STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

September 29, 2009

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

ATTN: Mr. Eric Alsmeyer
NCDOT Coordinator

Dear Sir,

Subject: **Application for Section 404 Nationwide Permit 14 and Section 401 Water Quality Certification** for the extension of Timber Drive from NC 50 to White Oak Road (SR 2547) in Garner, Federal Aid Project Number STP-0508(2), Division 5, T.I.P No. U-4703.

Debit $249.00 from WBS No. 35871.1.1

The North Carolina Department of Transportation (NCDOT) proposes to extend Timber Drive (SR 2812) from NC 50 eastward to White Oak Road (SR 2547), a distance of approximately 1.3 miles. Please see the enclosed copies of the Pre-Construction Notification (PCN), Stormwater Management Plan, permit drawings, compensatory mitigation debit, and design plans for the above-referenced project.

The Environmental Assessment (EA) was completed for this project in May 2006, and the Finding of No Significant Impact (FONSI) was completed in December 2007. Additional copies are available upon request.

This project calls for a letting date of May 18, 2010 and a review date of April 6, 2010. However, the let date may advance as additional funds become available.

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

TELEPHONE: 919-431-2000

FAX: 919-431-2001

WEBSITE: WWW.NCDOT.ORG

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

A copy of this permit application will be posted on the NCDOT Website at: http://www.ncdot.org/doh/preconstruct/pe/. If you have any questions or need additional information, please call Sara Easterly at (919) 431-1605.

Sincerely,

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

W/attachment

Mr. Brian Wrenn, NCDWQ (5 Copies)
Mr. J. Wally Bowman, P.E., Division Engineer
Mr. Chris Murray, DEO

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, P.E., Project Services Unit
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. Gary Jordan, USFWS
Mr. Travis Wilson, NCWRC
Mr. Ma'ad Hassan, P.E., PDEA Project Planning Engineer
Ms. LeiLani Paugh, NEU
Mr. Randy Griffin, NEU

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

Pre-Construction Notification (PCN) Form

A. Applicant Information

1. Processing

1a. Type(s) of approval sought from the Corps:	☒ Section 404 Permit	☐ Section 10 Permit
1b. Specify Nationwide Permit (NWP) number: 14	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:	Timber Drive East Extension (SR 2812) from NC 50 to White Oak Road
2b. County:	Wake
2c. Nearest municipality / town:	Garner
2d. Subdivision name:	*not applicable*
2e. NCDOT only, T.I.P. or state project no:	U-4703

3. Owner Information

3a. Name(s) on Recorded Deed:	North Carolina Department of Transportation
3b. Deed Book and Page No.	*not applicable*
3c. Responsible Party (for LLC if applicable):	*not applicable*
3d. Street address:	1598 Mail Service Center
3e. City, state, zip:	Raleigh, NC 27699-1598
3f. Telephone no.:	(919) 431-1605
3g. Fax no.:	(919) 431-2002
3h. Email address:	seeasterly@ncdot.gov

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

B. Project Information and Prior Project History	
1. Property Identification	
1a. Property identification no. (tax PIN or parcel ID):	*not applicable*
1b. Site coordinates (in decimal degrees):	Latitude: 35.6856 (DD.DDDDDD) Longitude: - 78.5965 (-DD.DDDDDD)
1c. Property size:	82 acres
2. Surface Waters	
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	Mahlers Creek
2b. Water Quality Classification of nearest receiving water:	C, NSW
2c. River basin:	Neuse
3. Project Description	
3a. Describe the existing conditions on the site and the general land use in the vicinity of the project at the time of this application: Urban and Developed Land	
3b. List the total estimated acreage of all existing wetlands on the property: 0.72	
3c. List the total estimated linear feet of all existing streams (intermittent and perennial) on the property: 257	
3d. Explain the purpose of the proposed project: The primary purposes of the proposed action are as follows: To provide additional roadway capacity to serve local traffic and to supplement the US 70 corridor with a parallel travel route, to provide improved access and service to existing, occurring, and planned development in the project area, and to provide for orderly economic development in the area.	
3e. Describe the overall project in detail, including the type of equipment to be used: The North Carolina Department of Transportation (NCDOT) proposes to extend Timber Drive (SR 2812) from NC 50 eastward to White Oak Road (SR 2547), a distance of approximately 1.3 miles. The proposed extension project will be a four-lane, median divided roadway with curbs and gutters, bicycle provisions, and sidewalks within a 150 to 200-foot wide right of way. New Rand Road (SR 2562) will be disconnected from Timber Drive East Extension and will be connected to NC 50 about 1100-feet north of Timber Drive. NC 50 is to be improved to three lanes from the proposed intersection with the New Rand Road connector southwest to the intersection with Timber Drive/Timber Drive East. A southbound travel lane is to be extended along the west side of White Oak Road from the intersection with Timber Drive East southward to the intersection with Hillandale Land. Standard road building equipment, such as trucks, dozers, and cranes will be used.	
4. Jurisdictional Determinations	
4a. Have jurisdictional wetland or stream determinations by the Corps or State been requested or obtained for this property / project (including all prior phases) in the past? Comments:	☒ Yes ☐ No ☐ Unknown
4b. If the Corps made the jurisdictional determination, what type of determination was made?	☐ Preliminary ☒ Final
4c. If yes, who delineated the jurisdictional areas? Name (if known):	Agency/Consultant Company: RK&K Other:
4d. If yes, list the dates of the Corps jurisdictional determinations or State determinations and attach documentation. The initial verification was on December 10, 2004. The NC Department of Transportation does not request the Corps to evaluate our site using the Rapanos Guidance. Instead, I am satisfied with the delineation as reviewed and approved in the field by the Corps prior to 6/5/2007, and ask that you approve the delineation submitted to you based on that field review by your staff. Please note that on 2/13/2007 an area between NC 50 and New Rand Road that had originally been called jurisdictional was reviewed by the USACE and DWQ and determined to be ephemeral and not jurisdictional.	

5. Project History			
5a. Have permits or certifications been requested or obtained for this project (including all prior phases) in the past?	☐ Yes	☒ No	☐ Unknown
5b. If yes, explain in detail according to "help file" instructions.			
6. Future Project Plans			
6a. Is this a phased project?	☐ Yes	☒ No	
6b. If yes, explain.			

C. Proposed Impacts Inventory

1. Impacts Summary

1a. Which sections were completed below for your project (check all that apply):

☒ Wetlands ☒ Streams - tributaries ☒ Buffers

☐ Open Waters ☐ Pond Construction

2. Wetland Impacts

If there are wetland impacts proposed on the site, then complete this question for each wetland area impacted.

2a. Wetland impact number – Permanent (P) or Temporary (T)	2b. Type of impact	2c. Type of wetland (if known)	2d. Forested	2e. Type of jurisdiction (Corps - 404, 10 DWQ – non-404, other)	2f. Area of impact (acres)
Site 1 ☒ P ☒ T	Fill, Excavation, Mechanized Clearing	Riverine	☐ Yes ☒ No	☒ Corps ☐ DWQ	0.33 (P) 0.11 (T)
Site 2 ☒ P ☐ T	Mechanized Clearing	Riverine	☐ Yes ☒ No	☒ Corps ☐ DWQ	0.004
Site 1 ☒ P ☐ T Utility	Fill From Sewer Line		☐ Yes ☐ No	☒ Corps ☐ DWQ	0.0015
Site 4 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 5 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
				2g. **Total wetland impacts**	0.34 Permanent 0.11 Temporary

2h. Comments:

3. Stream Impacts

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

3a. Stream impact number - Permanent (P) or Temporary (T)	3b. Type of impact	3c. Stream name	3d. Perennial (PER) or intermittent (INT)?	3e. Type of jurisdiction (Corps - 404, 10 DWQ – non-404, other)	3f. Average stream width (feet)	3g. Impact length (linear feet)
Site 1 ☒ P ☒ T	Fill	UT to Mahlers Creek	☐ PER ☒ INT	☒ Corps ☐ DWQ	4	160 (P) 22 (T)
Site 2 ☒ P ☒ T	Fill	UT to Swift Creek	☐ PER ☒ INT	☒ Corps ☐ DWQ	6	62 (P) 15 (T)
Site 3 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
Site 4 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
Site 5 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
Site 6 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
					3h. **Total stream and tributary impacts**	222 Perm 37 Temp

3i. Comments:

4. Open Water Impacts

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

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

4g. Comments:

5. Pond or Lake Construction

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

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

5g. Comments:

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

6. Buffer Impacts (for DWQ)

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

6a. Project is in which protected basin?			☒ Neuse ☐ Catawba ☐ Tar-Pamlico ☐ Randleman ☐ Other:		
6b. Buffer impact number – Permanent (P) or Temporary (T)	6c. Reason for impact	6d. Stream name	6e. Buffer mitigation required?	6f. Zone 1 impact (square feet)	6g. Zone 2 impact (square feet)
B1 ☒ P ☐ T	Bridge and Storm Water Outfall	Mahlers Creek	☐ Yes ☒ No	7,875	5,399
B2 ☒ P ☐ T	Road Crossing	UT to Swift Creek	☐ Yes ☒ No	3,818	1,222
B3 ☒ P ☐ T	Road Impacts other than Road Crossings	UT to Mahlers Creek	☒ Yes ☐ No	10,601	6,002
			6h. **Total buffer impacts**	22,294	12,623
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.

Initially NCDOT proposed to place two culverts at the Mahlers Creek Crossing. One culvert was going to be installed to handle the hydraulic flow of Mahlers Creek and the other culvert was going to accommodate the proposed greenway for the City of Garner. Upon further discussion it was determined that installing dual parallel bridges to span the Mahlers Creek crossing would significantly reduce the wetland and stream impacts. The selected alternative crosses wetlands of Mahlers Creek at the narrowest point. The selected alternative also bridges Mahlers Creek, most of the projects wetlands and the proposed Town of Garner Greenway. There will be no deck drains in Zone 1. A dry detention basin will also be used. See Stormwater Management Plan.

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

2:1 slopes are to be used, and Best Management Practices for Surface Waters.

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

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

3. Complete if Using a Mitigation Bank

3a. Name of Mitigation Bank: not applicable

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

3c. Comments:

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

4a. Approval letter from in-lieu fee program is attached.	☒ Yes
4b. Stream mitigation requested:	0 linear feet
4c. If using stream mitigation, stream temperature:	☐ warm ☐ cool ☐ cold
4d. Buffer mitigation requested (DWQ only):	0 square feet
4e. Riparian wetland mitigation requested:	0.68 acres
4f. Non-riparian wetland mitigation requested:	0 acres
4g. Coastal (tidal) wetland mitigation requested:	0 acres

4h. Comments:

5. Complete if Using a Permittee Responsible Mitigation Plan

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

Compensatory Mitigation using Jeffery's Warehouse Mitigation Site. See Attached.

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	Road Impacts other than Road Crossings	5,508	3 (2 for Catawba)	16,524
Zone 2	Road Impacts other than Road Crossings	5,289	1.5	7,934
		6f. **Total buffer mitigation required:**		24,458

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).

Jeffrey's Warehouse Mitigation Site Debit. See attached.

6h. Comments:

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

F. Supplementary Information		
1. Environmental Documentation (DWQ Requirement)		
1a. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land?	☒ Yes	☐ No
1b. If you answered "yes" to the above, does the project require preparation of an environmental document pursuant to the requirements of the National or State (North Carolina) Environmental Policy Act (NEPA/SEPA)?	☒ Yes	☐ No
1c. If you answered "yes" to the above, has the document review been finalized by the State Clearing House? (If so, attach a copy of the NEPA or SEPA final approval letter.) Comments:	☒ Yes	☐ No
2. Violations (DWQ Requirement)		
2a. Is the site in violation of DWQ Wetland Rules (15A NCAC 2H .0500), Isolated Wetland Rules (15A NCAC 2H .1300), DWQ Surface Water or Wetland Standards, or Riparian Buffer Rules (15A NCAC 2B .0200)?	☐ Yes	☒ No
2b. Is this an after-the-fact permit application?	☐ Yes	☒ No
2c. If you answered "yes" to one or both of the above questions, provide an explanation of the violation(s):		
3. Cumulative Impacts (DWQ Requirement)		
3a. Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality?	☐ Yes ☒ No	
3b. If you answered "yes" to the above, submit a qualitative or quantitative cumulative impact analysis in accordance with the most recent DWQ policy. If you answered "no," provide a short narrative description. Due to the minimal transportation impact resulting from this project, this project will neither influence nearby land uses nor stimulate growth. Therefore, a detailed indirect or cumulative effects study will not be necessary.		
4. Sewage Disposal (DWQ Requirement)		
4a. Clearly detail the ultimate treatment methods and disposition (non-discharge or discharge) of wastewater generated from the proposed project, or available capacity of the subject facility. not applicable		

5. Endangered Species and Designated Critical Habitat (Corps Requirement)		
5a. Will this project occur in or near an area with federally protected species or habitat?	☐ Yes	☒ No
5b. Have you checked with the USFWS concerning Endangered Species Act impacts?	☐ Yes	☒ No
5c. If yes, 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? NHP, USFWS website, NCDOT field surveys on May 29, 2009.		
6. Essential Fish Habitat (Corps Requirement)		
6a. Will this project occur in or near an area designated as essential fish habitat?	☐ Yes	☒ No
6b. What data sources did you use to determine whether your site would impact Essential Fish Habitat? NMFS County Index		
7. Historic or Prehistoric Cultural Resources (Corps Requirement)		
7a. Will this project occur in or near an area that the state, federal or tribal governments have designated as having historic or cultural preservation status (e.g., National Historic Trust designation or properties significant in North Carolina history and archaeology)?	☐ Yes	☒ No
7b. What data sources did you use to determine whether your site would impact historic or archeological resources? NEPA Documentation		
8. Flood Zone Designation (Corps Requirement)		
8a. Will this project occur in a FEMA-designated 100-year floodplain?	☐ Yes	☒ No
8b. If yes, explain how project meets FEMA requirements: NCDOT Hydraulics Unit coordination with FEMA		
8c. What source(s) did you use to make the floodplain determination? FEMA Maps		

Dr. Gregory J. Thorpe, Ph D Applicant/Agent's Printed Name	E.P. Luck Applicant/Agent's Signature (Agent's signature is valid only if an authorization letter from the applicant is provided.)	9.29.09 Date

Compensatory Mitigation

The Jeffreys Warehouse Mitigation Site was originally constructed as on-site mitigation for R-1030 US 117 from south of NC 581 in Goldsboro to the US 264 Bypass in Wilson. There are two parcels associated with this mitigation site. The west parcel (approximately 50.2 acres) is bounded on the northwest by the Little River and on the southeast by the US 117 right-of-way. The east parcel (approximately 37.5 acres) is bounded on the northwest by the US 117 right-of-way, on the northeast by a Wayne County Board of Education school bus maintenance shop, and on the east and southeast by private property. The site was constructed in 2006 and has undergone three year of hydrologic and vegetative monitoring.

To offset unavoidable stream impacts associated with T.I.P. U-4703, the Jeffereys Warehouse Mitigation site will be debited 222 L.F. of stream restoration. To offset unavoidable Neuse Buffer impacts associated with T.I.P U-4703, the Jeffreys Warehouse Mitigation Site will be debited 24,458 S.F of Neuse Buffer restoration. These debits are reflected in the debit ledger below.

Site name	Site TIP	HUC	River Basin	Division	County
Jefferey's Warehouse (JALO)	**R-1030AA**	**3020201**	**Neuse**	**4**	**Wayne**

Mitigation Type	As Built Quantity	Available	Debit	Debit
			B-3528	**B-4300**
Stream Restoration	3,731	2,971	452(226@2:1)	
Riverine Wetland Restoration	3.66	0.12		
Non-Riverine Wetland Restoration	23.02	18.49		
Riverine Wetland Preservation	12.36	8.61		
Neuse Buffer Restoration	689,607	311,501	75,577	40,075

Debit	Debit	Debit	Debit	Debit	Debit	Debit
R-2719A	**B-4592**	**B-4304**	**U-3344A**	**U-4011**	**R-2814A**	**U-4703**
			25	61		222
		0.92			2.62	
2.76					1.77	
					3.75(5:1ratio)	
172,387	16,398	3,653	45,558			24,458

Supporting Information for Section II - Required Items Checklist

TIP project U-4703 is a roadway construction project in Wake County, North Carolina. The mainline roadway (SR 2812 Timber Drive East) is a four lane curb and gutter roadway with grass medians and sidewalks on new location. The length of the mainline roadway is 1.404 miles. The mainline roadway will utilize a closed storm drainage system to drain the roadway right-of-way. The project also includes modifications to and widening SR 2547 (White Oak Road), NC 50 and SR 2562 (New Rand Road). A new connector between SR 2562 (New Rand Road) and NC 50 will also be constructed as part of the project.

The project includes several important features to help reduce adverse impacts from stormwater discharges. These features include the following items:

Bridge over Mahlers Creek – A reinforced concrete box culvert is all that is required to provide adequate hydraulic capacity for the stream crossing at Mahlers Creek. However, in an attempt to minimize impacts to existing wetlands and surface waters a 368' long bridge (4 spans at 92' each) is proposed at the Mahlers Creek crossing. The proposed bridge structure will include deck drains over the existing wetlands and Zone 2 of the Neuse River Basin Buffers. Deck drains are not proposed over Zone 1 of the stream buffer.

Dry Detention Basins at Mahlers Creek – two extended dry detention basins are proposed at the Mahlers Creek stream crossing. The basins will receive all discharge from the proposed roadway storm drainage systems at Mahlers Creek and provide stormwater treatment prior to its discharge from the storm drainage system. The basins were designed in accordance with the guidelines presented in the North Carolina Department of Transportation Stormwater Best Management Toolbox. The basins are designed to capture the runoff from the first one inch of rainfall in a water quality pool and draw that volume down slowly over a three to five day period. Discharges from larger storm events are designed to safely pass through the dry detention pond. Outflow from each of the basins is directed to an energy dissipater device to reduce outlet velocities from the outlet pipe to a non-erosive velocity.

Vegetated Roadside Ditches – Most of the proposed project uses a curb and gutter typical section with associated storm drainage piping. However, where possible vegetated roadside ditches have been used to convey stormwater through the right-of-way. These features are primarily used to collect off-site stormwater flows and convey them to cross pipes where they cross the proposed roadway and do not mix with proposed roadway storm drainage.

Ecosystem Enhancement PROGRAM

September 25, 2009

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

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

U-4703, Timber Drive East Extension from NC 50 to White Oak Road, Wake County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory riparian wetland mitigation for the subject project. Based on the information supplied by you on September 21, 2009, the impacts are located in CU 03020201 of the Wake River Basin in the Central Piedmont (CP) Eco-Region, and are as follows:

Neuse 03020201 CP	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	0	0	0	0.34	0	0	0	0
Mitigation Units (Credits-up to 2:1)	0	0	0	0.68	0	0	0	0

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

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

Sincerely,

William D. Gilmore

William D. Gilmore, P.E.
EEP Director

cc: Mr. Eric Alsmeyer, USACE – Raleigh Regulatory Field Office
Mr. Brian Wrenn, Division of Water Quality, Wetlands/401 Unit
File: U-4703

Ecosystem Enhancement PROGRAM

September 25, 2009

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

Dear Mr. Alsmeyer:

Subject: EEP Mitigation Acceptance Letter:

U-4703, Timber Drive East Extension from NC 50 to White Oak Road, Wake County; Neuse River Basin (Cataloging Unit 03020201); Central Piedmont (CP) Eco-Region

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory riparian wetland mitigation for the unavoidable impact associated with the above referenced project. Based on the information supplied by the NCDOT on September 25, 2009, the impacts are located in CU 03020201 of the Neuse River Basin in the Central Piedmont (CP) Eco-Region, and the anticipated mitigation credits needed to offset the impacts are as follows:

Neuse 03020201 CP	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	0	0	0	0.34	0	0	0	0
Mitigation Units (Credits-up to 2:1)	0	0	0	0.68	0	0	0	0

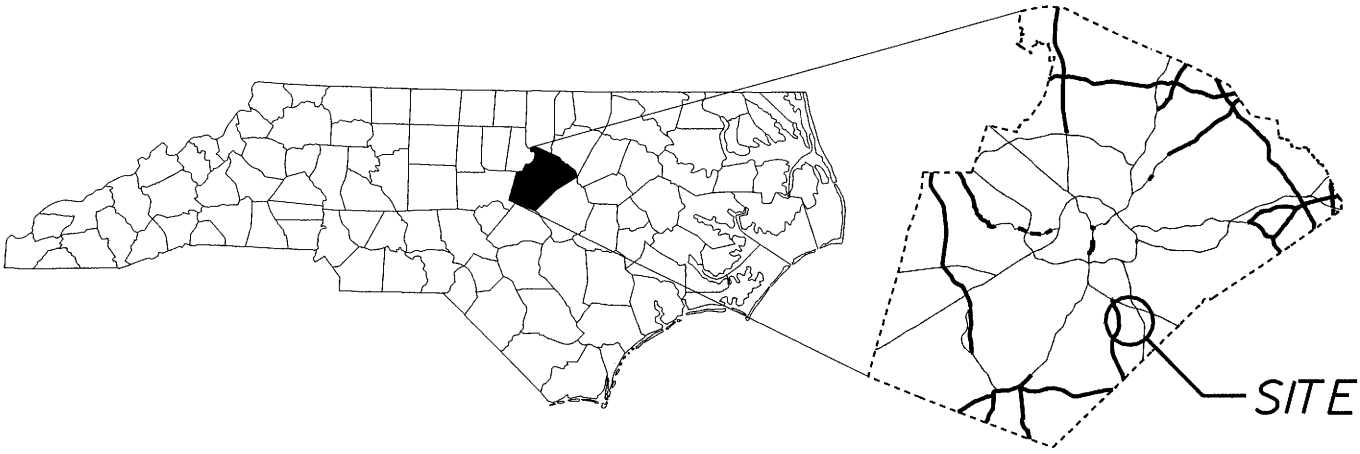
Mitigation associated with this project will be provided in accordance with Section X of Amendment No. 2 to the Memorandum of Agreement between the N. C. Department of Environment and Natural Resources, the N. C. Department of Transportation, and the U. S. Army Corps of Engineers fully executed on March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

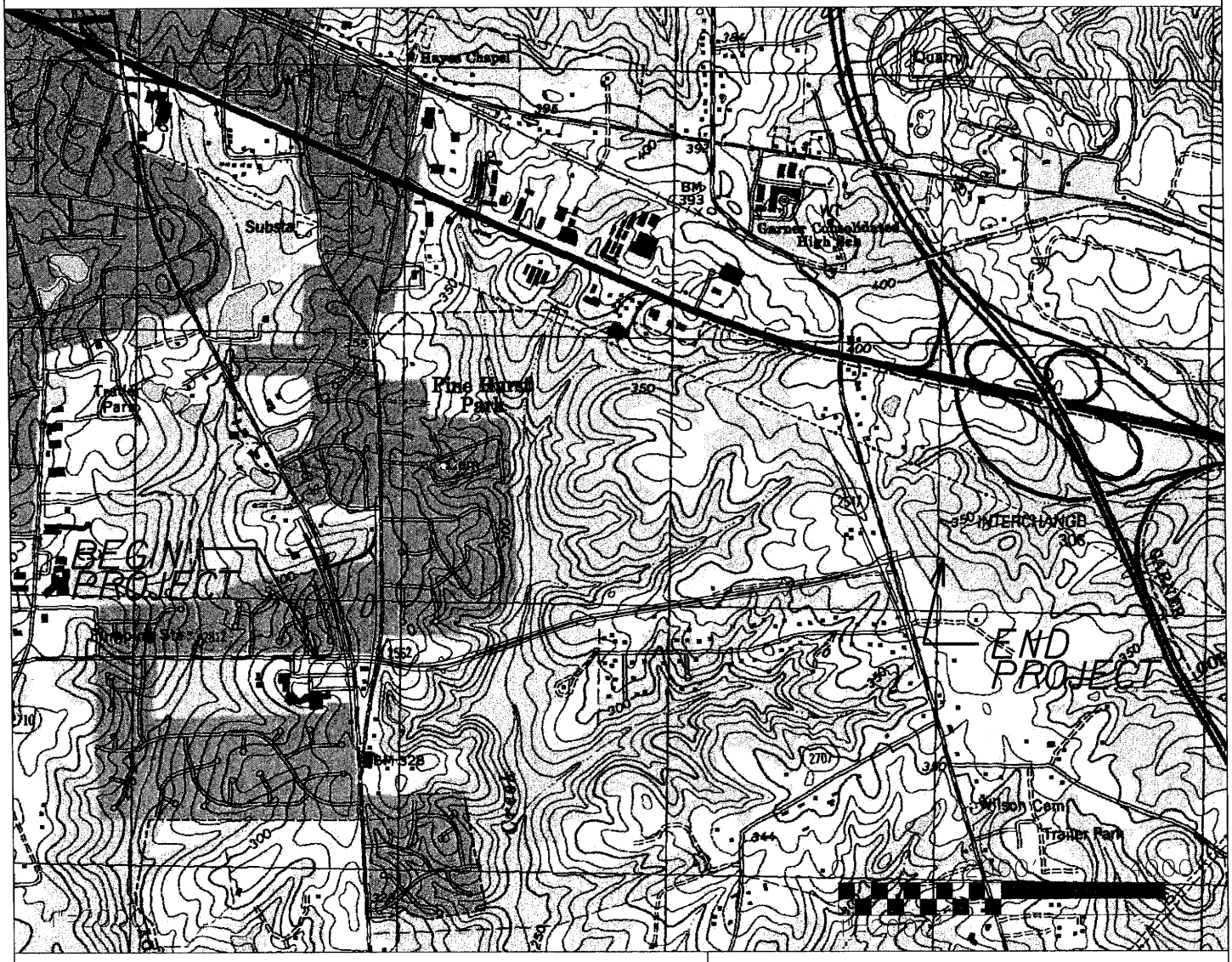
If you have any questions or need additional information, please contact Ms. Beth Harmon at 919-715-1929.

Sincerely,

William D. Gilmore, P.E.
EEP Director

cc: Mr. Gregory J. Thorpe, Ph.D., NCDOT-PDEA
Mr. Brian Wrenn, Division of Water Quality, Wetlands/401 Unit
File: U-4703





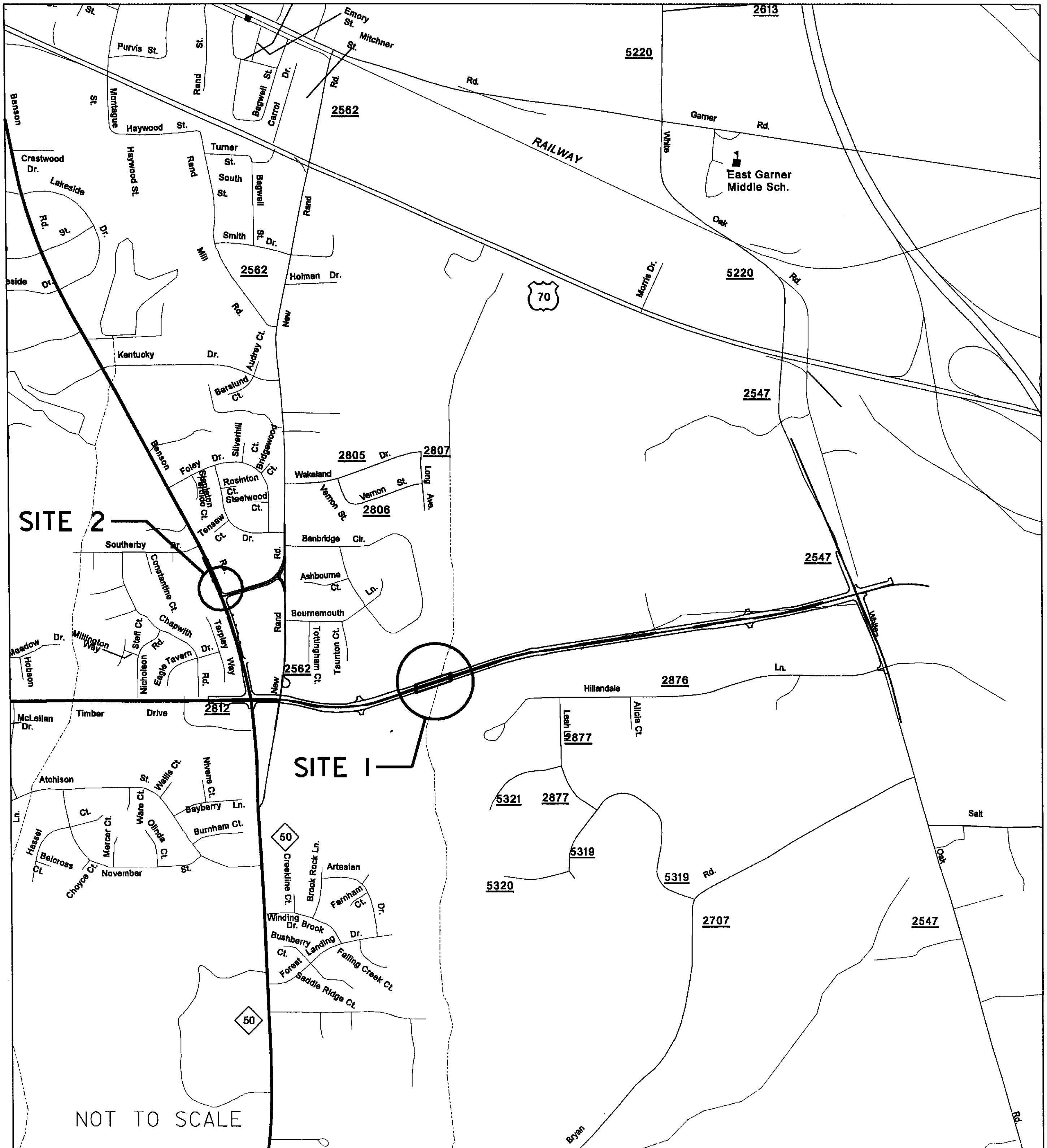
STREAM AND WETLAND VICINITY MAP

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
WAKE COUNTY

PROJECT: 35871.1.1 (U4703)

TIMBER DR. EAST EXTENSION (SR 2812)
FROM NC 50 TO WHITE OAK ROAD (SR 2547)

Permit Drawing
Sheet 1 of 18



STREAM AND WETLAND

LOCATION MAP

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
WAKE COUNTY

PROJECT: 35871.1.1 (U4703)

TIMBER DR. EAST EXTENSION (SR 2812)
FROM NC 50 TO WHITE OAK ROAD (SR 2547)

Permit Drawing
Sheet 2 of 18

PROP. NO.	PROPERTY OWNER NAME	PROP. OWNER ADDRESS
3	First Union National Bank	First Union National Bank, c\o Cheryl Welch First Union Plaza, Cont-2, Charlotte, NC 28288
4	Bonnie G. Ray	420 Hillandale Lane, Garner NC 27529
11	Garner Church of Christ	118 Park Ave, Fuquay-Varina NC 27526
13	Ryan L. Creech	101 Tarpley Way, Garner NC 27529
14	Heidi K. Moore	103 Tarpley Way, Garner NC 27529

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY
PROJECT: 35871.1.1 (U-4703)

6/17/2009

R:/z-misc/Hydro/Wetprop.xls

Permit Drawing
Sheet 3 of 18

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	WETLAND IMPACTS: Temp. Fill In Wetlands (ac)	WETLAND IMPACTS: Excavation in Wetlands (ac)	WETLAND IMPACTS: Mechanized Clearing in Wetlands (ac)	WETLAND IMPACTS: Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	SURFACE WATER IMPACTS: Temp. SW impacts (ac)	SURFACE WATER IMPACTS: Existing Channel Impacts Permanent (ft)	SURFACE WATER IMPACTS: Existing Channel Impacts Temp. (ft)	SURFACE WATER IMPACTS: Natural Stream Design (ft)
1	-L- 30+88 to 34+83	368' BRIDGE	0.18 [1]	0.11	0.02	0.13	0.28	0.02	< 0.01 [2]	160	22	
2	-Y- 16+40 to 18+11 RT	42" RCP				< 0.01 [4]		0.01	< 0.01 [3]	62	13	
TOTALS:			0.18	0.11	0.02	0.13	0.28	0.03	0.00	222	35	

[1] INCLUDES 115.4 SF IMPACT FROM BRIDGE PIERS
[2] 0.002 AC IMPACT
[3] 0.001 AC IMPACT
[4] 0.004 AC IMPACT

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY
PROJECT: 35871.1.1 (U-4703)

8/31/09

ATN Revised 3/31/05

S:\ProjMgmt\Central Region\Easterly\U-Projects\U-4703 Wake\U-4703 Copy of Permit Summary

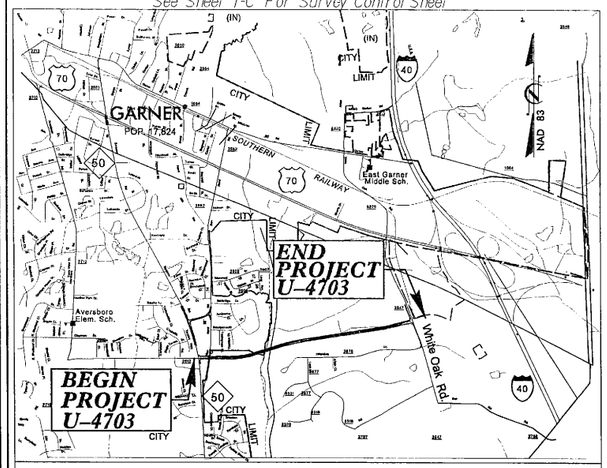
Permit Drawing
Sheet 4 of 18

8/31/2009

TIP PROJECT: U-4703

CONTRACT:

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4703	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
35871.1.1	STP-0508(2)	PE
35871.2.1	STP-0508(2)	R/W & UTILITIES
35871.3.1	STPDA-0508(3)	CONST.

