STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAT L. MCCRORY
GOVERNOR

ANTHONY J. TATA
SECRETARY

April 1, 2013

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

ATTN: Mr. John Thomas
NCDOT Division 9 Coordinator

SUBJECT: Application for Section 404 Nationwide Permit 14, Section 401 Water Quality Certification, and Randleman Lake and Jordan Lake Riparian Buffer Authorizations for the widening and extension of SR 2601 (Macy Grove Road) from near SR 4319 (Industrial Park Drive) to north of SR 1005 (Old US 421/East Mountain Street), Forsyth and Guilford Counties, North Carolina. Federal Aid Project No. STP-2601(1), TIP No. U-2800.

Debit $570.00 from WBS 34858.1.1.

The North Carolina Department of Transportation (NCDOT) proposes to widen SR 2601 (Macy Grove Road) to multi-lanes from near SR 4319 (Industrial Park Drive) to SR 2042 (Old Greensboro Road) and extend Macy Grove Road on new location from Old Greensboro Road to north of SR 1005 (Old US 421 / East Mountain Street). The project will include a new alignment interchange with Macy Grove Road and I-40 Business. Please see the attached Pre-Construction Notification (PCN) for a detailed description of the jurisdictional impacts associated with this project.

This project was combined with future TIP project U-4734 (extension of Macy Grove on new location from the interchange with Old US 421 / East Mountain Street to NC 150) in the NEPA documentation. Although it was initially proposed to permit these projects together, discussion at the Concurrence Point 4C Meeting for U-2800 (held on January 16, 2013) found each project to have independent utility; therefore, these projects can be permitted separately.

Please find enclosed the PCN form, US Corps of Engineers' Notification of Jurisdictional Determination, NC Department of Natural Resources (NCDENR) – Department of Water Quality (DWQ) On-Site Determination, ICE Land Use Scenario Assessment, Stormwater Management Plan, permit drawings, buffer drawings, and roadway design plans for the

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

TELEPHONE: 919-707-6100
FAX: 919-212-5785
WEBSITE: WWW.NCDOT.ORG

PHYSICAL ADDRESS:
Century Center - Building B
1020 Birch Ridge Dr
Raleigh, NC 27610-4328

above-referenced project. A revised Mitigation Acceptance Letter from the N.C. Ecosystem Enhancement Program (EEP) is forthcoming.

An Environmental Assessment (EA) for both U-2800 and U-4734 was completed in September 2010. A Finding on No Significant Impact (FONSI) for both projects was completed in June 2011. Both documents were distributed shortly after completion. Additional copies are available upon request.

This project had a Design Build let date of July 17, 2012. Construction of this project is projected to commence in July of 2013 or sooner, contingent on issuance of permits.

A copy of this permit application will be posted on the NCDOT Website at: https://connect.ncdot.gov/resources/Environmental/Pages/default.aspx.

Thank you for your assistance with this project. If you have any questions or need additional information, please contact Mr. James Mason at either jsmason@ncdot.gov or (919) 707-6136.

Sincerely,

E. L. Luck

for Gregory J. Thorpe, Ph.D., Manager
Project Development and Environmental Analysis Unit

cc: NCDOT Permit Application Standard Distribution List
Rodger Rochelle, Transportation Program Management Unit

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 ☐ 401 Water Quality Certification – Express ☐ Non-404 Jurisdictional General Permit ☒ 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:	Improvements to SR 2601 (Macy Grove Road)
2b. County:	Forsyth, Guilford
2c. Nearest municipality / town:	Kernersville
2d. Subdivision name:	N/A
2e. NCDOT only, T.I.P. or state project no:	T.I.P. U-2800

3. Owner Information

3a. Name(s) on Recorded Deed:	North Carolina Department of Transportation
3b. Deed Book and Page No.	N/A
3c. Responsible Party (for LLC if applicable):	N/A
3d. Street address:	1598 Mail Service Center
3e. City, state, zip:	Raleigh, NC 27699-1598
3f. Telephone no.:	(919) 707-6136
3g. Fax no.:	(919) 212-2785
3h. Email address:	jsmason@ncdot.gov

4. Applicant Information (if different from owner)	
4a. Applicant is:	☐ Agent ☐ Other, specify:
4b. Name:	
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:	
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):	N/A
1b. Site coordinates (in decimal degrees):	Latitude: 36.10837 (DD.DDDDDD) Longitude: - 80.046417 (-DD.DDDDDD)
1c. Property size:	124.1 acres
2. Surface Waters	
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	West Fork Deep River (Randleman); Reedy Fork (Jordan)
2b. Water Quality Classification of nearest receiving water:	WS IV* (West Fork Deep River);WS III NSW (Reedy Fork)
2c. River basin:	Cape Fear
3. Project Description	
3a. Describe the existing conditions on the site and the general land use in the vicinity of the project at the time of this application: Existing roadway surrounded by highly commercial area; landfill located on east side of project.	
3b. List the total estimated acreage of all existing wetlands on the property: 0.12	
3c. List the total estimated linear feet of all existing streams (intermittent and perennial) on the property: 2,238	
3d. Explain the purpose of the proposed project: To provide a link between I-40 Business/US 421 and NC 150 (N. Main Street) north of Kernersville.	
3e. Describe the overall project in detail, including the type of equipment to be used: Roadway widening of Macy Grove Road from near Industrial Park Drive to Old Greensboro Road and extension of Macy Grove Road from Old Greensboro Road to north of Old US 421/East Mountain Street. Existing grade separation of I-40 Business will be converted to an interchange, and bridges will be built over Norfolk Southern Railroad and also Old US 421/East Mountain Street. Project also includes repaving approximately 1.6 miles of I-40 Business. Standard road building equipment, such as truck, 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): Susan Shelingoski (now Westberry)	Agency/Consultant Company: URS Other:
4d. If yes, list the dates of the Corps jurisdictional determinations or State determinations and attach documentation. November 3, 2009 (USACE), October 23, 2009 (DWQ)	
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 3 ☒ P ☐ T	Mechanized Clearing	Bottomland Hardwood Forest	☒ Yes ☐ No	☒ Corps ☐ DWQ	0.03 (P)
2g. **Total wetland impacts**					**0.03 (P)**

2h. Comments: Site 3 is within the Randleman Lake Watershed (HUC 03030003).

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 4 ☒ P ☐ T	Culvert	UT West Fork Deep River (S12)	☐ PER ☒ INT	☒ Corps ☐ DWQ	10-20	12 (P)
Site 4 ☒ P ☐ T	Bank Stabilization	UT West Fork Deep River (S12)	☐ PER ☒ INT	☒ Corps ☐ DWQ	10-20	24 (P)
Site 5 ☒ P ☒ T	Permanent and Temporary Fill	UT West Fork Deep River (S9)	☐ PER ☒ INT	☒ Corps ☐ DWQ	3-4	203 (P) 26 (T)
Site 5 ☒ P ☐ T	Bank Stabilization	UT West Fork Deep River (S9)	☐ PER ☒ INT	☒ Corps ☐ DWQ	3-4	16 (P)
Site 6 ☒ P ☒ T	Culvert	UT Reedy Fork (S17)	☒ PER ☐ INT	☒ Corps ☐ DWQ	6-10	245 (P) 7 (T)
Site 6 ☒ P ☐ T	Bank Stabilization	UT Reedy Fork (S17)	☒ PER ☐ INT	☒ Corps ☐ DWQ	6-10	17 (P)
Site 7 ☐ P ☒ T	Temporary Fill	UT West Fork Deep River (S10)	☐ PER ☒ INT	☒ Corps ☐ DWQ	1-1.5	27 (T)
3h. **Total stream and tributary impacts**						**517 (P) 60 (T)**

3i. Comments: Site 6 is within the Jordan Lake Watershed (HUC 03030002), while Sites 4, 5, and 7 are within the Randleman Lake Watershed (HUC 03030003). For S17 at Site 6, 1:1 mitigation was determined by John Thomas of USACE during Jurisdictional Determination Site Verification on May 27, 2009.

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				
4f. Total open water impacts				

4g. Comments:

5. Pond or Lake Construction

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

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

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			Jordan, Randleman		
6b. Buffer impact number – Permanent (P) or Temporary (T)	6c. Reason for impact	6d. Stream name	6e. Buffer mitigation required?	6f. Zone 1 impact (square feet)	6g. Zone 2 impact (square feet)
Jordan Lake Watershed					
Site 1 ☒ P ☐ T	Road Crossing	UT Reedy Fork (S19)	☒ No	2,115	2,850
Site 1 ☒ P ☐ T	Road Crossing	UT Reedy Fork (S19)	☒ Yes	32	41
Site 6 ☒ P ☐ T	Road Crossing	UT Reedy Fork (S17)	☒ Yes	17,807	12,794
6h(a) **Total for Jordan Lake buffer impacts**				**19,954 (P)**	**15,685 (P)**
Randleman Lake Watershed					
Site 2 ☒ P ☐ T	Parallel Impact	UT West Fork Deep River (S9)	☒ Yes	176	0
Site 3 ☒ P ☐ T	Parallel Impact	West Fork Deep River (S6)	☒ Yes	6,007	7,311
Site 4 ☒ P ☐ T	Stormwater Conveyance	UT West Fork Deep River (S12)	☒ No	54	572
Site 5 ☒ P ☐ T	Road Crossing	UT West Fork Deep River (S9)	☒ Yes	10,804	2,788
Site 5 ☒ P ☐ T	Stormwater BMP	UT West Fork Deep River (S9)	☒ No	0	67
Site 7 ☒ P ☐ T	Parallel Impact	UT West Fork Deep River (S10)	☒ Yes	1,165	234
6h(b). Total for Randleman Lake buffer impacts				18,206 (P)	10,972 (P)
(Wetlands in buffer at Site 3)				-(1,199)	-(99)
6h(c). Total for Randleman Lake buffer impact amounts *minus* wetlands in buffer				**17,007 (P)**	**10,873 (P)**

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. In addition to those listed in the NEPA documents and Stormwater Management Plan, impacts to UT to Reedy Fork were reduced by eliminating proposed ramp in the northeast quadrant of Macy Grove Road and East Mountain Street intersection.		
1b. Specifically describe measures taken to avoid or minimize the proposed impacts through construction techniques. Will follow NCDOT construction guidelines and BMPs, including no staging of construction equipment or storage of construction supplies in jurisdictional areas; Installation of temporary sediment control fences, earth berms, and temporary ground cover during construction; 2:1 fill slopes utilized in wetland and stream areas where possible. Due to the project being within both the Randleman Lake and Jordan Lake watersheds, Design Standards in Sensitive Watersheds will be employed.		
2. Compensatory Mitigation for Impacts to Waters of the U.S. or Waters of the State		
2a. Does the project require Compensatory Mitigation for impacts to Waters of the U.S. or Waters of the State?	☒ Yes ☐ No	
2b. If yes, mitigation is required by (check all that apply):	☒ DWQ ☒ Corps	
2c. If yes, which mitigation option will be used for this project?	☐ Mitigation bank ☒ Payment to in-lieu fee program ☐ Permittee Responsible Mitigation	
3. Complete if Using a Mitigation Bank		
3a. Name of Mitigation Bank:		
3b. Credits Purchased (attach receipt and letter)	Type	Quantity
3c. Comments:		
4. Complete if Making a Payment to In-lieu Fee Program		
4a. Approval letter from in-lieu fee program is attached.	☒ Yes	
4b. Stream mitigation requested:	692 linear feet (262 in Jordan, 430 in Randleman)	
4c. If using stream mitigation, stream temperature:	☒ warm ☐ cool ☐ cold	
4d. Buffer mitigation requested (DWQ only):	138,980 square feet (72,770 in Jordan, 66,210 in Randleman)	
4e. Riparian wetland mitigation requested:	0.0 acres	
4f. Non-riparian wetland mitigation requested:	acres	
4g. Coastal (tidal) wetland mitigation requested:	acres	
4h. Comments: Mitigation required by NCDWQ for bank stabilization and stream impacts within the Jordan Lake Watershed exceeds the amount required by USACE (262 linear ft. @ 1:1 for NCDWQ, 245 linear ft. @ 1:1 for USACE). Mitigation required by USACE for stream impacts within the Randleman Lake Watershed exceeds the amount required by NCDWQ (215 linear ft. @ 2:1 for USACE, 219 linear ft. @ 1:1 for NCDWQ).		
5. Complete if Using a Permittee Responsible Mitigation Plan		
5a. If using a permittee responsible mitigation plan, provide a description of the proposed mitigation plan.		

6. **Buffer Mitigation (State Regulated Riparian Buffer Rules) – required by DWQ**				
6a. Will the project result in an impact within a protected riparian buffer that requires buffer mitigation?				☒ Yes ☐ No
6b. If yes, then identify the square feet of impact to each zone of the riparian buffer that requires mitigation. Calculate the amount of mitigation required.				
Zone	6c. Reason for impact	6d. Total impact (square feet)	Multiplier	6e. Required mitigation (square feet)
Jordan Lake Watershed				
Zone 1	Road Crossing	17,839	3 (2 for Catawba)	53,517
Zone 2	Road Crossing	12,835	1.5	19,252.5
	6f(a). **Total buffer mitigation required for Jordan Lake Watershed:**			**72,769.5**
Randleman Lake Watershed				
Zone 1	Road Crossing, Parallel Impact	16,953	3 (2 for Catawba)	50,859
Zone 2	Road Crossing, Parallel Impact	10,234	1.5	15,351
	6f(b). **Total buffer mitigation required for Randleman Lake Watershed:**			**66,210**
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). Payment into an approved in-lieu fee fund (EEP)				
6h. Comments:				

E. Stormwater Management and Diffuse Flow Plan (required by DWQ)	
1. Diffuse Flow Plan	
1a. Does the project include or is it adjacent to protected riparian buffers identified within one of the NC Riparian Buffer Protection Rules?	☒ Yes ☐ No
1b. If yes, then is a diffuse flow plan included? If no, explain why. Comments:	☒ Yes ☐ No
2. Stormwater Management Plan	
2a. What is the overall percent imperviousness of this project?	N/A
2b. Does this project require a Stormwater Management Plan?	☒ Yes ☐ No
2c. If this project DOES NOT require a Stormwater Management Plan, explain why:	
2d. If this project DOES require a Stormwater Management Plan, then provide a brief, narrative description of the plan: Narrative is attached, along with the SMP	
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?	N/A
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?	N/A
5b. Have all of the 401 Unit submittal requirements been met?	N/A

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. ICE Land Use Scenario Assessment is attached.		
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.		

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, NCDOT Field Surveys		
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? Consulted with SHPO		
8. Flood Zone Designation (Corps Requirement)		
8a. Will this project occur in a FEMA-designated 100-year floodplain?	☐ Yes	☒ No
8b. If yes, explain how project meets FEMA requirements:		
8c. What source(s) did you use to make the floodplain determination? FEMA Maps		

Dr. Gregory J. Thorpe, Ph.D. Applicant/Agent's Printed Name	E. L. Luke Applicant/Agent's Signature (Agent's signature is valid only if an authorization letter from the applicant is provided.)	4.1.13 Date

U.S. ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT

Action Id. **200902019** County: **Forsyth** U.S.G.S. Quad: **Kernersville**

NOTIFICATION OF JURISDICTIONAL DETERMINATION

Mason

RECEIVED
NOV 6 2009
DIVISION OF HIGHWAYS
PDEA-OFFICE OF NATURAL ENVIRONMENT

Property Owner/Agent: **James Mason**
Address: **ND DOT - PDEA - NEU**
1598 Mail Service Center
Raleigh, NC 27699-1598
Telephone No.: _____

Property description:
Size (acres) **100** Nearest Town **Kernersville**
Nearest Waterway **Reedy Fork** River Basin **Haw River**
USGS HUC **03030002** Coordinates N **36.123772** W **-80.0410142**
Location description **Macy Grove Road (SR 2601) north to NC 150 TIP U-4734 & U-2800 adjacent to Reedy Fork and West Fork Deep River, east of Kernersville, in Forsyth County, North Carolina. (Delineations confirmed on May 27, 2009, with changes recorded by memo dated August 25, 2009.)**

Indicate Which of the Following Apply:

A. Preliminary Determination

_ Based on preliminary information, there may be wetlands on the above described property. We strongly suggest you have this property inspected to determine the extent of Department of the Army (DA) jurisdiction. To be considered final, a jurisdictional determination must be verified by the Corps. This preliminary determination is not an appealable action under the Regulatory Program Administrative Appeal Process (Reference 33 CFR Part 331).

B. Approved Determination

_ There are Navigable Waters of the United States within the above described property subject to the permit requirements of Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

X There are waters of the U.S. including wetlands on the above described project area subject to the permit requirements of Section 404 of the Clean Water Act (CWA)(33 USC § 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

_ We strongly suggest you have the wetlands on your property delineated. Due to the size of your property and/or our present workload, the Corps may not be able to accomplish this wetland delineation in a timely manner. For a more timely delineation, you may wish to obtain a consultant. To be considered final, any delineation must be verified by the Corps.

X The waters of the U.S. including wetland on your project area have been delineated and the delineation has been verified by the Corps. We strongly suggest you have this delineation surveyed. Upon completion, this survey should be reviewed and verified by the Corps. Once verified, this survey will provide an accurate depiction of all areas subject to CWA jurisdiction on your property which, provided there is no change in the law or our published regulations, may be relied upon for a period not to exceed five years.

_ The waters of the U.S. including wetlands have been delineated and surveyed and are accurately depicted on the plat signed by the Corps Regulatory Official identified below on _____. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

_ There are no waters of the U.S., to include wetlands, present on the above described property which are subject to the permit requirements of Section 404 of the Clean Water Act (33 USC 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

Action ID: _____

_ The property is located in one of the 20 Coastal Counties subject to regulation under the Coastal Area Management Act (CAMA). You should contact the Division of Coastal Management in Washington, NC, at (252) 946-6481 to determine their requirements.

Placement of dredged or fill material within waters of the US and/or wetlands without a Department of the Army permit may constitute a violation of Section 301 of the Clean Water Act (33 USC § 1311). If you have any questions regarding this determination and/or the Corps regulatory program, please contact **John Thomas** at **919 554-4884 ext. 25**.

C. Basis For Determination

There are stream channels within your project site which are tributaries of Reedy Fork and West Fork Deep River which flows into the Cape Fear River and the Atlantic Ocean.

D. Remarks

_____

E. Appeals Information (This information applies only to approved jurisdictional determinations as indicated in B. above)

This correspondence constitutes an approved jurisdictional determination for the above described site. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and request for appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the following address:

District Engineer, Wilmington Regulatory Division
Attn:Jean Manuele, Project Manager,
Raleigh Regulatory Field Office
3331 Heritage Trade Drive, Suite 105
Raleigh, North Carolina 27615

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR part 331.5, and that it has been received by the District Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by **January 3, 2010**.

It is not necessary to submit an RFA form to the District Office if you do not object to the determination in this correspondence.

Corps Regulatory Official: _____

Date **11/03/2009** Expiration Date **11/03/2014**

The Wilmington District is committed to providing the highest level of support to the public. To help us ensure we continue to do so, please complete the Customer Satisfaction Survey located at our website at http://regulatory.usacesurvey.com/ to complete the survey online.

Copy furnished:

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL		
Applicant: NCDOT / James Mason/ TIP U-4734 & U-2800	File Number: SAW 2009 02019	Date: November 3, 2010
Attached is:		See Section below
☐ INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)		A
☐ PROFFERED PERMIT (Standard Permit or Letter of permission)		B
☐ PERMIT DENIAL		C
☐ APPROVED JURISDICTIONAL DETERMINATION		D
☒ PRELIMINARY JURISDICTIONAL DETERMINATION		E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the district engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact: John Thomas, Raleigh Regulatory Field Office, 919 554-4884 ext. 25	If you only have questions regarding the appeal process you may also contact: Mr. Mike Bell, Administrative Appeal Review Officer CESAD-ET-CO-R U.S. Army Corps of Engineers, South Atlantic Division 60 Forsyth Street, Room 9M15 Atlanta, Georgia 30303-8801

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

_____ Signature of appellant or agent.	Date:	Telephone number:

For appeals on Initial Proffered Permits and approved Jurisdictional Determinations send this form to:

District Engineer, Wilmington Regulatory Division, Attn:Jean Manuele, Project Manager, Raleigh Regulatory Field Office, 3331 Heritage Trade Drive, Suite 105, Wake Forest, North Carolina 27587

For Permit denials and Proffered Permits send this form to:

Division Engineer, Commander, U.S. Army Engineer Division, South Atlantic, Attn: Mr. Mike Bell, Administrative Appeal Officer, CESAD-ET-CO-R, 60 Forsyth Street, Room 9M15, Atlanta, Georgia 30303-8801

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Water Quality
Coleen H. Sullins
Director

Beverly Eaves Perdue
Governor

Dee Freeman
Secretary

October 23, 2009

Mason
RECEIVED
OCT 27 2009
DIVISION OF HIGHWAYS
PDEA-OFFICE OF NATURAL ENVIRONMENT

James Mason
NCDOT-PDEA-NEU
1598 Mail Service Center
Raleigh NC 27699-1598

Subject: NCDOT TIP #U-2800 and U-4734, Forsyth County
West Fork Deep River and UTs [Yadkin, 17-3-(0.3), WSIV]
Reedy Creek and UTs [Cape Fear, 16-11-(1), WSIII; NSW]

On-Site Determination for Applicability to the Randleman and Jordan Buffer Rules (15A NCAC 2B .0250 and 15A NCAC 2B .0267)
On-Site Determination for Applicability to the Mitigation Rules (15A NCAC 2H .0506(h))
On-Site Determination for Applicability to the Isolated Wetland Rules (15A NCAC 2H .1300)

Dear Mr. Mason:
On May 27, 2009, at your request and in your attendance, Amy Euliss, NC Division of Water Quality (NCDWQ) staff, conducted an on-site determination to review drainage features located in the vicinity of Macey Grove Road and Business 40 in Kernersville (Forsyth County) for applicability to the Randleman Lake and Jordan Lake Buffer Rules and for applicability to the mitigation rules (15A NCAC 2H .0506(h)). The drainage features are approximated on the attached map prepared by NCDOT initialed by myself and dated October 19, 2009.

Table 1: Jurisdictional stream and buffer determinations for U-2800 and U-4734 in Forsyth County

Feature ID	Stream Name	Site visited (yes/no) and Date visited	Stream Type*	Buffer Rules Applicable (NA-not applicable)
S1	UT to West Fork Deep River	No	Ephemeral	NA
S2	UT to West Fork Deep River	Yes, 5-27-2009	Perennial	Randleman
S3	UT to West Fork Deep River	No	Ephemeral	NA
S4	UT to West Fork Deep River	No	Ephemeral	NA
S5	UT to West Fork Deep River	Yes, 8-9-2005	Intermittent	Randleman
S6	West Fork Deep River	Yes, 2-26- 2007	Perennial	Randleman
S7	UT to West Fork Deep River	No	Ephemeral	NA
S8	UT to Reedy Fork	No	Perennial	Jordan
S9	UT to West Fork Deep River	No	Intermittent	Randleman
S10	UT to West Fork Deep River	No	Intermittent	Randleman
S11	UT to West Fork Deep River	No	Intermittent	Randleman
S12	UT to West Fork Deep River	Yes, 2-26-2007	Intermittent	Randleman
S13	UT to West Fork Deep River	Yes, 2-26- 2007	Intermittent	Randleman
S14	UT to West Fork Deep River	No	Ephemeral	NA
S15	UT to West Fork Deep River	Yes, 2-26-2007	Intermittent	Randleman
S16	Reedy Fork	Yes, 5-27-2009	Perennial	Jordan
S17	UT to Reedy Fork	Yes, 5-27-2009	Perennial	Jordan
S18	UT to Reedy Fork	Yes, 5-27-2009	Intermittent	Jordan

Transportation Permitting Unit
1650 Mail Service Center, Raleigh, North Carolina 27699-1650
Location: 2321 Crabtree Blvd., Raleigh, North Carolina 27604
Phone: 919-733-1786 \ FAX: 919-733-6893
Internet: http://h2o.enr.state.nc.us/ncwetlands/

S19	UT to Reedy Fork	Yes, 5-27-2009	Perennial	Jordan
S20	UT to Reedy Fork	Yes, 5-27-2009	Ephemeral	NA

Table 2: Jurisdictional Wetland determinations for U-2800 and U4734 in Forsyth County

Feature ID	Site visited (yes/no) and Date visited	Wetland Type (Riparian, Non-riparian, or Isolated)
W1	No	Riparian
W2	Yes, 5-27-2009	Non-riparian
W3	Yes, 5-27-2009	Non-riparian
W4	Yes, 5-27-2009	Non-riparian
W5	Yes, 5-27-2009	Non-riparian
W6	Yes, 5-27-2009	Riparian
W7	Yes, 5-27-2009	Riparian
W8	Yes, 5-27-2009	Riparian
W9	Yes, 5-27-2009	Riparian
W10	Yes, 5-27-2009	Riparian
W11	Yes, 8-9-2005	Isolated

Table 3: Pond jurisdictional determinations for U-2800 and U-4734

Feature ID	Site visited (yes/no) and Date visited	Jurisdictional (yes/no)	Buffer Rules Applicable (NA-not applicable)
P1	Yes, 5-27-2009	No	NA
P2	Yes, 5-27-2009	No	NA
P3	Yes,5-27-2009	Yes	Jordan
P4	No	Yes	Jordan
Pond associated with W11	Yes, 8-9-2005	No	NA

Please note that other sites identified in the jurisdiction verification request package but not reviewed on site by NCDWQ will be considered accurate as presented.

This letter only addresses the applicability to the mitigation rules and the buffer rules and does not approve any activity within the buffer, Waters of the United States, or Waters of the State. Any impacts to wetlands, streams and buffers must comply with the Randleman Lake or Jordan Lake Buffer Rules, 404/401 regulations, water supply regulations (15A NCAC 2B .0216), and any other required federal, state and local regulations. Please be aware that even if no direct impacts are proposed to the protected buffers, sheet flow of all new stormwater runoff as per 15A NCAC 2B .0250 and 15A NCAC 2B .0267 is required.

The owner (or future owners) or permittee should notify NCDWQ (and other relevant agencies) of this decision in any future correspondences concerning this property and/or project. This on-site determination shall expire five (5) years from the date of this letter.

Landowners or affected parties that dispute a determination made by NCDWQ or Delegated Local Authority that a surface water exists and that it is subject to the mitigation rules may request a determination by the Director. A request for a determination by the Director shall be referred to the Director in writing c/o Brian Wrenn, NCDWQ Wetlands/401 Unit, 1650 Mail Service Center, Raleigh, NC 27699-1650. Individuals that dispute a determination by NCDWQ or Delegated Local Authority that "exempts" a surface water from the mitigation rules may ask for an adjudicatory hearing. You must act within 60 days of the date that you receive this letter. Applicants are hereby notified that the 60-day statutory appeal time does not start until the affected party (including downstream and adjacent landowners) is notified of this decision. NCDWQ recommends that the applicant conduct this notification in order to be certain that third party appeals are made in a timely manner. To ask for a hearing, send a written petition, which conforms to Chapter 150B of the North Carolina General Statutes

to the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, N.C. 27699-6714. This determination is final and binding unless you ask for a hearing within 60 days.

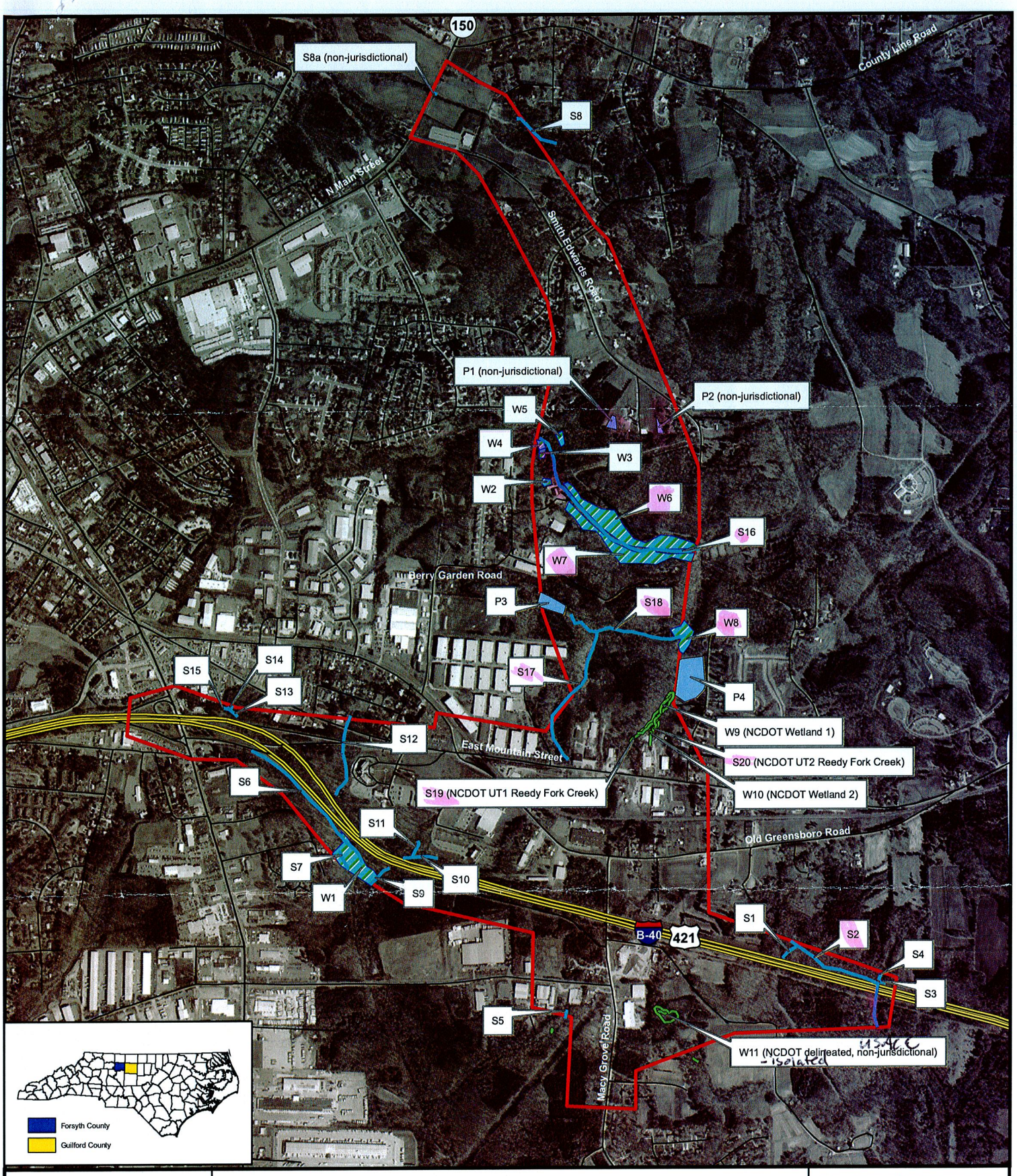
If you have any additional questions or require additional information please contact me at 336-771-4959 or at amy.euliss@ncdenr.gov.

Sincerely,

Amy Euliss

Attachments: Signed Location Map

cc: John Thomas, US Army Corps of Engineers – Raleigh Regulatory Field Office
Susan Shelingoski, URS Corporation, 1600 Perimeter Park Drive, Suite 400, Morrisville, NC 27650
NCDWQ Wetlands 401 Transportation Permitting Unit
File Copy



North Carolina Department of Transportation

Date: March 2009

Legend

- NCDOT Delineated Streams and Wetlands
- Delineated Streams
- Delineated Wetlands
- Delineated Pond
- Project Study Area
- Local Road
- Interstate
- US Highway
- NC Highway
- SR Route

0 0.25 0.5 Miles

Macy Grove Road Extension
STIP U-2800 & U-4734
Forsyth and Guilford Counties
North Carolina

Sheet 1 of 19

Stream and Wetland Overview

10/19/09

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

INDIRECT AND CUMULATIVE EFFECTS
LAND USE SCENARIO ASSESSMENT

Proposed Widening and Extension Project STIP U-2800 and U-4734,
WBS 34585.1.1 and 36600.1.1
Fed# STP-2601(1)

Macy Grove Road from SR 4319 (Industrial Park Drive) to NC 150 (North Main Street)
Town of Kernersville, Forsyth County

Submitted by: URS Corporation
Date: January 22, 2010

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EXECUTIVE SUMMARY

The North Carolina Department of Transportation (NCDOT) is proposing improvements to and the extension of SR 2601 (Macy Grove Road) in Forsyth County, North Carolina. The proposed project is located east of the Town of Kernersville, about 1.5 miles from the downtown center, west of the Forsyth and Guilford County line. State Transportation Improvement Program (STIP) project U-2800 consists of widening the existing Macy Grove Road, creating an interchange with I-40 Business, and extending on new location from SR 2042 (Old Greensboro Road) to north of SR 1005 (Old US 421/East Mountain Street). This portion of the project consists of widening the existing SR 2601 (Macy Grove Road) from a two-lane typical section to a four-lane, median-divided, curb and gutter typical section. This would widen the right of way from 60 feet to 260 feet. STIP project U-4734 includes extending Macy Grove Road on new location from north of East Mountain Street to NC 150 (North Main Street), and would be a median-divided, four-lane curb and gutter typical section. The right of way for the road would be 110 feet. Both portions of the project would be partial control of access.

The project will likely result in a moderate decrease in total travel time (five to ten minutes), an increase in property access due to the new location north/south roadway and the proposed interchange at I-40 Business and Macy Grove Road (currently a grade separation), and the creation of a major transportation node at I-40 Business and Macy Grove Road. This transportation node will provide more direct access to surrounding parcels (proposed industrial and commercial uses). The portion of the project on new location will create a transportation node at NC 150 and Macy Grove Road, and encourage development of non-residential uses in the northern and middle portions of the study area.

Based on the information gathered in the Indirect Land Use Screening Report, the majority of the categories on the screening tool reflected moderate to higher (not high) concern for indirect and cumulative effects potential. The overall result, considering scope of the project, annual population growth in the Future Land Use Study Area (FLUSA) and the amount of economic growth expected in the area suggest that further examination by an Indirect and Cumulative Effects (ICE) Land Use Scenario Assessment was warranted.

The FLUSA for this project includes approximately 4,934 acres, with 1,725 acres of undeveloped land (35%). The time horizon for the study is 2035. Notable features in the area include residential areas in the northern portion of the project that exhibit signs of community cohesion, Triad Park (which is traversed by the U-4734 portion of the project), and several streams and their associated wetlands.

Both Forsyth and Guilford Counties are expected to grow by between 10% and 15% each decade, though this is slightly less than the average growth for North Carolina. Kernersville, however, is expected to have an annual growth rate of 5.3% until 2020. The Triad Business Park and Kernersville Medical Park (both areas currently under construction) are anticipated to become an important job base for Kernersville and the surrounding area. Federal Express recently began construction of a new 400,000 square foot FedEx Regional Distribution Hub in the Triad Business Park. It is expected to open in 2010 and employ 750 people. According to the Town's Development Plan, the FedEx Regional Distribution Hub offers an opportunity to stimulate and further diversify Kernersville's economy. The close physical location of Kernersville to the Piedmont Triad International Airport, the existing trucking industry, the availability of industrial buildings and land, and accessibility to interstates and rail gives Kernersville an advantage to attract future businesses to the Triad Business Park. The

proposed project would help accelerate this growth by providing more efficient transportation options, including increased access from the proposed interchange.

The majority of development with or without the project is expected to occur near the proposed interchange, as well as south of the project near NC 66 and Old Salem Road. Development will likely be at a slower rate without the proposed project, due to lack of direct access to I-40 Business. Fairly stringent development regulations in the area address this future land use and will likely negate effects to water resources. Kernersville uses both special use district zoning and zoning overlay districts as implementation tools for its Land Use Plan in coordination with the Town's Unified Development Ordinance (UDO). Kernersville has adopted the *NC 66/Old Salem Road Area Metro Activity Center Guidelines* (2001) to guide development along NC 66 in the western portion of the FLUSA. The Town's UDO includes a Watershed Protection Ordinance and is covered by Phase II stormwater requirements. The West Fork Deep River watershed is subject to the Randleman Lake Watershed Protection Rules and Reedy Fork Creek is subject to the Jordan Lake Buffer Rules. The Floodway Ordinance includes standards for development in the floodway or floodway fringe. The Stormwater Ordinance includes standards for managing stormwater from construction and post-construction sites, and is designed to comply with the Town's National Pollutant Discharge Elimination System (NPDES) permit. The Winston-Salem/Forsyth County UDO also applies to the area within the FLUSA. It includes the Zoning Ordinance, the Environmental Ordinance, and the Subdivision Ordinance/Regulations.

The proposed project is unlikely to have significant impact to stormwater run-off or water quality in the watershed. The anticipated industrial development will occur with or without the proposed project. Triad Business Park and the Kernersville Medical Center have already been planned and are currently under construction. Waters within the watershed are subject to the Randleman and Jordan Lake Buffer Rules which require a 50-foot vegetated buffer be maintained along all intermittent and perennial streams, lakes, ponds, and estuarine waters. The project will not directly affect 303(d) waters, Outstanding Resources Water (ORW) or High Quality Waters (HQW); nor is induced development from the project likely to have a negative impact considering the buffer rules and watershed requirements in place for the purpose of protecting water quality.

The development pressures being experienced within the proposed project's FLUSA stem primarily from past and current economic growth. If constructed, the Macy Grove project would reduce travel times from those potentially developable parcels of land to the FLUSA and hence is anticipated to attract more non-residential development to the study area.

Past and future actions including prominent non-residential development and infrastructure improvements within the FLUSA have the potential to cumulatively alter or fragment natural habitats and wildlife regime, especially within Triad Park. The potential for the degradation of water quality also exists through erosion and stream sedimentation in the absence of stormwater management regulations requiring Best Management Practices. Yet, any direct natural environmental impacts by NCDOT projects would be addressed by avoidance, minimization, consistent with programmatic agreements with the natural resource agencies during the Merger and Permitting processes.

1.0 FUTURE LAND USE STUDY AREA

The Future Land Use Study Area (FLUSA) is the area surrounding a construction project that could possibly be indirectly affected by the actions of others as a result of the completion of the project and combined projects. This FLUSA encompasses all of the areas examined for potential increases in development pressure as a result of project construction. The area outlined in black on Figure 1 represents the FLUSA. This area has been chosen to include planned/potential future development areas, including Triad Business Park, the Kernersville Medical Park, and potential industrial/commercial/non-residential development areas; major mixed-density residential neighborhoods west and north of the proposed project; rural residential areas east of the project; all of Triad Park; and much of the proposed Kernersville Loop Road System. The FLUSA runs along road and property lines to incorporate the above areas, as well as watershed boundaries/ridgelines where appropriate (such as along NC 66).

2.0 TIME HORIZON

The time horizon for this analysis is 2035. The Census data and population projections reach from 2000 to 2030, and employment projections from regional plans reach to 2035. Adopted local and regional plans relevant to the project have future planning years ranging from 2015 to 2035. Finally, the *2030 Winston-Salem Urban Area Long Range Transportation Plan* (2005) has been developed for 2030. Therefore, a range from 2000-2035 encompasses all relevant plans and data.

3.0 PROJECT OVERVIEW

NCDOT is proposing improvements to and extension of SR 2601 (Macy Grove Road) in Forsyth County as part of NCDOT's State Transportation Improvement Program (STIP) projects U-2800 and U-4734. The proposed widening and extension of Macy Grove Road is also included in the Draft 2009-2015 Metropolitan Transportation Improvement Program (MTIP) as projects U-2800 and U-4734 (Winston-Salem Urban Area MPO, 2008). For U-2800, right of way will be acquired in 2011 and construction is planned to begin in 2013. U-4734 is not yet funded. The primary purpose is to provide a link between I-40 Business and NC 150 north of Kernersville.

U-2800 consists of widening the existing Macy Grove Road from a two-lane typical section to a four-lane, median-divided, curb and gutter typical section. This would widen the right of way from 60 feet to 260 feet. The project would create an interchange with I-40 Business, replacing the existing grade separation (Bridge No. 370). Macy Grove Road would then be extended on new location from SR 2042 (Old Greensboro Road) to north of SR 1005 (Old US 421/East Mountain Street). Grade separations are also proposed on new location crossing the Norfolk Southern Railroad and Old US 421/East Mountain Street. Access to East Mountain Street would be maintained via service roads.

U-4734 includes extending Macy Grove Road on new location from north of East Mountain Street to NC 150 (North Main Street). The new location would pass through the western portion of Triad Park, connect with Smith Edwards Road, and then continue on new location to terminate at NC 150. The proposed Macy Grove Road extension would be a median-divided, four-lane curb and gutter typical section. The right of way for the road would be 110 feet.

Motorists coming from areas north of Kernersville use NC 66/NC 150 to get to I-40 Business. According to previous forecasts done by NCDOT, this segment of NC 66/NC 150 had 16,000 annual average daily traffic (AADT) in the year 2000. It is projected that this same segment will

carry 32,600 AADT in the year 2025 with an anticipated 13,000 AADT on the proposed Macy Grove Road extension.

This project is a part of the future proposed Kernersville Loop Road System, which is included in the Town of Kernersville's *Land Use Plan* (2004) and Thoroughfare and Street Plan section of the *Kernersville Development Plan* (2005). The Town has existing plans (including preliminary designs and cost estimates) to extend the proposed Macy Grove Road/Loop Road from NC 150 to Piney Grove Road. In an interview with the Planning Director for the Town of Kernersville, this section (U-4734 project) was described as the "missing link" between I-40 Business and residential areas north or Kernersville.

The project is intended to help relieve traffic congestion in and around Kernersville. Growth and development within and north of the town have led to traffic congestion in the downtown area. Under existing conditions traffic from these residential areas must funnel through the downtown area to reach employment centers to the east (Greensboro areas) and west (Winston-Salem areas). According to the *Kernersville Development Plan* (2005), sections of NC 150 and NC 66 are currently over capacity, while East Mountain Street is projected to be over capacity by 2011. In addition, large planned industrial and commercial development areas around the existing Macy Grove Road/I-40 Business intersection would be served by this project.

Overall, the Town intends for the Kernersville Loop Road System to provide a bypass of the downtown area, thereby increasing mobility for travelers going to areas north and east of the downtown area, and reducing congestion in the central town areas.

3.1 ECONOMIC DEVELOPMENT

Kernersville is uniquely positioned for economic development with its central location in the Triad, within the Piedmont Triad International Airport growth area and the Norfolk Southern rail corridor. Kernersville's *Land Use Plan* (2004) recommends an employment center that supports industrial, office, and commercial growth in this area. The *Kernersville Development Plan* (2005) states the interchange at I-40 Business/Macy Grove Road will permit such businesses, which need highway exposure, to develop and prosper.

In keeping with these plans, large areas of non-residential development (currently zoned industrial and commercial) are proposed around the interchange of Macy Grove Road and I-40 Business. Northeast of the interchange is the planned Triad Business Park (570 acres); north of the interchange is a potential non-residential area (225 acres); southwest of the interchange is a potential industrial park (234 acres); south of the interchange is the planned Kernersville Medical Park, which includes a new hospital (189 acres); and southeast of the interchange is a potential commercial/retail area (550 acres). All of these areas are within the FLUSA and are shown in Figure 1.

The project would support the future industrial/commercial development areas described above through increased efficiency of transporting goods and increased access to I-40 Business. According to town planners, the planned development areas such as the Triad Business Park and Kernersville Medical Park, will proceed regardless of the proposed project, and are currently under construction. The potential development areas, including the industrial park and commercial/retail area, are still under consideration.

In addition, the project would provide greater access from Kernersville to the Piedmont Triad International Airport located about 10 miles east of the project. It is stated in the Development Plan that the industrial and office development around the Macy Grove Road interchange can

be directly linked to airport-related growth. Many trucks travel to the Kernersville industrial areas daily from the airport.

3.2 ENVIRONMENTAL DOCUMENTATION

Due to the level of perceived environmental impacts, the project will require an Environmental Assessment (EA) for permitting. The content of the EA will conform to the Council on Environmental Quality (CEQ) guidelines, which provide direction regarding implementation of the procedural provisions of the National Environmental Policy Act (NEPA), and the Federal Highway Administration's (FHWA's) *Guidance for Preparing and Processing Environmental and Section 4(f) Documents* (Technical Advisory T6640.8A, 1987). This document can generally be classified as a "moderate" level environmental analysis for documentation under NEPA.

4.0 OTHER TRANSPORTATION AND INFRASTRUCTURE PROJECTS

Other transportation projects in and around the vicinity of the proposed project are listed in Table 1. These projects, together and in conjunction with the proposed project, may cause cumulative effects related to land use, transportation, human demographics, and the environment.

Table 1: Other STIP Projects in the Vicinity of the FLUSA

ID No.*	Description	Schedule (Fiscal Years)
I-4924	I-73/74 Connector – Winston-Salem Beltway north of Kernersville to NC 68 west of Greensboro. Multi-lane freeway on new location.	Programmed for planning and environmental study only. Future North Carolina Turnpike Authority Project.
B-4510	I-40 Business/US 421 – West of US 158 in Forsyth County to west of SR 1850 in Guilford County. Pavement and bridge rehabilitation.	ROW – unfunded Construction – unfunded
R-0609	US 311 Bypass – High Point, South of SR 1920 East of Archdale to West of High Point Reservoir. Four lanes divided, new location.	Under construction
R-2611	SR 1008 (West Market Street) – SR 2007 at Colfax to NC 68. Widen to multi-lanes.	ROW – FY 09 Construction – FY 11
R-2577	US 158 – Multi-lanes north of US 421/I-40 Business in Winston-Salem to US 220. Widen to multi-lanes.	Programmed for planning and environmental study only. ROW – unfunded Construction – unfunded
R-2247	New route – Winston-Salem Northern Beltway. Four lane expressway on new location.	ROW – unfunded Construction – unfunded
R-2413	US 220-NC 68 – SR 2113 (Pleasant Ridge Road) to US 220-NC 68. Multi-lane connector on new location, NC 68 to US 220 and multi-lane US 220 to NC 68.	Planning/design – in progress: ROW – 2011 Construction - 2015
U-3617	SR 2045 (East Mountain Street/Old US 421), SR 1005, SR 1008, NC 66 in Kernersville (Forsyth County) to SR 2001 (Guilford County). Widen to multi-lanes.	ROW – unfunded Construction – unfunded
U-2579	Winston-Salem Northern Beltway, Eastern section (Future I-74), US 52 to US 311. Multi-lane freeway on new location.	Planning/design – in progress ROW – FY 08 (Section B) Construction – FY 13 (Section B)
U-4909	SR 2643 (Union Cross Road), SR 2691 (Wallburg Road) to SR 2632 (Sedge Garden Road). Widen to multi-lanes.	ROW – In progress Construction - 2012
U-2826	US 52, I-40 Bypass to proposed western loop interchange. Widen and upgrade roadway and interchanges.	Planning/Design – In progress ROW – unfunded Construction - unfunded
U-3615	SR 1003-SR 1820 (Skeet Club Road), US 311 to NC 68 (Eastchester Drive). Widen to multi-lanes.	ROW – unfunded Construction – unfunded
U-2524	Western Loop, North of I-85 to Lawndale Drive. Construct freeway on new location.	ROW – unfunded Construction – unfunded
Winston-Salem Urban Area Long Range Transportation Plan**		
B32	N. Main St./Piney Grove Rd. Connector – new 4-laned divided roadway.	N/A
C23	Macy Grove Road extension south – NC 66 to Industrial Park Drive.	N/A

Source: North Carolina Department of Transportation Draft 2009-2015 State Transportation Improvement Program, Divisions 7 and 9.

* I – Interstate Projects. R – Rural Projects. U – Urban Projects. B – Bridge Projects.

** List includes those projects not already noted under STIP projects.

5.0 TRANSPORTATION IMPACT CAUSING ACTIVITIES

The proposed project would affect travel patterns, travel time, property access, and property exposure within the FLUSA.

Connectivity around the eastern side of Kernersville would increase, particularly between existing Macy Grove Road, Industrial Park Drive, NC 66, NC 150, I-40 Business, and East Mountain Street. This would result in changing travel patterns such as reduced use of NC 150 and NC 66 through downtown Kernersville as the main north-south route. Pass-by traffic through the downtown would therefore decrease. As sections of NC 150 and NC 66 are currently over capacity according to NCDOT traffic counts (Kernersville Land Use Plan, 2004), this would be a benefit.

Travelers going from north/northeastern residential areas south to I-40 Business, would be re-routed to circumvent congested downtown areas. Due to the existing congestion in the areas and the more direct travel north-south travel route that would be created, travel time savings is anticipated. Because the project is less than two miles, it is likely the time travel savings would be less than ten minutes.

The new location of Macy Grove Road would create new access to a number of parcels. Residents along Smith Edwards Road, as well as neighborhoods west and east of Smith Edwards Road would have direct access to the extended Macy Grove Road, and a faster connection to I-40 Business. This may reduce traffic on Gralin Street. In addition, traffic may be reduced on rural Crosscreek Road, as fewer commuters would continue to use it as a north-south route. Travel patterns and times for businesses and residents along Old Greensboro Road and East Mountain Street would change through improved, more direct access to both directions of I-40 Business. East Mountain Street is projected to be over capacity in 2011 according to NCDOT traffic counts (Kernersville Land Use Plan, 2004), as this is currently the primary route to access I-40 Business via NC 66. Commercial businesses in this area would benefit from enhanced visibility and access for customers. Industrial businesses would benefit from improved efficiency in transporting goods.

The project would create a transportation node at I-40 Business and Macy Grove Road, due to the amount of traffic expected to utilize the proposed intersection to access I-40 Business. Access to parcels around this node would increase, which is likely to stimulate growth and indirectly support industrial and commercial development. Smaller transportation nodes would be created at NC 150 and Macy Grove Road, and East Mountain Street and Macy Grove Road.

6.0 POPULATION TRENDS/PROJECTIONS

Population trends show that the Town of Kernersville has been growing significantly over the last several decades. Between 1990 and 2000, the population of Forsyth County grew by about 1.5% per year, Guilford County grew by about 2.1% per year, and Kernersville grew by about 4.4% per year (US Census Bureau, 1990 and 2000). Between 2000 and 2007, Forsyth County grew about 1.0% per year (307,000 to 339,000) and Guilford County by about 0.9% (422,000 to 461,000) (NC State Demographics Unit).

Table 2 compares population forecasts for the state and the two counties included in the FLUSA (Guilford and Forsyth) between 2000 and 2030, in 10-year increments. Both counties are expected to grow by between 10% and 15% each decade, though this is slightly less than the average growth for North Carolina. Kernersville, however, is expected to grow by 53% each

decade. This number was developed by the Kernersville Planning Department and is based on historical trends.

Table 2: Population Forecasts

Area	Population		Growth	
	2000	**2010**	**Difference**	**% Change**
Kernersville*	17,126	26,203	9,077	53%
Guilford County	421,048	480,028	58,980	14.0%
Forsyth County	306,063	352,810	46,747	15.3%
North Carolina	8,046,813	9,502,904	1,456,091	18.1%
	2010	**2020**	**Difference**	**% Change**
Kernersville*	26,203	40,091	13,888	53%
Guilford County	480,028	539,335	59,307	12.4%
Forsyth County	352,810	401,019	48,209	13.7%
North Carolina	9,502,904	10,966,956	1,464,052	15.4%
	2020	**2030**	**Difference**	**% Change**
Kernersville*	40,091	Not available	Not available	Not available
Guilford County	539,335	600,192	60,857	11.3%
Forsyth County	401,019	451,350	50,331	12.6%
North Carolina	10,966,956	12,465,478	1,498,522	13.7%

Source: North Carolina State Demographics Unit (2008) and (*) Kernersville Development Plan

Due to the location of the FLUSA with about half within Kernersville and the half is split between Forsyth and Guilford Counties, it is likely that population in the FLUSA will grow at a rate between that of Kernersville (projected to grow about 5.3% annually up to 2020), Forsyth County (projected to grow about 1.4% annually up to 2020), and Guilford County (projected to grow at about 1.2% annually up to 2020).

7.0 JOB TRENDS/PROJECTIONS

According to the *Kernersville Development Plan* (2005), the Triad area job base was expected to increase 37% between 1994 and 2025. Data from the NC Employment Security Commission (ESC) shows total employment in Forsyth County has grown 5.7% between 2002 and 2006 (an average of 1.14% per year). However, data from the ESC shows that total employment for the Northwest Piedmont Workforce Development Board (WDB) region (including the counties of Davie, Forsyth, Rockingham, Stokes, Surry, and Yadkin), has grown by an average of just 0.18% per year between 2000 and 2008. Job growth in the FLUSA, however, is more likely represented by the average 1.14% job growth seen in Forsyth County rather than the 0.18% seen in the region. This is due to the project's central location in the Triad area, between Greensboro and Winston-Salem and near a major regional airport, as well as the likely increase in jobs from the planned Triad Business Park and Kernersville Medical Park/hospital.

According to the NC Economic Development Intelligence System (EDIS), healthcare is the largest employment sector for Forsyth County (18%), with manufacturing the second largest employment sector (13.4%), and retail the third largest (11.8%) (EDIS, 2008). For Kernersville, retail is the largest employment sector (22.6%), while manufacturing is second (21.3%), and wholesale trade is third (12.2%) (data from the 2002 Economic Census, Geographic Data Series). Similar trends exist for the greater Northwest Piedmont economy, which includes much of the Triad: 15% is manufacturing, 12% is retail, and 4% is wholesale trade.

From a regional perspective, however, growth in the manufacturing/industrial sector is declining. Manufacturing did fall within the top ten "industries with growing employment" according to a report by the Northwest Piedmont WDB. The food services/drinking industry, however, ranked third in projected future growth while hospitals ranked eighth. According to the ESC, similar trends were reported for the Greensboro/High Point/Guilford County WDB area, and the Northwest Piedmont WDB reported an annual decrease in manufacturing jobs for six of the seven years between 2000 and 2007. An annual increase in retail and health care/social service jobs was reported for this area during the same period. This suggests the potential commercial/retail center southeast of the proposed Macy Grove Road/I-40 Business interchange and the Kernersville Medical Park/hospital will provide important long-term job bases for the town.

The Triad Business Park is also anticipated to become an important job base for Kernersville and the surrounding area. Federal Express recently began construction of a new 400,000 square foot FedEx Regional Distribution Hub in the Triad Business Park. It is expected to open in 2010 and employ 750 people. According to the Town's Development Plan, the FedEx Regional Distribution Hub offers an opportunity to stimulate and further diversify Kernersville's economy. The close physical location of Kernersville to the airport, the existing trucking industry, the availability of industrial buildings and land, and accessibility to interstates and rail gives Kernersville a strategic advantage to attract future businesses to the Triad Business Park. The proposed project would help support this growth by providing more efficient transportation options.

8.0 MUNICIPAL UTILITIES

Sewer service is primarily provided within Kernersville, as shown on Figure 2. Extensions of sewer beyond the town limits occur for a neighborhood in the northern part of the FLUSA, for Triad Park, and for Industrial Park Drive. Water is provided to the county line, outside of town limits.

As shown in Figure 2, existing water and sewer lines cross the proposed project alignment in several places. Neighborhoods in the northwest portion of the FLUSA have water and sewer connections, as do the industrial and commercial areas north of I-40 Business. A sewer line runs from the northwestern neighborhoods across the proposed Macy Grove Road alignment south of Smith Edwards Road to end at a sewer pump on Reedy Fork Creek. Sewer lines cross the proposed alignment in several other places: Huntington Run Lane (lines run just up to Smith Edwards Road), East Mountain Street, Old Greensboro Road, Industrial Park Drive near the intersection with Macy Grove Road, and I-40 Business (between NC 66 and the proposed Macy Grove Road interchange).

Tim Shields, Public Works Director for the Town of Kernersville, stated that several sewer and water extensions are currently being planned. These include the following areas in the middle/southern portion of the FLUSA:

- Sewer for the Triad Business Park will be installed by 2010. This will extend to the proposed I-40 Business/Macy Grove Road interchange.
- Sewer and water is expected to be installed within 1,500 feet from the proposed I-40 Business/Macy Grove Road interchange to support industrial development.

- Sewer for the planned Kernersville Medical Park/hospital is currently under construction and will be completed by late 2009. This will also serve the residential neighborhoods of this area.

9.0 NOTABLE FEATURES

9.1 HUMAN ENVIRONMENT

Areas of community cohesion are evident in the FLUSA. Most notably, several neighborhoods exist in the northern section of the project, on and around Smith Edwards Road. These neighborhoods are connected to each other through a network of residential streets and Smith Edwards Road, currently a quiet, rural area with signs of neighbor interaction and cohesion. Nearby are two churches, at which many people were seen to congregate during the field visit, a sports complex (used for Kernersville Little League, among other things), and some lower-end retail. The general store at the intersection of NC 150 and County Line Road may also provide an area where local residents congregate, as observed during field visits.

Neighborhoods in the southern section of the FLUSA, south of Industrial Park Drive, are older, mixed-density, and relatively quiet. Fewer signs of community cohesion and interaction were seen in this area.

The Piedmont Greenway is a proposed project identified in the *Winston-Salem Forsyth County Greenway Plan* (2003) for Winston-Salem and Forsyth County and the *Parks and Open Space Plan for Winston-Salem and Forsyth County* (2006). The greenway will run from Salem Lake to Triad Park, thus connecting downtown Kernersville and surrounding neighborhoods with Triad Park. The extension of Macy Grove Road on new location will run through Triad Park, and across the future greenway. A culvert would therefore be needed to allow the greenway to run beneath the extended Macy Grove Road. Triad Park will provide a parking lot and access to the greenway from pedestrian and bicycle facilities on the extended Macy Grove Road.

