STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR
SECRETARY

December 1, 2010

U.S. Army Corps of Engineers
Regulatory Field Office
151 Patton Avenue, Room 208
Asheville, NC 28801-5006

ATTN: Ms. Lori Beckwith
NCDOT Coordinator

Subject: **Application for Individual Section 404 Permit and Individual Section 401 Certification** for Improvements to the NC 18 (Sterling Street) and I-40 Interchange in Morganton, Burke County, NC (TIP No. U-2550B, State Project No. 8.1851001, Federal Aid Project No. M-8165(1)).
T.I.P. Project U-2550B
Debit $570.00 from WBS Element 34831.2.4

Dear Ms. Beckwith:

The North Carolina Department of Transportation (NCDOT) proposes Interchange Improvements at the junction of NC 18 (Sterling Street) & I-40 in Morganton including relocating exit/entrance ramps to conform to current Federal Highway Administration standards; replacing existing I-40 bridges over NC 18 with new structures capable of accommodating six travel lanes and widening NC 18 to four-lanes with dual turn-lanes through the interchange.

This application package consists of: the cover letter, ENG form 4345, EEP mitigation acceptance letter, SHPO historical architecture concurrence letter, SHPO archaeology concurrence letter, interagency hydraulic design review (4b) meeting minutes, interagency permit drawing review (4c) meeting minutes and actions taken, Approved Jurisdiction Determination Form (Rapanos), Indirect and Cumulative Effects Update, Stormwater Management Plan, Stream Relocation Plan, permit (hydraulic) drawings and half-size roadway plan sheets.

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

TELEPHONE: 919-733-3141
FAX: 919-715-1501
WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

Purpose and Need

The purpose of this project is to alleviate existing and future capacity issues by widening NC 18 (Sterling Street) which is the primary route from I-40 to Grace Memorial Hospital and downtown Morganton. The widening of NC 18 will necessitate the removal of the I-40 bridges which will be replaced with wider structures that can incorporate future I-40 lane expansions. The interchange improvements will also address substandard I-40 entrance/exit ramps by lengthening acceleration and deceleration lanes to Federal Highway Administration standards.

Project Schedule

The project is currently scheduled to Let June 21, 2011 with a Review date of May 3, 2011.

Summary of Impacts

Construction of the proposed project will necessitate impacts to jurisdictional waters. Table 1 shows the impacts associated with this project.

Table 1 - Summary of Impacts

U-2550B	Permanent Wetland (ac)	Temporary Wetland (ac)	Permanent Surface Water (lf)	Temporary Surface Water (ac)
Totals	**0.0**	**0.0**	**1,350**	**0.03**

Summary of Utility Impacts:

There are no impacts to jurisdictional resources due to utility relocations on U-2550B

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Summary of Mitigation:

This project has been designed to avoid and minimize impacts to jurisdictional areas throughout the National Environmental Policy Act (NEPA) and design processes. U-2550B has a stream relocation due to project design and is depicted on the permit drawings with no separate mitigation plan. **481 linear feet** of natural stream design will be constructed for onsite mitigation and **525 linear feet** of stream impacts will be mitigated through the use of the North Carolina Department of Environment and Natural Resources Ecosystem Enhancement Program (EEP).

NEPA DOCUMENT STATUS

An Environmental Assessment (EA) was completed by the NCDOT in compliance with the NEPA. The EA explains the purpose and need for the project, provides a description of the alternatives considered and characterizes the social, economic, and environmental effects. After the approval of the EA (August 18, 1994) and Finding of No Significant Impact (FONSI) (March 27, 1995); Right of Way Consultations were completed on June 10, 2003 and October 22, 2008 and a Construction Consultation is currently in

preparation. Copies of approved documents were provided to regulatory review agencies involved in the approval process. Additional copies will be provided upon request.

INDEPENDENT UTILITY

U-2550B in compliance with 23 CFR Section 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; and
(3) The project does not restrict consideration of alternatives for other reasonable foreseeable transportation improvements.

RESOURCE STATUS

Waters within the project area are located in the Catawba River Basin (HUC 03050101) and drain to subasin 03-08-31. All streams have a best use classification of WS IV. Neither High Quality Waters (HQW), Water Supplies (WS-I or WS-II), nor Outstanding Resource Waters (ORW) occur within 1.0 mi. (1.6 km) of the project area. The Wildlife Resource Commission (WRC) lists Burke County as a trout county; however, the East Prong Hunting Creek is not listed as trout stream by WRC. According to the 2008 Final 303(d) List, there are no 303(d) streams within one mile of the project area. The 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).

History and Identification of Jurisdictional Features

Field investigations for this project occurred over a period of years. Preliminary investigations occurred in December, 1991; May and August of 1992. This preliminary work was documented in Natural Resources Technical Report issued September 1993 and incorporated into the EA approved August 1994. NCDOT personnel revisited the site in June, 2003 and updated plant surveys in August 2006 and July 2008. A Right of Way Consultation was issued in October 2008 after the Federal Highway Administration approved a Consultation in lieu of a re-evaluation for the project.

Delineations

Guidance on the jurisdictional status of questionable areas was provided by USACE representative Steve Lund of the USACE Asheville Regulatory Field Office during a June 16, 2003 on-site visit. During this field meeting Mr. Lund verified stream determinations for the project. Dave Baker, also from the USACE Asheville Regulatory Field Office visited the site in February 2008 and gave a verbal reverification for the project on March 18, 2009 with a final jurisdictional determination to be issued at permitting.

IMPACTS TO WATERS OF THE U.S.

Wetlands
No wetlands were observed in the project area.

Surface Waters
Permanent impacts to surface waters total 1,350 linear feet.

Temporary impacts will be necessary for the construction of culvert extensions, pipe installations, and for the replacement of culverts with bridges over East Prong Hunting Creek. Temporary impacts associated with this project include 0.09 acre of temporary fill in surface waters.

Table 2- Jurisdictional Streams

Permit Drawing Site #	Stream Name	Permanent Impacts (lf)	Temporary Impacts (ac)	Mitigation Ratio	Mitigation Required
1	East Prong Hunting Creek	Perm Fill: 29	0.01	USACE (2:1)	58 lf
2	East Prong Hunting Creek	Perm Fill: 204	0	USACE (2:1)	408 lf
2	Ramp UT to East Prong Hunting Creek	Perm Fill: 59	0	--	0
3	UT to East Prong Hunting Creek	Perm Fill: 865	0.01	USACE (2:1)	1,730 lf
4	East Prong Hunting Creek	Bank Stab: 96	0.01	--	0 *
4	Mexican Restaurant UT to East Prong Hunting Creek	Bank Stab: 19	0	--	0 *
5	UT1 to East Prong Hunting Creek	0	<0.01	--	0 *
6	UT to East Prong Hunting Creek	Bank Stab: 39	0	--	0 *
7	UT to East Prong Hunting Creek	Perm Fill: 23	0	USACE (2:1)	46 lf
7	UT to East Prong Hunting Creek	Bank Stab: 16	0	--	0 *
Totals	[redacted]	1,350 lf	0.03	[redacted]	2,242 lf

- Mitigation for Bank Stabilization is not required by DWQ if impacts are under the 150 lf threshold

Permit Site 1 : Perennial stream, East Prong Hunting Creek, will be impacted by an extension of the existing (3) 10' x 11' reinforced concrete box culverts (RCBC).
Permanent Impacts, Stream: 29 lf
Temporary Impact, Stream: 0.01 ac

Permit Site 2: Perennial stream, East Prong Hunting Creek, will be impacted by an extension of the existing (3) 10' x 11' reinforced concrete box culverts (RCBC) and relocation of the stream channel into the extension. A small nonmitigable intermittent UT to East Prong Hunting Creek (Ramp UT) will also be impacted by the RCBC extension.
Permanent Impacts, Stream: 263 lf (Including 59'of nonmitigable Intermittent stream)
Temporary Impacts, Stream: 0.00 ac

Permit Site 3: Perennial stream, UT to East Prong Hunting Creek, will be impacted by the extensions of existing (2) 36" Reinforced concrete pipes (RCP) on the downstream side and an 84" corrugated steel pipe (CSP) on the upstream end and channel relocation.
Permanent Impacts, Stream: 865 lf

Temporary Impacts, Stream: 0.01 ac
Natural Stream Design: 481 lf
Permit Site 4: Perennial stream, East Prong Hunting Creek, and an intermittent UT to East Prong Hunting Creek (Mexican Restaurant UT) will be impacted by bank stabilization placed along the stream after removal of the existing culvert.
Permanent Impacts, Stream: 0 lf
Bank Stabilization: 115 lf (Including 19'of mitigable Intermittent stream)
Temporary Impacts, Stream: 0.01 ac

Permit Site 5: Perennial stream, UT1 to East Prong Hunting Creek will be temporarily impacted by the relining of the existing 66" CSP with 60" welded steel.
Permanent Impacts, Stream: 0 lf
Temporary Impacts, Stream: <0.01 ac

Permit Site 6: Perennial stream, UT to East Prong Hunting Creek, will be impacted by the placement of bank stabilization and UT1 to East Prong Hunting Creek will be temporarily impacted by the relining of the existing 66" CSP with 60" welded steel.
Permanent Impacts, Stream: 0 lf
Bank Stabilization: 39 lf
Temporary Impacts, Stream: 0.00 ac

Permit Site 7: Perennial stream, UT to East Prong Hunting Creek will be impacted by the extension of an existing 78" CSP along with the placement of bank stabilization.
Permanent Impacts, Stream: 23 lf
Bank Stabilization: 16 lf
Temporary Impacts, Stream: 0.00 ac

FEDERALLY PROTECTED SPECIES

Plants and animals with federal classifications of Endangered (E), Threatened (T), Proposed Endangered (PE), Proposed Threatened (PT), are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of August 28, 2009, the United States Fish and Wildlife Service lists a total of seven federally protected species for Burke County (White irisette was added in 2008). Conclusions for all species listed below are "No Effect" (Table 1). Marginal habitat for dwarf-flowered heartleaf, small whorled pogonia and white irisette exist on the southeast portion of the interchange but an updated survey in August 2008 conducted by NCDOT personnel found no specimens.

The bald eagle has been delisted from the Endangered Species Act as of August 8, 2007. It is still protected under the Bald and Golden Eagle Protection Act. There are no large water bodies within one mile and 660 feet of the project study area, therefore no survey is needed.

Table 3. Federally protected species for Burke County

Common Name	Scientific Name	Status	Habitat	Biological Conclusion
Bog turtle	*Clemmys muhlenbergii*	T(S/A)	No	Not Subject
Spreading avens	*Geum radiatum*	E	No	No Effect
Dwarf-flowered heartleaf	*Hexastylis naniflora*	T	Yes	No Effect
Mountain golden heather	*Hudsonia montana*	T	No	No Effect
Small whorled pogonia	*Isotria medeoloides*	T	Yes	No Effect
Heller's blazing star	*Liatris helleri*	T	No	No Effect
White irisette	*Sisyrinchium dichotomum*	E	Yes	No Effect

TROUT WATERS AND MORATORIUMS

In a correspondence dated July 2, 2007, Marla Chambers of the North Carolina Wildlife Resources Commission (NCWRC) stated that a trout moratorium would not be required for this project. By copy of this letter and attachments, NCDOT hereby requests NCWRC review. NCDOT requests that NCWRC forward their comments to the Corps of Engineers within 30 days of receipt of this application.

CULTURAL RESOURCES

Archaeology

An archaeological survey was conducted to locate existing archaeological resources in the vicinity of the project area and to determine if any of these sites were potentially affected by the project. No additional archaeological investigations for these sites will be required. A copy of this letter is attached with this application package.

Historic Architecture & Section 4(f)

Based on architectural surveys, NCDOT and FHWA have determined that Broughton Hospital is listed on the National Register of Historic Places. The State Historic Preservation Office (SHPO) and FHWA have agreed to a finding of no adverse effect for the Broughton Hospital Historic district. A copy of this letter is attached with this application package.

UTILITY IMPACTS

No utility relocations will result in additional impacts to streams on U-2550B.

FEMA COMPLIANCE

Burke County is a participant in the National Flood Insurance Regular Program, which is administered by the Federal Emergency Management Agency (FEMA). The currently effective FEMA floodplain mapping indicates that the crossing of East Prong Hunting Creek is located within a detailed flood study. The NCDOT Hydraulics Unit is coordinating with the NC Floodplain Mapping Program (FMP) in accordance with NCDOT's Memorandum of Agreement with NC FMP to obtain approval for the project.

INDIRECT AND CUMULATIVE EFFECTS ANALYSIS

The Indirect and Cumulative Effects Update was completed in October 20, 2010. Potential indirect and cumulative impacts within the Growth Impact Study Area (GISA) can be found in the attached memorandum.

MITIGATION OPTIONS

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 and NEPA compliance stages; minimization measures were implemented during the design phase to include the examination of appropriate and practicable steps to reduce adverse impacts from the project.

Avoidance and Minimization for U-2550B: Best Management Practices (BMPs) and measures used on the project are non-structural and attempt to reduce storm water impacts to the receiving streams due to erosion and runoff. NC 18 is a curb and gutter road with associated piped drainage systems. I-40 is typically a shoulder-section road with a few areas of curbing in high fill locations and some areas along the ramps at steeper grades. Where possible, the piped outlets will be discharged into grassed roadside ditches prior to the receiving streams. Where warranted, ditches will be armored with appropriately sized rip rap to provide erosion resistance. Culverts were designed to protect stream stability and provide fish passage where possible. In locations where the proposed alignment will be shifted from the current alignment, the existing pavement will be removed. The remaining areas will then be replanted with vegetation. Natural stream design will be used in the stream relocation.

Minimization on U-2550B

Minimization includes the examination of appropriate and practicable steps to reduce the adverse impacts. General minimization techniques implemented include the following:

- Pipe Culvert Design: Pipe culvert and box culvert inverts are to be buried 20% of the pipe diameter, up to 1 foot deep. All pipe culverts and box culverts will

maintain the normal stream flow and channel characteristics. The design will allow unimpeded passage by fish and other aquatic organisms.

Site specific minimization efforts that have been employed on U-2550B include:

- Site 4 (Sheet 5, Station 47+99/49+50-Y1-): 115' of East Prong Hunting Creek will be day-lighted by the replacement of the existing culverts with bridges.
- Site 4 (Sheet 5, Station 49+50-Y1-): impacts to A UT to East Prong Hunting Creek (Mexican Restaurant UT) will be minimized by the proposed construction.
- Site 5 (Sheet 9, Station 32+05/32+45-Y1-): The existing pipe will be retained and relined instead of excavating and replacing the pipe.
- Site 6 (Sheet 9, Station 34+75/35+06-Y1-): The existing pipe will be retained and relined instead of excavating and replacing the pipe.

Compensation for U-2550B

Based upon the agreements stipulated in the "Memorandum of Agreement Among the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U.S. Army Corps of Engineers, Wilmington District" (MOA), it is understood that the North Carolina Department of Environment and Natural Resources Ecosystem Enhancement Program (EEP), will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for NCDOT projects. The offsetting mitigation will derive from an inventory of assets already in existence within the same 8-digit cataloguing unit. The Department has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above.

Compensatory Stream Mitigation: Stream impacts total 1,350 linear feet (lf) of impacts to perennial and intermittent streams.

- During a February 2008 field inspection, a small intermittent stream running along I-40 called Ramp UT (Site 2 – 59 lf of permanent impacts) was determined to be nonmitigable.

- The relocation of the UT to East Prong Hunting Creek (Site 3) will result in 481 lf of natural stream design which will provide mitigation at a ratio of 1:1. Stream restoration credit is proposed where 30-foot buffers can be installed on both sides of the new channel.

- At the May 12, 2010 Permit Drawing Review Meeting (CP4C), mitigation credit was recommended by the agencies for the day-lighting of East Prong Hunting Creek (Site 4 -115 lf).

- Stabilizing the bank of a stream does not require fill in the stream bed and, therefore, under Section 404 of the Clean Water Act, does not constitute Loss of Waters of the U.S. and is not subject to compensatory mitigation by the USACE. The DWQ does require mitigation for stream bank stabilization, at a ratio of 1:1, if the impacts to a particular stream exceed their mitigation threshold of 150 linear

feet. As such, none of the bank stabilization impacts exceed the 150 linear feet threshold; therefore, no mitigation is proposed for the 170 linear feet of bank stabilization for this project.

Therefore, subtracting 59 lf of nonmitigable impacts, 170 lf of bank stabilization impacts, 481 lf of natural stream design credit and 115 lf of day-lighting credit leaves permanent impacts of **525 linear feet** requiring mitigation that will be provided by EEP.

REGULATORY APPROVALS

Application is hereby made for a Department of the Army Individual 404 Permit as required for the above-described activities. We are also hereby requesting a 401 Water Quality Certification from the Division of Water Quality. A state stormwater permit is not required for this project since there are no HQW or ORW waters on or within one mile of the project site. In compliance with Section 143-215.3D(e) of the NCAC, we will provide $570.00 to act as payment for processing the Section 401 permit application previously noted in this application (see Subject line). 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.

If you have any questions or need additional information please call Mr. Jeff Hemphill, at (919) 431-6674. A copy of this application will also be posted at www.ncdot.org/doh/preconstruct/pe/neu/permit.html.

Sincerely,

E. L. Fluck

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

W/attachment
- Mr. Brian Wrenn, NCDWQ (5 Copies)
- Ms. Marella Buncick, USFWS
- Ms. Marla Chambers, NCWRC
- Ms. Jennifer Derby, USEPA-Whitter, NC

W/o attachment (see website for attachments)
- Dr. David Chang, P.E., Hydraulics
- Mr. Dewayne Sykes, P.E., Utilities Unit
- Mr. Greg Perfetti, P.E., Structure Design
- Mr. Mark Staley, Roadside Environmental
- Mr. J.J. Swain, P.E., Division Engineer
- Mr. Roger Bryan , DEO
- Mr. Jay Bennett, P.E., Roadway Design
- Mr. Majed Alghandour, P. E., Programming/TIP
- Mr. Art McMillan, P.E., Highway Design
- Mr. Scott McLendon, USACE, Wilmington
- Mr. Roger Bryan , DEO
- Ms. Beth Harmon, EEP
- Mr. Art McMillan, P.E., Highway Design
- Mr. Phillip Ayscue, NCDOT External Audit
- Mr John Conforti, PDEA Engineer
- Mr. Drew Joyner, PE, Human Environment
- Mr. Clarence W. Coleman, P.E., FHWA
- Ms. LeiLani Paugh, NEU
- Mr. Randy Griffin, NEU

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 Project Development & Environmental Analysis	
6. APPLICANT'S ADDRESS	**9. AGENT'S ADDRESS**
1548 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 919-431-2000	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)
U-2550B

13. NAME OF WATERBODY, IF KNOWN (if applicable)
Fourth Creek, Morrison Creek, Gregory Creek & UTs

14. PROJECT STREET ADDRESS (if applicable)

15. LOCATION OF PROJECT

Burke 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
Please see attached vicinity map and cover letter.

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

Interchange Improvements at the junction of NC 18 (Sterling Street) & I-40 in Morganton including relocating exit/entrance ramps to conform to current Federal Highway Administration standards;. replacing existing I-40 bridges over NC18 with new structures capable of accommodating six travel lanes and. widening NC 18 to four-lanes with dual turn-lanes through the interchange.

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

The purpose of this project is to alleviate existing and future capacity issues by widening NC 18 (Sterling Street) which is the primary route from I-40 to Grace Memorial Hospital and downtown Morganton. The widening of NC 18 will necessitate the removal of the I-40 bridges which will be replaced with wider structures that can incorporate future I-40 lane expansions. The interchange improvements will also address substandard I-40 entrance/exit ramps by lengthening acceleration and deceleration lanes to Federal Highway Administration standards.

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

20. Reason(s) for Discharge

Impacts will result from widening the roadway and shoulders stream relocation and lengthening/replacing hydraulic structures around the interchange of I-40/NC 18.

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

See attached cover letter.

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

See attached cover letter.

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).

Please see adjacent property landowners page in the permit drawing package.

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. Luple for Gregory J. Thorpe, PhD Dec 1, 2010

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.

Ecosystem Enhancement PROGRAM

November 1, 2010

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

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

U-2550B, NC 18 (Sterling Street) and I-40 Interchange, Burke County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory stream mitigation for the subject project. Based on the information supplied by you on October 28, 2010, the impacts are located in CU 03050101 of the Catawba River Basin in the Northern Mountains (NM) Eco-Region, and are as follows:

Catawba 03050101 NM	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	0	695	0	0	0	0	0	0
Mitigation Units (Credits-up to 2:1)	0	1,390	0	0	0	0	0	0

EEP commits to implementing sufficient compensatory stream mitigation credits to offset the impacts associated with this project in accordance with the N.C. Department of Environment and Natural Resources' Ecosystem Enhancement Program In-Lieu Fee Instrument dated July 28, 2010. 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: Ms. Liz Hair, USACE – Asheville Regulatory Field Office
Mr. Brian Wrenn, Division of Water Quality, Wetlands/401 Unit
File: U-2550B

North Carolina Department of Cultural Resources

es G. Martin, Governor
ic Dorsey, Secretary

Division of Archives and History
William S. Price, Jr., Director

September 6, 1991

MEMORANDUM

TO: L. J. Ward, P.E., Manager
Planning and Environmental Branch
Division of Highways
Department of Transportation

FROM: David Brook, Deputy State
Historic Preservation Officer

David Brook

SUBJECT: NC 18 (Sterling Street) from US 70 Bypass to I-40, Morganton, Burke County, U-2550, CH 92-E-4220-0087

We have received notification from the State Clearinghouse concerning the above project.

We have conducted a search of our maps and files and have located the following structures of historical or architectural importance within the general area of the project:

Broughton Hospital Historic District. Enola Road, NC 18, and Bickett Street. The Broughton Hospital Historic District was included in the National Register of Historic Places on November 9, 1987.

Broughton-staff Houses. Both sides of Bickett, Poteat, Eastview, and Bethel streets. The houses on both sides on Bickett Street are included in the National Register-listed Broughton Hospital Historic District. The other houses have not been evaluated for National Register-eligibility.

A map showing the Broughton Hospital Historic District is enclosed.

There are no known archaeological sites within the proposed project area. Based on our present knowledge of the area, it is unlikely that any archaeological resources which may be eligible for inclusion in the National Register of Historic Places will be affected by the project construction. We, therefore, recommend that no archaeological investigation be conducted in connection with this project.

109 East Jones Street • Raleigh, North Carolina 27601-2807

The above comments are made pursuant to Section 106 of the National Historic Preservation Act of 1966 and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106, codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763.

DB:slw

Enclosure

cc: State Clearinghouse
B. Church

North Carolina Department of Cultural Resources

James G. Martin, Governor
Patric Dorsey, Secretary

Division of Archives and History
William S. Price, Jr., Director

July 29, 1992

Nicholas L. Graf
Division Administrator
Federal Highway Administration
Department of Transportation
310 New Bern Avenue
Raleigh, N.C. 27601-1442

Re: NC 18 (Sterling Street) from US 70 Bypass to I-40, Morganton, Burke County, U-2550, 8.1851001, M-8165(1), ER 93-7069

Dear Mr. Graf:

Thank you for your letter of July 15, 1992, concerning the above project. We have reviewed the North Carolina Department of Transportation's (NCDOT) survey findings of properties over fifty years of age located in the area of potential effect.

The following property is listed in the National Register of Historic Places:

Broughton Hospital Historic District. The district was included in the National Register on November 9, 1987.

For purposes of compliance with Section 106 of the National Historic Preservation Act, we concur that the following properties are not eligible for listing in the National Register of Historic Places for the reasons cited:

Properties less than fifty years of age:

Modern Building (No. 6)

House (No. 27)

House (No. 30)

Commercial Building (No. 31)

Church (No. 32)

House (No. 33)

Commercial Building (No. 35)

109 East Jones Street • Raleigh, North Carolina 27601-2807

Properties that have undergone character-altering changes:

House (No. 17)

House (No. 36)

Properties that lack architectural significance and have no known association with Broughton Hospital:

House (No. 18)

House (No. 28)

House (No. 29)

House (No. 34)

In addition, we have reviewed the documentation provided to us to determine the effect of this project upon the Broughton Hospital Historic District. We understand that NCDOT will replace, in-kind and in an informal pattern appropriate to the hospital grounds, any trees or shrubs removed for the project. Based upon this commitment, we concur with NCDOT's determination of No Adverse Effect upon the Broughton Hospital Historic District.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act of 1966 and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106, codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763.

Sincerely,

David Brook
Deputy State Historic Preservation Officer

DB:slw

cc: L. J. Ward
B. Church

Advisory Council On Historic Preservation

The Old Post Office Building
1100 Pennsylvania Avenue, NW, #809
Washington, DC 20004

APR 20 1994

Mr. Nicholas L. Grab
Division Administrator
Federal Highway Administration
310 New Bern Avenue, Suite 410
Raleigh, NC 27601

REF: Proposed Improvements to NC 18 (Sterling Street)
From US 70 Bypass to I-40
Morganton, Burke County, North Carolina

Dear Mr. Grab:

On April 8, 1994, the Council received your determination, supported by the North Carolina State Historic Preservation Officer (SHPO), that the referenced undertaking will have no adverse effect upon the Broughton Hospital Historic District, which included in the National Register of Historic Places. Pursuant to Section 800.5(d)(2) of the Council's regulations, "Protection of Historic Properties" (36 CFR Part 800), we do not object to your determination. Therefore, you are not required to take any further steps to comply with Section 106 of the National Historic Preservation Act other than to implement the undertaking as proposed and consistent with any conditions you have reached with the North Carolina SHPO.

Thank you for your cooperation.

Sincerely,

[illegible] L. Klima
Director
Eastern Office of Review

Final Minutes for Avoidance and Minimization and Hydraulic Design Review Meeting
U-2550B
Morganton- NC18 and I-40 Interchange

A combined Avoidance and Minimization/ Hydraulic Design Review Meeting was held on Wednesday, January 23, 2008 in the Hydraulics Design conference room at the NCDOT Century Center Complex, Raleigh.

Team Members:
Andrew Nottingham-NCDOT Hydraulics, present
Ryan White: NCDOT PDEA, present
David Baker: USACE, present
Marella Buncick: USFWS, present
Marla Chambers: NCWRC, present
Brian Wrenn: NCDWQ, present
Chris Militscher: EPA absent
Kathy Matthews: EPA, present
Donnie Brew: FHWA, absent
David Harris: REU, absent
Gary Lovering: Roadway, present
Roy Girolami: NCDOT Structures, present
John Conforti: NCDOT PDEA, present
Carla Dagnino: NCDOT NEU, present
Ricky Tipton: Division 13, present

Participants:
Jeff Hemphill: NCDOT NEU
Troy Wilson: USFWS
John Nigro: NCDOT Project Services, Utilities
Brian Lipscomb, NCDOT Hydraulics
Stephen Morgan, NCDOT Hydraulics

The meeting began at 4:00 p.m. with introductions and NCDOT Hydraulics giving a brief description and history of the project. PDEA distributed documents explaining the project background and impacts.

PDEA noted that a UT to East Prong creek will need to be relocated along the I-40 west bound off ramp. A portion of East Prong Creek will be enclosed by a culvert between the I-40 crossing and the NC18 crossing to accommodate the I-40 west bound on-ramp; rock plating would be used at two locations to allow steeper slopes and reduce the required length of stream crossing structures. The group then discussed the exact location and classification of the remaining jurisdictional streams on the project. NEU stated that all

streams would need to be verified again because the original permit expires in the summer of 2008.

The group inquired about the justification of realigning the west bound I-40 off-ramp. NCDOT responded that the realignment was needed to achieve better horizontal and vertical alignments, as well as to accommodate the temporary detour along I-40. USFWS noted the degraded condition of the UT along the ramp, with little existing natural buffers. NCDOT proceeded to discuss the stream relocation along this portion of the project, saying the new stream would provide bank full relief, but would maintain a relatively straight alignment similar to the existing stream. DWQ inquired about the proposed buffer of the stream. NCDOT stated the new stream would have approximately 10' of floodplain either side of the relocated channel. DWQ stated this might not meet the threshold for on-site mitigation. EPA deferred the call on mitigation to DWQ, but stated some credit for on-site mitigation should be warranted, noting the present stream's condition. NCDOT noted the stream appears to have been relocated during the original I40/NC18 project, and presently is incised with a 3' drop at the outlet of the 78" cross pipe. NEU/COE estimated the stream will require 1:1mitigation. NCWRC, USFWS agreed a drop structure, if needed, would be acceptable for energy dissipation at the outlet of the 78" pipe crossing. NCDOT stated natural stream design would be used for the relocation.

NCDOT inquired if the group would prefer using the rock plating and 1.5:1 slopes to reduce the culvert length as stated earlier, or if using 2:1 vegetated slopes was acceptable. NCDOT stated the I-40 culvert would need to be extended approximately 5' even with rock plating. Without plating the culvert would be extended an additional 15'. The group noted that the vegetated slope option would be acceptable.

NCWRC inquired about the west bound I-40 on-ramp alignment, which will require the creek to be enclosed between the two existing culverts. NCDOT explained the current alignment presents unacceptable queuing of traffic along NC18, thus the revision.

NCDOT noted locations where treatment of roadway drainage might be achieved. The treatment option would be grass swales.

NCDOT inquired of the group if 2:1 vegetated slopes instead of 1.5:1 rock plated slopes could be used at the entrance of the 78" pipe crossing for the UT. The group noted that the 2:1 vegetated slope would be acceptable.

The meeting was adjourned at 4:50pm.

Final Minutes for Permit Drawing Review Meeting
U-2550B
Morganton- NC18 and I-40 Interchange

A Permit Drawing Review Meeting was held on Wednesday, March 18, 2009 in the Hydraulics Design conference room at the NCDOT Century Center Complex, Raleigh.

Team Members:
Andrew Nottingham-NCDOT Hydraulics, present
David Baker: USACE, present
Marella Buncick: USFWS, present
Marla Chambers: NCWRC, present
Brian Wrenn: NCDWQ, present
Kathy Matthews: EPA, present
Donnie Brew: FHWA, present
Mark Staley for David Harris: REU, present
Gary Lovering: Roadway, present
Roy Girolami: NCDOT Structures, present
John Conforti: NCDOT PDEA, present
Carla Dagnino: NCDOT NEU, present
Ricky Tipton: Division 13, absent

Participants:
Elizabeth Lusk: NCDOT NEU
Laura Sutton: NCDOT Structures
LeiLani Paugh: NCDOT NEU
Jamie Lancaster: NCDOT NEU
Brian Lipscomb, NCDOT Hydraulics
Stephen Morgan, NCDOT Hydraulics

The meeting began at 1:00 p.m. with introductions. NCDOT noted that a combined avoidance/minimization and hydraulic design (4A/4B) meeting was previously held on January 23, 2008, the minutes of which are attached.

NCDOT Hydraulics began a brief description of the project and advised the group to refer to the drawings cover sheet for orientation and site locations.

The group discussed the culvert impacts shown as sites 1, 2, 3, and 4. NCDOT described how storm water will be routed into the culvert. The group discussed the need for baffles. Baffles would be a retrofit in the existing culvert. The group decided the condition of the existing culvert and the quality of the stream would not warrant baffles. FEMA regulations further complicate baffle usage.

EPA asked if there are opportunities to provide storm water treatment. NCDOT discussed the storm water system design and noted locations where storm water will be routed through roadway ditches prior to entering streams . DWQ inquired about the 48" pipe crossing NC18 between site 3 and the culvert. NCDOT explained that the pipe will be needed for flooding relief. The inverts will be set such that only high flows will use the crossing. USACE asked if the small tributary along ramp B was added to the impacts for East Prong Creek at site2. NCDOT said it was.

The group then discussed the natural stream design for site 3. NCDOT indicated the latest design shows a minimum of a 30' vegetated buffer around the stream that will be contained in controlled-access right-of-way. The species selection for reforestation will be sensitive to site conditions; smaller tree and shrub species may be planted along the slopes and areas where visibility may be a concern. For roadside maintenance, NCDOT will only mow a small strip along the ramp which would be outside the 30' buffer. The group discussed the outlet stability of the 15" pipe at site 3 and decided to revise the outlet to provide better energy dissipation. NCDOT said this would likely be accomplished with a junction box and larger pipe outlet that can be partially buried and laid at a flat slope. The rip rap pad would be retained for bank protection. The group discussed the stream design parameters, noting that the stream cross section will be a more stable section than the existing stream section. With the increased buffers and natural stream design, DWQ indicated full mitigation credit would be allowed for site 3.

NCDOT will revise the topography at site 5 to show that the jurisdiction stream actually connects to the entrance of the 66" pipe. NCWRC inquired if the pipe outlet at site 6 is stable. NCDOT will investigate if bank protection measures are warranted. The group discussed if addition armoring was needed at site 7, and agreed it was. NCDOT will add additional bank protection at the 78" pipe entrance and Ramp C ditch outlet.

NCDOT inquired if there was any further discussion on any item. Hearing none, the meeting was adjourned at 1:50pm.

SRM

Final Minutes for Second Permit Drawing Review Meeting
U-2550B
Morganton- NC18 and I-40 Interchange

A Permit Drawing Review Meeting was held on Wednesday, May 12, 2010 in the Hydraulics Design conference room at the NCDOT Century Center Complex in Raleigh to discuss changes since the previous 4C meeting on March 18, 2009.

Team Members:
Andrew Nottingham-NCDOT Hydraulics, present
David Baker: USACE, present
Marella Buncick: USFWS, present
Marla Chambers: NCWRC, present
Brian Wrenn: NCDWQ, not present; comments via email
Chris Militscher: EPA, present
Mark Staley: REU, present
Gary Lovering: Roadway, present
Roy Girolami: NCDOT Structures, present
Carla Dagnino: NCDOT NEU, present
Ricky Tipton: Division 13, not present
Donnie Brew: FHWA, not present
John Conforti: PDEA, not present

Participants:
Elizabeth Lusk: NCDOT NEU
Laura Sutton: NCDOT Structures
LeiLani Paugh: NCDOT NEU
Jamie Lancaster: NCDOT NEU
Stephen Morgan, NCDOT Hydraulics

The meeting began at 2:10 p.m.

Due to a scheduling conflict, NCDOT met separately with DWQ prior to the current meeting (see addendum). NCDOT noted that a permit drawing review meeting was previously held on March 18, 2009. Since that time, some changes have occurred that warranted the current meeting. The most significant change was the removal of the existing culvert under I-40 and replacing it with a bridge. NCDOT said this option was needed because the existing culvert is failing and would not support additional roadway fill. Also, the option was approximately one million dollars less expensive than removing and replacing the culvert with a culvert. This impact will affect Site 4. Additionally, due to regulations by Duke Power Company, the ramp interchange under the power line had to be located away from the overhead power line easement. This affected the interchange design, which affected the stream impacts and stream relocation at Site 3. Permanent stream impacts at Site 3 increased from 776 feet to 865 feet. The amount of on-site stream mitigation at Site 3 decreased from 702 feet to 481 feet.

The permit drawings were then discussed site-by-site.

Site 1 and 2 had no changes.

Site 3 involves the relocation of an unnamed tributary to the East Prong of Hunting Creek. NCDOT said the rip rap shown in the stream was on the banks only and was needed where the stream benches narrowed below 10' where the ramp was realigned from the previous design. NCDOT asked if the mitigation ratio would be 1:1. COE said the ratio for mitigation would be a 1:1 ratio. (Note the previous 4C minutes show a 1:1 was agreed upon). NCWRC asked if the tail ditch from the pipe outlet approximately mid-way of the stream relocation could be aligned in a more down-stream angle. NCDOT said it could be, and would realign the tail ditch. COE asked about the limits of the rip rap. NCDOT explained that the rip rap was shown in the area that will not be receiving mitigation credits. NCWRC asked if the steam design is the same. NCDOT said the design is the same, just slightly shifted to follow the new ramp alignment, and the floodplain bench had to be reduced through the armored section where the ramp is closest to the service road. NCWRC asked if the stream joins the culvert downstream. NCDOT said it does, and an overflow pipe will be added at a higher elevation than the stream grade to convey larger flood events directly into the new section of the culvert under NC18. COE asked what the length of the portion of the stream relocation that did not have 30 ft buffers was at Site 3. NCDOT noted this length was approximately 265 ft.

Site 4 involves the removal of the existing box culvert under I-40 and replacing it with a single span bridge. NCDOT said the culvert and roadway fill will be removed after the bridge is constructed. DWQ had asked that the amount of rip rap at the site be reduced (see attached comments). NCDOT said the rip rap was needed for stabilization, and would look for opportunities to reduce the amount. NCDOT Geotechnical Unit will need to provide comments concerning stability of the slope. USFWS asked if deck drains would be located on the bridge. NCDOT said there would not be deck drains, and the deck drainage would be piped away from the stream as far as possible. NCDOT will pipe the storm drain inlet on I-40 east of the bridge to the next inlet east and will investigate adding rock check dams to the ditch that this system drains to prior to it entering the creek.

Site 5 had no changes.

The change at **Site 6** was the addition of bank stabilization as requested by the group at the previous permit drawing review meeting.

The change at **Site 7** was the addition of bank stabilization as requested by the group at the previous permit drawing review meeting.

Other discussion:
The group discussed possible mitigation credit for removal of the culvert and day lighting the stream at site 4. EPA said some incentive should be considered, otherwise there is no perceived benefit of bridging. NCDOT proposed using the culvert removal as well as planting the remaining portion of the stream relocation without 30 ft buffers at site 3 to

offset mitigation for all the stream impacts at site 3. The group was in agreement that offsetting mitigation is reasonable. NCWRC asked if vegetation could be established along the reestablished stream under I-40. NCDOT said where it was possible, the floodplain bench would be re-planted with appropriate vegetation. NCDOT noted that the rip rap benches shown in the lower portion of the stream were lower than the existing bank-full depth and are expected to silt over and reestablish vegetation in time.

The group had no further comments or discussion.
The meeting was adjourned at 3:00 pm.

Addendum:

NCDOT Hydraulics and DWQ met at the DWQ office on May 4th, 2010. DWQ said the new ramp design was acceptable. For Site 3, DWQ said on-site mitigation would only be considered for the relocated stream having a full 30' restored buffer. DWQ requested that the changes in impacts and reasons for changes should be explained.
For site 4, DWQ said a construction sequence needs to be developed for the removal of the box culvert, including dewatering and stabilization techniques; an upstream grade control such as a cross vane may be needed; try to minimize rip rap under bridge; try to eliminate direct discharge of storm water upstream of bridge- investigate vegetative conveyance.

Additional comments:

See attached email from DWQ concerning the stream mitigation site (Site 3) in response to the draft meeting minutes

Attachment

SRM

Nottingham, Andrew T

From: Wrenn, Brian

Sent: Monday, June 14, 2010 9:22 AM

To: Wrenn, Brian; Nottingham, Andrew T; Chambers, Marla J; Buncick, Marella; 'Baker, David; Militscher, Chris; Hemphill, Jeffrey L

Subject: RE: U-2550 mitigation

Based on my site visit on Friday, I have some comments:

- The stream at Site 3 has surprisingly decent biology. We found mayflies, caddisflies, damselflies, fish (some as big as 4" long), salamanders (mature and juvenile), and crayfish.
- The upper sections of the stream are incised and unstable with large erosional areas along the banks, some as high as 7' tall. There is also evidence of a recent slope failure on the slope adjacent to the exit ramp. The lower sections of the stream are very stable and less incised with good riffle-pool sections.
- The stream has a dense buffer along the length in question. The upper sections are lower growth woody vegetation and herbaceous, while the lower sections have large trees and shrubs with much less herbaceous vegetation.
- It is clear that the lower sections are in better shape due to the mature trees and shrubs in the buffer despite the steep slopes on the exit ramp side of the stream. In this section, there is also a ~40 foot wide floodplain along the northern stream bank.
- DWQ is concerned that when the stream is relocated with steep fill slopes on either side, it will be difficult to establish a stable stream. It will also be very difficult to establish a good wooded buffer along the stream on these steep fill slopes. Compounding the difficulties of establishing a good buffer will be vegetation management by businesses along the stream reach. Currently, a large part of the buffer is being mowed/sprayed to allow visibility of businesses to travelers on I-40. In addition, the power line easement will cross the upper part of the relocation buffer. Spraying along the easement will prohibit any good establishment of a wooded buffer.
- Bottom line, I'm not sure this is a good stream relocation for on-site mitigation. The present biology will be wiped out by the relocation with little to no upstream source of replacement biology due to the upstream culvert. A slow growing buffer to stabilize the steep banks will result in an unstable stream with minimal floodplain access. I would rather a stable channel be established, and mitigation found off-site.

Just my thoughts, I am open to any comments or discussion points I may have missed. Thanks and sorry for the long email.

Brian

From: Wrenn, Brian
Sent: Wednesday, June 09, 2010 8:33 AM
To: Nottingham, Andrew T; Chambers, Marla J; Buncick, Marella; 'Baker, David; Militscher, Chris; Hemphill, Jeffrey L
Subject: U-2550 mitigation

After discussions with others in DWQ regarding the proposed on-site mitigation site for this project, I will be visiting the site to make an assessment of the current stream conditions. Based on this visit, I will provide input on DWQ's opinion regarding possible mitigation credit.

At this time, my feelings are that too many times in the past we have allowed on-site mitigation in situations that were not optimal. The resulting projects were essentially ditches with grade control confined between steep fill slopes with little wooded buffer. DWQ will continue to promote on-site mitigation, but we are also trying to learn

from past mistakes. I feel like the proposed mitigation site for U-2550 will end up being one of these poor sites we shoe-horned in just to get on-site mitigation.

I will be visiting the site on Fri., June 11 at 10 am. I know that is short notice, but if anyone wants to join me, feel free to meet me in the Hampton Inn parking lot at 10 am.

Thanks,
Brian

Draft Minutes for Second Permit Drawing Review Meeting
U-2550B
Morganton- NC18 and I-40 Interchange

A Permit Drawing Review Meeting was held on Wednesday, May 12, 2010 in the Hydraulics Design conference room at the NCDOT Century Center Complex in Raleigh to discuss changes since the previous 4C meeting on March 18, 2009.

Team Members:
Andrew Nottingham-NCDOT Hydraulics, present
David Baker: USACE, present
Marella Buncick: USFWS, present
Marla Chambers: NCWRC, present
Brian Wrenn: NCDWQ, not present; comments via email
Chris Militscher: EPA, present
Mark Staley: REU, present
Gary Lovering: Roadway, present
Roy Girolami: NCDOT Structures, present
Carla Dagnino: NCDOT NEU, present
Ricky Tipton: Division 13, not present
Donnie Brew: FHWA, not present
John Conforti: PDEA, not present

Participants:
Elizabeth Lusk: NCDOT NEU
Laura Sutton: NCDOT Structures
LeiLani Paugh: NCDOT NEU
Jamie Lancaster: NCDOT NEU
Stephen Morgan, NCDOT Hydraulics

The meeting began at 2:10 p.m. NCDOT noted that a permit drawing review meeting was previously held on March 18, 2009. Since that time, some changes have occurred that warranted the current meeting. The most significant change was the removal of the existing culvert under I-40 and replacing it with a bridge. NCDOT said this option was needed because the existing culvert is failing and would not support additional roadway fill. Also, the option was approximately one million dollars less expensive than removing and replacing the culvert with a culvert. This impact will affect Site 4. Additionally, due to regulations by Duke Power Company, the ramp interchange under the power line had to be located away from the overhead power line easement. This affected the interchange design, which affected the stream impacts and stream relocation at Site 3. Permanent stream impacts at Site 3 increased from 776 feet to 865 feet. The amount of on-site stream mitigation at Site 3 decreased from 702 feet to 535 feet.

The permit drawings were then discussed site-by-site.

Site 1 and 2 had no changes.

Site 3 involves the relocation of an unnamed tributary to the East Prong of Hunting Creek. Prior to the meeting, NCDOT met with DWQ (see attached comments), and DWQ indicated that on-site mitigation would only be considered for the relocated stream having a full 30' restored buffer. NCDOT said the rip rap shown in the stream was on the banks only and was needed where the stream benches narrowed below 10' where the ramp was realigned from the previous design. NCDOT asked if the mitigation ratio would be l:1. COE said the ratio for mitigation would be a 1:1 ratio. (Note the previous 4C minutes show a 1:1 was agreed upon). NCWRC asked if the tail ditch from the pipe outlet approximately mid-way of the stream relocation could be aligned in a more down-stream angle. NCDOT said it could be, and would realign the tail ditch. COE asked about the limits of the rip rap. NCDOT explained that the rip rap was shown in the area that will not be receiving mitigation credits. NCWRC asked if the steam design is the same. NCDOT said the design is the same, just slightly shifted to follow the new ramp alignment, and the floodplain bench had to be reduced through the armored section where the ramp is closest to the service road. NCWRC asked if the stream joins the culvert downstream. NCDOT said it does, and an overflow pipe will be added at a higher elevation than the stream grade to convey larger flood events directly into the new section of the culvert under NC18. COE asked what the length of the portion of the stream relocation that did not have 30 ft buffers was at Site 3. NCDOT noted this length was approximately 265 ft.

