



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

December 18, 2009

U. S. Army Corps of Engineers
Regulatory Field Office
69 Darlington Ave.
Wilmington, NC 28402-1890

ATTN: Ms. Kim Garvey
NCDOT Coordinator

Dear Madam,

Subject: **Application for Section 404 Nationwide Permits 23 and 33 and Section 401 Water Quality Certification** for the proposed replacement of Bridge No. 207 over Holly Swamp and Bridge Nos. 210 and 211 over Raft Swamp on SR 1527 in Robeson County. Federal Aid Project No. BRZ-1527(2), **TIP No. B-3693**. Debit \$240 from WBS 33233.1.1.

Please find enclosed the PCN form, permit drawings, half-size plan sheets, Notification of Jurisdictional Determination, and EEP acceptance letter for the above referenced project. A Categorical Exclusion (CE) was completed for this project on February 28, 2008. A Right of Way Consultation was completed to update the CE on February 4, 2009. Both documents were distributed shortly after their respective completion dates. Additional copies are available upon request.

The North Carolina Department of Transportation (NCDOT) proposes to replace existing Bridge No. 207 over Holly Swamp and Bridge Nos. 210 and 211 over Raft Swamp on SR 1527 in Robeson County. Bridge No. 207 is currently a 53-foot, 3-span bridge and will be replaced with an 80-foot, 2 span structure. Bridge No. 210 is currently a 26 foot, 2 span bridge and will be replaced with a single span structure 50 feet in length. The existing structure of Bridge No. 211 is a 9-span, 155-foot bridge that will be replaced with a 4-span, 190-foot bridge. The proposed bridges will be replaced approximately on the existing alignment; however, the roadway between bridges 207 and 210 is being realigned east of the existing alignment to reduce the amount of curve in the road. All three bridges will be constructed with pre-stressed concrete cored slab structures. There will be 0.90 acre of permanent impacts and 1.34 acres of temporary impacts to riparian wetlands adjacent to Holly and Raft Swamps. Traffic will be detoured on-site during construction via a temporary detour bridge.

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

The let date for this project is June 15, 2010 and the review date is April 27, 2010; however, the let date may advance as additional funds become available.

Regulatory Approvals

Section 404 Permit: NCDOT anticipates that all aspects of the bridges associated with this project be authorized by a Nationwide Permit 23. We are also requesting the issuance of a Nationwide Permit 33 for temporary impacts associated with the on-site detour (72 CFR; 11092-11198, March 12, 2007).

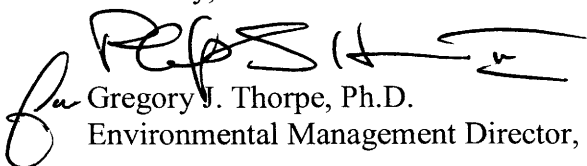
Section 401 Water Quality Certification: We anticipate 401 General Certification numbers 3701 and 3688 will apply to this project. All general conditions of the Water Quality Certifications will be met. In accordance with 15A NCAC 2H, Section .0500(a), we are providing five copies of this application to the NCDWQ for their approval. NCDOT authorizes the debit of \$240 from WBS 33233.1.1.

A copy of this application will be posted on the NCDOT website at:

<http://www.ncdot.org/doh/preconstruct/pe/neu/permit.html>

Thank you for your time and assistance with this project. Please contact Veronica Barnes at vabarnes@ncdot.gov or (919) 431-6758 if you have any questions or need additional information.

Sincerely,



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

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

Mr. Ahmad A Al-Sharawneh, PDEA

Ms. Beth Harmon, EEP

Mr. Phillip Ayscue, NCDOT External Audit Branch



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 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 207 over Holly Swamp and Bridges 210 and 211 over Raft Swamp on SR 1527
2b. County:	Robeson
2c. Nearest municipality / town:	Lumberton
2d. Subdivision name:	<i>not applicable</i>
2e. NCDOT only, T.I.P. or state project no:	B-3693

3. Owner Information

3a. Name(s) on Recorded Deed:	North Carolina Department of Transportation
3b. Deed Book and Page No.	<i>not applicable</i>
3c. Responsible Party (for LLC if applicable):	<i>not applicable</i>
3d. Street address:	1598 Mail Service Center
3e. City, state, zip:	Raleigh, NC 27699-1598
3f. Telephone no.:	(919) 431-6758
3g. Fax no.:	(919) 431-2002
3h. Email address:	vabarnes@ncdot.gov

4. Applicant Information (if different from owner)	
4a. Applicant is:	☐ Agent ☐ Other, specify:
4b. Name:	<i>not applicable</i>
4c. Business name (if applicable):	
4d. Street address:	
4e. City, state, zip:	
4f. Telephone no.:	
4g. Fax no.:	
4h. Email address:	
5. Agent/Consultant Information (if applicable)	
5a. Name:	<i>not applicable</i>
5b. Business name (if applicable):	
5c. Street address:	
5d. City, state, zip:	
5e. Telephone no.:	
5f. Fax no.:	
5g. Email address:	

B. Project Information and Prior Project History		
1. Property Identification		
1a. Property identification no. (tax PIN or parcel ID):	not applicable	
1b. Site coordinates (in decimal degrees):	Latitude: 34.661196 (DD.DDDDDD)	Longitude: - 79.68499 (-DD.DDDDDD)
1c. Property size:	10.85 acres	
2. Surface Waters		
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	Holly and Raft Swamps	
2b. Water Quality Classification of nearest receiving water:	WS-IV Sw	
2c. River basin:	Lumber	
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: Land use in the area consists of residential lots and Broadleaf Deciduous Forest Land.		
3b. List the total estimated acreage of all existing wetlands on the property: 2.06		
3c. List the total estimated linear feet of all existing streams (intermittent and perennial) on the property: 350		
3d. Explain the purpose of the proposed project: To replace structurally deficient and functionally obsolete bridges.		
3e. Describe the overall project in detail, including the type of equipment to be used: The project involves replacing three bridges. Bridge 207 is a 53-foot bridge being replaced with a 80-foot, 2-span bridge. Bridge 210 is a 36-foot bridge being replaced with a 50-foot, single span bridge, and Bridge 211 is a 155-foot bridge being replaced with a 190-foot, 4-span bridge. All three bridges will be replaced on approximately the existing alignment with an on-site detour. The roadway between bridges 207 and 210 is being realigned to reduce the sharpness of the curve in the road. 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): Adam McIntyre	Agency/Consultant Company: EcoScience Corp. Other:	
4d. If yes, list the dates of the Corps jurisdictional determinations or State determinations and attach documentation. A JD was issued on November 29, 2002 and expired on November 29, 2007. Documentation is attached. A reverification request was sent by Worth Calfee of NEU to Richard Spencer on April 14, 2008. Current conditions remain unchanged from the 2002 JD.		
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	Roadway fill, Excavation	Riparian	☒ Yes ☐ No	☒ Corps ☐ DWQ	0.03
Site 2 ☒ P ☐ T	Roadway fill	Riparian	☒ Yes ☐ No	☒ Corps ☐ DWQ	0.06
Site 2 ☐ P ☒ T	Detour fill	Riparian	☒ Yes ☐ No	☒ Corps ☐ DWQ	0.10
Site 3 ☒ P ☐ T	Roadway fill	Riparian	☒ Yes ☐ No	☒ Corps ☐ DWQ	0.39
Site 4 ☒ P ☐ T	Excavation	Riparian	☒ Yes ☐ No	☒ Corps ☐ DWQ	0.21
Site 4 ☐ P ☒ T	Detour Fill	Riparian	☒ Yes ☐ No	☒ Corps ☐ DWQ	0.69
Site 5 ☒ P ☐ T	Roadway fill	Riparian	☒ Yes ☐ No	☒ Corps ☐ DWQ	0.12
Site 6 ☒ P ☐ T	Roadway fill	Riparian	☒ Yes ☐ No	☒ Corps ☐ DWQ	0.06
Site 6 ☐ P ☒ T	Detour fill	Riparian	☒ Yes ☐ No	☒ Corps ☐ DWQ	0.31
Site 7 ☒ P ☐ T	Roadway fill	Riparian	☒ Yes ☐ No	☒ Corps ☐ DWQ	0.02
Site 8 ☐ P ☒ T	Detour fill	Riparian	☒ Yes ☐ No	☒ Corps ☐ DWQ	0.19
Site 9 ☒ P ☐ T	Roadway fill	Riparian	☒ Yes ☐ No	☒ Corps ☐ DWQ	0.01
2g. Total wetland impacts					0.90 Permanent 1.29 Temporary

2h. Comments: Additional temporary impacts to wetlands of 0.05 acre of Temporary Fill in Wetlands in the Hand Clearing areas are proposed for the installation of erosion control measures, including Temporary Silt Fence and/or Special Sediment Control Fence.

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			☐ PER ☐ INT	☐ Corps ☐ DWQ		

Site 2 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ				
Site 3 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ				
3h. Total stream and tributary impacts						X Perm X Temp		
3i. Comments: There will be <0.01 ac of permanent impacts in streams for the installation of permanent bents and <0.01 ac of temporary impacts for the installation of bents for the temporary detour bridges.								
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								
4f. Total open water impacts						X Permanent X Temporary		
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.

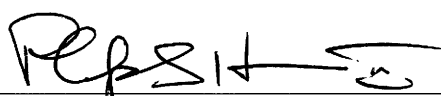
6a. Project is in which protected basin?			☐ Neuse ☐ Catawba	☐ Tar-Pamlico ☐ Randleman	☐ Other:
6b. Buffer impact number – Permanent (P) or Temporary (T)	6c. Reason for impact	6d. Stream name	6e. Buffer mitigation required?	6f. Zone 1 impact (square feet)	6g. Zone 2 impact (square feet)
B1 ☐ P ☐ T		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

D. Impact Justification and Mitigation		
1. Avoidance and Minimization		
1a. Specifically describe measures taken to avoid or minimize the proposed impacts in designing project. The proposed bridges are a total of 76 feet longer than the existing bridges; the proposed bridges will be at approximately the same grade as the existing structures; the number of bents in the water has been reduced for each bridge, a preformed scour hole has been utilized to diffuse stormwater velocity flowing into wetlands, 3:1 slopes are being utilized; hand clearing is being utilized instead of mechanized clearing.		
1b. Specifically describe measures taken to avoid or minimize the proposed impacts through construction techniques. Top down construction will be used on this project. The temporary detours will be removed, graded back to natural contours, and replanted with native vegetation. A monitoring plan is not proposed due to loamy soils in the project area. Method II clearing with 5' of hand clearing from fill slope limits.		
2. Compensatory Mitigation for Impacts to Waters of the U.S. or Waters of the State		
2a. Does the project require Compensatory Mitigation for impacts to Waters of the U.S. or Waters of the State?	☒ Yes ☐ No If no, explain:	
2b. If yes, mitigation is required by (check all that apply):	☐ DWQ ☒ Corps	
2c. If yes, which mitigation option will be used for this project?	☐ Mitigation bank ☒ Payment to in-lieu fee program ☐ Permittee Responsible Mitigation	
3. Complete if Using a Mitigation Bank		
3a. Name of Mitigation Bank: not applicable		
3b. Credits Purchased (attach receipt and letter)	Type	Quantity
3c. Comments:		
4. Complete if Making a Payment to In-lieu Fee Program		
4a. Approval letter from in-lieu fee program is attached.	☒ Yes	
4b. Stream mitigation requested:	0 linear feet	
4c. If using stream mitigation, stream temperature:	☐ warm ☐ cool ☐ cold	
4d. Buffer mitigation requested (DWQ only):	0 square feet	
4e. Riparian wetland mitigation requested:	1.80 acres	
4f. Non-riparian wetland mitigation requested:	0 acres	
4g. Coastal (tidal) wetland mitigation requested:	0 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: if yes, see attached permit drawings.	☐ Yes ☐ No
2. Stormwater Management Plan	
2a. What is the overall percent imperviousness of this project?	N/A
2b. Does this project require a Stormwater Management Plan?	☒ Yes ☐ No
2c. If this project DOES NOT require a Stormwater Management Plan, explain why:	
2d. If this project DOES require a Stormwater Management Plan, then provide a brief, narrative description of the plan: See attached permit drawings.	
2e. Who will be responsible for the review of the Stormwater Management Plan?	☐ Certified Local Government ☐ DWQ Stormwater Program ☐ DWQ 401 Unit
3. Certified Local Government Stormwater Review	
3a. In which local government's jurisdiction is this project?	not applicable
3b. Which of the following locally-implemented stormwater management programs apply (check all that apply):	☐ Phase II ☐ NSW ☐ USMP ☐ Water Supply Watershed ☐ Other:
3c. Has the approved Stormwater Management Plan with proof of approval been attached?	☐ Yes ☐ No
4. DWQ Stormwater Program Review	
4a. Which of the following state-implemented stormwater management programs apply (check all that apply):	☐ Coastal counties ☐ HQW ☐ ORW ☐ Session Law 2006-246 ☐ Other:
4b. Has the approved Stormwater Management Plan with proof of approval been attached?	☐ Yes ☐ No
5. DWQ 401 Unit Stormwater Review	
5a. Does the Stormwater Management Plan meet the appropriate requirements?	☒ Yes ☐ No
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? Natural Heritage Program database, NCDOT field surveys and USFWS website.		
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:		
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	 Applicant/Agent's Signature (Agent's signature is valid only if an authorization letter from the applicant is provided.)	12/17/09 Date



December 15, 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-3693, Replace Bridge Numbers 207, 210 and 211 over Holly and Raft Swamps on SR 1527, Robeson County; Lumber River Basin (Cataloging Unit 03040203); 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 riparian wetland mitigation for the unavoidable impact associated with the above referenced project. Based on the information supplied by the NCDOT on December 15, 2009, the impacts are located in CU 03040203 of the Lumber River Basin in the Southern Inner Coastal Plain (SICP) Eco-Region, and the anticipated mitigation credits needed to offset the impacts are as follows:

Lumber 03040203 SICP	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non- Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	0	0	0	0.90	0	0	0	0
Mitigation Units (Credits-up to 2:1)	0	0	0	1.80	0	0	0	0

This mitigation acceptance letter replaces the mitigation acceptance letter issued on December 10, 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 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-3693 Revised

Restoring... Enhancing... Protecting Our State





December 15, 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-3693, Replace Bridge Numbers 207, 210 and 211 over Holly and Raft Swamps on SR 1527, Robeson County

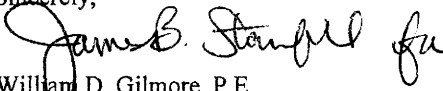
The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory riparian wetland mitigation for the subject project. Based on the information supplied by you on December 15, 2009, the impacts are located in CU 03040203 of the Lumber River Basin in the Southern Inner Coastal Plain (SICP) Eco-Region, and are as follows:

Lumber 03040203 SICP	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non- Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	0	0	0	0.90	0	0	0	0
Mitigation Units (Credits-up to 2:1)	0	0	0	1.80	0	0	0	0

This mitigation acceptance letter replaces the mitigation acceptance letter issued on December 10, 2009. EEP commits to implementing sufficient compensatory 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-3693 Revised

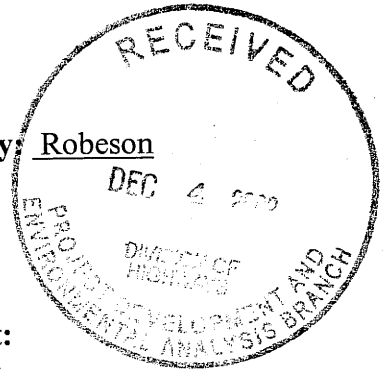
Restoring... Enhancing... Protecting Our State



U.S. ARMY CORPS OF ENGINEERS
Wilmington District

Action ID: 200300156

County: Robeson



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. Shay Garriock
EcoScience Corporation
1101 Haynes Street, Suite 101
Raleigh, North Carolina 27604

Size and Location of Project (waterbody, Highway name/number, town, etc.): TIP Project No. B-3693, Bridges No. 207, 210 & 211 on SR 1527 over Raft Swamp, Robeson County, North Carolina.

Basis for Determination: Onsite field inspection of jurisdictional area.

On August 8, 2002, the undersigned verified the Section 404 jurisdictional line as field delineated by the NCDOT and/or its representatives for the subject NCDOT project/corridor. The project site delineated jurisdictional boundaries were determined to accurately reflect the limits of Corps jurisdiction. The field delineated wetland jurisdictional limits, as shown on the attached plan 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

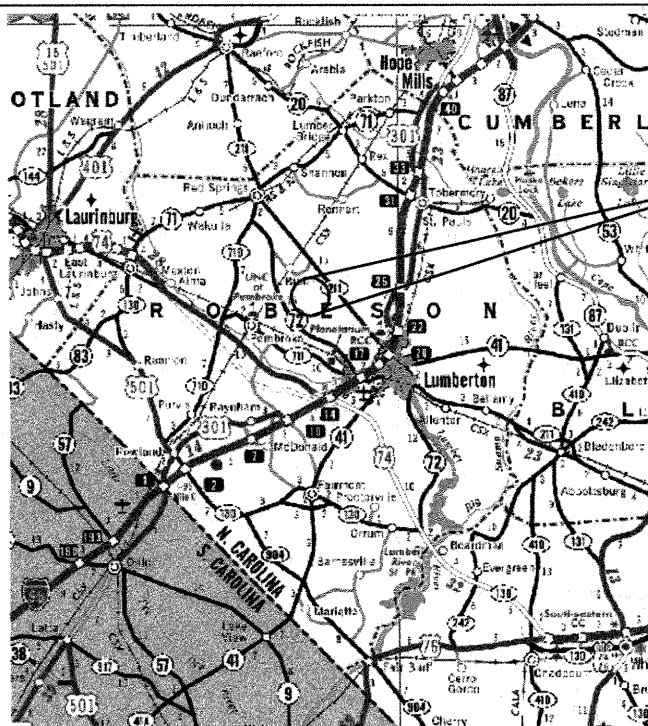
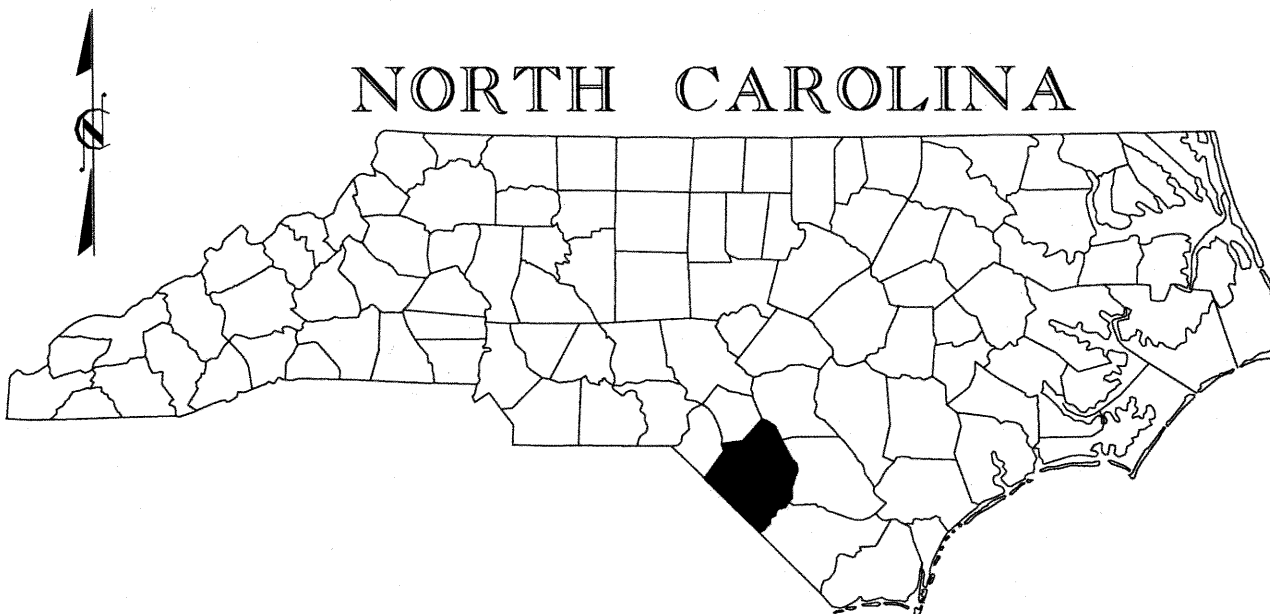
Richard K. Spencer

Date November 29, 2002

Expiration Date November 29, 2007

Attachments

CF: NCDOT, Division 6, Jim Rerko



VICINITY MAP

NCDOT

DIVISION OF HIGHWAYS

ROBESON COUNTY

PROJECT: 33233.1.1 (B-3693)

BRIDGE NO. 207 OVER HOLLY

SWAMP AND BRIDGE NOS.

210 AND 211 OVER RAFT SWAMP

ON SR 1527

SHEET

OF

Permit Drawing
Sheet 1 of 20

SUMMARY OF AFFECTED PROPERTY OWNERS

TRACT NO.	PROPERTY OWNER	ADDRESS	SITE NO.
1	SALLY CADE WALTERS	3720 N W 104 CORAL SPRINGS, FL 33065	1
3	DAN CADE JR.	P.O. BOX 8211 COLUMBIA, SC 29202	1
2	POLLY BARR	11165 MARTIN STREET CAMDEN, NJ 08104	2
4	BILLY DURELL CURRIE	3775 PINE LOG RD LUMBERTON, NC 28358	2
5	LARRY T. EDWARDS & THOMAS J. KEITH	311 E. 5TH ST. LUMBERTON, NC 28358	4, 6
6	BONNIE F. LOCKLEAR	1743 WHISTLING RUFUS RD. PEMBROKE, NC 28372	3, 5
7	DELMAR SPAULDING	P.O. BOX 604 LUMBERTON, NC 28359	8
8	WOODROW WILSON BECK JR.	P.O. BOX 935 LUMBERTON, NC 28359	7, 9



NCDOT

DIVISION OF HIGHWAYS

ROBESON COUNTY

PROJECT: 33233.1.1 (B-3693)

BRIDGE NO. 207 OVER HOLLY

SWAMP AND BRIDGE NOS.

210 AND 211 OVER RAFT SWAMP

ON SR 1527

SHEET

OF

Permit Drawing
Sheet *7* of *20*

WETLAND LEGEND

	WETLAND BOUNDARY		PROPOSED BRIDGE
	WETLAND		PROPOSED BOX CULVERT
	DENOTES FILL IN WETLAND		PROPOSED PIPE CULVERT 12"-48" PIPES 54" PIPES & ABOVE
	DENOTES PERMANENT SURFACE WATER IMPACTS	(DASHED LINES DENOTE EXISTING STRUCTURES)	
	DENOTES PERMANENT SURFACE WATER IMPACTS (POND)		SINGLE TREE
	DENOTES TEMPORARY FILL IN WETLAND		WOODS LINE
	DENOTES EXCAVATION IN WETLAND		DRAINAGE INLET
	DENOTES TEMPORARY SURFACE WATER IMPACTS		ROOTWAD
	DENOTES HAND CLEARING		RIP RAP
	DENOTES MECHANIZED CLEARING		ADJACENT PROPERTY OWNER OR PARCEL NUMBER IF AVAILABLE
	FLOW DIRECTION		PREFORMED SCOUR HOLE
	TOP OF BANK		LEVEL SPREADER (LS)
	EDGE OF WATER		DITCH / GRASS SWALE
	PROP. LIMIT OF CUT		
	PROP. LIMIT OF FILL		
	PROP. RIGHT OF WAY		
	NATURAL GROUND		
	PROPERTY LINE		
	TEMP. DRAINAGE EASEMENT		
	PERMANENT DRAINAGE EASEMENT		
	EXIST. ENDANGERED ANIMAL BOUNDARY		
	EXIST. ENDANGERED PLANT BOUNDARY		
	WATER SURFACE		
	LIVE STAKES		
	BOULDER		
	COIR FIBER ROLLS		

NCDOT

DIVISION OF HIGHWAYS

ROBESON COUNTY

PROJECT: 33233.1.1 (B-3693)

BRIDGE NO. 207 OVER HOLLY

SWAMP AND BRIDGE NOS.

210 AND 211 OVER RAFT SWAMP

ON SR 1527

SHEET

OF

Permit Drawing

Sheet 3 of 20

SURFACE WATER IMPACTS

TOTALS:

0.05 acres of Temporary Fill in Wetlands in the Hand Clearing areas for erosion control measures

SHEET

STORMWATER MANAGEMENT PLAN

Project: 33233.1.1

TIP No. B-3693

Robeson County

11/19/2009

Hydraulics Project Manager: W. Herbert Turner, Jr., PE (Ko/ Florence & Hutcheson)
Marshal Clawson, P.E. (NCDOT Hydraulics Unit)

ROADWAY DESCRIPTION

The purpose of this project is to replace Robeson County Bridge No. 207, 210, and 211 on SR 1527 (Pine Log Road) over Holy Swamp, Raft Swamp Overflow, and Raft Swamp, respectively. Bridge number 207 is 53 feet in length and has a clear roadway width of 28 feet. The replacement structure will be a bridge 80 feet long providing a 35.8 foot clear roadway width. The bridge will include two 12-foot lanes and 5 to 6.1 feet (varies) offset on left side and 5.7 to 6.8 feet (varies) offset on right side. Bridge number 210 is 36 feet in length and has a clear roadway width of 24 feet. The replacement structure will be a bridge 50 feet long providing a 35.8 foot clear roadway width. The bridge will include two 12-foot lanes and 5.6 to 5.9 feet (varies) offset on left side and 5.9 to 6.3 feet (varies) offset on right side. Bridge number 211 is 155 feet in length and has a clear roadway width of 24 feet. The replacement structure will be a bridge 190 feet long providing a 35.8 foot clear roadway width. The bridge will include two 12-foot lanes and 3.9 feet offset on left side and 7.9 feet offset on right side. The roadway grade will be raised approximately 1 to 2 feet above the existing structures.

The approach roadway will extend approximately 330 feet from the south end of the new bridge No. 207 and 460 feet from the east end of the new bridge No. 211. The approaches will be widened to include two 12-foot lanes with 8-foot shoulders, 4-foot of which will be paved. The roadway will be designed as a Rural Minor Collector with a 60 mile per hour design speed using the Sub Regional Tier Design Guidelines for Bridge Projects. Traffic will be detoured on-site during construction.

The project B-3693 creates impacts to three named stream (Holy Swamp, Raft Swamp Overflow, and Raft Swamp) within the Lumber River Basin. Table 1 shows the streams and the proposed crossing structures. The project drainage consists of grated inlets with associated pipes, and roadside and lateral grass swales.

