STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

December 2, 2008

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

Attn: Mr. Andy Williams
NCDOT Coordinator

Subject: **Application for Section 404 Individual Permit and Section 401 Water Quality Certification,** Extension of SR 4126 (Bridford Pkwy, new route) from SR 1541 (Wendover Ave.) at Hornaday Rd. to Burnt Poplar Rd. at Swing Rd., Guilford County. Federal Aid No. STP-4126(1); State Project 8.2496901; TIP No. U-4006.

Debit $570.00 from WBS Element 35007.1.1.

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes to extend SR 4126 (Bridford Pkwy, new route) from SR 1541 (Wendover Ave.) at Hornaday Rd. to Burnt Poplar Rd. at Swing Rd. in Greensboro, Guilford County, North Carolina. The proposed 1.1 mi. extension consists of a four-lane curb and gutter section with a raised grass median, 12-ft. inside lanes, and 14-ft. outside lanes, as well as the realignment of Big Tree Way with Bridford Pkwy and structures over I-40. This application package consists of the cover letter, ENG Form 4345, permit drawings, half size plan sheets, Hydraulic Design Review meeting minutes, Stormwater Management Plan, ICE Analysis Update, and the Ecosystem Enhancement Program (EEP) confirmation letter.

Project Schedule

The review date of this project is June 30, 2009 with a Let date of August 18, 2009.

Purpose and Need

The purpose of this project is to address the anticipated transportation needs along this corridor by improving the existing facility in a manner that reduces congestion, increases capacity, and improves system linkage in the area.

MAILING ADDRESS:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
1598 MAIL SERVICE CENTER
RALEIGH, NC 27699-1598

TELEPHONE: 919-715-1334
FAX: 919-715-5501

WEBSITE: WWW.NCDOT.ORG

PHYSICAL ADDRESS:
2728 CAPITAL BLVD., SUITE 240
RALEIGH, NC 27604

Summary of Impacts

The project lies in the Piedmont Physiographic Province in the Cape Fear River Basin (HUC 03030002, sub-basin 03-06-02). This project will permanently impact 479 ft. (0.04 ac.) and cause 99 ft. (0.01 ac.) of temporary impacts to the existing channel of South Buffalo Creek and one of its unnamed tributaries (UT), and will result in an additional 69 ft. of permanent bank stabilization impacts. No impacts to jurisdictional resources will occur due to the relocation or installation of utilities in the project area.

Summary of Mitigation

Throughout the design and NEPA process this project has been designed to avoid and minimize impacts to jurisdictional areas. EEP will provide mitigation as required for 548 linear feet of perennial stream impacts for the proposed project.

NEPA DOCUMENT STATUS

An Environmental Assessment (EA) was approved September 29, 2003. A Finding of No Significant Impact (FONSI) was approved on March 31, 2005. The right of way (ROW) consultation for the proposed project was completed on December 15, 2006, and revised July 17, 2007, and distributed shortly thereafter. The EA, FONSI, and ROW consultation have been provided to regulatory review agencies. Additional copies will be provided upon request.

INDEPENDENT UTILITY

The subject project is in compliance with 23 CFR Part 771.111(f) which lists the Federal Highway Administration (FHWA) characteristics of independent utility of a project:

(1) The project connects logical termini and is of sufficient length to address environmental matters on a broad scope;
(2) The project is usable and a reasonable expenditure, even if no additional transportation improvements are made in the area;
(3) The project does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

RESOURCE STATUS

Wetland delineations within U-4006 were conducted using the field delineation method outlined in the *1987 Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987), and the North Carolina Division of Water Quality's (DWQ) *Identification Methods for the Origins of Intermittent and Perennial Streams*, respectively.

There are no wetlands within the project limits.

Stream impacts have increased since the EA was completed. Stream impacts in the EA were calculated based on the linear feet of jurisdictional stream located within the proposed right of way (ROW) of 100 feet; however, this did not account for impacts beyond 100-feet due to pipe extensions in streams at Sites 2 and 3 (South Buffalo Creek). South Buffalo Creek at Site 3 was delineated after the EA was approved.

Within the project area, South Buffalo Creek and a UT to South Buffalo Creek, both perennial, were identified. Jurisdictional areas were originally verified by United States Army Corp of Engineers

(USACE) representative John Thomas on October 25, 2002. UT to South Buffalo Creek at Site 1 was originally verified as an intermittent stream and was documented as one in the EA. The status of this UT was subsequently changed to perennial per the request of DWQ representative Sue Homewood and approval of USACE representative Monte Matthews. South Buffalo Creek at Site 3 was verified as perennial by Monte Matthews on October 31, 2006.

IMPACTS TO WATERS OF THE UNITED STATES

The project is located in the Cape Fear River Basin in Guilford County. This area is part of Hydrologic Cataloging Unit 03030002 of the South Atlantic-Gulf Coast Region. South Buffalo Creek and a perennial UT to South Buffalo Creek (NCDWQ classification C; NSW; NCDWQ Index # 16-11-14-2) are located within the project limits. No wetlands are located within the project limits.

There are no designated Outstanding Resource Waters (ORW), High Quality Waters (HQW), Water Supply I (WS-I), or Water Supply (WS-II), waters occur within 1.0 mile of the project area. However, South Buffalo Creek is listed on the 2006 Final 303(d) list due to impaired biological integrity and turbidity. The UT discussed above, as well as two additional UTs to South Buffalo Creek, flow into a 303d stream (South Buffalo Creek) within 1-mile of the project area .

Streams: Surface water impacts are summarized in the following table:

Site	Stream Name	Structure Type		Permanent Impacts (ft)	Temporary Impacts (ft)	Mitigation Requirements (ft)
1	UT1 to South Buffalo Creek	60" RCP		405	30	810
		Bank Stabilization		8		8
2	South Buffalo Creek	15'-10" x 9'-10" Corrugated Structural Steel Plate Pipe		36	59	72
		Bank Stabilization		33		33
3	South Buffalo Creek	48" RCP	Upstream of Swing Rd.	29	10	29
			Downstream of Swing Rd.	9		18
		Bank Stabilization		28		28
			Total:	548	99	998

Site 1: There will be 405 linear feet of permanent impacts to the perennial UT to South Buffalo Creek at this location due to the installation of a 60-inch Reinforced Corrugated Pipe (RCP). The pipe is necessary to convey the stream under the roadway fill that will be used to construct the new location road section at this location. The pipe will be buried one foot below the streambed to allow for natural aquatic passage. Bank stabilization is necessary to prevent scour at the eastern outlet of the pipe, and will result in 8 linear feet of permanent impacts. There will also be 30 linear feet of temporary stream impacts to allow access for equipment and construction of the new roadway and pipe.

Site 2: There will be 36 linear feet of permanent impacts to the perennial South Buffalo Creek at this location due to the extension of a 15-foot 10-inch x 9-foot 10-inch Corrugated Structural Steel Plate Pipe in the stream channel. This pipe extension is necessary to allow for road fill due to the widening of the existing road in this location. Bank stabilization is necessary to prevent scour at the eastern outlet of the pipe, and will result in 33 linear feet of permanent impacts. There will also be 59 linear feet of temporary stream impacts to allow access for equipment and construction of the new roadway and pipe.

Site 3: There will be 38 linear feet of permanent impacts to the perennial South Buffalo Creek at this location due to the extension of a 48-inch RCP in the stream channel. The pipe is necessary to convey the portion of the stream under the roadway fill that will be used to widen the road. Bank stabilization is necessary to prevent scour at both outlets of the pipe, and will result in 28 linear feet of permanent impacts. There will also be 10 linear feet of temporary stream impacts to allow access for equipment and construction of the new roadway and pipes.

FEDERALLY PROTECTED SPECIES

Plants and animals with a Federal classification of Endangered (E) or Threatened (T) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of January 31, 2008 the USFWS lists one federally protected species for Guilford County, small whorled pogonia. A survey for this species was conducted by NCDOT biologists within the project limits on June 4, 2008. Though appropriate habitat exists within the project area in the form of open-understory hardwood forest, no small whorled pogonia individuals were found during the 16 person-hour walking-visual survey. A search of the North Carolina Natural Heritage Database (updated August 2008) indicated no known occurrences of federally protected species within 1-mile of the project area.

Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*), originally listed for Guilford County when the EA and FONSI were completed, was delisted from the Endangered Species Act as of August 8, 2007. However, it is still protected under the Bald and Golden Eagle Protection Act. No suitable nesting or foraging habitat exists within 660 feet of the project limits.

MITIGATION OPTIONS

The USACE has adopted, through the Council on Environmental Quality (CEQ), a wetland mitigation policy that embraces the concept of "no net loss of wetlands" and sequencing. The purpose of this policy is to restore and maintain the chemical, biological, and physical integrity of the waters of the United States. CEQ has defined mitigation of wetland and surface water impacts to include: avoiding impacts, minimizing impacts, rectifying impacts, reducing impacts over time, and compensating for impacts (40 CFR 1508.20).

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts. Avoidance measures were taken during the planning phase and minimization measures were incorporated as part of the project design. Minimization includes the examination of appropriate and practicable steps to reduce the adverse impacts.

Avoidance and Minimization

Avoidance and minimization has been employed in the project area to the maximum extent practicable. The following measures were implemented:

- NCDOT's Best Management Practices (BMPs) for the Protection of Surface Waters will be enforced.
- The RCP proposed at Site 1 will be buried one foot below the streambed to allow for natural aquatic passage, as stated in the Stormwater Management Plan.
- Use of Pre-formed scour holes at Y2 Station 13+50 LT, Y2 Station 16+50 LT, L Station 30+50 RT, and L Station 41+50 RT.

- Use of a dissipater basin at L Station 39+15 RT to provide for rapid energy dissipation of scouring velocities exiting from storm drain outlet pipes.
- To avoid further impacts to South Buffalo Creek at Site 3, slope stakes were pulled back from 2:1 to 1.5:1 and rock plating was used, as stated in the Stormwater Management Plan.
- Groundwater monitoring wells are present in the HP Triad Properties, Inc. parcel (L Station 60+). In order to avoid contaminating the nearby stream, the existing drainage system will be plugged and abandoned. New outfalls in this area were placed such that they would not directly enter the stream.

Compensatory Mitigation

The construction of the proposed project will result in permanent impacts to 548 linear feet of stream channel impacts within the Cape Fear River Basin. For this project, mitigation is required at a ratio of 2:1 for stream channel impacts at Sites 1, 2, and the east (downstream) side of Swing Rd. at Site 3, and at a 1:1 ratio for stream channel impacts on the west (upstream) side of Swing Rd. at Site 3 based on a telephone conversation with USACE representative Andy Williams on October 22, 2008 (please see the enclosed EEP acceptance letter). Further, 1:1 mitigation will be required for permanent bank stabilization impacts at Sites 1, 2, and 3, per a telephone conversation with NCDWQ representative Amy Euliss on October 27, 2008.

CULTURAL RESOURCES

The North Carolina Department of Cultural Resources, State Historic Preservation Office conducted a review of the project, and in a letter dated June 28, 2001, stated that no properties of architectural, historic, or archaeological significance will be affected by the proposed project. This letter is included in the EA.

FEMA COMPLIANCE

FEMA subjectivity for South Buffalo Creek begins downstream of the project area. As such, no FEMA compliance is required for this project.

UTILITY IMPACTS

No jurisdictional impacts will occur due to the removal or relocation of utilities.

INDIRECT AND CUMULATIVE EFFECTS

An Indirect and Cumulative Effects (ICE) Analysis Update was completed on October 16, 2008 and is included in the permit package.

WILD AND SCENIC RIVERS

This project will not impact any designated Wild and Scenic Rivers or any rivers included in the list of study rivers (Public Law 90-542, as amended) or North Carolina Natural and Scenic Rivers.

ESSENTIAL FISH HABITAT

The project will not impact any essential fish habitat afforded protection under the Magnuson-Stevens Act of 1996 (16 U.S.C 1801 *et seq.*).

REGULATORY APPROVALS

Application is hereby made for a Department of the Army Section 404 Individual Permit as required for the above-described activities for the proposed TIP project U-4006. We are also hereby requesting a Section 401 Water Quality Certification from the Division of Water Quality. In compliance with Section 143-215.3D(e) of the NCAC, we will provide $570 to act as payment for processing the Section 401 permit. We are providing five copies of this application to the North Carolina Department of Environment and Natural Resources, Division of Water Quality, for their review.

Thank you for your time and assistance with this project. Please contact David E. Bailey at debailey@ncdot.gov or (919) 715-7257 if you have any questions or need additional information.

Sincerely,

E. L. Lusk

for Gregory J. Thorpe, Ph.D., Environmental Management Director
Project Development and Environmental Analysis Branch

cc:
w/attachment
- Mr. Brian Wrenn, NCDWQ (5 Copies)
- Ms. Kathy Matthews, USEPA

W/o attachment (see website for attachments)
- Dr. David Chang, P.E., Hydraulics
- Mr. Greg Perfetti, P.E., Structure Design
- Mr. Victor Barbour, P.E., Project Services Unit
- Mr. Mark Staley, Roadside Environmental
- Mr. J. M. Mills, P.E., Division 7 Engineer
- Mr. Jerry Parker, Division 7 Environmental Officer
- Mr. Jay Bennett, P.E., Roadway Design
- Mr. Majed Alghandour, P. E., Programming and TIP
- Mr. Art McMillan, P.E., Highway Design
- Mr. Steve Brown, P.E., PDEA
- Mr. Scott McLendon, USACE, Wilmington
- Mr. Gary Jordan, USFWS
- Mr. Travis Wilson, NCWRC
- Ms. Beth Harmon, EEP
- Mr. Todd Jones, NCDOT External Audit Branch
- Mr. Drew Joyner, PE, Human Environment Unit Head
- Mr. Clarence W. Coleman, P.E., FHWA

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT (33 CFR 325)

OMB APPROVAL NO. 0710-003
Expires December 31, 2004

Public reporting burden for this collection of information is estimated to average 10 hours per response, although the majority of applications should require 5 hours or less. This includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Service Directorate of Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302; and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003), Washington, DC 20503. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authority: Rivers and Harbors Act, Section 10, 33 USC 403: Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research and Sanctuaries Act, 33 USC 1413, Section 103. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETED

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (an agent is not required)
North Carolina Department of Transportation	
6. APPLICANT'S ADDRESS	**9. AGENT'S ADDRESS**
1598 Mail Service Center Raleigh, NC 27699-1548	
7. APPLICANT'S PHONE NOs. W/AREA CODE	**10. AGENT'S PHONE NOs. W/AREA CODE**
a. Residence b. Business (919) 733-3141	a. Residence b. Business

11. STATEMENT OF AUTHORIZATION

I hereby authorize, _____ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

APPLICANT'S SIGNATURE DATE

NAME, LOCATION, AND DESCRIPTION OR PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions

NCDOT TIP No. U-4006, Guilford County, NC

13. NAME OF WATERBODY, IF KNOWN (if applicable)
South Buffalo Creek and an unnamed tributary to South Buffalo Creek.

14. PROJECT STREET ADDRESS (if applicable)

15. LOCATION OF PROJECT

Guilford	NC
COUNTY	STATE

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions) **Section, Township, Range, Lat/Lon, and/or Accessors's Parcel Number, for example.**

17. DIRECTIONS TO THE SITE I-85/I-40 to Wendover Ave. and/or Guilford College Rd. in Greensboro, NC

18. Nature of Activity (Description of project, include all features)

1.1 mi. extension of SR 4126 (Bridford Pkwy, new route) from SR 1541 (Wendover Ave.) at Hornaday Rd. to Burnt Poplar Rd. at Swing Rd., Guilford County, North Carolina. It is planned as a four-lane curb and gutter section with a raised grass median, 12-ft. inside lanes, and 14-ft. outside lanes, as well as the realignment of Big Tree Way with Bridford Pkwy and structures over I-40.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

The purpose of this project is to address the anticipated transportation needs along this corridor by improving the existing facility in a manner that reduces congestion, increases capacity, and improves system linkage in the area.

USE BLOCKS 20-22 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

Needed in order to construct 60'' reinforced concrete pipe, 15'-10" x 9'-10" corrugated structural steel plate pipe and 48" reinforced concrete pipe extensions for a wider roadway, provide bank stabilization of effected streams, and construction access.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards

See attached permit drawings.

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

548 linear feet of permanent and 99 linear feet of temporary stream impacts

23. Is Any Portion of the Work Already Complete? Yes ___ No _X_ IF YES, DESCRIBE THE COMPLETED WORK

24. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (If more than can be entered here, please attach a supplemental list).

See Attached List

25. List of Other Certifications or Approvals/Denials Received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED

* Would include but is not restricted to zoning, building, and flood plain permits

26. Application is hereby made for a permit or permits to authorize the work described in this application. I certify that the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

E. L. Lusk 12.2.08

SIGNATURE OF APPLICANT DATE SIGNATURE OF AGENT DATE

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

Subject: Draft Minutes from Interagency Hydraulic Design Review Meeting on March 22, 2006 for U-4006 in Guilford County

Team Members:

John Thomas-USACE	(present)
Sue Homewood-NCDWQ	(present)
Travis Wilson-NCWRC	(present)
Kathy Matthews-EPA	(present)
Chris Militscher-EPA	(present)
Susan Thebert-NCDOT-NEU	(absent)
Brad Wall-NCDOT-DIV 7	(absent)
Clarence Coleman-FHWA	(absent)

Participants:
Galen Cail, NCDOT Hydraulics
Ron Ferguson, Arcadis
Clayton Walston, NCDOT Roadway
Steve Smallwood, Arcadis
Linwood Stone, NCDOT-PDEA
Mark Staley, Roadside Environmental

GENERAL NOTES:

The project drains to a 303D stream (South Buffalo Creek). Therefore need to get stormwater treatment (in grassed swales) to extent practical.

Sheet 5:

Check outlet velocity of proposed 60" along jurisdictional stream. Make sure outlet energy is dissipated. Consider bank rip rap or rock vane, etc.

Sheet 6:

Anticipate extending existing culvert along South Buffalo Creek under Guilford College Road. Check outlet velocities. Rip rap on banks only.

Sheet 7:

There was discussion for potential on-site mitigation along South Buffalo Creek. The mitigation would involve removing the existing pipe system beginning from approximate Sta 58+00 –L- Rt. However, the site has a number of monitoring wells. Which raise concern over the extent and type of pollutants on the site and whether the site should be "open cut" for a stream relocation. Geotech will have to investigate and make their recommendations. Need to have this info available at the 4C meeting.

Sheet 8:

NEU needs to investigate potential jurisdictional site under Swing Road approximate Sta 19+70 –Y4-. The site is conveyed through an existing 48" pipe.

Meeting adjourned

Subject: Draft Minutes from Interagency Permit Review Meeting on July 25, 2007 for U-4006 in Guilford County

Team Members:

Andrew Williams-USACE	(present)
Sue Homewood-NCDWQ	(present)
Travis Wilson-NCWRC	(present)
Kathy Matthews-EPA	(absent)
Chris Militscher-EPA	(present)
Rachelle Beauregard-NCDOT-NEU	(present)
LeiLani Paugh-NCDOT-NEU	(present)
Deanna Riffey-NCDOT-NEU	(present)
Patty Eason-NCDOT-DIV 7	(present)
Steve Brown-NCDOT-PDEA	(present)
Marques Jacobs-NCDOT-PDEA	(present)
Donnie Brew-FHWA	(present)

Participants:
Marshall Clawson, NCDOT Hydraulics
Galen Cail, NCDOT Hydraulics
Julie Taylor, Arcadis
Steve Smallwood, Arcadis
Robert Stroup, NCDOT Roadway
Clayton Walston, NCDOT Roadway
Linwood Stone, NCDOT-PDEA
Mark Staley, Roadside Environmental

It was stated that South Buffalo Creek is a 303d stream. Stormwater treatment was provided, to the extent practical, with grassed swales.

Sheet 5; Site 1:

No comments.

Sheet 6; Site 2:

Account for impacts upstream to extent of ditch tie-in and embankment rip rap.

Sheet 7:

There are no impacts at this site so no permit site provided. However, there was discussion on potential stream mitigation site East of –L- that was discussed at 4B meeting in March 2006. Per Geotech assessment report provided December 2006, it is recommended to not pursue this site for mitigation. Contamination by petroleum and solvents has been confirmed on the property from previous investigations.

There was comment on outlet velocities/stability at the 30" CSP outlet Sta 59+75 RT. The calculated velocities looked low so will investigate and determine if Class I rip rap is adequate or if energy dissipater is needed. Outlet does not convey to stream but to existing 36" CSP that goes to stream outside of existing R/W.

Sheet 8; Site 3:

It was recommended to improve inlet transition between pipe and stream. A JB with skewed pipe inlet will be provided to improve.

Meeting adjourned

STORM WATER MANAGEMENT PLAN

TIP No. U-4006
Project No. 35007.1.1
Guilford County

ROADWAY DESCRIPTION

The project involves an extension of the existing Bridford Parkway, along a new route, from Hornaday Road, to the intersection of Burnt Poplar Road with S. Swing Road. The project is located entirely within the city of Greensboro. The overall length of the project is approximately 1.02 miles. The proposed roadway is a multi-lane undivided highway. The project drainage system consists of cross pipes, subsurface storm drain systems with outfall protection, and ditches. Major stream crossings are shown below:

Table 1: Major Stream Crossings

Location	Stream Name	Drainage Area	Proposed Structure	Bury Depth
Site 1 L Station 28+70	Tributary to S. Buffalo Creek	51 ac	60 inch RCP	1.0 FT
Site 2 Y3 Station 18+45	S. Buffalo Creek	200 ac	15'-10" x 9'-10" CSP	N/A Extension
Site 3 Y4 Station 19+69	S. Buffalo Creek	12.5 ac	48 inch RCP	N/A Extension

ENVIRONMENTAL DESCRIPTION

The project is located in the Cape Fear River Basin. Stream impacts are anticipated where the project crosses the South Buffalo Creek at the sites listed above.
Pipe outlet and channel bank protection measures were implemented at these sites.
There are no wetlands that fall within the project boundaries.

BEST MANAGEMENT PRACTICES (BMPs)

The primary goal of BMPs is to prevent degredation of the state's surface waters from construction and operation of the highway system. BMPs are practices and procedures undertaken to prevent or reduce storm water pollution.

The BMPs and measures used at the major stream crossing sites are as follows:

Site 1 - 60 inch Reinforced Concrete Pipe (RCP)

The culvert is to be buried one (1) foot below the natural streambed. As with most cross pipe installations, the pipe was aligned and sloped to closely match that of the existing stream. A short realignment was required for the incoming tributary to the jurisdictional stream. In this case, the channel was lined with temporary coir matting along the banks only. A small amount of rip-rap is specified to be placed along the outer bank in the bend of this tributary. This is to prevent scouring of the stream and cutting into the toe of the adjacent fill embankment. As an added scour protection measure, rip-rap will be placed at the outlet of the pipe and junction with the tributary. The rip-rap will only be placed along the stream banks.

Site 2 – 16' x 11' Corrugated Structural Plate Pipe

In order to accommodate the road widening, an extension of the existing culvert was necessary at this site. The culvert is proposed to be extended 19 ft. on the upstream side and 11 ft. on the downstream side. A construction sequence was provided which will allow the stream to maintain flow during operations. Stilling basins were included as part of the sequencing to allow pumped affluent to settle out any sediment stirred as a result of construction and prior to transferring water back into the stream. In addition, rip-rap will be placed at the outlet to protect the stream banks from erosive velocities.

Site 3 - 48 inch RCP

In order to accommodate the road widening, an extension of the existing culvert was necessary at this site. In an effort to avoid invading the stream, slope stakes were pulled back from a normal 2 H:1V to 1 ½ H:1V and rock plating was used. Rock plating is designed to lessen the effects from potential erosive velocities down and along the toe of steep slopes. In addition, rip-rap will be placed at the outlet to protect the stream banks from erosive velocities.