Site 4 involves the removal of the existing box culvert under I-40 and replacing it with a single span bridge. NCDOT said the culvert and roadway fill will be removed after the bridge is constructed. DWQ had asked that the amount of rip rap at the site be reduced (see attached comments). NCDOT said the rip rap was needed for stabilization, and would look for opportunities to reduce the amount. NCDOT Geotechnical Unit will need to provide comments concerning stability of the slope. USFWS asked if deck drains would be located on the bridge. NCDOT said there would not be deck drains, and the deck drainage would be piped away from the stream as far as possible. NCDOT will pipe the storm drain inlet on I-40 east of the bridge to the next inlet east and will investigate adding rock check dams to the ditch that this system drains to prior to it entering the creek.

Site 5 had no changes.

The change at **Site 6** was the addition of bank stabilization as requested by the group at the previous permit drawing review meeting.

The change at **Site 7** was the addition of bank stabilization as requested by the group at the previous permit drawing review meeting.

Other discussion:
The group discussed possible mitigation credit for removal of the culvert and day lighting the stream at site 4. EPA said some incentive should be considered, otherwise there is no perceived benefit of bridging. NCDOT proposed using the culvert removal as well as

planting the remaining portion of the stream relocation without 30 ft buffers at site 3 to offset mitigation for all the stream impacts at site 3. The group was in agreement that offsetting mitigation is reasonable. NCWRC asked if vegetation could be established along the reestablished stream under I-40. NCDOT said where it was possible, the floodplain bench would be re-planted with appropriate vegetation. NCDOT noted that the rip rap benches shown in the lower portion of the stream were lower than the existing bank-full depth and are expected to silt over and reestablish vegetation in time.

The group had no further comments or discussion.
The meeting was adjourned at 3:00 pm.

Attachments

SRM

Nottingham, Andrew T

From: Wrenn, Brian
Sent: Tuesday, May 11, 2010 11:08 AM
To: Nottingham, Andrew T
Cc: Hemphill, Jeffrey L
Subject: U-2550B

Thanks for meeting with me before the hydro meeting to get my comments. I've summarized them below. If you have any questions on these, please let me know. Thanks.

Brian

- Site 4 – A construction sequence needs to be developed for the removal of the box culvert. This should include dewatering and stabilization techniques. May need to investigate upstream grade control (cross vane) to prevent headcutting in new channel. Try to minimize use of rip rap under bridge. I understand that you want the area to be stable, but if there are other ways to stabilize without excessive use of rip rap, they should be used. Try to eliminate the direct discharges of stormwater on upstream side of bridge. Investigate potential of vegetative conveyances in this area.
- Site 3 – I'm ok with the new ramp designs. However, DWQ can only provide mitigation credit for stream reaches with 30' buffers on both sides of stream channel. Meeting minutes should detail the changes in impacts and in onsite mitigation totals and the reason for the changes.

Brian Wrenn
Transportation Permitting Unit, NCDWQ
2321 Crabtree Bvd., Ste 250
Raleigh, NC 27604
919-733-5715 (phone)
919-733-6893 (fax)
PLEASE NOTE THAT MY EMAIL ADDRESS HAS CHANGED
brian.wrenn@ncdenr.gov

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

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

SECTION I: BACKGROUND INFORMATION

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

B. DISTRICT OFFICE, FILE NAME, AND NUMBER:

C. PROJECT LOCATION AND BACKGROUND INFORMATION: TIP# NCDOT
State: NC County/parish/borough: Burke City: Morganton
Center coordinates of site (lat/long in degree decimal format): Lat. 35° N, Long. 82° W.
Universal Transverse Mercator:
Name of nearest waterbody: East Prong Hunting Creek
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Catawba River
Name of watershed or Hydrologic Unit Code (HUC): 03050101
☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):
☐ Office (Desk) Determination. Date:
☐ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There Are no *"navigable waters of the U.S."* within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]
☐ Waters subject to the ebb and flow of the tide.
☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
Explain: .

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

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

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

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
      Non-wetland waters: 2,000 linear feet: width (ft) and/or acres.
      Wetlands: 0 acres.

   c. **Limits (boundaries) of jurisdiction** based on: 1987 Delineation Manual
      Elevation of established OHWM (if known): .

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

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

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

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

1. **TNW**
   Identify TNW: .

   Summarize rationale supporting determination: .

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

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

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

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

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

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

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

   (i) General Area Conditions:
   Watershed size: Pick List
   Drainage area: Pick List
   Average annual rainfall: inches
   Average annual snowfall: inches

   (ii) Physical Characteristics:
   (a) Relationship with TNW:
   ☐ Tributary flows directly into TNW.
   ☐ Tributary flows through Pick List tributaries before entering TNW.

   Project waters are Pick List river miles from TNW.
   Project waters are Pick List river miles from RPW.
   Project waters are Pick List aerial (straight) miles from TNW.
   Project waters are Pick List aerial (straight) miles from RPW.
   Project waters cross or serve as state boundaries. Explain: .

   Identify flow route to TNW[5]: .
   Tributary stream order, if known: .

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.
[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

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

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

Tributary properties with respect to top of bank (estimate):
Average width: feet
Average depth: feet
Average side slopes: Pick List.

Primary tributary substrate composition (check all that apply):

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

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

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

Surface flow is: Pick List. Characteristics: .

Subsurface flow: Pick List. Explain findings: .
☐ Dye (or other) test performed: .

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

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

☐ Discontinuous OHWM.[7] Explain: .

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

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

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

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

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

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

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

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size: acres

Wetland type. Explain: .

Wetland quality. Explain: .

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

(b) General Flow Relationship with Non-TNW:

Flow is: Pick List. Explain: .

Surface flow is: Pick List

Characteristics: .

Subsurface flow: Pick List. Explain findings: .

- ☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:

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

(d) Proximity (Relationship) to TNW

Project wetlands are Pick List river miles from TNW.

Project waters are Pick List aerial (straight) miles from TNW.

Flow is from: Pick List.

Estimate approximate location of wetland as within the Pick List floodplain.

(ii) Chemical Characteristics:

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

Identify specific pollutants, if known: .

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

- ☐ Riparian buffer. Characteristics (type, average width): .
- ☐ Vegetation type/percent cover. Explain: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

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

All wetland(s) being considered in the cumulative analysis: Pick List

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

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

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

C. SIGNIFICANT NEXUS DETERMINATION

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

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

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

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

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

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

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

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

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

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☒ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: DWQ rating form greater than 30.
   - ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

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

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

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

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
   - ☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: **87 Corps Manuel Wetland criteria were met in areas adjacent to RPWs.**

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

   Provide acreage estimates for jurisdictional wetlands in the review area: **0.47** acres.

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

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

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

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

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

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

Identify water body and summarize rationale supporting determination: .

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

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

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

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

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

SECTION IV: DATA SOURCES.

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

B. ADDITIONAL COMMENTS TO SUPPORT JD: .

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY PURDUE
GOVERNOR

GENE CONTI
SECRETARY

October 20, 2010

MEMORANDUM

TO: Jeffrey Hemphill, Western Environmental Specialist
Natural Environment Project Management Group-NEU

FROM: Tristram Ford, Community Planner
Public Involvement and Community Studies-HEU

SUBJECT: ICE update for TIP No. U-2550B; Project No. 8.1851001, Federal Aid Project No. M-8165(1); Proposed modification of the existing NC 18 / I-40 interchange and widening of NC 18 / Sterling Road; City of Morganton, Burke County.

This memorandum details the additional Indirect and Cumulative Effects analysis/ language to be included in the U-2550B permit application, as needed.

Please let us know if we may be of further assistance.

ICE Update-U-2550B Burke County

TIP Project U-2550B is the proposed modification of the existing NC 18/I-40 interchange in Morganton, Burke County. As part of the reconfiguration, the existing I-40 bridges over NC 18 will be reconstructed in order to provide the required horizontal clearance for widened NC 18. The I-40 westbound off-ramp will be realigned in order to accommodate a temporary on-site detour. The I-40 westbound on-ramp will be realigned to tie into the current intersection of NC 18 and the I-40 westbound off-ramp. Acceleration and deceleration lanes along I-40 will also be extended in order to improve safety for traffic entering and exiting the highway. The project also proposes a multi-lane widening of NC 18 (Sterling Street) to be completed as TIP Project U-2550. NC 18 will be widened to a four-lane concrete median divided facility from Tabernacle Church Road to Grace Hospital Drive as part of this portion of the project.

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
OFFICE OF HUMAN ENVIRONMENT
1583 MAIL SERVICE CENTER
RALEIGH NC 27699-1583

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WEBSITE: WWW.NCDOT.ORG

LOCATION:
PARKER LINCOLN BUILDING
2728 CAPITAL BOULEVARD, SUITE 168
RALEIGH, NC 27604

The scope of proposed project is limited, as it consists primarily of an existing location interchange reconfiguration and widening. Access currently exists to adjacent parcels in all four quadrants of the interchange and along NC 18. Consequently, the exposure of adjacent parcels will remain the same. It is expected that the increased capacity of the roadway due to the project will result in very slight travel time savings and a minor change in traffic patterns. However, the lack of notable transportation impact causing activities will greatly reduce the potential for induced growth and change in land use.

The City of Morganton provides water and sewer service to the project area. Both services are available, through existing infrastructure, to all quadrants of the NC 18/I-40 interchange. All the land in the project area is within Morganton's planning jurisdiction and is subject to the *City of Morganton Zoning Ordinance*.

There is available land in the northwest quadrant to the east of W. Parker Road. Parcels in this quadrant are zoned Heavy Industrial (HI), General Business (GB), Office and Institutional (OI) and Residential High (RH).

There is available land in the southwest quadrant to the north of Brookwood Road. Parcels in this quadrant are zoned Residential Medium (RM), General Business (GB) and Light Industrial Conditional Use (LI-CU).

Available land in the northeast quadrant along Bush Drive is zoned General Business (GB). Vacant parcels in the southeast quadrant are zoned General Business (GB) and Residential High (RH)

According to the North Carolina Employment Security Commission data for the Western Piedmont Workforce Development Board (WBD), employment growth is projected remain static with an annualized rate of approximately 0% through 2016. According to the North Carolina State Demographics Unit, Burke County's population is projected to increase at a 0.38% annual rate through the year 2020.

There are no targeted or threatened resources in the immediate project area. However, there is a stream, Hunting Creek, located approximately 8000 feet to the northwest of the northern terminus of the project, which is listed on the draft 2010 303(d) list of impaired streams as being ecologically/biologically impaired.

The project is located within the Protected WS-IV Lake Rhodhiss Water Supply Watershed. As a result, all future development is required to conform to requirements contained within the *Burke County Watershed Water Supply Protection Ordinance.* Requirements include; erosion and sedimentation control, stormwater runoff protection measures that incorporate best management practices to minimize water quality impacts, density and buffer requirements and the specification of allowed land uses.

In conclusion, this project has the potential to minimally increase the development potential of and intensity in the areas adjacent to NC 18/Sterling Road. However, development already has occurred in these quadrants following established zoning and would be required to conform to existing development regulations. Furthermore, any future development will be in the form of infill. There are parcels of available land in all

four quadrants of the interchange and water and sewer service is available within the entire project area. In addition, employment and population trends are forecast to be flat and low to moderate growth, respectively.

Direct natural environmental impacts by NCDOT projects will be addressed by programmatic agreements with resource agencies, and will be further evaluated by the NCDOT Natural Environment Unit during project permitting. Natural environmental impacts that may result from any induced development may be avoided or minimized through the implementation of local, state and federal regulations. Because few indirect impacts are anticipated, the cumulative effect of this project when considered in the context of other past present and future actions, and the resulting impact on the notable human and natural features, should be minimal. Therefore, potential indirect and cumulative effects to downstream water quality should be minimal.

TBF

cc: Steve Gurganus, AICP, Community Studies Team Leader, PDEA HEU
Colin Mellor, Environmental Supervisor, NEU
Elizabeth Lusk, Supervisor, Natural Environment Project Management Group, NEU

STORMWATER MANAGEMENT PLAN

U-2550B, WBS No.: 34831.1.1 Date:06/25/10
Burke County
Hydraulics Project Manager: Andrew Nottingham, PE

ROADWAY DESCRIPTION

TIP Project U-2550B proposes to modify the existing interchange at the intersection of I-40 and NC18 in Morganton. The project also proposes to continue the multi-lane widening of NC18 (Sterling Street) completed under Tip project U-2550. NC 18 will be widened to a four-lane, concrete median divided facility. To accomplish this, the I-40 bridge over NC 18 will need to be reconstructed in order to provide adequate horizontal clearance. An on-site detour and temporary structure will be constructed to maintain traffic along I-40 during construction. The I-40 westbound off-ramp will be realigned in order to accommodate the temporary onsite detour. The I-40 westbound on-ramp will be realigned to tie into the current intersection of NC 18 and the I-40 westbound off-ramp. Acceleration and deceleration lanes along I-40 will also be extended improving safety for traffic entering and exiting the highway.

ENVIRONMENTAL DESCRIPTION AND IMPACTS

The project is located in the Catawba River Basin (HUC-03050101); Sub-basin 03-08-31 and crosses East Prong Hunting Creek. Adjacent to the proposed improvements are two perennial streams: an unnamed tributary to East Prong Hunting Creek (*UT to East Prong Hunting Creek*) and an additional unnamed tributary (*UT1*). East Prong Hunting Creek crosses under I-40 and then under NC 18 (Sterling St.) directly north of the interchange through 10'x 11' triple box culverts. *UT to E. Prong Hunting Creek* runs westwards paralleling the I-40 eastbound lanes. It then crosses under I-40 through a 78-inch diameter, 345-foot long steel pipe culvert. *UT to E. Prong Hunting Creek* then parallels the I-40 westbound off-ramp and Bush Drive for approximately 835 feet before flowing into East Prong Hunting Creek. *UT1* flows from a pond adjacent to Bush Drive and then through a 350-foot long, 66-inch diameter steel pipe culvert before flowing into *UT to E. Prong Hunting Creek.*

Impacts to East Prong Hunting Creek will involve extending the existing triple-barrel culvert upstream (south) of NC 18 and downstream (north) of NC18 to accommodate the realigning of the westbound I-40 on-ramp with the westbound I-40 off-ramp. Also the existing triple barrel culvert under I-40 will be removed and replaced with a single-span bridge. The total length of the new triple-barrel culvert is 225'. The length of existing culvert under I-40 to be removed is 211'. After removal of the existing culvert, the stream will be contained in a channel with low flow benches, and will be stabilized with rip rap along the fresh cut slopes. Upstream of I-40, the existing stream has migrated eastwardly and has begun to undermine the existing culvert eastern wing-wall.

Approximately 65' of stream will be relocated to better align the stream with the new open stream channel
Impacts to UT to E. Prong Hunting Creek will involve the relocation of 845'' of stream and extending the 78" pipe under I-40 on the upstream end of the reach, as well as the dual 36" pipes on the downstream of the reach. The total length of pipe extensions for UT East Prong Creek are 103'.

Impacts to UT1 East Prong Hunting Creek include temporary impacts associated with re-lining the existing 66" metal pipe under I-40 with a welded steel liner. The existing pipe length will be retained.

Neither High Quality Waters (HQW), Water Supplies (WS-I or WS-II), nor Outstanding Resources Waters (ORW) occur within 1.0 mile of the project. The North Carolina Wildlife Resources Commission (NCWRC) lists Burke County as a trout county. East Prong Hunting Creek is not listed as a trout stream. There are no 303(d) streams within one mile of the project.

BEST MANAGEMENT PRACTICES

Best Management Practices (BMPs) and measures used on the project are non-structural and attempt to reduce storm water impacts to the receiving streams due to erosion and runoff. NC 18 is a curb and gutter road with associated piped drainage systems. I-40 is typically a shoulder-section road with a few areas of curbing in high fill locations and some areas along the ramps at steeper grades. Where possible, the piped outlets will be discharged into grassed roadside ditches prior to the receiving streams. Where warranted, ditches will be armored with appropriately sized rip rap to provide erosion resistance. Culverts were designed to protect stream stability and provide fish passage where possible. In locations where the proposed alignment will be shifted from the current alignment, the existing pavement will be removed. The remaining areas will then be replanted with vegetation. Natural stream design will be used in the stream relocation.

Stream Relocation

- Ramp A station 14+93 to station 22+80 along the right side. 481 feet of natural stream design proposed.

Culverts

- -L- Station 18+14 left to 21+24 right and -Y1- 46+50 left to 47+99 right: extend NC 18 Culvert and remove I-40 culvert.
- -RPA- 14+45 left to -Y1- 36+73 right: extend existing 78" corrugated metal pipe.

Stream Relocation Summary

An unnamed tributary to East Prong Creek will be impacted by proposed roadway fill along Ramp A stations 14+45 to 23+00. The stream is perennial and has a drainage area of 120.5 acres. The existing stream is a G5c using the Rosgen classification system. The total stream reach length is 1000' and is located between the ramp and a service road along I-40. Downstream of the reach, two 36" metal pipes accept the stream flow and then discharge the stream into a box culvert carrying East Prong Creek. These pipe outlets are perched two feet inside the culvert. At the upper end of the reach, a 78" metal pipe discharges the stream after crossing I-40 from south to north. The outlet end of the 78" pipe is perched 2.4' and has developed a wide scour hole. Both the downstream and the upstream pipes will need to be extended to accommodate roadway fill. The only pools evident in the stream include the scour hole and two other small pools, all located within 300 feet of the downstream end of the 78" cross pipe. This scour hole/pool sequence is a likely evolution of the stream achieving energy dissipation. The current stream is functionally stable; a result of good vegetation and a stable profile slope. It's essentially non-sinuous as it follows the ramp alignment. The current stream is predominately entrenched, except for the lower portion of the reach where stream banks are somewhat lower and provide some flooding relief. The streambed is predominately sand.

The stream will be relocated and restored using a priority-2 stream restoration approach, and will be classified as a Rosgen C5 stream with no sinuosity or either a slightly entrenched Rosgen B5c stream with no sinuosity. The proposed grade is slightly less than the existing grade, which appears stable. To ensure stability, rock cross-vanes will be used to maintain grade control. Energy dissipation at the outlet of the 78" metal pipe will be achieved by using a "drop structure", which is a junction box with a drop in inverts between the existing pipe and the new pipe extension. A floodplain will be created along the stream relocation to provide bankfull flood stage relief, and decrease shear stresses along the stream. Reference reaches include a stable B4c and a C5 stream as well as the existing stream. To ensure long-term stability of the stream, the riparian buffer will be held in Right of Way to allow for vegetation establishment and buffer protection.

U-2550B Site 3
06/25/10

Sediment Transport Analysis

Shear stress, $\tau = \gamma R s$

γ = density of water (62.4 lb/ft^2)
R = hydraulic radius = Area/Wetted Perimeter
s = slope

Stream power computation

$P = v\tau$

v = channel velocity (ft/s)
τ = shear stress (lb/ft^2)

Existing Stream

R= 10.6^2/9.6ft = 1.10ft
s = 0.0124ft/ft
τ = (62.4 lb/ft^3)(1.10ft)(0.0124ft/ft) = 0.85lb/ft^2

P = (4.81 ft/s)(0.85lb/ft^2) = 4.1 ft.lbs/s.ft^2

Reference Stream

R = 12.2ft^2/13.7ft = 0.89ft
s = 0.0139ft/ft
τ = (62.4 lb/ft^3)(0.89ft)(0.0139t/ft) = 0.77lb/ft^2

P = (4.8 ft/s)(0.77lb/ft^2) = 3.7 ft.lbs/s.ft^2

Proposed Stream

R= 12.0ft^2/11.71ft = 1.02ft
s = 0.0123ft/ft
τ = (62.4 lb/ft^3)(1.02ft)(0.0123ft/ft) = 0.79lb/ft^2

P = (4.2 ft/s)(0.78lb/ft^2) = 3.3 ft.lbs/s.ft^2

Variables	*Existing Channel*	*Proposed Reach*	*Reference Reach*	*Reference Reach*
	E. Prong Trib.	E. Prong Trib	Lost Cove Cr.	Tr. to Rocky Br.
1. Stream type	G5c	C5/B5c	B4c	C5
2. Drainage area (D.A.)	120.5 ac.	120.5 ac.	24.8 sq. mi.	360 ac.
3. Bankfull width (Wbkf) ft.	6.1	11.0	62.3	13.3
4. Bankfull mean depth (dbkf) ft.	1.73	0.92	3.36	0.92
5. Width/depth ratio (Wbkf/dbkf)	3.5	12.0	18.5	14.5
6. Bankfull cross-sectional area (Abkf) $ft.^2$	10.6	12.0	208.0	12.2
7. Bankfull mean velocity (Vbkf) ft/sec	4.81	4.2		4.8
8. Bankfull discharge (Qbkf) $ft.^3$/sec	50	50		59
9. Bankfull max depth (dmbkf) ft.	2.1	1.5	5.4	1.8
10. Width of floodprone area (Wfpa) ft.	8.3- 22.1	37	>200	38-60
11. Entrenchment ratio (Wfpa/Wbkf)	1.4-3.6	3.4	>3	2.9-4.5
12. Meander length (Lm) ft.	N/A	N/A	540	38 to 51
13. Ratio of meander length to bankfull width (Lm/Wbkf)	N/A	N/A	8.7	2.9 to 3.8
14. Radius of curvature (Rc) ft.	N/A	N/A	62.5	20 to 30
15. Ratio of radius of curvature to bankfull width (Rc/Wbkf)	N/A	N/A	1	1.5 to 2.3
16. Belt width (Wblt) ft.	N/A	N/A	500	18
17. Meander width ratio (Wblt/Wbkf)	N/A	N/A	8	1.40
18. Sinuosity (stream length/valley length) (K)	1.03	1.01	1.2	1.09
19. Valley Slope (VS)	1.64%	1.25%	0.0088	1.27%
20. Average slope (CS)	1.24%	1.23%	0.0084	1.39%
21. Pool slope	0.003	0.0017		0.001
22. Ratio of pool slope to average slope	0.242	0.138		0.072
23. Maximum pool depth (dpmax) ft.	3.2 to 3.8	1.8	7.7	1.8
24. Ratio of pool depth to average bankfull depth (dp/dbkf)	1.86 to 2.22	1.96	2.3	1.96
25. Pool width (Wp) ft.	7.56 to 24.50	11.0	59.5	14.0
26. Ratio of pool width to bankfull width	1.24 to 4.0	1.00	0.96	1.05
27. Pool to pool spacing ft.	85 to 140	100 to 130	190	30 to 80
28. Ratio of pool to pool spacing to bankfull width	13.9 to 22.9	9.1 to 11.4	3.05	2.3 to 6.0
29. Ratio of lowest bank height to bankfull height (or max bankfull depth) (BHlow/dmbkf)	N/A	N/A	1.0	0.6

NATURAL CHANNEL DESIGN DATA

MORPHOLOGICAL MEASUREMENT TABLE

SITE 3: Station 14+97 to 19+75 Ramp A

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
Burke County
PROJECT: 34831.1.1 (U-2550B)

SHEET __ OF __ rev 6/25/10

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L- 18+14/18+74	3-10x11 RCBC ext.						0.01	0.01	29	35	
2	-L- 19+79/21+24	3-10x11 RCBC ext.						0.06		263		
3	-RPA- 14+45/23+00	2-36" RCP, 84" CSP						0.12	0.01	865	49	481
		Stream Relocation										
4	-Y1- 47+99/49+50	Rem. Ex. Culvert						0.02	0.01	115	52	
		Repl. with 172' Bridge										
5	-Y1- 32+05/32+45	Reline ex. 66" CSP							<0.01		45	
		w/ 60" Welded Steel										
6	-Y1- 34+75/35+06	Reline ex. 66" CSP						<0.01		39		
		w/ 60" Welded Steel										
		& Bank Stabilization										
7	-Y1- 36+35/36+73	78" CSP						<0.01		23		
7	-Y1- 36+35/36+73	Bank Stabilization						<0.01		16		
TOTALS:								0.21	0.03	1350	181	481

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

BURKE COUNTY
WBS - 34831.1.1 (U-2550B)

SHEET 6/25/2010

ATN Revised 3/31/05

Permit Drawing
Sheet 1 of 27

Adjacent Property Owners

Owner/ Business	Address
Robbins Investments, LLC	PO Box 207, Forest City, NC 28043
Grace Hospital, Inc.	2201 S. Sterling St., Morganton, NC 28655
Reece & Nelson LLP	420 Bost Road, Morganton, NC 28655
R. L. Bush, Jr.	1 Cedarwood Place, Lenoir, NC 28645
Southview Motel Corp.	2400 S. Sterling St., Morganton, NC 28655
Harriet T. Stroup	117 Brookwood Rd., Morganton, NC 28655
Lou Ellen Daves	811 Woodbrook Dr., Morganton, NC 27410
RCM Investments	PO Box 1600, Rowlett, TX 75030
NCDOT, Div. 13	PO Box 3279, Asheville, NC 28802

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Burke County
PROJ - 34831.1.1 (U-2550B)

SHEET 3/3/2009

Permit Drawing
Sheet 2 of 27

09/09/09

TIP PROJECT: U-2550B

CONTRACT:

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BURKE COUNTY

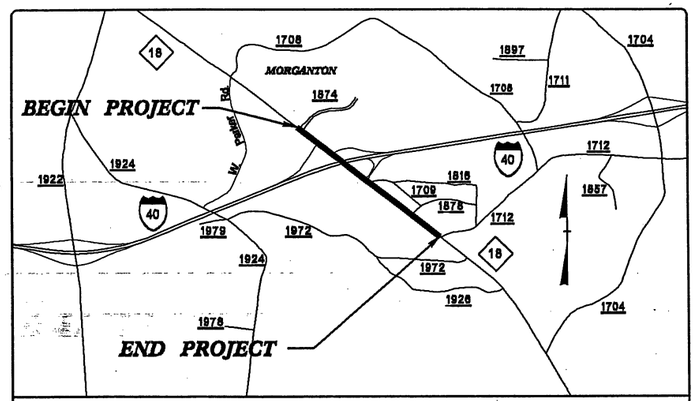
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2550B	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34831.1.1	STPNHF-M-8165(1)	P.E.
34831.2.4	STPNHF-0018(13)	RW, UTIL.

LOCATION: MORGANTON – NC 18 (STERLING STREET) AND I-40 INTERCHANGE

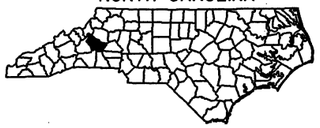
TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND STRUCTURES

PERMIT DRAWINGS

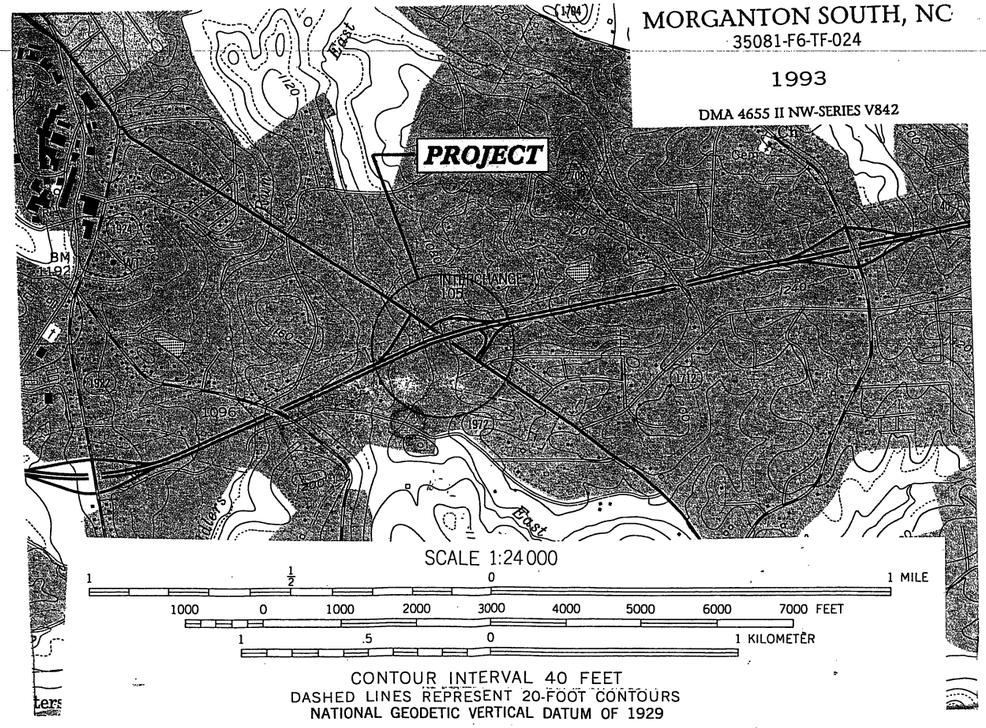


VICINITY MAP

NORTH CAROLINA



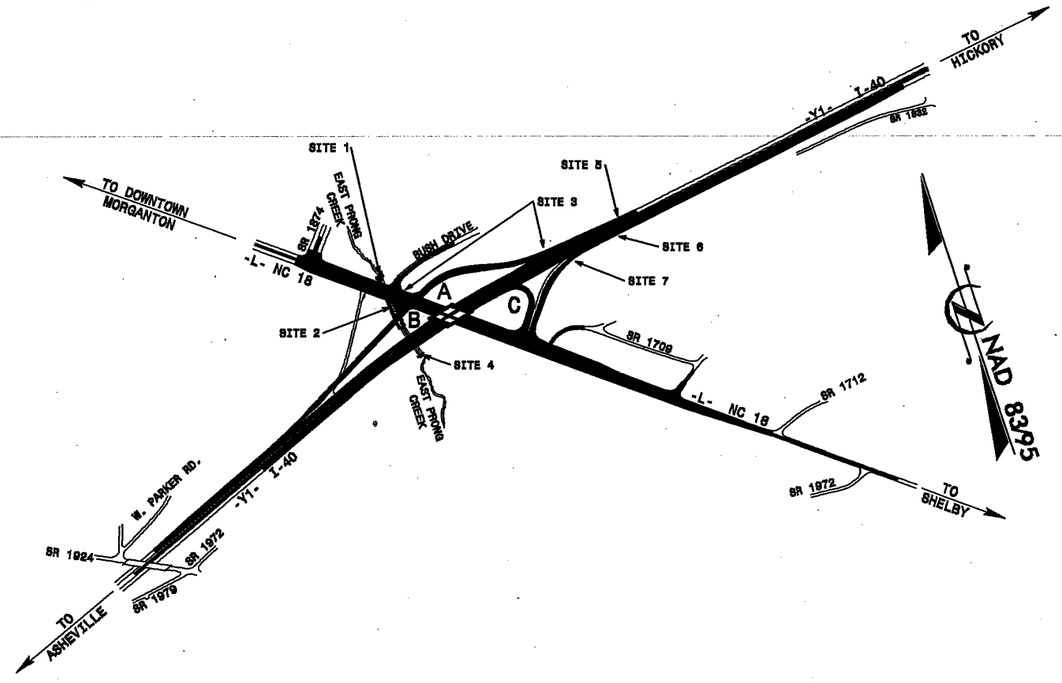
MORGANTON SOUTH, NC
35081-F6-TF-024
1993
DMA 4655 II NW-SERIES V842



SCALE 1:24 000

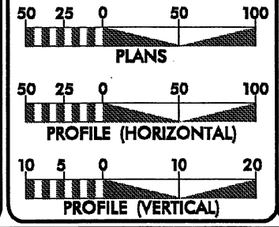
1 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 .5 0 1 KILOMETER

CONTOUR INTERVAL 40 FEET
DASHED LINES REPRESENT 20-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929



PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES



DESIGN DATA

ADT 2010 =	23652
ADT 2030 =	39800
DHV =	11 %
D =	60 %
T =	4 % *
V =	50 MPH
FUNC. CLASS =	URBAN ARTERIAL
* TTST 1%	DUAL 3%

PROJECT LENGTH

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 21, 2008

LETTING DATE:
MAY 18, 2010

GARY LOVERING, PE
PROJECT ENGINEER

RON McCOLLUM, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

Permit Drawing
Sheet 3 of 25

P.E.
STATE HIGHWAY DESIGN ENGINEER

03-MAR-2009 08:35
r:\hydraulics\permits_environmental\drawings\u2550b_hyd_prm_wet_tsh.dgn
blipscomb AT HY244556

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2550B	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

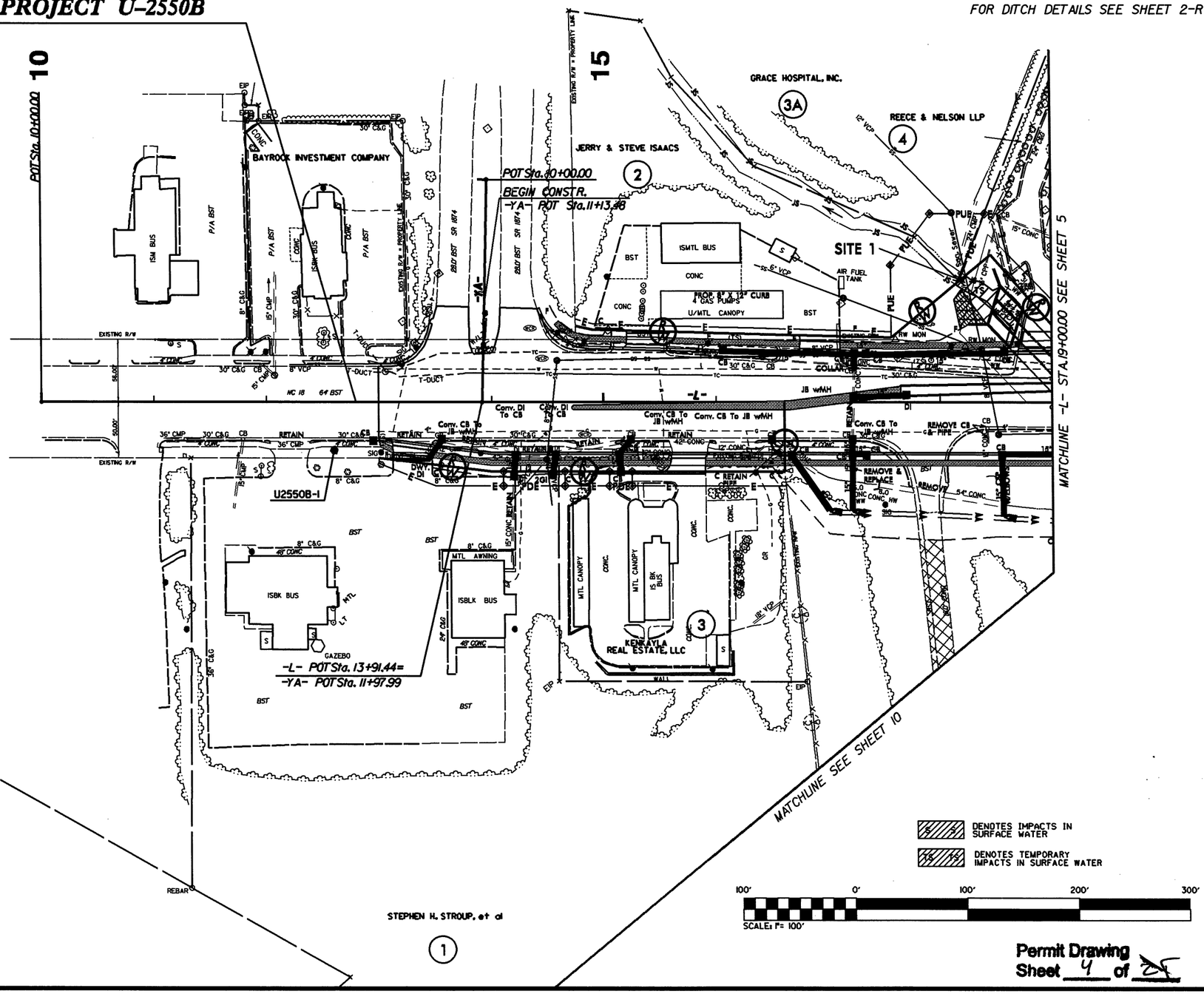
▨ PROP CONC SIDEWALK

▨ PROP 5" CONC MONO. ISLAND

FOR -L- PROFILE SEE SHEET 12
FOR DITCH DETAILS SEE SHEET 2-R

STA. 12+80.00 -L- BEGIN TIP PROJECT U-2550B

BEGIN CONSTRUCTION
FOR SIGNAL WORK
APPROXIMATELY 8950'
NORTHWEST ALONG
NC 18 (STERLING STREET)
SEE SIGNAL PLANS



▨ DENOTES IMPACTS IN SURFACE WATER

▨ DENOTES TEMPORARY IMPACTS IN SURFACE WATER

100' 0' 100' 200' 300'
SCALE: 1"= 100'

Permit Drawing
Sheet 4 of 25

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2550B	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROP CONC SIDEWALK

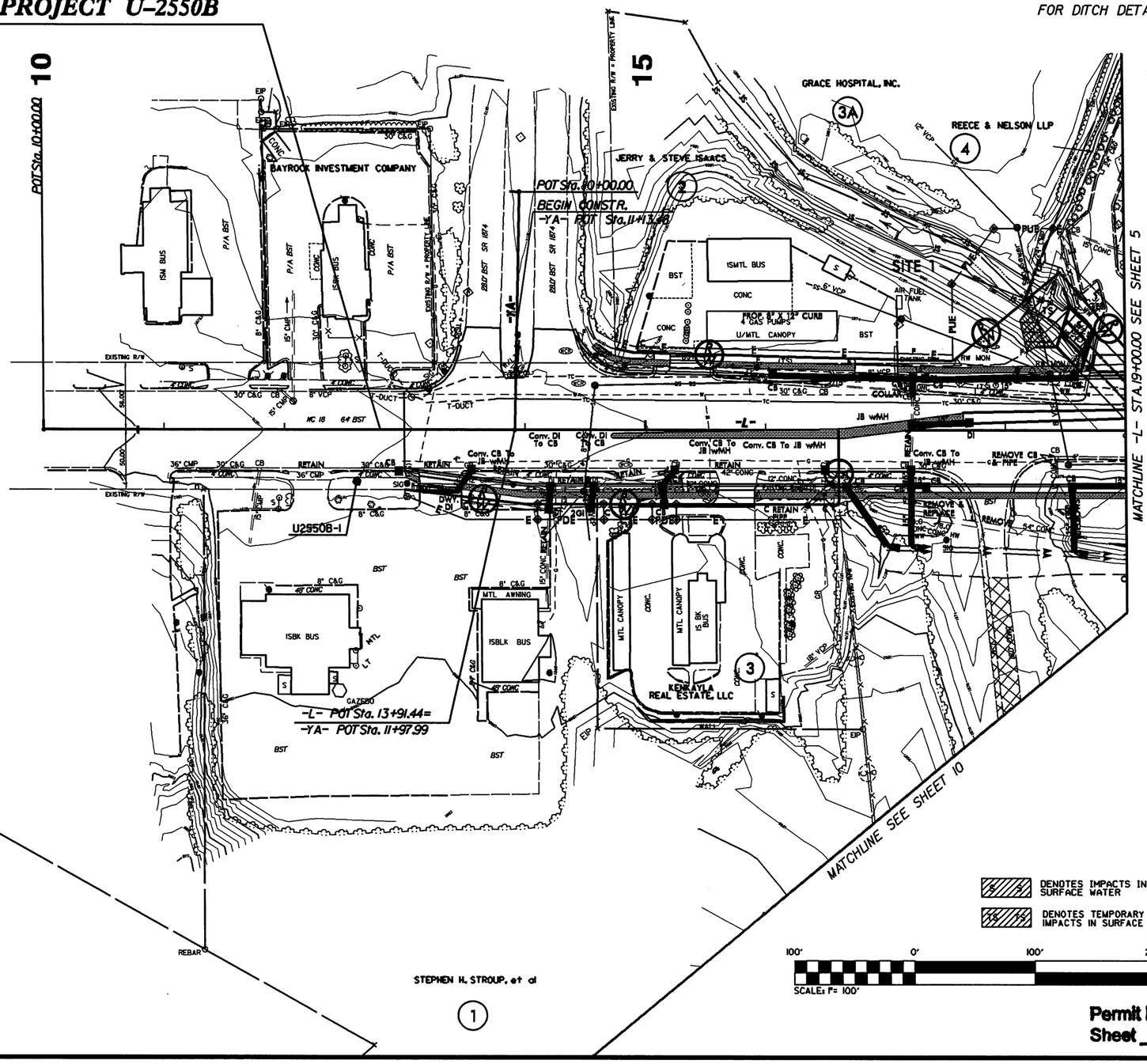
PROP 5' CONC MONO. ISLAND

NAD 83/95

FOR -L- PROFILE SEE SHEET 12
FOR DITCH DETAILS SEE SHEET 2-R

STA. 12+80.00 -L- BEGIN TIP PROJECT U-2550B

BEGIN CONSTRUCTION
FOR SIGNAL WORK
APPROXIMATELY 8950'
NORTHWEST ALONG
NC 18 (STERLING STREET)
SEE SIGNAL PLANS



DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

100' 0' 100' 200' 300'

SCALE: 1"= 100'

Permit Drawing
Sheet 5 of 24

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

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2550B	5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

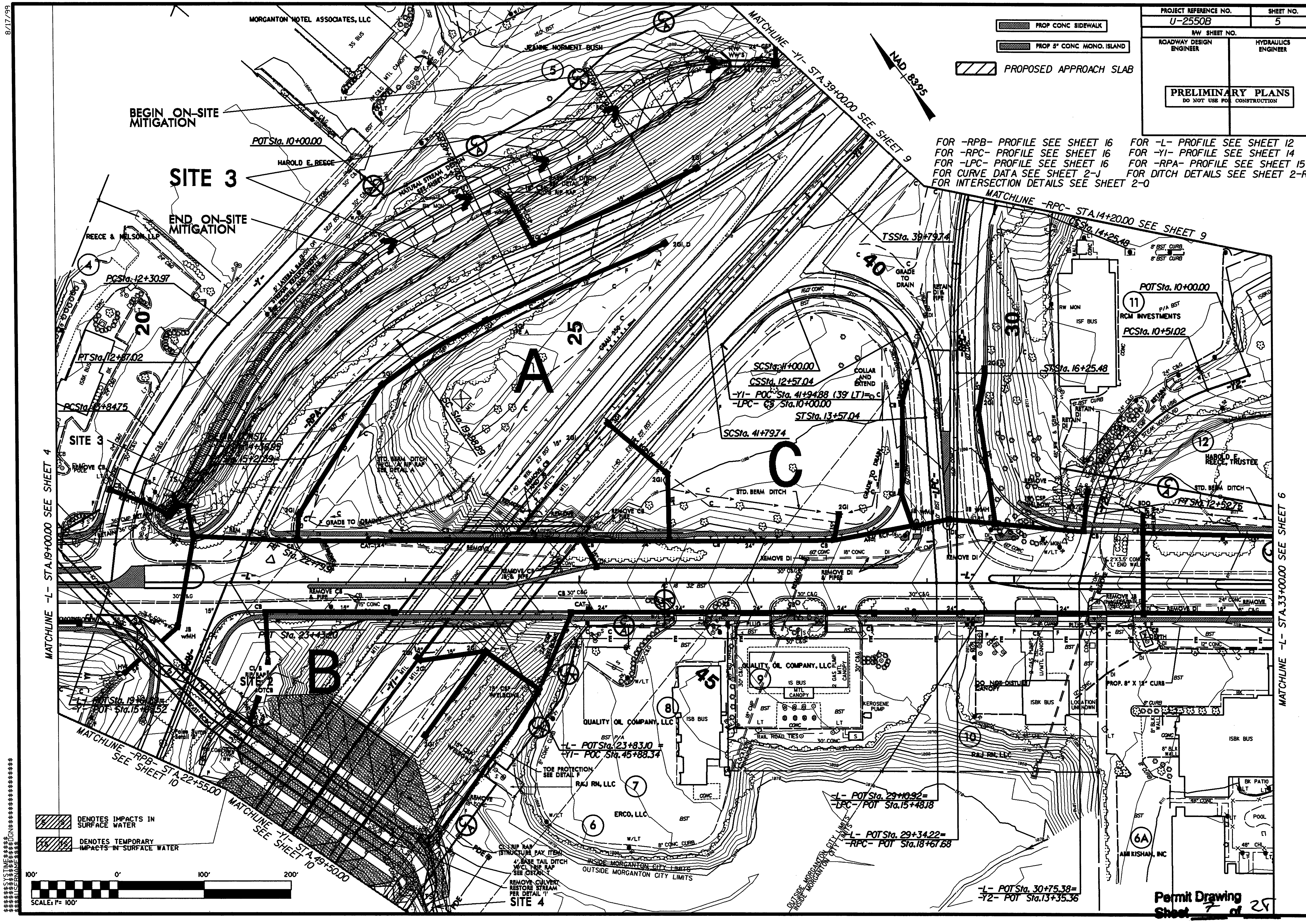
▨ PROP CONC SIDEWALK
▨ PROP 5" CONC MONO. ISLAND
▨ PROPOSED APPROACH SLAB

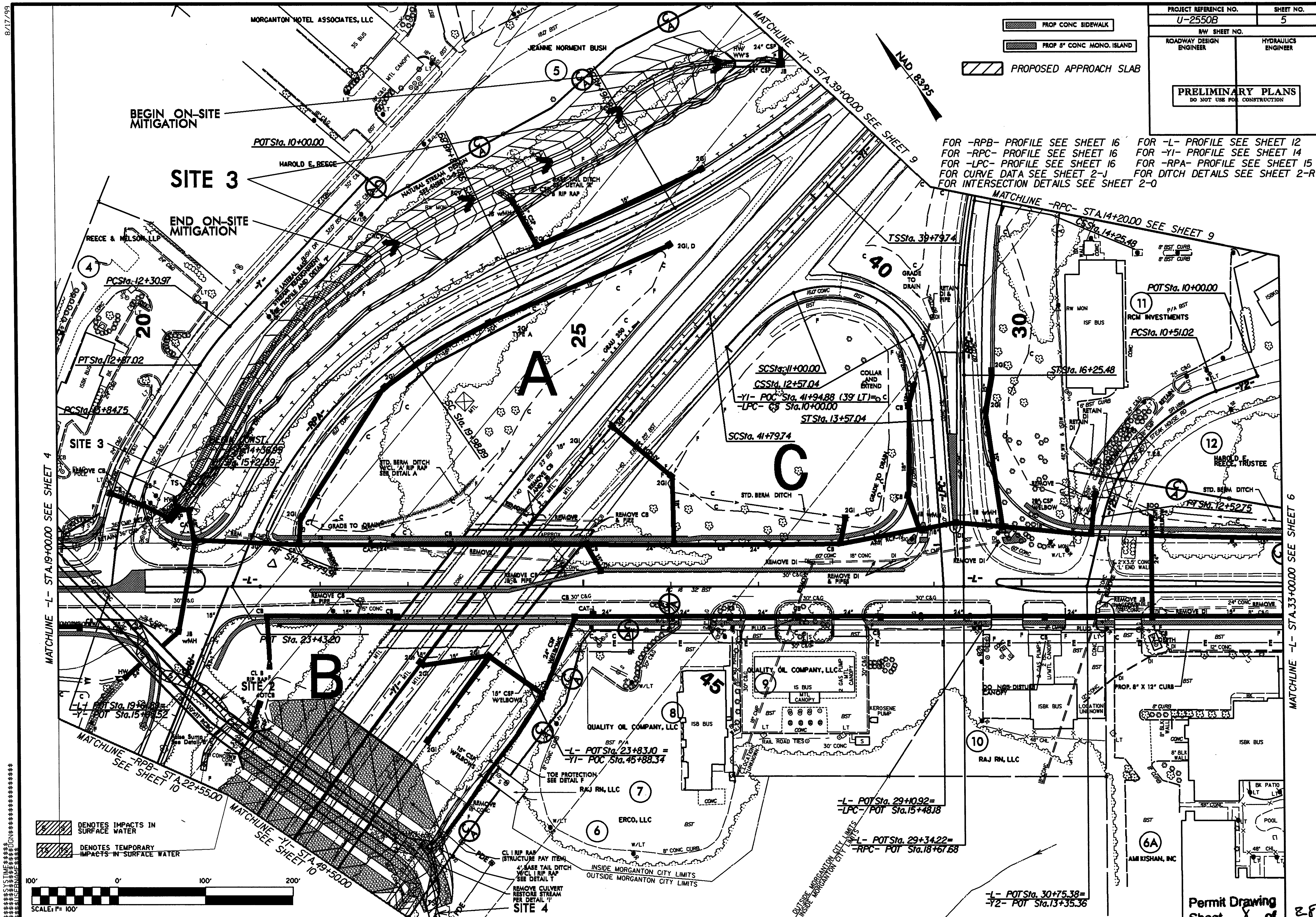
FOR -RPB- PROFILE SEE SHEET 16
FOR -RPC- PROFILE SEE SHEET 16
FOR -LPC- PROFILE SEE SHEET 16
FOR CURVE DATA SEE SHEET 2-J
FOR INTERSECTION DETAILS SEE SHEET 2-Q
FOR -L- PROFILE SEE SHEET 12
FOR -Y1- PROFILE SEE SHEET 14
FOR -RPA- PROFILE SEE SHEET 15
FOR DITCH DETAILS SEE SHEET 2-R

