STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

July 8, 2009

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

ATTN: Mr. Steve Lund
NCDOT Coordinator

Subject: **Application for Section 404 Nationwide Permit 23 and Section 401 Water Quality Certification** for the proposed replacement of Bridge No. 144 over Sandy Run Creek on SR 1327 in Cleveland County, Federal Aid Project No. BRSTP-1327(2); State Project No. 8.2802001; Division 12; TIP No. B-4468, $240.00 Debit Work Order WBS Element 33717.1.1.

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 144 over Sandy Run Creek on SR 1327. There will be 90 linear feet of permanent stream impacts on this project.

Please see enclosed copies of the Pre-Construction Notification (PCN), permit drawings, stormwater management plan and design plans for the above-referenced project. The Programmatic Categorical Exclusion (PCE) was completed in January 2009 and was distributed shortly thereafter. Additional copies are available upon request.

This project calls for a letting date of March 16, 2010 and a review date of January 26, 2010.

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

TELEPHONE: 919-715-1334
FAX: 919-715-5501
WEBSITE: WWW.NCDOT.ORG

LOCATION:
4701 ATLANTIC AVENUE
SUITE 116
RALEIGH NC 27604

A copy of this permit application will be posted on the NCDOT Website at: http://www.ncdot.org/doh/preconstruct/pe/. If you have any questions or need additional information, please e-mail Erin Cheely at ekcheely@ncdot.gov.

Sincerely,

E. L. Lush

for Gregory J. Thorpe, Ph.D.
Environmental Management Director, PDEA

W/attachment:

Mr. Brian Wrenn, NCDWQ (5 Copies)
Ms. Marella Buncick, USFWS
Ms. Marla Chambers, NCWRC

W/o attachment (see website for attachments):

Dr. David Chang, P.E., Hydraulics
Mr. Greg Perfetti, P.E., Structure Design
Mr. Victor Barbour, P.E., Project Services Unit
Mr. Mark Staley, Roadside Environmental
Mr. M.L. Holder, P.E., Division Engineer
Ms. Trish Simon, DEO
Mr. Jay Bennett, P.E., Roadway Design
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Scott McLendon, USACE, Wilmington
Mr. Hank Schwab, PDEA Project Planning Engineer

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: 23	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:	Replacment of Bridge No. 144 over Sandy Run Creek on SR 1327 (Mooresboro Rd.)
2b. County:	Cleveland
2c. Nearest municipality / town:	Mooresboro
2d. Subdivision name:	*not applicable*
2e. NCDOT only, T.I.P. or state project no:	B-4468

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) 431-6697
3g. Fax no.:	(919) 431-2002
3h. Email address:	ekcheely@ncdot.gov

4. Applicant Information (if different from owner)	
4a. Applicant is:	☐ Agent ☐ Other, specify:
4b. Name:	*not applicable*
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:	*not applicable*
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):	*not applicable*	
1b. Site coordinates (in decimal degrees):	Latitude: 35.34330 (DD.DDDDDD)	Longitude: - 81.70170 (-DD.DDDDDD)
1c. Property size:	1.3 acres	
2. Surface Waters		
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	Sandy Run Creek (HUC 03050105)	
2b. Water Quality Classification of nearest receiving water:	C	
2c. River basin:	Broad	
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 land use in the project vicinity is approximately 60% Cultivated Land (mainly pasture), 30% Forest Land (including broadleaf and mixed deciduous forests) and 10% Disturbed Land (impervious surfaces, maintained roadsides and residential areas).		
3b. List the total estimated acreage of all existing wetlands on the property: 0 acres		
3c. List the total estimated linear feet of all existing streams (intermittent and perennial) on the property: 329 linear feet		
3d. Explain the purpose of the proposed project: To replace a structurally deficient bridge. Bridge No. 144 has a sufficiency rating of 44.2 out of 100 and a structural evaluation appraisal of 2 out of a possible 9 according to Federal Highway Administration (FHWA) standards.		
3e. Describe the overall project in detail, including the type of equipment to be used: The project involves replacing a 121-foot bridge with a 145-foot, 3-span bridge on the existing alignment with an off-site detour. 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:	☒ 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): Steven Lund	Agency/Consultant Company: EcoScience Corporation Other:	
4d. If yes, list the dates of the Corps jurisdictional determinations or State determinations and attach documentation. October 22, 2007		
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	
Site 6 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
				2g. **Total wetland impacts**	0 Permanent 0 Temporary

2h. Comments: No wetlands within project area.

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)
Site 1 ☒ P ☐ T	stream relocation	UT to Sandy Run Creek	☐ PER ☒ INT	☒ Corps ☐ DWQ	4	90
Site 2 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
Site 3 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
Site 4 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
Site 5 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
					3h. **Total stream and tributary impacts**	90 Perm 0 Temp

3i. Comments: The maximum permanent impact in the stream from the construction of the proposed interior bent is an area of 58 square feet due to two 3'-6" diameter drilled shafts adjacent to the stream.

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	0 Permanent 0 Temporary

4g. Comments: No open water within project area.

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 ☐ Catawba	☐ Tar-Pamlico ☐ Randleman	☐ Other:
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: Project is not in a protected buffer area.

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 bridge will be replaced in place with an off-site detour and the new bridge will be longer than the existing one. There will be no discharge of deck drainage directly into the creek from the bridge.

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

The proposed 4' base lateral ditch that is relocating the existing UT to Sandy Run Creek will be lined with permanent soil reinforcement matting (PSRM) instead of rip rap.

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 No mitigation is proposed as there are minimal stream impacts (90 linear feet) and there are no HQW, ORW or other protected waters in the project area. Impacts for this project will not cause an adverse effect or significant loss of waters of the United States.
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:	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?	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
5b. Have all of the 401 Unit submittal requirements been met?	☒ Yes ☐ No

F. Supplementary Information		
1. Environmental Documentation (DWQ Requirement)		
1a. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land?	☒ Yes	☐ No
1b. If you answered "yes" to the above, does the project require preparation of an environmental document pursuant to the requirements of the National or State (North Carolina) Environmental Policy Act (NEPA/SEPA)?	☒ Yes	☐ No
1c. If you answered "yes" to the above, has the document review been finalized by the State Clearing House? (If so, attach a copy of the NEPA or SEPA final approval letter.) Comments:	☒ 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. The new bridge will be constructed in the same location as the old bridge.		
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 (Checked the USFWS website)
5c. If yes, indicate the USFWS Field Office you have contacted.	☐ Raleigh ☒ Asheville (Checked the USFWS website)
5d. What data sources did you use to determine whether your site would impact Endangered Species or Designated Critical Habitat? An NCDOT field survey for dwarf-flowered heartleaf was conducted on March 19, 2009. Marginally suitable habitat exists for this species within the project area, but no dwarf-flowered heartleaf plants were found ("No Effect").	
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 coordination with FEMA	
8c. What source(s) did you use to make the floodplain determination? FEMA Maps	

Dr. Gregory J. Thorpe, Ph D Applicant/Agent's Printed Name	E. L. Lusk Applicant/Agent's Signature (Agent's signature is valid only if an authorization letter from the applicant is provided.)	7-8-09 Date

U.S. ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT

Action Id. SAW-2006-32957-323 County: **Cleveland** U.S.G.S. Quad: **Boiling Springs North**

NOTIFICATION OF JURISDICTIONAL DETERMINATION

Property Owner/Agent: Gregory J. Thorpe, Director
Address: Project Development and Environmental Analysis Branch
North Carolina Department of Transportation
1548 Mail Service Center, Raleigh, NC 27699-1548
Telephone No.: 919-733-3141

Property description:

Size (acres)	7.5 approx.	Nearest Town	Dallas
Nearest Waterway	Sandy Run Creek	River Basin	Catawba
USGS HUC	03050105	Coordinates	N 35.3251 W 81.1829
Location description	Bridge No. 144 on SR 1327 north of Mooresboro, TIP B-4468		

Indicate Which of the Following Apply:

_ Based on preliminary information, there may be wetlands on the above described property. We strongly suggest you have this property inspected to determine the extent of Department of the Army (DA) jurisdiction. To be considered final, a jurisdictional determination must be verified by the Corps. This preliminary determination is not an appealable action under the Regulatory Program Administrative Appeal Process (Reference 33 CFR Part 331).