The BMPs and measures used on this project on behalf of roadside drainage are as follows:

Preformed Scour Holes (PSHs)

PSHs are used at the following locations in an effort to diffuse concentrated, higher velocity flow from the storm drain outlet pipe into sheet flow prior to entering the surface water.

Y2 Station 13+50 LT

Y2 Station 16+50 LT

L Station 30+50 RT

L Station 41+50 RT

Rip-Rapped Energy Dissipator Basin

A dissipator basin is used on L at Station 39+15 RT to provide for rapid energy dissipation of scouring velocities exiting the storm drain outlet pipes in this area.

AVOIDANCE MEASURES

Monitoring wells are present in the HP Triad Properties, Inc. parcel (-L- Station 60+). In an effort to avoid contaminating the nearby stream, the existing drainage system will be plugged and abandoned. New outfalls in this area were placed such that they would not directly enter the stream. Ductile iron was chosen as the pipe material to eliminate the possibility of corrosion, and subsequent contamination of the water.

October 16, 2008

To: **David Bailey**
NCDOT Natural Environment Unit

From: **Tristram Ford**
NCDOT Public Involvement and Community Studies-HEU

Re: **Memo update of ICE Analysis-- U-4006 Community Impact Assessment, Guilford County**

Indirect and Cumulative Effects Analysis Update

This memo is an update of the Indirect and Cumulative Effects analysis for U-4006 in Guilford County, which was previously submitted as part of the Community Impact Assessment for the project prepared by Parsons Brinckerhoff in December 2002.

This update will evaluate the scope of the project, transportation impact causing activities, population and growth trends, the project's consistency with local plans, market conditions and notable natural environmental features.

Project Description

U-4006 is a proposed project to extend Bridford Parkway on new location from its existing northern terminus at Hornaday Road, south of I-40 Business, to the intersection of Burnt Poplar Road and Swing Road, north of I-40 Business. The purpose of the project is to increase the capacity of roadways in the area, improve their level of service and to provide a connection between the existing industrial area surrounding the Burnt Poplar / Swing Road intersection and the Wendover Place commercial center south of I-40, adjacent to Hornaday Road. This project is approximately 1.1 miles in length. The proposed cross-section of this project will consist of a four-lane median divided facility with curb and gutter and five-foot wide sidewalks on both sides, which will require 90 to 100 feet of right-of-way along the entire length of the project. This project will also include a new bridge over I-40 to be constructed 0.3 miles east of the Guilford College Road interchange.

ICE and Demographic Study Area

The ICE and Demographic Study Area for this project is comprised of CT 160.04 BG's 4 and 5, CT 161.02 BG 7, and CT 165.03 BG 1. The criteria used to select the Demographic Study Area included any Census Tract Block Group adjacent to or within a 0.5 mile radius of the proposed project location.

Other Transportation and Infrastructure Projects in the Area
There are two other TIP projects in close proximity to U-4006. U-2524 is a project to construct the western portion of the Greensboro Outer Loop, of which three segments are currently complete between I-85 and I-40. U-4750 is the extension of Homeday Road which includes a grade-separated bridge over the Outer Loop.

Time Horizon
The time horizon for the project extends to 2035 based on population projections for the area by the NC State Data Center at the Office of State Management and Budget.

Transportation Impact Causing Activities
A transportation impact causing activity is a factor that could result in a change in land use. In the case of U-4006, there will be an increase in access due to the new location facility. U-4006 will result in the creation of a transportation node at the new intersection of Bridford Parkway and Guilford College Road. The proposed project would also likely result in a minimal reduction of travel time based on the new alignment.

Population and Job Growth
According to the NC State Data Center, Guilford County is expected to add 241,940 people to the 2002 base population of 432,570 people by the year 2035. This represents a total increase of 56%. In terms of annual population growth projections, it is estimated that Guilford County's population will increase 1.41% per year to the year 2025.

Guilford County experienced a 0.9% annual employment change during the decade time period from 1994 to 2004. In addition, Guilford County is projected to add 209,740 new jobs by the year 2035. It is also estimated that there will be an additional 98,620 new households by 2035.

Notable Features
There is one notable natural feature within the Demographic Study Area/ ICE Study Area. South Buffalo Creek, which parallels the northern portion of the proposed alignment, is on the NC Division of Water Quality's 303(d) list of impaired waters. The stream is listed as biologically impaired due to sediment from the source to McConnell Road.

In addition, there are portions of two WS-IV Water Supply / Watersheds for Randleman Lake (Deep River) and High Point Lake (East Fork of the Deep River), and one WS-III Water Supply Watershed for the Cape Fear River (Reedy Fork) located within the Demographic Study Area/ ICE Study Area. The two WS-IV Water Supply Watersheds are located as little as 500 feet to the southwest of

the proposed alignment; however they are not expected to be impacted by project construction due to topography.

Local and Regional Plans

U-4006 is consistent with the City of Greensboro's Urban Area Thoroughfare Plan which indentifies the Bridford Parkway extension project as important in providing system linkage and improved capacity. According to the generalized future land use map within the GUAMPO Draft 2035 Long Range Transportation Plan, which was formulated by combining the land use plans for Greensboro, Guilford County, Stokesdale, Summerfield, Oak Ridge and Pleasant Garden, the land adjacent to the proposed project is planned to continue to develop as a mix of industrial, high density residential, commercial and mixed-use commercial. The City of Greensboro Planning Department has incorporated plans for U-4006 in current and future land use plans and anticipates that future development will consist of primarily commercial and industrial development, which is generally in line with the current zoning.

The City of Greensboro is subject to Phase I storm water regulations that require municipalities to develop and implement a stormwater management program including education, illicit discharge detection and elimination, water quality monitoring, and storm sewer system and land use mapping. Municipalities in the Greensboro Urban Area who own and operate a municipal storm sewer system, including Greensboro, are also required under Phase II regulations, an extension of the Phase I regulations, to apply and obtain an NPDES permit for stormwater discharges and well as implement post-construction stormwater management for development.

Recently the City of Greensboro has secured funding from the Clean Water Management Trust Fund (CWMTF) to be supplemented by the City of Greensboro's matching funds which will be used to acquire approximately 40 acres of property located in the southeast quadrant of the Freeman Mill Road/ I-40 interchange to construct an approximately 20-acre riparian wetland. Vegetated Riparian buffers will also be provided along the banks of the South Buffalo Creek within that area. According to the NC Division of Water Quality, the objectives of the project are to improve the water quality in South Buffalo Creek's 13-square mile urbanized watershed that is currently 48% impervious by reducing the pollutants, particularly sediment loads. Other project objectives are to improve aquatic and terrestrial habitats through the development of the riparian wetland and vegetative stream buffers.

Market for Development

The market for development will continue to be strong in this area due to the projected growth in population, the availability of land, the proximity to the Piedmont Triad International Airport and the planned Fed Ex hub, and the desire of local officials to encourage economic growth. The southern terminus of the proposed project is adjacent to a large commercial shopping center, Wendover

Place. The population and job growth trends and existing adjacent land use are factors that will likely result in more commercial and industrial development in this area.

Findings and Conclusions

Indirect Effects

In conclusion, although the project could result in a slight increase in development (commercial and industrial) mainly because of the change in access and exposure, it is important to note that development of this nature would continue occur in this area irrespective of the proposed project. Land is available, local planning efforts and plans encourage and support new growth and the area is proximate to both the planned Fed Ex hub and the commercial center on the southern end of the project. Although there is a 303(d) listed stream that parallels a portion of the project, the limited project scope, best management practices, storm water regulations and initiatives such as the construction of a 20-acre forested wetland along South Buffalo Creek and land use controls should mitigate potential impacts to downstream water quality.

Cumulative Effects

The area surrounding the proposed project has been within the Greensboro urban growth area for a period of time and has experienced substantial development. Taken in conjunction with surrounding past, present and future transportation projects, U-4006 will likely serve as simply another factor in land use changes in the immediate area, thus a more detailed cumulative impact statement is not required. Furthermore, any future land use changes will be governed by stormwater regulations currently in place.

Ecosystem Enhancement
PROGRAM

November 24, 2008

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

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

U-4006, Greensboro – SR 4126 (New Route – Bridford Parkway) from SR 1541 (Wendover Avenue) at Hornaday Road to Burnt Poplar Road at Swing Road, Guilford County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the stream mitigation for the subject project. Based on the information supplied by you dated October 31, 2008 (received November 22, 2008), the impacts are located in CU 03030002 of the Cape Fear River Basin in the Central Piedmont (CP) Eco-Region, and are as follows:

Warm Stream: 548 feet

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

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

Sincerely,

William D. Gilmore, P.E.
EEP Director

cc: Mr. Andy Williams, USACE – Raleigh Regulatory Field Office
Mr. Brian Wrenn, Division of Water Quality, Wetlands/401 Unit
File: U-4006

Ecosystem Enhancement
PROGRAM

November 24, 2008

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

Dear Mr. Williams:

Subject: EEP Mitigation Acceptance Letter:

U-4006, Greensboro – SR 4126 (New Route – Bridford Parkway) from SR 1541 (Wendover Avenue) at Hornaday Road to Burnt Poplar Road at Swing Road; Cape Fear River Basin (Cataloging Unit 03030002); Central Piedmont (CP) Eco-Region

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the stream mitigation for the unavoidable impact associated with the above referenced project. As indicated in the NCDOT's mitigation request dated October 31, 2008, stream mitigation from EEP is required for 548 feet of warm stream impacts.

Stream restoration mitigation associated with this project will be provided in accordance with Section X of the Amendment No. 2 to the Memorandum of Agreement between the N. C. Department of Environment and Natural Resources, the N. C. Department of Transportation, and the U. S. Army Corps of Engineers fully executed on March 8, 2007 (Tri-Party MOA). In the mitigation request, the NCDOT indicated this project will require compensatory stream mitigation for 450 feet of the impacts at a 2:1 ratio (900 compensatory stream credits) and restoration stream mitigation for 98 feet of the impacts at a 1:1 ratio (98 stream restoration credits). EEP commits to implement sufficient stream mitigation up to 998 stream restoration credits to offset the impacts associated with this project by the end of the MOA year in which this project is permitted. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from EEP.

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

Sincerely,

William D. Gilmore, P.E.
EEP Director

cc: Mr. Gregory J. Thorpe, Ph.D., NCDOT-PDEA
Mr. Brian Wrenn, Division of Water Quality, Wetlands/401 Unit
File: U-4006

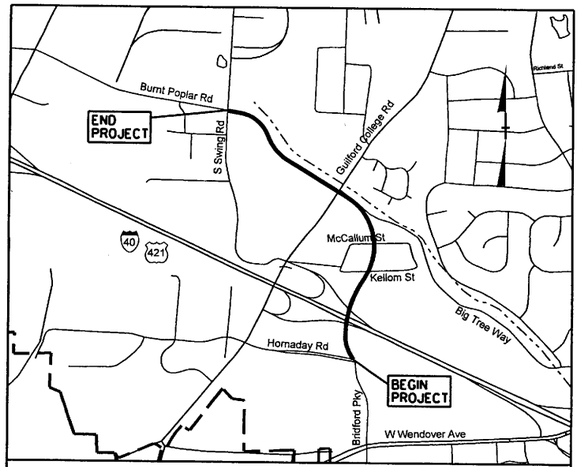
09/08/99

TIP PROJECT: U-4006

PROJECT:

ARCADIS G&M
Date: 8/4/2008 Time: 3:33:03 PM
Filename: R:\Hydraulics\Permits\U4006_prm_TSH.dgn

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

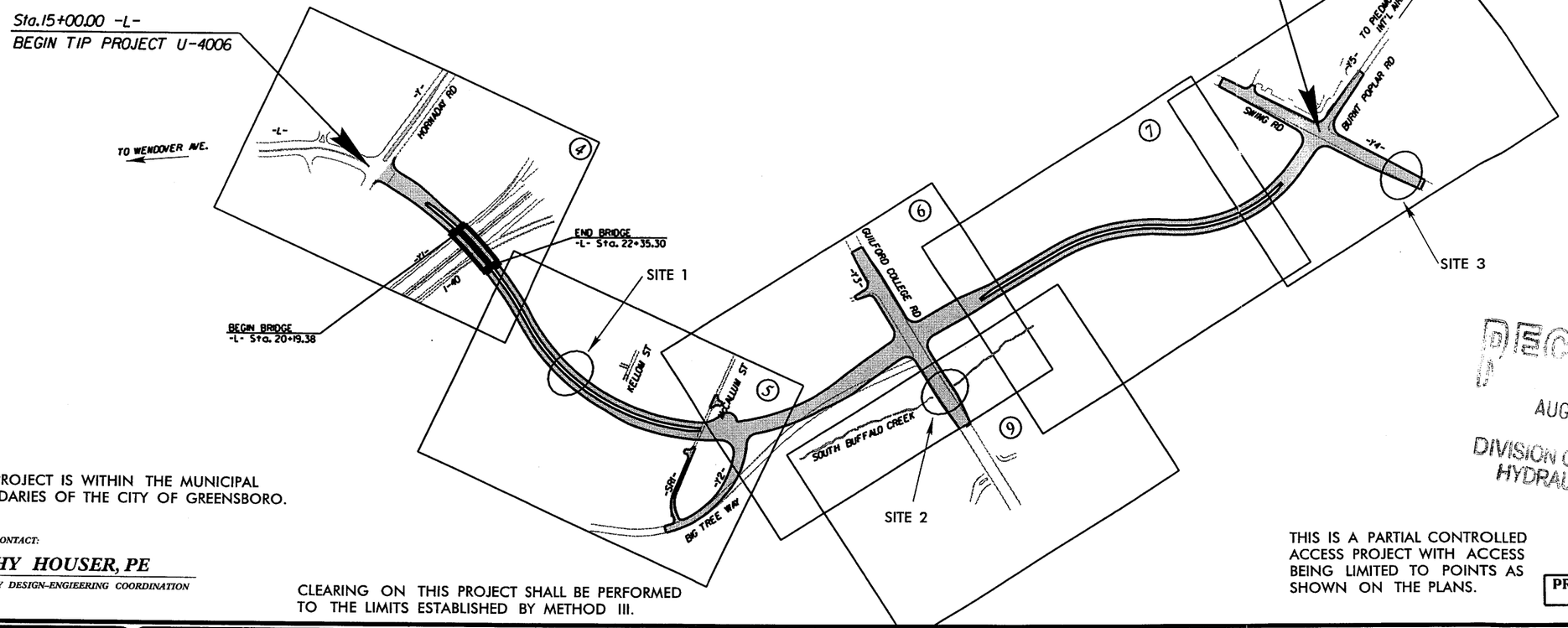
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4006	1	14
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
35007.1.1	STP-4126(1)	P.E.	

LOCATION: GREENSBORO SR 4126 (BRIDFORD PARKWAY, NEW ROUTE) FROM SR 1541 (WENDOVER AVE.) AT HORNDAY RD. TO SR 1607 (BURNT POPLAR ROAD) AT SWING ROAD

TYPE OF WORK: GRADING, PAVING, DRAINAGE, STRUCTURES, AND SIGNALS

U-4006: STREAM SITE MAP

NAD 83/95



THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF GREENSBORO.

NCDOT CONTACT:

CATHY HOUSER, PE

ROADWAY DESIGN-ENGIEERING COORDINATION

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

RECEIVED
AUG 05 2008
DIVISION OF HIGHWAYS
HYDRAULICS UNIT

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2008	=	23,162
ADT 2028	=	31,469
DHV	=	11 %
D	=	60 %
T	=	6 % *
V	=	40 MPH

* TTST 1% DUAL 5%

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT U-4006	=	0.982 miles
LENGTH OF STRUCTURE TIP PROJECT U-4006	=	0.041 miles
TOTAL LENGTH TIP PROJECT U-4006	=	1.023 miles

ARCADIS
G & B of North Carolina, Inc.
WWW.ARCADIS-US.COM
801 Corporate Center Drive, Suite 300
Raleigh, NC 27607-5073
Tel 919/854-0282 Fax 919/854-5448
for the North Carolina Department of Transportation

2006 STANDARD SPECIFICATIONS

ARCADIS CONTACT:

STEVE SMALLWOOD, P.E.
PROJECT ENGINEER

RIGHT OF WAY DATE:

LETTING DATE:
AUGUST 19, 2008

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

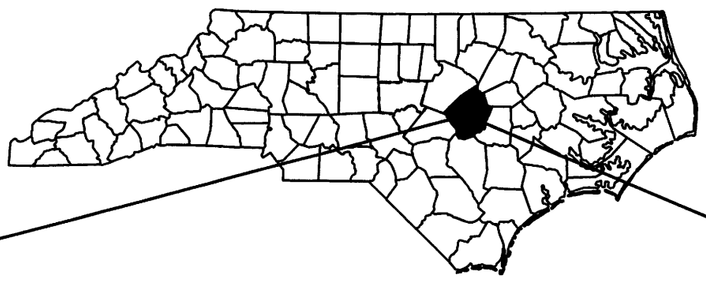
SIGNATURE: P.E.

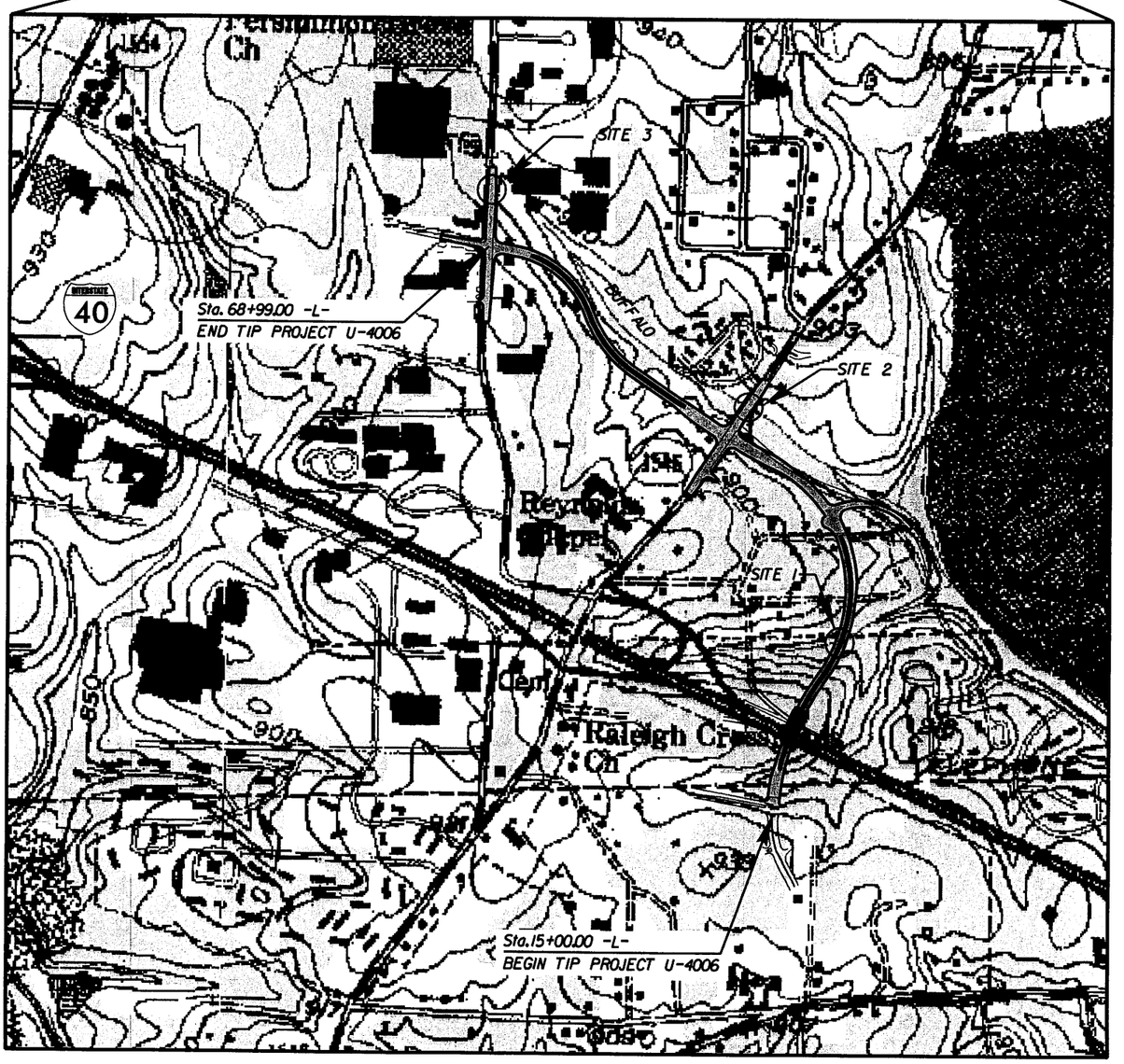
DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

Permit Drawing Sheet 1 of 15

STATE HIGHWAY DESIGN ENGINEER

VICINITY MAP





1000′ 0′ 1000′ 2000′

SCALE: 1" = 1000'

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

PROJECT: 35007.1.1 (U-4006)

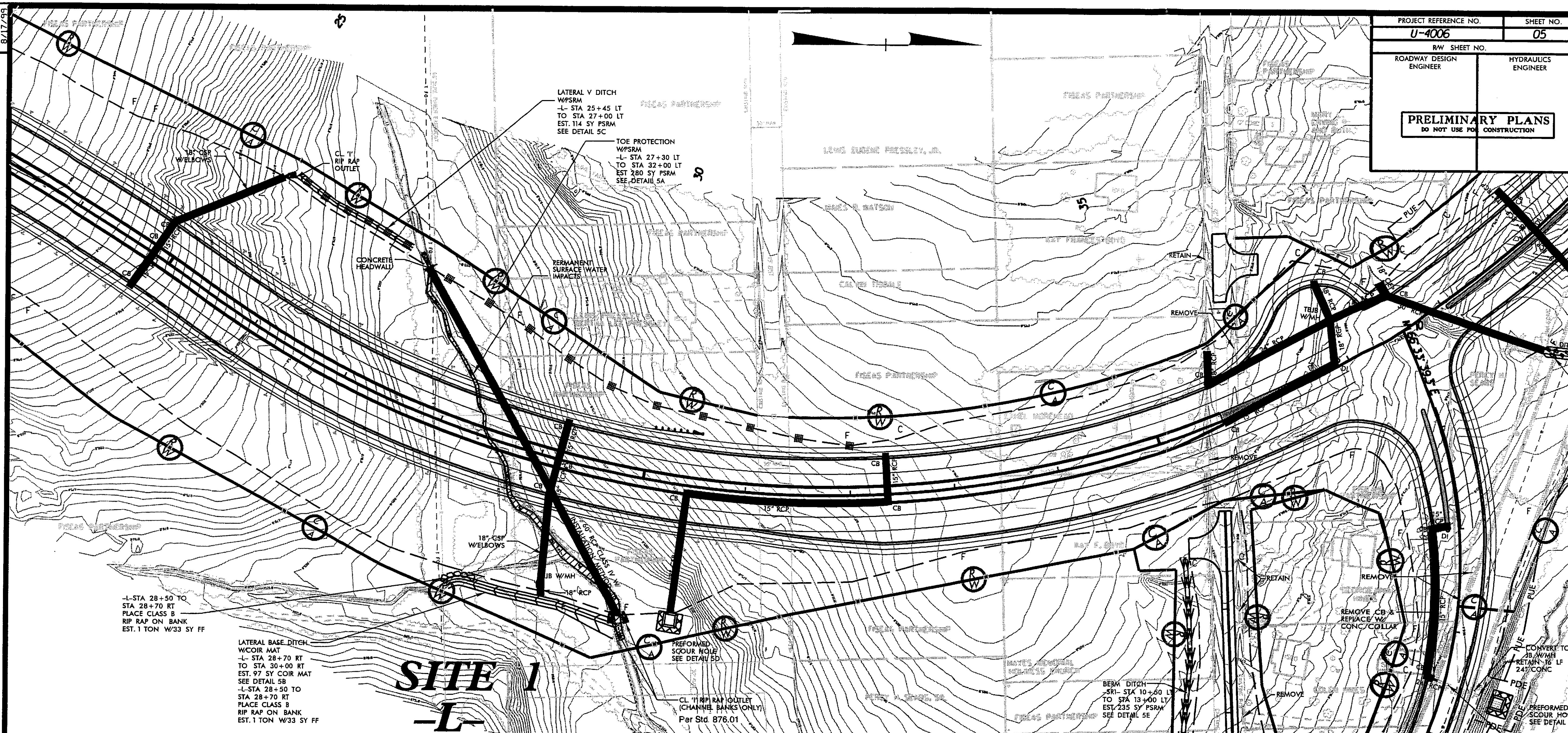
SR 4126 (BRIDFORD PKWY., NEW ROUTE)
FROM SR 1541 (WENDOVER AVE) AT HORNADAY RD
TO SR 1607 (BURNT POPLAR RD) AT SWING RD

SHEET 2 OF 14 11/20/07

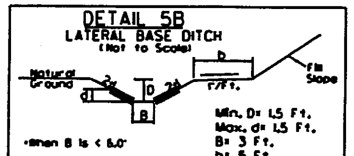
Permit Drawing
Sheet 2 of 15

PROJECT REFERENCE NO.	SHEET NO.
U-4006	05
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

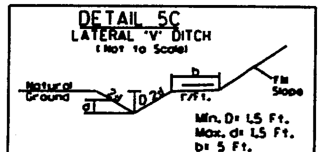


DETAIL 5B
LATERAL BASE DITCH
(Not to Scale)



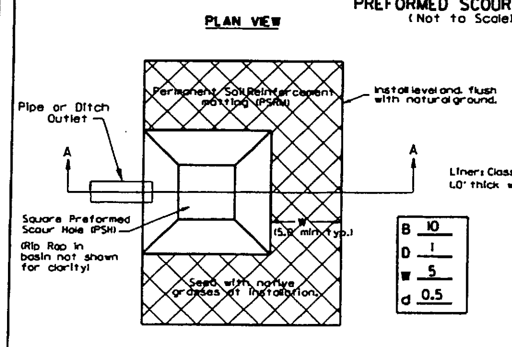
FROM STA. 28+70 TO STA. 30+00 RT.