▨ DENOTES IMPACTS IN SURFACE WATER
▨ DENOTES TEMPORARY IMPACTS IN SURFACE WATER

100' 0' 100' 200'
SCALE: 1" = 100'

Permit Drawing
Sheet 6 of 25


8/17/99
PROJECT REFERENCE NO. U-2550B
SHEET NO. 5
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
PROP CONC SIDEWALK
PROP 5" CONC MONO. ISLAND
PROPOSED APPROACH SLAB
NAD 83/95
FOR -RPB- PROFILE SEE SHEET 16
FOR -RPC- PROFILE SEE SHEET 16
FOR -LPC- PROFILE SEE SHEET 16
FOR CURVE DATA SEE SHEET 2-J
FOR INTERSECTION DETAILS SEE SHEET 2-O
FOR -L- PROFILE SEE SHEET 12
FOR -Y1- PROFILE SEE SHEET 14
FOR -RPA- PROFILE SEE SHEET 15
FOR DITCH DETAILS SEE SHEET 2-R
MATCHLINE -Y1- STA.39+00.00 SEE SHEET 9
MATCHLINE -RPC- STA.14+20.00 SEE SHEET 9
MATCHLINE -L- STA.33+00.00 SEE SHEET 6
MATCHLINE -L- STA.19+00.00 SEE SHEET 4
MATCHLINE -RPB- STA.22+55.00 SEE SHEET 10
MATCHLINE -Y1- STA.49+50.00 SEE SHEET 10
MORGANTON HOTEL ASSOCIATES, LLC
JEANNE NORMENT BUSH
HAROLD E. REECE
REECE & NELSON LLP
BEGIN ON-SITE MITIGATION
END ON-SITE MITIGATION
SITE 3
SITE 2
SITE 4
A
B
C
POT Sta. 10+00.00
PCSta. 12+30.97
PTSta. 12+87.02
TSSta. 39+79.74
SCSta. 11+00.00
CSSta. 12+57.04
-Y1- POC Sta. 41+94.88 (39' LT) = -LPC- CS Sta. 10+00.00
STSta. 13+57.04
SCSta. 41+79.74
STD. BERM DITCH
GRADE TO DRAIN
RCM INVESTMENTS
PCSta. 10+51.02
STSta. 16+25.48
HAROLD E. REECE, TRUSTEE
POT Sta. 23+43.40
QUALITY OIL COMPANY, LLC
-L- POT Sta. 23+83.10 = -Y1- POC Sta. 45+88.34
TOE PROTECTION SEE DETAIL F
RAJ RN, LLC
ERCO, LLC
-L- POT Sta. 29+10.92 = -LPC- POT Sta. 15+48.18
-L- POT Sta. 29+34.22 = -RPC- POT Sta. 18+67.68
-L- POT Sta. 30+75.38 = -Y2- POT Sta. 13+35.36
INSIDE MORGANTON CITY LIMITS
OUTSIDE MORGANTON CITY LIMITS
AMI KISHAN, INC
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
SCALE: 1"= 100'
Permit Drawing Sheet 7 of 25



PROJECT REFERENCE NO. U-2550B
SHEET NO. 5
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
PROP CONC SIDEWALK
PROP 5" CONC MONO. ISLAND
PROPOSED APPROACH SLAB
NAD 83/95
FOR -RPB- PROFILE SEE SHEET 16
FOR -RPC- PROFILE SEE SHEET 16
FOR -LPC- PROFILE SEE SHEET 16
FOR CURVE DATA SEE SHEET 2-J
FOR INTERSECTION DETAILS SEE SHEET 2-Q
FOR -L- PROFILE SEE SHEET 12
FOR -Y1- PROFILE SEE SHEET 14
FOR -RPA- PROFILE SEE SHEET 15
FOR DITCH DETAILS SEE SHEET 2-R
MATCHLINE -Y1- STA.39+00.00 SEE SHEET 9
MATCHLINE -RPC- STA.14+20.00 SEE SHEET 9
MATCHLINE -L- STA.33+00.00 SEE SHEET 6
MATCHLINE -L- STA.19+00.00 SEE SHEET 4
MATCHLINE -RPB- STA.22+55.00 SEE SHEET 10
MATCHLINE -Y1- STA.49+50.00 SEE SHEET 10
MORGANTON HOTEL ASSOCIATES, LLC
JEANNE NORMENT BUSH
HAROLD E. REECE
REECE & NELSON LLP
RCM INVESTMENTS
HAROLD E. REECE, TRUSTEE
QUALITY OIL COMPANY, LLC
RAJ RN, LLC
ERCO, LLC
AMI KISHAN, INC
BEGIN ON-SITE MITIGATION
END ON-SITE MITIGATION
SITE 3
SITE 2
SITE 4
A
B
C
POT Sta. 10+00.00
PCSta. 12+30.97
PTSta. 12+87.02
TSSta. 39+79.74
CSSta. 14+25.48
PCSta. 10+51.02
ST Sta. 16+25.48
SCSta. 11+00.00
CSSta. 12+57.04
-Y1- POC Sta. 41+94.88 (39' LT) = -LPC- CS Sta. 10+00.00
ST Sta. 13+57.04
SCSta. 41+79.74
PT Sta. 12+52.75
POT Sta. 23+43.20
-L- POT Sta. 23+83.10 = -Y1- POC Sta. 45+88.34
-L- POT Sta. 29+10.92 = -LPC- POT Sta. 15+48.18
-L- POT Sta. 29+34.22 = -RPC- POT Sta. 18+67.68
-L- POT Sta. 30+75.38 = -Y2- POT Sta. 13+35.36
STD. BERM DITCH W/CL 'A' RIP RAP SEE DETAIL A
STD. BERM DITCH
GRADE TO DRAIN
INSIDE MORGANTON CITY LIMITS
OUTSIDE MORGANTON CITY LIMITS
TOE PROTECTION SEE DETAIL F
CL I RIP RAP (STRUCTURE PAY ITEM)
4' BASE TAIL DITCH W/CL I RIP RAP SEE DETAIL T
REMOVE CULVERT RESTORE STREAM PER DETAIL 'I'
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
100' 0' 100' 200'
SCALE: 1" = 100'
Permit Drawing Sheet 8 of 28
8/17/99

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2550B	5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROP CONC SIDEWALK
PROP 5" CONC MONO. ISLAND
PROPOSED APPROACH SLAB

NAD 83/95

FOR -RPB- PROFILE SEE SHEET 16
FOR -RPC- PROFILE SEE SHEET 16
FOR -LPC- PROFILE SEE SHEET 16
FOR CURVE DATA SEE SHEET 2-J
FOR INTERSECTION DETAILS SEE SHEET 2-Q
FOR -L- PROFILE SEE SHEET 12
FOR -YI- PROFILE SEE SHEET 14
FOR -RPA- PROFILE SEE SHEET 15
FOR DITCH DETAILS SEE SHEET 2-R

MATCHLINE -YI- STA.39+00.00 SEE SHEET 9
MATCHLINE -RPC- STA.14+20.00 SEE SHEET 9
MATCHLINE -L- STA.19+00.00 SEE SHEET 4
MATCHLINE -L- STA.33+00.00 SEE SHEET 6
MATCHLINE -RPB- STA.22+55.00 SEE SHEET 10
MATCHLINE -YI- STA.49+50.00 SEE SHEET 10

MORGANTON HOTEL ASSOCIATES, LLC
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REECE & NELSON LLP
RCM INVESTMENTS
HAROLD E. REECE, TRUSTEE
QUALITY OIL COMPANY, LLC
RAJ RN, LLC
ERCO, LLC
AMI KISHAN, INC

BEGIN ON-SITE MITIGATION
END ON-SITE MITIGATION
SITE 3
SITE 2
SITE 4

POT Sta. 10+00.00
PC Sta. 12+30.97
PT Sta. 12+87.02
PC Sta. 20+84.75
TS Sta. 39+79.74
ST Sta. 16+25.48
PC Sta. 10+51.02
SC Sta. 11+00.00
CS Sta. 12+57.04
-YI- POC Sta. 41+94.88 (39' LT)
-LPC- CS Sta. 10+00.00
ST Sta. 13+57.04
SC Sta. 41+79.74
ST Sta. 12+52.76
POT Sta. 23+43.20
-L- POT Sta. 23+83.10 = -YI- POC Sta. 45+88.34
-L- POT Sta. 29+10.92 = -LPC- POT Sta. 15+48.18
-L- POT Sta. 29+34.22 = -RPC- POT Sta. 18+67.88
-L- POT Sta. 30+75.38 = -Y2- POT Sta. 13+35.36

DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER

100' 0' 100' 200'
SCALE: 1"= 100'

Permit Drawing
Sheet 9 of 65

Sites 1, 2, & 3 (partial) Enlargement

PROJECT REFERENCE NO.	SHEET NO.
U-2550B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

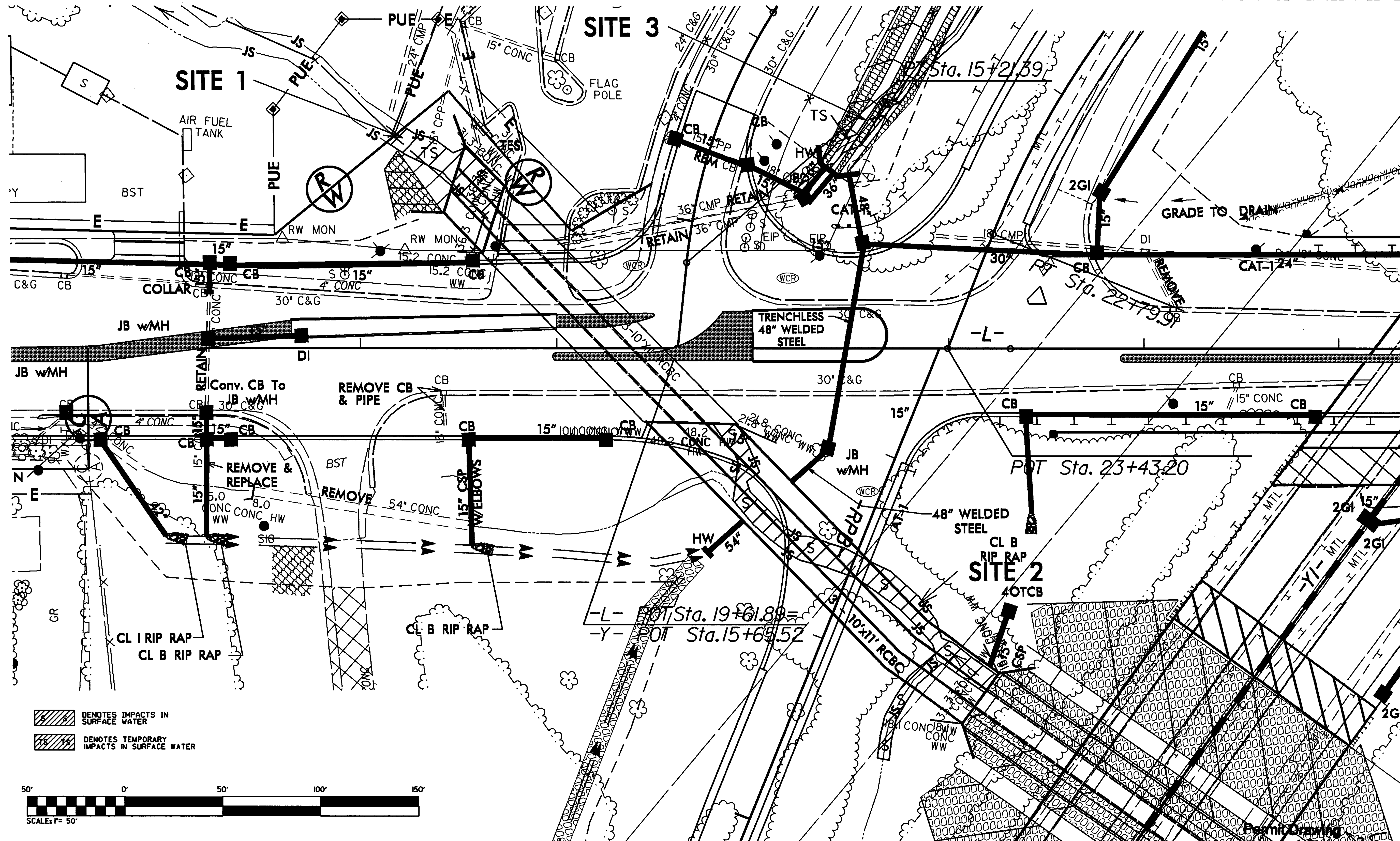
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROP CONC SIDEWALK

PROP 5" CONC MONO. ISLAND

NAD 83/95

FOR -L- PROFILE SEE SHEET 12
FOR DITCH DETAILS SEE SHEET 2-R



Permit Drawing
Sheet 10 of 25

8/17/99

8/17/99

Site 3 (partial) Enlargement

PROJECT REFERENCE NO.	SHEET NO.
U-2550B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

▨ PROP CONC SIDEWALK
▨ PROP 5" CONC MONO. ISLAND

▨ DENOTES IMPACTS IN SURFACE WATER
▨ DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 0' 50' 100'
SCALE: 1"= 50'

Permit Drawing
Sheet 11 of 25

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

8/17/99

Site 4 Enlargement

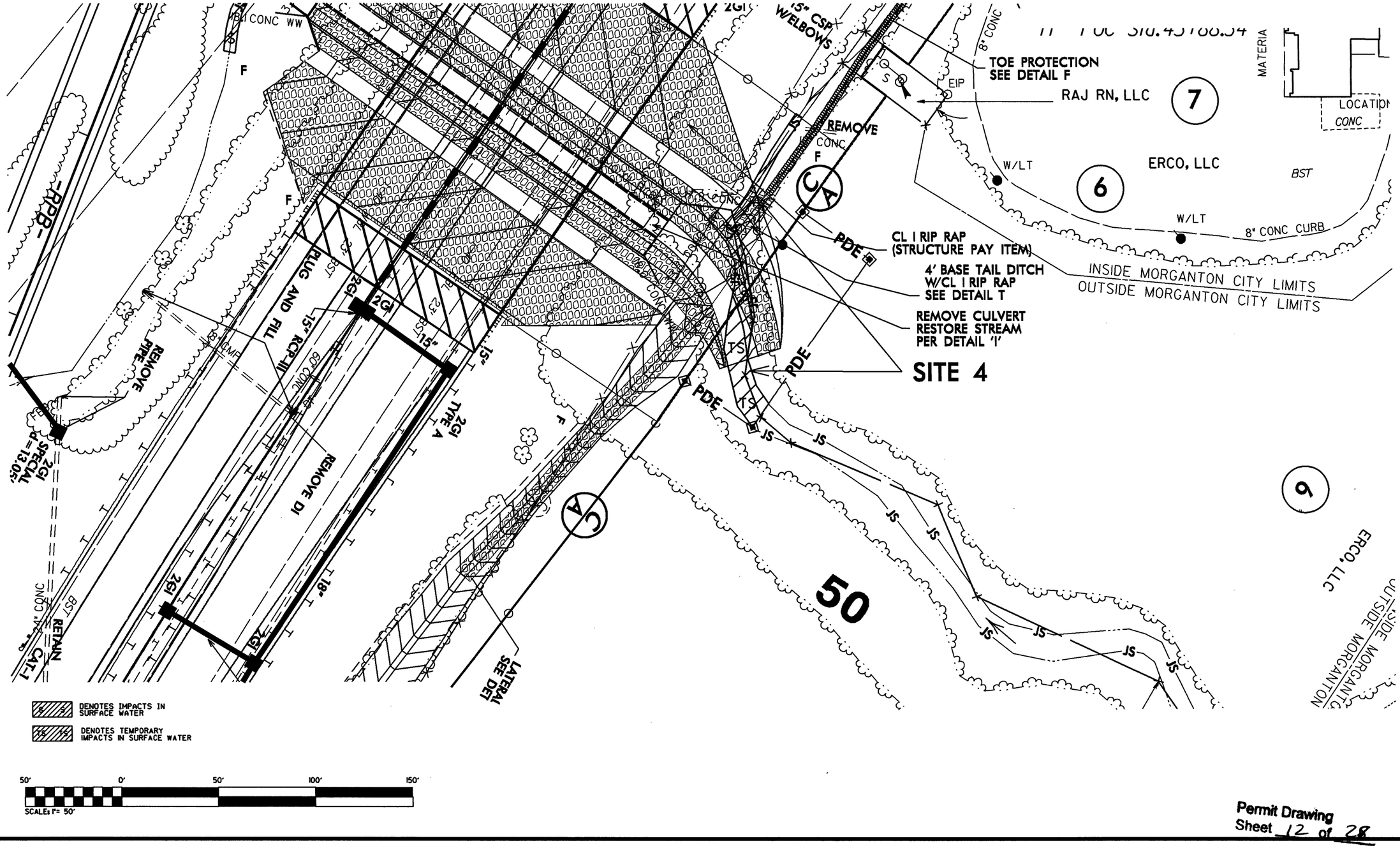
PROJECT REFERENCE NO.	SHEET NO.
U-2550B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROP CONC SIDEWALK
PROP 5" CONC MONO. ISLAND

NAD 83/95

FOR -L- PROFILE SEE SHEET 12
FOR DITCH DETAILS SEE SHEET 2-R



Permit Drawing
Sheet 12 of 28

8/17/99

REVISIONS

Sites 5, 6, & 7 Enlargement

PROJECT REFERENCE NO.	SHEET NO.
U-2550B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

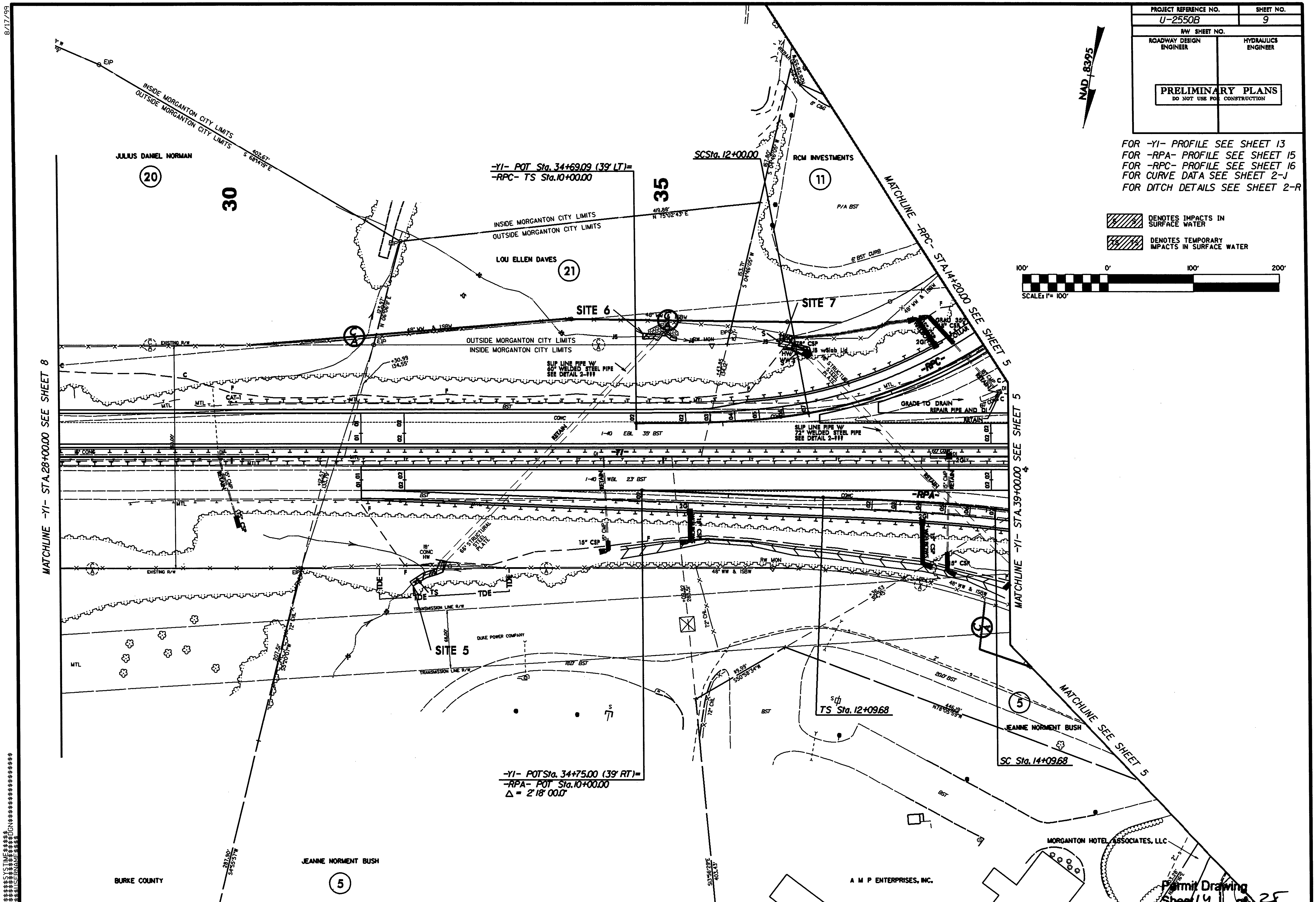
DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 0' 50' 100'
SCALE: 1"= 50'

Permit Drawing
Sheet 13 of 28

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


PROJECT REFERENCE NO.
U-2550B
SHEET NO.
9
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
NAD 83/95
FOR -Y1- PROFILE SEE SHEET 13
FOR -RPA- PROFILE SEE SHEET 15
FOR -RPC- PROFILE SEE SHEET 16
FOR CURVE DATA SEE SHEET 2-J
FOR DITCH DETAILS SEE SHEET 2-R
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
SCALE: 1"= 100'
8/17/99
INSIDE MORGANTON CITY LIMITS
OUTSIDE MORGANTON CITY LIMITS
JULIUS DANIEL NORMAN
20
30
35
-Y1- POT Sta. 34+69.09 (39' LT)=
-RPC- TS Sta.10+00.00
LOU ELLEN DAVES
21
SCSta. 12+00.00
RCM INVESTMENTS
11
MATCHLINE -RPC- STA.14+20.00 SEE SHEET 5
SITE 6
SITE 7
SLIP LINE PIPE W/ 60" WELDED STEEL PIPE SEE DETAIL 2-???
SLIP LINE PIPE W/ 72" WELDED STEEL PIPE SEE DETAIL 2-???
GRADE TO DRAIN REPAIR PIPE AND DI
I-40 EBL 39' BST
I-40 WBL 23' BST
-Y1-
-RPA-
-RPC-
MATCHLINE -Y1- STA.28+00.00 SEE SHEET 8
MATCHLINE -Y1- STA.39+00.00 SEE SHEET 5
SITE 5
DUKE POWER COMPANY
TRANSMISSION LINE R/W
TS Sta. 12+09.68
SC Sta. 14+09.68
5
JEANNE NORMENT BUSH
MATCHLINE SEE SHEET 5
-Y1- POTSta. 34+75.00 (39' RT)=
-RPA- POT Sta.10+00.00
Δ = 2°18' 00.0"
MORGANTON HOTEL ASSOCIATES, LLC
BURKE COUNTY
JEANNE NORMENT BUSH
5
A M P ENTERPRISES, INC.
Permit Drawing
Sheet 14 of 25

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2550B	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83/95

FOR -Y1- PROFILE SEE SHEET 13
FOR -RPA- PROFILE SEE SHEET 15
FOR -RPC- PROFILE SEE SHEET 16
FOR CURVE DATA SEE SHEET 2-J
FOR DITCH DETAILS SEE SHEET 2-R

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

100' 0' 100' 200'
SCALE: 1"= 100'

MATCHLINE -Y1- STA.28+00.00 SEE SHEET 8

MATCHLINE -RPC- STA.14+20.00 SEE SHEET 5

MATCHLINE -Y1- STA.39+00.00 SEE SHEET 5

MATCHLINE SEE SHEET 5

JULIUS DANIEL NORMAN (20)

LOU ELLEN DAVES (21)

RCM INVESTMENTS (11)

JEANNE NORMENT BUSH (5)

BURKE COUNTY

A M P ENTERPRISES, INC.

MORGANTON HOTEL ASSOCIATES, LLC

DUKE POWER COMPANY

-Y1- POT Sta. 34+69.09 (39' LT)=
-RPC- TS Sta.10+00.00

SCSta. 12+00.00

-Y1- POT Sta. 34+75.00 (39' RT)=
-RPA- POT Sta.10+00.00
Δ = 2°18'00.0"

TS Sta. 12+09.68

SC Sta. 14+09.68

SITE 5

SITE 6

SITE 7

EXISTING R/W

TRANSMISSION LINE R/W

SLIP LINE PIPE W/ 42" WELDED STEEL PIPE SEE DETAIL 2-III

SLIP LINE PIPE W/ 72" WELDED STEEL PIPE SEE DETAIL 2-III

GRADE TO DRAIN REPAIR PIPE AND RETAIN

I-40 EBL 35' BST

I-40 WBL 23' BST

180' BST

200' BST

-Y1-

-RPA-

-RPC-

Permit Drawing
Sheet 15 of 25

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2550B	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

FOR -Y1- PROFILE SEE SHEET 14
FOR -RPB- PROFILE SEE SHEET 15
FOR CURVE DATA SEE SHEET 2-J
FOR DITCH DETAILS SEE SHEET 2-R

▨ DENOTES TEMPORARY IMPACTS IN SURFACE WATER

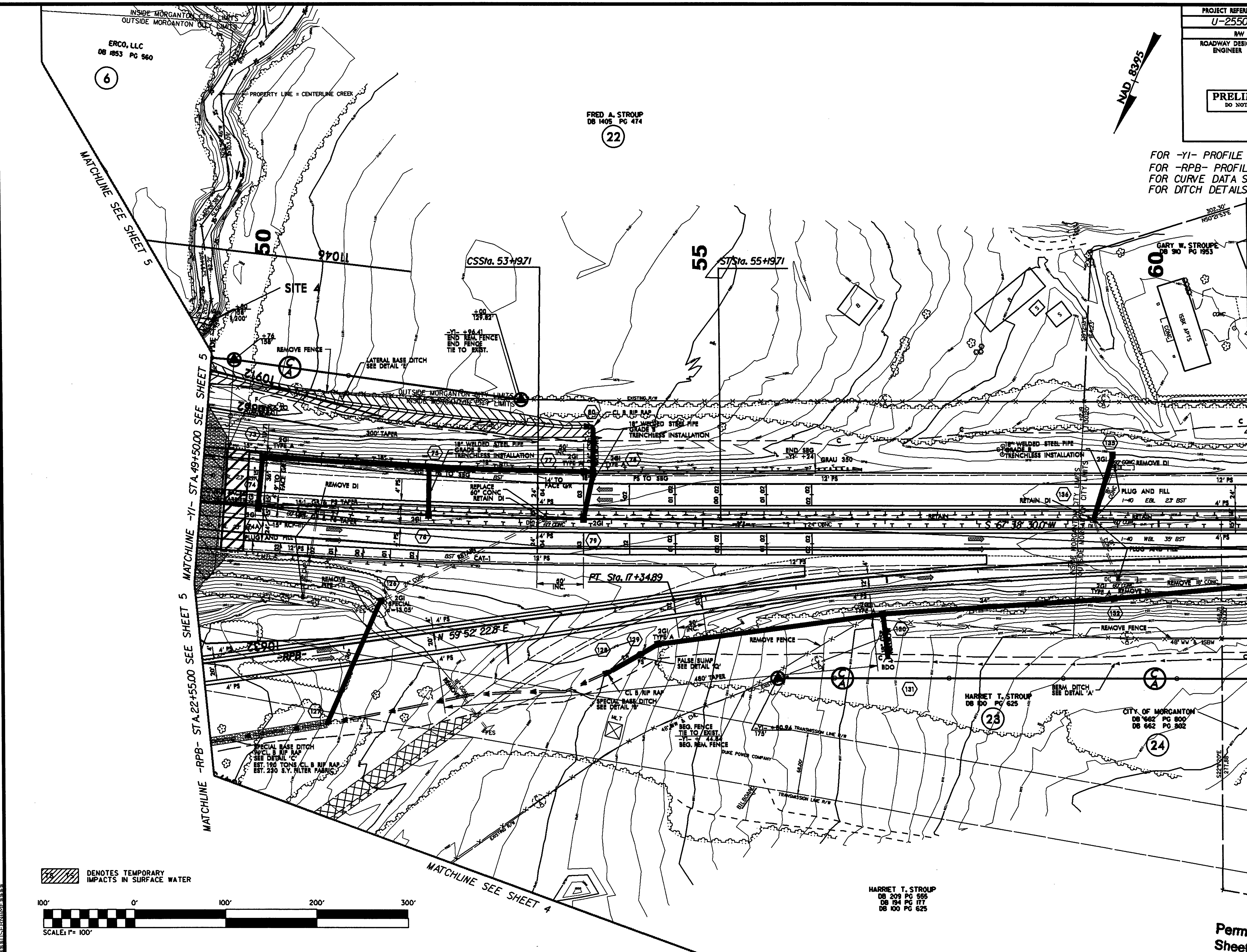
100' 0' 100' 200' 300'
SCALE: 1" = 100'

Permit Drawing
Sheet 16 of 25

PROJECT REFERENCE NO.	SHEET NO.
U-2550B	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

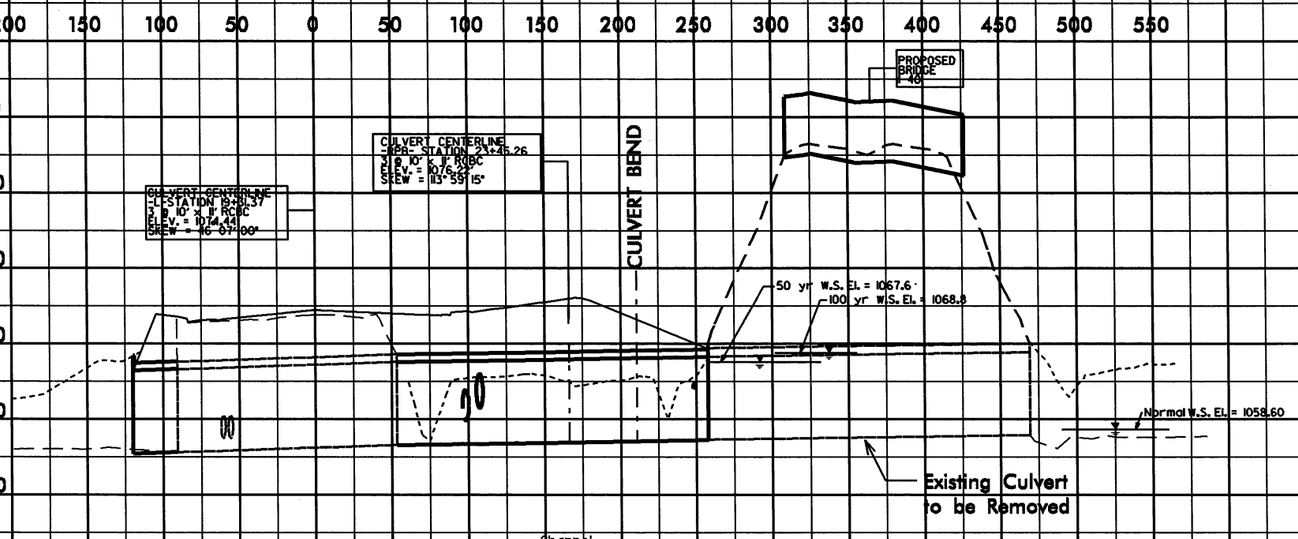
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

FOR -Y1- PROFILE SEE SHEET 14
FOR -RPB- PROFILE SEE SHEET 15
FOR CURVE DATA SEE SHEET 2-J
FOR DITCH DETAILS SEE SHEET 2-R



8/17/99
NAD 83/95
INSIDE MORGANTON CITY LIMITS
OUTSIDE MORGANTON CITY LIMITS
ERCO, LLC
DB 1853 PG 560
6
PROPERTY LINE = CENTERLINE CREEK
FRED A. STROUP
DB 1405 PG 474
22
MATCHLINE SEE SHEET 5
50
SITE 4
CSSta. 53+19.71
55
ST Sta. 55+19.71
GARY W. STROUPE
DB 910 PG 1953
60
REMOVE FENCE
LATERAL BASE DITCH SEE DETAIL 'E'
-Y1- +96.41 END REM. FENCE END FENCE TIE TO EXIST.
CL B RIP RAP
18" WELDED STEEL PIPE GRADE B TRENCHLESS INSTALLATION
300' TAPER
REMOVE DI
REPLACE 60" CONC. RETAIN DI
PS TO SBG
END SBG
PLUG AND FILL
RETAIN DI
S 67° 38' 30.0" W
MATCHLINE -Y1- STA.49+50.00 SEE SHEET 5
MATCHLINE -Y1- STA.61+00.00 SEE SHEET 11
PT Sta. 17+34.89
N 59° 52' 22.8" E
-RPB-
REMOVE FENCE
FALSE SUMP SEE DETAIL 'Q'
460' TAPER
CL B RIP RAP
SPECIAL BASE DITCH SEE DETAIL 'B'
BEG. FENCE TIE TO EXIST.
-Y1- +44.84 BEG. REM. FENCE
DUKE POWER COMPANY
TRANSMISSION LINE R/W
HARRIET T. STROUP
DB 100 PG 625
23
BERM DITCH SEE DETAIL 'A'
CITY OF MORGANTON
DB 662 PG 800
DB 662 PG 802
24
SPECIAL BASE DITCH W/CL B RIP RAP SEE DETAIL 'C' EST. 190 TONS CL B RIP RAP EST. 230 S.Y. FILTER FABRIC
MATCHLINE -RPB- STA.22+55.00 SEE SHEET 5
MATCHLINE SEE SHEET 4
HARRIET T. STROUP
DB 209 PG 566
DB 194 PG 177
DB 100 PG 625
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
100' 0' 100' 200' 300'
SCALE: 1" = 100'

Permit Drawing
Sheet 17 of 25



5/14/99

PROJECT REFERENCE NO. | SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

3 – 10'x11' RCBC

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

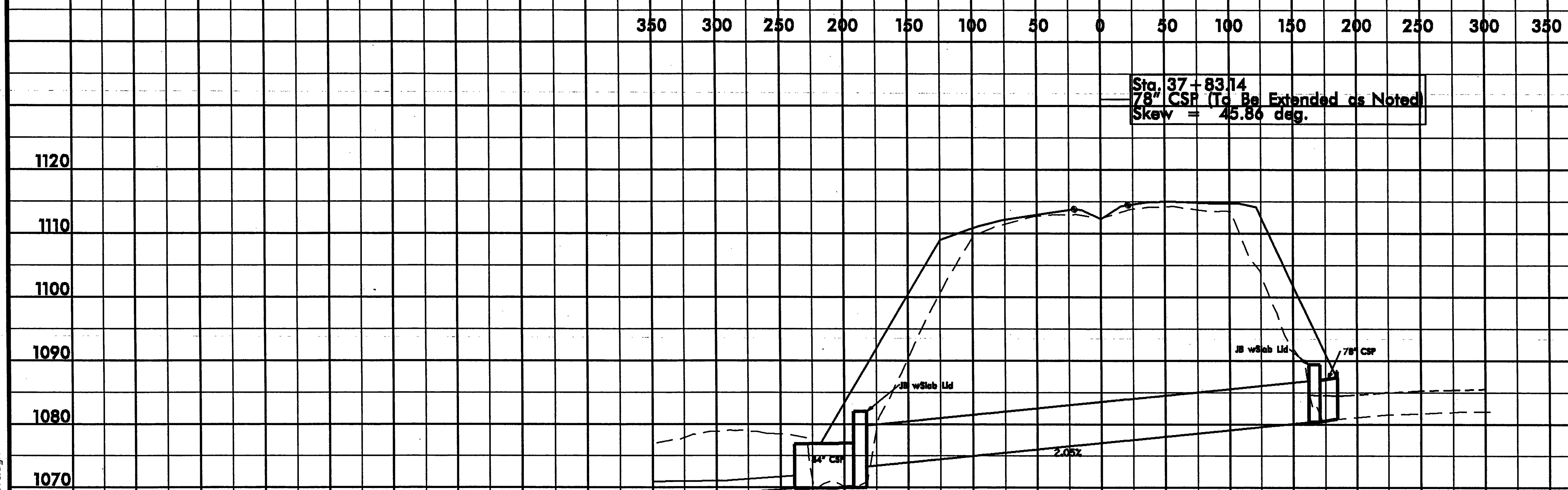
Permit Drawing
Sheet 18 of 25

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

78" CSP w/JB & 84" CSP Extension



Permit Drawing
Sheet 19 of 25

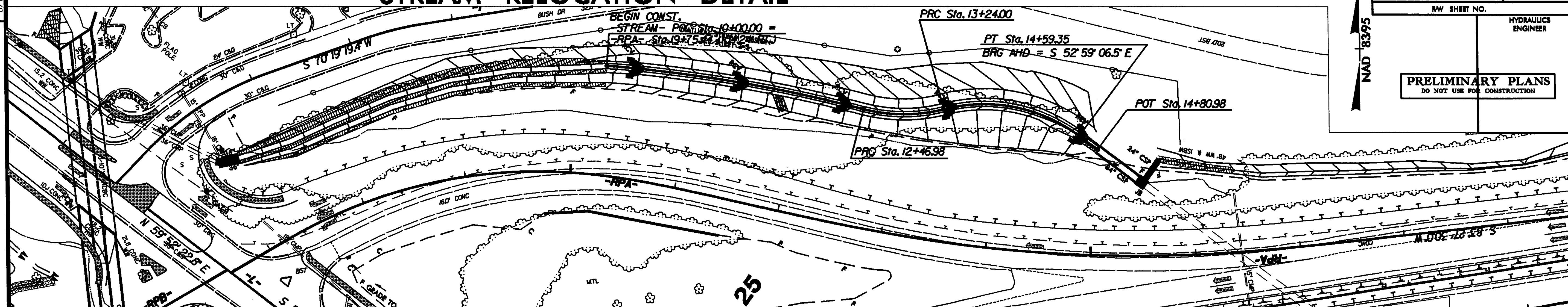
5/14/99

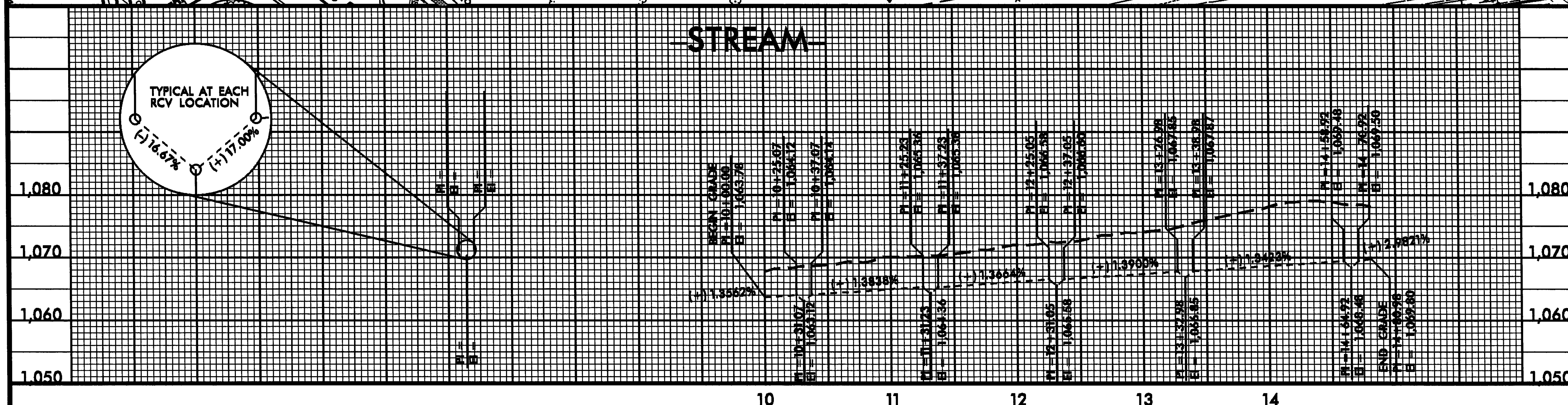
05-MAR-2009 08:54
r:\hydraulics\permits_environmental\drawings\u2550b_hyd_prm_wet_cul_pfl.dgn

STREAM RELOCATION DETAIL

PROJECT REFERENCE NO.	SHEET NO.
U-2550B	2-S
R/W SHEET NO.	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



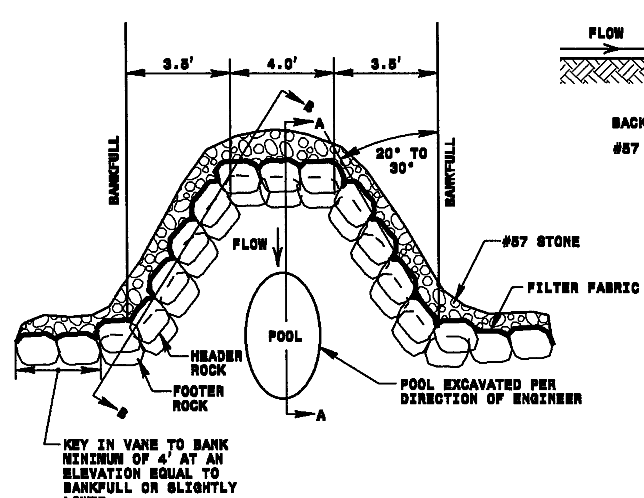


STREAM CURVE DATA

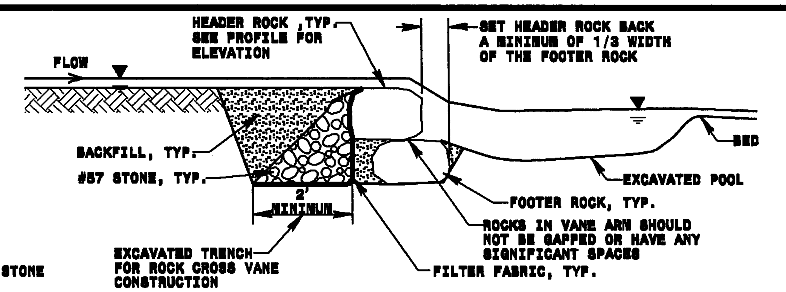
PI Sta 11+23.82
Δ = 10° 15' 14.8" (RT)
D = 4° 09' 06.7"
L = 246.98'
T = 123.82'
R = 1,380.00'

PI Sta 12+86.36
Δ = 29° 25' 12.1" (LT)
D = 38° 11' 49.9"
L = 77.02'
T = 39.38'
R = 150.00'

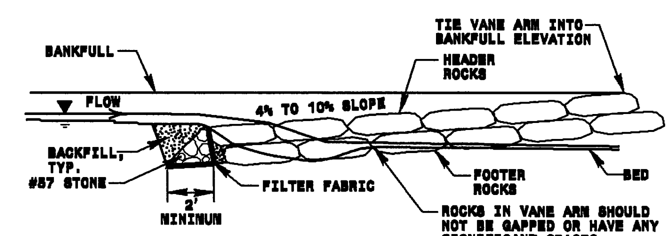
PI Sta 13+96.67
Δ = 51° 42' 06.3" (RT)
D = 38° 11' 49.9"
L = 135.35'
T = 72.68'
R = 150.00'



PLAN VIEW



SECTION A-A



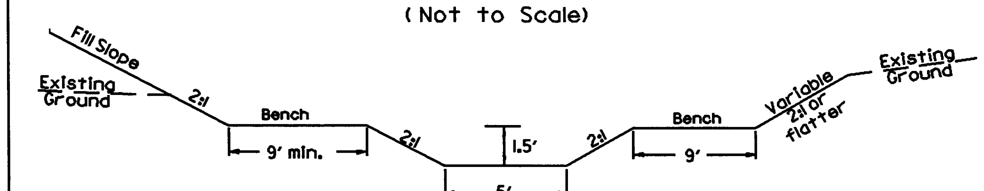
SECTION B-B

	BOULDER DIMENSIONS (FT)		
STATION	HEIGHT	LENGTH	WIDTH
10+31	2	2	4
11+31	2	2	4
12+31	2	2	4
13+33	2	2	4
14+65	2	2	4

ROCK CROSS VANE DETAIL
NOT TO SCALE

NOTES:
1. DEEPEST PART OF POOL TO BE IN LINE WITH WHERE VANE ARM TIES INTO BANKFULL.
2. DO NOT EXCAVATE POOL TOO CLOSE TO FOOTER BOULDERS.
3. CLASS "A" STONE CAN BE USED TO REDUCE VOIDS BETWEEN HEADERS AND FOOTERS.
4. COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.