Permit Drawing
Sheet 5 of 18

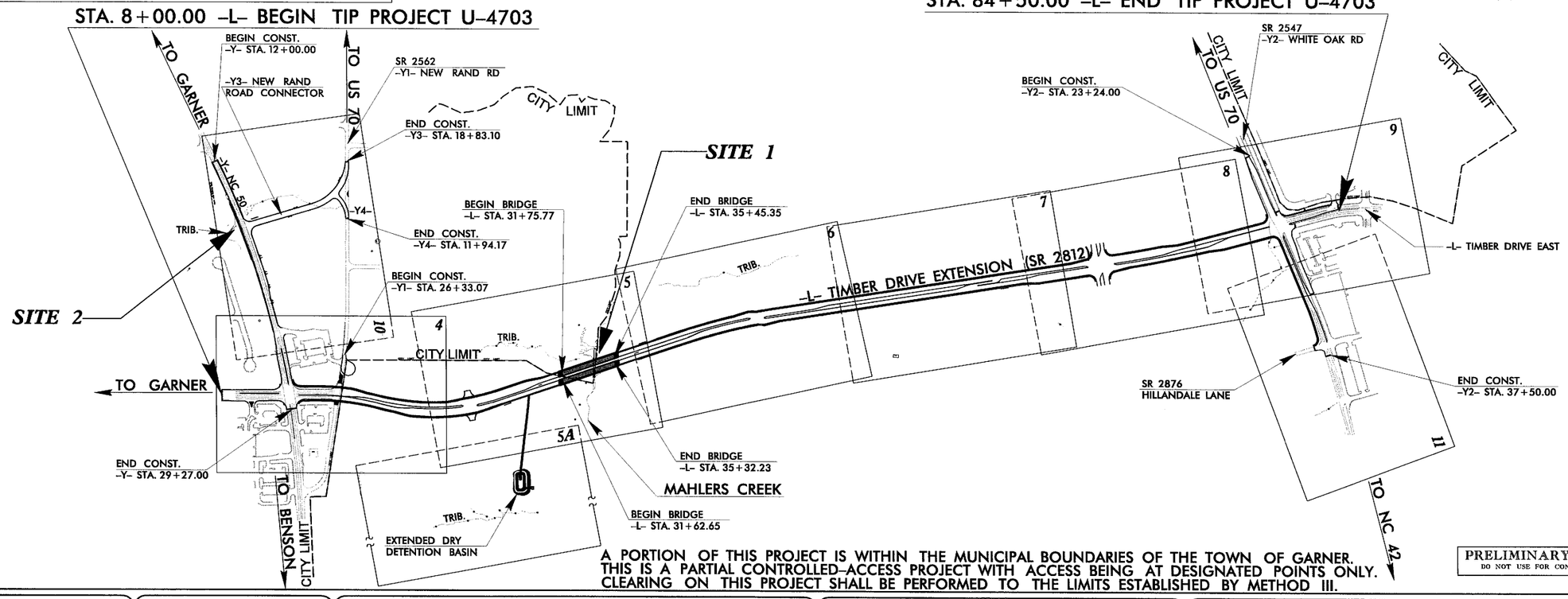
LOCATION: TIMBER DRIVE EAST EXTENSION (SR 2812)
FROM NC 50 TO WHITE OAK ROAD (SR 2547) IN GARNER

TYPE OF WORK: STREAM AND WETLAND PERMIT DRAWINGS

NAD 83

STA. 8+00.00 –L– BEGIN TIP PROJECT U-4703

STA. 84+50.00 –L– END TIP PROJECT U-4703



A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE TOWN OF GARNER.
THIS IS A PARTIAL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING AT DESIGNATED POINTS ONLY.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

PLANS 50 25 0 50 100

PROFILE (HORIZONTAL) 50 25 0 50 100

PROFILE (VERTICAL) 10 5 0 10 20

DESIGN DATA

ADT 2009 = 15,435
ADT 2030 = 24,000
DHV = 10 %
D = 55 %
T = 6 % *
V = 50 MPH
* TTST 2% DUAL 4%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-4703 = 1.379 mi.
LENGTH STRUCTURE OF TIP PROJECT U-4703 = 0.070 mi.
TOTAL LENGTH OF TIP PROJECT U-4703 = 1.449 mi.

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: AUGUST 20, 2008

LETTING DATE: MAY 18, 2010

JAMES A. SPEER, PE
PROJECT ENGINEER

DANIEL W. GARDNER, JR., PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER *P.E.*

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6/2/99

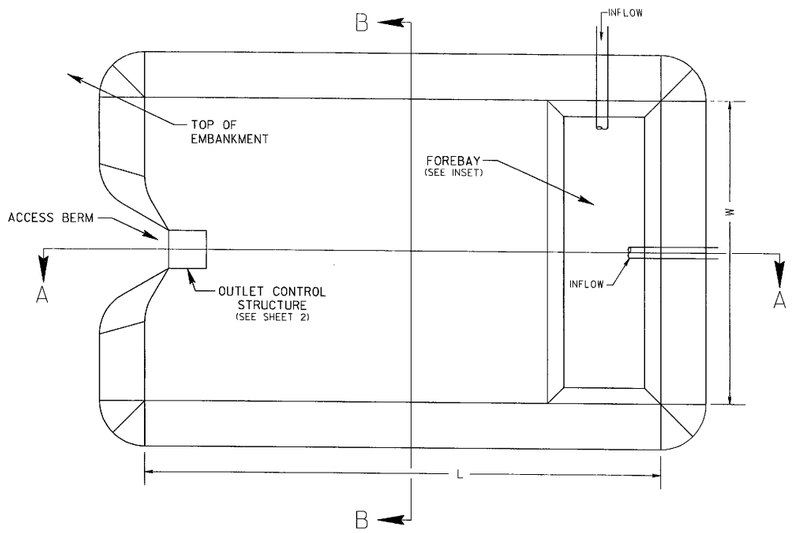
PROJECT REFERENCE NO.	SHEET NO.
U-4703	2-E

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

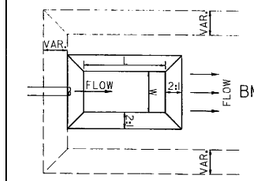
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 6 of 18

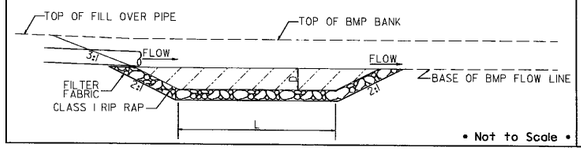


PLAN

INSET
PARALLEL FOREBAY WITH PIPE INLET

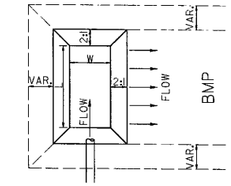


BASIN	L	W	D
1	24.0'	8.0'	3.0'

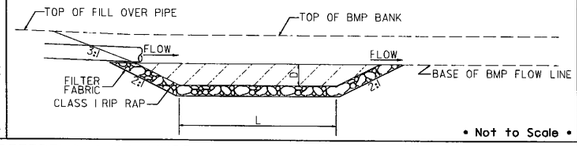


• Not to Scale •

INSET
PERPENDICULAR FOREBAY WITH PIPE INLET



BASIN	L	W	D
2	39.0'	19.0'	3.0'

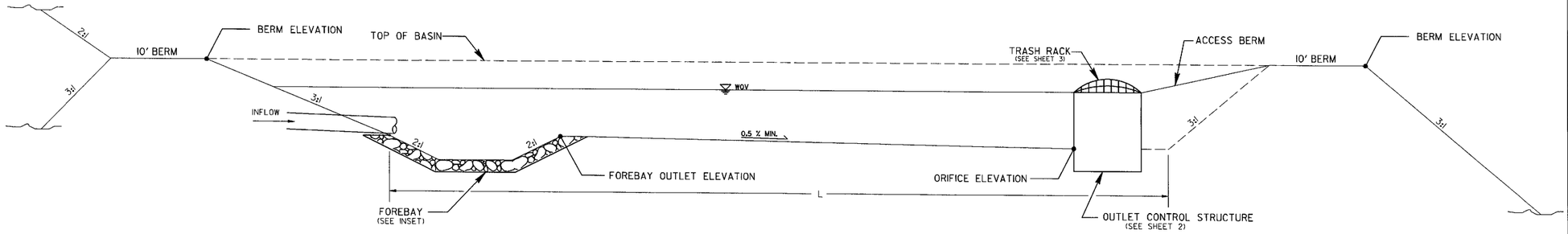


• Not to Scale •

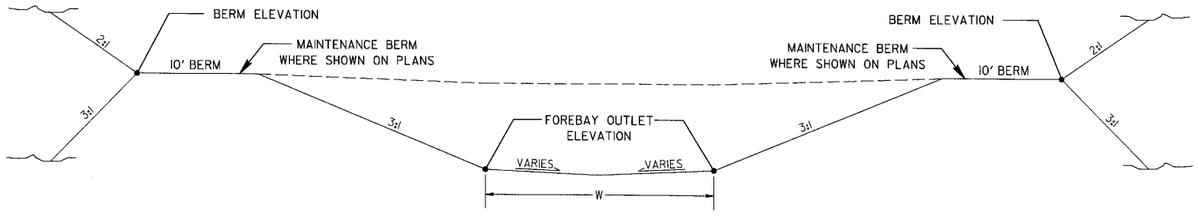
REFERENCED DRAWINGS

SHEET 2 - DRY DETENTION BASIN "OUTLET CONTROL STRUCTURE"
SHEET 3 - DRY DETENTION BASIN "TRASH RACKS"

PROFILE
SECTION A-A



PROFILE
SECTION B-B



BASIN	L	W	FOREBAY OUTLET ELEV.	ORIFICE ELEV.	BERM ELEV.
1	90.0'	30.0'	268.0	267.7	274.0
2	138.0	51.0'	292.0	290.2	298.0

NOT TO SCALE

DRY DETENTION BASIN
BASIN DETAILS

SHEET 1 OF 3

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DRY DETENTION BASIN
BASIN DETAILS

SHEET 1 OF 3

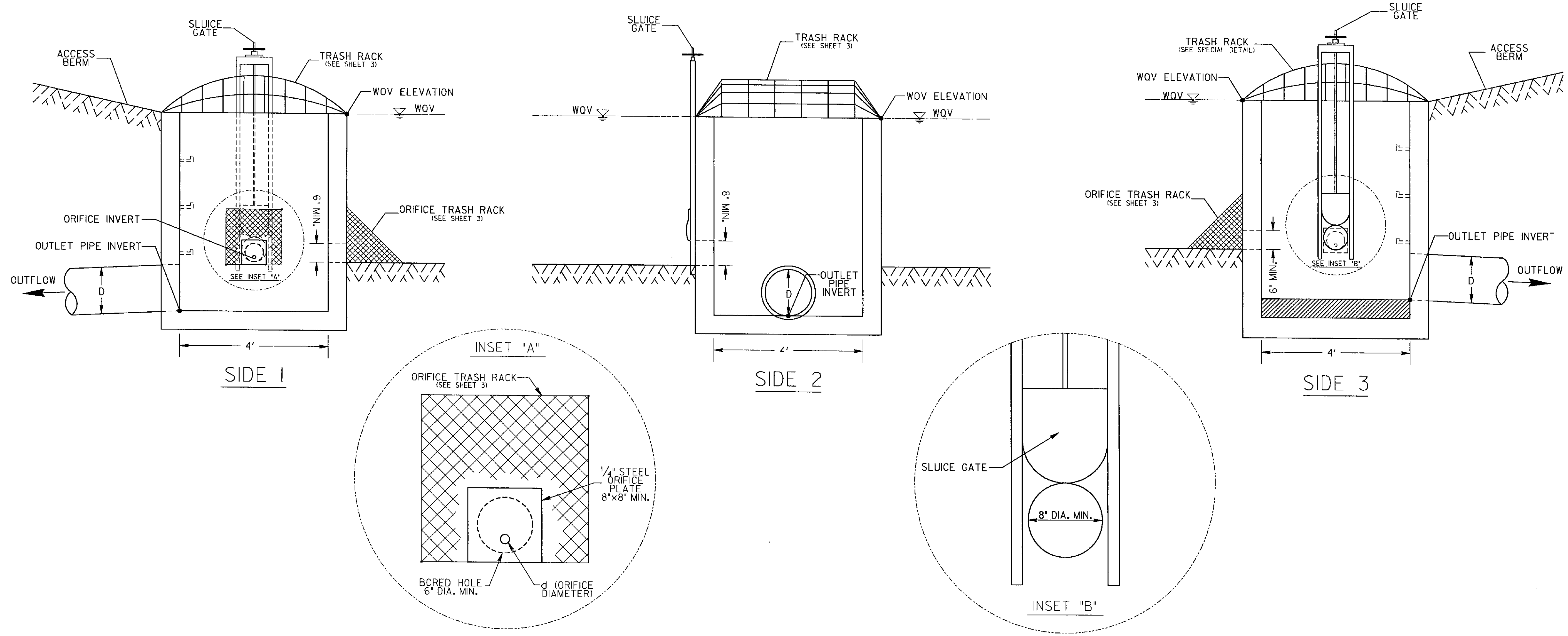
HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 7 of 18

DRY DETENTION BASIN
OUTLET CONTROL STRUCTURE



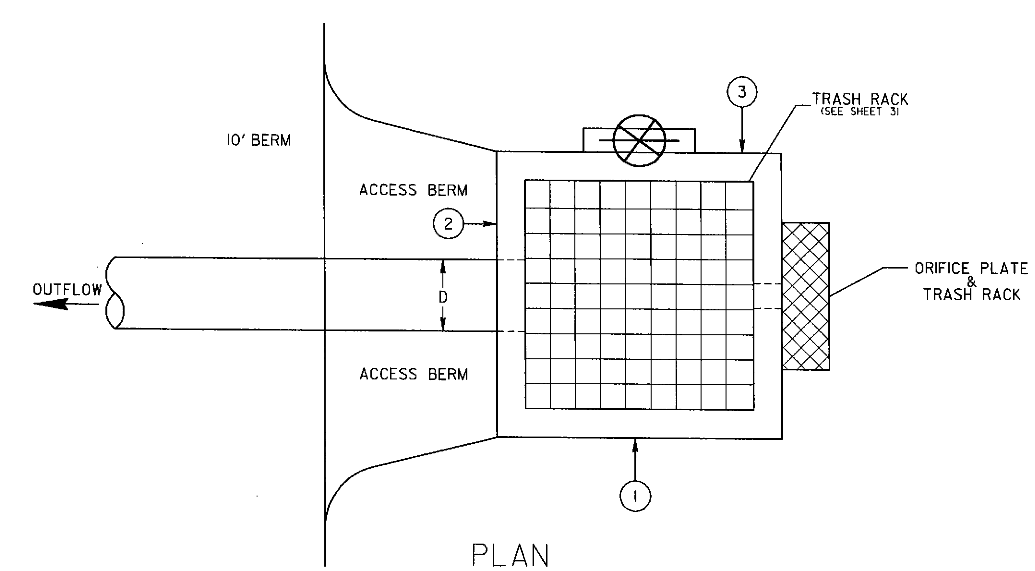
NOTES

1. 8" MIN. SLUICE GATE IS FOR MAINTENANCE AND SHOULD REMAIN CLOSED DURING NORMAL OPERATION.
2. FOR OUTLET STRUCTURE USE PRECAST DRAINAGE STRUCTURE STD. 840.45. PRECAST KNOCKOUT WALLS NOT ALLOWED. SOLID WALLS ONLY.

REFERENCED DRAWINGS

SHEET 1 - DRY DETENTION BASIN "BASIN DETAILS"
SHEET 3 - DRY DETENTION BASIN "TRASH RACKS"

BASIN	-L- STATION	WQV ELEV.	ORIFICE INVERT	OUTLET PIPE INVERT	D (IN), OUTLET DIAMETER	d (IN), ORIFICE DIAMETER
1	27+00 RT	271.0	267.7	267.0	36"	1.25"
2	37+50 RT	295.0	290.2	289.0	36"	2.00"



PLAN

NOT TO SCALE

DRY DETENTION BASIN
OUTLET CONTROL STRUCTURE
SHEET 2 OF 3

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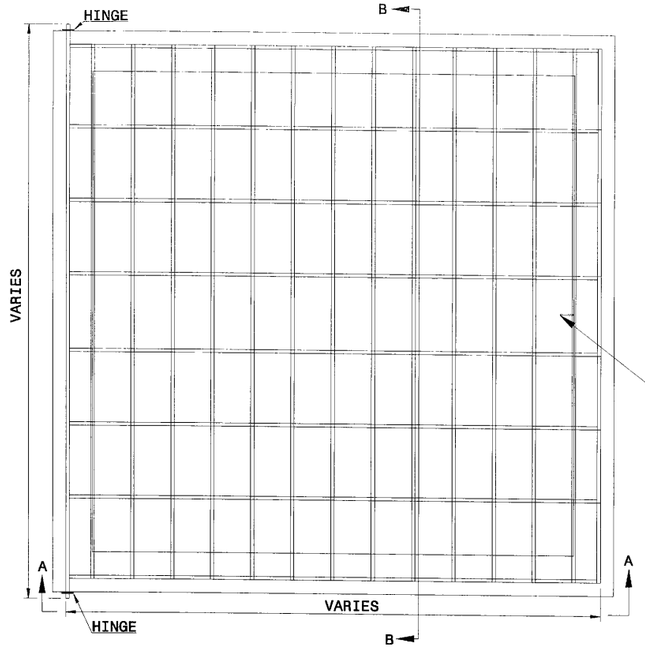
PROJECT REFERENCE NO.	SHEET NO.
U-4703	2-6

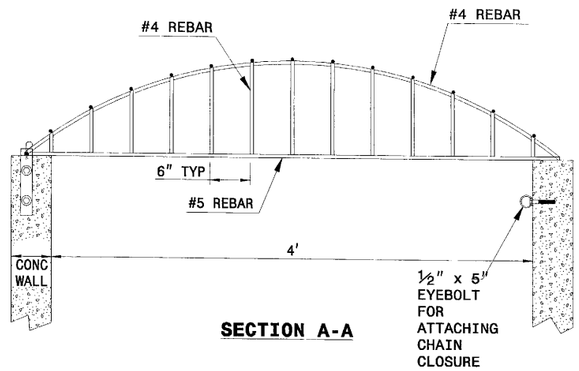
HYDRAULICS ENGINEER

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

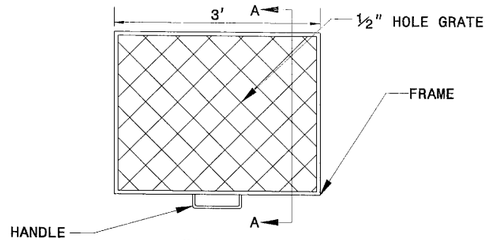
Permit Drawing
Sheet 8 of 18



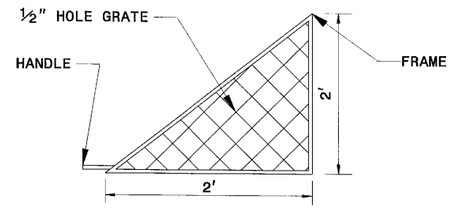
PLAN



SECTION A-A

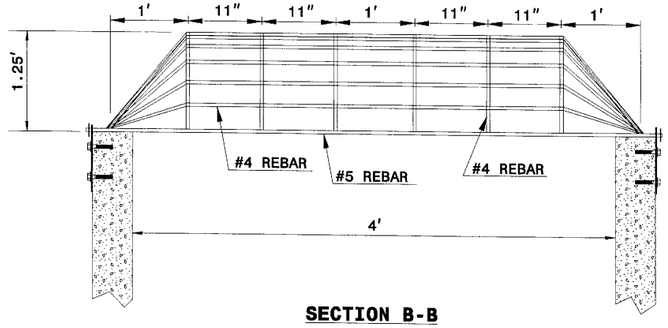


PLAN



SECTION A-A

RISER TRASH RACK NOTES:
1. ALL JOINTS SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A ¼" BEAD.
2. EYEBOLT FOR CHAIN CLOSURE SHALL BE INSTALLED BY THE SAME METHOD AS THE HINGE PLATE BOLTS.
3. RACK AND HARDWARE SHALL BE REBAR AND GALVANIZED IN ACCORDANCE WITH ASTWA153.



SECTION B-B

ORIFICE TRASH RACK NOTES:
1. ALL JOINTS SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A ¼" BEAD.
2. REMOVEABLE ORIFICE TRASH RACK SHALL BE ATTACHED TO CONCRETE BOX BY HINGE OR SLIDE RAIL SYSTEM.
3. RACK AND HARDWARE SHALL BE ALUMINUM OR GALVANIZED IN ACCORDANCE WITH ASTM A153.

REMOVABLE ORIFICE TRASH RACK

REBAR TRASH RACK

*** NOT TO SCALE**

DRY DETENTION BASIN
TRASH RACKS

DRY DETENTION BASIN
TRASH RACKS

SHEET 3 OF 3

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PROJECT REFERENCE NO.	SHEET NO.
U-4703	2-H

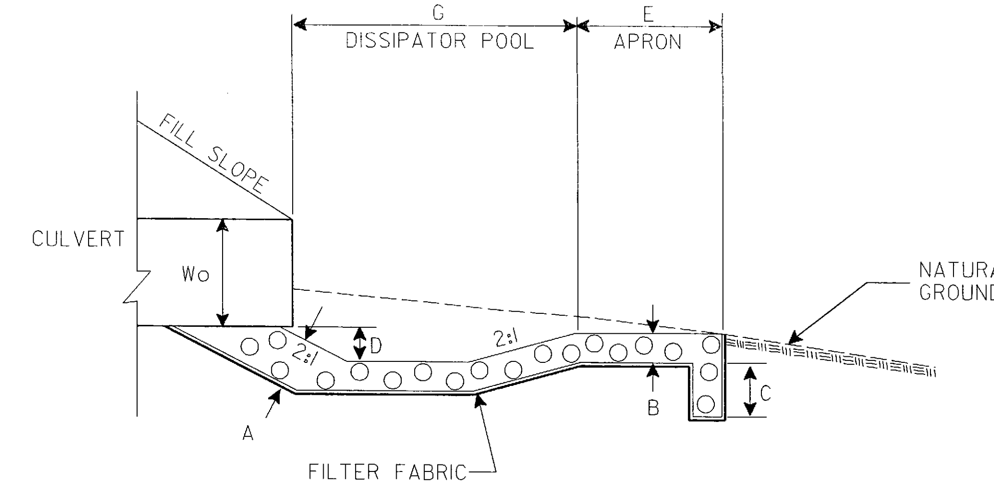
HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 9 of 18

℄ SECTION

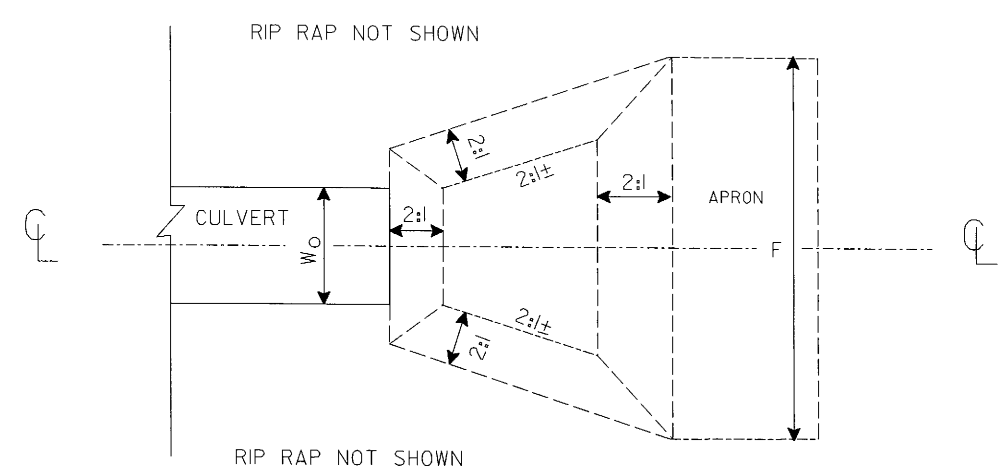


DIM.	RIP RAP BASIN # 1	2	3
A	2.0′	2.0′	2.0′
B	1.5′	1.5′	1.5′
C	2.0′	2.0′	0.0′
D	1.0′	1.0′	1.25′
E	4.5′	5.0′	6.5′
F	13.0′	13.0′	16.0′
G	9.5′	10.0′	12.5′

ALL DIMENSIONS APPROXIMATE

PLAN

BASIN #	LOCATION (AT OUTLET)
1	Sta 27+37 -L- (Rt)
2	Sta 34+59 -L- (Rt)
3	Sta 16+67.50 -Y- (Rt)



DETAIL OF RIP-RAPPED OUTLET ENERGY DISSIPATOR BASIN

PROJECT REFERENCE NO.	SHEET NO.
U-4703	5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Permit Drawing
Sheet 10 of 18

ENGLISH

HC HC DENOTES HAND CLEARING

E E DENOTES EXCAVATION IN WETLAND

T T DENOTES TEMPORARY FILL IN WETLAND

F F DENOTES FILL IN WETLAND

M M DENOTES MECHANIZED CLEARING

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83

CITY LIMIT

SITE 1

JAMES MOSS
DB 6930 PG 575

AARON MOORE
DB 3112 PG 332

FIRST UNION NATIONAL BANK
%CHERYL WELCH
DB 2903 PG 438

BONNIE G. RAY
DB 2164 PG 268

BRENDA W. FOWLER, et al
DB 6408 PG 164

CHANNEL RELOCATION
SEE DETAIL E
CL. I RIP-RAP ON BANKS ONLY
FIRST AND LAST
15' OF RELOCATION

TEMPORARY WORK PAD
(RIP RAP AND/OR TIMBER MATS)

EXCAVATE AT INLET
FOR PIPE STUB

TEMPORARY WORK BRIDGE

PIER (TYP.)

BUILDING RUINS
(OLD FOUNDATION)

JB w/MH

ENERGY DISSIPATOR BASIN
SEE SHEET 2-H
CLASS "B" RIP RAP
EST. 80 TONS
EST. 100 SY FABRIC

NOTE: SEE SHEETS 2-E THRU 2-G FOR
EXTENDED DRY DETENTION BASIN DETAILS

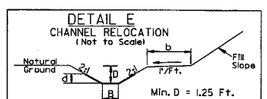
MATCHLINE -L- STA 23+00.00 (SEE SHEET 4)

MATCHLINE -L- STA 37+00.00 (SEE SHEET 6)

MATCHLINE (SEE SHEET 5A)

NOTE: SEE SHEET 2-### FOR SPECIAL DETAIL OF
DRAINAGE STRUCTURES 18, 19 AND 20

DETAIL E
CHANNEL RELOCATION
(Not to Scale)



Min. D = 1.25 Ft.
Max. d = 1.25 Ft.
B = 4.0 Ft.
b = 10.0 Ft.

Type of Liner= COIR FIBER MATTING
FROM STA. 31+46.30 TO STA. 32+81.50 LT.
DDE = 44 CY

REVISIONS

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
U-4703	5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Permit Drawing
Sheet 11 of 18

ENGLISH

HC HC DENOTES HAND CLEARING

F F DENOTES EXCAVATION IN WETLAND

N N DENOTES TEMPORARY FILL IN WETLAND

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83

CITY LIMIT

SITE 1

JAMES MOSS
DB 6930 PG 575

LAARON MOORE
DB 3112 PG 332

FIRST UNION NATIONAL BANK
/CHERYL WELCH
DB 2903 PG 438

CHANNEL RELOCATION
SEE DETAIL E
CL I RIP-RAP ON BANKS ONLY
FIRST AND LAST
15' OF RELOCATION

BONNIE G. RAY
DB 2164 PG 268

BRENDA W. FOWLER, et al
DB 6408 PG 164

TEMPORARY WORK PAD
(RIP RAP AND/OR RUBBER MATS)

EXCAVATE AT INLET
FOR PIPE STUB

BUILDING RUINS
(OLD FOUNDATION)

TEMPORARY WORK BRIDGE
PIER (TYP.)

JB w/MH

ENERGY DISSIPATOR BASIN
SEE SHEET 2-H
CLASS 'B' RIP RAP
EST. 80 TONS
EST. 100 SY FABRIC

RISER

MATCHLINE -L- STA 23+00.00 (SEE SHEET 4)

MATCHLINE -L- STA 37+00.00 (SEE SHEET 6)

MATCHLINE (SEE SHEET 5A)

NOTE: SEE SHEET 2-EEE FOR SPECIAL DETAIL OF DRAINAGE STRUCTURES 18, 19 AND 20

NOTE: SEE SHEETS 2-E THRU 2-G FOR EXTENDED DRY DETENTION BASIN DETAILS

DETAIL E
CHANNEL RELOCATION
(Not to Scale)

Min. D = 1.25 Ft.
Max. d = 1.25 Ft.
B = 4.0 Ft.
b = 10.0 Ft.

