STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

March 30, 2009

USACE Raleigh Regulatory Field Office
3331 Heritage Trade Drive, Suite 105
Wake Forest, NC 27857

ATTN: Mr. John Thomas
NCDOT Coordinator

Dear Sir,

Subject: **Application for Section 404 Nationwide Permits 13, 14, 33 and Section 401 Permit** for widening of NC 16 Southeast of SR 1158 (Claudemash Road) to southeast of NC 88 in Ashe County, Federal Aid Project Number STP 16 (1), State Project No. 8.1710901, Division 11, T.I.P No. R-2100B.

Debit $570.00 from WBS No. 34369.1.1.

The North Carolina Department of Transportation (NCDOT) proposes to improve a 2.4 mile section of NC 16 in Ashe County by widening the existing roadway to a 24-foot pavement, installation of guardrail at selected locations, construction of a new bridge over Bear Creek, and minor horizontal and vertical alignment changes to improve sight distance. There will be 732 feet of permanent surface water impacts and 0.03 acres of temporary surface water impacts at Sites 1 – 18 as well as less than 0.01 acre of wetland impact at Site 1. These impacts occur as a result of pipe installations and stabilizations, a stream relocation, and replacement of a culvert with a bridge.

Please see the enclosed copies of the Pre-Construction Notification (PCN), Ecosystem Enhancement Program (EEP) acceptance letter, meeting minutes from 4B and 4C, permit drawings, and design plans for the above-referenced project. Also included are the Stormwater Plan, application, and permit. The Environmental Assessment (EA) was completed for this project in June 1990, the Finding of No Significant Impact (FONSI) was completed in November 1995, and a Project Environmental Consultation update was completed in November 2007 and all were distributed shortly thereafter. Additional copies are available upon request.

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

TELEPHONE: 919-431-2000
FAX: 919-431-2001
WEBSITE: WWW.NCDOT.ORG

LOCATION:
4701 Atlantic Ave.,
Suite 116
Raleigh, NC 27604

This project calls for a letting date of November 17, 2009 and a review date of September 29, 2009.

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 Deanna Riffey at (919) 431-1594.

Sincerely,

E. L. Lusk

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

W/attachment

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

W/o attachment (see website for attachments)

Dr. David Chang, P.E., Hydraulics
Mr. Mark Staley, Roadside Environmental
Mr. Greg Perfetti, P.E., Structure Design
Mr. Victor Barbour, Project Services Unit
Mr. Michael A. Pettyjohn, P.E. Division 11 Engineer
Mr. Heath Slaughter, Division 11 Environmental Officer
Mr. Jay Bennett, P.E., Roadway Design
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Scott McLendon, USACE, Wilmington
Mr. Todd Jones, NCDOT External Audit Branch
Ms. Beth Harmon, EEP
Mr. Michael Penney, PDEA

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

Pre-Construction Notification (PCN) Form

A. Applicant Information

1. Processing

1a. Type(s) of approval sought from the Corps:	☒ Section 404 Permit ☐ Section 10 Permit	
1b. Specify Nationwide Permit (NWP) number: 13 14 33 or General Permit (GP) number:		
1c. Has the NWP or GP number been verified by the Corps?	☒ Yes	☐ No
1d. Type(s) of approval sought from the DWQ (check all that apply): ☒ 401 Water Quality Certification – Regular ☐ Non-404 Jurisdictional General Permit ☐ 401 Water Quality Certification – Express ☐ Riparian Buffer Authorization		
1e. Is this notification solely for the record because written approval is not required?	For the record only for DWQ 401 Certification: ☐ Yes ☒ No	For the record only for Corps Permit: ☐ Yes ☒ No
1f. Is payment into a mitigation bank or in-lieu fee program proposed for mitigation of impacts? If so, attach the acceptance letter from mitigation bank or in-lieu fee program.	☒ Yes	☐ No
1g. Is the project located in any of NC's twenty coastal counties. If yes, answer 1h below.	☐ Yes	☒ No
1h. Is the project located within a NC DCM Area of Environmental Concern (AEC)?	☐ Yes	☒ No

2. Project Information

2a. Name of project:	Proposed Widening of NC 16 Southeast of SR 1158 (Claudemash Road) to southeast of NC 88.
2b. County:	Ashe
2c. Nearest municipality / town:	Orion
2d. Subdivision name:	not applicable
2e. NCDOT only, T.I.P. or state project no:	R-2100 B

3. Owner Information	
3a. Name(s) on Recorded Deed:	North Carolina Department of Transportation
3b. Deed Book and Page No.	
3c. Responsible Party (for LLC if applicable):	not applicable
3d. Street address:	1 South Wilmington Street
3e. City, state, zip:	Raleigh, NC 27601
3f. Telephone no.:	(919) 431-2000
3g. Fax no.:	(919) 431-2002
3h. Email address:	driffey@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: 36.37 (DD.DDDDDD) Longitude: - 81.40 (-DD.DDDDDD)
1c. Property size:	23 acres
2. Surface Waters	
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	South Fork New River
2b. Water Quality Classification of nearest receiving water:	WSIV, HQW
2c. River basin:	New
3. Project Description	
3a. Describe the existing conditions on the site and the general land use in the vicinity of the project at the time of this application: The local area surrounding the proposed project consists of forest, rock outcrops, and rural residential.	
3b. List the total estimated acreage of all existing wetlands on the property: 0.11ac	
3c. List the total estimated linear feet of all existing streams (intermittent and perennial) on the property: 1450 ft	
3d. Explain the purpose of the proposed project: To improve sight distance, design speed, and the safety of the facility	
3e. Describe the overall project in detail, including the type of equipment to be used: NCDOT proposes to improve a 2.4 mi. section of NC16 by widening the existing roadway to a 24ft pavement, installation of guardrail at selected locations, construction of a new bridge over Bear Creek, and horizontal & vertical alignment changes to improve sight distance. Traffic will be routed to surrounding roads & use part of existing road. Heavy duty excavation equipment will be used such as dozers, cranes and other equipment necessary for roadway construction.	
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): Deanna Riffey	Agency/Consultant Company: NCDOT Other:
4d. If yes, list the dates of the Corps jurisdictional determinations or State determinations and attach documentation. 6/2/05 & 8/29/07	
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. Stormwater Permit #SW4090101 1/22/09	
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)
W1 ☒ P ☐ T	Pipe install & bank stablization	Non-Tidal Freshwater Marsh	☐ Yes ☒ No	☒ Corps ☐ DWQ	<0.01
W2 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
W3 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
W4 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
W5 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
W6 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
				2g. **Total wetland impacts**	<0.01

2h. Comments:

3. Stream Impacts

If there are perennial or intermittent stream impacts (including temporary impacts) proposed on the site, then complete this question for all stream sites impacted.

3a. Stream impact number - Permanent (P) or Temporary (T)	3b. Type of impact	3c. Stream name	3d. Perennial (PER) or intermittent (INT)?	3e. Type of jurisdiction (Corps - 404, 10 DWQ – non-404, other)	3f. Average stream width (feet)	3g. Impact length (linear feet)
S1 ☒ P ☐ T	Bank stabilization	Brush Creek (UT1)	☒ PER ☐ INT	☒ Corps ☐ DWQ		15 (P)
S2 ☒ P ☒ T	Pipe install & bank stabilization	UT 2 to Brush Creek	☒ PER ☐ INT	☒ Corps ☐ DWQ		45 (P) 14 (T)
S3 ☒ P ☒ T	Pipe install & bank stabilization	UT 3 to Brush Creek	☒ PER ☐ INT	☒ Corps ☐ DWQ		32 (P) 8 (T)
S4 ☒ P ☒ T	Pipe install & bank stabilization	UT 4A to Brush Creek	☐ PER ☒ INT	☒ Corps ☐ DWQ		32 (P) 7 (T)
S5 ☒ P ☒ T	Pipe install & bank stabilization	UT 4 to Brush Creek	☒ PER ☐ INT	☒ Corps ☐ DWQ		52 (P) 16 (T)
S6 ☒ P ☒ T	Pipe install , stream relocate & bank stabilization	UT 6 to Brush Creek	☒ PER ☐ INT	☒ Corps ☐ DWQ		128 (P) 42 (T)
					3h. **Total stream and tributary impacts**	304 (P) 87 (T)

3i. Comments: See page 4A for additional steam impacts.

3. Stream Impacts (Continued) – TIP: R-2100 B

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)
S7 ☒ P ☒ T	Pipe install & bank stabilization	UT 7 to Brush Creek	☒ PER ☐ INT	☒ Corps ☐ DWQ		35 (P) 31 (T)
S8 ☒ P ☒ T	Pipe install & bank stabilization	UT 8 to South Fork	☒ PER ☐ INT	☒ Corps ☐ DWQ		79 (P) 25 (T)
S9 ☒ P ☒ T	Pipe install & bank stabilization	UT 9 to South Fork	☒ PER ☐ INT	☒ Corps ☐ DWQ		66 (P) 32 (T)
S10 ☒ P ☒ T	Pipe install & bank stabilization	UT 10 to South Fork	☐ PER ☒ INT	☒ Corps ☐ DWQ		46 (P) 10 (T)
S11 ☒ P ☒ T	Pipe install & bank stabilization	UT 11 to South Fork	☒ PER ☐ INT	☒ Corps ☐ DWQ		57 (P) 20 (T)
S12 ☒ P ☒ T	Bank stabilization	Bear Creek	☒ PER ☐ INT	☒ Corps ☐ DWQ		95 (P) 34 (T)
S13 ☒ P ☐ T	Bank stabilization	South Fork New River	☒ PER ☐ INT	☒ Corps ☐ DWQ		50 (P)
S14 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
S15☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
S16 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
S17 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
S18 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
S19 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
S20 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
S21 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
S22 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
Total Stream and Tributary Impacts Page 4A						428 (P) 152 (T)
Total Stream and Tributary Impacts Page 4						304 (P) 87 (T)
Project Total						732 (P) 239(T)

4. Open Water Impacts

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

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

4g. Comments:

5. Pond or Lake Construction

If pond or lake construction proposed, then complete the chart below.

5a. Pond ID number	5b. Proposed use or purpose of pond	5c. Wetland Impacts (acres)			5d. Stream Impacts (feet)			5e. Upland (acres)
		Flooded	Filled	Excavated	Flooded	Filled	Excavated	Flooded
P1								
P2								
	5f. Total							

5g. Comments:

5h. Is a dam high hazard permit required?	☐ Yes ☒ No If yes, permit ID no:
5i. Expected pond surface area (acres):	
5j. Size of pond watershed (acres):	
5k. Method of construction:	

6. Buffer Impacts (for DWQ)

If project will impact a protected riparian buffer, then complete the chart below. If yes, then individually list all buffer impacts below. If any impacts require mitigation, then you **MUST** fill out Section D of this form.

6a. Project is in which protected basin?	☐ Neuse ☐ Tar-Pamlico ☐ Other: ☐ Catawba ☐ Randleman

6b. Buffer impact number – Permanent (P) or Temporary (T)	6c. Reason for impact	6d. Stream name	6e. Buffer mitigation required?	6f. Zone 1 impact (square feet)	6g. Zone 2 impact (square feet)
B1 ☐ P ☐ T			☐ Yes ☐ No		
B2 ☐ P ☐ T			☐ Yes ☐ No		
B3 ☐ P ☐ T			☐ Yes ☐ No		
			6h. **Total buffer impacts**		

6i. Comments:

D. Impact Justification and Mitigation

1. Avoidance and Minimization

1a. Specifically describe measures taken to avoid or minimize the proposed impacts in designing project.

Use of 2:1 max side slopes at wetland and stream locations, retaining walls along stream/river side shoulder, preformed scour holes, where practical, Permanent Soil Reinforcement Matting in lieu of rip rap in some ditches, where possible, NCDOT is spanning Bear Creek, decreasing shoulder width in the area where the Virginia spiraea is located and utilizing a horizontal alignment design exception that enables a reduction in cut/fills/earthwork. Also, Division 11 eliminated the temporary roadway detour at the bridge construction site. .

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

With the exception of not building the project, there are no means of avoiding impacts to waters of the State. NCDOT will minimize impacts to the streams through the use of Best Management Practices.

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

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

3. Complete if Using a Mitigation Bank

3a. Name of Mitigation Bank:

3b. Credits Purchased (attach receipt and letter)	Type	Quantity

3c. Comments:

4. Complete if Making a Payment to In-lieu Fee Program

4a. Approval letter from in-lieu fee program is attached.	☒ Yes
4b. Stream mitigation requested:	732 linear feet
4c. If using stream mitigation, stream temperature:	☐ warm ☒ cool ☐ cold
4d. Buffer mitigation requested (DWQ only):	square feet
4e. Riparian wetland mitigation requested:	acres
4f. Non-riparian wetland mitigation requested:	acres
4g. Coastal (tidal) wetland mitigation requested:	acres

4h. Comments:

5. Complete if Using a Permittee Responsible Mitigation Plan

5a. If using a permittee responsible mitigation plan, provide a description of the proposed mitigation plan.

6. **Buffer Mitigation (State Regulated Riparian Buffer Rules) – required by DWQ**				
6a. Will the project result in an impact within a protected riparian buffer that requires buffer mitigation?			☐ Yes ☐ No	
6b. If yes, then identify the square feet of impact to each zone of the riparian buffer that requires mitigation. Calculate the amount of mitigation required.				
Zone	6c. Reason for impact	6d. Total impact (square feet)	Multiplier	6e. Required mitigation (square feet)
Zone 1			3 (2 for Catawba)	
Zone 2			1.5	
	6f. **Total buffer mitigation required:**			
6g. If buffer mitigation is required, discuss what type of mitigation is proposed (e.g., payment to private mitigation bank, permittee responsible riparian buffer restoration, payment into an approved in-lieu fee fund).				
6h. Comments:				

E. Stormwater Management and Diffuse Flow Plan (required by DWQ)	
1. Diffuse Flow Plan	
1a. Does the project include or is it adjacent to protected riparian buffers identified within one of the NC Riparian Buffer Protection Rules?	☐ Yes ☒ No
1b. If yes, then is a diffuse flow plan included? If no, explain why. Comments:	☐ Yes ☐ No
2. Stormwater Management Plan	
2a. What is the overall percent imperviousness of this project?	Not applicable %
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 Plan attachment	
2e. Who will be responsible for the review of the Stormwater Management Plan?	☐ Certified Local Government ☐ DWQ Stormwater Program ☐ DWQ 401 Unit
3. Certified Local Government Stormwater Review	
3a. In which local government's jurisdiction is this project?	not applicable
3b. Which of the following locally-implemented stormwater management programs apply (check all that apply):	☐ Phase II ☐ NSW ☐ USMP ☐ Water Supply Watershed ☐ Other:
3c. Has the approved Stormwater Management Plan with proof of approval been attached?	☐ Yes ☐ No
4. DWQ Stormwater Program Review	
4a. Which of the following state-implemented stormwater management programs apply (check all that apply):	☐ Coastal counties ☒ HQW ☐ ORW ☐ Session Law 2006-246 ☐ Other:
4b. Has the approved Stormwater Management Plan with proof of approval been attached?	☒ Yes ☐ No
5. DWQ 401 Unit Stormwater Review	
5a. Does the Stormwater Management Plan meet the appropriate requirements?	☒ Yes ☐ No
5b. Have all of the 401 Unit submittal requirements been met?	☒ Yes ☐ No

F. Supplementary Information		
1. Environmental Documentation (DWQ Requirement)		
1a. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land?	☒ Yes	☐ No
1b. If you answered "yes" to the above, does the project require preparation of an environmental document pursuant to the requirements of the National or State (North Carolina) Environmental Policy Act (NEPA/SEPA)?	☒ Yes	☐ No
1c. If you answered "yes" to the above, has the document review been finalized by the State Clearing House? (If so, attach a copy of the NEPA or SEPA final approval letter.) Comments:	☒ Yes	☐ No
2. Violations (DWQ Requirement)		
2a. Is the site in violation of DWQ Wetland Rules (15A NCAC 2H .0500), Isolated Wetland Rules (15A NCAC 2H .1300), DWQ Surface Water or Wetland Standards, or Riparian Buffer Rules (15A NCAC 2B .0200)?	☐ Yes	☒ No
2b. Is this an after-the-fact permit application?	☐ Yes	☒ No
2c. If you answered "yes" to one or both of the above questions, provide an explanation of the violation(s):		
3. Cumulative Impacts (DWQ Requirement)		
3a. Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality?	☐ Yes	☒ No
3b. If you answered "yes" to the above, submit a qualitative or quantitative cumulative impact analysis in accordance with the most recent DWQ policy. If you answered "no," provide a short narrative description.		
4. Sewage Disposal (DWQ Requirement)		
4a. Clearly detail the ultimate treatment methods and disposition (non-discharge or discharge) of wastewater generated from the proposed project, or available capacity of the subject facility. not applicable		

5. Endangered Species and Designated Critical Habitat (Corps Requirement)		
5a. Will this project occur in or near an area with federally protected species or habitat?	☒ Yes	☐ No
5b. Have you checked with the USFWS concerning Endangered Species Act impacts?	☒ Yes	☐ No
5c. If yes, indicate the USFWS Field Office you have contacted.	☐ Raleigh ☒ Asheville	
5d. What data sources did you use to determine whether your site would impact Endangered Species or Designated Critical Habitat? USFWS website, NCNHP, endangered species field surveys by NCDOT, USFWS approval letter dated 9/6/07 for Virginia Spiraea for May Affect Not Likely to Adversely Affect. Remaining 6 species are No Effect.		
6. Essential Fish Habitat (Corps Requirement)		
6a. Will this project occur in or near an area designated as essential fish habitat?	☐ Yes	☒ No
6b. What data sources did you use to determine whether your site would impact Essential Fish Habitat? National Marine Fisheries Service 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? NCDOT staff Archeologist and Historic Architecture performed required surveys and received approval from NC Dept of Cultural Resources on 1/9/90		
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: See NCDOT Hydraulics Unit - Galen Cail (919-250-4100)		
8c. What source(s) did you use to make the floodplain determination? Ashe Co. FIRM Panel 2996		

Gregory J. Thorpe, PhD Applicant/Agent's Printed Name	E. L. Luck Applicant/Agent's Signature (Agent's signature is valid only if an authorization letter from the applicant is provided.)	3.30.09 Date

Ecosystem Enhancement PROGRAM

March 16, 2009

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

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

R-2100B, NC 16 from Southeast of SR 1158 (Claude Mash Road) to Southeast of NC 88, Ashe County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the stream mitigation for the subject project. Based on the information supplied by you dated March 6, 2009, the impacts are located in CU 05050001 of the New River Basin in the Northern Mountains (NM) Eco-Region, and are as follows:

Stream (cool): 732 feet

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

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

Sincerely,

James B. Stanfill for

William D. Gilmore, P.E.
EEP Director

cc: Mr. Monte Matthews, USACE – Raleigh Regulatory Field Office
Mr. Brian Wrenn, Division of Water Quality, Wetlands/401 Unit
File: R-2100B

Ecosystem Enhancement PROGRAM

March 16, 2009

Mr. Monte Matthews
U. S. Army Corps of Engineers
Raleigh Regulatory Field Office
3331 Heritage Trade Drive, Suite 105
Wake Forest, North Carolina 27587

Dear Mr. Matthews:

Subject: EEP Mitigation Acceptance Letter:

R-2100B, NC 16 from Southeast of SR 1158 (Claude Mash Road) to Southeast of NC 88, Ashe County; New River Basin (Cataloging Unit 05050001); Northern Mountains (NM) Eco-Region

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory stream mitigation for the unavoidable impact associated with the above referenced project. As indicated in the NCDOT's mitigation request dated March 6, 2009, stream mitigation from EEP is required for 732 feet of cool stream impact.

Mitigation associated with this project will be provided in accordance with Section X of Amendment No. 2 to the Memorandum of Agreement between the N. C. Department of Environment and Natural Resources, the N. C. Department of Transportation, and the U. S. Army Corps of Engineers fully executed on March 8, 2007 (Tri-Party MOA). EEP commits to implement sufficient stream mitigation up to 1,464 cool stream credits to offset the impacts associated with this project by the end of the MOA year in which this project is permitted. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from EEP.

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

Sincerely,

William D. Gilmore, P.E.
EEP Director

cc: Mr. Gregory J. Thorpe, Ph.D., NCDOT-PDEA
Mr. Brian Wrenn, Division of Water Quality, Wetlands/401 Unit
File: R-2100B

Subject: Minutes from Interagency Hydraulic Design Review Meeting on January 25, 2006 for R-2100B in Ashe County

Team Members:

John Thomas-USACE	(present)
Sue Homewood-NCDWQ	(present)
Marla Chambers-NCWRC	(absent)
Marella Buncick-USFWS	(present)
Chris Militscher-EPA	(present)
Kathy Matthews-EPA	(present)
Carla Dagnino-NCDOT-NEU	(present)
Deanna Riffey-NCDOT-NEU	(present)
Trent Beaver-NCDOT-DIV 11	(present)
Shannon Lasater-NCDOT-PDEA	(present)

Participants:
Marshall Clawson, NCDOT Hydraulics
Galen Cail, NCDOT Hydraulics
Jonathan Scarce, Mulkey E & C
Kevin Alford, Mulkey E & C
Betsy Cox, NCDOT Structures
Doug Petrey, NCDOT Structures

After introductions, Jonathan Scarce proceeded with review.

General

- Retaining walls have been added along the project to keep the construction footprint to a minimum. Paved ditches will be behind the retaining walls on the mountain side.
- Shoulder berm gutter (SBG) will be along the retaining walls on the stream side.
- Jon Scarce is going to give Galen Cail a list of all box structures on the project to see if they can be retained or should be removed
- At jurisdictional streams, rip rap should be placed on banks only. Note on plans.
- At system outlets, investigate using deeper drainage structures to flat outlet pipes to reduce velocities. Use preformed scour holes (PSH) at outlets, where practical.
- Use roadside ditches, to extent practical, to get stormwater treatment.

Sheet 4

- Stream at Sta. 252+50 +/- Lt. to Sta. 257+00 +/- Lt.
    - A wall is proposed to keep the fill out of the stream. If access to construct the wall results in stream impacts then consider stream relocation. DOT will investigate constructability of wall.
    - The stream outside of the project limits may be reviewed for potential mitigation.
- Wetlands at Sta. 258+00+/- Lt. to Sta. 259+50 +/- Lt.
    - Possible impact to the wetland due to rip rap at the 54" CMP (pipe size shown wrong on plans) outlet at Sta. 258+00 +/- . Wetland not shown on prior 1993 delineation.

Sheet 5

- Existing 3'x3' Conc. Box at Sta. 267+00 +/- Lt.
    - Site was recently reclassified as "roadside ditch". Not jurisdictional.
- System along proposed wall to outlet to PSH Sta. 266+75 Lt.

- System along proposed wall to outlet to PSH Sta. 269+10 Lt.
- Existing 4' X 4' RCBC at Sta. 272+00+/-
    - Culvert may be replaced with pipe. Potential stream impacts at inlet and outlet.
- Existing Pipe at Sta. 274+50+/-
    - Proposed pipe to outlet just as existing, at the stream. Investigate using flat outlet pipe.
    - Investigate piping drainage down the shoulder of the road and outlet near Sta. 276+75 +/- Lt. to PSH.

Sheet 6

- Existing 24" CMP at Sta. 277+50+/-
    - Stream impacts anticipated at the outlet of pipe. Investigate using Permanent Soil Reinforcement Mat (PSRM) instead of rip rap
- Proposed SBG at Sta. 280+50 +/- Lt. to Sta. 286+00 +/- Lt.
    - Investigate outlet at 282+50 +/- Lt at benched area to PSH.
    - Investigate taking drainage in SBG Sta. 286+00 +/- to roadside ditch Rt. in order to get some treatment.
- Existing 6' X 3' RCBC at Sta. 284+00+/- Rt.
    - Anticipate impacts due to channel realignment. Since existing mature trees do not anticipate extensive stream relocation or mitigation credits.
- Existing 60" CMP at Sta. 286+70+/-
    - Anticipate extending pipe with impacts at inlet.

Sheet 7

- Existing 24" RCP's Sta. 291+00+/- & 293_75+/-
    - Anticipate some treatment in roadside ditch Rt.
- Existing 24" CMP at Sta. 297+00+/-
    - Jurisdictional Stream. Anticipate impacts at inlet and outlet. Anticipate some treatment in roadside ditch.
- Bank Failures Along the Banks of the South Fork of the New River
    - Existing bank erosion. Investigate use of rock vanes to mitigate erosion.
    - Include rock vane details and specific locations in the permit.

Sheet 8

- Retaining walls Lt and Rt. Due to proximity of road to river/mountain the site limits the ability to get treatment prior to outlet into South Fork New River. The river is HQW. Possible stormwater requirements will need to be investigated for direct discharge into river.

Sheet 9

- Existing Box Culvert at Sta. 318+00+/-
    - Anticipate impacts at inlet and outlet due to extending box culvert w/ pipe.
- Existing Box Culvert at Sta. 322+50+/-
    - Anticipate impacts at inlet and outlet due to replacing box culvert w/ pipe..

- Anticipate placing rip rap on roadway fill slopes to protect up to 2 ft above the 50-yr WSEL of the South Fork New River.

- Proposed Wall at Sta. 323+00+/- Lt. to Sta. 327 +00 +/- Lt.
  - There is not a good place to outlet the stormwater from this wall.
  - An outfall is proposed at station Sta. 327+00 +/- Lt. Investigate getting treatment from outfall swale to river.

Sheet 10

- Existing Pipe at Sta. 330+60+/-
  - Anticipate inlet and outlet impacts due to extension. Anticipate getting some treatment from roadside ditch Rt.
- Proposed Wall at Sta. 334+00+/- Lt. to Sta. 341+50 +/- Lt.
  - An outfall is proposed at 341+00 +/- Rt. There is only about 15 ft for treatment. The area is flat.

Sheet 11

- Existing 4' X 3' RCBC extended with 48" CMP at the inlet and outlet at Sta. 345+00+/-
  - The pipe will be replaced. There will be stream impacts at the inlet and out.
- Proposed Wall at Sta. 348+50 +/- Rt. to Sta. 363+50 +/- Rt.
  - Outlet wall drainage at Sta. 348+50 Lt. to a PSH.

Sheet 12

- Outlet wall drainage at Sta. 359+50 +/- Lt. to a PSH.
- Bear Creek
  - The original design was a 3 @ 7' X 8' with sills and a low flow channel. Mulkey investigated both a single span 50 ft. vertical abutment and a 100 ft. long spill-thru abutment bridge. Investigate the use of a bottomless culvert or Con-Span. Geotech will need to investigate.
  - Investigate using an off-site detour. There are concerns with the on-site detour being located in the river floodplain.
- Outlet drainage at Sta. 368+00 +/- Lt. to a PSH.

Sheet 13

- Proposed Wall at Sta. 369+00+/- Rt. to Sta. 374+50 +/- Rt.
  - Anticipate using existing outlets Lt.
- Outlet wall drainage at Sta. 370+25 +/- & 375+00 +/- Lt. to PSH's.
- Pipe System at Sta. 378+50 +/- goes under the existing business and mainly drains roadway drainage. Likely not enough room to do improvements in the area. Investigate placing a PSH in the ditch behind the business Lt.

Subject: Minutes from the Interagency 4C Permit Drawings Review Meeting on July 25, 2007 at 2:00 pm for R-2100B in Ashe County

Team Members:

John Thomas-USACE	(Present)
Marla Chambers-NCWRC	(Present)
Marella Buncick-USFWS	(Present)
Chris Militscher-USEPA	(Present)
Rachelle Beauregard-NCDOT NEU	(Present)
Sue Homewood-NCDWQ	(Present)
Donnie Brew, FHWA	(Present)
Deanna Riffey, NCDOT-NEU	(Present)
Elizabeth Lusk, NCDOT-NEU	(Present)
Katie Lindahl, NCDOT-NEU	(Present)
LeiLani Paugh, NCDOT-NEU	(Present)
Jamie Lancaster, NCDOT-NEU	(Present)
Derrick Weaver, NCDOT-PDEA	(Present)

Participants:
Marshall Clawson, NCDOT Hydraulics
Galen Cail, NCDOT Hydraulics
Trent Beaver, NCDOT DIV 11 Construction
Heath Slaughter, NCDOT DIV 11 DEO
Betsy Cox, NCDOT Structures
Doug Taylor, NCDOT Roadway
Chris Smitherman, NCDOT Roadway
Mark Staley, NCDOT-REU
Jeremy Goodwin, NCDOT-REU
John Wadsworth, NCDOT-ADU
Jon Scarce, Mulkey Engineers & Consultants
Kevin Alford, Mulkey Engineers & Consultants
Scott Hunt, Mulkey Engineers & Consultants
Emmett Purdue, Mulkey Engineers & Consultants

The following is a brief summary of the discussions on the project:

General Introduction was initiated by Marshall Clawson. Introductions were made by all in attendance.

General

- The retaining walls were left off of the permit drawings and need to be shown on the final permit drawings.
- Station and location of all direct discharges need to be added to the stormwater management plan and a reason provided as to why direct discharge could not be avoided.
- Account for impacts where ditch/JS channel work is required to tie into other JS. Ie impacts associated with tie ins to Bear Creek and South Fork New River.

Sheet 4

- Retaining wall located from –L1- Station 252+50 +/- Lt. to 256+00 +/- Lt.
    - The wall is going to be built from the roadway side and will not impact to the stream.

- Cross pipes located at –L1- Station 258+05 +/- (Permit Site 1) and 260+30 +/- (Permit Site 2)
    - For onsite mitigation, stream restoration will be performed on the larger tributary just downstream of these crossings. Part of that plan may involve

utilizing a step pool system for these two smaller tributaries. This would be done from the proposed pipe outlets to the relocated larger downstream tributary.
    - The stream impact currently shown is only to the limits of the proposed pipe ends. The current wetland impacts are shown as 0.01 and 0.00 respectively. Impacts to both, could increase depending on the stream restoration final design.
    - The need for replacing the pipes was questioned. It was stated that the pipes have to be replaced due to their current condition and they are being replaced with a larger pipe to have the invert buried 20% of the pipe size up to one foot.
- Stream Restoration
    - A priority one restoration could not be achieved due to slope constraints. The design presented was a preliminary design, and changes would be forthcoming after a planned onsite meeting.

Sheet 5

- Cross pipe located at –L1- Station 266+77 +/- (Permit Site 3)
    - There is stream impact at the outlet. Outlet Channel Detail width to be revisited.
- Cross pipe located at –L1- Station 272+00 +/- (Permit Site 4)
    - There are stream impacts at the inlet and outlet.
- Legend symbology should read "Denotes Impact to Surface Waters"
- Due to a possible seep and wall weep holes, a TBDI will be added somewhere near 270+00 RT.

Sheet 6

- Cross pipe located at –L1- Station 277+45 +/- (Permit Site 5)
    - This site will be removed since there are not any impacts. Outlet channel detail width to be revisited.
- Lateral 5 foot base ditch from Station 283+42 +/- to Station 284+35 +/- (Permit Site 6)
    - Ditch is on a 10% grade and warrants the need for Rip Rap.
- Cross pipe located at Station 286+50 +/- (Permit Site 7)
    - There are stream impacts at the inlet and outlet.

Sheet 7

- Cross pipe located at –L1- Station 296+88 +/- (Permit Site 8)

- There are stream impacts at the outlet. Existing stream is rock, so the rip will be removed which will reduce amount of impacts shown on the permit drawings.

Sheet 8

- Spirea at –L1- Station 304+00 +/- (Permit Site 8)
  - No impacts were found on this sheet at the time of the permit drawings, including impacts to the spirea. This area has been looked at since the original permit drawings were completed and impacts due to the rip rap pad outlets out the South Fork of the New River will need to be calculated. This sheet was not included in the original permit package, but it will be added.