STREAM DIMENSIONS
(Not to Scale)

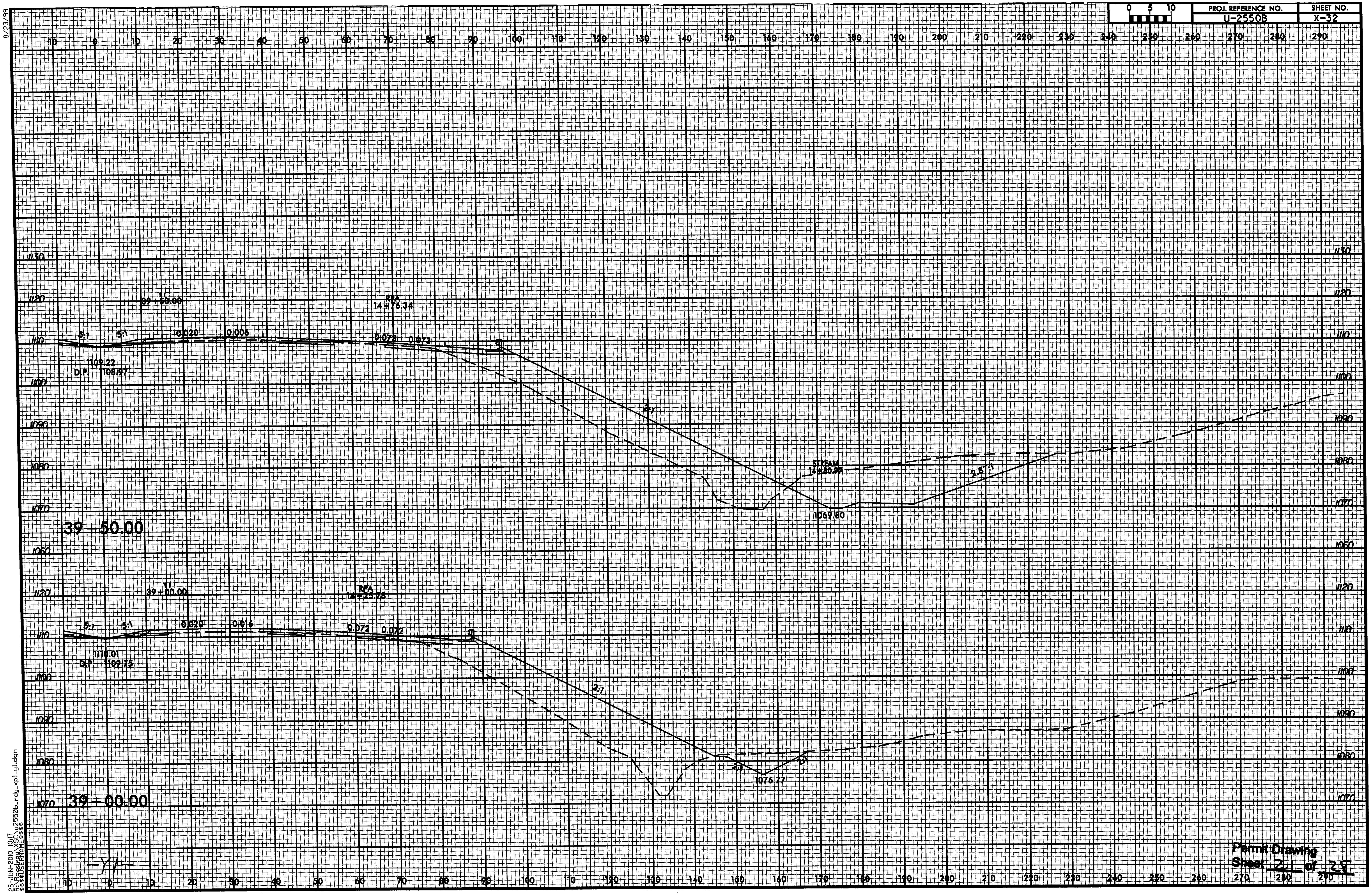


Note: Replant slopes, benches, and stream banks according to Erosion Control plans

REVISIONS

8/17/99

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



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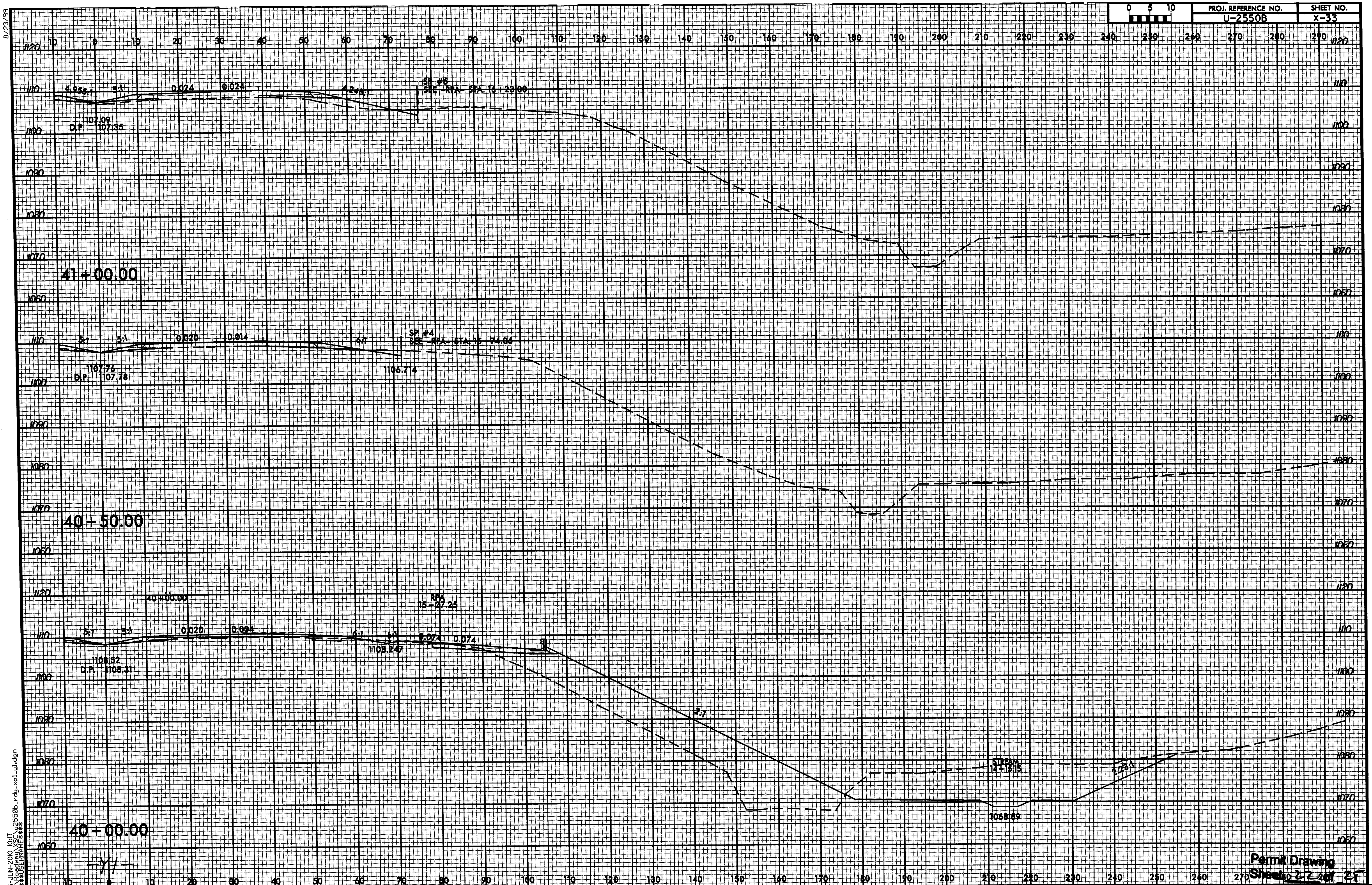
8/23/99



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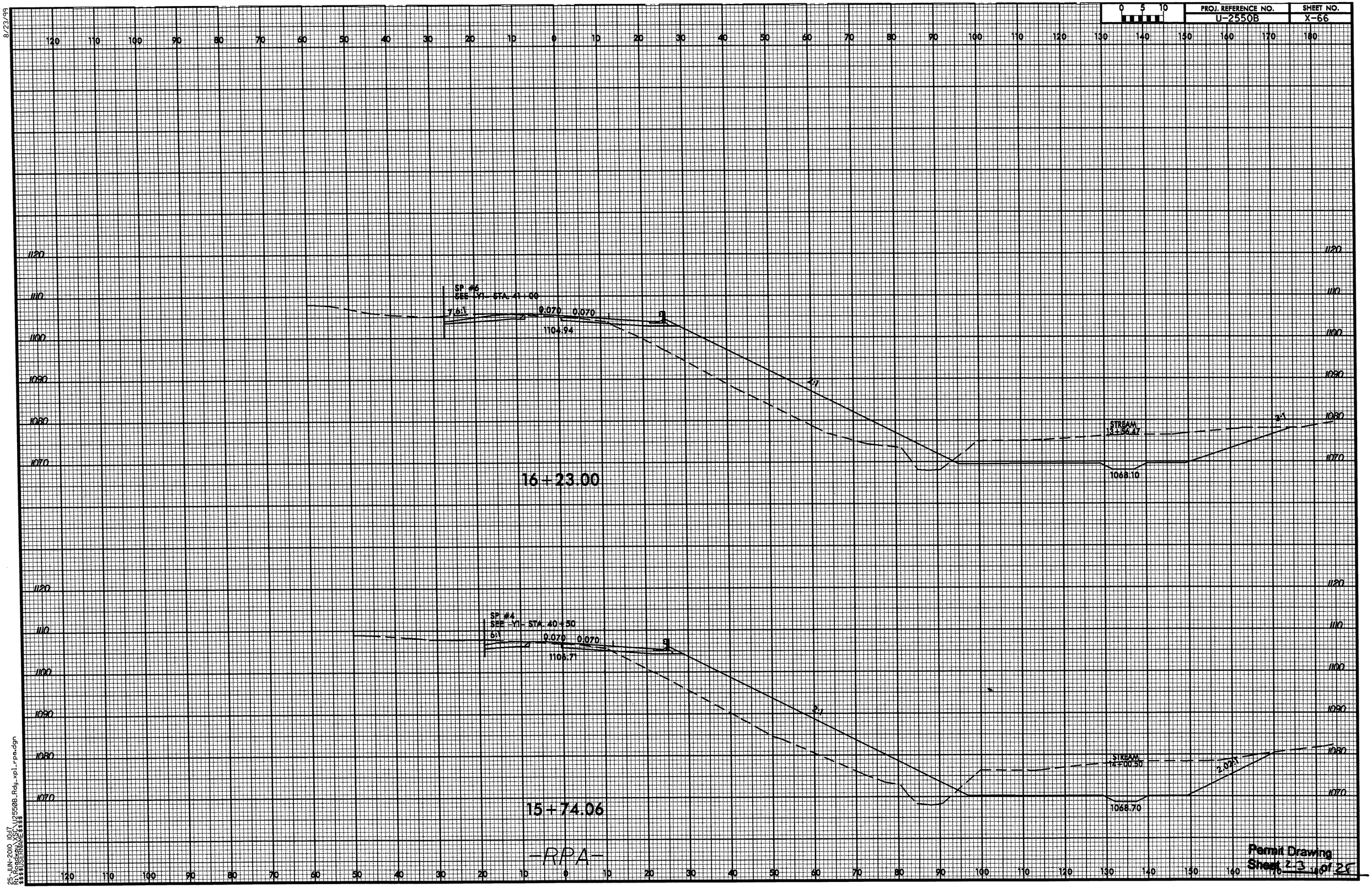
8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-2550B	X-66



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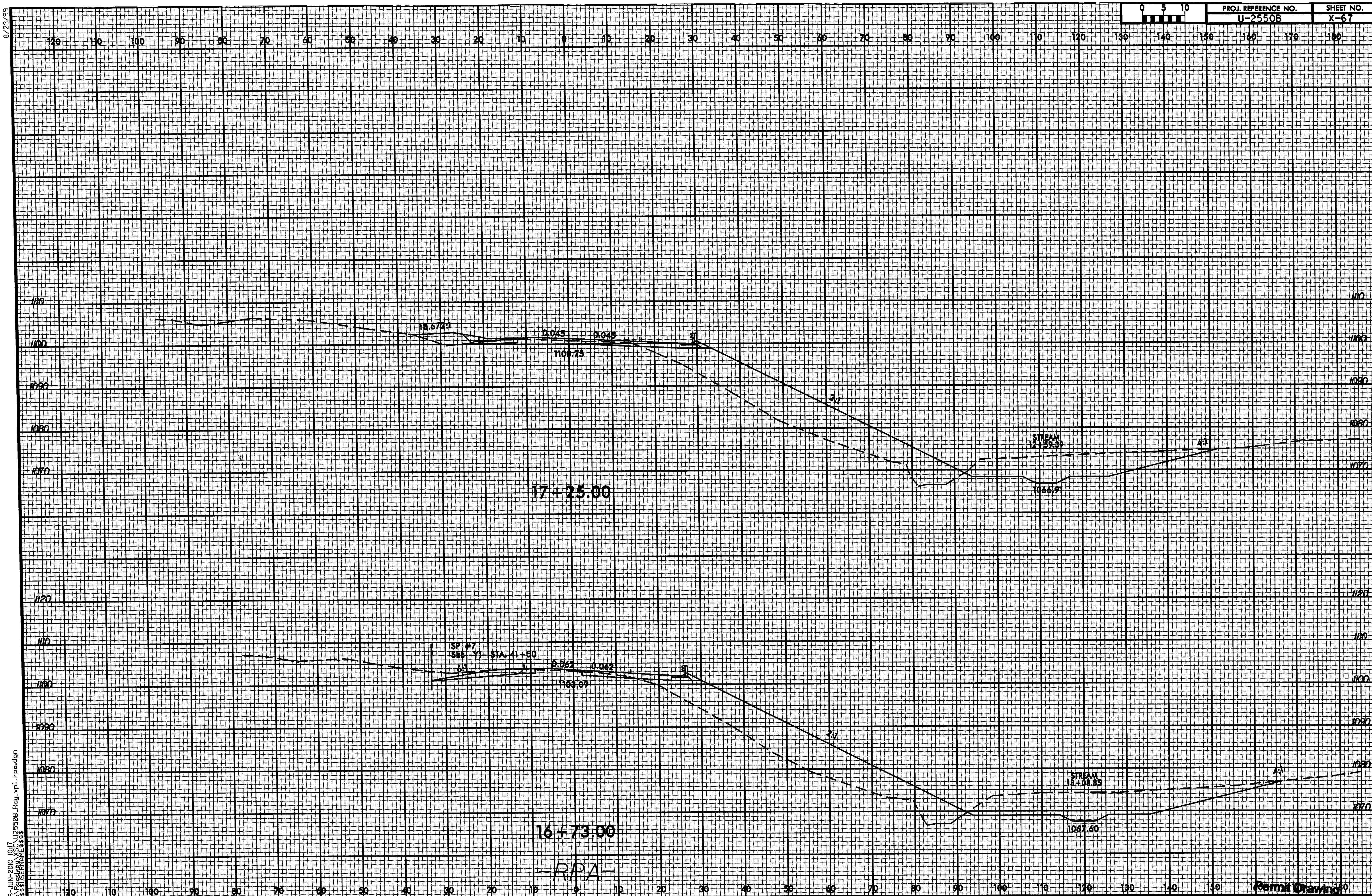
Permit Drawing
Sheet 23 of 25



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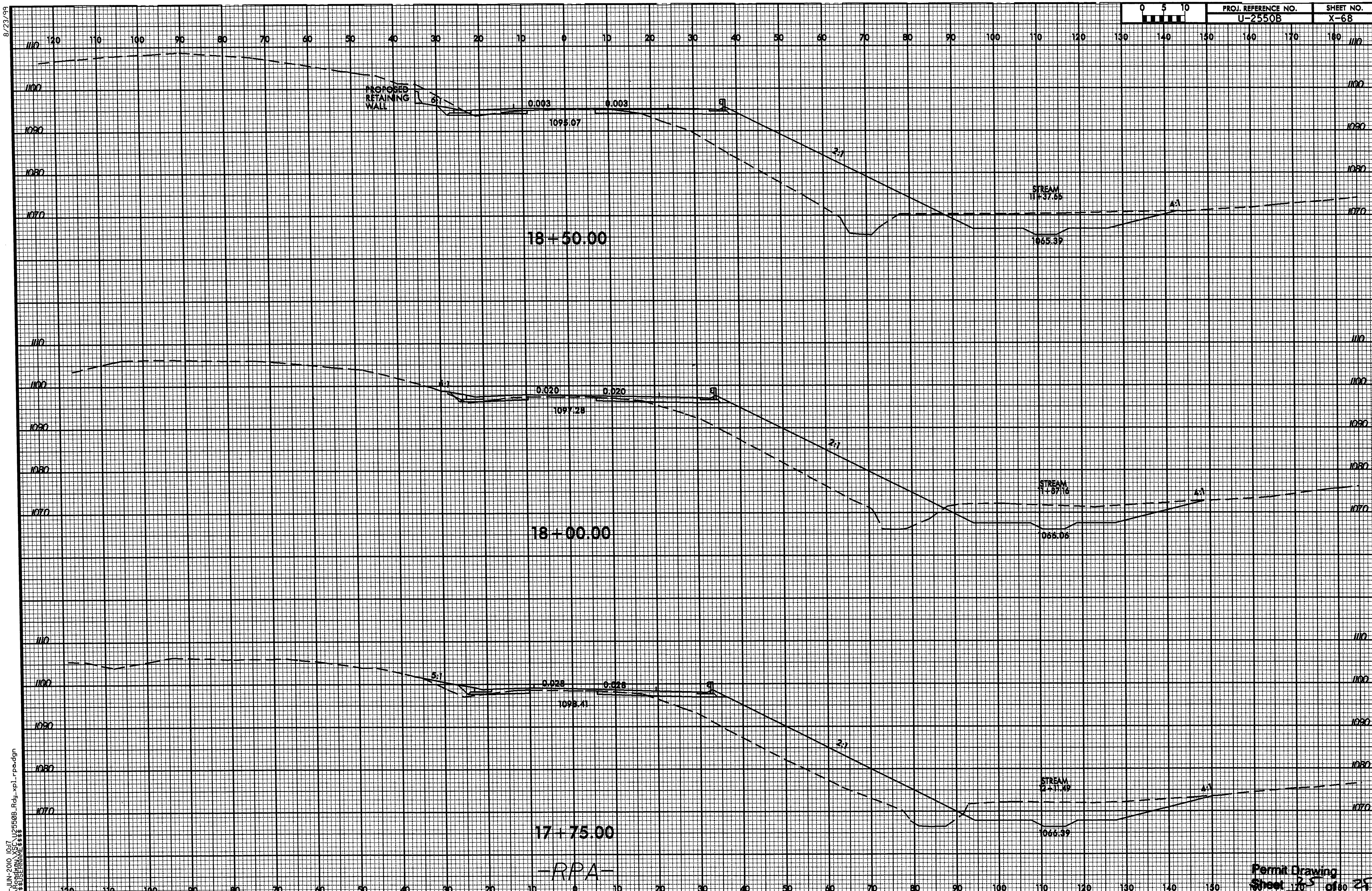
Permit Drawing
Sheet 24 of 25

PROJ. REFERENCE NO. U-2550B | SHEET NO. X-68



Permit Drawing Sheet 25 of 25

8/23/99

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$$$$USERNAME$$$$

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-2550B	X-69

120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180

1120
1110
1100
1090
1080
1070

PROPOSED RETAINING WALL

6:1

0.035

1090.48

0.035

2:1

STREAM 10+29.73

3:1

1063.89

19+50.00

PROPOSED RETAINING WALL

6:1

0.016

1092.69

0.016

2:1

STREAM 10+85.55

3:1

1064.81

19+00.00

-RPA-

Permit Drawing
Sheet 26 of 25

25-JUN-2010 10:17
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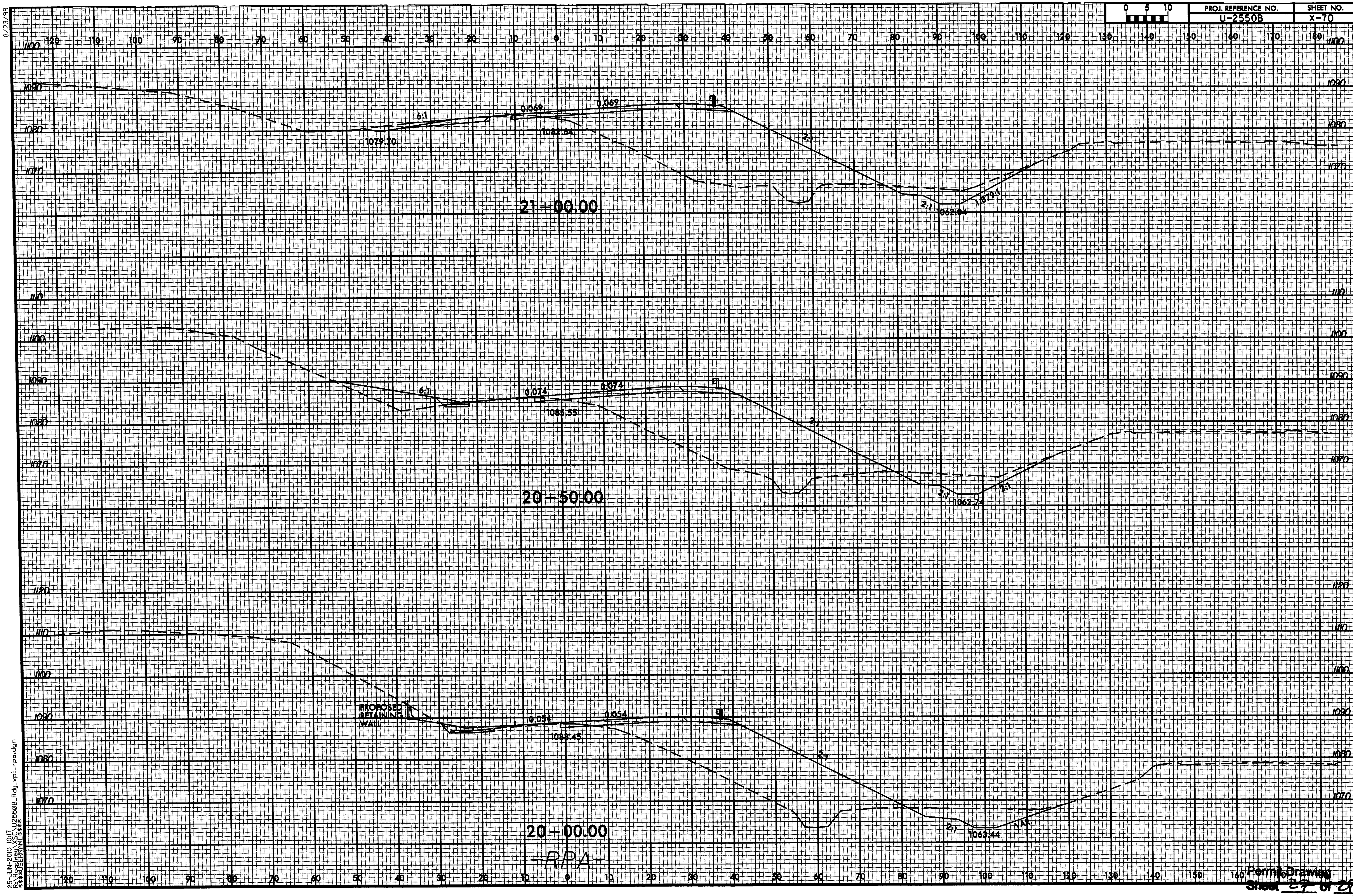
PROJ. REFERENCE NO.
U-2550B
SHEET NO.
X-70
0 5 10
8/23/99
21+00.00
0.069
0.069
6:1
2:1
1079.70
1082.64
1062.04
1.879:1
20+50.00
0.074
0.074
6:1
2:1
1085.55
1062.74
20+00.00
PROPOSED RETAINING WALL
0.054
0.054
2:1
1088.45
1063.44
VAR.
-RPA-
Permit Drawing
25-JUN-2010 10:17
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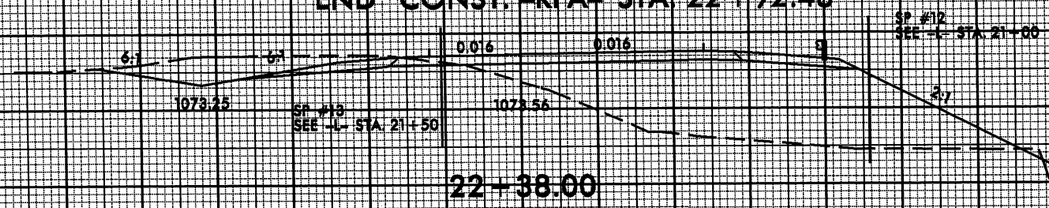
$$$$USERNAME$$$$

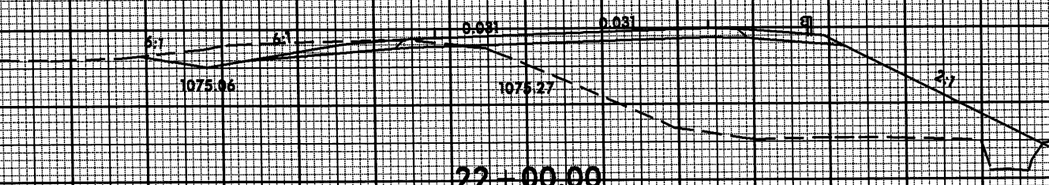
8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-2550B	X-71

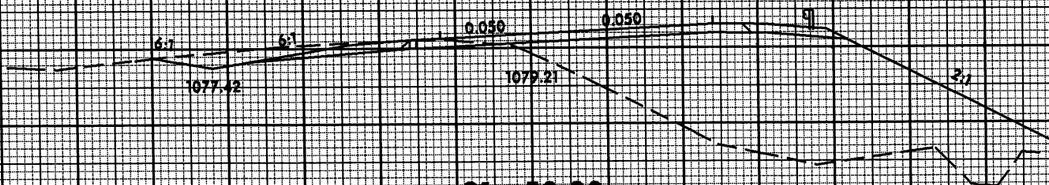
END CONST. -RPA- STA. 22+92.48



22+38.00



22+00.00



21+50.00

-RPA-

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Permit Drawing
Sheet 28 of 29

09/08/99

TIP PROJECT: U-2550B

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

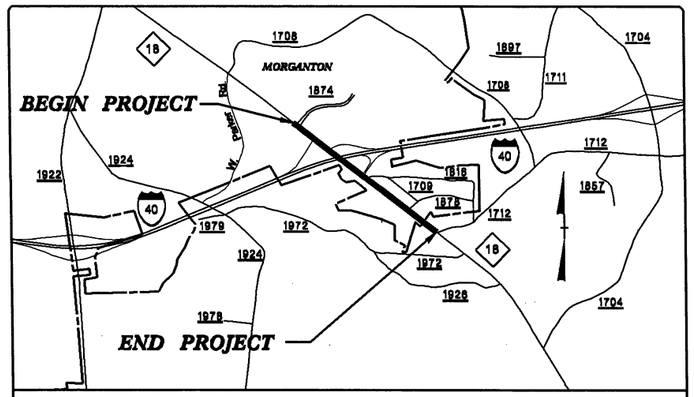
BURKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2550B	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34831.1.1	STPNHF-M-8165(1)	P.E.
34831.2.4	STPNHF-0018(13)	RW, UTIL.

LOCATION: MORGANTON – NC 18 (STERLING STREET) AND I-40 INTERCHANGE

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

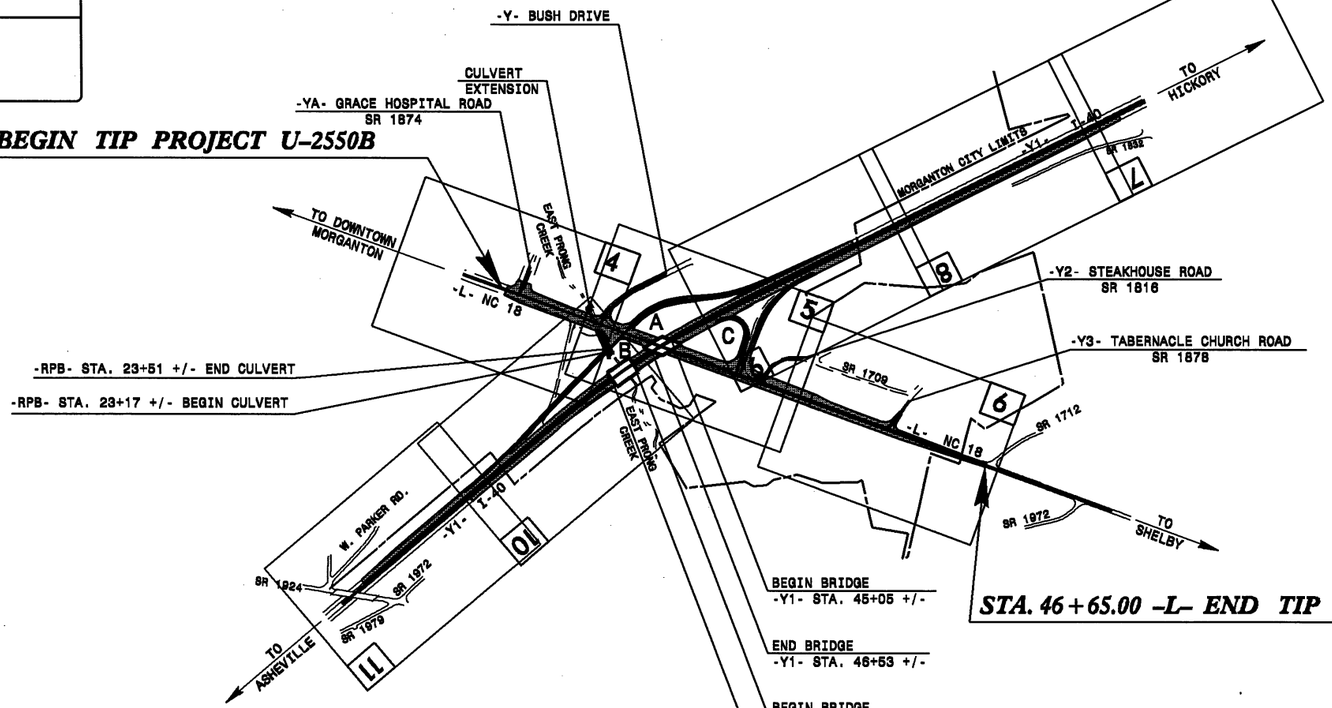


VICINITY MAP

NAD 8395

STA. 12+80.00 –L– BEGIN TIP PROJECT U-2550B

BEGIN CONSTRUCTION FOR SIGNAL WORK APPROXIMATELY 8950' NORTHWEST ALONG NC 18 (STERLING STREET)



STA. 46+65.00 –L– END TIP PROJECT U-2550B

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.
A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF MORGANTON.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONTRACT:

GRAPHIC SCALES

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

DESIGN DATA

ADT 2011 = 24459
ADT 2031 = 40607
DHV = 11 %
D = 60 %
T = 4 % *
V = 50 MPH
FUNC. CLASS = URBAN ARTERIAL
* TTST 1% DUAL 3%
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-2550B = 0.641 MI
TOTAL LENGTH OF TIP PROJECT U-2550B = 0.641 MI

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: NOVEMBER 21, 2008

LETTING DATE: JUNE 21, 2011

GARY LOVERING, PE
PROJECT ENGINEER

RON McCOLLUM, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER P.E.

30-JUN-2010 11:58
c:\projects\2010\u2550b_rdy_tsh.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
U-2550B	1-B

06/09/06

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream — JS
- Buffer Zone 1 — BZ 1
- Buffer Zone 2 — BZ 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch — FWM
- 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 Drainage / Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

PROJECT REFERENCE NO.	SHEET NO.
U-2550B	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PAVEMENT SCHEDULE

FINAL PAVEMENT DESIGN

C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
C3	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C4	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C5	PROP. VAR. DEPTH ASPHALT CONCRETE 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 2" IN DEPTH.
C6	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C7	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C8	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.
D3	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D4	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.
D5	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0D, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D6	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0D, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
E2	PROP. APPROX. 5.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
E3	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
E4	PROP. APPROX. 7" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
E5	PROP. APPROX. 16.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD. IN EACH OF THREE LAYERS.
E6	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
F	PROP. APPROX. ⅝" ULTRATHIN HOT MIX ASPHALT, TYPE B, AT AN AVERAGE RATE OF 70 LBS. PER SQ. YD. PER ⅝" DEPTH.
R1	5" MONOLITHIC CONCRETE ISLAND.
R2	2'-6" CONCRETE CURB AND GUTTER.
R3	CONCRETE EXPRESSWAY GUTTER.
R4	1'-6" CONCRETE CURB AND GUTTER.
S	4" CONCRETE SIDEWALK.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE DETAIL SHOWING METHOD OF WEDGING)

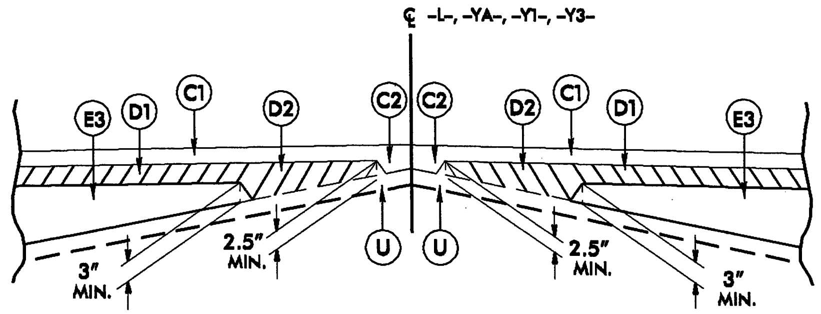
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

6/2/99

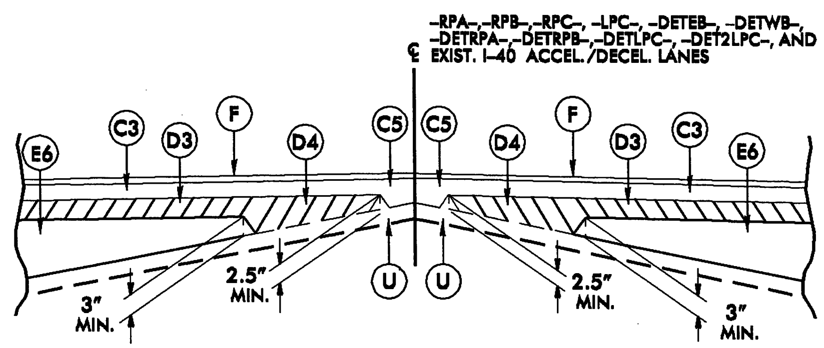
PROJECT REFERENCE NO.	SHEET NO.
U-2550B	2-A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PAVEMENT SCHEDULE FINAL PAVEMENT DESIGN	
C1	3" S9.5B
C2	VAR. S9.5B
C3	1.5" S9.5C
C4	3" S9.5C
C5	VAR. S9.5C
C6	1.5" S9.5D
C7	3" S9.5D
C8	VAR. S9.5D
D1	4" I19.0B
D2	VAR. I19.0B
D3	4" I19.0C
D4	VAR. I19.0C
D5	4" I19.0D
D6	VAR. I19.0D
E1	5" B25.0B
E2	5.5" B25.0B
E3	VAR. B25.0B
E4	7" B25.0C
E5	16.5" B25.0C
E6	VAR. B25.0C
F	5/8" UHMA, TYP.B
R1	5" MCI
R2	2'-6" C & G
R3	EXP. GUTTER
R4	1'-6" C & G
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING



Detail Showing Method of Wedging



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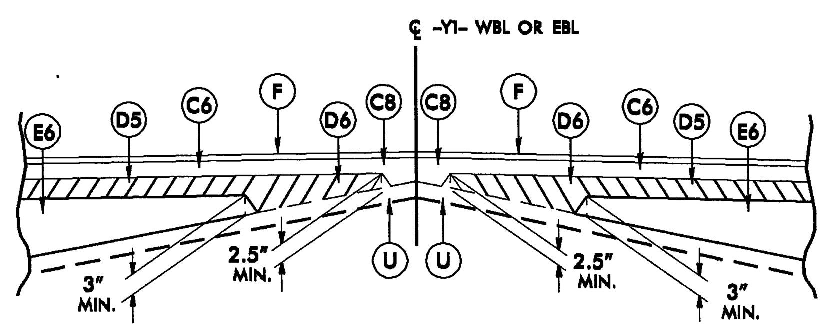
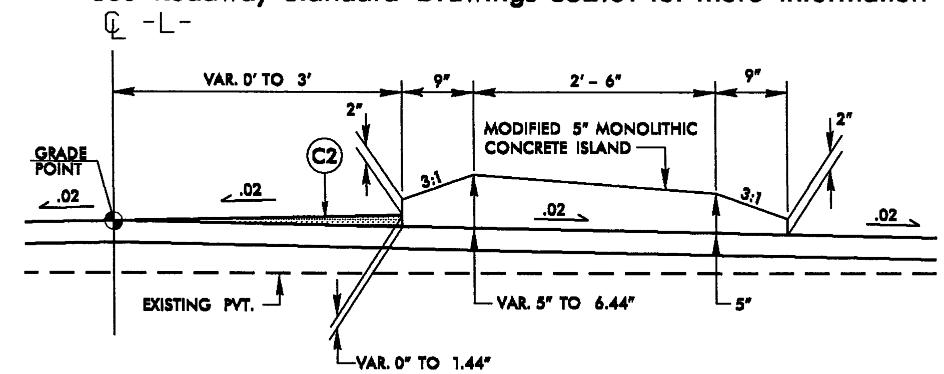


Detail Showing Method of Wedging

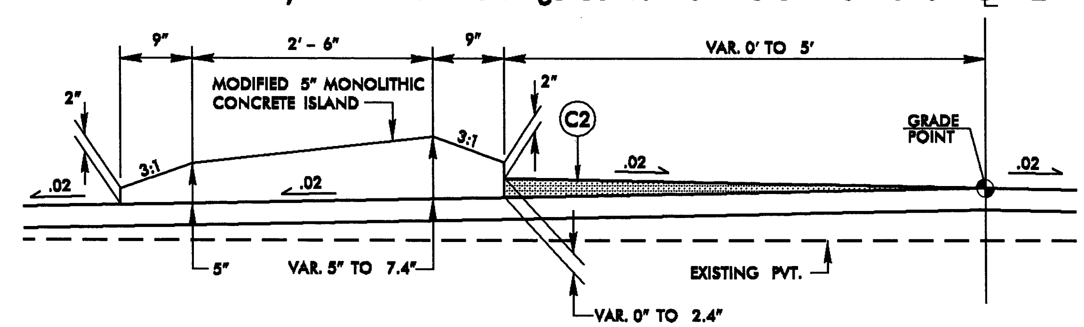
See Roadway Standard Drawings 852.01 for more information



Detail Showing Modified 5" Monolithic Conc. Island

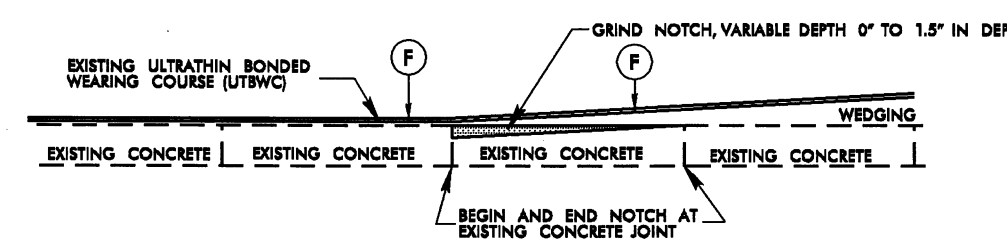
-L- STA. 22+10.00 TO STA. 24+27.50

See Roadway Standard Drawings 852.01 for more information



Detail Showing Modified 5" Monolithic Conc. Island

-L- STA. 35+05.56 TO STA. 39+46.00



Detail Showing Tie-in of Wedging to Existing Pavement on I-40

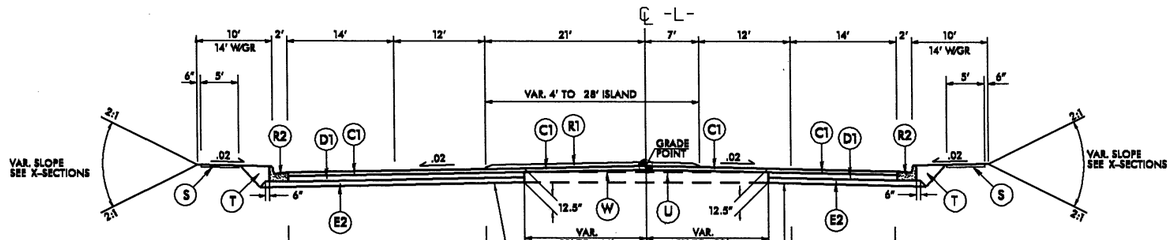
-Y1- STA. 31+50 +/-
-Y1- STA. 62+00 +/-

6/2/99

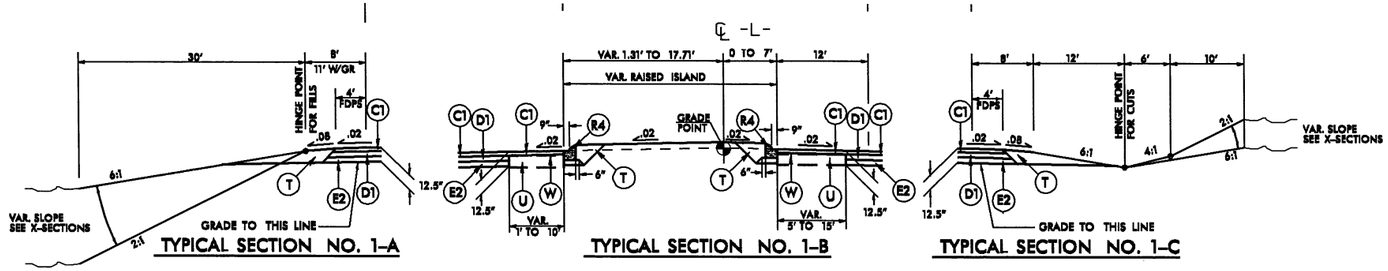
PAVEMENT SCHEDULE *FINAL PAVEMENT DESIGN*	
C1	3" S9.5B
C2	VAR. S9.5B
C3	1.5" S9.5C
C4	3" S9.5C
C5	VAR. S9.5C
C6	1.5" S9.5D
C7	3" S9.5D
C8	VAR. S9.5D
D1	4" I19.0B
D2	VAR. I19.0B
D3	4" I19.0C
D4	VAR. I19.0C
D5	4" I19.0D
D6	VAR. I19.0D
E1	5" B25.0B
E2	5.5" B25.0B
E3	VAR. B25.0B
E4	7" B25.0C
E5	16.5" B25.0C
E6	VAR. B25.0C
F	5/8" UHMA, TYP.B
R1	5" MCI
R2	2'-6" C & G
R3	EXP. GUTTER
R4	1'-6" C & G
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING

PROJECT REFERENCE NO.	SHEET NO.
U-2550B	2-B
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



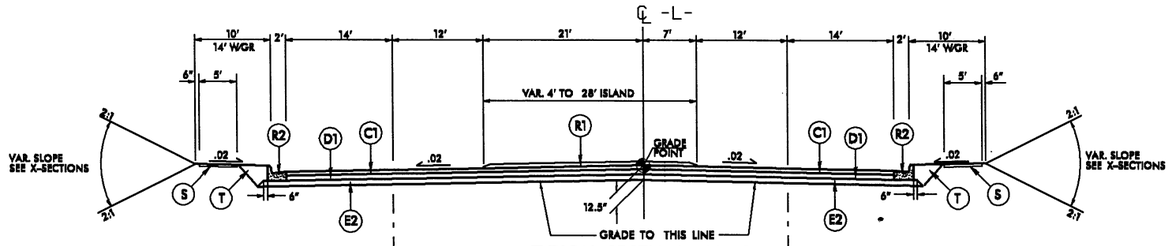
TYPICAL SECTION NO. 1



TYPICAL SECTION NO. 1-A

TYPICAL SECTION NO. 1-B

TYPICAL SECTION NO. 1-C



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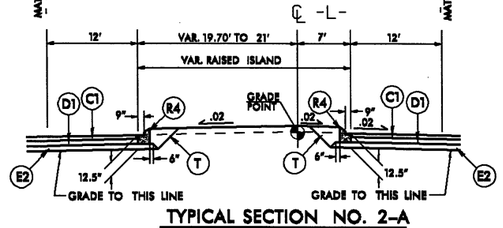
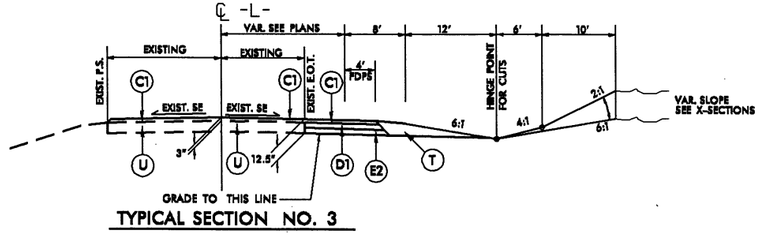


TYPICAL SECTION NO. 2-A



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 1
-L- STA. 13+00.00 TO STA. 20+00.00
-L- STA. 27+50.00 TO STA. 39+75.00. LT.
-L- STA. 27+50.00 TO STA. 41+25.00, RT.
SEE PLANS FOR SIDEWALK LIMITS
SEE PLANS FOR MONOLITHIC ISLAND LIMITS

USE TYPICAL SECTION NO. 1-A
-L- STA. 39+75.00 TO 44+70.00, LT.

