STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAT L. MCCRORY
GOVERNOR

ANTHONY J. TATA
SECRETARY

January 16, 2014

U. S. Army Corps of Engineers
Regulatory Field Office
3331 Heritage Trade Dr., Suite 205
Wake Forest, NC 27587

ATTN: Mr. Andy Williams
NCDOT Coordinator

Dear Sir:

Subject: **Application for Section 404 Nationwide Permits 39 and 33 and Modification to the Section 401 Water Quality Certification and Jordan Buffer Authorization** for the AICDZ proposed road in Alamance County, North Carolina. TIP No. U-5538.

The North Carolina Department of Transportation (NCDOT) proposes to to build a new location road providing access to an approximate 1,200 acre site that has been designated as Alamance Interstate Corridor Development Zone (AICDZ) in Alamance County. This submittal is a modification to permits received for this project. Since then, final design was developed and has changed the jurisdictional impact numbers. Please find enclosed the Pre-Construction Notification (PCN) form, revised Bryan Blvd. Mitigation Site debit ledger, landowner information, stormwater management plan, permit drawings, and design plans for the above referenced project. A revised request to EEP has been submitted and will forwarded upon receipt. For impact totals, please see the PCN.

This project is scheduled to go out to bid to contractors March 1, 2104. We respectfully request if we could receive permits by February 24, 2014.

Thank you for your assistance with this project. If you have any questions or need additional information, please contact Rachelle Beauregard at rbeauregard@ncdot.gov or (919) 707-6105.

Sincerely,

Charles N. Edwards, P.E.,
District Engineer

cc: Sue Homewood, DWR
Kyle Smith, AWCK
Brad Luckey, ECS
Galen Cail, NCDOT

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT & ENVIRONMENTAL ANALYSIS UNIT
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1548

TELEPHONE: 919-707-6000
FAX: 919-212-5785
WEBSITE:NCDOT.GOV

LOCATION:
CENTURY CENTER, BUILDING B
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610

Office Use Only:
Corps action ID no. _____
DWQ project no. _____
Form Version 1.3 Dec 10 2008

Pre-Construction Notification (PCN) Form

A. Applicant Information

1. Processing		
1a. Type(s) of approval sought from the Corps:	☒ Section 404 Permit ☐ Section 10 Permit	
1b. Specify Nationwide Permit (NWP) number: 39, 33	or General Permit (GP) number:	
1c. Has the NWP or GP number been verified by the Corps?	☒ Yes ☐ No	
1d. Type(s) of approval sought from the DWQ (check all that apply): ☒ 401 Water Quality Certification – Regular ☐ Non-404 Jurisdictional General Permit ☐ 401 Water Quality Certification – Express ☒ Riparian Buffer Authorization		
1e. Is this notification solely for the record because written approval is not required?	For the record only for DWQ 401 Certification: ☐ Yes ☒ No	For the record only for Corps Permit: ☐ Yes ☒ No
1f. Is payment into a mitigation bank or in-lieu fee program proposed for mitigation of impacts? If so, attach the acceptance letter from mitigation bank or in-lieu fee program.	☒ Yes ☐ No	
1g. Is the project located in any of NC's twenty coastal counties. If yes, answer 1h below.	☐ Yes ☒ No	
1h. Is the project located within a NC DCM Area of Environmental Concern (AEC)?	☐ Yes ☒ No	
2. Project Information		
2a. Name of project:	AICDZ-Proposed Road	
2b. County:	Alamance	
2c. Nearest municipality / town:	Mebane/Graham	
2d. Subdivision name:		
2e. NCDOT only, T.I.P. or state project no:	U-5538	
3. Owner Information		
3a. Name(s) on Recorded Deed:	The proposed road crosses portions of parcels that are owned by multiple owners, View Attachments	
3b. Deed Book and Page No.		
3c. Responsible Party (for LLC if applicable):		
3d. Street address:		
3e. City, state, zip:		
3f. Telephone no.:		
3g. Fax no.:		
3h. Email address:		

4. Applicant Information (if different from owner)	
4a. Applicant is:	☐ Agent ☒ Other, specify: N.C. DOT
4b. Name:	Chuck Edwards, P.E.
4c. Business name (if applicable):	
4d. Street address:	PO Box 766 (127 East Crestant Square Drive)
4e. City, state, zip:	Graham, NC 27253
4f. Telephone no.:	336-570-6833
4g. Fax no.:	336-570-8873
4h. Email address:	cnedwards@ncdot.gov
5. Agent/Consultant Information (if applicable)	
5a. Name:	
5b. Business name (if applicable):	
5c. Street address:	
5d. City, state, zip:	
5e. Telephone no.:	
5f. Fax no.:	
5g. Email address:	

B. Project Information and Prior Project History	
1. Property Identification	
1a. Property identification no. (tax PIN or parcel ID):	Multiple Owners, View Attachments
1b. Site coordinates (in decimal degrees):	Latitude: 36.0547796 (DD.DDDDDD) Longitude: -79.316641 (-DD.DDDDDD)
1c. Property size:	NA - Linear Project- 11,600 linear feet acres
2. Surface Waters	
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	Back Creek
2b. Water Quality Classification of nearest receiving water:	WS-V, NSW
2c. River basin:	Cape Fear

3. Project Description

3a. Describe the existing conditions on the site and the general land use in the vicinity of the project at the time of this application:

The site is a linear road corridor providing access to an approximate 1,200 acre site that has been designated as Alamance Interstate Corridor Development Zone (AICDZ). The site consists of a portion of a mobile home park, wooded land and fields. Surrounding properties contain residences, a mobile home park,wooded land and fields.

3b. List the total estimated acreage of all existing wetlands on the property:

In July 2013, the N.C. DOT delineated the proposed road corridor (with the exception of one stream/wetland crossing) during the preliminary planning process and for completion of an alternative's anaylsis. ECS delineated one stream/wetland crossing for the proposed road corridor in August 2013, prior to its design. Approximately 0.5 acres of wetlands were delineated within the proposed road right of way. The proposed road and right of way will permanently impact 0.17 acres of wetlands.

3c. List the total estimated linear feet of all existing streams (intermittent and perennial) on the property:

In July 2013, the N.C. DOT delineated the proposed road corridor (with the exception of one stream/wetland crossing) during the preliminary planning process and for completion of an alternative's anaylsis. ECS delineated one stream/wetland crossing for the proposed road corridor in August 2013, prior to its design. Approximately 2,500 linear feet of stream channel were delineated in the vicinity of the proposed road corridor. A total of 403 linear feet of stream channel will be permanently impacted by the proposed road. Of the 403 linear feet of stream channel, 161 linear feet of stream channel (0.0048 and 0.0099 acres of stream channels SG and SK, respectively) have been determined to be unmitigable by the USACE.

3d. Explain the purpose of the proposed project:

The overall purpose of the project is to provide road access and sewer/water services to the approximate 1,200 acre AICDZ. Additionally, an approximate 1,000,000 square foot distribution center, parking areas and landscaped areas will be constructed on an approximate 190 acre portion of the 1,200 acre AICDZ (hereby referred to as the Swordfish site). Impacts to streams and wetlands are cumulative for the purposes of permitting thresholds and required mitigation for the proposed AICDZ road, AICDZ sewer line and development of the Swordfish site. However, due to separate permit applicants, individual PCNs are being submitted to the USACE and the NCDENR-DWR for the AICDZ road, AICDZ sewer line and Swordfish sites.

This PCN documents impacts to waters of the U.S. for the proposed road portion of the project. The purpose and need of the proposed AICDZ road is documented in the previous submitted Alternative Analysis.

Additionally, anticipated vehicular traffic for the first portion of the AICDZ, which includes the proposed Swordfish site, has been estimated by the N.C. DOT to be approximately 2,100 vehicles a day. Furthermore, average daily traffic counts for existing Swordfish distribution centers that are 403,000 and 402,300 square feet have been determined to be 648 and 643 (including 190 and 187 average truck trips per day). A similair size distribution facility (837,000 square feet) to the one being proposed on the swordfish site has an average daily traffic count of 771 (including 315 average truck trips per day). Based on the N.C. DOT estimated vehicle traffic and review of traffic counts for similair Swordfish distribution centers smaller than the one being proposed, the proposed road is necessary for efficiency, economics and logistics of the Swordfish distrubtion center and future industrial development within the AICDZ. Additionally, with the majority of Swordfish distribution center's vehicle traffic being truck traffic, and the proximity of two schools, a day care, a church, a community park, a mobile home park, several residential neighborhoods and various commercial/retail facitlies in proximity to the AICDZ/existing roadways that border the AICDZ, the proposed road will provide the most direct access to Interstate 40/85, thus, eliminating severe safety concerns from the utilization of the exisiting road infrastructure.

3e. Describe the overall project in detail, including the type of equipment to be used:

The site is an 11,600 feet linear road corridor on new location providing access to an approximate 1,200 acre site that has been designated as Alamance Interstate Corridor Development Zone (AICDZ). The site consists of a portion of a mobile home park, wooded land and fields. Surrounding properties contain residences, a mobile home park,wooded land and fields.

Proposed aluminum pipe culverts will range in size from 54"-72" will be installed in the various stream crossings as shown on the plans. The roadway right of way width has been minimized to the most practicable extent possible and is being proposed to be approximately 60 feet with permanent drainage easements as indicated on the roadway plans. Endwalls will be installed at pipe ends at the stream crossing locations to minimize pipe lengths. Grassed swale treatment provided, where practical and according to criteria, prior to discharge through buffers. As indicated in the project plans, discharge thru stream buffers will be accommodated via bio-retention basins where slopes allow and via rock lined channels where slopes do not accommodate other measures.

Typical highway construction equipment will be used to clear and grade the right of way and easements and construct the proposed road. Temporary stream crossings will be constructed in accordance with NCDOT design standards and Best Management Practices to accommodate construction activities prior to installation of the permanent pipe culverts. Site dewatering will be performed in accordance with Best Management Practices with temporary and permanent impacts limited to areas as designated in the impact drawings. Erosion and sedimentation control measures will be installed in accordance with NCDOT requirements.

4. Jurisdictional Determinations

4a. Have jurisdictional wetland or stream determinations by the Corps or State been requested or obtained for this property / project (including all prior phases) in the past? Comments: Portions of the proposed road corridor were verified by Mr. Andy Williams-USACE and Ms. Sue Homewood-NCDWQ in August 5, 2013. Mr. Andy Williams-USACE and Ms. Sue Homewood visited the remainder of the proposed road corridor on August 27, 2013.	☒ Yes ☐ No ☐ Unknown
4b. If the Corps made the jurisdictional determination, what type of determination was made?	☒ Preliminary ☐ Final
4c. If yes, who delineated the jurisdictional areas? Name (if known): N.C. DOT (Deanna Riffey, Rachelle Beauregard, Tyler Stanton, Amy James, Jim Mason) and ECS Carolinas, LLP (Bradley Luckey, David Brame and Michael Brame)	Agency/Consultant Company: ECS Carolinas, LLP Other: N.C. DOT

4d. If yes, list the dates of the Corps jurisdictional determinations or State determinations and attach documentation.

5. Project History

5a. Have permits or certifications been requested or obtained for this project (including all prior phases) in the past?	☒ Yes ☐ No ☐ Unknown

5b. If yes, explain in detail according to "help file" instructions.

A Section 404 Nationwide 39 Permit was issued 10/30/13 Action ID SAW-2013-01456. A Section 401 Water Quaility Certification and Jordan Buffer Authorization was issued 10/28/13/ DWQ#13-1045.

6. Future Project Plans

6a. Is this a phased project?	☒ Yes ☐ No

6b. If yes, explain.

The first phase of the AICDZ road consists of approximately 8,750 linear feet of road that connects Trollingwood-Hawfields Road to the 190 acre swordfish site and the eastern portion of the AICDZ. The second phase of the road consists of approximately 2,850 linear feet that will provide access to the western portion of the AICDZ. Additional phases or extensions of the proposed road are not planned or anticipated at this time. Additional impacts to streams and wetlands, outside of those proposed in the AICDZ road, AICDZ sewer line or Swordfish permit applications, are not being proposed at this time.

C. Proposed Impacts Inventory

1. Impacts Summary

1a. Which sections were completed below for your project (check all that apply):

☒ Wetlands ☒ Streams - tributaries ☒ Buffers

☐ Open Waters ☐ Pond Construction

2. Wetland Impacts

If there are wetland impacts proposed on the site, then complete this question for each wetland area impacted.

2a. Wetland impact number – Permanent (P) or Temporary (T)	2b. Type of impact	2c. Type of wetland (if known)	2d. Forested	2e. Type of jurisdiction (Corps - 404, 10 DWQ – non-404, other)	2f. Area of impact (acres)
W1 ☒ P ☐ T	Fill	Freshwater Marsh	☒ Yes ☐ No	☒ Corps ☐ DWQ	0.01
W2 ☒ P ☐ T	Fill	Freshwater Marsh	☒ Yes ☐ No	☒ Corps ☐ DWQ	0.17
W3 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
W4 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
W5 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
W6 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
2g. **Total wetland impacts**					0.18

2h. Comments: The proposed road will permanently impact 0.18 acres of riparian wetlands by fill.

3. Stream Impacts

If there are perennial or intermittent stream impacts (including temporary impacts) proposed on the site, then complete this question for all stream sites impacted.

3a. Stream impact number - Permanent (P) or Temporary (T)	3b. Type of impact	3c. Stream name	3d. Perennial (PER) or intermittent (INT)?	3e. Type of jurisdiction (Corps - 404, 10 DWQ – non-404, other)	3f. Average stream width (feet)	3g. Impact length (linear feet)
S1 ☒ P ☐ T	Culvert	UT To Back Creek (SA)	☒ PER ☒ INT	☒ Corps ☐ DWQ	2	56
S2 ☒ P ☐ T	Culvert	UT To Back Creek (SB)	☒ PER ☐ INT	☒ Corps ☐ DWQ	5	94
S3 ☒ P ☐ T	Culvert	UT To Back Creek (SC)	☒ PER ☐ INT	☒ Corps ☐ DWQ	3	75
S4 ☒ P ☐ T	Culvert	UT To Back Creek (SH)	☐ PER ☒ INT	☒ Corps ☐ DWQ	2	17
S5 ☒ P ☐ T	Culvert	UT To Back Creek (SK)	☐ PER ☒ INT	☒ Corps ☐ DWQ	7	85
S6 ☒ P ☐ T	Culvert	UT To Back Creek (SG)	☐ PER ☒ INT	☒ Corps ☐ DWQ	3	69
3h. **Total stream and tributary impacts**						403

3i. Comments: 0.0048 acres of stream SG and 0.0099 acres of stream SK will be permanantly impacted by culvert/rip-rap/fill for the proposed construction of the roadway. Mr. Andrew Williams of the USACE has determined that these linear stream impacts are unmitigable. Although, 0.0147 acres of USACE unmitigable stream channel will count towards Nationwide Permit thresholds. DWR has determined a 1:1 mitigation ratio for stream channel SG and due to stream channel SK being classified

as ephemeral by DWR, DWR will not require mitigation for stream channel SK.

Of the 403 feet of impacts a total of 334 linear feet of stream channel will be impacted by culvert installation and 69 feet will be for streambank stabilization (See table on cover page of permit drawings). Of the 334 feet of stream channel, 141 linear feet of stream channel (Crossing 3-SG and Crossing 5-SK) has been determined to be unmitiable by Mr. Andrew Williams of the USACE and will not count towards stream Nationwide Permit thresholds. Also the 69 feet of streambank stabilization will not count towards the stream Nationwide thresholds in linear feet or acres. A total of 0.0147 acres (0.0048 acres of stream SG and 0.0099 acres of stream SK) that will be permanantly impacted by culvert/fill for the proposed construction of the roadway will count towards wetland impacts for permitting thresholds.

Stream Crossing 1 (SA) is impacting 13 feet of intermittent stream channel across Trollingwood-Hawfields Road due to the installation of a junction box and headwall. The remaining 43 feet of impact at Stream Crossing 1 (SA) is due to installation of culvert and streamback stablization in the perennial reach of the SA stream.

Stream SG will contain streambank stabilization during the first plase. When the second phase is built, then a culvert will be placed in the area of the streambank stabilization. The 69 feet of impacts to the future culvert is what is being mitigated for in the application and recorded as impacts.

4. Open Water Impacts

If there are proposed impacts to lakes, ponds, estuaries, tributaries, sounds, the Atlantic Ocean, or any other open water of the U.S. then individually list all open water impacts below.

4a. Open water impact number – Permanent (P) or Temporary (T)	4b. Name of waterbody (if applicable)	4c. Type of impact	4d. Waterbody type	4e. Area of impact (acres)
O1 ☐ P ☐ T				
O2 ☐ P ☐ T				
O3 ☐ P ☐ T				
O4 ☐ P ☐ T				
4f. Total open water impacts				

4g. Comments: Open water impacts are not proposed.

5. Pond or Lake Construction

If pond or lake construction proposed, then complete the chart below.

5a. Pond ID number	5b. Proposed use or purpose of pond	5c. Wetland Impacts (acres)			5d. Stream Impacts (feet)			5e. Upland (acres)
		Flooded	Filled	Excavated	Flooded	Filled	Excavated	Flooded
P1								
P2								
5f. Total								

5g. Comments: Constructed ponds or lakes are not being proposed for this portion of the site.

5h. Is a dam high hazard permit required?	☐ Yes ☒ No If yes, permit ID no:
5i. Expected pond surface area (acres):	
5j. Size of pond watershed (acres):	
5k. Method of construction:	

6. Buffer Impacts (for DWQ)

If project will impact a protected riparian buffer, then complete the chart below. If yes, then individually list all buffer impacts below. If any impacts require mitigation, then you **MUST** fill out Section D of this form.

6a. Project is in which protected basin?	☐ Neuse ☐ Tar-Pamlico ☒ Other: Jordan ☐ Catawba ☐ Randleman				
6b. Buffer impact number – Permanent (P) or Temporary (T)	6c. Reason for impact	6d. Stream name	6e. Buffer mitigation required?	6f. Zone 1 impact (square feet)	6g. Zone 2 impact (square feet)
B1 ☐ P ☐ T			☐ Yes ☐ No		
B2 ☐ P ☐ T			☐ Yes ☐ No		
B3 ☐ P ☐ T			☐ Yes ☐ No		
		6h. **Total buffer impacts**		24,503	18,326

6i. Comments: The proposed road will impact vegetative stream buffers at 6 locations (See Table 1 on cover sheet of permit drawings). The road crossings have been designed to cross as near to perpendicular as possbile, given topographic constraints. With the exception of Site 3 (SC) and Site 7 (SF), the road crossings have been designed to impact less than 150 linear feet or 1/3 acre of riparian buffer (in accordance with "allowable without mitigation" activities for road crossings of streams and other surface waters in the NCDENR Red Book, Jordan Lake Buffer Rules).

Due to the location of Stream Crossing 3 (SC) and proximity to the convergence of streams SC and SD, 90 square feet of Zone 1 buffer and 678 square feet of Zone 2 buffer is considered a parallel impact and will require mitigation (in accordance with "allowable with mitigation" activities for road crossings of streams and other surface waters in the NCDENR Red Book, Jordan Lake Buffer Rules). However, the buffer impacts from Stream Crossing 3 (SC), including the parallel portion of buffer impacts, has been designed to impact less than 150 linear feet or 1/3 acre of riparian buffer.

After final design, a rip pad will be needed at Site 7. While it does not impact stream SF, there will be impacts to Buffer Zone 2 for construction purposes. This will impact 441 square feet in Zone 2 and will require mitigaiton.

D. Impact Justification and Mitigation

1. Avoidance and Minimization

1a. Specifically describe measures taken to avoid or minimize the proposed impacts in designing project.
NCDOT evaluated the 'do-nothing" alternative, the "improve existing" alternative, and a new location alternative to meet the purpose and need of the proposed project (attached)t. Based on this evaluation, the least environmentally damaging practicable alternative is to construct a new location access road from Trollingwood-Hawfield Road just south of the I-40/85 interchange through the AICDZ.

Option D has been further re-deisgned to minimize the number/extent of stream crossings and wetland impacts. Impacts to stream SA and wetland WA has been minimized by shifting the connection of the proposed road and Trollingwood-Hawfields road further to the south. The revised design has shifted the SC stream crossing to the north, to avoid impacts to SD and SE streams/buffers. Additionally, the revised Option D is aligned such that impacts to wetlands WB and streams SI are avoided with minimal impacts to stream SH and SH/SI buffers. The roadway has been shifted to the north to avoid impacts to streams SF and SJ and their assoicated buffers.

The proposed roadway has been designed to cross streams at locations that the streams are relatively perpendicular. Furthermore, construction of headwalls/endwalls at heights ranging from approximately 5 to 9 feet have been designed to minimze impacts to streams and their assoicated buffers. Slopes are being proposed to be 2:1 or less from the toe of slope in the areas of the proposed wetland impacts.

The site (linear portion of the AICDZ) contains approximately 0.5 acres of wetland and 2,500 linear feet of stream channel. The proposed road corridor is approximately 11,600 feet in length. The proposed road has been designed to avoid the remaining 2,100 feet of stream channel and 0.33 acres of wetlands. The proposed road has been designed to avoid and minimize future impacts to streams/wetlands/buffers associated with development of the larger AICDZ tract.

Since the original applicatoin dated 9/25/13 impacts have been minimized even greater during development of final design. Stream impacts were reduced by 70 feet

1b. Specifically describe measures taken to avoid or minimize the proposed impacts through construction techniques. The clearing limits will be staked and silt fence will be used. The roadway right of way width has been minimized to the most practicable extent possible and is being proposed to be approximately 60 feet with permanent drainage easements as indicated on the roadway plans. Endwalls will be installed at pipe ends at the stream crossing locations to minimize pipe lengths. Grassed swale treatment provided, where practical and according to criteria, prior to discharge through buffers. As indicated in the project plans, discharge thru stream buffers will be accommodated via bio-retention basins where slopes allow and via rock lined channels where slopes do not accommodate other measures.

Temporary stream crossings will be constructed in accordance with NCDOT design standards and Best Management Practices to accommodate construction activities prior to installation of the permanent pipe culverts. Site dewatering will be performed in accordance with Best Management Practices with temporary and permanent impacts limited to areas as designated in the impact drawings. Erosion and sedimentation control measures will be installed in accordance with NCDOT requirements.

Stream impacts from the previously issued permits have increased slightly. Since the issued permits, final design was developed and additional streambank stabilization was needed for the drainage ditches.

2. Compensatory Mitigation for Impacts to Waters of the U.S. or Waters of the State

2a. Does the project require Compensatory Mitigation for impacts to Waters of the U.S. or Waters of the State?	☒ Yes ☐ No
2b. If yes, mitigation is required by (check all that apply):	☒ DWQ ☒ Corps
2c. If yes, which mitigation option will be used for this project?	☐ Mitigation bank ☒ Payment to in-lieu fee program ☐ Permittee Responsible Mitigation

3. Complete if Using a Mitigation Bank

3a. Name of Mitigation Bank:		
3b. Credits Purchased (attach receipt and letter)	Type	Quantity
3c. Comments:		

4. Complete if Making a Payment to In-lieu Fee Program

4a. Approval letter from in-lieu fee program is attached.	☒ Yes
4b. Stream mitigation requested:	434 linear feet
4c. If using stream mitigation, stream temperature:	☒ warm ☐ cool ☐ cold
4d. Buffer mitigation requested (DWQ only):	1949 square feet
4e. Riparian wetland mitigation requested:	acres
4f. Non-riparian wetland mitigation requested:	acres
4g. Coastal (tidal) wetland mitigation requested:	acres

4h. Comments:

Stream	Permanent fill Impacts (feet)	Strembank Stabilizaion Impacts(feet)	Impacts Requiring USACE Mitigation	USACE Mitigation Ratio	Impacts Requring DWR Mitigation**
Crossing 1-SA (east)	13	0	13	1:1	13
Crossing 1-SA (west)	31	12	31	2:1	43
Crossing 2-SB	73	21	73	2:1	94
Crossing 3-SC	68	7	68	2:1	75
Crossing 4-SH	8	9	8	1:1	17
Crossing 5-SK	72	13	0	0	0
Crossing 6-SG	69	7	0	0	69
Total	334	69	193		311

**All DWR mitigation is 1:1 ratio.

Only mitigating for 69 feet at SG because the streambank stabilization is in the same place as the future culvert placement.

Stream Mitigation Requested to EEP:
172 feet (2:1) = 344 feet
90 feet (1:1) = 90 feet

There will be 0.18 acres of unavoidable riparian wetland impacts for U-5538 (AICDZ Road) debited from the Bryan Boulevard/Horse Pen Creek (attached revised wetland debit ledger).

5. Complete if Using a Permittee Responsible Mitigation Plan

5a. If using a permittee responsible mitigation plan, provide a description of the proposed mitigation plan.

6. Buffer Mitigation (State Regulated Riparian Buffer Rules) – required by DWQ

6a. Will the project result in an impact within a protected riparian buffer that requires buffer mitigation?	☒ Yes ☐ No

6b. If yes, then identify the square feet of impact to each zone of the riparian buffer that requires mitigation. Calculate the amount of mitigation required.

Zone	6c. Reason for impact	6d. Total impact (square feet)	Multiplier	6e. Required mitigation (square feet)
Zone 1	parallel impacts to Streams SC	90	3 (2 for Catawba)	270
Zone 2	parallel impacts to Streams SC and SF	1,119	1.5	1,679
	6f. **Total buffer mitigation required:**			1,949

6g. If buffer mitigation is required, discuss what type of mitigation is proposed (e.g., payment to private mitigation bank, permittee responsible riparian buffer restoration, payment into an approved in-lieu fee fund).

Payment to approved in-lieu fee fund (N.C. EEP acceptance letter will be forwarded when received by NCDOT)

6h. Comments: Due to the location of Stream Crossing 3 (SC) and proximity to the convergence of streams SC and SD, 90 square feet of Zone 1 buffer and 678 square feet of Zone 2 buffer is considered a parallel impact and will require mitigation (in accordance with "allowable with mitigation" activities for road crossings of streams and other surface waters in the NCDENR Red Book, Jordan Lake Buffer Rules). However, the buffer impacts from Stream Crossing 3 (SC), including the parallel portion of buffer impacts, has been designed to impact less than 150 linear feet or 1/3 acre of riparian buffer.

At Site 7, there will be a parallel impact to Stream SF due to the necessary placement of a rip rap pad. Impacts to 441 square feet of Buffer Zone 2 will require mitigation.

Buffer mitgation totals are 90 sq ft in Buffer Zone 1 and 1,119 sq feet in Buffer Zone 2.

Totat buffer mitigation for Zone 1 is 270 sq ft and Zone 2 is 1679 sq ft.

Buffer mitigation should not be required for the remainder of the buffer impacts due to stream/buffer crossings being designed in accordance with "allowable without mitigation" activities for road crossings in the NCDENR Red Book, Jordan Lake Riparian Buffer Rules.

E. Stormwater Management and Diffuse Flow Plan (required by DWQ)	
1. Diffuse Flow Plan	
1a. Does the project include or is it adjacent to protected riparian buffers identified within one of the NC Riparian Buffer Protection Rules?	☒ Yes ☐ No
1b. If yes, then is a diffuse flow plan included? If no, explain why. Comments: (See attached Stormwater Plan)	☐ Yes ☒ No
2. Stormwater Management Plan	
2a. What is the overall percent imperviousness of this project?	41 %
2b. Does this project require a Stormwater Management Plan?	☒ Yes ☐ No
2c. If this project DOES NOT require a Stormwater Management Plan, explain why: .	
2d. If this project DOES require a Stormwater Management Plan, then provide a brief, narrative description of the plan: See attached Stormwater Management Plan	
2e. Who will be responsible for the review of the Stormwater Management Plan?	☐ Certified Local Government ☐ DWQ Stormwater Program ☒ DWQ 401 Unit
3. Certified Local Government Stormwater Review	
3a. In which local government's jurisdiction is this project?	
3b. Which of the following locally-implemented stormwater management programs apply (check all that apply):	☐ Phase II ☐ NSW ☐ USMP ☐ Water Supply Watershed ☐ Other:
3c. Has the approved Stormwater Management Plan with proof of approval been attached?	☐ Yes ☒ No
4. DWQ Stormwater Program Review	
4a. Which of the following state-implemented stormwater management programs apply (check all that apply):	☐ Coastal counties ☐ HQW ☐ ORW ☐ Session Law 2006-246 ☐ Other:
4b. Has the approved Stormwater Management Plan with proof of approval been attached?	☐ Yes ☒ No
5. DWQ 401 Unit Stormwater Review	
5a. Does the Stormwater Management Plan meet the appropriate requirements?	☒ Yes ☐ No
5b. Have all of the 401 Unit submittal requirements been met?	☒ Yes ☐ No

F. Supplementary Information		
1. Environmental Documentation (DWQ Requirement)		
1a. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land?	☒ Yes	☐ No
1b. If you answered "yes" to the above, does the project require preparation of an environmental document pursuant to the requirements of the National or State (North Carolina) Environmental Policy Act (NEPA/SEPA)?	☐ Yes	☒ No
1c. If you answered "yes" to the above, has the document review been finalized by the State Clearing House? (If so, attach a copy of the NEPA or SEPA final approval letter.) Comments: Based upon the determination of the N.C. DOT, a Programmatic Categorical Exclusion (PCE) will be required to satisfy NEPA requirements. The project will be processed as a State Minimum Criteria Checklist that requires no circulation.	☐ Yes	☒ No
2. Violations (DWQ Requirement)		
2a. Is the site in violation of DWQ Wetland Rules (15A NCAC 2H .0500), Isolated Wetland Rules (15A NCAC 2H .1300), DWQ Surface Water or Wetland Standards, or Riparian Buffer Rules (15A NCAC 2B .0200)?	☐ Yes	☒ No
2b. Is this an after-the-fact permit application?	☐ Yes	☒ No
2c. If you answered "yes" to one or both of the above questions, provide an explanation of the violation(s):		
3. Cumulative Impacts (DWQ Requirement)		
3a. Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality?	☐ Yes	☒ No
3b. If you answered "yes" to the above, submit a qualitative or quantitative cumulative impact analysis in accordance with the most recent DWQ policy. If you answered "no," provide a short narrative description. Due to the minimal transportation impact resulting from this access road, this project will have low to moderate influence on land uses and stimulate growth within a confined and planned for industrial development zone. Any future development which, with or without the project, potentially impacts jurisdictional resources will be subject to regulatory permitting requirements. Furthermore, any development within the FLUSA will be subject to the Jordan Rules and requirements of adopted ordinances, land use plans and zoning regulations. Although change in land use and an associated increase in impervious surface is anticipated, the presence of Phase II stormwater regulations, which stipulate post-construction stormwater treatment, and the implementation of Best Management Practices during construction, will further mitigate potential water quality effects. A secondary Indirect and cumulative screening analysis was completed and is included in the CIA report in the Appendix of the attached N.C. DOT Alternatives Analysis.		
4. Sewage Disposal (DWQ Requirement)		
4a. Clearly detail the ultimate treatment methods and disposition (non-discharge or discharge) of wastewater generated from the proposed project, or available capacity of the subject facility. Wastewater will not be generated by the construction of the proposed road. Wastewater will be generated by the proposed development of the swordfish site and associated impacts are addressed in the AICDZ sewer line PCN.		

5. Endangered Species and Designated Critical Habitat (Corps Requirement)	
5a. Will this project occur in or near an area with federally protected species or habitat?	☐ Yes ☒ No
5b. Have you checked with the USFWS concerning Endangered Species Act impacts?	☐ Yes ☒ No
5c. If yes, indicate the USFWS Field Office you have contacted.	☐ Raleigh ☐ Asheville
5d. What data sources did you use to determine whether your site would impact Endangered Species or Designated Critical Habitat? As of September 22, 2010 the USFWS does not list any federally protected species for Alamance County.	
6. Essential Fish Habitat (Corps Requirement)	
6a. Will this project occur in or near an area designated as essential fish habitat?	☐ Yes ☒ No
6b. What data sources did you use to determine whether your site would impact Essential Fish Habitat? NMFS County Index.	
7. Historic or Prehistoric Cultural Resources (Corps Requirement)	
7a. Will this project occur in or near an area that the state, federal or tribal governments have designated as having historic or cultural preservation status (e.g., National Historic Trust designation or properties significant in North Carolina history and archaeology)?	☐ Yes ☒ No
7b. What data sources did you use to determine whether your site would impact historic or archeological resources? A previous intensive archaeological survey [Office of State Archaeology ER # 97-8950, (Cassedy, Daniel F. 1997)] covered the archaeological Area of Potential Effects (APE) for this project, a proposed new roadway including any associated construction easements. As a result of that reporting, no archaeological resources were identified that were considered eligible for the National Register of Historic Places (NRHP). Please see the attached "No National Register of Historic Place Eligible or Listed Archaeological Sites Present or Affected Form" prepared by the NCDOT Archaeology Group dated August 5, 2013, as part of the Programmatic Agreement for Minor Transportation Projects. Comprehensive historic architectural survey of Alamance County (under the direction of the SHPO) is extensive (1978-9, 1989-90, 1991-2, and 2001-2) and illustrates, as do the county GIS/tax records, the absence of critical historic buildings, structures, and landscapes in the APE. NCDOT Historic Architecture's onsite investigation of the National Register-listed Hawfields Presbyterian Church (AM 7) vicinity for PA project 12-03-0051 (WBS No. 7C.001019) in June of 2012 confirms this finding. The current APE does not intersect the nearby, National Register-listed Kerr-Scott Farm (AM 464) and Henderson Scott Farm (AM 497). Please see the attached "No Historic Properties Present or Affected Form" for PA project 13-03-0072 (Addendum) dated August 6, 2013	
8. Flood Zone Designation (Corps Requirement)	
8a. Will this project occur in a FEMA-designated 100-year floodplain?	☐ Yes ☒ No
8b. If yes, explain how project meets FEMA requirements: The proposed road and right of way are located outside of the 100 Year Floodplain.	
8c. What source(s) did you use to make the floodplain determination? NC Floodplain Mapping Information Systems, online map (attachment).	

Charles N. Edwards, P.E. Applicant/Agent's Printed Name	 Applicant/Agent's Signature (Agent's signature is valid only if an authorization letter from the applicant is provided.)	1-16-14 Date

U-5538
AICDZ Site
Mitigation Proposal

Mitigation for this project is proposed to be provided by the North Carolina Department of Transportation which is an allowable option per the Federal Mitigation Rule, 33 CFR chapter II 332.3 (b) (1)-(6). The NCDOT has been providing mitigation for road projects for almost 20 years and has established a record of acquiring, designing, and constructing successful mitigation sites with over 225 closed out sites protected in perpetuity either through fee-simple ownership or conservation easements throughout the state. Remaining, available credits on these and other post-construction mitigation sites are tracked on the NCDOT's On-site Debit Ledger (ODL). Therefore, ODL mitigation proposals involve sites that are constructed and functioning prior to the impacts resulting in a reduced temporal lag and reduced uncertainty about project success.

More specifically, the Bryan Boulevard Mitigation Site is located approximately 30 miles from the impact site within the same HUC and successfully completed the monitoring period and was closed out ten years ago in 2003. Currently the NCEEP does not have any riparian wetland mitigation available within that HUC, 03030002. In addition to location and availability, the cost of the compensatory mitigation project is another general consideration when determining the most appropriate mitigation option. Acquiring advance mitigation from EEP would not be a fiscally responsible when the Department has available assets on the ODL.

Due to all of these factors, it has been determined that use of NCDOT's On-site Debit Ledger Bryan Boulevard Mitigation Site is environmentally preferable to other options which is consistent with the criteria set forth in 332.3(a) (1) of the Rule.

ODL – Bryan Boulevard Mitigation Site

The Bryan Boulevard Mitigation Site is located in Guilford County, adjacent to the Bryan Boulevard Extension. (Bryan Boulevard/ Horse Pen Creek) are located at the intersection of Bryan Boulevard and Fleming Road. This site was constructed in 1996 and provided 29.7 acres of mitigation. 26.9 acres of the wetland mitigation were used to offset wetland impacts associated with project U-608, the extension of Bryan Boulevard. A final monitoring report was provided from year 2000.
http://www.ncdot.org/doh/preconstruct/pe/neu/Monitoring/2000Monitoring/BryanBlvd/bryan2k.pdf
A closeout letter was received from the ACOE on March 18, 2003. The credit for the Oak ridge site was removed from the debit ledger after NCDOT conveyed the property to the Fed Ex Regional sorting facility.

There will be 0.18 acres of unavoidable wetland impacts for U-5538 (AICDZ Road) debited from the Bryan Boulevard/Horse Pen Creek as shown in the table below.

U-5538
AICDZ Site
Mitigation Proposal

Credits

HUC	Mitigation Type	Starting Amount (Ac)	Additional Notes
3030002	Riverine Wetland Restoration	3.8	
3030002	Riverine Wetland Enhancement	1.9	NO MORE CREDIT
3030002	Riverine Wetland Creation	24	NO MORE CREDIT

Debits

Mitigation Type	Debit Amount (Ac)	Site TIP	Notes
Riverine Wetland Restoration	1	U-608	
Riverine Wetland Restoration	0.18	AICDZ Road (U-5538)	

Mitigation Type	Debit Amount (Ac)	Site TIP	Notes
Riverine Wetland Enhancement	1.9	U-608	No Credit Remaining

Mitigation Type	Debit Amount (Ac)	Site TIP	Notes
Riverine Wetland Creation	24	U-608	No Credit Remaining

PARCEL IDENTIFICATION NUMBERS AND LAND OWNERS

AICDZ-Proposed Road

Parcel ID	Owner
159502	Scott Mayo Properties
159503	Scott Mayo Properties
159585	Phillips Nell Kimrey
159661	Rowland Allen
160190	Interstate Investments
160191	Interstate Investments
160376	Bradley Thomas Clinton
160112	Kimrey Vernon Betty
160091	Kimrey Ruth Trust
160522	Howard Neese

- The parcel and owner information shown in the above table was obtained from the Alamance County GIS Website. **Individual land owners should NOT be contacted concerning regulatory issues**. All comments, conversations and correspondence concerning regulatory information should be directed to the applicant and/or ECS Carolinas, LLP.

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR LINEAR ROADWAY PROJECTS

(Version 1.2; Released September 2011)

General Project Information

Project No.:	U-5538 - AWCK 13097		**Project Type:**	New Location	**Date:** 1/15/2014
NCDOT Contact:	Chuck Edwards		**Contractor / Designer:**	Franz Holt, Kyle Smith - Alley Williams Carmen & King Inc.	
	Address:	PO Box 766 127 East Crescent Square Drive Graham, NC 27253		**Address:**	PO Box 1179 740 Chapel Hill Road Burlington, NC 27216
	Phone:	(336) 570-6833		**Phone:**	(336) 226-5534
	Email:	cnedwards@ncdot.gov		**Email:**	fholt@awck.com, ksmith@awck.com
City/Town:	Mebane		**County(ies):**	Alamance	
River Basin(s):	Cape Fear		**CAMA County?**	No	
Primary Receiving Water:	Back Creek		**NCDWQ Stream Index No.:**	16-18-(6)	
NCDWQ Surface Water Classification for Primary Receiving Water	**Primary:**		Water Supply V (WS-V)		
	Supplemental:		Nutrient Sensitive Waters (NSW)		
Other Stream Classification:					
303(d) Impairments:					
Buffer Rules in Effect	Jordan Lake				

Project Description

Project Length (lin. Miles or feet):	8,785 Feet	**Surrounding Land Use:**	Surrounding properties contain residences, a mobile home park, wooded land and fields.

	Proposed Project	**Existing Site**
Project Built-Upon Area (ac.)	6.35 ac.	0.77 ac.
Typical Cross Section Description:	Typical cross-section consists of 2-12' travel lanes with 2.0% normal crown. 6' shoulder widths in cut sections and 8' shoulder widths in fill sections at 8.33% slope.	
Average Daily Traffic (veh/hr/day):	Design/Future: 2,100 vehicles a day	Existing:

General Project Narrative:

The site is an 8,785 feet linear road corridor providing access to an approximate 1,200 acre site that has been designated as Alamance Interstate Corridor Development Zone (AIDCZ). The site consists of a portion of a mobile home park, wooded land and fields. Surrounding properties contain residences, a mobile home park, wooded land and fields.

Construction of the road will unavoidably impact six streams and two wetlands. The right of way width has been minimized to the most practicable extent possible and is being proposed to be approximately 60 feet. NCDOT Std. 838.80.headwalls are being installed at the stream crossing locations with rip rap on banks only for downstream stabilization. Grassed shoulders and swales are utilized to promote infiltration and provide the primary stormwater treatment for this project. Level spreaders were investigated to provide diffuse flow into the buffers. However, all but 2 buffer slopes were in excess of the maximum slope per Table 8-1 of the NC Division of Water Quality Stormwater Best Management Practices Manual. In all areas where buffers slopes exceeded the maximum slope, stormwater was conveyed through the buffer through a rip rap lined channel. Bio-retention cell were used in lieu of level spreaders at the 2 locations where level spreaders could have been installed. Bioretention cells were selected due to lengths of level spreaders required and the desire to reduce the overall project footprint away from the proposed roadway.

References

Project Environmental Summary

Surface Water Impacts

Sheet No.	Station (From / To)	Feature Impacted	Water / Wetland / Buffer Type	Receiving Surface Water Name	NRTR Map ID	NCDWQ Stream Index	NCDWQ Surface Water Classification	303(d) Impairments	Type of Impact	Existing SCM	Proposed SCM
4	19+18.27 19+72.65	Buffer	Jordan Lake	UT to Back Creek	SB	16-18-(6)	WS-V; NSW	None	Culvert	N/A	Swale, Bio-Retention
4	19+72.65 19+78.50	Stream	Perennial	UT to Back Creek	SB	16-18-(6)	WS-V; NSW	None	Culvert	N/A	Swale
4	19+78.50 20+28.77	Buffer	Jordan Lake	UT to Back Creek	SB	16-18-(6)	WS-V; NSW	None	Culvert	N/A	Swale
6	40+02.83 40+96.60	Buffer	Jordan Lake	UT to Back Creek	SC	16-18-(6)	WS-V; NSW	None	Culvert	N/A	Swale
6	40+87.01 40+96.60	Wetland	Non-Tidal Freshwater Marsh	UT to Back Creek	WC	16-18-(6)	WS-V; NSW	None	Culvert	N/A	Swale
6	40+96.60 41+03.18	Stream	Perennial	UT to Back Creek	SC	16-18-(6)	WS-V; NSW	None	Culvert	N/A	Swale
6	41+03.18 41+53.48	Buffer	Jordan Lake	UT to Back Creek	SC	16-18-(6)	WS-V; NSW	None	Culvert	N/A	Swale
6	41+03.18 41+92.05	Wetland	Non-Tidal Freshwater Marsh	UT to Back Creek	WC	16-18-(6)	WS-V; NSW	None	Culvert	N/A	Swale
6	48+49.52 49+78.59	Buffer	Jordan Lake	UT to Back Creek	SH	16-18-(6)	WS-V; NSW	None	Culvert	N/A	Swale, Bio-Retention
6	49+07.29 49+12.93	Stream	Intermittent	UT to Back Creek	SH	16-18-(6)	WS-V; NSW	None	Culvert	N/A	Swale
7	54+06.27 54+10.77	Stream	Ephemeral	UT to Back Creek	SK	16-18-(6)	WS-V; NSW	None	Culvert	N/A	Swale
9	80+34.24 80+44.06	Stream	Ephemeral	UT to Back Creek	SF	16-18-(6)	WS-V; NSW	None	Culvert	N/A	Swale
11	3+98.70 4+51.64	Buffer	Jordan Lake	UT to Back Creek	SA	16-18-(6)	WS-V; NSW	None	Culvert	N/A	Swale
11	4+51.64 4+53.79	Stream	Intermittent	UT to Back Creek	SA	16-18-(6)	WS-V; NSW	None	Culvert	N/A	Swale
11	4+53.79 4+61.07	Wetland	Non-Tidal Freshwater Marsh	UT to Back Creek	WA	16-18-(6)	WS-V; NSW	None	Culvert	N/A	Swale
11	4+53.79 5+11.72	Buffer	Jordan Lake	UT to Back Creek	SA	16-18-(6)	WS-V; NSW	None	Culvert	N/A	Swale

* List all stream and surface water impact locations regardless of jurisdiction or size.
Equalizer Pipes to be noted as a minimization of impacts.
All proposed SCMs listed must also be listed under Swales, Preformed Sour Holes and other Energy Dissipators, or Other Stormwater Control Measures.

