STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

September 30, 2011

U. S. Army Corps of Engineers
Regulatory Field Office
3331 Heritage Trade Drive, Suite 105
Wake Forest, NC 27587

ATTN: Mr. Eric Alsmeyer
NCDOT Coordinator

Dear Sir,

Subject: **Application for Section 404 Nationwide Permits 33 and 23, Section 401 Water Quality Certification, and Jordan Lake Riparian Buffer Authorization** for the replacement of Bridge No. 55 on SR 1600 Over White Oak Creek, Wake County, Federal Aid Project No. BRZ-1600(9), Division 5, T.I.P No. B-4697.

Debit $240.00 from WBS No. 38474.1.1

The North Carolina Department of Transportation (NCDOT) proposes to replace bridge No. 55 over White Oak Creek on SR 1600.

Please see the enclosed copies of the Pre-Construction Notification (PCN), Stormwater Management Plan, Final Jurisdictional Determination, permit drawings, and design plans for the above-referenced project. The Categorical Exclusion (CE) was completed for this project in September 2010. Additional copies are available upon request.

There will be 0.25 acres of wetland impacts from permanent fill and mechanized clearing. Mitigation will be through the Ecological Enhancement Program (EEP).

This project calls for a letting date of April 17, 2012 and a review date of March 13, 2012. However, the let date may advance as additional funds become available.

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

TELEPHONE: 919-707-6000

FAX: 919-212-5785

WEBSITE: WWW.NCDOT.ORG

LOCATION:
CENTURY CENTER, BUILDING B
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610

A copy of this permit application will be posted on the NCDOT Website at: http://www.ncdot.org/doh/preconstruct/pe/. If you have any questions or need additional information, please call Sara Easterly at (919) 707-6113.

Sincerely,

E. L. Lusk

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

Cc: NCDOT Standard Permit Application Distribution List
File B-4697

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 N WP 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:	Replace Bridge No. 55 Over White Oak Creek on SR 1600 (Green Level Church Road)
2b. County:	Wake
2c. Nearest municipality / town:	Apex
2d. Subdivision name:	*not applicable*
2e. NCDOT only, T.I.P. or state project no:	B-4697

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 i f applicable):	*not applicable*
3d. Street address:	1598 Mail Service Center
3e. City, state, zip:	Raleigh, NC 27699-1598
3f. Telephone no.:	(919) 707-6113
3g. Fax no.:	(919) 212-5785
3h. Email address:	seeasterly@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: 35.7760 (DD.DDDDDD) Longitude: -78 .9026 (-DD.DDDDDD)
1c. Property size:	8 acres
2. Surface Waters	
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	White Oak Creek
2b. Water Quality Classification of nearest receiving water:	WS-IV, NSW
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: Urban and Developed Land	
3b. List the total estimated acreage of all existing wetlands on the property: 0.25	
3c. List the total estimated linear feet of all existing streams (intermittent and perennial) on the property: 187	
3d. Explain the purpose of the proposed project: To replace Bridge No. 55 on SR 1600 over White Oak Creek	
3e. Describe the overall project in detail, including the type of equipment to be used: The North Carolina Department of Transportation (NCDOT) proposes to replace bridge No. 55 on SR 1600 (Green Level Church Road) over White Oak Creek. The project will be a replace in place with an off-site detour. Standard road building equipment, such as trucks, dozers, and cranes will be used.	
4. Jurisdictional Determinations	
4a. Have jurisdictional wetland or stream determinations by the Corps or State been requested or obtained for this property / project (including all prior phases) in the past? Comments:	☒ Yes ☐ No ☐ Unknown
4b. If the Corps made the jurisdictional determination, what type of determination was made?	☐ Preliminary ☒ Final
4c. If yes, who delineated the jurisdictional areas? Name (if known):	Agency/Consultant Company: RK&K Other:
4d. If yes, list the dates of the Corps jurisdictional determinations or State determinations and attach documentation. The initial verification was on January 10, 2006 with Eric Alsmeyer of the U.S. Army Corp of Engineers. As per a conversation with Eric Alsmeyer on August 12, 2011, Jurisdictional Determination Forms have been included with this permit application. NCDOT is requesting an approved JD with this application.	
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, Temporary Fill, Excavation	Riverine	☐ Yes ☒ No	☒ Corps ☐ DWQ	0.25 Perm. 0.20 Temp.
Site 2 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 3 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 4 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 1 ☒ P ☐ T Utility Impacts	Hand Clearing for Utilities and Permanent Fill	Riverine	☐ Yes ☒ No	☒ Corps ☐ DWQ	<0.01 Perm. 0.20 Hand Clearing
				2g. **Total wetland impacts**	0.25 Perm 0.20 Temp

2h. Comments: * There will be <0.01 ac of permanent wetland impacts from fill associated with utility poles and 0.20 ac of hand clearing.

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	Bank Stabilization, Temporary Impacts from Boardwalk	White Oak Creek and Bachelor Branch	☒ PER ☐ INT	☒ Corps ☐ DWQ	4 - 6	20 (T) 106 (P)
Site 2 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
Site 3 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
Site 4 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
Site 5 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
					3h. **Total stream and tributary impacts**	20 Temp

	106 Perm
3i. Comments:	

4. Open Water Impacts

If there are proposed impacts to lakes, ponds, estuaries, tributaries, sounds, the Atlantic Ocean, or any other open water of the U.S. then individually list all open water impacts below.

4a. Open water impact number – Permanent (P) or Temporary (T)	4b. Name of waterbody (if applicable)	4c. Type of impact	4d. Waterbody type	4e. Area of impact (acres)
O1 ☐ P ☐ T				
O2 ☐ P ☐ T				
O3 ☐ P ☐ T				
O4 ☐ P ☐ T				
			4f. Total open water impacts	0 Permanent 0 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: Jordan

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	Bridge	White Oak Creek and Bachelor Branch	☐ Yes ☒ No	4294	2456
B2 ☒ P ☐ T	*Road Crossing	White Oak Creek and Bachelor Branch	☐ Yes ☒ No	3318	3283
B3 ☒ P ☐ T	Greenway	White Oak Creek and Bachelor Branch	☐ Yes ☒ No	1365	762
B3 ☒ P ☐ T	Utility Poles	White Oak Creek and Bachelor Branch	☐ Yes ☒ No	4804	624
		6h. **Total buffer impacts**		13781	7125

6i. Comments: * While the road crossing impacts are >150 feet, they are allowable with mitigation. The entire buffered areas are within wetlands that will already be mitigated for, therefore, no buffer mitigation is proposed.

D. Impact Justification and Mitigation		
1. Avoidance and Minimization		
1a. Specifically describe measures taken to avoid or minimize the proposed impacts in designing project. See Stormwater Management Plan. The project is a replace in place, spanning the creek which reduces current bents in the watrer. The new bridge is longer bridge and will have an off-site detour.		
1b. Specifically describe measures taken to avoid or minimize the proposed impacts through construction techniques. 2:1 slopes are to be used at jurisdictional sites,, and Best Management Practices for Surface Waters.		
2. Compensatory Mitigation for Impacts to Waters of the U.S. or Waters of the State		
2a. Does the project require Compensatory Mitigation for impacts to Waters of the U.S. or Waters of the State?	☒ Yes ☐ No	
2b. If yes, mitigation is required by (check all that apply):	☒ DWQ ☒ Corps	
2c. If yes, which mitigat ion 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	
4c. If using stream mitigation, stream temperature:	☐ warm ☐ cool ☐cold	
4d. Buffer mitigation requested (DWQ only):	0 square feet	
4e. Riparian wetland mitigation requested:	0	
4f. Non-riparian wetland mitigation requested:	0 acres	
4g. Coastal (tidal) wetland mitigation requested:	0 acres	
4h. Comments: Mitigation was not proposed for the 106 linear feet of permanent stream impacts because the impacts are from bank stabilization.		
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.

The Bryan Boulevard Mitigation Sites are located in Guilford County, adjacent to the Bryan Boulevard Extension. Site 1 (Horsepen Creek) is located at the intersection of Bryan Boulevard and Flemming Road; site 2 (Oak Ridge Road) is located near the intersection of Bryan Boulevard and Old Oak Ridge Road. These two sites provide 31.17 acres of mitigation to offset wetland impacts associated with project U-608, the extension of Bryan Boulevard.

In order to offset unavoidable stream impacts associated with B-4697, the Bryan Boulevard Mitigation Site will be debited .25 acres of riparian wetland restoration. This debit is reflected in the table below.

See Attached Sheet

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				
Zone 2				
			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: See permit drawings and stormwater management plan.	☒ 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.	
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 NA ☐ No
5b. Have all of the 401 Unit submittal requirements been met?	☐ Yes NA ☐ 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 project, 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, ind icate 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? NHP, USFWS website, NCDOT field surveys on May 26, 2009 for red-cockaded woodpecker, and Michaux's sumac. Surveys for dwarf wedgemussel was conducted on April 23, 2009.		
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. Luck Applicant/Agent's Signature (Agent's signature is valid only if an authorization letter from the applicant is provided.)	9-30-11 Date

B-4697 Bryan Boulevard Mitigation

The Bryan Boulevard Mitigation Sites are located in Guilford County, adjacent to the Bryan Boulevard Extension. Site 1 (Horsepen Creek) is located at the intersection of Bryan Boulevard and Flemming Road; site 2 (Oak Ridge Road) is located near the intersection of Bryan Boulevard and Old Oak Ridge Road. These two sites provide 31.17 acres of mitigation to offset wetland impacts associated with project U-608, the extension of Bryan Boulevard.

In order to offset unavoidable stream impacts associated with B-4697, the Bryan Boulevard Mitigation Site will be debited .25acres of riparian wetland restoration. This debit is reflected in the table below.

MITIGATION TYPE	DEBIT AMOUNT (ac)	DEBITS
Riparian Wetland Restoration	0.58	U-3110B
Riparian Wetland Restoration	1.59	R-2413C
Riparian Wetland Restoration	1	U-608
Riparian Wetland Restoration	0.25	B-4697

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

B. **DISTRICT OFFICE, FILE NAME, AND NUMBER: Wilmington, B-4697**

C. PROJECT LOCATION AND BACKGROUND INFORMATION: This form is for White Oak Creek, Bachelor Brance, and abutting wetlands.

State: North Carolina County/parish/borough: Wake City: Apex
Center coordinates of site (lat/long in degree decimal format): Lat. 35.7760° N, Long. -78.9026° W.
Universal Transverse Mercator:
Name of nearest waterbody: White Oak Creek and Bachelor Branch
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Jordan Lake
Name of watershed or Hydrologic Unit Code (HUC): 03030002

☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☐ Office (Desk) Determination. Date:
☒ Field Determination. Date(s): 01/10/2006

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are no** *"navigable waters of the U.S."* within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]

☐ Waters subject to the ebb and flow of the tide.
☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
Explain: .

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are** *"waters of the U.S."* within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
      ☐ TNWs, including territorial seas
      ☐ Wetlands adjacent to TNWs
      ☒ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
      ☐ Non-RPWs that flow directly or indirectly into TNWs
      ☒ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
      ☐ Impoundments of jurisdictional waters
      ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
      Non-wetland waters: li near feet: widt h (ft) and/or acres.
      Wetlands: acres.

   c. **Limits (boundaries) of jurisdiction** based on: **Pick List**
      Elevation of established OHWM (if known): .

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   ☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
   Explain: .

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[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**
   Identify TNW: .

   Summarize rationale supporting determination: .

2. **Wetland adjacent to TNW**
   Summarize rationale supporting conclusion that wetland is "adjacent": .

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

   (i) General Area Conditions:
   Watershed size: 268.59 **square miles**
   Drainage area: 7.19 **square miles**
   Average annual rainfall: 50 inches
   Average annual snowfall: 2-4 inches

   (ii) Physical Characteristics:
   (a) Relationship with TNW:
   ☒ Tributary flows directly into TNW.
   ☒ Tributary flows through **2** tributaries before entering TNW.

   Project waters are **10-15** river miles from TNW.
   Project waters are **1 (or less)** river miles from RPW.
   Project waters are **2-5** aerial (straight) miles from TNW.
   Project waters are **1 (or less)** aerial (straight) miles from RPW.
   Project waters cross or serve as state boundaries. Explain: .

   Identify flow route to TNW[5]: Bachelor Branch flows into White Oak Creek. White Oak Creek flows into Jordan Lake. Jordan Lake empties into the Haw River and the Haw River flows into the Cape Fear River. .

---

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Tributary stream order, if known: .

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☒ Natural
☐ Artificial (man-made). Explain: .
☐ Manipulated (man-altered). Explain: .

Tributary properties with respect to top of bank (estimate):
Average width: 6-8 feet
Average depth: 1-3 feet
Average side slopes: **2:1.**

Primary tributary substrate composition (check all that apply):

☒ Silts	☒ Sands	☐ Concrete
☐ Cobbles	☒ Gravel	☐ Muck
☐ Bedrock	☐ Vegetation. Type/% cover:	
☐ Other. Explain: .		

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: .
Presence of run/riffle/pool complexes. Explain: .
Tributary geometry: **Meandering**
Tributary gradient (approximate average slope): %

(c) Flow:
Tributary provides for: **Seasonal flow**
Estimate average number of flow events in review area/year: **2-5**
Describe flow regime: .
Other information on duration and volume: .

Surface flow is: **Confined.** Characteristics: .

Subsurface flow: **Unknown**. Explain findings: .
☐ Dye (or other) test performed: .

Tributary has (check all that apply):
☒ Bed and banks
☒ OHWM[6] (check all indicators that apply):

☐ clear, natural line impressed on the bank	☐ the presence of litter and debris
☐ changes in the character of soil	☐ destruction of terrestrial vegetation
☐ shelving	☐ the presence of wrack line
☐ vegetation matted down, bent, or absent	☐ sediment sorting
☐ leaf litter disturbed or washed away	☐ scour
☐ sediment deposition	☒ multiple observed or predicted flow events
☒ water staining	☐ abrupt change in plant community
☐ other (list):	

☐ Discontinuous OHWM.[7] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

☐ High Tide Line indicated by:	☐ Mean High Water Mark indicated by:
☐ oil or scum line along shore objects	☐ survey to available datum;
☐ fine shell or debris deposits (foreshore)	☐ physical markings;
☐ physical markings/characteristics	☐ vegetation lines/changes in vegetation types.
☐ tidal gauges	
☐ other (list):	

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: Water was clear.
Identify specific pollutants, if known: .

---

[6]A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7]Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- ☒ Riparian corridor. Characteristics (type, average width): .
- ☐ Wetland fringe. Characteristics: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size:0.012 acres

Wetland type. Explain: Riverine.

Wetland quality. Explain: .

Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:

Flow is: **Pick List**. Explain: .

Surface flow is: **Pick List**

Characteristics: .

Subsurface flow: **Pick List**. Explain findings:

- ☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:

- ☐ Directly abutting
- ☐ Not directly abutting
  - ☐ Discrete wetland hydrologic connection. Explain: .
  - ☐ Ecological connection. Explain: .
  - ☐ Separated by berm/barrier. Explain: .

(d) Proximity (Relationship) to TNW

Project wetlands are **2-5** river miles from TNW.

Project waters are **1-2** aerial (straight) miles from TNW.

Flow is from: **Wetland to navigable waters.**

Estimate approximate location of wetland as within the **2-year or less** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: .

Identify specific pollutants, if known: .

(iii) Biological Characteristics. Wetland supports (check all that apply):

- ☒ Riparian buffer. Characteristics (type, average width): .
- ☐ Vegetation type/percent cover. Explain: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☒ Aquatic/wildlife diversity. Explain findings:Evidence of birds, deer and other wildlife using wetland area.

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: **2**

Approximately ( ) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)
WA Yes	3.57	WB Yes	0.79

Summarize overall biological, chemical and physical functions being performed: .

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: li near feet width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☒ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: White Oak Creek and Batchelor Branch both had water in them during the driest part of the summer of 2011.
   - ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
☒ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
☒ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2. above. Provide rationale indicating that wetland is directly abutting an RPW: **Wetlands are directly abutting White Oak Creek and Batchelor Branch.**

☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2. above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: **0.012** acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[9]**
As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
☐ Demonstrate that impoundment was created from "waters of the U.S.," or
☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]
☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain: .
☐ Other factors. Explain: .

---

[8] See Footnote # 3.
[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
[10] **Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.***

Identify water body and summarize rationale supporting determination: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
- ☐ Tributary waters: linear feet widt h (ft).
- ☐ Other non-wetland waters: acres.
  - Identify type(s) of waters: .
- ☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
- ☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- ☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
  - ☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- ☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
- ☐ Other: (explain, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
- ☐ Non-wetland waters (i.e., rivers, streams): li near feet width (ft).
- ☐ Lakes/ponds: acres.
- ☐ Other non-wetland waters: acres. List type of aquatic resource: .
- ☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
- ☐ Non-wetland waters (i.e., rivers, streams): li near feet, width (ft).
- ☐ Lakes/ponds: acres.
- ☐ Other non-wetland waters: acres. List type of aquatic resource: .
- ☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
- ☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: .
- ☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☐ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps: .
- ☐ Corps navigable waters' study: .
- ☐ U.S. Geological Survey Hydrologic Atlas: .
  - ☐ USGS NHD data.
  - ☐ USGS 8 and 12 digit HUC maps.
- ☒ U.S. Geological Survey map(s). Cite scale & quad name:Lexington West (NC).
- ☐ USDA Natural Resources Conservation Service Soil Survey. Citation: Davidson Co.
- ☐ National wetlands inventory map(s). Cite name: .
- ☐ State/Local wetland inventory map(s):
- ☐ FEMA/FIRM maps: .
- ☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- ☐ Photographs: ☐ Aerial (Name & Date): .
  - or ☐ Other (Name & Date): .
- ☐ Previous determination(s). File no. and date of response letter: .
- ☐ Applicable/supporting case law: .
- ☐ Applicable/supporting scientific literature: .
- ☐ Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD: This form is for UT7 and UT8 to Rat Spring Branch. Wetland E (WE) is associated with UT8.

NCDOT Highway Stormwater Program

Released: July 2010 (DRAFT)

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

Version 1.1

General Project Information

Project No.:	B-4697		**Date:**	10/15/2010			
City/Town:	Town of Cary		**Designer:**	Brook Anderson, PE			
County(ies):	Wake County		**Project Manager:**	John W. Twisdale, Jr., PE			
River Basin(s):	**Cape Fear**		**CAMA County?**	no	**TVA County?**	no	
Primary Receiving Water:	White Oak Creek		**NCDWQ Stream Index:**	16-41-6-(0.7)			
NCDWQ Surface Water Classification for Primary Receiving Water		**Primary:**	Water Supply IV (WS-IV)				
		Supplemental:	Nutrient Sensitive Waters (NSW)				
Other Stream Classification:							
303(d) Stream?	no	**Type(s) of Impairment:**					
State Stormwater Permit Required?	no	**If yes, why?**					
Could the Project Impact Threatened or Endangered Species?			no				
Description:	Biological conclusion for B-4697 is No Effect						
Anadromous Fish Present?	**no**						
Description:							
Buffer Rules in Effect?	yes	**Buffer Rules:**	Jordan Lake Watershed				

Existing Site

Description of Existing Project Area:	Bridge No. 55 on SR 1600 over White Oak Creek. SR 1600 is classified as local subregional tier route and is not part of the NHS route.
Average Daily Traffic (existing):	7900 VPD (2012)
Existing Cross Section:	Roadway: 24' pavement width with 2-foot grass shoulders. Bridge: 24' clear width.
Surrounding Land Use:	Immediate project area is woods and swamp. Surrounding area is urbanized with single family home subdivisions and commercial/retail development.
General Comments:	There is an existing Town of Cary greenway that connects to the roadway on the eastern side.

Project Description

Description of Proposed Project:	Replace Bridge No. 55 on SR 1600 over White Oak Creek		
Average Daily Traffic (proposed):	7900 VPD (2012); 22,000 VPD (2035)		
Proposed Cross-Section:	Roadway: 2, 12' lanes, total pavement width 32', and 43'-54' shoulder pt to shoulder pt. Bridge: 42'-6" clear width.		
Interchange Modification:	no	**Median Type:**	none
Terminus:			
Terminus:			
Project Length (lin. miles/feet):	0.29 miles	**Added Impervious Area (ac.):**	Approx. 0.5ac
General Comments:	Town of Cary will construct greenway under proposed bridge.		

Environmental Summary

Riparian Buffer and Jurisdictional Stream Impacts and Associated SCMs

Station	Stream Name	Stream Type	Jurisdict. Stream	Buffer?	Classific-ation?	Proposed Structure	SCM Type	Checklist Complete?	DA (ac.)	Q_2 (ft^3/s)	Q_{10} (ft^3/s)	WQv^c (ft^3)
-L- 23+70	White Oak Creek	Perennial	RPW	Jordan	Water Supply IV (WS-IV)	1 @ 70', 1 @ 90', 2 @ 60'; Length=280' Prestressed Concrete Girder						
-L- 26+50 RT	Bachelor Branch	Perennial	RPW	Jordan	Water Supply IV (WS-IV)	Greenway and Parallel Impacts due to roadway						

General Comments: Existing drainage patterns were maintained to the maximum extent practical. Grass or PSRM ditches were used to aid in treatment of runoff. Proposed design disperses ditch flow into sheet flow so that no concentrated flow enters the buffers.

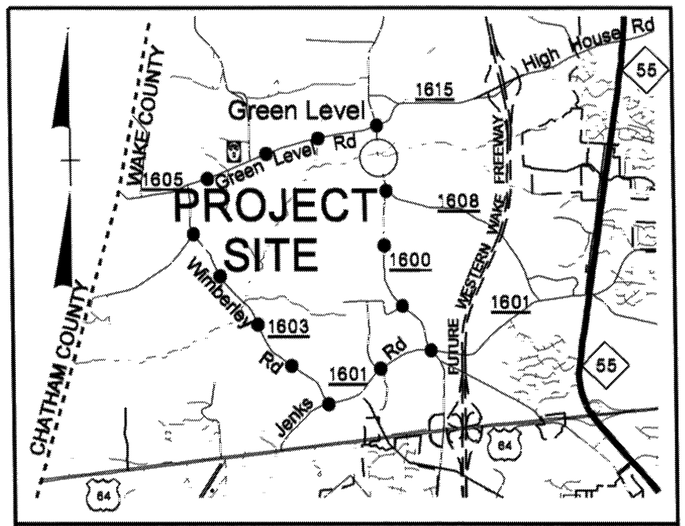
Jurisdictional Wetlands

Station	Type of Impact	Minimization of Impact
-L- 22+54 RT	Fill and Clearing	Roadway fill slopes kept as steep as possible, clearing only what's required for construction.
-L- 24+00 to 30+80 RT	Fill, Excavation, and Clearing	Roadway fill slopes kept as steep as possible, clearing only what's required for construction, utilize hand clearing when possible.
-L- 28+50 to 29+60 LT	Clearing	Clearing only what's required for construction, utilize hand clearing when possible.
General Comments:		

TIP PROJECT: B-4697

CONTRACT: _____

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



VICINITY MAP

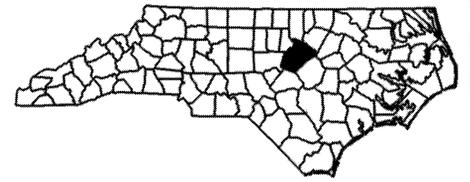
DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4697	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
38474.1.1	BRZ-1600(9)	PE	
38474.2.1	BRZ-1600(9)	ROW, UTL.	

Permit Drawing
Sheet 3 of 12

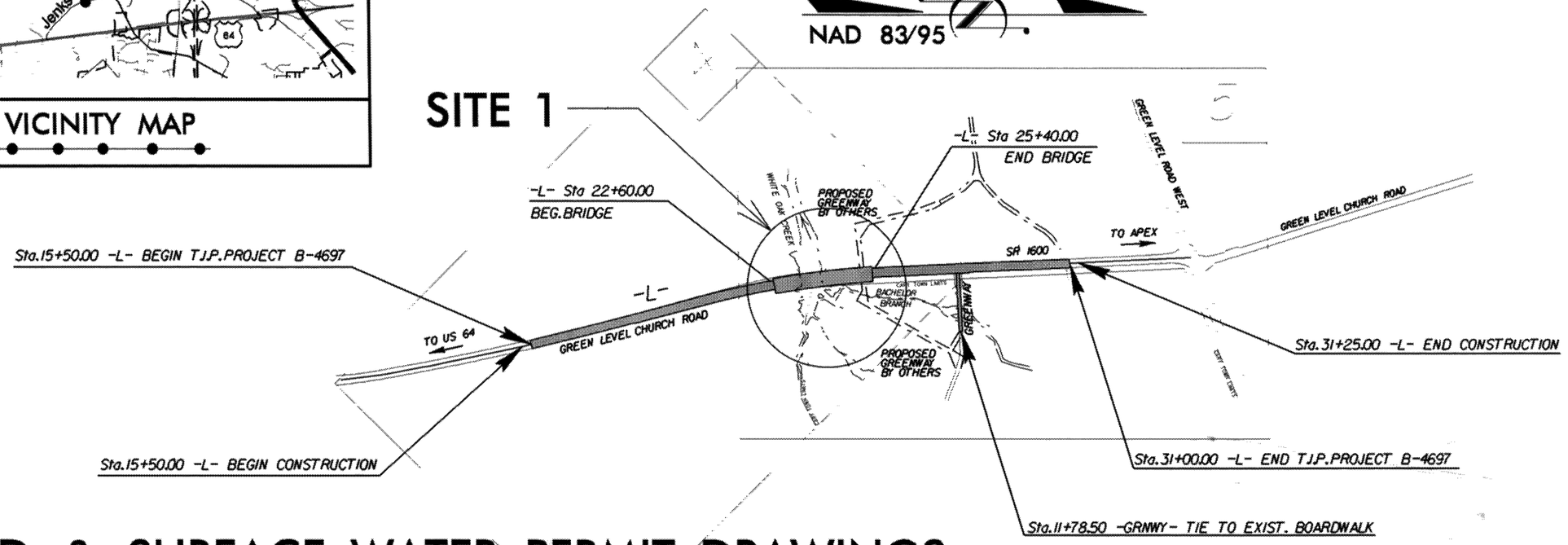


LOCATION: BRIDGE NO. 55 OVER WHITE OAK CREEK
ON SR 1600 (GREEN LEVEL CHURCH RD)

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

NAD 83/95

SITE 1



WETLAND & SURFACE WATER PERMIT DRAWINGS

THIS IS NOT A CONTROL OF ACCESS PROJECT.
THIS PROJECT IS PARTIALLY WITHIN THE CARY CITY LIMITS.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

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 2012 = 7,900
ADT 2035 = 22,000
DHV = 8 %
D = 60 %
T = 5 % *
V = 50 MPH
* TTST 2% DUAL 3%
FUNC CLASS = LOCAL
SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4697	=	0.241 MILES
LENGTH STRUCTURE TIP PROJECT B-4697	=	0.053 MILES
TOTAL LENGTH TIP PROJECT B-4697	=	0.294 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MARCH 17, 2011

LETTING DATE: APRIL 17, 2012

JASON MOORE, PE
PROJECT ENGINEER

KEVIN E. MOORE, 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 P.E.

$$$$$$SYSTIME$$$$$$
$$$$$$DIGINS$$$$$$
$$$$$$USERNAME$$$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-4697	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 32 of 12

ENGLISH

NAD 83/95

REVISIONS

8/17/99

-L- PT Sta. 11+38.29 -L- PC Sta. 12+36.32

-L- PT Sta. 12+92.07

-L- PC Sta. 15+09.07

-L- PT Sta. 15+43.17

-L- PC Sta. 16+92.82

-L- PRC Sta. 20+56.85

15+00

20+00

4 LASSITER, DONALD C.

5A ANDERSON, ELIZABETH S.