_ There are Navigable Waters of the United States within the above described property subject to the permit requirements of Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

X There are surface waters on the above described property subject to the permit requirements of Section 404 of the Clean Water Act (CWA)(33 USC § 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

_ We strongly suggest you have the wetlands on your property delineated. Due to the size of your property and/or our present workload, the Corps may not be able to accomplish this wetland delineation in a timely manner. For a more timely delineation, you may wish to obtain a consultant. To be considered final, any delineation must be verified by the Corps.

_ The wetland on your property have been delineated and the delineation has been verified by the Corps. We strongly suggest you have this delineation surveyed. Upon completion, this survey should be reviewed and verified by the Corps. Once verified, this survey will provide an accurate depiction of all areas subject to CWA jurisdiction on your property which, provided there is no change in the law or our published regulations, may be relied upon for a period not to exceed five years.

X The surface waters have been delineated and surveyed and are accurately depicted on the GPS plat provided by EcoScience Corporation and dated 13 March 2006. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

_ There are no waters of the U.S., to include wetlands, present on the above described property which are subject to the permit requirements of Section 404 of the Clean Water Act (33 USC 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

_ The property is located in one of the 20 Coastal Counties subject to regulation under the Coastal Area Management Act (CAMA). You should contact the Division of Coastal Management in Washington, NC, at (252) 946-6481 to determine their requirements.

Action ID: _____
SAW-2006-32957-323

Placement of dredged or fill material within waters of the US and/or wetlands without a Department of the Army permit may constitute a violation of Section 301 of the Clean Water Act (33 USC § 1311). If you have any questions regarding this determination and/or the Corps regulatory program, please contact Steven Lund at 828-271-7980.

Basis For Determination: Sandy Run Creek and its tributary are perennial waters that exhibits a distinct ordinary high water mark and flow directly to the Broad River, a navigable water.

Remarks: Consultant's report dated 13 March, 2006 identifies Sandy Run Creek and an unnamed tributary in the project area consisting of an approximate 1100-foot long by 300-foot wide corridor centered on the existing bridge site.

Corps Regulatory Official: Steven W. Lund, Project Manager, Asheville Regulatory Field Office

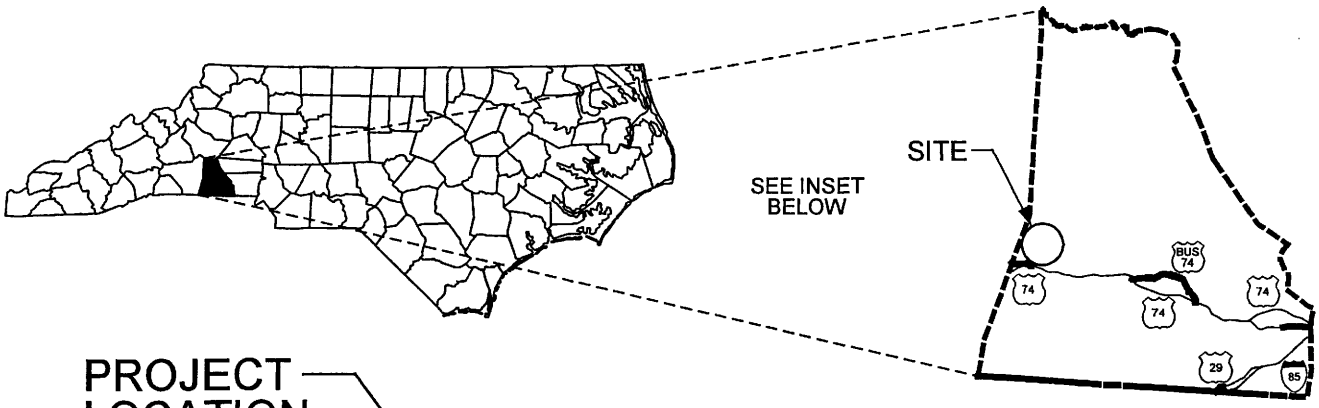
Date: October 22, 2007 Expiration Date: October 22, 2012

Corps Regulatory Official (Initial): SWL

FOR OFFICE USE ONLY:

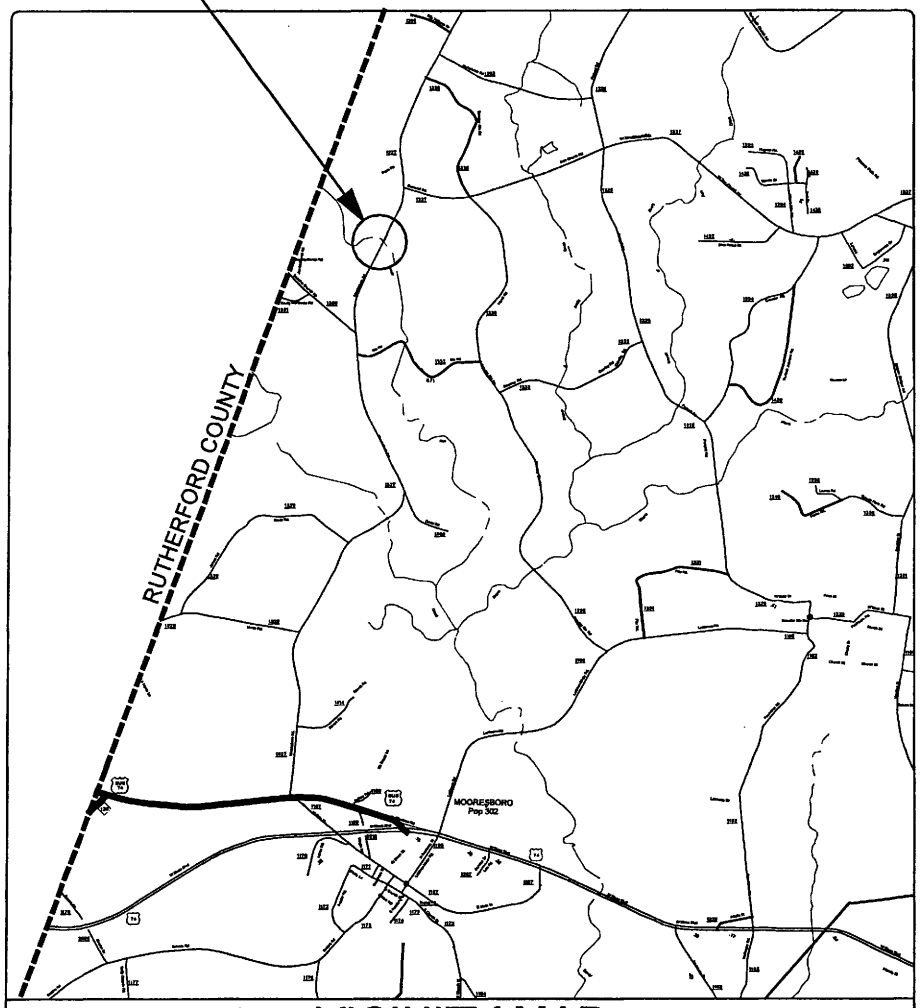
- A plat or sketch of the property and the wetland data form must be attached to the file copy of this form.
- A copy of the "Notification Of Administrative Appeal Options And Process And Request For Appeal" form must be transmitted with the property owner/agent copy of this form.
- If the property contains isolated wetlands/waters, please indicate in "Remarks" section and attach the "Isolated Determination Information Sheet" to the file copy of this form.