DETAIL 5C
LATERAL 'V' DITCH
(Not to Scale)



FROM STA. 25+50 TO STA. 27+00 LT.

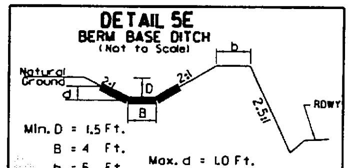
DETAIL 5D
PREFORMED SCOUR HOLE
(Not to Scale)



B	10
D	1
W	5
d	0.5

BASIN #	LOCATION (AT OUTLET)
1	-L- 30+50 RT
2	-L- 41+50 RT
3	-Y2- 13+50 LT
4	-Y2- 16+50 LT
5	
6	
7	

DETAIL 5E
BERM BASE DITCH
(Not to Scale)



FROM STA. 10+50 TO STA. 13+00 LT -SR1-

LEGEND

- PERMANENT SURFACE WATER IMPACTS
- TEMPORARY SURFACE WATER IMPACTS

NCDOT
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 35007.1.1 (U-4006)
SR 4126 (BRIDFORD PKWY., NEW ROUTE) FROM SR 1541 (WENDOVER AVE) AT HORNADAY RD TO SR 1607 (BURNT POPLAR RD) AT SWING RD

SHEET 3 OF 15 11/20/07

8/4/2008
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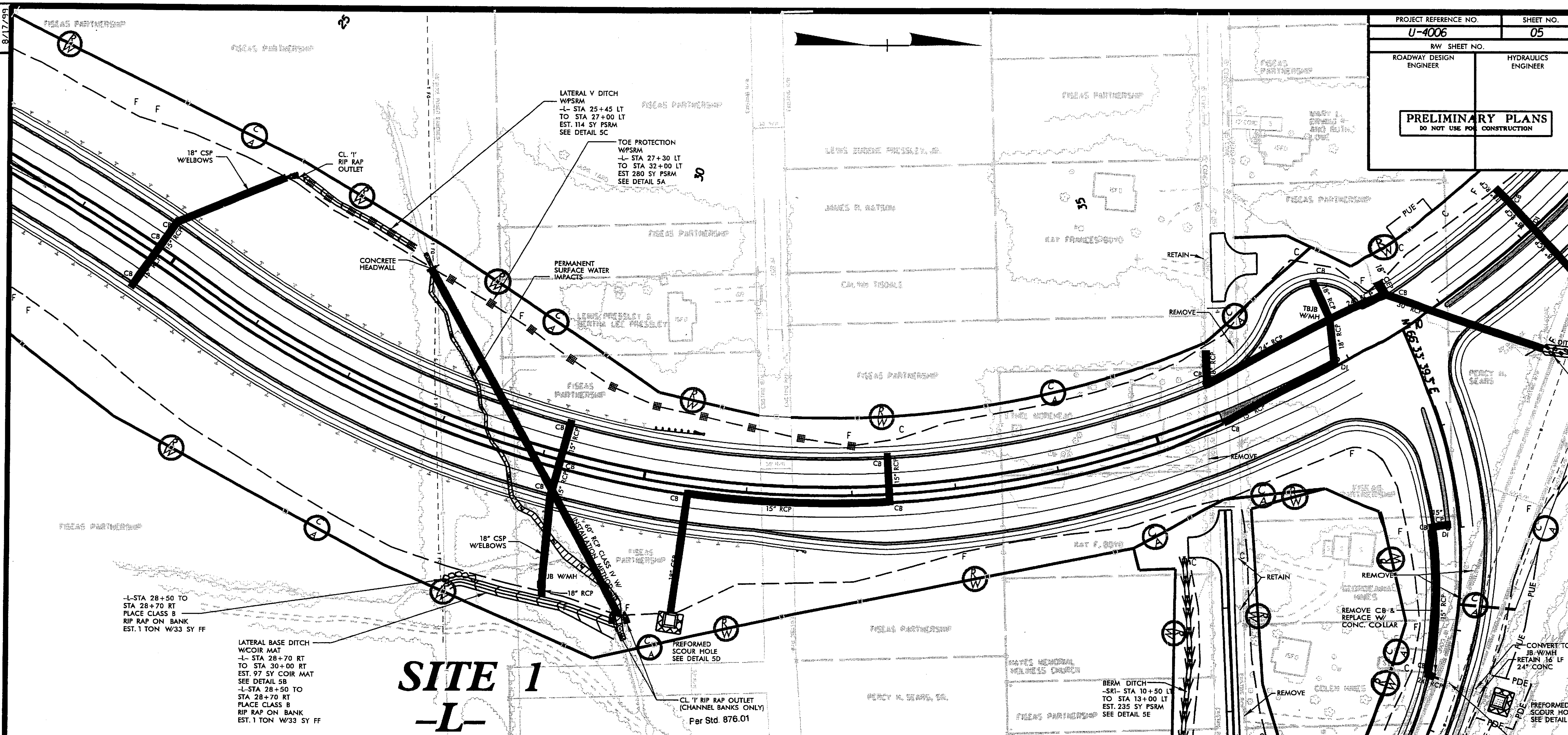
PROJECT REFERENCE NO.	SHEET NO.
U-4006	05
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



DETAIL 5B
LATERAL BASE DITCH (Not to Scale)

Min. D= 1.5 Ft. Max. d= 1.5 Ft. B= 3 Ft. b= 5 Ft.
Type of Liner= COIR MAT
FROM STA. 28+70 TO STA. 30+00 RT.

DETAIL 5C
LATERAL 'V' DITCH (Not to Scale)

Min. D= 1.5 Ft. Max. d= 1.5 Ft. b= 5 Ft.
Type of Liner: PSRM
FROM STA. 25+50 TO STA. 27+00 LT.

DETAIL 5D
PREFORMED SCOUR HOLE (Not to Scale)

PLAN VIEW — SECTION A-A

Liner: Class B Rip Rap, 1.0' thick on Filter Fabric

B	10
D	1
W	5
d	0.5

BASIN #	LOCATION (AT OUTLET)
1	-L- 30+50 RT
2	-L- 41+50 RT
3	-Y2- 13+50 LT
4	-Y2- 16+50 LT
5	
6	
7	

DETAIL 5E
BERM BASE DITCH (Not to Scale)

Min. D = 1.5 Ft. B = 4 Ft. b = 5 Ft. Max. d = 1.0 Ft.
Type of Liner = PSRM
FROM STA. 10+50 TO STA. 13+00 LT -SR1-

LEGEND
PERMANENT SURFACE WATER IMPACTS
TEMPORARY SURFACE WATER IMPACTS

NCDOT
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 35007.1.1 (U-4006)
SR 4126 (BRIDFORD PKWY., NEW ROUTE) FROM SR 1541 (WENDOVER AVE) AT HORNADAY RD TO SR 1607 (BURNT POPLAR RD) AT SWING RD

SHEET 4 OF 15 11/20/07

8/4/2008

PROJECT REFERENCE NO.	SHEET NO.
U-4006	05
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

8/17/99

LATERAL V DITCH W/PSRM

CONCRETE HEADWALL

PERMANENT SURFACE WATER IMPACTS

CB
15" RCP
CB
15" RCP
CB

FREAS PARTNERSHIP

LEWIS PRESSLEY & BERTHA LEE PRESSLEY

CB
15" RCP
CB
15" RCP
CB
15" RCP

60" RCP CLASS IV W/ INSTALLATION METHOD

18" CSP W/ELBOWS

JB W/MH

18" RCP

18" CSP

FREAS PARTNERSHIP

SITE 1
-L-

-L- STA 28+50 TO STA 28+70 RT
PLACE CLASS B RIP RAP ON BANK
EST. 1 TON W/33 SY FF

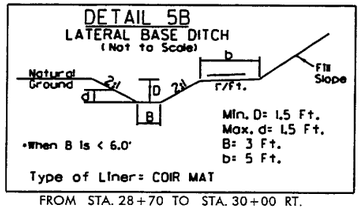
LATERAL BASE DITCH W/COIR MAT
-L- STA 28+70 RT TO STA 30+00 RT

PREFORMED SCOUR HO
SEE DETAIL

Per Std. 876.01

CL. 'I' RIP (CHANNE

DETAIL 5B
LATERAL BASE DITCH
(Not to Scale)



Type of Liner= COIR MAT
FROM STA. 28+70 TO STA. 30+00 RT.

LEGEND

PERMANENT SURFACE WATER IMPACTS

TEMPORARY SURFACE WATER IMPACTS

NCDOT
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 35007.1.1 (U-4006)
SR 4126 (BRIDFORD PKWY., NEW ROUTE) FROM SR 1541 (WENDOVER AVE) AT HORNADAY RD TO SR 1607 (BURNT POPLAR RD) AT SWING RD

SHEET 5 OF 15 11/20/07

8/4/2008
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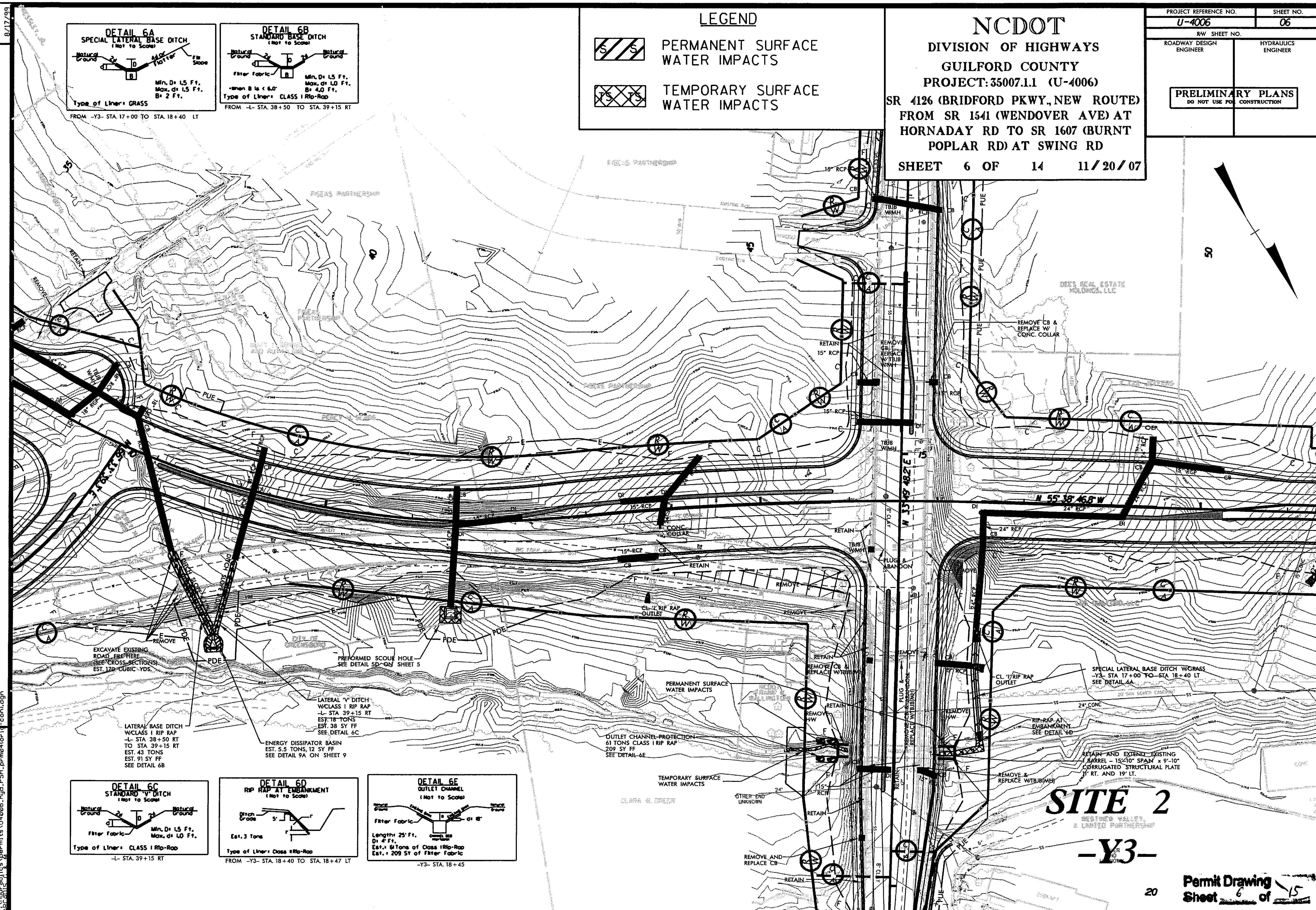

LEGEND
PERMANENT SURFACE WATER IMPACTS
TEMPORARY SURFACE WATER IMPACTS
NCDOT
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 35007.1.1 (U-4006)
SR 4126 (BRIDFORD PKWY., NEW ROUTE) FROM SR 1541 (WENDOVER AVE) AT HORNADAY RD TO SR 1607 (BURNT POPLAR RD) AT SWING RD
SHEET 6 OF 14 11/20/07
PROJECT REFERENCE NO. U-4006
SHEET NO. 06
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
DETAIL 6A
SPECIAL LATERAL BASE DITCH
(Not to Scale)
Min. D= 1.5 Ft.
Max. d= 1.5 Ft.
B= 2 Ft.
Type of Liner= GRASS
FROM -Y3- STA. 17+00 TO STA. 18+40 LT
DETAIL 6B
STANDARD BASE DITCH
(Not to Scale)
Filter Fabric
Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 4.0 Ft.
Type of Liner= CLASS I Rip-Rap
FROM -L- STA. 38+50 TO STA. 39+15 RT
DETAIL 6C
STANDARD 'V' DITCH
(Not to Scale)
Filter Fabric
Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
Type of Liner= CLASS I Rip-Rap
-L- STA. 39+15 RT
DETAIL 6D
RIP RAP AT EMBANKMENT
(Not to Scale)
Est. 3 Tons
Type of Liner= Class I Rip-Rap
FROM -Y3- STA. 18+40 TO STA. 18+47 LT
DETAIL 6E
OUTLET CHANNEL
(Not to Scale)
Filter Fabric
Length= 25' Ft.
D= 4' Ft.
Est.= 61 Tons of Class I Rip-Rap
Est.= 209 SY of Filter Fabric
-Y3- STA. 18+45
EXCAVATE EXISTING ROAD FILL HERE (SEE CROSS-SECTIONS) EST. 170 CUBIC YDS.
LATERAL BASE DITCH W/CLASS I RIP RAP -L- STA 38+50 RT TO STA 39+15 RT EST. 43 TONS EST. 91 SY FF SEE DETAIL 6B
ENERGY DISSIPATOR BASIN EST. 5.5 TONS, 12 SY FF SEE DETAIL 9A ON SHEET 9
LATERAL 'V' DITCH W/CLASS I RIP RAP -L- STA 39+15 RT EST. 18 TONS EST. 38 SY FF SEE DETAIL 6C
PREFORMED SCOUR HOLE SEE DETAIL 5D ON SHEET 5
CL 'I' RIP RAP OUTLET
PERMANENT SURFACE WATER IMPACTS
TEMPORARY SURFACE WATER IMPACTS
OUTLET CHANNEL PROTECTION 61 TONS CLASS I RIP RAP 209 SY FF SEE DETAIL 6E
SPECIAL LATERAL BASE DITCH W/GRASS -Y3- STA 17+00 TO STA 18+40 LT SEE DETAIL 6A
RIP-RAP AT EMBANKMENT SEE DETAIL 6D
RETAIN AND EXTEND EXISTING 1 BARREL - 15'-10" SPAN x 9'-10" CORRUGATED STRUCTURAL PLATE 11' RT. AND 19' LT.
REMOVE & REPLACE W/TBJB(MH)
REMOVE CB & REPLACE W/ CONC. COLLAR
REMOVE AND REPLACE CB
N 55°38'46.8" W
SITE 2
-Y3-
Permit Drawing Sheet 6 of 15

PROJECT REFERENCE NO.	SHEET NO.
U-4006	06
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NCDOT

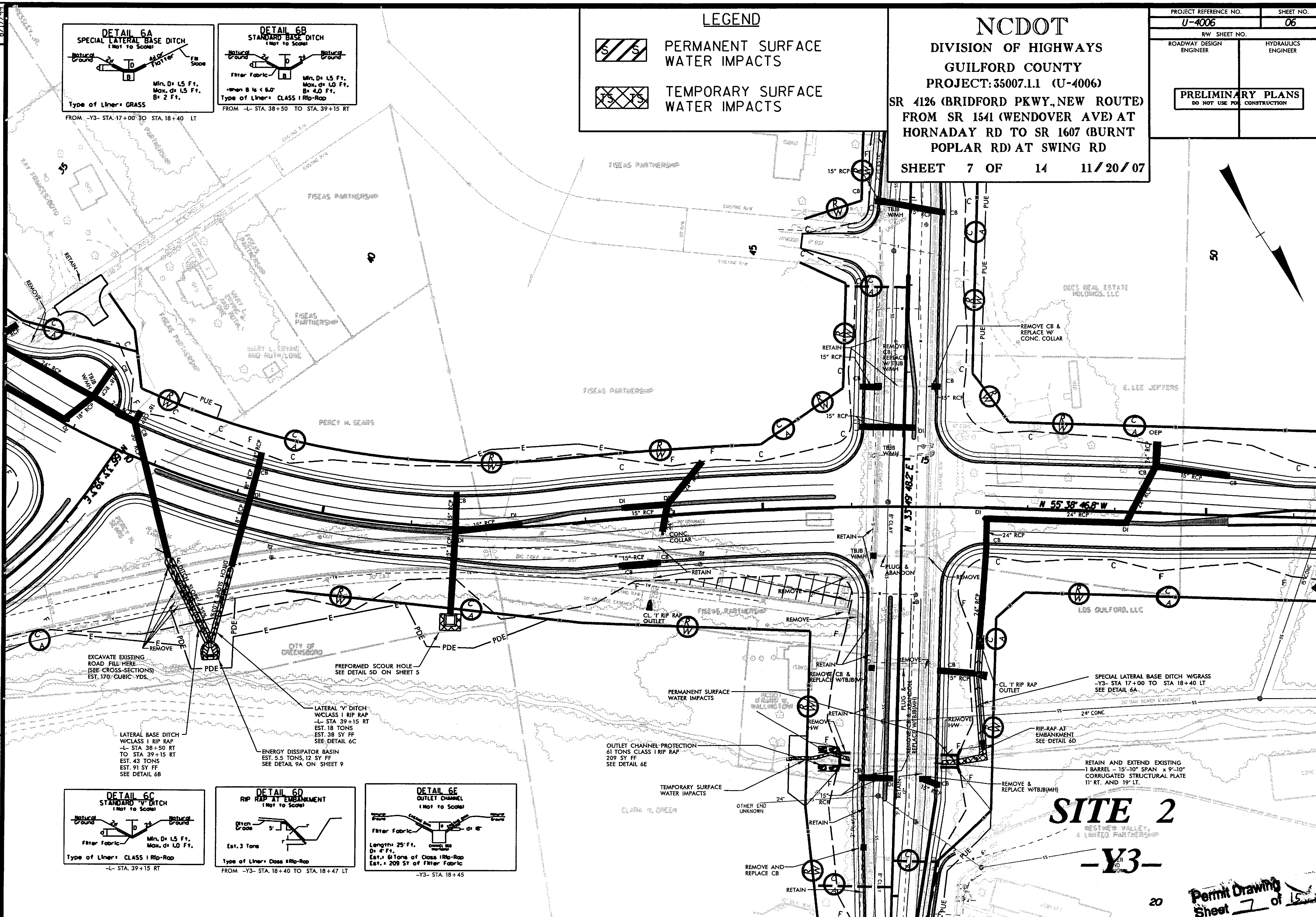
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 35007.1.1 (U-4006)
SR 4126 (BRIDFORD PKWY., NEW ROUTE) FROM SR 1541 (WENDOVER AVE) AT HORNADAY RD TO SR 1607 (BURNT POPLAR RD) AT SWING RD