Sheet 9

- Cross pipe located at –L1- Station 318+04 +/- (Permit Site 9)
  - There are stream impacts at the inlet and outlet. Request was made to have rip rap added in outlet stream channel to reduce erosion potential. Add a note in channel detail about flaring the outlet channel width from the pipe width down to the existing channel width.
- Cross pipe located at –L1- Station 322+20 +/- (Permit Site 10)
  - There are stream impacts at the inlet and outlet. Request was made to have rip rap added in outlet stream channel to reduce erosion potential.

Sheet 10

- Cross pipe located at –L1- Station 330+50 +/- (Permit Site 11)
  - There are stream impacts at the inlet. No stream or impacts at outlet.

Sheet 11

- Cross pipe located at –L1- Station 344+97 +/- (Permit Site 12)
  - This site has been added since the 4B meeting. There are stream impacts at the inlet and outlet. Outlet Channel Detail width to be revisited.

Sheet 12

- Bridge located at –L1- Station 364+50 +/- (Permit Site 13)
  - Existing structure will be removed. A Single span, 80 foot long bridge will be put back in its place. The stream banks will be laid back and rip rapped. It is still unclear whether an onsite or offsite detour will be used at this location.
  - Look at removing rip rap along the 10 foot berms near top of banks to allow for better wildlife passage.

  - The detour structure is currently a 143"x86" CSPA. It was questioned why a temporary bridge couldn't be used instead. *Per Structures, the CSPA is preferred from a constructability, construction life, safety and cost*

perspective. A conventional temporary detour bridge could not be constructed on curved (0.06 super) alignment. The curve would have to be placed on a wider, tangent bridge. Construction of bridge could increase construction time a minimum of one month. Also, the potential icing of a bridge on this superelevation is more a concern than the road at the superelevation.

- o

Sheet 2A

- Temp Crossing located at –L1- Station 15+65 –DET- +/- (Permit Site 14)
  - The temporary detour structure will cause temporary impacts to the stream. As stated from sheet 12, an offsite detour may be used in the place of this temporary structure.

Meeting Adjourned.

Beverly Eaves Perdue, Governor

Dee Freeman, Secretary
North Carolina Department of Environment and Natural Resources

Coleen H. Sullins, Director
Division of Water Quality

January 22, 2009

D.R. Henderson, P.E.
NCDOT Hydraulics
1548 Mail Service Center
Raleigh, NC 27699-1548

Subject: Permit No. SW4090101
NC 16 Improvements with Replacement of Bridge No. 9 over Bear Creek, R-2100B
Other Stormwater Permit
Linear Public Road / Bridge Project
Ashe County

Dear Mr. Henderson:

The Winston-Salem Regional Office received a complete Stormwater Management Permit Application for the NC 16 Improvements with Replacement of Bridge No. 9 over Bear Creek (R-2100B) on January 5, 2009. Staff review of the plans and specifications has determined that the project, as proposed, will comply with the Stormwater Regulations set forth in Title 15A NCAC 2H .1000. We are forwarding Permit No. SW4090101 dated January 22, 2009, for the construction of the subject project.

This permit shall be effective from the date of issuance until rescinded and shall be subject to the conditions and limitations as specified therein.

If any parts, requirements, or limitations contained in this permit are unacceptable, you have the right to request an adjudicatory hearing upon written request within thirty (30) days following receipt of this permit. This request must be in the form of a written petition, conforming to Chapter 150B of the North Carolina General Statutes, and filed with the Office of Administrative Hearings, P.O. Drawer 27447, Raleigh, NC 27611-7447. Unless such demands are made this permit shall be final and binding.

If you have any questions, or need additional information concerning this matter, please contact Amy Euliss at amy.euliss@ncmail.net or (336) 771-4959.

Sincerely,

Steve Tedder
WSRO Regional Supervisor
Surface Water Protection Section

cc: Monte Mathews, USACE
Dr. David Chang, P.E., Hydraulics
Heath Slaughter, DEO Division 11
Wetlands/ 401 Transportation Permitting Unit
File copy, WSRO

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WATER QUALITY
STATE STORMWATER MANAGEMENT PERMIT
OTHER PERMIT

In accordance with the provisions of Article 21 of Chapter 143, General Statutes of North Carolina as amended, and other applicable Laws, Rules and Regulations

PERMISSION IS HEREBY GRANTED TO
NC Department of Transportation
NC 16 Improvements with Replacement of Bridge No. 9 over Bear Creek, R-2100B
Ashe County
FOR THE:

construction of a public road / bridge in compliance with the provisions of 15A NCAC 2H .1000 (hereafter referred to as the "stormwater rules") and the approved stormwater management plans and specifications, and other supporting data as attached and on file with and approved by the Division of Water Quality and considered a part of this permit.

The Permit shall be effective from the date of issuance until rescinded and shall be subject to the following specific conditions and limitations:

I. DESIGN STANDARDS

1. The runoff from the impervious surfaces has been directed away from surface waters as much as possible.

2. The amount of built-upon area has been minimized as much as possible.

3. Best Management Practices are employed which minimize water quality impacts.

4. Approved plans and specifications for projects covered by this permit are incorporated by reference and are enforceable parts of the permit.

5. For the majority of the roadside ditches 3:1 slopes or flatter were unobtainable due to the presence of steep topography. Where possible, ditches were constructed at 3:1; however, for the majority, rip rap or permanent soil reinforcement matting was utilized to control erosion.

II. SCHEDULE OF COMPLIANCE

1. The permittee shall at all times provide adequate erosion control measures in conformance with the approved Erosion Control Plan.

2. The Director may notify the permittee when the permitted site does not meet one or more of the minimum requirements of the permit. Within the time frame specified in the notice, the

permittee shall submit a written time schedule to the Director for modifying the site to meet minimum requirements. The permittee shall provide copies of revised plans and certification in writing to the Director that the changes have been made.

3. The permittee shall submit all information requested by the Director or his representative within the time frame specified in the written information request.

4. The permittee shall submit to the Director and shall have received approval for revised plans, specifications, and calculations prior to construction for the following items:

a. Major revisions to the approved plans, such as road realignment, deletion of any proposed BMP, changes to the drainage area or scope of the project, etc.
b. Project name change.
c. Redesign of, addition to, or deletion of the approved amount of built-upon area, regardless of size.
d. Alteration of the proposed drainage.

5. The Director may determine that other revisions to the project should require a modification to the permit.

III. GENERAL CONDITIONS

1. Failure to abide by the conditions and limitations contained in this permit may subject the Permittee to an enforcement action by the Division of Water Quality, in accordance with North Carolina General Statutes 143-215.6A to 143-215.6C.

2. The permit issued shall continue in force and effect until revoked or terminated.

3. The permit may be modified, revoked and reissued or terminated for cause. The filing of a request for a permit modification, revocation and reissuance, or termination does not stay any permit condition.

4. The issuance of this permit does not prohibit the Director from reopening and modifying the permit, revoking and reissuing the permit, or terminating the permit as allowed by the laws, rules, and regulations contained in Title 15A of the North Carolina Administrative Code, Subchapter 2H.1000; and North Carolina General Statute 143-215.1 et. al.

5. The permit is not transferable to any person except after notice to and approval by the Director. The Director may require modification or revocation and reissuance of the permit to change the name and incorporate such other requirements as may be necessary. A formal permit request must be submitted to the Division of Water Quality accompanied by the appropriate fee, documentation from both parties involved, and other supporting materials as may be appropriate. The approval of this request will be considered on its merits, and may or may not be approved. The permittee is responsible for compliance with the terms and conditions of this permit until such time as the Director approves the transfer.

6. The issuance of this permit does not preclude the Permittee from complying with any and all statutes, rules, regulations, or ordinances, which may be imposed by other government agencies (local, state and federal) which have jurisdiction.

7. The permittee shall notify the Division of any name, ownership or mailing address changes within 30 days.

Permit issued this, the 22 of January

NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

_____

Coleen Sullins, Director
Division of Water Quality
By Authority of the Ecosystem Management Commission

Permit Number SW4090101

STORMWATER MANAGEMENT PLAN

October 23, 2008

WBS No. (State Project No.): 34369.1.1
TIP Project: R-2100B
Ashe County, North Carolina
Hydraulics Project Engineer: Jonathan K. Scarce, PE
NCDOT Hydraulics Project Engineer: Marshall W. Clawson, PE

Project Description:

This project, designated as the "B" section, will be improvements to NC 16 from Southeast of SR 1158 to Southeast of NC 88. The project is a proposed upgrade of the existing two lane road. The overall project is 2.4 miles in length.

Environmental Description

This project is located in the New River Basin, for which no buffer regulations have been implemented. Bear Creek will be crossed once by the proposed action. The South Fork New River and an unnamed tributary to the South Fork New River parallel portions of the project. Bear Creek is listed on the NCDENR classifications list as a Class WS-IV and Class Tr. The South Fork New River and the unnamed tributary to the South Fork New River are listed as a Class WS-IV and HQW. Class WS-IV means the stream is a "Water Supply IV" which stands for highly developed water supply. Class Tr means the stream is trout water. HQW means the stream is high quality waters. Neither Water Supplies (WS-I or WS-II) nor Outstanding Resource Waters (ORW) occur within 1.0 miles of the project. Bear Creek, the South Fork New River nor the unnamed tributary to the South Fork New River were found on the 303(d) list for impaired streams. Wetlands are located on the southeast quadrant at the beginning of the project along the unnamed tributary to the South Fork of the New River. Less than 0.1 acres of wetland are impacted at this site.

Roadway Description:

The proposed roadway cross section is a 2-lane facility, consisting of 12 foot travel lanes, 2 foot full depth paved shoulders, 6 foot grass shoulders (9 foot with guardrail). The project drainage system will consist mainly of ditches and cross pipes. Storm systems will also be used in order to pick up roadside ditch drainage as well as drainage at the retaining walls along the project and discharge into a preformed scour hole, ditch or stream.

Berm drainage outlets will be used in order to pick up off site drainage at the top of the high cut slopes. The berm drainage outlets will discharge into a 2GI along the bottom of the cut slope. The 2GI will connect into a storm system and outlet into a ditch.

Shoulder berm gutter will be utilized in areas of high fill and/or excessive runoff as well as along the top of retaining walls. In these instances, the runoff will be collected in a 2GI and discharged into a preformed scour hole, ditch or stream.

Best Management Practices and Major Structures:

- ***Major Structure***

  A single span bridge will be placed from –L1- Station 364+10.00 to –L1- Station 364+90.00 in order to replace the existing cast in place concrete slab bridge with vertical abutments. The proposed bridge will have spill thru abutments. Neither the existing nor the proposed bridge has bents in the channel. The bridge is also designed so that no deck drains will be used in order to avoid any direct discharges into Bear Creek. All deck drainage will be picked up in a storm system and discharge at the toe of slope near the bridge.

- **Retaining Walls**

  Retaining walls were used in order to keep the fill slope from encroaching into the unnamed Tributary to South Fork and the South Fork New River, as well as to decrease the amount of cut needed along the mountainside paralleling the South Fork New River.

- **Roadside Ditches**

  The majority of roadside ditches on this project were unable to obtain a 3:1 slope or flatter due to the physical constraints of the mountainside. Most ditches on this project were lined with rip rap or permanent soil reinforcement matting in order to control erosion.

- ***Rip Rap Pads & Preformed Scour Holes***

  Rip Rap pads and Preformed Scour Holes were used in order to dissipate energy and reduce velocities at pipe outlets. These structures are located throughout the project.

- ***Cross Pipes***

  In order to allow for fish passage, cross pipes will be buried a minimum of 20% of the diameter of the proposed pipe size, up to and including 48" diameter. Pipes greater than 48" will be buried 1 foot.

- ***Unavoidable Direct Discharge Locations***

  Station 274+75 LT – Proposed system is replacing an existing system that currently discharges directly into the Tributary to South Fork of New River. The proposed retaining wall on the left side keeps the fill from encroaching on the Tributary and there is a mountainside on the right;

therefore, there is no room left to avoid direct discharge. Grassed lined ditches are used at the inlet for treatment. The last box in the system has also been designed as a drop box to minimize outlet pipe velocities into the receiving stream.

Station 280+15 LT & 291+00 LT - Proposed systems are replacing existing systems that currently discharge directly into the Tributary to the South Fork of New River. The proposed retaining wall on the left side keeps the fill from encroaching on the Tributary and there is a mountainside on the right; therefore, there is no room left to avoid direct discharge. Permanent soil reinforcement matting has been placed on the incoming ditches to allow for treatment in a grass lined ditches.

Station 293+75 LT - Proposed system is replacing an existing system that currently discharges directly into the Tributary to the South Fork of New River. The proposed retaining wall on the left side keeps the fill from encroaching on the Tributary and there is a mountainside on the right; therefore, there is no room left to avoid direct discharge. Permanent soil reinforcement matting has been placed on the incoming ditch to allow for treatment in a grass lined ditch. The last box in the system has also been designed as a drop box to minimize outlet pipe velocities into the receiving stream.

Stations 299+95, 302+55, 306+50, 311+05, 315+00 LT - Proposed systems are replacing existing systems at or near the same locations where they currently directly discharge into the South Fork of New River. The proposed retaining wall on the left side keeps the fill from encroaching on the South Fork of the New River and there is a mountainside on the right; therefore, there is no room left to avoid direct discharge. Pipes are outletting near the shoulder of the road, and Class II Rip Rap with Filter Fabric has been placed along the stream banks to dissipate outlet velocities from the pipes and to protect the stream banks from erosion.

OFFICE USE ONLY		
Date Received	Fee Paid	Permit Number

State of North Carolina
Department of Environment and Natural Resources
Division of Water Quality

STORMWATER MANAGEMENT PERMIT APPLICATION FORM

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
LINEAR ROADWAY PROJECT
This form may be photocopied for use as an original.

DWQ Stormwater Management Plan Review:
A complete stormwater management plan submittal includes this application form, a supplement form for each BMP proposed (see Section V), design calculations, and plans and specifications showing all road and BMP details.

I. PROJECT INFORMATION

NCDOT Project Number: 34369.1.1 (R-2100B) County: Ashe

Project Name: Improvements to NC 16 and Replacement of Bridge #9

Project Location: NC 16 From Southeast of SR 1158 to Southeast of NC 88

Contact Person: Galen Cail, PE Phone: 919-250-4100 Fax: 919-250-4108

Receiving Stream Name: **South Fork New River River Basin: **New Class: **WS-IV; HQW

Proposed linear feet of project: 2.40 mi.

Proposed Structural BMP and Road Station *(attach a list of station and BMP type if more room is needed)*:

Preformed Sour Holes with Level Spreader Apron are located at –L1- 252+00 Lt., 256+80 Lt., 266+27 Lt., 269+08 Lt., 282+60 Lt., 285+85 Rt.

Type of proposed project: *(check all that apply)*:

☐ New ☒Widening ☒2 lane* ☐4 lane* ☐Curb and Gutter ☒Bridge Replacement
☒Other *(Describe)* Upgrade existing Two Lane Road

**2 lane and 4 lane imply that roadside ditches are used unless Curb and Gutter is also checked.*

***Bear Creek will be crossed over once by the proposed project (replacement of Bridge #9). Bear Creek is a Class WS-IV and Tr. South Fork New River and unnamed Tributary to South Fork New River parallel the project and are classified as WS-IV, as well as HQW. All water bodies on this project are located in the New River Basin.*

II. REQUIRED ITEMS CHECKLIST

Initial in the space provided below to indicate the following design requirements have been met and supporting documentation is attached. Supporting documentation shall, at a minimum, consist of a brief narrative description including (1) the scope of the project, (2) how the items below are met, (3) how the proposed best management practices minimize water quality impacts, and (4) any significant constraints and/or justification for not meeting a, b, c and d to the maximum extent practicable.

Designer's Initials

KBA a. The amount of impervious surface has been minimized as much as possible.

KBA b. The runoff from the impervious areas has been diverted away from surface waters as much as possible.

KBA c. Best Management Practices are employed which minimize water quality impacts.

_____ d. Vegetated roadside ditches are 3:1 slope or flatter.

III. OPERATION AND MAINTENANCE AGREEMENT

I acknowledge and agree by my initials below that the North Carolina Department of Transportation is responsible for the implementation of the four maintenance items listed. I agree to notify DWQ of any operational problems with the BMP's that would impact water quality or prior to making any changes to the system or responsible party.

Maintenance Engineer's Initials

a. BMP's shall be inspected and maintained in good working order.

b. Eroded areas shall be repaired and reseeded as needed.

c. Stormwater collection systems, including piping, inlets, and outlets, shall be maintained to insure proper functioning.

Maintenance Engineer's Name: CHARLES C. REINHARDT

Title: DIVISION MAINTENANCE ENGINEER

IV. APPLICATION CERTIFICATION

I, *(print or type name)* Galen Cail of NCDOT Hydraulics Branch, certify that the information included on this permit application form is, to the best of my knowledge, correct and that the project will be constructed in conformance with the approved plans and that the proposed project complies with the requirements of 15A NCAC 2H .1000.

Title: TES I

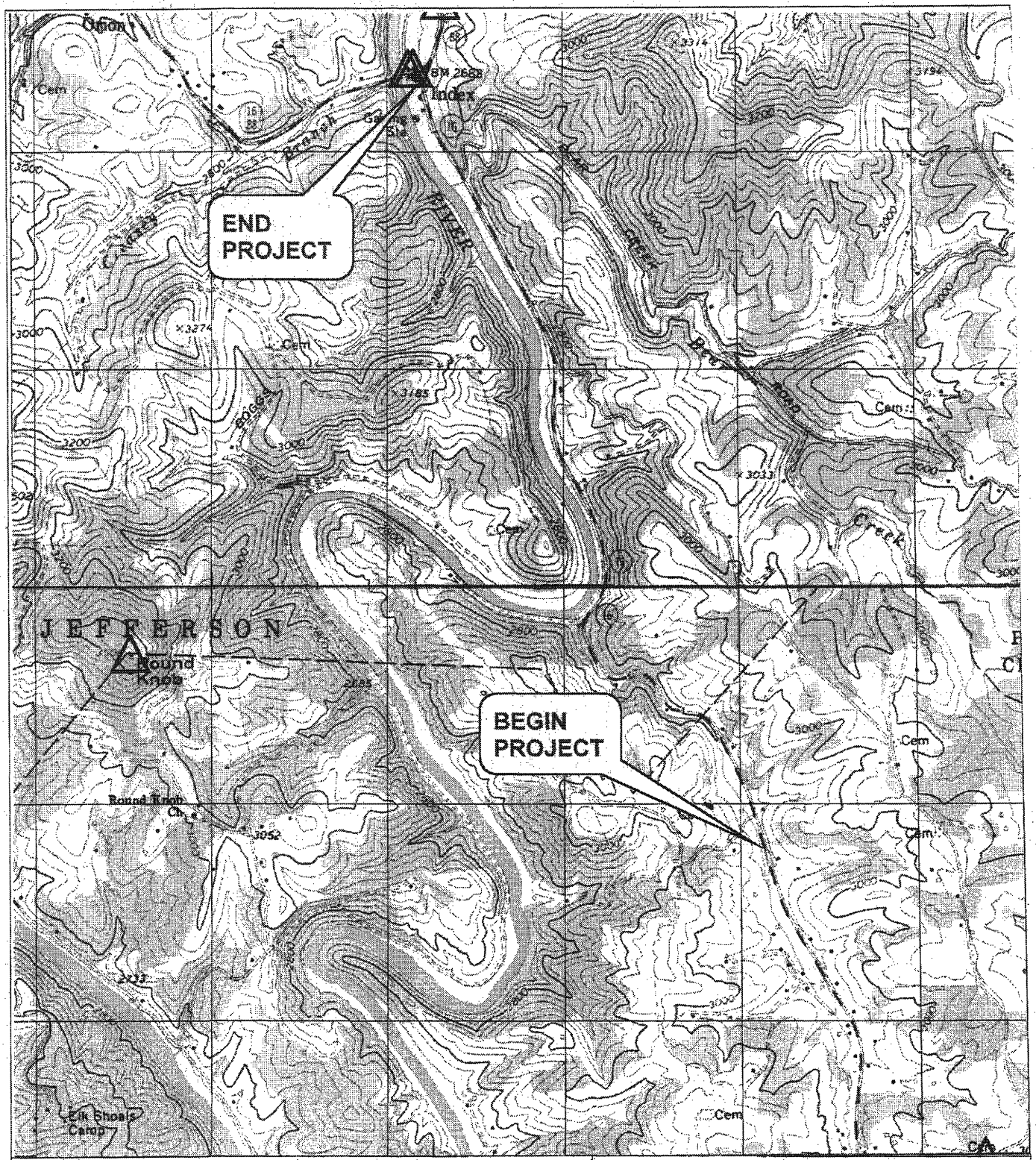
Address: 1590 MSC, Raleigh NC 27699

Signature: William Galen Cail Date: 1/5/09

V. SUPPLEMENT FORMS

The applicable state stormwater management permit supplement form(s) listed below must be submitted for each BMP specified for this project. Contact the Stormwater and General Permits Unit at (919) 733-5083 for the status and availability of these forms.

Form SWU-102	Wet Detention Basin Supplement
Form SWU-103	Infiltration Basin Supplement
Form SWU-104	Low Density Supplement
Form SWU-105	Curb Outlet System Supplement
Form SWU-106	Off-Site System Supplement
Form SWU-107	Underground Infiltration Trench Supplement
Form SWU-108	Neuse River Basin Supplement
Form SWU-109	Innovative Best Management Practice Supplement
Form SWU-110	Extended Dry Detention Basin Supplement



TOPO MAP

SCALE: 1" : 2000'

NCDOT

DIVISION OF HIGHWAYS
ASHE COUNTY
PROJECT: R-2100B

NC 16 FROM SOUTHEAST
OF SR 1158 TO SOUTHEAST
OF NC 88

SHEET 1 OF 34

07 / 06 / 2007

PROPERTY OWNERS

NAMES AND ADDRESSES

	NAMES	ADDRESSES
6	Alma Mash	5677 NC Highway 16 S. Jefferson, NC 28640
7	Mozelle Rivers	400 Ford Street Kannapolis, NC 28083
8	Bryce Mash	5637 NC Highway 16 S. Jefferson, NC 28640
9	Gladys McNeil	251 Gate St. North Wilkesboro, NC 28659
13	Kenneth Mash	620 Claude Mash Road Jefferson, NC 28640
14	Jack Farrington	5521 NC Highway 16 S. Jefferson, NC 28640
17	Bobby Stanley	436 Highway 16 S. Jefferson, NC 28640
19	Kathy Hudler Redd	10109 Zackery Avenue Charlotte, NC 28277
21	Dale Sheets Trustee	111 Rainbow Road West Jefferson, NC 28694
25	Warren Miller	P.O. Box 418 Jefferson, NC 28640
26	Peggy Hartzog	617 San Marina Drive The Village, FL 32159
27	R.J. Combs	620 Old Wikesboro Road Jefferson, NC 28640
32	George Sheets	4243 NC Highway 16 S. Jefferson, NC 28640
40	Newton Farrington	3874 NC Highway 16 S. Jefferson, NC 28640
41	Gale Bennett	3423 NC Highway 16 S. Jefferson, NC 28640
42	Donald Sheets	3412 NC Highway 16 S. Jefferson, NC 28640

NCDOT

DIVISION OF HIGHWAYS
ASHE COUNTY
PROJECT: R-2100B

NC 16 FROM SOUTHEAST
OF SR 1158 TO SOUTHEAST
OF NC 88

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L1- 258+05 Lt. & Rt.	60" RCP	<0.01					<0.01		29		
		Bank Stablization to Unnamed Trib. to Brush Cr.	<0.01					<0.01	<0.01	16	14	
2	-L1- 260+30 Lt. & Rt.	36" RCP						<0.01		21		
		Bank Stablization to Unnamed Trib. to Brush Cr.						<0.01	<0.01	11	8	
3	-L1- 266+77 Lt.	48" RCP						<0.01		15		
		Bank Stablization to Unnamed Trib. to Brush Cr.						<0.01	<0.01	17	7	
4	-L1- 272+00 Lt. & Rt.	48" CSP						<0.01		9		
		Bank Stablization to Unnamed Trib. to Brush Cr.						0.01	<0.01	43	16	
		Bank Stablization to Brush Cr.						<0.01		15		
5	-L1- 277+45 Lt.	SITE ELIMINATED										
6	-L1- 283+27 to 284+35	Lateral 5' Base Ditch Rt						0.01		112		
		Bank Stabilization to Unnamed Trib. to Brush Cr.							<0.01		29	
7	-L1- 286+50 Rt.	60" CSP						<0.01		9		
		Bank Stabilization to Unnamed Trib. to Brush Cr.						<0.01	<0.01	7	13	
8	-L1- 296+88 Lt. & Rt.	42" CSP						<0.01		16		
		Bank Stabilization to Unnamed Trib. to Brush Cr.						<0.01	<0.01	19	31	
SHEET 1 TOTALS:			<0.01					0.04	0.01	339	118	

ATN Revised 3/31/05

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
Ashe County
Project: R-2100B
NC 16 FROM SOUTHEAST OF SR 1158
TO SOUTHEAST OF NC 88
SHEET 1 OF 2 2/19/2009

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
9	-L1- 299+93 Lt.	Bank Stablization to South Fork New River						<0.01		10		
10	-L1- 302+56 Lt.	Bank Stablization to South Fork New River						<0.01		10		
11	-L1- 306+37 Lt.	Bank Stablization to South Fork New River						<0.01		10		
12	-L1- 311+05 Lt.	Bank Stablization to South Fork New River						<0.01		10		
13	-L1- 315+00 Lt.	Bank Stabilization to South Fork New River						<0.01		10		
14	-L1- 318+04 Lt. & Rt.	72" RCP						<0.01		21		
		Bank Stablization to Unnamed Trib. To S. Fork New River						0.01	<0.01	58	25	
15	-L1- 322+20 Lt. & Rt.	54" CSP						<0.01		29		
		Bank Stablization to Unnamed Trib. To S. Fork New River						<0.01	<0.01	37	32	
16	-L1- 330+55 Rt.	30" CSP						<0.01		7		
		Bank Stablization to Unnamed Trib. To S. Fork New River						0.01	<0.01	39	10	
17	-L1-344+97 Lt. & Rt.	54" RCP						<0.01		19		
		Bank Stablization to Unnamed Trib. To S. Fork New River						<0.01	<0.01	38	20	
18	-L1-364+39 to 364+65	1 Span @ 80' - 54" Pre. Conc. Girder						0.01	0.01	95	34	
SHEET 2 TOTALS:								0.04	0.02	393	121	
SHEET 1 TOTALS:			<0.01					0.04	0.01	339	118	
PROJECT TOTALS:			<0.01					0.08	0.03	732	239	

ATN Revised 3/31/05

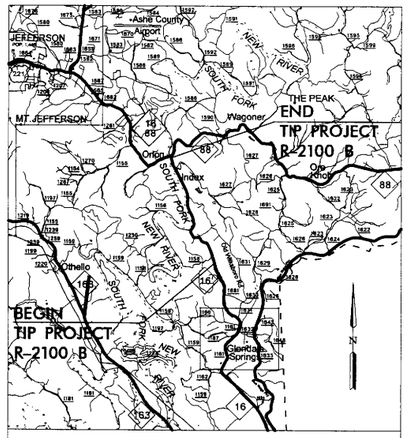
NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
Ashe County
Project: R-2100B
NC 16 FROM SOUTHEAST OF SR 1158
TO SOUTHEAST OF NC 88
SHEET 2 of 2 2/19/2009

Permit Drawing
Sheet 4 of 34

TIP PROJECT: R-2100B

CONTRACT:

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



VICINITY MAP
(NOT TO SCALE)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ASHE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2100B	1	

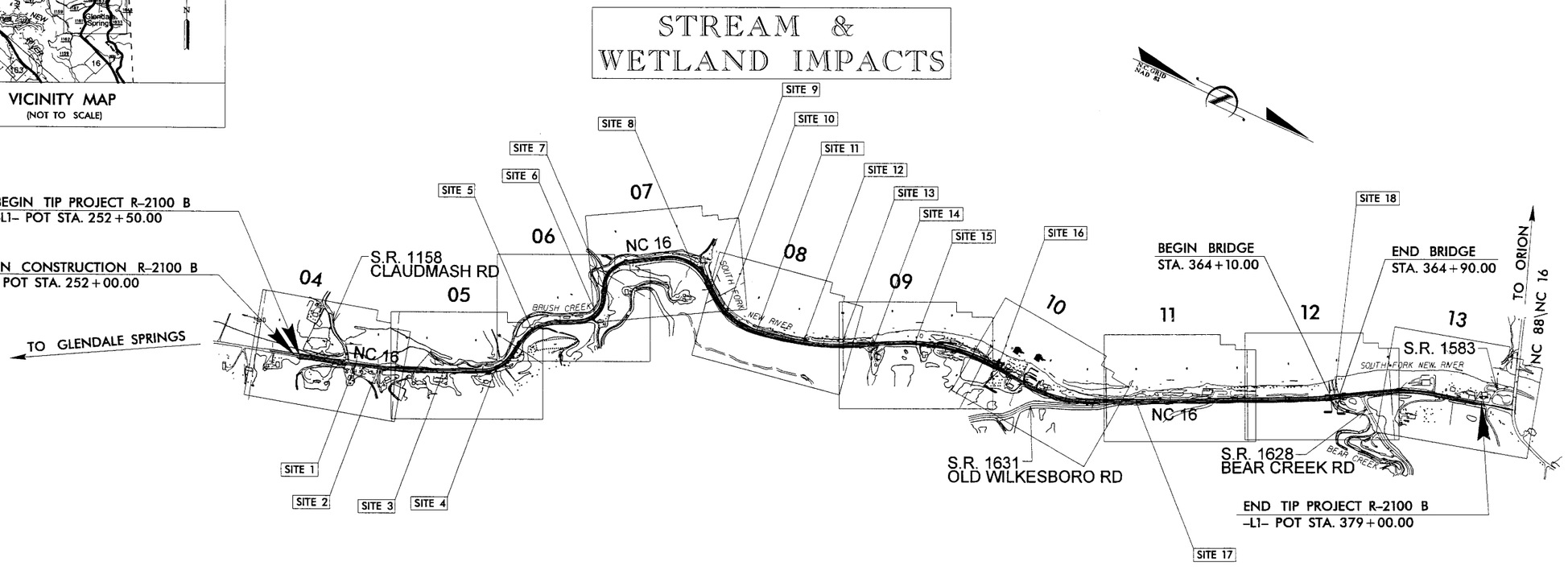
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34369.1.1	STP – 16 (1)	PE
34369.2.4	STP – 0016 (4)	R/W & UTILITIES

Permit Drawing Sheet 5 of 34

LOCATION: *NC 16 FROM SOUTHEAST OF SR 1158 TO SOUTHEAST OF NC 88*

TYPE OF WORK: *CULVERTS, GRADING, DRAINAGE, PAVING, LONGLIFE PAVEMENT MARKERS AND SNOWPLOWABLE PAVEMENT MARKERS*

STREAM & WETLAND IMPACTS



NOTE: BURY PIPES AT JURISDICTIONAL STREAMS 20% OF PIPE DIAMETER UP TO 1 FOOT.

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

FUNCTIONAL CLASSIFICATION:
RURAL MAJOR COLLECTOR

ADT 2005 = 3000
ADT 2030 = 6100
DHV = 13 %
D = 60 %
T = 9 % *
V = 60 MPH

* TTST = 6 % DUAL = 3%

DESIGN EXCEPTION REQUIRED FOR HORIZONTAL AND VERTICAL ALIGNMENTS LESS THAN 60 MPH

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2100B =	2.38 MI.
LENGTH STRUCTURES TIP PROJECT R-2100B =	0.02 MI.
TOTAL LENGTH TIP PROJECT R-2100B =	2.40 MI.