Much industrial and office development currently exists in the central portion of the FLUSA, along East Mountain Street, Old Greensboro Road, and Industrial Park Drive. The industrial/office development surrounds the few residential enclaves that exist in these areas. The major planned business/industrial activities in the FLUSA include the Triad Business Park on East Mountain Street and Kernersville Medical Park on Macy Grove Road. In addition, large areas of potential non-residential development (currently zoned industrial and commercial) have been identified around the future interchange of Macy Grove Road and East Mountain Street, and north of the intersection of Smith Edwards Road and NC150. South of the interchange are several areas of potential industrial and commercial/retail development. All development areas are shown in Figure 1.

9.2 NATURAL ENVIRONMENT

As mentioned, the project will cross through Triad Park, a regional natural and recreation area jointly owned by Forsyth and Guilford Counties. The area where the project crosses the park supports a stream (Reedy Fork Creek) and associated wetland system. A minimum hydraulically-required bridge will be used to cross the system.

All subbasins and water features are shown on Figure 3. Streams within the FLUSA include Reedy Creek, West Fork Deep River, Abbotts Creek, and East Belews Creek. With the exception of Belews Creek, each of these streams represents a protected water supply

watershed. Reedy Creek is classified as WS-III Nutrient Sensitive Water (NSW). This means it is protected as a water supply in a low to moderately developed watershed, and needs additional nutrient management to stay healthy. The West Fork Deep River is classified as WS-IV (water supply in a moderately to highly developed watershed). It is also a "Critical Area," indicating the existence of more stringent development and permitting rules for the watershed, including the North Carolina Division of Water Quality's (NCDWQ) Randleman Lake watershed rules (NCDWQ "Redbook," 15A NCAC 02B .0248). Streamside riparian zones for Reedy Creek and all of its Unnamed Tributaries (UTs) within the FLUSA are protected under provisions of the Jordan Lake Water Supply Watershed Buffer Rules administered by NCDWQ (15A NCAC 2B .0267). Abbotts Creek is designated WS-III, and drains to Randleman Lake (also subject to buffer rules). Belews Creek is not a water supply watershed.

A section of the West Fork Deep River immediately downstream of the FLUSA was listed on the *Final North Carolina Water Quality Assessment and Impaired Waters List* (NCDWQ, 2007). No Outstanding Resources Water (ORW) or High Quality Waters (HQW) exists within or near the FLUSA. A section of Reedy Creek immediately downstream of the study area was listed on the state's 303(d) list of impaired waters in 2008, but no water bodies within the FLUSA are listed.

Since 1993 the Town of Kernersville has adopted and implemented a Water Supply Watershed Protection Ordinance which places limits on the type and amount of development/impervious surface that may occur near surface waters classified as water supplies.

A 10-acre Voluntary Agricultural District (VAD) is located just north of the Triad Park property near the intersection of Crosscreek Road and County Line Road (Figure 1). Lands under VAD protection have a conservation agreement between the landowner and the county or local municipality that prohibits non-farm use or development for a period of at least ten years.

10.0 DEVELOPMENT REGULATIONS

Kernersville

Kernersville uses both special use district zoning and zoning overlay districts as implementation tools for its *Land Use Plan* (2004). These zoning districts and overlays are also discussed in *Kernersville's Development Plan* (2005), and are coordinated under the Town's UDO (2006). Special use district zoning allows a developer to present a limited list of uses and a specific site layout that complies with community plans and goals. The Zoning Overlay District standards apply to sites within the district and require a minimum design standard for buildings, landscaping, sidewalks, parking, and signage. Zoning overlay districts that accommodate industrial and business parks such as those planned and proposed within the FLUSA include Corporate Park Office, Corporate Park Industrial, General Industrial, Limited Industrial, and Campus. Each of these has a set of development regulations associated with it.

Kernersville has adopted the NC *66/Old Salem Road Area Metro Activity Center Guidelines* (Town of Kernersville, 2001) to guide development along NC 66 in the western portion of the FLUSA. These guidelines provide specific development standards for all commercial, residential, and office development within ¼-mile around the metro activity center.

The Town's UDO includes an environmental ordinance that addresses watershed protection, stormwater runoff, and floodways. The Watershed Protection Ordinance, adopted in 1993, applies to all designated water supply watersheds in the town. It includes a 100-foot riparian buffer for high density development, a 30-foot riparian buffer for low density development, and

other development and land use regulations. The West Fork Deep River has been designated a "Critical Area" by the state. The Randleman Lake Watershed Protection Rules and Jordan Lake Buffer Rules provide a set of more stringent development and permitting rules for the watersheds within the FLUSA. The Floodway Ordinance includes standards for development in the floodway or floodway fringe. The Stormwater Ordinance includes standards for managing stormwater from construction and post-construction sites, and is designed to comply with the Town's National Pollutant Discharge Elimination System (NPDES) permit.

Forsyth County

The Winston-Salem/Forsyth County UDO applies to areas of the FLUSA that are in Forsyth County and outside the town limits. This UDO includes a Zoning Ordinance, an Environmental Ordinance, and a Subdivision Ordinance/Regulations. The Environmental Ordinance is similar to that of the Town of Kernersville, with articles on Floodways/Floodway Fringes, Watershed Protection (similar riparian buffer distances), and Erosion Control.

The Legacy Comprehensive Plan is Forsyth County's comprehensive plan adopted in 2000. Within this plan is a *Growth Management Plan*, which was designed to guide and manage growth within the county. The Growth Management Plan classifies land area in the county as City/Town Center, Urban Neighborhood, Suburban Neighborhood, Future Growth Area, and Rural Area. It also identifies the limits of municipal services (water and sewer). The proposed project borders between the Suburban Neighborhood and Future Growth Area limit identified in the *Growth Management Plan*.

Guilford County

The Guilford County Development Ordinance applies to areas of the FLUSA that are in Guilford County and outside the town limits. This ordinance includes a zoning map, development standards, and environmental regulations. The environmental regulations are similar to the Environmental Ordinances of the Town of Kernersville and Forsyth County, with sections on stormwater management/watershed protection, illicit and illegal discharges, soil erosion and sedimentation control, and flood damage prevention.

Guilford County updated and adopted their Comprehensive Plan in 2006 (Guilford County, 2006). Within this plan are several area plans, including the *Airport Area Plan* (including a Future Land Use Map) for areas around Piedmont Triad Airport. Some parts of the FLUSA are within the area of the *Airport Area Plan*. The plan has identified areas southeast of the Macy Grove/I-40 Business interchange as "non-residential," which is consistent with Forsyth County's plan to make it commercial/retail.

The watershed and storm water protection rules included in the above-discussed ordinances will help moderate environmental impacts of the proposed project. Additionally, the zoning overlay districts and special use districts will only allow development that has been planned for by the town, as given by the zoning.

11.0 AVAILABLE LAND

The FLUSA includes approximately 4,934 acres of land. Of this, approximately 1,725 acres (35%) are considered developable.

Developable land was determined to include undeveloped parcels of land (those without building structures), larger rural lots that could be subdivided, and agricultural land that is within the "Future Developed Area" as determined by Forsyth County's *Growth Management Plan* (2006). It also includes areas listed for "potential" commercial or industrial development, as this is not yet planned development.

Developable land does not include protected lands such as parks (i.e, Triad Park) or VADs. No other public lands or lands managed for conservation and open space were identified within the FLUSA. Jordan Lake and Randleman Lake Buffer rules apply to most of the streams within the FLUSA. These dictate a 50-foot vegetated buffer be maintained along streams within the abovementioned drainages. Since the applicability of buffer rules is dependent on the type of development and the possibility of mitigation, buffer areas have not been excluded from developable parcels. However, the rules could lessen the developable acres in some instances. Developable land does not include agricultural land that is outside of the Future Developed Area. It does not include areas listed for "proposed" development (medical park and Triad Business Park), as this is development that is already planned for the near future.

Figure 1 shows the potential and proposed future development referenced above. These areas were determined from maps provided by Kernersville's Planning Department and Public Works Department, and are included in their *Land Use Plan*.

12.0 MARKET FOR DEVELOPMENT

12.1 CURRENT DEVELOPMENT PRESSURES

Within the FLUSA, the major current development pressures stem from the area around the proposed Macy Grove Road and I-40 Business interchange, as discussed in the Economic Development section above. Triad Business Park and the Kernersville Medical Park are both planned developments that are currently under construction. These developments are occurring regardless of the proposed project. An industrial park and commercial/retail development are proposed south of the interchange, while other non-residential development is proposed north of the interchange. These developments would be more dependent on the proposed project, due to limited existing access, and have been proposed with some anticipation of the project and a future Kernersville Loop Road.

Little residential development pressure exists or is expected in the future. In a meeting with the Kernersville Planning Director, it was suggested that rather than create new residential development areas, the expansion of industrial and commercial businesses along the East Mountain Street/Macy Grove Road corridors will result in redevelopment and infill of existing residential areas. The reason for this is the limited land available for (zoned) residential development that is within the town's service areas (water/sewer). Most of the areas of available land are either outside of the current town service area, or have been reserved (via zoning) for industrial/commercial development.

Annexation has been identified as a preferred method for generating tax revenue to cover expansions in public infrastructure and services as Kernersville continues to grow. Annexation history shows the town has averaged a 62% increase in geographic area per decade. It is estimated that annexations will account for 31% of the 53% increase in population per decade. Areas likely to be annexed by Kernersville in the future include "Future Growth Areas" identified in the Forsyth County *Growth Management Plan* (2006), and "Areas of Consideration for Future Annexation" identified in the *Kernersville Development Plan* (2005). In relation to the project,

these include the northern and southern sections of the FLUSA. However, with the existing industrial areas and hospital/medical center already underway, annexation is likely to reach the middle and southern areas of the project first. Annexation may increase residential development pressure through the provision of water and sewer to newly-annexed areas; however, the current zoning of these areas supports the non-residential development proposed by the town, so residential development pressure likely will be less than industrial/commercial development pressure.

12.2 DEVELOPMENT MARKET ASSUMPTIONS

According to the Kernersville Development Plan, commercial and industrial development has grown each year for several decades. From 1995-2004, an average of nine commercial and seven industrial building permits were issued each year. During the same time period, an average of 137,000 square feet of commercial and 132,000 square feet of industrial space was added each year. By 2004, nearly 19% of land in Kernersville was dedicated to Industrial and Business Park/Office land use in 2004 (Kernersville Land Use Plan).

As described in the above sections, Kernersville supports continued economic development in these sectors which will require further development of land. Given the available land and current development pressures, it is likely that the commercial/industrial development trends described will continue over the next several decades.

13.0 INDIRECT SCREENING MATRIX METHODOLOGY

The categories listed on the Indirect Screening Matrix (Table 3) have been shown to influence land development decisions in numerous areas statewide and nationally. The measures used to rate the impacts from a high concern for indirect effects potential to less concern for indirect effects potential are supported by the discussions presented in this document. Each characteristic is assessed individually and the results of the table are looked at comprehensively to determine the indirect effects potential of the proposed project. The scope of the project and change in accessibility categories are given extra weight to determine if future growth in the area is related to the project modifications.

14.0 SCREENING MATRIX RESULTS

Based on the information gathered, the majority of the categories on the screening tool reflected moderate to higher (not high) concern for indirect and cumulative effects potential. A summary of justification for each category rating follows.

- Scope of Project - The project includes a section of new location and a new interchange, in addition to improvements to an existing road, so this category was rated medium-high.

- Change in Accessibility - The project would result in some travel time savings and greater accessibility to I-40 Business, so this category was rated medium.

- Forecasted Population Growth - While population forecasts for the town and counties suggest a possible annual growth rate of over 3%, the town is promoting non-residential (commercial and industrial) development around the project. Thus, the actual growth for this area is likely to be somewhat less than 3%, so this category was rated medium-high.

- Forecasted Employment Growth - Triad Business Park and Kernersville Medical Park will bring a number of new jobs to the area. Other commercial and industrial areas are proposed, but are not yet underway. Thus, this category was rated medium-high.

- Available Land - It was calculated that fewer than 2,000 acres of land are available for development, so this category was rated medium-high.

- Water and Sewer Availability - About half of the FLUSA is served by sewer and all is served by water. While plans exist to extend sewer to the Triad Business Park and Medical Park, there are not plans to extend sewer further. Thus, this category was rated medium.

- Market for Development - The major planned developments are the Triad Business Park and Medical Park; other commercial and industrial areas are proposed, but are not yet underway. Residential development is limited by the availability of sewer and by zoning. Thus, this category was rated medium.

- Public Policy - Standard town and county ordinances exist that provide development and environmental regulations. Special regulations exist such as the Randleman Lake Watershed rules (which pertain to development within the West Fork Deep River watershed) and the Jordan Lake Buffer rules (which pertain to development within the Reedy Creek watershed). At the time of the indirect screening, only the Randleman Lake Watershed rules were in effect, and the category was rated medium. Due to the recent inclusion of the Jordan Lake Buffer rules, pertaining to the Reedy Creek Watershed and its associated tributaries (the majority of water features in the FLUSA), the category was reduced to a low rating.

- Notable Environmental Features - Stream and wetland systems exist within Triad Park that would be crossed by the project. However, bridges would be used to cross these areas, and only a small portion of the park would be affected, so this category was rated medium.

The overall result, considering scope of the project, annual population growth in the FLUSA, and the amount of economic growth expected in the area, suggests that further examination is warranted.

The indirect screening tool noted that land use and development decisions in this area could be altered by construction of the project as currently proposed. This report will now examine the probable growth scenarios to determine if impacts to notable features, including waterways, are likely. The examination will look at the changes that could occur in the area with the proposed project (Build) and look at the changes that could occur in the area without (No-Build) the proposed project.

Table 3: Indirect Land Use Effects Screening Tool – STIP U-2800 & U-4734
Macy Grove Road Improvements and Extension

Rating	Scope of Project	Change in Accessibility	Forecasted Population Growth	Forecasted Employment Growth	Available Land	Water/Sewer Availability	Market for Development	Public Policy	Notable Environmental Features	Result
More Concern	Major New Location	> 10 minute travel time savings	>3% annual population growth	Substantial # of New Jobs Expected	2000+ Acres of Land	All services existing/ available	Development activity abundant	Less stringent, no growth management	Protected and Impaired Resources	
	x		x	x	x					Likely Indirect Scenario Assessment
⬆		x				x	x		x	
								x		
↑										
Less Concern ↔	Very Limited Scope	No travel time savings	No population growth or decline	No new Jobs or Job Losses	Limited Land Availability	No service available now or in future	Development activity lacking	More stringent, growth management	Features incorporated in local protection	

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15.0 PROBABLE DEVELOPMENT SCENARIOS

To determine the type of development that could occur in the FLUSA, with and without the project, a number of sub-areas will be examined. Development pressures and regulations, proposed future land use, infrastructure, and proximity to proposed economic centers will regulate how areas within the FLUSA will develop. Predictions of the type of development within recognized probable development areas will determine the amount of impacts to notable features and waterways will be developed for each sub-area with and without the project.

15.1 PROBABLE DEVELOPMENT AREAS

All sub-areas discussed below are graphically represented on Figure 4.

1) NC 150/Smith Edwards Road Area

This sub-area is located at the northern terminus of the proposed project and encompasses approximately 167 acres of land between NC 150 and Piney Grove Road. The land use in this area consists of low-density residential areas, vacant/agricultural land, and mobile home parks, and is actively marketed. The land is currently designated for mixed residential use, but will be revised in an update to the Town of Kernersville's *Future Land Use Plan* as a light industrial complex.

The northern terminus of the proposed project is located within this area; therefore the demand and market for commercial and/or industrial services in this area will grow with additional access. This area will be actively pushed for development, as it is centrally located between residential areas in northern Kernersville, and the dense commercial and industrial districts occurring at the proposed interchange between I-40 Business and Macy Grove Road (U-2800 portion of project).

No-Build: Commercial and/or industrial development in this area is likely due to the rezoning of this area by Kernersville as a non-residential area. Without direct access to I-40 Business, the transition of this area from vacant land to industrial land may be slow.

Build: The extension of Macy Grove Road to NC 150 will increase access to I-40 Business, therefore increasing access to this area. This would make the area more attractive to intensified industrial development. Change in access would make this area more similar to the developing areas around the proposed I-40 Business interchange with Macy Grove Road. The roadway will increase exposure to area business, likely intensifying commercial development along NC 150, such as the vacant commercial area along NC 150 and Gralin Street.

2) Berry Garden Road/East Mountain Street Area

This sub-area is located to the west of Triad Park and encompasses approximately 225 acres of land north and south of East Mountain Street. This area is currently occupied by commercial/industrial complexes. There also exists a small to medium density (average of 1/3 acre) residential neighborhood off of Floyd Berrier Drive.

This proposed extension of Macy Grove Road is located within this area, therefore the demand and market for commercial and/or industrial services in this area will grow with additional access. This area will be actively pushed for development, as it is centrally located between residential areas in northern Kernersville, and the dense commercial and industrial districts

occurring at the proposed interchange between I-40 Business and Macy Grove Road (U-2800 portion of project).

No-Build: Commercial and/or industrial development on this property is likely due to the designation of this area by the Town as an industrial land use. Without direct access to I-40 Business, the transition of this area from vacant land to industrial land may not be as intense as there would be with more direct access to I-40 Business, with less potential for job generation.

Build: The extension of Macy Grove Road to NC 150 directly through this area will increase access to I-40 Business. This would make this area more attractive to intensified industrial development. This change in access would make this area more similar to the developing areas around the proposed I-40 Business interchange with Macy Grove Road. The roadway will increase exposure to area business.

3) Triad Business Park

The Triad Business Park is located east of the proposed interchange and is bordered by East Mountain Street/West Market Street, I-40 Business, and Macy Grove Road. The entire area designated as the business park includes 570 acres. It is zoned business industrial, and has been included in land use plans developed by the Kernersville Planning Department and Public Works Department. Construction of the FedEx Regional Distribution Hub is currently underway and is expected to be open for business in 2010.

No-Build: Industrial development on this property is currently underway, but will likely develop at a slower rate without the proposed project. Without direct access to I-40 Business, it is likely that lower-tier warehousing and less traffic demanding facilities will develop on this site.

Build: The extension of Macy Grove Road to NC 150 and the proposed interchange with I-40 Business will make this area more attractive to intensified industrial development, and could potentially become a major economic and employment center. As discussed in Section 7.0, the close physical location of Kernersville to the airport, the existing trucking industry, the availability of industrial buildings and land, as well as future accessibility to the interstate via the proposed interchange will attract future businesses to the Triad Business Park. The proposed project would help support this growth by providing more efficient transportation options.

4) I-40 Business/I-40/Macy Grove Road Area

This sub-area is located east of the existing portion of Macy Grove Road, between I-40 Business and I-40 and encompasses approximately 550 acres of land. Land in this area currently consists of vacant/agricultural land and low-density residential areas. It is marketed as a potential commercial/retail area, and has been identified by the Town of Kernersville as suitable for this type of use. The area's development is dependent on the construction of the proposed interchange, as access is limited to this area. According to the Town of Kernersville's planning director, further development in this area without the interchange is unlikely.

No-Build: Large-scale development on this property is less likely without the proposed project. Some commercial development is likely due to the available acreage and current access to Macy Grove Road, as well as its proximity to the Kernersville Medical Park and residential developments. According to the Town of Kernersville planning director, an annexation agreement exists between the Town of Kernersville and the City of High Point to extend sewer to this area for non-residential development. Access to I-40 Business, as well as I-40, is limited without the proposed project; therefore development pressure in this area is low.

Build: The extension of Macy Grove Road to NC 150 and the proposed interchange with I-40 Business will make this area more attractive to intensified development, and could potentially become a major economic and employment center.

5) Industrial Park Drive / Macy Grove Road Area

Industrial development is already present in this area. It is located east of NC 66, south of the proposed interchange with I-40 Business and Macy Grove Road. Current access is provided via Industrial Park Drive, from Macy Grove Road or NC 66. The area is 123 acres and consists of large warehouses and businesses with few employees. Higher intensity businesses and industrial tenants would be likely if access is improved. It is zoned business industrial, and has been included in land use plans developed by the Kernersville Planning Department and Public Works Department.

No-Build: Industrial development on this property exists. Further development is likely, but will likely develop at a slower pace, if at all, without the proposed project. The proposed project will provide direct access to the area via I-40 Business. Without the project it is likely that lower-tier industry and less traffic demanding facilities will develop on this site.

Build: The proposed project will improve access to the industrial area and encourage development. Better access will allow for business development that will employ more employees compared to the existing warehouses; which will increase the job base in the area and will likely increase property values. Development in the area will intensify with the construction of the proposed project. Similar to Triad Business Park, the proximity of the area to the airport, the existing trucking industry, the availability of industrial buildings and land, as well as future accessibility to the interstate via the proposed interchange will attract future businesses.

6) Kernersville Medical Park

Construction of the 189-acre Kernersville Medical Park is currently underway. The Kernersville Medical Park is located north of I-40 and access is provided via Macy Grove Road. The site was partially chosen based on the project being built in the future. Construction of the proposed project would improve access, but will not affect the type of development of the land.

No-Build: Construction of the Medical Park is currently underway, and will continue without the project. The construction of the project will not impact the type of development occurring at the site or the rate of development. However, the proposed project will allow for better access of the property.

Build: The extension of Macy Grove Road to NC 150 and the proposed interchange with I-40 Business will improve access to the medical facility and will also improve response time for emergencies. The proposed project will increase the number of routes available to access the Medical Park and allow patients and emergency vehicles more direct access from both the northern and southern portions of Kernersville.

16.0 LAND USE SCENARIO ASSESSMENT MATRIX METHODOLOGY

The categories listed on the Scenario Assessment Tool (Table 4) have been shown to have a direct relationship to future quality of life and resource impacts. The measures used to rate the impacts from a high concern for quality of life and resource impacts to less concern for quality of

life and resource impacts are also supported by documentation and case studies. Each characteristic is assessed individually, for the Build Scenario and the No-Build Scenario, and the results of the table represent a comprehensive determination as to whether greater quality of life or resource impacts are expected to result from the project. In general, the more the Build Scenario and the No-Build Scenario diverge the greater the potential for future quality of life or resource impacts.

Table 4: Indirect Land Use Effects Screening Tool – STIP U-2800 & U-4734
Macy Grove Road Improvements and Extension

Rating	Pressure/Demand for Typically Higher Impact Development	Future Shift of Regional Population Growth to the Project Area	Pressure for Land Development Outside Regulated Areas	Pressure for Land Development Outside Planned Areas	Development Pattern	Planned/Managed Land Use and Impacts
More Concern	Commercial/Industrial Development with Large Parking Lots Likely	Strong Attraction of Development in this Area	A Large Number of Acres in the Probable Growth Areas are Outside a Regulated Area	A Large Number of Acres in the Probable Growth Areas are Outside a Planned Area	Strip or Sprawling Development Likely	Land Development and Storm Water Management Goals Not Set
						
	Build Scenario					
					Build Scenario No-Build Scenario	
	No-Build Scenario	Build Scenario				
		No-Build Scenario	Build Scenario No Build Scenario	Build Scenario No Build Scenario		Build Scenario No Build Scenario
Less Concern	Commercial Development and/or Large Residential Developments Not Likely	No Population Shift Likely	All Probable Growth Areas in a Regulated Areas	All Probable Growth Areas in a Planned Areas	Likely to Support Planned and Clustered Development	Growth Areas are Consistent with Land Development and Storm Water Management Goals

17.0 SCENARIO ASSESSMENT CONCLUSIONS

Examination of the probable development areas shows that the Macy Grove Road Improvements project, which includes an interchange at I-40 Business and Macy Grove Road, as well as a new location extension of Macy Grove Road to NC 150, could encourage more industrial and commercial development in the area. Six probable development areas have been identified. Areas 1 through 5 are very dependent on the construction of the proposed project. Area 6 (Kernersville Medical Park) is under construction and will not be directly affected by the project.

Buffer rules and water quality regulations pertaining to waters within the Randleman and Jordan Lake watershed areas will likely decrease development pressures in currently forested areas containing surface waters. Existing industrial and commercial areas will continue to grow, and planned developments will follow through.

The new location roadway and interchange is not expected to increase the pressure for development outside of planned development areas. Little residential development pressure exists or is expected in the future. In a meeting with the Kernersville Planning Director, it was suggested that rather than create new residential development areas, the expansion of industrial and commercial businesses along the East Mountain Street/Macy Grove Road corridors will result in redevelopment and infill of existing residential areas. The reason for this is the limited land available for (zoned) residential development that is within the town's service areas (water/sewer). Most of the areas of available land are either outside of the current town service area, or have been reserved (via zoning) for industrial/commercial development.

18.0 SUMMARY OF INDIRECT AND CUMULATIVE IMPACTS

Indirect Assessment

The widening and extension of Macy Grove Road and the addition of the interchange with I-40 Business will improve travel time in the area. Industrial and residential in-filling is expected to continue in the area with or without the proposed project. However, growth will occur more rapidly if the proposed project is constructed and access is improved to current and future industrial areas.

The Jordan Lake and Randleman Lake Watershed Buffer Rules regulate destruction of forested buffers throughout most of the FLUSA. Both sets of rules require that a 50-foot vegetated buffer be protected and maintained on both sides of intermittent and perennial streams, lakes, ponds, and estuarine waters. In addition, streams within the FLUSA are located within protected water-supply watershed areas.

Construction of the proposed project will increase development pressure around the new interchange area, namely in the industrial sector. Industrial development is planned in the southern portion of the FLUSA and may sprawl more rapidly with the construction of the proposed project as a result of improved access.

Cumulative Assessment

Indirect effects in the form of change in land use as a result of the extension of Macy Grove Road and the construction of the new intersection may occur in the form of increased commercial and industrial development and redevelopment. Impacts to stormwater runoff and

downstream water quality are not expected from this change in development patterns due to local regulations and policies. The proposed project alone will not have significant indirect or cumulative impacts. However, if the other sections of the Kernersville Loop Road are constructed as presented in local and regional transportation plans, there is a possibility for increased traffic, commercial, and industrial development as well as associated sprawl in areas outside of the FLUSA.

Water Quality Statement

The proposed project is unlikely to have significant impact to stormwater run-off or water quality in the watershed. Triad Business Park and the Kernersville Medical Center have been in planning documents and will continue to develop; however the rate of development may be impacted by the project. Waters within the watershed are subject to the Randleman and Jordan Lake Buffer Rules which require a 50-foot vegetated buffer be maintained along all intermittent and perennial streams, lakes, ponds, and estuarine waters. Neither the project, nor induced development is likely to directly or indirectly affect nor 303(d) waters, ORW or HQW.

Cumulative Effects Statement

Cumulative impacts are environmental impacts resulting from the incremental effects of an activity when added to other past, present and reasonably foreseeable future activities regardless of what entities undertake such action. These effects can result from individually minor but collectively significant activities taking place over time and over a broad geographical scale, and can include both direct and indirect impacts (40 CFR 1508.7).

The development pressures being experienced within the proposed project's FLUSA stem primarily from past and current economic growth. Recent non-residential development along Macy Grove Road, Industrial Park Drive, NC 66, NC 150, 1-40 Business, and East Mountain Street provides evidence of this pattern. The development of the Triad Business Park and the Kernersville Medical Center indicate economic pressure is being experienced along Macy Grove Road now and into the foreseeable future.

In addition to the availability of developable land, an important generator of probable cumulative effects in the FLUSA is its proximity to the Piedmont Trial International Airport and the Norfolk Southern rail corridor.

If constructed, the Macy Grove project would reduce travel times from those potentially developable parcels of land to the FLUSA and hence is anticipated to attract more non-residential development to the study area.

The proposed project when considered incrementally with the future widening of SR 2045 (East Mountain Street/Old US 421 (U-3617) could notably improve accessibility to potentially developable land in the northern and middle portions of the FLUSA. Kernersville is currently looking at potential build sites for industrial commercial and retail sites that typically depend heavily on available transportation infrastructure (See Figure 1). Improvements such as the proposed project and U-3617 could influence the location decisions of such sites.

Past and future actions including prominent non-residential development and infrastructure improvements within the FLUSA have the potential to cumulatively alter or fragment natural habitats and wildlife regime, especially within Triad Park. The potential for the degradation of water quality also exists through erosion and stream sedimentation in the absence of

stormwater management regulations requiring Best Management Practices. Yet, any direct natural environmental impacts by NCDOT projects would be addressed by avoidance, minimization, consistent with programmatic agreements with the natural resource agencies during the Merger and Permitting processes.

19.0 SOURCES

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U-2800 Stormwater Management Plan Narrative
Macy Grove Rd. / I-40 Business
Forsyth and Guilford Counties, NC

The Blythe Development Company and RK&K were awarded U-2800 in Forsyth and Guilford Counties. This is a new alignment interchange with Macy Grove Rd. and I-40 Business. It includes widening Macy Grove Rd. within the project limits from 2 lanes with open shoulder to 4 lanes with a raised median and curb and gutter. It also involves repaving I-40 Business. The project is primarily in the Cape Fear River basin with a small western portion in the Yadkin-Pee Dee River Basin. Within these basins, the project lies on the boundary of the Jordan Lake (to the north) and Randleman Lake basins. Each of these basins has its own set of buffer rules.

During the 4B Interagency Meeting held on November 8, 2012, each buffer zone was verified. These sites are reflected in the permit package and the attached buffer calculations sheet. A field meeting was held on January 3, 2013 at which time the majority of the sites were visited. The 4C meeting was held on January 16, 2013.

Sites 2-5 are in the Randleman Lake basin.

Site 2 is due to Method III clearing for an area approximately 2' X 150' and will remain in sheet flow with no filtration ditches required.

Site 3 is also due to construction of the roadway facility and will remain in sheet flow not requiring filtration ditches.

Site 4 is due to tying a proposed ditch to an existing ditch inside the buffer. Diffuse flow was not achieved because the existing condition at this location is a point discharge due to the existing ditch. Filtration was achieved due to ditching. The drainage is a point discharge with a stable 10 year velocity of 1.45 ft/s as it exits the proposed ditch.

At site 5, the roadway facility is encroaching in to the buffer. Diffuse flow was not achieved because the existing condition at this location is a point discharge due to the jurisdictional stream. The drainage is a point discharge with a stable 10 year velocity of 3.28 ft/s off the riprap pad in to the jurisdictional stream. The 48" RCP is not buried since it ties to an existing 48" RCP. The roadway slopes in this area (left and right) are not 2:1. Upstream (left), the slopes were extended to provide cover over the proposed 48" RCP. The 48" RCP had to be extended due to the stream elevations immediately upstream of the existing pipe being lower than the existing inlet elevation. Downstream (right), the slopes were lengthened to provide cover over the proposed 48" RCP which was extended to allow the drainage to exit in to a straight portion of the stream. The buffer area impacted under the preformed scour hole due to the 15" RCP outlet at –Y2- 45+75 LT is considered allowable since it is a stormwater management device.

There are two buffer sites in the Jordan Lake basin (sites 1 and 6). During the design process, it became evident that it would be extremely difficult to provide filtration for each of these sites. Site 1 at –L- 56+00 RT has a 24" CSP and roadway fill encroaching on to the beginning of a buffer call. Filtration is provided for drainage on the inlet end of the 24" CSP with ditching. At the outlet end, a 15" CSP enters the buffer discharging drainage from the roadway facility. During 4B discussions, it was determined that discharging the pipe at approximately –L- 58+70 RT would possibly cause erosion along the existing slope prior to reaching the buffer instead of sheet flow. Due to elevations of the system, the drainage could not be taken to the left side of the road for filtration in the ditch (the bottom of CB #0615 is 3.44' lower than the inlet of #0612 24" CSP.) The existing contours do not provide an area conducive to building a retention pond or ditches to provide filtration. Also, the area is near an old, existing landfill. Cut in this area was to be limited as much as possible. For these reasons, the 1.52ac in this system did not receive buffer filtration prior to entering the stream the buffer surrounds. Diffuse flow was not achieved because the existing condition at this location is a point discharge due to the jurisdictional stream. The drainage is a point discharge with a stable 10 year velocity of 3.85 ft/s off the riprap pad. The 24" CSP is not buried since the jurisdictional stream call does not begin until approximately 6' beyond the end of the riprap apron.

Site 6 is the other location that buffer filtration was not achieved in the Jordan Lake basin, -Y7- 18+42 RT. It is located in a high commercial area. The outlet for the system is located in an area with very steep terrain precluding the use of a retention basin or ditches to provide filtration. The roadway facility is 7.34ac of the 32.4ac that the outlet 48" RCP conveys. Diffuse flow was not achieved; however the existing condition at this location is a point discharge due to the jurisdictional stream. The drainage is a point discharge with a stable 10 year velocity of 3.60 ft/s off the riprap pad. The 48" RCP is not buried since the jurisdictional stream call does not begin until under the new roadway facility.

Using ditches for filtration was mostly successful for this project. Two locations were not at buffer sites and were used as a means to achieve extra filtration. They have been changed back to "V" ditches.

The remaining two locations are located in the Randleman basin and required filtration before eventually entering buffered streams:

- -Y2- 47+50 RT: Prior to entering Site 5, the drainage that enters the structure at this location needs to be filtered. The special cut base ditch cross section was changed to a swale (V ditch with 6:1 side slopes) and the slope was modified slightly. This location achieves the filtration required.
- -Y2- 22+50 RT: Prior to entering a buffered stream (not a location that impacts the buffers), the drainage that enters the structure at this location requires filtration however it could not be achieved. This area is between I-40 Business (-Y2-) and a ramp to get on I-40 business. The D-B Team has tried modifying the slope in this area several different ways. Over one acre of the 3.6ac needing filtration comes on to the project along I-40 Business before our construction limits. This existing ditch was analyzed and cannot provide filtration. Using 6:1 slopes and a slope of 0.50% would provide filtration but cut in to the ramp. Using 4:1 side slopes and a slope of 0.30% would provide filtration but require over 12' of vertical cut. Given the severity of contours in this location coupled

with safety of the motoring public in the roadway facility in close proximity to devices, basins would not be advisable. The amount of drainage, albeit minimal, is still above the threshold of other standard BMPs (preformed scour holes, level spreaders). For these reasons, filtration was not achieved at this location.

The project was designed with the intent to provide as much buffer filtration as possible. Unfortunately, the existing topography and planimetrics only allowed for additional ditch buffer filtration in the Jordan Lake basin of 185'. The 185' is beyond the length required in a proposed ditch.

However, in the Randleman Lake basin an additional 3515' of ditch buffer filtration has been provided in ditches not requiring filtration, of which 1674' would have been required. Also in Randleman in the ditches that required filtration, there is an additional 1983' beyond the length required.

In total, the unfiltered roadway facility of sites 1 and 6 in the Jordan basin and the location needing filtration in the Randleman basin would have required additional filtration for 12.49ac or 1249' of ditch which is less than the extra 5683' provided (185' plus 3515' plus 1983').

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR LINEAR ROADWAY PROJECTS

(Version 1.2; Released July 2012)

Project/TIP No.: U-2800 **County(ies):** Forsyth Guilford

General Project Information

Project No.:	U-2800		**Project Type:**	New Location		**Date:**	3/22/2012
NCDOT Contact:	Marshall Clawson		**Contractor / Designer:**	RK&K: Matthew L. Cook			
	Address:	1590 Mail Service Center Raleigh, NC 27699		**Address:**			
	Phone:	919-707-6713		**Phone:**	919-878-9560		
	Email:	mclawson@ncdot.gov		**Email:**	mcook@rkk.com		
City/Town:	Kernersville		**County(ies):**	Forsyth	Guilford		
River Basin(s):	Cape Fear	Yadkin-Pee Dee	**CAMA County?**	No	No		
Primary Receiving Water:	West Fork Deep River		**NCDWQ Stream Index No.:**	17-3-(0.3)			
NCDWQ Surface Water Classification for Primary Receiving Water		**Primary:**	Water Supply IV (WS-IV)				
		Supplemental:					
Other Stream Classification:							
303(d) Impairments:	turbidity	biological impairment					
Buffer Rules in Effect	Randleman, Jordan						

Project Description

Project Length (lin. Miles or feet):	0.92mi	**Surrounding Land Use:**	Commercial	
	Proposed Project		**Existing Site**	
Project Built-Upon Area (ac.)	39.70	ac.	21.10	ac.
Typical Cross Section Description:	2 lanes each direction with raised medain and curb and gutter		1 lane each direction with open shoulder	
Average Daily Traffic (veh/hr/day):	Design/Future:	34400	Existing:	12500
General Project Narrative:	Widening and realignment of existing Macy Grove Rd. with new location and a new interchange with I-40 Business; repaving of I-40 Business			

References

Project Environmental Summary

Surface Water Impacts

Sheet No.	Station (From / To)	Feature Impacted	Water / Wetland / Buffer Type	Receiving Surface Water Name	NRTR Map ID	NCDWQ Stream Index	NCDWQ Surface Water Classification	303(d) Impairments	Type of Impact	Existing SCM	Proposed SCM
6	-L- 55+67- 57+11 RT	Buffer	Jordan Lake	UT Reedy Fork	S19	16-11-(1)	WS III, NSW	None	Culvert	N/A	Riprap Pad
9	-Y2- 24+00- 25+64 RT	Buffer	Randleman Lake	UT West Fork Deep River	S9	17-3-(0.3)	WS IV	biological impairment; turbidity	Fill	N/A	None
10	-Y2- 30+08- 41+09 RT	Buffer	Randleman Lake	West Fork Deep River	S6	17-3-(0.3)	WS IV	biological impairment; turbidity	Fill	N/A	None
10	-Y2- 34+89- 35+15 LT	Buffer	Randleman Lake	UT West Fork Deep River	S12	17-3-(0.3)	WS IV	biological impairment; turbidity	Excavation	N/A	None
10	-Y2- 35+60 RT	Stream	Intermittent	UT West Fork Deep River	S12	17-3-(0.3)	WS IV	biological impairment; turbidity	Culvert	N/A	Riprap Pad
10	-Y2- 38+09- 39+60 RT	Wetland	Unknown	West Fork Deep River	W1	N/A	N/A	NA	Clearing	N/A	None
11	-Y2- 44+16- 47+94	Buffer	Randleman Lake	UT West Fork Deep River	S9, S11	17-3-(0.3)	WS IV	biological impairment; turbidity	Culvert	N/A	Riprap Pad
11	-Y2- 47+28 LT 47+93	Buffer	Randleman Lake	UT West Fork Deep River	S10	17-3-(0.3)	WS IV	biological impairment; turbidity	Culvert	N/A	Riprap Pad
11	-Y2- 44+57- 47+26	Stream	Intermittent	UT West Fork Deep River	S9, S11	17-3-(0.3)	WS IV	biological impairment; turbidity	Culvert	N/A	Riprap Pad
11	-Y2- 47+50 LT	Stream	Intermittent	UT West Fork Deep River	S9, S11	17-3-(0.3)	WS IV	biological impairment; turbidity	Fill	N/A	None
16	-Y7- 17+65- 20+58	Buffer	Jordan Lake	UT Reedy Fork	S17	16-11-(1)	WS III, NSW	None	Culvert	N/A	Riprap Pad
16	-Y7- 18+28- 20+04	Stream	Perennial	UT Reedy Fork	S17	16-11-(1)	WS III, NSW	None	Culvert	N/A	Riprap Pad

* List all stream and surface water impact locations regardless of jurisdiction or size.
Equalizer Pipes to be noted as a minimization of impacts.
All proposed SCMs listed must also be listed under Swales, Preformed Sour Holes and other Energy Dissipators, or Other Stormwater Control Measures.

Description of Minimization of Impacts or Mitigation

2:1 slopes in wetland / buffer areas

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR LINEAR ROADWAY PROJECTS

(Version 1.2; Released July 2012)

Project/TIP No.: U-2800 **County(ies):** Forsyth Guilford

Swales

Sheet No.	Station (From / To)	Stream Crossing Station	Base Width (ft)	Front Slope (H:V)	Back Slope (H:V)	Drainage Area (ac)	Recommended Treatment Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used
See	attachment						0							
							0							
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☐ YES ☑ NO Have minimum design criteria, as presented in the NCDOT Best Management Practices Toolbox, Version 1 (March 2008), been met and verified? If No, provide further explanantion of why design criteria was not met.

Additional Comments

See narrative

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR LINEAR ROADWAY PROJECTS

(Version 1.2; Released July 2012)

Project/TIP No.: U-2800 **County(ies):** Forsyth Guilford

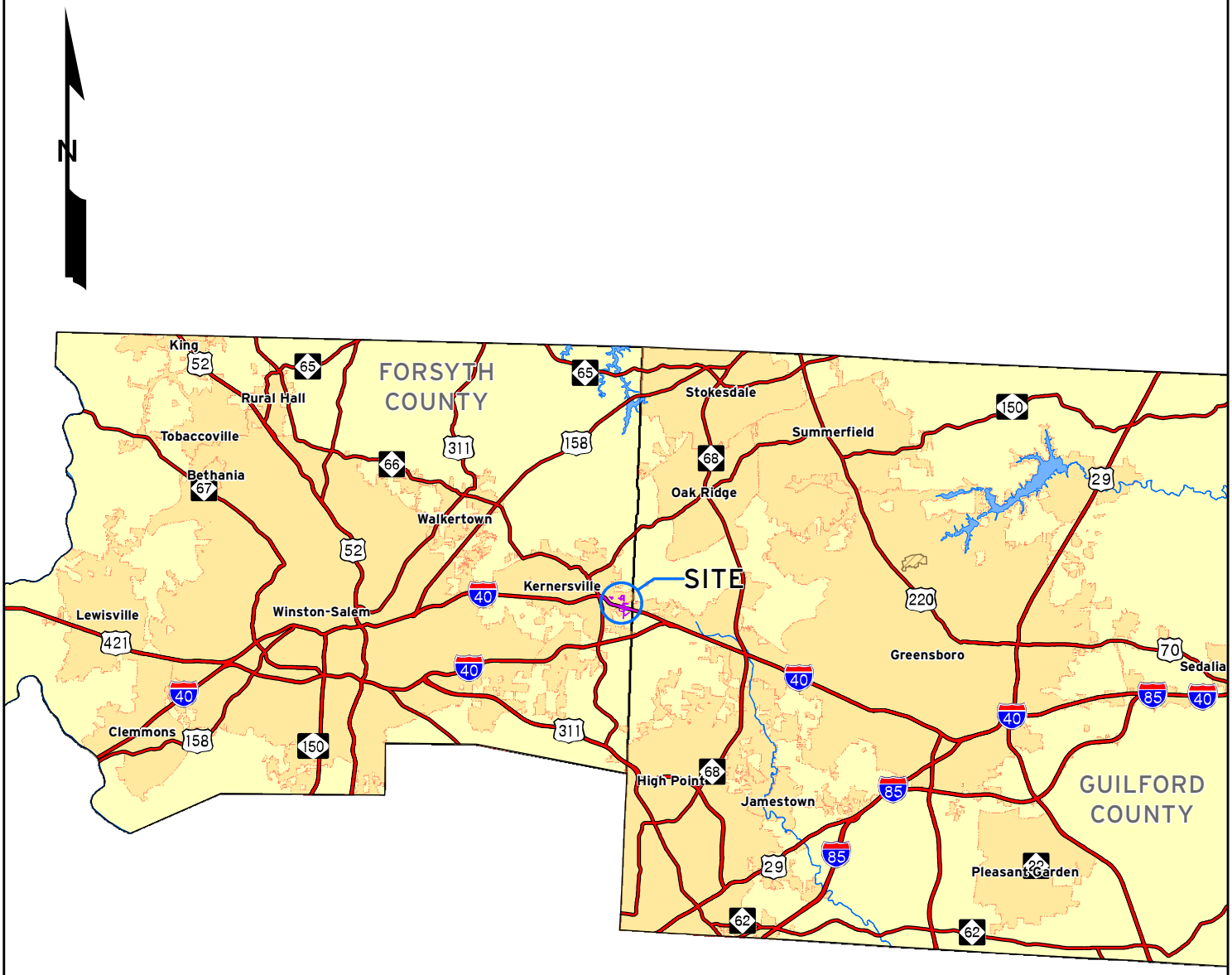
Preformed Scour Holes and Energy Dissipators

Sheet No.	Station	Energy Dissipator Type	Riprap Type	Drainage Area (ac)	Conveyance Structure	Pipe/Structure Dimensions (in)	Q10 (cfs)	V10 (fps)
6	-L- 56+27 RT	Riprap Apron / Pad	Class 'B'	3.42	Pipe	24" CSP	13.6	3.9
10	-Y2- 35+57 RT	Riprap Apron / Pad	Class I	74.00	Pipe	54" RCP	114.0	2.3
10	-Y2- 39+48 RT	Riprap Apron / Pad	Class 'B'	4.41	Pipe	18" CSP	10.6	2.3
11	-Y2- 44+79 RT	Riprap Apron / Pad	Class I	83.10	Pipe	48" RCP	126.0	3.3
11	-Y2- 45+54 LT	PFSH	N/A	0.92	Pipe	15" RCP	3.8	0.7
16	-Y7- 18+42 RT	Riprap Apron / Pad	Class I	32.40	Pipe	48" RCP	54.0	3.6

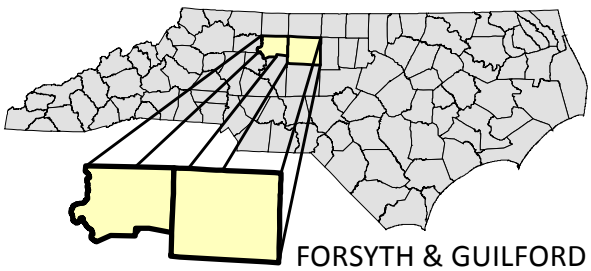
☑ YES ☐ NO Have minimum design criteria, as presented in the NCDOT Best Management Practices Toolbox (2008), NCDOT Standard Details, or FHWA HEC-14 (July 2006), been met and verified, as applicable? If No, provide further explanantion of why design criteria was not met.

Additional Comments

* Refer to the NCDOT Best Management Practices Toolbox, Version 1 (March 2008), NCDOT Standard Details, the Federal Highway Administration (FHWA) Hydraulic Engineering Circular No. 14 (HEC-14), Third Edition, Hydraulic Design of Energy Dissipators for Culverts and Channels (July 2006), as applicable, for design guidance and criteria.



VICINITY MAP

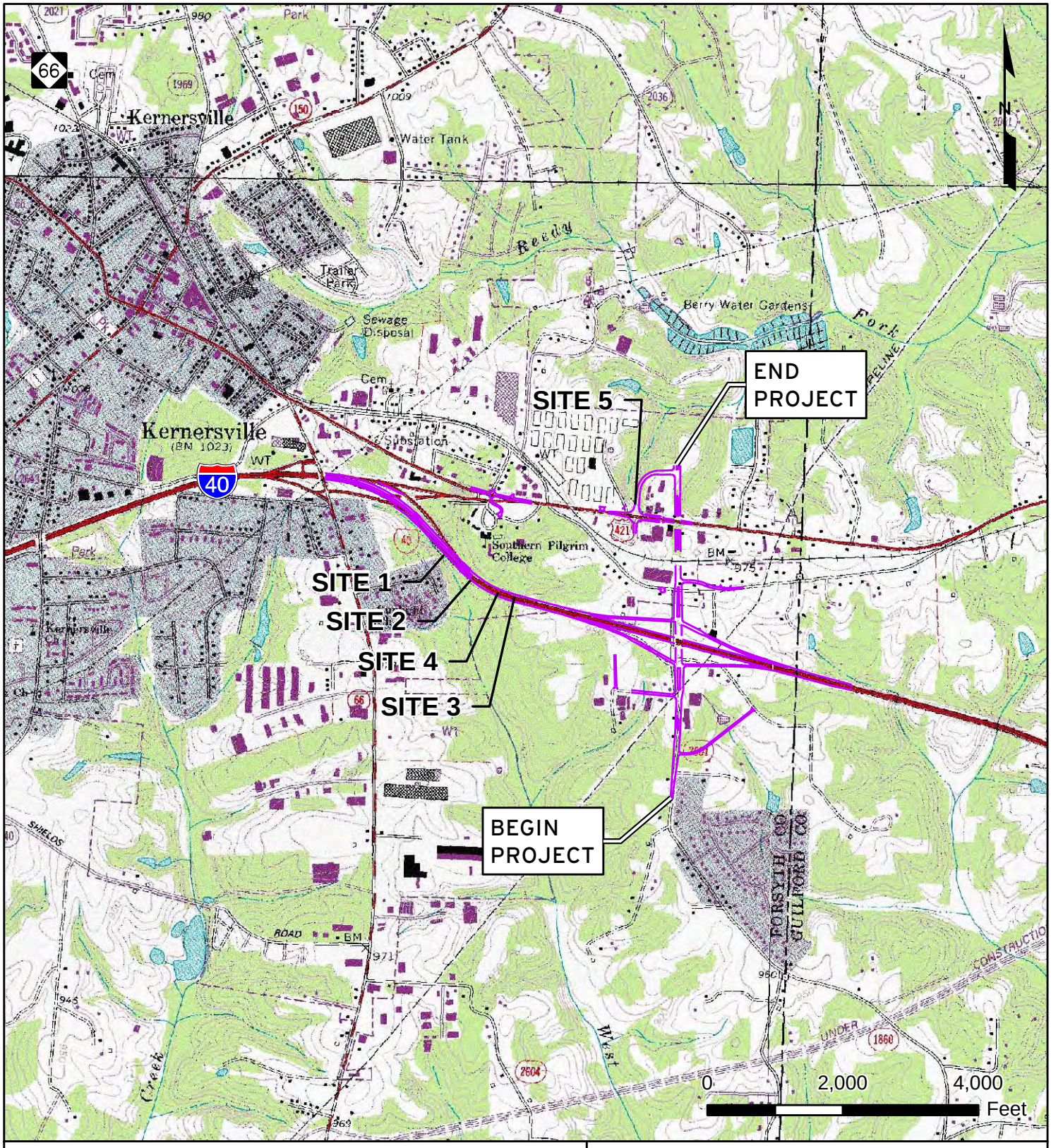


NCDOT

DIVISION OF HIGHWAYS
FORSYTH AND GUILFORD COUNTIES

PROJECT: 34858.3.3 (U-2800)
MACY GROVE RD.

PERMIT DRAWING SHEET 1 OF 13



LOCATION

WETLAND AND STREAM IMPACTS

NCDOT

DIVISION OF HIGHWAYS
FORSYTH AND GUILFORD COUNTIES

PROJECT: 34858.3.3 (U-2800)
MACY GROVE RD.

PERMIT DRAWING SHEET 2 OF 13

Path: T:\BRIDGE_Maps\U2800_Macy_Grove\U2800_USGS_WetStrm.mxd

Source: USGS 7.5 Minute Quadrangle, Kernersville, NC

PROP. NO.	PROPERTY OWNER NAME	PROPERTY OWNER ADDRESS
39	Michael York	2488 Dellwood DR Atlanta, GA 30305
42	Garden Towers, LLP	2101 NE Rhode Island AVE Washington DC 20018
43	Twin City Properties	125 Allen ST Kernersville, NC 27284

WETLAND AND STREAM IMPACTS

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

FORSYTH AND GUILFORD COUNTIES
PROJECT: 34858.3.3 (U-2800)

PERMIT DRAWING SHEET 3 OF 13

R:\Hydraulics\Calculations\Permit\U-2800 WetProp.xls

WETLAND AND STREAM PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
Jordan Watershed												
6	-Y7- 18+28 TO 20+04	48" RCP						0.03	<0.01	245	7	
6	-Y7- 18+28 TO 20+04	Bank Stabilization						<0.01		17		
TOTALS:								**0.03**	**<0.01**	**262**	**7**	
Randleman Watershed												
3	-Y2- 38+09 TO 39+60 RT	ROADWAY FILL				0.03						
4	-Y2- 35+60 RT	54" RCP						<0.01		12		
4	-Y2- 35+60 RT	Bank Stabilization						0.01		24		
5	-Y2- 44+57 TO 47+26	ROADWAY FILL						0.03	<0.01	203	26	
5	-Y2- 44+57 TO 47+26	Bank Stabilization						<0.01		16		
7	-Y2- 47+50 LT	ROADWAY FILL							<0.01		27	
TOTALS:						**0.03**		**0.04**	**<0.01**	**255**	**53**	
NOTE: NO SITES 1 OR 2												

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

FORSYTH & GUILFORD COUNTIES
PROJECT: 34858.3.3 (U-2800)

PERMIT DRAWING 4 OF 13

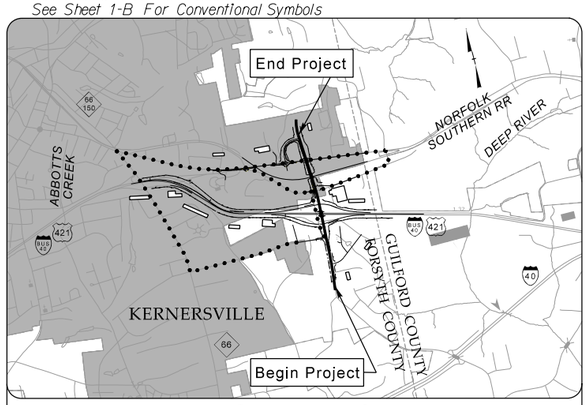
ATN Revised 3/31/05

09/08/99

TIP PROJECT: U-2800

CONTRACT: C202853

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



VICINITY MAP N.T.S.

OFFSITE DETOUR ROUTES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

FORSYTH / GUILFORD COUNTIES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2800	1	

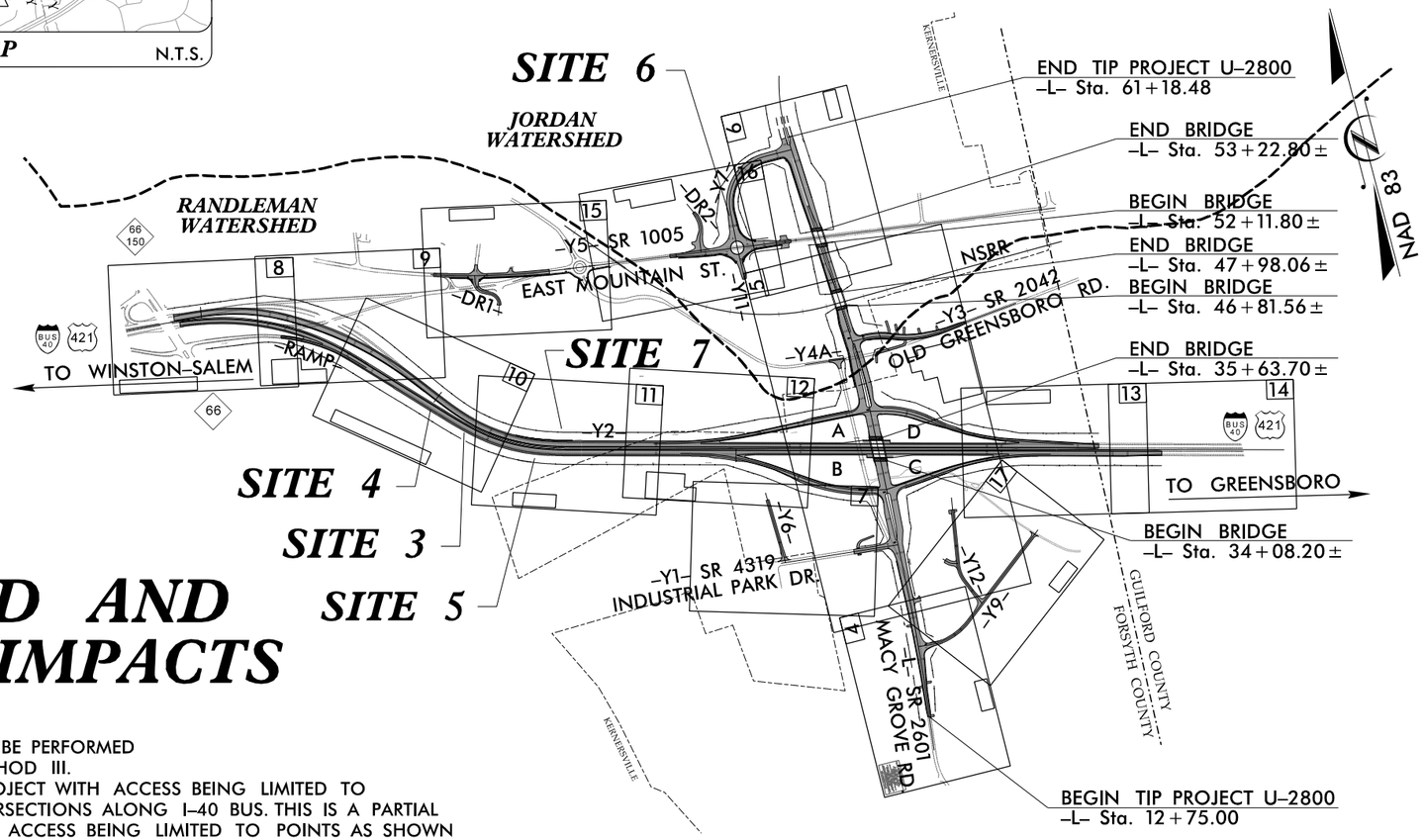
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34858.3.3	STP-2601 (1)	

LOCATION: ***KERNERSVILLE – SR 2601 (MACY GROVE ROAD)***
FROM SOUTH OF SR 4319 (INDUSTRIAL PARK DRIVE) TO
NORTH OF SR 1005 (EAST MOUNTAIN STREET) IN KERNERSVILLE

TYPE OF WORK: ***WETLAND AND STREAM IMPACTS***

ENGLISH

PERMIT DRAWING
SHEET 5 OF 13



WETLAND AND STREAM IMPACTS

NOTES:
1. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.
2. THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES AND AT GRADE INTERSECTIONS ALONG I-40 BUS. THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS FOR MACY GROVE RD.
3. A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF KERNERSVILLE.