USE TYPICAL SECTION NO. 1-B
-L- STA. 17+65.00 TO STA. 19+00.00
-L- STA. 29+71.00 TO STA. 34+50.00

USE TYPICAL SECTION NO. 1-C
-L- STA. 41+25.00 TO STA. 44+70.00, RT.

USE TYPICAL SECTION NO. 2
-L- STA. 20+00.00 TO STA. 27+50.00
SEE PLANS FOR SIDEWALK LIMITS
SEE PLANS FOR MONOLITHIC ISLAND LIMITS

USE TYPICAL SECTION NO. 2-A
-L- STA. 20+00.00 TO STA. 21+07.00

USE TYPICAL SECTION NO. 3
-L- STA. 44+70.00 TO STA. 46+65.00

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6/2/99

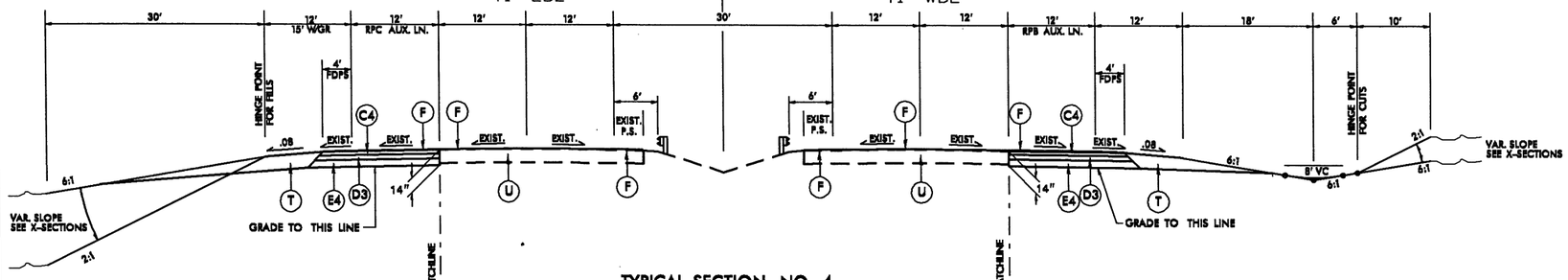
PAVEMENT SCHEDULE *FINAL PAVEMENT DESIGN*	
C1	3" S9.5B
C2	VAR. S9.5B
C3	1.5" S9.5C
C4	3" S9.5C
C5	VAR. S9.5C
C6	1.5" S9.5D
C7	3" S9.5D
C8	VAR. S9.5D
D1	4" I19.0B
D2	VAR. I19.0B
D3	4" I19.0C
D4	VAR. I19.0C
D5	4" I19.0D
D6	VAR. I19.0D
E1	5" B25.0B
E2	5.5" B25.0B
E3	VAR. B25.0B
E4	7" B25.0C
E5	16.5" B25.0C
E6	VAR. B25.0C
F	5/8" UHMA, TYP.B
R1	5" MCI
R2	2'-6" C & G
R3	EXP. GUTTER
R4	1'-6" C & G
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING

PROJECT REFERENCE NO.	SHEET NO.
U-2550B	2-C
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

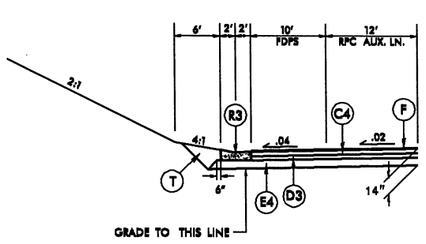
℄ -Y1-

-Y1- EBL -Y1- WBL

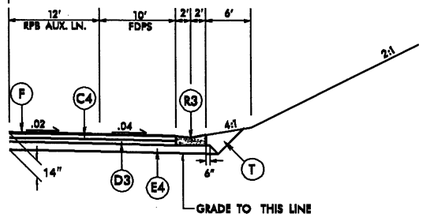


TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4
-Y1- EBL STA. 12+00.00 TO STA. 31+50.00
-Y1- WBL STA. 62+00.00 TO STA. 71+00.00



TYPICAL SECTION NO. 4-A



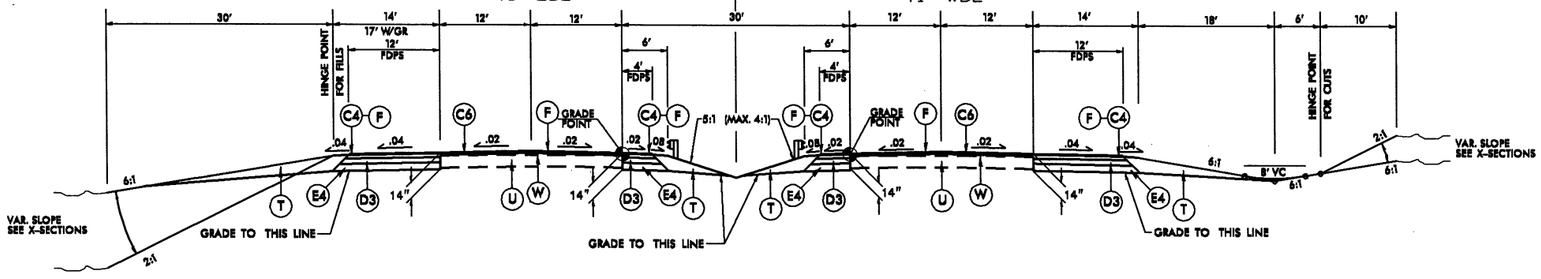
TYPICAL SECTION NO. 4-B

USE TYPICAL SECTION NO. 4-A
-Y1- EBL STA. 14+50.00 TO STA. 23+00.00

USE TYPICAL SECTION NO. 4-B
-Y1- WBL STA. 62+00.00 TO STA. 69+50.00

℄ -Y1-

-Y1- EBL -Y1- WBL

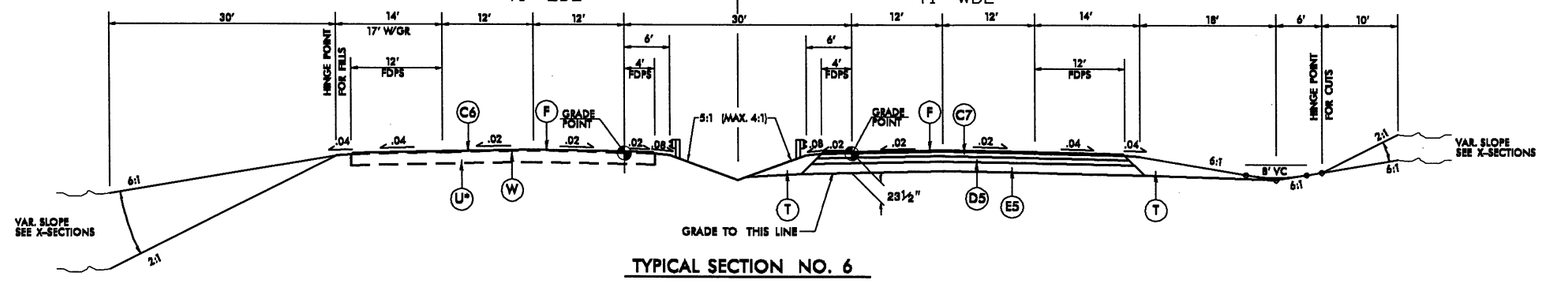


TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5
-Y1- STA. 31+50.00 TO STA. 42+00.00
-Y1- STA. 52+00.00 TO STA. 62+00.00

℄ -Y1-

-Y1- EBL -Y1- WBL



TYPICAL SECTION NO. 6

* BUILT DURING DETOUR II

USE TYPICAL SECTION NO. 6
-Y1- STA. 42+00.00 TO 45+05 +/- (BEG. BRIDGE)
-Y1- STA. 46+53 +/- (END BRIDGE) TO 48+00 +/- (BEG. BRIDGE)
-Y1- STA. 49+76 +/- (END BRIDGE) TO STA. 52+00.00

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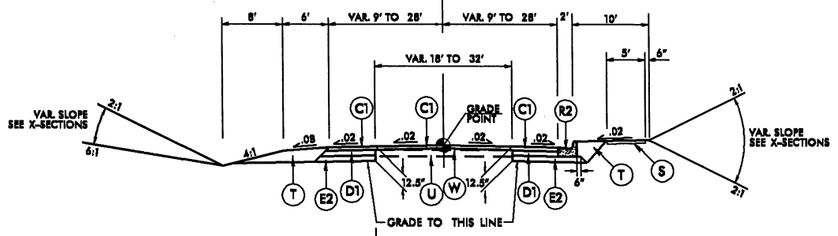
6/2/99

PAVEMENT SCHEDULE *FINAL PAVEMENT DESIGN*	
C1	3" S9.5B
C2	VAR. S9.5B
C3	1.5" S9.5C
C4	3" S9.5C
C5	VAR. S9.5C
C6	1.5" S9.5D
C7	3" S9.5D
C8	VAR. S9.5D
D1	4" I19.0B
D2	VAR. I19.0B
D3	4" I19.0C
D4	VAR. I19.0C
D5	4" I19.0D
D6	VAR. I19.0D
E1	5" B25.0B
E2	5.5" B25.0B
E3	VAR. B25.0B
E4	7" B25.0C
E5	16.5" B25.0C
E6	VAR. B25.0C
F	5/8" UHMA, TYP.B
R1	5" MCI
R2	2'-6" C & G
R3	EXP. GUTTER
R4	1'-6" C & G
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING

PROJECT REFERENCE NO.	SHEET NO.
U-2550B	2-D
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

℄ -YA-, -Y-, -Y3-

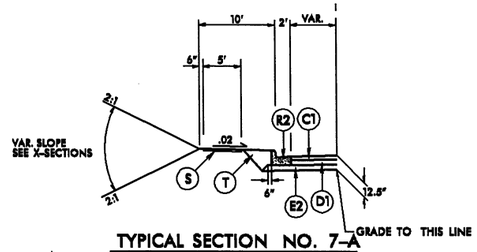


TYPICAL SECTION NO. 7

USE TYPICAL SECTION NO. 7

-YA- STA. 11+13.48 TO STA. 11+64.40
-Y- STA. 14+36.95 TO STA. 15+20.19
-Y3- STA. 11+00.00 TO STA. 12+13.88
SEE PLANS FOR SIDEWALK LIMITS

MATCHLINE

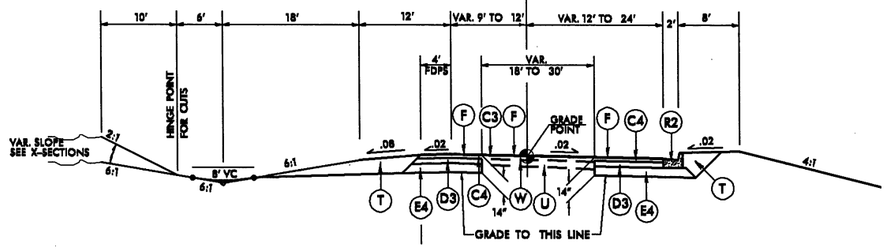


TYPICAL SECTION NO. 7-A

USE TYPICAL SECTION NO. 7-A

-Y- STA. 14+36.95 TO STA. 15+20.19
-YA- STA. 11+13.48 TO STA. 11+64.40
SEE PLANS FOR SIDEWALK LIMITS

℄ -LPC-

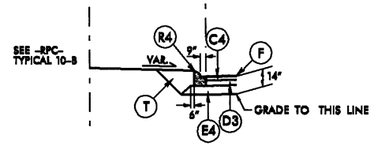


TYPICAL SECTION NO. 8

USE TYPICAL SECTION NO. 8

-LPC- STA. 10+00.00 TO STA. 15+01.09

MATCHLINE



TYPICAL SECTION NO. 8-A

USE TYPICAL SECTION NO. 8-A

-LPC- STA. 12+84.56 TO STA. 13+73.88, LT.

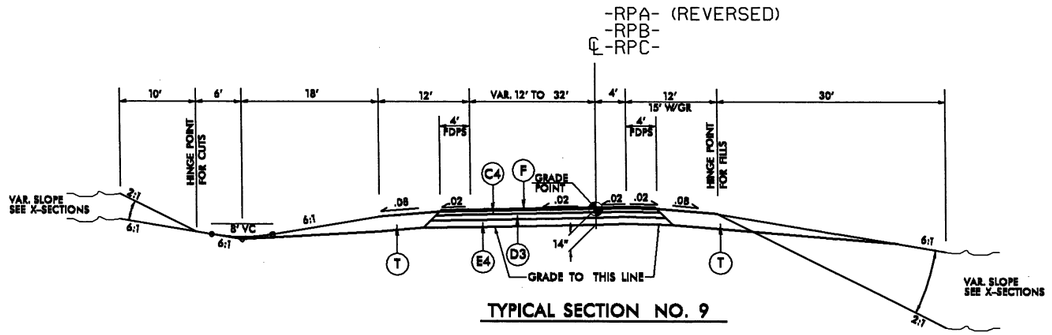
30-JUN-2010 11:58
r:\roadgen\prs\u2550b_rdy_typ.dgn
$$$$INCLUDE$$$$

6/2/99

PAVEMENT SCHEDULE *FINAL PAVEMENT DESIGN*	
C1	3" S9.5B
C2	VAR. S9.5B
C3	1.5" S9.5C
C4	3" S9.5C
C5	VAR. S9.5C
C6	1.5" S9.5D
C7	3" S9.5D
C8	VAR. S9.5D
D1	4" I19.0B
D2	VAR. I19.0B
D3	4" I19.0C
D4	VAR. I19.0C
D5	4" I19.0D
D6	VAR. I19.0D
E1	5" B25.0B
E2	5.5" B25.0B
E3	VAR. B25.0B
E4	7" B25.0C
E5	18.5" B25.0C
E6	VAR. B25.0C
F	5/8" UHMA, TYP.B
R1	5" MCI
R2	2'-6" C & G
R3	EXP. GUTTER
R4	1'-6" C & G
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING

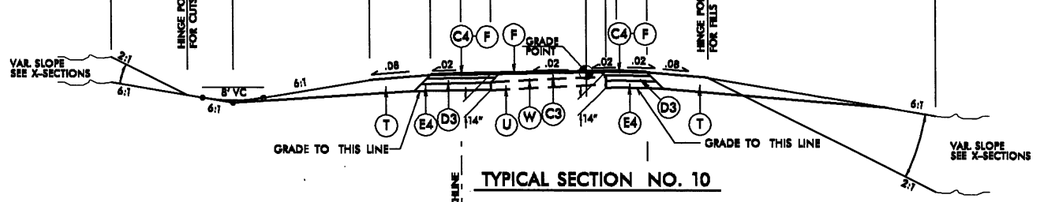
PROJECT REFERENCE NO.	SHEET NO.
U-2550B	2-E
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



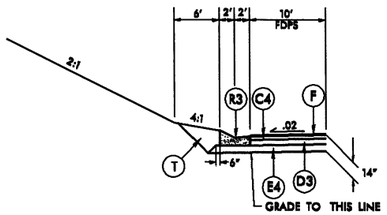
TYPICAL SECTION NO. 9

USE TYPICAL SECTION NO. 9
-RPA- STA. 21+60.00 TO STA. 22+92.48
-RPB- STA. 10+00.00 TO STA. 16+18.75
-RPB- STA. 18+50.00 TO STA. 24+38.76
-RPC- STA. 12+84.00 TO STA. 16+00.00



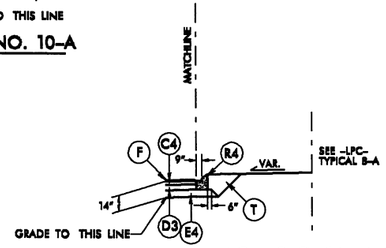
TYPICAL SECTION NO. 10

USE TYPICAL SECTION NO. 10
-RPA- STA. 10+00.00 TO STA. 21+60.00
-RPB- STA. 16+70.00 TO STA. 18+50.00
-RPC- STA. 10+00.00 TO STA. 12+84.00
-RPC- STA. 16+00.00 TO STA. 18+20.68



TYPICAL SECTION NO. 10-A

USE TYPICAL SECTION NO. 10-A
-RPA- STA. 17+00.00 TO STA. 20+50.00, LT.
-RPC- STA. 14+50.00 TO STA. 16+85.39, LT.



TYPICAL SECTION NO. 10-B

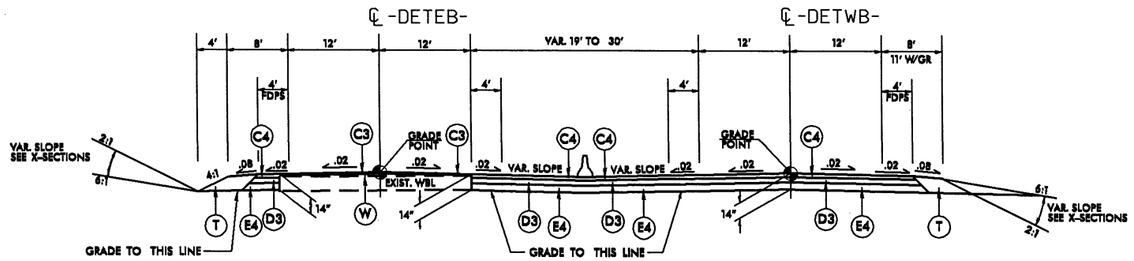
USE TYPICAL SECTION NO. 10-B
-RPC- STA. 16+00.00 TO STA. 16+92.89, RT.

6/2/99

PAVEMENT SCHEDULE *FINAL PAVEMENT DESIGN*	
C1	3" S9.5B
C2	VAR. S9.5B
C3	1.5" S9.5C
C4	3" S9.5C
C5	VAR. S9.5C
C6	1.5" S9.5D
C7	3" S9.5D
C8	VAR. S9.5D
D1	4" I19.0B
D2	VAR. I19.0B
D3	4" I19.0C
D4	VAR. I19.0C
D5	4" I19.0D
D6	VAR. I19.0D
E1	5" B25.0B
E2	5.5" B25.0B
E3	VAR. B25.0B
E4	7" B25.0C
E5	16.5" B25.0C
E6	VAR. B25.0C
F	5/8" UHMA, TYP.B
R1	5" MCI
R2	2'-6" C & G
R3	EXP. GUTTER
R4	1'-6" C & G
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING

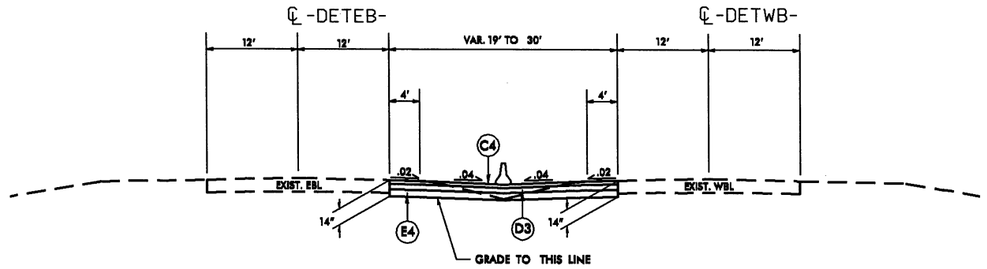
PROJECT REFERENCE NO.	SHEET NO.
U-2550B	2-F
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



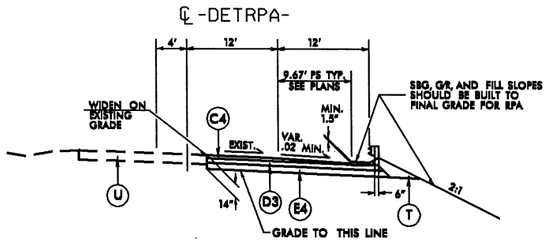
TYPICAL SECTION NO. 11

USE TYPICAL SECTION NO. 11
-DETEB- STA. 38+23.35 TO STA. 44+25.00
-DETEB- STA. 49+15.00 TO STA. 55+62.01
-DETWB- STA. 39+17.28 TO TEMP. BRIDGE
-DETWB- TEMP. BRIDGE TO STA. 54+70.05



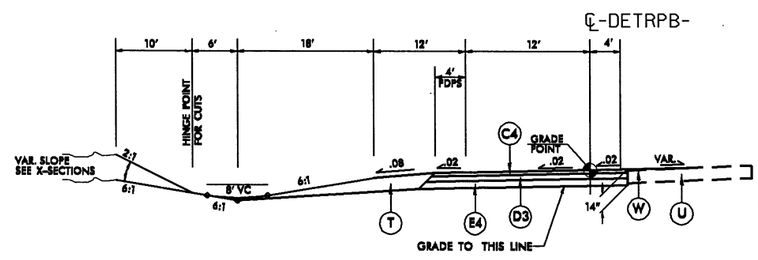
TYPICAL SECTION NO. 12

USE TYPICAL SECTION NO. 12
-DETEB- STA. 35+14.74 TO STA. 38+23.35
-DETEB- STA. 55+62.01 TO STA. 58+65.60
-DETWB- STA. 36+13.31 TO STA. 39+17.28
-DETWB- STA. 54+70.05 TO STA. 57+70.22



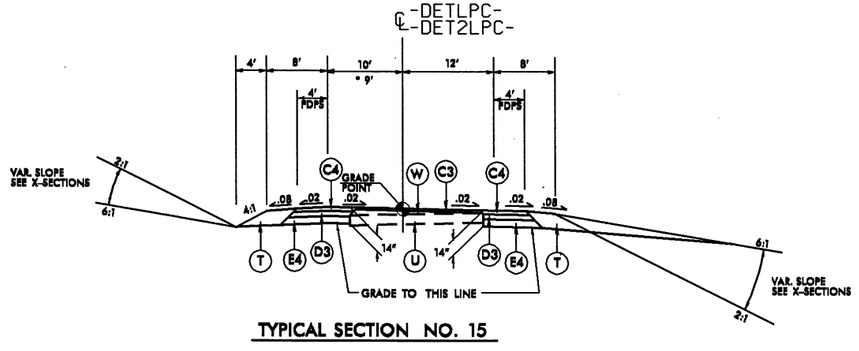
TYPICAL SECTION NO. 13A

USE TYPICAL SECTION NO. 13
-Y1- STA. 31+50.00 TO STA. 34+75.00 (-DETRPA- TAPER AND PS)
-DETRPA- STA. 10+00.00 TO STA. 18+90.95



TYPICAL SECTION NO. 14

USE TYPICAL SECTION NO. 14
-DETRPB- STA. 16+07.38 TO STA. 19+60.14



TYPICAL SECTION NO. 15

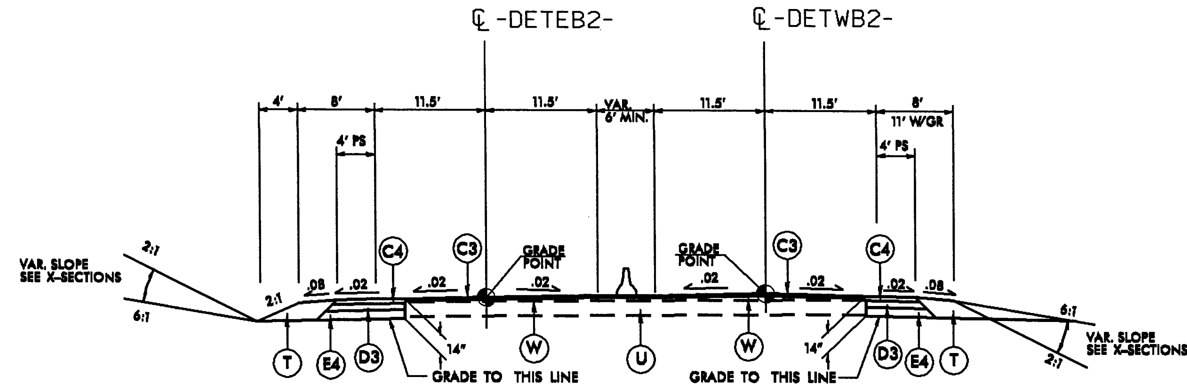
USE TYPICAL SECTION NO. 15
-DETLPC- STA. 10+00.00 TO STA. 13+00.00
-DET2LPC- STA. 10+00.00 TO STA. 11+36.90

PROJECT REFERENCE NO.	SHEET NO.
U-2550B	2-G
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

6/2/99

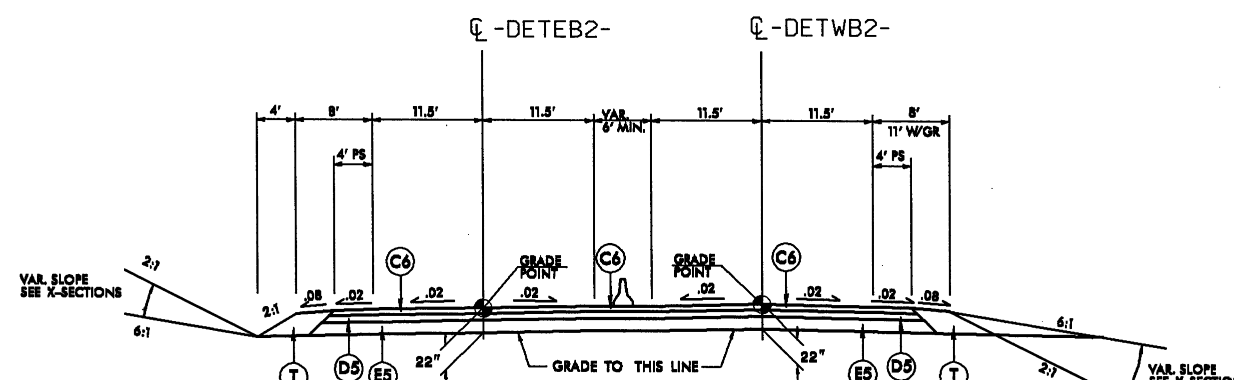
PAVEMENT SCHEDULE *FINAL PAVEMENT DESIGN*	
C1	3" S9.5B
C2	VAR. S9.5B
C3	1.5" S9.5C
C4	3" S9.5C
C5	VAR. S9.5C
C6	1.5" S9.5D
C7	3" S9.5D
C8	VAR. S9.5D
D1	4" I19.0B
D2	VAR. I19.0B
D3	4" I19.0C
D4	VAR. I19.0C
D5	4" I19.0D
D6	VAR. I19.0D
E1	5" B25.0B
E2	5.5" B25.0B
E3	VAR. B25.0B
E4	7" B25.0C
E5	16.5" B25.0C
E6	VAR. B25.0C
F	5/8" UHMA, TYP.B
R1	5" MCI
R2	2'-6" C & G
R3	EXP. GUTTER
R4	1'-6" C & G
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING



TYPICAL SECTION NO. 16

USE TYPICAL SECTION NO. 16

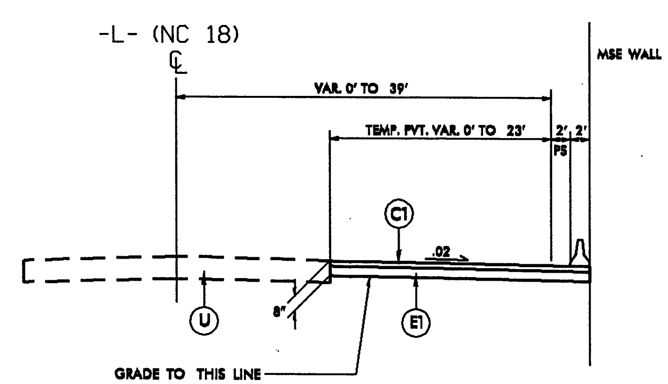
-DETEB2- STA. 39+50.00 TO STA. 42+00.00
-DETWB2- STA. 41+00.00 TO STA. 42+00.00



TYPICAL SECTION NO. 17

USE TYPICAL SECTION NO. 17

-DETEB2- STA. 42+00.00 TO 44+42.83 (BEGIN APP. SLAB)
-DETWB2- STA. 42+00.00 TO 44+69.53 (BEGIN APP. SLAB)
-DETEB2- STA. 46+39.23 (END APP. SLAB) TO 47+70.24 (BEGIN APP. SLAB)
-DETWB2- STA. 46+65.31 (END APP. SLAB) TO 47+75.50 (BEGIN APP. SLAB)
-DETEB2- STA. 49+94.24 (END APP. SLAB) TO 51+91.81
-DETWB2- STA. 49+99.50 (END APP. SLAB) TO 51+98.72



TYPICAL SECTION NO. 18

NOTE : FOR MAINTENANCE OF TRAFFIC ONLY

USE TYPICAL SECTION NO. 18

-L- STA. 20+50.00 TO STA. 27+50.00
SEE PLANS FOR TAPERS

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6/2/99

STRUCTURE TYPICAL SECTIONS

PROJECT REFERENCE NO.	SHEET NO.
U-2550B	2-H

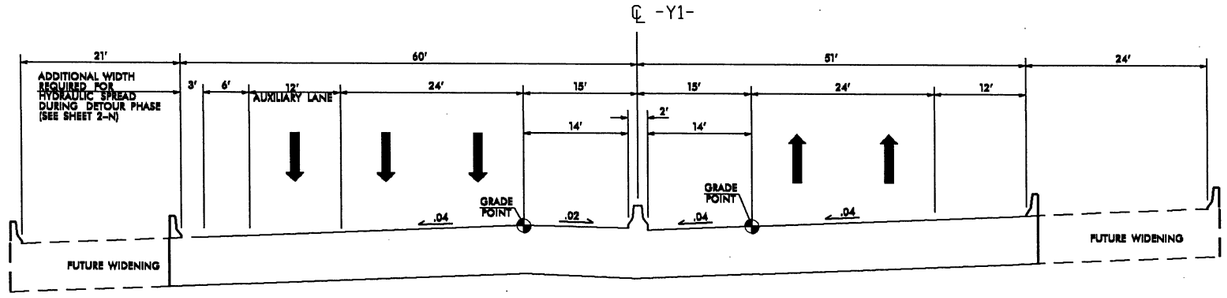
ROADWAY DESIGN ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

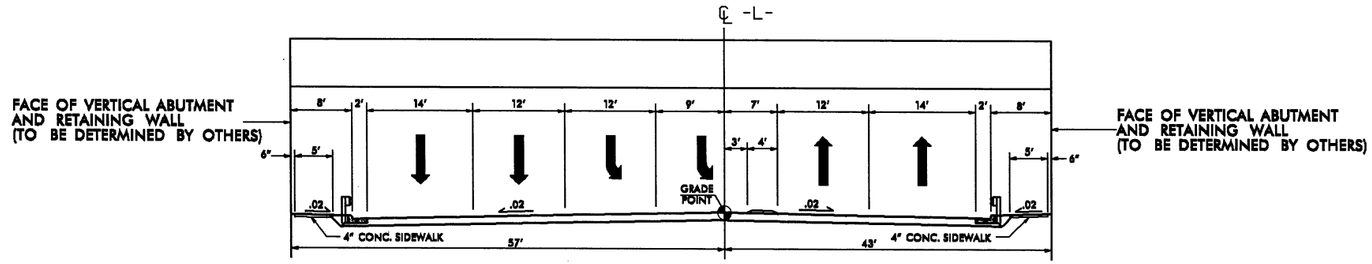
DESIGN DATA -Y1-

ADT 2011 = 57,867
ADT 2031 = 96,533
D = 60%
DHV = 11%
TTST = 15%
DUAL = 5%
V = 70 mph
FUNC. CLASS = INTERSTATE
MINIMUM VERTICAL CLEARANCE = 16.5'

-Y1- OVER -L- STRUCTURE



TYPICAL SECTION ON STRUCTURE



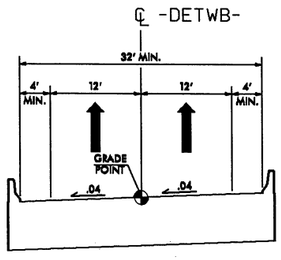
TYPICAL SECTION ON ROADWAY UNDER STRUCTURE

DESIGN DATA -DETWB-

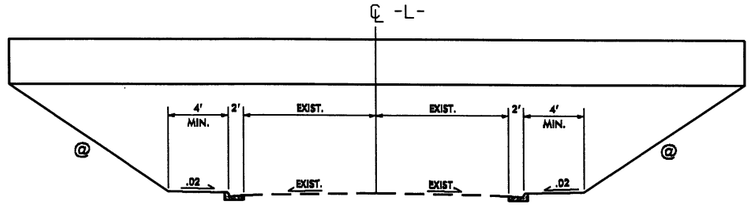
ADT 2011 = 57,867
ADT 2031 = 96,533
D = 60%
DHV = 11%
TTST = 15%
DUAL = 5%
V = 60 mph
FUNC. CLASS = INTERSTATE
MINIMUM VERTICAL CLEARANCE = 14'-4"

@ SLOPES DETERMINED BY GEOTECHNICAL ENGINEERING UNIT

-DETWB- OVER -L- STRUCTURE

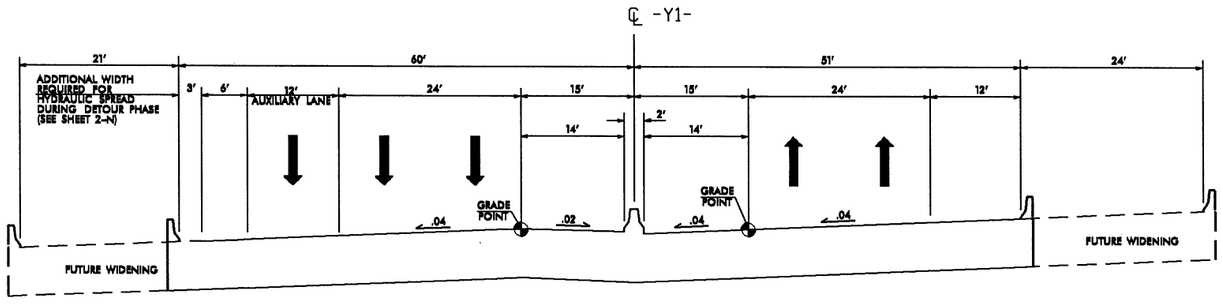


TYPICAL SECTION ON TEMPORARY DETOUR STRUCTURE



TYPICAL SECTION ON ROADWAY UNDER TEMPORARY DETOUR STRUCTURE

-Y1- OVER E. PRONG CREEK STRUCTURE



TYPICAL SECTION ON STRUCTURE

DESIGN DATA -Y1-

ADT 2011 = 57,867
ADT 2031 = 96,533
D = 60%
DHV = 11%
TTST = 15%
DUAL = 5%
V = 70 mph
FUNC. CLASS = INTERSTATE

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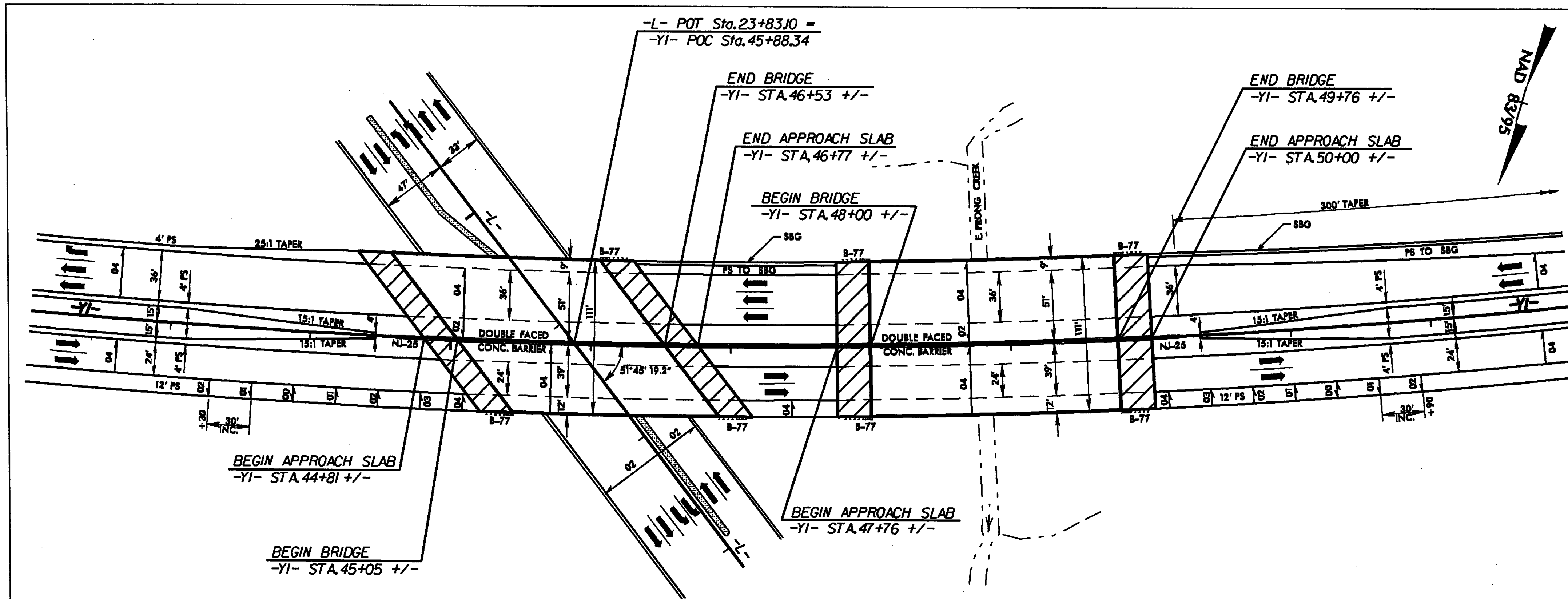
SKETCH SHOWING PAVEMENT WIDTH TO BRIDGE WIDTH RELATIONSHIP

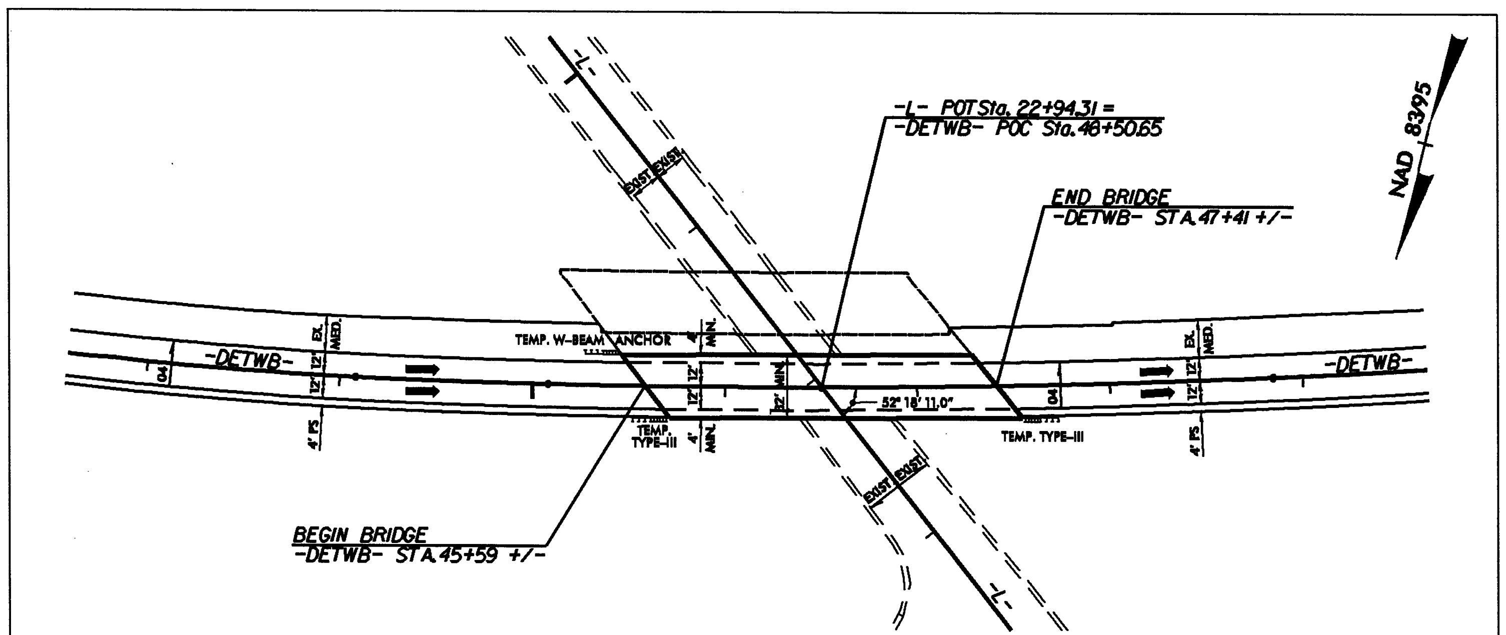
PROJECT REFERENCE NO.	SHEET NO.
U-2550B	2-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROPOSED APPROACH SLAB



SKETCH SHOWING PAVEMENT WIDTH TO BRIDGE WIDTH RELATIONSHIP FOR -Y1- OVER -L- AND -Y1- OVER E.PRONG CREEK.



SKETCH SHOWING PAVEMENT WIDTH TO BRIDGE WIDTH RELATIONSHIP FOR -DETWB- OVER -L-.