Table 1. List of Stream Crossings in Project B-3693

Site #	Station	Stream Name	Drainage area	Proposed Structure
1	-L- 14+20	Holy Swamp	9.0 Sq Mi	2-Span Cored Slab (1@50', 1@30')
2	-L- 21+37	Raft Swamp Overflow	156 Sq Mi	1-Span Cored Slab (1@50')

3	-L- 25+45	Raft Swamp	156 Sq Mi	4-Span Cored Slab (1@40', 3@50')
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ENVIRONMENTAL DESCRIPTION

The project is located within the Lumber River Basin and Robeson County which is not a CAMA county. The streams listed in Table 1 have been classified as jurisdictional stream. The NCDWQ Surface Water Classification is listed as WS-IV, SW for these streams and they are not identified as impaired according to the current NCDWQ's 303(d) Impaired Waters List.

There are wetland areas that will be impacted by the proposed project. Wetland impacts have been reduced to a minimum by keeping roadway fill slopes at 3:1 for most of the project area.

Deck drains are not required for the three proposed bridges. In order to eliminate the deck drains for the bridge No. 211, the bridge width offset on the right (low) side will be adjusted to 7.9 feet due to design spread.

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 BMPs and measures that will be used on this project to reduce stormwater impacts are as follows:

PREFORMED SCOUR HOLE

A preformed scour hole has been utilized to diffuse the velocity from the storm drain pipe at Sta 27+70 on the right that drains into the jurisdictional wetland.

GRASS SWALE

The Grass Swale will provide treatment for the pavement runoff before entering wetland at the following locations: 10+70 to 12+75 LT, 10+50 to 11+20 RT, 27+00 to 29+50 LT

AVOID DITCHING THROUGH WETLAND

Grass swale will ends at edge of wetland to avoid impact to the wetland at following locations: 12+75 LT, 27+00 LT

METHOD II CLEARING TO MINIMIZE WETLAND IMPACTS

Method II clearing with additional 5' clearance from fill slope limits will be used to minimize mechanized clearing for permanent road and temporary fill in wetlands for on-site detour throughout the project area.

RESTORE WETLNAD FOR DETOUR

On-site detour fills in wetlands will be temporary. They will be removed after construction to avoid permanent impacts to wetlands.

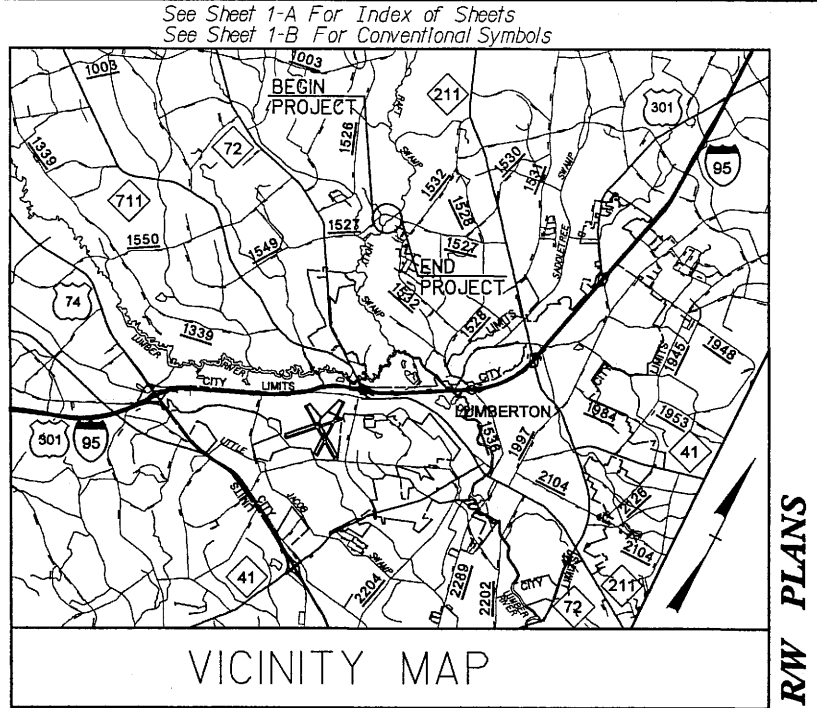
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3693	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33233.1.1	BRZ-1527(2)	P.E.	
33233.2.1	BRZ-1527(2)	R/W & UTIL.	

NCDOT
 DIVISION OF HIGHWAYS
 ROBESON COUNTY
 PROJECT: 33233.1.1 (B-3693)
 BRIDGE NO. 207 OVER HOLLY SWAMP AND BRIDGE NOS. 210 AND 211 OVER RAFT SWAMP
 SHEET OF

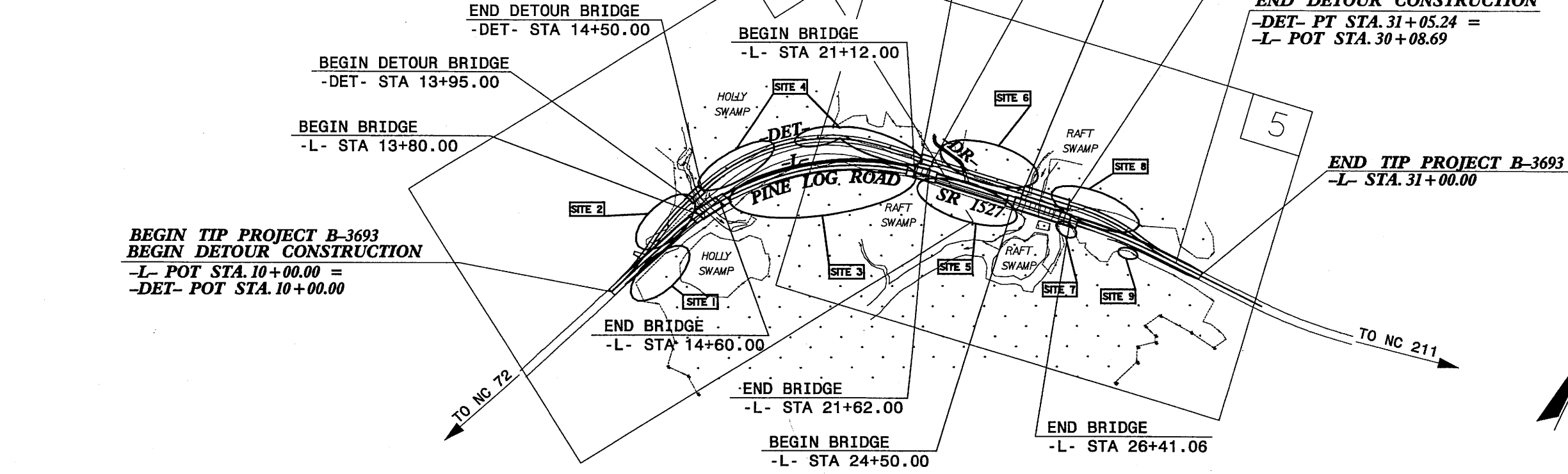
STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS
ROBESON COUNTY

LOCATION: BRIDGE NO. 207 OVER HOLLY SWAMP AND BRIDGE NOS. 210 AND 211 OVER RAFT SWAMP ON SR 1527

TYPE OF WORK: GRADING, DRAINAGE, PAVING & STRUCTURES



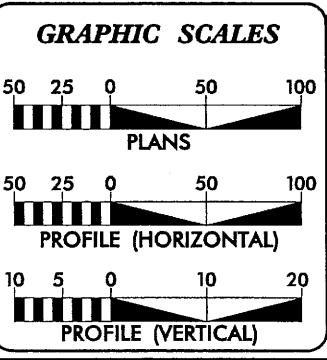
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.



** DESIGN EXCEPTION REQUIRED FOR:
 MIN. HORIZONTAL CURVE RADIUS AND BRIDGE WIDTH
 NCDOT CONTACT: DOUG TAYLOR, P.E.
 ROADWAY DESIGN - ENGINEERING COORDINATION

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

PRELIMINARY PLANS
 DO NOT USE FOR CONSTRUCTION



DESIGN DATA	
RURAL MINOR COLLECTOR	
ADT 2010	= 10,570
ADT 2030	= 17,150
DHV	= 10 %
D	= 57 %
T	= 4 % *
V	= 60 MPH**
* (TTST 2% + DUAL 2%)	

PROJECT LENGTH	
LENGTH ROADWAY TIP PROJECT B-3693	= 0.337 MI.
LENGTH STRUCTURES TIP PROJECT B-3693	= 0.061 MI.
TOTAL LENGTH OF TIP PROJECT B-3693	= 0.398 MI.

Prepared in the Office of: KO & ASSOCIATES, P.C. Consulting Engineers A Florence & Hutcheson, Inc. Company 5121 KINGDOM WAY, SUITE 100 RALEIGH, N.C. 27607 (919) 851-0062	
2006 STANDARD SPECIFICATIONS RIGHT OF WAY DATE: MAY 15, 2009 LETTING DATE: MAY 18, 2010	MICHAEL A. YOUNG, PE PROJECT ENGINEER DAVID C. WALLER, PE PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER	
SIGNATURE:	P.E.
ROADWAY DESIGN ENGINEER	
SIGNATURE:	P.E.

DIVISION OF HIGHWAYS
 STATE OF NORTH CAROLINA

Permit Drawing
 Sheet 7 of 20
 STATE HIGHWAY DESIGN ENGINEER

TIP PROJECT: B-3693

CONTRACT:

10/22/2009 R:\Hydraulics\Permit\B3693_Hyd.prm_tsh.dgn KO & Associates, P.C.

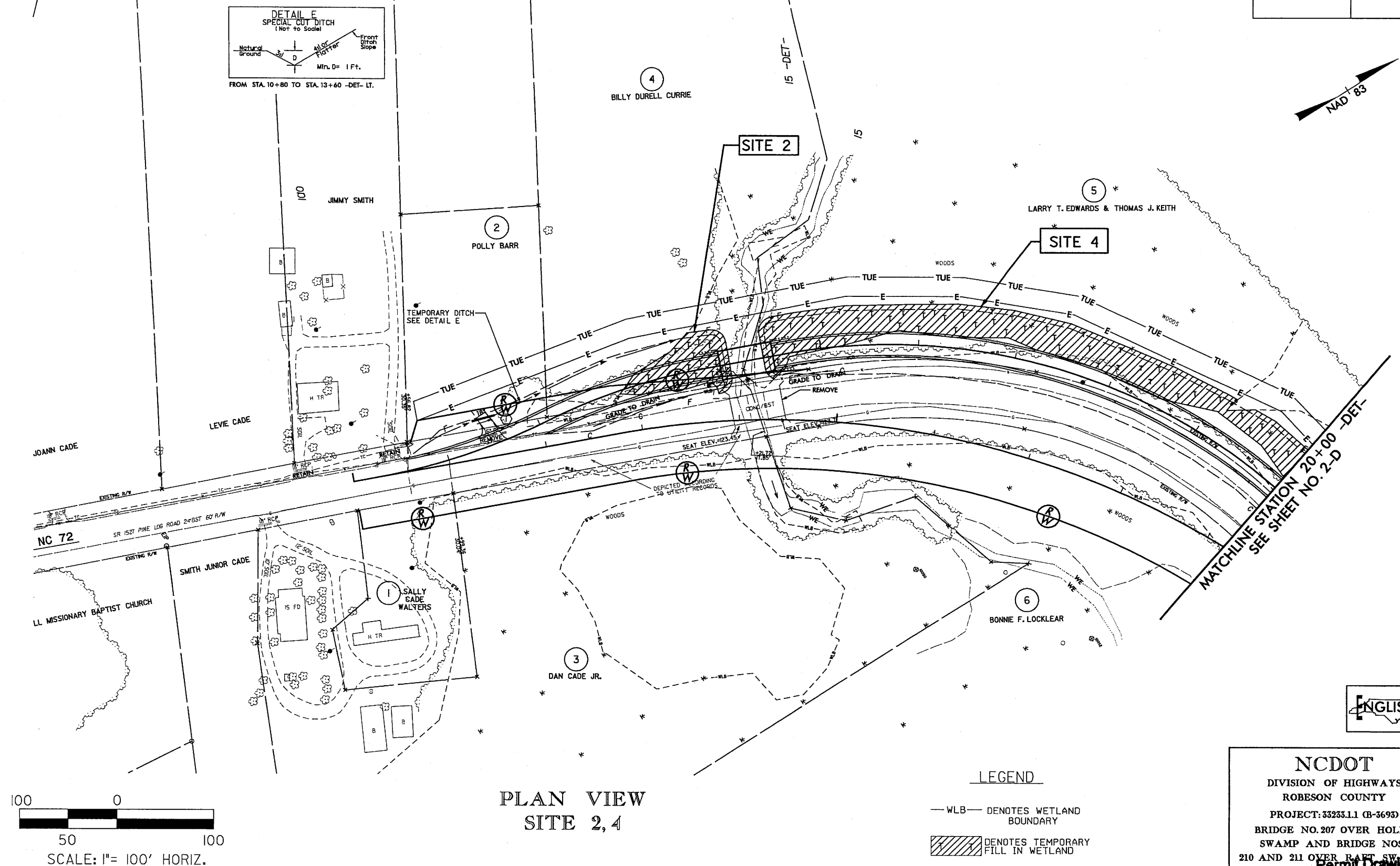
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KO & Associates, P.C.

KO & ASSOCIATES, P.C.
Consulting Engineers
A Florence & Hutcheson, Inc. Company
5121 KINGDOM WAY, SUITE 100 RALEIGH, N.C. 27607
(919) 851-6066

PROJECT REFERENCE NO. B-3693	SHEET NO. 2-C
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

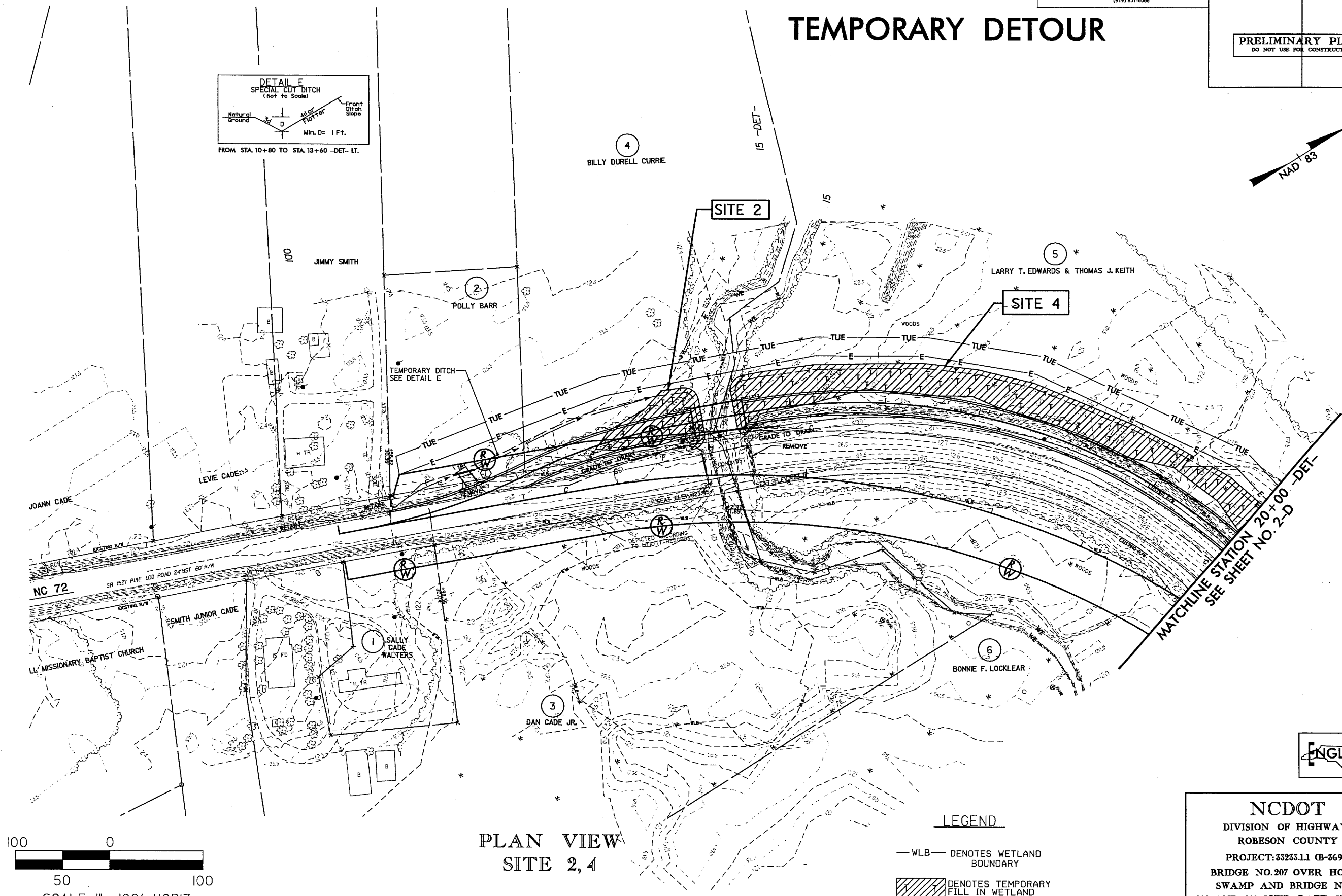
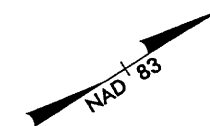
TEMPORARY DETOUR



NCDOT
DIVISION OF HIGHWAYS
ROBESON COUNTY
PROJECT: 33233.1.1 (B-3693)
BRIDGE NO. 207 OVER HOLLY
SWAMP AND BRIDGE NOS.
210 AND 211 OVER RAFT SWAMP
Permit Drawing
SHEET OF Sheet 8 of 20

0/28/2009
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TEMPORARY DETOUR



PLAN VIEW
SITE 2, 4

LEGEND

—WLB— DENOTES WETLAND
BOUNDARY

 DENOTES TEMPORAR
FILL IN WETLAND

NCDOT
DIVISION OF HIGHWAYS
ROBESON COUNTY
PROJECT: 33233.11 (B-3693)
BRIDGE NO. 207 OVER HOLLY
SWAMP AND BRIDGE NOS.
210 AND 211 OVER RAFT SWAMP

SHEET OF
Permit Drawing
Sheet 9 of 20

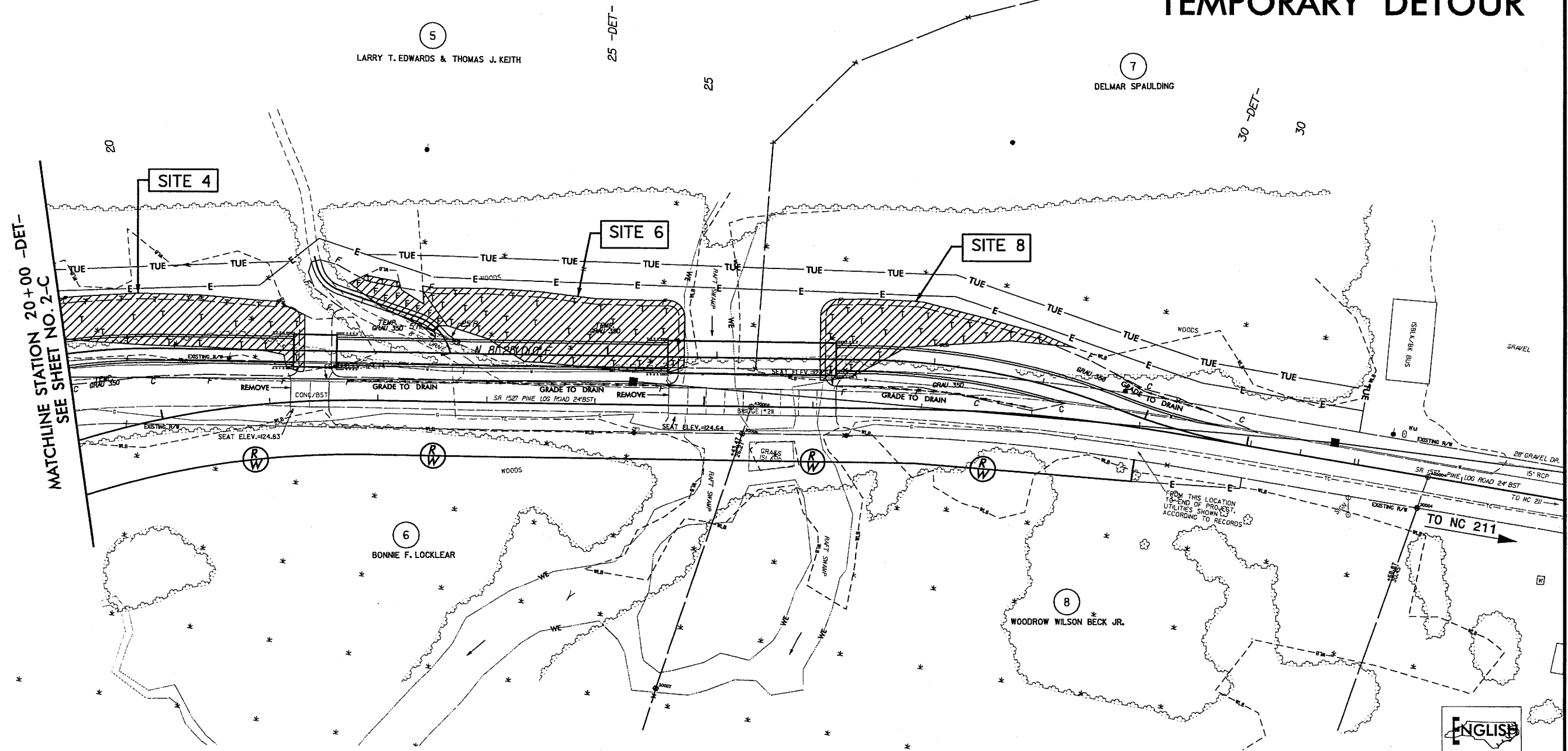
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KO & Associates, P.C.

KO & ASSOCIATES, P.C.
Consulting Engineers
A Florence & Hutcheson, Inc. Company
5121 KINGDOM WAY, SUITE 100 RALEIGH, N.C. 27607
(919) 851-6066

PROJECT REFERENCE NO.		SHEET NO.	
B-3693		2-D	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			

TEMPORARY DETOUR



PLAN VIEW SITE 4, 6, AND 8

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- ▨ DENOTES TEMPORARY FILL IN WETLAND
- ▨ DENOTES FILL IN WETLAND

NCDOT
DIVISION OF HIGHWAYS
ROBESON COUNTY
PROJECT: 33233.1.1 (B-3693)
BRIDGE NO. 207 OVER HOLLY SWAMP AND BRIDGE NOS. 210 AND 211 OVER RAFT SWAMP
SHEET OF

Permit Drawing
Sheet 10 of 20

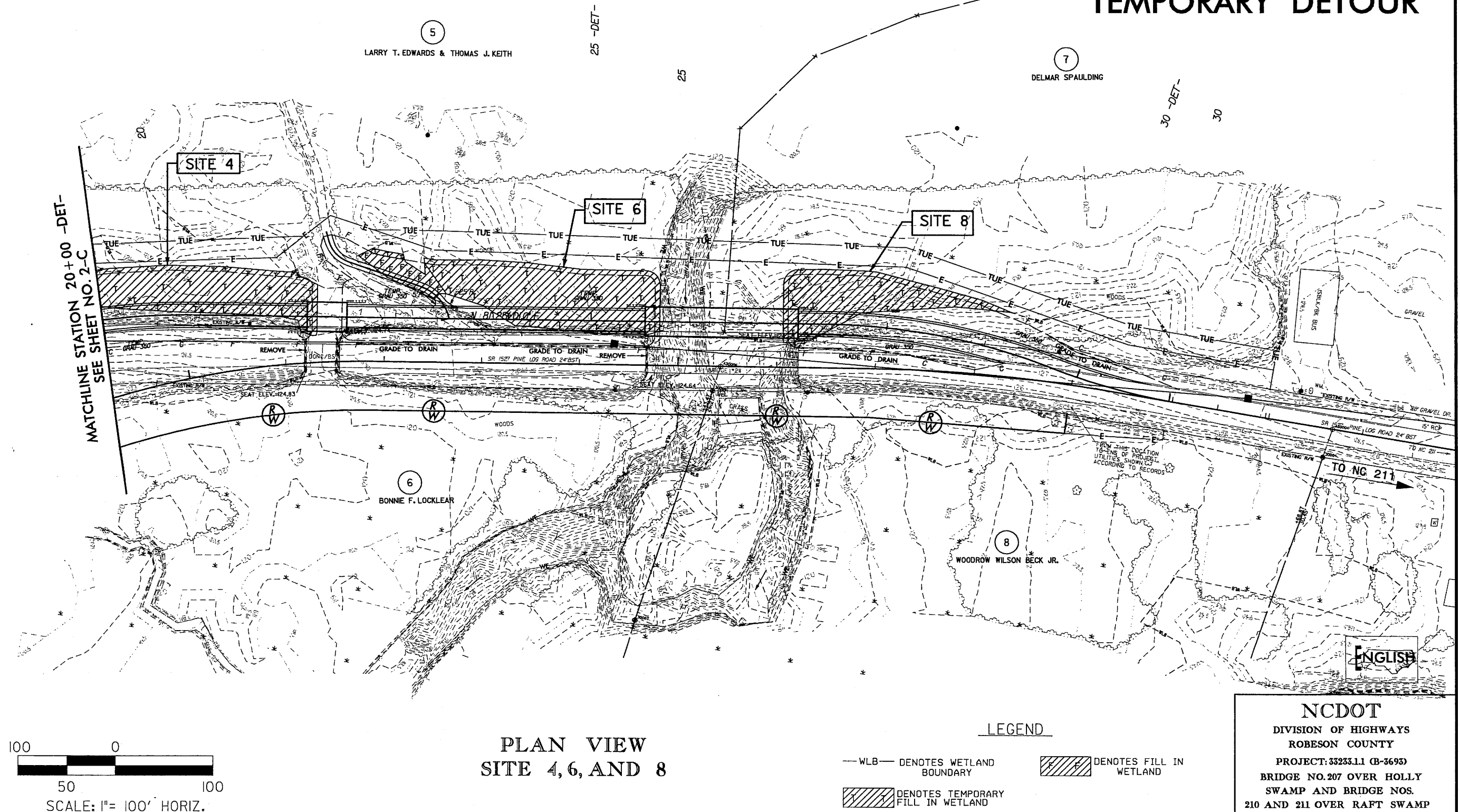
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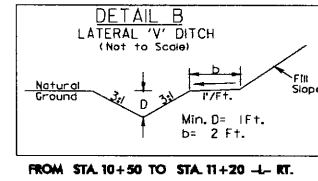
KO & ASSOCIATES, P.C.
Consulting Engineers
A Florence & Hutcheson, Inc. Company
5121 KINGDOM WAY, SUITE 100 RALEIGH, N.C. 27607
(919) 851-6666