Copy Furnished: Ms. Heather Jean Saunders, EcoScience Corporation, 1101 Haynes Street, Suite 101, Raleigh, NC 27604



PROJECT
LOCATION

CLEVELAND COUNTY



VICINITY MAP NTS

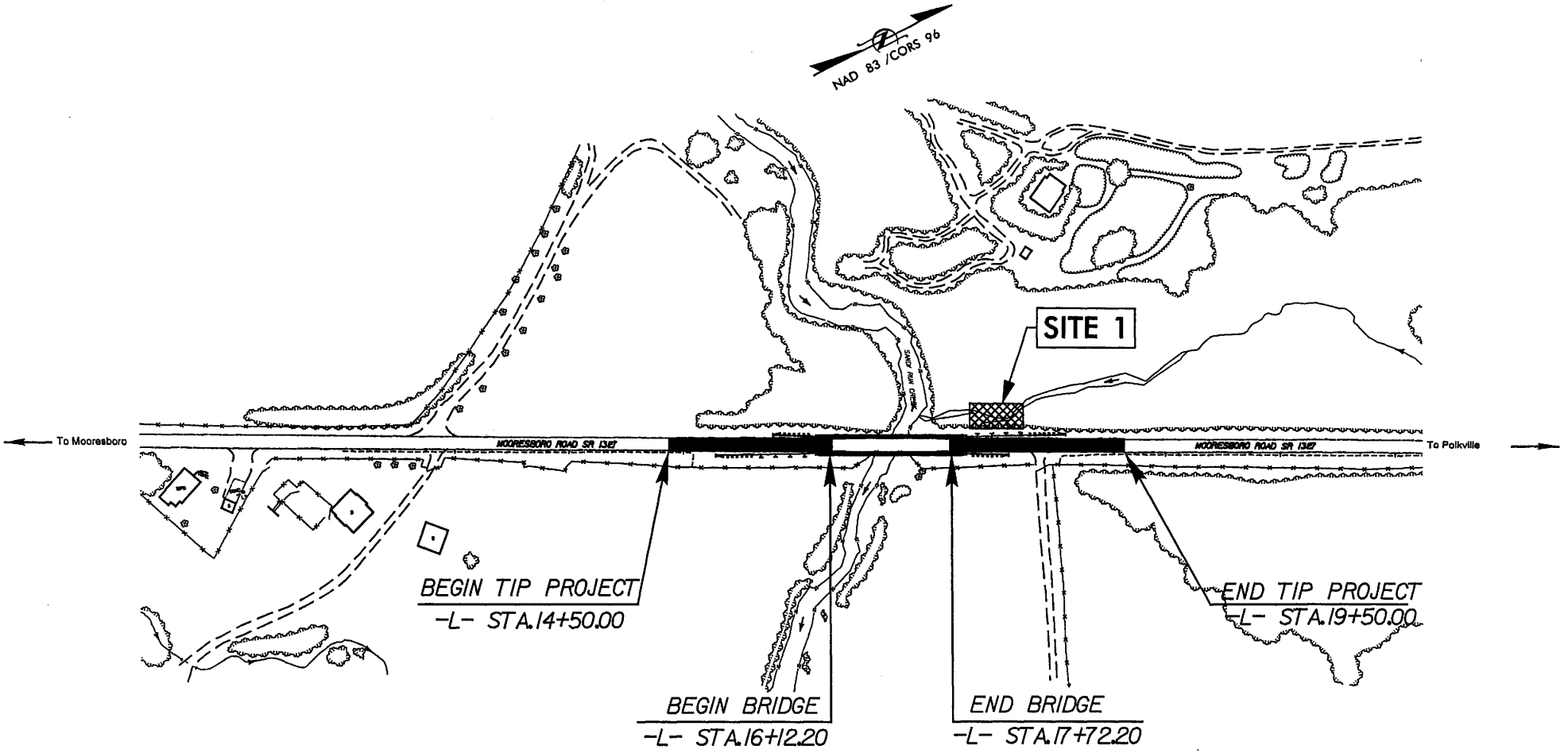
WETLAND/STREAM IMPACTS

Permit Drawings Sheet 1 of 10

NCDOT

DIVISION OF HIGHWAYS
CLEVELAND COUNTY
PROJECT: 33717.1.1 (B-4468)
BRIDGE NO. 144 ON SR 1327
(MOORESBORO ROAD)
OVER SANDY RUN CREEK

SHEET 1 OF 10 **4/14/09**



Permit Drawing
Sheet ___ of ___

PLAN VIEW

WETLAND/STREAM IMPACTS

NCDOT

DIVISION OF HIGHWAYS
CLEVELAND COUNTY
PROJECT: 33717.1.1 (B-4468)
BRIDGE NO. 144 ON SR 1327
(MOORESBORO ROAD)
OVER SANDY RUN CREEK

SHEET 2 OF 10 **4/14/09**

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
	PLATO D. CROWDER	

Permit Drawing
Sheet 3 of 10

NCDOT

DIVISION OF HIGHWAYS
CLEVELAND COUNTY
PROJECT: 33717.1.1 (B-4468)
BRIDGE NO. 144 ON SR 1327
(MOORESBORO ROAD)
OVER SANDY RUN CREEK

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From / To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill in Wetlands (ac)	Temporary Fill in Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (Method III) (ac)	Hand Clearing in Wetlands (ac)	Permanent SW Impacts (ac)	Temporary SW Impacts (ac)	Existing Channel Impacts Permanent (ft)	Natural Stream Design (ft)	Stream Bank Stabilization (ft)
1	-L- 18+00 To 18+75 LT	Ditch						0.01		90		
TOTALS:								0.01		90		

NOTE: The maximum permanent impact in the stream from the construction of the proposed interior bent is an area of 57.7 square feet due to 3'-6" diameter drilled shafts adjacent to the stream.

Permit Drawing
Sheet 4 of 10

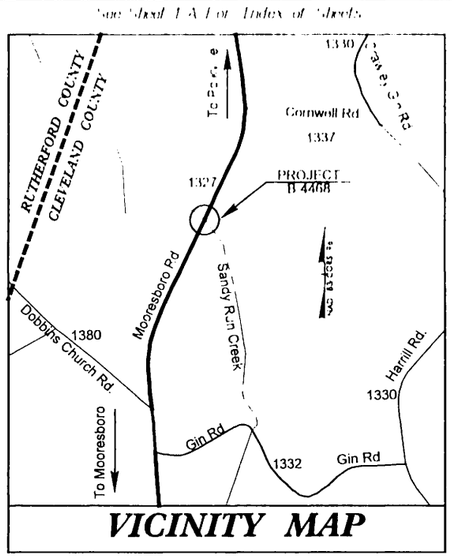
NCDOT

DIVISION OF HIGHWAYS
CLEVELAND COUNTY
PROJECT: 33717.1.1 (B-4468)
BRIDGE NO. 144 ON SR 1327
(MOORESBORO ROAD)
OVER SANDY RUN CREEK

09/08/58

TIP PROJECT: B-4468

CONTRACT:



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

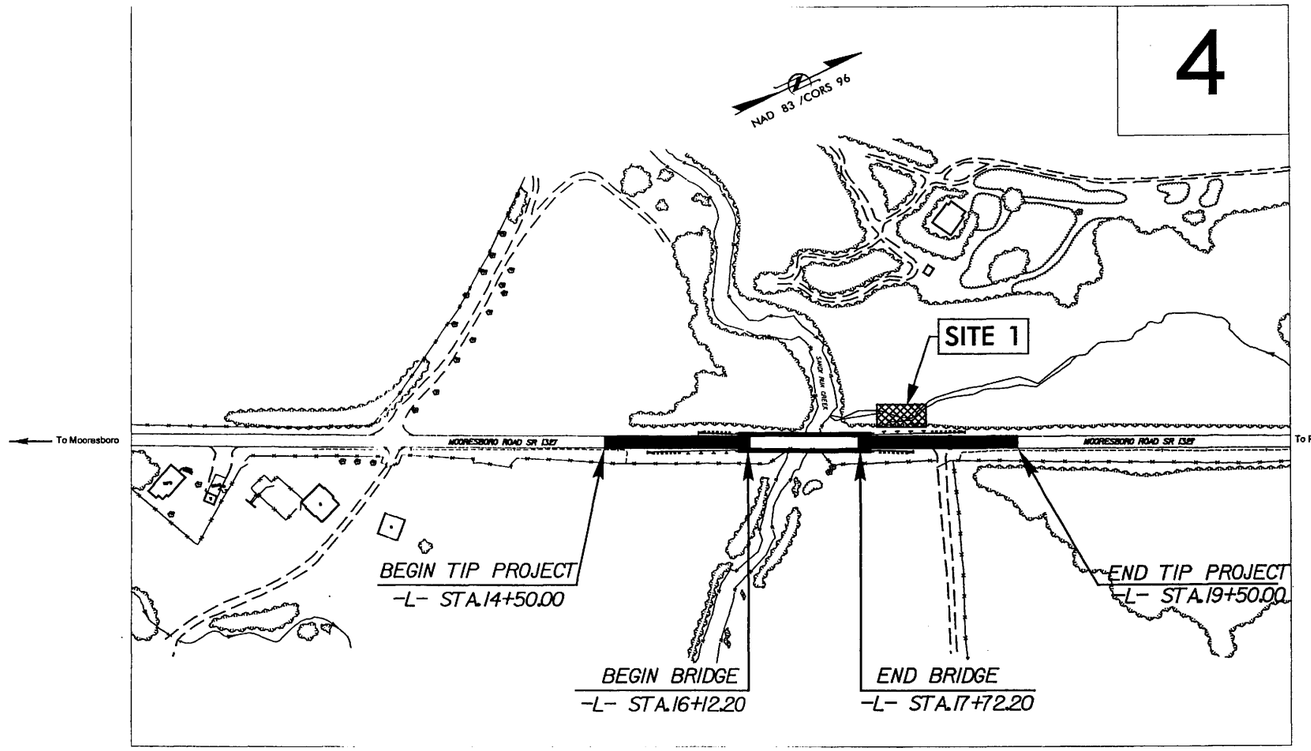
CLEVELAND COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4468	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33717.1.1	BRSTP-1327(2)	P.E.

