

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAT L. MCCRORY
GOVERNOR

ANTHONY J. TATA
SECRETARY

November 10, 2014

U.S. Army Corps of Engineers
Regulatory Field Office
151 Patton Avenue, Room 208
Asheville, NC 28801-5006

ATTN: Ms. Lori Beckwith
NCDOT Coordinator

Subject: **Application for Section 404 Nationwide Permits 13, 23, 33 and Section 401 Water Quality Certification** for the Replacement of Bridge 17 on US 221 over the Second Broad River, McDowell County, Federal Aid Project No. BRNHS-221(10); Division 13; TIP No. B-3673; \$570.00 debit WBS No. 33217.1.1.

Dear Madam:

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge 17 on US 221 with a 4 span, 320' prestressed concrete girder bridge on a new alignment to the west of the existing bridge. The existing bridge will be utilized as an onsite detour during construction. The new bridge alignment will lead to the reconfiguration of the approaches north and south of the new bridge which will necessitate the relocation of three streams into new longer culverts in the project footprint. There will be 708 lf of permanent impacts to surface waters consisting of 412 lf from roadway fill and 296 lf from bank stabilization. There will be 0.08 acre of temporary impacts to surface waters resulting from dewatering and three temporary causeways (Please refer to Table 1 below).

Please see enclosed copies of the Pre-Construction Notification (PCN), EEP Acceptance Letter, Stormwater Management Plan, Permit Drawings, Roadway Plansheets. A Categorical Exclusion (CE) was completed in April 2013 and distributed shortly thereafter. Additional copies are available upon request.

Comments from the North Carolina Wildlife Resources Commission (NCWRC) will be required prior to authorization by the Corps of Engineers. By copy of this letter and attachment, NCDOT hereby requests NCWRC review. NCDOT requests that NCWRC forward their comments to the Corps of Engineers and the NCDOT within 30 calendar days of receipt of this application.

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

Table 1. B-3673 Final Design Stream Impacts

Permit Site No.	Stream Name	Impact Type	Impact Length (linear feet)	USACE Mitigation	NCDWQ Mitigation
1	UT to Second Broad River	Perm. Fill	75	75	
		Bank Stabilization	--		
		Temp. Fill	28		
2	Second Broad River	Perm. Fill	20	20	
		Bank Stabilization	--		
		Temp. Fill	--		
3	UT to Second Broad River	Perm. Fill	182	182	182
		Bank Stabilization			
		Temp. Fill	19		
4	UT to Second Broad River	Perm. Fill	135	135	
		Bank Stabilization	--		
		Temp. Fill	10		
5	Second Broad River	Perm. Fill	--		
		Bank Stabilization	--		
		Temp. Fill	36		
6	Second Broad River	Perm. Fill	--		
		Bank Stabilization	107		107
		Temp. Fill	231		
7	UT to Second Broad River	Perm. Fill	--		
		Bank Stabilization	71		
		Temp. Fill	--		
8	Second Broad River	Perm. Fill	--		
		Bank Stabilization	118		118
		Temp. Fill	--		

Total Permanent Impacts (Perm. Fill +Bank Stabilization):	708		
Total Temporary Impacts (Linear feet)	324		
Impacts requiring Mitigation by USACE (2:1):		412	
Impact requiring Mitigation by NCDWQ (1:1):			407

This project calls for a letting date of April 21, 2015 and a review date of March 3, 2015; however, the let date may advance as additional funding becomes available.

A copy of this permit application and its distribution list will be posted on the NCDOT Website at: <http://connect.ncdot.gov/resources/Environmental>. If you have any questions or need additional information, please call Jeff Hemphill at (919) 707-6126.

Sincerely,

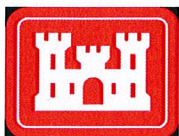


for

Richard W. Hancock, P.E., Manager
Project Development and Environmental Analysis Unit

cc:

NCDOT Permit Application Standard Distribution List



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: 13, 23, 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 ☒ 401 Water Quality Certification – Express ☐ Non-404 Jurisdictional General Permit ☐ 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:	Replacement of Bridge 17 on US 221 over the Second Broad River
2b. County:	McDowell
2c. Nearest municipality / town:	Marion
2d. Subdivision name:	not applicable
2e. NCDOT only, T.I.P. or state project no:	B-3673

3. Owner Information

3a. Name(s) on Recorded Deed:	North Carolina Department of Transportation
3b. Deed Book and Page No.	not applicable
3c. Responsible Party (for LLC if applicable):	not applicable
3d. Street address:	1598 Mail Service Center
3e. City, state, zip:	Raleigh, NC 27699-1598
3f. Telephone no.:	(919) 707-6126
3g. Fax no.:	(919) 212-5785
3h. Email address:	jhemphill@ncdot.gov

4. Applicant Information (if different from owner)	
4a. Applicant is:	☐ Agent ☐ Other, specify:
4b. Name:	<i>not applicable</i>
4c. Business name (if applicable):	
4d. Street address:	
4e. City, state, zip:	
4f. Telephone no.:	
4g. Fax no.:	
4h. Email address:	
5. Agent/Consultant Information (if applicable)	
5a. Name:	<i>not applicable</i>
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):	<i>not applicable</i>
1b. Site coordinates (in decimal degrees):	Latitude: 35.5753 (DD.DDDDDD) Longitude: - 81.9758 (-DD.DDDDDD)
1c. Property size:	3.2 acres
2. Surface Waters	
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	Second Broad River
2b. Water Quality Classification of nearest receiving water:	WS-V
2c. River basin:	Broad River

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: Forestland interspersed with residential development	
3b. List the total estimated acreage of all existing wetlands on the property: 0	
3c. List the total estimated linear feet of all existing streams (intermittent and perennial) on the property: 2,599	
3d. Explain the purpose of the proposed project: To replace a structurally deficient (and/ or) functionally obsolete bridge.	
3e. Describe the overall project in detail, including the type of equipment to be used: Replace an existing 117' three span concrete girder bridge with a 4 span, 320' prestressed concrete girder bridge on a new alignment to the west of the existing bridge. The new bridge alignment will lead to the reconfiguration of the approaches north and south of the new bridge which will necessitate the relocation of three streams into new longer culverts in the project footprint. Standard road building equipment, such as trucks, dozers, and cranes will be used.	
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: This project was part of the 2004 Verification of R-2597 and not part of the 2012 Re-verification of R-2597	☒ 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): Buck Engineering	Agency/Consultant Company: NCDOT Other:
4d. If yes, list the dates of the Corps jurisdictional determinations or State determinations and attach documentation. This project area was verified by Angie Pennock of the Corps as part of a larger project, R-2597, the US 221 Widening from I-40 to Rutherfordton, on August 4, 2004. B-3673 was subsequently separated from the larger project and was not part of the 2012 reverification.	
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.	
6. Future Project Plans	
6a. Is this a phased project?	☐ Yes ☒ No
6b. If yes, explain.	

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)
Site 1 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 2 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 3 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 4 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 5 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
2g. Total wetland impacts					

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) (Perm/Temp)
Site 1 ☒ P ☒ T	Channel Relocation	UT to Second Broad River	☒ PER ☐ INT	☒ Corps ☐ DWQ	2	75/28
Site 2 ☒ P ☐ T	Outfall Protection	Second Broad River	☒ PER ☐ INT	☒ Corps ☐ DWQ	25	20/00
Site 3 ☒ P ☒ T	Channel Relocation	UT to Second Broad River	☒ PER ☐ INT	☒ Corps ☐ DWQ	3	182/19
Site 4 ☒ P ☒ T	Roadway Fill	UT to Second Broad River	☒ PER ☐ INT	☒ Corps ☐ DWQ	10	135/10
Site 5 ☐ P ☒ T	Tail Ditch	Second Broad River	☒ PER ☐ INT	☒ Corps ☐ DWQ	25	00/36
Site 6 ☒ P ☒ T	Bank Stabilization /Work Pads	Second Broad River	☒ PER ☐ INT	☒ Corps ☐ DWQ	25	107/231
Site 7 ☒ P ☐ T	Bank Stabilization	UT to Second Broad River	☒ PER ☐ INT	☒ Corps ☐ DWQ	3	71/00
Site 8 ☒ P ☐ T	Bank Stabilization	Second Broad River	☒ PER ☐ INT	☒ Corps ☐ DWQ	25	118/00
3h. Total stream and tributary impacts						708 Perm/ 324 Temp

3i. Comments:

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:

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:

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):

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: ☐ 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					
6i. Comments:					

D. Impact Justification and Mitigation

1. Avoidance and Minimization

1a. Specifically describe measures taken to avoid or minimize the proposed impacts in designing project.

The relocation of the bridge alignment to the west allows the bridge to cross the Second Broad River at a more perpendicular angle which reduces impacts to the flood plain and reduces surface water impacts to the river.

1b. Specifically describe measures taken to avoid or minimize the proposed impacts through construction techniques.

Stormwater runoff from the bridge deck will be captured with inlets and conveyed to the northeast and southeast sides of the road where it will be discharged to a riprap outlet pads prior to entering the stream.

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

If no, explain:

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: not applicable

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:

412 lf

4c. If using stream mitigation, stream temperature:

☐ warm ☐ cool ☒ cold

4d. Buffer mitigation requested (DWQ only):

square feet

4e. Riparian wetland mitigation requested:

acres

4f. Non-riparian wetland mitigation requested:

acres

4g. Coastal (tidal) wetland mitigation requested:

acres

4h. Comments:

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			3 (2 for Catawba)	
Zone 2			1.5	
6f. Total buffer mitigation required:				

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).

6h. Comments:

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 not, explain why.

Comments: If required from 1a, see attached buffer permit drawings.

☐ Yes

☐ No

2. Stormwater Management Plan	
2a. What is the overall percent imperviousness of this project?	N/A
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 permit drawings.	
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?	not applicable
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 N/A
5b. Have all of the 401 Unit submittal requirements been met?	☐ Yes ☐ No N/A

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:	☒ 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 bridge replacement, this project will neither influence nearby land uses nor stimulate growth. Therefore, a detailed indirect or cumulative effects study will not be necessary.	
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. not applicable	

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? NCDOT personnel conducted in-season surveys for Small whorled pogonia in May 2004 and April 2013 in the project area with no specimens found – No Effect. A US Fish and Wildlife Service proposal for listing the Northern Long-eared Bat (<i>Myotis septentrionalis</i>) as an Endangered species was published in the Federal Register in October 2013. The listing will become effective on or before April, 2015. Furthermore, this species is included in USFWS's current list of protected species for McDowell County. NCDOT is working closely with the USFWS to understand how this proposed listing may impact NCDOT projects. NCDOT will continue to coordinate appropriately with USFWS to determine if this project will incur potential effects to the Northern long-eared bat, and how to address these potential effects, if necessary.		
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? NEPA Documentation		
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: NCDOT Hydraulics Unit coordination with FEMA		
8c. What source(s) did you use to make the floodplain determination? FEMA Maps		
For <u>Richard W. Hancock, PE.</u> Applicant/Agent's Printed Name	 Applicant/Agent's Signature (Agent's signature is valid only if an authorization letter from the applicant is provided.)	<u>11-10-2014</u> Date



North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Michael Ellison, Director
Ecosystem Enhancement Program

John E. Skvarla, III
Secretary

October 28, 2014

Mr. Richard W. Hancock, P.E.
Project Development and Environmental Analysis Unit
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Dear Mr. Hancock:

Subject: EEP Mitigation Acceptance Letter:

B-3673, Replace Bridge Number 17 over the Second Broad River on US 221, McDowell County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory stream mitigation for the subject project. Based on the information supplied by you on October 23, 2014, the impacts are located in CU 03050105 of the Broad River basin in the Northern Mountains (NM) Eco-Region, and are as follows:

Broad 03050105 NM	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	412.0	0	0	0	0	0	0	0

*Some of the stream impacts may be proposed to be mitigated at a 1:1 mitigation ratio. See permit application for details.

This impact and associated mitigation need were under projected by the NCDOT in the 2014 impact data. EEP will commit to implement sufficient compensatory stream mitigation credits to offset the impacts associated with this project as determined by the regulatory agencies using the delivery timeline listed in Section F.3.c.iii of the N.C. Department of Environment and Natural Resources' Ecosystem Enhancement Program In-Lieu Fee Instrument dated July 28, 2010. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from EEP.

If you have any questions or need additional information, please contact Beth Harmon at 919-707-8420.