PROJECT REFERENCE NO. B-3693		SHEET NO. 2-D	
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ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			

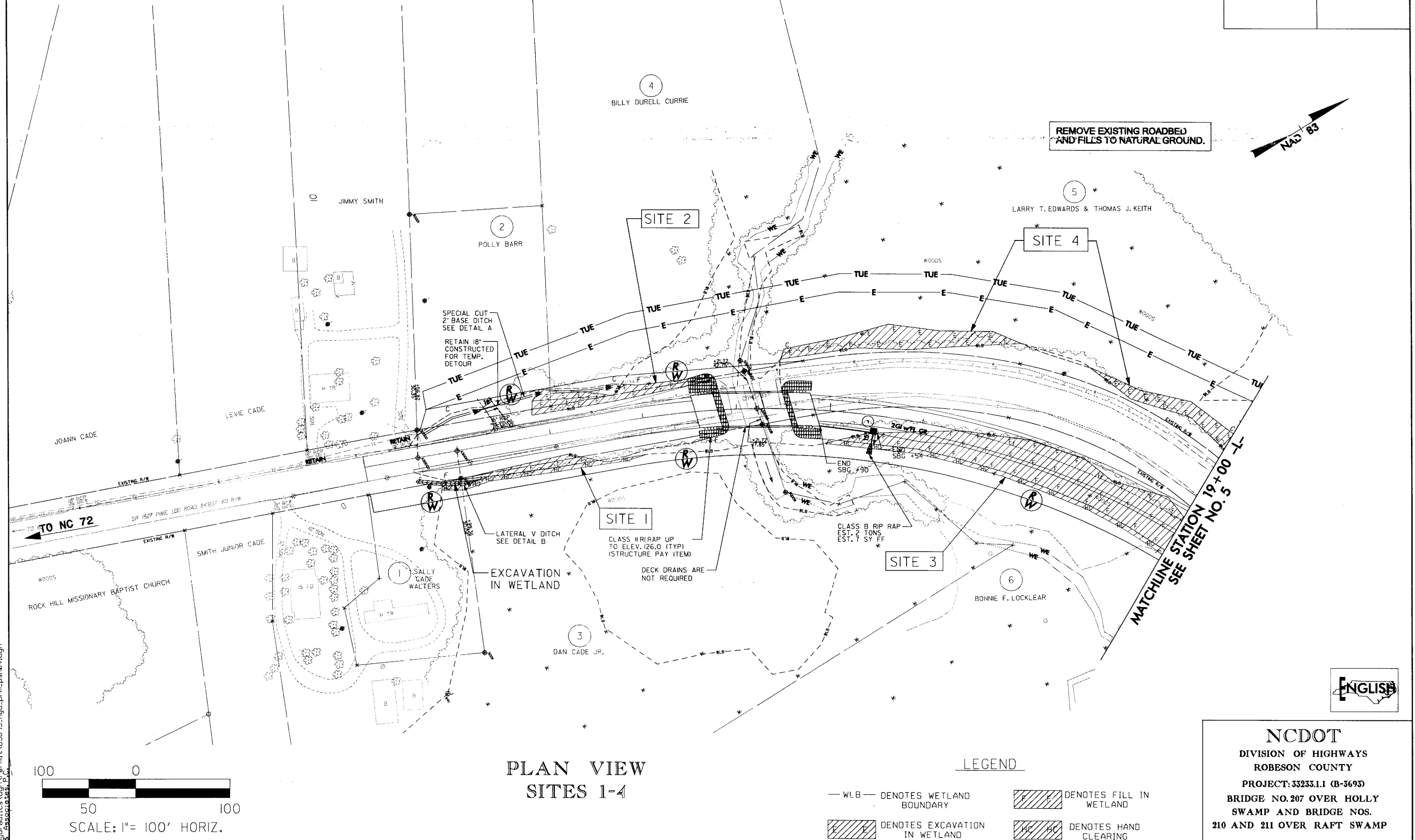
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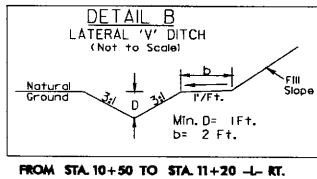
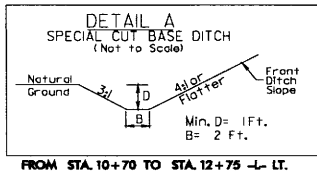
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B-3693	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



NCDOT
DIVISION OF HIGHWAYS
ROBESON COUNTY
PROJECT: 33233.1.1 (B-3693)
BRIDGE NO. 207 OVER HOLLY
SWAMP AND BRIDGE NOS.
210 AND 211 OVER RAFT SWAMP
SHEET OF
Permit Drawing
Sheet 12 of 20

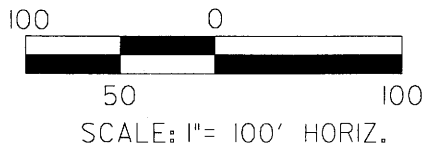
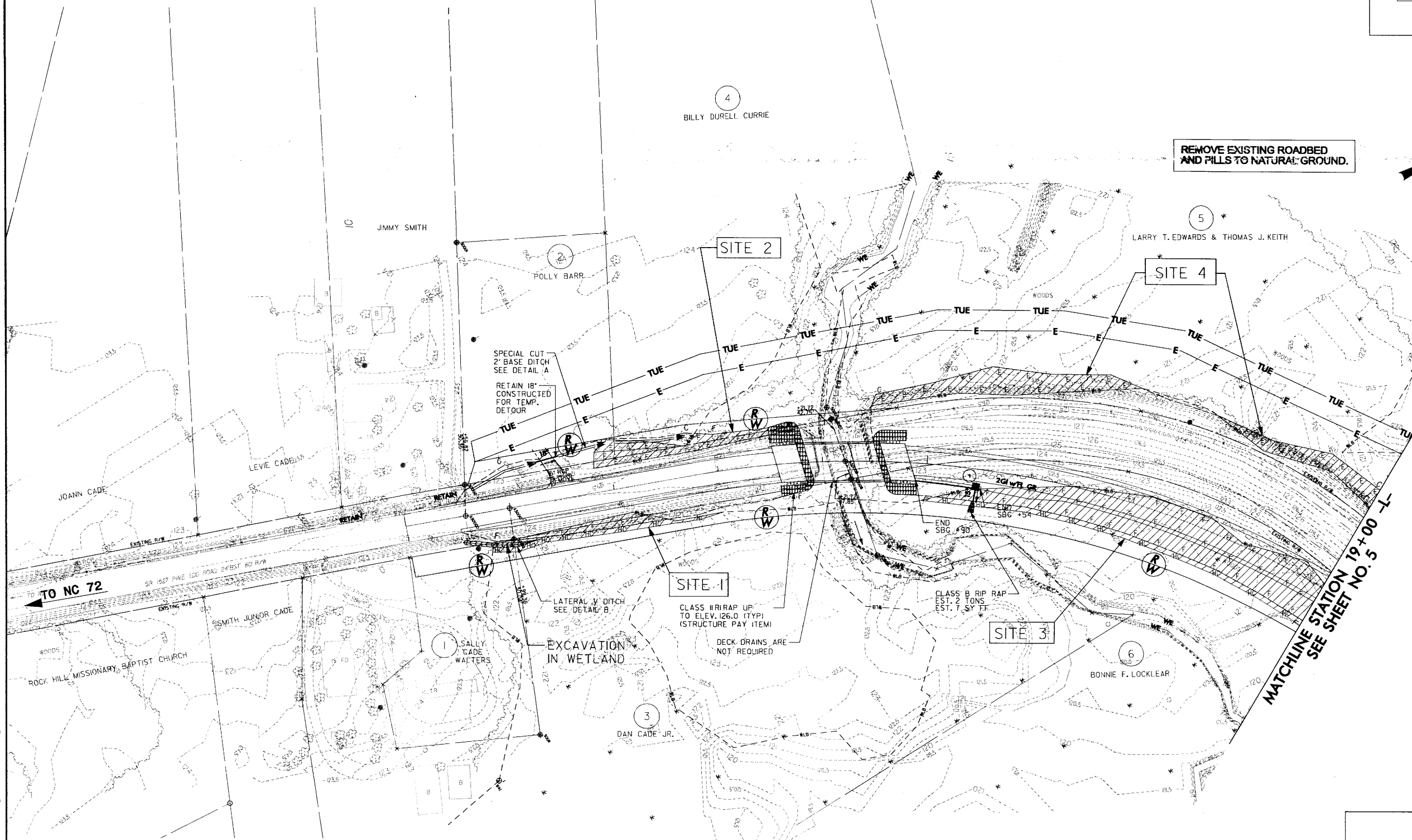
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KO & Associates, P.C.



KO & ASSOCIATES, P.C.
Consulting Engineers
A Florence & Hutcheson, Inc. Company
5121 KINGDOM WAY, SUITE 100 RALEIGH, N.C. 27607
(919) 851-6666

PROJECT REFERENCE NO. B-3693		SHEET NO. 4	
RAW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			



LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- [Hatched Box] DENOTES FILL IN WETLAND
- [Hatched Box] DENOTES EXCAVATION IN WETLAND
- [Hatched Box] DENOTES HAND CLEARING

NCDOT
DIVISION OF HIGHWAYS
ROBESON COUNTY
PROJECT: 33233.1.1 (B-3693)
BRIDGE NO. 207 OVER HOLLY SWAMP AND BRIDGE NOS. 210 AND 211 OVER RAFT SWAMP
SHEET OF

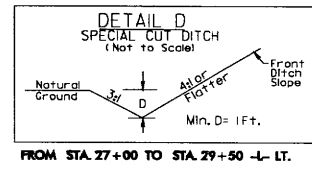
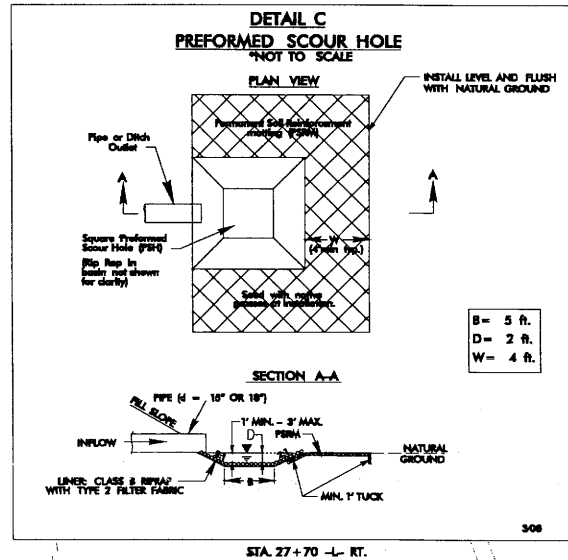
Permit Drawing

8/17/99

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(919) 851-6006

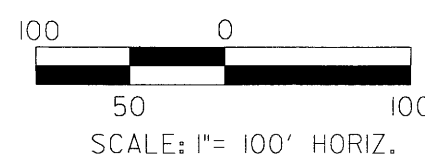
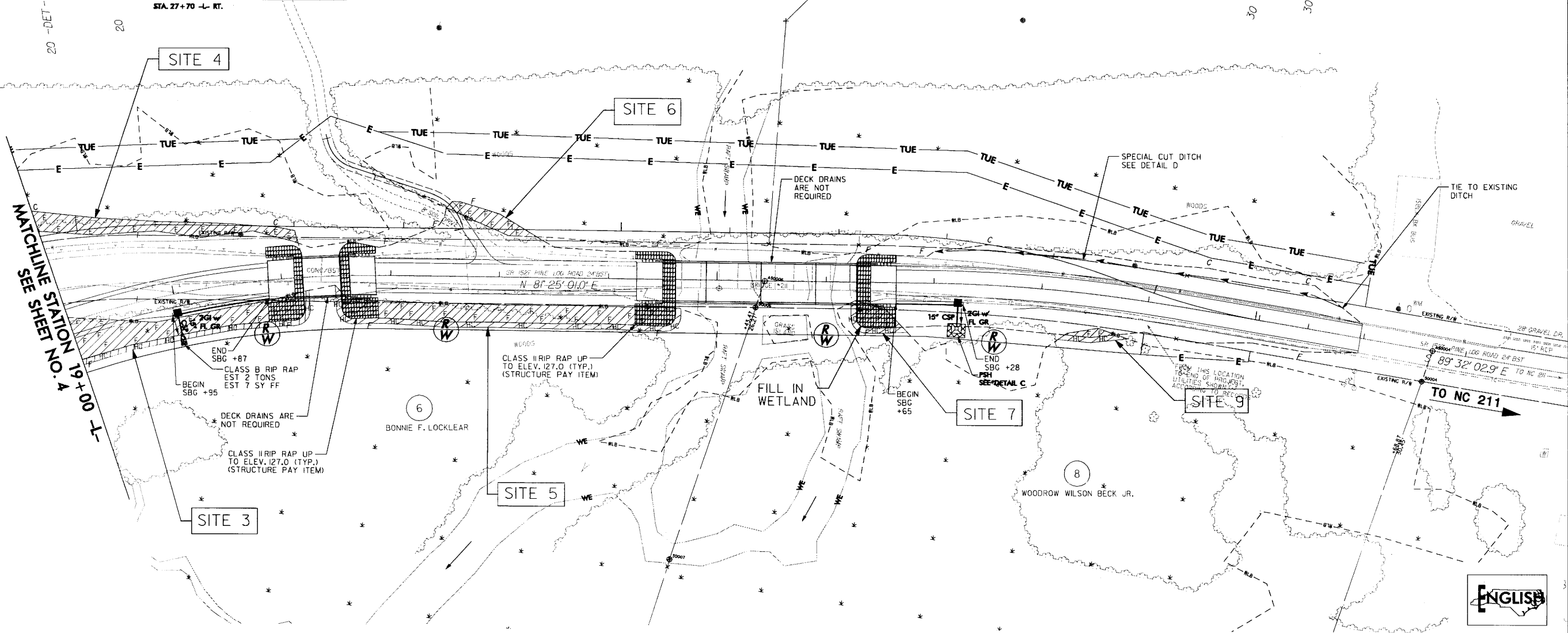
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B-3693		5
RW SHEET NO.		HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		



REMOVE EXISTING ROADBED AND FILLS TO NATURAL GROUND.

5
LARRY T. EDWARDS & THOMAS J. KEITH

NOTE:
SEE SHEET NO. 2-D FOR
RELOCATED DRIVE INFO.



**PLAN VIEW
SITES 3-7 AND 9**

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- [Hatched Box] DENOTES FILL IN WETLAND
- [Hatched Box] DENOTES EXCAVATION IN WETLAND
- [Hatched Box] DENOTES HAND CLEARING

NCDOT
DIVISION OF HIGHWAYS
ROBESON COUNTY
PROJECT: 33233.1.1 (B-3693)
BRIDGE NO. 207 OVER HOLLY
SWAMP AND BRIDGE NOS.
210 AND 211 OVER RAFT SWAMP

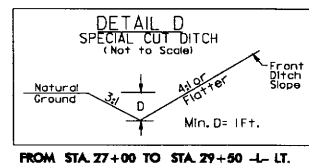
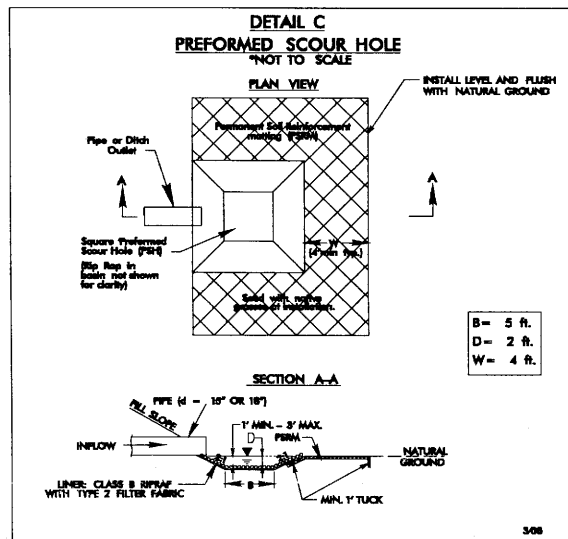
SHEET OF
Permit Drawing
Sheet 14 of 20

8/17/99

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KO & ASSOCIATES, P.C.
Consulting Engineers
A Florence & Hatcheson, Inc. Company
5121 KINGDOM WAY, SUITE 100 RALEIGH, N.C. 27607
(919) 851-6066

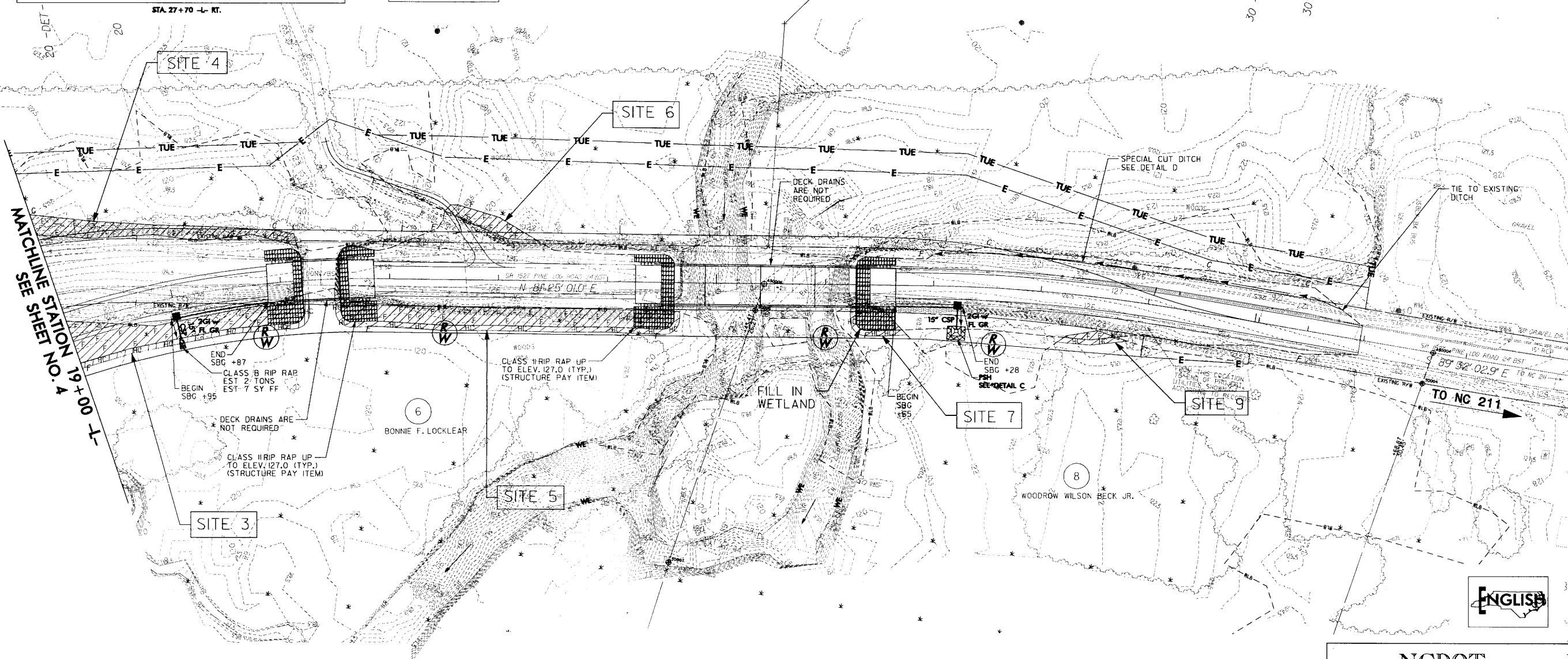
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B-3693		5
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		



REMOVE EXISTING ROADBED AND FILLS TO NATURAL GROUND.

LARRY T. EDWARDS & THOMAS J. KEITH

NOTE:
SEE SHEET NO. 2-D FOR
RELOCATED DRIVE INFO.



PLAN VIEW
SITES 3-7 AND 9

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- [Hatched Box] DENOTES FILL IN WETLAND
- [Hatched Box] DENOTES EXCAVATION IN WETLAND
- [Hatched Box] DENOTES HAND CLEARING

NCDOT
DIVISION OF HIGHWAYS
ROBESON COUNTY
PROJECT: 33233.1.1 (B-3693)
BRIDGE NO. 207 OVER HOLLY
SWAMP AND BRIDGE NOS.
210 AND 211 OVER RAFT SWAMP

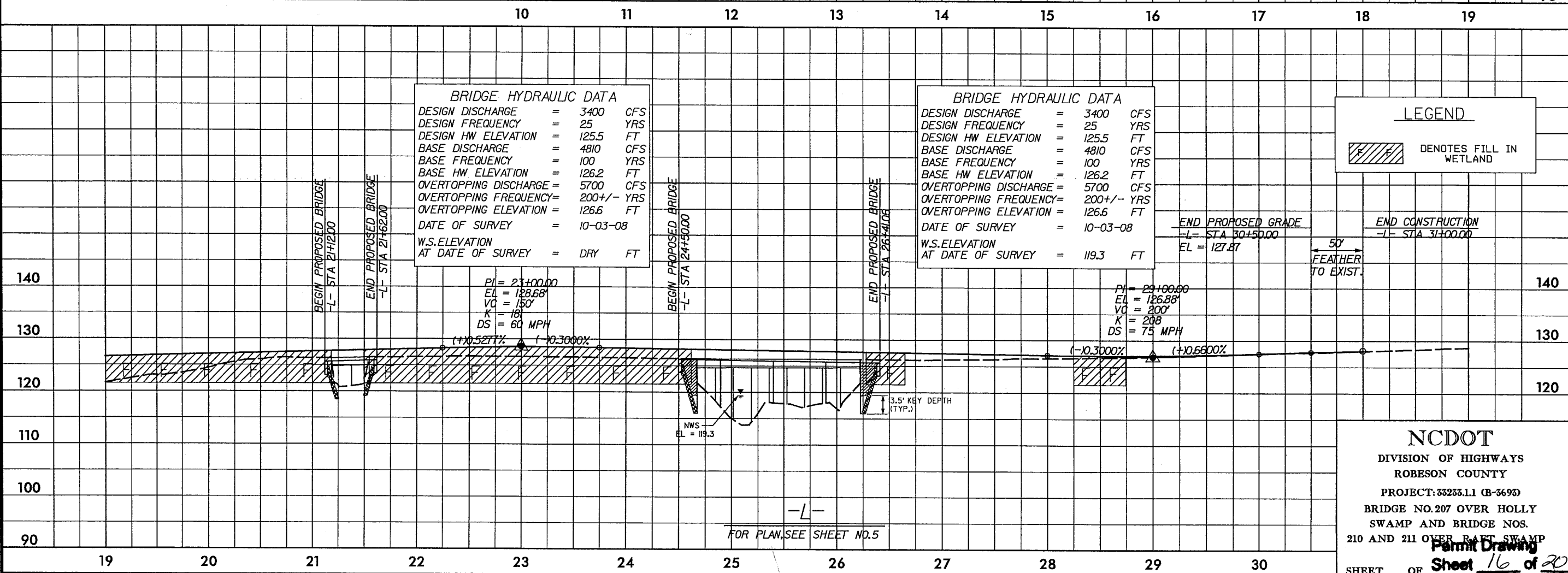
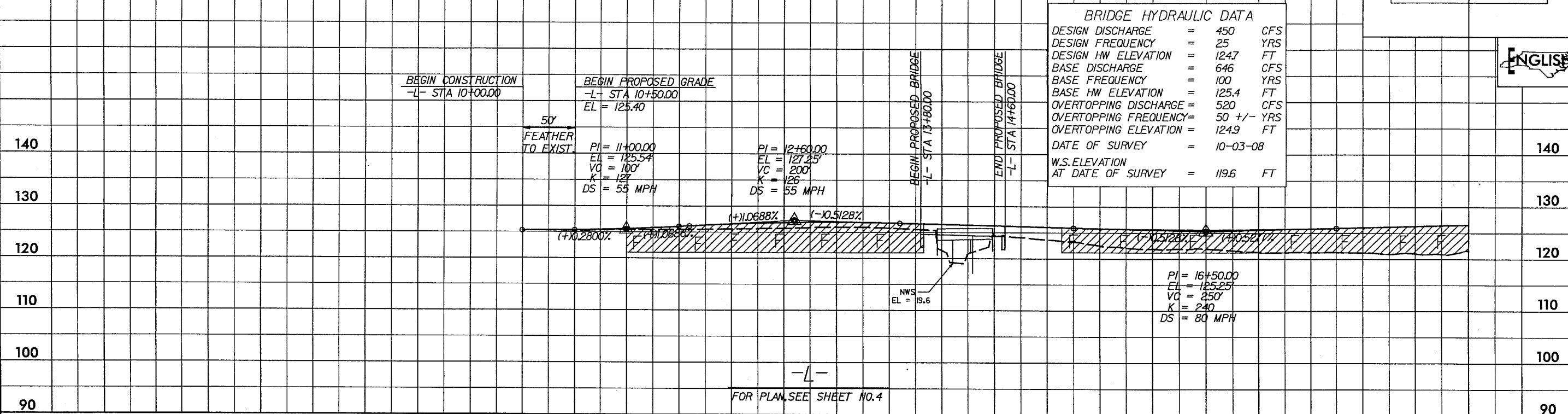
SHEET OF
Permit Drawing
Sheet 15 of 20

5/28/99

KO & ASSOCIATES, P.C.
Consulting Engineers
A Florence & Hutcheson, Inc. Company
5121 KINGDOM WAY, SUITE 100 RALEIGH, N.C. 27607
(919) 851-6066

PROJECT REFERENCE NO. **B-3693**
SHEET NO. **6**
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ENGLISH



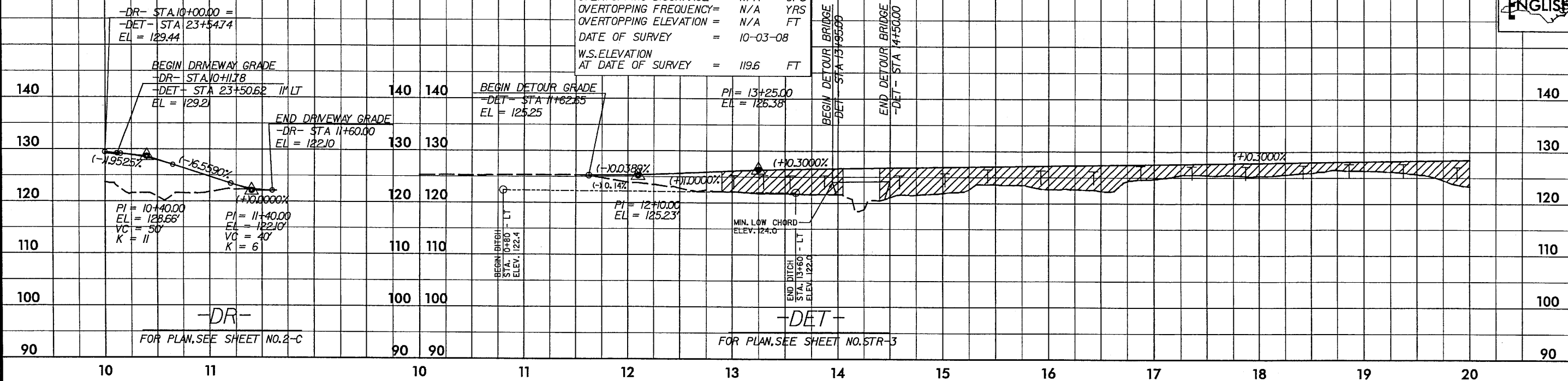
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KO & ASSOCIATES, P.C.