6 COUNCIL HEIRS, ALBERT M.

5 WAKE COUNTY BOARD OF EDUCATION FACILITIES BLDG

7 CARY, TOWN OF

SEE ENLARGEMENT 1

SPECIAL CUT DITCH W/CLASS B RIP RAP SEE DETAIL A

SPECIAL CUT DITCH W/CLASS B RIP RAP SEE DETAIL B

LATERAL 'V' DITCH W/CLASS B RIP RAP SEE DETAIL C

LATERAL 'V' DITCH W/CLASS B RIP RAP SEE DETAIL E

STANDARD 'V' DITCH W/ CLASS B RIP RAP SEE DETAIL G

LATERAL 2' BASE DITCH W/CLASS B RIP RAP SEE DETAIL D

LATERAL 2' BASE DITCH W/CLASS B RIP RAP SEE DETAIL F

BANK STABILIZATION SEE DETAIL H

BANK STABILIZATION SEE DETAIL I

REMOVE

CLEAN OUT 12" RCP

RETAIN

15" CSP W/ 2 ELBOWS

ROD & LUG W/ SLEEVE GASKETS

EXCAVATE TO NATURAL GROUND (SEE PAY ITEM)

MATCH LINE -L- 24+75.00 SEE SHEET 5

FOR -L- PROFILE SEE SHEET 6

DENOTES EXCAVATION IN WETLAND

DENOTES FILL IN WETLAND

DENOTES TEMPORARY FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

DETAIL H
BANK STABILIZATION
(Not to Scale)

Type of Liner= 295 TONS CLASS II RIP RAP
Filter Fabric= 295 SY

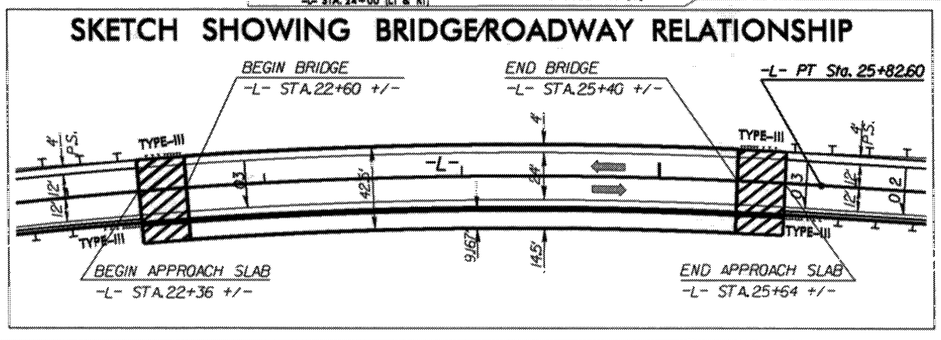
-L- STA. 23+30 (LT & RT)
-L- STA. 24+00 (LT & RT)

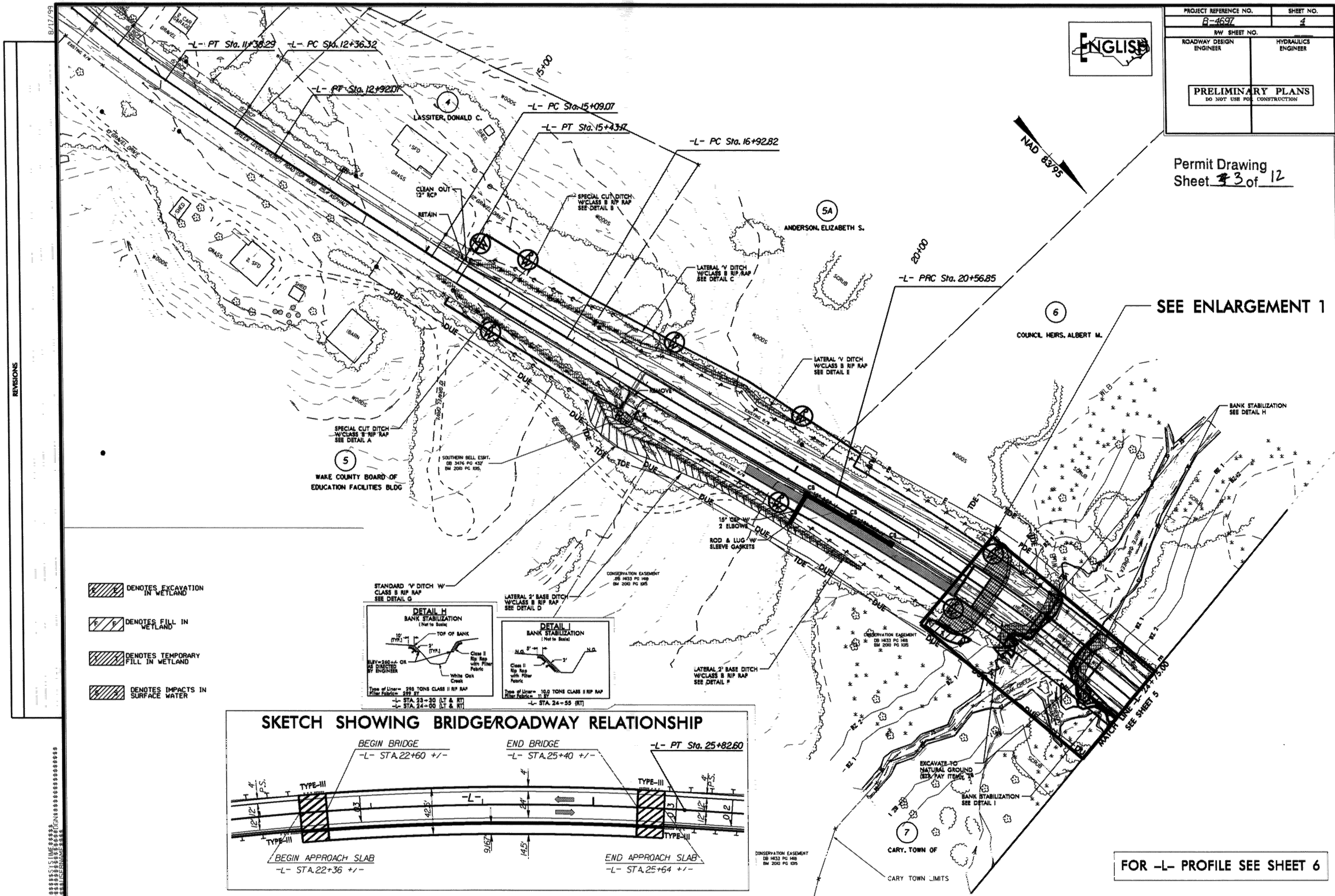
DETAIL I
BANK STABILIZATION
(Not to Scale)

Type of Liner= 10.0 TONS CLASS II RIP RAP
Filter Fabric= 11 SY

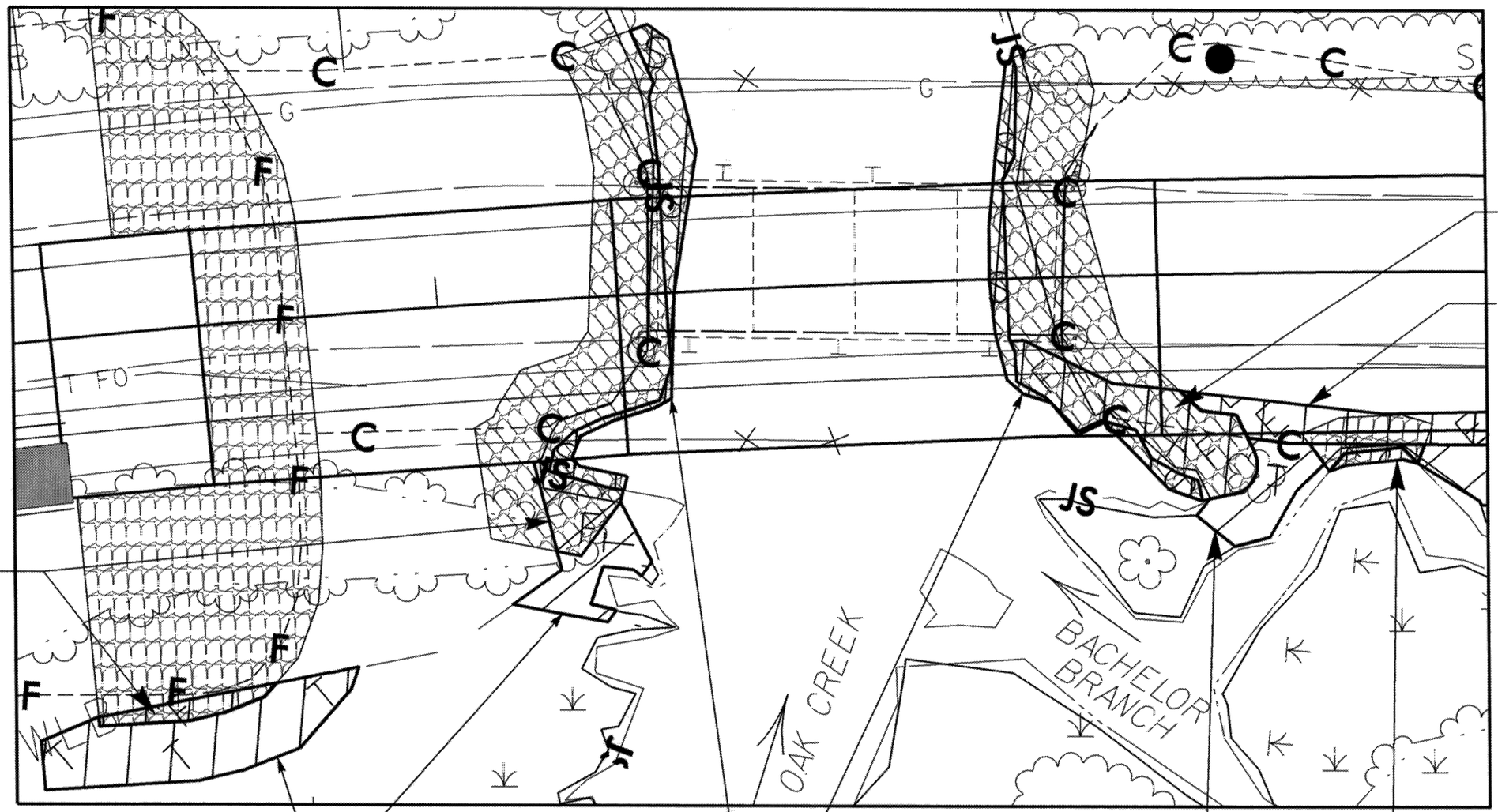
-L- STA. 24+55 (RT)

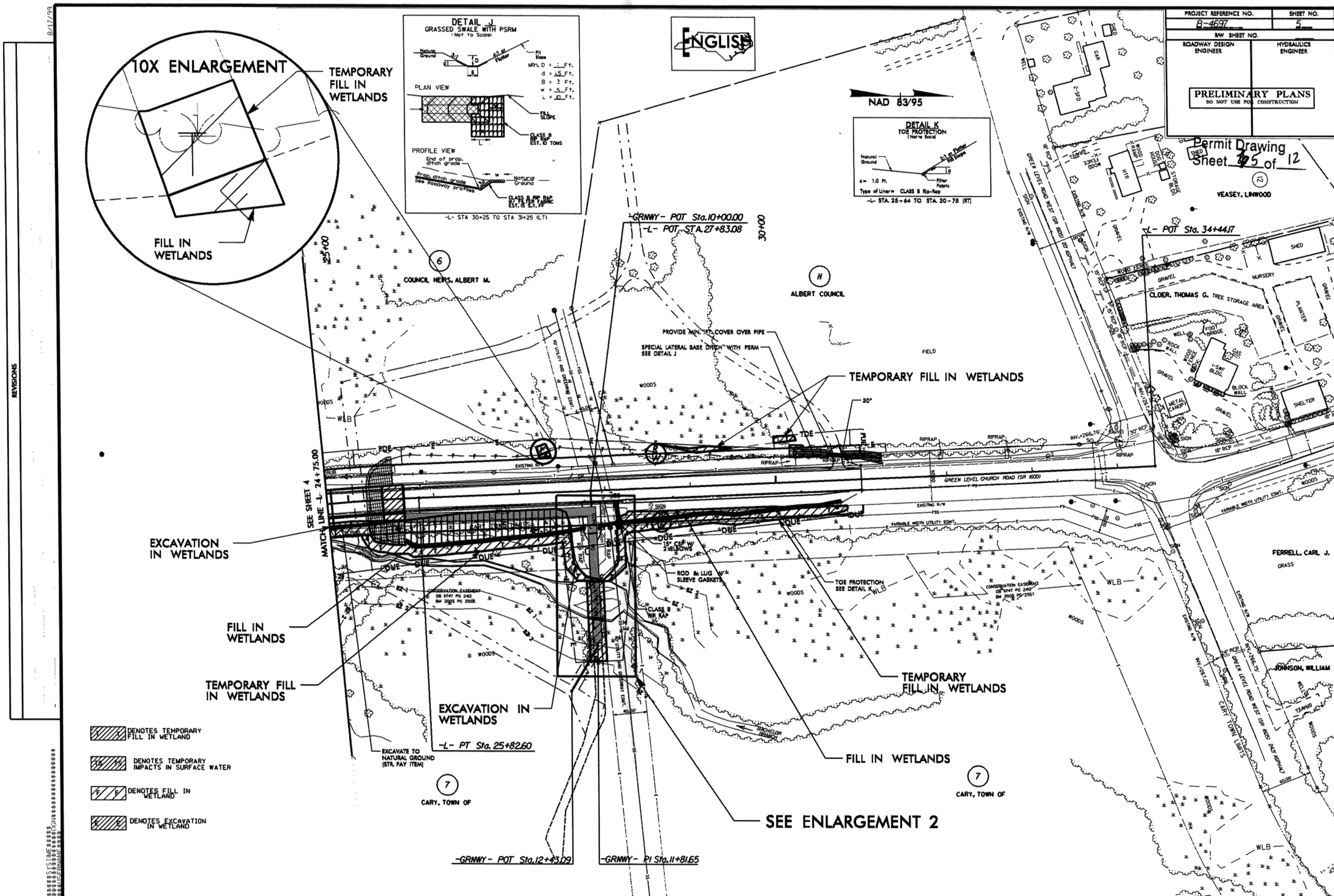
SKETCH SHOWING BRIDGE/ROADWAY RELATIONSHIP




PROJECT REFERENCE NO.
B-4697
SHEET NO.
4
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
ENGLISH
NAD 83/95
Permit Drawing Sheet 3 of 12
-L- PT Sta. 11+38.29
-L- PC Sta. 12+36.32
-L- PT Sta. 12+92.07
-L- PC Sta. 15+09.07
-L- PT Sta. 15+43.17
-L- PC Sta. 16+92.82
-L- PRC Sta. 20+56.85
LASSITER, DONALD C.
ANDERSON, ELIZABETH S.
COUNCIL HEIRS, ALBERT M.
WAKE COUNTY BOARD OF EDUCATION FACILITIES BLDG
CARY, TOWN OF
SEE ENLARGEMENT 1
MATCH LINE -L- 24+75.00 SEE SHEET 5
SPECIAL CUT DITCH W/CLASS B RIP RAP SEE DETAIL B
LATERAL 'V' DITCH W/CLASS B RIP RAP SEE DETAIL C
LATERAL 'V' DITCH W/CLASS B RIP RAP SEE DETAIL E
SPECIAL CUT DITCH W/CLASS B RIP RAP SEE DETAIL A
STANDARD 'V' DITCH W/ CLASS B RIP RAP SEE DETAIL G
LATERAL 2' BASE DITCH W/CLASS B RIP RAP SEE DETAIL D
LATERAL 2' BASE DITCH W/CLASS B RIP RAP SEE DETAIL F
BANK STABILIZATION SEE DETAIL H
BANK STABILIZATION SEE DETAIL I
EXCAVATE TO NATURAL GROUND (NO PAY ITEM)
CARY TOWN LIMITS
DENOTES EXCAVATION IN WETLAND
DENOTES FILL IN WETLAND
DENOTES TEMPORARY FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DETAIL H BANK STABILIZATION (Not to Scale)
DETAIL I BANK STABILIZATION (Not to Scale)
SKETCH SHOWING BRIDGE/ROADWAY RELATIONSHIP
BEGIN BRIDGE -L- STA.22+60 +/-
END BRIDGE -L- STA.25+40 +/-
-L- PT Sta. 25+82.60
BEGIN APPROACH SLAB -L- STA.22+36 +/-
END APPROACH SLAB -L- STA.25+64 +/-
FOR -L- PROFILE SEE SHEET 6
REVISIONS

ENLARGEMENT 1





PROJECT REFERENCE NO.
B-4697
SHEET NO.
5
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Permit Drawing
Sheet 5 of 12
ENGLISH
NAD 83/95
DETAIL J
GRASSED SWALE WITH PSRM
(Not to Scale)
PLAN VIEW
PROFILE VIEW
-L- STA 30+25 TO STA 31+25 (LT)
DETAIL K
TOE PROTECTION
(Not to Scale)
Type of Liner= CLASS B Rip-Rap
-L- STA. 25+64 TO STA. 30+75 (RT)
10X ENLARGEMENT
TEMPORARY FILL IN WETLANDS
FILL IN WETLANDS
COUNCIL HEIRS, ALBERT M.
ALBERT COUNCIL
VEASEY, LINWOOD
CLOER, THOMAS G.
FERRELL, CARL J.
JOHNSON, WILLIAM H.
CARY, TOWN OF
-GRNWY- POT Sta.10+00.00
-L- POT STA.27+83.08
-L- POT Sta. 34+44.17
-L- PT Sta. 25+82.60
-GRNWY- POT Sta.12+43.09
-GRNWY- PI Sta.11+81.65
MATCH LINE -L- 24+75.00
SEE SHEET 4
PROVIDE MIN. 1FT. COVER OVER PIPE
SPECIAL LATERAL BASE DITCH WITH PSRM
SEE DETAIL J
TEMPORARY FILL IN WETLANDS
EXCAVATION IN WETLANDS
FILL IN WETLANDS
TEMPORARY FILL IN WETLANDS
EXCAVATION IN WETLANDS
TOE PROTECTION SEE DETAIL K
TEMPORARY FILL IN WETLANDS
FILL IN WETLANDS
SEE ENLARGEMENT 2
GREEN LEVEL CHURCH ROAD (SR 1600)
GREEN LEVEL ROAD WEST (SR 1600)
CONSERVATION EASEMENT
EXCAVATE TO NATURAL GROUND (STR. PAY ITEM)
DENOTES TEMPORARY FILL IN WETLAND
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES FILL IN WETLAND
DENOTES EXCAVATION IN WETLAND
REVISIONS
8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-4697	5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 56 of 72

8/17/99

REVISIONS

10X ENLARGEMENT

TEMPORARY FILL IN WETLANDS

FILL IN WETLANDS

DETAIL J
GRASSED SWALE WITH PSRM
(Not To Scale)

PLAN VIEW

PROFILE VIEW

Min. D = 1 Ft.
d = 1.5 Ft.
B = 3 Ft.
w = 5 Ft.
L = 10 Ft.

CLASS B RIP RAP EST. 10 TONS

CLASS B RIP RAP W/ FILTER FABRIC EST. 0 S.Y.

-L- STA 30+25 TO STA 31+25 (LT)

ENGLISH

NAD 83/95

DETAIL K
TOE PROTECTION
(Not to Scale)

d= 1.0 Ft.
Type of Liner= CLASS B Rip-Rap

-L- STA. 25+84 TO STA. 30+75 (RT)

-GRNWY- POT Sta.10+00.00
-L- POT STA. 27+83.08

-L- POT Sta. 34+44.17

25+00

30+00

6 COUNCIL HEIRS, ALBERT M.

H ALBERT, GOUNCIL

7 CARY, TOWN OF

VEASEY, LINWOOD

CLOER, THOMAS G.

PROVIDE MIN. 1FT. COVER OVER PIPE

SPECIAL LATERAL BASE DITCH WITH PSRM SEE DETAIL J

TEMPORARY FILL IN WETLANDS

TOE PROTECTION SEE DETAIL K

ROD & LUG W/ SLEEVE GASKETS

15" CSP W/ 2 BLOWS

CLASS B RIP RAP

EXCAVATION IN WETLANDS

-L- PT Sta. 25+82.60

EXCAVATE TO NATURAL GROUND (STR. PAY ITEM)

FILL IN WETLANDS

TEMPORARY FILL IN WETLANDS

SEE ENLARGEMENT 2

-GRNWY- POT Sta.12+43.09

-GRNWY- PI Sta.11+81.65

SEE SHEET 4
MATCH LINE -L- 24+75.00

GREEN LEVEL CHURCH ROAD (SR 1600)

GREEN LEVEL ROAD WEST (SR 1600) 24' ASPHALT

FERRELL, CARL J.

JOHNSON, WILLIAM H.

CARY TOWN LIMITS

CONSERVATION EASEMENT DB 8747 PG 242 BM 2005 PG 2551

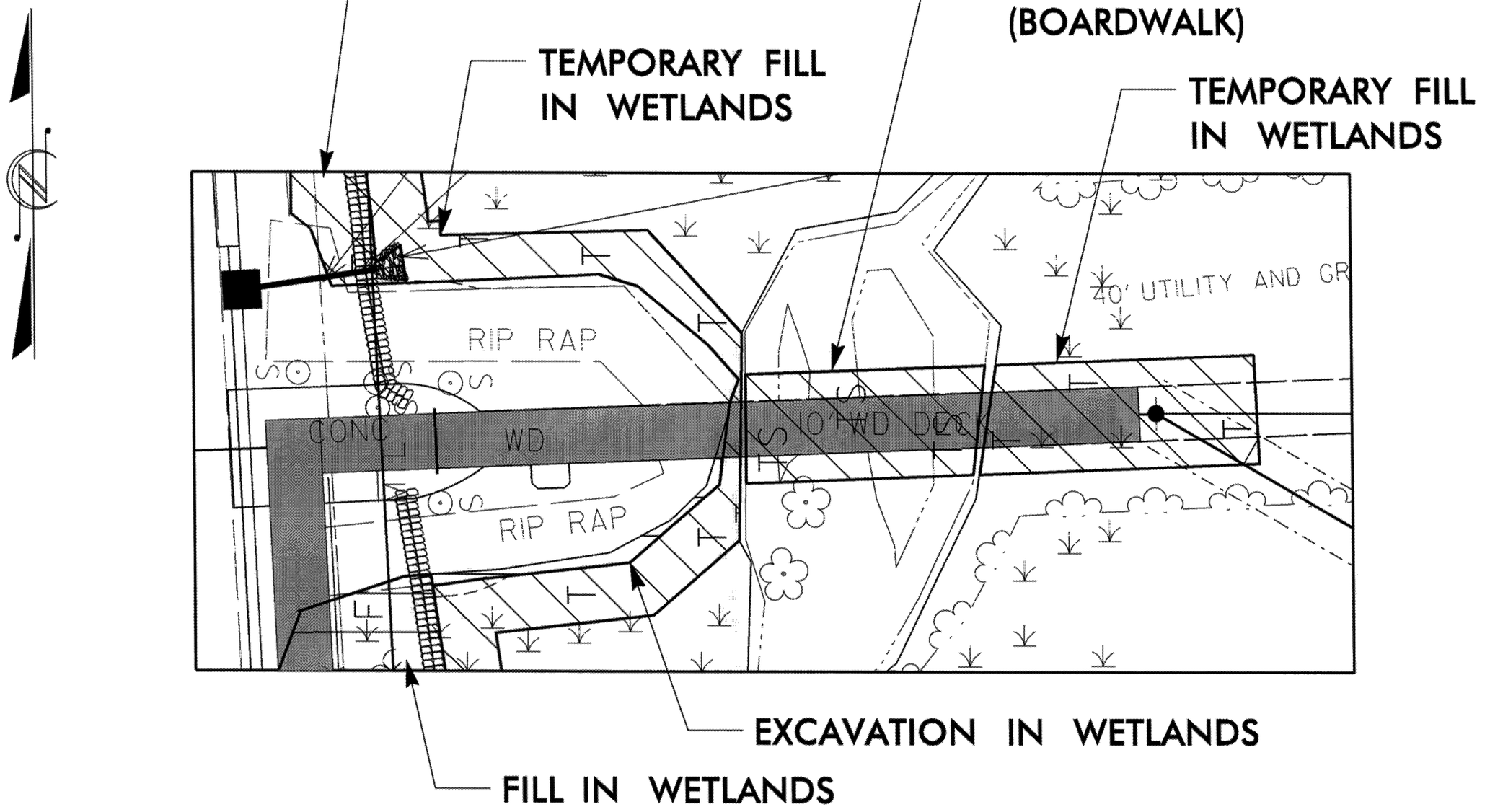
DENOTES TEMPORARY FILL IN WETLAND

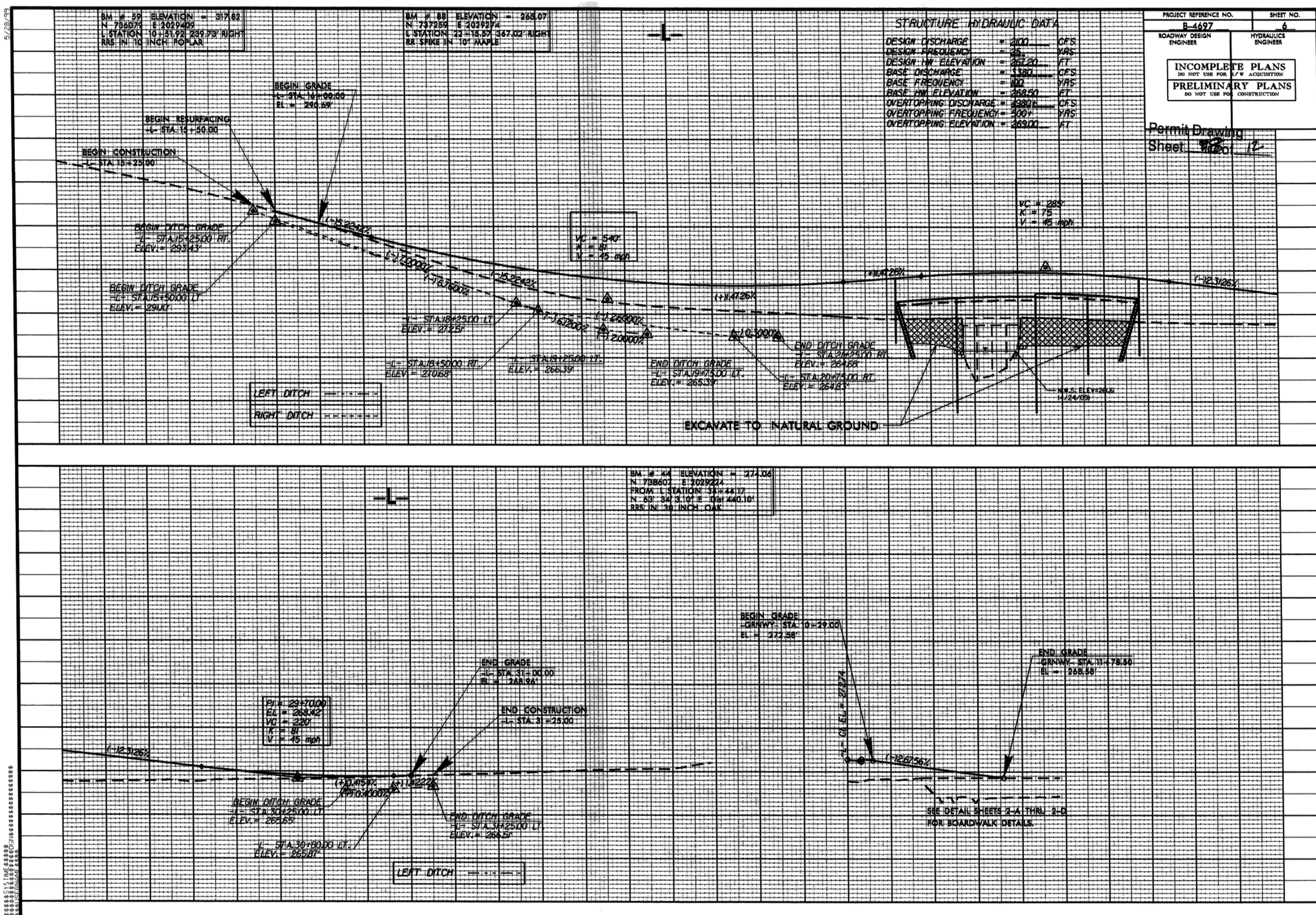
DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLAND

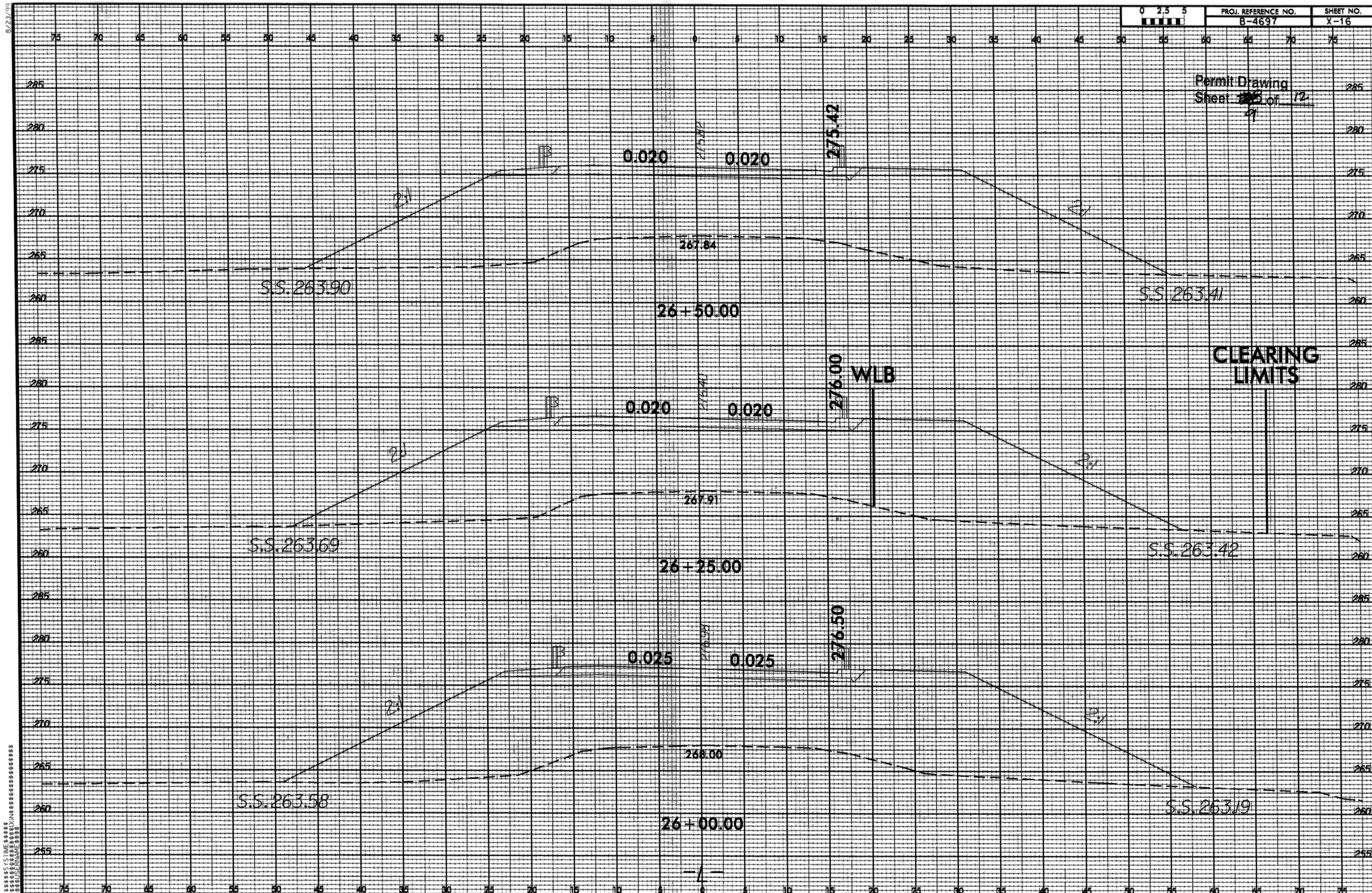
DENOTES EXCAVATION IN WETLAND

ENLARGEMENT 2





5/28/99
PROJECT REFERENCE NO. B-4697
SHEET NO. 6
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Permit Drawing
Sheet of 12
STRUCTURE HYDRAULIC DATA
DESIGN DISCHARGE = 2100 CFS
DESIGN FREQUENCY = 25 YRS
DESIGN HW ELEVATION = 267.20 FT
BASE DISCHARGE = 3380 CFS
BASE FREQUENCY = 100 YRS
BASE HW ELEVATION = 268.50 FT
OVERTOPPING DISCHARGE = 4980± CFS
OVERTOPPING FREQUENCY = 500+ YRS
OVERTOPPING ELEVATION = 269.00 FT
BM # 59 ELEVATION = 317.82
N 736079 E 2029409
L STATION 10+51.92 239.73' RIGHT
RRS IN 10 INCH POPLAR
BM # 88 ELEVATION = 265.07
N 737259 E 2029274
L STATION 22+15.57 367.02' RIGHT
RR SPIKE IN 10" MAPLE
-L-
BEGIN GRADE
-L- STA. 16+00.00
EL = 290.69'
BEGIN RESURFACING
-L- STA. 15+50.00
BEGIN CONSTRUCTION
-L- STA. 15+25.00
BEGIN DITCH GRADE
-L- STA.15+25.00 RT.
ELEV. = 293.43'
BEGIN DITCH GRADE
-L- STA.15+50.00 LT.
ELEV. = 291.10'
VC = 540'
K = 81
V = 45 mph
VC = 285'
K = 75
V = 45 mph
-L- STA.18+25.00 LT.
ELEV. = 272.51'
-L- STA.18+50.00 RT.
ELEV. = 270.68'
-L- STA.19+25.00 LT.
ELEV. = 266.39'
END DITCH GRADE
-L- STA.19+75.00 LT.
ELEV. = 265.39'
END DITCH GRADE
-L- STA.20+25.00 RT.
ELEV. = 264.68'
-L- STA.20+75.00 RT.
ELEV. = 264.83'
W.S. ELEV=261.6
(4/24/09)
EXCAVATE TO NATURAL GROUND
LEFT DITCH
RIGHT DITCH
BM # 44 ELEVATION = 274.06
N 738607 E 2029224
FROM L STATION 34+44.17
N 63 34 3.10" E Dist 440.10'
RRS IN 30 INCH OAK
-L-
PI = 29+70.00
EL = 268.42
VC = 220
K = 81
V = 45 mph
END GRADE
-L- STA. 31+00.00
EL = 268.96'
END CONSTRUCTION
-L- STA. 31+25.00
BEGIN DITCH GRADE
-L- STA.30+25.00 LT.
ELEV. = 265.65'
-L- STA.30+60.00 LT.
ELEV. = 265.87'
END DITCH GRADE
-L- STA.31+25.00 LT.
ELEV. = 266.51'
LEFT DITCH
BEGIN GRADE
-GRNWY- STA. 10+29.00
EL = 272.58'
-L- CL EL = 272.74
(-)2.6756%
END GRADE
-GRNWY- STA. 11+78.50
EL = 268.58'
SEE DETAIL SHEETS 2-A THRU 2-D
FOR BOARDWALK DETAILS.