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

Prepared in the Office of:
EarthTech
FOR THE N. C. DEPT. OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: December 21, 2007

LETTING DATE: November 17, 2009

NCDOT CONTACT: B. D. TAYLOR, P.E.
PROJECT ENGINEER – ROADWAY DESIGN

G. TOM SHEARIN, P.E.
PROJECT ENGINEER

KEVIN M. HAUGHEY, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER *P.E.*

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR *DATE*

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

EarthTech
A Tyco International Ltd. Company

ENGLISH

USE METHOD 3 FOR CLEARING AND GRUBBING

ASHE COUNTY
NC 16
11/10/2008

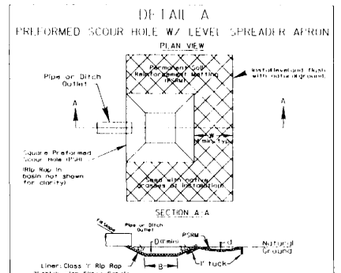
NC GRID NAD 83

• Permit Drawing Sheet 6 of 39

REVISIONS

USER: $$USER$$
DATE: $$DATE$$
TIME: $$TIME$$
DGN: $$DGN$$

DETAIL 'A'
PREFORMED SCOUR HOLE W/ LEVEL SPREADER APRON



STATION	B FT.	D FT.	W FT.	d FT.	CLASS I RIP RAP TONS	DOE FT	FILTER FABRIC FT²
252+00 LT	5	1	5	0.5	7.1	1.8	26
256+80 LT	5	1	5	0.5	7.1	1.8	26

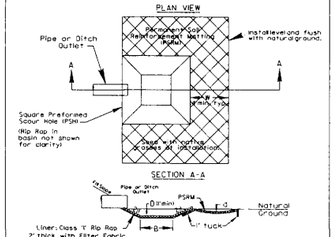
F F DENOTES FILL IN WETLAND

S S DENOTES IMPACT TO SURFACE WATER

T T DENOTES TEMPORARY IMPACT TO SURFACE WATER

DETAIL A

PREFORMED SCOUR HOLE W/ LEVEL SPREADER APRON



STATION	B FT.	D FT.	W FT.	d FT.	CLASS I RIP RAP TONS	ODE FT	FILTER FABRIC FT²
252+00 LT	5	1	5	0.5	7.1	1.8	26
256+80 LT	5	1	5	0.5	7.1	1.8	26

EarthTech
A Tyco International Ltd. Company

ENGLISH

USE METHOD 3 FOR CLEARING AND GRUBBING

ASHE COUNTY
NC 16
11/10/2008

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 7 of 34

REVISIONS

USER: $$USER$$
DATE: $$DATE$$
TIME: $$TIME$$
DGN: $$DGN$$

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	5

RW SHEET NO.

ROADWAY DESIGN ENGINEER — HYDRAULICS ENGINEER

EarthTech
A Tyco International Ltd. Company

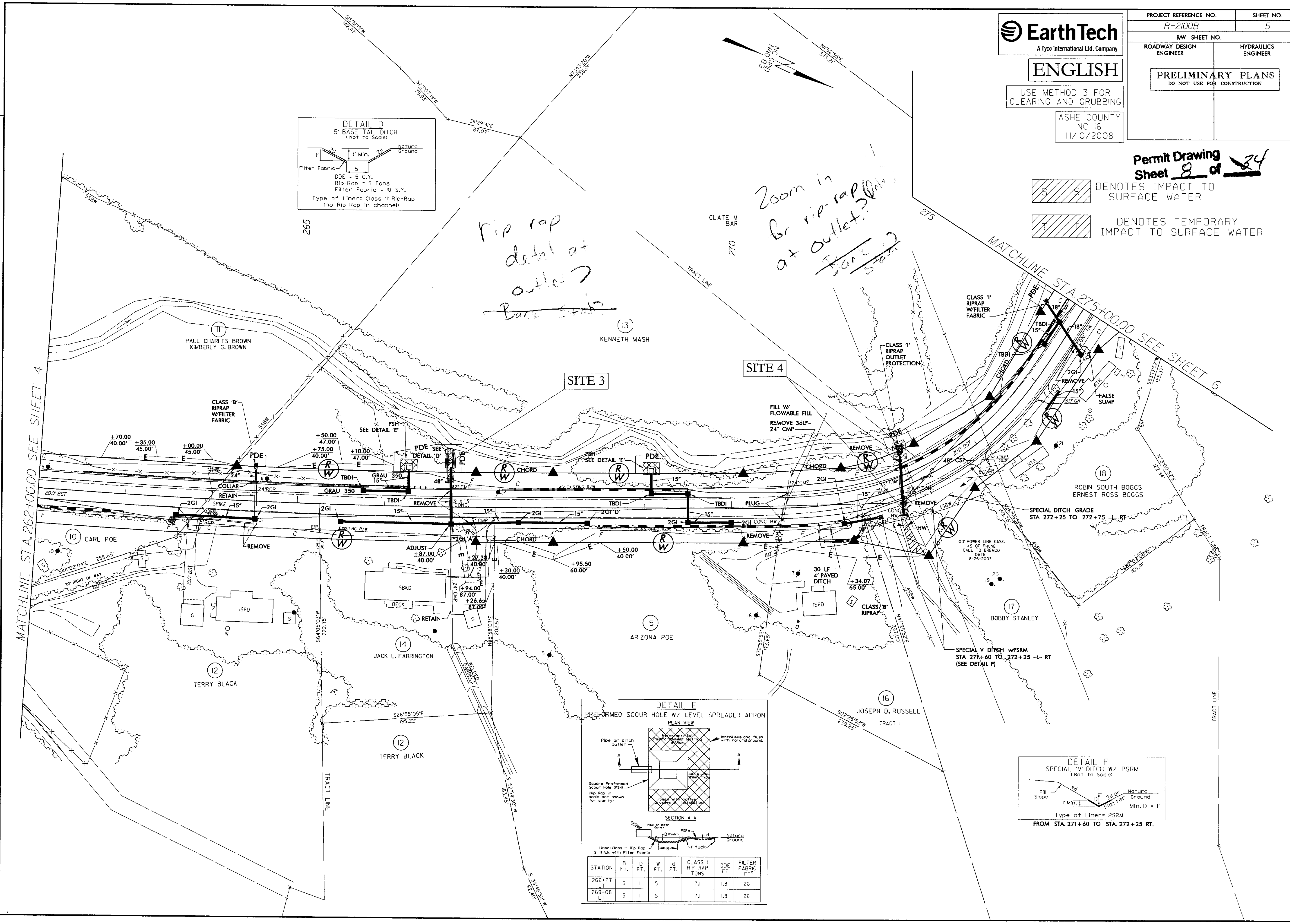
ENGLISH

USE METHOD 3 FOR CLEARING AND GRUBBING

ASHE COUNTY
NC 16
11/10/2008

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing Sheet 8 of 34



DENOTES IMPACT TO SURFACE WATER
DENOTES TEMPORARY IMPACT TO SURFACE WATER
MATCHLINE STA. 275+00.00 SEE SHEET 6
MATCHLINE STA. 262+00.00 SEE SHEET 4
SITE 3
SITE 4
DETAIL D
5' BASE TAIL DITCH
(Not to Scale)
Natural Ground
Filter Fabric
1' Min.
DDE = 5 C.Y.
Rip-Rap = 5 Tons
Filter Fabric = 10 S.Y.
Type of Liner= Class 'I' Rip-Rap
(no Rip-Rap in channel)
rip rap detail at outlet?
Bank Stab
Zoom in for rip-rap at outlet? Bank Stab?
PAUL CHARLES BROWN
KIMBERLY G. BROWN
KENNETH MASH
CLATE M BAR
CARL POE
TERRY BLACK
JACK L. FARRINGTON
ARIZONA POE
JOSEPH D. RUSSELL
BOBBY STANLEY
ROBIN SOUTH BOGGS
ERNEST ROSS BOGGS
CLASS 'B' RIPRAP W/FILTER FABRIC
CLASS 'I' RIPRAP W/FILTER FABRIC
CLASS 'I' RIPRAP OUTLET PROTECTION
FILL W/ FLOWABLE FILL
REMOVE 36LF- 24" CMP
PSH SEE DETAIL 'E'
PDE
SEE DETAIL 'D'
30 LF 4' PAVED DITCH
CLASS 'B' RIPRAP
FALSE SUMP
SPECIAL DITCH GRADE STA 272+25 TO 272+75 -L- RT
SPECIAL V DITCH w/PSRM STA 271+60 TO 272+25 -L- RT (SEE DETAIL F)
100' POWER LINE EASE. AS OF PHONE CALL TO BREMCO DATE 8-25-2003
DETAIL F
SPECIAL 'V' DITCH W/ PSRM
(Not to Scale)
Type of Liner= PSRM
FROM STA. 271+60 TO STA. 272+25 RT.
DETAIL E
PREFORMED SCOUR HOLE W/ LEVEL SPREADER APRON
PLAN VIEW
SECTION A-A
TRACT LINE
REVISIONS

STATION	B FT.	D FT.	W FT.	d FT.	CLASS I RIP RAP TONS	DDE FT	FILTER FABRIC FT²
266+27 LT	5	1	5		7.1	1.8	26
269+08 LT	5	1	5		7.1	1.8	26

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

EarthTech
A Tyco International Ltd. Company

ENGLISH

USE METHOD 3 FOR CLEARING AND GRUBBING

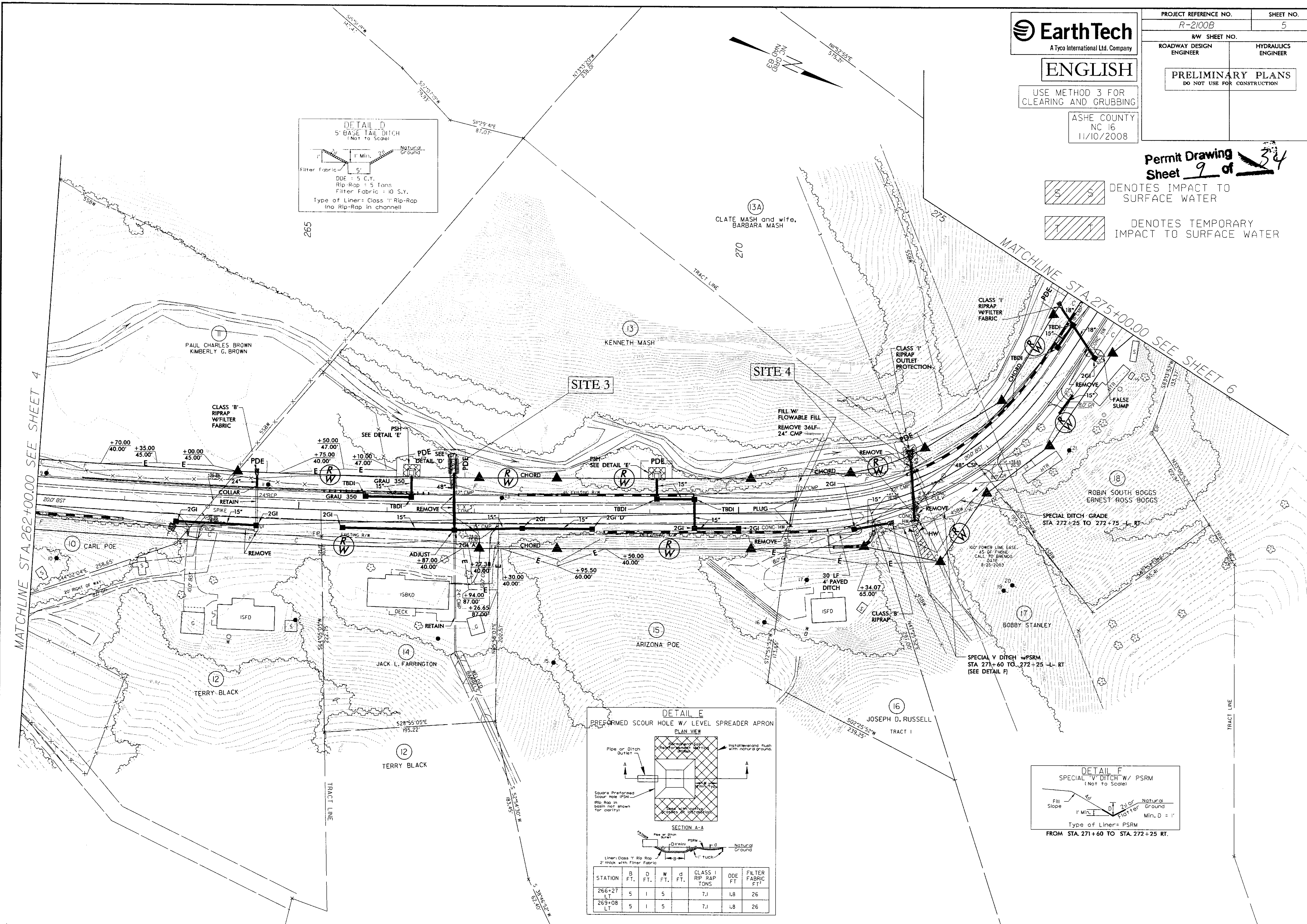
ASHE COUNTY
NC 16
11/10/2008

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

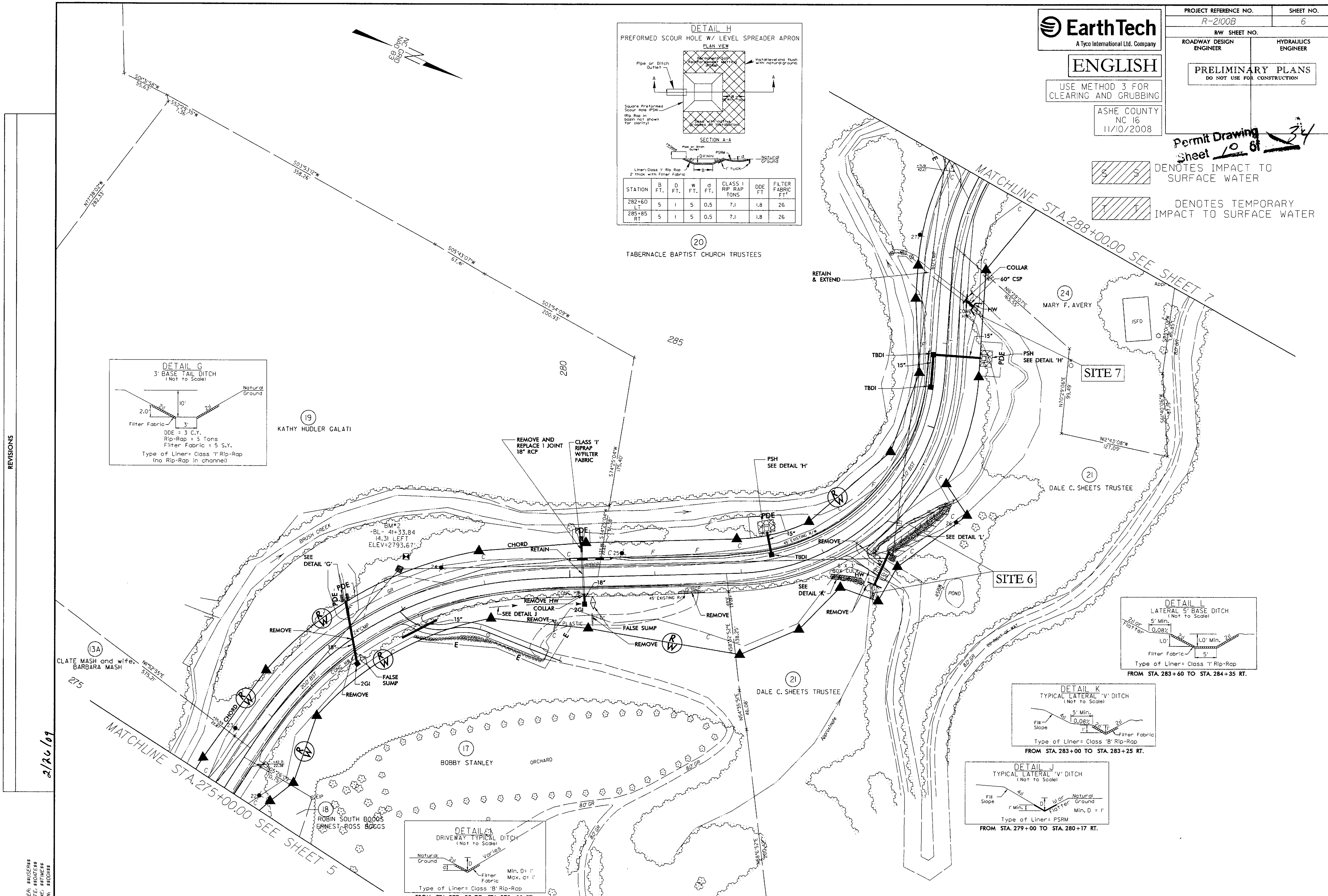
Permit Drawing
Sheet 9 of 34

S S DENOTES IMPACT TO SURFACE WATER

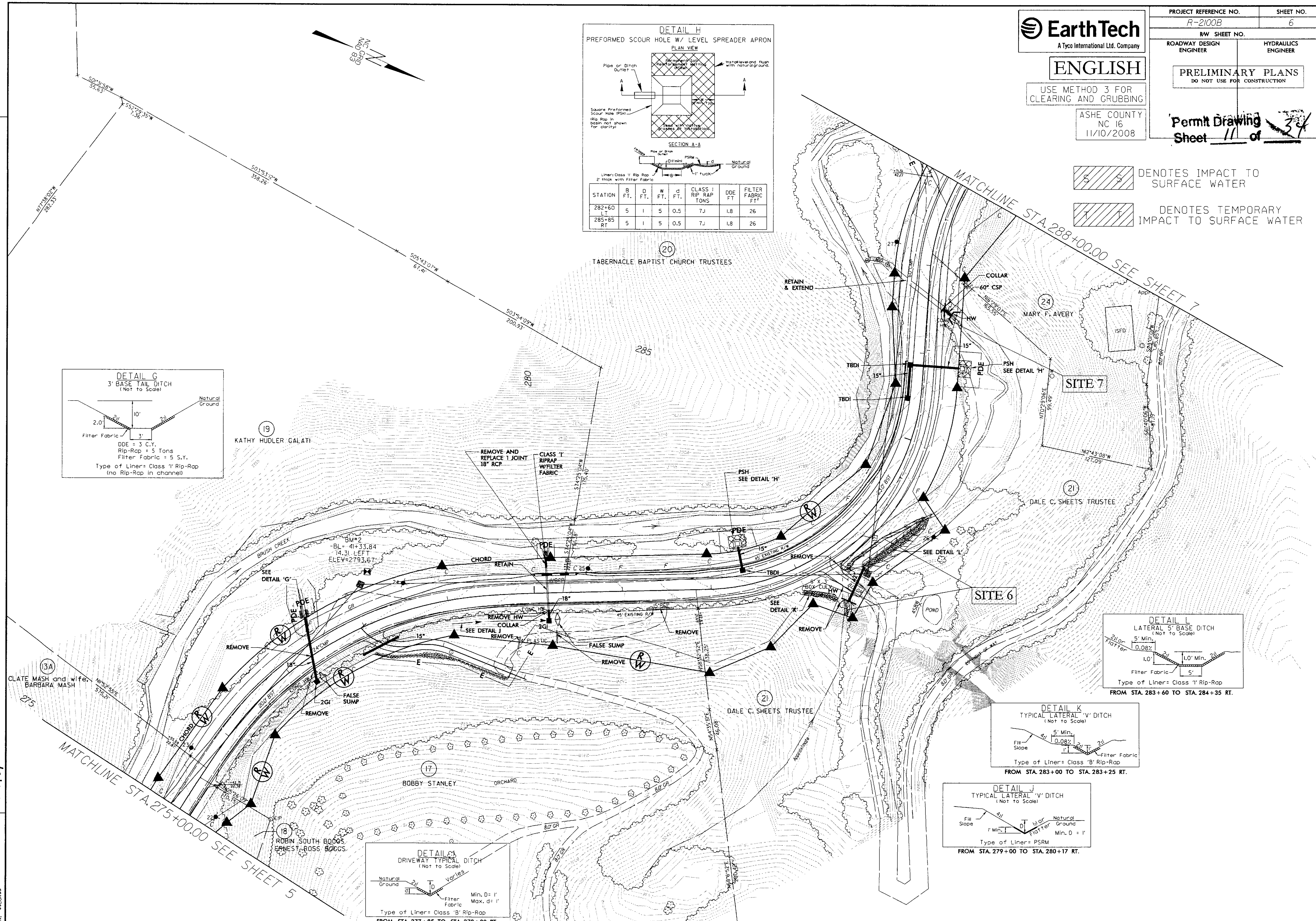
T T DENOTES TEMPORARY IMPACT TO SURFACE WATER



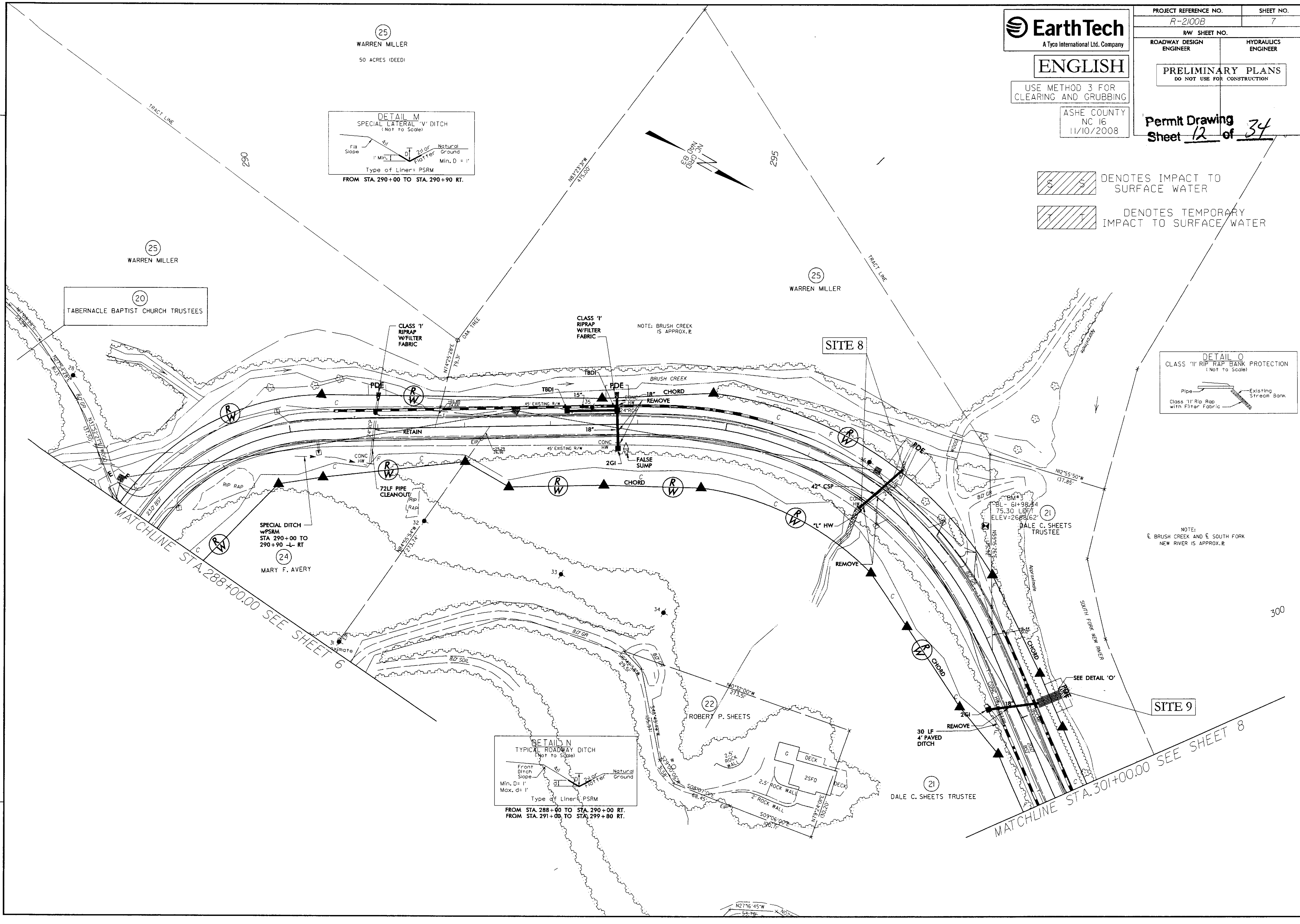
STATION	B FT.	D FT.	W FT.	d FT.	CLASS I RIP RAP TONS	DDE FT	FILTER FABRIC FT²
266+27 LT	5	1	5		7.1	1.8	26
269+08 LT	5	1	5		7.1	1.8	26



STATION	B FT.	D FT.	W FT.	d FT.	CLASS I RIP RAP TONS	DDE FT	FILTER FABRIC FT²
282+60 LT	5	1	5	0.5	7.1	1.8	26
285+85 RT	5	1	5	0.5	7.1	1.8	26



STATION	B FT.	D FT.	W FT.	d FT.	CLASS I RIP RAP TONS	DDE FT	FILTER FABRIC FT²
282+60 LT	5	1	5	0.5	7.1	1.8	26
285+85 RT	5	1	5	0.5	7.1	1.8	26



EarthTech
A Tyco International Ltd. Company
PROJECT REFERENCE NO. R-2100B
SHEET NO. 7
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
ENGLISH
USE METHOD 3 FOR CLEARING AND GRUBBING
ASHE COUNTY
NC 16
11/10/2008
Permit Drawing
Sheet 12 of 34
DENOTES IMPACT TO SURFACE WATER
DENOTES TEMPORARY IMPACT TO SURFACE WATER
REVISIONS
25
WARREN MILLER
50 ACRES (DEED)
TRACT LINE
290
295
300
NC GRID NAD 83
DETAIL M
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Fill Slope
1' Min.
D
2:1 or Flatter
Natural Ground
Min. D = 1'
Type of Liner: PSRM
FROM STA. 290+00 TO STA. 290+90 RT.
20
TABERNACLE BAPTIST CHURCH TRUSTEES
CLASS 'I' RIPRAP W/FILTER FABRIC
NOTE: BRUSH CREEK IS APPROX. ℄
SITE 8
BRUSH CREEK
PDE
TBDI
CHORD
REMOVE
RETAIN
45' EXISTING R/W
CONC HW
2GI
FALSE SUMP
42" CSP
72LF PIPE CLEANOUT
RIP RAP
SPECIAL DITCH w/PSRM STA 290+00 TO 290+90 -L- RT
24
MARY F. AVERY
"L" HW
DETAIL O
CLASS 'II' RIP RAP BANK PROTECTION
(Not to Scale)
Pipe
Existing Stream Bank
Class 'II' Rip Rap with Filter Fabric
BM#3
BL- 61+98.34
75.30 LEFT
ELEV=2688.62'
21
DALE C. SHEETS TRUSTEE
NOTE:
℄ BRUSH CREEK AND ℄ SOUTH FORK NEW RIVER IS APPROX. ℄
SOUTH FORK NEW RIVER
SEE DETAIL 'O'
SITE 9
30 LF 4' PAVED DITCH
MATCHLINE STA. 288+00.00 SEE SHEET 6
MATCHLINE STA. 301+00.00 SEE SHEET 8
22
ROBERT P. SHEETS
DETAIL N
TYPICAL ROADWAY DITCH
(Not to Scale)
Front Ditch Slope
Min. D= 1'
Max. d= 1'
2:1 or Flatter
Natural Ground
Type of Liner: PSRM
FROM STA. 288+00 TO STA. 290+00 RT.
FROM STA. 291+00 TO STA. 299+80 RT.
2.5' ROCK WALL
2' ROCK WALL
DECK
2SFD

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

EarthTech
A Tyco International Ltd. Company

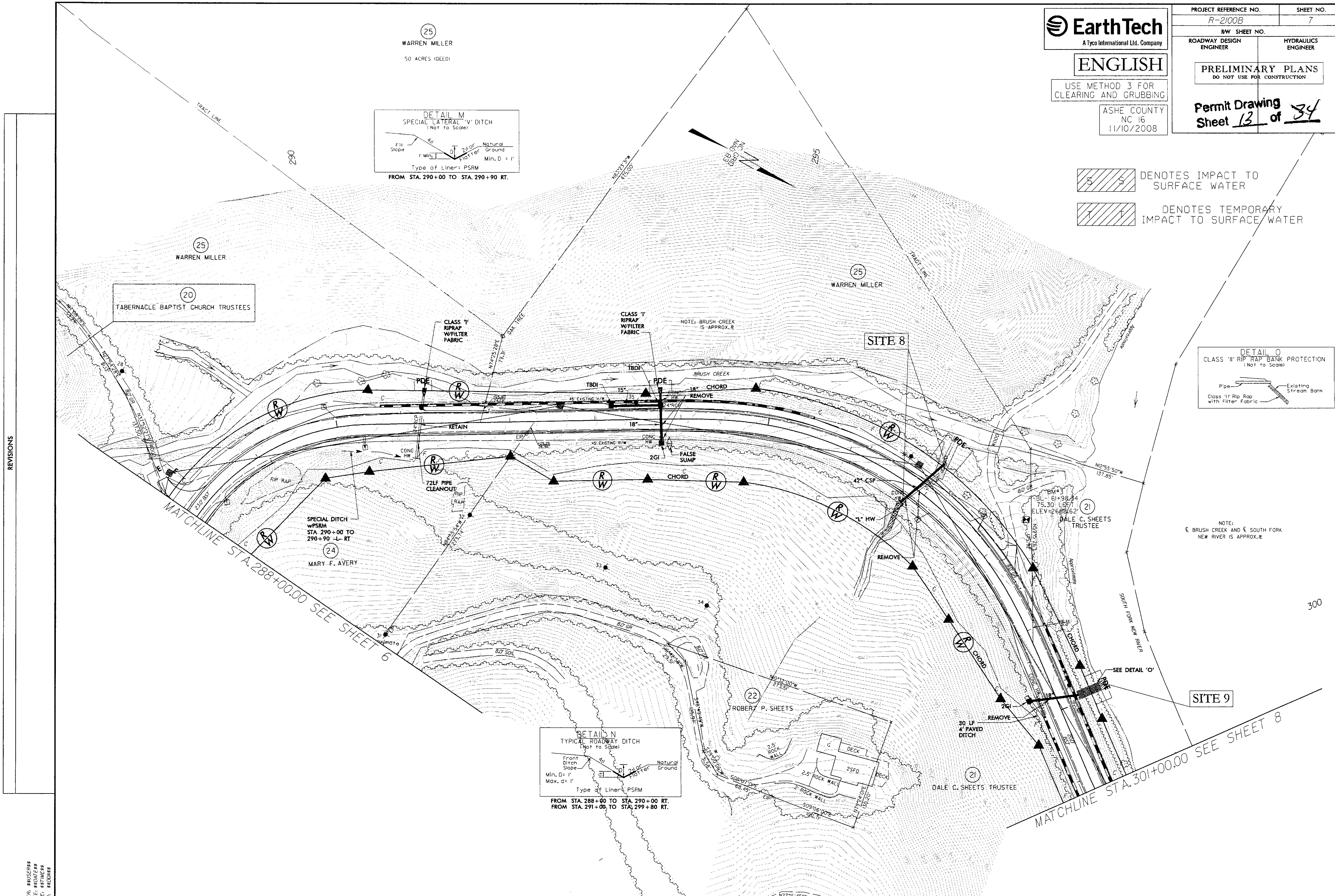
ENGLISH

USE METHOD 3 FOR CLEARING AND GRUBBING

ASHE COUNTY
NC 16
11/10/2008

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 13 of 34



EarthTech
A Tyco International Ltd. Company

ENGLISH

USE METHOD 3 FOR CLEARING AND GRUBBING

ASHE COUNTY
NC 16
11/10/2008

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing Sheet 14 of 34

NC GRID NAD 83

S S DENOTES IMPACT TO SURFACE WATER

305 310 315

MATCHLINE STA. 301+00.00 SEE SHEET 7

MATCHLINE STA. 315+0000 SEE SHEET 9

SITE 10 SITE 11 SITE 12 SITE 13

ENVIRONMENTAL ENDANGERED PLANT BOUNDARY (SPIREA)