SHEET 7 OF 14 11/20/07

LEGEND

S — PERMANENT SURFACE WATER IMPACTS

TS — TEMPORARY SURFACE WATER IMPACTS



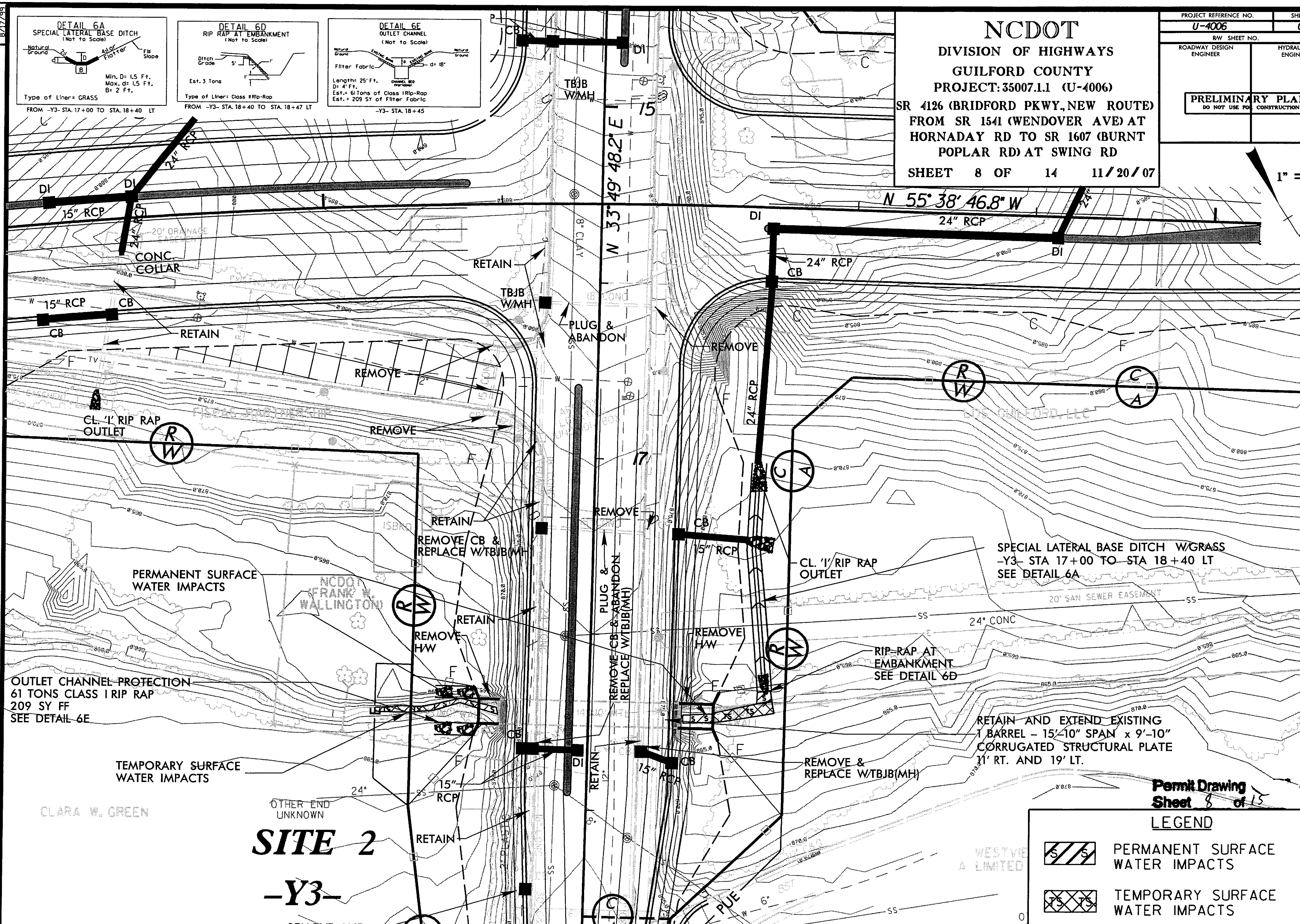
REVISIONS

8/17/99

8/4/2008

Permit Drawing Sheet 7 of 15

20



NCDOT
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 35007.1.1 (U-4006)
SR 4126 (BRIDFORD PKWY., NEW ROUTE)
FROM SR 1541 (WENDOVER AVE) AT
HORNADAY RD TO SR 1607 (BURNT
POPLAR RD) AT SWING RD

SHEET 8 OF 14 11/20/07

PROJECT REFERENCE NO.	SHEET NO.
U-4006	06
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

1" = 50'

Permit Drawing
Sheet 8 of 15

LEGEND

PERMANENT SURFACE WATER IMPACTS

TEMPORARY SURFACE WATER IMPACTS

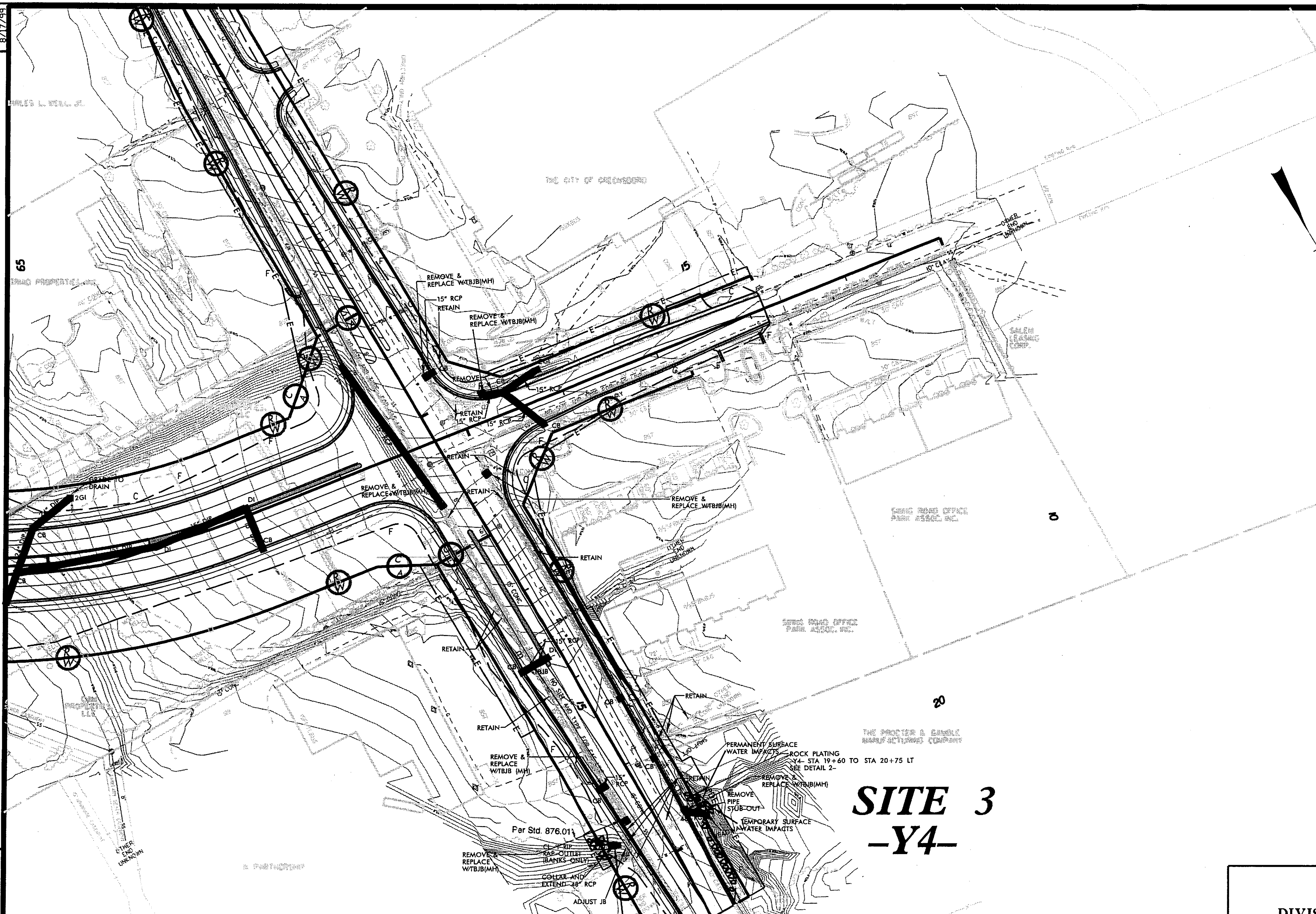
REVISIONS

8/17/99

8/4/2008

PROJECT REFERENCE NO.	SHEET NO.
U-4006	08
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



REVISIONS

LEGEND

PERMANENT SURFACE WATER IMPACTS

TEMPORARY SURFACE WATER IMPACTS

NCDOT

DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 35007.1.1 (U-4006)
SR 4126 (BRIDFORD PKWY., NEW ROUTE) FROM SR 1541 (WENDOVER AVE) AT HORNADAY RD TO SR 1607 (BURNT POPLAR RD) AT SWING RD

SHEET 9 OF 15 11/20/07

8/4/2008
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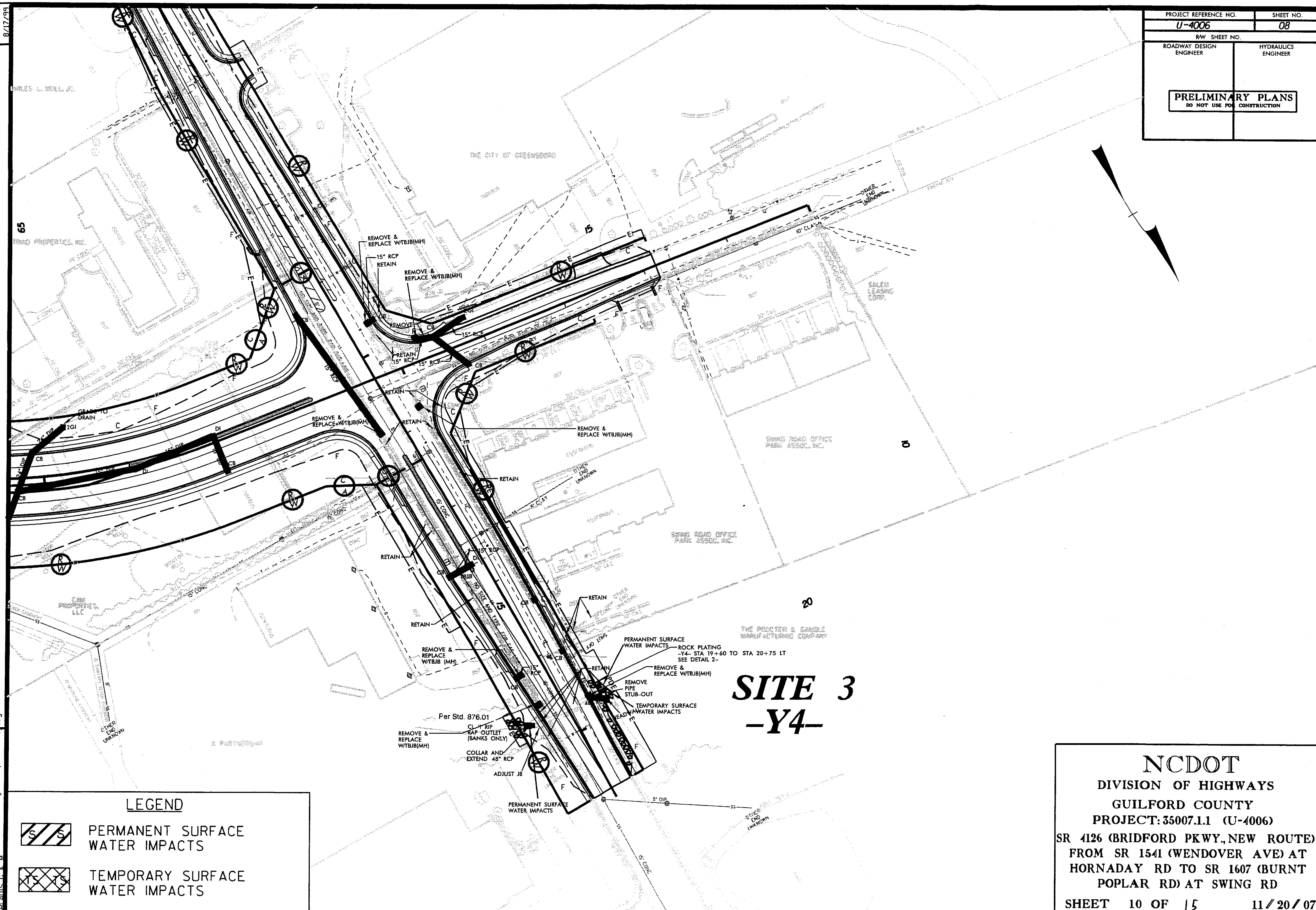


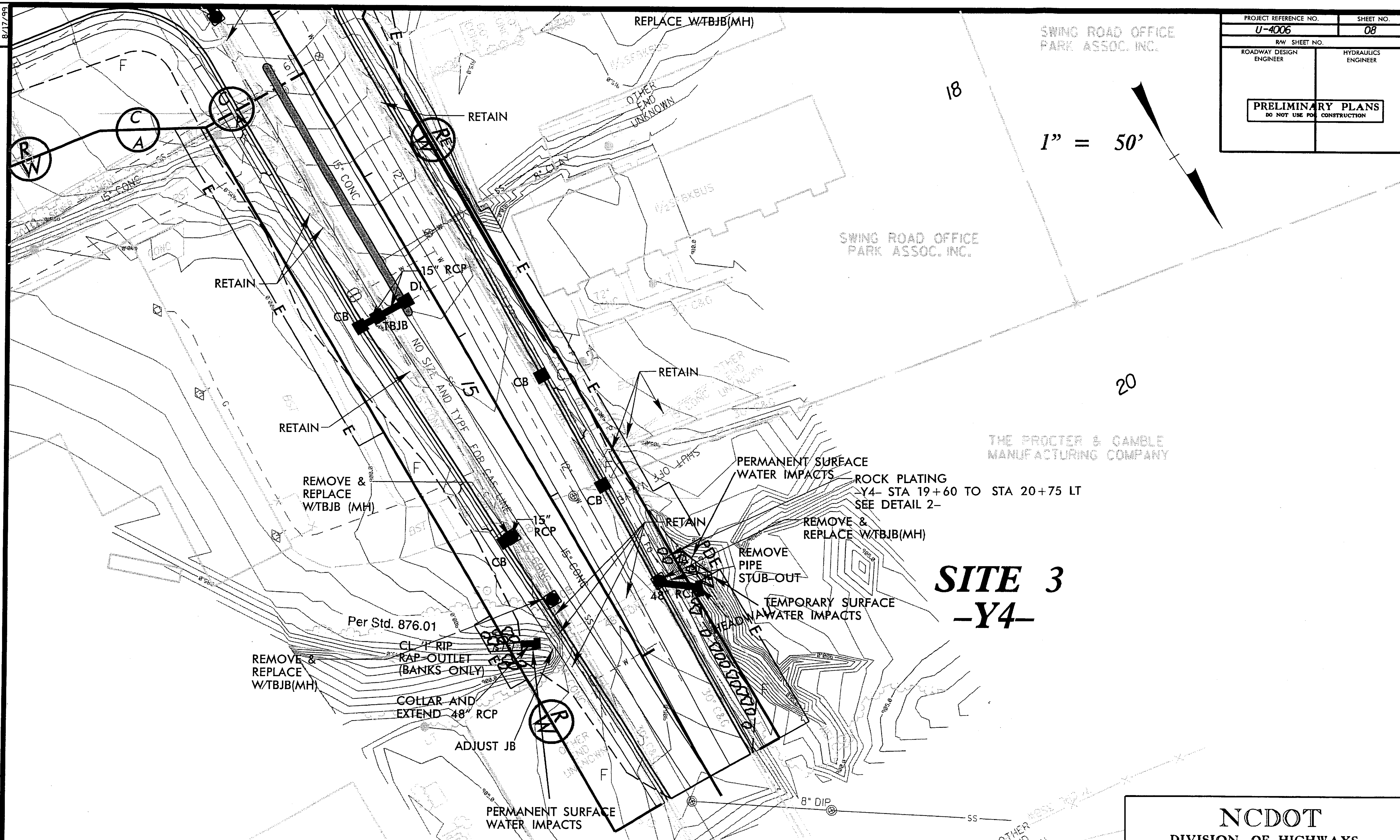
LEGEND

PERMANENT SURFACE WATER IMPACTS

TEMPORARY SURFACE WATER IMPACTS

NCDOT
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 35007.1.1 (U-4006)
SR 4126 (BRIDFORD PKWY., NEW ROUTE) FROM SR 1541 (WENDOVER AVE) AT HORNADAY RD TO SR 1607 (BURNT POPLAR RD) AT SWING RD

SHEET 10 OF 15 11/20/07



PROJECT REFERENCE NO.	SHEET NO.
U-4006	08
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

LEGEND

PERMANENT SURFACE WATER IMPACTS

TEMPORARY SURFACE WATER IMPACTS

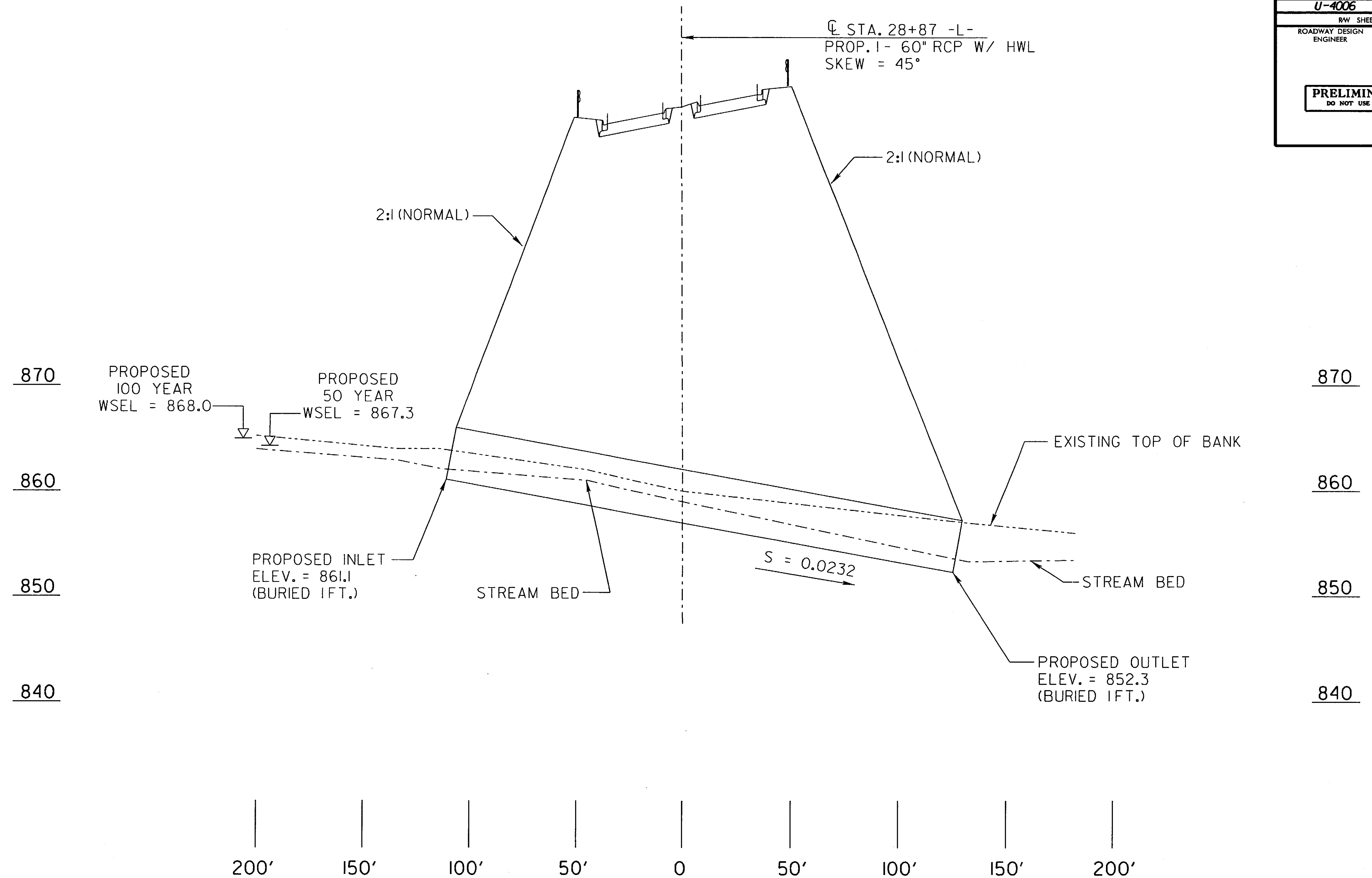
NCDOT

DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 35007.1.1 (U-4006)
SR 4126 (BRIDFORD PKWY., NEW ROUTE) FROM SR 1541 (WENDOVER AVE) AT HORNADAY RD TO SR 1607 (BURNT POPLAR RD) AT SWING RD

SHEET 11 OF 15 11/20/07

PROJECT REFERENCE NO.	SHEET NO.
U-4006	8PAS
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PROFILE ALONG STRUCTURE

SITE 1

SCALE:
1" = 50' HORIZONTAL
1" = 10' VERTICAL

NCDOT
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 35007.1.1 (U-4006)
SR 4126 (BRIDFORD PKWY., NEW ROUTE) FROM SR 1541 (WENDOVER AVE) AT HORNADAY RD TO SR 1607 (BURNT POPLAR RD) AT SWING RD

SHEET 12 OF 15 11/20/07

REVISIONS

8/17/99

8/4/2008
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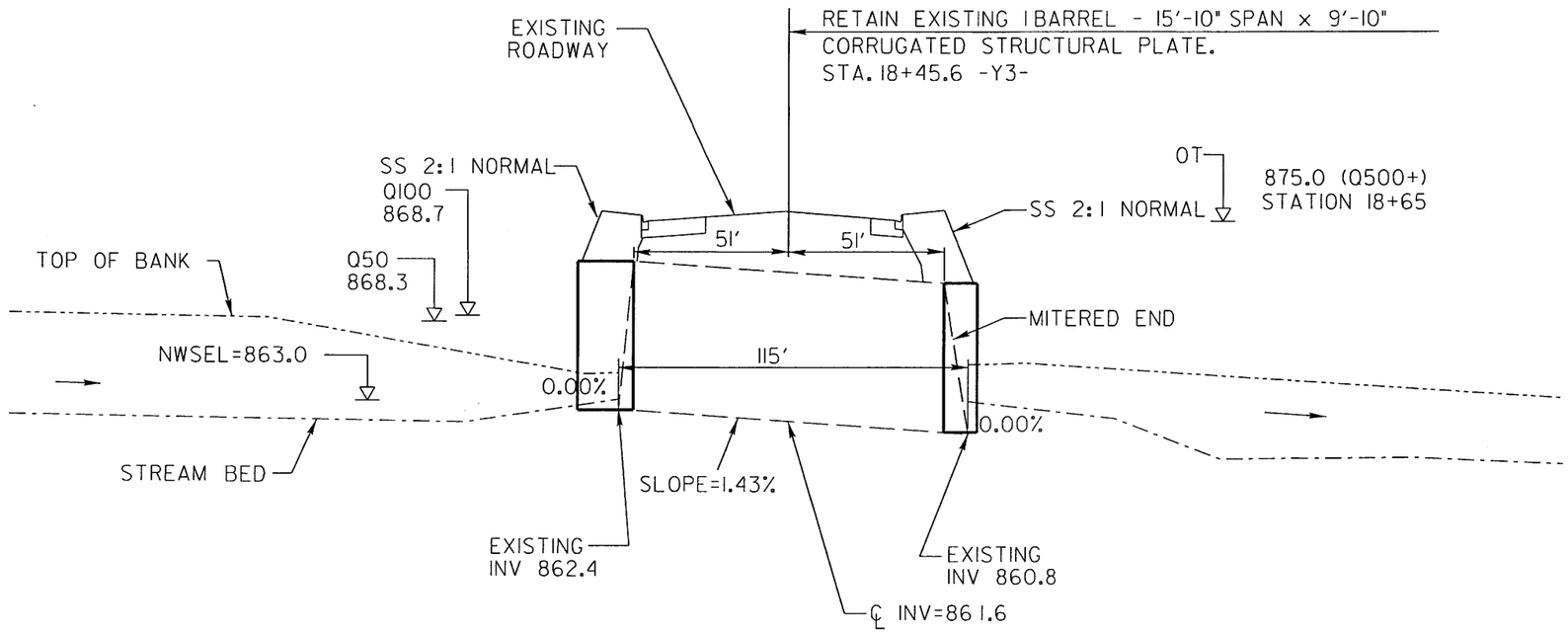
PROJECT REFERENCE NO.	SHEET NO.
U-4006	9PAS
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PROFILE ALONG STRUCTURE

SITE 2

SCALE:
1" = 50' HORIZONTAL
1" = 10' VERTICAL

NCDOT
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 35007.1.1 (U-4006)
SR 4126 (BRIDFORD PKWY., NEW ROUTE) FROM SR 1541 (WENDOVER AVE) AT HORNADAY RD TO SR 1607 (BURNT POPLAR RD) AT SWING RD
SHEET 13 OF 15 11/20/07

REVISIONS 8/17/99

8/4/2008
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PROJ. REFERENCE NO.	SHEET NO.
35007.1.1	
U-4006 Permit Drawings	Jul-07

