STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

July 25, 2017

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

ATTN: Ms. Crystal Amschler
NCDOT Coordinator

Subject: **Application for Section 404 Nationwide Permit 13, 23, 33, and 401 Water Quality Certification** for the proposed replacement of Bridge No. 71 over Clear Creek on US 601 in Union County, Federal Aid Project No. BRSTP-0601(21), Division 10, TIP No. B-5371. Debit $240 from WBS 46086.1.1.

Dear Madam:

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 71 over Clear Creek on US 601 in Union County. Bridge No 71 is a 85- foot long, two span bridge. The replacement structure will be a 140-foot, two span bridge replaced to the east (downstream) of the current bridge. The existing bridge will carry traffic during the construction of the new bridge, as US 601 has traffic volumes too high for an off-site detour.

There will be 245 feet of permanent impact to streams by way of:

83 feet of permanent fill to a UT to Clear Creek for placement of the new bridge,
6 feet of permanent fill to a UT to Clear Creek for the placement of rip rap protection at the outlet of a pipe,
35 feet of permanent fill to a UT to Clear Creek to stabilize existing erosion as it enters Clear Creek.
51 feet of bank stabilization at the outlet of three base ditches (1@15, 1@7, 1@29) into Clear Creek,
70 feet of bank stabilization placed on banks where an existing mass concrete pier currently acts as the bank.

Total “loss of water” impacts: 124 linear feet,
Total bank stabilization impacts: 121 linear feet.

There will also be a total of 0.02 acre of temporary stream impacts by way of:

<0.01 acre (25 feet) of temporary causeway needed for the removal of an interior mass concrete pier. (Due to the location of this pier at the edge of a steep bank, this rip rap will be retained to help stabilize the bank and is accounted for as permanent impact above.)

The remaining 0.01 (78 feet) of temporary impact is necessary for the installation of the bank rip rap bank stabilization.

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
NATURAL ENVIRONMENT SECTION
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1598

Telephone: (919) 707-6000
Fax: (919) 212-5785
Customer Service: 1-877-368-4968
Website: www.ncdot.gov

Location:
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610

Please see enclosed copies of the Pre-Construction Notification (PCN), DMS acceptance letter, stormwater management plan, permit drawings, and design plans for the above-referenced project. The Categorical Exclusion (CE) was completed in January 2016 and distributed shortly thereafter. Additional copies are available upon request.

This project calls for a letting date of February 20, 2018 and a review date of January 2, 2018.

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 contact Michael Turchy at maturchy@ncdot.gov or (919) 707-6157.

Sincerely,

for Philip S. Harris III, P.E., C.P.M.
Natural Environment Section Head

cc: NCDOT Standard Permit Application Distribution List

Office Use Only:
Corps action ID no. _____
DWQ project no. _____
Form Version 1.4 January 2009

Pre-Construction Notification (PCN) Form

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** ☐ 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:	**B-5371 Replacement of Bridge 71 over Clear Creek on US 601**
2b. County:	**Union**
2c. Nearest municipality / town:	**Midland**
2d. Subdivision name:	**n/a**
2e. NCDOT only, T.I.P. or state project no:	**B-5371**

3. Owner Information

3a. Name(s) on Recorded Deed:	**North Carolina Department of Transportation**
3b. Deed Book and Page No.	
3c. Responsible Party (for LLC if applicable):	
3d. Street address:	**1598 Mail Service Center**
3e. City, state, zip:	**Raleigh, NC 27699-1598**
3f. Telephone no.:	**919-707-6157**
3g. Fax no.:	**919-212-5785**
3h. Email address:	**maturchy@ncdot.gov**

4. Applicant Information (if different from owner)	
4a. Applicant is:	☐ Agent ☐ Other, specify:
4b. Name:	
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:	
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):	**n/a**
1b. Site coordinates (in decimal degrees):	Latitude: **35.194592** (DD.DDDDDD) Longitude: **- 80.529225** (-DD.DDDDDD)
1c. Property size:	**Approximately 12 acres**
2. Surface Waters	
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	**Clear Creek**
2b. Water Quality Classification of nearest receiving water:	**C**
2c. River basin:	**Yadkin-Pee Dee River Basin**
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 primary land use is farmland with maintained disturbed homes and small businesses dispersed throughout.**	
3b. List the total estimated acreage of all existing wetlands on the property: **0.08 acre of wetlands are present on the property.**	
3c. List the total estimated linear feet of all existing streams (intermittent and perennial) on the property: **Approximately 842 linear feet of stream exist within project study area.**	
3d. Explain the purpose of the proposed project: **The purpose of the project is to replace a structurally deficient bridge, built in 1929 (then reconstructed in 1968) that is approaching the end of its useful life.**	
3e. Describe the overall project in detail, including the type of equipment to be used: **The project involves replacing a 85-foot long, two- span bridge with a 140-foot long, two-span bridge replaced to the east (downstream) of the current bridge. The existing bridge will carry traffic during the construction of the new bridge, as US 601 has traffic volumes too high for an off-site detour.** **Standard bridge and 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:	☐ 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):	Agency/Consultant Company: Other:
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.	
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	
2g. Total wetland impacts					

2h. Comments:

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 Fill / Bank Stab / Temp Impact
Site 1 ☒ P ☐ T	**Bank Stabilization**	**Clear Creek**	☒ **PER** ☐ INT	☒ **Corps** ☐ DWQ	**30**	**121**
Site 1 ☐ P ☒ T	**Temporary impact to install bank stabilization**	**Clear Creek**	☒ **PER** ☐ INT	☒ **Corps** ☐ DWQ	**30**	**<0.01 ac (48')**
Site 1 ☐ P ☒ T	**Temporary Work Pad for bridge pier removal**	**Clear Creek**	☒ **PER** ☐ INT	☒ **Corps** ☐ DWQ	**30**	**<0.01 ac (25')**
Site 2 ☒ P ☐ T	**Riprap at outlet channel**	**UT to Clear Creek (SB)**	☐ PER ☒ **INT**	☒ **Corps** ☐ DWQ	**2**	**6**
Site 2 ☐ P ☒ T	**Temporary impact to install riprap at outlet channel**	**UT to Clear Creek (SB)**	☐ PER ☒ **INT**	☒ **Corps** ☐ DWQ	**2**	**<0.01 ac (20')**
Site 2 ☒ P ☐ T	**Stabilization of stream at confluence**	**UT to Clear Creek (SB)**	☐ PER ☒ **INT**	☒ **Corps** ☐ DWQ	**2**	**35**
Site 2 ☐ P ☒ T	**Temporary impact to above Stabilization at confluence**	**UT to Clear Creek (SB)**	☐ PER ☒ **INT**	☒ **Corps** ☐ DWQ	**2**	**<0.01 ac (10')**
Site 3 ☒ P ☐ T	**Permanent fill for new bridge**	**UT to Clear Creek (SA)**	☐ PER ☒ **INT**	☒ **Corps** ☐ DWQ	**2**	**83**
3h. Total stream and tributary impacts						**Permanent Fill = 124' Bank Stabil. = 121 Temporary = 0.02 ac NW 23 = 124' NW 13 = 121' NW 33 = 0.02ac (103')**

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):	
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: ☐ 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		
			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 replacement to the east (downstream) alternative was chosen to avoid more jurisdictional resources (Wetland A and Stream B). This alternative also provides a better roadway alignment.

A longer bridge will provide an increase in hydraulic connectivity. There will be one interior bent, but it will be located outside of any jurisdictional resources.

There will be no direct discharge of stormwater into Clear Creek.

The banks of Clear Creek are approximately 5' tall and steep. Bank stabilization will be used in areas of disturbance to reduce streambank erosion.

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

Best Management Practices (BMPs) will be utilized during construction to attempt to reduce the stormwater impacts to the receiving streams due to erosion and runoff.

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:	**124** linear feet
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 no, explain why. Comments:	☐ 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?	**n/a**
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: **N/A**
4b. Has the approved Stormwater Management Plan with proof of approval been attached?	☐ Yes ☐ No **n/a**
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: **- CE completed January 2016.**	☒ **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.		
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? **USFWS website:** **Schweinitz's sunflower- No Effect, habitat present, last survey: 10/20/2015.** **Michaux's sumac – No Effect, habitat present, last survey: 10/20/2015.** **Carolina heelsplitter – No Effect due to the "relatively poor habitat quality, lack of any live native mussel taxa, and the isolation of this surveyed stream from known species occurrences.**		
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?		
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?		
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:		
8c. What source(s) did you use to make the floodplain determination? **approved NEPA documents**		

for **Philip S. Harris C.P.M., 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.)	07-25-2017 Date

Environmental Quality

ROY COOPER
Governor

July 6, 2017

Mr. Philip S. Harris, III, P.E., CPM
Project Development and Environmental Analysis Unit
North Carolina Department of Transportation
1598 Mail Service Center
Raleigh, North Carolina 27699-1598

Dear Mr. Harris:

Subject: Mitigation Acceptance Letter:

B-5371, Replace Bridge Number 71 over Clear Creek on US 601, Union County

The purpose of this letter is to notify you that the Division of Mitigation Services (DMS) will provide the compensatory stream mitigation for the subject project. Based on the information supplied by you on July 6, 2017, the impacts are located in CU 03040105 of the Yadkin River basin in the Southern Piedmont (SP) Eco-Region, and are as follows:

Yadkin 03040105 SP	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	0	0	124.0	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 mitigation acceptance letter replaces the mitigation acceptance letter issued on June 1, 2017. The impacts and associated mitigation needs were under projected by the NCDOT in the 2017 impact data. DMS 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 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 DMS.

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

Sincerely,

James B. Stanfill
Credit Management Supervisor

cc: Mr. Crystal Amschler, USACE – Asheville Regulatory Field Office
Ms. Amy Chapman, NCDWR
File: B-5371 Revised

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.07; Released October 2016)

WBS Element: 46086.1.1 **TIP No.:** B-5371 **County(ies):** Union

General Project Information

WBS Element:	46086.1.1	**TIP Number:**	B-5371	**Project Type:**	Bridge Replacement	**Date:**	4/3/2017
NCDOT Contact:	WILLIAM G. (GALEN) CAIL, P.E.			**Contractor / Designer:**	JEFF RECK, P.E.		
Address:	HYDRAULICS UNIT 1590 MAIL SERVICE CENTER RALEIGH, NC 27699			**Address:**	MOFFATT & NICHOL 4700 FALLS OF NEUSE RD, SUITE 300 RALEIGH, NC 27609		
Phone:	(919) 707-6711			**Phone:**	(919) 781-4626		
Email:	gcail@ncdot.gov			**Email:**	jreck@moffattnichol.com		
City/Town:	Fairview			**County(ies):**	Union		
River Basin(s):	Yadkin-Pee Dee			**CAMA County?**	No		
Wetlands within Project Limits?	No						

Project Description

Project Length (lin. miles or feet):	0.369 miles	**Surrounding Land Use:**	Woods, wetlands, light residential areas, and pastures.