LOCATION: BRIDGE NO. 144 ON SR 1327 (MOORESBORO ROAD) OVER SANDY RUN CREEK

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE



WETLAND/STREAM IMPACTS

Permit Drawing
Sheet 5 of 10

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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 2010 = 830
ADT 2030 = 1,200
DHV = 10 %
D = 60 %
T = 3 % *
V = 40 MPH

* TTST 1% DUAL 2%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4468 = 0.065 Miles

LENGTH STRUCTURE TIP PROJECT B-4468 = 0.030 Miles

TOTAL LENGTH ROADWAY TIP PROJECT B-4468 = 0.095 Miles

Prepared In the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: February 15, 2009

LETTING DATE: February 16, 2010

G.E. BREW PE
PROJECT ENGINEER

D.WILLIAMS
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

4/14/2009
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elenl_riggs

PROJECT REFERENCE NO.	SHEET NO.
B-4468	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SEE SHEET 5 FOR -L- PROFILE

DRAINAGE NOTES:

1) TB 2GI STD. 840.35 W/
WIDE SLOT FLAT GRATE STD. 840.20

STA. 16+05 -L- (LEFT)
TOP ELEV. = 833.01
INV. ELEV = 830.34

DA = 0.06 AC
C = 0.95
Hr = 4
Rdwy. Grade = 0.006
(Begin Bridge to End Bridge)
Cross Slope = 0.02

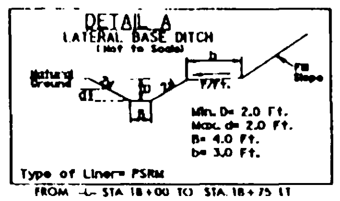
2) TB 2GI STD. 840.35 W/
WIDE SLOT FLAT GRATE STD. 840.20

STA. 16+05-L- (RIGHT)
TOP ELEV. = 833.01
INV. ELEV. = 830.34
DA = 0.06 AC
C = 0.95
Hr = 4
Rdwy. Grade = 0.006
(Begin Bridge to End Bridge)
Cross Slope = 0.02

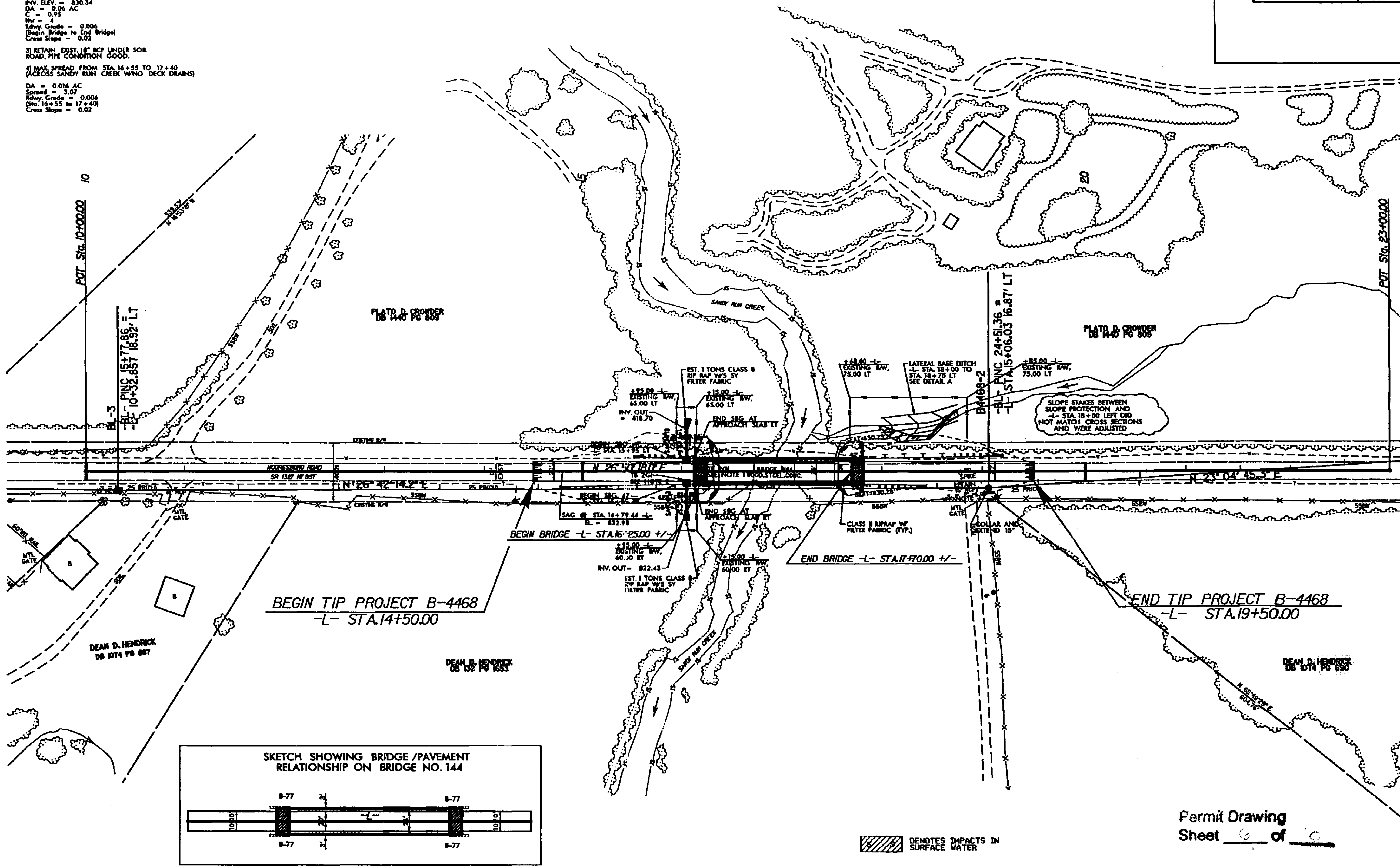
3) RETAIN EXIST. 18" RCP UNDER SOIL
ROAD, PIPE CONDITION GOOD.

4) MAX. SPREAD FROM STA. 16+55 TO 17+40
(ACROSS SANDY RUN CREEK W/NO DECK DRAINS)

DA = 0.016 AC
Spread = 3.07
Rdwy. Grade = 0.006
(Sta. 16+55 to 17+40)
Cross Slope = 0.02



*RECOMMENDED BRIDGE LENGTH HAS BEEN MODIFIED FROM 160' TO 145'
NEW BEGIN BRIDGE @ -L- STA 16+25
NEW END BRIDGE @ -L- STA 17+70



Permit Drawing
Sheet 6 of 6

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-4468	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SEE SHEET 5 FOR -L- PROFILE

DRAINAGE NOTES.

1) TB 2GI STD. 840.35 W/
WIDE SLOT FLAT GRATE STD 840.20

STA. 16+05 -L- (LEFT)
TOP ELEV = 833.01
INV. ELEV. = 830.34

DA = 0.06 AC
C = 0.95
Hw = 4
Rdwy. Grade = 0.006
(Begin Bridge to End Bridge)
Cross Slope = 0.02

2) TB 2GI STD. 840.35 W/
WIDE SLOT FLAT GRATE STD. 840.20

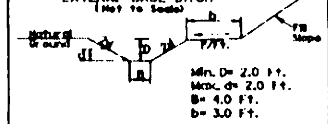
STA. 16+05-L- (RIGHT)
TOP ELEV. = 833.01
INV. ELEV. = 830.34
DA = 0.06 AC
C = 0.95
Hw = 4
Rdwy Grade = 0.006
(Begin Bridge to End Bridge)
Cross Slope = 0.02

3) RETAIN EXIST. 18" RCP UNDER SOIL ROAD, PIPE CONDITION GOOD.