Sincerely,

James B. Stanfill
EEP Asset Management Supervisor

cc: Ms. Lori Beckwith, USACE – Asheville Regulatory Field Office
Mr. Kevin Barrett, NCDWQ – Swannanoa Office
Ms. Linda Fitzpatrick, NCDOT – PDEA
File: B-3673

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North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR LINEAR ROADWAY PROJECTS

(Version 1.2; Released July 2012)

Project/TIP No.: 33217.1.1 (B-3673)

County(ies): Mcdowell

Page 1 of 1

General Project Information

Project No.:	33217.1.1 (B-3673)	Project Type:	Bridge Replacement	Date:	7/14/2014
NCDOT Contact:	William "Bill" Zerman, Jr., PE	Contractor / Designer:	Sungate Design Group, PA		
Address:	1590 Mail Service Center Raleigh, NC 27699-1590	Address:	915 Jones Franklin Road Raleigh, NC 27606		
	Phone:		(919) 707-6755	Phone:	(919) 859-2243
	Email:		bzerman@ncdot.gov	Email:	jdalton@sungatedesign.com
City/Town:	Marion	County(ies):	Mcdowell		
River Basin(s):	Broad	CAMA County?	No		
Primary Receiving Water:	Second Broad River	NCDWQ Stream Index No.:	9-41-(0.5)		
NCDWQ Surface Water Classification for Primary Receiving Water	Primary:	Water Supply V (WS-V)			
	Supplemental:	None			
Other Stream Classification:	None				
303(d) Impairments:	None				
Buffer Rules in Effect	N/A				

Project Description

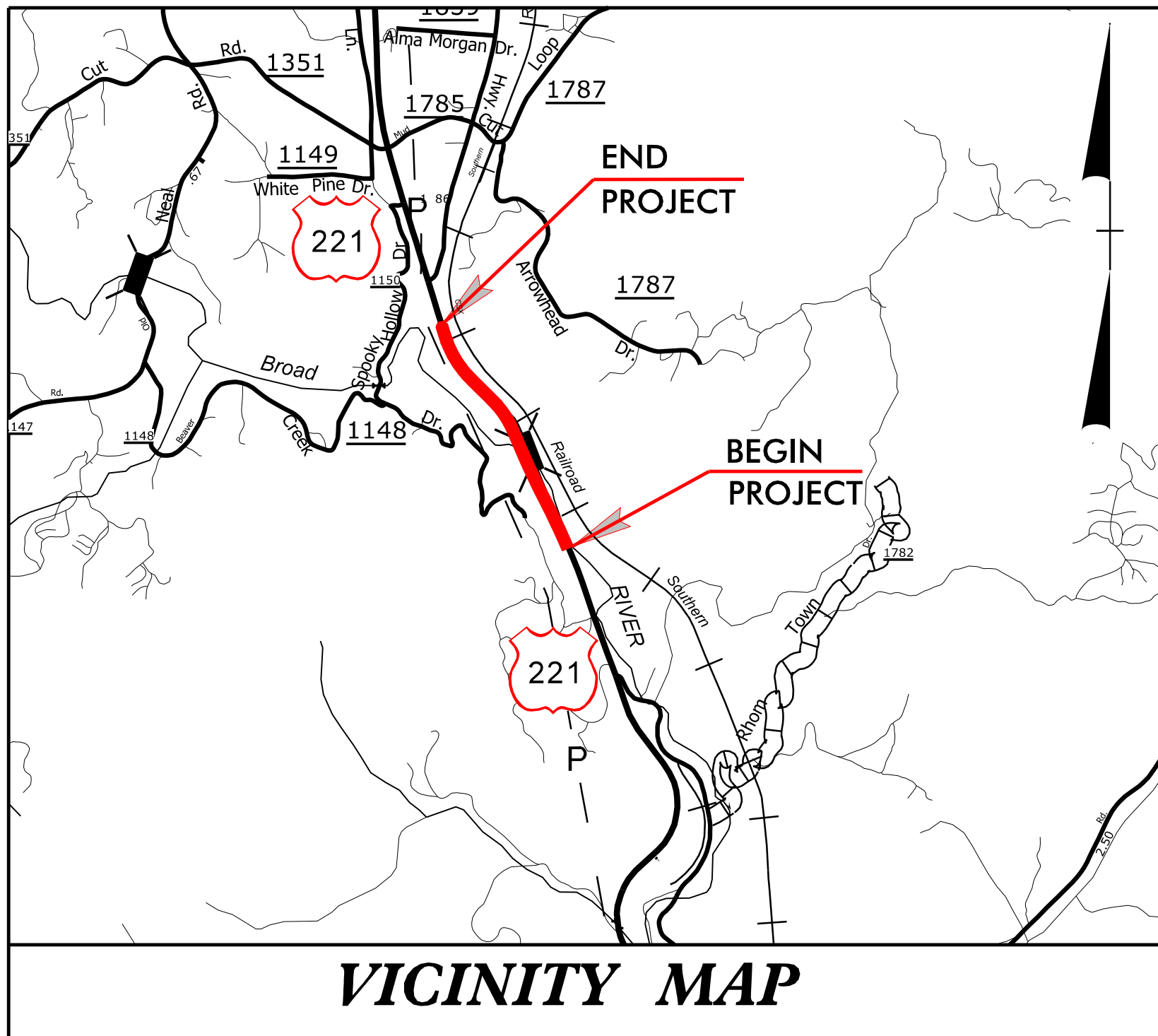
Project Length (lin. Miles or feet):	0.511 Miles	Surrounding Land Use:	Rural		
	Proposed Project		Existing Site		
Project Built-Upon Area (ac.)	3.22 ac.		1.63 ac.		
Typical Cross Section Description:	Two 12' lanes, 4' shoulder sections		Two 10' lanes		
Average Daily Traffic (veh/hr/day):	Design/Future:	11,800	Existing:	7,800	

General Project Narrative: This project involves the replacement of Bridge No. 017 over Second Broad River on US 221. Stormwater runoff from the bridge deck will be captured with inlets and conveyed to the southeast side of the road where it will be discharged to a riprap outlet pad prior to entering the stream. Stormwater runoff north of the bridge will be captured with inlets and conveyed to the northeast side of the road to a riprap outlet pad prior to entering the stream. Due to high velocities and steep topography at these outlets, the use of preformed scour holes is not practical. The southwest quadrant drains away from the bridge. Riprap bank stabilization has been specified where the existing concrete bridge abutments will be removed. Hazardous Spill Basin(s) are not required since this stream is not identified as an ORW or WS-I watersupply, nor is the stream crossing within 1/2 mile of the critical area of a water supply source classified as WS-II, WS-III or WS-IV.

References

09.08/99

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

McDOWELL COUNTY

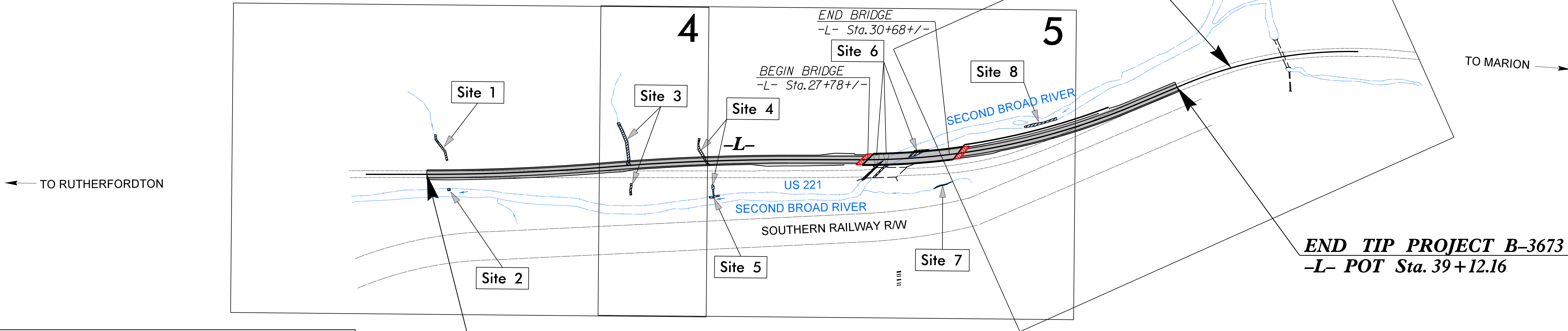
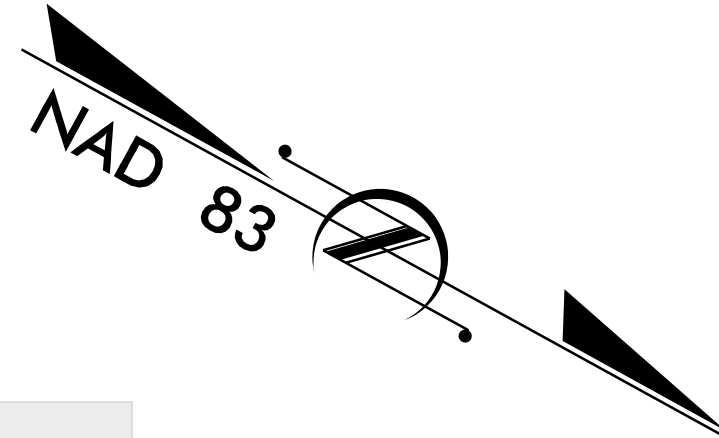
LOCATION: BRIDGE NO.17 OVER SECOND BROAD
RIVER ON US 221

TYPE OF WORK: GRADING, PAVING, DRAINAGE, STRUCTURE
AND RETAINING WALL

WETLAND AND SURFACE WATER IMPACTS PERMIT

PERMIT DRAWING
SHEET 1 OF 9

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3673	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33217.1.1	BRNHS-221(10)	PE	
33217.2.UFS1	BRNHS-221(10)	UTILITIES	
33217.2.FS1	BRNHS-221(10)	RIGHT-OF-WAY	



THIS IS A PARTIAL CONTROLLED-ACCESS PROJECT
WITH ACCESS BEING LIMITED TO POINTS AS
SHOWN ON THE PLANS.

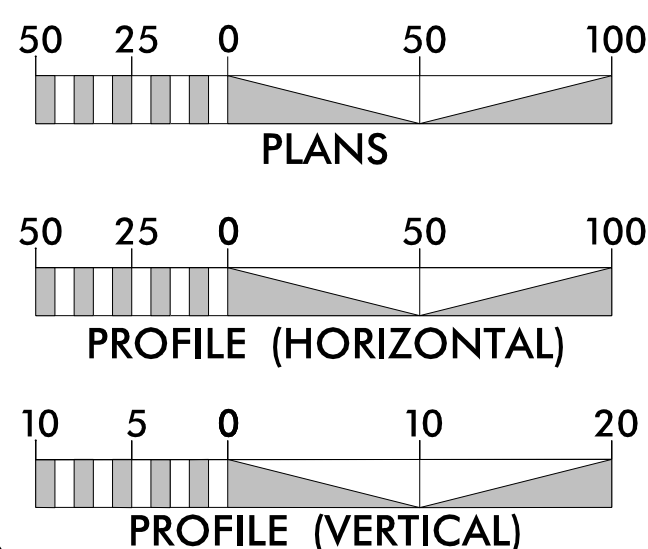
CLEARING ON THIS PROJECT SHALL BE PERFORMED
TO THE LIMITS ESTABLISHED BY METHOD II.

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL
BOUNDARIES.

BEGIN TIP PROJECT B-3673
-L- PC Sta. 12+16.15
BEGIN CONSTRUCTION

END TIP PROJECT B-3673
-L- POT Sta. 39+12.16

GRAPHIC SCALES



DESIGN DATA

ADT 2015 = 7,800
ADT 2035 = 11,800
DHV = 10 %
D = 55 %
T = 13 % *
V = 60 MPH
* TTST 8% DUAL 5%
FUNC CLASS =
RURAL ARTERIAL
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-3673 = 0.460 MI
LENGTH STRUCTURE TIP PROJECT B-3673 = 0.051 MI
TOTAL LENGTH OF TIP PROJECT B-3673 = 0.511 MI

Baker

RIGHT OF WAY DATE:
SEPTEMBER 20, 2013

LETTING DATE:
APRIL 21, 2015

Prepared In the Office of:
Michael Baker Engineering, Inc.
8000 Regency Parkway, Suite 600
Cary, NC 27518
Professional Corporation License Number:
F-1084

DAVID L. WILVER, P.E.
PROJECT ENGINEER

WARREN JOHNSON
PROJECT DESIGN ENGINEER

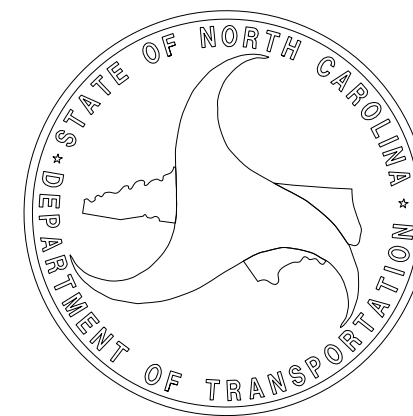
BRENDA L. MOORE, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN
ENGINEER

SIGNATURE: P.E.



INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

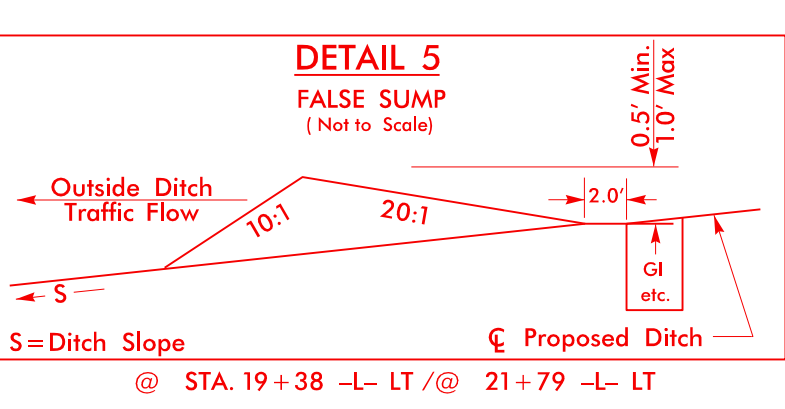
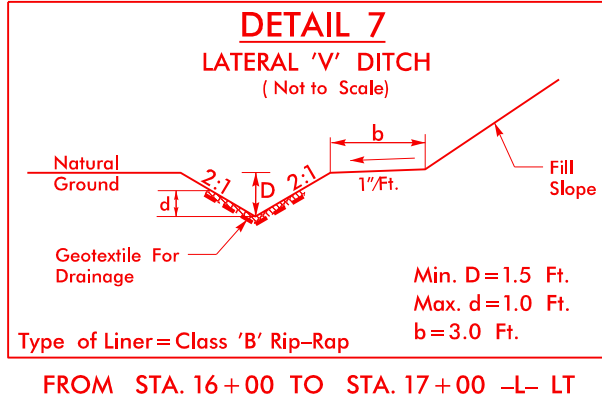
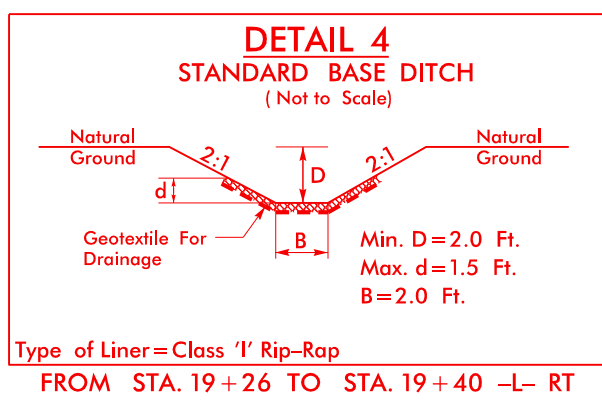
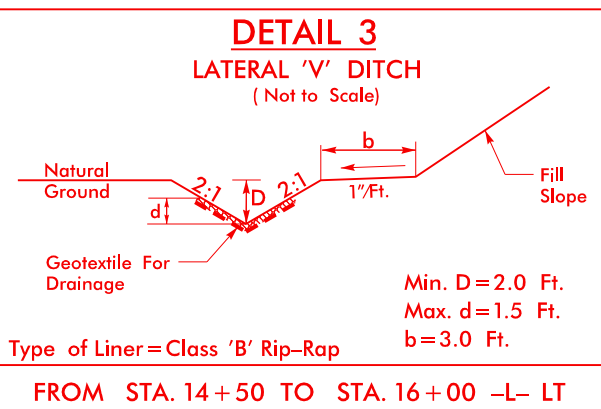
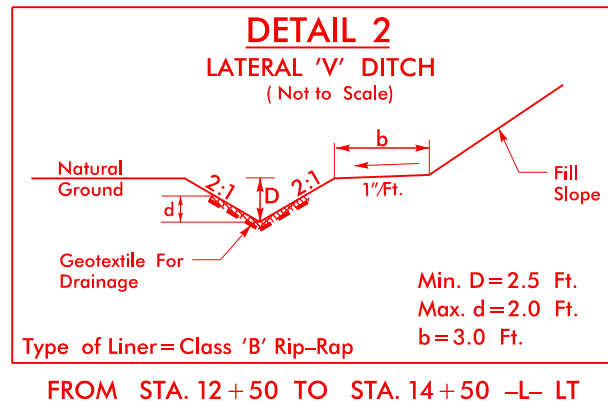
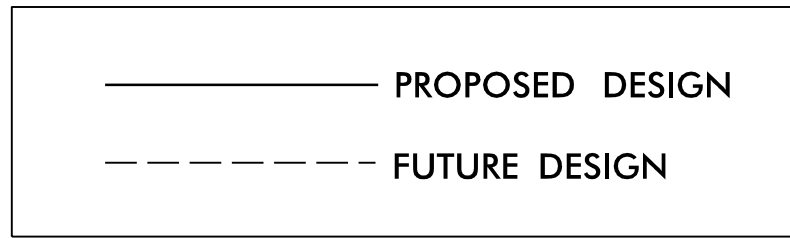
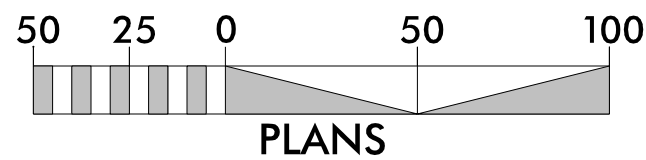
TIP PROJECT: B-3673

CONTRACT:

8/17/99

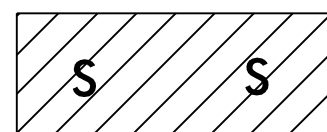
REVISIONS

10/20/2014
B-3673.dwg pr-m-wet_psh_04.dgn
Paw
Paw

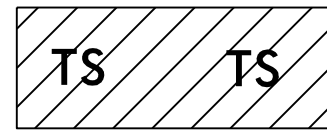


PAUL H. CARTWRIGHT

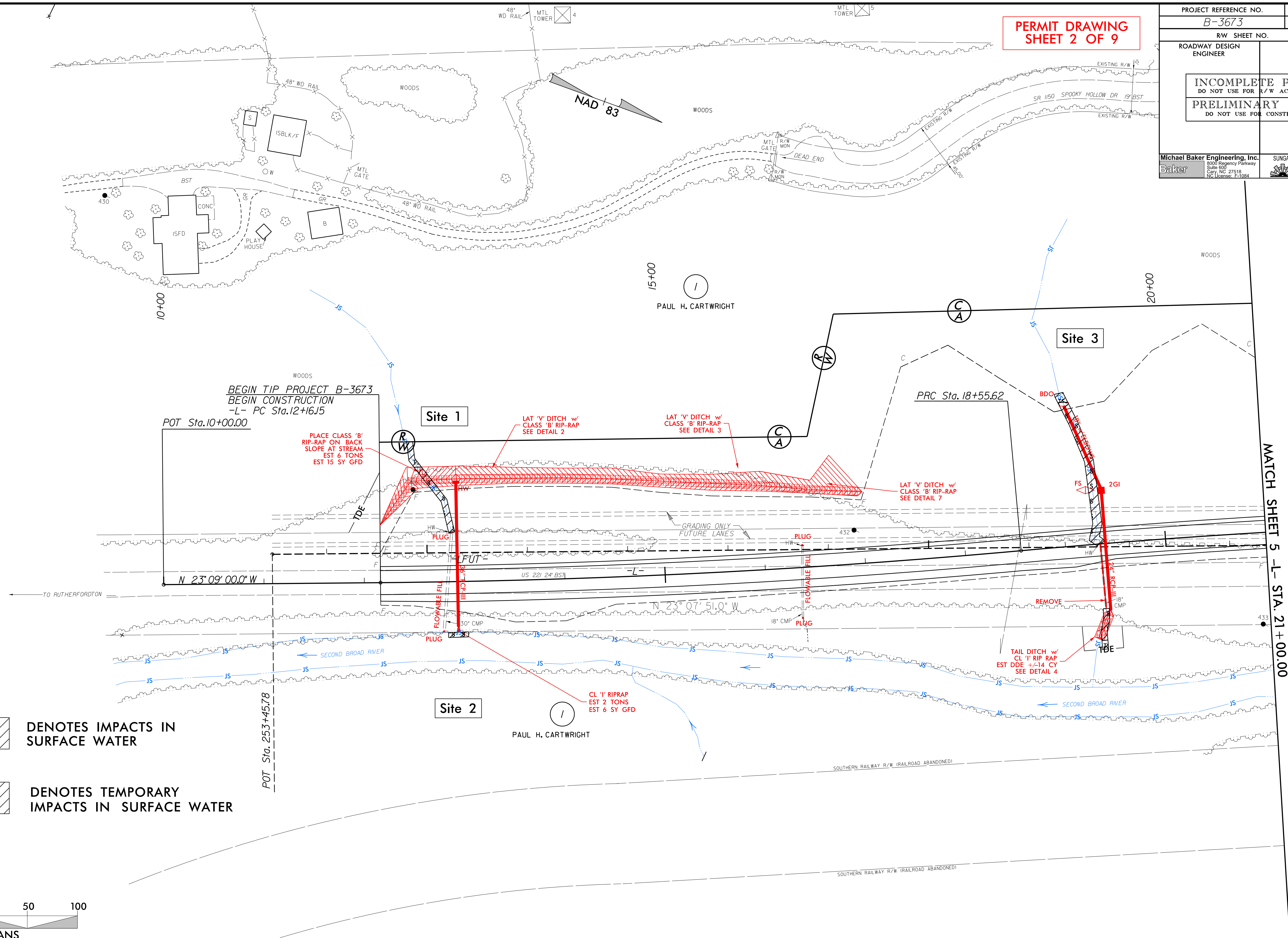
GFD = GEOTEXTILE FOR DRAINAGE
SEE SHEET 7 FOR -L- PROFILE



DENOTES IMPACTS IN
SURFACE WATER



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER



PROJECT REFERENCE NO.		SHEET NO.	
B-3673		4	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
Michael Baker Engineering, Inc. 8000 Hagenway Parkway Suite 600 Cary, NC 27519 NC License: E-1084		SUNGATE DESIGN GROUP, P.A. 915 Jones Franklin Road Raleigh, NC 27603 NC CDA No. C-0890	

8/17/99

REVISIONS

10/20/2014
B-3673.dwg prj-wet.psh_04.con.dgn
Baker

PERMIT DRAWING
SHEET 3 OF 9

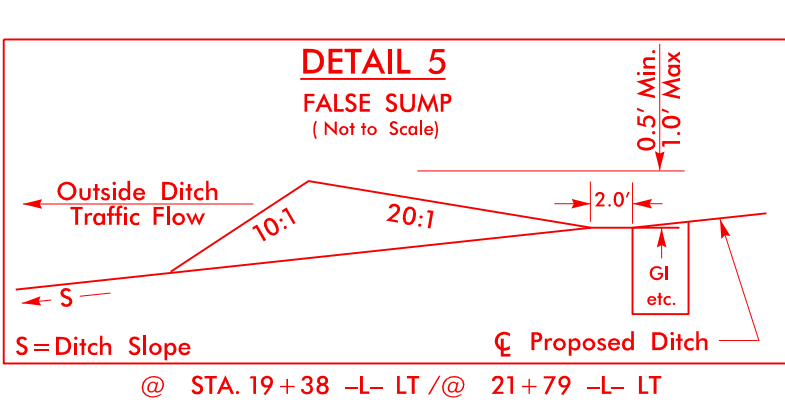
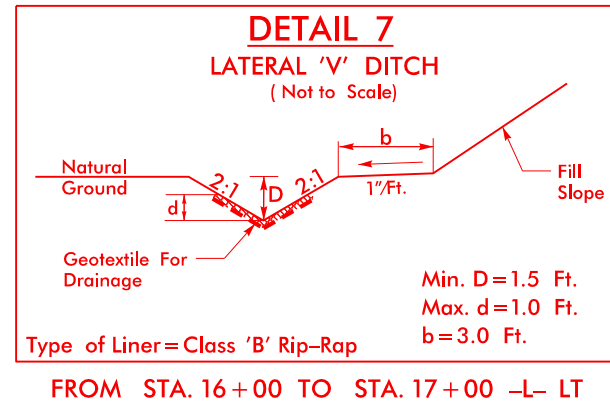
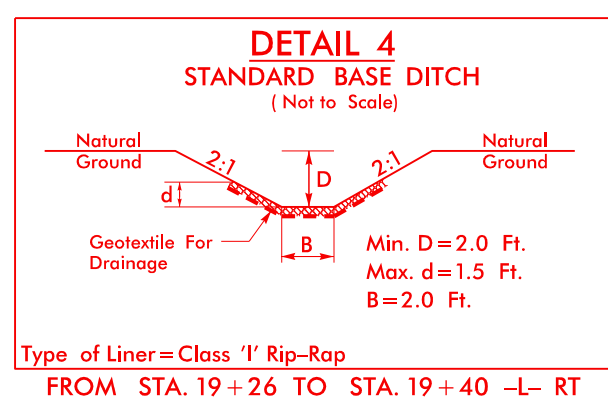
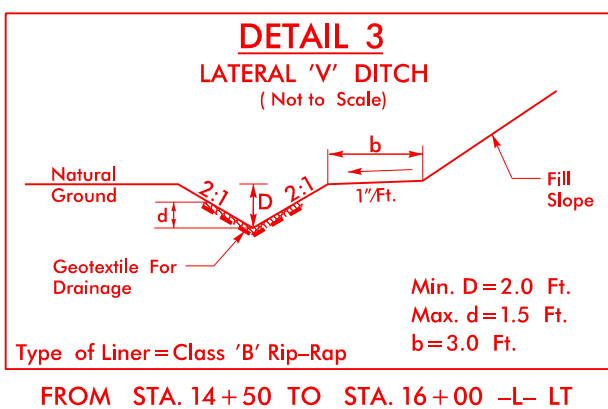
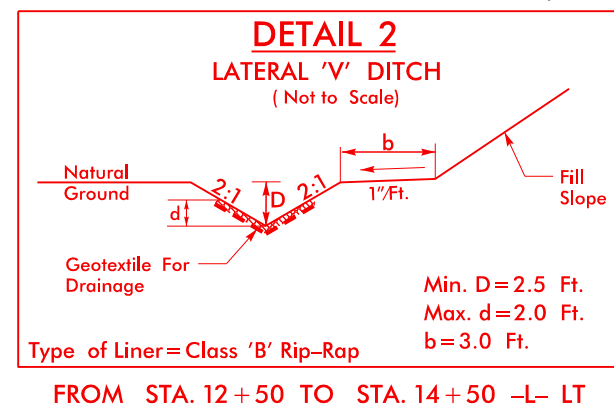
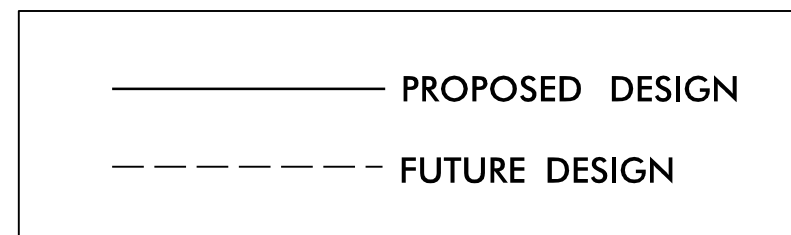
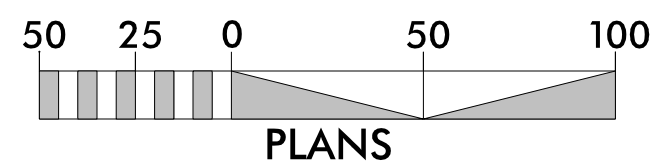
PROJECT REFERENCE NO.		SHEET NO.	
B-3673		4	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		SUNGATE DESIGN GROUP, P.A.	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		915 Jones Franklin Road Raleigh, NC 27603 NC CDA No. C-0890	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
Michael Baker Engineering, Inc. 8000 Agency Parkway Suite 600 Raleigh, NC 27603 NC License # 1084			