Type of Liner= COIR FIBER MATTING

FROM STA. 31+46.30 TO STA. 32+81.50 LT.
DDE = 44 CY

REVISIONS

8/17/99

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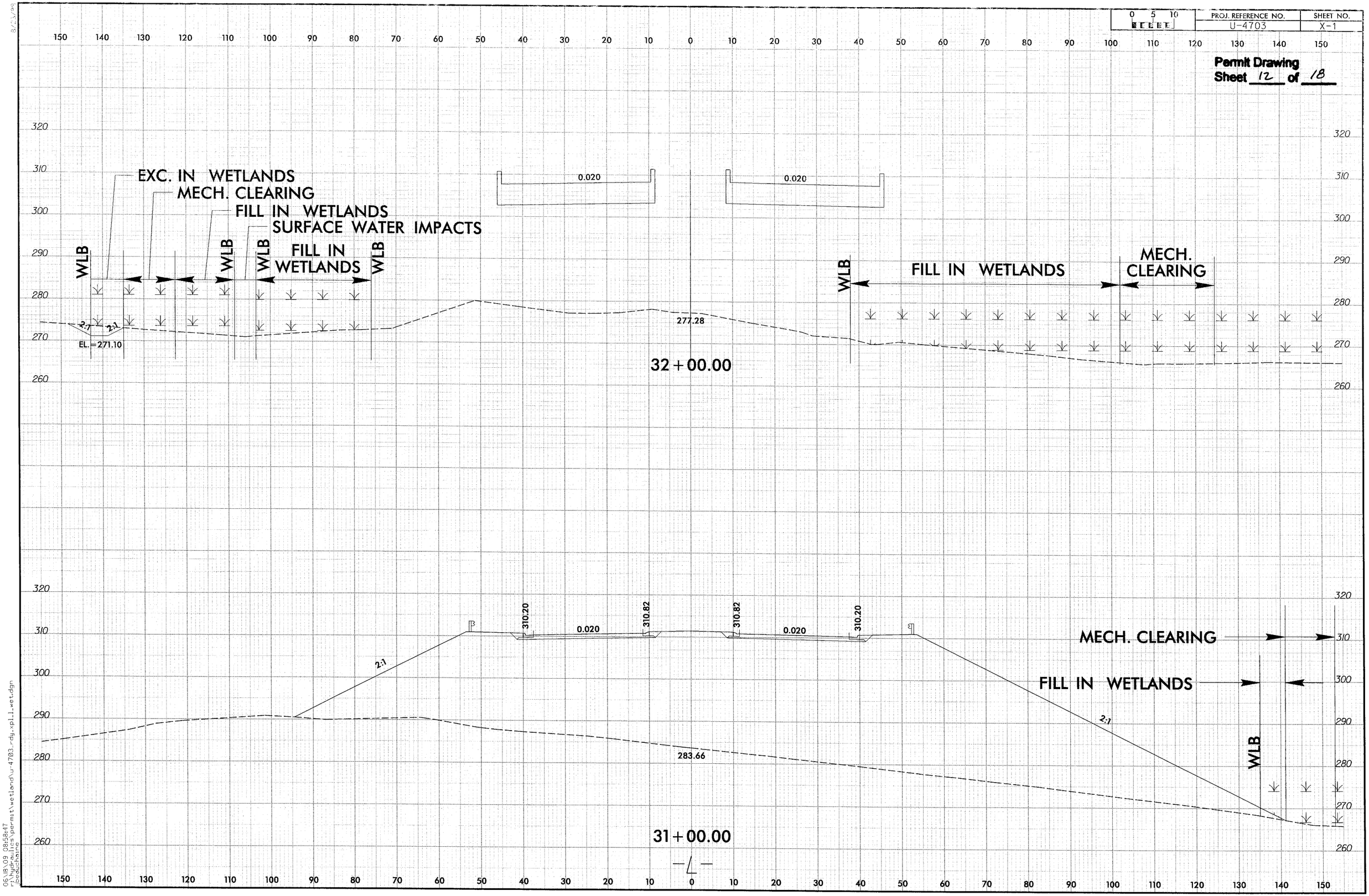
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4703	X-1

Permit Drawing
Sheet 12 of 18



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8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4703	X-2

Permit Drawing
Sheet 13 of 18

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

310 300 290 280 270 260

0.020

0.020

WLB

WLB

HAND CLEARING

WLB

WLB

HAND CLEARING

WLB

HAND CLEARING

268.36

34+00.00

310 300 290 280 270 260

0.020

0.020

WLB

WLB

WLB

HAND CLEARING

275.03

33+00.00

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

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5/28/09

PROJECT REFERENCE NO.	SHEET NO.
U-4703	12
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing Sheet 14 of 18

-L-

BEGIN 1.5' OVERLAY
-L- STA. 8+00.00

END 1.5" OVERLAY
-L- STA. 12+92.77

BEGIN GRADE -L- STA. 13+61.48
ELEV. = 339.58'
INCLUDES 1.5" RESURFACING ON -Y-

PI = 15+98.00
EL = 343.73'
VC = 200'
K = 84 (DS = 50 mph)

PI = 18+70.00
EL = 342.01'
VC = 300'
K = 159 (DS > 60 mph)

(+)1.7546%
(-)0.6324%
(-)0.6324%
(-)2.5157%
(-) 0.7576%
24" RCP

BEGIN LAT. V DITCH
STA. 13+74.00 LT
EL. 334.50'

END LAT. V DITCH
STA. 14+07.00 LT
EL. 334.25'

331.19

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO. 7

DRAINAGE AREA	=	4.91	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	18.7	CFS
DESIGN HW ELEVATION	=	339.35	FT
100 YEAR DISCHARGE	=	20.4	CFS
100 YEAR HW ELEVATION	=	339.70	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	43.2	CFS
OVERTOPPING ELEVATION	=	346.39	FT

BM # 1 ELEV. = 341.67'
N 705018.498 E 2117875.266
-BL- STA. 11+91.78 - 48.16' LT. =
-L- STA. 16+19.92 - 87.78' RT.
RR SPIKE IN BASE OF 24" PINE

DITCH LEGEND
LEFT DITCH
RIGHT DITCH
SEE SHEET 4 FOR PLAN VIEW

-L-

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 880	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 272.0	FT
BASE DISCHARGE	= 1230	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 272.7	FT
OVERTOPPING DISCHARGE	= 500+ yr.	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 303.6	FT
	=	FT
DATE OF SURVEY	= 06/2007	
W.S. ELEVATION AT DATE OF SURVEY	= 266.3	FT

(EASTBOUND/WESTBOUND BRIDGES)
℄ BRIDGE STA. 33+54.00 -L-
ELEV. = 305.40' SPANS (4 @ 92')
54" PRE-STRESSED GIRDER
SKEW = 105°

PI = 35+92.00
EL = 298.69'
VC = 800'
K = 177 (DS > 65 mph)

303.26

(-)2.5157%
(+)2.0000%

1.5:1 NORMAL (TYP.)
3.5' KEY IN (TYP.)
(-) 0.9246%
HWS 266.3

BM # 2 ELEV. = 306.53'
N 705052.762 E 2119195.351
-BL- STA. 25+14.25 - 28.03' LT. =
-L- STA 29+94.27 - 61.82' RT.
RR SPIKE IN BASE OF 14" OAK

BEGIN LAT. BASE DITCH
STA. 31+46.30 LT
EL. 271.60'

END LAT. BASE DITCH
STA. 32+81.50 LT
EL. 270.35'

DITCH LEGEND
LEFT DITCH
RIGHT DITCH
SEE SHEET 5 FOR PLAN VIEW

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PROJECT REFERENCE NO.	SHEET NO.
U-4703	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Permit Drawing
Sheet 15 of 18

NAD 83

REVISIONS

9/17/99 R/W REVISION (05/29/09) DMG - REVISED THE PROPERTY OWNER NAME ON PARCEL 14 TO (NATALIE HEATON). REVISED THE PUE TO AUE ON PARCEL 18 (GLENN BAREFOOT). PARCEL 19 (RONALD THOMPSON) AND PARCEL 22 (PHILIP KING).

VICTOR SHAW DB 4598 PG 253
FLORENCE TAYLOR DB 2356 PG 391
MICHAEL WILLIS DB 9491PG 2466
EVELYN GRAHAM DB 7563 PG 233
TIMOTHY HERRIN DB 11098 PG 478
WILLIE VICK DB 3044 PG 423
STEVEN LYONS DB 8245 PG 1588
JENNIFER EDMONDSON DB 4803 PG 281
GILES SHAVER DB 8931PG 115
LIZZIE WILSON DB 6485 PG 392
W. E. MCLAMB DB 7615 PG 789
WILLIAM C. MCLAMB DB 9557 PG 1629
W. E. MCLAMB DB 1882 PG 136
ALFRED ELMORE DB 3068 PG 610
BILLY STUART DB 2842 PG 338
DAVID BREWER DB 6125 PG 98
EDWARD HARRELSON DB 3404 PG 220
JAAN UTNO DB 8994 PG 1519
ROLAND DODSON DB 8433 PG 1750
JOSEPH LOVEJOY DB 9521PG 881
MELVETINE MATOKO DB 10801PG 546
FAYE TROTTER DB 5377 PG 3
ROBERT HINES DB 7798 PG 100
PERRY KIRCH DB 9366 PG 544
RONALD THOMPSON DB 7674 PG 106
PHILIP KING DB 1569 PG 726
GLENN BAREFOOT DB 1583 PG 476
HEIDIK. MOORE DB 6554 PG 766
RYAN L. CREECH DB 6604 PG 623
GARNER CHURCH OF CHRIST DB 3221PG 483
JACK ROSE DB 8298 PG 276
RONALD RUSSIAN DB 8614 PG 2623
RICHARD MIGNEL DB 7919 PG 934

MATCHLINE -Y1- STA 24+00.00 (SEE SHEET 4)
MATCHLINE -Y- STA 23+50.00 (SEE SHEET 4)

DETAIL P
CUT DITCH
(Not to Scale)
Natural Ground, 2H, D, 4:1 or Flatter, Front Ditch Slope
Min. D = 1.5 Ft.
FROM -Y- STA. 13+50 TO 14+50 LT
-Y3- STA. 17+50 RT TO -Y4- STA. 11+00 LT

DETAIL Q
LATERAL 'V' DITCH
(Not to Scale)
Natural Ground, 2H, D, 2H, b, 1'/Ft., Fill Slope
Min. D = 0.5 Ft.
b = 2.0 Ft.
FROM -Y- STA. 14+50 TO STA. 16+07 LT.
DDE = 127 CY

DETAIL R
LATERAL 'V' DITCH
(Not to Scale)
Natural Ground, 2H, D, 2H, b, 1'/Ft., Fill Slope
Min. D = 1.0 Ft.
b = 2.0 Ft.
FROM -Y- STA. 17+41.80 TO 17+70.00 LT.
DDE = 10 CY
-Y4- STA. 11+00 TO STA. 11+75 RT.
DDE = 18 CY

DETAIL S
STANDARD BASE DITCH
(Not to Scale)
Natural Ground, 2H, d, D, 2H, Natural Ground, Filter Fabric, B
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
B = 4.0 Ft.
*When B Is < 6.0'
Type of Liner= Class B Rip-Rap
FROM -Y- STA. 15+94.40 TO STA. 16+12.00 LT.
DDE = 4 CY
-Y3- STA 10+85.2 TO STA 10+92.5 LT.
DDE = 8 CY

DETAIL T
CUT DITCH
(Not to Scale)
Natural Ground, 2H, d, D, 4:1 or Flatter, Front Ditch Slope
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
Type of Liner= PSRM
FROM -Y3- STA. 17+50 TO STA. 18+00 RT.
-Y4- STA. 11+00 TO STA. 11+50 LT.

ENGLISH

DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES MECHANIZED CLEARING

SPEC. CUT DITCH SEE DETAIL T
CL B RIP RAP W/FILTER FABRIC EST. 3 TONS EST. 10 SY FABRIC
SPEC. CUT DITCH SEE DETAIL P
SPEC. CUT DITCH SEE DETAIL T
REMOVE
LAT V DITCH SEE DETAIL R
CL I RIP RAP W/FILTER FABRIC EST. 15 TONS EST. 30 SY FABRIC
CL B RIP RAP W/FILTER FABRIC EST. 1 TON EST. 5 SY FABRIC
RETAIN
CL I RIP RAP W/FILTER FABRIC EST. 15 TONS EST. 30 SY FABRIC
LAT V DITCH SEE DETAIL R
LAT V DITCH SEE DETAIL Q
SPEC. CUT DITCH SEE DETAIL P
COLLAR & EXTEND
REMOVE DI
PLUG & FILL W/FLOWABLE FILL
15" BCCS ROD & LUG CONNECTORS ELBOWS
ENERGY DISSIPATOR SEE SHEET 2-H CLASS 'B' RIP RAP EST. 170 TONS EST. 215 SY FABRIC
SITE 2

AUE AUE
AERIAL UTILITY EASEMENT

SEE SHEET 15 FOR -Y- PROFILE
SEE SHEET 16 FOR -Y1- PROFILE
SEE SHEET 18 FOR -Y3- & -Y4- PROFILES

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PROJECT REFERENCE NO.	SHEET NO.
U-4703	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Permit Drawing
Sheet 16 of 18

NAD 83

REVISIONS
8/17/99
R/W REVISION (05/29/09).DWG - REVISED THE PROPERTY OWNER NAME ON PARCEL 14 TO (NATALIE HEATON). REVISED THE PUE TO AUE ON PARCEL 18 (GLENN BAREFOOT).
PARCEL 19 (RONALD THOMPSON), AND PARCEL 22 (PHILIP KING).

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VICTOR SHAW
DB 4598 PG 253

FLORENCE TAYLOR
DB 2556 PG 391

MICHAEL WILLIS
DB 9491PG 2466
SPEC. CUT DITCH
SEE DETAIL T
CL B RIP RAP
W/FILTER FABRIC
EST. 3 TONS
EST. 10 SY FABRIC

EVELYN GRAHAM
DB 7563 PG 233

TIMOTHY HERRIN
DB 11098 PG 478

WILLIE VICK
DB 3044 PG 423

STEVEN LYONS
DB 8245 PG 1588

JENNIFER EDMONDSON
DB 4803 PG 281

GILES SHAVER
DB 8931PG 115

LIZZIE WILSON
DB 6485 PG 392

SPEC. CUT DITCH
SEE DETAIL P

SPEC. CUT DITCH
SEE DETAIL T

REMOVE

LAT V DITCH
SEE DETAIL R

CL TRIP RAP
W/FILTER FABRIC
EST. 15 TONS
EST. 30 SY FABRIC

W. E. MCLAMB
DB 7615 PG 789

WILLIAM C. MCLAMB
DB 9557 PG 1629

ALFRED ELMORE
DB 3068 PG 610

BILLY STUART
DB 2842 PG 338

DAVID BREWER
DB 6125 PG 96

EDWARD HARRELSON
DB 3404 PG 220

JAAN UTNO
DB 8994 PG 1519

W. E. MCLAMB
DB 1882 PG 136

CL B RIP RAP
W/FILTER FABRIC
EST. 1 TON
EST. 5 SY FABRIC

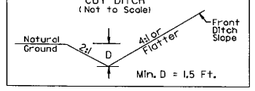
RETAIN

CL I RIP RAP
W/FILTER FABRIC
EST. 15 TONS
EST. 30 SY FABRIC

MATCHLINE -Y1- STA 24+00.00
(SEE SHEET 4)

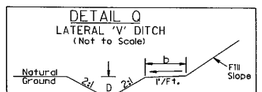
AUE — AUE
AERIAL UTILITY EASEMENT

DETAIL P
CUT DITCH
(Not to Scale)



FROM -Y- STA. 13+50 TO 14+50 LT
-Y3- STA. 17+50 RT TO -Y4- STA. 11+00 LT

DETAIL Q
LATERAL 'V' DITCH
(Not to Scale)

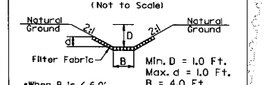


FROM -Y- STA. 14+50 TO STA. 16+07 LT.
DDE = 127 CY

DETAIL R
LATERAL 'V' DITCH
(Not to Scale)

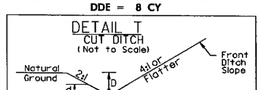
FROM -Y- STA. 17+41.80 TO 17+70.00 LT.
DDE = 10 CY
-Y4- STA. 11+60 TO STA. 11+75 RT.
DDE = 18 CY

DETAIL S
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= Class B Rip-Rap
FROM -Y- STA. 15+94.40 TO STA. 16+12.00 LT.
DDE = 4 CY
-Y3- STA 10+85.2 TO STA 10+92.5 LT.
DDE = 8 CY

DETAIL T
CUT DITCH
(Not to Scale)



Type of Liner= PSRM
FROM -Y3- STA. 17+50 TO STA. 18+00 RT.
-Y4- STA. 11+00 TO STA. 11+50 LT.

ENGLISH

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

SITE 2

W. E. MCLAMB
DB 1882 PG 136
STD. BASE DITCH
SEE DETAIL S
CLASS B RIP RAP
EST. 29 TONS
79 SY FILTER FABRIC

LAT V DITCH W. E. MCLAMB
SEE DETAIL R DB 1510 PG 188

LAT V DITCH
SEE DETAIL Q

COLLAR & EXTEND

SPEC. CUT DITCH
SEE DETAIL P

PLUG & FILL W/FLOWABLE FILL

15" BCCS
ROD & LUG CONNECTORS
2 ELBOWS

GARNER CHURCH OF CHRIST
DB 3221PG 483

ENERGY DISSIPATOR
SEE SHEET 2-H
CLASS 'B' RIP RAP
EST. 170 TONS
EST. 215 SY FABRIC

RYAN L. CREECH
DB 6904 PG 623

HEIDI K. MOORE
DB 6554 PG 766

ROLAND DODSON
DB 8193 PG 1750

JOSEPH LOVEJOY
DB 9521PG 881

MELVETINE MATOKO
DB 10801PG 546

FAYE TROTTER
DB 5377 PG 3

ROBERT HINES
DB 7798 PG 100

RONALD THOMPSON
DB 7674 PG 106

PHILIP KING
DB 1569 PG 726

GLENN BAREFOOT
DB 1583 PG 476

PERRY KIRCH
DB 9366 PG 544

RICHARD MIGNEL
DB 7919 PG 934

JACK ROSE
DB 8298 PG 276

RONALD RUSSIAN
DB 8614 PG 2623

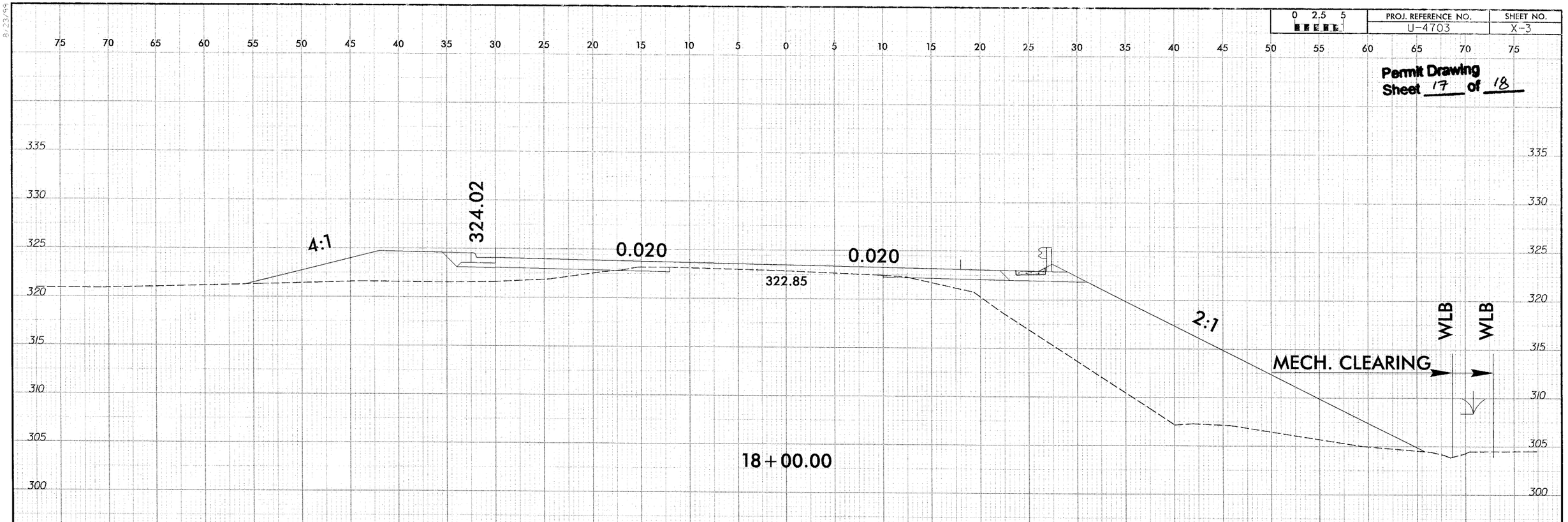
MATCHLINE -Y- STA 23+50.00 (SEE SHEET 4)

SEE SHEET 15 FOR -Y- PROFILE
SEE SHEET 16 FOR -Y1- PROFILE
SEE SHEET 18 FOR -Y3- & -Y4- PROFILES

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-4703	X-3

Permit Drawing
Sheet 17 of 18



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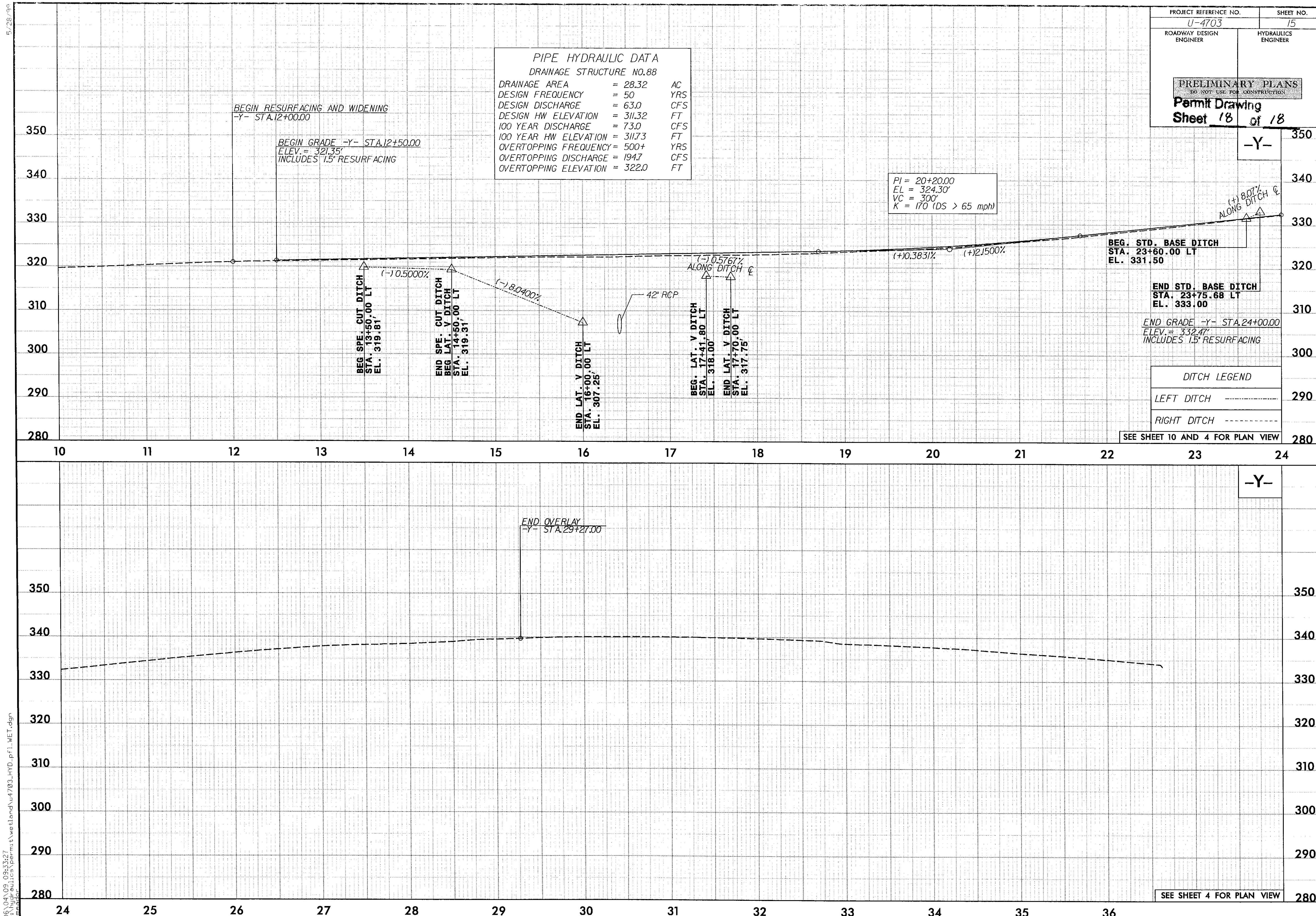

PROJECT REFERENCE NO. U-4703
SHEET NO. 15
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Permit Drawing
Sheet 18 of 18
PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.88
DRAINAGE AREA = 28.32 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 63.0 CFS
DESIGN HW ELEVATION = 311.32 FT
100 YEAR DISCHARGE = 73.0 CFS
100 YEAR HW ELEVATION = 311.73 FT
OVERTOPPING FREQUENCY = 500+ YRS
OVERTOPPING DISCHARGE = 194.7 CFS
OVERTOPPING ELEVATION = 322.0 FT
BEGIN RESURFACING AND WIDENING
-Y- STA.12+00.00
BEGIN GRADE -Y- STA.12+50.00
ELEV.= 321.35'
INCLUDES 1.5' RESURFACING
PI = 20+20.00
EL = 324.30'
VC = 300'
K = 170 (DS > 65 mph)
-Y-
(+) 8.07% ALONG DITCH ℄
BEG. STD. BASE DITCH
STA. 23+60.00 LT
EL. 331.50
END STD. BASE DITCH
STA. 23+75.68 LT
EL. 333.00
END GRADE -Y- STA.24+00.00
ELEV.= 332.47'
INCLUDES 1.5' RESURFACING
(+)0.3831%
(+)2.1500%
(-) 0.5767% ALONG DITCH ℄
(-) 0.5000%
(-) 8.0400%
42" RCP
BEG SPE. CUT DITCH
STA. 13+50.00 LT
EL. 319.81'
END SPE. CUT DITCH
BEG LAT. V DITCH
STA. 14+50.00 LT
EL. 319.31'
END LAT. V DITCH
STA. 16+00.00 LT
EL. 307.25'
BEG. LAT. V DITCH
STA. 17+41.80 LT
EL. 318.00'
END LAT. V DITCH
STA. 17+70.00 LT
EL. 317.75'
DITCH LEGEND
LEFT DITCH
RIGHT DITCH
SEE SHEET 10 AND 4 FOR PLAN VIEW
350 340 330 320 310 300 290 280
10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
-Y-
END OVERLAY
-Y- STA.29+27.00
SEE SHEET 4 FOR PLAN VIEW
24 25 26 27 28 29 30 31 32 33 34 35 36
5/28/99
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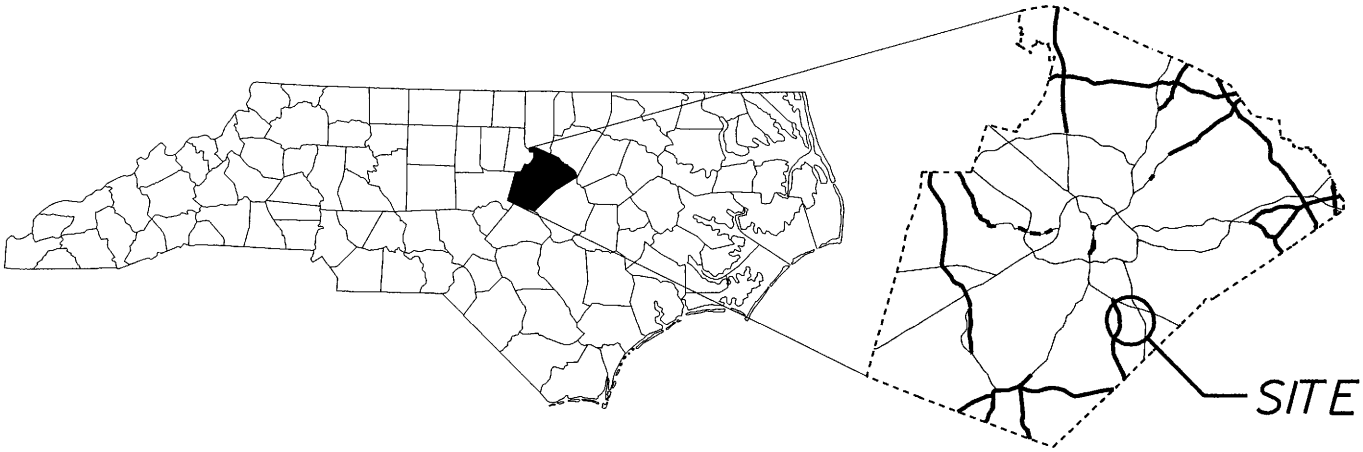
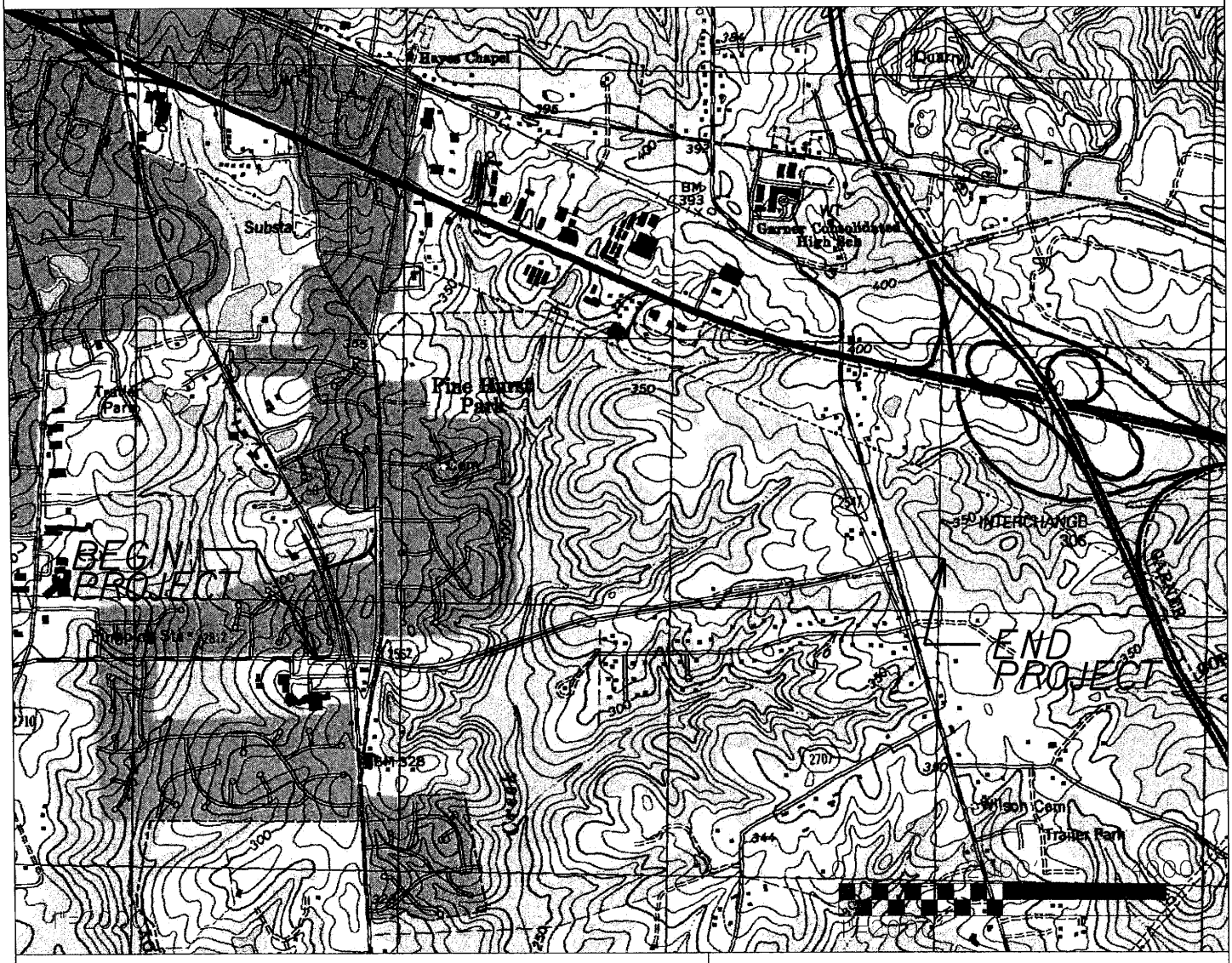