4) MAX. SPREAD FROM STA. 16+55 TO 17+40
(ACROSS SANDY RUN CREEK W/NO DECK DRAINS)

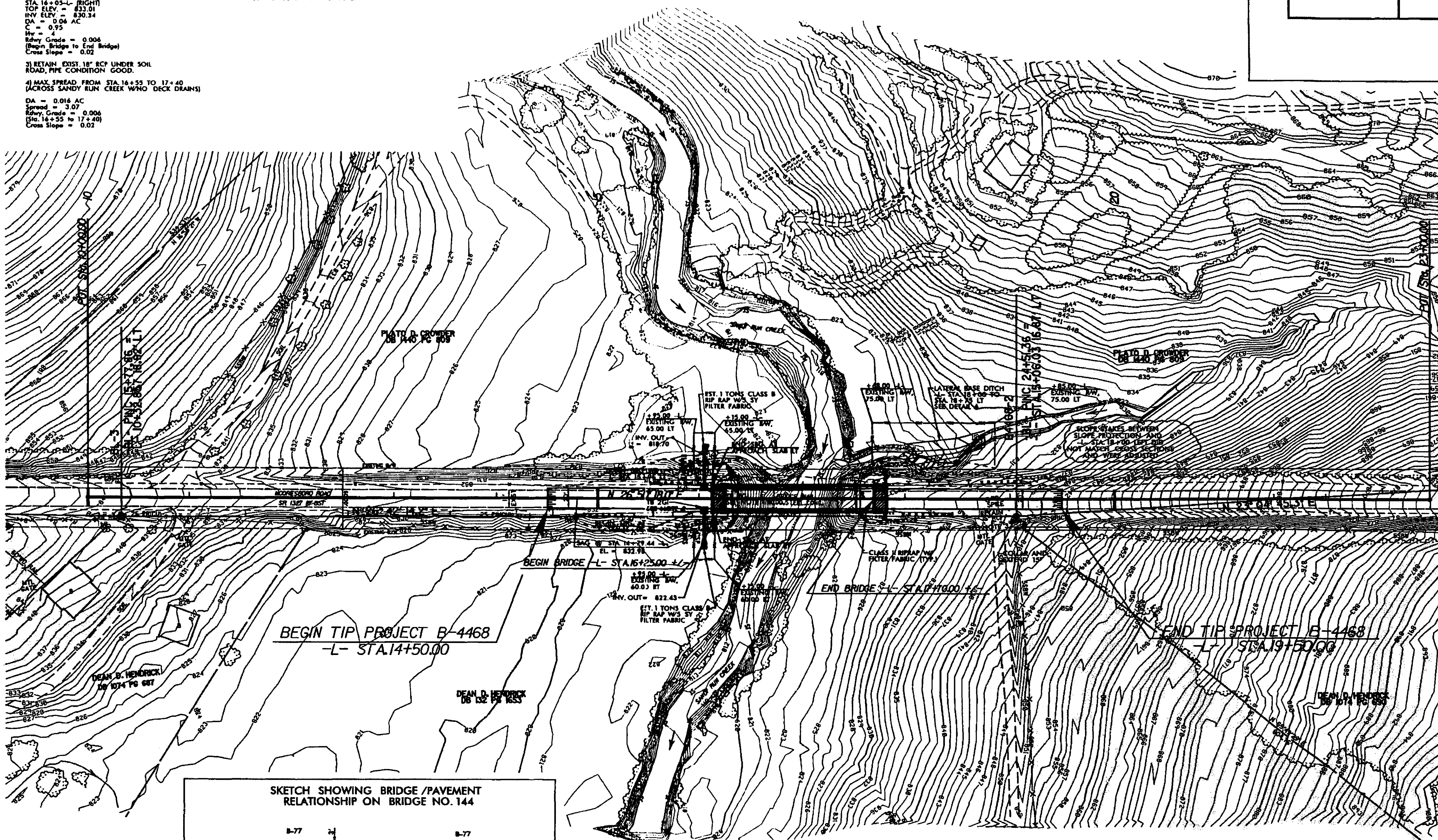
DA = 0.016 AC
Spread = 3.07
Rdwy. Grade = 0.006
(Sta. 16+55 to 17+40)
Cross Slope = 0.02

DETAIL A
LATERAL BASE DITCH
(Not to Scale)

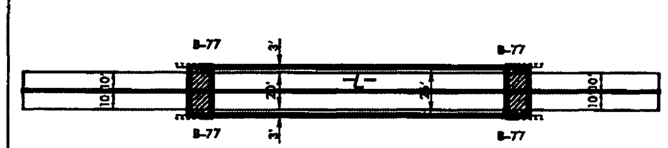


Type of Liner: PSRM
FROM -L- STA. 18+00 TO STA 18+75 LT

RECOMMENDED BRIDGE LENGTH HAS BEEN MODIFIED FROM 160' TO 145'
NEW BEGIN BRIDGE @ -L- STA. 16+25
NEW END BRIDGE @ -L- STA 17+70