DENOTES IMPACTS IN
SURFACE WATER



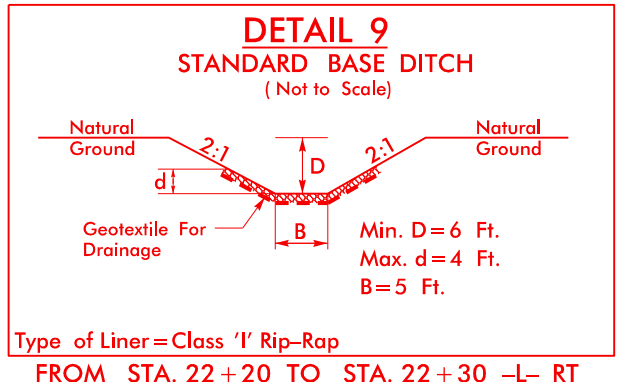
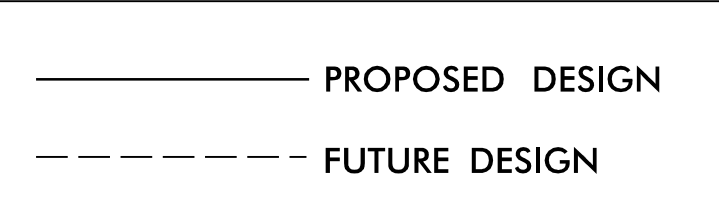
DENOTES TEMPORARY
IMPACTS IN SURFACE WATER



PAUL H. CARTWRIGHT

GFD = GEOTEXTILE FOR DRAINAGE
SEE SHEET 7 FOR -L- PROFILE

MATCH SHEET 5 -L- STA. 21+00.00



SEE SHEET 7 FOR -L- PROFILE
SEE SHEETS S-1 THRU S-? FOR STRUCTURE PLANS
SEE SHEETS W-1 THRU W-? FOR RETAINING WALL PLANS



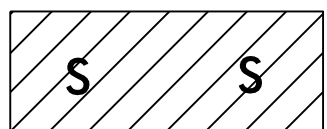
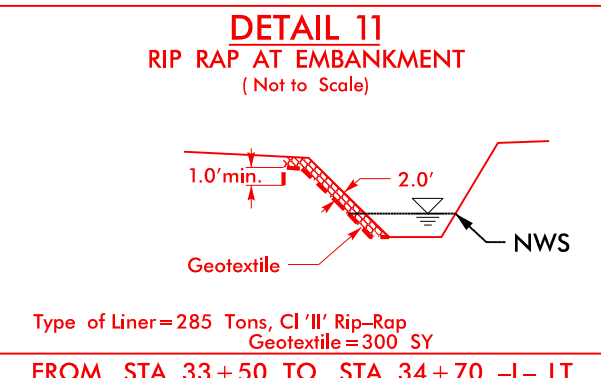
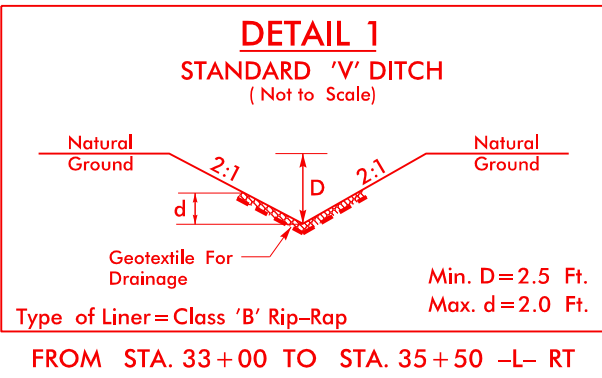
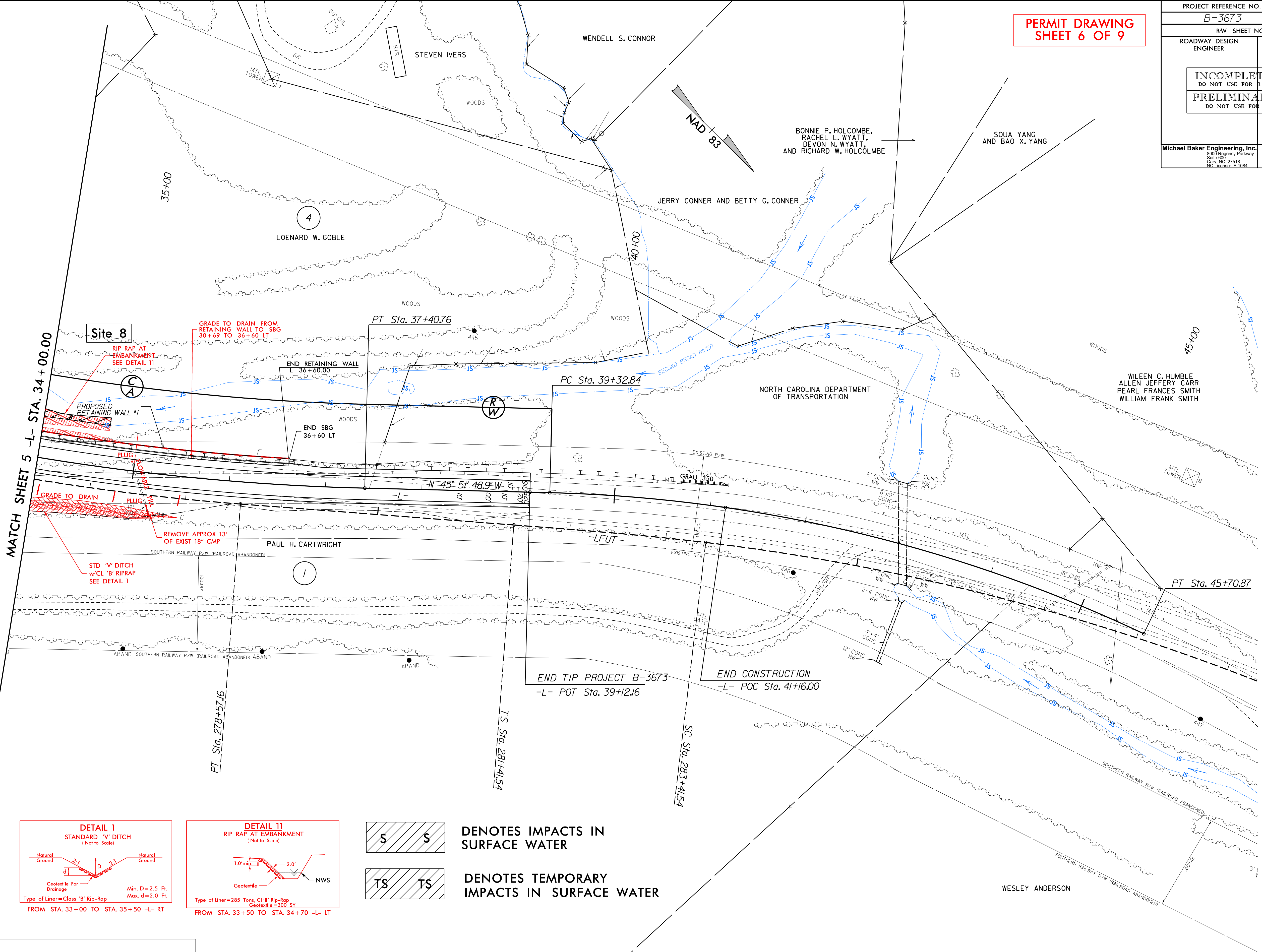
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7/14/2014
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Revised

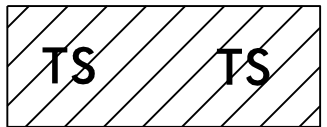
REVISIONS

PERMIT DRAWING
SHEET 6 OF 9

PROJECT REFERENCE NO.		SHEET NO.	
B-3673		6	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
Michael Baker Engineering, Inc. 5000 Highway Parkway Suite 200 Salem, NC 27585 NC License: E-1084		SUNGATE DESIGN GROUP, P.A. 915 Jones Franklin Road Raleigh, NC 27603 NC CDA No. C-0890	



DENOTES IMPACTS IN
SURFACE WATER



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

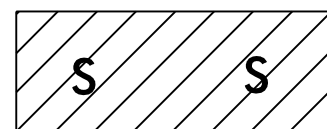
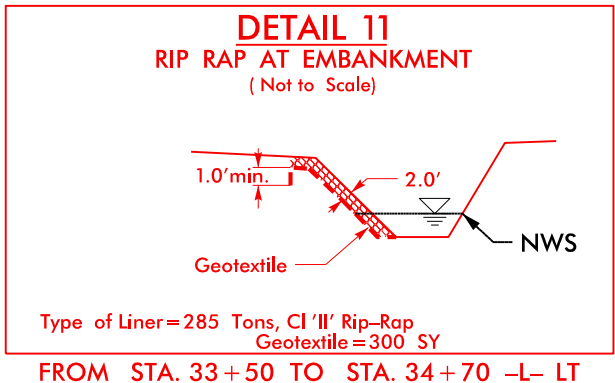
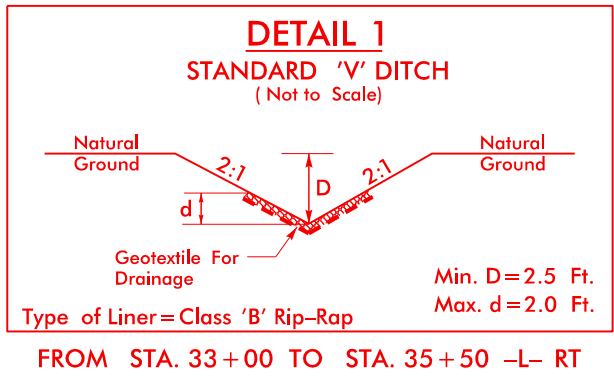
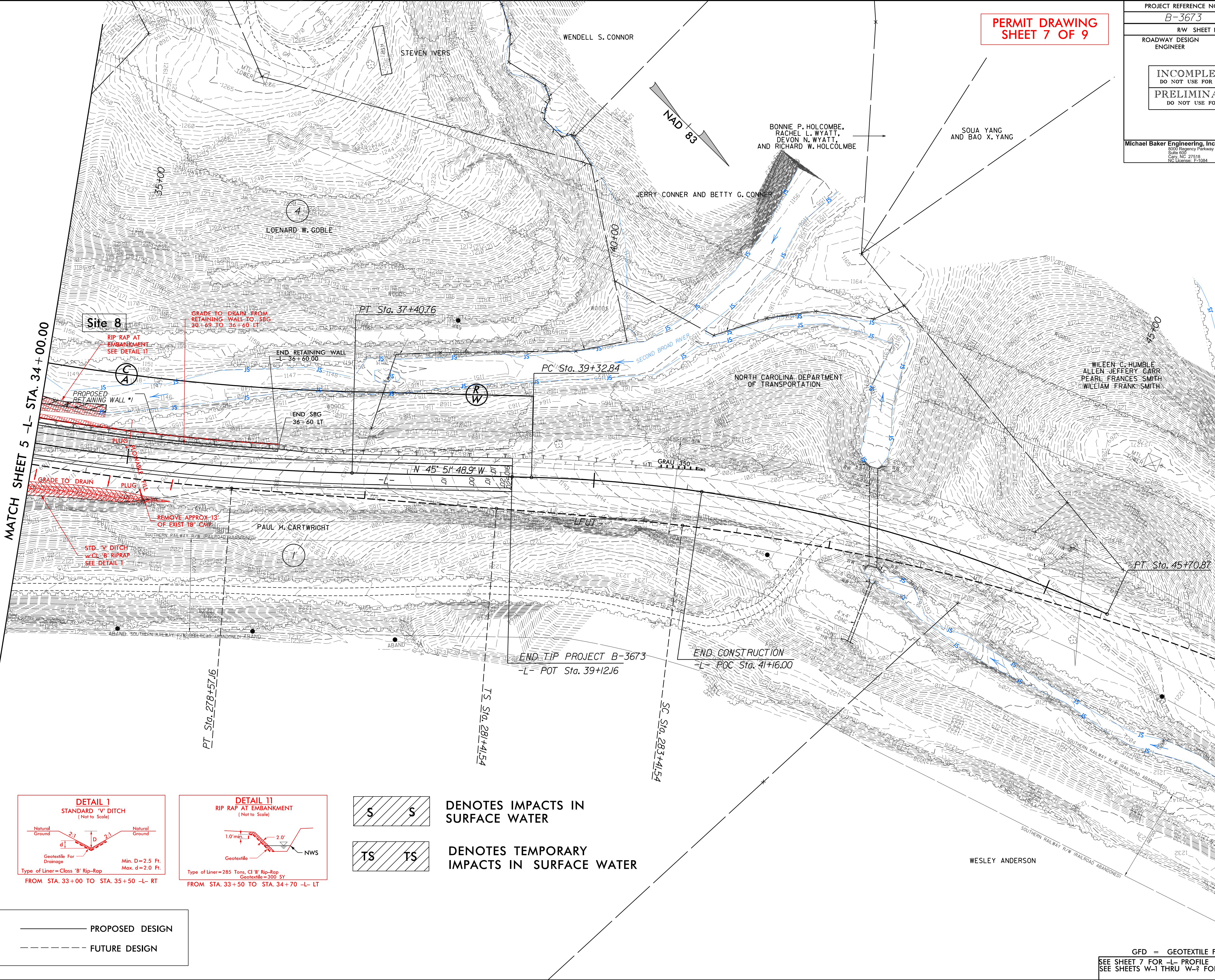
— PROPOSED DESIGN
- - - FUTURE DESIGN