REVISIONS

8/17/99

30-JUN-2010 11:58

PROJECT REFERENCE NO.	SHEET NO.
U-2550B	2-J
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	

PRELIMINARY PLANS
NO RIGHT OF WAY OR CONSTRUCTION

HORIZONTAL ALIGNMENT CURVE DATA

-RPA-

Pls Sta 13+43.05	Pl Sta 15+29.62	Pls Sta 17+15.60	Pls Sta 19+49.02	Pl Sta 21+43.65
θs = 4° 24' 26.5"	Δ = 10° 32' 35.4" (RT)	θs = 4° 24' 26.5"	Ls = 150.00'	Δ = 33° 53' 47.5" (LT)
Ls = 200.00'	D = 4° 24' 26.5"	Ls = 200.00'	LT = 100.13'	D = 12° 03' 44.2"
LT = 133.37'	L = 239.22'	LT = 133.37'	ST = 50.12'	L = 281.01'
ST = 66.70'	T = 119.95'	ST = 66.70'		T = 144.75'
	R = 1,300.00'			R = 475.00'
	SE = SEE PLANS			SE = SEE PLANS

-RPB-

Pl Sta 13+68.01
Δ = 7° 46' 07.2" (LT)
D = 1° 03' 25.6"
L = 734.89'
T = 368.01'
R = 5,420.00'
SE = SEE PLANS

-LPC-

Pls Sta 10+66.81	Pl Sta 11+95.28	Pls Sta 12+91.04
θs = 0° 29' 27.4"	Δ = 81° 47' 52.5" (RT)	θs = 26° 02' 36.7"
θs = 26° 03' 37.3"	D = 52° 05' 13.5"	Ls = 100.00'
Ls = 100.00'	L = 157.04'	LT = 67.40'
LT = 66.81'	T = 95.28'	ST = 34.00'
ST = 34.68'	R = 110.00'	
	SE = .08 (SEE PLANS)	

-RPC-

Pls Sta 11+33.55	Pl Sta 13+14.23	Pls Sta 14+92.34
θs = 10° 03' 06.8"	Δ = 22° 39' 53.4" (LT)	θs = 10° 03' 06.8"
Ls = 200.00'	D = 10° 03' 06.8"	Ls = 200.00'
LT = 133.55'	L = 225.48'	LT = 133.55'
ST = 66.86'	T = 114.23'	ST = 66.86'
	R = 570.00'	
	SE = .07	

-Y-

Pl Sta 12+59.08	Pl Sta 14+54.27
Δ = 10° 42' 13.2" (LT)	Δ = 26° 05' 45.5" (LT)
D = 19° 05' 54.9"	D = 19° 05' 54.9"
L = 56.04'	L = 136.64'
T = 28.10'	T = 69.53'
R = 300.00'	R = 300.00'

-Y1-

Pls Sta 41+13.08	Pl Sta 47+51.65	Pls Sta 53+86.38
θs = 1° 00' 31.4"	Δ = 11° 29' 57.2" (LT)	θs = 1° 00' 31.4"
Ls = 200.00'	D = 1° 00' 31.4"	Ls = 200.00'
LT = 133.34'	L = 1,139.97'	LT = 133.34'
ST = 66.67'	T = 571.91'	ST = 66.67'
	R = 5,680.00'	
	SE = .04	

-Y2-

Pl Sta 11+60.90
Δ = 56° 22' 55.9" (LT)
D = 27° 56' 57.0"
L = 201.73'
T = 109.88'
R = 205.00'

-DETWB-

Pl Sta 38+22.97	Pl Sta 42+20.55	Pls Sta 44+51.57	Pl Sta 46+96.41	Pls Sta 49+41.12	Pl Sta 51+91.76	Pl Sta 55+84.27
Δ = 6° 00' 03.1" (RT)	Δ = 8° 36' 52.8" (LT)	θs = 0° 29' 53.5"	Δ = 3° 45' 02.8" (LT)	θs = 0° 29' 53.5"	Δ = 9° 28' 33.3" (LT)	Δ = 5° 36' 43.6" (RT)
D = 1° 25' 56.6"	D = 2° 17' 30.6"	θs = 1° 08' 45.4"	D = 0° 59' 47.2"	θs = 1° 08' 45.4"	D = 2° 17' 30.6"	D = 1° 30' 28.0"
L = 418.94'	L = 375.89'	Ls = 100.00'	L = 376.42'	Ls = 100.00'	L = 413.46'	L = 371.21'
T = 209.66'	T = 188.30'	LT = 56.57'	T = 188.28'	LT = 56.57'	T = 207.20'	T = 186.25'
R = 4,000.00'	R = 2,500.00'	ST = 43.44'	R = 5,750.00'	ST = 43.44'	R = 2,500.00'	R = 3,800.00'
SE = SEE PLANS	SE = SEE PLANS		SE = SEE PLANS		SE = SEE PLANS	SE = SEE PLANS

-DETEB-

Pl Sta 37+57.58	Pl Sta 42+03.16	Pls Sta 44+48.93	Pl Sta 46+92.42	Pls Sta 49+35.79	Pl Sta 52+02.82	Pl Sta 56+45.66
Δ = 6° 51' 45.5" (RT)	Δ = 9° 27' 12.9" (LT)	θs = 0° 30' 07.1"	Δ = 3° 45' 02.8" (LT)	θs = 0° 30' 07.1"	Δ = 10° 23' 39.0" (LT)	Δ = 6° 33' 11.6" (RT)
D = 1° 24' 53.0"	D = 2° 19' 48.2"	θs = 1° 09' 54.1"	D = 1° 00' 14.2"	θs = 1° 09' 54.1"	D = 2° 19' 48.2"	D = 1° 29' 17.5"
L = 485.09'	L = 405.73'	Ls = 100.00'	L = 373.60'	Ls = 100.00'	L = 446.09'	L = 440.35'
T = 242.84'	T = 203.32'	LT = 56.63'	T = 186.87'	LT = 56.63'	T = 223.66'	T = 220.41'
R = 4,050.00'	R = 2,459.00'	ST = 43.37'	R = 5,707.00'	ST = 43.37'	R = 2,459.00'	R = 3,850.00'
SE = SEE PLANS	SE = SEE PLANS		SE = SEE PLANS		SE = SEE PLANS	SE = SEE PLANS

-DETLPC-

Pl Sta 11+90.03	Pl Sta 13+05.78
Δ = 74° 48' 37.9" (RT)	Δ = 27° 04' 44.1" (RT)
D = 34° 43' 29.0"	D = 52° 05' 13.5"
L = 215.44'	L = 51.99'
T = 126.18'	T = 26.49'
R = 165.00'	R = 110.00'
SE = SEE PLANS	

-DETRPA-

Pls Sta 13+43.05	Pl Sta 15+56.84	Pl Sta 20+52.71
θs = 4° 24' 26.5"	Δ = 12° 55' 01.6" (RT)	Δ = 37° 36' 42.4" (LT)
Ls = 200.00'	D = 4° 24' 26.5"	D = 12° 03' 44.2"
LT = 133.37'	L = 293.08'	L = 311.81'
ST = 66.70'	T = 147.16'	T = 161.76'
	R = 1,300.00'	R = 475.00'
	SE = SEE PLANS	

-DETRPB-

Pl Sta 18+06.73
Δ = 29° 12' 43.3" (LT)
D = 1° 29' 22.7"
L = 390.03'
T = 199.35'
R = 765.00'
SE = SEE PLANS

-DETWB2-

Pl Sta 37+78.54	Pl Sta 42+35.22	Pl Sta 47+21.11	Pl Sta 52+27.19	Pl Sta 56+98.99
Δ = 5° 11' 34.2" (LT)	Δ = 1° 45' 58.1" (RT)	Δ = 6° 04' 55.3" (LT)	Δ = 1° 04' 16.8" (RT)	Δ = 5° 04' 45.4" (LT)
D = 0° 57' 17.7"	D = 0° 28' 38.9"	D = 1° 00' 41.0"	D = 0° 15' 37.6"	D = 0° 57' 17.7"
L = 543.79'	L = 369.90'	L = 601.35'	L = 411.36'	L = 531.90'
T = 272.08'	T = 184.96'	T = 300.96'	T = 205.69'	T = 266.12'
R = 6,000.00'	R = 12,000.00'	R = 5,665.00'	R = 22,000.00'	R = 6,000.00'
	SE = SEE PLANS			

-DETEB2-

Pl Sta 39+74.66	Pl Sta 47+19.18	Pl Sta 53+02.77
Δ = 3° 28' 43.7" (LT)	Δ = 6° 01' 47.7" (LT)	Δ = 4° 00' 28.6" (LT)
D = 0° 23' 18.4"	D = 1° 00' 59.4"	D = 1° 19' 56.9"
L = 895.57'	L = 593.20'	L = 300.79'
T = 447.92'	T = 296.87'	T = 150.46'
R = 14,750.00'	R = 5,636.50'	R = 4,300.00'
SE = SEE PLANS		

-DET2LPC-

Pl Sta 10+76.88	Pl Sta 11+65.37
Δ = 75° 06' 32.4" (RT)	Δ = 34° 37' 07.9" (RT)
D = 57° 17' 44.8"	D = 52° 05' 13.5"
L = 131.09'	L = 66.46'
T = 76.88'	T = 34.28'
R = 100.00'	R = 110.00'
SE = SEE PLANS	

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I-40 DETOUR I

PROJECT REFERENCE NO.	SHEET NO.
U-2550B	2-K
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83/95

FOR -DETEB- PROFILE SEE SHEET 17
FOR -DETWB- PROFILE SEE SHEET 18
FOR -DETRPA- PROFILE SEE SHEET 19
FOR -DETLPC- PROFILE SEE SHEET 19
FOR CURVE DATA SEE SHEET 2-J
FOR DITCH DETAILS SEE SHEET 2-R
FOR STREAM DETAIL SEE SHEET 2-S

ALL BARRIER USED ON -DETEB- AND -DETWB- MUST BE SLOTTED BARRIER.

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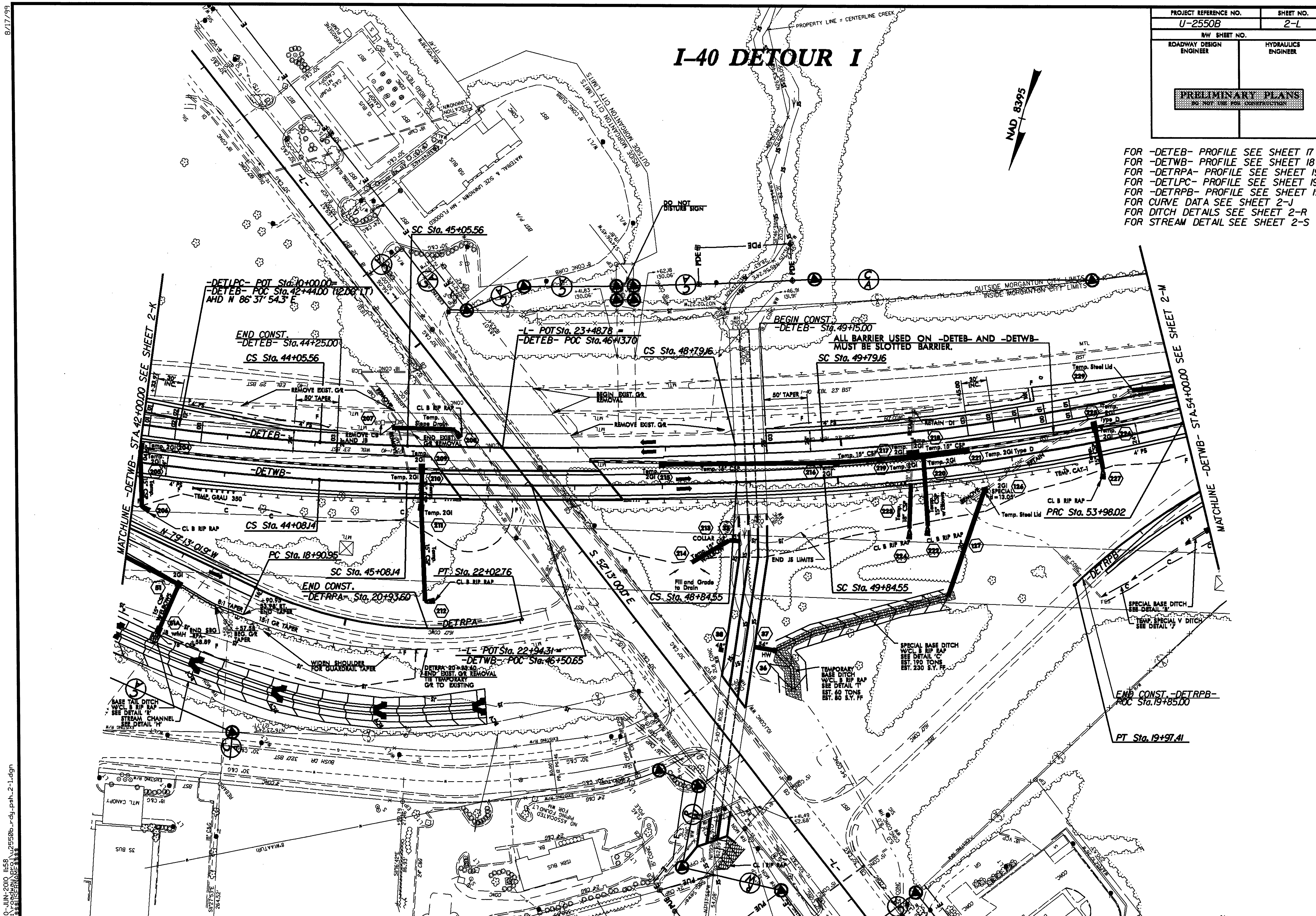
PROJECT REFERENCE NO.	SHEET NO.
U-2550B	2-L
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

I-40 DETOUR I

FOR -DETEB- PROFILE SEE SHEET 17
FOR -DETWB- PROFILE SEE SHEET 18
FOR -DETRPA- PROFILE SEE SHEET 19
FOR -DETLPC- PROFILE SEE SHEET 19
FOR -DETRPB- PROFILE SEE SHEET 19
FOR CURVE DATA SEE SHEET 2-J
FOR DITCH DETAILS SEE SHEET 2-R
FOR STREAM DETAIL SEE SHEET 2-S



NAD 83/95
PROPERTY LINE = CENTERLINE CREEK
OUTSIDE MORGANTON CITY LIMITS
INSIDE MORGANTON CITY LIMITS
DO NOT DISTURB SIGN
SC Sta. 45+05.56
-DETLPC- POT Sta. 10+00.00 =
-DETEB- POC Sta. 42+44.00 (12.00' LT)
AHD N 86°37'54.3" E
END CONST. -DETEB- Sta. 44+25.00
CS Sta. 44+05.56
-L- POT Sta. 23+48.78 =
-DETEB- POC Sta. 46+13.70
CS Sta. 48+79.16
BEGIN CONST. -DETEB- Sta. 49+15.00
ALL BARRIER USED ON -DETEB- AND -DETWB- MUST BE SLOTTED BARRIER.
SC Sta. 49+79.16
MATCHLINE -DETWB- STA. 42+00.00 SEE SHEET 2-K
MATCHLINE -DETWB- STA. 54+00.00 SEE SHEET 2-M
-DETEB-
-DETWB-
BEGIN EXIST. G/R REMOVAL
REMOVE EXIST. G/R
CS Sta. 44+08.14
PC Sta. 18+90.95
SC Sta. 45+08.14
PT Sta. 22+02.76
END CONST. -DETRPA- Sta. 20+93.60
-DETRPA-
PRC Sta. 53+98.02
SC Sta. 49+84.55
CS Sta. 48+84.55
S 52°13'00.0" E
N 79°13'01.8" W
END JS LIMITS
Fill and Grade to Drain
-L- POT Sta. 22+94.31 =
-DETWB- POC Sta. 46+50.65
WIDEN SHOULDER FOR GUARDRAIL TAPER
DETRPA 20+93.60 END EXIST. G/R REMOVAL TIE TEMPORARY G/R TO EXISTING
BASE TAIL DITCH W/CL B RIP RAP SEE DETAIL 'E'
STREAM CHANNEL SEE DETAIL 'H'
SPECIAL BASE DITCH W/CL B RIP RAP SEE DETAIL 'C' EST. 190 TONS EST. 230 S.Y. FF
TEMPORARY BASE DITCH W/CL B RIP RAP SEE DETAIL 'I' EST. 60 TONS EST. 80 S.Y. FF
SPECIAL BASE DITCH SEE DETAIL 'B'
TEMP. SPECIAL V DITCH SEE DETAIL 'J'
END CONST. -DETRPB- POC Sta. 19+85.00
PT Sta. 19+97.41
-DETRPB-
CL B RIP RAP
BUSH DR
MATERIAL & SIZE UNKNOWN - MH FLOODED

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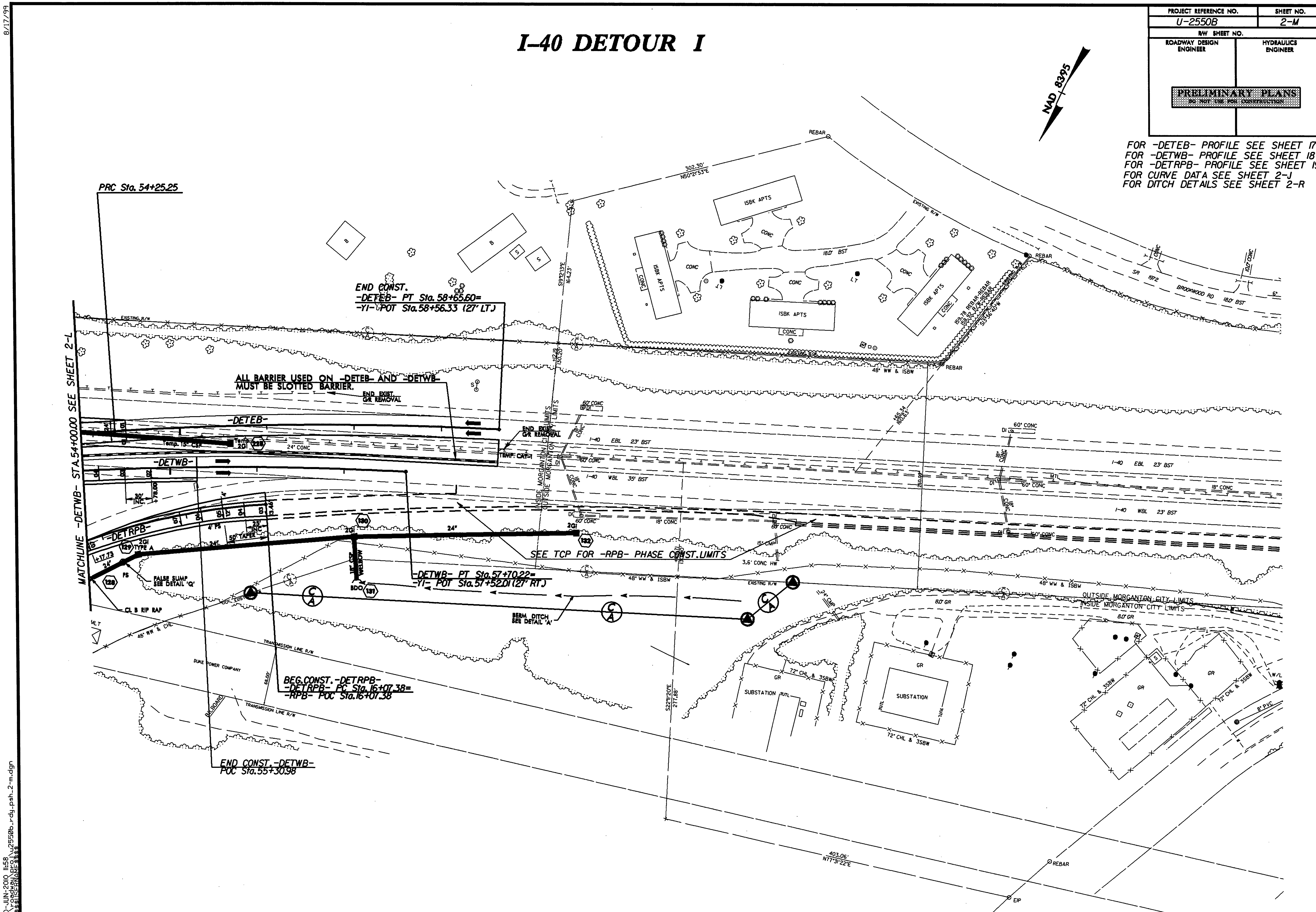
I-40 DETOUR I

FOR -DETEB- PROFILE SEE SHEET 17
FOR -DETWB- PROFILE SEE SHEET 18
FOR -DETRPB- PROFILE SEE SHEET 19
FOR CURVE DATA SEE SHEET 2-J
FOR DITCH DETAILS SEE SHEET 2-R



R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
NAD 83/95
PRC Sta. 54+25.25
END CONST.
-DETEB- PT Sta. 58+65.60=
-Y1- POT Sta. 58+56.33 (27' LT.)
ALL BARRIER USED ON -DETEB- AND -DETWB- MUST BE SLOTTED BARRIER.
END EXIST. G/R REMOVAL
-DETEB-
-DETWB-
-DETRPB-
MATCHLINE -DETWB- STA. 54+00.00 SEE SHEET 2-L
I-40 EBL 23' BST
I-40 WBL 35' BST
I-40 WBL 23' BST
SEE TCP FOR -RPB- PHASE CONST. LIMITS
-DETWB- PT Sta. 57+70.22=
-Y1- POT Sta. 57+52.01 (27' RT.)
FALSE SUMP SEE DETAIL 'Q'
CL B RIP RAP
BERM DITCH SEE DETAIL 'A'
BEG. CONST. -DETRPB-
-DETRPB- PC Sta. 16+07.38=
-RPB- POC Sta. 16+07.38
END CONST. -DETWB-
POC Sta. 55+30.98
ISBK APTS
SR 1972 BROOKWOOD RD 18.0' BST
OUTSIDE MORGANTON CITY LIMITS
INSIDE MORGANTON CITY LIMITS
SUBSTATION
DUKE POWER COMPANY
TRANSMISSION LINE R/W
302.30' N50°21'53"E
403.06' N77°31'22"E
REBAR
EIP

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PROJECT REFERENCE NO.	SHEET NO.
U-2550B	2-N

R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

FOR -DETWB2- PROFILE SEE SHEET 20
FOR -DETEB2- PROFILE SEE SHEET 20
FOR -DET2LPC- PROFILE SEE SHEET 20
FOR CURVE DATA SEE SHEET 2-J

ALL BARRIER USED ON -DETEB2- AND -DETWB2- MUST BE SLOTTED BARRIER.

I-40 DETOUR II

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2550B	2-0
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

I-40 DETOUR II

NAD 8395

FOR -DETWB2- PROFILE SEE SHEET 20
FOR -DETEB2- PROFILE SEE SHEET 20
FOR CURVE DATA SEE SHEET 2-J
FOR DITCH DETAILS SEE SHEET 2-R

INSIDE MORGANTON CITY LIMITS
OUTSIDE MORGANTON CITY LIMITS

PROPERTY LINE = CENTERLINE CREEK

-DETEB2- POC Sta. 49+94.24 =
-Y1- POC Sta. 50+00.96 (43.5' LT)

ALL BARRIER USED ON -DETEB2- AND -DETWB2- MUST BE SLOTTED BARRIER.

PT Sta. 50+15.51

PC Sta. 51+52.31

LATERAL BASE DITCH SEE DETAIL 'E'

CL B RIP RAP

END CONST. OF PROPOSED -Y1- ELEVATIONS
-DETEB2- Sta. 53+90.57 =
-Y1- Sta. 54+00.00 (37.25' RT.)

WIDEN EXIST. SHOULDER TO ACCOMODATE GUARDRAIL SEE -DETEB2- CROSS SECTIONS

PT Sta. 54+53.11

430' TRANSITION TO EXISTING LANES REINFORCE PAVED SHOULDER FOR MAINTENANCE OF TRAFFIC

END CONST.
-DETEB2- Sta. 60+20.57

-DETEB2- POT Sta. 61+40.34 =
-Y1- Sta. 61+50.00 (37.5' LT.)

ISBK APTS

CONC

-DETEB2-

S 67° 38' 30.0" W

I-40 EBL 23' BST

I-40 WBL 35' BST

-DETWB2-

END SBG -Y1- +24

8:1 TAPER GRAU 350

18" WELDED STEEL PIPE GRADE B TRENCHLESS INSTALLATION

2GI TYPE A

S 71° 38' 58.6" W

Temp. Steel Lid

REMOVE DI

TEMP. W-BEAM ANCHOR

PLUG AND FILL

PRC Sta. 50+21.50

END CONST.
-DETWB2- Sta. 53+98.90

PRC Sta. 54+32.86

-DETWB2- POC Sta. 49+99.50 =
-Y1- POC Sta. 50+00.33 (15' LT.)

2GI SPECIAL d=13.05'

TEMP. SHORING SEE TCP

COLLAR

END JS LIMITS

TEMP. LATERAL BASE DITCH SEE DETAIL 'O'

CL B RIP RAP

Fill and Grade to Drain

TEMP. STANDARD BASE DITCH SEE DETAIL 'O'

MLT

DUKE POWER COMPANY

TRANSMISSION LINE R/W

BILLBOARD

-DETWB2- PT Sta. 59+64.76 =
-Y1- Sta. 59+65.03 (27' RT.)

EXISTING R/W

MATCHLINE -DETWB2- STA. 48+00.00 SEE SHEET 2-N

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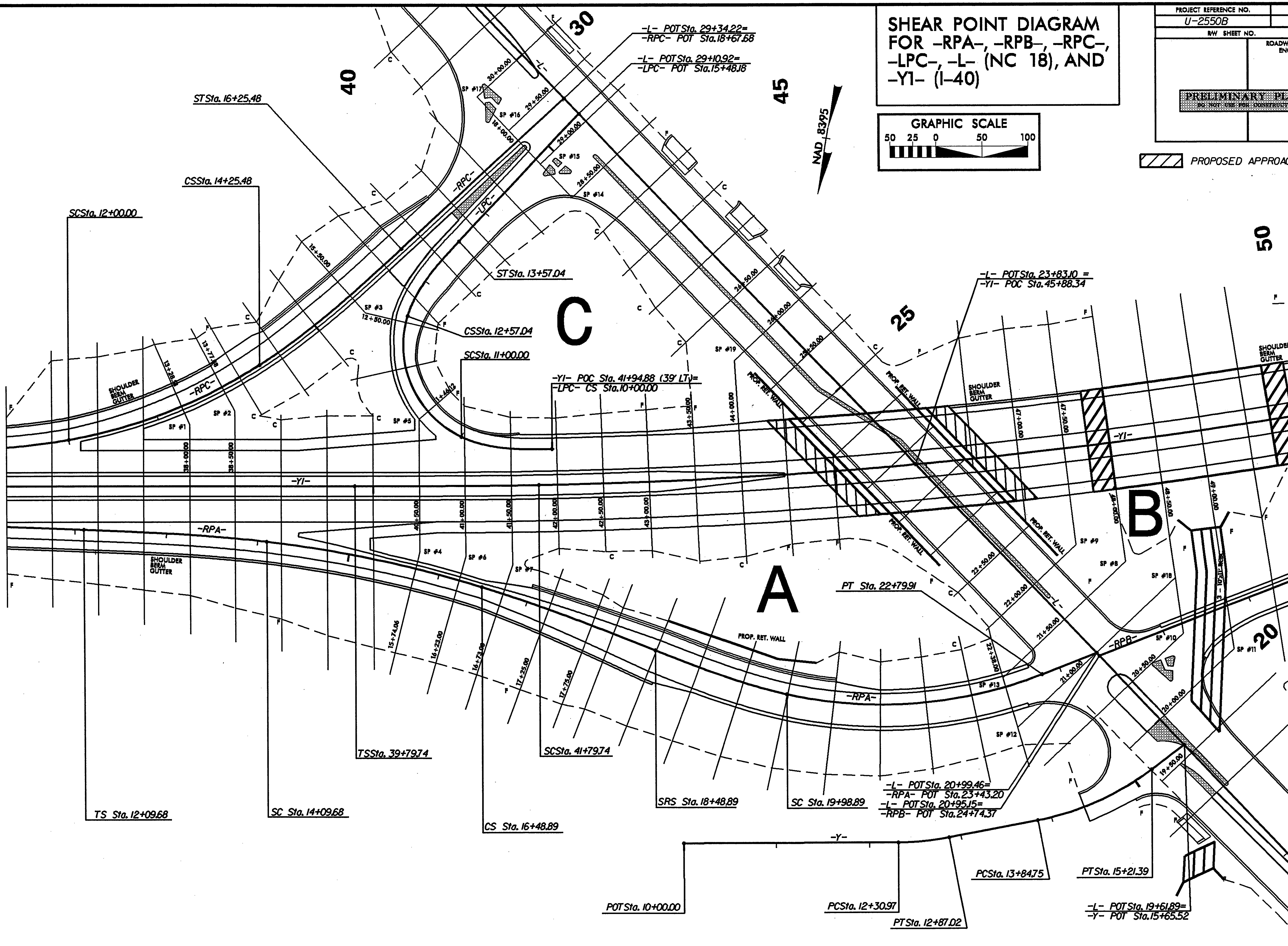
PROJECT REFERENCE NO.	SHEET NO.
U-2550B	2-P
R/W SHEET NO.	ROADWAY DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SHEAR POINT DIAGRAM FOR -RPA-, -RPB-, -RPC-, -LPC-, -L- (NC 18), AND -Y1- (I-40)

GRAPHIC SCALE
50 25 0 50 100

PROPOSED APPROACH SLAB



-L- POT Sta. 29+34.22=
-RPC- POT Sta. 18+67.68
-L- POT Sta. 29+10.92=
-LPC- POT Sta. 15+48.18
ST Sta. 16+25.48
CS Sta. 14+25.48
SC Sta. 12+00.00
ST Sta. 13+57.04
CS Sta. 12+57.04
SC Sta. 11+00.00
-Y1- POC Sta. 41+94.88 (39' LT)=
-LPC- CS Sta. 10+00.00
-L- POT Sta. 23+83.10 =
-Y1- POC Sta. 45+88.34
NAD 83/95
C
A
B
-RPA-
-RPB-
-RPC-
-LPC-
-Y1-
-Y-
-L-
SHOULDER BERM GUTTER
PROP. RET. WALL
PT Sta. 22+79.91
TS Sta. 12+09.68
SC Sta. 14+09.68
TS Sta. 39+79.74
CS Sta. 16+48.89
SC Sta. 41+79.74
SRS Sta. 18+48.89
SC Sta. 19+98.89
-L- POT Sta. 20+99.46=
-RPA- POT Sta. 23+43.20
-L- POT Sta. 20+95.15=
-RPB- POT Sta. 24+74.37
POT Sta. 10+00.00
PC Sta. 12+30.97
PT Sta. 12+87.02
PC Sta. 13+84.75
PT Sta. 15+21.39
-L- POT Sta. 19+61.89=
-Y- POT Sta. 15+65.52

REVISIONS

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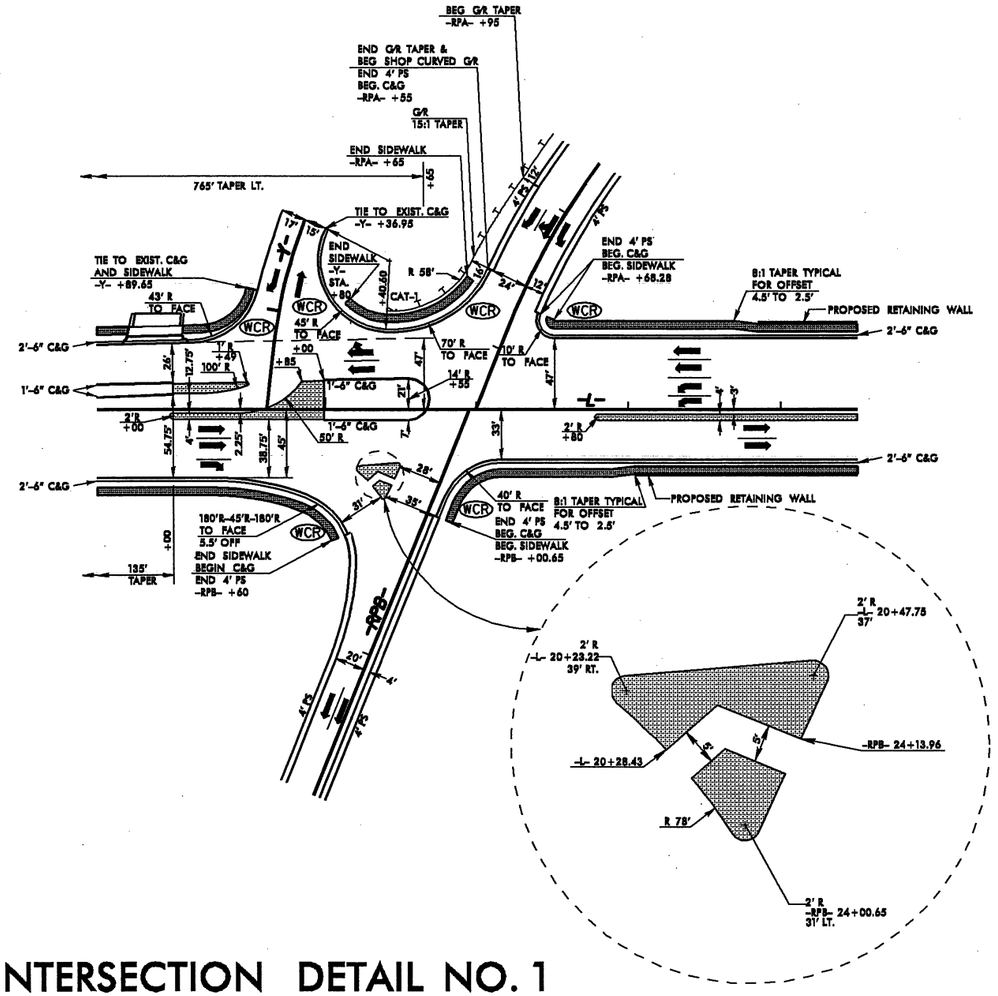
PROJECT REFERENCE NO.	SHEET NO.
U-2550B	2-0
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

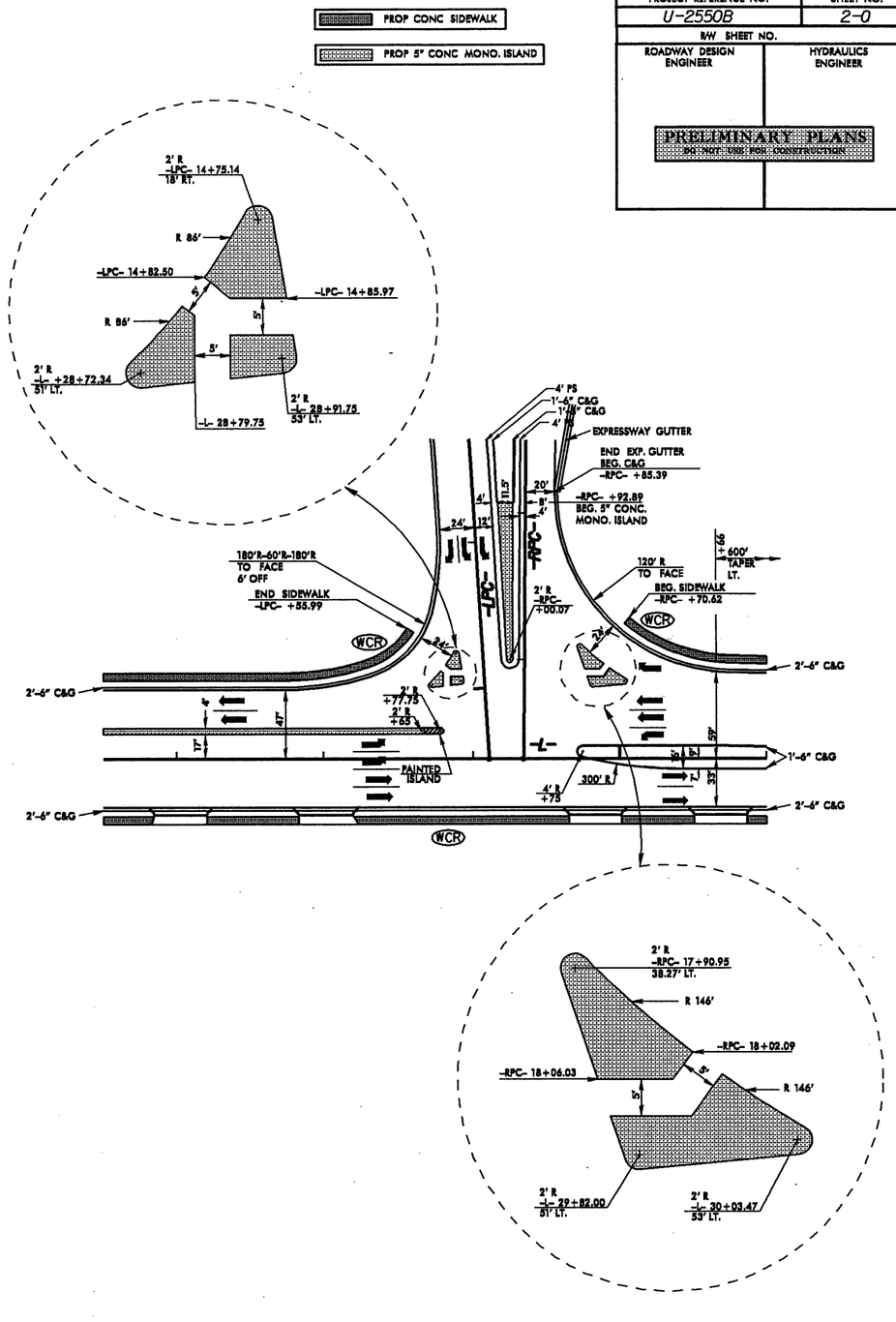
8/17/99

REVISIONS



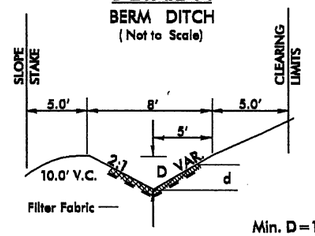
INTERSECTION DETAIL NO. 1

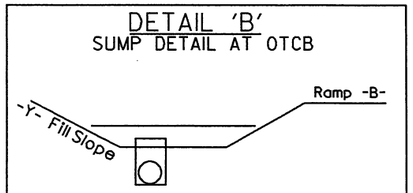
-Y- WITH -L-
-RPA- & -RPB- WITH -L-

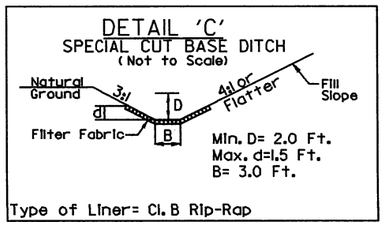


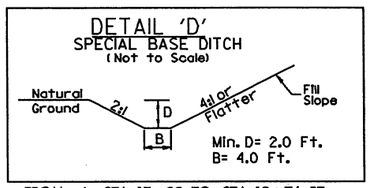
INTERSECTION DETAIL NO. 2

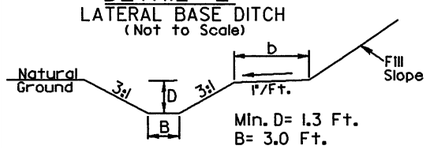
-RPC- & -LPC- WITH -L-

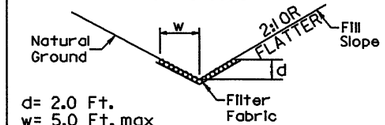


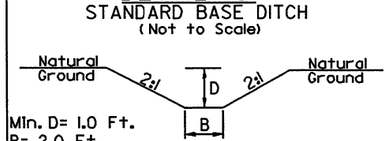


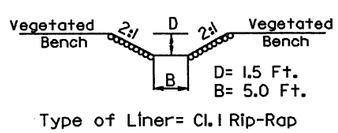


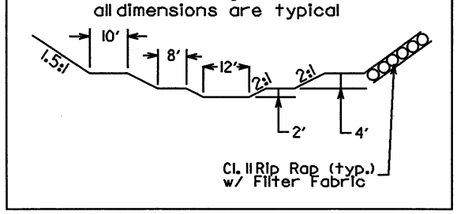


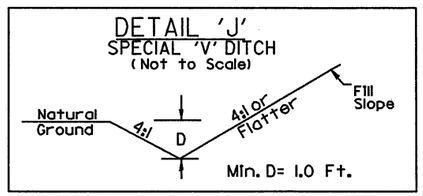


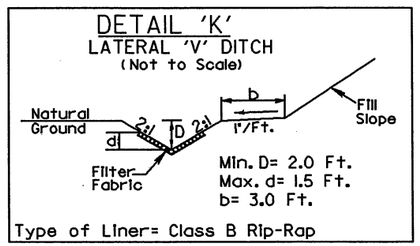


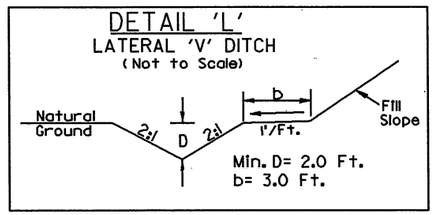


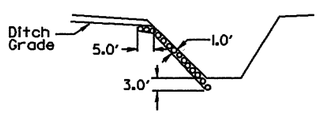


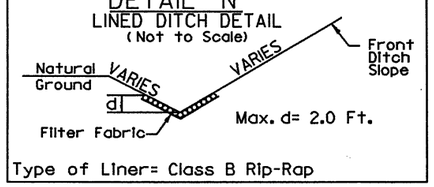


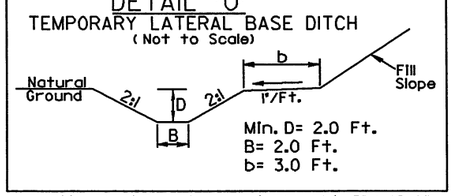


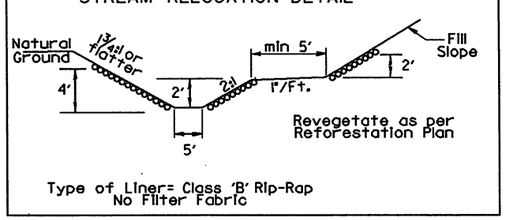


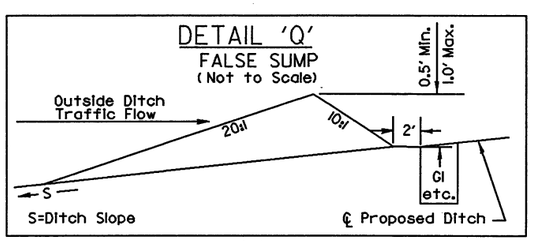


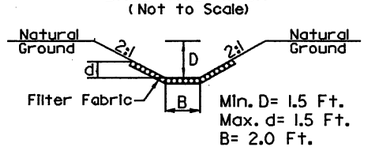


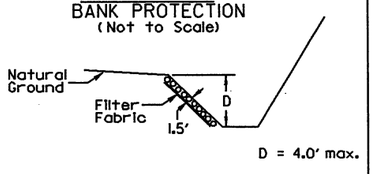


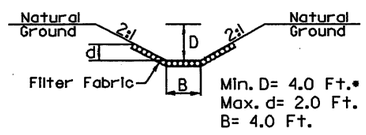












PROJECT REFERENCE NO.	SHEET NO.
U-2550B	2-R
R/W SHEET NO.	
	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

REVISIONS

$$$$SYSTIME$$$$
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$$$$USERNAME$$$$

DETAIL A

FROM -L- STA. 33+50 TO STA. 34+50 LT.
FROM -L- STA. 22+50 TO STA. 23+76 LT.

DETAIL 'B'

-Ramp B- 23+40 RT.

DETAIL 'C'

FROM -RPB- STA. 18+13 TO STA. 23+30 LT.

DETAIL 'D'

FROM -L- STA. 17+00 TO STA. 19+76 RT.

DETAIL 'E'

FROM -Y1- STA. 49+15 TO STA. 53+80 LT.

DETAIL 'F'

FROM -Y1- STA. 46+38 TO STA. 48+63 LT.
FROM -RPC- STA. 12+00 TO STA. 13+80 LT.

DETAIL 'G'

FROM -L- STA. 20+53 TO STA. 20+99 LT.
FROM -DETWB- STA. 49+18 TO STA. 50+26 RT.

DETAIL 'H'

FROM -STREAM- 14+56 TO 14+80,
RT. OF -RPA- 15+06

DETAIL 'I'

DETAIL 'J'

FROM -LPC- STA. 13+25 TO STA. 14+50 RT.
FROM -DETRPB- STA. 18+91 TO 19+85 LT.

DETAIL 'K'

FROM -Y1- STA. 38+28 TO STA. 38+94 RT.

DETAIL 'L'

FROM -Y1- STA. 34+50 TO STA. 38+28 RT.

DETAIL 'M'

FROM -L- STA. 17+55 TO STA. 17+75 RT.

DETAIL 'N'

FROM -Y1- STA. 29+50 TO STA. 32+20 RT.
FROM -Y1- STA. 32+40 TO STA. 33+00 RT.