	Proposed Project	**Existing Site**
Project Built-Upon Area (ac.)	2.4 ac.	2.2 ac.
Typical Cross Section Description:	12' TRAVEL LANES. 8' SHOULDER ON BOTH SIDES OF THE ROADWAY. 42'-2" BRIDGE OUT TO OUT.	12' TRAVEL LANES. 3'-6" SHOULDER ON BOTH SIDES OF THE ROADWAY. 35.9' BRIDGE OUT TO OUT.
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 13005 Year: 2032	Existing: 7641 Year: 2018

General Project Narrative: (Description of Minimization of Water Quality Impacts)

The project will replace Bridge #71 over Clear Creek on US 601 and its approaches in Union County. The proposed replacement structure is a 54" Prestressed Girder with a face to face length of 150' with a clear roadway width of 40'. This structure provides for 2 - 12' travel lanes with 8' shoulders.

There are no wetlands present within the proposed limits of construction. Riprap bank stabilization at the end of proposed ditches and on the banks under the existing bridge will result in 245 linear feet of permanent stream impacts.

STORMWATER CONTROLS: The proposed bridge project does not utilize deck drains. A stormwater inlet at station -L- 22+19 LT collects runoff from the bridge deck and discharges it through a pipe to a mitigable jurisdictional stream that flows into Clear Creek. A new ditch is proposed from -L- 13+00 to 22+16 RT and -L- 30+50 to 23+51 RT to collect runoff from the roadway and discharge it to Clear Creek.

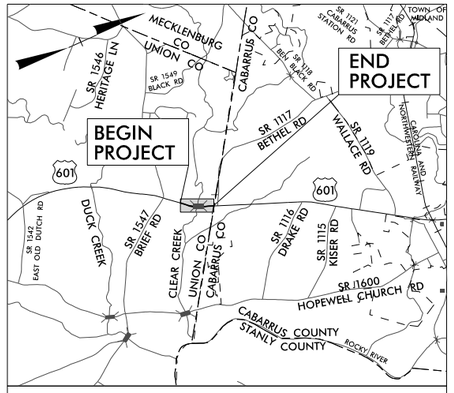
Waterbody Information

Surface Water Body (1):	Clear Creek		**NCDWR Stream Index No.:**	13-17-17	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:			
Other Stream Classification:					
Impairments:	turbidity	mercury (Hg)			
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	N/A			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

09/08/09

TIP PROJECT: B-5371

CONTRACT:



VICINITY MAP
(NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UNION COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5371	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
46086.1.1	BRSTP-0601 (21)	P.E.
46086.2.1	BRSTP-0601 (21)	R/W
46086.2.1	BRSTP-0601 (21)	UTL

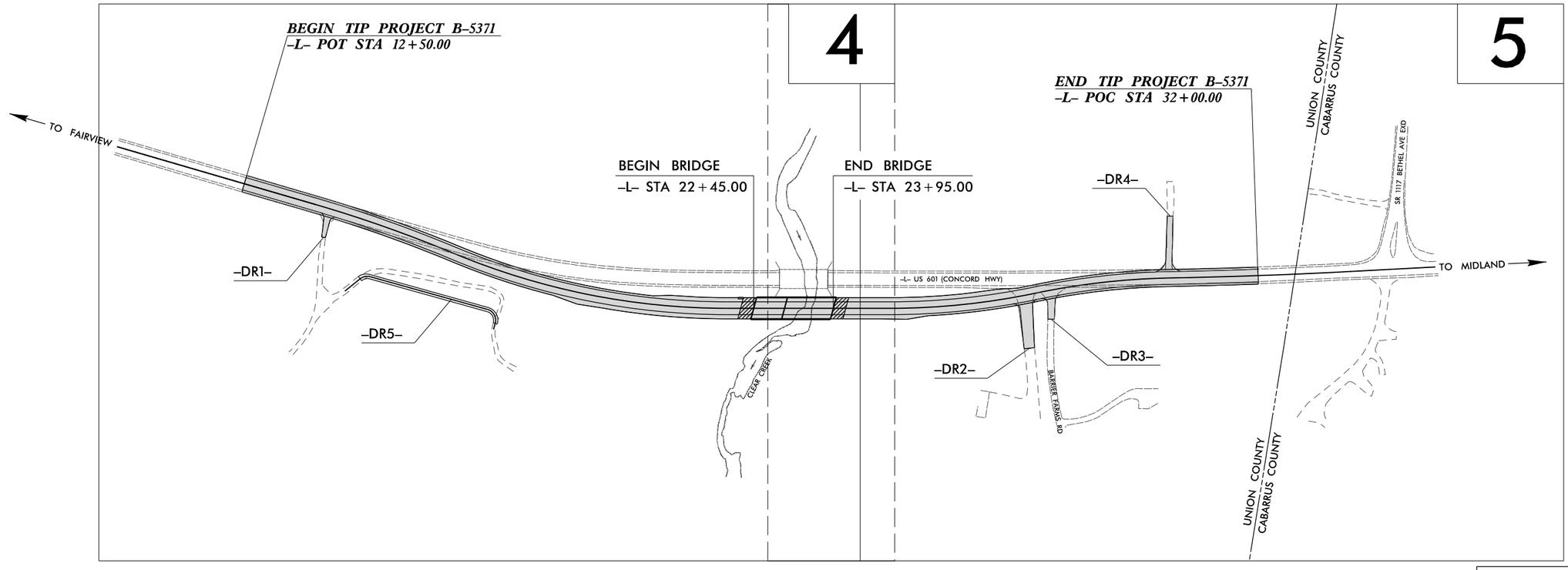
PERMIT DRAWING
SHEET 2 OF 10

LOCATION: REPLACE BRIDGE No. 71 OVER CLEAR CREEK ON US 601

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

WETLAND AND SURFACE WATER IMPACTS PERMIT

NAD 83/NA 2011



THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
THERE IS NO CONTROL OF ACCESS ON THIS PROJECT.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III

NCDOT CONTACT: GALEN CAIL, P.E.

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2018 = 7,641
ADT 2038 = 13,005
K = 10 %
D = 55 %
T = 20 % *
V = 60 MPH
* TTST =11% DUAL 9%
FUNC CLASS =
MINOR ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-5371 = 0.341 MILES
LENGTH OF STRUCTURE TIP PROJECT B-5371 = 0.028 MILES
TOTAL LENGTH OF TIP PROJECT B-5371 = 0.369 MILES

Prepared for NCDOT In the Office of:
moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX
NC License NO.: F-0105

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 17, 2017

LETTING DATE:
FEBRUARY 20, 2018

TIM R. REID, P.E.
PROJECT ENGINEER

TRENT E. HUFFMAN, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
moffatt & nichol
P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER
moffatt & nichol
P.E.
SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

4/3/2017
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jdavenport

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-5371	PRM-2
R/W SHEET NO.	PSH_04
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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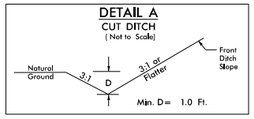
NC License NO.: F-0105

PERMIT DRAWING SHEET 3 OF 10

50' 0' 50'

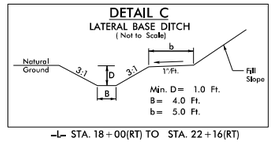
NAD 83/NA 2011

DETAIL A
CUT DITCH
(Not to Scale)



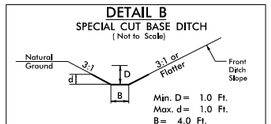
–L– STA. 13+00(LT) TO STA. 14+93.30(LT)
–L– STA. 29+00(LT) TO STA. 30+50(LT)

DETAIL C
LATERAL BASE DITCH
(Not to Scale)



–L– STA. 18+00(RT) TO STA. 22+16(RT)

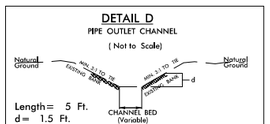
DETAIL B
SPECIAL CUT BASE DITCH
(Not to Scale)



Type of Liner= PSRM

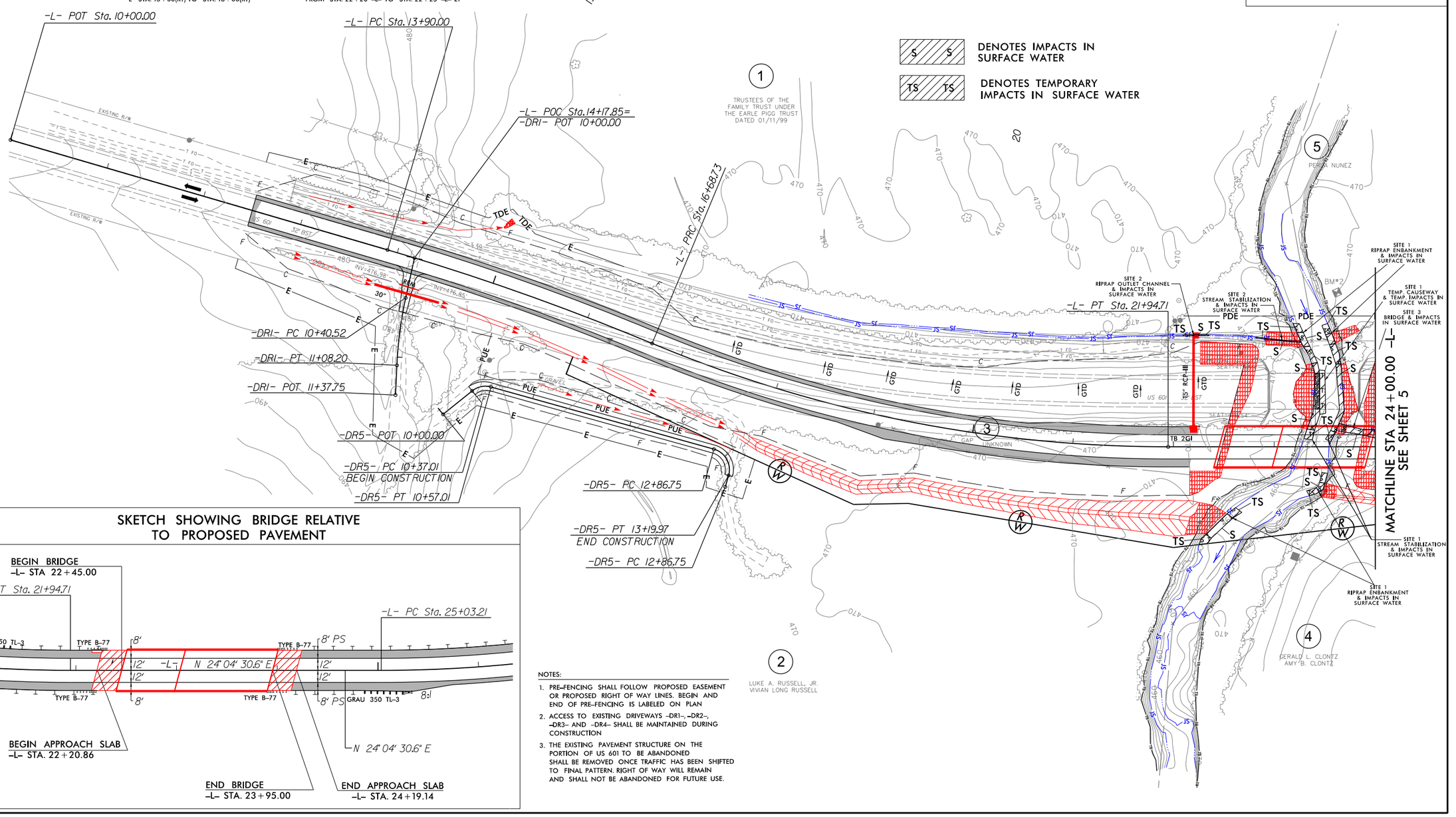
–L– STA. 13+00(RT) TO STA. 18+00(RT)

DETAIL D
PIPE OUTLET CHANNEL
(Not to Scale)



Length= 5 Ft.
d= 1.5 Ft.
Est.= 4 Tons of Class I Rip-Rap
5 SY of GEOTEXTILE

FROM STA. 22+20 –L– TO STA. 22+25 –L– LT



SKETCH SHOWING BRIDGE RELATIVE TO PROPOSED PAVEMENT

NOTES:

1. PRE-FENCING SHALL FOLLOW PROPOSED EASEMENT OR PROPOSED RIGHT OF WAY LINES. BEGIN AND END OF PRE-FENCING IS LABELED ON PLAN
2. ACCESS TO EXISTING DRIVEWAYS –DR1–, –DR2–, –DR3– AND –DR4– SHALL BE MAINTAINED DURING CONSTRUCTION
3. THE EXISTING PAVEMENT STRUCTURE ON THE PORTION OF US 601 TO BE ABANDONED SHALL BE REMOVED ONCE TRAFFIC HAS BEEN SHIFTED TO FINAL PATTERN. RIGHT OF WAY WILL REMAIN AND SHALL NOT BE ABANDONED FOR FUTURE USE.