GFD = GEOTEXTILE FOR DRAINAGE
SEE SHEET 7 FOR -L- PROFILE
SEE SHEETS W-1 THRU W-? FOR RETAINING WALL PLANS

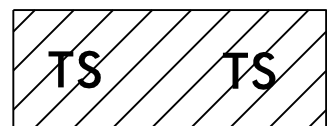
8/17/99

7/14/2014
B-3673 Hyd.prm.wet.psh_06.con.dgn
Revised

REVISIONS



DENOTES IMPACTS IN
SURFACE WATER



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

———— PROPOSED DESIGN
----- FUTURE DESIGN

GFD = GEOTEXTILE FOR DRAINAGE
SEE SHEET 7 FOR -L- PROFILE
SEE SHEETS W-1 THRU W-? FOR RETAINING WALL PLANS

PROJECT REFERENCE NO. <u>B-3673</u>		SHEET NO. <u>6</u>	
RW SHEET NO. _____			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
Michael Baker Engineering, Inc. 8000 Regency Parkway Suite 200 Cary, NC 27518 NC License E-1084		SUNGATE DESIGN GROUP, P.A.  915 Jones Franklin Road Raleigh, NC 27606 NC CDA No. C-0890	

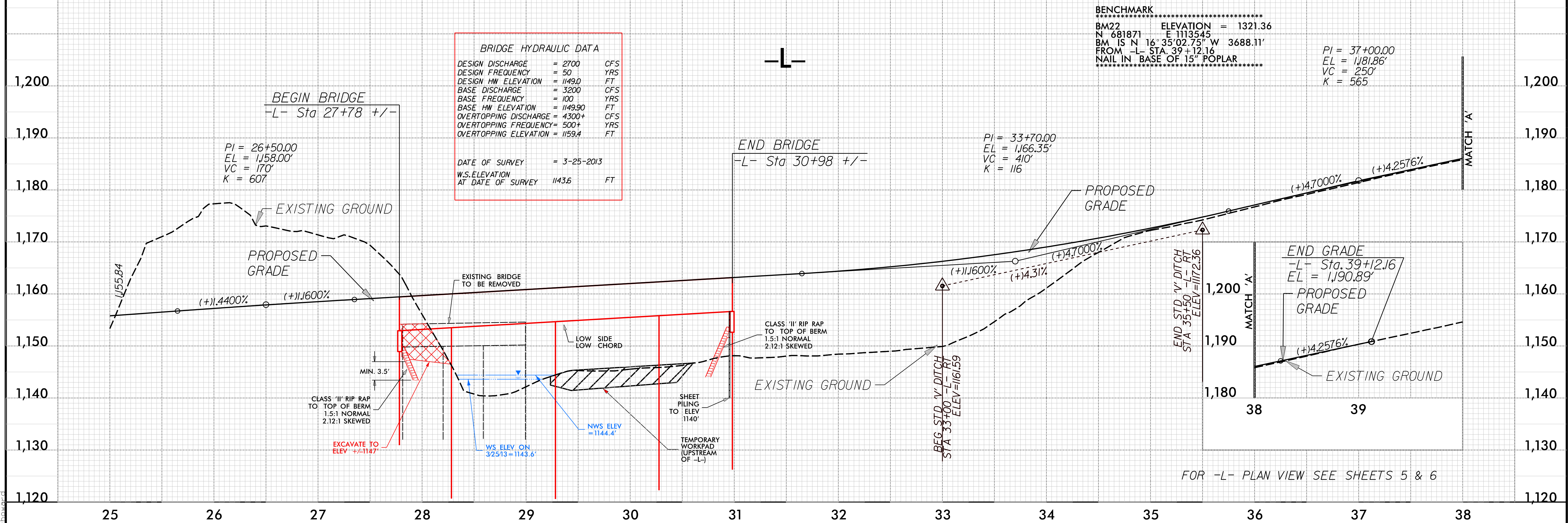
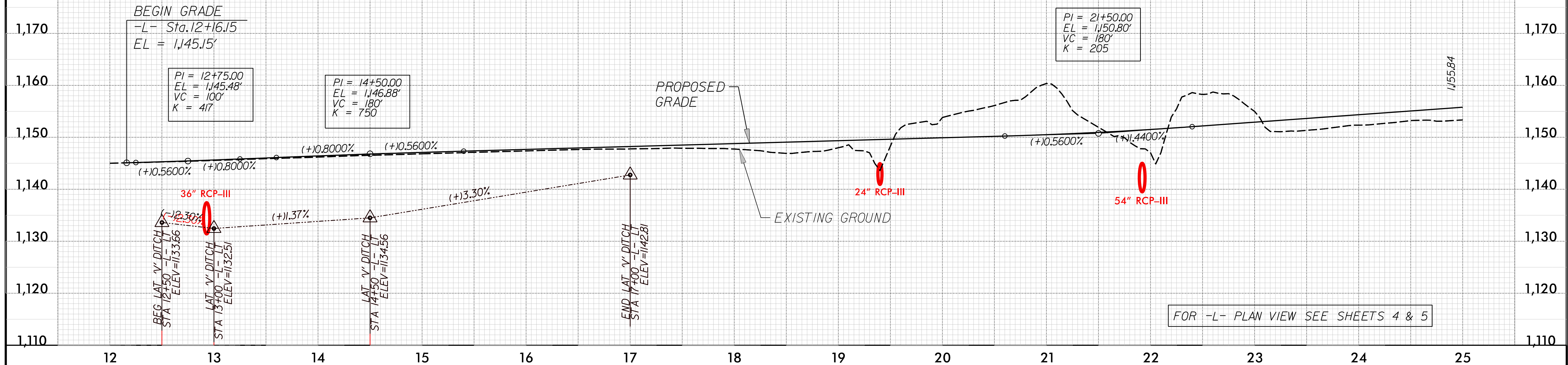
PERMIT DRAWING
SHEET 7 OF 9

36" RCP - CULVERT HYDRAULIC DATA		
DESIGN DISCHARGE	= 27	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 1135.1	FT
BASE DISCHARGE	= 33	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 1135.4	FT
OVERTOPPING DISCHARGE	= 49+	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 1145.6	FT

EXIST. 24" CMP - CULVERT	HYDRAULIC DATA
DESIGN DISCHARGE	= 12 CFS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 143.8 FT
BASE DISCHARGE	= 113 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 144.0 FT
OVERTOPPING DISCHARGE	= 21+ CFS
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING ELEVATION	= 149.6 FT

54 RCP-III - CULVERT HYDRAULIC DATA			
DESIGN DISCHARGE	= 130	CFS	
DESIGN FREQUENCY	= 50	YRS	
DESIGN HW ELEVATION	= 1157.8	FT	
BASE DISCHARGE	= 150	CFS	
BASE FREQUENCY	= 100	YRS	
BASE HW ELEVATION	= 1158.5	FT	
OVERTOPPING DISCHARGE	= 190	CFS	
OVERTOPPING FREQUENCY	= 200	YRS	
OVERTOPPING ELEVATION	= 1159.3	FT	

PERMIT DRAWING
SHEET 8 OF 9



WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	12+50 -L- Lt	36" RCP						0.01	0.00	75	28	
2	13+00 -L- Rt	CI 'I' Rip Rap						0.00		20		
3	19+00 -L- Lt	18" BDO & Pipe						0.03	0.00	150	10	
3	19+50 -L- Rt	24" RCP & Ditch						0.00	0.00	32	9	
4	21+75 -L- Lt	54" CSP & RCP						0.01	0.00	96	10	
4	22+25 -L- Rt	54" RCP						0.01		39		
5	22+25 -L- Rt	Tail Ditch							0.00		36	
6	28+00 -L- Rt	Bank Stabilization						0.02		107		
6	28+50 -L- Rt	Ex. Bent Removal							0.02		83	
6	29+50 -L- Lt	Work Pad							0.05		148	
7	30+50 -L- Rt	Bank Stabilization						0.00		71		
8	34+00 -L- Lt	Bank Stabilization						0.02		118		
TOTALS:								0.11	0.08	708	324	

NCDOT Structural Design Unit: Permanent SW Impacts = 80 sq. ft. (0.0018 ac.)

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Mc DOWELL COUNTY

WBS - 33217.1.1 (B-3673)

SHEET 9 OF 9 9/10/2014

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Mc DOWELL COUNTY

WBS - 33217.1.1 (B-3673)

SHEET 9 OF 9 9/10/2014

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Mc DOWELL COUNTY

WBS - 33217.1.1 (B-3673)

SHEET 9 OF 9 9/10/2014

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Mc DOWELL COUNTY

WBS - 33217.1.1 (B-3673)

SHEET 9 OF 9 9/10/2014

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Mc DOWELL COUNTY

WBS - 33217.1.1 (B-3673)

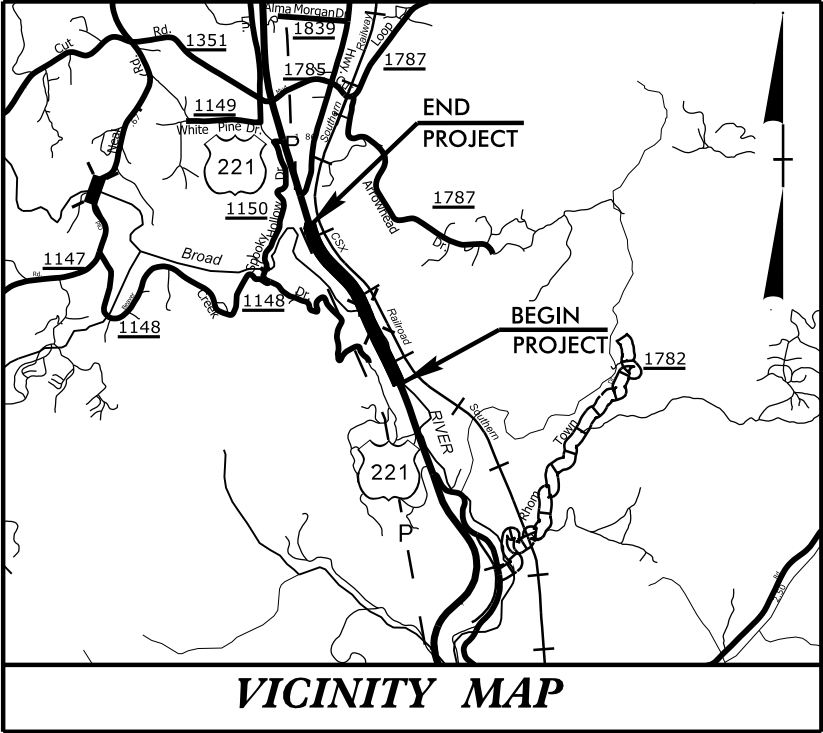
SHEET 9 OF 9 9/10/2014

ATN Revised 3/31/05

Permit Drawing
Sheet 9 of 9

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3673	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33217.1.1	BRNHS-221(10)	PE	
33217.2.UFS1	BRNHS-221(10)	UTILITIES	
33217.2.FS1	BRNHS-221(10)	RIGHT-OF-WAY	

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols



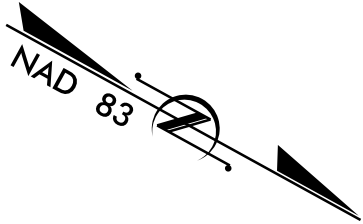
VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

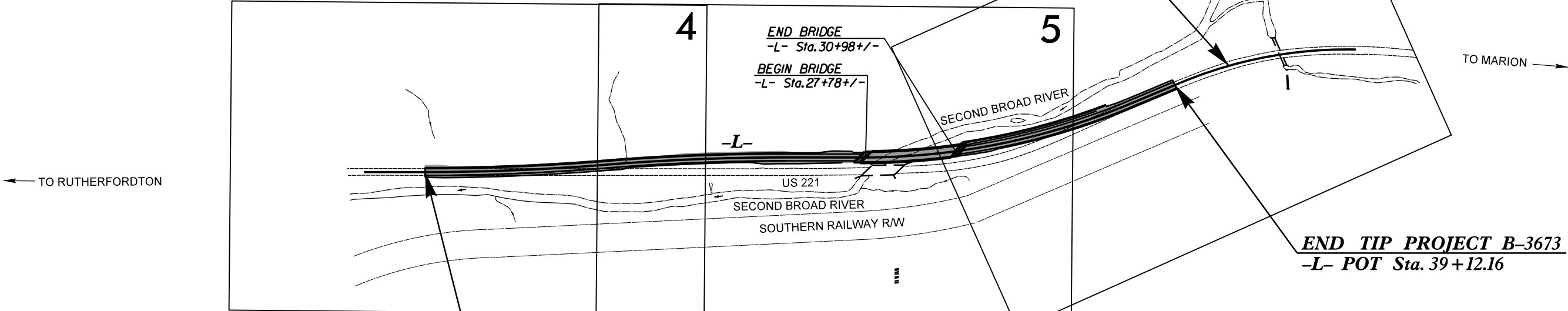
McDOWELL COUNTY

LOCATION: BRIDGE NO.17 OVER SECOND BROAD RIVER
ON US 221

TYPE OF WORK: GRADING, PAVING, DRAINAGE, STRUCTURE
AND RETAINING WALL



END CONSTRUCTION
-L- POC Sta. 41+16.00



END TIP PROJECT B-3673
-L- POT Sta. 39+12.16

BEGIN TIP PROJECT B-3673
-L- PC Sta. 12+16.15
BEGIN CONSTRUCTION

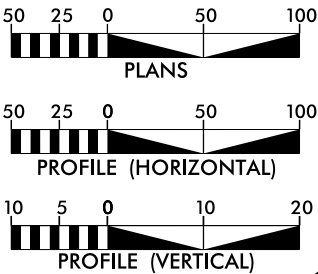
THIS IS A PARTIAL CONTROLLED-ACCESS PROJECT
WITH ACCESS BEING LIMITED TO POINTS AS
SHOWN ON THE PLANS.