WITH CENTERLINE OF RIVER

SEE DETAIL 'P'

SOUTH FORK NEW RIVER

21 DALE C. SHEETS TRUSTEE

REMOVE SP. DITCH GRADE STA. 302+00 TO 302+10 -L- RT

3GI 'A'

2GI

TBDI

PDE

RETAIN

PLUG

CHORD

FILL W/ FLOWABLE FILL

REMOVE 15LF- EX. 18" CMP

REMOVE 10LF- EX. 18" CMP

REMOVE HW & PLUG

REMOVE HW

FILL W/ FLOWABLE FILL

SP. DITCH GRADE STA. 310+50 TO 310+75 -L- RT

2GI 'A'

DETAIL P
CLASS 'II' RIP RAP BANK PROTECTION
(Not to Scale)

Pipe
Existing Stream Bank
Class 'II' Rip Rap with Filter Fabric

REVISIONS

USER: $$USER$$
DATE: $$DATE$$
TIME: $$TIME$$
DGN: $$DGN$$

EarthTech
A Tyco International Ltd. Company

ENGLISH

USE METHOD 3 FOR CLEARING AND GRUBBING

ASHE COUNTY
NC 16
11/10/2008

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 15 of 34

NAD 83 GRID NORTH

DENOTES IMPACT TO SURFACE WATER

305 310 315

MATCHLINE STA. 301+00.00 SEE SHEET 7

MATCHLINE STA. 315+00.00 SEE SHEET 9

SITE 10 SITE 11 SITE 12 SITE 13

SEE DETAIL 'P'

ENVIRONMENTAL ENDANGERED PLANT BOUNDARY (SPIREA)

WITH CENTERLINE OF RIVER

SOUTH FORK NEW RIVER

21 DALE C. SHEETS TRUSTEE

REMOVE

SP. DITCH GRADE STA. 302+00 TO 302+10 -L- RT

3GI 'A'

2GI

TBDI

PDE

RETAIN

PLUG

REMOVE HW & PLUG

FILL W/ FLOWABLE FILL

REMOVE 15LF- EX. 18" CMP

REMOVE 10LF- EX. 18" CMP

CHORD

2GI 'A'

SP. DITCH GRADE STA. 310+50 TO 310+75 -L- RT

REMOVE HW

DETAIL 'P'
CLASS 'A' RIP RAP BANK PROTECTION
(Not to Scale)

Pipe
Class 'A' Rip Rap with Filter Fabric
Existing Stream Bank

REVISIONS

USER: $$USER$$
DATE: $$DATE$$
TIME: $$TIME$$
DGN: $$DGN$$

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

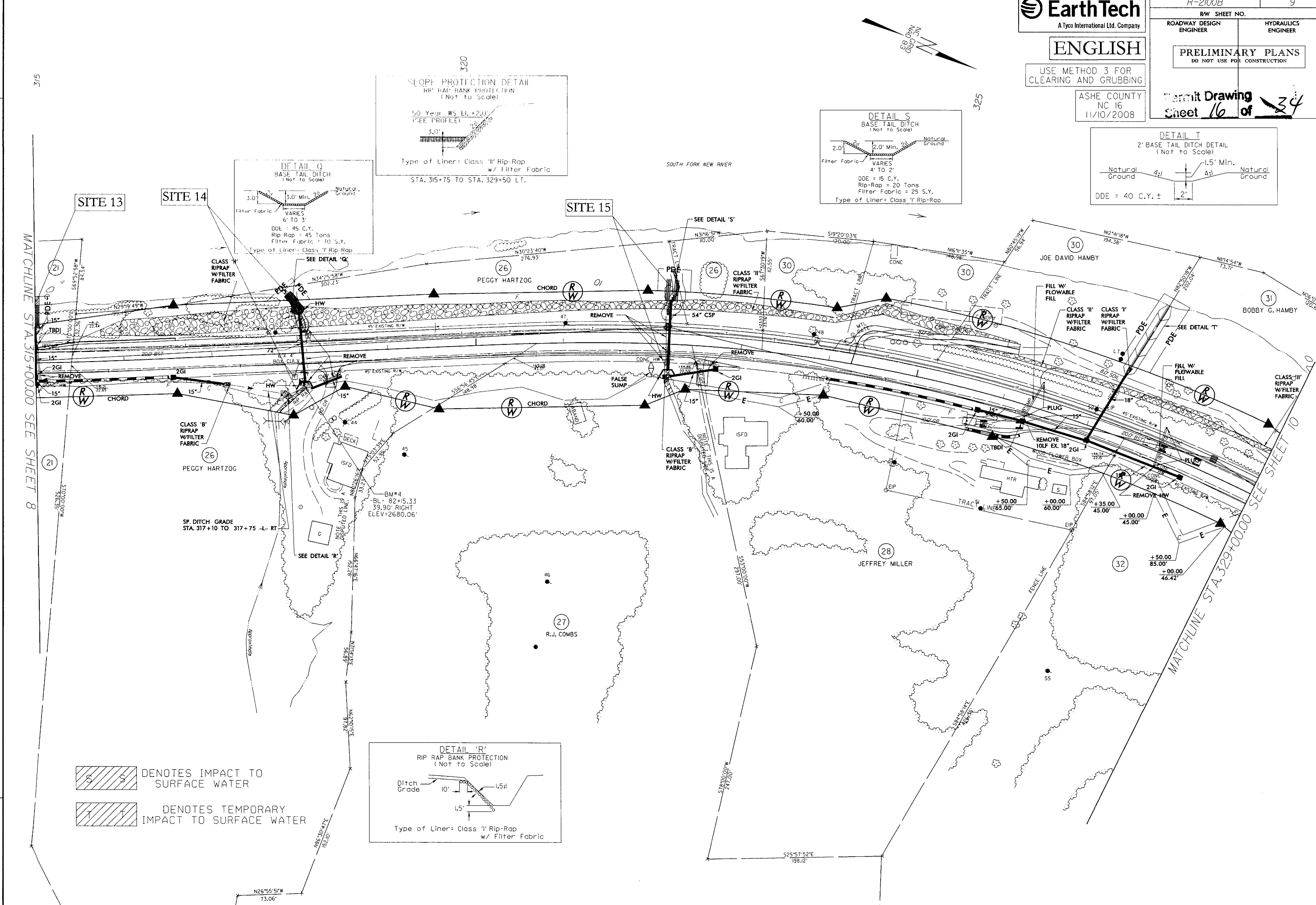
EarthTech
A Tyco International Ltd. Company

ENGLISH

USE METHOD 3 FOR CLEARING AND GRUBBING

ASHE COUNTY
NC 16
11/10/2008

Permit Drawing
Sheet 16 of 34

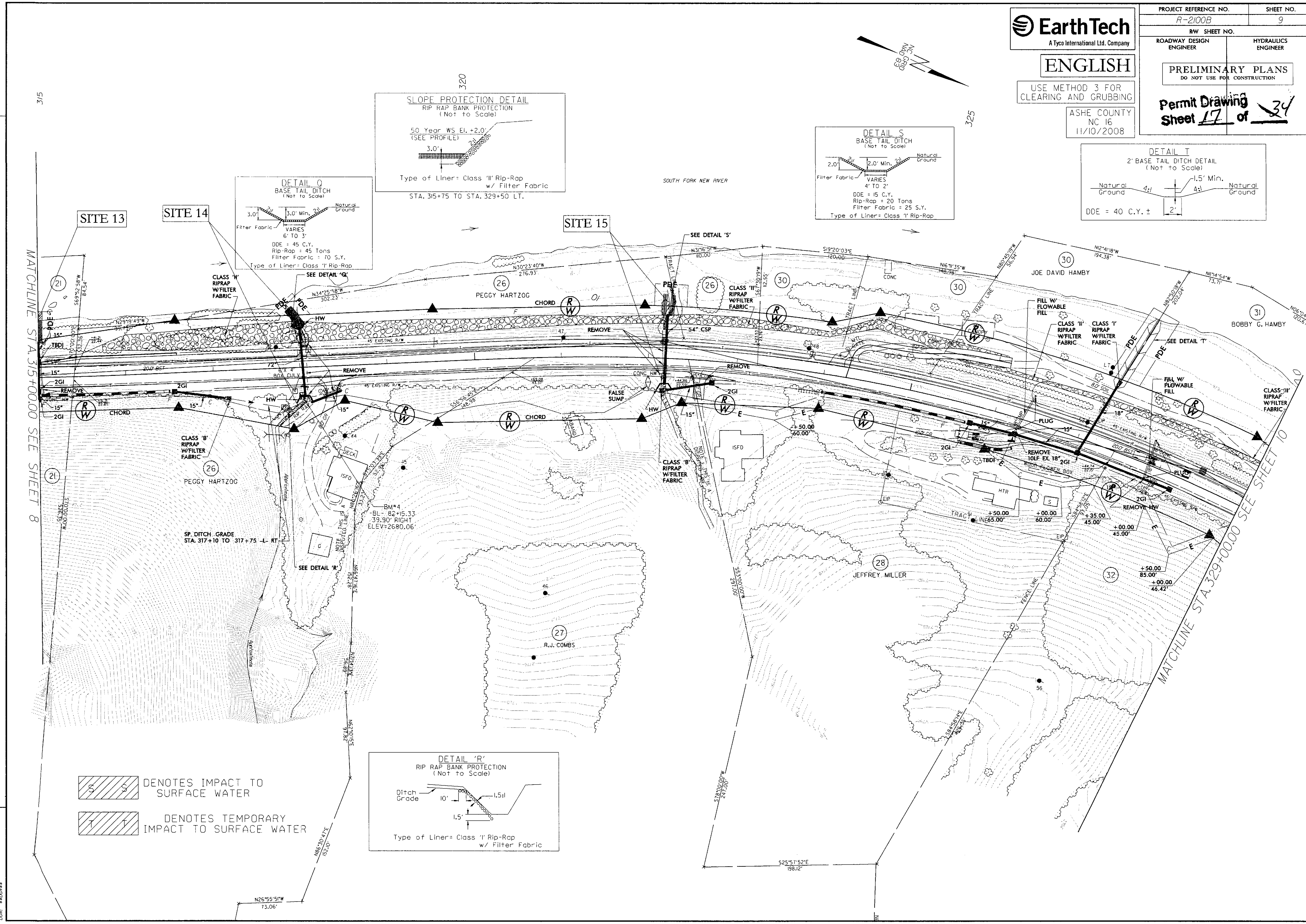


SLOPE PROTECTION DETAIL
RIP RAP BANK PROTECTION
(Not to Scale)
50 Year WS El. +2.0'
(SEE PROFILE)
Type of Liner= Class 'II' Rip-Rap w/ Filter Fabric
STA. 315+75 TO STA. 329+50 LT.
DETAIL Q
BASE TAIL DITCH
DDE = 45 C.Y.
Rip-Rap = 45 Tons
Filter Fabric = 70 S.Y.
Type of Liner= Class 'I' Rip-Rap
DETAIL S
BASE TAIL DITCH
DDE = 15 C.Y.
Rip-Rap = 20 Tons
Filter Fabric = 25 S.Y.
Type of Liner= Class 'I' Rip-Rap
DETAIL T
2' BASE TAIL DITCH DETAIL
DDE = 40 C.Y. ±
SITE 13
SITE 14
SITE 15
SOUTH FORK NEW RIVER
MATCHLINE STA. 315+00.00 SEE SHEET 8
MATCHLINE STA. 329+00.00 SEE SHEET 10
PEGGY HARTZOG
JOE DAVID HAMBY
BOBBY G. HAMBY
JEFFREY MILLER
R.J. COMBS
SP. DITCH GRADE STA. 317+10 TO 317+75 -L- RT
BM#4 -BL- 82+15.33 39.90' RIGHT ELEV=2680.06'
DETAIL 'R'
RIP RAP BANK PROTECTION
(Not to Scale)
Type of Liner= Class 'I' Rip-Rap w/ Filter Fabric

DENOTES IMPACT TO SURFACE WATER

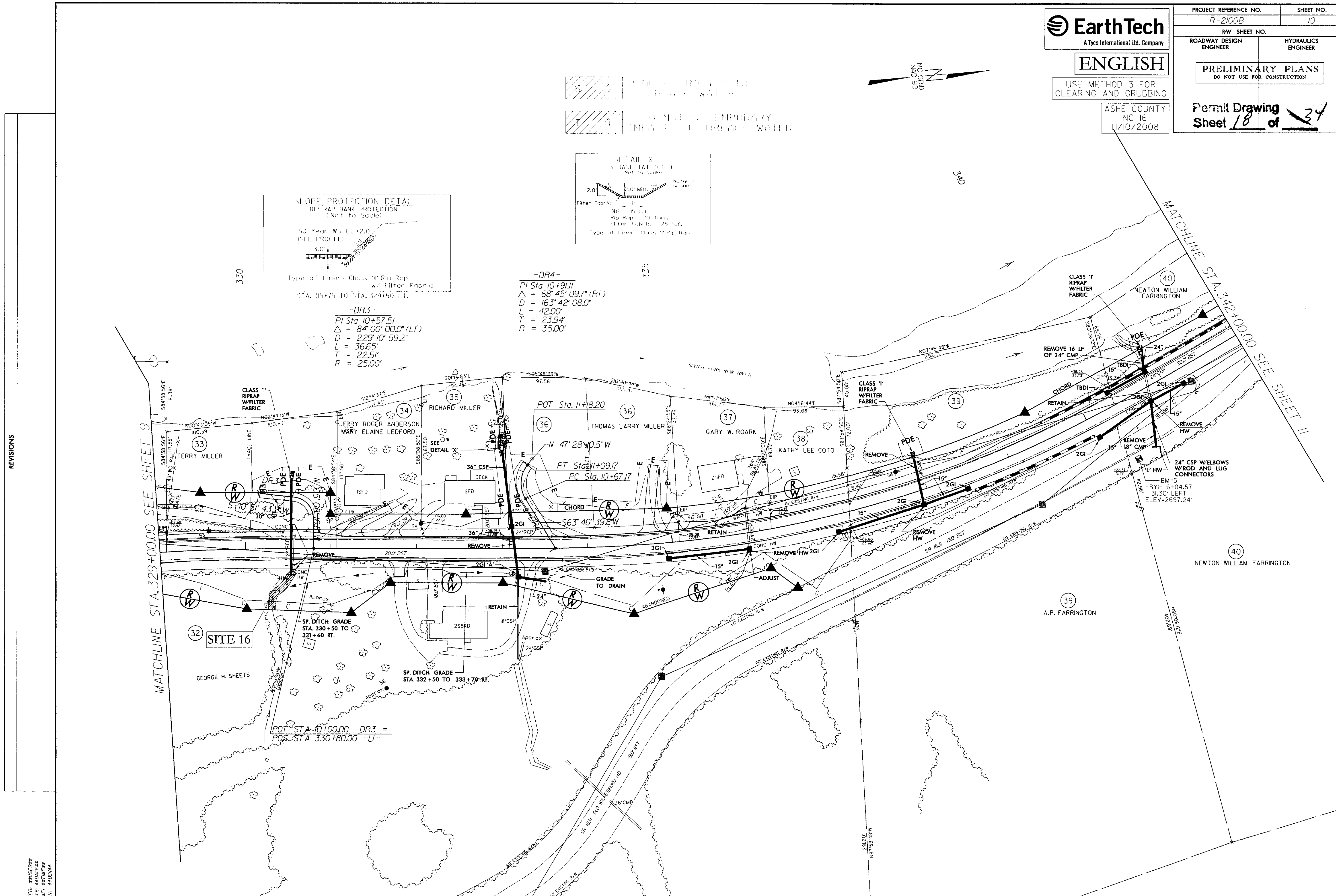
DENOTES TEMPORARY IMPACT TO SURFACE WATER

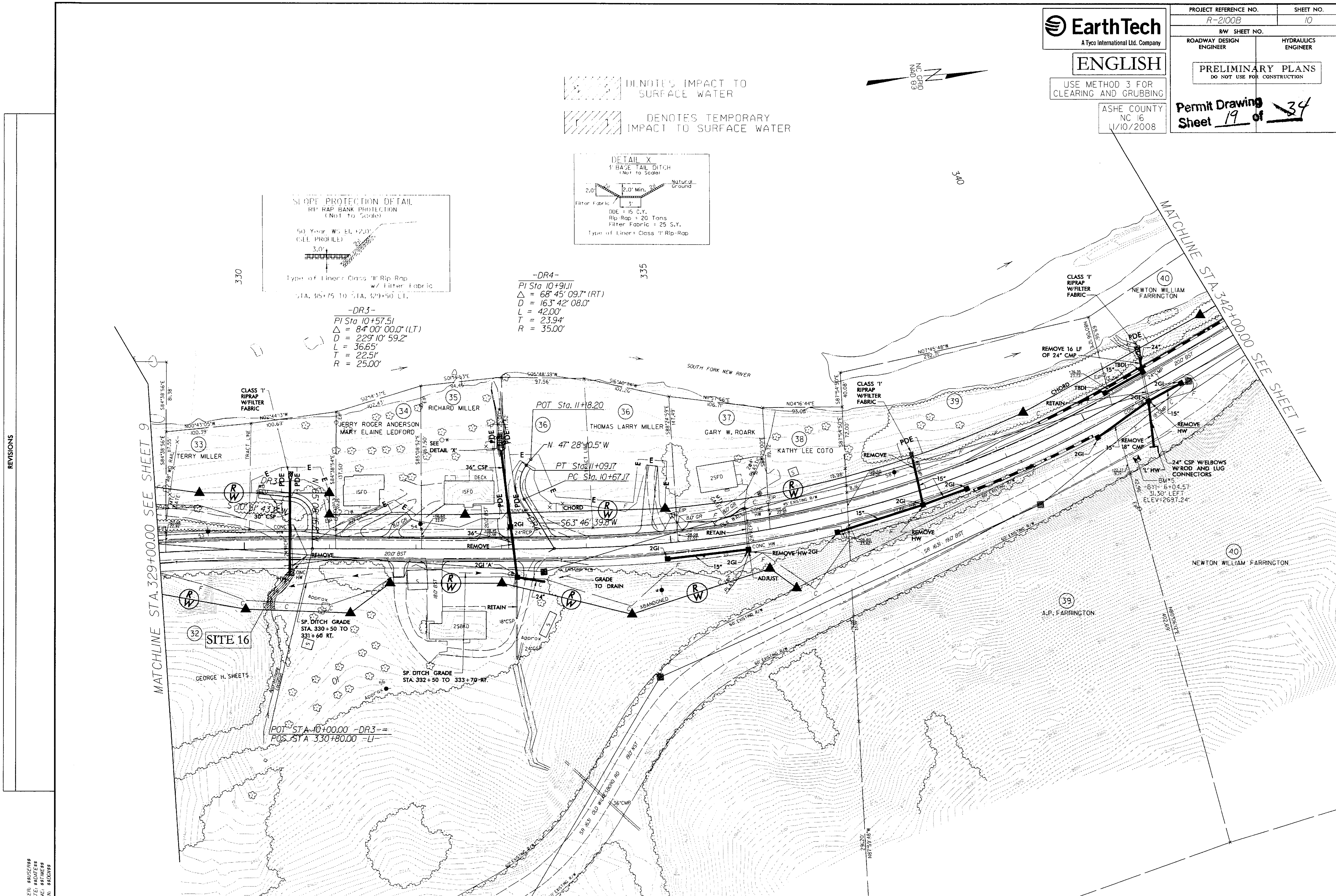
REVISIONS



REVISIONS

USER: $$USER$$
DATE: $$DATE$$
TIME: $$TIME$$
DGN: $$DGN$$


EarthTech
A Tyco International Ltd. Company
ENGLISH
USE METHOD 3 FOR CLEARING AND GRUBBING
ASHE COUNTY
NC 16
11/10/2008
PROJECT REFERENCE NO.
R-2100B
SHEET NO.
10
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Permit Drawing Sheet 18 of 34
NC GRID NAD 83
REVISIONS
USER: $$USER$$
DATE: $$DATE$$
TIME: $$TIME$$
DGN: $$DGN$$
DENOTES TEMPORARY IMPACT TO SURFACE WATER
SLOPE PROTECTION DETAIL
RIP RAP BANK PROTECTION
(Not to Scale)
50 Year WS EL +2.0'
(SEE PROFILE)
3.0'
2:1
Type of Liner: Class 'II' Rip-Rap w/ Filter Fabric
STA. 315+75 TO STA. 329+50 LT.
DETAIL X
Natural Ground
2.0'
2.0' Min.
Filter Fabric
5'
DDE 15 C.Y.
Rip-Rap 20 Tons
Filter Fabric 25 S.Y.
Type of Liner: Class 'I' Rip-Rap
330
335
340
-DR3-
PI Sta 10+57.51
△ = 84° 00' 00.0" (LT)
D = 229° 10' 59.2"
L = 36.65'
T = 22.51'
R = 25.00'
-DR4-
PI Sta 10+91.11
△ = 68° 45' 09.7" (RT)
D = 163° 42' 08.0"
L = 42.00'
T = 23.94'
R = 35.00'
SOUTH FORK NEW RIVER
MATCHLINE STA. 329+00.00 SEE SHEET 9
MATCHLINE STA. 342+00.00 SEE SHEET 11
CLASS 'I' RIPRAP W/FILTER FABRIC
33 TERRY MILLER
34 JERRY ROGER ANDERSON MARY ELAINE LEDFORD
35 RICHARD MILLER
36 THOMAS LARRY MILLER
37 GARY W. ROARK
38 KATHY LEE COTO
39 A.P. FARRINGTON
40 NEWTON WILLIAM FARRINGTON
32 GEORGE H. SHEETS
SITE 16
SEE DETAIL 'X'
36" CSP
DECK
ISFD
2SFD
2SBKD
POT Sta. 11+18.20
N 47° 28' 10.5" W
PT Sta. 11+09.17
PC Sta. 10+67.17
S63° 46' 39.8" W
S 10° 31' 43.2" W
30" CSP
CHORD
RETAIN
REMOVE
ADJUST
ABANDONED
GRADE TO DRAIN
2GI 'A'
24" RCP
20.0' BST
SP. DITCH GRADE STA. 330+50 TO 331+60 RT.
SP. DITCH GRADE STA. 332+50 TO 333+70 RT.
POT STA 10+00.00 -DR3-=
POS STA 330+80.00 -L1-
REMOVE 16 LF OF 24" CMP
REMOVE 18" CMP
REMOVE HW
24" CSP W/ELBOWS W/ROD AND LUG CONNECTORS
'L' HW
BM#5
-BYI- 6+04.57
31.30' LEFT
ELEV=2697.24'
SR 1631 19.0' BST
SR 1631 OLD WILKESBORO RD
19.0' NST
36" CMP
60' EXISTING R/W
45' EXISTING R/W
N07°45'48"W 292.71'
N80°06'12"E 402.69'
291.20' N87°59'48"W


EarthTech
A Tyco International Ltd. Company
PROJECT REFERENCE NO.
R-2100B
SHEET NO.
10
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
ENGLISH
USE METHOD 3 FOR CLEARING AND GRUBBING
ASHE COUNTY
NC 16
11/10/2008
Permit Drawing
Sheet 19 of 34
NC GRID NAD 83
DENOTES IMPACT TO SURFACE WATER
DENOTES TEMPORARY IMPACT TO SURFACE WATER
DETAIL X
5' BASE TAIL DITCH
(Not to Scale)
Natural Ground
Filter Fabric
DDE = 15 C.Y.
Rip-Rap = 20 Tons
Filter Fabric = 25 S.Y.
Type of Liner= Class 'I' Rip-Rap
SLOPE PROTECTION DETAIL
RIP RAP BANK PROTECTION
(Not to Scale)
Type of Liner= Class 'II' Rip Rap w/ Filter Fabric
-DR3-
PI Sta 10+57.51
Δ = 84° 00' 00.0" (LT)
D = 229° 10' 59.2"
L = 36.65'
T = 22.51'
R = 25.00'
-DR4-
PI Sta 10+91.11
Δ = 68° 45' 09.7" (RT)
D = 163° 42' 08.0"
L = 42.00'
T = 23.94'
R = 35.00'
SOUTH FORK NEW RIVER
MATCHLINE STA. 329+00.00 SEE SHEET 9
MATCHLINE STA. 342+00.00 SEE SHEET 11
TERRY MILLER
JERRY ROGER ANDERSON
MARY ELAINE LEDFORD
RICHARD MILLER
THOMAS LARRY MILLER
GARY W. ROARK
KATHY LEE COTO
NEWTON WILLIAM FARRINGTON
A.P. FARRINGTON
GEORGE H. SHEETS
SITE 16
CLASS 'I' RIPRAP W/FILTER FABRIC
POT Sta. 11+18.20
PT Sta. 11+09.17
PC Sta. 10+67.17
N 47° 28' 40.5" W
S63° 46' 39.8" W
SP. DITCH GRADE STA. 330+50 TO 331+60 RT.
SP. DITCH GRADE STA. 332+50 TO 333+70 RT.
POT STA 10+00.00 -DR3-=
POS STA 330+80.00 -L1-
GRADE TO DRAIN
REMOVE 16 LF OF 24" CMP
24" CSP W/ELBOWS W/ROD AND LUG CONNECTORS
BM#5
-BY1- 6+04.57
31.30' LEFT
ELEV=2697.24'
SR 1631 OLD WILKESBORO RD
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	11
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 20 of 34