Description of Minimization of Impacts or Mitigation

References

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR LINEAR ROADWAY PROJECTS

(Version 1.2; Released September 2011)

Project/TIP No.: U-5538 - AWCK 13097 **County(ies):** Alamance

Swales

Sheet No.	Station (From / To)	Stream Crossing Station	Base Width (ft)	Front Slope (H:V)	Back Slope (H:V)	Drainage Area (ac)	Recommended Treatment Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used
4	L - 16+84 L - 18+42	19+70.47	6.0	3:1	3:1	0.73	73	158	1.90%	1.5	1.8	1.9	2.0	No
4	R - 16+34 R - 19+14	19+70.47	6.0	3:1	3:1	0.74	74	280	2.22%	1.5	2.0	1.9	2.3	No
4	L - 23+75 L - 21+44	19+70.47	2.0	3:1	3:1	0.24	24	231	1.20%	0.2	1.0	0.3	1.2	No
4	R - 24+03 R - 21+54	19+70.47	2.0	3:1	3:1	0.45	45	249	1.20%	1.2	1.9	1.5	2.1	No
6	L - 38+82 L - 40+05	41+01.69	4.5	3:1	3:1	0.62	62	123	3.25%	1.6	1.3	2.0	1.4	Yes
6	R - 38+64 R - 40+12	41+01.69	2.0	3:1	3:1	0.29	29	148	3.38%	0.3	1.7	0.4	2.0	No
6	L - 44+08 L - 42+24	41+01.69	2.0	3:1	3:1	0.26	26	184	1.63%	0.6	1.8	0.7	1.8	No
6	R - 44+08 R - 43+33	41+01.69	2.0	3:1	3:1	0.23	23	75	1.33%	0.5	1.5	0.7	1.8	No
7	L - 46+57 L - 47+69	49+10.11	2.0	3:1	3:1	0.21	21	112	1.79%	0.2	1.1	0.3	1.5	No
7	R - 45+58 R - 47+51	49+10.11	2.0	3:1	3:1	0.40	40	193	1.30%	1.0	1.9	1.3	2.1	No
7	L - 52+97 L - 50+32	49+10.11	2.0	3:1	3:1	0.24	24	265	0.75%	0.5	1.3	0.7	1.4	No
7	R - 52+97 R - 50+65	49+10.11	2.0	3:1	3:1	0.23	23	232	2.16%	0.6	1.9	0.7	2.1	No
7	L - 55+92 L - 55+16	54+08.52	6.0	3:1	3:1	0.53	53	76	2.63%	0.8	1.6	1.1	1.8	No
7	R - 56+89 R - 55+44	54+08.52	2.0	3:1	3:1	0.21	21	145	2.07%	0.2	1.3	0.2	1.3	No
9	L - 77+86 L - 78+85	80+41.17	6.0	3:1	3:1	0.89	89	99	2.60%	2.5	1.3	3.1	1.4	Yes
9	R - 78+43 R - 79+16	80+41.17	2.0	3:1	3:1	0.39	39	73	2.70%	0.4	1.7	0.5	2.0	No
10	L - 86+54 L - 87+21	NA	3.0	3:1	3:1	0.27	27	73	2.74%	0.5	1.7	1.5	2.5	No
10	R - 86+45 R - 87+50	NA	6.0	3:1	3:1	0.42	42	124	1.61%	1.2	1.6	1.5	1.8	No
11	R - 2+95 R - 3+84	4+60.74	6.0	3:1	3:1	0.59	59	89	2.50%	1.5	2.0	1.9	2.2	No

☑ YES ☐ NO Have minimum design criteria, as presented in the NCDOT Best Management Practices Toolbox, Version 1 (March 2008), been met and verified? If No, provide further explanantion of why design criteria was not met.

Additional Comments

Stormwater treatment is achieved in swales prior to entering buffers. Buffer slopes should be less than 5% to use Level Spreaders to meet diffuse flow requirements. Buffer slopes are greater than 5% in all areas except at stations L-18+91 and R-49+95 therefore stormwater will be conveyed through the buffer by the use of rip rap channels. In areas where buffer slopes are less than 5%, diffuse flow will be achieved through the use of Bioretention Cells in lieu of Level Spreaders. See sheet 5 for Bio-Retention information.

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR LINEAR ROADWAY PROJECTS

(Version 1.2; Released September 2011)

Project/TIP No.: U-5538 - AWCK 13097 **County(ies):** Alamance

Preformed Scour Holes and Energy Dissipators

Sheet No.	Station	Energy Dissipator Type	Riprap Type	Drainage Area (ac)	Conveyance Structure	Pipe/Structure Dimensions (in)	Q10 (cfs)	V10 (fps)
3	R - 3+05	Riprap Apron / Pad	Class 'B'	1.50	Culvert	18	5.9	1.2
3	R - 8+49	Riprap Apron / Pad	Class I	11.38	Culvert	36	19.0	1.5
5	L - 26+22	Riprap Apron / Pad	Class 'B'	1.13	Culvert	18	2.8	0.9
5	R - 32+22	Riprap Apron / Pad	Class 'B'	0.72	Culvert	18	1.6	0.8
6	L - 40+78	Riprap Apron / Pad	Class I	0.62	Ditch	24" Trapizodal Ditch	2.0	1.0
6	R - 40+89	Riprap Apron / Pad	Class 'B'	0.29	Ditch	54" Trapizodal Ditch	0.4	0.6
6	L - 41+80	Riprap Apron / Pad	Class 'B'	0.26	Ditch	24" Trapizodal Ditch	0.7	0.8
6	R - 42+04	Riprap Apron / Pad	Class 'B'	0.23	Ditch	24" Trapizodal Ditch	0.7	0.8
7	L - 48+53	Riprap Apron / Pad	Class 'B'	0.21	Ditch	24" Trapizodal Ditch	0.3	0.5
8	L - 64+37	Riprap Apron / Pad	Class 'B'	0.62	Ditch	24" Trapizodal Ditch	2.3	1.2
8	R - 65+26	Riprap Apron / Pad	Class 'B'	0.32	Ditch	24" Trapizodal Ditch	0.5	0.7
8	R - 65+62	Riprap Apron / Pad	Class I	13.92	Culvert	42	28.0	1.7
8	L - 66+14	Riprap Apron / Pad	Class 'B'	0.59	Ditch	24" Trapizodal Ditch	2.2	1.2
8	R - 66+14	Riprap Apron / Pad	Class 'B'	0.06	Ditch	24" Trapizodal Ditch	0.1	0.4
9	R - 80+56	Riprap Apron / Pad	Class I	41.70	Culvert	60	77.0	2.2

☑ YES ☐ NO Have minimum design criteria, as presented in the NCDOT Best Management Practices Toolbox (2008), NCDOT Standard Details, or FHWA HEC-14 (July 2006), been met and verified, as applicable? If No, provide further explanation of why design criteria was not met.

Additional Comments

* Refer to the NCDOT Best Management Practices Toolbox, Version 1 (March 2008), NCDOT Standard Details, the Federal Highway Administration (FHWA) Hydraulic Engineering Circular No. 14 (HEC-14), Third Edition, Hydraulic Design of Energy Dissipators for Culverts and Channels (July 2006), as applicable, for design guidance and criteria.

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR LINEAR ROADWAY PROJECTS

(Version 1.2; Released September 2011)

Project/TIP No.: U-5538 - AWCK 13097 **County(ies):** Alamance

Other Stormwater Control Measures

Sheet No.	Station	SCM Type	Drainage Area (ac)	Required / Minimum Treatment			Design Treatment		All Design Criteria Met?
4 & 36	L - 18+55 L - 18+91	Bio-Retention	0.74	Designed to Treat 1st inch of Runoff	1016.00	CF	1263.00	CF	Yes
7 & 36	R - 49+95 R - 50+45	Bio-Retention	0.23	Designed to Treat 1st inch of Runoff	434.00	CF	804.00	CF	Yes

Additional Comments

Bio-Retention cells were designed per the NCDWQ BMP Manual. Cells were designed with Internal Water Storage providing 85% Total Suspended Solids Removal, 40% Total Nitrogen Removal, and 45% Total Phosphorus Removal. Bio-Retention Cells are installed in lieu of level spreaders in 2 locations.

* Equalizer Pipes to be noted as a minimization of impacts.

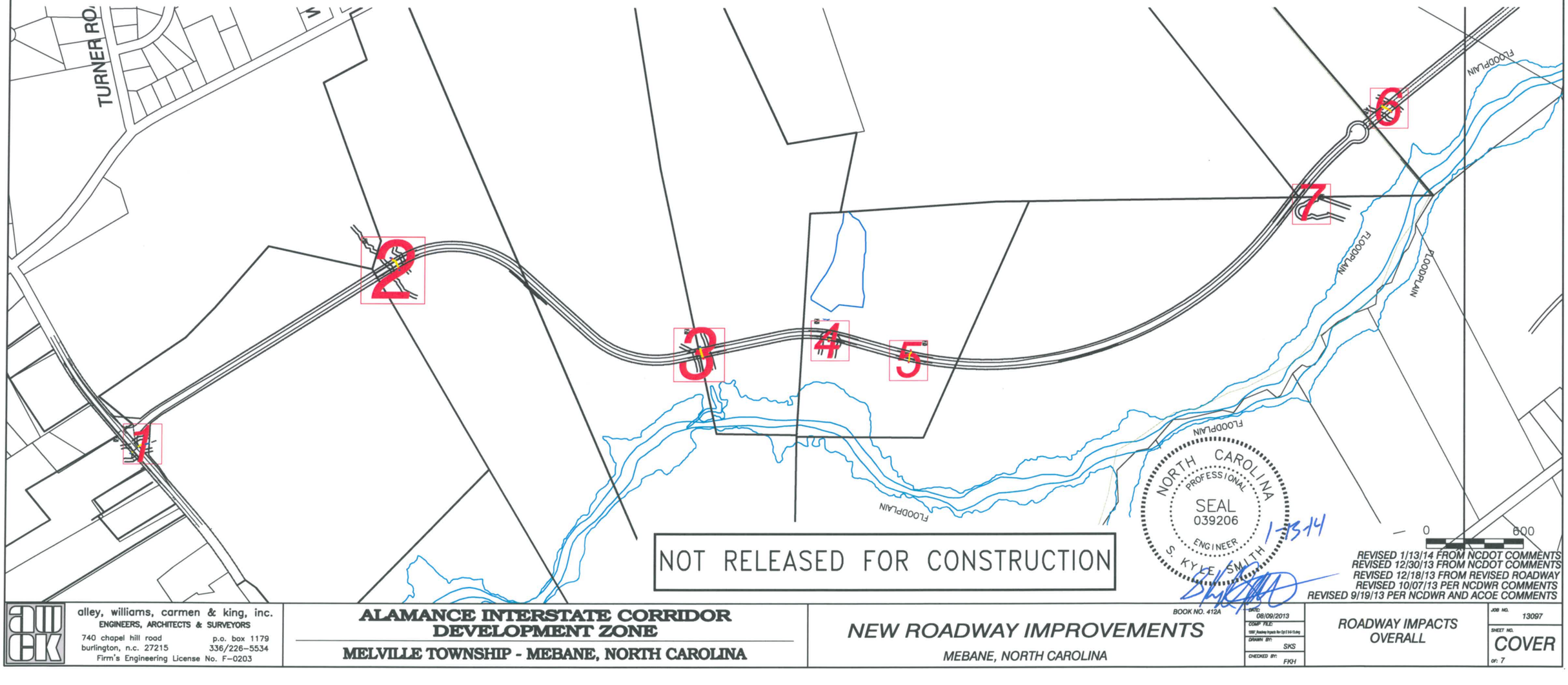
Waters of the US Impacts

Water of the US	Crossing Number	Latitude	Longitude	DWR Stream Classification & USACE Wetland Classification	USACE Compensatory Mitigation Required	DWR Compensatory Mitigation Required	Impacted Length (lf)	Impacted Area (ac)	Temporary Stream Impacts (lf)	Bank Stabilization (lf)
SA*	1	36°03'45" N	79°18'27" W	Intermittent	1:1	1:1	13	0.0006	7	0
SA*	1	36°03'45" N	79°18'27" W	Perennial	2:1	1:1	31	0.0014	30	12
SB*	2	36°03'33" N	79°18'46" W	Perennial	2:1	1:1	73	0.0084	8	21
SC*	3	36°03'39" N	79°19'09" W	Perennial	2:1	1:1	68	0.0047	7	7
SD				Perennial	Avoided (No Impacts)	Avoided (No Impacts)	0	0.0000	0	0
SE				Intermittent	Avoided (No Impacts)	Avoided (No Impacts)	0	0.0000	0	0
SF	(Sheet 7)	36°03'30" N	79°19'53" W	Intermittent	Avoided (No Impacts)	Avoided (No Impacts)	0	0.0000	0	0
SG**	6	36°03'24" N	79°20'00" W	Intermittent	No Mitigation Required	1:1	69	0.0048	6	7
SH*	4	36°03'38" N	79°19'19" W	Intermittent	1:1	1:1	8	0.0004	0	9
SI				Intermittent	Avoided (No Impacts)	Avoided (No Impacts)	0	0.0000	0	0
SJ				Intermittent	Avoided (No Impacts)	Avoided (No Impacts)	0	0.0000	0	0
SK**	5	36°03'39" N	79°19'25" W	Intermittent	No Mitigation Required	No Mitigation Required	72	0.0099	0	13
WA**	1	36°03'45" N	79°18'27" W	Non-Tidal Freshwater Marsh / Headwater Forest	2:1	N/A	N/A	0.0101	N/A	N/A
WB				Non-Tidal Freshwater Marsh	Avoided (No Impacts)	N/A	N/A	0.0000	N/A	N/A
WC**	3	36°03'39" N	79°19'09" W	Non-Tidal Freshwater Marsh	2:1	N/A	N/A	0.1739	N/A	N/A

Total Bank Stabilization (lf)	69
Total Temporary Stream Impacts (lf)	58
Total Intermittent Stream Impacts (lf)	162
Total Perennial Stream Impacts (lf)	172
Total Stream Impacts (lf)	461
*Total Stream Impacts Counted Towards NWP 39 Threshold (lf)	193
**Total Waters of the US Counted Towards NWP 39 Threshold (ac)	0.2141

Permanent Bufer Impacts

Water of the US	Zone 1 Impact (sq ft)	*minus* Wetlands in Zone 1 (sq ft)	= Zone 1 Buffers (not wetlands) (sq ft)	Zone 1 Buffer Mitigation Required (using 3:1 ratio) (sf)	Zone 2 Impact (sq ft)	*minus* Wetlands in Zone 2 (sq ft)	= Zone 2 Buffers (not wetlands) (sq ft)	Zone 2 Buffer Mitigation Required (using 1.5:1 ratio) (sf)
SA*	1,126	0	1,126	Not Reqired	474	0	474	Not Reqired
SA*	4,264	439	3,825	Not Reqired	2,818	0	2,818	Not Reqired
SB*	5,917	0	5,917	Not Reqired	3,791	0	3,791	Not Reqired
SC*	5,061	3,113	1,948	Not Reqired	3,394	1,613	1,781	Not Reqired
SC*	90	0	90	270	678	0	678	1017
SD	0	0	0	Not Reqired	0	0	0	Not Reqired
SE	0	0	0	Not Reqired	0	0	0	Not Reqired
SF	0	0	0	Not Reqired	441	0	441	662
SG**	4,776	0	4,776	Not Reqired	2,992	0	2,992	Not Reqired
SH*	3,269	0	3,269	Not Reqired	3,738	0	3,738	Not Reqired
SI	0	0	0	Not Reqired	0	0	0	Not Reqired
SJ	0	0	0	Not Reqired	0	0	0	Not Reqired
SK**	0	0	0	Not Reqired	0	0	0	Not Reqired
Totals	24,503	3,552	20,951	270	18,326	1,613	16,713	1,679



alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road p.o. box 1179
burlington, n.c. 27215 336/226-5534
Firm's Engineering License No. F-0203

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE

MELVILLE TOWNSHIP - MEBANE, NORTH CAROLINA

NEW ROADWAY IMPROVEMENTS

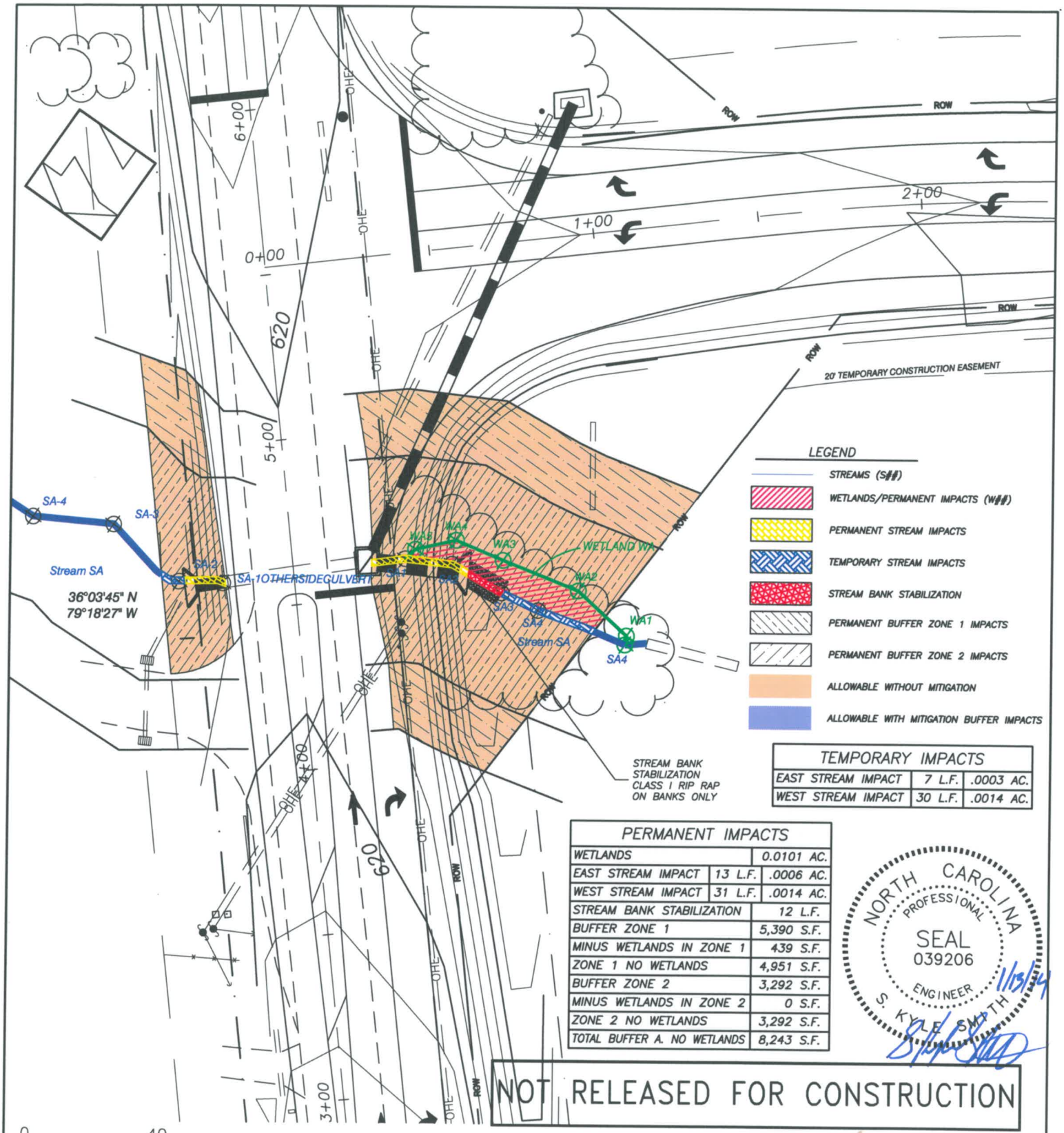
MEBANE, NORTH CAROLINA

BOOK NO. 412A

DATED: 08/09/2013
COMP. FILE:
DRAWN BY: SKS
CHECKED BY: FKH

ROADWAY IMPACTS OVERALL

JOB NO. 13097
SHEET NO. COVER of: 7



TEMPORARY IMPACTS		
EAST STREAM IMPACT	7 L.F.	.0003 AC.
WEST STREAM IMPACT	30 L.F.	.0014 AC.

PERMANENT IMPACTS		
WETLANDS		0.0101 AC.
EAST STREAM IMPACT	13 L.F.	.0006 AC.
WEST STREAM IMPACT	31 L.F.	.0014 AC.
STREAM BANK STABILIZATION		12 L.F.
BUFFER ZONE 1		5,390 S.F.
MINUS WETLANDS IN ZONE 1		439 S.F.
ZONE 1 NO WETLANDS		4,951 S.F.
BUFFER ZONE 2		3,292 S.F.
MINUS WETLANDS IN ZONE 2		0 S.F.
ZONE 2 NO WETLANDS		3,292 S.F.
TOTAL BUFFER A. NO WETLANDS		8,243 S.F.

NORTH CAROLINA PROFESSIONAL SEAL 039206 ENGINEER S. KYLE SMITH 11/13/14

NOT RELEASED FOR CONSTRUCTION

PROJECT NO. - 13097

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road
burlington, n.c. 27215
p.o. box 1179
336/226-5534
Firm's Engineering License No. F-0203

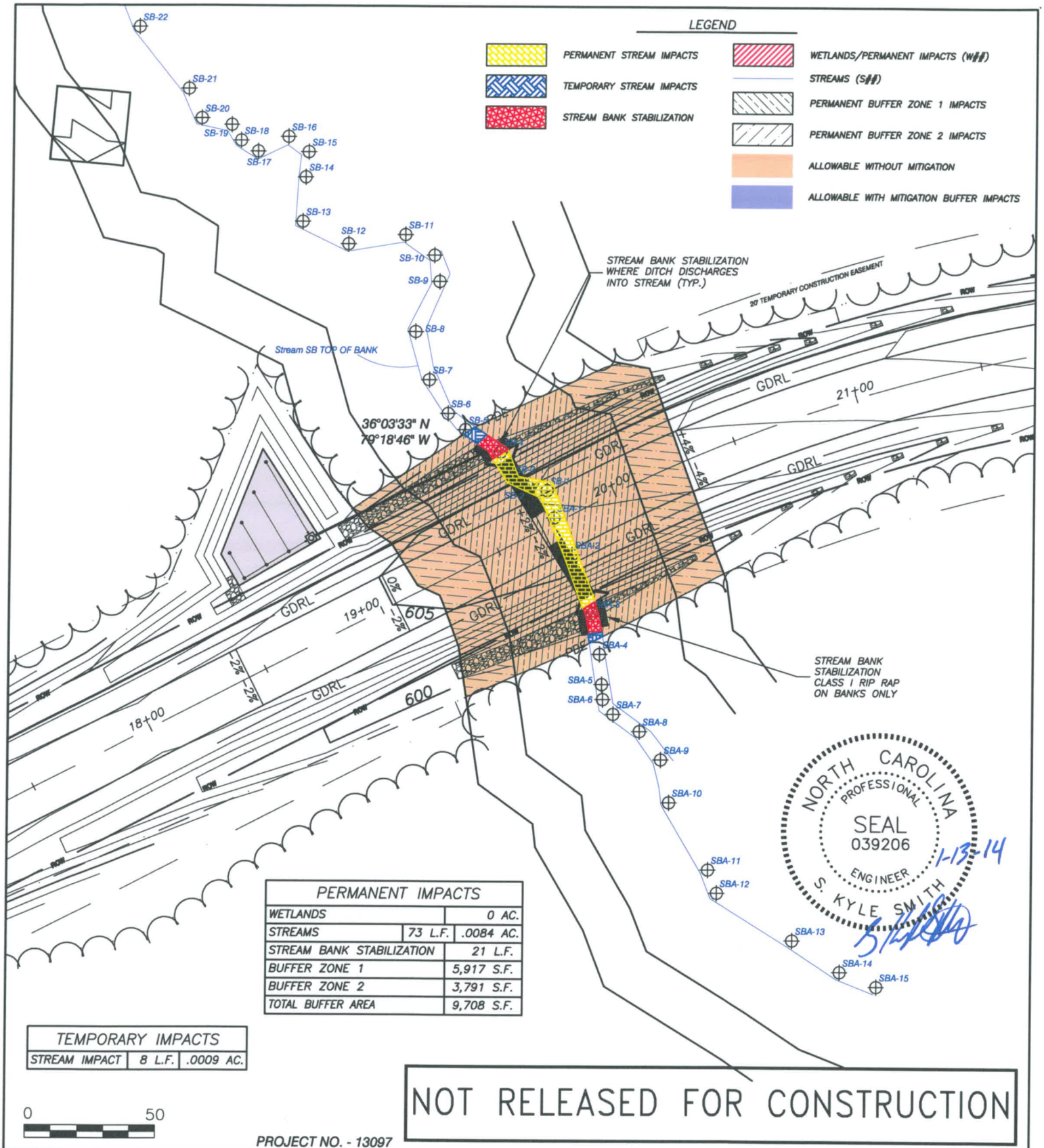
NEW ROADWAY IMPACTS FOR :

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE

MELVILLE TWSP., ALAMANCE COUNTY, N.C.

SCALE : 1" = 40' | DATE : 1/8/2014 | DWG. BY MHW

SHEET NO. : 1 OF 7



PERMANENT IMPACTS		
WETLANDS		0 AC.
STREAMS	73 L.F.	.0084 AC.
STREAM BANK STABILIZATION		21 L.F.
BUFFER ZONE 1		5,917 S.F.
BUFFER ZONE 2		3,791 S.F.
TOTAL BUFFER AREA		9,708 S.F.

TEMPORARY IMPACTS		
STREAM IMPACT	8 L.F.	.0009 AC.

NOT RELEASED FOR CONSTRUCTION

PROJECT NO. - 13097

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road
burlington, n.c. 27215
p.o. box 1179
336/226-5534
Firm's Engineering License No. F-0203

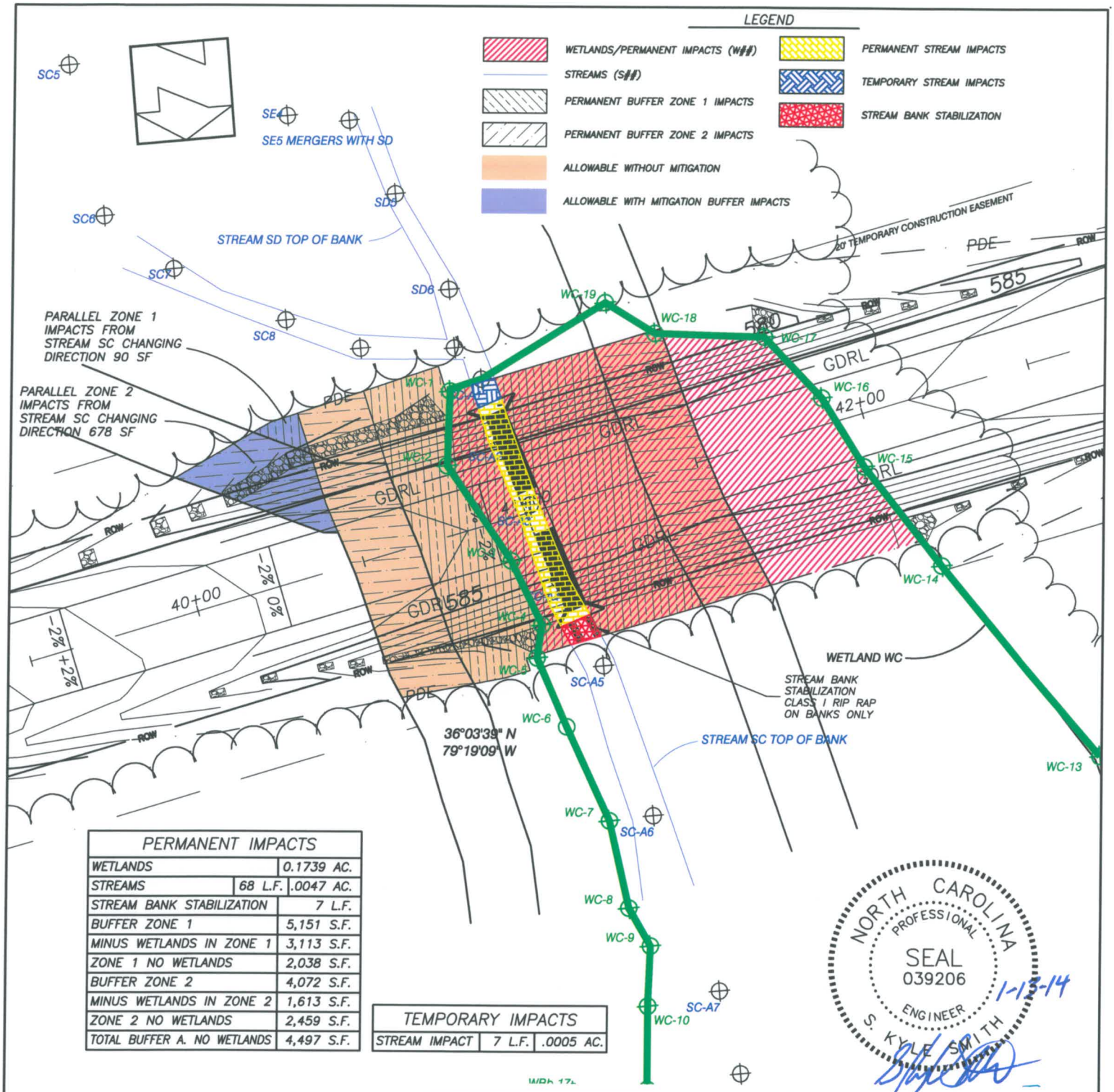
NEW ROADWAY IMPACTS FOR :

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE

MELVILLE TWSP., ALAMANCE COUNTY, N.C.

SCALE : 1" = 50' | DATE : 1/8/2014 | DWG. BY MHW

SHEET NO. : 2 OF 7



PERMANENT IMPACTS		
WETLANDS		0.1739 AC.
STREAMS	68 L.F.	.0047 AC.
STREAM BANK STABILIZATION		7 L.F.
BUFFER ZONE 1		5,151 S.F.
MINUS WETLANDS IN ZONE 1		3,113 S.F.
ZONE 1 NO WETLANDS		2,038 S.F.
BUFFER ZONE 2		4,072 S.F.
MINUS WETLANDS IN ZONE 2		1,613 S.F.
ZONE 2 NO WETLANDS		2,459 S.F.
TOTAL BUFFER A. NO WETLANDS		4,497 S.F.

TEMPORARY IMPACTS		
STREAM IMPACT	7 L.F.	.0005 AC.

NORTH CAROLINA PROFESSIONAL SEAL 039206 ENGINEER S. KYLE SMITH

1-13-14

NOT RELEASED FOR CONSTRUCTION

0 50

PROJECT NO. - 13097

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road
burlington, n.c. 27215
p.o. box 1179
336/226-5534
Firm's Engineering License No. F-0203

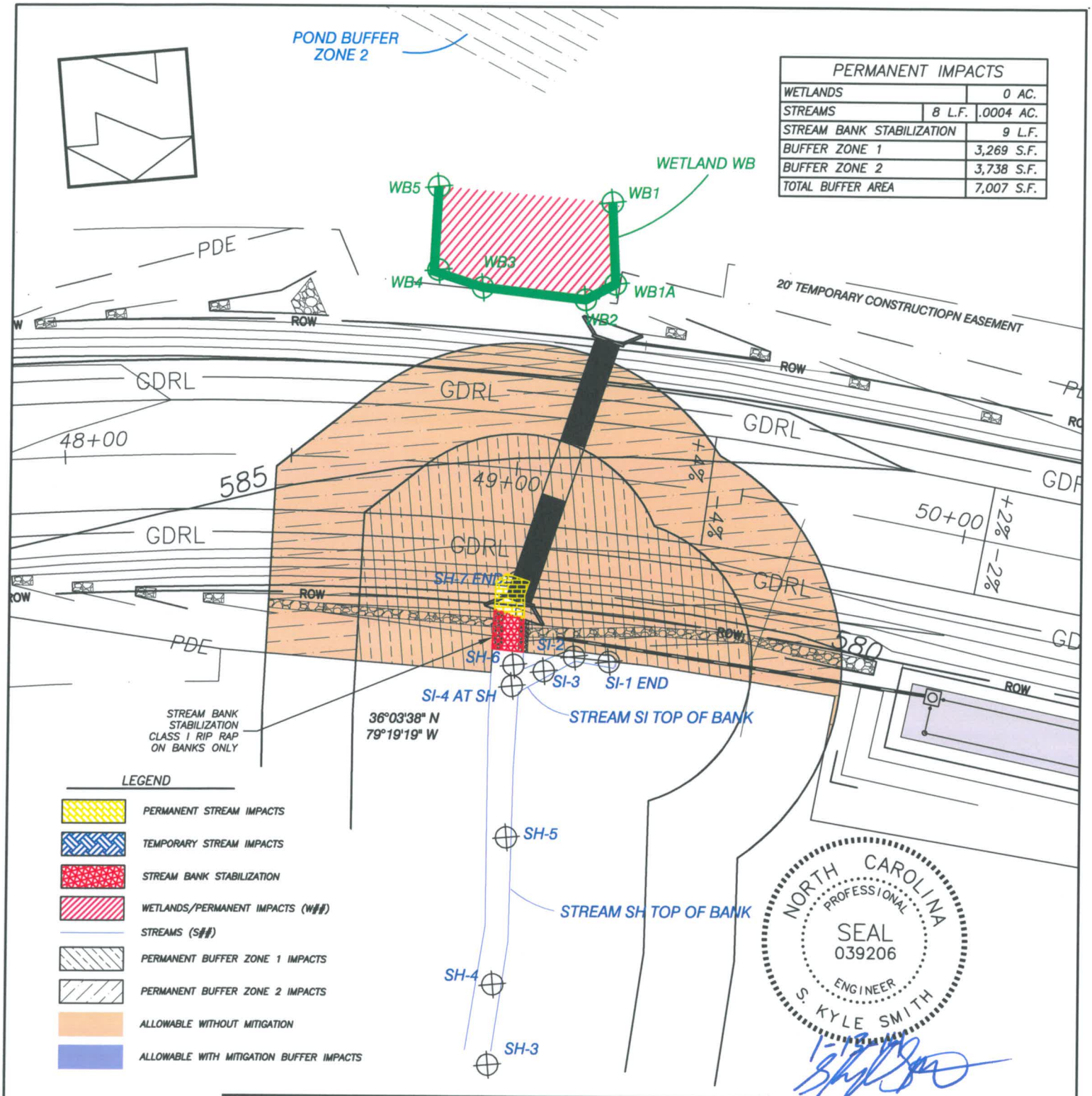
NEW ROADWAY IMPACTS FOR :

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE

MELVILLE TWSP., ALAMANCE COUNTY, N.C.

SCALE : 1" = 40' | DATE : 1/8/2014 | DWG. BY MHW

SHEET NO. : 3 OF 7



PERMANENT IMPACTS		
WETLANDS		0 AC.
STREAMS	8 L.F.	.0004 AC.
STREAM BANK STABILIZATION		9 L.F.
BUFFER ZONE 1		3,269 S.F.
BUFFER ZONE 2		3,738 S.F.
TOTAL BUFFER AREA		7,007 S.F.

NORTH CAROLINA PROFESSIONAL SEAL 039206 ENGINEER S. KYLE SMITH

1-17

NOT RELEASED FOR CONSTRUCTION

PROJECT NO. - 13097

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road
burlington, n.c. 27215
p.o. box 1179
336/226-5534
Firm's Engineering License No. F-0203

NEW ROADWAY IMPACTS FOR :

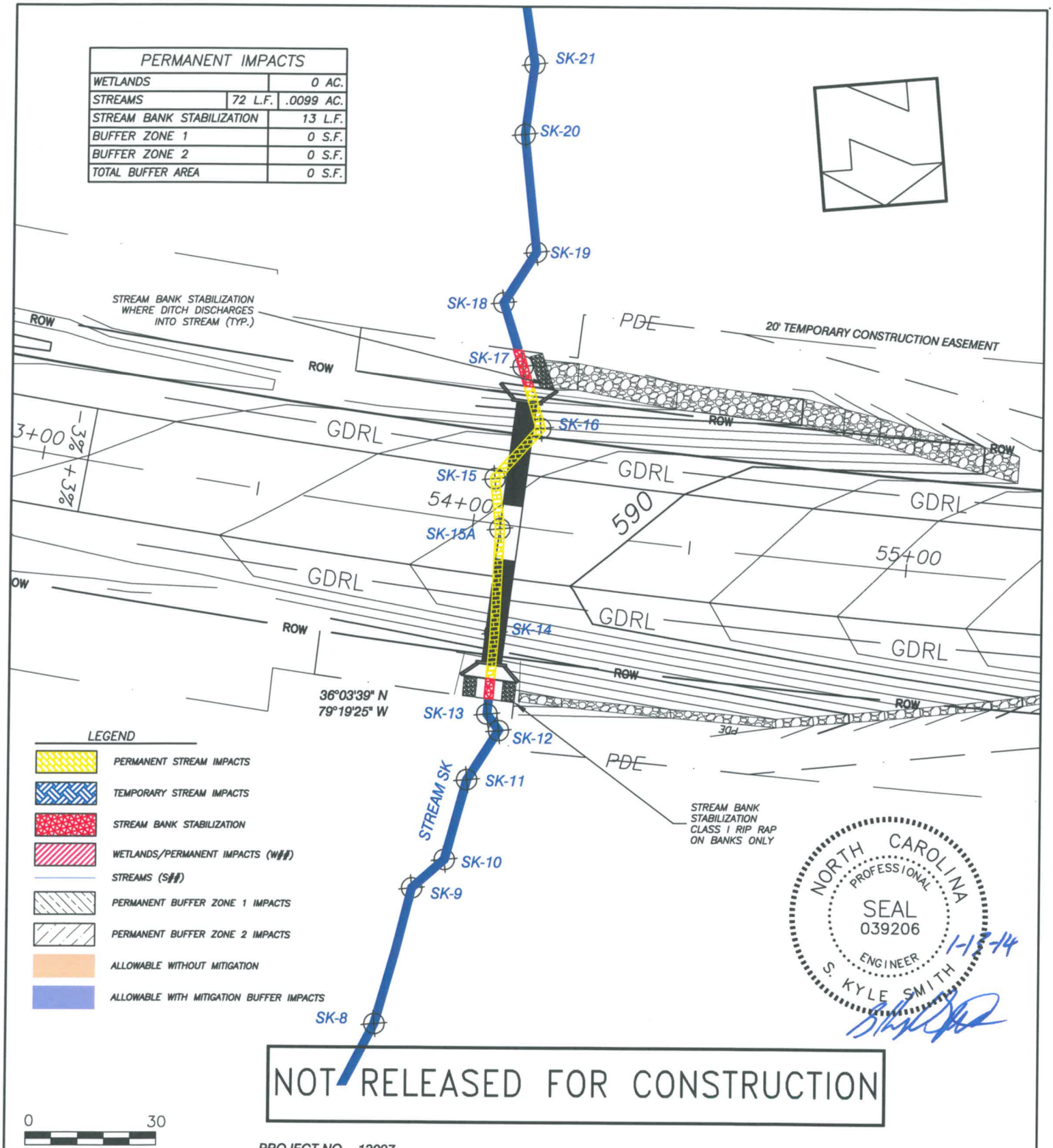
ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE

MELVILLE TWSP., ALAMANCE COUNTY, N.C.

SCALE : 1" = 30' | DATE : 1/8/2014 | DWG. BY MHW

SHEET NO. : 4 OF 7

PERMANENT IMPACTS		
WETLANDS		0 AC.
STREAMS	72 L.F.	.0099 AC.
STREAM BANK STABILIZATION		13 L.F.
BUFFER ZONE 1		0 S.F.
BUFFER ZONE 2		0 S.F.
TOTAL BUFFER AREA		0 S.F.



NORTH CAROLINA PROFESSIONAL SEAL 039206 ENGINEER S. KYLE SMITH

1-13-14

NOT RELEASED FOR CONSTRUCTION

PROJECT NO. - 13097

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road
burlington, n.c. 27215
p.o. box 1179
336/226-5534
Firm's Engineering License No. F-0203

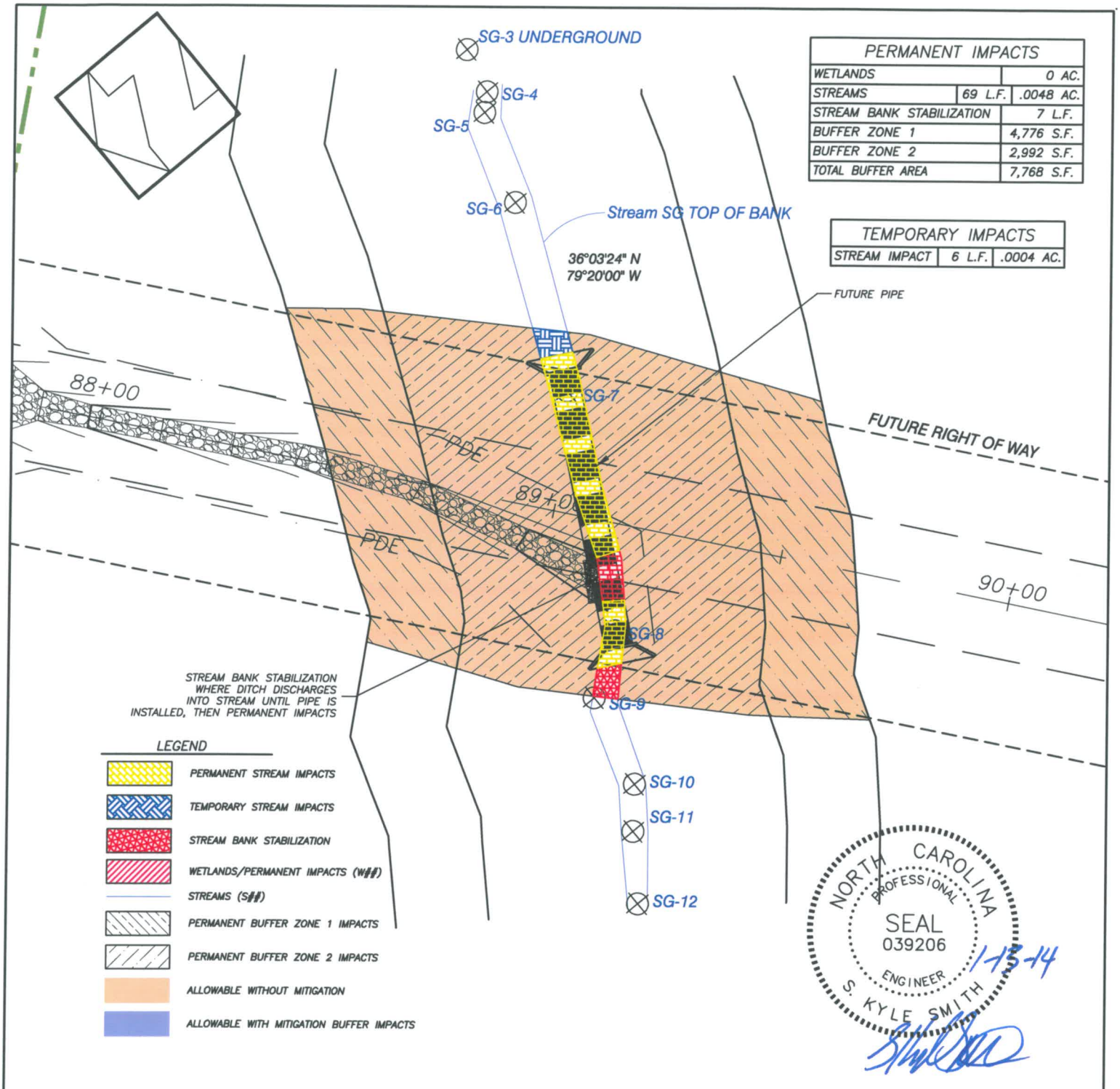
NEW ROADWAY IMPACTS FOR :

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE

MELVILLE TWSP., ALAMANCE COUNTY, N.C.

SCALE : 1" = 30' | DATE : 1/8/2014 | DWG. BY MHW

SHEET NO. : 5 OF 7



PERMANENT IMPACTS		
WETLANDS		0 AC.
STREAMS	69 L.F.	.0048 AC.
STREAM BANK STABILIZATION		7 L.F.
BUFFER ZONE 1		4,776 S.F.
BUFFER ZONE 2		2,992 S.F.
TOTAL BUFFER AREA		7,768 S.F.

TEMPORARY IMPACTS		
STREAM IMPACT	6 L.F.	.0004 AC.