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

GRAPHIC SCALES

PLANS 50 25 0 50 100
PROFILE (HORIZONTAL) 50 25 0 50 100
PROFILE (VERTICAL) 10 5 0 10 20

DESIGN DATA

ADT 2012 = 12,500
ADT 2030 = 34,400
DHV = 10 %
D = 55 %
T = 9 % *
V = 50 MPH

* (TTST 2% + DUALS 7%)

FUNC. CLASS = URBAN COLLECTOR

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-2800.....	0.844 mi
LENGTH STRUCTURE TIP PROJECT U-2800.....	0.073 mi
TOTAL LENGTH TIP PROJECT U-2800.....	0.917 mi

DESIGN - BUILD TEAM

RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE, SUITE 350
RALEIGH, NORTH CAROLINA 27609
NC LICENSE NO. F-0112
1-888-521-4455 OR 919-878-9560

FOR
DIVISION OF HIGHWAYS

2012 STANDARD SPECIFICATIONS

LETTING DATE:
AUGUST 13, 2012

J. T. Peacock, Jr., P.E.
PROJECT ENGINEER

Brandon J. McInnis, P.E.
PROJECT DESIGN ENGINEER

CONTRACTOR :
Blythe
BLYTHE DEVELOPMENT COMPANY
1415 E.WESTINGHOUSE BLVD.
CHARLOTTE,NC 28273

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

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

3/19/2013
R:\Hydraulics\PERMITS_Environmental\Drawings\Wetlands\U2800_HYD_prm_wet_tsh.dgn
FKeys

8/17/99

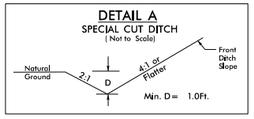
PROJECT REFERENCE NO.	SHEET NO.
U-2800	DITCH DETAILS
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

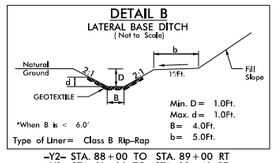
PERMIT DRAWING SHEET 6 OF 13

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



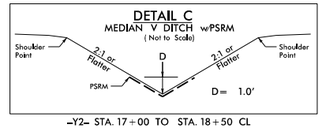
–L– STA. 12+71 TO STA. 13+50 RT
–L– STA. 12+72 TO STA. 25+50 LT
–DR2– STA. 11+00 TO STA. 12+50 LT & RT
–RPA– STA. 18+15 TO STA. 20+15 LT (USE 6:1)
–RPB– STA. 16+95 TO STA. 19+90 RT
–RPD– STA. 18+85 TO STA. 20+75 LT
–Y2– STA. 20+00 TO STA. 24+50 LT
–Y2– STA. 22+50 TO STA. 24+00 RT
–Y2– STA. 31+50 TO STA. 35+00 RT
–Y2– STA. 39+50 TO STA. 41+50 LT
–Y2– STA. 44+00 TO STA. 45+00 LT
–Y2– STA. 47+50 TO STA. 51+50 RT (USE 6:1)
–Y2– STA. 54+00 TO STA. 57+00 LT (USE 6:1)
–Y2– STA. 62+00 TO STA. 66+50 LT
–Y2– STA. 75+00 TO STA. 83+50 LT
–Y2– STA. 80+50 TO STA. 81+50 RT
–Y2– STA. 93+50 TO STA. 96+58 RT
–Y6– STA. 10+65 TO STA. 11+00 RT
–Y6– STA. 11+00 TO STA. 11+50 LT
–Y12– STA. 16+00 TO STA. 17+50 RT
–Y12A– STA. 10+25 TO STA. 10+75 LT

DETAIL B
LATERAL BASE DITCH
(Not to Scale)



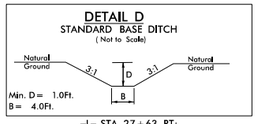
Type of Liner= Class B Rip-Rap
–Y2– STA. 88+00 TO STA. 89+00 RT
–Y2– STA. 91+00 TO STA. 92+40 RT
–Y12– STA. 14+50 TO STA. 16+00 RT

DETAIL C
MEDIAN V DITCH w/PSRM
(Not to Scale)



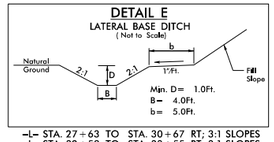
–Y2– STA. 17+00 TO STA. 18+50 CL

DETAIL D
STANDARD BASE DITCH
(Not to Scale)



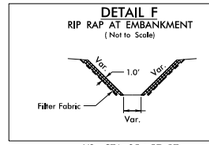
–L– STA. 27+63 RT;
FIRST 60' SEE DETAIL Q;
NEXT 89'; L=89', S=1.55%
BEG EL=957.0, END EL=955.6;
LAST 61'; L=61', S=0.30%
BEG EL=955.6, END EL=955.4

DETAIL E
LATERAL BASE DITCH
(Not to Scale)



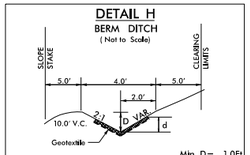
–L– STA. 27+63 TO STA. 30+67 RT; 3:1 SLOPES
–L– STA. 32+58 TO STA. 33+55 RT; 3:1 SLOPES
–L– STA. 54+00 TO STA. 58+00 LT; 3:1 SLOPES
–RPB– STA. 19+90 TO STA. 21+65 RT
–RPC– STA. 18+00 TO STA. 21+94 RT; 3:1 SLOPES
–Y2– STA. 35+00 TO STA. 39+00 LT; 3:1 SLOPES
–Y2– STA. 89+00 TO STA. 91+00 RT
–Y2– STA. 92+40 TO STA. 93+50 RT
–Y5– STA. 17+00 TO STA. 19+50 LT; 3:1 SLOPES
–Y9– STA. 10+72 TO STA. 16+12 LT
–Y9– STA. 17+00 TO STA. 18+25 RT
–Y12– STA. 10+34 TO STA. 11+00 LT
–Y12– STA. 14+50 TO STA. 16+00 RT

DETAIL F
RIP RAP AT EMBANKMENT
(Not to Scale)



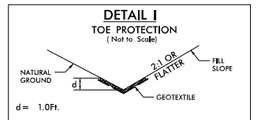
–Y2– STA. 35+57 RT
–Y2– STA. 44+79 RT
–Y7– STA. 18+39 RT

DETAIL H
BERM DITCH
(Not to Scale)



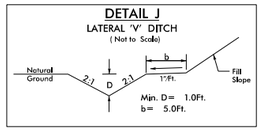
Type of Liner= PSRM
–Y5– STA. 31+00 TO STA. 34+00 RT

DETAIL I
TOE PROTECTION
(Not to Scale)



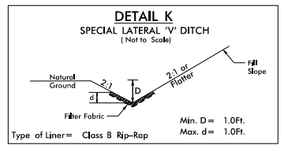
Type of Liner= Class B Rip-Rap
–Y2– STA. 47+00 TO STA. 47+60 LT
–Y7– STA. 17+50 TO STA. 20+40 LT
–Y7– STA. 18+40 TO STA. 20+20 RT
–Y9– STA. 18+00 TO STA. 19+50 LT

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



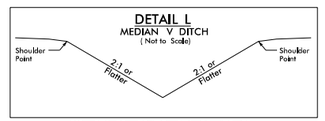
–Y3– STA. 14+75 TO STA. 16+50 LT (3:1 SIDE SLOPES)
–Y9– STA. 13+00 TO STA. 17+00 RT
–Y9– STA. 17+15 TO STA. 18+00 LT

DETAIL K
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



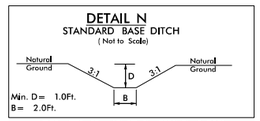
Type of Liner= Class B Rip-Rap
–Y12– STA. 14+50 TO STA. 16+00 LT

DETAIL L
MEDIAN V DITCH
(Not to Scale)



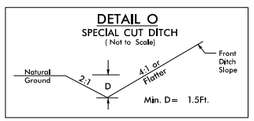
–Y2– STA. 18+50 TO STA. 22+50 CL
–Y2– STA. 24+00 TO STA. 26+00 CL
–Y2– STA. 32+50 TO STA. 36+00 CL
–Y2– STA. 39+50 TO STA. 41+50 CL
–Y2– STA. 48+20 TO STA. 50+00 CL

DETAIL N
STANDARD BASE DITCH
(Not to Scale)



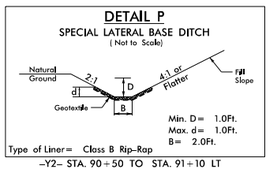
–DR1– STA. 11+40 LT; L=311', S=0.50%
BEG EL=967.9, END EL=966.2
–RPD– STA. 19+06 RT; L=48', S=0.42%
BEG EL=965.7, END EL=965.5
–Y1– STA. 10+64 TO STA. 12+77 LT
L=213', S=0.30%
BEG EL=954.5, END EL=953.8

DETAIL O
SPECIAL CUT DITCH
(Not to Scale)



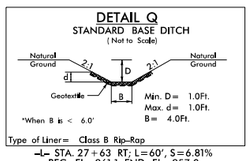
–Y3– STA. 17+50 TO STA. 19+00 LT

DETAIL P
SPECIAL LATERAL BASE DITCH
(Not to Scale)



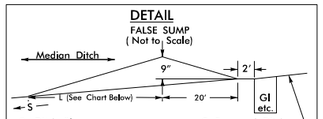
Type of Liner= Class B Rip-Rap
–Y2– STA. 90+50 TO STA. 91+10 LT

DETAIL Q
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= Class B Rip-Rap
–L– STA. 27+63 RT; L=60', S=6.81%
BEG EL=961.1, END EL=957.0

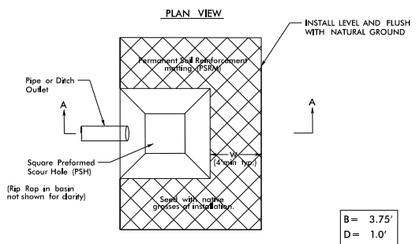
DETAIL
FALSE SUMP
(Not to Scale)



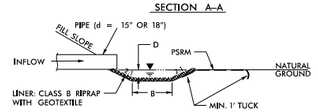
Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

PREFORMED SCOUR HOLE DETAIL R
*NOT TO SCALE

PLAN VIEW

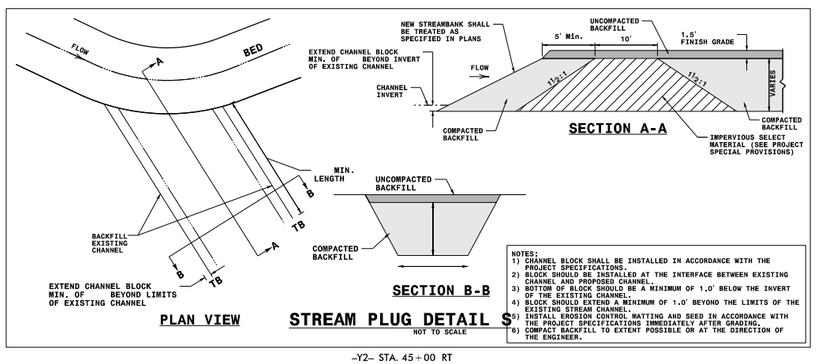


SECTION A–A



308

–Y2– STA. 45+43 LT



STREAM PLUG DETAIL S
NOT TO SCALE

NOTES:
1) CHANNEL BLOCK SHALL BE INSTALLED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
2) BLOCK SHOULD BE INSTALLED AT THE INTERFACE BETWEEN EXISTING CHANNEL AND PROPOSED CHANNEL.
3) BOTTOM OF BLOCK SHOULD BE A MINIMUM OF 1.0' BELOW THE INVERT OF THE EXISTING CHANNEL.
4) BLOCK SHOULD EXTEND A MINIMUM OF 1.0' BEYOND THE LIMITS OF THE EXISTING STREAM CHANNEL.
5) INSTALL EROSION CONTROL MATTING AND SEED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS IMMEDIATELY AFTER GRADING.
6) COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.

–Y2– STA. 45+00 RT

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

3/19/2013
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Ekeus

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2800	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWING
SHEET 7 OF 13

ENGLISH

NAD 83

CONGRESS GARDENS, INC
DB 2952 PG 292

-Y2- ST Sta. 30+54.69

-Y2_LT- CS Sta. 32+96.74

-Y2_LT- SRS Sta. 36+26.74

-Y2_LT- SC Sta. 40+56.74

-Y2- TS Sta. 37+41.54

-RAMP- ST Sta. 10+00.00

-Y2- SC Sta. 41+71.54

LP
-Y2- STA. 35+28.66

LP
-Y2_LT- STA. 39+84.42

MATCHLINE -Y2- STA. 29+50 SEE SHEET 9

MATCHLINE -Y2- STA. 42+50 SEE SHEET 11

46
CONGRESS GARDENS INC
DB 2715 PG 387

42
GARDEN TOWERS, LLP
DB 2963 PG 1013

39
MICHAEL YORK
DB 794 PG 33
DB 903 PG 611
DB 1119 PG 884
DB 905 PG 395
DB 957 PG 184
DB 1039 PG 505
DB 996 PG 444
DB 1143 PG 1615

DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

2 TONS CL B RIPRAP W/7 SY FIL FAB INV=939.9

15" CSP 2 ELBOWS ROD & LUG

2 TONS CL B RIPRAP W/7 SY FIL FAB INV=928.6

33 TONS CL B RIPRAP KEYED IN

S 43° 35' 53.4" E

MEDIAN V DITCH SEE DETAIL L

LATERAL BASE DITCH SEE DETAIL E

SPECIAL CUT DITCH SEE DETAIL A

MEDIAN Y DITCH SEE DETAIL L

PROP. 48" WW FENCE

REMOVE DI

COLLAR 18" RCP-III

18" CSP 2 ELBOWS ROD & LUG 3 TONS CL B RIPRAP W/10 SY FIL FAB INV=921.6

FILL SLOPE 1.5:1 ENDWALL 9.0' PROVIDES 25' DISTANCE FROM ENDWALL TO JS

INV=918.5 RIPRAP AT EMBANKMENT SEE DETAIL E 33 TONS CL I RIPRAP W/62 SY FIL FAB ON BANKS ONLY

JB wSlab Lid
15" RCP-III
INV=918.5
RIPRAP AT EMB
SEE DE
33 TO

Q10=10.64cfs
V10=2.34ft/s

SITE 4

SITE 3

RANDLEMAN WATERSHED

A-A	B-B	C-C
12.0'	15.0'	8.0'
0.3'	0.5'	0.1'
3.5'	2.5'	1.0'
5.0' INFALL	10.0' OUTFALL	5.0' OUTFALL

FOR -Y2- PROFILE SEE SHTS. 21 & 22
FOR -Y2_LT- PROFILE SEE SHTS. 21 & 22
FOR -RAMP- PROFILE SEE SHT. 29
FOR DITCH DETAILS SEE SHT. 2-M

PLANS PREPARED BY :

RK&K

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

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FLEIS

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PROJECT REFERENCE NO.	SHEET NO.
U-2800	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWING SHEET 8 OF 13

ENGLISH

NAD 83

MATCHLINE –Y2– STA. 29+50 SEE SHEET 9

MATCHLINE –Y2– STA. 42+50 SEE SHEET 11

CONGRESS GARDENS, INC
DB 2952 PG 292

CONGRESS GARDENS INC
DB 2715 PG 387

GARDEN TOWERS, LLP
DB 2963 PG 1013

ISBK SCHOOL

DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

–Y2– ST Sta. 30+54.69

–Y2_LT– CS Sta. 32+96.74

–Y2_LT– SRS Sta. 36+26.74

–Y2_LT– SC Sta. 40+56.74

LP
Y2 LT STA. 39+84.42

–Y2– TS Sta. 37+41.54

LP
–Y2– STA. 35+28.66

–Y2– SC Sta. 41+71.54

–RAMP– ST Sta. 10+00.00

2 TONS CL B RIPRAP W/7 SY FIL FAB INV=939.9

15" CSP 2 ELBOWS ROD & LUG

MEDIAN V DITCH SEE DETAIL L

LATERAL BASE DITCH SEE DETAIL E

2 TONS CL B RIPRAP W/7 SY FIL FAB INV=928.6

2 TONS CL B RIPRAP W/7 SY FIL FAB INV=928.6

33 TONS CL B RIPRAP KEYED IN

SPECIAL CUT DITCH SEE DETAIL A

PROP. 48" WW FENCE

REMOVE DI

COLLAR 18" RCP-III

MEDIAN V DITCH SEE DETAIL L

JB wSlab Lid
15" RCP-III

FILL SLOPE 1.5:1 ENDWALL 9.0' PROVIDES 25' DISTANCE FROM ENDWALL TO JS

INV=918.5
RIPRAP AT EMBANKMENT SEE DETAIL F
33 TONS CL I RIPRAP W/62 SY FIL FAB ON BANKS ONLY

Adj 2GI

Q10=10.64cfs
V10=2.34ft/s

18" CSP 2 ELBOWS ROD & LUG 3 TONS CL B RIPRAP W/10 SY FIL FAB INV=921.6

MICHAEL YORK
DB 794 PG 33
DB 903 PG 511
DB 1119 PG 884
DB 905 PG 395
DB 957 PG 184
DB 1039 PG 505
DB 996 PG 444
DB 1143 PG 1615

SITE 4

SITE 3

RANDLEMAN WATERSHED

A–A	B–B	C–C
12.0'	15.0'	8.0'
0.3'	0.5'	0.1'
3.5'	2.5'	1.0'
5.0' INFALL	10.0' OUTFALL	5.0' OUTFALL

FOR –Y2– PROFILE SEE SHTS. 21 & 22
FOR –Y2 LT– PROFILE SEE SHTS. 21 & 22
FOR –RAMP– PROFILE SEE SHT. 29
FOR DITCH DETAILS SEE SHT. 2-M

PLANS PREPARED BY :

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ELLIS

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-2800	X-41

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

PERMIT DRAWING
SHEET 9 OF 13

ENGLISH

950 945 940 935 930 925 920 915

0.066 6:1 2:1 5:1 2:1 0.039 2:1

930.58 930.60

D.P. 932.488

WETLAND

39+50.00

950 945 940 935 930 925 920 915

3:1 3:1 6:1 0.056 2:1 5:1 0.029 2:1

929.87 932.45

D.P. 932.041

WETLAND

39+00.00

950 945 940 935 930 925 920 915

0.047 3:1 3:1 6:1 2:1 5:1 0.020 2:1

929.66 931.68

D.P. 931.558

WETLAND

38+50.00

950 945 940 935 930 925 920 915

0.037 3:1 3:1 6:1 2:1 5:1 0.011 2:1

929.46 931.09

D.P. 931.187

38+00.00

-Y2-

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

3/19/2013
R:\Hydraulics\PERMITS_Environmental\Drawings\Wetlands\U2800_rdy_xpl-y2.dgn
FKeys

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2800	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT SHEET | **DRAWING 10 OF 13**

SITE 5

SITE 7

RANDLEMAN WATERSHED

MATCHLINE –Y2– STA. 42+50 SEE SHEET 10

MATCHLINE –Y2– STA. 54+50 SEE SHEET 12

–Y2– CS Sta. 45+18.91=
–Y2_LT– PT Sta. 45+45.52 (15' LT)

–Y2– ST Sta. 49+48.91

PSH
Q10 = 3.77cfs
V10 = 0.69ft/s

A–A 8.0' 0.5' 3.0' 4.0' INFALL

B–B 6.0' 0.1' 2.5' 3.0' INFALL

C–C 6.0' 0.5' 3.0' 4.0' INFALL

D–D 12.0' 0.5' 4.0' 5.0' OUTFALL

42 GARDEN TOWERS LLP DB 2963 PG 1013

39 MICHAEL YORK DB 794 PG 33, DB 903 PG 511, DB 1119 PG 884, DB 905 PG 395, DB 957 PG 184, DB 1039 PG 505, DB 996 PG 444, DB 1143 PG 1615

38 SIXTY-SIX-I-40 ASSOCIATES DB 1163 PG 1006

FORSYTH TECHNICAL COMMUNITY COLLEGE DB 1845 PG 798

TOWN OF KERNERSVILLE
FORSYTH COUNTY

PROP. 48" WW FENCE

REMOVE FENCE

SPECIAL CUT DITCH SEE DETAIL A

2 TONS CL B RIPRAP W/7 SY FIL FAB INV=935.7

5 TONS CL B RIPRAP W/14 SY FIL FAB INV=919.8

TOE PROTECTION SEE DETAIL L

MEDIAN V DITCH SEE DETAIL L

JB w/Slab Lid

Adj. DI

18" CSP 2 ELBOWS ROD & LUG

STREAM PLUG SEE DETAIL S

REMOVE EXIST. GUARDRAIL

RIPRAP AT EMBANKMENT SEE DETAIL F 26 TONS CL I RIPRAP W/50 SY FIL FAB ON BANKS ONLY INV=912.5

DO NOT BURY

GRADE TO DRAIN 919.05

15" RCP-III

24" RCP-III

48" RCP-III

30" CONC 30" RCP

12" CONC 12" RCP

18" C&G

6" TYPE UNKNOWN

44" PLASTIC TO ROOF DRAIN

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

FOR –Y2– PROFILE SEE SHTS. 22 & 23
FOR –Y2_LT– PROFILE SEE SHTS. 22 & 23
FOR DITCH DETAILS SEE SHT. 2-M

NAD 83

ENGLISH

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PROJECT REFERENCE NO.	SHEET NO.
U-2800	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWING SHEET 11 OF 13

SITE 5

SITE 7

RANDLEMAN WATERSHED

MATCHLINE –Y2– STA. 42+50 SEE SHEET 10

MATCHLINE –Y2– STA. 54+50 SEE SHEET 12

–Y2– CS Sta. 45+18.91=
–Y2_LT– PT Sta. 45+45.52 (15' LT)

–Y2– ST Sta. 49+48.91

PSH
Q10 = 3.77cfs
V10 = 0.69ft/s

GRADE TO DRAIN 919.05

DO NOT BURY

REMOVE EXIST. GUARDRAIL

SPECIAL CUT DITCH SEE DETAIL A

PROP. 48" WW FENCE

REMOVE FENCE

TOE PROTECTION SEE DETAIL L

MEDIAN V DITCH SEE DETAIL L

STREAM PLUG SEE DETAIL S

RIPRAP AT EMBANKMENT SEE DETAIL F
26 TONS CL I RIPRAP W/50 SY FIL FAB ON BANKS ONLY
INV = 912.5

GARDEN TOWERS LLP
DB 2963 PG 1013

FORSYTH TECHNICAL COMMUNITY COLLEGE
DB 1845 PG 198

MICHAEL YORK
DB 794 PG 33
DB 903 PG 511
DB 1119 PG 884
DB 905 PG 395
DB 957 PG 184
DB 1039 PG 505
DB 996 PG 444
DB 1143 PG 1615

SIXTY-SIX-I-40 ASSOCIATES
DB 1163 PG 1006

TOWN OF KERNERSVILLE
FORSYTH COUNTY

NAD 83

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

FOR –Y2– PROFILE SEE SHTS. 22 & 23
FOR –Y2_LT– PROFILE SEE SHTS. 22 & 23
FOR DITCH DETAILS SEE SHT. 2-M

ENGLISH

PLANS PREPARED BY :

RK&K

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Kevin

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2800	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWING SHEET 12 OF 13

PROJECT REFERENCE NO.	SHEET NO.
U-2800	16

NAD 83

MATCHLINE -Y7- STA. 14+50 SEE SHEET 6

MATCHLINE -Y5- STA. 24+00 SEE SHEET 15

MATCHLINE -Y5- STA. 37+00 SEE SHEET 6

SITE 6

JORDAN WATERSHED

RANDLEMAN WATERSHED

-Y5- POT Sta.25+20.16
-RR- POT Sta.15+24.36

-DR2- POT Sta.14+28.63

-DR2- PRC Sta.11+40.77

-DR2- PC Sta.10+75.00

-DR2- POT Sta.10+00.00=
-Y5- POT Sta.32+05.00

-RR- PC Sta.16+48.00

-Y7- PT Sta.17+89.14

-RAB- PCC Sta.12+57.78=
-Y7- POT Sta.20+40.46

-RAB- PC Sta.10+00.00=
-RAB- PC Sta.13+39.29=
-Y5- POT Sta.34+46.00

-Y5- POT Sta.35+00.00=
-Y7- POT Sta.20+94.46=
-YII- POT Sta.10+00.00

-RAB- PCC Sta.10+90.78=
-YII- POT Sta.10+54.00

-YII- POT Sta.12+60.00
END CONSTRUCTION

-RAB- PCC Sta.11+69.65=
-Y5- POT Sta.35+54.00

LP -Y7- STA. 16+35.28

LP -RAB- STA. 12+59.88

LP -DR2- STA. 11+32.12

HP -Y5- STA. 35+54.00

HP -RAB- STA. 10+90.10

TOE PROTECTION SEE DETAIL I

BERM DITCH SEE DETAIL H

REMOVE DI & 11' 12" PLASTIC PIPE

GRADE TO DRAIN

RETAIN SYSTEM

REMOVE SYSTEM

NO FEATURE

TWIN CITY PROPERTIES
DB 2071 PG 1510

JONATHAN & SABRINA DIXON
DB 2862 PG 4414

SOUTHWEST LANDCOM LP
DB 2311 PG 203

LANDRETH PROPERTIES KERN LLC
DB 2679 PG 1442

CALVARY CHAPEL OF THE TRIAD, INC
DB 2945 PG 3223

A–A: 8.0' / 0.0' / 1.5' / 3.0' ROADSIDE

B–B: 20.0' / 0.5' / 8.0' / 6.0' OUTFALL

-Y5- EAST MOUNTAIN ROAD

	-Y7-	
ADT 2012		7,500
ADT 2030		18,800
4,700 / 11,100		2,800 / 7,700
6,200 / 14,400	-Y5-	4,300 / 11,000

NOTE:
#1615 HAS BEEN DESIGNED TO PICK UP THE EXISTING 36" RCP RUNNING BESIDE THE BUILDING ON PARCEL #30. IN THE EVENT THE PIPE DOES NOT CONNECT AT #1615, INVESTIGATE THE SITE TO DETERMINE WHERE TO TIE IT TO THE PROPOSED DRAINAGE.

STAMPED AND STAINED ASPHALT

FOR -Y5- PROFILE SEE SHT. 31
FOR -Y7- PROFILE SEE SHT. 31
FOR -YII- PROFILE SEE SHT. 32
FOR -RAB- PROFILE SEE SHT. 33
FOR -DR2- PROFILE SEE SHT. 33
FOR ROUNDABOUT DETAIL SEE SHEET 2-L
FOR DITCH DETAILS SEE SHT. 2-M

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PROJECT REFERENCE NO.	SHEET NO.
U-2800	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWING SHEET 13 OF 13

PROJECT REFERENCE NO.	SHEET NO.
U-2800	16

NAD 83

MATCHLINE -Y7- STA. 14+50 SEE SHEET 6

MATCHLINE -Y5- STA. 24+00 SEE SHEET 15

MATCHLINE -Y5- STA. 37+00 SEE SHEET 6

SITE 6

JORDAN WATERSHED

RANDLEMAN WATERSHED

-Y5- POT Sta.25+20.16
-RR- POT Sta.15+24.36

-DR2- POT Sta. 14+28.63

-Y7- PT Sta. 17+89.14

-DR2- PRC Sta. 11+40.77

-DR2- PC Sta. 10+75.00

-DR2- POT Sta.10+00.00=
-Y5- POT Sta.32+05.00

-RR- PC Sta.16+48.00

-RAB- PC Sta.10+00.00=
-RAB- PC Sta.13+39.29=
-Y5- POT Sta.34+46.00

-Y5- POT Sta.35+00.00=
-Y7- POT Sta.20+94.46=
-YII- POT Sta.10+00.00

-RAB- PCC Sta.10+90.00=
-YII- POT Sta.10+54.00

-YII- POT Sta.12+60.00
END CONSTRUCTION

-RAB- PCC Sta.11+69.65=
-Y5- POT Sta.35+54.00

-RAB- PCC Sta.12+57.78=
-Y7- POT Sta.20+40.46

LP -Y7- STA. 16+35.28

LP -DR2- STA. 11+32.12

LP -RAB- STA. 12+59.88

HP -Y5- STA. 35+54.00

HP -RAB- STA. 10+90.10

TOE PROTECTION SEE DETAIL I

BERM DITCH SEE DETAIL H

REMOVE DI & 11' 12" PLASTIC PIPE

GRADE TO DRAIN

NO FEATURE

NOTE:
#1615 HAS BEEN DESIGNED TO PICK UP THE EXISTING 36" RCP RUNNING BESIDE THE BUILDING ON PARCEL #30. IN THE EVENT THE PIPE DOES NOT CONNECT AT #1615, INVESTIGATE THE SITE TO DETERMINE WHERE TO TIE IT TO THE PROPOSED DRAINAGE.

TWIN CITY PROPERTIES
DB 2071 PG 1510

JONATHAN & SABRINA DIXON
DB 2862 PG 4414

SOUTHWEST LANDCOM LP
DB 2311 PG 203

LANDRETH PROPERTIES KERN LLC
DB 2679 PG 1442

CALVARY CHAPEL OF THE TRIAD, INC
DB 2945 PG 3223

A-A		B-B	
8.0'		20.0'	
0.0'		0.5'	
1.5'		8.0'	
3.0'	ROADSIDE	6.0'	OUTFALL

-Y5- EAST MOUNTAIN ROAD

ADT 2012 / ADT 2030	-Y7-	7,500 / 18,800
4,700 / 11,100		2,800 / 7,700
-Y5-		
6,200 / 14,400		4,300 / 11,000

STAMPED AND STAINED ASPHALT

FOR -Y5- PROFILE SEE SHT. 31
FOR -Y7- PROFILE SEE SHT. 31
FOR -YII- PROFILE SEE SHT. 32
FOR -RAB- PROFILE SEE SHT. 33
FOR -DR2- PROFILE SEE SHT. 33
FOR ROUNDABOUT DETAIL SEE SHEET 2-L
FOR DITCH DETAILS SEE SHT. 2-M

PLANS PREPARED BY :
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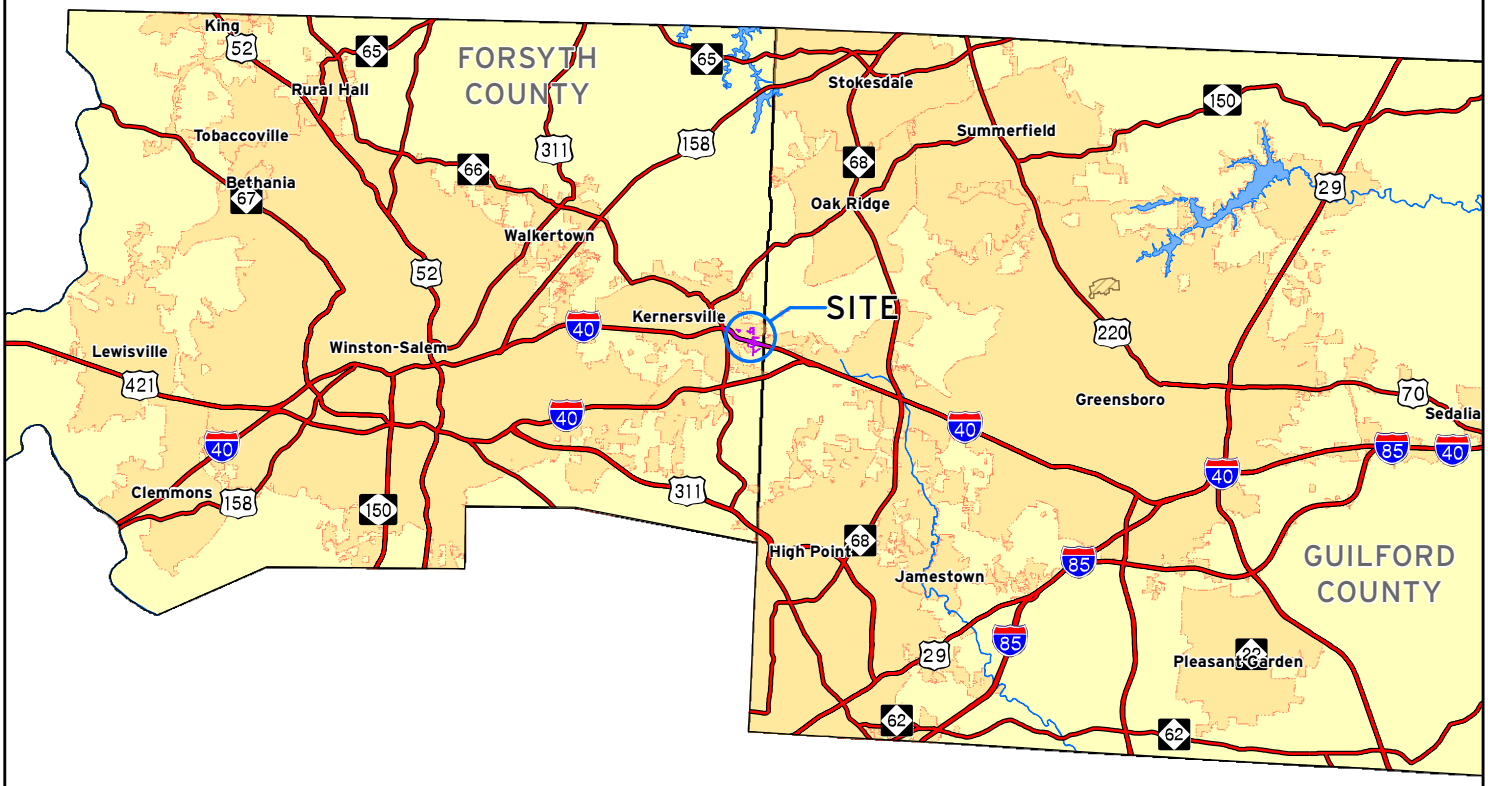
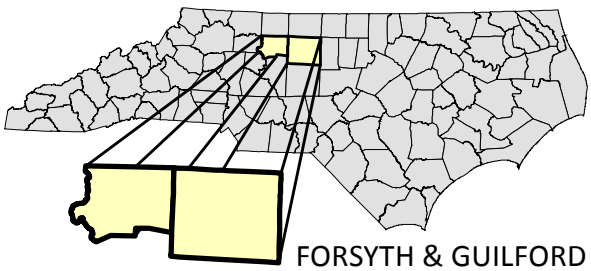


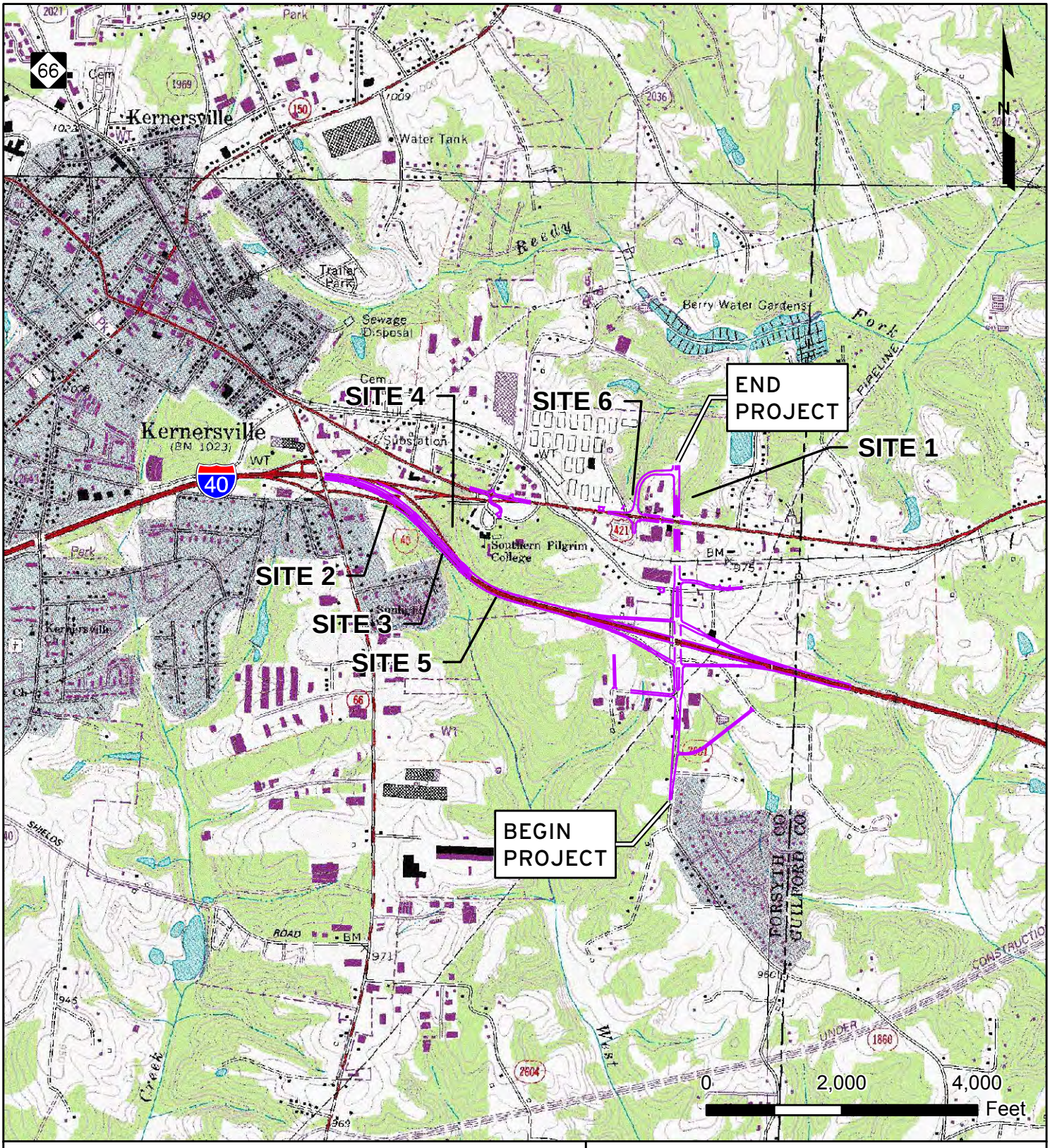
VICINITY MAP



NCDOT

DIVISION OF HIGHWAYS
FORSYTH AND GUILFORD COUNTIES

PROJECT: 34858.3.3 (U-2800)
MACY GROVE RD.
BUFFER DRAWING SHEET 1 OF 13



LOCATION

BUFFER IMPACTS

NCDOT

DIVISION OF HIGHWAYS
FORSYTH AND GUILFORD COUNTIES

PROJECT: 34858.3.3 (U-2800)
MACY GROVE RD

BUFFER DRAWING SHEET 2 OF 13

Path: T:\BRIDGE_Maps\U2800_Macy_Grove\U2800_USGS_Buffers.mxd

Source: USGS 7.5 Minute Quadrangle, Kernersville, NC

PROP. NO.	PROPERTY OWNER NAME	PROPERTY OWNER ADDRESS
34	Jonathan & Sabrina Dixon	305 E Bodenhamer ST Kernersville, NC 27284
39	Michael York	2488 Dellwood DR Atlanta, GA 30305
42	Garden Towers, LLP	2101 NE Rhode Island AVE Washington DC 20018
43	Twin City Properties	125 Allen ST Kernersville, NC 27284

BUFFER IMPACTS

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

FORSYTH AND GUILFORD COUNTIES
PROJECT: 34858.3.3 (U-2800)

BUFFER DRAWING SHEET 3 OF 13

BUFFER IMPACTS SUMMARY

SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	IMPACT TYPE: ROAD CROSSING	IMPACT TYPE: BRIDGE	IMPACT TYPE: PARALLEL IMPACT	ALLOWABLE: ZONE 1 (ft^2)	ALLOWABLE: ZONE 2 (ft^2)	ALLOWABLE: TOTAL (ft^2)	MITIGABLE: ZONE 1 (ft^2)	MITIGABLE: ZONE 2 (ft^2)	MITIGABLE: TOTAL (ft^2)	BUFFER REPLACEMENT: ZONE 1 (ft^2)	BUFFER REPLACEMENT: ZONE 2 (ft^2)
Jordan Watershed													
1	24" CSP	-L- 55+67 TO 57+11 RT	X			2115	2850	4965					
1	UNDER 24" CSP	-L- 55+67 TO 57+11 RT	X						32	41	73		
6	48" RCP	-Y7- 17+65 TO 20+58	X						17807	12794	30601		
TOTAL:						**2115**	**2850**	**4965**	**17839**	**12835**	**30674**		
Randleman Watershed													
2	ROADWAY FILL	-Y2- 24+00 TO 25+64 RT			X				176	0	176		
3	ROADWAY FILL	-Y2- 30+08 TO 41+09 RT			X				6007	7311	13318		
4	ROADWAY DITCH	-Y2- 34+89 TO 35+15 LT	STORMWATER MANAGEMENT			54	572	626					
5	48" RCP	-Y2- 44+16 TO 47+50	X						10804	2788	13592		
5	PSH	-Y2- 45+75 LT	STORMWATER MANAGEMENT			0	67	67					
7	ROADWAY FILL	-Y2- 44+16 TO 47+94			X				1165	234	1399		
TOTAL:						**54**	**639**	**693**	**18152**	**10333**	**28485**		

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

FORSYTH & GUILFORD COUNTIES
PROJECT: 34858.3.3 (U-2800)

BUFFER DRAWING 4 OF 13

BUFFER IMPACTS SUMMARY

		WETLANDS IN BUFFER	
Site	Station	ZONE 1 (ft^2)	ZONE 2 (ft^2)
Randleman Watershed			
3	-Y2- 38+09 TO 39+60 RT	1199	99
TOTALS:		**1199**	**99**

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

FORSYTH & GUILFORD COUNTIES
PROJECT: 34858.3.3 (U-2800)

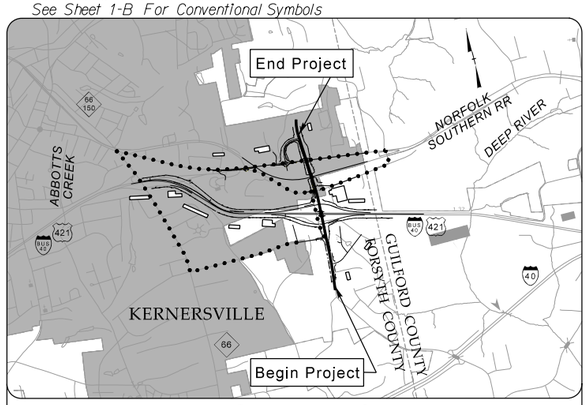
BUFFER DRAWING 5 OF 13

09/08/99

TIP PROJECT: U-2800

CONTRACT: C202853

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



VICINITY MAP N.T.S.

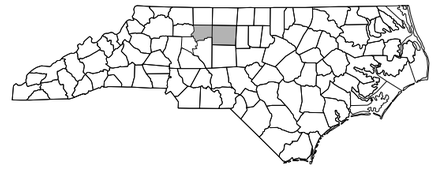
OFFSITE DETOUR ROUTES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

FORSYTH / GUILFORD COUNTIES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2800	1	

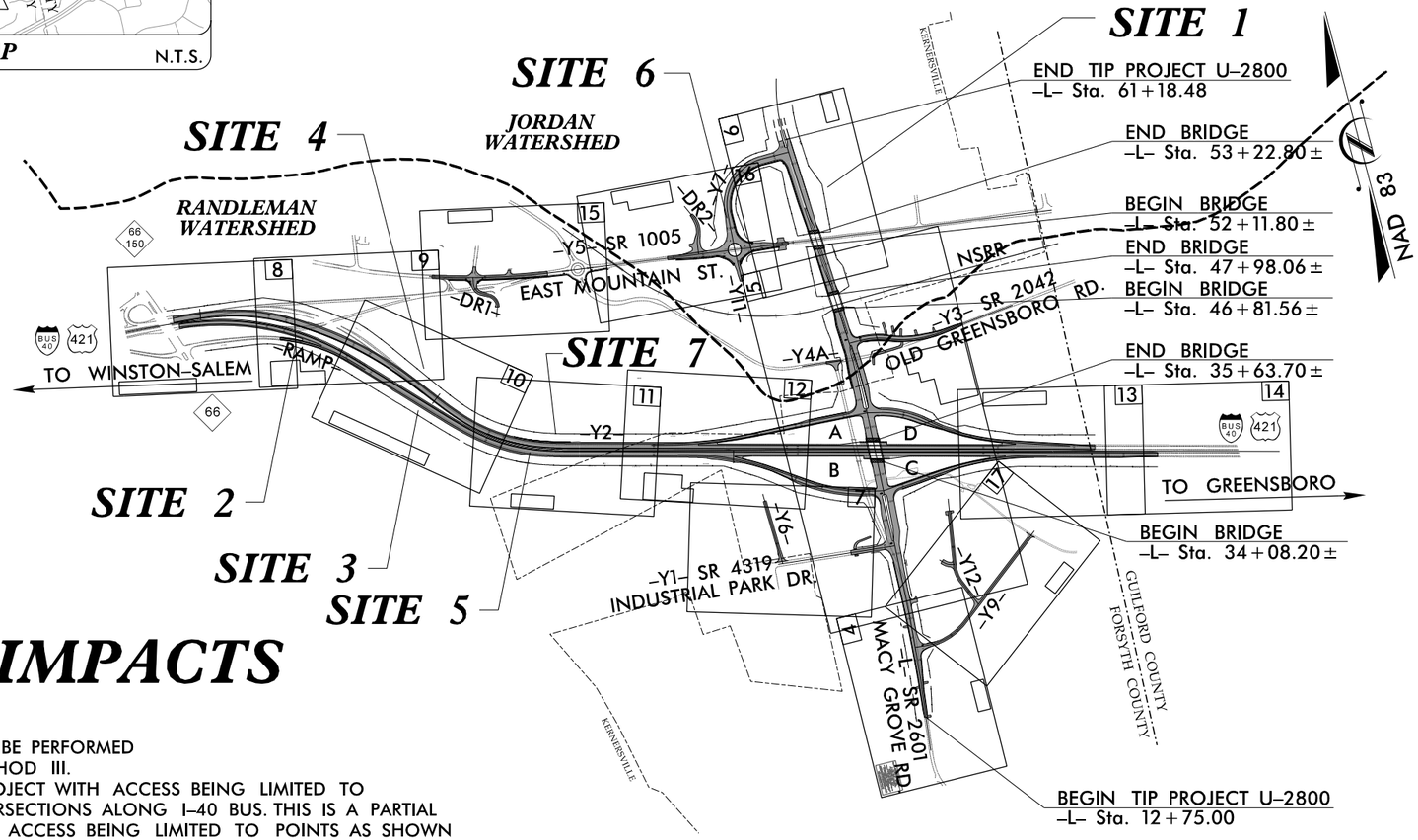
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34858.3.3	STP-2601 (1)	



LOCATION: ***KERNERSVILLE – SR 2601 (MACY GROVE ROAD)***
FROM SOUTH OF SR 4319 (INDUSTRIAL PARK DRIVE) TO
NORTH OF SR 1005 (EAST MOUNTAIN STREET) IN KERNERSVILLE
TYPE OF WORK: BUFFER IMPACTS

ENGLISH

BUFFER DRAWING
SHEET 6 OF 13



BUFFER IMPACTS

NOTES:
1. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.
2. THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES AND AT GRADE INTERSECTIONS ALONG I-40 BUS. THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS FOR MACY GROVE RD.
3. A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF KERNERSVILLE.

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

GRAPHIC SCALES

PLANS: 50 25 0 50 100
PROFILE (HORIZONTAL): 50 25 0 50 100
PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2012 = 12,500
ADT 2030 = 34,400
DHV = 10 %
D = 55 %
T = 9 % *
V = 50 MPH

* (TTST 2% + DUALS 7%)

FUNC. CLASS = URBAN COLLECTOR

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-2800.....	0.844 mi
LENGTH STRUCTURE TIP PROJECT U-2800.....	0.073 mi
TOTAL LENGTH TIP PROJECT U-2800.....	0.917 mi

DESIGN - BUILD TEAM

RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE, SUITE 350
RALEIGH, NORTH CAROLINA 27609
NC LICENSE NO. F-0112
1-888-521-4455 OR 919-878-9560

FOR
DIVISION OF HIGHWAYS

2012 STANDARD SPECIFICATIONS

LETTING DATE:
AUGUST 13, 2012

J. T. Peacock, Jr., P.E.
PROJECT ENGINEER

Brandon J. McInnis, P.E.
PROJECT DESIGN ENGINEER

CONTRACTOR :
Blythe
BLYTHE DEVELOPMENT COMPANY
1415 E.WESTINGHOUSE BLVD.
CHARLOTTE,NC 28273

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

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

3/19/2013
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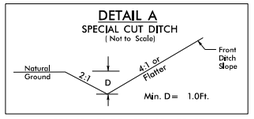
PROJECT REFERENCE NO.	SHEET NO.
U–2800	DITCH DETAILS
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

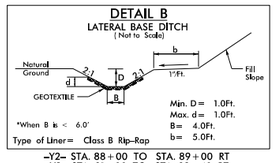
BUFFER DRAWING SHEET 7 OF 13

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



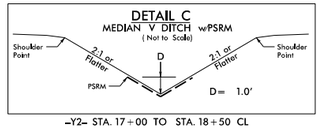
–L– STA. 12+71 TO STA. 13+50 RT
–L– STA. 12+72 TO STA. 25+50 LT
–DR2– STA. 11+00 TO STA. 12+50 LT & RT
–RPA– STA. 18+15 TO STA. 20+15 LT (USE 6:1)
–RPB– STA. 16+95 TO STA. 19+90 RT
–RPD– STA. 18+85 TO STA. 20+75 LT
–Y2– STA. 20+00 TO STA. 24+50 LT
–Y2– STA. 22+50 TO STA. 24+00 RT
–Y2– STA. 31+50 TO STA. 35+00 RT
–Y2– STA. 39+50 TO STA. 41+50 LT
–Y2– STA. 44+00 TO STA. 45+00 LT
–Y2– STA. 47+50 TO STA. 51+50 RT (USE 6:1)
–Y2– STA. 54+00 TO STA. 57+00 LT (USE 6:1)
–Y2– STA. 62+00 TO STA. 66+50 LT
–Y2– STA. 75+00 TO STA. 83+50 LT
–Y2– STA. 80+50 TO STA. 81+50 RT
–Y2– STA. 93+50 TO STA. 96+58 RT
–Y6– STA. 10+65 TO STA. 11+00 RT
–Y6– STA. 11+00 TO STA. 11+50 LT
–Y12– STA. 16+00 TO STA. 17+50 RT
–Y12A– STA. 10+25 TO STA. 10+75 LT

DETAIL B
LATERAL BASE DITCH
(Not to Scale)



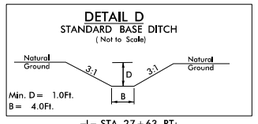
–Y2– STA. 88+00 TO STA. 89+00 RT
–Y2– STA. 91+00 TO STA. 92+40 RT
–Y12– STA. 14+50 TO STA. 16+00 RT

DETAIL C
MEDIAN V DITCH w/PSRM
(Not to Scale)



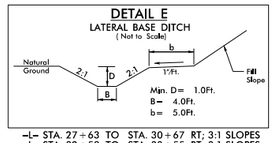
–Y2– STA. 17+00 TO STA. 18+50 CL

DETAIL D
STANDARD BASE DITCH
(Not to Scale)



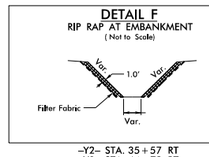
–L– STA. 27+63 RT;
FIRST 60' SEE DETAIL Q;
NEXT 89'; L=89', S=1.55%
BEG EL=957.0, END EL=955.6;
LAST 61'; L=61', S=0.30%
BEG EL=955.6, END EL=955.4

DETAIL E
LATERAL BASE DITCH
(Not to Scale)



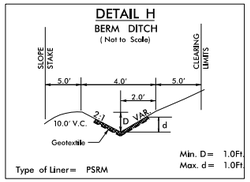
–L– STA. 27+63 TO STA. 30+67 RT; 3:1 SLOPES
–L– STA. 32+58 TO STA. 33+55 RT; 3:1 SLOPES
–L– STA. 54+00 TO STA. 58+00 LT; 3:1 SLOPES
–RPB– STA. 19+90 TO STA. 21+65 RT
–RPC– STA. 18+00 TO STA. 21+94 RT; 3:1 SLOPES
–Y2– STA. 35+00 TO STA. 39+00 LT; 3:1 SLOPES
–Y2– STA. 89+00 TO STA. 91+00 RT
–Y2– STA. 92+40 TO STA. 93+50 RT
–Y5– STA. 17+00 TO STA. 19+50 LT; 3:1 SLOPES
–Y9– STA. 10+72 TO STA. 16+12 LT
–Y9– STA. 17+00 TO STA. 18+25 RT
–Y12– STA. 10+34 TO STA. 11+00 LT
–Y12– STA. 14+50 TO STA. 16+00 RT

DETAIL F
RIP RAP AT EMBANKMENT
(Not to Scale)



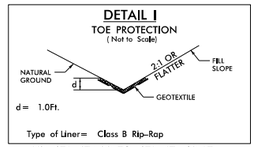
–Y2– STA. 35+57 RT
–Y2– STA. 44+79 RT
–Y7– STA. 18+39 RT

DETAIL H
BERM DITCH
(Not to Scale)



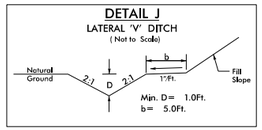
–Y5– STA. 31+00 TO STA. 34+00 RT

DETAIL I
TOE PROTECTION
(Not to Scale)



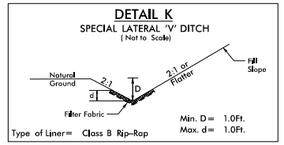
–Y2– STA. 47+00 TO STA. 47+60 LT
–Y7– STA. 17+50 TO STA. 20+40 LT
–Y7– STA. 18+40 TO STA. 20+20 RT
–Y9– STA. 18+00 TO STA. 19+50 LT

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



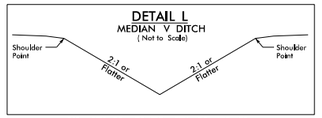
–Y3– STA. 14+75 TO STA. 16+50 LT (3:1 SIDE SLOPES)
–Y9– STA. 13+00 TO STA. 17+00 RT
–Y9– STA. 17+15 TO STA. 18+00 LT

DETAIL K
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



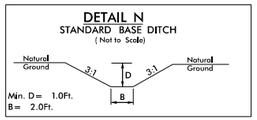
–Y12– STA. 14+50 TO STA. 16+00 LT

DETAIL L
MEDIAN V DITCH
(Not to Scale)



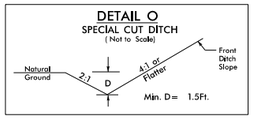
–Y2– STA. 18+50 TO STA. 22+50 CL
–Y2– STA. 24+00 TO STA. 26+00 CL
–Y2– STA. 32+50 TO STA. 36+00 CL
–Y2– STA. 39+50 TO STA. 41+50 CL
–Y2– STA. 48+20 TO STA. 50+00 CL

DETAIL N
STANDARD BASE DITCH
(Not to Scale)



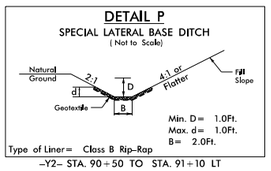
–DR1– STA. 11+40 LT; L=311', S=0.50%
BEG EL=967.9, END EL=966.2
–RPD– STA. 19+06 RT; L=48', S=0.42%
BEG EL=965.7, END EL=965.5
–Y1– STA. 10+64 TO STA. 12+77 LT
L=213', S=0.30%
BEG EL=954.5, END EL=953.8

DETAIL O
SPECIAL CUT DITCH
(Not to Scale)



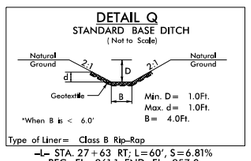
–Y3– STA. 17+50 TO STA. 19+00 LT

DETAIL P
SPECIAL LATERAL BASE DITCH
(Not to Scale)



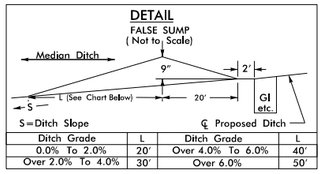
–Y2– STA. 90+50 TO STA. 91+10 LT

DETAIL Q
STANDARD BASE DITCH
(Not to Scale)



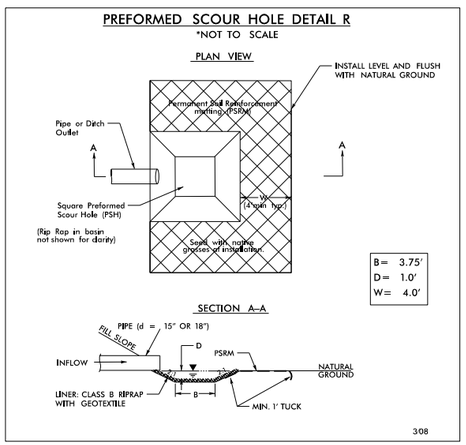
–L– STA. 27+63 RT; L=60', S=6.81%
BEG EL=961.1, END EL=957.0

