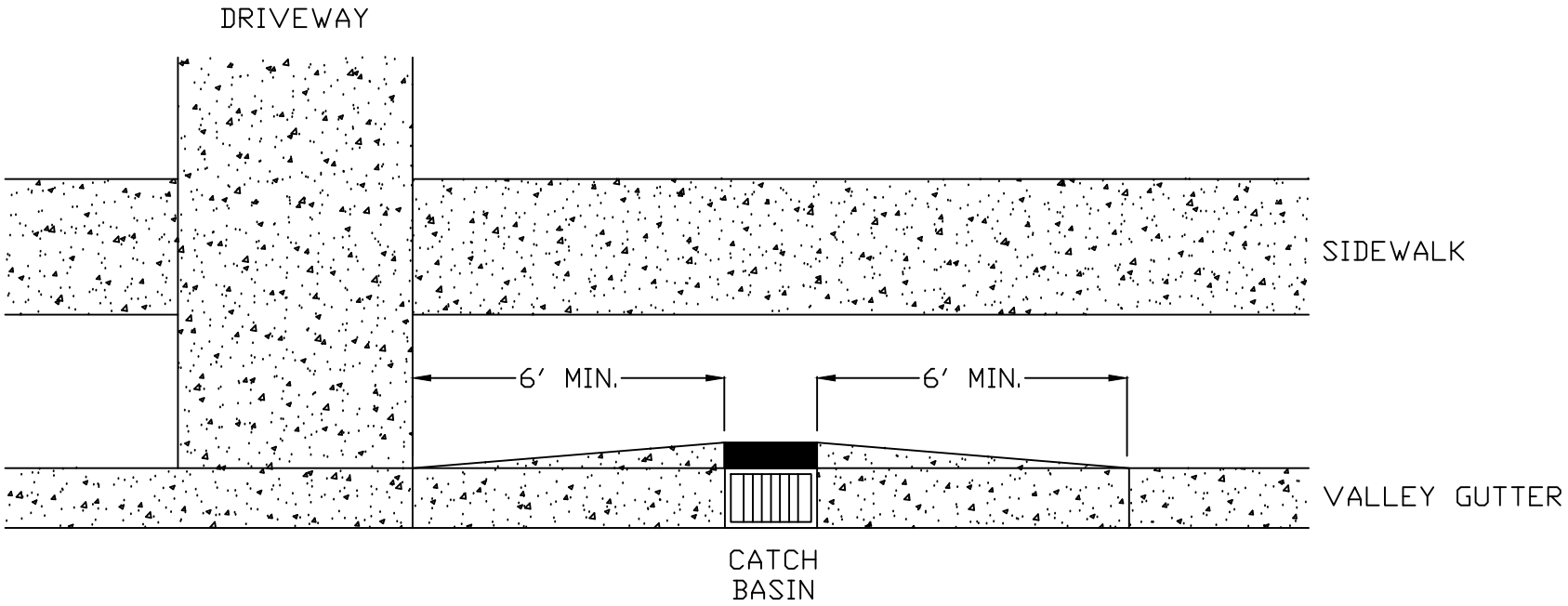
CULVERT CROSSING

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: KMM | DATE: 03-31-25
CHECKED BY: SAM | SCALE: N.T.S.

DETAIL 02.03.05



NOTE: MAXIMIZE SEPARATION BETWEEN CATCH BASIN AND DRIVEWAY

NOTE: FAILURE TO MAINTAIN PROPER CLEARANCE TO BASINS MAY REQUIRE CONVERSION TO DROP INLET STRUCTURE AND ADDITIONAL STRUCTURE TO OFFSET LOSS IN FLOW CAPACITY. ALL COSTS ASSOCIATED TO CONVERT THE STRUCTURE AND ADD AN ADDITIONAL STRUCTURE, IF REQUIRED, SHALL BE BORNE BY THE BUILDING CONTRACTOR/PROPERTY OWNER.

APPROVED DATE _____

REVISIONS		
NO.	DATE	DESCRIPTION
1	04/25	CHANGED TRANSITION MINIMUM, ADDED NOTE

Monroe North Carolina

DRIVEWAY PLACEMENT IN RELATION TO STORM DRAIN CATCH BASIN

CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

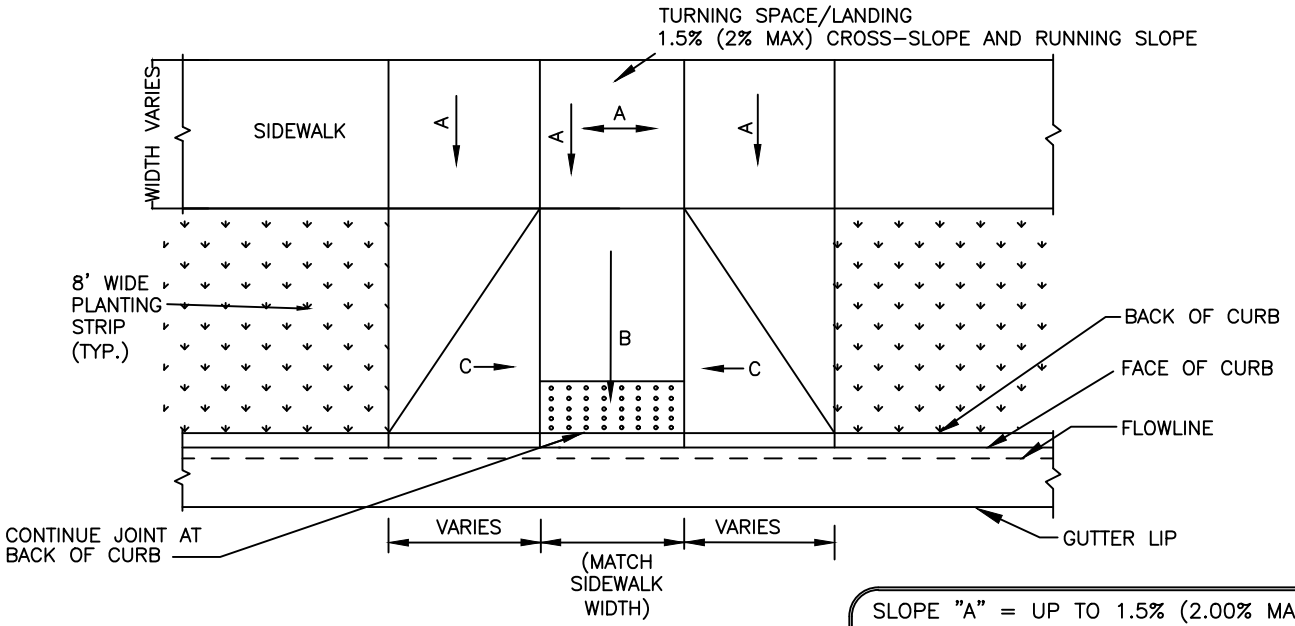
PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details	
DRAWN BY: JAM	DATE: 08-07-01
CHECKED BY: JNL	SCALE: N.T.S.

DETAIL 02.04.04

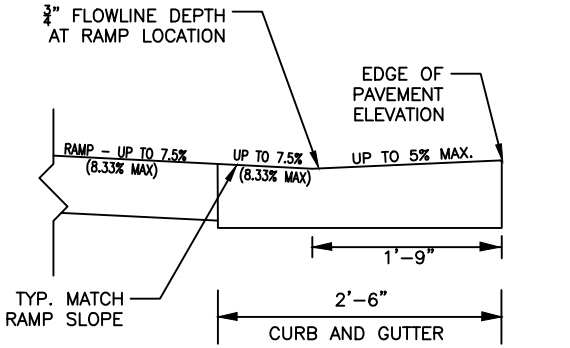
NOTES:

1. ENSURE FLUSH CONDITIONS AT CURB RAMP TO GUTTER TRANSITION.
2. TYPICALLY, THE SIDEWALK RUNNING SLOPE SHALL NOT EXCEED THE GENERAL GRADE ESTABLISHED FOR THE ADJACENT STREET.
3. IF THE SLOPE FROM FLOWLINE TO BACK OF CURB AT RAMP IS LESS THAN 8.33%, THEN THE SLOPE FROM LIP TO FLOWLINE AT RAMP MAY EXCEED 5% AS LONG AS THE ALGEBRAIC DIFFERENCE BETWEEN THESE TWO SLOPES IS LESS THAN 13.33%.



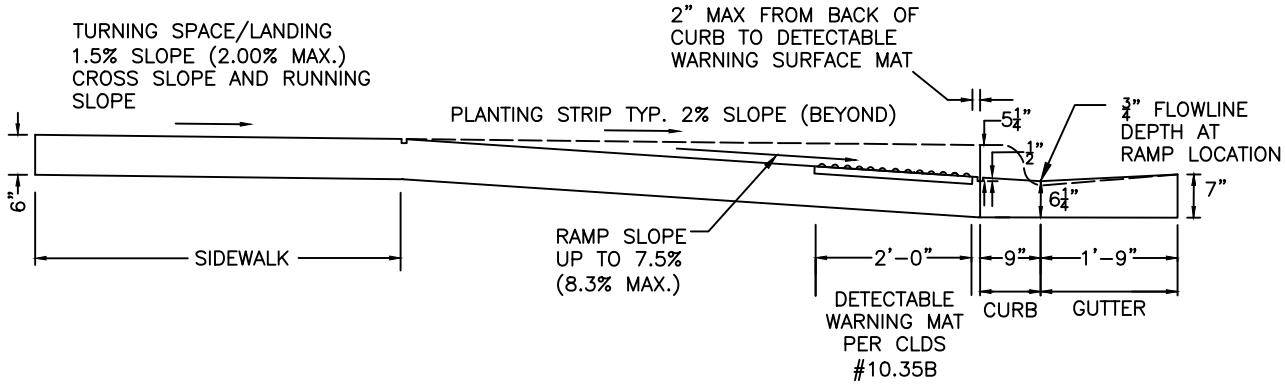
SLOPE "A"	= UP TO 1.5% (2.00% MAX)
SLOPE "B"	= UP TO 7.5% (8.33% MAX)
SLOPE "C"	= UP TO 10% MAX

PLAN VIEW



2'-6" CURB AND GUTTER RAMP DETAIL

MAXIMUM SLOPES FOR CURB AND GUTTER DEPRESSION AT RAMPS



TYPICAL RAMP SECTION AT CENTERLINE

REVISIONS		
NO.	DATE	DESCRIPTION
1	4-20-04	ALLOW DIAGONAL RAMP
2	05/08	NEW ADA STANDARDS
3	04/25	MATCH CHARLOTTE'S STANDARDS

Monroe North Carolina

PERPENDICULAR CURB RAMP WITH 2'-6" CURB AND GUTTER (1 of 2)

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

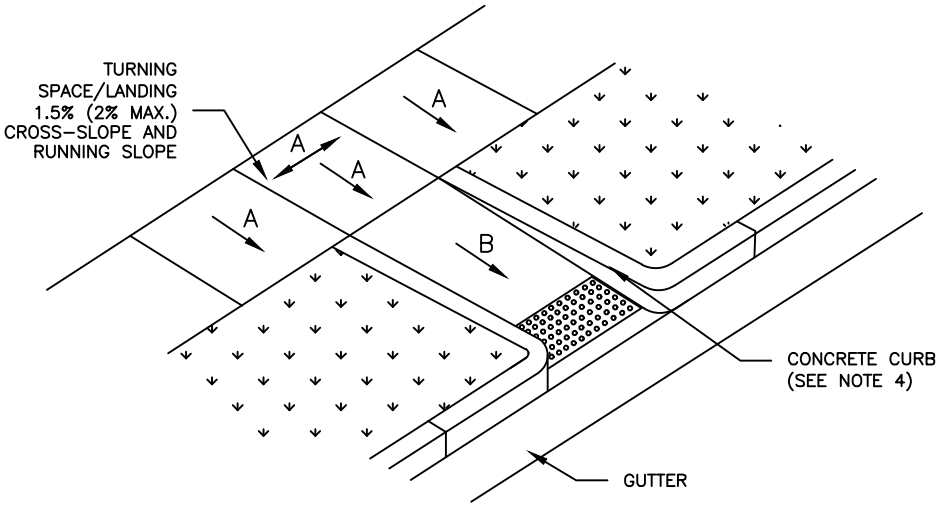
PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details	
DRAWN BY: JAM	DATE: 08-07-01
CHECKED BY: JNL	SCALE: N.T.S.

DETAIL 02.05.01A

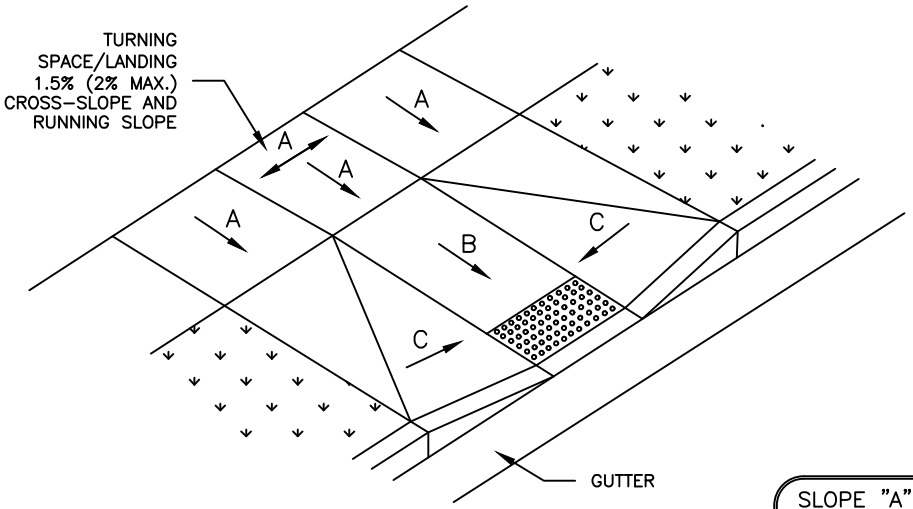
NOTES:

1. THIS DETAIL PRESENTS ALTERNATIVE TREATMENTS FOR THE SIDES OF THE RAMP – RETURNED CURBS, RECTANGULAR WINGS, AND ANGLED WINGS.
2. ENSURE FLUSH CONDITIONS AT CURB RAMP TO GUTTER TRANSITION.
3. TYPICALLY, THE SIDEWALK RUNNING SLOPE SHALL NOT EXCEED THE GENERAL GRADE ESTABLISHED FOR THE ADJACENT STREET.
4. CURB RAMPS WITH RETURNED CURBS MAY BE USED ONLY WHERE PEDESTRIANS WOULD NOT TYPICALLY WALK ACROSS THE RAMP, THE ADJACENT SURFACE IS PLANTING OR OTHER NON-WALKING SURFACE, OR THE SIDE APPROACH IS SUBSTANTIALLY OBSTRUCTED.

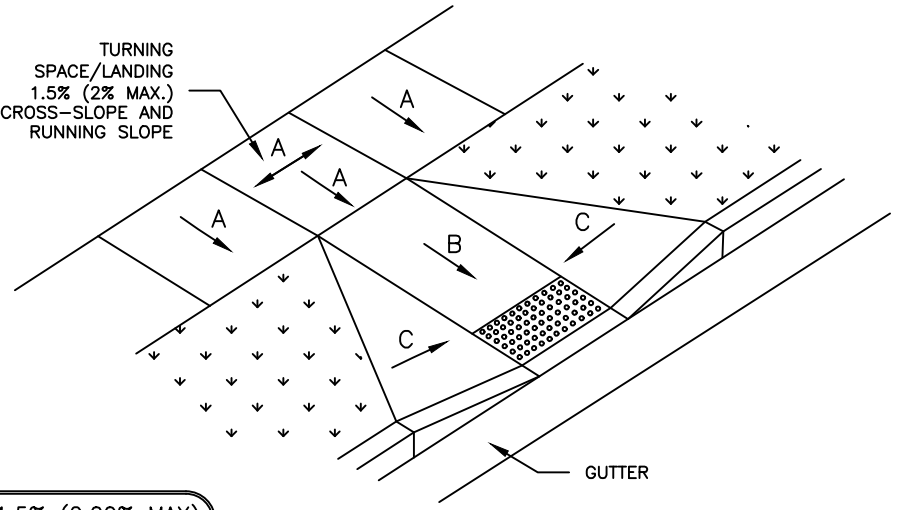


ALTERNATIVE 1: RETURNED CURBS

(SEE NOTE 4)



ALTERNATIVE 2: RECTANGULAR FLARES



ALTERNATIVE 3: ANGLED FLARES

SLOPE "A" = UP TO 1.5% (2.00% MAX)
SLOPE "B" = UP TO 7.5% (8.33% MAX)
SLOPE "C" = UP TO 10% MAX

REVISIONS		
NO.	DATE	DESCRIPTION
1	05/08	NEW ADA STANDARDS
2	04/25	MATCH CHARLOTTE'S STANDARDS

Monroe North Carolina

PERPENDICULAR CURB RAMP WITH 2'-6" CURB AND GUTTER (2 of 2)

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

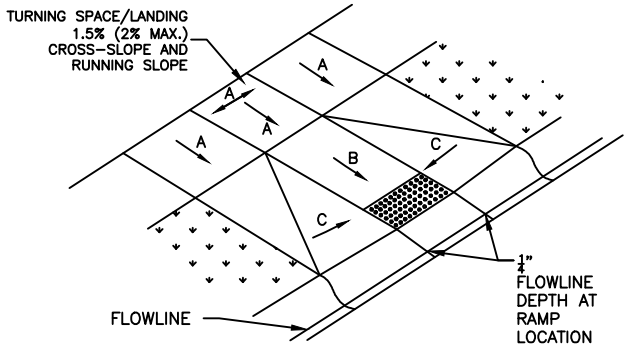
PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: DKO | DATE: 4-20-04
CHECKED BY: JNL | SCALE: N.T.S.

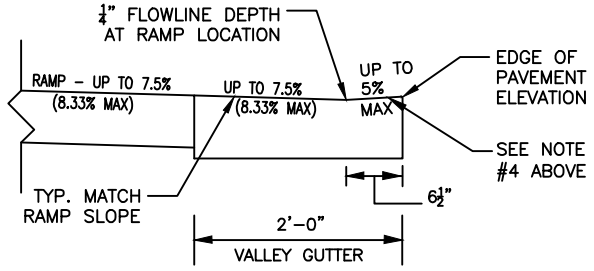
DETAIL 02.05.01B

NOTES:

1. ENSURE FLUSH CONDITIONS AT CURB RAMP TO GUTTER TRANSITION.
2. TYPICALLY, THE SIDEWALK RUNNING SLOPE SHALL NOT EXCEED THE GENERAL GRADE ESTABLISHED FOR THE ADJACENT STREET.
3. MAINTAIN POSITIVE DRAINAGE ALONG THE LIP OF GUTTER IN RAMP. IN FLAT AREAS, ADDITIONAL CATCH BASINS MAY BE REQUIRED ON THE SIDES OF THE RAMP TO MINIMIZE STANDING WATER AT THE RAMP LOCATION.
4. IF THE SLOPE FROM FLOWLINE TO BACK OF CURB AT RAMP IS LESS THAN 8.3%, THEN THE SLOPE FROM LIP TO FLOWLINE AT RAMP MAY EXCEED 5% AS LONG AS THE DIFFERENCE BETWEEN THESE TWO SLOPES IS LESS THAN 13.3%.

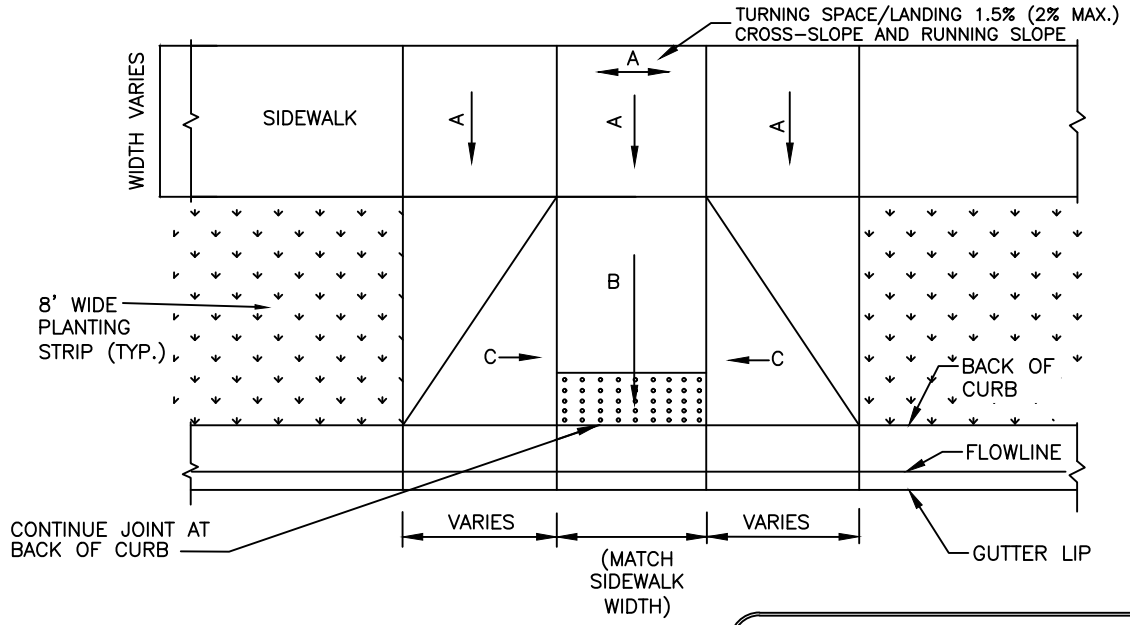


ISOMETRIC VIEW



2'-0" VALLEY GUTTER RAMP DETAIL

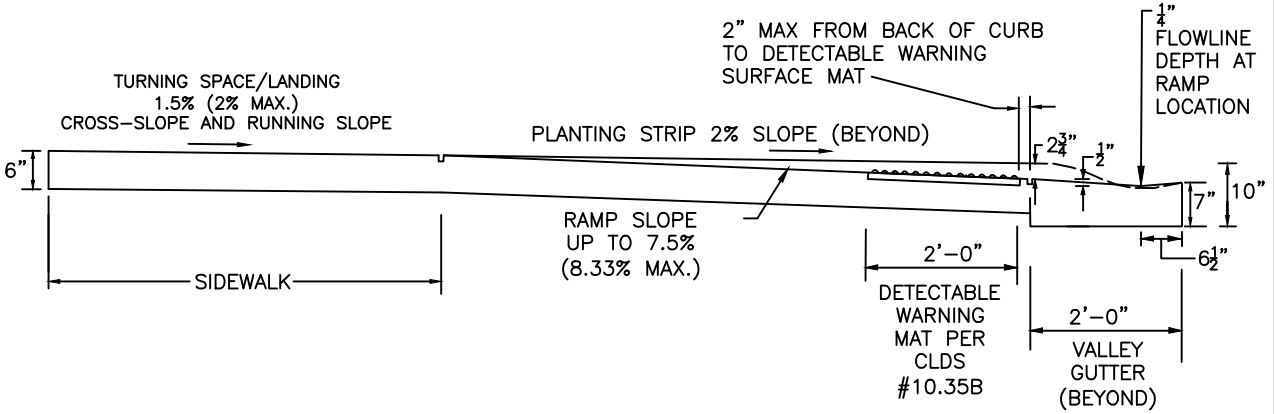
MAXIMUM SLOPES FOR VALLEY GUTTER DEPRESSION AT RAMPS



PLAN VIEW

NOT TO SCALE

SLOPE "A"	= UP TO 1.5% (2.00% MAX)
SLOPE "B"	= UP TO 7.5% (8.33% MAX)
SLOPE "C"	= UP TO 10% MAX



TYPICAL RAMP SECTION AT CENTERLINE

REVISIONS		
NO.	DATE	DESCRIPTION
1	4/20/04	CORRECTED NOTES
2	05/08	NEW ADA STANDARDS
3	04/25	MATCH CHARLOTTE'S STANDARDS

Monroe North Carolina

PERPENDICULAR CURB RAMP WITH 2'-0" VALLEY GUTTER

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

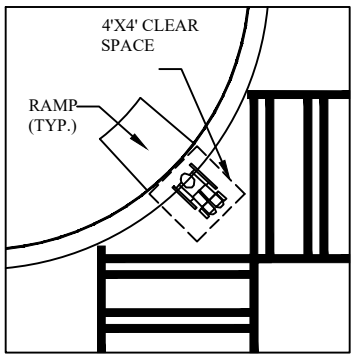
PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: JAM | DATE: 08-07-01
CHECKED BY: JNL | SCALE: N.T.S.

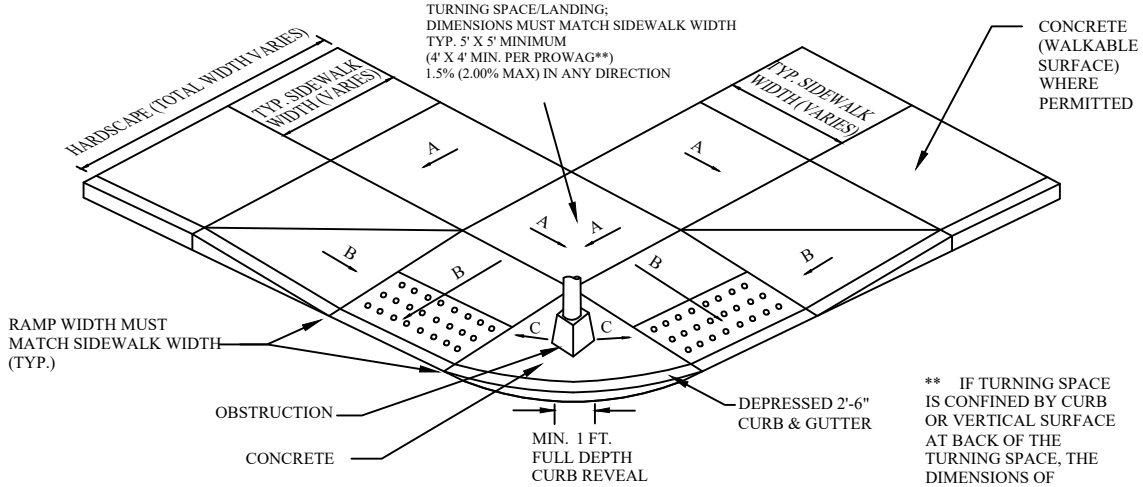
DETAIL 02.05.02

NOTES:

1. MAINTAIN A MINIMUM OF 0.5% SLOPE ON ALL CONCRETE SURFACES TO PROMOTE SURFACE DRAINAGE TOWARD CURB.
2. GUTTER FLOW LINE AND PLAN PROFILE SHALL BE MAINTAINED THROUGH THE RAMP AREA.
3. THE SURFACE OF THE RAMP SHALL BE FLUSH WITH THE FLOWLINE OF THE CURB AND GUTTER.
4. THE WING AND RAMP SURFACES SHALL BE 3600 PSI CONCRETE WITH A SIDEWALK FINISH IN ACCORDANCE WITH CURRENT EDITION NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.
5. DRAINAGE STRUCTURES, MAST ARMS, LIGHT POLES AND OTHER OBSTRUCTIONS SHALL NOT BE PLACED IN LINE WITH RAMPS. LOCATION OF THE RAMP SHALL TAKE PRECEDENCE OVER LOCATION OF OBSTRUCTIONS EXCEPT WHERE EXISTING OBSTRUCTIONS ARE BEING UTILIZED IN THE NEW CONSTRUCTION.
6. SEE STANDARD DRAWING 10.35B FOR DETECTABLE WARNING INSTALLATION.
7. SEE USDG INTERSECTION DIAGRAMS I-1 THROUGH I-3 FOR TYPICAL RAMP PLACEMENT AND INTERSECTION LAYOUTS.
8. CURB RAMPS SHALL HAVE A SEGMENT OF STRAIGHT CURB AT LEAST 24 INCHES LONG LOCATED ON EACH SIDE OF THE WING SLOPE AND WITHIN THE CROSSWALK MARKINGS.
9. FOR ALL RAMPS AT MARKED CROSSWALKS THE RAMP OPENING (AT THE FULLY DEPRESSED CURB) SHALL BE LOCATED WITHIN THE PARALLEL BOUNDARIES OF CROSSWALK MARKINGS.
10. IF A SINGLE DIAGONAL RAMP ON A CORNER IS USED (TYP. ONLY IN RETROFITS), THE RAMP CENTERLINE SHALL BE LOCATED AT THE CORNER RADIUS CENTERLINE UNLESS OTHERWISE DIRECTED BY THE ENGINEER. A MIN. 4'X4' CLEAR SPACE BEYOND THE CURB FACE MUST BE WHOLLY OUTSIDE OF THE PARALLEL VEHICLE TRAVEL LANE (SEE DIAGRAM BELOW):



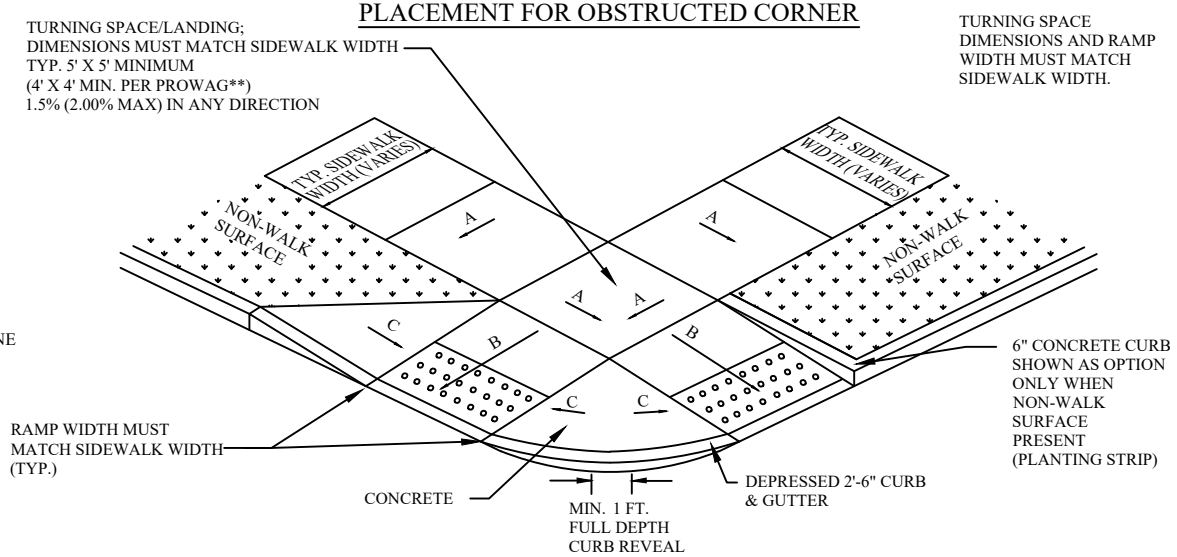
CLEAR SPACE:
- 4' X 4' MINIMUM
- BEYOND BOTTOM GRADE BREAK
- WITHIN PEDESTRIAN STREET CROSSING
- OUTSIDE PARALLEL VEHICLE TRAVEL LANE



PLACEMENT FOR OBSTRUCTED CORNER

** IF TURNING SPACE IS CONFINED BY CURB OR VERTICAL SURFACE AT BACK OF THE TURNING SPACE, THE DIMENSIONS OF TURNING SPACE MUST BE 5'X5' MINIMUM.

TURNING SPACE DIMENSIONS AND RAMP WIDTH MUST MATCH SIDEWALK WIDTH.



SLOPE "A" 1.5% (2.00% MAX)
SLOPE "B" 7.5% (8.33% MAX)
SLOPE "C" 10% MAX

PLACEMENT FOR SMALL CORNER RADIUS

REVISIONS		
NO.	DATE	DESCRIPTION
1	4/20/04	ADD DETECTABLE WARNING NOTE
2	04/25	MATCH CHARLOTTE'S STANDARDS

Monroe North Carolina

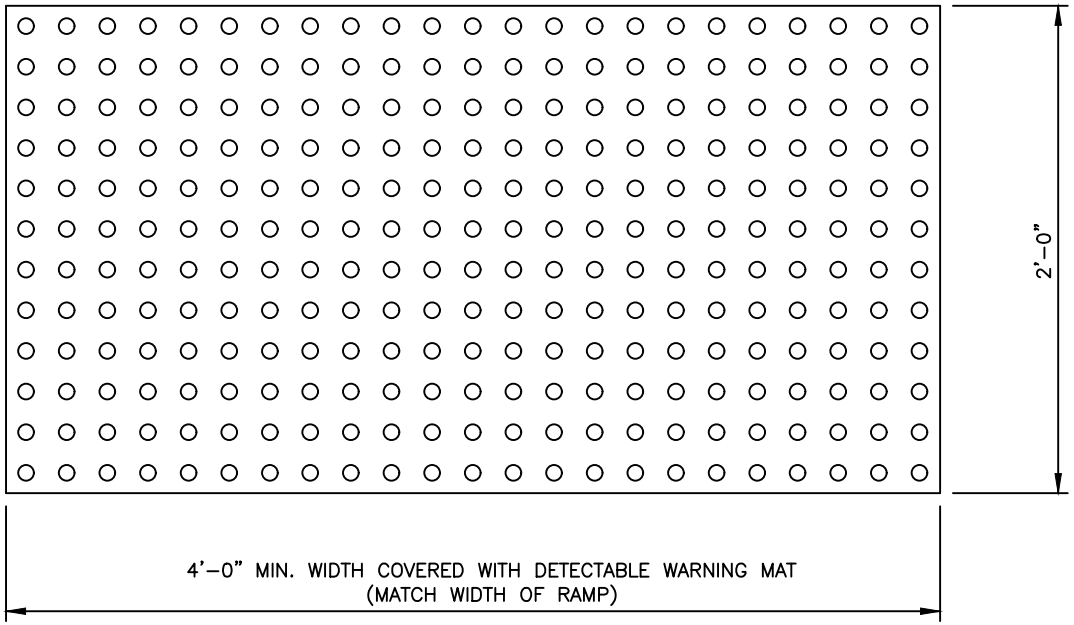
PLACEMENT OF CURB RAMPS AT OBSTRUCTED OR SMALL CORNER RADIUS

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

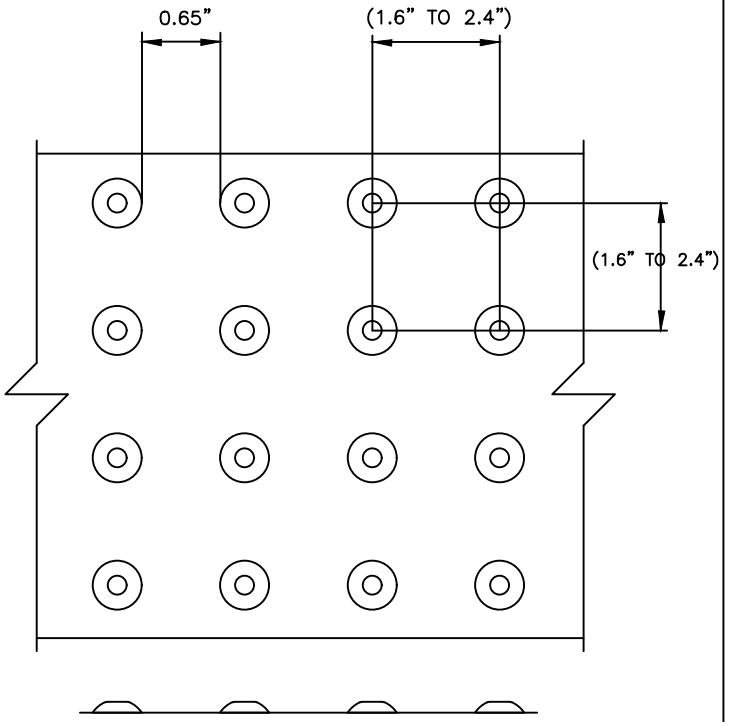
PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: JAM DATE: 08-07-01
CHECKED BY: JNL SCALE: N.T.S.

DETAIL 02.05.03



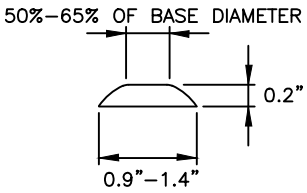
TRUNCATED DOME PLAN VIEW



TRUNCATED DOME SPACING

NOTES:

1. ALL DETECTABLE WARNING DEVICES USED IN NEW CONSTRUCTION SHALL BE OF A RIGID PRECAST OR EMBEDDED PRODUCT APPROVED BY THE CITY ENGINEER. RETROFIT MATS WILL ONLY BE ALLOWED ON EXISTING RAMPS WITH PRIOR APPROVAL OF THE CITY ENGINEER FOR MATERIAL TYPE AND INSTALLATION (IE. RESURFACING).
2. RAMPS AND DETECTABLE WARNING AREA SHALL BE A MINIMUM OF 4 FEET IN WIDTH, BUT NO LESS THAN THE WIDTH OF SIDEWALK LEADING TO BACK OF RAMP.
3. DETECTABLE WARNING SURFACES SHALL EXTEND 2.0 FT MINIMUM IN THE DIRECTION OF PEDESTRIAN TRAVEL.
4. DETECTABLE WARNING AREA CAN BE PLACED SQUARE WHERE USED IN A CURB RADIUS.
5. THE ROWS OF TRUNCATED DOMES IN DETECTABLE WARNING SURFACES SHOULD BE ALIGNED PERPENDICULAR TO THE GRADE BREAK BETWEEN THE RAMP RUN AND THE STREET. WHERE DETECTABLE WARNING SURFACES ARE PROVIDED ON A SURFACE WITH A SLOPE THAT IS LESS THAN 5 PERCENT, DOME ORIENTATION IS LESS CRITICAL.
6. DETECTABLE WARNING AREA SHALL CONTRAST VISUALLY WITH ADJACENT GUTTER, STREET OR HIGHWAY, OR PEDESTRIAN ACCESS ROUTE SURFACE; EITHER LIGHT–ON–DARK OR DARK–ON–LIGHT.
7. IF PAVERS ARE TO BE USED, PAVERS SHALL BE MINIMUM 8000 PSI CONCRETE WITH A 2–INCH MINIMUM THICKNESS, SET ON A THIN–SET MORTAR ON TOP OF 4" THICK 3600 PSI CONCRETE BASE.
8. MATS ARE TO BE RIGID WITH TURNED–DOWN EDGES EMBEDDED IN CONCRETE TO ELIMINATE TRIP HAZARD.
9. DIMENSIONS PER NCDOT 848.06



TRUNCATED DOME SECTION

APPROVED DATE _____

REVISIONS		
NO.	DATE	DESCRIPTION
1	04/25	MATCH CHARLOTTE'S STANDARDS

Monroe North Carolina

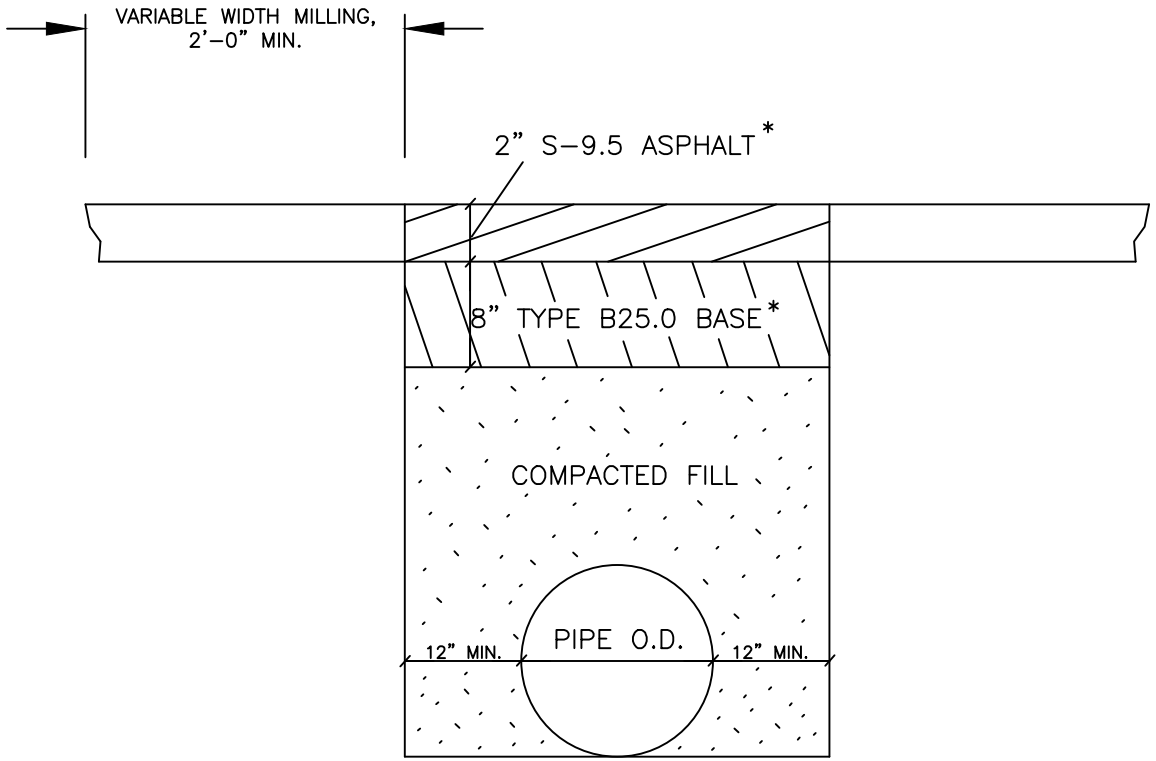
TRUNCATED DOMES PLAN AND CROSS-SECTION

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

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DRAWN BY: DKO DATE: 4-20-04
CHECKED BY: JNL SCALE: N.T.S.

DETAIL 02.05.04



PAVEMENT REPAIR OF UTILITY CUTS

*REFER TO DETAIL 02.01.13
FOR ASHPALT TYPE

NOTES:

1. A PERMIT MUST BE OBTAINED PRIOR TO CUTTING A ROADWAY. FOLLOWING PERMIT APPROVAL ALL PAVEMENT SHALL BE SAW CUT OR JACK-HAMMERED.

2. BACKFILL OF OPEN CUTS SHALL BE PLACED IN LAYERS NOT EXCEEDING 6 INCHES AND THOROUGHLY TAMPED (EACH SUCCESSIVE LAYER).

3. ALL MATERIAL FROM BOTTOM OF CUT TO WITHIN 12 INCHES OF SUBGRADE SHALL BE 95% MAXIMUM DENSITY OF STANDARD PROCTOR.

4. ALL MATERIAL WITHIN 12 INCHES OF SUBGRADE SHALL BE 100% MAXIMUM DENSITY OF STANDARD PROCTOR.

5. INITIAL PAVEMENT REPAIRS SHALL BE COMPLETED WITHIN A 24-HOUR PERIOD OR SAME DAY IF RAIN IS IMMINENT.

6. FINAL REPAIR SHALL BE IN ACCORDANCE WITH THE CITY OF MONROE STREET CUT PAVEMENT REPAIR STANDARDS.

REVISIONS		
NO.	DATE	DESCRIPTION
1	4/20/04	MODIFY FOR SUPERPAVE
2	04/25	ADD NOTE AND MILLING WIDTH

Monroe North Carolina

PAVEMENT REPAIR OF UTILITY CUTS

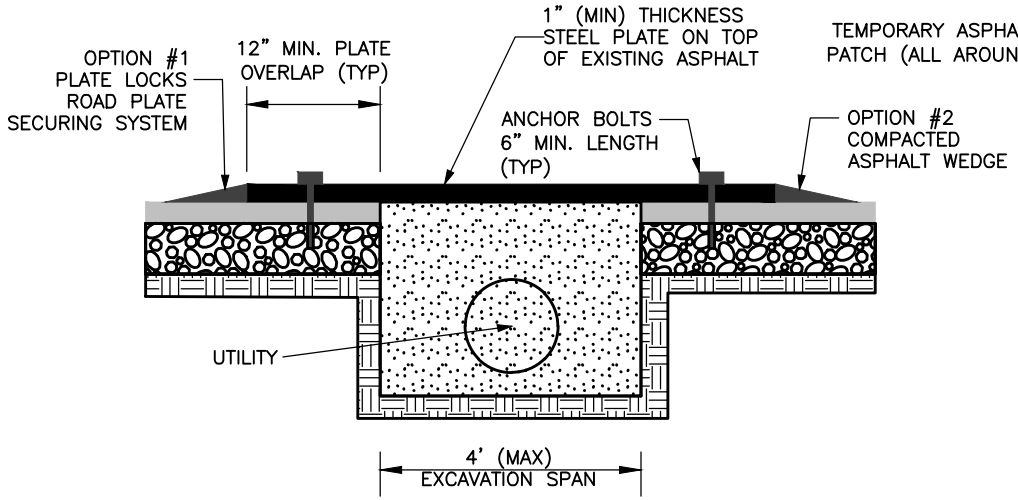
CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

PREPARED BY:
ENGINEERING DEPARTMENT

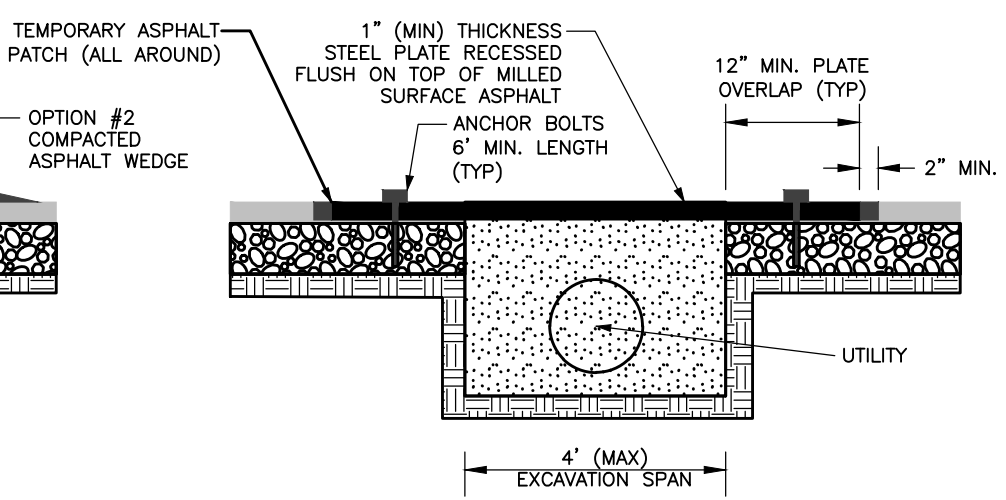
FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: JAM | DATE: 08-07-01
CHECKED BY: JNL | SCALE: N.T.S.

DETAIL 02.06.01

TYPE 1 INSTALLATION DETAIL



TYPE 2 INSTALLATION DETAIL



NOTES:

1. ALL ROAD PLATES MUST BE ACCOMPANIED BY A VALID CITY OF MONROE ENCROACHMENT AGREEMENT AND/OR OPEN CUT PERMIT.
2. TYPE A INSTALLATIONS ARE FOR USE ON ROADWAYS WITH A POSTED SPEED LIMIT UNDER 35 MPH.
3. TYPE 2 INSTALLATIONS ARE FOR USE OF ROADWAYS WITH A POSTED SPEED LIMIT ABOVE 35 MPH.
4. ALL ROAD PLATE INSTALLATIONS SHALL BE APPROVED BY THE INSPECTOR PRIOR TO ALLOWING PUBLIC TRAFFIC.
5. ALL ROAD PLATE INSTALLATIONS, LIABILITY AND MAINTENANCE ARE THE RESPONSIBILITY OF THE CONTRACTOR.
6. METAL PLATES SHALL BE IDENTIFIED WITH A 24" HIGH STENCILED TEXT OF THE CONTRACTOR NAME OR DESIGNATED ABBREVIATION AND A 6" HIGH STENCILED TEXT OF THE CONTRACTORS AFTER–HOURS 24/7 CONTACT PHONE NUMBER. ANY MARKING DEEMED UNREADABLE MUST BE REPAINTED. SEE DETAIL 02.06.03
7. METAL PLATES WILL HAVE WHITE REFLECTIVE MARKING TAPE ON ALL FOUR CORNERS OF EACH END OF A TRENCH. THESE PLATES DESIGNATE THE BEGINNING AND END OF THE EXCAVATION. THE REFLECTIVE TAPE WILL BE DURABLE ENOUGH TO WITHSTAND TRAFFIC. ANY PEELING TAPE DEEMED UNREADABLE MUST BE REPLACED IMMEDIATELY. SEE DETAIL 02.06.03
8. WARNING SIGNS ADVISING MOTORISTS THAT THEY SHOULD EXPECT TO ENCOUNTER METAL PLATES SHALL BE PLACED AT APPROXIMATELY 100 FEET IN ADVANCE OF THE METAL PLATE LOCATION THE "BUMP" OR "STEEL PLATE AHEAD" SHALL BE USED. SEE DETAIL 02.06.03.
9. PLATES THAT ARE LEFT OVERNIGHT WILL REQUIRE THAT THE WARNING SIGN BE SUPPLEMENTED WITH A LOW–INTENSITY–FLASHING WARNING LIGHT MOUNTED ON OR ADJACENT TO THE ADVANCE WARNING SIGNAGE.
10. FAILURE TO FOLLOW THE STEPS OUTLINED ABOVE WILL RESULT IN STOP WORK ORDERS, CITATIONS AND FINES TO THE PERMITTEE OR CONTRACTOR WORKIN WITHOUT A VALID PERMIT. ROAD PLATES REMOVED OR REPAIRED BY THE CITY WILL RESULT IN STOP WORK ORDERS, CITATION AND FINES.
11. PAVEMENT MUST BE RESTORED TO THE PREVIOUS OR BETTER CONDITION ONCE THE PLATE HAS BEEN REMOVED.

REVISIONS		
NO.	DATE	DESCRIPTION

Monroe North Carolina

STEEL ROAD PLATE
(1 OF 2)

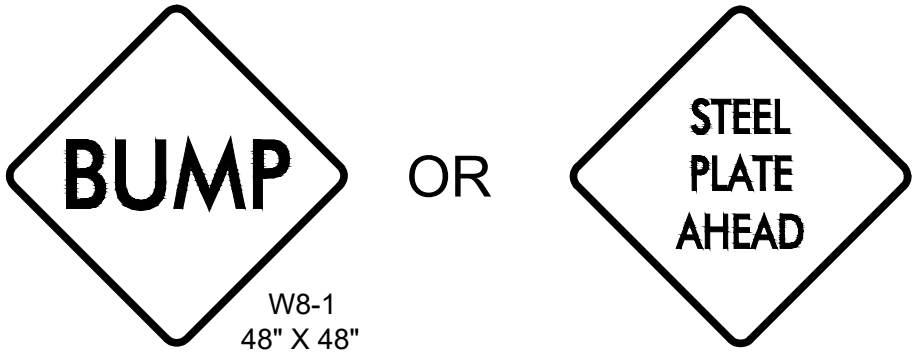
CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details	
DRAWN BY: KMM	DATE: 04-09-25
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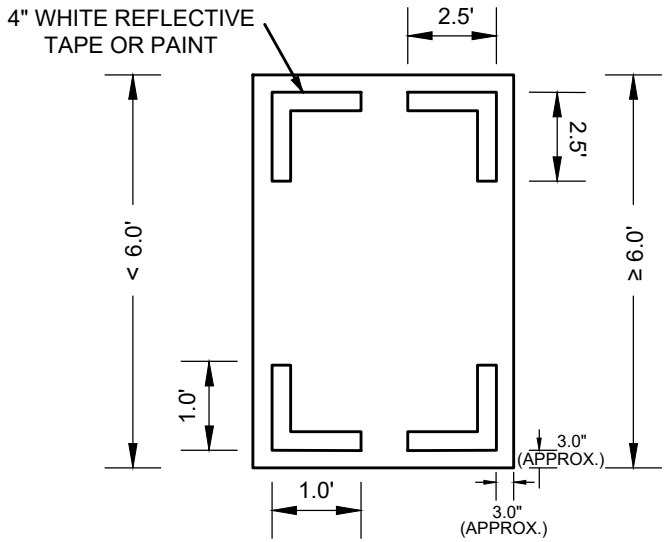
DETAIL 02.06.02

ADVANCED WARNING SIGNAGE



W8-1
48" X 48"

METAL PLATE REFLECTIVE TAPE DETAILS



METAL PLATE MARKING EXAMPLES

RALEIGH CONTRACTING
919-555-5555

EB
984-555-5555

REVISIONS		
NO.	DATE	DESCRIPTION

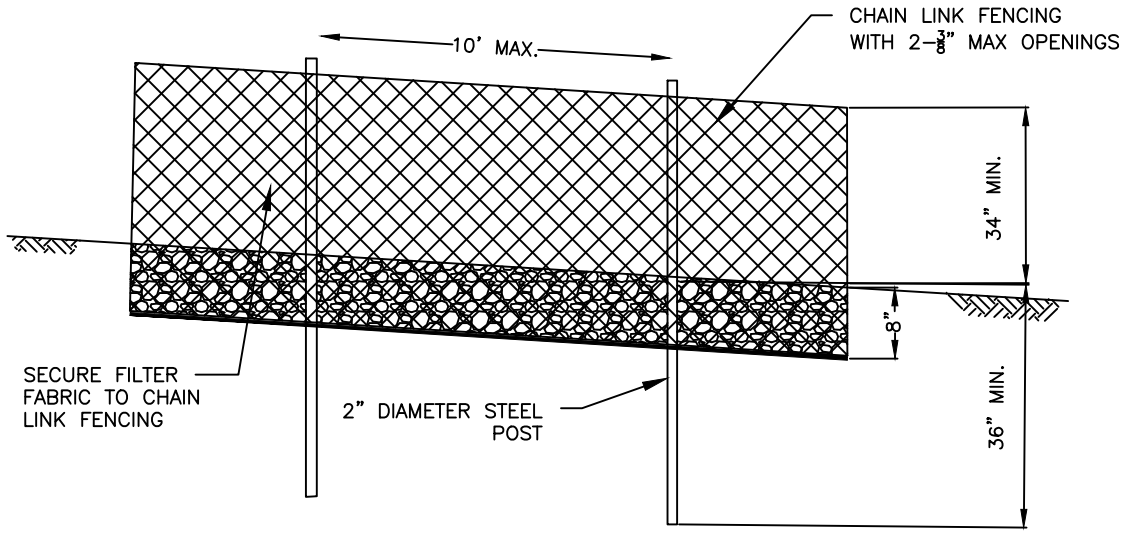
STEEL ROAD PLATE
(2 OF 2)

CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

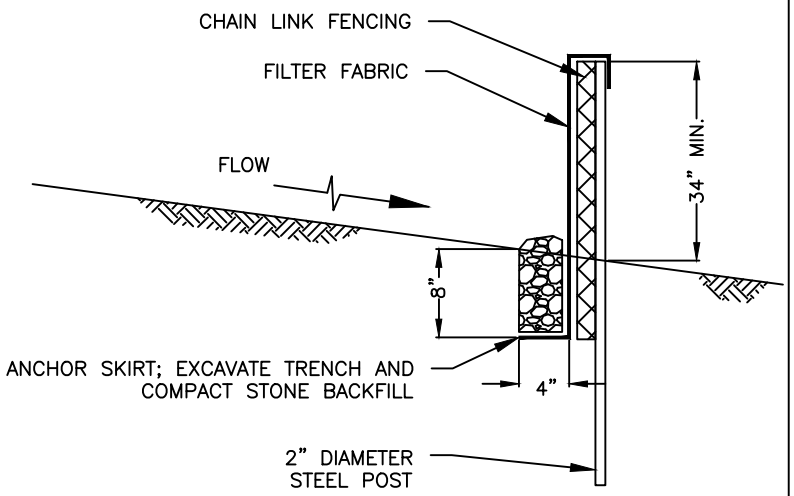
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ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: KMM | DATE: 04-09-25
CHECKED BY: SAM | SCALE: N.T.S.

DETAIL 02.06.03



ELEVATION



CROSS SECTION

GENERAL NOTES:

1. SUPER SILT FENCE MAY BE USED IN CRITICAL AREAS IN LIEU OF DOUBLE ROW HIGH HAZARD SILT FENCE.
2. INSTALL MINIMUM 2 INCH DIAMETER GALVANIZED STEEL POSTS, SIX FOOT LENGTH, SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36" INTO THE GROUND.
3. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2 3/8 INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HOG RINGS.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BYPASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. WASHED STONE (#5 OR #57) STALL BE USED IN THE SILT FENCE TRENCH AND COMPACTED.
7. ORANGE SAFETY FENCE IS REQUIRED WHEN GRADING IS ADJACENT TO SWIM BUFFERS, STREAMS OR WETLANDS (REFER TO SWIM BUFFER GUIDELINES). THE COLOR ORANGE IS RESERVED FOR VISUAL IDENTIFICATION OF ENVIRONMENTALLY SENSITIVE AREAS.
8. DRAINAGE AREA CANNOT BE GREATER THAN ¼ ACRE PER 100 FT OF FENCE.
9. SLOPE LENGTHS CANNOT EXCEED CRITERIA SHOWN IN TABLE 6.62A NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.
10. DO NOT INSTALL SUPER SILT FENCE ACROSS STREAMS, DITCHES, WATERWAYS OR OTHER AREAS OF CONCENTRATED FLOW.

MAINTENANCE NOTES:

1. FILTER BARRIERS SHALL BE INSPECTED BY THE FINANCIALLY RESPONSIBLE PARTY OR HIS AGENT IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS NEEDED SHALL BE MADE IMMEDIATELY.
2. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL IS NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN DEPOSITS REACH HALF THE HEIGHT OF THE BARRIER. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS REMOVED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.

REVISIONS		
NO.	DATE	DESCRIPTION

Monroe North Carolina

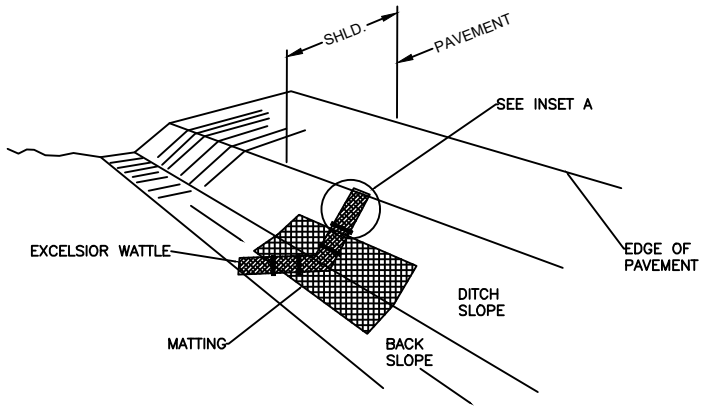
SUPER SILT FENCE

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

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FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: KMM | DATE: 04-03-25
CHECKED BY: SAM | SCALE: N.T.S.

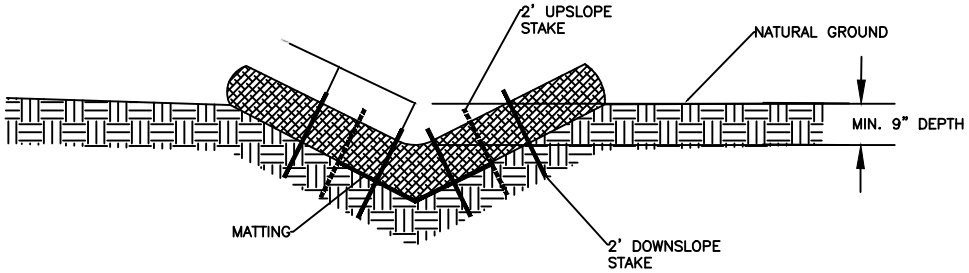
DETAIL 03.01.02



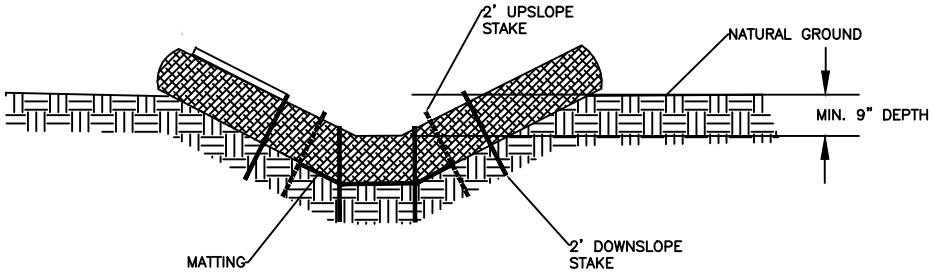
ISOMETRIC VIEW

GENERAL NOTES:

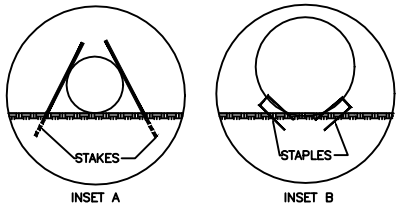
1. USE MINIMUM 12 INCH DIAMETER FIBER WATTLE.
2. USE 2 FT. WOODEN STAKES WITH A 2 IN. X 2 IN. NOMINAL CROSS SECTION
3. ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.
4. INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.
5. PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.
6. INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.
7. INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE NCDOT STANDARD SPECIFICATIONS.

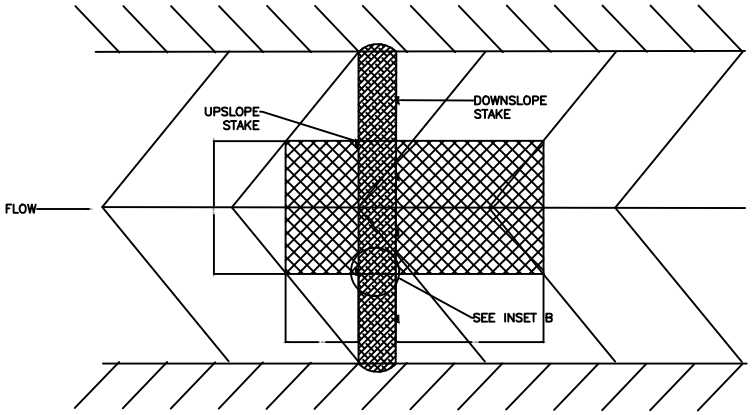


CROSS SECTION
VEE DITCH



CROSS SECTION
TRAPEZOIDAL DITCH





REVISIONS		
NO.	DATE	DESCRIPTION

Monroe North Carolina

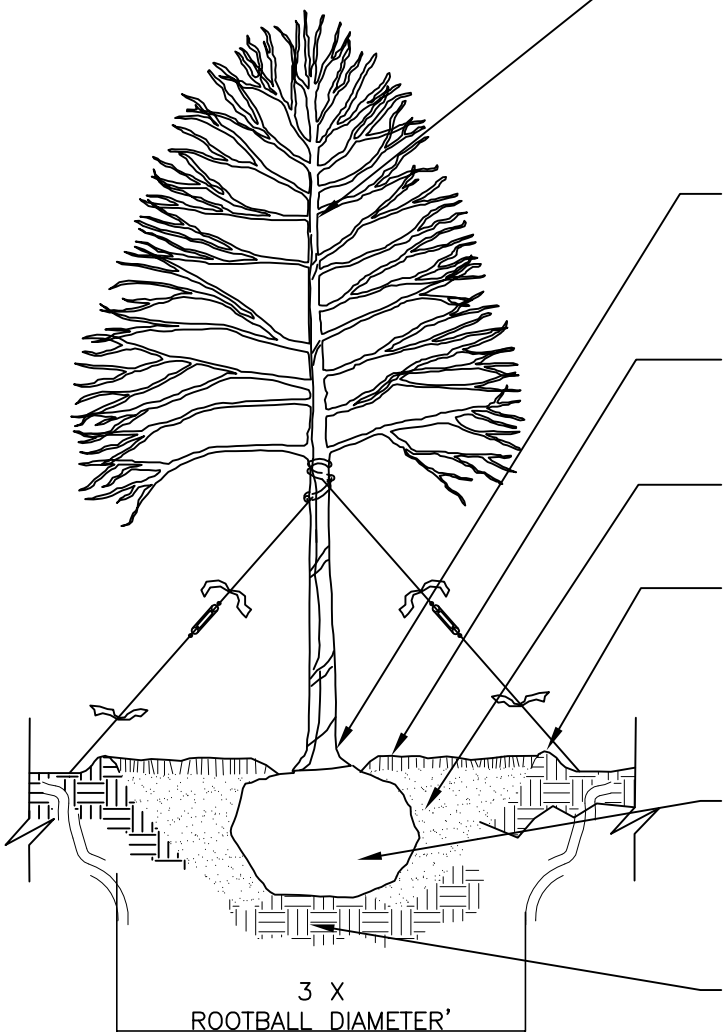
TEMPORARY WATTLE CHECK DAM WITH MATTING

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: KMM | DATE: 04/03/25
CHECKED BY: SAM | SCALE: N.T.S.

DETAIL 03.03.02



PRUNE ONLY TO REMOVE ANY BROKEN, DEAD OR DISEASED WOOD WHILE PRESERVING FORM AND CHARACTER OF TREE; DO NOT CUT LEADER; DO NOT PRUNE TO REDUCE CANOPY SIZE.

THE ROOT FLARE SHALL BE PLANTED AT GRADE, NO HIGHER THAN 2" ABOVE GRADE, AND NEVER BELOW GRADE. REMOVE EXCESS SOIL TO EXPOSE THE ROOT FLARE AT GRADE. TREE SHALL BE SET PLUMB. .

MULCH DEPTH 3".
KEEP MULCH 3" FROM ROOT FLARE AND DO NOT CONTACT STEM.

HIGH QUALITY SOIL MIX AS SPECIFIED IN TREE PLANTING NOTES 06.01.02

WATER SAUCER SHALL BE NO MORE THAN 3" ABOVE GRADE.

COMPLETELY REMOVE TOP HALF OF BURLAP, LACING AND WIRE BASKET AND DISCARD FROM HOLE.

ROOT BALL SHALL BE PLACED DIRECTLY ON COMPACTED SUBGRADE. HANDLE TREE BY THE ROOT BALL ONLY.

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NO.	DATE	DESCRIPTION
1	4/22/25	UPDATE TO CURRENT STANDARDS

Monroe North Carolina

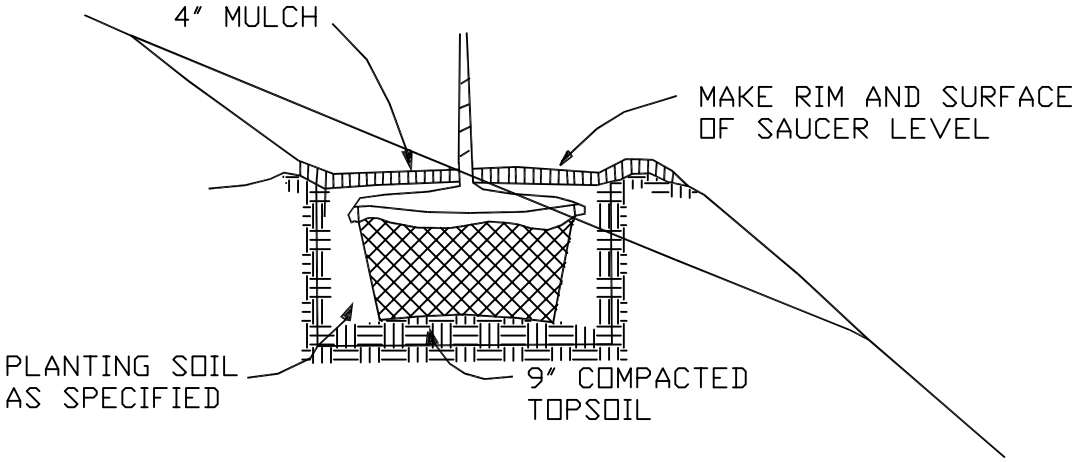
TYPICAL TREE PLANTING

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

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DETAIL 06.01.01



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Monroe North Carolina

SLOPE PLANTING SECTION

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
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DETAIL 06.02.01

TREE PLANTING NOTES

1.) SMALL MATURING TREES SHALL BE TREE FORM, 1.5" CALIPER AND HAVE NO BRANCHES LOWER THAN 3–4' AT TIME OF PLANTING.

2) MEDIUM MATURING TREES SHALL BE TREE FORM, 2.5" CALIPER AND HAVE NO BRANCHES LOWER THAN 4–5' AT TIME OF PLANTING.

3) PLANTING BACKFILL MIXTURE: 4 PARTS TOPSOIL; 1 PART PEAT MOSS; 10 LBS. 5–10–5 PLANTING FERTILIZER THOROUGHLY MIXED PER CUBIC YARD.

4) FOR CONTAINER GROWN TREES, CAREFULLY REMOVE THE PLANT FROM THE CONTAINER WITHOUT USING THE TRUNK FOR LEVERAGE OR AS A HANDLE. ROUGH UP THE ROOT BALL TO IDENTIFY AND CUT OUT MATTED, GIRDLING OR CIRCLING ROOTS. DO NOT LEAVE ROOTS EXPOSED FOR MORE THAN FIVE MINUTES.

4) STAKING OF TREES IS NOT RECOMMENDED, EXCEPT IN VERY WINDY LOCATIONS OR WHEN REQUIRED BY THE CITY ENGINEER. STAKING WHEN REQUIRED SHALL BE DONE USING FLEXIBLE STRAPS–NOT HOSE AND WIRE TO ALLOW SLACK FOR THE TREE TO MOVE IN THE WIND. STAKING SHALL BE REMOVED 1 YEAR AFTER PLANTING.