5/28/99

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

ENGLISH

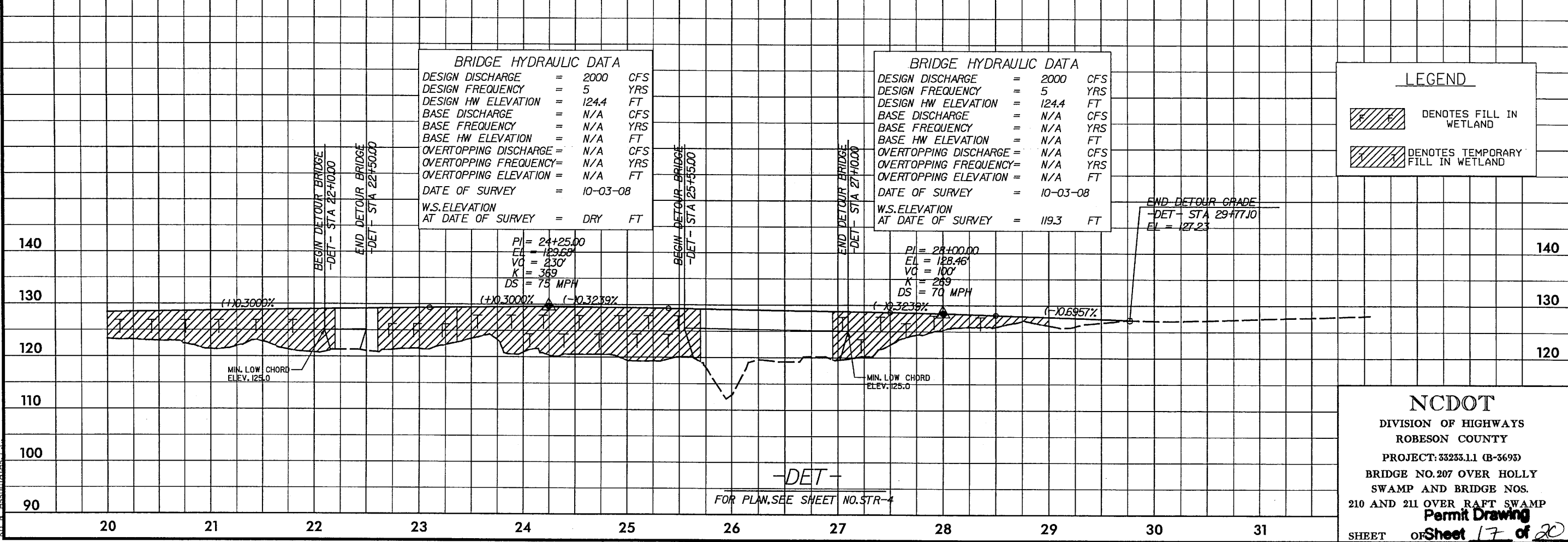
BRIDGE HYDRAULIC DATA		
DESIGN DISCHARGE	=	260 CFS
DESIGN FREQUENCY	=	5 YRS
DESIGN HW ELEVATION	=	123.5 FT
BASE DISCHARGE	=	N/A CFS
BASE FREQUENCY	=	N/A YRS
BASE HW ELEVATION	=	N/A FT
OVERTOPPING DISCHARGE	=	N/A CFS
OVERTOPPING FREQUENCY	=	N/A YRS
OVERTOPPING ELEVATION	=	N/A FT
DATE OF SURVEY	=	10-03-08
W.S.ELEVATION AT DATE OF SURVEY	=	119.6 FT



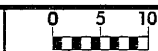
BRIDGE HYDRAULIC DATA		
DESIGN DISCHARGE	=	2000 CFS
DESIGN FREQUENCY	=	5 YRS
DESIGN HW ELEVATION	=	124.4 FT
BASE DISCHARGE	=	N/A CFS
BASE FREQUENCY	=	N/A YRS
BASE HW ELEVATION	=	N/A FT
OVERTOPPING DISCHARGE	=	N/A CFS
OVERTOPPING FREQUENCY	=	N/A YRS
OVERTOPPING ELEVATION	=	N/A FT
DATE OF SURVEY	=	10-03-08
W.S.ELEVATION AT DATE OF SURVEY	=	DRY FT

BRIDGE HYDRAULIC DATA		
DESIGN DISCHARGE	=	2000 CFS
DESIGN FREQUENCY	=	5 YRS
DESIGN HW ELEVATION	=	124.4 FT
BASE DISCHARGE	=	N/A CFS
BASE FREQUENCY	=	N/A YRS
BASE HW ELEVATION	=	N/A FT
OVERTOPPING DISCHARGE	=	N/A CFS
OVERTOPPING FREQUENCY	=	N/A YRS
OVERTOPPING ELEVATION	=	N/A FT
DATE OF SURVEY	=	10-03-08
W.S.ELEVATION AT DATE OF SURVEY	=	119.3 FT

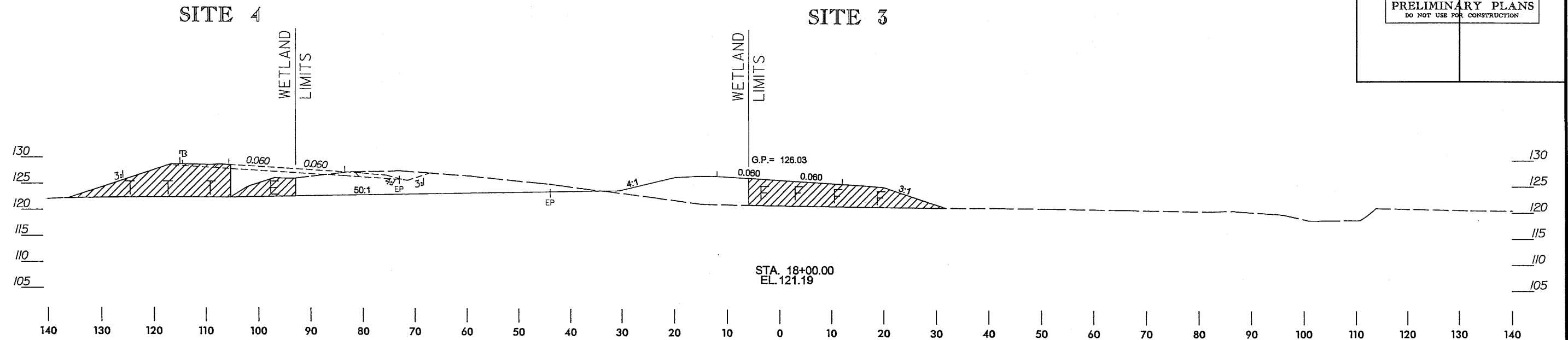
LEGEND	
	DENOTES FILL IN WETLAND
	DENOTES TEMPORARY FILL IN WETLAND



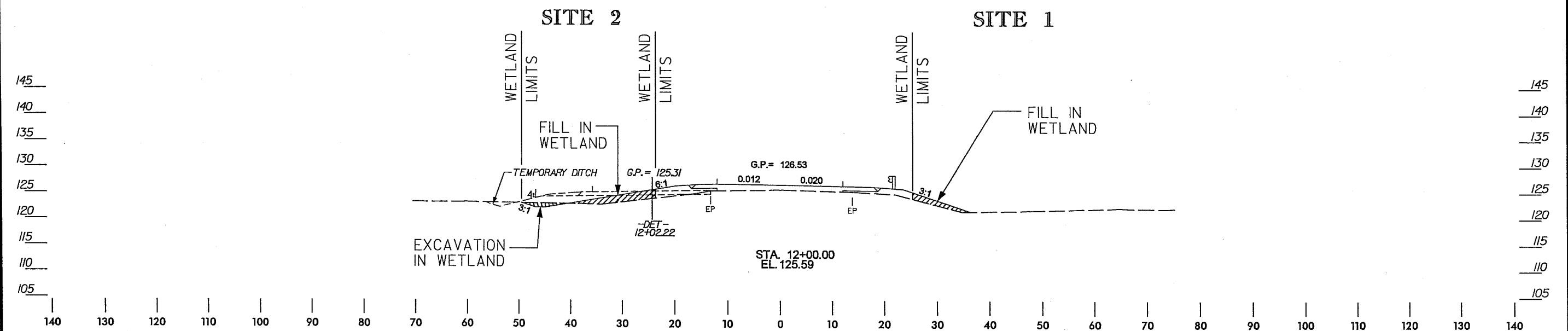
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KO & Associates, P.C.



PROJ. REFERENCE NO.	SHEET NO.
B-3693	XSC SITE 1-4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



SITE 3 AND 4
X-SECTION
STA 18+00 -L-



SITE 1 AND SITE 2
X-SECTION
STA 12+00 -L-

LEGEND

- DENOTES EXCAVATION IN WETLAND
- DENOTES TEMPORARY FILL IN WETLAND
- DENOTES FILL IN WETLAND



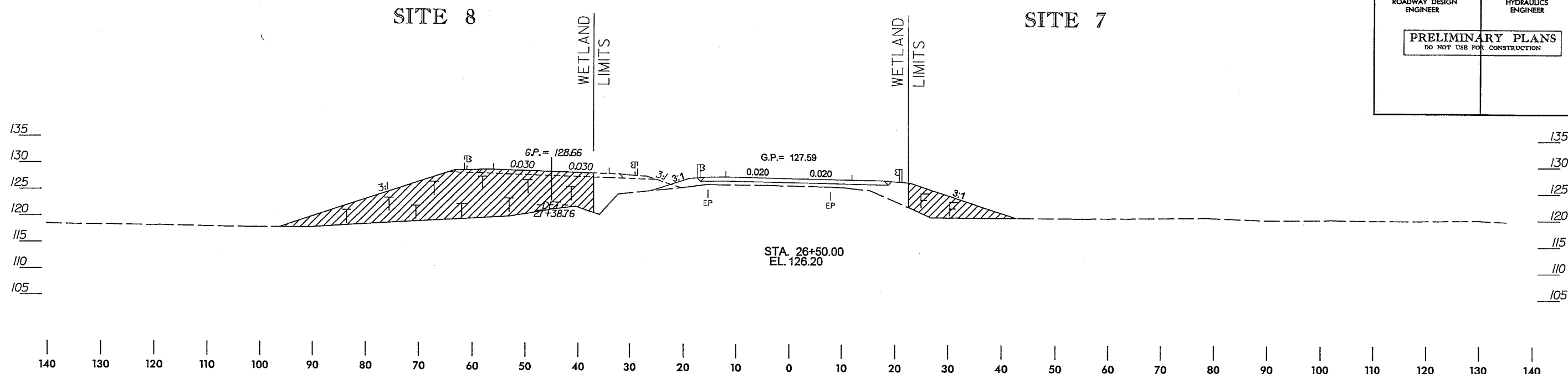
NCDOT
DIVISION OF HIGHWAYS
ROBESON COUNTY
PROJECT: 33233.1.1 (B-3693)
BRIDGE NO. 207 OVER HOLLY
SWAMP AND BRIDGE NOS.
210 AND 211 OVER RATT SWAMP
Permit Drawing
SHEET 18 OF 20

KO & ASSOCIATES, P.C.
Consulting Engineers
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(919) 851-6066

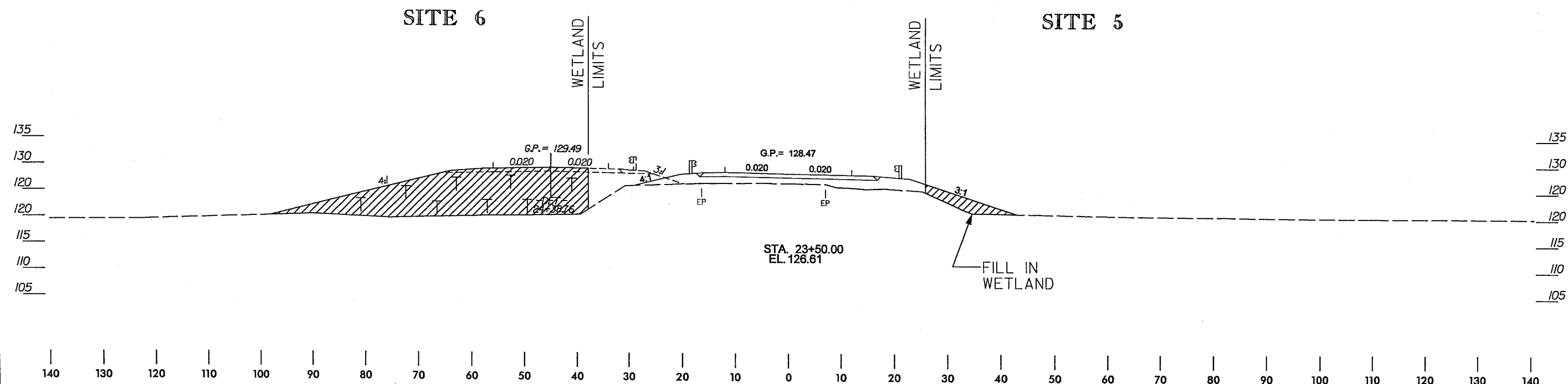
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5/8/2009



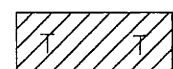
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ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

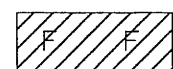


SITE 7 AND 8
X-SECTION
STA 26+50 -L-



LEGEND

 DENOTES TEMPORARY
FILL IN WETLAND

 DENOTES FILL IN
WETLAND

SITE 5 AND SITE 6
X-SECTION
STA 23+50 -L-

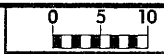
ENGLISH

NCDOT
DIVISION OF HIGHWAYS
ROBESON COUNTY
PROJECT: 33233.1.1 (B-3693)
BRIDGE NO. 207 OVER HOLLY
SWAMP AND BRIDGE NOS.
210 AND 211 OVER RAFT SWAMP
Permit Drawing
SHEET OF Sheet 19 of 20

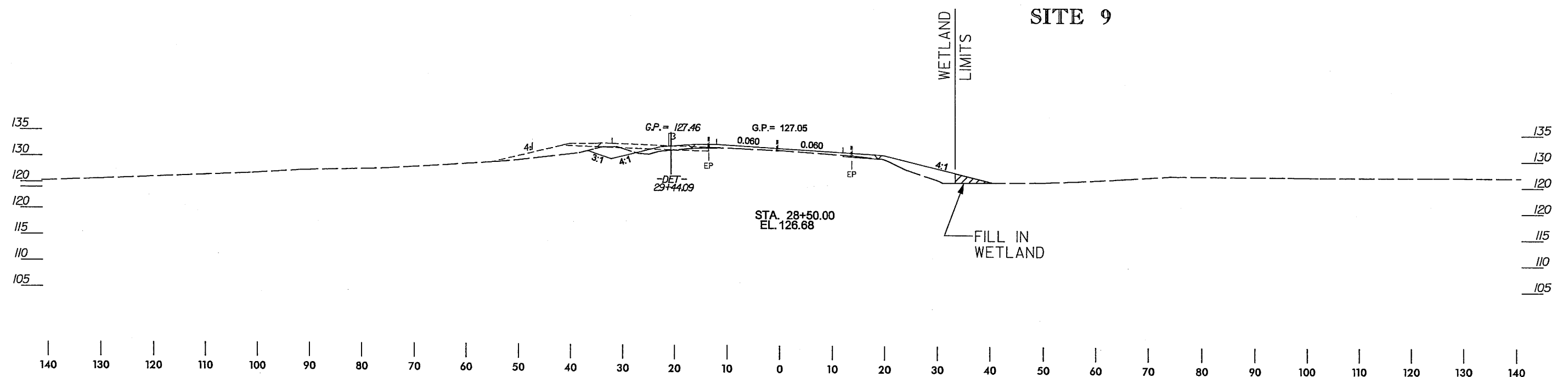
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Consulting Engineers
A Florence & Hutcheson, Inc. Company
5121 KINGDOM WAY, SUITE 100 RALEIGH, N.C. 27607
(919) 851-6066

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5/8/2009



PROJ. REFERENCE NO.	SHEET NO.
B-3693	XSC SITE 9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



LEGEND

 DENOTES FILL IN WETLAND

SITE 9
X-SECTION
STA 28+50 -L-

ENGLISH

KO & ASSOCIATES, P.C.
Consulting Engineers
A Florence & Hutcheson, Inc. Company
5121 KINGDOM WAY, SUITE 100 RALEIGH, N.C. 27607
(919) 851-6066

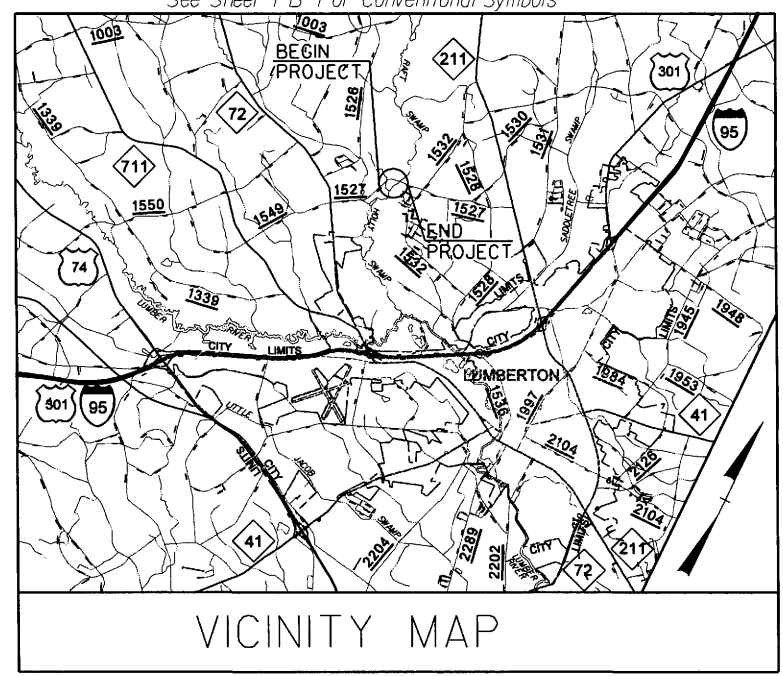
NCDOT
DIVISION OF HIGHWAYS
ROBESON COUNTY
PROJECT: 33233.1.1 (B-3693)
BRIDGE NO. 207 OVER HOLLY
SWAMP AND BRIDGE NOS.
210 AND 211 OVER RAFT SWAMP
Permit Drawing
SHEET **20** of **20**

10/22/2009 R:\Roadway\Proj\B3693_Rdy_tsh.dgn KO & Associates, P.C.

TIP PROJECT: B-3693

CONTRACT:

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



VICINITY MAP

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

RW PLANS

**BEGIN TIP PROJECT B-3693
BEGIN DETOUR CONSTRUCTION**
-L- POT STA. 10+00.00 =
-DET- POT STA. 10+00.00

BEGIN DETOUR BRIDGE
-DET- STA 13+95.00

BEGIN BRIDGE
-L- STA 13+80.00

END DETOUR BRIDGE
-DET- STA 14+50.00

END BRIDGE
-L- STA 14+60.00

END BRIDGE
-L- STA 21+62.00

BEGIN BRIDGE
-L- STA 24+50.00

BEGIN DETOUR BRIDGE
-DET- STA 22+10.00

END DETOUR BRIDGE
-DET- STA 22+50.00

BEGIN DETOUR BRIDGE
-DET- STA 25+55.00

END DETOUR BRIDGE
-DET- STA 27+10.00

END DETOUR CONSTRUCTION
-DET- PT STA. 31+05.24 =
-L- POT STA. 30+08.69

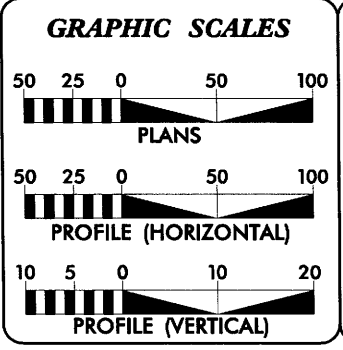
END TIP PROJECT B-3693
-L- STA. 31+00.00

** DESIGN EXCEPTION REQUIRED FOR:
MIN. HORIZONTAL CURVE RADIUS AND BRIDGE WIDTH

NCDOT CONTACT: DOUG TAYLOR, P.E.
ROADWAY DESIGN - ENGINEERING COORDINATION

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



DESIGN DATA	
RURAL MINOR COLLECTOR	
ADT 2010 =	10,570
ADT 2030 =	17,150
DHV =	10 %
D =	57 %
T =	4 % *
V =	60 MPH**
* (TTST 2% + DUAL 2%)	

PROJECT LENGTH	
LENGTH ROADWAY TIP PROJECT B-3693	= 0.337 MI.
LENGTH STRUCTURES TIP PROJECT B-3693	= 0.061 MI.
TOTAL LENGTH OF TIP PROJECT B-3693	= 0.398 MI.

Prepared in the Office of:
KO & ASSOCIATES, P.C.
Consulting Engineers
A Florence & Hutcheson, Inc. Company
5121 KINGDOM WAY, SUITE 100 RALEIGH, N.C. 27607
(919) 851-5565

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MAY 15, 2009

LETTING DATE:
MAY 18, 2010

MICHAEL A. YOUNG, PE
PROJECT ENGINEER

DAVID C. WALLER, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER

PROJECT REFERENCE NO.	SHEET NO.
B-3693	1-A
ROADWAY DESIGN ENGINEER	

GENERAL NOTES:

2006 ROADWAY
STANDARD DRAWINGS

EFF. 07-18-06
REV. 01-02-07

SHEET NUMBER	DESCRIPTION
1	Title Sheet
1-A	Index of Sheets, General Notes and List of Standards
1-B	Conventional Symbols
1-C	Survey Control Sheet
2	Typical Sections, Wedging Detail and Pavement Schedule
2-A	Anchorage for Frames Detail
3	Summary of Quantities
3-A	Summary of Earthwork
3-B	Summaries of Drainage, Guardrail and Pavement Removal
4	Plan Sheet
5	Profile Sheet
TCP-1 thru TCP-3	Traffic Control Plans
SD-1	Special Sign Design
EC-1 thru EC-	Erosion Control Plans
RF-1	Reforestation Plan
U0-1 thru U0-2	Utility by Others
X-1	Cross-Section Summary Sheet
X-2 thru X-6	Cross-Sections
S-1 thru S-25	Structure Plans

GENERAL NOTES:	2006 SPECIFICATIONS EFFECTIVE: 07-18-06 REVISED: 07-18-06
GRADE LINE: GRADING AND SURFACING:	THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.
CLEARING:	CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD 11.
SUPERELEVATION:	ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.
SHOULDER CONSTRUCTION:	ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01.
SIDE ROADS:	THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.
GUARDRAIL:	THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.
TEMPORARY SHORING:	SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.
SUBSURFACE PLANS:	NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.
END BENTS:	THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.
UTILITIES:	UTILITY OWNERS ON THIS PROJECT ARE Progress Energy, Embark & Piedmont Natural Gas. ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.
RIGHT-OF-WAY MARKERS:	ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY CONTRACT.