DETAIL
FALSE SUMP
(Not to Scale)

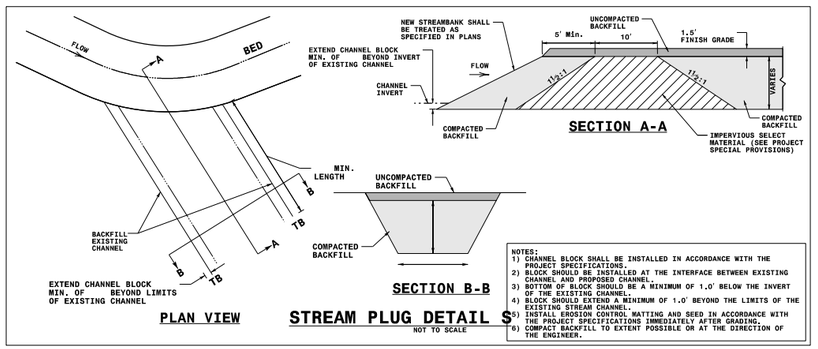


Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

PREFORMED SCOUR HOLE DETAIL R
*NOT TO SCALE



–Y2– STA. 45+43 LT



–Y2– STA. 45+00 RT

PLANS PREPARED BY :

RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609–3960
NC LICENSE NO. F–0112 • (919) 878–9560

3/19/2013
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GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA
DA= 0.50ac SLOPE= 1.16% L REQ.= 0' L PRO.= 200' (ADD. 200') Q2= 1.36cfs V2= 1.90ft/s D2= 0.69' Q10= 1.76cfs V10= 2.03ft/s D10= 0.76'	DA= 7.86ac SLOPE= 0.30% L REQ.= 0' L PRO.= 61' (ADD. 61') Q2= 17.92cfs V2= 1.56ft/s D2= 0.99' Q10= 23.29cfs V10= 1.85ft/s D10= 1.05'	DA= 2.08ac (6.50ac TOT) SLOPE= 0.30% L REQ.= 0' L PRO.= 304' (ADD. 304') Q2= 15.70cfs V2= 1.51ft/s D2= 0.92' Q10= 21.63cfs V10= 1.81ft/s D10= 1.02'	DA= 1.91ac SLOPE= 1.30% L REQ.= 0' L PRO.= 97' (ADD. 97') Q2= 6.04cfs V2= 1.76ft/s D2= 0.40' Q10= 7.81cfs V10= 1.90ft/s D10= 0.46'	DA= 0.74ac SLOPE= 1.86% L REQ.= 74' L PRO.= 215' (ADD. 141') Q2= 1.84cfs V2= 1.34ft/s D2= 0.18' Q10= 2.38cfs V10= 1.46ft/s D10= 0.21'	DA= 1.06ac SLOPE= 2.75% L REQ.= 106' L PRO.= 150' (ADD. 44') Q2= 2.87cfs V2= 1.77ft/s D2= 0.21' Q10= 3.72cfs V10= 1.93ft/s D10= 0.25'	DA= 1.33ac SLOPE= 1.65% L REQ.= 133' L PRO.= 150' (ADD. 17') Q2= 3.01cfs V2= 1.89ft/s D2= 0.52' Q10= 3.89cfs V10= 2.02ft/s D10= 0.57'	DA= 2.50ac SLOPE= 0.30% L REQ.= 0' L PRO.= 394' (ADD. 394') Q2= 4.93cfs V2= 1.08ft/s D2= 0.50' Q10= 6.63cfs V10= 1.18ft/s D10= 0.59'	DA= 1.52ac SLOPE= 0.42% L REQ.= 0' L PRO.= 48' (ADD. 48') Q2= 3.44cfs V2= 1.35ft/s D2= 0.65' Q10= 4.45cfs V10= 1.45ft/s D10= 0.73'	DA= 2.05ac SLOPE= 0.30% L REQ.= 205' L PRO.= 213' (ADD. 8') Q2= 6.02cfs V2= 1.43ft/s D2= 0.90' Q10= 7.79cfs V10= 1.69ft/s D10= 0.95'	DA= 1.16ac SLOPE= 0.80% L REQ.= 116' L PRO.= 150' (ADD. 34') Q2= 3.67cfs V2= 1.86ft/s D2= 0.86' Q10= 4.75cfs V10= 1.98ft/s D10= 0.95'	DA= 2.82ac SLOPE= 0.34% L REQ.= 282' L PRO.= 450' (ADD. 168') Q2= 5.74cfs V2= 1.87ft/s D2= 1.07' Q10= 7.42cfs V10= 2.00ft/s D10= 1.18'	DA= 0.57ac SLOPE= 1.20% L REQ.= 57' L PRO.= 100' (ADD. 43') Q2= 1.80cfs V2= 1.81ft/s D2= 0.61' Q10= 2.33cfs V10= 1.93ft/s D10= 0.67'	DA= 0.35ac SLOPE= 1.01% L REQ.= 35' L PRO.= 200' (ADD. 165') Q2= 1.19cfs V2= 0.93ft/s D2= 0.31' Q10= 1.54cfs V10= 1.62ft/s D10= 0.60'
SPECIAL CUT DITCH A –L– STA. 23+50 TO 25+50 LT	STANDARD BASE DITCH D –L– STA. 27+63 RT ENTERING BUFFER	LATERAL BASE DITCH E –L– STA. 27+63 TO 30+67 RT	LATERAL BASE DITCH E –L– STA. 32+58 TO 33+55 RT (SEE –L– 27+63 TO 30+67 RT FOR ADDITIONAL LENGTH)	LATERAL BASE DITCH E –L– STA. 54+00 TO 56+15 LT	LATERAL BASE DITCH E –L– STA. 56+50 TO 58+00 LT	SPECIAL CUT DITCH A –RPA– STA. 18+15 TO 20+15 LT	LATERAL BASE DITCH E –RPC– STA. 18+00 TO 21+94 RT	STANDARD BASE DITCH N –RPD– STA. 19+06 RT	STANDARD BASE DITCH N –Y1– STA. 10+64 TO 12+77 LT	MEDIAN V DITCH L –Y2– STA. 18+50 TO 20+00 CL	SPECIAL CUT DITCH A –Y2– STA. 20+00 TO 24+50 LT	MEDIAN V DITCH L –Y2– STA. 21+50 TO 22+50 CL	SPECIAL CUT DITCH A –Y2– STA. 22+50 TO 24+00 RT

GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA
DA= 0.83ac SLOPE= 1.00% L REQ.= 83' L PRO.= 100' (ADD. 17') Q2= 2.45cfs V2= 1.94ft/s D2= 0.79' Q10= 3.17cfs V10= 2.07ft/s D10= 0.87'	DA= 1.38ac SLOPE= 0.34% L REQ.= 138' L PRO.= 271' (ADD. 133') Q2= 4.48cfs V2= 1.87ft/s D2= 1.08' Q10= 5.80cfs V10= 2.00ft/s D10= 1.19'	DA= 0.69ac SLOPE= 0.33% L REQ.= 69' L PRO.= 350' (ADD. 281') Q2= 2.19cfs V2= 1.68ft/s D2= 0.93' Q10= 2.83cfs V10= 1.98ft/s D10= 0.98'	DA= 3.50ac SLOPE= 0.42% L REQ.= 350' L PRO.= 400' (ADD. 50') Q2= 5.72cfs V2= 1.28ft/s D2= 0.50' Q10= 7.47cfs V10= 1.37ft/s D10= 0.57'	DA= 0.57ac SLOPE= 0.82% L REQ.= 57' L PRO.= 79' (ADD. 22') Q2= 1.49cfs V2= 1.60ft/s D2= 0.68' Q10= 1.92cfs V10= 1.71ft/s D10= 0.74'	DA= 0.16ac SLOPE= 0.78% L REQ.= 16' L PRO.= 12' Q2= 0.33cfs V2= 1.05ft/s D2= 0.46' Q10= 0.43cfs V10= 1.17ft/s D10= 0.50'	DA= 1.38ac SLOPE= 0.35% L REQ.= 138' L PRO.= 150' (ADD. 12') Q2= 4.79cfs V2= 1.93ft/s D2= 1.10' Q10= 6.20cfs V10= 2.05ft/s D10= 1.22'	DA= 1.82ac SLOPE= 0.43% L REQ.= 182' L PRO.= 188' (ADD. 6') Q2= 2.97cfs V2= 1.98ft/s D2= 1.00' Q10= 3.89cfs V10= 2.12ft/s D10= 1.11'	DA= 1.05ac SLOPE= 1.80% L REQ.= 105' L PRO.= 200' (ADD. 95') Q2= 1.68cfs V2= 1.71ft/s D2= 0.49' Q10= 2.50cfs V10= 1.99ft/s D10= 0.51'	DA= 0.92ac SLOPE= 0.30% L REQ.= 92' L PRO.= 100' (ADD. 8') Q2= 2.35cfs V2= 1.15ft/s D2= 0.88' Q10= 3.08cfs V10= 1.23ft/s D10= 0.97'	DA= 2.27ac SLOPE= 0.85% L REQ.= 277' L PRO.= 300' Q2= 7.51cfs V2= 1.87ft/s D2= 0.82' Q10= 9.72cfs V10= 2.03ft/s D10= 0.89'	DA= 1.15ac SLOPE= 1.15% L REQ.= 115' L PRO.= 130' (ADD. 15') Q2= 2.34cfs V2= 1.90ft/s D2= 0.68' Q10= 3.03cfs V10= 2.03ft/s D10= 0.75'	DA= 0.81ac SLOPE= 2.01% L REQ.= 81' L PRO.= 400' (ADD. 319') Q2= 2.20cfs V2= 1.74ft/s D2= 0.46' Q10= 2.84cfs V10= 1.94ft/s D10= 0.50'	DA= 1.31ac SLOPE= 1.40% L REQ.= 131' L PRO.= 200' (ADD. 69') Q2= 3.55cfs V2= 1.88ft/s D2= 0.56' Q10= 4.60cfs V10= 2.00ft/s D10= 0.62'
MEDIAN V DITCH L –Y2– STA. 25+00 TO 26+00 CL	MEDIAN V DITCH L –Y2– STA. 32+50 TO 35+21 CL	SPECIAL CUT DITCH A –Y2– STA. 31+50 TO 35+00 RT	LATERAL BASE DITCH E –Y2– STA. 35+00 TO 39+00 LT	MEDIAN V DITCH L –Y2– STA. 35+21 TO 36+00 CL	SPECIAL CUT DITCH A –Y2– STA. 39+50 TO 39+62 LT	MEDIAN V DITCH L –Y2– STA. 39+50 TO 41+00 CL	SPECIAL CUT DITCH A –Y2– STA. 39+62 TO 41+50 LT	CUT DITCH –Y2– STA. 42+00 TO 44+00 LT	SPECIAL CUT DITCH A –Y2– STA. 44+00 TO 45+00 LT	SPECIAL CUT DITCH A –Y2– STA. 47+00 TO 51+50 RT	MEDIAN V DITCH L –Y2– STA. 48+20 TO 50+00 CL	CUT DITCH –Y2– STA. 50+00 TO 54+00 LT	SPECIAL CUT DITCH A –Y2– STA. 54+00 TO 56+00 LT

GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA
DA= 1.51ac SLOPE= 0.69% (AVE.) L REQ.= 151' L PRO.= 400' (ADD. 249') Q2= 4.44cfs V2= 1.52ft/s D2= 0.70' Q10= 5.74cfs V10= 1.62ft/s D10= 0.77'	DA= 0.63ac SLOPE= 1.67% L REQ.= 63' L PRO.= 200' (ADD. 137') Q2= 1.85cfs V2= 1.89ft/s D2= 0.50' Q10= 2.40cfs V10= 1.98ft/s D10= 0.54'	DA= 1.38ac SLOPE= 0.30% L REQ.= 138' L PRO.= 250' (ADD. 112') Q2= 3.43cfs V2= 1.26ft/s D2= 1.00' Q10= 4.44cfs V10= 1.49ft/s D10= 1.06'	DA= 2.81ac SLOPE= 0.30% L REQ.= 0' L PRO.= 600' (ADD. 600') Q2= 4.26cfs V2= 1.48ft/s D2= 1.04' Q10= 6.53cfs V10= 1.85ft/s D10= 1.15'	DA= 0.13ac SLOPE= 0.30% L REQ.= 0' L PRO.= 50' (ADD. 50') Q2= 0.35cfs V2= 0.66ft/s D2= 0.45' Q10= 0.46cfs V10= 0.70ft/s D10= 0.50'	DA= 2.26ac SLOPE= 3.00% L REQ.= 0' L PRO.= 650' (ADD. 424') Q2= 4.60cfs V2= 1.86ft/s D2= 0.25' Q10= 5.95cfs V10= 2.01ft/s D10= 0.28'	DA= 1.09ac SLOPE= 2.80% L REQ.= 0' L PRO.= 550' (ADD. 441') Q2= 1.98cfs V2= 1.41ft/s D2= 0.16' Q10= 2.56cfs V10= 1.53ft/s D10= 0.18'	DA= 2.38ac SLOPE= 0.63% L REQ.= 0' L PRO.= 250' (ADD. 250') Q2= 6.99cfs V2= 1.45ft/s D2= 0.50' Q10= 9.05cfs V10= 1.68ft/s D10= 0.57'	DA= 0.94ac SLOPE= 0.50% L REQ.= 0' L PRO.= 311' (ADD. 311') Q2= 2.13cfs V2= 1.28ft/s D2= 0.50' Q10= 2.76cfs V10= 1.35ft/s D10= 0.56'
CUT DITCH –Y2– STA. 59+00 TO 63+00 LT	SPECIAL CUT DITCH A –Y2– STA. 62+00 TO 64+00 LT	SPECIAL CUT DITCH A –Y2– STA. 64+00 TO 66+50 LT	SPECIAL CUT DITCH A –Y2– STA. 74+50 TO 80+50 LT	SPECIAL CUT DITCH A –Y2– STA. 83+00 TO 83+50 LT	SWALE –Y2_LT– STA. 26+09 L=650'	SWALE –Y2_LT– STA. 26+63 L=550'	LATERAL BASE DITCH E –Y5– STA. 17+00 TO 19+50 LT	STANDARD BASE DITCH N –DR1– STA. 11+40 LT	

PROJECT REFERENCE NO.	SHEET NO.
U–2800	DITCH DETAILS
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

BUFFER DRAWING SHEET 8 OF 13

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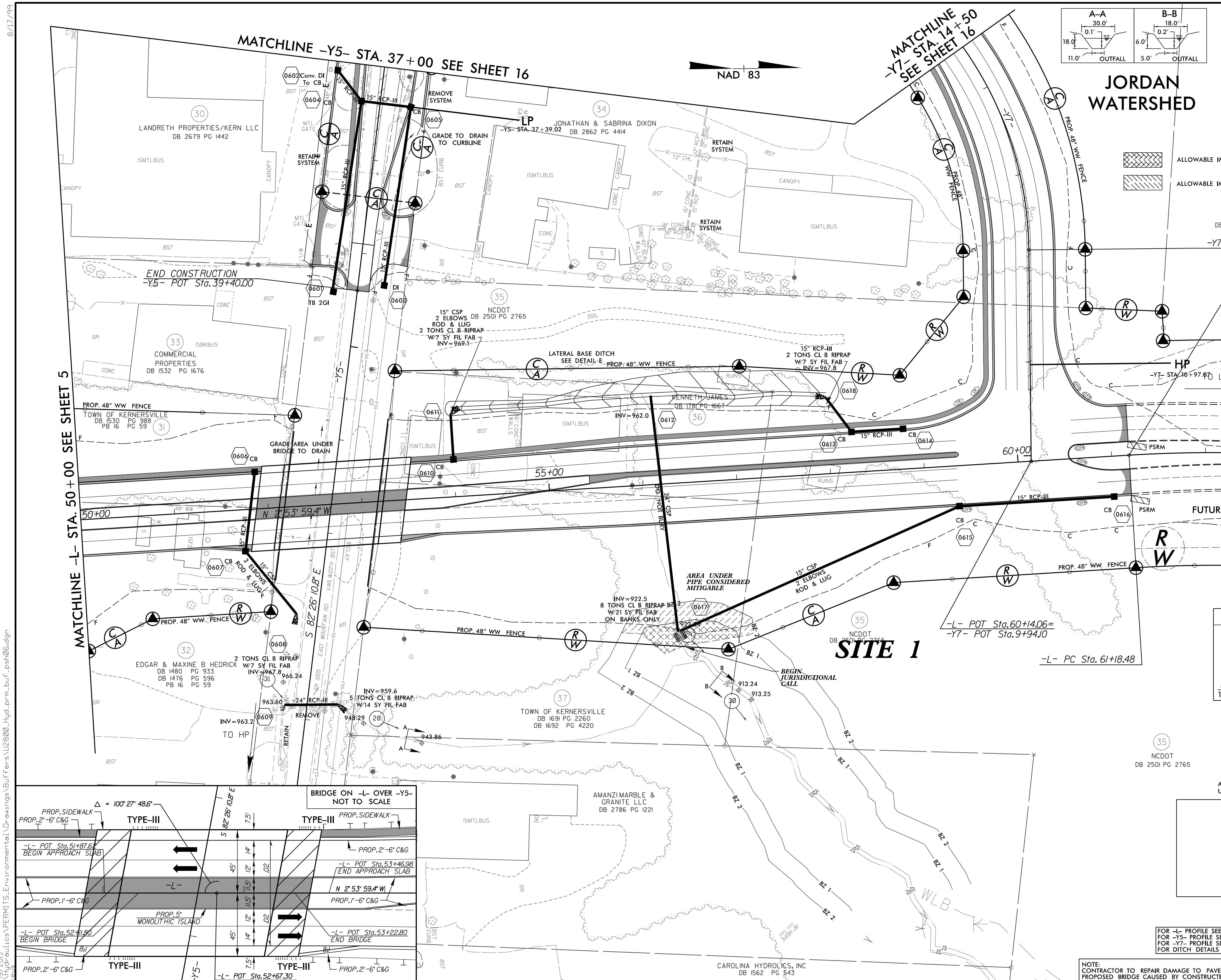

MATCHLINE -Y5- STA. 37+00 SEE SHEET 16
MATCHLINE -Y7- STA. 14+50 SEE SHEET 16
MATCHLINE -L- STA. 50+00 SEE SHEET 5
NAD 83
JORDAN WATERSHED
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
A-A
B-B
OUTFALL
LANDRETH PROPERTIES/KERN LLC
DB 2679 PG 1442
JONATHAN & SABRINA DIXON
DB 2862 PG 4414
NCDOT
DB 2501 PG 2765
COMMERCIAL PROPERTIES
DB 1532 PG 1676
TOWN OF KERNERSVILLE
DB 1530 PG 988
PB 16 PG 59
KENNETH JAMES
DB 1781 PG 1667
EDGAR & MAXINE B HEDRICK
DB 1480 PG 933
DB 1476 PG 596
PB 16 PG 59
TOWN OF KERNERSVILLE
DB 1691 PG 2260
DB 1692 PG 4220
AMANZI MARBLE & GRANITE LLC
DB 2786 PG 1221
CAROLINA HYDROLICS, INC
DB 1562 PG 543
END CONSTRUCTION
-Y5- POT Sta.39+40.00
LP
-Y5- STA. 37+39.02
GRADE TO DRAIN TO CURBLINE
REMOVE SYSTEM
RETAIN SYSTEM
LATERAL BASE DITCH SEE DETAIL E
PROP. 48" WW FENCE
GRADE AREA UNDER BRIDGE TO DRAIN
15" CSP 2 ELBOWS ROD & LUG 2 TONS CL B RIPRAP W/7 SY FIL FAB INV=969.1
15" RCP-III 2 TONS CL B RIPRAP W/7 SY FIL FAB INV=967.8
INV=962.0
24" CSP DO NOT BURY
AREA UNDER PIPE CONSIDERED MITIGABLE
INV=922.5 8 TONS CL B RIPRAP W/21 SY FIL FAB ON BANKS ONLY
15" CSP 2 ELBOWS ROD & LUG
2 TONS CL B RIPRAP W/7 SY FIL FAB INV=967.8
INV=959.6 5 TONS CL B RIPRAP W/14 SY FIL FAB
INV=963.2
TO HP
REMOVE
END PROJECT
-L- PC Sta. 61+18.48
HP
-Y7- STA. 10+97.97
-Y7- PC Sta. 12+19.11
FUTURE MACY GROVE ROAD EXTENSION
-L- POT Sta.60+14.06= -Y7- POT Sta.9+94.10
-L- PC Sta. 61+18.48
SITE 1
BEGIN JURISDICTIONAL CALL
APPROXIMATE LIMITS OF UNREGULATED LANDFILL
BRIDGE ON -L- OVER -Y5- NOT TO SCALE
TYPE-III
PROP. SIDEWALK
PROP. 2'-6" C&G
PROP. 1'-6" C&G
PROP. 5' MONOLITHIC ISLAND
-L- POT Sta.51+87.62 BEGIN APPROACH SLAB
-L- POT Sta.53+46.98 END APPROACH SLAB
-L- POT Sta.51+81.80 BEGIN BRIDGE
-L- POT Sta.53+22.80 END BRIDGE
-L- POT Sta.52+67.30
-Y5- POT Sta.41+69.22
N 2°53' 59.4" W
S 82°26' 10.8" E

PROJECT REFERENCE NO. U-2800 | SHEET NO. 6

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS — DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS — DO NOT USE FOR CONSTRUCTION

BUFFER DRAWING SHEET 9 OF 13

ENGLISH

-Y7- LOOP		
ADT 2012	7,500	-Y7-
ADT 2030	18,800	
	4,200 / 10,400	3,300 / 8,400
5,900 / 17,200	MACY GROVE ROAD	5,100 / 15,200

FOR -L- PROFILE SEE SHT. 19
FOR -Y5- PROFILE SEE SHT. 31
FOR -Y7- PROFILE SEE SHT. 31
FOR DITCH DETAILS SEE SHT. 2-M

NOTE:
CONTRACTOR TO REPAIR DAMAGE TO PAVEMENT UNDER PROPOSED BRIDGE CAUSED BY CONSTRUCTION ACTIVITY.

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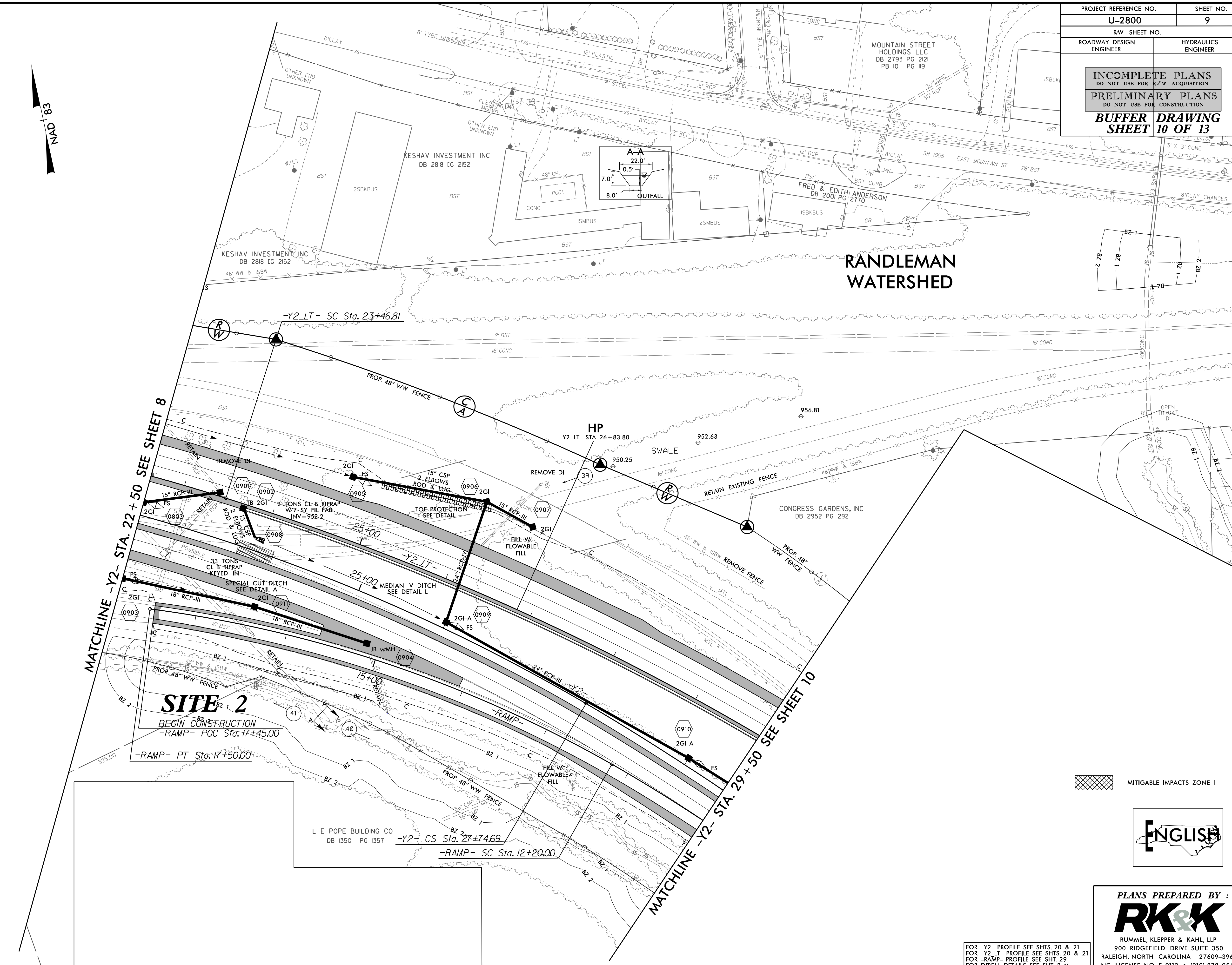
PROJECT REFERENCE NO.	SHEET NO.
U-2800	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

BUFFER SHEET **DRAWING 10 OF 13**



NAD 83
RANDLEMAN WATERSHED
KESHAV INVESTMENT INC
DB 2818 EG 2152
MOUNTAIN STREET HOLDINGS LLC
DB 2793 PG 2121
PB 10 PG 119
FRED & EDITH ANDERSON
DB 2001 PG 2770
CONGRESS GARDENS, INC
DB 2952 PG 292
L E POPE BUILDING CO
DB 1350 PG 1357
EAST MOUNTAIN ST
SR 1005
A-A
22.0'
0.5'
7.0'
8.0'
OUTFALL
-Y2_LT- SC Sta. 23+46.81
PROP 48" WW FENCE
HP
-Y2 LT- STA. 26+83.80
SWALE
REMOVE DI
RETAIN EXISTING FENCE
REMOVE FENCE
15" CSP
2 ELBOWS
ROD & LUG
TOE PROTECTION
SEE DETAIL I
2 TONS CL B RIPRAP
W/7 SY FIL FAB
INV=952.2
FILL W/ FLOWABLE FILL
33 TONS
CL B RIPRAP
KEYED IN
SPECIAL CUT DITCH
SEE DETAIL A
MEDIAN V DITCH
SEE DETAIL L
-Y2_LT-
-Y2-
-RAMP-
SITE 2
BEGIN CONSTRUCTION
-RAMP- POC Sta. 17+45.00
-RAMP- PT Sta. 17+50.00
-Y2- CS Sta. 27+74.69
-RAMP- SC Sta. 12+20.00
MATCHLINE -Y2- STA. 22+50 SEE SHEET 8
MATCHLINE -Y2- STA. 29+50 SEE SHEET 10
MITIGABLE IMPACTS ZONE 1
ENGLISH

FOR -Y2- PROFILE SEE SHTS. 20 & 21
FOR -Y2_LT- PROFILE SEE SHTS. 20 & 21
FOR -RAMP- PROFILE SEE SHT. 29
FOR DITCH DETAILS SEE SHT. 2-M

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PROJECT REFERENCE NO.	SHEET NO.
U-2800	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

BUFFER DRAWING SHEET 11 OF 13

ENGLISH

MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2

MATCHLINE -Y2- STA. 29+50 SEE SHEET 9

MATCHLINE -Y2- STA. 42+50 SEE SHEET 11

NAD 83

CONGRESS GARDENS, INC
DB 2952 PG 292

CONGRESS GARDENS INC
DB 2715 PG 387

GARDEN TOWERS, LLP
DB 2963 PG 1013

MICHAEL YORK
DB 794 PG 33
DB 903 PG 611
DB 1119 PG 884
DB 905 PG 395
DB 957 PG 184
DB 1039 PG 505
DB 996 PG 444
DB 1143 PG 1615

-Y2- ST Sta. 30+54.69

-Y2_LT- CS Sta. 32+96.74

-Y2_LT- SRS Sta. 36+26.74

-Y2_LT- SC Sta. 40+56.74

-Y2- TS Sta. 37+41.54

-RAMP- ST Sta. 10+00.00

-Y2- SC Sta. 41+71.54

LP
-Y2- STA. 35+28.66

LP
Y2 LT- STA. 39+84.42

S 43° 35' 53.4" E

SITE 4

SITE 3

SITE 3

RANDLEMAN WATERSHED

A-A	B-B	C-C
12.0'	15.0'	8.0'
0.3'	0.5'	0.1'
3.5'	2.5'	1.0'
5.0' INFALL	10.0' OUTFALL	5.0' OUTFALL

FOR -Y2- PROFILE SEE SHTS. 21 & 22
FOR -Y2_LT- PROFILE SEE SHTS. 21 & 22
FOR -RAMP- PROFILE SEE SHT. 29
FOR DITCH DETAILS SEE SHT. 2-M

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PROJECT REFERENCE NO.	SHEET NO.
U-2800	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

BUFFER SHEET | **DRAWING 12 OF 13**

NAD 83

MATCHLINE -Y2- STA. 42+50 SEE SHEET 10

MATCHLINE -Y2- STA. 54+50 SEE SHEET 12

RANDLEMAN WATERSHED

SITE 5

SITE 7

SITE 5

-Y2- CS Sta. 45+18.91=
-Y2_LT- PT Sta. 45+45.52 (15' LT)

-Y2- ST Sta. 49+48.91

PSH
Q10 = 3.77cfs
V10 = 0.69ft/s

AREA UNDER PSH CONSIDERED ALLOWABLE

GRADE TO DRAIN

TOE PROTECTION SEE DETAIL L

5 TONS CL B RIPRAP W/14 SY FIL FAB INV=919.8

2 TONS CL B RIPRAP W/7 SY FIL FAB INV=935.7

PSH SEE DETAIL R INV=928.0

JB w/Slab Lid

MEDIAN V DITCH SEE DETAIL L

18" CSP 2 ELBOWS ROD & LUG

STREAM PLUG SEE DETAIL S

REMOVE EXIST. GUARDRAIL

RIPRAP AT EMBANKMENT SEE DETAIL F 26 TONS CL I RIPRAP W/50 SY FIL FAB ON BANKS ONLY INV=912.5

SPECIAL CUT DITCH SEE DETAIL A

PROP. 48" WW FENCE

REMOVE FENCE

FORSYTH TECHNICAL COMMUNITY COLLEGE
DB 1845 PG 798

MICHAEL YORK
DB 794 PG 33
DB 903 PG 511
DB 1119 PG 884
DB 905 PG 395
DB 957 PG 184
DB 1039 PG 505
DB 996 PG 444
DB 1143 PG 1615

SIXTY-SIX-I-40 ASSOCIATES
DB 1163 PG 1006

GARDEN TOWERS LLP
DB 2963 PG 1013

TOWN OF KERNERSVILLE
FORSYTH COUNTY

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

FOR -Y2- PROFILE SEE SHTS. 22 & 23
FOR -Y2_LT- PROFILE SEE SHTS. 22 & 23
FOR DITCH DETAILS SEE SHT. 2-M

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PROJECT REFERENCE NO.	SHEET NO.
U-2800	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

BUFFER SHEET DRAWING 13 OF 13

PROJECT REFERENCE NO.	SHEET NO.
U-2800	16

NAD 83

IMPACTS ZONE 1

IMPACTS ZONE 2

A–A		B–B	
8.0'		20.0'	
0.0'		0.5'	
1.5'		8.0'	
3.0'	ROADSIDE	6.0'	OUTFALL

MATCHLINE –Y7– STA. 14+50 SEE SHEET 6

MATCHLINE –Y5– STA. 24+00 SEE SHEET 15

MATCHLINE –Y5– STA. 37+00 SEE SHEET 6

–Y5– POT Sta.25+20.16
–RR– POT Sta.15+24.36

–DR2– POT Sta.14+28.63

–DR2– POT Sta.13+40.00
END CONSTRUCTION
–DR2– PT Sta.13+18.88

–Y7– PT Sta.17+89.14

BEGIN RESURFACING
–Y5– POT STA. 29+50.00

–DR2– PRC Sta.11+40.77

–DR2– PC Sta.10+75.00

–DR2– POT Sta.10+00.00=
–Y5– POT Sta.32+05.00

–RR– PC Sta.16+48.00

–RR– POT Sta.16+35.28

–RAB– PC Sta.10+00.00=
–RAB– PC Sta.13+39.29=
–Y5– POT Sta.34+46.00

–RAB– PCC Sta.12+57.78=
–Y7– POT Sta.20+40.46

–RAB– PCC Sta.10+90.78=
–YII– POT Sta.10+54.00

–Y5– POT Sta.35+00.00=
–Y7– POT Sta.20+94.46=
–YII– POT Sta.10+00.00

–YII– POT Sta.12+60.00
END CONSTRUCTION

–RAB– PCC Sta.11+69.65=
–Y5– POT Sta.35+54.00

SITE 6

JORDAN WATERSHED

RANDLEMAN WATERSHED

TWIN CITY PROPERTIES
DB 2071 PG 1510

JONATHAN & SABRINA DIXON
DB 2862 PG 4414

SOUTHWEST LANDCOM LP
DB 2311 PG 203

LANDRETH PROPERTIES KERN LLC
DB 2679 PG 1442

CALVARY CHAPEL OF THE TRIAD, INC
DB 2945 PG 3223

N 24° 37' 03.4" W

S 82° 26' 10.8" E

S 1° 38' 06.0" W

TO HP 25+00

HP –Y5– STA. 35+54.00

HP –RAB– STA. 10+90.10

LP –RAB– STA. 12+59.88

LP –DR2– STA. 11+32.12

LP –DR2– STA. 12+28.63

LP –Y7– STA. 16+35.28

HP –DR2– STA. 12+28.63

48" RCP-III RIPRAP AT EMBANKMENT SEE DETAIL F 26 TONS CL-I RIPRAP W/50 SY FIL FAB ON BANKS ONLY

TOE PROTECTION SEE DETAIL I

SPECIAL CUT DITCH SEE DETAIL A

BERM DITCH SEE DETAIL H

REMOVE DI & 11' 12" PLASTIC PIPE

GRADE TO DRAIN

RETAIN SYSTEM

REMOVE SYSTEM

24" RCP-III

18" CSP 2 ELBOWS ROD & LUG

15" CSP 2 ELBOWS ROD & LUG

36" CSP 2 ELBOWS ROD & LUG

36" RCP-III

NO FEATURE

STAMPED AND STAINED ASPHALT

NOTE:
#1615 HAS BEEN DESIGNED TO PICK UP THE EXISTING 36" RCP RUNNING BESIDE THE BUILDING ON PARCEL #30. IN THE EVENT THE PIPE DOES NOT CONNECT AT #1615, INVESTIGATE THE SITE TO DETERMINE WHERE TO TIE IT TO THE PROPOSED DRAINAGE.

–Y5– EAST MOUNTAIN ROAD

	–Y7–	
ADT 2012 / ADT 2030	7,500 / 18,800	
4,700 / 11,100		2,800 / 7,700
6,200 / 14,400	–Y5–	4,300 / 11,000

FOR –Y5– PROFILE SEE SHT. 31
FOR –Y7– PROFILE SEE SHT. 31
FOR –YII– PROFILE SEE SHT. 32
FOR –RAB– PROFILE SEE SHT. 33
FOR –DR2– PROFILE SEE SHT. 33
FOR ROUNDABOUT DETAIL SEE SHEET 2–L
FOR DITCH DETAILS SEE SHT. 2–M

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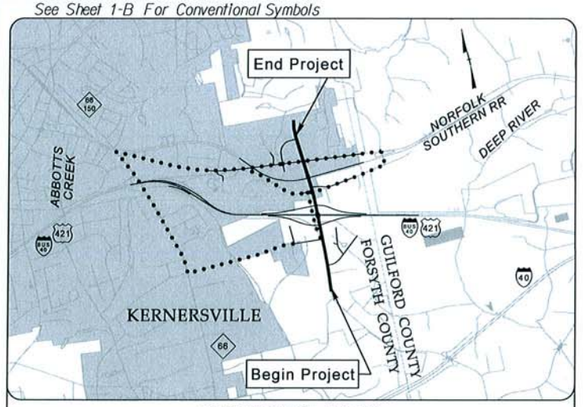
09/08/09

TIP PROJECT: U-2800

CONTRACT: C202853

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



VICINITY MAP N.T.S.

OFFSITE DETOUR ROUTES ••••••

FYI
PERMIT PACKAGE

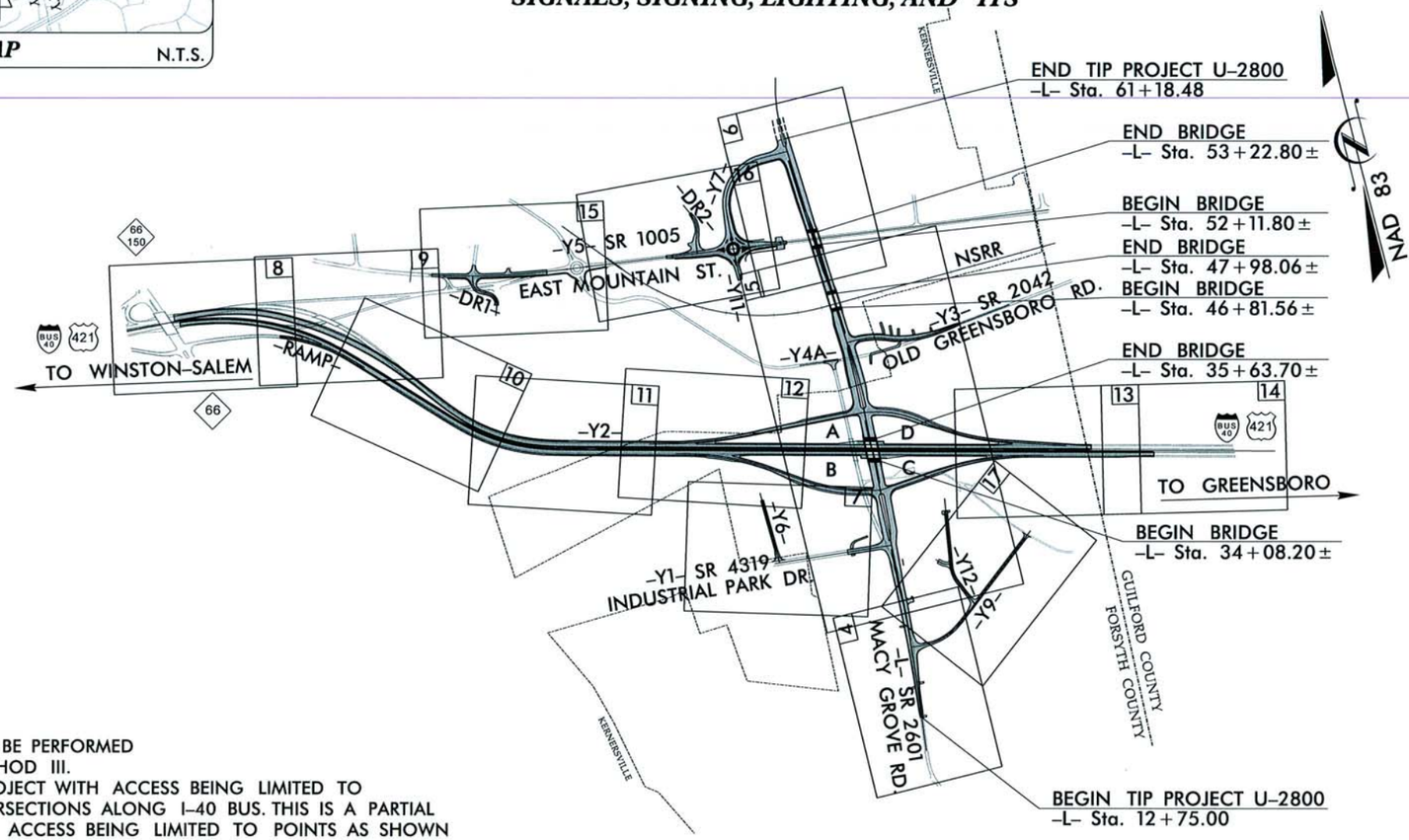
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

FORSYTH / GUILFORD COUNTIES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2800	1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
34858.3.3	STP-2601 (1)		

LOCATION: ***KERNERSVILLE – SR 2601 (MACY GROVE ROAD) FROM SOUTH OF SR 4319 (INDUSTRIAL PARK DRIVE) TO NORTH OF SR 1005 (EAST MOUNTAIN STREET) IN KERNERSVILLE***

TYPE OF WORK: ***GRADING, DRAINAGE, PAVING, STRUCTURES, SIGNALS, SIGNING, LIGHTING, AND ITS***



NOTES:
1. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.
2. THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES AND AT GRADE INTERSECTIONS ALONG I-40 BUS. THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS FOR MACY GROVE RD.
3. A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF KERNERSVILLE.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

PLANS: 50 25 0 50 100

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2012 = 12,500
ADT 2030 = 34,400
DHV = 10 %
D = 55 %
T = 9 % *
V = 50 MPH

* (TTST 2% + DUALS 7%)

FUNC. CLASS = URBAN COLLECTOR

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-2800..... 0.844 mi
LENGTH STRUCTURE TIP PROJECT U-2800..... 0.073 mi
TOTAL LENGTH TIP PROJECT U-2800..... 0.917 mi

DESIGN - BUILD TEAM

RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE, SUITE 350
RALEIGH, NORTH CAROLINA 27609
NC LICENSE NO. F-0112
1-888-521-4455 OR 919-878-9560

FOR DIVISION OF HIGHWAYS

2012 STANDARD SPECIFICATIONS

LETTING DATE: AUGUST 13, 2012

J. T. Peacock, Jr., P.E.
PROJECT ENGINEER

Brandon J. McInnis, P.E.
PROJECT DESIGN ENGINEER

CONTRACTOR :
Blythe
BLYTHE DEVELOPMENT COMPANY
1415 E.WESTINGHOUSE BLVD.
CHARLOTTE, NC 28273

HYDRAULICS ENGINEER
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
SIGNATURE: P.E.

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

3/21/2013
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Fkeys

04/16/11

PROJECT REFERENCE NO.	SHEET NO.
U-2800	1-B

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

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

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 R/W Marker — RW
- Proposed Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage / Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

- TV Satellite Dish
- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- Recorded U/G TV Cable — TV
- Designated U/G TV Cable (S.U.E.*) — TV
- Recorded U/G Fiber Optic Cable — TV FO
- Designated U/G Fiber Optic Cable (S.U.E.*) — TV FO

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

04/16/11

PROJECT REFERENCE NO.	SHEET NO.
U-2800	1-C

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CENTERLINE COORDINATE LIST

Point #	Chain	Station	Northing (Y)	Easting (X)
1	L	11+00.00	856,923.1641	1,690,856.0762
2	L	12+00.00	857,022.5292	1,690,867.3268
3	L	13+00.00	857,121.8943	1,690,878.5774
4	L	14+00.00	857,221.2594	1,690,889.8280
5	L	15+00.00	857,320.6245	1,690,901.0786
6	L	16+00.00	857,420.0334	1,690,911.9327
7	L	17+00.00	857,519.5293	1,690,921.9583
8	L	18+00.00	857,619.1053	1,690,931.1544
9	L	19+00.00	857,718.7544	1,690,939.5204
10	L	20+00.00	857,818.4698	1,690,947.0558
11	L	21+00.00	857,918.2446	1,690,953.7599
12	L	22+00.00	858,018.0717	1,690,959.6323
13	L	23+00.00	858,117.9384	1,690,964.7924
14	L	24+00.00	858,217.8098	1,690,969.8630
15	L	25+00.00	858,317.6811	1,690,974.9337
16	L	26+00.00	858,417.5525	1,690,980.0043
17	L	27+00.00	858,517.4238	1,690,985.0750
18	L	28+00.00	858,617.2952	1,690,990.1457
19	L	29+00.00	858,717.1666	1,690,995.2163
20	L	30+00.00	858,817.0379	1,691,000.2870
21	L	31+00.00	858,916.9093	1,691,005.3577
22	L	32+00.00	859,016.7806	1,691,010.4283
23	L	33+00.00	859,116.6520	1,691,015.4990
24	L	34+00.00	859,216.5233	1,691,020.5697
25	L	35+00.00	859,316.3947	1,691,025.6403
26	L	36+00.00	859,416.2661	1,691,030.7110
27	L	37+00.00	859,516.1374	1,691,035.7816
28	L	38+00.00	859,616.0088	1,691,040.8523
29	L	39+00.00	859,715.8884	1,691,045.7513
30	L	40+00.00	859,815.8341	1,691,048.9943
31	L	41+00.00	859,915.8247	1,691,050.2379
32	L	42+00.00	860,015.8202	1,691,049.4816
33	L	43+00.00	860,115.7805	1,691,046.7256
34	L	44+00.00	860,215.6722	1,691,042.0918
35	L	45+00.00	860,315.5441	1,691,037.0328
36	L	46+00.00	860,415.4161	1,691,031.9739
37	L	47+00.00	860,515.2880	1,691,026.9149
38	L	48+00.00	860,615.1600	1,691,021.8559
39	L	49+00.00	860,715.0319	1,691,016.7969
40	L	50+00.00	860,814.9039	1,691,011.7379
41	L	51+00.00	860,914.7758	1,691,006.6789
42	L	52+00.00	861,014.6478	1,691,001.6199
43	L	53+00.00	861,114.5197	1,690,996.5609
44	L	54+00.00	861,214.3917	1,690,991.5019
45	L	55+00.00	861,314.2636	1,690,986.4430
46	L	56+00.00	861,414.1356	1,690,981.3840
47	L	57+00.00	861,514.0075	1,690,976.3250
48	L	58+00.00	861,613.8795	1,690,971.2660
49	L	59+00.00	861,713.7514	1,690,966.2070
50	L	60+00.00	861,813.6234	1,690,961.1480
51	L	61+00.00	861,913.4953	1,690,956.0890
52	L	62+00.00	862,013.4397	1,690,953.2739
53	L	63+00.00	862,113.3475	1,690,957.0977
54	L	64+00.00	862,212.7692	1,690,967.6582
55	L	65+00.00	862,311.2510	1,690,984.9072
56	L	66+00.00	862,408.3435	1,691,008.7659
57	L	66+24.54	862,431.9098	1,691,015.6200

Point #	Chain	Station	Northing (Y)	Easting (X)

Point #	Chain	Station	Northing (Y)	Easting (X)

Point #	Chain	Station	Northing (Y)	Easting (X)

Point #	Chain	Station	Northing (Y)	Easting (X)

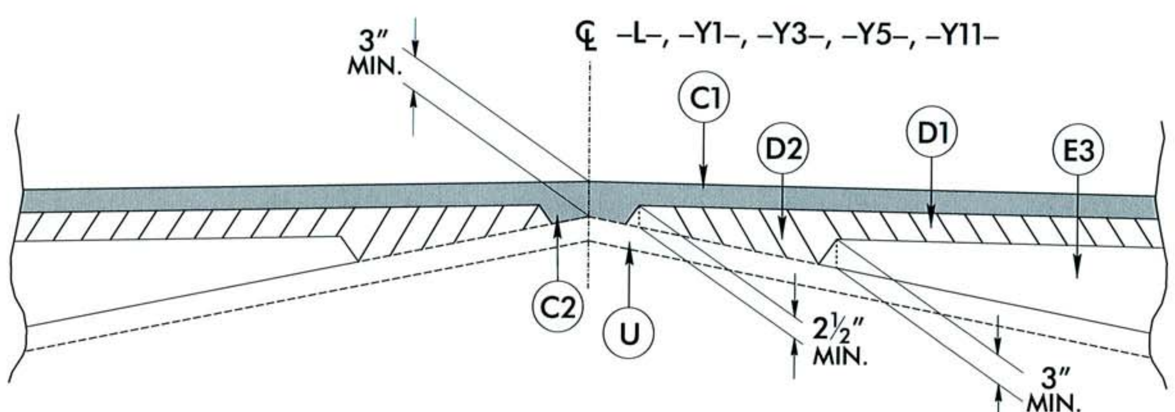
PROJECT REFERENCE NO.	SHEET NO.
U-2800	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

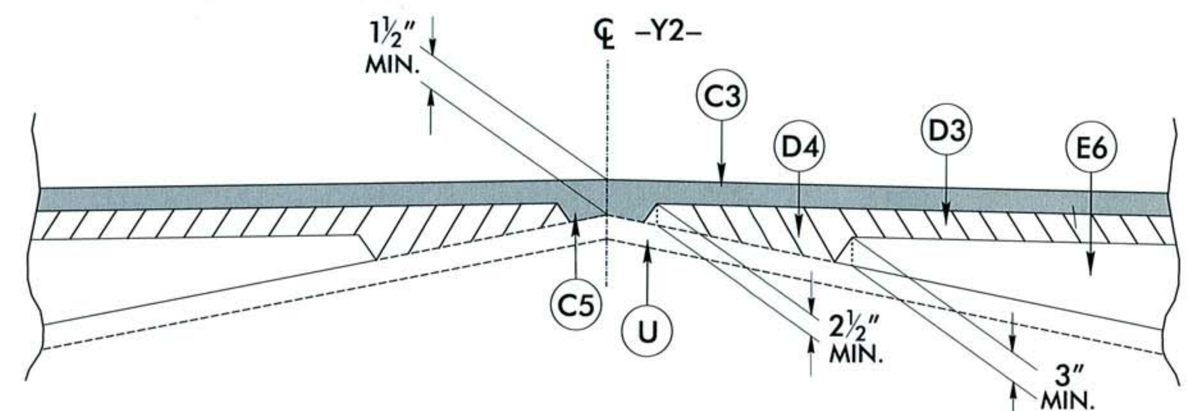
PAVEMENT SCHEDULE

C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.IN EACH OF TWO LAYERS	E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	J4	PROP. VAR. DEPTH AGGREGATE BASE COURSE.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1.5" OR GREATER THAN 2" IN DEPTH.	E2	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.	R1	2'-6" CONCRETE CURB AND GUTTER.
C3	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E3	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5.5" IN DEPTH.	R2	1'-6" MOUNTABLE CONCRETE CURB AND GUTTER.
C4	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.IN EACH OF TWO LAYERS	E4	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R3	5" MONOLITHIC CONCRETE ISLAND (KEYED-IN).
C5	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1.5" OR GREATER THAN 2" IN DEPTH.	E5	PROP. APPROX. 13" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C AT AN AVERAGE RATE OF 494 LBS. PER SQ. YD.IN EACH OF THREE LAYERS	R4	SHOULDER BERM GUTTER.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	E6	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5.5" IN DEPTH.	S	4" CONCRETE SIDEWALK.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2.5" IN DEPTH OR GREATER THAN 4" IN DEPTH.	J1	PROP. 6" AGGREGATE BASE COURSE.	T	EARTH MATERIAL.
D3	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0D, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	J2	PROP. 8" AGGREGATE BASE COURSE.	U	EXISTING PAVEMENT.
D4	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0D, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2.5" IN DEPTH OR GREATER THAN 4" IN DEPTH.	J3	PROP. 10" AGGREGATE BASE COURSE.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAILS, THIS SHEET).