PROJ. REFERENCE NO.
B-4697
SHEET NO.
X-16
Permit Drawing
0.020
0.020
275.42
267.84
S.S. 263.90
S.S. 263.41
26+50.00
CLEARING LIMITS
WLB
0.020
0.020
276.00
267.91
S.S. 263.69
S.S. 263.42
26+25.00
0.025
0.025
276.50
268.00
S.S. 263.58
S.S. 263.19
26+00.00

PROJECT REFERENCE NO.	SHEET NO.
B-4697	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Permit Drawing
Sheet 10 of 12

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
6	COUNCIL HEIRS, ALBERT M.	3705 GREEN LEVEL WEST RD., APEX, NC 27523-7503
7	TOWN OF CARY	P.O. BOX 8005, CARY, NC 27512-8005
11	COUNCIL, ALBERT	2706 WESTBROOKE DRIVE, KINSTON, NC 28504-1151

PROJECT REFERENCE NO.	SHEET NO.
B-4697	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Permit Drawing
Sheet 11 of 12

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
6	COUNCIL HEIRS, ALBERT M.	3705 GREEN LEVEL WEST RD., APEX, NC 27523-7503
7	TOWN OF CARY	P.O. BOX 8005, CARY, NC 27512-8005
11	COUNCIL, ALBERT	2706 WESTBROOKE DRIVE, KINSTON, NC 28504-1151

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	-L- STA. 23+68	BRIDGE/ROADWAY	0.22	0.18	0.02							
		BANK STABILIZATION	0.01	<0.01				0.01		106		
		BOARDWALK		0.02					0.02		20	
TOTALS:			0.23	0.20	0.02			0.01	0.02	106	20	

There will be one, 3'-6" drilled pier in surface waters. Area impacted=10sq. ft. (<0.001 acres).

Excavation in wetlands is due to removal of existing roadway and greenway fill.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY
WBS - 38474.1.1 (B-4697)

SHEET 12 of 12 5/20/2011

ATN Revised 3/31/05

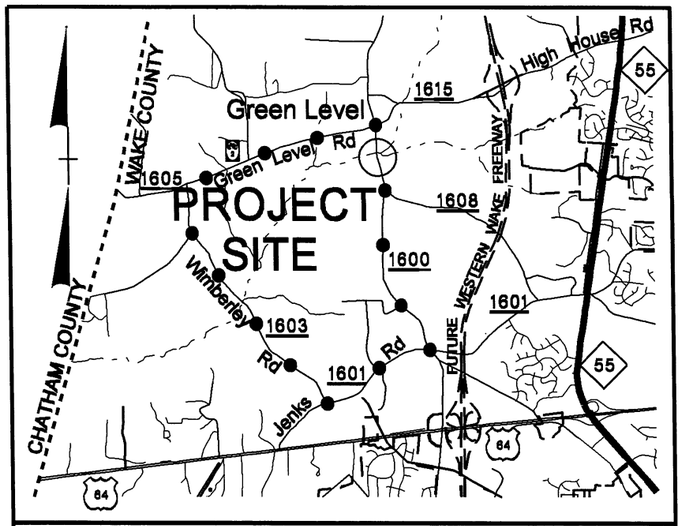
09/08/99

TIP PROJECT: B-4697

CONTRACT: _____

$$$$$$$$SYSTIME$$$$$$$$
$$$$$$$$DGN$$$$$$$$
$$$$$$$$USERNAME$$$$$$$$

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



VICINITY MAP

DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4697	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
38474.1.1	BRZ-1600(9)	PE
38474.2.1	BRZ-1600(9)	ROW, UTL.

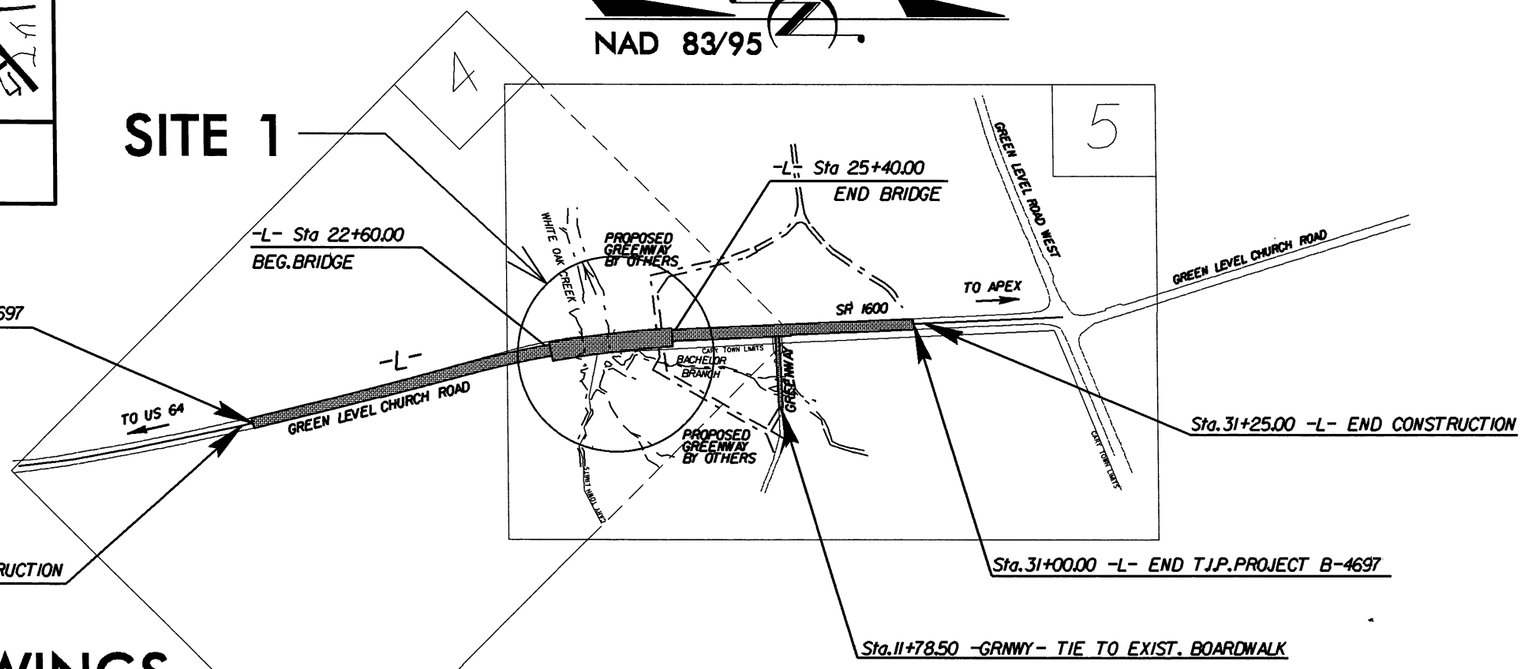
Buffer Drawing
Sheet 1 of 1

LOCATION: BRIDGE NO. 55 OVER WHITE OAK CREEK ON SR 1600 (GREEN LEVEL CHURCH RD)

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

NAD 83/95

SITE 1



BUFFER PERMIT DRAWINGS

THIS IS NOT A CONTROL OF ACCESS PROJECT.
THIS PROJECT IS PARTIALLY WITHIN THE CARY CITY LIMITS.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

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 2012 = 7,900
ADT 2035 = 22,000
DHV = 8 %
D = 60 %
T = 5 % *
V = 50 MPH
* TTST 2% DUAL 3%
FUNC CLASS = LOCAL
SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4697	=	0.241 MILES
LENGTH STRUCTURE TIP PROJECT B-4697	=	0.053 MILES
TOTAL LENGTH TIP PROJECT B-4697	=	0.294 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MARCH 17, 2011

LETTING DATE: APRIL 17, 2012

JASON MOORE, PE
PROJECT ENGINEER

KEVIN E. MOORE, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

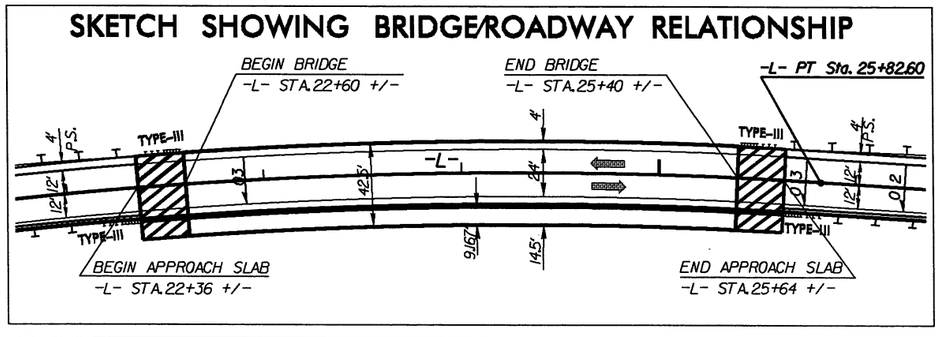
SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER _____ P.E.



PROJECT REFERENCE NO.	SHEET NO.
B-4697	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Buffer Drawing
Sheet ~~4~~2 of 7

8/17/99

FOR -L- PROFILE SEE SHEET 6

PROJECT REFERENCE NO.	SHEET NO.
B-4697	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ENGLISH

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83/95

Buffer Drawing
Sheet 3 & of 7

REVISIONS

8/17/99

-L- PT Sta. 11+38.29
-L- PC Sta. 12+36.32
-L- PT Sta. 12+92.07
-L- PC Sta. 15+09.07
-L- PT Sta. 15+43.17
-L- PC Sta. 16+92.82
-L- PRC Sta. 20+56.85
-L- PT Sta. 25+82.60

15+00
20+00

GREEN LEVEL CHURCH ROAD (SR 1600) 22' ASPHALT

LASSITER, DONALD C.

ANDERSON, ELIZABETH S.

COUNCIL HEIRS, ALBERT M.

WAKE COUNTY BOARD OF EDUCATION FACILITIES BLDG

CARY, TOWN OF

CARY TOWN LIMITS

SPECIAL CUT DITCH W/CLASS B RIP RAP SEE DETAIL A

SPECIAL CUT DITCH W/CLASS B RIP RAP SEE DETAIL B

LATERAL 'V' DITCH W/CLASS B RIP RAP SEE DETAIL C

LATERAL 'V' DITCH W/CLASS B RIP RAP SEE DETAIL E

STANDARD 'V' DITCH W/ CLASS B RIP RAP SEE DETAIL G

LATERAL 2' BASE DITCH W/CLASS B RIP RAP SEE DETAIL D

LATERAL 2' BASE DITCH W/CLASS B RIP RAP SEE DETAIL F

BANK STABILIZATION SEE DETAIL H

BANK STABILIZATION SEE DETAIL I

CLEAN OUT 12" RCP

RETAIN

REMOVE

15" CMP W/ 2 ELBOWS

ROD & LUG W/ SLEEVE GASKETS

EXCAVATE TO NATURAL GROUND (REF. PAY ITEM# 2)

SOUTHERN BELL ESMT. DB 3476 PG 432 BM 2010 PG 1015

CONSERVATION EASEMENT DB 14133 PG 1481 BM 2010 PG 1015

ALLOWABLE ZONE 1

ALLOWABLE ZONE 2

ALLOWABLE ZONE 1

ALLOWABLE IMPACTS ZONE 1

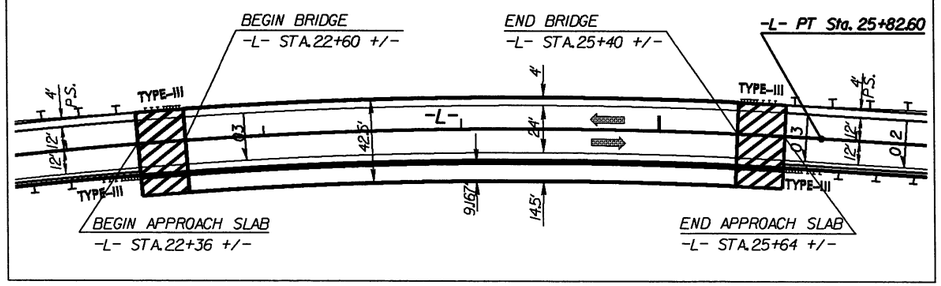
ALLOWABLE IMPACTS ZONE 2

MATCH LINE -L- 24+75.00 SEE SHEET 5

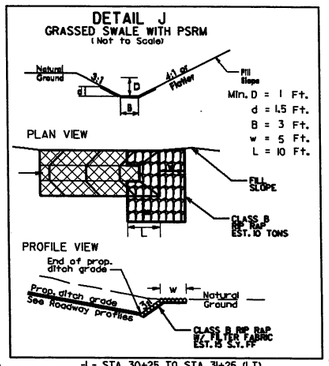
50' 0' 50' 100' 150'

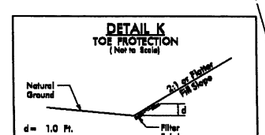
FOR -L- PROFILE SEE SHEET 6

SKETCH SHOWING BRIDGE/ROADWAY RELATIONSHIP



$$$$USERNAME$$$$ $$$$SYSTIME$$$$ $$$$DGN$$$$





PROJECT REFERENCE NO.	SHEET NO.
B-4697	5

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Buffer Drawing
Sheet ~~6~~ 4 of 7

8/17/99

REVISIONS

▨ MITIGABLE IMPACTS ZONE 2

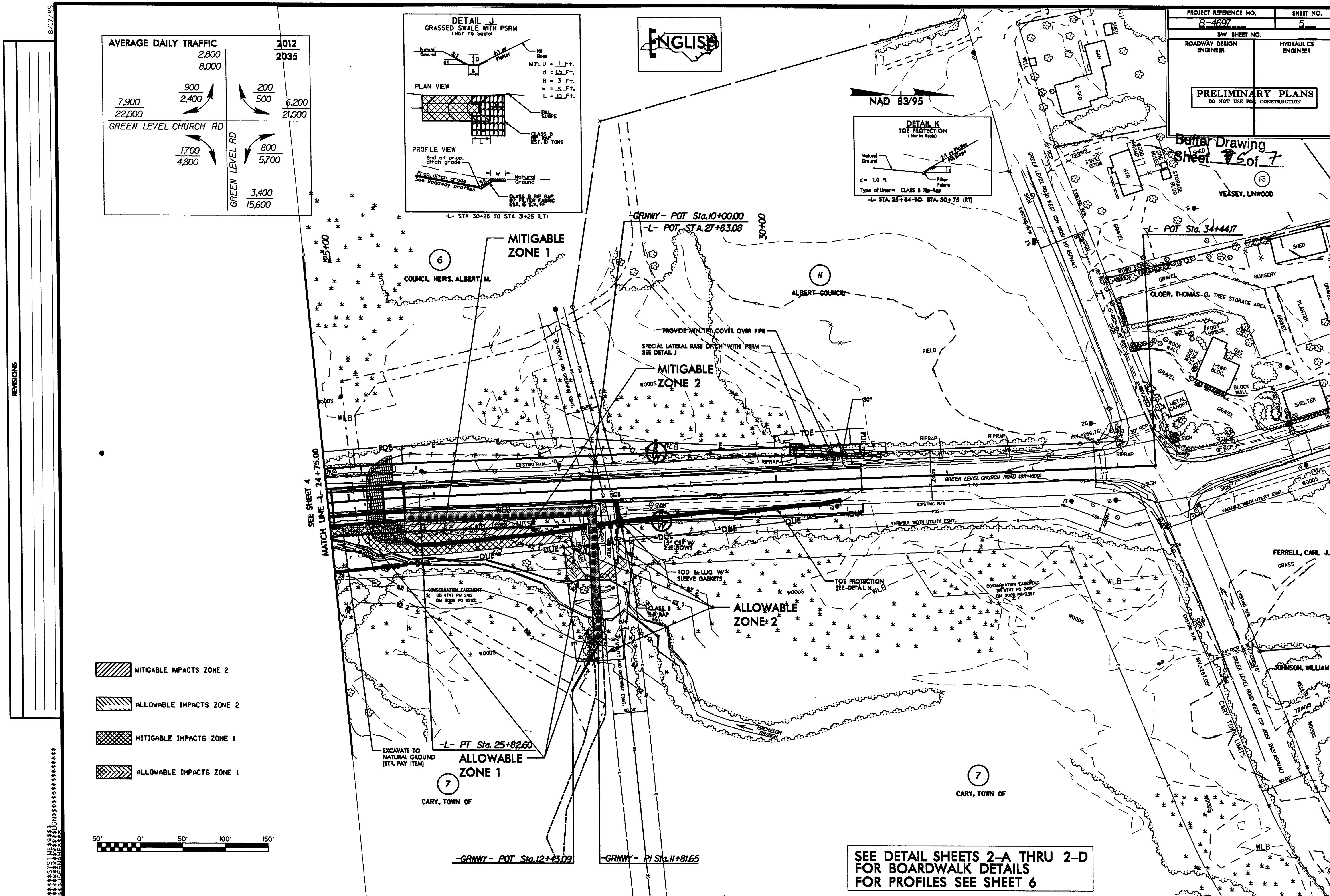
▨ ALLOWABLE IMPACTS ZONE 2

▩ MITIGABLE IMPACTS ZONE 1

▨ ALLOWABLE IMPACTS ZONE 1

SEE DETAIL SHEETS 2-A THRU 2-D
FOR BOARDWALK DETAILS
FOR PROFILES SEE SHEET 6

$$$$$SYSTIME$$$$
$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$



PROJECT REFERENCE NO. B-4697
SHEET NO. 5
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Buffer Drawing Sheet 5 of 7
ENGLISH
NAD 83/95
AVERAGE DAILY TRAFFIC
2012
2035
2,800
8,000
900
2,400
200
500
7,900
22,000
6,200
21,000
GREEN LEVEL CHURCH RD
GREEN LEVEL RD
1,700
4,800
800
5,700
3,400
15,600
DETAIL J
GRASSED SWALE WITH PSRM
(Not to Scale)
Natural Ground
Fill Slope
Min. D = 1 Ft.
d = 1.5 Ft.
B = 3 Ft.
w = 5 Ft.
L = 10 Ft.
PLAN VIEW
FILL SLOPE
CLASS B RIP RAP EST. 10 TONS
PROFILE VIEW
End of prop. ditch grade
Prop. ditch grade
See Roadway profiles
Natural Ground
CLASS B RIP RAP W/ FILTER FABRIC EST. 15 S.Y. FF
-L- STA 30+25 TO STA 31+25 (LT)
DETAIL K
TOE PROTECTION
(Not to Scale)
Natural Ground
Filter Fabric
d= 1.0 Ft.
Type of Liner= CLASS B Rip-Rap
-L- STA. 25+84 TO STA. 30+75 (RT)
MITIGABLE ZONE 1
MITIGABLE ZONE 2
ALLOWABLE ZONE 1
ALLOWABLE ZONE 2
COUNCIL HEIRS, ALBERT M.
ALBERT COUNCIL
VEASEY, LINWOOD
CLOER, THOMAS G.
FERRELL, CARL J.
JOHNSON, WILLIAM H.
CARY, TOWN OF
-GRNWY- POT Sta.10+00.00
-L- POT STA.27+83.08
-L- POT Sta. 34+44.17
-L- PT Sta. 25+82.60
-GRNWY- POT Sta.12+43.09
-GRNWY- PI Sta.11+81.65
SEE SHEET 4
MATCH LINE -L- 24+75.00
GREEN LEVEL CHURCH ROAD (SR 1600)
GREEN LEVEL ROAD WEST (SR 1600)
PROVIDE MIN. 1 FT. COVER OVER PIPE
SPECIAL LATERAL BASE DITCH WITH PSRM SEE DETAIL J
TOE PROTECTION SEE DETAIL K
ROD & LUG W/ SLEEVE GASKETS
CONSERVATION EASEMENT
EXCAVATE TO NATURAL GROUND (STR. PAY ITEM)
FIELD
WOODS
NURSERY
TREE STORAGE AREA
SHELTER
PLANTER
METAL CANOPY
EXISTING R/W
VARIABLE WIDTH UTILITY ESMT.
CARY TOWN LIMITS
MITIGABLE IMPACTS ZONE 2
ALLOWABLE IMPACTS ZONE 2
MITIGABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 1
50' 0' 50' 100' 150'
SEE DETAIL SHEETS 2-A THRU 2-D FOR BOARDWALK DETAILS
FOR PROFILES SEE SHEET 6
REVISIONS
8/17/99

BUFFER IMPACTS SUMMARY

			IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	GREENWAY	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
1	BRIDGE	-L- STA. 23+68		X		4294	2456	6750					
	ROAD	FROM -L- 25+40 (RT)			X				3318	3283	6601		
		TO -L- 27+47 (RT)											
	GREENWAY	-L- STA. 27+84 (RT)	X			1365.0	762.0	2127					
TOTAL:						5659.0	3218.0	8877.0	3318.0	3283.0	6601.0		

METHOD III CLEARING

10,081 ft^2 of wetland impacts fall within the reflected buffer impacts. See attached for details.

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY
PROJECT: 38474.1.1 (B-4697)

5/6/2011
SHEET 6 OF 7

Rev. May 2006

WETLANDS IN BUFFER IMPACTS SUMMARY

SITE NO.	STATION (FROM/TO)		WETLANDS IN BUFFERS ZONE 1 (ft^2)	WETLANDS IN BUFFERS ZONE 2 (ft^2)
	BRIDGE		1780	19
	ROAD		3318	3283
	GREENWAY		959	722
TOTAL:			6057	4024

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY
PROJECT: 38474.1.1 (B-4697)

5/6/2011
SHEET 37 OF 7

Rev. Jan 2009

T.I.P. NO.	SHEET NO.
B-4697	UO-1

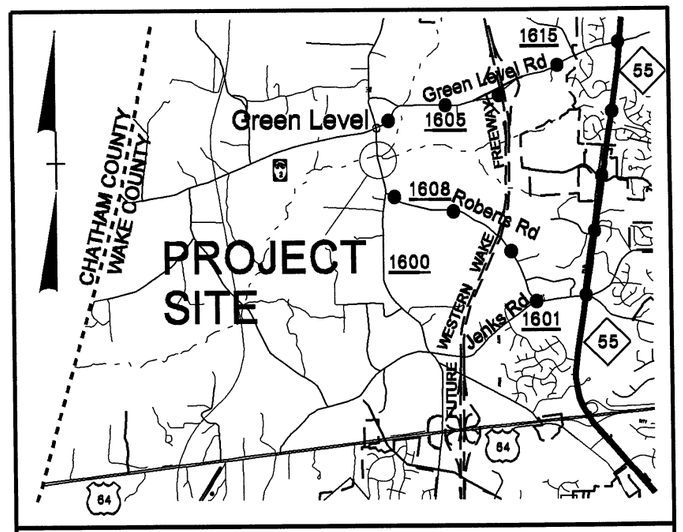
Utility Permit Drawing
Sheet 1 of 4

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES BY OTHERS PLANS
WAKE COUNTY

LOCATION: BRIDGE NO. 55 OVER WHITE OAK CREEK ON SR 1600 (GREEN LEVEL CHURCH ROAD)

TYPE OF WORK: UTILITY RELOCATION

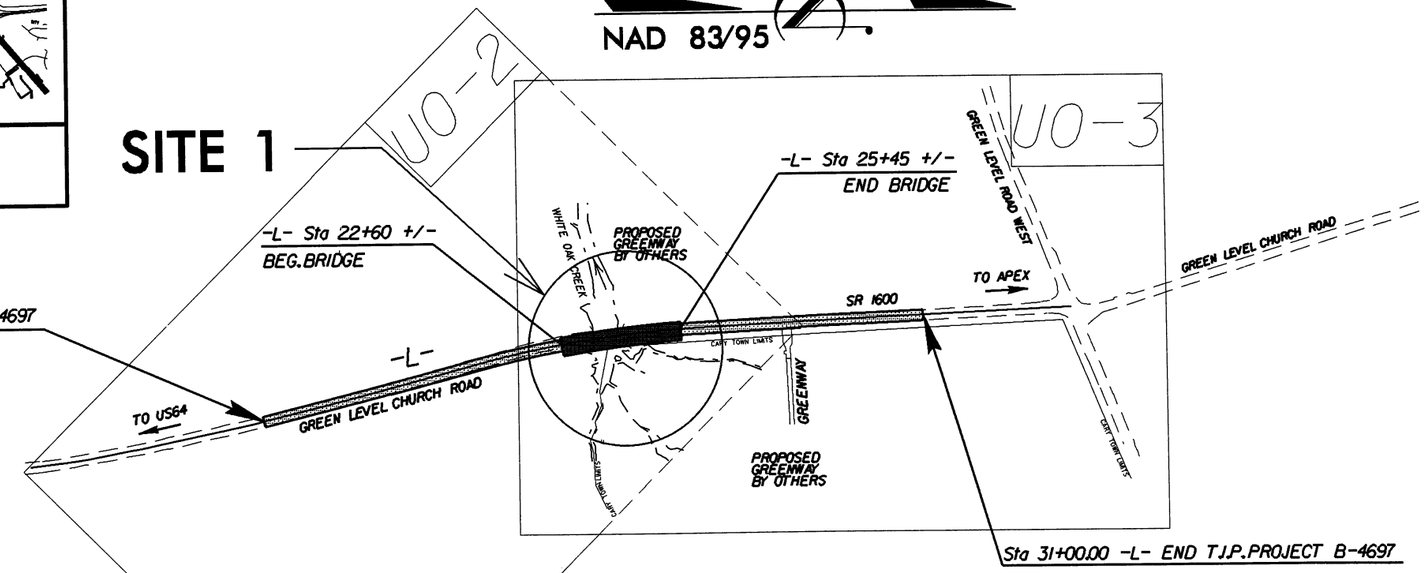


VICINITY MAP

DETOUR ROUTE

NAD 83/95

SITE 1



WETLAND & SURFACE WATER PERMIT DRAWINGS

THIS IS NOT A CONTROL OF ACCESS PROJECT
THIS PROJECT IS PARTIALLY WITHIN THE CARY & APEX CITY LIMITS.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ___

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)

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
UO-1	TITLE SHEET
UO-2 THRU UO-3	UTILITY BY OTHERS PLAN SHEETS

UTILITY OWNERS ON PROJECT

(A) PROGRESS ENERGY - POWER DISTRIBUTION
(B) A T & T - TELEPHONE
(C) PSNC - NATURAL GAS
(D) TOWN OF CARY - SANITARY SEWER

PREPARED IN THE OFFICE OF:
DIVISION OF HIGHWAYS
UTILITIES UNIT
ENGINEERING SECTION

1555 MAIL SERVICES CENTER
RALEIGH NC 27699-1591
PHONE (919) 707-6690
FAX (919) 250-4119

Roger Worthington, P.E. UTILITIES SECTION ENGINEER
Steve McKee, P.E. UTILITIES SQUAD LEADER PROJECT ENGINEER
John A. Nigro, P.E. UTILITIES PROJECT DESIGNER