5) TREES SHALL HAVE A TAG ATTACHED AT TIME OF PLANTING LISTING THE COMMON AND SCIENTIFIC NAME. THIS TAG SHALL REMAIN IN PLACE UNTIL REMOVED BY THE CITY OF MONROE ENGINEERING DEPARTMENT CONSTRUCTION INSPECTOR

REVISIONS		
NO.	DATE	DESCRIPTION

Monroe North Carolina

TREE PLANTING NOTES

CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

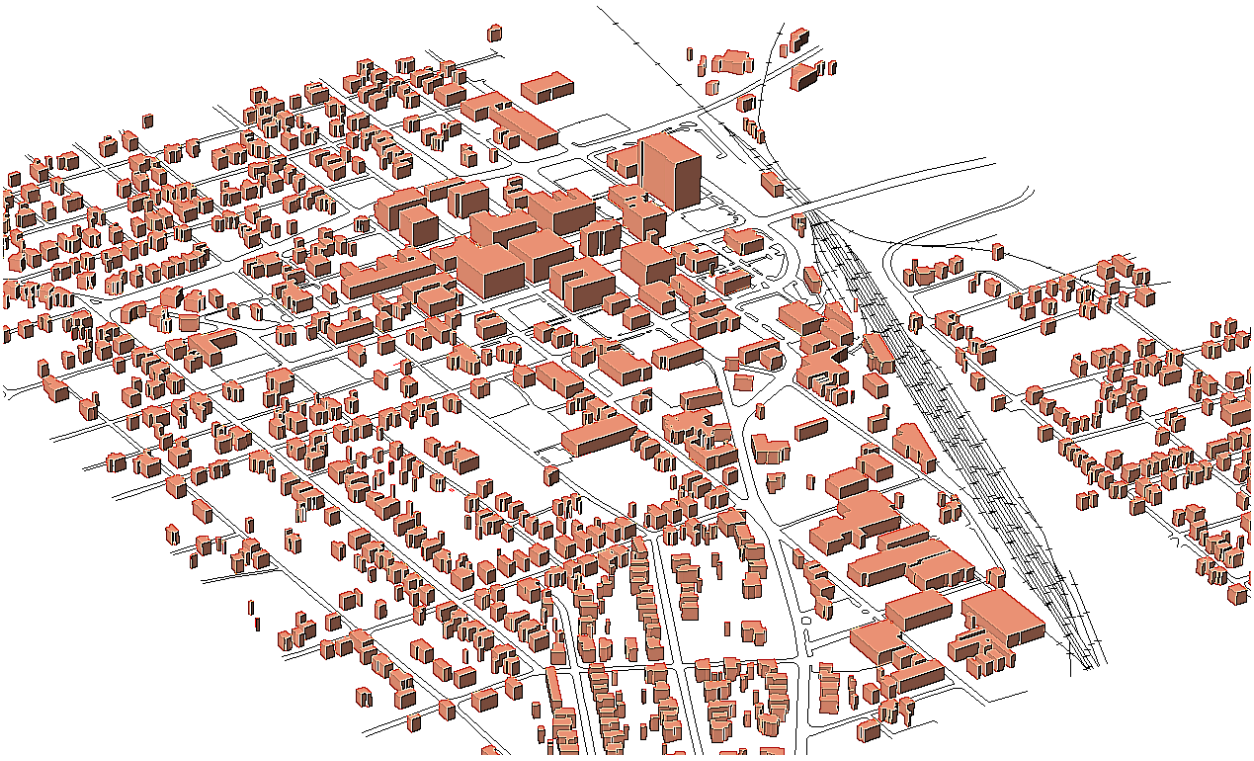
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ENGINEERING DEPARTMENT

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DETAIL 06.03.01

CITY OF MONROE

STANDARD SPECIFICATIONS

AND DETAIL MANUAL



www.monroenc.org/engineering/engpages_0.htm

CITY OF MONROE
a heritage of progress

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300 W. CROWELL ST
MONROE, NC 28112
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PREFACE

This manual, entitled City of Monroe Standard Specifications and Detail Manual, sets forth the minimum acceptable criteria for public and private roadway facilities, storm drainage structures, stormwater control structures, water mains, and sewer mains within the City of Monroe. Deviations from these standards may be considered; however, it shall be the responsibility of the applicant to demonstrate to the satisfaction of the City's Engineering Director or the City's Water Resources Director that the proposed deviation meets or exceeds the minimum acceptable criteria. Any proposed waiver of a standard provision may only be made according to the procedures set forth in this manual. Policies and technical criteria not specifically addressed in this document shall follow the provisions of the latest editions of the American Association of State Highway and Transportation Officials' "A Policy on Geometric Design of Highways and Streets "Standard Specifications for Roads and Structures" of the North Carolina Department of Transportation, the NCDOT- Guidelines for Drainage Studies and Hydraulic Design, and the NCDEQ Stormwater Design Manual.

REVISION LOG

Rev. No.	Date Adopted by City Council	Summary
	August 21, 2001	City of Monroe Standard Specifications and Detail Manual Adopted. Ordinance O-2001-32
1.	September 4, 2001	Added: Section 02.02.06 Sidewalk Requirements, Detail 02.01.08 Residential Cul-de-sacs, Detail 02.01.09 Commercial Cul-de-sacs Ordinance O-2001-39
2.	April 2, 2002	Section 03.00 Erosion and Sedimentation Control: Effective Date July 1, 2002 Updated Pages: ii, 03-1, 07-13 Ordinance O-2002-24
3.	July 16, 2002	Section 02.02.06 Sidewalk Requirements Added: M. L. King, Jr. Boulevard to Sub-section B.1.and added Sub-Section B. 2. Updated Pages: Table of Contents, ii, 02-9 through 02-15; Ordinance O-2002-37
4.	April 20, 2004	Revised per Ordinance 0-2004-12
5.	October 5, 2004	Revised per Ordinance O-2004-35
6.	December 7, 2004	Revised per Ordinance O-2004-47
7.	January 18, 2005	Revised per Ordinance O-2005-03
8.	July 15, 2008	Revised per Ordinance O-2008-18
9.	September 16, 2008	Revised per Ordinance O-2008-37
10.	November 4, 2008	Revised per Ordinance O-2008-48
11.	April 5, 2011	Revised per Ordinance O-2011-02
12.	April 21, 2015	Revised per Ordinance O-2015-01
13.	March 6, 2018	Revised per Ordinance O-2018-04
13.	September 4, 2018	Revised per Ordinance O-2018-27
14.	May 7, 2019	Revised per Ordinance O-2019-29
15.	October 11, 2022	Revised per Ordinance O-2022-67
16.	October 10, 2023	Revised per Ordinance O-2023-55
17.	May 13, 2025	Revised per Ordinance O-2025-05

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A6 CULVERT DESIGN – OUTLET CONTROL
A7 RATIONAL METHOD PIPE DESIGN FOR INLET CONTROL FORM
A8 SAMPLE CALCULATION FOR DETERMINING REQUIRED PIPE SIZE
A9 RATIONAL METHOD PIPE DESIGN FOR INLET CONTROL ~~FOR~~ SAMPLE CALCULATION

A10 DENSITY TEST WORKSHEET

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.

~~6.~~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.

~~7.~~8. CONTRACT – The agreement between the Contractor and the City of Monroe or the Contractor and a Developer.

~~8.~~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.

~~9.~~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.

~~10.~~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.

~~11.~~12. ENGINEER – An individual duly licensed in accordance with Chapter 89C of the N.C. General Statutes.

~~12.~~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).

~~13.~~14. INSPECTOR – The City of Monroe Construction Inspector or other representative duly authorized by the Engineering Director.

~~14.~~15. INVERT – The lowest point in the internal cross section of a pipe or other culvert.

~~15.~~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

~~16.~~

~~17.~~18. LAND SURVEYOR - An individual duly licensed in accordance with Chapter 89C of the N.C. General Statutes.

~~18.~~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.

~~19.~~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.

~~20.~~21. RIGHT OF WAY – The land area dedicated for public use and reserved for vehicular access.

~~21.~~22. ROADWAY – The portion of a street reserved for vehicular travel.

~~22.~~23. ROADWAY CONSTRUCTION - Any work on new roadway improvements including but not limited to undercut, embankment, storm drain, storm drain structures and pavement construction.

~~23.~~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.

~~24.~~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.

~~25.~~26. STORM DRAIN – Conduit and appurtenances intended for the conveyance of storm water runoff.

~~26.~~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.

~~27.~~28. SUBDIVIDER – A person who owns a property and divides that property into smaller properties in accordance with the Monroe City Code.

~~28.~~29. SUBDIVISION ADMINISTRATOR – The Planning Director of the City of Monroe or his designee who is authorized to approve final plat recordation.

~~29.~~30. SUBGRADE – That portion of the roadbed prepared as a foundation for the pavement structure.

~~30.~~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-~~residentail~~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~~2~~ 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
	07.145	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~~Subdivision Development~~
	01.07	Roadway and Storm Drainage Construction Plan Requirements
	01.07 ~~01.08~~	Construction Inspections
	01.09	Post- Construction Inspections
	01.10~~09~~	Warranty
	01.11~~0~~	As-Built Drawing Requirements
	01.12~~1~~	~~Concrete~~ 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
	07.08	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~~Construction Checklist~~
	07.10	Final Inspection and Acceptance
	07.11	Post-Construction Checklist
	07.13	As-Built Drawing Checklist
	~~07.14~~	~~Concrete Monument Report Form~~

3. The following divisions and/or standards shall apply to single lot ~~non-single~~multi-~~-~~family residential, commercial and industrial development:

A.	01.11~~0~~	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 ~~Retention and Detention Facilities~~
D.	07.04	Stormwater ~~Control Structure Operation and~~ Maintenance Agreement~~Plan~~
	07.08	Certification Forms
		Certification Form 1-01
		Certification Form 1-04
		Certification Form 1-05
		Certification Form 1-06
	07.12	~~Commercial Site~~Watershed Post-Construction Checklist for Stormwater Control MEasures~~Retention and Detention Ponds~~
	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 ~~issued through~~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 ~~then~~ than those listed must to 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 ~~s~~Section 01.05.02. A Pre-Construction meeting ~~may be~~is required for ~~Commercial~~ all ~~D~~development ~~dependant on utilities to be installed~~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 ~~Planning~~ 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, ~~all~~ approvals and permits for the development (erosion control, environmental, ~~storm drainage, water, sewer,~~ 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);
   - ~~Telephone Utility;~~

- ~~Cable Television Utility;~~
- Developer.

The Developer shall be responsible for contacting his Agent, Engineer, Builder, ~~and~~ 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:

Task	Appropriate Standard	
Confined Space Entry	Confined Space	OSHA 1910.146
Use of Explosives	Explosives and Blasting Agents	OSHA 1910.109
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 Protection Agency	30, 58 & 395
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 ~~ok~~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 ~~48 hours~~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. ~~**Reference Appendix A-10 Density Test Worksheet.**~~

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.

~~9~~7. Quality Assurance and Quality Control for ~~Strom~~Storm Drainage Installation

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.

~~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.~~

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 ~~and performed~~ by a North Carolina Professional Engineer. Inspections shall be completed as described in the most recent version of the City of ~~Charlotte~~Monroe ~~Storm Water Services~~Engineering Department Document "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.

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.~~09~~10 WARRANTY – PUBLIC STREETS

1. Prior to ~~the approval of the final plat or~~ 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.

~~1.~~2. Upon successful performance of the improvements, as determined by the ~~Subdivision Administrator~~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 ~~Subdivision Administrator~~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 ~~Subdivision Administrator~~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 ~~Subdivision Administrator~~Engineering Director, the warranty shall not expire.

~~2.~~3. See standards 07.10 Final Inspection and Acceptance of Subdivision Construction and 07.16 Warranty.

01.1~~0~~1 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. All applicable information listed on the As-Built Drawing Checklist in Standard 07.13 must be included on all as-built drawings, and ~~T~~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 of the Final As-built PDF, signed and sealed per NCBELS Board Rule – 21 NCAC 56 .1103 STANDARD. ~~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~~. The Developer shall submit a Summary Information File in an ASCII file format that contains the following items: Project Name, Name of Firm that prepared the data, Date the data was prepared, Specification of two or more survey control monuments established and/or used for the project, and a statement that indicates the horizontal and vertical datum of the control monuments.

~~6.~~ The Developer shall submit one or more AutoCad (DWG or DXF format) drawing files that contain the entire utility infrastructure (water, sewer, and stormwater) that was constructed during the project, as well as all other pertinent reference lines, project information, and survey control data. The infrastructure shall be drawn in the file at the as-built locations as surveyed and certified by the Professional Land Surveyor. The CAD files shall be delivered as the overall working drawing in "model space" that is registered to North Carolina State Plane, NAD 1983. Each structure type and right-of-way element (centerline, sidewalk, curb & Gutter) shall be isolated in the CAD file layers, not all combined in one XREF file.

01.121 SURVEY CONTROL ~~MONUMENTS~~

Platted surveys shall comply with North Carolina ~~General Statutes 39-32.1 through 32.4, and~~ General Statute 47-30.

01.132 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
~~For first review and subsequent reviews for Site Plan and Conditional Use, Subdivision and Erosion Control Approval, submit 7 plan sets; for review of Stormwater Best Management Practices, submit 3 plan sets.~~

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

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

City of Monroe Driveway Permit: ~~2~~ a ~~copies~~ copy of the site plan~~s~~ plus completed permit

NC DOT Driveway Permit: ~~5 copies of the site plan and a completed NC DOT Driveway Permit Application (one original and 4 copies)~~submit to NCDOT

~~Erosion and Sedimentation Control: 4 plan sets plus digital copy in PDF format~~
~~Subdivision, Roadway and Storm Drainage approval: 4 plan sets plus digital copy in PDF format~~

~~Stormwater Best Management Practices: 3 plan sets plus digital copy in PDF format and copy of final calculations in PDF format~~

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.**

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~~ing~~ ~~Director~~ 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~~ing Director~~ 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 ~~conditional or special use permits~~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 ~~a conditional or special use permit~~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 ~~five~~ copies of the site plan and a completed NCDOT Driveway Application ~~(one original and four copies)~~ 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 ~~two~~a digital cop~~y~~~~ies~~ 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~~ing Director~~, 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~~ing Director~~.

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~~ing Director~~.

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^{o}. Intersections may be allowed to have a minimum angle of 75^{o} for low volume, extreme conditions subject to the approval of the City Engineer~~ing Director~~.

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~~ing Director~~.

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. ~~Design requirements defined by this Section may be amended in keeping with Traditional Neighborhood Development (TND) Guidelines as published by the Division of Highways North Carolina Department of Transportation. A copy of the TND Guidelines is found at www.doh.dot.state.nc.us/operations/tnd.pdf. Traditional neighborhood designs are coordinated by the City of Monroe Planning Department.~~

32. 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~~d~~ vehicular access to ~~at least two pp~~ublic streets unless such provision is deemed impractical by the Planning Director and/or City Engineer~~ing Director~~ 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~~obtain~~ 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 ~~Zoning~~ 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, ~~five copies~~a digital copy of the site plan shall be submitted ~~(one original and four copies)~~ 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.

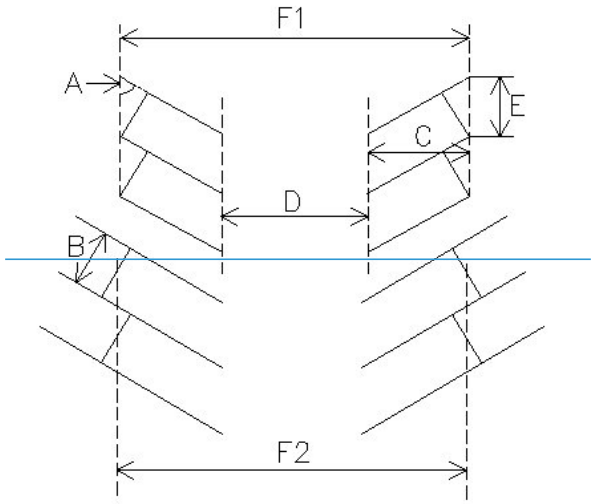
~~4. Parking Bays shall be designed in accordance with Table 02-01.~~

TABLE 02-01

MINIMUM DIMENSIONS FOR OFF-STREET PARKING

	A	B	C	D	E	F1	F2
Parking Direction	Parking Angle (Degrees)	Stall Width * (ft.)	Stall to Curb (ft.)	Aisle Width (ft.)	Curb Length (ft.)	Center to Width of Bin with Road (ft.)	Center Two Row Access Between
						Curb-to-Curb	Overlap Curb-to-Curb
One-Way	0	7.0 9.0	7.0 9.0	12.0 12.0	20.0 20.0	26.0 30.0	-
One-Way	45	7.0 9.0	19.1 20.5	12.0 12.0	9.9 12.7	50.2 53.0	45.2 46.6
One-Way	60	7.0 9.0	20.8 21.8	14.0 16.0	8.1 10.4	55.6 59.6	52.2 55.2
Two-Way	60	7.0 9.0	20.8 21.8	21.0 24.0	8.1 10.4	62.6 67.6	59.2 63.2
Two-Way	90	7.0 9.0	20.0 20.0	21.0 24.0	7.0 9.0	61.0 64.0	-

* 7 Feet = Compact Size Vehicles Only. See City of Monroe Zoning Ordinance for complete information.



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

~~*Listing of Identified Existing Arterial Streets and Existing Collector Streets found in Section 02.02.06 B. Non-Single Family Single-Lot Development Requirements~~

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 ~~identified in Section 02.02.06 B. and~~ 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~~. if the parcel is located along the following existing arterial and collector roads:~~

~~A. Allen Street SR 1245~~

~~B. Charlotte Avenue/Highway SR 1009~~
~~C. Concord Avenue~~
~~D. Dickerson Boulevard SR 1223~~
~~E. Fowler Secrest Road~~
~~F. Franklin Street NC 75, SR 2100~~
~~G. Goldmine Road SR 1162~~
~~H. Griffith Road SR 2139~~
~~I. Hayne Street NC 207~~
~~J. James Hamilton Road~~
~~K. Lancaster Avenue/Highway NC 200~~
~~L. Medlin Road SR 2102~~
~~M. M. L. King, Jr. Boulevard SR 1223~~
~~N. Morgan Mill Road NC 200, SR 2188~~
~~O. Myers Road~~
~~P. Pageland Highway US 601~~
~~Q. Rocky River Road SR 1007~~
~~R. Roosevelt Boulevard US 74~~
~~S. Secrest Avenue~~
~~T. Secrest Short Cut Road SR 1501~~
~~U. Skyway Drive US 601, NC 200~~
~~V. Sunset Drive SR 2180, SR 2181~~
~~W. Sutherland Avenue~~
~~X. Walkup Avenue SR 1751~~

2.0 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~~ing Director~~. 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 ~~cost~~ Fee ~~s~~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 ~~Subdivision~~ 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, ~~and~~ widening of pavement ~~and widening~~ 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.

~~D. In cases where a street is stubbed into adjoining property for future extension and such street serves as the frontage for one or more lots which are not corner lots, the Planning Board/City Engineer may require the pavement of a temporary turn-around in a form similar to a cul-de-sac on such street where in their opinion such turn-around is necessary for the public convenience, safety and service. Temporary easements for such purposes may be required.~~

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 anyeach publicly maintained street. ~~as listed in 02.02.06(B).~~

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~~ing Director~~ 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.

~~1.~~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.

2. 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.

3. A deviation ~~variance~~ from the requirements for curb and gutter and sidewalk may be approved by the Monroe City Council in the following circumstances:

1) The project involves the extension or construction of a residential street to provide conformity to the existing neighborhood; or

2) A roadway is identified as an arterial street as defined in this manual ~~on the Thoroughfare Plan for the City of Monroe~~; or

3) The deviation ~~variance~~ is in accordance with the provisions provided by the Unified Development Ordinance.

4) The deviation ~~variance~~ 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.

5) The deviation ~~variance~~ is required by other outside Agencies to lessen the impervious impact on environmentally sensitive areas.

~~Any exception to the requirements of the Standard Specifications and Detail Manual meeting the criteria of the above circumstances 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 City Council by the Engineering Director 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.~~

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 ~~Transportation~~ Council Committee may require certain improvements be made if they are determined to be in the public interest or needed to ensure public safety.

5. ~~If the new building is an addition by which the total developed area does not exceed 50 percent of the site, the construction of sidewalk facilities shall not be required. However, necessary drainage facilities shall be required.~~

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 ~~1 year warranty bond and~~ 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 ~~or similar pneumatic tired vehicle~~ 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~~s~~ some other method of subgrade stabilization is appropriate. Approved methods of stabilization shall include chemical~~lime~~ 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~~ing Director~~.

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~~to a minimum of 92% of the target specific gravity~~.

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.~~Surfaces shall be tacked when asphalt is being placed over existing asphalt streets or when newly placed asphalt base course is more than 7 days old.~~

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~~ing Director~~. 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~~ing Director~~. 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. ~~A surface~~Surface course asphalt ~~or sand seal~~ shall be placed on any bituminous asphalt base or intermediate course ~~by December 1 of that year to seal the asphalt course. If the base or intermediate course is placed on or after December 1, the sealing layer must be placed within 15 days of the base or intermediate course's placement.~~ 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. ~~A canvas cover or other suitable cover shall be required for transporting plant mix asphalt during cool weather when the following conditions are present:~~

~~17.~~

~~18. a. Air temperature is below 60° F.~~

~~19.~~

~~20. b. Length of haul from plant to job is greater than five (5) miles.~~

~~21.~~

~~22. c. Other occasions at the Inspector's discretion when a combination of factors indicate that material should be covered in order to assure proper placement temperature.~~

~~23.~~16.

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.

~~22.~~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.

~~23.~~24. When curb and gutter are placed adjacent to sidewalk, the joints shall align.

~~24.~~25. All sidewalks shall be steel troweled and have a light broomed finish.

~~25.~~26. All sidewalks shall have a lateral slope of 2.0%~~¼ inch per foot~~ or less.

~~26.~~27. All sidewalks shall have contraction joints located~~ every~~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.

~~27.~~28. All sidewalks shall be a minimum of 4 inches thick, 6 inches thick at driveways.

~~28.~~29. Sidewalks shall be a minimum of 5 feet wide unless otherwise noted on the approved plan.

~~29.~~30. Accessible ramps are required per the Public Right-of-way Accessibility Guidelines ~~North Carolina State Building Code, Volume 1.C, latest edition~~, and per Details 02.05.01-02.05.04.

~~30.~~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.~~Insulation protection shall be provided on all newly placed concrete when temperature drops below 35 degrees F for more than 6 hours within any 24 consecutive hours of 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.~~Pavement shall be milled or removed by other appropriate method to preclude a lip greater than 1/4 inch at curb line and to allow uniform placement of asphalt surface layer in accordance with Street Cut Pavement Repair Standards minimum depths for asphalt construction~~.

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 ~~Transportation~~Council Committee agenda.

2. The appropriate City of Monroe ~~Transportation~~ 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 ~~is~~ 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 07.1~~9~~8 CUSTOMER PETITION TO PERMANENTLY CLOSE A PUBLIC STREET OR PUBLIC ALLEY

03.00 EROSION AND SEDIMENTATION CONTROL

03.01 GENERAL

03.01.01 REQUIREMENTS

1. General requirements are listed in the City of Monroe Erosion and Sedimentation Control Ordinance, Chapter 158 of the City Code.

2. In cases where a subdivision developer will also be constructing on individual lots within the subdivision, the Erosion and Sedimentation Control Plan Review and Approval may be completed simultaneously. It is the property owner's ultimate responsibility to ensure that all land-disturbing activities are properly permitted and maintained in accordance with all local state, and federal requirements. (A Sseparate ESC Plan ~~or ESC Installation & Maintenance Agreements are~~ is required for property owner's building within an approved subdivision under construction by a separate developer.)

3. If property changes ownership at any time during the course of land-disturbing activity or before permanent erosion control measures are established, the new property owner must submit a revised Installation & Maintenance Agreement or Financial Responsibility Form for the property.

4. The Erosion and Sedimentation Control Ordinance requires erosion and sedimentation control measures to be installed in areas of land-disturbing activity to prevent accelerated erosion and movement of soil from the project location. Any activities which transport soil, mud or dust onto the public right-of-way or adjacent private properties will cause the person conducting the land-disturbing activity to be in violation of the Erosion and Sedimentation Control Ordinance and subject to applicable penalties.

5. Effort should be made not to uncover more than 20 acres at any one time. If more than 20 acres are to be uncovered at any one time, the plan shall contain the following:

   a. The method of limiting the time of exposure and amount of exposed area to achieve the objectives of this chapter
   b. A cut/fill analysis that shows where soil will be moved from one area of the tract to another as ground elevation is changed.
   c. Construction sequence and construction phasing to justify the time and amount of exposure.
   d. Techniques to be used to prevent sedimentation associated with larger disturbed area.
   e. Additional erosion control measures, structures, and devices to prevent sedimentation.

6. A lien agent is required in accordance with North Carolina Statute 44A-11.1 for improvements to real property at the time the original building permit is issued if the costs of the improvements are $30,000 or more. Per North Carolina General Statute 87-14, a building permit will not be issued until lien agent verification has been obtained through the City of Monroe Permit Department.

03.01.02 COMPUTATIONS

1. All computations and assumptions used to formulate an erosion control plan shall be in accordance with the City of Monroe's Stormwater Ordinance and the City of Monroe's Erosion and Sedimentation Control Ordinance and shall be reviewed by the City of Monroe Engineering Department.

2. Erosion and sedimentation control measures, structures, and devices shall be planned, designed, and constructed to control the calculated peak runoff from a 10-year frequency storm.

3. Runoff rates shall be calculated using the USDA Soil Conservation Service Method, the Rational Method, or other acceptable calculation procedures as approved by the Engineering Director.

4. Runoff computations shall be based on rainfall data published by the National Weather Service for the Monroe, NC station~~this area~~. The National Weather Service website is http://www.nws.noaa.gov/.

03.01.03 SCHEDULING

1. Temporary and permanent erosion control measures shall be provided for all land disturbing work in accordance with an erosion control plan reviewed and approved by the City of Monroe Engineering Department.

2. A grading permit shall be obtained from the City of Monroe Engineering Department prior to beginning site work.

3. Erosion Control measures shall be installed by the Developer and inspected by the City of Monroe Engineering Department for compliance prior to any land disturbing activity.

4. All permanent erosion control measures shall be incorporated into the work at the earliest practical time.

5. All temporary measures shall be maintained until the permanent measures have taken effect or are approved for removal by the City of Monroe Engineering Department.

6. Temporary and permanent measures shall be coordinated to provide effective and continuous erosion control throughout the construction and

post-construction period to minimize siltation of streams, lakes, reservoirs, and other impoundments, ground surfaces, and other property.

7. Temporary measures shall remain in place until the Engineering Director approves Certification Form 1-07~~6~~ Final Erosion Control Acceptance Form.

03.01.04 CONSTRUCTION SEQUENCE

1. Obtain Approval Letter for Erosion Control and schedule pre-construction meeting on-site with the City of Monroe Engineering Department Erosion Control Specialist. All approved plans and required permits will be issued at the meeting prior to any land disturbing activity.

2. Install all erosion control measures as shown on Approved Plan.

3. Submit Certification Form 1-01, Primary Erosion Control Inspection Form, to the Erosion Control Specialist during the inspection of installed erosion control measures.

4. Proceed with grading.

5. Clean sediment basins when one-half full. Check after every rain event. Maintain rain gauge and record keeping per NPDES permitting requirements.

6. Seed and mulch denuded area immediately after finished grades are established.

7. Maintain soil erosion control measures until a permanent ground cover is established.

8. Additional measures may be required based upon actual site conditions.

9. Submit Certification Form 1-07~~6~~, Final Erosion Control Acceptance Form, to the Erosion Control Specialist to schedule a final on-site inspection.

10. Remove soil erosion control measures and stabilize these areas upon approval of Certification Form 1-07~~6~~.

11. Submit Certification Form 1-06~~7~~ when there is an intermediary removal of erosion control measures.

12. If compost blankets are to be installed for temporary erosion/sediment control, installation and maintenance shall be in accordance with Section 6.18 Compost Blanket in the North Carolina Erosion and Sediment Control Planning and Design Manual. Construction Specifications from Section 6.18 Compost Blanket shall be included in the construction sequence of the erosion and sedimentation control plan.

03.02 DESIGN

All erosion control designs shall be in accordance with the NCDENR Erosion and Sedimentation Control Planning and Design Manual, latest edition, unless otherwise stated by this manual.

03.02.01 TEMPORARY MEASURES

1. Silt Fence shall be installed in accordance with the details at the toe of all fill slopes and any other necessary locations.

2. Diversion Ditches shall be installed in accordance with the details at the top of cut and fill slopes and any other necessary locations.

3. Construction Entrances shall be installed at all points of access to construction sites in accordance with the details. Any access point which does not have a construction entrance shall be barricaded to prevent its use.

4. Sediment Traps or Filter Basins shall be installed in accordance with the appropriate details at all points where accumulated runoff is released to natural drainage channels, and any other necessary locations. Sediment traps and basins must provide a minimum of three (3) porous baffles. Basins less than 20' in length may use two (2) baffles. The minimum sediment storage volume for sediment traps is 3600 cubic feet per acre of the disturbed area. The minimum sediment storage volume for sediment basins is 1800 cubic feet per acre of disturbed area. Skimmer dewatering time of 2-5 days is required.

5. Temporary Seeding is the use of rapid growing annual grasses, small grains or legumes to provide initial, temporary cover for erosion control on disturbed areas for less than 12 months. Seed bed preparations and soil amendments shall be in accordance with the method described under "Seeding and Mulching".

6. Seeding and Mulching shall be done immediately following construction. All disturbed areas shall be dressed to a depth of 8 inches. The top 3 inches shall be pulverized to provide a uniform seedbed. Agricultural lime shall be applied at the rate of 95 lbs./1000 sq. ft. immediately before plowing. Grass seed shall be applied at the rates outlined in the ~~Tables 03-01 and 03-02 in~~ City of Monroe Detail 03.07.01~~Standard 03.03.02~~, Seedbed Preparation and Temporary Seeding.~~eding Requirements~~.

7. On projects that will be maintained by the City of Monroe, verification of soil amendments and seeding rates may be required, and changes to these rates may be requested by the City of Monroe during the plan review process. Reuse of topsoil and/or other measures to assure final soil conditions are conducive to rapid establishment of vegetation cover is required.

8. 10-10-10 fertilizer shall be applied to all disturbed areas at 700-1000 lbs/acre, and mulching shall consist of small grain straw applied at a rate of 70 lbs./1000 sq. ft. Mulched areas shall be tacked with asphalt at a rate of 200 to 400 gallons per acre, or other approved method sufficient to hold the straw in place.

9. ~~Ground cover on exposed slopes shall be applied within 14 calendar days following completion of any phase of grading~~. Slopes left exposed will, within 14 calendar days in~~of completion of~~ any phase of grading, be planted or otherwise provided with temporary or permanent ground cover, devices, or structures sufficient to restrain erosion. ~~Permanent ground cover for all disturbed areas shall be applied within 15 working days or 60 calendar days, whichever is sooner. Slopes left exposed will, within 14 calendar days of completion of any phase of grading, be planted or otherwise provided with temporary or permanent ground cover, devices, or structures sufficient to restrain erosion.~~

10. Compost blankets shall be installed per details shown in the North Carolina Erosion and Sediment Control Planning and Design Manual at the top of the cut and fill slopes and any other necessary locations.

11. For any land-disturbing activity~~If disturbing 1 acre or more~~, stabilize the site in accordance with the following, per NPDES General Permit NC010000:

GROUND STABILIZATION TIMEFRAMES		
Site Area Description	Stabilization	Timeframe Exceptions
Perimeter dikes, swales and slopes	7 Days	None
High Quality Water (HQW) Zones	7 Days	None
Slopes Steeper than 3:1	7 Days	If slopes are 10’ or less in length and are not steeper than 2:1, 14 days are allowed
Slopes 4:1 or flatter	14 Days	7 days for slopes greater than 50’ in length 7 days for perimeter dikes, swales, ditches, perimeter slopes, and HQW Zones
All other areas with slopes flatter than 4:1	14 Days	~~None, except for perimeters~~7 days for perimeter dikes, swales, ditches, perimeter slopes, and HQW Zones

12. Seeding and soil stabilization of disturbed riparian areas shall be in accordance with Sections 6.24 Riparian Area Seeding of the North Carolina Erosion and Sediment Control Planning and Design Manual.

13. The use of compost sock shall be in accordance with Section 6.66 Compost Sock of the North Carolina Erosion and Sediment Control Planning and Design Manual. Uses include but are not limited to site perimeters, above graded slopes to serve as a diversion berm, check dams, drainage inlets, on paved surfaces, etc.

03.02.02 PERMANENT MEASURES

1. Permanent Ground Cover is the establishment of perennial vegetation cover for periods longer than 12 months. All disturbed areas shall receive a permanent ground cover. Permanent ground cover shall be applied within 15 working days or 60 calendar days, whichever is sooner. Permanent seeding and temporary seeding differ only in the type of seed to be used (i.e. annual versus perennial). Seed bed preparations and soil amendments shall be in accordance with Standard 03.02.01, number 6, "Seeding and Mulching". As a part of permanent seeding, maintenance may be required to maintain vegetation for 12 months. This maintenance shall be considered a part of establishing permanent ground cover.

2. Riprap Dissipation Pads and Riprap Protection - All stormwater release points shall be protected by riprap dissipation pads designed to reduce discharge velocities to non-erosive levels. Dissipation pads shall be designed and constructed with ~~either an~~an engineering fabric or washed stone barrier between the pad and the natural ground. Calculations shall be furnished to indicate the sufficiency of the dissipation pads specified. Riprap pad design shall be in accordance with NYDOT or NRCS methods found in the North Carolina Erosion and Sedimentation Control Planning and Design Manual. Filter fabric, or a washed stone liner, shall be used on all sediment basins, riprap dissipaters, and channels.

03.03 CONSTRUCTION

03.03.01 CONSTRUCTION NOTES

1. Erosion control measures shall be installed prior to clearing operations. No land disturbing activity, except that which is required to install erosion control measures, may commence prior to approval of Certification Form 1-01 by the Engineering Director.

2. Any failure to maintain erosion control measures will result in appropriate enforcement actions in accordance with the City of Monroe Erosion and Sedimentation Control Ordinance, the North Carolina Sedimentation Pollution Control Act of 1973 (NCGS Chapter 113A, Article 4), and the North Carolina Administrative Code Title 15A, Department of Environment and Natural Resources Chapter 4.

3. If failures to maintain erosion control measures are not corrected, the City of Monroe will initiate enforcement action as authorized by the City Code of Ordinances.

4. Any existing streets that are affected by mud, debris, or sediment shall be cleaned within 24 hours of notice. If the streets are not cleaned within 24 hours of notice, the City will initiate cleaning and bill the developer in the amount of current policies. For a new subdivision, the City of Monroe shall not accept the right-of-way for maintenance until all outstanding bills are paid in full.

5. Sites disturbing one acre or more or any land-disturbing activity within a common plan of development one acre or more in size are subject to requirements of NPDES General Permit NCG-00-10-000. Non-compliance of this permit will be subject to enforcement by the Division of Water Quality for any violations.

~~03.03.02 SEEDING REQUIREMENTS~~

~~**For requirements see City of Monroe Detail 03.07.01**~~

04.00 STORM DRAINAGE COLLECTION FACILITIES

04.01 GENERAL

1. Adequate storm drainage shall be provided throughout the development by means of storm drainage pipe; box, elliptical, or arch culverts; or properly graded channels.

2. Storm drainage pipe shall be placed at all low points in street grade to transmit storm water transversely across the street with catch basins being constructed on both sides of the street at the low point.

3. A comprehensive storm drainage system shall be planned and implemented for each subdivision in accordance with the general standards and requirements of this Division. The general storm drainage plan shall be shown on the preliminary plan. Detail plans where required shall be submitted as part of the construction plan requirement. Where easements are required, they shall be noted on the final plan and plat.

4. Storm drainage plans shall be considered on an individual basis depending upon the situation within a given subdivision. Generally the following standards shall apply:

   A. Types of drainage ways requiring treatment.

      i. Those draining one acre of land or more.

      ii. Those carrying storm water runoff from public streets either existing or proposed.

      iii. Those carrying storm water runoff from large impervious surfaces other than streets.

   B. Design storms.

      i. Open drainage channels shall be designed to carry the 25-year design storm with minimum 6” freeboard.

      ii. Collection system pipes that convey stormwater along a proposed street shall be designed for non-pressure conditions based upon Manning’s equation for the 10-year design storm.

      iii. Cross drainage pipes (culverts) that convey the natural flow of water from one side of a street to the other side shall be designed for the 25-year design storm.

      iv.

v. Roadways crossing within the special flood hazard areas (SFHA) designated under the National Flood Insurance Program shall be designed in

conformance with the City's Flood Damage Prevention Ordinance and shall be reviewed and approved by the City's Floodplain Administrator.

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C. Types of treatment.

i. Enclosed subsurface drains;

ii. Open, improved channel;

iii. Open channel with flood plain and open space dedicated to the City of Monroe. This option shall not be available except in cases where the City Council agrees in principle to accept such dedication prior to final plat approval. After considering such proposed dedications, the City Council shall consider, among others, the following characteristics of the proposal: size and shape; physical condition; suitability as open space; ease of maintenance; access; relationship to surrounding property; and relationship to open space in the vicinity.

D. Easements.

i. Maintenance easements shall be required dependent upon the size of the drainage area and the maintenance responsibility as determined by the City Engineer. See Section 04.02.01.5.

ii. In any case whether maintenance is to be the responsibility of the property owner, the City may require a right to enter for maintenance purposes where the City Council determines that the public health, safety, or general welfare constitutes a public necessity for such maintenance.

04.02 DESIGN

04.02.01 DESIGN CRITERIA

1. The following criteria shall be used for drainage collection facilities within rights-of-way and permanent easements to be accepted by the City:

i. Pipe shall be 15" – 60" diameter RCP Class III, or other material as approved. See Section 04.03.04.

ii. Greater than 60" pipe (or arch equivalent) may be aluminum or aluminized pipe subject to approval from the City Engineer.

iii. Drainage pipe for driveways shall be a 12" minimum diameter.

iv. Refer to NCDOT Pipe Material Selection Guide for allowable pipe fill heights and specifications. For fill heights less than 2' (measured from top of pipe to bottom of pavement structure) Class IV/Class V Reinforced Concrete Pipe (RCP) will be required. Designs outside of the selection guide will be approved at the discretion of the City Engineer.
The minimum allowable slope for pipes shall be 1.0 percent..

vi. The maximum grade for pipes shall be 5%.

vii. The minimum angle of entry for a pipe into a "built" structure shall be 75 degrees.

viii. The minimum angle of entry for a pipe into a "pre-cast" structure shall be 90 degrees or other subject to approval by the City Engineer.

ix. The minimum grade for open channels shall be 1.0% unless otherwise approved by the City Engineer.

x. Positive drainage and fall shall be provided along all channels.

xi. Ditches shall be properly stabilized with positive fall prior to acceptance by the City of Monroe.

xii. The maximum side slope for open ditches shall be 2H:1V, with 3H: 1V preferred.

xiii. Where applicable, storm drain pipe shall be extended to the rear of the building set back line or to the edge of the buffer, whichever comes first.

2.

3. Culverts shall be analyzed for both inlet control and outlet control conditions. Where inlet control governs conveyance, headwater depth is also limited to the ratio of headwater depth divided by pipe diameter (rise for arches) equal to 1.2 or 1.5 feet below the shoulder point (at the sag in vertical alignment), whichever results in the lower headwater depth. Where outlet control governs conveyance, the allowable Head (H) shall be limited to 2 feet maximum and provide 1.5 feet freeboard below the shoulder point.

4. Culverts must be long enough to accommodate the proposed typical roadway section with a 2:1 fill slope from shoulder point, or flatter. Handrails may be required at the direction of the City Engineer.

5. Headwalls are recommended on the inlet end of culverts 36-inch and larger. Maximum height of headwalls shall be one foot above pipe structure. Neither Mechanically Stabilized Earth (MSE) nor Modular Block walls shall be allowed for culvert headwall applications.

6. .

7. Public storm drainage easements shall be required on all open storm drainage channels and storm drainage pipes outside the street right- of-way as follows:

Open channels	0-45 Acres = 20' min. easement required >45 Acres = As directed by the City Engineer
Storm drainage pipe	15", 18", 24" = 15' min. easement required 30", 36", 42" or 48" = 20' min. easement required 54" Plus = 30' min. easement required

Plantings other than grass stabilization within the drainage easements must be approved by the City Engineer

8. Not more than one-half acre or 2 cfs of runoff based on a storm of the 10-year return period may drain into the street at a single point discharge. i.e. roof drains, driveway connections, etc.

9. Any low-point that occurs in a superelevated section shall only be required to have one catch basin on the low side. However, to ensure water does not flow across the street, a catch basin will be required within 20 feet prior to the transition from normal crown.

   No storm drainage trunk line shall extend longitudinally more than 500 feet without access to a drainage structure provided.. Catch basins shall be placed on both sides of the street at the upstream end of the longitudinally placed storm drain, and connected transversely to convey Stormwater to the nearest low point in the street grade.

10. If storm drainage pipe does not extend a minimum of 10 feet beyond the back of sidewalk with a 3:1 slope or flatter (depending on depth of cover, height of fill, etc.), a hand rail may be required by PROWAG.

11. Inlets shall be spaced in such a manner that the design curb gutter flow does not exceed the spread limitations, based on a detailed study of inlet locations, capacities, and gutter spread. Design parameters are as follows:

    a) Standard rainfall intensity of 4.0 inches per hour.

    b) Inlet capacity in sags shall allow for debris blockage by providing twice the required computed opening.

    c) Maximum spread of 6 feet from lip of gutter into a travel lane based on a rainfall intensity of 4 inches per hour.

d) Maximum spacing between inlets or drainage structures shall not exceed a maximum interval of 500 feet.

e) Ponding at yard inlets outside the roadway shall be limited to a maximum of 6" above a grated inlet for the 10-year storm.

f) Double catch basins shall be required where more than 2 acres of runoff along a given length of street is to be collected at a single given point except where deviations are allowed by this Detail Manual.

g) Single catch basins may be allowed if an adequate design can limit the stormwater spread in the flow line of the street to 6 feet from the lip of gutter into the travel lane.

14. Relief by curb overflow shall be provided at all sags or a sufficient number of catch basins shall be provided to limit ponding over top of basins to 6 inches for a storm of the 25-year return period. Drainage pipes within the sag shall be designed to meet this requirement.

15.

04.02.02 HYDROLOGIC ANALYSIS

1. For drainage areas consisting of less than or equal to 200 total acres, the Engineer shall provide calculations by use of the Rational Method, NRCS Method, HEC-HMS, or method by which the Design Engineer is most familiar and can support with calculations, subject to approval by the City Engineer.

2. For drainage areas consisting of greater than 200 total acres, the Engineer shall provide calculations by use of the NRCS Method (TR-55), HEC-HMS, or method by which the Engineer is most familiar, subject to approval by the City Engineer.

3. All storm water conveyances shall be designed based on fully developed land use conditions as shown on current County and City Land Use Plans and Zoning Maps or existing land use, whichever generates the higher runoff rate.

4. Rainfall data for stormwater management design calculations shall be the most current available and shall be obtained from the National Oceanic and Atmospheric (NOAA) Precipitation Frequency Data Server website for the Monroe NC Station.

   Design nomographs, charts, tables, and a sample calculation for pipe sizing utilizing the Rational Method are provided in Appendix A. The engineer should use good engineering judgment in applying these design

aids and should make appropriate adjustments when specific site characteristics dictate that these adjustments are appropriate.

5. The Engineer shall submit a copy of all storm drainage calculations with the plans to the City of Monroe Engineering Department for review.

04.02.03 CONSTRUCTION PLANS

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

04.02.03 25 + 1 FLOOD ANALYSIS

1. For streams located outside of the mapped FEMA SFHA (Special Flood Hazard Area) limits and which serve a drainage area of 10 acres or more, the Engineer shall provide a flood analysis utilizing the 25-year design storm to establish finish floor elevations. Finish floor shall be established at least one foot above the 25-year storm elevation.

2. Runoff coefficients shall be based on assumption of full development of drainage area per current zoning.

3. Proposed calculated Flood Protection Elevations (FPE) shall be labeled on the site and grading plans for each lot. FPE shall also be shown for each lot on the Final Plat.

4. Show and label the calculated 25+1 flood elevation flood line on site plan and grading plan.

5. Show and label or describe on plan the location and elevation (ref. vertical datum, i.e. (NAVD 88) of permanent benchmark used in channel survey. All topographic information shown on grading plan shall also be referenced to this benchmark.

6. Provide a copy of all channel analysis input and output files with plan submittal.

04.03 CONSTRUCTION

04.03.01 STANDARD SPECIFICATIONS AND DETAIL 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 govern.
2. All pipe materials referenced herein shall be installed in accordance with Section 300 of the current version of the NCDOT Standard Specifications

for Roads and Structures, Pipe installation and the NCDOT Roadway Standard Drawings for method of pipe installation.

04.03.02 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 and Standard 1.09 POST-CONSTRUCTION INSPECTIONS of this manual.

04.03.03 INSPECTIONS BY CITY

1. The City shall designate a construction inspector for each subdivision. The inspector shall make visits to the job-site as required 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 Standards 01.08 and 1.09 of this manual.

04.03.04 MATERIALS

1. All materials used shall be in accordance with Division 10 of the NCDOT Standard Specifications for Roads and Structures, latest edition.
2. HDPE pipe material is only approved for use when located outside the public right of way.
3. A complete materials list of all items proposed to be furnished and installed shall be included in a Stormwater Materials Table in the construction plans .

04.03.05 STORMWATER CHECKLISTS AND CONSTRUCTION NOTES –

1. A completed copy of the Stormwater Gateway Checklist shall be submitted with all first plan reviews or the submittal shall be considered incomplete. A copy of the Gateway checklist may be found on the City Stormwater webpage.

2. A completed copy of the Stormwater Checklist found in Section 07.06.03 shall accompany all plan submittals.

3. Construction Notes found in Section 07.06.03 of the Stormwater checklist shall be included on all construction plans. .

05.00 STORMWATER ~~BEST~~ MANAGEMENT ~~PRACTICES~~

05.01 GENERAL

05.01.01 ~~GENERAL NOTES~~STORMWATER MANAGEMENT PRACTICES

1. Stormwater Management practices shall be utilized in accordance with Chapter 159 Stormwater Management Ordinance~~,~~ of the City Code.

2. The Developer and his Engineer shall be responsible for meeting the requirements of the City of Monroe Stormwater Management Ordinance for stormwater control and ensure that the proposed development does not cause off-site flooding, drainage, or erosion problems.

05.01.02 EXEMPTIONS

1. Certain activities are exempt from this division in accordance with the requirements of Chapter 159 Stormwater Management Ordinance of the City Code.

05.01.03 RIGHT OF ENTRY

1. The ~~Engineering Director~~City Engineer or ~~his~~ their designee shall have right-of-entry to the property of any person in accordance with the requirements of the City of Monroe Stormwater Management Ordinance and any permit/document issued under said Ordinance.

05.01.04 STORMWATER MANAGEMENT PLAN REQUIREMENTS

1. A stormwater management plan and separate stormwater maintenance agreement in accordance with the requirements of the City of Monroe Stormwater Management Ordinance shall be submitted to the City of Monroe Engineering Department.

2. A professional, as defined in Standard 01.04, Note 1, licensed in the State of North Carolina, shall sign and seal any structural stormwater management improvement required by the City of Monroe Stormwater Management Ordinance.

3. The following information shall be included on all plans:

   i. Indicate the name of Watershed (i.e., Stewarts Creek, Richardson Creek or Bearskin Creek) if applicable, for the proposed site development;

   ii. Show the existing impervious coverage, if any, and note the square footage;

iii. Show the proposed impervious coverage, and note the square footage;

iv. Area(s) to be disturbed or denuded and note the acreage;

v. List the NRCS soil types and characteristics;

vi. Show existing and proposed stormwater collection facilities (pipes, channels, swales, catch basins, etc.) proposed layouts, connections to existing systems, and applicable easements;

vii. Label stormwater structure attributes (pipe size, channel / swale dimensions, materials, inverts and rim elevations, slopes and structure types (grate inlet, manhole, etc.));

viii. Label the amount of drainage area and runoff quantities that discharge onto site;

ix. If the site was previously approved or part of a subdivision that was previously approved by the City of Monroe for stormwater management provide the name of the plan and the date that the plan was approved;

x. Show the location of all streams and drainage ways that require buffers;

xi. Show buffers and where measured from (that is, top of bank, top of steep slopes adjacent to stream, or edge of wetlands);

xii. Label the dimensions and restrictions within the buffer (that is, to remain undisturbed, ~~50%~~ % impervious allowed, vegetated, etc.);

xiii. Show the location of jurisdictional waters and wetlands;

xiv. Indicate proposed location of stream crossing(s) showing the proposed grading and overall stream impact (includes culvert and outlet protection length);

xv. Show and note FEMA-regulated floodway ~~fringe~~ or non-encroachment area on property, and show and note the 100-year flood limits, if applicable;

xvi. For sites located within FEMA Special Flood Hazard Areas:

A. Note the finished floor/floodproofing elevations of all structures;

B. Note that no encroachment/development into FEMA-regulated floodway is permitted except as specifically listed in the Flood ~~Hazard~~ Damage Prevention Ordinance;

C. If a FEMA-designated floodway~~/floodway fringe~~ or non-encroachment area does not exist on the property/parcel, note the nearest distance to a FEMA-designated floodway, if within 2,000 feet.

05.01.05 STORMWATER MANAGEMENT IMPROVEMENTS AND MAINTENANCE

1. ~~No b~~The City may withhold issuance of a building certificate of occupancy ~~shall be issued by the City of Monroe prior~~ until~~to~~ the satisfactory completion of any and all required and approved structural stormwater management improvements, as allowed by the Stormwater Management Ordinance.

2. No ~~recordation of the final plat or~~ release of bond guaranteeing the improvements shall be allowed prior to completion of any and all required and approved structural stormwater management improvements.

~~2.~~3. No streets shall be accepted for public maintenance prior to completion of any and all required and approved structural stormwater management improvements.

~~3.~~4. Any and all access and/or maintenance easements shall be in accordance with the City of Monroe Stormwater Management ~~Control~~ Ordinance.

~~4.~~5. The Developer shall submit as-built drawings that include all permanent stormwater management practices associated with and constructed in the development. Refer to Standard 07.13 AS-BUILT DRAWING CHECKLIST.

~~5.~~6. Prior to acceptance of a permanent stormwater management facility, the applicant must submit an Operation and Maintenance Plan Agreement. An example of this agreement ~~can~~ may be found ~~in Standard 07.04~~on the City's website.~~–~~ Official Operation and Maintenance Plan Agreement forms shall be obtained by the Developer from the City of Monroe Engineering Department.

~~05.01.06 STORMWATER CONTROL REQUIREMENTS~~

~~1. The Developer and his Engineer shall be responsible for meeting the requirements of the City of Monroe Stormwater Management Ordinance and ensure that the proposed development does not cause off-site flooding, drainage, or erosion problems.~~

05.02 STORMWATER ~~BMP'S~~ CONTROL MEASURES (SCMs)

05.02.01 ~~GENERAL~~ DESIGN CRITERIA
~~STORWWATER BMP DEVELOPMENT NOTES~~

1. ~~When required,~~ Stormwater ~~BMP~~ SCMs shall be designed and installed in accordance with the NCDEQ ~~DENR~~ Stormwater ~~Best Management Practices m~~Manual. Minor ~~M~~modifications to the details ~~will~~ may be acceptable to accommodate individual site conditions, with~~. D~~details ~~shall be~~ placed on the plan and reviewed for approval by the Engineering Department as part of the plan approval process.

~~2.~~ Stormwater ~~BMP~~SCM~~(s)~~ for water quality shall be designed in accordance with ~~NCDENR~~ NCDEQ Stormwater ~~Best Management Practices~~Design Manual ~~manual~~, latest edition which is available for downloading at the following website:

~~3.~~2. https://www.deq.nc.gov ~~/about/divisions/energy-mineral-and-land-resources/stormwater/stormwater-program/stormwater-design-manual http://portal.ncdenr.org/web/lr/bmp-manual~~

~~4.~~3. Stormwater ~~BMP~~SCM(s) for flood control shall be designed utilizing the NRCS method, TR-55 method, or other standard practice methods, subject to approval from the ~~Engineering Director~~City Engineer, and must demonstrate that post-development stormwater ~~volume~~ discharge rate is less than or equal to the pre-existing ~~volume~~discharge rate ~~for the 2-year and 10-year return period storm for sites exceeding 20,000 square feet in new impervious coverage~~ in accordance with the standards of ~~Sections 159.301 – 159.308~~ of the Stormwater Management Ordinance. ~~A TR-55 computer program is available for free downloading at the following website:~~

~~http://www.wcc.nrcs.usda.gov/water/quality/common/tr55/tr55.html~~

05.02.02 CONSTRUCTION PROJECT PROVISIONS FOR ~~CONSTRUCTION OF STORMWATER BMP~~ SCM STRUCTURES

1. Construction of the ~~stormwater BMP~~SCM(s) shall be completed in strict compliance with the approved plans unless otherwise approved by the Professional of Record and the City Engineering Department. Approval of the drawings indicate that the Professional of Record has demonstrated to the City Engineering Department that the proposed construction is in accordance with the Monroe Stormwater Management Ordinance and the ~~NCDENR~~ NCDEQ guidelines for~~ 85% efficiency in~~primary and secondary SCM design.~~ pollutant removal.~~ Deviations from the approved stormwater ~~BMP~~ SCM design ~~,~~plan ~~including surface area of the pond, depth and outlet structure~~ cannot be altered in the field without prior approval.

2. Prior to the start of construction, an on-site Pre-Construction Meeting must be held with the Professional of Record and the City Construction Inspector. The contractor is responsible for arranging this meeting. Contact the City of Monroe Engineering Department at 704-282-4515.

3. Periodic inspections of the construction will be performed by the City Engineering Department. The City's Construction Inspector is to be contacted a minimum of 48 hours prior to the start of construction.

4. The owner and his contractor are responsible for insuring all methods of construction are in accordance with standard practice of the industry.

5. Dam and Embankment Construction.

   A. The stormwater ~~BMP~~ SCM and dam area shall be cleared, grubbed and stripped of all vegetative material and topsoil prior to dam construction. The disposal of trees, stumps, construction debris, vegetative material, etc., shall not be permitted in the dam or pool area of the pond. When blasting is used to remove rock from the pool area, the blasted area shall be over-excavated to a depth of at least two feet (2') below finish grade and brought back to finish grade with clean, relative impervious soil material compacted in place. The use of a liner is strongly recommended for all pond construction or other BMPs impounding water as part of their design due to prior problems with pond construction and leakage.

   B. Soil materials used for earth fill which are highly permeable or which exhibit significant shrink/swell or dispersion shall not be used in the embankment unless specific detailed design report from a soil's engineer is submitted as part of the plan approval.

   C. A cutoff trench (core trench) shall be provided with a minimum width of four feet (4'). The centerline of the cutoff trench shall be aligned with the centerline of the dam. The cutoff trench shall be carefully backfilled with highly impermeable material and compacted at least 95% of standard proctor density.

   D. Slopes shall not be steeper than 3:1 (three horizontal to one vertical) on the dam or embankments around the pond.

   E. Embankments shall be properly compacted to 95% of the standard proctor density.

   F. All disturbed areas and embankments surrounding the ~~pond~~ stormwater BMP shall be mechanically stabilized or have permanent ground cover established upon completion of construction.

   G. The outlet control structure and outlet pipe shall be constructed to maintain water tightness at all joints.

6. Final acceptance of the stormwater ~~BMP~~SCM construction by the City ~~Engineering~~ Engineer~~Department~~ will be contingent upon the following:

~~A. If the stormwater BMP is used as a sediment trap during construction, all accumulated sediment must be removed from the basin area.~~

~~B. The pond is at permanent pool elevation and functioning without leakage through the outlet structure or impoundment. (Applies to any BMP designed to impound water).~~

A. All items as listed in Section 07.12, "Post-Construction Checklist for Stormwater SCM" have been satisfactorily completed.

~~C.~~B. A certification has been received from the Professional of Record that the stormwater BMP construction has been completed in accordance with the approved plans and specifications.

~~D.~~C. The Construction Inspector has verified that the stormwater ~~BMP~~SCM(s) ~~–~~has been constructed in accordance with the approved plans and specifications.

~~E. All disturbed areas within the immediate vicinity of the stormwater BMP have been properly stabilized.~~

~~F.~~D. Deviations from the approved plans or deficiencies in construction must be addressed prior to the final inspection of the stormwater BMP and outlet structure by the City Engineering Department.

~~G.~~E. Prior to release of the certificate of occupancy, the applicant must present an as-built survey of the property prepared and sealed by a Professional Land Surveyor, Professional Engineer, or Architect licensed by the State of North Carolina. Such as-built survey shall show the location and dimension of all impervious coverage and the total amount of impervious coverage built as a percentage of the total site. ~~–~~The as-built survey shall also verify stormwater BMP construction, including but not limited to permanent pool elevation, spillway elevation, top of bank elevation, depth, and surface area. The certificate of occupancy shall not be released if the impervious coverage of the site exceeds that allowed by the permit issued.

7. Revisions to the approved drawings due to field conditions are to be initiated by the owner and his contractor through the Professional of Record and will require approval from the City Engineer. 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.

05.03 STREAM PROTECTION AND BUFFER ZONES

1. Perennial streams may not be channelized or piped, except as approved by the City of Monroe in accordance with Chapter 159 of the Stormwater

Management Ordinance. All applicable federal and state permits and certifications must be obtained prior to approval by the City.

2. Buffer zones and widths shall be in accordance with Chapter 159~~,~~ of the Stormwater Management Ordinance.

05.04 OTHER PRACTICES

1. In lieu of installing ~~retention and detention~~ primary SCMs ~~ponds and subject to approval from the City~~, the Engineer ~~can~~ may opt to combine various ~~Best Management Practices~~ secondary SCMs ~~Stormwater Control Measures~~ to achieve the same required ~~removal of 85% total suspended solids in~~ treatment capacity as the primary SCM , in accordance with the ~~NCDENR~~ NCDEQ Stormwater ~~Best Management Practices~~Design Manual, latest edition, subject to approval from the City. ~~However, the Best Management Practices~~All SCM(s) must meet all local, state, and federal watershed and stormwater management regulations.

~~1.~~2. ~~Add proprietary~~ Any proposed proprietary SCMs ~~should~~shall be designed and installed according to ~~follow guideliens~~ the manufacturer's guidelines ~~.....~~and may be approved by the City Engineer on a case by case basis. ~~?~~

~~END OF SECTION~~

06.00 LANDSCAPING

06.01 GENERAL

1. All planting of street trees shall be in accordance with the American Standard for Nursery Stock, latest edition and shall be positioned in accordance with Details 02.01.03, 02.01.04 and 02.01.07.

2. Refer to Details 06.01.01, 06.01.02 and 06.02.01 for additional tree planting standards.

06.02 ACCEPTED TREES FOR STREET TREE PLANTINGS

1. The following trees are acceptable for street tree plantings:

Small Maturing Trees (Up to 25' H)		
Common Name	Scientific Name	Notes
American Holly	Ilex opaca	Tree-form only
Carolina Silverbell	Halesia carolina	
Crape Myrtle	Lagerstroemia indica	
Eastern Redbud	Cercis canadensis	
Flowering Dogwood	Cornus florida	
Hybrid Dogwood	Cornus x rutgersensis	Fruitless varieties such as 'Constellation' produce no fruit
Japanese Tree Lilac	Syringa reticulata	
Magnolia, ‘Little Gem’	Magnolia grandiflora ‘Little Gem’	
Magnolia, 'Merrill'	Magnolia X loebneri 'Merrill'	
Magnolia, Saucer	Magnolia X soulangiana	
Magnolia, Star	Magnolia stellata	
Maple, Amur 'Flame'	Acer tataricum ginnala 'Flame'	
Maple, Japanese	Acer palmatum	Variety must be approved by City Engineer
Maple, Purplebow/Shantung	Acer truncatum	
Paperbark Maple	Acer griseum	
Serviceberry	Amelanchier canadensis	Tree-form only
White Fringetree	Chionanthus virginicus	Tree-form only

Medium Maturing Trees (30-50' H)		
Common Name	Scientific Name	Notes
American Hornbeam	Carpinus caroliniana	Columnar shape
Chalkbark Maple	Acer leucoderme	
Chinese Pistache	Pistacia chinensis	Male clones only such as 'Keith Davey'
Golden Raintree	Koelreuteria paniculata	
Hedge Maple	Acer campestre	
Honey Locust	Gleditsia tricanthos ‘inermis’	''Skyline' or 'Shademaster'
Lacebark Elm	Ulmus parvifolia	‘Allee' or 'Bosque'
Osage Orange	Maclura pomifera	Fruitless and thornless varieties such as 'White Shield' or 'Wichita'
Persian Ironwood	Parrotia persica	
Trident Maple	Acer buergeranum	

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07.00 PERMITS, CHECKLISTS, AND FORMS

07.01 PERMIT CONTACT INFORMATION

The following is contact information for typical permits and approvals associated with development. Some permits or approvals may not apply and other permits or approvals may be required. It is the Developer/Contractor's ultimate responsibility to secure all applicable permits and approvals prior to the start of construction.

1. Erosion Control Certificate of Approval

Engineering Associate (Plan Review)
City of Monroe
Planning and Development Department
PO Box 69; Monroe, NC 28111-0069
300 W. Crowell Street; Monroe, NC 28112
Phone: (704) 282-4533

~~Engineering Director~~
~~City of Monroe~~
~~Engineering Department~~
~~PO Box 69; Monroe, NC 28111-0069~~
~~300 W. Crowell Street; Monroe, NC 28112~~
~~Phone: (704) 282-4515~~
~~Fax: (704) 282-4735~~

~~2. Grading Permit~~ Erosion Control Permit

Permit Technician
City of Monroe
Planning and Development Department
PO Box 69; Monroe, NC 28111-0069
300 W. Crowell Street; Monroe, NC 28112
Phone: (704) 282-4524
~~Fax: (704) 282-4735~~

~~3.~~2. ~~Roadway,~~ Storm Drainage, and Flood Control Review

Stormwater Engineering Manager
City of Monroe
PO Box 69; Monroe, NC 28111-0069
300 W. Crowell Street; Monroe, NC 28112
Phone: (704) 282-4537

~~Engineering Director~~
~~City of Monroe~~
~~Engineering Department~~
~~PO Box 69; Monroe, NC 28111-0069~~
~~300 W. Crowell Street; Monroe, NC 28112~~
~~Phone: (704) 282-4515~~
~~Fax: (704) 282-4735~~

~~4.~~3. Water Supply System and Gravity Sewer Permit

Water Resources Engineer
City of Monroe
Water Resources Department
PO Box 69; Monroe, NC 28111-0069
2401 Walkup Avenue; Monroe, NC 28110
Phone: (704) 282-4600
~~North Carolina Department of Environment and Natural Resources~~
~~Division of Environmental Health; Public Water Supply Section~~
~~1634 Mail Service Center~~
~~Raleigh, NC 27699-1634~~
~~Phone: (919) 733-2321~~

~~5.~~4. ~~Gravity Sewer,~~ Pump Stations, and Force Main Permit

North Carolina Department of Environment Quality ~~and Natural Resources~~
Division of Environmental Health; Non-Discharge Permitting Unit
1617 Mail Service Center; Raleigh, NC 27699-1617
512 N. Salisbury St., Suite 1219; Raleigh, NC 27604
Phone: (919) 707-3654~~733-5083~~
~~Fax: (919) 715-6048~~

~~6. Water and Sanitary Sewer Review~~

~~Water Resources Engineer~~
~~City of Monroe~~
~~Water Resources Department~~
~~PO Box 69; Monroe, NC 28111-0069~~
~~2401 Walkup Avenue; Monroe, NC 28110~~
~~Phone: (704) 282-4600~~
~~Fax: (704) 283-6492~~

~~7.~~5. North Carolina Department of Transportation Encroachment Agreement (if required)

District Engineer
North Carolina Department of Transportation
Monroe District Office
130 S. Sutherland Avenue

Monroe, NC 28112
Phone: (704) 218-5100 ~~289-1397~~
~~Fax: (704) 292-1800~~

~~8.~~6. North Carolina Department of Transportation Driveway Permit (if required)

District Engineer
North Carolina Department of Transportation
Monroe District Office
130 S. Sutherland Avenue
Monroe, NC 28112
Phone: (704) 218-5100 ~~289-1397~~
~~Fax: (704) 292-1800~~

9. North Carolina Department of Environmental Quality ~~and Natural Resources~~
401 & Buffer Permitting Unit- Mooresville Regional Office

Mooresville Regional Office
610 East Center Avenue
Mooresville, NC 28115
(Courier 09-08-06)
Phone: (704) 235-2100 ~~663-1699~~
~~Fax: (704) 663-6040~~

10. North Carolina Department of Environmental Quality

Raleigh Office
Dam Safety Program
1612 Mail Service Center
Raleigh, NC 27699
Phone: 919-707-9200

10. Army Corp of Engineers Wetlands Permit

Wilmington District
USAED, Wilmington
69 Darlington Avenue
Wilmington, NC 28403
Phone: ~~(~~910) 251-4625 ext.26

Asheville Regulatory Field Office
US Army Corp of Engineers
151 Patton Avenue, Room 208
Asheville, NC 28801
Phone: (828) 271-7980
~~Fax: (828) 281-8120~~

11. North Carolina Forest Service

Union County – District 12
1933 Mountain Island Highway
Mount Holly, NC 28120
Phone: (704) 827-7576

~~07.02.01 DEVELOPMENT REVIEW & PROCEDURE CHECKLIST FOR SUBDIVISIONS~~

~~Note: Typical review time and comment periods for a project depends on coordination between the applicant and their surveyor or engineer, the applicant and the Planning Department, the Planning Department and other departments, complexity and size of the project, and completeness and accuracy of the information submitted.~~

~~_____ Receive subdivision plat checklist from the Department of Planning and Development.~~

~~_____ Submit 7 copies of a sketch plan for review along with a completed subdivision plat checklist to the Department of Planning and Development. (Sketch plans may be submitted at any time). ***The sketch plan is processed and reviewed as follows:***~~

- ~~Subdivision plats are routed to departments for review and recommended conditions~~
- ~~Comments from involved departments are returned and then reviewed by the Planning Department.~~
- ~~Sketch Plan is reviewed and discussed at the Technical Review Committee (TRC) meeting (contact 704-282-4520 for current schedule)~~
- ~~Applicant is called to pick up the sketch plan with redline comments~~

_____ Pick up the sketch plan with redline comments (Sketch Plan approval shall entitle the surveyor or engineer to prepare the Preliminary Plat).

_____ Submit Preliminary Plats to the Department of Planning and Development for review, along with a completed subdivision plat checklist. The preliminary review process will be reviewed with the same procedure as the sketch plan. ***For all special use rezonings and subdivisions, the following items must be completed and submitted to the Department of Planning and Development:***

_____

_____ Completed General Use Rezoning application.

_____ Completed Special Use Permit application.

_____ Cash or check in accordance with current established fee schedule to cover the cost of both applications. Checks should be payable to the City of Monroe.

_____ A legal description of the property, and documentation to support the petition.

_____ A synopsis or overview of the project with proposed design standards.

_____ Adjacent property owners typed on mailing labels.

~~_____ Submit additional copies of the Preliminary Plat if needed, after all comments have been changed or addressed. ***For all special use rezonings and subdivisions, submit the following to the Department of Planning and Development:***~~

~~_____ 25 copies of an appraisal report by a state certified real estate appraiser that conforms to Standard 5 of the Uniform Standards of Professional Appraisal Practice (must be submitted a minimum of 10 days prior to Planning Board meeting – Contact 704-282-4520 for current schedule).~~

~~_____ Planning Board meeting (is typically held on the Wednesday following the first City Council meeting of the month). ***For all special use rezonings and subdivisions:***~~

~~_____ City Council Meeting – Typically held about 30 days after Planning Board (applicant will be notified).~~

~~_____ Receive a copy of the Special Use Permit once it has been signed and sealed by the Mayor and City Clerk.~~

~~_____ The Special Use Permit is signed by the owners, sealed, and notarized.~~

~~_____ Submit signed form to the Planning Department for recordation at the Union County Register of Deeds Office.~~

_____ Submit ~~7 (sets)~~ a digital copy of construction plans (civil drawings), Erosion Control application,
checklist, and fee to the City of Monroe Permitting Department

_____ Pre-construction meeting is scheduled with the City of Monroe Engineering Department (704-282-4515) following approval of the construction plans (civil drawings). Developers, designers or surveyors shall provide a digital copy of the plans in AUTOCAD format at the meeting.

_____ Proceed with subdivision construction (refer to construction checklist). In order to record the final plat, the subdivision improvements must be completed or guaranteed with a financial instrument that can be converted into cash. ***Follow these steps for the option of guaranteeing subdivision improvements in order to apply for building permits:***

_____ Submit complete Subdivision Bond Estimate form to the Department of Planning and Development (this form will be reviewed by the Engineering Department, and the Water Resources Department to determine the costs of project completion).

_____ Receive a letter from the Department of Planning and Development stating the amount for which a letter of credit or other acceptable financial guarantee must be submitted (110% of the estimated cost of improvements).

_____ Submit letter of credit or other acceptable financial guarantee to the Department of Planning and Development for review.