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME	ADDRESS	CITY	STATE	ZIP
4	4	FISEAS PARTNERSHIP	1215 Alderman Drive	Greensboro	NC	27408
901	6,9	NCDOT (FRANK W. WALLINGTON)	501 Guilford College Road	Greensboro	NC	27409
37	7,9	WESTVIEW VALLEY, A LIMITED PARTNERSHIP	P. O. Box 26560	Greensboro	NC	27415
41	8	K PARTNERSHIP	1400 Battleground Avenue	Greensboro	NC	27408
47	8	THE PROCTER & GAMBLE MANUFACTURING COMPANY	P. O. Box 599	Cincinnati	OH	45201

Permit Drawing
Sheet 14 of 15

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation In Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW Impacts (ac)	Temporary SW Impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temporary (ft)	Natural Stream Design (ft)
1	-L- 27+30 LT to	60" RCP						0.04	<0.01	405	30	
	-L- 30+00 RT	Bank Stabilization						<0.01		8		
2	-Y3- 18+45	15'-10" x 9'-10"						<0.01	0.01	36	59	
		Corrugated Structrual										
		Steel Plate Pipe										
		Bank Stabilization						<0.01		33		
3	-Y4- 19+68	48" RCP						<0.01	<0.01	38	10	
		Bank Stabilization						<0.01		28		
TOTALS:			0.00	0.00	0.00	0.00	0.00	0.04	0.01	548	99	0

Permit Drawing Sheet 15 of 15

Form Revised 3/31/05

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GUILFORD COUNTY
PROJECT 35007.1.1 U-4006

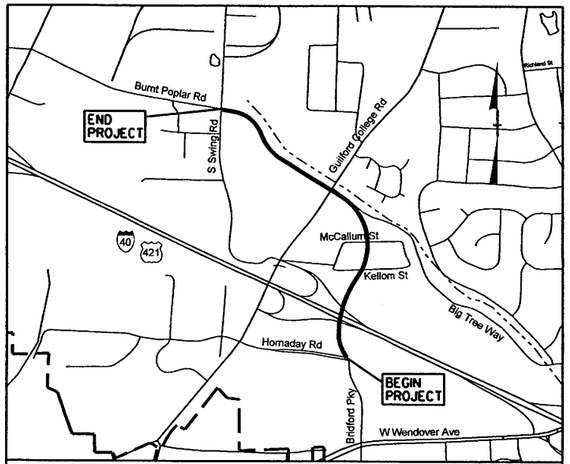
SHEET OF August-08

03/28/08

TIP PROJECT: U-4006

PROJECT:

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

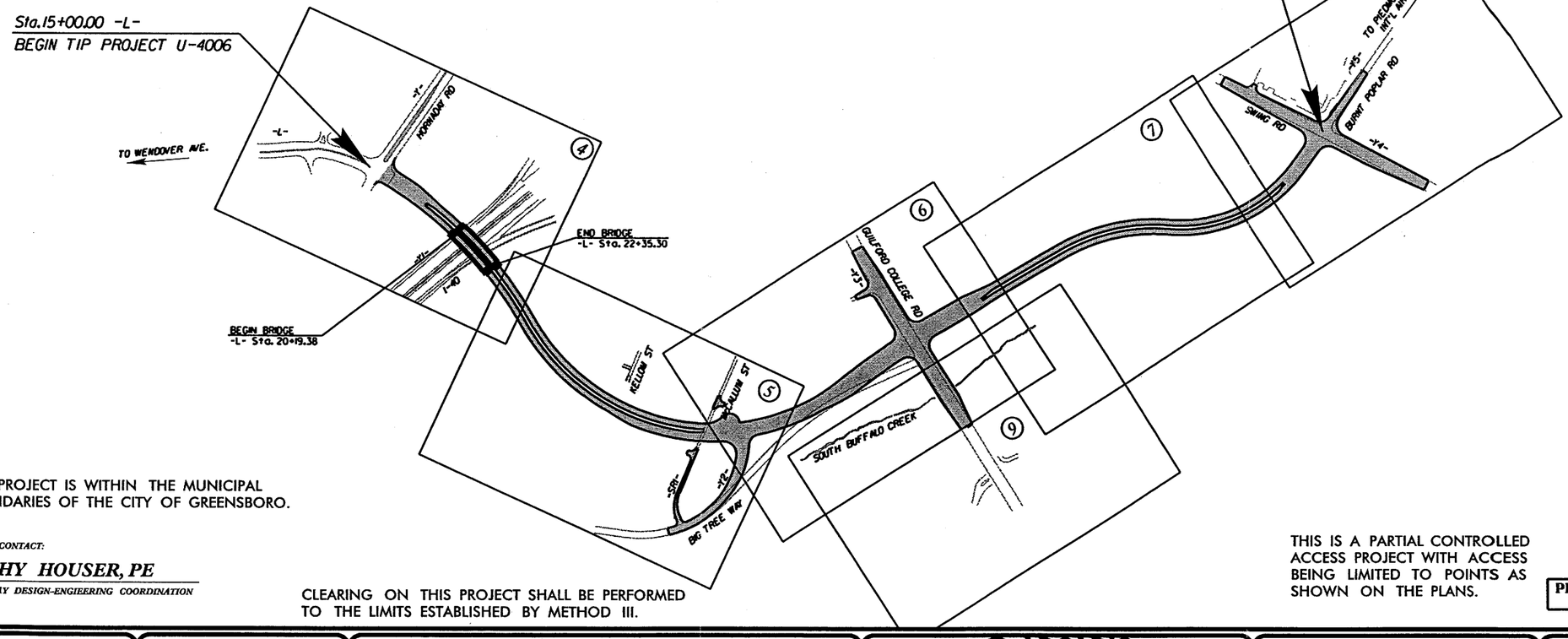
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4006	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
35007.1.1	STP-4126(1)	P.E.

LOCATION: GREENSBORO SR 4126 (BRIDFORD PARKWAY, NEW ROUTE) FROM SR 1541 (WENDOVER AVE.) AT HORNDAY RD. TO SR 1607 (BURNT POPLAR ROAD) AT SWING ROAD

TYPE OF WORK: GRADING, PAVING, DRAINAGE, STRUCTURES, AND SIGNALS

NAD 83/95



THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF GREENSBORO.

NCDOT CONTACT:

CATHY HOUSER, PE

ROADWAY DESIGN-ENGIEERING COORDINATION

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

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2008	=	23,162
ADT 2028	=	31,469
DHV	=	11 %
D	=	60 %
T	=	6 % *
V	=	40 MPH

* TTST 1% DUAL 5%

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT U-4006	=	0.982 miles
LENGTH OF STRUCTURE TIP PROJECT U-4006	=	0.041 miles
TOTAL LENGTH TIP PROJECT U-4006	=	1.023 miles

ARCADIS
G & M of North Carolina, Inc.
www.arcadis-us.com
801 Corporate Center Drive, Suite 300
Raleigh, NC 27607-5073
Tel: 919/854-1282 Fax: 919/854-5448
for the North Carolina Department of Transportation

2006 STANDARD SPECIFICATIONS	ARCADIS CONTACT:
RIGHT OF WAY DATE:	STEVE SMALLWOOD, P.E. PROJECT ENGINEER
LETTING DATE: AUGUST 19, 2008	

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

ARCADIS G&M
Date: 7/3/2008 Time: 8:50:34 AM
Filename: r:\roadways\proj\U4006_RDY_TSH.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-4006	1B

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 High Quality Wetland Boundary — HQ WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- River Basin Buffer — RBB
- Flow Arrow
- Disappearing Stream
- Spring
- Swamp Marsh
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

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

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

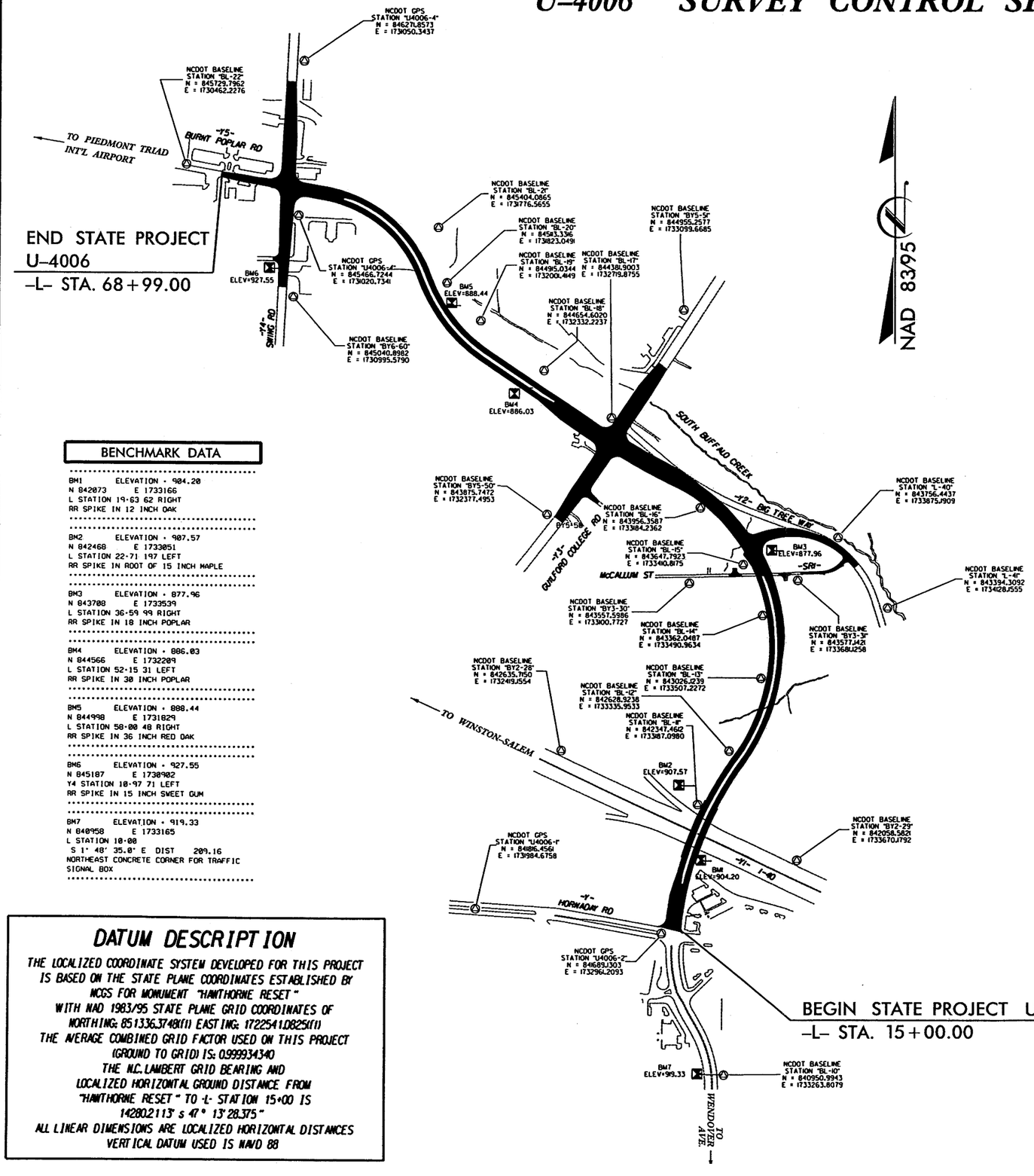
MISCELLANEOUS:

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

12/01/2006

U-4006 SURVEY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
U-4006	1C
Location and Surveys	



BENCHMARK DATA

BM1 ELEVATION = 904.20
N 842073 E 1733166
L STATION 19+63 62 RIGHT
RR SPIKE IN 12 INCH OAK

BM2 ELEVATION = 907.57
N 842468 E 1733051
L STATION 22+71 197 LEFT
RR SPIKE IN ROOT OF 15 INCH MAPLE

BM3 ELEVATION = 877.96
N 843700 E 1733539
L STATION 36+59 99 RIGHT
RR SPIKE IN 18 INCH POPLAR

BM4 ELEVATION = 886.03
N 844566 E 1732289
L STATION 52+15 31 LEFT
RR SPIKE IN 30 INCH POPLAR

BM5 ELEVATION = 888.44
N 844998 E 1731829
L STATION 58+00 48 RIGHT
RR SPIKE IN 36 INCH RED OAK

BM6 ELEVATION = 927.55
N 845187 E 1730982
Y4 STATION 10+97 71 LEFT
RR SPIKE IN 15 INCH SWEET GUM

BM7 ELEVATION = 919.33
N 840958 E 1733165
L STATION 10+00
S 1° 48' 35.0" E DIST 209.16
NORTHEAST CONCRETE CORNER FOR TRAFFIC SIGNAL BOX

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "HAWTHORNE RESET" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 851336.3748(ft) EASTING: 1722541.0825(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999934340 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "HAWTHORNE RESET" TO -L- STATION 15+00 IS 142802.113' s 47° 13' 28.375" ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

BASELINE DATA

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
10	BL-10	840950.9943	1733263.8079	920.87	OUTSIDE PROJECT LIMITS	
2	U4006-2	841689.1303	1732961.2093	916.50	15+45.79	65.89 LT
11	BL-11	842347.4612	1733187.0980	907.27	22+28.27	21.27 LT
12	BL-12	842628.9238	1733335.9533	882.98	25+41.20	40.02 LT
13	BL-13	843026.1239	1733507.2272	878.49	29+95.75	41.13 LT
14	BL-14	843362.0487	1733490.9634	892.24	33+51.21	59.20 LT
15	BL-15	843647.7923	1733410.8175	885.23	36+64.62	42.25 LT
16	BL-16	843956.3587	1733184.2362	889.59	40+62.21	21.94 LT
17	BL-17	844381.9003	1732719.8755	879.58	46+87.46	184.11 RT
18	BL-18	844654.6020	1732332.2237	878.60	51+63.50	111.20 RT
19	BL-19	844915.0344	1732001.4149	880.65	56+06.24	129.00 RT
20	BL-20	845113.3316	1731823.0491	889.11	59+13.82	98.34 RT
21	BL-21	845404.0865	1731776.5655	886.73	61+66.58	185.37 RT
3	U4006-3	845466.7244	1731020.7341	920.00	68+43.15	139.84 LT
22	BL-22	845729.7962	1730462.2276	918.86	OUTSIDE PROJECT LIMITS	

BY1

POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
1	U4006-1	841816.4561	1731984.6758	923.59	OUTSIDE PROJECT LIMITS	
62	U-4006-2	841689.1303	1732961.2093	916.50	14+68.48	0.58 RT

BY2

POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
28	BY2-28	842635.7150	1732419.1554	909.90	OUTSIDE PROJECT LIMITS	
63	BL-11	842347.4612	1733187.0980	907.27	12+35.98	138.48 LT
29	BY2-29	842058.5821	1733670.1792	899.75	OUTSIDE PROJECT LIMITS	

BY3

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
30	BY3-30	843557.5986	1733100.7727	901.22	37+66.80	355.17 LT
64	BL-15	843647.7923	1733410.8175	885.23	36+64.62	42.25 LT
31	BY3-31	843577.1421	1733681.1258	878.38	35+03.72	170.87 RT

BY4

POINT	DESC.	NORTH	EAST	ELEVATION	Y2 STATION	OFFSET
65	BL-16	843956.3587	1733184.2362	889.59	OUTSIDE PROJECT LIMITS	
40	BY4-40	843756.4437	1733875.1909	859.42	14+81.91	23.87 LT
41	BY4-41	843394.3092	1734128.1555	853.37	OUTSIDE PROJECT LIMITS	

BY5

POINT	DESC.	NORTH	EAST	ELEVATION	Y3 STATION	OFFSET
50	BY5-50	843875.7472	1732377.4953	914.29	18+45.71	31.75 LT
66	BL-17	844381.9003	1732719.8755	879.58	16+58.75	31.79 LT
51	BY5-51	844955.2577	1733099.6685	893.72	OUTSIDE PROJECT LIMITS	

BY6

POINT	DESC.	NORTH	EAST	ELEVATION	Y4 STATION	OFFSET
60	BY6-60	845040.8982	1730995.5790	928.38	OUTSIDE PROJECT LIMITS	
61	U4006-3	845466.7244	1731020.7341	920.00	13+81.31	36.18 RT
4	U4006-4	846271.8573	1731050.3437	909.47	OUTSIDE PROJECT LIMITS	

NOTES

2. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:

   HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

   THE FILE TO BE FOUND IS:

   U4006_LS_CONTROL_060227.TXT

2. SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

△ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT. PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM FROM EXISTING NCGS MONUMENTATION.

NOTE: DRAWING NOT TO SCALE

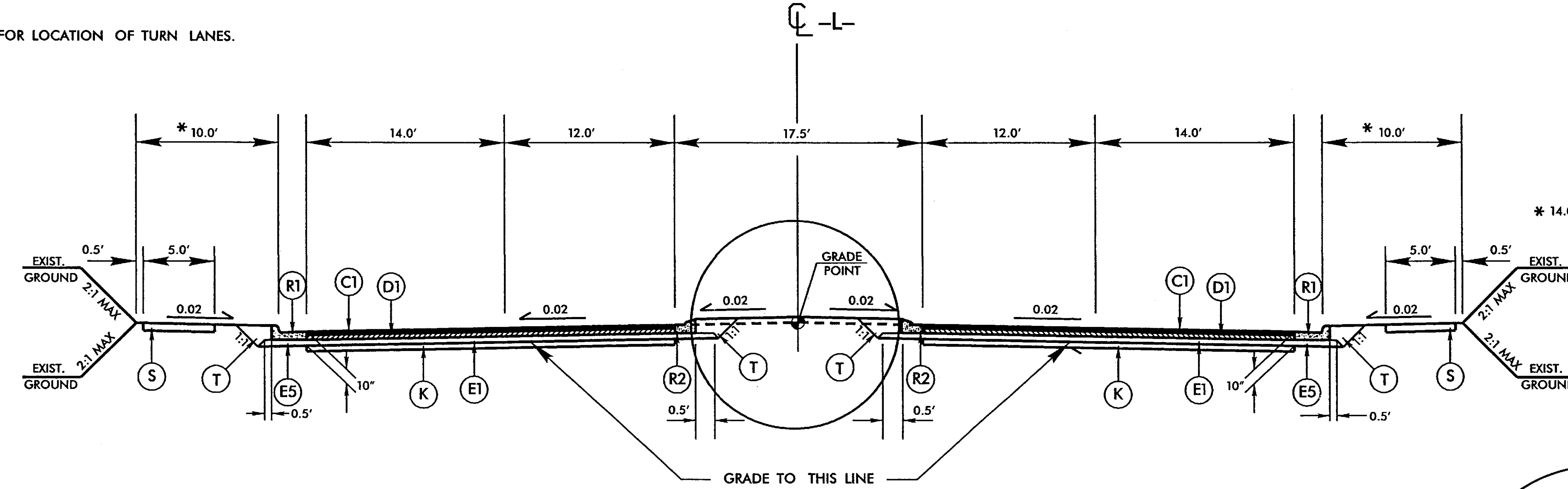
3/2008
V:\Projects\U-4006\proj\u4006_ls_lc_060227.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-4006	2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NOTE: SEE PLANS FOR LOCATION OF TURN LANES.

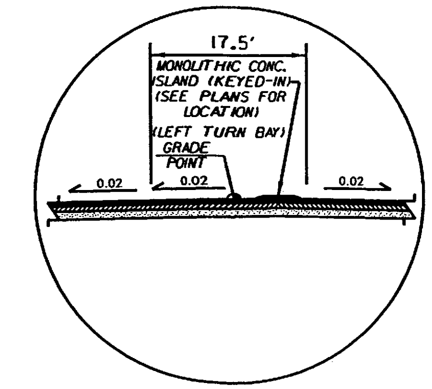
* 14.0' WHERE WIDENED FOR GUARDRAIL



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1:

STA. 15+50.00 TO STA. 20+19.38 -L- (BRIDGE)
STA. 22+35.30 (BRIDGE) TO STA. 46+29.81 -L-
STA. 46+83.93 TO STA. 68+58.62 -L-



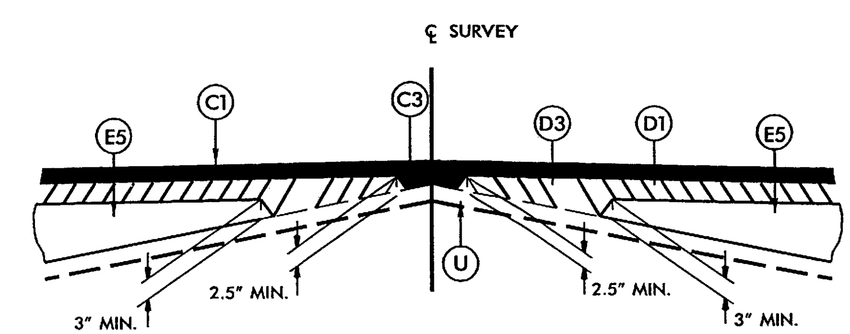
PARTIAL SECTION #1

USE IN CONJUNCTION WITH TYPICAL SECTION #1

NOTE: SEE PLANS FOR LOCATION OF MONOLITHIC CONCRETE ISLAND (KEYED-IN)

CODE	PAVEMENT SCHEDULE
C1	PROP. APPROX. 3.0" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD IN EACH OF TWO LAYERS.
C2	PROP. APPROX. 3.0" ASPHALT CONC. SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 1.5" IN DEPTH.
C4	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 1.5" IN DEPTH.
D1	PROP. APPROX. 4.0" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. APPROX. 4.0" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D3	PROP. VAR. DEPTH ASPHALT CONC. 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" OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 3.0" ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.
E2	PROP. APPROX. 4.0" ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E3	PROP. APPROX. 5.5" ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
E4	PROP. APPROX. 7.0" ASPHALT CONC. BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
E5	PROP. VAR. DEPTH ASPHALT CONC. BASE SOURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT GREATER THAN 5.5" OR LESS THAN 3" IN DEPTH
E6	PROP. VAR. DEPTH ASPHALT CONC. BASE SOURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT GREATER THAN 5.5" OR LESS THAN 3" IN DEPTH
K	SUBBASE TO BE TREATED WITH LIME TO A DEPTH OF 8 IN., AT AN APPROX. RATE OF 20 LBS./SQ. YD. AS DIRECTED BY THE ENGINEER, OR SUBBASE TO BE TREATED WITH CEMENT TO A DEPTH OF 7 IN., AT AN APPROX. RATE OF 55 LBS./SQ. YD. AS DIRECTED BY THE ENGINEER.
R1	2' – 6" CONCRETE CURB AND GUTTER
R2	1' – 6" CONCRETE CURB AND GUTTER
S	SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V1	1.5" MILLING, REPLACE S9.5C
V2	1.5" MILLING, REPLACE S9.5B
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)