TIP PROJECT: _____

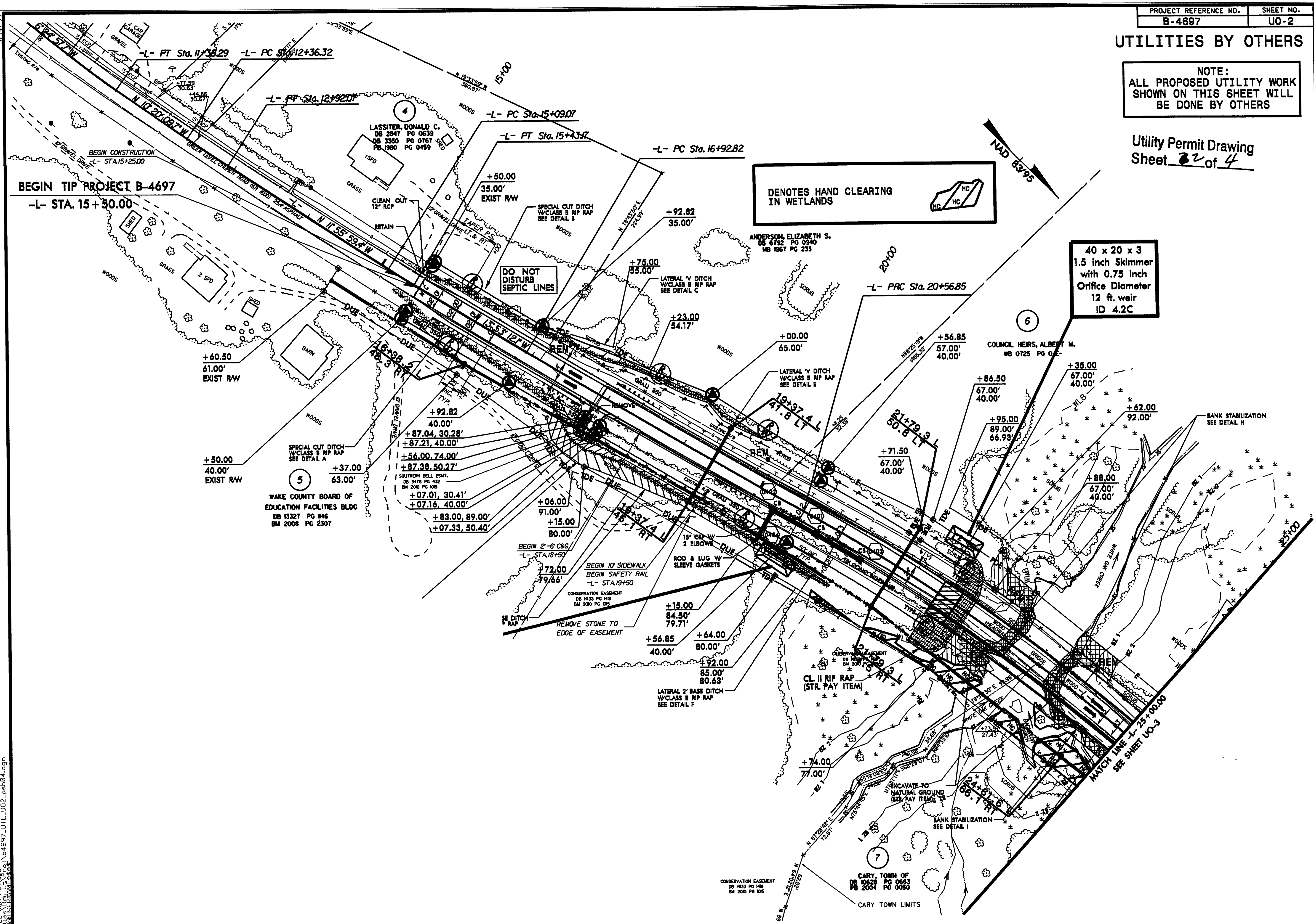
09/08/99
22-JUN-2011 14:24
R:\UTILITIES\RGY_Ut\Proj\b4697_utl_envlr_permit_tsh.dgn
$$$USERNAME$$$

PROJECT REFERENCE NO.	SHEET NO.
B-4697	UO-2

UTILITIES BY OTHERS

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS

Utility Permit Drawing
Sheet 2 of 4

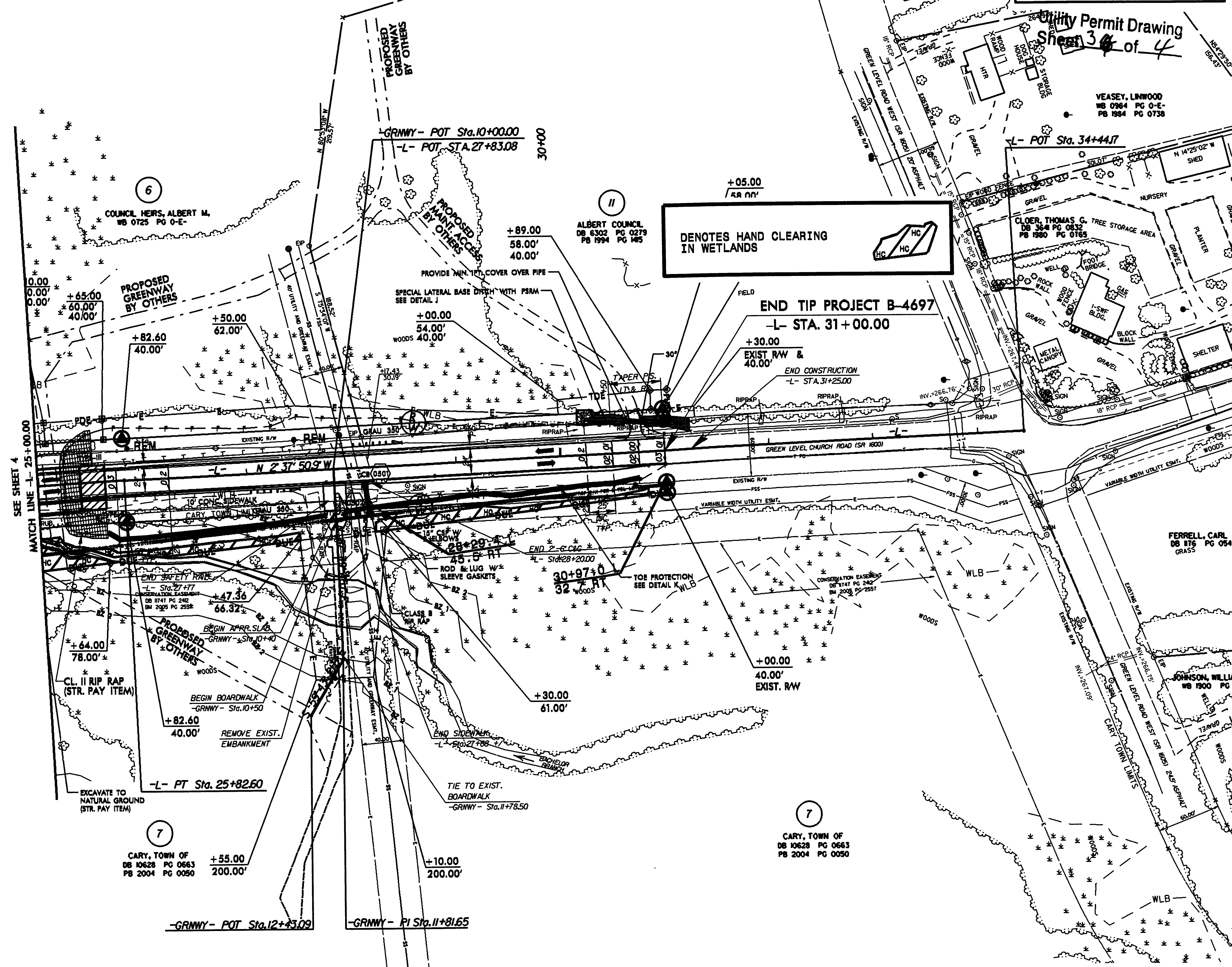


DENOTES HAND CLEARING IN WETLANDS
40 x 20 x 3
1.5 inch Skimmer
with 0.75 inch
Orifice Diameter
12 ft. weir
ID 4.2C
NAD 83/95
BEGIN TIP PROJECT B-4697
-L- STA. 15+50.00
BEGIN CONSTRUCTION
-L- STA.15+25.00
-L- PT Sta. 11+38.29
-L- PC Sta. 12+36.32
-L- PT Sta. 12+92.07
-L- PC Sta. 15+09.07
-L- PT Sta. 15+43.17
-L- PC Sta. 16+92.82
-L- PRC Sta. 20+56.85
LASSITER, DONALD C.
DB 2847 PG 0639
DB 3350 PG 0767
PB 1980 PG 0459
ANDERSON, ELIZABETH S.
DB 6792 PG 0940
MB 1967 PG 233
COUNCIL HEIRS, ALBERT M.
WAKE COUNTY BOARD OF EDUCATION FACILITIES BLDG
DB 13327 PG 846
BM 2006 PG 2307
CARY, TOWN OF
DB 10628 PG 0663
PB 2004 PG 0050
CARY TOWN LIMITS
DO NOT DISTURB SEPTIC LINES
SPECIAL CUT DITCH W/CLASS B RIP RAP SEE DETAIL A
SPECIAL CUT DITCH W/CLASS B RIP RAP SEE DETAIL B
LATERAL 'V' DITCH W/CLASS B RIP RAP SEE DETAIL C
LATERAL 'V' DITCH W/CLASS B RIP RAP SEE DETAIL E
LATERAL 2' BASE DITCH W/CLASS B RIP RAP SEE DETAIL F
BANK STABILIZATION SEE DETAIL H
BANK STABILIZATION SEE DETAIL I
BEGIN 2'-6" C&G -L- STA.18+50
BEGIN 10' SIDEWALK
BEGIN SAFETY RAIL
-L- STA.19+50
REMOVE STONE TO EDGE OF EASEMENT
CONSERVATION EASEMENT
DB 1433 PG 1418
BM 2010 PG 1015
CL. II RIP RAP (STR. PAY ITEM)
EXCAVATE TO NATURAL GROUND (STR. PAY ITEM)
ROD & LUG W/ SLEEVE GASKETS
MATCH LINE -L- 25+00.00 SEE SHEET UO-3
WHITE OAK CREEK

PROJECT REFERENCE NO.	SHEET NO.
B-4697	UO-3

UTILITIES BY OTHERS

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS



Utility Permit Drawing
Sheet 3 of 4
NAD 83/95
DENOTES HAND CLEARING IN WETLANDS
END TIP PROJECT B-4697
-L- STA. 31+00.00
END CONSTRUCTION
-L- STA.31+25.00
-GRNWY- POT Sta.10+00.00
-L- POT STA.27+83.08
-L- POT Sta. 34+44.17
-L- PT Sta. 25+82.60
-GRNWY- POT Sta.12+43.09
-GRNWY- PI Sta.11+81.65
PROPOSED GREENWAY BY OTHERS
PROPOSED MAINT. ACCESS BY OTHERS
COUNCIL HEIRS, ALBERT M.
WB 0725 PG 0-E-
ALBERT COUNCIL
DB 6302 PG 0279
PB 1994 PG 1415
VEASEY, LINWOOD
WB 0964 PG 0-E-
PB 1984 PG 0738
CLOER, THOMAS G.
DB 3641 PG 0832
PB 1980 PG 0765
FERRELL, CARL J.
DB 876 PG 0540
JOHNSON, WILLIAM H
WB 1900 PG 0-E-
CARY, TOWN OF
DB 10628 PG 0663
PB 2004 PG 0050
GREEN LEVEL CHURCH ROAD (SR 1600)
GREEN LEVEL ROAD WEST (SR 1605)
CARY TOWN LIMITS
SEE SHEET 4
MATCH LINE -L- 25+00.00
N 2° 37' 50.9" W
PROVIDE MIN. 1FT COVER OVER PIPE
SPECIAL LATERAL BASE DITCH WITH PSRM
SEE DETAIL J
TOE PROTECTION
SEE DETAIL K
ROD & LUG W/ SLEEVE GASKETS
CL. II RIP RAP (STR. PAY ITEM)
EXCAVATE TO NATURAL GROUND (STR. PAY ITEM)
BEGIN BOARDWALK
-GRNWY- Sta.10+50
REMOVE EXIST. EMBANKMENT
TIE TO EXIST. BOARDWALK
-GRNWY- Sta.11+78.50
END SAFETY RAIL
BEGIN APPR. SLAB
END SIDEWALK
10' CONC. SIDEWALK
EXIST R/W & 40.00'
CONSERVATION EASEMENT
DB 8747 PG 242
BM 2005 PG 2557

22-JUN-2011 16:20
b4697_UTL_U03.psh05.dgn

5/14/99

UTILITY WETLAND IMPACTS

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (sf)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L- STA. 21+10 to	Utility poles										
		and					0.20					
	-L- STA. 28+30	Overhead lines										
	-L- 24+61.6	Pole	3.00									
	66.1 RT											
	-L- sta 28+29.4	Pole	3.00									
	45.5 RT											
TOTALS:			6.00	0.00	0.00		0.20	0.00	0.00	0	0	

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY
WBS - 38474.1.1 (B-4697)

SHEET 4 of 4 6/23/2011

ATN Revised 3/31/05

T.I.P. NO.	SHEET NO.
B-4697	UO-1

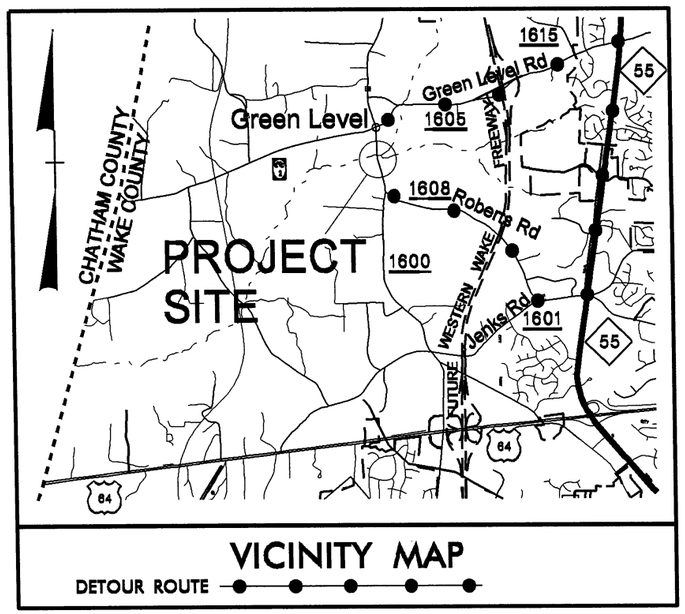
Utility Buffer Drawing
Sheet 1 of 4

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES BY OTHERS PLANS
WAKE COUNTY

LOCATION: BRIDGE NO. 55 OVER WHITE OAK CREEK ON SR 1600 (GREEN LEVEL CHURCH ROAD)

TYPE OF WORK: UTILITY RELOCATION

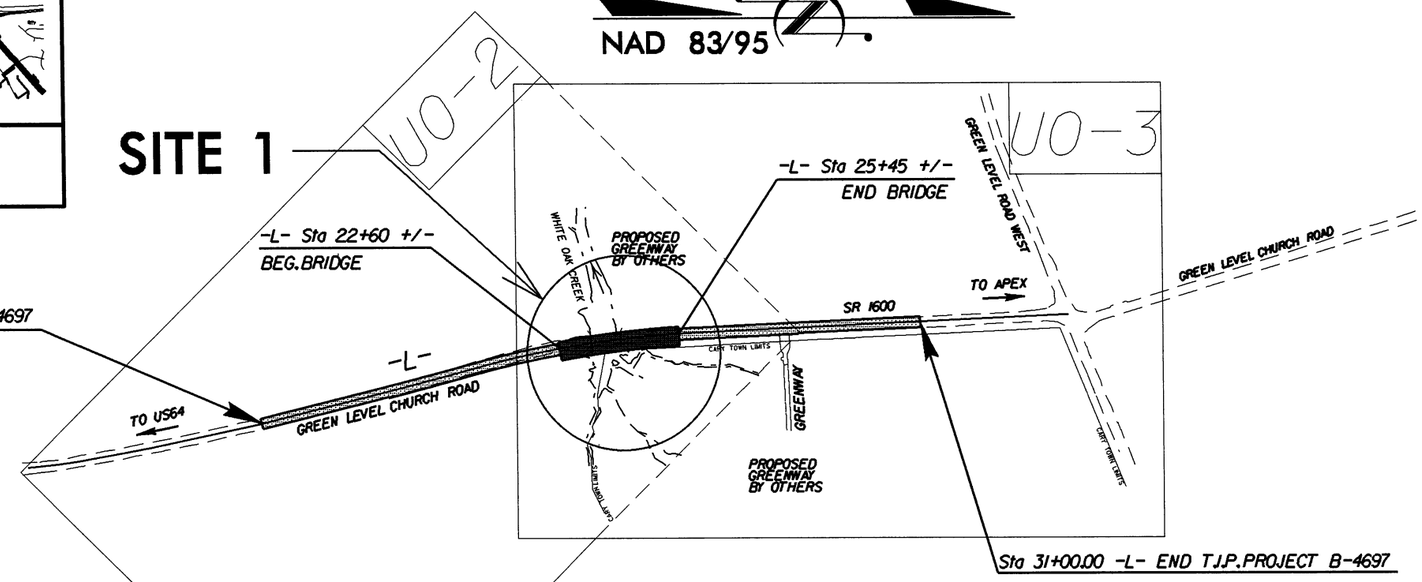


VICINITY MAP

DETOUR ROUTE

NAD 83/95

SITE 1



BUFFER PERMIT DRAWINGS

THIS IS NOT A CONTROL OF ACCESS PROJECT
THIS PROJECT IS PARTIALLY WITHIN THE CARY & APEX CITY LIMITS.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ___

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

TIP PROJECT:

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

INDEX OF SHEETS

UTILITY OWNERS ON PROJECT

(A) PROGRESS ENERGY - POWER DISTRIBUTION
(B) A T & T - TELEPHONE
(C) PSNC - NATURAL GAS
(D) TOWN OF CARY - SANITARY SEWER

PREPARED IN THE OFFICE OF:
DIVISION OF HIGHWAYS
UTILITIES UNIT
ENGINEERING SECTION

1555 MAIL SERVICES CENTER
RALEIGH NC 27699-1591
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Steve McKee, P.E. UTILITIES SQUAD LEADER PROJECT ENGINEER
John A. Nigro, P.E. UTILITIES PROJECT DESIGNER

09/08/99
23-JUN-2011 13:27
R:\Utilities\Rdy_Ut\Proj\b4697_utl_envir_permit_tsh.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-4697	UO-2

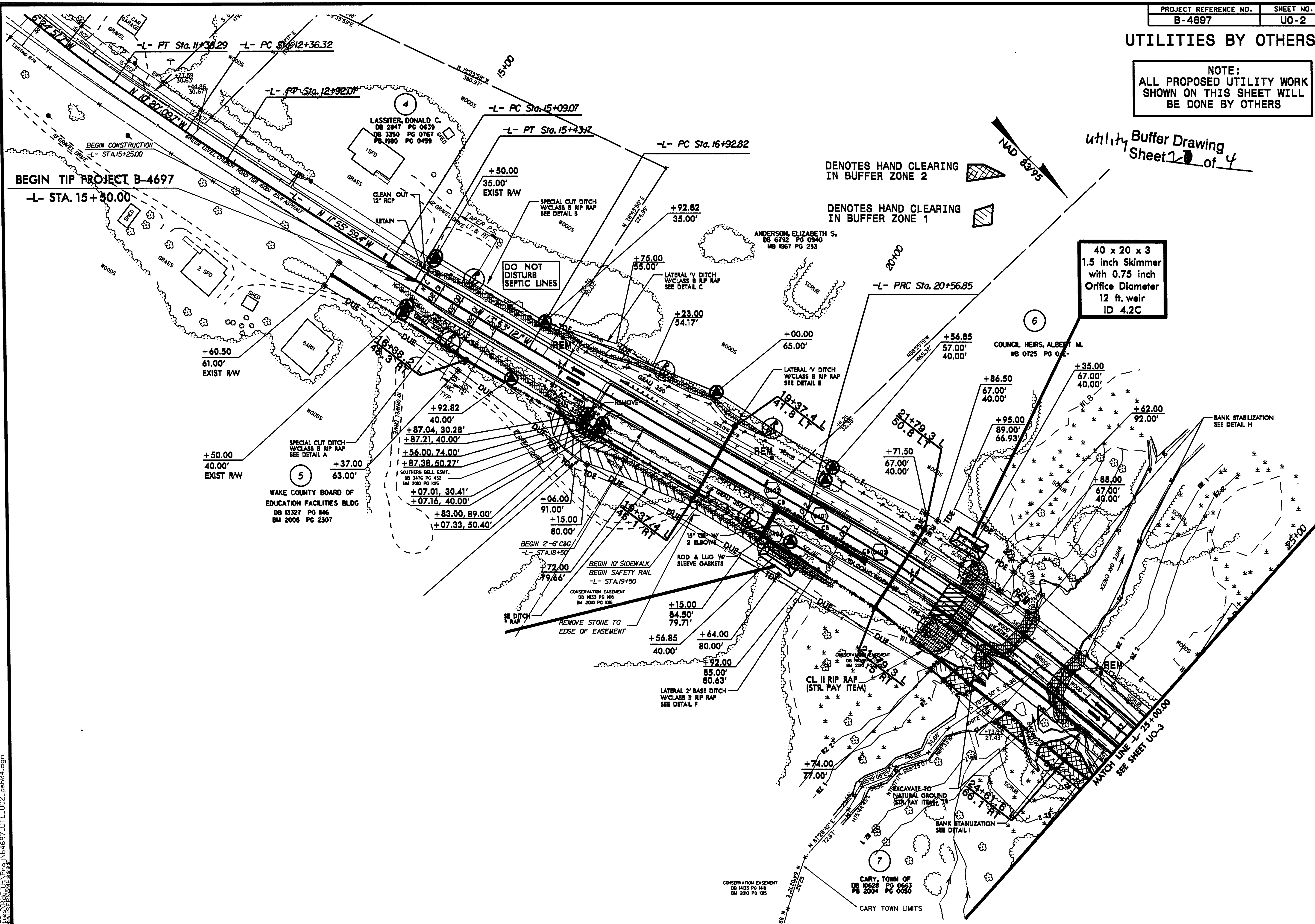
UTILITIES BY OTHERS

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS

utility Buffer Drawing Sheet 2 of 4

DENOTES HAND CLEARING IN BUFFER ZONE 2

DENOTES HAND CLEARING IN BUFFER ZONE 1

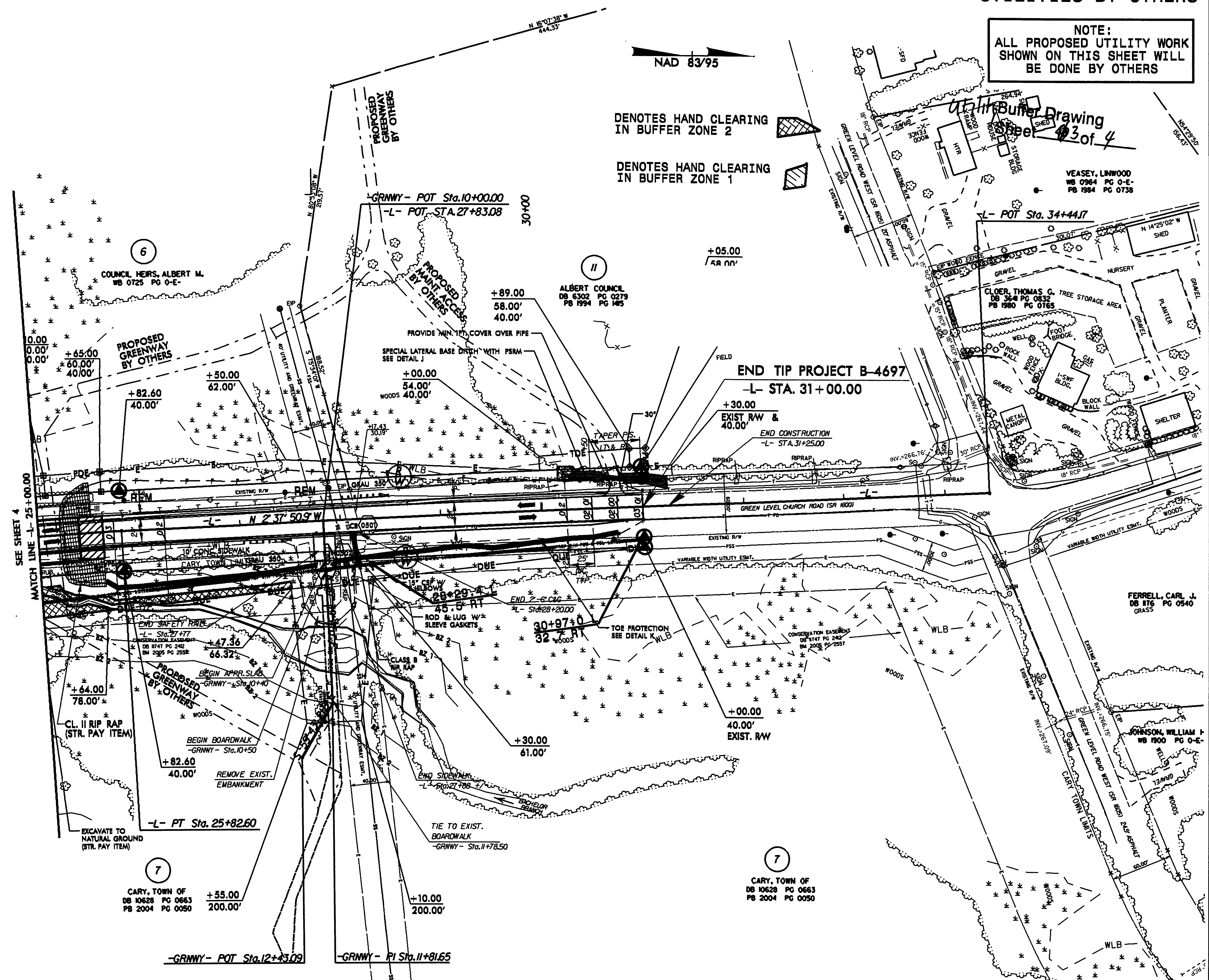


NAD 83/95
BEGIN TIP PROJECT B-4697
-L- STA. 15+50.00
BEGIN CONSTRUCTION
-L- STA.15+25.00
-L- PT Sta. 11+38.29
-L- PC Sta. 12+36.32
-L- PT Sta. 12+92.01
-L- PC Sta. 15+09.07
-L- PT Sta. 15+43.17
-L- PC Sta. 16+92.82
-L- PRC Sta. 20+56.85
LASSITER, DONALD C.
DB 2847 PG 0639
DB 3350 PG 0767
PB 1980 PG 0459
ANDERSON, ELIZABETH S.
DB 6792 PG 0940
MB 1967 PG 233
COUNCIL HEIRS, ALBERT M.
WAKE COUNTY BOARD OF EDUCATION FACILITIES BLDG
DB 13327 PG 846
BM 2006 PG 2307
CARY, TOWN OF
DB 10628 PG 0663
PB 2004 PG 0050
CARY TOWN LIMITS
DO NOT DISTURB SEPTIC LINES
40 x 20 x 3
1.5 inch Skimmer
with 0.75 inch
Orifice Diameter
12 ft. weir
ID 4.2C
SPECIAL CUT DITCH W/CLASS B RIP RAP SEE DETAIL A
SPECIAL CUT DITCH W/CLASS B RIP RAP SEE DETAIL B
LATERAL 'V' DITCH W/CLASS B RIP RAP SEE DETAIL C
LATERAL 'V' DITCH W/CLASS B RIP RAP SEE DETAIL E
LATERAL 2' BASE DITCH W/CLASS B RIP RAP SEE DETAIL F
BANK STABILIZATION SEE DETAIL H
BANK STABILIZATION SEE DETAIL I
BEGIN 2'-6" C&G -L- STA.18+50
BEGIN 10' SIDEWALK BEGIN SAFETY RAIL -L- STA.19+50
REMOVE STONE TO EDGE OF EASEMENT
CONSERVATION EASEMENT DB 1433 PG 1418 BM 2010 PG 1015
CL. II RIP RAP (STR. PAY ITEM)
EXCAVATE TO NATURAL GROUND (STR. PAY ITEM)
ROD & LUG W/ SLEEVE GASKETS
15" CSP W/ 2 ELBOWS
CLEAN OUT 12" RCP
RETAIN
REMOVE
MATCH LINE -L- 25+00.00 SEE SHEET UO-3
+60.50 61.00' EXIST R/W
+50.00 40.00' EXIST R/W
+50.00 35.00' EXIST R/W
+92.82 35.00'
+75.00 55.00'
+23.00 54.17'
+00.00 65.00'
+56.85 57.00' 40.00'
+86.50 67.00' 40.00'
+95.00 89.00' 66.93'
+71.50 67.00' 40.00'
+35.00 67.00' 40.00'
+62.00 92.00'
+88.00 67.00' 40.00'
+37.00 63.00'
+92.82 40.00'
+87.04, 30.28'
+87.21, 40.00'
+56.00, 74.00'
+87.38, 50.27'
+07.01, 30.41'
+07.16, 40.00'
+83.00, 89.00'
+07.33, 50.40'
+06.00 91.00'
+15.00 80.00'
+72.00 79.66'
+15.00 84.50' 79.71'
+56.85 40.00'
+64.00 80.00'
+92.00 85.00' 80.63'
+74.00 77.00'
16+38.2 L 48.3 RT
19+37.4 L 41.8 LT
19+37.4 L 45.1 RT
21+79.3 L 50.8 LT
21+79.3 L 75 RT
24+61.6 66.1 RT
15+00
20+00
25+00
WAKE COUNTY SOUTHERN BELL ESMT.
23-JUN-2011 13:25
b4697_UTL_U02_psh04.dgn
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4697	UO-3

UTILITIES BY OTHERS

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS



Utility Buffer Drawing Sheet 3 of 4
NAD 83/95
DENOTES HAND CLEARING IN BUFFER ZONE 2
DENOTES HAND CLEARING IN BUFFER ZONE 1
-GRNWY- POT Sta.10+00.00
-L- POT STA.27+83.08
PROPOSED GREENWAY BY OTHERS
PROPOSED MAINT. ACCESS BY OTHERS
COUNCIL HEIRS, ALBERT M.
WB 0725 PG O-E-
ALBERT COUNCIL
DB 6302 PG 0279
PB 1994 PG 1415
PROVIDE MIN. 1FT COVER OVER PIPE
SPECIAL LATERAL BASE DITCH WITH PSRM
SEE DETAIL J
END TIP PROJECT B-4697
-L- STA. 31+00.00
EXIST R/W &
END CONSTRUCTION
-L- STA.31+25.00
GREEN LEVEL CHURCH ROAD (SR 1600)
N 2°37'50.9" W
10' CONC. SIDEWALK
MATCH LINE -L- 25+00.00
SEE SHEET 4
END SAFETY RAIL
-L- Sta.27+77
BEGIN APPR. SLAB
-GRNWY- Sta.10+40
BEGIN BOARDWALK
-GRNWY- Sta.10+50
REMOVE EXIST. EMBANKMENT
END SIDEWALK
CL. II RIP RAP (STR. PAY ITEM)
-L- PT Sta. 25+82.60
EXCAVATE TO NATURAL GROUND (STR. PAY ITEM)
TIE TO EXIST. BOARDWALK
-GRNWY- Sta.11+78.50
TOE PROTECTION SEE DETAIL K
END 2'-6" C&G
-L- Sta.28+20.00
CONSERVATION EASEMENT
CARY, TOWN OF
DB 10628 PG 0663
PB 2004 PG 0050
-GRNWY- POT Sta.12+43.09
-GRNWY- PI Sta.11+81.65
VEASEY, LINWOOD
WB 0964 PG O-E-
PB 1984 PG 0738
-L- POT Sta. 34+44.17
CLOER, THOMAS G.
DB 3641 PG 0832
PB 1980 PG 0765
TREE STORAGE AREA
NURSERY
SHELTER
FERRELL, CARL J.
DB 1176 PG 0540
JOHNSON, WILLIAM H.
WB 1900 PG O-E-
GREEN LEVEL ROAD WEST (SR 1625)
CARY TOWN LIMITS

5/14/99
23-JUN-2011 13:24
b4697_UTL_U03_psh05.dgn

UTILITY BUFFER IMPACTS

BUFFER IMPACTS SUMMARY

SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
			GREENWAY	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
1													
	Utility Poles and	FROM -L- 21+10 (RT)									0		
	Overhead power	TO -L- 28+30 (RT)				4804.0	624.0	5428.0					
	and telephone lines												
TOTAL:						4804.0	624.0	5428.0	0.0	0.0	0.0		

METHOD III CLEARING

3286 ft^2 of wetland impacts fall within the reflected buffer impacts. See attached for details.

