



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

April 12, 2010

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

ATTN: Ms. Sarah Hair
NCDOT Coordinator

Dear Madam:

Subject: **Application for an Individual Section 404 and Section 401 Water Quality Certification** for the widening of NC 49 from East of NC 73 to East of SR 2630 (Cline Road) in Cabarrus County. Federal Aid Project No. NHS-0049(26), Division 10, TIP No. R-2533CC. Debit \$570 from WBS 34448.1.1.

The North Carolina Department of Transportation (NCDOT) proposes to widen the existing 2-lane section of NC 49 to a 4-lane divided highway. The total length of the project is approximately 2.1 miles. Please see the enclosed ENG 4345, NCEEP mitigation acceptance letter, merger 4B and 4C meeting minutes, Rapanos jurisdictional determination form, State Stormwater Management Plan, permit drawings, and design plans for the above referenced project. An Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) have been completed and distributed for this project. Also, an Indirect and Cumulative Effects Assessment was completed and distributed in October 2006. Additional copies of these documents are available upon request.

Purpose and Need:

The purpose of this project is to provide a higher level of service for the user and to provide safer and more efficient travel along NC 49. NC 49 from Charlotte to Asheboro, along with US 64 from Asheboro to Raleigh, basically parallels I-85/I-40 from Charlotte to Raleigh. Several widening projects have been developed in NCDOT's Transportation Improvement Program that provide a multi-lane cross section along the NC 49/US 64 corridor between Charlotte and Raleigh. This corridor can act as a relief for the busy I-85/I-40 corridor by providing an alternative high speed route between Raleigh and Charlotte via Asheboro.

Summary of Impacts:

The project will permanently impact 0.22 acres of wetlands, 2129 linear feet of streams, and temporarily impact 558 linear feet of streams.

Summary of Mitigation: The project has been designed to avoid and minimize impacts to jurisdictional areas throughout the NEPA and design processes. Compensatory mitigation for proposed impacts to jurisdictional streams and wetlands will be accomplished by off-site mitigation provided by NCEEP. It is proposed that no mitigation be required of 35 linear feet of permanent stream impact due to bank stabilization.

NEPA DOCUMENT STATUS

An EA was prepared for the entirety of R-2533 (NC 49 in Harrisburg to the Yadkin River) in March 1994. A FONSI was prepared in October 1994. A reevaluation of these documents as pertaining to Sections CC and CD was completed in August 2009. Additional copies will be provided upon request.

MERGER PROCESS SUMMARY

Due to its limited scope and age, this project was not a part of the formal merger process. However informal 4B and 4C meetings were held with agency personnel on November 19, 2008 and March 18, 2009, respectively, to review the project.

INDEPENDENT UTILITY

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

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

In discussions with Steve Lund (USACE), it was agreed that section CC of this project had independent utility.

PROJECT SCHEDULE

R-2533CC calls for an April 19, 2011 let date, and a review date of March 1, 2011, however the let date may advance as additional funding becomes available. This application provides final design and impacts for the project.

The table below gives the project limits and projected let dates for each section of the NC 49 project.

R-2533 Project Schedule

Section	Project Limits	Let Date
R-2533 A	Harrisburg to east of SR 1155	December 2001 (Complete)
R-2533 B	East of SR 1155 to east of SR 2630	June 2002 (Complete)
R-2533 CC	East of SR 2630 to east of NC 73	April 19, 2011
R-2533 CD	East of NC 73 to SR 2444	Post Year
R-2533 CB	SR 2444 to US 52	Post Year
R-2533 D	US 52 to the Yadkin River	Post Year

RESOURCE STATUS

Wetland delineations:

Potential wetland communities were investigated pursuant to the 1987 Corps of Engineers Wetland Delineation Manual. Ms. Polly Lespinasse of the North Carolina Division of Water Quality visited the site on September 4, 2008. Information from this site visit was forwarded along with follow-up information on March 20, 2009 to Mr. Steve Lund of the U.S. Army Corps of Engineers for a jurisdictional determination. On March 11, 2010 a site visit was conducted with Ms. Sarah Hair (USACE) to review the streams and wetlands on the project. With this application NCDOT requests a jurisdictional determination for R-2533CC.