DETAIL 'O'

FROM -DETWB- STA. 50+26 TO STA. 51+43 RT.

DETAIL 'P'

FROM -RPA- STA. 19+75 TO STA. 22+81 RT.

DETAIL 'Q'

-DETRPB- STA. 17+85 LT.

DETAIL 'R'

-RPA- STA. 18+11.50 RT., 13 L.F.

DETAIL 'S'

FROM -Y1- STA. 34+84 TO STA. 35+18 LT.
FROM -Y1- STA. 36+35 TO STA. 36+55 LT.

DETAIL 'T'

FROM -L- STA. 19+24 TO STA. 19+75 RT.
FROM -Y1- STA. 48+40 TO STA. 48+70 LT. (Min. D=3')

PROJECT REFERENCE NO.	SHEET NO.
U-2550B	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

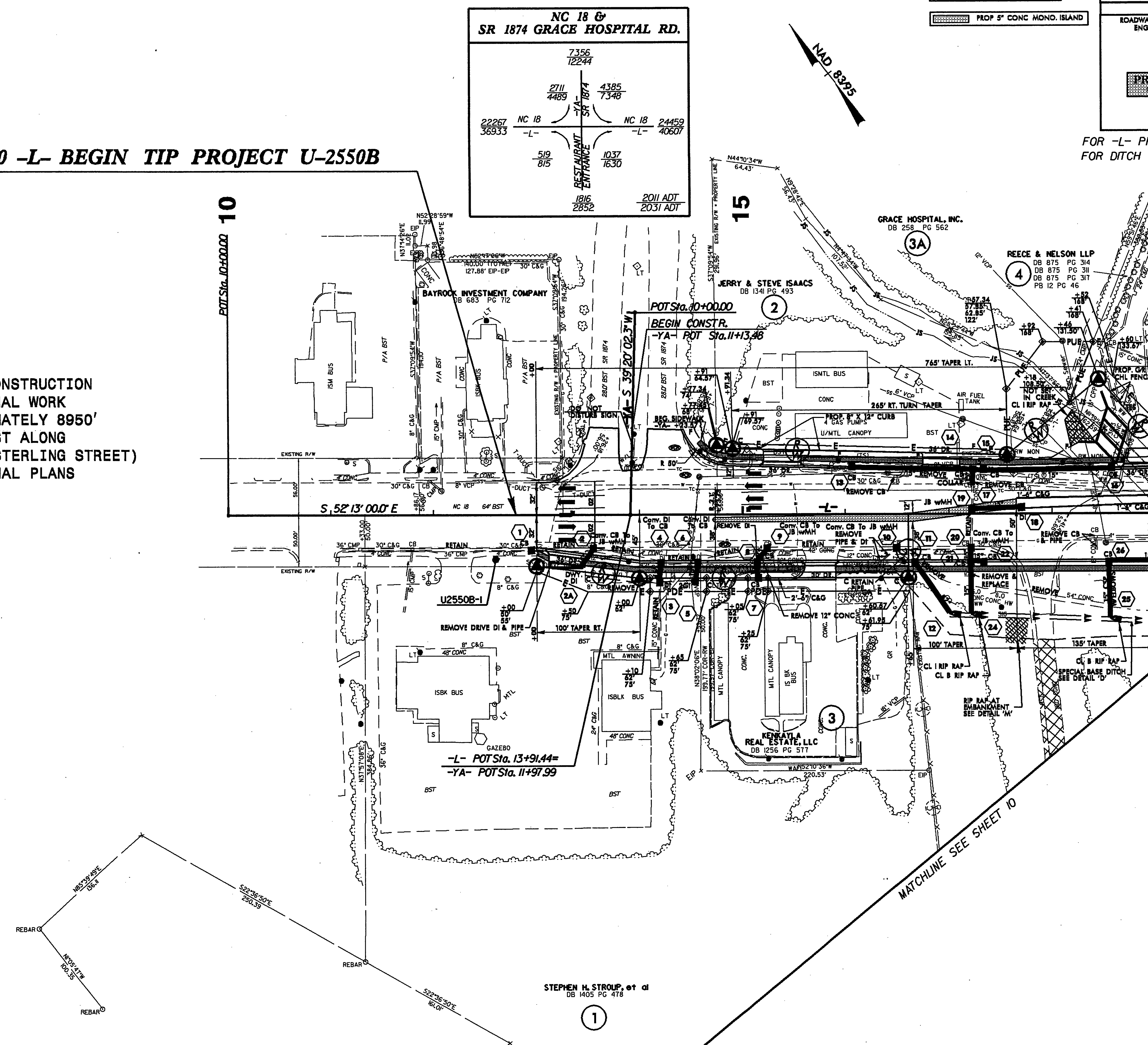
PROP CONC SIDEWALK

PROP 5" CONC MONO. ISLAND

FOR -L- PROFILE SEE SHEET 12
FOR DITCH DETAILS SEE SHEET 2-R

STA. 12+80.00 -L- BEGIN TIP PROJECT U-2550B

BEGIN CONSTRUCTION
FOR SIGNAL WORK
APPROXIMATELY 8950'
NORTHWEST ALONG
NC 18 (STERLING STREET)
SEE SIGNAL PLANS



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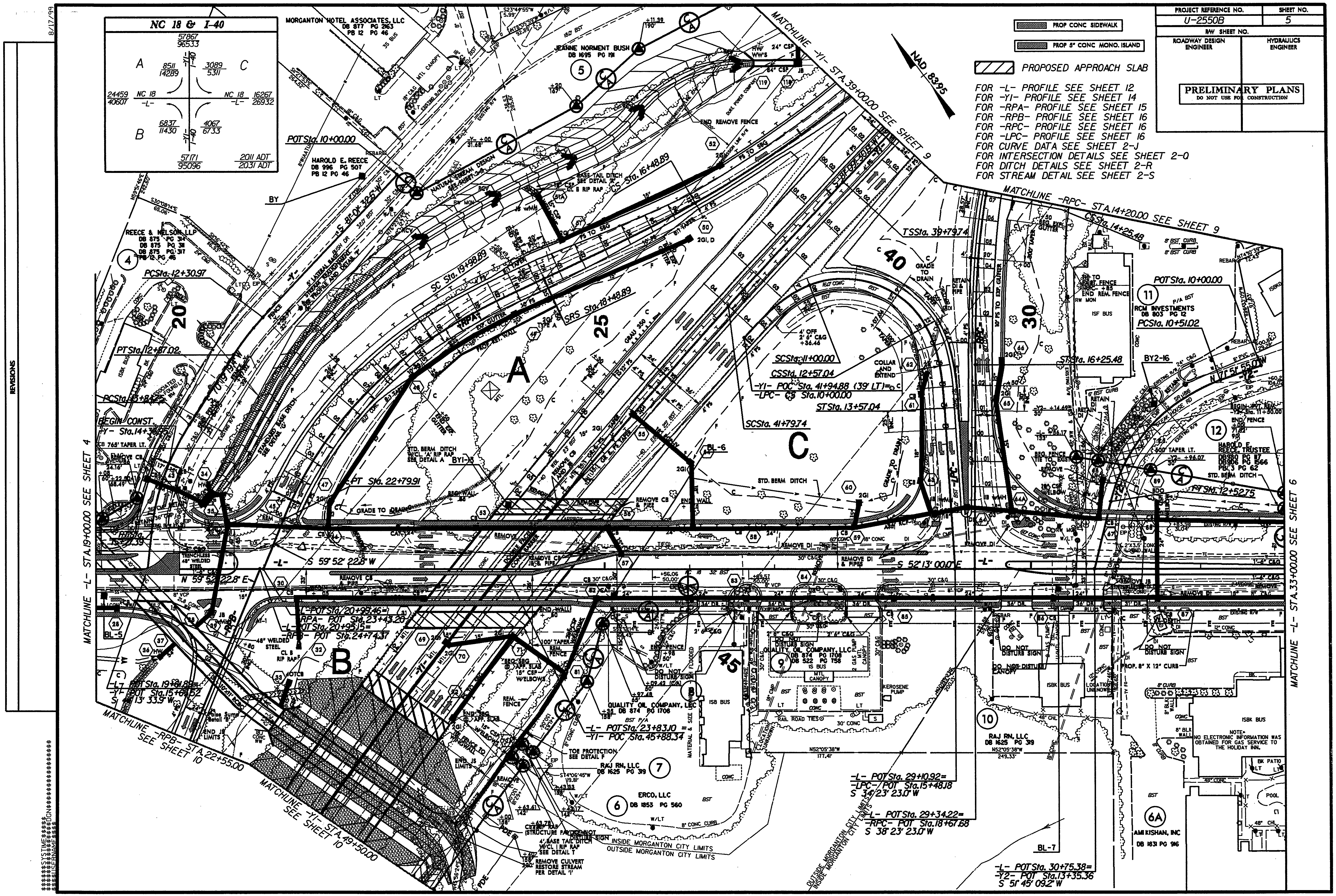
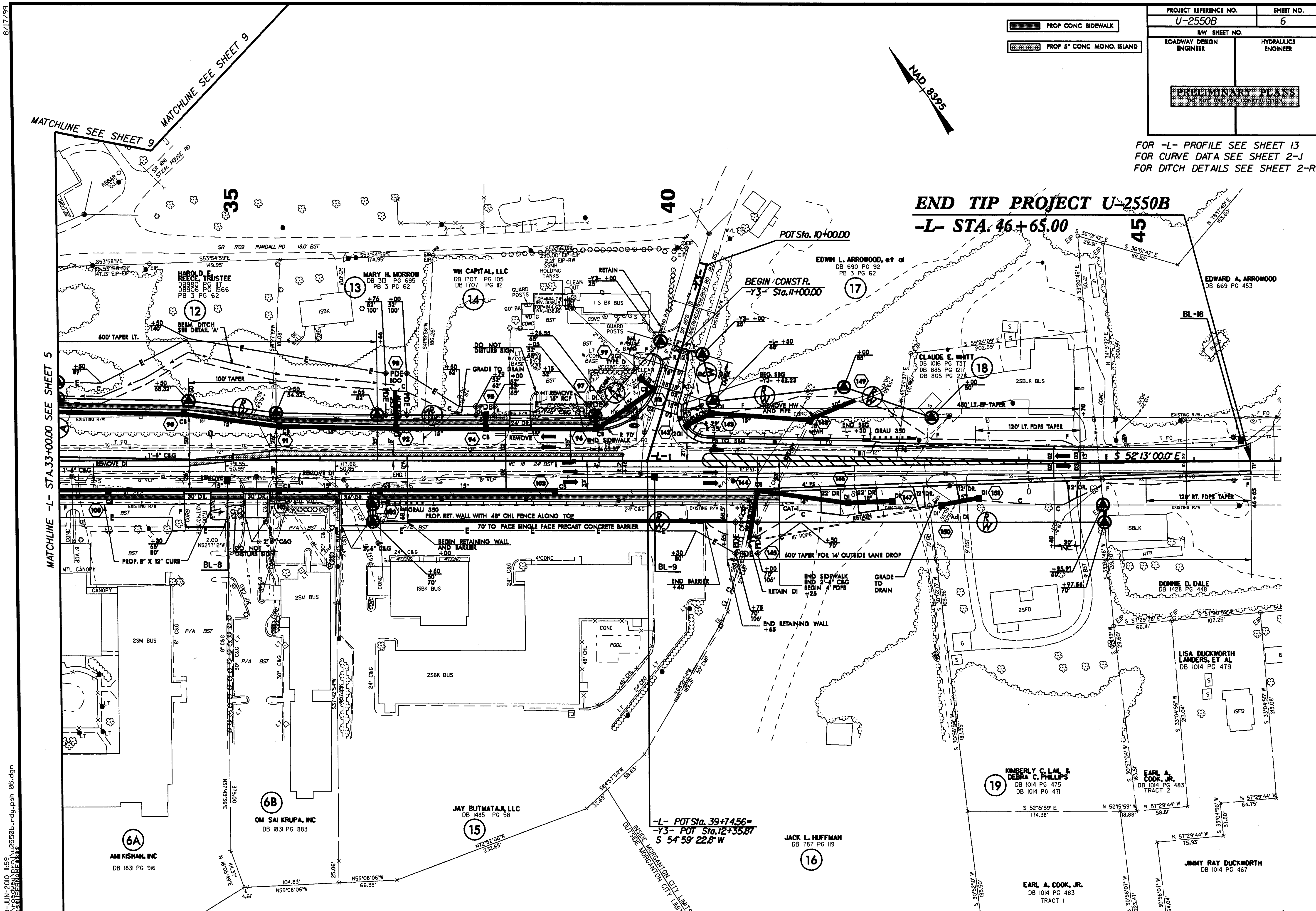

PROJECT REFERENCE NO.
U-2550B
SHEET NO.
5
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
PROP CONC SIDEWALK
PROP 5" CONC MONO. ISLAND
PROPOSED APPROACH SLAB
NAD 83/95
FOR -L- PROFILE SEE SHEET 12
FOR -Y1- PROFILE SEE SHEET 14
FOR -RPA- PROFILE SEE SHEET 15
FOR -RPB- PROFILE SEE SHEET 16
FOR -RPC- PROFILE SEE SHEET 16
FOR -LPC- PROFILE SEE SHEET 16
FOR CURVE DATA SEE SHEET 2-J
FOR INTERSECTION DETAILS SEE SHEET 2-Q
FOR DITCH DETAILS SEE SHEET 2-R
FOR STREAM DETAIL SEE SHEET 2-S
NC 18 & I-40
2011 ADT
2031 ADT
MATCHLINE -Y1- STA.39+00.00 SEE SHEET 9
MATCHLINE -RPC- STA.14+20.00 SEE SHEET 9
MATCHLINE -L- STA.33+00.00 SEE SHEET 6
MATCHLINE -L- STA.19+00.00 SEE SHEET 4
MATCHLINE -RPB- STA.22+55.00 SEE SHEET 10
MATCHLINE -Y1- STA.49+50.00 SEE SHEET 10
MORGANTON HOTEL ASSOCIATES, LLC
JEANNE NORMENT BUSH
HAROLD E. REECE
REECE & NELSON LLP
RCM INVESTMENTS
QUALITY OIL COMPANY, LLC
RAJ RN, LLC
ERCO, LLC
AMI KISHAN, INC
NOTE: NO ELECTRONIC INFORMATION WAS OBTAINED FOR GAS SERVICE TO THE HOLIDAY INN.
INSIDE MORGANTON CITY LIMITS
OUTSIDE MORGANTON CITY LIMITS
-L- POT Sta. 29+10.92 = -LPC- POT Sta. 15+48.18
-L- POT Sta. 29+34.22 = -RPC- POT Sta. 18+67.68
-L- POT Sta. 30+75.38 = -Y2- POT Sta. 13+35.36
-L- POT Sta. 23+83.10 = -Y1- POC Sta. 45+88.34
REVISIONS
8/17/99



PROJECT REFERENCE NO.
SHEET NO.
U-2550B
6
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
PROP CONC SIDEWALK
PROP 5" CONC MONO. ISLAND
NAD 83/95
FOR -L- PROFILE SEE SHEET 13
FOR CURVE DATA SEE SHEET 2-J
FOR DITCH DETAILS SEE SHEET 2-R
END TIP PROJECT U-2550B
-L- STA. 46+65.00
MATCHLINE SEE SHEET 9
MATCHLINE -L- STA. 33+00.00 SEE SHEET 5
SR 1709 RANDALL RD 180' BST
SR 1816 STEAK HOUSE RD
POT Sta. 10+00.00
BEGIN CONSTR. -Y3- Sta. 11+00.00
S 52° 13' 00.0" E
-L- POT Sta. 39+74.56= -Y3- POT Sta. 12+35.87
S 54° 59' 22.8" W
INSIDE MORGANTON CITY LIMITS
OUTSIDE MORGANTON CITY LIMITS
HAROLD F. REECE, TRUSTEE DB 980 PG 117 DB 906 PG 1566 PB 3 PG 62
MARY H. MORROW DB 313 PG 695 PB 3 PG 62
WH CAPITAL, LLC DB 1707 PG 105 DB 1707 PG 112
EDWIN L. ARROWOOD, et al DB 690 PG 92 PB 3 PG 62
EDWARD A. ARROWOOD DB 669 PG 453
CLAUDE E. WHITT DB 1016 PG 737 DB 885 PG 1217 DB 805 PG 278
DONNIE D. DALE DB 1428 PG 448
LISA DUCKWORTH LANDERS, ET AL DB 1014 PG 479
KIMBERLY C. LAIL & DEBRA C. PHILLIPS DB 1014 PG 475 DB 1014 PG 471
EARL A. COOK, JR. DB 1014 PG 483 TRACT 2
EARL A. COOK, JR. DB 1014 PG 483 TRACT 1
JIMMY RAY DUCKWORTH DB 1014 PG 467
JACK L. HUFFMAN DB 787 PG 119
JAY BUTMATAJI, LLC DB 1485 PG 58
OM SAI KRUPA, INC DB 1831 PG 883
AMI KISHAN, INC DB 1831 PG 916
PROP. RET. WALL WITH 48" CHL FENCE ALONG TOP
70' TO FACE SINGLE FACE PRECAST CONCRETE BARRIER
BEGIN RETAINING WALL AND BARRIER
END RETAINING WALL
600' TAPER FOR 14' OUTSIDE LANE DROP
600' TAPER LT.
100' TAPER
120' LT. FDPS TAPER
120' RT. FDPS TAPER
BL-8
BL-9
BL-18
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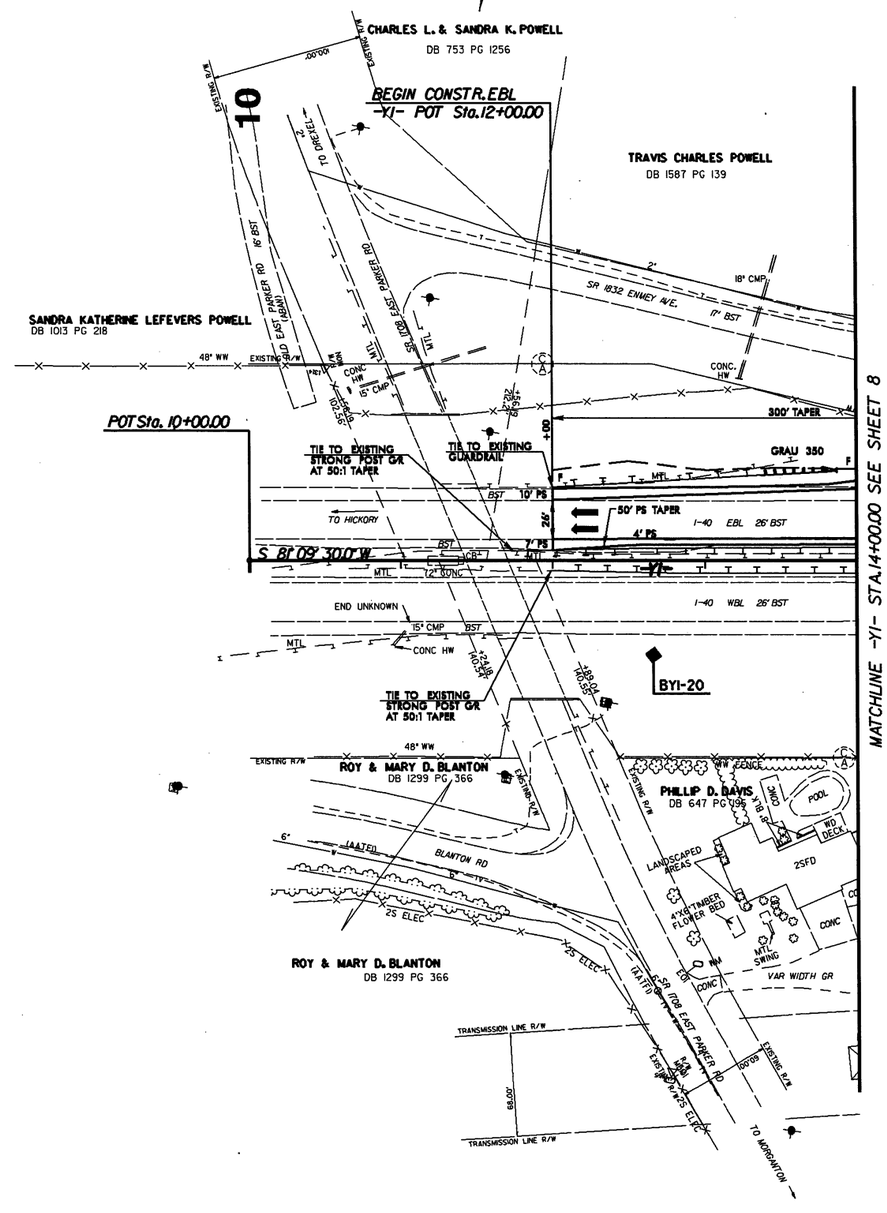
8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2550B	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83/95



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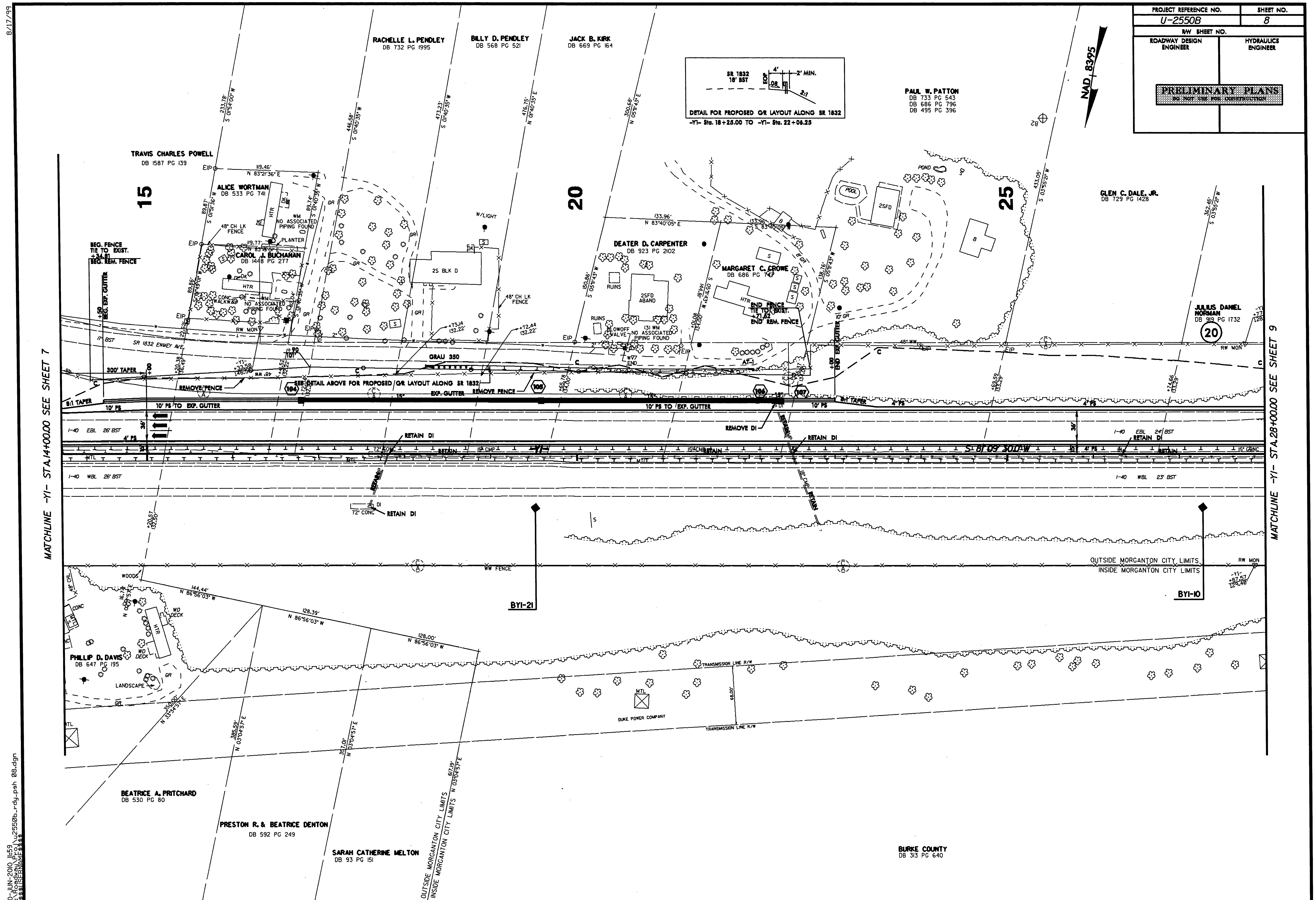

8/17/99
PROJECT REFERENCE NO.
U-2550B
SHEET NO.
8
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
NAD 83/95
DETAIL FOR PROPOSED GR LAYOUT ALONG SR 1832
-Y1- Sta. 18+25.00 TO -Y1- Sta. 22+06.25
SR 1832 18' BST
2' MIN.
2:1
RACHELLE L. PENDLEY
DB 732 PG 1995
BILLY D. PENDLEY
DB 568 PG 521
JACK B. KIRK
DB 669 PG 164
PAUL W. PATTON
DB 733 PG 543
DB 686 PG 796
DB 495 PG 396
TRAVIS CHARLES POWELL
DB 1587 PG 139
ALICE WORTMAN
DB 533 PG 741
CAROL J. BUCHANAN
DB 1448 PG 277
DEATER D. CARPENTER
DB 923 PG 2102
MARGARET C. CROWE
DB 686 PG 747
GLEN C. DALE, JR.
DB 729 PG 1428
JULIUS DANIEL NORMAN
DB 919 PG 1732
15
20
25
SR 1832 EMMEY AVE.
GRAU 350
SEE DETAIL ABOVE FOR PROPOSED GR LAYOUT ALONG SR 1832
REMOVE FENCE
EXP. GUTTER
10' PS TO EXP. GUTTER
I-40 EBL 26' BST
I-40 WBL 26' BST
I-40 EBL 24' BST
I-40 WBL 23' BST
RETAIN DI
REMOVE DI
-Y1-
S 81°09'30.0" W
MATCHLINE -Y1- STA.14+00.00 SEE SHEET 7
MATCHLINE -Y1- STA.28+00.00 SEE SHEET 9
BY1-21
BY1-10
WW FENCE
OUTSIDE MORGANTON CITY LIMITS
INSIDE MORGANTON CITY LIMITS
PHILLIP D. DAVIS
DB 647 PG 195
TRANSMISSION LINE R/W
DUKE POWER COMPANY
BEATRICE A. PRITCHARD
DB 530 PG 80
PRESTON R. & BEATRICE DENTON
DB 592 PG 249
SARAH CATHERINE MELTON
DB 93 PG 151
BURKE COUNTY
DB 313 PG 640
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REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-2550B	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

FOR -Y1- PROFILE SEE SHEET 13
FOR -RPA- PROFILE SEE SHEET 15
FOR -RPC- PROFILE SEE SHEET 16
FOR CURVE DATA SEE SHEET 2-J
FOR DITCH DETAILS SEE SHEET 2-R

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PROJECT REFERENCE NO.	SHEET NO.
U-2550B	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

FOR -Y1- PROFILE SEE SHEET 14
FOR -RPB- PROFILE SEE SHEET 15
FOR CURVE DATA SEE SHEET 2-J
FOR DITCH DETAILS SEE SHEET 2-R

8/17/99

REVISIONS

$$$$$$$SYSTIME$$$$$
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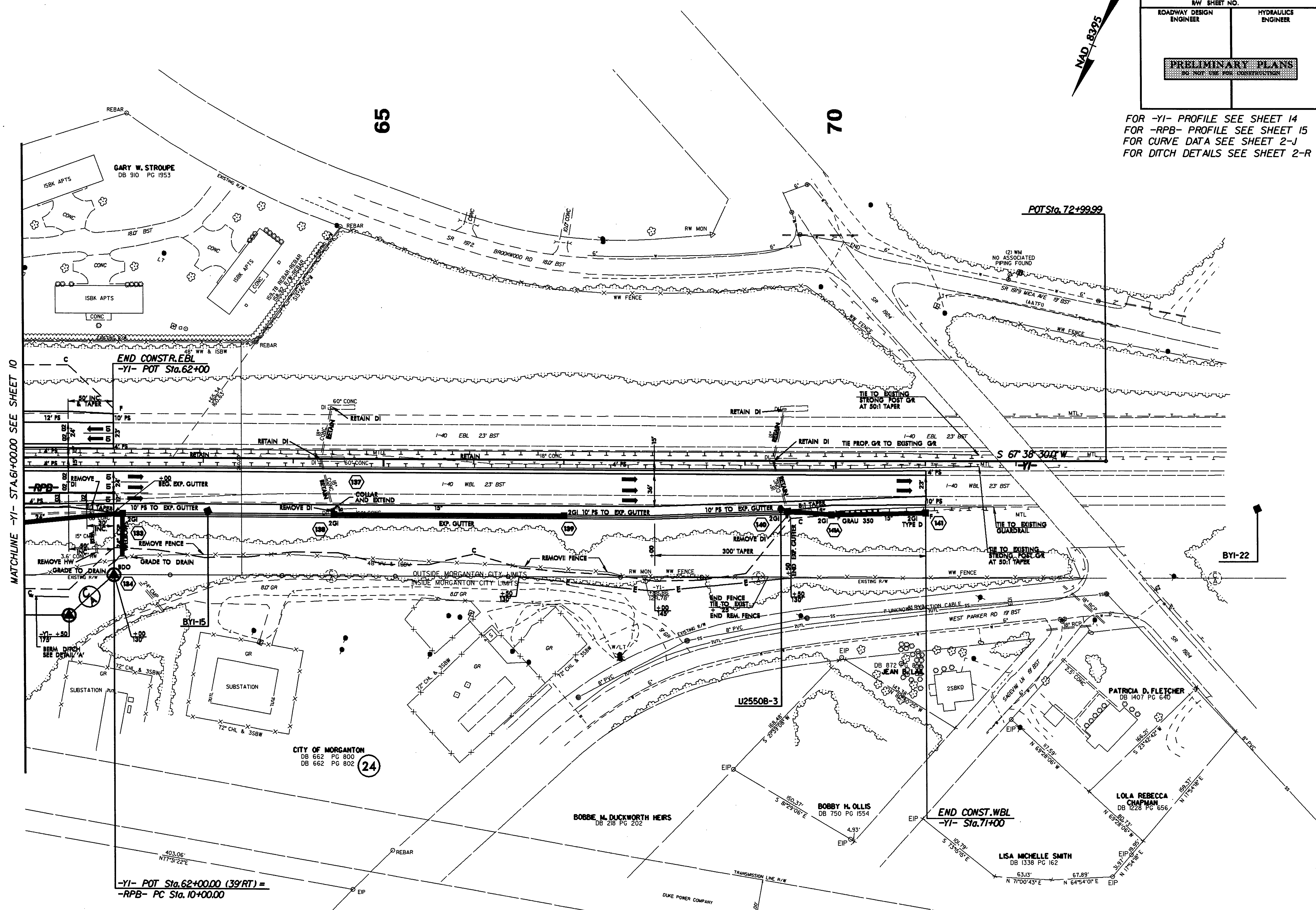
PROJECT REFERENCE NO.	SHEET NO.
U-2550B	11

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

FOR -YI- PROFILE SEE SHEET 14
FOR -RPB- PROFILE SEE SHEET 15
FOR CURVE DATA SEE SHEET 2-J
FOR DITCH DETAILS SEE SHEET 2-R



NAD 83/95
65
70
GARY W. STROUPE
DB 910 PG 1953
15BK APTS
POT Sta. 72+99.99
SR 1972 BROOKWOOD RD 18.0' BST
RW MON
SR 1979 MICA AVE 19' BST
(2) WM NO ASSOCIATED PIPING FOUND
WW FENCE
MATCHLINE -YI- STA.61+00.00 SEE SHEET 10
END CONSTR. EBL
-YI- POT Sta. 62+00
I-40 EBL 23' BST
I-40 WBL 23' BST
S 67° 38' 30.0" W
-YI-
-RPB-
RETAIN DI
TIE TO EXISTING STRONG POST GR AT 50:1 TAPER
TIE PROP. GR TO EXISTING GR
10' PS TO EXP. GUTTER
REMOVE DI
COLLAR AND EXTEND
EXP. GUTTER
REMOVE FENCE
GRADE TO DRAIN
REMOVE HW
300' TAPER
OUTSIDE MORGANTON CITY LIMITS
INSIDE MORGANTON CITY LIMITS
END FENCE TIE TO EXIST.
END REM. FENCE
TIE TO EXISTING GUARDRAIL
BYI-22
BYI-15
BERM DITCH SEE DETAIL 'A'
U2550B-3
SUBSTATION
72" CHL & 3SBW
CITY OF MORGANTON
DB 662 PG 800
DB 662 PG 802
24
WEST PARKER RD 19' BST
SR 1924
DB 872 JEAN B. LAIL
2SBKD
PATRICIA D. FLETCHER
DB 1407 PG 640
BOBBY H. OLLIS
DB 750 PG 1554
LOLA REBECCA CHAPMAN
DB 1228 PG 656
BOBBIE M. DUCKWORTH HEIRS
DB 218 PG 202
END CONST. WBL
-YI- Sta. 71+00
LISA MICHELLE SMITH
DB 1338 PG 162
TRANSMISSION LINE R/W
DUKE POWER COMPANY
403.06'
N 77°31'22" E
-YI- POT Sta. 62+00.00 (39' RT) =
-RPB- PC Sta. 10+00.00

8/17/99

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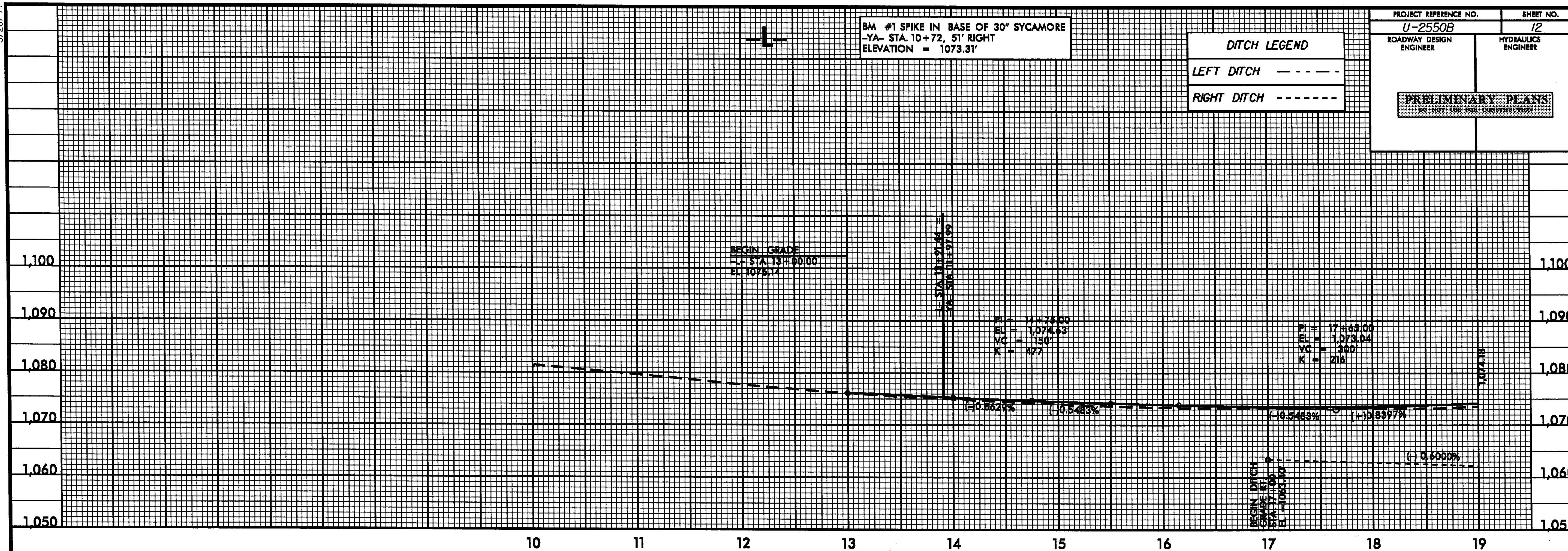
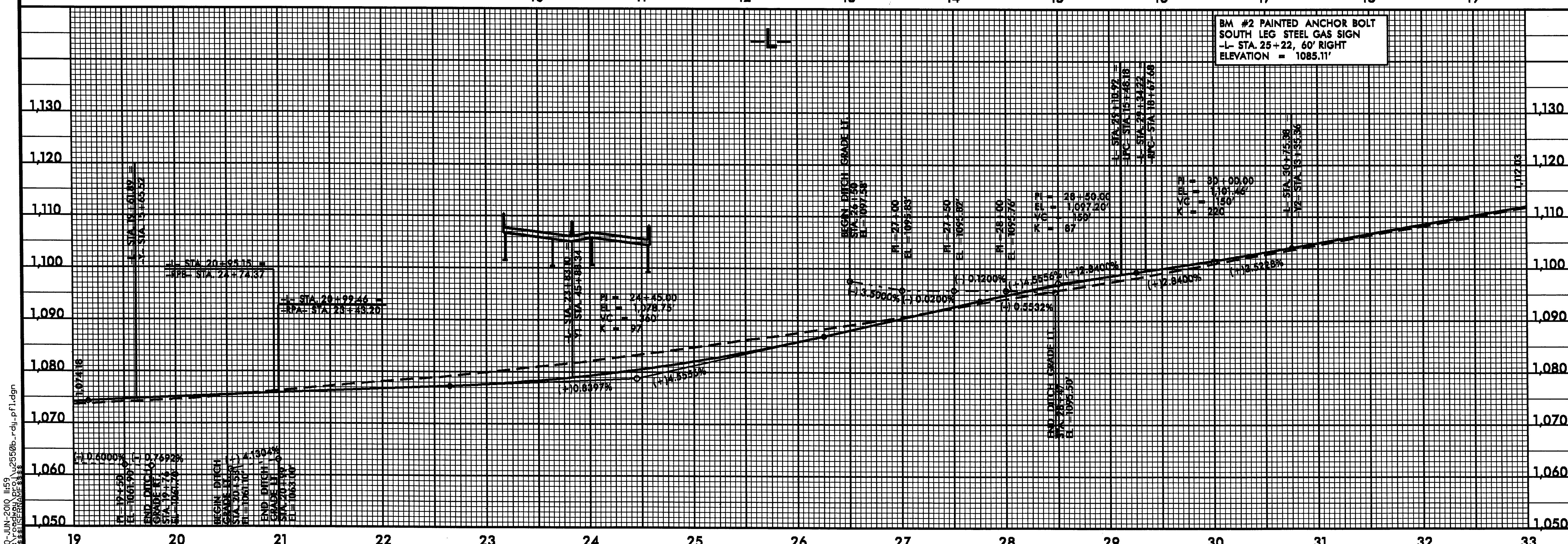
PROJECT REFERENCE NO.	SHEET NO.
U-2550B	12
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

5/28/99



-L-
BM #1 SPIKE IN BASE OF 30" SYCAMORE
-YA- STA. 10+72, 51' RIGHT
ELEVATION = 1073.31'
DITCH LEGEND
LEFT DITCH
RIGHT DITCH
BEGIN GRADE
-L- STA. 13+00.00
EL. 1075.14
-L- STA. 13+91.44 =
-YA- STA. 11+97.99
PI = 14+75.00
EL = 1,074.63
VC = 150'
K = 477
PI = 17+65.00
EL = 1,073.04
VC = 300
K = 216
1,074.18
(-)0.8629%
(-)0.5465%
(-)0.5465%
(+)0.8397%
(-) 0.6000%
BEGIN DITCH GRADE RT.
STA. 17+00
EL =1063.40
1,100
1,090
1,080
1,070
1,060
1,050
10
11
12
13
14
15
16
17
18
19



-L-
BM #2 PAINTED ANCHOR BOLT
SOUTH LEG STEEL GAS SIGN
-L- STA. 25+22, 60' RIGHT
ELEVATION = 1085.11'
-L- STA. 19+61.89 =
-Y- STA. 11+65.57
-L- STA. 20+95.15 =
-RPE- STA. 24+74.37
-L- STA. 20+99.46 =
-RPA- STA. 25+43.20
-L- STA. 24+15.10 =
-Y1- STA. 15+08.37
PI = 24+45.00
EL = 1,078.75
VC = 360'
K = 97
(+)0.8397%
(+)4.5556%
BEGIN DITCH GRADE LT.
STA. 26+50
EL =1097.54'
PI =27+00
EL =1095.85'
PI =27+50
EL =1095.92'
PI =28+00
EL =1095.76'
PI = 28+50.00
EL = 1,097.20'
VC = 150'
K = 87
(-)3.5900%
(-)0.0200%
(-)0.1200%
(+)4.5556%
(-)0.5532%
(+)12.3400%
END DITCH GRADE LT.
STA. 28+50
EL =1096.50'
-L- STA. 29+10.92 =
-EPC- STA. 10+46.18
-L- STA. 29+34.22 =
-RPC- STA. 18+67.68
PI = 30+00.00
EL = 1,101.46'
VC = 150'
K = 220
(+)12.3400%
(+)2.5283%
-L- STA. 30+75.38 =
-Y2- STA. 13+35.36
1,112.03
1,074.18
(-)0.6000%
(-)0.7692%
(-)4.1304%
PI =19+50
EL =1061.90
END DITCH GRADE RT.
STA. 19+76
EL =1061.78
BEGIN DITCH GRADE LT.
STA. 20+56
EL =1061.10
END DITCH GRADE LT.
STA. 21+00
EL =1063.00'
1,130
1,120
1,110
1,100
1,090
1,080
1,070
1,060
1,050
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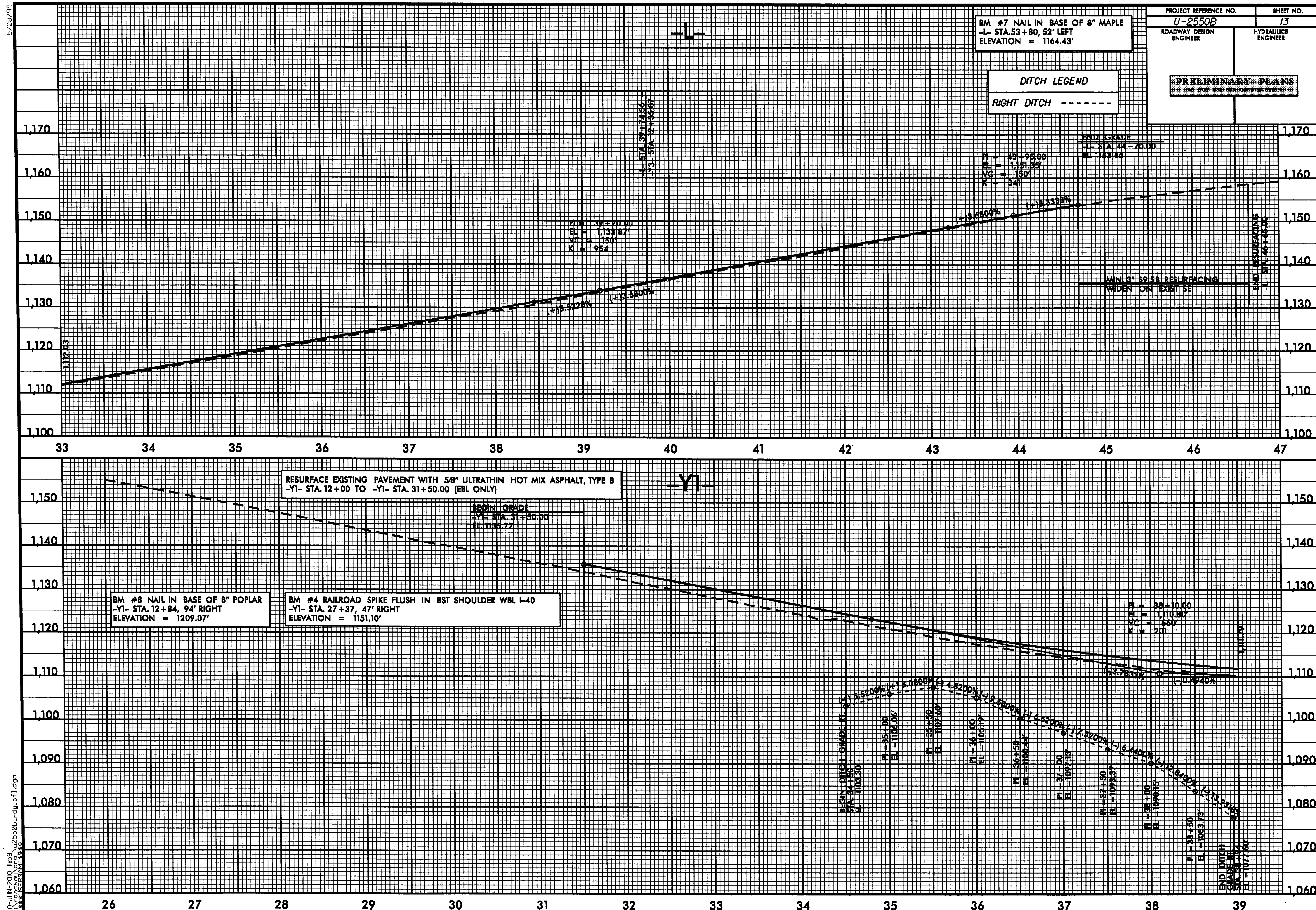