SKETCH SHOWING BRIDGE/PAVEMENT RELATIONSHIP ON BRIDGE NO. 144



DENOTES IMPACTS IN SURFACE WATER

Permit Drawing
Sheet 7 of 10

REVISIONS

8/17/99

5/22/2009
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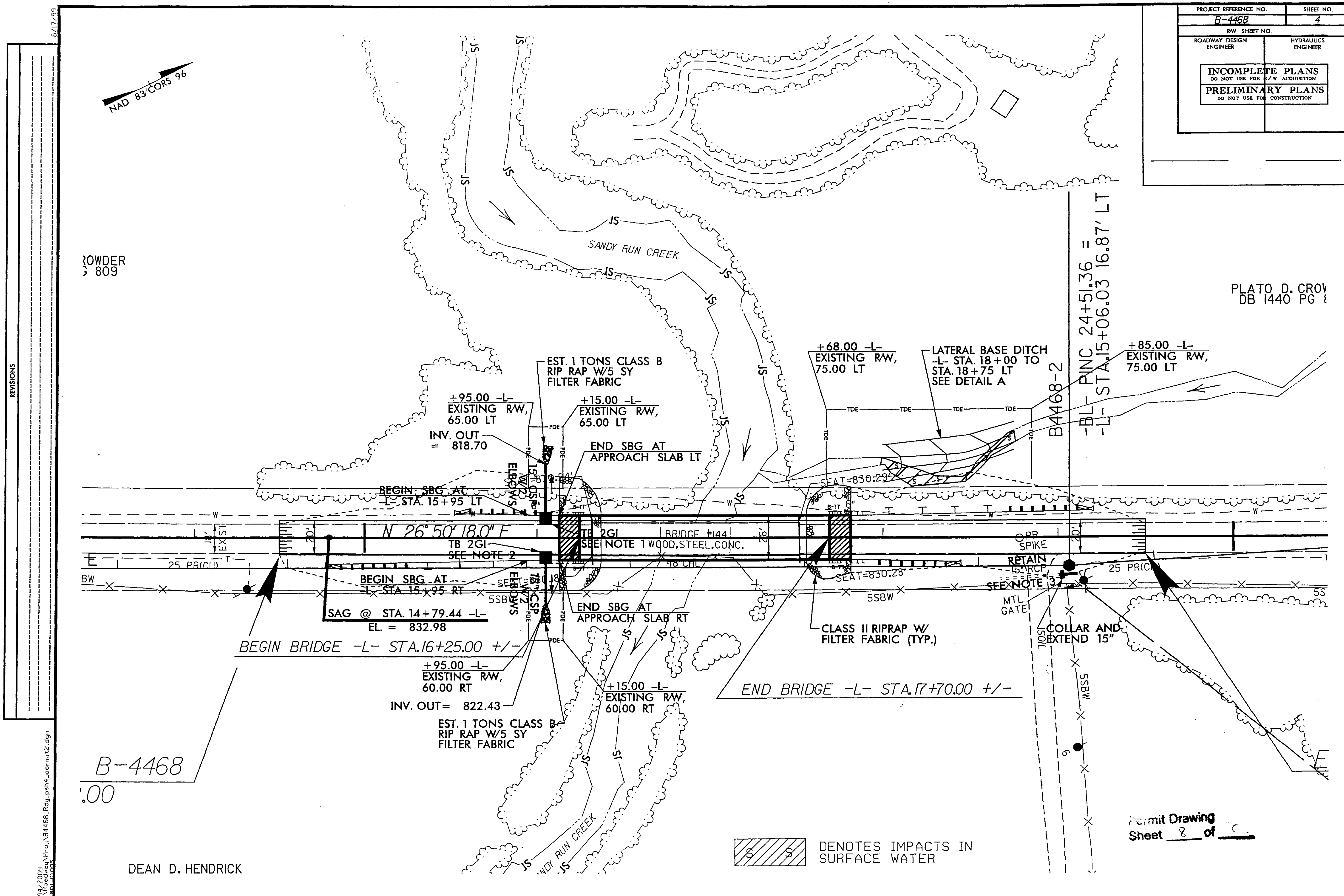
PROJECT REFERENCE NO.
SHEET NO.
B-4468
4
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
NAD 83/CORS 96
REVISIONS
8/17/99
SANDY RUN CREEK
ROWDER
G 809
PLATO D. CROW
DB 1440 PG 8
EST. 1 TONS CLASS B RIP RAP W/5 SY FILTER FABRIC
+95.00 -L- EXISTING R/W, 65.00 LT
+15.00 -L- EXISTING R/W, 65.00 LT
INV. OUT = 818.70
END SBG AT APPROACH SLAB LT
+68.00 -L- EXISTING R/W, 75.00 LT
LATERAL BASE DITCH -L- STA. 18+00 TO STA. 18+75 LT SEE DETAIL A
+85.00 -L- EXISTING R/W, 75.00 LT
B4468-2
-BL- PINC 24+51.36 =
-L- STA.15+06.03 16.87' LT
BEGIN SBG AT -L- STA. 15+95 LT
N 26° 50' 18.0" E
TB 2GI SEE NOTE 2
TB 2GI SEE NOTE 1
BRIDGE #144
WOOD,STEEL,CONC.
SEAT=830.29
SEAT=830.28
SEAT=830.18
BEGIN SBG AT -L- STA. 15+95 RT
SAG @ STA. 14+79.44 -L- EL. = 832.98
25 PR(CU)
48 CHL
5SBW
OBR SPIKE
RETAIN 15" RCP
SEE NOTE 3
MTL GATE
COLLAR AND EXTEND 15"
END SBG AT APPROACH SLAB RT
CLASS II RIPRAP W/ FILTER FABRIC (TYP.)
BEGIN BRIDGE -L- STA.16+25.00 +/-
END BRIDGE -L- STA.17+70.00 +/-
+95.00 -L- EXISTING R/W, 60.00 RT
INV. OUT= 822.43
+15.00 -L- EXISTING R/W, 60.00 RT
EST. 1 TONS CLASS B RIP RAP W/5 SY FILTER FABRIC
B-4468
.00
DEAN D. HENDRICK
DENOTES IMPACTS IN SURFACE WATER
Permit Drawing
Sheet 8 of
4/14/2009
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PROJECT REFERENCE NO.	SHEET NO.
B-4468	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

8/17/99

NAD 83/CORS 96

SANDY RUN CREEK

EST. 1 TONS CLASS B RIP RAP W/5 SY FILTER FABRIC

+95.00 -L- EXISTING R/W, 65.00 LT

+15.00 -L- EXISTING R/W, 65.00 LT

INV. OUT = 818.70

END SBG AT APPROACH SLAB LT

BEGIN SBG AT -L- STA. 15+95 LT

N 26°50'18.0" E

TB 2GI SEE NOTE 2

BRIDGE #144 WOOD, STEEL, CONC.

TB 2GI SEE NOTE 1

BEGIN SBG AT -L- STA. 15+95 RT

SAG @ STA. 14+79.44 -L- EL. = 832.98

END SBG AT APPROACH SLAB RT

BEGIN BRIDGE -L- STA. 16+25.00 +/-

+95.00 -L- EXISTING R/W, 60.00 RT

INV. OUT = 822.43

+15.00 -L- EXISTING R/W, 60.00 RT

EST. 1 TONS CLASS B RIP RAP W/5 SY FILTER FABRIC

+68.00 -L- EXISTING R/W, 75.00 LT

LATERAL BASE DITCH -L- STA. 18+00 TO STA. 18+75 LT SEE DETAIL A

+85.00 -L- EXISTING R/W, 75.00 LT

CLASS II RIPRAP W/ FILTER FABRIC (TYP.)

END BRIDGE -L- STA. 17+70.00 +/-

RETAIN 15" RCP SEE NOTE 3

COLLAR AND EXTEND 15"

PLATO D. CROW DB 1440 PG

B-4468-2 BL1 PINC 24+51.36 = STA. 15+06.03 16.87' LT

B-4468

DEAN D. HENDRICK

DENOTES IMPACTS IN SURFACE WATER

Permit Drawings Sheet ____ of ____

4/14/2009
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User: rjones

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4468	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 2,200	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 823.38	FT
BASE DISCHARGE	= 3,820	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 824.37	FT
OVERTOPPING DISCHARGE	= 15,000	CFS
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING ELEVATION	= 832.98	FT

BM #1 -L- STA 11+25.84 42' LEFT ELEV. 841.95'

BM #2 -L- STA 17+94.91 77.5' LEFT ELEV. 826.21'

BM #3 -L- STA 23+59.02 27' LEFT ELEV. 878.21'

BEGIN GRADE
-L- STA 11+50.00
ELEV. = 833.02'

BEGIN BRIDGE
-L- STA 16+24.50

END BRIDGE
-L- STA 17+69.50

PI = 15+00.00
K = 123
EL = 832.90'
VC = 100'
V = 55 mph

PI = 18+65.00
K = 16
EL = 835.00'
VC = 123'
V = 15 mph

-L-

END GRADE
-L- STA 19+50.00
ELEV. = 841.85'

END LATERAL BASE DITCH LT.
STA 18+75
ELEV. = 823.85

BEGIN LATERAL BASE DITCH LT.
STA 16+66
ELEV. = 817.94

Permit Drawings Sheet 10 of 10

22-APR-2009 11:07
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STORMWATER MANAGEMENT PLAN

Project: 33717.1.1
TIP No. B-4468
Cleveland County 4/21/2009

Hydraulics Project Manager: Dennis Hoyle, P.E. (URS Corporation),
Marshal Clawson, P.E. (NCDOT Hydraulics Unit)

ROADWAY DESCRIPTION

The project B4468 consists of replacing bridge No. 144 on SR 1327 (Mooresboro Road) over Sandy Run Creek. The existing structure consists of wood, steel and concrete and the proposed structure is to be a three span prestressed cored slab superstructure, 145'-0" in length. The total length of the roadway TIP project is 0.095 miles. The project B4468 creates impacts to one unnamed tributary to Sandy Run Creek. Table 1 lists this stream and the proposed crossing structure. The project drainage system consists of grated inlets with associated pipe systems and lateral storm water ditches.

Table 1. List of Stream Crossings in Project B-4468

Site #	Station	Stream Name	Drainage area	Proposed Structure
1	-L- 18+00 to 18+75 LT	UT to Sandy Run Creek	24.5 acres	4' Lateral Base Ditch (Min. D = 2') Lined w/ PSRM

ENVIRONMENTAL DESCRIPTION

The stream listed in Table 1 has been classified as jurisdictional. Stream impacts have been avoided and minimized by keeping roadway fill slopes at 3:1 or steeper.

BEST MANAGEMENT PRACTICES AND MAJOR STRUCTURES

The primary goal of Best Management Practices (BMPs) is to prevent degradation of the states surface waters by the location, construction and operation of the highway system. The BMPs are activities, practices and procedures taken to prevent or reduce stormwater pollution. The measures that will be used on this project are placing rip rap pads at the outlets of the two proposed pipes and to line the proposed lateral ditch with permanent soil reinforcement matting (PSRM).