R-2533CC Stream Classifications

Permit Site No.	Stream Name	Sub-basin	Stream Index No.	Best Usage Classification
1	Adams Creek and UTs	03-07-12	13-17-11-7	C
2	McAllister Creek	03-07-12	13-17-11-7-1	C
4,5,6,7,8	UTs to McAllister Creek	03-07-12	13-17-11-7-1	C

All streams impacted in the project area are perennial

Impacts to Waters of the United States

Each impact is described below, in detail. Site and station numbers correspond with the permit (hydraulic) drawings included in this application.

Wetland Impacts & Descriptions

Permit Site No.	Permanent (ac)	Temporary (ac)	Mitigation Ratio
1	0.02	--	2:1
3	0.20	--	2:1
Total	0.22	--	--

All wetlands impacted are riparian wetlands.

Surface Water Impacts

Permit Site No.	Stream Name	Source of Impact	Permanent (lf)	Temporary (lf)	Mitigation Ratio
1	Adams Creek and UTs	3@3.7x3.7 RCBC	144	125	2:1
		Bank Stabilization	108*	--	1:1
2	McAllister Creek	1@11.0x2.7 Bottomless Culvert	46	184	2:1
		Bank Stabilization	20**	--	0
4	UT to McAllister Creek	4@2.7x2.7 RCBC	315	62	2:1
		Bank Stabilization	26	--	1:1
5	UT to McAllister Creek	1050 mm RCP	52	--	2:1
		Bank Stabilization	10**	--	0
6	UT to McAllister Creek	4@2.7x2.7 RCBC	338	144	2:1
		Bank Stabilization	30	--	1:1
7	UT to McAllister Creek	1@1650mm RCP 1@1800mm RCP 1@450mm RCP	1020	43	2:1
8	UT to McAllister Creek	1@600mm RCP	20	--	2:1
Total			2129	558	--

*No mitigation is proposed for 25 linear feet of bank stabilization (see Compensation section on page 7 for explanation).

**No mitigation is proposed for this impact (see Compensation section on page 7 for explanation).

Permanent impacts have increased by 84 linear feet of stream and 0.22 acre of wetland from impacts reported in the Environmental Assessment (1994). Differences in stream impacts are attributed to design changes, while wetland impacts increased due to discovery of wetlands in the project area in subsequent NRTR updates.

Utility Impacts

Utility impacts on this project involve the relocation of an existing 12" ductile iron water line which is currently installed over top of the existing RCBC. The existing culvert located at Station 12+68 -Y1 Rev- (Sheet 19 of 40) will be removed and replaced with a new culvert in the same alignment (Site 6). The new culvert will have new headwalls at locations different than the existing box culvert with an armored open channel on the west side of -Y1 Rev-. The existing water line will be lowered in place below the new armored channel section with a minimum of three feet of cover (below the streambed). This work is being performed in an area already permitted for the aforementioned hydraulics work and causes no additional stream impacts.

PROTECTED SPECIES

Plants and animals with a federal classification of Endangered (E) or Threatened (T) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of January 31, 2008, the U.S. Fish and Wildlife Service (USFWS) lists two

federally protected species for Cabarrus County (Table 1). Biological conclusions of “No Effect” were rendered for both species.

Federally protected species listed for Cabarrus County.

Scientific Name	Common Name	Federal Status	Habitat Present	Biological Conclusion
<i>Lasmigona decorata</i>	Carolina heelsplitter	E	No	No Effect
<i>Helianthus schweinitzii</i>	Schwienitz’s sunflower	E	Yes	No Effect

A survey of suitable habitat for Schwienitz’s sunflower in the study area was conducted on September 23, 2008. No specimens were observed.

INDIRECT CUMULATIVE IMPACT ANALYSIS

An Indirect and Cumulative Effects Report was completed for the entire R-2533 project in October, 2006 (URS Corp.). This document provides a detailed assessment of likely future conditions in the project area. Potential changes in future land use as a result of indirect and cumulative effects of the project were analyzed for an area radiating 1-mile along the entire approximately 30-mile project length. The report concluded that the additional roadway capacity provided by the project will improve existing access to the project area. This in turn will likely increase the project area’s attractiveness for development, influencing some residential and business location decision-making. The western segment of the R-2533 project, which is adjacent to Charlotte, in Mecklenburg County, is most likely to see large-scale residential and commercial developments. Overall, potential Indirect and Cumulative Effects were found to range from Low to Moderate as summarized in the report’s Executive Summary Table below.

