STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

December 14, 2009

Ms. Kimberly Garvey
U.S. Army Corps of Engineers
Regulatory Field Office
69 Darlington Avenue
Wilmington, North Carolina 28403-1343

Dear Ma'am:

Subject: **Application for Section 404 Nationwide Permit 13, 23, 33, and Section 401 Water Quality Certification** for the replacement of Bridge 46 over the Cape Fear River on US 401/NC 211 in Harnett County. Federal Aid Project Number BRSTP-401(146). Debit $570.00 from WBS 33490.1.1.; **TIP No. B-4138**

Please find enclosed a site map, a Pre-Construction Notification (PCN) form, Stream Mitigation Plan, EEP acceptance letter, original Jurisdictional Determination, USFWS concurrence letter, permit drawings, and a copy of the roadway plans for the above referenced project. A Categorical Exclusion (CE) was completed for this project on July 28, 2008, and distributed shortly thereafter. Additional copies are available upon request.

The North Carolina Department of Transportation (NCDOT), Division of Highways, in consultation with the Federal Highway Administration (FHWA), proposes to replace Bridge No. 46 (south bound lane) in Harnett County. The project involves replacement of the existing functionally obsolete and structurally deficient 808-foot bridge with a new 640-foot bridge. The new bridge will feature two 12-foot lanes with 4-foot paved shoulders on the southeast side of the bridge and curb and gutter with an approximate 5-foot sidewalk on the northwest side. The south approach will be approximately 1,565 feet long and the north approach will be approximately 1,420 feet long. Proposed permanent impacts to riverine wetlands consist of 0.08 acre for fill, and 0.13 acre of mechanized clearing. Permanent impacts to streams consist of 741 feet and 69 feet for bank stabilization (totaling 810 feet); of which, 608 feet will be mitigated through onsite stream mitigation.

The proposed let date for the project is May 18, 2010 with a review date of March 30, 2010; however, the let date may advance as additional funds become available.

Regulatory Approvals

Section 404 Permit: This project are being processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR 771.115(b). The NCDOT requests that a

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

TELEPHONE: 919-431-2000
FAX: 919-431-2002
WEBSITE: WWW.NCDOT.ORG

LOCATION:
4701 ATLANTIC AVENUE
SUITE 116
RALEIGH NC 27604

Nationwide Permit 23 for permanent impacts resulting from bridge construction, a Nationwide Permit 13 due to bank stabilization and a Nationwide Permit 33 for temporary impacts resulting from temporary fill for erosion control measures and the temporary causeway be issued to authorize these activities.

Section 401 Permit: We anticipate 401 General Certification numbers 3701, 3689 and 3688 will apply to this project. In accordance with 15A NCAC 2H, Section .0500(a), we are providing five copies of this application to the NCDWQ for their approval.

A copy of this permit application will be posted on the NCDOT website at:
http://www.ncdot.org/doh/preconstruct/pe/neu/permit.html

If you have any questions or need additional information, please call or email John S. Merritt at 919-431-6749 or jsmerritt@ncdot.gov.

Sincerely,

for Gregory J. Thorpe, Ph.D. Environmental Management Director
Project Development and Environmental Analysis Branch

W/attachment
Mr. Brian Wrenn, NCDWQ (5 Copies)

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. Greg Burns, P.E, Division 6 Engineer
Mr. Jim Rerko, Division 6 Environmental Officer
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. Travis Wilson, NCWRC
Mr. Gary Jordan, USFWS
Ms. Anne Deaton, NCDMF
Mr. Ron Sechler, NMFS
Mrs. Natalie Lockhart, PDEA Project Planning Engineer
Ms. Beth Harmon, EEP
Mr. Phillip Ayscue, NCDOT External Audit Branch
Ms. LeiLani Paugh, NEU
Mr. Randy Griffin, NEU

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

Pre-Construction Notification (PCN) Form

A. Applicant Information

1. Processing

1a. Type(s) of approval sought from the Corps:	☒ Section 404 Permit	☐ Section 10 Permit
1b. Specify Nationwide Permit (NWP) number: 13, 23, 33 or General Permit (GP) number:		
1c. Has the NWP or GP number been verified by the Corps?	☐ Yes	☒ No

1d. Type(s) of approval sought from the DWQ (check all that apply):

☒ 401 Water Quality Certification – Regular ☐ 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:	Replacement of Bridge 46 over the Cape Fear River on US 401/NC 211
2b. County:	Harnett
2c. Nearest municipality / town:	Lillington
2d. Subdivision name:	*not applicable*
2e. NCDOT only, T.I.P. or state project no:	B-4138

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) 431-6667
3g. Fax no.:	(919) 431-2002
3h. Email address:	jsmerritt@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: 35.406961 Longitude: -78.813128
1c. Property size:	20.4 acres
2. Surface Waters	
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	Cape Fear River
2b. Water Quality Classification of nearest receiving water:	WS-IV
2c. River basin:	Cape Fear
3. Project Description	
3a. Describe the existing conditions on the site and the general land use in the vicinity of the project at the time of this application: Existing conditions on the site include maintained/disturbed, commercial properties, mixed hardwood forest and bottomland hardwood forest. General land use is commercial and undeveloped.	
3b. List the total estimated acreage of all existing wetlands on the property: 6.49	
3c. List the total estimated linear feet of all existing streams (intermittent and perennial) on the property: 2,059	
3d. Explain the purpose of the proposed project: To replace a structurally deficient and functionally obsolete bridge.	
3e. Describe the overall project in detail, including the type of equipment to be used: The project involves replacing an 808-foot bridge with a 640-foot bridge on an alignment just up-stream of the original structure. Traffic will be maintained on the original bridge during construction. Standard road building equipment, such as trucks, dozers, and cranes will be used. A temporary rip-rap causeway will be utilized as a foundation to build the new bridge structure.	
4. Jurisdictional Determinations	
4a. Have jurisdictional wetland or stream determinations by the Corps or State been requested or obtained for this property / project (including all prior phases) in the past? Comments: This project was verified by the USACE (Action ID: 2003300357) and expired on April 8, 2008. The NCDOT revisited the site to evaluate the accuracy of the prior Jurisdictional Determination (JD) and found a few changes had occurred. One wetland was reduced in size and another wetland was enlarged. Also it appears one small wetland has been filled along a utility road. Due to these changes the NCDOT will submit a new JD request under separate cover. The original JD is attached.	☒ 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): Mr. Norton Webster	Agency/Consultant Company: Kimley-Horn & Assoc., Inc. Other:
4d. If yes, list the dates of the Corps jurisdictional determinations or State determinations and attach documentation. April 8, 2003	

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	Permanent Fill and Mechanized Clearing	Riparian	☒ Yes ☐ No	☒ Corps ☐ DWQ	0.08
Site 2 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 3 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 4 ☒ P ☐ T	Permanent Fill and Mechanized Clearing	Riparian	☒ Yes ☐ No	☒ Corps ☐ DWQ	0.13
				2g. **Total wetland impacts**	0.21

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)
Site 1 ☒ P ☐ T	Channel Impact from Fill	UT to Cape Fear River	☒ PER ☐ INT	☒ Corps ☐ DWQ	5	128
Site 1 ☐ P ☒ T	Channel Impact from Fill	UT to Cape Fear River	☒ PER ☐ INT	☒ Corps ☐ DWQ	5	110
Site 2 ☒ P ☐ T	Embankment Rip Rap	Cape Fear River	☒ PER ☐ INT	☒ Corps ☐ DWQ	500	69
Site 2 ☐ P ☒ T	Temp. causeway	Cape Fear River	☒ PER ☐ INT	☒ Corps ☐ DWQ	500	200
Site 3 ☒ P ☐ T	Channel Impact from Fill	UT to Cape Fear River	☒ PER ☐ INT	☒ Corps ☐ DWQ	4	613
Site 3 ☐ P ☒ T	Channel Impact from Fill	UT to Cape Fear River	☒ PER ☐ INT	☒ Corps ☐ DWQ	4	20
					3h. **Total stream and tributary impacts**	P – 810 T - 330

3i. Comments: Impacts to surface waters due to bents are < 0.01 acre

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		
B3 ☐ P ☐ T			☐ Yes ☐ No		
			6h. **Total buffer impacts**		

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 proposed bridge the proposed bridge will be at approximately the same grade as the existing structure; No more than original number of bents (5) will be located in the water and they will be aligned with the bents of the existing northbound bridge; BMP's for sediment and erosion control will be applied; an in-water work moratorium for anadromous fish from February 15 through June 15 will be adhered to.

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

3:1 fill slopes in jurisdictional areas where practicable; NCDOT's Best Management Practices (BMP's) for Bridge Demolition, Removal, and Protection of Surfacewaters; Temporary work causeway will not block more that 50% of the river's width at anytime and will be constructed using class II rip rap with fabric underneath to facilitate removal of the causeway; Temporary work causeway will be two feet above normal water level, ten feet below the ten year flood stage height, to allow for water to over-flow in the event of modest level fluctuations; existing bents will be cut off at or near current bed elevation.

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

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

3. Complete if Using a Mitigation Bank

3a. Name of Mitigation Bank:		
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:	266 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:	0.42 acres
4f. Non-riparian wetland mitigation requested:	acres
4g. Coastal (tidal) wetland mitigation requested:	acres
4h. Comments: The NCDOT is not proposing compensatory mitigation for the 69 feet of bank stabilization for the Cape Fear River. These impacts are distributed at three different locations and do not extend across the entire channel.	
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. Please see attached Stream 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 Stormwater Management Plan.	
2e. Who will be responsible for the review of the Stormwater Management Plan?	☐ Certified Local Government ☐ DWQ Stormwater Program ☐ DWQ 401 Unit
3. Certified Local Government Stormwater Review	
3a. In which local government's jurisdiction is this project?	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. Due to the minimal transportation impact resulting from this bridge replacement, this project will neither influence nearby land uses nor stimulate growth. Therefore, a detailed indirect or cumulative effects study will not be necessary.		
4. Sewage Disposal (DWQ Requirement)		
4a. Clearly detail the ultimate treatment methods and disposition (non-discharge or discharge) of wastewater generated from the proposed project, or available capacity of the subject facility. not applicable		

5. Endangered Species and Designated Critical Habitat (Corps Requirement)		
5a. Will this project occur in or near an area with federally protected species or habitat?	☒ Yes	☐ No
5b. Have you checked with the USFWS concerning Endangered Species Act impacts?	☒ Yes	☐ No
5c. If yes, indicate the USFWS Field Office you have contacted.	☒ Raleigh ☐ Asheville	
5d. What data sources did you use to determine whether your site would impact Endangered Species or Designated Critical Habitat? NCNHP, USFWS, NCDOT Biological Surveys Group conducted surveys in two tributaries (Hector and Neills Creek) to assist in assessing the current status of the endangered Cape Fear Shiner in July of 2006. Concurrence from the USFWS and survey results are attached. Biological Conclusions for the remaining species were all 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 Unit 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. J. Lusk Applicant/Agent's Signature (Agent's signature is valid only if an authorization letter from the applicant is provided.)	12.11.09 Date

Ecosystem Enhancement PROGRAM

December 11, 2009

Ms. Kimberly Garvey
U. S. Army Corps of Engineers
Wilmington Regulatory Field Office
69 Darlington Avenue
Wilmington, North Carolina 28402

Dear Ms. Garvey:

Subject: EEP Mitigation Acceptance Letter:
B-4138, Replace Bridge Number 46 over the Cape Fear River on I-40/NC 210, Harnett County; Cape Fear River Basin (Cataloging Unit 03030004); Southern Inner Coastal Plain (SICP) Eco-Region

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory stream and riparian wetland mitigation for the unavoidable impact associated with the above referenced project. Based on the information supplied by the NCDOT on December 11, 2009, the impacts are located in CU 03030004 of the Cape Fear River Basin in the Southern Inner Coastal Plain (SICP) Eco-Region, and the anticipated mitigation credits needed to offset the impacts are as follows:

Cape Fear 03030004 SICP	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	0	0	133	0.21	0	0	0	0
Mitigation Units (Credits-up to 2:1)	0	0	266	0.42	0	0	0	0

This mitigation acceptance letter replaces the mitigation acceptance letters issued on November 17 and 19, 2009. Mitigation associated with this project will be provided in accordance with Section X of Amendment No. 2 to the Memorandum of Agreement between the N. C. Department of Environment and Natural Resources, the N. C. Department of Transportation, and the U. S. Army Corps of Engineers fully executed on March 8, 2007 (Tri-Party MOA). EEP commits to implement sufficient compensatory stream and riparian wetland mitigation in the appropriate cataloging unit in the amount listed in the above table to offset the impacts associated with this project by the end of the MOA year in which this project is permitted. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from EEP.

If you have any questions or need additional information, please contact Ms. Beth Harmon at 919-715-1929.

Sincerely,

William D. Gilmore, P.E.
EEP Director

cc: Mr. Gregory J. Thorpe, Ph.D., NCDOT-PDEA
Mr. Brian Wrenn, Division of Water Quality, Wetlands/401 Unit
File: B-4138 Revised - 2

Ecosystem Enhancement PROGRAM

December 14, 2009

Mr. Gregory J. Thorpe, Ph.D.
Manager, Project Development and Environmental Analysis Branch
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:
B-4138, Replace Bridge Number 46 over the Cape Fear River on I-40/NC 210, Harnett County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory stream and riparian wetland mitigation for the subject project. Based on the information supplied by you on December 11, 2009, the impacts are located in CU 03030004 of the Cape Fear River Basin in the Southern Inner Coastal Plain (SICP) Eco-Region, and are as follows:

Cape Fear 03030004 SICP	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	0	0	133	0.21	0	0	0	0
Mitigation Units (Credits-up to 2:1)	0	0	266	0.42	0	0	0	0

This mitigation acceptance letter replaces the mitigation accepted letters issued on November 17 and 19, 2009. EEP commits to implementing sufficient compensatory stream and riparian wetland mitigation credits to offset the impacts associated with this project by the end of the MOA Year in which this project is permitted, in accordance with Section X of the Amendment No. 2 to the Memorandum of Agreement between the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U. S. Army Corps of Engineers, fully executed on March 8, 2007. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from EEP.

If you have any questions or need additional information, please contact Ms. Beth Harmon at 919-715-1929.

Sincerely,

William D. Gilmore, P.E.
EEP Director

cc: Ms. Kimberly Garvey, USACE – Wilmington Regulatory Field Office
Mr. Brian Wrenn, Division of Water Quality, Wetlands/401 Unit
File: B-4138 Revised - 2

HM

U.S. ARMY CORPS OF ENGINEERS
Wilmington District

Action ID: 200300357 **County:** Harnett

Notification of Jurisdictional Determination

Requestor:
Mr. Gregory J. Thorpe, Ph.D.
Environmental Management Director
Project Development & Environmental Analysis
1548 Mail Service Center
Raleigh, N.C. 27699-1548

Authorized Agent:
Mr. Norton Webster ✓
Kimley-Horn & Assoc., Inc.
P.O. Box 33068
Raleigh, N.C. 27636-3068

Size and Location of Project (waterbody, Highway name/number, town, etc.): TIP Project No. B-4138, Replacement of bridge 45 & 46 on NC 401 in Harnett County, North Carolina.

Basis for Determination: Type 328.3(a)(1) waters of the United States, Cape Fear River, Cape Fear River Basin and Type 328.3(a)(7) wetlands based on positive identification of hydric soils (Wehadkee series), dominant hydrophytic vegetation (Greater than 50% FAC) and hydrology (Numerous Primary and Secondary indicators).

On **January 30, 2003** the undersigned inspected the Section 404 jurisdictional boundaries as field delineated by the NCDOT and/or its representatives for the subject NCDOT project/corridor. The project site was inspected and the delineated jurisdictional boundaries as identified on the attached plan were found to accurately reflect the limits of Corps jurisdiction. The field delineated jurisdictional limits, as shown on the attached plans dated **January 27, 2003**, can be relied on for project planning and impact assessment. This verification is valid for five (5) years from the date of this letter.

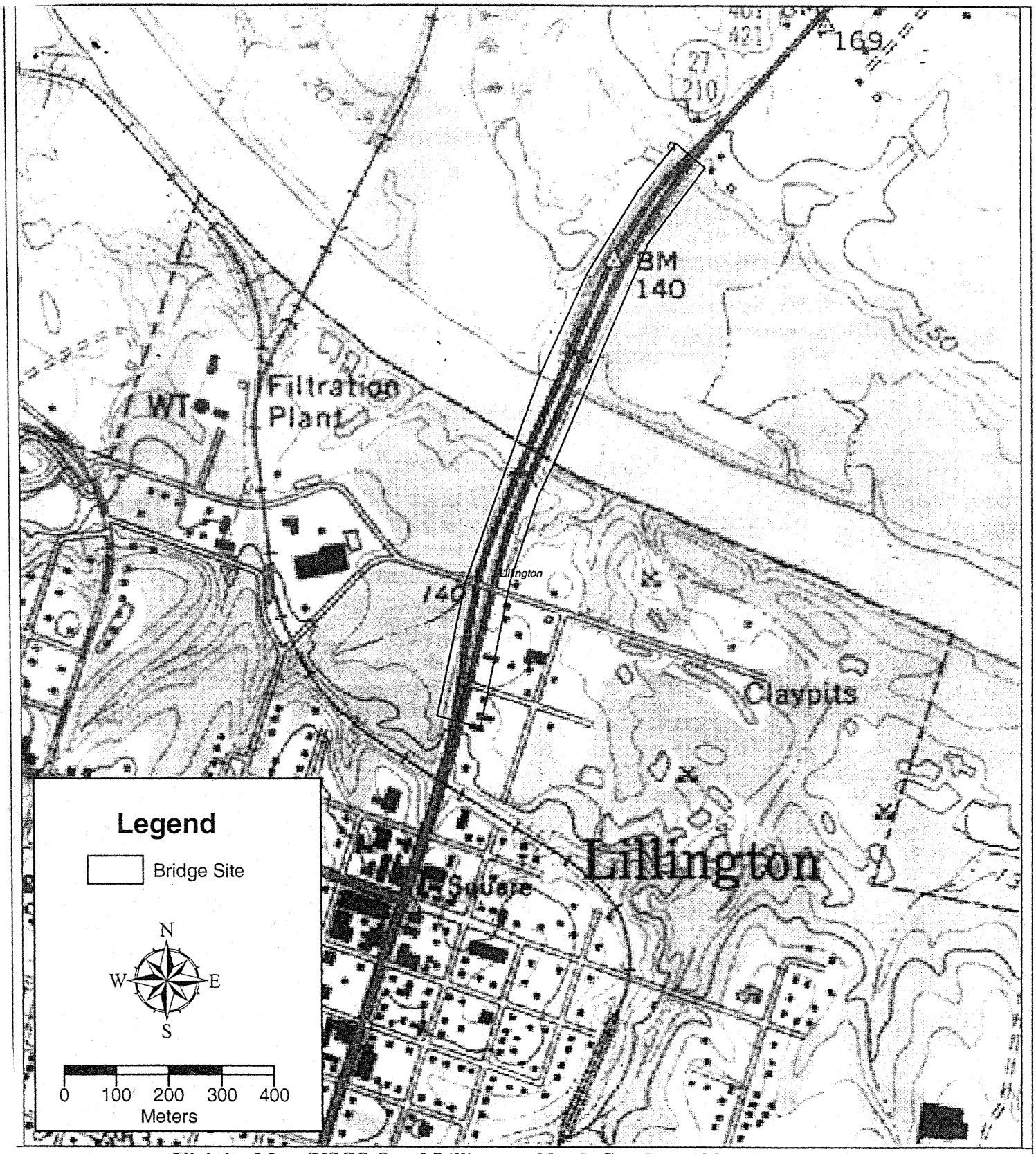
Any placement of dredged or fill material within the delineated jurisdictional limits will require Department of the Army authorization pursuant to Section 404 of the Clean Water Act, as amended (33 USC 1344). Any un-authorized placement of dredged or fill material within the delineated jurisdictional limits would be a violation of Section 301 of the Clean Water Act (33 USC 1311) and subject to enforcement action. If you have any questions regarding this verification or the Corps of Engineers' regulatory program, please contact Mr. Richard K. Spencer at 910-251-4172.

Project Manager Signature Richard K. Spencer

Richard K. Spencer

Date April 8, 2003 **Expiration Date** April 8, 2008

CF: Jim Rerko, DEO, NCDOT Div. 6

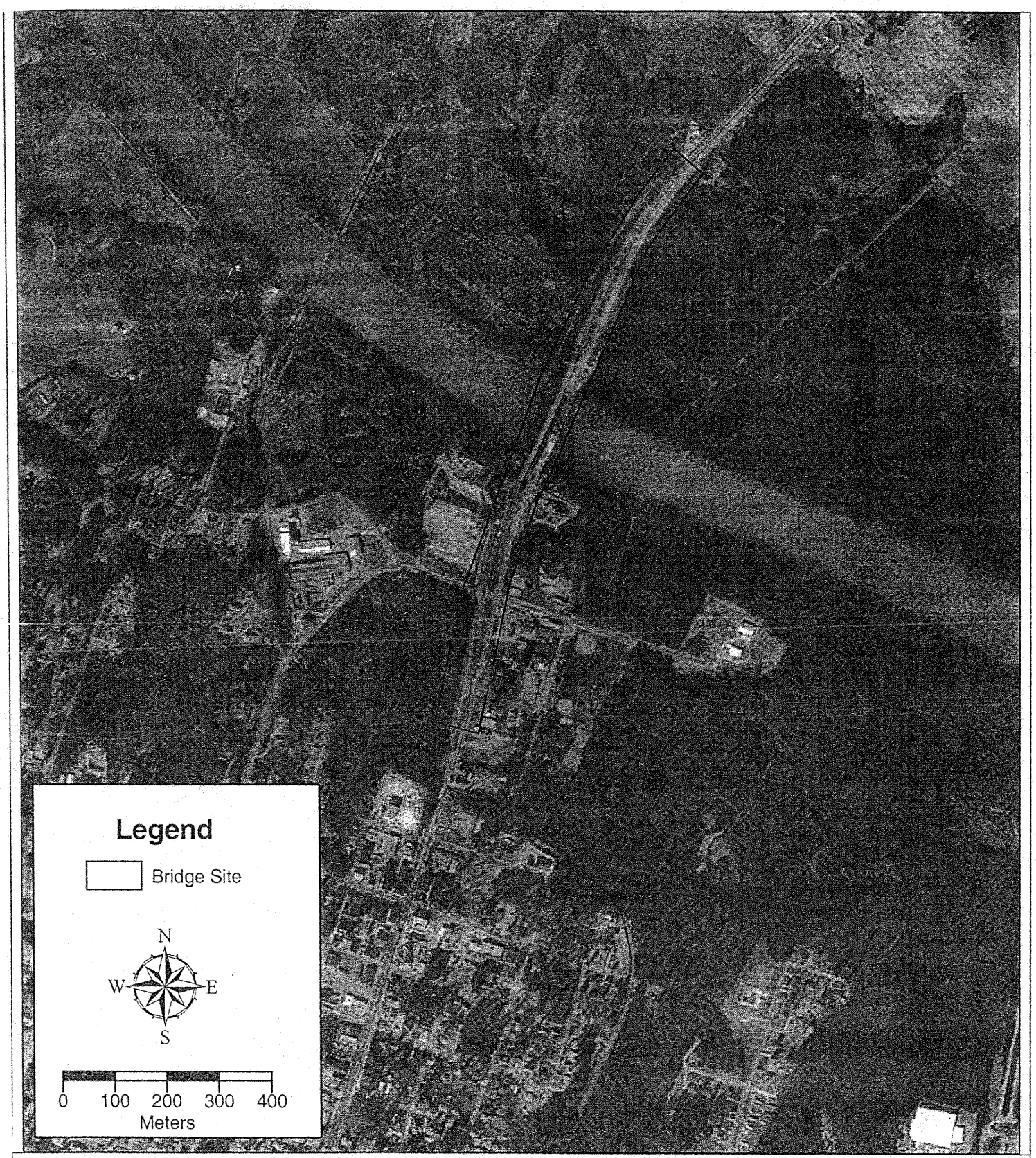


Title: **Vicinity Map (USGS Quad Lillington, North Carolina 1987)**

Kimley-Horn and Associates, Inc.