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY
PROJECT: 38474.1.1 (B-4697)

5/6/2011
SHEET 4 OF 4

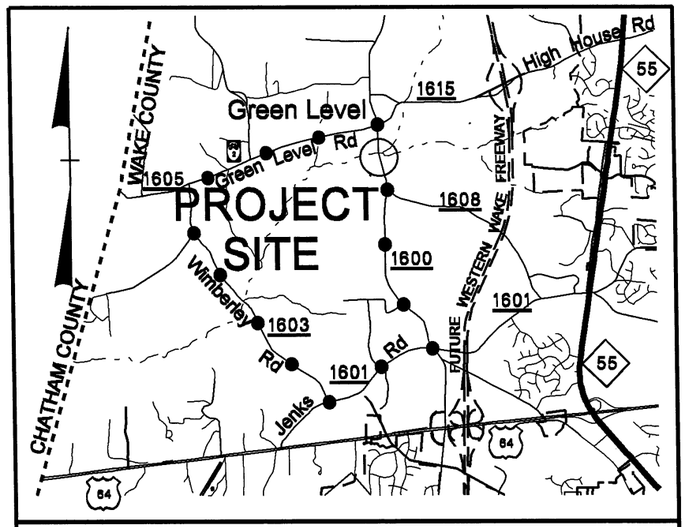
Rev. May 2006

09/08/99

TIP PROJECT: B-4697

CONTRACT:

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



VICINITY MAP

DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

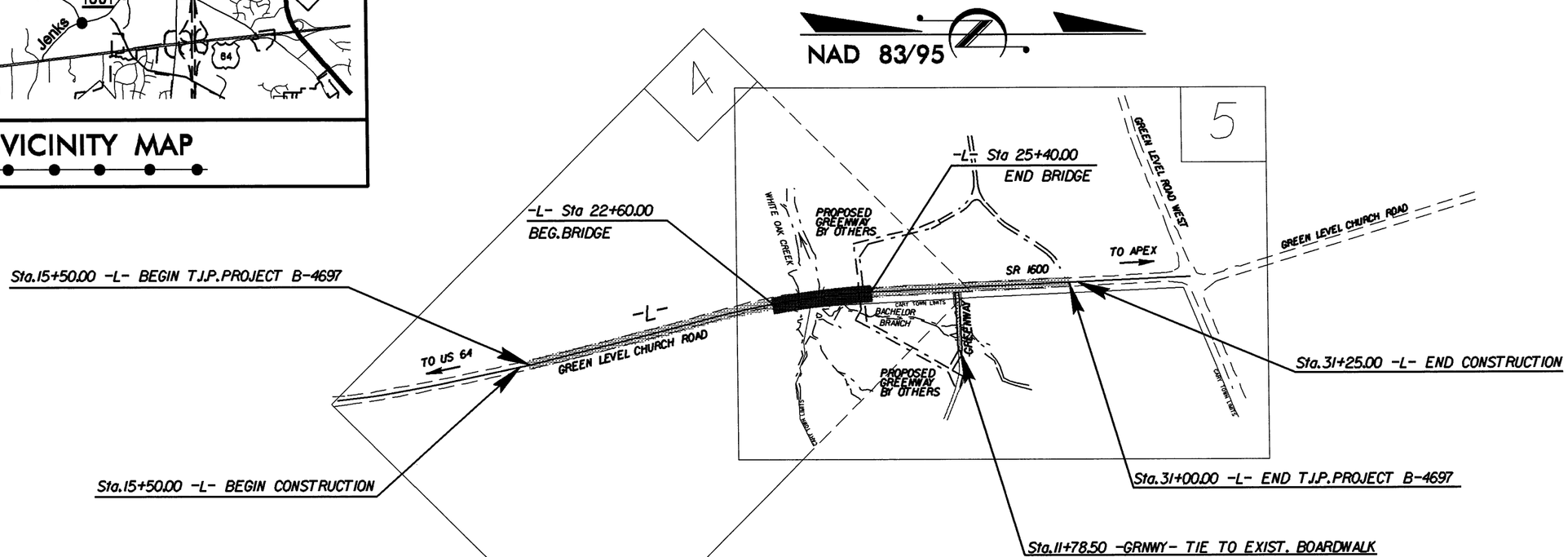
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4697	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
38474.1.1	BRZ-1600(9)	PE
38474.2.1	BRZ-1600(9)	ROW, UTL.

LOCATION: BRIDGE NO. 55 OVER WHITE OAK CREEK ON SR 1600 (GREEN LEVEL CHURCH RD)

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

NAD 83/95



THIS IS NOT A CONTROL OF ACCESS PROJECT.
THIS PROJECT IS PARTIALLY WITHIN THE CARY CITY LIMITS.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

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 2012 = 7,900
ADT 2035 = 22,000
DHV = 8 %
D = 60 %
T = 5 % *
V = 50 MPH
* TTST 2% DUAL 3%
FUNC CLASS = LOCAL
SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4697	=	0.241 MILES
LENGTH STRUCTURE TIP PROJECT B-4697	=	0.053 MILES
TOTAL LENGTH TIP PROJECT B-4697	=	0.294 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MARCH 17, 2011

LETTING DATE: APRIL 17, 2012

JASON MOORE, PE
PROJECT ENGINEER

KEVIN E. MOORE, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION

P.E.
STATE HIGHWAY DESIGN ENGINEER

02-MAY-2011 14:37
R:\Roadway\Proj\b4697_rdy_tsh.dgn
$$$$USERNAME$$$$

01/20/11

PROJECT REFERENCE NO.	SHEET NO.
B-4697	1-B

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

- 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 — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage / Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE
- 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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Booth
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- 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 — T FO
- Designated U/G Fiber Optics Cable (S.U.E.*) — T FO

WATER:

- Water Manhole — W
- 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 — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- Recorded U/G TV Cable — TV
- Designated U/G TV Cable (S.U.E.*) — TV
- Recorded U/G Fiber Optic Cable — TV FO
- Designated U/G Fiber Optic Cable (S.U.E.*) — TV FO

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 Gas

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

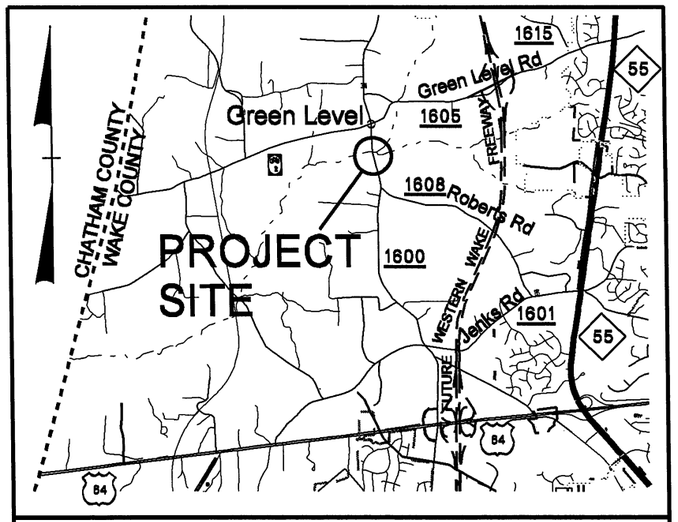
MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line — ?UTL
- 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.

6/2/99

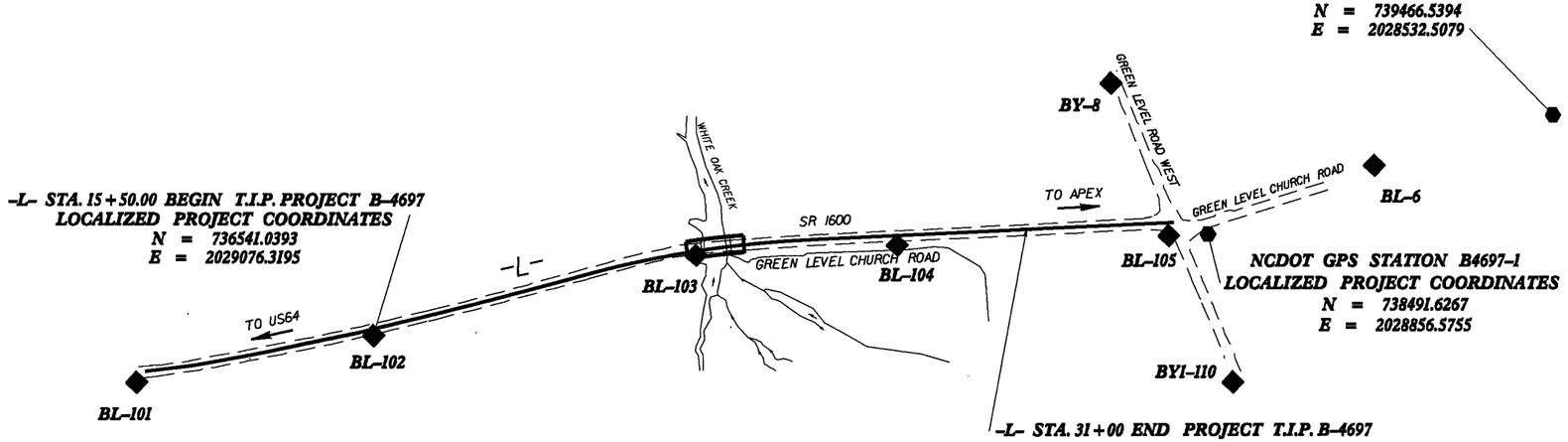
PROJECT REFERENCE NO.	SHEET NO.
B-4697	1-C
Location and Surveys	

SURVEY CONTROL SHEET B4697



VICINITY MAP

NC NAD 83/95 GRID



CONTROL DATA

BLREV

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
101	BL-101	735981.0758	2029201.9905	314.37	OUTSIDE PROJECT LIMITS	
102	BL-102	736537.0797	2029092.2653	293.30	15+42.34	14.53 RT
103	BL-103	737290.9909	2028904.7212	268.62	23+20.31	9.06 RT
104	BL-104	737764.5867	2028880.8662	267.65	27+96.01	21.23 RT
105	BL-105	738399.6460	2028859.4952	270.55	34+31.38	29.03 RT
6	BL-6	738883.3462	2028695.1300	282.82	OUTSIDE PROJECT LIMITS	

BYREV

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
8	BY-8	738266.9945	2028501.5777	275.92	33+15.29	334.60 LT
Y105	BL-105	738399.6460	2028859.4952	270.55	34+31.38	29.03 RT
110	BY1-110	738545.7851	2029203.2038	271.01	OUTSIDE PROJECT LIMITS	

```
**************************************
44        ELEVATION = 274.06
N 738607      E 2029224
L STATION 34+44.17
N 63°34'03.1" E  DIST    440.10'
RRS IN 30 INCH OAK
**************************************
**************************************
59        ELEVATION = 317.82
N 736079      E 2029409
L STATION 10+51.92 239.73' RIGHT
RRS IN 10 INCH POPLAR
**************************************
**************************************
88        ELEVATION = 265.07
N 737259      E 2029274
L STATION 22+15.57 367.02' RIGHT
RR SPIKE IN 10" MAPLE
**************************************
```

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B-4697-2"
WITH NAD 83/95 STATE PLANE GRID COORDINATES OF
NORTHING: 739466.5394(ft) EASTING: 2028532.5079(ft)
ELEVATION: 322.22(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99991087
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B-4697-2" TO -L- STATION 15+50.00 IS
S 10 31 49.2 E 2975.61'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

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/

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   B4697_LS_CONTROL_100517.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 NGS ONLINE POSITIONING SERVICE (OPUS)

NOTE: DRAWING NOT TO SCALE

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6/2/99

PROJECT REFERENCE NO.	SHEET NO.
B-4697	1-D
Location and Surveys	

SURVEY CONTROL SHEET B4697

Design Alignments

L

TYPE	STATION	NORTH	EAST
POT	10+00.01	736000.6245	2029176.5714
PC	10+69.88	736070.0546	2029168.7639
PT	11+38.29	736137.7282	2029158.7997
PC	12+36.32	736234.1640	2029141.2117
PT	12+92.07	736288.8642	2029130.4456
PC	15+09.07	736501.1761	2029085.5761
PT	15+43.17	736534.4078	2029077.9589
PC	16+92.82	736679.6869	2029042.0418
PRC	20+56.85	737032.0564	2028950.6870
PT	25+82.60	737550.4295	2028869.4518
POT	34+44.17	738411.0915	2028829.9058

GRNWY

TYPE	STATION	NORTH	EAST
POT	10+00.00	737750.6989	2028860.2497
POT	11+81.65	737758.1076	2029041.7508
POT	12+43.09	737727.1304	2029094.8103

DATUM DESCRIPTION

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NOTE: DRAWING NOT TO SCALE

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/*

   THE FILES TO BE FOUND ARE AS FOLLOWS: B4697_LS_CONTROL_100517.TXT

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PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING SERVICE (OPUS)

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6/2/99

PROJECT REFERENCE NO.	SHEET NO.
B-4697	1-E
Location and Surveys	

SURVEY CONTROL SHEET B4697

ROW MARKER BRIDGE SPIKE

ALIGN	STATION	OFFSET	NORTH	EAST
L	15+50.00	-55.00	736527.8391	2029022.9270
L	15+50.00	40.00	736550.6394	2029115.1503
L	16+92.82	-55.00	736666.4848	2028988.6498
L	20+56.85	-40.00	737021.5808	2028912.0830
L	25+82.60	-40.00	737548.5935	2028829.4940
L	16+92.82	40.00	736689.2870	2029080.8727
L	20+56.85	40.00	737042.5319	2028989.2909
L	25+82.60	40.00	737552.2655	2028909.4096
L	31+00.00	-40.00	738065.4489	2028805.7453
L	31+00.00	40.00	738069.1209	2028885.6610
L	31+00.00	-30.00	738065.9079	2028815.7347
L	31+00.00	30.00	738068.6619	2028875.6715
L	15+50.00	30.00	736548.2394	2029105.4426
L	15+50.00	-30.00	736533.8392	2029047.1963
L	19+00.00	-65.00	736864.0733	2028928.1317
L	20+56.85	-57.00	737017.1287	2028895.6764
L	17+87.04	30.28	736778.5274	2029048.5089
L	17+87.21	40.00	736781.0762	2029057.8941
L	18+07.01	30.41	736797.9479	2029043.7076
L	18+07.16	40.00	736800.4627	2029052.9676

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	22+35.00	-67.00	737192.8598	2028844.6676
L	22+88.00	-67.00	737246.4610	2028834.9300
L	22+88.00	-40.00	737250.9934	2028861.5469
L	22+35.00	-40.00	737197.9788	2028871.1779
L	25+10.00	-40.00	737474.9245	2028833.9964
L	25+65.00	-40.00	737530.7229	2028830.3808
L	25+65.00	-60.00	737529.6584	2028810.4091
L	25+10.00	-60.00	737473.4027	2028814.0544
L	14+60.50	30.00	736459.8552	2029124.9714
L	14+60.50	61.00	736466.2651	2029155.3015
L	16+37.00	63.00	736640.6166	2029116.5979
L	18+15.00	80.00	736817.9705	2029089.7829
L	20+64.00	80.00	737059.6816	2029026.0944
L	22+74.00	84.00	737258.4973	2028986.0940
L	25+64.00	78.00	737536.0372	2028948.2652
L	20+56.85	-68.00	737014.2479	2028885.0603
L	20+72.85	-68.00	737030.1424	2028880.8040
L	20+72.85	-40.00	737037.2949	2028907.8751
L	28+30.00	61.00	737800.3694	2028919.0318
L	30+89.00	-58.00	738053.6343	2028788.2692
L	31+05.00	-58.00	738069.6174	2028787.5348
L	31+05.00	-30.00	738070.9026	2028815.5052
L	30+89.00	-40.00	738054.4605	2028806.2502
L	17+87.38	50.27	736783.7691	2029067.8098
L	18+07.33	50.40	736803.1903	2029063.0077

DATUM DESCRIPTION

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VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

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/*

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PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING SERVICE (OPUS)

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5/14/99

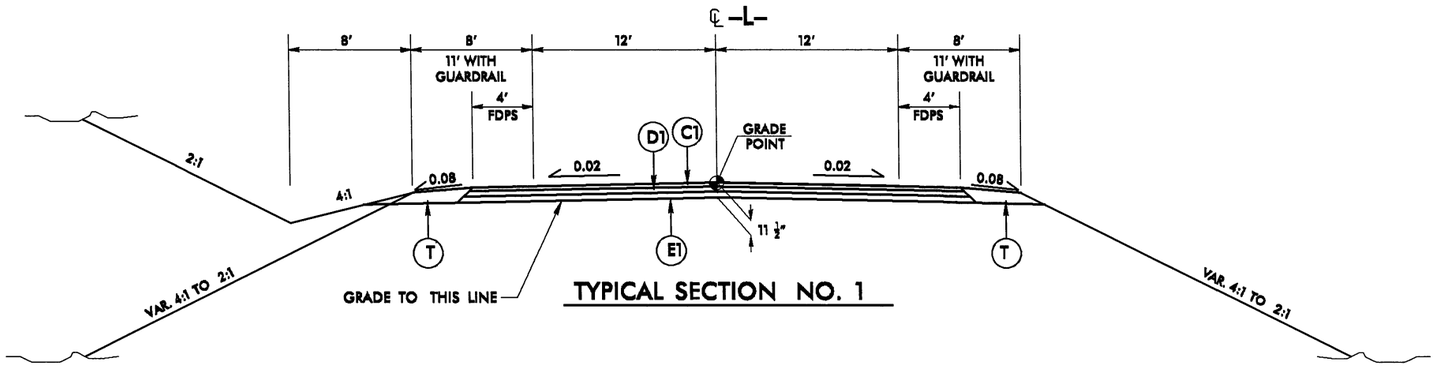
PROJECT REFERENCE NO.	SHEET NO.
B-4697	2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PAVEMENT SCHEDULE

C1	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.	R2	BICYCLE SAFE RAIL, SEE DETAIL SHEET xx
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	S	4" CONCRETE SIDEWALK
E1	PROP. APPROX. 4 ½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.	T	EARTH MATERIAL
R1	2'-6" CONCRETE CURB AND GUTTER	U	EXISTING PAVEMENT

Note: Pavement Edge Slopes are 1:1 Unless Noted Otherwise.



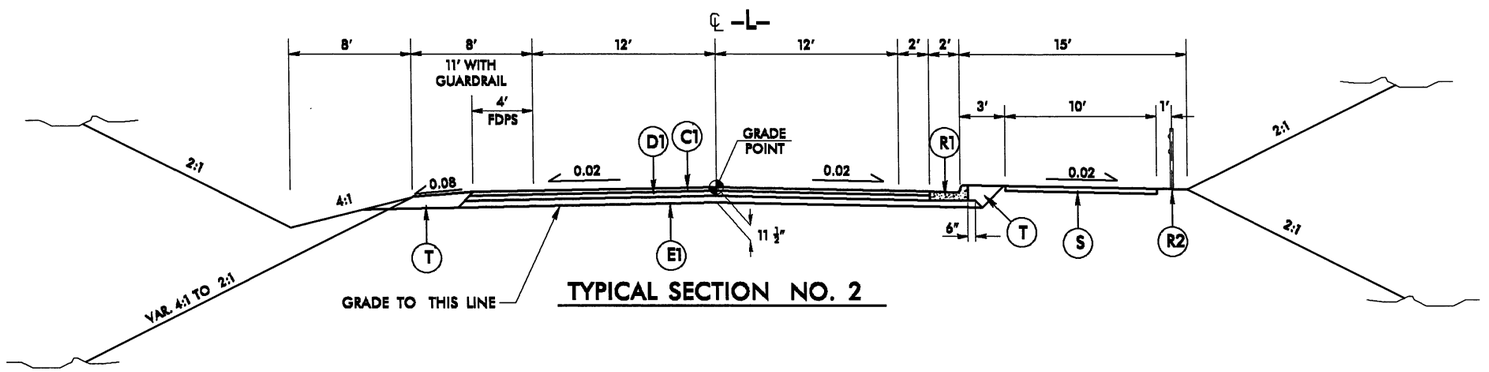
TYPICAL SECTION NO. 1

NOTE: TRANSITION FROM EXISTING TO T.S. NO. 1
FROM -L- STA. 15+50.00 TO STA. 16+00.00

USE TYPICAL SECTION NO. 1

-L- STA 16+00.00 TO STA 18+50.00
-L- STA 28+20.00 TO STA 30+50.00

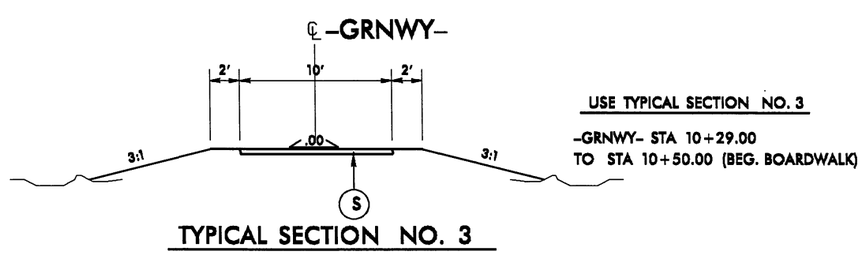
NOTE: TRANSITION FROM T.S. NO. 1 TO EXISTING
FROM -L- STA. 30+50.00 TO -L- STA. 31+00.00



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

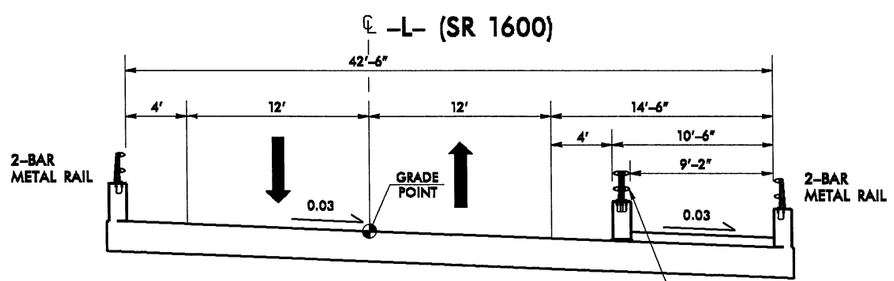
-L- STA 18+50.00 TO STA 22+60.00 (BEGIN BRIDGE)
-L- STA 25+40.00 (END BRIDGE) TO STA 28+20.00
NOTE: BERM SLOPES AWAY FROM THE CURB.
NOTE: SIDEWALK BEGINS -L- STA. 19+50
AND ENDS -L- STA. 27+88.00
NOTE: RAIL BEGINS -L- STA. 19+50
AND ENDS -L- STA. 27+77.00



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

-GRNWY- STA 10+29.00
TO STA 10+50.00 (BEG. BOARDWALK)



TYPICAL SECTION ON STRUCTURE

-L- STA 22+60 (BEGIN BRIDGE) TO STA 25+40 (END BRIDGE)
NOTE: TRANSITION SIDEWALK SLOPE ON APPROACH SLAB.