NORTH CAROLINA PROFESSIONAL SEAL 039206 ENGINEER S. KYLE SMITH

1-15-14

NOT RELEASED FOR CONSTRUCTION

0 30

PROJECT NO. - 13097

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road
burlington, n.c. 27215
p.o. box 1179
336/226-5534
Firm's Engineering License No. F-0203

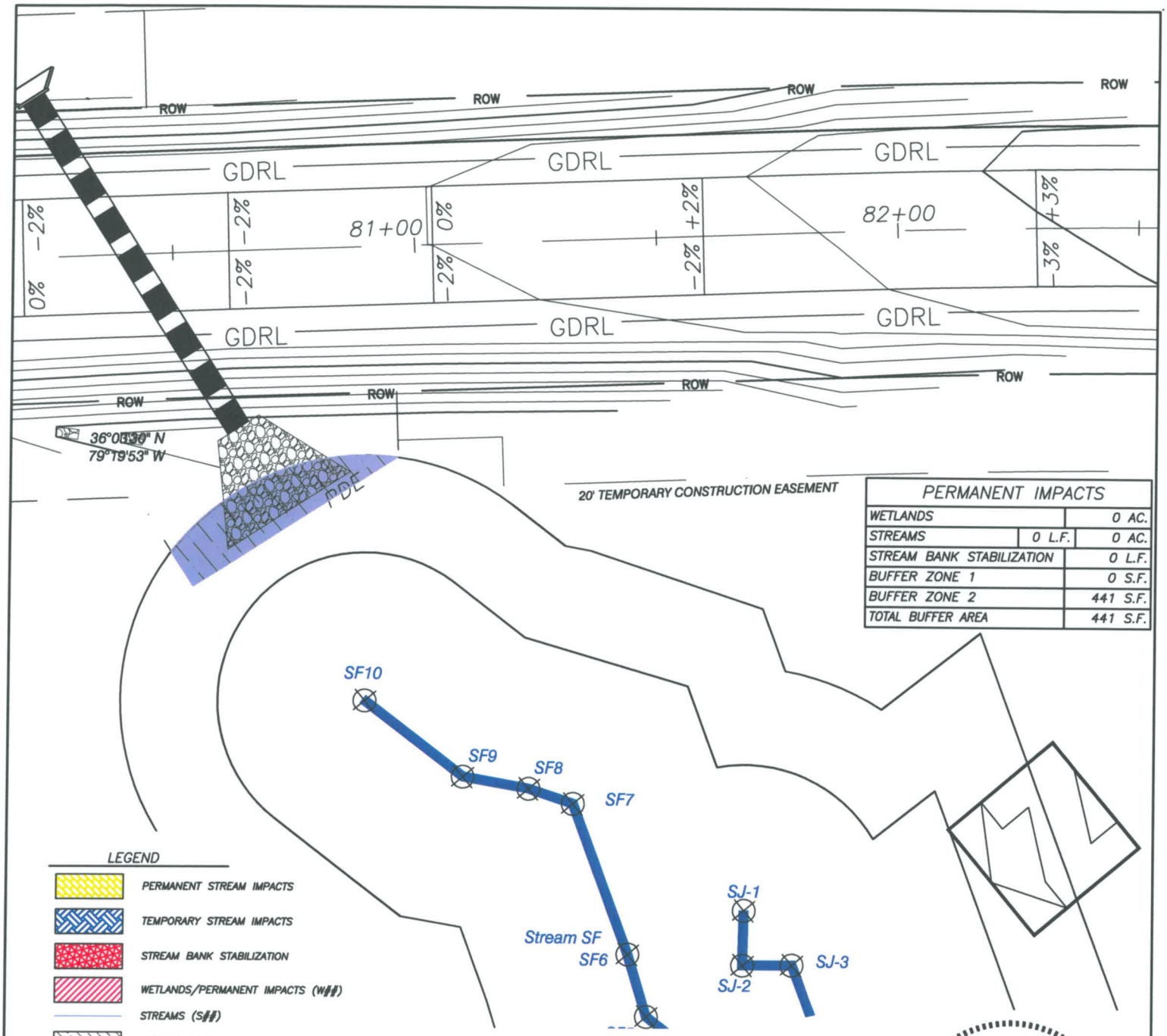
NEW ROADWAY IMPACTS FOR :

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE

MELVILLE TWSP., ALAMANCE COUNTY, N.C.

SCALE : 1" = 30' | DATE : 1/8/2014 | DWG. BY MHW

SHEET NO. : 6 OF 7



PERMANENT IMPACTS		
WETLANDS		0 AC.
STREAMS	0 L.F.	0 AC.
STREAM BANK STABILIZATION		0 L.F.
BUFFER ZONE 1		0 S.F.
BUFFER ZONE 2		441 S.F.
TOTAL BUFFER AREA		441 S.F.

LEGEND

- PERMANENT STREAM IMPACTS
- TEMPORARY STREAM IMPACTS
- STREAM BANK STABILIZATION
- WETLANDS/PERMANENT IMPACTS (W##)
- STREAMS (S##)
- BUFFER ZONE 1
- BUFFER ZONE 2
- ALLOWABLE WITHOUT MITIGATION
- ALLOWABLE WITH MITIGATION BUFFER IMPACTS

NOT RELEASED FOR CONSTRUCTION

NORTH CAROLINA PROFESSIONAL SEAL 039206 ENGINEER S. KYLE SMITH

1-15-14

0 30

PROJECT NO. - 13097

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road
burlington, n.c. 27215
p.o. box 1179
336/226-5534
Firm's Engineering License No. F-0203

NEW ROADWAY IMPACTS FOR :

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE

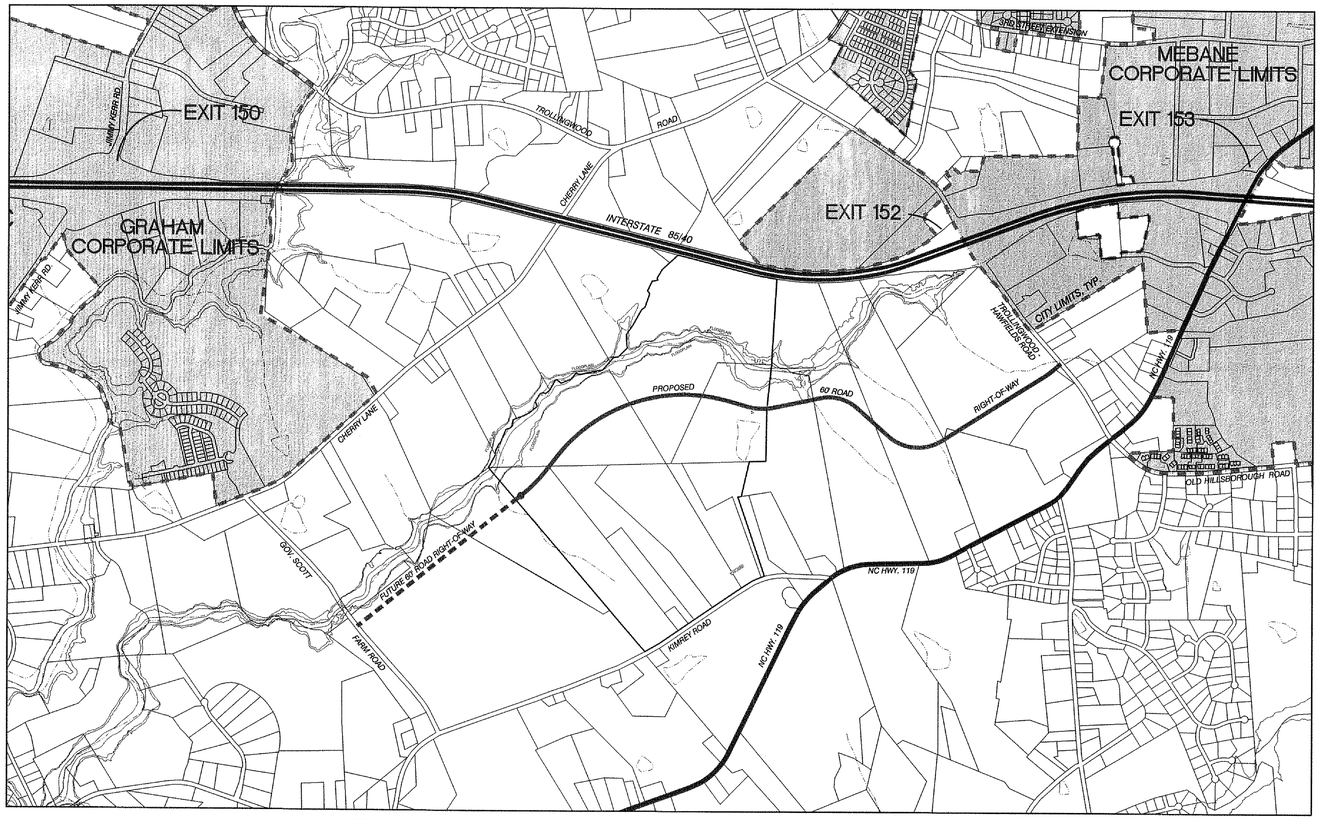
MELVILLE TWSP., ALAMANCE COUNTY, N.C.

SCALE : 1" = 30' | DATE : 1/8/2014 | DWG. BY MHW

SHEET NO. : 7 OF 7

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE NEW ROADWAY IMPROVEMENTS

FOR NCDOT



VICINITY MAP
1"=1000'

INDEX OF SHEETS

NORTH CAROLINA PROFESSIONAL SEAL 039206 ENGINEER S. KYLE SMITH
1-15-14

DATE: DECEMBER 12, 2013
REVISED 1/15/14 PER NCDOT COMMENTS

ALLEY, WILLIAMS, CARMEN, & KING, INC.
ENGINEERS & ARCHITECTS
740 CHAPEL HILL ROAD
BURLINGTON, NORTH CAROLINA 27215
TELEPHONE: 336-226-5534

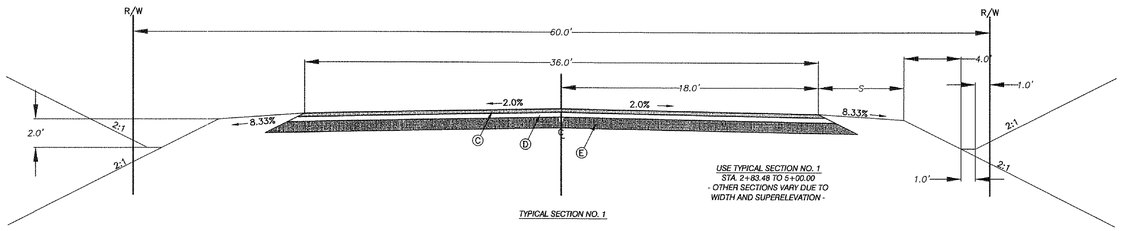
JOB NO. 13097

PAVEMENT SCHEDULE	
C	3" Asphalt Surface Course Type S9.5 C (2 - 1.5" Lifts)
D	4" Asphalt Intermediate Course Type I-19.0C
E	6" Asphalt Base Course Type B-25.0C (2 - 3" Lifts)

"S" VALUES FOR SHOULDER WIDTH

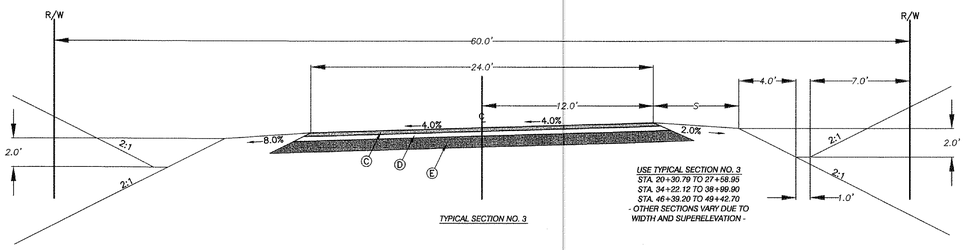
CUT S=6'

FILL S=8'



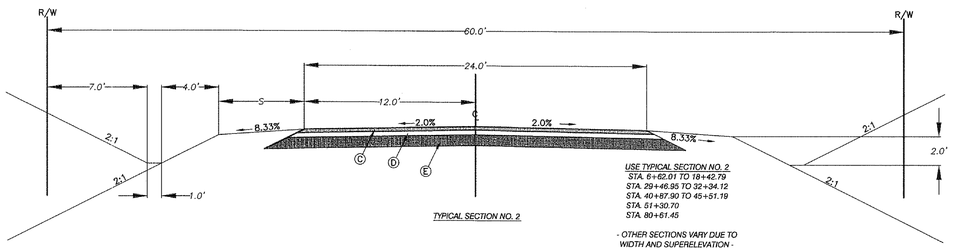
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
STA. 2+83.48 TO 5+00.00
- OTHER SECTIONS VARY DUE TO WIDTH AND SUPERELEVATION -



TYPICAL SECTION NO. 3

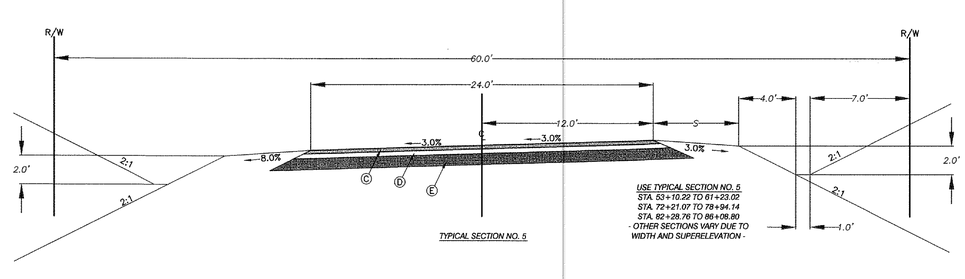
USE TYPICAL SECTION NO. 3
STA. 20+30.79 TO 27+58.95
STA. 34+22.12 TO 38+99.90
STA. 46+39.20 TO 49+42.70
- OTHER SECTIONS VARY DUE TO WIDTH AND SUPERELEVATION -



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2
STA. 6+62.01 TO 18+42.79
STA. 29+46.95 TO 32+34.12
STA. 40+87.90 TO 45+51.19
STA. 51+30.70
STA. 80+61.45

- OTHER SECTIONS VARY DUE TO WIDTH AND SUPERELEVATION -



TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5
STA. 53+10.22 TO 61+23.02
STA. 72+21.07 TO 78+94.14
STA. 82+28.76 TO 86+08.80
- OTHER SECTIONS VARY DUE TO WIDTH AND SUPERELEVATION -

GRAPHIC SCALE 1" = 5'

5 0 5 10

NORTH CAROLINA PROFESSIONAL SEAL 039206 ENGINEER S. KYLE SMITH 1-15-14

REVISED 1-15-14 - REVISED TYP. SECTIONS

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road p.o. box 1179
burlington, n.c. 27215 336/226-5534
Firm's Engineering License No. F-0203

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE

MELVILLE TOWNSHIP - MEBANE, NORTH CAROLINA

BOOK NO. 412A

NEW ROADWAY IMPROVEMENTS

MEBANE, NORTH CAROLINA

DATE: 12/12/13
COMP FILE: TYP SECTIONS.dwg
DRAWN BY: SKS
CHECKED BY: FKH

TYPICAL STREET SECTIONS

JOB NO. 13097
SHEET NO. 2
OF: 40

THIS PLAN DOES NOT PURPORT TO SHOW ALL EXISTING UTILITIES, LINES, APPURTENANCES, ETC., AND THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES, PIPES, VALVES, ETC. AS SHOWN ARE IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR THE ENGINEER/ARCHITECT. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES, LINES, PIPES, ETC. BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT RESULT FROM THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, PIPES AND VALVES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER/ARCHITECT OF ANY CONFLICTS WITH EXISTING AND PROPOSED FACILITIES TO DETERMINE IF AN ITEM WILL NEED TO BE RELOCATED.

THE ENGINEER/ARCHITECT HAS MADE NO EXAMINATION TO DETERMINE WHETHER ANY HAZARDOUS OR TOXIC MATERIALS ARE PRESENT OR CONTAINED IN, UNDER, OR ON THE SUBJECT PROPERTY OR ITS WATERS, OR IF ANY HAZARDOUS OR TOXIC MATERIALS HAVE CONTAMINATED THIS OR OTHER PROPERTIES OR ITS WATERS IN ANY WAY WHATSOEVER. NO SUB-SURFACE EXAMINATION OF ANY TYPE HAS BEEN MADE BY THE ENGINEER/ARCHITECT, AND ACCORDINGLY, NO OPINION IS EXPRESSED OR INFERRED ON ALL SUCH MATTERS. FURTHER, NO OPINION IS RENDERED AS TO ANY VIOLATION OF ANY ENVIRONMENTAL LAWS OR REGULATIONS, EITHER FEDERAL, STATE, OR LOCAL RELATED TO THE INFORMATION SHOWN ON THIS PLAN AND THE ENGINEER/ARCHITECT IS IN NO WAY LIABLE FOR ANY VIOLATION OF SUCH ENVIRONMENTAL LAWS SHOULD SUCH EXIST.

℄ CURVE DATA #1
Δ – 09° 15' 47"
T – 64.81'
R – 800.00'
L – 129.34'
D – 07° 09' 43"
NORMAL CROWN
ADJUST ENDWALLS IN FIELD TO FINISHED GRADES.
SEE IMPACT DRAWINGS (SHEET 36) FOR ASSOCIATED STREAM WETLAND & BUFFER IMPACTS
SPECIAL LATERAL BASE DITCH
(NOT TO SCALE)
NATURAL GROUND
3:1 OR FLATTER
FILL SLOPE
MIN. D=1FT.
B=6FT. (SEE PLANS)
FROM STA. -Y- 2+95 TO 3+84 RT
THOMAS CLINTON BRADLEY
D.B. 2597 PG. 327
GPIN #9804810638
PROP. 148' OF 36" CLASS IV RCP
PROP. 80' OF 18" CLASS III RCP
20'X80' PERMANENT DRAINAGE EASEMENT
160' TAPER
EDGE OF PAVEMENT
PROP. 80' OF 36" CLASS III RCP
12' STRIPED TRAVEL LANES
CLEARING LIMITS
20' TEMPORARY CONSTRUCTION EASEMENT
TROLLINGWOOD-HAWFIELDS ROAD
TAPER LENGTH = 233.5'
WIDTH = 35.2'
REMOVE EXISTING 18" PIPE AND RESTORE TO NATURAL TOPOGRAPHY
CLASS I RIP RAP ON BANKS ONLY
20'X25' PERMANENT DRAINAGE EASEMENT
CENTERLINE
STREAM – SA
CLEARING LIMITS
CLASS B RIP RAP PAD (NCDOT STD. 876.02)
W_1 = 3'
W_2 = 9'
PERMANENT DRAINAGE EASEMENT
CLASS I RIP RAP PAD (NCDOT STD. 876.02)
W_1 = 6'
W_2 = 18'
CLEARING LIMITS
PROP. ENDWALL NO. 1 (NCDOT STD. 838.80)
PROP. JUNCTION BOX NO. 2 TRAFFIC BEARING SEE DETAIL SHEET 38
PROP. ENDWALL NO. 3 (NCDOT STD. 838.80)
APPROXIMATE LOCATION 12" ORANGE-ALAMANCE WATER LINE
SEE SHEET 34 FOR TROLLINGWOOD-HAWFIELDS ROAD PAVEMENT MARKING PLAN
SEE SHEET 11 FOR TROLLINGWOOD-HAWFIELDS ROAD WIDENING PLAN
PLAN
SCALE: 1" = 40'
THOMAS CLINTON BRADLEY
D.B. 2597 PG. 327
GPIN #9804810638
SEE SHEET 12 FOR STORM DRAINAGE PROFILES
ALL ENDWALLS TO BE IN ACCORDANCE WITH NCDOT STD. 838.80 MIN. DIMENSIONS

PROFILE
SCALE: 1" = 40' HOR.
1" = 4' VERT.
LOW POINT ELEV = 617.71
LOW POINT STA = 3+25
PVI STA = 3+25
PVI ELEV = 616.71
A.D. = 2.00
K = 200.00
400.0' VC
HIGH POINT ELEV = 621.45
HIGH POINT STA = 8+55.84
PVI STA = 9+41.56
PVI ELEV = 622.88
A.D. = -3.50
K = 114.29
400.0' VC
50' RT.
50' LT.
PROPOSED C/L GRADE
EXISTING CENTERLINE
-1.00%
1.00%
PROP. 36" CLASS IV RCP
PROP. 18" CLASS III RCP
LEFT/RIGHT EOP
PROP. 36" CLASS III RCP
LEFT/RIGHT EOP
635
630
625
620
615
610
605
600
0+00
1+00
2+00
3+00
4+00
5+00
6+00
7+00
8+00
9+00
10+00
11+00
12+00

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road, burlington, n.c. 27215
p.o. box 1179
336/226-5534
Firm's Engineering License No. F-0203

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE

MELVILLE TOWNSHIP - MEBANE, NORTH CAROLINA

BOOK NO. 412A

NEW ROADWAY IMPROVEMENTS

MEBANE, NORTH CAROLINA

DATE: 12/12/13
COMP FILE: 13097_planprofile.dwg
DRAWN BY: MHW
CHECKED BY: FKH

PLAN & PROFILE
STA. 0+00 TO STA. 12+00

REVISED 1/15/14 PER NCDOT COMMENTS

JOB NO. 13097
SHEET NO. 3
OF 40

THIS PLAN DOES NOT PURPORT TO SHOW ALL EXISTING UTILITIES, LINES, APPURTENANCES, ETC., AND THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES, PIPES, VALVES, ETC. AS SHOWN ARE IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR THE ENGINEER/ARCHITECT. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES, LINES, PIPES, ETC. BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT RESULT FROM THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, PIPES AND VALVES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER/ARCHITECT OF ANY CONFLICTS WITH EXISTING AND PROPOSED FACILITIES TO DETERMINE IF AN ITEM WILL NEED TO BE RELOCATED.

THE ENGINEER/ARCHITECT HAS MADE NO EXAMINATION TO DETERMINE WHETHER ANY HAZARDOUS OR TOXIC MATERIALS ARE PRESENT OR CONTAINED IN, UNDER, OR ON THE SUBJECT PROPERTY OR ITS WATERS, OR IF ANY HAZARDOUS OR TOXIC MATERIALS HAVE CONTAMINATED THIS OR OTHER PROPERTIES OR ITS WATERS IN ANY WAY WHATSOEVER. NO SUB-SURFACE EXAMINATION OF ANY TYPE HAS BEEN MADE BY THE ENGINEER/ARCHITECT, AND ACCORDINGLY, NO OPINION IS EXPRESSED OR INFERRED ON ALL SUCH MATTERS. FURTHER, NO OPINION IS RENDERED AS TO ANY VIOLATION OF ANY ENVIRONMENTAL LAWS OR REGULATIONS, EITHER FEDERAL, STATE, OR LOCAL RELATED TO THE INFORMATION SHOWN ON THIS PLAN AND THE ENGINEER/ARCHITECT IS IN NO WAY LIABLE FOR ANY VIOLATION OF SUCH ENVIRONMENTAL LAWS SHOULD SUCH EXIST.

GUARDRAILS SHALL BE INSTALLED WITH GRAU-350 END TREATMENTS (TYPICAL.)

ALL ENDWALLS TO BE IN ACCORDANCE WITH NCDOT STD. 838.80 MIN. DIMENSIONS

ADJUST ENDWALLS IN FIELD TO FINISHED GRADES.

SEE IMPACT DRAWINGS (SHEET 36) FOR ASSOCIATED STREAM WETLAND & BUFFER IMPACTS

SEE SHEET 12 FOR STORM DRAINAGE PROFILES


THOMAS CLINTON BRADLEY
D.B. 2597 PG. 327
GPIN #9804810638
INTERSTATE INVESTMENTS
D.B. 801 PG. 471
GPIN #9804609819
BIO-RETENTION BASIN NO. 1 (SEE SHEET 36 FOR DETAILS)
STREAM - SB
PROP. ENDWALL NO. 4 (NCDOT STD. 838.80)
PERMANENT WATER QUALITY CHECK (TYP.)
PERMANENT DRAINAGE EASEMENT
2' WIDE RIP RAP CHANNEL
6' WIDE RIP RAP CHANNEL
PROP. 60' OF 8 GA. 72" CAP
CLASS I RIP RAP ON BANKS ONLY
CLEARING LIMITS
CENTERLINE
EDGE OF PAVEMENT
12' STRIPED TRAVEL LANES
20' TEMPORARY CONSTRUCTION EASEMENT
℄ CURVE DATA #2
Δ - 73° 40' 52"
T - 472.00'
R - 630.00'
L - 810.17'
D - 09° 05' 41"
SUPERELEVATION = 0.04
SPECIAL LATERAL BASE DITCH
(NOT TO SCALE)
NATURAL GROUND
3:1 OR FLATTER
FILL SLOPE
MIN. D=1FT.
MIN. B=2 TO 6FT. (SEE PLANS)
FROM STA. 16+84 TO 18+42 LT
FROM STA. 16+34 TO 19+14 RT
FROM STA. 21+44 TO 23+75 LT
FROM STA. 21+54 TO 24+03 RT
PLAN
SCALE: 1" = 40'
PROFILE
SCALE: 1" = 40' HOR.
1" = 4' VERT.
LOW POINT ELEV = 604.21
LOW POINT STA = 17+89.73
PVI STA = 17+37.02
PVI ELEV = 602.99
A.D. = 3.70
K = 81.08
300.0' VC
BVCS: 15+87.02
EVCS: 18+87.02
LEFT/RIGHT EOP
PROPOSED C/L GRADE
50' LT.
50' RT.
EXISTING CENTERLINE
LEFT EOP
RIGHT EOP
PROP. 8 GA. 72" CAP
NORMAL CROWN
FULL SUPER
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00
21+00
22+00
23+00
24+00

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road, burlington, n.c. 27215
p.o. box 1179, 336/226-5534
Firm's Engineering License No. F-0203

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE

MELVILLE TOWNSHIP - MEBANE, NORTH CAROLINA

BOOK NO. 412A

NEW ROADWAY IMPROVEMENTS

MEBANE, NORTH CAROLINA

DATE:	12/12/13
COMP FILE:	13097_planprofile.dwg
DRAWN BY:	MHW
CHECKED BY:	FKH

PLAN & PROFILE
STA. 12+00 TO STA. 24+00

JOB NO. 13097

SHEET NO. 4 OF 40

REVISED 1/15/14 PER NCDOT COMMENTS

THIS PLAN DOES NOT PURPORT TO SHOW ALL EXISTING UTILITIES, LINES, APPURTENANCES, ETC., AND THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES, PIPES, VALVES, ETC. AS SHOWN ARE IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR THE ENGINEER/ARCHITECT. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES, LINES, PIPES, ETC. BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT RESULT FROM THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, PIPES AND VALVES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER/ARCHITECT OF ANY CONFLICTS WITH EXISTING AND PROPOSED FACILITIES TO DETERMINE IF AN ITEM WILL NEED TO BE RELOCATED.

THE ENGINEER/ARCHITECT HAS MADE NO EXAMINATION TO DETERMINE WHETHER ANY HAZARDOUS OR TOXIC MATERIALS ARE PRESENT OR CONTAINED IN, UNDER, OR ON THE SUBJECT PROPERTY OR ITS WATERS, OR IF ANY HAZARDOUS OR TOXIC MATERIALS HAVE CONTAMINATED THIS OR OTHER PROPERTIES OR ITS WATERS IN ANY WAY WHATSOEVER. NO SUB-SURFACE EXAMINATION OF ANY TYPE HAS BEEN MADE BY THE ENGINEER/ARCHITECT, AND ACCORDINGLY, NO OPINION IS EXPRESSED OR INFERRED ON ALL SUCH MATTERS. FURTHER, NO OPINION IS RENDERED AS TO ANY VIOLATION OF ANY ENVIRONMENTAL LAWS OR REGULATIONS, EITHER FEDERAL, STATE, OR LOCAL RELATED TO THE INFORMATION SHOWN ON THIS PLAN AND THE ENGINEER/ARCHITECT IS IN NO WAY LIABLE FOR ANY VIOLATION OF SUCH ENVIRONMENTAL LAWS SHOULD SUCH EXIST.

INTERSTATE INVESTMENTS
D.B. 801 PG. 471
GPIN #9804609819

INTERSTATE INVESTMENTS
D.B. 801 PG. 657
GPIN #9804601723

CLASS B RIP RAP PAD (NCDOT STD. 876.02)
W_1 = 3'
W_2 = 9'

12' STRIPED TRAVEL LANES

20'X20' PERMANENT DRAINAGE EASEMENT

CLEARING LIMITS

PERMANENT DRAINAGE EASEMENT

PROP. 80' OF 18" CLASS III RCP

20' TEMPORARY CONSTRUCTION EASEMENT

PROP. 60' OF 18" CLASS III RCP

CENTERLINE

EDGE OF PAVEMENT

PT = 27+99.95

PC = 33+41.12

℄ CURVE DATA #2
Δ – 73° 40' 52"
T – 472.00'
R – 630.00'
L – 810.17'
D – 09° 05' 41"
SUPERELEVATION = 0.04

℄ CURVE DATA #3
Δ – 53° 27' 20"
T – 302.13'
R – 600.00'
L – 559.78'
D – 09° 32' 57"
SUPERELEVATION = 0.04

PLAN
SCALE: 1" = 40'

PROFILE
SCALE: 1" = 40' HOR.
1" = 4' VERT.

HIGH POINT ELEV = 613.54
HIGH POINT STA = 26+95.02
PVI STA = 26+88.26
PVI ELEV = 614.40
A.D. = -2.30
K = 130.64
300.0' VC

BVCS: 25+38.26
BVCE: 612.60

FULL SUPER STA: 27+58.95

EVCS: 28+38.26
EVCE: 612.76

NORMAL CROWN STA: 28+45.95

EXISTING CENTERLINE

PROPOSED C/L GRADE

-1.10%

50' RT.

50' LT.

PROP. 18" CLASS III RCP

LEFT EOP

RIGHT EOP

PVI STA = 34+85.65
PVI ELEV = 605.66
A.D. = -2.61
K = 115.16
300.0' VC

NORMAL CROWN STA: 33+85.65

BVCS: 33+35.65
BVCE: 607.31

FULL SUPER STA: 34+24.15

PROP. 18" CLASS III RCP

RIGHT EOP

LEFT EOP

NORTH CAROLINA PROFESSIONAL SEAL 039206 ENGINEER KYLE H. KING

REVISED 1/15/14 PER NCDOT COMMENTS

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road p.o. box 1179
burlington, n.c. 27215 336/226-5534
Firm's Engineering License No. F-0203

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE

MELVILLE TOWNSHIP - MEBANE, NORTH CAROLINA

BOOK NO. 412A

NEW ROADWAY IMPROVEMENTS

MEBANE, NORTH CAROLINA

DATE: 12/12/13
COMP FILE: 13097_planprofile.dwg
DRAWN BY: MHW
CHECKED BY: FKH

PLAN & PROFILE
STA. 24+00 TO STA. 36+00

JOB NO. 13097

SHEET NO. 5
OF: 40

THIS PLAN DOES NOT PURPORT TO SHOW ALL EXISTING UTILITIES, LINES, APPURTENANCES, ETC., AND THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES, PIPES, VALVES, ETC. AS SHOWN ARE IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR THE ENGINEER/ARCHITECT. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES, LINES, PIPES, ETC. BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT RESULT FROM THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, PIPES AND VALVES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER/ARCHITECT OF ANY CONFLICTS WITH EXISTING AND PROPOSED FACILITIES TO DETERMINE IF AN ITEM WILL NEED TO BE RELOCATED.

THE ENGINEER/ARCHITECT HAS MADE NO EXAMINATION TO DETERMINE WHETHER ANY HAZARDOUS OR TOXIC MATERIALS ARE PRESENT OR CONTAINED IN, UNDER, OR ON THE SUBJECT PROPERTY OR ITS WATERS, OR IF ANY HAZARDOUS OR TOXIC MATERIALS HAVE CONTAMINATED THIS OR OTHER PROPERTIES OR ITS WATERS IN ANY WAY WHATSOEVER. NO SUB-SURFACE EXAMINATION OF ANY TYPE HAS BEEN MADE BY THE ENGINEER/ARCHITECT, AND ACCORDINGLY, NO OPINION IS EXPRESSED OR INFERRED ON ALL SUCH MATTERS. FURTHER, NO OPINION IS RENDERED AS TO ANY VIOLATION OF ANY ENVIRONMENTAL LAWS OR REGULATIONS, EITHER FEDERAL, STATE, OR LOCAL RELATED TO THE INFORMATION SHOWN ON THIS PLAN AND THE ENGINEER/ARCHITECT IS IN NO WAY LIABLE FOR ANY VIOLATION OF SUCH ENVIRONMENTAL LAWS SHOULD SUCH EXIST.

ALL ENDWALLS TO BE IN ACCORDANCE WITH NCDOT STD. 838.80 MIN. DIMENSIONS

SEE IMPACT DRAWINGS (SHEET 36) FOR ASSOCIATED STREAM WETLAND & BUFFER IMPACTS

REVISED 1/15/14 PER NCDOT COMMENTS

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road p.o. box 1179
burlington, n.c. 27215 336/226-5534
Firm's Engineering License No. F-0203

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE

MELVILLE TOWNSHIP - MEBANE, NORTH CAROLINA

BOOK NO. 412A

NEW ROADWAY IMPROVEMENTS

MEBANE, NORTH CAROLINA

DATE:	12/12/13
COMP FILE:	13097_planprofile.dwg
DRAWN BY:	MHW
CHECKED BY:	FKH

PLAN & PROFILE
STA. 36+00 TO STA. 48+00

JOB NO. 13097
SHEET NO. 6
OF: 40

THIS PLAN DOES NOT PURPORT TO SHOW ALL EXISTING UTILITIES, LINES, APPURTENANCES, ETC., AND THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES, PIPES, VALVES, ETC. AS SHOWN ARE IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR THE ENGINEER/ARCHITECT. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES, LINES, PIPES, ETC. BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT RESULT FROM THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, PIPES AND VALVES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER/ARCHITECT OF ANY CONFLICTS WITH EXISTING AND PROPOSED FACILITIES TO DETERMINE IF AN ITEM WILL NEED TO BE RELOCATED.

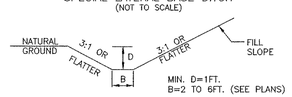
THE ENGINEER/ARCHITECT HAS MADE NO EXAMINATION TO DETERMINE WHETHER ANY HAZARDOUS OR TOXIC MATERIALS ARE PRESENT OR CONTAINED IN, UNDER, OR ON THE SUBJECT PROPERTY OR ITS WATERS, OR IF ANY HAZARDOUS OR TOXIC MATERIALS HAVE CONTAMINATED THIS OR OTHER PROPERTIES OR ITS WATERS IN ANY WAY WHATSOEVER. NO SUB-SURFACE EXAMINATION OF ANY TYPE HAS BEEN MADE BY THE ENGINEER/ARCHITECT, AND ACCORDINGLY, NO OPINION IS EXPRESSED OR INFERRED ON ALL SUCH MATTERS. FURTHER, NO OPINION IS RENDERED AS TO ANY VIOLATION OF ANY ENVIRONMENTAL LAWS OR REGULATIONS, EITHER FEDERAL, STATE, OR LOCAL RELATED TO THE INFORMATION SHOWN ON THIS PLAN AND THE ENGINEER/ARCHITECT IS IN NO WAY LIABLE FOR ANY VIOLATION OF SUCH ENVIRONMENTAL LAWS SHOULD SUCH EXIST.

GUARDRAILS SHALL BE INSTALLED WITH GRAU-350 END TREATMENTS (TYPICAL.)

SEE IMPACT DRAWINGS (SHEET 36) FOR ASSOCIATED STREAM WETLAND & BUFFER IMPACTS

ADJUST ENDWALLS IN FIELD TO FINISHED GRADES.

SPECIAL LATERAL BASE DITCH
(NOT TO SCALE)



MIN. D=1FT.
B=2 TO 6FT. (SEE PLANS)

FROM STA. 46+57 TO 47+69 LT
FROM STA. 45+58 TO 47+51 RT
FROM STA. 50+32 TO 52+97 LT
FROM STA. 50+65 TO 52+97 RT
FROM STA. 55+16 TO 55+92 LT
FROM STA. 55+44 TO 56+89 RT

BETTY KIMREY VERNON
D.B. 757 PG. 824
GPIN #9804405913

RUTH I. KIMREY REVOCABLE TRUST
D.B. 1643 PG. 533
GPIN #9804314534

℄ CURVE DATA #5
Δ – 67° 53' 13"
T – 1514.42'
R – 2250.00'
L – 2665.92'
D – 02° 32' 48"
SUPERELEVATION = 0.03

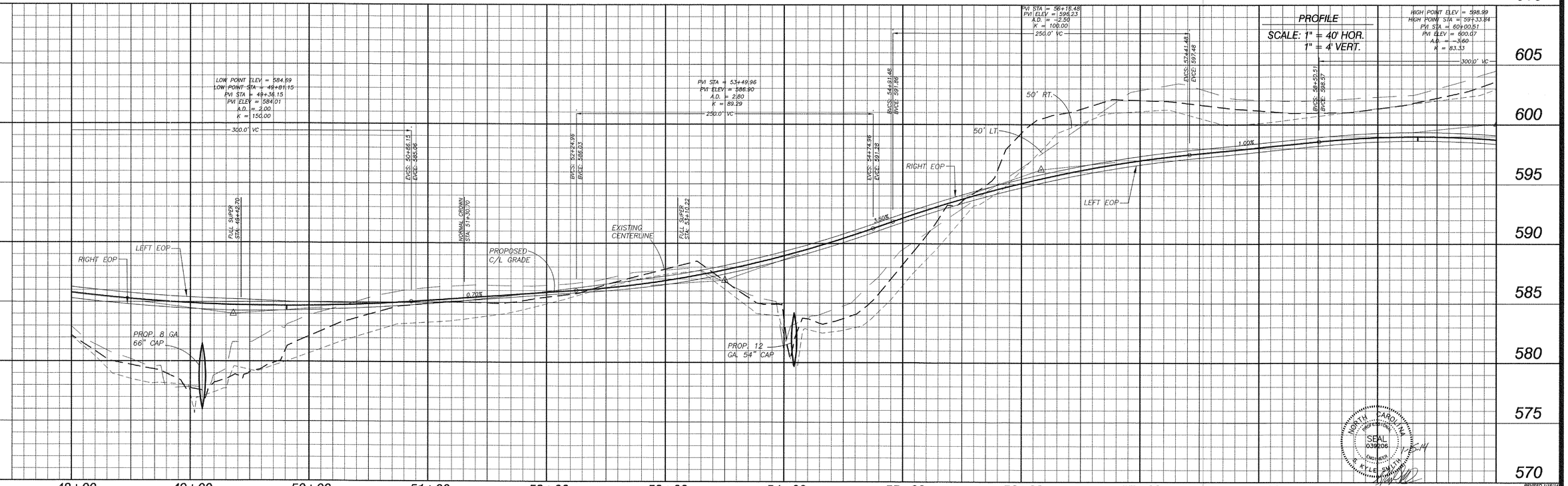
℄ CURVE DATA #4
Δ – 27° 36' 36"
T – 196.57'
R – 800.00'
L – 385.51'
D – 07° 09' 43"
SUPERELEVATION = 0.04

ALL ENDWALLS TO BE IN ACCORDANCE WITH NCDOT STD. 838.80 MIN. DIMENSIONS

SEE SHEET 13 FOR STORM DRAINAGE PROFILES

PLAN
SCALE: 1" = 40'

PROFILE
SCALE: 1" = 40' HOR.
1" = 4' VERT.



alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road p.o. box 1179
burlington, n.c. 27215 336/226-5534
Firm's Engineering License No. F-0203

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE

MELVILLE TOWNSHIP - MEBANE, NORTH CAROLINA

BOOK NO. 412A

NEW ROADWAY IMPROVEMENTS

MEBANE, NORTH CAROLINA

DATE: 12/12/13
COMP FILE: 13097_planprofile.dwg
DRAWN BY: MHW
CHECKED BY: FKH

PLAN & PROFILE
STA. 48+00 TO STA. 60+00

JOB NO. 13097
SHEET NO. 7
OF: 40

REVISED 1/15/14 PER NCDOT COMMENTS

THIS PLAN DOES NOT PURPORT TO SHOW ALL EXISTING UTILITIES, LINES, APPURTENANCES, ETC., AND THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES, PIPES, VALVES, ETC. AS SHOWN ARE IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR THE ENGINEER/ARCHITECT. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES, LINES, PIPES, ETC. BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT RESULT FROM THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, PIPES AND VALVES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER/ARCHITECT OF ANY CONFLICTS WITH EXISTING AND PROPOSED FACILITIES TO DETERMINE IF AN ITEM WILL NEED TO BE RELOCATED.

THE ENGINEER/ARCHITECT HAS MADE NO EXAMINATION TO DETERMINE WHETHER ANY HAZARDOUS OR TOXIC MATERIALS ARE PRESENT OR CONTAINED IN, UNDER, OR ON THE SUBJECT PROPERTY OR ITS WATERS, OR IF ANY HAZARDOUS OR TOXIC MATERIALS HAVE CONTAMINATED THIS OR OTHER PROPERTIES OR ITS WATERS IN ANY WAY WHATSOEVER. NO SUB-SURFACE EXAMINATION OF ANY TYPE HAS BEEN MADE BY THE ENGINEER/ARCHITECT, AND ACCORDINGLY, NO OPINION IS EXPRESSED OR INFERRED ON ALL SUCH MATTERS. FURTHER, NO OPINION IS RENDERED AS TO ANY VIOLATION OF ANY ENVIRONMENTAL LAWS OR REGULATIONS, EITHER FEDERAL, STATE, OR LOCAL RELATED TO THE INFORMATION SHOWN ON THIS PLAN AND THE ENGINEER/ARCHITECT IS IN NO WAY LIABLE FOR ANY VIOLATION OF SUCH ENVIRONMENTAL LAWS SHOULD SUCH EXIST.

REVISED 1/15/14 PER NCDOT COMMENTS

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road, burlington, n.c. 27215
p.o. box 1179, 336/226-5534
Firm's Engineering License No. F-0203

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE
MELVILLE TOWNSHIP - MEBANE, NORTH CAROLINA

NEW ROADWAY IMPROVEMENTS
MEBANE, NORTH CAROLINA

BOOK NO. 412A

DATE:	12/12/13
COMP FILE:	13097_planprofile.dwg
DRAWN BY:	MHW
CHECKED BY:	FKH

PLAN & PROFILE
STA. 60+00 TO STA. 72+00

JOB NO. 13097

SHEET NO. 8 OF: 40

SEE IMPACT DRAWINGS (SHEET 36) FOR ASSOCIATED STREAM WETLAND & BUFFER IMPACTS

THIS PLAN DOES NOT PURPORT TO SHOW ALL EXISTING UTILITIES, LINES, APPURTENANCES, ETC., AND THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES, PIPES, VALVES, ETC. AS SHOWN ARE IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR THE ENGINEER/ARCHITECT. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES, LINES, PIPES, ETC. BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT RESULT FROM THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, PIPES AND VALVES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER/ARCHITECT OF ANY CONFLICTS WITH EXISTING AND PROPOSED FACILITIES TO DETERMINE IF AN ITEM WILL NEED TO BE RELOCATED.

THE ENGINEER/ARCHITECT HAS MADE NO EXAMINATION TO DETERMINE WHETHER ANY HAZARDOUS OR TOXIC MATERIALS ARE PRESENT OR CONTAINED IN, UNDER, OR ON THE SUBJECT PROPERTY OR ITS WATERS, OR IF ANY HAZARDOUS OR TOXIC MATERIALS HAVE CONTAMINATED THIS OR OTHER PROPERTIES OR ITS WATERS IN ANY WAY WHATSOEVER. NO SUB-SURFACE EXAMINATION OF ANY TYPE HAS BEEN MADE BY THE ENGINEER/ARCHITECT, AND ACCORDINGLY, NO OPINION IS EXPRESSED OR INFERRED ON ALL SUCH MATTERS. FURTHER, NO OPINION IS RENDERED AS TO ANY VIOLATION OF ANY ENVIRONMENTAL LAWS OR REGULATIONS, EITHER FEDERAL, STATE, OR LOCAL RELATED TO THE INFORMATION SHOWN ON THIS PLAN AND THE ENGINEER/ARCHITECT IS IN NO WAY LIABLE FOR ANY VIOLATION OF SUCH ENVIRONMENTAL LAWS SHOULD SUCH EXIST.

ADJUST ENDWALLS IN FIELD TO FINISHED GRADES.

GUARDRAILS SHALL BE INSTALLED WITH GRAU-350 END TREATMENTS (TYPICAL.)

SEE SHEET 13 FOR STORM DRAINAGE PROFILES

ALL ENDWALLS TO BE IN ACCORDANCE WITH NCDOT STD. 838.80 MIN. DIMENSIONS

PLAN
SCALE: 1" = 40'

PROFILE
SCALE: 1" = 40' HOR.
1" = 4' VERT.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 039206 S. KYLE SMITH

[illegible]

REVISED 1/15/14 PER NCDOT COMMENTS

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road p.o. box 1179
burlington, n.c. 27215 336/226-5534
Firm's Engineering License No. F-0203

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE

MELVILLE TOWNSHIP - MEBANE, NORTH CAROLINA

BOOK NO. 412A

NEW ROADWAY IMPROVEMENTS

MEBANE, NORTH CAROLINA

DATE: 12/12/13
COMP FILE: 13097_planprofile.dwg
DRAWN BY: MHW
CHECKED BY: FKH

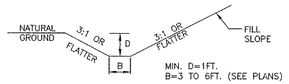
PLAN & PROFILE
STA. 72+00 TO STA. 84+00

JOB NO. 13097
SHEET NO. 9
OF: 40

THIS PLAN DOES NOT PURPORT TO SHOW ALL EXISTING UTILITIES, LINES, APPURTENANCES, ETC., AND THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES, PIPES, VALVES, ETC. AS SHOWN ARE IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR THE ENGINEER/ARCHITECT. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES, LINES, PIPES, ETC. BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT RESULT FROM THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, PIPES AND VALVES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER/ARCHITECT OF ANY CONFLICTS WITH EXISTING AND PROPOSED FACILITIES TO DETERMINE IF AN ITEM WILL NEED TO BE RELOCATED.

THE ENGINEER/ARCHITECT HAS MADE NO EXAMINATION TO DETERMINE WHETHER ANY HAZARDOUS OR TOXIC MATERIALS ARE PRESENT OR CONTAINED IN, UNDER, OR ON THE SUBJECT PROPERTY OR ITS WATERS, OR IF ANY HAZARDOUS OR TOXIC MATERIALS HAVE CONTAMINATED THIS OR OTHER PROPERTIES OR ITS WATERS IN ANY WAY WHATSOEVER. NO SUB-SURFACE EXAMINATION OF ANY TYPE HAS BEEN MADE BY THE ENGINEER/ARCHITECT, AND ACCORDINGLY, NO OPINION IS EXPRESSED OR INFERRED ON ALL SUCH MATTERS. FURTHER, NO OPINION IS RENDERED AS TO ANY VIOLATION OF ANY ENVIRONMENTAL LAWS OR REGULATIONS, EITHER FEDERAL, STATE, OR LOCAL RELATED TO THE INFORMATION SHOWN ON THIS PLAN AND THE ENGINEER/ARCHITECT IS IN NO WAY LIABLE FOR ANY VIOLATION OF SUCH ENVIRONMENTAL LAWS SHOULD SUCH EXIST.