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

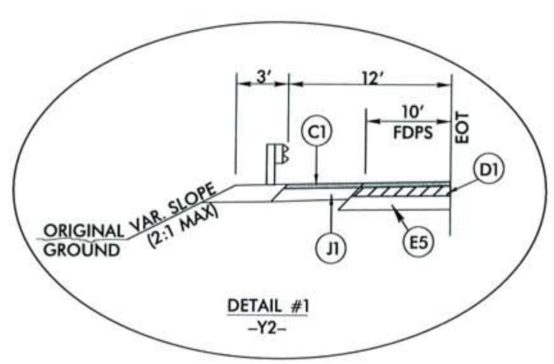


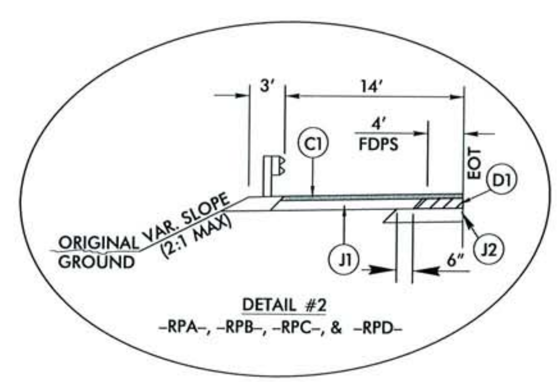
DETAIL SHOWING METHOD OF WEDGING NO. 1

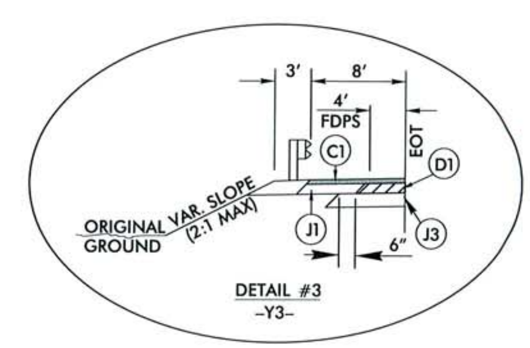


DETAIL SHOWING METHOD OF WEDGING NO. 2

GUARDRAIL WIDENING DETAILS







PLANS PREPARED BY :

RK&K

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

6/2/99

3/21/2013
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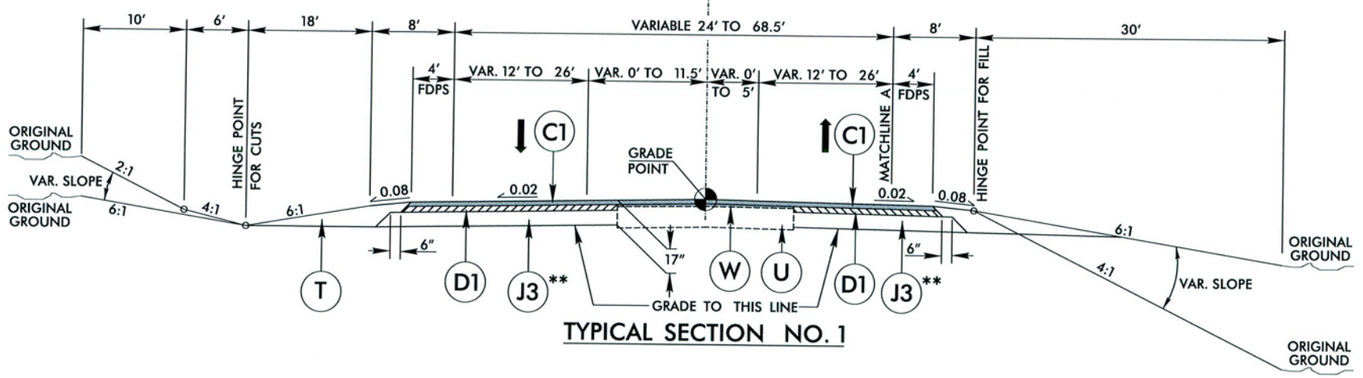
PROJECT REFERENCE NO.	SHEET NO.
U-2800	2-A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PAVEMENT SCHEDULE	
C1	3" TYPE S9.5B
C2	VAR. DEPTH S9.5B
C3	1.5" TYPE S9.5D
C4	3" TYPE S9.5D
C5	VAR. DEPTH S9.5D
D1	4" TYPE I19.0B
D2	VAR. DEPTH I19.0B
D3	4" TYPE I19.0D
D4	VAR. DEPTH I19.0D
E1	4" TYPE B25.0B
E2	5" TYPE B25.0B
E3	VAR. DEPTH B24.0B
E4	4" TYPE B25.0C
E5	13" TYPE B25.0C
E6	VAR. DEPTH B25.0C
J1	6" ABC
J2	8"ABC
J3	10" ABC
J4	VAR. DEPTH ABC
R1	2'-6" CONC. C&G
R2	1'-6" MOUNT. CONC. C&G
R3	5" CONC. ISLAND
R4	SBG
S	4" CONC. SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING

℄ -L- (MACY GROVE ROAD)

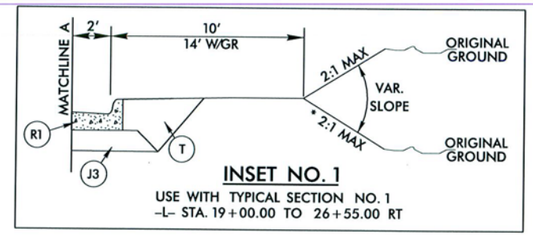


TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
-L- STA. 12+00.00 TO 26+55.00

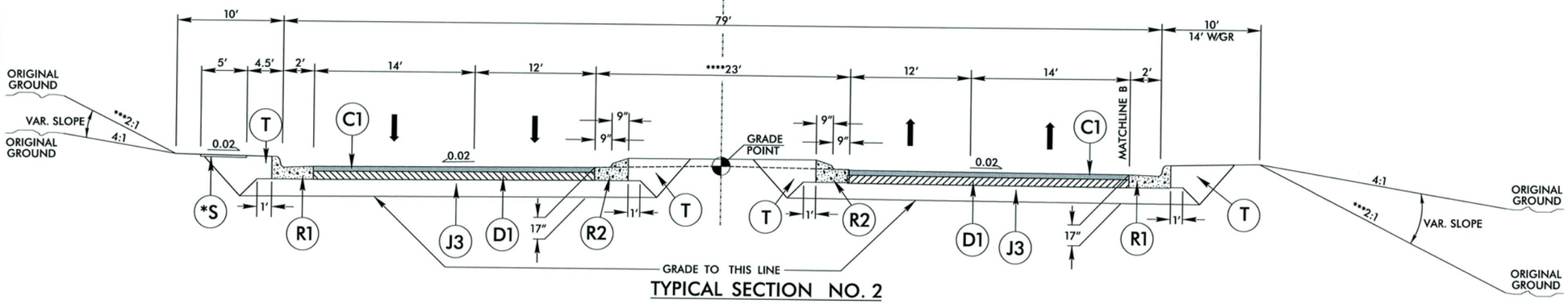
NOTE: TRANSITION FROM EXISTING TO TYPICAL SECTION NO. 1 AT THE FOLLOWING LOCATIONS:
-L- STA. 11+50.00 TO 12+00.00

** IN AREAS OF NARROW WIDENING (6' OR LESS) USE E2 IN PLACE OF J3



INSET NO. 1
USE WITH TYPICAL SECTION NO. 1
-L- STA. 19+00.00 TO 26+55.00 RT

℄ -L- (MACY GROVE ROAD)



TYPICAL SECTION NO. 2

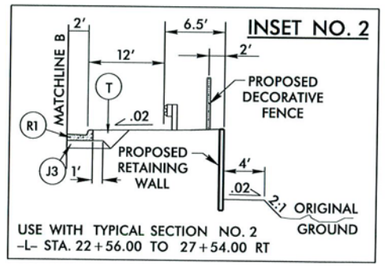
USE TYPICAL SECTION NO. 2
-L- STA. 26+55.00 TO 34+08.20 +/- (BEGIN BRIDGE)
-L- STA. 35+63.70 +/- (END BRIDGE) TO 46+81.56 +/- (BEGIN BRIDGE)
-L- STA. 47+98.06 +/- (END BRIDGE) TO 52+11.80 +/- (BEGIN BRIDGE)
-L- STA. 53+22.80 +/- (END BRIDGE) TO 61+00.00

NOTE: USE SIDEWALK AT THE FOLLOWING LOCATIONS:
-L- STA. 40+15.00 TO 46+81.56 +/- (BEGIN BRIDGE)
-L- STA. 47+98.06 +/- (END BRIDGE) TO 52+11.80 +/- (BEGIN BRIDGE)
-L- STA. 53+22.80 +/- (END BRIDGE) TO 61+00.00-L-

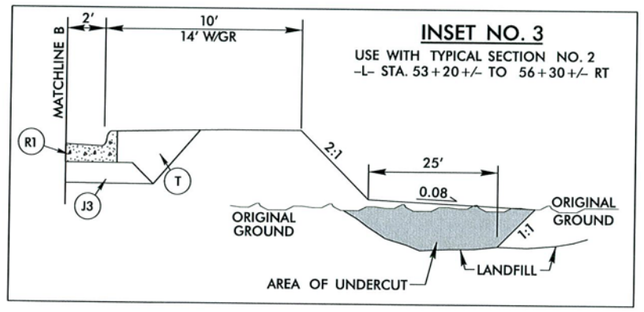
*** USE 1.5:1 SLOPES AT THE FOLLOWING LOCATIONS:
-L- STA. 28+25.00 TO 31+00.00 RT

**** USE A 30' MEDIAN AT THE FOLLOWING LOCATIONS:
-L- STA. 55+85.00 TO 61+00.00

**** USE A 40' MEDIAN AT THE FOLLOWING LOCATIONS:
-L- STA. 31+00.00 TO 38+75.00



INSET NO. 2
USE WITH TYPICAL SECTION NO. 2
-L- STA. 22+56.00 TO 27+54.00 RT



INSET NO. 3
USE WITH TYPICAL SECTION NO. 2
-L- STA. 53+20 +/- TO 56+30 +/- RT

NOTES:
SEE PLANS FOR LOCATION OF CONCRETE ISLANDS, AUXILIARY LANES, AND TAPERS.
*** 4:1 MAX INSIDE INTERCHANGE

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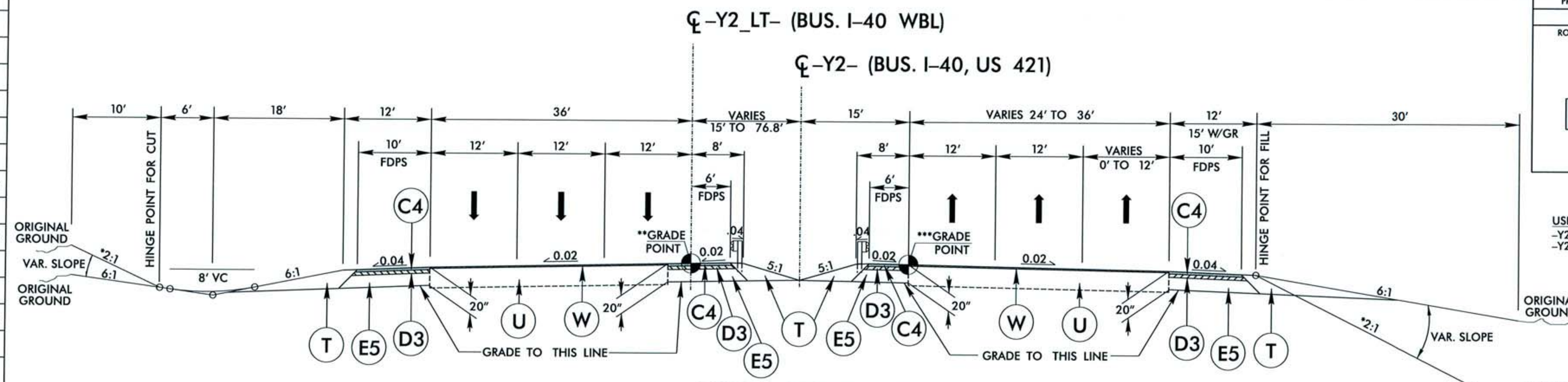
Users

6/2/99

PAVEMENT SCHEDULE	
C1	3" TYPE S9.5B
C2	VAR. DEPTH S9.5B
C3	1.5" TYPE S9.5D
C4	3" TYPE S9.5D
C5	VAR. DEPTH S9.5D
D1	4" TYPE I19.0B
D2	VAR. DEPTH I19.0B
D3	4" TYPE I19.0D
D4	VAR. DEPTH I19.0D
E1	4" TYPE B25.0B
E2	5" TYPE B25.0B
E3	VAR. DEPTH B24.0B
E4	4" TYPE B25.0C
E5	13" TYPE B25.0C
E6	VAR. DEPTH B25.0C
J1	6" ABC
J2	8"ABC
J3	10" ABC
J4	VAR. DEPTH ABC
R1	2'-6" CONC. C&G
R2	1'-6" MOUNT. CONC. C&G
R3	5" CONC. ISLAND
R4	SBG
S	4" CONC. SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING

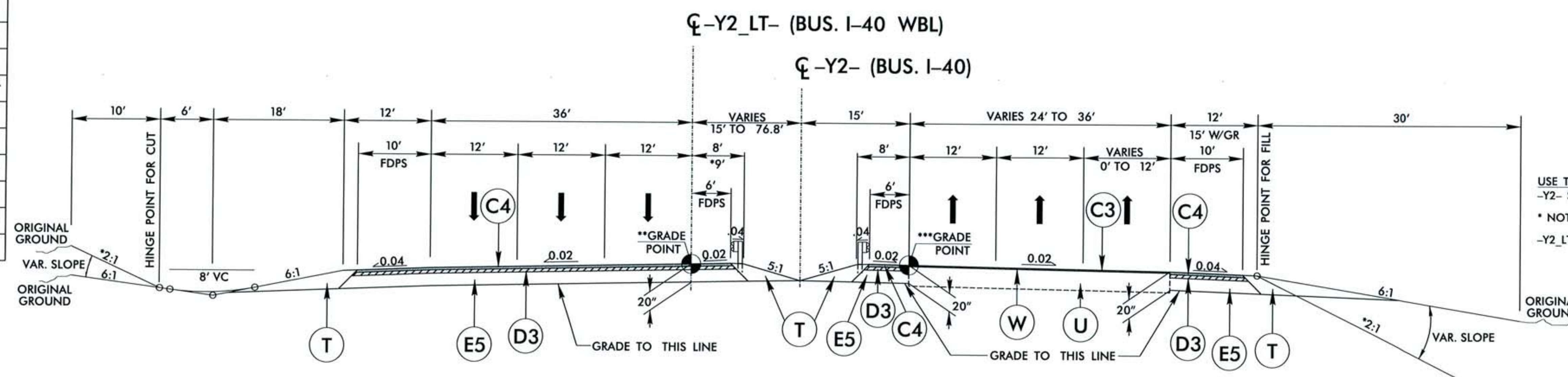
PROJECT REFERENCE NO.	SHEET NO.
U-2800	2-B
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



TYPICAL SECTION NO. 3

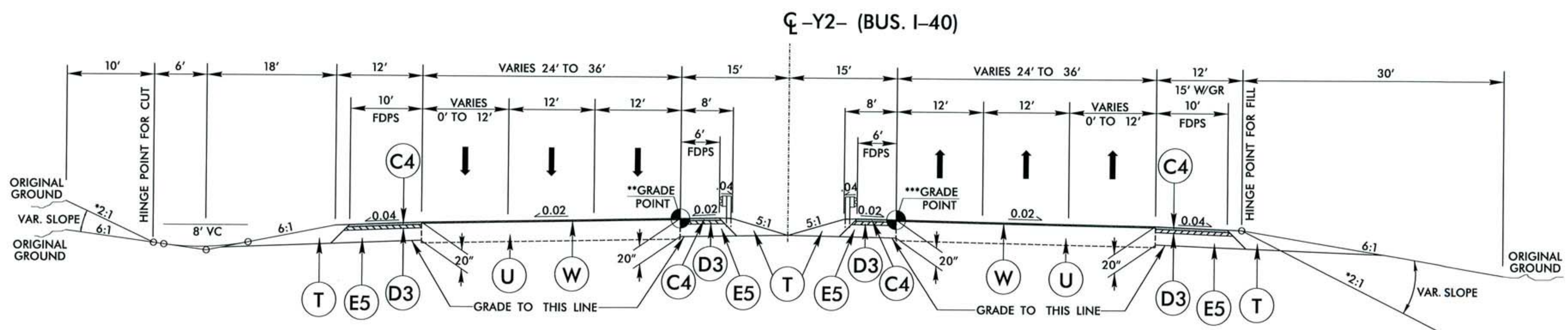
USE TYPICAL SECTION NO. 3
-Y2- STA. 14+00.00 TO 19+30.69
-Y2- STA. 31+08.80 TO 45+18.91



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4
-Y2- STA. 19+30.69 TO 31+08.80

* NOTE: USE 9' AT THE FOLLOWING LOCATIONS:
-Y2_LT- STA. 22+50.00 TO 38+50.00



TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5
-Y2- STA. 45+18.91 TO 91+40.69

NOTES:
SEE PLANS FOR LOCATION OF AUXILIARY LANES AND TAPERS.
* 4:1 MAX INSIDE INTERCHANGE
** USE PROFILE "-Y2 LT-" & "-Y2- WESTBOUND LANES" FOR I-40 BUS. WESTBOUND LANES
*** USE PROFILE "-Y2- EASTBOUND LANES" FOR I-40 BUS. EASTBOUND LANES

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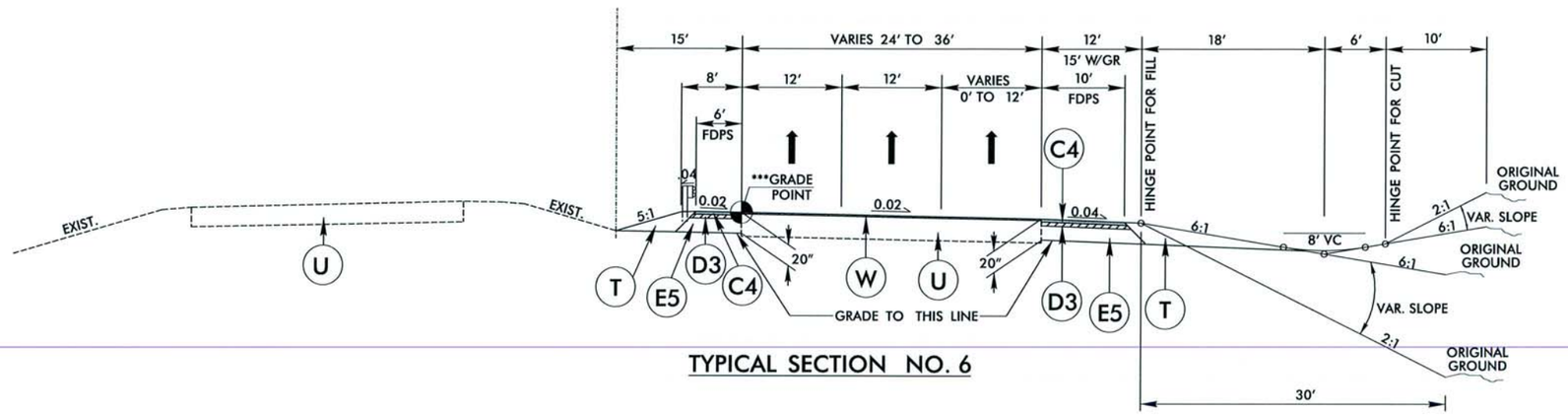
PAVEMENT SCHEDULE	
C1	3" TYPE S9.5B
C2	VAR. DEPTH S9.5B
C3	1.5" TYPE S9.5D
C4	3" TYPE S9.5D
C5	VAR. DEPTH S9.5D
D1	4" TYPE I19.0B
D2	VAR. DEPTH I19.0B
D3	4" TYPE I19.0D
D4	VAR. DEPTH I19.0D
E1	4" TYPE B25.0B
E2	5" TYPE B25.0B
E3	VAR. DEPTH B24.0B
E4	4" TYPE B25.0C
E5	13" TYPE B25.0C
E6	VAR. DEPTH B25.0C
J1	6" ABC
J2	8"ABC
J3	10" ABC
J4	VAR. DEPTH ABC
R1	2'-6" CONC. C&G
R2	1'-6" MOUNT. CONC. C&G
R3	5" CONC. ISLAND
R4	SBG
S	4" CONC. SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING

PROJECT REFERENCE NO.	SHEET NO.
U-2800	2-C
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

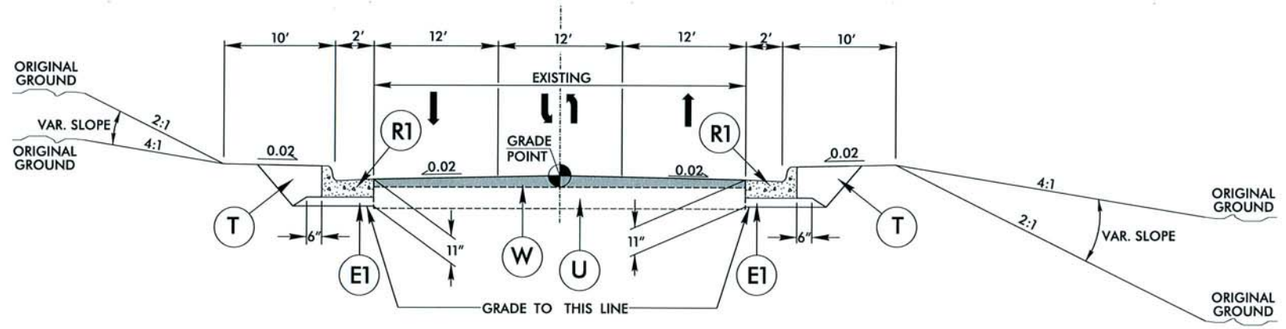
℄ -Y2- (BUS. I-40)



TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 6
-Y2- STA. 91+40.69 TO 96+51.51

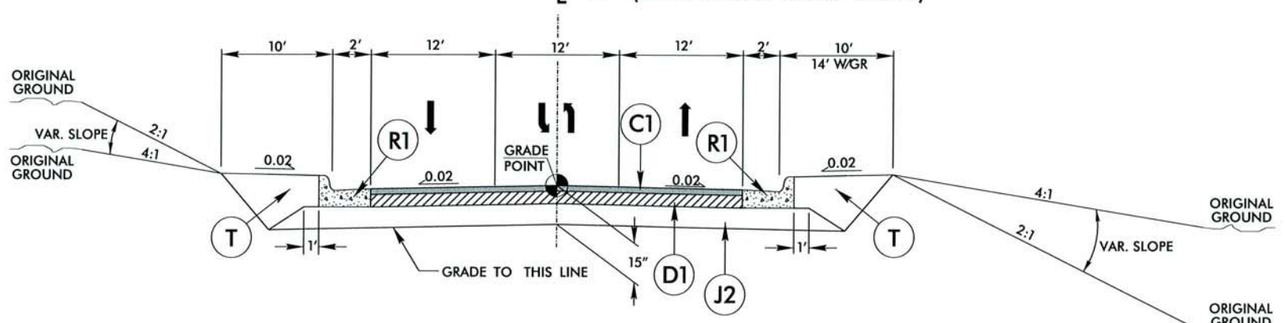
℄ -Y1- (INDUSTRIAL PARK DRIVE)



TYPICAL SECTION NO. 7

USE TYPICAL SECTION NO. 7
-Y1- STA. 16+00.00 TO 17+75.00

℄ -Y1- (INDUSTRIAL PARK DRIVE)



TYPICAL SECTION NO. 8

USE TYPICAL SECTION NO. 8
-Y1- STA. 17+75.00 TO 19+23.73

NOTES:
SEE PLANS FOR LOCATION OF CONCRETE ISLANDS, AUXILIARY LANES, AND TAPERS.
*** USE PROFILE -Y2- EB LANES

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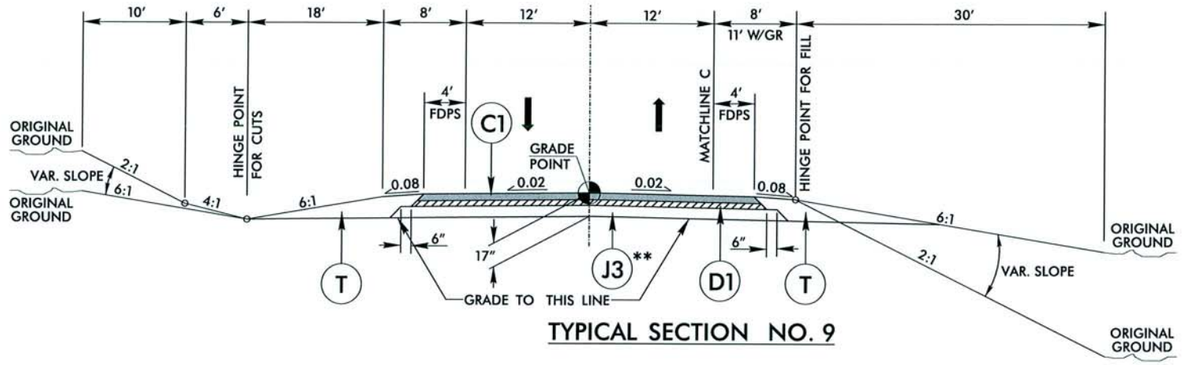
PAVEMENT SCHEDULE	
C1	3" TYPE S9.5B
C2	VAR. DEPTH S9.5B
C3	1.5" TYPE S9.5D
C4	3" TYPE S9.5D
C5	VAR. DEPTH S9.5D
D1	4" TYPE I19.0B
D2	VAR. DEPTH I19.0B
D3	4" TYPE I19.0D
D4	VAR. DEPTH I19.0D
E1	4" TYPE B25.0B
E2	5" TYPE B25.0B
E3	VAR. DEPTH B24.0B
E4	4" TYPE B25.0C
E5	13" TYPE B25.0C
E6	VAR. DEPTH B25.0C
J1	6" ABC
J2	8"ABC
J3	10" ABC
J4	VAR. DEPTH ABC
R1	2'-6" CONC. C&G
R2	1'-6" MOUNT. CONC. C&G
R3	5" CONC. ISLAND
R4	SBG
S	4" CONC. SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING

℄ –Y3– (OLD GREENSBORO ROAD)



TYPICAL SECTION NO. 9

PROJECT REFERENCE NO.	SHEET NO.
U-2800	2-D
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

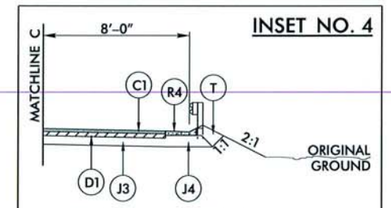
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

USE TYPICAL SECTION NO. 9
–Y3– STA. 10+37.54 TO 18+90.00

NOTE: TRANSITION FROM EXISTING TO TYPICAL SECTION NO. 9 AT THE FOLLOWING LOCATIONS:
–Y3– STA. 18+90.00 TO 19+40.00

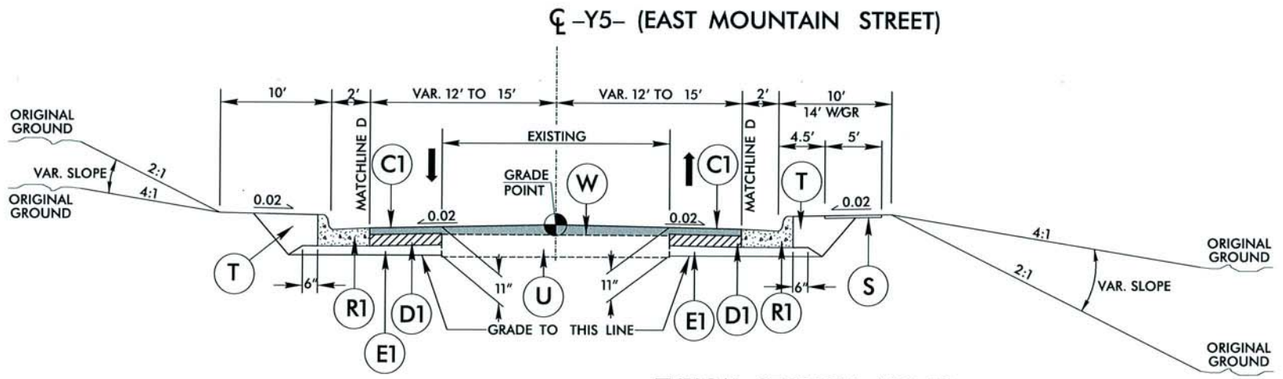
** IN AREAS OF NARROW WIDENING (6′ OR LESS) USE E2 IN PLACE OF J3

INSET NO. 4



USE WITH TYPICAL SECTION NO. 9
–Y3– STA. 11+24.77 TO 13+00.00 RT

℄ –Y5– (EAST MOUNTAIN STREET)

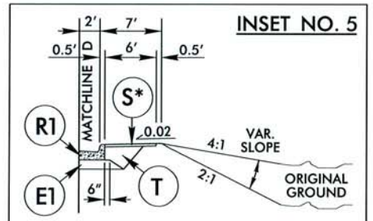


TYPICAL SECTION NO. 10

USE TYPICAL SECTION NO. 10
–Y5– STA. 11+60.00 TO 19+65.00
–Y5– STA. 30+00.00 TO 34+28.00
–Y5– STA. 35+72.00 TO 38+90.00

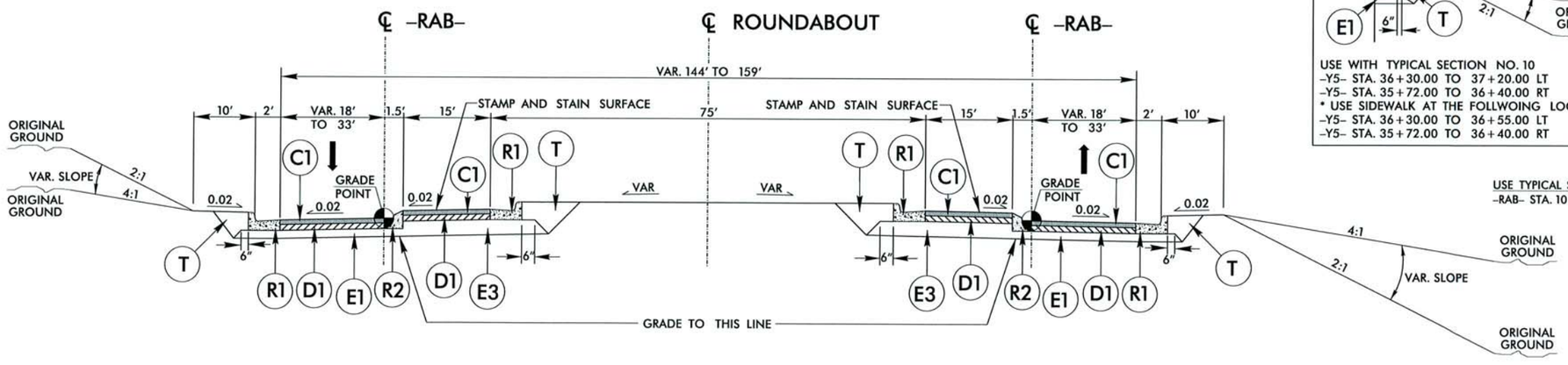
NOTE: TRANSITION FROM EXISTING TO TYPICAL SECTION NO. 10 AT THE FOLLOWING LOCATIONS:
–Y5– STA. 10+25.00 TO 11+60.00
–Y5– STA. 29+50.00 TO 30+00.00
–Y5– STA. 38+90.00 TO 39+40.00

INSET NO. 5



USE WITH TYPICAL SECTION NO. 10
–Y5– STA. 36+30.00 TO 37+20.00 LT
–Y5– STA. 35+72.00 TO 36+40.00 RT
* USE SIDEWALK AT THE FOLLWOING LOCATIONS:
–Y5– STA. 36+30.00 TO 36+55.00 LT
–Y5– STA. 35+72.00 TO 36+40.00 RT

℄ –RAB– ℄ ROUNDABOUT ℄ –RAB–



TYPICAL SECTION NO. 11

USE TYPICAL SECTION NO. 11
–RAB– STA. 10+00.00 TO 13+39.29

NOTES:
SEE PLANS FOR LOCATION OF CONCRETE ISLANDS, AUXILIARY LANES, AND TAPERS.

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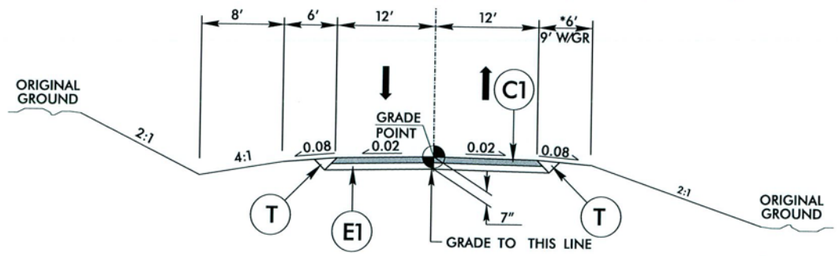
PROJECT REFERENCE NO.	SHEET NO.
U-2800	2-E
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PAVEMENT SCHEDULE	
C1	3" TYPE S9.5B
C2	VAR. DEPTH S9.5B
C3	1.5" TYPE S9.5D
C4	3" TYPE S9.5D
C5	VAR. DEPTH S9.5D
D1	4" TYPE I19.0B
D2	VAR. DEPTH I19.0B
D3	4" TYPE I19.0D
D4	VAR. DEPTH I19.0D
E1	4" TYPE B25.0B
E2	5" TYPE B25.0B
E3	VAR. DEPTH B24.0B
E4	4" TYPE B25.0C
E5	13" TYPE B25.0C
E6	VAR. DEPTH B25.0C
J1	6" ABC
J2	8"ABC
J3	10" ABC
J4	VAR. DEPTH ABC
R1	2'-6" CONC. C&G
R2	1'-6" MOUNT. CONC. C&G
R3	5" CONC. ISLAND
R4	SBG
S	4" CONC. SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING

℄ –Y6–, –Y9–, –Y12–, –Y12A–, & –DR2–

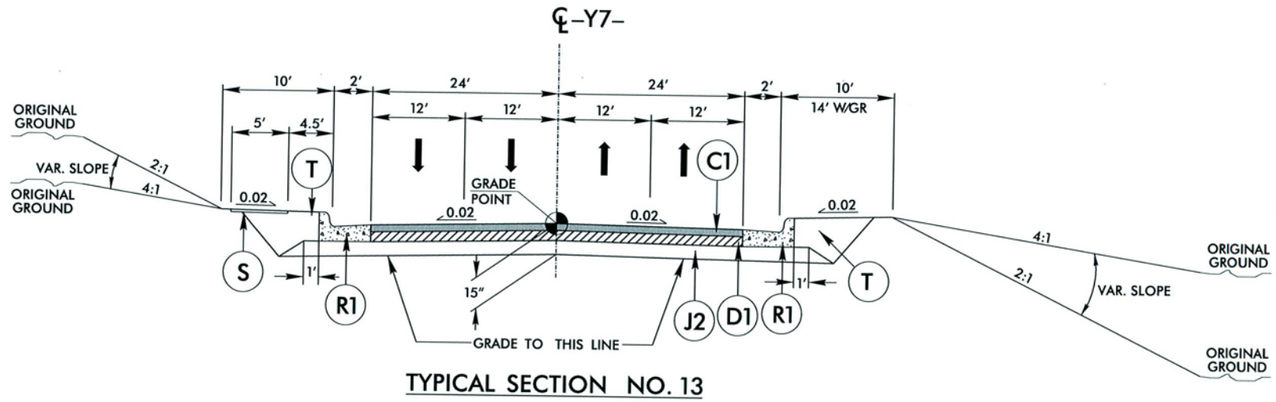


USE TYPICAL SECTION NO. 12
–Y6– STA. 10+18.15 TO 15+28.57
–Y9– STA. 10+31.01 TO 23+54.90
–Y12– STA. 10+12.42 TO 18+20.00
–Y12A– STA. 10+12.00 TO 11+10.00
–DR2– STA. 10+16.38 TO 13+40.00

NOTE: USE 5' IN THE FOLLOWING AREAS:
–Y12– STA. 13+90.00 TO 14+20.00 RT

TYPICAL SECTION NO. 12

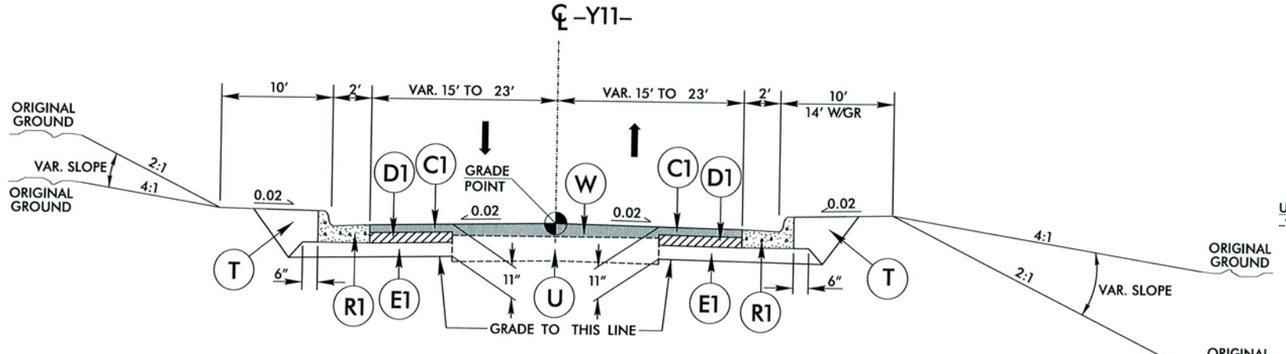
℄ –Y7–



USE TYPICAL SECTION NO. 13
–Y7– STA. 10+35.16 TO 20+22.46

TYPICAL SECTION NO. 13

℄ –Y11–



USE TYPICAL SECTION NO. 14
–Y11– STA. 10+90.00 TO 12+60.00

TYPICAL SECTION NO. 14

NOTES:
SEE PLANS FOR LOCATION OF CONCRETE ISLANDS, AUXILIARY LANES, AND TAPERS.

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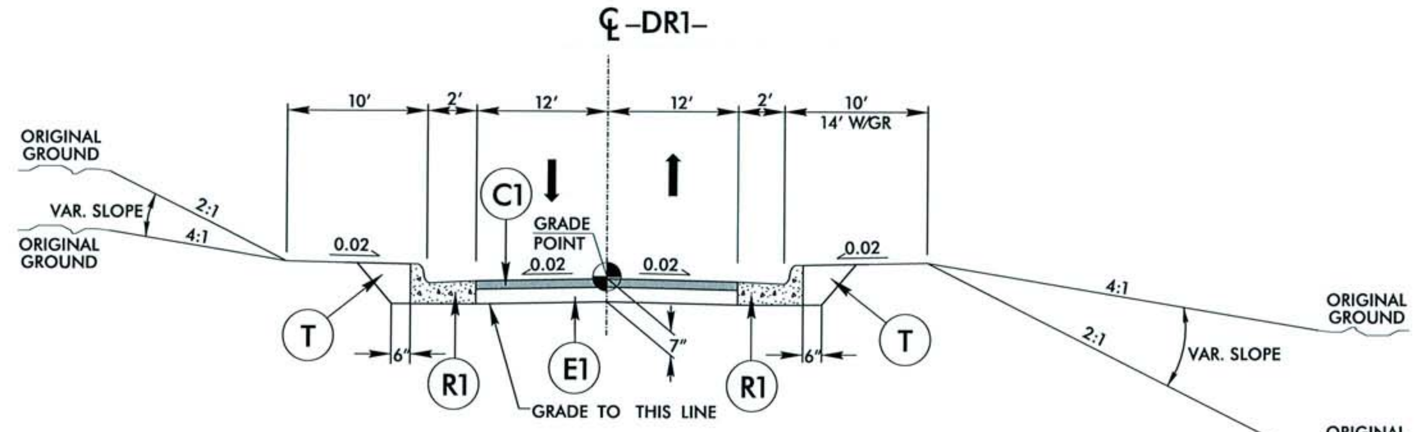
PROJECT REFERENCE NO.	SHEET NO.
U-2800	2-F
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

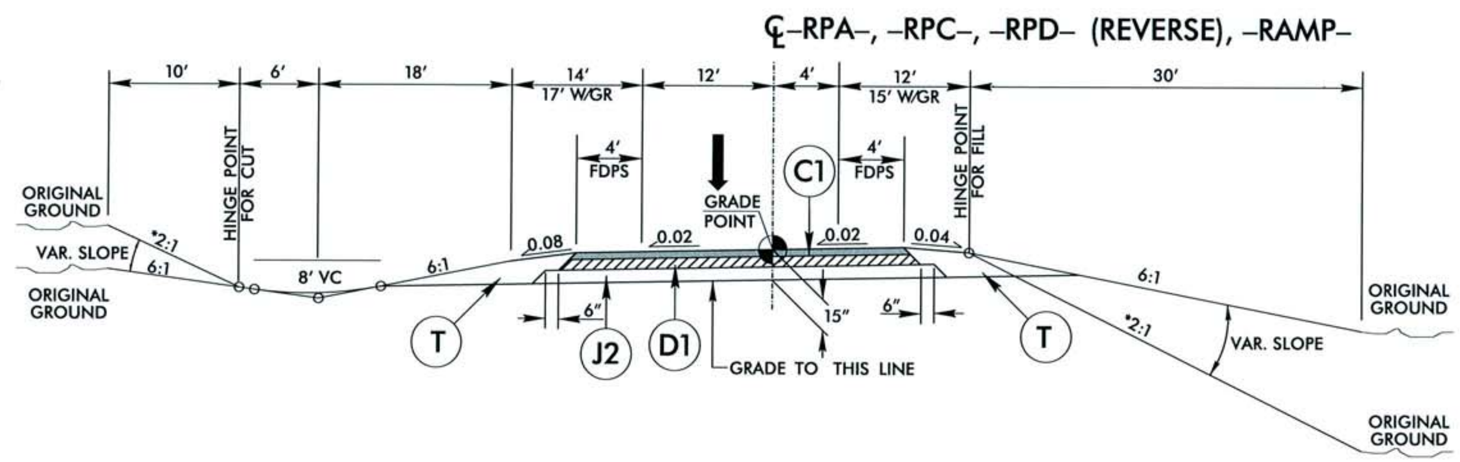
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PAVEMENT SCHEDULE	
C1	3" TYPE S9.5B
C2	VAR. DEPTH S9.5B
C3	1.5" TYPE S9.5D
C4	3" TYPE S9.5D
C5	VAR. DEPTH S9.5D
D1	4" TYPE I19.0B
D2	VAR. DEPTH I19.0B
D3	4" TYPE I19.0D
D4	VAR. DEPTH I19.0D
E1	4" TYPE B25.0B
E2	5" TYPE B25.0B
E3	VAR. DEPTH B24.0B
E4	4" TYPE B25.0C
E5	13" TYPE B25.0C
E6	VAR. DEPTH B25.0C
J1	6" ABC
J2	8"ABC
J3	10" ABC
J4	VAR. DEPTH ABC
R1	2'-6" CONC. C&G
R2	1'-6" MOUNT. CONC. C&G
R3	5" CONC. ISLAND
R4	SBG
S	4" CONC. SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING



TYPICAL SECTION NO. 15

USE TYPICAL SECTION NO. 15
-DR1- STA. 10+13.00 TO 13+50.00



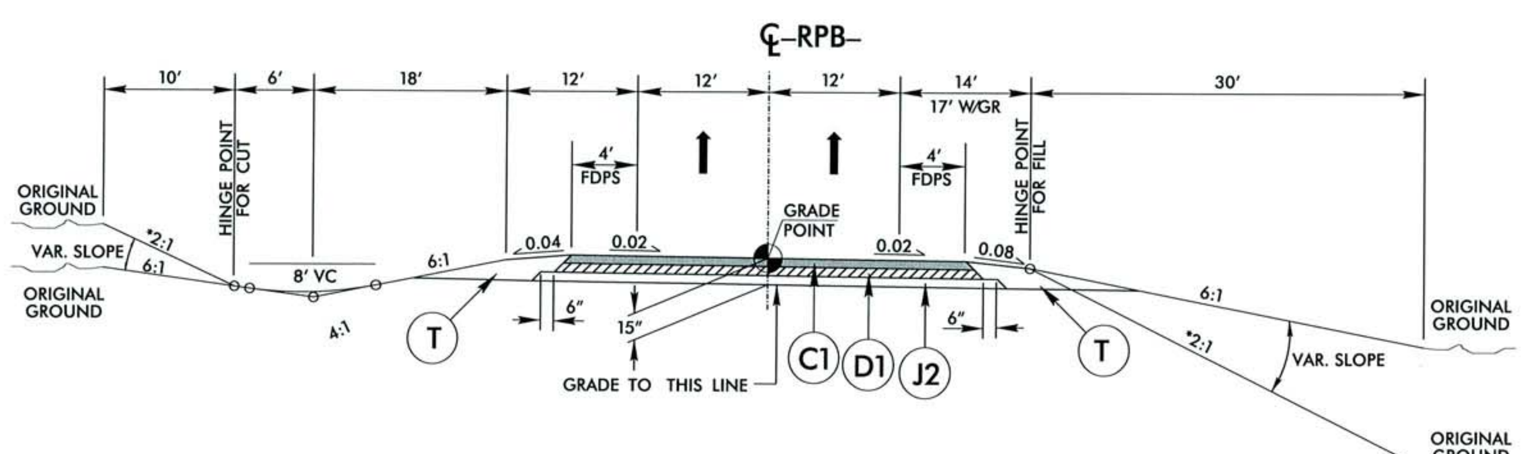
TYPICAL SECTION NO. 16

USE TYPICAL SECTION NO. 16
-RPA- STA. 10+00.00 TO 27+33.17
-RPC- STA. 10+00.00 TO 23+25.23
-RPD- STA. 10+00.00 TO 26+37.61
-RAMP- STA. 10+00.00 TO 16+45.00

NOTE: USE -Y2- PAVEMENT DESIGN AT THE FOLLOWING LOCATIONS:
-RPA- STA. 10+00.00 TO 15+37.51
-RPC- STA. 10+00.00 TO 14+64.30
-RPD- STA. 10+00.00 TO 15+51.72
-RAMP- STA. 10+00.00 TO 15+64.97

NOTE: TRANSITION FROM EXISTING TO TYPICAL SECTION NO. 16 AT THE FOLLOWING LOCATIONS:
-RAMP- STA. 16+45.00 TO 17+45.00

* USE 1.5:1 SLOPES AT THE FOLLOWING LOCATIONS:
-RPC- STA. 20+50.00 TO 23+25.23 LT
-RPD- STA. 19+55.00 TO 21+15.00 RT



TYPICAL SECTION NO. 17

USE TYPICAL SECTION NO. 17
-RPB- STA. 10+00.00 TO 26+63.98

NOTE: USE -Y2- PAVEMENT DESIGN AT THE FOLLOWING LOCATIONS:
-RPB- STA. 10+00.00 TO 15+23.80

NOTES:
SEE PLANS FOR LOCATION OF CONCRETE ISLANDS, AUXILIARY LANES, AND TAPERS.
* 4:1 MAX INSIDE INTERCHANGE

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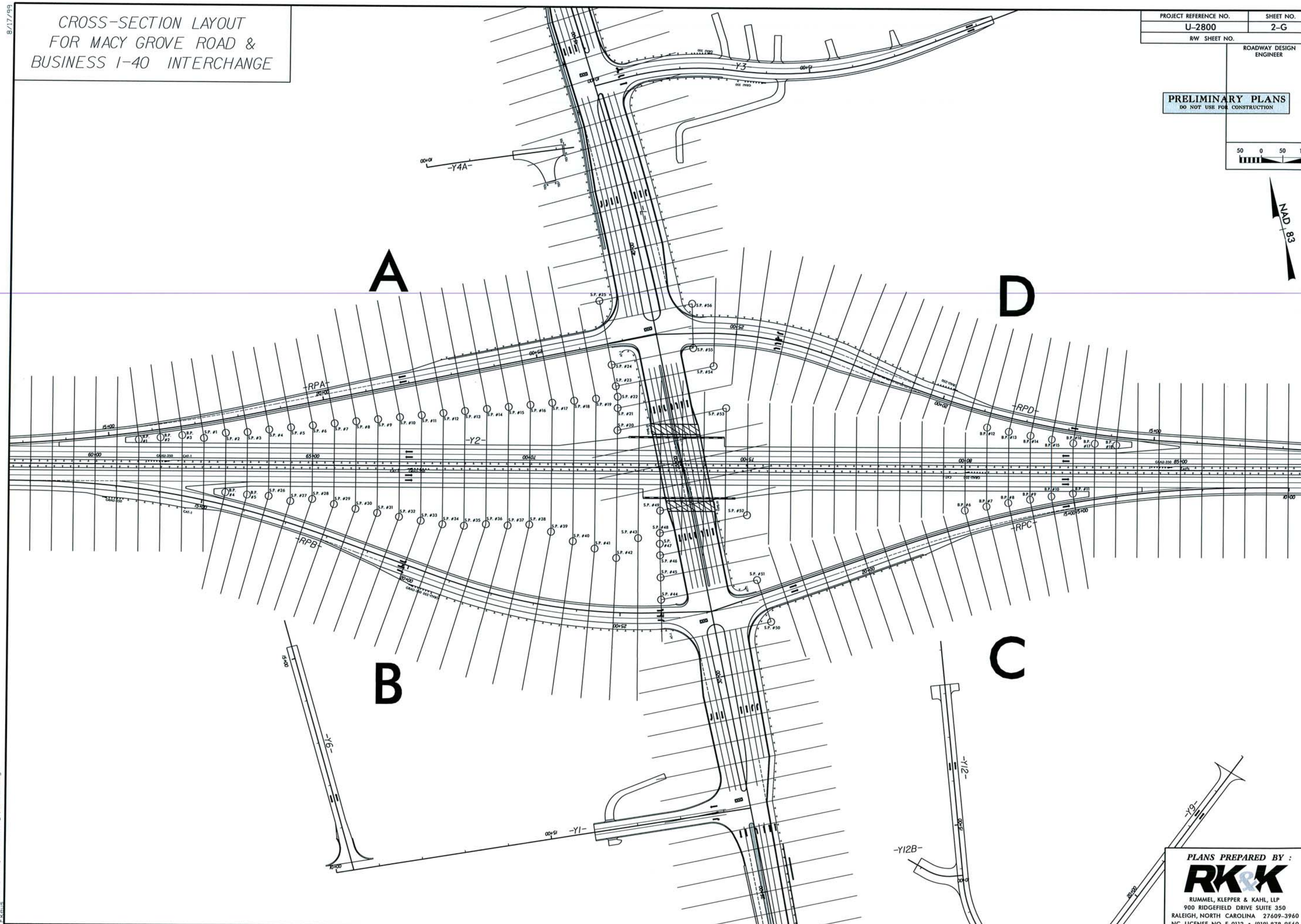
CROSS-SECTION LAYOUT FOR MACY GROVE ROAD & BUSINESS I-40 INTERCHANGE



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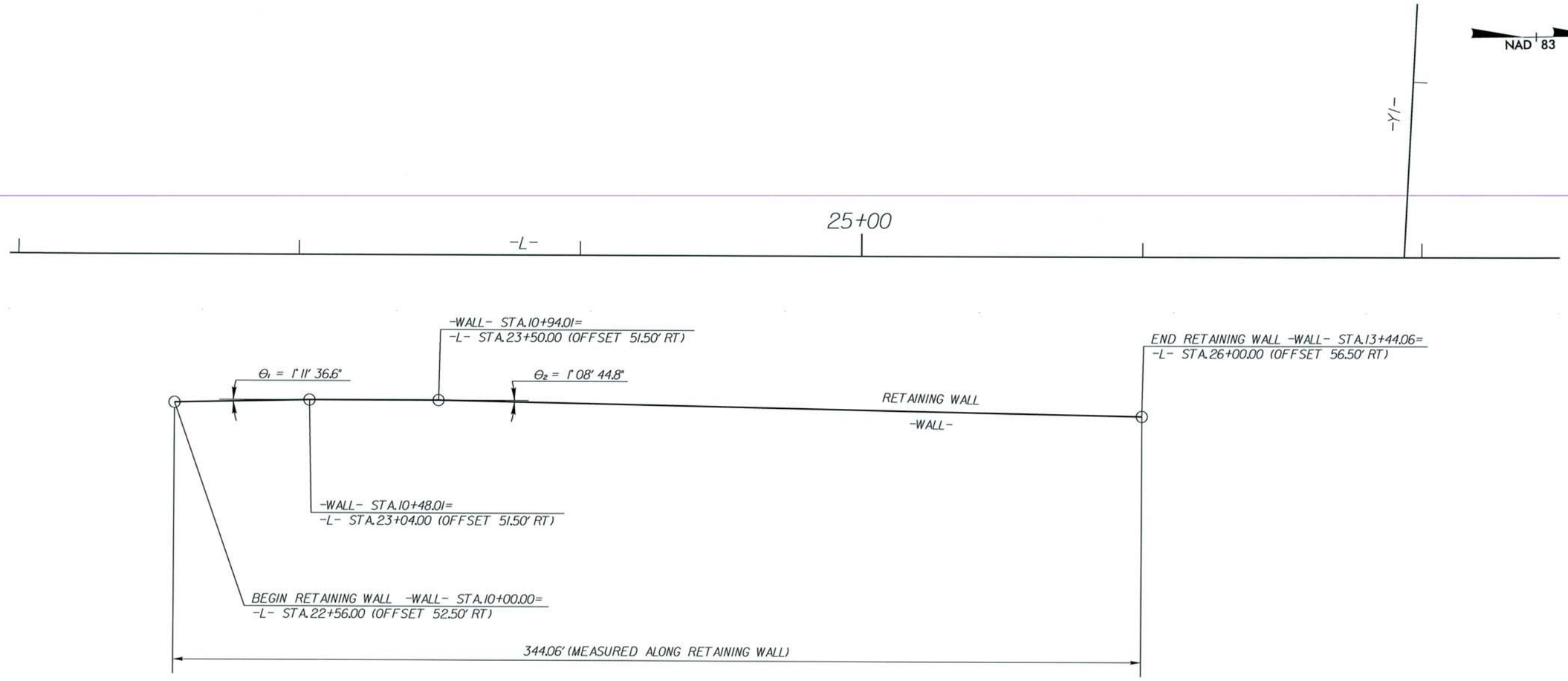
PROJECT REFERENCE NO.	SHEET NO.
U-2800	2-H
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

RETANING WALL DETAIL – LOCATION DETAIL

NAD 83



FOR PLAN SEE SHT. 5

GRAPHIC SCALE
20 10 0 20 40
PLANS

PLANS PREPARED BY :
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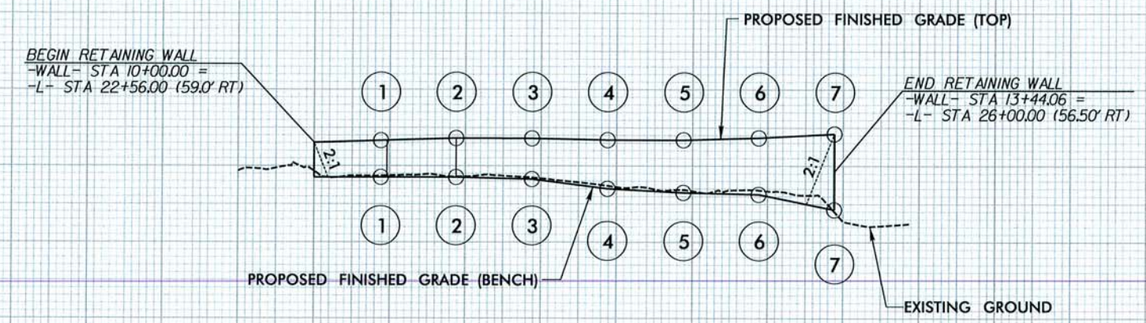
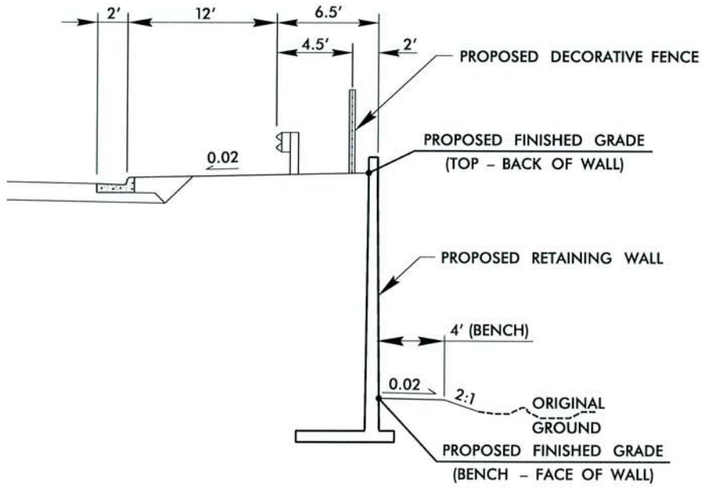
PROJECT REFERENCE NO.	SHEET NO.
U-2800	2-I
RW SHEET NO.	
	ROADWAY DESIGN ENGINEER

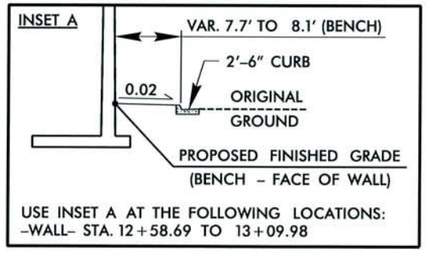
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

RETAINING WALL PROFILE DETAIL





ELEVATION LOCATIONS
N.T.S.