4/3/2017
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davenport

PROJECT REFERENCE NO.	SHEET NO.
B-5371	PRM-3
R/W SHEET NO. PSH_05	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
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NC License NO.: F-0105

PERMIT DRAWING SHEET 4 OF 10

REVISIONS 8/17/99

5
PERLA NUNEZ

S S DENOTES IMPACTS IN SURFACE WATER

MATCHLINE STA. 24+00.00 -L-
182' +/- PROP R/W
SEE SHEET 4

-L- PC Sta. 25+03.21

-L- PRC Sta. 27+79.40

SITE 3
BRIDGE & IMPACTS IN SURFACE WATER

-DR4- PT 10+00.00

-DR4- PI 11+17.56

-L- PT Sta. 33+78.83

-L- POT Sta. 35+34.63

-DR2- POT 11+10.34

-L- PRC Sta. 30+30.70

-DR3- POT 11+06.44

TOE PROTECTION
SEE DETAIL H
EST. 80 SY PSRM

NAD 83/NA 2011

50' 0' 50'

4
GERALD L. CLONTZ
AMY B. CLONTZ

6
DONALD B. McLAIN
DIANE C. McLAIN

GERALD L. CLONTZ
AMY B. CLONTZ

UNION COUNTY
CABARRUS COUNTY

ALONZO E. MORRISON
PRISCILLA I. MORRISON

Duke Energy Progress

US 601

NOTES:

1. PRE-FENCING SHALL FOLLOW PROPOSED EASEMENT OR PROPOSED RIGHT OF WAY LINES. BEGIN AND END OF PRE-FENCING IS LABELED ON PLAN
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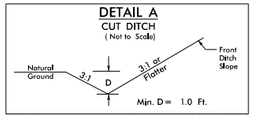
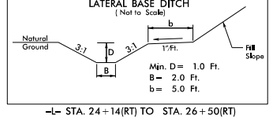
DETAIL A
CUT DITCH
(Not to Scale)



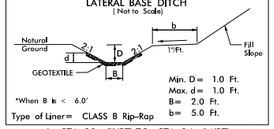
–L– STA. 13+00(LT) TO STA. 14+93.30(LT)
–L– STA. 29+00(LT) TO STA. 30+50(LT)

DETAIL D
LATERAL BASE DITCH
(Not to Scale)



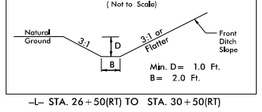
–L– STA. 24+14(RT) TO STA. 26+50(RT)

DETAIL F
LATERAL BASE DITCH
(Not to Scale)



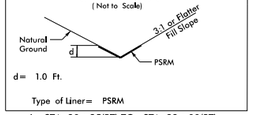
–L– STA. 23+51(RT) TO STA. 24+14(RT)

DETAIL G
SPECIAL CUT BASE DITCH
(Not to Scale)



–L– STA. 26+50(RT) TO STA. 30+50(RT)

DETAIL H
TOE PROTECTION
(Not to Scale)



–L– STA. 30+85(RT) TO STA. 32+00(RT)

4/7/2017
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idavenport

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-5371	PRM-4
R/W SHEET NO.	PSH_04
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

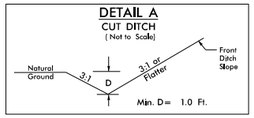
moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4865 FAX
NC License NO.: F-0105

PERMIT DRAWING
SHEET 5 OF 10

50' 0' 50'

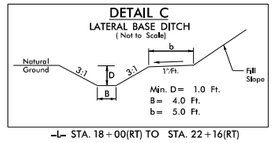
NAD 83/NA 2011

DETAIL A
CUT DITCH
(Not to Scale)



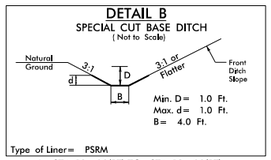
–L– STA. 13+00(LT) TO STA. 14+93.30(LT)
–L– STA. 29+00(LT) TO STA. 30+50(LT)

DETAIL C
LATERAL BASE DITCH
(Not to Scale)



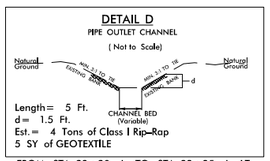
–L– STA. 18+00(RT) TO STA. 22+16(RT)

DETAIL B
SPECIAL CUT BASE DITCH
(Not to Scale)

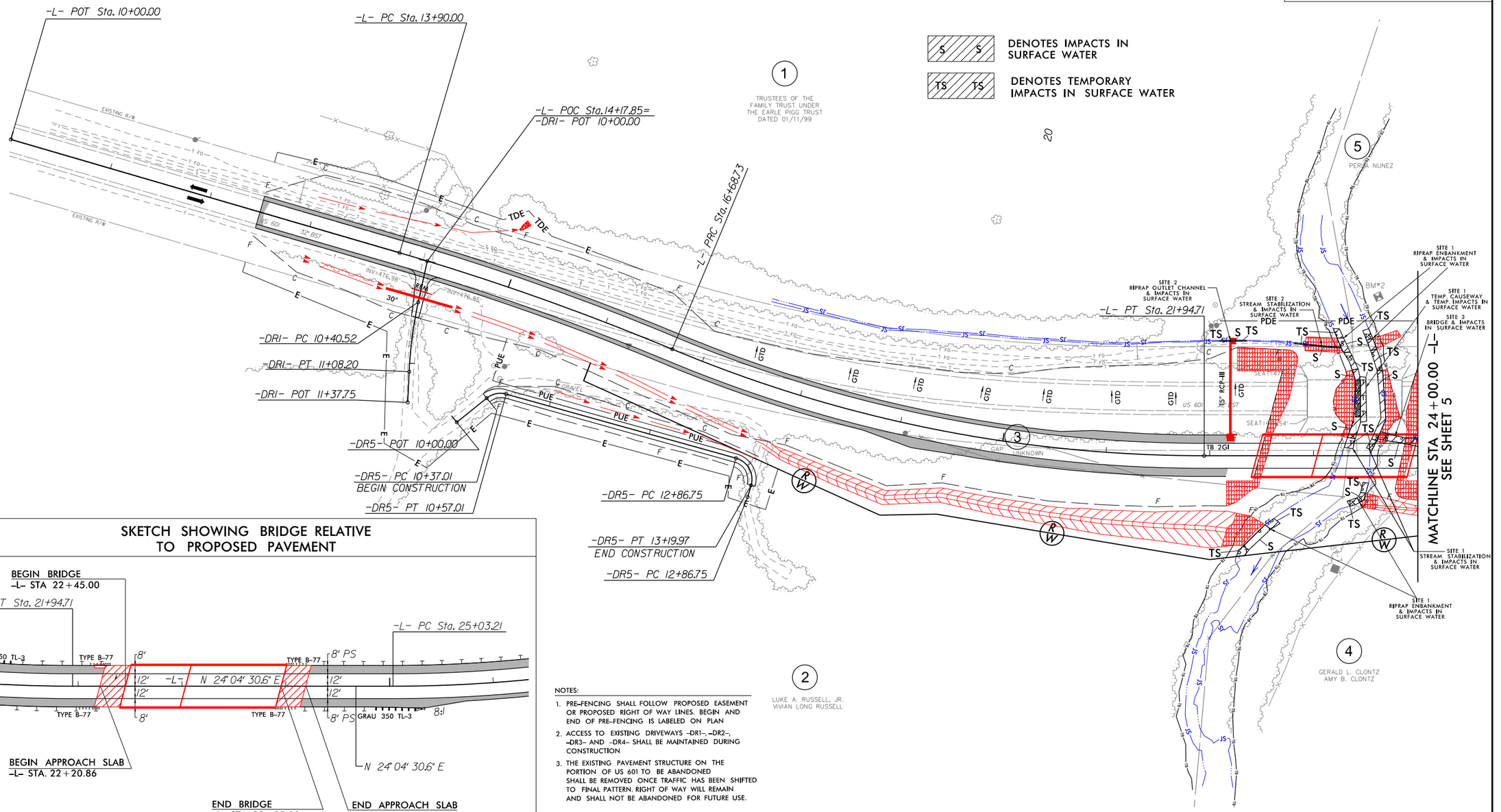


–L– STA. 13+00(RT) TO STA. 18+00(RT)

DETAIL D
PIPE OUTLET CHANNEL
(Not to Scale)



FROM STA. 22+20 –L– TO STA. 22+25 –L– LT



S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

1 TRUSTEES OF THE FAMILY TRUST UNDER THE EARLE PIGG TRUST DATED 01/11/99

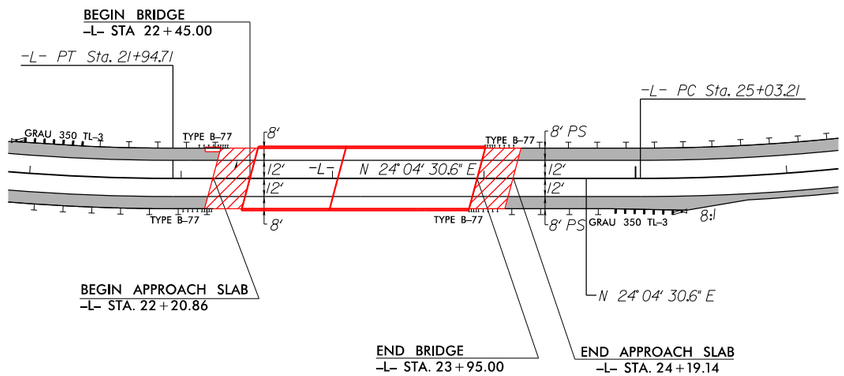
2 LUKE A. RUSSELL, JR. VIVIAN LONG RUSSELL

3

4 GERALD L. CLONTZ AMY B. CLONTZ

5 PERFECTA NUNEZ

SKETCH SHOWING BRIDGE RELATIVE TO PROPOSED PAVEMENT



NOTES:

1. PRE-FENCING SHALL FOLLOW PROPOSED EASEMENT OR PROPOSED RIGHT OF WAY LINES. BEGIN AND END OF PRE-FENCING IS LABELED ON PLAN
2. ACCESS TO EXISTING DRIVEWAYS –DR1–, –DR2–, –DR3– AND –DR4– SHALL BE MAINTAINED DURING CONSTRUCTION
3. THE EXISTING PAVEMENT STRUCTURE ON THE PORTION OF US 601 TO BE ABANDONED SHALL BE REMOVED ONCE TRAFFIC HAS BEEN SHIFTED TO FINAL PATTERN. RIGHT OF WAY WILL REMAIN AND SHALL NOT BE ABANDONED FOR FUTURE USE.