Project: Vicinity Map
T.I.P. No. 4138 Replacement of Bridge #s 45 and 46 on NC 401 over Cape Fear River
Harnett County, North Carolina

Date:	Scale:	Project No.:	Figure:
1/27/03		011700019	1

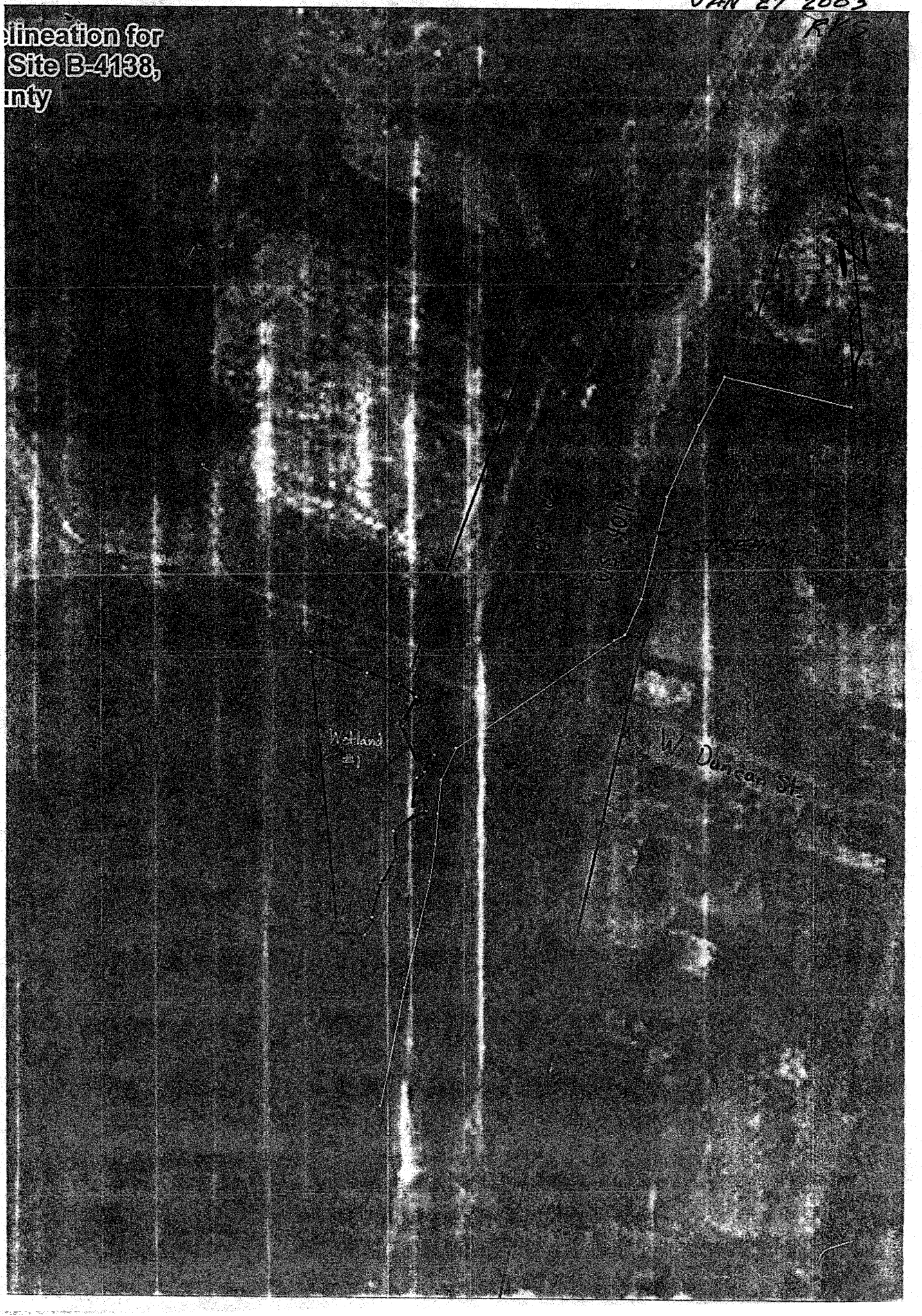


Title: **Project Area (1993 USGS Orthophoto)**

Kimley-Horn and Associates, Inc.

Project:	Project Area T.I.P. No. 4138 Replacement of Bridge #s 45 and 46 on NC 401 over Cape Fear River Harnett County, North Carolina		
Date: 1/27/03	Scale:	Project No.: 011700019	Figure: 2

JAN 27 2003
RKS



RKS

Wetland #7
Wetland #6
Wetland #5
Wetland #4
Wetland #3
Wetland #2
US 401
US 401
Channel #1
Channel #2

UT to Cape Fear
Bridge No. 46 on US 401/NC 210
Stream Mitigation Plan
TIP B-4138
September 2009

The North Carolina Department of Transportation will perform on-site mitigation for stream impacts associated with TIP B-4138 on US 401/ NC 210. The mitigation site contains approximately 608 linear feet of stream restoration and occurs within the right of way located adjacent to NC 210 near Station 40+00.

NCDOT plans to restore 608 linear feet of stream by relocating the stream west of the existing location, establishing a stable channel and replanting the buffer along the unnamed tributary that leads to the Cape Fear River. This site is proposed to offset 608 feet of stream impacts associated with the road project.

Existing Conditions

This project is located in the northeastern region of Harnett County on NC 210 about 0.5 miles north of Lillington NC. NCDOT plans to replace both north and south bound bridges over the Cape Fear River. The stream flows southerly through an old pond north of the Cape Fear River that no longer exists due to the failing of the dam. The existing channel below the pond dam seems to have been straightened in the past and is approximately 3 to 4 ft wide at the bottom and approximately 8 to 10 foot wide at the top of the bank. Below the dam, the channel is incised, degraded, and has unstable stream banks. These conditions are causing silt and sediment from bank erosion to enter the stream system which flows directly into the Cape Fear River. The riparian area adjacent to the stream on the western bank is dense woody vegetation. On the eastern side, the buffer is currently dominated by herbaceous species with very sparse woody vegetation.

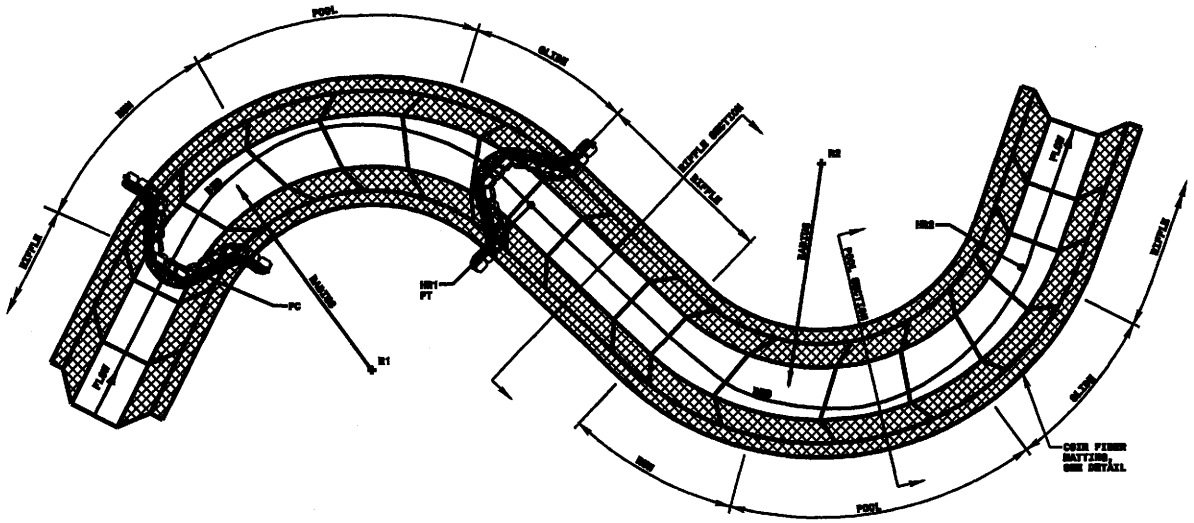
Proposed Conditions

The proposed stream channel design involves relocating 608 feet of the stream west of the existing location with the appropriate dimensions, pattern and profile. The design proposes a C type channel with a 0.66 percent slope and a cross sectional area of 18 sq/ft. This information is shown in detail on the morphological table included in Appendix A. The proposed design includes constructing a new channel, applying the appropriate cross sectional areas and installing grade control structures. The design parameters were verified using the NC Regional Curves also found in Appendix A. A minimum 50 ft buffer along the western side of the channel will be planted. A minimum of 30 ft buffer will be planted on the eastern side of the channel to the limits of the proposed fill of the new bridge preventing it from having the extra 20ft of buffer. The following species will be planted on the banks and buffers: sycamore (*Plantanus occidentalus*), river birch (*Betula nigra)*, white oak (*Quercus alba*), and yellow poplar (*Liriodendron tulipifera).*

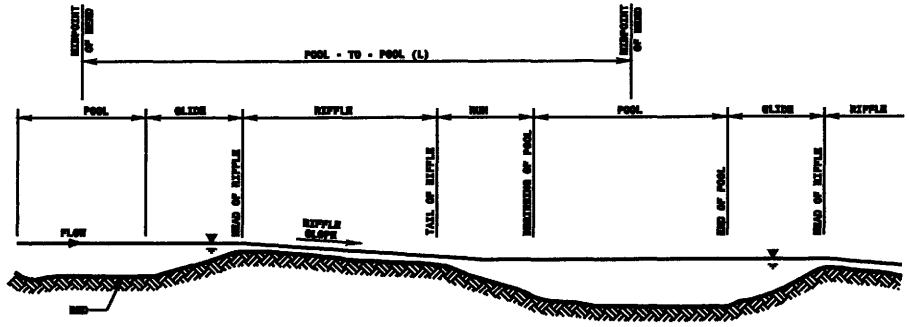
Monitoring

NCDOT proposes to monitor the restoration site by visual observation for channel and bank stability and by, photo documentation for the survival and the density of the vegetation. NCDOT will monitor the site for a minimum of three years or until the site is deemed successful. The USACE stream quality assessment forms used to evaluate success criteria are shown in Appendix A.

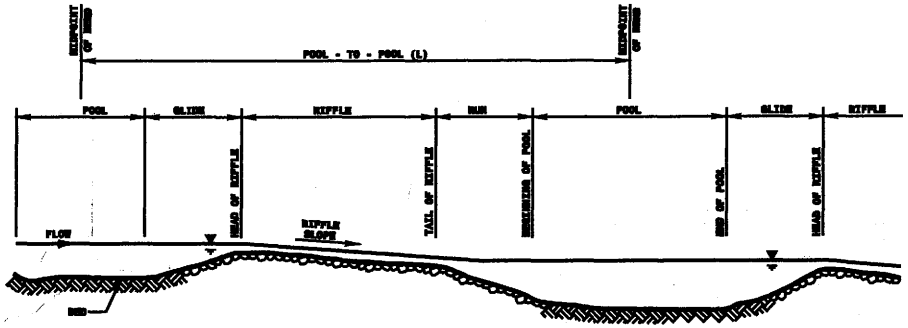
The mitigation site was purchased fee simple and will be held in perpetuity by NCDOT



TYPICAL PLAN



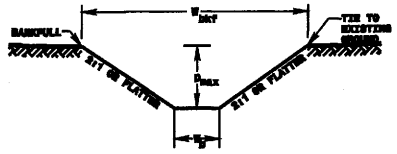
TYPICAL PROFILE



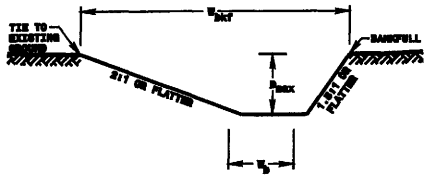
TYPICAL PROFILE FOR ARMORED RIFFLE SECTION

CHANNEL TYPICAL DETAIL

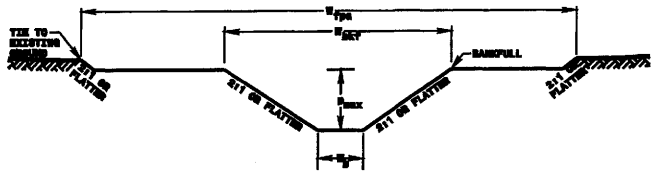
NOT TO SCALE



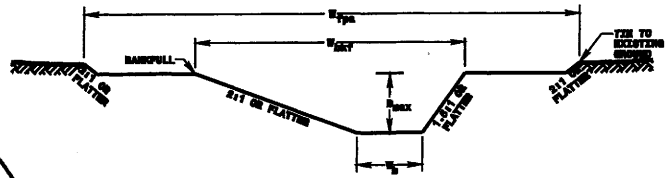
TYPICAL RIFFLE



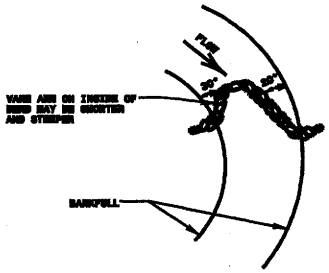
TYPICAL POOL



TYPICAL RIFFLE WITH BANKFULL BENCH



TYPICAL POOL WITH BANKFULL BENCH



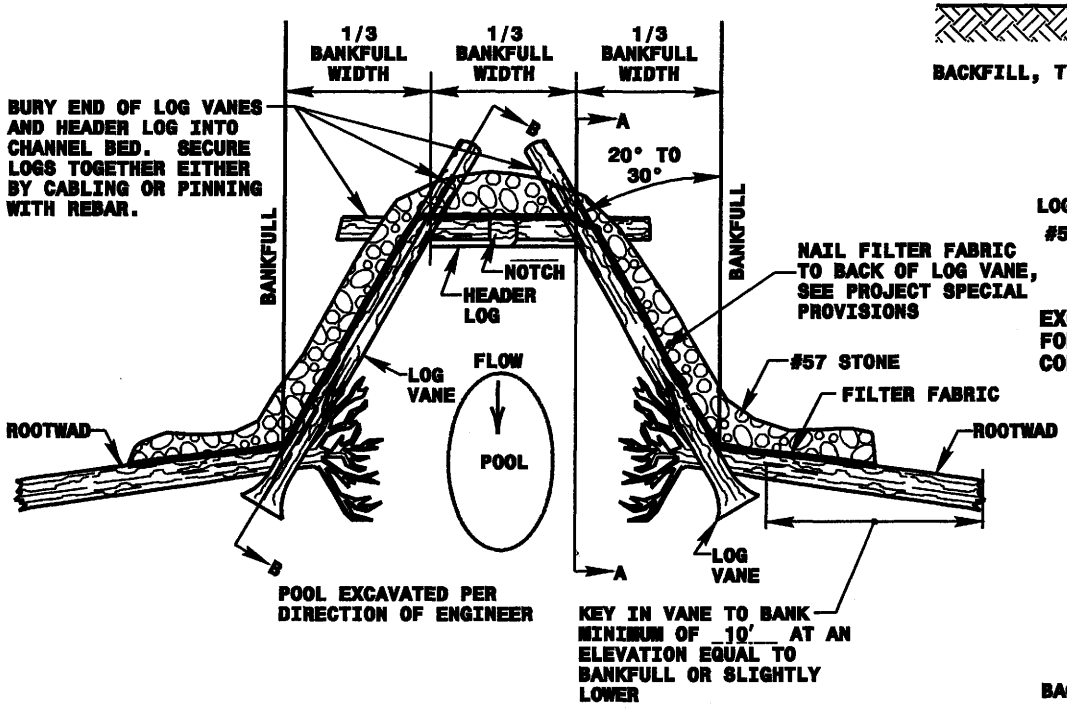
CROSS VANE CONSTRUCTION IN MEANDER-BEND PLAN VIEW

W_{BKF} = BANKFULL WIDTH
D_{MAX} = MAXIMUM DEPTH
W_b = BOTTOM WIDTH
W_{FPA} = FLOOD PRONE AREA WIDTH

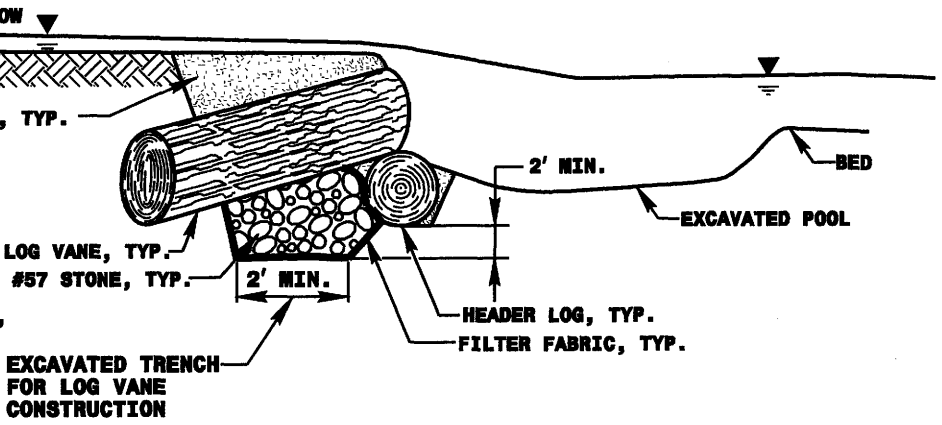
NOTES:
1. TIE COORDINATES FOR EACH CENTER OF RADIUS (EX. "RC1", "RC2") AND EACH HEAD OF RIFFLE (EX. "HR1", "HR2") ARE INDICATED ON THE PLAN SHEETS.

CROSS-SECTION DIMENSIONS

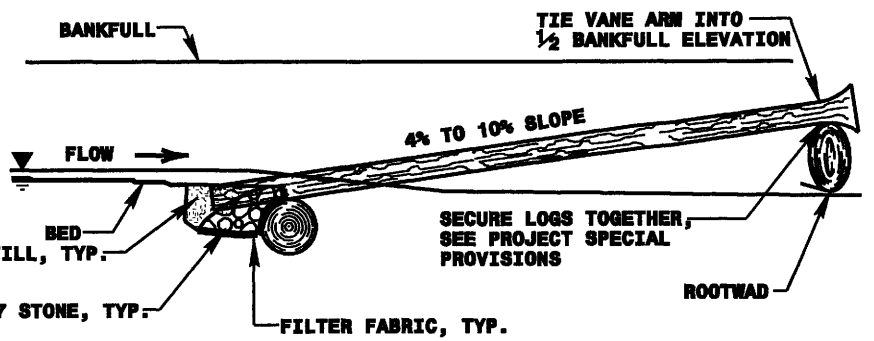
	RIFFLE				POOL				
REACH	W_{BKF}	D_{MAX}	W_b	W_{FPA}	W_{BKF}	D_{MAX}	W_b	W_{FPA}	WIDTH/DEPTH RATIO
Sta. 10+00 - Sta. 10+84	18'	0.6'	0.0'	61'					0.0
Sta. 11+67 - Sta. 12+00									
Sta. 12+00 - Sta. 12+00					18'	4.0'	0.0'	61'	
Sta. 12+00 - Sta. 12+11	18'	0.6'	0.0'	61'					0.0
Sta. 12+11 - Sta. 12+41					18'	4.0'	0.0'	61'	
Sta. 12+41 - Sta. 14+00	18'	0.6'	0.0'	61'					0.0
Sta. 14+00 - Sta. 14+00					18'	4.0'	0.0'	61'	
Sta. 14+00 - Sta. 14+84	18'	0.6'	0.0'	61'					0.0
Sta. 14+84 - Sta. 14+84					18'	4.0'	0.0'	61'	
Sta. 14+84 - Sta. 15+13	18'	0.6'	0.0'	61'					0.0
Sta. 15+13 - Sta. 15+41					18'	4.0'	0.0'	61'	
Sta. 15+41 - Sta. 16+00	18'	0.6'	0.0'	61'					0.0
Sta. 16+00 - Sta. 16+00					18'	4.0'	0.0'	61'	
Sta. 16+00 - Sta. 16+00	18'	0.6'	0.0'	61'					0.0



PLAN VIEW



SECTION A-A



SECTION B-B

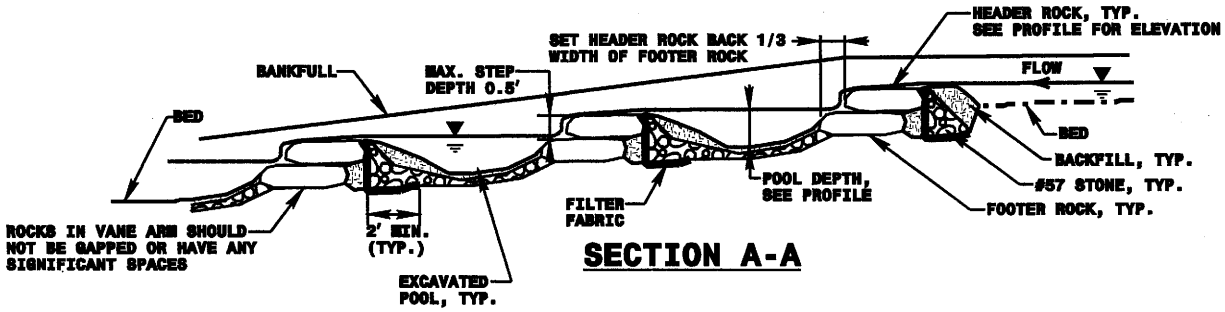
	LOG DIMENSIONS (FT)		
STATION	DIAMETER	LENGTH	
12+56	1.5' min	5' - 15'	___
13+41	"	"	___
14+33	"	"	___
14+94	"	"	___
15+43	"	"	___
16+30	"	"	___

NOTES:
1. DEEPEST PART OF POOL TO BE IN LINE WITH WHERE VANE ARM TIES INTO BANKFULL.
2. DO NOT EXCAVATE POOL TOO CLOSE TO FOOTER BOULDERS.
3. CLASS "A" STONE CAN BE USED TO REDUCE VOIDS BETWEEN HEADERS AND FOOTERS.
4. COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.
5. POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.