USE INSET A AT THE FOLLOWING LOCATIONS:
-WALL- STA. 12+58.69 TO 13+09.98

POINT NO.	-WALL- STATION	PROPOSED FINISHED GRADE (TOP)	PROPOSED FINISHED GRADE (BENCH)
1	10+44.01	973.31	968.50
2	10+94.01	973.61	968.50
3	11+44.02	973.59	968.25
4	11+94.03	973.39	967.00
5	12+44.04	973.40	966.50
6	12+94.05	973.68	966.27
7	13+44.06	973.21	964.25

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PLANS PREPARED BY :
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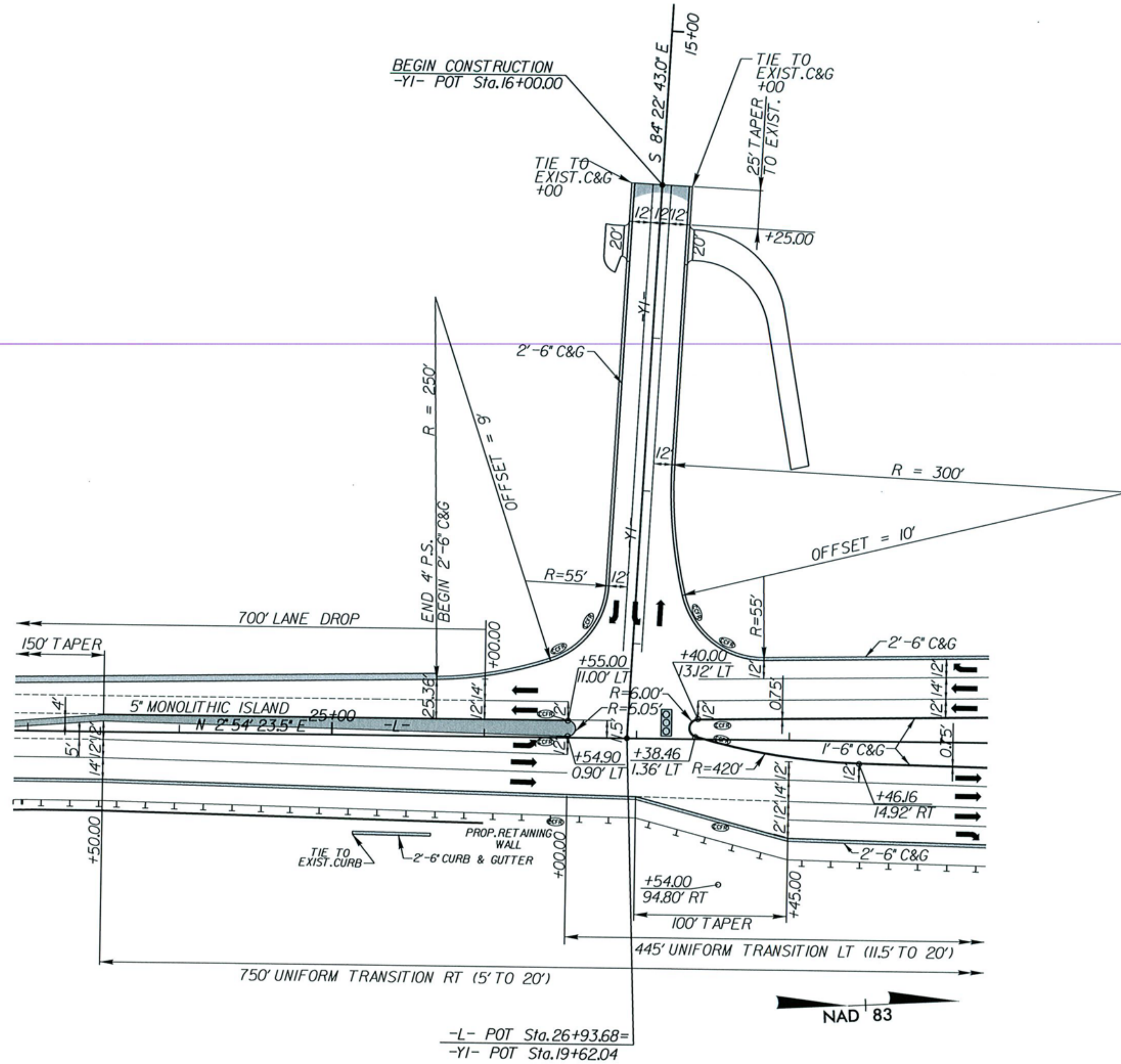
PROJECT REFERENCE NO.	SHEET NO.
U-2800	2-J
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

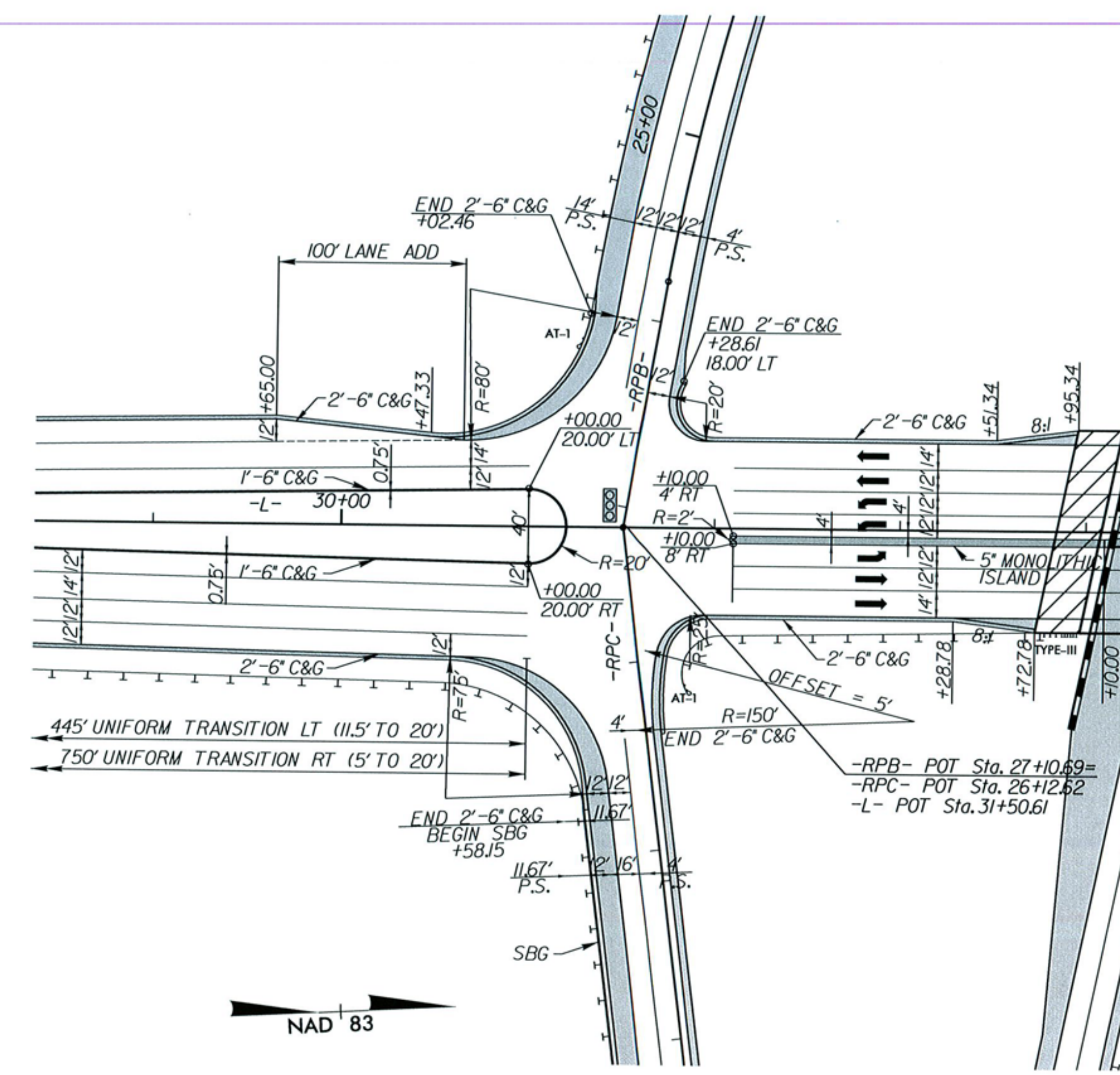
-Y1- INTERSECTION DETAIL

SCALE 1"=50'



-RPB-/-RPC- INTERSECTION DETAIL

SCALE 1"=50'



FOR PLAN SEE SHT. 5
FOR -L- PROFILE SEE SHT. 18
FOR -Y1- PROFILE SEE SHT. 26
FOR -RPB- PROFILE SEE SHT. 27
FOR -RPC- PROFILE SEE SHT. 28

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

3/21/2013
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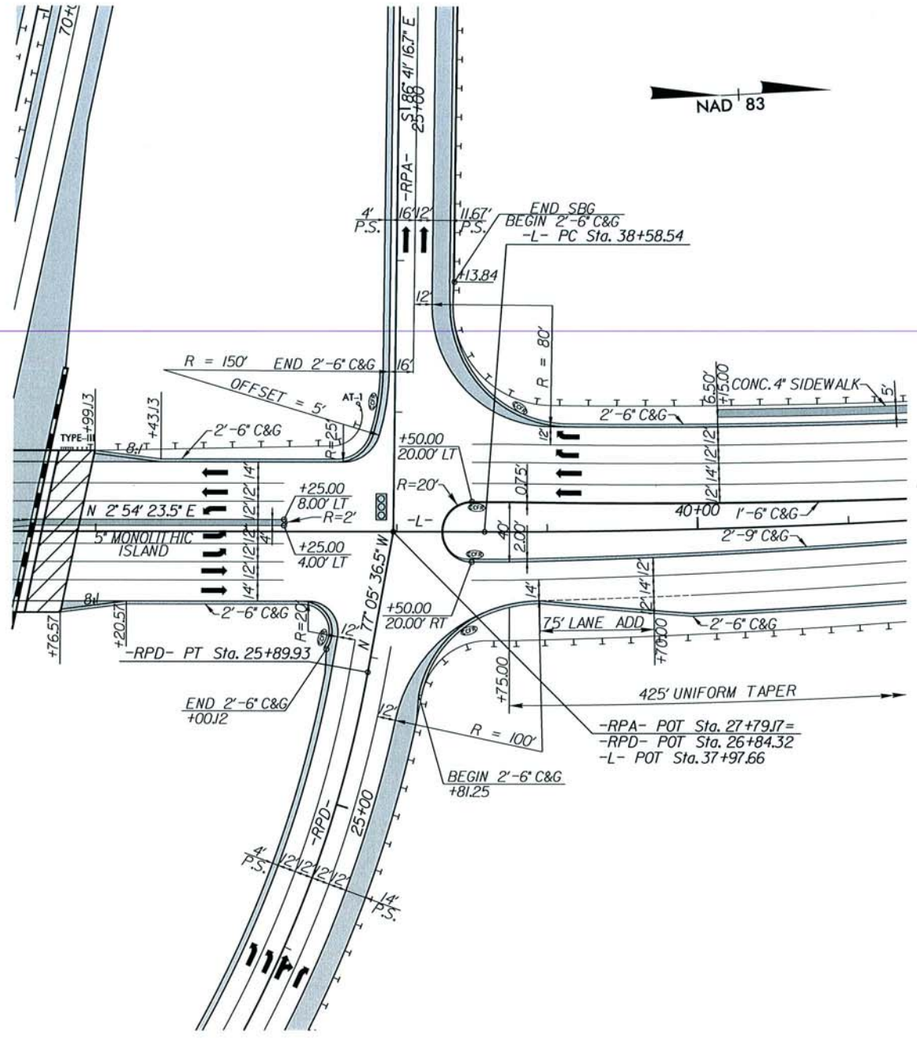
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
U-2800	2-K
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

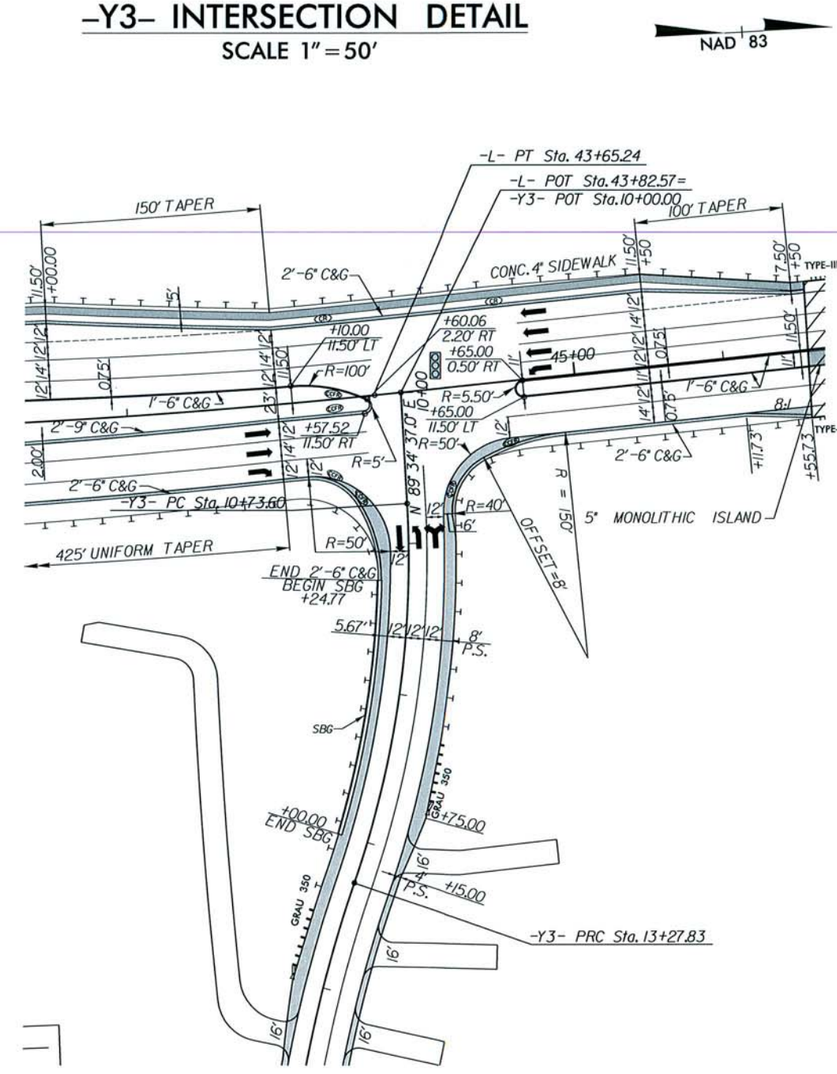
–RPA–/–RPD– INTERSECTION DETAIL

SCALE 1" = 50'



–Y3– INTERSECTION DETAIL

SCALE 1" = 50'



FOR PLAN SEE SHT. 5
FOR –L– PROFILE SEE SHTS. 18 & 19
FOR –RPA– PROFILE SEE SHT. 26
FOR –RPD– PROFILE SEE SHT. 29
FOR –Y3– PROFILE SEE SHT. 30

PLANS PREPARED BY :
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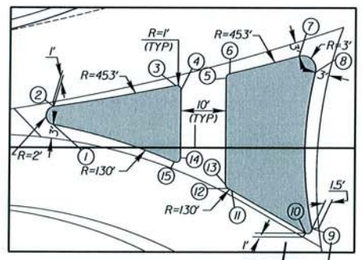
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
U-2800	2-L
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ROUNDABOUT INTERSECTION DETAIL

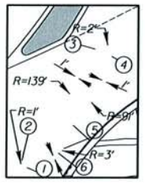
SCALE 1" = 100'



INSET A

NTS

POINT NUMBER	-Y5- STATION	OFFSET	LT / RT
1	+68.41	+5.00'	LT
2	+68.50	8.55'	LT
3	+95.64	13.62'	LT
4	+96.84	12.64'	LT
5	+06.84	15.25'	LT
6	+07.61	16.22'	LT
7	+23.14	20.12'	LT
8	+26.85	16.56'	LT
9	+26.31	17.68'	RT
10	+24.83	18.66'	RT
11	+08.27	9.39'	RT
12	+07.36	8.89'	RT
13	+06.84	8.01'	RT
14	+96.84	2.22'	RT
15	+95.45	3.12'	RT



INSET B

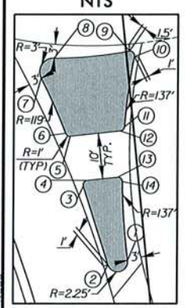
NTS

POINT NUMBER	-Y7- STATION	OFFSET	LT / RT
1	+36.47	50.81'	RT
2	+34.85	51.90'	RT
3	+11.28	34.21'	RT
4	+13.11	30.66'	RT
5	+32.75	42.42'	RT
6	+33.68	43.66'	RT

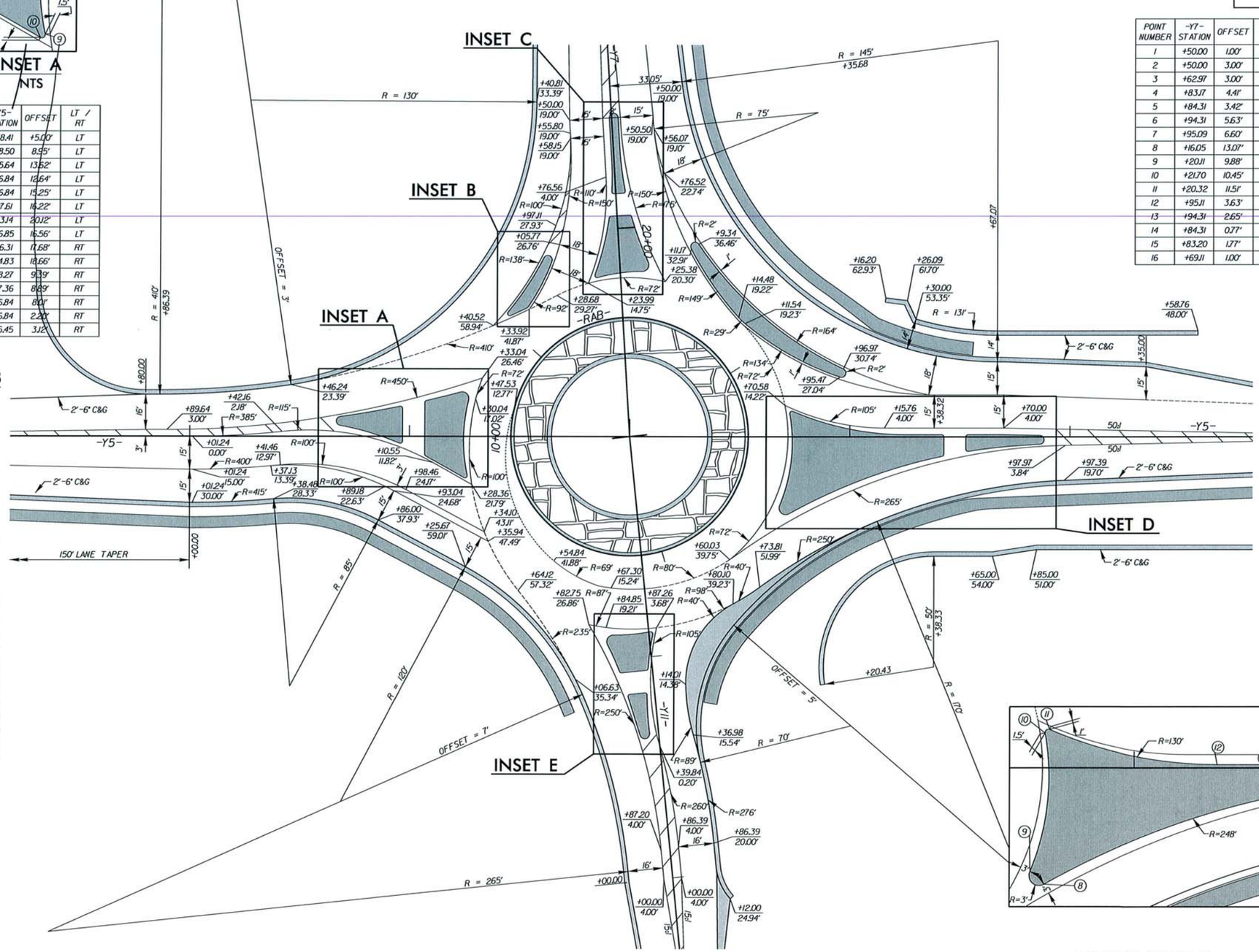
POINT NUMBER	-Y11- STATION	OFFSET	LT / RT
1	+34.19	4.09'	RT
2	+34.74	8.54'	RT
3	+17.13	12.31'	RT
4	+15.92	11.33'	RT
5	+05.92	14.12'	RT
6	+05.19	15.08'	RT
7	+92.64	19.33'	RT
8	+88.58	16.00'	RT
9	+88.76	0.79'	LT
10	+90.05	1.73'	LT
11	+05.10	1.92'	RT
12	05.92	2.90'	RT
13	+15.92	4.56'	RT
14	+17.01	3.56'	RT

INSET E

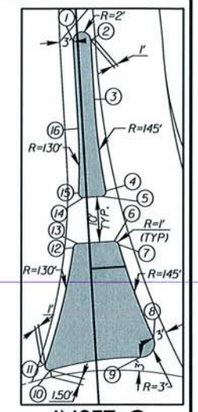
NTS



INSET C



POINT NUMBER	-Y7- STATION	OFFSET	LT / RT
1	+50.00	1.00'	RT
2	+50.00	3.00'	LT
3	+62.97	3.00'	LT
4	+83.17	4.41'	LT
5	+84.31	3.42'	LT
6	+94.31	5.63'	LT
7	+95.09	6.60'	LT
8	+16.05	13.07'	LT
9	+20.11	9.88'	LT
10	+21.70	10.45'	RT
11	+20.32	11.51'	RT
12	+95.11	3.63'	RT
13	+94.31	2.65'	RT
14	+84.31	0.77'	RT
15	+83.20	1.77'	RT
16	+69.11	1.00'	RT



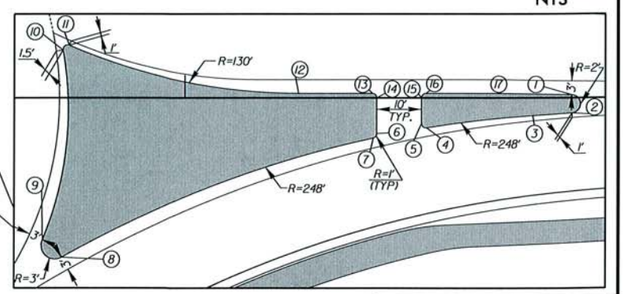
INSET C

NTS

POINT NUMBER	-Y5- STATION	OFFSET	LT / RT
1	+86.33	0.67'	LT
2	+86.41	3.32'	RT
3	+77.71	3.87'	RT
4	+53.89	6.55'	RT
5	+52.73	5.56'	RT
6	+42.73	7.80'	RT
7	+41.93	8.78'	RT
8	+72.49	34.86'	RT
9	+68.29	31.00'	RT
10	+72.75	10.45'	LT
11	+74.14	11.51'	LT
12	+25.35	1.00'	LT
13	+41.73	1.00'	LT
14	+42.73	0.00'	CL
15	+52.73	0.00'	CL
16	+53.73	1.00'	LT
17	+70.00	1.00'	LT

INSET D

NTS



FOR PLAN SEE SHT. 16
FOR -Y5- PROFILE SEE SHT. 31
FOR -Y7- PROFILE SEE SHT. 31
FOR -Y11- PROFILE SEE SHT. 32
FOR -RAB- PROFILE SEE SHT. 33

PLANS PREPARED BY :
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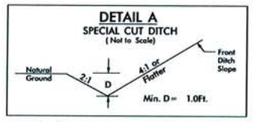
8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2800	2-M
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

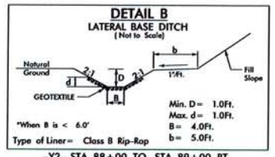
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



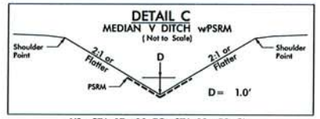
-L- STA. 12+71 TO STA. 13+50 RT
-L- STA. 12+72 TO STA. 25+50 LT
-RPA- STA. 18+15 TO STA. 20+15 LT (USE 6:1)
-RPB- STA. 16+95 TO STA. 19+90 RT
-Y2- STA. 17+00 TO STA. 18+50 RT
-Y2- STA. 20+00 TO STA. 24+50 LT
-Y2- STA. 22+50 TO STA. 24+00 RT
-Y2- STA. 31+50 TO STA. 35+00 RT
-Y2- STA. 39+50 TO STA. 41+50 LT
-Y2- STA. 44+00 TO STA. 45+00 LT
-Y2- STA. 54+00 TO STA. 57+00 LT (USE 6:1)
-Y2- STA. 62+00 TO STA. 66+50 LT
-Y2- STA. 75+00 TO STA. 83+50 LT
-Y2- STA. 80+50 TO STA. 81+50 RT
-Y6- STA. 10+65 TO STA. 11+00 RT
-Y6- STA. 11+00 TO STA. 11+50 LT
-Y12- STA. 16+00 TO STA. 17+50 RT
-Y12A- STA. 10+25 TO STA. 11+50 RT

DETAIL B
LATERAL BASE DITCH
(Not to Scale)



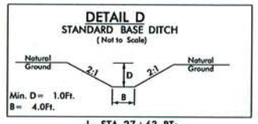
-Y2- STA. 88+00 TO STA. 89+00 RT
-Y2- STA. 91+00 TO STA. 92+40 RT

DETAIL C
MEDIAN V DITCH wPSRM
(Not to Scale)



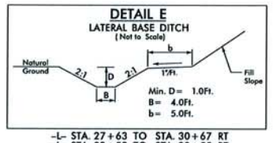
-Y2- STA. 17+00 TO STA. 18+50 CL

DETAIL D
STANDARD BASE DITCH
(Not to Scale)



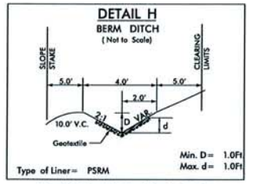
-L- STA. 27+63 RT;
FIRST 60' SEE DETAIL Q;
NEXT 89': L=89', S=1.55%
BEG EL=957.0, END EL=955.6;
LAST 61': L=61', S=0.30%
BEG EL=955.6, END EL=955.4

DETAIL E
LATERAL BASE DITCH
(Not to Scale)



-L- STA. 27+63 TO STA. 30+67 RT
-L- STA. 32+58 TO STA. 33+55 RT
-L- STA. 54+00 TO STA. 58+00 LT
-RPB- STA. 19+90 TO STA. 21+65 RT
-RPC- STA. 18+00 TO STA. 21+94 RT
-Y2- STA. 35+00 TO STA. 39+00 LT
-Y2- STA. 89+00 TO STA. 91+00 RT
-Y2- STA. 92+40 TO STA. 93+50 RT
-Y5- STA. 17+00 TO STA. 19+50 LT
-Y9- STA. 10+72 TO STA. 16+12 LT
-Y9- STA. 17+00 TO STA. 18+25 RT
-Y12- STA. 10+43 TO STA. 12+50 LT
-Y12- STA. 14+50 TO STA. 16+00 RT

DETAIL H
BERM DITCH
(Not to Scale)

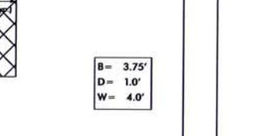


-Y5- STA. 31+00 TO STA. 34+00 RT

DETAIL I
TOE PROTECTION
(Not to Scale)

-Y2- STA. 47+00 TO STA. 47+60 LT
-Y7- STA. 17+50 TO STA. 20+40 LT
-Y7- STA. 18+40 TO STA. 20+20 RT
-Y9- STA. 18+00 TO STA. 19+50 LT

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



-Y3- STA. 14+75 TO STA. 16+50 LT (3:1 SIDE SLOPES)
-Y9- STA. 13+00 TO STA. 17+00 RT
-Y9- STA. 17+15 TO STA. 18+00 LT

DETAIL K
CUT DITCH
(Not to Scale)

-Y12- STA. 12+50 TO STA. 14+00 LT

DETAIL L
MEDIAN V DITCH
(Not to Scale)

-Y2- STA. 18+50 TO STA. 22+50 CL
-Y2- STA. 24+00 TO STA. 26+00 CL
-Y2- STA. 32+50 TO STA. 36+00 CL
-Y2- STA. 39+50 TO STA. 41+50 CL
-Y2- STA. 48+20 TO STA. 50+00 CL

DETAIL M
SPECIAL CUT BASE DITCH
(Not to Scale)

-RPD- STA. 18+85 TO STA. 20+75 LT
-Y2- STA. 18+50 TO STA. 22+50 RT
-Y2- STA. 47+50 TO STA. 51+50 RT
-Y2- STA. 93+50 TO STA. 96+58 RT
-Y9- STA. 11+50 TO STA. 13+50 LT
-Y9- STA. 14+50 TO STA. 15+45 LT
-Y9- STA. 16+20 TO STA. 17+00 LT

DETAIL N
STANDARD BASE DITCH
(Not to Scale)

-DRI- STA. 11+40 LT; L=311', S=0.50%
BEG EL=967.9, END EL=966.2
-RPD- STA. 19+06 RT; L=48', S=0.42%
BEG EL=965.7, END EL=965.5
-Y1- STA. 10+64 TO STA. 12+77 LT
L=213', S=0.30%
BEG EL=954.5, END EL=953.8

DETAIL O
SPECIAL CUT DITCH
(Not to Scale)

-Y3- STA. 17+50 TO STA. 19+00 LT

DETAIL P
SPECIAL LATERAL BASE DITCH
(Not to Scale)

-Y2- STA. 90+50 TO STA. 91+10 LT

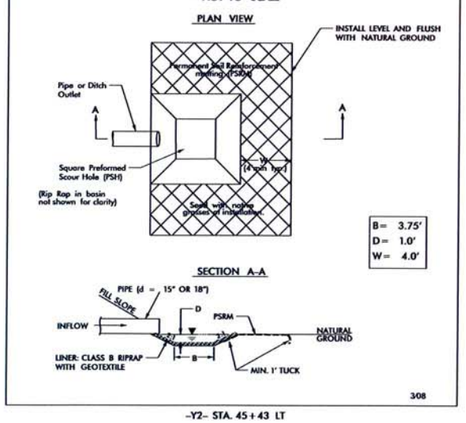
DETAIL Q
STANDARD BASE DITCH
(Not to Scale)

-L- STA. 27+63 RT; L=60', S=6.81%
BEG EL=961.1, END EL=957.0

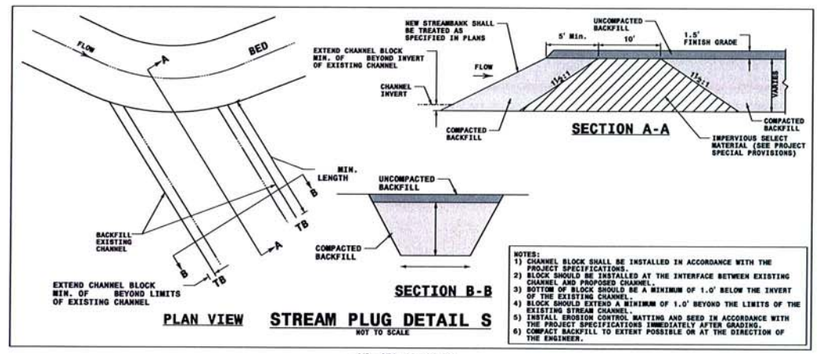
DETAIL
FALSE SUMP
(Not to Scale)

Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

PREFORMED SCOUR HOLE DETAIL R
*NOT TO SCALE



-Y2- STA. 45+43 LT



-Y2- STA. 45+00 RT

PLANS PREPARED BY :
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3/3/2003
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Engineering

PROJECT REFERENCE NO.	SHEET NO.
U-2800	3-A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4	ROBERT FELDMAN
2	4	LYMAN & MARY SPANGLER, JR
3	4	LEWIS C. SMITH, VI & ASHLEIGH S. ROGERS
4	4	PATTIE PACK
5	4	DAVID & DORIS CHAPPELL
6	4	ROBERT FELDMAN
7	4, 17	VIRGINIA A OSBURN
8	4, 5	WILMA BOLICK
9	4	GURNIE E SNOW
10	4, 5, 17	ROBINS RENTAL, LLC
11	5	W AVALON POTTS
12	5	MILDRED E PULLIAM
13	5	RUSSELL MORPHIS
14	5	LENNA SHEW
15	5	JAMES & MARGARET WILBURN
16	5	NC STATE HIGHWAY COMMISSION
17	5, 7	MODERN MACHINE & METAL FABRICATORS INC
18	5, 12	NCDOT
19	5, 13	TERRY BALLARD & BETTY HOLCOMB
20	5	CAL-CORP, LLC
21	5	CURTIS W. CAMPBELL JUDY W. OBBORNE
22	5, 12	NORMAN & REXINE BENNETT
23	5	PEMM PROPERTIES LLC
24	5	JAMES MCBRIDE
25	5	RONALD N SCHLESSINGER
26	5	ADILIO B VASQUEZ
27	5	JMM REAL ESTATE LLC
28	5	DENNIS CARLYLE
29	5	JANE & ANDREW VEACH
30	5, 6, 16	LANDRETH PROPERTIES/KERN LLC
31	5, 6	TOWN OF KERNERSVILLE
32	5, 6	EDGAR & MAXINE B HEDRICK
33	5, 6	COMMERCIAL PROPERTIES
34	6, 16	JONATHAN & SABRINA DIXON
35	6	NCDOT
36	6	KENNETH JAMES
37	6	TOWN OF KERNERSVILLE
38	7, 12	SIXTY-SIX-I-40 ASSOCIATES
39	10, 11	MICHAEL YORK
40	12	TOWN OF KERNERSVILLE
41	5, 13, 14, 17	HELEN H PRINCE
42	10, 11, 15	GARDEN TOWERS LLP
43	16	TWIN CITY PROPERTIES
44	16	SOUTHWEST LANDCOM LP
45	4, 17	BARBARA WHITT HICKS
46	10, 15	CONGRESS GARDENS INC

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

REVISIONS

ROW REVISION - 3/14/13 - ADDED PARCEL #46

5/28/99

3/21/2013
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PLANS PREPARED BY :

RK&K

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

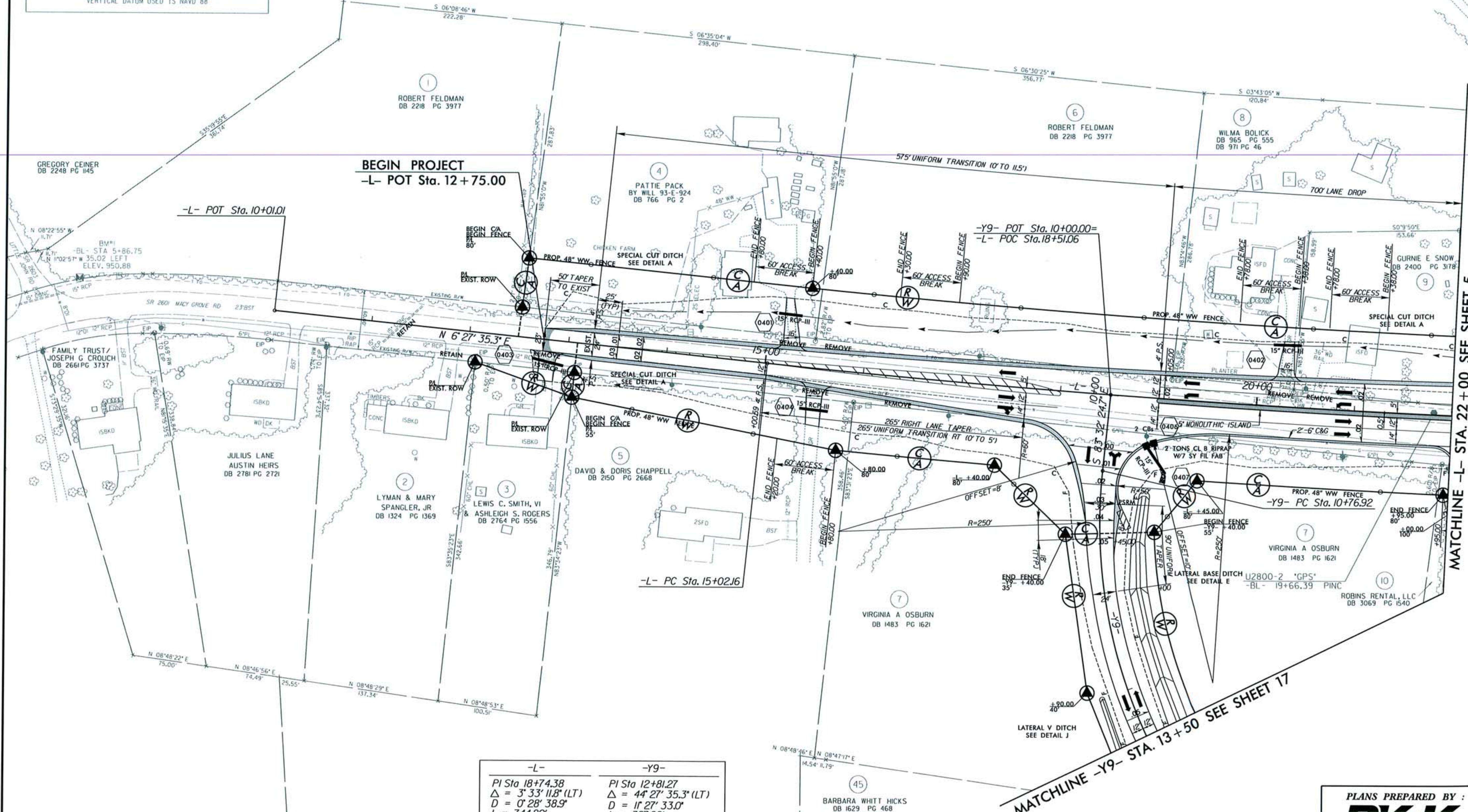
PROJECT REFERENCE NO.	SHEET NO.
U-2800	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "U2800-1"
WITH NAD 83/95 STATE PLANE GRID COORDINATES OF
NORTHING: 856538.3160(ft) EASTING: 1690838.4320(ft)
ELEVATION: 948.99(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99994142
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U2800-1" TO -L- STATION 10+01.01 IS 286.56(ft) N 1° 18' 04.3" E
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88



NAD 83
BEGIN PROJECT
-L- POT Sta. 12+75.00
-L- POT Sta. 10+01.01
-Y9- POT Sta. 10+00.00=
-L- POC Sta.18+51.06
-L- PC Sta. 15+02.16
-Y9- PC Sta. 10+76.92
575' UNIFORM TRANSITION (0' TO 11.5')
700' LANE DROP
265' RIGHT LANE TAPER
265' UNIFORM TRANSITION RT (0' TO 5')
N 6° 27' 35.3" E
SPECIAL CUT DITCH SEE DETAIL A
LATERAL BASE DITCH SEE DETAIL E
LATERAL V DITCH SEE DETAIL J
PROP. 48" WW FENCE
ROBERT FELDMAN DB 2218 PG 3977
GREGORY CEINER DB 2248 PG 1145
PATTIE PACK BY WILL 93-E-924 DB 766 PG 2
WILMA BOLICK DB 965 PG 555 DB 971 PG 46
GURNIE E SNOW DB 2400 PG 3178
FAMILY TRUST/ JOSEPH G CROUCH DB 2661 PG 3737
JULIUS LANE AUSTIN HEIRS DB 2781 PG 2721
LYMAN & MARY SPANGLER, JR DB 1324 PG 1369
LEWIS C. SMITH, VI & ASHLEIGH S. ROGERS DB 2764 PG 1556
DAVID & DORIS CHAPPELL DB 2150 PG 2668
VIRGINIA A OSBURN DB 1483 PG 1621
ROBINS RENTAL, LLC DB 3069 PG 1540
BARBARA WHITT HICKS DB 1629 PG 468 DB 1509 PG 622
U2800-2 "GPS" -BL- 19+66.39 PINC
MATCHLINE -L- STA. 22+00 SEE SHEET 5
MATCHLINE -Y9- STA. 13+50 SEE SHEET 17

-L-	-Y9-
PI Sta 18+74.38	PI Sta 12+81.27
Δ = 3° 33' 11.8" (LT)	Δ = 44° 27' 35.3" (LT)
D = 0° 28' 38.9"	D = 11° 27' 33.0"
L = 744.20'	L = 387.98'
T = 372.22'	T = 204.35'
R = 12,000.00'	R = 500.00'
SE = NC	SE = 0.05
V = 50mph	V = 30mph

FOR -L- PROFILE SEE SHT. 18
FOR -Y9- PROFILE SEE SHT. 32
FOR DITCH DETAILS SEE SHT. 2-M

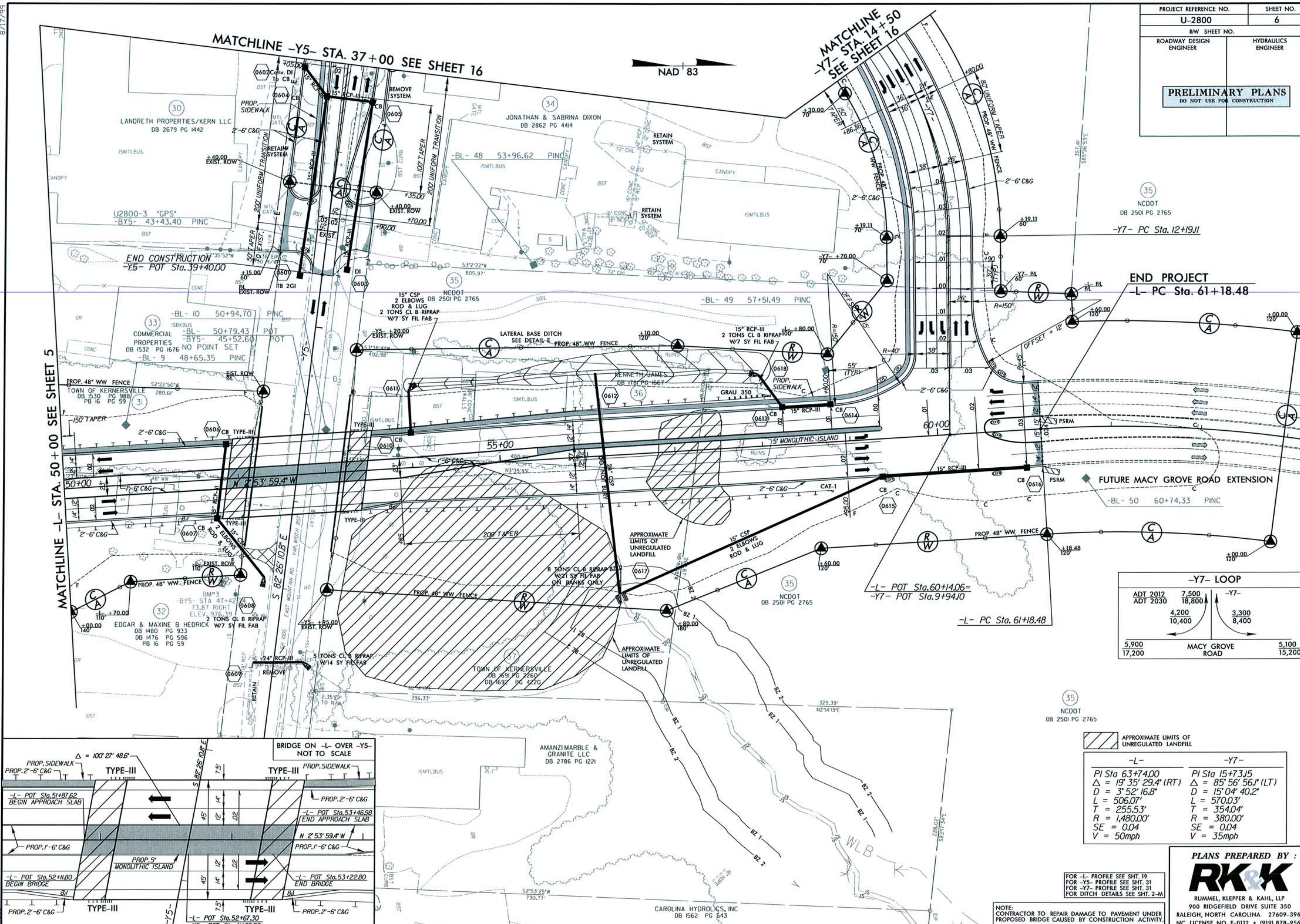
PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

3/21/2013
R:\Roadway\Proj\u2800_rdy_psh04.dgn

REVISIONS
ROW REVISION - 3/14/13 - ADDED ACCESS BREAK ON PARCEL #11; REVISED TCE ON PARCEL #41; ADDED DRIVES ON -Y12- & REVISED ROW & TCE FOR PARCELS #14 & #15
MATCHLINE -Y1- STA. 14+50 SEE SHEET 7
MATCHLINE -Y2- STA. 67+00 SEE SHEET 12
MATCHLINE -RPA- STA. 22+00 SEE SHEET 12
MATCHLINE -RPB- STA. 26+50 SEE SHEET 12
NAD 83
-Y3- OLD GREENSBORO ROAD
ADT 2012
ADT 2030
-L- MACY GROVE ROAD
12,500
34,000
8,100
17,200
1,600
-1
5,900
17,200
9,700
17,300
-Y3-
-Y2- I-40 BUSINESS
ADT 2012
ADT 2030
61,100
86,600
500
2,300
7,000
16,400
12,500
34,400
MACY GROVE ROAD
6,300
21,400
2,700
8,800
2,400
7,700
58,700
84,400
-Y2-
-Y1- INDUSTRIAL PARK DRIVE
ADT 2012
ADT 2030
-Y1-
5,100
9,000
1,800
7,600
3,300
6,400
4,800
17,600
6,300
21,400
-L- MACY GROVE ROAD
PROJECT REFERENCE NO.
U-2800
SHEET NO.
5
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
BRIDGE ON -L- OVER -RR- NOT TO SCALE
PROP. 2'-6" C&G
PROP. SIDEWALK
TYPE-III
Δ = 92° 06' 38.7"
-L- POT Sta. 46+52.39 BEGIN APPROACH SLAB
-L- POT Sta. 48+22.22 END APPROACH SLAB
PROP. 5' MONOLITHIC ISLAND
-L- POT Sta. 46+81.56 BEGIN BRIDGE
-L- POT Sta. 47+98.06 END BRIDGE
N 2° 53' 59.4" W
A
B
C
D
FELDMAN FAMILY LTD PARTNERSHIP DB 2918 PG 3265
MODERN MACHINE & METAL FABRICATORS INC DB 652 PG 1964
RUSSELL MORPHIS DB 2283 PG 3075
BEGIN CONSTRUCTION -Y1- POT Sta. 10+00.00
MILDRED E. PULLIAM
WILMA BOLICK
W. AVALON POTTS
NC STATE HIGHWAY COMMISSION
-RPB- SC Sta. 21+66.03
-RPB- PT Sta. 25+78.24
-RPB- POT Sta. 27+10.69
-RPC- POT Sta. 23+71.61
-L- POT Sta. 31+50.61
-RPA- POT Sta. 37+79.17
-RPD- POT Sta. 26+84.32
-L- POT Sta. 37+91.65
-L- PC Sta. 38+58.54
-Y4A- POT Sta. 10+00.00
BEGIN CONSTRUCTION -Y4A- POT Sta. 10+00.00
-Y4A- PT Sta. 11+34.66
PEMM PROPERTIES LLC DB 2082 PG 473
NORMAN & REXINE BENNETT
-L- PT Sta. 43+65.24
-L- POT Sta. 43+82.57
-Y3- POT Sta. 10+00.00
LANDRETH PROPERTIES/KERN LLC
COMMERCIAL PROPERTIES
TOWN OF KERNERSVILLE
EDGAR & MAXINE B. HEDRICK
-L- PT Sta. 22+46.36
MATCHLINE -L- STA. 22+00 SEE SHEET 4
MATCHLINE -L- STA. 50+00 SEE SHEET 6
PODAKS RENTAL LLC
-L- POT Sta. 26+93.68
-Y1- POT Sta. 19+62.04
-Y12A- POT Sta. 11+35.00
-Y12A- PC Sta. 10+22.66
N 45° 36' 12.3" W
END CONSTRUCTION -Y12A- POT Sta. 11+10.00
-Y12A- PT Sta. 10+84.77
MATCHLINE -Y12- STA. 12+50 SEE SHEET 17
LENNA SHEW
-RPC- ST Sta. 20+02.40
-Y12- PT Sta. 13+68.46
-RPC- CS Sta. 18+42.40
N 6° 11' 21.3" W
-Y12A- POT Sta. 10+00.00
-Y12- POT Sta. 13+85.00
-Y12- PT Sta. 13+68.46
HELEN H. PRINCE
JAMES & MARGARET WILBURN
-RPD- PT Sta. 25+89.93
-RPD- SC Sta. 23+31.48
-RPD- SRS Sta. 21+91.48
-RPD- CS Sta. 20+71.48
CAL-CORP, LLC DB 2296 PG 264
CURTIS W. CAMPBELL JUDY W. OSBORNE NO DB REFERENCE
RONALD N. SCHLESSINGER DB 2659 PG 455
-Y3- PRC Sta. 13+27.83
ADALID B. VASQUEZ DB 2651 PG 3723
JMM REAL ESTATE LLC DB 2513 PG 85
DENNIS CARLYLE DB 1677 PG 424
-Y3- PT Sta. 17+44.09
JANE & ANDREW VEACH
END CONSTRUCTION -Y3- POT Sta. 19+40.00
TERRY BALLARD & BETTY HOLCOMB
MATCHLINE -RPC- STA. 15+00 SEE SHEET 13
MATCHLINE -Y2- STA. 82+50 SEE SHEET 13
MATCHLINE -RPD- STA. 17+50 SEE SHEET 13
BRIDGE ON -L- OVER -Y2- NOT TO SCALE
-L- POT Sta. 33+64.06 BEGIN APPROACH SLAB
-L- POT Sta. 35+87.65 END APPROACH SLAB
N 2° 54' 23.5" E
PROP. 5' MONOLITHIC ISLAND
-L- POT Sta. 34+08.20 BEGIN BRIDGE
-L- POT Sta. 35+63.70 END BRIDGE
PROP. 2'-6" C&G
TYPE-III
-Y4A-
PI Sta 10+67.33
Δ = 1° 32' 35.0" (RT)
D = 1° 08' 45.3"
L = 134.66'
T = 67.33'
R = 5,000.00'
-Y12-
PI Sta 11+94.42
Δ = 29° 37' 26.3" (RT)
D = 22° 55' 05.9"
L = 129.26'
T = 66.11'
R = 250.00'
SE = NC
V = 30mph
-Y12A-
PI Sta 10+54.75
Δ = 35° 35' 09.0" (RT)
D = 57° 17' 44.8"
L = 62.11'
T = 32.09'
R = 100.00'
-L-
PI Sta 18+74.38
Δ = 3° 33' 11.8" (LT)
D = 0° 28' 38.9"
L = 744.20'
T = 372.22'
R = 12,000.00'
SE = NC
V = 50mph
PI Sta 41+12.11
Δ = 5° 48' 22.9" (LT)
D = 1° 08' 45.3"
L = 506.70'
T = 253.57'
R = 5,000.00'
SE = NC
V = 50mph
-Y3-
PI Sta 12+02.36
Δ = 22° 24' 33.5" (RT)
D = 8° 48' 53.0"
L = 254.23'
T = 128.76'
R = 650.00'
SE = 0.04
V = 25mph
PI Sta 15+40.22
Δ = 28° 03' 33.3" (LT)
D = 6° 44' 26.4"
L = 416.27'
T = 212.40'
R = 850.00'
SE = 0.06
V = 50mph
-RPB-
PIs Sta 21+12.72
θs = 3° 29' 56.3"
Ls = 160.00'
LT = 106.69'
ST = 53.35'
PI Sta 23+73.85
Δ = 18° 01' 44.2" (LT)
D = 4° 22' 25.4"
L = 412.21'
T = 207.82'
R = 1,310.00'
SE = 0.05
V = 40mph
-RPC-
PI Sta 15+03.33
Δ = 15° 38' 21.9" (LT)
D = 2° 17' 30.6"
L = 682.40'
T = 343.33'
R = 2,500.00'
SE = 0.06
V = 60mph
PIs Sta 18+95.74
θs = 1° 50' 00.5"
Ls = 160.00'
LT = 106.67'
ST = 53.34'
-RPD-
PI Sta 18+14.69
Δ = 14° 47' 46.3" (RT)
D = 2° 51' 53.2"
L = 516.48'
T = 259.69'
R = 2,000.00'
SE = 0.05
V = 50mph
PIs Sta 21+11.49
θs = 1° 43' 07.9"
Ls = 120.00'
LT = 80.00'
ST = 40.00'
PIs Sta 22+84.86
θs = 5° 00' 48.2"
Ls = 140.00'
LT = 93.37'
ST = 46.70'
PI Sta 24+61.84
Δ = 18° 30' 34.4" (LT)
D = 7° 09' 43.1"
L = 258.44'
T = 130.36'
R = 800.00'
SE = 0.05
V = 30mph
FOR -L- PROFILE SEE SHTS. 18 & 19
FOR -Y1- PROFILE SEE SHT. 21
FOR -Y2- PROFILE SEE SHTS. 23-26
FOR -Y3- PROFILE SEE SHT. 30
FOR -Y12- PROFILE SEE SHT. 33
FOR -Y12A- PROFILE SEE SHT. 33
FOR -RPA- PROFILE SEE SHT. 26
FOR -RPB- PROFILE SEE SHT. 27
FOR -RPC- PROFILE SEE SHT. 28
FOR -RPD- PROFILE SEE SHT. 29
FOR INTERSECTION DETAILS SEE SHTS. 2-J & 2-K
FOR DITCH DETAILS SEE SHT. 2-M
LOYAL ORDER OF MOOSE, INC KERNERSVILLE LODGE NO. 2101 DB 1008 PG 209 PB 16 PG 58
PLANS PREPARED BY:
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560
LOCATION:
TIP NO.: U-2800
COUNTY: FORSYTH
DESIGNED BY:
CHECKED BY:
DATE:
GRAPHIC SCALE
50 25 0 50 100
PLANS

PROJECT REFERENCE NO.	SHEET NO.
U-2800	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



MATCHLINE -Y5- STA. 37+00 SEE SHEET 16
MATCHLINE -Y7- STA. 14+50 SEE SHEET 16
MATCHLINE -L- STA. 50+00 SEE SHEET 5
NAD 83
END PROJECT
-L- PC Sta. 61+18.48
END CONSTRUCTION
-Y5- POT Sta.39+40.00
-Y7- PC Sta. 12+19.11
LANDRETH PROPERTIES/KERN LLC
DB 2679 PG 1442
JONATHAN & SABRINA DIXON
DB 2862 PG 4414
NCDOT
DB 2501 PG 2765
COMMERCIAL PROPERTIES
DB 1532 PG 1676
TOWN OF KERNERSVILLE
DB 1530 PG 988
PB 16 PG 59
EDGAR & MAXINE B HEDRICK
DB 1480 PG 933
DB 1476 PG 596
PB 16 PG 59
KENNETH JAMES
DB 1781 PG 1667
TOWN OF KERNERSVILLE
DB 1691 PG 2260
DB 1692 PG 4220
AMANZI MARBLE & GRANITE LLC
DB 2786 PG 1221
CAROLINA HYDROLICS, INC
DB 1562 PG 543
FUTURE MACY GROVE ROAD EXTENSION
-BL- 50 60+74.33 PINC
APPROXIMATE LIMITS OF UNREGULATED LANDFILL
-L- POT Sta.60+14.06=
-Y7- POT Sta.9+94.10
-L- PC Sta. 61+18.48
LATERAL BASE DITCH SEE DETAIL E
BRIDGE ON -L- OVER -Y5- NOT TO SCALE
-L- POT Sta.51+87.62 BEGIN APPROACH SLAB
-L- POT Sta.53+46.98 END APPROACH SLAB
-L- POT Sta.52+11.80 BEGIN BRIDGE
-L- POT Sta.53+22.80 END BRIDGE
-L- POT Sta.52+67.30
-Y5- POT Sta.41+69.22
N 2°53′59.4″ W
S 82°26′10.8″ E

-Y7- LOOP

		-Y7-	
ADT 2012 / ADT 2030	7,500 / 18,800		
	4,200 / 10,400	3,300 / 8,400	
5,900 / 17,200	MACY GROVE ROAD		5,100 / 15,200

APPROXIMATE LIMITS OF UNREGULATED LANDFILL

-L-	-Y7-
PI Sta 63+74.00	PI Sta 15+73.15
Δ = 19° 35′ 29.4″ (RT)	Δ = 85° 56′ 56.1″ (LT)
D = 3° 52′ 16.8″	D = 15° 04′ 40.2″
L = 506.07′	L = 570.03′
T = 255.53′	T = 354.04′
R = 1,480.00′	R = 380.00′
SE = 0.04	SE = 0.04
V = 50mph	V = 35mph

FOR -L- PROFILE SEE SHT. 19
FOR -Y5- PROFILE SEE SHT. 31
FOR -Y7- PROFILE SEE SHT. 31
FOR DITCH DETAILS SEE SHT. 2-M

NOTE:
CONTRACTOR TO REPAIR DAMAGE TO PAVEMENT UNDER PROPOSED BRIDGE CAUSED BY CONSTRUCTION ACTIVITY.

PLANS PREPARED BY :
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900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

8/17/99
3/21/2013

PROJECT REFERENCE NO.	SHEET NO.
U-2800	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

8/17/99

STAR PAPER TUBE INC
DB 1884 PG 2565

38 SIXTY-SIX-I-40 ASSOCIATES
DB 1163 PG 1006

-Y6- POT Sta. 15+90.44

END CONSTRUCTION
-Y6- POT STA.15+28.57

-L- 15+00

JOHNNY & CYNTHIA BLACKBURN
DB 1503 PG 975

17 MODERN MACHINE & METAL FABRICATORS INC
DB 1686 PG 4078

13 RUSSELL MORPHIS
DB 2283 PG 3075

SEE SHEET 5

MATCHLINE -Y1- STA. 14+50

DO NOT DISTURB FENCE

SPECIAL CUT DITCH SEE DETAIL A

STANDARD BASE DITCH SEE DETAIL N

3 TONS CL B RIPRAP W/10 SY FIL FAB

18" RCP-III

45' UNIFORM TAPER

RETAIN SYSTEM

FORSYTH COUNTY EXISTING R/W
TOWN OF KERNERSVILLE

-BYI- 37 5+00.00 POT

-Y1- POT Sta.10+00.00

-Y6- POT Sta. 10+00.00=
-Y1- POT Sta. 10+40.06

TIE TO EXIST.C&G

SR 439 INDUSTRIAL PARK DR 36' BST

RICHARD & SALLIE GRONER
DB 1861 PG 3379

NORMAN BENNETT
DB 2485 PG 855

4"PLASTIC

STAR PAPER TUBE INC
DB 1884 PG 2565

FOR -Y6- PROFILE SEE SHT. 32
FOR DITCH DETAILS SEE SHT. 2-M

PLANS PREPARED BY :
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3/29/2013
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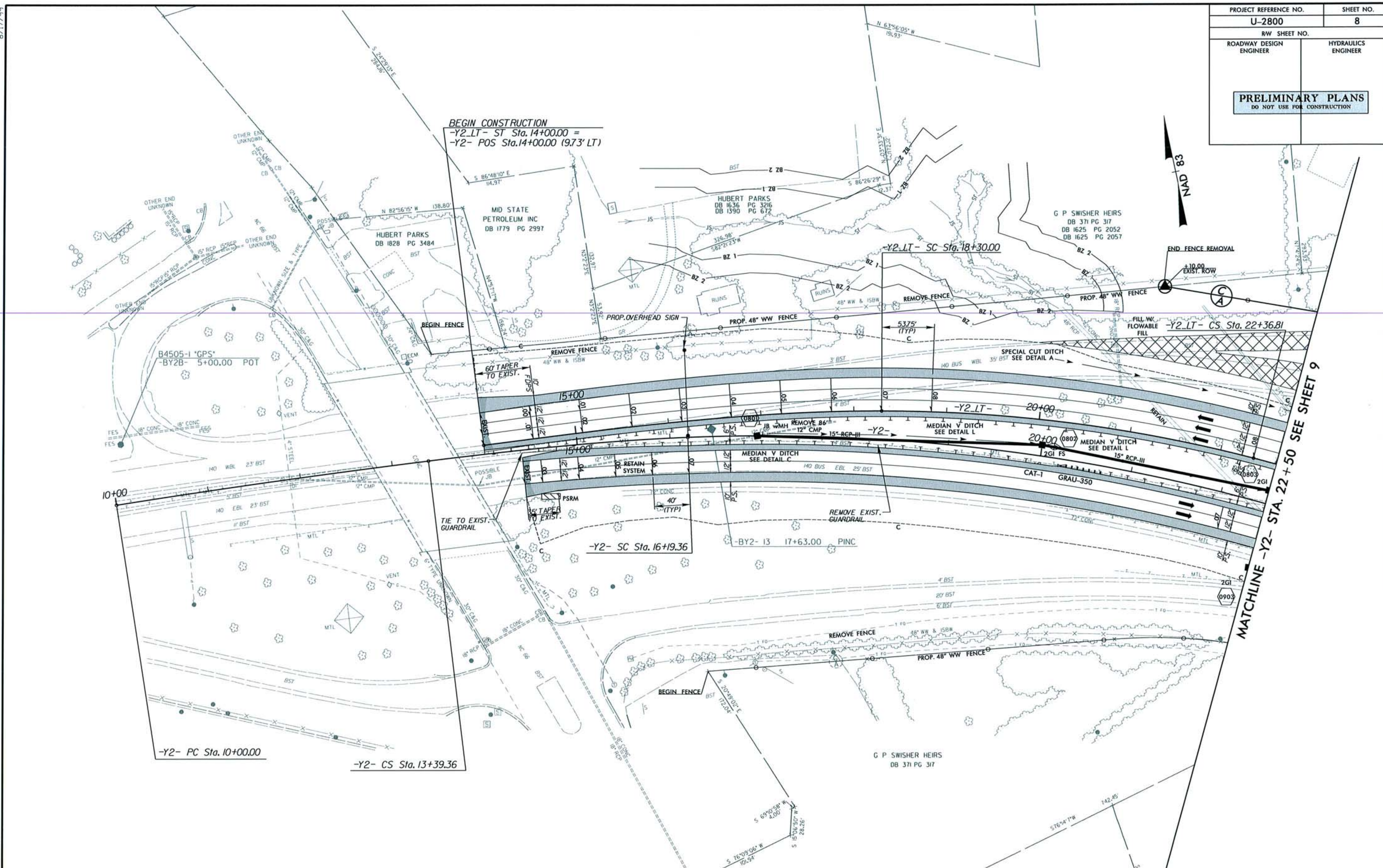
PROJECT REFERENCE NO.	SHEET NO.
U-2800	8

R/W SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



BEGIN CONSTRUCTION
-Y2_LT- ST Sta. 14+00.00 =
-Y2- POS Sta.14+00.00 (9.73' LT)
MID STATE PETROLEUM INC
DB 1779 PG 2997
HUBERT PARKS
DB 1828 PG 3484
HUBERT PARKS
DB 1636 PG 3216
DB 1390 PG 672
G P SWISHER HEIRS
DB 371 PG 317
DB 1625 PG 2052
DB 1625 PG 2057
NAD 83
END FENCE REMOVAL
-Y2_LT- SC Sta. 18+30.00
-Y2_LT- CS Sta. 22+36.81
PROP. 48" WW FENCE
REMOVE FENCE
BEGIN FENCE
PROP.OVERHEAD SIGN
SPECIAL CUT DITCH SEE DETAIL A
60' TAPER TO EXIST.
B4505-I 'GPS'
-BY2B- 5+00.00 POT
MEDIAN V DITCH SEE DETAIL L
MEDIAN V DITCH SEE DETAIL C
RETAIN SYSTEM
CAT-1
GRAU-350
TIE TO EXIST. GUARDRAIL
REMOVE EXIST. GUARDRAIL
-Y2- SC Sta. 16+19.36
-BY2- I3 17+63.00 PINC
MATCHLINE -Y2- STA. 22+50 SEE SHEET 9
-Y2- PC Sta. 10+00.00
-Y2- CS Sta. 13+39.36
G P SWISHER HEIRS
DB 371 PG 317
BEGIN FENCE
PROP. 48" WW FENCE
REMOVE FENCE

-Y2-			-Y2_LT-		
PI Sta 11+69.70	PIs Sta 15+10.36	PI Sta 22+13.14	PIs Sta 16+86.93	PI Sta 20+34.47	PIs Sta 22+86.98
△ = 1° 56' 39.9" (RT)	Θs = 0° 48' 07.3"	△ = 32° 36' 30.8" (RT)	Θs = 7° 33' 26.7"	△ = 14° 17' 58.7" (RT)	Θs = 1° 07' 31.4"
D = 0° 34' 22.6"	Θs = 3° 57' 05.5"	D = 2° 49' 20.8"	Ls = 430.00'	D = 3° 30' 54.3"	Θs = 1° 56' 00.1"
L = 339.36'	Ls = 280.00'	L = 1,155.33'	LT = 286.93'	L = 406.81'	Ls = 110.00'
T = 169.70'	LT = 170.99'	T = 593.78'	ST = 143.57'	T = 204.47'	LT = 59.86'
R = 10,000.00'	ST = 109.15'	R = 2,030.00'		R = 1,630.00'	ST = 50.17'
SE = NC		SE = 0.07		SE = 0.08	
V = 60mph		V = 60mph		V = 60mph	

FOR -Y2- PROFILE SEE SHT. 20
FOR -Y2 LT- PROFILE SEE SHT. 20
FOR DITCH DETAILS SEE SHT. 2-M

PLANS PREPARED BY :

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PROJECT REFERENCE NO.	SHEET NO.
U-2800	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

NAD 83

-BY5- II 5+00.00 POT

MOUNTAIN STREET HOLDINGS LLC
DB 2793 PG 2121
PB 10 PG 119

KESHAV INVESTMENT INC
DB 2818 PG 2152

FRED & EDITH ANDERSON
DB 2001 PG 2770

SR 1005 EAST MOUNTAIN ST

-BY5- 25 12+54.72 PINC

KESHAV INVESTMENT INC
DB 2818 PG 2152

B4505-2 *GPS*
-BY2A- 5+00.00 POT
-BY2B- 19+48.17 PINC

-Y2_LT- SC Sta. 23+46.81

PROP. 48" WW FENCE

REMOVE EXIST. GUARDRAIL

REMOVE EXIST. BRIDGE

TIE TO EXIST. FENCE

RETAIN EXISTING FENCE

CONGRESS GARDENS, INC
DB 2952 PG 292

-BY2A- 23 10+51.39 PINC

-BY2B- 35 27+74.63 PINC

REMOVE DI

15" CSP
2 ELBOWS
ROD & LUG

TOE PROTECTION
SEE DETAIL I

25+00 -Y2_LT-

FILL W/ FLOWABLE FILL

33 TONS CL B RIPRAP KEYED IN

SPECIAL CUT DITCH
SEE DETAIL A

25+00 MEDIAN V DITCH
SEE DETAIL L

GRAU-350

100' TAPER TO EXIST.