4/3/2017
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dawenport

PROJECT REFERENCE NO. B-5371 | SHEET NO. PRM-5
R/W SHEET NO. PSH_05
ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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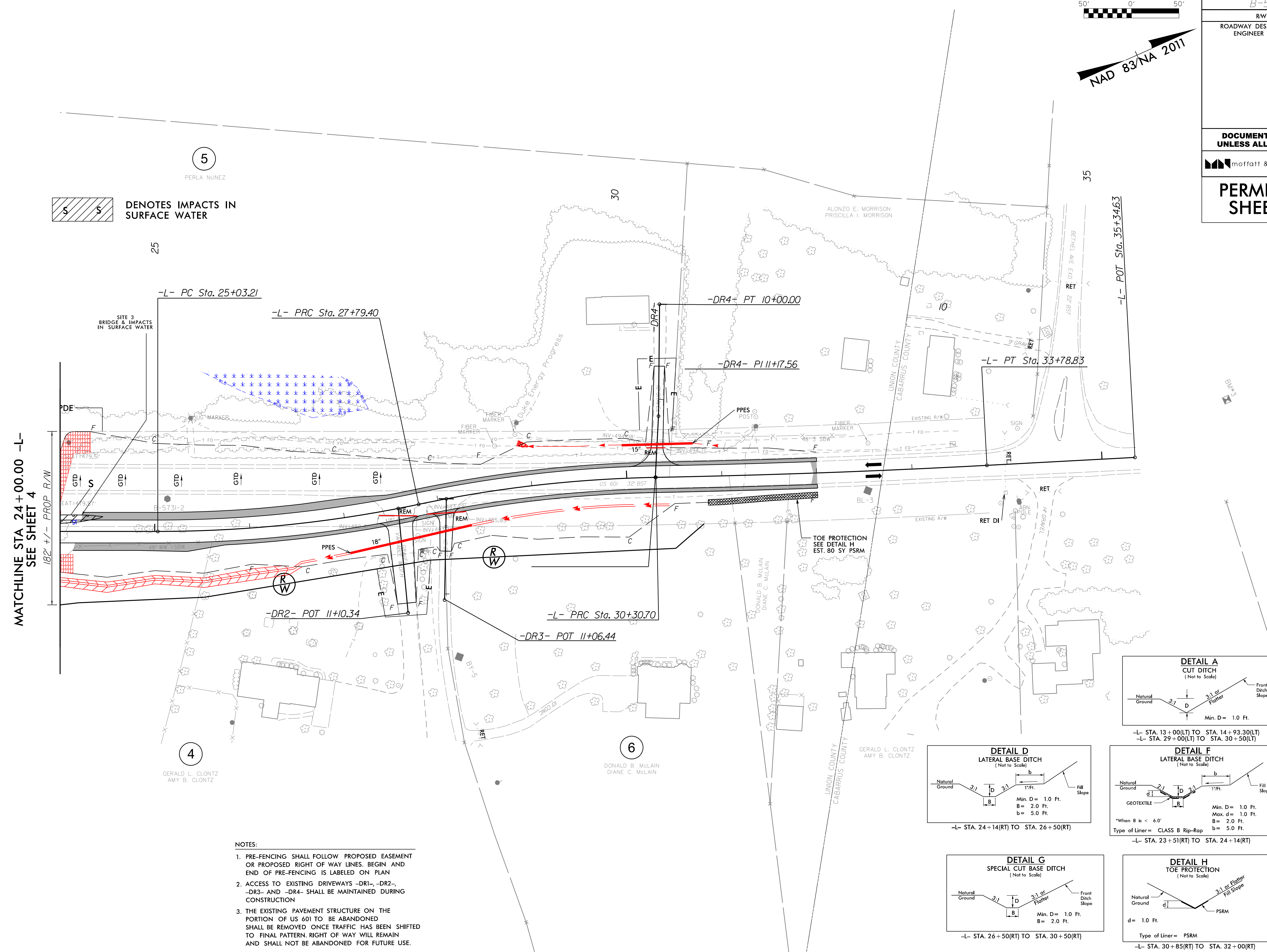
PERMIT DRAWING SHEET 6 OF 10



NAD 83/NA 2011
50' 0' 50'
DENOTES IMPACTS IN SURFACE WATER
MATCHLINE STA 24+00.00 -L- SEE SHEET 4
182' +/- PROP R/W
-L- PC Sta. 25+03.21
-L- PRC Sta. 27+79.40
SITE 3 BRIDGE & IMPACTS IN SURFACE WATER
-DR4- PT 10+00.00
-DR4- PI 11+17.56
-L- PT Sta. 33+78.83
-L- POT Sta. 35+34.63
-DR2- POT 11+10.34
-L- PRC Sta. 30+30.70
-DR3- POT 11+06.44
TOE PROTECTION SEE DETAIL H EST. 80 SY PSRM
PERLA NUNEZ
ALONZO E. MORRISON
PRISCILLA I. MORRISON
GERALD L. CLONTZ
AMY B. CLONTZ
DONALD B. McLAIN
DIANE C. McLAIN
UNION COUNTY
CABARRUS COUNTY
US 601
Duke Energy Progress
DETAIL A
CUT DITCH
(Not to Scale)
Min. D = 1.0 Ft.
-L- STA. 13+00(LT) TO STA. 14+93.30(LT)
-L- STA. 29+00(LT) TO STA. 30+50(LT)
DETAIL D
LATERAL BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft.
B = 2.0 Ft.
b = 5.0 Ft.
-L- STA. 24+14(RT) TO STA. 26+50(RT)
DETAIL F
LATERAL BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
B = 2.0 Ft.
b = 5.0 Ft.
Type of Liner = CLASS B Rip-Rap
-L- STA. 23+51(RT) TO STA. 24+14(RT)
DETAIL G
SPECIAL CUT BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft.
B = 2.0 Ft.
-L- STA. 26+50(RT) TO STA. 30+50(RT)
DETAIL H
TOE PROTECTION
(Not to Scale)
d = 1.0 Ft.
Type of Liner = PSRM
-L- STA. 30+85(RT) TO STA. 32+00(RT)

NOTES:

1. PRE-FENCING SHALL FOLLOW PROPOSED EASEMENT OR PROPOSED RIGHT OF WAY LINES. BEGIN AND END OF PRE-FENCING IS LABELED ON PLAN
2. ACCESS TO EXISTING DRIVEWAYS -DR1-, -DR2-, -DR3- AND -DR4- SHALL BE MAINTAINED DURING CONSTRUCTION
3. THE EXISTING PAVEMENT STRUCTURE ON THE PORTION OF US 601 TO BE ABANDONED SHALL BE REMOVED ONCE TRAFFIC HAS BEEN SHIFTED TO FINAL PATTERN. RIGHT OF WAY WILL REMAIN AND SHALL NOT BE ABANDONED FOR FUTURE USE.

REVISIONS

8/17/99

4/3/2017
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davenport

PROJECT REFERENCE NO.	SHEET NO.
B-5371	PRM-6

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

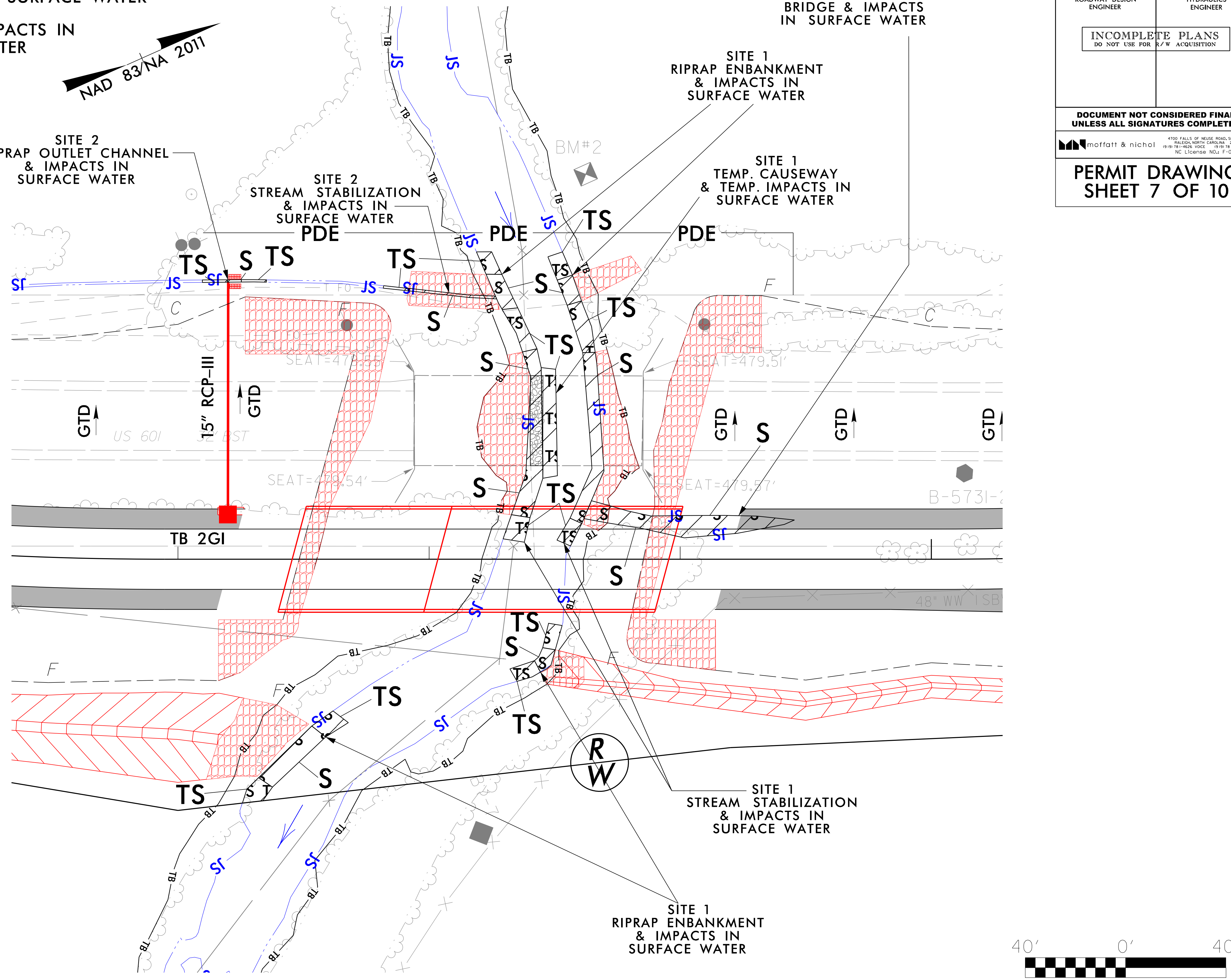
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300 RALEIGH, NORTH CAROLINA 27609
NC License No.: F-0105