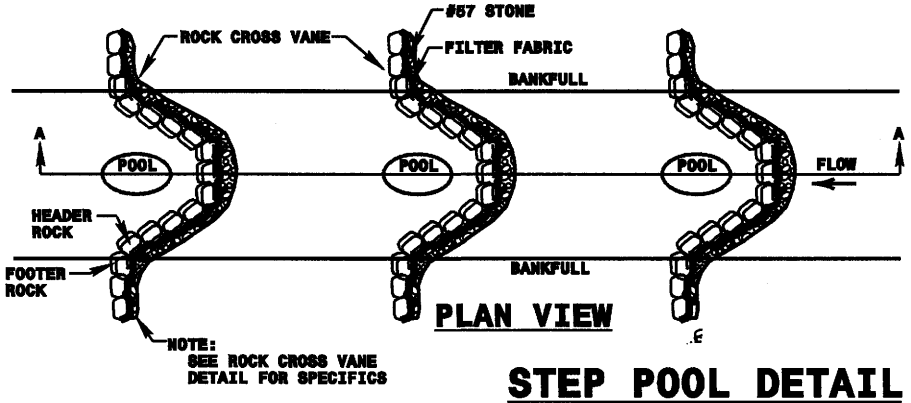
LOG CROSS VANE DETAIL

NOT TO SCALE

b4138_hyd_streamreloc.dgn 8/6/2009 11:36:11 AM



SECTION A-A

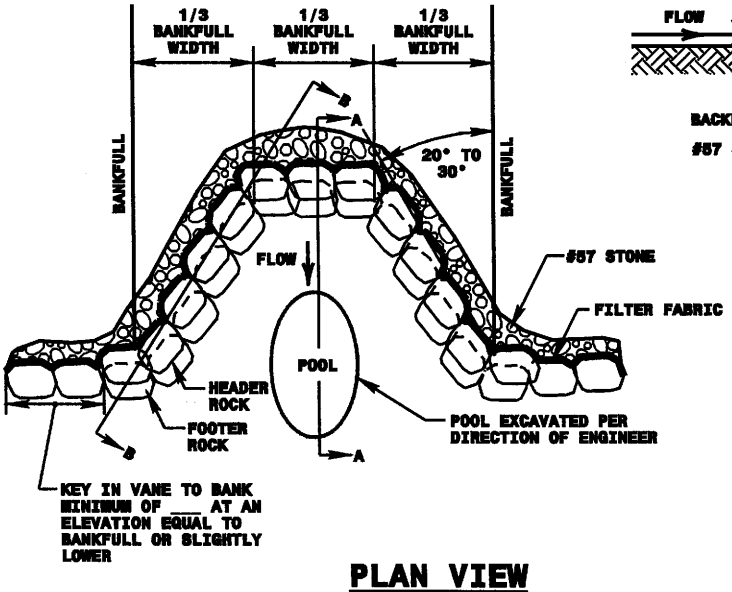


PLAN VIEW

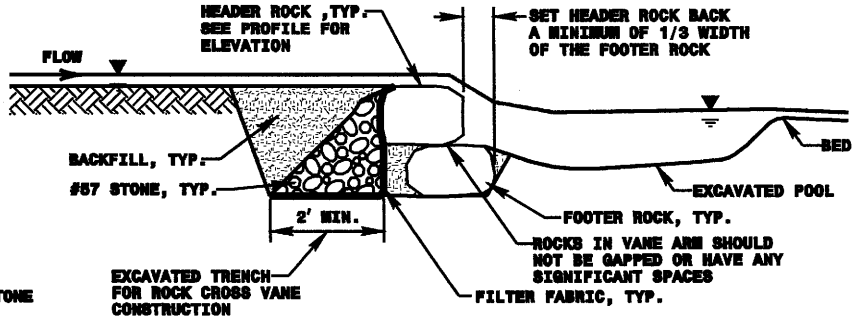
STEP POOL DETAIL

NOT TO SCALE

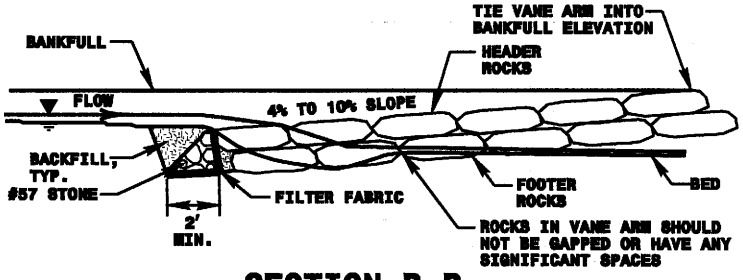
NOTES:
1. STEPS TO BE SHORT, FREQUENT, AND CLOSELY SPACED.
2. POOL SPACING SHALL BE INVERSELY PROPORTIONAL TO STREAM SLOPE, AND DIRECTLY PROPORTIONAL TO BANKFULL WIDTH.
3. POOL DEPTHS AT BANKFULL ELEVATION SHALL BE TYPICALLY 2 TO 3 TIMES DEEPER THAN STEP DEPTHS AT BANKFULL ELEVATION.
4. ADEQUATE NUMBER OF FOOTER BOULDERS TO BE USED IN ORDER TO HOLD UP THE BOULDERS AT HEAD OF STEPS DURING HIGH ENERGY/HIGH FLOW EVENTS.
5. STEP POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.



PLAN VIEW



SECTION A-A



SECTION B-B

	BOULDER DIMENSIONS (FT)		
STATION	HEIGHT	LENGTH	WIDTH
10+93	2.0'	4.0'	2.0'
11+22	"	"	"
11+61	"	"	"

NOT TO SCALE

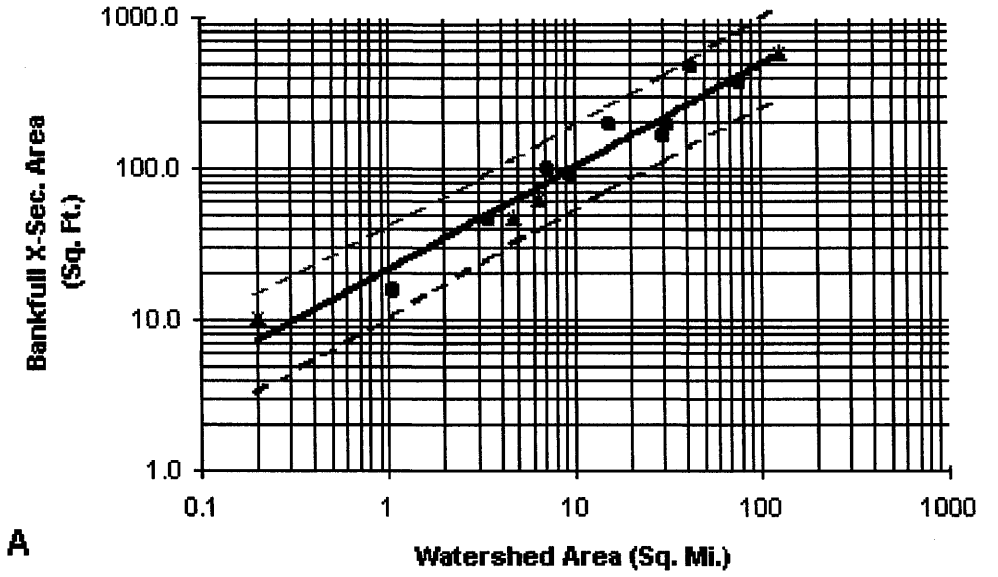
ROCK CROSS VANE DETAIL FOR STEP POOLS STA 10+65-STA 11+51 -NSD-

NOTES:
1. DEEPEST PART OF POOL TO BE IN LINE WITH WHERE VANE ARM TIES INTO BANKFULL.
2. DO NOT EXCAVATE POOL TOO CLOSE TO FOOTER BOULDERS.
3. CLASS "A" STONE CAN BE USED TO REDUCE VOIDS BETWEEN HEADERS AND FOOTERS.
4. COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.
5. POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.

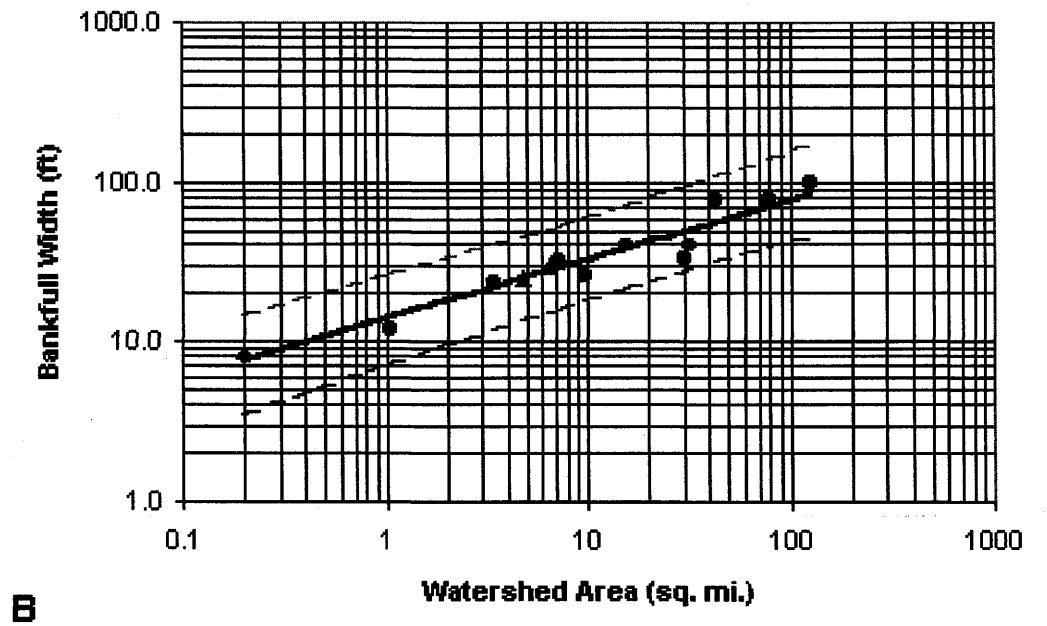
MORPHOLOGICAL MEASUREMENTS TABLE

UT to Cape Fear River — Harnett County — B-4138
-UT to Cape Fear River- Sta. 1n+nn.nn to Sta. nn+nn.nn

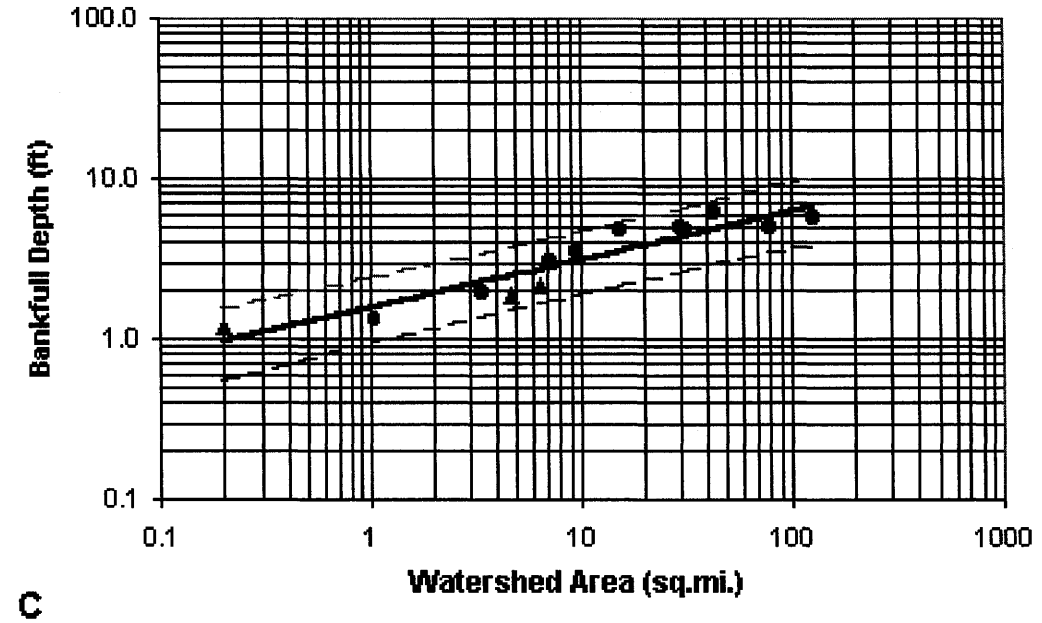
Variables	Existing Channel	Proposed Reach	USGS Station	Reference Reach
1. Stream type	Trib to Cape Fear - C6	Trib to Cape Fear - C6	--	Muddy Creek - E5/C5
2. Drainage area	.07 sq mi (45.0 ac)	.07 sq mi (45.0 ac)	-----	0.85 sq mi (545 ac)
3. Bankfull width (ft)	Mean: 9 Range: 9-10	Mean: 13 Range:		Mean: 11.2 Range:
4. Bankfull mean depth (ft)	Mean: 2.2 Range: 2.5-3.2	Mean: 1.4 Range:		Mean: 1.0 Range:
5. Width/depth ratio	Mean: 3.5 Range: 3.2-4.0	Mean: 9.3 Range:		Mean: 10.8 Range:
6. Bankfull cross-sectional area (sq ft)	Mean: 19.3 Range: 17.9-20.3	Mean: 18 Range:		Mean: 11.5 Range:
7. Bankfull mean velocity (ft/s)	Mean: 4.1 Range: 2.8 - 5.9	Mean: 3.4 Range: 3.2 - 3.5		Mean: 1.0 Range:
8. Bankfull discharge (cfs)	Mean: 69 Range:	Mean: 69 Range:		Mean: 11.0 Range:
9. Bankfull max depth (ft)	Mean: 2.8 Range: 2.5-3.2	Mean: 2.0 Range:		Mean: 1.7 Range:
10. Width of floodprone area (ft)	Mean: 11.7 Range: 12-21	Mean: 41 Range:		Mean: 24.5 Range:
11. Entrenchment ratio	Mean: 8.0 Range:	Mean: 29.3 Range:		Mean: 22.0 Range:
12. Meander length (ft)	Mean: N/A Range:	Mean: 175 Range: 155 - 195		Mean: 76 Range: 55 - 97
13. Ratio of meander length to bankfull width	Mean: N/A Range:	Mean: 13.5 Range: 11.9 - 15		Mean: 6.8 Range: 4.9 - 8.7
14. Radius of curvature (ft)	Mean: N/A Range:	Mean: 100 Range:		Mean: 16.2 Range: 10.4 - 21.9
15. Ratio of radius of curvature to bankfull width	Mean: N/A Range:	Mean: 7.7 Range:		Mean: 1.4 Range: 0.9 - 2.0
16. Belt width (ft)	Mean: N/A Range:	Mean: 33 Range:		Mean: 39.5 Range:
17. Meander width ratio	Mean: N/A Range:	Mean: 2.5 Range:		Mean: 3.5 Range: 2.7 - 4.4
18. Sinuosity (stream length/valley length)	Mean: 1.00 Range:	Mean: 1.02 Range:		Mean: 1.1 Range:
19. Valley slope (%)	Mean: 0.003 Range:	Mean: 0.003 Range:		Mean: 0.00417 Range:
20. Average slope (%)	Mean: 0.005 Range: 0.003-0.012	Mean: 0.003 Range:		Mean: 0.002 Range:
21. Pool slope (%)	Mean: 0.005 Range:	Mean: 0.003 Range:		Mean: 0.0019 Range:
22. Ratio of pool slope to average slope	Mean: 1.0 Range:	Mean: 1.0 Range:		Mean: 1.0 Range:
23. Maximum pool depth (ft)	Mean: 2.8 Range:	Mean: 4.0 Range:		Mean: 1.8 Range:
24. Ratio of pool depth to average bankfull depth	Mean: 1.0 Range:	Mean: 2.9 Range:		Mean: 1.7 Range:
25. Pool width (ft)	Mean: 7 Range: 6-8	Mean: 15 Range:		Mean: 17.2 Range:
26. Ratio of pool width to bankfull width	Mean: 0.8 Range:	Mean: 1.2 Range:		Mean: 1.5 Range:
27. Pool to pool spacing (ft)	Mean: 73 Range: 66-78	Mean: 95 Range: 90 - 100		Mean: 37 Range: 18 - 68
28. Ratio of pool to pool spacing to bankfull width	Mean: 7.2 Range:	Mean: 7.3 Range: 6.9 - 7.7		Mean: 3.3 Range: 1.6 - 6.1
29. Ratio of lowest bank height to bankfull height (or max bankfull depth)	Mean: 1.4 Range:	Mean: 1.0 Range:		Mean: 3.7 Range: 1.8 - 6.8


1000.0
100.0
10.0
1.0
0.1
1
10
100
1000
Bankfull X-Sec. Area (Sq. Ft.)
Watershed Area (Sq. Mi.)

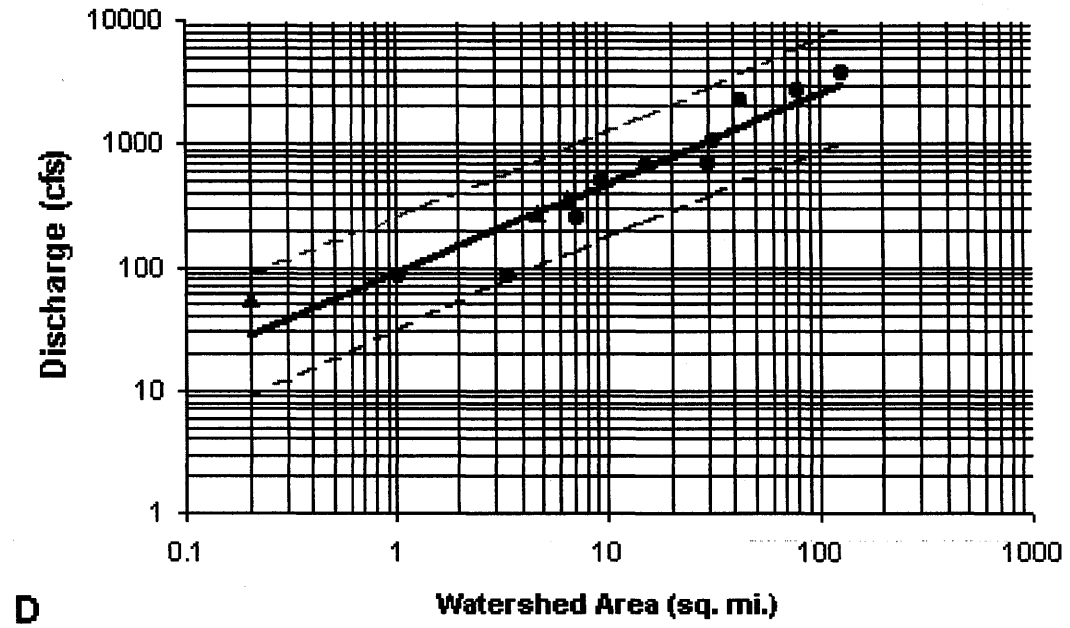
A


1000.0
100.0
10.0
1.0
0.1
1
10
100
1000
Bankfull Width (ft)
Watershed Area (sq. mi.)

B


100.0
10.0
1.0
0.1
Bankfull Depth (ft)
0.1
1
10
100
1000
Watershed Area (sq.mi.)

C


10000
1000
100
10
1
Discharge (cfs)
0.1
1
10
100
1000
Watershed Area (sq. mi.)

D

Channel Mitigation Monitoring Sheets I, II, III, AND IV

Monitoring Data Record

Project Title: _____ COE Action ID: _____
Stream Name: _____ DWQ Number: _____
City, County and other Location Information: _____
Date Construction Completed:_____ Monitoring Year: ( ) of 5
Ecoregion:_____ 8 digit HUC unit_____
USGS Quad Name and Coordinates: _____
Rosgen Classification: _____
Length of Project: _____ Urban or Rural: _____ Watershed Size: _____
Monitoring DATA collected by: _____ Date: _____
Applicant Information:
Name: _____
Address: _____
Telephone Number: _____ Email address:_____
Consultant Information:
Name: _____
Address: _____
Telephone Number: _____ Email address:_____
Project Status: _____
_____

Monitoring Level required by COE and DWQ (404 permit/ 401 Cert.): Level **1** ~~2~~ ~~3~~
Monitoring Level 1 requires completion of *Section 1, Section 2 and Section 3*

Section 1. PHOTO REFERENCE SITES
(Monitoring at all levels must complete this section)

Total number of reference photo locations at this site: _____
Dates reference photos have been taken at this site: _____
_____
Individual from whom additional photos can be obtained (name, address, phone):_____
_____
Other Information relative to site photo reference: _____
_____

If required to complete Level 3 monitoring only stop here; otherwise, complete section 2.

Section 2. PLANT SURVIVAL
Attach plan sheet indicating reference photos.

Identify specific problem areas (missing, stressed, damaged or dead plantings):

Estimated causes, and proposed/required remedial action:

ADDITIONAL COMMENTS:

If required to complete Level 1 and Level 2 monitoring only stop here; otherwise, complete section 3.

Section 3. CHANNEL STABILITY

Visual Inspection: The entire stream project as well as each in-stream structure and bank stabilization/revetment structure must be evaluated and problems addressed.

Report on the visual inspection of channel stability. Physical measurements of channel stability/morphology will not be required. Include a discussion of any deviations from as-built and an evaluation of the significance of these deviations and whether they are indicative of a stabilizing or destabilizing situation.

Date Inspected	Station Number	Station Number	Station Number	Station Number	Station Number
Structure Type					
Is water piping through or around structure?					
Head cut or down cut present?					
Bank or scour erosion present?					
Other problems noted?					