EarthTech
A Tyco International Ltd. Company

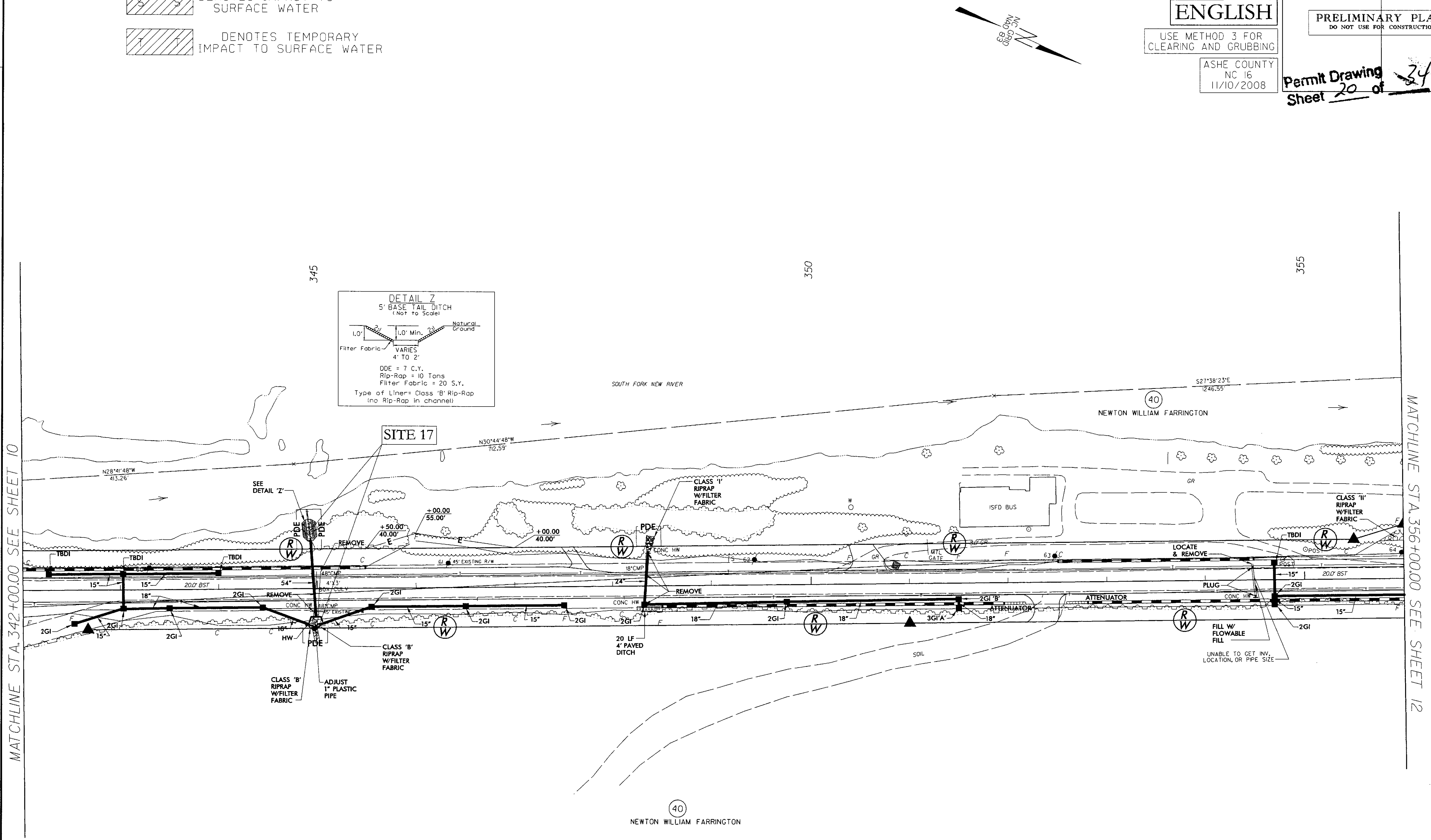
ENGLISH

USE METHOD 3 FOR CLEARING AND GRUBBING

ASHE COUNTY
NC 16
11/10/2008

DENOTES IMPACT TO SURFACE WATER

DENOTES TEMPORARY IMPACT TO SURFACE WATER



REVISIONS

USER: $$USER$$
DATE: $$DATE$$
TIME: $$TIME$$
DGN: $$DGN$$

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	11

RW SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

EarthTech
A Tyco International Ltd. Company

ENGLISH

USE METHOD 3 FOR CLEARING AND GRUBBING

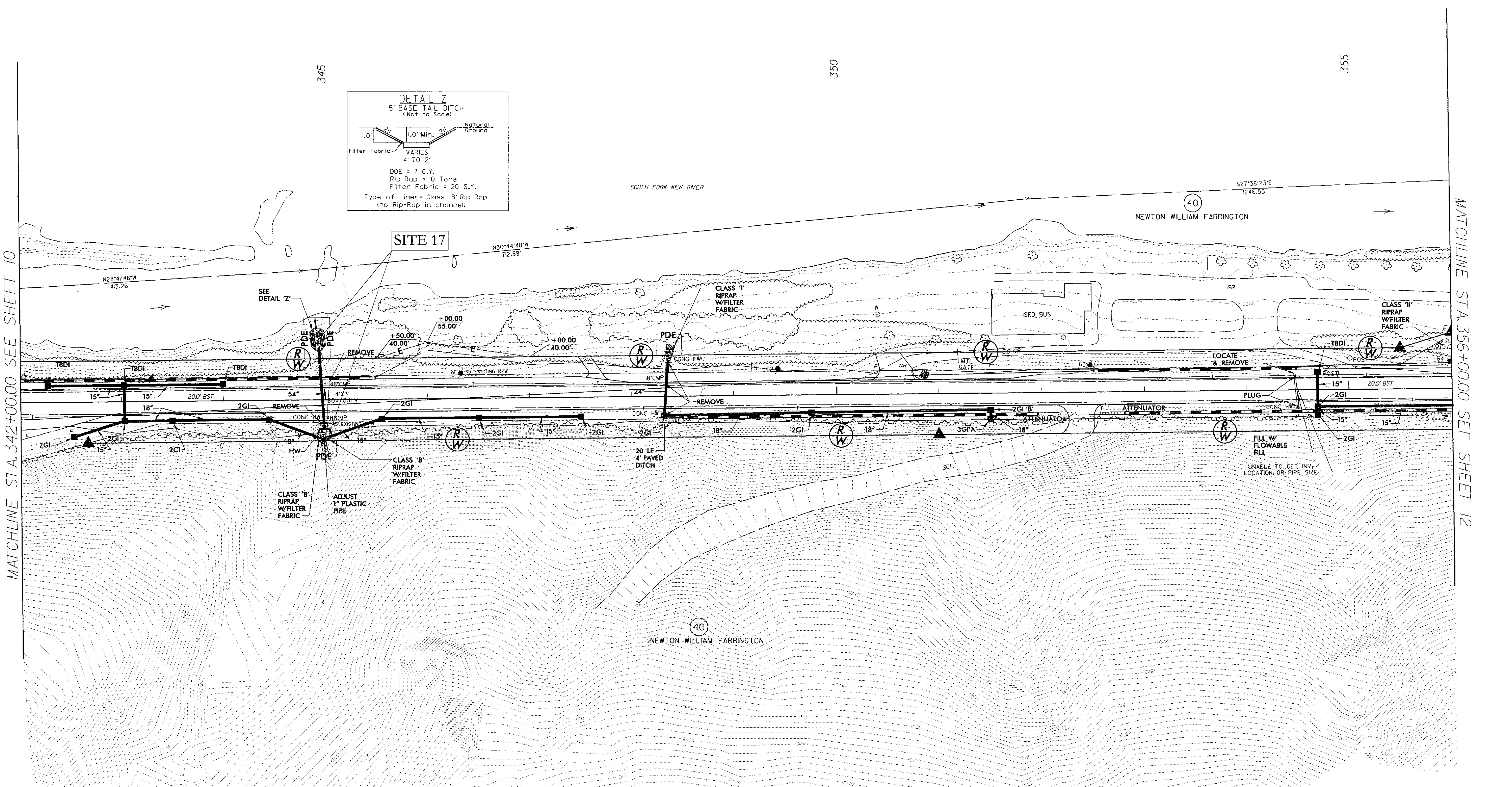
ASHE COUNTY
NC 16
11/10/2008

Permit Drawing
Sheet 21 of 34

S S DENOTES IMPACT TO SURFACE WATER

T T DENOTES TEMPORARY IMPACT TO SURFACE WATER

REVISIONS



USER: $$USER$$
DATE: $$DATE$$
TIME: $$TIME$$
DGN: $$DGN$$

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

EarthTech
A Tyco International Ltd. Company

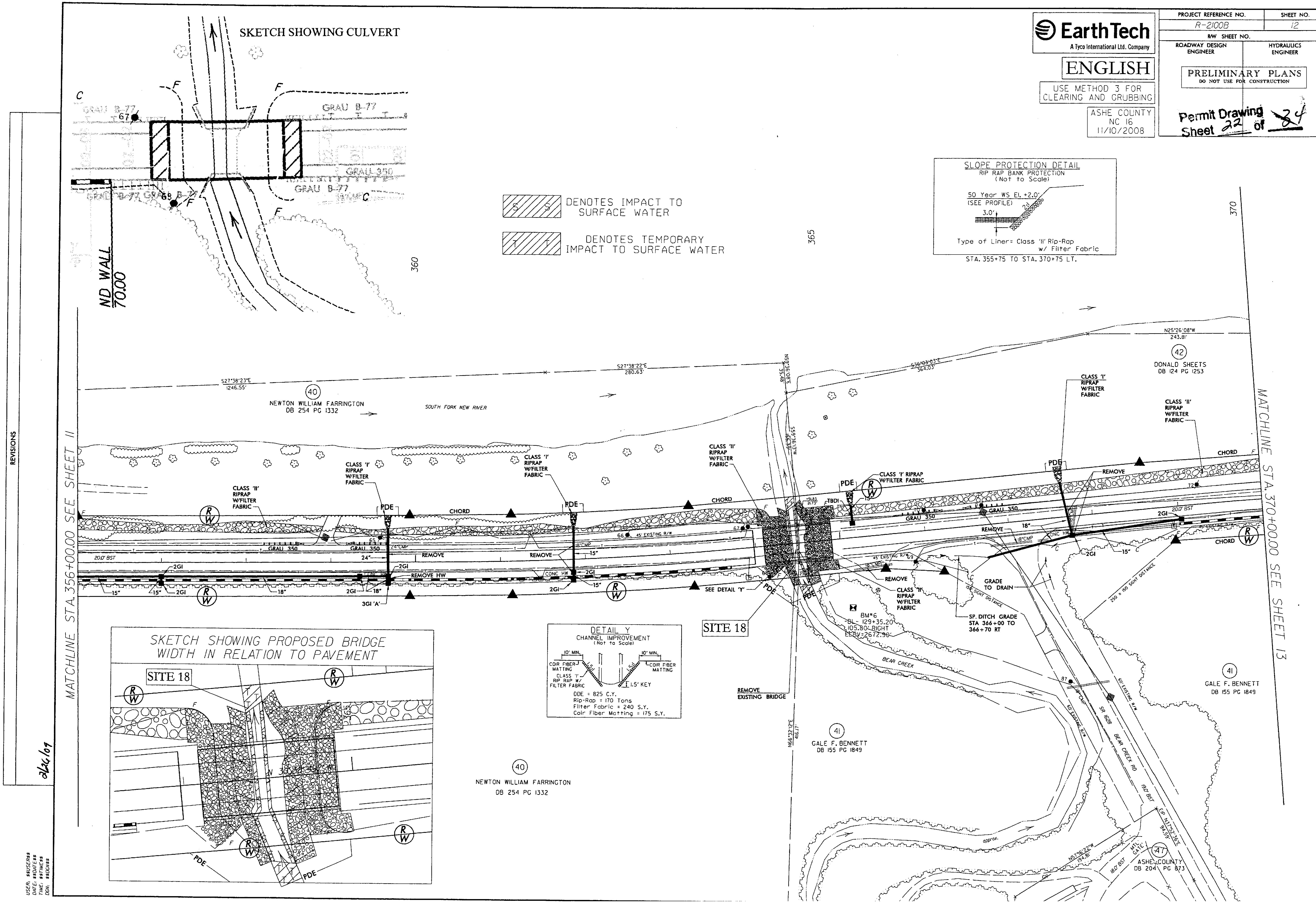
ENGLISH

USE METHOD 3 FOR CLEARING AND GRUBBING

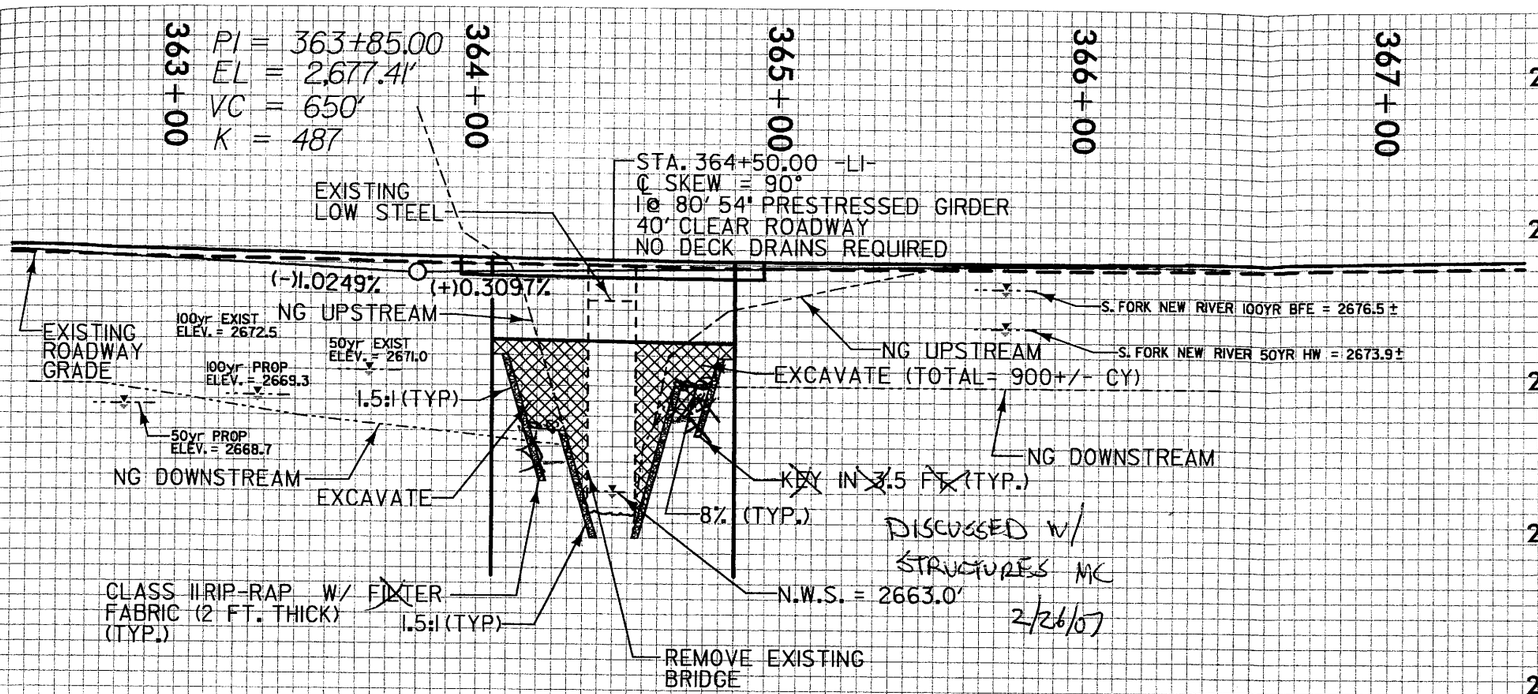
ASHE COUNTY
NC 16
11/10/2008

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 22 of 84

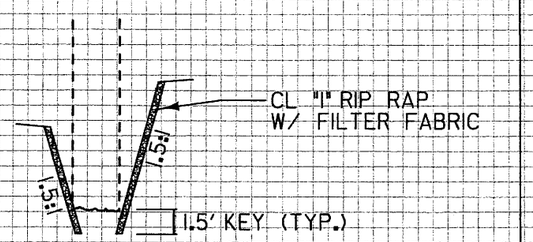


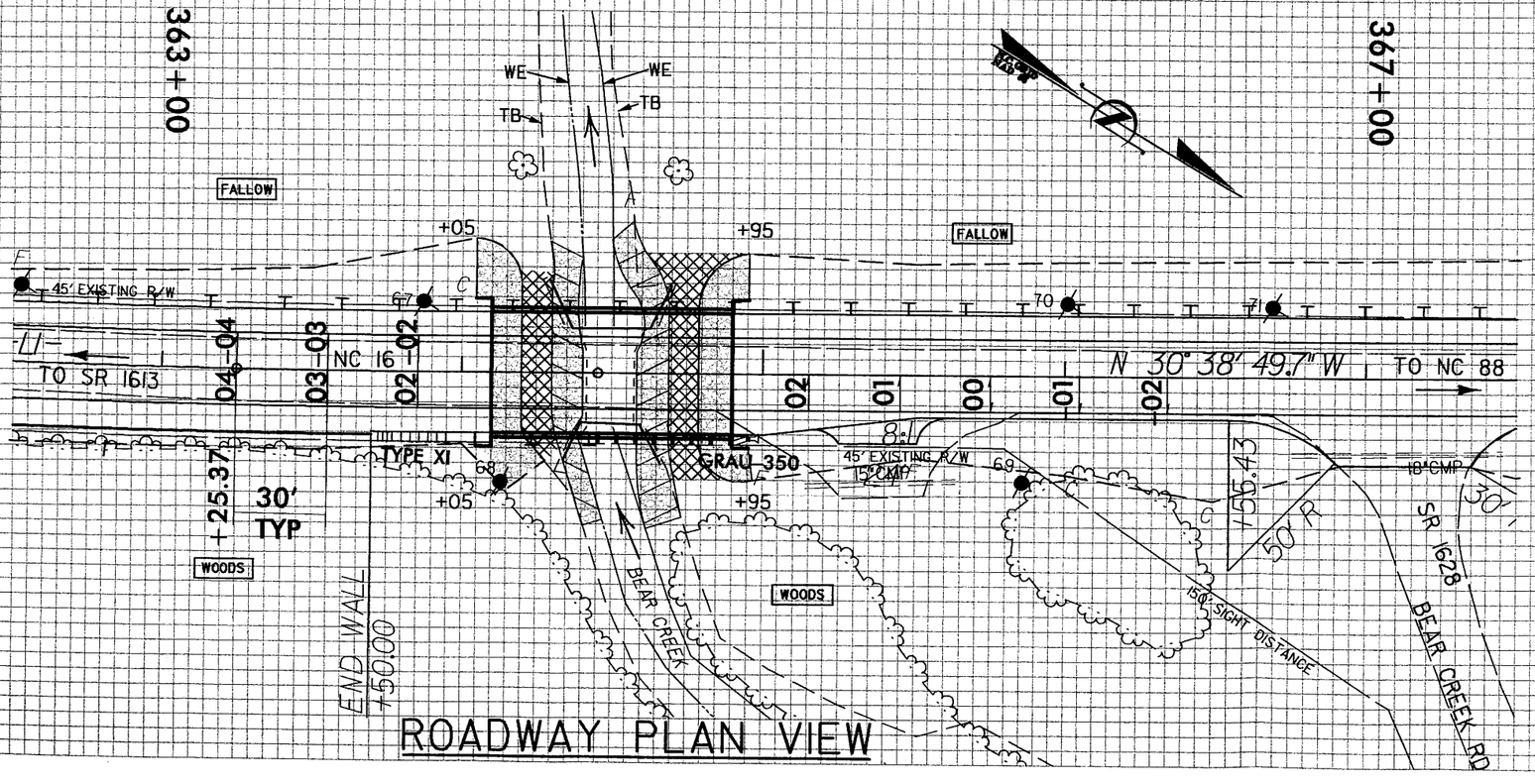
SKETCH SHOWING CULVERT
GRAU B-77
GRAU 350
ND WALL
70.00
DENOTES IMPACT TO SURFACE WATER
DENOTES TEMPORARY IMPACT TO SURFACE WATER
SLOPE PROTECTION DETAIL
RIP RAP BANK PROTECTION
(Not to Scale)
50 Year WS El. +2.0'
(SEE PROFILE)
3.0'
2:1
Type of Liner= Class 'II' Rip-Rap w/ Filter Fabric
STA. 355+75 TO STA. 370+75 LT.
360
365
370
S27°38'23"E 1246.55'
S27°38'22"E 280.63'
S36°03'03"E 364.03'
N25°26'08"W 243.81'
40
NEWTON WILLIAM FARRINGTON
DB 254 PG 1332
SOUTH FORK NEW RIVER
42
DONALD SHEETS
DB 124 PG 1253
CLASS 'I' RIPRAP W/FILTER FABRIC
CLASS 'II' RIPRAP W/FILTER FABRIC
CHORD
PDE
REMOVE
REMOVE HW
CONC HW
SEE DETAIL 'Y'
SITE 18
REMOVE EXISTING BRIDGE
BM*6
-BL- 129+35.20
105.80' RIGHT
ELEV=2672.98'
BEAR CREEK
GRADE TO DRAIN
SP. DITCH GRADE
STA 366+00 TO 366+70 RT
MATCHLINE STA. 356+00.00 SEE SHEET 11
MATCHLINE STA. 370+00.00 SEE SHEET 13
REVISIONS
SKETCH SHOWING PROPOSED BRIDGE WIDTH IN RELATION TO PAVEMENT
DETAIL Y
CHANNEL IMPROVEMENT
(Not to Scale)
10' MIN.
COIR FIBER MATTING
CLASS 'I' RIP RAP W/ FILTER FABRIC
1.5' KEY
DDE = 825 C.Y.
Rip-Rap = 170 Tons
Filter Fabric = 240 S.Y.
Coir Fiber Matting = 175 S.Y.
41
GALE F. BENNETT
DB 155 PG 1849
SR 1608 BEAR CREEK RD
47
ASHE COUNTY
DB 204 PG 873
2/26/09



PROFILE ALONG ROADWAY

CHANNEL IMPROVEMENTS





ROADWAY PLAN VIEW

Note: Deck drains are not required.

Note: Allowable bridge spread = 8.0 ft.
Calculated spread = 5.2 ft.

Note: There are no structures located upstream of the site.

Note: The 100 year Base Flood elevation is lowered; therefore, the proposed bridge does not cause any adverse impacts upstream.

EarthTech
A Tyco International Ltd. Company

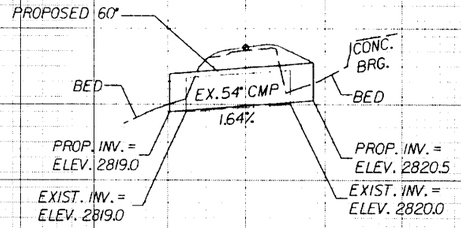
PROJECT REFERENCE NO.	SHEET NO.
R-2100B	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 25 of 34

SITE 1
(PSH 4)

-L1-
258+04.86
GP=2827.51



2,880
2,870
2,860
2,850
2,840
2,830
2,820
2,810
2,800
2,790

100 50 ℄ 50 100

REVISIONS

Revision 0 – 09-24-2004

USER: $$USER$$
DATE: $$DATE$$
TIME: $$TIME$$
DGN: $$DGN$$

EarthTech
A Tyco International Ltd. Company

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 20 of 34

SITE 7
(PSH 6)

-L1-
286+64.61
GP=2753.99

PROPOSED 60"
CS EXTENSION

BED

EX.60" CMP

BED

PROP. INV.=
ELEV. 2745.2

0.50%

EXIST. INV.=
ELEV. 2741.52

EXIST. INV.=
ELEV. 2745.5

2,790
2,780
2,770
2,760
2,750
2,740
2,730
2,720
2,710
2,700

100 50 ℄ 50 100

REVISIONS

Revision 0 – 09-24-2004

USER: $$USER$$
DATE: $$DATE$$
TIME: $$TIME$$
DGN: $$DGN$$

EarthTech
A Tyco International Ltd. Company

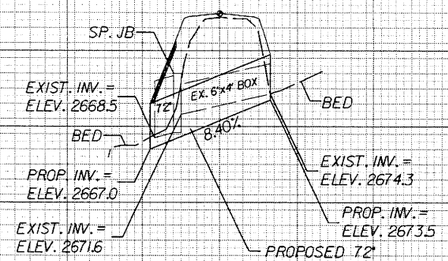
PROJECT REFERENCE NO.	SHEET NO.
R-2100B	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing Sheet 27 of 34

SITE 14
(PSH 9)

-L-
318+03.58
GP=2684.89



2,710
2,700
2,690
2,680
2,670
2,660
2,650
2,640
2,630
2,620

100 50 ℄ 50 100

REVISIONS

Revision 0 – 09-24-2004

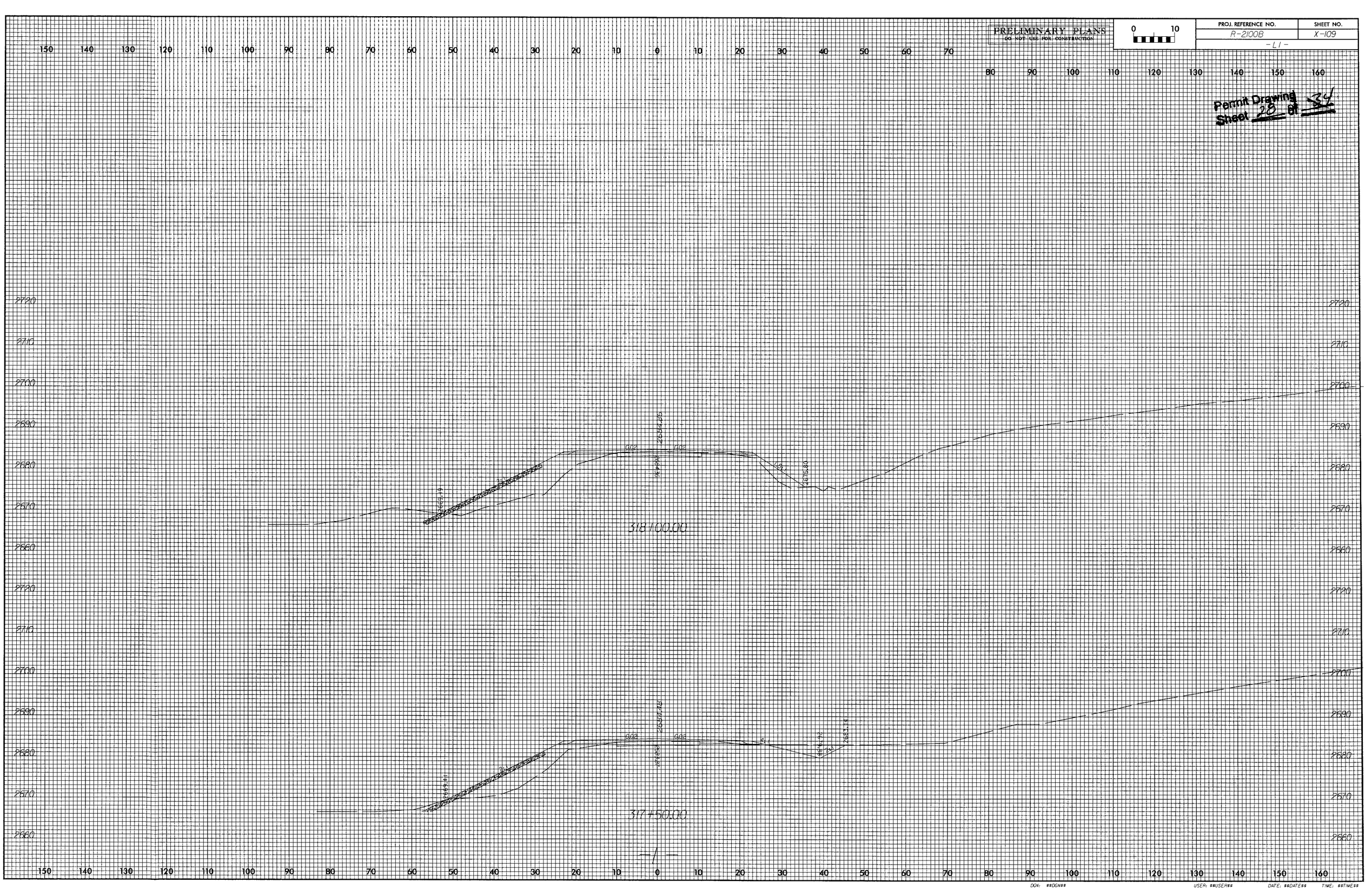
USER: $$USER$$
DATE: $$DATE$$
TIME: $$TIME$$
DGN: $$DGN$$

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

0 10

PROJ. REFERENCE NO.	SHEET NO.
R-2100B	X-109
-L1-	

Permit Drawing Sheet 28 of 34

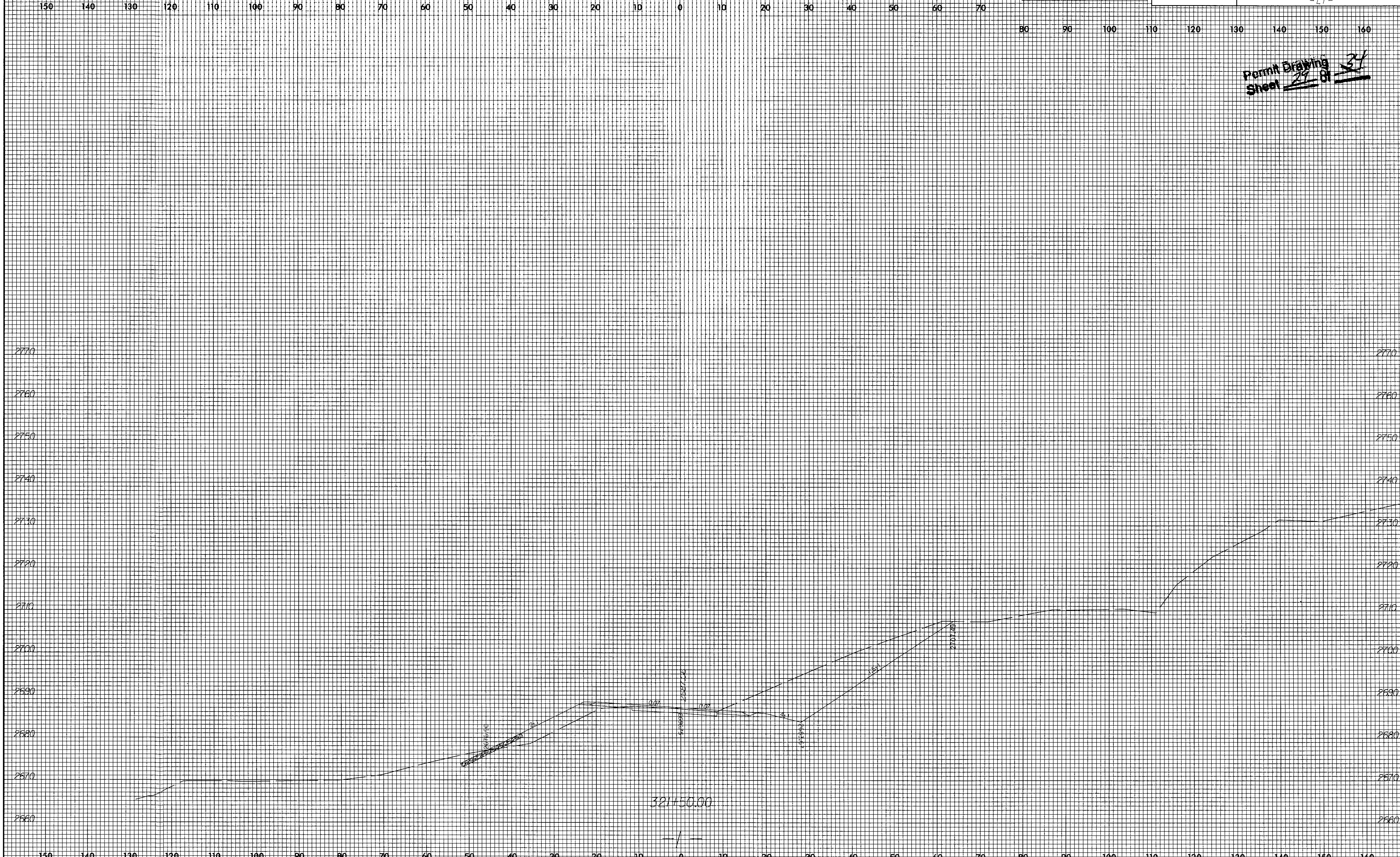


DGN: $$DGN$$ USER: $$USER$$ DATE: $$DATE$$ TIME: $$TIME$$

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROJ. REFERENCE NO.	SHEET NO.
R-2100B	X-115
-L1-	

Permit Drawing
Sheet 29 of 34



DGN: $$DGN$$ USER: $$USER$$ DATE: $$DATE$$ TIME: $$TIME$$

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

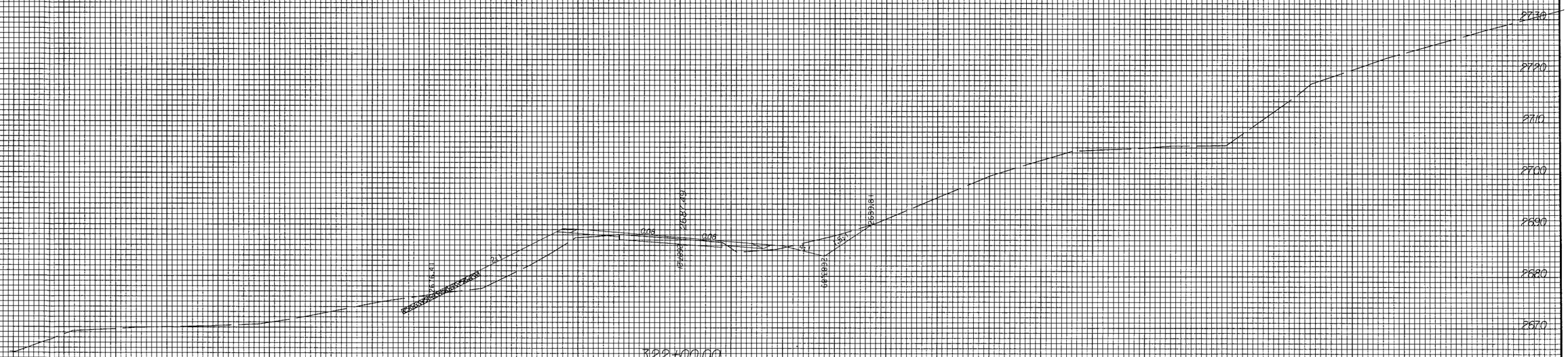
0 10

PROJ. REFERENCE NO.	SHEET NO.
R-2100B	X-116
-L1-	

Permit Drawing Sheet 30 of 34

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160

2770
2760
2750
2740
2730
2720
2710
2700
2690
2680
2670
2660

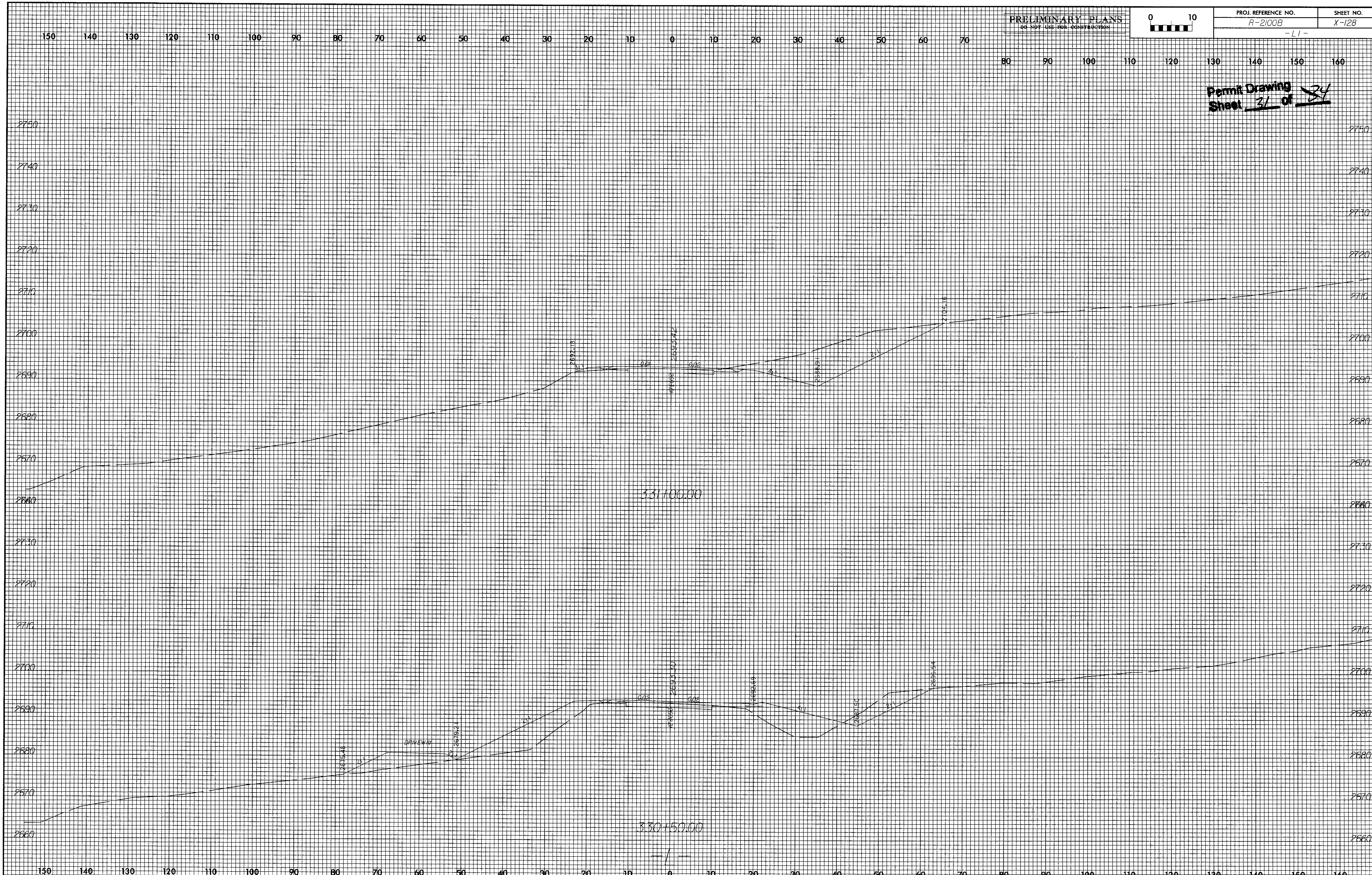


DGN: $$DGN$$ USER: $$USER$$ DATE: $$DATE$$ TIME: $$TIME$$

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROJ. REFERENCE NO.	SHEET NO.
R-2100B	X-128
-L1-	