Impact Type	No-Action Future Conditions (Conditions Without the Proposed Action)		Impacts of the Proposed Action (Incremental Effect of the Proposed Action)			Cumulative Effect (Future Conditions with the Proposed Action)
	Other Past / Present Action	Other Future Actions	Direct Impacts	Indirect Effects Encroachment Alteration Effects	Induced Growth Effects	
Habitat Fragmentation/ Degradation	Low	Low	Low	Low	Moderate	Moderate
Ecosystem Disruption	Low	Low	Low	Low	Moderate	Moderate
Natural Process Disruption	Low	Low	Low	Low	Moderate	Moderate
Water Quality	Low	Low	Low	Low	Moderate	Moderate
Community Cohesion / Stability	Negligible	Negligible	Low	Low	Low	Low
Alteration of Travel Patterns	Positive	Positive	Positive	Positive	Positive	Positive
KEY:	Low Adverse Effect Positive Effect	Moderate Adverse Effect Negligible Effect	High Adverse Effect			

As the R-2533 corridor approaches Mount Pleasant, the land is zoned for residential, with only a few scattered sites zoned for commercial, light industrial, and office/institutional. This characteristic is maintained through the city limits of Mount Pleasant. The current proposed project, section CC of R-2533, is located in Cabarrus County, within the municipal boundaries of the Town of Mount Pleasant. Development within Mount Pleasant is guided by the Mount Pleasant Unified Development Ordinance (UDO). This document was completed jointly with Cabarrus County as part of the Eastern Area Land Use Plan. Each governing body retains control over land use within its jurisdiction. The UDO contains zoning, land use, and subdivision regulations as well as site design standards, and environmental controls. The UDO states:

“The Town Board hereby finds that hydrologic conditions in Cabarrus County and Mecklenburg County are similar and that it is in the public interest to maintain a uniform regional procedure for computing the stormwater impacts of new development. Accordingly, the design of stormwater management facilities shall be computed in accordance with *Charlotte Mecklenburg Storm Water Design Manual*”

The following federal, state, and local regulations are in place in the project area to protect surface water quality and accommodate future growth:

- EPA National Pollution Discharge Elimination System (NPDES) - Phase II Stormwater Rules
- North Carolina – Water Supply Watershed Protection Act
- North Carolina – Basinwide Water Quality Planning
- North Carolina - Nonpoint Source Program
- Cabarrus County – Land use and Storm Water Regulations

No currently listed 303(d) streams are located within the vicinity of R-2533CC. Adhering to the regulations for the protection of surface waters should limit any potential direct and indirect effects to surface water resources. Direct impacts will be avoided, minimized, or mitigated. Any potential change in land use as a result of the transportation impact causing activities of this project should be governed by the management practices outlined above. By actively adhering to all regulations and commitments any potential indirect and long-term cumulative effects should not substantially contribute to water quality degradation.

MORATORIUM

No moratoriums were proposed by the NCWRC and this project does not occur in trout waters or waters used by anadromous fish.

CULTURAL RESOURCES

Historical Structures & Archaeology:

An architectural survey for structures listed in the National Register or eligible for nomination to the National Register was conducted in the project area. There are no properties in the project area that are eligible for or are listed in the National Register of Historic Places.

No archeological sites are present in the project area.

FEMA COMPLIANCE

The NCDOT Hydraulics Unit will coordinate with the North Carolina Floodplain Mapping Program (FMP), the delegated state agency for administering FEMA's National Flood Insurance Program, to determine the status of the project with regard to the applicability of NCDOT's Memorandum of Agreement with the FMP (dated 6-5-08) or approval of a Conditional Letter of Map Revision (CLOMR) and subsequent final Letter of Map Revision (LOMR).

WILD AND SCENIC RIVER SYSTEM

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).

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 incorporated as part of the project design.

Avoidance and Minimization:

The NCDOT has avoided impacting many wetlands and streams and reduced impacts to wetlands and streams to the greatest extent practicable. Other specific examples of avoidance and minimization measures include:

- The removal of the existing culvert at McAllister Creek and replacement with a bottomless structure.
- Use of 2:1 side slopes in jurisdictional streams.
- No erosion control structures will be placed in waters of the U.S.
- Rip rap will be placed on the banks and not in the bottom of channels.
- Use of grass swales.
- Strict adherence to the procedures contained in Best Management Practices for Protection of Surface Waters, as well as NC Department of Environmental and Natural Resources (NCDENR), Division of Land Resources, Land Quality's Section's *North Carolina Erosion and Sediment Control Planning and Design Manual* will aid in avoiding and minimizing impacts to water resources and aquatic communities.