PERMIT DRAWING
SHEET 7 OF 10

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES IMPACTS IN SURFACE WATER



REVISIONS

8/17/99

4/3/2017
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davenport

5/28/99

PERMIT DRAWING
SHEET 8 OF 10

PROJECT REFERENCE NO.	SHEET NO.
B-5371	PRM-7
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4865 FAX
NC License NO.: F-0105

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 4500	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 474.9	FT
BASE DISCHARGE	= 5206	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 475.71	FT
OVERTOPPING DISCHARGE	= 12000	CFS
OVERTOPPING FREQUENCY	= >500	YRS
OVERTOPPING ELEVATION	= 479.3	FT
DATE OF SURVEY	= 02/04/2016	
W.S. ELEVATION AT DATE OF SURVEY	= 462.6	FT

BM2 ELEVATION = 472.99'
N 529,335.02 E 1,543,084.54
-L- STA 23+68.27 151.91' (LT)
RR SPIKE IN ROOT OF 36" OAK TREE

-L-

BEGIN GRADE
-L- STA 12+50.00
ELEV = 483.52

PI = 15+65.00
EL = 477.92'
VC = 390'
K = 143

LOW POINT
STA 16+24.70
EL = 479.12'

PI = 20+00.00
EL = 482.02'
VC = 120'
K = 186

BEGIN BRIDGE
STA 22+45.00

END BRIDGE
STA 23+95.00

APPROXIMATE
EXCAVATION = 1,200 CY
STRUCTURE PAY ITEM

CLASS II RIPRAP
EST. 370 TONS
STRUCTURE PAY ITEM

CLASS II RIPRAP
EST. 320 TONS
STRUCTURE PAY ITEM

(−) 3.41%
(−) 3.90%
(−) 11.7779%
(+) 0.9444%
(−) 1.38%
(+) 0.9444%
(+) 0.3000%
(−) 1.05%
(+) 4.62%

+00.00 479.70 LT
+00.00 479.00 RT
+00.00 475.10 RT
+93.30 473.00 LT
+00.00 469.60 RT
+16.00 465.25 RT
+41.00 470.99 RT

NWS = 462.6'

DITCH LEGEND
LEFT DITCH
RIGHT DITCH

FOR PLAN VIEW SEE SHEET 4

-L-

END GRADE
-L- STA 32+00.00
ELEV = 503.33

BARRIER FARMS RD

BETHEL AVE EXD

PI = 26+75.00
EL = 484.05'
VC = 490'
K = 137

PI = 31+00.00
EL = 500.56'
VC = 170'
K = 151

(+) 2.88%
(+)0.3000%
(+)3.8855%
(+) 3.48%
(+) 4.06%
(+) 4.59%
(+) 0.73%
(+)3.8855%
(+)12.7633%

+14.00 473.00 RT
+50.00 479.80 RT
+31.00 486.10 RT
+00.00 487.90 LT
+09.00 492.90 LT
+50.00 493.20 LT
+50.00 495.00 RT

DITCH LEGEND
LEFT DITCH
RIGHT DITCH

FOR PLAN VIEW SEE SHEET 5

4/13/2017
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jdavenport

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-5371	PRM-8

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

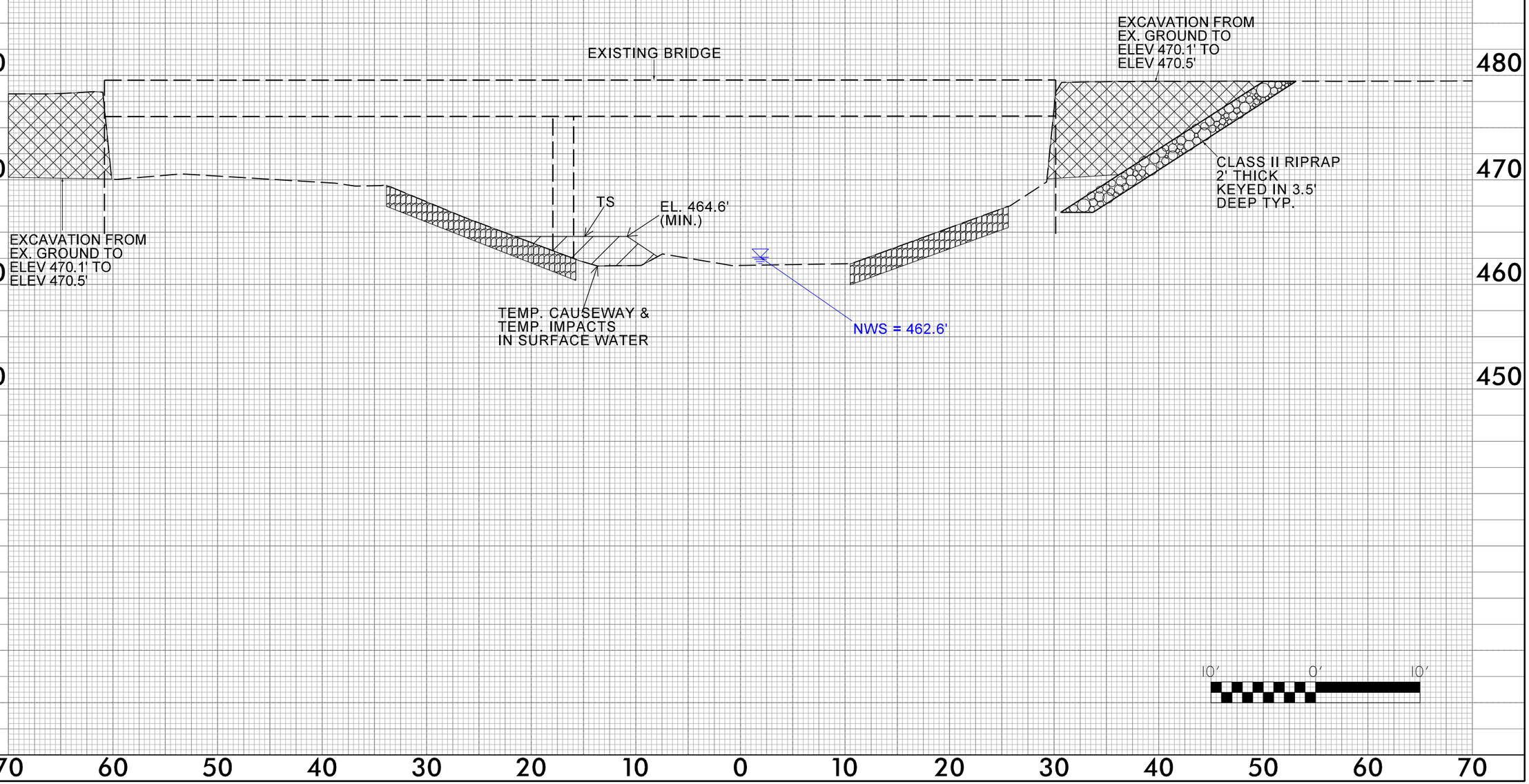
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 9 OF 10

REMOVAL OF EXISTING BENT

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 4500	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 474.9	FT
BASE DISCHARGE	= 5206	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 475.71	FT
OVERTOPPING DISCHARGE	= 12000	CFS
OVERTOPPING FREQUENCY	= >500	YRS
OVERTOPPING ELEVATION	= 479.3	FT
DATE OF SURVEY	= 02/04/2016	
W.S. ELEVATION AT DATE OF SURVEY	= 462.6	FT



4/7/2017
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dsvenport

WETLAND AND SURACE WATER IMPACTS 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	-L- 23+19 LT to 23+65 LT	Riprap Enbankment						< 0.01	< 0.01	15	8	
1	-L- 23+31 LT to 23+70 LT	Stream Stabilization						0.02	< 0.01	70	25	
1	-L- 23+32 RT to 23+53 RT	Riprap Enbankment						< 0.01	< 0.01	7	20	
1	-L- 22+26 RT to 22+68 RT	Riprap Enbankment						< 0.01	< 0.01	29	20	
2	-L- 22+14 LT to 22+40 LT	Riprap Outlet Channel						< 0.01	< 0.01	6	20	
2	-L- 22+82 LT to 23+27 LT	Stream Stabilization						< 0.01	< 0.01	35	10	
3	-L- 23+62 LT to 24+46 LT	Bridge						0.01		83		
TOTALS*:								0.04	0.02	245	103	0

*Rounded totals are sum of actual impacts

NOTES:

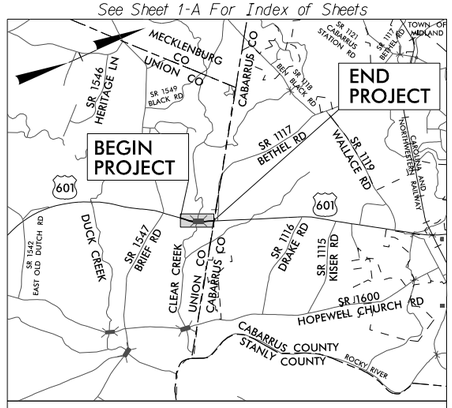
NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
04/03/2017
UNION COUNTY
B-5371
46086.1.1

Revised 2016 09 09

09/08/99

TIP PROJECT: B–5371

See Sheet 1-A For Index of Sheets



VICINITY MAP
(NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UNION COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–5371	1	