Permit Drawing
Sheet 31 of

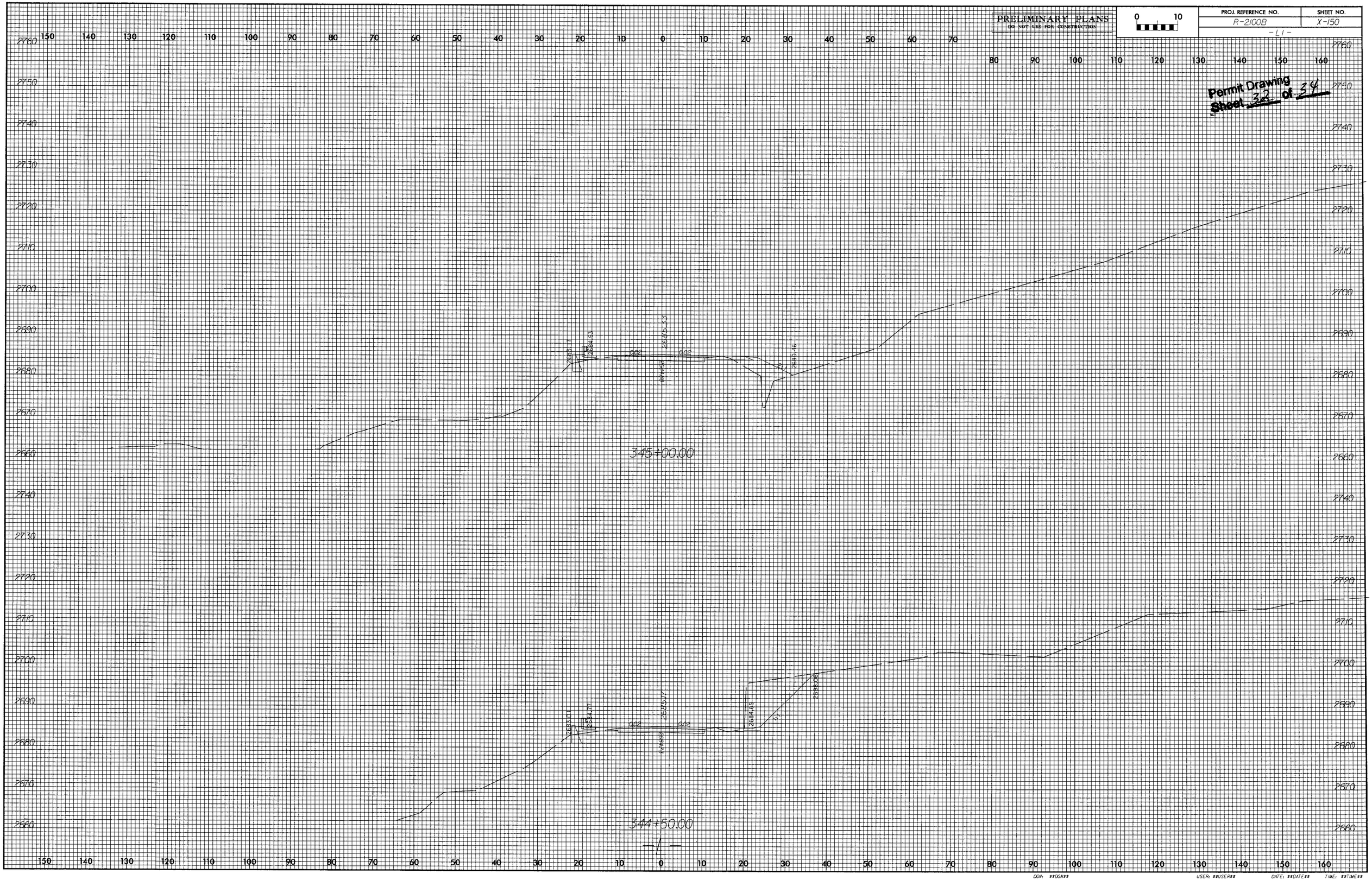


DGN: $$DGN$$ USER: $$USER$$ DATE: $$DATE$$ TIME: $$TIME$$

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROJ. REFERENCE NO.	SHEET NO.
R-2100B	X-150
-L1-	

Permit Drawing
Sheet 32 of 34



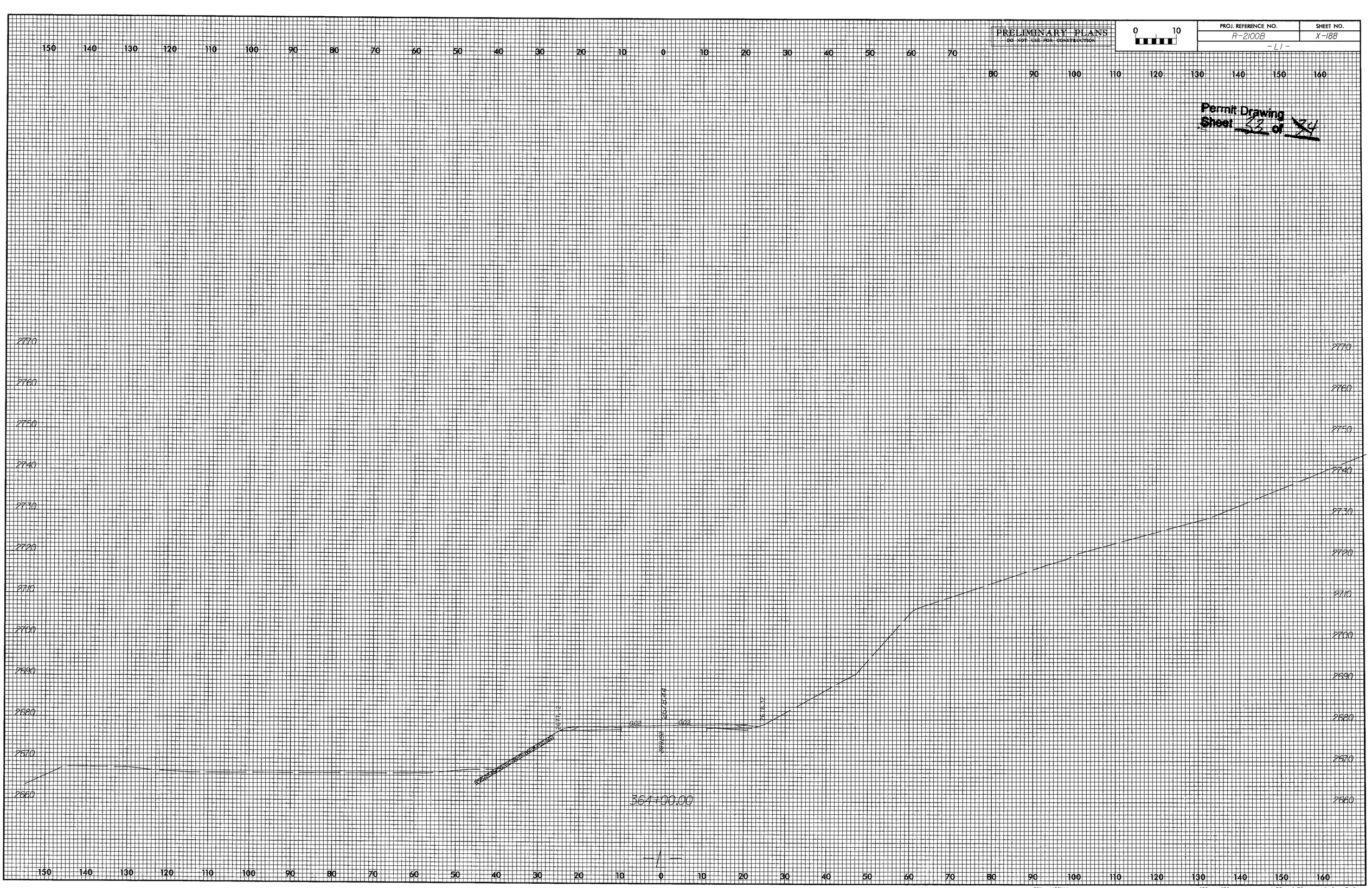
DGN: $$DGN$$ USER: $$USER$$ DATE: $$DATE$$ TIME: $$TIME$$

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

0 10

PROJ. REFERENCE NO.	SHEET NO.
R-2100B	X-188
-L1-	

Permit Drawing
Sheet 23 of 34

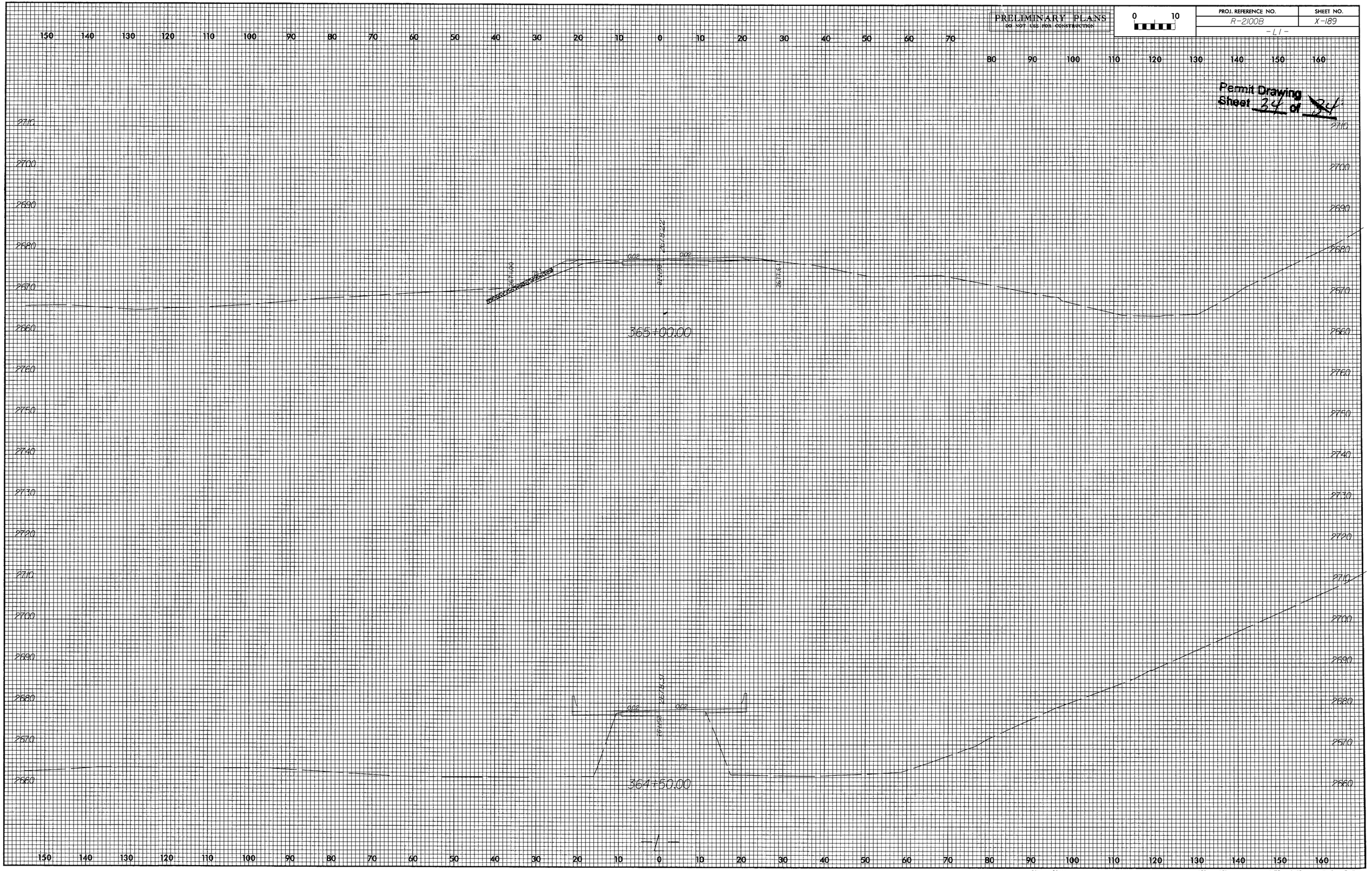


PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

0 10

PROJ. REFERENCE NO.	SHEET NO.
R-2100B	X-189
-L1-	

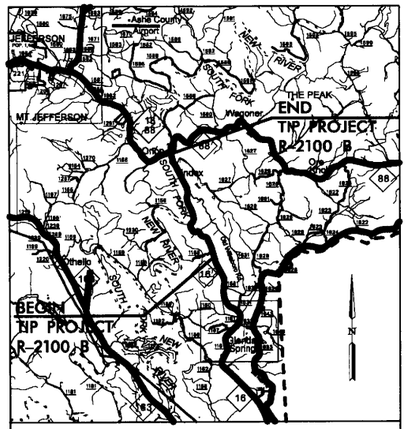
Permit Drawing
Sheet 2 of 2



OGN: $$OGN$$ USER: $$USER$$ DATE: $$DATE$$ TIME: $$TIME$$

CONTRACT: TIP PROJECT: R-2100B

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



VICINITY MAP
(NOT TO SCALE)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

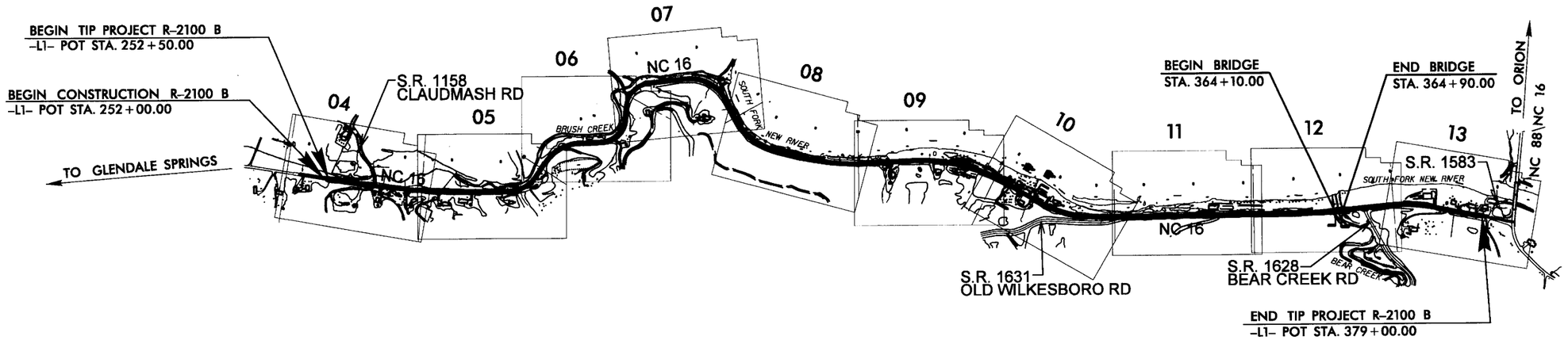
ASHE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2100B	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34369.1.1	STP - 16 (1)	PE
34369.2.4	STP - 0016 (4)	R/W & UTILITIES

LOCATION: NC 16 FROM SOUTHEAST OF SR 1158 TO SOUTHEAST OF NC 88

TYPE OF WORK: CULVERTS, GRADING, DRAINAGE, PAVING, LONGLIFE PAVEMENT MARKERS AND SNOWPLOWABLE PAVEMENT MARKERS



NOTE: BURY PIPES AT JURISDICTIONAL STREAMS 20% OF PIPE DIAMETER UP TO 1 FOOT.

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

FUNCTIONAL CLASSIFICATION:
RURAL MAJOR COLLECTOR
ADT 2005 = 3000
ADT 2030 = 6100
DHV = 13 %
D = 60 %
T = 9 % *
V = 60 MPH
* TTST=6 % DUAL=3%
·DESIGN EXCEPTION REQUIRED FOR HORIZONTAL AND VERTICAL ALIGNMENTS LESS THAN 60 MPH

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2100B = 2.38 MI.

LENGTH STRUCTURES TIP PROJECT R-2100B = 0.02 MI.

TOTAL LENGTH TIP PROJECT R-2100B = 2.40 MI.

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

Prepared In the Office of:
EarthTech
FOR THE N. C. DEPT. OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE: December 21, 2007	G. TOM SHEARIN, P.E. *PROJECT ENGINEER*
LETTING DATE: November 17, 2009	KEVIN M. HAUGHEY, P.E. *PROJECT DESIGN ENGINEER*
NCDOT CONTACT:	B. D. TAYLOR, P.E. *PROJECT ENGINEER - ROADWAY DESIGN*

HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER *P.E.*

DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION

APPROVED DIVISION ADMINISTRATOR *DATE*

PROJECT REFERENCE NO.	SHEET NO.
K-2100 B	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 — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing High Quality Wetland Boundary — HQ 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
- River Basin Buffer — RBB
- Flow Arrow
- Disappearing Stream
- Spring
- Swamp Marsh
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

- Standard Guage — 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 Utility Easement — PUE

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
- Curb Cut for Future Wheel Chair Ramp — CCFR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equaility 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 — HH
- 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.

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

EarthTech
A Tyco International Ltd. Company

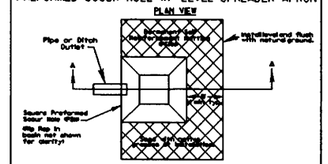
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

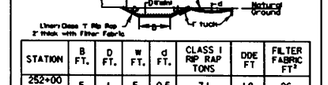
REVISION 1: 8/12/2008 Added existing Right-of-Way elements left and right of 253+00. Changed Property Line between Parcel 2 and Parcel 3. Changed limits of R/W for On Site Mitigation area left of 262+00.
REVISION 2: 1/13/2009 Changed name and deed book reference for parcels 7, 9, and 11 to standard 40.0' width and added easements.

DETAIL A
PREFORMED SCOUR HOLE W/ LEVEL SPREADER APRON

PLAN VIEW



SECTION A-A



STATION	B FT.	D FT.	W FT.	d FT.	CLASS I RIP RAP TONS	DDE FT	FILTER FABRIC FT²
252+00 LT	5	1	5	0.5	7J	L8	26
256+80 LT	5	1	5	0.5	7J	L8	26

-L 1- POT STA 252+50.00
BEGIN TIP PROJECT R-2100 B

-L 1- POT STA 252+00.00
BEGIN CONSTRUCTION R-2100 B

-BY-155
5+00.00 POT

-BY-154
6+62.67 PINC

-BY-153
8+09.95 PINC

-BY-148
10+03.47 PINC

-L 1-

PIs Sta 255+31.43	PI Sta 261+34.54	PIs Sta 267+35.50
Θs = 0° 20' 15.0"	Δ = 8° 34' 49.8" (LT)	Θs = 0° 20' 15.0"
Ls = 90.00'	D = 0° 45' 00.0"	Ls = 90.00'
LT = 60.00'	L = 1,144.07'	LT = 60.00'
ST = 30.00'	T = 573.10'	ST = 30.00'
	R = 7,639.44'	
	Ds = 60 mph	
	e MAX = 0.08	
	e = 0.03	
	Ro = 90.00'	

BL-33
PINC 19+62.18
-BY- 11+62.35
-LI- 256+71.68 OFFSET 17.52 LT.

BM#1
-BY- 5+17.49
13.96 RIGHT
ELEV=2826.77'

1 FRED N. MASH DB 126 PG 452
2 LORRAINE MASH DB X5 PG 533
3 JAMES C. DANCY DB 205 PG 973
4 MARSHALL W. BLACK DB 0-5 PG 519
5 PAMELA S. MILLER DB 198 PG 2042
6 FLORENCE M. MILLER DB 342 PG 907 PB 5 PG 617
7 MOZELLE M. RIVERS DB 144 PG 1560
8 RICKY D. ROTEN BRENDA K. ROTEN DB 341 PG 339
9 GLADYS MCNEIL DB 134 PG 1228
10 CARL POE DB 210 PG 44
11 PAUL CHARLES BROWN -KIMBERLY G. BROWN DB 348 PG 998

POT Sta. 249+50.00
TIE TO EXISTING GUARDRAIL
BEGIN WALL +00.00
END WALL +00.00
BEGIN EXPRESSWAY GUTTER +00.00
END EXPRESSWAY GUTTER +60.00
MATCHLINE STA. 262+00.00 SEE SHEET 5
-L 1-
N 15°52'17.3"W
PSH SEE DETAIL 'A'
RETAIN
REMOVE
REMOVE HW
FILL W/ FLOWABLE FILL
PLUG
SPECIAL DITCH STA 257+20 TO 258+70 -L- RT
FOR -L- PROFILE SEE SHEET 14

REVISION 2: 1/21/2009 Changed name and deed book reference for parcels 6 ,8, and 11.

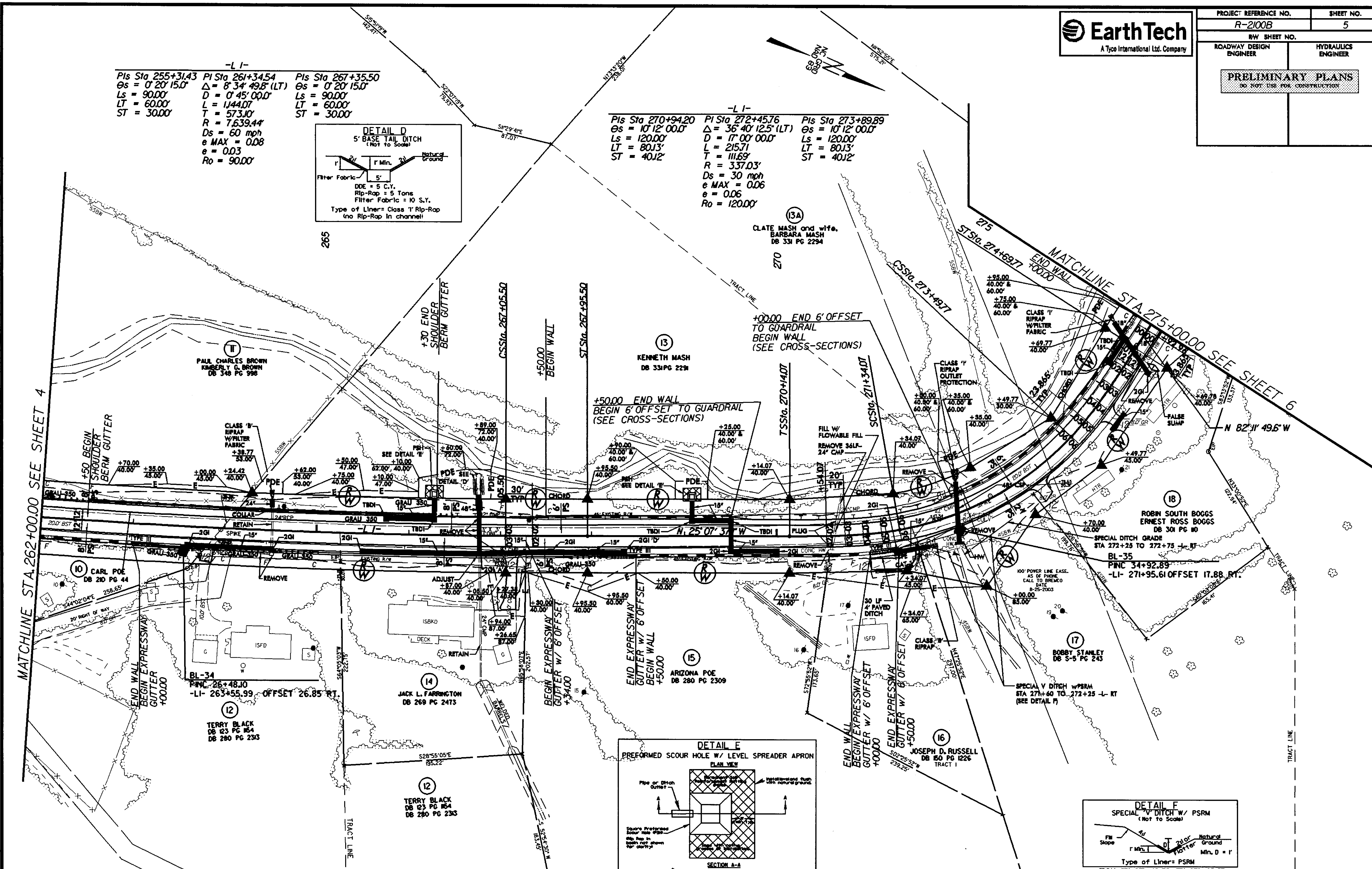
PROJECT REFERENCE NO.	SHEET NO.
R-2100B	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

EarthTech
A Tyco International Ltd. Company

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

REVISION: 8/12/2008 Changed property owner and deed book number for Parcel 13. Renumbered a tract of Parcel 13 to 13A and changed owner name and deed book number. Changed name and deed book number for Parcel 16. Changed limits of On Site Mitigation left of 264+00. Added easement for driveway right of 267+00.
REVISION 2: 10/23/2008 Modified drainage system at 269+50.
REVISION 3: 12/19/2008 Added Deed Book Number for parcel 12. Changed Property Owner Name for parcel 15.



-L1-
PIs Sta 255+31.43 Θs = 0° 20' 15.0" Ls = 90.00' LT = 60.00' ST = 30.00'
PI Sta 261+34.54 Δ = 8° 34' 49.8" (LT) D = 0° 45' 00.0" L = 1,144.07 T = 573.10' R = 7,639.44' Ds = 60 mph e MAX = 0.08 e = 0.03 Ro = 90.00'
PIs Sta 267+35.50 Θs = 0° 20' 15.0" Ls = 90.00' LT = 60.00' ST = 30.00'
PIs Sta 270+94.20 Θs = 10° 12' 00.0" Ls = 120.00' LT = 80.13' ST = 40.12'
PI Sta 272+45.76 Δ = 36° 40' 12.5" (LT) D = 17° 00' 00.0" L = 215.71 T = 111.69' R = 337.03' Ds = 30 mph e MAX = 0.06 e = 0.06 Ro = 120.00'
PIs Sta 273+89.89 Θs = 10° 12' 00.0" Ls = 120.00' LT = 80.13' ST = 40.12'
DETAIL D
5' BASE TAIL DITCH (Not to Scale)
DDE = 5 C.Y. Rip-Rap = 5 Tons Filter Fabric = 10 S.Y.
Type of Liner= Class 'I' Rip-Rap (no Rip-Rap in channel)
MATCHLINE STA. 262+00.00 SEE SHEET 4
MATCHLINE STA 275+00.00 SEE SHEET 6
PAUL CHARLES BROWN KIMBERLY C. BROWN DB 348 PG 998
KENNETH MASH DB 331 PG 2291
CLATE MASH and wife, BARBARA MASH DB 331 PG 2294
CARL POE DB 210 PG 44
TERRY BLACK DB 123 PG 1164 DB 280 PG 2313
JACK L. FARRINGTON DB 269 PG 2473
ARIZONA POE DB 280 PG 2309
JOSEPH D. RUSSELL DB 150 PG 1226 TRACT I
BOBBY STANLEY DB S-5 PG 243
ROBIN SOUTH BOGGS ERNEST ROSS BOGGS DB 301 PG 110
BL-34 PINC 26+48.10 -L1- 263+55.99 OFFSET 26.85' RT.
BL-35 PINC 34+92.89 -L1- 271+95.61 OFFSET 17.88' RT.
N 82° 11' 49.6" W
+00.00 END 6' OFFSET TO GUARDRAIL BEGIN WALL (SEE CROSS-SECTIONS)
+50.00 END WALL BEGIN 6' OFFSET TO GUARDRAIL (SEE CROSS-SECTIONS)
SPECIAL DITCH GRADE STA 272+25 TO 272+75 -L- RT
SPECIAL V DITCH w/PSRM STA 271+60 TO 272+25 -L- RT (SEE DETAIL F)

DETAIL E
PREFORMED SCOUR HOLE W/ LEVEL SPREADER APRON
PLAN VIEW
SECTION A-A

STATION	B FT.	D FT.	W FT.	d FT.	CLASS I RIP RAP TONS	DDE FT	FILTER FABRIC FT²
266+27 LT	5	1	5		7.1	1.8	26
269+08 LT	5	1	5		7.1	1.8	26

DETAIL F
SPECIAL "V" DITCH W/ PSRM (Not to Scale)
Type of Liner= PSRM
FROM STA. 271+60 TO STA. 272+25 RT.

REVISION 4: 1/13/2009 Reduced Take for Future Mitigation Site on Parcels 11 and 13 to standard 40.0' width with easements.

REVISION 4: 1/21/2009 Changed name and deed book reference for parcels 11, 12, 15, and 18. Corrected deed book reference for parcel 14. Changed property lines and coverage of parcels 12 and 15. Added opening in guardrail left of -L1- 265+75 to 266+00. Corrected end station label for Retaining Wall, -L1- 271+00, RT. Eliminated Tract 2 of Parcel 18 by merging with Parcel 18.

FOR -L1- PROFILE SEE SHEET 14

REVISIONS

REVISION: 6/5/2008 Renumbered a tract of Parcel 13 to 13A and changed owner name and deed book number.
REVISION: 6/5/2008 Change property owner name for Parcel 19
REVISION: 1/13/2009 Changed name and deed book reference for Parcel 18. Eliminated Tract 2 of Parcel 18 by merging with Parcel 18.

USER: ##USER##
DATE: ##DATE##
TIME: ##TIME##
DGN: ##DGN##

EarthTech
A Tyco International Ltd. Company

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-DRI-
PI Sta 10+35.87
Δ = 61° 45' 00.0" (LT)
D = 95° 29' 34.7"
L = 64.66'
T = 35.87'
R = 60.00'

PI Sta 10+87.59
Δ = 34° 00' 00.0" (RT)
D = 76° 23' 39.7"
L = 44.51'
T = 22.93'
R = 75.00'

-LI-
PI Sta 284+22.48
Δ = 84° 37' 04.7" (LT)
D = 23° 00' 00.0"
L = 367.90'
T = 226.75'
R = 249.11'
Ds = 30 mph
e MAX = 0.08
e = 0.08
Ro = 160.00'

-LI-
PI Sta 288+97.52
Δ = 79° 57' 49.4" (RT)
D = 23° 00' 00.0"
L = 347.67'
T = 208.90'
R = 249.11'
Ds = 30 mph
e MAX = 0.08
e = 0.08
Ro = 160.00'

-LI-
PIs Sta 275+96.23
Θs = 8° 42' 00.0"
Ls = 120.00'
LT = 80.10'
ST = 40.09'

PI Sta 277+73.35
Δ = 38° 17' 59.0" (RT)
D = 14° 30' 00.0"
L = 264.14'
T = 137.22'
R = 395.14'
Ds = 35 mph
e MAX = 0.06
e = 0.06
Ro = 120.00'

PIs Sta 279+40.36
Θs = 8° 42' 00.0"
Ls = 120.00'
LT = 80.10'
ST = 40.09'

DETAIL H
PREFORMED SCOUR HOLE W/ LEVEL SPREADER APRON
PLAN VIEW
SECTION A-A

STATION	B FT.	D FT.	W FT.	d FT.	CLASS I RIP RAP TONS	DDE FT	FILTER FABRIC S.Y.
282+60 LT	5	1	5	0.5	7.1	L.8	26
285+85 RT	5	1	5	0.5	7.1	L.8	26

(20) TABERNACLE BAPTIST CHURCH TRUSTEES
DB 196 PG 1490

DETAIL G
3' BASE TAIL DITCH
(NOT to Scale)
DDE = 3 C.Y.
Rip-Rap = 5 Tons
Filter Fabric = 5 S.Y.
Type of Liner= Class 'I' Rip-Rap
(no Rip-Rap in channel)

(19) KATHY MUDLER GALATI
DB 556 PG 663
DB 203 PG 353

(13A) CLATE MASH and wife: BARBARA MASH
DB 331 PG 2294

(18) ROBIN SOUTH BOGGS
ERNEST ROSS BOGGS
DB 301 PG 110

(17) BOBBY STANLEY
DB 46 PG 361

(21) DALE C. SHEETS TRUSTEE
DB 250 PG 99

(24) MARY F. AVERY
DB 260 PG 2190

DETAIL C1
DRIVEWAY TYPICAL DITCH
(Not to Scale)
Type of Liner= Class 'B' Rip-Rap
FROM STA. 277+85 TO STA. 279+00 RT.