Note: Pavement Edge Slopes are 1:1 Unless Shown Otherwise



Detail Showing Method of Wedging

7/3/2008

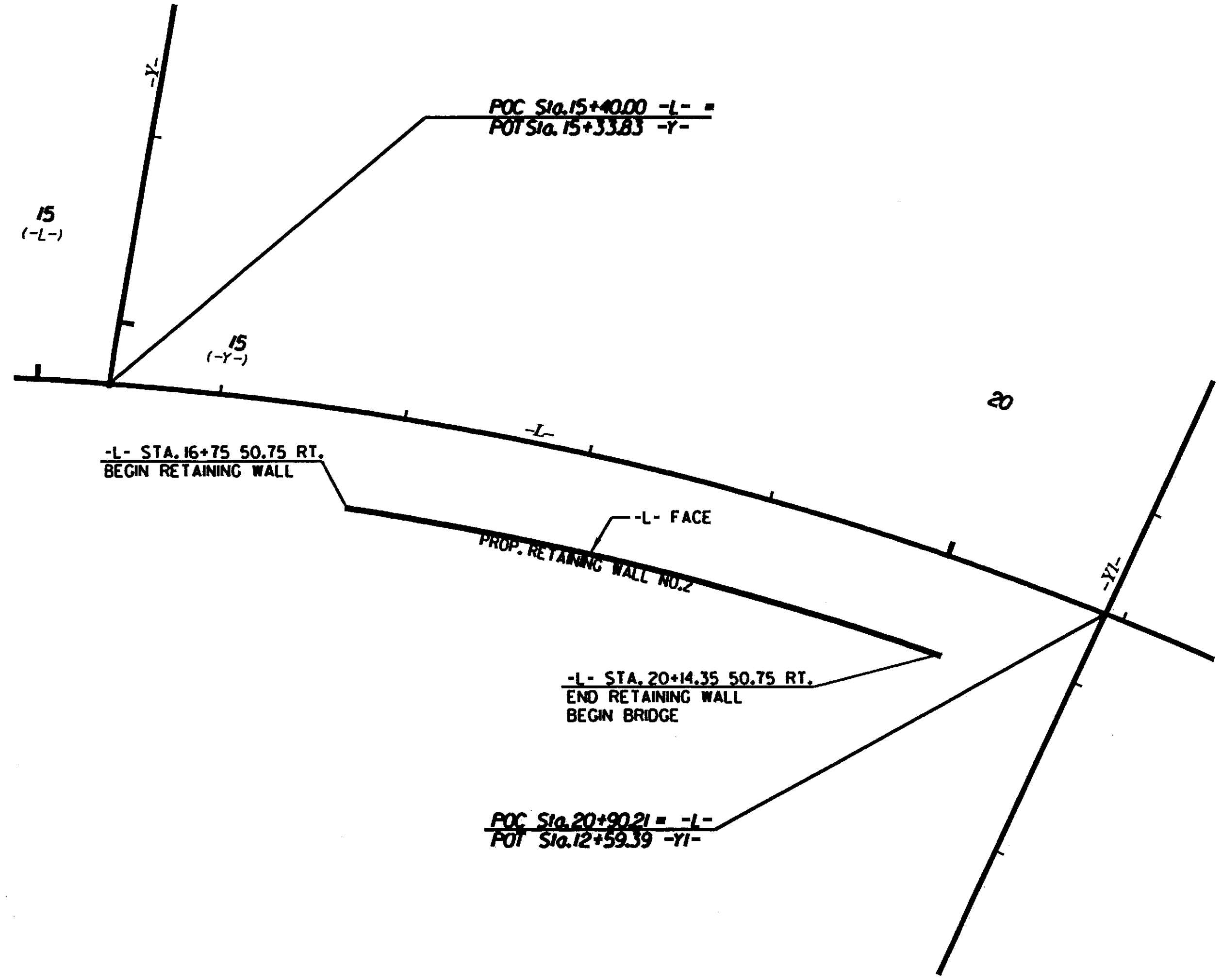
PROJECT REFERENCE NO.	SHEET NO.
U-4006	2D

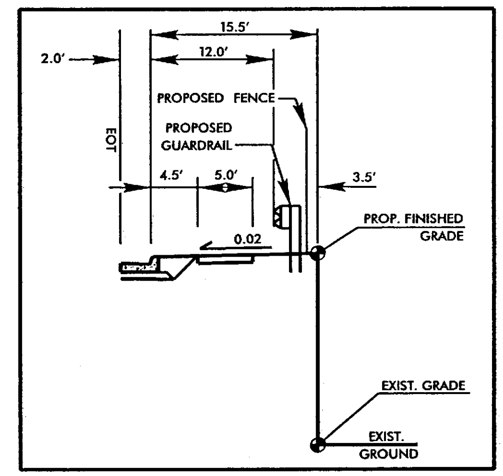
R/W SHEET NO.

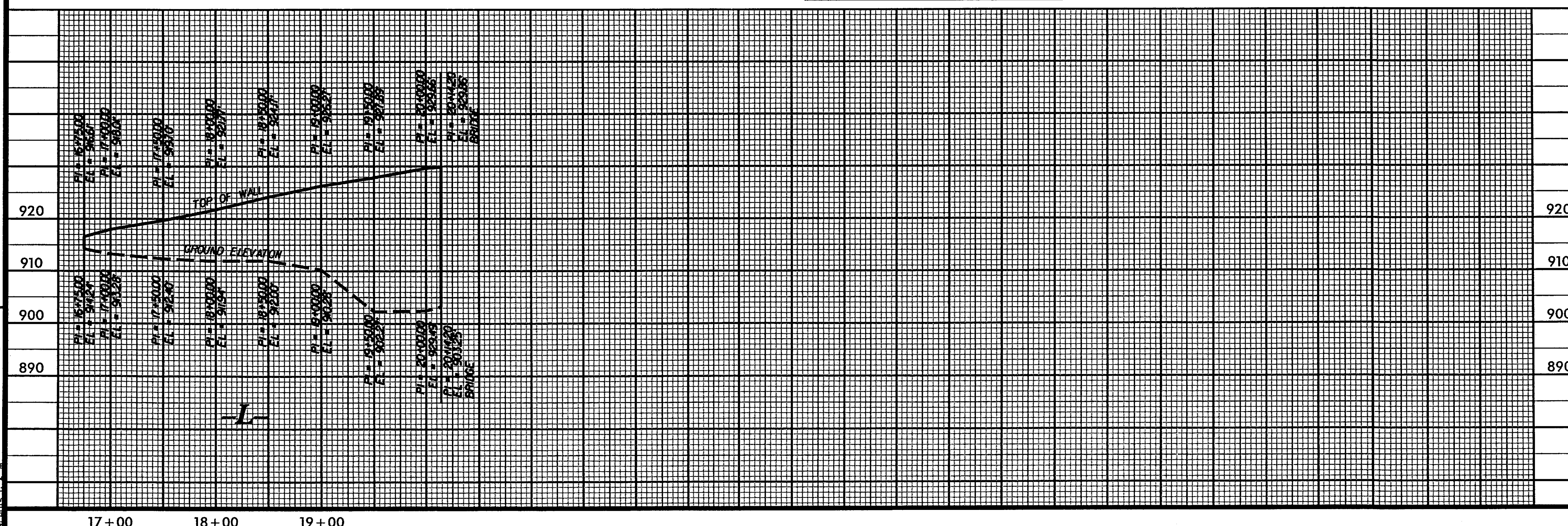
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS







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PROJECT REFERENCE NO.	SHEET NO.
U-4006	2E

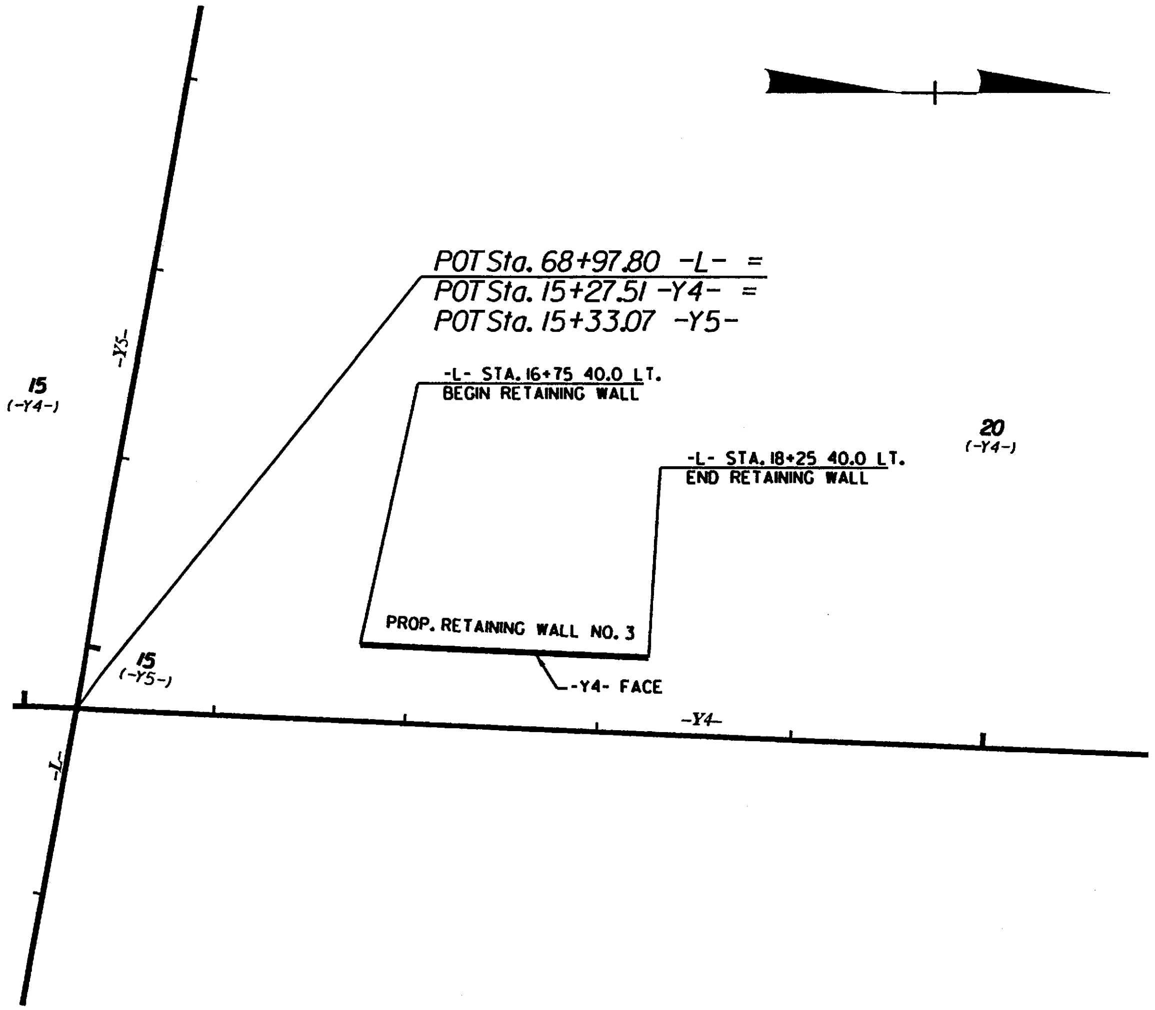
R/W SHEET NO.

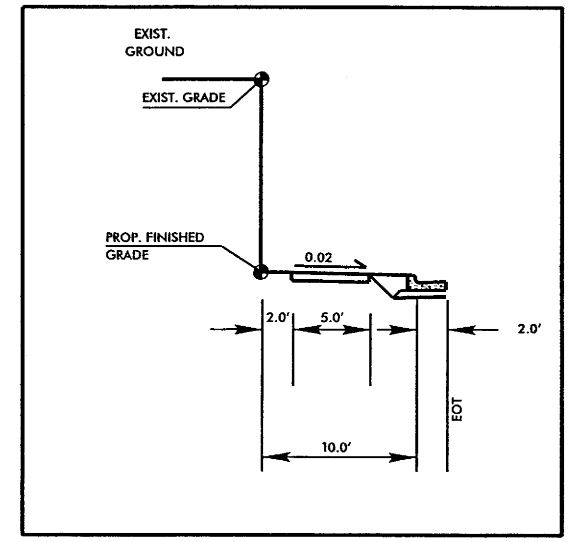
ROADWAY DESIGN ENGINEER

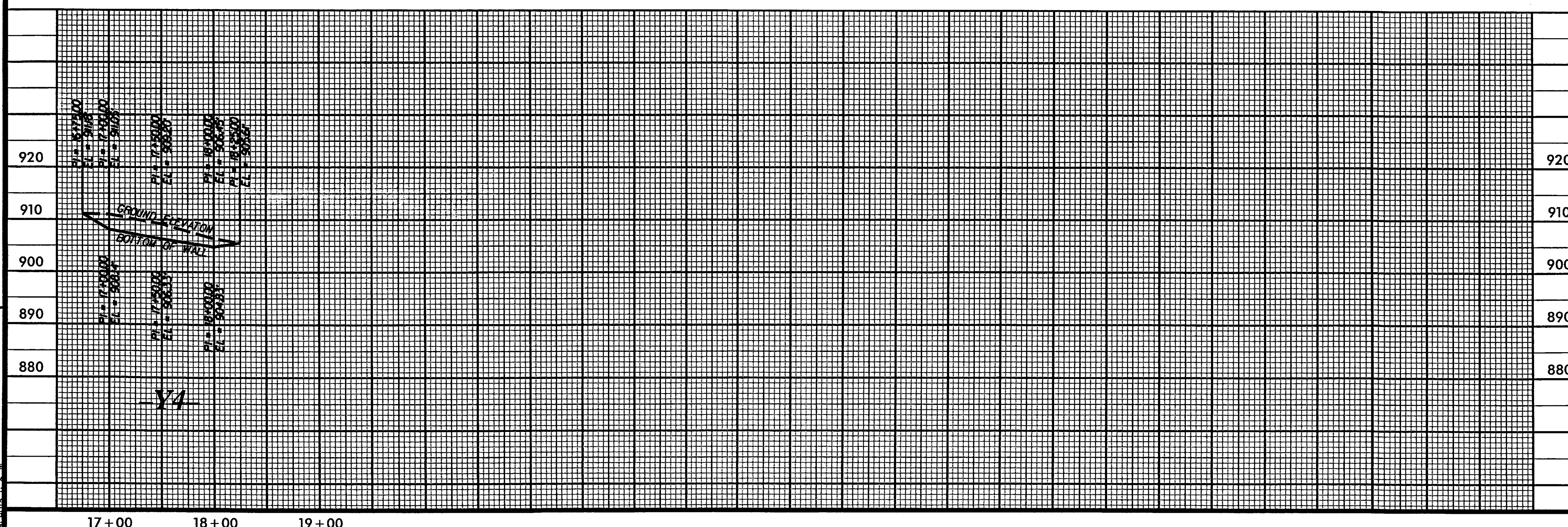
HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS







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PROJECT REFERENCE NO.	SHEET NO.
U-4006	03

RW SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCL. EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
SUMMARY #1					
-L-					
15+68.00 TO 20+19.38	103		21529	21426	0
TOTAL SUMMARY #1	20088		23190	3102	0
SUMMARY #2					
-L-					
22+35.30 TO 45+50.00	14496		197066	182570	0
-Y2-					
10+00.00 TO 45+50.00	241		289	48	0
-SR1-					
10+16.80 TO 12+77.81	3440		0	0	3440
-Y3-					
10+60.00 TO 20+40.00	2614		3406	792	0
TOTAL SUMMARY #2	20791		200761	183410	3440
SUMMARY #3					
-L-					
47+50.00 TO 68+00.00	18574		21218	2645	0
-Y4-					
10+00.00 TO 20+75.00	1358		1773	415	0
-Y5-					
11+85.00 TO 15+11.00	156		199	42	0
TOTAL SUMMARY #3	20088		23190	3102	0
TOTAL SUMMARY #1,2,3	40983		245480	207938	3440
LOSS DUE TO CLEAR. & GRUB.					
WASTE TO REPLACE BORROW	0		0	-3440	-3440
PROJECT TOTALS	40983		245480	204498	0
EST. TO REPLACE TOPSOIL FOR BORROW PIT				10225	
GRAND TOTALS	40983		0	214723	0
SAY	41000			215000	0

REVISIONS

8/17/9

7/3/2008
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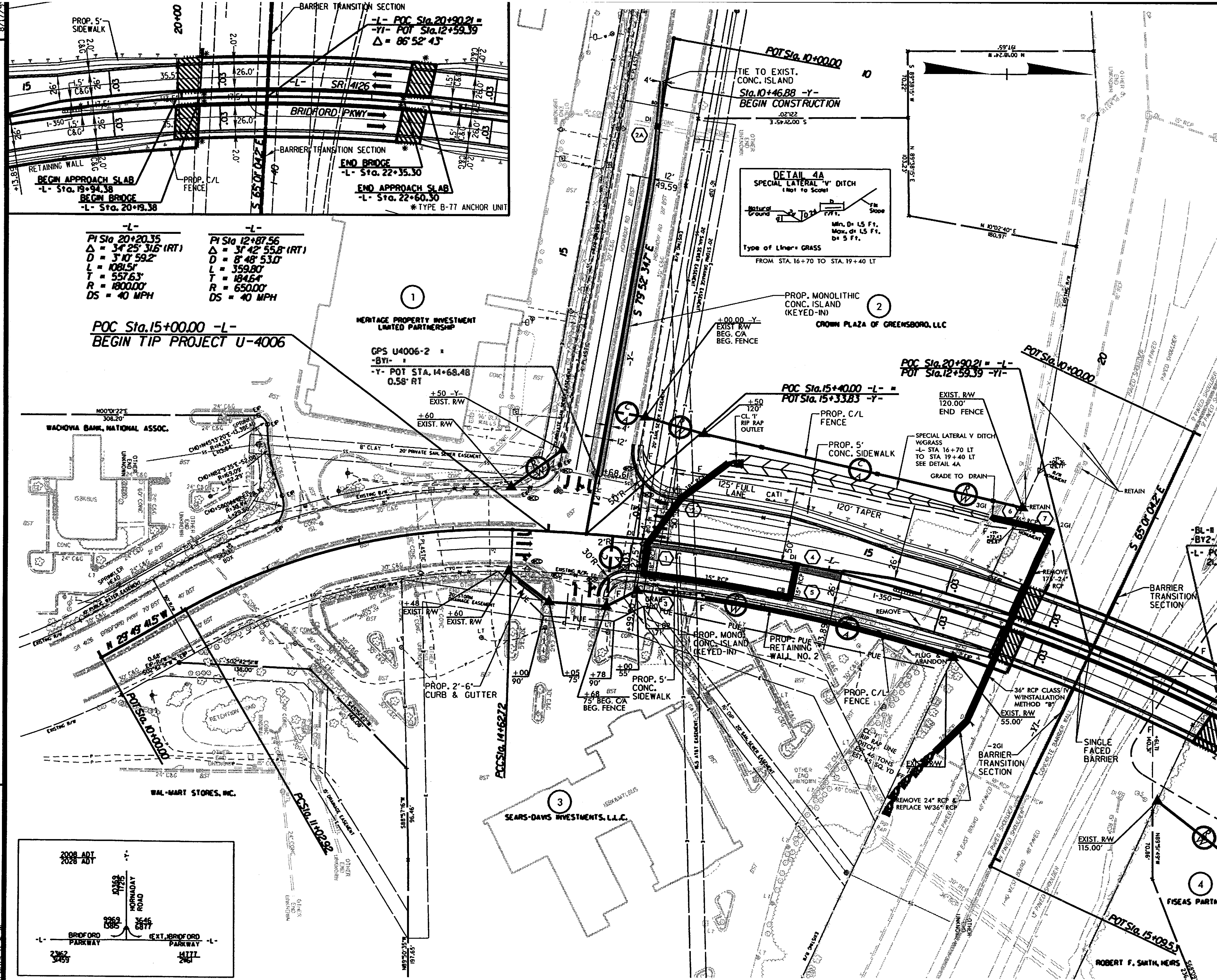
PROJECT REFERENCE NO.	SHEET NO.
U-4006	04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-L-	-L-
PI Sta. 20+20.35	PI Sta. 12+87.56
Δ = 34°25' 31.6" (RT)	Δ = 31°42' 55.8" (RT)
D = 3°10' 59.2"	D = 8°48' 53.0"
L = 1081.51'	L = 359.80'
T = 557.63'	T = 184.64'
R = 1800.00'	R = 650.00'
DS = 40 MPH	DS = 40 MPH

NOTE:
SEE SIGNAL PLANS FOR EXACT LOCATION OF WHEELCHAIR RAMPS

SEE SHEET 10 FOR -L- PROFILE
SEE SHEET 12 FOR -Y- PROFILE
SEE SHEET 12 FOR -Y1- PROFILE

REVISIONS
REVISION "1STS 5/24/07 REVISED PROPERTY LINES, REVISED PROPERTY OWNER NAMES

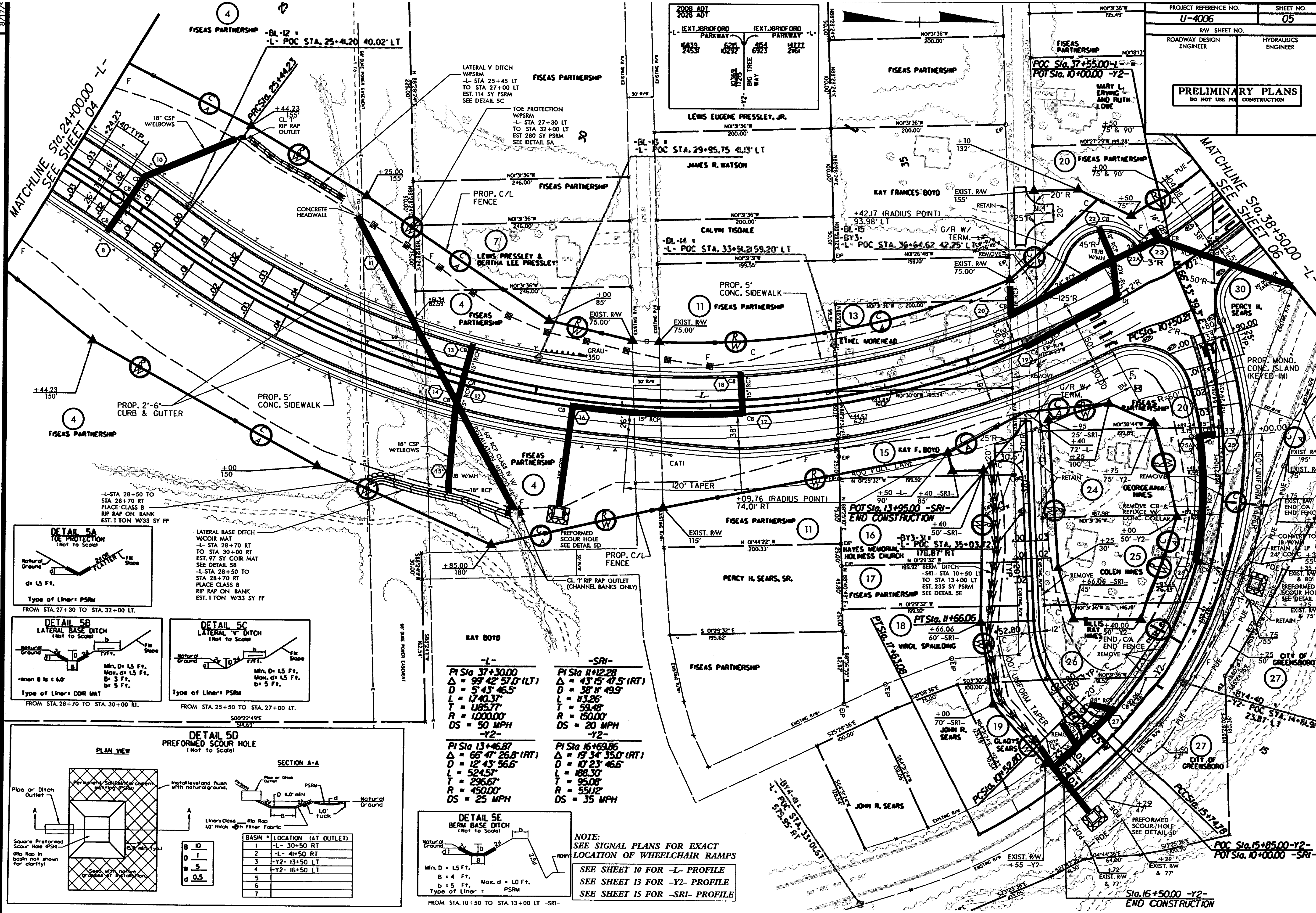
7/3/2008
U4006_RDY_PSH_04.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-4006	05
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