5/28/99
PROJECT REFERENCE NO. U-2550B
SHEET NO. 13
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
-L-
BM #7 NAIL IN BASE OF 8" MAPLE
-L- STA.53+80, 52' LEFT
ELEVATION = 1164.43'
DITCH LEGEND
RIGHT DITCH
END GRADE
-L- STA. 44+70.00
EL. 1153.85
-L- STA. 39+74.56 =
-Y1- STA. 12+35.67
PI = 43+95.00
EL = 1,151.35'
VC = 150'
K = 34
PI = 39+20.00
EL = 1,133.87'
VC = 150'
K = 954
(+)3.5228%
(+)3.5800%
(+)3.6800%
(+)3.3333%
MIN. 3" S9.5B RESURFACING
WIDEN ON EXIST SE
END RESURFACING
-L- STA. 46+65.00
1,112.03
-Y1-
RESURFACE EXISTING PAVEMENT WITH 5/8" ULTRATHIN HOT MIX ASPHALT, TYPE B
-Y1- STA. 12+00 TO -Y1- STA. 31+50.00 (EBL ONLY)
BEGIN GRADE
-Y1- STA. 31+50.00
EL. 1135.77
BM #8 NAIL IN BASE OF 8" POPLAR
-Y1- STA. 12+84, 94' RIGHT
ELEVATION = 1209.07'
BM #4 RAILROAD SPIKE FLUSH IN BST SHOULDER WBL I-40
-Y1- STA. 27+37, 47' RIGHT
ELEVATION = 1151.10'
PI = 38+10.00
EL = 1,110.80'
VC = 660'
K = 201
1,111.79
(-)3.7833%
(-)0.4540%
BEGIN DITCH GRADE RT
PI - 35+00
PI - 35+50
PI - 36+00
PI - 36+50
PI - 37+00
PI - 37+50
PI - 38+00
PI - 38+50
END DITCH GRADE RT
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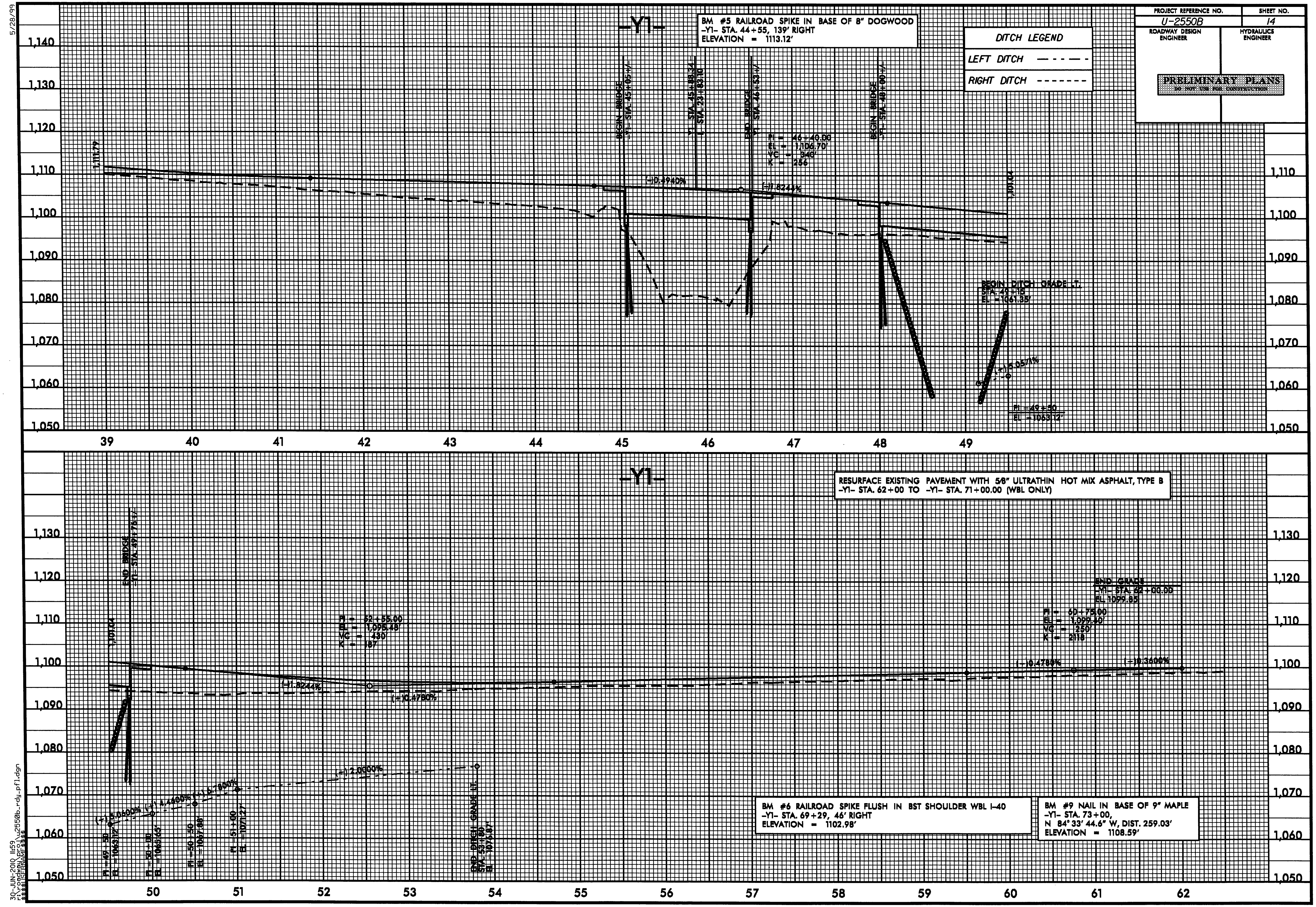
PROJECT REFERENCE NO. U-2550B
SHEET NO. 14
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
-Y1-
BM #5 RAILROAD SPIKE IN BASE OF 8" DOGWOOD
-Y1- STA. 44+55, 139' RIGHT
ELEVATION = 1113.12'
DITCH LEGEND
LEFT DITCH
RIGHT DITCH
BEGIN BRIDGE -Y1- STA. 45+05 +/-
END BRIDGE -Y1- STA. 46+53 +/-
BEGIN BRIDGE -Y1- STA. 48+00 +/-
PI = 46+40.00
EL = 1,106.70'
VC = 340'
K = 256
(-)0.4940%
(-)1.8244%
BEGIN DITCH GRADE LT.
PI = 49+50
EL = 1063.12'
-Y1-
RESURFACE EXISTING PAVEMENT WITH 5/8" ULTRATHIN HOT MIX ASPHALT, TYPE B
-Y1- STA. 62+00 TO -Y1- STA. 71+00.00 (WBL ONLY)
END BRIDGE -Y1- STA. 49+75 +/-
PI = 52+55.00
EL = 1,095.48
VC = 430'
K = 187
(-)1.8244%
(+)0.4780%
END GRADE
-Y1- STA. 62+00.00
EL 1099.85
PI = 60+75.00
EL = 1,099.40
VC = 250'
K = 218
(+)0.4780%
(+)0.3600%
(+)2.0000%
END DITCH GRADE LT.
BM #6 RAILROAD SPIKE FLUSH IN BST SHOULDER WBL I-40
-Y1- STA. 69+29, 46' RIGHT
ELEVATION = 1102.98'
BM #9 NAIL IN BASE OF 9" MAPLE
-Y1- STA. 73+00,
N 84° 33' 44.6" W, DIST. 259.03'
ELEVATION = 1108.59'
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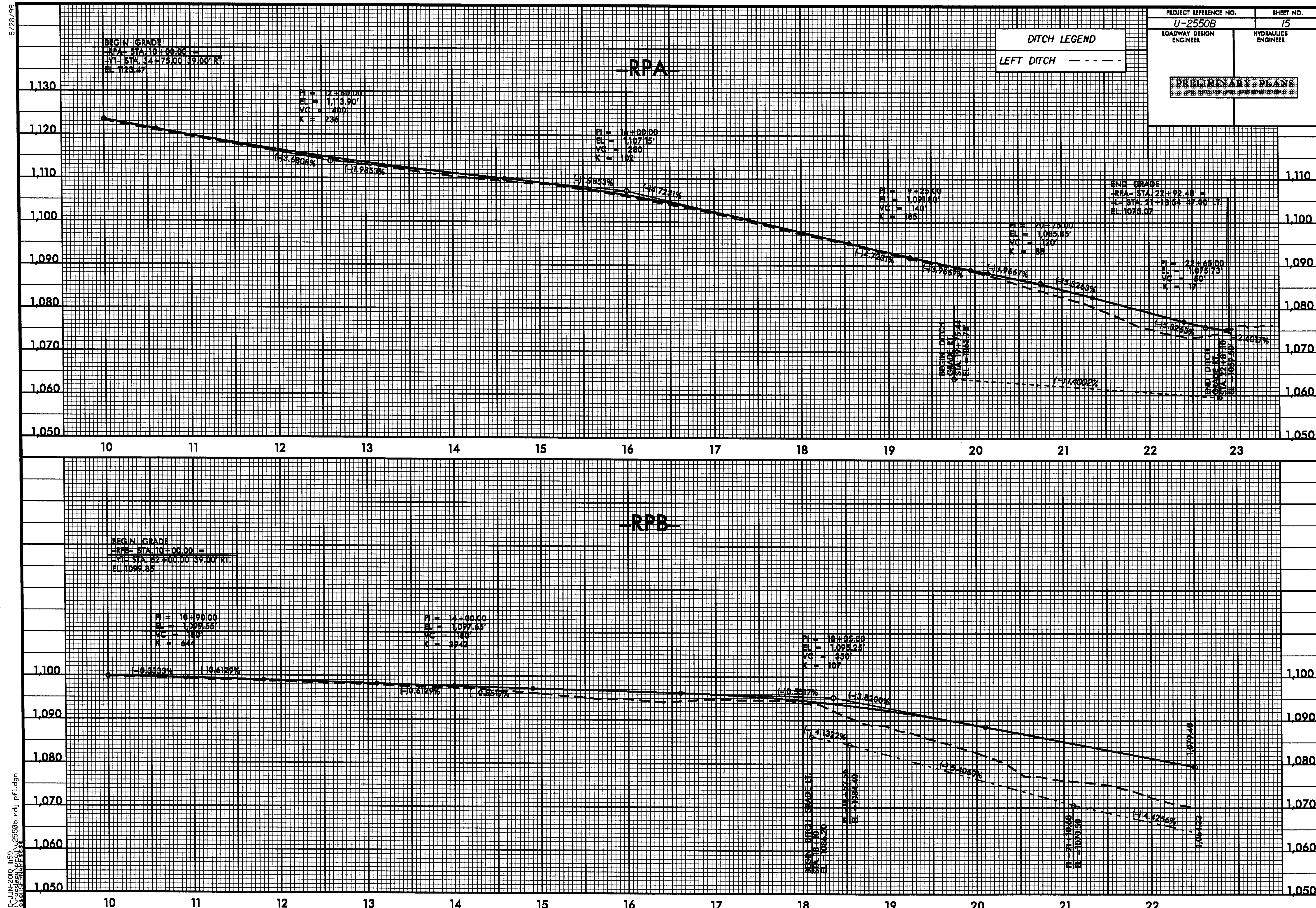

PROJECT REFERENCE NO.
U-2550B
SHEET NO.
15
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
DITCH LEGEND
LEFT DITCH
-RPA-
BEGIN GRADE
-RPA- STA. 10+00.00 =
-Y1- STA. 34+75.00 39.00' RT.
EL. 1123.47
PI = 12+60.00
EL = 1,113.90'
VC = 400'
K = 236
PI = 16+00.00
EL = 1,107.15'
VC = 280'
K = 102
PI = 19+25.00
EL = 1,091.80'
VC = 140'
K = 185
PI = 20+75.00
EL = 1,085.85'
VC = 120'
K = 88
PI = 22+65.00
EL = 1075.73'
VC = 50'
K = 17
END GRADE
-RPA- STA. 22+92.48 =
-L- STA. 21+18.54 47.00' LT.
EL. 1075.07
(-)3.6808%
(-)1.9853%
(-)1.9853%
(-)4.7231%
(-)4.7231%
(-)3.9667%
(-)3.9667%
(-)5.3263%
(-)5.9253%
(-)2.4017%
(-)11.4002%
BEGIN DITCH GRADE RT. STA. 19+75.44 EL. 1063.78
END DITCH GRADE RT.
1,130
1,120
1,110
1,100
1,090
1,080
1,070
1,060
1,050
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21
22
23
-RPB-
BEGIN GRADE
-RPB- STA. 10+00.00 =
-Y1- STA. 62+00.00 39.00' RT.
EL. 1099.85
PI = 10+90.00
EL = 1,099.55'
VC = 180'
K = 644
PI = 14+00.00
EL = 1,097.65'
VC = 180'
K = 2942
PI = 18+35.00
EL = 1,095.25'
VC = 350'
K = 107
(-)0.3333%
(-)0.6129%
(-)0.6129%
(-)0.5517%
(-)0.5517%
(-)3.8260%
(-)4.1322%
(-)5.4069%
(-)4.4256%
BEGIN DITCH GRADE LT.
EL. 1086.20
PI = 18+53.36
EL = 1084.40
PI = 21+18.68
EL = 1070.50
1,079.40
1064.33
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PROJECT REFERENCE NO.	SHEET NO.
U-2550B	16

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

5/28/99

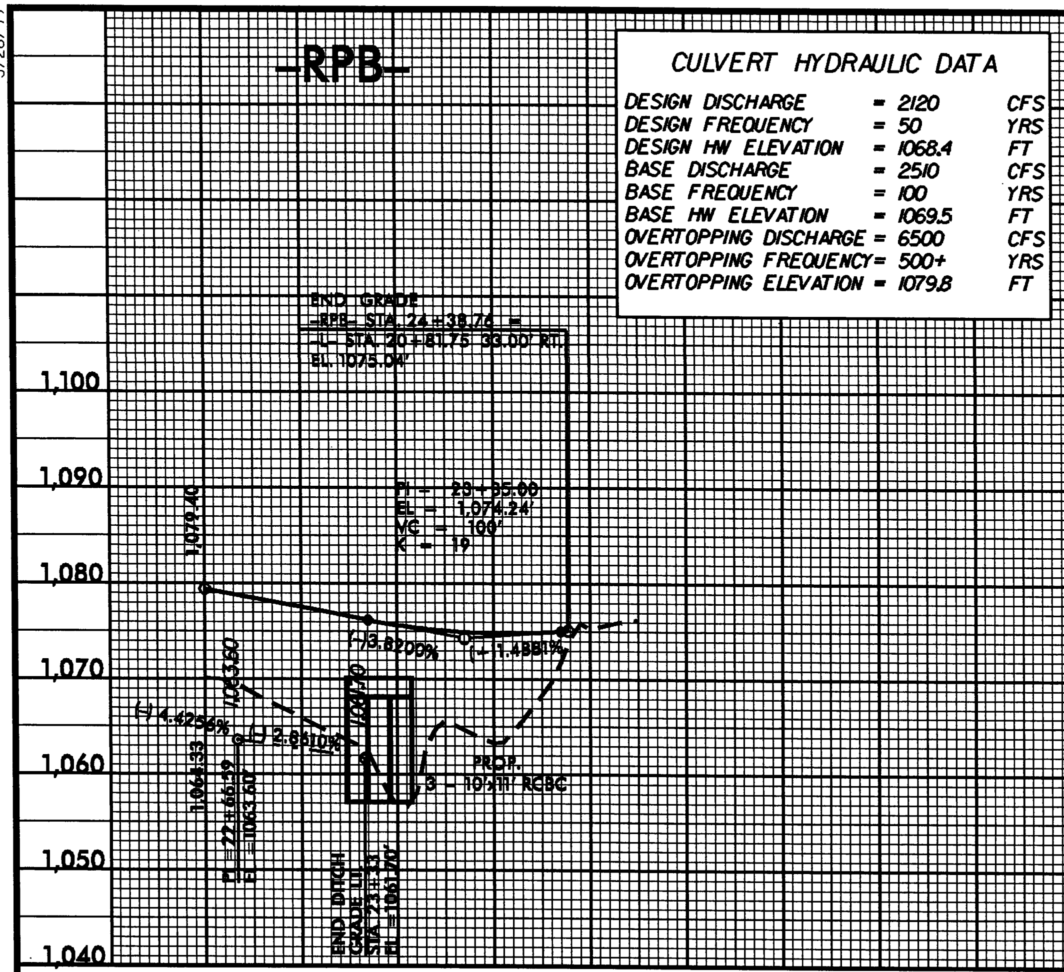
CULVERT HYDRAULIC DATA

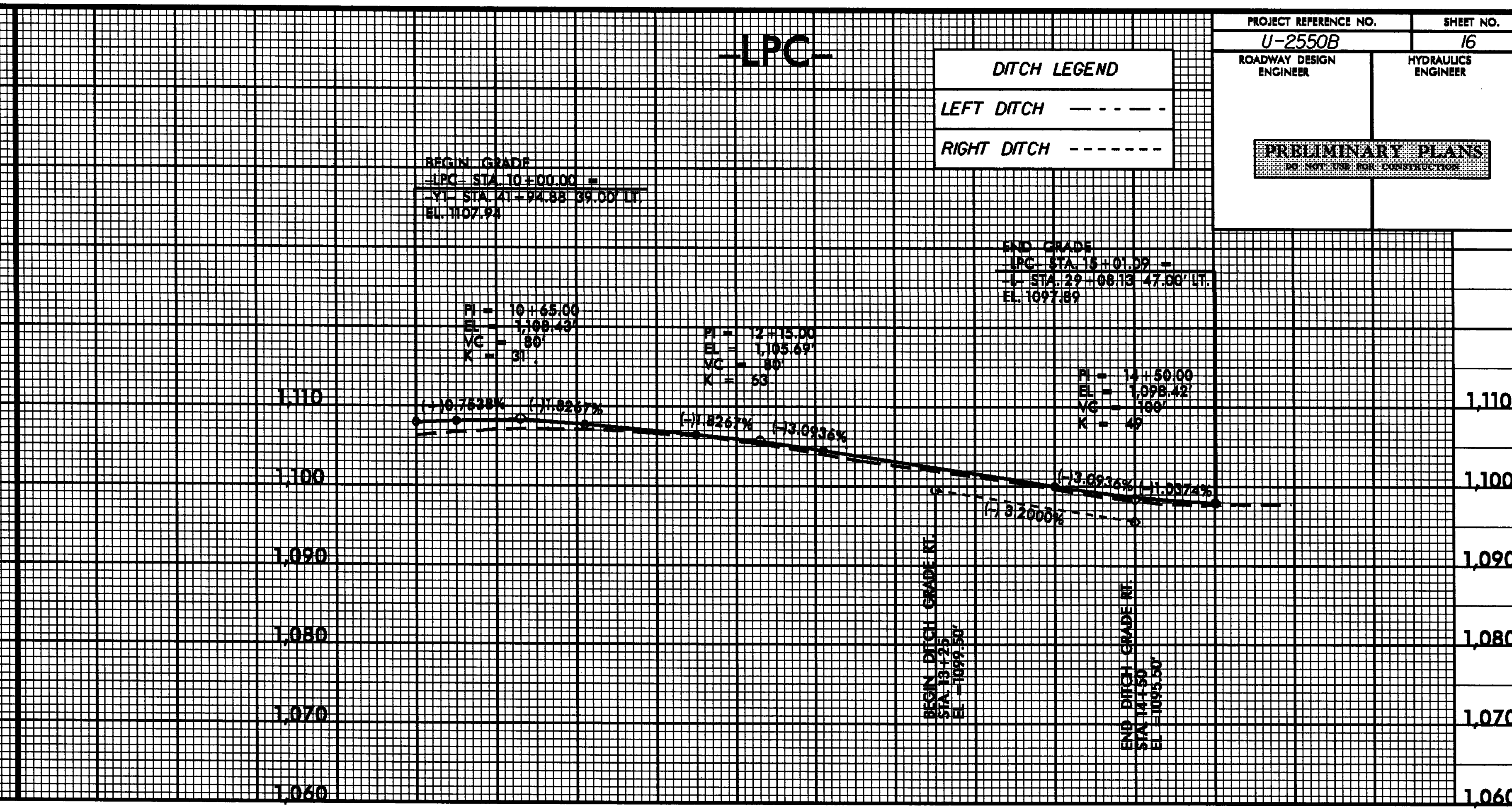
DESIGN DISCHARGE	=	2120	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	1068.4	FT
BASE DISCHARGE	=	2510	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	1069.5	FT
OVERTOPPING DISCHARGE	=	6500	CFS
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING ELEVATION	=	1079.8	FT

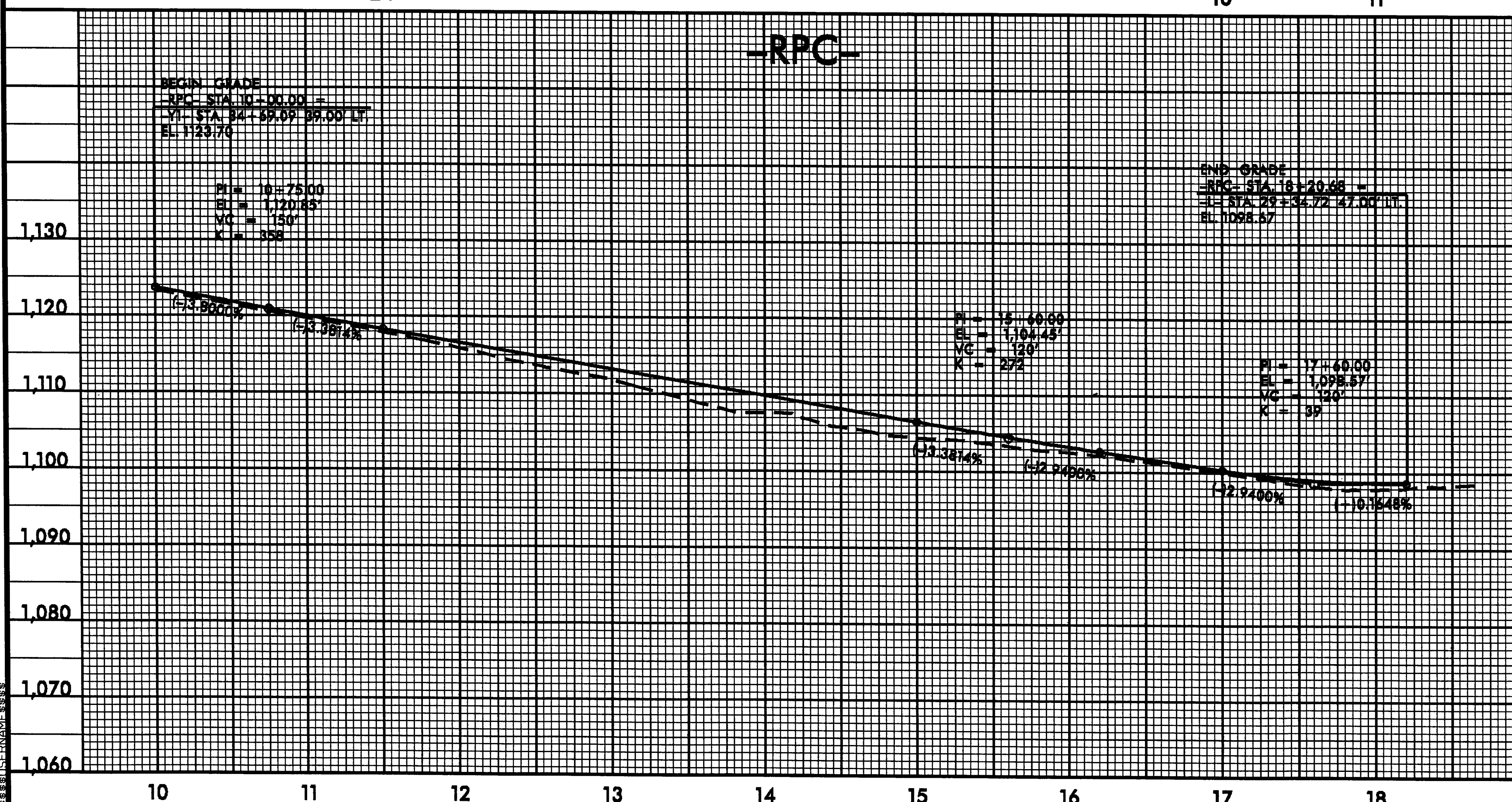
DITCH LEGEND

LEFT DITCH — - — - —

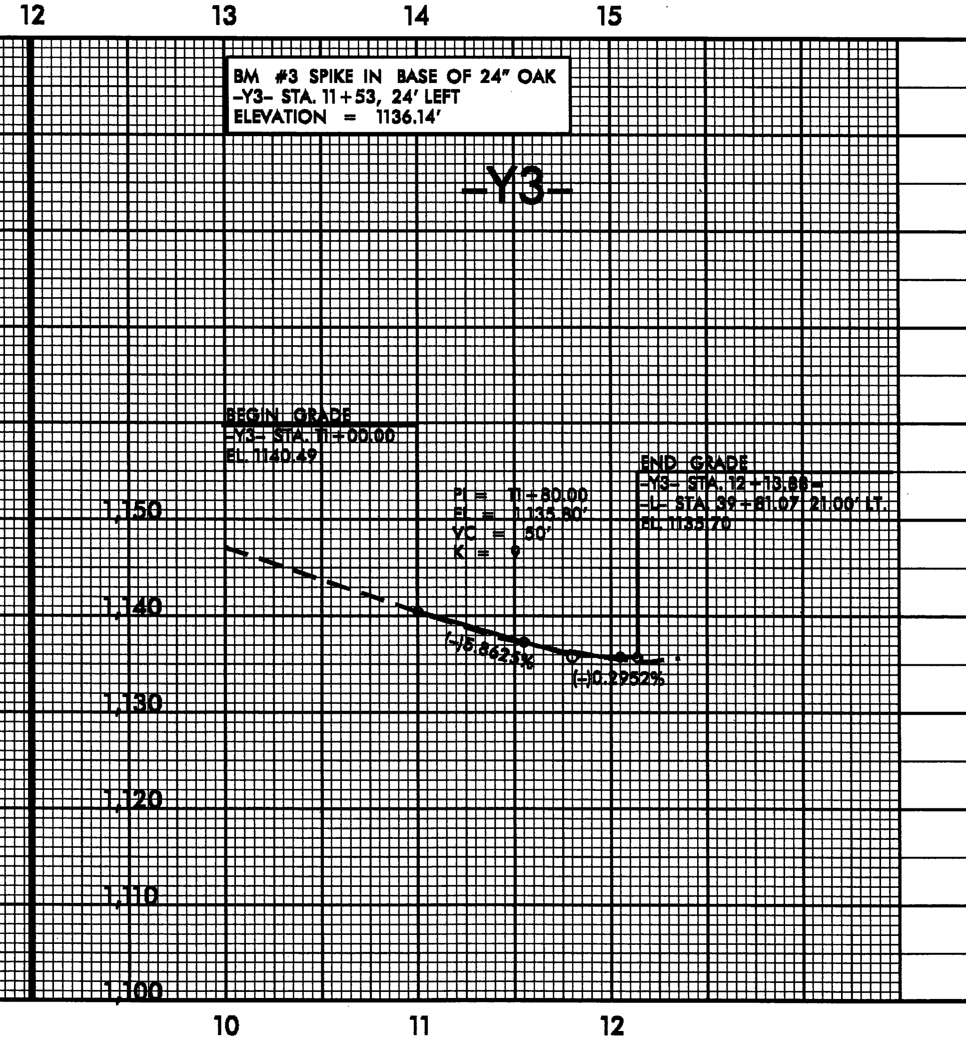
RIGHT DITCH - - - - - - -







BM #3 SPIKE IN BASE OF 24" OAK
-Y3- STA. 11+53, 24' LEFT
ELEVATION = 1136.14'



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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
U-2550B	17
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-DETEB-

BEGIN GRADE
-DETEB- STA. 38+23.95
EL. 1112.48'

PI = 39+05.00
EL = 1,111.09'
VC = 160'
K = 246

PI = 41+55.00
EL = 1,108.48'
VC = 160'
K = 180

PI = 43+35.00
EL = 1,104.75'
VC = 180'
K = 423

END GRADE
-DETEB- STA. 44+25.60
EL. 1103.28'

(-)1.7024%
(-)1.0560%
(-)2.9556%
(-)1.6333%

1,130 1,120 1,110 1,100 1,090 1,080 1,070 1,060 1,050

36 37 38 39 40 41 42 43 44 45 46 47 48

-DETEB-

BEGIN GRADE
-DETEB- STA. 49+15.00
EL. 1095.87'

PI = 50+20.00
EL = 1,094.71'
VC = 230'
K = 150

PI = 53+70.00
EL = 1,096.25'
VC = 200'
K = 755

END GRADE
-DETEB- STA. 55+62.01'
EL. 1096.59'

(-)1.0087%
(+)0.4278%
(+)0.4278%
(+)0.1628%

1,130 1,120 1,110 1,100 1,090 1,080 1,070 1,060 1,050

48 49 50 51 52 53 54 55 56 57 58

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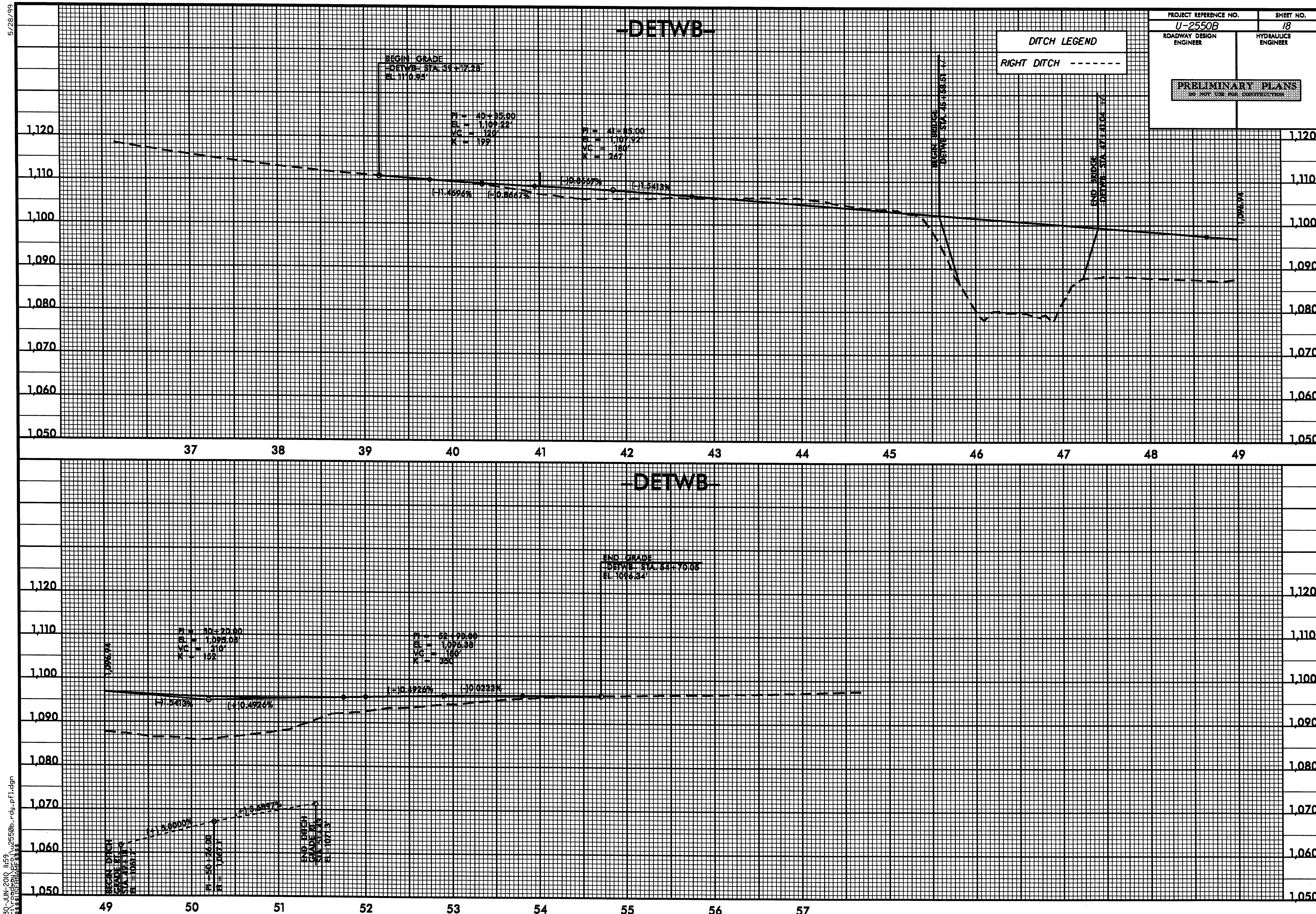

5/28/99
PROJECT REFERENCE NO. U-2550B
SHEET NO. 18
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
-DETWB-
DITCH LEGEND
RIGHT DITCH -------
BEGIN GRADE -DETWB- STA. 39+17.28 EL. 1110.95'
PI = 40+35.00 EL = 1,109.22' VC = 120' K = 199
PI = 41+85.00 EL = 1,107.92' VC = 180' K = 267
(-)1.4696%
(-)0.8667%
(-)0.8667%
(-)1.5413%
BEGIN BRIDGE -DETWE- STA. 45+58.61 ±
END BRIDGE -DETWB- STA. 47+81.04 ±
1,096.94
1,120
1,110
1,100
1,090
1,080
1,070
1,060
1,050
37
38
39
40
41
42
43
44
45
46
47
48
49
-DETWB-
END GRADE -DETWB- STA. 54+70.05 EL. 1096.34'
PI = 50+20.00 EL = 1,095.03' VC = 210' K = 152
PI = 52+90.00 EL = 1,096.38' VC = 180' K = 350
1,096.94
(-)1.5413%
(+)0.4926%
(+)0.4926%
(-)0.0222%
(+)5.0000%
(+)0.5997%
BEGIN DITCH GRADE PI STA. 49+10 EL = 1061.2
PI = 50+26.00 EL = 1067.1
END DITCH GRADE PI STA. 51+45 EL = 1071.3
49
50
51
52
53
54
55
56
57
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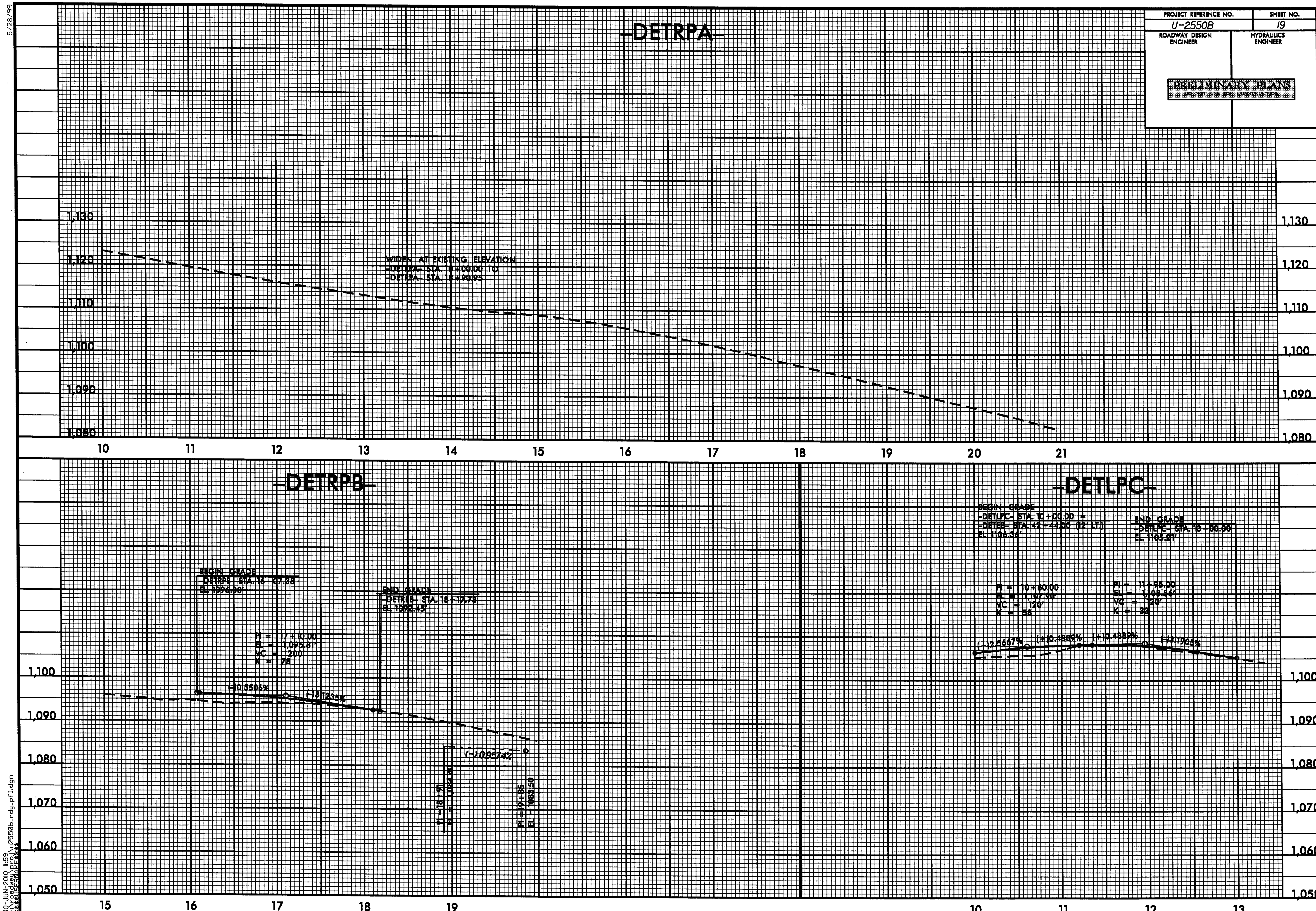

PROJECT REFERENCE NO.
U-2550B
SHEET NO.
19
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
-DETRPA-
WIDEN AT EXISTING ELEVATION
-DETRPA- STA. 10+00.00 TO
-DETRPA- STA. 18+90.95
1,130
1,120
1,110
1,100
1,090
1,080
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11
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14
15
16
17
18
19
20
21
-DETRPB-
BEGIN GRADE
-DETRPB- STA. 16+07.38
EL 1096.38'
END GRADE
-DETRPB- STA. 18+17.73
EL 1092.45'
PI = 17+10.00
EL = 1,095.81'
VC = 200'
K = 78
(-)0.5506%
(-)3.1235%
(-)0.9574%
PI = 18+97
EL = 1,084.40
PI = 19+85
EL = 1083.50
1,100
1,090
1,080
1,070
1,060
1,050
15
16
17
18
19
-DETLPC-
BEGIN GRADE
-DETLPC- STA. 10+00.00 +
-DETEB- STA. 42+44.00 (12' LT.)
EL 1106.36'
END GRADE
-DETLPC- STA. 13+00.00
EL 1105.21'
PI = 10+60.00
EL = 1,107.90'
VC = 120'
K = 58
PI = 11+95.00
EL = 1,108.56'
VC = 120'
K = 33
(-)2.5667%
(+)0.4889%
(+)0.4889%
(-)3.1905%
10
11
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13
5/28/99
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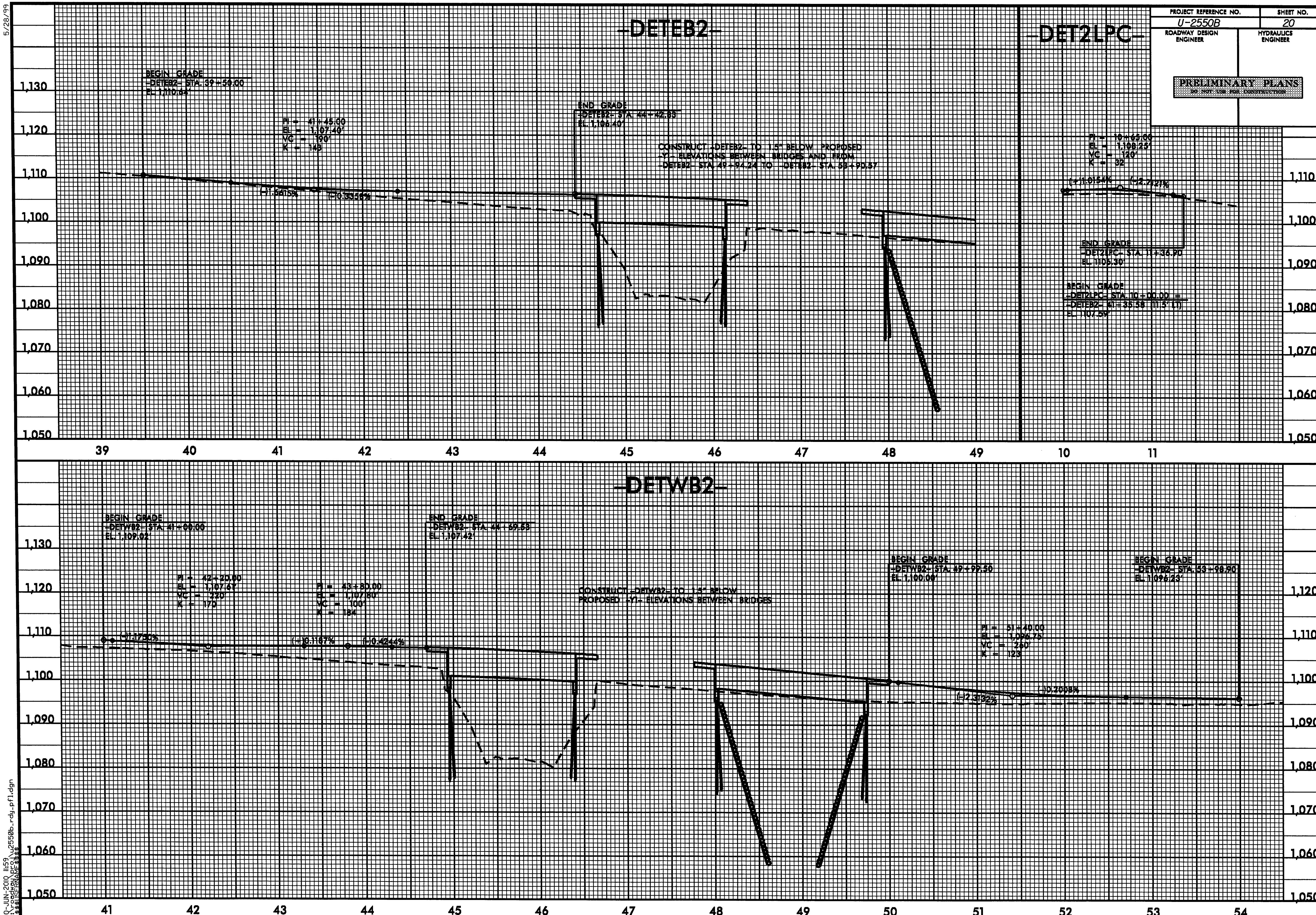
PROJECT REFERENCE NO.	SHEET NO.
U-2550B	20

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-DETEB2-
BEGIN GRADE
-DETEB2- STA. 39+50.00
EL. 1,110.64'
PI = 41+45.00
EL = 1,107.40'
VC = 190'
K = 143
(-)1.6615%
(-)0.3356%
END GRADE
-DETEB2- STA. 44+42.83
EL. 1,106.40'
CONSTRUCT -DETEB2- TO 1.5" BELOW PROPOSED
-Y- ELEVATIONS BETWEEN BRIDGES AND FROM
-DETEB2- STA. 49+94.24 TO -DETEB2- STA. 53+90.57
-DET2LPC-
PI = 10+65.00
EL = 1,108.25'
VC = 120'
K = 32
(+)1.0154%
(-)2.7121%
END GRADE
-DET2LPC- STA. 11+36.90
EL. 1105.30'
BEGIN GRADE
-DET2LPC- STA. 10+00.00 =
-DETEB2- 41+35.58 (11.5' LT)
EL. 1107.59'
1,130
1,120
1,110
1,100
1,090
1,080
1,070
1,060
1,050
39
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41
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49
10
11
-DETWB2-
BEGIN GRADE
-DETWB2- STA. 41+00.00
EL. 1,109.02'
PI = 42+20.00
EL = 1,107.61'
VC = 220'
K = 170
PI = 43+80.00
EL = 1,107.80'
VC = 100'
K = 184
(-)1.1750%
(+)0.1187%
(-)0.4244%
END GRADE
-DETWB2- STA. 44+69.53
EL. 1,107.42'
CONSTRUCT -DETWB2- TO 1.5" BELOW
PROPOSED -Y1- ELEVATIONS BETWEEN BRIDGES
BEGIN GRADE
-DETWB2- STA. 49+99.50
EL. 1,100.00'
PI = 51+40.00
EL = 1,096.75'
VC = 260'
K = 123
(-)2.3132%
(-)0.2008%
BEGIN GRADE
-DETWB2- STA. 53+98.90
EL. 1096.23'
41
42
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49
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51
52
53
54