FILE COPY

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

February 23, 2006

Gregory J. Thorpe, Ph.D.
North Carolina Department of Transportation
Project Development and Environmental Analysis
1598 Mail Service Center
Raleigh, North Carolina 27699-1598

Dear Dr. Thorpe:

This letter is in response to your letter of February 14, 2006 which provided the U.S. Fish and Wildlife Service (Service) with the biological determination of the North Carolina Department of Transportation (NCDOT) that the replacement of Bridge No. 46 on US 401/421 over Cape Fear River in Harnett County (TIP No. B-4138) may affect, but is not likely to adversely affect the federally endangered Cape Fear shiner (*Notropis mekistocholas*). These comments are provided in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

During an on-site meeting held on January 18, 2006 between Mr. Gary Jordan (Service biologist) and NCDOT staff, several conservation measures were discussed and agreed upon by both parties. The commitments are listed below:

- Bridge No. 46 will be replaced in place. Traffic will be detoured onto the adjacent bridge.
- Bridge No. 46 will be taken down in such a manner that no part of it will be allowed to fall into the river. BMPs for bridge demolition will be employed throughout the demolition phase of the project.
- The existing bents for Bridge No. 46 will be cut off at or near the current river bed elevation using a wire saw or other appropriate apparatus.
- Temporary work causeways will not block more than 50 percent of the river's width at any time during the project.
- The temporary causeways will be constructed using class II rip rap with fabric underneath the rock to facilitate removal of the causeway upon completion of the structure.
- The new bridge will have five (5) bents located in the water and these will be aligned with the five (5) bents of the existing bridge.
- The new bridge will be constructed with a closed deck drainage system so that water does not drain directly into the river but is diverted into detention areas at the ends of the bridge.

- BMPs for sediment and erosion control will be utilized throughout all phases of construction.
- Prior to project let date, NCDOT's Biological Surveys Group will conduct fisheries surveys in the two (2) tributaries (Hector Creek and Neills Creek) where the Cape Fear shiner has been previously documented. This effort will assist in assessing the current status of the species.

Based on the commitment to the conservation measures listed above, the Service concurs with your determination that the proposed bridge replacement may affect, but is not likely to adversely affect the Cape Fear shiner. We believe that the requirements of section 7(a)(2) of the ESA have been satisfied for this species. We remind you that obligations under section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered in this review; (2) this action is subsequently modified in a manner that was not considered in this review; or (3) a new species is listed or critical habitat determined that may be affected by this identified action.

The Service appreciates the opportunity to review this project. If you have any questions regarding our response, please contact Mr. Gary Jordan at (919) 856-4520 (Ext. 32).

Sincerely,

Pete Benjamin
Ecological Services Supervisor

cc: Richard Spencer, USACE, Wilmington, NC
Nicole Thomson, NCDWQ, Raleigh, NC
Travis Wilson, NCWRC, Creedmoor, NC
Chris Militscher, USEPA, Raleigh, NC
John Sullivan, FHWA, Raleigh, NC

STORMWATER MANAGEMENT PLAN

Project: 33490.1.1 (B-4138)
Harnett County

Project Description:
Replace Bridge #46 over the Cape Fear River on US 401. Includes structure replacement and roadway approach work. Bridge will be relocated approximately 85' upstream of existing bridge. The Cape Fear River is classified as WS-IV at this location. It is downstream of the Town of Lillington intake and approximately 9 miles upstream from the Town of Erwin intake.

Roadway Description:
The typical section will remain as a four-lane highway with divided grass median. The median width will vary from 40' to 110'. The length of roadway approach work will be approximately 0.60 miles. It is proposed to use curb and gutter on the West side of the project and grassed shoulder on the East side.

Bridge Structure:
Bridge #46 is one of two bridges at this crossing on US 401 that span the Cape Fear River. Existing Bridge #46 is the southbound bridge and is 16 spans, 803' in length, built in 1958. Proposed Bridge #46 will be a 6 span, 605' bridge. This will reduce the number of piers in the river from 9 piers to 5 piers. There will be no deck drains over the river but they will be provided in the overbank areas. Rip rap swales will be provided along the overbank, under the deck drains.

BMP's:
Most drainage along the project will go into grassed ditches/swales. The typical ditch section has a 6:1 front slope with a 3:1 to 6:1 back slope. Storm drain systems will outlet into either rip rap lined ditches/embankment or will outlet to drop box structures prior to entering a river/stream. The rip rap lined ditches and drop structures will reduce velocities at confluence with river/stream. Culverts located in streams (Sta 20+00 –SBL-RT) will be buried up to 1' and placed at a minimum slope of 0.3%.

Avoidance and Minimization:
There is a stream and wetland system located at the beginning of the project along the West side of US 401. The fill slopes were steepened and shoulder section narrowed to minimize impacts to the wetland and to avoid impact to the stream.

Stream Relocation:
In the Northwest quadrant of the Cape Fear River crossing an existing stream will be impacted. The stream presently runs just parallel to the existing US 401 road fill. The realigned bridge and roadway will cover the stream so it will be relocated just outside the proposed roadway fill. The relocated stream will provide an improved section. The existing stream has predominantly vertical, eroding banks with the bankfull discharge having little to no access to the floodplain. The relocated section will be increased in

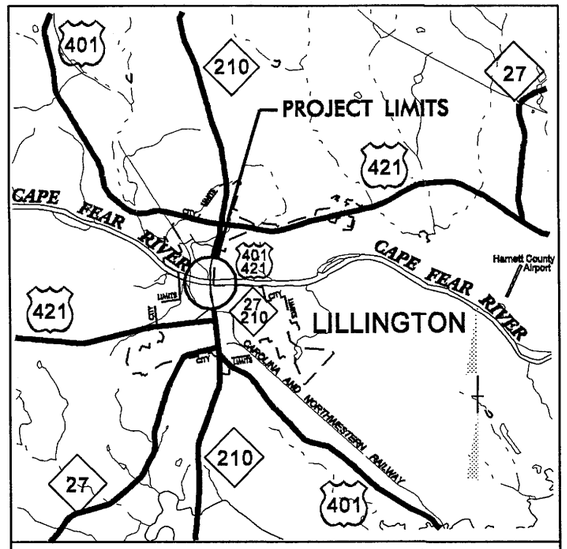
area with the bankfull flow having access to a wider floodplain bench. The design used stream morphology analysis.

09/08/99

TIP PROJECT: B-4138

CONTRACT:

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HARNETT COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4138	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
33490.1.1	BRSTP-401(146)	PE
33490.2.1	BRSTP-0401(146)	R/W /UTIL.

LOCATION: BRIDGE 46 OVER CAPE FEAR RIVER ON US 401

TYPE OF WORK: GRADING, DRAINAGE, PAVING, PAVEMENT MARKINGS, STRUCTURES, SIGNING, AND WIDENING

NAD 83

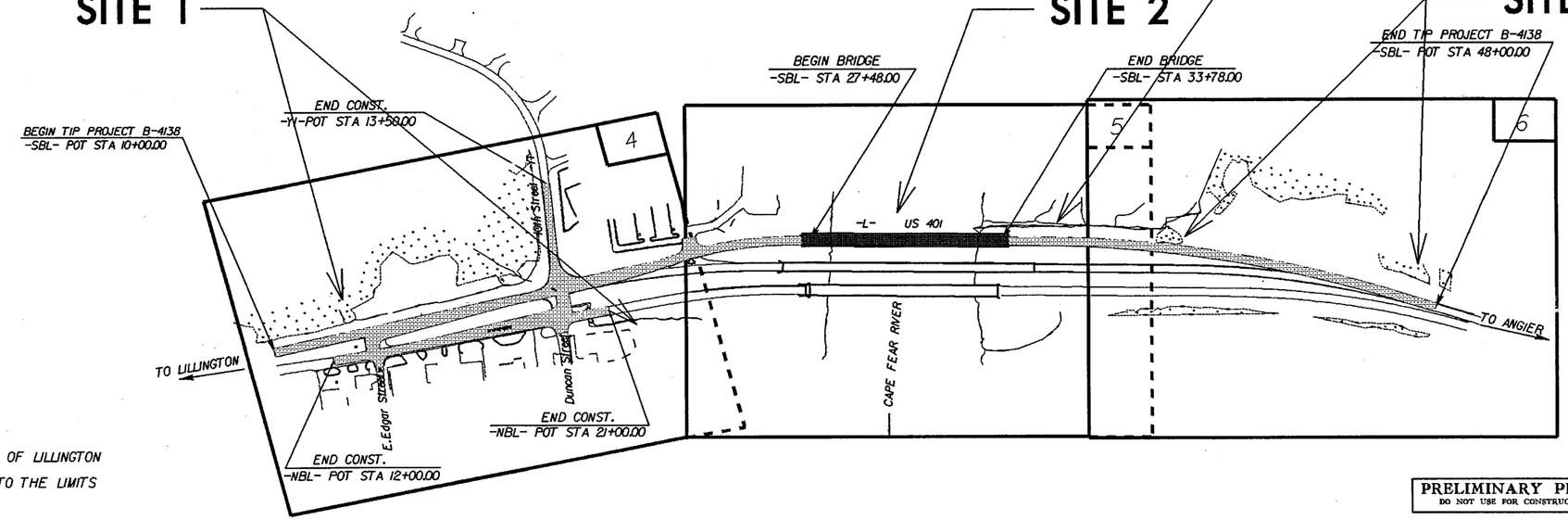
WETLAND /STREAM PERMIT

SITE 1

SITE 2

SITE 3

SITE 4



Notes:

THIS PROJECT IS WITHIN THE MUNCIPAL BOUNDARIES OF LILLINGTON

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

SEE SHEET 7 FOR DETOUR

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

PLANS 50 25 0 50 100

PROFILE (HORIZONTAL) 50 25 0 50 100

PROFILE (VERTICAL) 10 5 0 10 20

DESIGN DATA

ADT 2009 = 28500
ADT 2035 = 52600
DHV = 10 %
D = 55 %
T = 8 % *
V = 50 MPH

* TTST 4 DUAL 4

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4138 = 0.601 MILES

LENGTH STRUCTURE TIP PROJECT B-4138 = 0.119 MILES

TOTAL LENGTH OF TIP PROJECT B-4138 = 0.720 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

JASON MOORE, P. E.
PROJECT ENGINEER

BRYAN KEY, P. E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

Permit Drawing
Sheet 1 of 16

STATE HIGHWAY DESIGN ENGINEER P.E.

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gcall AT HY24577

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	WETLAND IMPACTS: Temp. Fill In Wetlands (ac)	WETLAND IMPACTS: Excavation in Wetlands (ac)	WETLAND IMPACTS: Mechanized Clearing in Wetlands (ac)	WETLAND IMPACTS: Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	SURFACE WATER IMPACTS: Temp. SW impacts (ac)	SURFACE WATER IMPACTS: Existing Channel Impacts Permanent (ft)	SURFACE WATER IMPACTS: Existing Channel Impacts Temp. (ft)	SURFACE WATER IMPACTS: Natural Stream Design (ft)
1	12+00 -SBL- LT	ROAD FILL	<0.01			0.07						
	18+00 -SBL- LT											
	13+00 -SBL- LT	ROAD FILL						0.02	0.01	128	110	
	TO 20+50 -SBL- RT											
2	28+50-L- RT&RRT	EMBANKMENT						0.03		8		
	32+85 -L- RT&RRT	RIP RAP								8		
	33+10 -L- LLT									53		
	28+35-L- LT. TO	PHASE I							0.41		100	
	30+50-L- LT.	TEMP CAUSEWAY										
	30+70-L- LT. TO	PHASE II							0.40		100	
	33+10-L- LT.	TEMP CAUSEWAY										
3	33+10-L- LT. TO	ROAD FILL						0.08	<0.01	613	20	608
	39+62-L- LT.											
4	38+70-L- LT. TO	ROAD FILL	0.08			0.06						
	47+60-L- LT.											
TOTALS:			0.08			0.13		0.13	0.81	810	330	608

Impacts due to piers = 196 sq ft

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

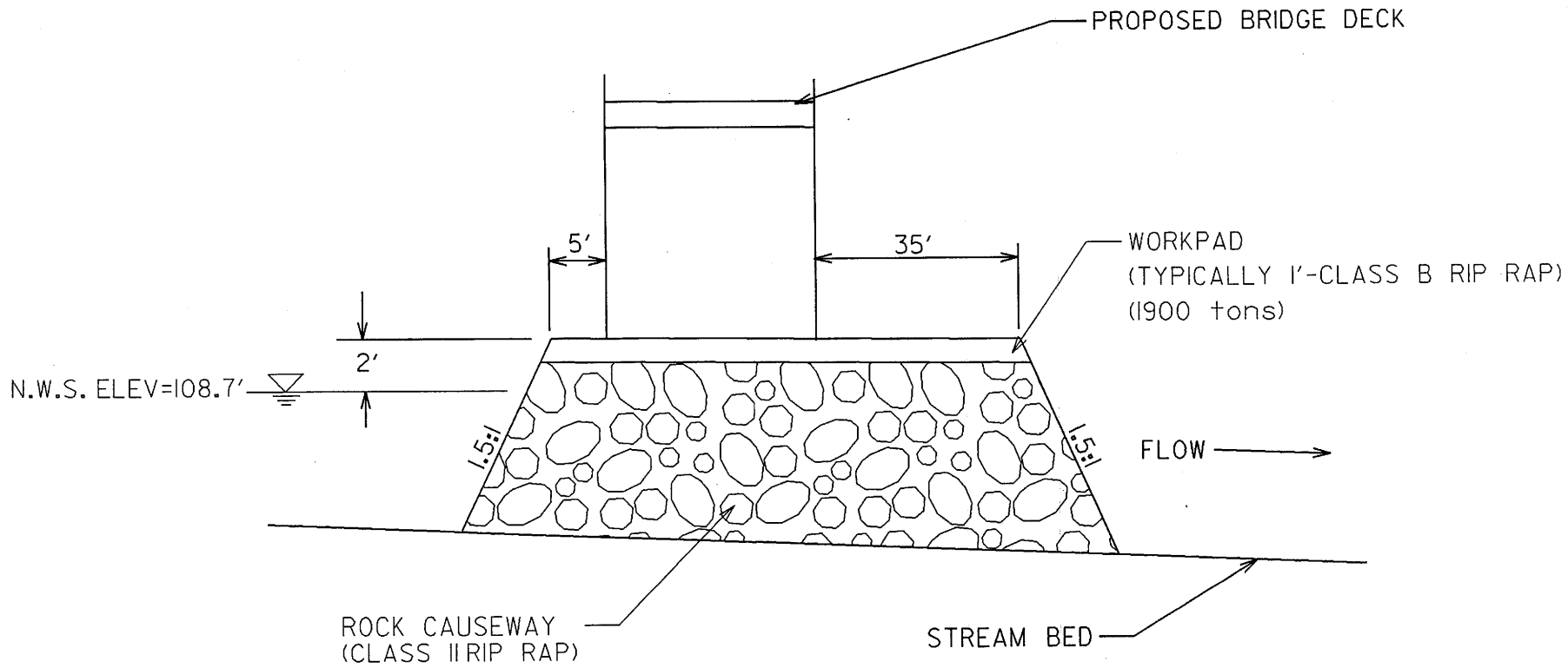
HARNETT COUNTY
WBS - 33490.1.1 (B-4138)

SHEET 9/24/2009

ATN Revised 3/31/05

Permit Drawing
Sheet 3 of 16

WORKPAD DETAIL
(NOT TO SCALE)



QUANTITIES OF ESTIMATES

VOLUME OF CLASS II RIP RAP= 8500 cy
AREA OF CLASS II RIP RAP= 0.81 ac
ESTIMATE 14400 TONS CLASS II RIP RAP

NCDOT

DIVISION OF HIGHWAYS
HARNETT COUNTY

PROJECT: 33490.1.1 (B-4138)

LILLINGTON
BRG. #46 OVER CAPE FEAR RIVER
ON US 401

SHEET **OF** **10/09**

Permit Drawing
Sheet 3 of 16

PROJECT REFERENCE NO.	SHEET NO.
B-4138	4

R/W SHEET NO.

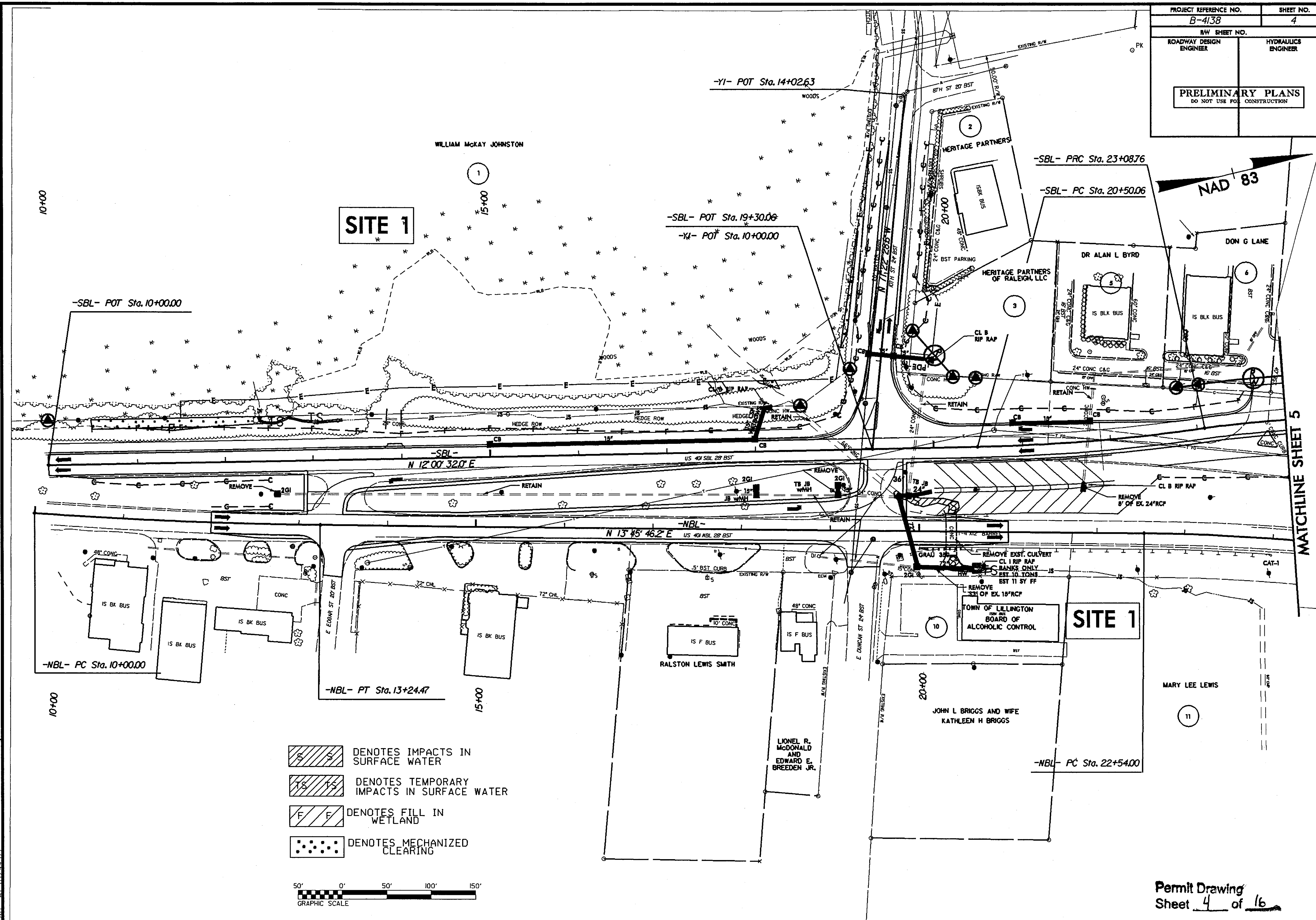
ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

ROW REVISION:6/02/09 rea.Revise Easements on Parcel No.6
Design Revision:6/02/09 rea.Adding a driveway curb cut and driveway pipe in the proposed ditch adjacent to Parcel 1.

8/17/99



Permit Drawing
Sheet 4 of 16

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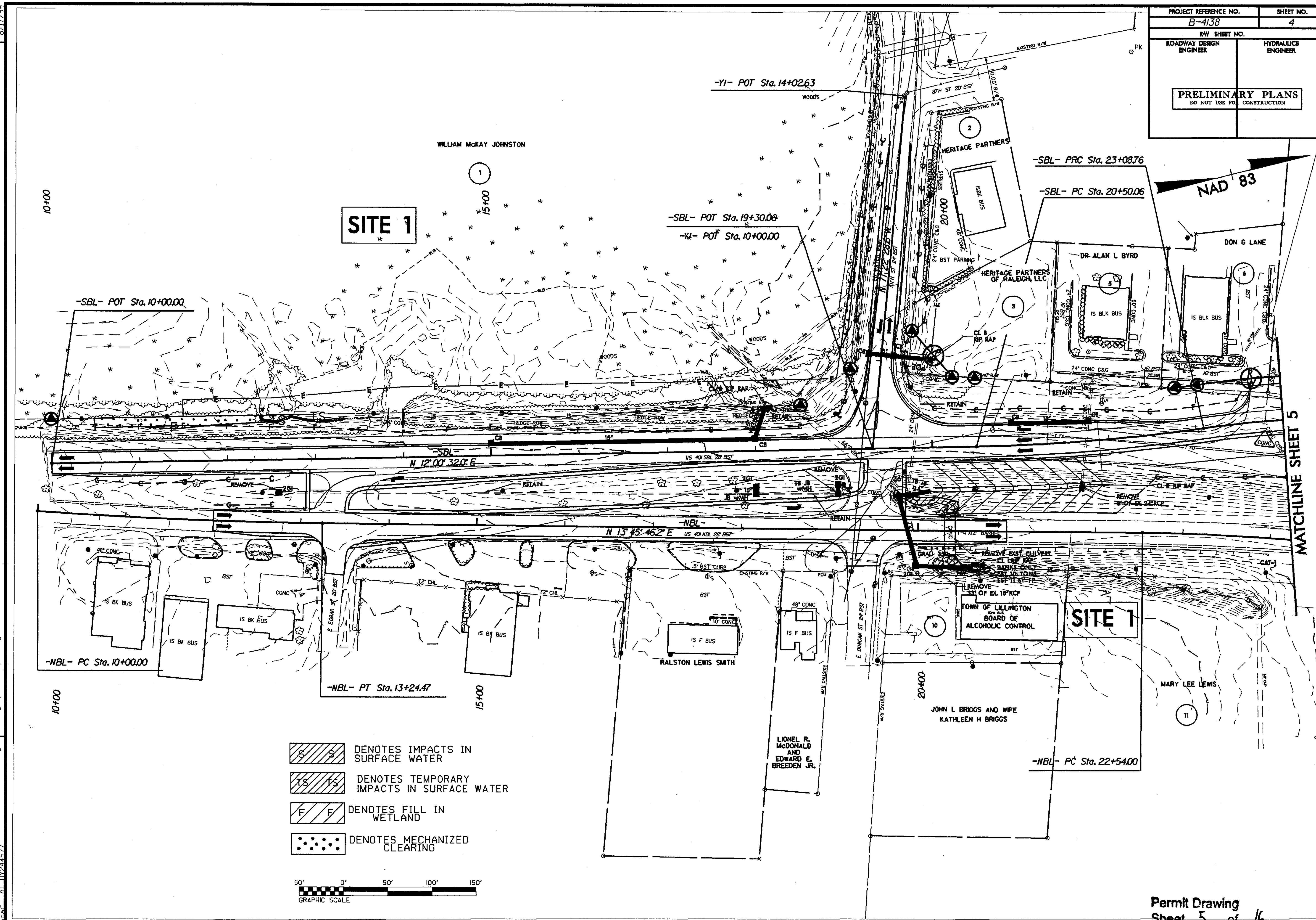

REVISIONS

ROW REVISION:6/02/09 rea.Revise Easements on Parcel No.6
Design Revision:6/02/09 rea.Adding a driveway curb cut and driveway pipe in the proposed ditch adjacent to Parcel 1.