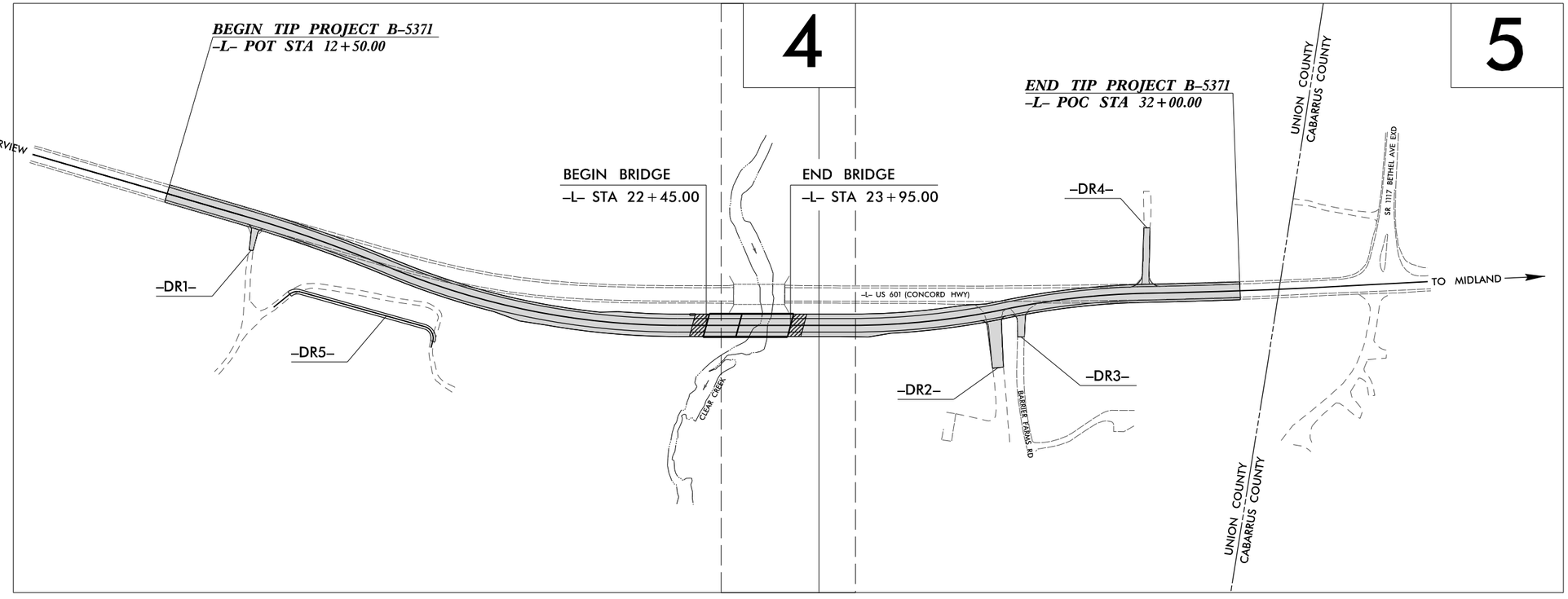
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
46086.1.1	BRSTP–0601 (21)	P.E.
46086.2.1	BRSTP–0601 (21)	R/W & UTL

LOCATION: REPLACE BRIDGE No. 71 OVER CLEAR CREEK ON US 601

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

RIGHT OF WAY PLANS

NAD 83/NA 2011



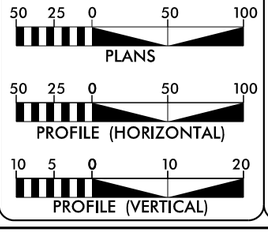
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III

NCDOT CONTACT: THAD DUNCAN, P.E.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACT:

GRAPHIC SCALES



DESIGN DATA

ADT 2018 = 7,641
ADT 2038 = 13,005
K = 10 %
D = 55 %
T = 20 % *
V = 60 MPH
* TTST = 11% DUAL 9%
FUNC CLASS = MINOR ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B–5371 = 0.341 MILES
LENGTH OF STRUCTURE TIP PROJECT B–5371 = 0.028 MILES
TOTAL LENGTH OF TIP PROJECT B–5371 = 0.369 MILES

Prepared for NCDOT In the Office of:

moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX
NC License NO.: F-0105

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: FEBRUARY 24, 2017

LETTING DATE: FEBRUARY 20, 2018

TIM R. REID, P.E.
PROJECT ENGINEER

TRENT E. HUFFMAN, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
moffatt & nichol
P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER
moffatt & nichol
P.E.
SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

3/28/2017
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jdavenport

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
B-5371	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale **S.U.E. = Subsurface Utility Engineering*

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Computed Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Existing Historic Property Boundary — HPB
- Known Contamination Area: Soil — S
- Potential Contamination Area: Soil — S
- Known Contamination Area: Water — W
- Potential Contamination Area: Water — W
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:

- Secondary Horiz and Vert Control Point
- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Exist Permanent Easement Pin and Cap
- New Permanent Easement Pin and Cap
- Vertical Benchmark
- Existing Right of Way Marker
- Existing Right of Way Line
- New Right of Way Line — RW
- New Right of Way Line with Pin and Cap — RW
- New Right of Way Line with Concrete or Granite R/W Marker — RW
- New Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- New Control of Access — CA
- Existing Easement Line — E
- New Temporary Construction Easement — E
- New Temporary Drainage Easement — TDE
- New Permanent Drainage Easement — PDE
- New Permanent Drainage / Utility Easement — DUE
- New Permanent Utility Easement — PUE
- New Temporary Utility Easement — TUE
- New Aerial Utility Easement — AUE

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
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — Vineyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H-Frame Pole
- U/G Power Line LOS B (S.U.E.*) — P
- U/G Power Line LOS C (S.U.E.*) — P
- U/G Power Line LOS D (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- U/G Telephone Cable LOS B (S.U.E.*) — T
- U/G Telephone Cable LOS C (S.U.E.*) — T
- U/G Telephone Cable LOS D (S.U.E.*) — T
- U/G Telephone Conduit LOS B (S.U.E.*) — TC
- U/G Telephone Conduit LOS C (S.U.E.*) — TC
- U/G Telephone Conduit LOS D (S.U.E.*) — TC
- U/G Fiber Optics Cable LOS B (S.U.E.*) — T FO
- U/G Fiber Optics Cable LOS C (S.U.E.*) — T FO
- U/G Fiber Optics Cable LOS D (S.U.E.*) — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line LOS B (S.U.E*) — W
- U/G Water Line LOS C (S.U.E*) — W
- U/G Water Line LOS D (S.U.E*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- U/G TV Cable LOS B (S.U.E.*) — TV
- U/G TV Cable LOS C (S.U.E.*) — TV
- U/G TV Cable LOS D (S.U.E.*) — TV
- U/G Fiber Optic Cable LOS B (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS C (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS D (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line LOS B (S.U.E.*) — G
- U/G Gas Line LOS C (S.U.E.*) — G
- U/G Gas Line LOS D (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- SS Forced Main Line LOS B (S.U.E.*) — FSS
- SS Forced Main Line LOS C (S.U.E.*) — FSS
- SS Forced Main Line LOS D (S.U.E.*) — FSS

MISCELLANEOUS:

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

PROJECT REFERENCE NO.	SHEET NO.
B-5371	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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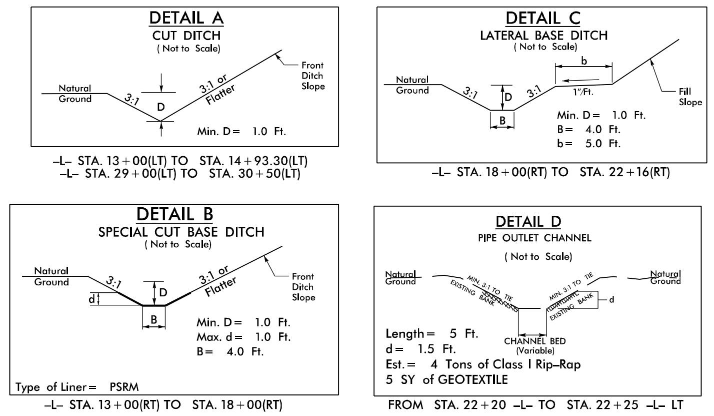
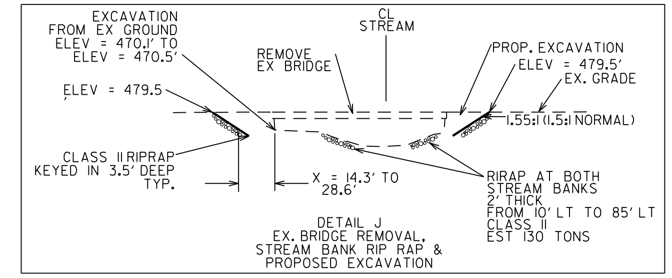

DETAIL A
CUT DITCH
(Not to Scale)
Min. D= 1.0 Ft.
-L- STA. 13+00(LT) TO STA. 14+93.30(LT)
-L- STA. 29+00(LT) TO STA. 30+50(LT)
DETAIL C
LATERAL BASE DITCH
(Not to Scale)
Min. D= 1.0 Ft.
B= 4.0 Ft.
b= 5.0 Ft.
-L- STA. 18+00(RT) TO STA. 22+16(RT)
DETAIL B
SPECIAL CUT BASE DITCH
(Not to Scale)
Min. D= 1.0 Ft.
Max. d= 1.0 Ft.
B= 4.0 Ft.
Type of Liner= PSRM
-L- STA. 13+00(RT) TO STA. 18+00(RT)
DETAIL D
PIPE OUTLET CHANNEL
(Not to Scale)
Length= 5 Ft.
d= 1.5 Ft.
Est.= 4 Tons of Class I Rip-Rap
5 SY of GEOTEXTILE
FROM STA. 22+20 -L- TO STA. 22+25 -L- LT

-L-

PI Sta 15+29.51	PI Sta 19+35.20
Δ = 6° 23' 16.6" (RT)	Δ = 22° 39' 32.2" (LT)
D = 2° 17' 30.6"	D = 4° 18' 28.6"
L = 278.73'	L = 525.98'
T = 139.51'	T = 266.47'
R = 2,500.00'	R = 1,330.00'
SE = .05	SE = .06
Ro = 135'	Ro = 162'

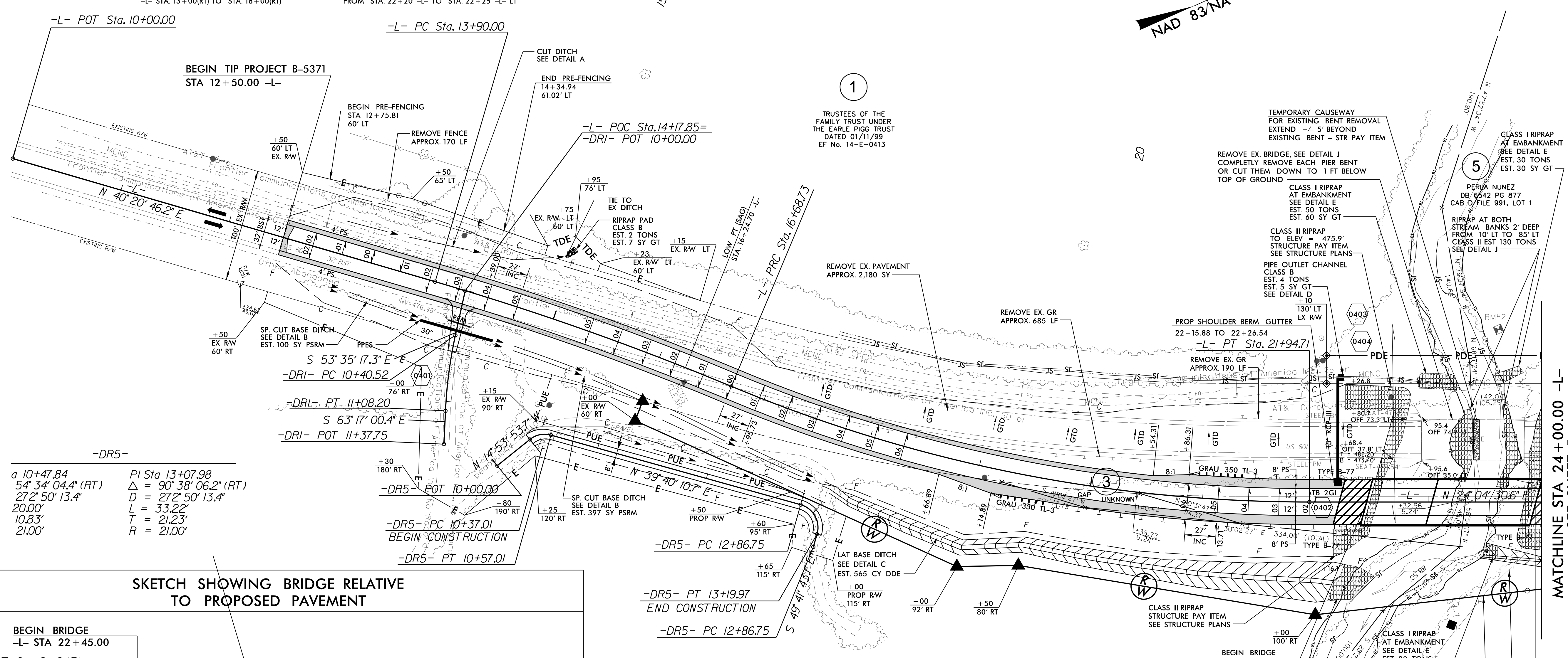

EXCAVATION FROM EX GROUND
ELEV = 470.1' TO
ELEV = 470.5'
CL STREAM
REMOVE EX BRIDGE
PROP. EXCAVATION
ELEV = 479.5'
EX. GRADE
ELEV = 479.5
1.55:1(1.5:1 NORMAL)
CLASS II RIPRAP KEYED IN 3.5' DEEP TYP.
X = 14.3' TO 28.6'
RIRAP AT BOTH STREAM BANKS 2' THICK FROM 10' LT TO 85' LT CLASS II EST 130 TONS
DETAIL J
EX. BRIDGE REMOVAL, STREAM BANK RIP RAP & PROPOSED EXCAVATION