_____ Submit Final Plat to the Department of Planning and Development digital copy (PDF)~~(5 blue-line copies)~~ for review. (This can be submitted along with the completed bond estimate form). Plat is then routed to all applicable departments and reviewed by the Planning Department.

_____ After all comments are returned, submit revised final plat for review if necessary.

_____ Submit copies of the final plat to be recorded (2 ~~3 or 4~~ mylars) along with the appropriate subdivision and recording fees to the Department of Planning and Development. (See City of Monroe Fee Schedule for subdivision fees) The Union County Register of Deeds requires 1~~2~~ copy~~ies~~, and The City of Monroe requires 1 copy of the final plat. ***The procedure to record the plat is as follows:***

- Planner reviews mylar copies to make sure all corrections were made, and all appropriate signatures were included.
- Plat is signed by the City of Monroe Subdivision Administrator.
- Plat is signed by the Union County Review Officer.
- Plat is recorded at the Union County Register of Deeds office.

_____ Provide a digital copy of plat to the City of Monroe Engineering Department for roadway updates. (This should be submitted at the same time as the mylars)

07.02.02 CITY OF MONROE SITE PLAN AND LEGISLATIVE REZONING ~~CONDITIONAL DISTRICT~~ REVIEW REQUIREMENTS

Project Name: _____
Permit No.: _____
Address/Intersection
_____:_____
Date Reviewed:
_____
Reviewer: _____

GENERAL SUBMITTAL REQUIREMENTS
All plans shall include at a minimum;

_____ North Arrow & Vicinity Map
_____ Plan sheet shall be 24" x 36"
_____ Plan sheets shall have the seal, signature, and date of the professional registered in the State of North Carolina under whose supervision the plans were prepared
_____ Show a title block on every sheet of the plan set that includes Developer's and his consultant's name, address, and telephone number, name of the development, original date of the plans, scale indication, sheet number and revision columns
_____ Adjacent properties along with name, deed book reference and tax map reference
_____ Existing and proposed paved areas, buildings, structures & utilities
_____ Typical sections –for streets and –divided entrances, if applicable (Public and Private)
_____ Typical sections for parking areas if applicable
_____ Sidewalk in accordance with Section 02.02.06 Sidewalk Requirements.
_____ Existing and proposed contours
_____ All right-of-ways and easements, existing and proposed
_____ Street Names
_____ Sight Triangles (Detail 02.01.10)
_____ Roadway alignments shall be in conformance with Section 02.02.01 of the General Roadway Design Criteria (150 feet minimum centerline radius with 100 feet minimum between reverse curves)
_____ Dead end streets do~~es~~ not exceed 1200 ft. in length
_____ Identify all drainage features including but not limited to wetlands, perennial streams, intermittent streams-, existing and proposed drainage systems
_____ Indicate all buffers: 35' perennial and intermittent
_____ Indicate setback for streams outside the designated floodplains - 5 times
width of stream at top of bank or 35 feet on each side, whichever is greater
_____ 100 year flood-plain (old and, if needed, new) and base flood elevation
_____ Location of stormwater management facilities if required for site development

_____ Impervious Coverage
Existing _____Parcel Area _____
Proposed _____% Coverage _____

_____ Show off-street parking for non-residential in accordance with Table 02-01.

_____ General Notes (to be placed on plan sheet)

A. 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.
B. Deviations from the City of Monroe Standard Specifications and Detail Manual must be clearly noted on the plan and listed below. *(The Developer must request any deviation from the Detail Manual in writing along with justification for review and recommendation by Staff.)*

Additional Submittal Requirements:

_____ Traffic Impact Studies in accordance with Section 02.01.03 Traffic Studies.

_____ NCDOT Driveway Permit -and/or City o~~O~~f Monroe Driveway Permit

_____ Copies of written approvals from USACOE and/or NC Dept. of Quality Approvals

07.03 SUBDIVISION PLAT CHECKLIST

City of Monroe
SUBDIVISION PLAT CHECKLIST

Name of Subdivision		Date:	
Name of Subdivider		Contact Phone No:	
Name of Preparer			

City Department E=Engineering P=Planning	Item #	Item Description	When Required F=Final, S=Sketch P=Preliminary	Preparers check here if complete	Office use only
		TITLE BLOCK INFORMATION			
	1	Title Block is shown containing:			
P		A. Name of development	S,P,F		
P		B. Name of map or plan (sketch plan, preliminary plan, or Final Plat)	S,P,F		
P		C. Owner's name with address and daytime phone number	S,P,F		
P		D. Location, including address, city, township, county, & state,	S,P,F		
P		E. Date(s) map(s) prepared or revised	S,P,F		
P		F. Scale of drawing in feet per inch – drawing scale shall not be less than 1" equals 200'	S,P,F		
P		G. Name, address, and telephone number of preparer of map	S,P,F		
P		H. Developer's name, address and daytime phone number, if different from owner's)	S,P,F		
		ZONING AND LAND USES			
P	2	Zoning district(s) within the property and adjacent properties are shown	S,P,F		
P	3	Existing land uses within the property and adjacent properties are noted	S,P		
P	4	Dimensions, location, and use of all existing buildings; distances between buildings measured at the closest point; distance from buildings to closest property lines; buildings to remain on final plat	S,P,F		
		STREETS			
	5	Street data is shown illustrating:			
P		A. Existing and proposed rights-of-way within and adjacent to property are shown	S,P,F		
P		1. Total right-of-way width dimensions are shown	S,P,F		
E		2. Cite Book & Page where right-of-way is recorded	P,F		
		3. Dimension from centerline of existing pavement to all corners are shown	P,F		
P		4. Cul-de-sac right-of-way radius from center point are shown	S,P		
P		B. Pavement or curb lines are shown	P		
P		C. Pavement width dimensions are shown	P		
P		D. Cul-de-sac pavement radius from centerpoint are shown	P		
E	6	All existing streets and proposed streets are named and approved by E-911	F		
P		MAP INFORMATION AND DESCRIPTION			
P	7	Bar Graph Scale is shown	S,P,F		
P	8	(Deed or Record) Book references to subject property	P,F		
P	9	Names of adjoining property owners (Deed or Record) Book reference are shown	P,F		

City Department E=Engineering P=Planning	Item #	Item Description	When Required F=Final, S=Sketch P=Preliminary	Preparers check here if complete	Office use only
P	10	Tax block and parcel(s) number(s) are shown	S,P,F		
P	11	A vicinity map, at a scale of 1" = 2000', is shown	S,P,F		
P	12	All jurisdiction lines which adjoin or cross the tract are shown	S,P,F		
P	13	North arrow and orientation (oriented towards top of map where practicable)	S,P,F		
	14	Boundaries of the tract to be subdivided are shown as follows:			
E		A. At least one corner is tied to: (1) N.C. Grid and provide grid coordinates where at least one of two control monuments needed are within 2000' of the boundary and show the combined grid factor or (2) tie to the nearest street intersection	F		
P		B. All locations of intersecting boundary lines of adjoining properties are shown	P,F		
P		C. Distinctly and accurately represent and show all distances; show bearings and distances on final; show bearings and distances and curve data on outside boundaries and street centerlines on preliminary with street centerline tied to boundary	S,P,F		
P	15	Location and descriptions of all monuments, markers, and control corners is shown on plat	F		
P	16	Existing "old" property lines on tract to be subdivided are shown as dashed lines and are labeled as "old property lines"	S,P,F		
P	17	Existing and proposed topography of tract and 100 feet beyond property showing existing contour intervals of no greater than 5 feet (2 feet where available) and labeling at least two contours per map and all others at 10 foot intervals from sea level	P		
		ENVIRONMENTAL AND NATURAL FEATURES			
P	18	Existing and proposed topography of tract	P		
P	19	Marshes, swamps, and other wetlands are shown	S,P,F		
P	20	Water courses, ponds, lakes, and streams are shown	S,P,F		
P	21	Undisturbed, vegetative buffers along perennial streams are shown	S,P,F		
P	22	Railroad lines and rights-of-way are shown	S,P,F		
P	23	Areas to be dedicated or reserved for public use are shown	S,P,F		
P	24	The name and location of any property or building on the National Register of Historic Places or locally designated historic property is shown	P,F		
P	25	Areas designated as a common area or open space under control of a Developer's or Homeowner's Association are shown	S,P,F		
		FLOOD IMPACT AREAS			
P,E	26	The location of floodway and floodway fringe areas (where applicable) are shown referenced from FEMA Flood Hazard Boundary Maps and/or approved Engineering Flood studies Flood Protection Elevation (FPE) for all lots adjacent to regulated floodplain	P,F		
		SITE DATA			
	27	Site calculations are shown including:			
P		A. Acreage in total tract	S,P,F		
P		B. Acreage in public greenways and other open space	P,F		
P		C. Total number of lots proposed	S,P,F		
P		D. Linear feet in streets	P,F		
P		E. Area in newly dedicated right-of-way	P,F		
P		F. General location of the boundaries of any residual lot (> 10 acres)	S,P		
P	28	Proposed lot lines and dimensions, with bearing and distances shown	S,P,F		
P	29	Area in square footage of all proposed lots under one (1) acre in size; area in acres is shown for all lots one acre or more in size; smallest lot is indicated	P,F		
P	30	Lots shown are sequenced or numbered consecutively	P,F		
		EASEMENT AND UTILITIES			
P	31	Location, dimension, and type of all easements (existing and proposed) are shown	P,F		
E	32	General Public Utility Easements are tied to the property lines	P,F		

City Department E=Engineering P=Planning	Item #	Item Description	When Required F=Final, S=Sketch P=Preliminary	Preparers check here if complete	Office use only
E	33	Public Storm Drainage Easements are shown centered over the creeks, ditches, and/or structures. Ties to property lines are not required.	P,F		
P	34	Plat contains a utility layout plan for water, sewer, storm sewer, natural gas, electric, and cable TV	P		
		NOTES AND STATEMENTS			
P	35	Plat contains *NCDOT Construction Standards Certification* (where applicable)	P,F		
P	36	Plat contains an *On-Site Water and/or Sewer Note* (where applicable)	P,F		
P	37	Plat contains a *Special Flood Hazard Area Note*	P,F		
P	38	Plat contains a *Notary Certificate of Owners Signature*	F		
P	39	Plat contains a *Certificate of Ownership and Dedication*	F		
P	40	Plat contains a *Subdivision Administrator Approval Certificate*	F		
E	41	Plat contains a *Certification of Survey and Accuracy*	F		
E	42	Plat contains a *Union County Review Officer's Statement*	F		
E	43	Plat contains *Storm Drainage Note* (where applicable)	P,F		
E	44	*Complete Stormwater Operation and Maintenance Agreement for Recordation Attached*	F		
E	45	*The following notation shall appear on all final plats of major subdivisions with new private streets:* *ROAD MAINTENANCE DISCLOSURE STATEMENT* *This subdivision contains private streets and storm drainage that were designed and constructed or financially guaranteed in accordance with the City of Monroe's Standard Specifications and Detail Manual. Maintenance of these improvements shall be the responsibility of the developer(s) or the property owner(s) until accepted and maintenance responsibilities are assumed by a homeowners or property owners association established by the collective lot owners. Neither NCDOT nor the City of Monroe are responsible for any maintenance associated with these improvements or enforcement of the responsibilities noted within this statement. (Note: This statement shall not serve as a substitute for any other statutory disclosure requirement.)*	P,F		
E	46	*The follow notation shall appear on all final plats of major subdivisions with new public streets:* *ROAD MAINTENANCE DISCLOSURE STATEMENT* *The street and storm drainage system in this subdivision were designed and constructed or financially guaranteed in accordance with the City of Monroe's Standard Specifications and Detail Manual. Property owners should be aware the City of Monroe is not responsible for any maintenance associated with these improvements until the street right-of-ways have been completed by the developer and accepted by the City of Monroe. Maintenance of these improvements shall be the responsibility of the developer(s) or the property owner(s) until the City of Monroe has accepted maintenance responsibilities. The city is not responsible for any maintenance associated with these improvements or enforcement of the responsibilities noted within this statement. (Note: This statement shall not serve as a substitute for any other statutory disclosure requirement.)*	P,F		

NOTE: This checklist is intended for the use of the public in order to comply with the City of Monroe Subdivision mapping standards. Specifics are addressed in the City of Monroe subdivision Ordinance.

07.04 STORM WATER MAINTENANCE AGREEMENT

Prior to the conveyance or transfer of any lot or building site to be served by a structural SCM, and prior to issuance of any permit for development or redevelopment requiring a structural SCM, the applicant or owner of the site must execute an operation and maintenance agreement that shall be binding on all subsequent owners of the site, portions of the site, and lots or parcels served by the structural SCM. The operation and maintenance agreement shall require the owner or owners to maintain, repair and, if necessary, reconstruct the structural SCM, and shall state the terms, conditions, access conditions, and schedule of maintenance for the structural SCM. The operation and maintenance agreement must be approved by the Stormwater Administrator prior to plan approval and shall be recorded with the County Register of Deeds.

A copy of the standard form Operation and Maintenance Agreement may be found on the City's Stormwater webpage.

~~THIS FORM IS A COPY FOR REFERENCE ONLY AND IS IMCOMPLETE. THREE INCH BLANK SPACE REQUIRED AT TOP BY REIGSTER OF DEEDS. FOR ACTUAL AGREEMENT, CONTACT THE ENGINEERING DEPARTMENT.~~

~~Prepared By:_____~~
~~Return to: City of Monroe Tax Parcel No._____~~

~~STATE OF NORTH CAROLINA~~
~~UNION COUNTY~~

~~STORMWATER MAINTENANCE AGREEMENT~~

~~THIS AGREEMENT, made and entered into this the _____ day of _____, 20____, by and between City of Monroe, hereinafter referred to as City, and _____, hereinafter referred to as Owner;~~

~~WITNESSETH~~

~~WHEREAS, the City has adopted certain storm water management regulations applicable to the property of Permittee located in the City of Monroe, Union County, North Carolina, and more particularly described In Book ___ _____, Page _____, Union County Registry (the "Property); and~~

~~WHEREAS, such regulations require the Permittee to operate and maintain an engineered storm water control facility as part of the development of the Property; and~~

~~WHEREAS, Permittee has constructed a private on-site engineered storm water control facility (the "Facility") to satisfy the requirements of such regulations, the boundaries of such Facility being described in Exhibit "A" attached hereto and incorporated herein by reference; and~~

~~WHEREAS, a separate deed vesting title to the real estate on which the Facility is located in Permittee has been recorded in the Union County Registry; and~~

~~WHEREAS, as a condition of the development of the Property, Permittee is required to enter into an operation and maintenance agreement providing for a continued operation and maintenance of the Facility.~~

~~NOW, THEREFORE, for and in consideration of the premises and the approval by the City the development activities on the Property, the Permittee does hereby covenant and agree with the City that the Facility shall be held, operated, maintained, and encumbered pursuant to the covenants and conditions hereinafter set forth;~~

~~1) No conveyance of Facility without New Agreement. Permittee covenants and agrees that it will not convey, transfer, assign, lease, or otherwise release or relinquish ownership or control of the Facility, in whole or in part, unless and until the proposed new owner of the Facility, or any interest therein, has entered into a Stormwater Maintenance Agreement with the City containing substantially the same terms and conditions as this Agreement, and a copy thereof has been recorded in the Union County Register of Deed's Office.~~

~~2) Operation and Maintenance Plan. Permittee has prepared and submitted to the City an Operation and Maintenance Plan for the Facility which has been approved by the City. Permittee shall operate, maintain, repair, and, if necessary, reconstruct the Facility in accordance with the Operation and Maintenance Plan.~~

3) Inspection and Maintenance of Facility. In addition to the maintenance provided for in the Operation and Maintenance Plan, Permittee shall undertake and provide the following inspection, repair, and maintenance of the Facility:
   a) Grassing around the Facility shall be maintained to prevent the erosion of these areas. The areas shall be periodically mowed to maintain the aesthetic quality of the site and to prevent a reduction in capacity of the stormwater system. Grass should not exceed a height of 12 inches. All eroded areas shall be repaired.
   b) Open ditches shall be kept free of undesirable growth and mowed or maintained to the design cross-section and area as shown on the construction plans approved by Stormwater Administrator and on file in the Engineering Department. Growth on the slopes and bottom should not exceed a height of 8 inches.
   c) Landscaping of the area around the Facility shall not reduce the capacity or hinder operation and maintenance of the Facility. Landscaping shall be maintained to ensure that landscape materials live and prosper. Re-vegetation of areas may be required by the Stormwater Administrator.
   d) The Facility shall be routinely checked as directed by the Stormwater Administrator for, and cleared of, all accumulation of debris and the Facility's outlet structure cleared of any blockage that is present.
   e) Storm drainage pipes and culverts shall be periodically inspected after storm event for debris and sand build-up. They shall be cleaned as necessary to provide for the free conveyance of stormwater as designed.
   f) The Facility shall be maintained at the design depth as shown on the construction plans approved by the Stormwater Administrator and on file in the office of the Engineering Department. The pond shall be inspected and maintained by the Permittee on a regular basis. Debris and sedimentation shall be removed by the Permittee when:
      i) The primary outlet capacity is impaired and/or;
      ii) The depth of the Facility has been reduced by more than one foot from the original depth or the Facility volume is reduced by 20% of the design impoundment volume. Sediment bays and forebays shall be kept clean of any sediment.
   g) The Facility shall be maintained in a manner to control insects, odors and algae as determined necessary by the Stormwater Administrator.
   h) Any fencing or other security measures shall be maintained in good condition. If no fencing or security measures are included with the original construction, they shall be added at the Permittee's expense at such time as the Stormwater Administrator determines that unauthorized persons are disturbing the Facility and that security measures will help prevent such unauthorized activity.

4) Annual Inspection Report. Annually, the Permittee shall provide an inspection report from a licensed professional to occur each year beginning one year from the date of as-built certification and each year thereafter on or before the date of the as-built certification. A financial statement documenting the available funding established in the escrow account for operation and maintenance of the stormwater control and management facilities must be included as part of the annual inspection report. This report should be mailed to:

City of Monroe – Engineering Department
Attn: Engineering Director
PO Box 69
Monroe, NC 28111-0069

5) Remedies for Violations of this Agreement.
   a) If the Permittee shall fail to maintain or repair the Facility as set forth herein, or otherwise violates this Agreement, the City may order the Permittee to undertake the necessary repair or maintenance or to correct such violation. If the Permittee shall fail to comply with such order within thirty (30) days from the date thereof, the permittee shall be considered in violation of this agreement and Chapter 159 of the City of Monroe Code of Ordinance and will be subject to penalties as provided in section 159-502 of the City of Monroe Code of Ordinance and pursuant to the authority contained in Article 19 of Chapter 160A, Planning and Development and 15A NCAC 2B.0258. Should the permitee fail to make the required corrections within 30 days of the issuance of the civil penalty, the City may enter the Property and perform all necessary work to place the Facility in proper working condition. The full cost of performing the work including administrative costs and penalties shall be assessed as a lien on the property.
   b) If deemed by the City that there poses an immediate danger to the public health, safety, or welfare, the City will notify the Owner and with due notice, may enter the property and take whatever steps it deems necessary to return the facility or facilities to good working order. This provision shall not be construed to allow the City to erect any structure of a permanent nature on the property. It is expressly understood and

agreed that the City is under no obligation to maintain or repair the facility or facilities and in no event shall this Agreement be construed to impose any such obligation on the City.

c) The City shall have the right to bring an action and recover sums due, damages, seek injunctive relief, and/or such other and further relief as may be just and appropriate.

d) The remedies provided by this paragraph are cumulative; and are in addition to any other remedies provided by law.

6) No Waiver of Breach. In the event of a breach of any term of this Agreement, any delay or failure on the part of the City to exercise any rights, powers, or remedies herein provided shall not be construed as a waiver thereof or acquiescence of such breach or any future breach.

7) Amendments. This Agreement may be amended, revised or modified only by a written document signed by the parties.

8) Binding Effect. The conditions and restrictions set forth herein with regard to the Facility shall run with the land and shall bind the Permittee and its successors and assigns and all parties claiming by, through, or under them shall be taken to hold, agree, and covenant with the City, with its successors and assigns, and with each of them to conform to and observe said conditions and restrictions. The City shall be deemed a beneficiary of the conditions and restrictions set forth herein and such conditions and restrictions shall run with the land in favor of the City.

9) Warranties of Title. The Permittee covenants and warrants that it is lawfully seized and possess of the Facility and real estate described in Exhibit "A", that it has good right and lawful authority to enter into this Agreement for the purposes herein expressed, and that no consent or waiver by the holder of any mortgage, deed of trust, or other security instrument, or any other person, firm, or corporation is required prior to entering into this Agreement.

10) Interpretation. Use of the masculine gender herein includes the feminine and neuter, and the singular number used herein shall equally include the plural. The captions preceding the various provisions of this Agreement are for the convenience of reference only, and shall not be used as an aid in interpretation or construction of this Agreement.

11) Severability. Invalidation of any one of these covenants or conditions by judgment or order of any court shall in no way affect any of the other provisions, which shall remain in full force and effect.

12) Liability Disclaimer: The Owner, its administrators, executors, successors, heirs, or assigns hereby indemnifies and holds harmless the City, authorized agents and employees, for any and all damages, accidents, casualties, occurrences or claims that may arise or be asserted against the City from the construction, presence, existence or maintenance of the facility or facilities by the Owner or the City. In the event a claim is asserted against the City, authorized agents and employees, the City shall promptly notify the property owner and the Owner shall defend at its own expense any suit based on such claim. If any judgment or claims against the City, its authorized agents or employees, shall be allowed, the Owner shall pay for all costs and expenses in connection herewith.

13) Right of Entry: Owner, its administrators, executors, successors, heirs, or assigns hereby grant permission to the City, authorized agents and employees, to enter upon the Property and to inspect the stormwater management/BMP facilities whenever the City deems necessary.

IN WITNESS WHEREOF, the parties have hereunto set their hands and seals this the day and year first above written.

Owner

_____

Name of Owner
Address

_____

City of Monroe

ATTEST:

_____

CITY CLERK

STATE OF NORTH CAROLINA
COUNTY OF _____

~~I, _____, a notary public in and for said county and state, certify that _____ personally appeared before me this date, stated that he or she is _____ of _____ _____, and acknowledged the execution of the foregoing instrument with the City of Monroe on behalf of said _____.~~

~~This the _____ day of _____, 20____.~~

_____
~~Notary Public~~

~~My Commission Expires: _____~~

STATE OF NORTH CAROLINA
COUNTY OF _____

I, _____, a notary public in and for said county and state, certify that _____ personally appeared before me this day, stated that he or she is the City Clerk of the City of Monroe, a municipal corporation, and that by authority duly given and as the act of the City, foregoing contract was signed in its corporate name by its _____, sealed with its corporate seal, and attested by herself as its said City Clerk.

This the _____ day of _____, 20____.

_____
Notary Public

My Commission Expires: _____

(SEAL)

APPROVED AS TO FORM:

_____
City Attorney

07.05 PRE-CONSTRUCTION MEETING AGENDA

The following items will be discussed at all Pre-Construction meetings for proposed developments. Refer to Standard 01.05.00 regarding the Pre-Construction Conferences. This agenda shall be modified to suit site conditions for each proposed development and distributed at the meeting.

AGENDA
PRE-CONSTRUCTION CONFERENCE
DEVELOPMENT NAME
TIME; DATE
LOCATION

I. Introduction of Attendees

II. Emergency Contacts

III. Erosion Control

IV. Clearing & Grubbing

V. Undercuts & Embankments

VI. Storm Drains & On- and Off-Site Drainage

VII. Curb

VIII. Subgrade

IX. Stone Base

X. Asphalt Base & Asphalt Surface

XI. Shoulders

XII. Landscaping

XIII. Utilities within Proposed Street Right-of-Way

XIV. Checklists and Certification Forms

XV. Safety

XVI. Inspections by City & Developer

XVII. Post Construction Stormwater Requirements

XVIV. Maintenance of Roadways and Right of Ways Prior to Acceptance

~~XVI.~~XVIII. Final Inspection

~~XVII.~~XIX. Other

07.06 EROSION CONTROL FORMS AND CHECKLISTS

07.06.01 EROSION CONTROL FINANCIAL RESPONSIBILITY FORM

No person may initiate any land-disturbing activity as defined in Chapter 158 of the Monroe City Code prior to completion of this form, and an applicable and acceptable erosion and sedimentation control plan has been approved by the City of Monroe Engineering Department. (Please type or print)

Part I

1. Name of Project_____

2. Will there be any public funds allocated to this project? The allocation of public funds to a project requires the Erosion and Sedimentation Control plans to be reviewed and approved by the North Carolina Department of Environmental Quality.

2. Address where land disturbing activity will take place_____

_____

3. Latitude (decimal degrees)_____ Longitude (decimal degrees)_____

3. Approximate date disturbing activity will commence _____/_____/_____

4. Purpose of development (residential, commercial, industrial, etc.)_____

5. Total acreage of land to be disturbed or uncovered, (include off site roadway improvements, utilities and borrow/waste areas) _____

6. Amount of fee enclosed (fee will be ~~the amount of current policies per acre multiplied by the total number of acres or any part of an acre from number 5~~ in accordance with current policy found in the City of Monroe Fee Schedule Ordinance, Chapter VII. Engineering/Publicworks, Article A, Section 4. Charges and Fees. ~~i.e. 7.28 acres equals 8 acres.)~~_____

7. North Carolina Registered Agent to contact should sediment control issues arise during land disturbing activity

Name_____ Phone_____

Email_____

~~8.~~ Landowner(s) of Record (use blank page to list additional owners)

If the landpwner(s) of record is not the person(s) or firm(s) financially responsible as listed in Part II.B., a separate signed letter of consent to initiate land disturbing activity from the landowner(s) of record or their authorized agent will be required prior to approval of the Erosion Control Plans.

Name_____ Name_____

Mailing Address_____ Mailing Address_____

_____ _____

Street Address_____ Street Address_____

_____ _____

Phone_____ Phone_____

EmailFax_____ EmailFax_____

9. Indicate Book and Page where deed of the property where land disturbing activity will take place is recorded (use blank page to list additional owners)

Book_____ Book_____

Page_____ Page_____

10. Tax Map Parcel Number where land disturbing activity will take place _____--_____--_____

_____--_____--_____

_____--_____--_____

Part II

1. Person(s) or firm(s) who are financially responsible for this land disturbing activity (use blank page to list additional owners)

Name_____ Name_____

Mailing Address_____ Mailing Address_____

_____ _____

Street Address_____ Street Address_____

_____ _____

Phone_____ Phone_____

Email~~Fax~~_____ Email~~Fax~~_____

_____

2. A) If the Financially Responsible Party is not a resident of North Carolina, give name and address of a North Carolina Agent

B) If the Financially Responsible Party is a Partnership or other person engaging in business under an assumed name, **attach a copy of the Certificate of Assumed Name**. If the Financially Responsible Party is a Corporation, give the name and street address of the North Carolina Registered Agent:

_____

Name of Registered Agent Email Address

_____

Current Mailing Address Current Street Address

_____

City State Zip City State Zip

Phone# _____ ~~Fax#~~Email_____

_____

3. The above information is true and correct to the best of my knowledge and belief and was provided by me under oath. I agree to provide corrected information should there be any change in the information provided herein. (This form must be signed by the financially responsible person if an individual or his attorney in fact, or if not an individual, by an officer, director, partner, or registered agent with authority to execute instruments for the financially responsible person)

Type or Print Name_____ **Title**_____

Signature_____ **Date** _____/_____/_____

I, _____, a Notary Public of the County of _____, State of North Carolina, hereby certify that _____ appeared personally before me this day and being duly sworn acknowledged that the above form was executed by him.

Witness my hand and notarial seal, this _____ day of _____, _____

SEAL

_____
(Notary)

My commission expires _____

07.06.02 EROSION CONTROL PLAN CHECKLIST

This Erosion Control Plan Checklist shall accompany all plan submittals or the submittal shall be considered incomplete. Items not applicable should be marked "N.A." Refer to City Of Monroe "Standard Specifications and Detail Manual", City Of Monroe Land Use Ordinance, Title XV, Chapter 158, and NCDEQ~~NR~~ Design Manual, latest edition. Prior to Erosion and Sedimentation Control Plan approval, all applicable plan submittals and approvals from the Engineering Department shall be obtained, including but not limited to ~~watershed~~, roadway ~~and ,storm drainage,~~ City and State driveway permits and encroachments. All plans must be submitted concurrently with the erosion control plans.

_____Detailed cover letter stating the purpose of the submission

_____Maximum plan sheet size is 24"x 36".

_____Show a north arrow and vicinity map on the erosion control plan.

_____Show a final grading plan, if different from the erosion control plan.

_____The maximum scale is 1" = 50'.

_____Show all property lines and right-of-ways.

_____Show sidewalks in accordance with Section 02.02.06 - Sidewalk Requirements.

_____Show a legend. Call out each measure on the plan. The legend symbols and plan should match.

_____Show water and sewer erosion control measures on erosion control plan. Show the size and location of existing and proposed storm and sewer structures.

_____Show existing and proposed *(*2 foot or 1 foot*)* contours.

_____ Show limits of disturbed area (provide acreage total, delineate limits, and label). Be sure to include all access to measures, lots that will be disturbed, offsite borrow/waste areas and utilities/roadway improvements that may extend offsite. _~~Show denuded areas (outline in BOLD on plans and note denuded acreage on plans).~~

_____Show planned and existing buildings locations and FFE.

_____Show planned and existing roads locations, elevations and profiles.

_____Show lot and/or building numbers.

_____Show seeps, springs, or wetland limits.

_____Show all easement lines.

_____Show boundaries of the total tract of land where disturbing activity will take place.

_____Show borrow, waste areas, and stockpiled soil locations.

_____Show existing and planned drainage areas including off-site areas that drain through the project area.

_____Indicate the size of drainage areas above drainage structures.

_____Show soil type(s) and special characteristics.

_____Show design calculations for peak discharges of runoff.

_____Show a watershed plan.

_____Show a storm drainage plan.

_____Show design calculations per Section 04.00 of the City Of Monroe Standard Specifications and Detail Manual and construction details for storm and sewer structures.

_____Show design calculations per Section 04.00 of the City Of Monroe Standard Specifications and Detail Manual, cross-sections and method of stabilization of existing and planned channels per the NCDEQ~~NR~~ Design Manual, latest edition.

_____Show design and construction details of energy dissipat~~o~~ers below storm outlets including the size of stone used for rip rap per the ~~NCDENR~~NCDEQ Design Manual, latest edition.

_____Show design calculations and construction details to control groundwater per the NC DENR Design Manual, latest edition.

_____~~Impervious Coverage:~~
~~Existing _____ Parcel Area _____~~
~~Proposed _____ % Coverage _____~~

_____NCDOT Driveway Permit and/or City o~~O~~f Monroe Driveway Permit/Encroachments

_____~~Copies~~ Approved, signed documentation ~~of written approvals~~ from USACOE and/or NC Dept. of ~~Water~~ Environmental Quality,
Floodplain Development Permit and other applicable approvals.

_____Show all perennial and intermittent stream buffers and show widths. Add note requiring orange net fencing along all stream buffers.

_____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.

_____Show the name of the first watercourse into which storm water leaving the site is tributary.

_____Show the location of all temporary and permanent erosion and sedimentation control measures.

_____Show construction detail drawings for all temporary and permanent erosion and sedimentation control measures per the City o~~O~~f Monroe Detail Manual.

_____Show all design calculations for sediment basins and sediment traps per the NCDEQ~~NR~~ Design Manual, latest edition. Note: Minimum of 3 coir fiber baffles per the NCDEQ~~NR~~ Design Manual.

_____Label basin contours. Tie into existing contours. Show basin dimensions and weir lengths on the plans.

_____Show wetland protection measures (Orange net fence).

_____Show temporary stream crossings (work along streams, lakes, ponds and wetlands) and details of how each will be stabilized.

_____Show maintenance requirements of temporary erosion and sedimentation control measures during construction.

_____Indicate the name and phone number of the person who is responsible for maintenance of temporary measures during construction on the plans.

_____Show maintenance requirements of permanent erosion and sedimentation control measures following construction.

_____Indicate the name and phone number of the person who is responsible for maintenance of permanent measures following construction on the plans.

_____Show all areas and acreage to be vegetatively stabilized.

_____Drainage area maps clearly and legibly depicts on-site and off-site areas (colored coded maps encouraged). All drainage area maps indicate project limits and are at a legible scale.

_____Show planned vegetation with details of plants, seed, mulch, and fertilizer. Include Seeding Requirement ~~03.03.02~~ 03.07.01 from the City Of Monroe Standard Specifications and Detail Manual.

_____Show specifications for permanent and temporary vegetation. Include the method of soil preparation prior to seeding.

_____~~Indicate the specified method of soil preparation.~~

_____Attach the Financial Responsibility Form from Standard 07.07.01 of the City of Monroe Standard Specifications and Detail Manual.

_____Attach ~~bid specifications regarding erosion and sedimentation control measures.~~bond estimate for all erosion and sedimentation control measures.

_____Indicate setback for streams outside the designated floodplains - 5 times width of

top of bank or 35 ~~20~~ feet on each side, whichever is greater, as measured from the top of bank.

_____100-year flood plain ~~(old and, if needed, new)~~ and base flood elevation.

_____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.

_____Deviations from the City of Monroe Standard Specifications and Detail Manual must be clearly noted on the plan. *(The Developer must request any deviation from the Detail Manual in writing along with justification for review and recommendation by Staff and/or City Council prior to plan review).* ~~Modifications to the City Of Monroe Standard Details require that the City's title block be removed from the detail.~~

_____The following notes will be included on all plan sets:

~~1. If disturbing less than 1 acre, add this note: Ground cover on exposed slopes shall be applied within 14 working days following completion of any phase of grading. Permanent ground cover for all disturbed areas shall be applied within 15 working days or 60 calendar days, whichever is sooner. Slopes left exposed will, within 14 calendar days of completion of any phase of grading, be planted or otherwise provided with temporary or permanent ground cover, devices, or structures sufficient to restrain erosion.~~

2. ~~If disturbing 1 acre or more, add this note: As required by the NPDES General Permit NCG010000, all perimeter dikes, swales, ditches, perimeter slopes and all slopes steeper than 3 horizontal to 1 vertical (3:1) shall be provided temporary or permanent stabilization with ground cover as soon as practicable but in any event within 7 calendar days from the last land disturbing activity. All other disturbed areas shall be provided temporary or permanent stabilization with ground cover as soon as practicable but in any event within 14 calendar days from the last land disturbing activity. Ground stabilization timeframe exemptions can be found in the NPDES General Permit NCG010000 under Section 2.b. Ground Stabilization.~~

3. No land disturbing activity, except that which is required to install erosion control measures, may commence prior to approval by the ~~Engineering Director~~City Engineer of Certification Form 1-01.

4. Additional erosion control measures may be required based upon specific site conditions.

5. Contact the City of Monroe Engineering Department~~, at 704-282-4515,~~ for a pre-construction meeting prior to any land disturbing activity.

6. Remove all temporary erosion control devices and structures only after site is fully stabilized and approval has been obtained from the City of Monroe Engineering Department.

7. All erosion control designs shall be in accordance with the City of Monroe Standard Specifications and Detail Manual, and the NCDEQ~~NR~~ Erosion and Sedimentation Control Planning and Design Manual, latest edition.

8. For phased erosion control plans, the Contractor shall meet with the Erosion Control ~~Specialist~~ Inspector prior to commencing each phase of erosion control measures.

9. Site grading is to be covered under the General Stormwater Permit NCG010000. Any land disturbing activity > 1 acre requires compliance with all conditions of this general permit under the NPDES. Any noncompliance is a violation of the Clean Water Act and may require enforcement by NCDEQ~~NR~~.

10. Contractor is to keep street clear of mud and other debris per the City of Monroe Mud Ordinance, Title VII, paragraph 71.20.

11. The Professional Engineer registered with the State of North Carolina who prepared the Erosion Control Plan is solely responsible for identification and location of all environmental wetlands, perennial and intermittent streams and buffers shown on the plans.

12. 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.

13. Silt sacks will be placed in basins/inlets along roadways after initial asphalt surface work is completed.

14. The financially responsible party/agent or the landowner/agent of a land disturbing activity > one acre is required to self-inspect the project. A self inspection, as well as documentation of a project after each phase of the project, is required.

_____ Include Scheduling Notes 03.01.03, and Construction Notes 03.03.01 as well as all pertinent Division 08.00 Erosion Control Details from the City of Monroe Standard Specifications and Detail Manual on all plan sheets.

_____ Provide Construction Sequence 03.01.04 notes 1 through 11 as well as any additional notes necessary to describe the basic sequence of events on the site. Include site specific sequencing for individual phases.

_____ ~~Projects disturbing one acre or more in area are automatically covered by the NPDES General Stormwater Permit NG010000 for construction related activities, provided that basin design requirements and ground stabilization requirements from that permit are included on the erosion control plan. To meet this requirement, include the ground stabilization timeframe table from Section 3.02.01 Temporary Measures from the City of Monroe Standard Specifications and~~

~~Detail Manual and basin design requirements on the erosion control plan and/or detail sheet, if disturbing 1 acre or more.~~

_____ NPDES General Stormwater Permit NG010000 requires plans to identify areas where the 7 and 14 day ground stabilization requirements will apply. Please show areas on erosion control plan by using hatching, labeling, or other similar conventions.

_____ Erosion Control Review Fee.

_____ Bond Amount in the form of certified check, cash, or irrevocable letter of credit. The person(s) or firm(s) posting the bond and listed as the financial responsible party must be registered with the North Carolina Secretary of State.

07.06.03 STORMWATER CHECKLIST

This Stormwater Checklist shall accompany all plan submittals or the submittal shall be considered incomplete. Items not applicable should be marked "N.A." Refer to the City of Monroe "Standard Specifications and Detail Manual".

_____Show impervious areas/runoff coefficients ~~per the City Of Monroe Unified Development Ordinance and the~~ City Of Monroe Standard Specifications and Detail Manual, Appendix A, Rational Method.

_____Show stormwater runoff controls

_____ wet detention pond	_____ extended dry detention pond	_____ grassed swales
_____ sand filters	_____ bio-retention	_____ stormwater wetlands
_____ proprietary systems	_____ filter strips	_____ infiltration devices
_____ stream buffers	_____ permeable pavement	_____ other

_____Show soil types.

_____Provide boring/test pits, infiltration tests, groundwater impacts for infiltration structures.

_____~~Provide as-built plans for completed structures after construction. Offsite structures and channels require permanent drainage easements. (Standard Specifications and Detail Manual Section 04.02.01.)~~

_____Provide calculations of pre- and post-development peak runoff rates, volumes and velocities. The same hydrologic procedure shall be used to determine pre and post-developed hydrology.

_____Provide copy of the 404 Permit from the US Army Corp of Engineers (wetlands) and 401 permit from the North Carolina Department of Environmental Quality. ~~and Natural Resources.~~

_____Show the water body that the SCM ~~BMP~~ is discharging into, if applicable.

_____Provide a map and certified reports that includes locations of all perennial and intermittent streams, wetlands, 100-year floodplain boundaries, and other natural features as determined by survey.

_____Show time of concentration calculations for all hydrographs.

_____Show curve number calculations for both pre-developed and post-developed conditions for hydrographs.

_____Provide 2 drainage area maps, one for pre-development and one for post-development, that shows the dividing lines and direction of flow for each drainage area contributing to the project site.

_____Delineate sub-watershed areas on the plan for both pre- and post-development conditions. Clearly show the "Tc" path, slope and soil types in each sub watershed; provide the areas in acres.

_____Show a maintenance plan and schedule for all permanent ~~stormwater~~ SCM ~~BMP~~ management practices.

_____Provide inlet and outlet invert elevations for all drainage structures.

_____Provide profiles for all outfall pipes 15" and larger and channels located within recorded public easements. Include the Hydraulic Grade Line (HGL) profile for the Ten Year Return Period.

_____Provide cross sections for diversions, ditches, ponds, swales, infiltration structures, etc.

_____Provide a name of the person responsible for longtime maintenance of stormwater management facilities. ~~and BMP practices.~~

_____Show natural and manmade features at the site, including wetlands, watercourses, floodplains and developments (roads, buildings, and other structures).

~~_____Stormwater control systems shall attain 85% average annual removal of total suspended solids.~~

_____Design criteria for drainage collection facilities within the right-of-ways must follow ~~(~~Standard Specifications and Detail Manual, Section 04.02.01.~~)~~

_____The following construction notes shall be included on the plans:

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 when otherwise noted.

2. All storm drain pipes shall be placed to proper grade and alignment per approved plans.

3. No cracked or broken pipes shall be placed or accepted in construction of the project.

4. All catch basins 3'-6" deep or more shall have steps placed at 1'-2" on center.

5. Erosion control measures shall be placed around drainage inlets and catch basins.

6. All pipes in storm drainage structures shall be cut off flush with the inside wall.

7. All structures shall be smooth inside and outside of the structure using mortar mixed to manufacturer's specifications to avoid debris build-up obstructing flow.

8. All tail ditches shall have positive drainage with a minimum 1.0% slope.

9. The Developer shall obtain any off-site drainage easement from adjacent property owners required to complete the improvements or provide positive drainage flow prior to construction plan approval.

10. All concrete for drainage structures shall be a minimum of 3,600 psi except where otherwise noted or required.

11. If the Developer wishes to use any pre-cast storm drainage structures within a proposed street right-of-way, ~~he must submit~~ a Professional ~~Engineer certification~~Engineer certification must be submitted for the structure. All structures must be certified to adequately carry H20 loading. Prior approval from the ~~Engineering Director~~City Engineer shall be obtained in order to incorporate ANY pre-cast storm drainage structures in a proposed street right-of-way.

12. Under no circumstances shall a pre-cast storm drainage structure be cut or altered without a Professional Engineer's Certification of adequate load bearing strength following the alteration of the structure, except where designated "knock-out" panels are provided.

13. Under no circumstances shall water be permitted to rise in un-backfilled trenches after the pipe has been placed.

14. The laying of pipe in the finished trench shall be started at the lowest point and laid upgrade. The bell shall be laid upgrade.

15. Survey staking and proposed grades shall be consistent with plans and field conditions

16. No construction activities are allowed to take place beyond the floodplain line or the stream buffer line, whichever is greater, without a permit issued by the U.S. Army Corps of Engineers, the North Carolina Department of Environmental Quality ~~and Natural Resources~~, and the City of Monroe.

Clearly delineate the following on the site and grading plans:
_____ Proposed FEMA floodplain line
_____ Existing FEMA floodplain line (to be shown until FEMA approval of proposed line)
_____ Existing FEMA floodway line

_____ Floodway cross-sections (stream station, location, existing and future flood elevations)

_____ Undisturbed vegetated s~~S~~tream buffer lines (35' intermittent and perennial streams, 50' ~~Special Districts~~for Legislative Rezonings, measured from the top of bank)

_____ Building setback for streams outside designated floodplains (5 times the stream width at the top of bank or 35'~~20'~~ each side, whichever is greater)

25+1 Flood Analysis

For streams located outside of FEMA regulated waters and FEMA regulated "A" zones which serve a drainage area of 10 acres or more, perform a flood analysis utilizing the 25-year storm to establish finish floor elevations. Finish floor shall be established at least one foot above the 25-year storm elevation.

_____ Runoff coefficients shall be based on assumption of full development of parcels per current zoning

_____ Proposed elevations shall be labeled on the site and grading plans for each lot

_____ Show and label 25+1 flood elevation flood line on site and grading plan

_____ Show and label or describe on plan the location and elevation (ref. vertical datum, i.e. NAVD 88) of permanent benchmark used in channel survey. All topographic information shown on grading plan shall also be referenced to this benchmark.

_____ Provide a hard copy of all channel analysis input and output files along with plan submittal.

07.07 DRIVEWAY PERMIT

Property Owner/ Lessee: _____
Property Address: _____
City, State & Zip code: _____

Driveway location by address: _____

Type of usage: Residential _____ Business _____ Industrial _____
(Select one)

Driveway is located on the _____ side of _____,
(Direction N, E, S, W) (Street Name)
_____ feet _____ of the centerline of _____.
(distance) (Direction N,E,S,W) (Street Name)

(Sketch driveway plan of back or attach sketch plan to permit.
For multiple driveways attach sketch plan to permit.)

Driveways are to be paved in accordance with Chapter ~~156.188(F)~~8.4.3, B of the City of Monroe ~~Code of~~Unified Development Ordinance~~s.~~

Driveway width: _____

Type of driveway pavement: Asphalt _____ Concrete_____
(Select one)

Type of Approach:
(Select one)

_____ Concrete ramp with no pipe.
_____ Concrete ramp with _____ _____ Pipe.
(12" minimum size) (material)
_____ City Standard Concrete ramp through curb and gutter section.
_____ Asphalt ramp with no pipe.
_____ Asphalt ramp with _____ _____ Pipe.
(12" minimum size) (material)
_____ Street type entrance for shopping centers only.

Existing Sidewalk? Yes _____ No _____
(Select one)

Approved by: _____ _____
Engineering Department Date

07.08 CERTIFICATION FORMS

1. The following forms shall be utilized in accordance with Standards 07.05.00 and 07.06.00.

2. Table 07-01 gives a description of the following Certification Forms contained in this document.

Table 07-01

Certification No.	Description	Notarization Required
1-01	Primary Erosion Control Inspection Form	No
1-02	Intermittent Subdivision Construction Form	Yes
1-03	Final Subdivision Construction Form	Yes
1-04A	Pre-Construction Certification Form – Post Construction Stormwater BMP	Yes
1-04B	Final Certification Form – Post Construction Stormwater BMP	Yes
1-05	Re-Inspection Form	No
1-06	Final Erosion Control Acceptance Form	No
1-07	Intermediary Erosion Control Acceptance Form	No

3. No construction activities other than installation of erosion control measures shall begin prior to the ~~Engineering Director~~City Engineer's approval of Certification Form 1-01.

4. The Developer or his contractor shall not remove any Temporary Erosion Control Measure prior to approval of Certification Form 1-07~~5~~ by the ~~Engineering Director~~City Engineer.

CITY OF MONROE

Certification Form 1-01

Primary Erosion Control Inspection Form

Project Name _____ Date _____

Developer _____ Contractor _____

1. The City of Monroe Erosion Control Permit Number for this project is _____

2. All approved erosion control measures have been installed per approved plans.

3. I understand that any failure to maintain these erosion control measures will result in appropriate enforcement actions in accordance with the City of Monroe Erosion and Sedimentation Control Ordinance, the North Carolina Sedimentation Pollution Control Act of 1973 (NCGS Chapter 113A, Article 4), and the North Carolina Administrative Code Title 15A, Department of Environmental Quality ~~and Natural Resources~~ Chapter 4.

4. Additional erosion control measures may be required based upon specific site conditions.

I, _____ of _____
(Responsible Agent) (Development Company)
hereby certify that the information contained herein is true and correct to the best of my knowledge and belief and was provided by me under oath.

_____ _____
(Developer Agent Signature) (Date) (Contractor Agent Signature) (Date)

_____
(Project Engineer Signature) (Date)

ACCEPTANCE BY CITY OF MONROE:

_____ _____
(Erosion Control Inspector ~~Specialist~~ Signature) (Date) (~~Engineering Director~~City Engineer ~~-~~Signature) (Date)

CITY OF MONROE

Certification Form 1-02

Intermittent Subdivision Construction Form

Project Name _____ Date _____

Developer _____ Contractor _____

1. All approved rough grading operations have been completed per approved plans.
2. All approved sanitary sewer system components have been installed per approved plans and in accordance with the City of Monroe Standard Specifications and Detail Manual.
3. All approved storm drainage system components have been installed per approved plans, and all construction was completed in accordance with the City of Monroe Standard Specifications and Detail Manual.
4. All curb has been installed, each section of curb was backfilled within 3 to 5 days of placement, and all construction was completed in accordance with the City of Monroe Standard Specifications and Detail Manual.
5. All approved water line system components have been installed per approved plans, and all work has been completed in accordance with the City of Monroe Standard Specifications and Detail Manual.
6. Attached are all ~~previous~~ geotechnical reports not previously submitted for roadway fill material and utility trench construction. Deviations from minimum testing requirements stipulated by Section 01.08 INSPECTIONS are documented and noted in the final report prepared by the independent testing firm.
7. The City of Monroe Energy Services Department, telephone, and television/cable utility service organizations have been contacted for utility service installation and sleeve/conduit installations for proposed curb crossings.
8. Upon receipt, the City of Monroe Engineering Department will issue costs for street sign installation.

I, _____ of _____
(Responsible Agent) (Development Company)
hereby certify that the information contained herein is true and correct to the best of my knowledge and belief and was provided by me under oath.

_____ _____
(Developer Agent Signature) (Date) (Contractor Agent Signature) (Date)

_____
(Project/Geotechnical-Engineer Signature) (Date)

I, _____, a Notary Public of the County of _____, State of North Carolina, hereby certify that _____ appeared personally before me this day and being duly sworn acknowledged that the above form was executed by him.

Witness my hand and notarial seal, this _____ day of _____, _____

SEAL

_____
(Notary)

My commission expires _____

ACCEPTANCE BY CITY OF MONROE:

_____ _____
(Construction Inspector Signature) (Date) (~~Engineering Director~~City Engineer) (Date)

CITY OF MONROE

Certification Form 1-03

Final Subdivision Construction Form

Project Name _____ Date _____

Developer _____ Contractor _____

1. The asphalt or stone base course for this project has been installed, and all construction was completed in accordance with the City of Monroe Standard Specifications and Detail Manual.
2. ~~2.~~ Attached are all post installation inspection reports for storm drainage pipe as required by Standard 1.08 INSPECTIONS, including identification of any defects with an assessment for severity and recommendations for repairs of lines inside right of way and public easements..
3. Attached are all post installation re-inspection reports for storm drainage pipe as required by Standard 1.08 INSPECTIONS verifying that recommended remediation of identified defects have been properly completed.
2. The asphalt roadway surface course for this project has been installed, and all construction was completed in accordance with the City of Monroe Standard Specifications and Detail Manual.
3. All sidewalk has been installed, each section of curb was backfilled within 3 to 5 days of placement, and all construction was completed in accordance with the City of Monroe Standard Specifications and Design Manual.
4. Attached are all ~~previous~~ geotechnical reports not previously submitted for roadway construction. Deviations from minimum testing requirements stipulated by Section 01.08 INSPECTIONS are documented and noted in the final report prepared by the independent testing firm.
5. All punch list items contained on the Post-Construction Checklist, Standard 07.11.00 are completed.
6. I have read items 1-11 within Standard 07.10.00 and understand that by requesting the final walk-through, the City of Monroe expects that all major items are completed to the fullest extent possible.
7. I further understand that any evident misrepresentation will incur a re-inspection fee in the amount of current policies and that no re-inspection will be scheduled until all fees are paid.
8. The completed Post-Construction Checklist is attached to this form.
9. ~~7.~~ The Concrete Monument Report Form of Standard 07.14.00 has been submitted to the Engineering Department.
10. ~~8.~~ The warranty period will initiate upon final acceptance by the City of Monroe.

I, _____ of _____
(Responsible Agent) (Development Company)
hereby certify that the information contained herein is true and correct to the best of my knowledge and belief and was provided by me under oath.

_____ _____
(Developer Agent Signature) (Date) (Contractor Agent Signature) (Date)_____
(Project/Geotechnical Engineer Signature)(Date) (Project Engineer SEAL)

I, _____, a Notary Public of the County of _____, State of North Carolina, hereby certify that _____ appeared personally before me this day and being duly sworn acknowledged that the above form was executed by him.

Witness my hand and notarial seal, this _____ day of _____, _____

SEAL

_____
(Notary)

My commission expires _____

ACCEPTANCE BY CITY OF MONROE:

_____ _____
(Construction Inspector Signature) (Date) (~~Engineering Director~~City Engineer) (Date)

CITY OF MONROE

Certification Form 1-04 A

~~*Pre-Construction Certification Form --*~~ *Erosion Control BMP to* ~~*-*~~*Post-Construction Stormwater Control Measure* ~~*-(SCM)BMP*~~ *Conversion Form*

Project Name _____ Date _____

Developer _____ Contractor _____

1. The contributing drainage area for the ~~Stormwater~~ SCM ~~BMP~~ structure is sufficiently stable to allow construction to begin or
2. Erosion and Sedimentation Control BMPs are in place to protect any proposed ~~Stormwater~~ SCM ~~BMPs~~ during construction.
3. I understand that failure to protect any ~~Stormwater~~ SCM ~~BMP~~ from sedimentation during construction may result in a delay of final acceptance.
4. I further understand that the ~~Stormwater~~ SCM ~~BMP~~ must be fully functional with all features, vegetation, and controls installed before final acceptance.

I, _____ of _____
(Responsible Agent) (Development Company)
hereby certify that the information contained herein is true and correct to the best of my knowledge and belief and was provided by me under oath.

_____ _____
(Developer Agent Signature) (Date) (Contractor Agent Signature) (Date)

_____
(Project Engineer Signature) (Date) (Project Engineer SEAL)

I, _____, a Notary Public of the County of _____, State of North Carolina, hereby certify that _____ appeared personally before me this day and being duly sworn acknowledged that the above form was executed by him.

Witness my hand and notarial seal, this _____ day of _____, _____

SEAL

_____
(Notary)

My commission expires _____

ACCEPTANCE BY CITY OF MONROE:

_____ _____
(Construction Inspector Signature) (Date) (~~Engineering Director~~City Engineer) (Date)

CITY OF MONROE

Certification Form 1-04B

Final Inspection~~Certification~~ Form~~-~~ -- Post-Construction Stormwater ~~SCM~~Control Measures (SCMs)~~BMP~~

Project Name _____ Date _____

Developer _____ Contractor _____

5. All ~~Stormwater BMPs~~SCMs and related construction is completed and the ~~Stormwater~~ SCM ~~BMP~~ is fully functional with all features, vegetation, and controls installed.
6. A City of Monroe Stormwater Maintenance Agreement has been submitted along with the ~~$25.00~~ current recording ~~fee and~~fee and site sketch, as-built drawing of the SCM ~~BMP~~(s), and engineer of record's certification.
7. A copy of the Post-Construction Checklist for Post-Construction ~~Stormwater~~ SCMs ~~BMP~~s 07.12~~1~~ is attached and all applicable items have been verified and checked.
8. I have read items 1-6 within Standard 07.12~~0~~ and understand that by requesting the final walk-through, the City of Monroe expects that all major items are completed to the fullest extent.
9. I further understand that any evident misrepresentation on the Checklist will incur a re-inspection fee in the amount of current policies and completion ~~of Form~~of Form 1-05 and that no re-inspection will be scheduled until all fees are paid and Form 1-05 is complete.

I, _____ of _____
(Responsible Agent) (Development Company)
hereby certify that the information contained herein is true and correct to the best of my knowledge and belief and was provided by me under oath.

_____ _____
(Developer Agent Signature) (Date) (Contractor Agent Signature) (Date)

_____
(Project Engineer Signature) (Date) (Project Engineer SEAL~~)~~

I, _____, a Notary Public of the County of _____, State of North Carolina, hereby certify that _____ appeared personally before me this day and being duly sworn acknowledged that the above form was executed by him.

Witness my hand and notarial seal, this _____ day of _____, _____

SEAL

_____
(Notary)

My commission expires _____

ACCEPTANCE BY CITY OF MONROE:

_____ _____
(Construction Inspector Signature) (Date) (~~Engineering Director~~City Engineer) (Date)

CITY OF MONROE

Certification Form 1-04C

Professional Engineer's Certification of
Engineered Stormwater Control Measure(s)and Associated Infrastructure

Project Name _____ SW Permit # _____

SCM Type _____ Name/No. per Plans* _____

I, _____ as a duly licensed Professional Engineer, do hereby certify that the Engineered Stormwater Control Measure listed above has been constructed within substantial compliance and intent of the approved construction plans, drawings, and specifications and that the associated infrastructure has been installed in compliance with the approved construction plans, drawings, and specifications. This statement is based upon reference and reviews of the as-built drawings and as-built calculations prepared for this site and upon periodic field inspections and project reviews completed during the construction of the referenced Engineered Stormwater Control Measure, including a final inspection of the measure made within 30-days prior to the signature dated below.

_____

(Project Engineer Signature) (Date) (Project Engineer SEAL)

*Complete a separate form for each SCM.

ACCEPTANCE BY CITY OF MONROE:

_____

(Construction Inspector Signature) (Date) (City Engineer) (Date)

CITY OF MONROE

Certification Form 1-05

Re-Inspection Form

Project Name _____ Date _____

Developer _____ Contractor _____

1. On _____ (Date) an inspection ~~final~~ was performed and the following items were found to be incomplete:

To be completed by Construction Inspector

2. All items listed above are now completed.
3. All re-inspection fees have been paid in full and a receipt is attached.

I, _____ of _____
(Responsible Agent) (Development Company)
hereby certify that the information contained herein is true and correct to the best of my knowledge and belief and was provided by me under oath.

_____ _____
(Developer Agent Signature) (Date) (Contractor Agent Signature) (Date)

Form can be returned at the Re-Inspection along with a check made payable to the City of Monroe. Alternatively, the fee can be paid and a receipt received at the City of Monroe Customer Service Center located at 201 E Windsor St. Monroe. NC 28112. Receipt shall be presented at Re-Inspection.

_____
(Project/Geotechnical Engineer Signature) (Date) (Project Engineer SEAL)

ACCEPTANCE BY CITY OF MONROE:

_____ _____
(Construction Inspector Signature) (Date) (~~Engineering Director~~City Engineer) (Date)

CITY OF MONROE

Certification Form 1-06

Final Erosion Control Acceptance Form

Project Name _____ Date _____

Developer _____ Contractor _____

1. The City of Monroe Erosion Control Number for this project is _____

2. This project is substantially complete and the site is sufficiently stabilized to allow removal of erosion control measures.~~and all associated construction activities are completed.~~

3. ~~Certification Form 1-03 or 1-04 has been approved by the Engineering Director~~City Engineer~~ and Certification Form 1-05 (if needed) has been approved by the Engineering Director~~City Engineer~~.~~

I, _____ of _____
(Responsible Agent) (Development Company)
hereby certify that the information contained herein is true and correct to the best of my knowledge and belief and was provided by me under oath.

_____ _____
(Developer Agent Signature) (Date) (Contractor Agent Signature) (Date)

_____
(Project Engineer Signature) (Date) (Project Engineer SEAL)

ACCEPTANCE BY CITY OF MONROE:

_____ _____
(Erosion Control Specialist Signature) (Date) (~~Engineering Director~~City Engineer) (Date)

CITY OF MONROE
Certification Form 1-07

Intermediary Erosion Control Acceptance Form

Project Name _____ Date _____

Developer _____ Contractor _____

1. The City of Monroe Erosion Control Number for this project is _____.

2. The following temporary measures are no longer required for sedimentation and erosion control for the development site and removal is requested:

Measure/ Plan ID	Location	Comment

3. Upon removal, the area is to be seeded and permanent stabilization provided within 30 calendar days; or for residential developments, temporary measures in accordance with the ESC Installation and Maintenance Agreement Form are to be installed and maintained.

4. Certification Form 1-06 Final Erosion Control Acceptance will be submitted after all associated construction activities are completed.

I, _____ of _____
(Responsible Agent) (Development Company)
hereby certify that the information contained herein is true and correct to the best of my knowledge and belief and was provided by me under oath.

_____ _____
(Developer Agent Signature) (Date) (Contractor Agent Signature) (Date)

_____
(Engineer Signature) (Date)

Project Engineer Seal

ACCEPTANCE BY CITY OF MONROE:

_____ _____
(Erosion Control Specialist Signature) (Date) (~~Engineering Director~~City Engineer) (Date)

07.09 NOTIFICATION REQUIREMENTS ~~CONSTRUCTION CHECKLIST~~

_____All plan approvals required for this development must be completed and authorization received from the Subdivision Administrator to proceed prior to the start of construction.

_____Install temporary erosion control devices per Erosion Control Certificate of Approval and approved plans. No land disturbing activity, except that which is required to install erosion control measures, may commence prior to approval by the ~~Engineering Director~~City Engineer of Certification Form 1-01.

_____Contact the Erosion Control Specialist within 48 hours following installation of erosion control devices to schedule primary erosion control inspection.

_____Submit completed Certification Form 1-01 to the Erosion Control Specialist.

~~_____Clear and grub proposed rights-of-way including a 10-foot wide utility easement on both sides and/or to the proposed tie and toe of slopes, whichever is greater.~~

~~_____Perform rough grading operations.~~

~~_____Install all proposed sanitary sewer system components per approved plans.~~

~~_____Install storm drainage system pipes, ditches, swales, and structures per approved plans.~~

~~_____Break off pipes flush with the wall of all sanitary and storm sewer structures, and grout and trowel smooth the inside walls.~~

_____~~Construction Inspector will s~~ Schedule manhole vacuum tests, line pressure tests, and applicable mandrel tests within approximately 30 days following installation.

_____Contact Construction Inspector following storm drainage installation to schedule a visual inspection of the constructed system.

_____Prior to curb and gutter installation, contact the City of Monroe Energy Services Department (for gas and electric), Telephone, and Cable Companies for utility service installation and for locations to place sleeves/conduit under the proposed curb line.

_____Grade for curb installation.

_____Contact Construction Inspector 24 hours in advance to schedule a proof roll for curb.

_____Install curb per approved plans. Each section of curb shall be backfilled within 3 to 5 days following placement.

_____Install water line system components per approved plans

_____The Developer and/or his Agent shall contact the Construction Inspector 24 hours in advance to schedule water line pressure tests. Water line pressure tests must be completed prior to paving operations.

_____Fine grade shoulders per approved plans.

_____Grade roadway section for subgrade.

_____Contact construction inspector, via email, 48 ~~24~~ hours in advance to schedule a proof roll for roadway subgrade.

_____Submit completed and notarized Certification Form 1-02 to Construction Inspector. Certification has provisions for sanitary sewer, storm drainage, water system, curb installation, and contacting utilities outside the contractor's scope of work. Submit all previous geotechnical reports with Certification Form 1-02.

_____Install stone or asphalt roadway base per approved plans.

_____Contact the Construction Inspector, via email, 48 ~~24~~ hours in advance to schedule a proof roll for the
constructed roadway stone base material.

_____Water line testing must be completed prior to paving operation.

_____Install asphalt roadway pavement per approved plans.

_____Submit documentation on tests performed on the pavement to the Construction Inspector.

_____Contact the City of Monroe Engineering Department for the cost and to schedule the installation of street signs.

_____All underground utilities and service taps must be installed prior to installation of concrete sidewalk.

_____Install concrete sidewalk per approved plans.

_____Perform all fine grading, landscaping, and installation of street trees (if applicable).

_____ Submit CCTV footage report and repair recommendations.

AFTER ALL ITEMS HAVE BEEN CHECKED, REFER TO STANDARD 07.11

07.10 FINAL INSPECTION AND ACCEPTANCE OF SUBDIVISION CONSTRUCTION

1. No final inspection shall be scheduled until Certification 1-03 is approved by the ~~Engineering Director~~City Engineer.

2. The Developer, his Agent and the Contractor are responsible for utilizing the Post-Construction Checklist to generate the punch list for this project. The City of Monroe may generate a punch list for additional items not contained in the Post-Construction Checklist as well as prepare the Certificate Form 1-05.

3. Any item checked on the Post-Construction Checklist that is found during the walk-through to be an evident misrepresentation shall incur a re-inspection fee in the amount of current policies per each occurrence.

4. The City of Monroe will not accept the street right-of-ways for maintenance until every item on the Post-Construction Checklist and any punch list item is completed to the Construction Inspector's satisfaction, and all outstanding balances have been paid in full.

5. The Developer must submit the As-Built Drawings as required in Standard 01.10, and the City of Monroe must approve the drawings prior to acceptance of the street right-of-ways for maintenance by the City.

6. The developer is responsible for coordinating the installation of all private and public underground utilities including but not limited to telephone, natural gas, cable, and electric prior to acceptance of streets, storm drainage, sewer and water by the City of Monroe. Developer shall be responsible for notifying and keeping the builders and buyers within the development apprised of the acceptance status of municipal services.

7. Final air test of public and private sewer mains and service laterals along with final certification will not be accepted until all utilities are installed. The developer has the option to expedite the acceptance process prior to the installation of all utilities by agreeing to perform closed circuit television (CCTV) inspection at the conclusion of construction and to repair problems identified by the CCTV to the sewer mains and service laterals. Acceptance of the sewer certification will enable the City of Monroe to accept final certification of water, streets, and storm drainage. All testing, air test or CCTV, shall be performed to the requirements as set forth by the Water Resources Department.

8. The developer and/or owner shall submit a written request for acceptance to the Engineering Department outlining the street names(s) and the length in miles.

~~9. A warranty bond shall be provided for streets built by the subdivider for a minimum warranty period of 1 year.~~

~~10. The subdivider shall deposit with the City cash, an irrevocable letter of credit, or other instrument readily convertible into cash at face value for the warranty period. Such financial guarantees for maintenance shall be in an amount not less than 20% of the estimated costs of construction, but no less then $20,000 as determined by the Engineering Department. Duration of the warranty bond shall be for a minimum warranty period of 1 year.~~

~~11.~~9. The developer is required to provide a one year written warranty utilizing Warrnty Form 07.16 The subdivider shall be responsible for completing all street repairs resulting from defects in materials and workmanship. ~~Failure to do so may result in the City drawing the entire amount of the financial guarantee to complete the repairs and retaining the remainder until the requirements of the warranty period as set forth above are met.~~ A final inspection shall be completed by the Engineering Department prior to conclusion of the warranty period.

07.11 POST-CONSTRUCTION CHECKLIST

_____All necessary erosion control measures are in place, sediment basins are clean and in working order.

_____Streets, curb and gutter, and sidewalks are clear of debris and dirt.

_____All storm drain lines are in proper alignment and have straight and positive grade.

_____All storm drain lines are free of dirt, rocks, and debris.

_____All pipes are cut flush with the inside wall of catch basins and other drainage structures.

_____All inside walls of drainage structures are grouted and troweled smooth.

_____All steps in drainage structures are in placed at proper location (if needed).

_____All catch basins have the proper throat area as designed.

_____All inverts of drainage structures are ~~trowelled~~troweled smooth and sloped toward the outlet pipe.

_____All grates are the proper type for the slope (type "E", "F", or "G").

_____All double boxes have either a steel I-beam or two 4" X 4" X $^{3}/_{8}$" angle irons supporting the middle of the frames & grates.

_____All ditches have proper grade and side slopes for positive drainage.

_____All ditches have proper permanent erosion control measures in place.

_____All offsite drainage maintains positive flow from the proposed subdivision to adjacent properties.

_____All curb & gutter has proper alignment and grades specified by the approved plans.

_____Any ponding in the flow line of the gutter is within tolerances per Standard 02.03.06.

_____All accessibility ramps and sidewalks are constructed in accordance with the ~~Americans with Disabilities~~ PROWAG ~~Act~~ current specifications.

_____All roadway sections are constructed with proper cross-sectional slope.

_____There is no prolonged ponding in roadway areas.

_____All manholes, valves, and grates are set flush with pavement and follow the grade of the street.

_____All sidewalks are placed at proper alignment and grade with proper expansion joint material and contraction joints placed at the correct locations per the plans and/or Standard Detail 02.03.01.

_____Asphalt pavement is free of subgrade failure (settlement), and free of failures in the asphalt (cracking).

_____Any asphalt surface repairs are within tolerances per Standard 02.03.06 and the City of Monroe Street Cut Pavement Repair Standards.

_____All broken and cracked curb, sidewalk, accessibility ramps, are within tolerances per Standard 02.03.06.

_____All shoulders are compacted and graded per the typical sections.

_____The shoulders are graded to proper slope, seeded, mulched, and free of large rocks and debris to the back of the utility easement.

_____The right-of-way is clear of all obstructions other than those permitted by existing policies.

Street trees, including root protection, are installed per the plans and viable.

_____Concrete monuments are placed per Standard 01.11.00 and Detail 07.03.01.

1. This Checklist shall be considered the Punch List for the proposed subdivision development.

2. The City of Monroe does not generate a Punch List for the items contained within this Checklist.

3. The City of Monroe may generate a Punch List for additional items not listed on this Checklist as well as prepare Certificate Form 1-05.

4. The Developer and his Contractor shall have full quality control of the development, which includes these Punch List items.

5. After all items have been checked, submit completed and notarized Certification Form 1-03 to the construction inspector to schedule a final walk-through.

6. Any item checked that is found during the final walk-through to be an evident misrepresentation shall incur a re-inspection fee in the amount of current policies per each occurrence.

7. In the event a re-inspection is required, submit Certification Form 1-05 to the Construction Inspector. A re-inspection will not be scheduled until the required fees are paid in full.

8. After the City has approved all checked items in this standard and any punch list items that may have been generated, submit Certification Form 1-06 to

the Construction Inspector for authorization to remove all Temporary Erosion Control Measures.

07.12 POST-CONSTRUCTION CHECKLIST FOR STORMWATER ~~BEST MANAGEMENT PRACTICES~~ Control Measures (SCM~~BMP~~)

_____The Stormwater SCM~~BMP~~ area including barrel, riser, and emergency spillway, if applicable are all free of debris, trash, and other obstructions.

_____The Stormwater SCM~~BMP~~ including pond, barrel, riser, embankment and emergency spillway, if applicable are free of holes, leaks, and slides.

_____All bare earth areas have been properly stabilized.

_____All forebay areas are free of sediment (if applicable).

_____The Stormwater SCM~~BMP~~ is at the permanent pool elevation and functioning without leakage (if applicable).

_____All disturbed areas within the contributing drainage area and the immediate vicinity of the pond have been properly stabilized.