2006 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated July 18, 2006 are applicable to this project and by reference hereby are considered a part of these plans:

STD. NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method 11
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation - Method 'A'
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.10	Reinforced Bridge Approach Fills
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method 1
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.45	Precast Drainage Structure
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

Note: Not to Scale***S.U.E. = Subsurface Utility Engineering**STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYSPROJECT REFERENCE NO.
B-3693SHEET NO.
1-B

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EIP
Property Corner	-----
Property Monument	□ ECM
Parcel/Sequence Number	(23)
Existing Fence Line	-x-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	--- WLB ---
Proposed Wetland Boundary	WLB
Existing Endangered Animal Boundary	--- EAB ---
Existing Endangered Plant Boundary	--- EPB ---

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

Stream or Body of Water	-----
Hydro, Pool or Reservoir	□
Jurisdictional Stream	--- JS ---
Buffer Zone 1	--- BZ 1 ---
Buffer Zone 2	--- BZ 2 ---
Flow Arrow	←
Disappearing Stream	→
Spring	○
Wetland	~
Proposed Lateral, Tail, Head Ditch	-----
False Sump	◇

RAILROADS:

Standard Gauge	+++++
RR Signal Milepost	○ CSX TRANSPORTATION MILEPOST 35
Switch	□ SWITCH
RR Abandoned	-----
RR Dismantled	-----

RIGHT OF WAY:

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	-----
Proposed Right of Way Line with Iron Pin and Cap Marker	-----
Proposed Right of Way Line with Concrete or Granite Marker	-----
Existing Control of Access	○
Proposed Control of Access	○
Existing Easement Line	--- E ---
Proposed Temporary Construction Easement	--- E ---
Proposed Temporary Drainage Easement	--- TDE ---
Proposed Permanent Drainage Easement	--- PDE ---
Proposed Permanent Utility Easement	--- PUE ---
Proposed Temporary Utility Easement	--- TUE ---
Proposed Permanent Easement with Iron Pin and Cap Marker	◆

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	C
Proposed Slope Stakes Fill	F
Proposed Wheel Chair Ramp	WCR
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equality Symbol	⊕
Pavement Removal	XXXXX

VEGETATION:

Single Tree	✿
Single Shrub	✿
Hedge	~~~~~
Woods Line	~~~~~
Orchard	✿ ✿ ✿ ✿
Vineyard	□ Vineyard

EXISTING STRUCTURES:

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

UTILITIES:

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

TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	Ⓣ
Telephone Booth	Ⓣ
Telephone Pedestal	Ⓣ
Telephone Cell Tower	Ⓣ
U/G Telephone Cable Hand Hole	PH
Recorded U/G Telephone Cable	--- T ---
Designated U/G Telephone Cable (S.U.E.*)	--- T ---
Recorded U/G Telephone Conduit	--- TC ---
Designated U/G Telephone Conduit (S.U.E.*)	--- TC ---
Recorded U/G Fiber Optics Cable	--- F O ---
Designated U/G Fiber Optics Cable (S.U.E.*)	--- F O ---

WATER:

Water Manhole	Ⓜ
Water Meter	○
Water Valve	⊗
Water Hydrant	Ⓜ
Recorded U/G Water Line	--- W ---
Designated U/G Water Line (S.U.E.*)	--- W ---
Above Ground Water Line	A/G Water

TV:

TV Satellite Dish	✕
TV Pedestal	Ⓣ
TV Tower	Ⓣ
U/G TV Cable Hand Hole	PH
Recorded U/G TV Cable	--- TV ---
Designated U/G TV Cable (S.U.E.*)	--- TV ---
Recorded U/G Fiber Optic Cable	--- F O ---
Designated U/G Fiber Optic Cable (S.U.E.*)	--- F O ---

GAS:

Gas Valve	◇
Gas Meter	Ⓜ
Recorded U/G Gas Line	--- G ---
Designated U/G Gas Line (S.U.E.*)	--- G ---
Above Ground Gas Line	A/G Gds

SANITARY SEWER:

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

MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	Ⓢ
Utility Unknown U/G Line	--- ? ---
U/G Tank; Water, Gas, Oil	□
A/G Tank; Water, Gas, Oil	□
U/G Test Hole (S.U.E.*)	Ⓜ
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

SURVEY CONTROL SHEET B-3693

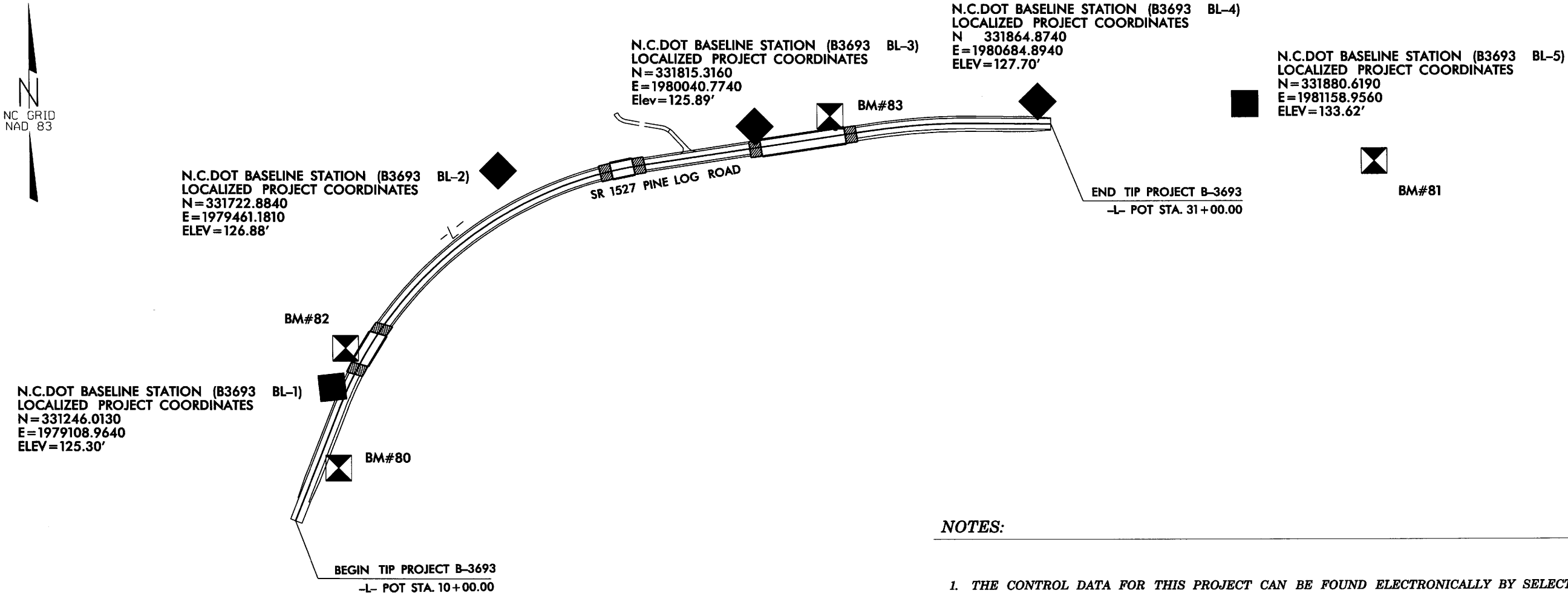
BL	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1		B3693 BL-1	331246.0130	1979108.9640	125.30	13+00.99	20.12 LT
2		B3693 BL-2	331722.8840	1979461.1810	126.88	18+69.33	79.46 LT
3		B3693 BL-3	331815.3160	1980040.7740	125.89	24+34.90	21.46 LT
4		B3693 BL-4	331864.8740	1980684.8940	127.70	30+79.42	16.64 LT
5		B3693 BL-5	331880.6190	1981158.9560	133.62	OUTSIDE PROJECT LIMITS	

BM80 ELEVATION = 122.95
N 331080 E 1979101
L STATION 11+44 34 RIGHT
RR SPIKE IN BASE OF 24IN GUM TREE

BM81 ELEVATION = 138.69
N 331834 E 1981289
L STATION 33+21
S 88° 04' 14.9" E DIST 362.70
RR SPIKE IN BASE OF 15IN OAK TREE

BM82 ELEVATION = 127.14
N 331330 E 1979147
L STATION 13+91 23 LEFT
CHISELED SQ IN BRIDGE CURB (NCGS
BENCHMARK - ROB76 RM)

BM83 ELEVATION = 126.90
N 331838 E 1980226
L STATION 26+21 16 LEFT
MARK IS IN BRIDGE CURB (NCGS BENCHMARK -
ROB76)



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY FOR MONUMENT "SEE"

WITH STATE PLANE GRID COORDINATES OF
NORTHING: 3397545.173(ft) EASTING: 1984874.0289(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999925560
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "SEE" TO L- STATION 10+00 IS
S 33°39'37" W 10568.1099'

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

- NOTES:**
1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.org/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/)
THE FILES TO BE FOUND ARE AS FOLLOWS:
B3693_LS_CONTROL_080930.TXT
SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- © INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

NOTE: DRAWING NOT TO SCALE

PAVEMENT SCHEDULE

A	CONCRETE OVERLAY (STRUCTURE PAY ITEM)	E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE 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 5½" IN DEPTH.
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	J	PROP. 8" AGGREGATE BASE COURSE.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	P	PRIME COAT AT THE RATE OF .35 GAL. 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 TO EXCEED 2" IN DEPTH.	T	EARTH MATERIAL.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.		

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

TRANSITION FROM EXISTING TO T.S. NO. 1

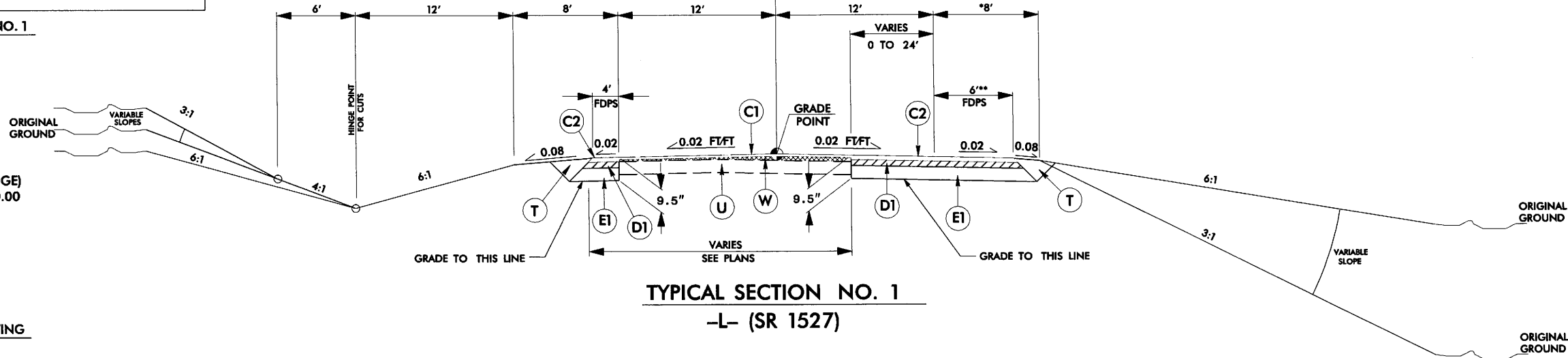
-L- STA. 10+00.00 TO 10+50.00

USE TYPICAL SECTION NO. 1

-L- STA. 10+50.00 TO 13+80.00 (BRIDGE)
-L- STA. 26+41.06 (BRIDGE) TO 30+50.00

TRANSITION FROM T.S. NO. 1 TO EXISTING

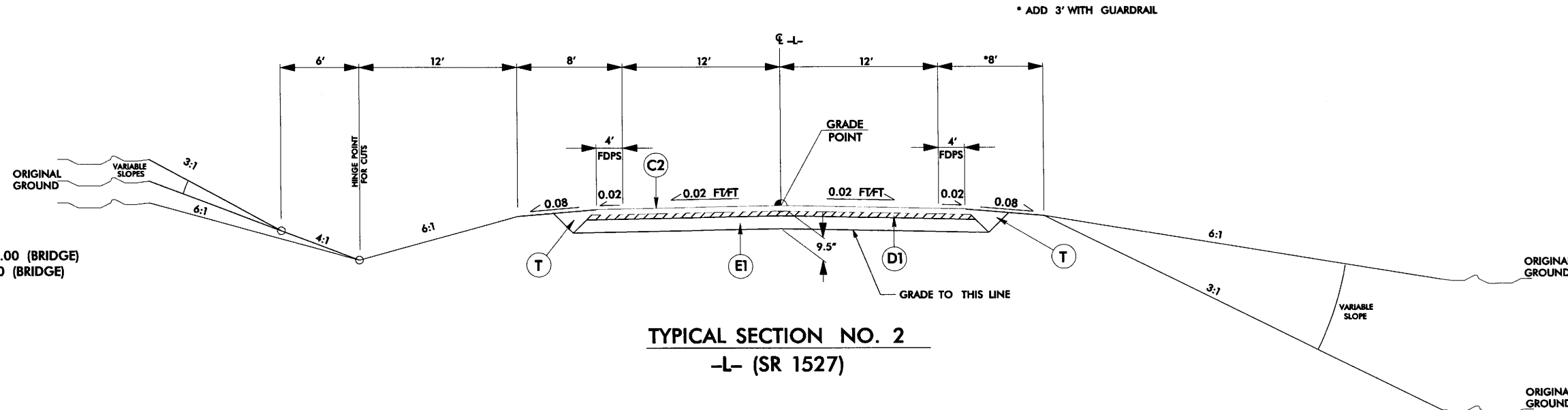
-L- STA. 30+50.00 TO 31+00.00



TYPICAL SECTION NO. 1
-L- (SR 1527)

USE TYPICAL SECTION NO. 2

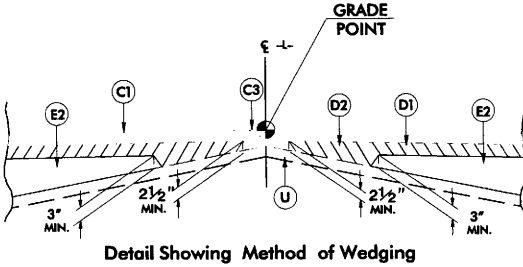
-L- STA. 14+60.00 (BRIDGE) TO 21+12.00 (BRIDGE)
-L- STA. 21+62 (BRIDGE) TO 24+50.00 (BRIDGE)



TYPICAL SECTION NO. 2
-L- (SR 1527)

KO & ASSOCIATES, P.C.
Consulting Engineers
A Florence & Hutcheson, Inc. Company
5121 KINGDOM WAY, SUITE 100 RALEIGH, N.C. 27607
(919) 851-6066

PROJECT REFERENCE NO. B-3693	SHEET NO. 2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



* ADD 3' WITH GUARDRAIL
** EXTRA 2' OF FULL DEPTH PAVED SHOULDER
REQUIRED FOR MAINTENANCE OF TRAFFIC.



KO & ASSOCIATES, P.C.
Consulting Engineers
 A Florence & Hutcheson, Inc. Company
 5121 KINGDOM WAY, SUITE 100 RALEIGH, N.C. 27601
 (919) 851-6066

CL -DR-

2' 2' 4' 4' 2'

ORIGINAL GROUND

3:1

0.08 0.02 FT/FT 0.02 FT/FT 0.08

GRADE POINT

8"

GRADE TO THIS LINE

ORIGINAL GROUND

PRELIMINARY PLAN
DO NOT USE FOR CONSTRUCTION

USE TYPICAL SECTION NO. 3
-DR- STA. 10+13.00 TO 11+60.00

-DET- STA. 10 +00.00 TO 13 +95.00 (BRIDGE)
 -DET- STA. 14 +50.00 (BRIDGE) TO 22 +10.00 (BRIDGE)
 -DET- STA. 22 +50.00 (BRIDGE) TO 25 +55.00 (BRIDGE)
 -DET- STA. 27 +10.00 (BRIDGE) TO 31 +05.24



-L- STA. 13+80.00 TO 14+60.00



TYPICAL SECTION NO. 5
-L- (SR 1527)

6/2/99

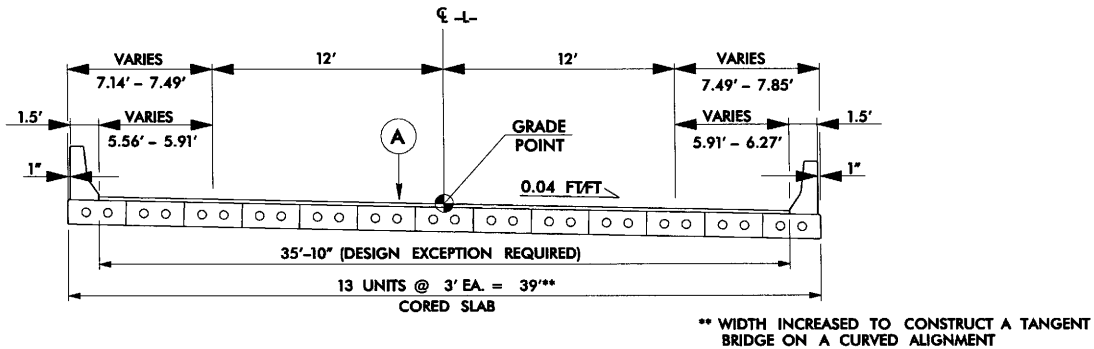
10/22/2009
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KO & ASSOCIATES, P.C.

PAVEMENT SCHEDULE			
A	CONCRETE OVERLAY (STRUCTURE PAY ITEM)	E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE 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 5½" IN DEPTH.
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	J	PROP. 8" AGGREGATE BASE COURSE.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	P	PRIME COAT AT THE RATE OF .35 GAL. 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 TO EXCEED 2" IN DEPTH.	T	EARTH MATERIAL.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.	



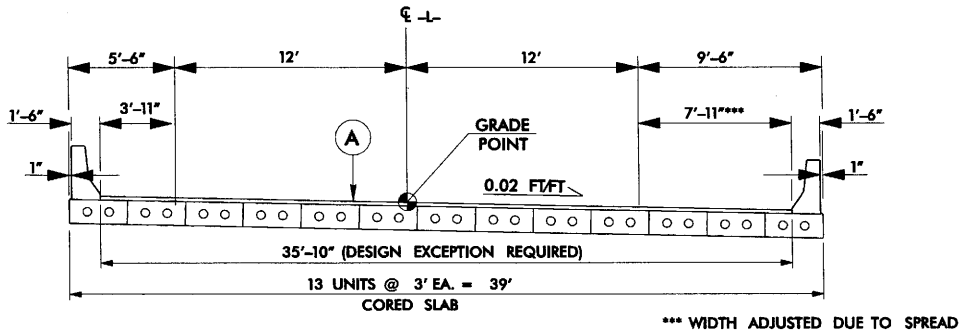
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Consulting Engineers
A Florence & Hutcheson, Inc. Company
5121 KINGDOM WAY, SUITE 100 RALEIGH, N.C. 27607
(919) 851-6066

PROJECT REFERENCE NO.		SHEET NO.	
B-3693		2-B	
ROADWAY DESIGN ENGINEER		PAVEMENT DESIGN ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			



TYPICAL SECTION NO. 6
-L- (SR 1527)

USE TYPICAL SECTION NO. 6
-L- STA. 21+12.00 TO 21+62.00



TYPICAL SECTION NO. 7
-L- (SR 1527)

USE TYPICAL SECTION NO. 7
-L- STA. 24+50.00 TO 26+41.06

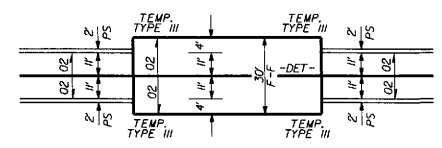
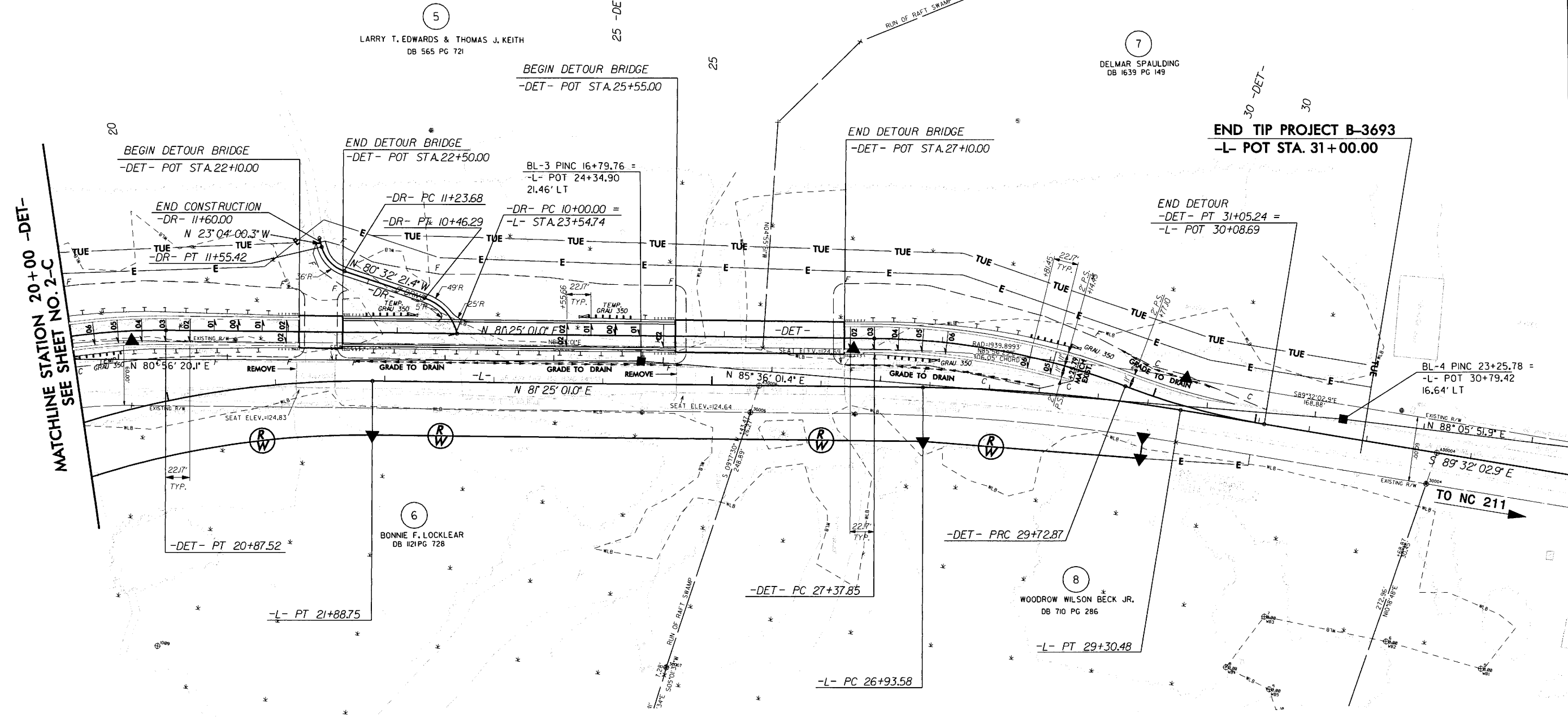
8/17/99

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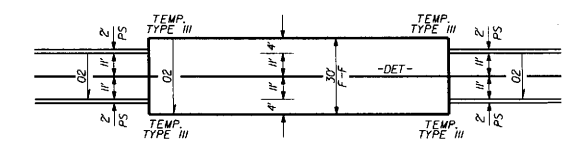
PROJECT REFERENCE NO. B-3693		SHEET NO. 2-D	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			

-L-		-DET-	
PI Sta 17+78.38	PI Sta 28+12.28	PI Sta 28+56.66	PI Sta 30+39.29
$\Delta = 59^{\circ} 51' 12.7''$ (RT)	$\Delta = 9^{\circ} 02' 56.1''$ (RT)	$\Delta = 20^{\circ} 43' 01.3''$ (RT)	$\Delta = 1^{\circ} 40' 05.2''$ (LT)
D = 6' 32' 53.1"	D = 3' 49' 11.0"	D = 8' 48' 53.0"	D = 8' 48' 53.0"
L = 914.06'	L = 236.90'	L = 235.03'	L = 132.37'
T = 503.69'	T = 118.70'	T = 118.81'	T = 66.41'
R = 875.00'	R = 1,500.00'	R = 650.00'	R = 650.00'
e = .06	e = .06	e = .06	e = .06
RUNOFF = 160'	RUNOFF = 160'	RUNOFF = 133'	RUNOFF = 133'
* DESIGN EXCEPTION REQUIRED			
-DR-			
PI Sta 10+25.43	PI Sta 11+41.03		
$\Delta = 58^{\circ} 56' 11.4''$ (LT)	$\Delta = 57^{\circ} 28' 21.1''$ (RT)		
D = 127' 19' 26.2"	D = 181' 04' 16.6"		
L = 46.29'	L = 317.4'		
T = 25.43'	T = 17.35'		
R = 45.00'	R = 31.64'		

TEMPORARY DETOUR



PAVEMENT - BRIDGE RELATIONSHIP SKETCH



PAVEMENT - BRIDGE RELATIONSHIP SKETCH

LEGEND
PAVED SHOULDER

FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-7
FOR -DET- PROFILE, SEE SHEET NO. 7
FOR -DR- PROFILE, SEE SHEET NO. 7

REVISIONS
10-28-09 REVISED PROPERTY OWNERS FOR PARCELS 4,5,6 & 7. REVISED TCE ON PARCEL 8.

10/28/2009
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PARCEL INDEX SHEET

PARCEL NO.	R/W SHEET NO.	PROPERTY OWNERS NAME
1	4	Sally Cade Walters
2	4	Polly Barr
3	4	Dan Cade, Jr.
4	4	Billy Durell Currie
5	4,5	Larry T. Edwards & Thomas J. Keith
6	4,5	Bonnie F. Locklear
7	5	Delmar Spaulding
8	5	Woodrow Wilson Beck, Jr.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SUMMARY OF EARTHWORK
IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
SUMMARY NO. 1					
-L- 10+00 TO 13+80	10		570	560	
TOTAL SUMMARY NO. 1	10		570	560	
SUMMARY NO. 2					
-L- 14+60 TO 21+12	9		4817	4808	
TOTAL SUMMARY NO. 2	9		4817	4808	
SUMMARY NO. 3					
-L- 21+62 TO 24+50	4		1582	1578	
TOTAL SUMMARY NO. 3	4		1582	1578	
SUMMARY NO. 4					
-L- 26+41.06 TO 31+00	114		757	643	
TOTAL SUMMARY NO. 4	114		757	643	
SUMMARY NO. 5					
(DETOUR) -L- 10+00 TO 13+80	38		1225	1187	
TOTAL SUMMARY NO. 5	38		1225	1187	
SUMMARY NO. 6					
(DETOUR) -L- 14+60 TO 21+12	342		6613	6271	
TOTAL SUMMARY NO. 6	342		6613	6271	
SUMMARY NO. 7					
(DETOUR) -L- 21+62 TO 24+50	0		5591	5591	
TOTAL SUMMARY NO. 7	0		5591	5591	
SUMMARY NO. 8					
(DETOUR) -L- 26+41.06 TO 31+00	79		1887	1808	
TOTAL SUMMARY NO. 8	79		1887	1808	
SUB-TOTAL (SUMMARIES 1 THRU 8)	595		23,041	22,446	
SUMMARY NO. 9					
(DETOUR REMOVAL) -L- 10+00 TO 13+80	941				941
TOTAL SUMMARY NO. 9	941				941
SUMMARY NO. 10					
(DETOUR REMOVAL) -L- 14+60 TO 21+12	5586				5586
(REMOVE EX. RD. BED) -L- 14+60 TO 21+12	4404				4404
TOTAL SUMMARY NO. 10	9990				9990
SUMMARY NO. 11					
(DETOUR REMOVAL) -L- 21+62 TO 24+50	3615				3615
TOTAL SUMMARY NO. 114	3615				3615
SUMMARY NO. 12					
(DETOUR REMOVAL) -L- 26+41.06 TO 31+00	1554				1554
TOTAL SUMMARY NO. 12	1554				1554
SUB-TOTAL (SUMMARIES 9 THRU 12)	16,100				16,100
PROJECT TOTAL	16,695		23,041	22,446	16,100
EST. 5% FOR REPLACING TOPSOIL IN BORROW PITS				1122	
GRAND TOTAL	16,695		23,041	23,568	16,100
SAY	16,700			23,600	16,100

ESTIMATE DDE = 10 CY

ESTIMATE UNDERCUT EXCAVATION = 900 CY

SELECT MATERIAL, CLASS II OR III = 900 CY

NOTE: Earthwork quantities are calculated by the Roadway Design Unit.
These earthwork quantities are based in part on subsurface data
provided by the Geotechnical Engineering Unit.

NOTE: Approximate quantities only. Unclassified Excavation, Borrow Excavation,
Fine Grading, Clearing and Grubbing, and Removal of Existing Asphalt
Pavement will be paid for at the contract lump sum price for "Grading."