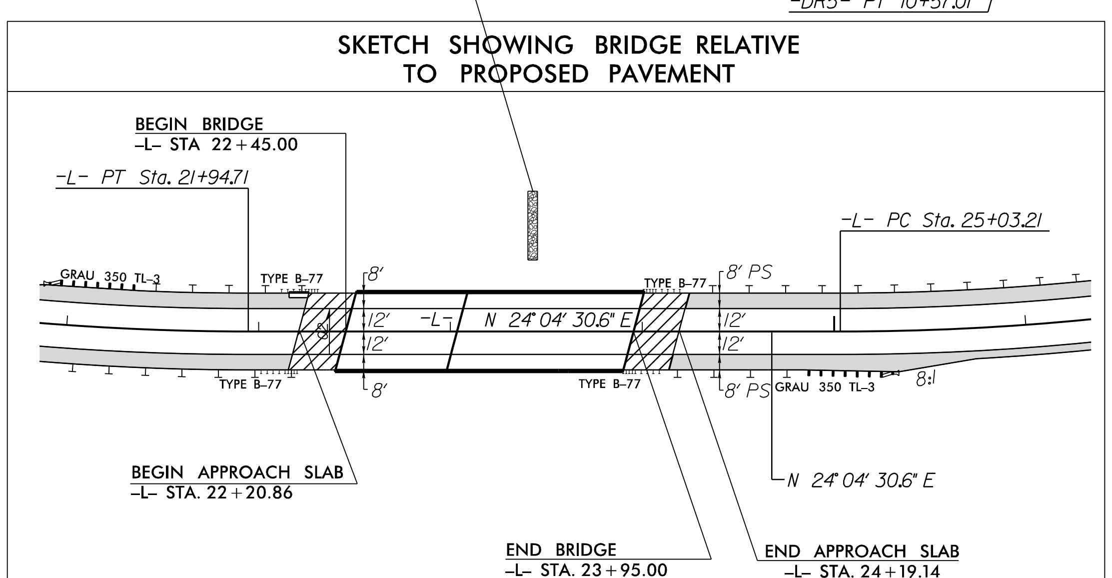
-DR1-

PI Sta 10+74.44
Δ = 9° 41' 43.2" (LT)
D = 14° 19' 26.2"
L = 67.69'
T = 33.92'
R = 400.00'

-DR5-

a 10+47.84	PI Sta 13+07.98
54° 34' 04.4" (RT)	Δ = 90° 38' 06.2" (RT)
272° 50' 13.4"	D = 272° 50' 13.4"
20.00'	L = 33.22'
10.83'	T = 21.23'
21.00'	R = 21.00'

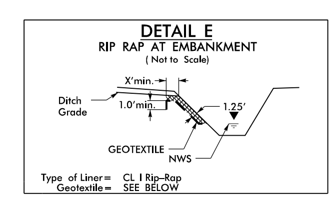

NAD 83/NA 2011
-L- POT Sta. 10+00.00
BEGIN TIP PROJECT B-5371
STA 12+50.00 -L-
-L- PC Sta. 13+90.00
CUT DITCH SEE DETAIL A
END PRE-FENCING 14+34.94 61.02' LT
BEGIN PRE-FENCING STA 12+75.81 60' LT
REMOVE FENCE APPROX. 170 LF
-L- POC Sta.14+17.85= -DR1- POT 10+00.00
TIE TO EX DITCH
RIPRAP PAD CLASS B EST. 2 TONS EST. 7 SY GT
-L- PRC Sta. 16+68.73
LOW PT (SAG) STA. 16+24.70 -L-
TRUSTEES OF THE FAMILY TRUST UNDER THE EARLE PIGG TRUST DATED 01/11/99 EF No. 14-E-0413
N 40° 20' 46.2" E
SP. CUT BASE DITCH SEE DETAIL B EST. 100 SY PSRM
S 53° 35' 17.3" E
-DR1- PC 10+40.52
-DR1- PT 11+08.20
S 63° 17' 00.4" E
-DR1- POT 11+37.75
-DR5- POT 10+00.00
-DR5- PC 10+37.01
BEGIN CONSTRUCTION
-DR5- PT 10+57.01
SP. CUT BASE DITCH SEE DETAIL B EST. 397 SY PSRM
N 39° 40' 10.7" E
-DR5- PC 12+86.75
-DR5- PT 13+19.97
END CONSTRUCTION
-DR5- PC 12+86.75
S 49° 41' 43
LAT BASE DITCH SEE DETAIL C EST. 565 CY DDE
REMOVE EX. PAVEMENT APPROX. 2,180 SY
REMOVE EX. GR APPROX. 685 LF
PROP SHOULDER BERM GUTTER 22+15.88 TO 22+26.54
-L- PT Sta. 21+94.71
REMOVE EX. GR APPROX. 190 LF
CLASS II RIPRAP STRUCTURE PAY ITEM SEE STRUCTURE PLANS
BEGIN BRIDGE -L- STA 22+45 +/-
CLASS I RIPRAP AT EMBANKMENT SEE DETAIL E EST. 90 TONS EST. 100 SY GT
TEMPORARY CAUSEWAY FOR EXISTING BENT REMOVAL EXTEND +/- 5' BEYOND EXISTING BENT - STR PAY ITEM
REMOVE EX. BRIDGE, SEE DETAIL J COMPLETLY REMOVE EACH PIER BENT OR CUT THEM DOWN TO 1 FT BELOW TOP OF GROUND
CLASS I RIPRAP AT EMBANKMENT SEE DETAIL E EST. 50 TONS EST. 60 SY GT
CLASS II RIPRAP TO ELEV = 475.9' STRUCTURE PAY ITEM SEE STRUCTURE PLANS
PIPE OUTLET CHANNEL CLASS B EST. 4 TONS EST. 5 SY GT SEE DETAIL D
CLASS I RIPRAP AT EMBANKMENT SEE DETAIL E EST. 30 TONS EST. 30 SY GT
PERLA NUNEZ DB 6542 PG 877 CAB D FILE 991, LOT 1
RIPRAP AT BOTH STREAM BANKS 2' DEEP FROM 10' LT TO 85' LT CLASS II EST 130 TONS SEE DETAIL J
N 24° 04' 30.6" E
MATCHLINE STA 24+00.00 -L- SEE SHEET 5
CLASS I RIPRAP AT EMBANKMENT SEE DETAIL E EST. 20 TONS EST. 30 SY GT
BEGIN PRE-FENCING STA 23+48.96 83.07' RT
GERALD L. CLONTZ AMY B. CLONTZ DB 421 PG 326
REMOVE EX. FENCE APPROX. 300 LF
END BRIDGE -L- STA. 23+95.00



LUKE A. RUSSELL, JR.
VIVIAN LONG RUSSELL
DB 98 PG 482

NOTES:

1. PRE-FENCING SHALL FOLLOW PROPOSED EASEMENT OR PROPOSED RIGHT OF WAY LINES. BEGIN AND END OF PRE-FENCING IS LABELED ON PLAN
2. ACCESS TO EXISTING DRIVEWAYS -DR1-, -DR2-, -DR3- AND -DR4- SHALL BE MAINTAINED DURING CONSTRUCTION
3. THE EXISTING PAVEMENT STRUCTURE ON THE PORTION OF US 601 TO BE ABANDONED SHALL BE REMOVED ONCE TRAFFIC HAS BEEN SHIFTED TO FINAL PATTERN. RIGHT OF WAY WILL REMAIN AND SHALL NOT BE ABANDONED FOR FUTURE USE.



-L- STA. 23+08(115' LT) TO STA. 23+27(100' LT); 50 TONS CL I, 60 SY GEOTEXT; X=30'
-L- STA. 23+63(108' LT) TO STA. 24+00(118' LT); 30 TONS CL I, 30 SY GEOTEXT; X=20'
-L- STA. 22+16(86' RT) TO STA. 22+52(65' RT): 90 TONS CL I, 100 SY GEOTEXT; X=10'