DETAIL L
LATERAL 5' BASE DITCH
(Not to Scale)
Type of Liner= Class 'I' Rip-Rap
FROM STA. 283+40 TO STA. 284+35 RT.

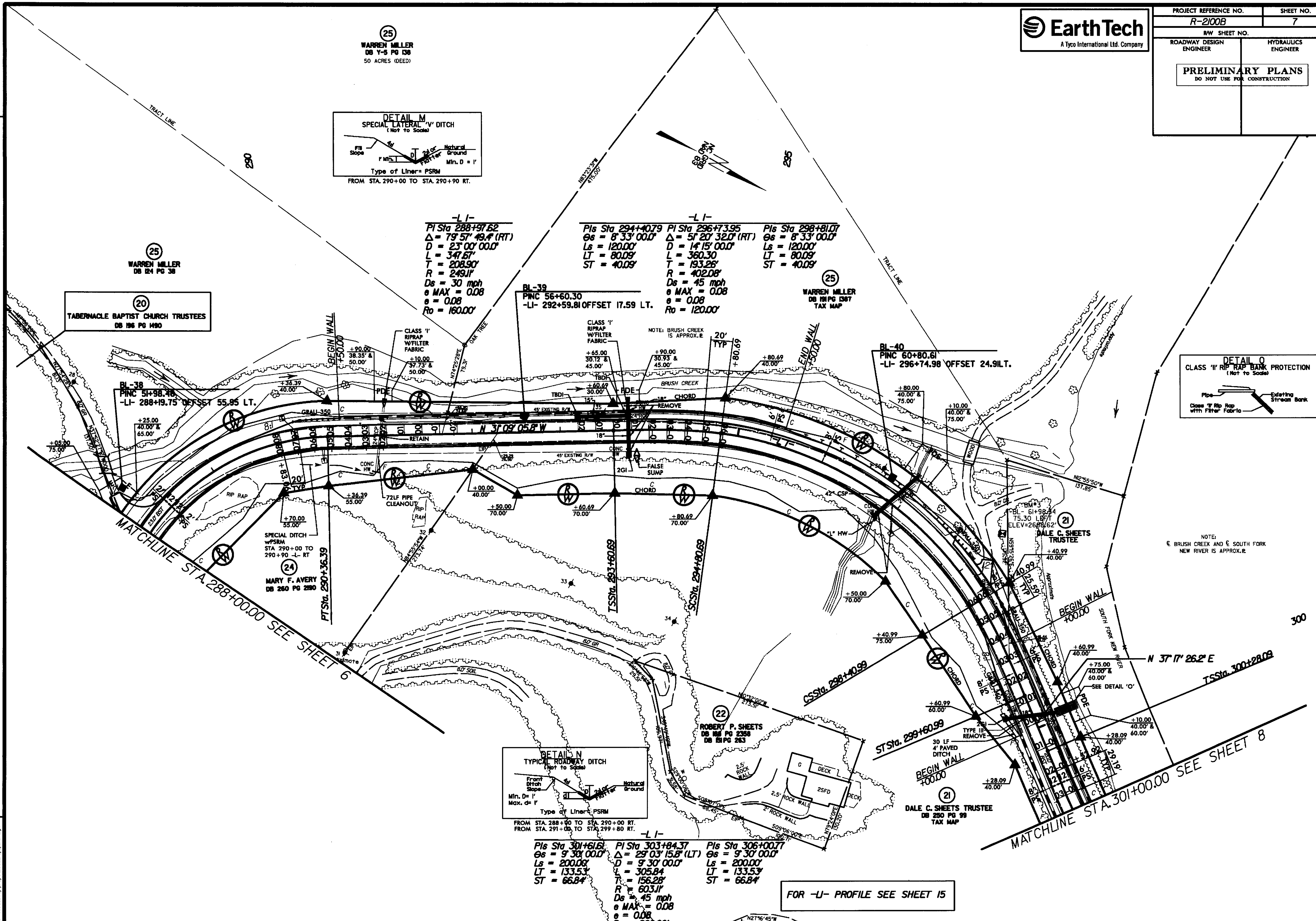
DETAIL K
TYPICAL LATERAL 'V' DITCH
(Not to Scale)
Type of Liner= Class 'B' Rip-Rap
FROM STA. 283+00 TO STA. 283+25 RT.

DETAIL J
TYPICAL LATERAL 'V' DITCH
(Not to Scale)
Type of Liner= PSRM
FROM STA. 279+00 TO STA. 280+17 RT.

FOR -LI- PROFILE SEE SHEETS 14 & 15
FOR -DRI- PROFILE SEE SHEETS 19

MATCHLINE STA. 275+00.00 SEE SHEET 5

MATCHLINE STA. 288+00.00 SEE SHEET 7



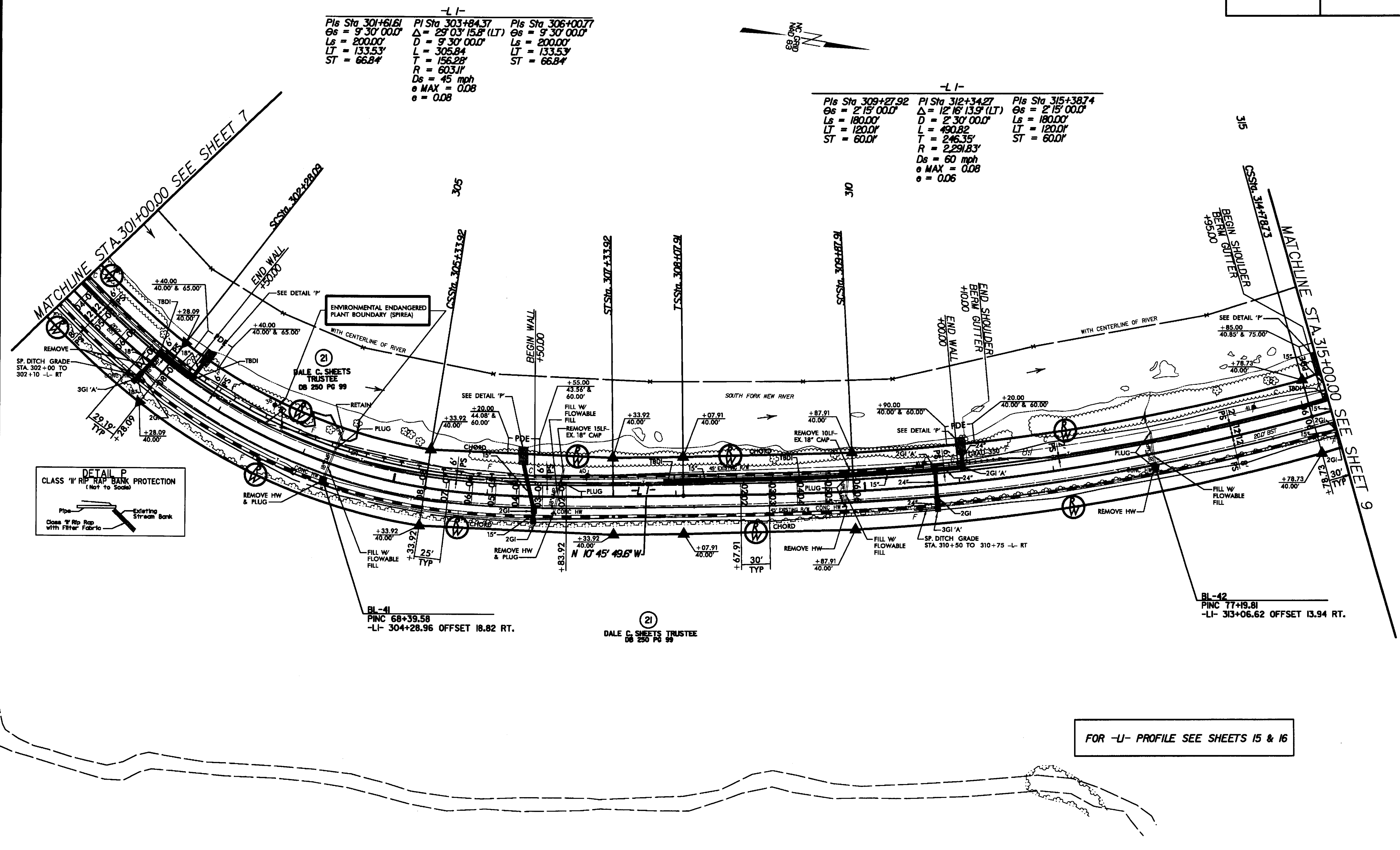
REVISIONS

REVISION 1: 10/23/2008 Removed proposed riprap at pipe outlet 45' LT of 297+00.

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

EarthTech
A Tyco International Ltd. Company

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-L1-
PIs Sta 301+61.61
Θs = 9° 30' 00.0"
Ls = 200.00'
LT = 133.53'
ST = 66.84'
PI Sta 303+84.37
Δ = 29° 03' 15.8" (LT)
D = 9° 30' 00.0"
L = 305.84
T = 156.28'
R = 603.11'
Ds = 45 mph
e MAX = 0.08
e = 0.08
PIs Sta 306+00.77
Θs = 9° 30' 00.0"
Ls = 200.00'
LT = 133.53'
ST = 66.84'
-L1-
PIs Sta 309+27.92
Θs = 2° 15' 00.0"
Ls = 180.00'
LT = 120.01'
ST = 60.01'
PI Sta 312+34.27
Δ = 12° 16' 13.9" (LT)
D = 2° 30' 00.0"
L = 490.82
T = 246.35'
R = 2,291.83'
Ds = 60 mph
e MAX = 0.08
e = 0.06
PIs Sta 315+38.74
Θs = 2° 15' 00.0"
Ls = 180.00'
LT = 120.01'
ST = 60.01'
NC GRID NAD 83
MATCHLINE STA. 301+00.00 SEE SHEET 7
MATCHLINE STA. 315+00.00 SEE SHEET 9
SCSta. 302+28.09
CSSta. 305+33.92
STSta. 307+33.92
TSSta. 308+07.91
SCSta. 309+87.91
CSSta. 314+78.73
END WALL +50.00
BEGIN WALL +50.00
END WALL +00.00
END SHOULDER BERM GUTTER +10.00
BEGIN SHOULDER BERM GUTTER +95.00
ENVIRONMENTAL ENDANGERED PLANT BOUNDARY (SPIREA)
WITH CENTERLINE OF RIVER
SOUTH FORK NEW RIVER
DALE C. SHEETS TRUSTEE
DB 250 PG 99
SEE DETAIL 'P'
REMOVE HW & PLUG
FILL W/ FLOWABLE FILL
REMOVE 15LF-EX. 18" CMP
REMOVE 10LF-EX. 18" CMP
SP. DITCH GRADE STA. 302+00 TO 302+10 -L- RT
SP. DITCH GRADE STA. 310+50 TO 310+75 -L- RT
N 10° 45' 49.6" W
DETAIL P
CLASS 'II' RIP RAP BANK PROTECTION
(Not to Scale)
Pipe
Existing Stream Bank
Class 'II' Rip Rap with Filter Fabric
BL-41
PINC 68+39.58
-L1- 304+28.96 OFFSET 18.82 RT.
BL-42
PINC 77+19.81
-L1- 313+06.62 OFFSET 13.94 RT.
FOR -L1- PROFILE SEE SHEETS 15 & 16

REVISIONS

EarthTech
A Tyco International Ltd. Company

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

-L 1-
PIs Sta 309+27.92
Es = 2'15' 00.0"
Ls = 180.00'
LT = 120.01'
ST = 60.01'

PI Sta 312+34.27
Δ = 12°16' 13.9" (LT)
D = 2° 30' 00.0"
L = 490.82
T = 246.35'
R = 2,291.83'
Ds = 60 mph
e MAX = 0.08
e = 0.06
Ro = 180.00'

PIs Sta 315+38.74
Es = 2'15' 00.0"
Ls = 180.00'
LT = 120.01'
ST = 60.01'

-L 1-
PIs Sta 321+14.55
Es = 4°12' 00.0"
Ls = 240.00'
LT = 160.05'
ST = 80.04'

PI Sta 325+44.53
Δ = 24°08' 19.1" (RT)
D = 3° 30' 00.0"
L = 689.68
T = 350.03'
R = 1637.02'
Ds = 60 mph
e MAX = 0.08
e = 0.06
Ro = 240.00'

PIs Sta 329+64.22
Es = 4°12' 00.0"
Ls = 240.00'
LT = 160.05'
ST = 80.04'

SLOPE PROTECTION DETAIL
RIP RAP BANK PROTECTION
(Not to Scale)
50 Year WS El. +2.0'
3.0'
Type of Liner= Class 'II' Rip-Rap w/ Filter Fabric
STA. 315+75 TO STA. 329+50 LT.

DETAIL Q
BASE TAIL DITCH
(Not to Scale)
3.0' Min.
Natural Ground
Filter Fabric
VARIES 6' TO 3'
DDE = 45 C.Y.
Rip-Rap = 45 Tons
Filter Fabric = 70 S.Y.
Type of Liner= Class 'I' Rip-Rap

DETAIL S
BASE TAIL DITCH
(Not to Scale)
2.0' Min.
Natural Ground
Filter Fabric
VARIES 4' TO 2'
DDE = 15 C.Y.
Rip-Rap = 20 Tons
Filter Fabric = 25 S.Y.
Type of Liner= Class 'I' Rip-Rap

DETAIL T
2' BASE TAIL DITCH DETAIL
(Not to Scale)
Natural Ground
1.5' Min.
Natural Ground
DDE = 40 C.Y. ±

MATCHLINE STA. 315+00.00 SEE SHEET 8

MATCHLINE STA. 329+00.00 SEE SHEET 10

SOUTH FORK NEW RIVER

POT STA. 10+00.00 -DR2- =
POC STA. 324+25.00 -LI-

BL-43
PINC 86+33.25
-LI- 322+17.49 OFFSET 19.42 LT.

BL-44
PINC 92+65.46
-LI- 328+46.39 OFFSET 18.15 LT.

N 14° 58' 34.2" W
S 82° 51' 35.3" W

-DR2-

PI Sta 10+41.93
Δ = 82° 09' 50.4" (RT)
D = 286° 28' 44.0"
L = 28.68'
T = 17.44'
R = 20.00'

PI Sta 11+10.38
Δ = 11° 48' 00.0" (LT)
D = 28° 38' 52.4"
L = 41.19'
T = 20.67'
R = 200.00'

PI Sta 11+54.15
Δ = 13° 15' 36.0" (RT)
D = 28° 38' 52.4"
L = 46.28'
T = 23.25'
R = 200.00'

PEGGY HARTZOG
DB 170 PG 238

PEGGY HARTZOG
DB 247 PG 1992
DB 170 PG 238

R.J. COMBS
DB 123 PG 272

JEFFREY MILLER
DB 272 PG 845
PB 1 PG 71

JOE DAVID HAMBY
DB 138 PG 195
PB 001 PG 071

BOBBY G. HAMBY
DB 227 PG 392
PB 001 PG 071

IRENE BARE SHEETS
DB S-3 PG 254

SLOPE PROTECTION DETAIL
RIP RAP BANK PROTECTION
(Not to Scale)
50 Year WS El. +2.0'
3.0'
Type of Liner= Class 'II' Rip-Rap w/ Filter Fabric
STA. 315+75 TO STA. 330+60 LT.

DETAIL 'R'
RIP RAP BANK PROTECTION
(Not to Scale)
Ditch Grade
10'
L.5:1
1.5'
Type of Liner= Class 'I' Rip-Rap w/ Filter Fabric

FOR -LI- PROFILE SEE SHEET 16
FOR -DR2- PROFILE SEE SHEET 19
FOR -DR3- PROFILE SEE SHEET 19

USER: ##USER##
DATE: ##DATE##
TIME: ##TIME##
DGN: ##DGN##

EarthTech
A Tyco International Ltd. Company

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

REVISION 1: 8/12/2008 Added improvements to Parcels 33 and 37. Moved drive left of 330+00. Added driveways left of 330+80 and 331+75.

REVISION 2: 10/23/2008 Changed station range on the Slope Protection Detail.

USER: pmiller/rtm
DATE: 10/23/2008
TIME: 3:32:08 PM
DGN: N:\roadway\proj\R2100b_rdy_pan01.dgn

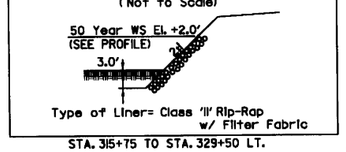
-L 1-

Pls Sta 321+14.55	Pl Sta 325+44.53	Pls Sta 329+64.22
Θs = 4°12'00.0"	Δ = 24°08'19.1" (RT)	Θs = 4°12'00.0"
Ls = 240.00'	D = 3°30'00.0"	Ls = 240.00'
LT = 160.05'	L = 689.68	LT = 160.05'
ST = 80.04'	T = 350.03'	ST = 80.04'
	R = 1637.02'	
	Ds = 60 mph	
	e MAX = 0.08	
	e = 0.08	
	Ro = 240.00'	

-DR3-

Pl Sta 10+46.94	Pl Sta 11+10.41
Δ = 92°34'58.8" (LT)	Δ = 9°31'23.9" (RT)
D = 286°28'44.0"	D = 28°38'52.4"
L = 32.32'	L = 33.59'
T = 20.92'	T = 16.84'
R = 20.00'	R = 200.00'

SLOPE PROTECTION DETAIL
RIP RAP BANK PROTECTION
(Not to Scale)



Type of Liner= Class 'II' Rip-Rap w/ Filter Fabric
STA. 315+75 TO STA. 329+50 LT.

DETAIL X
3' BASE TAIL DITCH
(Not to Scale)

DDE = 15 C.Y.
Rip-Rap = 20 Tons
Filter Fabric = 25 S.Y.
Type of Liner= Class 'I' Rip-Rap

-DR3-
Pl Sta 10+57.51
Δ = 84°00'00.0" (LT)
D = 229°10'59.2"
L = 36.65'
T = 22.51'
R = 25.00'

-DR4-
Pl Sta 10+91.11
Δ = 68°45'09.7" (RT)
D = 163°42'08.0"
L = 42.00'
T = 23.94'
R = 35.00'

MATCHLINE STA.329+00.00 SEE SHEET 9

MATCHLINE STA.342+00.00 SEE SHEET 11

CSSta. 332+57.27
CSSta. 334+97.27
CSSta. 339+38.83
STSta. 341+78.83

POT Sta. 11+18.20
PT Sta 11+09.17
PC Sta. 10+67.11
POT STA 10+00.00 -DR4-=
POC STA 333+61.70 -LI-
POT STA 10+00.00 -DR3-=
POS STA 330+80.00 -LI-
BL-45
PINC 91+8.29
-LI- 333+49.1 OFFSET 27.09 RT.
BL-46
PINC 105+51.40
-BYI- 5+00.00 POT
-LI- 341+27.83 OFFSET 19.80 RT.
-BYI-156
12+06.10 PINC
-BYI-149
7+25.15 PINC
-BYI- 6+04.57
31.30' LEFT
ELEV=2697.24'
BM#5

SOUTH FORK NEW RIVER

CLASS 'I' RIPRAP W/FILTER FABRIC

REMOVE 16 LF OF 24" CMP

BEGIN WALL +50.00

N 25°39'58.1"W

N 68°05'32"E 402.69'

N 23°49'48"W 29.20'

-L I-

Pls Sta 334+17.34	Pl Sta 337+20.29	Pls Sta 340+18.90
Θs = 5°24'00.0"	Δ = 19°52'13.6" (LT)	Θs = 5°24'00.0"
Ls = 240.00'	D = 4°30'00.0"	Ls = 240.00'
LT = 160.07'	L = 441.57'	LT = 160.07'
ST = 80.07'	T = 223.02'	ST = 80.07'
	R = 1273.24'	
	Ds = 60 mph	
	e MAX = 0.08	
	e = 0.08	
	Ro = 240.00'	

FOR -LI- PROFILE SEE SHEETS 16 & 17
FOR -DR3- PROFILE SEE SHEETS 19
FOR -DR4- PROFILE SEE SHEETS 19

EarthTech
A Tyco International Ltd. Company

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

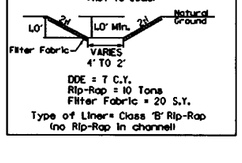
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NC GRID NAD 83

REVISIONS

345 350 355

DETAIL 'Z'
5' BASE TAIL DITCH
(Not to Scale)



DDE = 7 C.Y.
Rip-Rap = 10 Tons
Filter Fabric = 20 S.Y.
Type of Liner= Class 'B' Rip-Rap
(no Rip-Rap in channel)

MATCHLINE STA 342+00.00 SEE SHEET 10

MATCHLINE STA 356+00.00 SEE SHEET 12

SOUTH FORK NEW RIVER

N28°41'48"W 413.26'

N30°44'48"W 712.59'

S27°38'23"E 1246.55'

(40) NEWTON WILLIAM FARRINGTON DB 254 PG 1332

BL-147
PINC 115+10.78
-LI- 350+86.37 OFFSET 18.31 LT.

-L1- N 25° 39' 58" W

SEE DETAIL 'Z'

BEGIN EXPRESSWAY GUTTER +30.00

END EXPRESSWAY GUTTER +50.00

BEGIN EXPRESSWAY GUTTER +50.00

END EXPRESSWAY GUTTER BEGIN WALL +50.00

END WALL +50.00

BEGIN WALL +50.00

END WALL BEGIN SHOULDER BERM GUTTER +50.00

END SHOULDER BERM GUTTER +75.00

CLASS 'B' RIPRAP W/FILTER FABRIC

CLASS 'I' RIPRAP W/FILTER FABRIC

CLASS 'II' RIPRAP W/FILTER FABRIC

ADJUST 1" PLASTIC PIPE

20 LF 4' PAVED DITCH

ISFD BUS

ATTENUATOR

FILL W/ FLOWABLE FILL

PLUG

UNABLE TO GET INV. LOCATION, OR PIPE SIZE

FOR -LI- PROFILE SEE SHEETS 17 & 18

USER: $$USER$$
DATE: $$DATE$$
TIME: $$TIME$$
DGN: $$DGN$$

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
NO RIGHT OF WAY OR CONSTRUCTION

EarthTech
A Tyco International Ltd. Company

-L 1-

PIs Sta 363+65.38	PI Sta 362+19.37	PIs Sta 360+73.31
Θs = 0° 54' 00.0"	Δ = 3° 10' 51.6" (LT)	Θs = 0° 54' 00.0"
Ls = 120.00'	D = 1° 30' 00.0"	Ls = 120.00'
LT = 80.00'	L = 212.07'	LT = 80.00'
ST = 40.00'	T = 106.06'	ST = 40.00'
	R = 3,819.72'	
	Ds = 60 mph	
	e MAX = 0.08	
	e = 0.04	
	Ro = 120.00'	

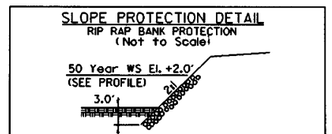
-L 1-

PIs Sta 370+21.11	PI Sta 371+94.30	PIs Sta 373+67.33
Θs = 4° 48' 00.0"	Δ = 7° 26' 56.9" (RT)	Θs = 4° 48' 00.0"
Ls = 240.00'	D = 4° 00' 00.0"	Ls = 240.00'
LT = 160.06'	L = 186.23'	LT = 160.06'
ST = 80.05'	T = 93.25'	ST = 80.05'
	R = 1,432.39'	
	Ds = 60 mph	
	e MAX = 0.08	
	e = 0.08	
	Ro = 240.00'	

-DET L 1-

PI Sta 11+16.98	PI Sta 15+94.16	PI Sta 20+40.42
Δ = 15° 56' 57.7" (LT)	Δ = 25° 04' 45.8" (RT)	Δ = 12° 22' 09.1" (LT)
D = 6° 51' 42.4"	D = 6° 51' 42.4"	D = 6° 51' 42.4"
L = 232.44'	L = 365.49'	L = 180.26'
T = 116.98'	T = 185.72'	T = 90.48'
R = 835.00'	R = 835.00'	R = 835.00'
	Ds = 50 mph	
	e = 0.06	
	Ro = 132.00'	

SLOPE PROTECTION DETAIL
RIP RAP BANK PROTECTION
(Not to Scale)



Type of Liner= Class 'II' Rip-Rap w/ Filter Fabric
STA. 355+75 TO STA. 370+75 LT.

SKETCH SHOWING PROPOSED BRIDGE WIDTH IN RELATION TO PAVEMENT

DETAIL Y
CHANNEL IMPROVEMENT
(Not To Scale)

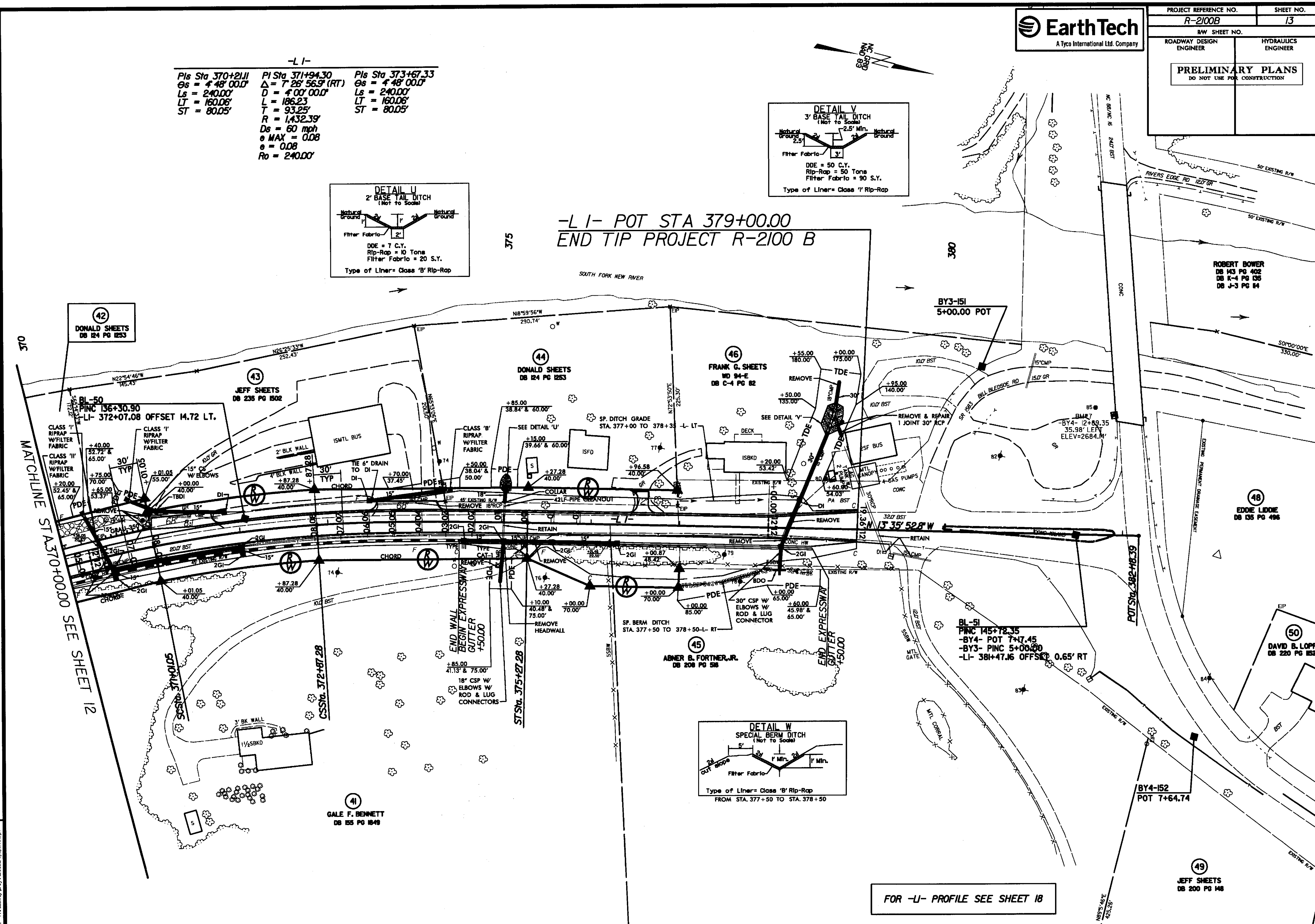
DDE = 825 C.Y.
Rip-Rap = 170 Tons
Filter Fabric = 240 S.Y.