62100

COMPUTED BY:	DATE:
CHECKED BY:	DATE:

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-3655	3-C

SUMMARY OF PAVEMENT REMOVAL

SURVEY LINE	STATION TO STATION	LOCATION	ASPHALT REMOVAL (SY)
-L-	13+57 TO 13+95	CL	116.7
-L-	14+47 TO 21+18	LT	2,173.4
-L-	21+54 TO 24+67	CL	830.2
-L-	26+22 TO 26+65	CL	110.9
-DET-	10+61 TO 13+95	CL	599.7
-DET-	14+50 TO 22+10	CL	1,857.8
-DET-	22+50 TO 25+50	CL	745.6
-DET-	27+10 TO 30+47	CL	666.6
	TOTAL		7,100.9
	SAY		7,110

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL
 TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
 FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL
 W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL
 G = GATING IMPACT ATTENUATOR TYPE 350
 NG = NON-GATING IMPACT ATTENUATOR TYPE 350

[illegible]

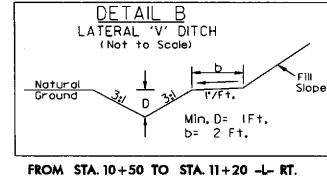
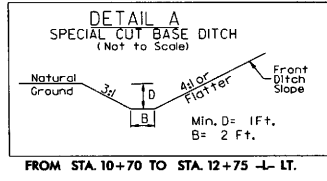
*N = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL
 TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
 FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL
 W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL
 G = GATING IMPACT ATTENUATOR TYPE 350
 NG = NON-GATING IMPACT ATTENUATOR TYPE 350

10/22/2009
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8/17/99

KO & ASSOCIATES, P.C.
Consulting Engineers
A Florence & Hutcheson, Inc. Company
5121 KINGDOM WAY, SUITE 100 RALEIGH, N.C. 27607
(919) 851-4066

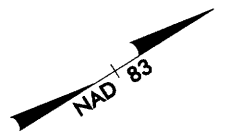
PROJECT REFERENCE NO.		SHEET NO.
B-3693		4
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		



-DET-		
PI Sta 11+6.91 $\Delta = 16' 15' 36.7''$ (LT) $D = 8' 48' 53.0''$ $L = 184.47'$ $T = 92.86'$ $R = 650.00'$ $e = .06$ RUNOFF = 133'	PI Sta 12+94.23 $\Delta = 16' 15' 36.7''$ (RT) $D = 9' 32' 57.5''$ $L = 170.28'$ $T = 85.71'$ $R = 600.00'$ $e = .06$ RUNOFF = 133'	PI Sta 18+06.12 $\Delta = 59' 51' 12.7''$ (RT) $D = 9' 32' 57.5''$ $L = 626.78'$ $T = 345.39'$ $R = 600.00'$ $e = .06$ RUNOFF = 133'

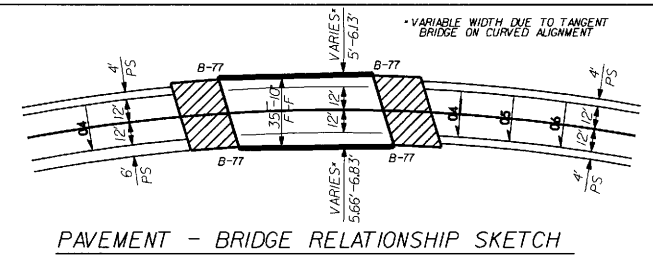
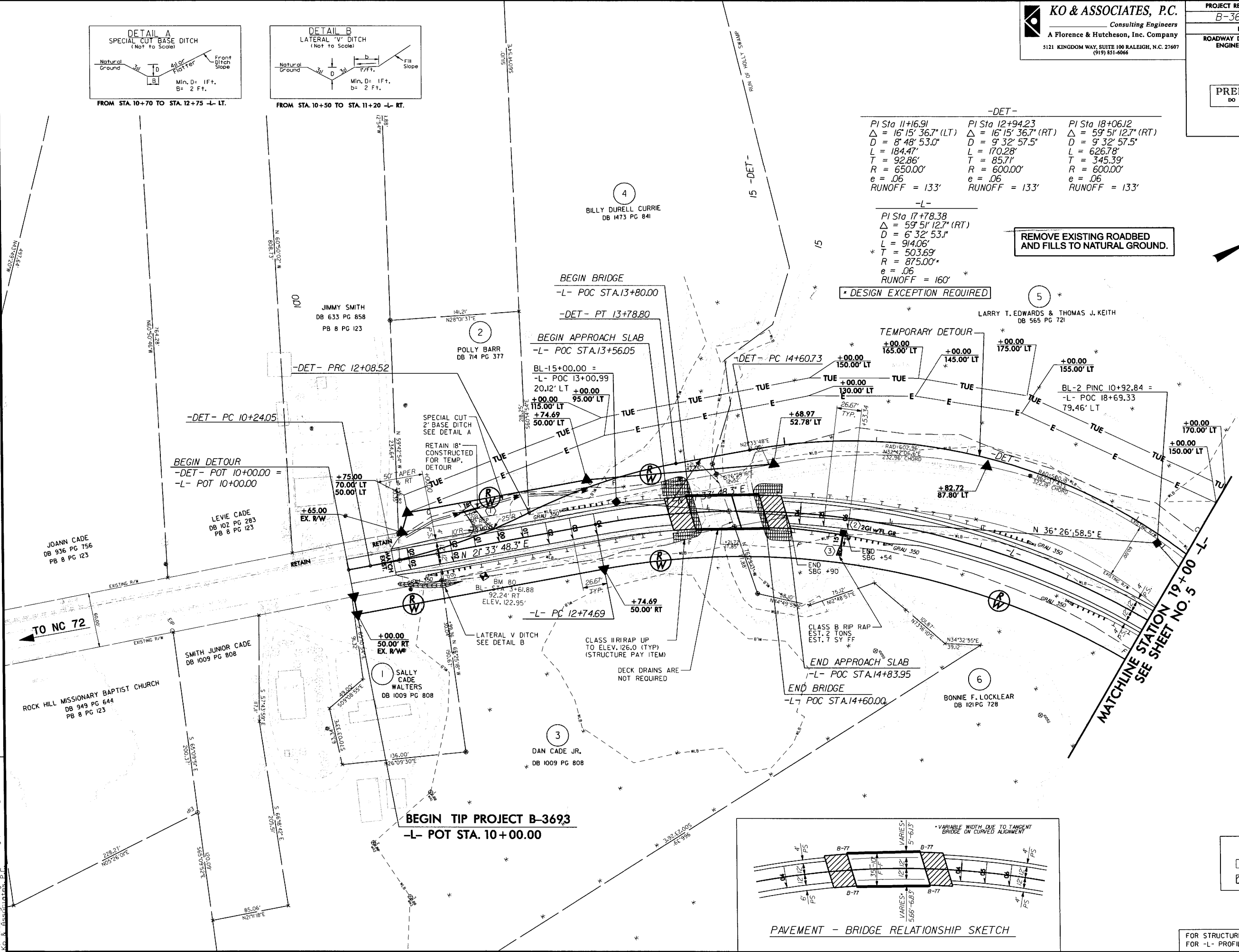
-L-	
PI Sta 17+78.38 $\Delta = 59' 51' 12.7''$ (RT) $D = 6' 32' 53.1''$ $L = 914.06'$ $T = 503.69'$ $R = 875.00'$ $e = .06$ RUNOFF = 160'	

REMOVE EXISTING ROADBED
AND FILLS TO NATURAL GROUND.



REVISIONS
10-28-09 REVISED PROPERTY OWNERS FOR PARCELS 4, 5, 6 & 7. REVISED TCE ON PARCEL 8.

10/28/2009
K:\Rockway\p\B3693_Rdwy_Psh_04.dgn
K. H. HARRIS



LEGEND

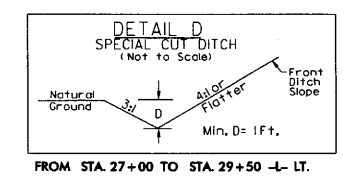
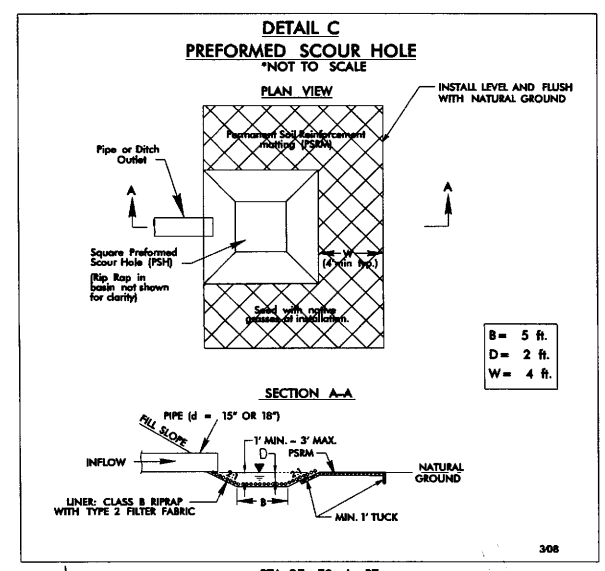
	PAVED SHOULDER
	APPROACH SLAB

FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-4
FOR -L- PROFILE, SEE SHEET NO. 6

8/17/99

KO & ASSOCIATES, P.C.
Consulting Engineers
A Florence & Hutcheson, Inc. Company
5121 KINGDOM WAY, SUITE 100 RALEIGH, N.C. 27607
(919) 851-6066

PROJECT REFERENCE NO. B-3693		SHEET NO. 5	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		DO NOT USE FOR CONSTRUCTION	



-L-	-DET-
PI Sta 17+78.38 $\Delta = 59' 51" 12.7" (RT)$ $D = 6' 32' 53.1"$ $L = 914.06'$ $T = 503.69'$ $R = 875.00'$ $e = .06$ RUNOFF = 160'	PI Sta 28+12.28 $\Delta = 9' 02' 56.1" (RT)$ $D = 3' 49' 11.0"$ $L = 236.90'$ $T = 118.70'$ $R = 1,500.00'$ $e = .06$ RUNOFF = 160'
* DESIGN EXCEPTION REQUIRED	
-DR-	
PI Sta 10+25.43 $\Delta = 58' 56' 11.4" (LT)$ $D = 127' 19' 26.2"$ $L = 46.29'$ $T = 25.43'$ $R = 45.00'$	PI Sta 11+41.03 $\Delta = 57' 28' 21.1" (RT)$ $D = 181' 04' 16.6"$ $L = 317.4'$ $T = 17.35'$ $R = 31.64'$

REMOVE EXISTING ROADBED AND FILLS TO NATURAL GROUND.

5
LARRY T. EDWARDS & THOMAS J. KEITH
DB 565 PG 721

NOTE: SEE SHEET NO. 2-D FOR RELOCATED DRIVE INFO.

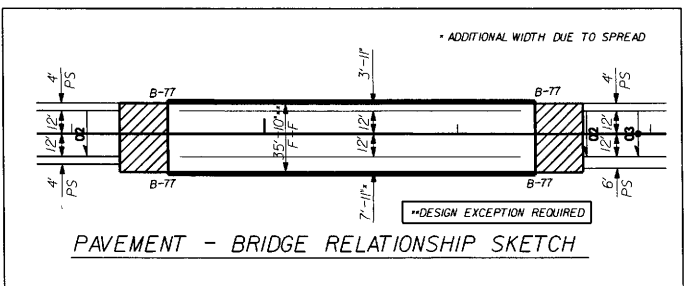
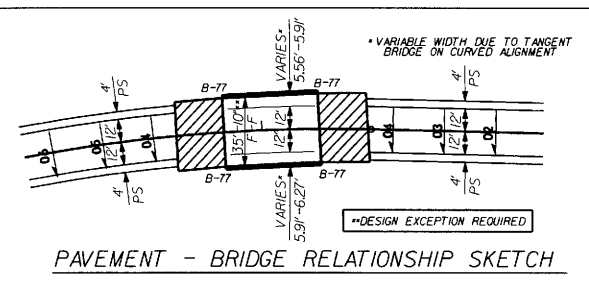
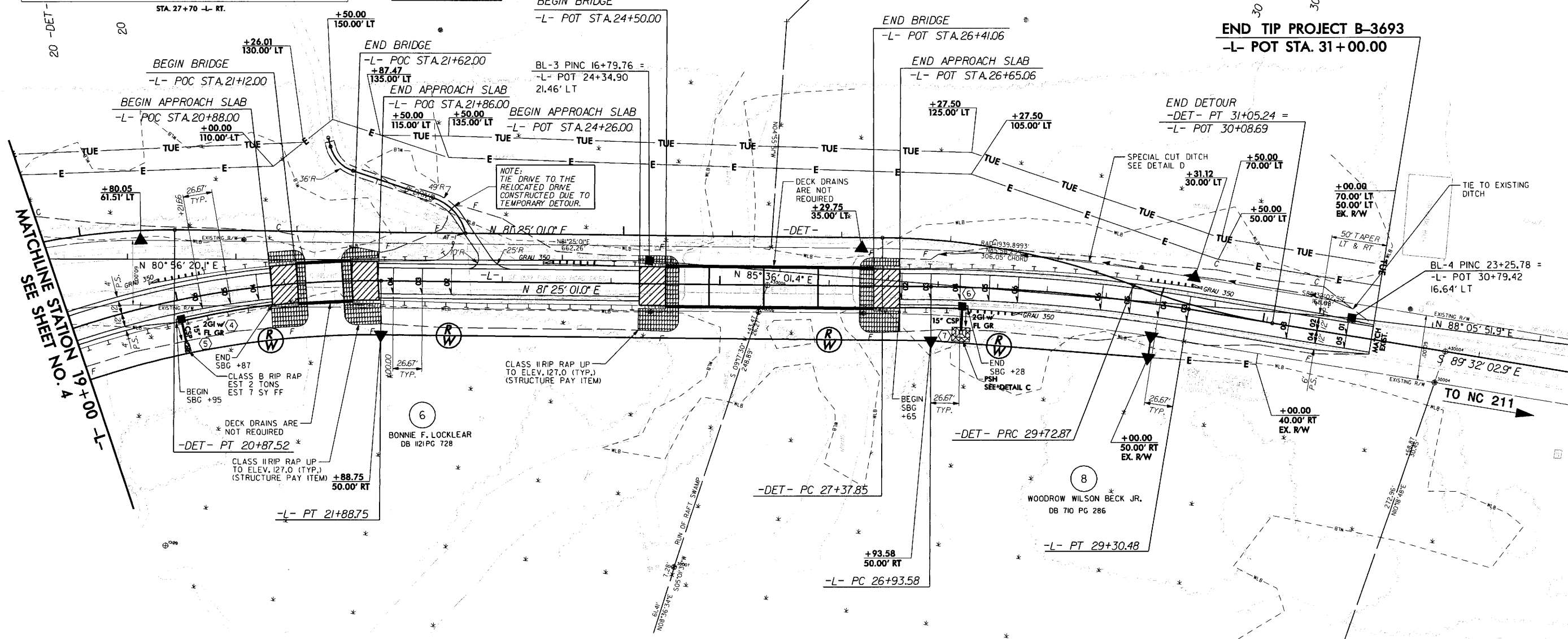
BEGIN BRIDGE
-L- POT STA. 24+50.00

END BRIDGE
-L- POT STA. 26+41.06

END APPROACH SLAB
-L- POT STA. 26+65.06

END TIP PROJECT B-3693
-L- POT STA. 31+00.00

END DETOUR
-DET- PT 31+05.24 =
-L- POT 30+08.69



LEGEND

[Symbol]	PAVED SHOULDER
[Symbol]	APPROACH SLAB

FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-4
FOR -L- PROFILE, SEE SHEET NO. 6

REVISIONS
10-28-09 REVISED PROPERTY OWNERS FOR PARCELS 4, 5, 6 & 7. REVISED TCE ON PARCEL 8.

10/28/2009
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K. S. Associates, P.C.

5/28/99
10/28/2009
KO & ASSOCIATES, P.C.
B-3693
RDY.pfl 06.dgn

**KO & ASSOCIATES, P.C.**
Consulting Engineers
A Florence & Hutcheson, Inc. Company
5121 KINGDOM WAY, SUITE 100 RALEIGH, N.C. 27607
(919) 851-0066

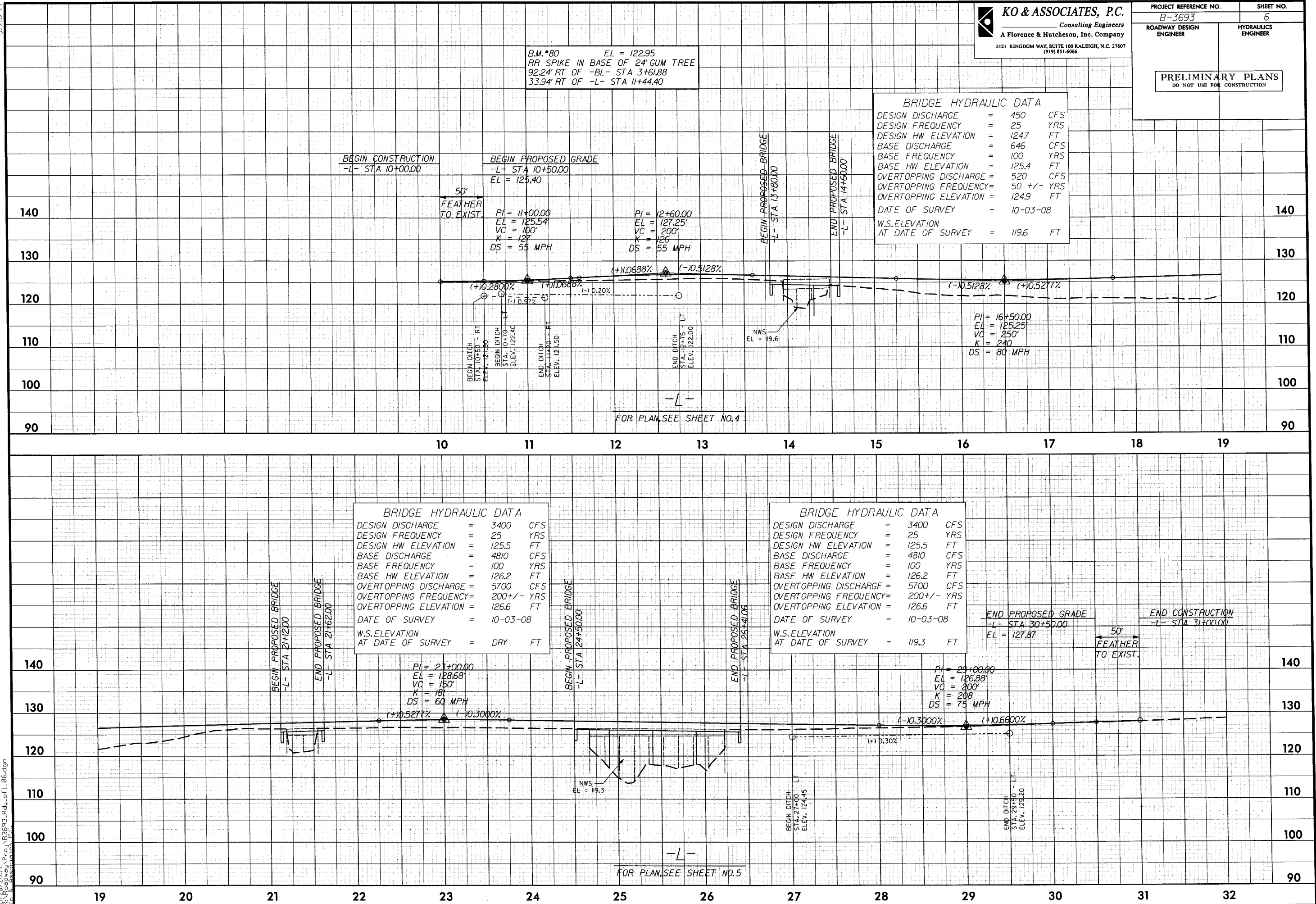
PROJECT REFERENCE NO.
B-3693

SHEET NO.
6

ROADWAY DESIGN
ENGINEER

HYDRAULICS
ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

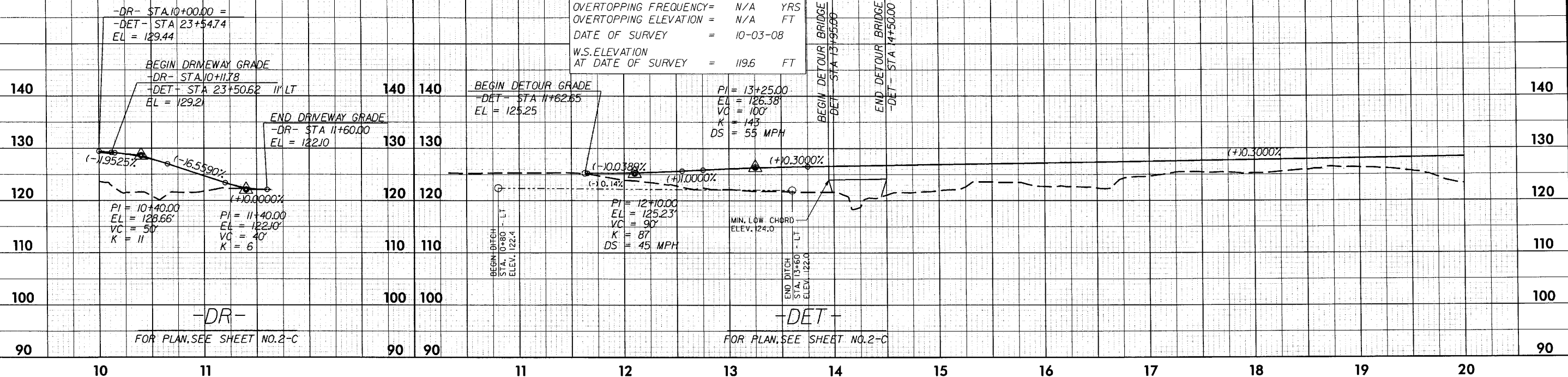


BRIDGE HYDRAULIC DATA		
DESIGN DISCHARGE	=	450 CFS
DESIGN FREQUENCY	=	25 YRS
DESIGN HW ELEVATION	=	124.7 FT
BASE DISCHARGE	=	646 CFS
BASE FREQUENCY	=	100 YRS
BASE HW ELEVATION	=	125.4 FT
OVERTOPPING DISCHARGE	=	520 CFS
OVERTOPPING FREQUENCY	=	50 +/- YRS
OVERTOPPING ELEVATION	=	124.9 FT
DATE OF SURVEY	=	10-03-08
W.S. ELEVATION AT DATE OF SURVEY	=	119.6 FT

BRIDGE HYDRAULIC DATA		
DESIGN DISCHARGE	=	3400 CFS
DESIGN FREQUENCY	=	25 YRS
DESIGN HW ELEVATION	=	125.5 FT
BASE DISCHARGE	=	4810 CFS
BASE FREQUENCY	=	100 YRS
BASE HW ELEVATION	=	126.2 FT
OVERTOPPING DISCHARGE	=	5700 CFS
OVERTOPPING FREQUENCY	=	200 +/- YRS
OVERTOPPING ELEVATION	=	126.6 FT
DATE OF SURVEY	=	10-03-08
W.S. ELEVATION AT DATE OF SURVEY	=	DRY FT

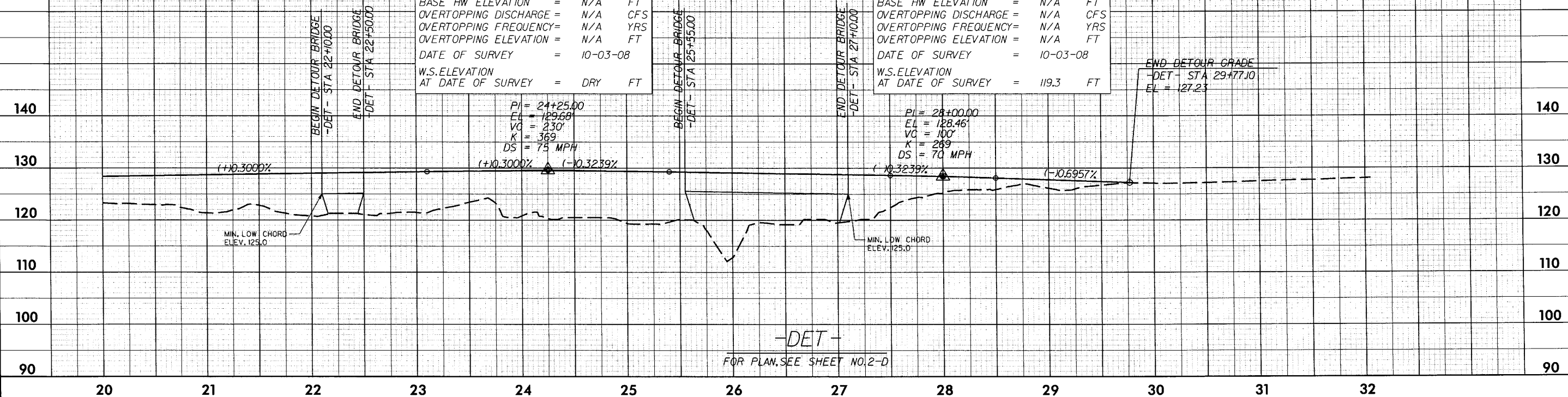
BRIDGE HYDRAULIC DATA		
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DESIGN FREQUENCY	=	25 YRS
DESIGN HW ELEVATION	=	125.5 FT
BASE DISCHARGE	=	4810 CFS
BASE FREQUENCY	=	100 YRS
BASE HW ELEVATION	=	126.2 FT
OVERTOPPING DISCHARGE	=	5700 CFS
OVERTOPPING FREQUENCY	=	200 +/- YRS
OVERTOPPING ELEVATION	=	126.6 FT
DATE OF SURVEY	=	10-03-08
W.S. ELEVATION AT DATE OF SURVEY	=	119.3 FT

BRIDGE HYDRAULIC DATA		
DESIGN DISCHARGE	=	260 CFS
DESIGN FREQUENCY	=	5 YRS
DESIGN HW ELEVATION	=	123.5 FT
BASE DISCHARGE	=	N/A CFS
BASE FREQUENCY	=	N/A YRS
BASE HW ELEVATION	=	N/A FT
OVERTOPPING DISCHARGE	=	N/A CFS
OVERTOPPING FREQUENCY	=	N/A YRS
OVERTOPPING ELEVATION	=	N/A FT
DATE OF SURVEY	=	10-03-08
W.S. ELEVATION AT DATE OF SURVEY	=	119.6 FT