Compensation:

The NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent practicable as described above. This project will cause 2,129 linear feet of permanent impact to jurisdictional streams and 0.22 acre of permanent impact to wetlands. Mitigation will be acquired through the use of the NCEEP for 2,074 linear feet of stream impact and 0.22 acre of wetland impact. There are 55 linear feet of permanent impact, due to bank stabilization, for which NCDOT proposes no mitigation. These areas occur at Site 1, Site 2 and Site 5. Bank stabilization at these three sites do not constitute permanent impacts greater than 150 linear feet combined for one stream. The remaining 139 linear feet of permanent impact due to bank stabilization will be mitigated at a 1:1 ratio. All other permanent impacts (1,935 linear feet stream and 0.22 acre wetland) will be mitigated at a ratio of 2:1.

Site 1: Total bank stabilization impacts will be 108 linear feet (67 linear feet on Adams Creek and 41 linear feet on UT to Adams Creek). There will be 16 linear feet of bank stabilization from the UT entering Adams Creek. NCDOT proposes no mitigation for the remaining 25 linear feet of permanent impacts due to bank stabilization that occurs on the UT to Adams Creek.

Site 2: There will be 20 linear feet of bank stabilization to McAllister Creek, where rip rap lining a base ditch enters the creek on the northeast side of NC 49. NCDOT proposes no mitigation for the 20 linear feet of permanent impact.

Site 5: There will be 10 linear feet of bank stabilization to a UT to McAllister Creek, where rip rap will be placed at the outlet end of a pipe carrying the stream. NCDOT proposes no mitigation for the 10 linear feet of permanent impact.

REGULATORY APPROVALS

Section 404: Application is hereby made for a USACE Individual 404 Permit as required for the above-described activities.

Section 401: We are hereby requesting a 401 Water Quality Certification from the N. C. Division of Water Quality. 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 (5) copies of this application to the NCDWQ for their review and approval.

Thank you for your assistance with this project. If you have any questions or need additional information, please contact Mr. Jason Dilday at jldilday@ncdot.gov or (919) 413-6693. A copy of this application will also be posted at <http://www.ncdot.org/planning/pe/naturalunit/Permit.html>.

Sincerely,



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. Kathy Matthews, USEPA-Whitter, NC

W/o attachment (see website for attachments)

Dr. David Chang, P.E., Hydraulics
Mr. Victor Barbour, P.E., Project Services Unit
Mr. Greg Perfetti, P.E., Structure Design
Mr. Mark Staley, Roadside Environmental
Mr. Barry Moose, P.E. (Div. 10), Division Engineer
Mr. Larry Thompson (Div. 10), DEO
Mr. Jay Bennett, P.E., Roadway Design
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Scott McLendon, USACE, Wilmington
Ms. Beth Harmon, EEP
Mr. Philip Ayscue, NCDOT External Audit Branch
Mr. Ryan White, P.E., PDEA Planning Engineer
Mr. Drew Joyner, PE, Human Environment Unit
Mr. Clarence W. Coleman, P.E., FHWA

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

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

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

PRIVACY ACT STATEMENT

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

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

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

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETED
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(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME North Carolina Department of Transportation Project Development & Environmental Analysis	8. AUTHORIZED AGENT'S NAME AND TITLE (an agent is not required)
6. APPLICANT'S ADDRESS 1598 Mail Service Center Raleigh, NC 27699-1548	9. AGENT'S ADDRESS
7. APPLICANT'S PHONE NOs. W/AREA CODE a. Residence b. Business 919-431-6693	10. AGENT'S PHONE NOs. W/AREA CODE 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) R-2533CC	14. PROJECT STREET ADDRESS (if applicable)
13. NAME OF WATERBODY, IF KNOWN (if applicable) Adams Creek, UTs to Adams Creek, McAllister Creek and UTs to McAllister Creek	
15. LOCATION OF PROJECT Cabarrus COUNTY NC 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)

Widening the current NC 49 from a two-lane facility to a four-lane divided facility.