REVISION •1 STS 5/24/07 REVISED PROPERTY LINES, REVISED PROPERTY OWNER NAMES



-L-	-SRI-
PI Sta 37+30.00	PI Sta 11+12.28
Δ = 99° 42' 57.0" (LT)	Δ = 43° 15' 47.5" (RT)
D = 5° 43' 46.5"	D = 38° 11' 49.9"
L = 1,740.37'	L = 113.26'
T = 1,185.77'	T = 59.48'
R = 1,000.00'	R = 150.00'
DS = 50 MPH	DS = 20 MPH

-Y2-	-Y2-
PI Sta 13+46.87	PI Sta 16+69.86
Δ = 66° 47' 26.8" (RT)	Δ = 19° 34' 35.0" (RT)
D = 12° 43' 56.6"	D = 10° 23' 46.6"
L = 524.57'	L = 188.30'
T = 296.67'	T = 95.08'
R = 450.00'	R = 551.12'
DS = 25 MPH	DS = 35 MPH

B	D	W	d
10	1	5	0.5

BASIN #	LOCATION (AT OUTLET)
1	-L- 30+50 RT
2	-L- 41+50 RT
3	-Y2- 13+50 LT
4	-Y2- 16+50 LT
5	
6	
7	

NOTE:
SEE SIGNAL PLANS FOR EXACT LOCATION OF WHEELCHAIR RAMPS

SEE SHEET 10 FOR -L- PROFILE
SEE SHEET 13 FOR -Y2- PROFILE
SEE SHEET 15 FOR -SRI- PROFILE

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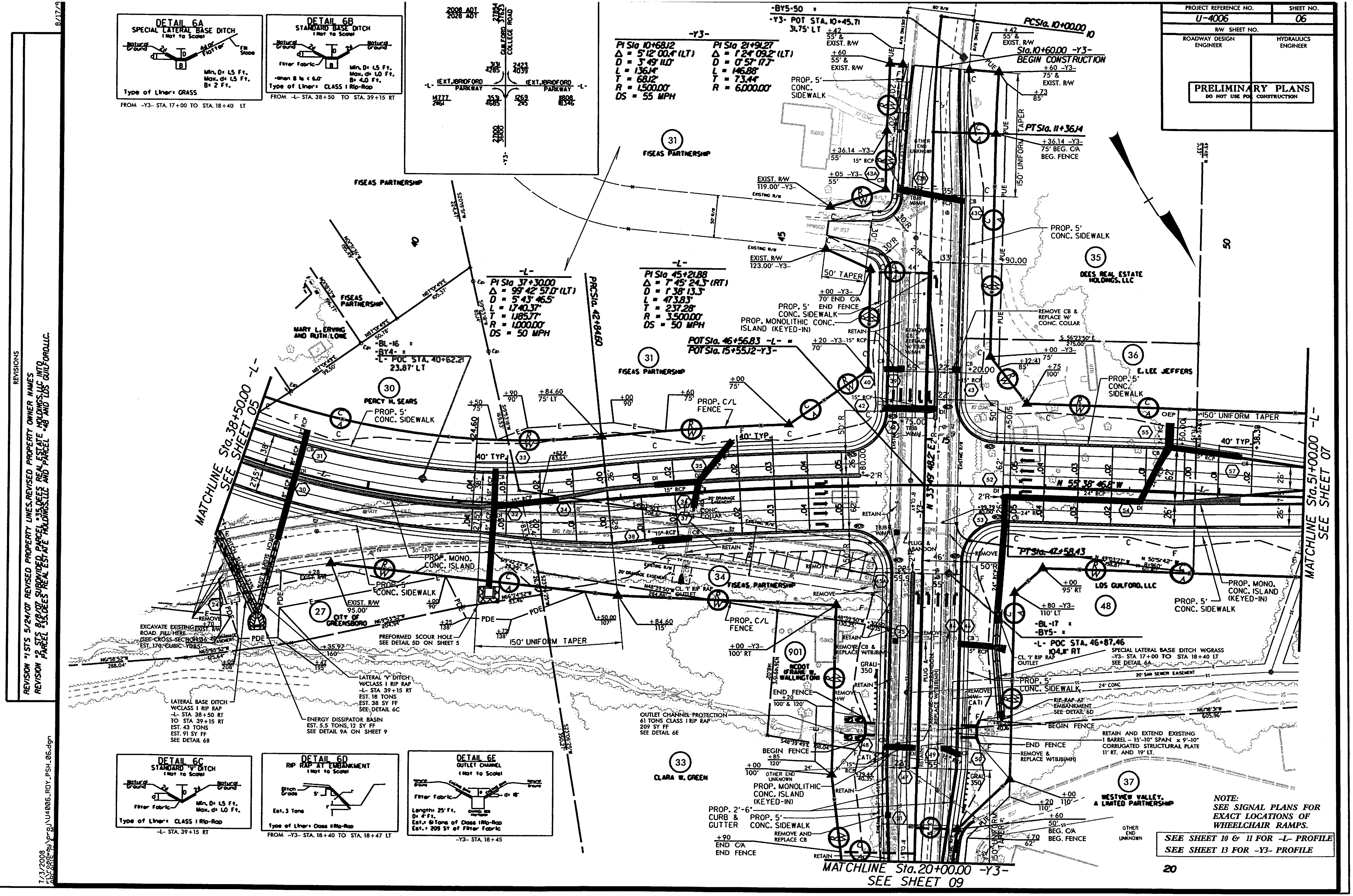

PROJECT REFERENCE NO. U-4006
SHEET NO. 06
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
REVISIONS
REVISION #1 STS 5/24/07 REVISED PROPERTY LINES, REVISED PROPERTY OWNER NAMES
REVISION #2 STS 8/8/07 SUBDIVIDED PARCEL #35, DEES REAL ESTATE HOLDINGS, LLC INTO PARCEL #35, DEES REAL ESTATE HOLDINGS, LLC AND PARCEL #48 AND LDS GUILFORD, LLC.
DETAIL 6A
SPECIAL LATERAL BASE DITCH
(Not to Scale)
Natural Ground
Fill Slope
Min. D= 1.5 Ft.
Max. d= 1.5 Ft.
B= 2 Ft.
Type of Liner: GRASS
FROM -Y3- STA. 17+00 TO STA. 18+40 LT
DETAIL 6B
STANDARD BASE DITCH
(Not to Scale)
Natural Ground
Filter Fabric
Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 4.0 Ft.
*When B is < 6.0'
Type of Liner: CLASS I Rip-Rap
FROM -L- STA. 38+50 TO STA. 39+15 RT
2008 ADT
2028 ADT
GUILFORD COLLEGE ROAD
(EXT.)BRIDFORD PARKWAY
-L-
-Y3-
-Y3-
PI Sta 10+68.12
Δ = 5° 12' 00.4" (LT)
D = 3° 49' 11.0"
L = 136.14'
T = 68.12'
R = 1,500.00'
DS = 55 MPH
PI Sta 21+91.27
Δ = 1° 24' 09.2" (LT)
D = 0° 57' 17.7"
L = 146.88'
T = 73.44'
R = 6,000.00'
-L-
PI Sta 37+30.00
Δ = 99° 42' 57.0" (LT)
D = 5° 43' 46.5"
L = 1,740.37'
T = 1,185.77'
R = 1,000.00'
DS = 50 MPH
-L-
PI Sta 45+21.88
Δ = 7° 45' 24.3" (RT)
D = 1° 38' 13.3"
L = 473.83'
T = 237.28'
R = 3,500.00'
DS = 50 MPH
POT Sta. 46+56.83 -L- = POT Sta. 15+55.12 -Y3-
PRC Sta. 42+84.60
PC Sta. 10+00.00
Sta. 10+60.00 -Y3- BEGIN CONSTRUCTION
PT Sta. 11+36.14
PT Sta. 47+58.43
-BY5-50 =
-Y3- POT STA. 10+45.71 31.75' LT
-BL-16 =
-BY4- =
-L- POC STA. 40+62.21 23.87' LT
-BL-17 =
-BY5- =
-L- POC STA. 46+87.46 104.11' RT
FISEAS PARTNERSHIP
MARY L. ERVING AND RUTH LOWE
PERCY H. SEARS
DEES REAL ESTATE HOLDINGS, LLC
E. LEE JEFFERS
LDS GUILFORD, LLC
CITY OF GREENSBORO
NCDOT (FRANK W. WALLINGTON)
CLARA W. GREEN
WESTVIEW VALLEY, A LIMITED PARTNERSHIP
PROP. 5' CONC. SIDEWALK
PROP. MONOLITHIC CONC. ISLAND (KEYED-IN)
PROP. MONO. CONC. ISLAND (KEYED-IN)
PROP. C/L FENCE
PROP. 2'-6" CURB & GUTTER
150' UNIFORM TAPER
50' TAPER
40' TYP.
REMOVE CB & REPLACE W/ CONC. COLLAR
EXCAVATE EXISTING ROAD. FILL HERE (SEE CROSS-SECTIONS) EST. 170 CUBIC YDS.
LATERAL BASE DITCH W/CLASS I RIP RAP -L- STA 38+50 RT TO STA 39+15 RT EST. 43 TONS EST. 91 SY FF SEE DETAIL 6B
LATERAL 'V' DITCH W/CLASS I RIP RAP -L- STA 39+15 RT EST. 18 TONS EST. 38 SY FF SEE DETAIL 6C
ENERGY DISSIPATOR BASIN EST. 5.5 TONS, 12 SY FF SEE DETAIL 9A ON SHEET 9
PREFORMED SCOUR HOLE SEE DETAIL 5D ON SHEET 5
OUTLET CHANNEL PROTECTION 61 TONS CLASS I RIP RAP 209 SY FF SEE DETAIL 6E
SPECIAL LATERAL BASE DITCH W/GRASS -Y3- STA 17+00 TO STA 18+40 LT SEE DETAIL 6A
RIP-RAP AT EMBANKMENT SEE DETAIL 6D
RETAIN AND EXTEND EXISTING 1 BARREL - 15'-10" SPAN x 9'-10" CORRUGATED STRUCTURAL PLATE 11' RT. AND 19' LT.
CL. 'I' RIP RAP OUTLET
REMOVE & REPLACE W/TBJB(MH)
PLUG & ABANDON
DETAIL 6C
STANDARD 'V' DITCH
(Not to Scale)
Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
Type of Liner: CLASS I Rip-Rap
-L- STA. 39+15 RT
DETAIL 6D
RIP RAP AT EMBANKMENT
(Not to Scale)
Ditch Grade
Est. 3 Tons
Type of Liner: Class I Rip-Rap
FROM -Y3- STA. 18+40 TO STA. 18+47 LT
DETAIL 6E
OUTLET CHANNEL
(Not to Scale)
Filter Fabric
Length: 25' Ft.
D= 4' Ft.
Est.= 61 Tons of Class I Rip-Rap
Est.= 209 SY of Filter Fabric
-Y3- STA. 18+45
MATCHLINE Sta. 38+50.00 -L- SEE SHEET 05
MATCHLINE Sta. 51+00.00 -L- SEE SHEET 07
MATCHLINE Sta. 20+00.00 -Y3- SEE SHEET 09
NOTE: SEE SIGNAL PLANS FOR EXACT LOCATIONS OF WHEELCHAIR RAMPS.
SEE SHEET 10 & 11 FOR -L- PROFILE
SEE SHEET 13 FOR -Y3- PROFILE
7/3/2008
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8/17/9

PROJECT REFERENCE NO.	SHEET NO.
U-4006	07
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

REVISION #1 ST'S 5/24/07 REVISED PROPERTY LINES, REVISED PROPERTY OWNER NAMES
REVISION #2 ST'S 8/8/07 SUBDIVIDED PARCEL #35 DEES REAL ESTATE HOLDINGS LLC INTO PARCEL #35 DEES REAL ESTATE HOLDINGS LLC AND PARCEL #48 AND LOS GUILFORD LLC.

8/17/2

MATCHLINE Sta. 51+00.00 -L- SEE SHEET 06

MATCHLINE Sta. 64+00.00 -L- SEE SHEET 08

48 LOS GUILFORD, LLC

38 CHARLES L. BELL, JR.

39 HP TRIAD PROPERTIES, INC.

40 CAM PROPERTIES, LLC

ADDSON POINT, LLC

CITY OF GREENSBORO

-L-
PI Sta 57+35.15
Δ = 35° 46' 25.5" (RT)
D = 6° 44' 26.4"
L = 530.71'
T = 274.33'
R = 850.00'
DS = 45 MPH

-L-
PI Sta 63+79.84
Δ = 59° 49' 12.5" (LT)
D = 8° 29' 17.7"
L = 704.74'
T = 388.30'
R = 675.00'
DS = 40 MPH

PC Sta. 54+60.83

PC Sta. 59+49.54

SPECIAL LATERAL V DITCH W/PSRM
-L- STA 54+00 LT
TO STA 54+50 LT
EST 37 SY PSRM
SEE DETAIL 7C

SPECIAL BERM DITCH W/PSRM
-L- STA 54+50 LT
TO STA 59+00 LT
EST 335 SY PSRM
SEE DETAIL 7B

SPECIAL LATERAL V DITCH W/PSRM
-L- STA 59+00 LT
TO STA 61+25 LT
EST 168 SY PSRM
SEE DETAIL 7C

TOE PROTECTION W/PSRM
-L- STA 61+25 LT
TO STA 62+50 LT
EST 100 SY PSRM
SEE DETAIL 7A

PROP. 5' CONC. SIDEWALK

PROP. 2'-6" CURB & GUTTER

PROP. C/L FENCE

-BL-18 :
-L- POT STA. 51+63.50 120' RT

-BL-19 :
-L- POC STA. 56+06.24 129.00' RT

-BL-20 :
-L- POC STA. 59+13.82 98.34' RT

-BL-21 :
-L- POC STA. 59+13.82 98.34' RT

DETAIL 7B
SPECIAL BERM DITCH
(Not to Scale)

Type of Liner: PSRM
Min. D= 1.5 Ft.
Max. d= 1.5 Ft.

FROM STA. TO 54+50 TO STA. 59+00 LT

DETAIL 7A
TOE PROTECTION
(Not to Scale)

Type of Liner: PSRM
d= 1.5 Ft.

FROM STA. 61+25 TO STA. 62+50 LT

DETAIL 7C
SPECIAL LATERAL "V" DITCH
(Not to Scale)

Type of Liner: PSRM
Min. D= 1.5 Ft.
Max. d= 1.5 Ft.
D= 5 Ft.

FROM STA. 54+00 TO STA. 54+50 LT
FROM STA. 59+00 TO STA. 61+25 LT

SEE SHEET 11 FOR -L- PROFILE

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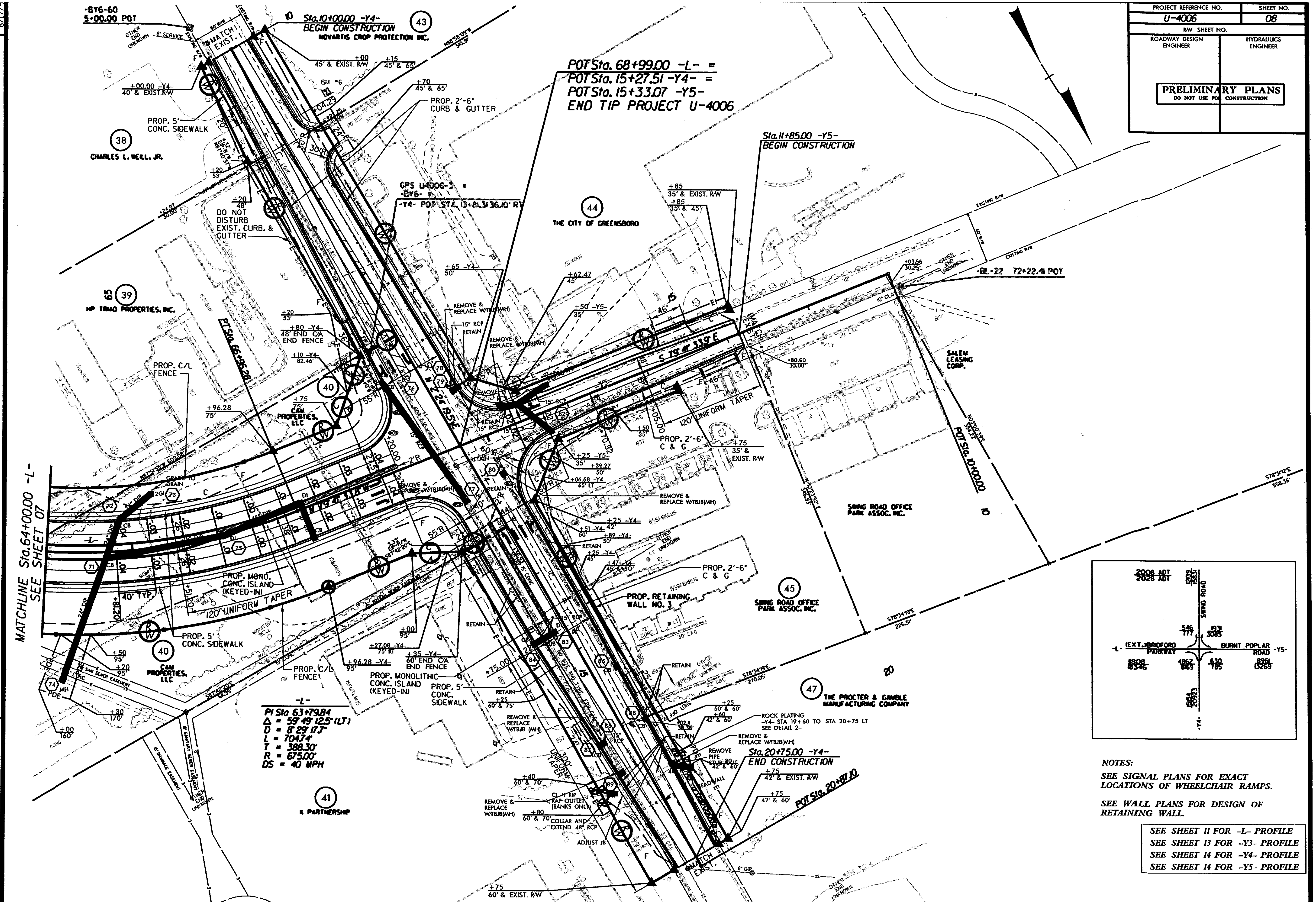
PROJECT REFERENCE NO.	SHEET NO.
U-4006	08
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



NOTES:

SEE SIGNAL PLANS FOR EXACT LOCATIONS OF WHEELCHAIR RAMPS.

SEE WALL PLANS FOR DESIGN OF RETAINING WALL.

SEE SHEET 11 FOR -L- PROFILE
SEE SHEET 13 FOR -Y3- PROFILE
SEE SHEET 14 FOR -Y4- PROFILE
SEE SHEET 14 FOR -Y5- PROFILE

REVISIONS

REVISION #1 STS 5/24/07 REVISED PROPERTY LINES, REVISED PROPERTY OWNER NAMES

7/3/2008
U4006_RDY_PSH_08.dgn

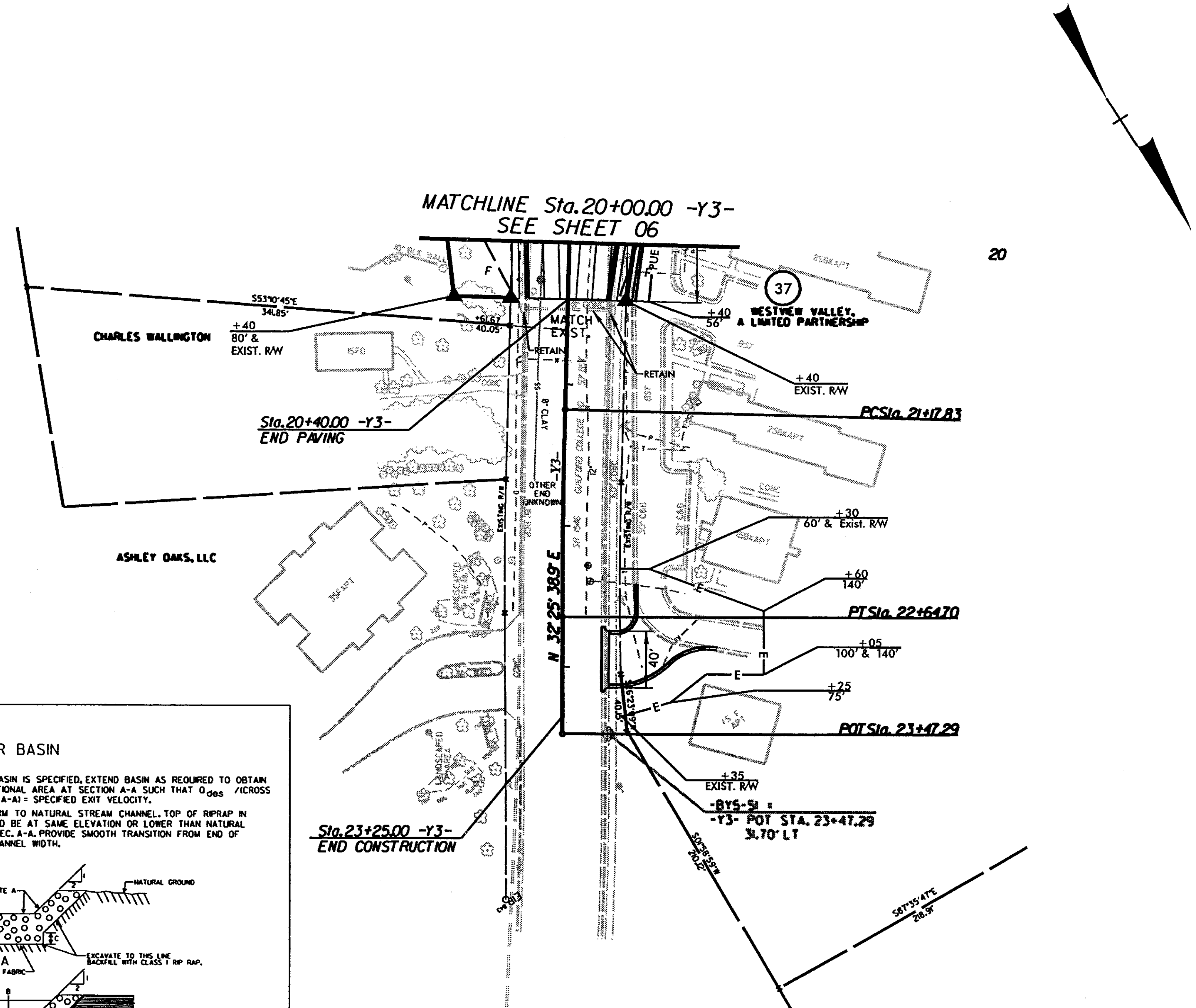
PROJECT REFERENCE NO.	SHEET NO.
U-4006	09

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS
REVISION #1 STS 5/24/07 REVISED PROPERTY LINES, REVISED PROPERTY OWNER NAMES

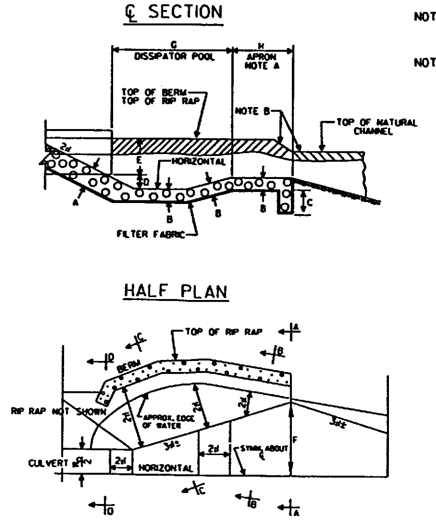


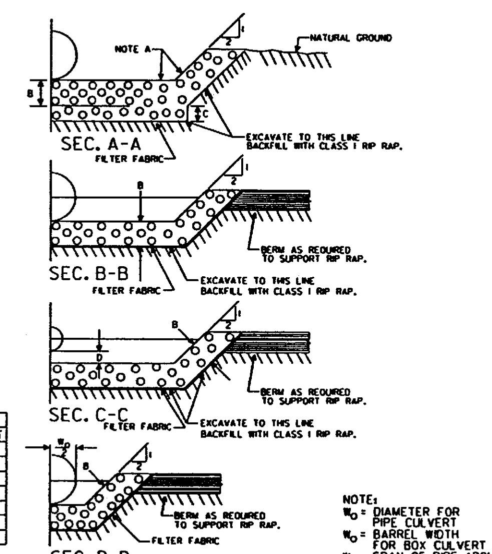
DETAIL 9A

RIP-RAPPED ENERGY DISSIPATOR BASIN

NOTE A IF EXIT VELOCITY OF BASIN IS SPECIFIED, EXTEND BASIN AS REQUIRED TO OBTAIN SUFFICIENT CROSS SECTIONAL AREA AT SECTION A-A SUCH THAT Q_{des} /(CROSS SECTION AREA AT SEC. A-A) = SPECIFIED EXIT VELOCITY.