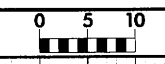
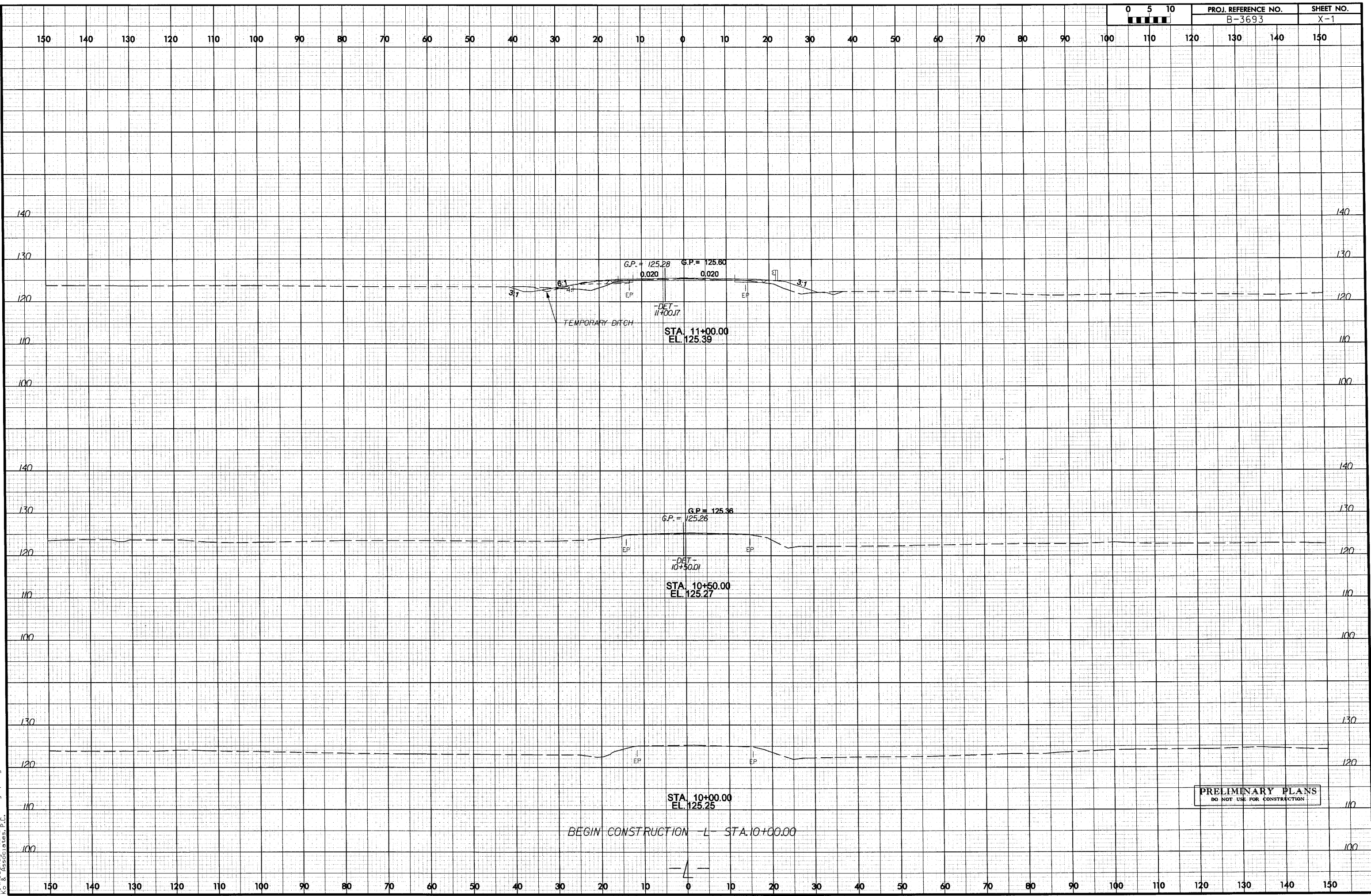
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DESIGN FREQUENCY	=	5 YRS
DESIGN HW ELEVATION	=	124.4 FT
BASE DISCHARGE	=	N/A CFS
BASE FREQUENCY	=	N/A YRS
BASE HW ELEVATION	=	N/A FT
OVERTOPPING DISCHARGE	=	N/A CFS
OVERTOPPING FREQUENCY	=	N/A YRS
OVERTOPPING ELEVATION	=	N/A FT
DATE OF SURVEY	=	10-03-08
W.S. ELEVATION AT DATE OF SURVEY	=	DRY FT

BRIDGE HYDRAULIC DATA		
DESIGN DISCHARGE	=	2000 CFS
DESIGN FREQUENCY	=	5 YRS
DESIGN HW ELEVATION	=	124.4 FT
BASE DISCHARGE	=	N/A CFS
BASE FREQUENCY	=	N/A YRS
BASE HW ELEVATION	=	N/A FT
OVERTOPPING DISCHARGE	=	N/A CFS
OVERTOPPING FREQUENCY	=	N/A YRS
OVERTOPPING ELEVATION	=	N/A FT
DATE OF SURVEY	=	10-03-08
W.S. ELEVATION AT DATE OF SURVEY	=	119.3 FT

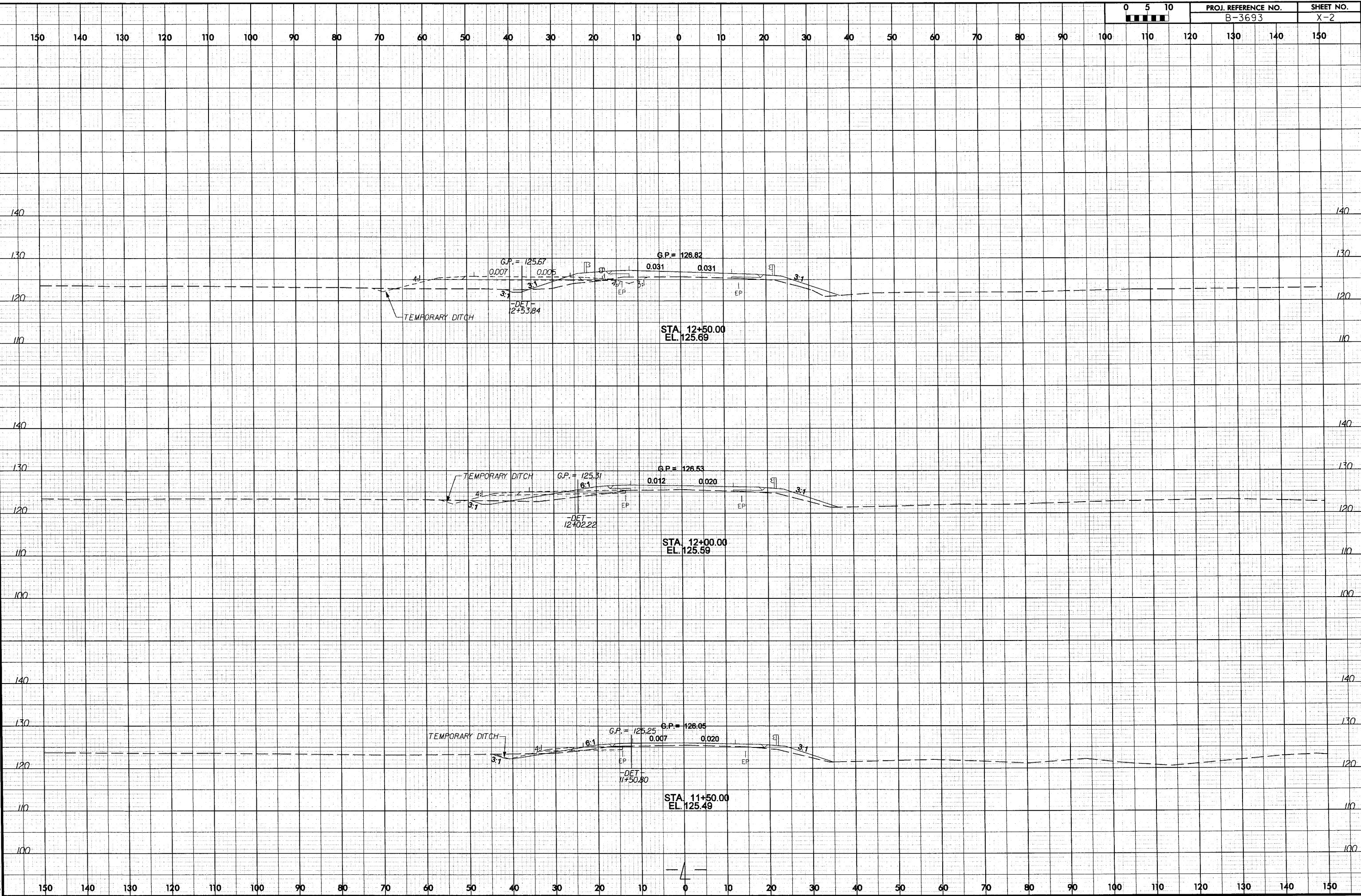


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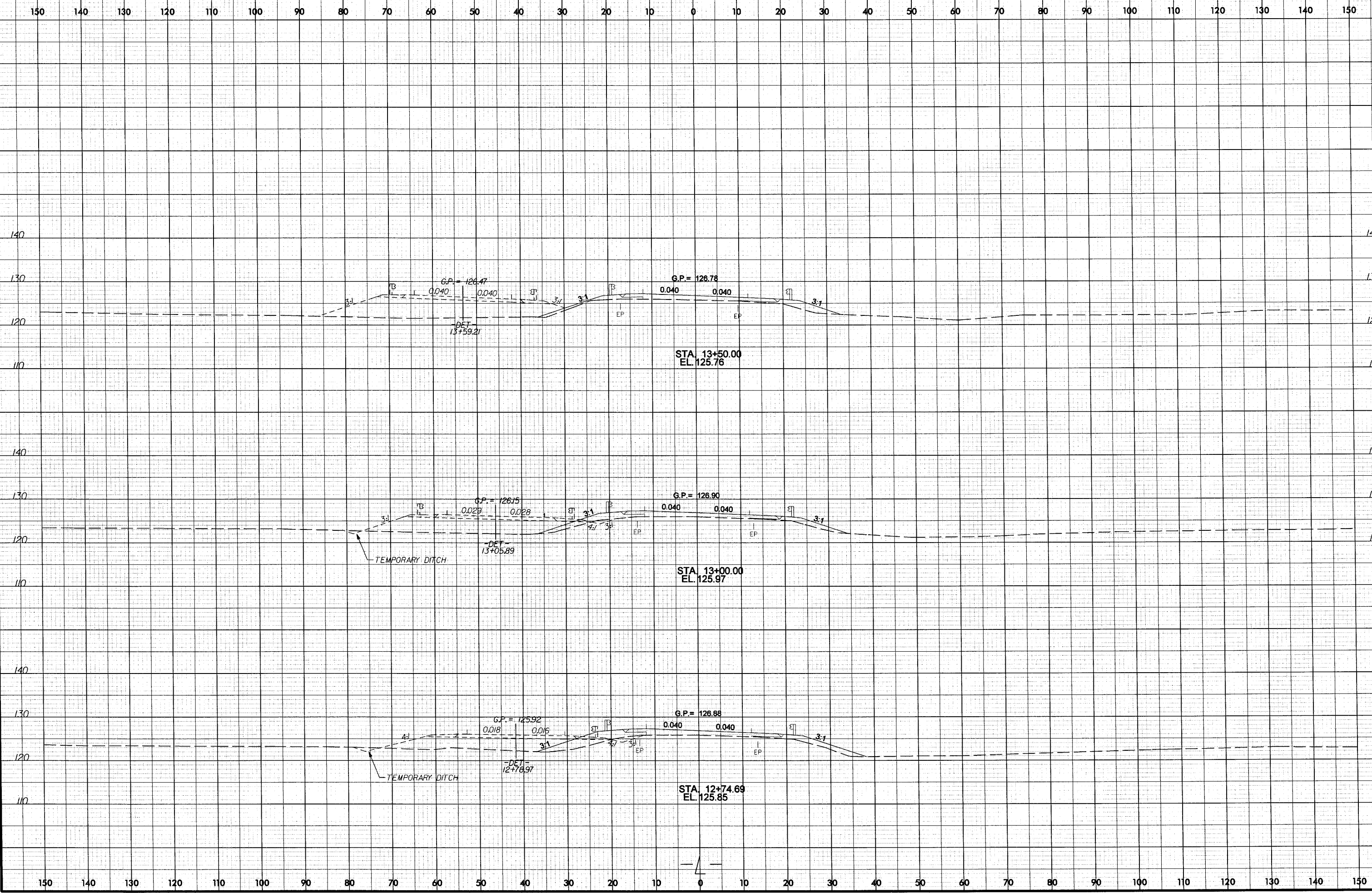
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Ko & Associates, P.C.



PROJ. REFERENCE NO.	SHEET NO.
B-3693	X-1

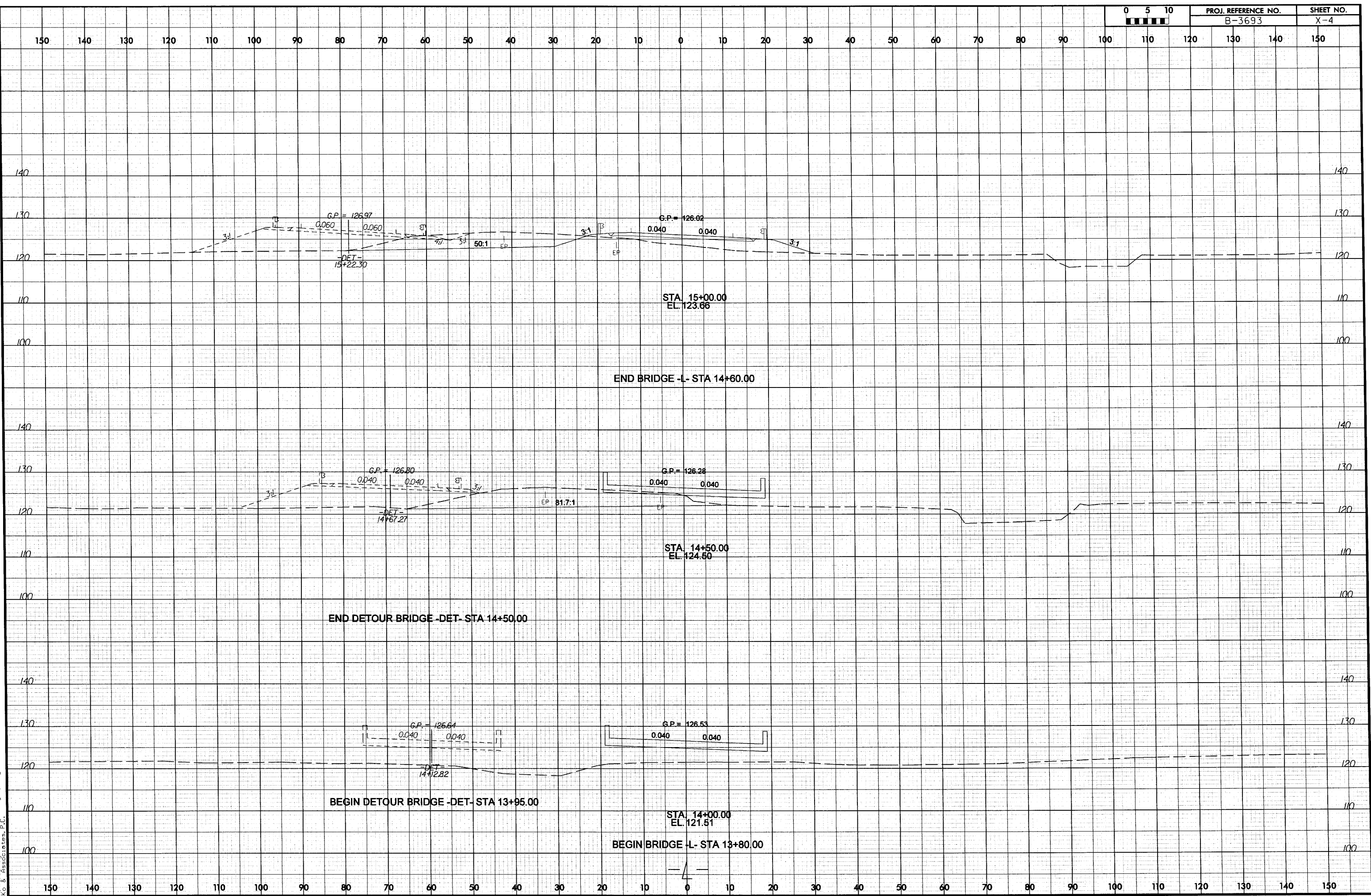


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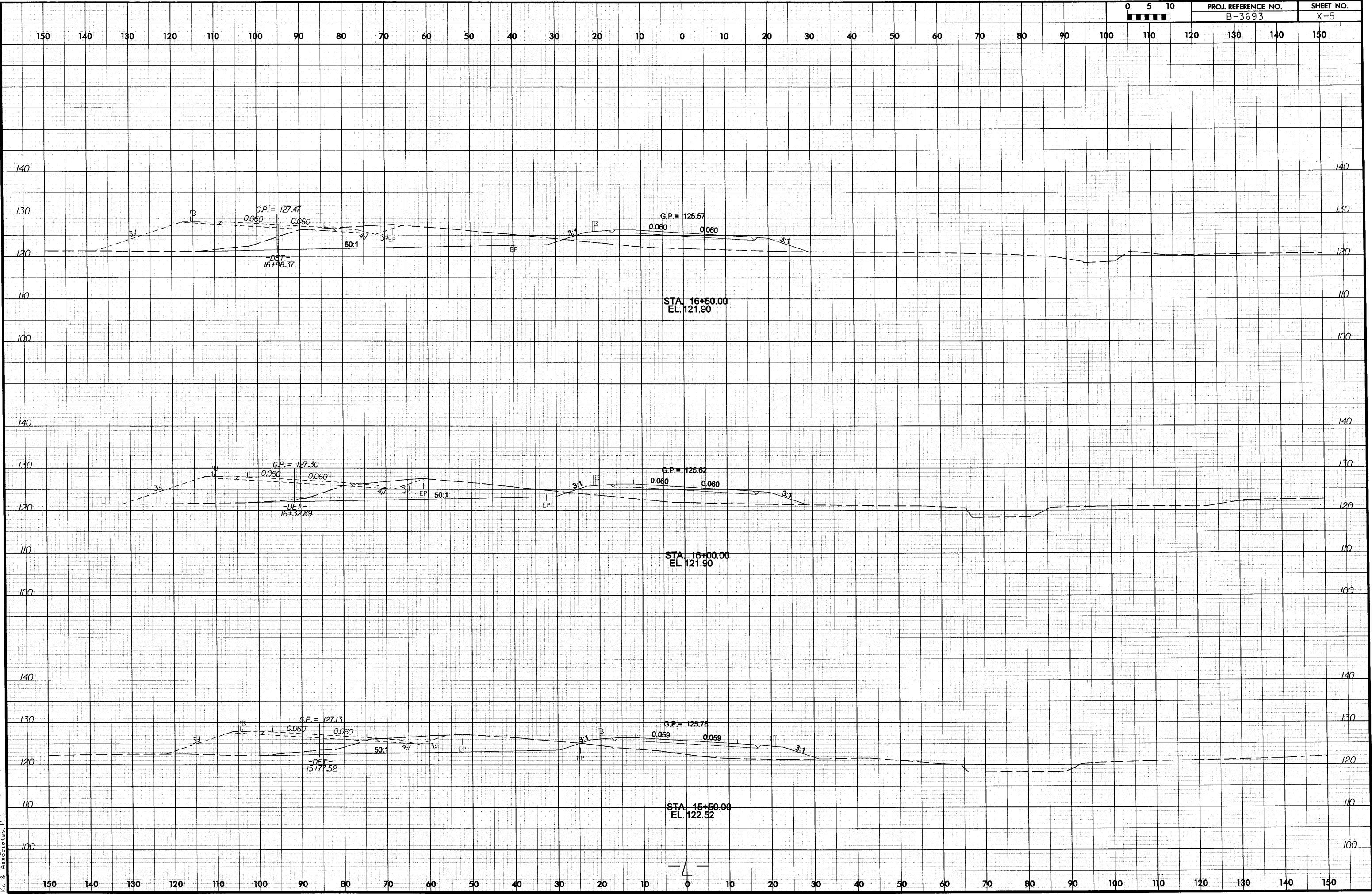
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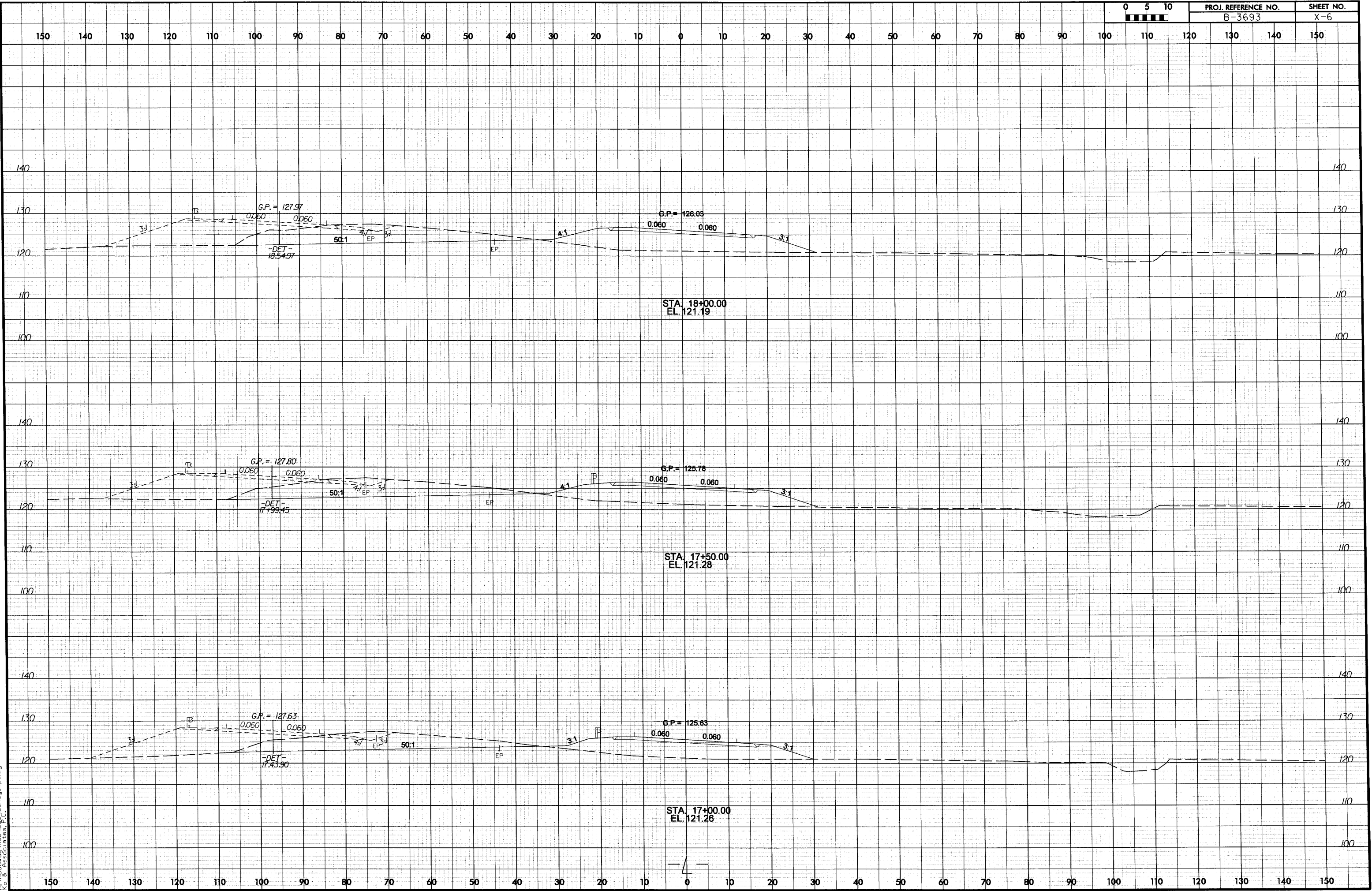
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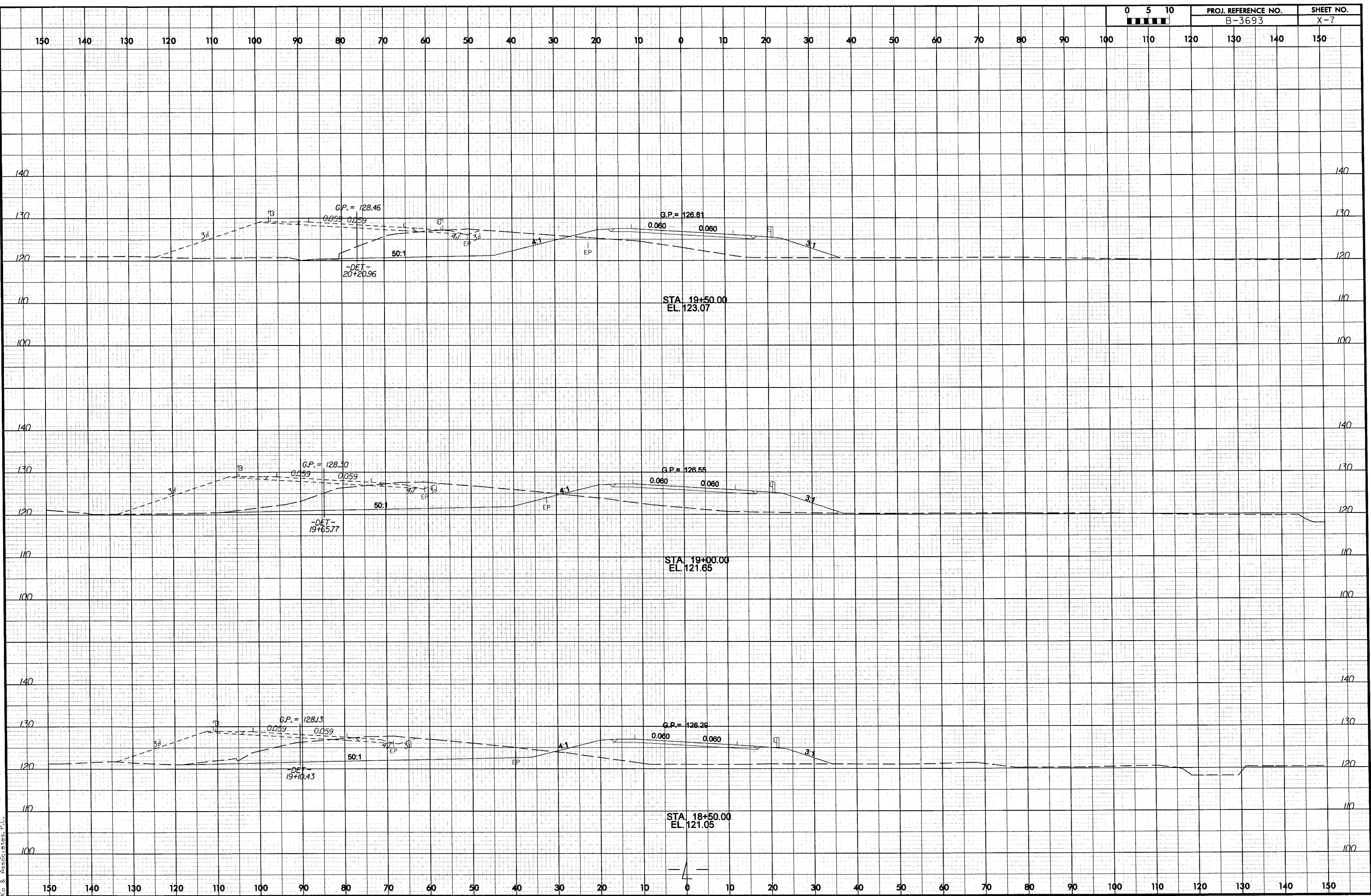
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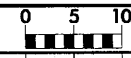