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

The purpose of this project is to provide a higher level of service for the user and to provide safer and more efficient travel along NC 49.

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, lengthening/ replacing hydraulic structures and realignment of streams around the interchange of NC 49/73.

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 attached to 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
N/A					

N/A

* 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. J. Lueh

SIGNATURE OF APPLICANT

4-12-10

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.



February 18, 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:

R-2533CC, Widening NC 49 to a Four-Lane Divided Facility from East of SR 2630
 (Cline Road) to East of NC 73, Cabarrus County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory stream and riparian wetland mitigation for the subject project. Based on the information supplied by you on February 17, 2010, the impacts are located in CU 03040105 of the Yadkin River Basin in the Southern Piedmont (SP) Eco-Region, and are as follows:

Yadkin 03040105 SP	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	0	0	2,094	0.22	0	0	0	0
Mitigation Units (Credits-up to 2:1)	0	0	4,188	0.44	0	0	0	0

This mitigation acceptance letter replaces the mitigation acceptance letter issued on January 26, 2010. EEP commits to implementing sufficient compensatory stream and riparian wetland mitigation credits to offset the impacts associated with this project by the end of the MOA Year in which this project is permitted, in accordance with Section X of the Amendment No. 2 to the Memorandum of Agreement between the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U. S. Army Corps of Engineers, fully executed on March 8, 2007. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from EEP.

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

Sincerely,

William D. Gilmore, P.E.
 EEP Director

cc: Ms. Liz Hair, USACE – Asheville Regulatory Field Office
 Mr. Brian Wrenn, Division of Water Quality, Wetlands/401 Unit
 File: R-2533CC Revised

Restoring... Enhancing... Protecting Our State



Subject: Minutes from Interagency 4B Hydraulic Design Review Meeting
On November 19, 2008 for R-2533CC in Cabarrus County

Team Members:

Steve Lund-USACOE	(absent)
Polly Lespinasse-NCDWQ	(present-by phone)
Marla Chambers-NCWRC	(present)
Marella Buncick-USFWS	(present)
Kathy Matthews-EPA	(absent)
Chris Militscher-EPA	(present)
Donnie Brew-FHWA	(present)
John Conforti-PDEA	(absent)
Carla Dagnino-NEU	(absent)
Michael Turchy-NEU	(present)
Jason Dilday-NEU	(present)
Tawana Brooks-Div 10	(absent)

Participants:

Marshall Clawson, NCDOT Hydraulics
Bill Zerman, NCDOT Hydraulics
Josh Dalton, Sungate Design Group
Cathy Houser, NCDOT Roadway Design
Dave Scheffel, NCDOT Roadway Design
Bruce Klappenbach, NCDOT Structures

General Comments:

Marshall Clawson started the meeting by introducing the project and stating that the purpose of the meeting was to review the 30% hydraulic designs. PDEA will need to address the concurrence history with the Agencies. Mr. Clawson then handed the meeting over to Josh Dalton.

Mr. Dalton noted that the current plans show the project as R-2533CA and the new CC section of project ends at approximately station 234+00 –L- on Plan Sheet 12. The plans will eventually be renumbered to eliminate the portion of the project that will not be constructed under this contract.

Mr. Dalton also noted that the plans were currently showing the 2004 wetland delineation and there is a new 2008 delineation that is being reviewed. Mr. Dalton then proceeded through the project sheet by sheet explaining the proposed drainage design and fielding questions.

Ms. Houser noted that all right-of-way and easements shown have been purchased.

Plan Sheet 4:

Mr. Dalton noted that there is an existing culvert under NC 49 that will be extended on the downstream end and the headwall will be raised on the upstream end. The existing box culvert is 3 @ 11' x 12' and conveys Adams Creek. Photographs of the stream and culvert were passed around. No comments were noted regarding the proposed culvert extension.

Ms. Lespinasse noted that the channel located left of station 201+45 –L-REV is Jurisdictional (intermittent). Mr. Dalton stated that only riprap toe protection would be used adjacent to this stream.

Per the 2004 delineation, there are two wetlands on the plan sheet. The pocket wetland right of station 201+00 –L- REV is not included in the new 2008 delineation. The other wetland is located right of station 201+30 –L- REV. This wetland was classified as a linear wetland and it located in a channelized area. Mr. Turchy will discuss with Mr. Lund about whether this should be classified as a linear wetland or stream. It was determined that this was the best place to outlet the drainage system as an outlet anywhere else in the vicinity would potentially cause a new channel to be cut by erosion.