8/17/99

24-SEP-2009 16:43
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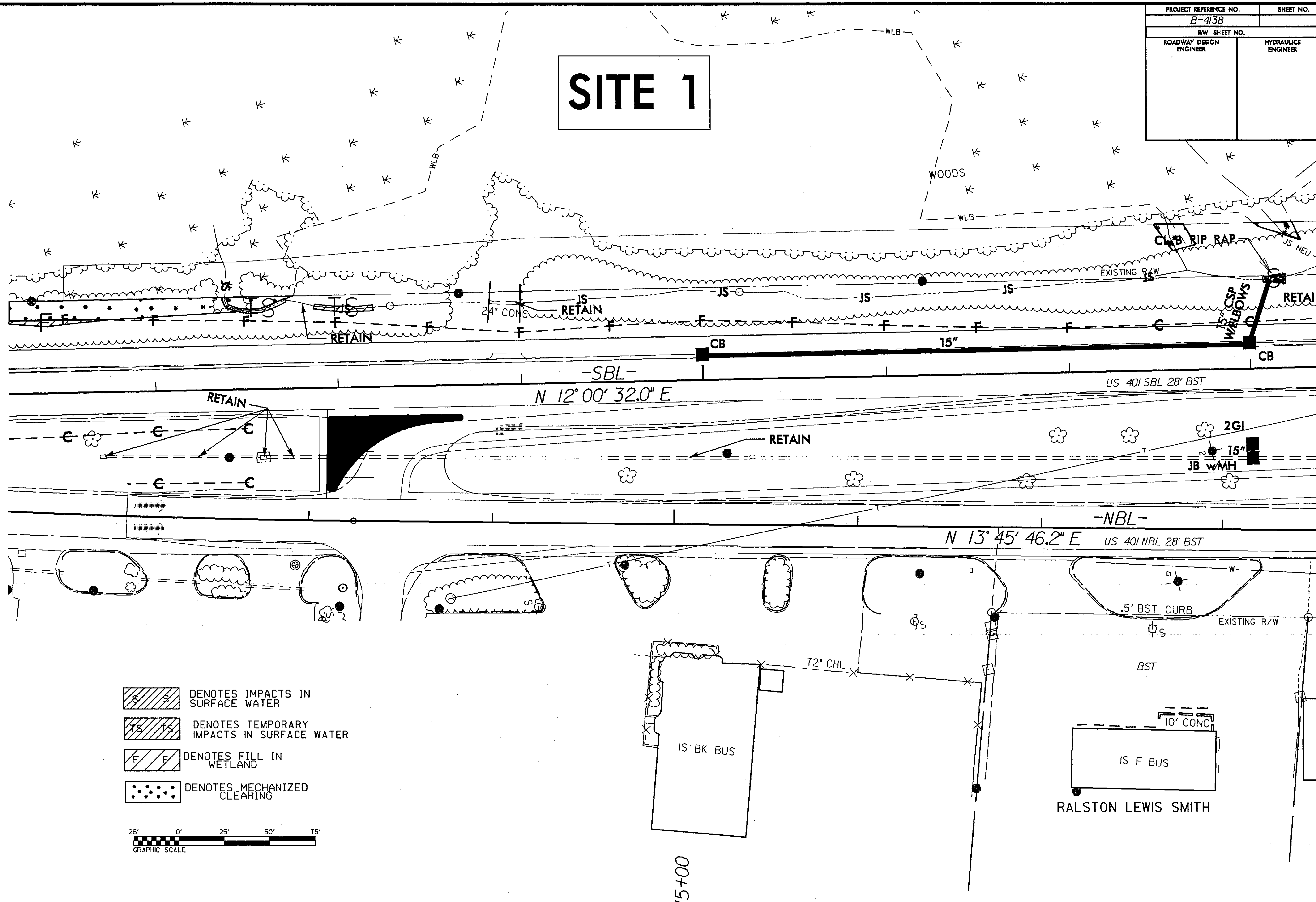
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4138	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SITE 1



S / S	DENOTES IMPACTS IN SURFACE WATER
TS / TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
F / F	DENOTES FILL IN WETLAND
(dots)	DENOTES MECHANIZED CLEARING

25' 0' 25' 50' 75'
GRAPHIC SCALE

Permit Drawing
Sheet 6 of 16

12-OCT-2009 16:46
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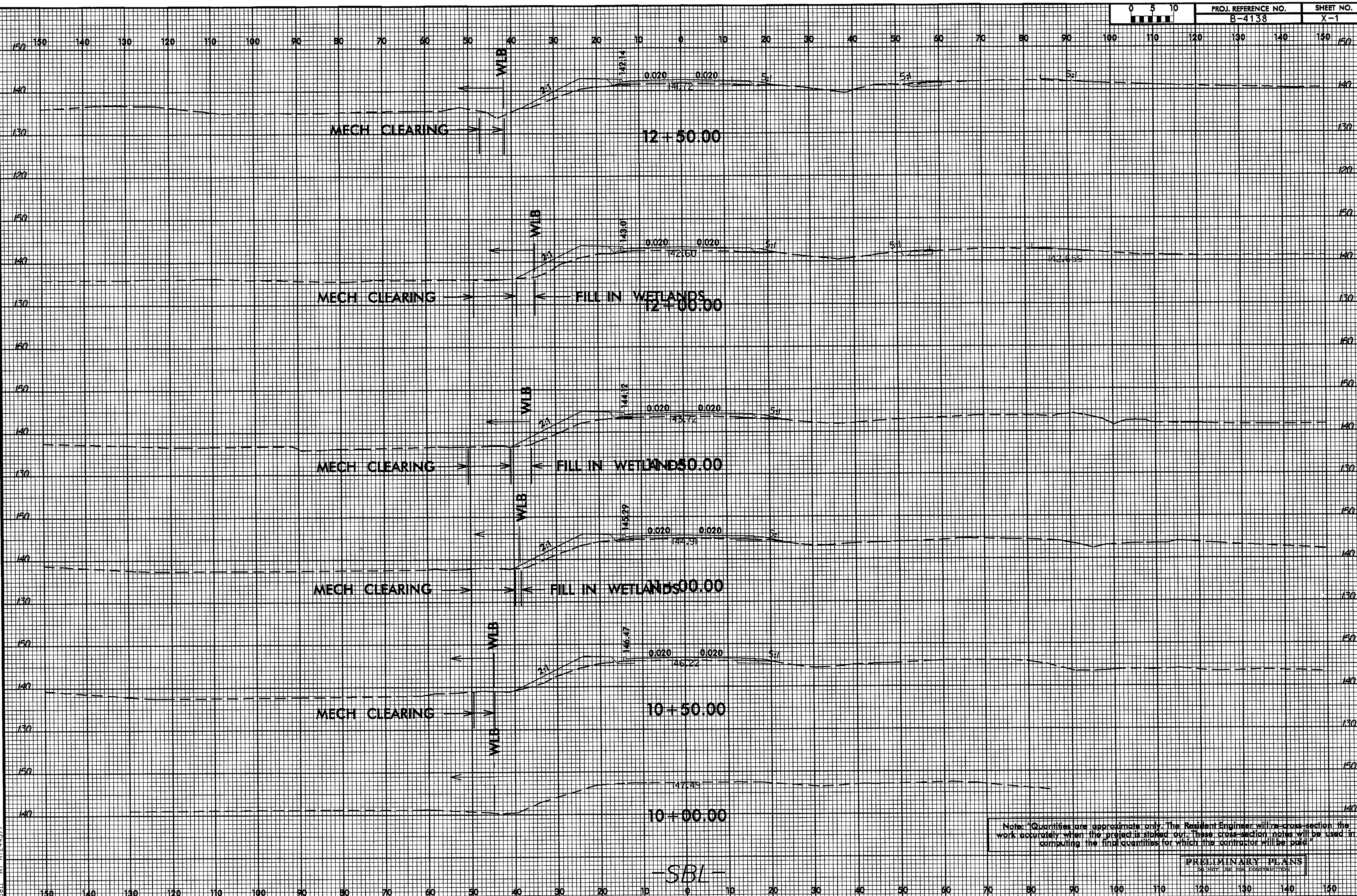
AT HY244577

PROJ. REFERENCE NO.	SHEET NO.
B-4138	X-1



Note: "Quantities are approximate only. The Resident Engineer will re-cross-section the work accurately when the project is staked out. These cross-section notes will be used in computing the final quantities for which the contractor will be paid."

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawin...

8/23/99

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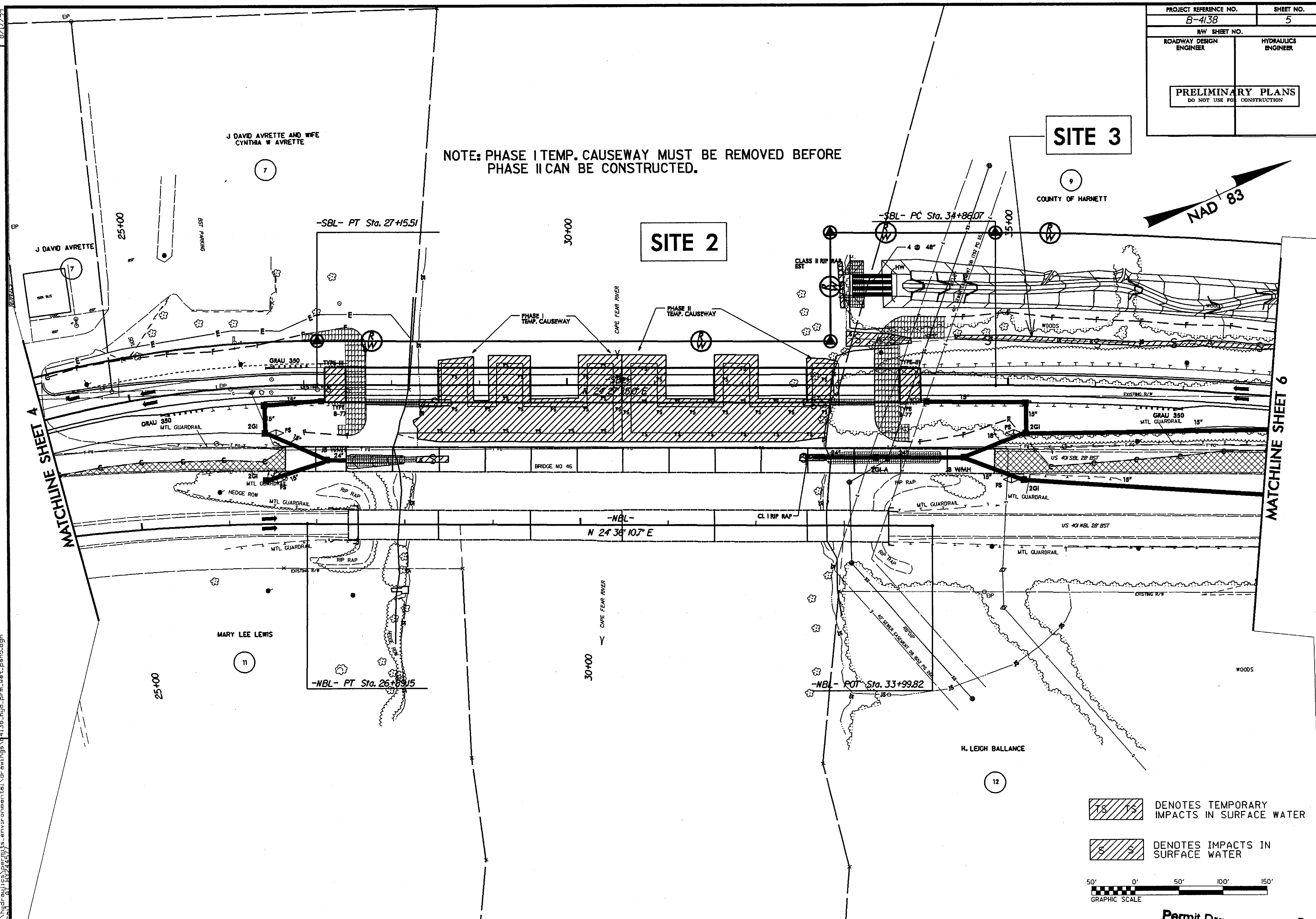
REVISIONS

ROW REVISION: 6/11/09 rea. Revised Easements to Parcel 7 and changing parcel 8 to parcel 7.



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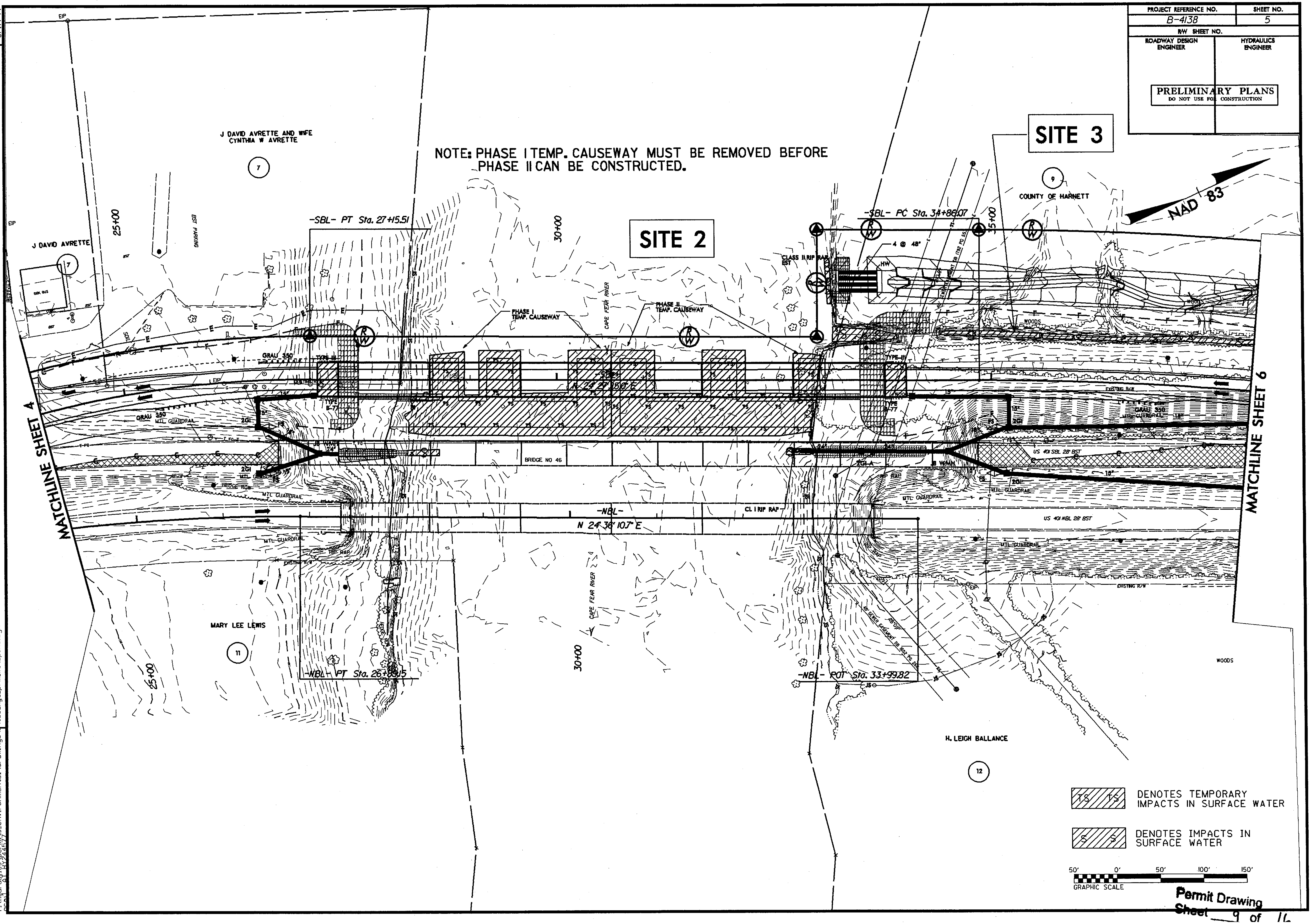
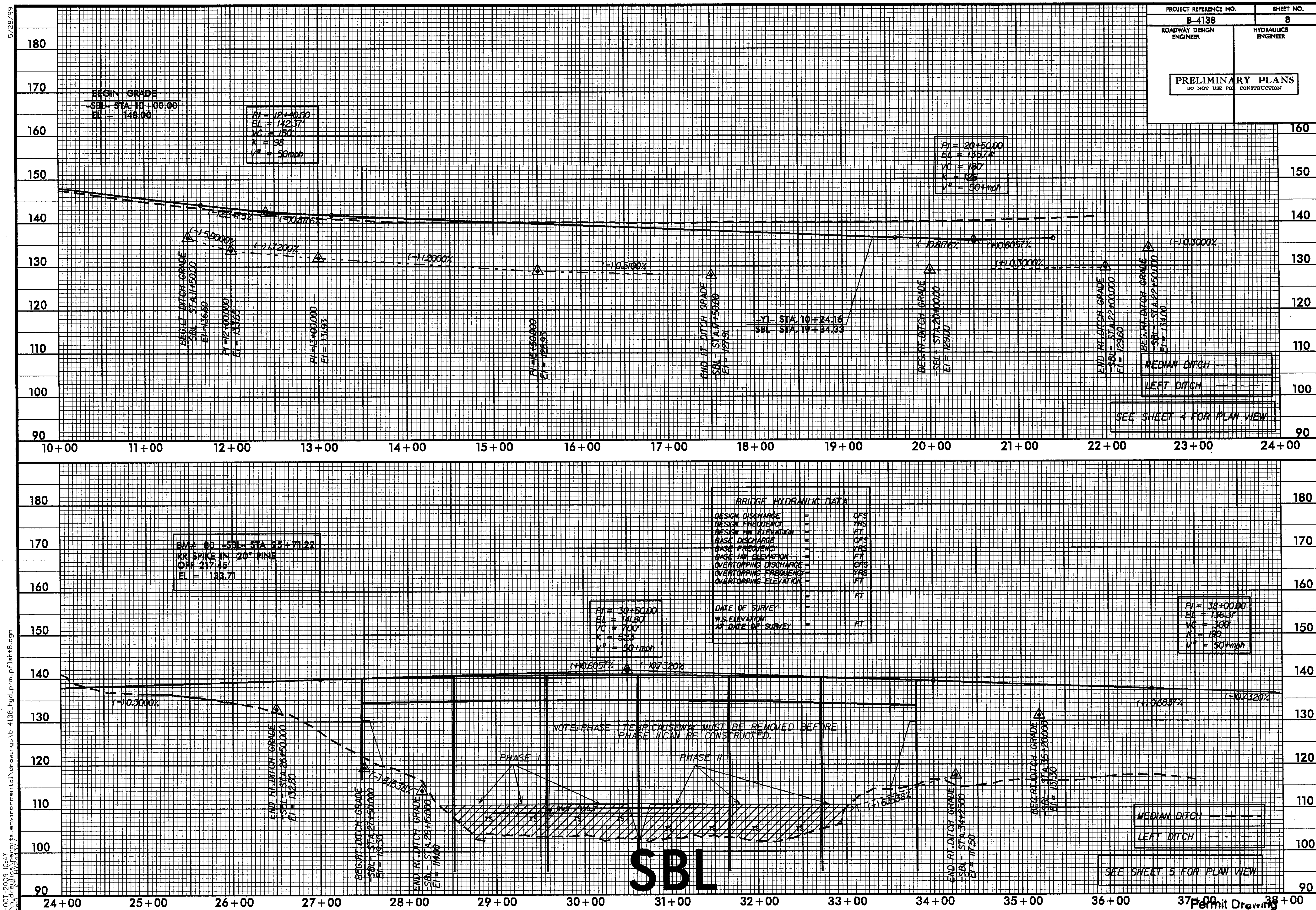
Permit Drawing
Sheet

REVISIONS
ROW REVISION: 6/11/09 rea, Revised Easements to Parcel 7 and changing parcel 8 to parcel 7.