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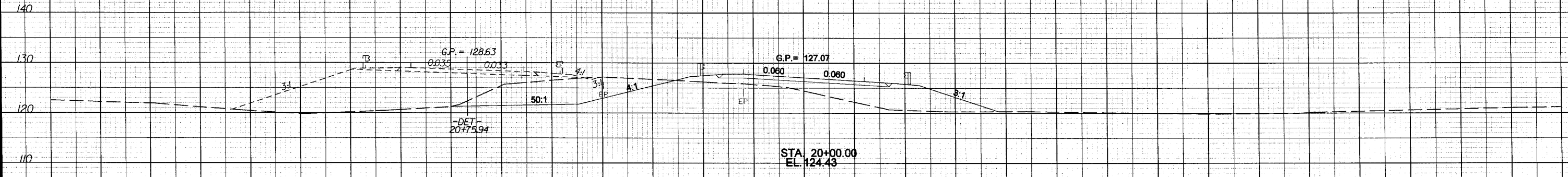
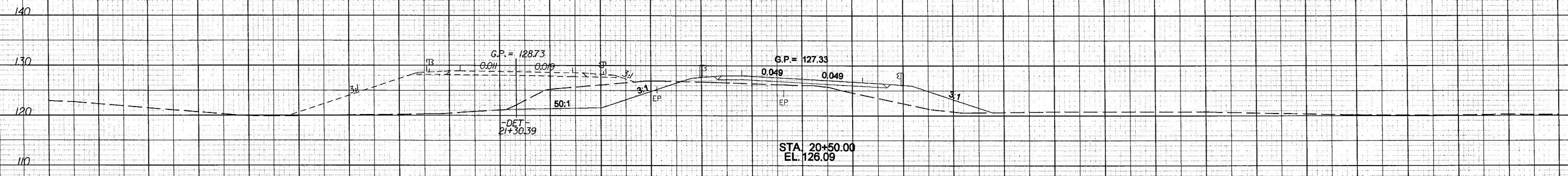
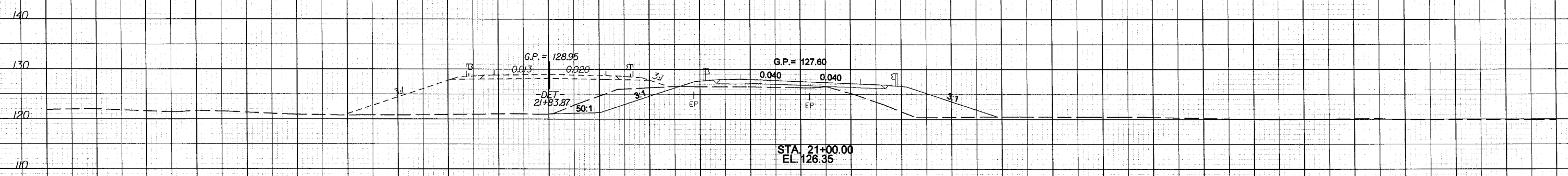


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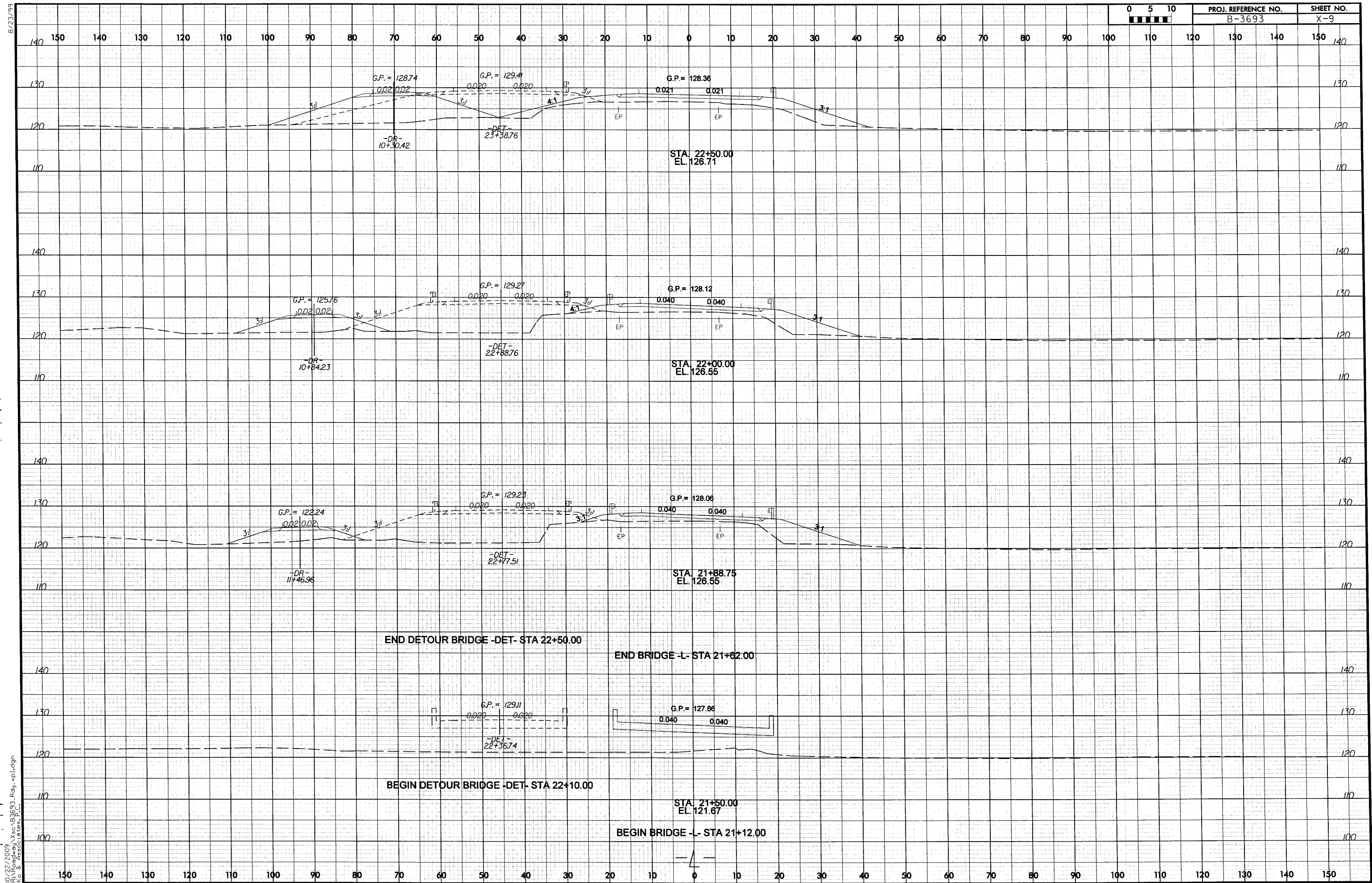
PROJ. REFERENCE NO.	SHEET NO.
B-3693	X-8

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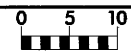


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K & Associates, P.C.

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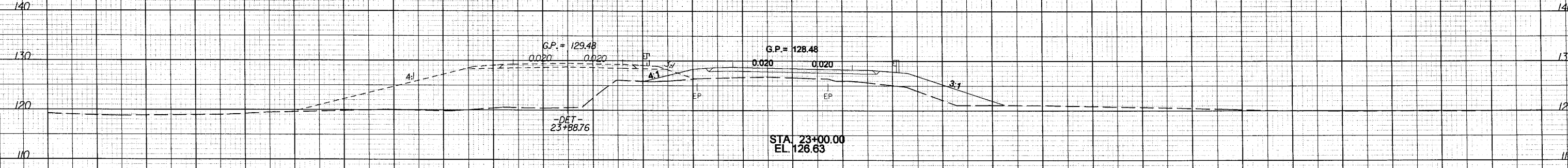
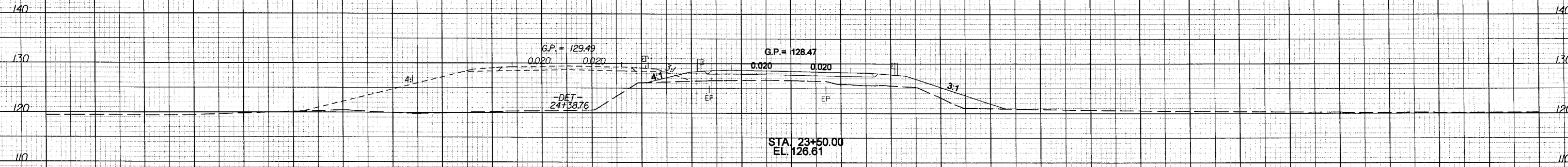
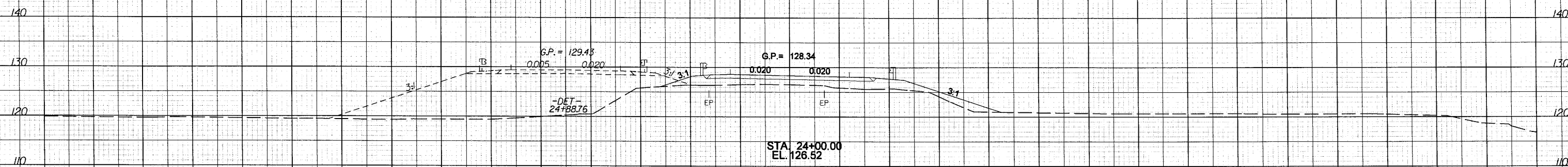
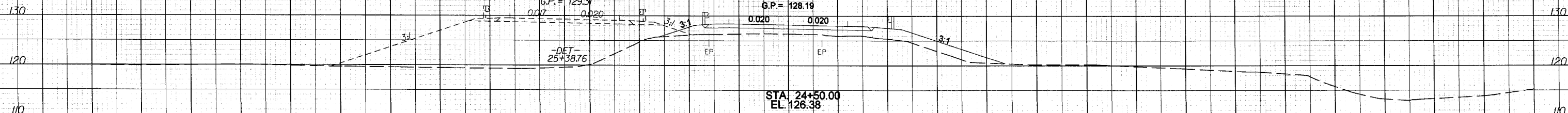
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PROJ. REFERENCE NO.
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SHEET NO.
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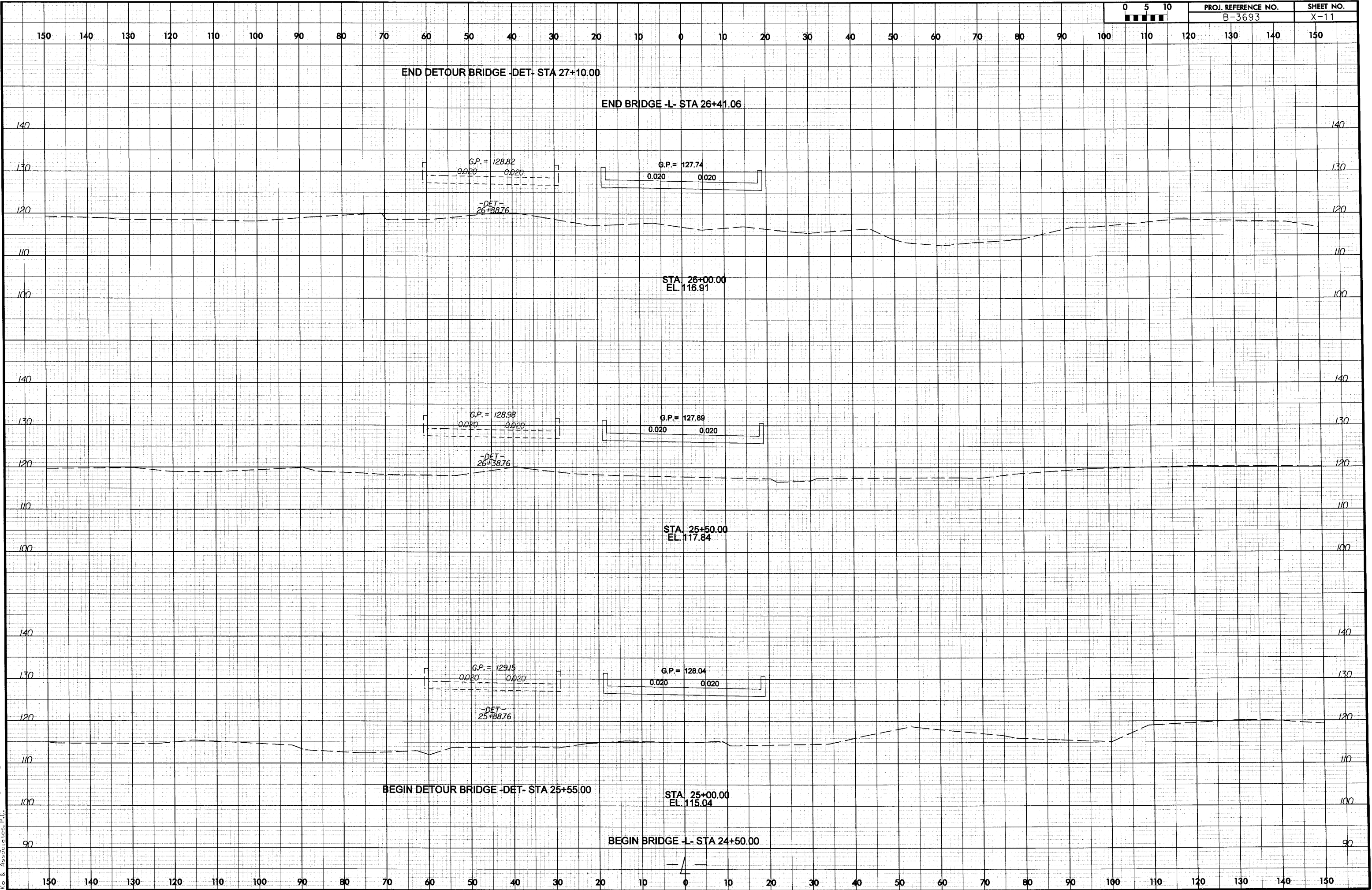


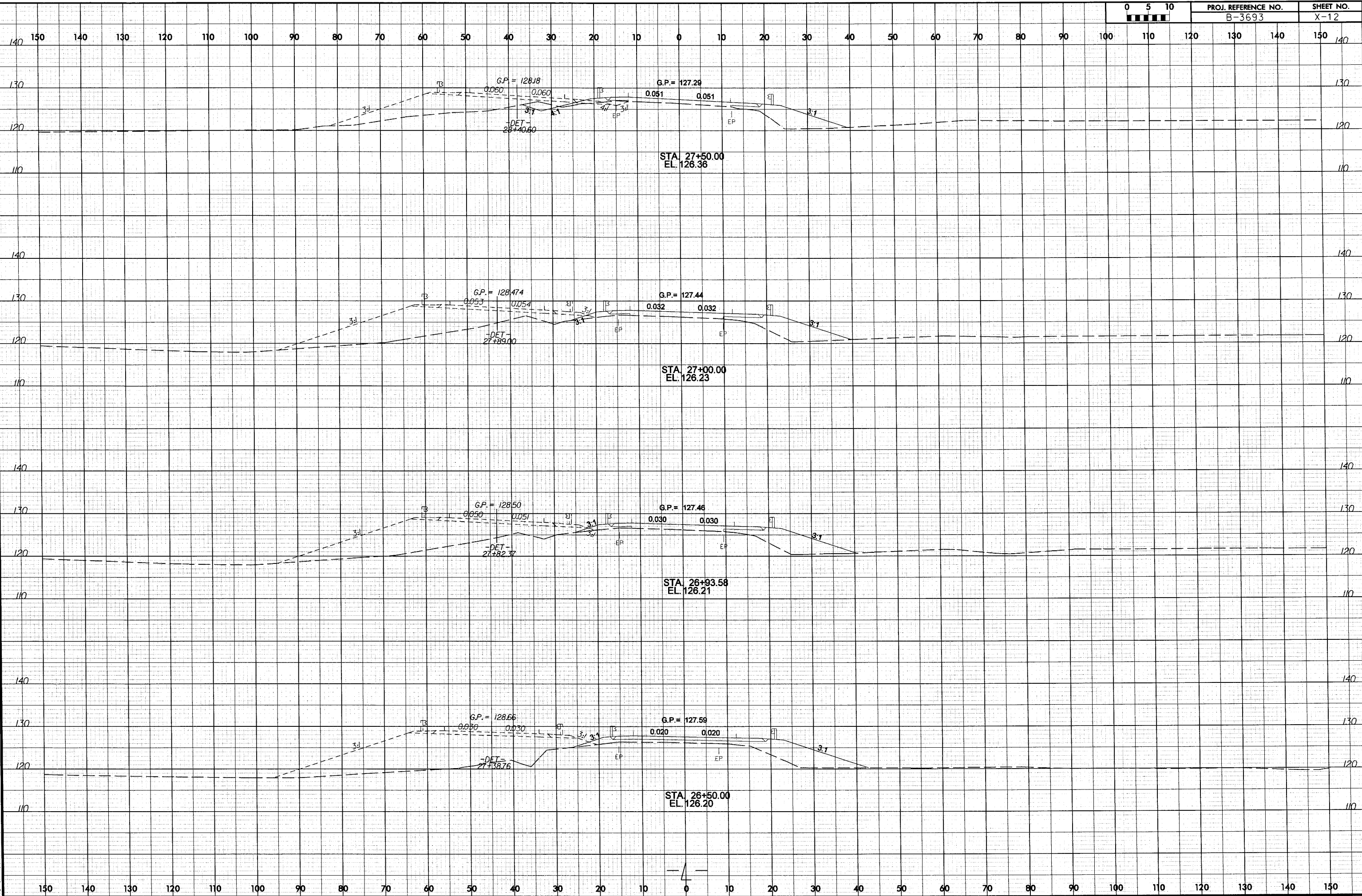
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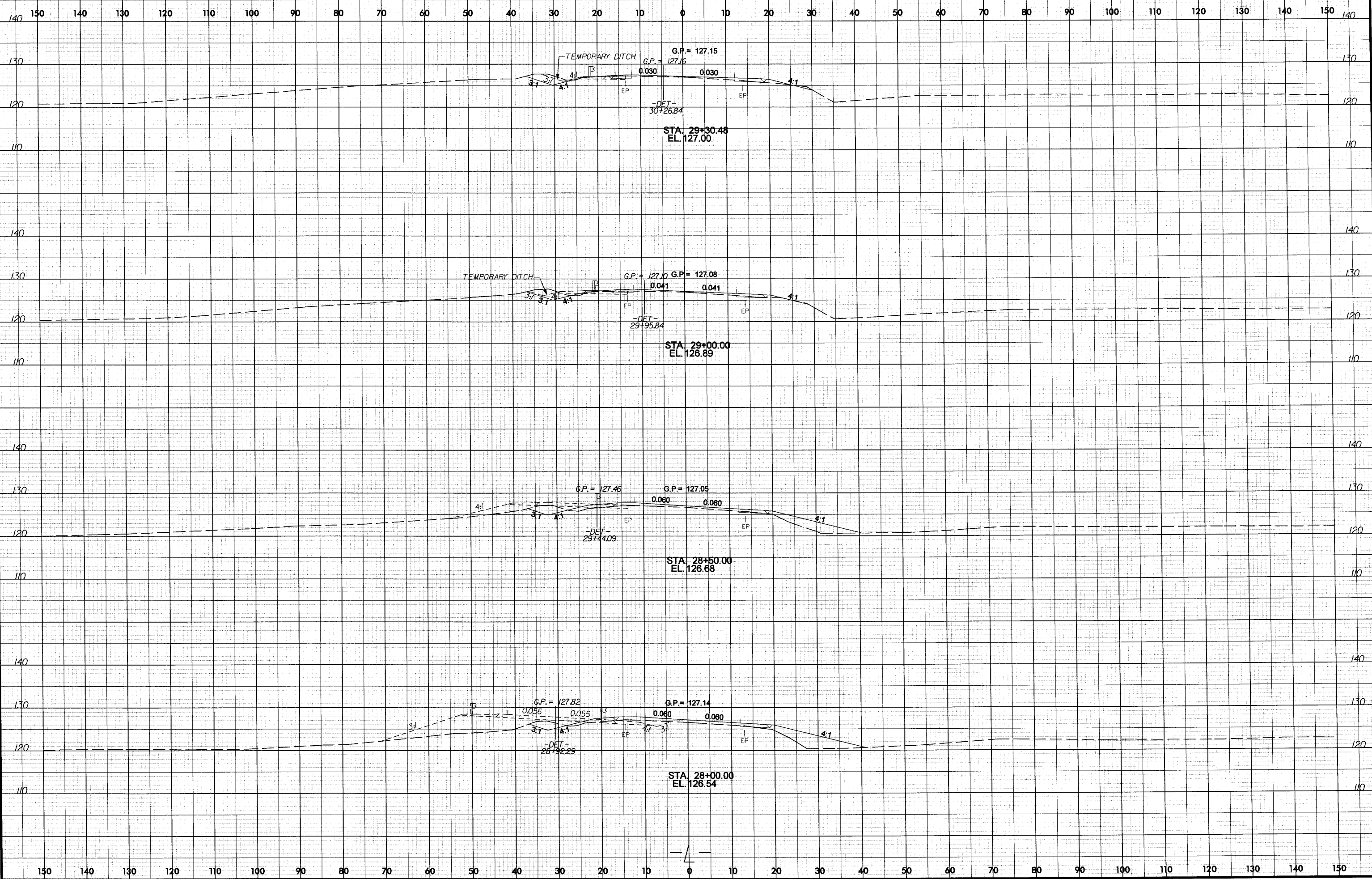
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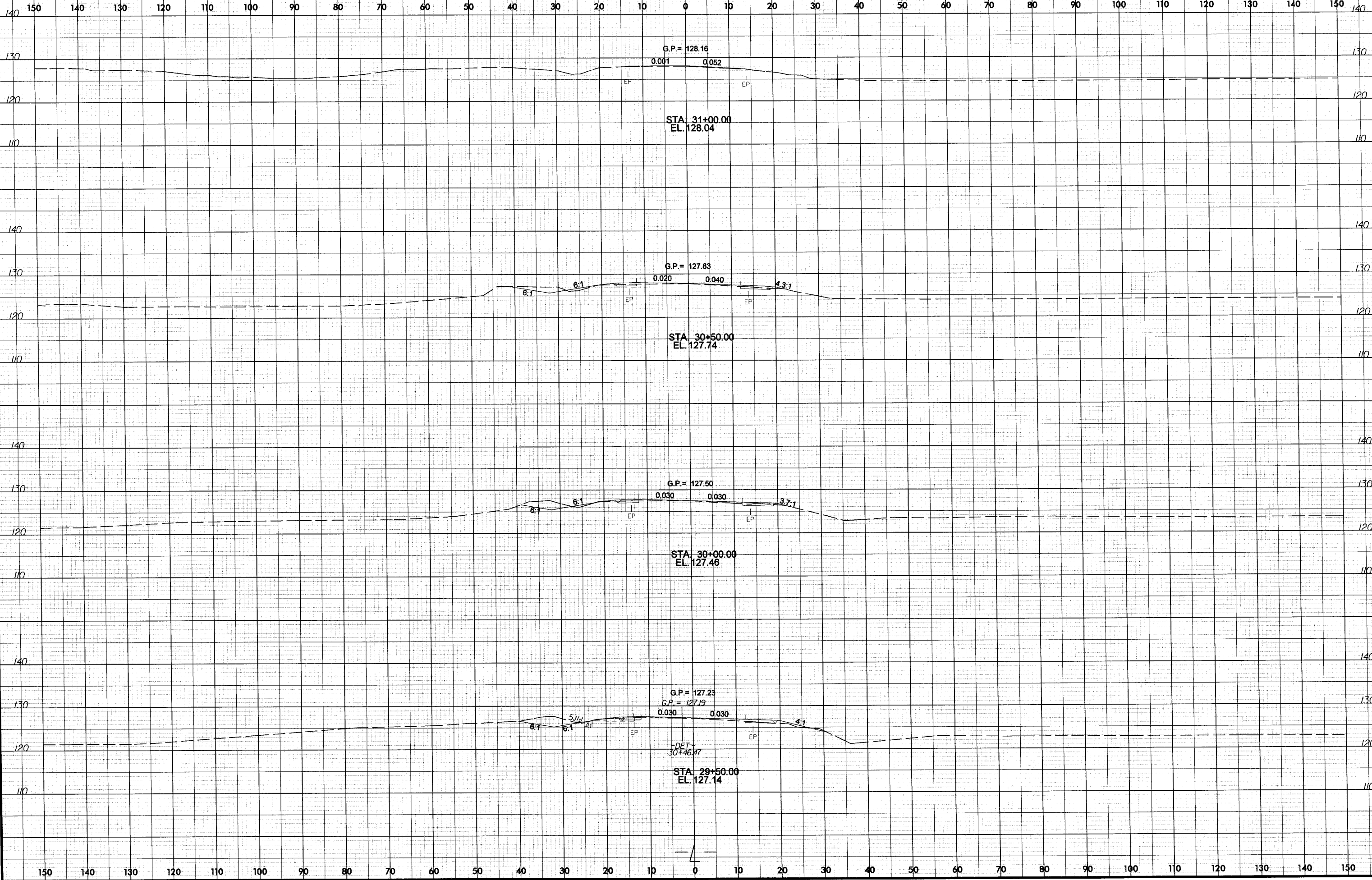


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PROJ. REFERENCE NO.
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