FOR L PROFILE SEE SHEET 6
FOR DR1 PROFILE SEE SHEET 7

REVISIONS

8/17/99

3/28/2017
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davenport

PROJECT REFERENCE NO.	SHEET NO.
B-5371	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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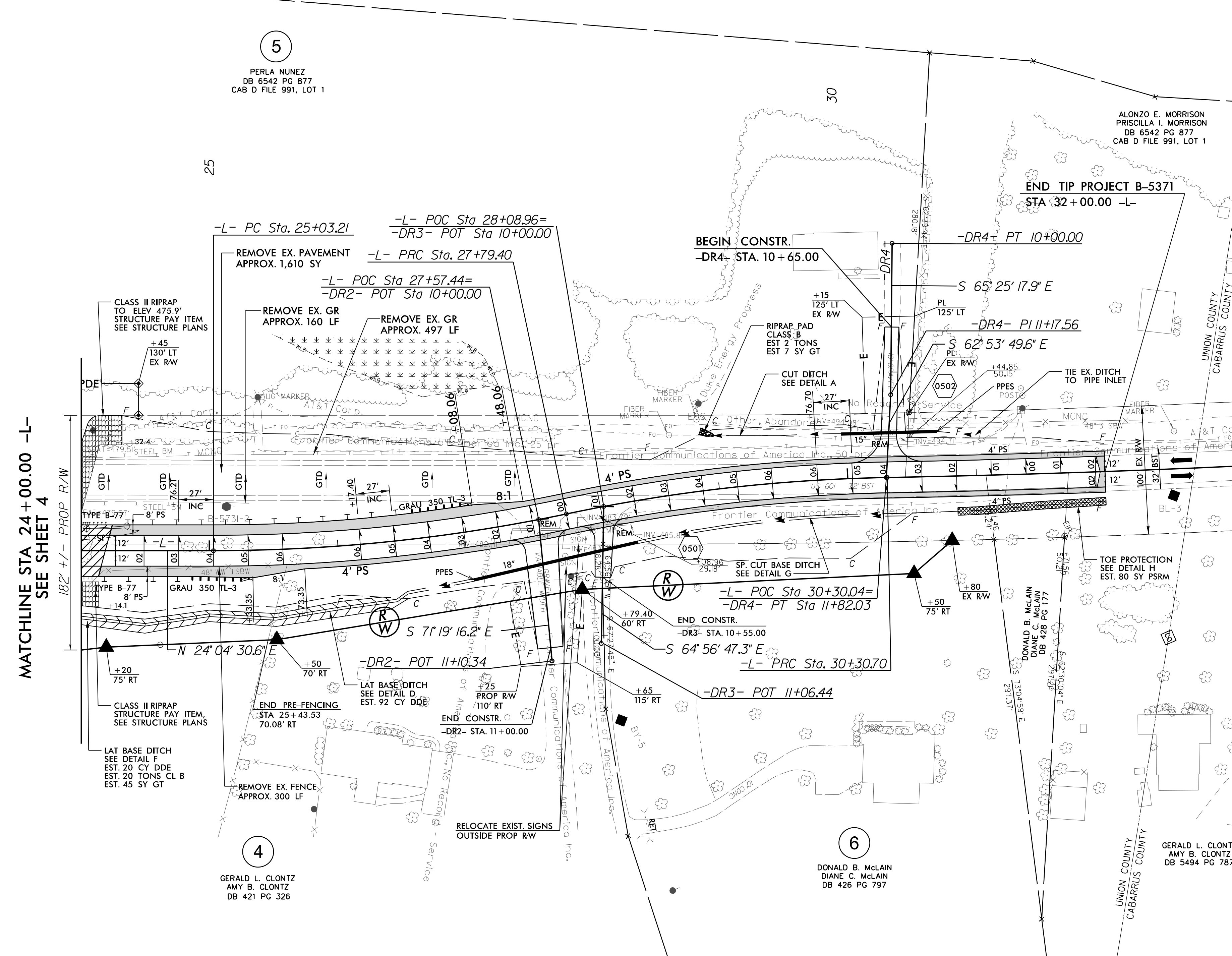
NC License No.: F-0105

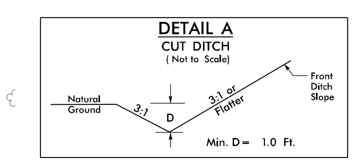
NAD 83/NA 2011

-L-

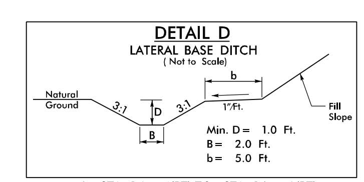
PI Sta 26+41.80	PI Sta 29+05.42	PI Sta 32+04.78
△ = 11° 53' 53.2" (LT)	△ = 10° 49' 34.3" (RT)	△ = 1° 59' 40.6" (LT)
D = 4° 18' 28.6"	D = 4° 18' 28.6"	D = 0° 34' 22.6"
L = 276.19'	L = 251.31'	L = 348.13'
T = 138.59'	T = 126.03'	T = 174.08'
R = 1,330.00'	R = 1,330.00'	R = 10,000.00'
SE = .06	SE = .06	SE = NC
Ro = 162'	Ro = 162'	Ro = exist



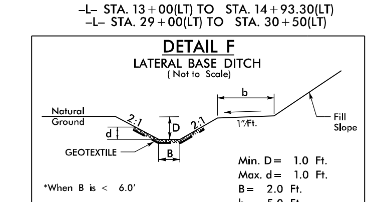
PERLA NUNEZ
DB 6542 PG 877
CAB D FILE 991, LOT 1
ALONZO E. MORRISON
PRISCILLA I. MORRISON
DB 6542 PG 877
CAB D FILE 991, LOT 1
END TIP PROJECT B-5371
STA 32+00.00 -L-
BEGIN CONSTR.
-DR4- STA. 10+65.00
-DR4- PT 10+00.00
S 65° 25' 17.9" E
-DR4- PI 11+17.56
S 62° 53' 49.6" E
-L- PT Sta. 33+78.83
-L- POT Sta. 35+34.63
-L- PC Sta. 25+03.21
-L- POC Sta 28+08.96=
-DR3- POT Sta 10+00.00
-L- PRC Sta. 27+79.40
-L- POC Sta 27+57.44=
-DR2- POT Sta 10+00.00
REMOVE EX. PAVEMENT
APPROX. 1,610 SY
REMOVE EX. GR
APPROX. 160 LF
REMOVE EX. GR
APPROX. 497 LF
CLASS II RIPRAP
TO ELEV 475.9'
STRUCTURE PAY ITEM
SEE STRUCTURE PLANS
RIPRAP PAD
CLASS B
EST 2 TONS
EST 7 SY GT
CUT DITCH
SEE DETAIL A
TIE EX. DITCH
TO PIPE INLET
MATCHLINE STA 24+00.00 -L-
SEE SHEET 4
-L- N 21° 00' 31.0" E
TOE PROTECTION
SEE DETAIL H
EST. 80 SY PSRM
SP. CUT BASE DITCH
SEE DETAIL G
-L- POC Sta 30+30.04=
-DR4- PT Sta 11+82.03
END CONSTR.
-DR3- STA. 10+55.00
S 64° 56' 47.3" E
-L- PRC Sta. 30+30.70
-DR3- POT 11+06.44
S 71° 19' 16.2" E
N 24° 04' 30.6" E
-DR2- POT 11+10.34
LAT BASE DITCH
SEE DETAIL D
EST. 92 CY DDE
END PRE-FENCING
STA 25+43.53
70.08' RT
END CONSTR.
-DR2- STA. 11+00.00
CLASS II RIPRAP
STRUCTURE PAY ITEM,
SEE STRUCTURE PLANS
LAT BASE DITCH
SEE DETAIL F
EST. 20 CY DDE
EST. 20 TONS CL B
EST. 45 SY GT
REMOVE EX. FENCE
APPROX. 300 LF
RELOCATE EXIST. SIGNS
OUTSIDE PROP R/W
GERALD L. CLONTZ
AMY B. CLONTZ
DB 421 PG 326
DONALD B. McLAIN
DIANE C. McLAIN
DB 426 PG 797
GERALD L. CLONTZ
AMY B. CLONTZ
DB 5494 PG 787
DONALD B. McLAIN
DIANE C. McLAIN
DB 428 PG 177
UNION COUNTY
CABARRUS COUNTY



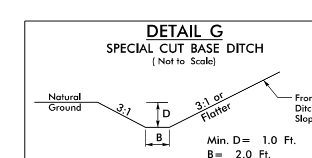
-L- STA. 13+00(LT) TO STA. 14+93.30(LT)
-L- STA. 29+00(LT) TO STA. 30+50(LT)



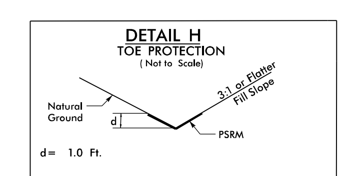
-L- STA. 24+14(RT) TO STA. 26+50(RT)



-L- STA. 23+51(RT) TO STA. 24+14(RT)



-L- STA. 26+50(RT) TO STA. 30+50(RT)



-L- STA. 30+85(RT) TO STA. 32+00(RT)

NOTES:

1. PRE-FENCING SHALL FOLLOW PROPOSED EASEMENT OR PROPOSED RIGHT OF WAY LINES. BEGIN AND END OF PRE-FENCING IS LABELED ON PLAN
2. ACCESS TO EXISTING DRIVEWAYS -DR1-, -DR2-, -DR3- AND -DR4- SHALL BE MAINTAINED DURING CONSTRUCTION
3. THE EXISTING PAVEMENT STRUCTURE ON THE PORTION OF US 601 TO BE ABANDONED SHALL BE REMOVED ONCE TRAFFIC HAS BEEN SHIFTED TO FINAL PATTERN. RIGHT OF WAY WILL REMAIN AND SHALL NOT BE ABANDONED FOR FUTURE USE.

FOR L PROFILE SEE SHEET 6
FOR DR2 PROFILE SEE SHEET 7
FOR DR3 PROFILE SEE SHEET 7
FOR DR4 PROFILE SEE SHEET 7

REVISIONS

8/17/99

3/28/2017
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davenport

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
B-5371	6
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4865 FAX
NC License NO.: F-0105

-L-

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 4500	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 474.9	FT
BASE DISCHARGE	= 5206	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 475.71	FT
OVERTOPPING DISCHARGE	= 12000	CFS
OVERTOPPING FREQUENCY	= >500	YRS
OVERTOPPING ELEVATION	= 479.3	FT
DATE OF SURVEY	= 02/04/2016	
W.S. ELEVATION AT DATE OF SURVEY	= 462.6	FT

BM2 ELEVATION = 472.99'
N 529,335.02 E 1,543,084.54
-L- STA 23+68.27 151.91' (LT)
RR SPIKE IN ROOT OF 36" OAK TREE

BEGIN GRADE
-L- STA 12+50.00
ELEV = 483.52

PI = 15+65.00
EL = 477.92'
VC = 390'
K = 143

LOW POINT
STA 16+24.70
EL = 479.12'

PI = 20+00.00
EL = 482.02'
VC = 120'
K = 186

BEGIN BRIDGE
STA 22+45.00

END BRIDGE
STA 23+95.00

APPROXIMATE
EXCAVATION = 1,200 CY
STRUCTURE PAY ITEM

CLASS II RIPRAP
EST. 370 TONS
STRUCTURE PAY ITEM

CLASS II RIPRAP
EST. 320 TONS
STRUCTURE PAY ITEM

(−) 3.41%
(−) 3.90%
(−) 11.7779%
(+) 0.9444%
(−) 1.38%
(+) 0.9444%
(+) 0.3000%
(−) 1.05%
(+) 4.62%

+00.00 479.70 LT
+00.00 479.00 RT
+00.00 475.10 RT
+93.30 473.00 LT
+00.00 469.60 RT
+16.00 465.25 RT
+41.00 470.99 RT

DITCH LEGEND
LEFT DITCH
RIGHT DITCH

FOR PLAN VIEW SEE SHEET 4

-L-

END GRADE
-L- STA 32+00.00
ELEV = 503.33

PI = 26+75.00
EL = 484.05'
VC = 490'
K = 137

PI = 31+00.00
EL = 500.56'
VC = 170'
K = 151

BARRIER FARMS RD

BETHEL AVE EXD

(+) 2.88%
(+)0.3000%
(+)3.8855%
(+) 3.48%
(+) 4.06%
(+) 4.59%
(+) 0.73%
(+)3.8855%
(+)12.7633%

+14.00 473.00 RT
+50.00 479.80 RT
+31.00 486.10 RT
+00.00 487.90 LT
+09.00 492.90 LT
+50.00 493.20 LT
+50.00 495.00 RT

DITCH LEGEND
LEFT DITCH
RIGHT DITCH

FOR PLAN VIEW SEE SHEET 5

3/28/2017
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jdavenport