8/17/99

24-SEP-2009 16:46



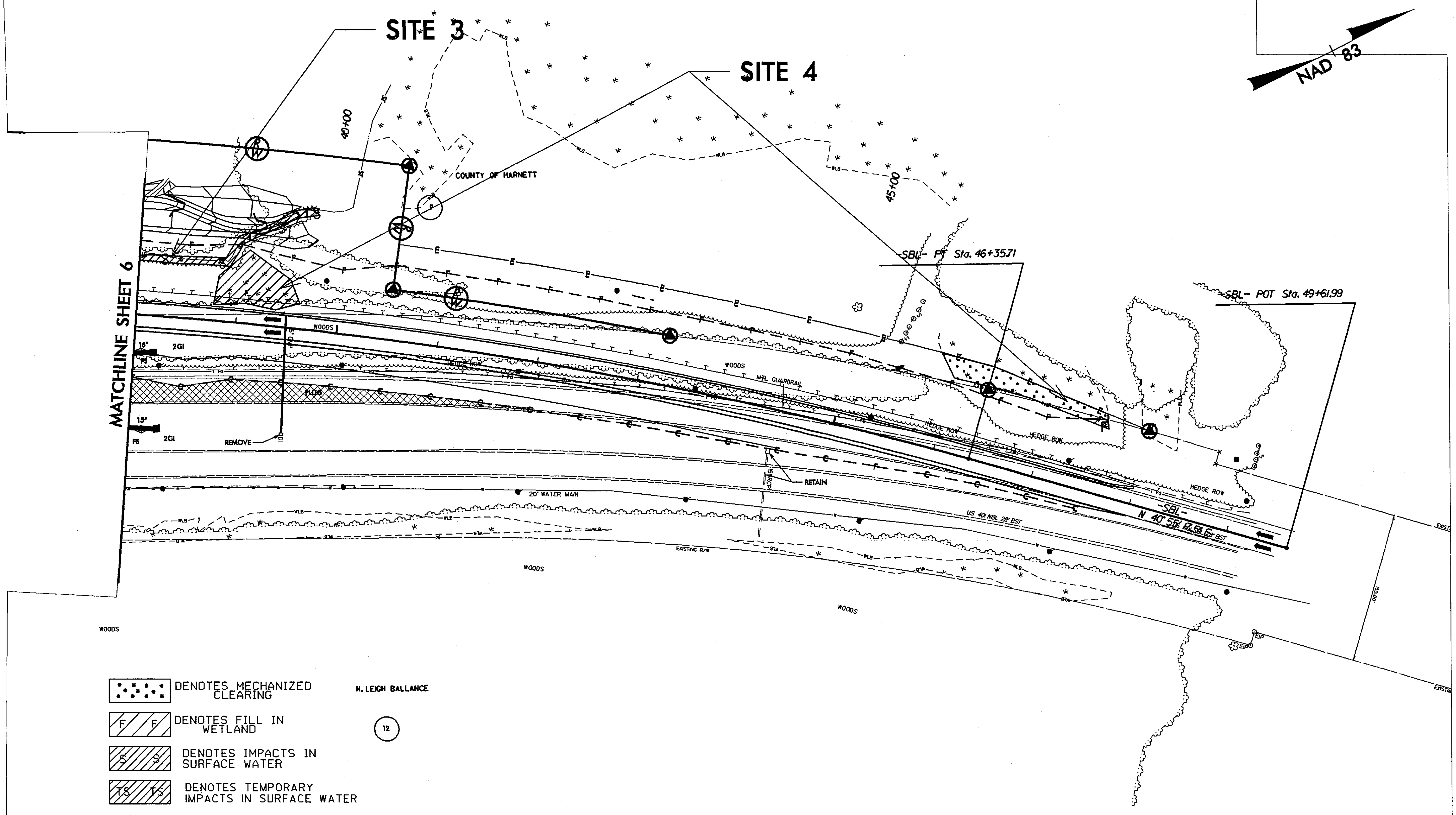


Permit Drawing
Sheet 10 of 16

PROJECT REFERENCE NO.	SHEET NO.
B-4138	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS



DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

H. LEIGH BALLANCE

12

50' 0' 50' 100' 150'
GRAPHIC SCALE

24-SEP-2009 16:44
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8/17/99

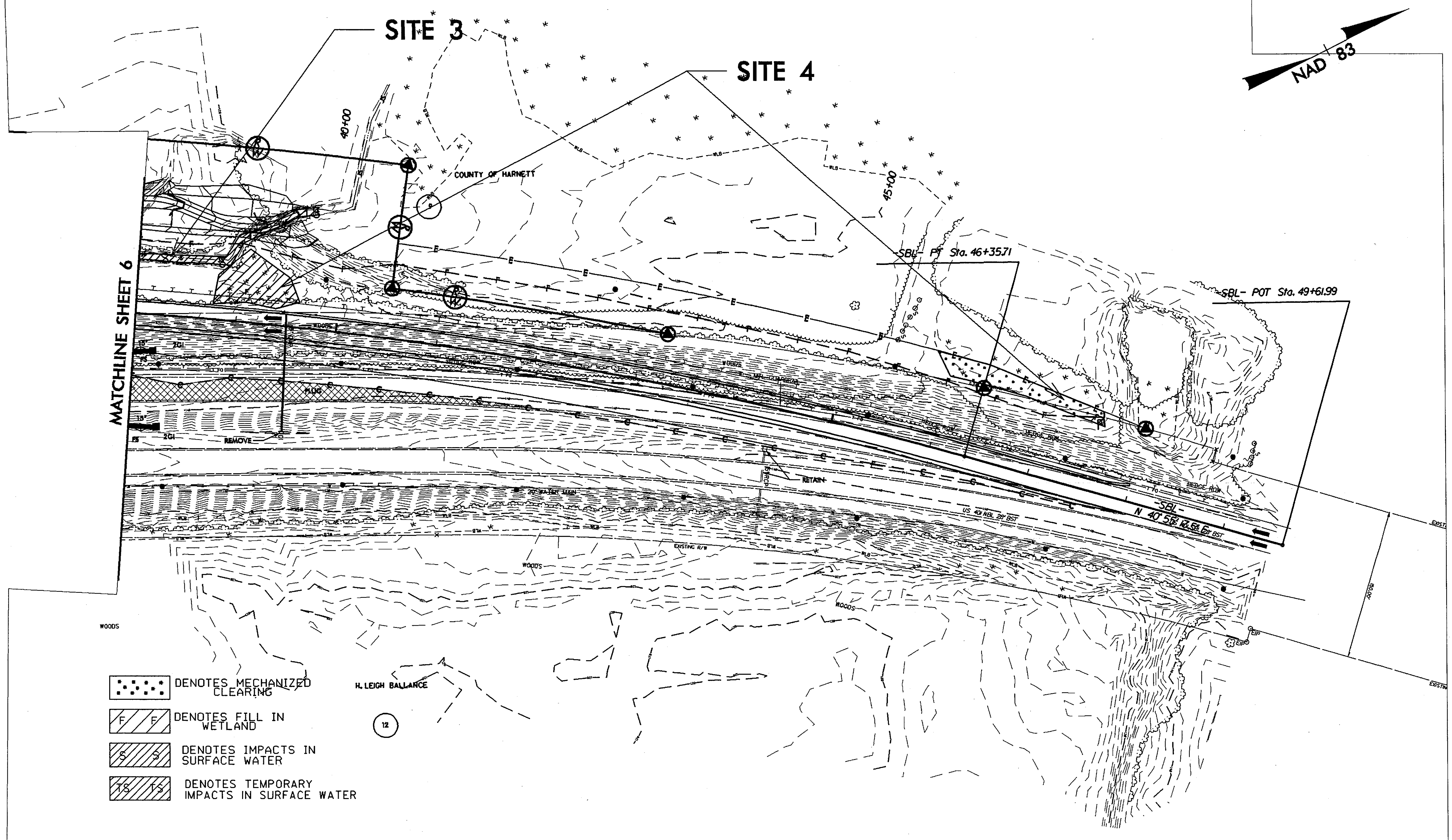
Permit Drawing
Sheet 11 of 16

PROJECT REFERENCE NO.	SHEET NO.
B-4138	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

8/17/99



DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 0' 50' 100' 150'
GRAPHIC SCALE

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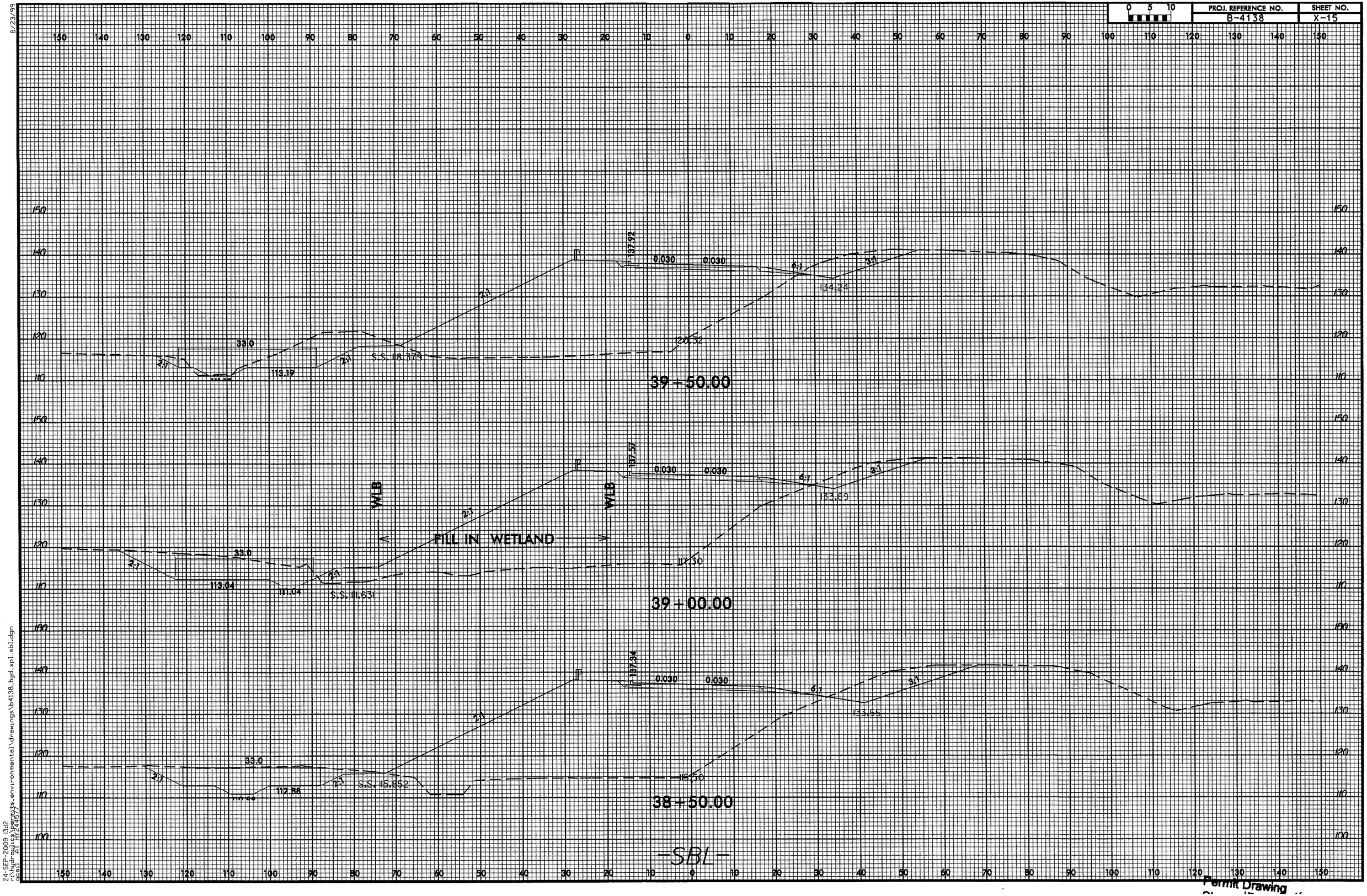
Permit Drawing
Sheet 12 of 16

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4138	X-15



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Permit Drawing

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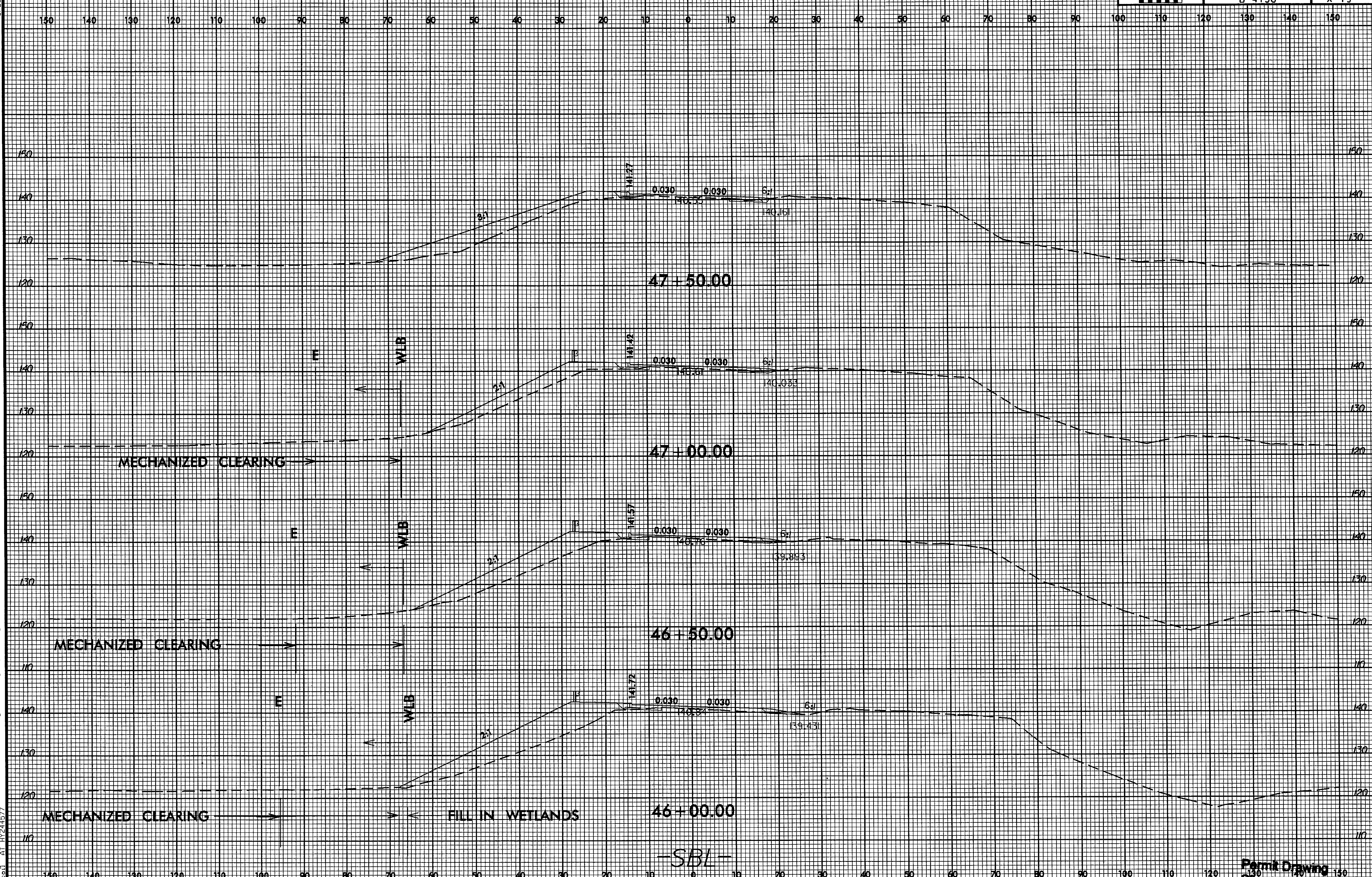
B-4138	X-19



Permit Drawing
Sheet 14 of 16

8/23/99
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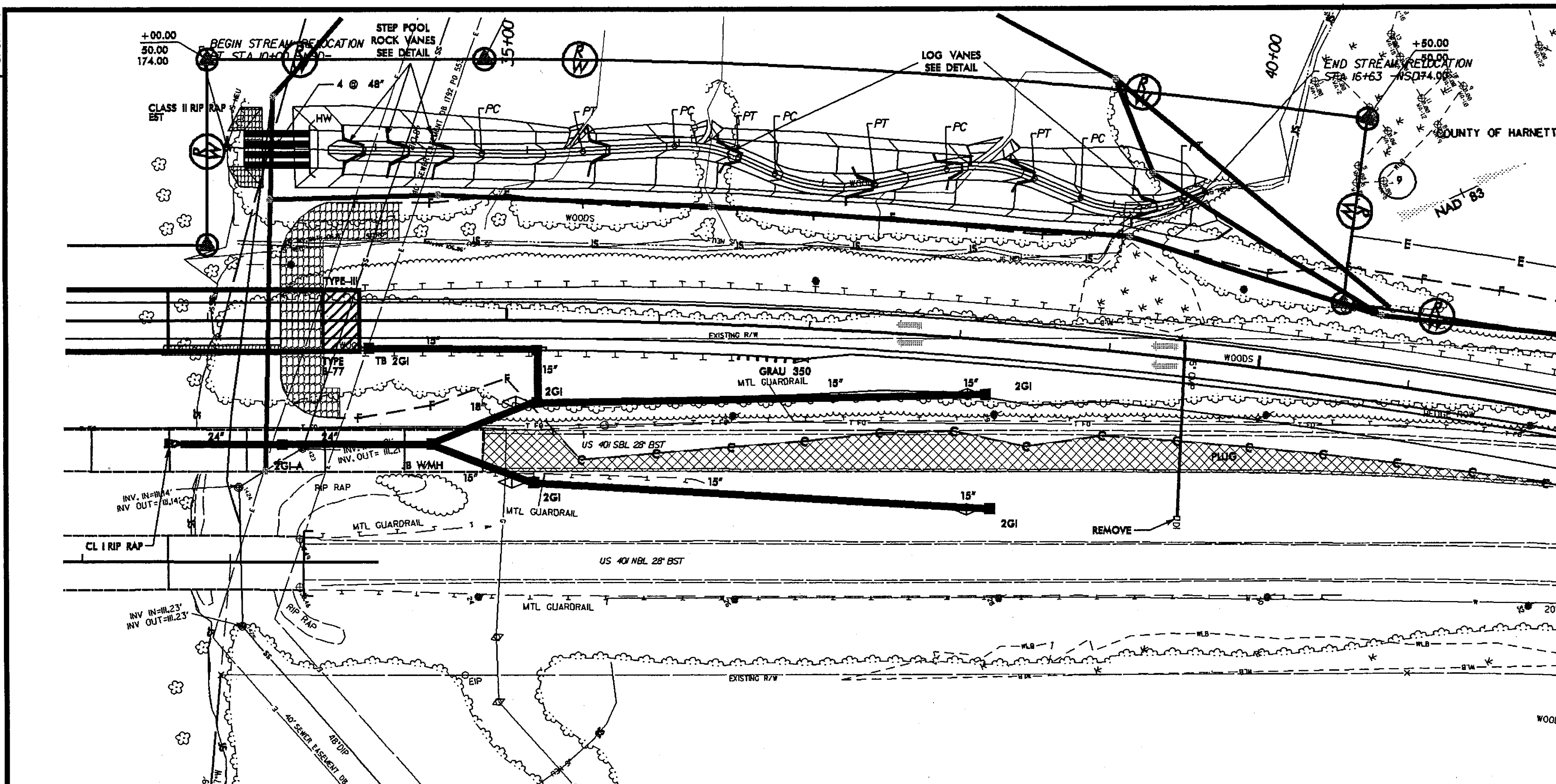
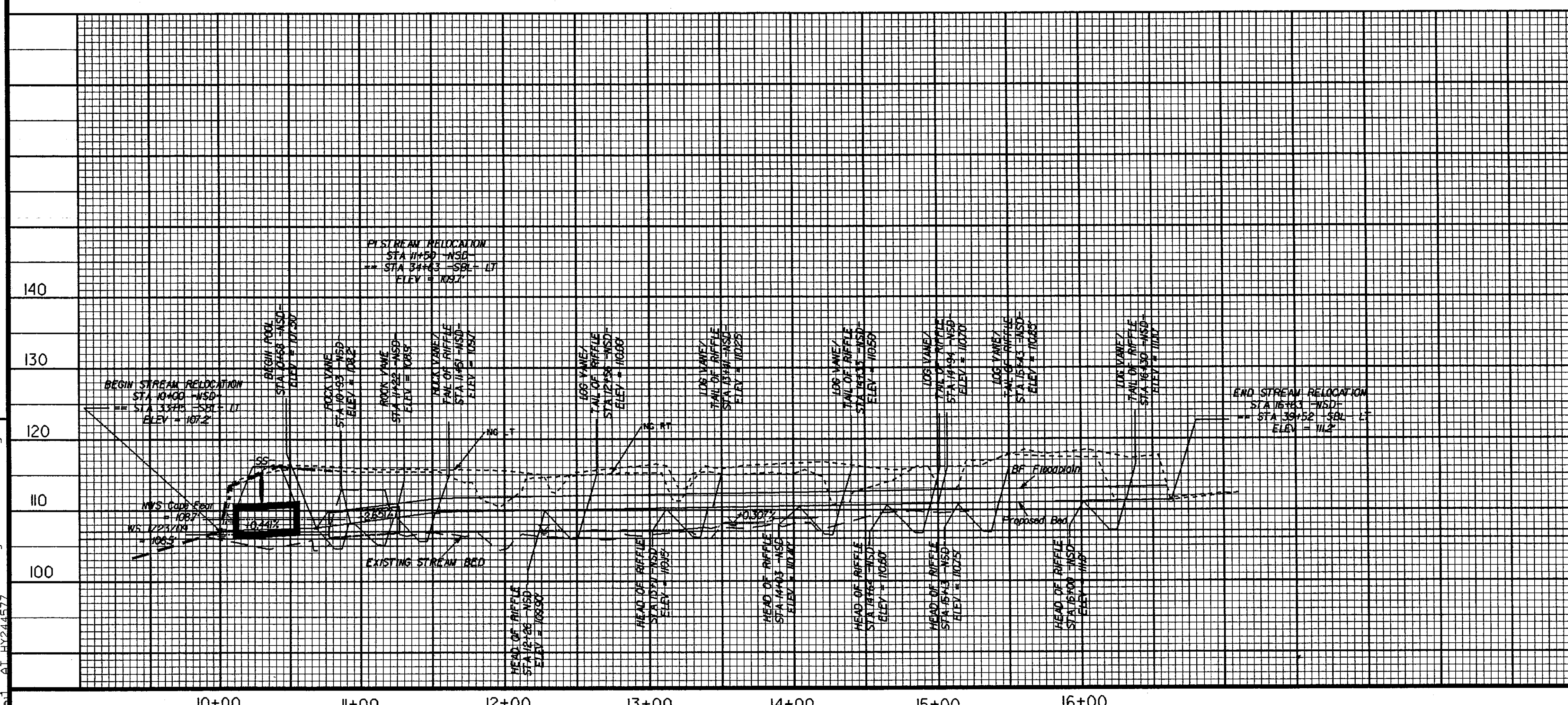
PROJECT REFERENCE NO.	SHEET NO.
B-4138	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



STREAM RELOCATION
STA 10+00 -NSD- (STA 33+15 -SBL- LT) TO STA 16+63 -NSD- (STA 39+52 -SBL- LT)