_____All horizontal alignments and vertical elevations are in accordance with the approved plans.

_____Pipe ends have stabilized outlet per approved plans.

_____ Filter surfaces are stable and are not clogged (if applicable).

_____ A copy of the soil report on soil media used was submitted and accepted (Applicable for Sand Filters, infiltration and Bioretention ~~-~~SCM~~BMP~~'s only).

_____Sediment within the Stormwater SCM ~~BMP~~ has been removed (if ~~Stromwater~~Stormwater SCM~~BMP~~ has been used as a sediment Basin ~~trap~~ throughout construction).

_____The Engineer's Certification ~~Letter~~ Form 1-04C and As-built survey from the Professional of Record ~~is~~ are attached.

_____ All required vegetation for hydrologic zones has been installed per approved plan.

_____ ~~The Engineer's Certification Letter, As-built survey from the Engineer of Record,~~
_____Stormwater Maintenance Agreement, ~~$265.00~~plat recording fee, and Site Sketch Map are attached.

_____Certification Form 1-04B has been submitted and accepted.

1. This Checklist shall be considered the Punch List for the proposed Stormwater SCM ~~BMP~~.

2. The City of Monroe does not generate a Punch List for the items contained within this Checklist.

3. The City of Monroe may generate a Punch List for items not listed on this Checklist.

4. The Developer and his Contractor shall have full quality control of the Stormwater SCM~~BMP~~ construction, which includes these Punch List items.

5. Any item checked that is found during the final walk-through to be an evident misrepresentation shall incur a reinspection fee in the amount of current policies per each occurrence.

6. In the event a reinspection is required, all fees are required to be paid by the Developer and verified by the City prior to scheduling the reinspection.

07.13 AS-BUILT DRAWING CHECKLIST

1 AS-BUILT INFORMATION

Submitted by_____

Phone # _____

CHECK ONE

- ❑ (Please check) Blue Line For Review Only
- ❑ Mylar or Vellum (Final)

Transmittal Date _____

2. GENERAL AS-BUILT INFORMATION

_____	A.	Copy of recorded plat or deed of easements, indicating easements and right of way
_____	B.	Boundary of tract by courses and distance with references
_____	C.	Tie to N.C. grid coordinate system
_____	D.	Vicinity map
_____	E.	Scale of drawings and bar scale
_____	F.	North arrow
_____	G.	Location of benchmark with M.S.L. elevations
_____	H.	Seal and signature of North Carolina registered P.E. or P.L.S. that generated as-built drawings on each sheet
_____	I.	All easements identified and dimensioned
_____	J.	Statement designating drawings are "as-built" on each sheet
_____	K.	Digital As-builts streets and stormwater designs in AutoCAD format. Include locations for all drainage structures.

3. STREETS

_____	A.	Horizontal alignment with radii, P.C.'s, and P.T.'s of all curves
_____	B.	Vertical alignment with centerline grades, vertical curve lengths and station and elevation of all PVC's and PVT's and centerline profile
_____	C.	Dimensioned right of way and street widths
_____	D.	Pavement section
_____	E.	Typical cross section
_____	F.	Horizontal and vertical sight lines
_____	G.	Delineation of landscaping limits and materials

4. STORM DRAINAGE SYSTEMS

A. Electronic (PDF) copy of as-built plans of constructed structures, pipes, channels, and drainage easements.
B. Supplemental digital file for City records in AutoCAD format
C. Cover Sheet with Professional Engineer and Registered Surveyor Certifications.
D. Site Plan or Grading Plan with all storm system structures identified to match the approved Plans.
E. 100- year flood plain boundary shown and labeled, if applicable.
F. Easement dedication for storm drainage extensions outside right of way shown with bearings and distances.
G. Pipe material per the approved plans.
H. Pipe size, slope, and length (design values text struck-through and constructed values labeled).
I. Structure rim elevations (center of grate at lip) and invert elevations.
J. Grate elevations for grated yard inlets, throat opening dimensions and inverts for "slab type" yard inlets. Provide sufficient spot elevations for finished grade around inlet to confirm that the required sump has been provided.
K. Size and depth of riprap dissipation pad
L. Minimum 2 feet of cover provided in Public Rights of way or provide verification that Class IV Reinforced Concrete Pipe or another approved pipe was installed.
M. Statement of stormwater velocity and discharge at all outlets (??)
N. Professionally sealed as-built pipe ~~capacity calculations~~profiles with plotted hydraulic grade line (HGL) ~~profiles~~ to confirm constructed system meets intent of the approved plans.
O. Provide ditch/channel cross-sections to define the ditch section and slope as shown by the approved plans, plotted to scale at 100 feet maximum intervals with minimum of 2 cross sections per ditch with adequate spot elevations. Label distances between spot elevations on the cross sections (Receiving one acre or more of drainage area),
P. Show and label ditch/channel cross sections on the plan view.

~~A. Electronic (PDF) copy of as-built plans of constructed structures, pipes, channels, and drainage easements sealed by a professional surveyor.~~Outline of 100 year flood plain
~~B. Supplemental digital file for City records in AutoCAD format~~ Pipe material
~~C. Cover Sheet~~Structure invert and top elevations
~~D. Registered Surveyor stamp and signature~~Pipe diameter
~~E. All storm system structures identified and labeled in the plan view to match the approved Plans.~~Pipe slope and length
~~F. Show and label the 100- year flood plain boundary, if applicable.~~Size of riprap dissipation pad
~~G. Structure rim elevations (center of grate at lip) and invert elevations. Statement of stormwater velocity and discharge at all~~

~~outlets~~

~~H. Grate elevations for grated yard inlets, throat opening dimensions and inverts for "slab type" yard inlets. Provide sufficient spot elevations for finish grade around inlet to confirm that the required sump has been provided. A separate, recorded easement dedication plat for utility extensions outside right of way~~

~~I. Pipe material, size, slope, and length per the approved plans (design values text struck-through and constructed values labeled)~~

~~J. Size and depth of riprap dissipation pad~~

~~K. Statement of stormwater velocity and discharge at all outlets~~

~~L. A separate, recorded easement dedication plat for utility extensions outside right of way ??~~

~~M. Associated drainage easements shown and labeled with bearings and distances.~~

~~N. Minimum 2 feet of cover provided in Public Rights of way or provide verification that Class IV Reinforced Concrete Pipe or another approved pipe was installed.~~

~~O. Professionally sealed as-built pipe capacity calculations with plotted hydraulic grade line (HGL) profiles to confirm constructed system meets intent of the approved plans.~~

~~P. Provide ditch/channel cross-sections to define the ditch section and slope as shown by the approved plans, plotted to scale at 100 feet maximum intervals with minimum of 2 cross sections per ditch with adequate spot elevations. Label distances between spot elevations on the cross sections (all ditches/channels receiving one acre or more of drainage area)~~

~~Q. Show and label channel/ditch cross sections on the plan view.~~

Note: Any new or revised storm drainage systems or easements shown on as-built plans may require a review of revised subdivision plans, engineering calculations, and drainage area maps.

5. STORMWATER ~~Control~~CONTROL MEASURES ~~Measures~~ (SCM)~~BEST MANAGEMENT PRACTICES~~

_____ A. Show and label the 100- year flood plain boundary~~Outline of 100 year flood plain~~, if applicable

_____ B. Pipe material, diameter, slope, and length (design values text struck-through and Constructed values labeled)

_____ C. Show structure orifice and/or weir dimensions and elevation(s) (design and constructed)

_____ D. Show structure invert and top elevations (design and constructed)

_____ E. Dimensions and depth of riprap dissipation pad

_____ F. Show limits of permanent ~~stormwater best management~~SCM(s) in Plan view ~~practice(s)~~

_____ G. Show and label limits of filter media (soil or sand), if applicable

_____ H. Water Quality Storage Volume (design and constructed volumes)

_____ I. Water Quantity Storage Volume (design and constructed volumes), if applicable
_____ J. Contour elevations at 1-foot intervals
_____ K. Permanent easement around stormwater ~~BMP~~SCM(s)
_____ L. Clean out and underdrain system, if applicable

_____ M. Show location and dimensions of all impervious coverage and show the total amount of ~~percentage of~~ impervious coverage ~~in drainage~~built as a percentage of the total site in a summary table. ~~area~~
_____ N. Permanent pool elevation, spillway elevation, top of bank elevation, depth, and surface area.

City of Monroe Use Only

As-Builts Reviewed by_____ Date _____

CHECK ONE

❑ Approved _____ Date _____

❑ Returned _____ Date _____

PAGE 2 of 2

07.14 CONCRETE MONUMENT REPORT FORM

Section A) Concrete Monument Designation _____ located in _____ Township,
(assigned by the City)
Union County, North Carolina.
To reach the point
from_____
_____
_____
_____
_____

Horizontal control originated on _____ order control established by _____ in ___/____/_____ on _____ datum.

Vertical control originated on _____ order control established by _____ in ___/____/_____ on _____ datum.

Location sketch Date set _____ Sketch by _____

Elevation is _____ MSL established by a _____ order survey.

Coordinates are _____ North, _____ East, established by a _____ order survey.

Concrete Monument required, for _____Subdivision.

Set By: _____ R.L.S.

R.L.S. Number _____

(SEAL)

Section B) If the data is known complete the following information.
Geographic Position: Long. _____, Lat. _____

Grid bearing to other visible points:

Point	Bearing	Distance	Point	Bearing	Distance
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Recovered by: _____ Date: _____

Fill in all blanks above in section **A** of this form on page 07-35A. If data is, known for section **B** fill in the blanks. Copy this form as many times as needed.

07.15 PERMIT TO OPEN CUT UTILITY TRENCHES CITY MAINTAINED STREET RIGHT OF WAY

PROJECT:_____
LOCATION:_____
STREET_____MH_____TO MH_____
SHEET_____OF CONTRACT_____

REQUEST TO OPEN CUT IS DUE TO THE FOLLOWING:_____
_____
_____
_____
_____
_____
_____

BY APPLICATION, THE UNDERSIGNED CONTRACTOR AGREES TO ADHERE TO THE SPECIAL PROVISIONS ~~ON THE REVERSE SIDE~~ REQUIRED FOR ALL OPEN CUTS WITHIN CITY MAINTAINED RIGHT OF WAY.

_____
SIGNATURE OF CONTRACTOR

NAME OF CONTRACTOR:_____
ADDRESS: _____
_____
CONTACT PERSON:_____
PHONE NO.:_____

RECOMMENDED BY PROJECT INSPECTOR:_____DATE:_____

ENGINEERING DEPARTMENT APPROVAL
BY:_____DATE:_____

FINAL ACCEPTANCE OF WORK

FINAL INSPECTION REQUESTED BY CONTRACTOR ON
DATE:_____
ACCEPTED BY PROJECT INSPECTOR
BY:_____ DATE:_____
ACCEPTED BY ENGINEERING DEPARTMENT
BY:_____ DATE:_____

C: UTILITY DIRECTOR
CONTRACTOR
PROJECT ENGINEER

PERMIT TO OPEN CUT UTILITY TRENCHES
SPECIAL PROVISIONS

1. CONTACT THE ENGINEERING DEPARTMENT AT 704-282-4515, AT LEAST 24 HOURS PRIOR TO CONSTRUCTION. THE ENGINEERING DEPARTMENT MUST BE NOTIFIED IN WRITING UPON COMPLETION SO AN INSPECTION CAN BE MADE.
2. THE MONROE POLICE AND FIRE DEPARTMENTS SHALL BE NOTIFIED 24 HOURS IN ADVANCE OF A ROAD CLOSURE ~~OPEN CUTTING~~ BY THE CONTRACTOR.
3. TRAFFIC SHALL BE MAINTAINED THROUGH THE WORK AREA AT ALL TIMES. ONLY ONE LANE MAY BE CLOSED AT ANY GIVEN TIME UNLESS OTHERWISE APPROVED.
4. PROPER TRAFFIC CONTROL DEVICES, SIGNS, ETC. IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES SHALL BE INSTALLED TO E~~I~~NSURE PUBLIC SAFETY.
5. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE CITY OF MONROE STANDARD SPECIFICATIONS AND DETAIL MANUAL. TRENCH BACKFILL MATERIAL SHALL MEET NCDOT MATERIAL REQUIREMENTS.
6. THE AREA DISTURBED AT EACH SITE SHALL BE LEFT IN A NEAT AND SATISFACTORY CONDITION.
7. NO TRENCHES ARE TO BE OPEN OVERNIGHT.
8. CONTRACTOR IS RESPONSIBLE FOR PROVIDING ADEQUATE SHORING IN ALL TRENCHES TO PREVENT COLLAPSE DURING CONSTRUCTION.
9. MANHOLES WILL BE ADJUSTED TO CORRECT ELEVATION MAKING THEM LEVEL WITH EXISTING GROUND.
10. OPEN CUT IS TO BE PATCHED IN ACCORDANCEWITH STANDARD DETAIL 02.06.01 AND THE CITY OF MONROE STREET CUT PAVEMENT REPAIR STANDARDS:
    ~~2" TYPE "S-9.5" ASPHALT SURFACE COURSE~~
    ~~8" TYPE "B25.0" ASPHALT BASE COURSE~~
11. PATCHING IS TO BE PERFORMED THE SAME DAY THE CUT IS MADE. Plating Per detail…..is required
12. PAVEMENT IS TO BE SAW CUT. (CUTS SHALL BE PERPENDICULAR TO EOP)
13. PAVEMENT REPAIR SHOULD MATCH EXISTING ROADWAY ELEVATION WITH NO DIPS OR RAISES.
14. BACKFILL OF TRENCHES WITHIN THE ROAD RIGHT OF WAY SHALL BE BACKFILLED IN LAYERS NOT TO EXCEED SIX (6) INCHES AND THOROUGHLY TAMPED (EACH SUCCESSIVE LAYER).
15. (A) UNLESS OTHERWISE DIRECTED BY THE CITY ENGINEERING DEPARTMENT, ALL MATERIAL FROM THE BOTTOM OF THE TRENCH TO WITHIN TWELVE (12) INCHES OF THE SUBGRADE SHALL BE 95% MAXIMUM DENSITY OF STANDARD PROCTOR. (B) ALL MATERIAL WITHIN TWELVE (12) INCHES OF THE SUBGRADE LEVEL SHALL BE 100% MAXIMUM DENSITY OF STANDARD PROCTOR.

THE CITY ENGINEERING DEPARTMENT RESERVES THE RIGHT TO REQUIRE THE CONTRACTOR TO EMPLOY THE SERVICES OF A GEOTECHNICAL FIRM TO

RUN DENSITY TESTS AND TO CERTIFY THE COMPACTION OF THE BACKFILL MATERIAL.

07.16 WARRANTY

North Carolina
Union County

Date: _____

RE: _____
(Name of Subdivision)

That Whereas, the undersigned subdivider of _____ has requested
(Name of Subdivision)
approval by the City of Monroe of the final plat and/or acceptance by the City of any improvements in said subdivision; and,

Whereas Chapter ~~154 § 154.60~~ 02.02.11-6 of the ~~Monroe Code of Ordinances~~City of Monroe Detail Manual provides that prior to said approval and/or acceptance of improvements the subdivider shall furnish to the City a written warranty against defects which shall guarantee the material and workmanship in said subdivision for a period of not less than **twelve (12)** months from the date of such acceptance;

Now, Therefore in consideration of the provisions of said section, which are incorporated herein by reference, and the granting of final plat approval and/or acceptance of improvements by the City, the undersigned subdivider does hereby guarantee to the City of Monroe, its successors and assigns, the material and workmanship of said subdivision against any defects for a period of twelve (12) months from the date of acceptance, which said date is set out herein below, provided however, that until successful performance is obtained as determined by the Subdivision Administrator, this warranty shall not expire.

_____
(Date of Acceptance)

_____ _____
(Signature of Subdivider) (Print Name of Subdivider)

North Carolina
Union County

I, _____, a Notary Public in and aforesaid State and _____County, do hereby certify that _____ subdivider(s), personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

WITNESS my Hand and Notarial Seal, this the _____ day of _____, 200____

_____
Notary Public

My Commission Expires:

07.17 GUARANTEEING SUBDIVISION IMPROVEMENTS

In lieu of requiring the completion, installation, and inspection of all or any part of required subdivision improvements (as described in Section 156.60 of the City Code of Ordinances) prior to final plat approval, the City permits subdividers to deposit with the City cash, an irrevocable letter of credit, or other instrument readily convertible into cash at face value. Such financial guarantees shall be in an amount equal to 110% of the estimated cost of completing the required improvements. The duration of the guarantee shall be of a reasonable period to allow for completion and acceptance of the improvements. All subdivisions for which improvements have not been completed and accepted by the appropriate governmental agency at least thirty (30) days prior to the expiration of the guarantee shall be considered to be in default. The City may at this time use the financial guarantee to complete all necessary improvements unless an extension is granted.

The following is a discussion of the process required for acceptance by the City of a financial guarantee.

Step 1: The subdivider must submit to the Subdivision Administrator an itemized list showing cost estimates signed by his contractor for all required improvements not completed in the subdivision. *Note: As a minimum, for each work item the quantity of work along with the unit price and total cost must be provided. If this list is incomplete or doesn't provide sufficient detail for independent analysis, the request cannot be reviewed by the City.*

Step 2: The cost estimates are reviewed by the City's Engineering Department and Water Resources Department for accuracy and completeness. Comments are forwarded to the Subdivision Administrator.

Step 3: The subdivider is given a letter by the Subdivision Administrator showing the amount for which a letter of credit or other acceptable form of guarantee must be submitted.

Step 4: If a letter of credit or other acceptable legal instrument is submitted by the subdivider, the Subdivision Administrator, Finance Director, and City Attorney will review the instrument to determine its sufficiency. If it is found to be insufficient the subdivider will be notified and given the chance to resubmit a guarantee. If it is found to be sufficient, the subdivider will be notified that the final plant can be recorded as soon as recordable copies (2 ~~3~~ mylars) have been filed with the Planning and Development Department and all fees are paid.

Step 5: The subdivider may request a one-time reduction in the financial guarantee not to exceed 50% of the original amount of the guarantee once at least 50% of the required improvements have been made. Steps 1, 2, and 3 of the process outlined above are repeated for this process.

All subdividers are encouraged to work closely with City staff to ensure that unexpected delays are prevented whenever possible. City staff may require as many as ten (10) working days to review a request for financial guarantee, so please submit your requests and required information as soon as possible. The actual time required for review and approval of the requests will vary depending upon staff workload and the completeness of the request.

07.18 SUBDIVISION BOND ESTIMATE FORM

Typical listing of items for roadway, storm drainage, water, and sewer improvements

DATE: _____ **BY:** _____

ITEM	QUANTITY	UNIT COST	AMOUNT
ROADWAY & STORM DRAINAGE CONSTRUCTION			
Mobilization	Lump Sum		
Clearing & Grubbing	Lump Sum		
Unclassified Excavation	C.Y.		
Borrow	C.Y.		
Curb & Gutter	L.F.		
CABC	Ton		
Asphalt~~Black~~ Base B25.0	Ton		
Intermediate Course I19.0	Ton		
Asphalt Surface Course Type S9.5	Ton		
Asphalt Cement	Ton		
4" Concrete Walk	S.Y.		
6" Concrete Drive	S.Y.~~C.Y.~~		
Accessible Ramp with Detectable Warning Strip	Each		
~~Catch Basins/Drop Inlet~~ Drainage Structure	Each		
~~Catch Basin/Drop Inlet~~ Drainage Structure Frame & Grate	Each		
Manholes	Each		
Manhole Frame & Cover	Each		
Adjusting Street Structures	Each		
Reinforced Concrete Pipe - _____ inch	L.F.		
Reinforced Concrete Pipe - _____ inch	L.F.		
Reinforced Concrete Pipe - _____ inch	L.F.		
Reinforced Concrete Pipe - _____ inch	L.F.		
Foundation Condition Material	Ton		
Flared End Section	Each		

ITEM	QUANTITY	UNIT COST	AMOUNT
End Wall/Head Wall	C.Y.		
Street Trees	Each		
Street Tree Root Protection (Both Sides)	LF		
Seeding	S.Y.		
Concrete Steps	C.Y.		
Reset Fence	L.F.		
Rip-Rap	S.Y.		
Pavement Sawing (Unclassified Excavation)	L.F.		
Tree Removal (Unclassified Excavation)	Lump Sum		
Other:			
SUB-TOTAL			
WATER MAIN CONSTRUCTION			
Mobilization	Lump Sum		
Water Distribution Pipe			
12" Water Main	L.F.		
10" Water Main	L.F.		
8" Water Main	L.F.		
6" Water Main	L.F.		
2" Water Main	L.F.		
Gate Valves			
12"	Each		
10"	Each		
8"	Each		
6"	Each		
2"	Each		
Fire Hydrant Assemblies with 6" Gate Valve	Each		
Fire Hydrant Extensions 0 > 1	V.F.		

ITEM	QUANTITY	UNIT COST	AMOUNT
Fire Hydrant Extensions 1<	V.F.		
Fittings			
Tapping Sleeve and Valve - 12"	Each		
Tapping Sleeve and Valve - 8"	Each		
Tapping Sleeve and Valve - 6"	Each		
3/4" Water Services			
Services on Same Side as Water Main	Each		
Services involving a Road Crossing	Each		
Testing of Water Mains	L.F.		
Other:			
SUB-TOTAL			
SEWER MAIN CONSTRUCTION			
Mobilization	Lump Sum		
Sanitary Sewer Pipe - 12" Sanitary Sewer Main			
0' - 6' Depth	L.F.		
6' - 8' Depth	L.F.		
8' - 10' Depth	L.F.		
10' - 12' Depth	L.F.		
12' and Deeper	L.F.		
Sanitary Sewer Pipe - 10" Sanitary Sewer Main			
0' - 6' Depth	L.F.		
6' - 8' Depth	L.F.		
8' - 10' Depth	L.F.		
10' - 12' Depth	L.F.		
12' and Deeper	L.F.		
Sanitary Sewer Pipe - 8" Sanitary Sewer Main			
0' - 6' Depth	L.F.		
6' - 8' Depth	L.F.		
8' - 10' Depth	L.F.		

ITEM	QUANTITY	UNIT COST	AMOUNT
10' - 12' Depth	L.F.		
12' and Deeper	L.F.		
Substituting Ductile Iron Pipe			
12" DIP	L.F.		
10" DIP	L.F.		
8" DIP	L.F.		
4' Diameter Manholes (0' - 6')			
Grouted in Place	Each		
Bolted Down Frame and Cover	Each		
Extra Depth Manholes	V.F.		
4" Sanitary Sewer Service Laterals	Each		
Connections to Existing Sanitary Sewer Main	Each		
Solid Rock Excavation	C.Y.		
Testing for Exfiltration	L.F.		
Other:			
Sub-Total Sanitary Sewer			
TOTAL SUBDIVISION BOND ESTIMATE (Roadway, Storm Drainage, Water and Sewer Improvements)			

07.19 CUSTOMER PETITION TO PERMANENTLY CLOSE A PUBLIC STREET OR PUBLIC ALLEY

Any citizen, business, institution, or other entity wishing to request that the City of Monroe abandon a publicly dedicated street or alley must submit the following information to the Engineering Department. City consideration will be based on the procedure outlined below.

I) Preliminary Review Requirements – complete the following:

- A) Petitioner to acquire the signature of all adjoining property owners, along the street or alley that is requested abandoned, indicating the owners support to the street abandonment. (per table below)
- B) Petitioner submits letter of request along with a drawing showing the area to be abandoned for review by staff, the Technical Review Committee and the ~~Transportation~~ Committee to conduct an appropriate review.
  1) Engineering Technician responds back to Petitioner with additional needs from the various committees.
  2) Regardless of the recommendation for or against the abandonment of the petitioned street, the petitioner may fulfill the requirements for City Council as outlined below. Any discrepancies between the original description and the finished plat for City Council may require additional review by the previous committees.

II) City Council Review Requirements – Complete the following

- A) Petitioners submit the nonrefundable fee in accordance with the City of Monroe fee schedule.
- B) A list of all current property owners adjoining the street of alley as shown on Union County tax records (including addresses and tax identification numbers) and a mailing label for each.
- C) A written description of the street to be abandoned is submitted along with a map showing the area to be abandoned. Map may be a recorded subdivision plat or tax map with the area to be abandoned clearly defined. In cases where a new plat is required to define the area, plat must meet requirements of GS 47-30 mapping standards and prepared by a Registered Land Surveyor. The written description must be provided in digital format accepted by the City of monroe~~of Microsoft Word 6.0 or higher~~.
- D) Petition **will not** be placed on the City Council agenda without a map or completed plat, written description or payment of applicable fees.

TAX ID#	OWNER'S MAILING ADDRESS (including Company Name)	NAME (signers name printed legibly)	SIGNATURE	AGAINST CLOSING	FOR CLOSING

*i.e. an exhibit referencing existing city and/or state maintained intersections at both ends of the street to be closed, along with a tax parcel numbers, north arrow and drawing scale

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PAVEMENT SCHEDULE*

Ⓐ 1 in. BIT. CONC., SURFACE COURSE, TYPE S9.5

Ⓑ 2.5 in. BIT. CONC. BINDER COURSE, TYPE I 19.0C

Ⓒ 4 in. BIT. CONC. BASE COURSE, TYPE B 25.0C
OR 8 in. COMPACTED AGGREGATE BASE COURSE

Ⓓ 2 ft. 0 in. VALLEY & GUTTER

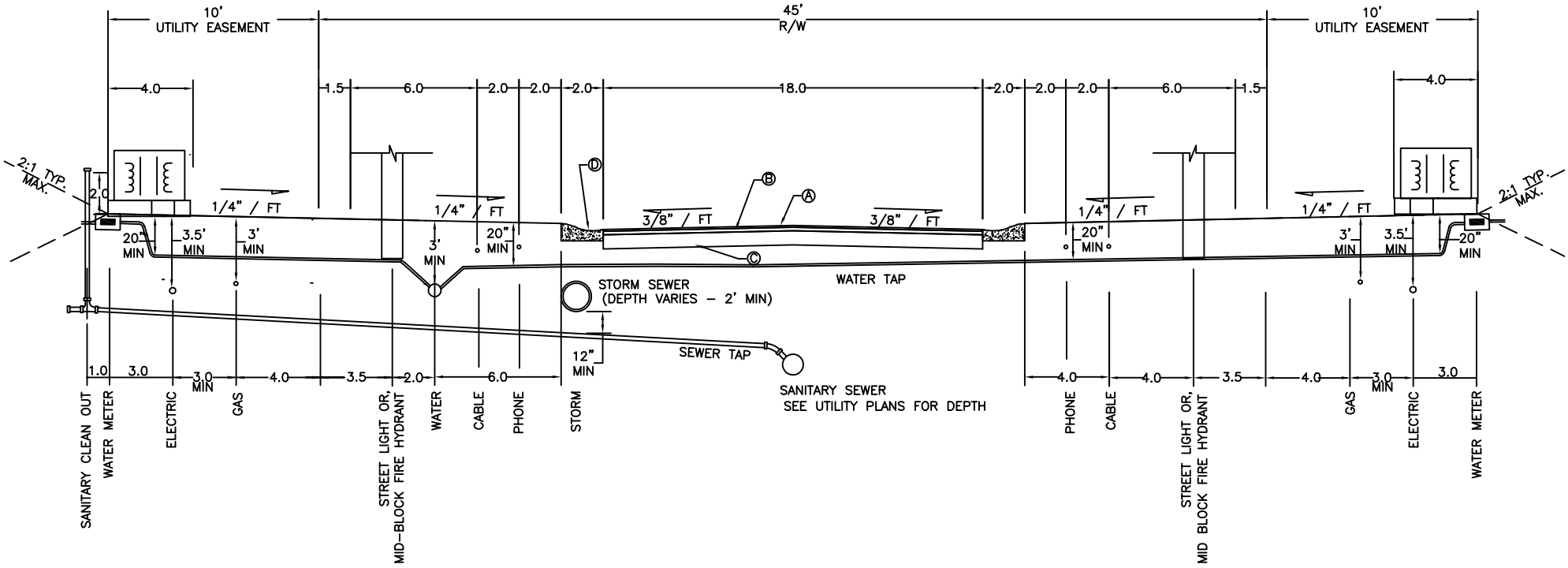
changed type

Removed note: "Pavement structure for residential streets with less than 4,000 vehicles per day

NOTES

1. UTILITY LOCATIONS SHOWN ARE FOR ALL UTILITIES AND SHALL NOT BE DEVIATED FROM WITHOUT CITY OF MONROE APPROVAL
2. DEPTHS SHOWN ARE MINIMUM DEPTHS
3. STREET LIGHTS WILL BE ON ONE SIDE OF ROAD DEPENDING ON SUBDIVISION LAYOUT
4. FIRE HYDRANT/STREET LIGHTS SHALL BE ALIGNED WITH COMMON LOT LINE OF PARCELS
5. MAINTAIN AT LEAST ONE SURVEY STAKE FOR THE BACK OF CURB AND THE BACK OF THE UTILITY EASEMENT PER LOT.
6. FINAL SURFACE ASPHALT TO BE PLACED ONCE PARCEL(S) ARE 80% DEVELOPED OR ONE YEAR FOLLOWING INTERMEDIATE COURSE PLACEMENT, WHICHEVER OCCURS FIRST.
7. TACK COAT TO BE APPLIED BETWEEN EACH LAYER OF ASPHALT, EVEN WHEN LAYERS ARE PLACED ON THE SAME DAY.

New notes



REVISIONS		
NO.	DATE	DESCRIPTION
1	04/20/04	MODIFIED FOR SUPERPAVE
2	05/2008	UTIL EASEMENT 1/4"/FT PHONE CABLE SPACING ADD PLAN VIEW, PAVEMENT SCHEDULE "B"
3	10/2022	RELOCATE SANITARY SEWER CLEAN OUT & WATER METER BOX. ADDED NOTE 5.
4	03/2025	ADD NOTES 6 AND 7. CHANGE ASPHALT TYPES. DELETE ITEMS

Monroe North Carolina

LOCAL RESIDENTIAL STREET FOR 45' R/W

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: JAM | DATE: 08-07-01
CHECKED BY: JNL | SCALE: N.T.S.

DETAIL 02.01.01

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PAVEMENT SCHEDULE*

- Ⓐ 1 in. BIT. CONC., SURFACE COURSE, TYPE S9.5
- Ⓑ 2.5 in. BIT. CONC. BINDER COURSE, TYPE I 19.0C
- Ⓒ 4 in. BIT. CONC. BASE COURSE, TYPE B 25.0C OR 8 in. COMPACTED AGGREGATE BASE COURSE
- Ⓓ 4 in. CONCRETE SIDEWALK; 5 ft. WIDTH

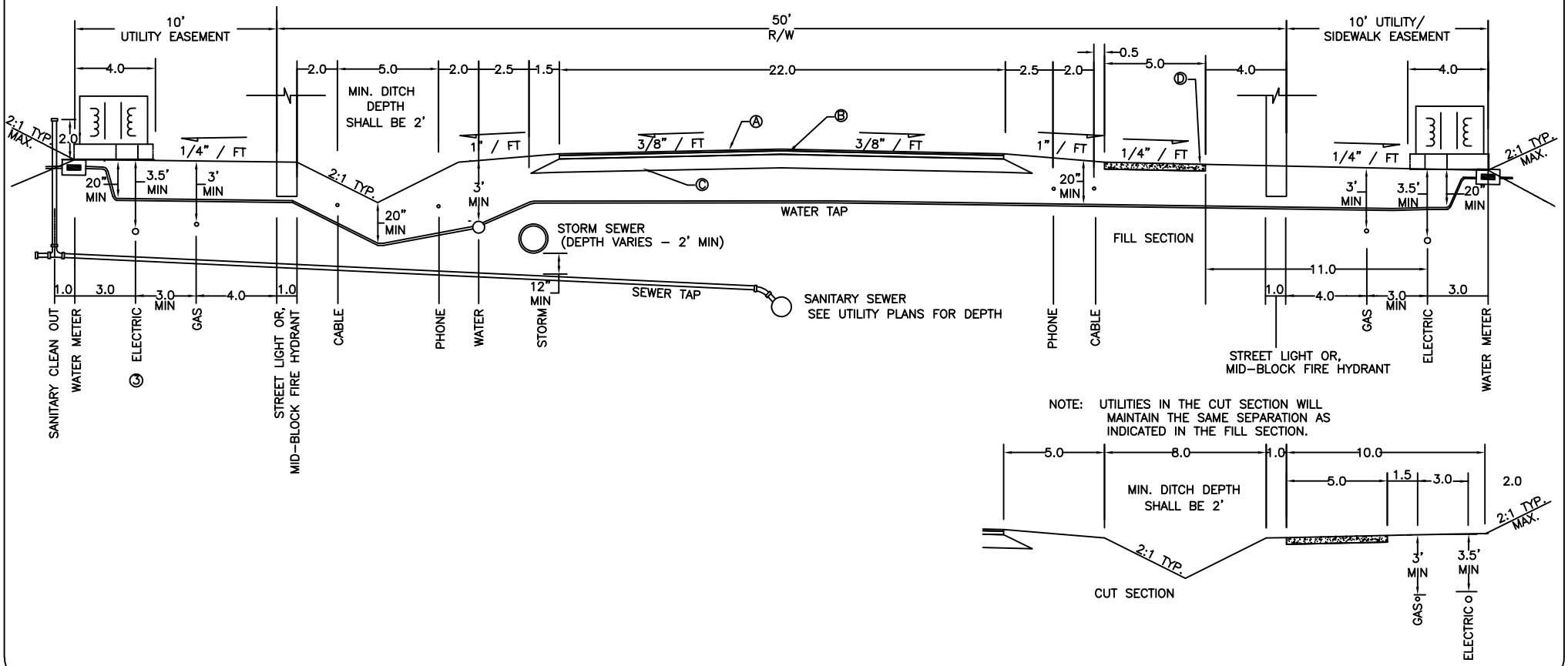
changed type

Removed note: "Pavement structure for residential streets with less than 4,000 vehicles per day

NOTES

1. UTILITY LOCATIONS SHOWN ARE FOR ALL UTILITIES AND SHALL NOT BE DEVIATED FROM WITHOUT CITY OF MONROE APPROVAL
2. DEPTHS SHOWN ARE MINIMUM DEPTHS
3. STREET LIGHTS WILL BE ON ONE SIDE OF ROAD DEPENDING ON SUBDIVISION LAYOUT
4. FIRE HYDRANT/STREET LIGHTS SHALL BE ALIGNED WITH COMMON LOT LINE OF PARCELS
5. MAINTAIN AT LEAST ONE SURVEY STAKE FOR THE BACK OF CURB AND THE BACK OF THE UTILITY EASEMENT PER LOT.
6. FINAL SURFACE ASPHALT TO BE PLACED ONCE PARCEL(S) ARE 80% DEVELOPED OR ONE YEAR FOLLOWING INTERMEDIATE COURSE PLACEMENT, WHICHEVER OCCURS FIRST.
7. TACK COAT TO BE APPLIED BETWEEN EACH LAYER OF ASPHALT, EVEN WHEN LAYERS ARE PLACED ON THE SAME DAY.

New notes



NOTE: UTILITIES IN THE CUT SECTION WILL MAINTAIN THE SAME SEPARATION AS INDICATED IN THE FILL SECTION.

REVISIONS		
NO.	DATE	DESCRIPTION
1	4/20/04	MODIFIED FOR SUPERPAVE
2	05/2008	UTIL EASEMENT 1/4"/FT RELOCATE CABLE/PHONE PAVEMENT SCHEDULE "B"
3	01/2015	RELOCATE UTILITIES
4	10/2022	RELOCATE SANITARY SEWER CLEAN OUT & WATER METER BOX. ADDED NOTE 5.
5	03/2025	ADD NOTES 6 AND 7. CHANGE ASPHALT TYPES. DELETE ITEMS

Monroe North Carolina

RESIDENTIAL STREET WITH DITCHES FOR 50' R/W

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: JAM | DATE: 08-07-01
CHECKED BY: JNL | SCALE: N.T.S.

DETAIL 02.01.02

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PAVEMENT SCHEDULE*

- Ⓐ 1 in. BIT. CONC., SURFACE COURSE, TYPE S9.5
- Ⓑ 2.5 in. BIT. CONC. BINDER COURSE, TYPE I 19.0C
- Ⓒ 4 in. BIT. CONC. BASE COURSE, TYPE B 25.0C OR 8 in. COMPACTED AGGREGATE BASE COURSE
- Ⓓ 2 ft. 0 in. VALLEY & GUTTER
- Ⓔ 4 in. CONCRETE SIDEWALK; 5 ft. WIDTH

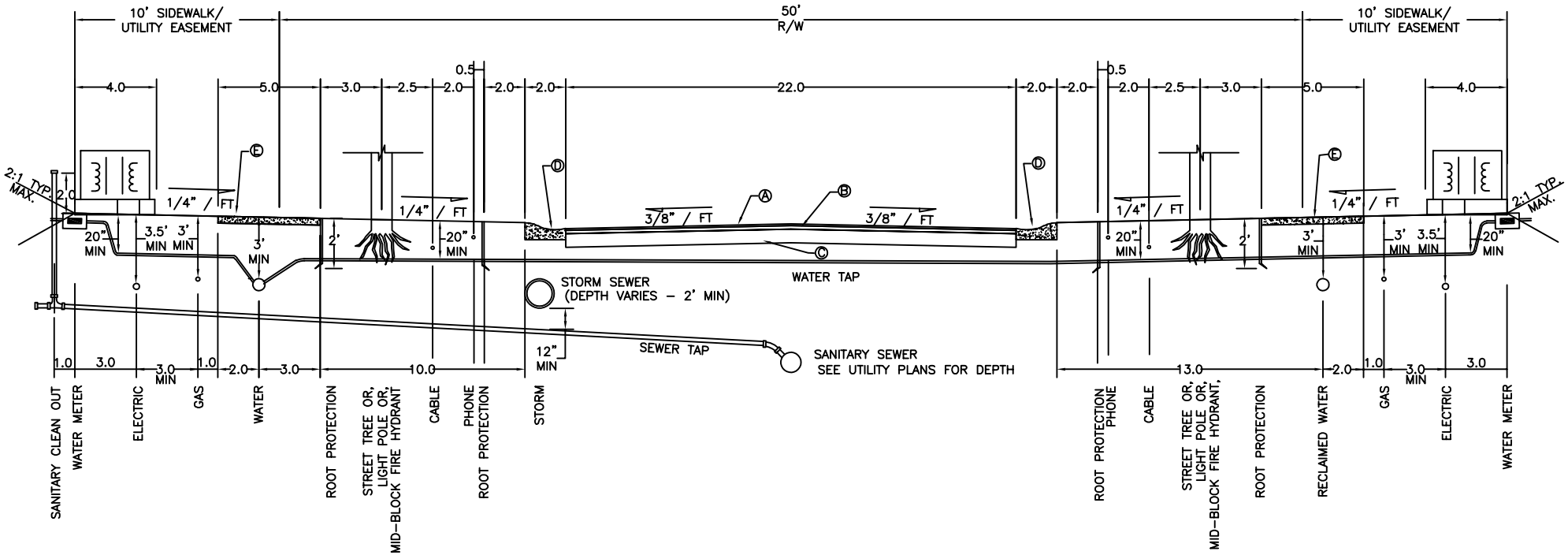
changed type

Removed note: "Pavement structure for residential streets with less than 4,000 vehicles per day

NOTES

1. UTILITY LOCATIONS SHOWN ARE FOR ALL UTILITIES AND SHALL NOT BE DEVIATED FROM WITHOUT CITY OF MONROE APPROVAL
2. DEPTHS SHOWN ARE MINIMUM DEPTHS
3. STREET LIGHTS WILL BE ON ONE SIDE OF ROAD DEPENDING ON SUBDIVISION LAYOUT
4. FIRE HYDRANT/STREET LIGHTS SHALL BE ALIGNED WITH COMMON LOT LINE OF PARCELS
5. MAINTAIN AT LEAST ONE SURVEY STAKE FOR THE BACK OF CURB AND THE BACK OF THE EASEMENT PER LOT.
6. FINAL SURFACE ASPHALT TO BE PLACED ONCE PARCEL(S) ARE 80% DEVELOPED OR ONE YEAR FOLLOWING INTERMEDIATE COURSE PLACEMENT, WHICHEVER OCCURS FIRST.
7. TACK COAT TO BE APPLIED BETWEEN EACH LAYER OF ASPHALT, EVEN WHEN LAYERS ARE PLACED ON THE SAME DAY.
8. ROOT BARRIER SHALL BE A MINIMUM OF TWO FEET DEEP FROM FINAL SUB GRADE AND EXTEND THREE FEET PAST THE CANOPY ON EACH SIDE OF THE TREE.

New notes



REVISIONS		
NO.	DATE	DESCRIPTION
1	4/20/04	WAS 02.01.03
2	4/20/04	MODIFIED FOR SUPERPAVE
3	05/2008	UTIL EASEMENT 1/4"/FT RELOCATE PHONE/CABLE PAVEMENT SCHEDULE "B"
4	10/2022	RELOCATE SANITARY SEWER CLEAN OUT & WATER METER BOX. ADDED TREE ROOT PROTECTION DEPTH. ADDED NOTE 5.
5	03/2025	ADD NOTES 6, 7 AND 8. CHANGE ASPHALT TYPES. DELETE ITEMS

Monroe North Carolina

RESIDENTIAL STREET WITH STREET TREES FOR 50' R/W (1 of 2)

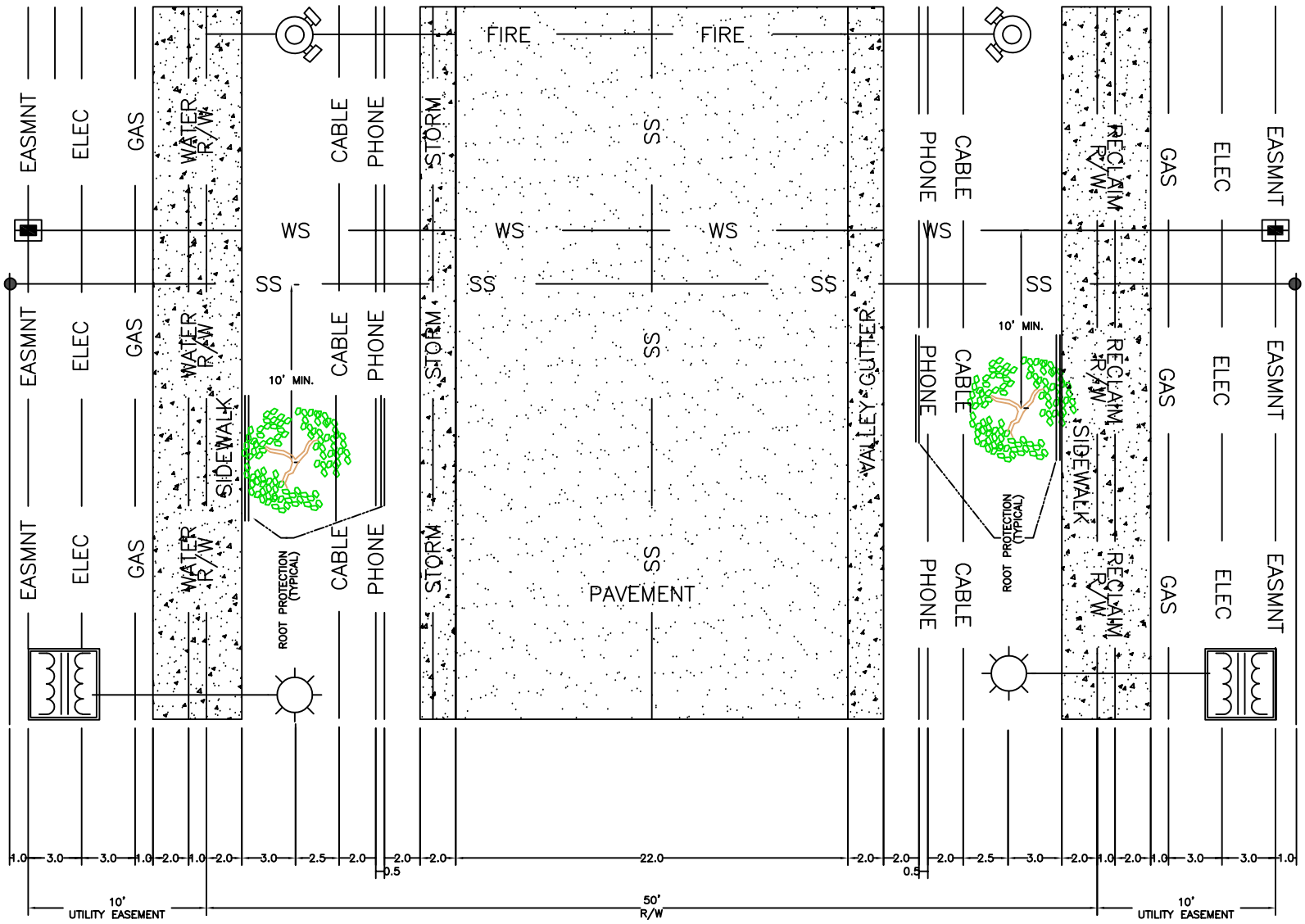
CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: JAM | DATE: 08-07-01
CHECKED BY: JNL | SCALE: N.T.S.

DETAIL 02.01.03A

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REVISIONS		
NO.	DATE	DESCRIPTION
1	4/20/04	WAS 02.01.04
2	05/2008	RELOCATE PHONE/CABLE
3	10/2022	RELOCATE SANITARY SEWER CLEAN OUT & WATER METER BOX.

Monroe North Carolina

RESIDENTIAL STREET WITH STREET TREES FOR 50' R/W; PLAN VIEW (2 of 2)

CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: JAM | DATE: 08-07-01
CHECKED BY: JNL | SCALE: N.T.S.

DETAIL 02.01.03B

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PAVEMENT SCHEDULE*
Ⓐ 2" BIT. CONC., SURFACE COURSE, TYPE S9.5
Ⓑ 2.5" BIT. CONC. BINDER COURSE, TYPE I 19.0C
Ⓒ 10" COMPACTED AGGREGATE BASE COURSE
Ⓓ 2'–0" VALLEY & GUTTER
Ⓔ 4"CONCRETE SIDEWALKS, 5' WIDTH

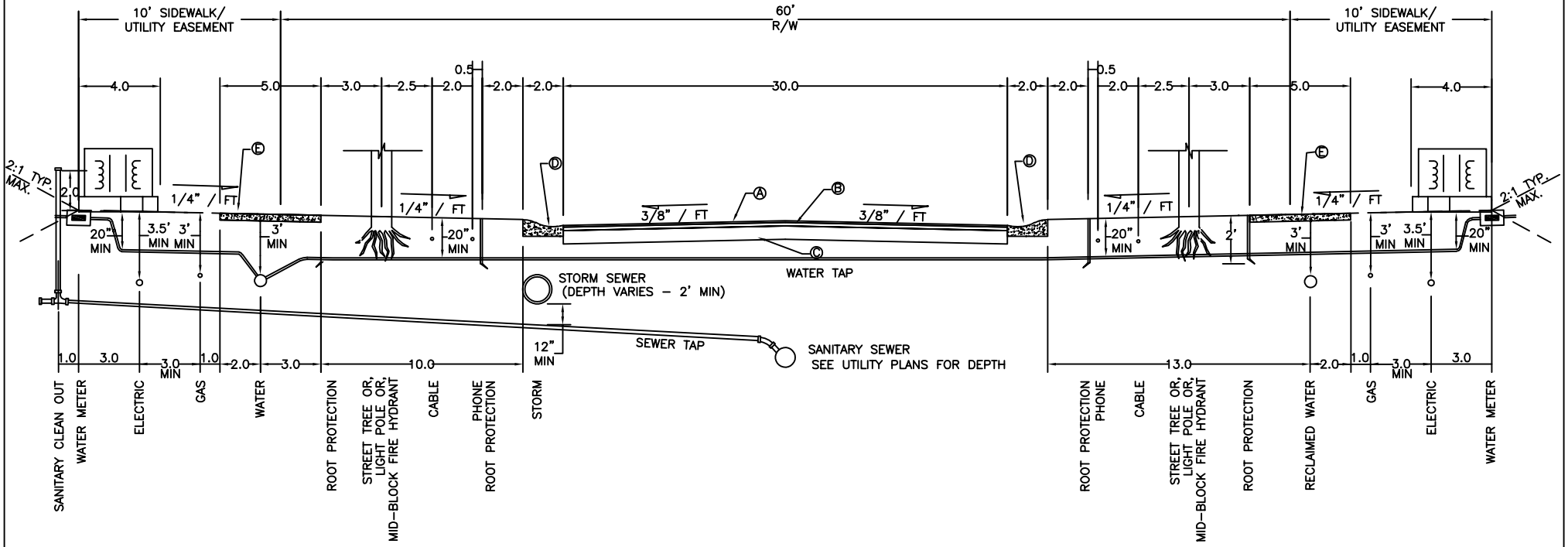
changed type

Removed note: "Pavement structure for residential streets with less than 4,000 vehicles per day

NOTES

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2. DEPTHS SHOWN ARE MINIMUM DEPTHS
3. STREET LIGHTS WILL BE ON ONE SIDE OF ROAD DEPENDING ON SUBDIVISION LAYOUT
4. FIRE HYDRANT/STREET LIGHTS SHALL BE ALIGNED WITH COMMON LOT LINE OF PARCELS
5. MAINTAIN AT LEAST ONE SURVEY STAKE FOR THE BACK OF CURB AND THE BACK OF THE UTILITY EASEMENT PER LOT.
6. SURFACE ASPHALT TO BE PLACED ONCE PARCEL(S) ORE 80% DEVELOPED OR ONE YEAR FOLLOWING INTERMEDIATE COURSE PLACEMENT, WHICHEVER OCCURS FIRST.
7. TACK COAT TO BE APPLIED BETWEEN EACH LAYER OF ASPHALT, EVEN WHEN LAYERS ARE PLACED ON THE SAME DAY.
8. 2" ASPHALT SURFACE MAY BE APPLIED IN TWO LIFTS. FIRST SURFACE LIFT APPLIED IMMEDIATELY FOLLOWING INTERMEDIATE PLACEMENT.
9. ROOT BARRIER SHALL BE A MINIMUM OF TWO FEET DEEP FROM FINAL SUB GRADE AND EXTEND THREE FEET PAST THE CANOPY ON EACH SIDE OF THE TREE

New notes



REVISIONS		
NO.	DATE	DESCRIPTION
1	05/2008	ADD"B"TO 19.0 & UTIL 1/4"/FT, RELOCATE PHONE/CABLE, PAVEMENT SCHEDULE "B"
2	10/2022	RELOCATE SANITARY SEWER CLEAN OUT & WATER METER BOX. ADDED TREE ROOT PROTECTION DEPTH. ADDED NOTE 5.
3	03/2025	ADD NOTES 6 – 9, DELETE ITEMS

Monroe North Carolina

RESIDENTIAL COLLECTOR STREET WITH STREET TREES FOR 60' R/W (1 of 2)

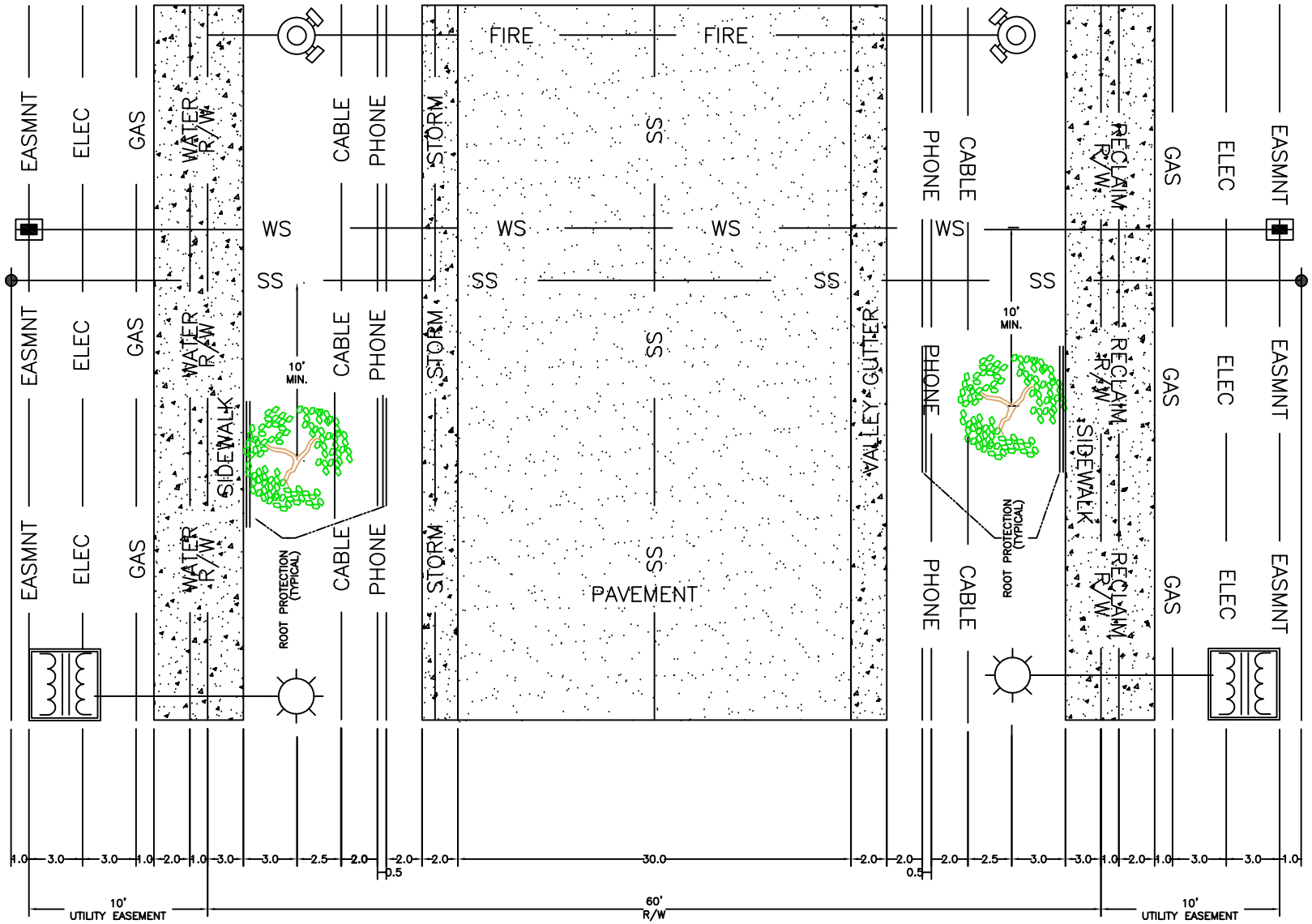
CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: CJO | DATE: 4-20-04
CHECKED BY: JNL | SCALE: N.T.S.

DETAIL 02.01.04A

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REVISIONS		
NO.	DATE	DESCRIPTION
1	05/2008	RELOCATE PHONE/CABLE
2	10/2022	RELOCATE SANITARY SEWER CLEAN OUT & WATER METER BOX.

Monroe North Carolina

RESIDENTIAL COLLECTOR STREET WITH STREET TREES FOR 60' R/W; PLAN VIEW (2 of 2)

CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: CJO | DATE: 4-20-04
CHECKED BY: JNL | SCALE: N.T.S.

DETAIL 02.01.04B

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PAVEMENT SCHEDULE*

- Ⓐ 1 in. BIT. CONC., SURFACE COURSE, TYPE S9.5
- Ⓑ 2.5 in. BIT. CONC. BINDER COURSE, TYPE I 19.0C
- Ⓒ 4 in. BIT. CONC. BASE COURSE, TYPE B 25.0C OR 8 in. COMPACTED AGGREGATE BASE COURSE
- Ⓓ 2 ft. 0 in. VALLEY & GUTTER
- Ⓔ 4 in. CONCRETE SIDEWALK; 5 ft. WIDTH

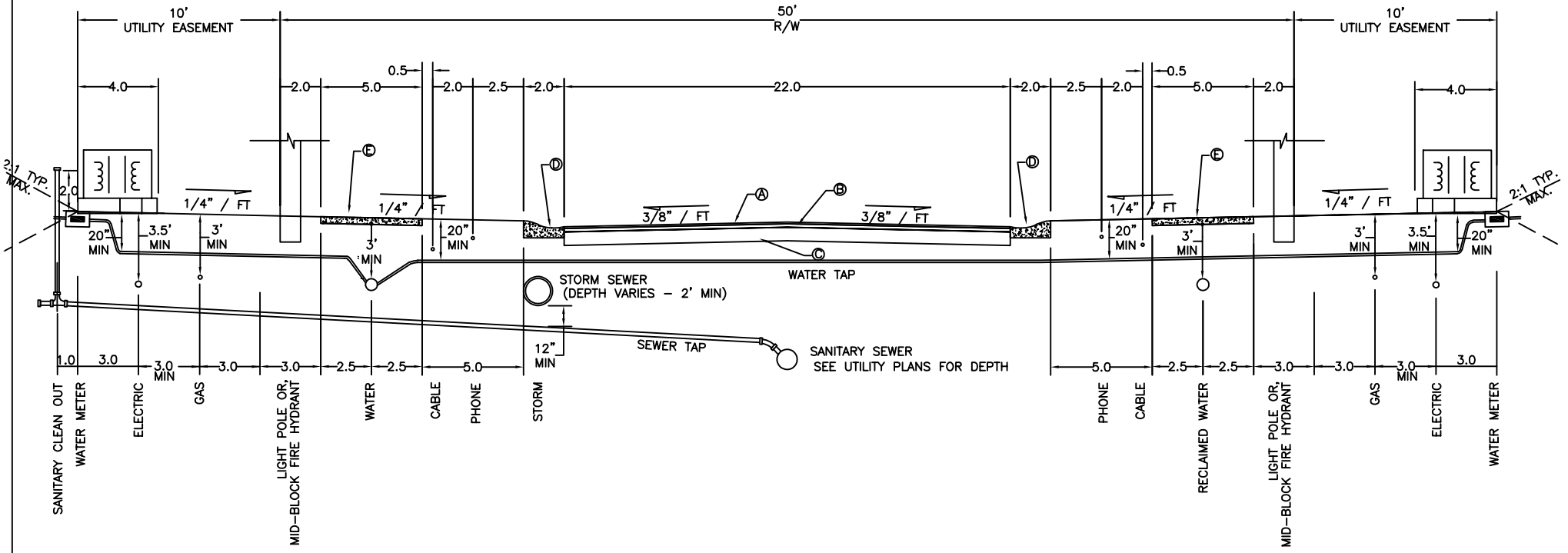
changed type

Removed note: "Pavement structure for residential streets with less than 4,000 vehicles per day

NOTES

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7. TACK COAT TO BE APPLIED BETWEEN EACH LAYER OF ASPHALT, EVEN WHEN LAYER ARE PLACED ON THE SAME DAY

New notes



REVISIONS		
NO.	DATE	DESCRIPTION
1	4/20/04	MODIFIED FOR SUPERPAVE
2	05/2008	UTIL EASEMENT 1/4"/FT;RELOCATE PHONE/CABLE, PAVEMENT SCHEDULE "B"
3	10/2022	RELOCATE SANITARY SEWER CLEAN OUT & WATER METER BOX. ADDED NOTE 6.
4	03/2025	ADD NOTES 6 AND 7, CHANGE ASPHALT TYPES, DELETE ITEMS

Monroe North Carolina

RESIDENTIAL STREET WITHOUT STREET TREES FOR 50' R/W

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: JAM | DATE: 08-07-01
CHECKED BY: JNL | SCALE: N.T.S.

DETAIL 02.01.05

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PAVEMENT SCHEDULE *
Ⓐ 2.5 in. BIT. CONC., SURFACE COURSE, TYPE S9.5
Ⓑ 2.5 in. BIT. CONC., BASE COURSE, TYPE I 19.0C
Ⓒ 10 in. AGGREGATE BASE COURSE **
Ⓓ 2 ft. 6 in. CURB & GUTTER
Ⓔ 4 in. CONCRETE SIDEWALK, 5 ft. WIDTH

changed type

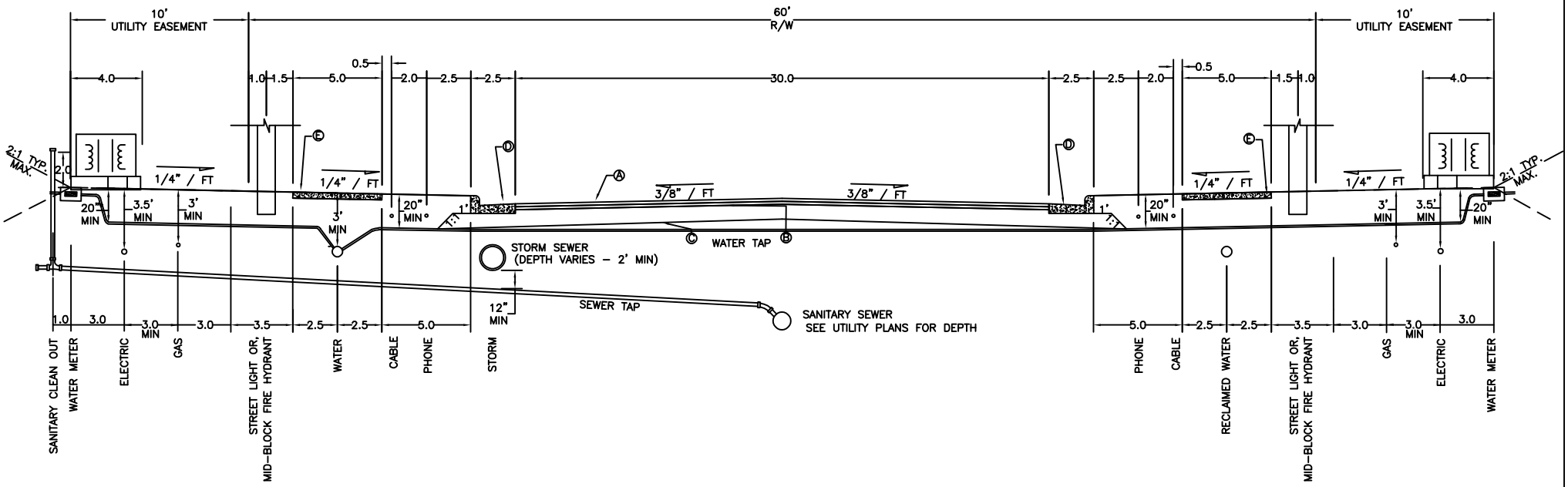
Removed notes: "Pavement structure for residential streets with less than 4,000 vehicles per day

"Stone requirements under the curbline may be waived for certain uses...etc.

NOTES

1. UTILITY LOCATIONS SHOWN ARE FOR ALL UTILITIES AND SHALL NOT BE DEVIATED FROM WITHOUT CITY OF MONROE APPROVAL
2. DEPTHS SHOWN ARE MINIMUM DEPTHS
3. STREET LIGHTS WILL BE ON ONE SIDE OF ROAD DEPENDING ON SUDIVISION LAYOUT
4. FIRE HYDRANT/STREET LIGHTS SHALL BE ALIGNED WITH COMMON LOT LINE OF PARCELS
5. MAINTAIN AT LEAST ONE SURVEY STAKE FOR THE BACK OF CURB AND THE BACK OF THE UTILITY EASEMENT EVERY 100 FT
6. FINAL SURFACE ASPHALT TO BE PLACED ONCE PARCEL(S) ARE 80% DEVELOPED OR ONE YEAR FOLLOWING INTERMEDIATE COURSE PLACEMENT, WHICHEVER OCCURS FIRST
7. TACK COAT TO BE APPLIED BETWEEN EACH LAYER OF ASPHALT, EVEN WHEN LAYERS ARE PLACED ON THE SAME DAY

New notes



REVISIONS		
NO.	DATE	DESCRIPTION
1	4/20/04	UPDATE NOTES
2	05/2008	UTIL EASEMENT 1/4" /RELOCATE PHONE/CABLE PAVEMENT SCHEDULE A & B
3	10/2022	RELOCATE SANITARY SEWER CLEAN OUT & WATER METER BOX. ADDED NOTE 5.
4	03/2025	ADDED NOTES 6 AND 7, CHANGED ASPHALT TYPES, DELETED ITEMS

Monroe North Carolina

COLLECTOR/COMMERCIAL/INDUSTRIAL STREET FOR 60' R/W

CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: JAM | DATE: 08-07-01
CHECKED BY: JNL | SCALE: N.T.S.

DETAIL 02.01.06

deleted text

PAVEMENT SCHEDULE*
Ⓐ 2.5 in. BIT. CONC., SURFACE COURSE, TYPE S9.5
Ⓑ 2.5 in. BIT. CONC. BINDER COURSE, TYPE I 19.0C
Ⓒ 10 in. COMPACTED AGGREGATE BASE COURSE
Ⓓ 2 ft. 6 in. CURB & GUTTER
Ⓔ 4 in. CONCRETE SIDEWALKS, 5 ft. WIDTH

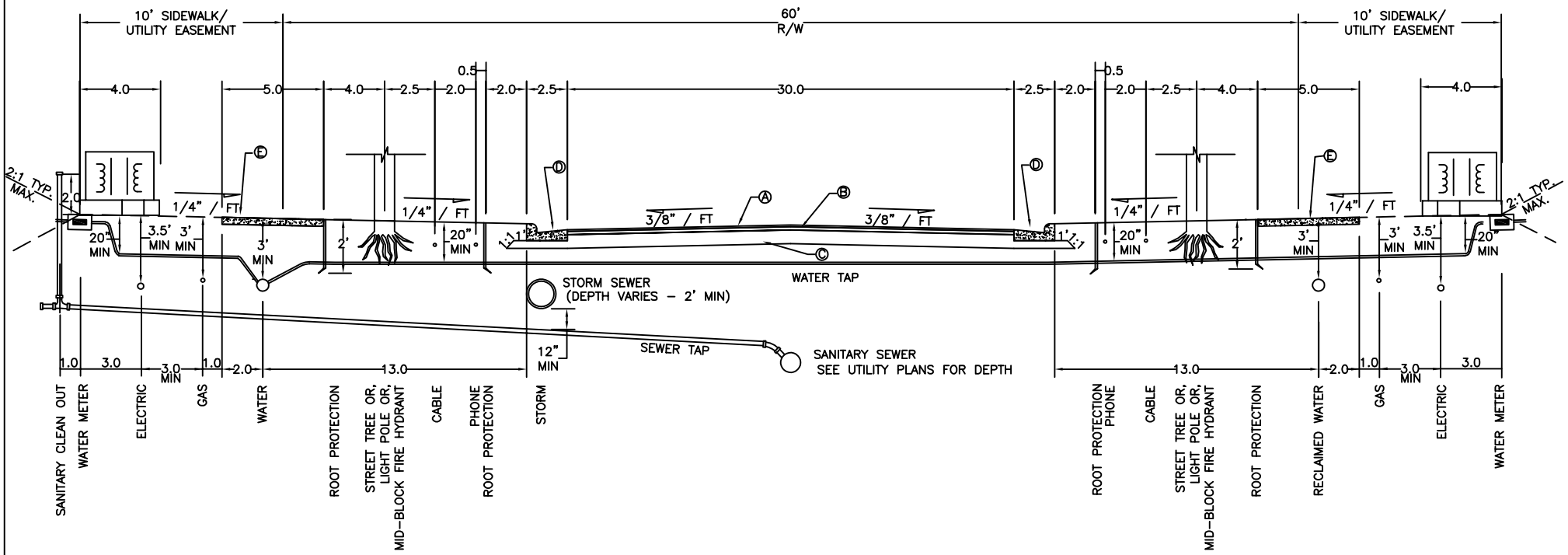
changed type

Removed note: "Pavement structure for residential streets with less than 4,000 vehicles per day

NOTES

1. UTILITY LOCATIONS SHOWN ARE FOR ALL UTILITIES AND SHALL NOT BE DEVIATED FROM WITHOUT CITY OF MONROE APPROVAL
2. DEPTHS SHOWN ARE MINIMUM DEPTHS
3. STREET LIGHTS WILL BE ON ONE SIDE OF ROAD DEPENDING ON SUBDIVISION LAYOUT
4. FIRE HYDRANT/STREET LIGHTS SHALL BE ALIGNED WITH COMMON LOT LINE OF PARCELS
5. MAINTAIN AT LEAST ONE SURVEY STAKE FOR THE BACK OF CURB AND THE BACK OF THE UTILITY EASEMENT EVERY 100 FT
6. FINAL SURFACE ASPHALT TO BE PLACED ONCE PARCEL(S) ARE 80% DEVELOPED OR ONE YEAR FOLLOWING INTERMEDIATE COURSE PLACEMENT, WHICHEVER OCCURS FIRST
7. TACK COAT TO BE APPLIED BETWEEN EACH LAYER OF ASPHALT, EVEN WHEN LAYERS ARE PLACE ON THE SAME DAY
8. ROOT BARRIER SHALL BE A MINIMUM OF TWO FEET DEEP FROM FINAL SUB GRADE AND EXTEND THREE FEET PAST THE CONOPY ON EACH SIDE OF THE TREE

New notes



REVISIONS		
NO.	DATE	DESCRIPTION
1	05/2008	UTIL EASEMENT 1/4" /FT, RELOCATE PHONE/CABLE PAVEMENT SCHEDULE A & B
2	10/2022	RELOCATE SANITARY SEWER CLEAN OUT & WATER METER BOX. ADDED TREE ROOT PROTECTION DEPTH. ADDED NOTE 6.
3	03/2025	ADD NOTE 6, 7 AND 8, CHANGE ASPHALT TYPES, DELETE ITEMS

Monroe North Carolina

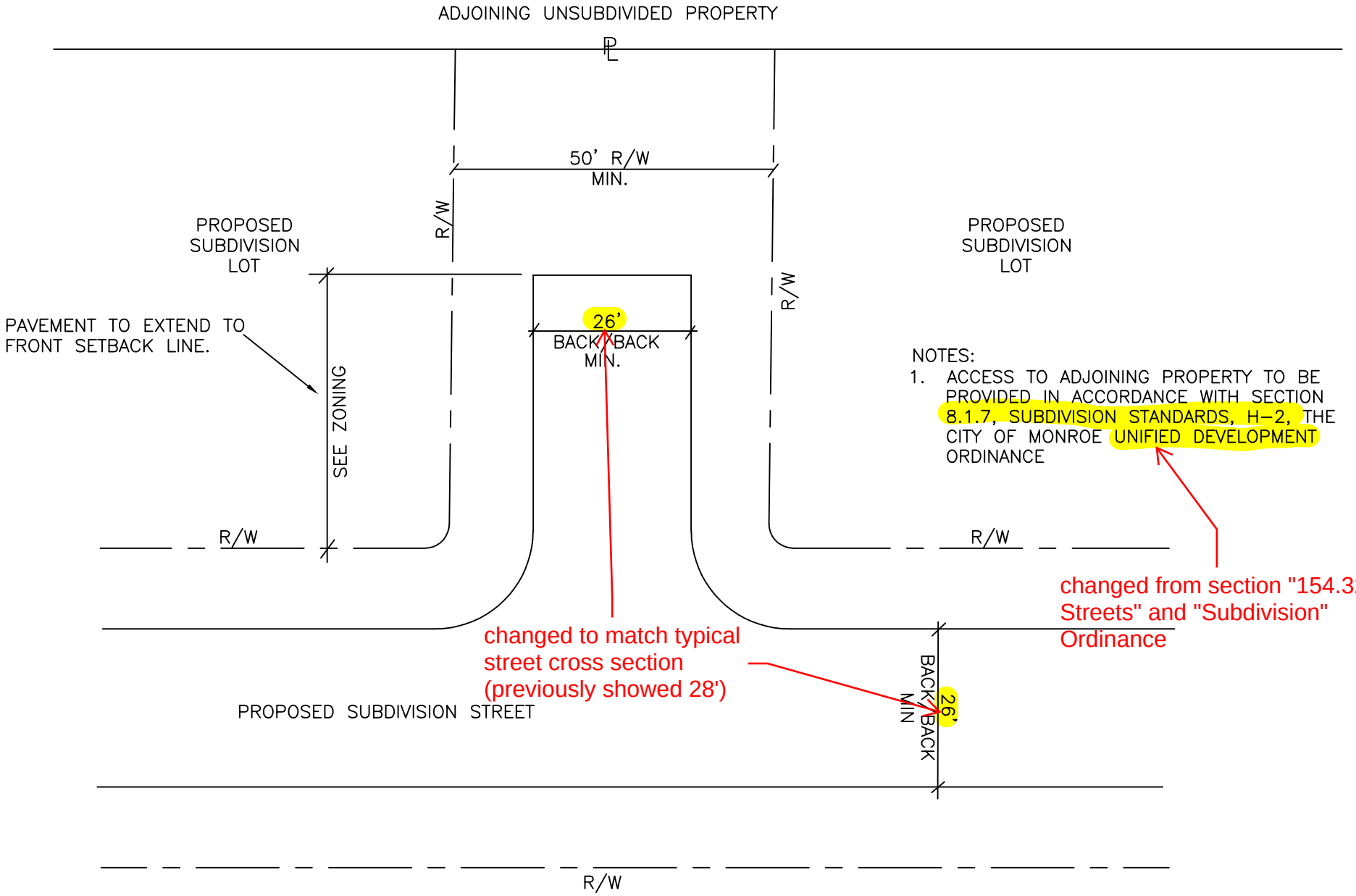
COLLECTOR/COMMERCIAL/INDUSTRIAL STREET WITH STREET TREES FOR 60' R/W

CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: DKO | DATE: 04-20-04
CHECKED BY: JNL | SCALE: N.T.S.