SPECIAL LATERAL BASE DITCH
(NOT TO SCALE)



MIN. D=1FT.
B=3 TO 6FT. (SEE PLANS)

FROM STA. 86+54 TO 87+21 LT
FROM STA. 86+45 TO 87+50 RT

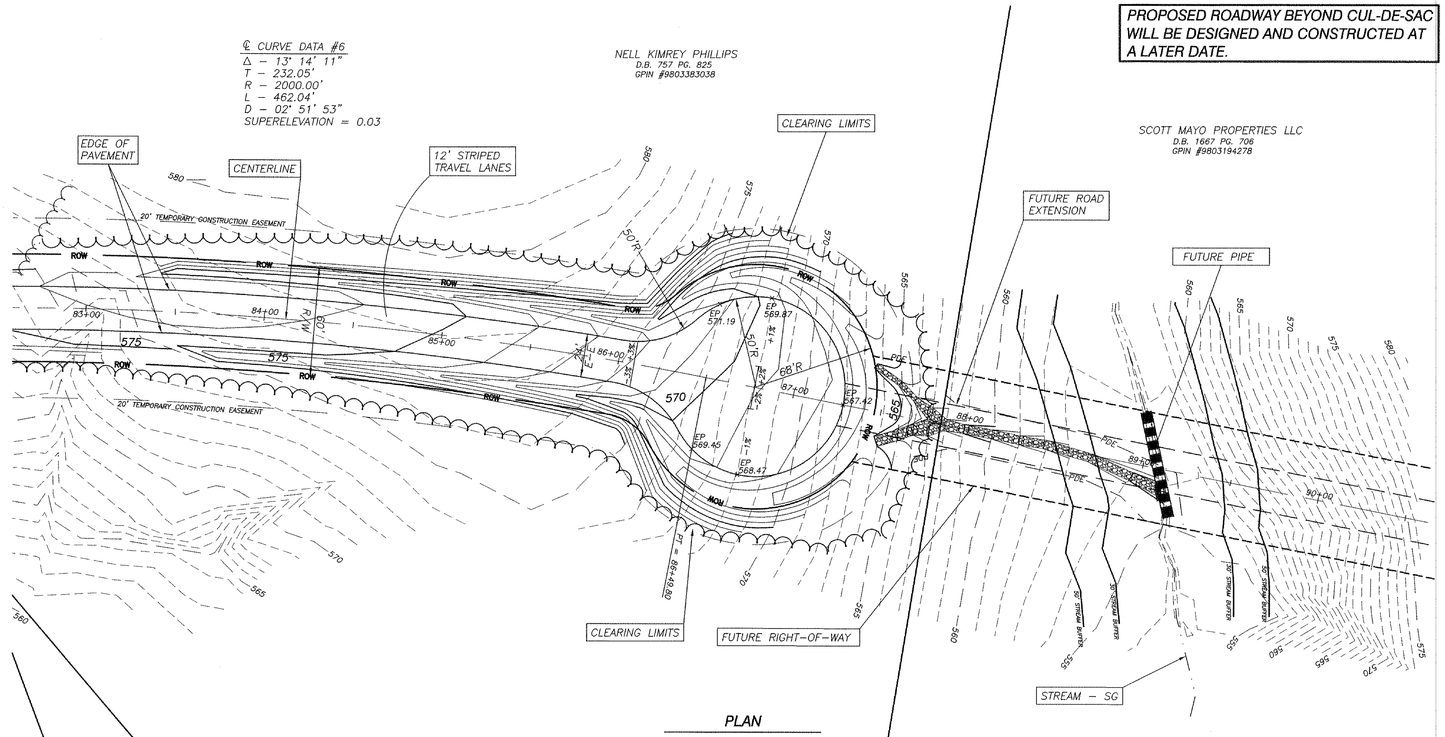
℄ CURVE DATA #6
Δ = 13° 14' 11"
T = 232.05'
R = 2000.00'
L = 462.04'
D = 02° 51' 53"
SUPERELEVATION = 0.03

NELL KIMREY PHILLIPS
D.B. 757 PG. 825
GPIN #9803383038

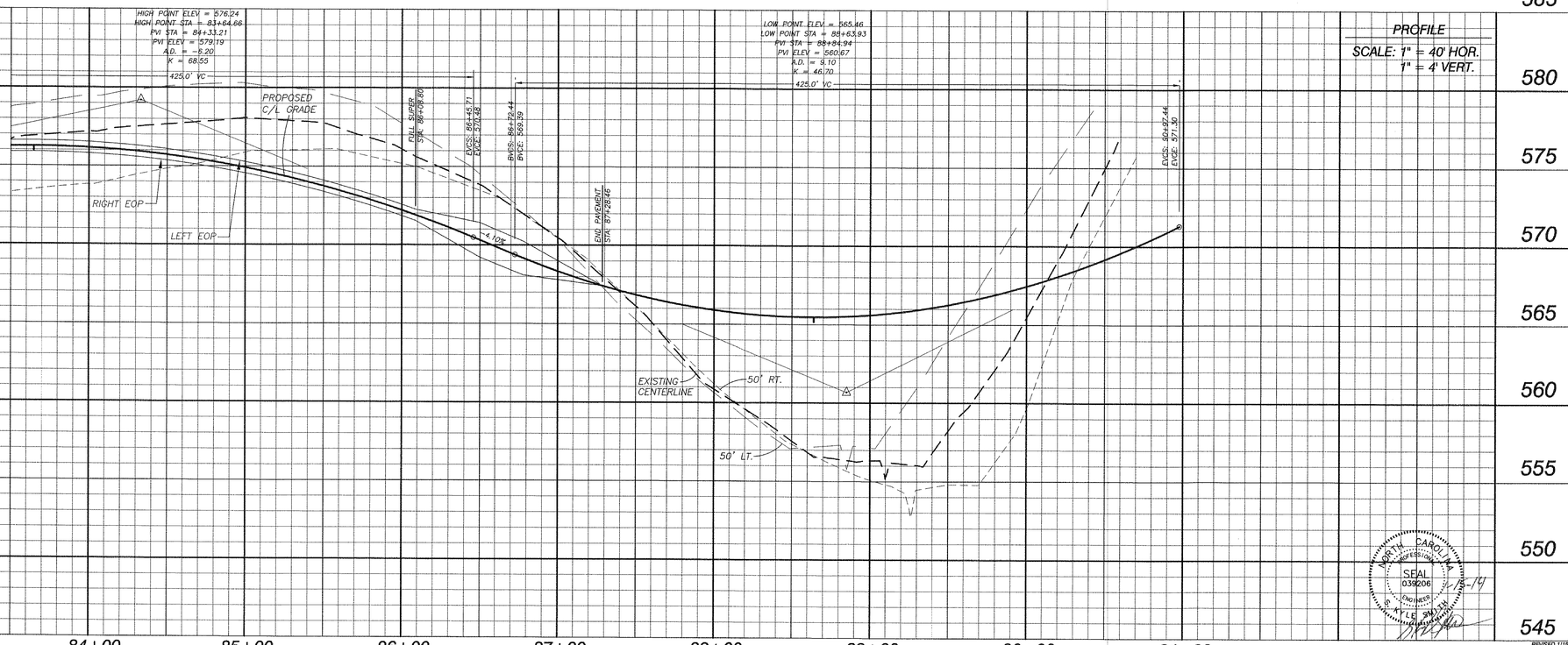
SCOTT MAYO PROPERTIES LLC
D.B. 1667 PG. 706
GPIN #9803194278

PROPOSED ROADWAY BEYOND CUL-DE-SAC WILL BE DESIGNED AND CONSTRUCTED AT A LATER DATE.

ALL ENDWALLS TO BE IN ACCORDANCE WITH NCDOT STD. 838.80 MIN. DIMENSIONS



PLAN
SCALE: 1" = 40'



PROFILE
SCALE: 1" = 40' HOR.
1" = 4' VERT.

NORTH CAROLINA PROFESSIONAL SEAL 039206 ENGINEER S. KYLE SMITH
1-15-14

REVISED 1/15/14 PER NCDOT COMMENTS

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road p.o. box 1179
burlington, n.c. 27215 336/226-5534
Firm's Engineering License No. F-0203

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE

MELVILLE TOWNSHIP - MEBANE, NORTH CAROLINA

BOOK NO. 412A

NEW ROADWAY IMPROVEMENTS

MEBANE, NORTH CAROLINA

DATE: 12/12/13
COMP FILE: 13097_planprofile.dwg
DRAWN BY: MHW
CHECKED BY: FKH

PLAN & PROFILE
STA. 84+00 TO STA. 87+84

JOB NO. 13097
SHEET NO. 10
OF. 40

THIS PLAN DOES NOT PURPORT TO SHOW ALL EXISTING UTILITIES, LINES, APPURTENANCES, ETC., AND THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES, PIPES, VALVES, ETC. AS SHOWN ARE IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR THE ENGINEER/ARCHITECT. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES, LINES, PIPES, ETC. BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT RESULT FROM THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, PIPES AND VALVES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER/ARCHITECT OF ANY CONFLICTS WITH EXISTING AND PROPOSED FACILITIES TO DETERMINE IF AN ITEM WILL NEED TO BE RELOCATED.

THE ENGINEER/ARCHITECT HAS MADE NO EXAMINATION TO DETERMINE WHETHER ANY HAZARDOUS OR TOXIC MATERIALS ARE PRESENT OR CONTAINED IN, UNDER, OR ON THE SUBJECT PROPERTY OR ITS WATERS, OR IF ANY HAZARDOUS OR TOXIC MATERIALS HAVE CONTAMINATED THIS OR OTHER PROPERTIES OR ITS WATERS IN ANY WAY WHATSOEVER. NO SUB-SURFACE EXAMINATION OF ANY TYPE HAS BEEN MADE BY THE ENGINEER/ARCHITECT, AND ACCORDINGLY, NO OPINION IS EXPRESSED OR INFERRED ON ALL SUCH MATTERS. FURTHER, NO OPINION IS RENDERED AS TO ANY VIOLATION OF ANY ENVIRONMENTAL LAWS OR REGULATIONS, EITHER FEDERAL, STATE, OR LOCAL RELATED TO THE INFORMATION SHOWN ON THIS PLAN AND THE ENGINEER/ARCHITECT IS IN NO WAY LIABLE FOR ANY VIOLATION OF SUCH ENVIRONMENTAL LAWS SHOULD SUCH EXIST.

MARTIN L. SHOFFNER
SHADRA S. SHOFFNER
D.B. 1423 PG. 548
GPIN #9804920166

TOMMY V. STRIGO
D.B. 1389 PG. 231
GPIN #9804928118

GLORIA A. VANSAVAGE
BERNARD M. VANSAVAGE
D.B. 2573 PG. 382
GPIN #9804921054

HOWARD P & VIRGINIA NEESE
D.B. 309 PG. 539
GPIN #9804913675

JACQUELINE L. ALBRIGHT
D.B. 2180 PG. 656
GPIN #9804916434

THOMAS CLINTON BRADLEY
D.B. 2597 PG. 327
GPIN #9804810638

HAWFIELDS PRESBYTERIAN CHURCH
D.B. 2597 PG. 330
GPIN #9804901755

STA. 1+33± TO STA. 2+83

STA. 2+83 TO STA. 4+53

STA. 4+53 TO STA. 6+04±

STA. 6+04± TO STA. 11+50±

(A) 6" B 25.0 B BASE COURSE
(B) 4" I 19.0 B INTERMEDIATE COURSE
(C) 3" SF 9.5 B SURFACE COURSE (TWO LIFTS)
(D) 1.5" SF 9.5 B SURFACE COURSE (OVERLAY) ON EXISTING PAVEMENT

TROLLINGWOOD-HAWFIELDS ROAD

RELOCATE MAILBOX 1'

RELOCATE MAILBOX 3'-6"

RELOCATE DRIVEWAY PIPE 3'-3"

RELOCATE DRIVEWAY PIPE 4'-6"

RELOCATE MAILBOXES ON BRICK WALL AND WIDEN MAILBOX TURNOUT 7'

PROP. ENDWALL NO. 3 (NCDOT STD. 838.80)

PROP. 8' OF CLASS III 42" RCP

RELOCATE DRIVEWAY PIPE 5'-2"

ADJUST WATER METER TO FINISHED GRADE

RELOCATE DRIVEWAY PIPE 5'-3"

RELOCATE MAILBOX 3'-6"

RELOCATE DRIVEWAY PIPE 4'-10"

RELOCATE MAILBOXES 4'-10"

150' STORAGE

100' BAY TAPER

300' TAPER

BEGIN TAPER STA. 4+56

END TAPER STA. 8+56

END TAPER STA. 11+56

APPROXIMATE LOCATION 12" ORANGE-ALAMANCE WATER LINE

BEGIN PAVEMENT WIDENING STA. 1+33

END TAPER STA. 1+33

150' TAPER

170' STORAGE

BEGIN TAPER STA. 2+83

POWER POLES TO BE RELOCATED

PROPOSED 24' OF 60" CLASS III RCP

PROP. ENDWALL NO. 1 (NCDOT STD. 838.80)

CLASS I RIP RAP ON BANKS ONLY

JUNCTION BOX NO. 2
SEE DETAIL SHEET 38

18" RCP TO BE REMOVED

TAPER LENGTH = 233.5'
WIDTH = 35.2'

18" RCP TO BE REMOVED

PROP. 148' OF CLASS IV 36" RCP

RELOCATE DRIVEWAY PIPE 6'-6"

END PAVEMENT WIDENING STA. 11+50

ALL ENDWALLS TO BE IN ACCORDANCE WITH NCDOT STD. 838.80 MIN. DIMENSIONS

ADJUST ENDWALLS IN FIELD TO FINISHED GRADES.

SEE SHEET 35 FOR TROLLINGWOOD-HAWFIELDS ROAD PAVEMENT MARKING PLAN

SEE SHEET 12 FOR STORM DRAINAGE PROFILE

PLAN
SCALE: 1" = 40'

SPECIAL LATERAL BASE DITCH
(NOT TO SCALE)

NATURAL GROUND, 3:1 OR FLATTER, D, B, 3:1 OR FLATTER, FILL SLOPE

MIN. D=1FT.
B=6FT. (SEE PLANS)

FROM STA. 2+95 TO 3+84 RT

HATCHING SHOWN TO DESIGNATE DIAGONAL YELLOW LINES REPRESENTS AREA ONLY. DIAGONAL YELLOW LINE PLACEMENT SHALL BE IN ACCORDANCE W/NCDOT STD. 1205.09.

DIRECTIONAL ARROWS SHOWN FOR PLAN REVIEW PURPOSES. SEE PAVEMENT MARKING PLAN FOR ACTUAL LOCATIONS.

SHADED AREA DENOTES PROPOSED WIDENING. SEE TYPICAL SECTIONS THIS SHEET.

ALL V-DITCHES SHALL BE PROVIDED WITH EXCELSIOR MATTING PER NCDOT STANDARDS

ALL WORK WITHIN TROLLINGWOOD HAWFIELDS ROAD RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH NCDOT STANDARD SPECIFICATIONS & DRAWINGS.

PROFILE
SCALE: 1" = 40' HOR.
1" = 4' VERT.

PROPOSED EDGE OF PAVEMENT

EXISTING CENTERLINE

C/L PROPOSED ROAD
STA. 5+52.32

JUNCTION BOX NO. 2
SEE DETAIL SHEET 38
STA. 4+60.71
TOP=619.10

INV. OUT=609.29
INV. IN=611.29
INV. IN=609.39

150'-36" CLASS IV RCP @ 1.77%

APPROX. LOCATION OF EXISTING 12" WATER MAIN

635 630 625 620 615 610 605

0+00 1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00 10+00 11+00 12+00

NORTH CAROLINA PROFESSIONAL SEAL 039206 ENGINEER KYLE SMITH

REVISED 1/15/14 PER NCDOT COMMENTS

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road p.o. box 1179
burlington, n.c. 27215 336/226-5534
Firm's Engineering License No. F-0203

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE

MELVILLE TOWNSHIP - MEBANE, NORTH CAROLINA

BOOK NO. 412A

NEW ROADWAY IMPROVEMENTS

MEBANE, NORTH CAROLINA

DATE: 12/12/13
COMP FILE: 13097_planprofile.dwg
DRAWN BY: MHW
CHECKED BY: FKH

PLAN & PROFILE
TROLLINGWOOD-HAWFIELDS
ROAD WIDENING

JOB NO. 13097

SHEET NO. 11 OF: 40

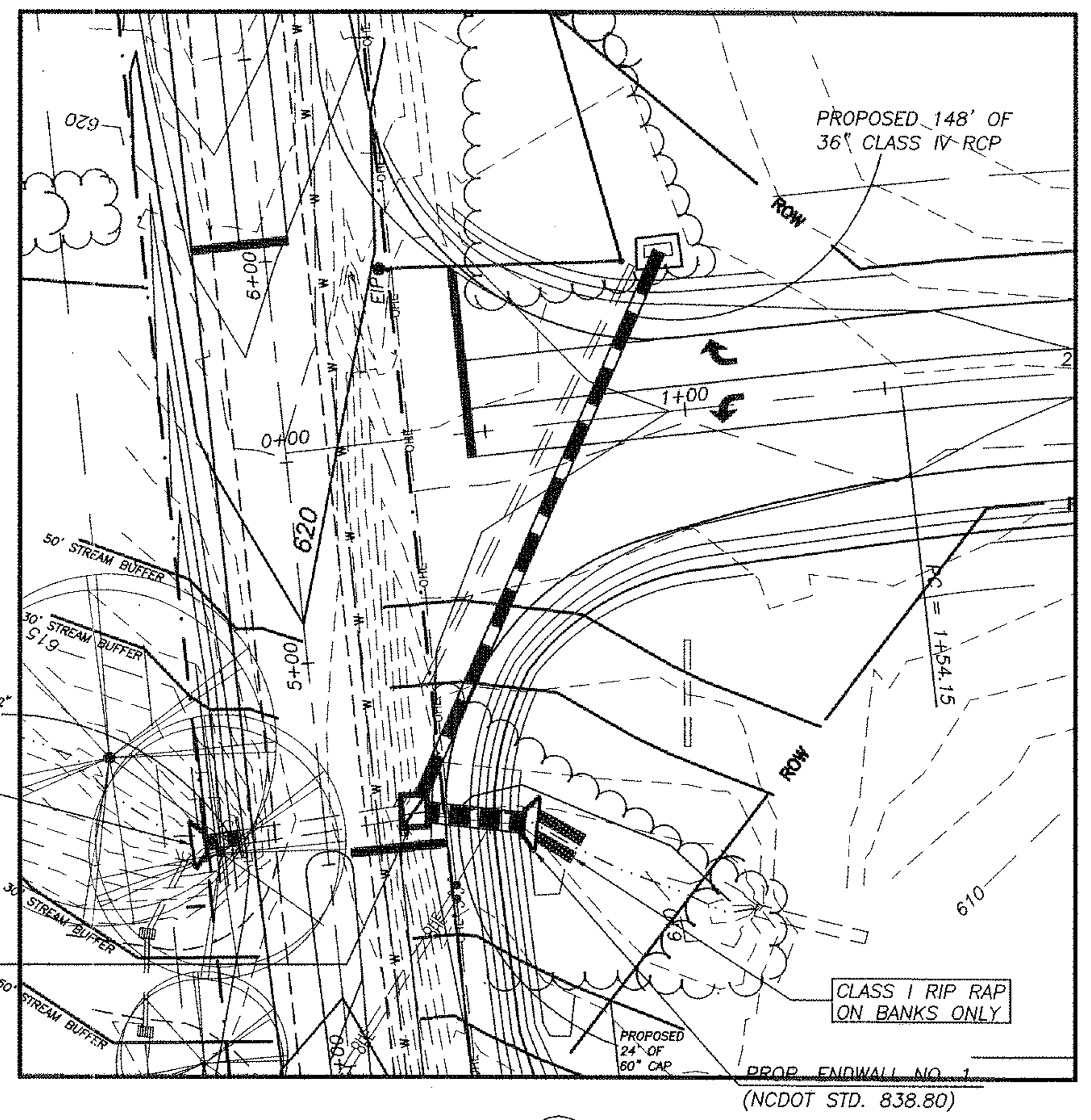
THIS PLAN DOES NOT PURPORT TO SHOW ALL EXISTING UTILITIES, LINES, APPURTENANCES, ETC., AND THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES, PIPES, VALVES, ETC. AS SHOWN ARE IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR THE ENGINEER/ARCHITECT. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES, LINES, PIPES, ETC. BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT RESULT FROM THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, PIPES AND VALVES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER/ARCHITECT OF ANY CONFLICTS WITH EXISTING AND PROPOSED FACILITIES TO DETERMINE IF AN ITEM WILL NEED TO BE RELOCATED.

THE ENGINEER/ARCHITECT HAS MADE NO EXAMINATION TO DETERMINE WHETHER ANY HAZARDOUS OR TOXIC MATERIALS ARE PRESENT OR CONTAINED IN, UNDER, OR ON THE SUBJECT PROPERTY OR ITS WATERS, OR IF ANY HAZARDOUS OR TOXIC MATERIALS HAVE CONTAMINATED THIS OR OTHER PROPERTIES OR ITS WATERS IN ANY WAY WHATSOEVER. NO SUB-SURFACE EXAMINATION OF ANY TYPE HAS BEEN MADE BY THE ENGINEER/ARCHITECT, AND ACCORDINGLY, NO OPINION IS EXPRESSED OR INFERRED ON ALL SUCH MATTERS. FURTHER, NO OPINION IS RENDERED AS TO ANY VIOLATION OF ANY ENVIRONMENTAL LAWS OR REGULATIONS, EITHER FEDERAL, STATE, OR LOCAL RELATED TO THE INFORMATION SHOWN ON THIS PLAN AND THE ENGINEER/ARCHITECT IS IN NO WAY LIABLE FOR ANY VIOLATION OF SUCH ENVIRONMENTAL LAWS SHOULD SUCH EXIST.

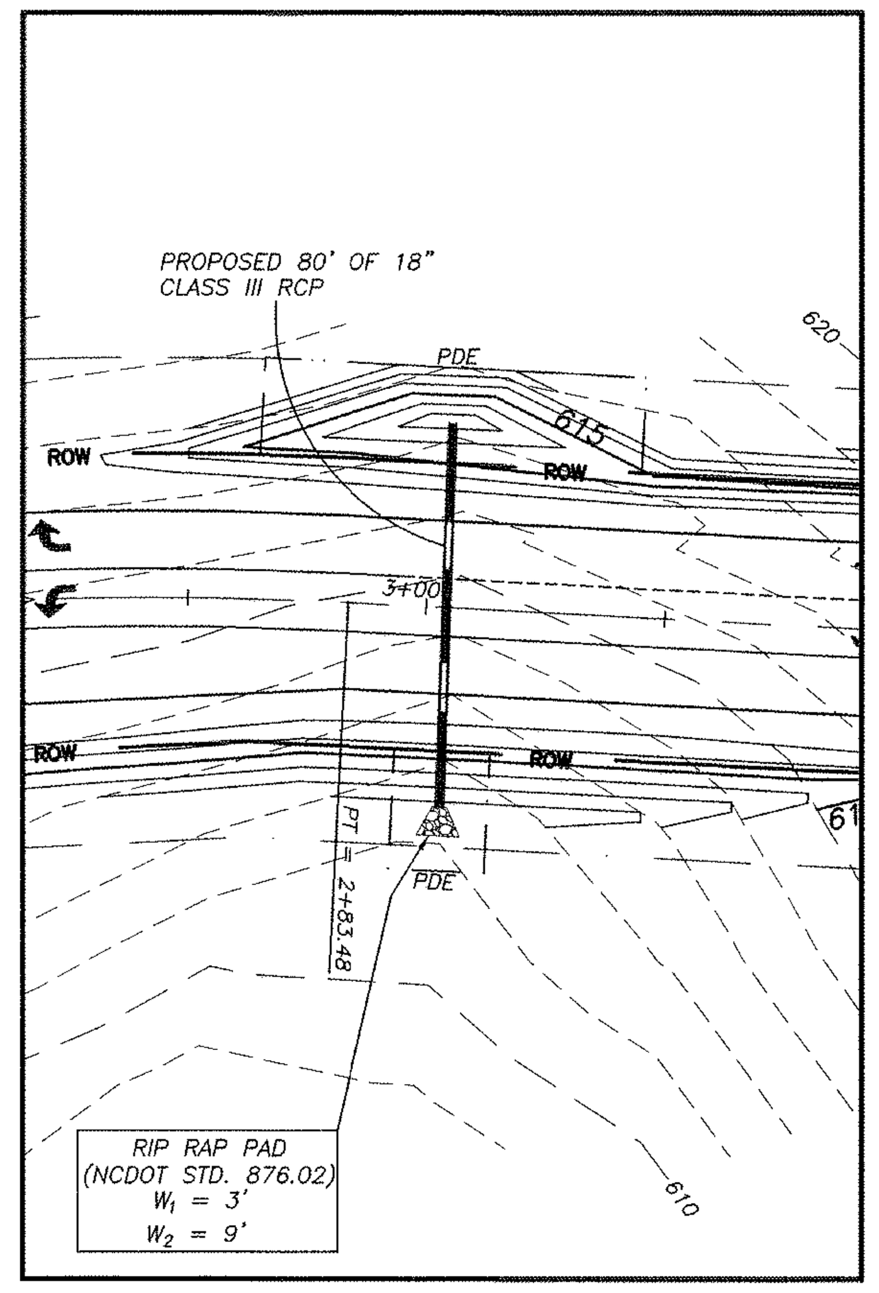
SEE IMPACT DRAWINGS (SHEET 38) FOR ASSOCIATED STREAM WETLAND & BUFFER IMPACTS

SEE PLAN PROFILE SHEETS (SHEET 3-11) FOR ASSOCIATED PERMANENT DRAINAGE EASEMENT INFORMATION

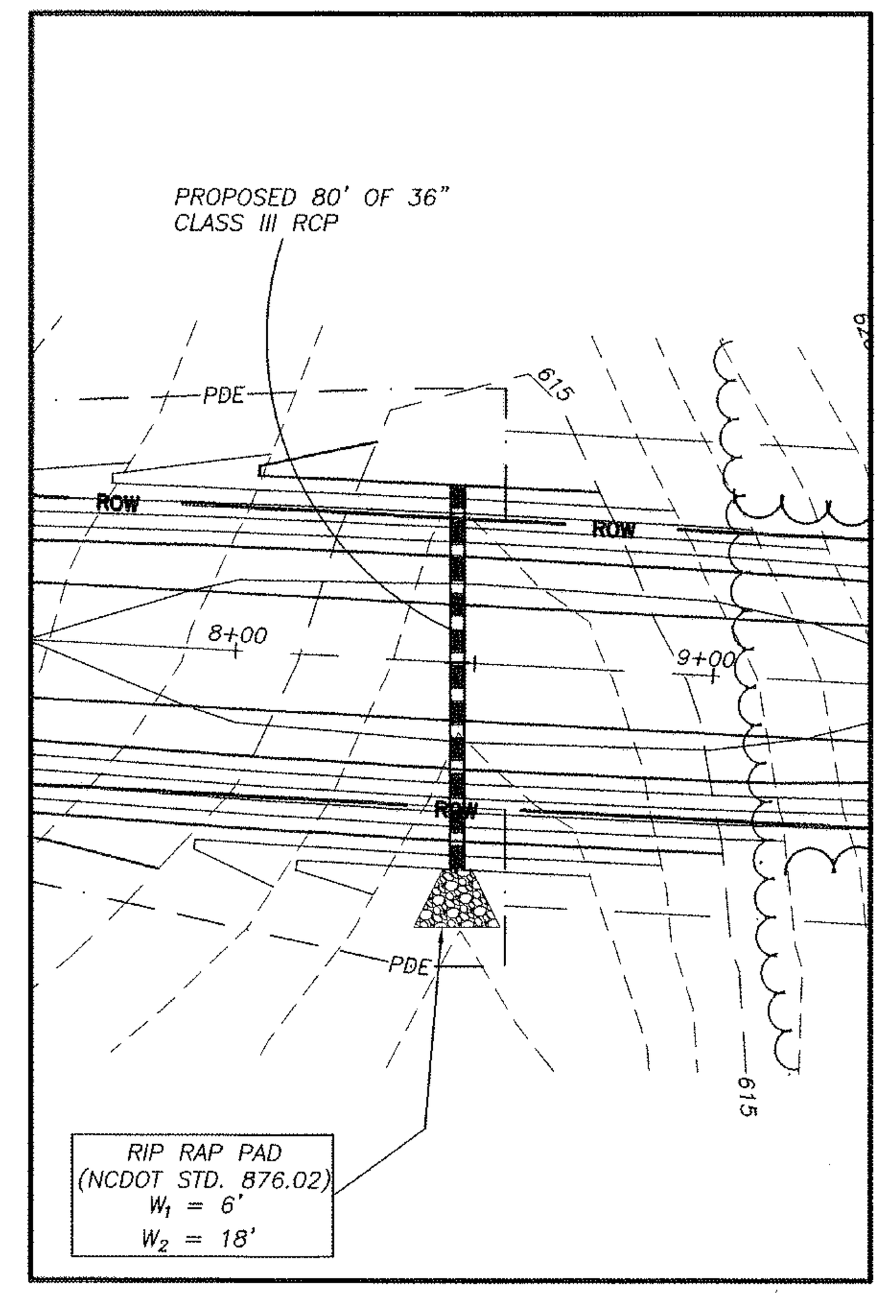
ADJUST ENDWALLS IN FIELD TO FINISHED GRADES.



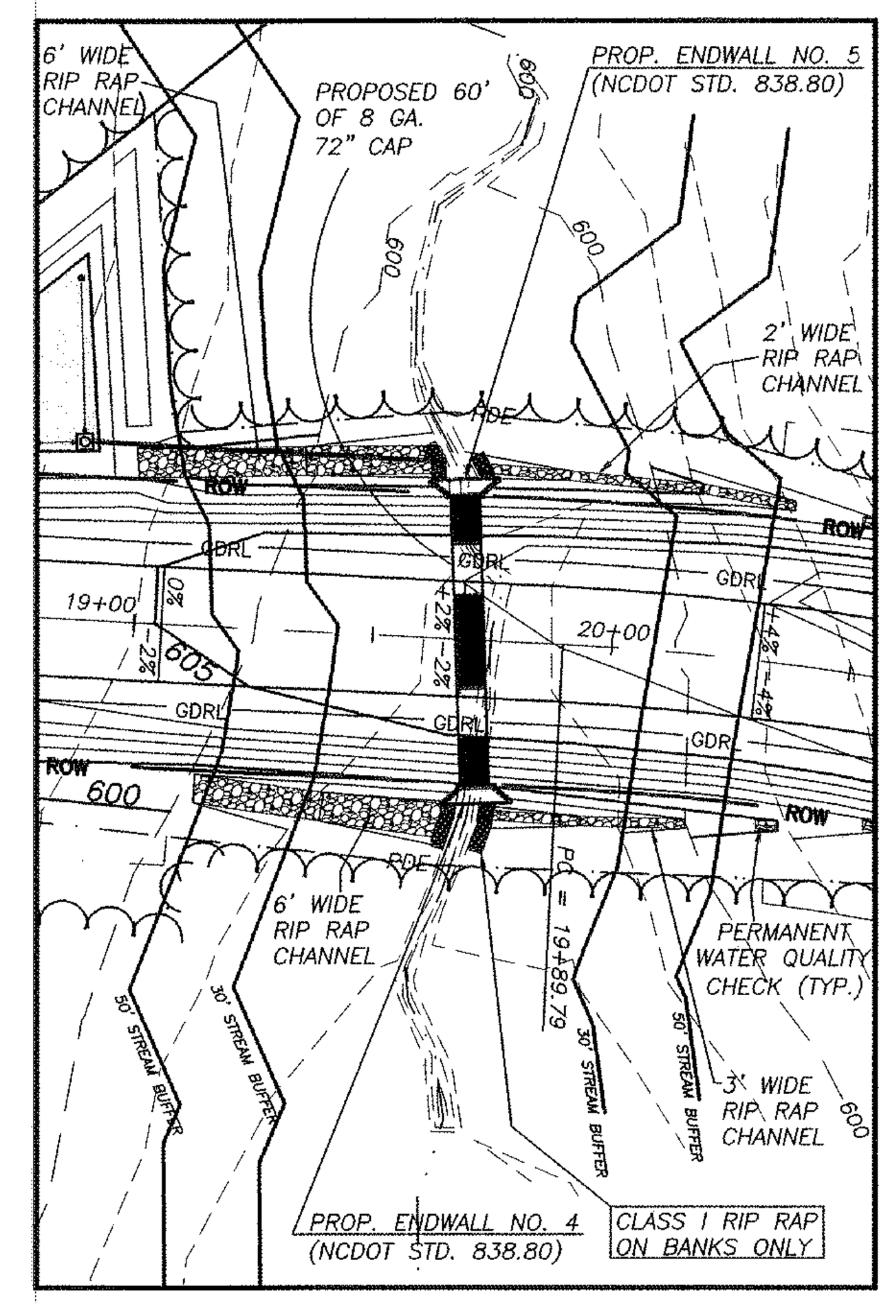
STREAM CROSSING: (SA) + STA. 0+75



STA. 3+04.21



STA. 8+46.36



STREAM CROSSING: (SB)
STA. 19+70.35

PLAN
SCALE: 1" = 40'

Storm Sewer Computations

Structure From	Structure To	Pipe Length (ft.)	Drainage Area "A" Incr. (Ac.)	Drainage Area "A" Total (Ac.)	Runoff Coeff. "C"	"A" x "C" Incr.	"A" x "C" Total	Time of Conc. Tc (min.)	Design Storm (Yr.)	Rainfall Intensity "I" (in/hr)	Total Runoff (cfs)	Pipe Diameter (in.)	Mannings "n" Value	Full Capacity (cfs)	Velocity Full Flow (fps)	Invert Elevations Lower End	Invert Elevations Upper End	Slope of Pipe (%)	Ground/Rim Elevations Lower End	Ground/Rim Elevations Upper End
PIPE END	JB2	148	10.91	10.91	0.35	3.82	3.82	10	25	6.2	23.82	36	0.012	88.74	4.90	611.33	613.95	1.77	618.81	618.0
EW3	JB2	48.75	47.3	47.3	0.4	18.92	18.92	10	25	6.2	118.0	42	0.012	89.99	12.27	609.39	609.78	0.79	618.81	618.81
JB2	EW1	24	0	58.21	0	0	22.74	10	25	6	137.0	60	0.012	198.9	6.98	609.15	609.29	0.58	617.0	618.81

Culvert Data — Station -L- 3+04.21, 18" RCP, 1.5 DA (ac)

Freq (yr)	Q (cfs)	TW (ft)	HW (ft)	HW/D	V_0 (fps)
10	5.94	1.2225	1.45	0.97	3.85
25	6.55	1.245833	1.56	1.04	4.17
100	7.27	1.274167	1.69	1.12	4.54
$>100_{OT}$	17.68	1.473333	4.98	3.32	10.04

Culvert Data — Station -L- 8+46.36, 36" RCP, 11.38 DA (ac)

Freq (yr)	Q (cfs)	TW (ft)	HW (ft)	HW/D	V_0 (fps)
10	19.04	2.204167	2.01	0.67	3.42
25	25.7	2.320833	2.43	0.81	4.38
100	40.94	2.545	3.36	1.12	6.4
$>100_{OT}$	83.88	2.904167	7.58	2.53	11.98

Culvert Data — Station -L- 19+70.35, 72" CAP, 60.43 DA (ac)

Freq (yr)	Q (cfs)	TW (ft)	HW (ft)	HW/D	V_0 (fps)
10	105	4.243	4.08	0.72	5.19
25	141.75	4.482	4.96	0.88	6.64
100	225.75	4.928	6.97	1.23	9.71
$>100_{OT}$	307.79	5.243	9.7	1.71	12.66

PROFILE
SCALE: 1" = 40' HOR.
1" = 4' VERT.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 039206 S. KYLE SMITH 1-15-14

REVISED 1/15/14 PER NCDOT COMMENTS

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road p.o. box 1179
burlington, n.c. 27215 336/226-5534
Firm's Engineering License No. F-0203

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE

MELVILLE TOWNSHIP - MEBANE, NORTH CAROLINA

NEW ROADWAY IMPROVEMENTS

MEBANE, NORTH CAROLINA

BOOK NO. 412A

DATE: 12/12/13
COMP FILE: 13097_planprofile.dwg
DRAWN BY: WDF
CHECKED BY: SKS

STORM DRAINAGE PROFILES

JOB NO. 13097
SHEET NO. 12
OF: 40

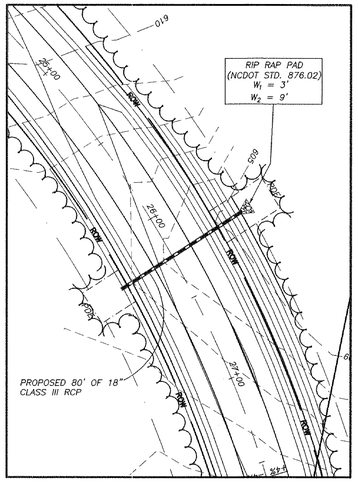
THIS PLAN DOES NOT PURPORT TO SHOW ALL EXISTING UTILITIES, LINES, APPURTENANCES, ETC., AND THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES, PIPES, VALVES, ETC. AS SHOWN ARE IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR THE ENGINEER/ARCHITECT. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES, LINES, PIPES, ETC. BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT RESULT FROM THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, PIPES AND VALVES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER/ARCHITECT OF ANY CONFLICTS WITH EXISTING AND PROPOSED FACILITIES TO DETERMINE IF AN ITEM WILL NEED TO BE RELOCATED.

THE ENGINEER/ARCHITECT HAS MADE NO EXAMINATION TO DETERMINE WHETHER ANY HAZARDOUS OR TOXIC MATERIALS ARE PRESENT OR CONTAINED IN, UNDER, OR ON THE SUBJECT PROPERTY OR ITS WATERS, OR IF ANY HAZARDOUS OR TOXIC MATERIALS HAVE CONTAMINATED THIS OR OTHER PROPERTIES OR ITS WATERS IN ANY WAY WHATSOEVER. NO SUB-SURFACE EXAMINATION OF ANY TYPE HAS BEEN MADE BY THE ENGINEER/ARCHITECT, AND ACCORDINGLY, NO OPINION IS EXPRESSED OR INFERRED ON ALL SUCH MATTERS. FURTHER, NO OPINION IS RENDERED AS TO ANY VIOLATION OF ANY ENVIRONMENTAL LAWS OR REGULATIONS, EITHER FEDERAL, STATE, OR LOCAL RELATED TO THE INFORMATION SHOWN ON THIS PLAN AND THE ENGINEER/ARCHITECT IS IN NO WAY LIABLE FOR ANY VIOLATION OF SUCH ENVIRONMENTAL LAWS SHOULD SUCH EXIST.

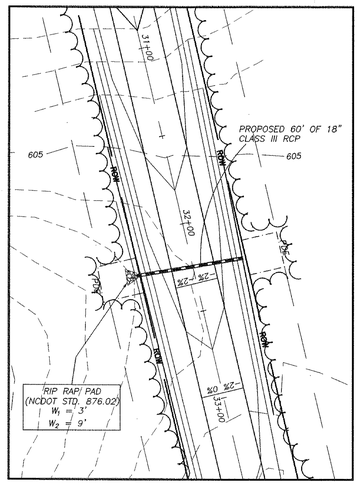
SEE IMPACT DRAWINGS (SHEET 38) FOR ASSOCIATED STREAM WETLAND & BUFFER IMPACTS

SEE PLAN PROFILE SHEETS (SHEET 3-11) FOR ASSOCIATED PERMANENT DRAINAGE EASEMENT INFORMATION

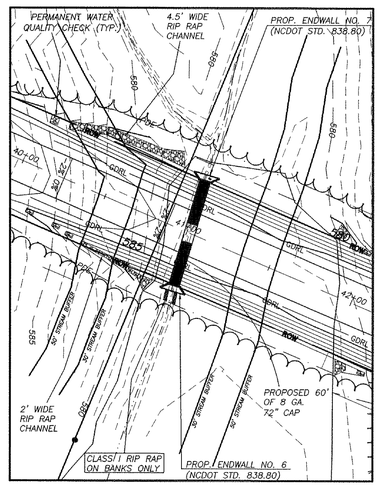
ADJUST ENDWALLS IN FIELD TO FINISHED GRADES.



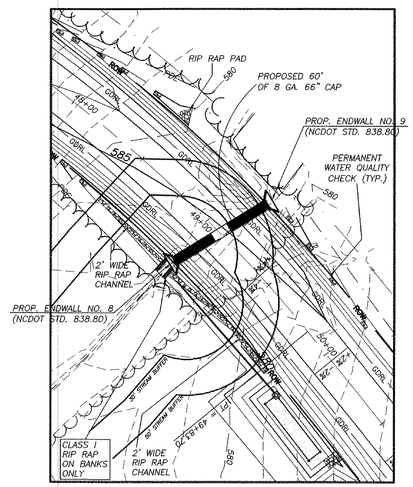
STA. 26+24.32



STA. 32+24.52



STREAM CROSSING : (SC)
STA. 41+01.69

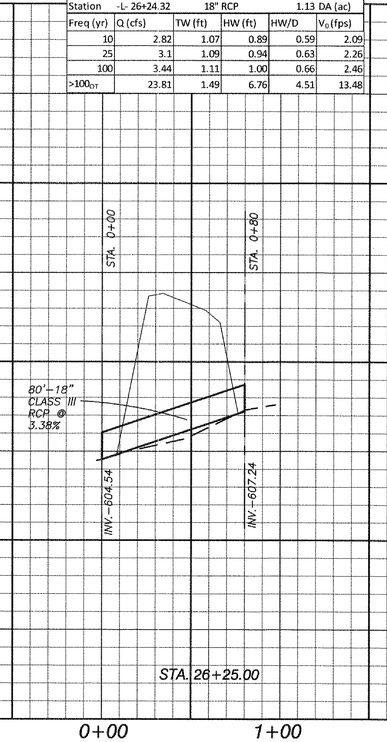


STREAM CROSSING : (SH)
STA. 49+10.11

PLAN
SCALE: 1" = 40'

Culvert Data

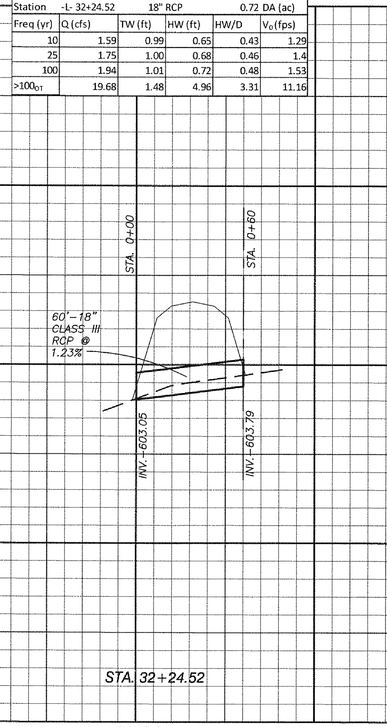
Station	-L- 26+24.32	18" RCP			1.13 DA (ac)
Freq (yr)	Q (cfs)	TW (ft)	HW (ft)	HW/D	V_o (fps)
10	2.82	1.07	0.89	0.59	2.09
25	3.1	1.09	0.94	0.63	2.26
100	3.44	1.11	1.00	0.66	2.46
>100$_{DT}$	23.81	1.49	6.76	4.51	13.48



STA. 26+25.00

Culvert Data

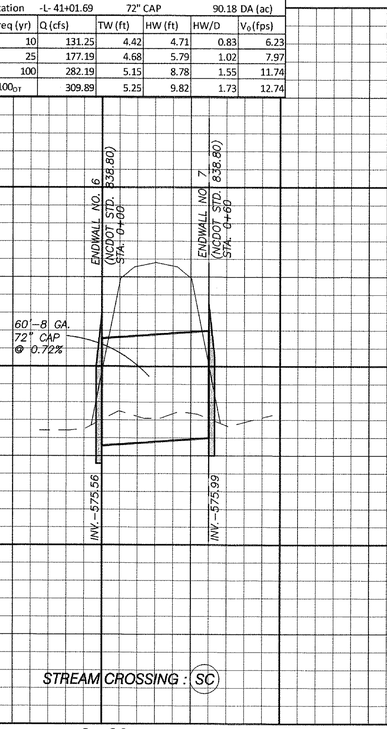
Station	-L- 32+24.52	18" RCP			0.72 DA (ac)
Freq (yr)	Q (cfs)	TW (ft)	HW (ft)	HW/D	V_o (fps)
10	1.59	0.99	0.65	0.43	1.29
25	1.75	1.00	0.68	0.46	1.4
100	1.94	1.01	0.72	0.48	1.53
>100$_{DT}$	19.68	1.48	4.96	3.31	11.16



STA. 32+24.52

Culvert Data

Station	-L- 41+01.69	72" CAP			90.18 DA (ac)
Freq (yr)	Q (cfs)	TW (ft)	HW (ft)	HW/D	V_o (fps)
10	131.25	4.42	4.71	0.83	6.23
25	177.19	4.68	5.79	1.02	7.97
100	282.19	5.15	8.78	1.55	11.74
>100$_{DT}$	309.89	5.25	9.82	1.73	12.74

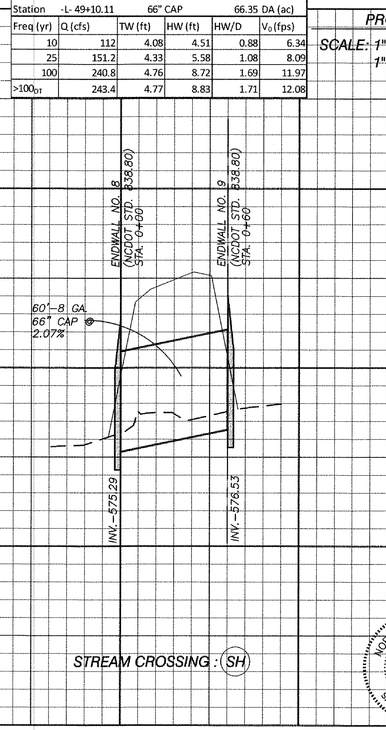


STREAM CROSSING : (SC)

Culvert Data

Station	-L- 49+10.11	66" CAP			66.35 DA (ac)
Freq (yr)	Q (cfs)	TW (ft)	HW (ft)	HW/D	V_o (fps)
10	112	4.08	4.51	0.88	6.34
25	151.2	4.33	5.58	1.08	8.09
100	240.8	4.76	8.72	1.69	11.97
>100$_{DT}$	243.4	4.77	8.83	1.71	12.08

PROFILE
SCALE: 1" = 40' HOR.
1" = 4' VERT.