USER: $USER$
DATE: $$DATE$$
TIME: $$TIME$$
DGN: $$DGN$$

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

EarthTech
A Tyco International Ltd. Company

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-L1-
PIs Sta 370+21.11
Θs = 4°48'00.0"
Ls = 240.00'
LT = 160.06'
ST = 80.05'
PI Sta 371+94.30
Δ = 7°26'56.9" (RT)
D = 4°00'00.0"
L = 186.23
T = 93.25'
R = 1,432.39'
Ds = 60 mph
e MAX = 0.08
e = 0.08
Ro = 240.00'
PIs Sta 373+67.33
Θs = 4°48'00.0"
Ls = 240.00'
LT = 160.06'
ST = 80.05'
DETAIL U
2' BASE TAIL DITCH
(Not to Scale)
DDE = 7 C.Y.
Rip-Rap = 10 Tons
Filter Fabric = 20 S.Y.
Type of Liner= Class 'B' Rip-Rap
DETAIL V
3' BASE TAIL DITCH
(Not to Scale)
DDE = 50 C.Y.
Rip-Rap = 50 Tons
Filter Fabric = 90 S.Y.
Type of Liner= Class 'I' Rip-Rap
-L1- POT STA 379+00.00
END TIP PROJECT R-2100 B
SOUTH FORK NEW RIVER
DONALD SHEETS
DB 124 PG 1253
JEFF SHEETS
DB 235 PG 1502
FRANK G. SHEETS
WD 94-E
DB C-4 PG 82
ROBERT BOWER
DB 143 PG 402
DB K-4 PG 135
DB J-3 PG 114
BY3-151
5+00.00 POT
BL-50
PINC 136+30.90
-L1- 372+07.08 OFFSET 14.72 LT.
MATCHLINE STA.370+00.00 SEE SHEET 12
EDDIE LIDDIE
DB 135 PG 496
BL-51
PINC 145+78.35
-BY4- POT 7+17.45
-BY3- PINC 5+00.00
-L1- 381+47.16 OFFSET 0.65' RT
POT Sta. 382+18.39
DAVID B. LOPP
DB 220 PG 152
ABNER B. FORTNER, JR.
DB 208 PG 518
GALE F. BENNETT
DB 155 PG 1849
DETAIL W
SPECIAL BERM DITCH
(Not to Scale)
Type of Liner= Class 'B' Rip-Rap
FROM STA. 377+50 TO STA. 378+50
BY4-152
POT 7+64.74
JEFF SHEETS
DB 200 PG 148
FOR -L1- PROFILE SEE SHEET 18

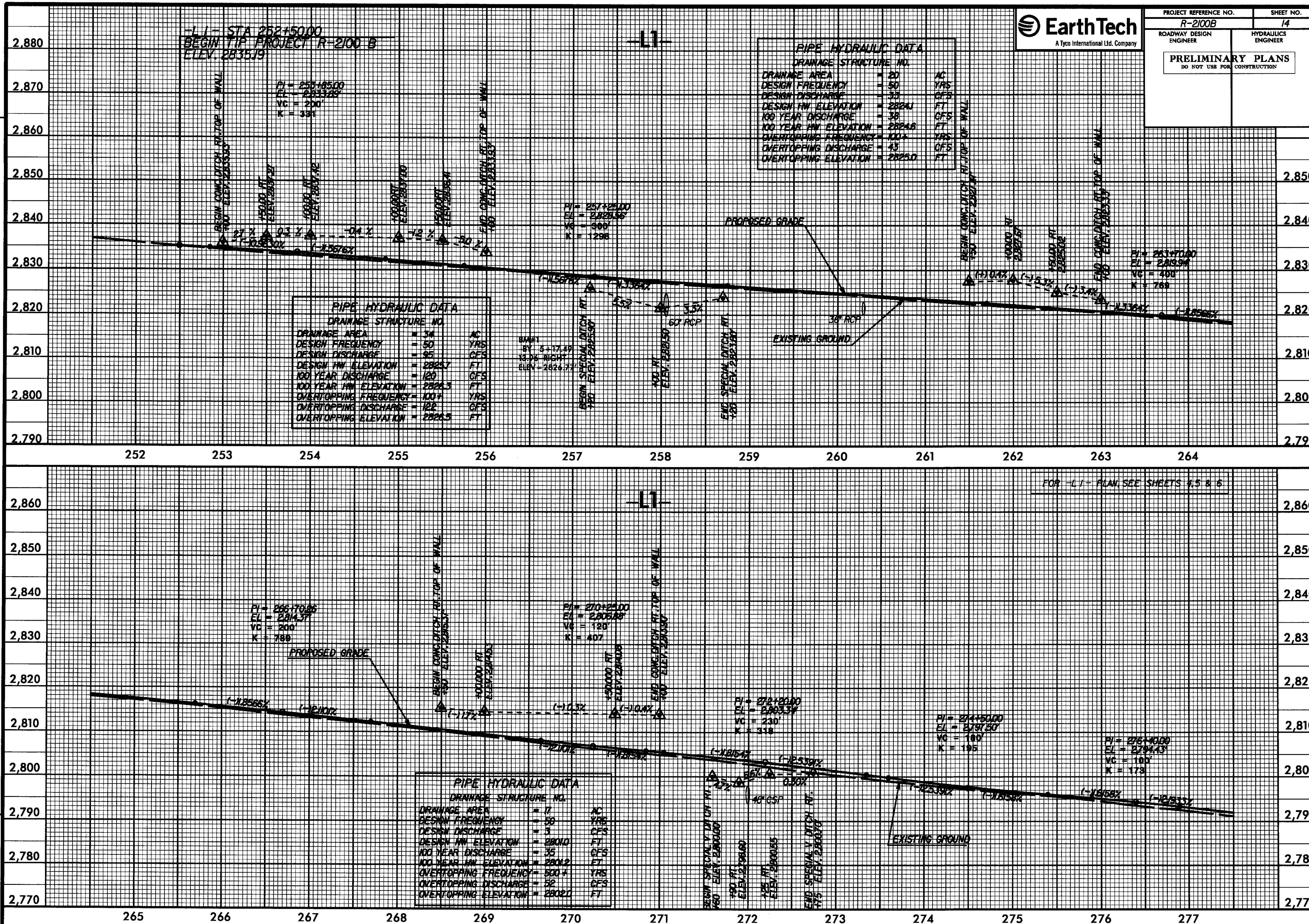
REVISIONS

REVISION: 6/5/2008 Added existing above ground tank to Parcel 46

Earth Tech
A Tyco International Ltd. Company

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	14
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	=	20	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	33	CFS
DESIGN HW ELEVATION	=	2824.1	FT
100 YEAR DISCHARGE	=	38	CFS
100 YEAR HW ELEVATION	=	2824.6	FT
OVERTOPPING FREQUENCY	=	100+	YRS
OVERTOPPING DISCHARGE	=	43	CFS
OVERTOPPING ELEVATION	=	2825.0	FT

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	=	34	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	95	CFS
DESIGN HW ELEVATION	=	2825.7	FT
100 YEAR DISCHARGE	=	120	CFS
100 YEAR HW ELEVATION	=	2826.3	FT
OVERTOPPING FREQUENCY	=	100+	YRS
OVERTOPPING DISCHARGE	=	122	CFS
OVERTOPPING ELEVATION	=	2826.5	FT

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	=	17	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	3	CFS
DESIGN HW ELEVATION	=	2801.0	FT
100 YEAR DISCHARGE	=	35	CFS
100 YEAR HW ELEVATION	=	2801.2	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	52	CFS
OVERTOPPING ELEVATION	=	2802.0	FT

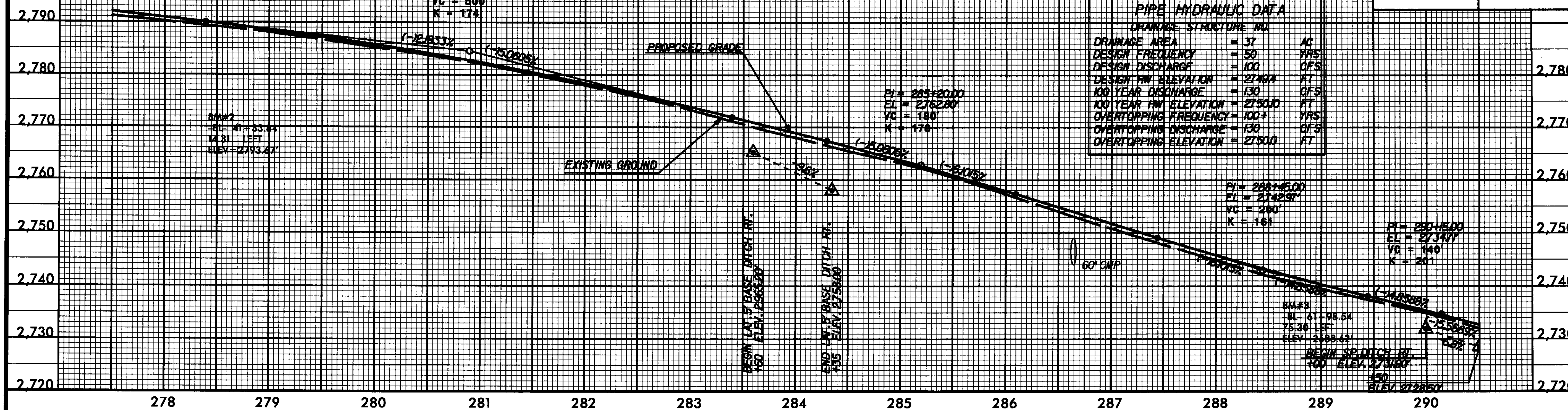
REVISIONS
Revision 0 - 09-24-2004

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

EarthTech
A Tyco International Ltd. Company

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

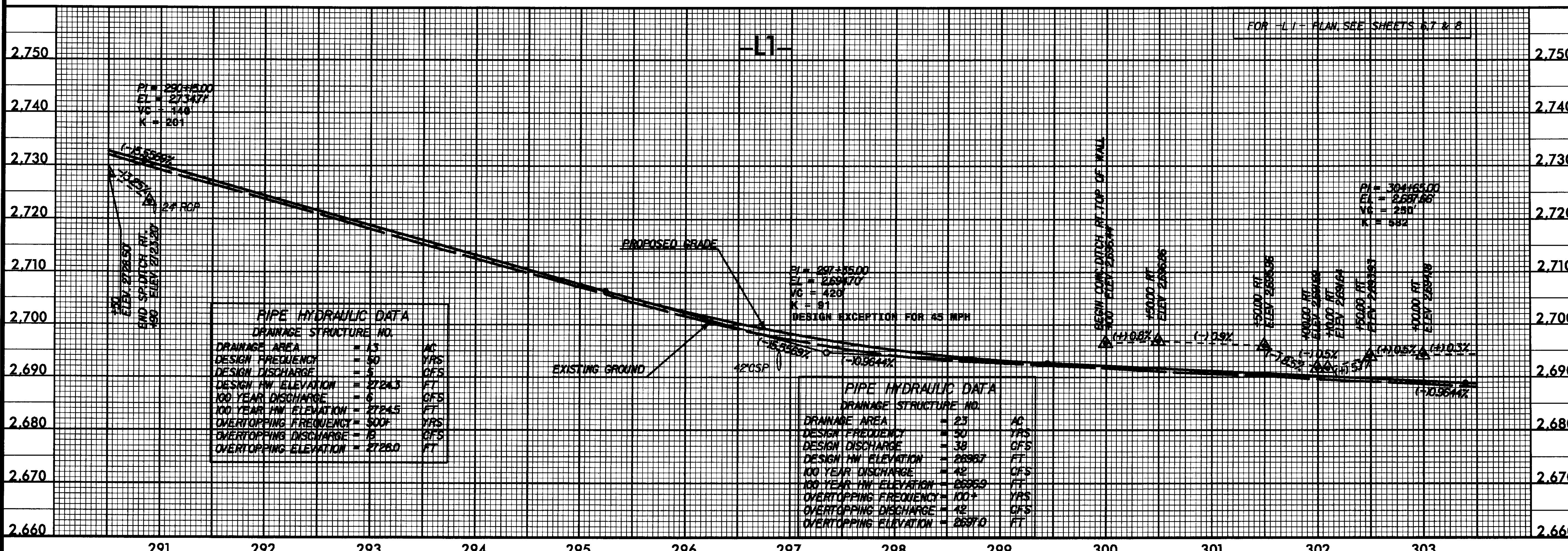
-L1-



PIPE HYDRAULIC DATA		
DRAINAGE STRUCTURE NO.		
DRAINAGE AREA	= 37	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 100	CFS
DESIGN HW ELEVATION	= 2749.4	FT
100 YEAR DISCHARGE	= 130	CFS
100 YEAR HW ELEVATION	= 2750.0	FT
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING DISCHARGE	= 130	CFS
OVERTOPPING ELEVATION	= 2750.0	FT

FOR -L1- PLAN, SEE SHEETS 6,7 & 8

-L1-



PIPE HYDRAULIC DATA		
DRAINAGE STRUCTURE NO.		
DRAINAGE AREA	= 13	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 5	CFS
DESIGN HW ELEVATION	= 2724.3	FT
100 YEAR DISCHARGE	= 6	CFS
100 YEAR HW ELEVATION	= 2724.5	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 19	CFS
OVERTOPPING ELEVATION	= 2726.0	FT

PIPE HYDRAULIC DATA		
DRAINAGE STRUCTURE NO.		
DRAINAGE AREA	= 23	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 38	CFS
DESIGN HW ELEVATION	= 2696.7	FT
100 YEAR DISCHARGE	= 42	CFS
100 YEAR HW ELEVATION	= 2696.9	FT
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING DISCHARGE	= 42	CFS
OVERTOPPING ELEVATION	= 2697.0	FT

REVISIONS

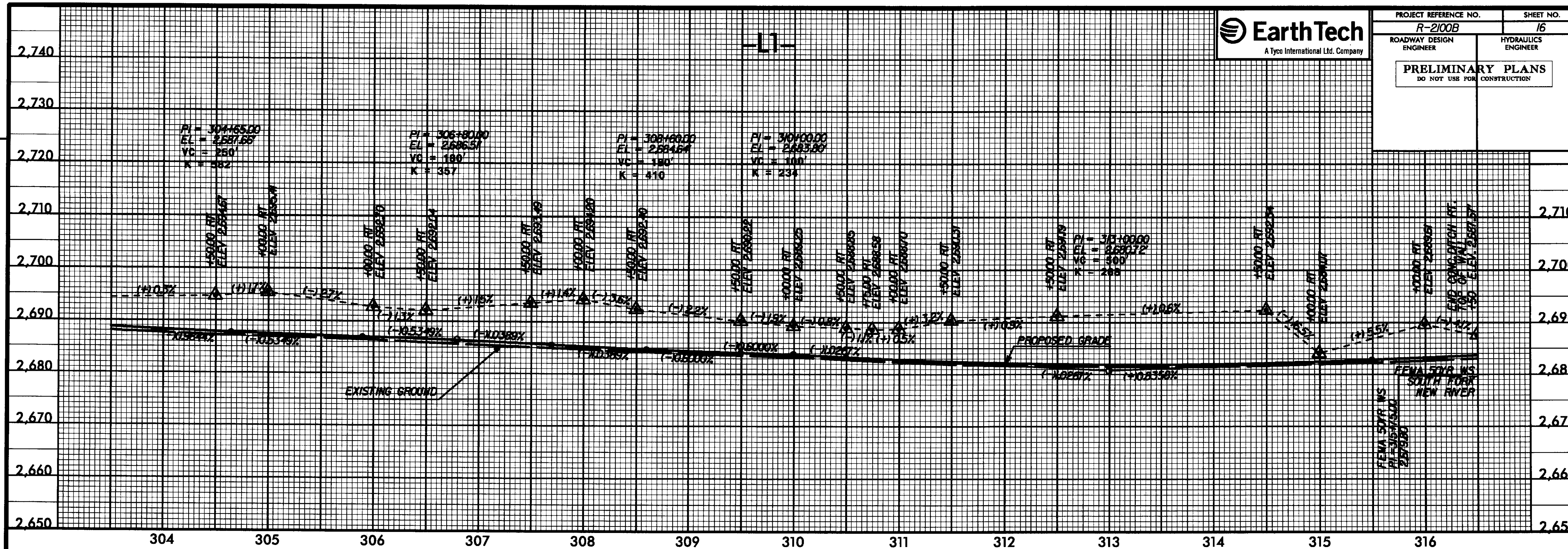
Revision 0 - 09-24-2004

EarthTech — A Tyco International Ltd. Company

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

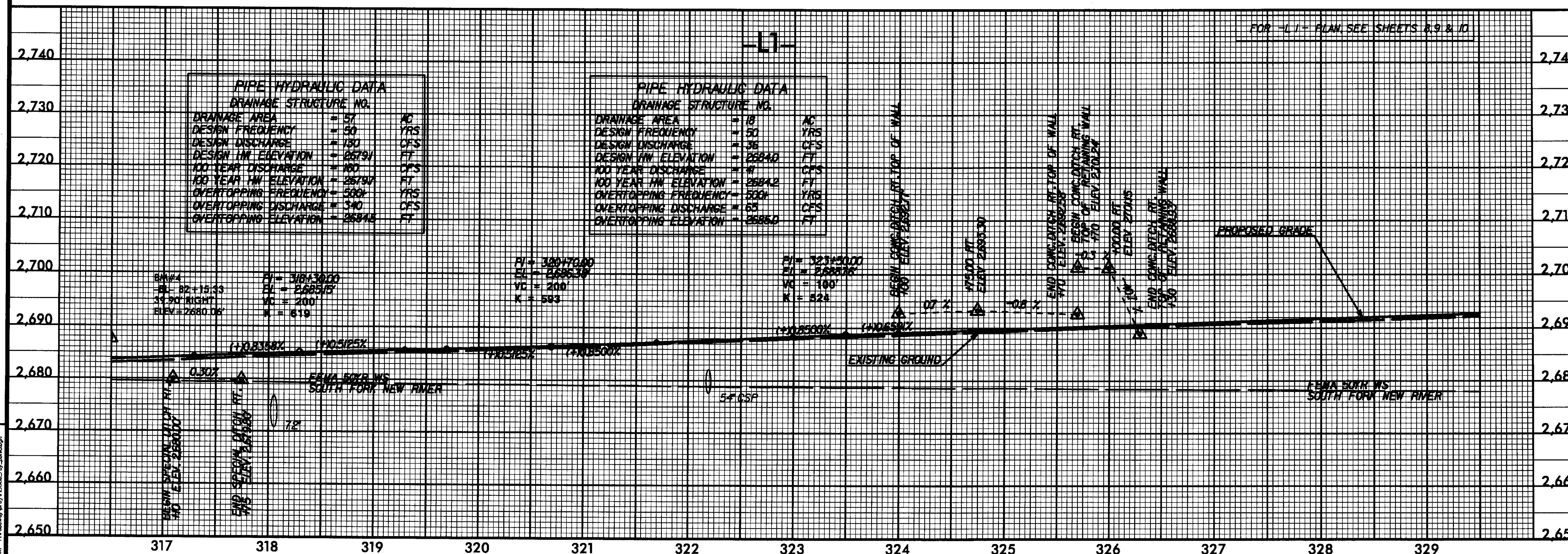
PRELIMINARY PLANS — DO NOT USE FOR CONSTRUCTION

-L1-



-L1-

FOR -L1- PLAN SEE SHEETS 8,9 & 10



PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.

DRAINAGE AREA	=	57	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	130	CFS
DESIGN HW ELEVATION	=	2679.1	FT
100 YEAR DISCHARGE	=	160	CFS
100 YEAR HW ELEVATION	=	2679.7	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	340	CFS
OVERTOPPING ELEVATION	=	2684.5	FT

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.

DRAINAGE AREA	=	18	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	36	CFS
DESIGN HW ELEVATION	=	2684.0	FT
100 YEAR DISCHARGE	=	41	CFS
100 YEAR HW ELEVATION	=	2684.2	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	65	CFS
OVERTOPPING ELEVATION	=	2685.0	FT

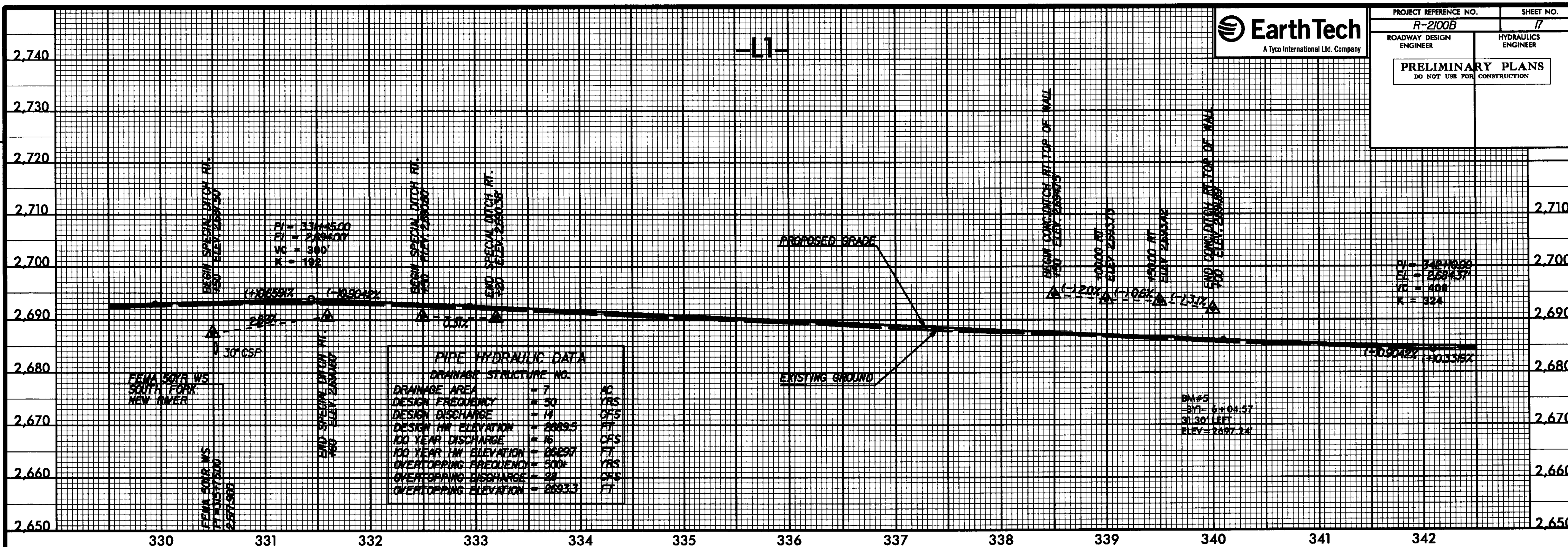
REVISIONS

Revision 0 - 09-24-2004

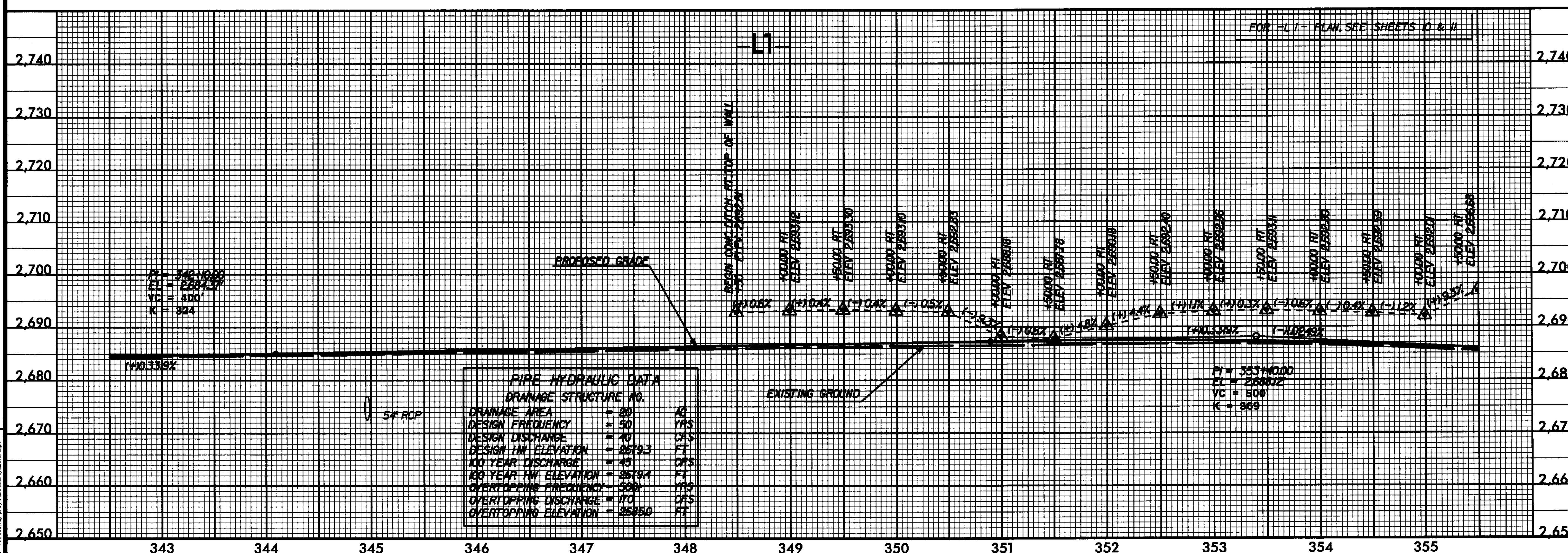
EarthTech
A Tyco International Ltd. Company

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	17
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PIPE HYDRAULIC DATA		
DRAINAGE STRUCTURE NO.		
DRAINAGE AREA	= 7	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 14	CFS
DESIGN HW ELEVATION	= 2689.5	FT
100 YEAR DISCHARGE	= 16	CFS
100 YEAR HW ELEVATION	= 2629.7	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 28	CFS
OVERTOPPING ELEVATION	= 2693.3	FT



PIPE HYDRAULIC DATA		
DRAINAGE STRUCTURE NO.		
DRAINAGE AREA	= 20	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 40	CFS
DESIGN HW ELEVATION	= 2679.3	FT
100 YEAR DISCHARGE	= 45	CFS
100 YEAR HW ELEVATION	= 2679.4	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 170	CFS
OVERTOPPING ELEVATION	= 2685.0	FT

REVISIONS

Revision 0 - 09-24-2004

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	18

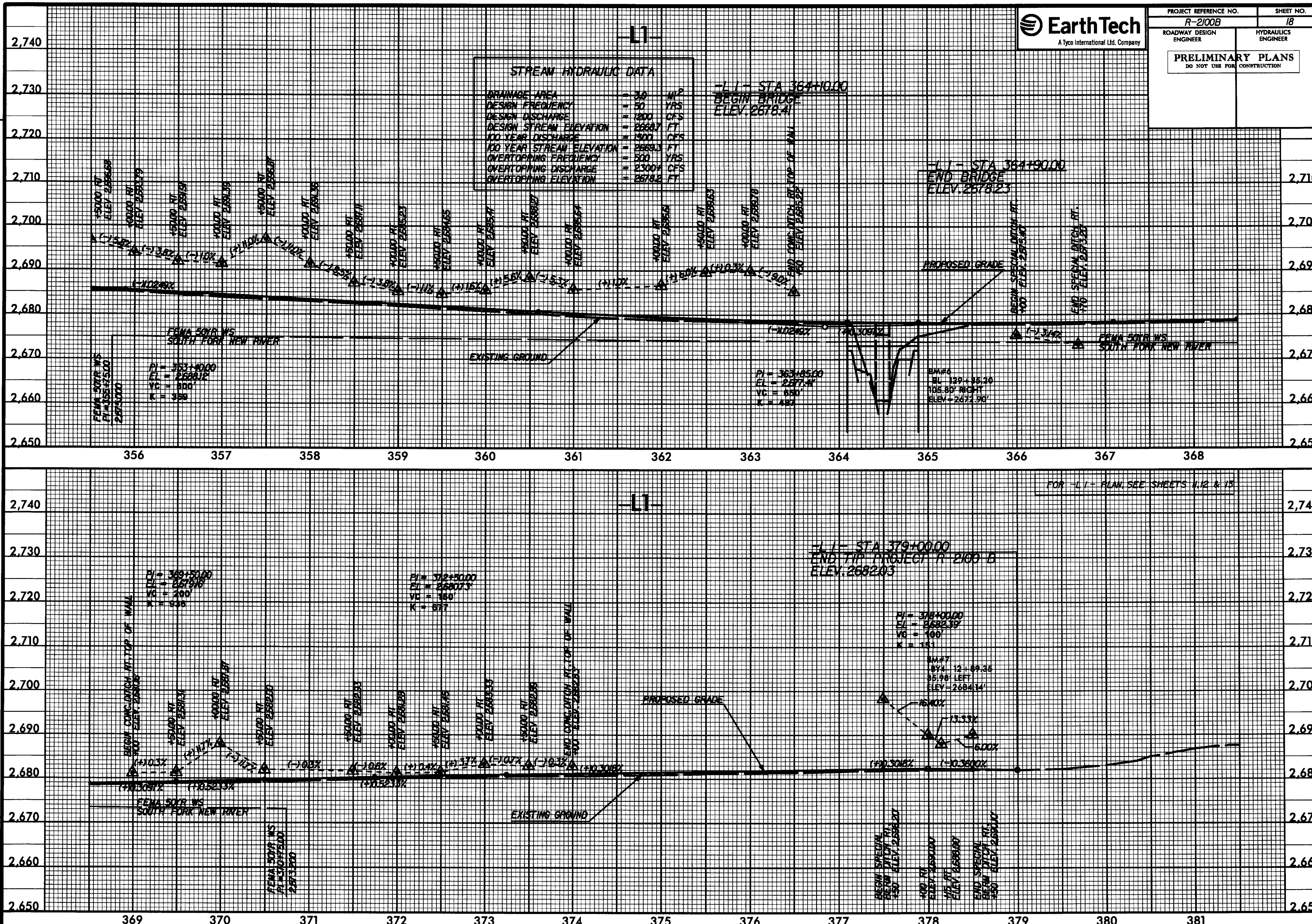
ROADWAY DESIGN ENGINEER — HYDRAULICS ENGINEER

EarthTech — A Tyco International Ltd. Company

PRELIMINARY PLANS — DO NOT USE FOR CONSTRUCTION

STREAM HYDRAULIC DATA

DRAINAGE AREA	= 3.0	MI^2
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 1200	CFS
DESIGN STREAM ELEVATION	= 2668.7	FT
100 YEAR DISCHARGE	= 1500	CFS
100 YEAR STREAM ELEVATION	= 2669.3	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 2300+	CFS
OVERTOPPING ELEVATION	= 2678.2	FT



REVISIONS

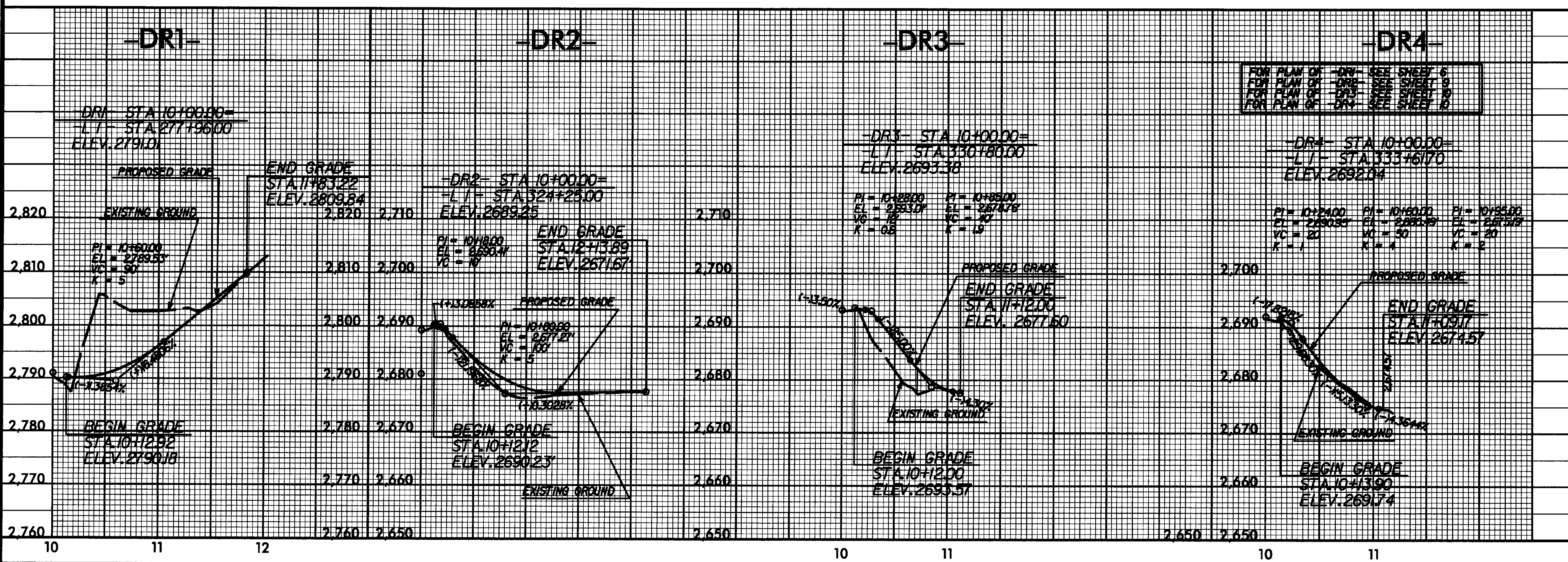
Revision 0 - 09-24-2004

EarthTech
A Tyco International Ltd. Company

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS
Revision 0 – 09-24-2004
REVISION 1: 8/12/2008 Changed Proposed Grade, DR3. Removed Detour Profile.



USER: paulschrum
DATE: 10/23/2008
TIME: 3:31:48 PM
DGN: R:\Roadway\Proj\r2100b_rdy_psh19.dgn