DETAIL 02.01.07



REVISIONS		
NO.	DATE	DESCRIPTION
1	03/2025	CHANGE ORDINANCE REF

Monroe North Carolina

ACCESS TO ADJOINING UNSUBDIVIDED PROPERTY

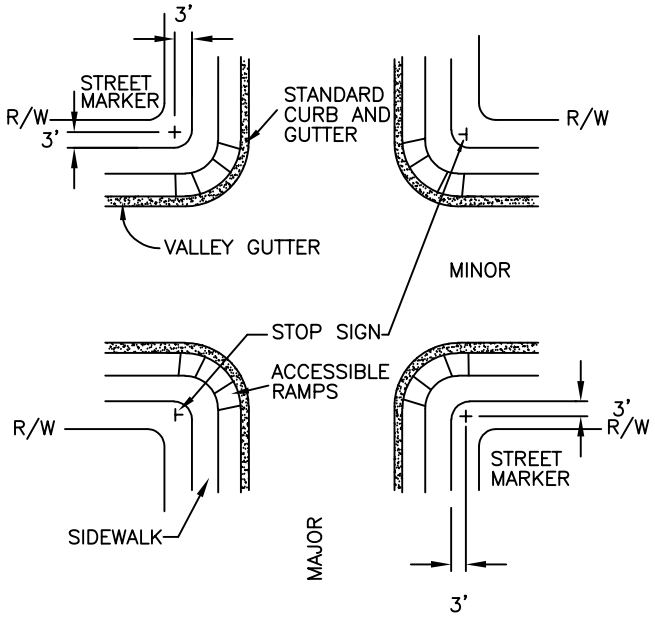
CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

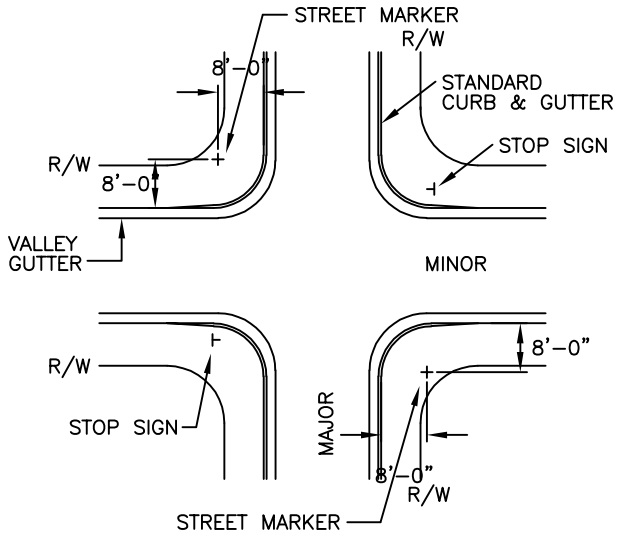
FILE: I:/Maps-Details/Detail Manual/Details	
DRAWN BY: JAM	DATE: 08-07-01
CHECKED BY: JNL	SCALE: N.T.S.

DETAIL 02.01.11

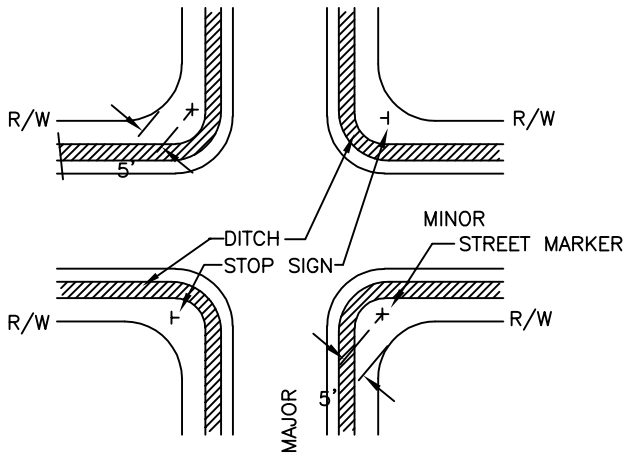
INTERSECTION with SIDEWALK, CURB, and GUTTER



INTERSECTION with CURB and GUTTER



INTERSECTION with DITCHES, and NO CURB and GUTTER



NOTE:
THE DEVELOPER IS REQUIRED TO CONTACT THE CITY OF MONROE ENGINEERING DEPARTMENT FOR SIGN INSTALLATION IN ACCORDANCE WITH SECTION 02.02.07.

New numbering to match new page 02.01.12B

REVISIONS		
NO.	DATE	DESCRIPTION
1	05/08	WAS 02.02.06
2	04/25	WAS 02.01.12

Monroe North Carolina

STREET NAME SIGN INSTALLATION LOCATIONS

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: JAM | DATE: 08-07-01
CHECKED BY: JNL | SCALE: N.T.S.

DETAIL 02.01.12A

NEW PAGE

Supplement to 02.01.12A

NOTES

- All traffic signs and other traffic control devices placed on the municipal street system must conform to the appearance criteria of the Manual on Uniform Traffic Control Devices. Reference is made to North Carolina General Statute 136–30.
- All decorative posts shall be of a suitable breakaway or yielding design.
- All signs shall have high intensity prismatic reflective sheeting.
- All signs shall be installed with a minimum vertical distance from the edge of pavement to the bottom of the sign of 7 feet.
- The standard size for stop signs is 30 x 30 inches.
- The standard size for speed limit signs is 24 x 30 inches.
- Street identification signs shall be placed on the corner opposite the stop signs and shall be 9–inch blade in width. The signs shall have a green background with white lettering. Lettering shall be composed of initial upper–case letter 6–inches in height and lower–case letters 4.5 inches in height.
- Costs associated with the installation of the decorative posts and signs are the developer's responsibility. Placement of the signs in the field shall be coordinated with the City's construction inspector. If the decorative posts should become damaged or in need of repair and/or maintenance, it will be the Homeowners Association's responsibility to correct at their costs. The City reserves the right to re–install any sign with a galvanized post until replacement decorative post(s) can be installed by the Homeowners Association.
- Installation of the decorative sign posts will indicate acceptance of the above requirements and that the developer is accepting the future maintenance responsibility on behalf of the Homeowners Association.

REVISIONS		
NO.	DATE	DESCRIPTION

Monroe North Carolina

MINIMUM REQUIREMENTS for DEVELOPER INSTALLED STREET SIGNS

CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details	
DRAWN BY: KMM	DATE: 04-07-25
CHECKED BY: SAM	SCALE: N.T.S.

DETAIL 02.01.12B

THE SUBGRADE AND STONE BASE IN PAVED AREAS SHALL BE PROOF–ROLLED WITH A LOADED DUMP TRUCK OR SIMILAR PNEUMATIC TIRED VEHICLE WITH A LOADED WEIGHT OF AT LEAST 20 TONS. ANY IDENTIFIED UNSTABLE AREAS SHALL BE REPAIRED BEFORE PLACEMENT OF THE NEXT SUCCESSIVE LIFT.

AREAS THAT RUT OR PUMP 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.

Added method of stabilization

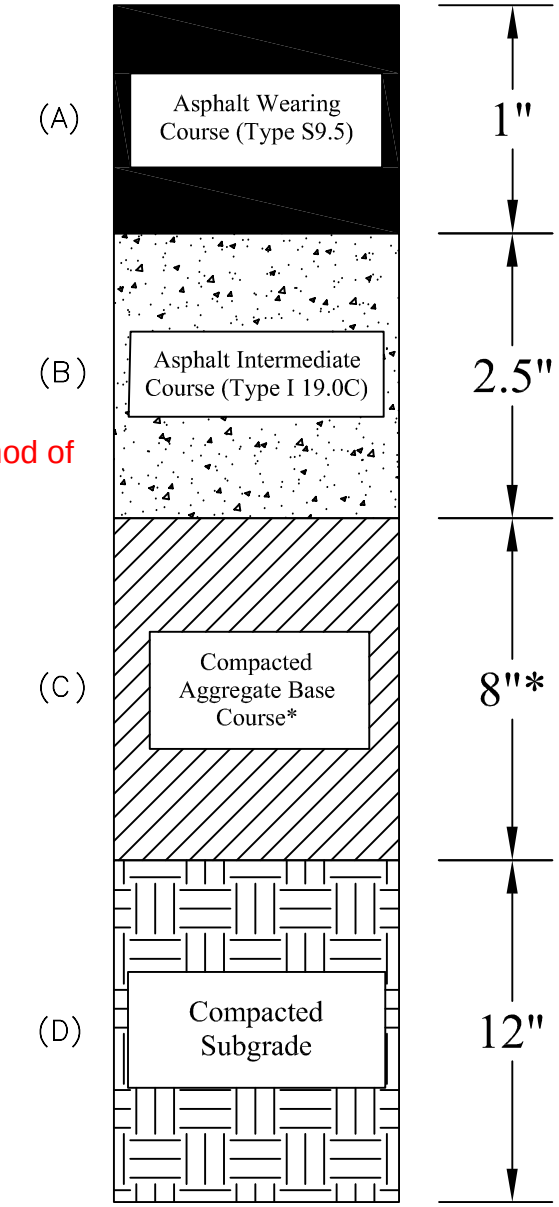
APPROVED METHODS OF STABILIZATION SHALL INCLUDE LIME STABILIZATION OF HIGH PLASTICITY CLAYS OR EXCESSIVELY WET SOILS, SOIL CEMENT STABILIZATION, THE USE OF GEOSYNTHETIC OR GEOGRID MATERIAL, OR OTHER STABILIZATION METHODS AS APPROVED BY THE CITY ENGINEER.

PAVEMENT STRUCTURE IS FOR LOW–VOLUME RESIDENTIAL ROADWAYS. ROADWAYS WITH TRAFFIC GREATER THAN 4,000 VEHICLES PER DAY (VPD) REQURE A PAVEMENT DESIGN.

EXPOSED LAYERS OF I19.0C MUST BE PAVED WITH LAYER "A" OR SEALED IN ACCORDANCE WITH SECTION 660 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

* TACK COAT TO BE APPLIED BETWEEN EACH LAYER OF ASPHALT, EVEN WHEN LAYERS ARE PLACED ON THE SAME DAY

Added note



COMPACTION REQUIREMENTS:

(A) 92% MAX. SPEC. GRAVITY (AASHTO T209)

(B) 92% MAX. SPEC. GRAVITY (AASHTO T209)

(C) 100% MAX. DRY DENSITY (AASHTO T180)

(D) 100% MAX. DRY DENSITY (AASHTO T99)

Added

ROADBED BELOW (D) SHALL BE PROOF–ROLLED AND UNSTABLE AREAS REMOVED BEFORE PLACEMENT OF FILL. OR BEFORE BEGINNING ALTERNATIVE, APPROVED METHODS OF ROADWAY STABILIZATION. ROADWAY EMBANKMENT MATERIAL SHALL BE COMPACTED TO A DENSITY OF AT LEAST 95% OF THE MAX. DRY DENSITY (AASHTO T99) EXCEPT FOR THE FINAL 12" AS DEFINED BY (D)

PROPER EVALUATION OF SOILS WITHIN A DEVELOPMENT IS RECOMMENDED TO DETERMINE IF THE MINIMUM REQUIRED PAVEMENT STRUCTURE IS ACCEPTABLE FOR THE SOILS AND USES PLANNED. REDUCTION IN PAVEMENT STRUCTURE WILL BE ALLOWED PURSUANT TO CBR TESTING OF THE SOILS AND SUBMITTED PAVEMENT DESIGN, BUT IN NO CASE WILL A PAVEMENT STRUCTURE LESS THAN 8" OF COMPACTED AGGREGATE BASE COURSE (OR 4" ASPHALT BASE COURSE, TYPE B 25.0C) AND 1.5" ASPHALT SURFACE COURSE, TYPE S9.5 BE ACCEPTED.

* 4" OF ASPHALT BASE, TYPE B 25.0C, MAY BE USED IN LIEU OF LAYER "C."

REVISIONS		
NO.	DATE	DESCRIPTION
1	4/20/04	MODIFIED TO SUPERPAVE
2	05/2008	CLARIFICATION OF SPECIFICATIONS
3	03/2025	CHANGED ASPHALT TYPES, EDITED SOME NOTES

Monroe North Carolina

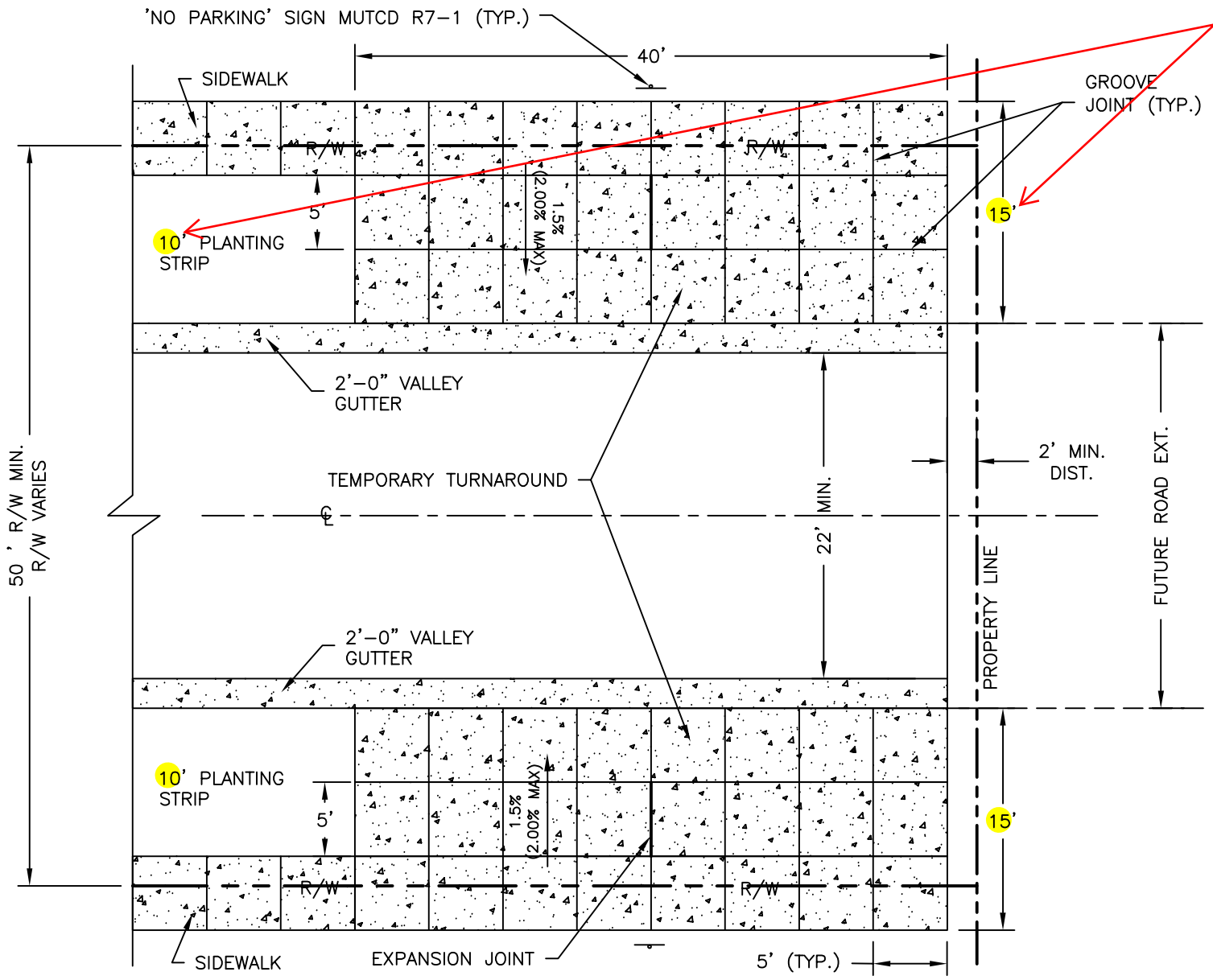
RESIDENTIAL STREET PAVEMENT STRUCTURE

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: JAM | DATE: 08-07-01
CHECKED BY: JNL | SCALE: N.T.S.

DETAIL 02.01.13



redrawn with proper scaling to illustrate CoM Standards

NOTES

1. TEMPORARY TURNAROUND MATERIAL SHALL BE MIN. 3600 PSI CONCRETE, 6" THICK.

2. TEMPORARY INSTALLATION ONLY – TO BE REMOVED WHEN FUTURE DEVELOPMENT CONNECTS TO STREET. "SIDEWALK" PORTION OF TURNAROUND MAY BE LEFT IN PLACE IF NOT DAMAGED.

3. NOT TO BE USED AS A PRIVATE DRIVEWAY.

4. END OF ROADWAY MARKERS TO BE INSTALLED ACCORDING TO CITY OF MONROE STANDARD DETAIL 02.07.01

REVISIONS		
NO.	DATE	DESCRIPTION
1	03/2025	ADJUSTED SCALING

Monroe North Carolina

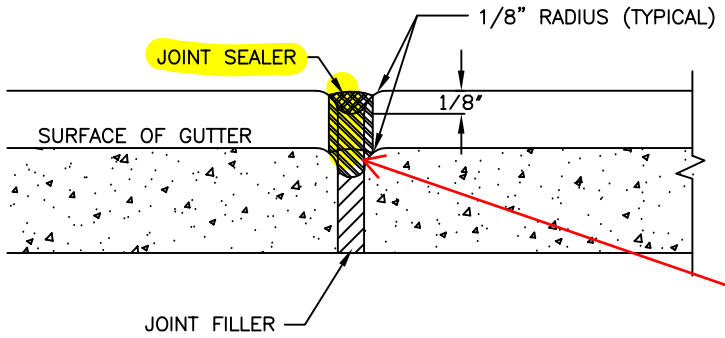
VALLEY CURB "T" TURNAROUND TEMPORARY

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details	
DRAWN BY: KMM	DATE: 05/2022
CHECKED BY: SAM	SCALE: N.T.S.

DETAIL 02.01.15B



TRANSVERSE EXPANSION JOINT

Added note and depiction of joint sealer

NOTES:

1. CONTRACTION JOINTS SHALL BE SPACED AT 10–FOOT INTERVALS. FOR VALLEY GUTTER, A 15–FOOT SPACING MAY BE USED WHEN A MACHINE IS USED. JOINT SPACING MAY BE ALTERED BY THE ENGINEER TO PREVENT UNCONTROLLED CRACKING.
2. CONTRACTION JOINTS MAY BE INSTALLED BY THE USE OF TEMPLATES OR FORMED BY OTHER APPROVED METHODS. WHERE SUCH JOINTS ARE NOT FORMED BY TEMPLATES, A MINIMUM DEPTH OF 1 1/2" SHALL BE OBTAINED.
3. ALL EXPANSION JOINTS SHALL BE SPACED AT 90 FOOT INTERVALS, AND ADJACENT TO ALL RIGID OBJECTS. JOINTS SHALL MATCH LOCATIONS WITH JOINTS IN ABUTTING SIDEWALK.
4. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3600 P.S.I. IN 28 DAYS.
5. CURB SHALL BE DEPRESSED TO MEET ALL CURRENT ADA STANDARDS AT INTERSECTIONS TO PROVIDE FOR FUTURE ACCESSIBLE RAMPS IF RAMPS ARE NOT PART OF PROJECT.
6. TOP 12" OF SUBGRADE BENEATH THE CURB AND GUTTER SHALL BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.
7. THE SUBGRADE SHALL BE PROOF ROLLED PRIOR TO PLACING FORMS.
8. ALL EXPANSION JOINT FOR CONCRETE TO 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 (NOT BLACK).

REVISIONS		
NO.	DATE	DESCRIPTION
1	03/2025	ADDED JOINT SEALER REFS

Monroe North Carolina

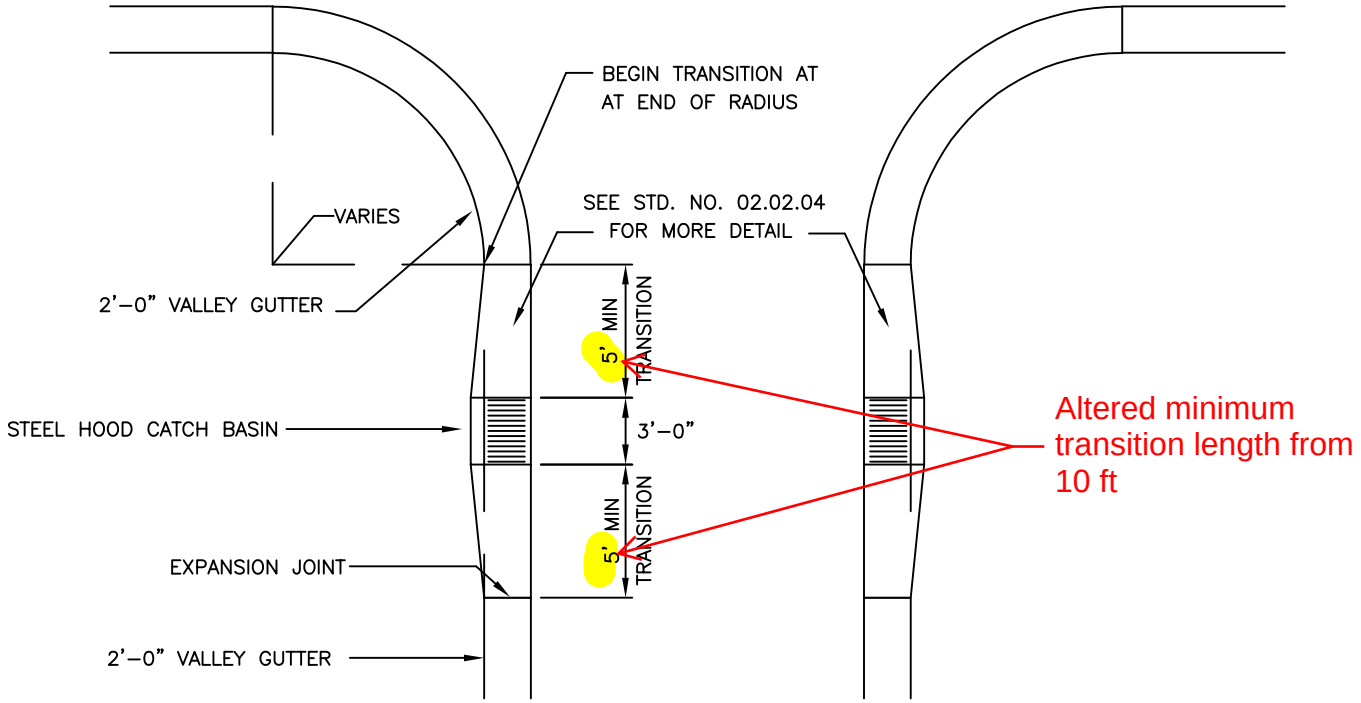
CURB AND GUTTER
(3 of 3)

CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: JAM | DATE: 08-07-01
CHECKED BY: JNL | SCALE: N.T.S.

DETAIL 02.02.03



PLAN

NOTE:
1. WHERE 2'–6" CURB AND GUTTER IS USED, CATCH BASINS MAY BE LOCATED AT END OF RADIUS.

2. RADIUS AT INTERSECTION MAY VARY.

REVISIONS		
NO.	DATE	DESCRIPTION
1	03/2025	CHANGED TRANSITION LENGTH

Monroe North Carolina

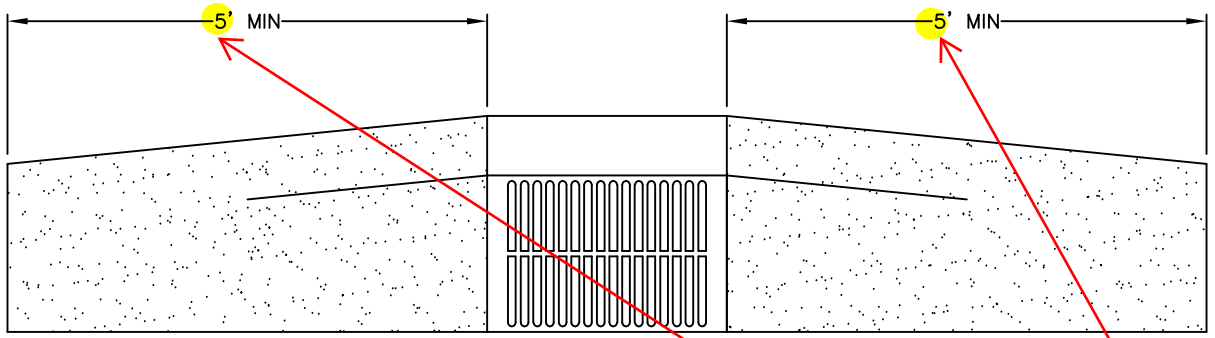
CATCH BASIN PLACEMENT AT INTERSECTION

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details	
DRAWN BY: JAM	DATE: 08-07-01
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DETAIL 02.02.05

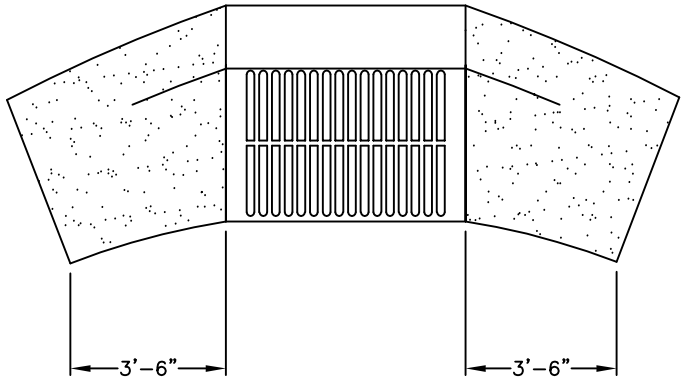


PLAN FOR TANGENT SECTION

Altered minimum transition length from 10 ft

NOTE:

TRANSITION FROM VALLEY GUTTER TO 2'–6" SECTION TO BE MADE PER STD. 02.02.04



PLAN FOR RESIDENTIAL CUL–DE–SAC

REVISIONS		
NO.	DATE	DESCRIPTION
1	05/08	WAS 10–19
2	03/25	CHANGED TRANSITION LENGTH

Monroe North Carolina

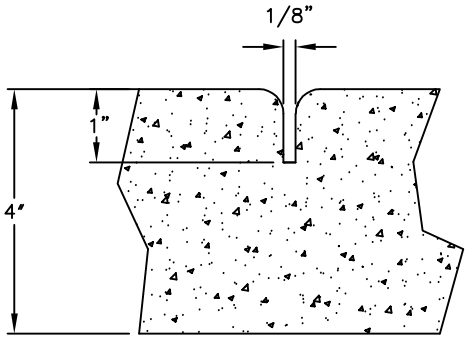
CATCH BASIN FRAME IN VALLEY GUTTER

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

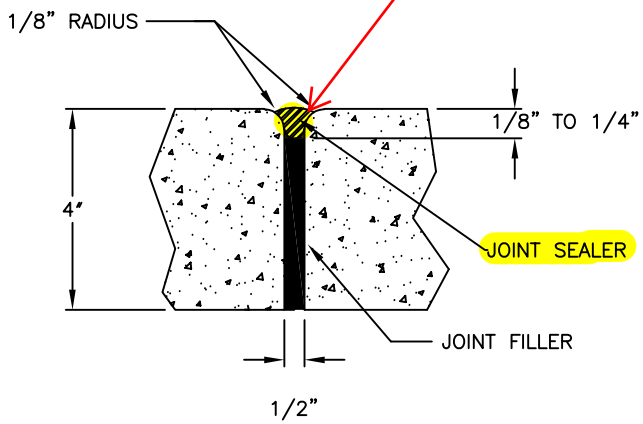
FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: JAM DATE: 08-07-01
CHECKED BY: JNL SCALE: N.T.S.

DETAIL 02.02.06



GROOVE JOINT IN SIDEWALK

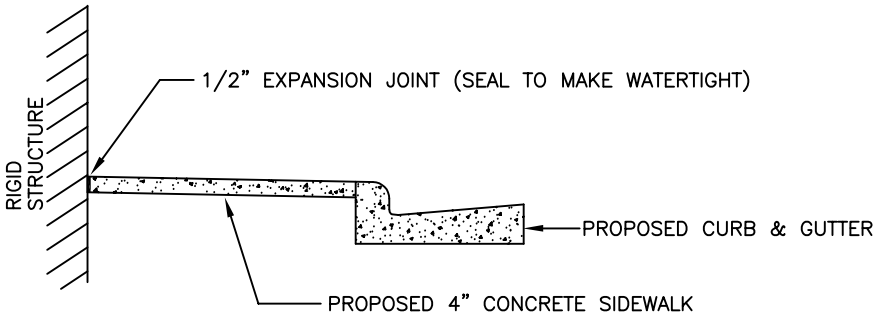
Added note and depiction of joint sealer



TRANSVERSE EXPANSION JOINT IN SIDEWALK

GENERAL NOTES:

1. A GROOVE JOINT 1" DEEP WITH 1/8" RADII SHALL BE REQUIRED IN THE CONCRETE SIDEWALK AT 5' INTERVALS. ONE 1/2" EXPANSION JOINT WILL BE REQUIRED AT 45' INTERVALS NOT TO EXCEED 50' AND MATCHING EXPANSION/CONSTRUCTION JOINT IN ADJACENT CURB. A SEALED 1/2" EXPANSION JOINT WILL BE REQUIRED WHERE THE SIDEWALK JOINS ANY RIGID STRUCTURE.
2. SIDEWALK AT DRIVEWAY ENTRANCES TO BE 6" THICK.
3. WIDTH OF NEW SIDEWALK ON ALL STREETS SHALL BE A MINIMUM OF 5'.
4. SIDEWALK TO BE POURED TO END OF RADIUS AT INTERSECTING STREETS.
5. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3600 PSI. IN 28 DAYS.
6. IN NEW DRIVE CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING EXISTING SIDEWALK, COMPACTING SUBGRADE, AND REPLACING WITH THE APPROPRIATE THICKNESS.
7. ALL NEW SIDEWALK SHALL MEET OR EXCEED ADA REGULATIONS.
8. CURING COMPOUND MEMBRANE IS REQUIRED ON ALL CONCRETE CONSTRUCTION.
9. ALL SIDEWALK TO HAVE LIGHT BROOMED FINISH. (SEE SECTION 02.03.05 NOTE #24)
10. ALL EXPANSION JOINTS FOR CONCRETE TO 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 (NOT BLACK)



DETAILS SHOWING EXPANSION JOINTS IN CONCRETE SIDEWALK

REVISIONS		
NO.	DATE	DESCRIPTION
1	05/08	ADD NOTE #8
2	01/15	ADD NOTE #9
3	03/25	ADD NOTE #10

Monroe North Carolina

CONCRETE SIDEWALKS

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: JAM DATE: 08-07-01
CHECKED BY: JNL SCALE: N.T.S.

DETAIL 02.03.01

NEW PAGE

Added to model Concord and Charlotte Standards, with references to CoM Standards (highlighted)

WARRANTS

STANDARD SAFETY RAIL (STD. 02.03.04) SHALL BE INSTALLED UNDER ANY OF THE FOLLOWING CIRCUMSTANCES IN BOTH NEW CONSTRUCTION AND IN RETROFITTING OR RECONSTRUCTION OF EXISTING ROADWAYS OR SITES:

1. WHEN THE CULVERT CROSSING DETAIL (02.03.05) APPLIES.
2. IF THERE IS A TWO FOOT OR GREATER DROPOFF WITHIN 2 FEET OF THE EDGE OF THE SIDEWALK (SEE DIAGRAM A).
3. IF THERE IS A 1–FOOT OR LARGER DROPOFF DIRECTLY ADJACENT TO THE SIDEWALK EDGE (SEE DIAGRAM B).
4. AT THE TOP OF ANY DROPOFF WITHIN THE PEDESTRIAN CLEAR ZONE OR WHERE PEDESTRIANS CAN REASONABLY BE EXPECTED IN THE VICINITY.
5. AT THE DIRECTION OF CITY TRANSPORTATION OR ENGINEERING STAFF BASED ON FIELD CONDITIONS.

DEFINITIONS

- DROPOFF –– A SLOPE OF 2:1 OR STEEPER. EXAMPLES INCLUDE HEADWALLS, RETAINING WALLS, AND CULVERTS.
- PEDESTRIAN CLEAR ZONE –– 10 FEET OF ANY COMBINATION OF SIDEWALK, SLOPE, AND SHOULDER SLOPED AT 6:1 OR FLATTER. SIDEWALK DOES NOT NEED TO BE PRESENT
- SIDEWALK –– FOR PURPOSES OF THIS STANDARD, THE TERM "SIDEWALK" IS USED GENERICALLY AND SHALL MEAN ANY PATH OR SURFACE TO BE USED FOR BICYCLE AND/OR PEDESTRIAN TRANSPORTATION. EXAMPLES INCLUDE, BUT ARE NOT LIMITED TO, SIDEWALKS, BIKE PATHS, SHARED–USE PATHS, PEDESTRIAN PATHS, AND GREENWAYS.

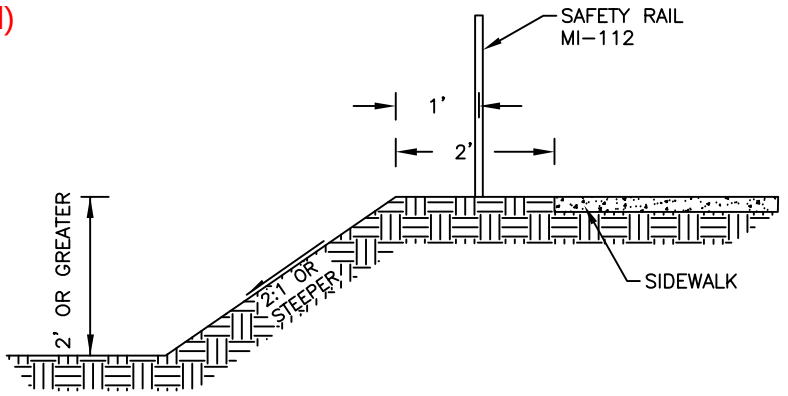


DIAGRAM A

SLOPED DROPOFF AT BACK OF SIDEWALK

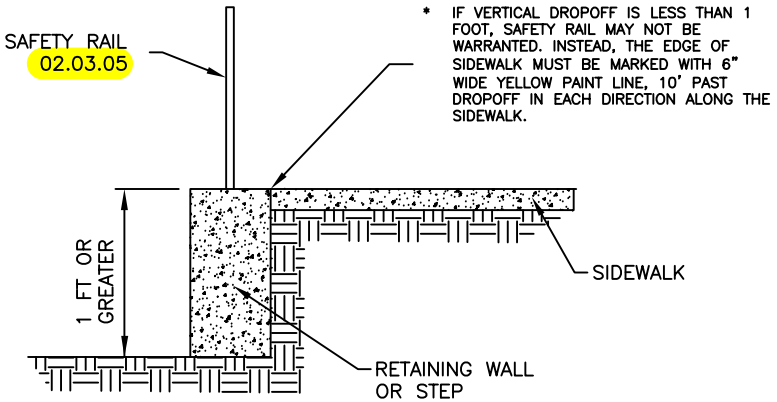


DIAGRAM B

VERTICAL DROPOFF AT BACK OF SIDEWALK

REVISIONS		
NO.	DATE	DESCRIPTION

Monroe North Carolina

SAFETY RAIL & WARRANTS (1 OF 2)

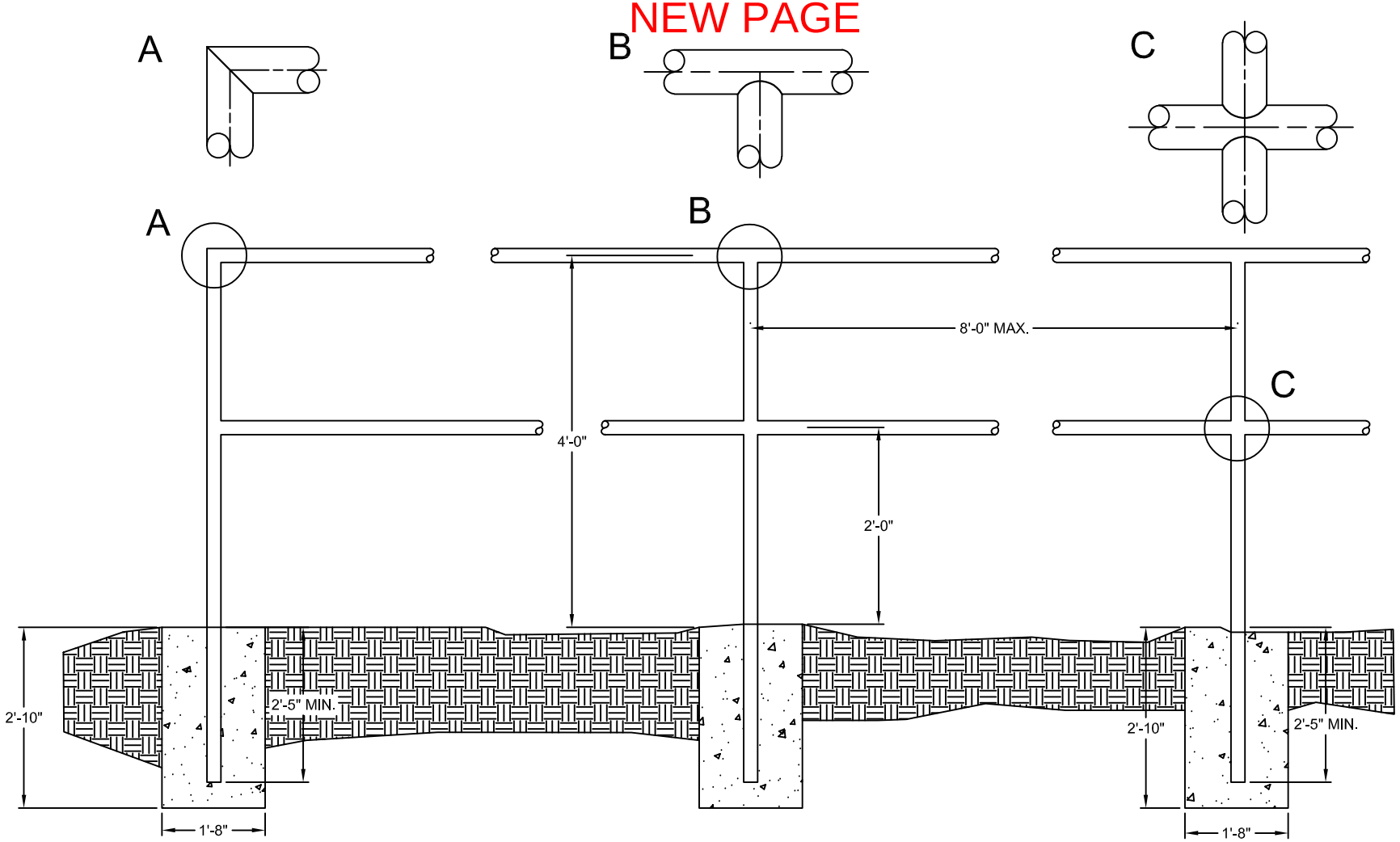
CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

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DETAIL 02.03.03

NEW PAGE



NOTES:

1. ALL CONCRETE TO BE 3600 P.S.I. COMPRESSIVE STRENGTH.
2. TYPE OF PIPE TO BE USED IS 1–5/8" MAX. O.D. BLACK IRON, LOW CARBON PIPE OR GALVANIZED.
3. ALL JOINTS TO HAVE A 1/2" FILLET WELD AT ALL JOINTS.
4. PAINT ASSEMBLY AFTER INSTALLATION WITH BLACK ALL WEATHER ENAMEL.
5. SEE STD. 02.03.03 FOR WARRANTS.

Added to model Concord and Charlotte Standards, with references to CoM Standards (highlighted)

REVISIONS		
NO.	DATE	DESCRIPTION

Monroe North Carolina

SAFETY RAIL & WARRANTS (2 OF 2)

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details	
DRAWN BY: KMM	DATE: 03-28-25
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DETAIL 02.03.04	

NEW PAGE

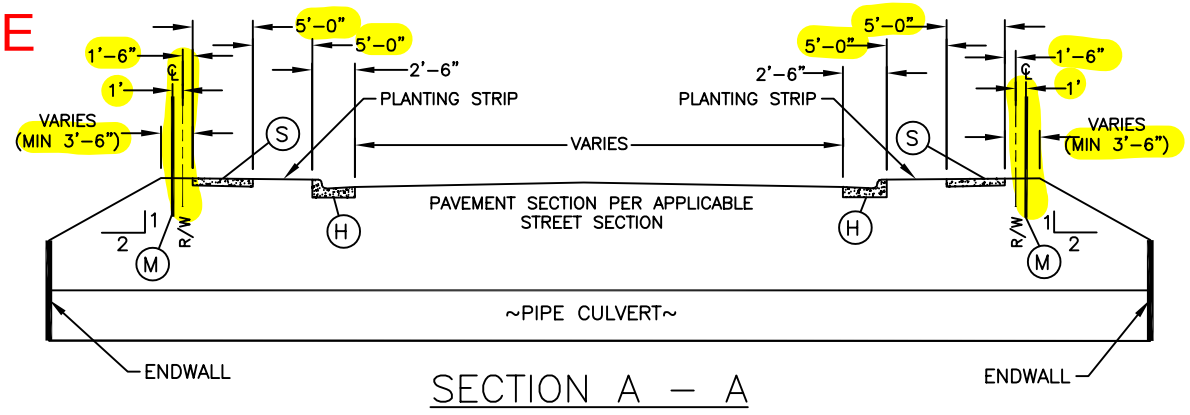
(H) 2'–6" CURB AND GUTTER, STD 02.02.01

(M) SAFETY RAIL, STD 02.03.03 & 02.03.04

(S) 5'–0" SIDEWALK, STD 02.03.01, NOTE 3

(H1) 2'–0" VALLEY GUTTER, STD 02.02.01

(H2) CURB TRANSITION 2'–6" CURB AND GUTTER TO 2'–0" VALLEY GUTTER, STD 02.02.04



SECTION A – A

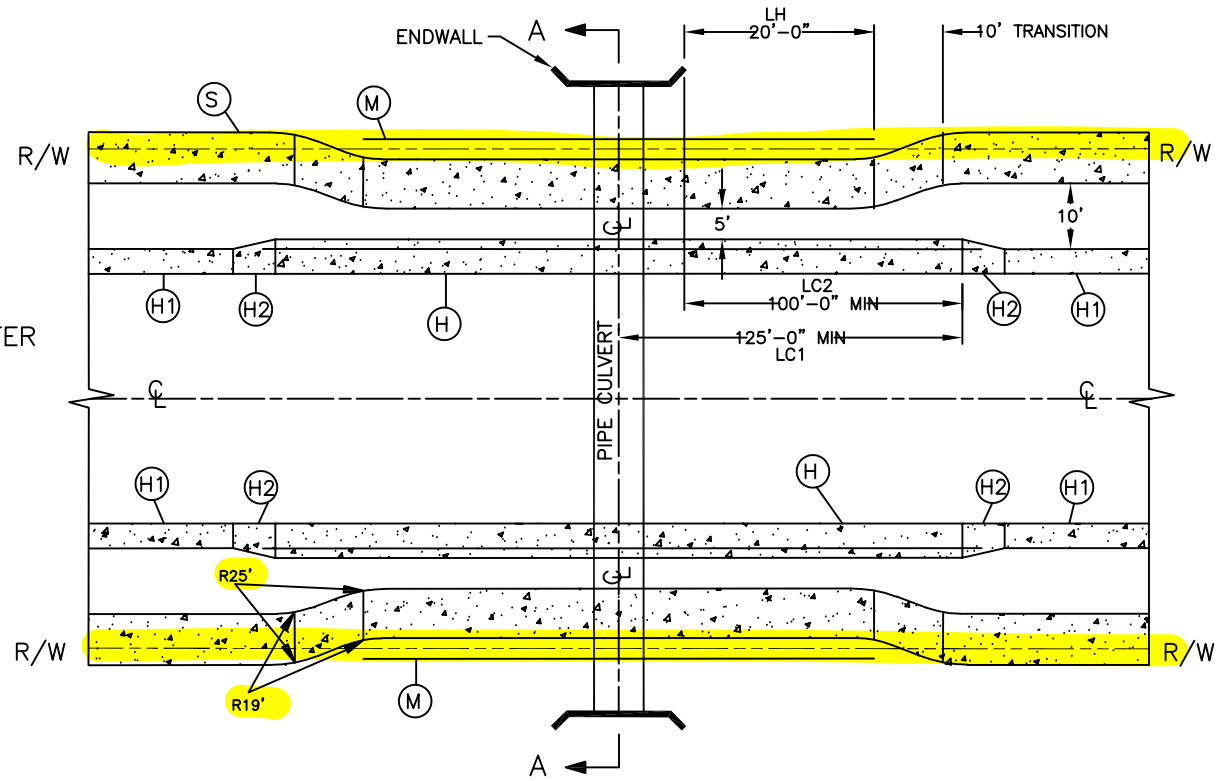
LH* = DISTANCE FROM END OF WINGWALL TO END OF SAFETY RAIN

LC1 = DISTANCE FROM C/L OF CULVERT TO END OF 2'–6" CURB AND GUTTER

LC2* = DISTANCE FROM END OF WINGWALL TO END OF 2'–6" CURB AND GUTTER

* LH AND LC2 TO BE MEASURED FROM THE OUTSIDE OF THE NEAREST WALL OF THE CULVERT BARREL

Added to model Concord Standards, with adjustments made to meet other Monroe Standards and refer to CoM details (highlighted)



REVISIONS		
NO.	DATE	DESCRIPTION

Monroe North Carolina

CULVERT CROSSING

CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
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DETAIL 02.03.05A

GENERAL NOTES:

NEW PAGE

1. UNLESS OTHERWISE DETERMINED BY THE CITY, THE MEASURES ILLUSTRATED SHALL BE USED WHEN CULVERT DIAMETER, 'D', IS GREATER THAN OR EQUAL TO 24 INCHES AND WHEN THE DIFFERENCE IN ELEVATION BETWEEN THE CULVERT INVERT AND THE TOP OF SLOPE, 'H', IS GREATER THAN OR EQUAL TO 5 FEET.
2. INSTALLATION OF 2'–6" CURB AND GUTTER MAY NOT BE REQUIRED WHEN AN ADEQUATE CLEAR ZONE IS PROVIDED FOR VEHICLES WITH A MAXIMUM OF 6:1 SLOPE (SEE TABLE 1).
3. INSTALLATION OF SAFETY RAIL MAY NOT BE REQUIRED WHEN A 10–FOOT PEDESTRIAN CLEAR ZONE IS PROVIDED BEHIND THE SIDEWALK WITH A MAXIMUM OF 6:1 SLOPE. WHERE NO SIDEWALK IS REQUIRED, INSTALLATION OF SAFETY RAIL MAY NOT BE REQUIRED WHEN A 15–FOOT PEDESTRIAN CLEAR ZONE IS PROVIDED BEHIND THE CURB WITH A MAXIMUM OF 6:1 SLOPE.
4. FOR CULVERT CROSSING WITHOUT ENDWALLS, LH AND LC2 SHALL BE MEASURED FROM THE OUTSIDE OF THE NEAREST WALL OF THE CULVERT BARREL.
5. FOR MULTIPLE BARREL CULVERT CROSSINGS, LC1 SHALL BE MEASURED FROM THE CENTERLINES OF THE OUTBOARD CULVERT BARRELS.
6. WHEN NECESSARY, AS DETERMINED BY THE CITY, ADDITIONAL MEASURES MAY BE REQUIRED.
7. INSTALLATION OF SAFETY RAIL IS REQUIRED ON BOTH SIDES OF THE STREET IF SIDEWALK IS REQUIRED ON BOTH SIDES.
8. INSTALLATION OF SAFETY RAIL IS REQUIRED ON BOTH SIDES OF THE STREET IF NO SIDEWALK IS REQUIRED EXCEPT WHEN A 15–FT PEDESTRIAN CLEAR ZONE IS PROVIDED BEHIND THE CURB WITH A MAXIMUM OF 6:1 SLOPE.
9. INSTALLATION OF SAFETY RAIL IS REQUIRED ON THE SIDEWALK SIDE OF THE STREET IF SIDEWALK IS ONLY REQUIRED ON ONE SIDE OF THE STREET. INSTALL EITHER SAFETY RAIL OR 15–FOOT CLEAR ZONE ON SIDE WITHOUT SIDEWALK.
10. DESIGN ADT IS CALCULATED ASSUMING A TRIP GENERATION OF 10 DAILY TRIPS PER SINGLE FAMILY DWELLING UNIT.

Added to model Charlotte Standards, with references to CoM Standards (highlighted)

TABLE 1.
CLEAR ZONE DISTANCES
LOCAL, COLLECTOR, AND COMMERCIAL STREETS

DESIGN ADT	CLEAR ZONE FROM EDGE OF PAVEMENT	
	TANGENT SECTION	CURVE (WITHIN 125' OF CULVERT)
UNDER 750	10'	15'
750 – 1500	12'	18'
1501 – 6000	14'	21'
OVER 6000	16'	24'

SEE STD DETAIL 02.03.05A FOR PLAN AND SECTIONAL SCHEMATICS

REVISIONS		
NO.	DATE	DESCRIPTION

Monroe North Carolina

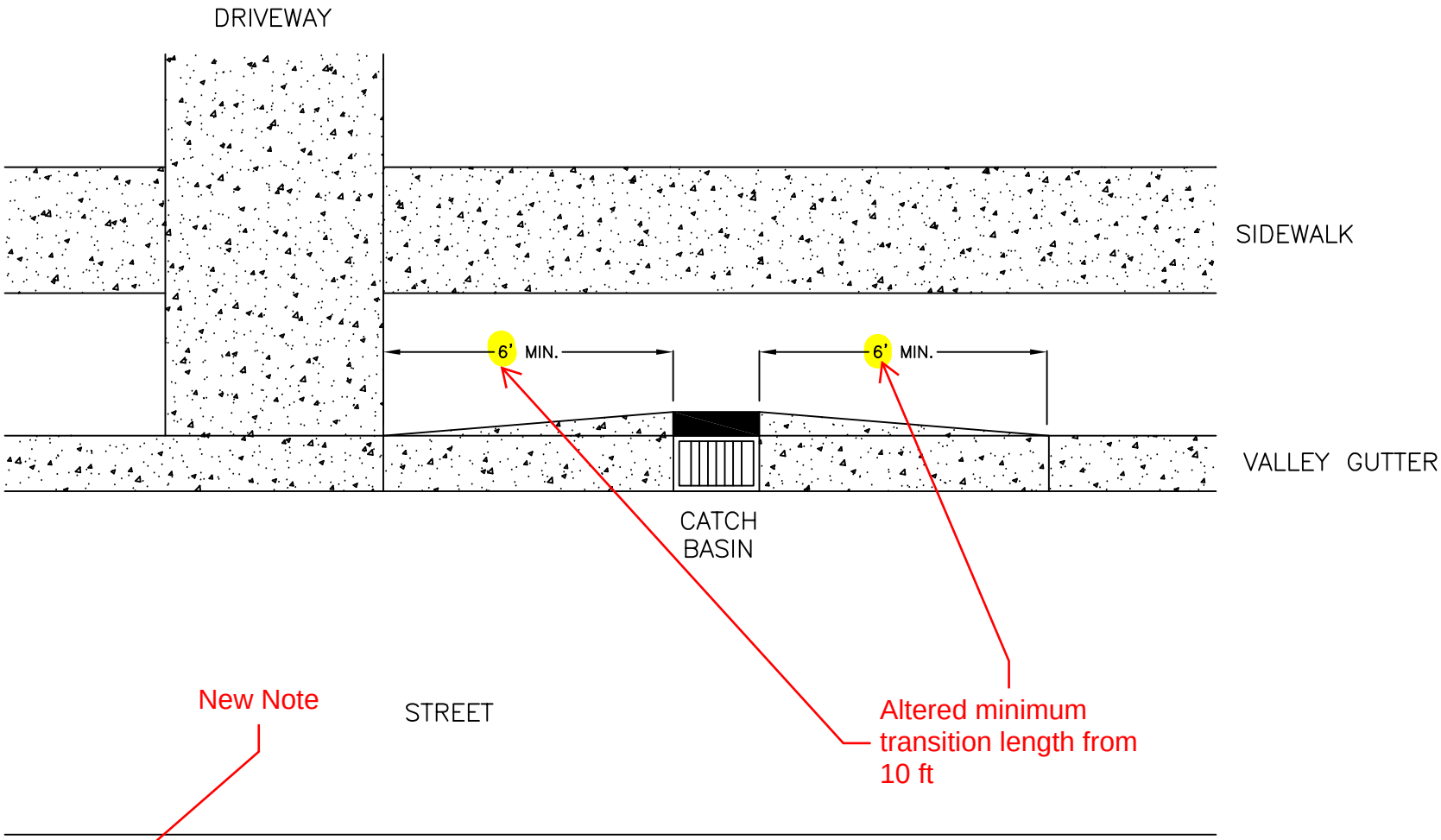
CULVERT CROSSING
(2 of 2)

CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
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DETAIL 02.03.05B



NOTE: MAXIMIZE SEPARATION BETWEEN CATCH BASIN AND DRIVEWAY

NOTE: FAILURE TO MAINTAIN PROPER CLEARANCE TO BASINS MAY REQUIRE CONVERSION TO DROP INLET STRUCTURE AND ADDITIONAL STRUCTURE TO OFFSET LOSS IN FLOW CAPACITY. ALL COSTS ASSOCIATED TO CONVERT THE STRUCTURE AND ADD AN ADDITIONAL STRUCTURE, IF REQUIRED, SHALL BE BORNE BY THE BUILDING CONTRACTOR/PROPERTY OWNER.

REVISIONS		
NO.	DATE	DESCRIPTION
1	04/25	CHANGED TRANSITION MINIMUM, ADDED NOTE

Monroe North Carolina

DRIVEWAY PLACEMENT IN RELATION TO STORM DRAIN CATCH BASIN

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

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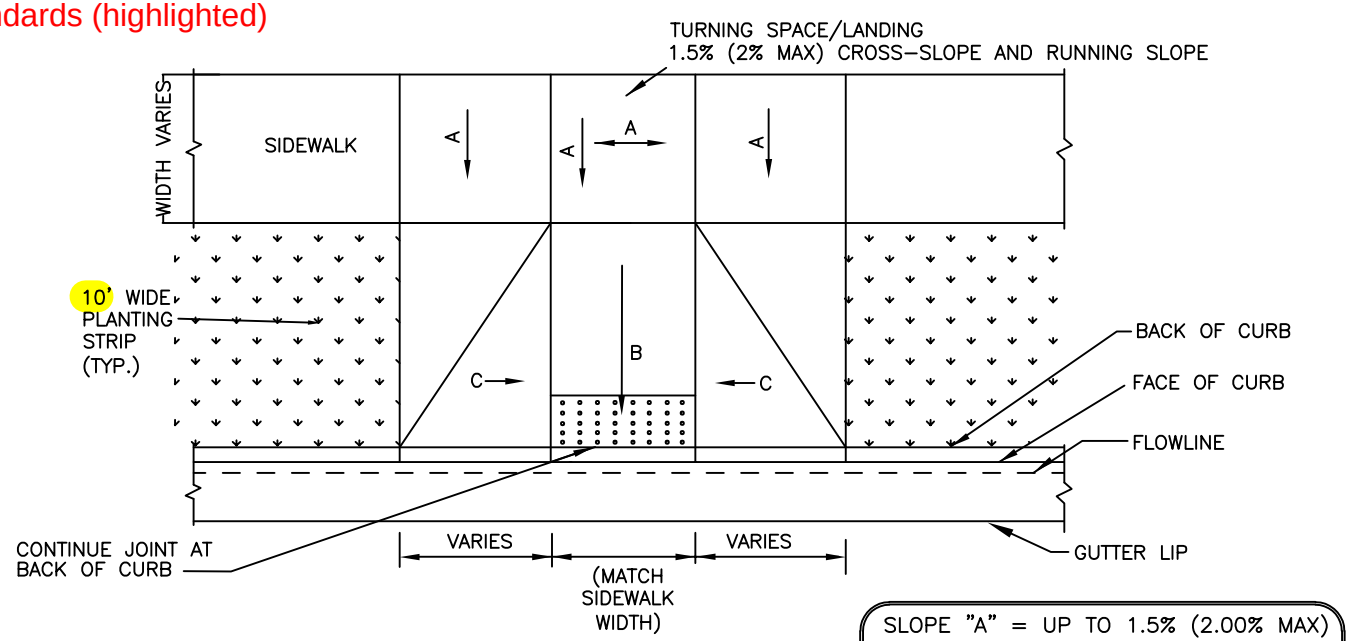
DETAIL 02.04.04

Changed entirely to model City of Charlotte Standards, with adjustments made to meet other Monroe Standards (highlighted)

NOTES:

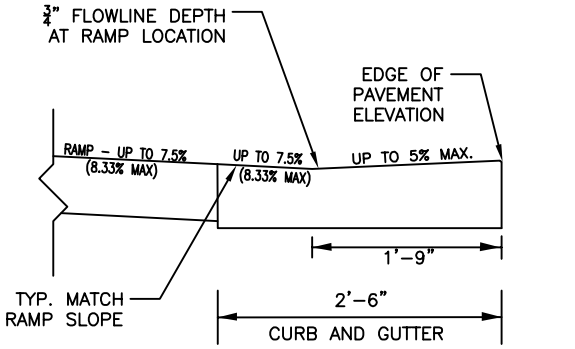
1. ENSURE FLUSH CONDITIONS AT CURB RAMP TO GUTTER TRANSITION.
2. TYPICALLY, THE SIDEWALK RUNNING SLOPE SHALL NOT EXCEED THE GENERAL GRADE ESTABLISHED FOR THE ADJACENT STREET.
3. IF THE SLOPE FROM FLOWLINE TO BACK OF CURB AT RAMP IS LESS THAN 8.33%, THEN THE SLOPE FROM LIP TO FLOWLINE AT RAMP MAY EXCEED 5% AS LONG AS THE ALGEBRAIC DIFFERENCE BETWEEN THESE TWO SLOPES IS LESS THAN 13.33%.
4. THIS DETAIL AND SUBSEQUENT DETAILS (02.05.01B, 02.05.02, 02.05.03, AND 02.05.04) SHALL ALSO BE SUBJECT TO NCDOT DETAILS 848.05 AND 848.06.

Added NCDOT detail ref



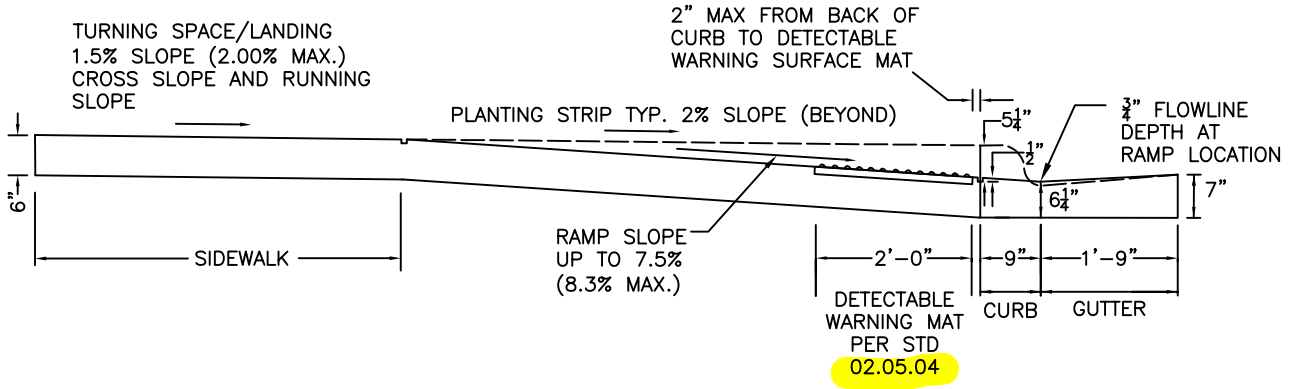
SLOPE "A"	= UP TO 1.5% (2.00% MAX)
SLOPE "B"	= UP TO 7.5% (8.33% MAX)
SLOPE "C"	= UP TO 10% MAX

PLAN VIEW



2'-6" CURB AND GUTTER RAMP DETAIL

MAXIMUM SLOPES FOR CURB AND GUTTER DEPRESSION AT RAMPS



TYPICAL RAMP SECTION AT CENTERLINE

REVISIONS		
NO.	DATE	DESCRIPTION
1	4/20/04	ALLOW DIAGONAL RAMP
2	05/08	NEW ADA STANDARDS
3	04/25	MATCH CHARLOTTE'S STANDARDS

Monroe North Carolina

PERPENDICULAR CURB RAMP WITH 2'-6" CURB AND GUTTER (1 of 2)

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

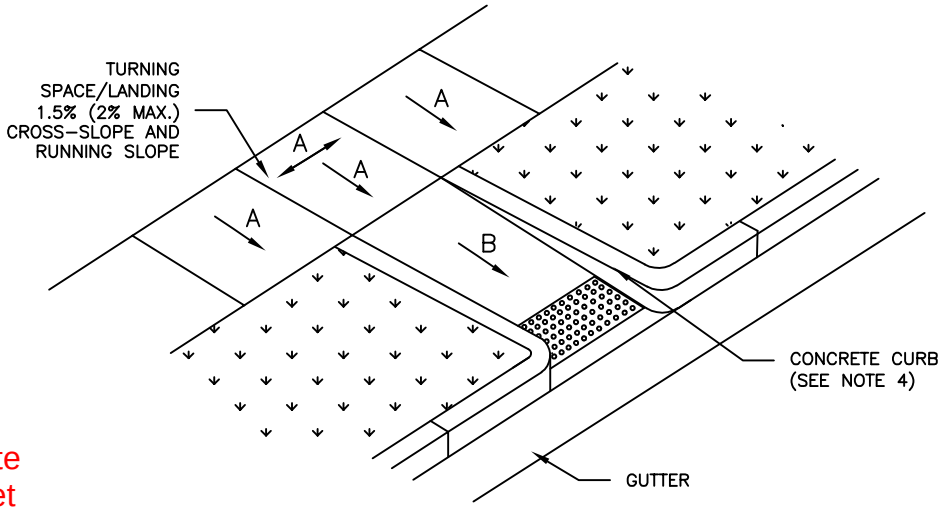
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DETAIL 02.05.01A

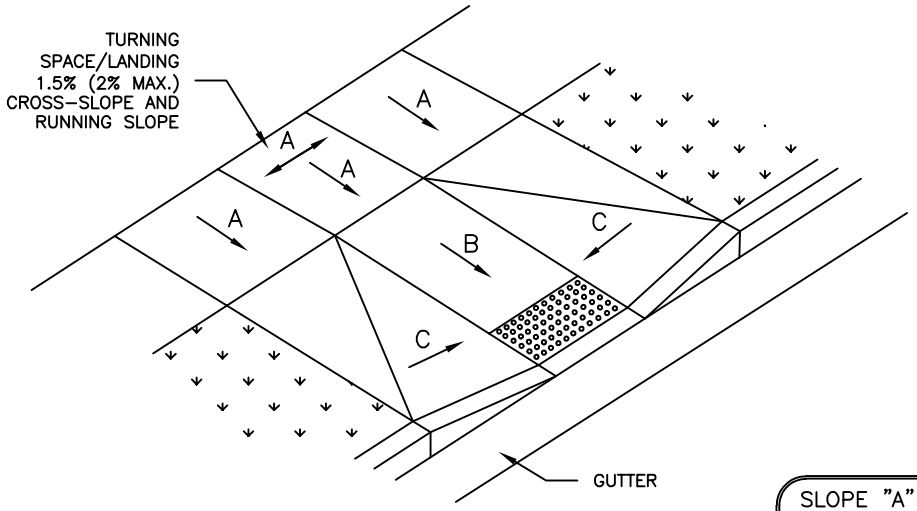
NOTES:

1. THIS DETAIL PRESENTS ALTERNATIVE TREATMENTS FOR THE SIDES OF THE RAMP – RETURNED CURBS, RECTANGULAR WINGS, AND ANGLED WINGS.
2. ENSURE FLUSH CONDITIONS AT CURB RAMP TO GUTTER TRANSITION.
3. TYPICALLY, THE SIDEWALK RUNNING SLOPE SHALL NOT EXCEED THE GENERAL GRADE ESTABLISHED FOR THE ADJACENT STREET.
4. CURB RAMPS WITH RETURNED CURBS MAY BE USED ONLY WHERE PEDESTRIANS WOULD NOT TYPICALLY WALK ACROSS THE RAMP, THE ADJACENT SURFACE IS PLANTING OR OTHER NON–WALKING SURFACE, OR THE SIDE APPROACH IS SUBSTANTIALLY OBSTRUCTED.