STREAM CROSSING : (SH)

0+00 1+00 0+00 1+00 0+00 1+00 0+00 1+00

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 039206 KYLE S. KING

REVISED 11/15/14 PER NCDOT COMMENTS

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road p.o. box 1179
burlington, n.c. 27215 336/226-5534
Firm's Engineering License No. F-0203

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE

MELVILLE TOWNSHIP - MEBANE, NORTH CAROLINA

BOOK NO. 412A

DATE: 12/12/13
COMP. FILE: 13097_planprofile.dwg
DRAWN BY: WDF
CHECKED BY: SKS

NEW ROADWAY IMPROVEMENTS

MEBANE, NORTH CAROLINA

STORM DRAINAGE PROFILES

JOB NO. 13097
SHEET NO. 13
OF: 40

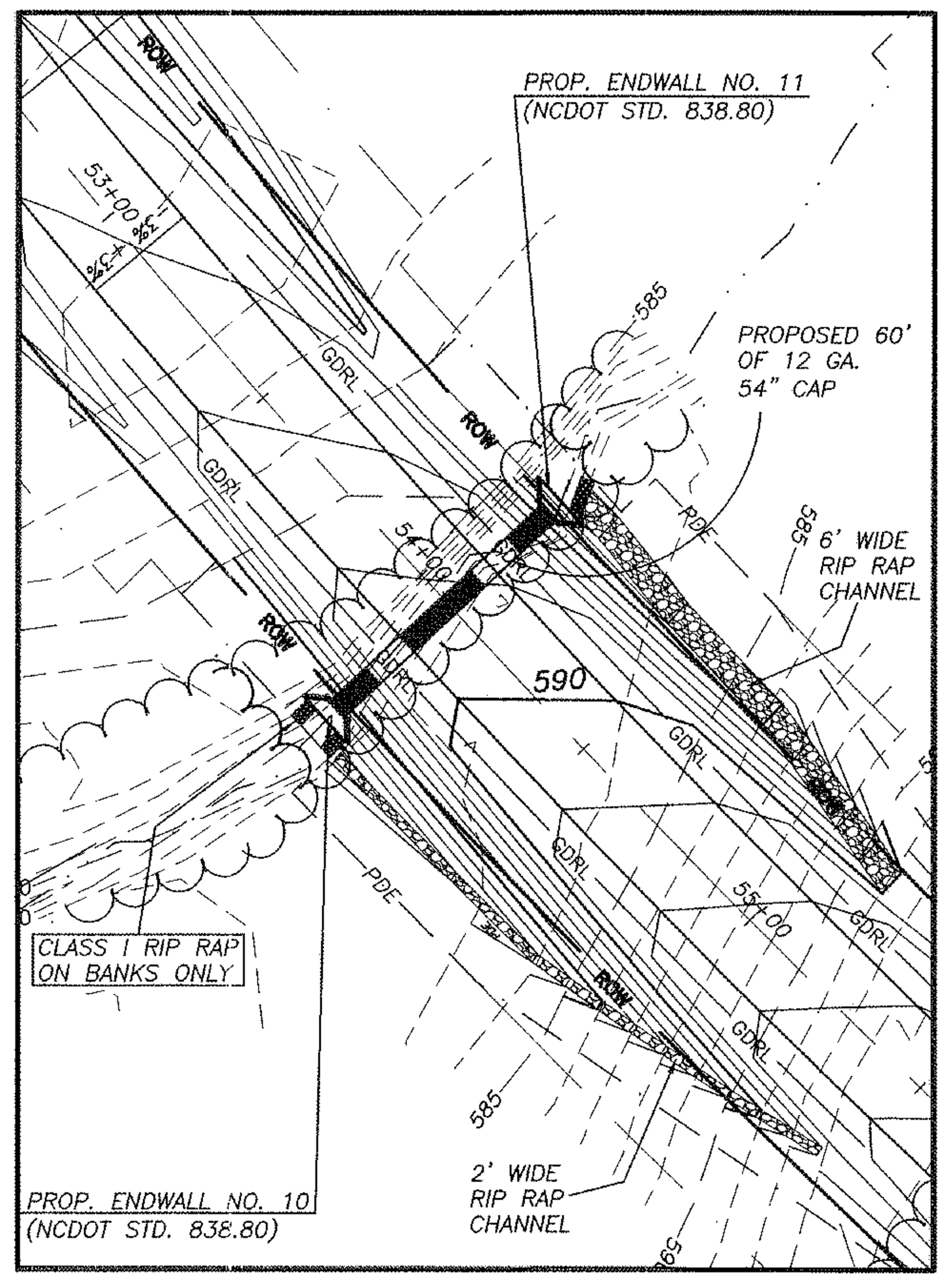
THIS PLAN DOES NOT PURPORT TO SHOW ALL EXISTING UTILITIES, LINES, APPURTENANCES, ETC., AND THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES, PIPES, VALVES, ETC. AS SHOWN ARE IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR THE ENGINEER/ARCHITECT. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES, LINES, PIPES, ETC. BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT RESULT FROM THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, PIPES AND VALVES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER/ARCHITECT OF ANY CONFLICTS WITH EXISTING AND PROPOSED FACILITIES TO DETERMINE IF AN ITEM WILL NEED TO BE RELOCATED.

THE ENGINEER/ARCHITECT HAS MADE NO EXAMINATION TO DETERMINE WHETHER ANY HAZARDOUS OR TOXIC MATERIALS ARE PRESENT OR CONTAINED IN, UNDER, OR ON THE SUBJECT PROPERTY OR ITS WATERS, OR IF ANY HAZARDOUS OR TOXIC MATERIALS HAVE CONTAMINATED THIS OR OTHER PROPERTIES OR ITS WATERS IN ANY WAY WHATSOEVER. NO SUB-SURFACE EXAMINATION OF ANY TYPE HAS BEEN MADE BY THE ENGINEER/ARCHITECT, AND ACCORDINGLY, NO OPINION IS EXPRESSED OR INFERRED ON ALL SUCH MATTERS. FURTHER, NO OPINION IS RENDERED AS TO ANY VIOLATION OF ANY ENVIRONMENTAL LAWS OR REGULATIONS, EITHER FEDERAL, STATE, OR LOCAL RELATED TO THE INFORMATION SHOWN ON THIS PLAN AND THE ENGINEER/ARCHITECT IS IN NO WAY LIABLE FOR ANY VIOLATION OF SUCH ENVIRONMENTAL LAWS SHOULD SUCH EXIST.

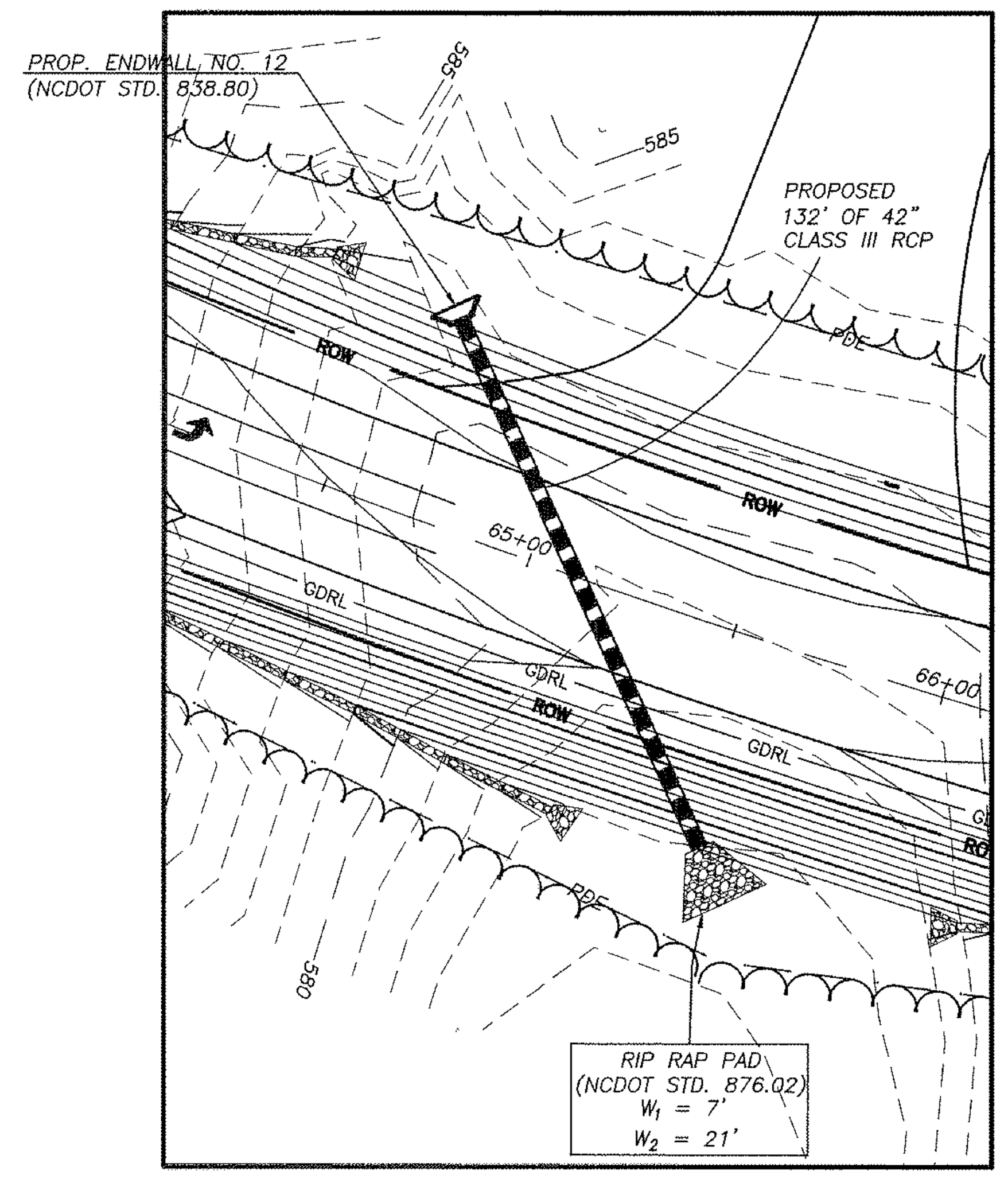
SEE IMPACT DRAWINGS (SHEET 38) FOR ASSOCIATED STREAM WETLAND & BUFFER IMPACTS

SEE PLAN PROFILE SHEETS (SHEET 3-11) FOR ASSOCIATED PERMANENT DRAINAGE EASEMENT INFORMATION

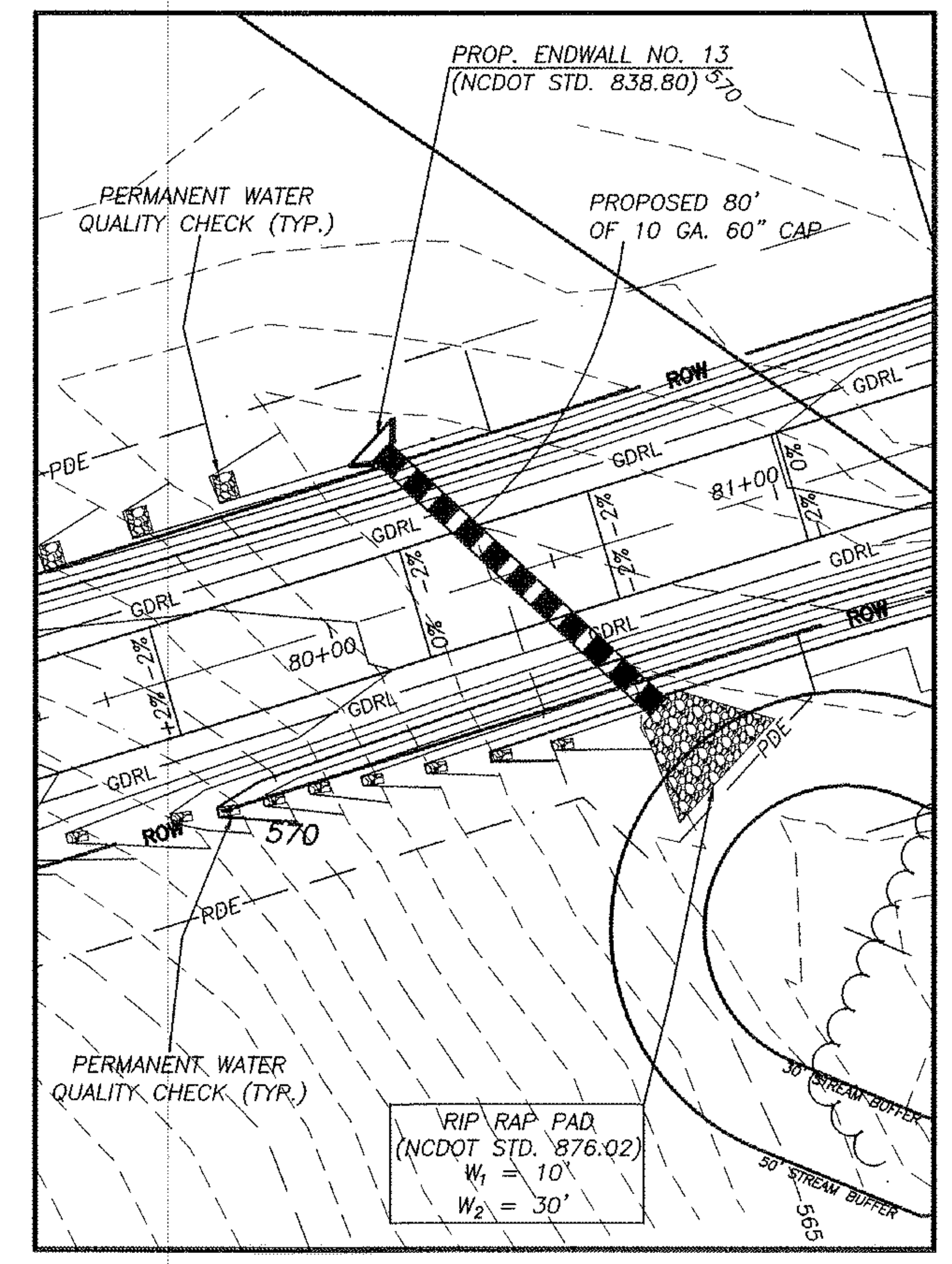
ADJUST ENDWALLS IN FIELD TO FINISHED GRADES.



STREAM CROSSING : (SK)
STA. 54+08.52



STA. 65+11.95



STREAM CROSSING : (SJ)
STA. 80+41.16

PLAN
SCALE: 1" = 40'

PROFILE
SCALE: 1" = 40' HOR.
1" = 4' VERT.

Culvert Data

Station	-L- 54+08.52	54" CAP		28.94 DA (ac)	
Freq (yr)	Q (cfs)	TW (ft)	HW (ft)	HW/D	V_0 (fps)
10	53.2	3.15	3.20	0.78	4.88
25	71.82	3.33	3.91	0.95	6.24
100	114.38	3.67	5.70	1.39	9.16
$>100_{OT}$	175.97	3.96	9.75	2.37	13.44

Culvert Data

Station	-L- 65+11.95	42" RCP		13.92 DA (ac)	
Freq (yr)	Q (cfs)	TW (ft)	HW (ft)	HW/D	V_0 (fps)
10	28	2.39	2.53	0.83	4.55
25	37.8	2.53	3.12	1.02	5.82
100	60.2	2.78	4.68	1.53	8.58
$>100_{OT}$	92.68	2.98	8.34	2.73	12.71

Culvert Data

Station	-L- 80+41.16	60" CAP		41.7 DA (ac)	
Freq (yr)	Q (cfs)	TW (ft)	HW (ft)	HW/D	V_0 (fps)
10	77	3.60	3.77	0.81	5.48
25	103.95	3.81	4.63	1	7.01
100	165.55	4.19	6.89	1.49	10.32
$>100_{OT}$	190.98	4.31	8.16	1.76	11.69

REVISED 1/15/14 PER NCDOT COMMENTS

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road p.o. box 1179
burlington, n.c. 27215 336/226-5534
Firm's Engineering License No. F-0203

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE

MELVILLE TOWNSHIP - MEBANE, NORTH CAROLINA

BOOK NO. 412A

NEW ROADWAY IMPROVEMENTS

MEBANE, NORTH CAROLINA

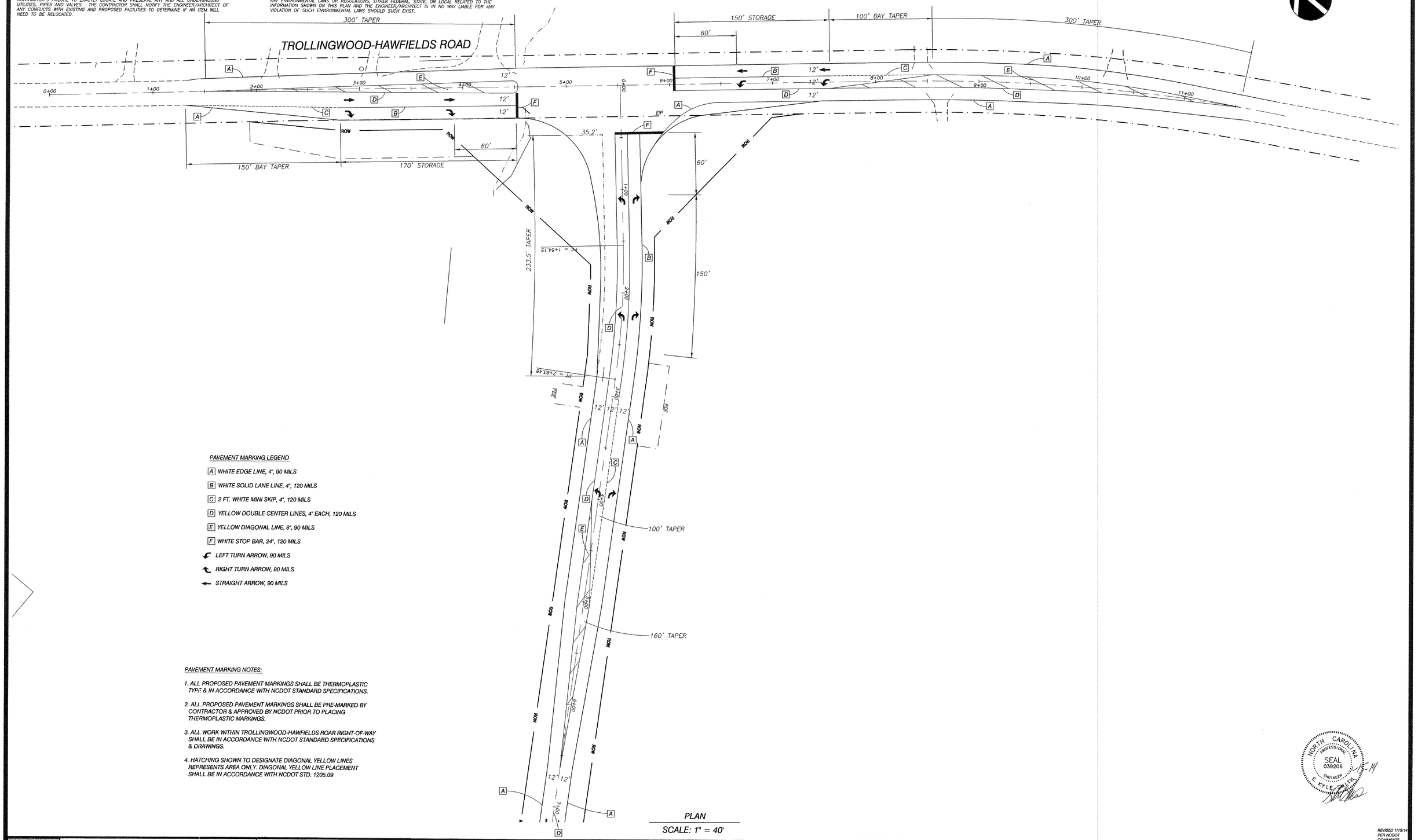
DATE: 12/12/13
COMP FILE: 13097_planprofile.dwg
DRAWN BY: WDF
CHECKED BY: SKS

STORM DRAINAGE PROFILES

JOB NO. 13097
SHEET NO. 14
OF: 40

THIS PLAN DOES NOT PURPORT TO SHOW ALL EXISTING UTILITIES, LINES, APPURTENANCES, ETC., AND THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES, PIPES, VALVES, ETC. AS SHOWN ARE IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR THE ENGINEER/ARCHITECT. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES, LINES, PIPES, ETC. BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT RESULT FROM THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, PIPES AND VALVES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER/ARCHITECT OF ANY CONFLICTS WITH EXISTING AND PROPOSED FACILITIES TO DETERMINE IF AN ITEM WILL NEED TO BE RELOCATED.

THE ENGINEER/ARCHITECT HAS MADE NO EXAMINATION TO DETERMINE WHETHER ANY HAZARDOUS OR TOXIC MATERIALS ARE PRESENT OR CONTAINED IN, UNDER, OR ON THE SUBJECT PROPERTY OR ITS WATERS, OR IF ANY HAZARDOUS OR TOXIC MATERIALS HAVE CONTAMINATED THIS OR OTHER PROPERTIES OR ITS WATERS IN ANY WAY WHATSOEVER. NO SUB-SURFACE EXAMINATION OF ANY TYPE HAS BEEN MADE BY THE ENGINEER/ARCHITECT, AND ACCORDINGLY, NO OPINION IS EXPRESSED OR INFERRED ON ALL SUCH MATTERS. FURTHER, NO OPINION IS RENDERED AS TO ANY VIOLATION OF ANY ENVIRONMENTAL LAWS OR REGULATIONS, EITHER FEDERAL, STATE, OR LOCAL RELATED TO THE INFORMATION SHOWN ON THIS PLAN AND THE ENGINEER/ARCHITECT IS IN NO WAY LIABLE FOR ANY VIOLATION OF SUCH ENVIRONMENTAL LAWS SHOULD SUCH EXIST.



PLAN

SCALE: 1" = 40'

PAVEMENT MARKING LEGEND

- A WHITE EDGE LINE, 4", 90 MILS
- B WHITE SOLID LANE LINE, 4", 120 MILS
- C 2 FT. WHITE MINI SKIP, 4", 120 MILS
- D YELLOW DOUBLE CENTER LINES, 4" EACH, 120 MILS
- E YELLOW DIAGONAL LINE, 8", 90 MILS
- F WHITE STOP BAR, 24", 120 MILS
- LEFT TURN ARROW, 90 MILS
- RIGHT TURN ARROW, 90 MILS
- STRAIGHT ARROW, 90 MILS

PAVEMENT MARKING NOTES:

1. ALL PROPOSED PAVEMENT MARKINGS SHALL BE THERMOPLASTIC TYPE & IN ACCORDANCE WITH NCDOT STANDARD SPECIFICATIONS.
2. ALL PROPOSED PAVEMENT MARKINGS SHALL BE PRE-MARKED BY CONTRACTOR & APPROVED BY NCDOT PRIOR TO PLACING THERMOPLASTIC MARKINGS.
3. ALL WORK WITHIN TROLLINGWOOD-HAWFIELDS ROAR RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH NCDOT STANDARD SPECIFICATIONS & DRAWINGS.
4. HATCHING SHOWN TO DESIGNATE DIAGONAL YELLOW LINES REPRESENTS AREA ONLY. DIAGONAL YELLOW LINE PLACEMENT SHALL BE IN ACCORDANCE WITH NCDOT STD. 1205.09

NORTH CAROLINA PROFESSIONAL SEAL 039206 ENGINEER S. KYLE SMITH

REVISED 1/15/14 PER NCDOT COMMENTS

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road p.o. box 1179
burlington, n.c. 27215 336/226-5534
Firm's Engineering License No. F-0203

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE

MELVILLE TOWNSHIP - MEBANE, NORTH CAROLINA

BOOK NO. 412A

NEW ROADWAY IMPROVEMENTS

MEBANE, NORTH CAROLINA

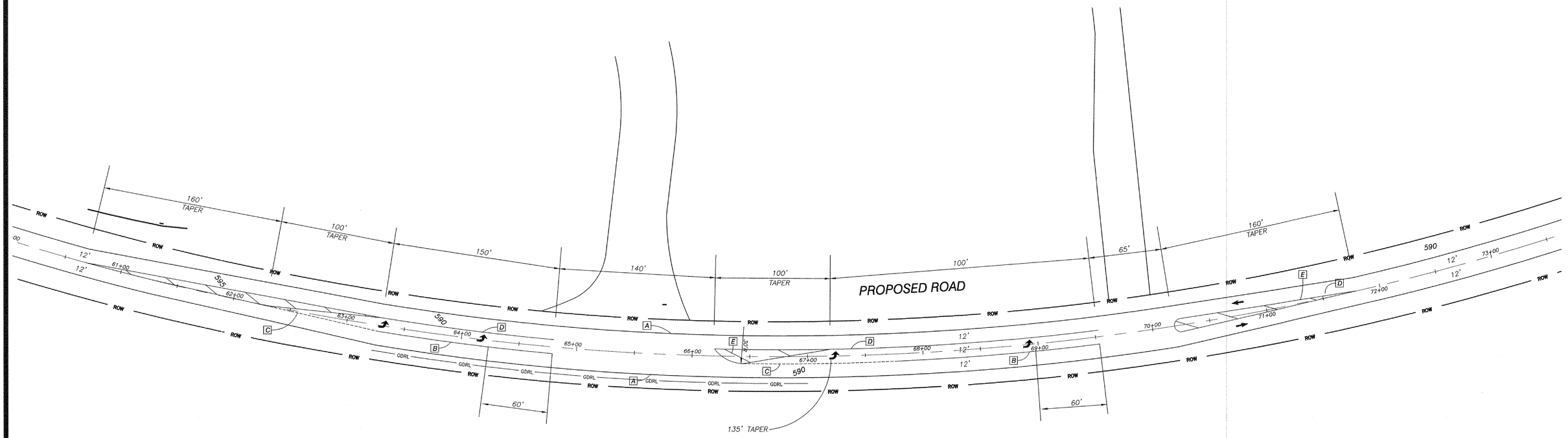
DATE: 12/12/13
COMP FILE: 13097_planprofile.dwg
DRAWN BY: MHW
CHECKED BY: FKH

TROLLINGWOOD-HAWFIELDS ROAD PAVEMENT MARKING PLAN

JOB NO. 13097
SHEET NO. 34
OF: 40

THIS PLAN DOES NOT PURPORT TO SHOW ALL EXISTING UTILITIES, LINES, APPURTENANCES, ETC., AND THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES, PIPES, VALVES, ETC. AS SHOWN ARE IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR THE ENGINEER/ARCHITECT. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES, LINES, PIPES, ETC. BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT RESULT FROM THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, PIPES AND VALVES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER/ARCHITECT OF ANY CONFLICTS WITH EXISTING AND PROPOSED FACILITIES TO DETERMINE IF AN ITEM WILL NEED TO BE RELOCATED.

THE ENGINEER/ARCHITECT HAS MADE NO EXAMINATION TO DETERMINE WHETHER ANY HAZARDOUS OR TOXIC MATERIALS ARE PRESENT OR CONTAINED IN, UNDER, OR ON THE SUBJECT PROPERTY OR ITS WATERS, OR IF ANY HAZARDOUS OR TOXIC MATERIALS HAVE CONTAMINATED THIS OR OTHER PROPERTIES OR ITS WATERS IN ANY WAY WHATSOEVER. NO SUB-SURFACE EXAMINATION OF ANY TYPE HAS BEEN MADE BY THE ENGINEER/ARCHITECT, AND ACCORDINGLY, NO OPINION IS EXPRESSED OR INFERRED ON ALL SUCH MATTERS. FURTHER, NO OPINION IS RENDERED AS TO ANY VIOLATION OF ANY ENVIRONMENTAL LAWS OR REGULATIONS, EITHER FEDERAL, STATE, OR LOCAL RELATED TO THE INFORMATION SHOWN ON THIS PLAN AND THE ENGINEER/ARCHITECT IS IN NO WAY LIABLE FOR ANY VIOLATION OF SUCH ENVIRONMENTAL LAWS SHOULD SUCH EXIST.



PAVEMENT MARKING LEGEND

- A WHITE EDGE LINE, 4", 90 MILS
- B WHITE SOLID LANE LINE, 4", 120 MILS
- C 2 FT. WHITE MINI SKIP, 4", 120 MILS
- D YELLOW DOUBLE CENTER LINES, 4" EACH, 120 MILS
- E YELLOW DIAGONAL LINE, 8", 90 MILS
- LEFT TURN ARROW, 90 MILS
- RIGHT TURN ARROW, 90 MILS
- STRAIGHT ARROW, 90 MILS

PAVEMENT MARKING NOTES:

1. ALL PROPOSED PAVEMENT MARKINGS SHALL BE THERMOPLASTIC TYPE & IN ACCORDANCE WITH NCDOT STANDARD SPECIFICATIONS.
2. ALL PROPOSED PAVEMENT MARKINGS SHALL BE PRE-MARKED BY CONTRACTOR & APPROVED BY NCDOT PRIOR TO PLACING THERMOPLASTIC MARKINGS.
3. ALL WORK WITHIN THE PROPOSED ROAD RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH NCDOT STANDARD SPECIFICATIONS & DRAWINGS.
4. HATCHING SHOWN TO DESIGNATE DIAGONAL YELLOW LINES REPRESENTS AREA ONLY. DIAGONAL YELLOW LINE PLACEMENT SHALL BE IN ACCORDANCE WITH NCDOT STD. 1205.09

PLAN
SCALE: 1" = 40'

NORTH CAROLINA PROFESSIONAL SEAL 039206 ENGINEER S. KYLE SMITH
1-14-14

REVISED 1/15/14 PER NCDOT COMMENTS

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road p.o. box 1179
burlington, n.c. 27215 336/226-5534
Firm's Engineering License No. F-0203

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE

MELVILLE TOWNSHIP - MEBANE, NORTH CAROLINA

BOOK NO. 412A

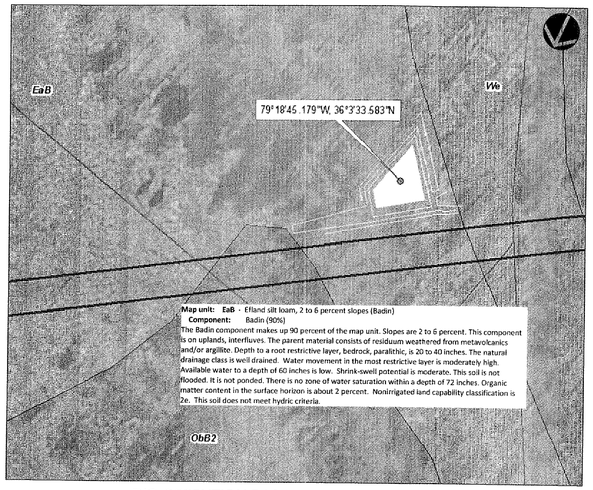
NEW ROADWAY IMPROVEMENTS

MEBANE, NORTH CAROLINA

DATE: 12/12/13
COMP FILE: 13097_planprofile.dwg
DRAWN BY: MHW
CHECKED BY: FKH

PROPOSED ROAD PAVEMENT MARKING PLAN

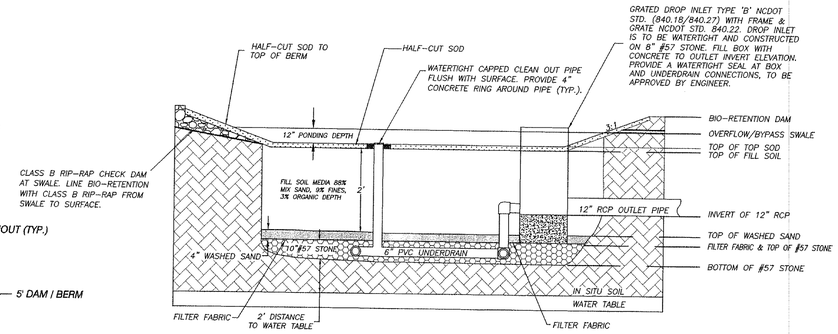
JOB NO. 13097
SHEET NO. 35
OF: 40



BIO-RETENTION BASIN # 1 SOIL INFORMATION
N.T.S.

NOTE:
BIORETENTION BASINS ARE TO BE SODDED WITH SAND BASED HALF CUT SOD. DO NOT PLANT SHRUBS, BUSHES, OR TREES ON DAM OR WITHIN BASIN.

BIO-RETENTION BASIN # 1
SCALE: 1" = 10'



TYPICAL STORMWATER BIO-RETENTION BASIN CROSS-SECTIONAL VIEW
N.T.S.

SEE CALCULATION TABLES FOR SPECIFIC ELEVATIONS.

UNDERDRAINS SHALL HAVE BETWEEN 0.25% & 1.0% SLOPE AT ALL TIMES. UNDERDRAINS SHALL ALWAYS HAVE A MIN. OF 2" OF #57 STONE, FILTER FABRIC & 4" OF WASHED SAND FOR COVER. UNDERDRAINS DO NOT HAVE A MINIMUM DEPTH OF STONE UNDER THE PIPES.

Bio-Retention Basin # 1

Drainage Characteristics			Peak Flow Characteristics		
Drainage Area	0.74	ac	1-yr 24 Hour Intensity	5.5	in/hr
Total Impervious Area	0.27	ac	Pre-Development 1-yr 24 Hour Flow	0.55	cf/s
Impervious %	36%		Post-Development 1-yr 24 Hour Flow	1.27	cf/s
Design Rainfall Depth	1.0	in	Difference in Pre vs. Post Flow	0.7	cf/s

Bio-Retention Cell Characteristics				
Top of Dam	602.00		in	ft
Bypass Structure	601.00	Depth of Flow	1	0.08
Surface	600.00	Ponding Depth	12	1.00
Top of Washed Sand	598.00	Depth of Fill Soil	24	2.00
Top of #57 Stone	597.67	Depth of Washed Sand	4	0.33
Bottom of #57 Stone	596.83	Depth of #57 Stone	10	0.83
Invert of Upturned Elbow	598.67	Size of Underdrains	6	0.50
Invert of Outlet Pipe	598.57	Depth of IWS	22	1.84
Drop Inlet Rim Elevation	601.00			

Runoff Calculations			Soil Characteristics		
Surface Area	985.63	sf	% Sand	88	%
Max Ponding Area	1540.56	sf	% Fines	9	%
Min. Volume Required	1016	cf	% Organic	3	%
Volume Provided	1263	cf	Soil Permeability	1.5	in/hr
Underdrains			P-Index		
Underdrains	5		Drawdown Time Above Surface	8	hr
Underdrain Size	6	in	Drawdown Time Below Surface	16	hr
Factor of Safety	10		Total Drawdown Time	24	hr
Underdrain Invert	598.67	elev			

Miscellaneous Information					
Groundcover	Sod		Forebay?		
Bypass Structure	Channel		Grassed Swale?	X	

Bio-Retention Basin # 2

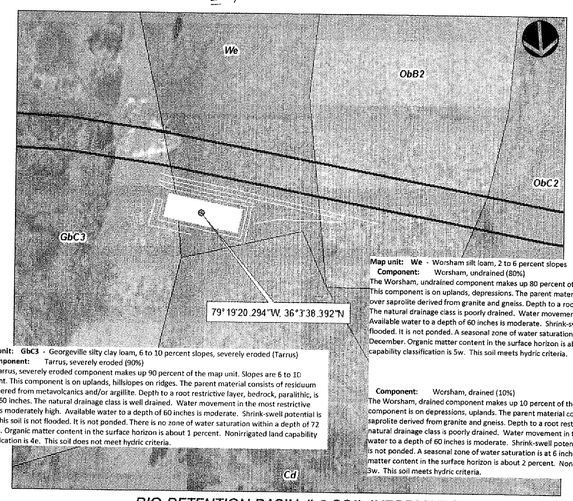
Drainage Characteristics			Peak Flow Characteristics		
Drainage Area	0.23	ac	1-yr 24 Hour Intensity	5.5	in/hr
Total Impervious Area	0.12	ac	Pre-Development 1-yr 24 Hour Flow	0.17	cf/s
Impervious %	52%		Post-Development 1-yr 24 Hour Flow	0.49	cf/s
Design Rainfall Depth	1.0	in	Difference in Pre vs. Post Flow	0.32	cf/s

Bio-Retention Cell Characteristics				
Top of Dam	581.00		in	ft
Bypass Structure	580.00	Depth of Flow	1	0.08
Surface	579.00	Ponding Depth	12	1.00
Top of Washed Sand	577.00	Depth of Fill Soil	24	2.00
Top of #57 Stone	576.67	Depth of Washed Sand	4	0.33
Bottom of #57 Stone	575.83	Depth of #57 Stone	10	0.83
Invert of Upturned Elbow	577.50	Size of Underdrains	6	0.50
Invert of Outlet Pipe	577.40	Depth of IWS	20	1.67
Drop Inlet Rim Elevation	580.00			

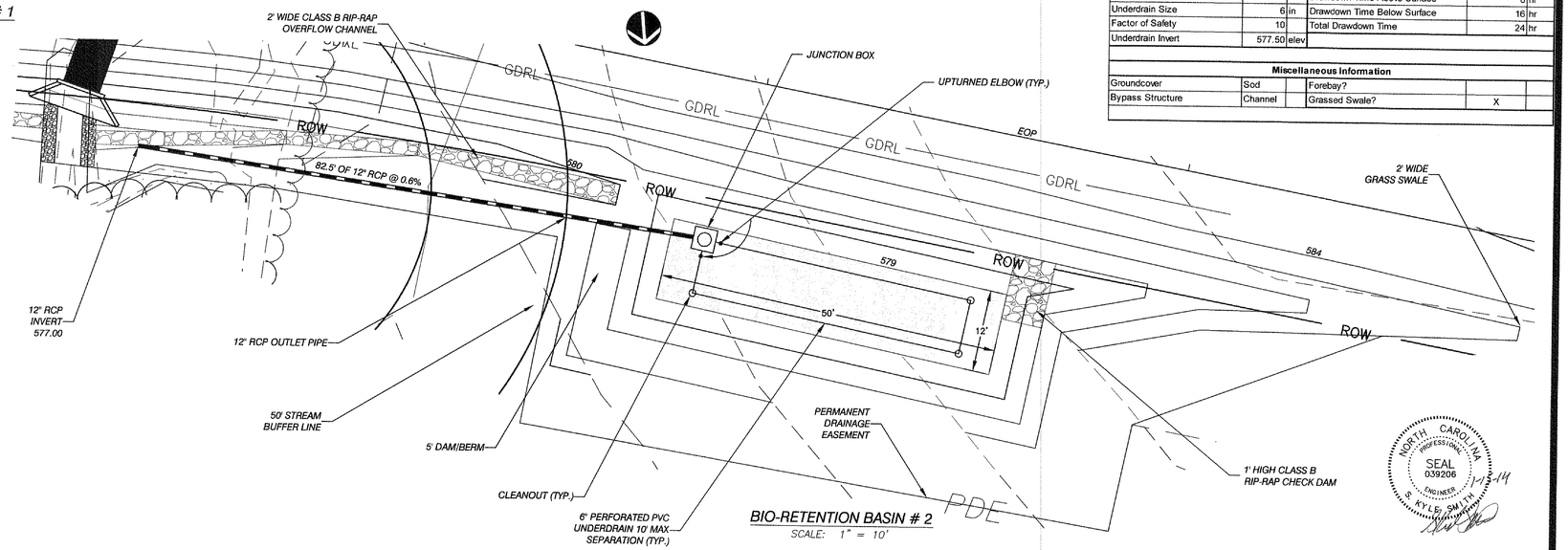
Runoff Calculations			Soil Characteristics		
Surface Area	600	sf	% Sand	88	%
Max Ponding Area	1008	sf	% Fines	9	%
Min. Volume Required	434	cf	% Organic	3	%
Volume Provided	804	cf	Soil Permeability	1.5	in/hr
Underdrains			P-Index		
Underdrains	4		Drawdown Time Above Surface	8	hr
Underdrain Size	6	in	Drawdown Time Below Surface	16	hr
Factor of Safety	10		Total Drawdown Time	24	hr
Underdrain Invert	577.50	elev			

Miscellaneous Information					
Groundcover	Sod		Forebay?		
Bypass Structure	Channel		Grassed Swale?	X	

NOTE:
ALL UPSTREAM AREAS SHALL BE STABILIZED PRIOR TO INSTALLATION OF BIO-RETENTION CELLS. HOLD AN ENGINEERING/PRECONSTRUCTION REVIEW PRIOR TO CONSTRUCTION OF CELLS.



BIO-RETENTION BASIN # 2 SOIL INFORMATION
N.T.S.



BIO-RETENTION BASIN # 2
SCALE: 1" = 10'

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 039206 KYLE SMITH 1-13-14

REVISED 1/15/14 PER NCDOT COMMENTS

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road p.o. box 1179
burlington, n.c. 27215 336/226-5534
Firm's Engineering License No. F-0203

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE
MELVILLE TOWNSHIP - MEBANE, NORTH CAROLINA

BOOK NO. 412A

NEW ROADWAY IMPROVEMENTS
MEBANE, NORTH CAROLINA

DATE: 12/12/13
COMP FILE: 13097 Bioretention Details.dwg
DRAWN BY: SKS
CHECKED BY: FKH

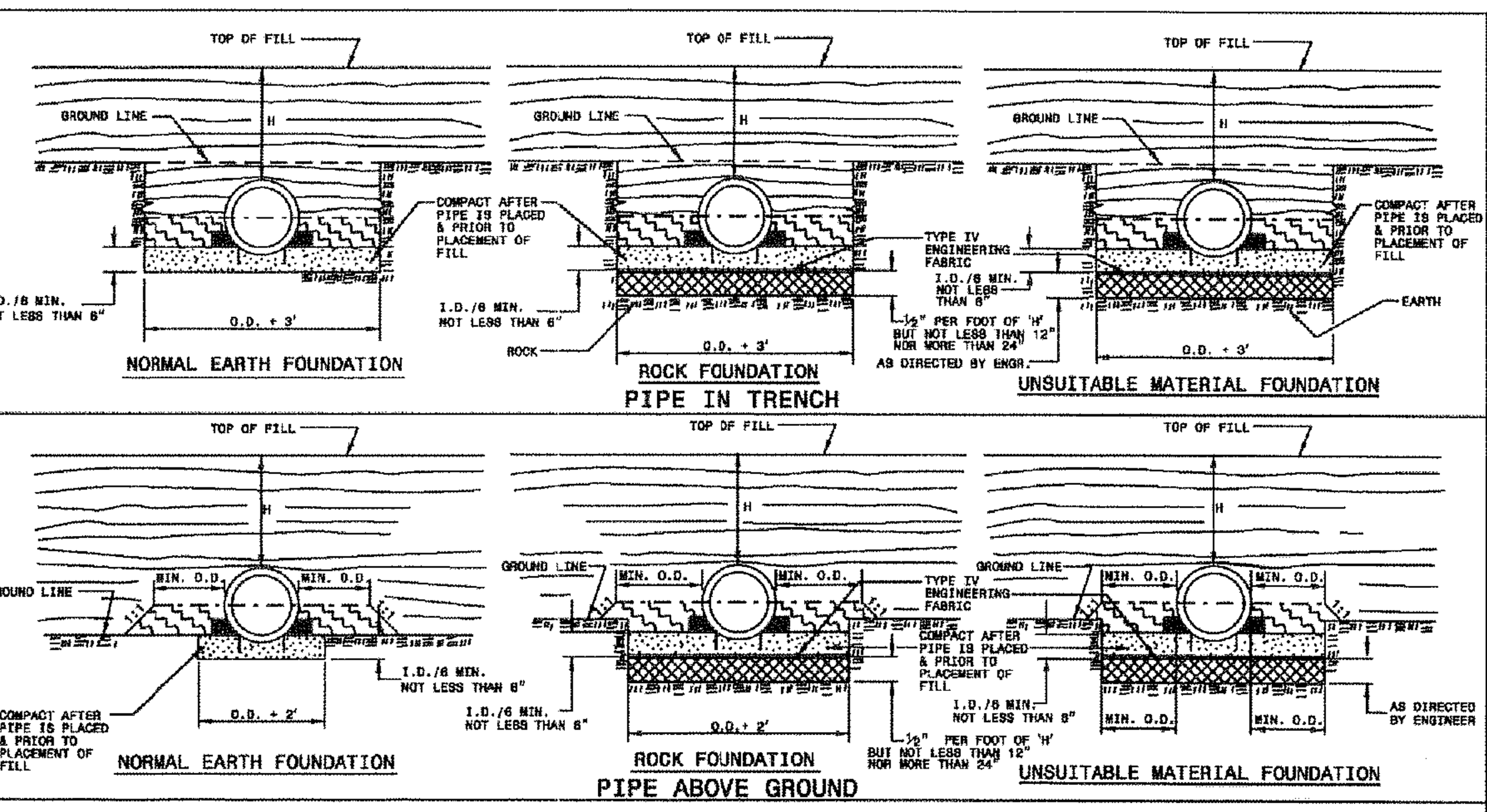
BIO-RETENTION DETAILS

JOB NO. 13097
SHEET NO. 36
OF: 40

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-12

ENGLISH STANDARD DRAWING FOR
METHOD OF PIPE INSTALLATION
RIGID PIPE



GENERAL NOTES:

I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.