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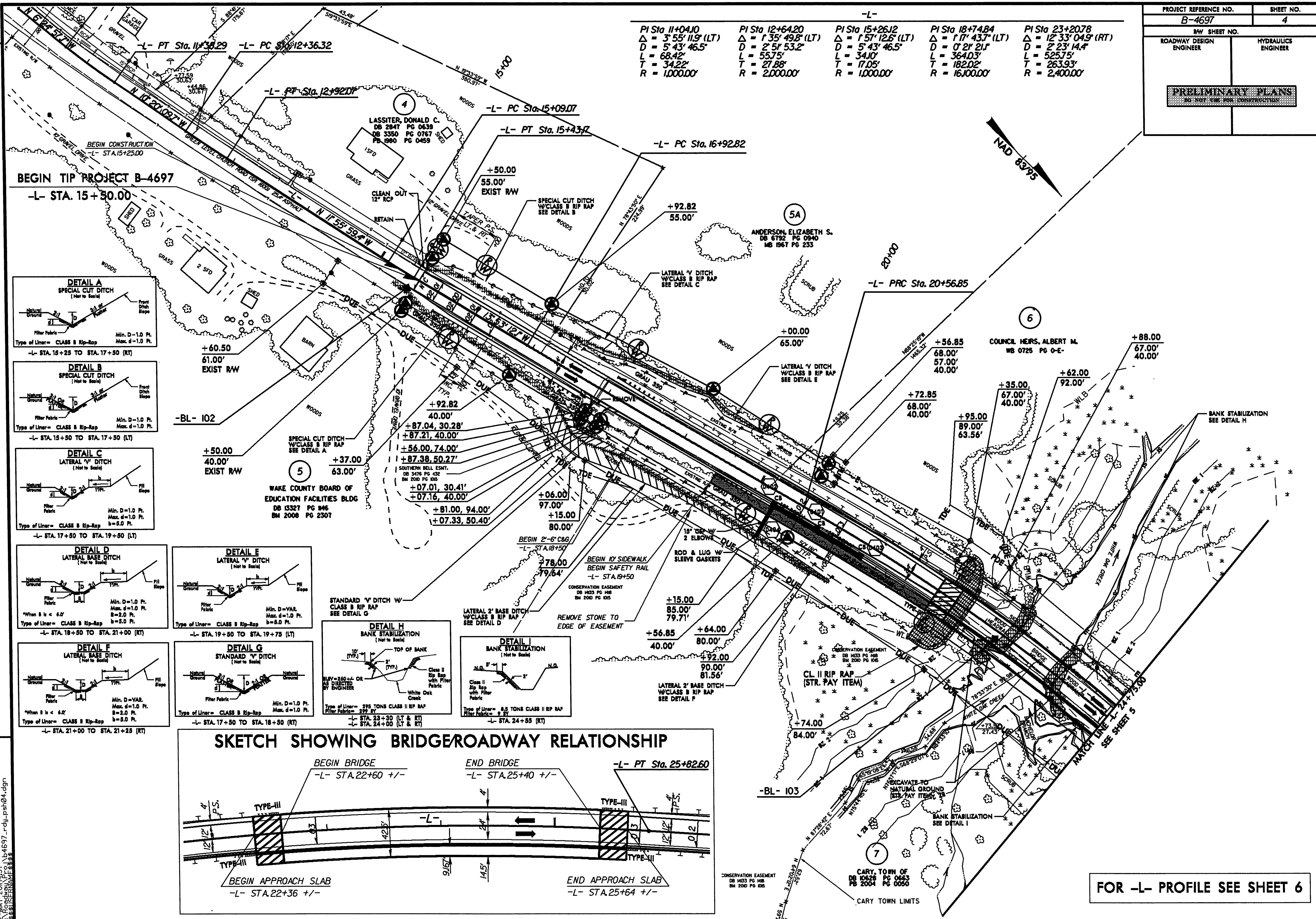
PROJECT REFERENCE NO.	SHEET NO.
B-4697	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS

-L-

PI Sta 11+04.10	PI Sta 12+64.20	PI Sta 15+26.12	PI Sta 18+74.84	PI Sta 23+20.78
Δ = 3° 55' 11.9" (LT)	Δ = 1° 35' 49.8" (LT)	Δ = 1° 57' 12.6" (LT)	Δ = 1° 17' 43.7" (LT)	Δ = 12° 33' 04.9" (RT)
D = 5° 43' 46.5"	D = 2° 51' 53.2"	D = 5° 43' 46.5"	D = 0° 21' 21.1"	D = 2° 23' 14.4"
L = 68.42'	L = 55.75'	L = 34.10'	L = 364.03'	L = 525.75'
T = 34.22'	T = 27.88'	T = 17.05'	T = 182.02'	T = 263.93'
R = 1,000.00'	R = 2,000.00'	R = 1,000.00'	R = 16,100.00'	R = 2,400.00'



FOR -L- PROFILE SEE SHEET 6

REVISIONS

8/17/99

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8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-4697	5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

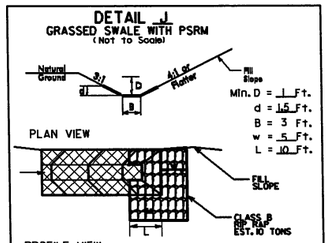
PRELIMINARY PLANS
NOT FOR CONSTRUCTION

AVERAGE DAILY TRAFFIC 2012 / 2035

GREEN LEVEL CHURCH RD: 2,800 / 8,000 — 900 / 2,400 — 200 / 500 — 6,200 / 21,000 — 7,900 / 22,000

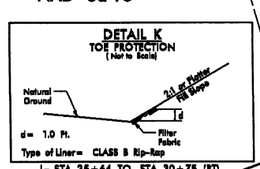
GREEN LEVEL RD: 1,700 / 4,800 — 800 / 5,700 — 3,400 / 15,600

DETAIL J
GRASSED SWALE WITH PSRM
(NOT TO Scale)



-L- STA 30+25 TO STA 31+25 (LT)

DETAIL K
TOE PROTECTION
(Not to Scale)



d= 1.0 Ft.
Type of Liner= CLASS B Rip-Rap
-L- STA. 25+64 TO STA. 30+75 (RT)

NAD 83/95

-BY- 8

-GRNWY- POT Sta.10+00.00
-L- POT Sta.27+83.08

-L- POT Sta. 34+44.17

VEASEY, LINWOOD
WB 0964 PG 0-E-
PB 1984 PG 0738

CLOER, THOMAS G.
DB 3641 PG 0832
PB 1980 PG 0765

ALBERT COUNCIL
DB 6302 PG 0279
PB 1994 PG 1485

COUNCIL HEIRS, ALBERT M.
WB 0725 PG 0-E-

CAROLINA POWER & LIGHT CO.
DB 1741 PG 240
BM 2005 PG 2557

CONSERVATION EASEMENT
DB 11741 PG 240
BM 2005 PG 2557

CONSERVATION EASEMENT
DB 11741 PG 240
BM 2005 PG 2558

FERRELL, CARL J.
DB 876 PG 0540

JOHNSON, WILLIAM H.
WB 1900 PG 0-E-

CARY, TOWN OF
DB 10628 PG 0663
PB 2004 PG 0050

PROPOSED GREENWAY BY OTHERS

PROPOSED MAINT. ACCESS BY OTHERS

END TIP PROJECT B-4697
-L- STA. 31+00.00

END CONSTRUCTION
-L- STA.31+25.00

-L- PT Sta. 25+82.60

-GRNWY- POT Sta.12+43.09

-GRNWY- PI Sta.11+81.65

-BL- 105
-BY- Y105

-BL- 104

-BYI- 110

SEE SHEET 4
MATCH LINE -L- 24+75.00

SEE DETAIL SHEETS 2-A THRU 2-D
FOR BOARDWALK DETAILS
FOR PROFILES SEE SHEET 6

RP_MAY_2011437
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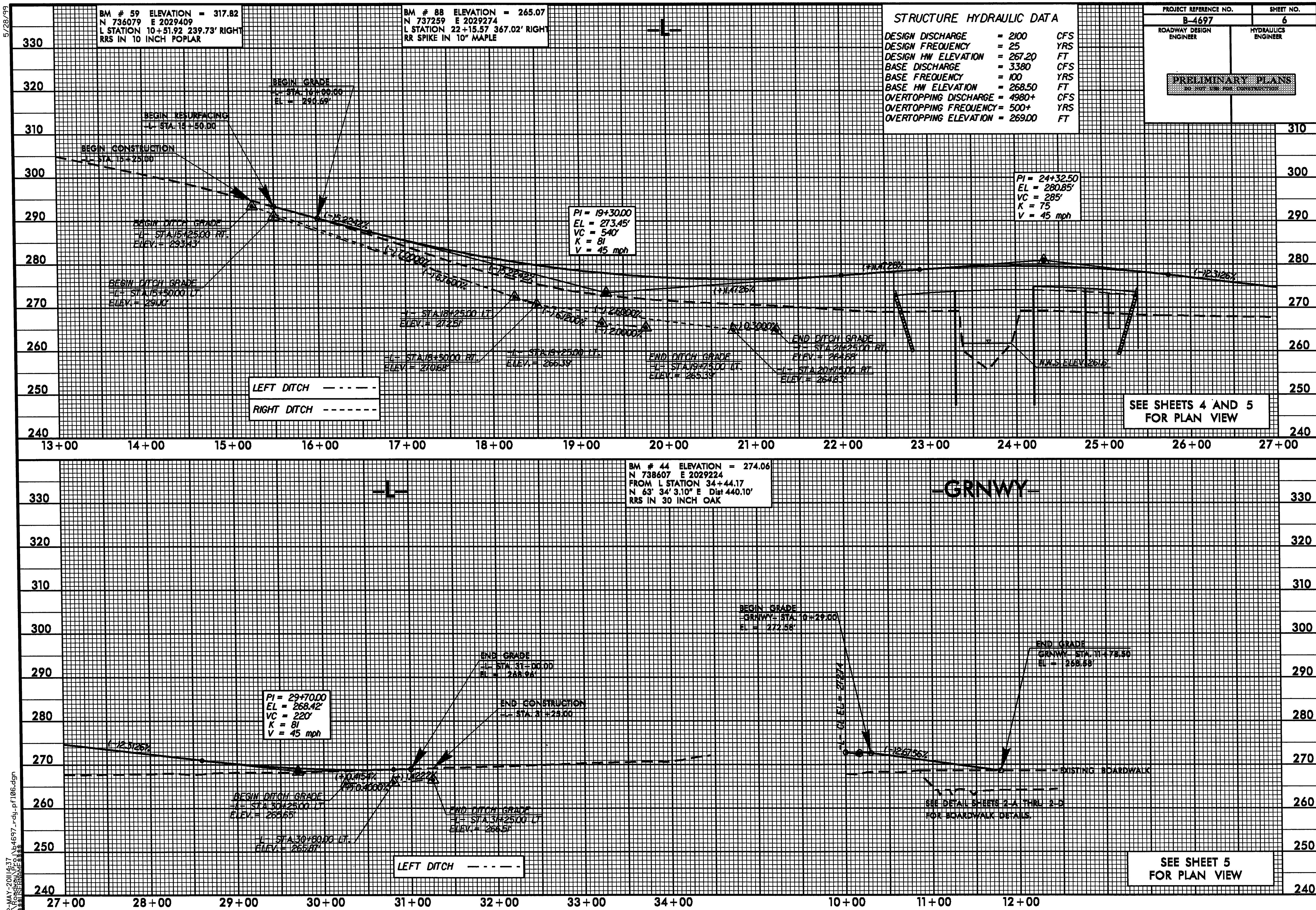
PROJECT REFERENCE NO. B-4697
SHEET NO. 6
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
5/28/99
BM # 59 ELEVATION = 317.82
N 736079 E 2029409
L STATION 10+51.92 239.73' RIGHT
RRS IN 10 INCH POPLAR
BM # 88 ELEVATION = 265.07
N 737259 E 2029274
L STATION 22+15.57 367.02' RIGHT
RR SPIKE IN 10" MAPLE
-L-
STRUCTURE HYDRAULIC DATA
DESIGN DISCHARGE = 2100 CFS
DESIGN FREQUENCY = 25 YRS
DESIGN HW ELEVATION = 267.20 FT
BASE DISCHARGE = 3380 CFS
BASE FREQUENCY = 100 YRS
BASE HW ELEVATION = 268.50 FT
OVERTOPPING DISCHARGE = 4980+ CFS
OVERTOPPING FREQUENCY = 500+ YRS
OVERTOPPING ELEVATION = 269.00 FT
BEGIN GRADE -L- STA. 16+00.00 EL = 290.69'
BEGIN RESURFACING -L- STA. 15+50.00
BEGIN CONSTRUCTION -L- STA. 15+25.00
BEGIN DITCH GRADE -L- STA.15+25.00 RT. ELEV.= 293.43'
BEGIN DITCH GRADE -L- STA.15+50.00 LT. ELEV.= 291.10'
PI = 19+30.00
EL = 273.45'
VC = 540'
K = 81
V = 45 mph
PI = 24+32.50
EL = 280.85'
VC = 285'
K = 75
V = 45 mph
(-)5.2242%
(-)1.0220%
(-)6.7400%
(-)5.2242%
(-)7.6780%
(-)1.2600%
(-)1.2000%
(+)1.4726%
(+)1.4726%
(-)2.5126%
(-)0.3000%
-L- STA.18+25.00 LT. ELEV.= 272.51'
-L- STA.18+50.00 RT. ELEV.= 270.68'
-L- STA.19+25.00 LT. ELEV.= 266.39'
END DITCH GRADE -L- STA.19+75.00 LT. ELEV.= 265.39'
END DITCH GRADE -L- STA.21+25.00 RT. ELEV.= 264.58'
-L- STA.20+75.00 RT. ELEV.= 264.83'
N.W.S.ELEV.=261.5'
LEFT DITCH
RIGHT DITCH
SEE SHEETS 4 AND 5 FOR PLAN VIEW
330 320 310 300 290 280 270 260 250 240
13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00 24+00 25+00 26+00 27+00
BM # 44 ELEVATION = 274.06
N 738607 E 2029224
FROM L STATION 34+44.17
N 63° 34' 3.10" E Dist 440.10'
RRS IN 30 INCH OAK
-L-
-GRNWY-
BEGIN GRADE -GRNWY- STA. 10+29.00 EL = 272.58'
-L- CL EL = 272.74
END GRADE -GRNWY- STA. 11+78.50 EL = 268.58'
END GRADE -L- STA. 31+00.00 EL = 268.96'
END CONSTRUCTION -L- STA. 31+25.00
PI = 29+70.00
EL = 268.42'
VC = 220'
K = 81
V = 45 mph
(-)2.5126%
(+)0.1154%
(+)0.4000%
(-)1.1222%
(-)2.6756%
BEGIN DITCH GRADE -L- STA.30+25.00 LT. ELEV.= 265.65'
-L- STA.30+80.00 LT. ELEV.= 265.87'
END DITCH GRADE -L- STA.31+25.00 LT. ELEV.= 266.51'
EXISTING BOARDWALK
SEE DETAIL SHEETS 2-A THRU 2-D FOR BOARDWALK DETAILS.
LEFT DITCH
SEE SHEET 5 FOR PLAN VIEW
27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00 10+00 11+00 12+00
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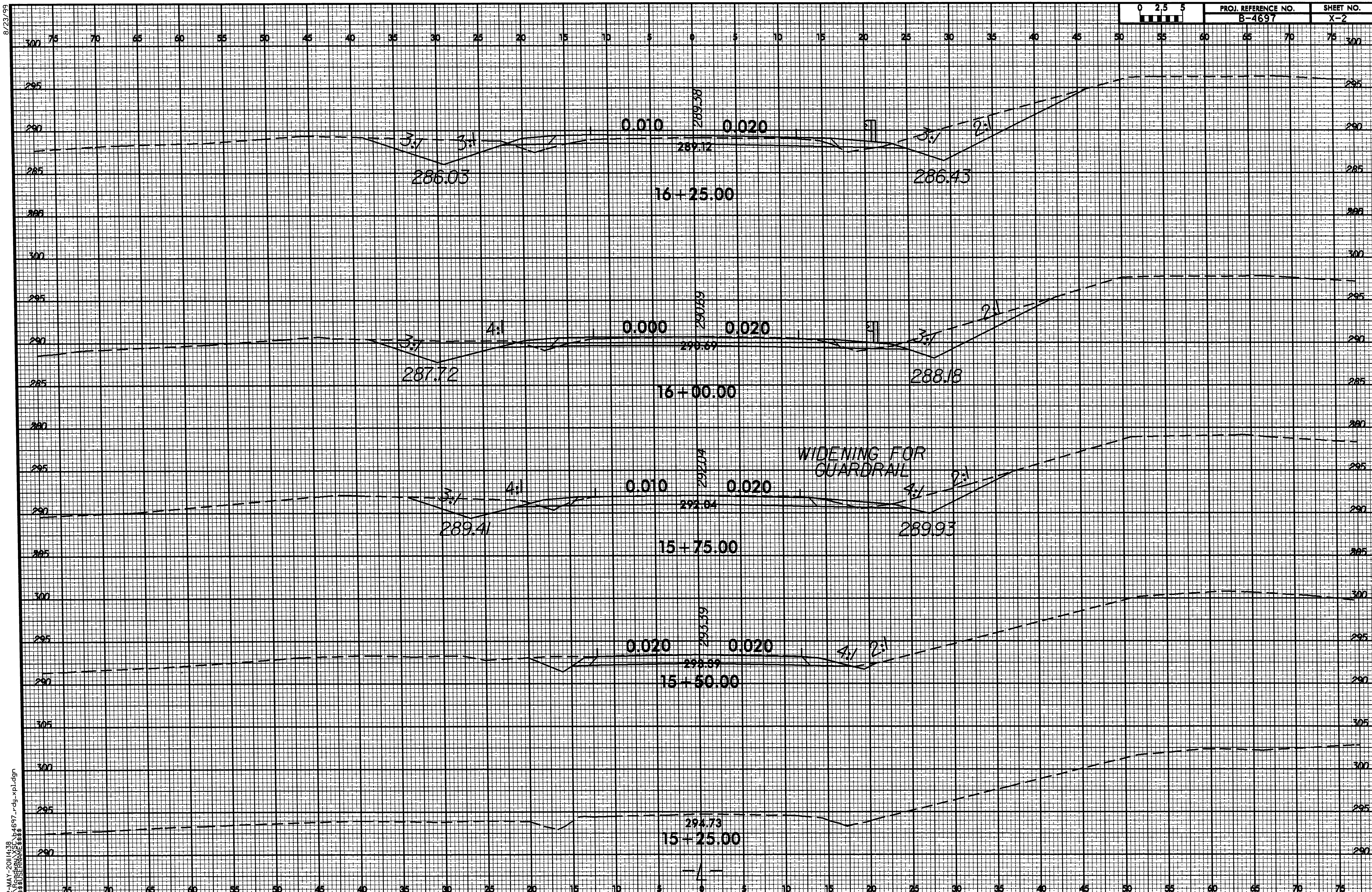
PROJ. REFERENCE NO.	SHEET NO.
B-4697	X-2



8/23/99

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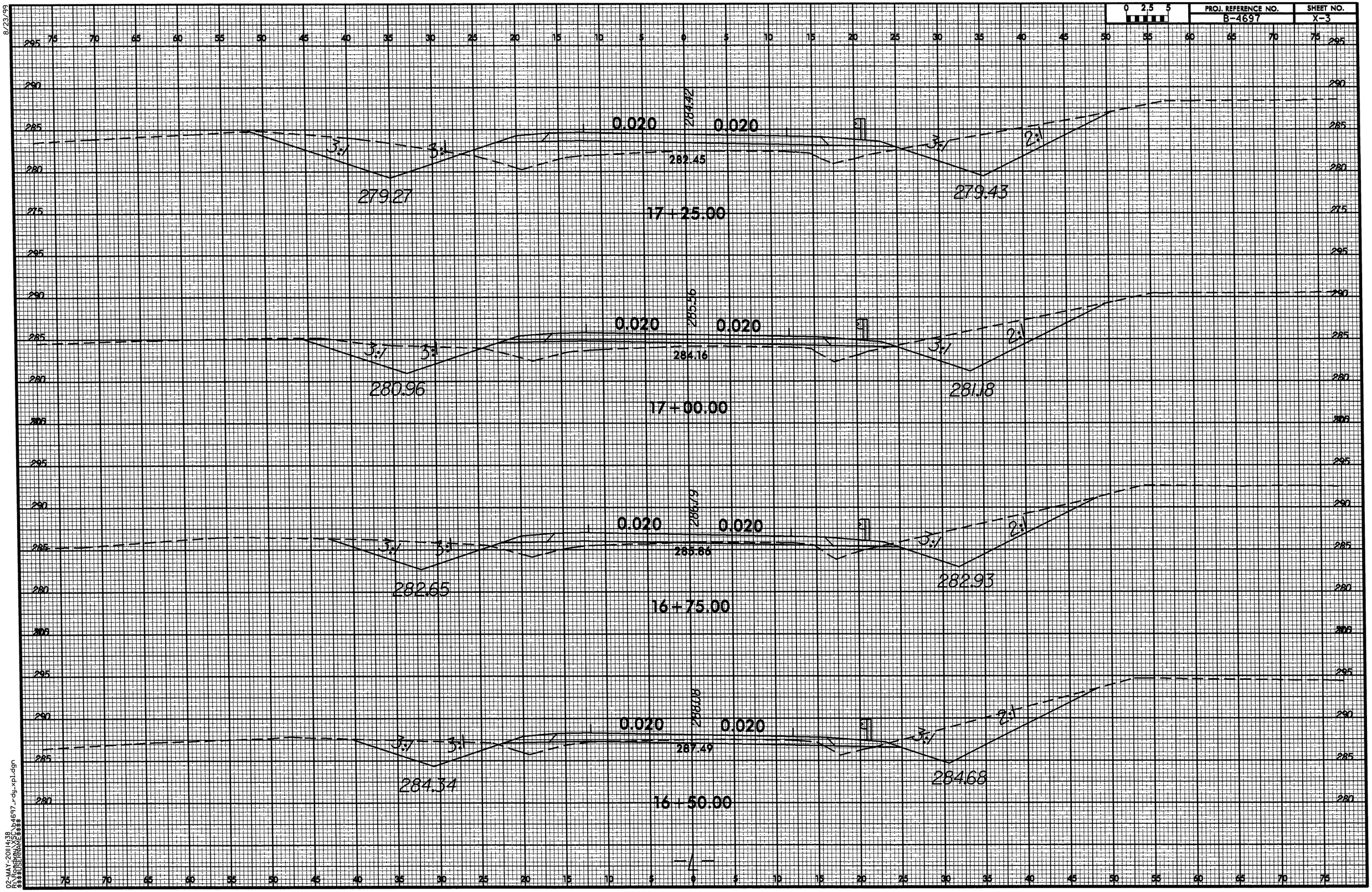
	B-4697	X-3



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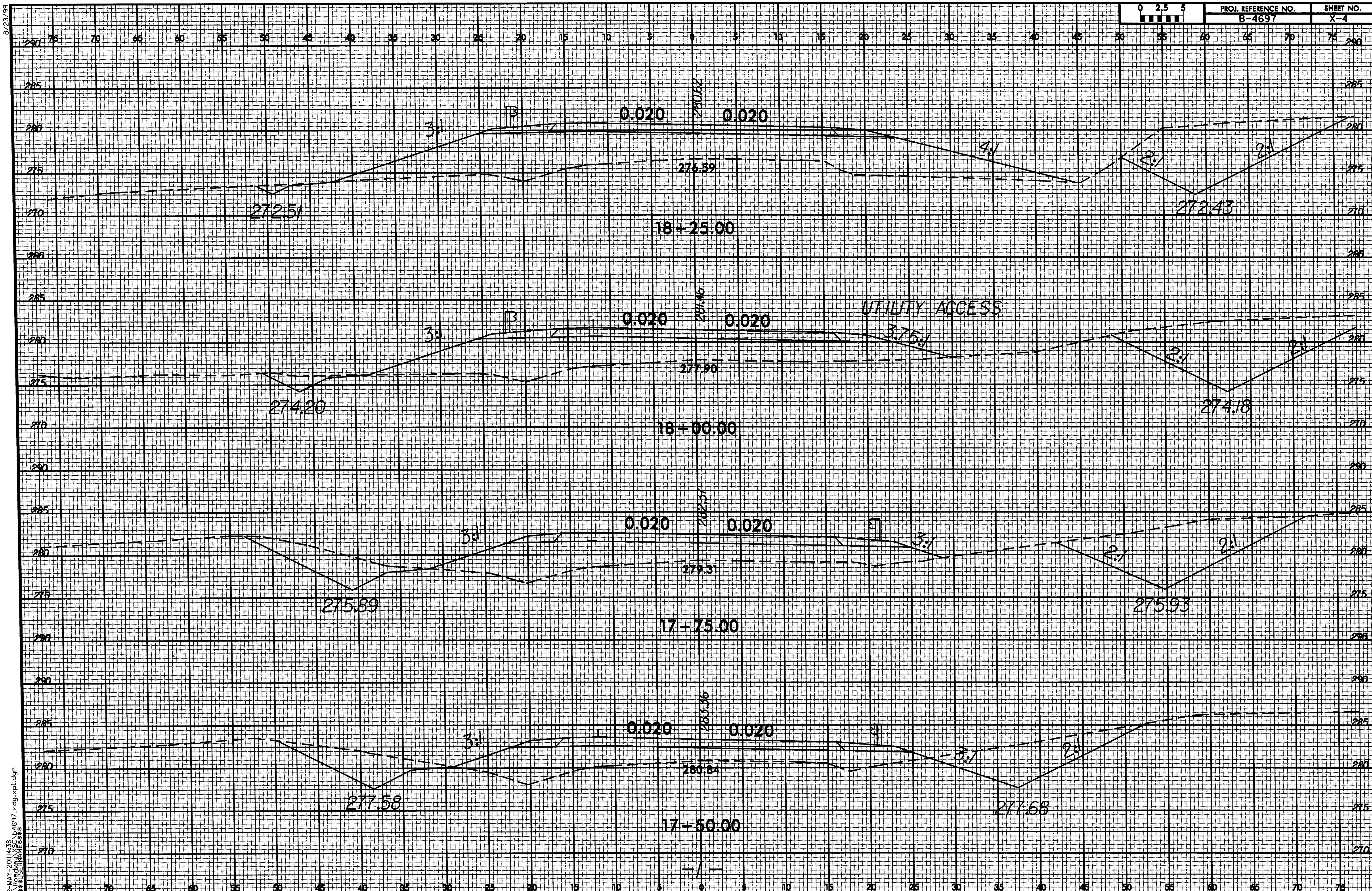

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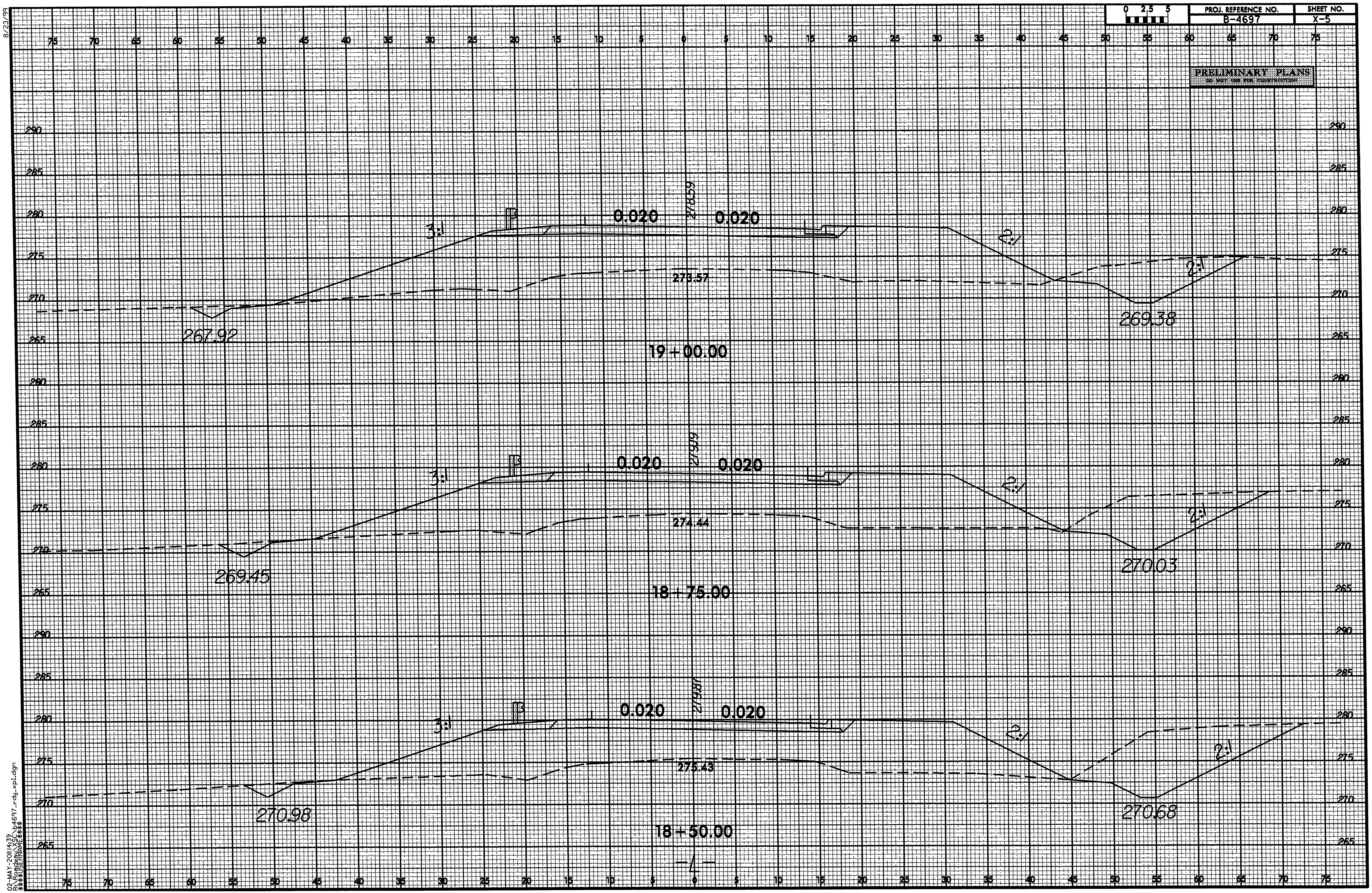
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B-4697
SHEET NO.
X-5
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
8/23/99
278.59
0.020
0.020
3:1
2:1
2:1
273.57
267.92
269.38
19+00.00
279.19
0.020
0.020
3:1
2:1
2:1
274.44
269.45
270.03
18+75.00
279.81
0.020
0.020
3:1
2:1
2:1
275.43
270.98
270.68
18+50.00
02-MAY-2011 14:39
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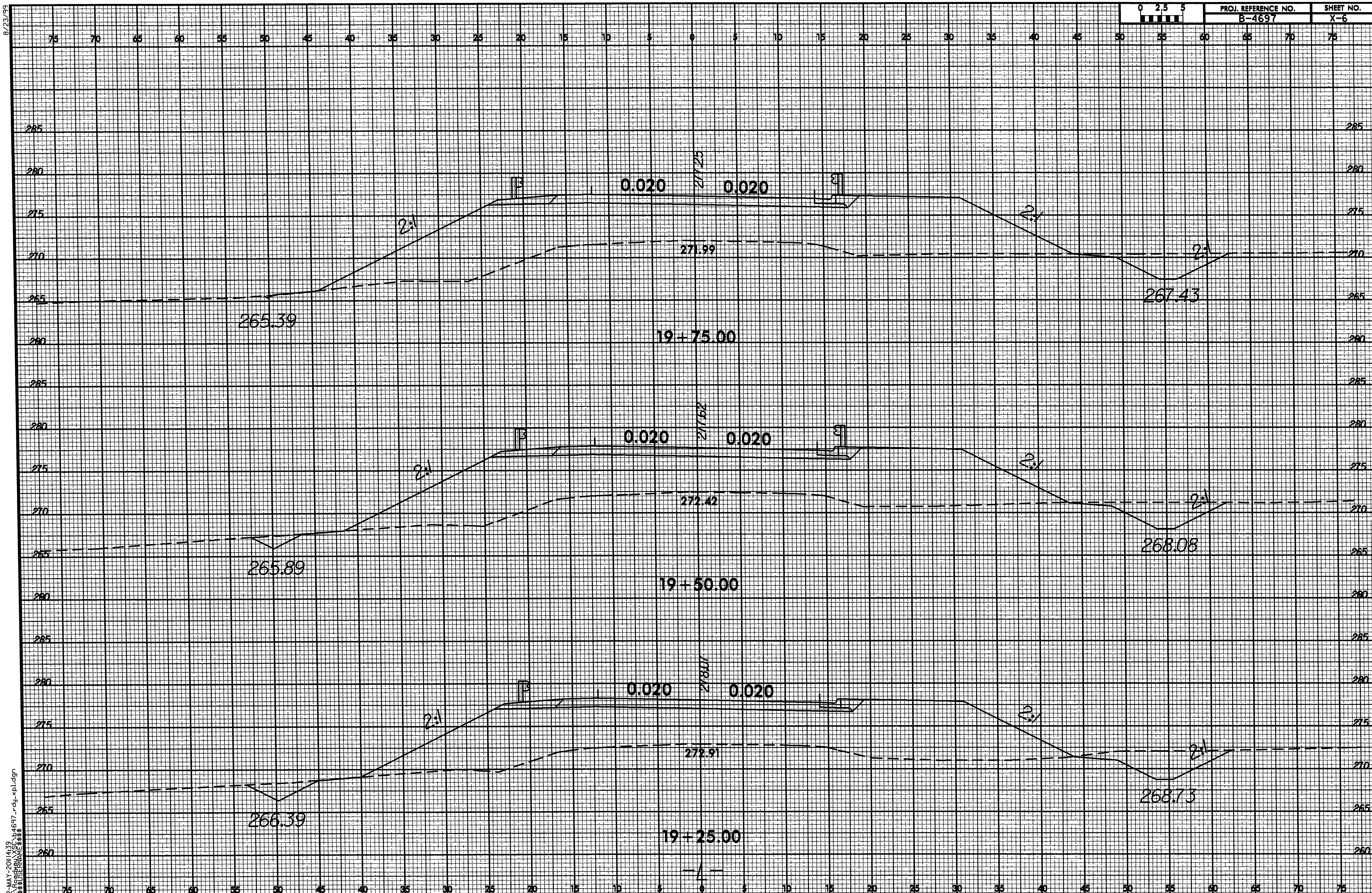
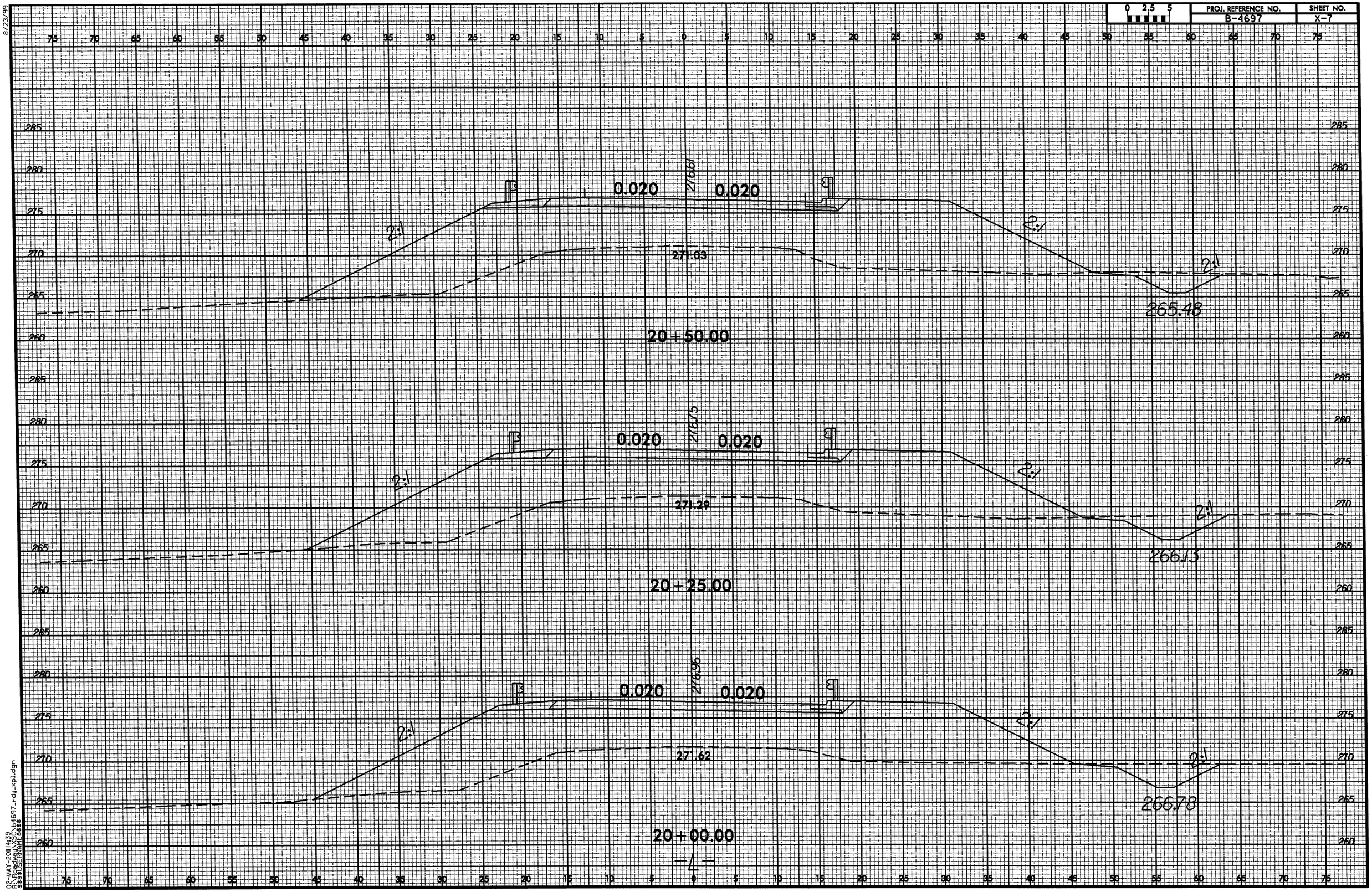
PROJ. REFERENCE NO.	SHEET NO.
B-4697	X-6