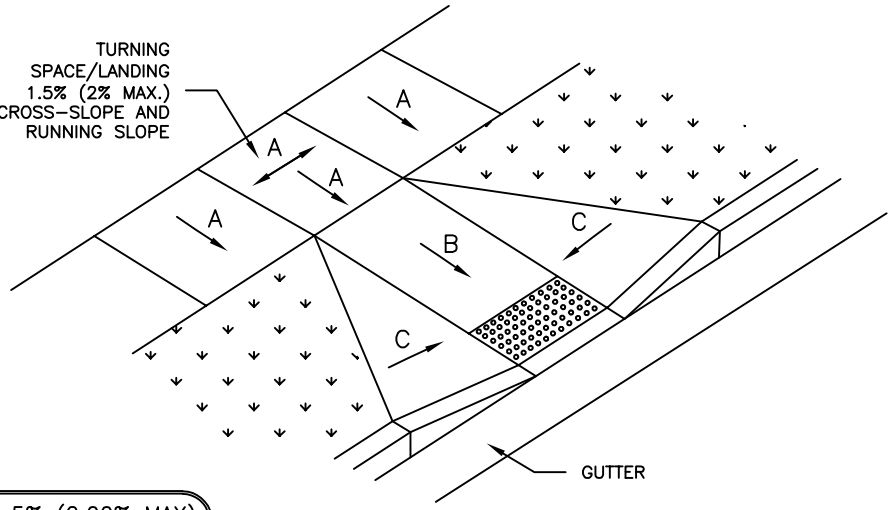
Changed entirely to model City of Charlotte Standards, with adjustments made to meet other Monroe Standards (highlighted)



ALTERNATIVE 1: RETURNED CURBS
(SEE NOTE 4)



ALTERNATIVE 2: RECTANGULAR FLARES



ALTERNATIVE 3: ANGLED FLARES

SLOPE "A" = UP TO 1.5% (2.00% MAX)
SLOPE "B" = UP TO 7.5% (8.33% MAX)
SLOPE "C" = UP TO 10% MAX

REVISIONS		
NO.	DATE	DESCRIPTION
1	05/08	NEW ADA STANDARDS
2	04/25	MATCH CHARLOTTE'S STANDARDS

Monroe North Carolina

PERPENDICULAR CURB RAMP WITH 2'-6" CURB AND GUTTER (2 of 2)

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

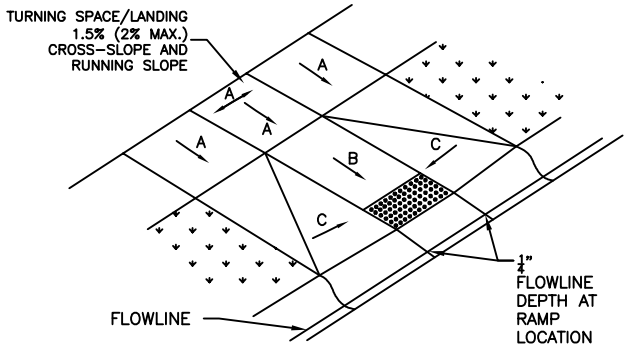
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DETAIL 02.05.01B

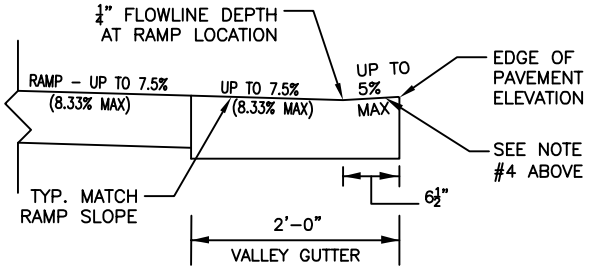
Changed entirely to model City of Charlotte Standards, with adjustments made to meet other Monroe Standards (highlighted)

NOTES:

1. ENSURE FLUSH CONDITIONS AT CURB RAMP TO GUTTER TRANSITION.
2. TYPICALLY, THE SIDEWALK RUNNING SLOPE SHALL NOT EXCEED THE GENERAL GRADE ESTABLISHED FOR THE ADJACENT STREET.
3. MAINTAIN POSITIVE DRAINAGE ALONG THE LIP OF GUTTER IN RAMP. IN FLAT AREAS, ADDITIONAL CATCH BASINS MAY BE REQUIRED ON THE SIDES OF THE RAMP TO MINIMIZE STANDING WATER AT THE RAMP LOCATION.
4. IF THE SLOPE FROM FLOWLINE TO BACK OF CURB AT RAMP IS LESS THAN 8.3%, THEN THE SLOPE FROM LIP TO FLOWLINE AT RAMP MAY EXCEED 5% AS LONG AS THE DIFFERENCE BETWEEN THESE TWO SLOPES IS LESS THAN 13.3%.

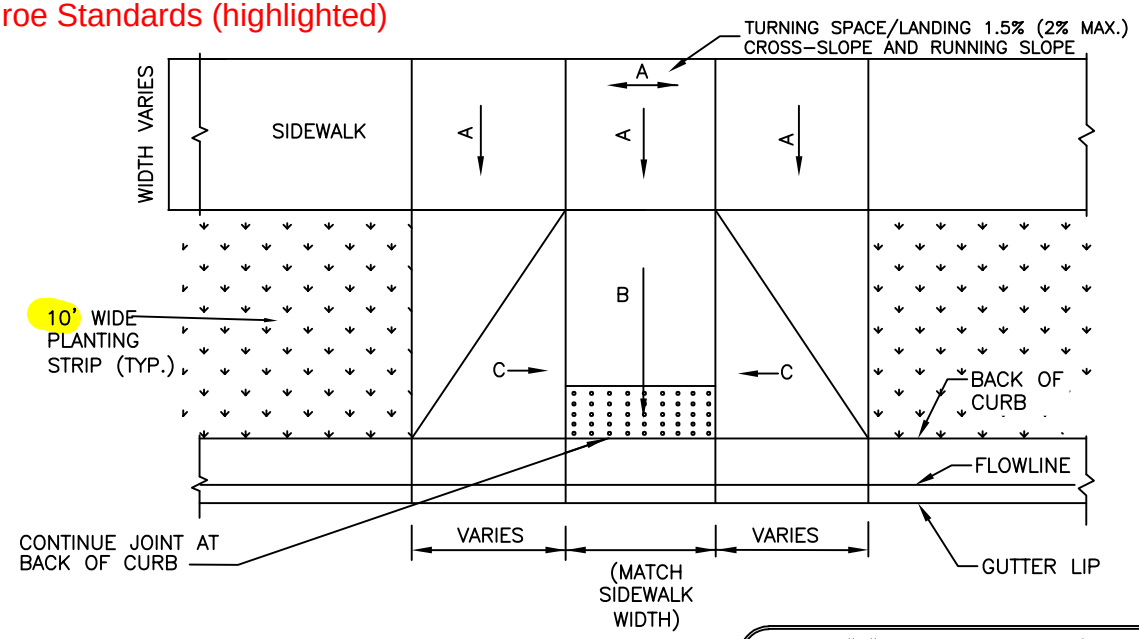


ISOMETRIC VIEW



2'-0" VALLEY GUTTER RAMP DETAIL

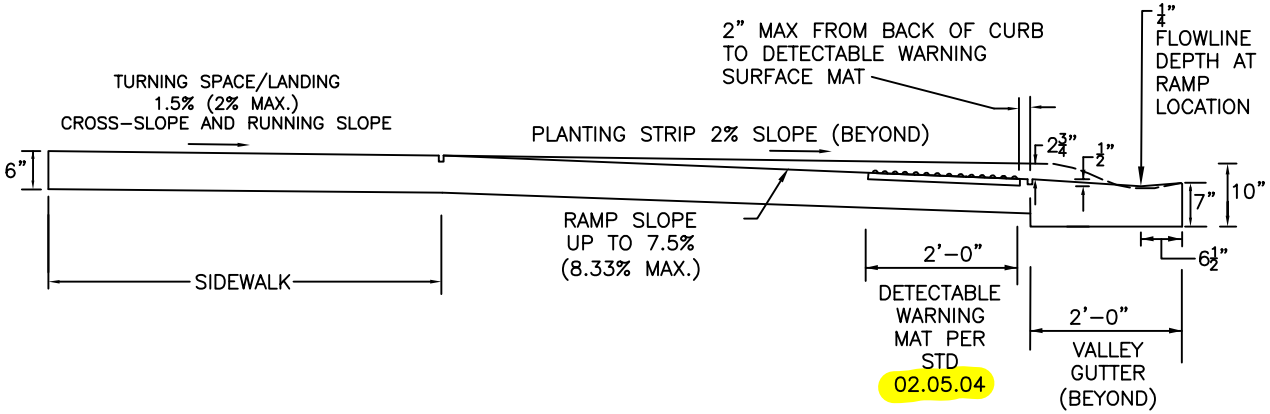
MAXIMUM SLOPES FOR VALLEY GUTTER DEPRESSION AT RAMPS



SLOPE "A"	= UP TO 1.5% (2.00% MAX)
SLOPE "B"	= UP TO 7.5% (8.33% MAX)
SLOPE "C"	= UP TO 10% MAX

PLAN VIEW

NOT TO SCALE



TYPICAL RAMP SECTION AT CENTERLINE

REVISIONS		
NO.	DATE	DESCRIPTION
1	4/20/04	CORRECTED NOTES
2	05/08	NEW ADA STANDARDS
3	04/25	MATCH CHARLOTTE'S STANDARDS

Monroe North Carolina

PERPENDICULAR CURB RAMP WITH 2'-0" VALLEY GUTTER

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

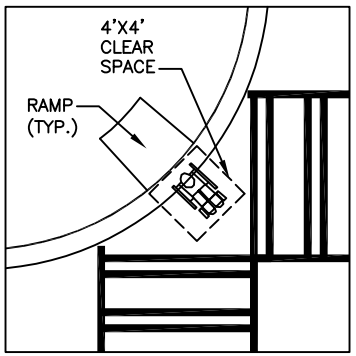
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DETAIL 02.05.02

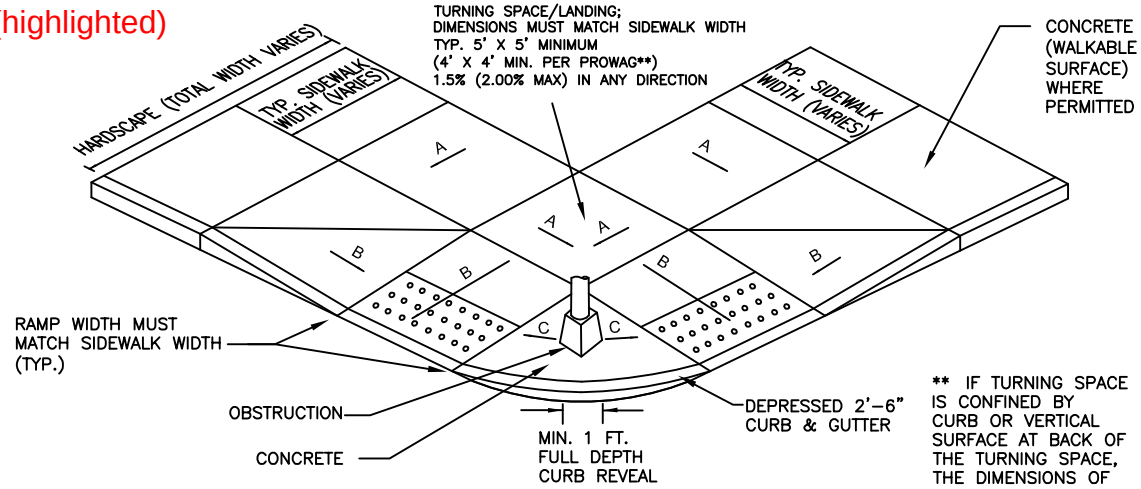
Changed entirely to model City of Charlotte Standards, with adjustments made to meet other Monroe Standards (highlighted)

NOTES:

1. MAINTAIN A MINIMUM OF 0.5% SLOPE ON ALL CONCRETE SURFACES TO PROMOTE SURFACE DRAINAGE TOWARD CURB.
2. GUTTER FLOW LINE AND PLAN PROFILE SHALL BE MAINTAINED THROUGH THE RAMP AREA.
3. THE SURFACE OF THE RAMP SHALL BE FLUSH WITH THE FLOWLINE OF THE CURB AND GUTTER.
4. THE WING AND RAMP SURFACES SHALL BE 3600 PSI CONCRETE WITH A SIDEWALK FINISH IN ACCORDANCE WITH CURRENT EDITION NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.
5. DRAINAGE STRUCTURES, MAST ARMS, LIGHT POLES AND OTHER OBSTRUCTIONS SHALL NOT BE PLACED IN LINE WITH RAMPS. LOCATION OF THE RAMP SHALL TAKE PRECEDENCE OVER LOCATION OF OBSTRUCTIONS EXCEPT WHERE EXISTING OBSTRUCTIONS ARE BEING UTILIZED IN THE NEW CONSTRUCTION.
6. SEE STANDARD DRAWING 02.05.04 FOR DETECTABLE WARNING INSTALLATION.
7. SEE USDG INTERSECTION DIAGRAMS I–1 THROUGH I–3 FOR TYPICAL RAMP PLACEMENT AND INTERSECTION LAYOUTS.
8. CURB RAMPS SHALL HAVE A SEGMENT OF STRAIGHT CURB AT LEAST 24 INCHES LONG LOCATED ON EACH SIDE OF THE WING SLOPE AND WITHIN THE CROSSWALK MARKINGS.
9. FOR ALL RAMPS AT MARKED CROSSWALKS THE RAMP OPENING (AT THE FULLY DEPRESSED CURB) SHALL BE LOCATED WITHIN THE PARALLEL BOUNDARIES OF CROSSWALK MARKINGS.
10. IF A SINGLE DIAGONAL RAMP ON A CORNER IS USED (TYP. ONLY IN RETROFITS), THE RAMP CENTERLINE SHALL BE LOCATED AT THE CORNER RADIUS CENTERLINE UNLESS OTHERWISE DIRECTED BY THE ENGINEER. A MIN. 4'X4' CLEAR SPACE BEYOND THE CURB FACE MUST BE WHOLLY OUTSIDE OF THE PARALLEL VEHICLE TRAVEL LANE (SEE DIAGRAM BELOW):



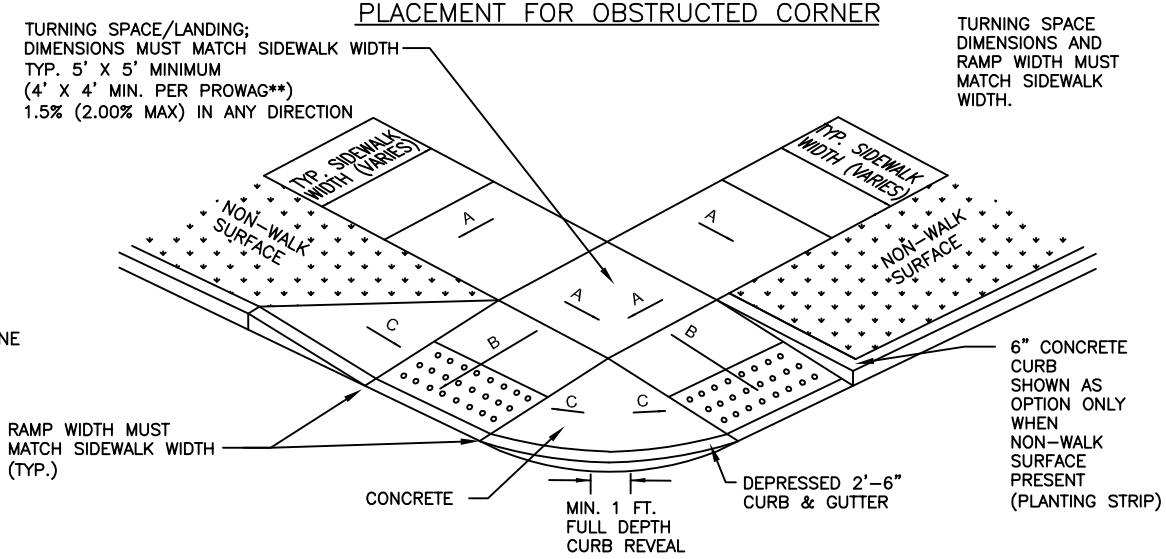
CLEAR SPACE:
- 4' X 4' MINIMUM
- BEYOND BOTTOM GRADE BREAK
- WITHIN PEDESTRIAN STREET CROSSING
- OUTSIDE PARALLEL VEHICLE TRAVEL LANE



PLACEMENT FOR OBSTRUCTED CORNER

** IF TURNING SPACE IS CONFINED BY CURB OR VERTICAL SURFACE AT BACK OF THE TURNING SPACE, THE DIMENSIONS OF TURNING SPACE MUST BE 5'X5' MINIMUM.

TURNING SPACE DIMENSIONS AND RAMP WIDTH MUST MATCH SIDEWALK WIDTH.



SLOPE "A" 1.5% (2.00% MAX)
SLOPE "B" 7.5% (8.33% MAX)
SLOPE "C" 10% MAX

PLACEMENT FOR SMALL CORNER RADIUS

REVISIONS		
NO.	DATE	DESCRIPTION
1	4/20/04	ADD DETECTABLE WARNING NOTE
2	04/25	MATCH CHARLOTTE'S STANDARDS

Monroe North Carolina

PLACEMENT OF CURB RAMPS AT OBSTRUCTED OR SMALL CORNER RADIUS

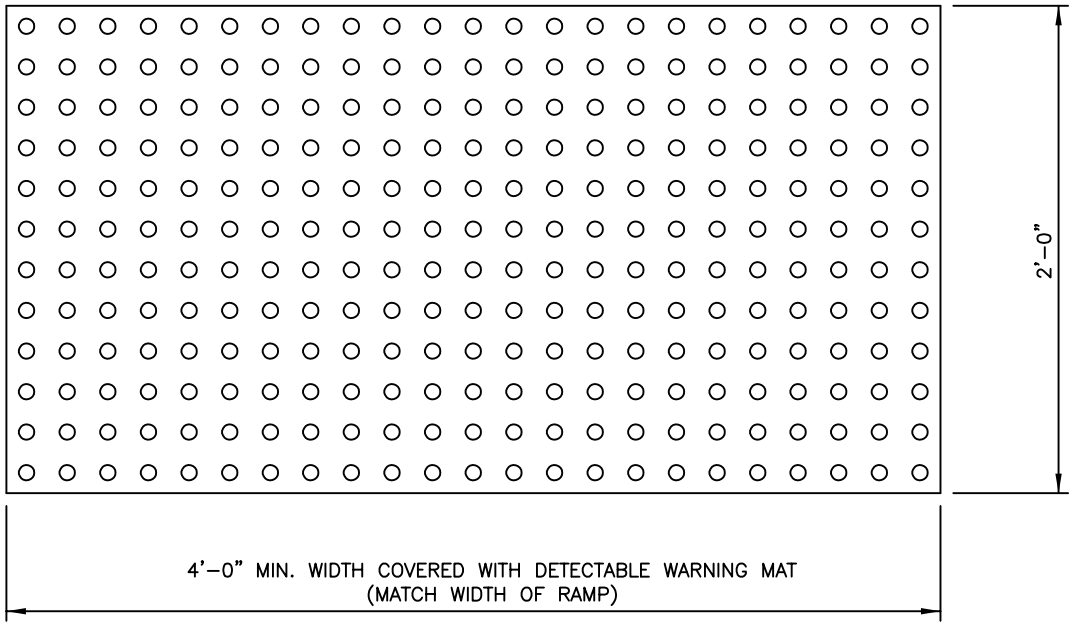
CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

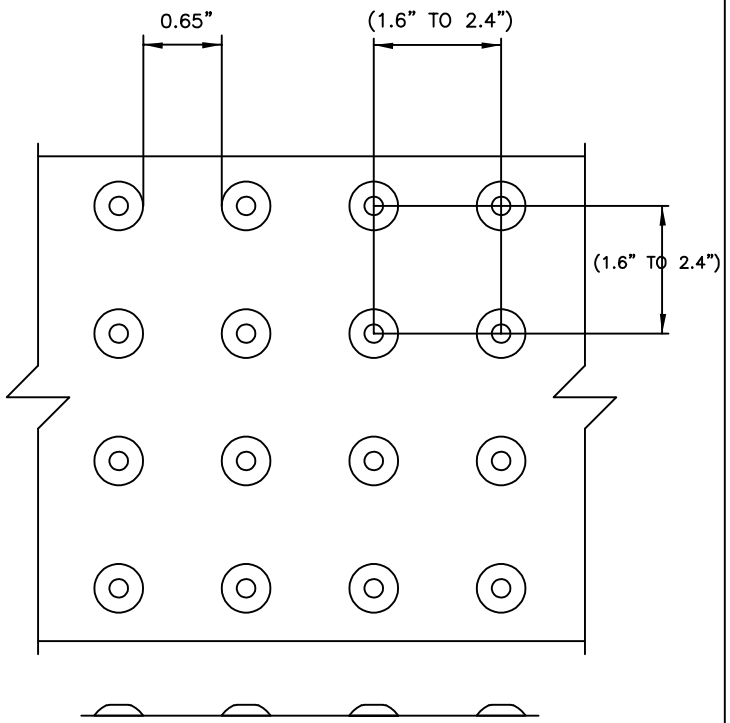
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DRAWN BY: JAM	DATE: 08-07-01
CHECKED BY: JNL	SCALE: N.T.S.

DETAIL 02.05.03

Changed to model City of Charlotte Standards, with adjustments made to meet other Monroe Standards (highlighted)



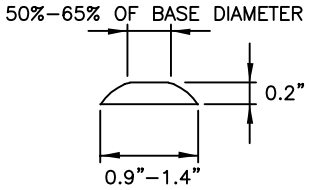
TRUNCATED DOME PLAN VIEW



TRUNCATED DOME SPACING

NOTES:

1. ALL DETECTABLE WARNING DEVICES USED IN NEW CONSTRUCTION SHALL BE OF A RIGID PRECAST OR EMBEDDED PRODUCT APPROVED BY THE CITY ENGINEER. RETROFIT MATS WILL ONLY BE ALLOWED ON EXISTING RAMPS WITH PRIOR APPROVAL OF THE CITY ENGINEER FOR MATERIAL TYPE AND INSTALLATION (IE. RESURFACING).
2. RAMPS AND DETECTABLE WARNING AREA SHALL BE A MINIMUM OF 4 FEET IN WIDTH, BUT NO LESS THAN THE WIDTH OF SIDEWALK LEADING TO BACK OF RAMP.
3. DETECTABLE WARNING SURFACES SHALL EXTEND 2.0 FT MINIMUM IN THE DIRECTION OF PEDESTRIAN TRAVEL.
4. DETECTABLE WARNING AREA CAN BE PLACED SQUARE WHERE USED IN A CURB RADIUS.
5. THE ROWS OF TRUNCATED DOMES IN DETECTABLE WARNING SURFACES SHOULD BE ALIGNED PERPENDICULAR TO THE GRADE BREAK BETWEEN THE RAMP RUN AND THE STREET. WHERE DETECTABLE WARNING SURFACES ARE PROVIDED ON A SURFACE WITH A SLOPE THAT IS LESS THAN 5 PERCENT, DOME ORIENTATION IS LESS CRITICAL.
6. DETECTABLE WARNING AREA SHALL CONTRAST VISUALLY WITH ADJACENT GUTTER, STREET OR HIGHWAY, OR PEDESTRIAN ACCESS ROUTE SURFACE; EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT.
7. IF PAVERS ARE TO BE USED, PAVERS SHALL BE MINIMUM 8000 PSI CONCRETE WITH A 2-INCH MINIMUM THICKNESS, SET ON A THIN-SET MORTAR ON TOP OF 4" THICK 3600 PSI CONCRETE BASE.
8. MATS ARE TO BE RIGID WITH TURNED-DOWN EDGES EMBEDDED IN CONCRETE TO ELIMINATE TRIP HAZARD.
9. DIMENSIONS PER NCDOT 848.06



TRUNCATED DOME SECTION

REVISIONS		
NO.	DATE	DESCRIPTION
1	04/25	MATCH CHARLOTTE'S STANDARDS

Monroe North Carolina

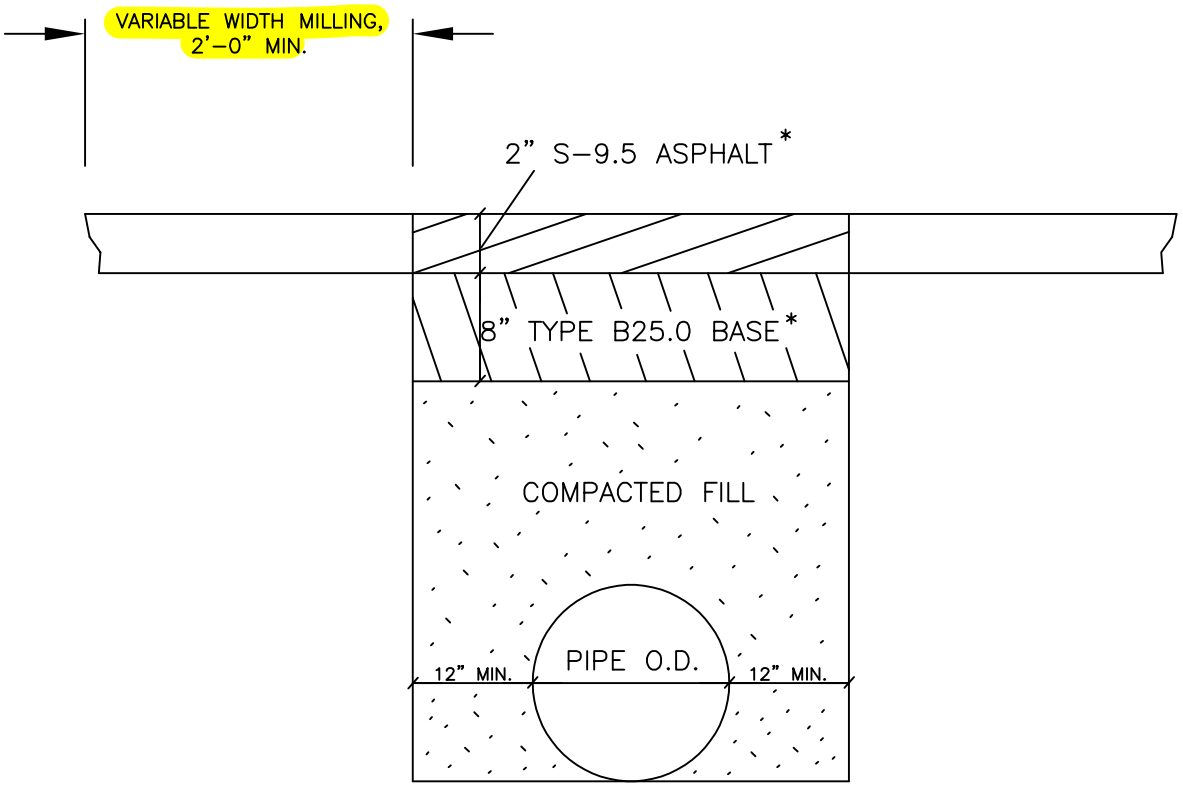
TRUNCATED DOMES PLAN AND CROSS-SECTION

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: DKO | DATE: 4-20-04
CHECKED BY: JNL | SCALE: N.T.S.

DETAIL 02.05.04



PAVEMENT REPAIR OF UTILITY CUTS

*REFER TO DETAIL 02.01.13 FOR ASHPALT TYPE

NOTES:

1. A PERMIT MUST BE OBTAINED PRIOR TO CUTTING A ROADWAY. FOLLOWING PERMIT APPROVAL ALL PAVEMENT SHALL BE SAW CUT OR JACK–HAMMERED.

2. BACKFILL OF OPEN CUTS SHALL BE PLACED IN LAYERS NOT EXCEEDING 6 INCHES AND THOROUGHLY TAMPED (EACH SUCCESSIVE LAYER).

3. ALL MATERIAL FROM BOTTOM OF CUT TO WITHIN 12 INCHES OF SUBGRADE SHALL BE 95% MAXIMUM DENSITY OF STANDARD PROCTOR.

4. ALL MATERIAL WITHIN 12 INCHES OF SUBGRADE SHALL BE 100% MAXIMUM DENSITY OF STANDARD PROCTOR.

5. INITIAL PAVEMENT REPAIRS SHALL BE COMPLETED WITHIN A 24–HOUR PERIOD OR SAME DAY IF RAIN IS IMMINENT.

6. FINAL REPAIR SHALL BE IN ACCORDANCE WITH THE CITY OF MONROE STREET CUT PAVEMENT REPAIR STANDARDS.

REVISIONS		
NO.	DATE	DESCRIPTION
1	4/20/04	MODIFY FOR SUPERPAVE
2	04/25	ADD NOTE AND MILLING WIDTH

Monroe North Carolina

PAVEMENT REPAIR OF UTILITY CUTS

CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

PREPARED BY:
ENGINEERING DEPARTMENT

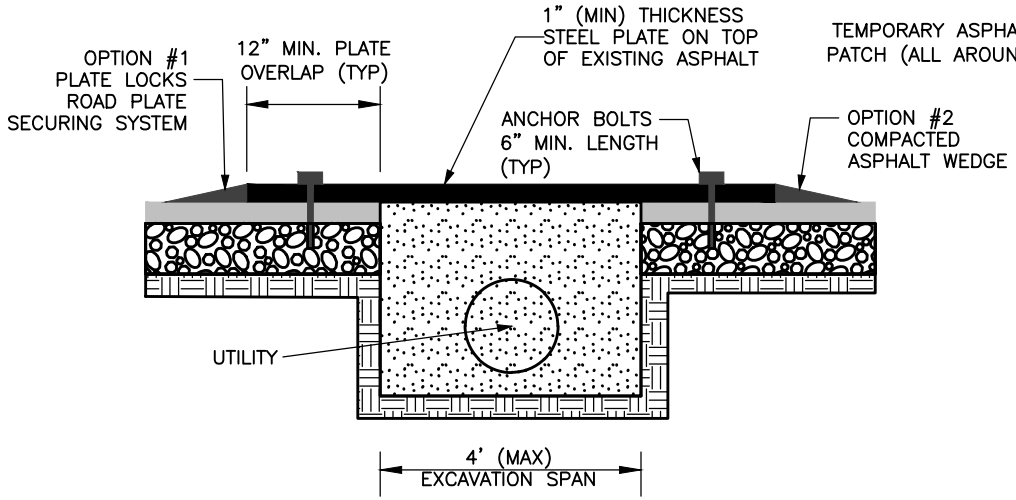
FILE: I:/Maps-Details/Detail Manual/Details	
DRAWN BY: JAM	DATE: 08-07-01
CHECKED BY: JNL	SCALE: N.T.S.

DETAIL 02.06.01

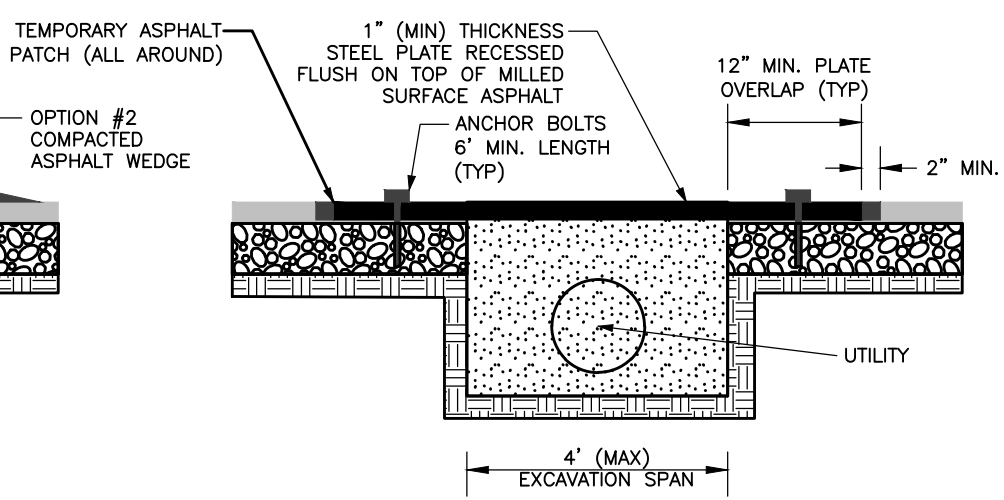
Added to model City of Raleigh Standards, with changes made to meet City of Monroe requirements

NEW PAGE

TYPE 1 INSTALLATION DETAIL



TYPE 2 INSTALLATION DETAIL



NOTES:

1. ALL ROAD PLATES MUST BE ACCOMPANIED BY A VALID CITY OF MONROE ENCROACHMENT AGREEMENT AND/OR OPEN CUT PERMIT.
2. TYPE A INSTALLATIONS ARE FOR USE ON ROADWAYS WITH A POSTED SPEED LIMIT UNDER 35 MPH.
3. TYPE 2 INSTALLATIONS ARE FOR USE OF ROADWAYS WITH A POSTED SPEED LIMIT ABOVE 35 MPH.
4. ALL ROAD PLATE INSTALLATIONS SHALL BE APPROVED BY THE INSPECTOR PRIOR TO ALLOWING PUBLIC TRAFFIC.
5. ALL ROAD PLATE INSTALLATIONS, LIABILITY AND MAINTENANCE ARE THE RESPONSIBILITY OF THE CONTRACTOR.
6. METAL PLATES SHALL BE IDENTIFIED WITH A 24" HIGH STENCILED TEXT OF THE CONTRACTOR NAME OR DESIGNATED ABBREVIATION AND A 6" HIGH STENCILED TEXT OF THE CONTRACTORS AFTER–HOURS 24/7 CONTACT PHONE NUMBER. ANY MARKING DEEMED UNREADABLE MUST BE REPAINTED. SEE DETAIL 02.06.03
7. METAL PLATES WILL HAVE WHITE REFLECTIVE MARKING TAPE ON ALL FOUR CORNERS OF EACH END OF A TRENCH. THESE PLATES DESIGNATE THE BEGINNING AND END OF THE EXCAVATION. THE REFLECTIVE TAPE WILL BE DURABLE ENOUGH TO WITHSTAND TRAFFIC. ANY PEELING TAPE DEEMED UNREADABLE MUST BE REPLACED IMMEDIATELY. SEE DETAIL 02.06.03
8. WARNING SIGNS ADVISING MOTORISTS THAT THEY SHOULD EXPECT TO ENCOUNTER METAL PLATES SHALL BE PLACED AT APPROXIMATELY 100 FEET IN ADVANCE OF THE METAL PLATE LOCATION THE "BUMP" OR "STEEL PLATE AHEAD" SHALL BE USED. SEE DETAIL 02.06.03.
9. PLATES THAT ARE LEFT OVERNIGHT WILL REQUIRE THAT THE WARNING SIGN BE SUPPLEMENTED WITH A LOW–INTENSITY–FLASHING WARNING LIGHT MOUNTED ON OR ADJACENT TO THE ADVANCE WARNING SIGNAGE.
10. FAILURE TO FOLLOW THE STEPS OUTLINED ABOVE WILL RESULT IN STOP WORK ORDERS, CITATIONS AND FINES TO THE PERMITTEE OR CONTRACTOR WORKIN WITHOUT A VALID PERMIT. ROAD PLATES REMOVED OR REPAIRED BY THE CITY WILL RESULT IN STOP WORK ORDERS, CITATION AND FINES.
11. PAVEMENT MUST BE RESTORED TO THE PREVIOUS OR BETTER CONDITION ONCE THE PLATE HAS BEEN REMOVED.

REVISIONS		
NO.	DATE	DESCRIPTION

Monroe North Carolina

STEEL ROAD PLATE
(1 OF 2)

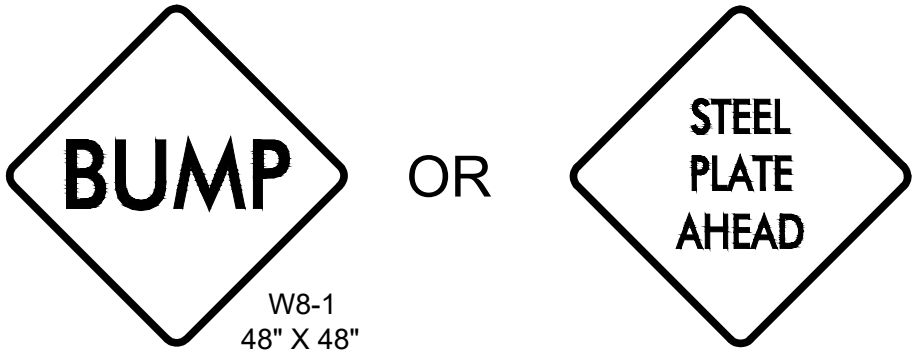
CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details	
DRAWN BY: KMM	DATE: 04-09-25
CHECKED BY: SAM	SCALE: N.T.S.

DETAIL 02.06.02

ADVANCED WARNING SIGNAGE

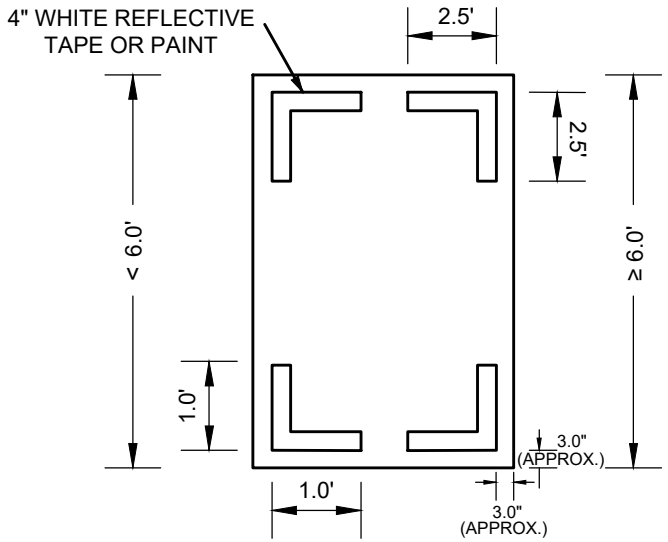


W8-1
48" X 48"

NEW PAGE

Added to model City of Raleigh Standards,

METAL PLATE REFLECTIVE TAPE DETAILS



METAL PLATE MARKING EXAMPLES

RALEIGH CONTRACTING
919-555-5555

EB
984-555-5555

REVISIONS		
NO.	DATE	DESCRIPTION

STEEL ROAD PLATE
(2 OF 2)

CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

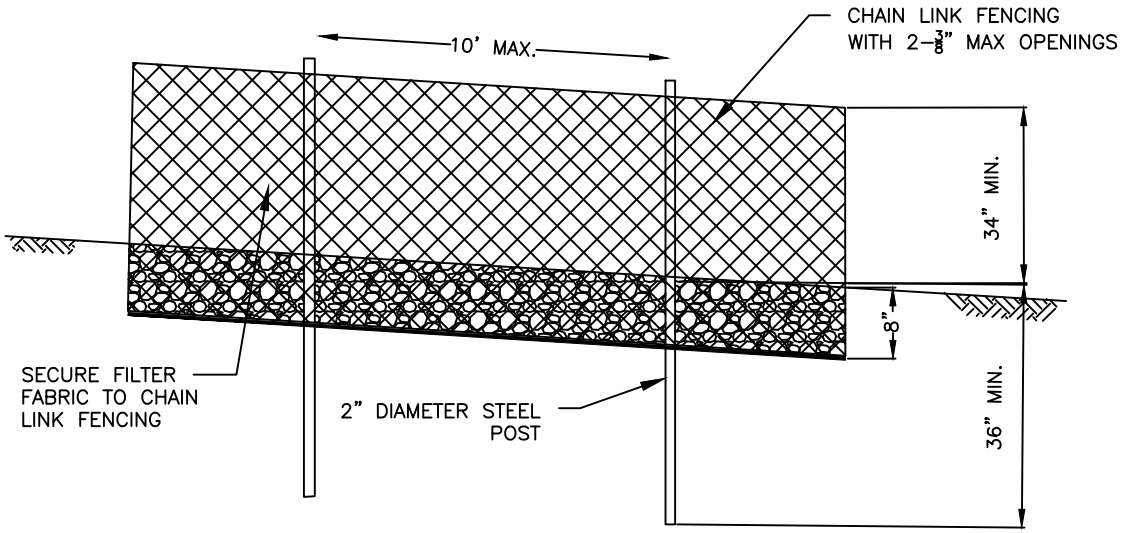
PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: KMM | DATE: 04-09-25
CHECKED BY: SAM | SCALE: N.T.S.

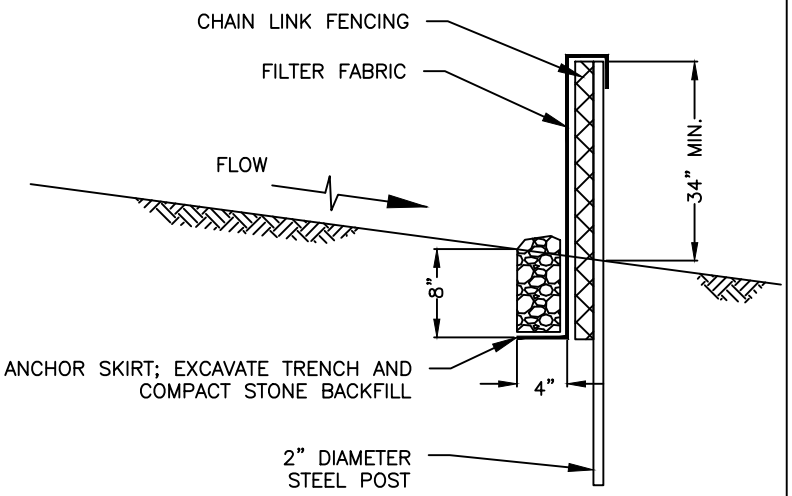
DETAIL 02.06.03

Added to model City of Charlotte Standards,

NEW PAGE



ELEVATION



CROSS SECTION

GENERAL NOTES:

1. SUPER SILT FENCE MAY BE USED IN CRITICAL AREAS IN LIEU OF DOUBLE ROW HIGH HAZARD SILT FENCE.
2. INSTALL MINIMUM 2 INCH DIAMETER GALVANIZED STEEL POSTS, SIX FOOT LENGTH, SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36" INTO THE GROUND.
3. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2 3/8 INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HOG RINGS.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BYPASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. WASHED STONE (#5 OR #57) STALL BE USED IN THE SILT FENCE TRENCH AND COMPACTED.
7. ORANGE SAFETY FENCE IS REQUIRED WHEN GRADING IS ADJACENT TO SWIM BUFFERS, STREAMS OR WETLANDS (REFER TO SWIM BUFFER GUIDELINES). THE COLOR ORANGE IS RESERVED FOR VISUAL IDENTIFICATION OF ENVIRONMENTALLY SENSITIVE AREAS.
8. DRAINAGE AREA CANNOT BE GREATER THAN ¼ ACRE PER 100 FT OF FENCE.
9. SLOPE LENGTHS CANNOT EXCEED CRITERIA SHOWN IN TABLE 6.62A NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.
10. DO NOT INSTALL SUPER SILT FENCE ACROSS STREAMS, DITCHES, WATERWAYS OR OTHER AREAS OF CONCENTRATED FLOW.

MAINTENANCE NOTES:

1. FILTER BARRIERS SHALL BE INSPECTED BY THE FINANCIALLY RESPONSIBLE PARTY OR HIS AGENT IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS NEEDED SHALL BE MADE IMMEDIATELY.
2. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL IS NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN DEPOSITS REACH HALF THE HEIGHT OF THE BARRIER. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS REMOVED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.

REVISIONS		
NO.	DATE	DESCRIPTION

Monroe North Carolina

SUPER SILT FENCE

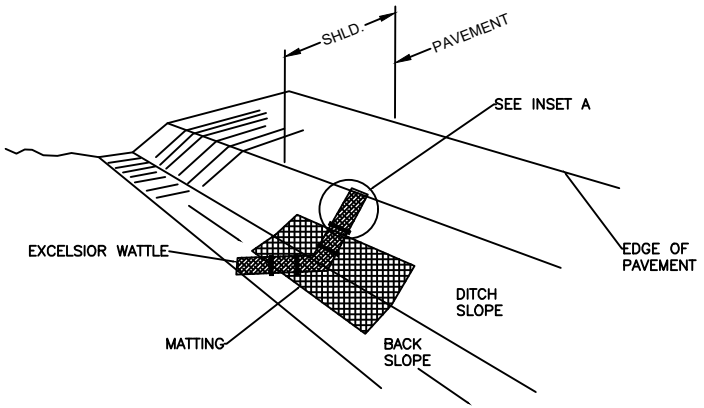
CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: KMM | DATE: 04-03-25
CHECKED BY: SAM | SCALE: N.T.S.

DETAIL 03.01.02

Added to model City of Charlotte Standards,

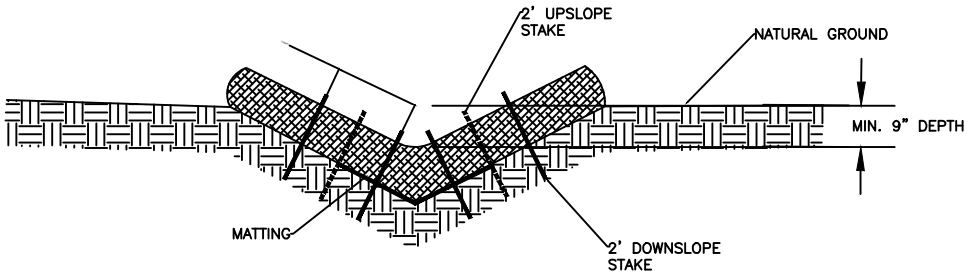


ISOMETRIC VIEW

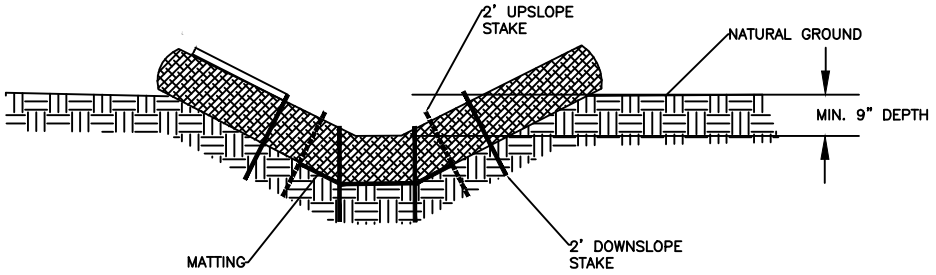
GENERAL NOTES:

1. USE MINIMUM 12 INCH DIAMETER FIBER WATTLE.
2. USE 2 FT. WOODEN STAKES WITH A 2 IN. X 2 IN. NOMINAL CROSS SECTION
3. ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.
4. INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.
5. PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.
6. INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.
7. INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE NCDOT STANDARD SPECIFICATIONS.

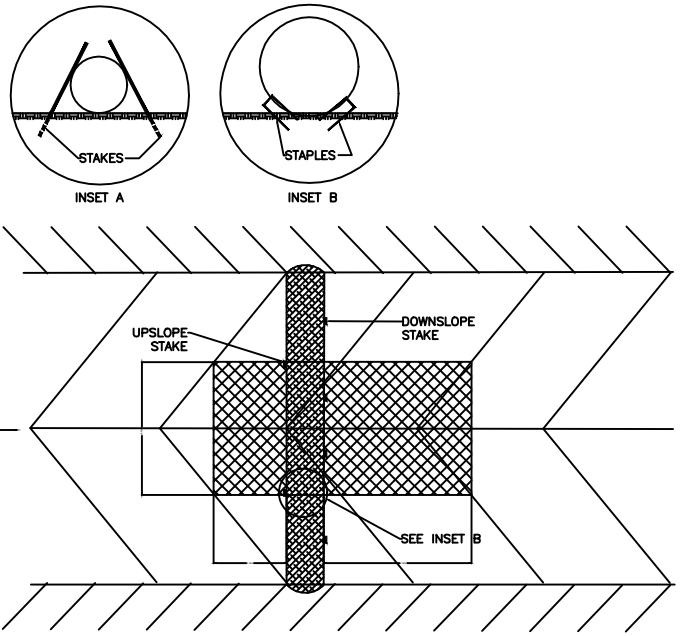
NEW PAGE



CROSS SECTION
VEE DITCH



CROSS SECTION
TRAPEZOIDAL DITCH



REVISIONS		
NO.	DATE	DESCRIPTION

Monroe North Carolina

TEMPORARY WATTLE CHECK DAM WITH MATTING

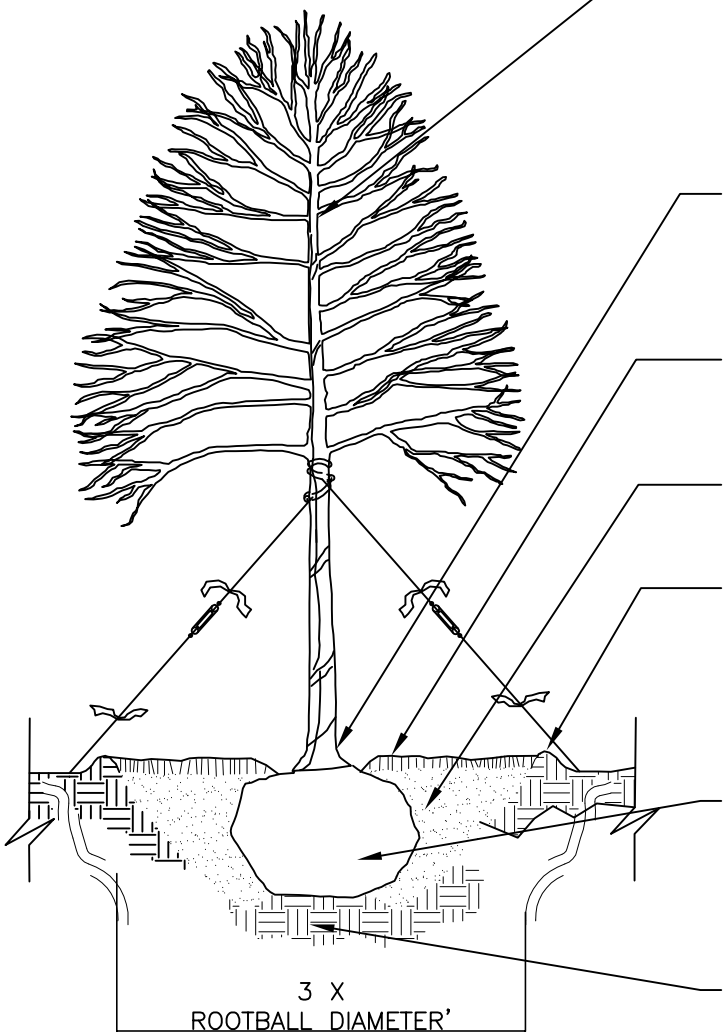
CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: KMM | DATE: 04/03/25
CHECKED BY: SAM | SCALE: N.T.S.

DETAIL 03.03.02

Updated to current county standards



PRUNE ONLY TO REMOVE ANY BROKEN, DEAD OR DISEASED WOOD WHILE PRESERVING FORM AND CHARACTER OF TREE; DO NOT CUT LEADER; DO NOT PRUNE TO REDUCE CANOPY SIZE.

THE ROOT FLARE SHALL BE PLANTED AT GRADE, NO HIGHER THAN 2" ABOVE GRADE, AND NEVER BELOW GRADE. REMOVE EXCESS SOIL TO EXPOSE THE ROOT FLARE AT GRADE. TREE SHALL BE SET PLUMB. .

MULCH DEPTH 3".
KEEP MULCH 3" FROM ROOT FLARE AND DO NOT CONTACT STEM.

HIGH QUALITY SOIL MIX AS SPECIFIED IN TREE PLANTING NOTES 06.01.02

WATER SAUCER SHALL BE NO MORE THAN 3" ABOVE GRADE.

COMPLETELY REMOVE TOP HALF OF BURLAP, LACING AND WIRE BASKET AND DISCARD FROM HOLE.

ROOT BALL SHALL BE PLACED DIRECTLY ON COMPACTED SUBGRADE. HANDLE TREE BY THE ROOT BALL ONLY.

REVISIONS		
NO.	DATE	DESCRIPTION
1	4/22/25	UPDATE TO CURRENT STANDARDS

Monroe North Carolina

TYPICAL TREE PLANTING

CITY OF MONROE
UNION COUNTY NORTH CAROLINA

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details	
DRAWN BY: JAM	DATE: 08-07-01
CHECKED BY: JNL	SCALE: N.T.S.

DETAIL 06.01.01

Updated to current county standards

TREE PLANTING NOTES

1.) SMALL MATURING TREES SHALL BE TREE FORM, 1.5" CALIPER AND HAVE NO BRANCHES LOWER THAN 3–4' AT TIME OF PLANTING.

2) MEDIUM MATURING TREES SHALL BE TREE FORM, 2.5" CALIPER AND HAVE NO BRANCHES LOWER THAN 4–5' AT TIME OF PLANTING.

3) PLANTING BACKFILL MIXTURE: 4 PARTS TOPSOIL; 1 PART PEAT MOSS; 10 LBS. 5–10–5 PLANTING FERTILIZER THOROUGHLY MIXED PER CUBIC YARD.

4) FOR CONTAINER GROWN TREES, CAREFULLY REMOVE THE PLANT FROM THE CONTAINER WITHOUT USING THE TRUNK FOR LEVERAGE OR AS A HANDLE. ROUGH UP THE ROOT BALL TO IDENTIFY AND CUT OUT MATTED, GIRDLING OR CIRCLING ROOTS. DO NOT LEAVE ROOTS EXPOSED FOR MORE THAN FIVE MINUTES.

4) STAKING OF TREES IS NOT RECOMMENDED, EXCEPT IN VERY WINDY LOCATIONS OR WHEN REQUIRED BY THE CITY ENGINEER. STAKING WHEN REQUIRED SHALL BE DONE USING FLEXIBLE STRAPS–NOT HOSE AND WIRE TO ALLOW SLACK FOR THE TREE TO MOVE IN THE WIND. STAKING SHALL BE REMOVED 1 YEAR AFTER PLANTING.

5) TREES SHALL HAVE A TAG ATTACHED AT TIME OF PLANTING LISTING THE COMMON AND SCIENTIFIC NAME. THIS TAG SHALL REMAIN IN PLACE UNTIL REMOVED BY THE CITY OF MONROE ENGINEERING DEPARTMENT CONSTRUCTION INSPECTOR

REVISIONS		
NO.	DATE	DESCRIPTION

Monroe North Carolina

TREE PLANTING NOTES

CITY OF MONROE
UNION COUNTY *NORTH CAROLINA*

PREPARED BY:
ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details
DRAWN BY: JAM | DATE: 08-07-01
CHECKED BY: JNL | SCALE: N.T.S.
DETAIL 06.03.01

City of Monroe
Where Heartland Meets High Tech

STAFF REPORT

TO: Public Enterprise Committee

VIA: Mark Watson, City Manager

DATE: May 6, 2025

FROM: Robert Miller, General Manager of Energy Services and Water Resources

PREPARED BY: Darwin De Los Santos, General Manager of Engineering

SUBJECT: Electric Service Policy Updates

SUMMARY STATEMENT

Energy Services staff requests the Public Enterprise Committee to consider approving proposed updates to the electric service policy that complement the proposed fee schedule changes.

REVIEW

Energy Services Staff is proposing updates to the Electric Service Policy to match proposed fee schedule changes for LED street lighting in new developments. Currently, we recover all lighting installation cost through our rates. The proposed changes will allow us to recover initial installation cost upfront by including lighting installation costs in the initial revenue analysis completed for each new development. The operating and maintenance cost will be recovered through the rates.

The updates also include labeling requirements for meter bases. This requirement will help standardize labeling of meter bases for multi-occupancy buildings (e.g., duplexes, apartment complexes, commercial units). This labeling is required to ensure accurate service identification, facilitate safe utility operations, billing accuracy, and support effective response during maintenance or emergency situations.

The Policy amendments will be effective July 1, 2025. The Fee Schedule amendments will be adopted as part of the Fiscal Year 2026 Budget process with an effective date of July 1, 2025.

RECOMMENDATION

Energy Services Staff recommends that the Public Enterprise Committee approve sending this request to City Council for consideration and approval of the proposed updates to the electric service policy. Energy Services S taff also request City Council authorizes the City Manager to execute the necessary documents. Staff requests that this item is placed on the City Council consent agenda.

Attachments: Electric Service Policy - (Updated 3-27-2025)
Proposed FY 26 Fee Schedule – Electric Revisions

Foreword

The Service Regulations for the City of Monroe Electric Department are filed with the City Clerk. The regulations are presented here and are incorporated by reference in each contract or agreement for electric service.

Definitions

The City of Monroe or the City of Monroe Electric Department is referred to herein as the "City" and the user and prospective user is referred to as the "Customer" or "Consumer," these terms to be considered as synonymous.

"*Customer Service Policy*" - City of Monroe Utility Customer Service Policy.

The term "*overhead facilities*" as used in this Plan, means an electrical distribution system having all components installed above ground level.

The term "*underground facilities"* as used in this Plan, means an electrical distribution system having some, or all, components installed below ground level.

A "*bulk feeder*" is a conductor system transporting the total electrical requirements of a large area from a substation or other supply point into such an area, which may consist of several residential developments and other loads. A "*subfeeder*" is a conductor system branching off of the bulk feeder to supply the requirements of a certain portion of the area. The subfeeder may terminate in a given development, but the bulk feeder may, or may not, pass through the development to serve adjacent areas.

A "*primary voltage loop system*" of conductors provides multiple supply routes to more than one transformer serving the load requirements. A "*primary voltage radial extension*" of underground facilities consists of a single supply route to a single transformer serving the load requirements.

"*Secondary facilities*" consist of equipment necessary to provide secondary voltage from the City's transformer to the owner's delivery point. "*Primary facilities*" consist of equipment, including transformation, to supply primary voltage into the owner's property or development.

"*Cost difference*" is the amount by which the estimated cost of underground facilities exceeds the estimated cost of comparable overhead facilities, but not less than zero.

"*Loss due to early retirement*" is the original cost of the facilities involved, less accrued depreciation, less salvage, plus the costs of removal.

Agreement

Electric service will be supplied under (a) the City's standard form of application (service agreement) or contract, (b) the applicable rate schedule or schedules, and (c) these service regulations, except insofar as provision is otherwise made in any particular rate schedule or contract on file with and approved by the City Council. The City shall not be required to supply service unless and until such agreement is executed by the customer and the City, it being understood and agreed that no promise, statement or representation by an agent, employee or other person shall be binding upon the City unless same be in writing and attached to and made a part of the agreement; notwithstanding the foregoing, when the requested supply of electricity is for residential use or residential water heating, and no extra charges for additional facilities are involved, the customer's application and the City's acceptance thereof may be verbal, and in such event the City's applicable rate schedules and these Service Regulations shall be effective in the same manner as if the City's standard form of application for service had been signed by the customer and accepted by the City. Such a verbal service agreement shall be conclusively presumed, when there is no written application by a customer accepted in writing by the City, if electricity supplied by the City is used by the customer or on the customer's premises.

Hold Harmless Clause

The "Customer" or "Consumer" shall indemnify and hold harmless the "City", its Agents and employees form and against all claims, damages, losses and expense including attorneys' fees arising out of or resulting form the service rendered to the "Customer" or "Consumer", provided that any such claim, damage, loss or expense (1) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property, including the loss of use resulting therefrom, and (2) is caused in whole or in part by an any negligent act or omission of the "Customer" or "Consumer", anyone directly or indirectly employed by any of them or any one for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder. In any and all claims against the City or any of their agents or employees by any employee of the "Customer" or "Consumer", anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under this paragraph shall not be limited in any way by any limitation of the amount or type of damages, compensation or benefits payable by or for the “Customer" or "Consumer" under Workmen’s Compensation acts, disability benefits acts or other employee benefit acts.

Agreement Personal

The rights which accrue to the customer under the agreement are personal and shall not be transferred or assigned by the customer without the written consent of the City.

Service Used in Advance

In the event service is used by the Customer before the agreement is signed, in those instances where the City requires a signed service agreement, such service shall be governed by these

regulations and the appropriate schedule, and the City may discontinue such service at any time upon failure or refusal of the customer to sign the agreement and pay in full the amount due for service to that date.

Vacated Premises

The customer will notify the City before quitting or vacating the premises served under the agreement as herein provided, and will pay upon presentation all bills due under all agreements or contracts.

Deposits

See Customer Service Policy.

Customer's Wiring and Equipment

Equipment which will operate in one locality may be useless in another due to difference in voltage, phase or frequency of electric service; therefore, before wiring a premises or purchasing equipment the customer shall give the City notice, and shall ascertain the character of service available at such premises. The City may specify the voltage and type of electric service to be furnished, also the location of the meter and the point where the service connection shall be made.

All the customer's wiring and equipment must be installed and maintained in accordance with the requirements of the local municipal and state authorities; otherwise the City may refuse to connect service to such customer, or may discontinue service the same. The customer shall keep in repair all such wiring and equipment to the point of connection with the facilities of the City.

Changes in Customer's Wiring and Equipment

The customer shall not employ or utilize, without the written consent of the City, any equipment, appliance or device, or permit the continuation of any condition, which tends to create any hazard or otherwise to affect adversely the City's service to such
customer or to others. When polyphase electric service is used by any customer, the customer shall control the use of service so that the load will be maintained in reasonable electrical balance between the phases at the point of delivery.

The customer shall give the City reasonable notice in writing of any anticipated increase in demand exceeding 20 KW or ten percent (10%) of former emand, whichever is greater, and stating the approximate excess and date required. If, in the opinion of the City, the unexpired

term of the agreement is sufficient to justify the additional investment required, the City will endeavor to provide additional capacity for any increase so requested by the customer, within ninety days of said notice.

The City will extend its facilities and change the point of delivery only when the investment required is warranted by the anticipated revenue and when such extension is permissible and feasible.

Access to Customer's Premises

The City shall at all reasonable times have the right of ingress to and egress from the premises of the customer, for any and all purposes connected with the delivery of service, or the exercise of any and all rights under the agreement.

Right of Way

The customer shall at all times furnish the City a satisfactory and lawful right of way over his premises for the City's lines and apparatus necessary or incidental to the furnishing of service, and shall also furnish satisfactory shelter for meters and other apparatus of the City installed on the premises, except where the City elects to install such equipment outdoors.

The City may change the location of the right of way upon request of the customer, and may require the customer to bear the expense of the change; the change will not be made where it will interfere with or jeopardize the City's service, either to the customer requesting the change, or to any other customer or customers. All privileges of the City incident to the original location shall apply to the new location.

The obligation of the City to supply service is dependent upon the City securing and retaining all necessary rights-of-way, privileges, franchises or permits, for the delivery of such service, and the City shall not be liable to the customer for any failure to deliver service because of the City's inability to secure or retain such rights-of-way, privileges, franchises, or permits.

Transmission, Distribution, and Service Facilities

The City's transmission, distribution, and service facilities will be installed above ground on poles, towers, or other fixtures; however, underground facilities will be provided when requested in accordance with the City's underground Installation Plan, as approved by the City Council.

The City will require a contribution in aid of construction when it is requested to provided facilities which it deems economically infeasible.

Service connections will be made as follows:

(1) Where both the City's lines and the customer's entrance conductors are above ground, and where the service requires a transformer of 500 KVA or less;

The City will extend its service conductors to the customer's building, terminating them on the outside of the building at a location to be provided by the customer and satisfactory to the City

for this purpose. The location must be of sufficient height to satisfy the requirements of the National Electric Safety Code and of applicable local codes, and the strength of the structure at the point of termination must be satisfactory to the City. The City will provide and own meter sockets and enclosures, or the customer, at this option, may provide and own a meter/switch enclosure (more commonly known as a housepower panel). The customer will install all meter sockets, enclosures, or meter switch enclosures. The City will utilize and provide service through the customer's meter/switch enclosure under the following conditions: (a) The meter/switch enclosure shall be in accordance with the City's specifications. (b) The wiring and connections are approved by the City. (c) The customer agrees to allow the City to open and inspect the meter/switch enclosure at any time. (d) The customer agrees to notify the City and obtain permission before altering or performing maintenance inside the metering section of the meter/switch enclosure. For Residential customers, the City will provide, own, and install service laterals and will connect such laterals to the line side terminals of the meter socket or enclosure.

The City will make the necessary connections from its service conductors to the customer's entrance conductors.

(2) Where both the City's lines and the customer's entrance conductors are below ground, or when one is above ground and the other is below ground, or where the size of the customer's demand or any unusual character of the customer's location requires a special service agreement between the City and the customer, the City will make the necessary connections from its service conductors to the customer's entrance conductors as in Section (1) above if applicable, or as in Section (3) below if applicable. If neither Section (1) above nor Section (3) is applicable, the connection shall be at a point to be agreed upon by the City and the customer.

(3) When, in the City's opinion, an individual transformer installation is necessary to serve the customer's demand and such demand exceeds the capacity of a pole-type transformer installation, the City may require the customer to provide suitable outdoor space on his premises to accommodate a ground-type transformer installation or substation. If the customer is unable to provide outdoor space for a ground-type transformer installation, or substation, then the City may require the customer to provide a transformer vault on his premises.

(a) When the customer provides space for a ground-type transformer installation, or substation, the City will erect a structure outside of and immediately adjacent to the fence surrounding such installation, and will connect to the customer's entrance conductors at that point. The City may require the customer to provide main disconnecting switches at the point of connection, which switches shall control all of the customer's load other than the fire pump circuit, if any. In the event the space agreed upon for such installation is adjacent to one or more of the customer's building walls, the City will connect to the customer's entrance conductors on the outside of one of the walls.

(b) When the customer provides a transformer vault, such vault shall be constructed in accordance with the City's specifications, and shall meet the requirements of the National Electrical Safety Code and other applicable safety codes and ordinances, and its location shall meet the City's requirements for accessibility and ventilation. The City will provide and install the transformers and necessary associated equipment including circuit breakers, switches, supporting structures for equipment, primary cable and secondary cable to the point of connection with the customer's entrance conductors, which point shall be 12" inside one of the walls of the vault. The City will coordinate the transformer vault installation with its Underground Distribution Plan for the installation of the primary cable from the customer's vault to the City's existing distribution facilities.

(4) With respect to any service, after a service connection has been made it may be changed by the City upon request of the customer, but the customer must bear the expense of the change and the change will not be made where it will interfere with or jeopardize the City's service either to the customer desiring the change or to do any other customer or customers.

Ownership of Equipment

All conductors and conduits, inside work and equipment, switches, fuses and circuit breakers, from the point of connection with the City's service shall be installed and maintained by and at the expense of the customer. All equipment furnished by the City shall be and remain the property of the City.

Meters

The City will furnish, test and repair all necessary meters. When a meter is moved from one location to another all expense in connection with such removal shall be borne by the City except where the removal is at the request of the customer, in which case the expense will be borne by him. The City shall have the right at its option and at its own expense, to place demand meters, volt meters and other instruments on the premises of the customer for the purpose of making tests with respect to the customer's service.

Location of Meter

Meters for all residential service, and for all other service to the extent practicable, shall be located out-of-doors on the customer's structure at a place or point which is suitable to the customer, but which meets all of the City's requirements for reading, testing and servicing accessibility, and for safety.

Where it is not practicable, in the City's opinion, to locate the meter and its associated apparatus, if any, out-of-doors, the customer shall provide a suitable indoor location which meets all of the City's requirements for reading, testing, and servicing accessibility, and for safety.

Failure or Inaccuracy of Meter

In case of the failure or inaccuracy of a meter, the customer's bill, for the appropriate portion of the period of such failure or inaccuracy, shall be estimated on the basis of the three months prior use.

Bills Due Where No Notice Received

See Customer Service Policy.

Billing and Collection Cycle

See Customer Service Policy.

Where Meter is Not Read

See Customer Service Policy.

Offsets Against Bills

See Customer Service Policy.

Adjustment of Billing Errors

See Customer Service Policy

Responsibility Beyond Delivery Point

It is understood and agreed that the City is merely a furnisher of electricity, deliverable at the point where is passes from the City's wires to the service wires of the customer, or through the divisional switch separating the customer's wires and equipment from the City's wires and equipment, where such a switch is installed, and the City shall not be responsible for any damage or injury to the buildings, motors, apparatus or other property of the customer due to lightning,

defects in wiring or other electrical installations, defective equipment or other cause not due to the negligence of the City. The City shall not be in any way responsible for the transmission, use or control of the electricity beyond the delivery point, and shall not be liable for any damage or injury to any person or property whatsoever, or death of any person or persons arising, accruing or resulting in any manner, from the receiving or use of said electricity.

Interference with City Property

The customer shall not interfere with, or alter, the City's meters, seals, or other property, or permit the same to be done by others than the City's authorized agent or employee. Damage caused or permitted by the customer to said property shall be paid for by the customer.

Resale Service

The contract is made and electricity is sold and delivered upon the express condition that the customer shall not directly or indirectly sell or resell, assign, or otherwise dispose of the electricity or any part thereof, to any person, firm or corporation, except where service is supplied under a contract specifically providing for resale.

Foreign Electricity

The customer shall not use the City's electric service in parallel with other electric service, nor shall other electric service be introduced on the premises of the customer for use in conjunction with or as a supplement to the City's electric service, without the written consent of the City.

Service Interruptions

The City does not guarantee continuous service. It shall use reasonable diligence at all times to provide uninterrupted service, and to remove the cause or causes in the event of failure, interruption, reduction or suspension of service, but the City shall not be liable for any loss or damage to a customer or customers resulting from such failure, interruption, reduction or suspension of service which is due to any accident or other cause beyond its control, or to any of the following:

(a) An emergency action due to an adverse condition or disturbance on the system of the City, or any other system directly or indirectly interconnected with it, which requires automatic or manual interruption of the supply of electricity to some customers or areas in order to limit the extent or damage of the adverse condition or disturbance, or to prevent damage to generating or transmission facilities, or to expedite restoration of service, or to effect a reduction in service to compensate for an emergency condition on an interconnected system.

(b) An Act of God, or the public enemy, or insurrection, riot, civil disorder, fire, or earthquake, or an order from Federal, State, or other public authority.

(c) Making necessary adjustments to, changes in, or repairs on its lines, substations and facilities, and in cases where, in its opinion, the continuance of service to customer's premises would endanger persons or property.