O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.

H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.

■ TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

▨ LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

— - — SPRINGLINE OF PIPE

▨ SELECT BACKFILL MATERIAL CLASS III OR CLASS II, BELOW SPRINGLINE.

▤ APPROVED SUITABLE LOCAL MATERIAL ABOVE SPRINGLINE.

▧ UNDISTURBED EARTH MATERIAL

▩ SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.

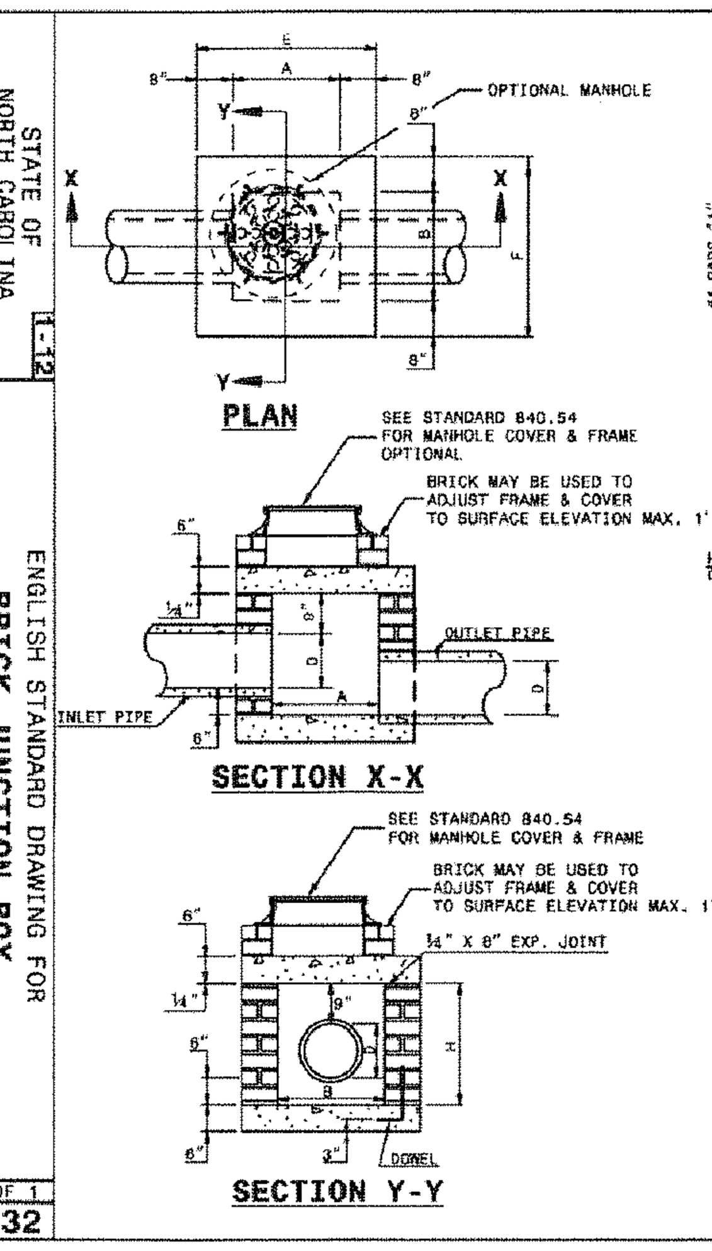
SHEET 2 OF 3
300.01

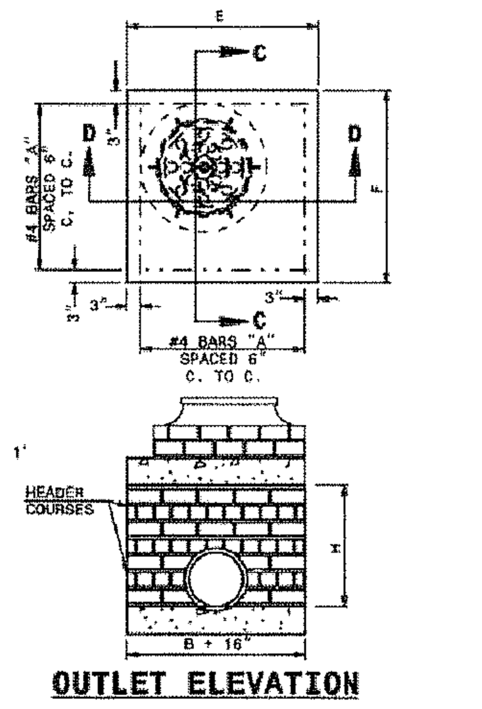
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.
ENGLISH STANDARD DRAWING FOR
METHOD OF PIPE INSTALLATION
RIGID PIPE
SHEET 2 OF 3
300.01

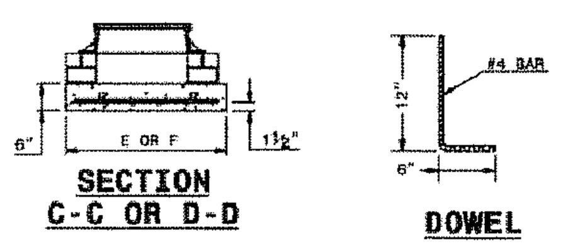
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-12

ENGLISH STANDARD DRAWING FOR
BRICK JUNCTION BOX
(WITH OPTIONAL MANHOLE)
12" THRU 66" PIPE







GENERAL NOTES:

CHAMFER ALL EXPOSED CORNERS 1".
USE CLASS "B" CONCRETE THROUGHOUT.
USE #4 BAR DOWELS AT 12" CENTERS.
MORTAR JOINTS ½" ± ⅛" THICK.
CONCAVE TOO ALL EXPOSED JOINTS.
USE FORMS TO CONSTRUCT THE BOTTOM SLAB.
JUMBO BRICK WILL BE PERMITTED. CONCRETE BRICK OR 4" SOLID CONCRETE BLOCKS MAY BE USED IN LIEU OF CLAY BRICK.
FOR 8'-0" IN HEIGHT OR LESS, USE 8" WALL. OVER 8'-0" IN HEIGHT, USE 12" WALL TO 6'-0" FROM TOP OF WALL, AND 8" WALL FOR THE REMAINING 6'-0". ADJUST DIMENSIONS AND QUANTITIES ACCORDINGLY.
IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OF BOX, ADD TO BASE AS SHOWN ON STANDARD NO. 840.00.
PROVIDE ALL JUNCTION BOXES OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTERS IN ACCORDANCE WITH STD. NO. 840.66.
ADJUST THE STEEL, CONCRETE AND BRICK MASONRY QUANTITIES TO INCLUDE THE ADDITION OF THE MANHOLE (I.E. DIAGONAL BARS SHORTENED AROUND OPENING IN TOP SLAB, ADDITIONAL VARIABLE HEIGHT BRICK MASONRY, OPENING IN TOP SLAB.)
MAX. DEPTH OF THIS STRUCTURE FROM TOP OF BOTTOM SLAB TO TOP ELEVATION IS 12 FEET.

DIMENSIONS AND QUANTITIES FOR BRICK JUNCTION BOXES

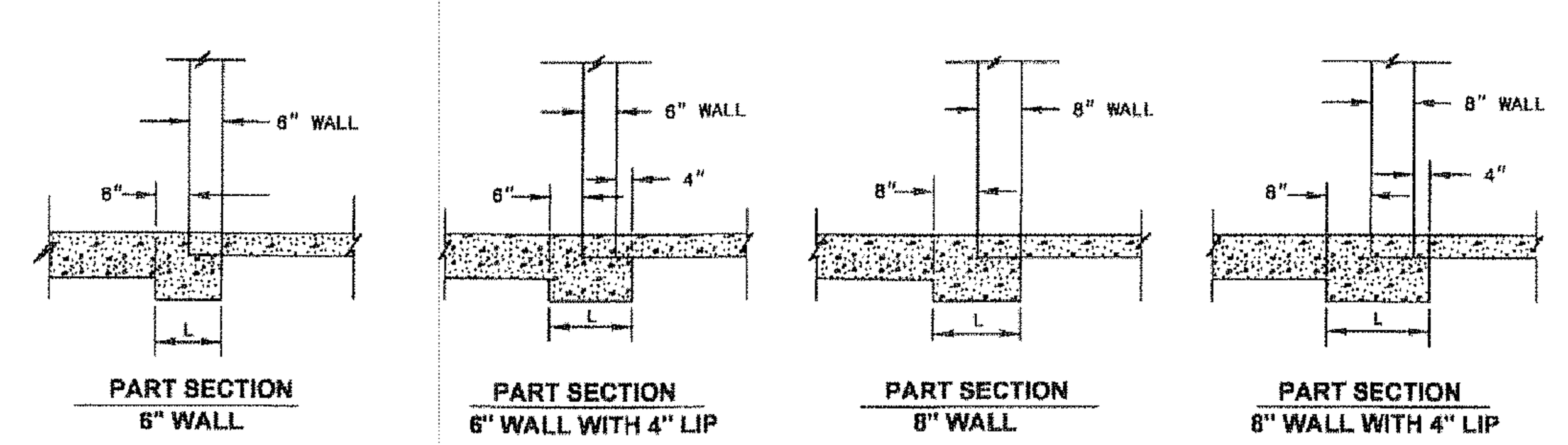
DIMENSIONS OF BOX AND PIPE				REINFORCEMENT BARS		TOP SLAB DIMENSIONS		CUBIC YARDS			DEDUCTIONS FOR ONE PIPE CU.YDS.	
PIPE	SPAN	WIDTH	HEIGHT					CONC.	BRICK MASONRY			
D	A	B	H	NO.	LENGTH	E	F	TOP & BOTTOM CU. YD.	MIN. HEIGHT CU. YD.	WALL PER FT. HT. CU. YD.	C.S.	R.C.
12"	2'-0"	2'-0"	2'-3"	12	3'-1"	3'-4"	3'-4"	0.412	0.591	0.263	0.020	0.032
15"	2'-0"	2'-0"	2'-6"	12	3'-1"	3'-4"	3'-4"	0.412	0.657	0.263	0.031	0.047
18"	2'-4"	2'-4"	2'-9"	14	3'-5"	3'-8"	3'-8"	0.498	0.814	0.296	0.044	0.065
24"	3'-0"	3'-0"	3'-3"	16	4'-1"	4'-4"	4'-4"	0.695	1.176	0.362	0.078	0.113
30"	3'-4"	3'-4"	3'-9"	16	4'-5"	4'-8"	4'-8"	0.807	1.481	0.395	0.122	0.170
36"	4'-0"	4'-0"	4'-3"	20	5'-1"	5'-4"	5'-4"	1.053	1.959	0.461	0.176	0.238
42"	4'-8"	4'-8"	4'-9"	22	5'-9"	6'-0"	6'-0"	1.333	2.503	0.527	0.240	0.323
48"	5'-4"	5'-4"	5'-3"	26	6'-5"	6'-8"	6'-8"	1.646	2.940	0.560	0.313	0.422
54"	5'-10"	5'-10"	5'-9"	28	6'-11"	7'-2"	7'-2"	1.902	3.502	0.609	0.396	0.535
60"	6'-6"	6'-6"	6'-3"	30	7'-7"	7'-10"	7'-10"	2.272	4.113	0.658	0.489	0.660
66"	7'-1"	7'-1"	6'-9"	32	8'-2"	8'-5"	8'-5"	2.624	4.778	0.708	0.591	0.798

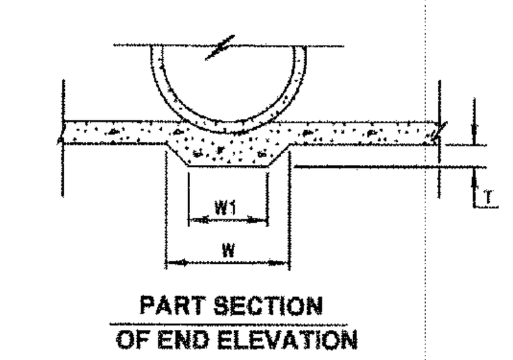
SHEET 1 OF 1
840.32

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-12

ENGLISH STANDARD DRAWING FOR
CONCRETE BASE PAD
FOR DRAINAGE STRUCTURES





TABLES OF QUANTITIES FOR PIPE SET IN PAD

PIPE	"W"	"W1"	"T"	C.Y. QUANTITIES WHEN L IS		
D	DIM	DIM	DIM	12"	16"	20"
12"	1'-1⅞"	0'-7⅞"	0'-2"	0.005	0.007	0.008
15"	1'-3⅝"	0'-9⅛"	0'-2"	0.006	0.008	0.010
18"	1'-5¼"	0'-10⅝"	0'-2"	0.007	0.010	0.012
24"	1'-8¾"	1'-0⅛"	0'-3"	0.011	0.014	0.018
30"	2'-0¼"	1'-2¾"	0'-3½"	0.014	0.018	0.023
36"	2'-3¾"	1'-5⅜"	0'-4"	0.017	0.023	0.025
42"	2'-7⅛"	1'-7"	0'-5¼"	0.025	0.030	0.038
48"	2'-10⅝"	1'-8¾"	0'-6¾"	0.028	0.038	0.047
54"	3'-2⅛"	1'-10½"	0'-8¼"	0.035	0.047	0.058
60"	3'-5⅝"	2'-0¼"	0'-6¾"	0.042	0.056	0.071
66"	3'-9"	2'-2¼"	0'-7¼"	0.050	0.067	0.084
72"	4'-0½"	2'-3¾"	0'-7¾"	0.059	0.078	0.098

GENERAL NOTES:
USE THIS STANDARD WITH ALL DRAINAGE STRUCTURES USING REINFORCED CONCRETE PIPE SET IN BASE SLAB.

SHEET 1 OF 1
840.00

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-12

ENGLISH STANDARD DRAWING FOR
METHOD OF PIPE INSTALLATION
FILL HEIGHT TABLES

FLEXIBLE PIPE

Round Corrugated Steel Pipe
2 2/3 x ½ corrugation **

Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet) (Ga) 16	14	12	10	8
12	12	204	256			
15	12	162	204			
18	12	135	169	239		
21	12	115	145	204		
24	12	100	126	178		
30	12	79	100	142		
36	12	65	83	117	152	
42	12	55	70	100	130	160
48	12	48	61	87	113	139
54	12		54	77	100	123
60	12			69	90	111
66	12				81	100
72	12				74	91
78	12					81
84	12					69

Round Corrugated Aluminum Pipe
2 2/3 x ½ corrugation **

Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet) (Ga) 16	14	12	10	8
12	12	123	155	218	281	344
15	12	98	123	174	224	275
18	12	81	102	144	187	228
21	12	69	87	123	160	195
24	12	60	76	108	139	171
27	12		67	95	123	151
30	12		60	85	111	136
36	12		50	71	92	113
42	12			60	78	96
48	12			52	68	84
54	12			46	50	74
60	12				50	62
66	12					51
72	12					41

** FOR DIFFERENT CORRUGATIONS AND ARCH PIPES REFER TO ROADWAY DESIGN MANUAL OR MANUFACTURERS SPECIFICATION.

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

CSP - AASHTO M36
CAAP - AASHTO M196
HDPE - AASHTO M294
PVC - ASTM F949 or AASHTO M304

HDPE - * (Minimum fill) 2' for pipe diameters ≥ 12" and ≤ 60"
* (Maximum fill) 20' for pipe diameters ≤ 24"
17' for pipe diameters ≥ 30" and ≤ 60"

PVC - * (Minimum fill) 2' for pipe diameters ≥ 12" and ≤ 36"
* (Maximum fill) 30' for pipe diameters ≥ 12" and ≤ 36"

* FILL HEIGHT IS MEASURED FROM THE TOP OF THE PIPE TO THE BOTTOM OF THE PAVEMENT STRUCTURE

NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

1' MINIMUM COVER FOR ALL SIDE DRAIN PIPE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

RIGID PIPE

RCP - * (Minimum fill) 1' for Class IV & CLASS V
2' for Class III & Class II

* (Maximum fill) 10' - Class II pipe
20' - Class III pipe
30' - Class IV pipe
40' - Class V pipe

(For fills > 40' & < 80' use LRFD Direct Design Method)

* FILL HEIGHT IS MEASURED FROM THE TOP OF THE PIPE TO THE BOTTOM OF THE PAVEMENT STRUCTURE

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

RCP - AASHTO M170

NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

1' MINIMUM COVER FOR ALL SIDE DRAIN PIPE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

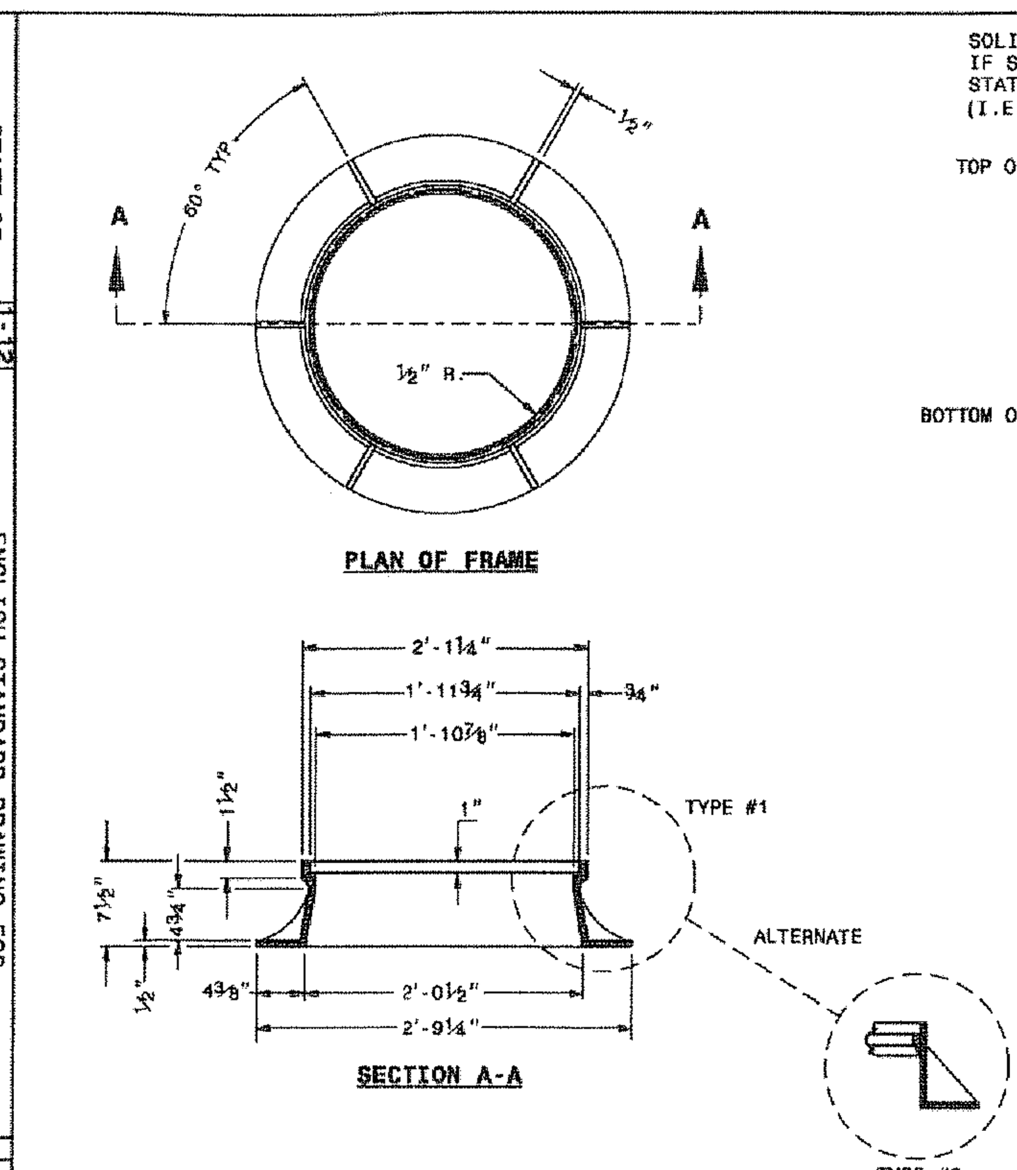
SHEET 3 OF 3
300.01

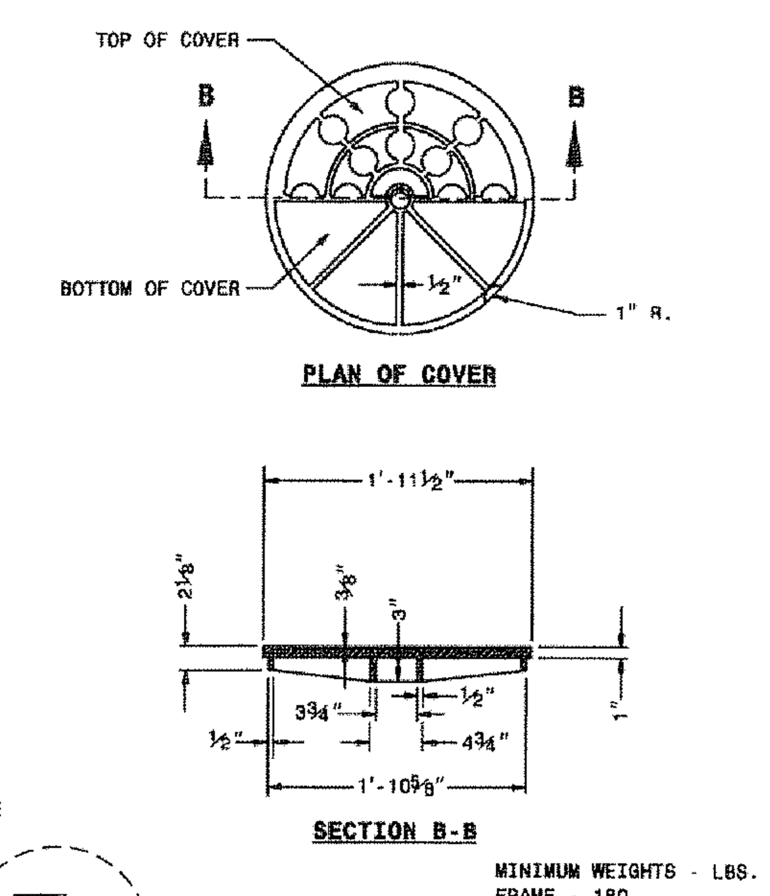
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-12

ENGLISH STANDARD DRAWING FOR
MANHOLE FRAME AND COVER

SOLID COVER SHOWN PERFORATED. PERFORATED AVAILABLE IF SPECIFIED.
STATE USE OF SYSTEM ON COVER
(I.E.: SEWER, STORM DRAIN, ELECTRICAL)





MINIMUM WEIGHTS - LBS.
FRAME - 180
COVER - 120
TOTAL - 300

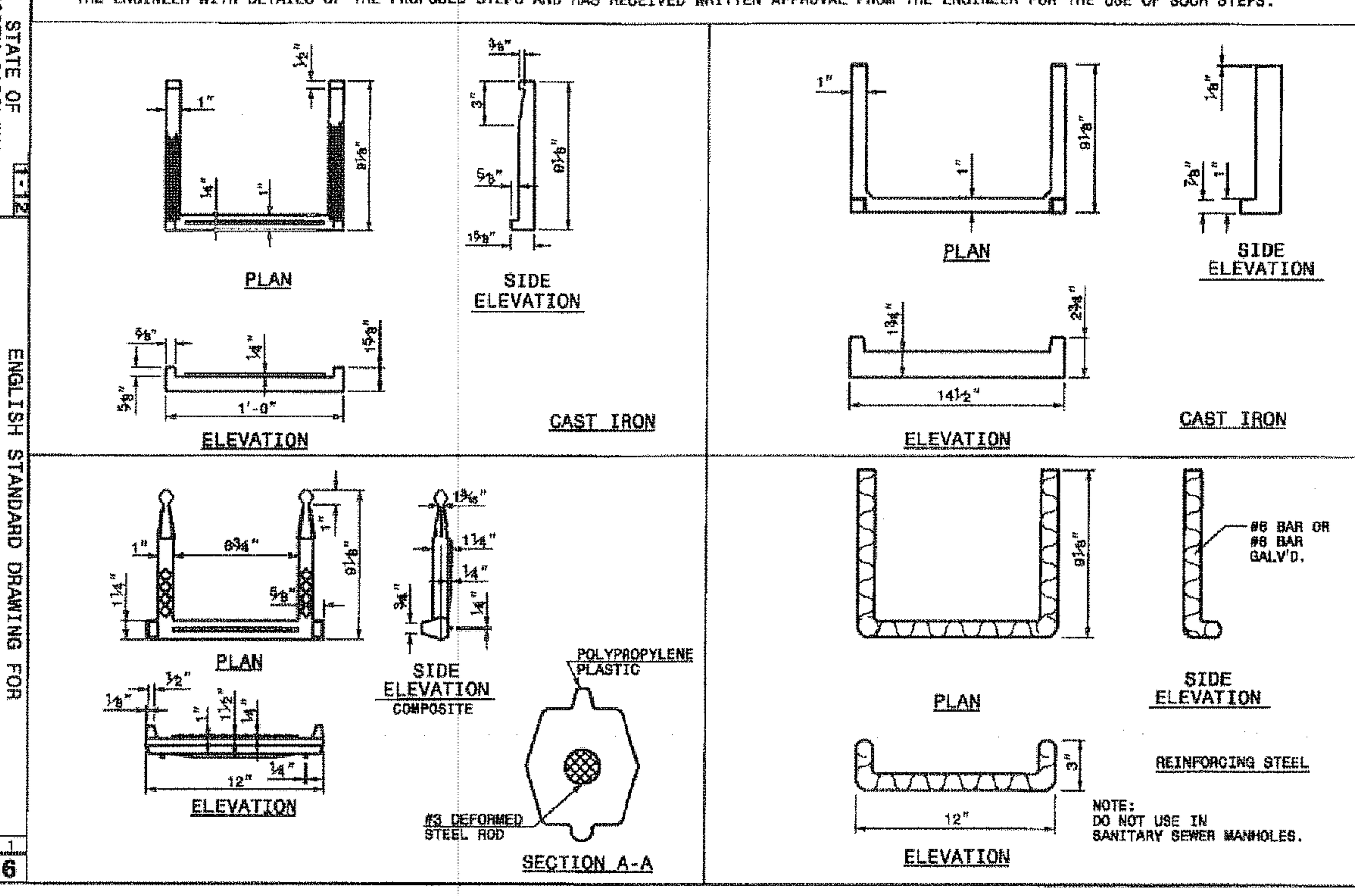
SHEET 1 OF 1
840.54

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-12

ENGLISH STANDARD DRAWING FOR
DRAINAGE STRUCTURE STEPS

NOTES:
INSTALL ALL STEPS PROTRUDING 4" FROM INSIDE FACE OF STRUCTURE WALL.
STEPS DIFFERING IN DIMENSIONS, CONFIGURATION, OR MATERIALS FROM THOSE SHOWN MAY ALSO BE USED PROVIDED THE CONTRACTOR HAS FURNISHED THE ENGINEER WITH DETAILS OF THE PROPOSED STEPS AND HAS RECEIVED WRITTEN APPROVAL FROM THE ENGINEER FOR THE USE OF SUCH STEPS.

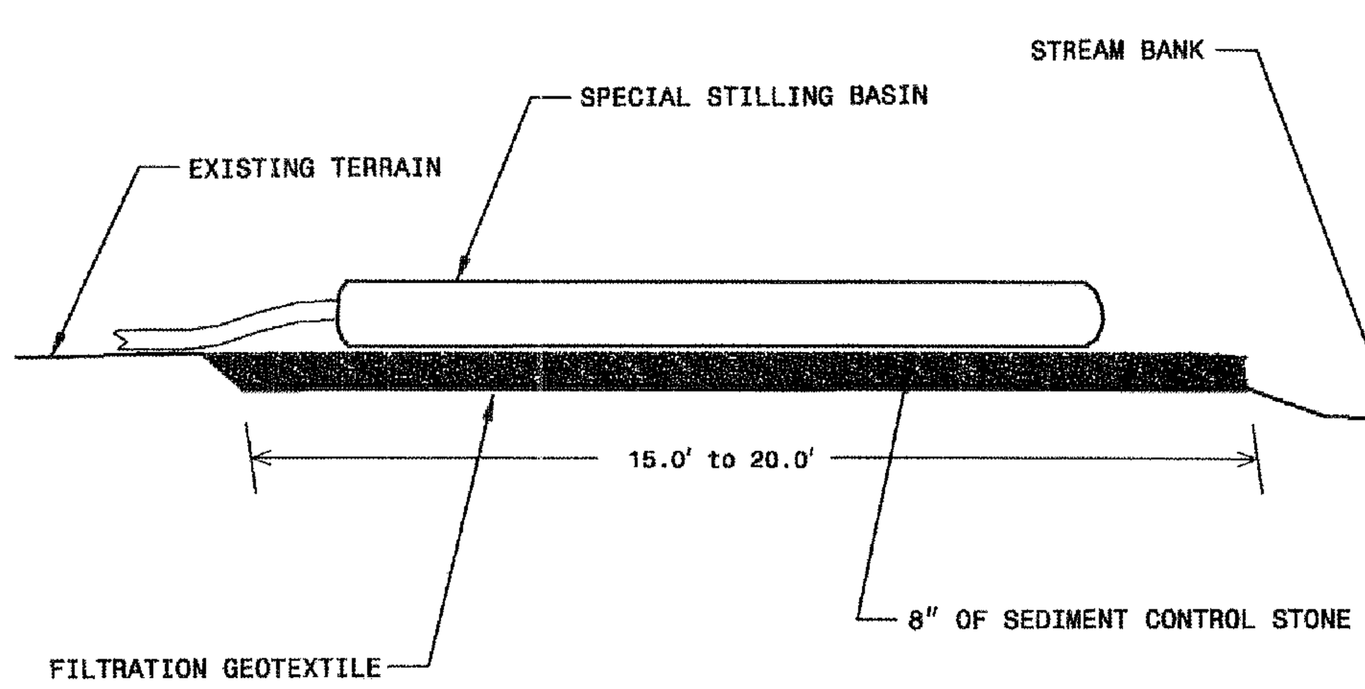


SHEET 1 OF 1
840.66

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-12

ENGLISH STANDARD DRAWING FOR
SPECIAL STILLING BASIN



NOTES

USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL STONE.
PROVIDE STABILIZED OUTLET TO STREAM BANK.
WOOD PALLETS MAY BE USED IN LIEU OF STONE AND GEOTEXTILE AS DIRECTED. A SUFFICIENT NUMBER OF PALLETS MUST BE PROVIDED TO ELEVATE THE ENTIRE SPECIAL STILLING BASIN ABOVE NATURAL GROUND.

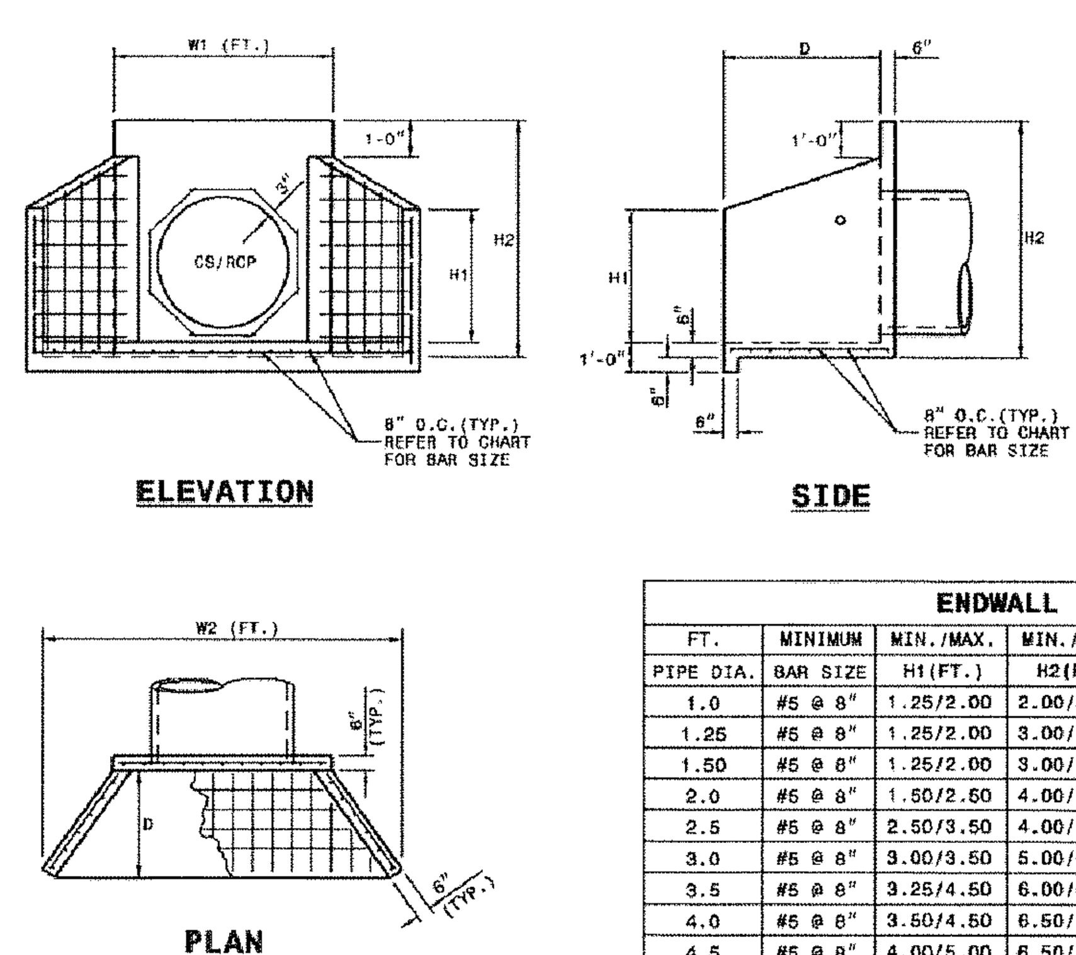
NOT TO SCALE

SHEET 1 OF 1
1630.06

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-12

ENGLISH STANDARD DRAWING FOR
PRECAST CONCRETE ENDWALL
FOR SINGLE 12" THRU 72" PIPE - 90° SKEW



NOTES:

* THIS PRECAST ENDWALL MAY BE USED FOR THE FOLLOWING STANDARDS: 838.01, 838.11, 838.21, 838.27, 838.33, 838.39, 838.51, 838.57, 838.63 AND 838.69.
* INSTALL PRECAST ENDWALLS WITH WINGS AND PAY FOR IN ACCORDANCE WITH SPECIFICATION SECTION 838.
* USE 4000 PSI CONCRETE.
* PROVIDE ALL REINFORCING STEEL WHICH MEETS ASTM A615 FOR GRADE 60 AND WELDED WIRE FABRIC CONFORMING TO ASTM A185 WITH 2" MIN. CLEARANCE.
* PLACE LIFT HOLES OR PINS IN ACCORDANCE WITH OSHA STANDARD 1926.704.
* PIPE TO BE GROUTED INTO HEADWALL AT JOB SITE BY CONTRACTOR
* ALL ELEMENTS PRECAST TO MEET ASTM C913.
* WELDED WIRE FABRIC MAY BE SUBSTITUTED FOR REBAR AS LONG AS THE SAME AREA OF STEEL IS PROVIDED.
* CHAMFER ALL CORNERS 1" OR HAVE A RADIUS OF 1".

NOTE: THE MINIMUM BAR SIZE SHALL BE #5 BARS AT 8" CTS.THE CONTRACTOR WILL HAVE THE OPTION TO INCREASE THIS BAR SIZE AS NEEDED.

ENDWALL DIMENSIONS

FT.	MINIMUM	MIN./MAX.	MIN./MAX.	MIN./MAX.	MIN./MAX.	MIN./MAX.
PIPE DIA.	BAR SIZE	H1(FT.)	H2(FT.)	D (FT.)	W1	W2
1.0	#5 @ 8"	1.25/2.00	2.00/3.75	1.25/1.75	3.00/3.75	5.50/6.00
1.25	#5 @ 8"	1.25/2.00	3.00/3.75	1.25/2.00	3.50/3.75	6.50/6.75
1.50	#5 @ 8"	1.25/2.00	3.00/4.25	1.50/2.50	3.50/3.75	6.50/6.75
2.0	#5 @ 8"	1.50/2.50	4.00/4.75	1.75/2.50	4.00/4.25	7.50/8.25
2.5	#5 @ 8"	2.50/3.50	4.00/6.00	2.00/3.00	4.50/5.50	10.00/11.50
3.0	#5 @ 8"	3.00/3.50	5.00/6.00	2.75/3.50	5.25/5.75	11.50/11.75
3.5	#5 @ 8"	3.25/4.50	6.00/6.75	3.25/3.50	6.00/6.75	12.00/13.25
4.0	#5 @ 8"	3.50/4.50	6.50/7.00	3.25/3.50	6.50/6.75	13.00/13.25
4.5	#5 @ 8"	4.00/5.00	6.50/8.50	3.25/4.00	7.00/9.25	13.50/15.75
5.0	#5 @ 8"	4.50/5.00	7.00/8.50	3.25/4.00	7.25/9.25	13.75/15.75
5.5	#5 @ 8"	4.50/5.00	7.50/8.50	3.25/4.00	7.25/9.25	14.00/15.75
6.0	#5 @ 8"	4.50/5.00	7.50/8.50	3.25/4.00	7.75/9.25	14.75/16.75

SHEET 1 OF 1
838.80

NORTH CAROLINA PROFESSIONAL SEAL 039206 ENGINEER S. KYLE SMITH
1-15-14
[illegible]

REVISED 1/15/14 PER NCDOT COMMENTS

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road p.o. box 1179
burlington, n.c. 27215 336/226-5534
Firm's Engineering License No. F-0203

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE
MELVILLE TOWNSHIP - MEBANE, NORTH CAROLINA

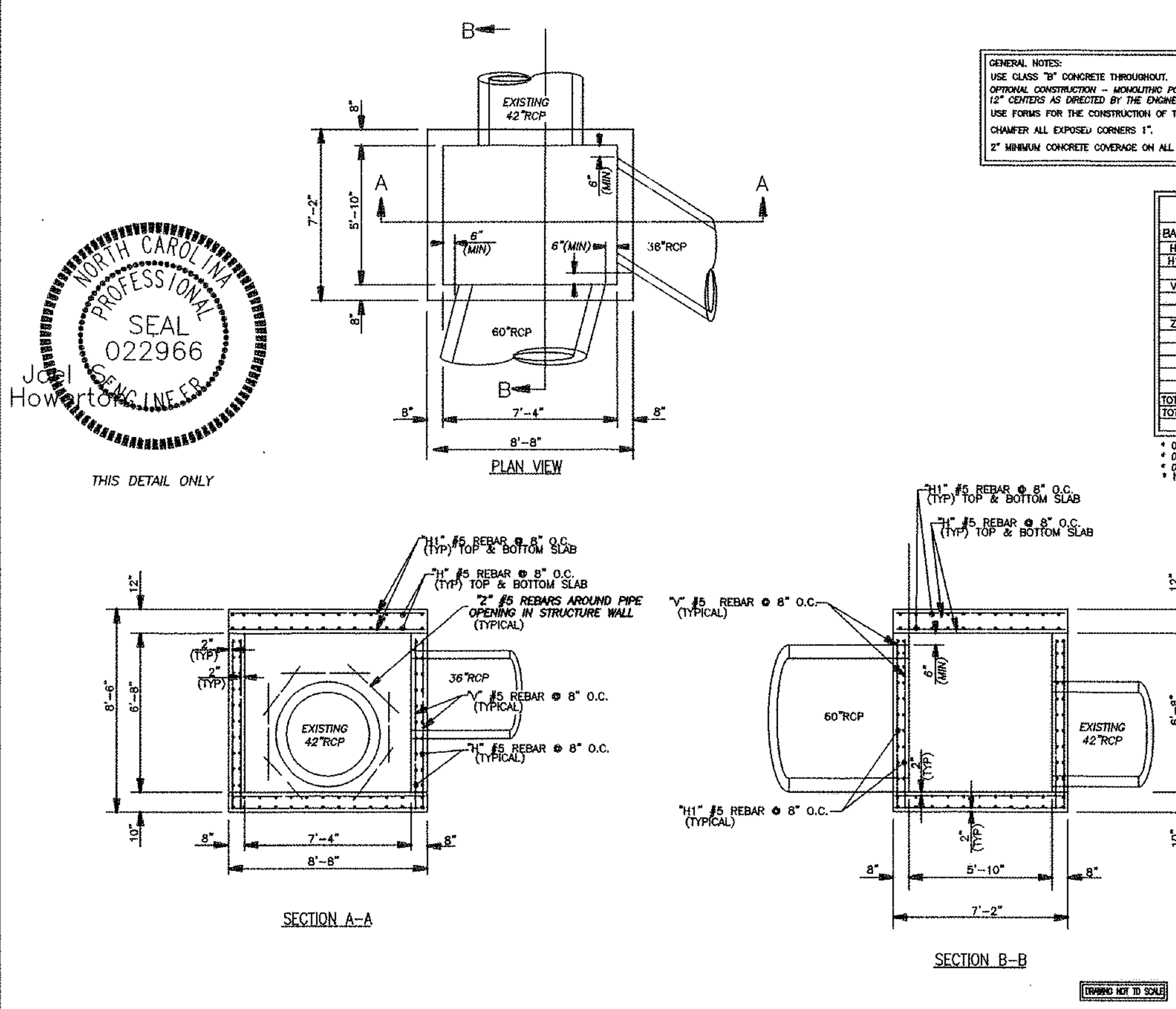
BOOK NO. 412A

NEW ROADWAY IMPROVEMENTS
MEBANE, NORTH CAROLINA

DATE:	12/12/13
COMP FILE:	13097DETAILS.DWG
DRAWN BY:	CHT
CHECKED BY:	FKH

CONSTRUCTION DETAILS

JOB NO. 13097
SHEET NO. 37
OF: 40

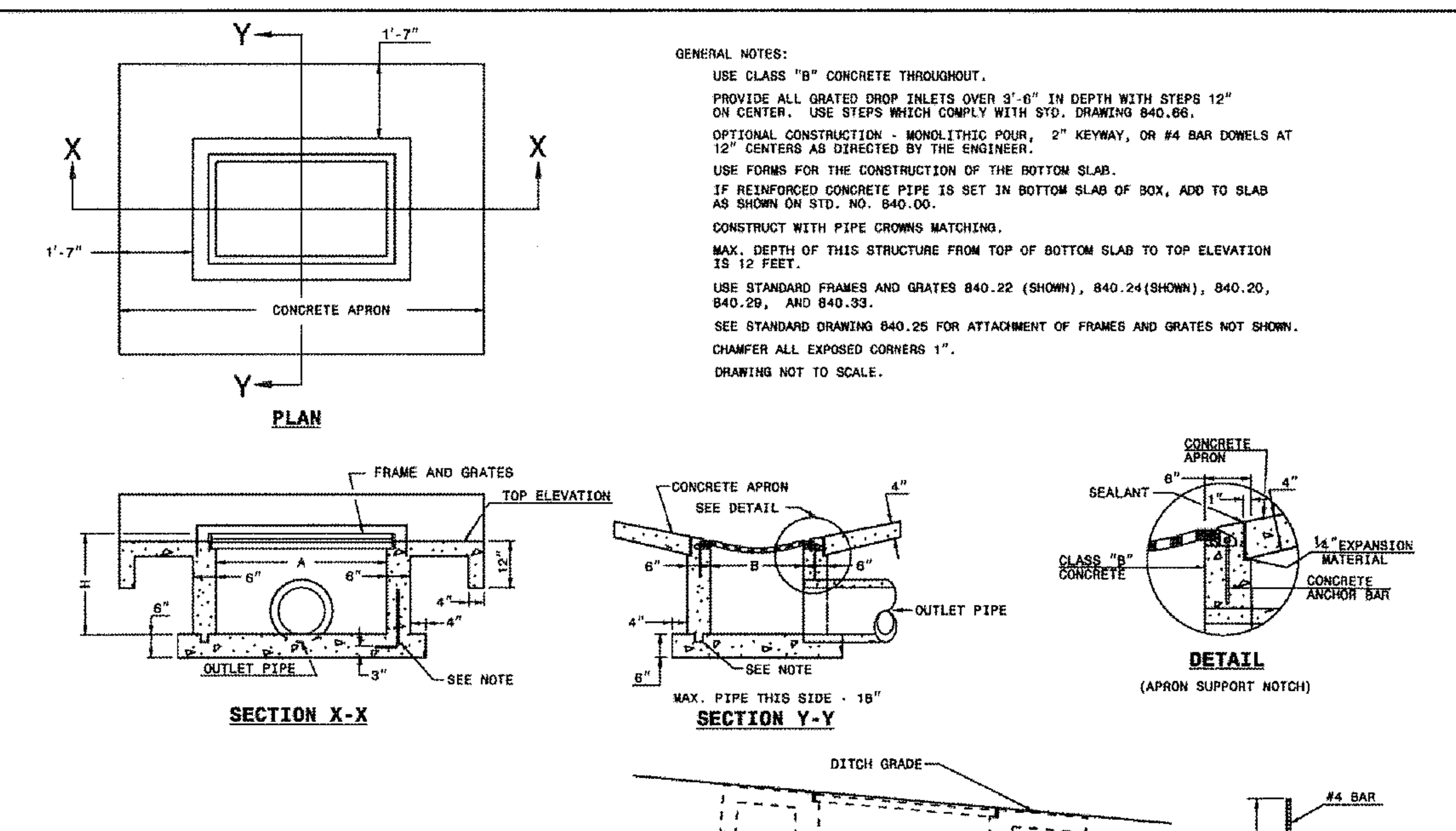


GENERAL NOTES:
USE CLASS "B" CONCRETE THROUGHOUT.
OPTIONAL CONSTRUCTION – MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.
USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
CHAMFER ALL EXPOSED CORNERS 1".
2" MINIMUM CONCRETE COVERAGE ON ALL REBAR.