8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4697	X-7



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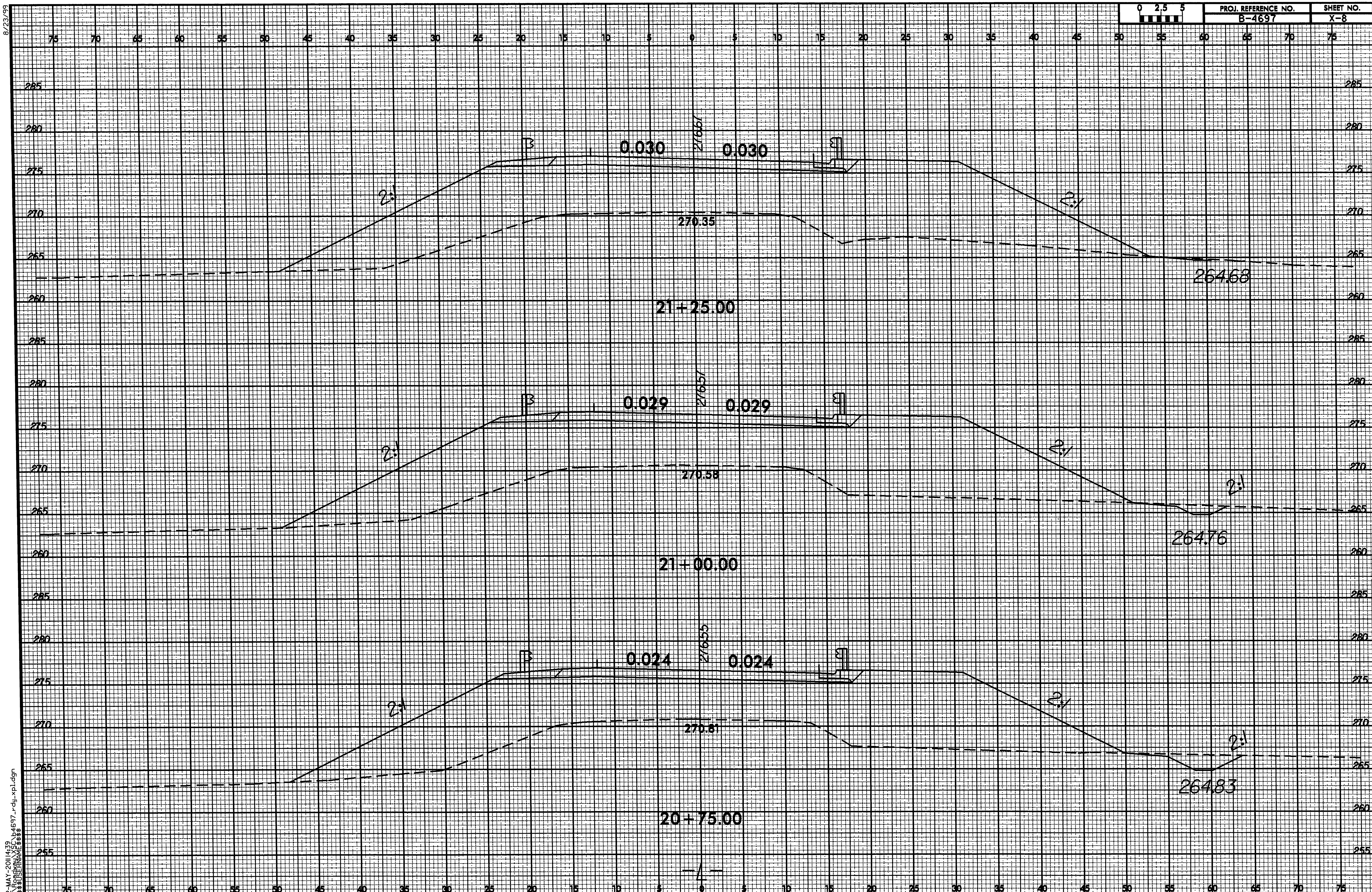
PROJ. REFERENCE NO.	SHEET NO.
B-4697	X-8

8/23/99



8/23/99

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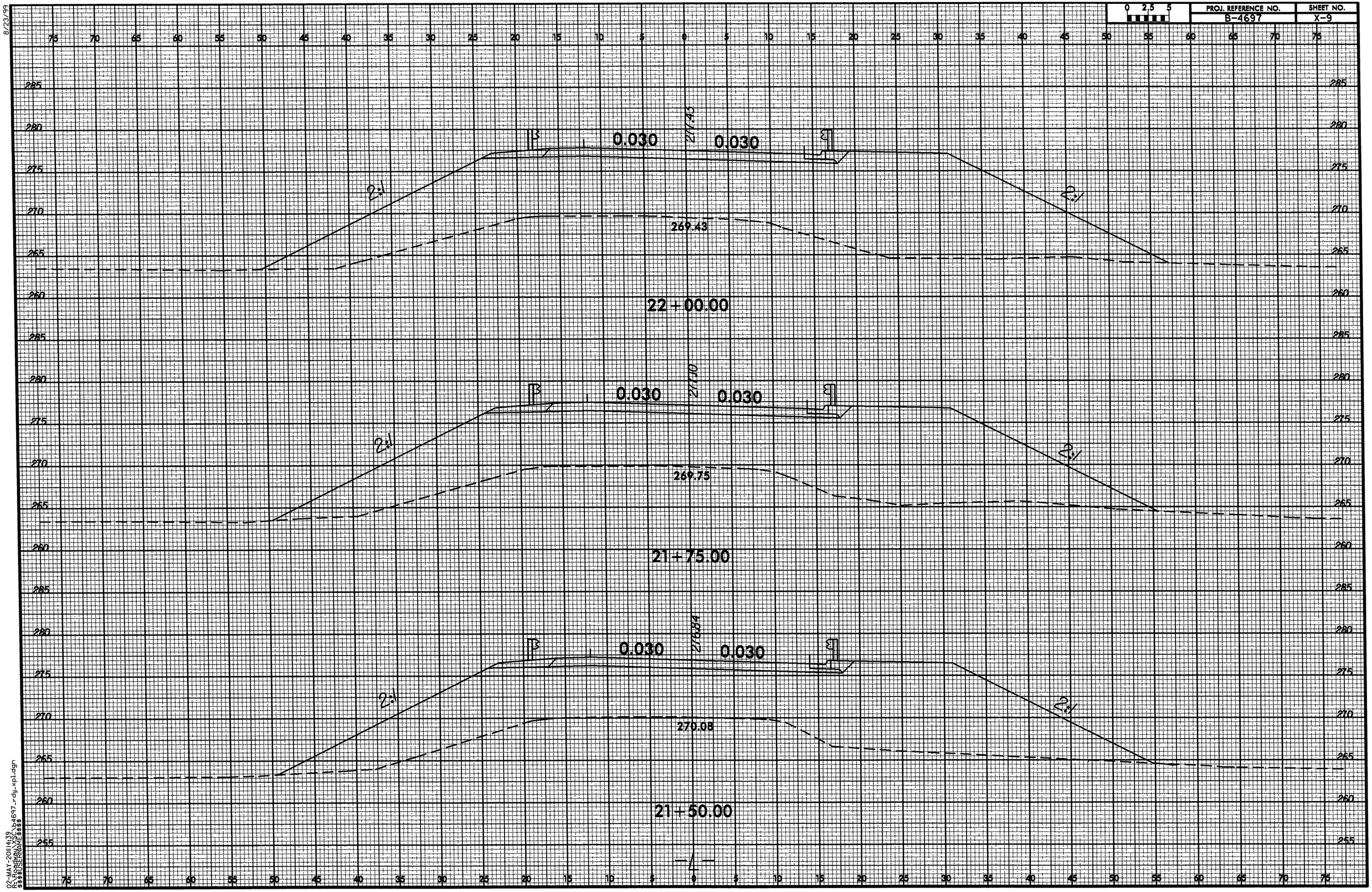
	B-4697	X-9



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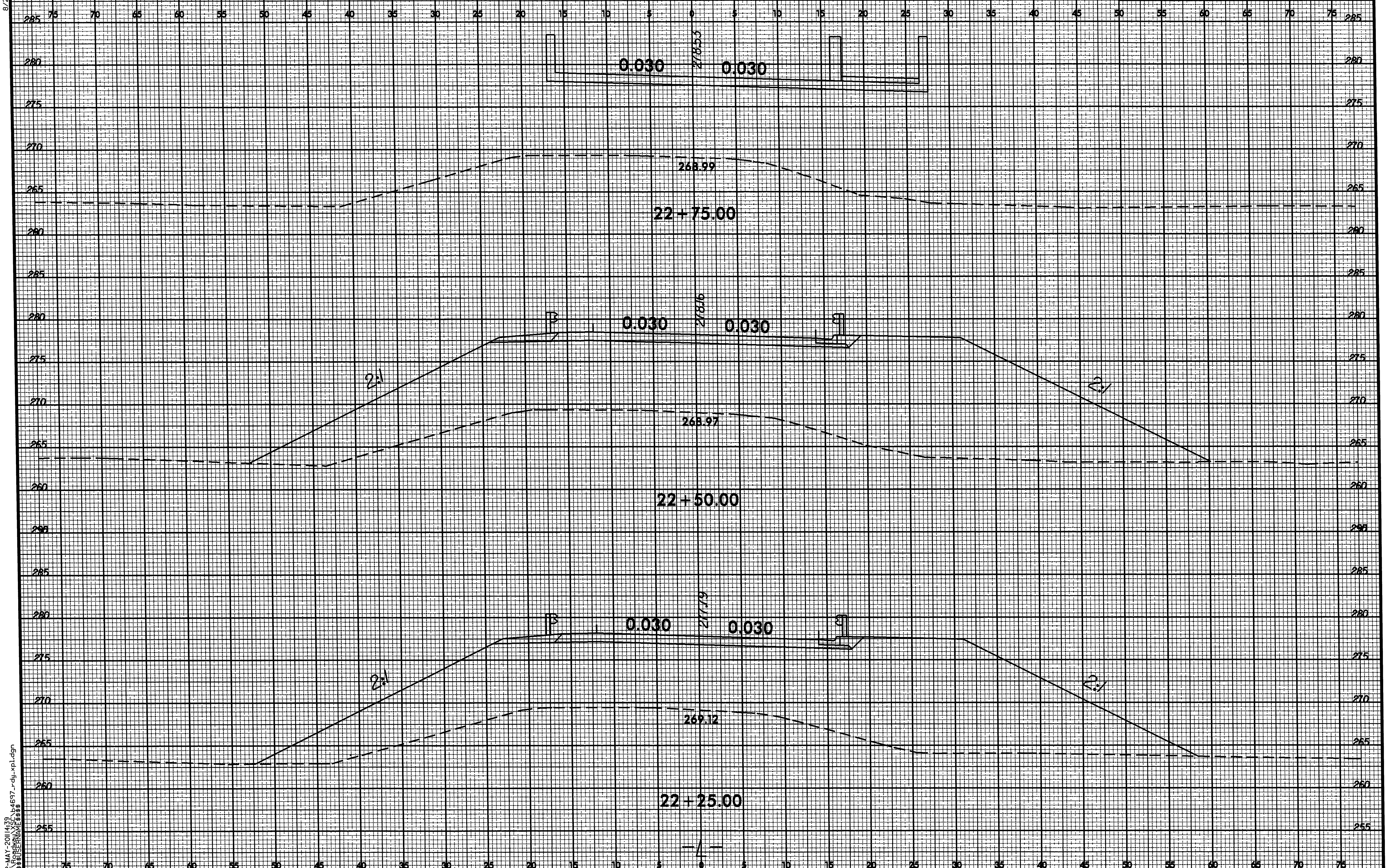
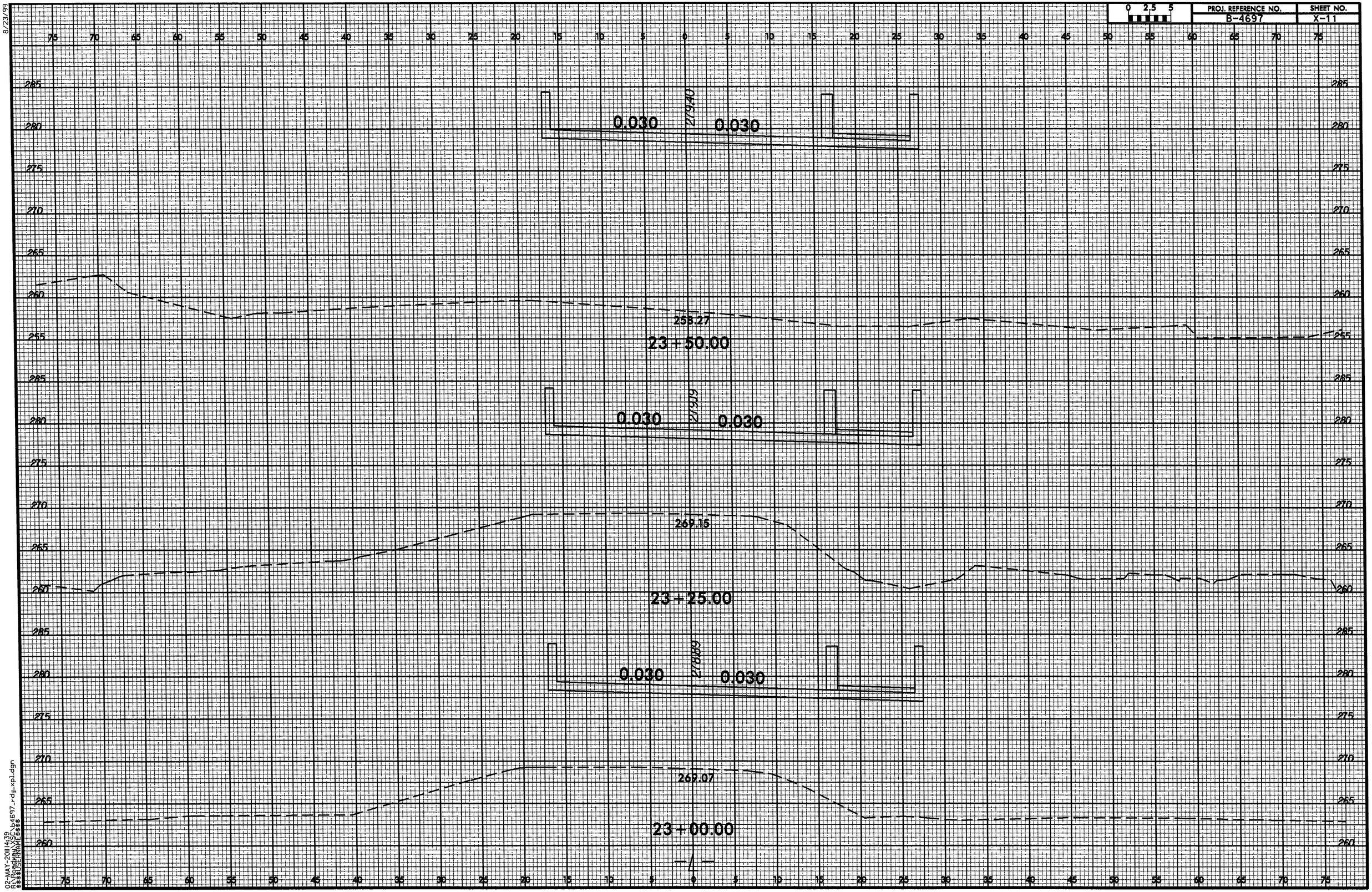

0 2.5 5
0.030
0.030
278.53
268.99
22+75.00
278.76
268.97
2:1
22+50.00
277.79
269.12
22+25.00
8/23/99
02-MAY-2011 14:39

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4697	X-11



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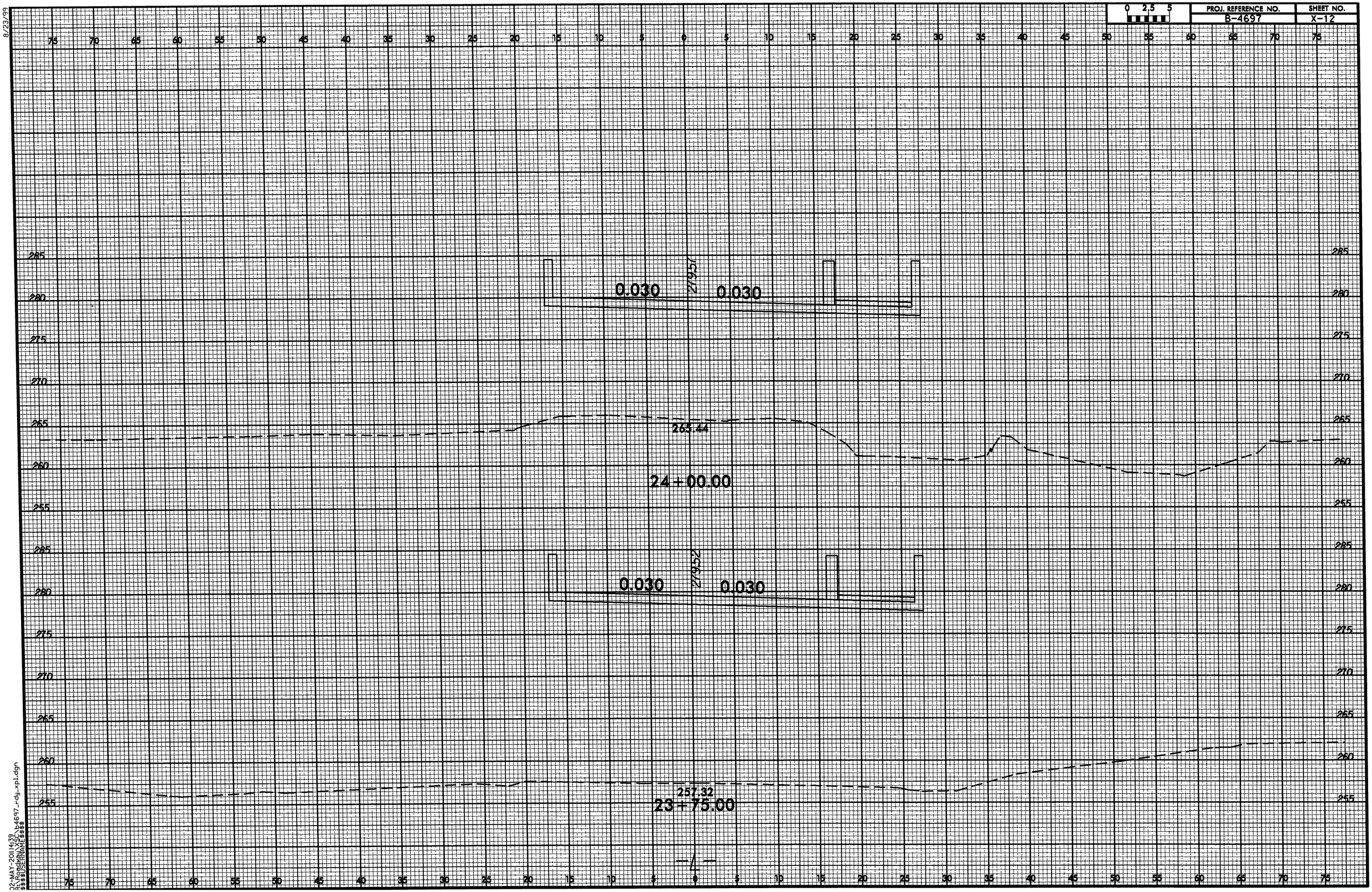
8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4697	X-12



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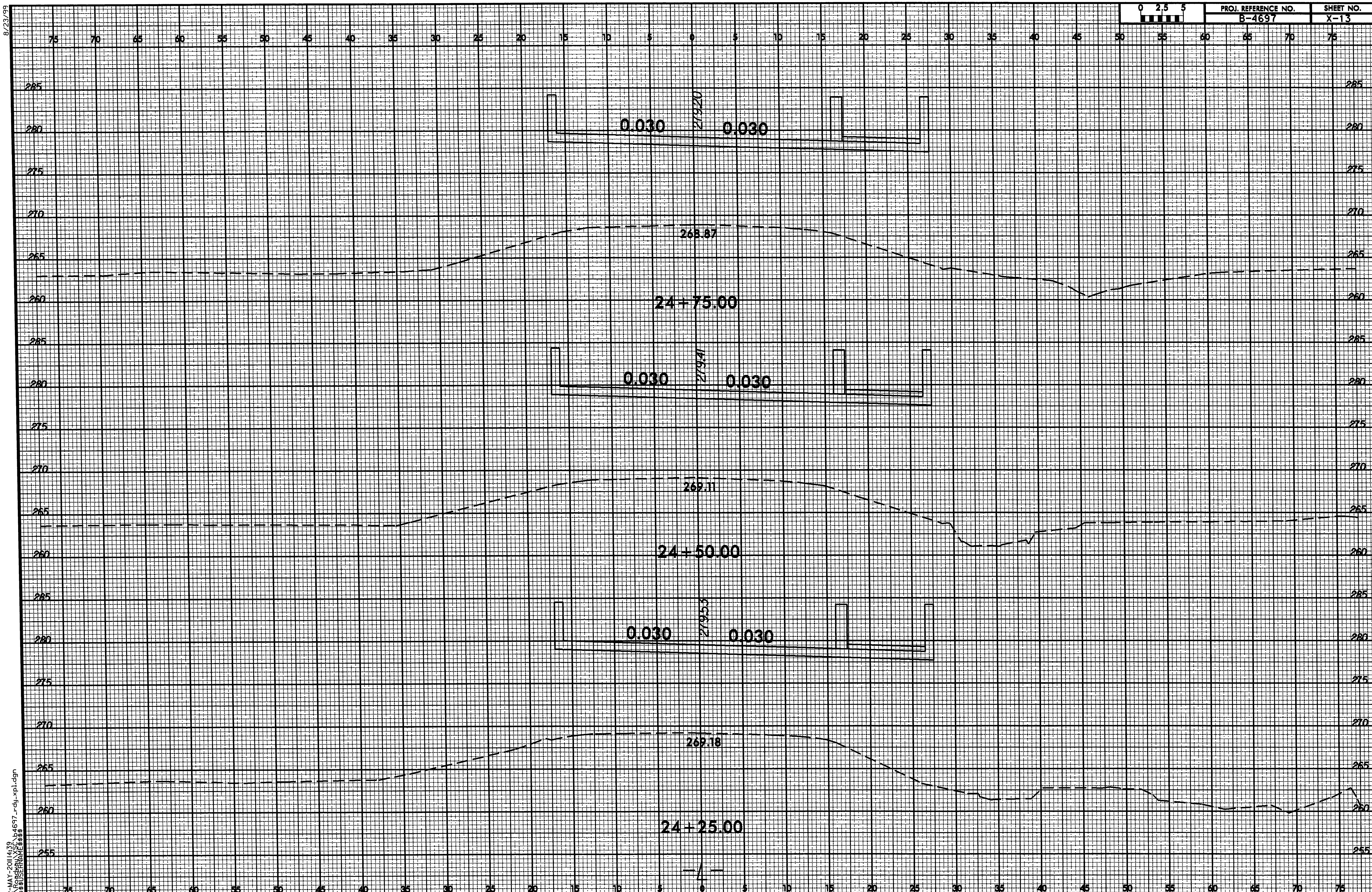
8/23/99



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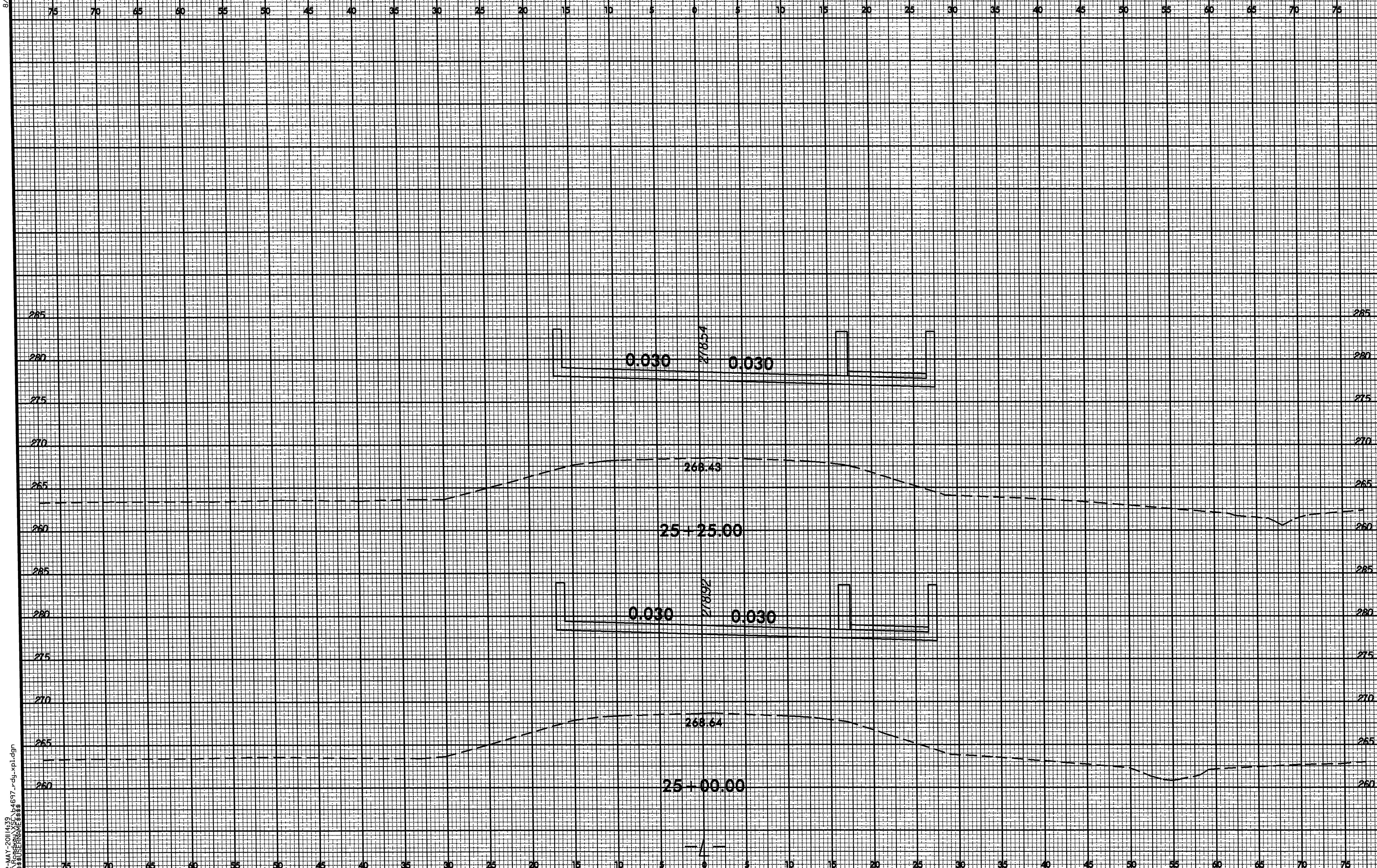
PROJ. REFERENCE NO.	SHEET NO.
B-4697	X-14