(d) It is expressly understood and agreed that the City does not contract to furnish power for pumping water for extinguishing fires, and that in the event that the customer shall use said electric power, or any part thereof, for pumping water to be used for extinguishing fires, the customer shall, at all times, keep on hand, or otherwise provide for, an adequate reserve supply of water so that it shall not be necessary to pump water by means of said electric power during a fire; and it is expressly understood and agreed that the City shall not, in any event, be liable to the customer, nor to any person, firm or corporation for any loss or injury of or to property or person by fire or fires occasioned by, or resulting directly or indirectly from the failure of any pump, pumping apparatus or appliances to operate, whether said failure shall be due to act or omission of the City or otherwise, it being the intention of the parties hereto that the City shall not, in any event, be liable for any loss or damage occasioned by fire or fires which may be caused by or result from the failure of the City to supply electric power to operate any pump or pumping apparatus or appliances.

Discontinuance of Service

The City shall have the right to suspend its service for repairs or other necessary work on its lines, or systems, or to suspend or discontinue its service for any of the following reasons: (See also: Customer Service Policy Section 13)

(1) For any misrepresentation as to the identity of the customer entering the contract for service.

(2) For violation by the customer of any terms or conditions of the agreement between the City and the customer, or violation of any of these service regulations which are a part of said agreement.

(3) For the reason that the customer's use of the City's service is detrimental to the service of other customers.

(4) For the reason that the customer's use of the City's service conflicts with, or violates orders, ordinance or laws of the state or any subdivision thereof, or of any other body having regulatory powers.

(5) For the reason that wiring, equipment, appliance or device is installed or in use on the customer's premises, which permits the electricity to be used without passing through the City's meter, or which prevents, or interferes with the measuring of the electricity by the City's meter.

Removal of Equipment

In the event of such discontinuation of service or expiration of contract, then it shall be lawful for the City to remove its meters, apparatus, appliances, fixtures or other property.

Waiver of Default

Any delay or omission on the part of the City to exercise its right to discontinue or suspend service, or the acceptance of a part of any amount due, shall not be deemed a waiver by the City of such right so long as any default in whole or in part or breach of contract on the part of the customer shall continue, and whenever and as often as any default or breach of contract shall occur.

Reconnect Fees

In case of discontinuance of service for any reason except repairs or other necessary work by the City, the customer shall pay the City a reconnect charge as spelled out in the Customer Service Policy.

Unavoidable Cessation of Consumption

In the event the customer's premises are destroyed by fire or other casualty, or the operation of its plant is shut down because of strike, fire, or other causes beyond customer's control, making a complete cessation of the use of service, then upon written notice by the customer to the City, within thirty days thereafter, advising that the customer intends to resume service as soon as possible, any minimum charge or guarantee for which the customer may be liable will be waived during the period of such cessation, and the term of the contract shall be extended for a corresponding period; otherwise the agreement for service shall immediately terminate.

Copies of Contracts and Policies

Forms of application (service agreement) or contract, schedules of rates and copies of service regulations are available at City Hall and will be furnished to the customer on request.

Changes

All agreements and contracts for service between the City and its customers, including the rate schedules and these service regulations, are subject to such changes and modifications as from time to time may be made in the same and approved by the City Council, or otherwise imposed by lawful authority.

Types of Service

The types of service supplied and the schedules applicable thereto are as follows:

(1) Residential Service

Residential service will be supplied on Schedule R, Schedule RE, whichever is applicable, to an individual residence or individually metered apartment unit. The Residential Service Schedules shall be applicable to only one meter serving an individual residence or an individual apartment unit.

Out buildings, water pumps, and other uses, which form a part of the general living establishment on the same property, may be connected to the Residential service meter, or they may be separately metered.

Residential service to two or more residences on the same property or to a residence or residences sub-divided into two or more individual housekeeping apartments or units may not be supplied through one meter on the Residential Service Schedule.

(a) Mobile Home Parks

Each space designated for the parking of mobile homes will be served through a separate meter and billing will be in accordance with the applicable residential or general service rate schedule.

The City will extend its conductors to groups of two or more spaces designated for the parking of mobile homes, and will provide and install at each such delivery location a service structure on which its conductors are terminated and on which may be mounted the switch panels, and wiring to accommodate a separate meter for each trailer space. Otherwise, service connections will be the same as set forth in these Service Regulations.

Energy used by the Park in its office, service buildings, yard lights, water pumps, and other purposes connected with the operation of the Park, including spaces designated for the overnight parking of mobile homes in transit or awaiting assignment to separately metered spaces available within a park, may be served through a single meter, and will be billed in accordance with the applicable Commercial rate schedule.

(b) Recreational Parks and Camping Grounds

Service to recreational parks and camping grounds may be supplied to each such an establishment at one delivery point, and energy used in its office, service buildings, yard lights, water pumps, and for other purposes connected with its operation, including service outlets at campsites, will be billed through one meter in accordance with the applicable Commercial rate schedule.

(c) Travel Trailers, Mobile Home, and Other Portable Structures

If the location is other than in a Mobile Home Park or Recreation Park, service to travel trailers, mobile homes, or other portable structures, will be provided as set forth in these Service Regulations, "Temporary Service", except that if the customer presents satisfactory

evidence of intent to remain at said location 12 months or longer, service will be provided as for any structure having a permanent foundation. Energy used will be billed on the applicable residential or Commercial rate schedule.

(2) Professional Offices or Business Activities in Residences

The supply of service under a Residential Schedule to a residence involving some business, professional or other gainful activity will be permitted only where the electric energy used in connection with such activity is less than 15% of the total use and is used only by equipment which would normally be in use if the space were used entirely as living quarters.

When a portion of a residence is used regularly for business, professional or other gainful activities, and more than 15% of the total use is for other than domestic purposes, or electrical equipment not normally used in living quarters is installed in connection with such activities referred to above, the entire premises shall be classified as non-residential and one of the commercial schedules shall be applied.

The customer may at his option provide separate circuits so that the residential uses can be metered and billed separately under a Residential Service Schedule and the other uses under a Commercial Service Schedule.

Hall lighting, stokers and other general electric uses in an apartment building will be classed as Commercial Service and metered and billed under a Commercial Service Schedule, while the individual apartments will be metered and billed separately under a Residential Schedule.

Residences in which a Day Nursery is operated may be served on the City's Residential Service Schedules provided that:

(a) The operator and the operator's family, if any, live there.

(b) The nursery requires no extra electrical equipment or space in addition to that normally required for the operator's family.

(c) There are no conspicuous business soliciting devices about the premises.

If all of the foregoing conditions cannot be met, then such residence shall be served on the City's applicable Commercial Schedule.

(3) Farm and Rural Service

The Residential Service Schedules are available for service through on meter to a farm residence, and for the usual farm uses outside the dwelling unit, but not for commercial or non-

farming operations or for the processing, preparing or distributing of products not raised on that farm.

The customer may at his option elect to take the entire service under one of the Commercial Service Schedules, or may provide separate circuits so that the residential uses, together with the usual farm uses outside the residence dwelling unit, can be metered and billed separately under a Residential Service Schedule, and the other under a Commercial Service Schedule.

(4) Commercial and Industrial Service

Commercial and Industrial Service Schedules are available to the individual customer for any purpose other than those excluded by the availability paragraph of the schedules, and they shall be applied to the following:

(a) Customer engaging in retail trade or personal service directly with the public, such as boarding houses, motor courts, and hotels;

(b) Office buildings, stores, shops, and other commercial establishments;

(c) Schools, churches, other non-residential customers, and industrial customers.

(5) Water Heating Service

Residential water heating service is available through the same meter as other residential service.

(6) Breakdown and Standby Service

The City does not supply breakdown or standby service, and service under its rate schedules may not be used for resale or exchange or in parallel with other electric power, or as a substitute for power contracted for or which may be contracted for, except at the option of the City, under special terms and conditions expressed in writing in the contract with the Customer.

(7) Temporary Service

Temporary Service for construction of buildings or other establishments which will receive, upon completion, permanent electric service from the lines will be provided.

Temporary Service for construction projects, other than those qualifying above, and for rock crushers, asphalt plants, carnivals, fairs and other non-permanent installations will be provided, when the customer agrees to pay the actual cost of connection and disconnection. The cost shall include payroll, transportation, and miscellaneous expense for both erection and dismantling of the temporary facilities, plus the cost of material used, less the salvage value of the material removed. A deposit may be required equal to the estimated cost of connection

and disconnection plus the estimated billing for the period involved, said deposit to be returned if the contract period is fulfilled.

(8) Special Provisions

X-Ray and Welding Service. Equipment of this type may be operated by the Customer through his regular service meter when such operation will not adversely affect the quality of service to neighboring customers.

If however, the use of such equipment causes voltage fluctuations detrimental to the service of other customers, the City may set a separate transformer for the exclusive use of the Customer, and extend a separate service to the Customer's premises. This service shall be metered, and shall be billed o n the applicable rate schedule. In addition, the Customer shall be billed any applicable extra facilities charges associated with the separate transformer. In lieu of setting the separate transformer, the City may require the Customer to either discontinue the operation of the equipment or install the necessary motor-generator set or other apparatus to eliminate the disturbance to other customers.

(9) Insulation Requirements

The City will not connect permanent service to any new building for which a building permit was issued after January 1, 1978 for any class of service unless the building has been certified as meeting the insulation requirements of the State Building Code, and a Certificate of Occupancy has been issued.

(10) More Than One Dwelling Unit Per Meter

When more than one dwelling unit is served by a single meter, each and all dwelling units must comply with the requirement under Availability of the Schedule involved; and the monthly bill shall be computed by dividing the total KWH metered during the billing period by the number of dwelling units; then calculating a bill "per dwelling unit" from this rate. The total bill shall be the "per dwelling unit" bill multiplied by the number of dwelling units.

(11) Tree Trimming

If, at any time, shrubbery, or other vegetation grows up into, and interferes with, the electric power lines of the City, through its duly authorized employees, shall have the right to enter upon the City privately owned property and trim such vegetation in order to clear the lines. All trimming of trees and shrubbery shall be done as neatly as possible and shall be done as requested by the owner where the request is reasonable.

(12) Extra Facilities

(a) At the request of the customer, the City will furnish, install, own and maintain facilities which are in addition to those necessary for delivery of service at one point, through one meter, at one voltage, in accordance with the applicable rate schedule, such additional facilities to be furnished under an "Extra Facilities Clause" added to and made a part of the City's standard form of contract, and containing the following provisions:

(1) Service shall be used solely by the contracting customer in a single enterprise located entirely on a single, contiguous premises, and there shall be no exemption from any of the other provisions of these Service Regulations.

(2) "Extra Facilities" shall consist of such of the following as may be required: voltage regulators, circuit breakers, duplicate service, transformers, substations, connecting lines, or other equipment installed for the exclusive use of the contracting customer, other than facilities which the City would furnish to the customer without cost under its standard form of contract.

(3) The facility to be supplied shall be City standard overhead transmission or distribution, or transmission and distribution, equipment to be installed only on the City side of the point of delivery.

(4) A monthly "Extra Facilities Charge", equal to 1.7% of the installed cost of the extra facilities, but not less than $25.00, shall be billed to the customer in addition to the billing for energy, or for demand plus energy, in accordance with the applicable rate schedule.

(5) The "installed cost of extra facilities" shall be the cost new of material used, including spare equipment, if any, plus applicable labor, transportation, storage, tax, engineering and general expense, all estimated if not known.

(6) "Extra Facilities" shall include the installed cost of extra meters and associated equipment necessary to record demand and energy at the voltage delivered to the customer. Upon mutual agreement between the customer and the City, demand and energy may be metered at primary voltage, without compensation for transformer loss, and without inclusion of any part of the metering cost as an extra facility. When extra facilities furnished include a voltage regulator, metering equipment shall be installed on the City side of the regulator, or it this is not feasible, the meter shall be compensated so as to include registration of the regulator losses.

(7) When the extra facilities requested by the customer consist of those required to furnish service at either more than one delivery point on the premises or at more than one voltage, or both, the installed cost of the extra facilities to be used in the computation of the Extra Facilities Charge shall be the difference between the installed cost of the facilities made necessary by the customer's request, and the installed cost of the

facilities which the City would furnish without cost of the customer under its standard form of contract.

(8) The City shall have the option of refusing requests for extra facilities if, on its own determination, the requested facilities are not feasible, or may adversely affect the City's service to other customers.

(9) Contracts containing the Extra Facilities Clause shall have a minimum original term of 5 years, to continue from year to year thereafter, but the City may require the payment of removal costs in contracts with original terms of 10 years or less, and may require advance payment of the Extra Facilities Charge for a period equal to one-half the original term of the contract.

(10) Customers for who the City may be furnishing extra facilities under existing contracts shall be exempt from all provisions of this Extra Facilities Clause except (1) until such time as their contracts may expire, or are terminated by the customer, or are terminated by the City for reasons not related to the furnishing of extra facilities.

(b) Purchase of Existing Delivery Equipment: Any customer subject to an "Extra Facilities Charge" may, at the City's option, purchase the existing facilities. In those instances where the customer purchases the existing delivery equipment, the City shall have the right to require the customer to install protective equipment to isolate the customers equipment from the City system.

Upon request of the customer, the City shall take an inventory of the equipment available for purchase and shall provide the customer with a sales price of such equipment within 90 days of receipt of such request. The sales price shall be computed at the then replacement cost of the existing delivery equipment, less accumulated depreciation as defined below:

(1) REPLACEMENT COST: Replacement Cost shall be the cost of the identical item at the time of the sale, the time of replacement, or retirement, as the case may be, or where such identical item is no longer available, the closest comparable item shall be used to determine the cost.

(2) DEPRECIATION: Depreciation shall be calculated at the annual rate of and in the manner of the then current rate and method as set forth in the publication, entitled "Depreciation and Amortization of Electric Plant" and shall be applied to Replacement Cost. Accumulated Depreciation is the Annual Depreciation so calculated times the number of years from the date of installation to the date on which the calculation is made. Depreciation shall be limited to a maximum of seventy-five percent (75%) of original value.

The City reserves the right to adjust the inventory and sales price up to thirty (30) days prior to the purchase date. Title for the equipment shall pass and the purchase price shall be due on the purchase date, at which time both parties shall execute a sales agreement.

UNDERGROUND INSTALLATION PLAN

Availability

Normally, the City's distribution and service facilities are installed above-ground on poles, towers, or other fixtures. At the request of an owner (including builders, developers, contractors and customers), the City will install, own and maintain underground facilities under the terms and conditions of this Plan.

At the determination of the City, in those areas where it is physically or economically infeasible, or impractical, to place facilities above-ground due to structural or geographical congestion or load density, the City may place its facilities underground at its own option and expense.

Service Categories

(a) Residential Service

At the request of an owner, the City will install, own and maintain underground facilities for service to single residences, apartments, condominiums, and manufactured homes following these Plan provisions. ~~–~~Any charge to the owner/developer for ~~the cost difference of the underground facilities requested is non-refundable. The signed agreement with the owner for underground service shall specify the payment arrangements.~~estimates required under this section are non-refundable. Residences which are to be served under a residential rate schedule of the City will be served from facilities as shown below.[1]

~~(1) Permanent Residences~~

~~Residences which are to be permanent customer locations on a residential rate schedule of the City will be served from facilities as shown below.[1]~~

1	New Residential Developments:
	Extension of facilities will be based on a 5-year revenue requirement. The City will estimate the cost of the installation of facilities ~~within the~~for the new development and estimate the margin from the customers over a five (5) year period. All expenses that exceed the estimated margin will require a contribution in aid from the developer. The estimated cost of installation shall be the cost of ~~new~~ primary, secondary ~~facilities~~, ~~and ss~~service~~s~~ lines, ~~and~~ lighting and all associated facilities for the development.[2]
2	Single-phase Service to New Single-Residences
	Secondary Service Line: will be installed at no charge. Overhead Primary: First 300 ft. will be installed at no cost. Underground Primary: First 100 ft. will be installed at no cost. Additional footages of ~~overhead and/or~~ primary will be charged based on estimated cost of installation.[2]
3	Single & Three-phase Service to New Multi-Residence Structures[3]
	Extension of facilities will be based on a 5-year revenue requirement. The City will estimate the cost of the installation of facilities within the new development and estimate the margin from the customers over a five (5) year period. All expenses that exceed the estimated margin will require a contribution in aid from the developer. The estimated cost of installation shall be the cost of ~~new~~ primary, secondary ~~facilities~~, ~~and~~ service~~s~~ lines, ~~and~~ lighting and all associated facilities for the development.[2]

1- Customer Service Policy and Fee Schedule Ordinance shall be referred to for other application and connection fees.

2- The estimate shall be the cost of material used, including spare equipment, if any, plus applicable labor, transportation, ~~stor~~storage~~s~~, tax, engineering and general expenses.

(b) Non-Residential Service

At the request of an owner, the City will install, own and maintain underground facilities to new commercial and industrial service and industrial service installations following these Plan provisions. ~~-~~Any charge to the owner/developer for estimates required under this section are non-refundable. Non- Residences which are to be served under a commercial/industrial rate schedule of the City will be served from facilities as shown below.[1] ~~the cost difference for the underground facilities requested is non-refundable. The signed agreement with the owner for underground service shall specify the payment arrangements.~~[1]

1	New Commercial Developments
	Extension of facilities will be based on a 4-year revenue requirement. The City will estimate the cost of the installation of facilities within the new development and estimate the margin from the customers over a four (4) year period. All expenses that exceed the estimated margin will require a contribution in aid from the developer.~~-~~ The estimated cost of installation shall be the cost of ~~new~~ primary, secondary ~~facilities~~, ~~and~~ service~~s~~ lines, lighting and all associated ~~and lighting~~ facilities for the development.[2]
2	New Single Commercial Structure
	Secondary Service Line: will be installed at no charge. Overhead Primary: First 300 ft. will be installed at no cost. Underground Primary: First 100 ft. will be installed at no cost. Additional footages of ~~overhead and/or~~ primary will be charged based on estimated cost of installation.[2]
3	New Industrial Developments (demand of 500 kW or larger)
	Extension of facilities will be based on a 3-year revenue requirement. The City will estimate the cost of the installation of facilities within the new development and estimate the margin from the customers over a three (3) year period. All expenses that exceed the estimated margin will require a contribution in aid from the developer. The estimated cost of installation shall be the cost of ~~new~~ primary, secondary ~~facilities~~, ~~and~~ service~~s~~ lines, ~~and~~ lighting and all associated facilities ~~-~~for the development.[2]

1- Customer Service Policy and Fee Schedule Ordinance shall be referred to for other application and connection fees.

2- The estimate shall be the cost of material used, including spare equipment, if any, plus applicable labor, transportation, storage~~s~~, tax, engineering and general expenses.

Conversion To Underground

The City will replace an existing overhead distribution system with an underground system in an existing residential development or other area under the following terms and conditions:

(1) The City shall place facilities underground by an agreement with the requesting persons which provides for payment of a nonrefundable contribution in aid of construction equal to the cost difference plus the loss due to early retirement of the existing overhead facilities.

(2) Preliminary engineering studies are necessary to determine the approximate costs of replacing overhead with underground facilities. Persons requesting replacement of such facilities shall pay, prior to commencement of such studies by the City, a good faith, nonrefundable deposit in an amount of $100 for each 600 feet of front lot lines for residential development studies, and, for studies of all other service areas, the estimated cost of the preliminary engineering study. If the replacement is undertaken following completion of such studies, actual costs, including preliminary engineering studies, will be charged and credit will be given for the estimated costs, or deposit, which was advanced.

(3) The City need not replace existing overhead systems with underground facilities, except individual services form pole to residence, unless at least one block or 600 feet of front lot line is involved, whichever is less.

(4) All customers served directly from the specific section of line or in the area to be replaced with underground facilities shall agree to the conditions outlined for replacement of overhead facilities.

(5) Owners shall arrange the wiring of their structures to receive underground service at meter locations which allow unimpeded installation of the underground service facilities. Owner shall locate all nonutility underground facilities before the City begins installation of any underground facilities. The City will not be responsible for damage to any nonutility facilities which are not located.

Estimates

Estimates of the cost of ~~the underground and overhead~~ facilities for the purpose of determining the amount of the contribution in aid of construction will be in accord with the City's current construction design practices and shall be based upon the equivalent conductor and transformer capacity required for the electrical load specified by the owner. The estimate shall be the cost of material used, including spare equipment, if any, plus applicable labor, transportation, stor~~es~~age, tax, engineering and general expenses.

A revenue analysis will be performed by comparing the estimate of the cost of facilities to the margin from the customers over a five (5), four (4) or three (3) year period for residential, commercial and industrial developments respectively. All expenses that exceed the estimated margin will require a contribution in aid from the owner/-developer.

Any contribution in aid required under this service policy is required to be paid in full prior to the City starting any work. Any charge to the owner/developer for estimates required under this service policy are non-refundable.

General Provisions

(1) Facilities associated with an underground distribution system, other than the conductors, may by installed above or below ground level as determined solely by the City in accord with the current construction design practices of the City.

(2) The City will normally not provide underground service at secondary voltages above 480 volts.

(3) The City will provide service to a single transformer using a loop system design at the request of the owner who desires to have a loop system installed and makes a payment equal to the estimated cost of the additional facilities in excess of the radial extension facilities.

(4) Existing overhead distribution bulk feeders will remain installed overhead unless the owner desires to have them installed underground. A contribution in aid equal to the estimated cost difference between underground and overhead facilities is required. If it is necessary to extend a distribution bulk feeder through an existing underground residential development, it will be installed underground at City expense.

(5) New subfeeders necessary to serve a new underground subdivision or development will be installed underground inside such areas. New subfeeders outside such areas normally will be installed overhead, unless the owner desires to have them installed underground and makes a contribution in aid of construction payment equal to the estimated cost difference.

(6) Developments shall be divided into established and defined lots the average size of lots shall be expressed in square feet.

(7) Prior to the installation of the underground distribution system by the City, the final grade levels of the building sites shall be established by the owner. The building construction program shall be coordinated with the installation of underground electrical facilities to permit unimpeded access of the Company's equipment to the installation sites; to allow installation of underground facilities at proper depth and before streets, curbs or other obstructions are installed; and to eliminate dig-ins to the underground electrical facilities after installation. Should streets, curbs or other obstructions be present prior to installation of underground facilities, resulting in additional expense to the City, payment for these additional expenses shall be made to the City by the owner. Should established lots of final grade levels change after installation of underground electrical facilities has begun, or if installation of electrical facilities are required by the owner before final grades are established, and either of these conditions results in additional expenses to the City, payment for these additional expenses shall be made to the City by the owner.

(8) Should existing sidewalks, septic tank systems, fuel tanks, other utility line, or other man-made obstructions result in additional expenses to the City, payment for same will be made by the owner.

(9) Actual costs brought about in connection with the compliance of special requirements, if any, of municipalities, State and Federal highway agencies or departments regarding the breaking of pavement, ditching backfilling, and other related conditions, will be paid by the owner.

(10) The City will make, or adjust, charges to the owner to collect the actual additional costs to the City due to adverse conditions, such as: the composition of the land where the underground facilities are to be installed is such that standard construction equipment cannot be used to complete the installation; or, special equipment and materials are needed for stream crossing structures or concrete structures; or, dynamite is required; or, if abrupt changes in final grade levels exceed a slope ratio of 1 when measured within three feet of the trench.

(11) The City's agreement to provide underground service is dependent upon the securing of all necessary rights, easements, rights-of-way, privileges, franchises or permits for the installation of such service from those requesting the underground facilities. The City shall exercise care in the utilization of its underground equipment during construction, but the ultimate responsibility for the protection of shrubs, trees and grass sod will be with the owner. Shrubs, trees, or any other obstacle shall not be placed within ten feet of transformer or cabinet openings which would hinder the access of the City at any time.

(12) Temporary service will not be available in the area served from underground facilities until the underground system is in place unless the owner elects to pay the "in and out" costs of temporary facilities necessary to deliver the temporary service from overhead distribution lines. After the underground facilities are in place, temporary service may be provided for no charge only at a transformer or pedestal location.

(13) ~~(13) Underground conductors to provide service to street lights along public streets, roads, and other public thoroughfares, will be installed a City expense concurrently with the installation of an underground system for new developments. Where such street light conductors are not installed concurrently with the underground system, subsequent installation of underground conductors will be made at no additional charge where the customer requesting the lights pays the cost of overcoming any man-made obstructions. Subsequent s~~S~~treet and area lighting service will be furnished under the applicable rate~~s~~ in the City of Monroe Fee ~~schedule~~Schedule and under the terms included in the electric division lighting agreement.

(14) The City will provide and coordinate underground service facilities with other requested facilities which are supplied under the Extra Facilities provision of the City's Service Regulations.

(15) Meter Identification for Multi-Occupancy Buildings (e.g., duplexes, apartments, commercial complexes) - On multi-occupancy buildings, each individual meter socket and main service disconnect shall be permanently and clearly labeled with numbers and/or letters that identify the specific unit, suite, or address it serves. Labels must be durable, weather-resistant, and securely affixed to the meter base. Handwritten, temporary or labels on removable components of the meter base are not acceptable. It is the responsibility of the property owner, developer, or licensed electrical contractor to ensure all meter bases are properly labeled. City of Monroe Electric Division will not establish electric service to unlabeled or improperly labeled meter bases.

CHAPTER VI. ELECTRIC

ARTICLE B. ELECTRIC RATES

LEGACY CUSTOMER LIGHTING SERVICE – SCHEDULE LL

AVAILABILITY. This schedule is available only to existing lighting customers. Service under the Legacy Customer Lighting Service will only be provided to facilities constructed in conformance with the City's specification, prior to November 9, 2022.

TYPE OF SERVICE. Legacy lighting units are being replaced by a new industry standard, Light Emitting Diodes (LED). LED lights are more energy efficient, brighter and more durable than legacy lights. Effective November 9, 2022, LED lights are the new standard of lighting for the City of Monroe. Legacy lighting units such as Mercury Vapor (MV), Metal Halide (MH) and High Pressure Sodium (HPS) are no longer available for new installations. Existing legacy lighting accounts that need to be serviced or replaced shall be replaced with equivalent LED units. ~~Existing legacy lighting accounts are still serviced; however, any legacy lighting units which need to be replaced shall be replaced with LED units.~~ The City of Monroe lighting service includes installation, maintenance, repair and the provision of electrical energy. Illumination for any lighting service provided by the City shall be from dusk to dawn. ~~. Initial installation includes the lighting unit, one pole, and one span of overhead secondary from an existing pole line. (Additional spans of secondary, poles, pole grounds, etc., must be paid by the consumer at actual cost of installation or at the monthly rate designated.)~~ All items of material and equipment used to make the installation remain the property of the City.

Legacy Units*	**Description: Power / Illumination / Energy**	**Rate Code**	**MONTHLY CHARGE**
Area Light			
High Pressure Sodium Vapor (HPS)	100 Watts/9,500 Lumens/47 kWh	A04	$13.55
	250 Watts/27,500 Lumens/104 kWh	A03	$19.35
	250 Watts/27,500 Lumens/104 kWh – Mongoose Light	A18	$28.46
	400 Watts Decorative/156 kWh	A15	$34.37
Metal Halide Decorative Fixture (MH)	400 Watts/36,000 Lumens/156 kWh	A12	$34.37
	400 Watts/50,000 Lumens/156 kWh – Mongoose Light	A19	$34.37
	1,000 Watts/107,800 Lumens/250 kWh	A13	$74.72
	100 Watts/9,500 Lumens/47 kWh	A17	$17.65
Semi-enclosed Luminaire with Mercury Lamp	175 Watts/7,200 Lumens		$13.66
Enclosed Luminaire with Mercury Lamp	175 Watts/7,200 Lumens/82 kWh		$14.60
	400 Watts/21,000 Lumens		$19.52
	1500 Watts		$75.78

		FY2024 - 2025	FY2025 - 2026	Effect on Revenue
LED Fixture	213 Watts Input/17,679 Lumens/83 kWh		A16	$37.25
Flood Light				
High Pressure Sodium Vapor (HPS)	250 Watts/27,500 Lumens/104 kWh		A10	$28.46
	400 Watts/50,000 Lumens/156 kWh		A11	$34.37
Metal Halide (MH)	400 Watts/34,000 Lumens/180 kWh		A08	$34.37
	1,000 Watts/107,800 Lumens/250 kWh		A06	$74.72

**Legacy lighting units such as Mercury Vapor (MV), Metal Halide (MH) and High Pressure Sodium (HPS) are no longer available for new installations.* *Existing legacy lighting accounts that need to be serviced or replaced shall be replaced with equivalent LED units.* ~~*Existing legacy lighting accounts are still serviced; however, any legacy lighting units which need to be replaced shall be replaced with LED units*~~

Pole Material	**Description: Size and features**	**Rate Code FY2025 – FY2026**		**MONTHLY CHARGE FY2025 – FY2026**	
Steel	Standard	FCS	FCS	$21.79	$21.79
Aluminum	Black Smoother Fluted Finish / 14 ft	FCA	FCA	$16.75	$16.75
Fiberglass	Decorative / Over 20 ft.	FCF	FCF	$8.41	$8.41
Fiberglass	Decorative / 20 ft. and under	FCU	FCU	$4.80	$4.80
Aluminum*	Black Smart Trac Pole, embedded / 17 ft		FCE		$19.04
Wood	Standard / Up to 35 ft.	FCW	*FCW*	No Charge	No Charge

**Only available for City of Monroe Downtown area and other Facilities.*

SALES TAX. Current North Carolina utilities sales tax shall be added to the above charges.

PURCHASED POWER ADJUSTMENT. The current Purchased Power Adjustment Rate Rider PP-1 shall apply to all service provided under this schedule.

SERVICE REGULATIONS. The applicable provisions of the current Service Regulations are made a part of this Schedule.

***There is no effect on revenue, ~~these~~ the revisions are clerical adjustments to account for updates to service policy and new legacy pole rate code.**

FY2024 - 2025 **FY2025 - 2026** **Effect on Revenue**

RESIDENTIAL CUSTOMER LIGHTING SERVICE – SCHEDULE RL

AVAILABILITY. This schedule is available only to any individual Residential consumer. Service will only be provided to facilities constructed in conformance with the City's specifications.

TYPE OF SERVICE. Light Emitting Diode (LED) lights are the new standard of lighting for the City of Monroe. LED lights are more energy efficient, brighter and more durable than legacy lights. See table below for specific LED units available. The City of Monroe lighting service includes installation, maintenance, repair and the provision of electrical energy. Illumination for any lighting service provided by the City shall be from dusk to dawn. Standard installation includes the lighting unit on an existing pole. If the lighting request requires the installation of new pole(s) a revenue analysis will be performed to determine the contribution in aid amount required from the customer. The revenue analysis will be per the electric service policy. All items of material and equipment used to make the installation remain the property of the City of Monroe. .
~~Initial installation includes the lighting unit, one pole, and one span of overhead secondary from an existing pole line. (Additional spans of secondary, poles, pole grounds, etc., must be paid by the consumer at actual cost of installation or at the monthly rate designated.).~~

MONTHLY RATE.

Light Emitting Diode (LED) Unit	Description: Power / Illumination / Energy	Rate Code	MONTHLY CHARGE
Area Light	50 Watts/6,485 Lumens/18.3 kWh	*A25*	*$13.55*
Flood Light	180 Watts/25,883 Lumens/65.7 kWh	*A31*	*$28.46*

Pole Material	Description: Size and features	Rate Code FY2025 – FY2026		MONTHLY CHARGE FY2025 – FY2026	
Wood	New / Standard / Up to 35 ft.		*NWP*		*$10.50*
Wood[1]	Existing / Standard / Up to 35 ft.	*FCW*	*EWP*	*No Charge*	*No Charge*

1- The existing wood pole rate is applicable to installations, including pole, prior to July 1st 2025. After this date, the existing wood pole rate is available only for light fixtures attached to poles which are not installed solely to support the light fixture.

SALES TAX. Current North Carolina utilities sales tax shall be added to the above charges.

PURCHASED POWER ADJUSTMENT. The current Purchased Power Adjustment Rate Rider PP-1 shall apply to all service provided under this schedule.

SERVICE REGULATIONS. The applicable provisions of the current Service Regulations are made a part of this Schedule.

Effective for service as determined on and after July 1st 2025.

***There is no effect on revenue, these increases are to be effective for new installations after July 1st 2025. These increases are to account for increases in the cost of labor and material to install new lighting poles. The other clerical edits are to account for updates in in service policy.**

	FY2024 - 2025	**FY2025 - 2026**	**Effect on Revenue**

COMMERCIAL/INDUSTRIAL CUSTOMER LIGHTING SERVICE – SCHEDULE CIL

AVAILABILITY. This schedule is available only to any individual Commercial/Industrial consumer. Service will only be provided to facilities constructed in conformance with the City's specifications.

TYPE OF SERVICE. Light Emitting Diode (LED) lights are the new standard of lighting for the City of Monroe. LED lights are more energy efficient, brighter and more durable than legacy lights. See below for specific units. The City of Monroe lighting service includes installation, maintenance, repair and the provision of electrical energy. Illumination for any lighting service provided by the City shall be from dusk to dawn. Standard installation includes the lighting unit on an existing pole. If the lighting request requires the installation of new pole(s) a revenue analysis will be performed to determine the contribution in aid amount required from the customer. The revenue analysis will be per the electric service policy. All items of material and equipment used to make the installation remain the property of the City of Monroe. ~~Initial installation includes the lighting unit, one pole and one span of overhead secondary from an existing pole line. (Additional spans of secondary, poles, pole grounds, etc., must be paid by the consumer at actual cost of installation or at the monthly rate designated.)~~

MONTHLY RATE

Light Emitting Diode (LED) Unit	**Description: Power / Illumination / Energy**	**Rate Code**	**MONTHLY CHARGE**
Area Light	50 Watts / 6,485 Lumens / 18.3 kWh	A25	$13.55
Flood Light	180 Watts / 25,883 Lumens / 65.7 kWh	A31	$28.46
	322 Watts / 46,802 Lumens / 117.5 kWh	A26	$74.72
Parking/Street Lights	234 Watts / 30,161 Lumens / 85.4 kWh	A32	$34.37
	200 Watts / 28,896 Lumens / 73.0 kWh	A36	$37.25
	94 Watts / 11664 Lumens / 34.3 kWh	A23	$19.35
	40 Watts / 5,541 Lumens / 14.6 kWh	A24	$13.55
	234 Watts / 30,616 Lumens / 85.4 kWh	A39	$34.37
	151 Watts / 19,667 Lumens / 55.1 kWh	A38	$28.46
Decorative Light	54 Watts / 6,559 Lumens / 19.7 kWh	A37	$17.65
Decorative Light*	80 Watts / 9,210 Lumens / 29.2 kWh	A40	$17.15

**Only available for City of Monroe Downtown area and other Facilities.*

Pole Material	**Description: Size and features**	**Rate Code FY2025 – FY2026**		**MONTHLY CHARGE FY2025 – FY2026**	
Aluminum	Standard / 20 ft. and under ~~/ Aluminum Smoother Fluted Finish 14ft~~	~~FCA~~	APU	~~$16.75~~	$18.03
Aluminum	Standard / Over 20 ft.		APO		$27.84
Aluminum*	Smart Trac / 20 ft. and under ~~Black Smart Trac Pole, embedded / 17 ft~~	~~FCE~~	STU	~~$19.04~~	$27.83
Aluminum*	Smart Trac / Over 20 ft. ~~Black Smart Trac Pole, Anchor based / 17 ft~~	~~FCB~~	STO	~~$28.82~~	$47.81
Fiberglass	Decorative / 20 ft. and under	~~FCU~~	FPU	~~$ 4.80~~	$14.56
Fiberglass	Decorative / Over 20 ft.	~~FCF~~	FPO	~~$ 8.41~~	$15.40

		FY2024 - 2025	FY2025 - 2026		Effect on Revenue
Steel	Standard	FCS	SP	$21.79	$23.31
Wood	New / Standard / Up to 35 ft.		*NWP*		*$10.50*
Wood[1]	Existing / Standard / Up to 35 ft.	*FCW*	*EWP*	*No Charge*	*No Charge*

**Only available for City of Monroe Downtown area and other Facilities.*

1-The existing wood pole rate is applicable to installations, including pole, prior to July 1st 2025. After this date, the existing wood pole rate is available only for light fixtures attached to poles which are not installed solely to support the light fixture.

SALES TAX. Current North Carolina utilities sales tax shall be added to the above charges.

PURCHASED POWER ADJUSTMENT. The current Purchased Power Adjustment Rate Rider PP-1 shall apply to all service provided under this schedule.

SERVICE REGULATIONS. The applicable provisions of the current Service Regulations are made a part of this Schedule.

Effective for service as determined on and after July 1st, 2025.

***There is no effect on revenue, these increases are to be effective for new installations after July 1st 2025. These increases are to account for increases in the cost of labor and material to install new lighting poles. The other clerical edits are to account for updates in in service policy.**

	FY2024 - 2025	**FY2025 - 2026**	**Effect on Revenue**

ARTICLE C. ELECTRIC RATE RIDERS

APPLICABILITY:
The Renewable Energy Portfolio Standards Charge set forth in this Rider is applicable to all customer accounts receiving electric service from the City of Monroe ("City"), except as provided below. These charges are collected for the expressed purpose of enabling the City to meet its Renewable Energy Portfolio Standards compliance obligations as required by the North Carolina General Assembly in its Senate Bill 3 ratified on August 2, 2007.

MONTHLY RATE:
Monthly electric charges for each customer account computed under the City's applicable electric rate schedule will be increased by an amount determined by the table below:

DEFINITIONS:	FY2024-2025	FY2025 - 2026	
Residential Account	$ 0.82	$ 0.87	
Commercial Account	$ 4.47	$ 4.72	
Industrial Account	$46.08	$48.67	

ELIGIBILITY REQUIREMENTS:
Industrial and Commercial Customer Opt-out: All industrial customers, regardless of size, and large commercial customers with usage greater than one million kWh's per year can elect not to participate in City's demand-side management and energy efficiency measures in favor of its own implemented demand-side management and energy efficiency measures by giving appropriate written notice to the City. In the event such customers "opt- out", they are not subject to the DSM/Energy Efficiency portion of the charges above. All customers are subject to the Renewable Resources portion of the charges above.

AUXILIARY SERVICE ACCOUNTS:
The following service schedules will not be considered accounts because of the low energy use associated with them and the near certainty that customers served under these schedules already will pay a per account charge under another residential, commercial or industrial service schedule:

- ~~Schedule AL and FL – Outdoor Lighting Service (metered and unmetered)~~
- ~~Schedule AL and FL – Street and Public Lighting ServiceSchedule TS – Traffic Signal Service~~

- Schedule LL – Legacy Lighting Service
- Schedule RL – Residential Lighting Service
- Schedule CIL – Commercial Industrial Lighting Service
- Schedule TS – Traffic Signal Service

***There is no effect on revenue, these are pass through charges from the NCMPA1 Power Agency. The REPS charges collected are all provided to the NCMPA1. NCMPA1 continues to plan its compliance (in aggregate, on behalf of the members) with the REPS. The other clerical edits are to account for changes in nomenclature of other service schedules.**

City of Monroe
Where Heartland Meets High Tech

STAFF REPORT

TO: Public Enterprise Committee

VIA: William Mark Watson, City Manager

DATE: May 6th, 2025

FROM: Robert Miller, General Manager of Energy Services and Water Resources

PREPARED BY: Darwin De Los Santos, General Manager of Engineering

SUBJECT: Marshville – Natural Gas Feasibility Update

SUMMARY STATEMENT

Staff will provide an update on a request from the Town of Marshville regarding natural gas service in the area.

REVIEW

Staff will provide an update on this item that was presented to the Public Enterprise Committee on March 4, 2025. Staff met with the Town of Marshville officials on April 2, 2025.

RECOMMENDATION

This item will be provided as information only.

City of Monroe
Where Heartland Meets High Tech

STAFF REPORT

TO: Public Enterprise Committee

VIA: William M. Watson, City Manager

DATE: May 6, 2025

FROM: Rob Miller, General Manager of Energy Services and Water Resources

PREPARED BY: Amy Cook, Water Resources General Manager of Operations

SUBJECT: Engineering Contract for Design of Filter #4 at the John Glenn Water Treatment Plant

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SUMMARY STATEMENT

The PEC is requested to consider an engineering contract for design of filter #4 at the John Glenn Water Treatment Plant.

REVIEW

The City of Monroe Water Resources Department requested Statements of Qualifications (SOQ's) from qualified engineering consultants to provide professional engineering services for the design of filter #4 at the John Glenn Water Treatment Plant. Five firms submitted Statements of Qualifications. Black and Veatch was selected based on qualifications.

An hourly not to exceed contract was negotiated with Black and Veatch for $289,955.00.

Sufficient funds are available in the WTP Capitalized Infrastructure budget.

RECOMMENDATION

It is the recommendation of Staff that Public Enterprise Committee take the following action:

Staff recommends PEC forward to City Council for consideration on the May 13, 2025 consent agenda, the award of a contract for professional engineering services for the design of filter #4 at the John Glenn Water Treatment Plant to Black and Veatch and authorize the City Manager to execute all Contract documents. The contract with Black and Veatch will be hourly not to exceed in the amount of $289,955.00.

Attachments:

Contract for Professional Engineering Services for Design of Filter #4 at the John Glenn Water Treatment Plant.

CONTRACT FOR THE DESIGN OF FILTER #4 AT THE JOHN GLENN WATER TREATMENT PLANT

This Contract is made and entered into as of the ___ day of _____, 20____, by the City of Monroe ("City") and Black & Veatch International Company ("Contractor"), (X) a corporation, ( ) a professional corporation, ( ) a professional association, ( ) a limited partnership, ( ) a sole proprietorship, or ( ) a general partnership; organized and existing under the laws of the State of Missouri.

Section 1. **Background and Purpose**. The City needs a fourth filter designed at the John Glenn Water Treatment Plant. This will improve redundancy and reliability at the Water Treatment Plant.

Section 2. **Services and Scope to be Performed**. The Contractor shall perform all the services as outlined in Attachment A (attached) by no later than _July 1, 2026_. In this contract, "Work" means the services that the Contractor is required to perform pursuant to this contract and all of the Contractor's duties to the City that arise out of this contract. Any amendments, corrections, or change orders by either party must be made in writing signed in the same manner as the original. (This form may be used for amendments and change orders.) The City reserves the right to refuse payment for any work outside that authorized herein or pursuant to a duly approved amendment or change order.

Section 3. **Complete Work without Extra Cost**. Unless otherwise provided, the Contractor shall obtain and provide, without additional cost to the City, all labor, materials, equipment, transportation, facilities, services, permits, and licenses necessary to perform the Work.

Section 4. **Compensation**. The City shall pay the Contractor for the Work as follows: Payments to the Contractor will be made on an hourly not-to-exceed basis and will be based on the contractor's hourly rates for specific positions as outlined in Attachment A (attached). The total compensation paid to the Contractor shall not exceed $ 289,955 as shown in Attachment A (attached). The City shall not be obligated to pay the Contractor any payments, fees, expenses, or compensation other than those authorized by this section.

Section 5. **Contractor's Billings to City.** The Contractor shall submit an original invoice to the Accounting Division at the City of Monroe. The Contractor can expect payment within 30 days.

Section 6. **Insurance.** Contractor shall maintain insurance policies at all times with minimum limits as follows:

COVERAGE	MINIMUM LIMITS

Workers' Compensation	Statutory Limits
Employers' Liability	$500,000
General Liability	$1,000,000 per occurrence/$2,000,000 aggregate
Automobile Liability	$1,000,000
Professional Liability (E & O)	$1,000,000 per claim/$2,000,000 aggregate

Contractor shall provide the City with a Certificate of Insurance for review prior to the issuance of any contract or Purchase Order. This should be an ACORD form (example attached). All Certificates of Insurance will require thirty (30) days written notice by the insurer or contractor's agent in the event of cancellation, reduction or other modifications of coverage. In addition to the notice requirement above, Contractor shall provide the City with immediate written notice of cancellation, reduction, or other modification of coverage of insurance. Upon failure of the Contractor to provide such notice, Contractor assumes sole responsibility for all losses incurred by the City for which insurance would have provided coverage. The insurance certificate shall be for the initial contract period of one (1) year and shall be renewed by the contractor for each subsequent renewal period of the contract.

The City shall be named as an additional insured on the General Liability and Auto Liability policies and it is required that coverage be placed with "A" rated insurance companies acceptable to the City. Statement should read "City of Monroe is to be added as an additional insured as evidenced by an endorsement attached to this certificate." Failure to maintain the required insurance in force may be cause for contract termination. In the event that the contractor fails to maintain and keep in force the insurance herein required, the City has the right to cancel and terminate the contract without notice.

Contractor shall provide proof that a Drug-Free Workplace Program is in place and that drivers meet DOT/CDL licensing requirements.

Section 7. **Performance of Work by City.** If the Contractor fails to perform the Work in accordance with the schedule referred to in Section 2 above, the City may, in its discretion, in order to bring the project closer to schedule, perform or cause to be performed some or all of the Work, and doing so shall not waive any of the City's rights and remedies. Before doing so, the City shall give the Contractor reasonable notice of its intention. The Contractor shall reimburse the City for all costs incurred by the City in exercising its right to perform or cause to be performed some or all of the Work pursuant to this section.

Section 8. **Attachments.** The following attachments are made a part of this contract and incorporated herein by reference:

Attachment A: Scope of Services and Fees containing 13 pages(s).

Attachment B: Certificate of Insurance containing 5 page(s).

In case of conflict between an attachment and the text of this contract excluding the attachment, the text of this contract shall control.

Section 9. **Notice.**

a. All notices and other communications required or permitted by this contract shall be in writing and shall be given either by personal delivery, fax, or certified United States mail, return receipt requested, addressed as follows:

To the City:	To the Contractor:
(By hand delivery, overnight delivery services, or other methods requiring a physical address): Amy Cook, PE City of Monroe 300 West Crowell Street Monroe, NC 28112 *(By United States Postal Service):* City of Monroe P.O. Box 69 Monroe, NC 28111-0069 Fax Number: (704) 290-1818	Kyle Massey, PE Black & Veatch 10925 David Taylor Drive, Suite 280 Charlotte, NC 28262 Fax Number: 704-548-8640

b. Change of Address, Date Notice Deemed Given: A change of address, fax number, or person to receive notice may be made by either party by notice given to the other party. Any notice or other communication under this contract shall be deemed given at the time of actual delivery, if it is personally delivered or sent by fax. If the notice or other communication is sent by US Mail, it shall be deemed given upon the third calendar day following the day on which such

notice or other communication is deposited with the US Postal Service or upon actual delivery, whichever first occurs.

Section 10. **Indemnification.** To the maximum extent allowed by law, unless otherwise prohibited under applicable limitations in Chapter 22B-1 of the North Carolina General Statutes, the Contractor shall defend, indemnify, and save harmless the City of Monroe, its agents, officers, and employees, from and against all charges that arise in any manner from, in connection with, or out of this contract as a result of the negligent acts or omissions of the Contractor or subcontractors or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable except for damage or injury caused by the negligence of the City its agents, officers, or employees. In performing its duties under this section, the Contractor shall at its sole expense defend the City of Monroe, its agents, officers, and employees with legal counsel reasonably acceptable to City. As used in this subsection – "Charges" means claims, judgments, costs, damages, losses, demands, liabilities, duties, obligations, fines, penalties, royalties, settlements, expenses, interest, reasonable attorney's fees, and amounts for alleged violations of sedimentation pollution, erosion control, pollution, or other environmental laws, regulations, ordinances, rules, or orders. Nothing in this section shall affect any warranties in favor of the City that are otherwise provided in or arise out of this contract. This section is in addition to and shall be construed separately from any other indemnification provisions that may be in this contract. This section shall remain in force despite termination of this contract (whether by expiration of the term or otherwise) and termination of the services of the Contractor under this contract.

Section 11. **E-Verify Requirement.** The Contractor shall comply with the requirements of Article 2 of Chapter 64 of the General Statutes. Further, if the Contractor utilizes a subcontractor, the Contractor shall require the subcontractor to comply with the requirements of Article 2 of Chapter 64 of the General Statutes.

Section 12. **Miscellaneous.**

a. Choice of Law and Forum. This contract shall be deemed made in Union County, North Carolina. This contract shall be governed by and construed in accordance with the law of North Carolina. The exclusive forum and venue for all actions arising out of this contract shall be the appropriate division of the North Carolina General Court of Justice, in Union County. Such actions shall neither be commenced in nor removed to federal court. This section shall not apply to subsequent actions to enforce a judgment entered in actions heard pursuant to this section.

b. Waiver. No action or failure to act by the City shall constitute a waiver of any of its rights or remedies that arise out this contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing.

c. Performance of Government Functions. Nothing contained in this contract shall be deemed or construed so as to in any way estop, limit, or impair the City from exercising or performing any regulatory, policing, legislative, governmental, or other powers or functions.

d. Severability. If any provision of this contract shall be unenforceable, the remainder of this contract shall be enforceable to the extent permitted by law.

e. Assignment, Successors and Assigns. Without the City's written consent, the Contractor shall not assign (which includes to delegate) any of its rights (including the right to payment) or duties that arise out this contract. Unless the City otherwise agrees in writing, the Contractor and all assigns shall be subject to all of the City's defenses and shall be liable for all of the Contractor's duties that arise out of this contract and all of the City's claims that arise out of this contract. Without granting the Contractor the right to assign, it is agreed that the duties of the Contractor that arise out of this contract shall be binding upon it and its heirs, personal representatives, successors, and assigns.

f. Compliance with Law. In performing all of the Work, the Contractor shall comply with all applicable law.

g. City Policy. THE CITY OPPOSES DISCRIMINATION ON THE BASIS OF RACE AND SEX AND URGES ALL OF ITS CONTRACTORS TO PROVIDE A FAIR OPPORTUNITY FOR MINORITIES AND WOMEN TO PARTICIPATE IN THEIR WORK FORCE AND AS SUBCONTRACTORS AND VENDORS UNDER CITY CONTRACTS.

h. EEO Provisions. During the performance of this Contract the Contractor agrees as follows:

(1) The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, political affiliation or belief, age, or handicap. The Contractor shall take affirmative action to insure that applicants are employed and that employees are

treated equally during employment, without regard to race, color, religion, sex, national origin, political affiliation or belief, age, or handicap. The Contractor shall post in conspicuous places available to employees and applicants for employment, notices setting forth these EEO provisions;

(2) The Contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, political affiliation or belief, age, or handicap.

i. No Third Party Right Created. This contract is intended for the benefit of the City and the Contractor and not any other person.

j. Principles of Interpretation. In this contract, unless the context requires otherwise, the singular includes the plural and the plural the singular. The pronouns "it" and "its" include the masculine and feminine. Reference to statutes or regulations include all statutory or regulatory provisions consolidating, amending, or replacing the statute or regulation. References to contracts and agreements shall be deemed to include all amendments to them. The word "person" includes natural persons, firms, companies, associations, partnerships, trusts, corporations, governmental agencies and units, and any other legal entities.

k. Modifications, Entire Agreement. A modification of this contract is not valid unless signed by both parties and otherwise in accordance with requirements of law. Further, a modification is not enforceable against the City unless the City Manager or other duly authorized official signs it for the City. This contract contains the entire agreement between the parties pertaining to the subject matter of this contract. With respect to that subject matter, there are no promises, agreements, conditions, inducements, warranties, or understandings, written or oral, expressed or implied, between the parties, other than as set forth or referenced in this contract.

IN WITNESS WHEREOF, the City of Monroe and the Contractor have caused this contract to be executed under seal by their respective duly authorized agents or officers.

CITY OF MONROE	**CONTRACTOR: Black & Veatch International Company**
BY: _____	BY: _____
( ) _____, Department Head	( ) President, ( ) CEO,

( ) William Mark Watson, City Manager

( ) Partner, ( ) Owner
( ) Other: _____

ATTEST:

_____
Secretary

(CORPORATE SEAL)

This Instrument has been pre-audited in the manner required by the Local Government Budget and Fiscal Control Act.

Finance Officer: _____ DATE: _____
Lisa Strickland

PROFESSIONAL DESIGN SERVICES
APPENDIX A – SCOPE OF SERVICES

Owner:	City of Monroe (NC)
Engineer:	Black & Veatch International Company
Project:	John Glenn WTP Filter No. 4

The City of Monroe owns and operates the John Glenn Water Treatment Plant (WTP) located at 2119 Old Camden Road in Monroe, NC. The WTP requires an additional filter (Filter No. 4) and associated piping, valves, meters, and instrumentation to increase treatment capacity during backwashes and to improve redundancy and reliability at the WTP.

This Project and Scope of Services is for the design and permitting for the addition of Filter No. 4 at the WTP, including all associated appurtenances. These services are further defined in specific phases of the work that follow. Bid Phase Services and Construction Administration Services will be negotiated later and be awarded via amendment to this contract.

Major components of the improvements to be designed are listed below:

1. Site grading and erosion and sediment control, limited to the area of excavations required for the new Filter No. 4.
2. Filter No. 4 foundation.
3. Filter No. 4 structure, including reinforced concrete bottom slab, walls, gullet, top slab, walkways, and guide railing.
4. Extend Filter No. 4 bottom slab to include necessary length of bottom slab for future Sedimentation Basin No. 4.
5. Filter No. 4 primary internal components, including filter underdrain, filter media, backwash wastewater troughs, and air supply to underdrains.
6. Filter pipe gallery piping, valves and actuators, meter(s), and pipe supports, including air supply piping, filtered water, filter to waste, backwash supply, backwash wastewater, and sample piping.
7. Filter piping tie-ins to existing pipes, as applicable.
8. Tie in to existing settled water piping (filter influent piping), including wall and floor sleeves, as necessary, and determine necessary construction sequencing for this connection to minimize WTP shutdown durations.
9. Evaluate existing air supply system to confirm ability to serve Filter No. 4.

10. Chemical feed connections, piping, and valves for Filter No. 4, including chlorine, polymer, caustic, and fluoride.

11. Instrumentation, including turbidimeters, pressure gauges, rate of flow transmitters, loss of head transmitters, float switches, impulse piping for transmitters and meters, and supports, as necessary, for the instruments.

12. Programming and controls, including new panels as may be required for new filter instruments and controls, adjustments to existing blower control panel, and adjustments to existing instrumentation panel.

13. Electrical installation modification as necessary for new Filter No. 4 and ancillary equipment, including new conduit, wiring, junction boxes, pull boxes, and raceways.

14. Electrical lighting and grounding, as necessary.

15. Develop Maintenance of Plant Operations (MOPO) to minimize duration(s) of WTP shutdown(s).

1.0 PROJECT MANAGEMENT & ADMINISTRATION

A. Provide administration and management of project for a duration of 9 months. Prepare project management documents including project procedures manual, budget, schedule, drafting standards manual, and quality assurance and quality control plan. Review ongoing activities. Monitor schedule and budget. Review progress with Owner on a regular basis. Discuss issues with the Owner as they are noted.

B. Provide project management to coordinate activities of the project team and to provide overall Project direction to meet Owner's objectives. Coordinate communication with Owner.

C. Coordinate the work of required sub-consultants.

D. Prepare monthly invoices for Engineer's services.

E. Maintain a project filing system throughout the life of the project to use for storage and retrieval of Project documents. Project filing system will be through a SharePoint site established for the project which will allow access by key Owner staff.

F. Update Owner Project Manager on Project Trend Reports.

G. Project Meetings

1. One (1) project kickoff meeting with the design team and Owner representatives. For budget purposes, one (1) in-person meeting held at the Owners' office is included.

2. Participate in informal meetings with the Owner to review progress and exchange ideas and information.

3. Prepare and distribute the minutes for project meetings. Minutes for the project meetings will include a record of decisions made.

H. Status Review. Conduct a virtual, monthly status review meeting to present the monthly status report which includes:

1. Status of work completed on each task

2. Discussion of project issues

3. Project budget update

4. Project schedule update

2.0 PRELIMINARY ENGINEERING AND BASIS OF DESIGN MEMO (BDM)

A. Site visits and field reconnaissance, as necessary.

B. Existing utility verification, including Level B subsurface utility exploration (SUE). Level A SUE in locations as determined by the Engineer. This scope assumes 3 test holes. Additional test holes can be provided as an additional service based on test hole unit price.

C. Geotechnical, as needed, to confirm existing site conditions.

1. Geotechnical services and reports to assess geology and presence of rock and ground water at the tank site.

2. Geotechnical engineering services including exploratory work, laboratory and field testing, professional guidance and a geotechnical report by a qualified geotechnical firm interpreting the data on the exploratory work and testing.

3. It is assumed that no more than two (2) boring locations will be required at the WTP site. The borings will provide rock quality designation, compressive strength and excavatability, as well as set the basis for the geotechnical report.

D. Review existing, available information, including record drawings. Existing record drawings will be used to create Revit files for use in creating the drawings. A thorough

survey of the site was completed in 2017 and it will be used as the basis for horizontal and vertical datum. No additional surveying is anticipated.

E. Engineer understands that it is the Owner's preference to use a filter media configuration similar to what is currently located within Filter Nos. 1 through 3. The same media configuration will be used for Filter No. 4 and will be documented as part of the BDM.

F. Engineer understands that it is the Owner's preference to use block style underdrains similar to what is currently located within Filter Nos. 1 through 3. The same block style underdrains will be used for Filter No. 4 and will be documented as part of the BDM.

G. Develop concepts for new Filter No. 4 and associated piping, valves, and appurtenances, including material and equipment preferences, and document decisions within BDM.

H. Develop a preliminary site plan.

I. Develop a preliminary P&ID for the addition of Filter No. 4 and associated appurtenances.

J. Evaluate and determine minimum electrical requirements at the site, with preliminary design components.

K. Set minimum structural design requirements for the Project, including new Filter No. 4 structure, pipe supports, guide railing, etc.

L. Discuss with Owner preference for sole-sourcing certain equipment due to overall maintenance standardization. Document decision within BDM.

M. Provide a list of anticipated technical specifications to be used for the construction contract documents.

N. Provide an anticipated drawing sheet list.

O. Prepare a conceptual Opinion of Probable Construction Cost (OPCC). It should be noted, all OPCCs developed will follow the recommendations of the Association for the Advancement of Cost Engineering (AACE) International Recommended Practice No. 18R and accepted industry guidelines regarding methodology and accuracy. Since Engineer has no control over the cost of labor, material, or equipment furnished by others not under contract to Engineer, Engineer's OPCC for the Work will be made based on experience and qualifications as an Engineer. Engineer does not guarantee or warranty that proposals, bids, or actual project costs will not vary from Engineer's opinions of probable cost.

P. Confirm and document permitting requirements by providing a list of the number and types of permits and approvals necessary for the construction of this Project.

Q. Deliver to Owner a Draft BDM for review, which shall entail conceptual design components described herein and will include additional technical memos as appropriate. Draft submittal will be electronic only.

R. Conduct a project review workshop with the Owner to review items within the Draft BDM and accept Owner comments. Prepare and distribute minutes for the review meeting.

S. Deliver to Owner a Final BDM which will be revised based on Owner feedback and will become the document which the design documents are created. Engineer will provide three (3) hard copies Final BDM reports to the Owner.

3.0 DETAILED DESIGN – CONSTRUCTION CONTRACT DOCUMENTS LEVEL 1.5 (50%)

A. Detailed design is to commence only after Owner has accepted design criteria and the Basis of Design Memo.

B. Begin preparation of construction contract design documents for one (1) construction contract.

C. Construction contract documents shall be prepared for selection of private construction contractors on a competitive bid basis.

D. Provide a 50% interim set of documents for review by Owner's staff and Engineer's quality control. The interim documents shall serve as milestones wherein certain features shall be fixed after a period of Owner review. The purpose of the interim documents and fixing certain features shall be to communicate the design progress and avoid later revisions that would impact design efficiency and Project cost and schedule.

E. Drawings will be prepared based on ENGINEER's drafting standards on 22" x 34" size sheets. The OWNER's applicable standard details available and current at the time of the work will be utilized. Where applicable OWNER standard details are not available, ENGINEER's standard details will be utilized. The technical specifications will be based on ENGINEER's standards and customized for the project.

F. It is anticipated that 50% construction contract documents will include the following:

1. P&ID drawings
2. Equipment control descriptions
3. Site plan
4. Grading plan

5. General site arrangements and yard piping drawings
6. Major facility plans and sections showing equipment and piping
7. Power and lighting plans
8. Structural framing plans and sections
9. Process equipment specifications and data sheets
10. Valve list
11. OPCC update

G. Provide one electronic copy (PDF) of drawings and specifications to Owner for distribution and review.

H. Attend one (1) meeting with Owner to receive and discuss Owner's review comments.

I. Revise documents as necessary to reflect decisions taken at this level.

4.0 DETAILED DESIGN – CONSTRUCTION CONTRACT DOCUMENTS LEVEL 3 (90%)

A. Level 3 design shall commence only after Owner has accepted Level 1.5 deliverables. Level 3 progress review meeting deliverables are as follows:

1. Final review set of drawings.
2. Final review set of specifications and construction contract documents.
3. Front End Documents, with comments for Owner review. It should be noted that Standard Front-End Documents compatible with EJCDC will be provided based on Engineer’s standard documents. Documents include Invitation to Bid, Instructions to Bidders, General Conditions, Supplemental Conditions, Agreement, and other documents and forms that may be required.
4. OPCC update

B. Provide one electronic copy (PDF) of drawings and specifications to Owner for distribution and review.

C. Attend one meeting with Owner to receive and discuss Owner's final review comments.

D. Refine documents according to mutual agreement.

5.0 PERMITTING

A. Assist Owner with forms and applications required for submittal to regulatory agencies. Owner will sign forms. Engineer will provide payment of any regulatory fees and Owner will reimburse Engineer for the direct costs of the permits.

B. Engineer to provide hard copy sets of final documents and submit to regulatory agencies for approval on behalf of Owner.

C. Nominal comments from the regulatory agencies will be addressed via response letter and may include a few updated drawings sheets, effort for which is included.

6.0 DETAILED DESIGN – CONSTRUCTION CONTRACT DOCUMENTS LEVEL 4 (100%)

A. Revise documents with final Owner and regulatory agency comments.

B. Meet with the Owner to review and finalize critical front-end document decisions.

7.0 BID AND PRE-AWARD SERVICES

Bid Phase Services will be completed as part of a subsequent phase and negotiated via amendment.

8.0 CONSTRUCTION PHASE SERVICES

Construction Phase Services will be completed as part of a subsequent phase and negotiated via amendment.

9.0 CONSTRUCTION MATERIALS TESTING

Construction Materials Testing will be completed as part of a subsequent phase and negotiated via amendment.

SCHEDULE

Scope of Services is anticipated to be performed as shown below.

Project Administration	June 2025 – February 2026
Preliminary Investigations	June 2025 – August 2025

Detailed Design & Permitting	August 2025 – February 2026
Bid Phase Services	TBD (Subsequent Phase)
Construction Phase Services	TBD (Subsequent Phase)

10.0 SUPPLEMENTAL SERVICES

Certain assumptions have been made in preparing this Scope of Services. To the extent possible, they are stated herein and are reflected in the budget for services. If the work tasks or level of effort required are different from the assumptions presented, or if the Owner desires additional services (Supplemental Services), the resultant change may serve as a basis for modifying the Agreement as agreed upon by both the Owner and Consultant.

Supplemental services are not in the scope of work for this contract. These services will be performed at Owner's request with compensation adjustments. Supplemental services that Owner might choose to add to the scope of services include, but are not limited to, the following items:

A. General

1. Assistance in financially related transactions for the project.
2. Safety Assessments.
3. Security Assessments.
4. Value Engineering reviews and services.
5. Revision of designs, drawings, and specifications to incorporate changes arising from Value Engineering review.
6. 3D modeling.
7. Renderings or photo realistic drawings.
8. Establishing a project communications site.
9. Prequalification of contractors or vendors.
10. Additional meetings with local, State, or Federal agencies to discuss the project.
11. Multiple rounds of submittals or extensive changes to the documents as required by regulatory agencies.

12. Additional appearances at public hearings or before special boards.

13. Supplemental engineering work required to meet the requirements of regulatory or funding agencies that become effective subsequent to the date of this agreement.

14. Special consultants or independent professional associates requested or authorized by Owner.

15. Assistance with bid protests and rebidding.

16. Preparation for litigation, arbitration, or other legal or administrative proceedings; and appearances in court or at arbitration sessions in connection with bid protests, change orders, or construction incidents.

17. Additions to an engineering report or other document to update or revise original recommendations.

B. Changes in the general scope, extent, schedule, or character of the project, including, but not limited to:

1. Changes in size or complexity.

2. Owner's schedule, design, or character of construction.

3. Method of financing.

4. Revision of previously accepted studies, reports, design documents, or construction contract documents when such revisions are required by changes in laws, rules, regulations, ordinances, codes, or orders enacted subsequent to the preparation of such studies, reports, documents, or designs; or are required by any other causes beyond Engineer's control.

C. Rights of way and/or property acquisition.

D. Scope assumes the following Permits will be required: NCDEQ ATC and City of Monroe Building Code.

E. Environmental Assessment:

1. Environmental assessment reports and/or environmental impact statements.

2. Cultural resources and/or archaeological study and reports.

3. Archaeological consultations regarding artifacts that may be uncovered during construction.

F. Testing:

1. Laboratory and field testing and any reports or studies on materials and equipment requested by Owner.

2. Observing factory tests and/or field retesting of equipment that fails to pass the initial test.

G. Hazardous Environmental Conditions:

1. Remedial investigation/feasibility study or Phase I environmental site assessment to determine the quantity and location of contamination.

2. Conduct asbestos or lead based paint abatement or other hazardous material abatement on existing facilities.

H. Conducting pilot plant studies and tests.

I. Support services for additional work in connection with public information activity.

J. Scope assumes minimal comments from Owner and Permitting Agencies in order to create Final Design set from 90% set.

K. Bid phase services.

L. Construction phase services.

M. Construction material testing.

PROFESSIONAL DESIGN SERVICES
APPENDIX B – COMPENSATION

Owner:	City of Monroe (NC)
Engineer:	Black & Veatch International Company
Project:	John Glenn WTP Filter No. 4

For services covered by this Contract, the Owner agrees to pay Engineer as follows:

A. For Tasks 1.0 through 6.0, as defined in Attachment A of the Contract, the Work performed as part of this Agreement will be invoiced on an hourly bill rate basis with a not to exceed limit of $289,955.00.

B. Tasks 7.0 through 9.0 are part of a subsequent phase in the project and scope and fee for this Work will be negotiated at a later date and executed via an amendment to this Contract.

C. For Phase 10.0 - Supplemental Services, as defined in Attachment A of the Contract, Owner and Engineer will negotiate a written amendment to this Contract prior to beginning work on any supplemental services.

D. The following expenses are reimbursable work items and will be billed at cost: bulk reproduction of documents (outside reproduction services will be treated as a subconsultant); charges for review of drawings and specifications by government agencies, if any; vehicular transportation costs at the rate established by the Internal Revenue Service; airline tickets, meals, and lodging with out-of-town travel; and permitting and/or regulatory application fees.