JB wMH

15+00 -RAMP-

34" RCP-III -Y2-

REMOVE FENCE

PROP. 48" WW FENCE

BEGIN CONSTRUCTION
-RAMP- POC Sta. 17+45.00
-BY2- 14 26+09.35 PINC

-RAMP- PT Sta. 17+50.00

-RAMP- SC Sta. 12+20.00

-Y2- CS Sta. 27+74.69

L E POPE BUILDING CO
DB 1350 PG 1357

MATCHLINE -Y2- STA. 22+50 SEE SHEET 8

MATCHLINE -Y2- STA. 29+50 SEE SHEET 10

-Y2-

PI Sta 22+13.14	PIs Sta 28+68.07
Δ = 32° 36' 30.8" (RT)	Θs = 3° 57' 05.2"
D = 2° 49' 20.8"	Ls = 280.00'
L = 1155.33'	LT = 186.71'
T = 593.78'	ST = 93.38'
R = 2,030.00'	
SE = 0.07	
V = 60mph	

-RAMP-

PIs Sta 11+46.72	PI Sta 14+88.36
Θs = 4° 36' 01.4"	Δ = 22° 09' 55.9" (LT)
Ls = 220.00'	D = 4° 10' 55.8"
LT = 146.72'	L = 530.00'
ST = 73.38'	T = 268.36'
	R = 1,370.00'
	SE = 0.08
	V = 60mph

-Y2_LT-

PIs Sta 22+86.98	PI Sta 28+26.38
Θs = 1° 07' 31.4"	Δ = 19° 26' 17.7" (RT)
Θs = 1° 56' 00.1"	D = 2° 02' 46.6"
Ls = 110.00'	L = 949.93'
LT = 59.86'	T = 479.57'
ST = 50.17'	R = 2,800.00'
	SE = 0.06
	V = 60mph

FOR -Y2- PROFILE SEE SHTS. 20 & 21
FOR -Y2 LT- PROFILE SEE SHTS. 20 & 21
FOR -RAMP- PROFILE SEE SHT. 29
FOR DITCH DETAILS SEE SHT. 2-M

PLANS PREPARED BY :
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900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

3/2/2013
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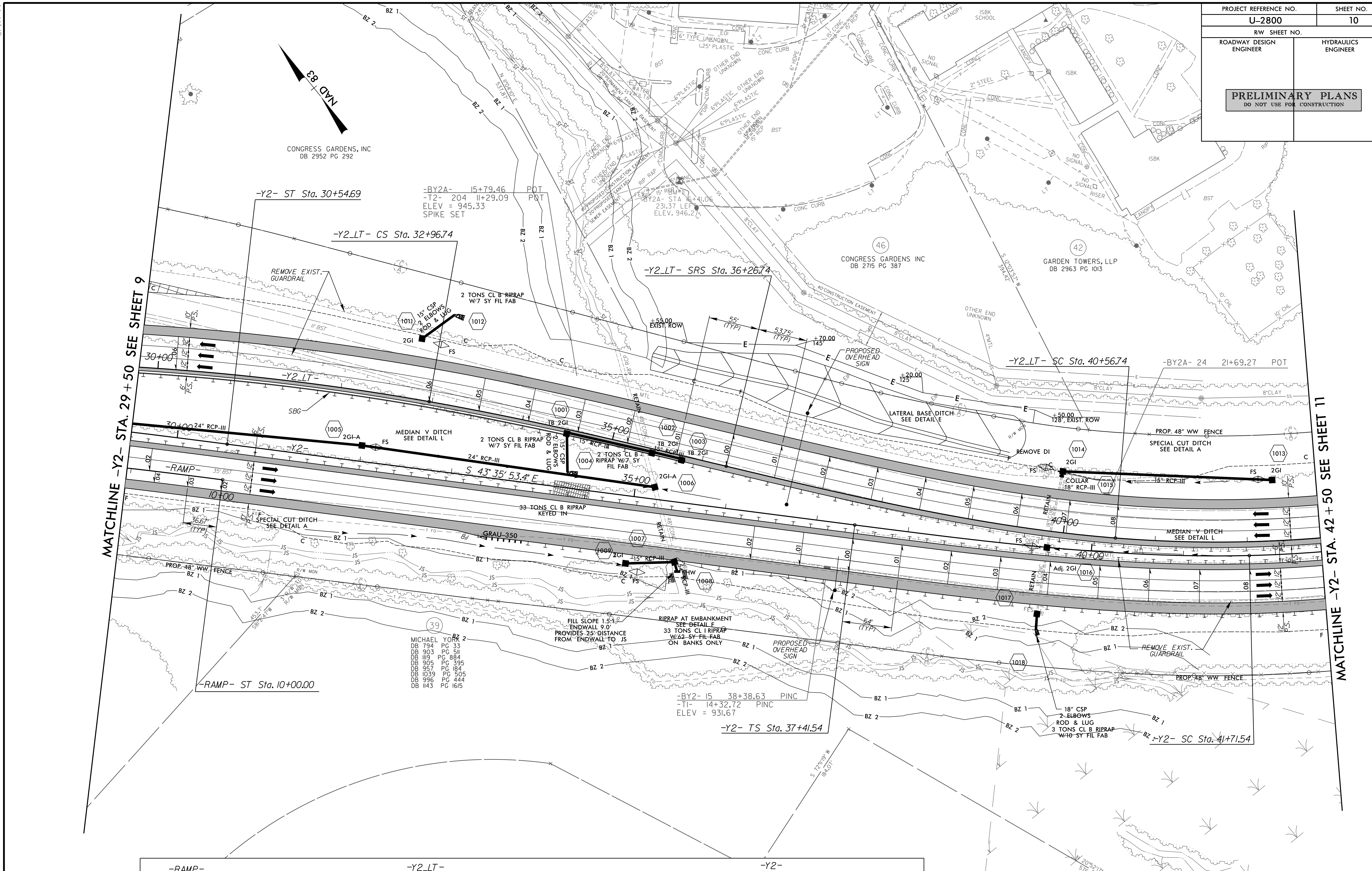
PROJECT REFERENCE NO.	SHEET NO.
U-2800	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-RAMP-	-Y2_LT-				-Y2-		
PIs Sta 11+46.72	PI Sta 28+26.38	PIs Sta 34+06.78	PIs Sta 39+13.76	PI Sta 43+03.66	PIs Sta 28+68.07	PIs Sta 40+28.56	PI Sta 43+46.11
Θs = 4° 36' 01.4"	△ = 19° 26' 17.7" (RT)	Θs = 3° 22' 34.9"	Θs = 8° 49' 49.9"	△ = 20° 04' 31.2" (LT)	Θs = 3° 57' 05.2"	Θs = 8° 44' 11.7"	△ = 14° 06' 54.7" (LT)
Ls = 220.00'	D = 2° 02' 46.6"	Ls = 330.00'	Ls = 430.00'	D = 4° 06' 26.0"	Ls = 280.00'	Ls = 430.00'	D = 4° 03' 48.7"
LT = 146.72'	L = 949.93'	LT = 220.04'	LT = 287.02'	L = 488.78'	LT = 186.71'	LT = 287.02'	L = 347.36'
ST = 73.38'	T = 479.57'	ST = 110.04'	ST = 143.66'	T = 246.92'	ST = 93.38'	ST = 143.65'	T = 174.57'
	R = 2,800.00'			R = 1,395.00'			R = 1,410.00'
	SE = 0.06			SE = 0.08			SE = 0.08
	V = 60mph			V = 60mph			V = 60mph

FOR -Y2- PROFILE SEE SHTS. 21 & 22
FOR -Y2_LT- PROFILE SEE SHTS. 21 & 22
FOR -RAMP- PROFILE SEE SHT. 29
FOR DITCH DETAILS SEE SHT. 2-M

PLANS PREPARED BY :
RK&K
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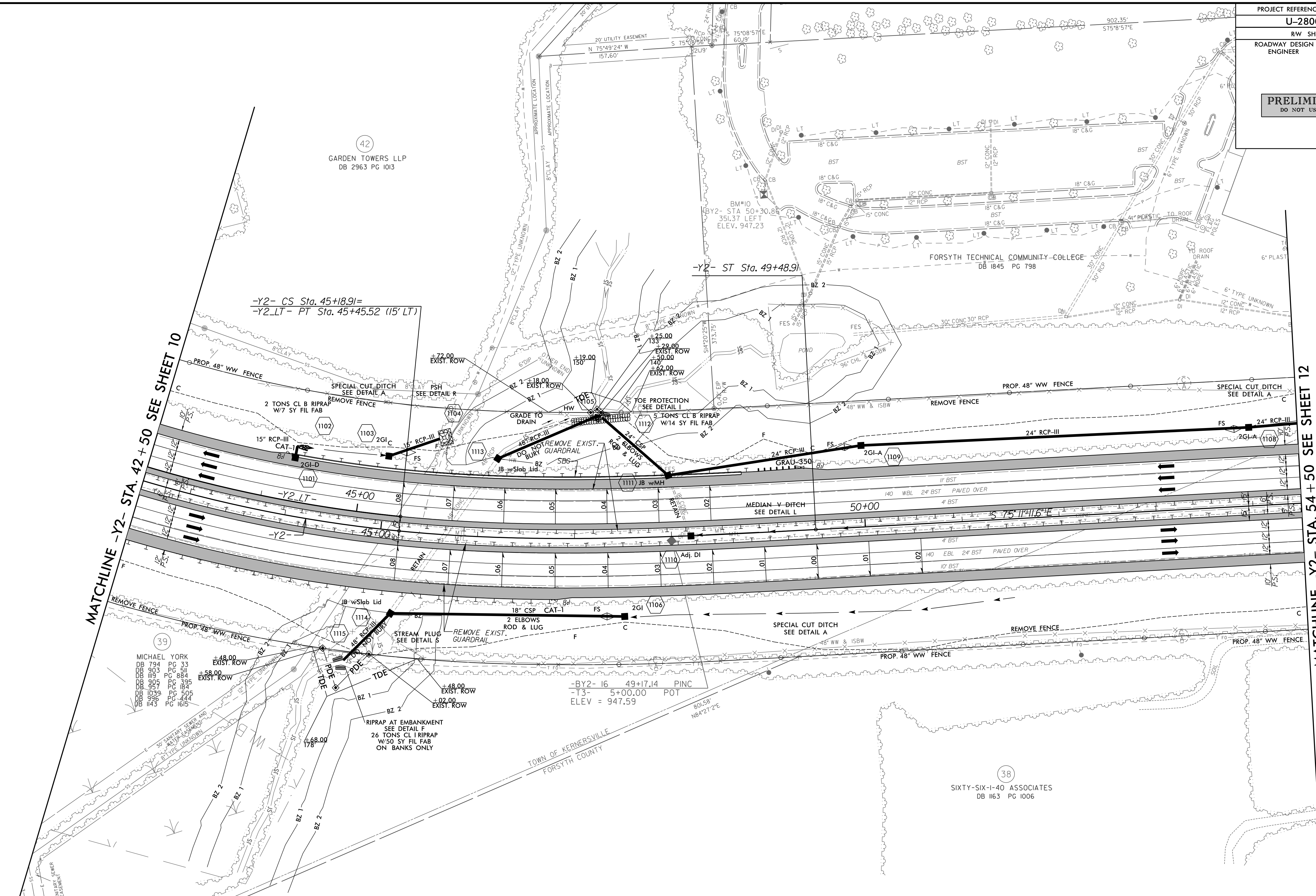
8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2800	11
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-Y2_LT-	-Y2-	
PI Sta 43+03.66	PI Sta 43+46.11	PIs Sta 46+62.56
△ = 20° 04' 31.2" (LT)	△ = 14° 06' 54.7" (LT)	Θs = 8° 44' 11.7"
D = 4° 06' 26.0"	D = 4° 03' 48.7"	Ls = 430.00'
L = 488.78'	L = 347.36'	LT = 287.02'
T = 246.92'	T = 174.57'	ST = 143.65'
R = 1,395.00'	R = 1,410.00'	
SE = 0.08	SE = 0.08	
V = 60mph	V = 60mph	

FOR -Y2- PROFILE SEE SHTS. 22 & 23
FOR -Y2_LT- PROFILE SEE SHTS. 22 & 23
FOR DITCH DETAILS SEE SHT. 2-M

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PROJECT REFERENCE NO.	SHEET NO.
U-2800	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

W AVALON POTTS
DB 1489 PG 1540

FORSYTH TECHNICAL COMMUNITY COLLEGE
DB 1845 PG 798

EDNA SNOW TILLEY
DB 1151 PG 1538
DB 1154 PG 556

CHARLES R & JOY S BEAVER
DB 2654 PG 3463
DB 2762 PG 409

TRIAD COMMERCIAL CORP
DB 1466 PG 496

NORMAN & REXINE BENNETT
DB 1981 PG 3915

TOWN OF KERNERSVILLE
DB 1680 PG 416

-RPA- CS Sta. 17+82.88

-RPA- ST Sta. 18+92.88

-RPA- ST Sta. 10+00.00 (39' LT)=
-Y2- POI Sta. 55+32.32

-RPA- SC Sta. 11+10.00

MATCHLINE -Y2- STA. 54+50 SEE SHEET 11

MATCHLINE -Y2- STA. 67+00 SEE SHEET 5

MATCHLINE -RPA- STA. 22+00 SEE SHEET 5

MATCHLINE -RPB- STA. 50+00 SEE SHEET 5

TOWN OF KERNERSVILLE
FORSYTH COUNTY

SIXTY-SIX-I-40 ASSOCIATES
DB 1163 PG 1006

STAR PAPER TUBE INC
DB 1884 PG 2565

NCDOT
DB 2236
PG 1502

-RPB- ST Sta. 10+00.00 (39' RT)=
-Y2- POI Sta. 57+49.56

-RPB- SC Sta. 11+90.00

-RPB- CS Sta. 16+84.90

-RPB- ST Sta. 18+74.90

-RPB- TS Sta. 20+06.03

-BY2- 17 60+81.46 PINC

PROPOSED OVERHEAD SIGN

600' LANE DROP

SPECIAL CUT DITCH SEE DETAIL A

REMOVE FENCE

REMOVE EXIST. GUARDRAIL

PROP. 48" WW FENCE

18" RCP-III

24" RCP-III

LATERAL BASE DITCH SEE DETAIL E

-RPA-

PIs Sta 10+73.33	PI Sta 14+47.28	PIs Sta 18+19.54
Θs = 0° 48' 28.9"	Δ = 9° 53' 07.3" (LT)	Θs = 0° 48' 28.9"
Ls = 110.00'	D = 1° 28' 08.8"	Ls = 110.00'
LT = 73.33'	L = 672.88'	LT = 73.33'
ST = 36.67'	T = 337.28'	ST = 36.67'
	R = 3,900.00'	
	SE = 0.04	
	V = 60mph	

-RPB-

PIs Sta 11+26.68	PI Sta 14+38.72	PIs Sta 17+48.25	PIs Sta 21+12.72
Θs = 2° 43' 17.6"	Δ = 14° 10' 40.5" (RT)	Θs = 2° 43' 17.6"	Θs = 3° 29' 56.3"
Ls = 190.00'	D = 2° 51' 53.2"	Ls = 190.00'	Ls = 160.00'
LT = 126.68'	L = 494.90'	LT = 126.68'	LT = 106.69'
ST = 63.35'	T = 248.72'	ST = 63.35'	ST = 53.35'
	R = 2,000.00'		
	SE = 0.07		
	V = 60mph		

FOR -Y2- PROFILE SEE SHT. 23
FOR -RPA- PROFILE SEE SHT. 26
FOR -RPB- PROFILE SEE SHT. 27
FOR DITCH DETAILS SEE SHT. 2-M

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2800	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

-RPC-

PIs Sta 11+06.67
Θs = 1° 50' 00.5"
Ls = 160.00'
LT = 106.67'
ST = 53.34'

PI Sta 15+03.33
Δ = 15° 38' 21.9" (LT)
D = 2° 17' 30.6"
L = 682.40'
T = 343.33'
R = 2,500.00'
SE = 0.06
V = 60mph

PIs Sta 18+95.74
Θs = 1° 50' 00.5"
Ls = 160.00'
LT = 106.67'
ST = 53.34'

-RPD-

PIs Sta 15+15.00
Θs = 1° 43' 07.9"
Ls = 120.00'
LT = 80.00'
ST = 40.00'

PI Sta 18+14.69
Δ = 14° 47' 46.3" (RT)
D = 2° 51' 53.2"
L = 516.48'
T = 259.69'
R = 2,000.00'
SE = 0.05
V = 50mph

-RPD- SC Sta. 15+55.00

-RRD- TS Sta. 14+35.00

MATCHLINE -RPD- STA. 17+50 SEE SHEET 5

MATCHLINE -Y2- STA. 82+50 SEE SHEET 5

MATCHLINE -RPC- STA. 15+00 -Y2- STA. 93+50 SEE SHEET 14

MATCHLINE -RPC- STA. 15+00 SEE SHEET 13

-BY2- 20 85+57.46 PINC

-RPD- POT Sta. 10+00.00 (39' LT)=
-Y2- POT Sta. 89+37.27
Δ = 3° 22' 55.4"

19
TERRY BALLARD & BETTY HOLCOMB
DB 1793 PG 57
DB 1793 PG 55

41
HELEN H PRINCE
DB 2250 PG 826

-RPC- SC Sta. 11+60.00

-RPC- ST Sta. 10+00.00 (39' RT)=
-Y2- POT Sta. 87+51.51

GUILFORD COUNTY
FORSYTH COUNTY

VENT PIPE

REMOVE FENCE

PROP. 48" WW FENCE

18" RCP-III

15" RCP-III

SPECIAL CUT DITCH SEE DETAIL A

REMOVE EXIST. GUARDRAIL

SP. LAT. BASE DITCH SEE DETAIL P

3 TONS CL B RIPRAP W/10 SY FIL FAB

LINE EXIST. DITCH WITH CLASS B RIPRAP TO A DEPTH OF 1.0' -Y2- 91+10 – 93+69 LT

END FENCE +40.69

45' TAPER TO EXIST.

TIE TO EXIST. GUARDRAIL

GRADE TO DRAIN RETAIN SYSTEM

JB w/Slab Lid

LATERAL BASE DITCH SEE DETAIL B

LATERAL BASE DITCH SEE DETAIL E

REMOVE FENCE

PUE

EXIST. ROW

600' UNIFORM TAPER

FOR -Y2- PROFILE SEE SHT. 25
FOR -RPC- PROFILE SEE SHT. 28
FOR -RPD- PROFILE SEE SHT. 29
FOR DITCH DETAILS SEE SHT. 2-M

PLANS PREPARED BY :

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2800	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

MATCHLINE -Y2- STA. 93+50 SEE SHEET 13

FEDEX GROUND PACKAGE SYSTEM INC
DB 6939 PG 2918

-Y2- POT Sta. 106+42.90

BM#8
-BY2- STA. 104+36.43
172.09' LEFT
ELEV. 902.62

TRENCHLESS INSTALLATION
36" WELDED STEEL
15 TONS CL I RIPRAP
W/37 SY FIL FAB

-BY2- 21 96+30.17 PINC

REMOVE EXIST. GUARDRAIL

32' TAPER TO EXIST

95+00

100+00

105+00

S 75° 11' 11.6" E

-Y2-

TIE TO EXIST. GUARDRAIL

RETAIN SYSTEM

140 BUS WBL 39 BST PAVED OVER

140 BUS EBL 39 BST PAVED OVER

10' BST

8' BST

11' BST

SPECIAL CUT DITCH
SEE DETAIL A

300' TAPER

PROP. 48" WW FENCE

END FENCE +51.51

END CONSTRUCTION
-Y2- Sta. 96+51.51

LAVELLE SILER ET AL
DB2796 PG 489

LUCILLE A FRICK
BY WILL 76-E-556
DB 910 PG 176

N 88°06'27" E
258.25'

R L ATKINS HEIRS
DB 644 PG 37
DB 438 PG 2015

(41)
HELEN H PRINCE
DB 2250 PG 826

POND

1-6' X 6' CONC

45BW

FOR -Y2- PROFILE SEE SHTS. 25 & 26
FOR DITCH DETAILS SEE SHT. 2-M

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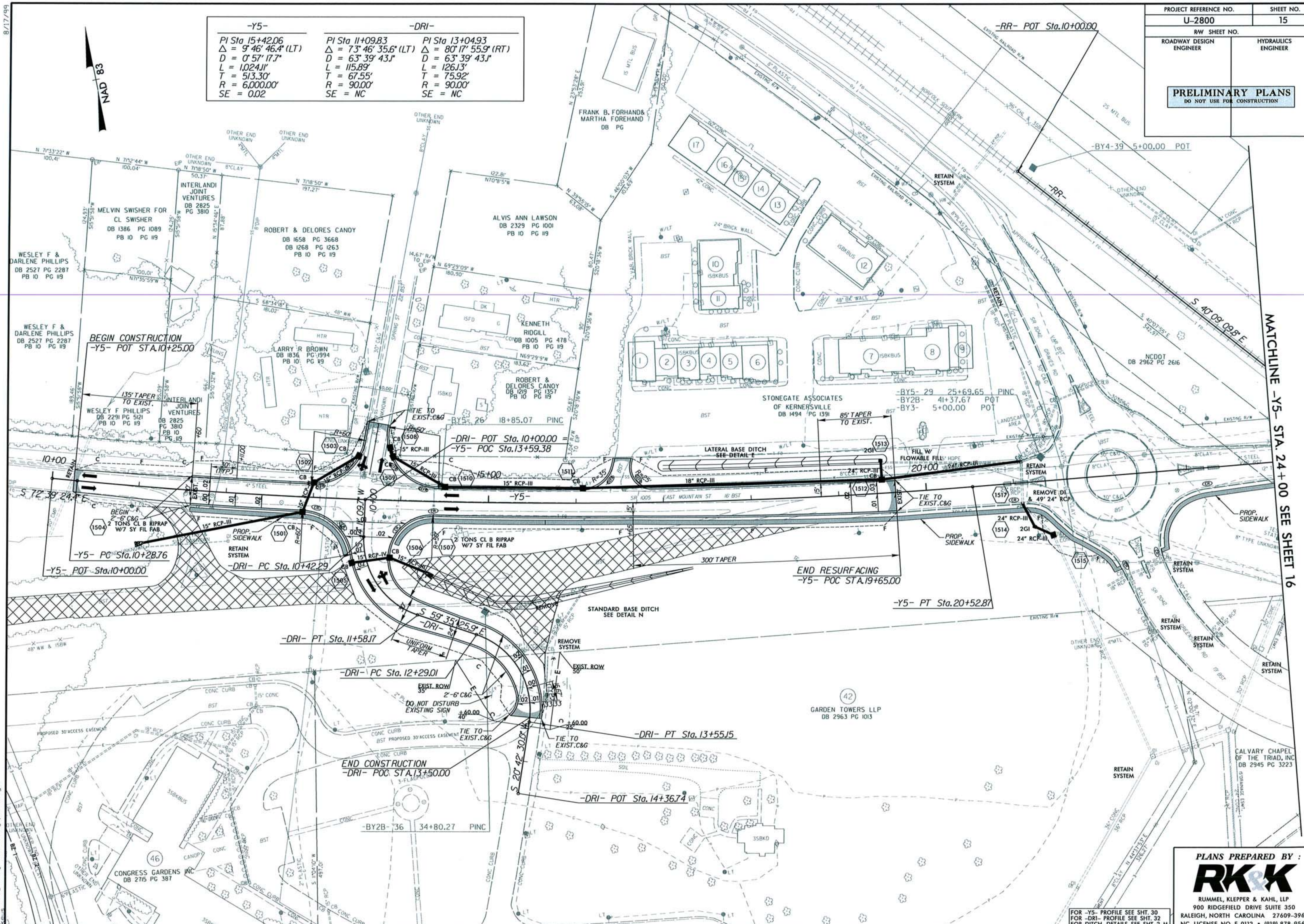
PROJECT REFERENCE NO.	SHEET NO.
U-2800	15
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y5-	-DRI-	
PI Sta 15+42.06	PI Sta 11+09.83	PI Sta 13+04.93
Δ = 9° 46' 46.4" (LT)	Δ = 73° 46' 35.6" (LT)	Δ = 80° 17' 55.9" (RT)
D = 0° 57' 17.7"	D = 63° 39' 43.J"	D = 63° 39' 43.J"
L = 1,024.J1'	L = 115.89'	L = 126.J3'
T = 513.30'	T = 67.55'	T = 75.92'
R = 6,000.00'	R = 90.00'	R = 90.00'
SE = 0.02	SE = NC	SE = NC



NAD 83
BEGIN CONSTRUCTION
-Y5- POT STA.10+25.00
-Y5- PC Sta.10+28.76
-Y5- POT Sta.10+00.00
-DRI- POT Sta.10+00.00 =
-Y5- POC Sta.13+59.38
-DRI- PC Sta.10+42.29
-DRI- PT Sta.11+58.17
-DRI- PC Sta.12+29.01
-DRI- PT Sta.13+55.15
-DRI- POT Sta.14+36.74
END CONSTRUCTION
-DRI- POC STA.13+50.00
END RESURFACING
-Y5- POC STA.19+65.00
-Y5- PT Sta.20+52.87
-RR- POT Sta.10+00.00
-BY4-39 5+00.00 POT
-BY5- 29 25+69.65 PINC
-BY2B- 41+37.67 POT
-BY3- 5+00.00 POT
-BY5- 26 18+85.07 PINC
-BY2B- 36 34+80.27 PINC
MATCHLINE -Y5- STA. 24+00 SEE SHEET 16
S 72° 39' 24.4" E
S 59° 35' 25.9" E
S 20° 42' 30.0" W
S 40° 09' 09.8" E
LATERAL BASE DITCH SEE DETAIL E
STANDARD BASE DITCH SEE DETAIL N
300' TAPER
85' TAPER TO EXIST.
135' TAPER TO EXIST.
UNIFORM TAPER
PROP. SIDEWALK
RETAIN SYSTEM
REMOVE SYSTEM
2 TONS CL B RIPRAP W/7 SY FIL FAB
TIE TO EXIST. C&G
DO NOT DISTURB EXISTING SIGN
FILL W/ FLOWABLE FILL
EXIST. ROW
MELVIN SWISHER FOR CL SWISHER DB 1386 PG 1089 PB 10 PG 119
INTERLANDI JOINT VENTURES DB 2825 PG 3810
ROBERT & DELORES CANOY DB 1658 PG 3668 DB 1268 PG 1263 PB 10 PG 119
ALVIS ANN LAWSON DB 2329 PG 1001 PB 10 PG 119
FRANK B. FORHAND& MARTHA FOREHAND DB PG
WESLEY F & DARLENE PHILLIPS DB 2527 PG 2287 PB 10 PG 119
WESLEY F PHILLIPS DB 2291 PG 5121 PB 10 PG 119
LARRY R BROWN DB 1836 PG 1994 PB 10 PG 119
KENNETH RIDGILL DB 1005 PG 478 PB 10 PG 119
ROBERT & DELORES CANOY DB 1219 PG 1357 PB 10 PG 119
STONEGATE ASSOCIATES OF KERNERSVILLE DB 1494 PG 1391
NCDOT DB 2962 PG 2616
GARDEN TOWERS LLP DB 2963 PG 1013
CALVARY CHAPEL OF THE TRIAD, INC DB 2945 PG 3223
CONGRESS GARDENS INC DB 2715 PG 387
SR 1005 EAST MOUNTAIN ST

FOR -Y5- PROFILE SEE SHT. 30
FOR -DRI- PROFILE SEE SHT. 32
FOR DITCH DETAILS SEE SHT. 2-M

PLANS PREPARED BY :
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PROJECT REFERENCE NO.	SHEET NO.
U-2800	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

NAD 83

-Y7-	-RAB-		-DR2-
PI Sta 15+73.15	PI Sta 10+59.90	PI Sta 11+39.09	PI Sta 11+08.19
Δ = 85° 56' 56.1" (LT)	Δ = 95° 55' 43.2" (LT)	Δ = 84° 04' 16.8" (LT)	Δ = 18° 50' 33.0" (RT)
D = 15° 04' 40.2"	D = 106° 06' 11.9"	D = 106° 06' 11.9"	D = 28° 38' 52.4"
L = 570.03'	L = 90.41'	L = 79.24'	L = 65.77'
T = 354.04'	T = 59.90'	T = 48.68'	T = 33.19'
R = 380.00'	R = 54.00'	R = 54.00'	R = 200.00'
SE = 0.04	SE = 0.02	SE = 0.02	SE = 0.02
V = 35mph	PI Sta 12+27.06	PI Sta 13+08.57	PI Sta 12+36.22
	Δ = 93° 30' 45.3" (LT)	Δ = 86° 29' 14.7" (LT)	Δ = 51° 01' 25.7" (LT)
	D = 106° 06' 11.9"	D = 106° 06' 11.9"	D = 28° 38' 52.4"
	L = 88.13'	L = 81.51'	L = 178.11'
	T = 57.42'	T = 50.79'	T = 95.45'
	R = 54.00'	R = 54.00'	R = 200.00'
	SE = 0.02	SE = 0.02	SE = 0.02

PROJECT REFERENCE NO. U-2800 | SHEET NO. 16

MATCHLINE -Y7- STA. 14+50 SEE SHEET 6

MATCHLINE -Y5- STA. 24+00 SEE SHEET 15

MATCHLINE -Y5- STA. 37+00 SEE SHEET 6

-Y5- POT Sta.25+20.16
-RR- POT Sta.15+24.36

-DR2- POT Sta.14+28.63

-DR2- POT Sta.13+40.00
END CONSTRUCTION

-DR2- PT Sta.13+18.88

-Y7- PT Sta.17+89.14

BEGIN RESURFACING
-Y5- POT STA. 29+50.00

-DR2- PRC Sta.11+40.77

-DR2- PC Sta.10+75.00

-DR2- POT Sta.10+00.00=
-Y5- POT Sta.32+05.00

-RAB- PCC Sta.12+57.78=
-Y7- POT Sta.20+40.46

-RR- PC Sta.16+48.00

-RAB- PC Sta.10+00.00=
-RAB- PC Sta.13+39.29=
-Y5- POT Sta.34+46.00

-Y5- POT Sta.35+00.00=
-Y7- POT Sta.20+94.46=
-YII- POT Sta.10+00.00

-YII- POT Sta.12+60.00
END CONSTRUCTION

-RAB- PCC Sta.10+90.41=
-YII- POT Sta.10+54.00

-RAB- PCC Sta.11+69.65=
-Y5- POT Sta.35+54.00

-BY4- 9+74.19 PINC
-BY6- 29+25.07 PINC
NO POINT SET

-BY5- 27 32+93.34 PINC

-BY4- 40 11+29.89 PINC

-BY4- 41 15+97.89 PINC

-BY3- 31 11+75.35 PINC

-BY5- STA 28+95.48
56.31 RIGHT
ELEV. 969.59

BM*6

TWIN CITY PROPERTIES
DB 2071 PG 1510 (43)

JONATHAN & SABRINA DIXON
DB 2862 PG 4414 (34)

SOUTHWEST LANDCOM LP
DB 2311 PG 203 (44)

LANDRETH PROPERTIES
KERN LLC
DB 2679 PG 1442 (30)

CALVARY CHAPEL OF THE TRIAD, INC
DB 2945 PG 3223

-Y5- EAST MOUNTAIN ROAD

ADT 2012		
ADT 2030	-Y7-	7,500 / 18,800
4,700 / 11,100		2,800 / 7,700
6,200 / 14,400	-Y5-	4,300 / 11,000

NOTE:
#1615 HAS BEEN DESIGNED TO PICK UP THE EXISTING 36" RCP RUNNING BESIDE THE BUILDING ON PARCEL #30. IN THE EVENT THE PIPE DOES NOT CONNECT AT #1615, INVESTIGATE THE SITE TO DETERMINE WHERE TO TIE IT TO THE PROPOSED DRAINAGE.

STAMPED AND STAINED ASPHALT

FOR -Y5- PROFILE SEE SHT. 31
FOR -Y7- PROFILE SEE SHT. 31
FOR -YII- PROFILE SEE SHT. 32
FOR -RAB- PROFILE SEE SHT. 33
FOR -DR2- PROFILE SEE SHT. 33
FOR ROUNDABOUT DETAIL SEE SHEET 2-L
FOR DITCH DETAILS SEE SHT. 2-M

PLANS PREPARED BY :
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PROJECT REFERENCE NO.	SHEET NO.
U-2800	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

NAD 83

MATCHLINE -Y12- STA. 12+50 SEE SHEET 5

MATCHLINE -Y9- STA. 13+50 SEE SHEET 4

-Y12- PI
-Y12- PT Sta. 13+68.46

-Y12- PC Sta. 12+29.66

-Y9- POT Sta. 24+00.00

END CONSTRUCTION
-Y9- POT Sta. 23+54.90

-Y9- PT Sta. 14+64.91

-Y12- POT Sta. 10+00.00 =
-Y9- POT Sta. 16+50.00

-Y9- N 22° 59' 59.9" W

-Y9- N 52° 00' 00.1" E

(10) ROBINS RENTAL, LLC
DB 3069 PG 1540

(7) VIRGINIA A OSBURN
DB 1483 PG 1621

(41) HELEN H PRINCE
DB 2250 PG 826

(45) BARBARA WHITT HICKS
DB 1629 PG 468
DB 1509 PG 622

POND
W.E. 947.15

LATERAL BASE DITCH SEE DETAIL E

LATERAL V DITCH SEE DETAIL J

8 TONS CL B RIPRAP W/21 SY FIL FAB

11 TONS CL B RIPRAP W/28 SY FIL FAB NO BANKS ON THE STREAM

2 TONS CL B RIPRAP W/7 SY FIL FAB CUT /FILL TRANSITION

JB w/HH

-Y9-	-Y12-
PI Sta 12+81.27	PI Sta 13+00.90
Δ = 44° 27' 35.3" (LT)	Δ = 31° 48' 38.6" (RT)
D = 11° 27' 33.0"	D = 22° 55' 05.9"
L = 387.98'	L = 138.80'
T = 204.35'	T = 71.24'
R = 500.00'	R = 250.00'
SE = 0.05	SE = NC
V = 30mph	

FOR -Y9- PROFILE SEE SHT. 32
FOR -Y12- PROFILE SEE SHT. 33
FOR DITCH DETAILS SEE SHT. 2-M

PLANS PREPARED BY :
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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
U-2800	18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

-L-

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

BEGIN CONSTRUCTION
-L- Sta.12+75.00
ELEV. = 956.57'

50' BLEND TO EXIST.

BEGIN GRADE
-L- Sta.13+25.00
ELEV. = 958.11'

BEGIN SP.CUT DITCH LT.
-L- STA.12+72.00
EI = 954.65

BEGIN SP.CUT DITCH RT.
-L- STA.12+77.00
EI = 953.64

END SP.CUT DITCH RT.
-L- STA.13+50.00
EI = 954.97

(+)1.6835%

PROPOSED GRADE

EXISTING GROUND

(+)2.6456%

(+)10.7284%

PI = 16+10.00
EL = 965.65'
VC = 270'
K = 141
V = 59mph

-L- Sta.18+51.06=
-Y9- Sta.10+00.00

(+)1.1628%

PI = 20+15.00
EL = 968.60'
VC = 200'
K = 204
V = 74mph

(+)10.7284%

(+)1.7097%

PI = 23+25.00
EL = 973.90'
VC = 190'
K = 86
V = 50mph

(-)0.5074%

1,010 1,000 990 980 970 960 950 940 920

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00 24+00

1,030 1,020 1,010 1,000 990 980 970 960 950 940

24+00 25+00 26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00 35+00 36+00 37+00 38+00

-L- Sta.26+93.68=
-Y1- Sta.19+62.04

PROPOSED GRADE

(+)4.5000%

(-)0.5074%

(+)1.1628%

END SP.CUT DITCH LT.
-L- STA.25+50.00
EI = 969.51

PI = 26+60.00
EL = 972.20'
VC = 480'
K = 96
V = 50mph

EXISTING GROUND

(+)0.2993%

BEGIN LAT.BASE DITCH RT.
-L- STA.27+63.00
EI = 961.09

END LAT.BASE DITCH RT.
-L- STA.30+67.00
EI = 962.00

-L- Sta.31+50.61=
-RPB- Sta.27+10.69
-RPC- Sta.26+12.62

BEGIN LAT.BASE DITCH RT.
-L- STA.32+58.00
EI = 968.07

END LAT.BASE DITCH RT.
-L- STA.33+55.00
EI = 969.33

(+)1.2990%

PI = 34+00.00
EL = 1,005.50'
VC = 830'
K = 154
V = 60mph

BEGIN BRIDGE
-L- Sta.34+08.20

(+)4.5000%

(-)0.8784%

-L- Sta.34+85.95=
-Y2- Sta.73+51.68

END BRIDGE
-L- Sta.35+63.70

-L- Sta.37+97.66=
-RPA- Sta.27+79.19
-RPD- Sta.26+84.32

FOR -L- PLAN SEE SHTS. 4 & 5

PLANS PREPARED BY :
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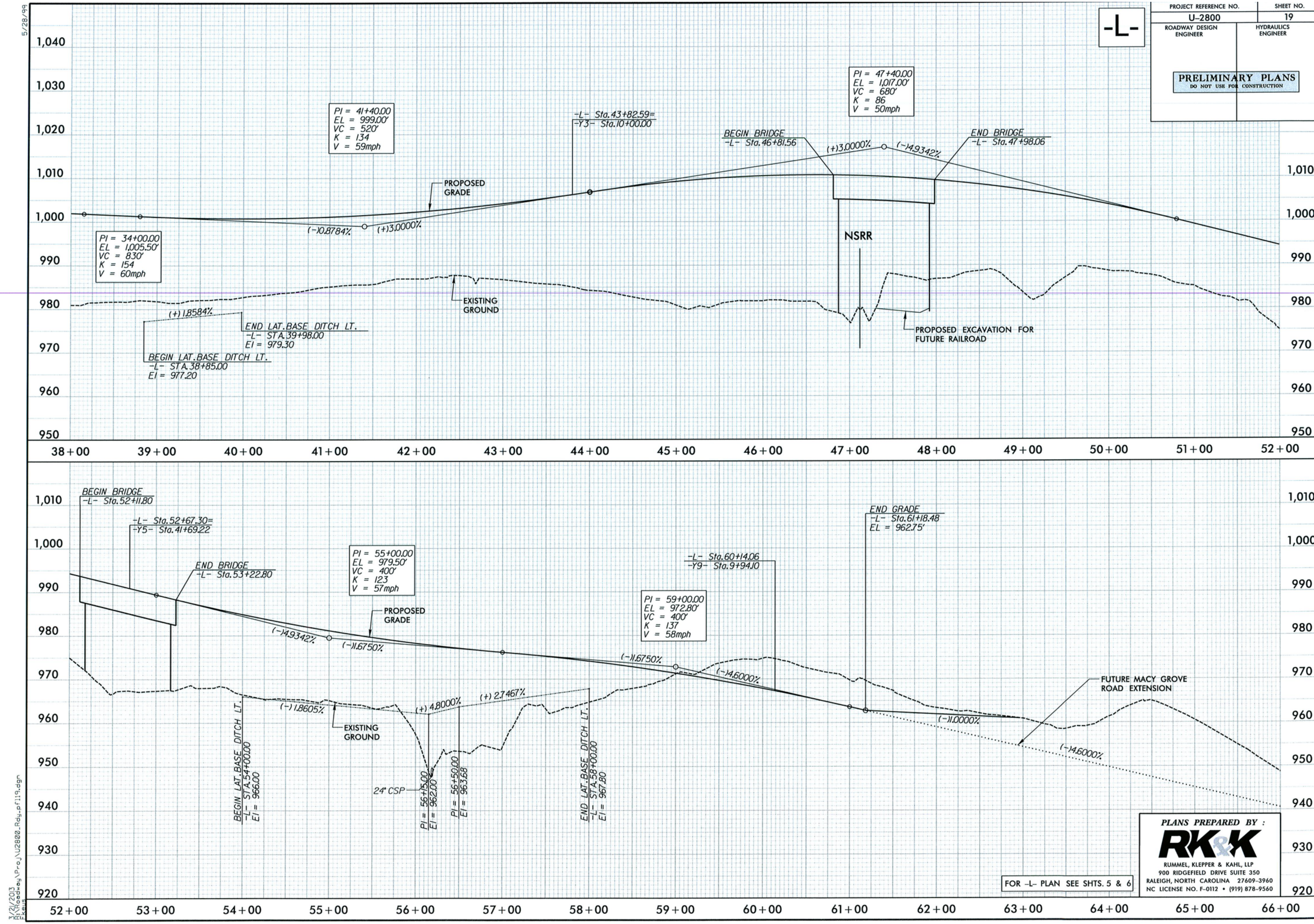
ejones



PROJECT REFERENCE NO.
U-2800
SHEET NO.
19
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
-L-
5/28/99
PI = 34+00.00
EL = 1,005.50'
VC = 830'
K = 154
V = 60mph
PI = 41+40.00
EL = 999.00'
VC = 520'
K = 134
V = 59mph
PI = 47+40.00
EL = 1,017.00'
VC = 680'
K = 86
V = 50mph
-L- Sta.43+82.59=
-Y3- Sta.10+00.00
BEGIN BRIDGE
-L- Sta.46+81.56
END BRIDGE
-L- Sta.47+98.06
(+)3.0000%
(-)4.9342%
PROPOSED GRADE
(-)0.8784%
(+)3.0000%
NSRR
EXISTING GROUND
PROPOSED EXCAVATION FOR FUTURE RAILROAD
(+)1.8584%
END LAT. BASE DITCH LT.
-L- STA.39+98.00
El = 979.30
BEGIN LAT. BASE DITCH LT.
-L- STA.38+85.00
El = 977.20
1,040
1,030
1,020
1,010
1,000
990
980
970
960
950
38+00
39+00
40+00
41+00
42+00
43+00
44+00
45+00
46+00
47+00
48+00
49+00
50+00
51+00
52+00
BEGIN BRIDGE
-L- Sta.52+11.80
-L- Sta.52+67.30=
-Y5- Sta.41+69.22
END BRIDGE
-L- Sta.53+22.80
PI = 55+00.00
EL = 979.50'
VC = 400'
K = 123
V = 57mph
PROPOSED GRADE
(-)4.9342%
(-)1.6750%
-L- Sta.60+14.06
-Y9- Sta.9+94.10
PI = 59+00.00
EL = 972.80'
VC = 400'
K = 137
V = 58mph
(-)1.6750%
(-)4.6000%
END GRADE
-L- Sta.61+18.48
EL = 962.75'
FUTURE MACY GROVE ROAD EXTENSION
(-)1.0000%
(-)4.6000%
(-)1.8605%
(+) 4.8000%
(+) 2.7467%
EXISTING GROUND
BEGIN LAT. BASE DITCH LT.
-L- STA.54+00.00
El = 966.00
24" CSP
PI = 56+15.00
El = 962.00
PI = 56+50.00
El = 963.68
END LAT. BASE DITCH LT.
-L- STA.58+00.00
El = 967.80
FOR -L- PLAN SEE SHTS. 5 & 6
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1,010
1,000
990
980
970
960
950
940
930
920
52+00
53+00
54+00
55+00
56+00
57+00
58+00
59+00
60+00
61+00
62+00
63+00
64+00
65+00
66+00
3/21/2013
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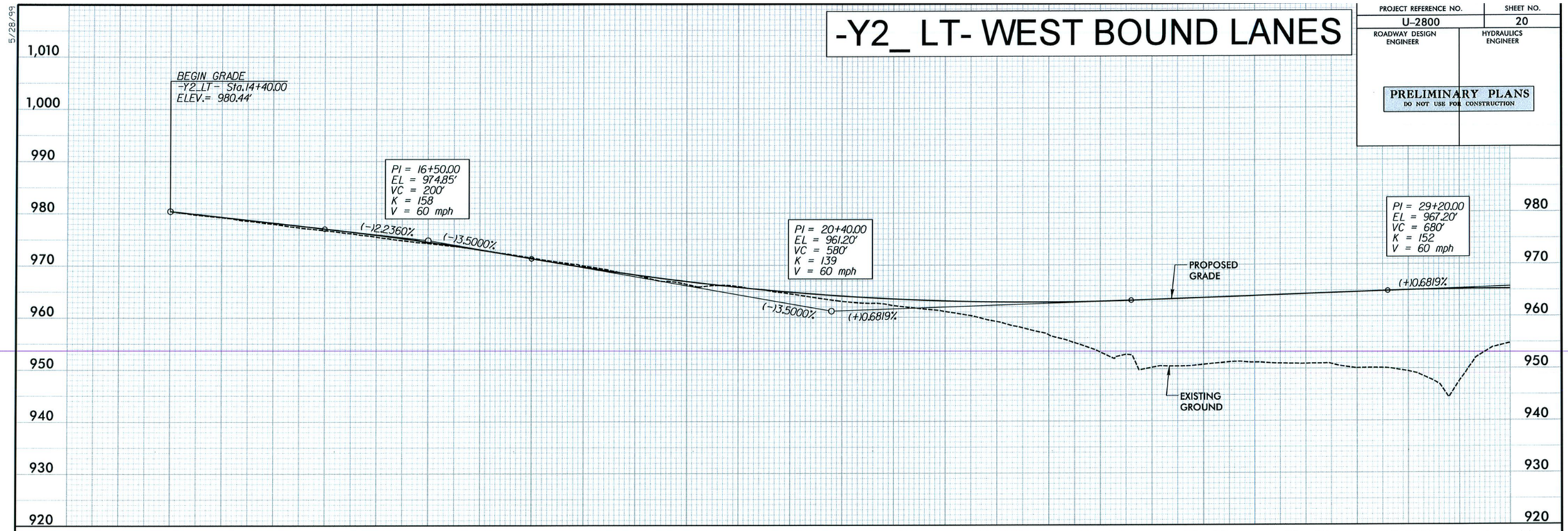
5/28/99

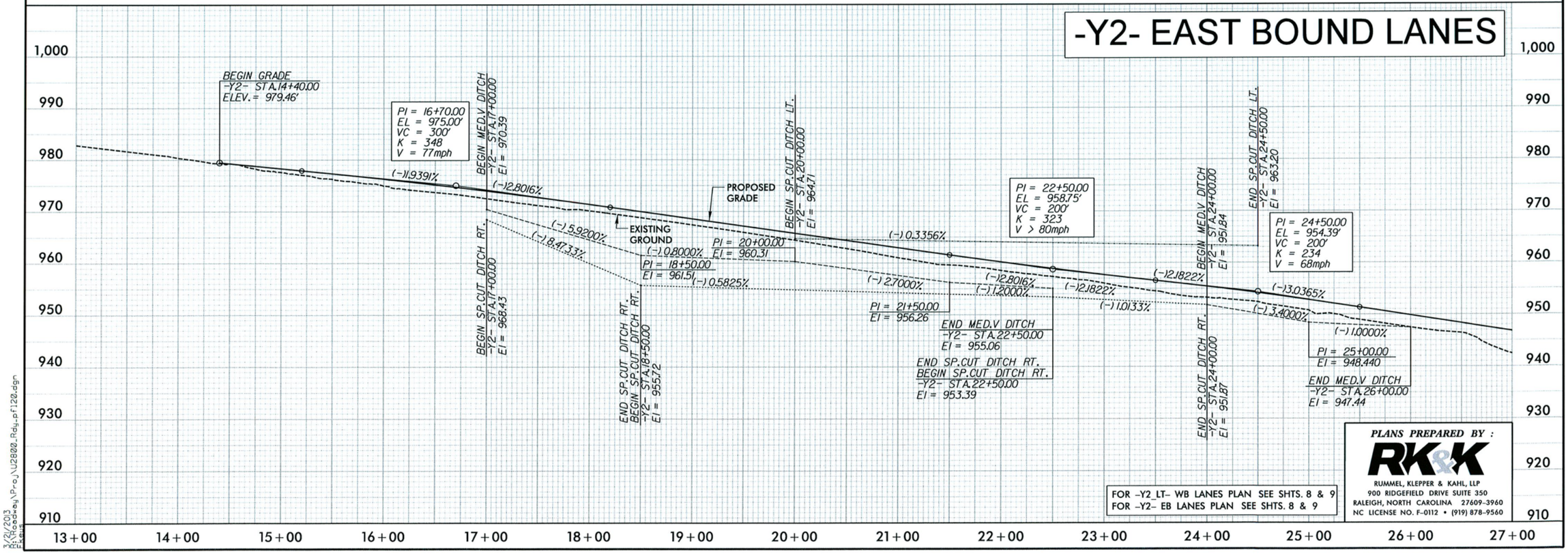
PROJECT REFERENCE NO.	SHEET NO.
U-2800	20
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y2_ LT- WEST BOUND LANES



-Y2- EAST BOUND LANES



FOR -Y2_LT- WB LANES PLAN SEE SHTS. 8 & 9
FOR -Y2- EB LANES PLAN SEE SHTS. 8 & 9

PLANS PREPARED BY :

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PROJECT REFERENCE NO.	SHEET NO.
U-2800	21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y2_ LT- WEST BOUND LANES

PI = 29+20.00
EL = 967.20'
VC = 680'
K = 152
V = 60 mph

(+)0.6819%

(−)13.7850%

PROPOSED GRADE

EXISTING GROUND

PI = 38+50.00
EL = 932.00'
VC = 770'
K = 137
V = 60 mph

(−)13.7850%

(+)1.8260%

1,000 990 980 970 960 950 940 930 920 910

27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00 35+00 36+00 37+00 38+00 39+00 40+00 41+00

-Y2- EAST BOUND LANES

-Y2- Sta. 30+54.69=
-RAMP- Sta. 10+00.00 39'RT

PROPOSED GRADE

EXISTING GROUND

PI = 32+35.00
EL = 930.55'
VC = 840'
K = 235
V > 80mph

(−)3.0365%

(−) 0.3432%

(−) 0.6000%

(+)0.5376%

(+) 0.8228%

(+) 0.4150%

(−) 0.7779%

(+)0.5376%

(+) 0.3533%

(+) 0.4299%

BEGIN SP.CUT DITCH RT.
-Y2- STA.31+50.00
EI = 930.90

BEGIN MED.V DITCH
-Y2- STA.32+50.00
EI = 929.19

END SP.CUT DITCH RT.
-Y2- STA.35+00.00
EI = 928.80

BEGIN LAT.BASE DITCH LT.
-Y2- STA.35+00.00
EI = 928.21

PI = 35+21.00
EI = 928.26

END MED.V DITCH
-Y2- STA.36+00.00
EI = 928.91

END LAT.BASE DITCH LT.
-Y2- STA.39+00.00
EI = 929.87

BEGIN MED.V DITCH
-Y2- STA.39+50.00
EI = 932.49

PI = 41+00.00
EL = 935.20'
VC = 210'
K = 137
V = 60mph

PI = 39+61.57 PI = 41+00.00
EI = 930.49 EI = 933.02

BEGIN SP.CUT DITCH LT.
-Y2- STA.39+50.00
EI = 930.58

980 970 960 950 940 930 920 910 900 890

27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00 35+00 36+00 37+00 38+00 39+00 40+00 41+00

FOR -Y2_LT- WB LANES PLAN SEE SHTS. 9 & 10
FOR -Y2- EB LANES PLAN SEE SHTS. 9 & 10

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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
U-2800	22
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y2_ LT- WEST BOUND LANES

48" RCP
-Y2- STA. 45+46

DESIGN DISCHARGE	= 233.1	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 933.77	FT
BASE DISCHARGE	= 270.9	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 939.91	FT
OVERTOPPING DISCHARGE	= 270.9	CFS
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING ELEVATION	= 936.30	FT
DATE OF SURVEY	=	
W.S. ELEVATION AT DATE OF SURVEY	=	FT

PI = 38+50.00
EL = 932.00'
VC = 770'
K = 137
V = 60 mph

(+)1.8260%

PROPOSED GRADE

END GRADE
-Y2_LT- STA. 45+45.52
EL = 944.70'

EXISTING GROUND

BEGIN GRADE
-Y2- Sta. 45+18.91
EL = 944.70'

PI = 46+20.00
EL = 946.55'
VC = 200'
K = 583
V > 80mph

(+)1.8260%
(+)1.4830%

PI = 48+90.00
EL = 950.55'
VC = 340'
K = 791
V > 80mph

(+)1.4830%
(+)1.9129%

PROPOSED GRADE

PI = 52+00.00
EL = 956.48'
VC = 200'
K = 1377
V > 80mph

(+)1.9129%
(+)1.7677%

EXISTING GROUND

48" RCP

41+00 42+00 43+00 44+00 45+00 45+00 46+00 47+00 48+00 49+00 50+00 51+00 52+00 53+00 54+00