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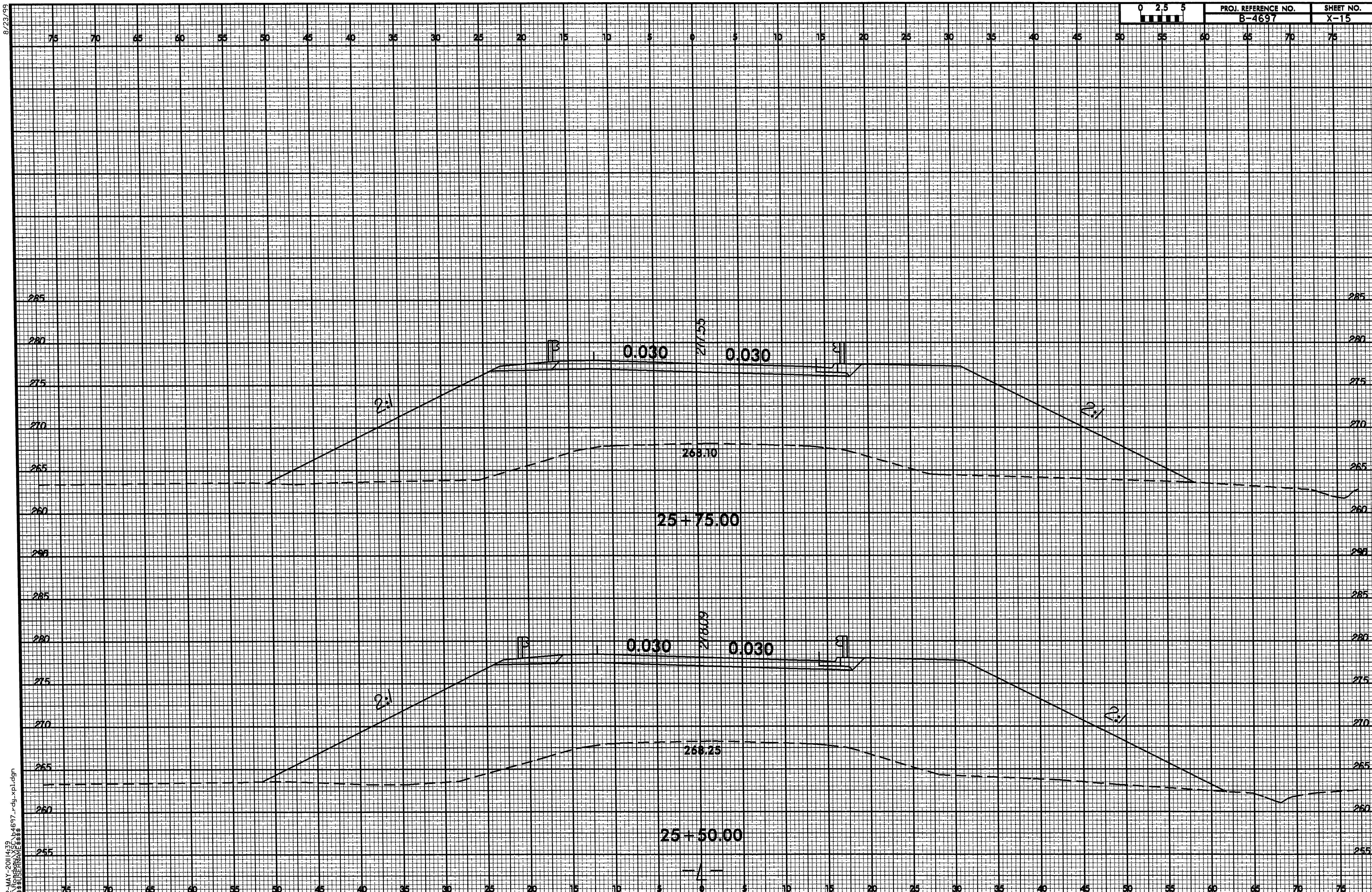
PROJ. REFERENCE NO.	SHEET NO.
B-4697	X-15

8/23/99



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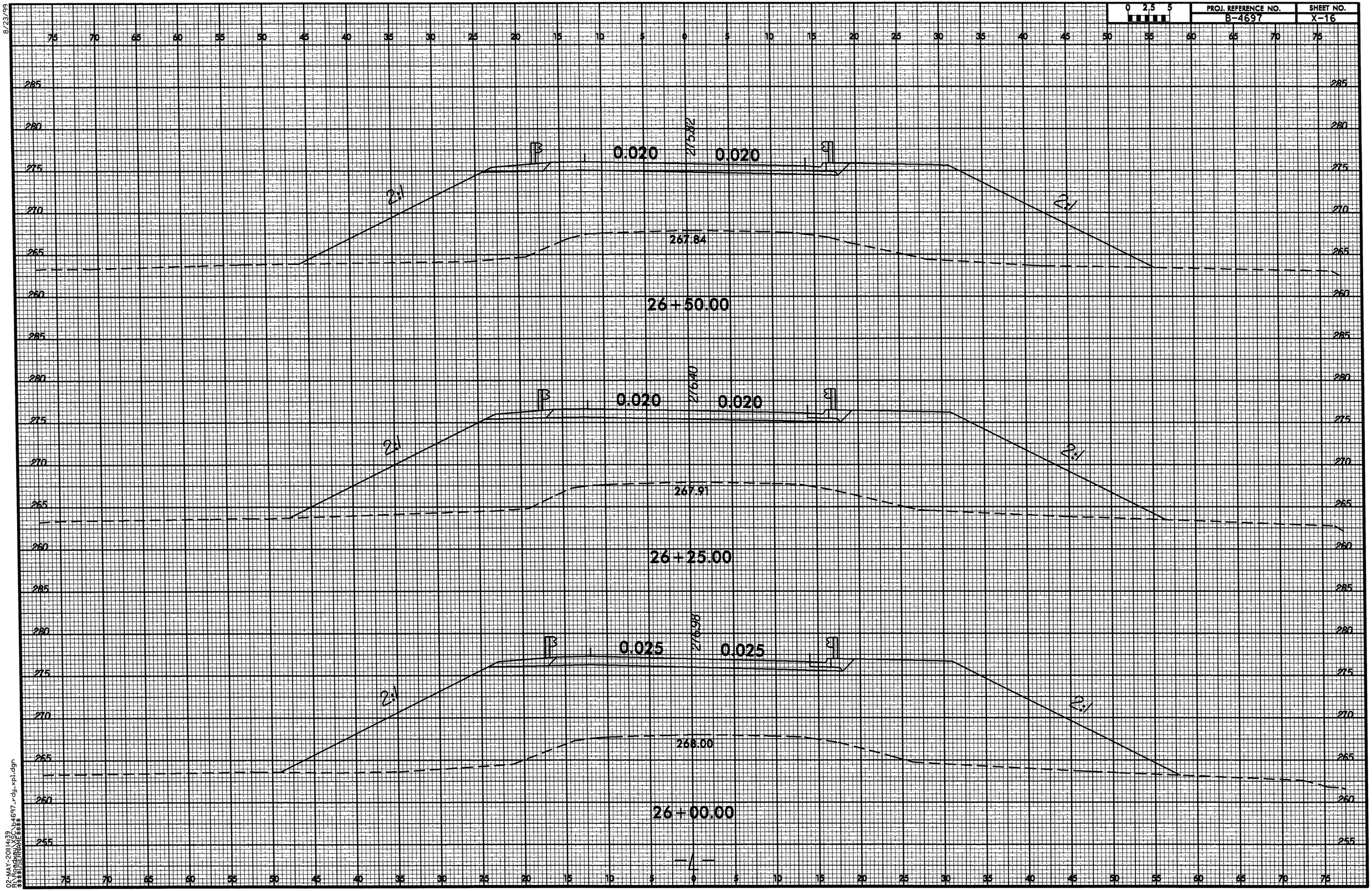
8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4697	X-16



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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
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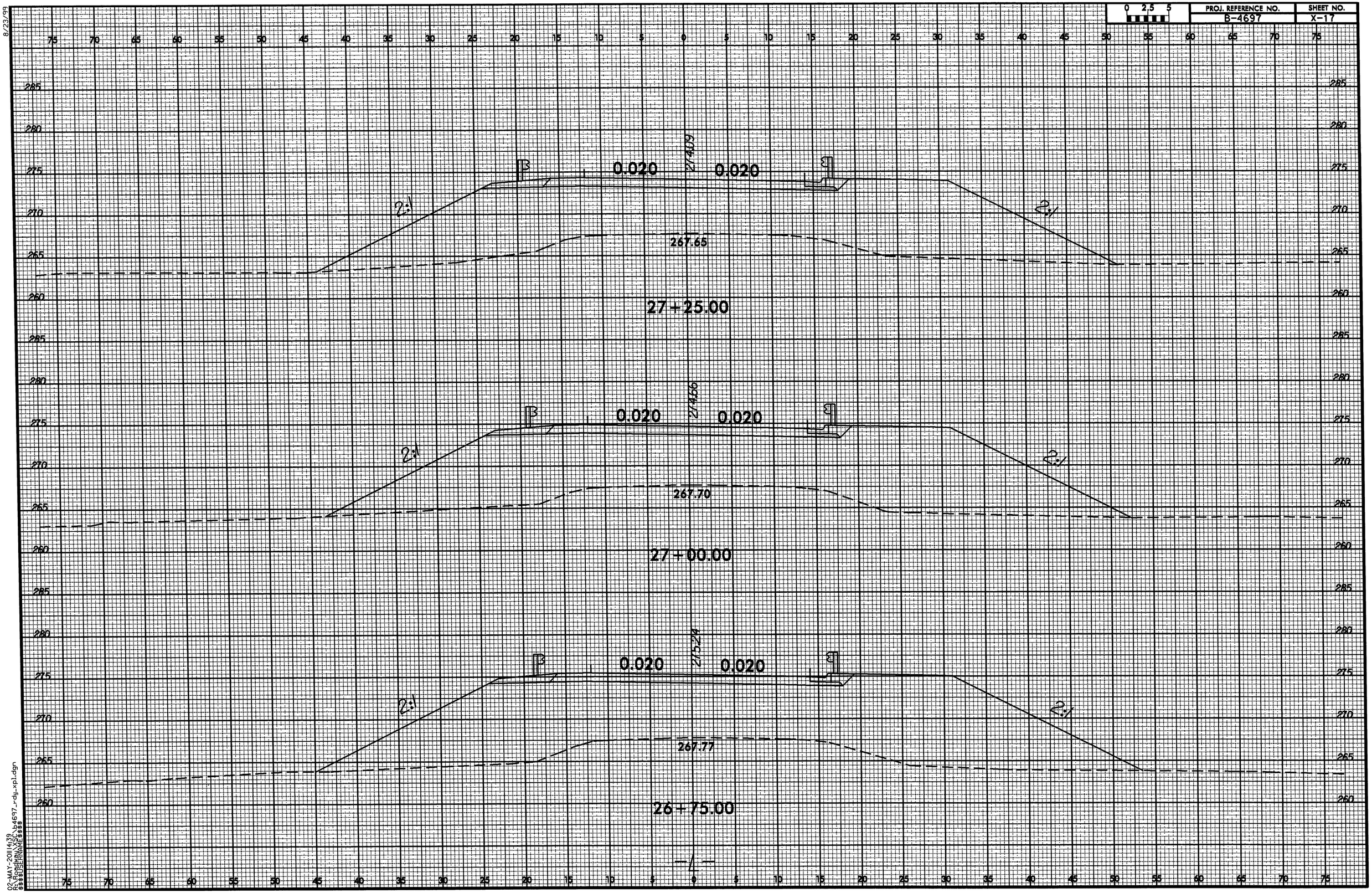

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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4697	X-18

-GRNWY- STA. 10+30

272.35

0.020 0.020

3:1

267.86

EXISTING GREENWAY

28+00.00

-GRNWY- STA. 10+30

PROPOSED BOARDWALK
AT -L- STA. 27+83 +/-

272.25

0.020 0.020

3:1

267.75

EXISTING GREENWAY

27+75.00

272.51

0.020 0.020

3:1

2:1

267.70

27+50.00

-L-

02-MAY-2011 14:39
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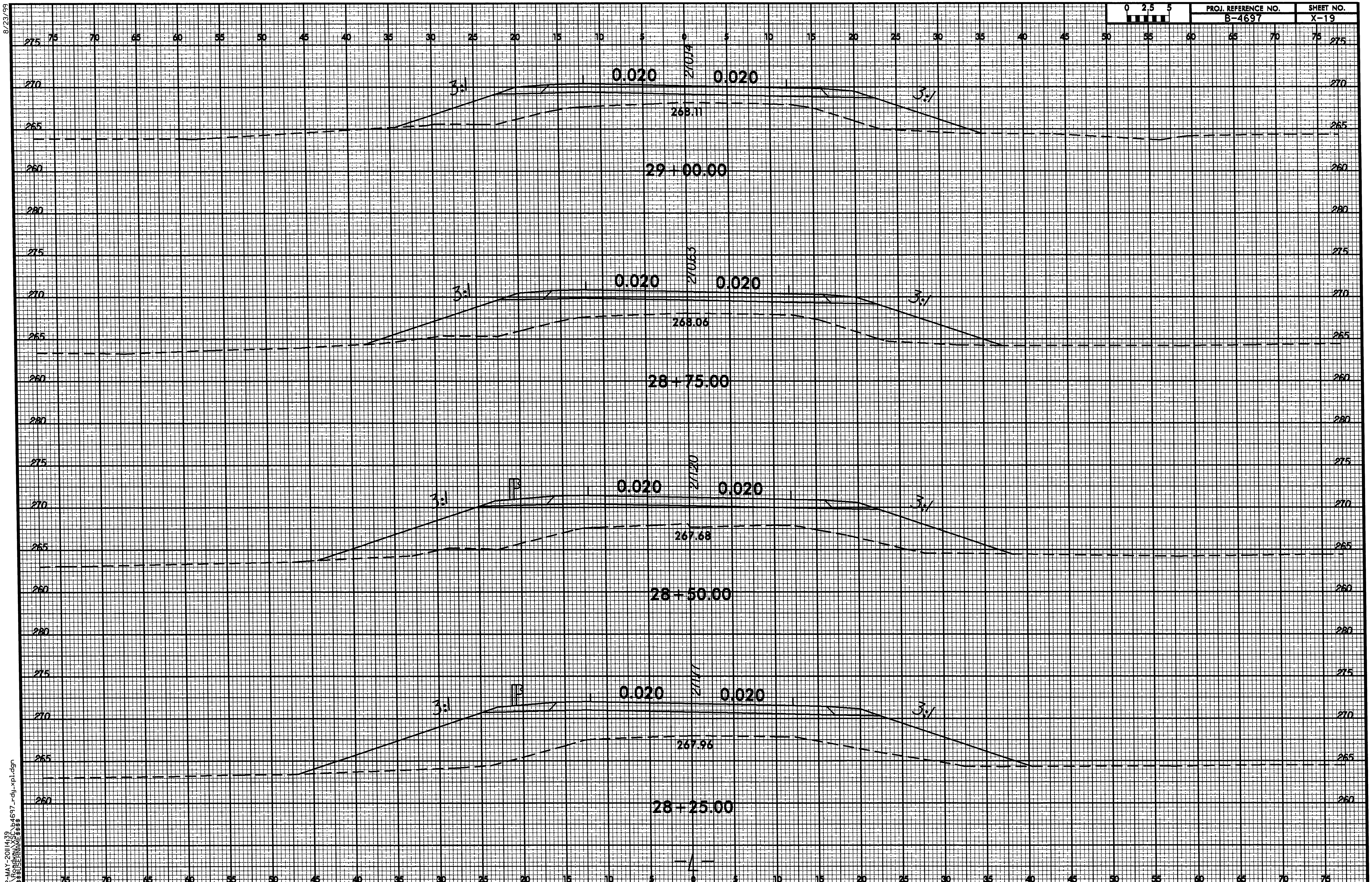
8/23/99

PROJ. REFERENCE NO.	SHEET NO.
B-4697	X-19



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8/23/99

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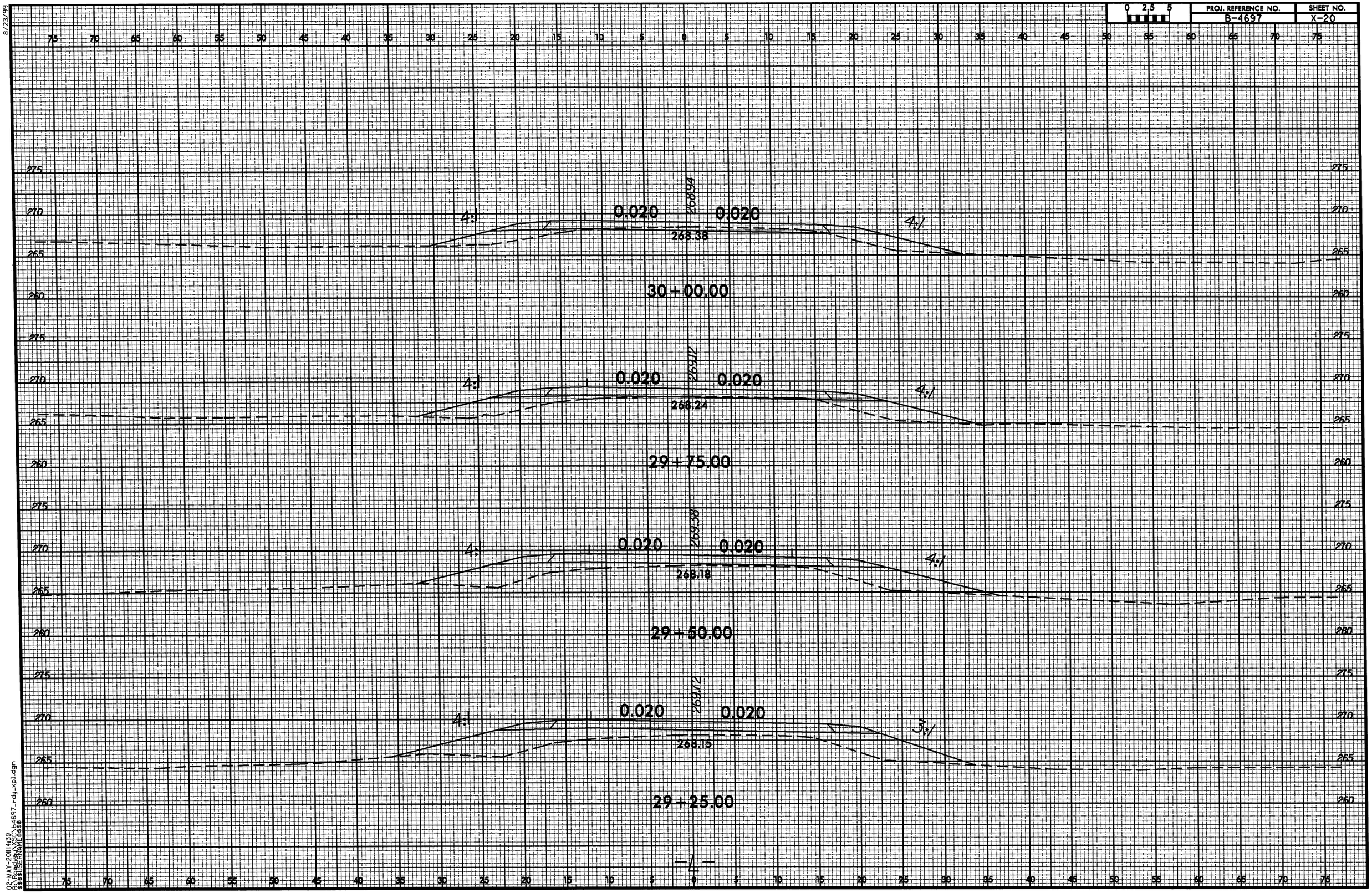

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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4697	X-21

269.22

31+50.00

269.10

31+25.00

268.96

0.010 0.030

268.96

3:1 4:1

31+00.00

268.56

4:1 0.000 0.020 4:1

268.83

3:1 4:1

265.85

30+75.00

268.81

4:1 0.010 0.020 4:1

268.68

3:1 4:1

265.75

30+50.00

268.84

4:1 0.020 0.020 4:1

268.53

3:1 4:1

265.65

30+25.00

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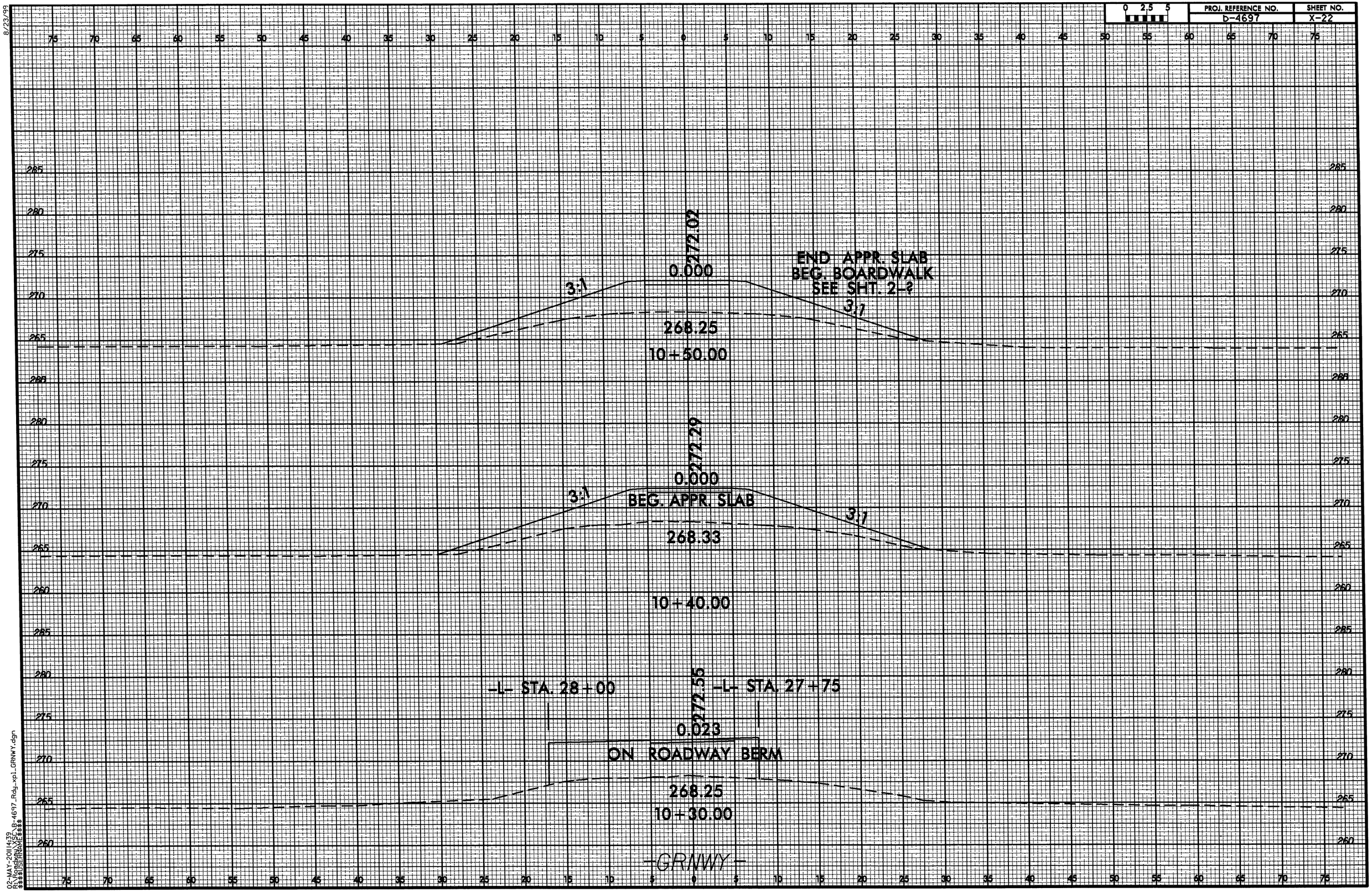
8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	D-4697	X-22



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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	D-4697	X-23

0.000
270.65
REMOVE EXISTING EMABANKMENT
266.82
10+90.00

0.000
271.22
REMOVE EXISTING EMABANKMENT
268.49
10+80.00

0.000
271.48
REMOVE EXISTING EMABANKMENT
268.31
10+70.00

0.000
271.75
EXCAVATE END BENT SLOPE
268.14
10+60.00

-GRNWY-

02-MAY-2011 14:39
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$$$$USERNAME$$$$

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	D-4697	X-24

269.88
0.000

264.28
11+30.00

270.15
0.000

263.58
11+20.00

270.41
0.000

263.58
11+10.00

270.68
0.000

REMOVE EXISTING
EMABANKMENT

264.67
11+00.00

←GRNWY→

02-MAY-2011 14:39
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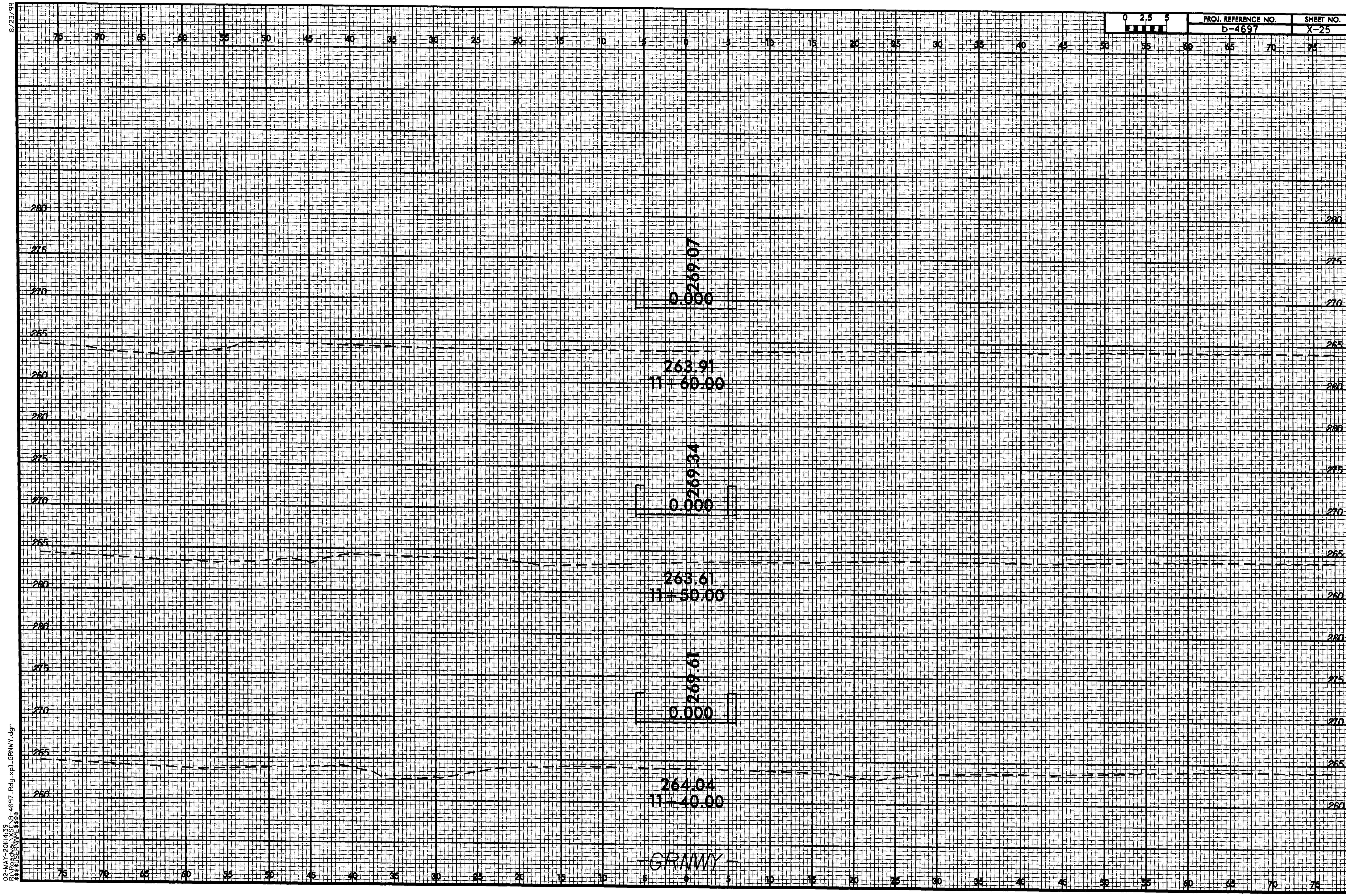
PROJ. REFERENCE NO.	SHEET NO.
B-4697	X-25



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8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
D-4697	X-26

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

265
260
280
275
270
265
260

264.09
11+80.00

0.000

268.81

264.03
11+70.00

GRNWY

02-MAY-2011 14:39
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