NOTE B WARP BASIN TO CONFORM TO NATURAL STREAM CHANNEL. TOP OF RIPRAP IN FLOOR OF BASIN SHOULD BE AT SAME ELEVATION OR LOWER THAN NATURAL CHANNEL BOTTOM AT SEC. A-A. PROVIDE SMOOTH TRANSITION FROM END OF APRON TO NATURAL CHANNEL WIDTH.





DIM.	RIP RAP BASIN *							
	1	2	3	4	5	6	7	8
A	2							
B	1							
C	0.5							
D	2							
E	1.5							
F	4							
G	10							
H	2							

*ALL DIMENSIONS APPROXIMATE IN FT.

BASIN *	LOCATION (AT OUTLET)
1	STATION 39+15 RT
2	
3	
4	
5	
6	
7	
8	

NOTE:
W_o = DIAMETER FOR PIPE CULVERT
W_o = BARREL WIDTH FOR BOX CULVERT
W_o = SPAN OF PIPE-ARCH CULVERT

SEE SHEET 13 FOR -Y3- PROFILE

7/3/2008
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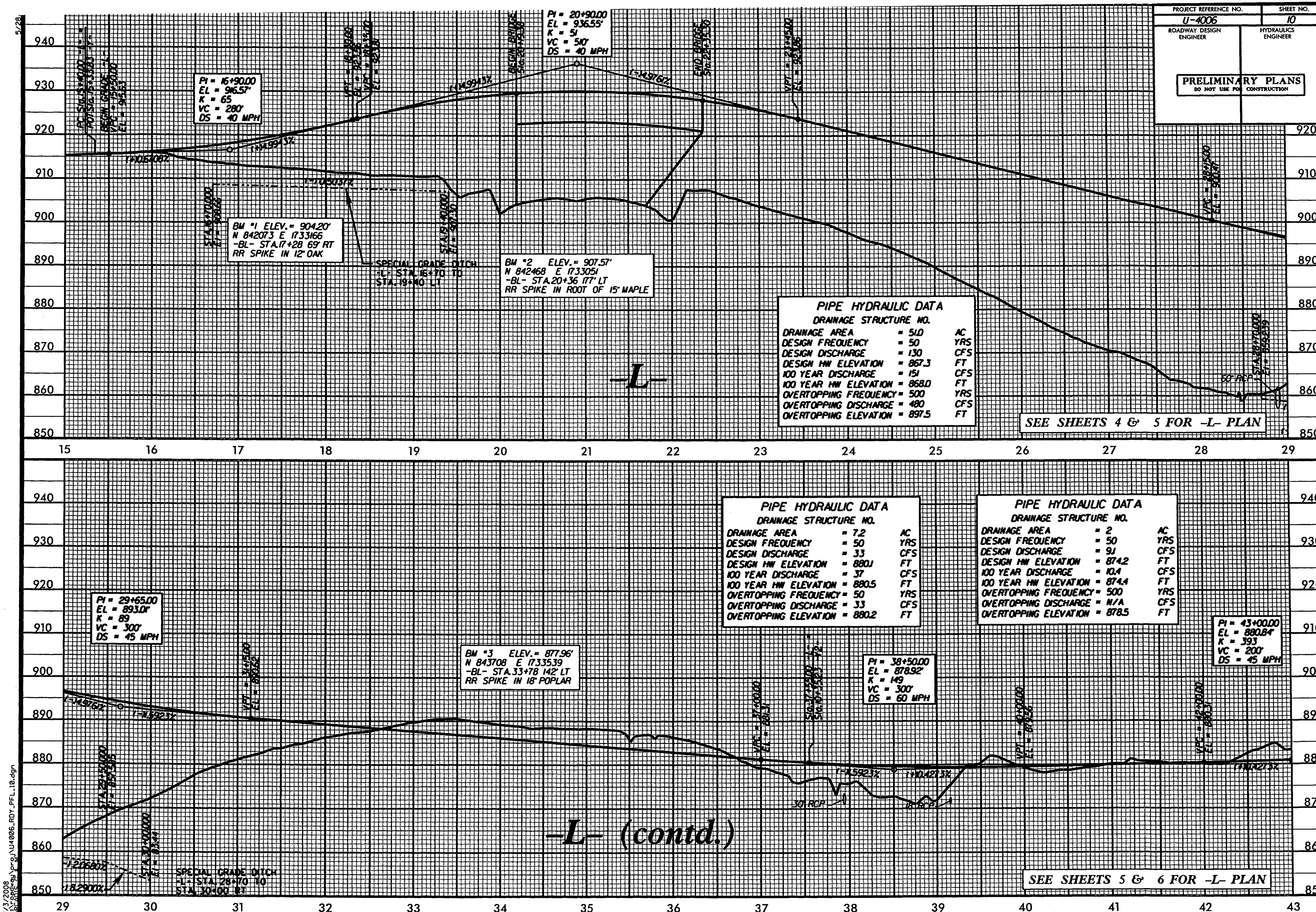
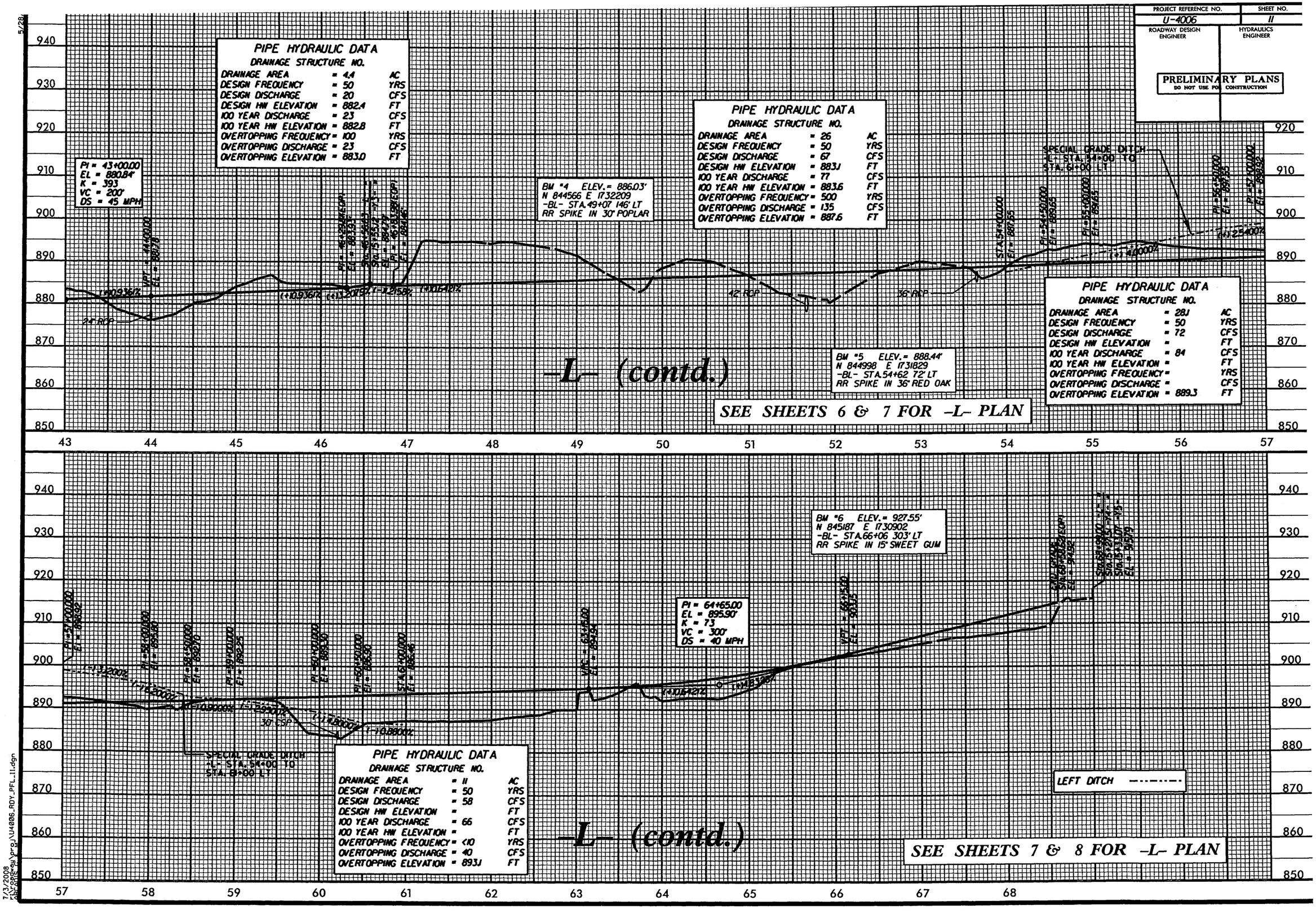


PROJECT REFERENCE NO.
U-4006
SHEET NO.
10
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
PI = 16+90.00
EL = 916.57'
K = 65
VC = 280'
DS = 40 MPH
PI = 20+90.00
EL = 936.55'
K = 51
VC = 510'
DS = 40 MPH
BEGIN BRIDGE
END BRIDGE
BM #1 ELEV. = 904.20'
N 842073 E 1733166
-BL- STA.17+28 69' RT
RR SPIKE IN 12" OAK
SPECIAL GRADE DITCH
-L- STA.16+70 TO
STA.19+40 LT
BM #2 ELEV. = 907.57'
N 842468 E 1733051
-BL- STA.20+36 177' LT
RR SPIKE IN ROOT OF 15" MAPLE
PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.
DRAINAGE AREA = 51.0 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 130 CFS
DESIGN HW ELEVATION = 867.3 FT
100 YEAR DISCHARGE = 151 CFS
100 YEAR HW ELEVATION = 868.0 FT
OVERTOPPING FREQUENCY = 500 YRS
OVERTOPPING DISCHARGE = 480 CFS
OVERTOPPING ELEVATION = 897.5 FT
-L-
60" RCP
SEE SHEETS 4 & 5 FOR -L- PLAN
PI = 29+65.00
EL = 893.01'
K = 89
VC = 300'
DS = 45 MPH
BM #3 ELEV. = 877.96'
N 843708 E 1733539
-BL- STA.33+78 142' LT
RR SPIKE IN 18" POPLAR
PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.
DRAINAGE AREA = 7.2 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 33 CFS
DESIGN HW ELEVATION = 880.1 FT
100 YEAR DISCHARGE = 37 CFS
100 YEAR HW ELEVATION = 880.5 FT
OVERTOPPING FREQUENCY = 50 YRS
OVERTOPPING DISCHARGE = 33 CFS
OVERTOPPING ELEVATION = 880.2 FT
PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.
DRAINAGE AREA = 2 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 9.1 CFS
DESIGN HW ELEVATION = 874.2 FT
100 YEAR DISCHARGE = 10.4 CFS
100 YEAR HW ELEVATION = 874.4 FT
OVERTOPPING FREQUENCY = 500 YRS
OVERTOPPING DISCHARGE = N/A CFS
OVERTOPPING ELEVATION = 878.5 FT
PI = 38+50.00
EL = 878.92'
K = 149
VC = 300'
DS = 60 MPH
PI = 43+00.00
EL = 880.84'
K = 393
VC = 200'
DS = 45 MPH
30" RCP
-L- (contd.)
SPECIAL GRADE DITCH
-L- STA. 28+70 TO
STA. 30+00 RT
SEE SHEETS 5 & 6 FOR -L- PLAN

PROJECT REFERENCE NO.	SHEET NO.
U-4006	11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L- (contd.)



7/3/2008
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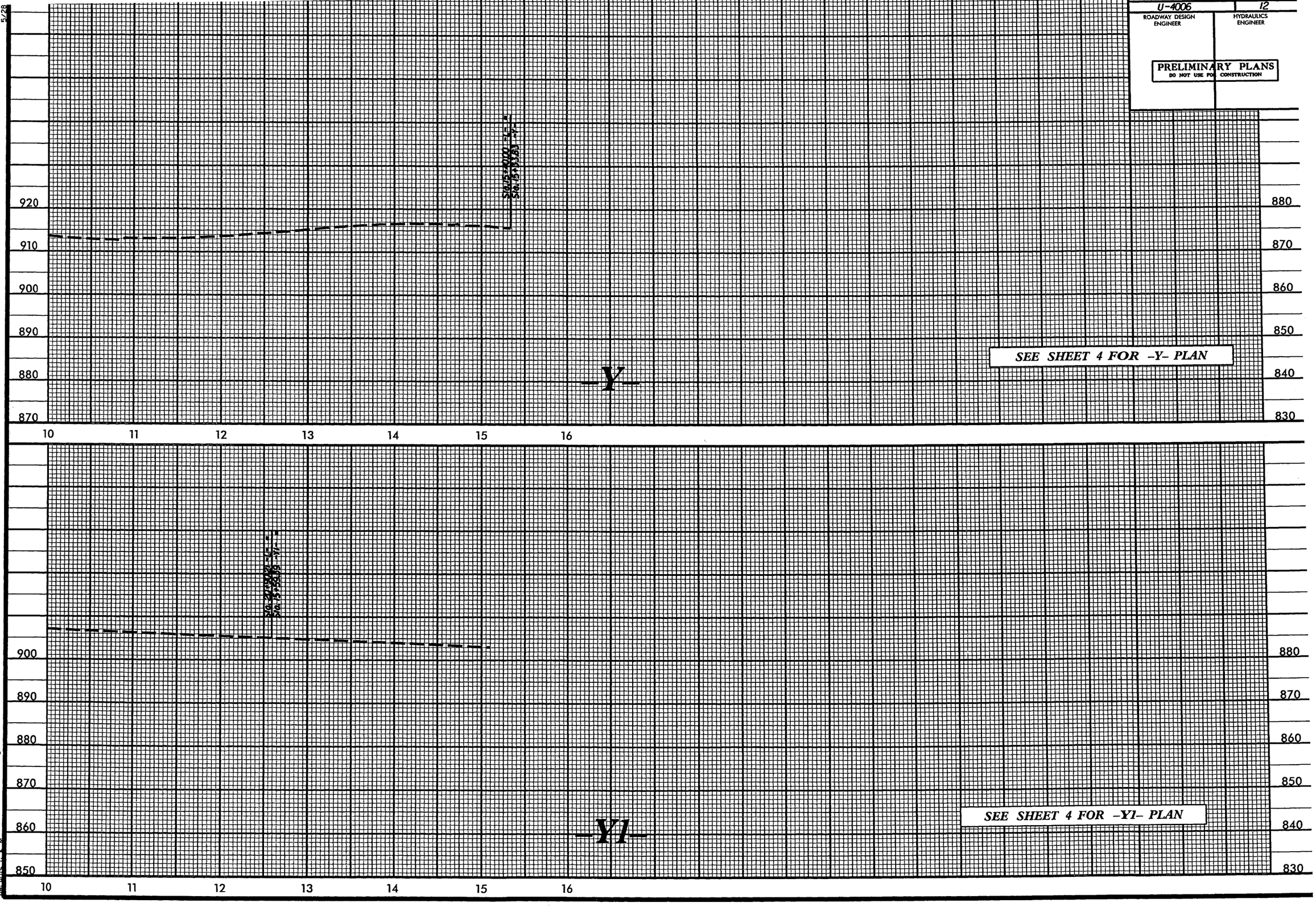
PROJECT REFERENCE NO.	SHEET NO.
U-4006	12
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

5/28



7/3/2008
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PROJECT REFERENCE NO.	SHEET NO.
U-4006	13
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PI = 10+76.00
EL = 881.59'
K = 11
VC = 80'
DS = 20 MPH

PI = 13+50.00
EL = 859.76'
K = 52
VC = 350'
DS = 25 MPH

-Y2-

SEE SHEET 5 FOR -Y2- PLAN

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 570	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 868.3	FT
BASE DISCHARGE	= 630	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 868.6	FT
OVERTOPPING DISCHARGE	=	CFS
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING ELEVATION	= 870.0	FT

SPECIAL GRADE DITCH -Y3- STA. 17+00 TO STA. 18+00 LT

-Y3-

EXTEND 1 BARREL
8'-0" SPAN X 9'-0" RISE CORRUGATED STRUCTURAL PLATE

SEE SHEETS 6 & 9 FOR -Y3- PLAN

7/3/2008
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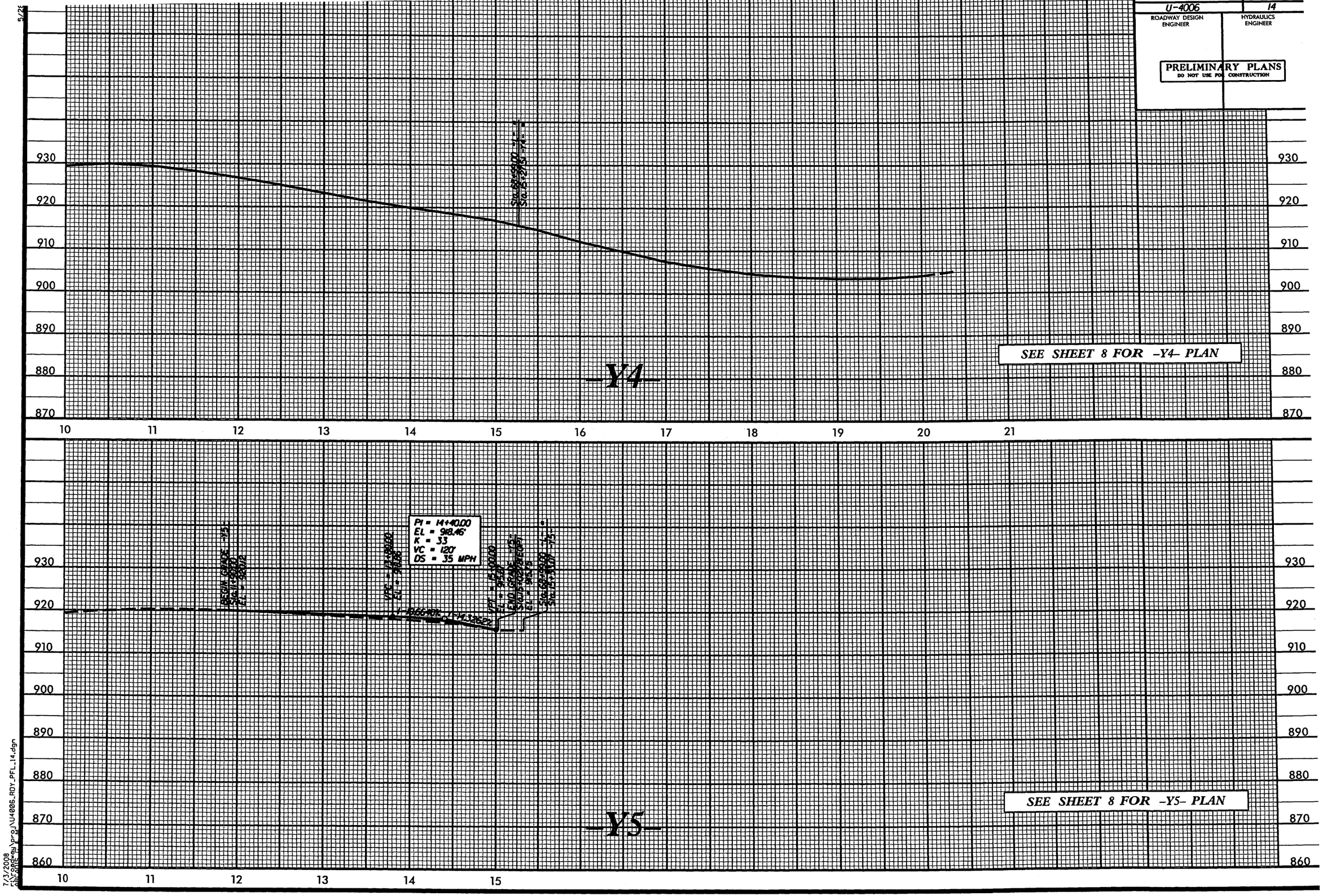
PROJECT REFERENCE NO.	SHEET NO.
U-4006	14
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



7/3/2008
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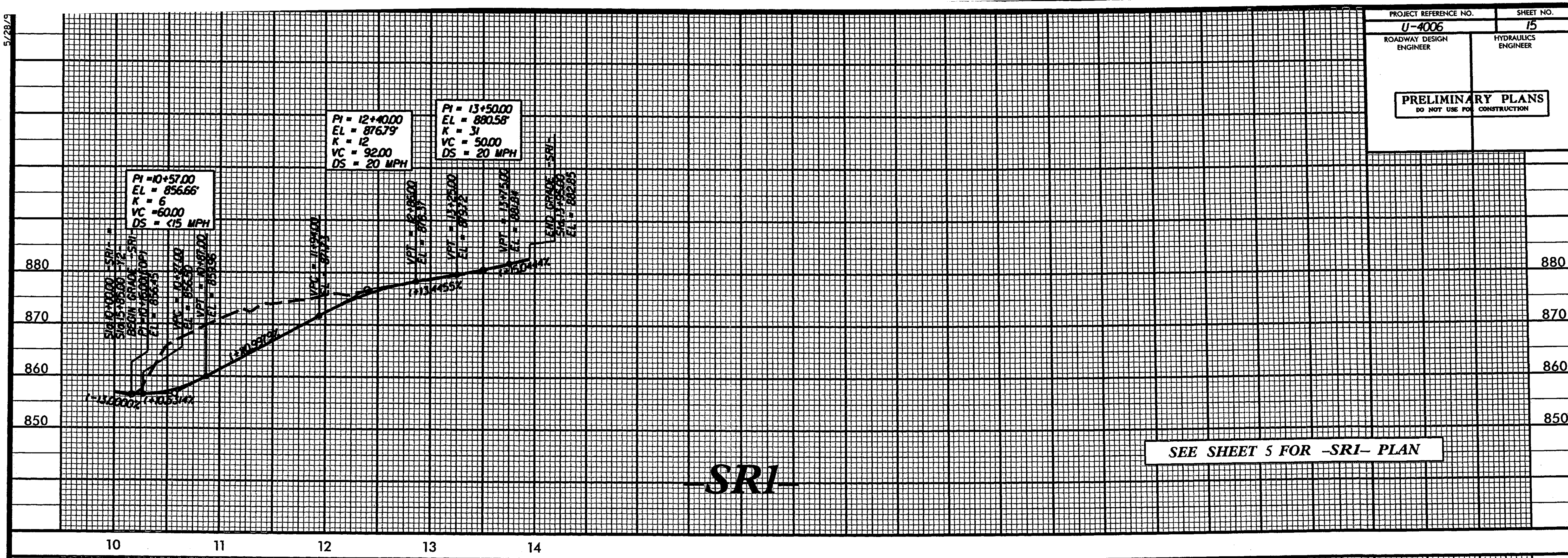
PROJECT REFERENCE NO.	SHEET NO.
U-4006	15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 5 FOR -SR1- PLAN

-SR1-

7/3/2008
U4006_RDY_PFL_15.dgn

PROJ. REFERENCE NO.	SHEET NO.
U-4006	X-41