CLEARING ON THIS PROJECT SHALL BE PERFORMED
TO THE LIMITS ESTABLISHED BY METHOD II .

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL
BOUNDARIES.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES



DESIGN DATA

ADT 2015 = 7,800
ADT 2035 = 11,800
DHV = 10 %
D = 55 %
T = 13 % *
V = 60 MPH
* TTST 8% DUAL 5%
FUNC CLASS =
RURAL ARTERIAL
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-3673 = 0.450 MI
LENGTH STRUCTURE TIP PROJECT B-3673 = 0.061 MI
TOTAL LENGTH OF TIP PROJECT B-3673 = 0.511 MI

Prepared In the Office of:
Baker
2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
SEPTEMBER 20, 2013

LETTING DATE:
APRIL 21, 2015

Michael Baker Engineering, Inc.
8000 Regency Parkway, Suite 600
Cary, NC 27518
Professional Corporation License Number:
F-1084

TODD H. BUCKNER, PE
PROJECT ENGINEER

WARREN JOHNSON
PROJECT DESIGN ENGINEER

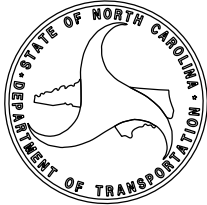
BRENDA L. MOORE, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN
ENGINEER

SIGNATURE: _____ P.E.



TIP PROJECT: B-3673

CONTRACT:

Note: Not to Scale

**S.U.E. = Subsurface Utility Engineering*

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

State Line	
County Line	
Township Line	
City Line	
Reservation Line	
Property Line	
Existing Iron Pin	
Property Corner	
Property Monument	
Parcel/Sequence Number	
Existing Fence Line	
Proposed Woven Wire Fence	
Proposed Chain Link Fence	
Proposed Barbed Wire Fence	
Existing Wetland Boundary	
Proposed Wetland Boundary	
Existing Endangered Animal Boundary	
Existing Endangered Plant Boundary	
Known Soil Contamination: Area or Site	
Potential Soil Contamination: Area or Site	

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	
Sign	
Well	
Small Mine	
Foundation	
Area Outline	
Cemetery	
Building	
School	
Church	
Dam	

HYDROLOGY:

Stream or Body of Water	
Hydro, Pool or Reservoir	
Jurisdictional Stream	
Buffer Zone 1	
Buffer Zone 2	
Flow Arrow	
Disappearing Stream	
Spring	
Wetland	
Proposed Lateral, Tail, Head Ditch	
False Sump	

RAILROADS:

Standard Gauge	
RR Signal Milepost	
Switch	
RR Abandoned	
RR Dismantled	

RIGHT OF WAY:

Baseline Control Point	
Existing Right of Way Marker	
Existing Right of Way Line	
Proposed Right of Way Line	
Proposed Right of Way Line with Iron Pin and Cap Marker	
Proposed Right of Way Line with Concrete or Granite R/W Marker	
Proposed Control of Access Line with Concrete C/A Marker	
Existing Control of Access	
Proposed Control of Access	
Existing Easement Line	
Proposed Temporary Construction Easement	
Proposed Temporary Drainage Easement	
Proposed Permanent Drainage Easement	
Proposed Permanent Drainage / Utility Easement	
Proposed Permanent Utility Easement	
Proposed Temporary Utility Easement	
Proposed Aerial Utility Easement	

Proposed Permanent Easement with Iron Pin and Cap Marker	
--	--

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	_____	_____
Existing Curb	_____	_____
Proposed Slope Stakes Cut	_____	_____ C _____
Proposed Slope Stakes Fill	_____	_____ F _____
Proposed Curb Ramp	_____	_____ (CR) _____
Existing Metal Guardrail	_____	_____ T T T T _____
Proposed Guardrail	_____	_____ T T T T _____
Existing Cable Guiderail	_____	_____ □ □ □ _____
Proposed Cable Guiderail	_____	_____ □ □ □ □ _____

Equality Symbol	
Pavement Removal	

VEGETATION:

Single Tree	
Single Shrub	
Hedge	
Woods Line	

Orchard	
Vineyard	

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	
Bridge Wing Wall, Head Wall and End Wall	
MINOR:	
Head and End Wall	
Pipe Culvert	
Footbridge	
Drainage Box: Catch Basin, DI or JB	
Paved Ditch Gutter	
Storm Sewer Manhole	
Storm Sewer	

UTILITIES:

POWER:	
Existing Power Pole	
Proposed Power Pole	
Existing Joint Use Pole	
Proposed Joint Use Pole	
Power Manhole	
Power Line Tower	
Power Transformer	
U/G Power Cable Hand Hole	
H-Frame Pole	
Recorded U/G Power Line	
Designated U/G Power Line (S.U.E.*)	

TELEPHONE:

Existing Telephone Pole	
Proposed Telephone Pole	
Telephone Manhole	
Telephone Booth	
Telephone Pedestal	
Telephone Cell Tower	
U/G Telephone Cable Hand Hole	
Recorded U/G Telephone Cable	
Designated U/G Telephone Cable (S.U.E.*)	
Recorded U/G Telephone Conduit	
Designated U/G Telephone Conduit (S.U.E.*)	
Recorded U/G Fiber Optics Cable	
Designated U/G Fiber Optics Cable (S.U.E.*)	

WATER:

Water Manhole	
Water Meter	
Water Valve	
Water Hydrant	
Recorded U/G Water Line	
Designated U/G Water Line (S.U.E.*)	
Above Ground Water Line	

TV:

TV Satellite Dish	
TV Pedestal	
TV Tower	
U/G TV Cable Hand Hole	
Recorded U/G TV Cable	
Designated U/G TV Cable (S.U.E.*)	
Recorded U/G Fiber Optic Cable	
Designated U/G Fiber Optic Cable (S.U.E.*)	

GAS:

Gas Valve	
Gas Meter	
Recorded U/G Gas Line	
Designated U/G Gas Line (S.U.E.*)	
Above Ground Gas Line	

SANITARY SEWER:

Sanitary Sewer Manhole	
Sanitary Sewer Cleanout	
U/G Sanitary Sewer Line	
Above Ground Sanitary Sewer	
Recorded SS Forced Main Line	
Designated SS Forced Main Line (S.U.E.*)	

MISCELLANEOUS:

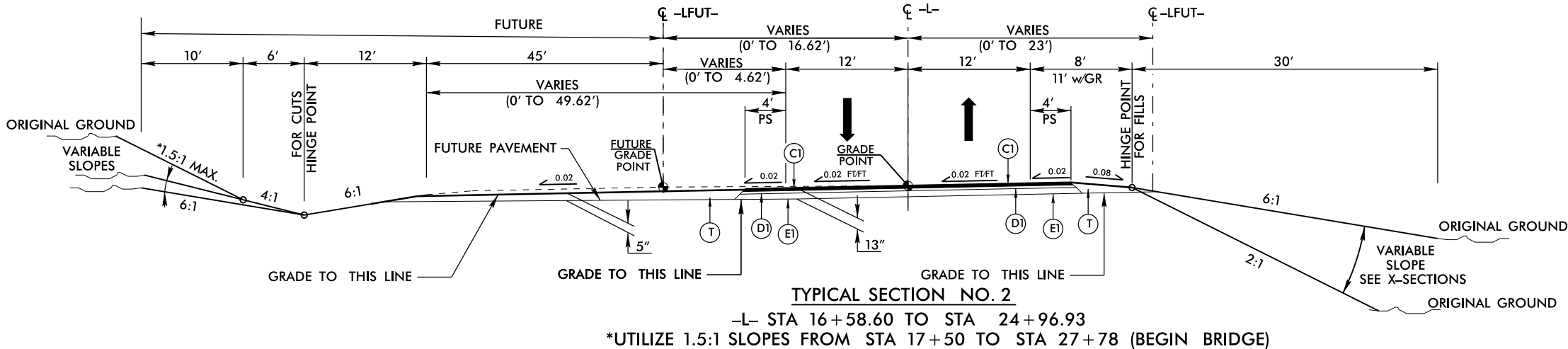
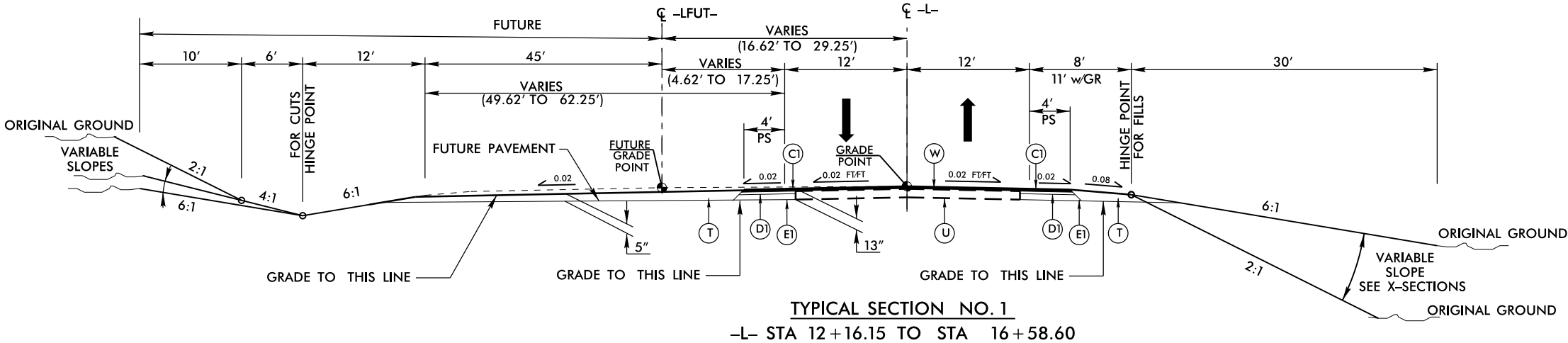
Utility Pole	
Utility Pole with Base	
Utility Located Object	
Utility Traffic Signal Box	
Utility Unknown U/G Line	
U/G Tank; Water, Gas, Oil	
Underground Storage Tank, Approx. Loc.	
A/G Tank; Water, Gas, Oil	
Geoenvironmental Boring	
U/G Test Hole (S.U.E.*)	
Abandoned According to Utility Records	
End of Information	

6/2/99

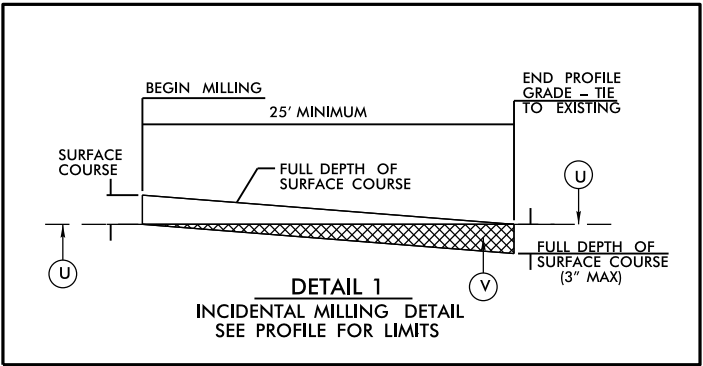
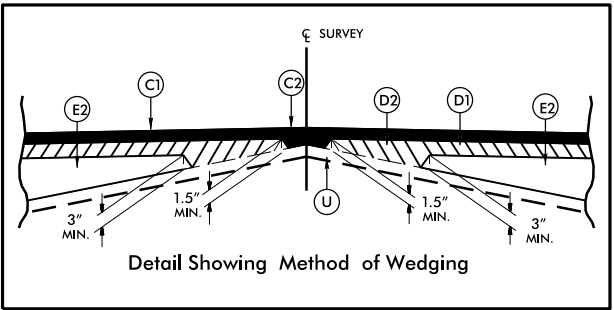
FINAL PAVEMENT SCHEDULE

C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E1	PROP. APPROX. 7" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	U	EXISTING PAVEMENT
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.	V	INCIDENTAL MILLING, VARIABLE MAX. 3"
D1	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	R1	SHOULDER BERM GUTTER	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAILS)
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2 1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH.	T	EARTH MATERIAL	NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE	

PROJECT REFERENCE NO.	SHEET NO.
B-3673	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
Michael Baker Engineering, Inc. 8000 Regency Parkway Suite 600 Cary, NC 27518 NC License: F-1084	
NC DEPARTMENT OF TRANSPORTATION PAVEMENT MANAGEMENT UNIT 1503 MAIL SERVICE CENTER RALEIGH, NC 27699-1593	