NEUSE RIVER BUFFER

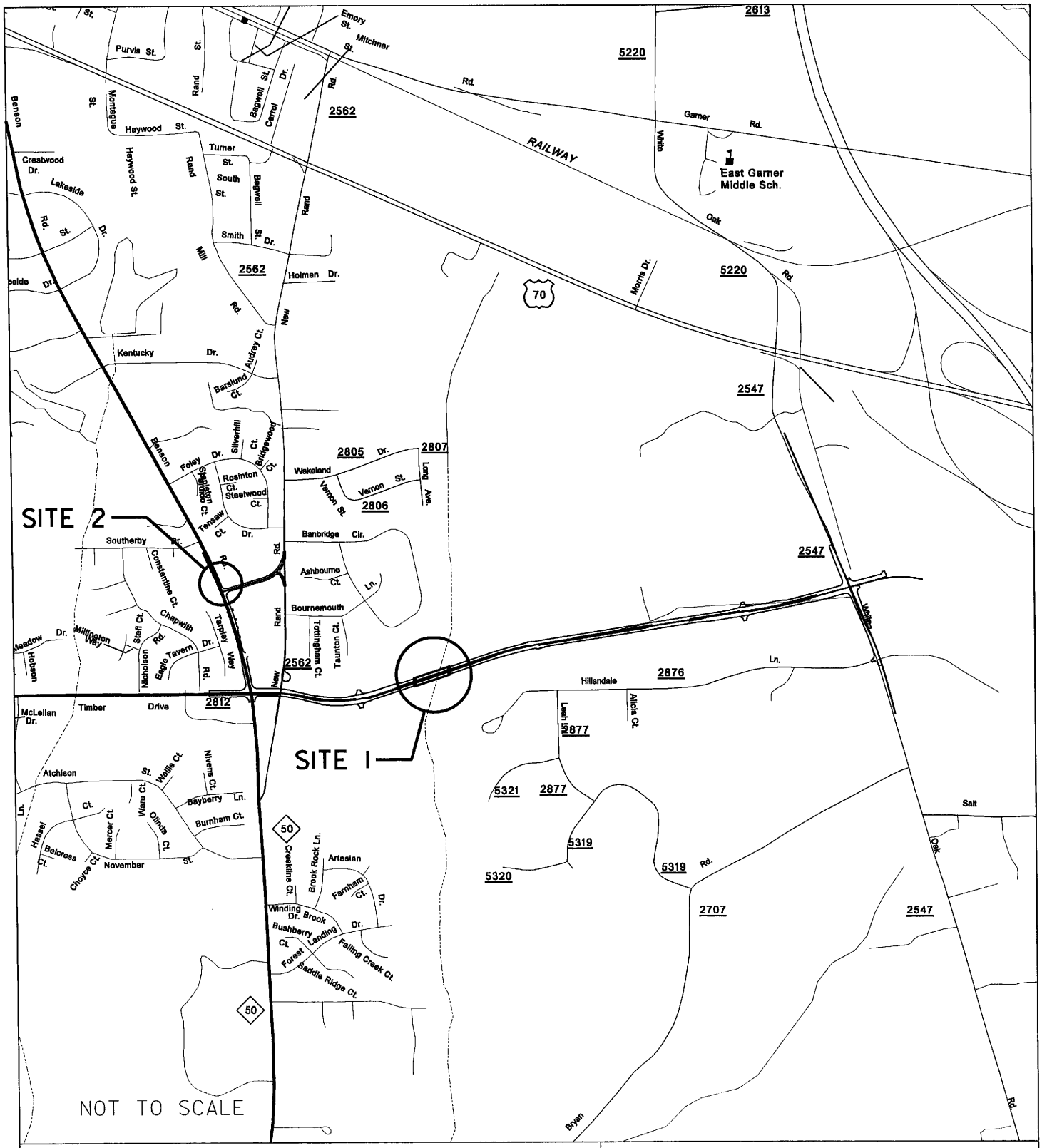
VICINITY MAP

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
WAKE COUNTY

PROJECT: 35871.1.1 (U4703)

TIMBER DR. EAST EXTENSION (SR 2812)
FROM NC 50 TO WHITE OAK ROAD (SR 2547)

Buffer Drawing
Sheet 1 of 14



NEUSE RIVER BUFFER
LOCATION MAP

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
WAKE COUNTY

PROJECT: 35871.1.1 (U4703)

TIMBER DR. EAST EXTENSION (SR 2812)
FROM NC 50 TO WHITE OAK ROAD (SR 2547)

Buffer Drawing
Sheet 2 of 14

PROP. NO.	PROPERTY OWNER NAME	PROP. OWNER ADDRESS
3	First Union National Bank	First Union National Bank, c\o Cheryl Welch First Union Plaza, Cont-2, Charlotte, NC 28288
4	Bonnie G. Ray	420 Hillandale Lane, Garner NC 27529
11	Garner Church of Christ	118 Park Ave, Fuquay-Varina NC 27526
13	Ryan L. Creech	101 Tarpley Way, Garner NC 27529
14	Heidi K. Moore	103 Tarpley Way, Garner NC 27529

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY
PROJECT: 35871.1.1 (U-4703)

6/17/2009

Buffer Drawing
Sheet 3 of 14

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BUFFER IMPACTS SUMMARY

SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
			ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
1	368' BRIDGE	-L- 33+13 TO 34+76		X		7875	5295	13170					
1	ENERGY DISS.	-L- 34+49 TO 34+60 RT	X				104	104					
2	42" PIPE	-Y- 15+90 TO 17+18 RT	X			3818	1222	5040					
3	ROADWAY	-L- 31+07 TO 33+59 LT			X				10601	6002	16603		
TOTAL:						11693	6621	18314	10601	6002	16603		

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY
PROJECT: 35871.1.1 (U-4703)

7/16/2009

Buffer Drawing Sheet 4 of 14

BUFFER IMPACTS SUMMARY

		WETLANDS IN BUFFER	
Site	Station	ZONE 1 (ft^2)	ZONE 2 (ft^2)
3	-L- 31+07 TO 33+59 LT	5093	713
		5093	713

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY
PROJECT: 35871.1.1 (U-4703)

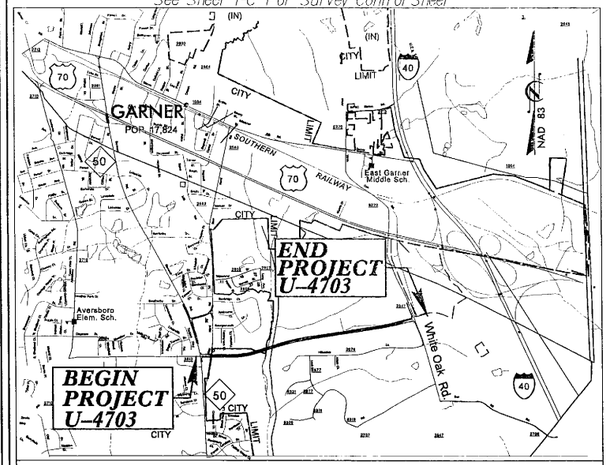
7/16/2009

Sheet 5 of 14

TIP PROJECT: U-4703

CONTRACT:

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4703	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
35871.1.1	STP-0508(2)	PE
35871.2.1	STP-0508(2)	R/W & UTILITIES
35871.3.1	STPDA-0508(3)	CONST.

Buffer Drawing Sheet 6 of 14

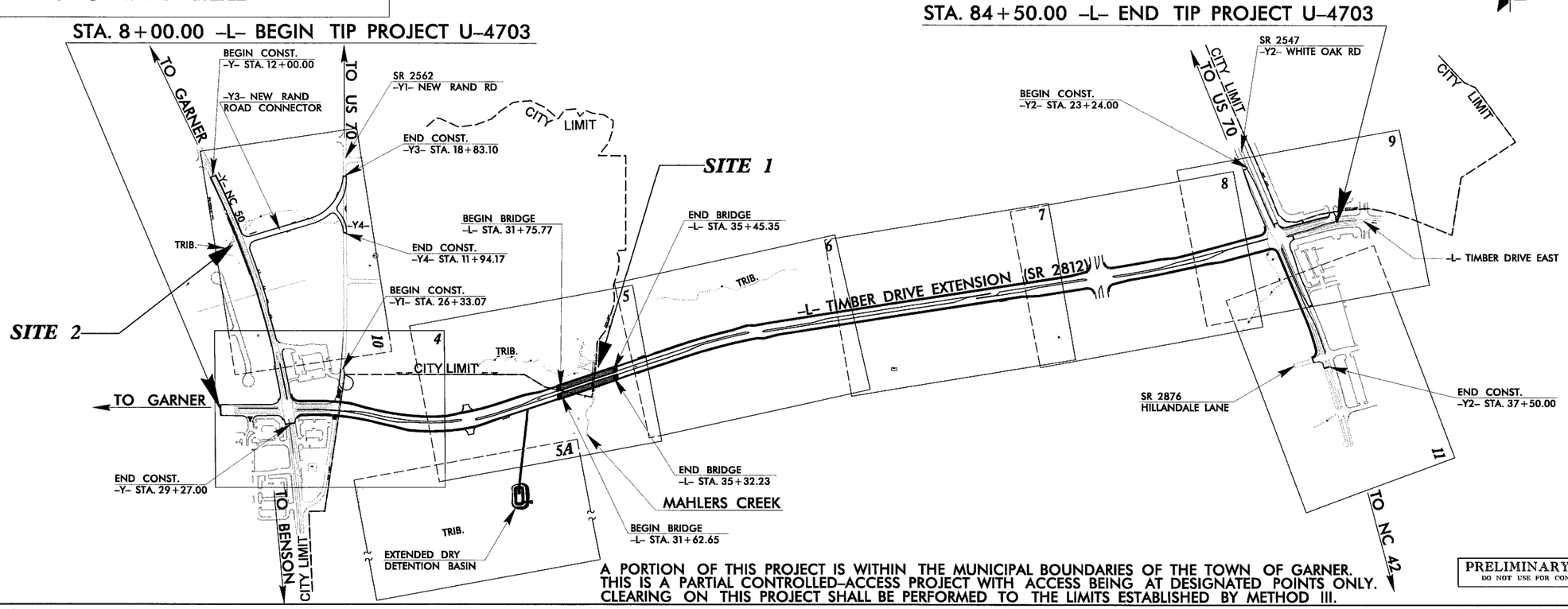
LOCATION: TIMBER DRIVE EAST EXTENSION (SR 2812) FROM NC 50 TO WHITE OAK ROAD (SR 2547) IN GARNER

TYPE OF WORK: NEUSE RIVER BASIN – BUFFER PERMIT DRAWINGS

NAD 83

STA. 8+00.00 –L– BEGIN TIP PROJECT U-4703

STA. 84+50.00 –L– END TIP PROJECT U-4703



A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE TOWN OF GARNER.
THIS IS A PARTIAL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING AT DESIGNATED POINTS ONLY.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

PLANS 50 25 0 50 100

PROFILE (HORIZONTAL) 50 25 0 50 100

PROFILE (VERTICAL) 10 5 0 10 20

DESIGN DATA

ADT 2009 = 15,435
ADT 2030 = 24,000
DHV = 10 %
D = 55 %
T = 6 % *
V = 50 MPH
* TTST 2% DUAL 4%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-4703 = 1.379 mi.
LENGTH STRUCTURE OF TIP PROJECT U-4703 = 0.070 mi.
TOTAL LENGTH OF TIP PROJECT U-4703 = 1.449 mi.

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: AUGUST 20, 2008

LETTING DATE: MAY 18, 2010

JAMES A. SPEER, PE
PROJECT ENGINEER

DANIEL W. GARDNER, JR., PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER P.E.

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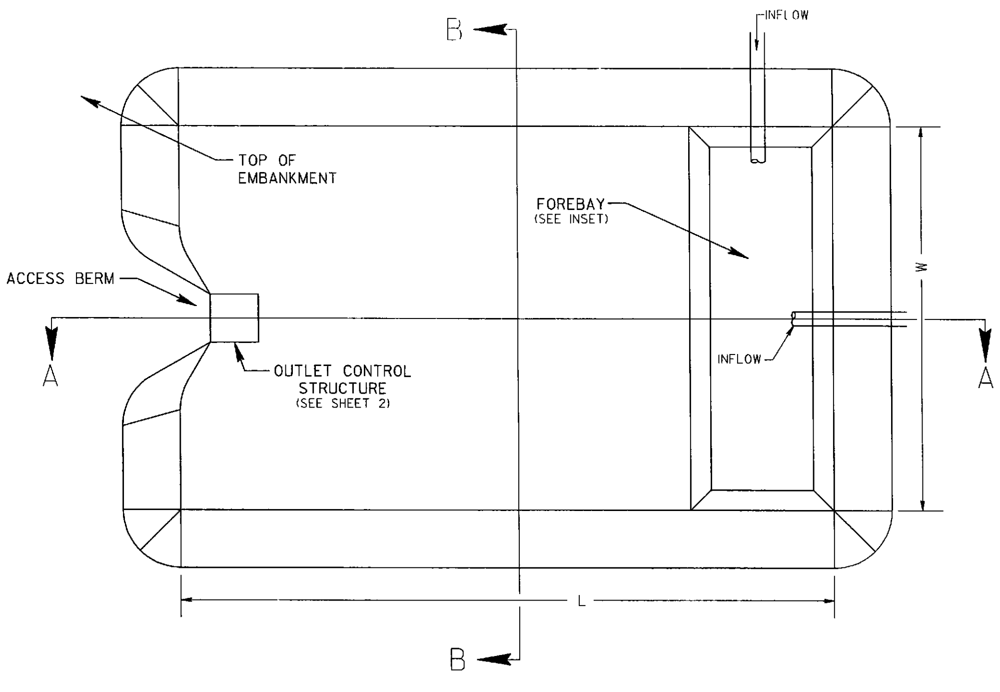
jmeador

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

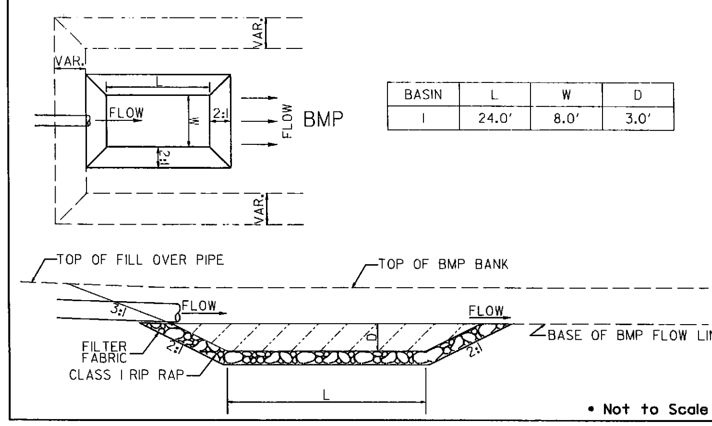
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Buffer Drawing
Sheet 7 of 14



PLAN

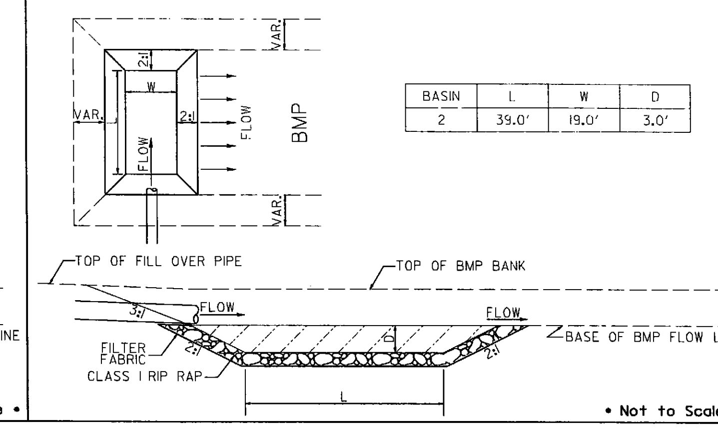
INSET
PARALLEL FOREBAY WITH PIPE INLET



BASIN	L	W	D
1	24.0'	8.0'	3.0'

• Not to Scale •

INSET
PERPENDICULAR FOREBAY WITH PIPE INLET



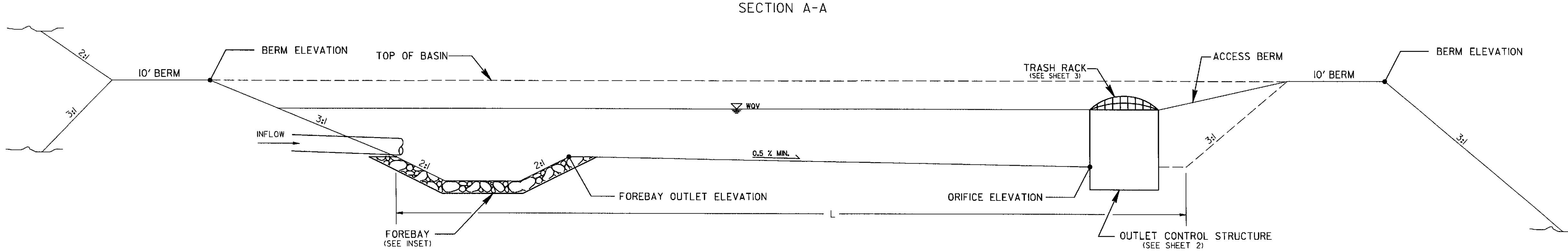
BASIN	L	W	D
2	39.0'	19.0'	3.0'

• Not to Scale •

REFERENCED DRAWINGS

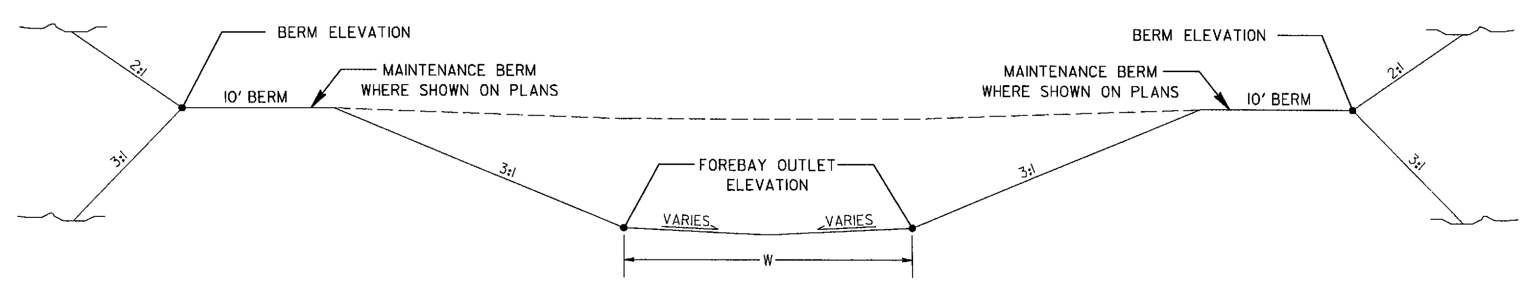
SHEET 2 - DRY DETENTION BASIN "OUTLET CONTROL STRUCTURE"
SHEET 3 - DRY DETENTION BASIN "TRASH RACKS"

PROFILE
SECTION A-A



PROFILE
SECTION B-B

BASIN	L	W	FOREBAY OUTLET ELEV.	ORIFICE ELEV.	BERM ELEV.
1	90.0'	30.0'	268.0	267.7	274.0
2	138.0	51.0'	292.0	290.2	298.0



NOT TO SCALE

DRY DETENTION BASIN
BASIN DETAILS

DRY DETENTION BASIN
BASIN DETAILS

SHEET 1 OF 3

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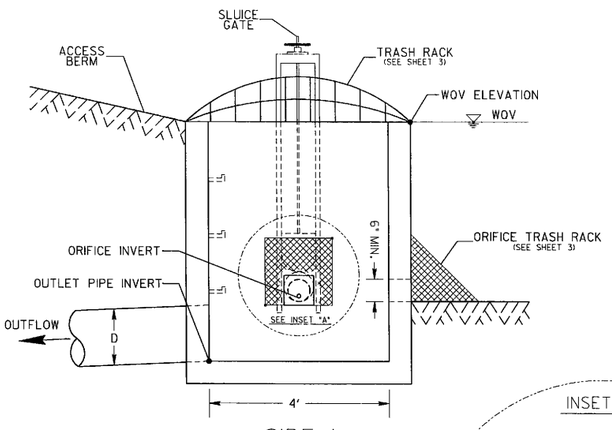
5/2/09

PROJECT REFERENCE NO.	SHEET NO.
U-4703	2-F

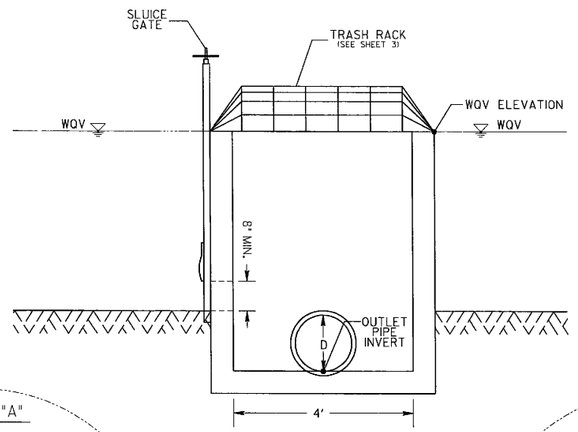
HYDRAULICS ENGINEER

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

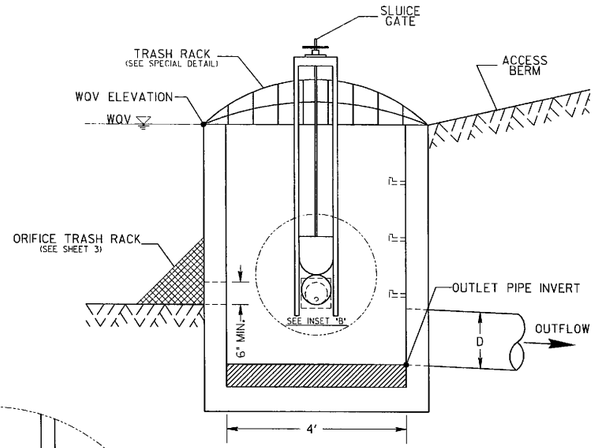
Buffer Drawing
Sheet 8 of 14



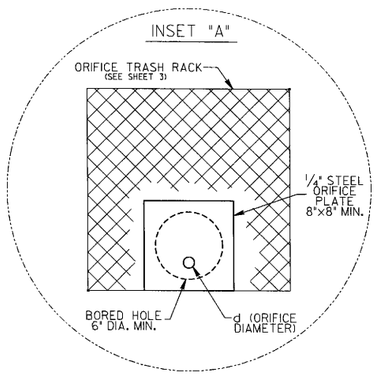
SIDE 1

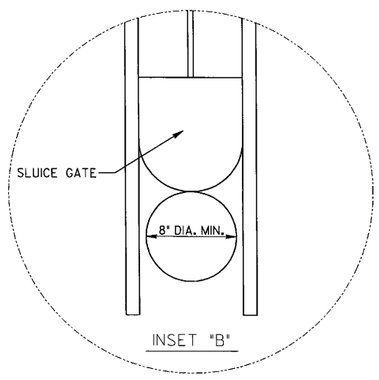


SIDE 2



SIDE 3





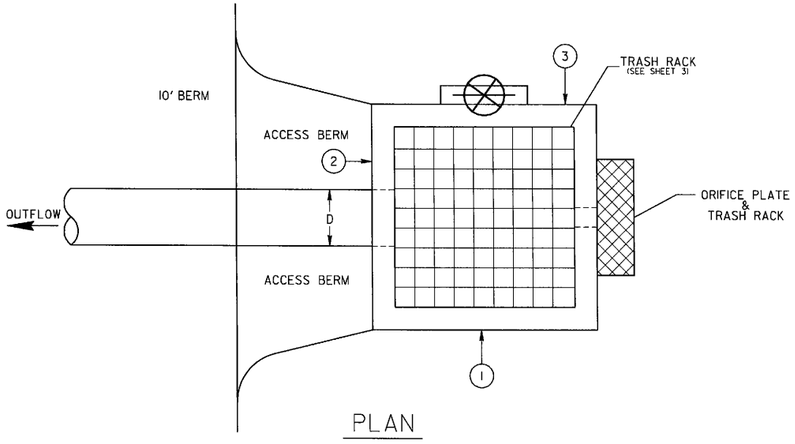
NOTES

1. 8" MIN. SLUICE GATE IS FOR MAINTENANCE AND SHOULD REMAIN CLOSED DURING NORMAL OPERATION.
2. FOR OUTLET STRUCTURE USE PRECAST DRAINAGE STRUCTURE STD. 840.45. PRECAST KNOCKOUT WALLS NOT ALLOWED. SOLID WALLS ONLY.

REFERENCED DRAWINGS

SHEET 1- DRY DETENTION BASIN "BASIN DETAILS"
SHEET 3 - DRY DETENTION BASIN "TRASH RACKS"

BASIN	-L- STATION	WQV ELEV.	ORIFICE INVERT	OUTLET PIPE INVERT	D (IN), OUTLET DIAMETER	d (IN), ORIFICE DIAMETER
1	27+00 RT	271.0	267.7	267.0	36"	1.25"
2	37+50 RT	295.0	290.2	289.0	36"	2.00"



PLAN

NOT TO SCALE

DRY DETENTION BASIN
OUTLET CONTROL STRUCTURE

SHEET 2 OF 3

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DRY DETENTION BASIN
OUTLET CONTROL STRUCTURE

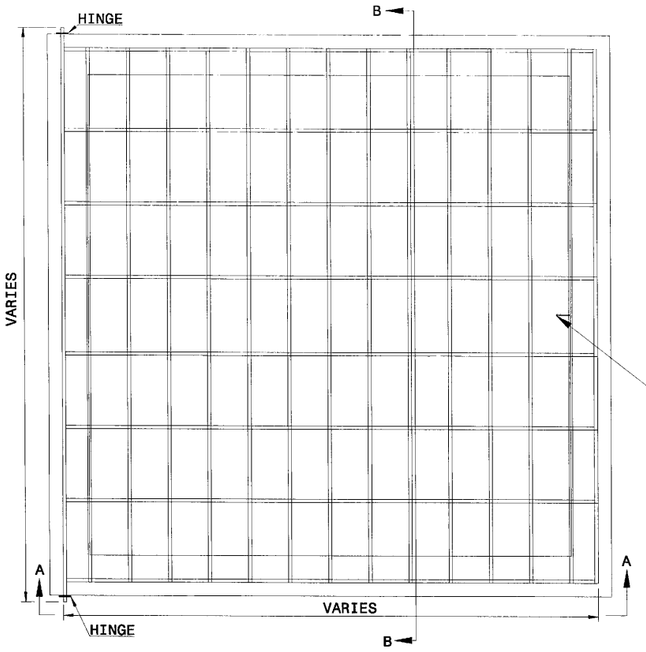
SHEET 2 OF 3

PROJECT REFERENCE NO.	SHEET NO.
U-4703	2-6

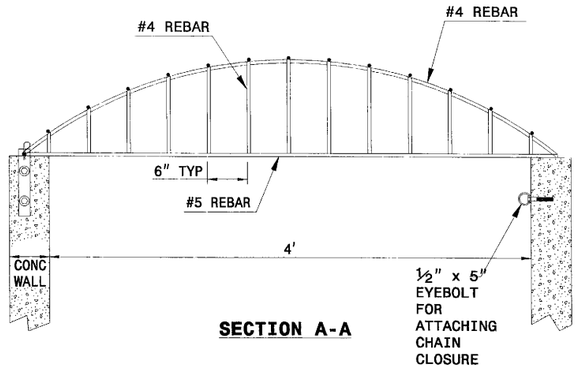
HYDRAULICS ENGINEER

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

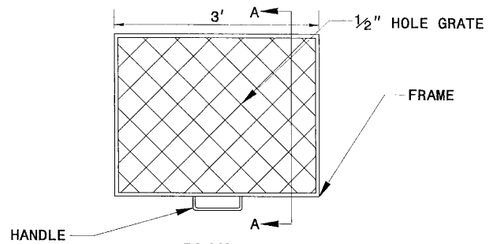
Buffer Drawing Sheet 9 of 14



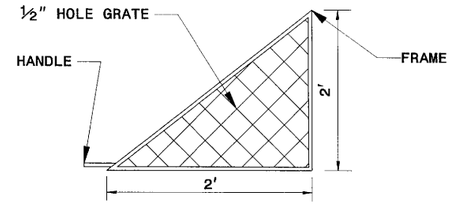
PLAN



SECTION A-A

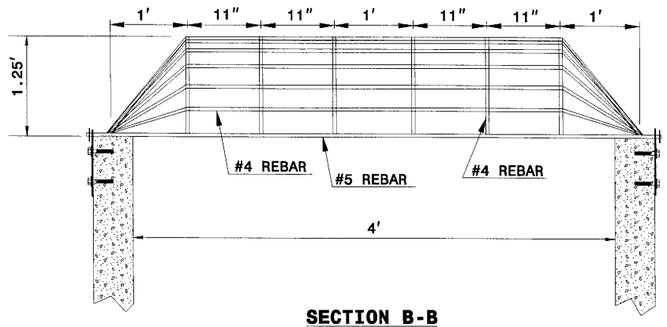


PLAN



SECTION A-A

RISER TRASH RACK NOTES:
1. ALL JOINTS SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A ¼" BEAD.
2. EYEBOLT FOR CHAIN CLOSURE SHALL BE INSTALLED BY THE SAME METHOD AS THE HINGE PLATE BOLTS.
3. RACK AND HARDWARE SHALL BE REBAR AND GALVANIZED IN ACCORDANCE WITH ASTMA153.



SECTION B-B

ORIFICE TRASH RACK NOTES:
1. ALL JOINTS SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A ¼" BEAD.
2. REMOVEABLE ORIFICE TRASH RACK SHALL BE ATTACHED TO CONCRETE BOX BY HINGE OR SLIDE RAIL SYSTEM.
3. RACK AND HARDWARE SHALL BE ALUMINUM OR GALVANIZED IN ACCORDANCE WITH ASTM A153.