CURVE DATA

PT Sta 10+00	
N 25° 44' 22.5" E	
PC Sta 11+70.41	PI Sta 12+03.67 Δ = 4° 28' 51.5" (LT) D = 6° 44' 26.4" L = 66.48' T = 33.26' R = 850.00'
PT Sta 12+36.89	
N 21° 15' 31.0" E	
PC Sta 12+97.00	PI Sta 13+18.90 Δ = 26° 30' 03.6" (RT) D = 61° 36' 30.1" L = 43.02' T = 21.90' R = 93.00'
PT Sta 13+40.02	
N 47° 45' 34.6" E	
PC Sta 13+67.17	PI Sta 14+02.09 Δ = 34° 38' 10.8" (LT) D = 51° 09' 25.0" L = 67.71' T = 34.92' R = 112.00'
PT Sta 14+34.88	
N 13° 07' 23.8" E	
PC Sta 14+83.52	PI Sta 15+14.60 Δ = 34° 51' 25.0" (RT) D = 57° 52' 28.3" L = 60.23' T = 31.08' R = 99.00'
PT Sta 15+43.75	
N 47° 58' 48.8" E	
PC Sta 15+76.94	PI Sta 16+13.24 Δ = 44° 22' 34.3" (LT) D = 64° 22' 38.2" L = 68.93' T = 36.30' R = 89.00'
PT Sta 16+45.87	
N 3° 36' 14.6" E	

REVISIONS

8/17/99

13-OCT-2009 11:17
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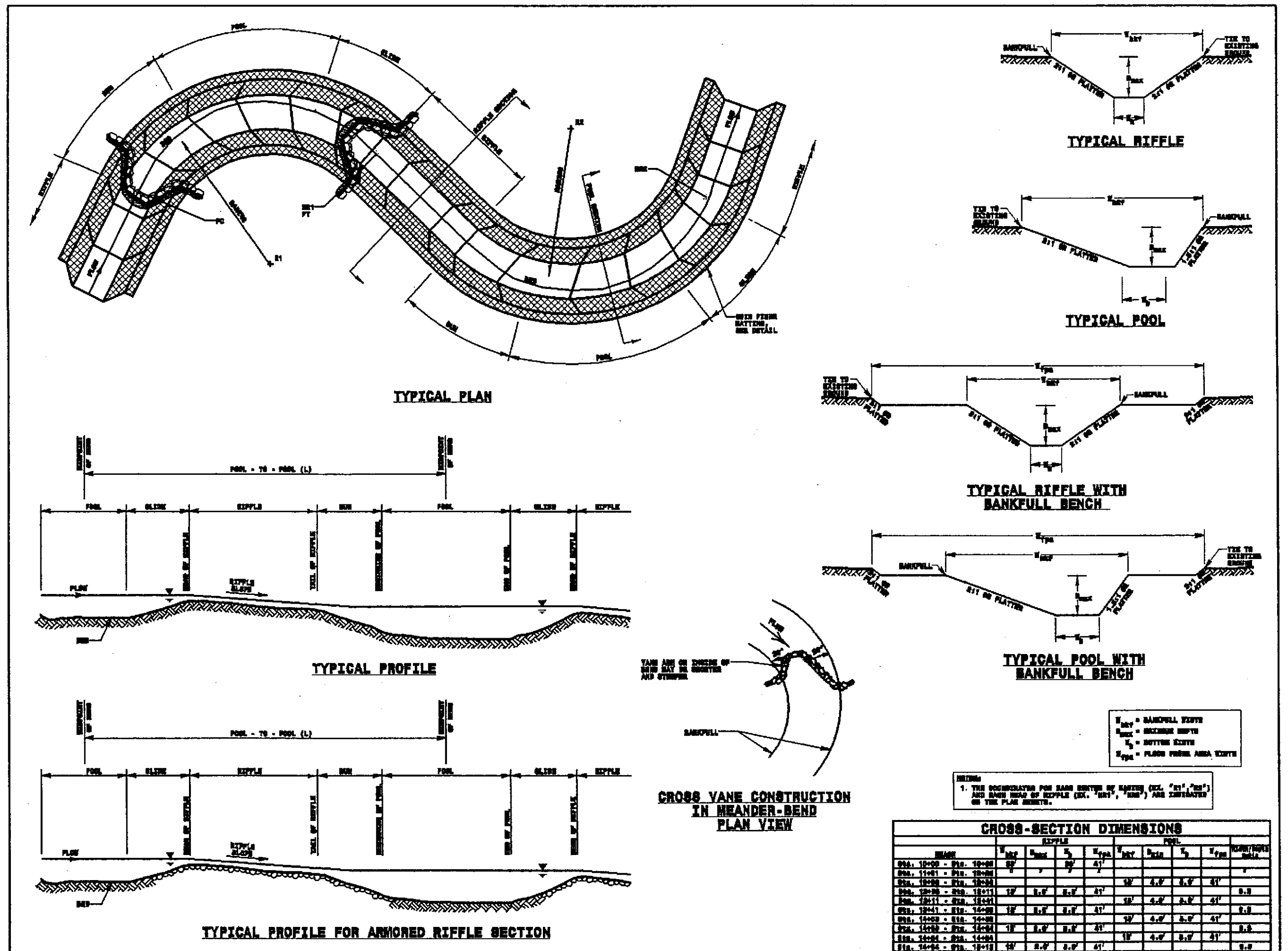
Permit Drawing
Sheet 15 of 16

PROJECT REFERENCE NO.	SHEET NO.
B-4138	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

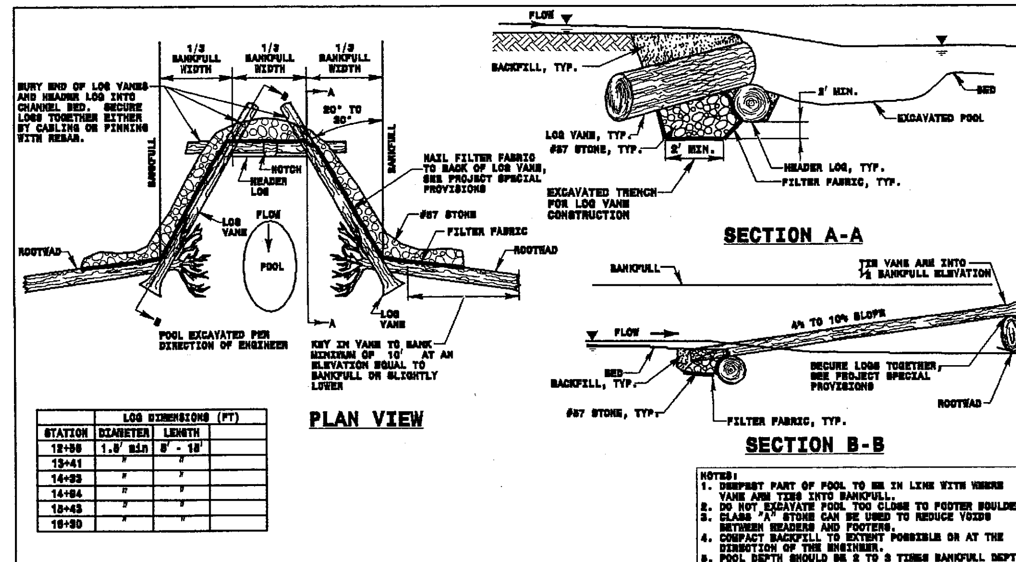
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



CHANNEL TYPICAL DETAIL

NOT TO SCALE



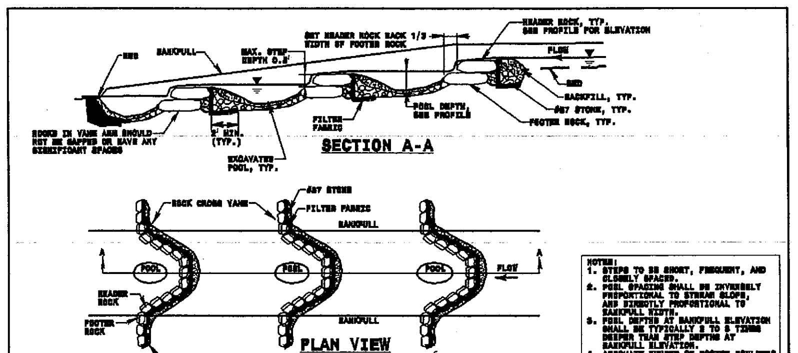
LOG CROSS VANE DETAIL

NOT TO SCALE

MORPHOLOGICAL MEASUREMENTS TABLE

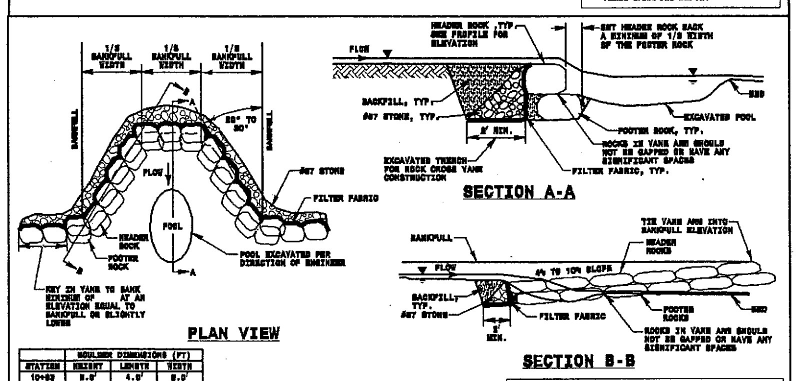
UT to Cape Fear River — Harnett County — B-4138
-UT to Cape Fear River- Sta. 1n+nn.nn to Sta. nn+nn.nn

Variables	Existing Channel	Proposed Reach	USGS Station	Reference Reach
1.Stream type	Trib to Cape Fear - G6	Trib to Cape Fear - C6		Muddy Creek - E5/C5
2.Drainage area	0.7 sq mi (450 ac)	0.7 sq mi (450 ac)		0.85 sq mi (545 ac)
3.Bankfull width (ft)	Mean: 9 Range: 9-10	Mean: 13 Range:		Mean: 11.2 Range:
4.Bankfull mean depth (ft)	Mean: 2.2 Range: 2.5-3.2	Mean: 1.4 Range:		Mean: 1.0 Range:
5.Width/depth ratio	Mean: 3.5 Range: 3.2-4.0	Mean: 9.3 Range:		Mean: 10.8 Range:
6.Bankfull cross-sectional area (sq ft)	Mean: 19.3 Range: 17.9-20.3	Mean: 18 Range:		Mean: 11.5 Range:
7.Bankfull mean velocity (ft/s)	Mean: 4.1 Range: 2.8 - 5.9	Mean: 3.4 Range: 3.2 - 3.5		Mean: 1.0 Range:
8.Bankfull discharge (cfs)	Mean: 69 Range:	Mean: 69 Range:		Mean: 11.0 Range:
9.Bankfull max depth (ft)	Mean: 2.8 Range: 2.5-3.2	Mean: 2.0 Range:		Mean: 1.7 Range:
10.Width of floodprone area (ft)	Mean: 17.7 Range: 12-21	Mean: 41 Range:		Mean: 245 Range:
11.Entrenchment ratio	Mean: 8.0 Range:	Mean: 29.3 Range:		Mean: 22.0 Range:
12.Meander length (ft)	Mean: N/A Range:	Mean: 175 Range: 155 - 195		Mean: 76 Range: 55 - 97
13.Ratio of meander length to bankfull width	Mean: N/A Range:	Mean: 13.5 Range: 11.9 - 15		Mean: 6.8 Range: 4.9 - 8.7
14.Radius of curvature (ft)	Mean: N/A Range:	Mean: 100 Range:		Mean: 16.2 Range: 10.4 - 21.9
15.Ratio of radius of curvature to bankfull width	Mean: N/A Range:	Mean: 7.7 Range:		Mean: 1.4 Range: 0.9 - 2.0
16.Belt width (ft)	Mean: N/A Range:	Mean: 33 Range:		Mean: 39.5 Range:
17.Meander width ratio	Mean: N/A Range:	Mean: 2.5 Range:		Mean: 3.5 Range: 2.7 - 4.4
18.Sinuosity (stream length/valley length)	Mean: 1.00 Range:	Mean: 1.02 Range:		Mean: 1.1 Range:
19.Valley slope (%)	Mean: 0.003 Range:	Mean: 0.003 Range:		Mean: 0.00417 Range:
20.Average slope (%)	Mean: 0.005 Range: 0.003-0.012	Mean: 0.003 Range:		Mean: 0.002 Range:
21.Pool slope (%)	Mean: .0005 Range:	Mean: 0.003 Range:		Mean: 0.0019 Range:
22.Ratio of pool slope to average slope	Mean: 0.1 Range:	Mean: 1.0 Range:		Mean: 1.0 Range:
23.Maximum pool depth (ft)	Mean: 2.8 Range:	Mean: 4.0 Range:		Mean: 1.8 Range:
24.Ratio of pool depth to average bankfull depth	Mean: 1.0 Range:	Mean: 2.9 Range:		Mean: 1.7 Range:
25.Pool width (ft)	Mean: 7 Range: 6-8	Mean: 15 Range:		Mean: 17.2 Range:
26.Ratio of pool width to bankfull width	Mean: 0.8 Range:	Mean: 1.2 Range:		Mean: 1.5 Range:
27.Pool to pool spacing (ft)	Mean: 73 Range: 66-78	Mean: 95 Range: 90 - 100		Mean: 37 Range: 18 - 68
28.Ratio of pool to pool spacing to bankfull width	Mean: 7.2 Range:	Mean: 7.3 Range: 6.9 - 7.7		Mean: 3.3 Range: 1.6 - 6.1
29.Ratio of lowest bank height to bankfull height (or max bankfull depth)	Mean: 1.4 Range:	Mean: 1.0 Range:		Mean: 3.7 Range: 1.8 - 6.8



STEP POOL DETAIL

NOT TO SCALE



ROCK CROSS VANE DETAIL
FOR STEP POOLS
STA 10+65-STA 11+51 -NSD-

NOT TO SCALE

REVISIONS

8/17/99

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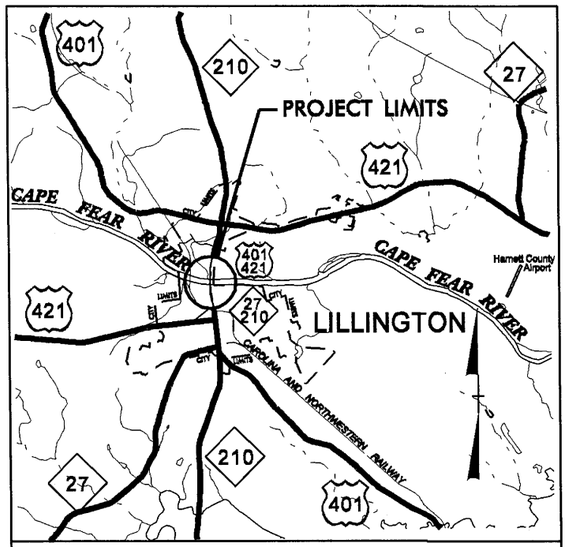
09/08/99

TIP PROJECT: B-4138

CONTRACT: C202335

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

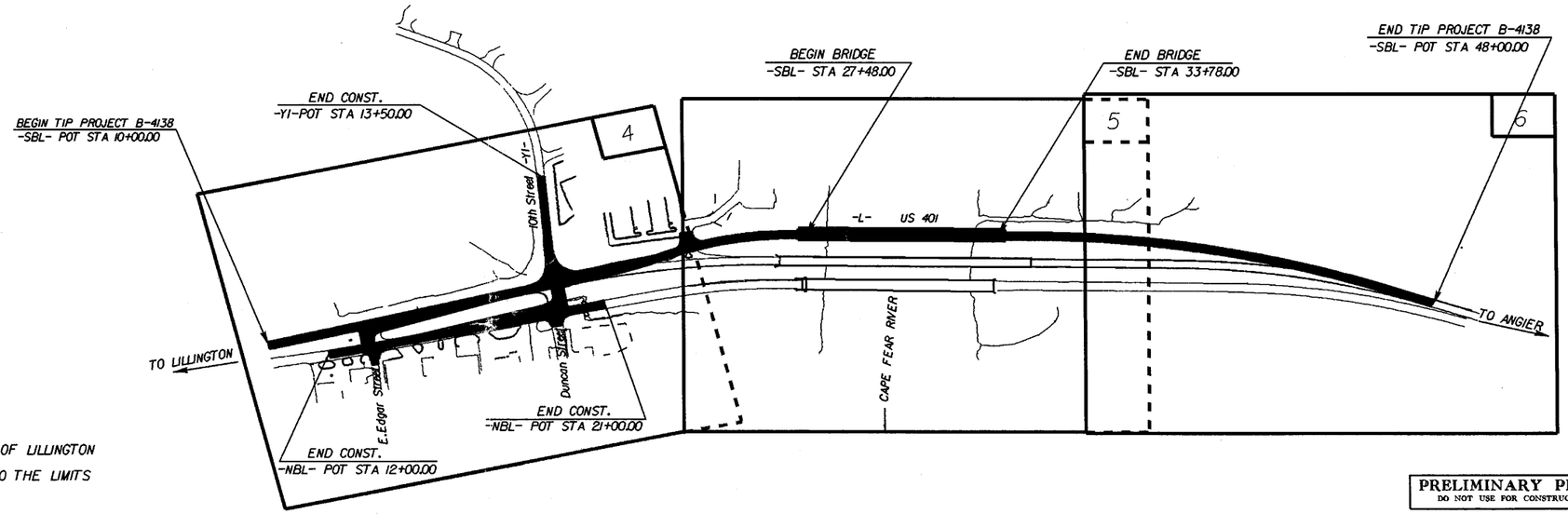
HARNETT COUNTY

LOCATION: BRIDGE 46 OVER CAPE FEAR RIVER ON US 401

TYPE OF WORK: GRADING, DRAINAGE, PAVING, PAVEMENT MARKINGS, STRUCTURES, SIGNING, AND WIDENING

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4138	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33490.1.1	BRSTP-401(146)	PE	
33490.2.1	BRSTP-0401(146)	R/W /UTIL.	

NAD 83



Notes:

THIS PROJECT IS WITHIN THE MUNCIPAL BOUNDARIES OF LILLINGTON

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

SEE SHEET 7 FOR DETOUR

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 2009 = 28500
ADT 2035 = 52600
DHV = 10 %
D = 55 %
T = 8 % *
V = 50 MPH

* TTST 4 DUAL 4

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4138 = 0.601 MILES

LENGTH STRUCTURE TIP PROJECT B-4138 = 0.119 MILES

TOTAL LENGTH OF TIP PROJECT B-4138 = 0.720 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

JASON MOORE, P. E.
PROJECT ENGINEER

BRYAN KEY, P. E.
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

13-OCT-2009 10:09
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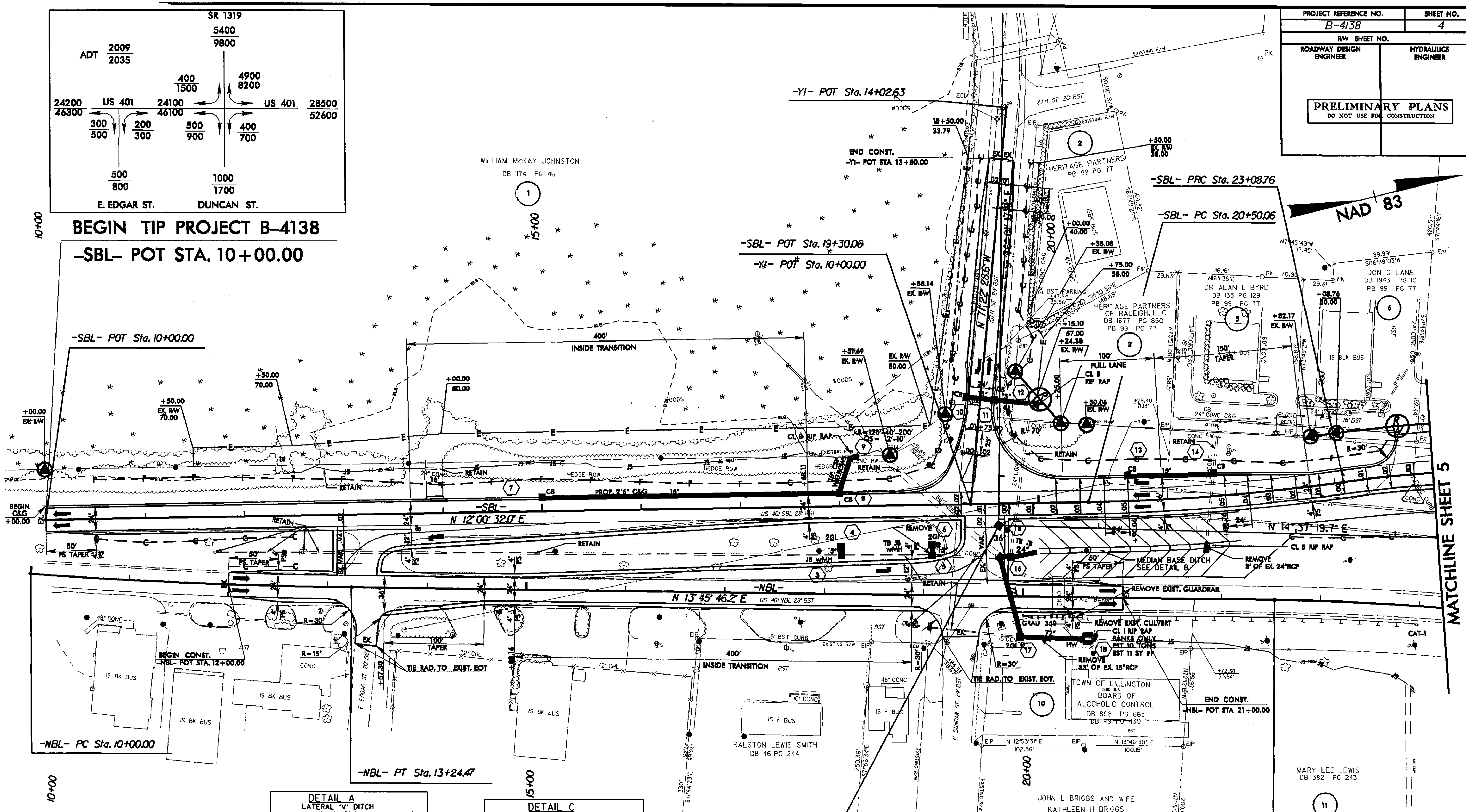
gadli AT H244577

PROJECT REFERENCE NO.	SHEET NO.
B-4138	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



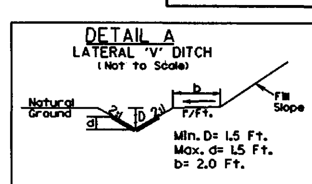
SR 1319
ADT 2009 2035
US 401
E. EDGAR ST.
DUNCAN ST.
BEGIN TIP PROJECT B-4138
-SBL- POT STA. 10+00.00
-SBL- POT Sta. 10+00.00
WILLIAM McKAY JOHNSTON
DB 1174 PG 46
-Y1- POT Sta. 14+02.63
END CONST.
-Y1- POT STA 13+80.00
HERITAGE PARTNERS
PB 99 PG 77
-SBL- PRC Sta. 23+08.76
-SBL- PC Sta. 20+50.06
NAD 83
-SBL- POT Sta. 19+30.06
-Y1- POT Sta. 10+00.00
HERITAGE PARTNERS OF RALEIGH, LLC
DB 1677 PG 850
PB 99 PG 77
DR ALAN L BYRD
DB 1331 PG 129
PB 99 PG 77
DON G LANE
DB 1943 PG 10
PB 99 PG 77
400' INSIDE TRANSITION
N 12°00'32.0" E
N 13°45'46.2" E
N 14°37'19.7" E
MATCHLINE SHEET 5
BEGIN CONST.
-NBL- POT STA. 12+00.00
-NBL- PC Sta. 10+00.00
-NBL- PT Sta. 13+24.47
RALSTON LEWIS SMITH
DB 461 PG 244
TOWN OF LILLINGTON
BOARD OF ALCOHOLIC CONTROL
DB 808 PG 663
END CONST.
-NBL- POT STA 21+00.00
JOHN L BRIGGS AND WIFE
KATHLEEN H BRIGGS
DB 1245 PG 247-248
PB 98 PG 10
LIONEL R. McDONALD AND EDWARD E. BREEDEN JR.
DB 910 PG 91
MARY LEE LEWIS
DB 382 PG 243
-NBL- PC Sta. 22+54.00

ROW REVISION 6/02/09 req. Revise Easements on Parcel No.6
Design Revision 6/02/09 req. Adding a driveway curb cut and driveway pipe in the proposed ditch adjacent to Parcel 1.