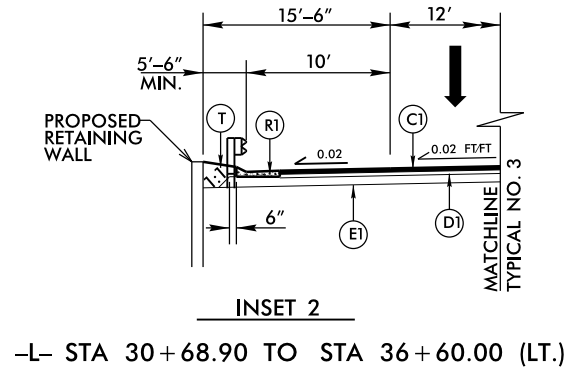
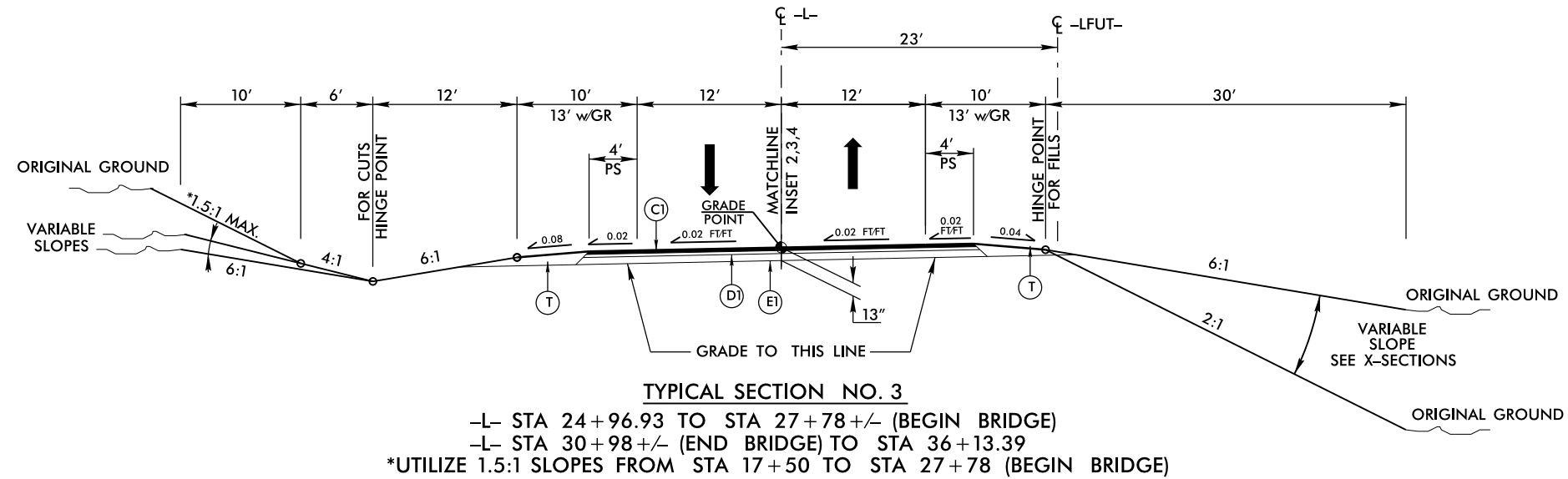
*UTILIZE 1.5:1 SLOPES FROM STA 17+50 TO STA 27+78 (BEGIN BRIDGE)



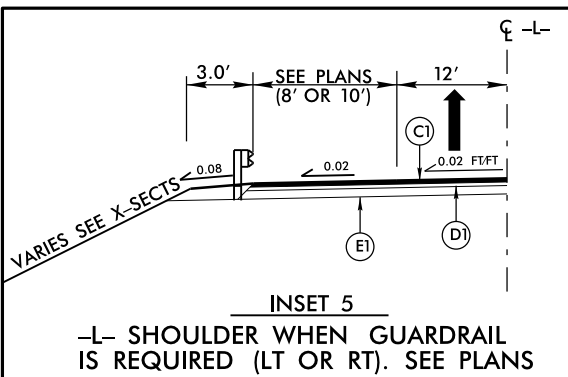
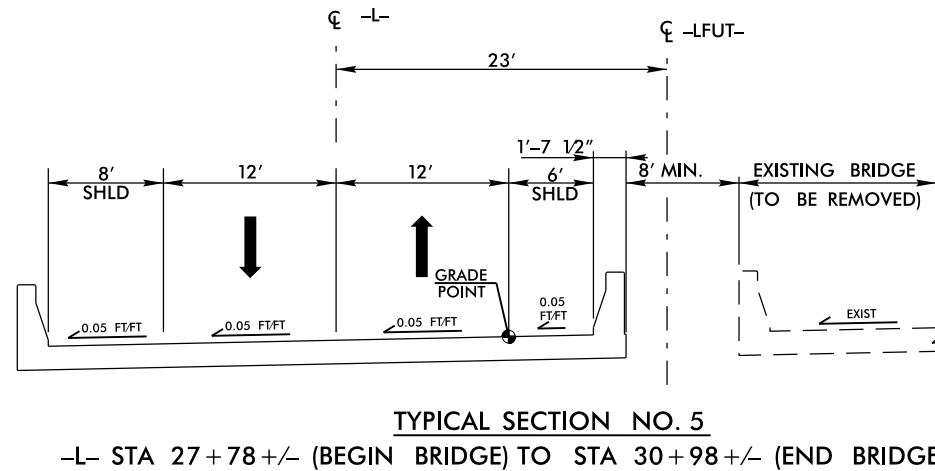
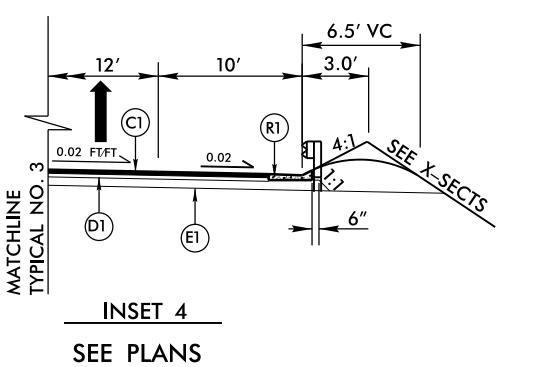
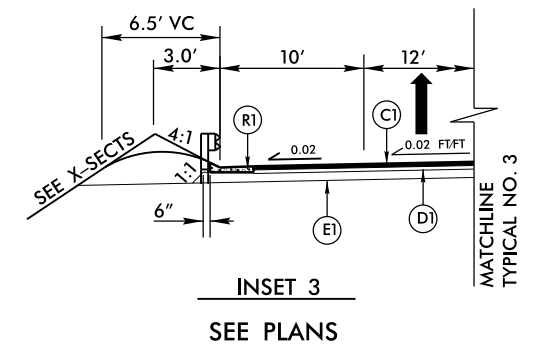
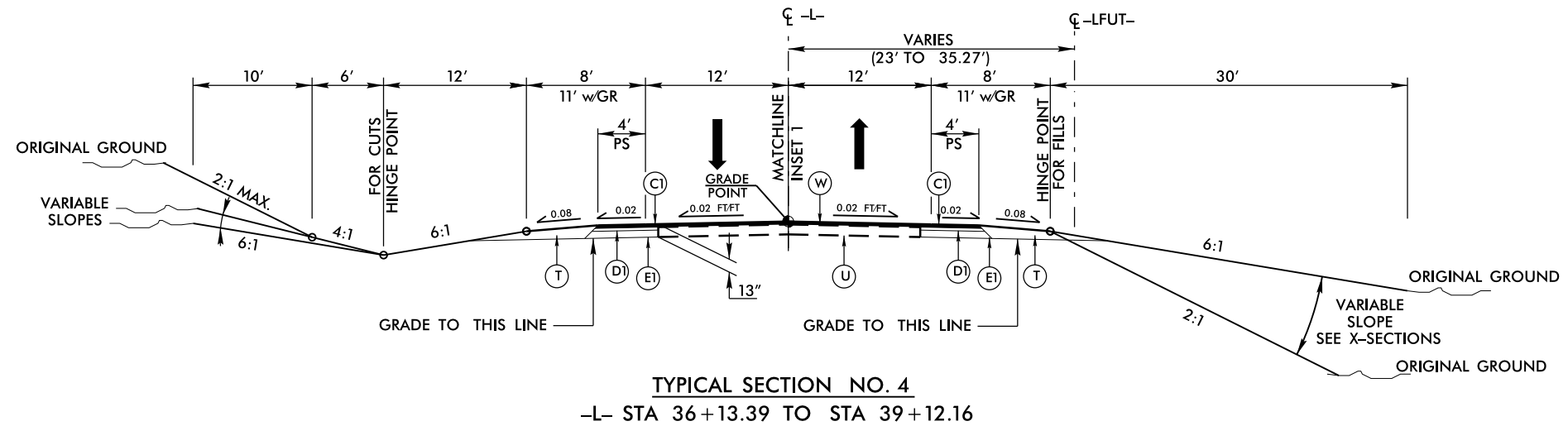
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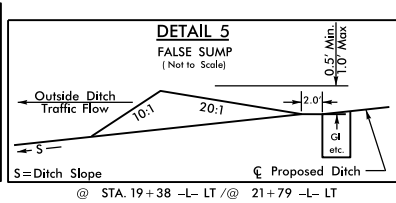
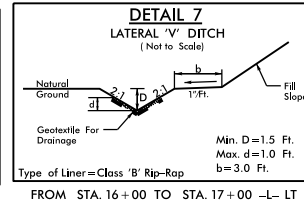
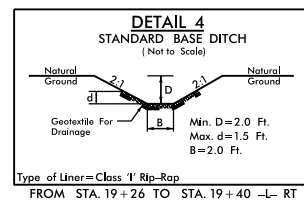
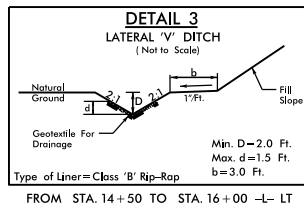
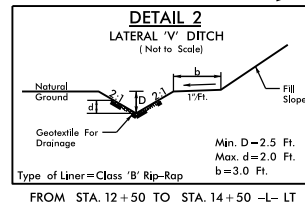
PROJECT REFERENCE NO.		SHEET NO.	
B-3673		2-A	
ROADWAY DESIGN ENGINEER		PAVEMENT DESIGN ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
Michael Baker Engineering, Inc. 8000 Regency Parkway Suite 600 Cary, NC 27518 NC License: E-1084		NC DEPARTMENT OF TRANSPORTATION PAVEMENT MANAGEMENT UNIT 1503 MAIL SERVICE CENTER RALEIGH, NC 27699-1593	



PAVEMENT SCHEDULE	
C1	3" S9.5C
C2	VAR. S9.5C
D1	3" I19.0C
D2	VAR. I19.0C
E1	7" B25.0C
E2	VAR. B25.0C
R1	SHLD BERM GUTTER
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V	MILLING
W	WEDGING

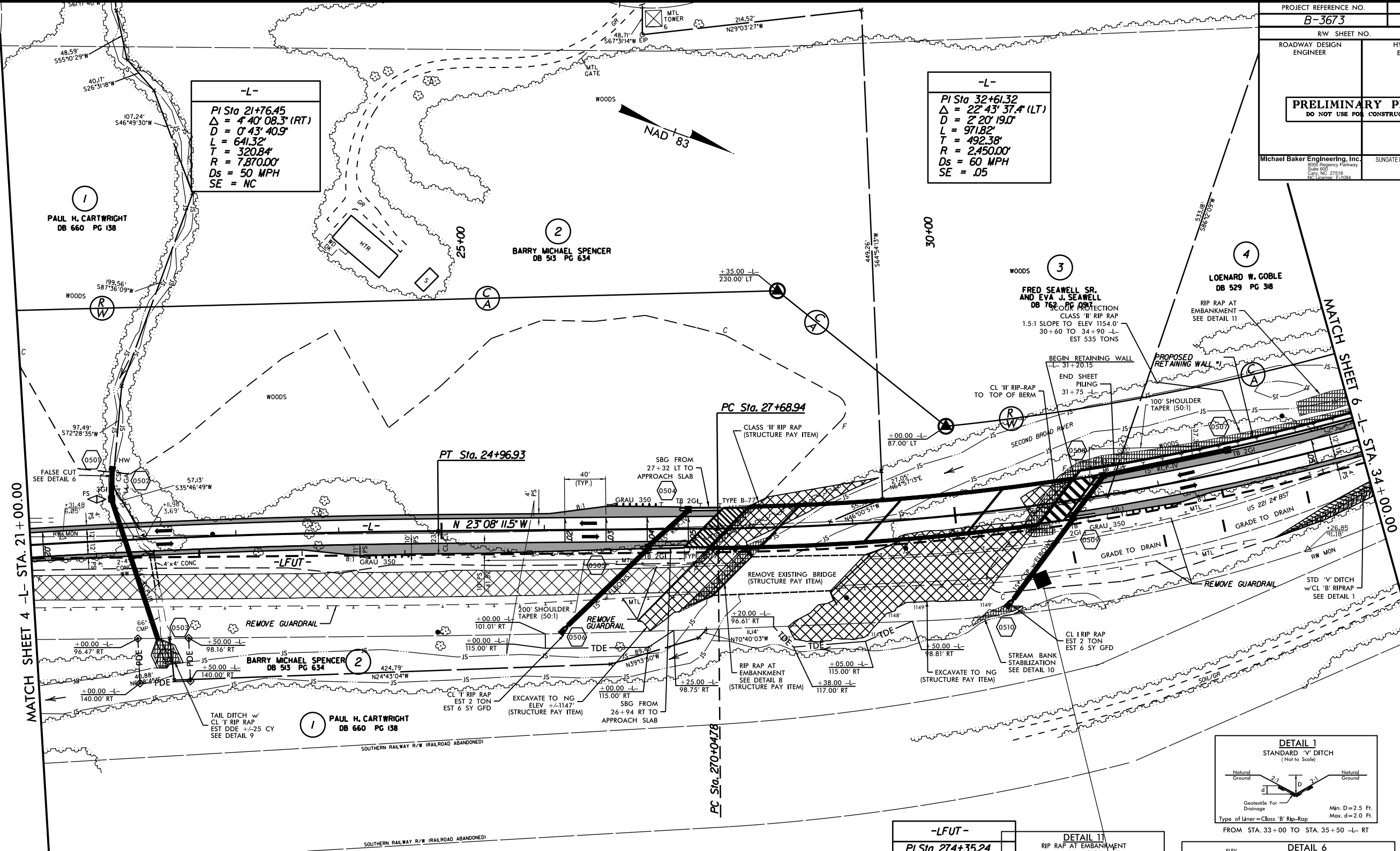


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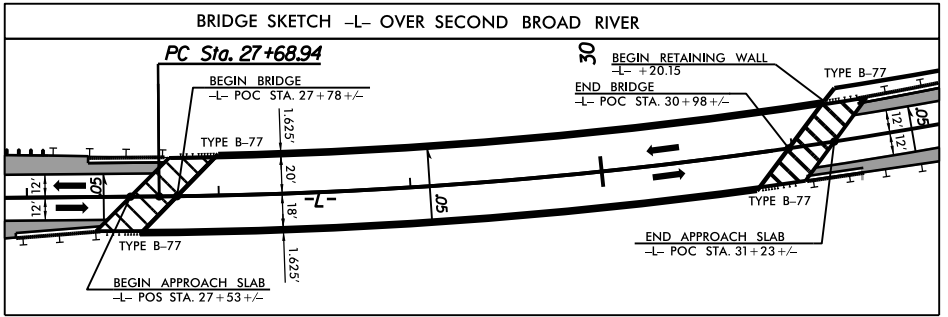
GFD = GEOTEXTILE FOR DRAINAGE
SEE SHEET 7 FOR -L- PROFILE