REMOVABLE ORIFICE TRASH RACK

REBAR TRASH RACK

*** NOT TO SCALE**

DRY DETENTION BASIN
TRASH RACKS

SHEET 3 OF 3

DRY DETENTION BASIN
TRASH RACKS

SHEET 3 OF 3

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PROJECT REFERENCE NO.	SHEET NO.
U-4703	2-H

HYDRAULICS ENGINEER

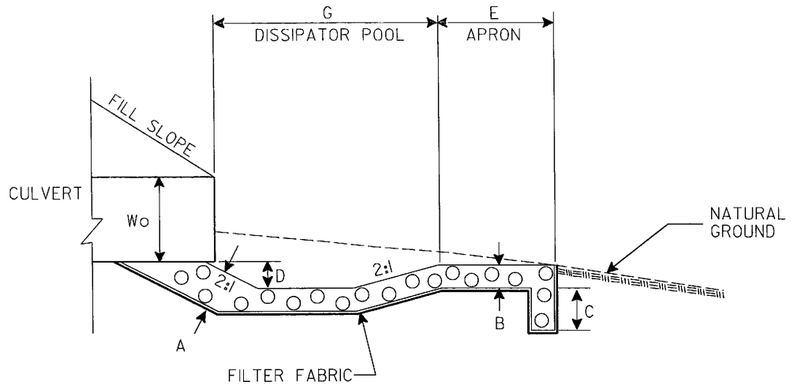
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Buffer Drawing
Sheet 10 of 14

DIM.	RIP RAP BASIN # 1	2	3
A	2.0'	2.0'	2.0'
B	1.5'	1.5'	1.5'
C	2.0'	2.0'	0.0'
D	1.0'	1.0'	1.25'
E	4.5'	5.0'	6.5'
F	13.0'	13.0'	16.0'
G	9.5'	10.0'	12.5'

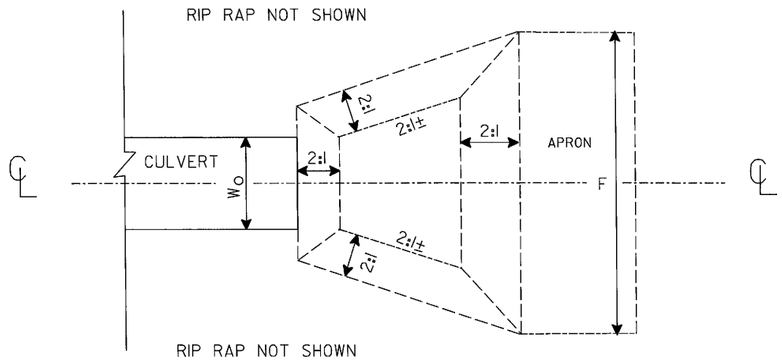
ALL DIMENSIONS APPROXIMATE

℄ SECTION



PLAN

BASIN #	LOCATION (AT OUTLET)
1	Sta 27+37 -L- (Rt)
2	Sta 34+59 -L- (Rt)
3	Sta 16+67.50 -Y- (Rt)



DETAIL OF RIP-RAPPED OUTLET ENERGY DISSIPATOR BASIN

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PROJECT REFERENCE NO.	SHEET NO.
U-4703	5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Buffer Drawing Sheet 11 of 14

ENGLISH

MITIGABLE IMPACTS ZONE 1 — ALLOWABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2 — ALLOWABLE IMPACTS ZONE 2

NAD 83

CITY LIMIT

AARON MOORE
DB 3112 PG 332

JAMES MOSS
DB 6930 PG 575

FIRST UNION NATIONAL BANK
%CHERYL WELCH
DB 2903 PG 438

BRENDA W. FOWLER, et al
DB 6408 PG 164

BONNIE G. RAY
DB 2164 PG 268

CHANNEL RELOCATION
SEE DETAIL E
CL I RIP-RAP ON BANKS ONLY
FIRST AND LAST
15' OF RELOCATION

SITE 1

SITE 3

TEMPORARY WORK PAD
(RIP RAP AND/OR TIMBER MATS)

TEMPORARY WORK BRIDGE

PIER (TYP.)

ENERGY DISSIPATOR BASIN
SEE SHEET 2-H
CLASS 'B' RIP RAP
EST. 80 TONS
EST. 100 SY FABRIC

NOTE: SEE SHEETS 2-E THRU 2-G FOR
EXTENDED DRY DETENTION BASIN DETAILS

EXCAVATE AT INLET
FOR PIPE STUB

EXISTING RUINS
SOLID FOUNDATION

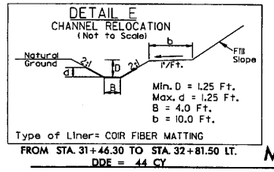
MATCHLINE -L- STA 23+00.00 (SEE SHEET 4)

MATCHLINE -L- STA 37+00.00 (SEE SHEET 6)

MATCHLINE (SEE SHEET 5A)

NOTE: SEE SHEET 2-??? FOR SPECIAL DETAIL OF
DRAINAGE STRUCTURES 18, 19 AND 20

DETAIL E
CHANNEL RELOCATION
(Not To Scale)



Type of Liner= COIR FIBER MATTING

FROM STA. 31+46.30 TO STA. 32+81.50 LT.
DDE = 44 CY

REVISIONS

8/17/99

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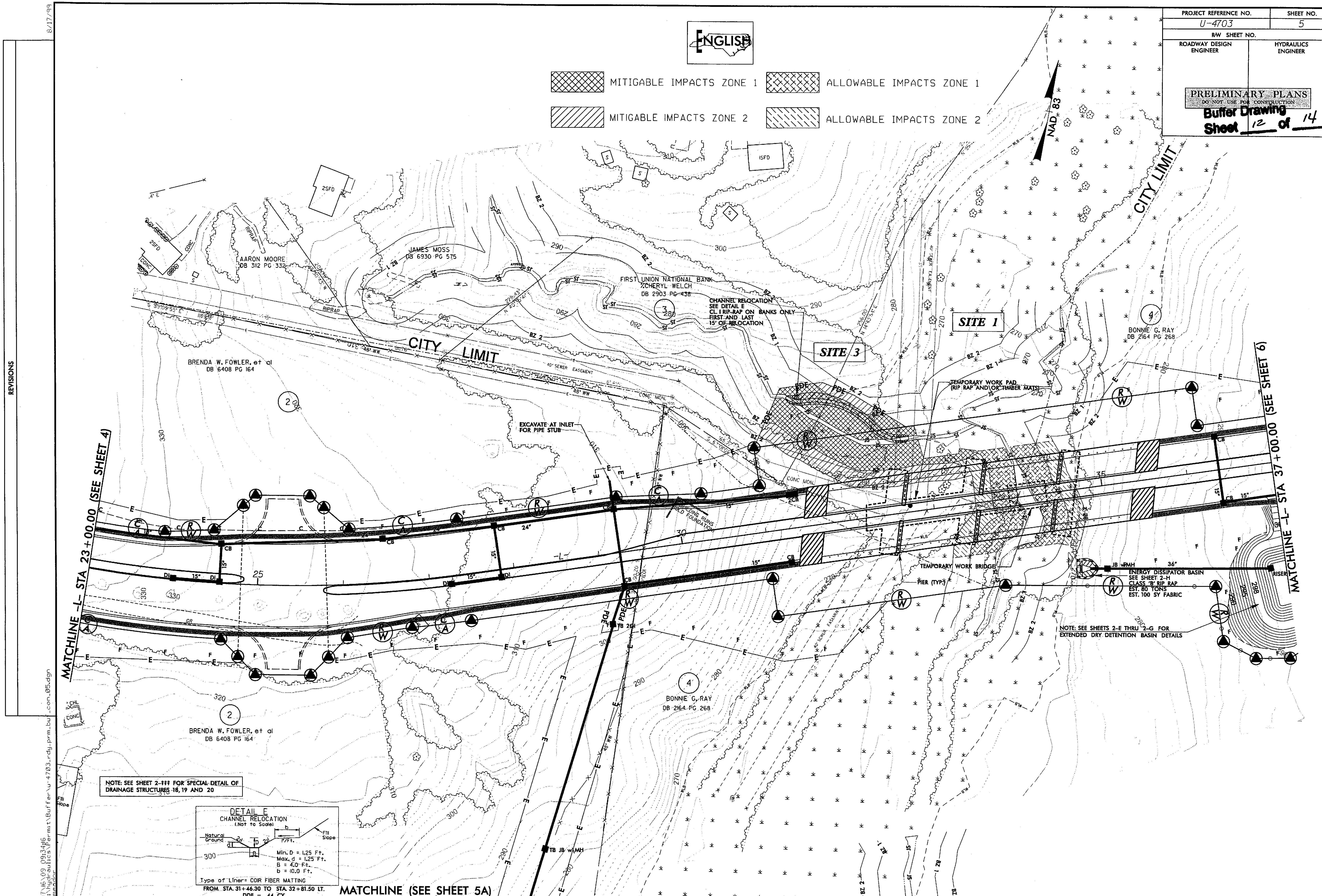

PROJECT REFERENCE NO. U-4703
SHEET NO. 5
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Buffer Drawing
Sheet 12 of 14
ENGLISH
MITIGABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
ALLOWABLE IMPACTS ZONE 2
NAD 83
CITY LIMIT
SITE 1
SITE 3
AARON MOORE
DB 3112 PG 332
JAMES MOSS
DB 6930 PG 575
FIRST UNION NATIONAL BANK
%CHERYL WELCH
DB 2903 PG 438
CHANNEL RELOCATION
SEE DETAIL E
CL I RIP-RAP ON BANKS ONLY
FIRST AND LAST
15' OF RELOCATION
BONNIE G. RAY
DB 2164 PG 268
BRENDA W. FOWLER, et al
DB 6408 PG 164
TEMPORARY WORK PAD
(RIP RAP AND/OR TIMBER MATS)
EXCAVATE AT INLET
FOR PIPE STUB
TEMPORARY WORK BRIDGE
PIER (TYP.)
ENERGY DISSIPATOR BASIN
SEE SHEET 2-H
CLASS 'B' RIP RAP
EST. 80 TONS
EST. 100 SY FABRIC
NOTE: SEE SHEETS 2-E THRU 2-G FOR
EXTENDED DRY DETENTION BASIN DETAILS
MATCHLINE -L- STA 23+00.00 (SEE SHEET 4)
MATCHLINE -L- STA 37+00.00 (SEE SHEET 6)
MATCHLINE (SEE SHEET 5A)
NOTE: SEE SHEET 2-??? FOR SPECIAL DETAIL OF
DRAINAGE STRUCTURES 18, 19 AND 20
DETAIL E
CHANNEL RELOCATION
(Not to Scale)
Natural Ground
Fill Slope
Min. D = 1.25 Ft.
Max. d = 1.25 Ft.
B = 4.0 Ft.
b = 10.0 Ft.
Type of Liner= COIR FIBER MATTING
FROM STA. 31+46.30 TO STA. 32+81.50 LT.
DDE = 44 CY
REVISIONS
8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-4703	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Buffer Drawing
Sheet 13 of 14

NAD 83

REVISIONS

R/W REVISION (05/29/09) DWG - REVISED THE PROPERTY OWNER NAME ON PARCEL 14 TO (NATALIE HEATON), REVISED THE PUE TO AUE ON PARCEL 18 (GLENN BAREFOOT), PARCEL 19 (RONALD THOMPSON), AND PARCEL 22 (PHILIP KING).

VICTOR SHAW
DB 4598 PG 253

FLORENCE TAYLOR
DB 2556 PG 391

MICHAEL WILLIS
DB 9491PG 2466
SPEC. CUT DITCH
SEE DETAIL T
CL B RIP RAP
W/FILTER FABRIC
EST. 3 TONS
EST. 10 SY FABRIC

EVELYN GRAHAM
DB 7563 PG 233

TIMOTHY HERRIN
DB 11098 PG 478

WILLIE VICK
DB 3044 PG 423

STEVEN LYONS
DB 8245 PG 1588

JENNIFER EDMONDSON
DB 4803 PG 281

GILES SHAVER
DB 8931PG 115

LIZZIE WILSON
DB 6485 PG 392

SPEC. CUT DITCH
SEE DETAIL P

SPEC. CUT DITCH
SEE DETAIL T

REMOVE

LAT V DITCH
SEE DETAIL R

CL I RIP RAP
W/FILTER FABRIC
EST. 15 TONS
EST. 30 SY FABRIC

W. E. MCLAMB
DB 7615 PG 789

WILLIAM C. MCLAMB
DB 9557 PG 1629

ALFRED ELMORE
DB 3068 PG 610

BILLY STUART
DB 2842 PG 338

DAVID BREWER
DB 6125 PG 98

EDWARD HARRELSON
DB 3404 PG 220

JAAN UTNO
DB 8994 PG 1519

MATCHLINE -Y1- STA 24+00.00
(SEE SHEET 4)

W. E. MCLAMB
DB 1882 PG 136

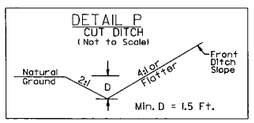
CL B RIP RAP
W/FILTER FABRIC
EST. 1 TON
EST. 5 SY FABRIC

RETAIN

CL I RIP RAP
W/FILTER FABRIC
EST. 15 TONS
EST. 30 SY FABRIC

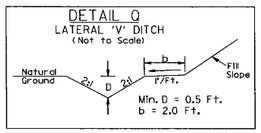
AUE — AUE
AERIAL UTILITY EASEMENT

DETAIL P
CUT DITCH
(Not to Scale)



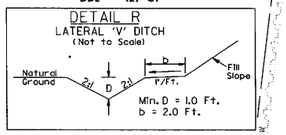
FROM -Y- STA. 13+50 TO 14+50 LT
-Y3- STA. 17+50 RT TO -Y4- STA. 11+00 LT

DETAIL Q
LATERAL 'V' DITCH
(Not to Scale)



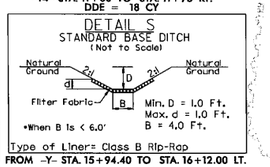
FROM -Y- STA. 14+50 TO STA. 16+07 LT.
DDE = 127 CY

DETAIL R
LATERAL 'V' DITCH
(Not to Scale)



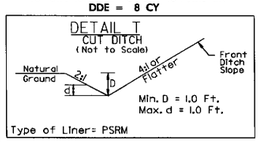
FROM -Y- STA. 17+41.80 TO 17+70.00 LT.
DDE = 10 CY
-Y4- STA. 11+00 TO STA. 11+75 RT.
DDE = 18 CY

DETAIL S
STANDARD BASE DITCH
(Not to Scale)



FROM -Y- STA. 15+94.40 TO STA. 16+12.00 LT.
DDE = 4 CY
-Y3- STA 10+85.2 TO STA 10+92.5 LT.
DDE = 8 CY

DETAIL T
CUT DITCH
(Not to Scale)



FROM -Y3- STA. 17+50 TO STA. 18+00 RT.
-Y4- STA. 11+00 TO STA. 11+50 LT.

ENGLISH

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

SITE 2

W. E. MCLAMB
DB 1882 PG 136
STD. BASE DITCH
SEE DETAIL S
CLASS B RIP RAP
EST. 29 TONS
79 SY FILTER FABRIC

LAT V DITCH W. E. MCLAMB
SEE DETAIL R DB 1510 PG 188

LAT V DITCH
SEE DETAIL Q

SPEC. CUT DITCH
SEE DETAIL P

COLLAR & EXTEND

REMOVE DI

PLUG & FILL W/FLOWABLE FILL

15" BCCS ROD & LUG CONNECTORS 2 ELBOWS

GARNER CHURCH OF CHRIST
DB 3221PG 483
ENERGY DISSIPATOR
SEE SHEET 2-H
CLASS 'B' RIP RAP
EST. 170 TONS
EST. 215 SY FABRIC

HEIDI K. MOORE
DB 6554 PG 766

RYAN L. CREECH
DB 6404 PG 623

ROLAND DODSON
DB 8153 PG 1750

JOSEPH LOVEJOY
DB 9521PG 881

MELVETINE MATOKO
DB 10801PG 546

FAYE TROTTER
DB 5377 PG 3

ROBERT HINES
DB 7798 PG 100

RICHARD MIGNEL
DB 7919 PG 934

JACK ROSE
DB 8298 PG 2716

RONALD RUSSIAN
DB 8614 PG 2623

RONALD THOMPSON
DB 7674 PG 106

GLENN BAREFOOT
DB 1583 PG 476

PHILIP KING
DB 1569 PG 726

PERRY KIRCH
DB 9366 PG 544

MATCHLINE -Y- STA 23+50.00 (SEE SHEET 4)

SEE SHEET 15 FOR -Y- PROFILE
SEE SHEET 16 FOR -Y1- PROFILE
SEE SHEET 18 FOR -Y3- & -Y4- PROFILES

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jmeador

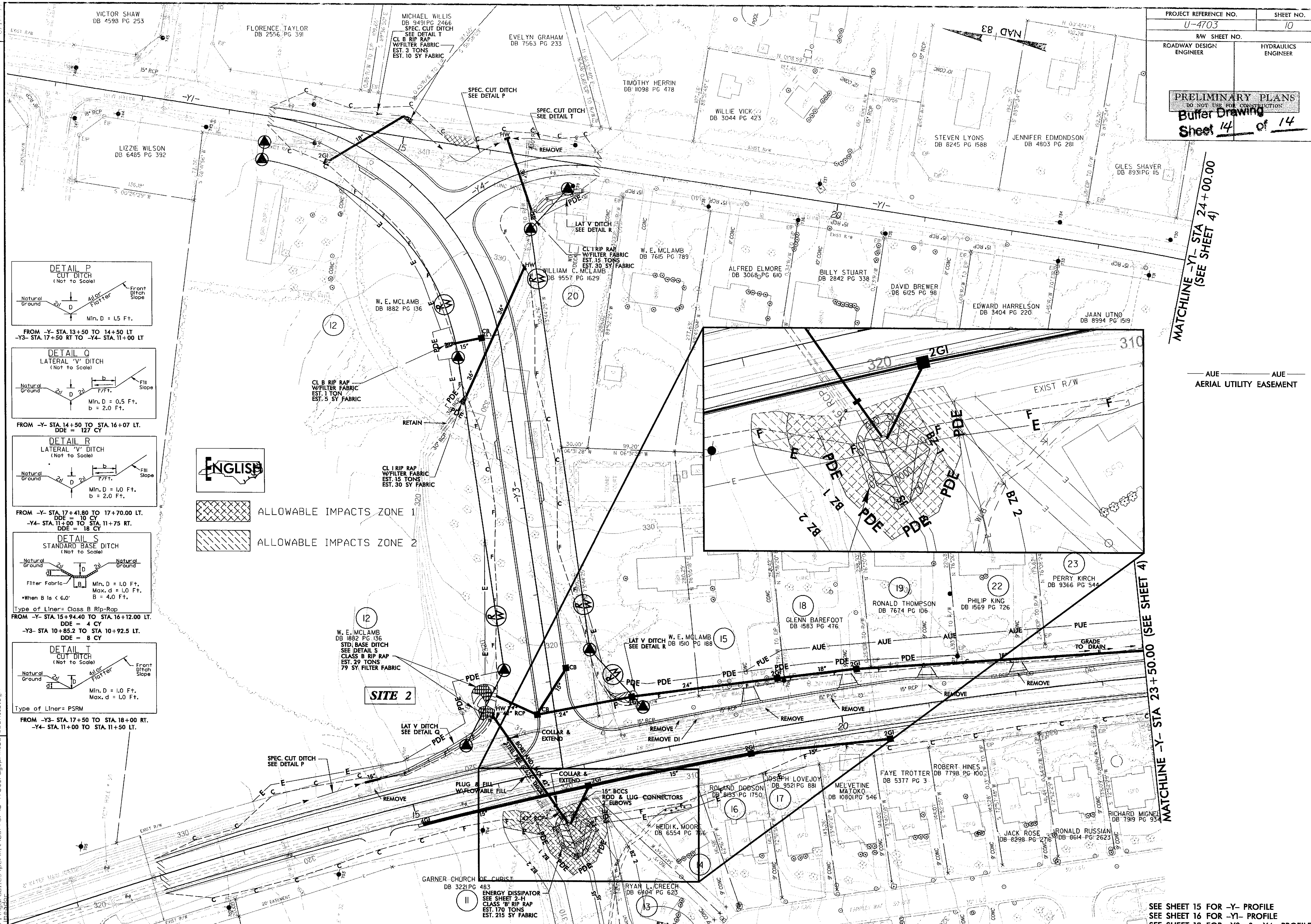
REVISIONS

R/W REVISION (05/29/09) DWG - REVISED THE PROPERTY OWNER NAME ON PARCEL 14 TO (NATALIE HEATON). REVISED THE PUE TO AUE ON PARCEL 18 (GLENN BAREFOOT), PARCEL 19 (RONALD THOMPSON), AND PARCEL 22 (PHILIP KING).

PROJECT REFERENCE NO.	SHEET NO.
U-4703	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Buffer Drawing
Sheet 14 of 14



NAD 83
VICTOR SHAW DB 4598 PG 253
FLORENCE TAYLOR DB 2556 PG 391
MICHAEL WILLIS DB 9491 PG 2466
SPEC. CUT DITCH SEE DETAIL T
CL B RIP RAP W/FILTER FABRIC EST. 3 TONS EST. 10 SY FABRIC
EVELYN GRAHAM DB 7563 PG 233
TIMOTHY HERRIN DB 11098 PG 478
WILLIE VICK DB 3044 PG 423
STEVEN LYONS DB 8245 PG 1588
JENNIFER EDMONDSON DB 4803 PG 281
GILES SHAVER DB 8931 PG 115
LIZZIE WILSON DB 6485 PG 392
SPEC. CUT DITCH SEE DETAIL P
SPEC. CUT DITCH SEE DETAIL T
REMOVE
-Y1-
-Y4-
-Y3-
LAT V DITCH SEE DETAIL R
CL I RIP RAP W/FILTER FABRIC EST. 15 TONS EST. 30 SY FABRIC
WILLIAM C. MCLAMB DB 9557 PG 1629
W. E. MCLAMB DB 7615 PG 789
ALFRED ELMORE DB 3068 PG 610
BILLY STUART DB 2842 PG 338
DAVID BREWER DB 6125 PG 98
EDWARD HARRELSON DB 3404 PG 220
JAAN UTNO DB 8994 PG 1519
W. E. MCLAMB DB 1882 PG 136
MATCHLINE -Y1- STA 24+00.00 (SEE SHEET 4)
AUE AERIAL UTILITY EASEMENT
DETAIL P CUT DITCH (Not to Scale)
Natural Ground
4:1 or Flatter
Front Ditch Slope
Min. D = 1.5 Ft.
FROM -Y- STA. 13+50 TO 14+50 LT -Y3- STA. 17+50 RT TO -Y4- STA. 11+00 LT
DETAIL Q LATERAL 'V' DITCH (Not to Scale)
Fill Slope
Min. D = 0.5 Ft. b = 2.0 Ft.
FROM -Y- STA. 14+50 TO STA. 16+07 LT. DDE = 127 CY
DETAIL R LATERAL 'V' DITCH (Not to Scale)
Min. D = 1.0 Ft. b = 2.0 Ft.
FROM -Y- STA. 17+41.80 TO 17+70.00 LT. DDE = 10 CY -Y4- STA. 11+00 TO STA. 11+75 RT. DDE = 18 CY
DETAIL S STANDARD BASE DITCH (Not to Scale)
Filter Fabric
Min. D = 1.0 Ft. Max. d = 1.0 Ft. B = 4.0 Ft.
*When B is < 6.0'
Type of Liner= Class B Rip-Rap
FROM -Y- STA. 15+94.40 TO STA. 16+12.00 LT. DDE = 4 CY -Y3- STA 10+85.2 TO STA 10+92.5 LT. DDE = 8 CY
DETAIL T CUT DITCH (Not to Scale)
Min. D = 1.0 Ft. Max. d = 1.0 Ft.
Type of Liner= PSRM
FROM -Y3- STA. 17+50 TO STA. 18+00 RT. -Y4- STA. 11+00 TO STA. 11+50 LT.
CL B RIP RAP W/FILTER FABRIC EST. 1 TON EST. 5 SY FABRIC
RETAIN
CL I RIP RAP W/FILTER FABRIC EST. 15 TONS EST. 30 SY FABRIC
ENGLISH
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
EXIST R/W
BZ 1
BZ 2
PDE
W. E. MCLAMB DB 1882 PG 136 STD. BASE DITCH SEE DETAIL S CLASS B RIP RAP EST. 29 TONS 79 SY FILTER FABRIC
SITE 2
LAT V DITCH SEE DETAIL Q
COLLAR & EXTEND
LAT V DITCH SEE DETAIL R
W. E. MCLAMB DB 1510 PG 188
GLENN BAREFOOT DB 1583 PG 476
RONALD THOMPSON DB 7674 PG 106
PHILIP KING DB 1569 PG 726
PERRY KIRCH DB 9366 PG 544
GRADE TO DRAIN
REMOVE DI
SPEC. CUT DITCH SEE DETAIL P
PLUG & FILL W/FLOWABLE FILL
15" BCCS ROD & LUG CONNECTORS 2 ELBOWS
ROLAND DODSON DB 8183 PG 1750
JOSEPH LOVEJOY DB 9521 PG 881
MELVETINE MATOKO DB 10801 PG 546
FAYE TROTTER DB 5377 PG 3
ROBERT HINES DB 7798 PG 100
HEIDI K. MOORE DB 6554 PG 756
JACK ROSE DB 8298 PG 276
RONALD RUSSIAN DB 8614 PG 2623
RICHARD MIGNEL DB 7919 PG 934
MATCHLINE -Y- STA 23+50.00 (SEE SHEET 4)
GARNER CHURCH OF CHRIST DB 3221 PG 483
ENERGY DISSIPATOR SEE SHEET 2-H CLASS 'B' RIP RAP EST. 170 TONS EST. 215 SY FABRIC
RYAN L. CREECH DB 6404 PG 623

SEE SHEET 15 FOR -Y- PROFILE
SEE SHEET 16 FOR -Y1- PROFILE
SEE SHEET 18 FOR -Y3- & -Y4- PROFILES

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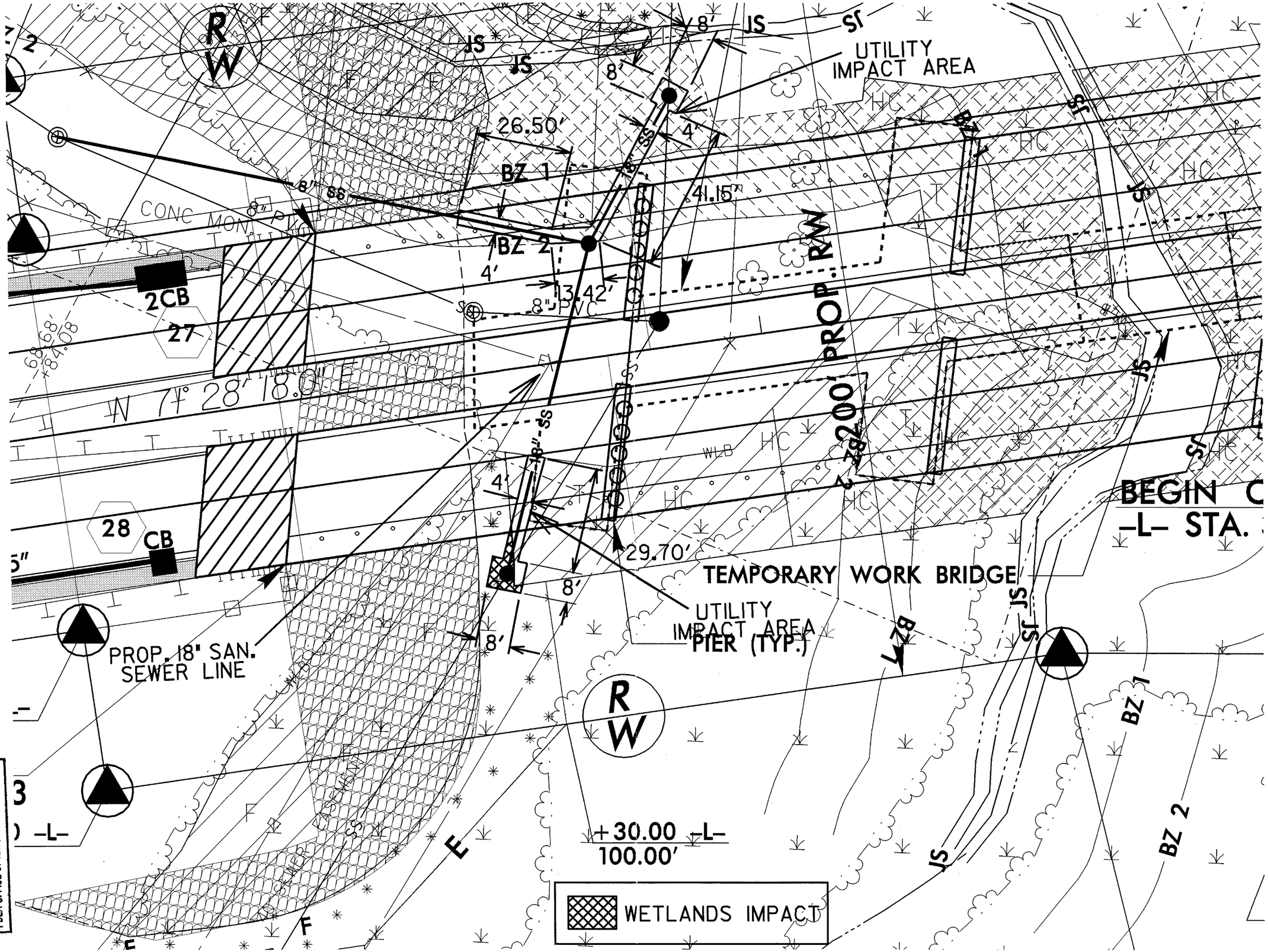
U-4703 Utility Impact Summary

Site	Station Number	Plan View Permit Drawing	Fill in Surface Water (Natural) Acre	Existing Wetlands Impacted (Acre) Mitigation	Existing Stream Channel Impacted (Feet) No Mitigation	Temporary Channel Impact (Feet)	Relocated Stream Channel (Feet)	Proposed On-Site Stream Mitigation (Feet)	Stream Channel Loss After On-Site Mitigation	Proposed 2:1 Off-Site Compensatory Stream Mitigation (Feet)
	-L- From 32+13.40 Rt. To 32+84.82 Lt.			Less Than 0.010 (0.0015)			-	-	-	-

The wetland and buffer zone impacts due to a proposed gravity sanitary sewer line installation involves excavation of the wetland and buffer zones to allow installation of a proposed 18" and 8" diameter ductile iron gravity sanitary sewer line. Excavation will be approximately four feet wide and one-hundred twenty-six feet (See Utility Impact Drawing) in total length. The excavated material will be placed back in the wetland and buffer zones after the proposed gravity sanitary sewer line is installed.

Part of the work area required for the installation of the gravity sanitary sewer line shall be the existing sewer easement for the City of Raleigh as shown on the NCDOT plans. This easement is 40' Wide and is clear of any trees, so clearing should be minimal and by non-mechanized methods. The construction impact shall be within the existing sanitary sewer line easement limits within the project limits of this NCDOT Project as shown on the Utility Impact Drawing.