BILL OF MATERIALS

BAR	NO.	SIZE	LENGTH	WEIGHT
H	92	#5	6'–10"	658
H1	84	#5	8'–4"	730
V	92	#5	7'–0"	672
Z	14	#5	4'–0"	59
TOTAL REINF. STEEL (LBS.)				2117
TOTAL CONC. (CU. YDS.)				9.6

* 0.75 CU. YD. DEDUCTION FOR 1–60" RC PIPE
* 0.37 CU. YD. DEDUCTION FOR 1–42" RC PIPE
* 0.34 CU. YD. DEDUCTION FOR 1–36" RC PIPE
* NO DEDUCTION HAS BEEN MADE FOR PIPES

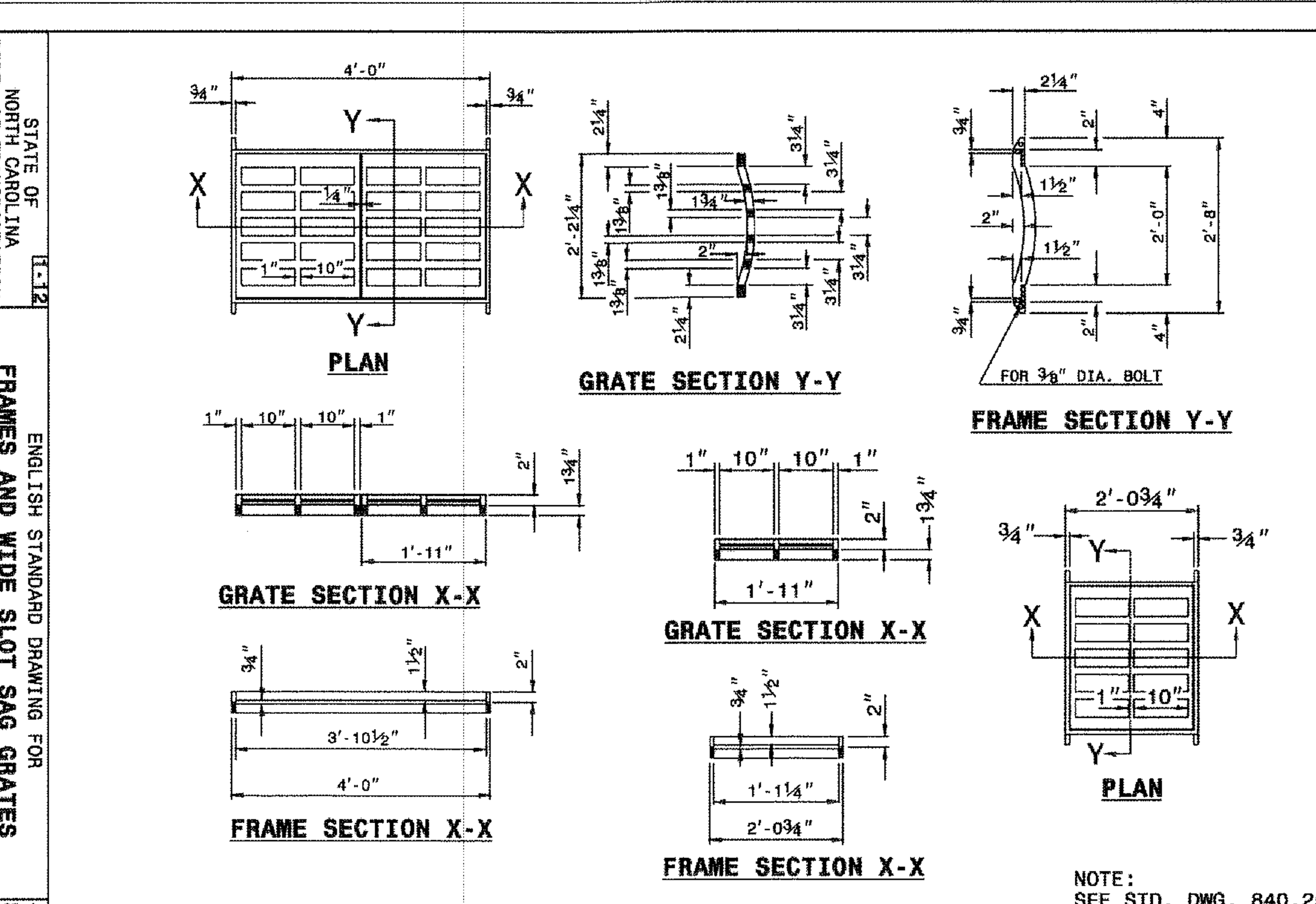


GENERAL NOTES:
USE CLASS "B" CONCRETE THROUGHOUT.
PROVIDE ALL GRATED DROP INLETS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.
OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.
USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.
CONSTRUCT WITH PIPE CROWNS MATCHING.
MAX. DEPTH OF THIS STRUCTURE FROM TOP OF BOTTOM SLAB TO TOP ELEVATION IS 12 FEET.
USE STANDARD FRAMES AND GRATES 840.22 (SHOWN), 840.24(SHOWN), 840.20, 840.29, AND 840.33.
SEE STANDARD DRAWING 840.25 FOR ATTACHMENT OF FRAMES AND GRATES NOT SHOWN.
CHAMFER ALL EXPOSED CORNERS 1".
DRAWING NOT TO SCALE.

MINIMUM DIMENSIONS AND QUANTITIES FOR CONCRETE GRATED DROP INLET

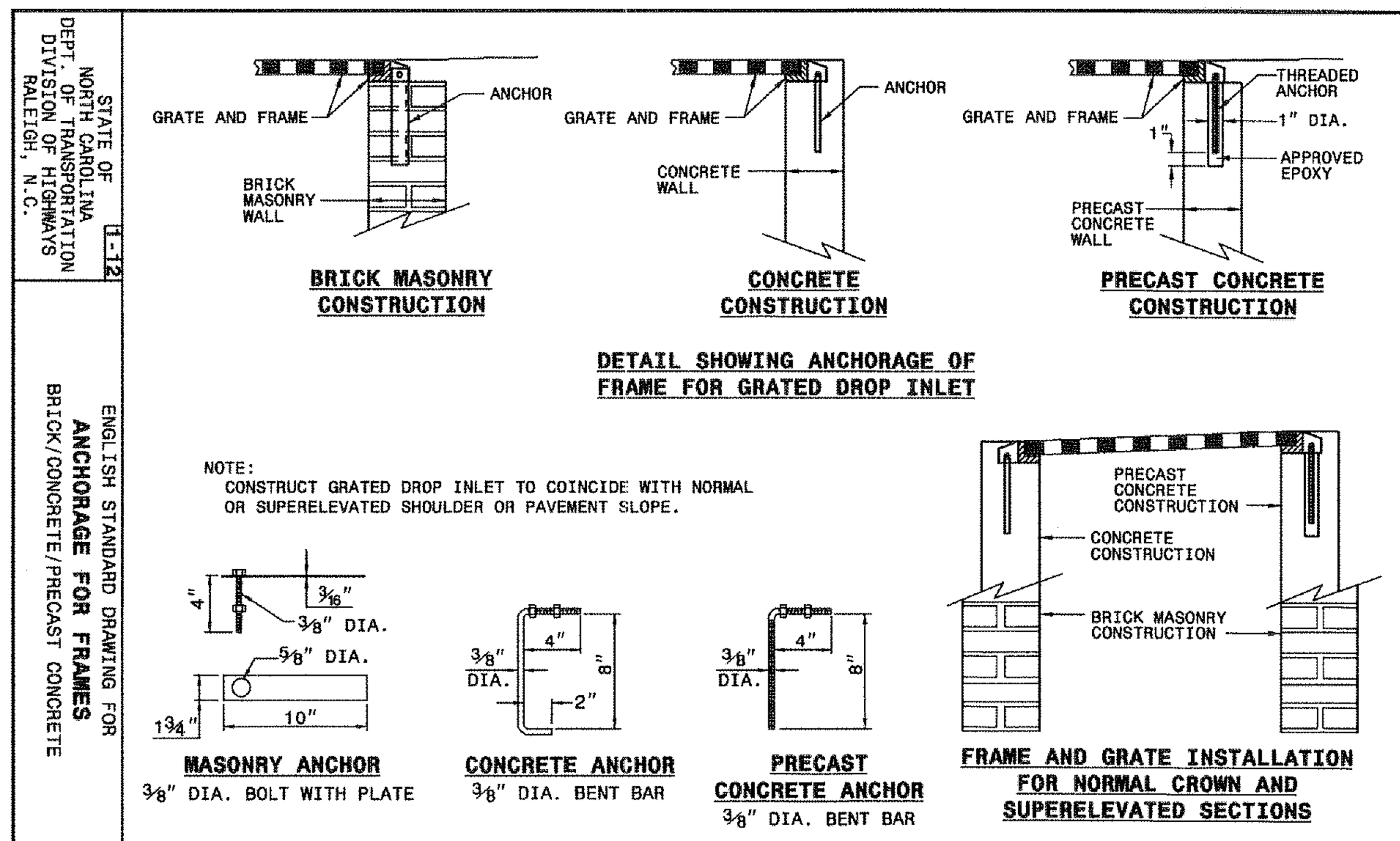
PIPE	SPAN	WIDTH	HEIGHT	CUBIC YARDS OF CONCRETE IN BOX				DEDUCTIONS FOR ONE PIPE	
D	A	B	H	BOTTOM SLAB	H PER FT. HT.	H MIN. TOTAL	TOTAL	C.S.	R.C.
12"	3'-8"	2'-0"	2'-6"	0.362	0.247	0.597	0.958	0.020	0.032
15"	3'-8"	2'-0"	2'-9"	0.362	0.247	0.659	1.021	0.023	0.036
18"	3'-8"	2'-0"	3'-0"	0.362	0.247	0.720	1.082	0.033	0.049
24"	3'-8"	2'-0"	3'-6"	0.362	0.247	0.865	1.227	0.059	0.085
30"	3'-8"	2'-0"	4'-0"	0.362	0.247	0.988	1.350	0.092	0.127
36"	3'-8"	2'-0"	4'-6"	0.362	0.247	1.112	1.474	0.132	0.178

SHEET 1 OF 1 840.18



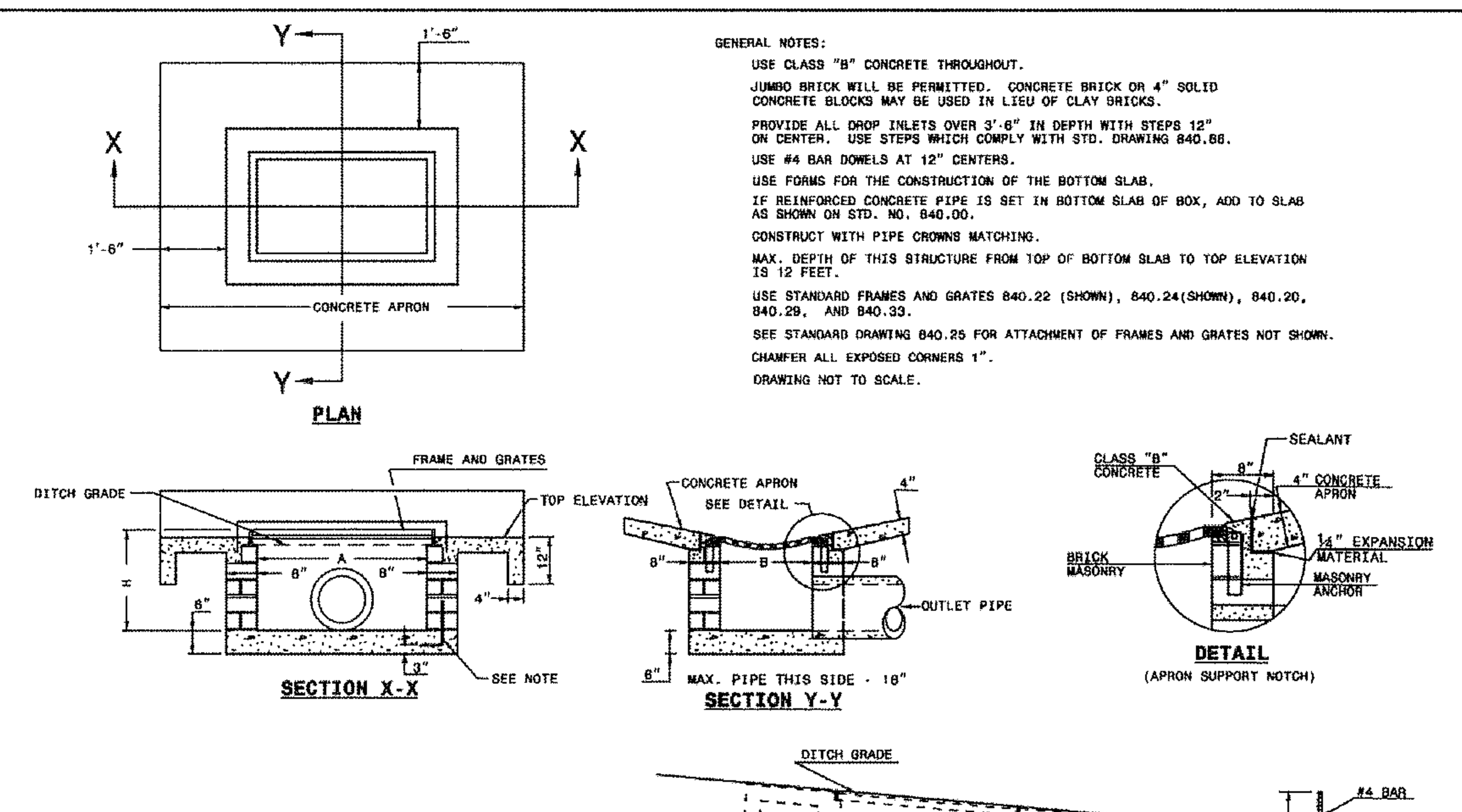
NOTE:
SEE STD. DWG. 840.25 FOR FRAME ANCHORAGE.

SHEET 1 OF 1 840.22


BRICK MASONRY CONSTRUCTION
CONCRETE CONSTRUCTION
PRECAST CONCRETE CONSTRUCTION
DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET
MASONRY ANCHOR
3/8" DIA. BOLT WITH PLATE
CONCRETE ANCHOR
3/8" DIA. BENT BAR
PRECAST CONCRETE ANCHOR
3/8" DIA. BENT BAR
FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS
ENGLISH STANDARD DRAWING FOR
ANCHORAGE FOR FRAMES
BRICK/CONCRETE/PRECAST CONCRETE
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.

SHEET 1 OF 1 840.25

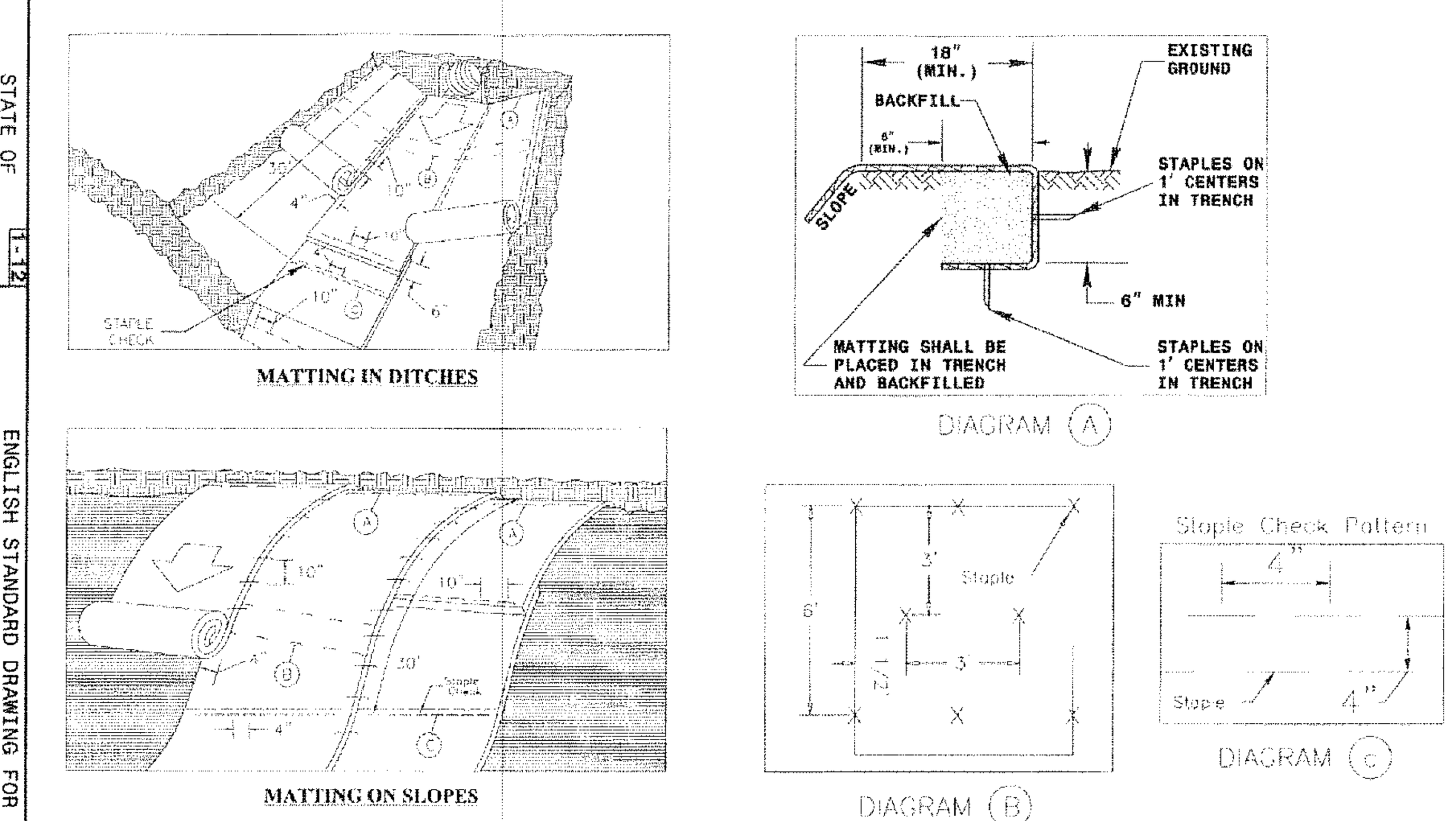


GENERAL NOTES:
USE CLASS "B" CONCRETE THROUGHOUT.
JUMBO BRICK WILL BE PERMITTED. CONCRETE BRICK OR 4" SOLID CONCRETE BLOCKS MAY BE USED IN LIEU OF CLAY BRICKS.
PROVIDE ALL DROP INLETS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.
USE #4 BAR DOWELS AT 12" CENTERS.
USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.
CONSTRUCT WITH PIPE CROWNS MATCHING.
MAX. DEPTH OF THIS STRUCTURE FROM TOP OF BOTTOM SLAB TO TOP ELEVATION IS 12 FEET.
USE STANDARD FRAMES AND GRATES 840.22 (SHOWN), 840.24(SHOWN), 840.20, 840.29, AND 840.33.
SEE STANDARD DRAWING 840.25 FOR ATTACHMENT OF FRAMES AND GRATES NOT SHOWN.
CHAMFER ALL EXPOSED CORNERS 1".
DRAWING NOT TO SCALE.

MINIMUM DIMENSIONS AND QUANTITIES FOR BRICK GRATED DROP INLET

PIPE	SPAN	WIDTH	HEIGHT	CU. YD. OF CONC IN BOX	CU. YD. OF BRICK MASONRY IN BOX		TOTAL CU. YD. IN BOX	DEDUCTIONS FOR ONE PIPE	
D	A	B	H	BOTTOM SLAB	H PER FT. HT.	TOTAL H		C.S.	R.C.
12"	3'-8"	2'-0"	2'-6"	0.309	0.346	0.836	1.145	0.020	0.032
15"	3'-8"	2'-0"	2'-9"	0.309	0.346	0.923	1.232	0.023	0.036
18"	3'-8"	2'-0"	3'-0"	0.309	0.346	1.009	1.318	0.033	0.049
24"	3'-8"	2'-0"	3'-6"	0.309	0.346	1.211	1.520	0.059	0.085
30"	3'-8"	2'-0"	4'-0"	0.309	0.346	1.384	1.693	0.092	0.127
36"	3'-8"	2'-0"	4'-6"	0.309	0.346	1.557	1.866	0.132	0.178

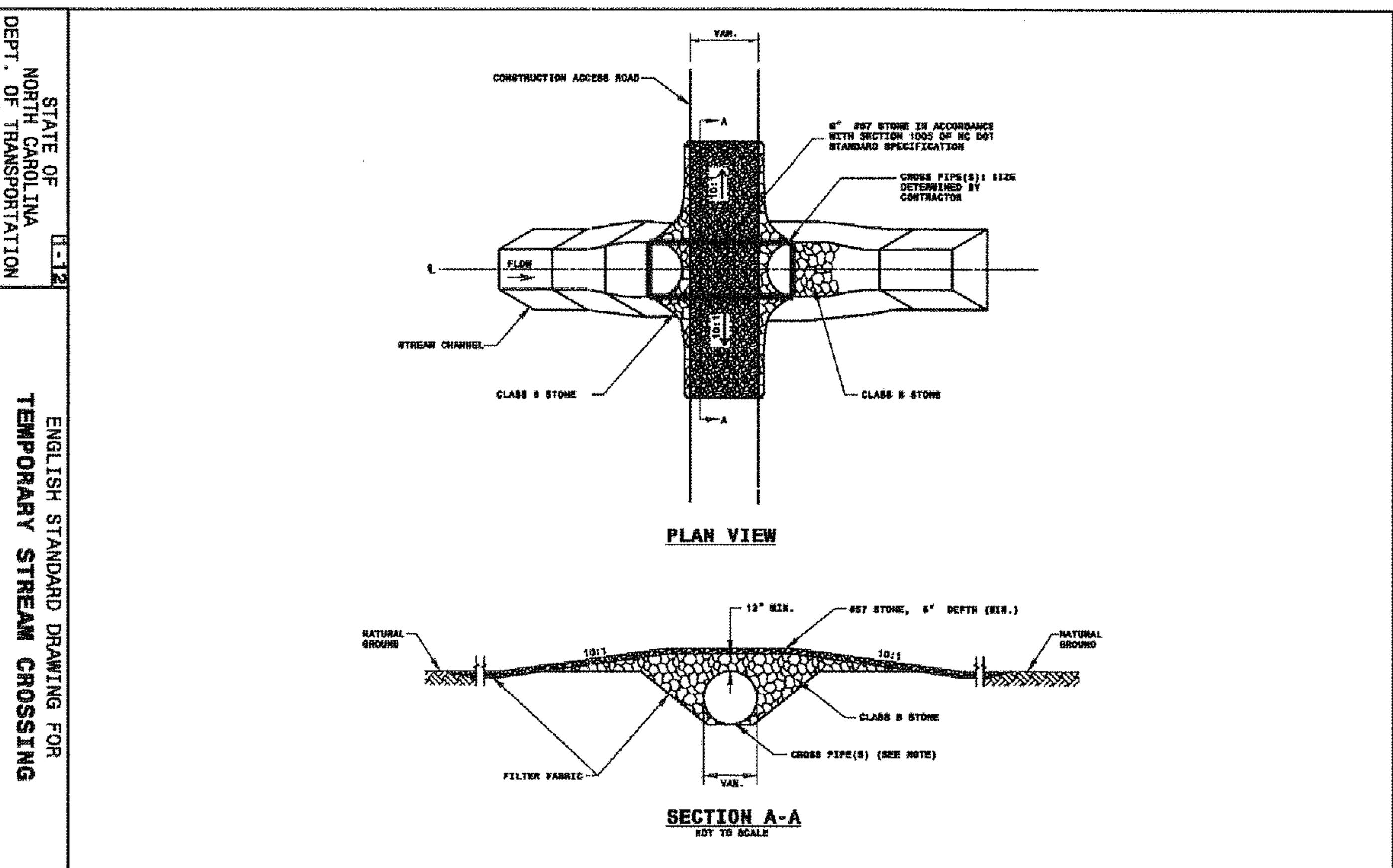
SHEET 1 OF 1 840.27



NOTES:
THIS DETAIL APPLIES TO STRAW, EXCELSIOR, AND PERMANENT SOIL REINFORCEMENT MAT (PSRM) INSTALLATION.
STAPLES SHALL BE NO. 11 GAUGE STEEL WIRE FORMED INTO A "U" SHAPE WITH A MINIMUM THROAT WIDTH OF 1 INCH AND NOT LESS THAN 6 INCHES IN LENGTH.

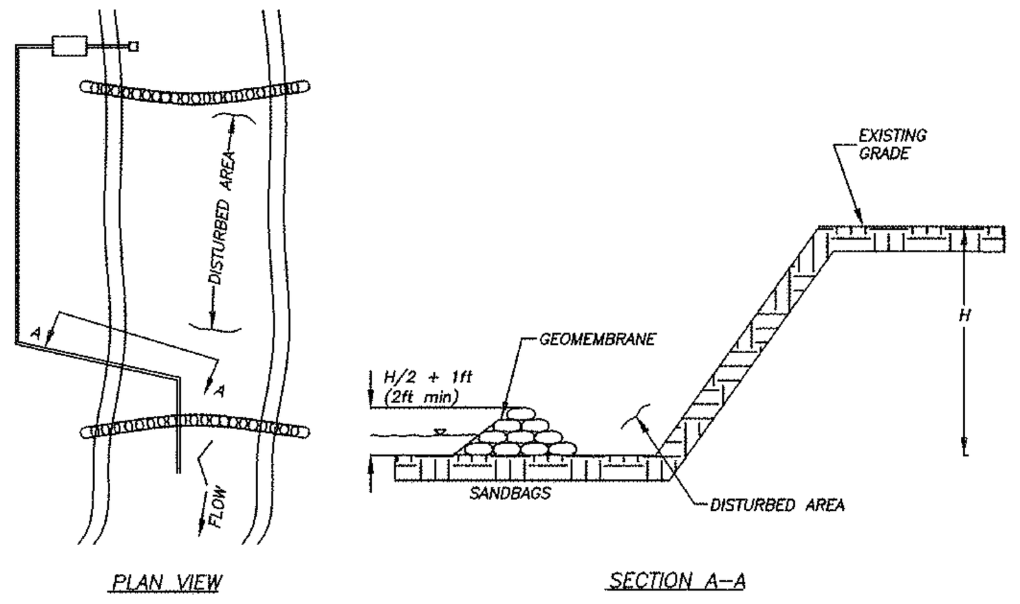
NOT TO SCALE

SHEET 1 OF 1 1631.01



NOTE: PIPE(S) FOR TEMPORARY STREAM CROSSING SHALL BE DESIGNED TO PASS THE PEAK OR BANKFULL FLOW, WHICHEVER IS LESS, FROM A 2-YEAR PEAK STORM, WITHOUT OVER TOPPING.

SHEET 1 OF 1 1645.01



I. DESCRIPTION
THE WORK SHALL CONSIST OF INSTALLING A PUMP AROUND WHEN CONSTRUCTION ACTIVITIES TAKE PLACE WITHIN THE STREAM CHANNEL

II. MATERIAL SPECIFICATIONS
SANDBAGS: SANDBAGS SHALL CONSIST OF MATERIALS WHICH ARE RESISTANT TO ULTRAVIOLET RADIATION, TEARING AND PUNCTURE, AND WOVEN TIGHTLY ENOUGH TO PREVENT LEAKAGE OF FILL MATERIAL (i.e. SAND, FINE GRAVEL, ETC.)

III. CONSTRUCTION REQUIREMENTS
1. ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE INSTALLED AS THE FIRST ORDER OF WORK.
2. THE HEIGHT OF THE SANDBAGS SHALL BE AS INDICATED IN SECTION A–A. THE SANDBAGS SHALL BE PLACED ON A SMOOTH PREPARED SURFACE.
3. ALL EXCAVATED MATERIALS SHALL BE DISPOSED OF OUTSIDE THE 100 YEAR FLOOD PLAIN UNLESS APPROVED ON THE PLANS.
4. ALL DEWATERING OF THE CONSTRUCTION AREA SHALL BE PUMPED TO A DEWATERING PUMP DISCHARGE FILTER BAG OR SILT BASIN.
5. THE PUMP SHALL BE OF SUFFICIENT SIZE TO CONVEY NORMAL STREAM FLOW.
6. SEDIMENT CONTROL DEVICES ARE TO REMAIN IN PLACE UNTIL ALL DISTURBED AREAS ARE STABILIZED AND THE CITY ENGINEERING DEPT APPROVES THEIR REMOVAL.

TEMPORARY CREEK CROSSING PUMP AROUND

NORTH CAROLINA PROFESSIONAL SEAL 039206 ENGINEER S. KYLE SMITH 1-15-14

REVISED 1/15/14 PER NCDOT COMMENTS

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road p.o. box 1179
burlington, n.c. 27215 336/226-5534
Firm's Engineering License No. F-0203

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE
MELVILLE TOWNSHIP - MEBANE, NORTH CAROLINA

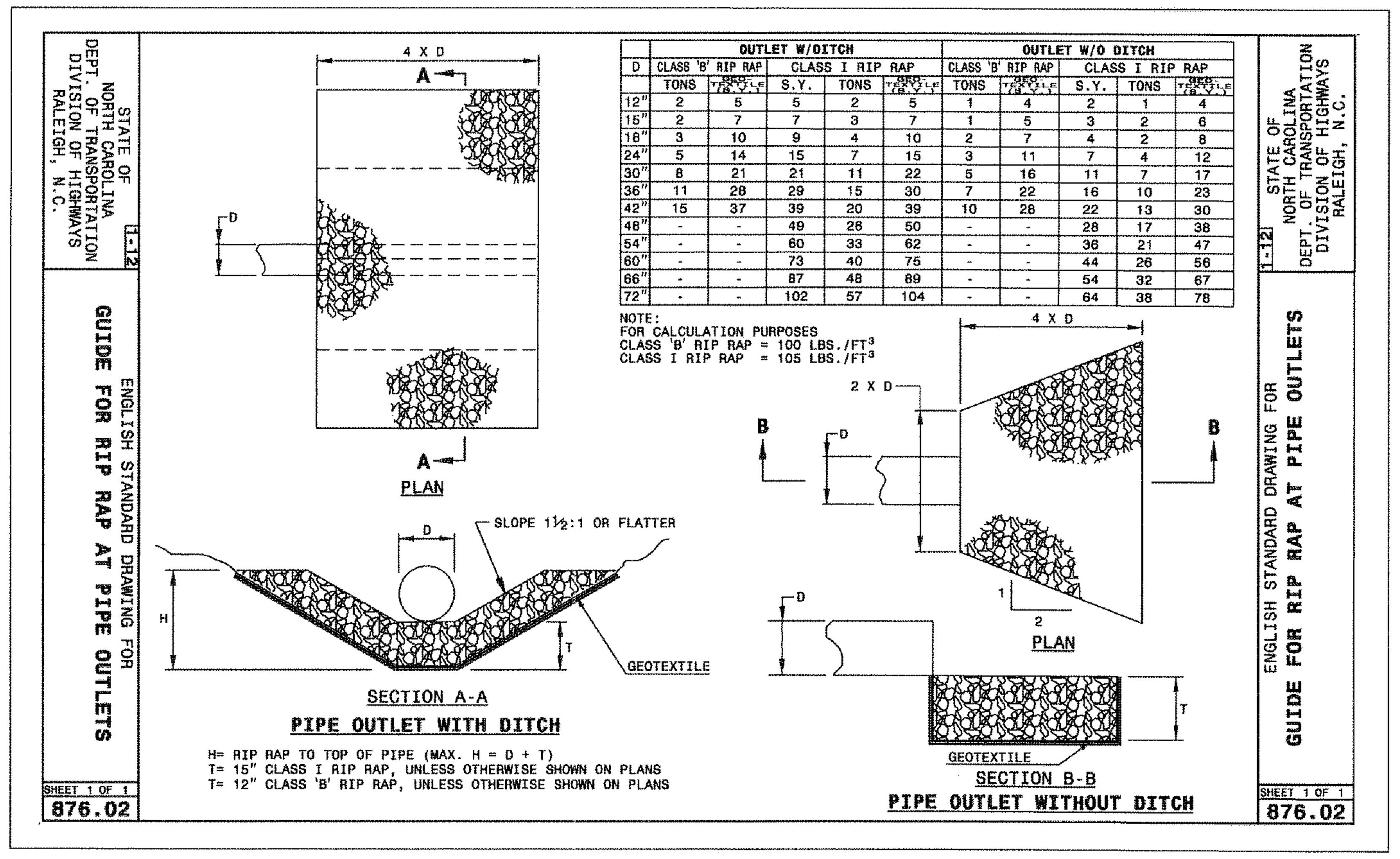
BOOK NO. 412A

NEW ROADWAY IMPROVEMENTS
MEBANE, NORTH CAROLINA

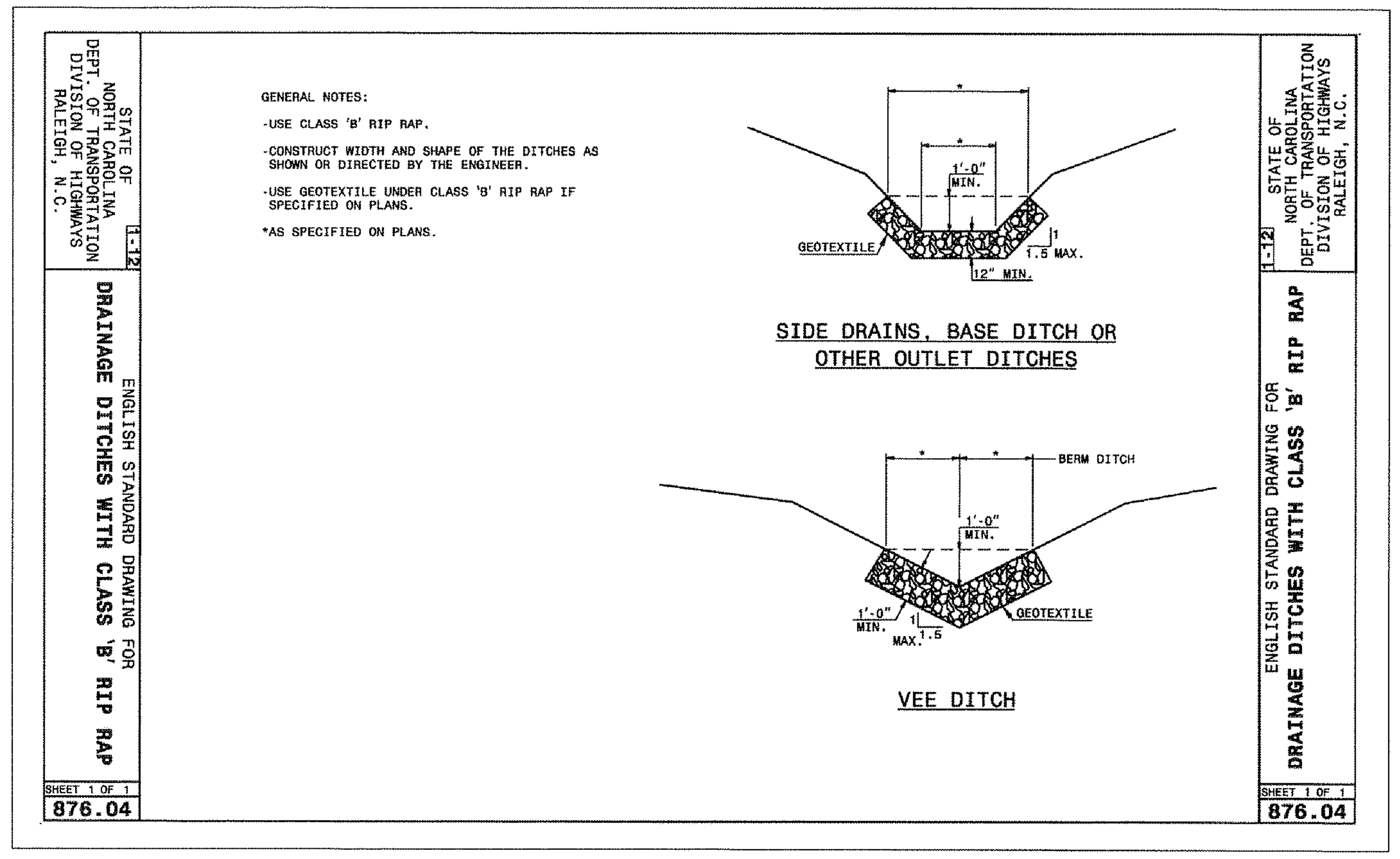
DATE:	12/12/13
COMP FILE:	13097DETAILS.DWG
DRAWN BY:	CHT
CHECKED BY:	FKH

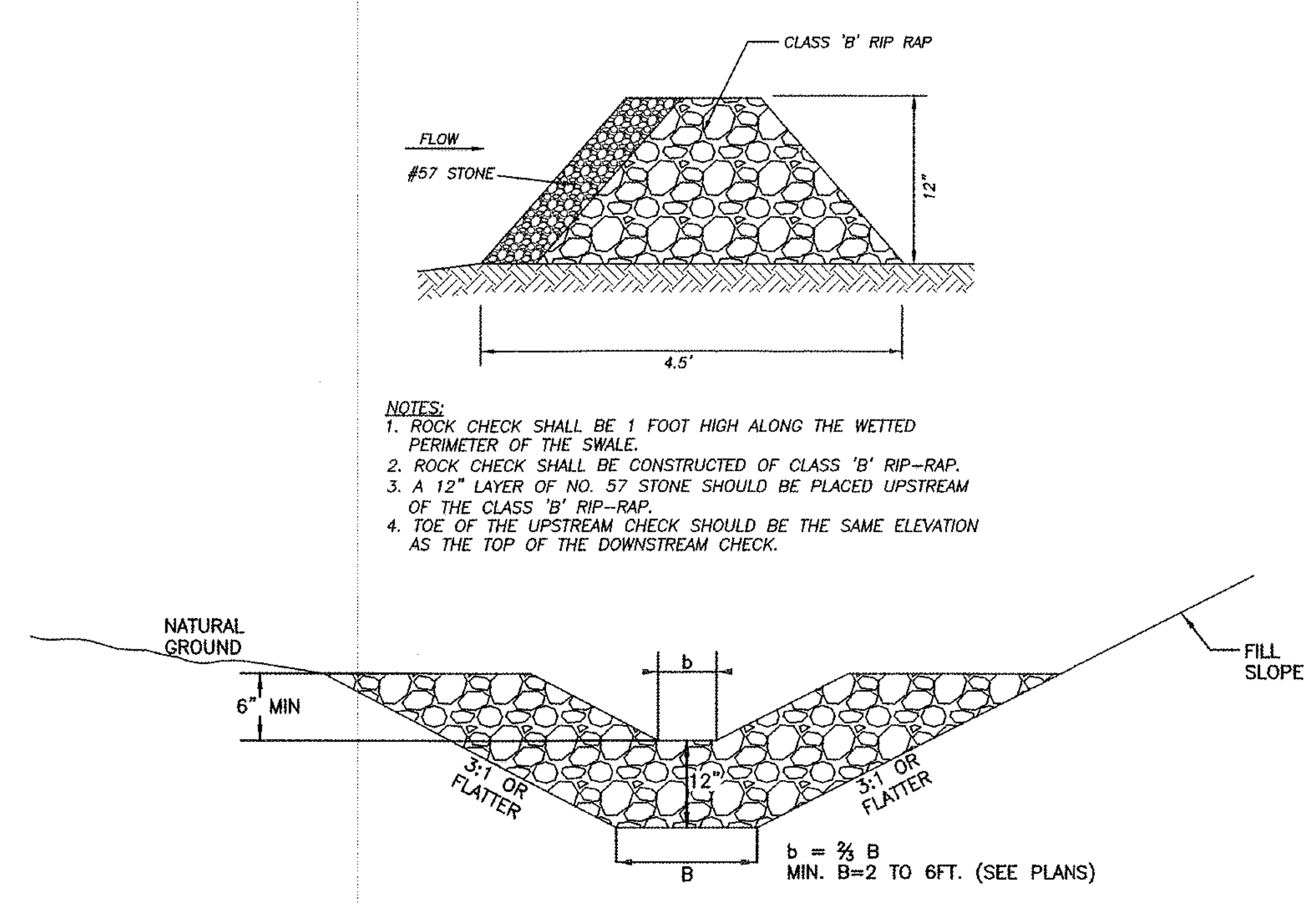
CONSTRUCTION DETAILS

JOB NO. 13097
SHEET NO. 38 OF: 40


STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.
1-12
ENGLISH STANDARD DRAWING FOR
GUIDE FOR RIP RAP AT PIPE OUTLETS
SHEET 1 OF 1
876.02
4 X D
A
D
PLAN
SLOPE 1½:1 OR FLATTER
H
T
GEOTEXTILE
SECTION A-A
PIPE OUTLET WITH DITCH
H= RIP RAP TO TOP OF PIPE (MAX. H = D + T)
T= 15" CLASS I RIP RAP, UNLESS OTHERWISE SHOWN ON PLANS
T= 12" CLASS 'B' RIP RAP, UNLESS OTHERWISE SHOWN ON PLANS
NOTE:
FOR CALCULATION PURPOSES
CLASS 'B' RIP RAP = 100 LBS./FT³
CLASS I RIP RAP = 105 LBS./FT³
2 X D
B
1
2
SECTION B-B
PIPE OUTLET WITHOUT DITCH

D	OUTLET W/DITCH					OUTLET W/O DITCH				
	CLASS 'B' RIP RAP		CLASS I RIP RAP			CLASS 'B' RIP RAP		CLASS I RIP RAP		
	TONS	GEOTEXTILE (S.Y.)	S.Y.	TONS	GEOTEXTILE (S.Y.)	TONS	GEOTEXTILE (S.Y.)	S.Y.	TONS	GEOTEXTILE (S.Y.)
12"	2	5	5	2	5	1	4	2	1	4
15"	2	7	7	3	7	1	5	3	2	6
18"	3	10	9	4	10	2	7	4	2	8
24"	5	14	15	7	15	3	11	7	4	12
30"	8	21	21	11	22	5	16	11	7	17
36"	11	28	29	15	30	7	22	16	10	23
42"	15	37	39	20	39	10	28	22	13	30
48"	-	-	49	26	50	-	-	28	17	38
54"	-	-	60	33	62	-	-	36	21	47
60"	-	-	73	40	75	-	-	44	26	56
66"	-	-	87	48	89	-	-	54	32	67
72"	-	-	102	57	104	-	-	64	38	78


STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.
1-12
ENGLISH STANDARD DRAWING FOR
DRAINAGE DITCHES WITH CLASS 'B' RIP RAP
SHEET 1 OF 1
876.04
GENERAL NOTES:
-USE CLASS 'B' RIP RAP.
-CONSTRUCT WIDTH AND SHAPE OF THE DITCHES AS SHOWN OR DIRECTED BY THE ENGINEER.
-USE GEOTEXTILE UNDER CLASS 'B' RIP RAP IF SPECIFIED ON PLANS.
*AS SPECIFIED ON PLANS.
1'-0" MIN.
GEOTEXTILE
1.5 MAX.
12" MIN.
SIDE DRAINS, BASE DITCH OR OTHER OUTLET DITCHES
BERM DITCH
1'-0" MIN.
GEOTEXTILE
MAX. 1.5
VEE DITCH


CLASS 'B' RIP RAP
FLOW
#57 STONE
12"
4.5'
NOTES:
1. ROCK CHECK SHALL BE 1 FOOT HIGH ALONG THE WETTED PERIMETER OF THE SWALE.
2. ROCK CHECK SHALL BE CONSTRUCTED OF CLASS 'B' RIP-RAP.
3. A 12" LAYER OF NO. 57 STONE SHOULD BE PLACED UPSTREAM OF THE CLASS 'B' RIP-RAP.
4. TOE OF THE UPSTREAM CHECK SHOULD BE THE SAME ELEVATION AS THE TOP OF THE DOWNSTREAM CHECK.
NATURAL GROUND
6" MIN
b
3:1 OR FLATTER
12"
FILL SLOPE
B
b = ⅔ B
MIN. B=2 TO 6FT. (SEE PLANS)