Plan Sheets 5 and 6:

No wetlands or jurisdictional streams are located on these plan sheets.

Plan Sheet 7:

Mr. Dalton noted that there is an existing culvert under NC 49 that will be extended on the downstream end and the headwall will be raised on the upstream end. The existing box culvert is 3 @ 10' x 8' and conveys McAllister Creek. McAllister Creek is mostly bedrock and large boulders in the vicinity of the culvert. Photographs of the stream and culvert were passed around. It was noted that the outlet of the culvert was perched. In comments received via email, Mr. Lund stated, "At the proposed crossing, McAllister Creek seems to be a rock bed stream. As such, the installation of a standard box culvert extension buried 1 foot below the bed elevation may be problematic. I request that the NCDOT consider a bottomless structure at this location as an extension of or replacement for the existing structure." Mr. Klappenbach noted that there may be construction issues with extending a traditional four-sided box culvert with a bottomless structure. Several agency members were in opposition to the proposed bend in the culvert extension citing concerns about debris. Mr. Clawson stated that would be a maintenance issue and should not be any worse than it is now. Ms. Chambers noted that the perch needed to be corrected to restore fish passage.

Ms. Chambers and Ms. Buncick requested that a bridge be investigated for this crossing. Mr. Dalton stated that a bridge would dramatically increase the cost of the crossing as the proposed roadway grade would need to be raised by more than five feet to provide freeboard and depth for the bridge superstructure. Also, it was noted that the recent inspection showed this culvert in good condition. It was determined that the use of a bottomless structure was not a good idea for a culvert extension, but a bottomless culvert should be investigated as a replacement option. Chris Militscher stated he would like to see this site in the field.

Mr. Dalton stated that a wetland (2008 delineation) exists right of stations 213+50 to 214+00 –L-REV. This wetland will be considered a total take.

Plan Sheet 8:

No wetlands or jurisdictional streams are located on these plan sheets.

Plan Sheet 9:

Mr. Dalton stated that a Jurisdictional Stream (UT to McAllister Creek) flows through the interchange. The stream flows through several existing culverts.

The existing culvert under NC 49 is a 2 @ 7' x 8' RCBC. Mr. Dalton stated that the culvert would be extended straight on both ends. Due to the widening of NC 49, a portion of the stream that flows adjacent to the existing fill slope will be filled. This channel will be relocated once the culvert has been extended. Ms. Chambers noted that the relocation will not receive credit. Ms. Chambers requested that stability of the stream relocation be investigated to see if the entire section should be armored. The existing culvert (2 @ 72" CMP) downstream of the stream relocation will also need to be replaced with 2 @ 96" CMP.

The existing culvert under NC 73 is a 2 @ 7' x 8' RCBC. Mr. Dalton stated that the culvert would be extended with a structure with multiple bends.

Mr. Dalton stated that there is another jurisdictional stream right of stations 222+60 to 224+60 –L-REV that will be impacted by the construction of Ramp D and Loop D. Mr. Dalton stated that the stream will be conveyed by a proposed 66" RCP which will be buried 1 foot. Instead of crossing NC 49 and NC 73 (which would require a bore and jack), the system is proposed to be installed entirely on the south side of NC 49. This option was considerably cheaper than crossing both roads and was selected since the stream in both options would be considered a total loss.

Plan Sheets 10 and 11:

No wetlands or jurisdictional streams are located on these plan sheets.

Plan Sheet 12:

A wetland is located on this plan sheet but it is beyond the limits of Section CC.

Plan Sheets 27, 28, and 29:

No wetlands or jurisdictional streams are located on these plan sheets.

Plan Sheet 30:

Mr. Dalton stated that a Jurisdictional Stream (UT to McAllister Creek) is located on the plan sheet. The proposed box culvert (2 @ 7' x 8' RCBC) will be added under the proposed relocation of SR 2471 (Radcliff Road). Mr. Dalton stated that the culvert will be buried 1 foot.

Meeting adjourned.