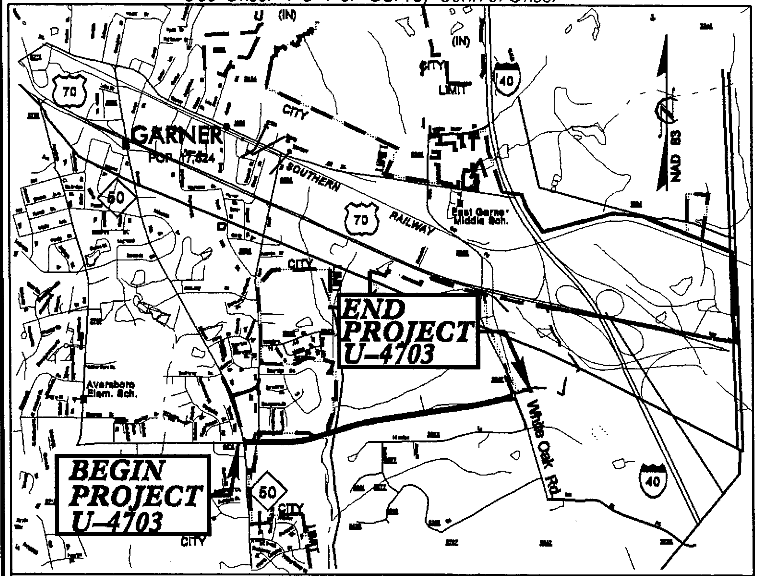
UTILITY IMPACTS
Sheet 2 of 2



RECEIVED
JUL 15 2009
DIVISION OF HIGHWAYS
PDEA-OFFICE OF NATURAL ENVIRONMENT

TIP PROJECT: U-4703

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

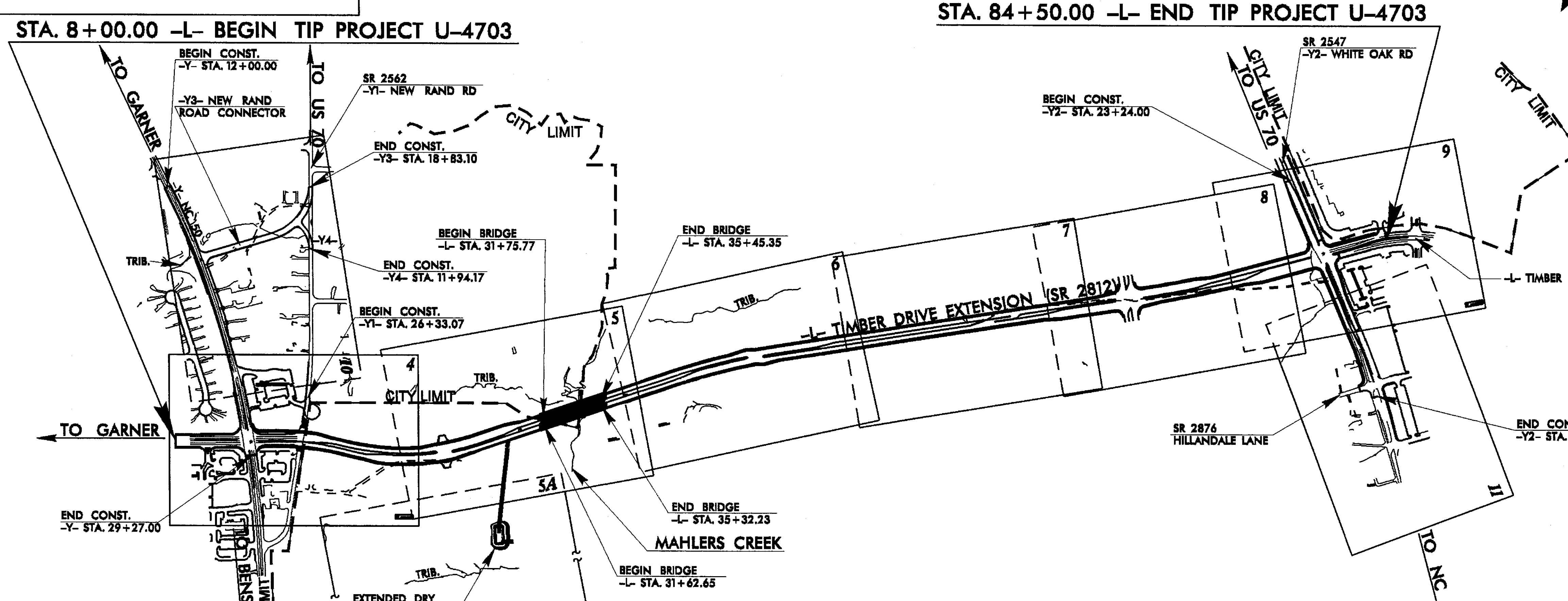
WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4703	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
35871.1.1	STP-0508(2)	PE
35871.2.1	STP-0508(2)	R/W & UTILITIES
35871.3.1	STPDA-0508(3)	CONST.

LOCATION: TIMBER DRIVE EAST EXTENSION (SR 2812) FROM NC 50 TO WHITE OAK ROAD (SR 2547) IN GARNER

TYPE OF WORK: GRADING, DRAINAGE, WIDENING, PAVING, CURB & GUTTER, STRUCTURES, AND SIGNALS



A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE TOWN OF GARNER.
THIS IS A PARTIAL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING AT DESIGNATED POINTS ONLY.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONTRACT:

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2009 = 15,435
ADT 2030 = 24,000
DHV = 10 %
D = 55 %
T = 6 % *
V = 50 MPH
* TTST 2% DUAL 4%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-4703 = 1.379 mi.
LENGTH STRUCTURE OF TIP PROJECT U-4703 = 0.070 mi.
TOTAL LENGTH OF TIP PROJECT U-4703 = 1.449 mi.

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: AUGUST 20, 2008

LETTING DATE: MAY 18, 2010

JAMES A. SPEER, PE
PROJECT ENGINEER

DANIEL W. GARDNER, JR., PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY DESIGN ENGINEER P.E.

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09/08/99

3/15/06

PROJECT REFERENCE NO.	SHEET NO.
U-4703	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 Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite Marker — RW
- 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
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole — 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 — PVTL
- 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.

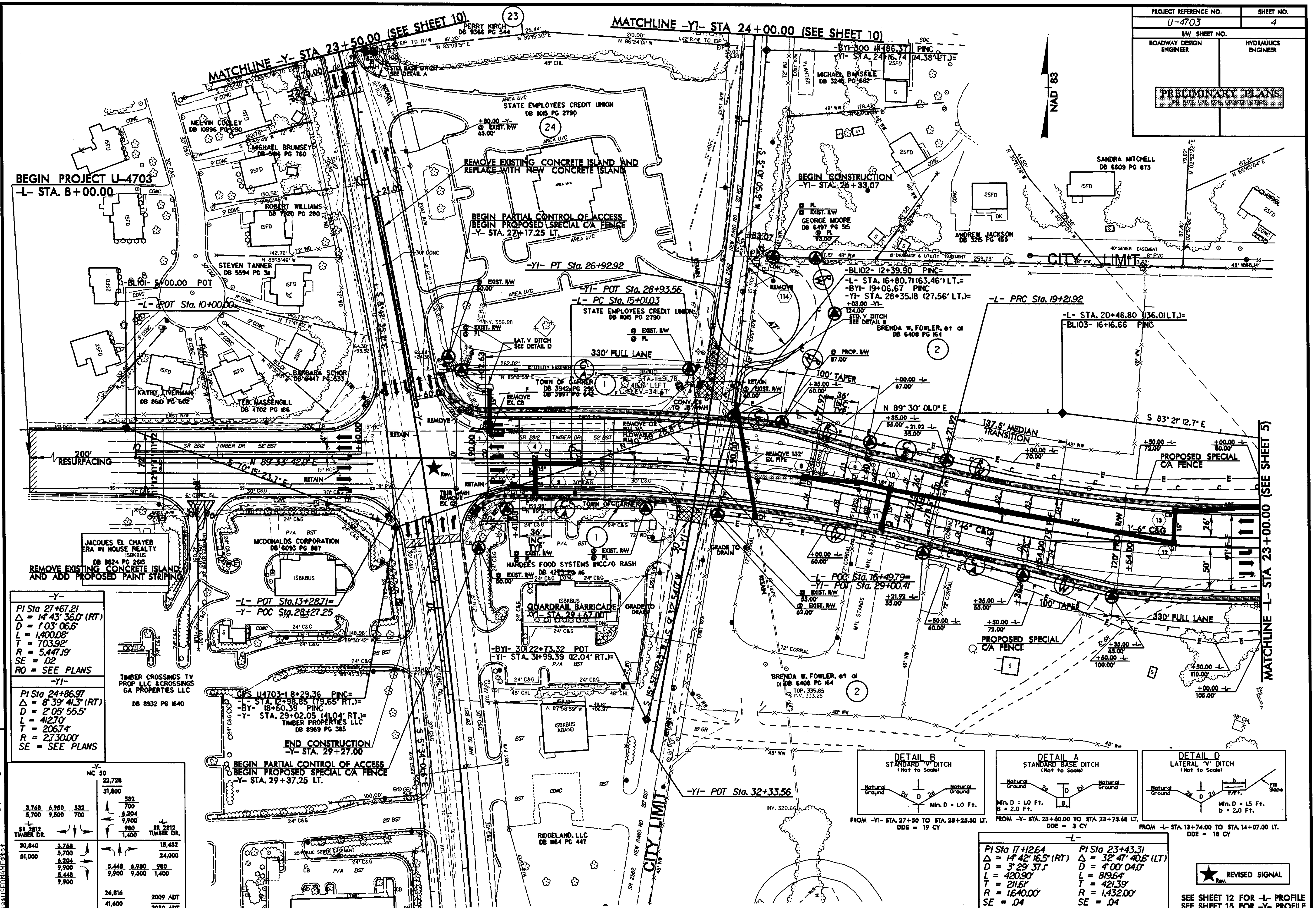
8/17/99

REVISIONS

R/W REVISION (11/20/08) DWG - PARCEL 23 (PERRY KIRCH) AND PARCEL 24 (STATE EMPLOYEES CREDIT UNION) WERE ADDED FOR THE PERMANENT UTILITY EASEMENT.

PROJECT REFERENCE NO.	SHEET NO.
U-4703	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-Y-	
PI Sta 27+67.21	
Δ = 14° 43' 36.0" (RT)	
D = 1° 03' 06.6"	
L = 1,400.08'	
T = 703.92'	
R = 5,447.19'	
SE = .02	
RO = SEE PLANS	

-Y1-	
PI Sta 24+86.97	
Δ = 8° 39' 41.3" (RT)	
D = 2° 05' 55.5"	
L = 412.70'	
T = 206.74'	
R = 2,730.00'	
SE = SEE PLANS	

DETAIL B STANDARD 'V' DITCH (Not to Scale) — Min. D = 1.0 Ft. FROM -Y1- STA. 27+50 TO STA. 28+25.30 LT. DDE = 19 CY

DETAIL A STANDARD BASE DITCH (Not to Scale) — Min. D = 1.0 Ft. B = 2.0 Ft. FROM -Y- STA. 23+60.00 TO STA. 23+75.68 LT. DDE = 3 CY

DETAIL D LATERAL 'V' DITCH (Not to Scale) — Min. D = 1.5 Ft. b = 2.0 Ft. FROM -L- STA. 13+74.00 TO STA. 14+07.00 LT. DDE = 18 CY

-L-	
PI Sta 17+12.64	PI Sta 23+43.31
Δ = 14° 42' 16.5" (RT)	Δ = 32° 47' 40.6" (LT)
D = 3° 29' 37.1"	D = 4° 00' 04.0"
L = 420.90'	L = 819.64'
T = 211.61'	T = 421.39'
R = 1,640.00'	R = 1,432.00'
SE = .04	SE = .04
RO = SEE PLANS	RO = SEE PLANS

★ REVISED SIGNAL

SEE SHEET 12 FOR -L- PROFILE
SEE SHEET 15 FOR -Y- PROFILE
SEE SHEET 16 FOR -Y1- PROFILE

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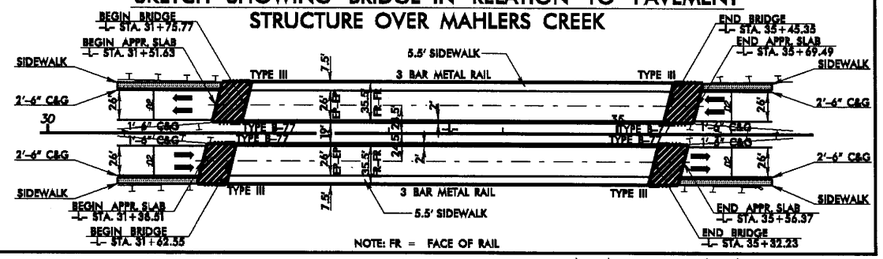
PROJECT REFERENCE NO.	SHEET NO.
U-4703	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

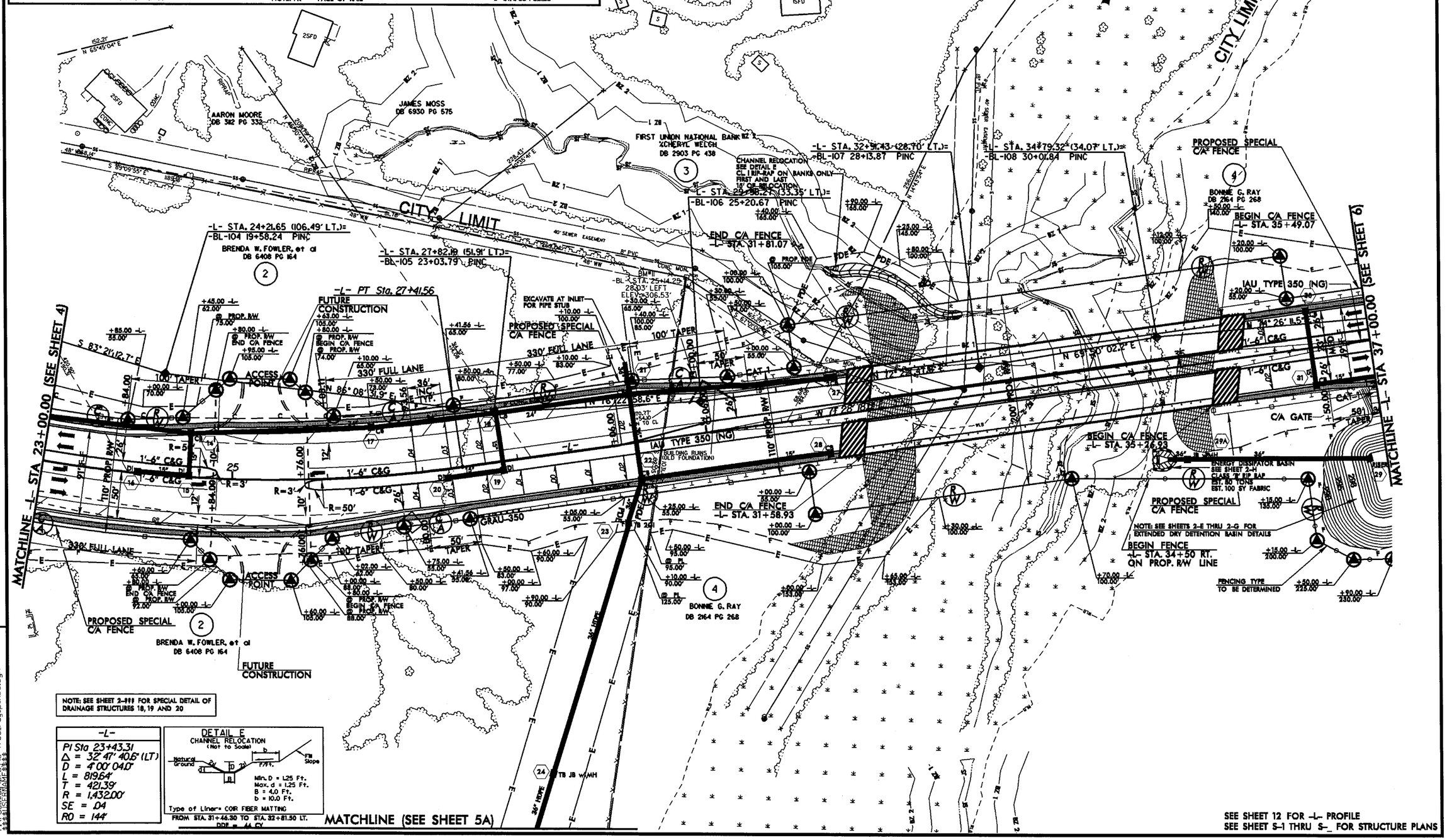
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/09

REVISIONS

SKETCH SHOWING BRIDGE IN RELATION TO PAVEMENT
STRUCTURE OVER MAHLERS CREEK





-L-
PI Sta 23+43.31
Δ = 32° 47' 40.6" (LT)
D = 4° 00' 04.0"
L = 819.64'
T = 421.39'
R = 1,432.00'
SE = .04
RO = 144'

DETAIL E
CHANNEL RELOCATION
(Not to Scale)

Type of Liner= COIR FIBER MATTING
FROM STA. 31+46.30 TO STA. 32+81.50 LT.
DDE = 44 CY

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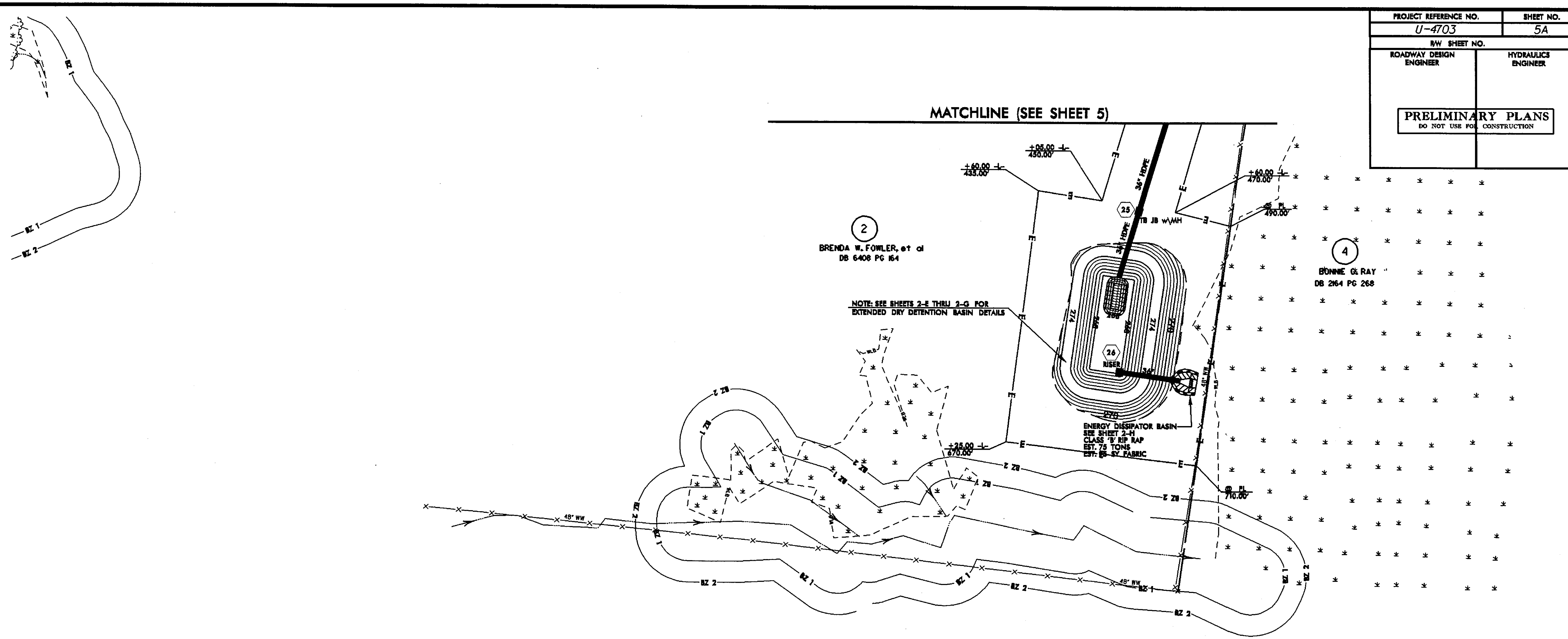
PROJECT REFERENCE NO.	SHEET NO.
U-4703	5A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

REVISIONS



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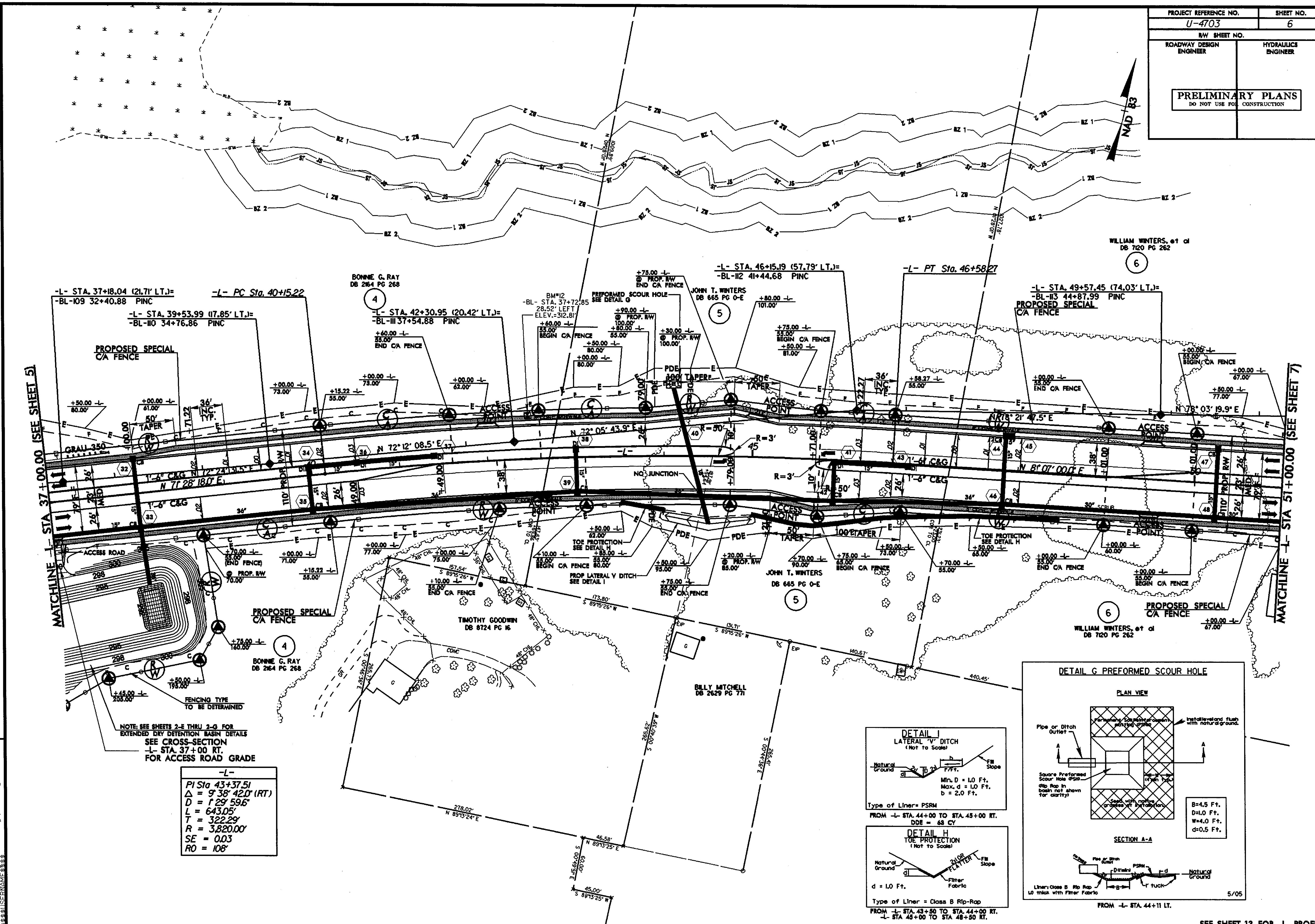
PROJECT REFERENCE NO.	SHEET NO.
U-4703	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

R/W REVISION (12/08/08) DWG - REVISED THE LOCATION OF THE 100 FOOT CONTROL OF ACCESS BREAK FROM -L- STA.43+35 RT.TO -L- STA.42+60 RT.ON PARCEL 4 (BONNIE G.RAY) AND PARCEL 5 (JOHN T.WINTERS).



NAD 83
-L- STA. 37+18.04 (21.71' LT.)=
-BL-109 32+40.88 PINC
-L- STA. 39+53.99 (17.85' LT.)=
-BL-110 34+76.86 PINC
-L- PC Sta. 40+15.22
-L- STA. 42+30.95 (20.42' LT.)=
-BL-111 37+54.88 PINC
BM#12
-BL- STA. 37+72.85
28.52' LEFT
ELEV.=312.81'
-L- STA. 46+15.19 (57.79' LT.)=
-BL-112 41+44.68 PINC
-L- PT Sta. 46+58.27
-L- STA. 49+57.45 (74.03' LT.)=
-BL-113 44+87.99 PINC
PROPOSED SPECIAL C/A FENCE
PREFORMED SCOUR HOLE SEE DETAIL G
BONNIE G. RAY DB 2164 PG 268
JOHN T. WINTERS DB 665 PG 0-E
WILLIAM WINTERS, et al DB 7120 PG 262
TIMOTHY GOODWIN DB 8724 PG 16
BILLY MITCHELL DB 2629 PG 771
MATCHLINE -L- STA 37+00.00 (SEE SHEET 5)
MATCHLINE -L- STA 51+00.00 (SEE SHEET 7)
ACCESS POINT
N 72° 05' 43.9" E
N 72° 12' 08.5" E
N 71° 28' 18.0" E
N 81° 07' 00.0" E
N 78° 03' 19.9" E
TOE PROTECTION SEE DETAIL H
PROP LATERAL V DITCH SEE DETAIL I
FENCING TYPE TO BE DETERMINED
NOTE: SEE SHEETS 2-E THRU 2-G FOR EXTENDED DRY DETENTION BASIN DETAILS
SEE CROSS-SECTION -L- STA. 37+00 RT. FOR ACCESS ROAD GRADE
DETAIL I LATERAL 'V' DITCH (Not to Scale)
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
b = 2.0 Ft.
Type of Liner= PSRM
FROM -L- STA. 44+00 TO STA. 45+00 RT.
DDE = 68 CY
DETAIL H TOE PROTECTION (Not to Scale)
d = 1.0 Ft.
Type of Liner = Class B Rip-Rap
FROM -L- STA. 43+50 TO STA. 44+00 RT.
-L- STA 48+00 TO STA 48+50 RT.
DETAIL G PREFORMED SCOUR HOLE
PLAN VIEW
SECTION A-A
B=4.5 Ft.
D=1.0 Ft.
W=4.0 Ft.
d=0.5 Ft.
FROM -L- STA. 44+11 LT.
5/05

-L-
PI Sta 43+37.51
Δ = 9° 38' 42.0" (RT)
D = 1° 29' 59.6"
L = 643.05'
T = 322.29'
R = 3,820.00'
SE = 0.03
RO = 108'

SEE SHEET 13 FOR -L- PROFILE

8/17/99

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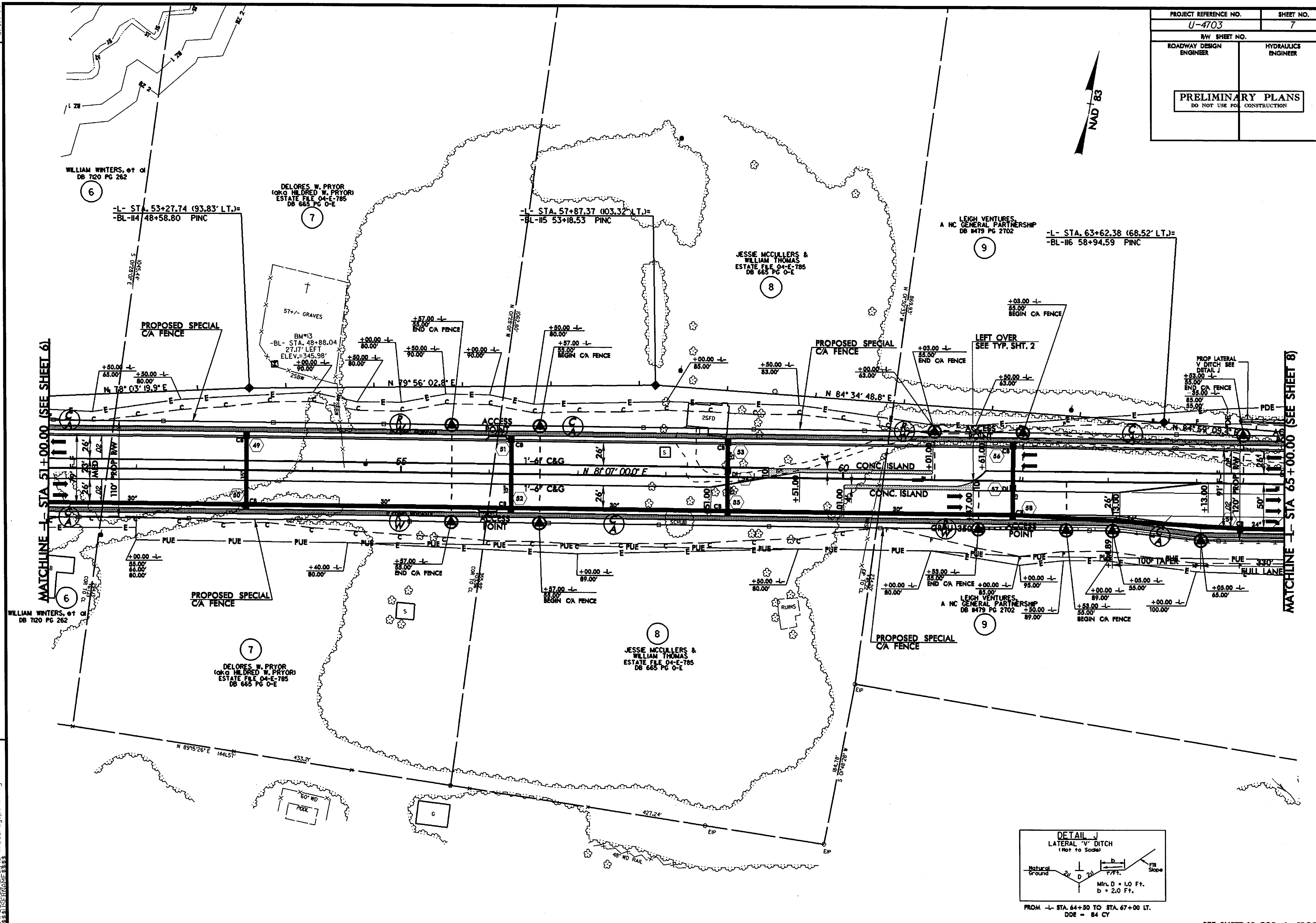
PROJECT REFERENCE NO.	SHEET NO.
U-4703	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

R/W REVISION (05/29/09) DWG - REVISED THE PROPERTY OWNER NAMES ON PARCEL 7 TO (DELORES W.PRYOR,AKA HILDRED W.PRYOR),PARCEL 8 TO (JESSIE MCCULLERS & WILLIAM THOMAS),AND PARCEL 9 TO (LEIGH VENTURES,A NC GENERAL PARTNERSHIP).

8/17/99



NAD 83
WILLIAM WINTERS, et al
DB 7120 PG 262
6
DELORES W. PRYOR
(aka HILDRED W. PRYOR)
ESTATE FILE 04-E-785
DB 665 PG 0-E
7
-L- STA. 53+27.74 (93.83' LT.)=
-BL-114 48+58.80 PINC
-L- STA. 57+87.37 (103.32' LT.)=
-BL-115 53+18.53 PINC
-L- STA. 63+62.38 (68.52' LT.)=
-BL-116 58+94.59 PINC
JESSIE MCCULLERS &
WILLIAM THOMAS
ESTATE FILE 04-E-785
DB 665 PG 0-E
8
LEIGH VENTURES,
A NC GENERAL PARTNERSHIP
DB 1479 PG 2702
9
57+/- GRAVES
BM#13
-BL- STA. 48+88.04
27.17' LEFT
ELEV.=345.98'
PROPOSED SPECIAL
C/A FENCE
N 78° 03' 19.9" E
N 79° 56' 02.8" E
N 84° 34' 48.8" E
N 81° 07' 00.0" E
1'-6" C&G
CONC. ISLAND
ACCESS POINT
LEFT OVER
SEE TYP. SHT. 2
PROP LATERAL
V DITCH SEE
DETAIL J
BEGIN C/A FENCE
END C/A FENCE
100' TAPER
330'
FULL LANE
MATCHLINE -L- STA 51+00.00 (SEE SHEET 6)
MATCHLINE -L- STA 65+00.00 (SEE SHEET 8)
RUINS
POOL
2SFD
N 89°15'26" E
DETAIL J
LATERAL 'V' DITCH
(Not to Scale)
Natural Ground
Min. D = 1.0 Ft.
b = 2.0 Ft.
FROM -L- STA. 64+50 TO STA. 67+00 LT.
DDE = 84 CY

SEE SHEET 13 FOR -L- PROFILE

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PROJECT REFERENCE NO.	SHEET NO.
U-4703	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

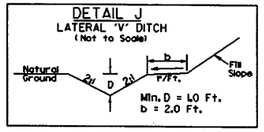
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

REVISIONS

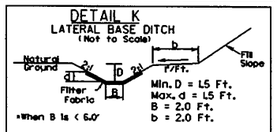
R/W REVISION (05/29/09).DWG - REVISED THE PROPERTY OWNER NAME ON PARCEL 9 TO (LEIGH VENTURES,A NC GENERAL PARTNERSHIP).