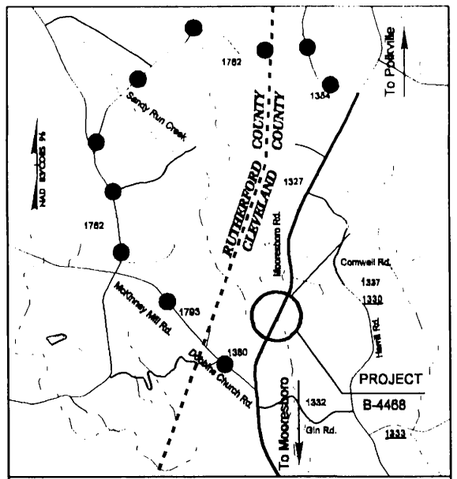
The pipe outlets will have rip rap pads in order to disperse the concentrated flow, reduce the outlet velocity and prevent future erosion. The proposed 4' base lateral ditch that is relocating the existing stream will be lined with PSRM which is more environmentally sensitive than to line it with rip rap.

09/08/99

TIP PROJECT: B-4468

CONTRACT:

See Sheet 1A for Index of Sheets



VICINITY MAP

OFFSITE DETOUR

PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

NAD 83 /CORS 96

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CLEVELAND COUNTY

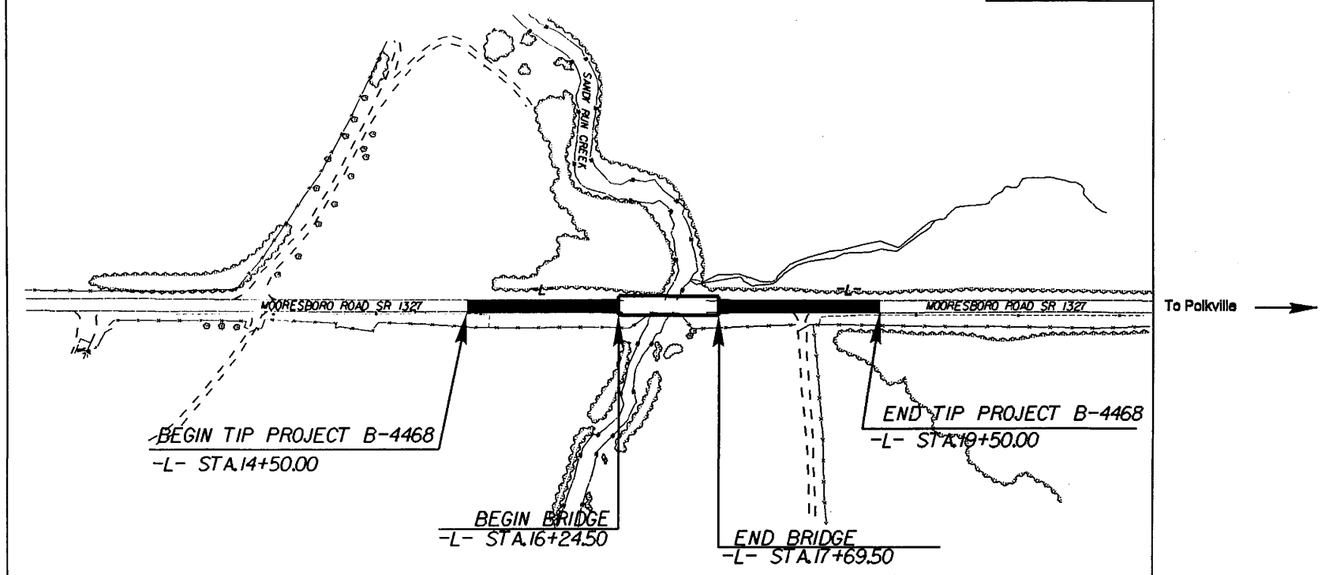
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4468	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33717.1.1	BRSTP-1327(2)	P.E.
33717.2.1	BRSTP-1327(2)	R\W, UTL.

LOCATION: BRIDGE NO. 144 ON SR 1327 (MOORESBORO ROAD) OVER SANDY RUN CREEK

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE

4



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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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 2010 = 830
ADT 2030 = 1,200
DHV = 10 %
D = 60 %
T = 3 % *
V = 40 MPH
FUNC CLASS = LOCAL
* TTST 1% DUAL 2%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4468 = 0.068 Miles

LENGTH STRUCTURE TIP PROJECT B-4468 = 0.027 Miles

TOTAL LENGTH ROADWAY TIP PROJECT B-4468 = 0.095 Miles

Prepared In the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: March 20, 2009

LETTING DATE: March 16, 2010

G.E. BREW PE
PROJECT ENGINEER

D.WILLIAMS
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

2-APR-2009 10:37
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6/2/99

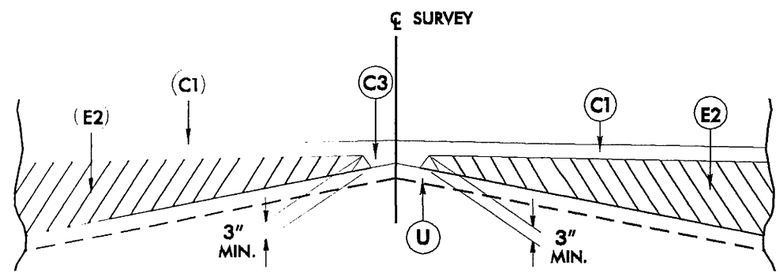
PROJECT REFERENCE NO.	SHEET NO.
B-4468	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

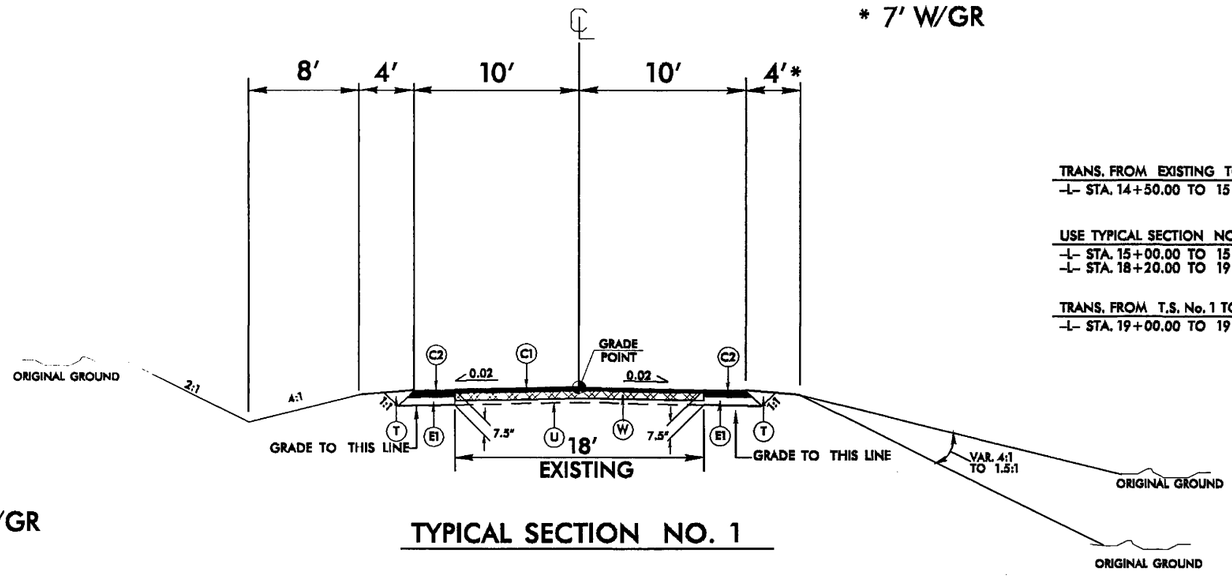
FINAL PAVEMENT SCHEDULE

C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 336 LBS. PER SQ. YD.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1.5" IN DEPTH OR GREATER THAN 3" IN DEPTH.
E1	PROP. APPROX. 4.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE B25.0B, 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 5.5" IN DEPTH.
R1	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL)

*NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE



Detail Showing Method of Wedging

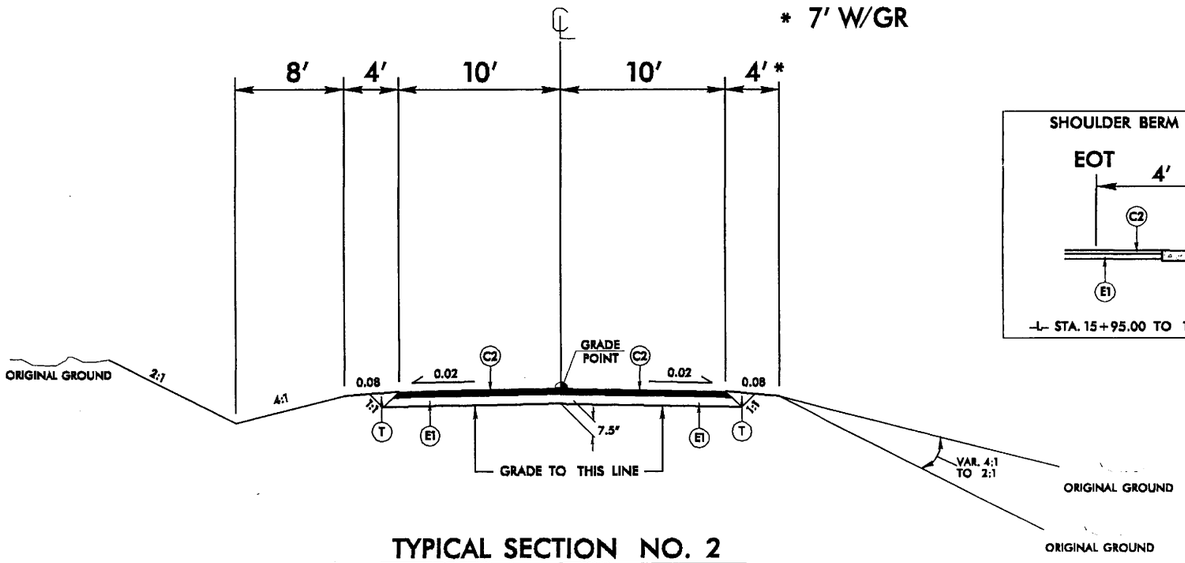


TYPICAL SECTION NO. 1

TRANS. FROM EXISTING TO T.S. No. 1
-L- STA. 14+50.00 TO 15+00.00

USE TYPICAL SECTION NO. 1
-L- STA. 15+00.00 TO 15+75.00
-L- STA. 18+20.00 TO 19+00.00

TRANS. FROM T.S. No. 1 TO EXISTING
-L- STA. 19+00.00 TO 19+50.00

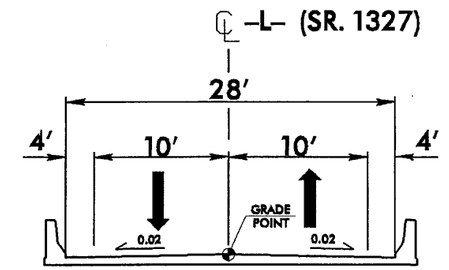


TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2
-L- STA. 15+75.00 TO 16+24.50 (BEGIN BRIDGE)
-L- STA. 17+69.50 (END BRIDGE) TO 18+20.00

SHOULDER BERM GUTTER DETAIL

-L- STA. 15+95.00 TO 16+13.50 (RT\LT)



-L- STA. 16+24.50 (BEGIN BRIDGE) TO -L- STA. 17+69.50 (END BRIDGE)

TYPICAL SECTION ON STRUCTURE

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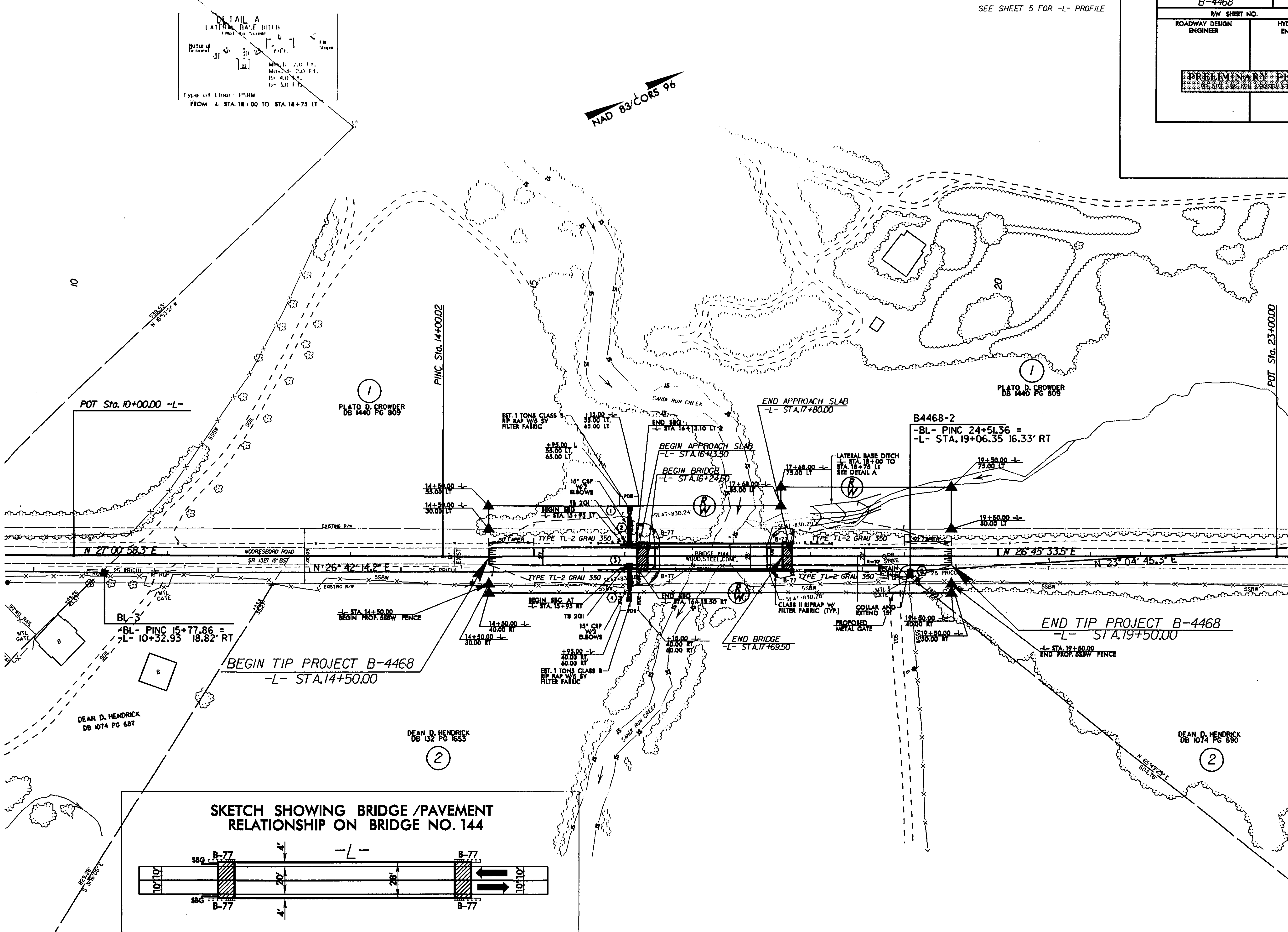
PROJECT REFERENCE NO.	SHEET NO.
B-4468	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SEE SHEET 5 FOR -L- PROFILE



REVISIONS

Note: The revisions consist of changes in station and offsets for the right of way monuments and an adjustment in the centerline and baseline alignments. MJJ 4-21-09

8/17/99

22-APR-2009 10:37
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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4468	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 2,200	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 823.38	FT
BASE DISCHARGE	= 3,820	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 824.37	FT
OVERTOPPING DISCHARGE	= 15,000	CFS
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING ELEVATION	= 832.98	FT

-L-

BM #1 -L- STA11+25.84 42' LEFT ELEV.841.95'

BM #2 -L- STA17+94.91 77.5' LEFT ELEV.826.21'

BM #3 -L- STA23+59.02 27' LEFT ELEV.878.21'

BEGIN GRADE
-L- STA14+50.00
ELEV.=833.02'

BEGIN BRIDGE
-L- STA16+24.50

PI = 15+00.00
K = 123
EL = 832.90'
VC = 100'
V = 55 mph

-2.400% = 1+05753½

END BRIDGE
-L- STA17+69.50

PI = 18+65.00
K = 16
EL = 835.00'
VC = 123'
V = 15 mph

+8.038%

1+05753½

END GRADE
-L- STA19+50.00
ELEV.=841.85'

END LATERAL BASE DITCH LT.
STA18+75
ELEV.= 823.66

+7.200%

BEGIN LATERAL BASE DITCH LT.
STA18+00
ELEV.= 817.94

890 880 870 860 850 840 830 820 810 800

10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

22-APR-2009 11:07
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$$$$USERNAME$$$$