PROJECT REFERENCE NO.		SHEET NO.
B-3673		5
RW SHEET NO.		HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER		
PRELIMINARY PLANS		
DO NOT USE FOR CONSTRUCTION		
Michael Baker Engineering, Inc. 8000 Regency Parkway Suite 600 Cary, NC 27518 (919) 467-1000 Fax: (919) 467-1084		SUNGATE DESIGN GROUP, P.A. 915 Jones Franklin Road Raleigh, NC 27606 (919) 876-1000 Fax: (919) 876-1084

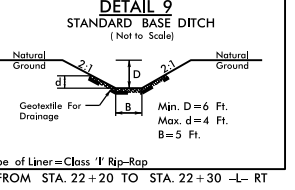
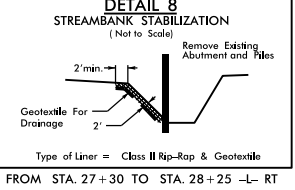
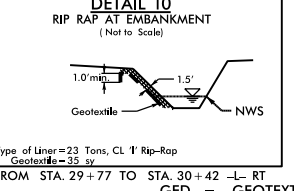
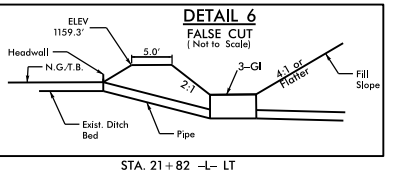
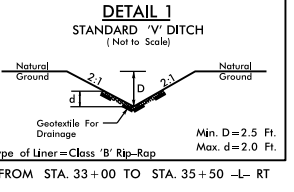


MATCH SHEET 4 -L- STA. 21+00.00

MATCH SHEET 6 -L- STA. 34+00.00



-LFUT-
PI Sta 274+35.24
Δ = 19° 44' 54.59" (LT)
D = 2' 19" 0.67"
L = 852.38'
T = 430.46'
R = 2.473.00'
Ds = 60 MPH
SE = .05

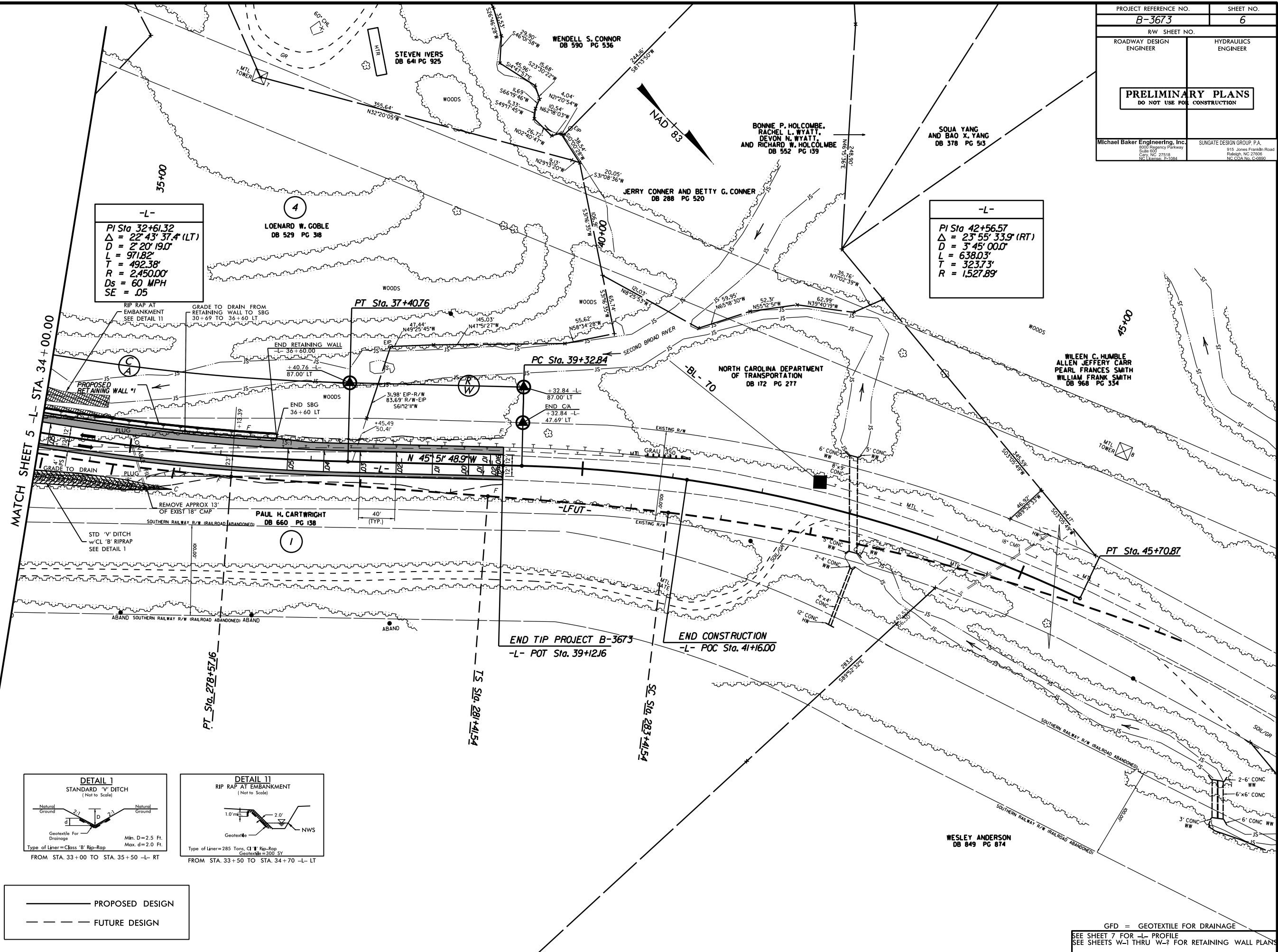


SEE SHEET 7 FOR -L- PROFILE
SEE SHEETS S-1 THRU S-? FOR STRUCTURE PLANS
SEE SHEETS W-1 THRU W-? FOR RETAINING WALL PLANS

— PROPOSED DESIGN
- - - FUTURE DESIGN

REVISIONS

8/17/99
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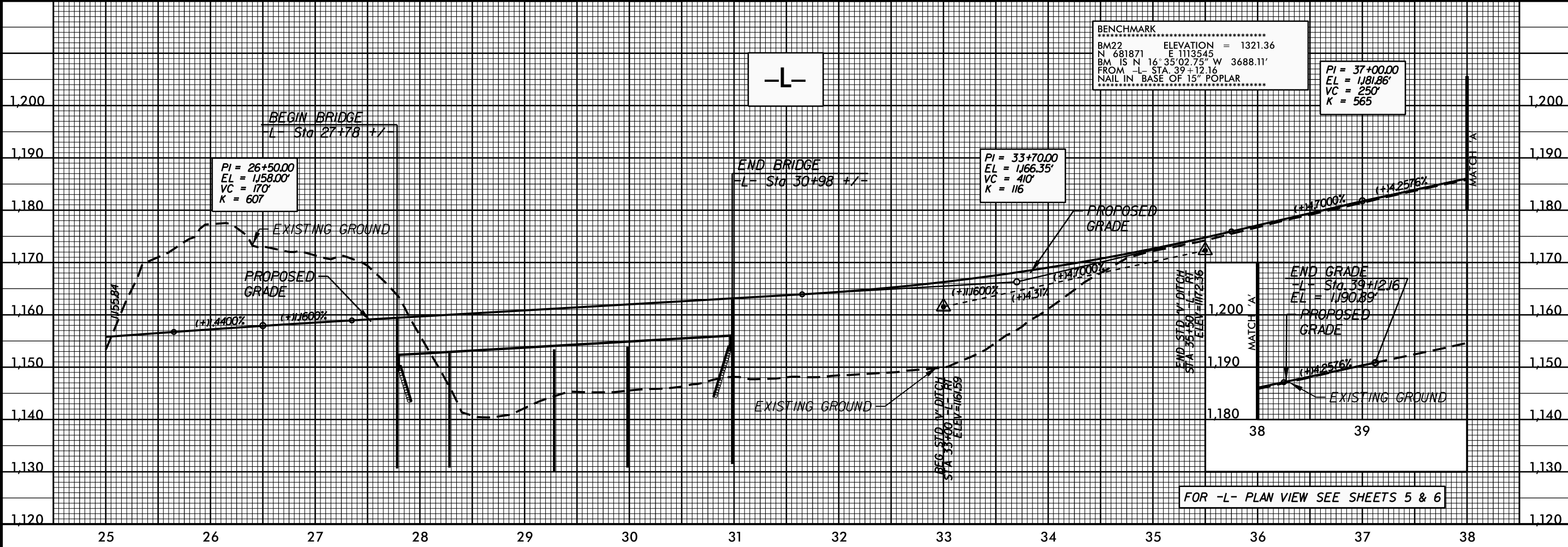
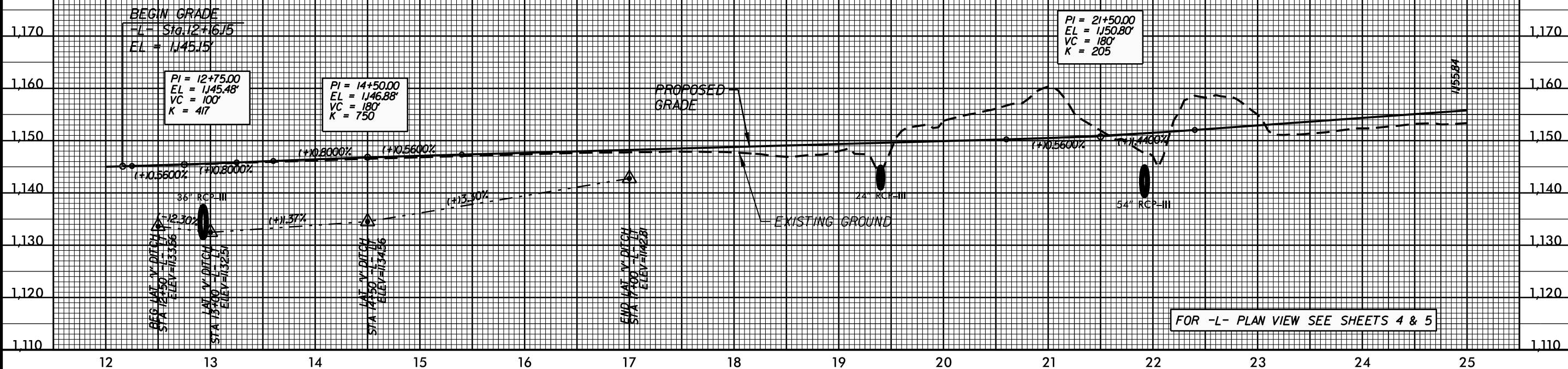
5/28/99

36" RCP - CULVERT HYDRAULIC DATA		
DESIGN DISCHARGE	= 27	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 1135.1	FT
BASE DISCHARGE	= 33	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 1135.4	FT
OVERTOPPING DISCHARGE	= 49+	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 1145.6	FT

EXIST. 24" CMP - CULVERT HYDRAULIC DATA		
DESIGN DISCHARGE	= 12	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 1143.8	FT
BASE DISCHARGE	= 13	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 1144.0	FT
OVERTOPPING DISCHARGE	= 21+	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 1149.6	FT

54" RCP-III - CULVERT HYDRAULIC DATA		
DESIGN DISCHARGE	= 130	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 1157.8	FT
BASE DISCHARGE	= 150	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 1158.5	FT
OVERTOPPING DISCHARGE	= 190	CFS
OVERTOPPING FREQUENCY	= 200	YRS
OVERTOPPING ELEVATION	= 1159.3	FT

PROJECT REFERENCE NO. B-3673	SHEET NO. 7
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
Michael Baker Engineering, Inc. 6300 Regency Parkway Suite 600 Cary, NC 27518 P: 919.275.1518 F: 919.275.1594	SUNGATE DESIGN GROUP, P.A. 915 Jones Franklin Road Raleigh, NC 27606 NC CDA No. C-2880



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3673-Fig1.dgn