DETAIL J
LATERAL 'V' DITCH
(Not to Scale)



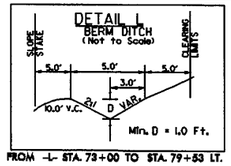
FROM -L- STA. 64+50 TO STA. 67+00 LT.
DDE = 84 CY

DETAIL K
LATERAL BASE DITCH
(Not to Scale)



FROM -L- STA. 67+00 TO STA. 69+50 LT.
DDE = 148 CY

DETAIL L
BERM DITCH
(Not to Scale)



FROM -L- STA. 73+00 TO STA. 79+53 LT.

NAD 83

LEIGH VENTURES,
A NC GENERAL PARTNERSHIP
DB 8479 PG 2702
9

-L- PC Sta. 69+59.26

-L- PT Sta. 75+84.34

-L- STA. 71+42.92 (12.86' LT.)=
BL-117 66+76.48 PINC

PROPOSED SPECIAL C/A FENCE

PROP LATERAL V DITCH SEE DETAIL J

PROP LATERAL BASE DITCH SEE DETAIL K
140 TONS CLASS B RIP-RAP W\380 SY FILTER FABRIC

FUTURE CONSTRUCTION

1.5% GRADE

100' TAPER

330' FULL LANE

162.5' MEDIAN TRANSITION

PROP BERM V DITCH SEE DETAIL L

BDO
18" SCCS
2 ELBOWS

MATCHLINE -L- STA 65+00.00 (SEE SHEET 7)

MATCHLINE -L- STA 76+00.00 (SEE SHEET 9)

N 84° 59' 09.4" E

N 86° 08' 07.9" E

1'-6" C&G

NO JUNCTION

150' ACCESS POINT

CAT-I

CL B RIP RAP W/FILTER FABRIC
EST. 5 TONS
EST. 16 SY FABRIC

CL B RIP RAP W/FILTER FABRIC
EST. 2 TONS
EST. 7 SY FABRIC

@ PROP. R/W
BEGIN C/A FENCE

@ PROP. R/W
END C/A FENCE

LEIGH VENTURES,
A NC GENERAL PARTNERSHIP
DB 8479 PG 2702

ISFD

-L-
PI Sta 72+72.10
Δ = 6° 10' 29.9" (LT)
D = 0° 59' 16.3"
L = 625.09'
T = 312.85'
R = 5,800.00'
SE = 0.02
RO = 72'

* SEE SHEET 14 FOR -L- PROFILE

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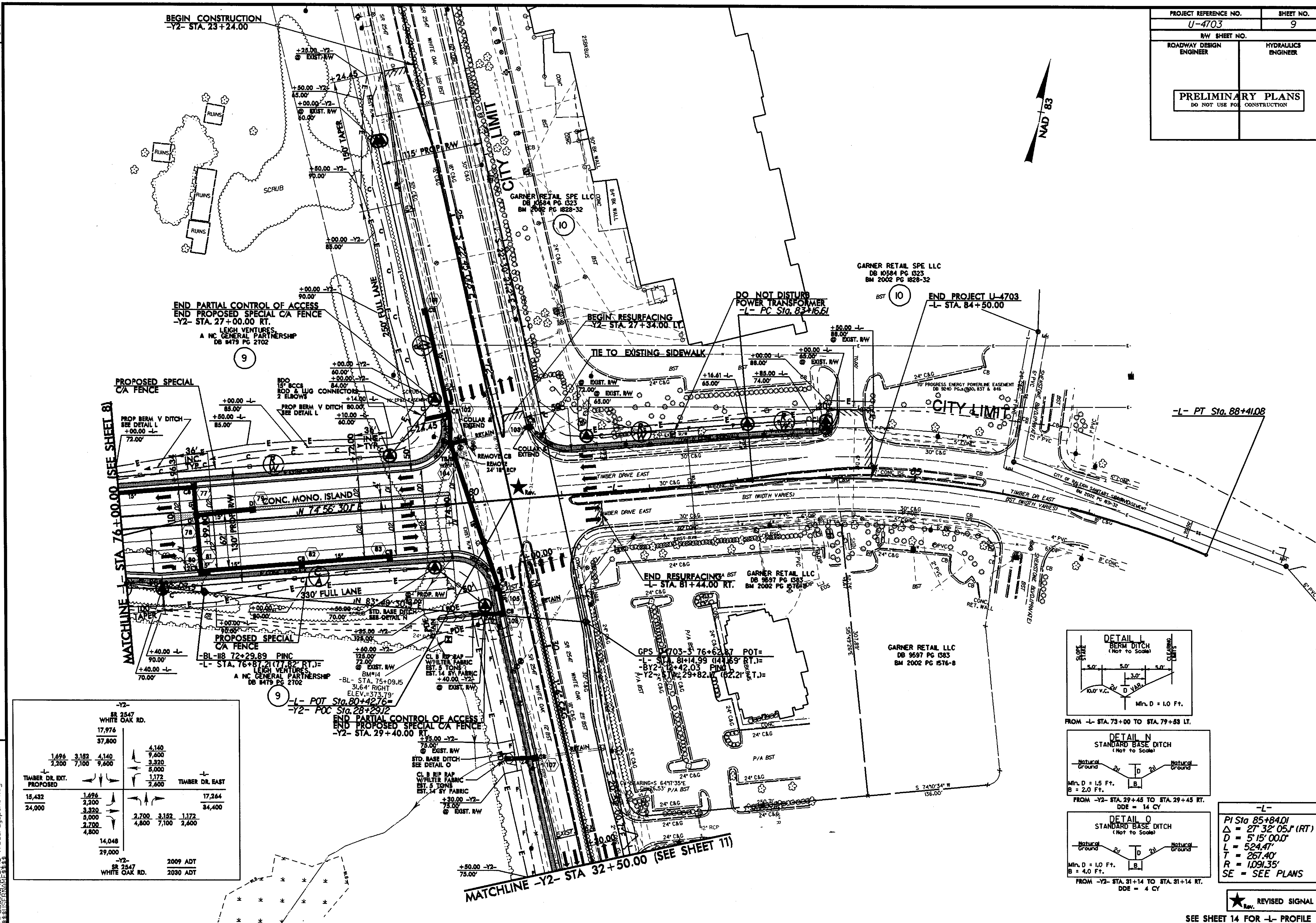
PROJECT REFERENCE NO.	SHEET NO.
U-4703	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS
R/W REVISION (05/29/09) DWG - REVISED THE PROPERTY OWNER NAME ON PARCEL 9 TO (LEIGH VENTURES,A NC GENERAL PARTNERSHIP).



-Y2- SR 2547 WHITE OAK RD.		
17,976 / 37,800		
TIMBER DR. EXT. PROPOSED: 1,696 / 2,200; 3,152 / 7,100; 4,140 / 9,600		TIMBER DR. EAST: 4,140 / 9,600; 3,320 / 5,000; 1,172 / 2,600
15,432 / 24,000		17,264 / 34,400
1,696 / 2,200; 3,320 / 5,000; 2,700 / 4,800		2,700 / 4,800; 3,152 / 7,100; 1,172 / 2,600
14,048 / 29,000		
-Y2- SR 2547 WHITE OAK RD.		2009 ADT / 2030 ADT

DETAIL L
BERM DITCH (Not to Scale)
5.0' 5.0' 5.0' 3.0' 10.0' V.C. D VAR. Min. D = 1.0 Ft.
FROM -L- STA. 73+00 TO STA. 79+53 LT.

DETAIL N
STANDARD BASE DITCH (Not to Scale)
Min. D = 1.5 Ft.
B = 2.0 Ft.
FROM -Y2- STA. 29+45 TO STA. 29+45 RT.
DDE = 14 CY

DETAIL O
STANDARD BASE DITCH (Not to Scale)
Min. D = 1.0 Ft.
B = 4.0 Ft.
FROM -Y2- STA. 31+14 TO STA. 31+14 RT.
DDE = 4 CY

-L-
PI Sta 85+84.01
Δ = 27° 32' 05.1" (RT)
D = 5° 15' 00.0"
L = 524.47'
T = 267.40'
R = 1,091.35'
SE = SEE PLANS

★ Rev. REVISED SIGNAL

SEE SHEET 14 FOR -L- PROFILE
SEE SHEET 17 FOR -Y2- PROFILE

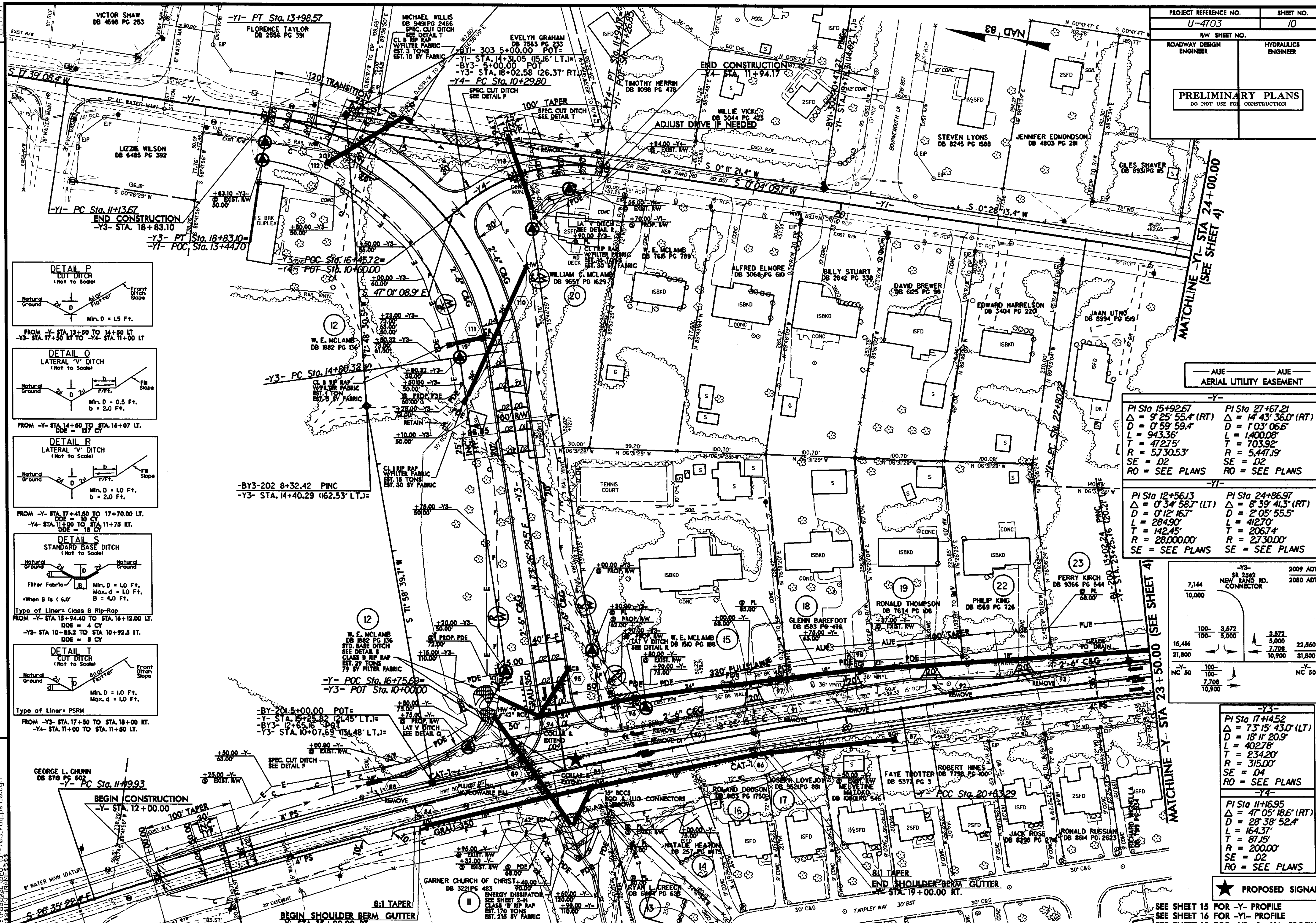
PROJECT REFERENCE NO.	SHEET NO.
U-4703	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

R/W REVISION (05/29/09) DWG - REVISED THE PROPERTY OWNER NAME ON PARCEL 14 TO (NATALIE HEATON), REVISED THE PUE TO AUE ON PARCEL 18 (GLENN BAREFOOT), PARCEL 19 (RONALD THOMPSON), AND PARCEL 22 (PHILIP KING).

8/17/99



NAD 83
MATCHLINE -Y1- STA 24+00.00 (SEE SHEET 4)
MATCHLINE -Y- STA 23+50.00 (SEE SHEET 4)
-Y1- PT Sta. 13+98.57
-Y1- PC Sta. 11+13.67
END CONSTRUCTION -Y3- STA. 18+83.10
-Y3- PT Sta. 18+83.10= -Y1- POC Sta. 13+44.70
END CONSTRUCTION -Y4- STA. 11+94.17
ADJUST DRIVE IF NEEDED
120' TRANSITION
100' TAPER
-Y3- POC Sta. 16+45.72= -Y4- POT Sta. 10+00.00
-Y3- PC Sta. 14+86.32
-BY3-202 8+32.42 PINC -Y3- STA. 14+40.29 (162.53' LT.)=
-Y- POC Sta. 16+75.69= -Y3- POT Sta. 10+00.00
-BY-201 5+00.00 POT= -Y- STA. 15+25.82 (21.45' LT.)= -BY3- 12+65.16 POT -Y3- STA. 10+07.69 (151.48' LT.)=
-Y- PC Sta. 11+19.93
BEGIN CONSTRUCTION -Y- STA. 12+00.00
BEGIN SHOULDER BERM GUTTER -Y- STA. 15+00.00 RT.
END SHOULDER BERM GUTTER -Y- STA. 19+00.00 RT.
-Y- PCC Sta. 20+63.29
8:1 TAPER
330' FULL LANE
NEW RAND RD
SR 2562
TARPLEY WAY
GARNER CHURCH OF CHRIST DB 3221 PG 483
VICTOR SHAW DB 4598 PG 253
FLORENCE TAYLOR DB 2556 PG 391
MICHAEL WILLIS DB 9491 PG 2466
EVELYN GRAHAM DB 7563 PG 233
TIMOTHY HERRIN DB 1098 PG 478
WILLIE VICK DB 3044 PG 423
STEVEN LYONS DB 8245 PG 1588
JENNIFER EDMONDSON DB 4803 PG 281
GILES SHAVER DB 8931 PG 5
LIZZIE WILSON DB 6485 PG 392
W. E. MCLAMB DB 7615 PG 789
WILLIAM C. MCLAMB DB 9557 PG 1629
ALFRED ELMORE DB 3068 PG 610
BILLY STUART DB 2842 PG 338
DAVID BREWER DB 6125 PG 96
EDWARD HARRELSON DB 3404 PG 220
JAAN UTNO DB 8994 PG 1519
W. E. MCLAMB DB 1882 PG 136
RONALD THOMPSON DB 7674 PG 106
PHILIP KING DB 1569 PG 726
PERRY KIRCH DB 9366 PG 544
GLENN BAREFOOT DB 1583 PG 476
W. E. MCLAMB DB 1510 PG 188
GEORGE L. CHUNN DB 8719 PG 602
FAYE TROTTER DB 5377 PG 3
ROBERT HINES DB 7798 PG 400
JACK ROSE
RONALD RUSSIAN DB 8614 PG 2623
NATALIE HEATON DB 257 PG 8472
RYAN L. CREECH
ROLAND DODSON
JOSEPH LOVEJOY
TENNIS COURT

DETAIL P CUT DITCH (Not to Scale)
Natural Ground, 4:1 or Flatter, Front Ditch Slope, Min. D = 1.5 Ft.
FROM -Y- STA. 13+50 TO 14+50 LT; -Y3- STA. 17+50 RT TO -Y4- STA. 11+00 LT

DETAIL Q LATERAL 'V' DITCH (Not to Scale)
Min. D = 0.5 Ft., b = 2.0 Ft.
FROM -Y- STA. 14+50 TO STA. 16+07 LT. DDE = 127 CY

DETAIL R LATERAL 'V' DITCH (Not to Scale)
Min. D = 1.0 Ft., b = 2.0 Ft.
FROM -Y- STA. 17+41.80 TO STA. 17+70.00 LT. DDE = 10 CY
-Y4- STA. 11+00 TO STA. 11+75 RT. DDE = 18 CY

DETAIL S STANDARD BASE DITCH (Not to Scale)
Filter Fabric, Min. D = 1.0 Ft., Max. d = 1.0 Ft., B = 4.0 Ft. *When B is < 6.0'
Type of Liner= Class B Rip-Rap
FROM -Y- STA. 15+94.40 TO STA. 16+12.00 LT. DDE = 4 CY
-Y3- STA. 10+85.2 TO STA. 10+92.5 LT. DDE = 8 CY

DETAIL T CUT DITCH (Not to Scale)
4:1 or Flatter, Front Ditch Slope, Min. D = 1.0 Ft., Max. d = 1.0 Ft.
Type of Liner= PSRM
FROM -Y3- STA. 17+50 TO STA. 18+00 RT. -Y4- STA. 11+00 TO STA. 11+50 LT.

—AUE—AUE— AERIAL UTILITY EASEMENT

-Y-

PI Sta 15+92.67	PI Sta 27+67.21
Δ = 9° 25' 55.4" (RT)	Δ = 14° 43' 36.0" (RT)
D = 0° 59' 59.4"	D = 1° 03' 06.6"
L = 943.36'	L = 1,400.08'
T = 472.75'	T = 703.92'
R = 5,730.53'	R = 5,447.19'
SE = .02	SE = .02
RO = SEE PLANS	RO = SEE PLANS

-Y1-

PI Sta 12+56.13	PI Sta 24+86.97
Δ = 0° 34' 58.7" (LT)	Δ = 8° 39' 41.3" (RT)
D = 0° 12' 16.7"	D = 2° 05' 55.5"
L = 284.90'	L = 412.70'
T = 142.45'	T = 206.74'
R = 28,000.00'	R = 2,730.00'
SE = SEE PLANS	SE = SEE PLANS

-Y3- SR 2562 NEW RAND RD. CONNECTOR — 2009 ADT / 2030 ADT

7,144 / 10,000	100– 3,572 / 100– 5,000
15,416 / 21,800	3,572 / 5,000
7,708 / 10,900	22,560 / 31,800
-Y- NC 50	-Y- NC 50
100– 100– 7,708 / 10,900	

-Y3-

PI Sta 17+14.52
Δ = 73° 15' 43.0" (LT)
D = 18° 11' 20.9"
L = 402.78'
T = 234.20'
R = 315.00'
SE = .04
RO = SEE PLANS

-Y4-

PI Sta 11+16.95
Δ = 47° 05' 18.6" (RT)
D = 28° 38' 52.4"
L = 164.37'
T = 87.15'
R = 200.00'
SE = .02
RO = SEE PLANS

★ PROPOSED SIGNAL

SEE SHEET 15 FOR -Y- PROFILE
SEE SHEET 16 FOR -Y1- PROFILE
SEE SHEET 18 FOR -Y3- & -Y4- PROFILES

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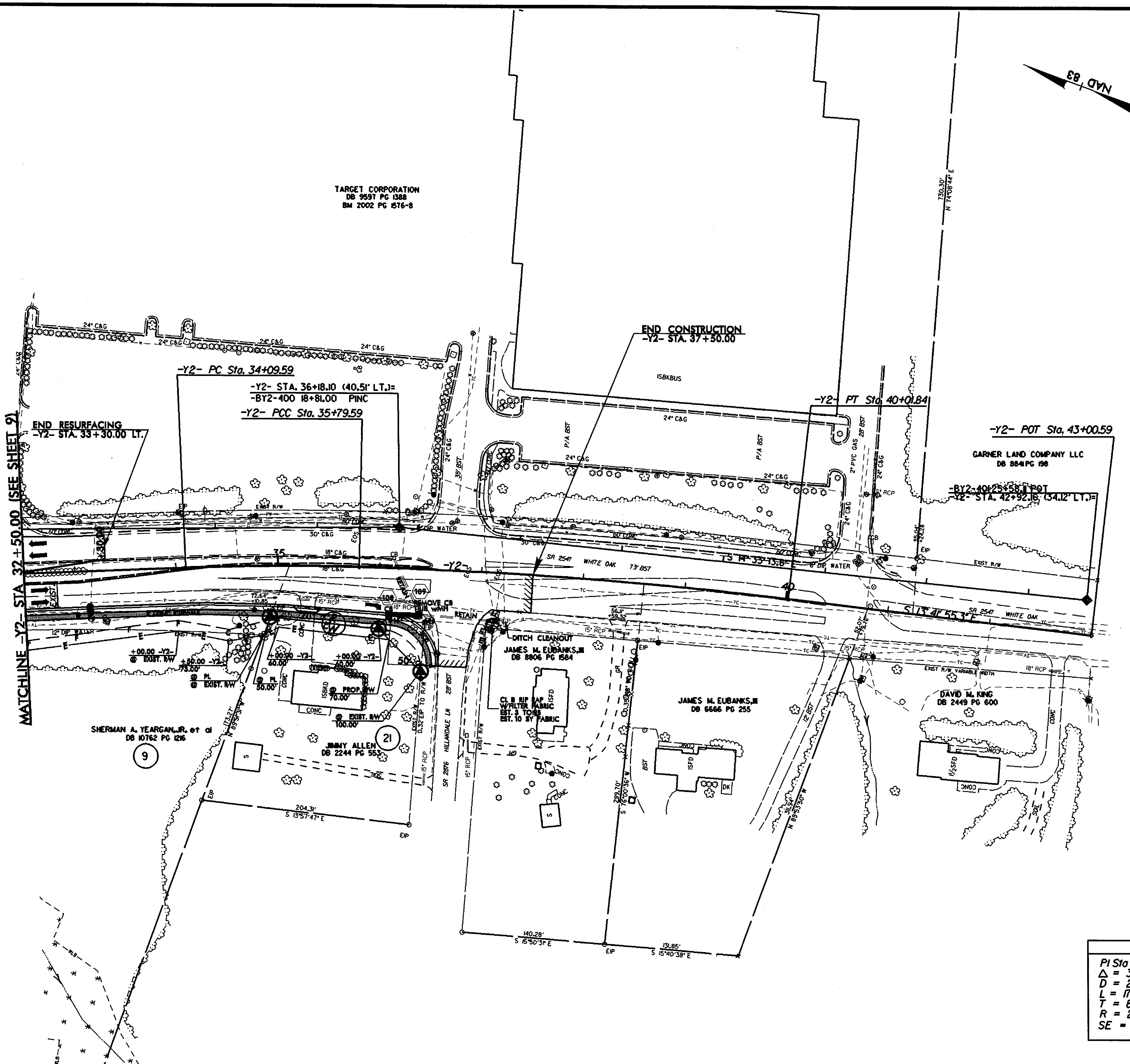
PROJECT REFERENCE NO.	SHEET NO.
U-4703	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS



NAD 83
TARGET CORPORATION
DB 9597 PG 1388
BM 2002 PG 1576-8
END CONSTRUCTION
-Y2- STA. 37+50.00
-Y2- PC Sta. 34+09.59
-Y2- STA. 36+18.10 (40.51' LT.)=
-BY2-400 18+81.00 PINC
-Y2- PCC Sta. 35+79.59
END RESURFACING
-Y2- STA. 33+30.00 LT.
-Y2- PT Sta. 40+01.84
-Y2- POT Sta. 43+00.59
GARNER LAND COMPANY LLC
DB 8841 PG 198
MATCHLINE -Y2- STA. 32+50.00 (SEE SHEET 9)
SR 2547 WHITE OAK 73' BST
DITCH CLEANOUT
JAMES M. EUBANKS,III
DB 8806 PG 1584
JAMES M. EUBANKS,III
DB 6666 PG 255
DAVID M. KING
DB 2449 PG 600
SHERMAN A. YEARGAN,JR. et al
DB 10762 PG 1216
JIMMY ALLEN
DB 2244 PG 553
SR 2876 HILLANDALE LN 28' BST
204.31'
S 13°57'47" E
140.28'
S 15°50'31" E
131.85'
S 15°40'38" E

-Y2-	
PI Sta 34+94.62	PI Sta 37+90.87
Δ = 3° 40' 32.1" (RT)	Δ = 5° 22' 34.4" (RT)
D = 2° 09' 43.6"	D = 1° 16' 23.7"
L = 170.00'	L = 422.25'
T = 85.03'	T = 211.28'
R = 2,650.00'	R = 4,500.00'
SE = SEE PLANS	SE = SEE PLANS

SEE SHEET 17 FOR -Y2- PROFILE

8/17/99

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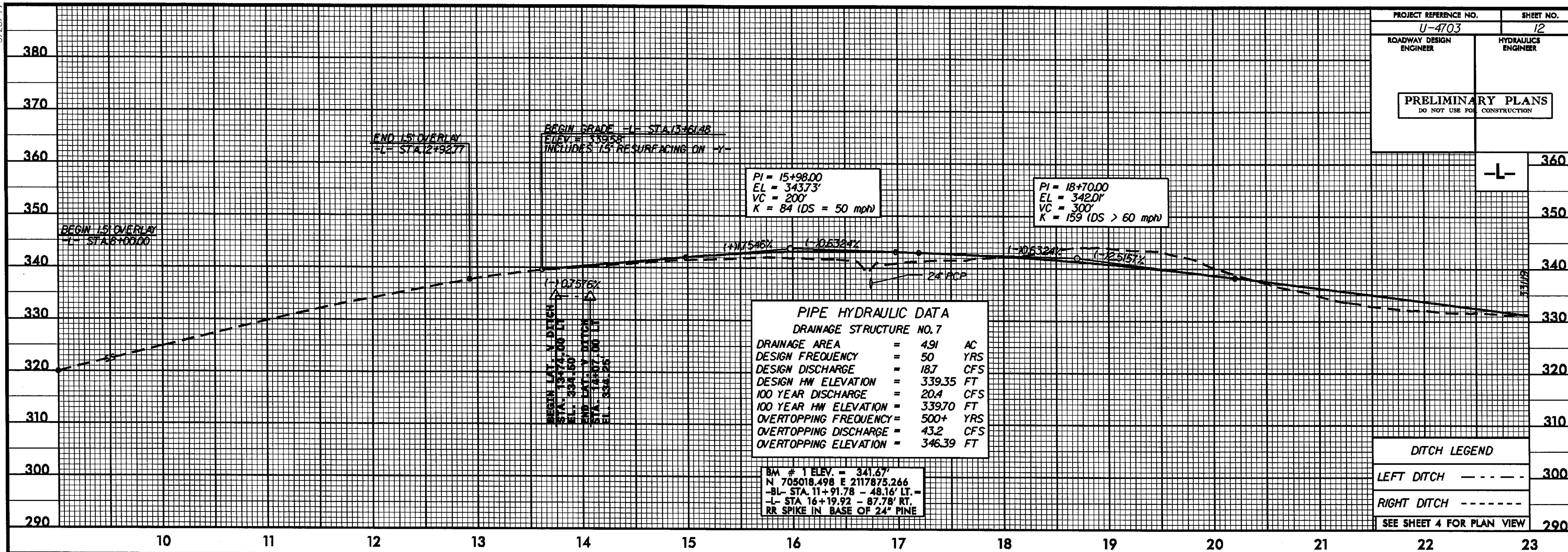
PROJECT REFERENCE NO.	SHEET NO.
U-4703	12
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

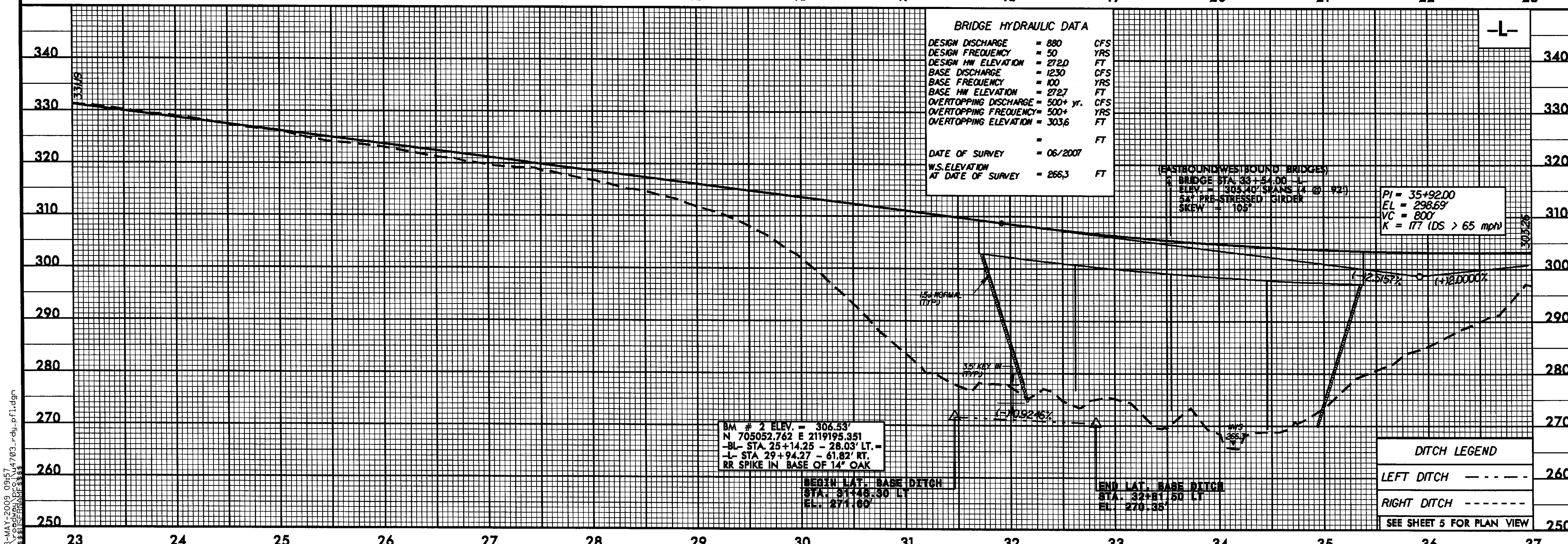
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PIPE HYDRAULIC DATA			
DRAINAGE STRUCTURE NO. 7			
DRAINAGE AREA	=	4.91	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	18.7	CFS
DESIGN HW ELEVATION	=	339.35	FT
100 YEAR DISCHARGE	=	20.4	CFS
100 YEAR HW ELEVATION	=	339.70	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	43.2	CFS
OVERTOPPING ELEVATION	=	346.39	FT