E. Subconsultant invoices will include a 10% markup.

F. Hourly bill rates for professionals are set on an annual basis and are subject to review and adjustment annually.

Owner: Monroe

Project: John Glenn WTP Filter 4

PHASE/Task (Billing Rate, $$,Hr.)		Sr Project Manager $285.00	Sr Project Controls $175.00	Project Accountant $145.00	Project Biller $145.00	Sr Estimator $270.00	Engineering Manager $220.00	Project Engineer $150.00	Sr Engineering Manager & QA/QC $260.00	Sr Structural Engineer $260.00	Structural Engineer $180.00	Mechanical Engineer $240.00	Sr Electrical Engineer $290.00	Electrical Engineer $185.00	Sr I&C Engineer $290.00	I&C Engineer $190.00	Sr Water Process Engineer $275.00	CAD Lead/Coordinator $220.00
WORK BREAKDOWN STRUCTURE	**TASK**																	
		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Design Project Management and Administration	1.0	32	19	16	16	-	24	24	-	-	-	-	-	-	-	-	-	-
Preliminary Engineering and Basis of Design Memo	2.0	4	-	-	-	4	24	36	-	8	14	2	8	12	8	16	4	12
50% Detailed Design	3.0	4	-	-	-	8	44	64	4	30	48	8	12	24	8	12	-	4
90% Detailed Design	4.0	4	-	-	-	14	52	72	4	24	36	14	16	40	10	24	2	4
Permitting	5.0	-	-	-	-	-	8	16	-	4	4	-	2	4	-	-	-	-
Final Design	6.0	-	-	-	-	-	10	16	-	2	4	-	-	4	-	4	-	-
		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total, Hours		**44**	**19**	**16**	**16**	**26**	**162**	**228**	**8**	**68**	**106**	**24**	**38**	**84**	**26**	**56**	**6**	**20**
Total, Billings		**$ 12,540**	**$ 3,325**	**$ 2,320**	**$ 2,320**	**$ 7,020**	**$ 35,640**	**$ 34,200**	**$ 2,080**	**$ 17,680**	**$ 19,080**	**$ 5,760**	**$ 11,020**	**$ 15,540**	**$ 7,540**	**$ 10,640**	**$ 1,650**	**$ 4,400**

Owner: Monroe

Project: John Glenn WTP Filter 4

PHASE/Task (Billing Rate, $$,Hr.)		CAD - Site Civil $155.00	CAD - Structural $155.00	CAD - Mech/Piping $155.00	CAD - Electrical $210.00	CAD - I&C $210.00	SUBTOTAL, Hours	SUBTOTAL, Billings $	Travel/Per Diem Expenses	Permit Fees	SUBTOTAL, EXPENSES	SUBCONTRACTS Richa	CES	S&ME	SUBTOTAL, SUBCONTRACTS	TOTAL Billings
WORK BREAKDOWN STRUCTURE	**TASK**															
		-	-	-	-	-	-	$ -	$ -	$ -	$ -				$ -	$ -
Design Project Management and Administration	1.0	-	-	-	-	-	131	$ 25,965	$ 700	$ -	$ 700				$ -	$ 26,665
Preliminary Engineering and Basis of Design Memo	2.0	12	54	70	-	12	300	$ 55,220	$ 250	$ -	$ 250		$ 8,000	$ 12,000	$ 22,000	$ 77,470
50% Detailed Design	3.0	12	40	36	20	8	386	$ 74,900	$ 250	$ -	$ 250				$ -	$ 75,150
90% Detailed Design	4.0	24	24	40	34	16	454	$ 89,350	$ 150	$ -	$ 150				$ -	$ 89,500
Permitting	5.0	-	-	-	-	-	38	$ 7,240	$ 500	$ 450	$ 950	$ 500			$ 550	$ 8,740
Final Design	6.0	6	8	8	4	4	70	$ 12,430	$ -	$ -	$ -				$ -	$ 12,430
		-	-	-	-	-	-	$ -	$ -	$ -	$ -				$ -	$ -
Total, Hours		**54**	**126**	**154**	**58**	**40**	**1,379**									
Total, Billings		**$ 8,370**	**$ 19,530**	**$ 23,870**	**$ 12,180**	**$ 8,400**		**$ 265,105**	**$ 1,850**	**$ 450**	**$ 2,300**	**$ 550**	**$ 8,800**	**$ 13,200**	**$ 22,550**	**$ 289,955**

ATTACHMENT B

ACORD®

CERTIFICATE OF LIABILITY INSURANCE

11/1/2025

DATE (MM/DD/YYYY) 3/24/2025

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Lockton Companies, LLC 444 W. 47th St., Ste. 900 Kansas City MO 64112-1906 (816) 960-9000 kcasu@lockton.com	CONTACT NAME: PHONE (A/C, No, Ext): FAX (A/C, No): E-MAIL ADDRESS:
INSURED 1482177 BLACK & VEATCH INTERNATIONAL COMPANY 11401 LAMAR AVE. OVERLAND PARK KS 66211 MASSEY, KYLE	INSURER(S) AFFORDING COVERAGE — NAIC # INSURER A : Zurich American Insurance Company — 16535 INSURER B : National Fire and Marine Insurance Co — 20079 INSURER C : Lloyds of London INSURER D : INSURER E : INSURER F :

COVERAGES **CERTIFICATE NUMBER:** 21547447 **REVISION NUMBER:** XXXXXXX

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY	Y	N	GLO 4641358	11/1/2024	11/1/2025	EACH OCCURRENCE	$ 2,000,000
A	CLAIMS-MADE X OCCUR			GLO 1365630	11/1/2024	11/1/2025	DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 100,000
							MED EXP (Any one person)	$ 10,000
							PERSONAL & ADV INJURY	$ 2,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$ 4,000,000
	POLICY X PRO-JECT LOC						PRODUCTS - COMP/OP AGG	$ 4,000,000
	OTHER:							$
A	AUTOMOBILE LIABILITY	Y	N	BAP 4641355 (AOS)	11/1/2024	11/1/2025	COMBINED SINGLE LIMIT (Ea accident)	$ 3,000,000
	X ANY AUTO						BODILY INJURY (Per person)	$ XXXXXXX
	X OWNED AUTOS ONLY; SCHEDULED AUTOS						BODILY INJURY (Per accident)	$ XXXXXXX
	X HIRED AUTOS ONLY; X NON-OWNED AUTOS ONLY						PROPERTY DAMAGE (Per accident)	$ XXXXXXX
								$ XXXXXXX
	UMBRELLA LIAB OCCUR			NOT APPLICABLE			EACH OCCURRENCE	$ XXXXXXX
	EXCESS LIAB CLAIMS-MADE						AGGREGATE	$ XXXXXXX
	DED RETENTION $							$ XXXXXXX
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY		N	WC 4641353 (AOS)	11/1/2024	11/1/2025	X PER STATUTE OTH-ER	
A	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y/N N	N/A		WC 4641354 (ID, MA, WI)	11/1/2024	11/1/2025	E.L. EACH ACCIDENT	$ 1,000,000
A	(Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below			WC 1365632	11/1/2024	11/1/2025	E.L. DISEASE - EA EMPLOYEE	$ 1,000,000
							E.L. DISEASE - POLICY LIMIT	$ 1,000,000
C	PROFESSIONAL	N	N	GLCON2400110	11/1/2024	11/1/2025	$10,000,000 PER CLAIM	
B	LIABILITY			42-EPP-324748-04	11/1/2024	11/1/2025	$10,000,000 ANNUAL AGGREGATE	

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

RE: PROJECT NUMBER: 00317669; PROJECT NAME: JOHN GLENN FILTER NO. 4; PROJECT MANAGER: MASSEY, KYLE; GENERAL LIABILITY AND AUTO LIABILITY ARE PRIMARY AND NON-CONTRIBUTORY. UPON AWARD OF CONTRACT, ADDITIONAL INSURED AND WAIVER OF SUBROGATION WILL BE PROVIDED. 30 DAY NOTICE OF CANCELLATION APPLIES, 10 DAYS NOTICE FOR NON-PAYMENT OF PREMIUM.

CERTIFICATE HOLDER

21547447
CITY OF MONROE, NC
2401 WALKUP AVENUE,
MONROE NC 28110

CANCELLATION See Attachments

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Joseph M Agnello

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Waiver Of Subrogation (Blanket) Endorsement

Policy No.	Eff.Date of Pol.	Exp. Date of Pol.	Eff. Date of End.	Producer	Add'l. Prem	Return Prem.
GLO 4641358	11/1/2024	11/1/2025	11/1/2024			
GLO 1365630	11/1/2024	11/1/2025	11/1/2024			

Named Insured: BLACK & VEATCH INTERNATIONAL COMPANY

This endorsement modifies the insurance provided under the following:

Commercial General Liability Coverage Part

The following is added to the **Transfer Of Rights Of Recovery Against Others To Us Condition:**

If you are required by a written contract or agreement, which is executed before a loss, to waive your rights of recovery from others, we agree to waive our rights of recovery. This waiver of rights shall not be construed to be a waiver with respect to any other operations in which the insured has no contractual interest.

POLICY NUMBER: BAP 4641355 (AOS)

COMMERCIAL AUTO
CA 20 48 02 99

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

DESIGNATED INSURED

This endorsement modifies insurance provided under the following:

BUSINESS AUTO COVERAGE
GARAGE COVERAGE FORM
MOTOR CARRIER COVERAGE FORM
TRUCKERS COVERAGE FORM

With respect to coverage provided by this endorsement, the provisions of the Coverage Form apply unless modified by this endorsement.

This endorsement indentifies person(s) or organization(s) who are "insureds" under the Who Is An Insured Provision of the Coverage Form. This endorsement does not alter coverage provided in the Coverage Form.

This endorsement changes the policy effective on the inception date of the policy unless another date is indicated below.

Endorsement Effective:11/1/2024
Named Insured: BLACK & VEATCH INTERNATIONAL COMPANY

SCHEDULE

Name of Person(s) or Organization(s): AS REQUIRED PER WRITTEN CONTRACT

(If no entry appears above, information required to complete this endorsement will be shown in the Declarations as applicable to the endorsement.)

Each person or organization shown in the Schedule is an "insured" for Liability Coverage, but only to the extent that person or organization qualifies as an "insured" under the Who Is An Insured Provision contained in **Section II** of the Coverage Form.

Waiver of Transfer Of Rights Of Recovery Against Others To Us

Policy No.	Eff.Date of Pol.	Exp. Date of Pol.	Eff. Date of End.	Producer No.	Add'l. Prem	Return Prem.
BAP 4641355 (AOS)	11/1/2024	11/1/2025	11/1/2024			

This endorsement is issued by the company named in the Declarations. It changes the policy on the effective date listed above at the hour stated in the Declarations.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

Named Insured: BLACK & VEATCH INTERNATIONAL COMPANY

Address (including ZIP code): 11401 LAMAR AVE. OVERLAND PARK KS 66211

This endorsement modifies insurance provided under the:

Business Auto Coverage Form
Truckers Coverage Form
Garage Coverage Form
Motor Carrier Coverage Form

SCHEDULE

Name of the Person or Organization:
AS REQUIRED BY WRITTEN CONTRACT

We waive any right of recovery we amy have against the designated person or organization shown in the schedule because of payments we make for injury or damage caused by an "accident" or "loss" resulting from the ownership, maintenance, or use of a covered "auto" for which a Waiver of Subrogation is required in conjunction with work performed by you for the designated person or organization. The waiver applies only to the designated person or organization shown in the schedule.

WC 00 03 13

WAIVER OF OUR RIGHT TO RECOVER FROM OTHERS ENDORSEMENT

We have the right to recover our payments from anyone liable for an injury covered by this policy. We will not enforce our right against the person or organization named in the Schedule. (This agreement applies only to the extent that you perform work under a written contract that requires you to obtain this agreement from us.)

This agreement shall not operate directly or indirectly to benefit anyone not named in the Schedule.

Schedule

AS REQUIRED PER WRITTEN CONTRACT

This endorsement changes the policy to which it is attached and is effective on the date issued unless otherwise stated.
(The information below is required only when this endorsement is issued subsequent to preparation of the policy.)

Effective Policy No. WC 4641353 (AOS), WC 4641354 (ID, MA, WI), WC 1365632
Insured: BLACK & VEATCH INTERNATIONAL COMPANY
Effective Date: 11/1/2024

City of Monroe
Where Heartland Meets High Tech

STAFF REPORT

TO: Public Enterprise Committee

VIA: William M. Watson, City Manager

DATE: May 6, 2025

FROM: Rob Miller, General Manager of Energy Services and Water Resources

PREPARED BY: Amy Cook, Water Resources General Manager of Operations

SUBJECT: Engineering Contract for Design of Chemical Storage Upgrades at the John Glenn Water Treatment Plant

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SUMMARY STATEMENT

The PEC is requested to consider an engineering contract for design of chemical storage upgrades at the John Glenn Water Treatment Plant.

REVIEW

The City of Monroe Water Resources Department requested Statements of Qualifications (SOQ's) from qualified engineering consultants to provide professional engineering services for the design of chemical storage upgrades at the John Glenn Water Treatment Plant. Five firms submitted Statements of Qualifications. Garver was selected based on qualifications.

An hourly not to exceed contract was negotiated with Garver for $359,286.00.

Sufficient funds are available in the WTP Capitalized Infrastructure budget.

RECOMMENDATION

It is the recommendation of Staff that Public Enterprise Committee take the following action:

Staff recommends PEC forward to City Council for consideration on the May 13, 2025 consent agenda, the award of a contract for professional engineering services for the design of chemical storage upgrades at the John Glenn Water Treatment Plant to Garver and authorize the City Manager to execute all Contract documents. The contract with Garver will be hourly not to exceed in the amount of $359,286.00.

Attachments:

Contract for Professional Engineering Services for Design of Chemical Storage Upgrades at the John Glenn Water Treatment Plant.

CONTRACT FOR THE DESIGN OF CHEMICAL STORAGE UPGRADES AT THE JOHN GLENN WATER TREATMENT PLANT

This Contract is made and entered into as of the ___ day of _____, 20____, by the City of Monroe ("City") and Garver, LLC ("Contractor"), a limited liability company; organized and existing under the laws of the State of Arkansas.

Section 1. **Background and Purpose**. The City needs chemical storage upgrades to expand and modernize the chemical storage and chemical feed facilities at the John Glenn Water Treatment Plant.

Section 2. **Services and Scope to be Performed**. The Contractor shall perform all the services as outlined in Attachment A (attached) by no later than September 1, 2026. In this contract, "Work" means the services that the Contractor is required to perform pursuant to this contract and all of the Contractor's duties to the City that arise out of this contract. Any amendments, corrections, or change orders by either party must be made in writing signed in the same manner as the original. (This form may be used for amendments and change orders.) The City reserves the right to refuse payment for any work outside that authorized herein or pursuant to a duly approved amendment or change order.

Section 3. **Complete Work without Extra Cost**. Unless otherwise provided, the Contractor shall obtain and provide, without additional cost to the City, all labor, materials, equipment, transportation, facilities, services, permits, and licenses necessary to perform the Work.

Section 4. **Compensation**. The City shall pay the Contractor for the Work as follows: Payments to the Contractor will be made on an hourly not-to-exceed basis and will be based on the contractor's hourly rates for specific positions as outlined in Attachment A (attached). The total compensation paid to the Contractor shall not exceed $ 359,286 as shown in Attachment A (attached). The City shall not be obligated to pay the Contractor any payments, fees, expenses, or compensation other than those authorized by this section.

Section 5. **Contractor's Billings to City.** The Contractor shall submit an original invoice to the Accounting Division at the City of Monroe. The Contractor can expect payment within 30 days.

Section 6. **Insurance.** Contractor shall maintain insurance policies at all times with minimum limits as follows:

COVERAGE	MINIMUM LIMITS
Workers' Compensation	Statutory Limits
Employers' Liability	$500,000

General Liability	$1,000,000 per occurrence/$2,000,000 aggregate
Automobile Liability	$1,000,000
Professional Liability (E & O)	$1,000,000 per occurence/$2,000,000 aggregate

Contractor shall provide the City with a Certificate of Insurance for review prior to the issuance of any contract or Purchase Order. This should be an ACORD form (example attached). All Certificates of Insurance will require thirty (30) days written notice by the insurer or contractor's agent in the event of cancellation, reduction or other modifications of coverage. In addition to the notice requirement above, Contractor shall provide the City with immediate written notice of cancellation, reduction, or other modification of coverage of insurance. Upon failure of the Contractor to provide such notice, Contractor assumes sole responsibility for all losses incurred by the City for which insurance would have provided coverage. The insurance certificate shall be for the initial contract period of one (1) year and shall be renewed by the contractor for each subsequent renewal period of the contract.

The City shall be named as an additional insured and it is required that coverage be placed with "A" rated insurance companies acceptable to the City. Statement should read "City of Monroe is to be added as an additional insured as evidenced by an endorsement attached to this certificate." Failure to maintain the required insurance in force may be cause for contract termination. In the event that the contractor fails to maintain and keep in force the insurance herein required, the City has the right to cancel and terminate the contract without notice.

Contractor shall provide proof that a Drug-Free Workplace Program is in place and that drivers meet DOT/CDL licensing requirements.

Section 7. **Performance of Work by City.** If the Contractor fails to perform the Work in accordance with the schedule referred to in Section 2 above, the City may, in its discretion, in order to bring the project closer to schedule, perform or cause to be performed some or all of the Work, and doing so shall not waive any of the City's rights and remedies. Before doing so, the City shall give the Contractor reasonable notice of its intention. The Contractor shall reimburse the City for all costs incurred by the City in exercising its right to perform or cause to be performed some or all of the Work pursuant to this section.

Section 8. **Attachments.** The following attachments are made a part of this contract and incorporated herein by reference:

Attachment A: Scope of Services and Fees containing 10 pages(s).

Attachment B: Certificate of Insurance containing 3 page(s).

In case of conflict between an attachment and the text of this contract excluding the attachment, the text of this contract shall control.

Section 9. **Notice.**

a. All notices and other communications required or permitted by this contract shall be in writing and shall be given either by personal delivery, fax, or certified United States mail, return receipt requested, addressed as follows:

To the City:	To the Contractor:
(By hand delivery, overnight delivery services, or other methods requiring a physical address): Amy Cook, P.E. City of Monroe 300 West Crowell Street Monroe, NC 28112 email: acook@monroenc.org phone: 704-282-4604 *(By United States Postal Service):* Amy Cook, P.E. City of Monroe P.O. Box 69 Monroe, NC 28111-0069	Jonathan Williams, P.E. Garver 10735 David Taylor Drive, Suite 130 Charlotte, NC 28262 Email: JDWilliams@garverusa.com Phone: 704-798-6831

b. Change of Address, Date Notice Deemed Given: A change of address, fax number, or person to receive notice may be made by either party by notice given to the other party. Any notice or other communication under this contract shall be deemed given at the time of actual delivery, if it is personally delivered or sent by fax. If the notice or other communication is sent by US Mail, it shall be deemed given upon the third calendar day following the day on which such

notice or other communication is deposited with the US Postal Service or upon actual delivery, whichever first occurs.

Section 10. **Indemnification.** To the maximum extent allowed by law, unless otherwise prohibited under applicable limitations in Chapter 22B-1 of the North Carolina General Statutes, the Contractor shall defend, indemnify, and save harmless the City of Monroe, its agents, officers, and employees, from and against all charges that arise in any manner from, in connection with, or out of this contract as a result of the acts or omissions of the Contractor or subcontractors or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable except for damage or injury caused by the negligence of the City its agents, officers, or employees. In performing its duties under this section, the Contractor shall at its sole expense defend the City of Monroe, its agents, officers, and employees with legal counsel reasonably acceptable to City. As used in this subsection – "Charges" means claims, judgments, costs, damages, losses, demands, liabilities, duties, obligations, fines, penalties, royalties, settlements, expenses, interest, reasonable attorney's fees, and amounts for alleged violations of sedimentation pollution, erosion control, pollution, or other environmental laws, regulations, ordinances, rules, or orders. Nothing in this section shall affect any warranties in favor of the City that are otherwise provided in or arise out of this contract. This section is in addition to and shall be construed separately from any other indemnification provisions that may be in this contract. This section shall remain in force despite termination of this contract (whether by expiration of the term or otherwise) and termination of the services of the Contractor under this contract.

Section 11. **E-Verify Requirement.** The Contractor shall comply with the requirements of Article 2 of Chapter 64 of the General Statutes. Further, if the Contractor utilizes a subcontractor, the Contractor shall require the subcontractor to comply with the requirements of Article 2 of Chapter 64 of the General Statutes.

Section 12. **Miscellaneous.**

a. Choice of Law and Forum. This contract shall be deemed made in Union County, North Carolina. This contract shall be governed by and construed in accordance with the law of North Carolina. The exclusive forum and venue for all actions arising out of this contract shall be the appropriate division of the North Carolina General Court of Justice, in Union County. Such actions shall neither be commenced in nor removed to federal court. This section shall not apply to subsequent actions to enforce a judgment entered in actions heard pursuant to this section.

b. Waiver. No action or failure to act by the City shall constitute a waiver of any of its rights or remedies that arise out this contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing.

c. Performance of Government Functions. Nothing contained in this contract shall be deemed or construed so as to in any way estop, limit, or impair the City from exercising or performing any regulatory, policing, legislative, governmental, or other powers or functions.

d. Severability. If any provision of this contract shall be unenforceable, the remainder of this contract shall be enforceable to the extent permitted by law.

e. Assignment, Successors and Assigns. Without the City's written consent, the Contractor shall not assign (which includes to delegate) any of its rights (including the right to payment) or duties that arise out this contract. Unless the City otherwise agrees in writing, the Contractor and all assigns shall be subject to all of the City's defenses and shall be liable for all of the Contractor's duties that arise out of this contract and all of the City's claims that arise out of this contract. Without granting the Contractor the right to assign, it is agreed that the duties of the Contractor that arise out of this contract shall be binding upon it and its heirs, personal representatives, successors, and assigns.

f. Compliance with Law. In performing all of the Work, the Contractor shall comply with all applicable law.

g. City Policy. THE CITY OPPOSES DISCRIMINATION ON THE BASIS OF RACE AND SEX AND URGES ALL OF ITS CONTRACTORS TO PROVIDE A FAIR OPPORTUNITY FOR MINORITIES AND WOMEN TO PARTICIPATE IN THEIR WORK FORCE AND AS SUBCONTRACTORS AND VENDORS UNDER CITY CONTRACTS.

h. EEO Provisions. During the performance of this Contract the Contractor agrees as follows:

(1) The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, political affiliation or belief, age, or handicap. The Contractor shall take affirmative action to insure that applicants are employed and that employees are

treated equally during employment, without regard to race, color, religion, sex, national origin, political affiliation or belief, age, or handicap. The Contractor shall post in conspicuous places available to employees and applicants for employment, notices setting forth these EEO provisions;

(2) The Contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, political affiliation or belief, age, or handicap.

i. No Third Party Right Created. This contract is intended for the benefit of the City and the Contractor and not any other person.

j. Principles of Interpretation. In this contract, unless the context requires otherwise, the singular includes the plural and the plural the singular. The pronouns "it" and "its" include the masculine and feminine. Reference to statutes or regulations include all statutory or regulatory provisions consolidating, amending, or replacing the statute or regulation. References to contracts and agreements shall be deemed to include all amendments to them. The word "person" includes natural persons, firms, companies, associations, partnerships, trusts, corporations, governmental agencies and units, and any other legal entities.

k. Modifications, Entire Agreement. A modification of this contract is not valid unless signed by both parties and otherwise in accordance with requirements of law. Further, a modification is not enforceable against the City unless the City Manager or other duly authorized official signs it for the City. This contract contains the entire agreement between the parties pertaining to the subject matter of this contract. With respect to that subject matter, there are no promises, agreements, conditions, inducements, warranties, or understandings, written or oral, expressed or implied, between the parties, other than as set forth or referenced in this contract.

IN WITNESS WHEREOF, the City of Monroe and the Contractor have caused this contract to be executed under seal by their respective duly authorized agents or officers.

CITY OF MONROE	**CONTRACTOR: Garver, LLC**
BY: _____	BY: _____
( ) _____, Department Head	( ) President, ( ) CEO,
( ) William Mark Watson, City Manager	( ) Partner, ( ) Owner

( ) Other: _____

ATTEST:

_____
Secretary

(CORPORATE SEAL)

This Instrument has been pre-audited in the manner required by the Local Government Budget and Fiscal Control Act.

Finance Officer: _____ DATE: _____
Lisa Strickland

STAFF REPORT

TO: Public Enterprise Committee

VIA: William M. Watson, City Manager

FROM: Robert Miller, General Manager of Utilities

DATE: May 6, 2025

PREPARED BY: Monica Bulos, Purchasing Assistant and Amy F. Cook, Water Resources General Manager of Operations

SUBJECT: Annual Bid Award for Water Resources Treatment Chemicals FY 2026

SUMMARY STATEMENT

The Public Enterprise Committee is requested to consider the bids received and recommend awarding contracts to the various vendors for water and wastewater treatment chemicals.

REVIEW

On April 4, 2025 staff received annual bids for the Water and Wastewater Treatment Chemicals. In addition to unit pricing, a performance evaluation of Powder Activated Carbon was required to be submitted by vendors submitting bids. The list of recommended awards based on pricing and the performance testing results are as follows:

Product	Vendor	Price per Dry LB
Liquid Chlorine	Brenntag Mid-South Inc.	$2,249/ton
Zinc Ortho Polyphosphate	Sterling Water	$1.8935/lb
Sulfur Dioxide	JCI Jones Chemicals	$1,850/ton and $224/cylinder
Dry Cationic Polymer- WTP	SNF Polydyne	$1.98/lb Clarifoc C-3226
Dry Non-Ionic Polymer	SNF Polydyne	$1.50/lb Clarifoc N-3300P
Calcium Hydroxide Slurry	Polytec Inc.	0.08 /dry lb
Dry Cationic Polymer-WWTP	SNF Polydyne	$1.98/lb Clarifloc SE-1278
Powder Activated Carbon	ARQ Purification	$0.96/lb

Funding for all Water and Wastewater Treatment Chemicals will be available beginning July 1, 2025 and upon approval of the FY26 Water Resources Operating Budget.

RECOMMENDATION

Staff recommends that the Public Enterprise Committee forward to City Council for consideration on the May 13, 2025 consent agenda that contracts be awarded to the Vendors previously identified for the water and wastewater treatment chemicals based on the results of the Annual Water Resources Department Treatment Chemical Bid and authorize the City Manager to execute the associated contracts for fiscal year 2026.

STAFF REPORT

TO:	Public Enterprise Committee
VIA:	Mark Watson, City Manager
DATE:	May 6, 2025
FROM:	Robert Miller, General Manager of Energy Services and Water Resources
PREPARED BY:	Barandyk Leo, E.I., Civil Engineer I of Water Resources
SUBJECT:	Outside City Service Requests

SUMMARY STATEMENT

Public Enterprise Committee (PEC) is requested to consider an outside City service request as described below.

REVIEW

Water Resources (WR) Department Staff has received a request for outside City services as shown on the attached exhibit (3 pages) and as follows:

1. Jose Albino Torres is requesting City water service for existing single-family home at 2208 White Store Rd. PIN 09-125-061(0.64 AC)

All outside City service requests require both City Council approval, and Union County Board of Commissioner (UCBC) approval pursuant to City Ordinances and the Water and Sewer Master Agreement with Union County. The UCBC approved this request at their April 7, 2025 meeting.

As a matter of policy, outside city water and sewer customers pay double tap fees and double monthly customer base charges on their City accounts.

RECOMMENDATION

It is the recommendation of WR Staff that Public Enterprise Committee take the following action:

Staff recommends a motion to approve the request for outside City water service to 2208 White Store Rd. PIN 09-125-061 and forward to City Council for consideration on the May 13th consent agenda.

Attachment(s):

Monroe
North Carolina

Out of City Limits
WATER AND/OR SEWER SERVICE REQUEST
Operations Center 704-282-4601

Applicant Name: Jose Albino Torres
Email address: alpulke452.cic@hotmail.com Phone number: 336) 669-6539
Property Address: 2208 White Store Rd Monroe NC 28112
Tax Map Parcel Number 091-25a 61 Parcel Size (Acres) 0.64

☑ **Water Service**

Request for Water Service is being submitted for the following reason(s).

☐ **New Construction**

☑ **Existing Well Failure.** Provide brief description: _____

☐ **Sewer Service**

Request for Sewer Service is being submitted for the following reason(s).

☐ **New Construction** ☐ **Existing Septic System Failure**

Out of City Limits - Water and Sewer Service Terms and Conditions

- All requests are subject to Union County Commission and City of Monroe Council approval.
- The Property Owner shall comply with the City of Monroe Water and/or Sewer Ordinances.
- An evaluation of voluntary annexation will be conducted.
- Property Owner shall pay the appropriate tap and capacity fees for outside City customers based on the prevailing fee schedule and will be required to set up an account with the City of Monroe Customer Service Department.
- Property Owner shall acquire all necessary offsite easements if required to connect to the City's water distribution and/or sewer collection system. A copy of the recorded private easement(s) shall be provided to the City of Monroe Water Resources Department.
- Upon payment of fees and completion of the water and/or sewer tap, billing shall begin immediately.
- Water services shall be per the City of Monroe Specifications and shall have remote radio read technology.
- Property Owner shall notify the City of Monroe prior to making the connection to the sewer tap to schedule an onsite inspection of the installation. Only one (1) property parcel shall be connected to the sewer tap.
- Property Owner agrees that the sewer tap shall be maintained by the City of Monroe at the Property Owner's expense.
- If a private grinder pump and sewer forcemain is required, the Property Owner shall install #12 gage coated plastic copper wire taped to the service lateral from the connection to the sewer tap to the house connection.
- Property Owner shall assume ownership and maintenance responsibility for the service forcemain and the sewer pump and all other plumbing past the sewer tap.
- Property Owner shall agree to pay a monthly flat rate sewer bill if water service is from a private well.
- Property Owner agrees that if the property is ever sold that he/she shall provide the new owner a copy of this Service Request/Terms and Conditions and shall fully explain the conditions, responsibilities and precise location of the private water service and/or sewer lateral or forcemain if a private pump is installed.
- Depending upon schedules for the Union County Commissioners meetings and Monroe City Council meetings, the total timeframe for service approval can take as long as 3-5 months.

I hereby certify that the information provided is, to the best of my knowledge, correct and complete. I understand that I must adhere to the City of Monroe's Out of City Limits – Water and Sewer Service Terms and Conditions as outlined above. I also understand that any approval may be revoked and penalties imposed under the City's ordinance if this certification is not complete and true or for failure to comply with the Terms and Conditions.

Applicant's Signature

03/05/2025
Date

Barandyk Leo

From: Crystal Panico <crystal.panico@unioncountync.gov>
Sent: Tuesday, April 8, 2025 11:21 AM
To: Barandyk Leo
Subject: RE: Water Service Connection Request – 2208 White Store Rd

Follow Up Flag: Follow up
Flag Status: Flagged

This Message Is From an External Sender
This message came from outside your organization.
Report Suspicious

Good morning,
The Board approved the City's request to serve 2208 White Store Rd last night as part of the consent agenda.
If you have any questions or need anything else, please let me know.
Thank you!

Crystal Outlaw Panico, PE
New Development Program Manager | Engineering
T 704.296.4239

crystal.panico@unioncountync.gov
unioncountywater.org

Union County Government
500 North Main Street, Suite 400
Monroe, NC 28112

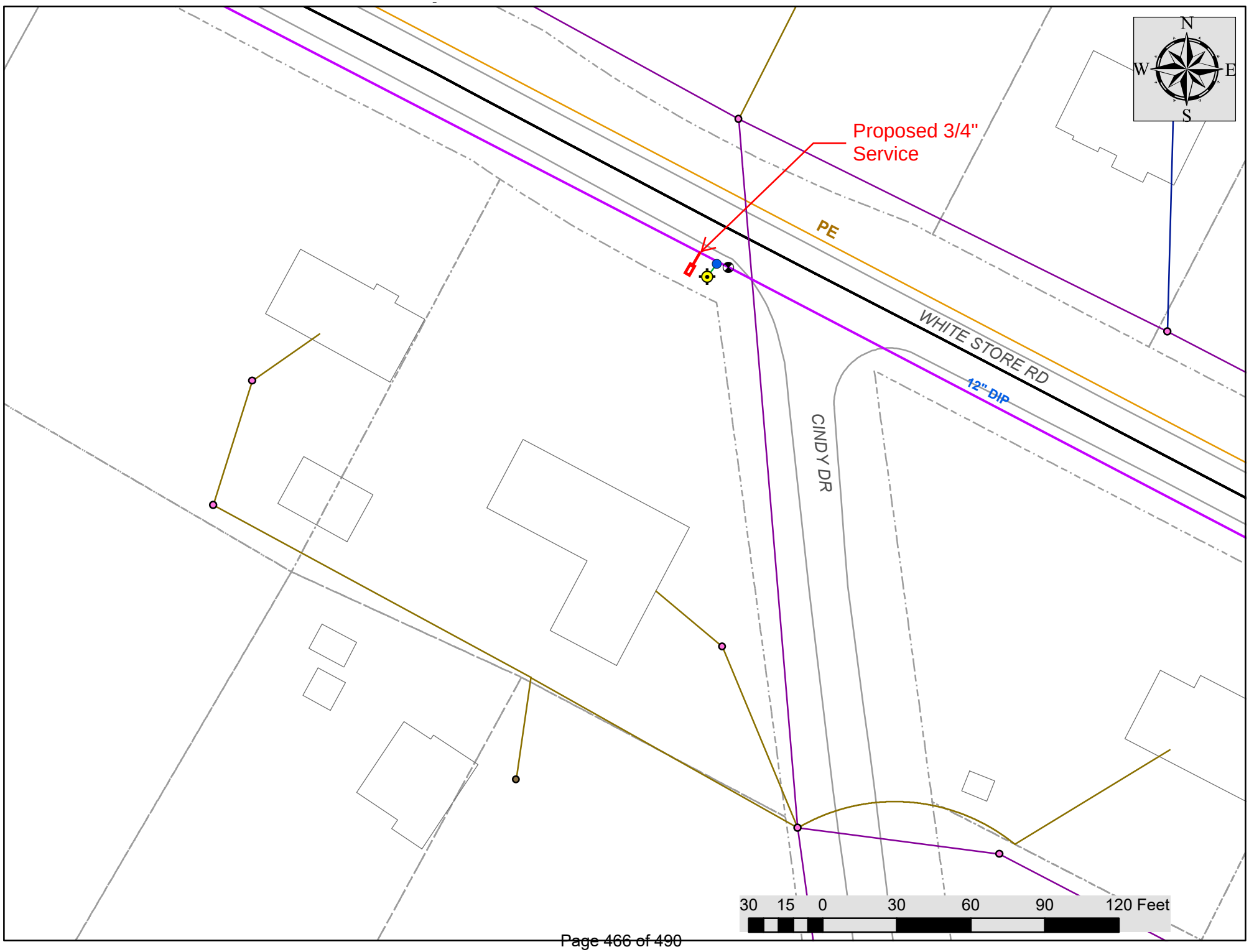
From: Crystal Panico
Sent: Tuesday, March 18, 2025 2:04 PM
To: Barandyk Leo <bleo@monroenc.org>
Subject: RE: Water Service Connection Request – 2208 White Store Rd

To follow up -This item has been submitted for consideration as part of the consent agenda for the BOCC April 07, 2025 meeting.
Please let me know if you have any questions or need anything else.
Thank you!

Crystal Outlaw Panico, PE
New Development Program Manager | Engineering
T 704.296.4239

crystal.panico@unioncountync.gov
unioncountywater.org

2208 White Store rd. Location Map



STAFF REPORT

TO:	Public Enterprise Committee
VIA:	Mark Watson, City Manager
DATE:	May 6, 2025
FROM:	Robert Miller, General Manager of Energy Services and Water Resources
PREPARED BY:	Richard Riser, P.E., Assistant Director of Water Resources
SUBJECT:	Outside City Service Requests

SUMMARY STATEMENT

Public Enterprise Committee (PEC) is requested to consider an outside City service request as described below.

REVIEW

Water Resources (WR) Department Staff has received a request for outside City services as shown on the attached exhibit (3 pages) and as follows:

1. Jose Sanchez is requesting City water service for JLS Masonry at 1371 N. Rocky River Rd. PIN 09-372-005-90 (9.21 AC).

All outside City service requests require both City Council approval, and Union County Board of Commissioner (UCBC) approval pursuant to City Ordinances and the Water and Sewer Master Agreement with Union County. The UCBC approved this request at their February 18, 2025 meeting.

As a matter of policy, outside city water and sewer customers pay double tap fees and double monthly customer base charges on their City accounts.

RECOMMENDATION

It is the recommendation of WR Staff that Public Enterprise Committee take the following action:

Staff recommends a motion to approve the request for outside City water service to 1371 N. Rocky River Rd. PIN 09-372-005-90 and forward to City Council for consideration on the May 13th consent agenda.

Attachment(s):

Monroe
North Carolina

Out of City Limits
WATER AND/OR SEWER SERVICE REQUEST
Operations Center 704-282-4601

Applicant Name: JLS MASONRY - JOSE SANCHEZ
Email address: JLSMASONRYINC@HOTMAIL Phone number: 980 346 7181
Property Address: 13711 N. ROCKY RIVER RD MONROE NC
Tax Map Parcel Number 093 -7200-590 Parcel Size (Acres) 9.21
093-7200-580

☒ **Water Service**

Request for Water Service is being submitted for the following reason(s).

☑ **New Construction**

☐ **Existing Well Failure**. Provide brief description: _____

☐ **Sewer Service**

Request for Sewer Service is being submitted for the following reason(s).

☑ **New Construction** ☐ **Existing Septic System Failure**

Out of City Limits - Water and Sewer Service Terms and Conditions

- All requests are subject to Union County Commission and City of Monroe Council approval.
- The Property Owner shall comply with the City of Monroe Water and/or Sewer Ordinances.
- An evaluation of voluntary annexation will be conducted.
- Property Owner shall pay the appropriate tap and capacity fees for outside City customers based on the prevailing fee schedule and will be required to set up an account with the City of Monroe Customer Service Department.
- Property Owner shall acquire all necessary offsite easements if required to connect to the City's water distribution and/or sewer collection system. A copy of the recorded private easement(s) shall be provided to the City of Monroe Water Resources Department.
- Upon payment of fees and completion of the water and/or sewer tap, billing shall begin immediately.
- Water services shall be per the City of Monroe Specifications and shall have remote radio read technology.
- Property Owner shall notify the City of Monroe prior to making the connection to the sewer tap to schedule an onsite inspection of the installation. Only one (1) property parcel shall be connected to the sewer tap.
- Property Owner agrees that the sewer tap shall be maintained by the City of Monroe at the Property Owner's expense.
- If a private grinder pump and sewer forcemain is required, the Property Owner shall install #12 gage coated plastic copper wire taped to the service lateral from the connection to the sewer tap to the house connection.
- Property Owner shall assume ownership and maintenance responsibility for the service forcemain and the sewer pump and all other plumbing past the sewer tap.
- Property Owner shall agree to pay a monthly flat rate sewer bill if water service is from a private well.
- Property Owner agrees that if the property is ever sold that he/she shall provide the new owner a copy of this Service Request/Terms and Conditions and shall fully explain the conditions, responsibilities and precise location of the private water service and/or sewer lateral or forcemain if a private pump is installed.
- Depending upon schedules for the Union County Commissioners meetings and Monroe City Council meetings, the total timeframe for service approval can take as long as 3-5 months.

I hereby certify that the information provided is, to the best of my knowledge, correct and complete. I understand that I must adhere to the City of Monroe's Out of City Limits – Water and Sewer Service Terms and Conditions as outlined above. I also understand that any approval may be revoked and penalties imposed under the City's ordinance if this certification is not complete and true or for failure to comply with the Terms and Conditions.

Jose Sanchez
Applicant's Signature

12/18/2024
Date

City of Monroe
Water Resources

monroenc.org • 704-282-4601 • PO Box 69, Monroe, NC 28111

December 9, 2024

Ms. Stephanie Gonzales
JLS Masonry
1371 Rocky River Rd.

Re: City of Monroe Water Service
Parcels 09372005 80 & 09372005 90

Ms. Gonzales

The City of Monroe is willing to provide water service to the referenced parcels. Parcel 09372005 80 (80) will be served by a 2" water meter. Developers contractor to provide the 2" water meter, meter box and setter meeting City of Monroe standards. Parcel 09372005 90 (90) will be served by a 3" water meter.

Sewer service will also be provided to the parcel 80. Parcel 90 will not have access to sewer service. The point of connection to the sewer is uncertain at this time. There has been an existing sewer service discovered on site. It has not been determined if this service can be used and will need to be determined such by your plumber.

Due to parcel 90 being out of the corporate limits of the City of Monroe, the service request must first be approved by the Union County Board of Commissioners and then Monroe City Council.

The general process for obtaining City Sewer service is outlined below. Please note that these requests can take 3 months or longer to receive approval.

1. Please complete the attached "Outside Water Sewer Service Request Form" indicating you are requesting water and/or sewer service, and the reason for the request. A copy of the form can be returned to me by email or by mail to the following address: City of Monroe Water Resources Department, 2401 Walkup Ave, Monroe, NC 28110.
2. You will then need to contact Union County with the completed request form. Contact Crystal Outlaw Panico, P.E., New Development Program Manager/Engineering, at 704-296-4239. She can help with the process, you may want to include a copy of this letter as part of what you submit to her.
3. Union County will place the request on their next County Commissioner's meeting for review.
4. If approved by the County, the Water Resources Department will submit your request to Monroe City Council.
5. If approved by Monroe City Council, the Water Resources Department will provide notification of approval, and the fee sheet for water service to parcel 90 will be issued.

Assuming both parties approve the water service for parcel 90, base fees for the water will be doubled per the current City of Monroe fee schedule. The current base fee for a 3" meter for out of City parcels is $399.50/month.

The developer will be required to pay for and install the meter vault, backflow device and provide the 3" meter, all meeting City of Monroe standards.

It should be pointed out that the current water capacity fee for a 3" meter is $29,429.00. This fee will be shown on the fee sheet and be required to be paid prior to putting the water service into service.

Please feel free to contact me with any questions.

Sincerely,

Richard Riser, P.E.
City of Monroe
Water Resources Engineering Manager

STAFF REPORT

TO:	Public Enterprise Committee
VIA:	William M. Watson, City Manager
DATE:	May 6, 2025
FROM:	Rob Miller, General Manager of Energy Services and Water Resources
PREPARED BY:	Amy Cook, Water Resources General Manager of Operations
SUBJECT:	Rehabilitation of the City of Monroe Wastewater Treatment Plant Chlorine Contact Tank with Sole Sourced Material and Construction Contract

SUMMARY STATEMENT

The Public Enterprise Committee is requested to consider the sole source of a lining system for rehabilitation of the City of Monroe Wastewater Treatment Plant Chlorine Contact Tank and a contract for its installation.

REVIEW

The Chlorine Contact Tank (CCT) at the City of Monroe Wastewater Treatment Plant was constructed in the mid 1970's and is in need of rehabilitation to extend the life of the structure. In February 2025, Water Resources contracted with the engineering firm Hazen and Sawyer (Hazen) to evaluate the amount of degradation of the CCT and to provide options for rehabilitation methods. Their recommended rehabilitation method for lining the CCT is to coat it with the OBIC Armor system (OBIC).

OBIC, a multi-layer corrosion and infiltration protection liner, was selected due to its unique composition, rapid set time, and published performance in wastewater environments. However, during their evaluation of rehabilitation methods, Hazen was unable to identify a product equal to OBIC. They have provided a memorandum detailing the benefits of installing OBIC including comparing the costs and time out of service to the standard lining method (Cementitious Polymer Modified Trowel-On) for rehabilitating similar concrete structures. The following table summarizes their findings.

Concrete Rehabilitation System	Cost of System CCT Channel Walls	Cost of System Effluent Weir Trough	Cost for Ancillary Items*	Total	Estimated CCT Out of Service Time
OBIC Armor System	$478,800	$8,400	$53,300	$540,500	Channel Walls – 14 days/channel
					Effluent Trough – 8 hours
Cementitious Polymer Modified Trowel-On System	$567,000	NA**	$53,,300	$620,000**	Channel Walls – 1 month/channel
					Effluent Trough – Not Feasible

* Mobilization, Concrete Repair, Channel Cleanout, PRV Touchups
** System is unable to be applied on the effluent weir trough because of system application and cure time requirements.

CTR Coatings is the OBIC, LLC Certified Installer for North Carolina, South Carolina, Kentucky and Tennessee. CTR Coatings provided a quote in the amount of $540,425.00.

According to a provision in the NC General Statues (G.S. 143-129(f)), local governments may purchase goods or services from a sole source without competitive bidding when the needed product is available from only one source of supply. Therefore, based on the comparison of OBIC to the Cementitious Polymer Modified Trowel-On System, Water Resources requests to sole source the OBIC Armor system and enter into a contract with CTR Coatings for lining of the Wastewater Treatment Plant CCT as allowed by G.S. 143-129 (f).

Sufficient funds are available in the Waste Water Treatment Plant Capitalized Infrastructure (5108040-424050) budget to enter a contract with CTR Coatings for lining the Wastewater Treatment Plant CCT.

RECOMMENDATION

It is the recommendation of Staff that Public Enterprise Committee take the following action:

Staff recommends PEC forward to City Council for consideration on the May 13, 2025 consent agenda, acceptance of the sole source OBIC Armor system as the lining method of the Wastewater Treatment Plant Chlorine Contact Tank, award a contract for installation of the OBIC Armor system to CTR Coatings in the amount of $540,425.00, and authorize the City Manager to execute all Contract documents.

Attachments:

Memorandum from Hazen, dated April 18, 2025, Re: Chlorine Contact Tank Rehabilitation – Justification for Use of OBIC Armor System

Letter from OBIC identifying Certified Installers

Contract with CTR Coatings

Hazen Memorandum

April 18, 2025

To: City of Monroe

From: Meredith Bridwell
Brandon Moretz
Ryan Ording
Colby Whiteley

Re: Chlorine Contact Tank Rehabilitation - Justification for Use of OBIC Armor System

The OBIC Armor system is a Multi-layer Corrosion and Infiltration Protection Lining and has been selected to coat the interior wall surfaces of the Chlorine Contact Tank (CCT) at the Monroe Wastewater Treatment Plant (MWWTP) due to its unique composition, rapid set time, and published performance in wastewater environments. This polyurea initial and finish coating system (50 mil each), which features a closed-cell (polymer) foam intermediate layer (400 mil), is stated to provide the needed chemical resistance and durability in high-chlorine conditions. The total system is approximately 500 mils (1/2") thick and provides good resistance to blistering and delamination due to negative infiltration pressure (groundwater). Given the condition and the operating exposure of the CCT, a robust and reliable lining system is essential to slow deterioration of the aging structure in an effort to extend its useful service life.

A characteristic of the design of the Monroe CCT is the division of the structure into two parallel channels – one of which must always be in operation unless costly bypass pumping and temporary disinfection are utilized. With at least one channel in continual service, there is always residual moisture present within the dewatered channel due to the shared channel wall. Common polyurethane and epoxy coating solutions are typically sensitive to the presence of moisture during application, causing poor adhesion and poor curing; however, it is understood that the OBIC Armor system is specifically designed with the ability to be used on saturated-surface-dry (SSD) surfaces. As the plant's flow must be restricted during coating application, the City of Monroe will receive both qualitative and quantitative gain by reducing the duration that a channel is out of service. The OBIC coating is published to set within 40 seconds and to have the ability to cure underwater (7-day cure time), providing a near instant return-to-service. This robust return-to-service claim as well as the stated resistance and watertightness make this coating system unique. We are unaware of any other Multi-Layer Corrosion and Infiltration Protection Lining which possesses all the parameters outlined herein. Additionally, the costs are competitive with traditional Cementitious Polymer Modified Trowel-On options.

Job no

Below is a comparison of probable cost and time for common Cementitious Polymer Modified Trowel-On Systems and the OBIC Armor system.

Concrete Rehabilitation System	Cost of System for CCT Channel Walls	Cost of System for Effluent Weir Trough	Cost for Mobilization, Concrete Repair, Channel Cleanout, PRV Touchups	Total
OBIC Armor System*	$478,800	$8,400	$53,300	**$540,500**
Cementitious Polymer Modified Trowel-On System	$567,000	NA**	$53,300	**$620,300****

* CTR/OBIC proposal dated 4-10-2025

** This system is not able to be applied on the effluent weir trough because of system application and cure time requirements.

Concrete Rehabilitation System	Estimated Time to Complete Work (CCT Out of Service)
OBIC Armor System	CCT Channel Walls – 14 days per channel
	CCT Effluent Weir Trough – 8 hours
Cementitious Polymer Modified Trowel-On System	CCT Channel Walls - 1 month per channel
	CCT Effluent Weir Trough – Not Feasible

As we understand it, OBIC is the only manufacturer of a system of this type, and there is only one certified installer servicing the region where the MWWTP is located (CTR Coatings, based out of York, South Carolina). As a result, alternative products are not able to be considered "as equal" in terms of coating properties and installation characteristics. Although Hazen has limited direct experience with the OBIC armor system, significant favorable research has been conducted, and the City of Monroe has also successfully installed this system in structures that remain in service today. Therefore, it is our opinion that sole-sourcing the OBIC armor system is both advantageous and necessary for the City of Monroe to satisfy all of the project goals.

When it absolutely, positively must last.

12 March 2025

To Whom It May Concern,

This letter is to confirm that OBIC LLC works through a network of Certified Installers and each installer has a designated protected territory. CTR Coatings is our Certified Installer for North Carolina, South Carolina, Kentucky and Tennessee. They are the exclusive installer for these states.

Please do not hesitate to contact me if you have any questions.

Sincerely,

Michael Hoffmaster
Vice President
OBIC LLC
E: mike@obicproducts.com
C: 240-818-3639

525 Winzeler Drive, Unit 1 • Bryan, OH 43506 • 419-633-3147 • 866-636-4854
www.OBICproducts.com

CONTRACT FOR LINING THE WASTEWATER TREATMENT PLANT CHLORINE CONTACT TANK

This Contract is made and entered into as of the ___ day of _____, 20____, by the City of Monroe ("City") and CTR Utility Rehab, LLC (CTR Coatings) ("Contractor"), ( ) a corporation, ( ) a professional corporation, ( ) a professional association, ( ) a limited liability company, ( ) a limited partnership, ( ) a sole proprietorship, or ( ) a general partnership; organized and existing under the laws of the State of _____.

Section 1. **Background and Purpose**. The Chlorine Contact Tank (CCT) at the City of Monroe Wastewater Treatment Plant was constructed in the mid 1970's and is in need of rehabilitation to extend the life of the structure. As part of the rehabilitation, the walls of the CCT must be lined with a protective coating system

Section 2. **Services and Scope to be Performed**. The Contractor shall remove and dispose of all sediment from the CCT, properly prepare surfaces to be lined, and install the OBIC Armor system on the interior and top of walls and floor. In this contract, "Work" means the services that the Contractor is required to perform pursuant to this contract and all of the Contractor's duties to the City that arise out of this contract. Any amendments, corrections, or change orders by either party must be made in writing signed in the same manner as the original. (This form may be used for amendments and change orders.) The City reserves the right to refuse payment for any work outside that authorized herein or pursuant to a duly approved amendment or change order.

Section 3. **Complete Work without Extra Cost**. Unless otherwise provided, the Contractor shall obtain and provide, without additional cost to the City, all labor, materials, equipment, transportation, facilities, services, permits, and licenses necessary to perform the Work.

Section 4. **Compensation**. The City shall pay the Contractor for the Work as follows: Upon successful completion of the CCT lining system an amount not to exceed $540,425.00. The City shall not be obligated to pay the Contractor any payments, fees, expenses, or compensation other than those authorized by this section.

Section 5. **Contractor's Billings to City**. Contractor shall submit an original pay request to the City construction inspector or project manager. It is suggested the Contractor superintendent meet with the City's construction inspector or manager prior to submitting the pay request to verify quantities of work completed, materials, and values. The pay request shall contain the following items, all submitted on City forms (digital forms are available upon request):

a. Recommendation for payment – all fields complete including history of change orders as appropriate;

b. Affidavit and Lien Waiver or Release – Notarized original with all fields complete;

c. Tax Statement and Certification – Notarized original with all fields complete;

d. Tax Table listing itemized invoices and showing county where tax was paid. Include copies of invoices that are itemized in the tax table. Submit notarized originals. If claiming no tax for the period, submit the statement and certification with table and note "no sales tax for this period" on the form.

Upon receipt of the above the City will verify the amounts and if all of the forms are correct and the amounts correct, the Contractor can expect payment within 15 days. For final payment after acceptance of the work by the City, submit an official pay request as outlined above. In addition, the request shall include an Affidavit of Final Payment (notarized original with all fields complete), and a Consent of Surety to Final Payment (notarized original with all fields complete) if applicable.

Section 6. **Insurance.** Contractor shall maintain insurance policies at all times with minimum limits as follows:

COVERAGE	MINIMUM LIMITS
Workers' Compensation	Statutory Limits
Employers' Liability	$500,000
General Liability	$1,000,000 per occurrence/$2,000,000 aggregate
Automobile Liability	$1,000,000
Professional Liability (E & O)	$1,000,000 per occurrence/$2,000,000 aggregate

Contractor shall provide the City with a Certificate of Insurance for review prior to the issuance of any contract or Purchase Order. This should be an ACORD form (example attached). All Certificates of Insurance will require thirty (30) days written notice by the insurer or contractor's agent in the event of cancellation, reduction or other modifications of coverage. In addition to the notice requirement above, Contractor shall provide the City with immediate written notice of cancellation, reduction, or other modification of coverage of insurance. Upon failure of the Contractor to provide such notice, Contractor assumes sole responsibility for all losses incurred by the City for which insurance would have provided coverage.

The insurance certificate shall be for the initial contract period of one (1) year and shall be renewed by the contractor for each subsequent renewal period of the contract.

The City shall be named as an additional insured and it is required that coverage be placed with "A" rated insurance companies acceptable to the City. Statement should read "City of Monroe is to be added as an additional insured as evidenced by an endorsement attached to this certificate." Failure to maintain the required insurance in force may be cause for contract termination. In the event that the contractor fails to maintain and keep in force the insurance herein required, the City has the right to cancel and terminate the contract without notice.

Contractor shall provide proof that a Drug-Free Workplace Program is in place and that drivers meet DOT/CDL licensing requirements.

Section 7. **Performance of Work by City.** If the Contractor fails to perform the Work in accordance with the schedule referred to in Section 2 above, the City may, in its discretion, in order to bring the project closer to schedule, perform or cause to be performed some or all of the Work, and doing so shall not waive any of the City's rights and remedies. Before doing so, the City shall give the Contractor reasonable notice of its intention. The Contractor shall reimburse the City for all costs incurred by the City in exercising its right to perform or cause to be performed some or all of the Work pursuant to this section.

Section 8. **Attachments.** The following attachments are made a part of this contract and incorporated herein by reference:

Attachment A: Certificate of Insurance containing [ ] pages(s).

Attachment B: CTR Coatings Quote containing 2 page(s).

In case of conflict between an attachment and the text of this contract excluding the attachment, the text of this contract shall control.

Section 9. **Notice.**

a. All notices and other communications required or permitted by this contract shall be in writing and shall be given either by personal delivery, fax, or certified United States mail, return receipt requested, addressed as follows:

To the City:	To the Contractor:

(By hand delivery, overnight delivery services, or other methods requiring a physical address): Amy Cook, P.E. City of Monroe Water Resources Department General Manager of Operations 2401 Walkup Ave. Monroe, NC 28110 O: (704) 282-4604 acook@monroenc.org *(By United States Postal Service):* City of Monroe P.O. Box 69 Monroe, NC 28111-0069 Fax Number: (704) 290-1818	Neal Bryant CTR Coatings CTR Utility Rehab, LLC 5715 Ball Camp Pike Knoxville, TN 37921 O: (865) 200-8191 C: (803) 630-2603 neal@ctrcoatings.com

b. Change of Address, Date Notice Deemed Given: A change of address, fax number, or person to receive notice may be made by either party by notice given to the other party. Any notice or other communication under this contract shall be deemed given at the time of actual delivery, if it is personally delivered or sent by fax. If the notice or other communication is sent by US Mail, it shall be deemed given upon the third calendar day following the day on which such notice or other communication is deposited with the US Postal Service or upon actual delivery, whichever first occurs.

Section 10. **Indemnification.** To the maximum extent allowed by law, unless otherwise prohibited under applicable limitations in Chapter 22B-1 of the North Carolina General Statutes, the Contractor shall defend, indemnify, and save harmless the City of Monroe, its agents, officers, and employees, from and against all charges that arise in any manner from, in connection with, or out of this contract as a result of the acts or omissions of the Contractor or subcontractors or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable except for damage or injury caused by the negligence of the City its agents, officers, or employees. In performing its duties under this section, the Contractor shall at its sole expense defend the City of Monroe, its agents, officers, and employees with legal counsel reasonably acceptable to City. As used in this subsection – "Charges" means claims, judgments, costs, damages, losses,

demands, liabilities, duties, obligations, fines, penalties, royalties, settlements, expenses, interest, reasonable attorney's fees, and amounts for alleged violations of sedimentation pollution, erosion control, pollution, or other environmental laws, regulations, ordinances, rules, or orders. Nothing in this section shall affect any warranties in favor of the City that are otherwise provided in or arise out of this contract. This section is in addition to and shall be construed separately from any other indemnification provisions that may be in this contract. This section shall remain in force despite termination of this contract (whether by expiration of the term or otherwise) and termination of the services of the Contractor under this contract.

Section 11. E-Verify Requirement. The Contractor shall comply with the requirements of Article 2 of Chapter 64 of the General Statutes. Further, if the Contractor utilizes a subcontractor, the Contractor shall require the subcontractor to comply with the requirements of Article 2 of Chapter 64 of the General Statutes.

Section 12. Miscellaneous.

a. Choice of Law and Forum. This contract shall be deemed made in Union County, North Carolina. This contract shall be governed by and construed in accordance with the law of North Carolina. The exclusive forum and venue for all actions arising out of this contract shall be the appropriate division of the North Carolina General Court of Justice, in Union County. Such actions shall neither be commenced in nor removed to federal court. This section shall not apply to subsequent actions to enforce a judgment entered in actions heard pursuant to this section.

b. Waiver. No action or failure to act by the City shall constitute a waiver of any of its rights or remedies that arise out this contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing.

c. Performance of Government Functions. Nothing contained in this contract shall be deemed or construed so as to in any way estop, limit, or impair the City from exercising or performing any regulatory, policing, legislative, governmental, or other powers or functions.

d. Severability. If any provision of this contract shall be unenforceable, the remainder of this contract shall be enforceable to the extent permitted by law.

e. Assignment, Successors and Assigns. Without the City's written consent, the Contractor shall not assign (which includes to delegate) any of its rights (including the right to payment) or duties that arise out this contract. Unless the City otherwise agrees in writing, the Contractor and all assigns shall be subject to all of the City's defenses and shall be liable for all of the Contractor's duties that arise out of this contract and all of the City's claims that arise out of this contract. Without granting the Contractor the right to assign, it is agreed that the duties of the Contractor that arise out of this contract shall be binding upon it and its heirs, personal representatives, successors, and assigns.

f. Compliance with Law. In performing all of the Work, the Contractor shall comply with all applicable law.

g. City Policy. THE CITY OPPOSES DISCRIMINATION ON THE BASIS OF RACE AND SEX AND URGES ALL OF ITS CONTRACTORS TO PROVIDE A FAIR OPPORTUNITY FOR MINORITIES AND WOMEN TO PARTICIPATE IN THEIR WORK FORCE AND AS SUBCONTRACTORS AND VENDORS UNDER CITY CONTRACTS.

h. EEO Provisions. During the performance of this Contract the Contractor agrees as follows:

(1) The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, political affiliation or belief, age, or handicap. The Contractor shall take affirmative action to insure that applicants are employed and that employees are treated equally during employment, without regard to race, color, religion, sex, national origin, political affiliation or belief, age, or handicap. The Contractor shall post in conspicuous places available to employees and applicants for employment, notices setting forth these EEO provisions;

(2) The Contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, political affiliation or belief, age, or handicap.

i. No Third Party Right Created. This contract is intended for the benefit of the City and the Contractor and not any other person.

j. Principles of Interpretation. In this contract, unless the context requires otherwise, the singular includes the plural and the plural the singular. The pronouns "it" and "its" include the masculine and feminine. Reference to statutes or regulations include all statutory or regulatory provisions consolidating, amending, or replacing the statute or regulation. References to contracts and agreements shall be deemed to include all amendments to them. The word "person" includes natural persons, firms, companies, associations, partnerships, trusts, corporations, governmental agencies and units, and any other legal entities.

k. Modifications, Entire Agreement. A modification of this contract is not valid unless signed by both parties and otherwise in accordance with requirements of law. Further, a modification is not enforceable against the City unless the City Manager or other duly authorized official signs it for the City. This contract contains the entire agreement between the parties pertaining to the subject matter of this contract. With respect to that subject matter, there are no promises, agreements, conditions, inducements, warranties, or understandings, written or oral, expressed or implied, between the parties, other than as set forth or referenced in this contract.

IN WITNESS WHEREOF, the City of Monroe and the Contractor have caused this contract to be executed under seal by their respective duly authorized agents or officers.

CITY OF MONROE

BY: _____
( ) _____, Department Head
( ) William Mark Watson, City Manager

CONTRACTOR: CTR Coatings
CTR Utility Rehab, LLC

BY: _____
( ) President, ( ) CEO,
( ) Partner, ( ) Owner
( ) Other: _____

ATTEST:

_____
Secretary

(CORPORATE SEAL)

This Instrument has been pre-audited in the manner required by the Local Government Budget and Fiscal Control Act.

Finance Officer: _____ DATE: _____
Lisa Strickland

CTR *coatings*

Proposal

5715 Ball Camp Pike, Knoxville, TN 37921

CTR Utility Rehab, LLC

Proposal Date:	4/10/2025	**Proposal Number:**	25-3047
Project name:	Monroe Chlorine Contact Chamber		
Job site address:	75Treeway Ln Monroe NC	**County**	Union
Job Owner:	City of Monroe		
GC:	CTR Coatings		
Address	300 Wcrowell St Monroe NC 28112		
Contact name	Amy Cook		
Email	acook@monroenc.org	Phone	704-282-4604
CTR Sales Manager	Neal Bryant		
Email	neal@ctrcoatings.com	Phone	803-630-2603

The following are submitted as specifications and estimates:

Item	Description	Qty	Unit	Unit Price	Total
1	Grey Color line floor all baffle walls over top, and tooutside edge of exterior	1	EA	478,800.00	478,800.00
2	Final efflunt box200sq ft to be lined as above	1	EA	8,400.00	8,400.00
3	Initial cleaning and grout injection debri to be dumped onsite	1	EA	31,225.00	31,225.00
4	Return trip to do touch ups around valves	2	EA	8,500.00	17,000.00
5	Mob	4	EA	1,250.00	5,000.00
					0.00
	Job should take 3 weeks total				0.00
					0.00
					0.00
					0.00
					0.00
					0.00
					0.00
	If payment and performance bonds are required, add 3% to total.				0.00

See page 2 for Assumptions and Excess grouting information.

If, after the date of this Quote/Purchase Order, any new or increased tariffs, duties, or other government-imposed costs on materials used in the work becomes effective, the Contract Price shall be adjusted to reflect the actual increased cost to the Contractor. The Contractor shall promptly notify the [Owner/Buyer] of any such cost impact. Failure to agree on a price adjustment shall not relieve the Buyer's obligation to pay the increased cost, and the Contractor shall be entitled to an extension of time if such tariffs result in material shortages or delays and/or Contractor may permanently suspend performance because of a delay or the inability of the parties to agree upon an adjusted price.

Total:	CTR Coatings to furnish material and labor - complete in accordance with above specifications for the sum of:	**540,425.00**

CTR *coatings*

CTR Utility Rehab, LLC

5715 Ball Camp Pike, Knoxville, TN 37921

Proposal

Proposal Date: 4/10/2025 **Proposal Number:** 25-3047

Project name: Monroe Chlorine Contact Chamber

Assumptions

1. Products shall be installed per manufacturer's recommended procedures.

2. Quoted price assumes structures to be lined are accessible - spray truck can safely **drive** to within 250 feet of structures without causing damage to vehicles and equipment. If needed, access roads shall be provided by others.

3. Standard traffic control using signs and cones is included in quoted price. Additional MOT shall be provided by others and is not included in price (e.g., flaggers, lighted signs, traffic lights, etc.).

4. Unless otherwise stated in quote, the following items are not included in the quoted price:
   a. Sales tax
   b. By-pass pumping.
   c. Permits.
   d. Payment and performance bonds. Add 3% to total price.
   e. Seeding, sodding or mulching.
   f. Debris removal or removal of existing sludge in structures.
   g. Removal of old liner.
   h. Any othe work not specified on proposal.

Grouting

1. Price for lining includes up to 4 tubes of grout per each structure.

2. **Grouting CIPP manhole connections to pipes**: Price for lining manholes does not include leak stopping at CIPP to manhole termination or filling annular space between the CIPP and host pipe. This work is to be done by CIPP installer or others. CTR will not perform this work without a written change order.

3. Pricing for excessive grouting or curtain grouting unless stated otherwise.
   a. Extra tubes (>4 per structure): $35.00 per tube.
   b. MaxSeal grout (pumpable): $350 per gallon.
   c. Hydraulic cement: $75.00 per bucket.
   d. Labor: $75.00 per man hour.

All material is guaranteed to be as specified. All work to be completed in a workmanlike manner according to standard practices. Any alteration or deviation from above specification involving extra costs will be executed only upon written orders, and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents or delays beyond our control. Owner to carry fire, tornado and other necessary insurance. Our workers are fully covered by Workers Compensation insurance.

Acceptance of Proposal:

The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made out to the name and address listed above.

Owner or GC Signature: _____

Date of acceptance: _____

Quote is valid for 60 days. If not accepted within 60 days, we reserve the right to withdraw this proposal.

STAFF REPORT

TO:	Public Enterprise Committee
VIA:	William M. Watson, City Manager
DATE:	May 6, 2025
FROM:	Rob Miller, General Manager of Energy Services and Water Resources
PREPARED BY:	Richard Riser, Assistant Director of Water Resources
SUBJECT:	Cleaning and Lining of Water Mains Downtown – for Information Only

SUMMARY STATEMENT

Staff wishes to provide the PEC information about upcoming work to rehabilitate a portion of the water system in the downtown area. The work will consist of cleaning and lining existing water mains along N. Stewart Street, W. Morgan Street and N. Main Street.

REVIEW

The City of Monroe Water Resources Department will be requesting proposals from contractors for the cleaning and lining of existing water mains as shown on the attached map.

All existing fire hydrants, valves and services will be replaced as part of this work. Pits for access to the water mains are shown on the attached map. If old valves do not shut off water tight, some additional new valves may need to be inserted. This may increase the footprint of the work zone slightly.

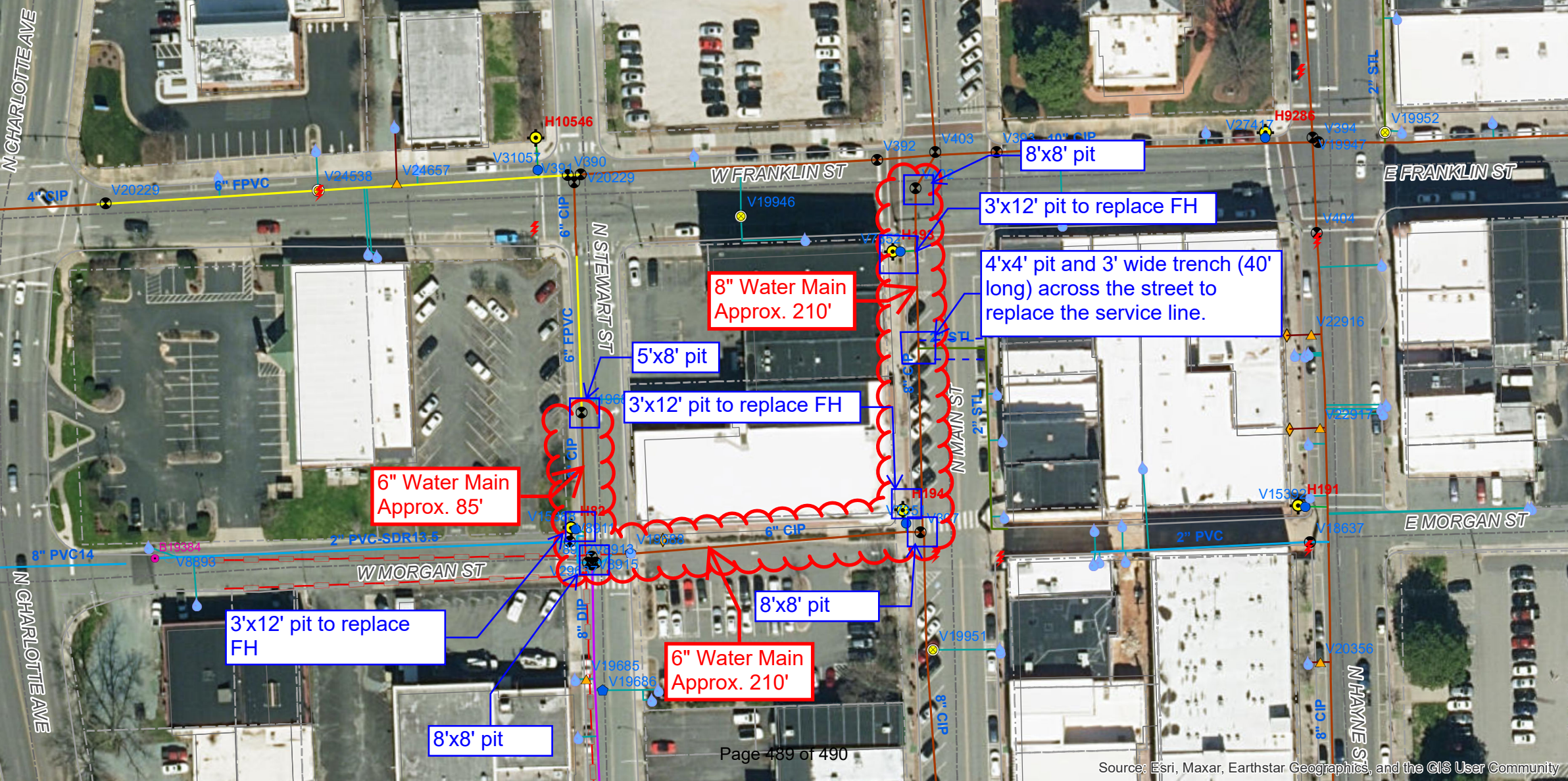
The construction work will be done at night (8pm-5am) Monday through Thursday so as to minimize disruptions to traffic and merchants. Traffic will be maintained during day time hours. Portions of on street parking will not be available for approximately 30 days. The construction work is expected to take approximately 30 days, however the contract will be for approximately 120 days to allow for material procurement and delivery.

A temporary 4” fire line will be available to provide fire protection to the area. Water service disruptions will be minimal. A temporary decrease in water pressure may be experienced.

The cleaning and lining work as described above is estimated to cost $325,000.

RECOMMENDATION

No action is necessary at this time. A construction contract will be presented to PEC and City Council for approval at a future date.



Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

City of Monroe
Where Heartland Meets High Tech

STAFF REPORT

TO: Public Enterprise Committee

VIA: William Mark Watson, City Manager

DATE: May 6, 2025

FROM: Robert Miller, General Manager of Energy Services and Water Resources

PREPARED BY: Robert Miller, General Manager of Energy Services and Water Resources

SUBJECT: Wastewater Treatment Plant Expansion Update

SUMMARY STATEMENT

Staff will provide an update on the Wastewater Treatment Plant Expansion project.

REVIEW

Staff will provide an update on the project activities and schedule.

RECOMMENDATION

This item will be provided as information only.