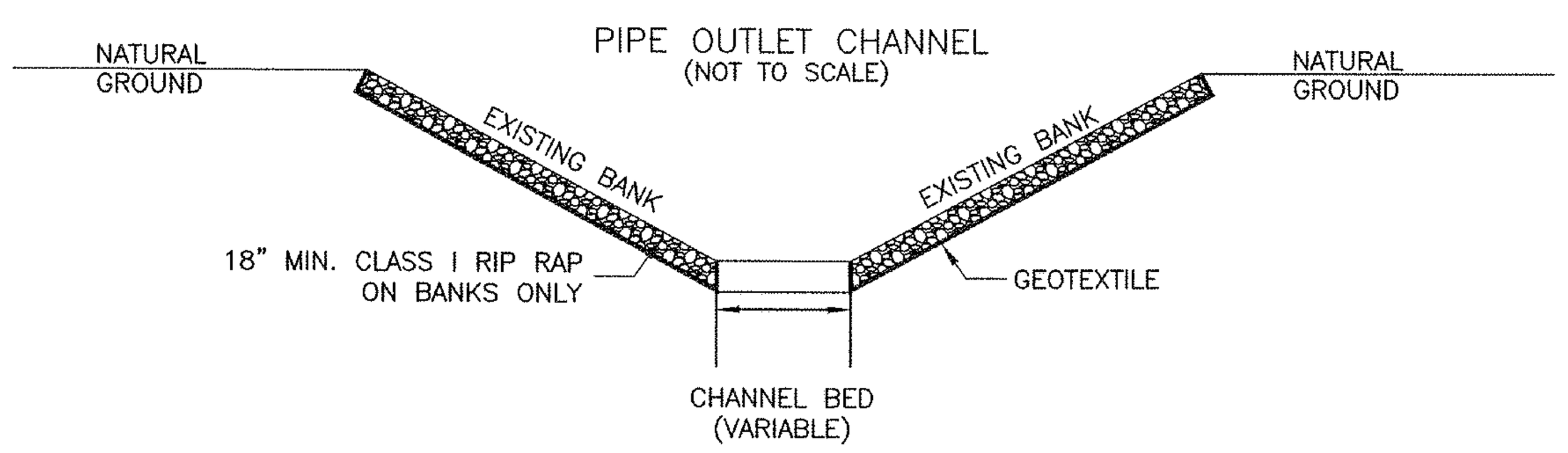
WATER QUALITY ROCK CHECK

(NOT TO SCALE)

RIP-RAP PADS				
SHEET	STATION +/-	RIP-RAP CLASS	ESTIMATED TONS OF RIP-RAP	ESTIMATED GEOTEXTILE FABRIC (SY)
3	3+05 RT	B	2.0	7.0
3	8+49 RT	I	10.0	23.0
5	26+22 LT	B	2.0	7.0
5	32+22 RT	B	2.0	7.0
6	40+78 LT	I	4.3	9.2
6	40+89 RT	B	2.0	7.0
6	41+80 LT	B	2.0	7.0
6	42+04 RT	B	2.0	7.0
7	48+53 LT	B	2.0	7.0
8	64+37 LT	B	2.0	7.0
8	65+26 RT	B	2.0	7.0
8	65+62 RT	I	13.0	30.0
8	66+14 LT	B	2.0	7.0
8	66+14 RT	B	2.0	7.0
9	80+62 RT	I	26.0	56.0
TOTAL ESTIMATED TONS OF CLASS B RIP-RAP			22.0	
TOTAL ESTIMATED TONS OF CLASS I RIP-RAP			53.3	
TOTAL ESTIMATED SQUARE YARDS OF GEOTEXTILE FABRIC				195.2

RIP-RAP CHANNEL						
SHEET NO.	FROM STA. +/-	TO STA. +/-	BOTTOM WIDTH (FT)	LENGTH OF CHANNEL (FT)	ESTIMATED TONS OF CLASS B RIP-RAP	ESTIMATED GEOTEXTILE FABRIC (SY)
4	19+00 LT	19+64 LT	6	64	32	71
4	19+14 RT	19+69 RT	6	55	28	61
4	19+69 LT	20+35 LT	2	66	20	44
4	19+74 RT	20+19 RT	2	45	14	30
6	40+17 LT	40+70 LT	4.5	53	23	50
6	40+47 RT	40+84 RT	2	37	11	25
7	48+46 RT	48+98 RT	2	52	16	35
7	49+05 RT	49+86 RT	2	81	24	54
7	54+09 LT	55+16 LT	6	115	54	119
7	54+16 RT	55+44 RT	2	148	38	85
8	63+26 LT	64+33 LT	2	123	32	71
8	63+48 RT	65+23 RT	2	180	53	117
8	66+18 LT	66+53 LT	2	51	11	23
8	67+62 LT		VARIES	16	8	17
8	66+18 RT	67+00 RT	2	92	25	55
8	67+63 RT	67+80 RT	2	31	5	11
10	87+42	89+14	VARIES	172	77	171
ESTIMATED TOTALS					469	1039

WATER QUALITY ROCK CHECKS					
SHEET NO.	FROM STA. +/-	TO STA. +/-	AVERAGE DISTANCE BETWEEN ROCK CHECKS (FT)	NUMBER OF CHECKS	ESTIMATED TONS OF CLASS B RIP-RAP
4	20+47	20+92 LT	8	4	3.6
4	21+16 LT		NA	1	0.9
4	20+37 RT		NA	1	0.9
4	20+58	20+91 RT	9.5	3	2.7
4	21+07 RT		NA	1	0.9
6	38+82	39+76 LT	23.75	4	5.9
6	40+05 LT		NA	1	1.5
6	40+17 RT		NA	1	0.9
6	40+29	40+42 RT	4	2	1.8
6	41+95	42+24 LT	8	3	2.7
6	42+18	43+33 RT	14	7	6.3
7	47+69	47+83 LT	5.25	2	1.8
7	47+95	48+14 LT	5	2	1.8
7	48+34 LT		NA	1	0.9
7	47+87	48+36 RT	9	4	3.6
7	49+29	49+73 LT	15.25	3	2.7
7	49+99 LT		NA	1	0.9
9	77+86	78+58 LT	29.25	3	5.4
9	78+85	79+90 LT	14.5	6	10.8
9	79+16	79+37 RT	12	2	1.8
9	79+56	80+43 RT	7.25	8	7.2
TOTAL ESTIMATED TONS OF CLASS B RIP-RAP					64.9



PIPE OUTLET CHANNEL						
SHEET	STATION +/-	STREAM IDENTIFIER	AVERAGE LENGTH (FT)	AVERAGE WIDTH (FT)	ESTIMATED TONS OF CLASS I RIP-RAP	ESTIMATED GEOTEXTILE FABRIC (SY)
3 & 11	-Y- 4+55 RT	SA	11.67	3	5.5	7.8
4	19+73 RT	SB	10	3	4.7	6.7
6	41+05 RT	SC	6.53	2	2.1	2.9
7	49+03 RT	SH	7.89	2	2.5	3.5
7	54+09 RT	SK	4.62	3	2.2	3.1
ESTIMATED TOTALS					17.0	23.9

NORTH CAROLINA PROFESSIONAL SEAL 039206 ENGINEER S. KYLE SMITH

1-15-14

[illegible]

REVISED 1/15/14 PER NCDOT COMMENTS

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road p.o. box 1179
burlington, n.c. 27215 336/226-5534
Firm's Engineering License No. F-0203

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE

MELVILLE TOWNSHIP - MEBANE, NORTH CAROLINA

BOOK NO. 412A

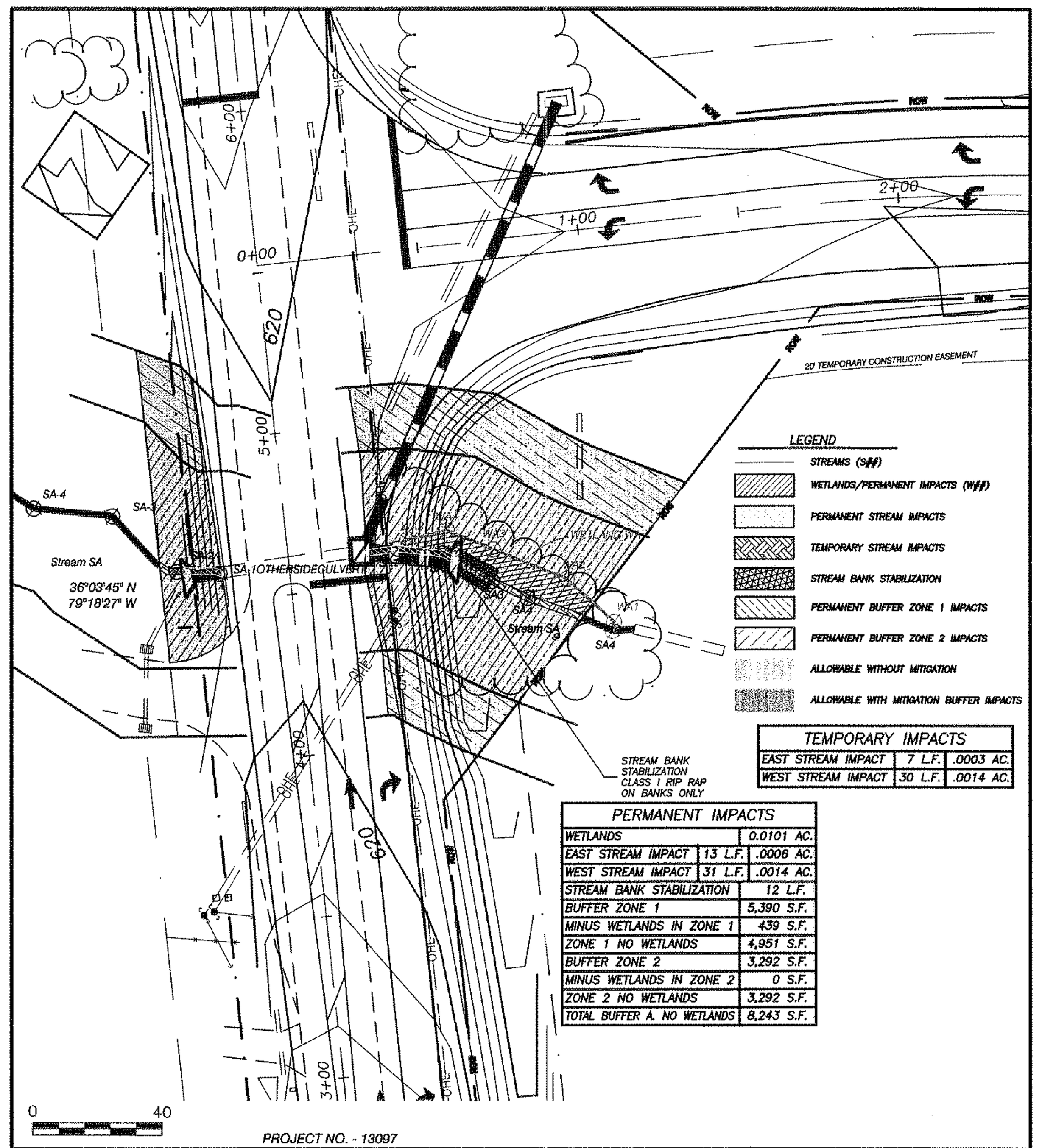
NEW ROADWAY IMPROVEMENTS

MEBANE, NORTH CAROLINA

DATE: 12/12/13
COMP FILE: 13097DETAILS.DWG
DRAWN BY: CHT
CHECKED BY: FKH

CONSTRUCTION DETAILS

JOB NO. 13097



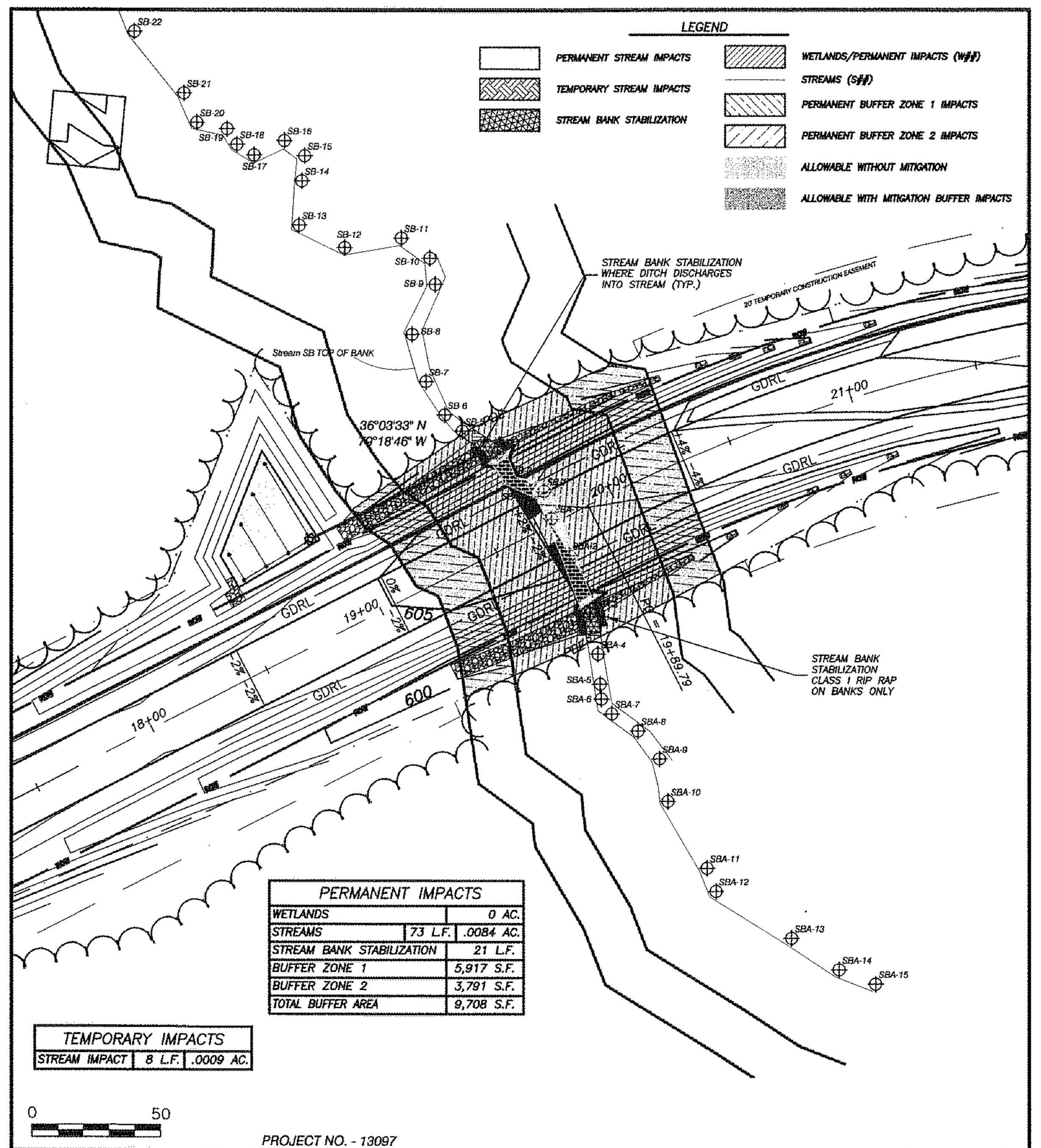
TEMPORARY IMPACTS		
EAST STREAM IMPACT	7 L.F.	.0003 AC.
WEST STREAM IMPACT	30 L.F.	.0014 AC.

PERMANENT IMPACTS		
WETLANDS		0.0101 AC.
EAST STREAM IMPACT	13 L.F.	.0006 AC.
WEST STREAM IMPACT	31 L.F.	.0014 AC.
STREAM BANK STABILIZATION		12 L.F.
BUFFER ZONE 1		5,390 S.F.
MINUS WETLANDS IN ZONE 1		439 S.F.
ZONE 1 NO WETLANDS		4,951 S.F.
BUFFER ZONE 2		3,292 S.F.
MINUS WETLANDS IN ZONE 2		0 S.F.
ZONE 2 NO WETLANDS		3,292 S.F.
TOTAL BUFFER A. NO WETLANDS		8,243 S.F.

PROJECT NO. - 13097

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road, burlington, n.c. 27215 — p.o. box 1179, 336/226-5534
Firm's Engineering License No. F-0203

NEW ROADWAY IMPACTS FOR :
ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE
MELVILLE TWSP., ALAMANCE COUNTY, N.C.
SCALE: 1" = 40' DATE: 1/8/2014 DWG. BY MHW
SHEET NO.: 1 OF 7



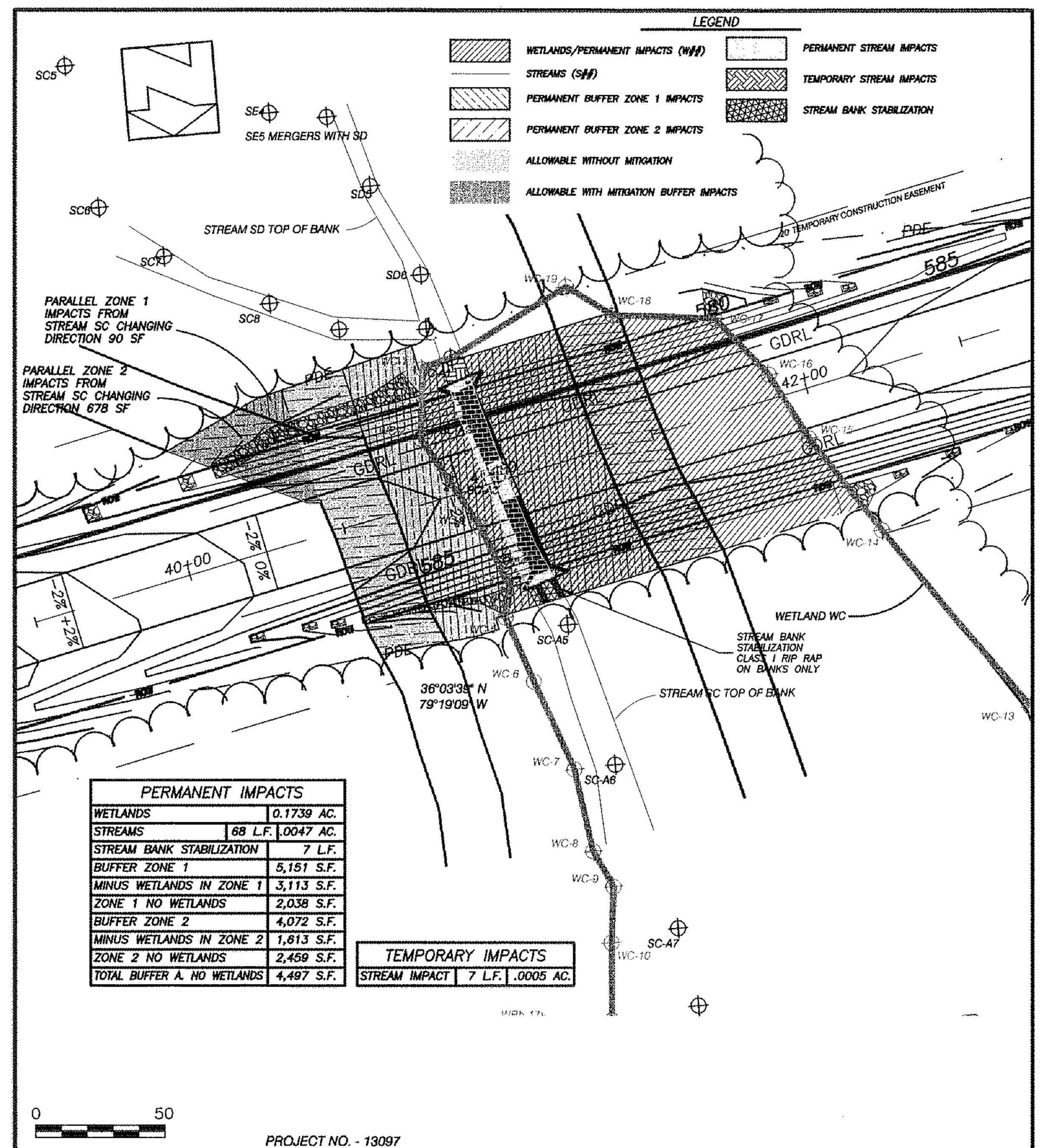
PERMANENT IMPACTS		
WETLANDS		0 AC.
STREAMS	73 L.F.	.0084 AC.
STREAM BANK STABILIZATION		21 L.F.
BUFFER ZONE 1		5,917 S.F.
BUFFER ZONE 2		3,791 S.F.
TOTAL BUFFER AREA		9,708 S.F.

TEMPORARY IMPACTS		
STREAM IMPACT	8 L.F.	.0009 AC.

PROJECT NO. - 13097

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road, burlington, n.c. 27215 — p.o. box 1179, 336/226-5534
Firm's Engineering License No. F-0203

NEW ROADWAY IMPACTS FOR :
ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE
MELVILLE TWSP., ALAMANCE COUNTY, N.C.
SCALE: 1" = 50' DATE: 1/8/2014 DWG. BY MHW
SHEET NO.: 2 OF 7



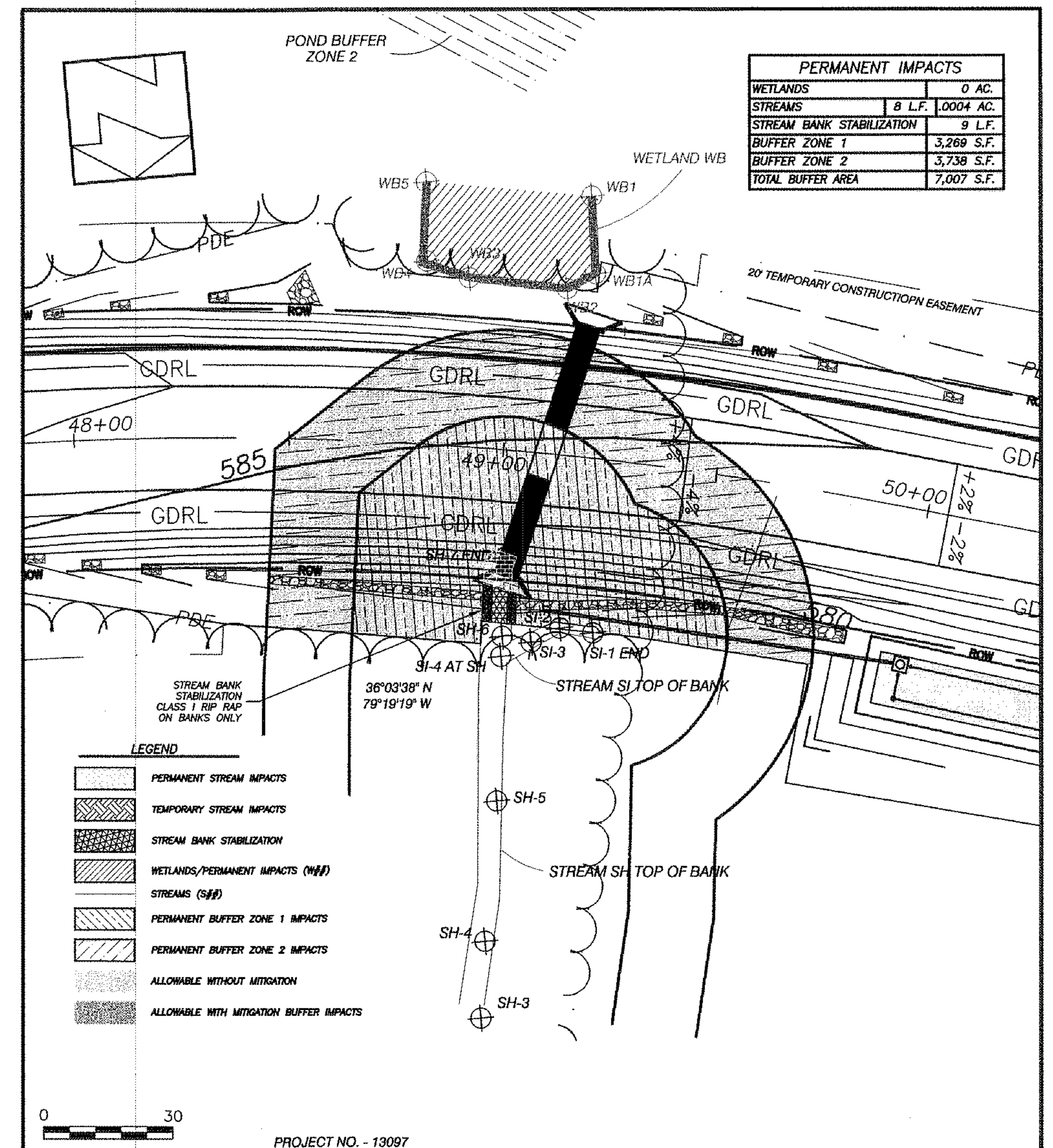
PERMANENT IMPACTS		
WETLANDS		0.1739 AC.
STREAMS	68 L.F.	.0047 AC.
STREAM BANK STABILIZATION		7 L.F.
BUFFER ZONE 1		5,151 S.F.
MINUS WETLANDS IN ZONE 1		3,113 S.F.
ZONE 1 NO WETLANDS		2,038 S.F.
BUFFER ZONE 2		4,072 S.F.
MINUS WETLANDS IN ZONE 2		1,613 S.F.
ZONE 2 NO WETLANDS		2,459 S.F.
TOTAL BUFFER A. NO WETLANDS		4,497 S.F.

TEMPORARY IMPACTS		
STREAM IMPACT	7 L.F.	.0005 AC.

PROJECT NO. - 13097

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road, burlington, n.c. 27215 — p.o. box 1179, 336/226-5534
Firm's Engineering License No. F-0203

NEW ROADWAY IMPACTS FOR :
ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE
MELVILLE TWSP., ALAMANCE COUNTY, N.C.
SCALE: 1" = 40' DATE: 1/8/2014 DWG. BY MHW
SHEET NO.: 3 OF 7



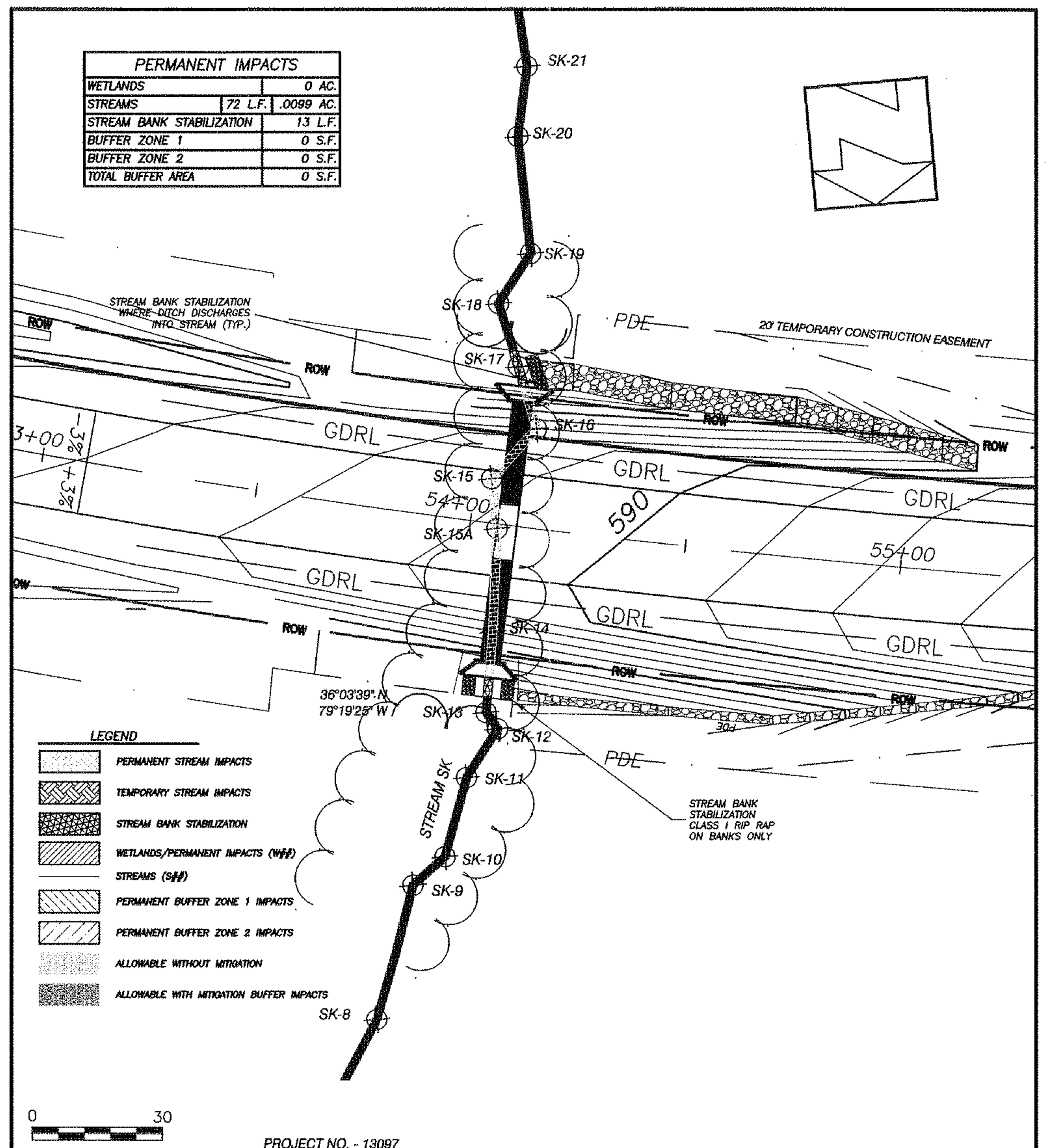
PERMANENT IMPACTS		
WETLANDS		0 AC.
STREAMS	8 L.F.	.0004 AC.
STREAM BANK STABILIZATION		9 L.F.
BUFFER ZONE 1		3,269 S.F.
BUFFER ZONE 2		3,738 S.F.
TOTAL BUFFER AREA		7,007 S.F.

PROJECT NO. - 13097

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road, burlington, n.c. 27215 — p.o. box 1179, 336/226-5534
Firm's Engineering License No. F-0203

NEW ROADWAY IMPACTS FOR :
ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE
MELVILLE TWSP., ALAMANCE COUNTY, N.C.
SCALE: 1" = 30' DATE: 1/8/2014 DWG. BY MHW
SHEET NO.: 4 OF 7

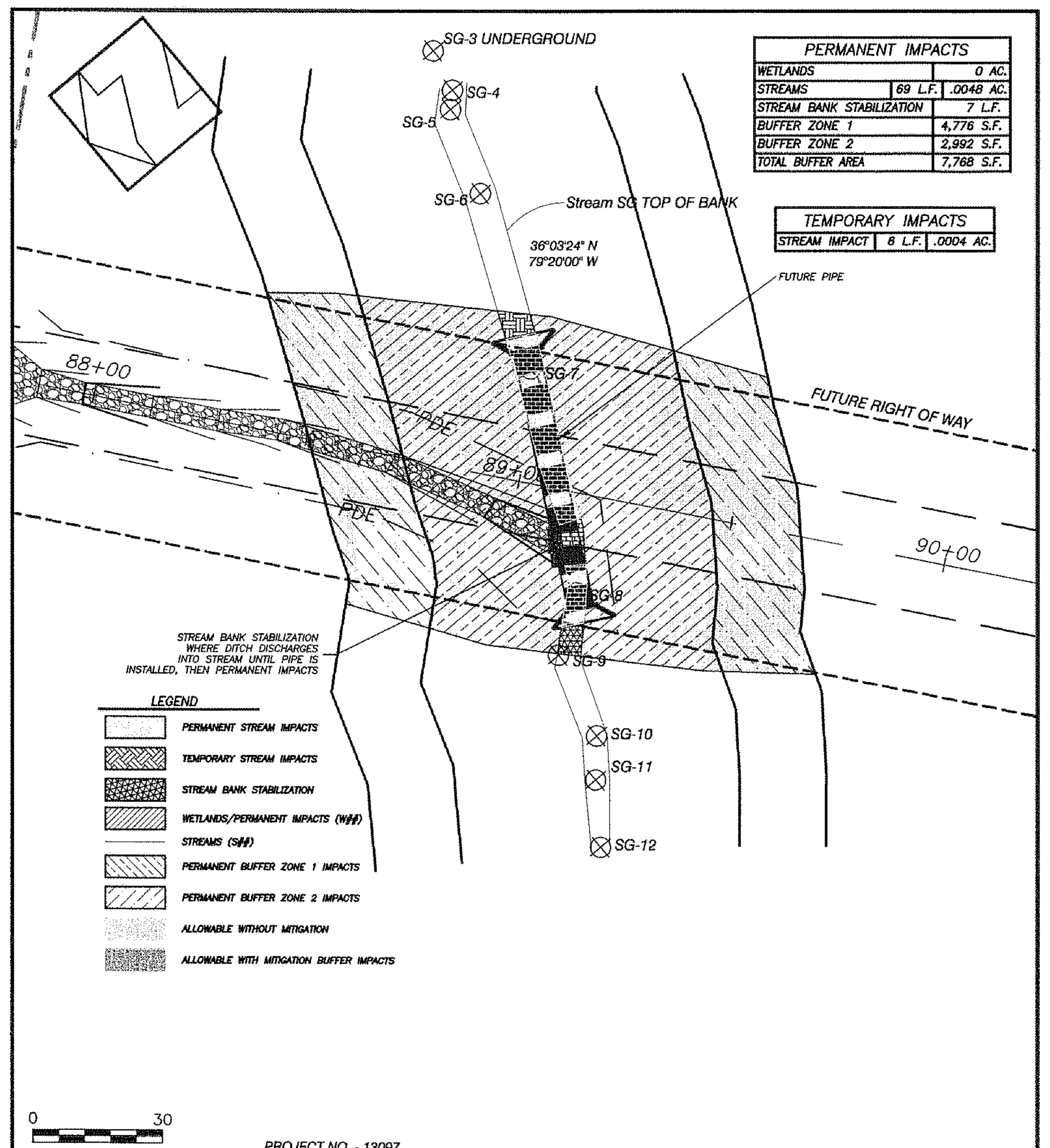
PERMANENT IMPACTS		
WETLANDS		0 AC.
STREAMS	72 L.F.	.0099 AC.
STREAM BANK STABILIZATION		13 L.F.
BUFFER ZONE 1		0 S.F.
BUFFER ZONE 2		0 S.F.
TOTAL BUFFER AREA		0 S.F.



PROJECT NO. - 13097

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road, burlington, n.c. 27215 — p.o. box 1179, 336/226-5534
Firm's Engineering License No. F-0203

NEW ROADWAY IMPACTS FOR :
ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE
MELVILLE TWSP., ALAMANCE COUNTY, N.C.
SCALE: 1" = 30' DATE: 1/8/2014 DWG. BY MHW
SHEET NO.: 5 OF 7



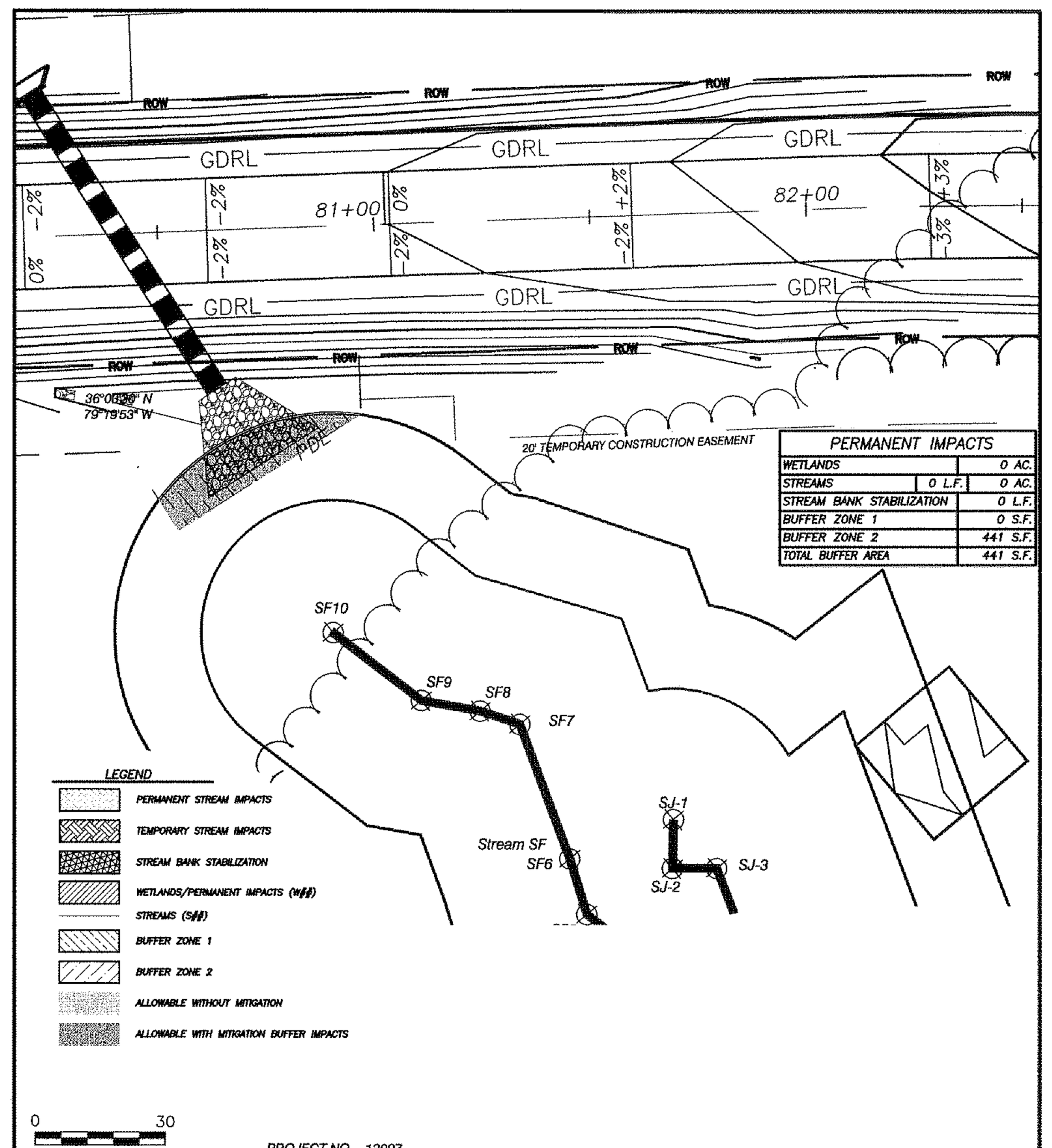
PERMANENT IMPACTS		
WETLANDS		0 AC.
STREAMS	69 L.F.	.0048 AC.
STREAM BANK STABILIZATION		7 L.F.
BUFFER ZONE 1		4,776 S.F.
BUFFER ZONE 2		2,992 S.F.
TOTAL BUFFER AREA		7,768 S.F.

TEMPORARY IMPACTS		
STREAM IMPACT	8 L.F.	.0004 AC.

PROJECT NO. - 13097

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road, burlington, n.c. 27215 — p.o. box 1179, 336/226-5534
Firm's Engineering License No. F-0203

NEW ROADWAY IMPACTS FOR :
ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE
MELVILLE TWSP., ALAMANCE COUNTY, N.C.
SCALE: 1" = 30' DATE: 1/8/2014 DWG. BY MHW
SHEET NO.: 6 OF 7



PERMANENT IMPACTS		
WETLANDS		0 AC.
STREAMS	0 L.F.	0 AC.
STREAM BANK STABILIZATION		0 L.F.
BUFFER ZONE 1		0 S.F.
BUFFER ZONE 2		441 S.F.
TOTAL BUFFER AREA		441 S.F.

PROJECT NO. - 13097

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road, burlington, n.c. 27215 — p.o. box 1179, 336/226-5534
Firm's Engineering License No. F-0203

NEW ROADWAY IMPACTS FOR :
ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE
MELVILLE TWSP., ALAMANCE COUNTY, N.C.
SCALE: 1" = 30' DATE: 1/8/2014 DWG. BY MHW
SHEET NO.: 7 OF 7

Waters of the US Impacts

Water of the US	Crossing Number	Latitude	Longitude	DWR Stream Classification & USACE Wetland Classification	USACE Compensatory Mitigation Required	DWR Compensatory Mitigation Required	Impacted Length (lf)	Impacted Area (ac)	Temporary Stream Impacts (lf)	Bank Stabilization (lf)
SA*	1	36°03'45" N	79°18'27" W	Intermittent	1:1	1:1	13	0.0006	7	0
SA*	1	36°03'45" N	79°18'27" W	Perennial	2:1	1:1	31	0.0014	30	12
SB*	2	36°03'33" N	79°18'46" W	Perennial	2:1	1:1	73	0.0084	8	21
SC*	3	36°03'39" N	79°19'09" W	Perennial	2:1	1:1	68	0.0047	7	7
SD				Perennial	Avoided (No Impacts)	Avoided (No Impacts)	0	0.0000	0	0
SE				Intermittent	Avoided (No Impacts)	Avoided (No Impacts)	0	0.0000	0	0
SF	(Sheet 7)	36°03'30" N	79°19'53" W	Intermittent	Avoided (No Impacts)	Avoided (No Impacts)	0	0.0000	0	0
SG**	6	36°03'24" N	79°20'00" W	Intermittent	No Mitigation Required	1:1	69	0.0048	6	7
SH*	4	36°03'38" N	79°19'19" W	Intermittent	1:1	1:1	8	0.0004	0	9
SI				Intermittent	Avoided (No Impacts)	Avoided (No Impacts)	0	0.0000	0	0
SJ				Intermittent	Avoided (No Impacts)	Avoided (No Impacts)	0	0.0000	0	0
SK**	5	36°03'39" N	79°19'25" W	Intermittent	No Mitigation Required	No Mitigation Required	72	0.0099	0	13
WA**	1	36°03'45" N	79°18'27" W	Non-Tidal Freshwater Marsh / Headwater Forest	2:1	N/A	N/A	0.0101	N/A	N/A
WB				Non-Tidal Freshwater Marsh	Avoided (No Impacts)	N/A	N/A	0.0000	N/A	N/A
WC**	3	36°03'39" N	79°19'09" W	Non-Tidal Freshwater Marsh	2:1	N/A	N/A	0.1739	N/A	N/A
Total Bank Stabilization (lf)										69
Total Temporary Stream Impacts (lf)										58
Total Intermittent Stream Impacts (lf)										162
Total Perennial Stream Impacts (lf)										172
Total Stream Impacts (lf)										461
*Total Stream Impacts Counted Towards NWP 39 Threshold (lf)										193
**Total Waters of the US Counted Towards NWP 39 Threshold (ac)										0.2141

Permanent Bufer Impacts

Water of the US	Zone 1 Impact (sq ft)	*minus* Wetlands in Zone 1 (sq ft)	= Zone 1 Buffers (not wetlands) (sq ft)	Zone 1 Buffer Mitigation Required (using 3:1 ratio) (sf)	Zone 2 Impact (sq ft)	*minus* Wetlands in Zone 2 (sq ft)	= Zone 2 Buffers (not wetlands) (sq ft)	Zone 2 Buffer Mitigation Required (using 1.5:1 ratio) (sf)
SA*	1,126	0	1,126	Not Reqired	474	0	474	Not Reqired
SA*	4,264	439	3,825	Not Reqired	2,818	0	2,818	Not Reqired
SB*	5,917	0	5,917	Not Reqired	3,791	0	3,791	Not Reqired
SC*	5,061	3,113	1,948	Not Reqired	3,394	1,613	1,781	Not Reqired
SC*	90	0	90	270	678	0	678	1017
SD	0	0	0	Not Reqired	0	0	0	Not Reqired
SE	0	0	0	Not Reqired	0	0	0	Not Reqired
SF	0	0	0	Not Reqired	441	0	441	662
SG**	4,776	0	4,776	Not Reqired	2,992	0	2,992	Not Reqired
SH*	3,269	0	3,269	Not Reqired	3,738	0	3,738	Not Reqired
SI	0	0	0	Not Reqired	0	0	0	Not Reqired
SJ	0	0	0	Not Reqired	0	0	0	Not Reqired
SK**	0	0	0	Not Reqired	0	0	0	Not Reqired
Totals	24,503	3,552	20,951	270	18,326	1,613	16,713	1,679

NORTH CAROLINA PROFESSIONAL SEAL 039206 ENGINEER S. KYLE SMITH 1-15-14

REVISED 1/15/14 PER NCDOT COMMENTS

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road, burlington, n.c. 27215 — p.o. box 1179, 336/226-5534
Firm's Engineering License No. F-0203

ALAMANCE INTERSTATE CORRIDOR DEVELOPMENT ZONE

MELVILLE TOWNSHIP - MEBANE, NORTH CAROLINA

BOOK NO. 412A

NEW ROADWAY IMPROVEMENTS

MEBANE, NORTH CAROLINA

DATE: 12/12/13
COMP FILE: 13097_Roadway Impacts.dwg
DRAWN BY: CHT
CHECKED BY: FKH

IMPACT DRAWINGS

JOB NO. 13097
SHEET NO. 40 OF: 40