BM # 1 ELEV. = 341.67'
N 705018.498 E 2117875.266
-BL- STA. 11+91.78 - 48.16' LT. =
-L- STA 16+19.92 - 87.78' RT.
RR SPIKE IN BASE OF 24" PINE

DITCH LEGEND
LEFT DITCH — - — -
RIGHT DITCH - - - - - - -
SEE SHEET 4 FOR PLAN VIEW



BRIDGE HYDRAULIC DATA			
DESIGN DISCHARGE	=	880	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	272.0	FT
BASE DISCHARGE	=	1230	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	272.7	FT
OVERTOPPING DISCHARGE	=	500+ yr.	CFS
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING ELEVATION	=	303.6	FT
	=		FT
DATE OF SURVEY	=	06/2007	
W.S. ELEVATION AT DATE OF SURVEY	=	266.3	FT

BM # 2 ELEV. = 306.53'
N 705052.762 E 2119195.351
-BL- STA. 25+14.25 - 28.03' LT. =
-L- STA 29+94.27 - 61.82' RT.
RR SPIKE IN BASE OF 14" OAK

DITCH LEGEND
LEFT DITCH — - — -
RIGHT DITCH - - - - - - -
SEE SHEET 5 FOR PLAN VIEW

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PROJECT REFERENCE NO.	SHEET NO.
U-4703	13

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.40

DRAINAGE AREA	=	2.01	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	7.6	CFS
DESIGN HW ELEVATION	=	308.88	FT
100 YEAR DISCHARGE	=	8.3	CFS
100 YEAR HW ELEVATION	=	309.08	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	15.9	CFS
OVERTOPPING ELEVATION	=	312.51	FT

-L-

328.26

(+)2.0000%

18" RCP

(-)3.4000%

328.85

BEGIN LAT. V DITCH
STA. 44+00.00 RT
EL. 309.07'

PT LAT. V DITCH
STA. 44+50.00 RT
EL. 307.30'

END LAT. V DITCH
STA. 45+00.00 RT
EL. 309.05'

BM # 3 ELEV. = 312.81'
N 705433.681 E 2120392.353
-BL- STA. 37+72.85 - 28.51' LT. =
-L- STA 42+47.39 - 49.77' RT.
RR SPIKE IN BASE OF 16" PINE

DITCH LEGEND
LEFT DITCH — - - - —
RIGHT DITCH - - - - - - -
SEE SHEET 6 FOR PLAN VIEW

-L-

PI = 63+00.00
EL = 352.85'
VC = 200'
K = 395 (DS > 80 mph)

328.85

(+)2.0000%

(+)1.4931%

(+)2.0000%

(-)0.5000%

352.85

BEGIN LAT. V DITCH
STA. 64+50.00 LT
EL. 349.30'

BM # 4 ELEV. = 345.98'
N 705698.715 E 2121478.022
-BL- STA. 48+88.04 - 27.17' LT. =
-L- STA 53+56.41 - 121.61' RT.
RR SPIKE IN BASE OF 48" OAK

DITCH LEGEND
LEFT DITCH — - - - —
RIGHT DITCH - - - - - - -
SEE SHEET 7 FOR PLAN VIEW

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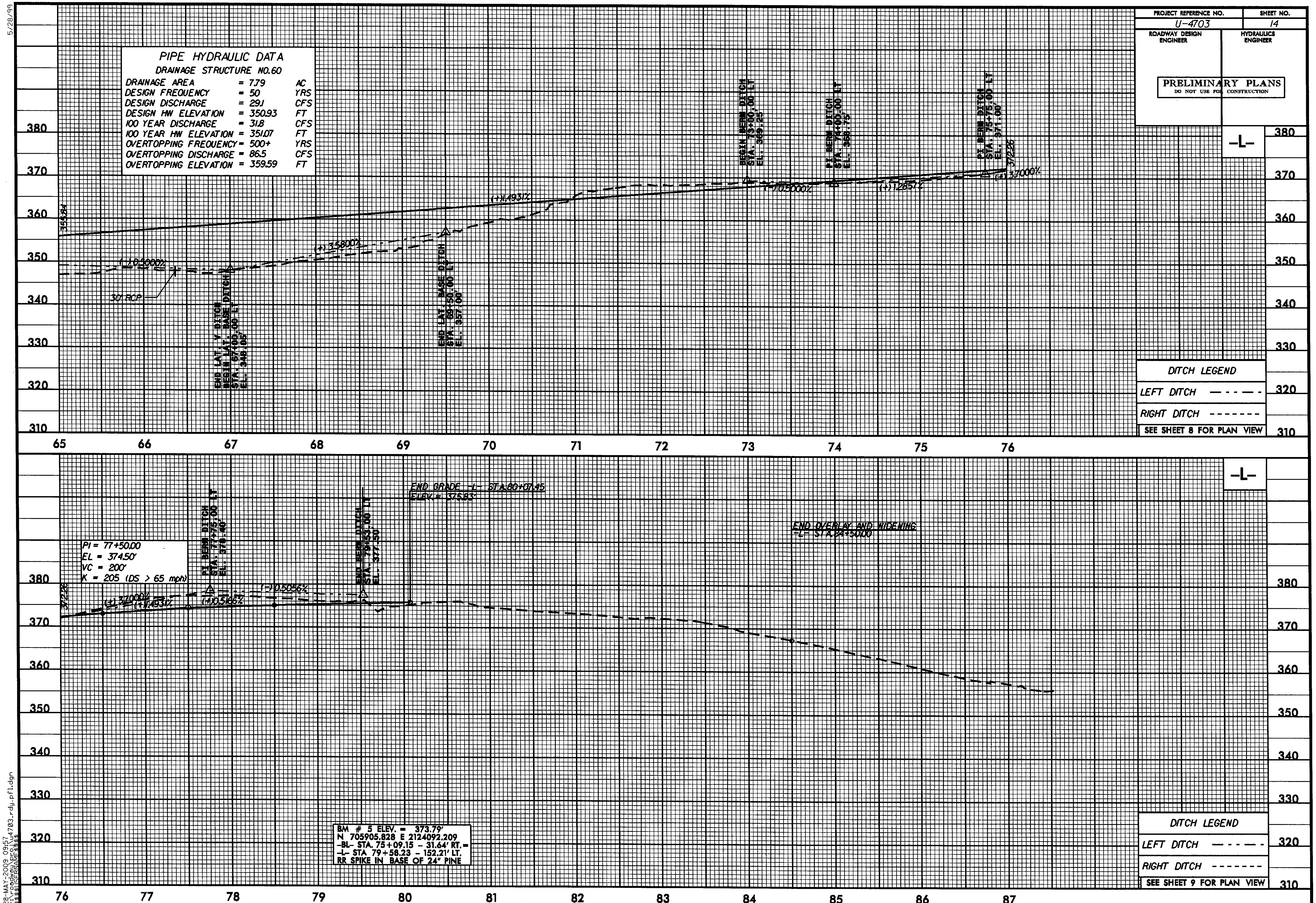

PROJECT REFERENCE NO.
U-4703
SHEET NO.
14
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
-L-
PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.60
DRAINAGE AREA = 7.79 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 29.1 CFS
DESIGN HW ELEVATION = 350.93 FT
100 YEAR DISCHARGE = 31.8 CFS
100 YEAR HW ELEVATION = 351.07 FT
OVERTOPPING FREQUENCY = 500+ YRS
OVERTOPPING DISCHARGE = 86.5 CFS
OVERTOPPING ELEVATION = 359.59 FT
355.84
(-)0.2000%
30" RCP
END LAT. V DITCH
BEGIN LAT. BASE DITCH
STA. 67+00.00 LT
EL. 348.05'
(+)3.5800%
END LAT. BASE DITCH
STA. 69+50.00 LT
EL. 357.00'
(+)1.4931%
BEGIN BERM DITCH
STA. 73+00.00 LT
EL. 369.25'
(+)0.5000%
PI BERM DITCH
STA. 74+00.00 LT
EL. 368.75'
(+)1.2857%
PI BERM DITCH
STA. 75+75.00 LT
EL. 371.00'
372.26
(+)1.37000%
DITCH LEGEND
LEFT DITCH
RIGHT DITCH
SEE SHEET 8 FOR PLAN VIEW
PI = 77+50.00
EL = 374.50'
VC = 200'
K = 205 (DS > 65 mph)
372.26
(+)1.3700%
(+)1.4631%
PI BERM DITCH
STA. 77+75.00 LT
EL. 376.40'
(+)0.5166%
(-)0.5056%
END BERM DITCH
STA. 79+53.00 LT
EL. 377.50'
END GRADE -L- STA.80+07.45
ELEV.= 375.83'
END OVERLAY AND WIDENING
-L- STA.84+50.00
BM # 5 ELEV. = 373.79'
N 705905.828 E 2124092.209
-BL- STA. 75+09.15 - 31.64' RT.=
-L- STA 79+58.23 - 152.21' LT.
RR SPIKE IN BASE OF 24" PINE
DITCH LEGEND
LEFT DITCH
RIGHT DITCH
SEE SHEET 9 FOR PLAN VIEW
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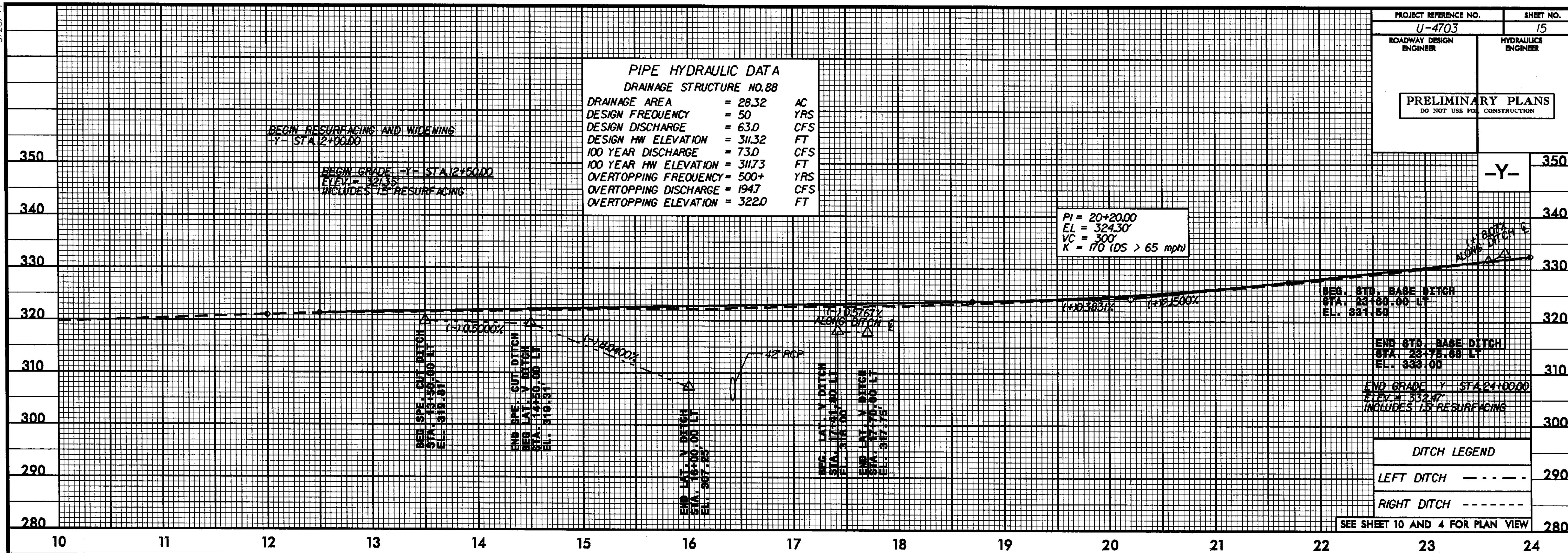
PROJECT REFERENCE NO.	SHEET NO.
U-4703	15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

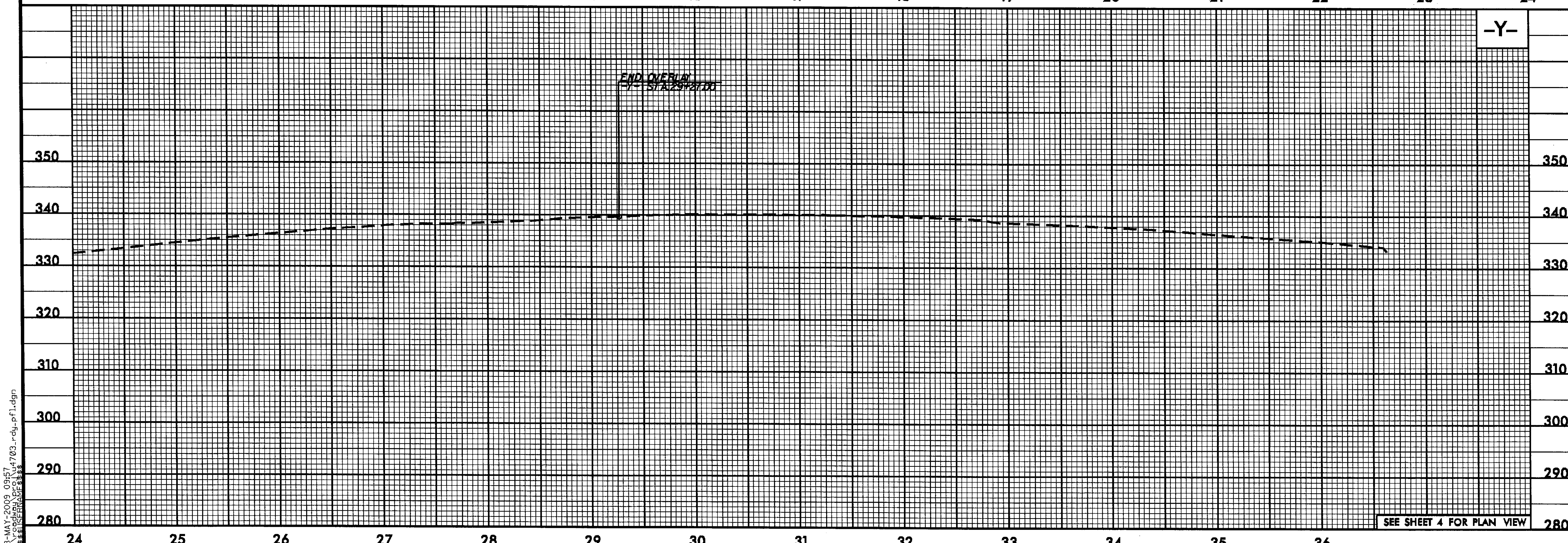


-Y-
BEGIN RESURFACING AND WIDENING
-Y- STA.12+00.00
BEGIN GRADE -Y- STA.12+50.00
ELEV.= 321.35'
INCLUDES 1.5" RESURFACING
PI = 20+20.00
EL = 324.30'
VC = 300'
K = 170 (DS > 65 mph)
(-)0.5000%
(-)8.0400%
42" RCP
(-)0.5761%
ALONG DITCH ℄
(+)0.3831%
(+)2.1500%
(+)8.07%
ALONG DITCH ℄
BEG. SPE. CUT DITCH
STA. 13+50.00 LT
EL. 319.81'
END SPE. CUT DITCH
BEG. LAT. V DITCH
STA. 14+50.00 LT
EL. 319.31'
END LAT. V DITCH
STA. 16+00.00 LT
EL. 307.25'
BEG. LAT. V DITCH
STA. 17+41.80 LT
EL. 318.00'
END LAT. V DITCH
STA. 17+75.00 LT
EL. 317.75'
BEG. STD. BASE DITCH
STA. 23+60.00 LT
EL. 331.50
END STD. BASE DITCH
STA. 23+75.68 LT
EL. 333.00
END GRADE -Y- STA.24+00.00
ELEV.= 332.47'
INCLUDES 1.5" RESURFACING
DITCH LEGEND
LEFT DITCH
RIGHT DITCH
SEE SHEET 10 AND 4 FOR PLAN VIEW

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.88

DRAINAGE AREA	= 28.32	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 63.0	CFS
DESIGN HW ELEVATION	= 311.32	FT
100 YEAR DISCHARGE	= 73.0	CFS
100 YEAR HW ELEVATION	= 311.73	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 194.7	CFS
OVERTOPPING ELEVATION	= 322.0	FT



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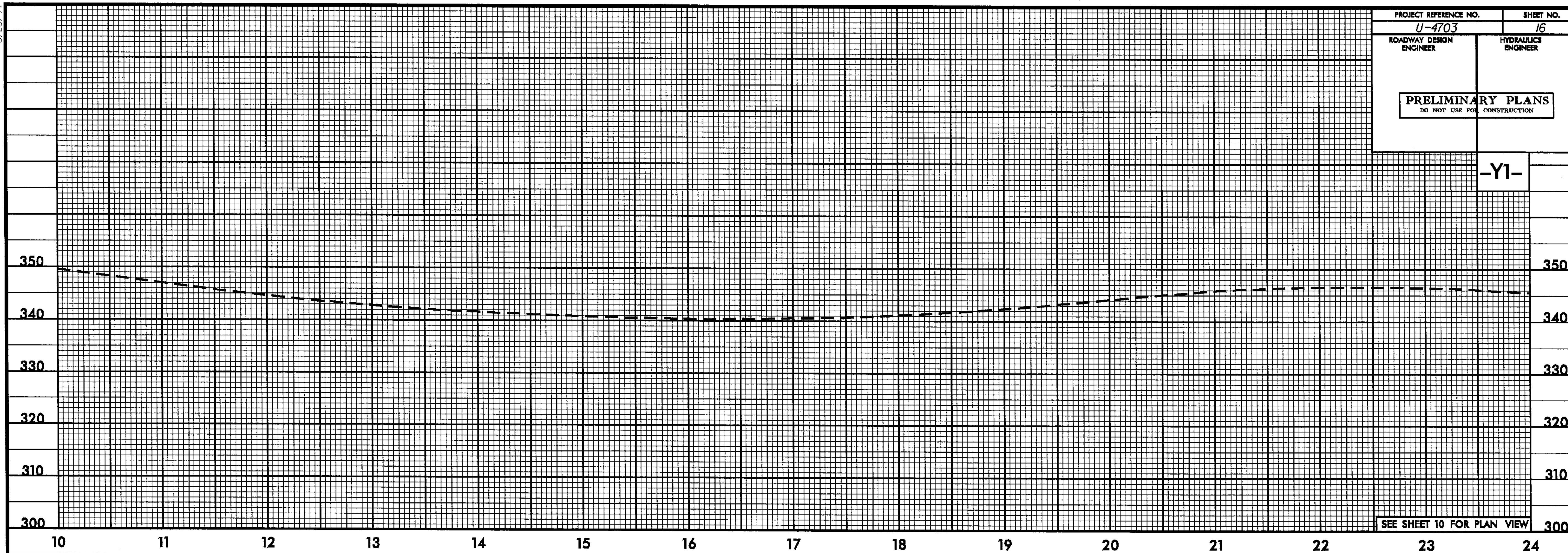
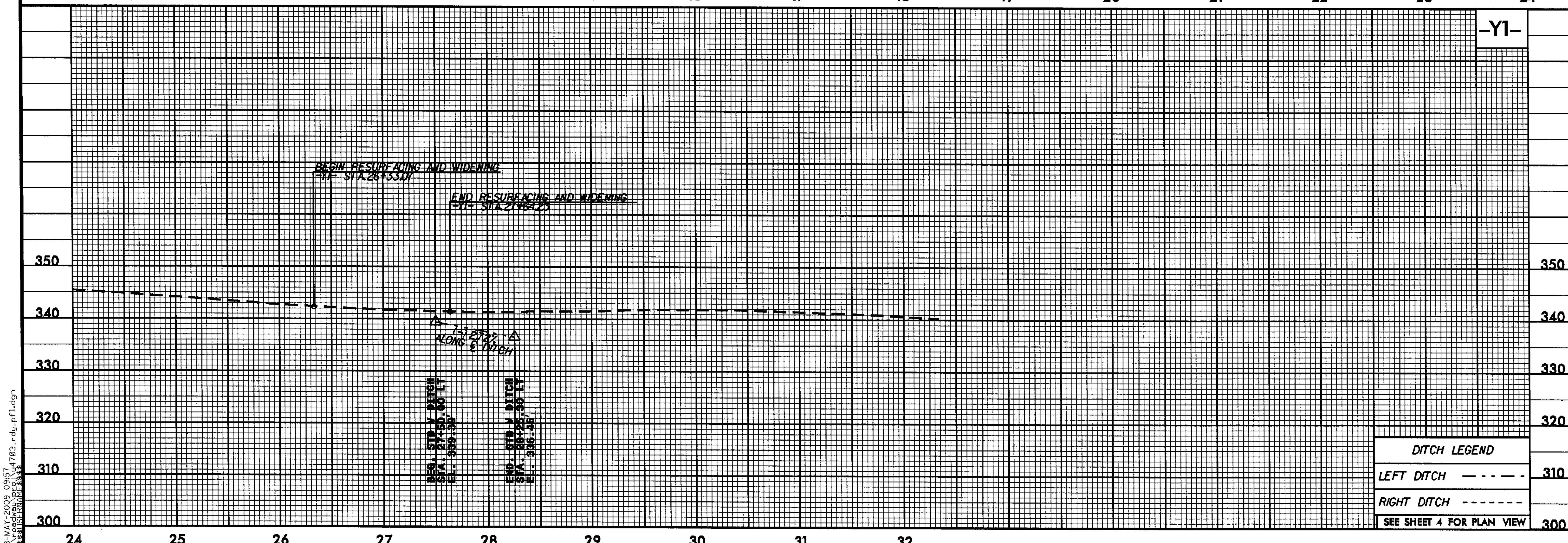
PROJECT REFERENCE NO.	SHEET NO.
U-4703	16

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION





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PROJECT REFERENCE NO.	SHEET NO.
U-4703	17

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y2-

BEGIN OVERLAY AND WIDENING
-Y2- STA 23+24.45

390 380 370 360 350 340 330

22 23 24 25 26 27 28 29 30 31 32 33 34 35 36

SEE SHEET 9 AND 11 FOR PLAN VIEW

-Y2-

END OVERLAY AND WIDENING
-Y2- STA 37+50.00

390 380 370 360 350 340 330

36 37 38 39 40 41 42 43 0 1 0 1

TAIL DITCH -Y2- STA. 31+14 RT.
PROFILE ALONG ℄ DITCH

380 370 360

END TAIL DITCH
STA. 0+12.00
EL. 370.29'
(-7.1333%

BEG. TAIL DITCH
STA. 0+00.00
EL. 370.45'

TAIL DITCH -Y2- STA. 26+48 RT.
PROFILE ALONG ℄ DITCH

380 370 360

END TAIL DITCH
STA. 0+50.30
EL. 370.68'
(-10.3777%

BEG. TAIL DITCH
STA. 0+00.00
EL. 371.04'

DITCH LEGEND

LEFT DITCH — - - — -

RIGHT DITCH - - - - - - -

SEE SHEET 11 FOR PLAN VIEW

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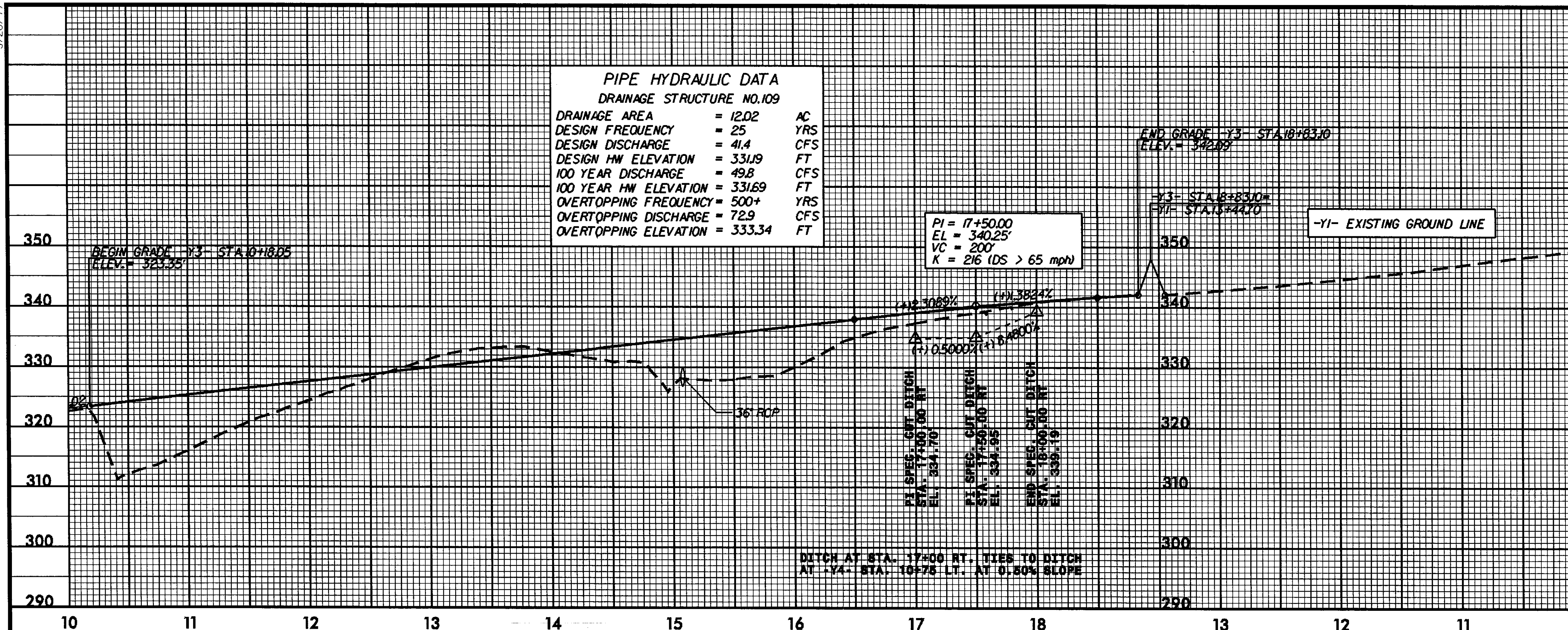
PROJECT REFERENCE NO.	SHEET NO.
U-4703	18

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y3-

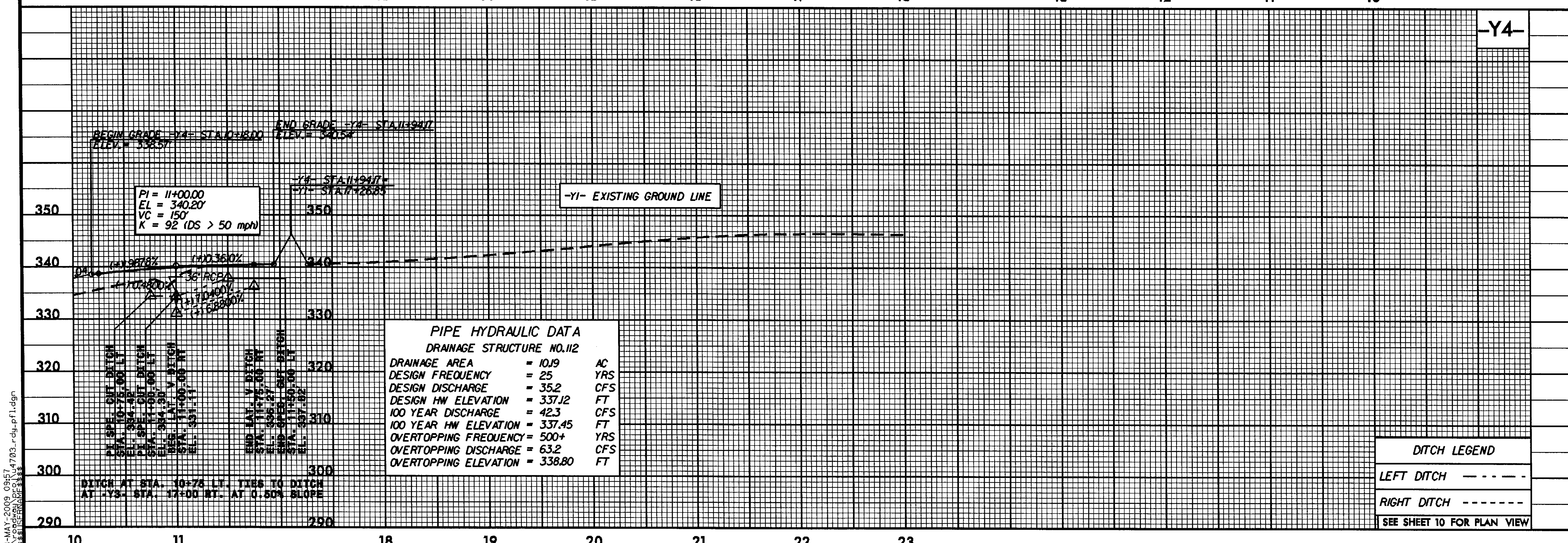


BEGIN GRADE -Y3- STA.10+18.05
ELEV.= 323.35'
END GRADE -Y3- STA.18+83.10
ELEV.= 342.09
-Y3- STA.18+83.10=
-Y1- STA.15+44.70
-Y1- EXISTING GROUND LINE
PI = 17+50.00
EL = 340.25'
VC = 200'
K = 216 (DS > 65 mph)
(+)2.3089%
(+)1.3824%
(+) 0.5000%
(+) 8.4800%
36" RCP
PI SPEC. CUT DITCH STA. 17+00.00 RT EL. 334.70'
PI SPEC. CUT DITCH STA. 17+50.00 RT EL. 334.95
END SPEC. CUT DITCH STA. 18+00.00 RT EL. 339.19
DITCH AT STA. 17+00 RT. TIES TO DITCH AT -Y4- STA. 10+75 LT. AT 0.50% SLOPE
DITCH LEGEND
LEFT DITCH
RIGHT DITCH
SEE SHEET 10 FOR PLAN VIEW
350
340
330
320
310
300
290
10
11
12
13
14
15
16
17
18
13
12
11
10

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.109

DRAINAGE AREA	=	12.02	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	41.4	CFS
DESIGN HW ELEVATION	=	331.19	FT
100 YEAR DISCHARGE	=	49.8	CFS
100 YEAR HW ELEVATION	=	331.69	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	72.9	CFS
OVERTOPPING ELEVATION	=	333.34	FT

-Y4-



BEGIN GRADE -Y4- STA.10+18.00
ELEV.= 338.37
END GRADE -Y4- STA.11+94.17
ELEV.= 340.54
-Y4- STA.11+94.17=
-Y1- STA.17+26.85
-Y1- EXISTING GROUND LINE
PI = 11+00.00
EL = 340.20'
VC = 150'
K = 92 (DS > 50 mph)
(+)0.9878%
(+)0.3610%
(+)0.4800%
(+)7.0400%
(+)6.8800%
36" RCP
PI SPE. CUT DITCH STA. 10+75.00 LT EL. 334.42'
PI SPE. CUT DITCH STA. 11+00.00 LT EL. 334.30'
BEG. LAT. V DITCH STA. 11+00.00 RT EL. 331.11'
END LAT. V DITCH STA. 11+75.00 RT EL. 336.27
END SPEC. CUT DITCH STA. 11+50.00 LT EL. 337.82
DITCH AT STA. 10+75 LT. TIES TO DITCH AT -Y3- STA. 17+00 RT. AT 0.50% SLOPE
DITCH LEGEND
LEFT DITCH
RIGHT DITCH
SEE SHEET 10 FOR PLAN VIEW
350
340
330
320
310
300
290
10
11
18
19
20
21
22
23

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.112

DRAINAGE AREA	=	10.19	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	35.2	CFS
DESIGN HW ELEVATION	=	337.12	FT
100 YEAR DISCHARGE	=	42.3	CFS
100 YEAR HW ELEVATION	=	337.45	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	63.2	CFS
OVERTOPPING ELEVATION	=	338.80	FT

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