1,000 990 980 970 960 950 940 930 920 910

-Y2- EAST BOUND LANES

48" RCP
-Y2- STA. 45+66

DESIGN DISCHARGE	= 233.1	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 933.77	FT
BASE DISCHARGE	= 270.9	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 939.91	FT
OVERTOPPING DISCHARGE	= 270.9	CFS
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING ELEVATION	= 936.30	FT
DATE OF SURVEY	=	
W.S. ELEVATION AT DATE OF SURVEY	=	FT

PI = 41+00.00
EL = 935.20'
VC = 210'
K = 137
V = 60mph

(+) 3.1000%
(+)0.4299%
(+)2.0682%

END MED.V DITCH
-Y2- STA. 41+50.00
EI = 934.57

END SP.CUT DITCH LT.
-Y2- STA. 41+50.00
EI = 931.30

PI = 43+20.00
EL = 939.75'
VC = 230'
K = 528
V > 80mph

(+)2.0682%
(+)1.6323%

PROPOSED GRADE

BEGIN SP.CUT DITCH LT.
-Y2- STA. 44+00.00
EI = 935.71

(-) 0.3000%

EXISTING GROUND

END SP.CUT DITCH LT.
-Y2- STA. 45+00.00
EI = 935.41

PI = 46+30.00
EL = 944.81'
VC = 200'
K = 352
V > 80mph

(+)1.6323%
(+)2.2000%

BEGIN SP.CUT DITCH RT.
-Y2- STA. 47+50.00
EI = 945.41

BEGIN MED.V DITCH
-Y2- STA. 48+20.00
EI = 947.84

PROPOSED GRADE

(+)1.5388%

EXISTING GROUND

PI = 49+50.00
EI = 949.340

PI = 50+25.00
EL = 953.50'
VC = 200'
K = 364
V = 78mph

(+)2.2000%
(+)3.9600%
(+) 0.8900%

END MED.V DITCH
-Y2- STA. 50+00.00
EI = 951.32

PI = 50+50.00
EI = 948.41'

(+)1.6500%
(+) 2.9700%

PI = 52+25.00
EL = 956.80'
VC = 200'
K = 1184
V > 80mph

(+)1.6500%
(+)1.8189%

END SP.CUT DITCH RT.
-Y2- STA. 51+50.00
EI = 951.37

48" RCP

41+00 42+00 43+00 44+00 45+00 45+00 46+00 47+00 48+00 49+00 50+00 51+00 52+00 53+00 54+00

980 970 960 950 940 930 920 910 900 890

FOR -Y2_LT- & -Y2- WB LANES PLAN SEE SHTS. 10 – 12
FOR -Y2- EB LANES PLAN SEE SHTS. 10 – 12

PLANS PREPARED BY :
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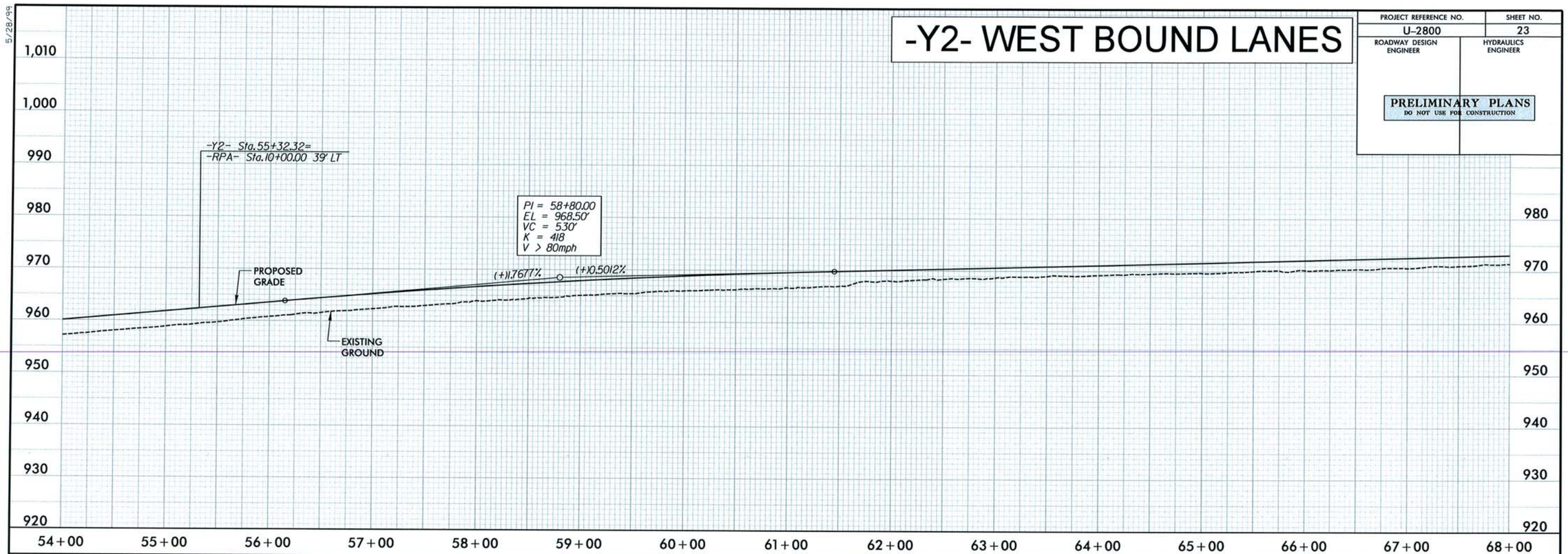
5/28/99

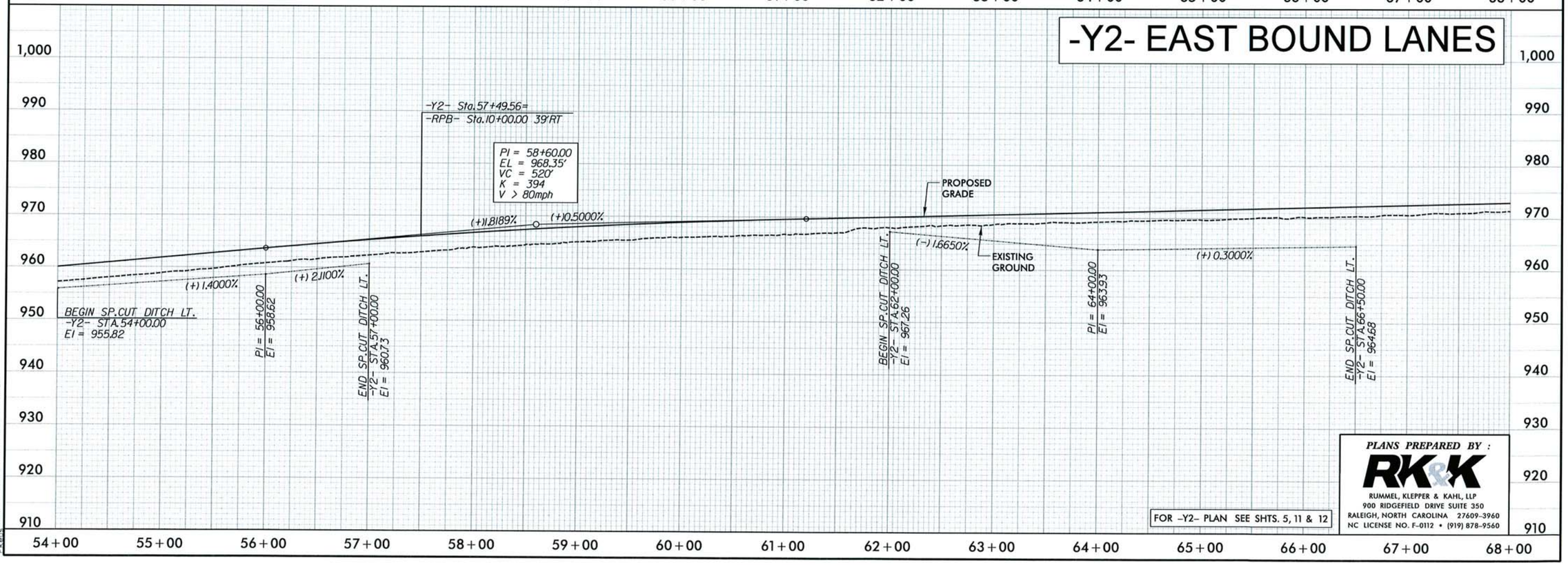
PROJECT REFERENCE NO.	SHEET NO.
U-2800	23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y2- WEST BOUND LANES



-Y2- EAST BOUND LANES



FOR -Y2- PLAN SEE SHTS. 5, 11 & 12

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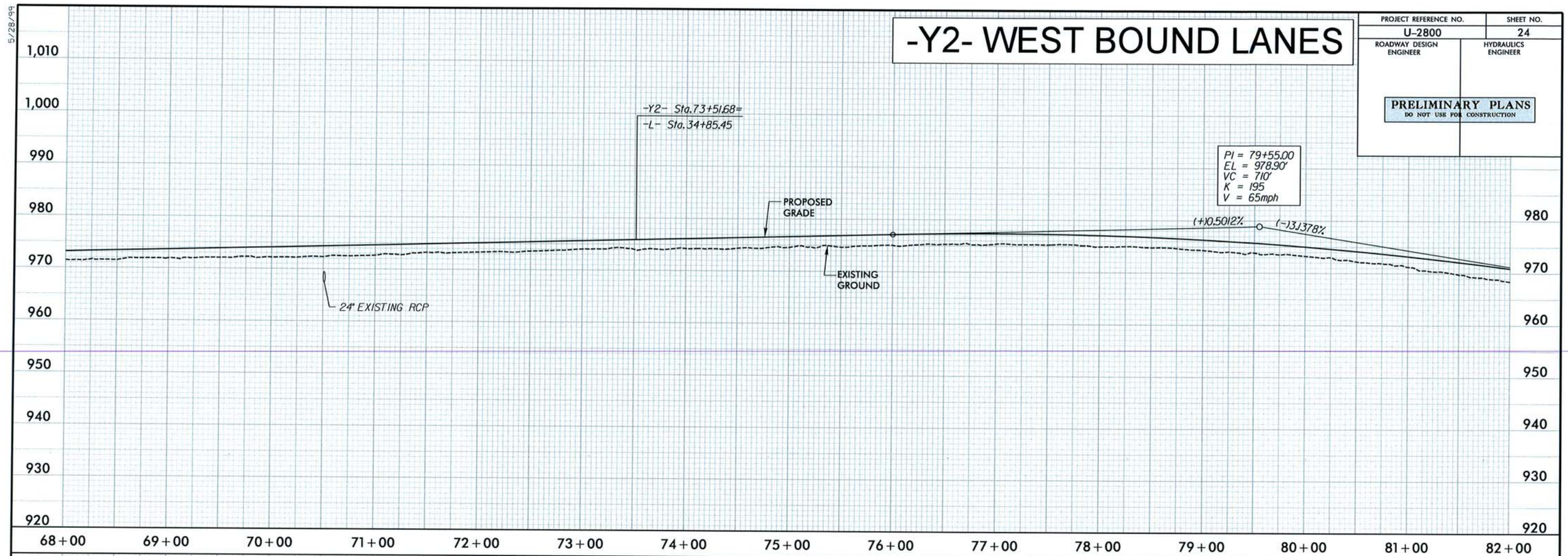
Engineering

5/28/99

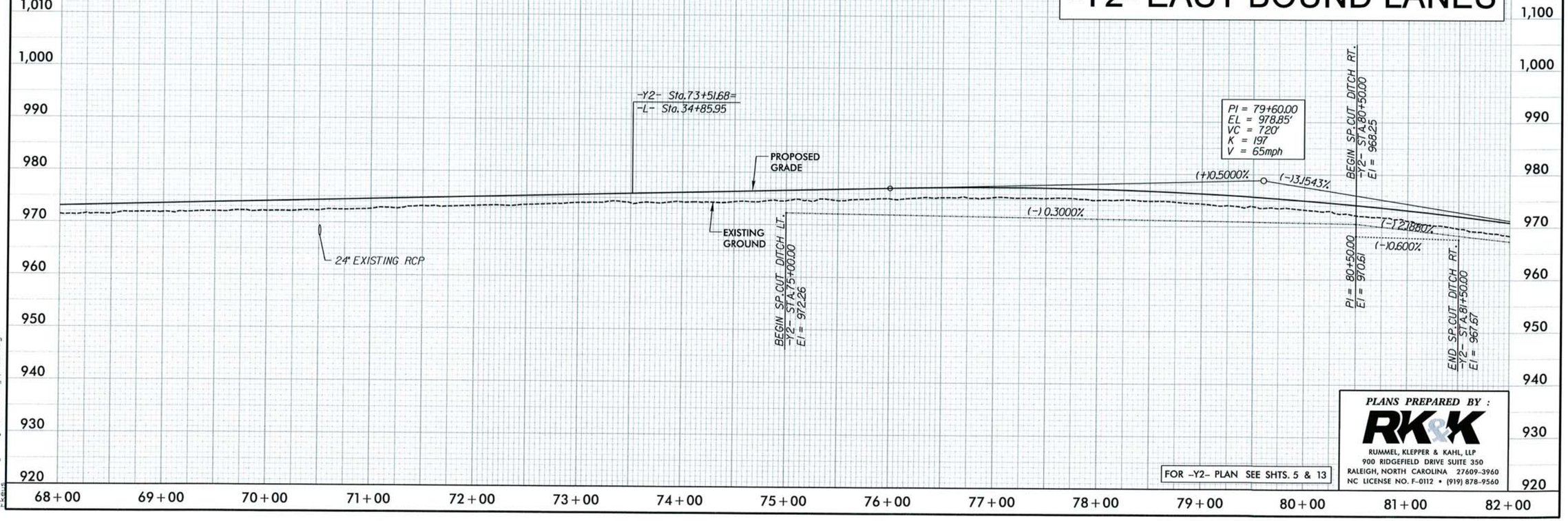
PROJECT REFERENCE NO.	SHEET NO.
U-2800	24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y2- WEST BOUND LANES



-Y2- EAST BOUND LANES



FOR -Y2- PLAN SEE SHTS. 5 & 13

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3/21/2013
R:\Roadway\Proj\U2800_Rdy_pf124.dgn
Elena

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
U-2800	25
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y2- WEST BOUND LANES

PI = 79+55.00
EL = 978.90'
VC = 710'
K = 195
V = 65mph

(-)3.1378%

PROPOSED GRADE

EXISTING GROUND

-Y2- Sta.89+37.27=
-RPB- Sta.10+00.00 39' LT

PI = 90+00.00
EL = 946.11'
VC = 200'
K = 570
V > 80mph

(-)3.1378%

(-)3.4886%

END GRADE
-Y2- Sta.91+40.69
ELEV.= 941.20'

1,000 990 980 970 960 950 940 930 920 910

82+00 83+00 84+00 85+00 86+00 87+00 88+00 89+00 90+00 91+00 92+00 93+00 94+00 95+00 96+00

-Y2- EAST BOUND LANES

PI = 79+60.00
EL = 978.85'
VC = 720'
K = 197
V = 65mph

(-)3.1543%

(-) 2.1880%

(+) 0.3000%

END SP.CUT DITCH LT.
-Y2- STA.83+50.00
EI = 965.29

PI = 83+00.00
EI = 965.14

PROPOSED GRADE

EXISTING GROUND

-Y2- Sta.87+51.51 =
-RPC- Sta.10+00.00 39'RT

BEGIN LAT.BASE DITCH RT.
-Y2- STA.88+00.00
EI = 947.16

(-) 9.3200%

END LAT.BASE DITCH RT.
BEGIN LAT.BASE DITCH RT.
-Y2- STA.89+00.00
EI = 937.84

(-) 0.9200%

BEGIN SP.LAT.BASE DITCH LT.
-Y2- STA.90+50.00
EI = 940.12

(-) 6.2000%

END LAT.BASE DITCH RT.
BEGIN LAT.BASE DITCH RT.
-Y2- STA.91+00.00
EI = 936.00

END SP.LAT.BASE DITCH LT.
-Y2- STA.91+10.00
EI = 936.40

PI = 92+50.00
EL = 938.16'
VC = 250'
K = 4887
V > 80mph

(-)3.1543%

(-)3.2054%

(-) 8.8571%

END LAT.BASE DITCH RT.
BEGIN LAT.BASE DITCH RT.
-Y2- STA.92+40.00
EI = 923.60

(+) 4.9091%

36" RCP

END LAT.BASE DITCH RT.
BEGIN SP.CUT DITCH RT.
-Y2- STA.93+50.00
EI = 929.00

(-) 1.9500%

EXISTING GROUND

PROPOSED GRADE

36" RCP
-Y2- STA.93+21.38

DESIGN DISCHARGE	= 46.0	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 927.05	FT
BASE DISCHARGE	= 57.6	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 927.71	FT
OVERTOPPING DISCHARGE	= NA	CFS
OVERTOPPING FREQUENCY	= NA	YRS
OVERTOPPING ELEVATION	= NA	FT
DATE OF SURVEY	=	
W.S.ELEVATION AT DATE OF SURVEY	=	FT

FOR -Y2- PLAN SEE SHTS. 5 & 13

980 970 960 950 940 930 920 910 900 890

82+00 83+00 84+00 85+00 86+00 87+00 88+00 89+00 90+00 91+00 92+00 93+00 94+00 95+00 96+00

PLANS PREPARED BY :
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Elaine

5/28/99

–Y2– EAST BOUND LANES

END GRADE
–Y2– Sta. 96+51.51
ELEV. = 925.29'

EXISTING GROUND

PROPOSED GRADE

END SP. CUT DITCH RT.
–Y2– STA. 96+58.00
EI = 923.00

18" EXISTING RCP

-Y1-

BEGIN GRADE
–Y1– Sta. 16+00.00
ELEV. = 956.94'

PI = 16+60.00
EL = 960.51'
VC = 120'
K = 104
V = 53mph

(+)5.9500%

(+)7.1001%

PROPOSED GRADE

(+)7.1001%

(+)11.9959%

(+)12.0000%

END GRADE
–Y1– Sta. 19+23.73 =
–L– Sta. 26+95.49
ELEV. = 975.21'

PI = 18+45.00
EL = 973.64'
VC = 150'
K = 29
V = 35mph

EXISTING GROUND

-RPA-

BEGIN GRADE
–RPA– Sta. 10+00.00 =
–Y2– Sta. 55+32.32
ELEV. = 961.87'

PI = 11+75.00
EL = 964.95'
VC = 200'
K = 309
V = 74mph

(+)11.7600%

(+)11.1120%

PI = 14+25.00
EL = 967.73'
VC = 200'
K = 266
V = 71mph

PROPOSED GRADE

(+)11.1120%

EXISTING GROUND

PROJECT REFERENCE NO.	SHEET NO.
U-2800	26
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-RPA-

PI = 14+25.00
EL = 967.73'
VC = 200'
K = 266
V = 71mph

(+)10.3600%

BEGIN SP. CUT DITCH LT.
–RPA– STA. 18+15.00
EI = 964.69

(+) 2.6200%

PI = 18+65.00
EI = 966.00

(+)10.3600%

(+) 1.6000%

END SP. CUT DITCH LT.
–RPA– STA. 20+15.00
EI = 968.40

PI = 20+00.00
EL = 969.80'
VC = 450'
K = 101
V = 51mph

(+)4.8136%

PROPOSED GRADE

EXISTING GROUND

BEGIN LAT. BASE DITCH LT.
–RPA– STA. 22+65.00
EI = 978.60

(–) 3.0909%

PI = 24+30.00
EI = 973.50

30" RCP

(+) 1.8593%

END LAT. BASE DITCH LT.
–RPA– STA. 26+29.00
EI = 977.20

(+)4.8136%

(+)2.0080%

PI = 25+90.00
EL = 998.20'
VC = 250'
K = 89
V = 50mph

END GRADE
–RPA– Sta. 27+33.17 =
–L– Sta. 37+97.99
ELEV. = 1,001.07'

(+)2.0000%

FOR –Y2– WB LANES SEE SHT. 14
FOR –Y1– PLAN SEE SHTS. 5 & 7
FOR –RPA– PLAN SEE SHTS. 5 & 12

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kburris

5/28/99

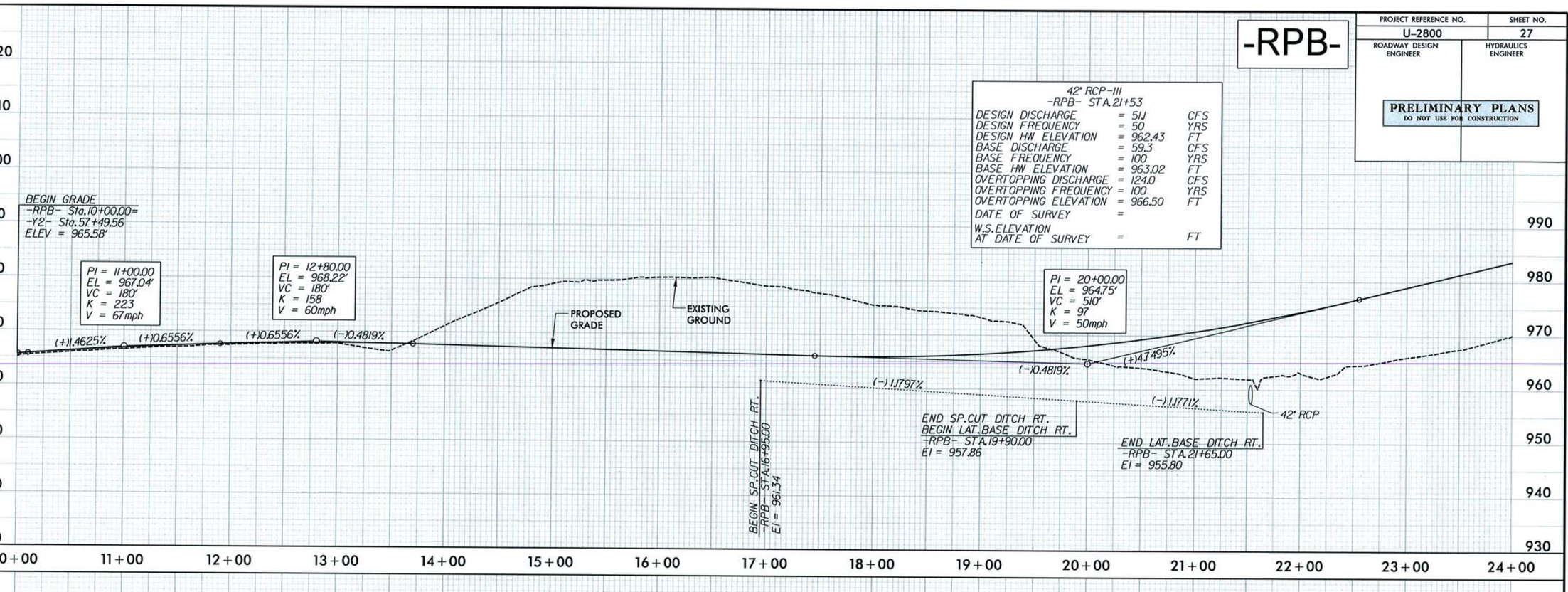
-RPB-

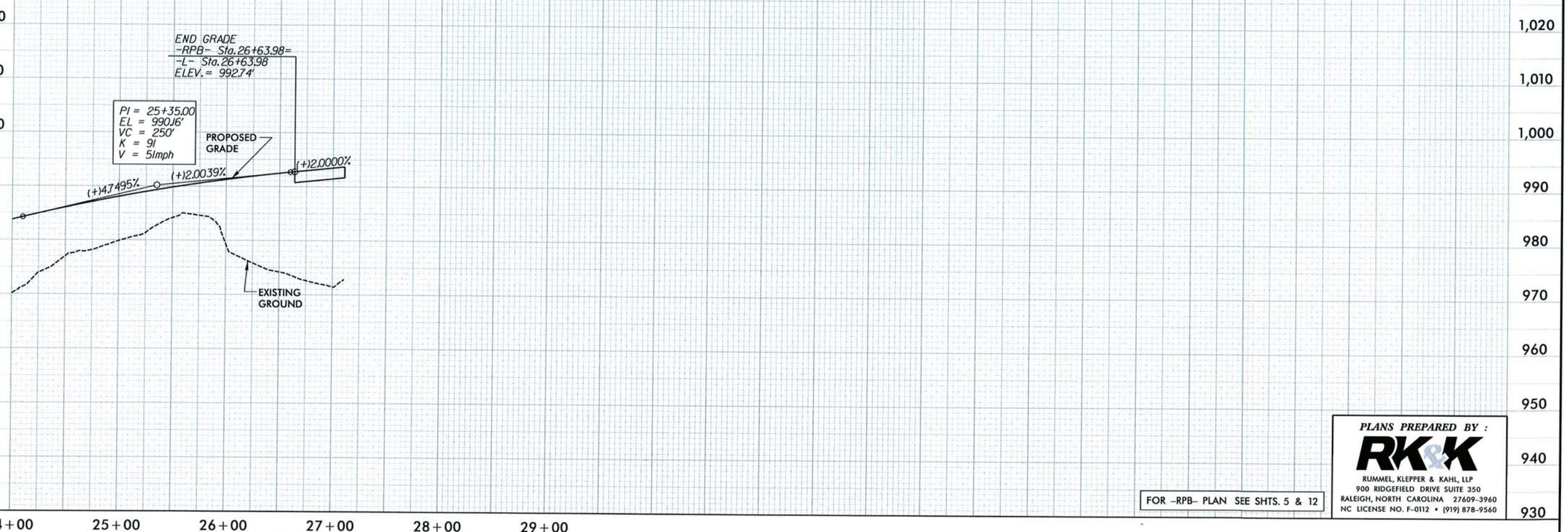
PROJECT REFERENCE NO.	SHEET NO.
U-2800	27
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

42" RCP-III
-RPB- STA.21+53

DESIGN DISCHARGE	= 511	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 962.43	FT
BASE DISCHARGE	= 59.3	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 963.02	FT
OVERTOPPING DISCHARGE	= 124.0	CFS
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING ELEVATION	= 966.50	FT
DATE OF SURVEY	=	
W.S.ELEVATION AT DATE OF SURVEY	=	FT





FOR -RPB- PLAN SEE SHTS. 5 & 12

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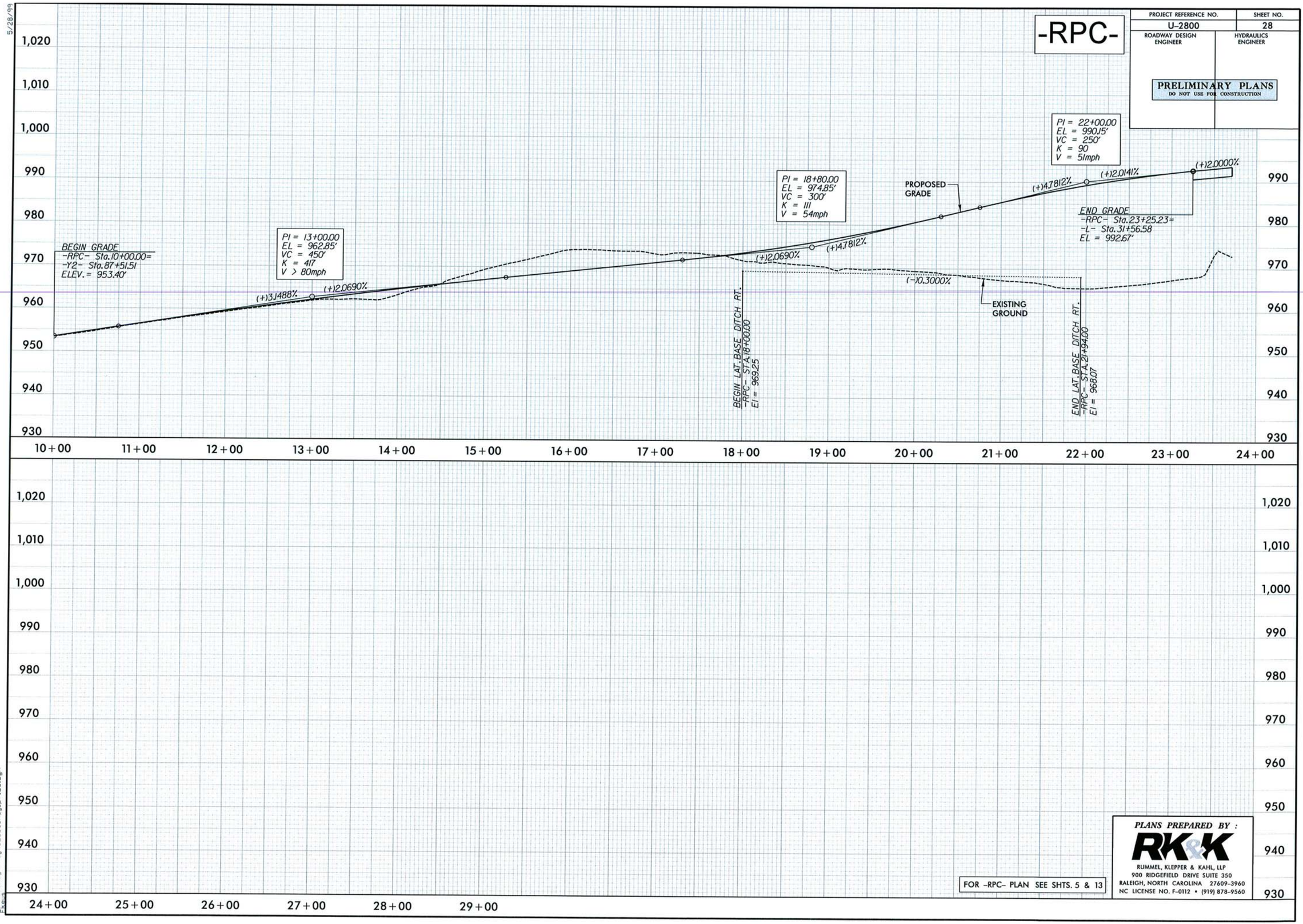
PROJECT REFERENCE NO.	SHEET NO.
U-2800	28
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-RPC-



FOR -RPC- PLAN SEE SHTS. 5 & 13

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Plotted by:

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PROJECT REFERENCE NO.	SHEET NO.
U-2800	29
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-RPD-

BEGIN GRADE
-RPD- Sta.10+00.00=
-Y2- Sta.89+37.27
ELEV. = 947.59'

PI = 16+80.00
EL = 968.10'
VC = 250'
K = 170
V = 62mph

PI = 20+30.00
EL = 973.50'
VC = 340'
K = 98
V = 51mph

(+)3.0167%
(+)1.5429%
(+) 3.0000%
(+)1.5429%
(+)5.0000%

PROPOSED GRADE
EXISTING GROUND
18" RCP

BEGIN SP.CUT DITCH LT.
-RPD- STA.18+85.00
EL = 967.30

END SP.CUT DITCH LT.
-RPD- STA.20+75.00
EL = 973.00

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00 24+00

1,020 1,010 1,000 990 980 970 960 950 940 930

990 980 970 960 950 940 930

-RPD-

END GRADE
-RPD- Sta.26+37.61=
-L- Sta.37+89.55
ELEV. = 1,001.21'

PI = 25+50.00
EL = 999.50'
VC = 170'
K = 56
V = 43mph

(+)5.0000%
(+)11.9524%
(+)2.0000%

PROPOSED GRADE
EXISTING GROUND

24+00 25+00 26+00 27+00

1,030 1,020 1,010 1,000 990 980 970 960 950 940

990 980 970 960 950 940

-RAMP-

BEGIN GRADE
-RAMP- Sta.10+00.00=
-Y2- Sta.30+54.69
EL = 936.77'

PI = 10+75.00
EL = 938.43'
VC = 150'
K = 430
V = 80 mph

PI = 12+60.00
EL = 941.88'
VC = 210'
K = 278
V = 80 mph

PI = 15+50.00
EL = 949.48'
VC = 150'
K = 238
V = 80 mph

END GRADE
-RAMP- Sta.16+45.00
ELEV = 952.57'

100' BLEND TO EXIST.

(+)2.2133%
(+)1.8649%
(+)2.6199%
(+)2.6199%
(+)3.2500%

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00

990 980 970 960 950 940 930 920 910 900

FOR -RPD- PLAN SEE SHTS. 5 & 13
FOR -RAMP- PLAN SEE SHTS. 9 & 10

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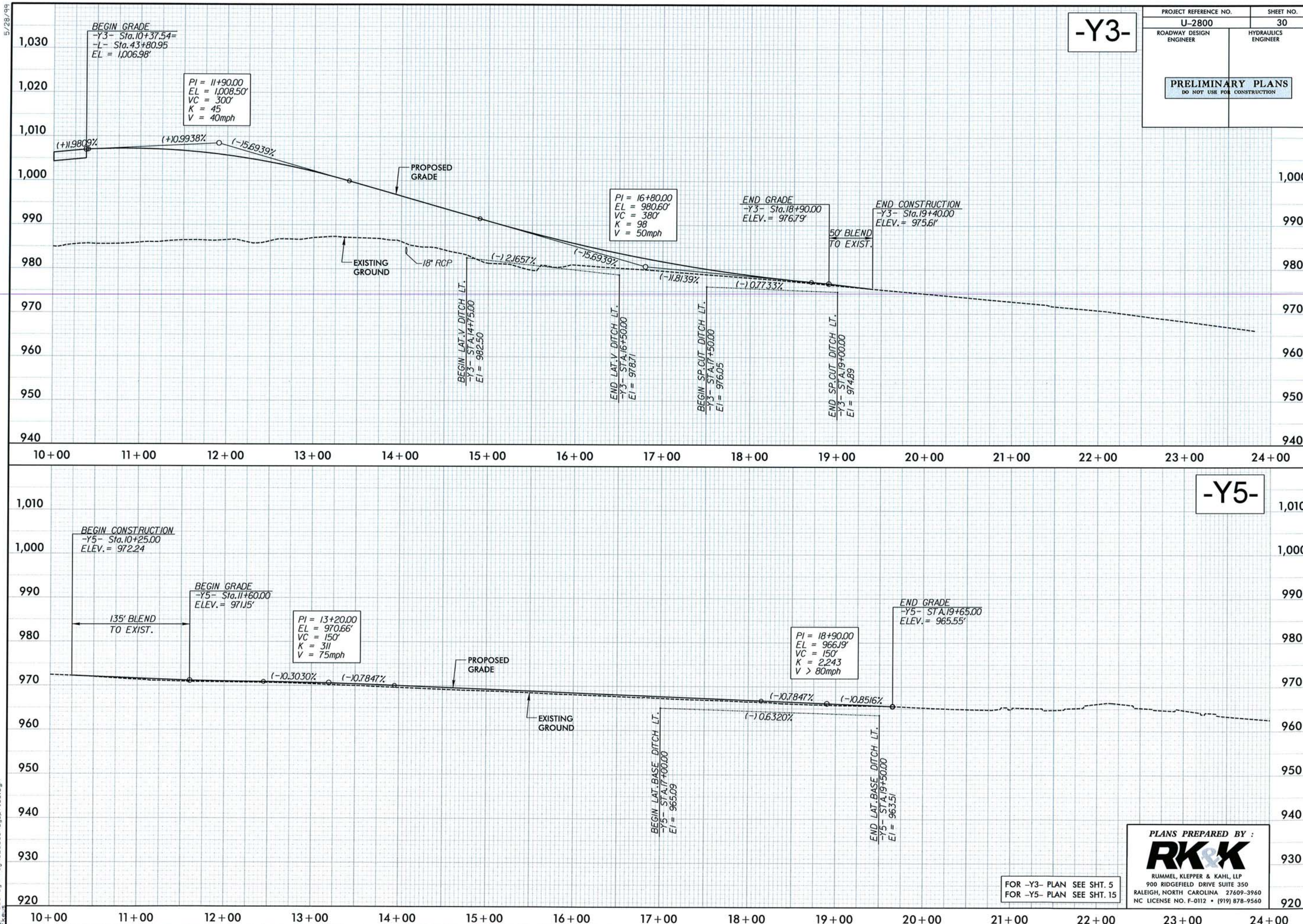

PROJECT REFERENCE NO.
U-2800
SHEET NO.
30
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
-Y3-
BEGIN GRADE
-Y3- Sta.10+37.54=
-L- Sta.43+80.95
EL = 1,006.98'
PI = 11+90.00
EL = 1,008.50'
VC = 300'
K = 45
V = 40mph
(+)1.9809%
(+)0.9938%
(−)5.6939%
PROPOSED GRADE
EXISTING GROUND
18" RCP
(−) 2.1657%
(−)5.6939%
PI = 16+80.00
EL = 980.60'
VC = 380'
K = 98
V = 50mph
(−)1.8139%
(−) 0.7733%
END GRADE
-Y3- Sta.18+90.00
ELEV.= 976.79'
50' BLEND
TO EXIST.
END CONSTRUCTION
-Y3- Sta.19+40.00
ELEV.= 975.61'
BEGIN LAT.V DITCH LT.
-Y3- STA.14+75.00
El = 982.50
END LAT.V DITCH LT.
-Y3- STA.16+50.00
El = 978.71
BEGIN SP.CUT DITCH LT.
-Y3- STA.17+50.00
El = 976.05
END SP.CUT DITCH LT.
-Y3- STA.19+00.00
El = 974.89
-Y5-
BEGIN CONSTRUCTION
-Y5- Sta.10+25.00
ELEV.= 972.24
135' BLEND
TO EXIST.
BEGIN GRADE
-Y5- Sta.11+60.00
ELEV.= 971.15'
PI = 13+20.00
EL = 970.66'
VC = 150'
K = 311
V = 75mph
(−)0.3030%
(−)0.7847%
PROPOSED GRADE
EXISTING GROUND
PI = 18+90.00
EL = 966.19'
VC = 150'
K = 2,243
V > 80mph
(−)0.7847%
(−)0.8516%
(−) 0.6320%
END GRADE
-Y5- STA.19+65.00
ELEV.= 965.55'
BEGIN LAT.BASE DITCH LT.
-Y5- STA.17+00.00
El = 965.09
END LAT.BASE DITCH LT.
-Y5- STA.19+50.00
El = 963.51
FOR -Y3- PLAN SEE SHT. 5
FOR -Y5- PLAN SEE SHT. 15
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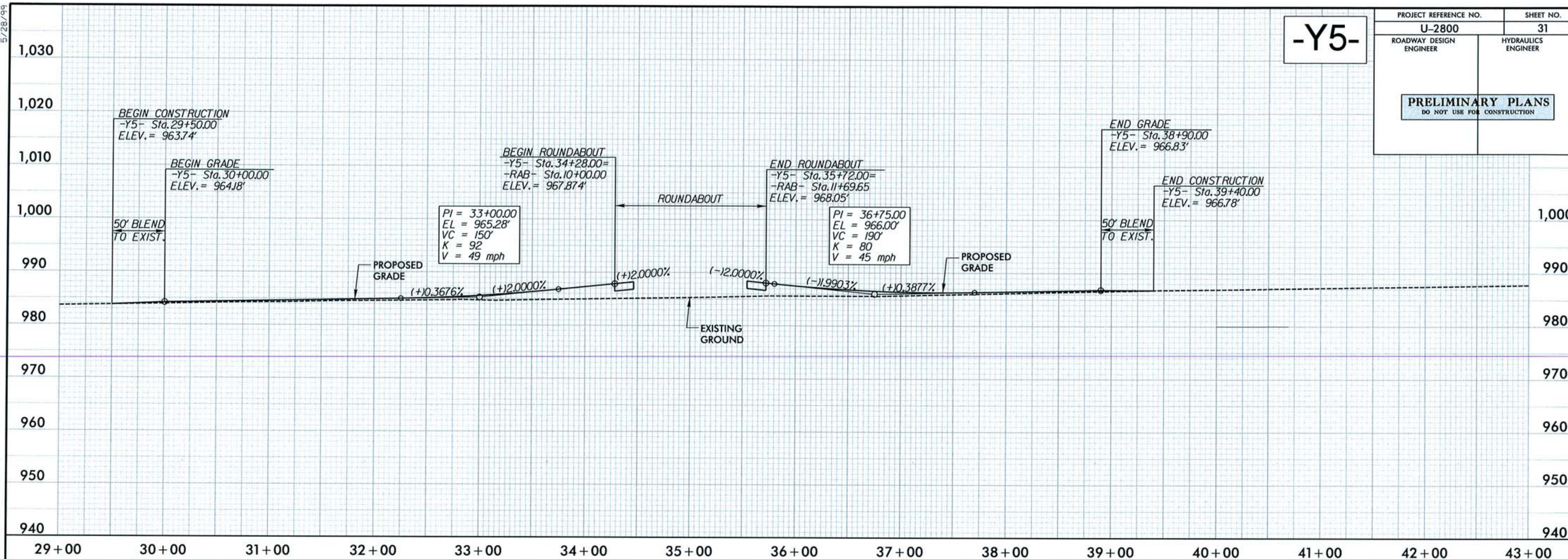
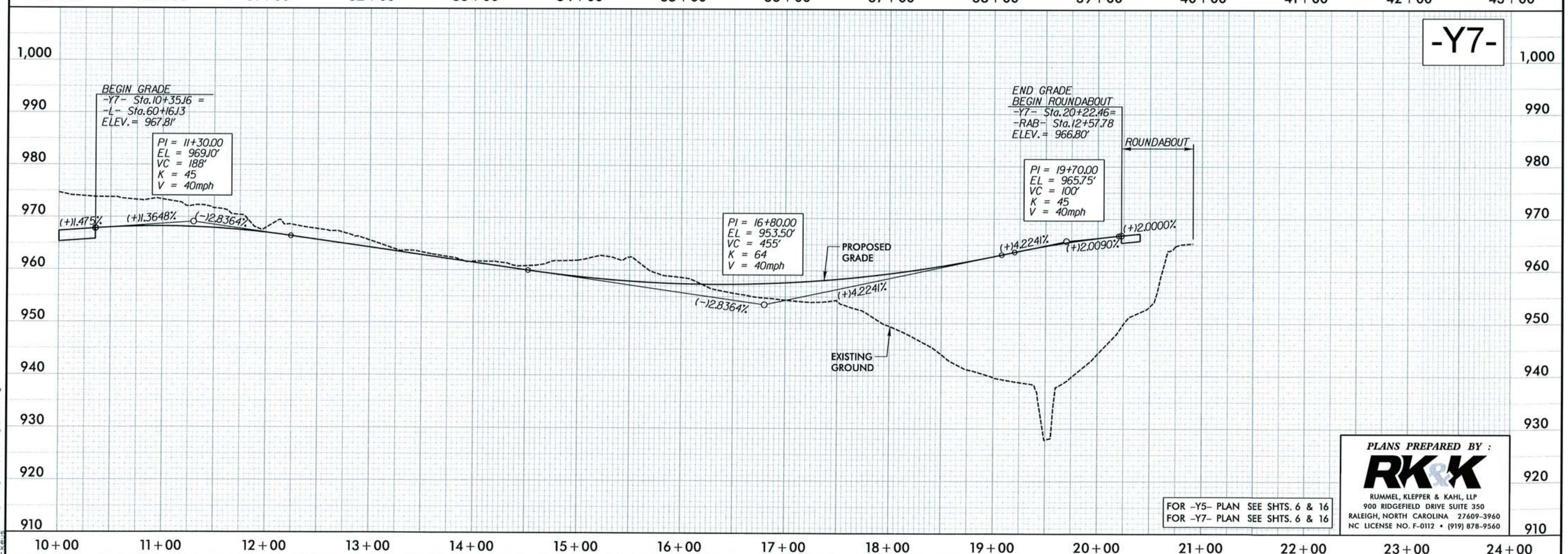
PROJECT REFERENCE NO.	SHEET NO.
U-2800	31
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION





FOR -Y5- PLAN SEE SHTS. 6 & 16
FOR -Y7- PLAN SEE SHTS. 6 & 16

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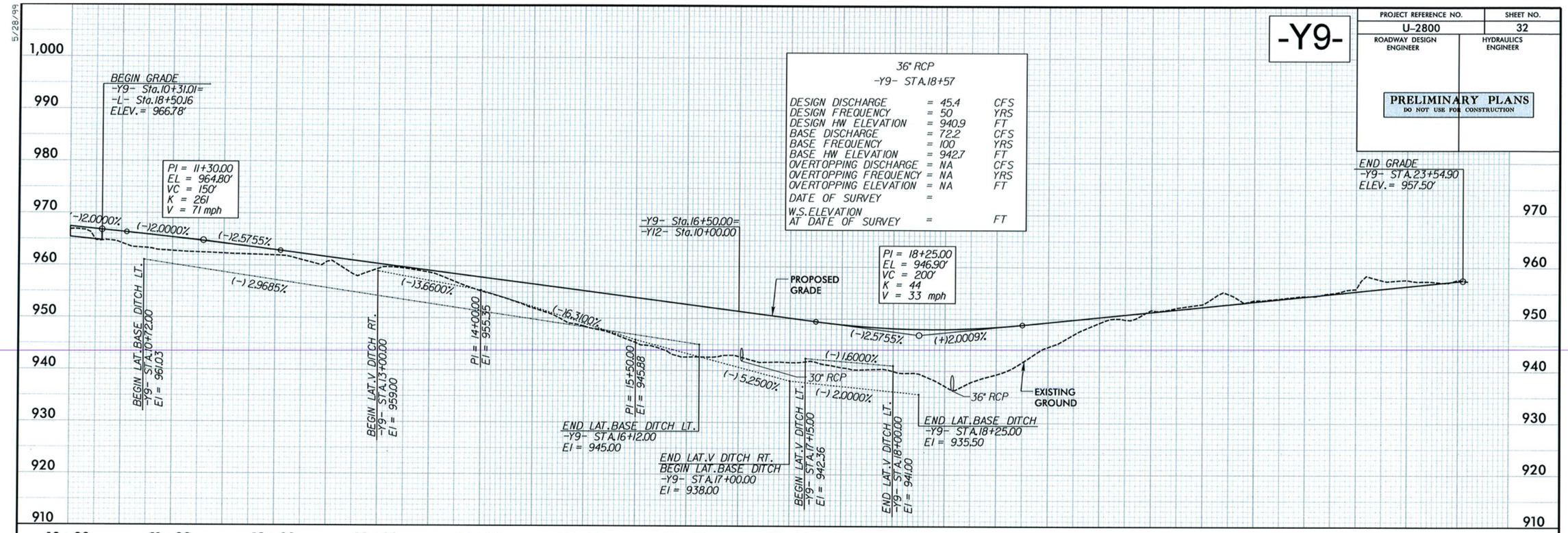
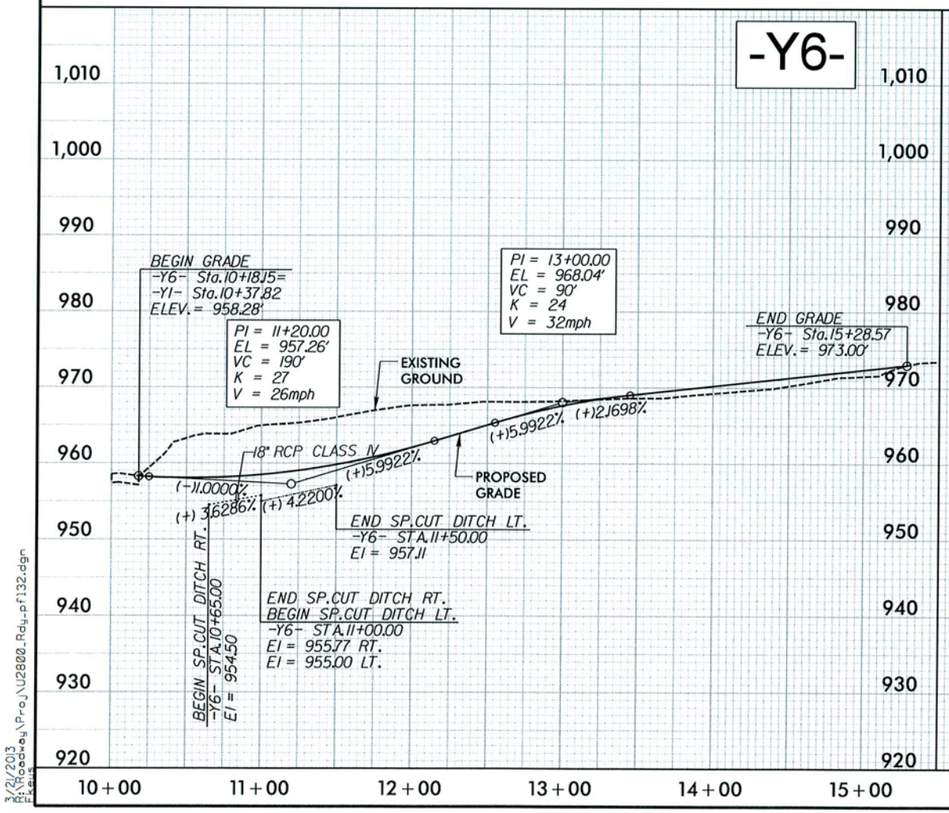
PROJECT REFERENCE NO.	SHEET NO.
U-2800	32
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

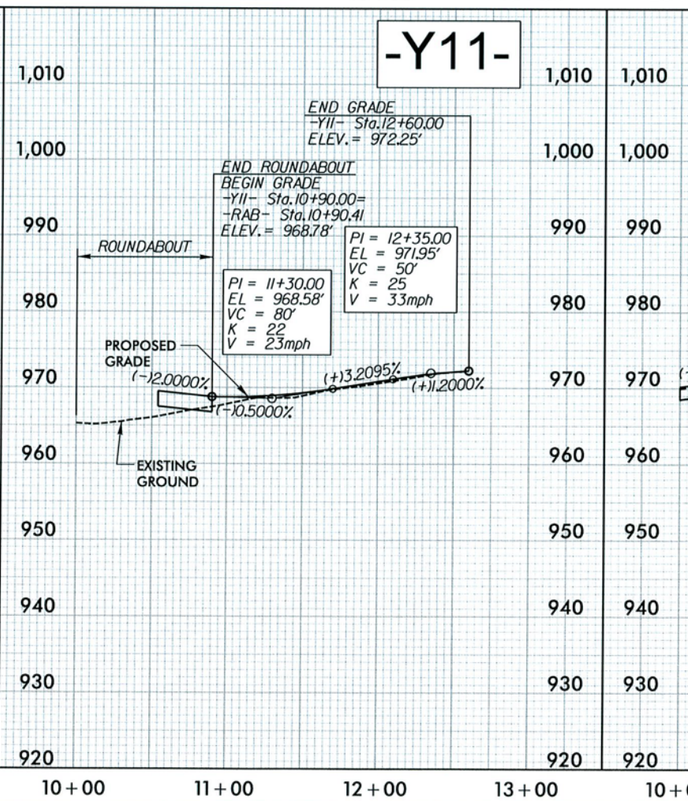
-Y9-



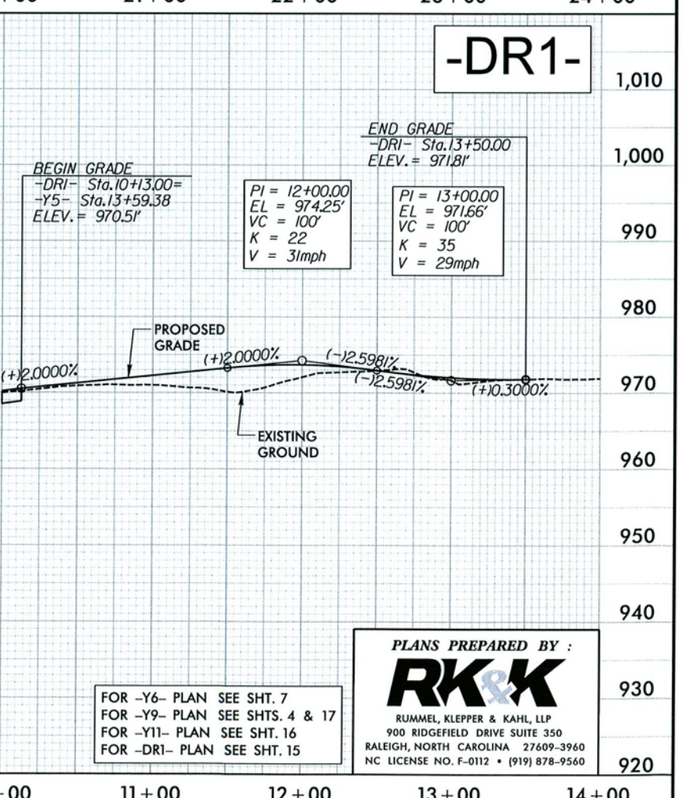
-Y6-



-Y11-



-DR1-



FOR -Y6- PLAN SEE SHT. 7
FOR -Y9- PLAN SEE SHTS. 4 & 17
FOR -Y11- PLAN SEE SHT. 16
FOR -DR1- PLAN SEE SHT. 15

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PROJECT REFERENCE NO.	SHEET NO.
U-2800	33
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y12-

36" RCP
-Y12- STA.16+21

DESIGN DISCHARGE	= 42.1	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 956.5	FT
BASE DISCHARGE	= 52.0	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 957.1	FT
OVERTOPPING DISCHARGE	= 46.7	CFS
OVERTOPPING FREQUENCY	= 50	YRS
OVERTOPPING ELEVATION	= 956.8	FT
DATE OF SURVEY	=	
W.S. ELEVATION AT DATE OF SURVEY	=	FT

BEGIN GRADE
-Y12- Sta.10+12.42=
-Y9- Sta.16+53.22
ELEV.= 951.08'

PI = 10+80.00
EL = 950.45'
VC = 130'
K = 26
V = 25 mph

PI = 13+05.00
EL = 959.45'
VC = 220'
K = 34
V = 37 mph

-Y12- Sta.13+85.00=
-Y12A- Sta.10+00.00

END GRADE
-Y12- Sta.18+20.00
ELEV.= 965.85'

PROPOSED GRADE
EXISTING GROUND

(-)10.9383%
(+)4.0000%
(+) 5.9100%
(-)12.4545%
(-)5.7300%
(+) 3.4000%
(+) 2.1100%
(+) 4.9100%

BEGIN SP.LAT.V. DITCH LT.
-Y12- STA.10+34.00
EI = 945.00

END LAT.BASE DITCH LT.
-Y12- STA.11+00
EI = 948.90

BEGIN LAT.BASE DITCH LT.
-Y12- STA.14+50.00
EI = 953.19

BEGIN LAT.BASE DITCH RT.
-Y12- STA.14+50.00
EI = 947.11

PI = 15+00.00
EI = 950.32

PI = 15+25.00
EL = 954.05'
VC = 170'
K = 26
V = 25 mph

PI = 15+50.00
EI = 950.51

END LAT.BASE DITCH RT.
BEGIN SP.CUT DITCH RT.
-Y12- STA.16+00.00
EI = 952.67

END SP.LAT.V. DITCH LT.
-Y12- STA.16+00.00
EI = 952.43

END SP.CUT DITCH RT.
-Y12- STA.17+50.00
EI = 960.33

36" RCP

-Y12A-

BEGIN GRADE
-Y12A- Sta.10+12.00=
-Y12- Sta.13+85.00
ELEV.= 957.11'

END GRADE
-Y12A- Sta.11+10.00
ELEV.= 959.63'

PROPOSED GRADE
EXISTING GROUND

(+)12%
(-)10.3011%
(+) 4.1237%
(+)2.1840%
(+) 1.960%

END SP.CUT DITCH LT.
-Y12A- STA.10+75
EI = 957.04

BEGIN SP.CUT DITCH LT.
-Y12A- STA.10+25.00
EI = 956.06

PI = 10+40.00
EL = 957.03'
VC = 56'
K = 13
V = 17 mph

PI = 10+95.00
EL = 959.30'
VC = 30'
K = 15
V = 27 mph

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 10+00 11+00 12+00

-RAB-

BEGIN GRADE
-RAB- Sta.10+00.00
ELEV.= 968.20

END GRADE
-RAB- Sta.13+39.29
ELEV.= 968.20

PI = 10+90.00
EL = 970.00'
VC = 100'
K = 25
V = 33mph

PI = 12+60.00
EL = 966.61'
VC = 110'
K = 28
V = 26mph

PROPOSED GRADE
EXISTING GROUND

(+)2.0000%
(-)11.9916%
(+)2.0000%

-DR2-

BEGIN GRADE
-DR2- Sta.10+16.38=
-Y5- Sta.32+05.00
ELEV.= 964.60'

END GRADE
-DR2- Sta.13+40.00
ELEV.= 962.17'

PI = 11+00.00
EL = 962.10'
VC = 90'
K = 26
V = 25mph

PI = 12+30.00
EL = 962.75'
VC = 100'
K = 97
V = 52mph

PROPOSED GRADE
EXISTING GROUND

(+)2.0000%
(-)12.9935%
(+)0.5000%
(+) 0.3000%
(-) 0.3000%
(-)0.5282%

PI = 11+40.00
EI = 959.49

BEGIN SP.CUT DITCH RT.
-DR2- STA.11+00.00
EI = 959.64

BEGIN SP.CUT DITCH LT.
-DR2- STA.11+00.00
EI = 960.50

END SP.CUT DITCH RT.
-DR2- STA.12+50.00
EI = 959.82

BEGIN SP.CUT DITCH LT.
-DR2- STA.12+50.00
EI = 960.95

10+00 11+00 12+00 13+00 14+00 10+00 11+00 12+00 13+00 14+00

FOR -Y12- PLAN SEE SHTS. 5 & 17
FOR -Y12A- PLAN SEE SHT. 5
FOR -RAB- PLAN SEE SHT. 16
FOR -DR2- PLAN SEE SHT. 16

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