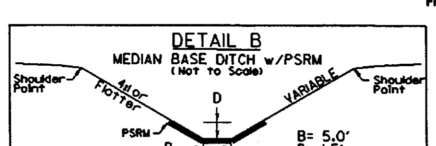
REVISIONS

-SBL-	
PI Sta 21+79.57	PI Sta 25+14.11
Δ = 6°58'31.3" (LT)	Δ = 19°25'14.3" (RT)
D = 2°41'46.6"	D = 4°46'28.7"
L = 258.70'	L = 406.74'
T = 129.51'	T = 205.34'
R = 2,125.00'	R = 1,200.00'
SE = .05	SE = .07
V = 50mph	V = 50mph

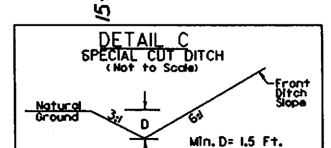
-NBL-	
PI Sta 11+62.28	PI Sta 24+72.23
Δ = 3°24'49.0" (LT)	Δ = 10°50'24.5" (RT)
D = 1°03'07.5"	D = 2°29'28.0"
L = 324.47'	L = 435.15'
T = 162.28'	T = 218.23'
R = 5,446.00'	R = 2,300.00'
SE = EXIST.	SE = EXIST.



FROM STA. 11+50-SBL- LT TO STA. 17+50-SBL- LT



FROM STA. 20+00 TO STA. 22+00 -SBL- MEDIAN



FROM STA. 22+50 TO STA. 26+50 -SBL- RT
FROM STA. 24+30 TO STA. 26+43 -NBL- LT
FROM STA. 35+20 TO STA. 45+00 -SBL- RT
FROM STA. 35+00 TO STA. 39+30 -NBL- LT

-BL- 1 POT 5+00.00 =
-BY- 8 POT 15+50.00

-SBL- POT Sta. 19+59.40
Offset 22.25' (RT)

SEE SHEET 7 FOR -DET-
SEE SHEET 8 FOR -SBL- PROFILE
SEE SHEET 11 FOR -Y1- PROFILE

PROP. MONOLITHIC ISLAND
SEE SHEET 2-D FOR DIRECTIONAL CROSSOVER DETAIL

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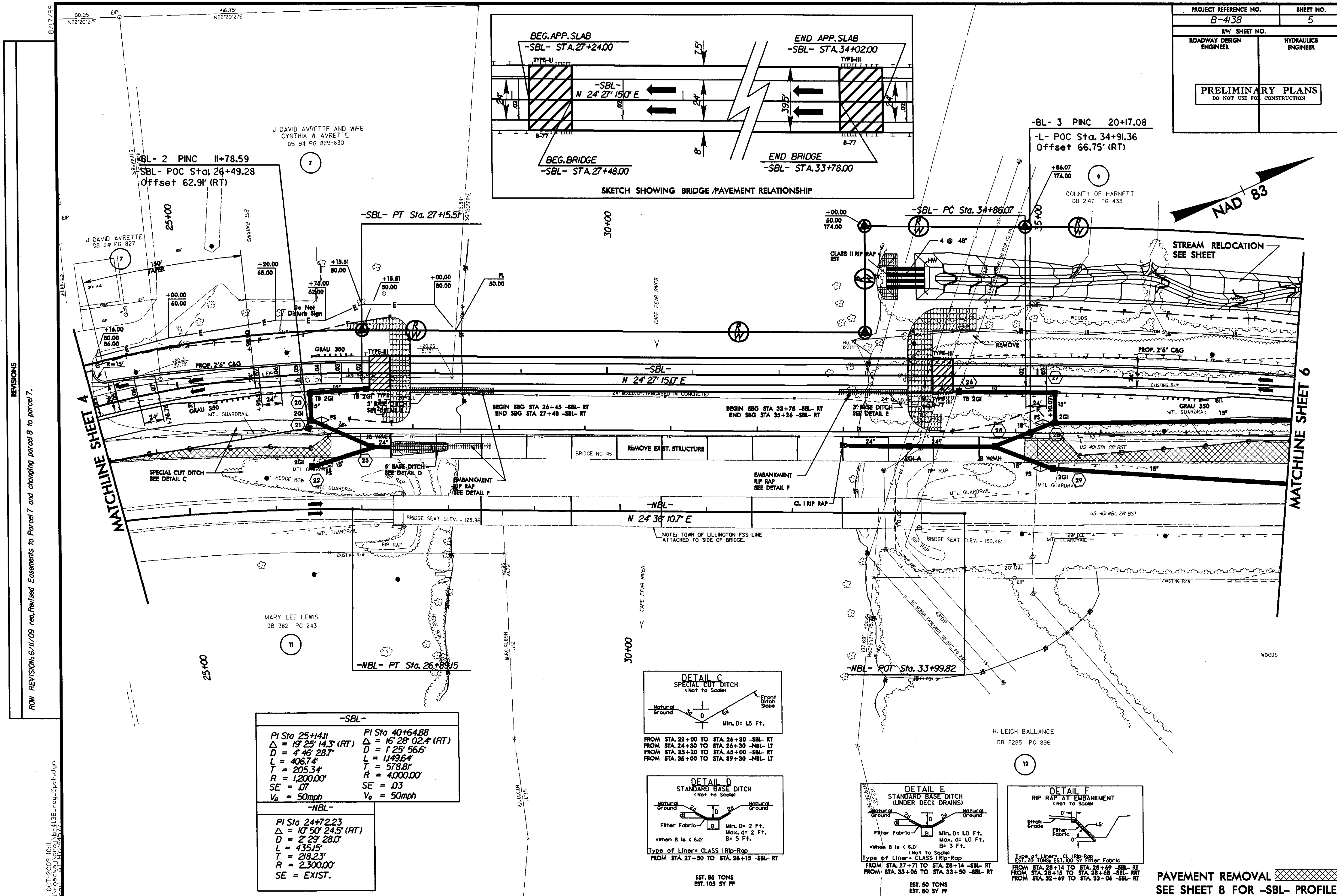
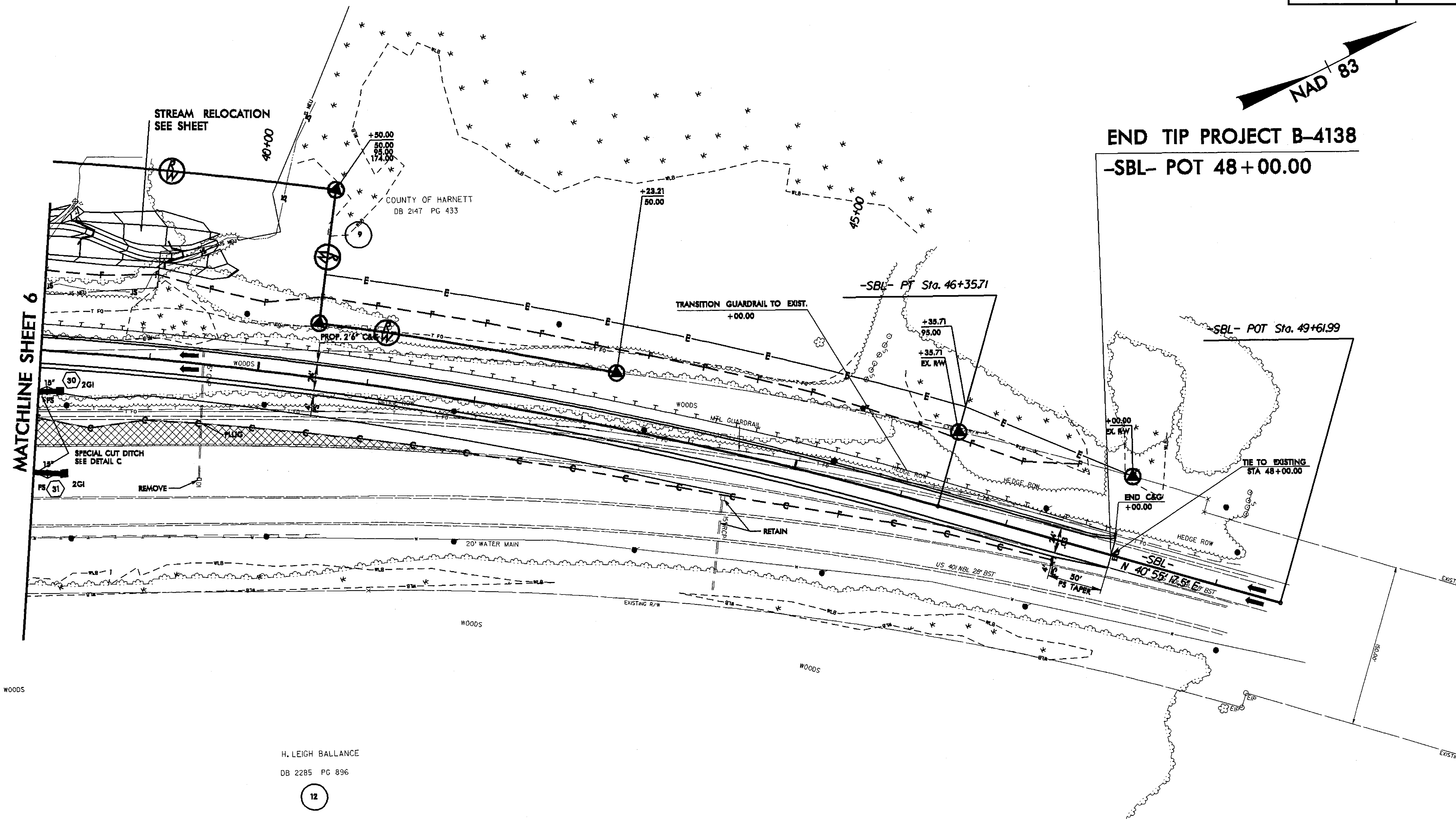


PROJECT REFERENCE NO. B-4138
SHEET NO. 5
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SKETCH SHOWING BRIDGE/PAVEMENT RELATIONSHIP
BEG. APP. SLAB -SBL- STA. 27+24.00
END APP. SLAB -SBL- STA. 34+02.00
BEG. BRIDGE -SBL- STA. 27+48.00
END BRIDGE -SBL- STA. 33+78.00
-SBL- N 24° 27' 15.0" E
-BL- 2 PINC 11+78.59
-SBL- POC Sta. 26+49.28
Offset 62.91' (RT)
-BL- 3 PINC 20+17.08
-L- POC Sta. 34+91.36
Offset 66.75' (RT)
-SBL- PT Sta. 27+15.51
-SBL- PC Sta. 34+86.07
-NBL- PT Sta. 26+89.15
-NBL- POT Sta. 33+99.82
-NBL- N 24° 38' 10.7" E
NAD 83
MATCHLINE SHEET 4
MATCHLINE SHEET 6
STREAM RELOCATION SEE SHEET
BRIDGE NO 46
REMOVE EXIST. STRUCTURE
CAPE FEAR RIVER
NOTE: TOWN OF LILLINGTON FSS LINE ATTACHED TO SIDE OF BRIDGE.
J DAVID AVRETTE AND WIFE CYNTHIA W AVRETTE DB 941 PG 829-830
J DAVID AVRETTE DB 941 PG 827
COUNTY OF HARNETT DB 2147 PG 433
MARY LEE LEWIS DB 382 PG 243
H. LEIGH BALLANCE DB 2285 PG 896
-SBL-
PI Sta 25+14.11
Δ = 19° 25' 14.3" (RT)
D = 4° 46' 28.7"
L = 406.74'
T = 205.34'
R = 1,200.00'
SE = .07
V = 50mph
PI Sta 40+64.88
Δ = 16° 28' 02.4" (RT)
D = 1° 25' 56.6"
L = 1,149.64'
T = 578.81'
R = 4,000.00'
SE = .03
V = 50mph
-NBL-
PI Sta 24+72.23
Δ = 10° 50' 24.5" (RT)
D = 2° 29' 28.0"
L = 435.15'
T = 218.23'
R = 2,300.00'
SE = EXIST.
DETAIL C SPECIAL CUT DITCH (Not to Scale)
FROM STA. 22+00 TO STA. 26+30 -SBL- RT
FROM STA. 24+30 TO STA. 26+30 -NBL- LT
FROM STA. 35+20 TO STA. 45+00 -SBL- RT
FROM STA. 35+00 TO STA. 39+30 -NBL- LT
DETAIL D STANDARD BASE DITCH (Not to Scale)
Type of Liner= CLASS I Rip-Rap
FROM STA. 27+50 TO STA. 28+15 -SBL- RT
EST. 85 TONS
EST. 105 SY FF
DETAIL E STANDARD BASE DITCH (UNDER DECK DRAINS)
FROM STA. 27+71 TO STA. 28+14 -SBL- RT
FROM STA. 33+06 TO STA. 33+50 -SBL- RT
EST. 50 TONS
EST. 80 SY FF
DETAIL F RIP RAP AT EMBANKMENT (Not to Scale)
FROM STA. 28+14 TO STA. 28+69 -SBL- RT
FROM STA. 28+15 TO STA. 28+68 -SBL- RRT
FROM STA. 32+69 TO STA. 33+06 -SBL- RT
PAVEMENT REMOVAL
SEE SHEET 8 FOR -SBL- PROFILE
REVISIONS
ROW REVISION: 6/11/09 rea, Revised Easements to Parcel 7 and changing parcel 8 to parcel 7.
13-OCT-2009 10:11

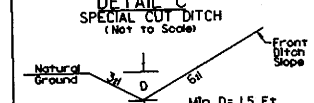
PROJECT REFERENCE NO.	SHEET NO.
B-4138	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-SBL-
PI Sta 40+64.88
Δ = 16° 28' 02.4" (RT)
D = 1° 25' 56.6"
L = 1,149.64'
T = 578.81'
R = 4,000.00'
SE = .03
V_o = 50mph

DETAIL C
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 22+00 TO STA. 26+30 -SBL- RT
FROM STA. 24+30 TO STA. 26+30 -NBL- LT
FROM STA. 35+20 TO STA. 45+00 -SBL- RT
FROM STA. 35+00 TO STA. 39+30 -NBL- LT

PAVEMENT REMOVAL
SEE SHEET 9 FOR -SBL- PROFILE

REVISIONS

8/17/99

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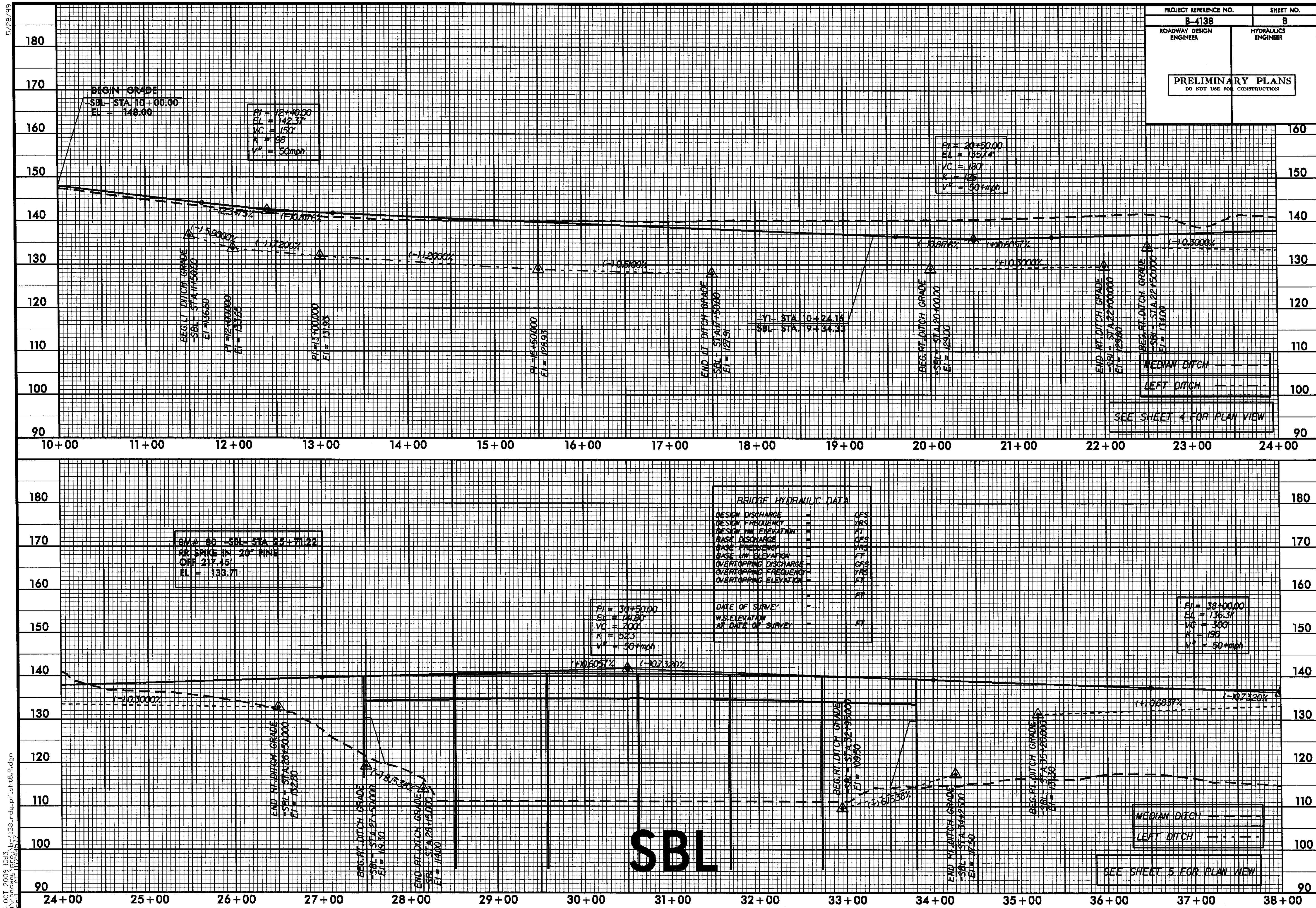

PROJECT REFERENCE NO. B-4138
SHEET NO. 8
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
5/28/99
BEGIN GRADE
-SBL- STA. 10+00.00
EL = 148.00
PI = 12+40.00
EL = 142.37'
VC = 150'
K = 98
V = 50mph
PI = 20+50.00
EL = 135.74'
VC = 180'
K = 125
V = 50mph
(-)1.2347%
(-)0.8176%
(-)5.9000%
(-)1.1200%
(-)1.2000%
(-)0.5100%
(+)0.6057%
(+)0.3000%
(+)0.3000%
BEG. LT. DITCH GRADE -SBL- STA.11+50.00 El = 136.50
PI = 12+00.000 El = 133.65
PI = 13+00.000 El = 131.93
PI = 15+50.000 El = 128.93
END LT. DITCH GRADE -SBL- STA.17+50.00 El = 127.91
-Y1- STA. 10+24.16
-SBL- STA. 19+34.33
BEG. RT. DITCH GRADE -SBL- STA.20+00.00 El = 129.00
END RT. DITCH GRADE -SBL- STA.22+00.000 El = 129.60
BEG. RT. DITCH GRADE -SBL- STA.22+50.000 El = 134.00
MEDIAN DITCH
LEFT DITCH
SEE SHEET 4 FOR PLAN VIEW
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00
21+00
22+00
23+00
24+00
BM# 80 -SBL- STA. 25+71.22
RR SPIKE IN 20" PINE
OFF 217.45'
EL = 133.71
BRIDGE HYDRAULIC DATA
DESIGN DISCHARGE = CFS
DESIGN FREQUENCY = YRS
DESIGN HW ELEVATION = FT
BASE DISCHARGE = CFS
BASE FREQUENCY = YRS
BASE HW ELEVATION = FT
OVERTOPPING DISCHARGE = CFS
OVERTOPPING FREQUENCY = YRS
OVERTOPPING ELEVATION = FT
DATE OF SURVEY =
W.S. ELEVATION AT DATE OF SURVEY = FT
PI = 30+50.00
EL = 141.80'
VC = 700'
K = 533
V = 50mph
PI = 38+00.00
EL = 136.31'
VC = 300'
K = 190
V = 50mph
(-)0.3000%
(+)0.6057%
(-)0.7320%
(+)0.6837%
(-)0.7320%
(-)8.5538%
(+)6.5538%
END RT. DITCH GRADE -SBL- STA.26+50.000 El = 132.80
BEG. RT. DITCH GRADE -SBL- STA.27+50.000 El = 119.50
END RT. DITCH GRADE -SBL- STA.28+15.000 El = 114.00
BEG. RT. DITCH GRADE -SBL- STA.32+95.000 El = 109.50
END RT. DITCH GRADE -SBL- STA.34+25.00 El = 117.50
BEG. RT. DITCH GRADE -SBL- STA.35+20.000 El = 131.30
MEDIAN DITCH
LEFT DITCH
SEE SHEET 5 FOR PLAN VIEW
SBL
24+00
25+00
26+00
27+00
28+00
29+00
30+00
31+00
32+00
33+00
34+00
35+00
36+00
37+00
38+00
13-OCT-2009 10:13