Subject: Minutes from Interagency 4C Permit Drawing Review Meeting
On March 18, 2009 for R-2533CC in Cabarrus County

Team Members:

Steve Lund-USACOE (present)
Polly Lespinasse-NCDWQ (present)
Marla Chambers-NCWRC (present)
Marella Buncick-USFWS (present)
Kathy Matthews-EPA (present)
Donnie Brew-FHWA (present)
John Conforti-PDEA (present)
Carla Dagnino-NEU (present)
Jason Dilday-NEU (present)
Tawana Brooks-Div 10 (absent)

Participants:

Marshall Clawson, NCDOT Hydraulics
Bill Zerman, NCDOT Hydraulics
Josh Dalton, Sungate Design Group
Dave Scheffel, NCDOT Roadway Design
Bruce Klappenbach, NCDOT Structures
Mack Bailey, NCDOT Structures
Mark Staley, NCDOT Roadside Environmental

General Comments:

Marshall Clawson started the meeting by introducing the project and stating that the purpose of the meeting was to review the permit drawings. Mr. Clawson then handed the meeting over to Josh Dalton. Mr. Dalton then proceeded through the permit package sheet by sheet discussing the proposed sites and impacts.

Impact Summary:

On the English Impact Summary, it was noted that the structure sizes are in metric.

Site 1:

Mr. Dalton noted that there is an existing culvert under NC 49. The permit drawings depict a culvert extension, but NCDOT Structures has recommended replacement of the entire culvert. The existing box culvert is 3 @ 11' x 12' and conveys Adams Creek. Photographs of the stream and culvert were passed around. Ms. Chambers expressed her recommendation for a bridge at this location. Mr. Clawson discussed the costs associated with installing a bridge compared to a culvert at this location. A cost estimate was not completed specifically for this location, but a cost estimate was completed for the McAllister Creek crossing which consists of a similar sized culvert. The estimate for the McAllister Creek location was for three options:

- Option 1: \$250,000.00 (Extend Existing Culvert)
- Option 2: \$550,000.00 (Replace Entirely with Bottomless Culvert)
- Option 3: \$1.85m (Replace with Dual Bridges)

Mr. Clawson explained that this location is not viable for a bottomless culvert since bedrock is not present.

Several agency members requested investigating the use of sills and baffles. Mr. Dalton stated that this may not be an option at this location since it is located in a FEMA detailed study area.

Mr. Lund noted that there is a pocket wetland right of station 201+00 –L- REV. Mr. Dilday stated that he would provide the updated wetland file showing this wetland. It was determined that this was the best place to outlet the drainage system as an outlet anywhere else in the vicinity would potentially cause a new channel to be cut by erosion. This site will be included in the final permit drawings as part of Site 1.

Site 2

Mr. Dalton stated that the existing 3 @ 10' x 8' box culvert would be removed and replaced with a bottomless structure. McAllister Creek is mostly bedrock and large boulders in the vicinity of the culvert. The cost of a bridge at this location was discussed and noted that it would be an additional \$1.3 million compared to the cost of the bottomless culvert. A preliminary culvert alignment was presented. Several agency members noted issues with channels reconstructed inside bottomless structures. Ms. Buncick noted that bankfull width should be used as a guide to re-establish any portion of the channel.

Site 3

Ms. Lespinasse asked if the wetland hydrology would now be provided by stormwater. Mr. Dalton stated that it would be. Mr. Lund stated that the wetland was hydraulically connected to the floodplain of McAllister Creek. This wetland was considered a total take as agreed to during the 4B meeting.

Site 4

The existing culvert under NC 49 is a 2 @ 7' x 8' RCBC and conveys UT to McAllister Creek. Mr. Dalton stated that the culvert would be removed and replaced with a similar structure. The new structure will be buried one foot. Ms. Chambers asked that sills and baffles be considered during design. Ms. Lespinasse asked about why the relocated channel was lined with riprap. Mr. Dalton stated that riprap was requested during the 4B meeting to protect this portion of the channel. Mr. Dalton stated that the riprap would be on the banks only.

Site 5

No comments.

Site 6

The existing culvert under NC 73 is a 2 @ 7' x 8' RCBC. Mr. Dalton stated that the culvert would be extended with a structure with multiple bends. Ms. Chambers requested that sills and baffles be investigated. Ms. Buncick noted that baffles might not be beneficial at this location since the existing culvert will not have baffles.

A proposed 2 @ 7' x 8' RCBC will be located under –Y16REV- just upstream of the culvert extension noted above. It was requested that sills and baffles be investigated for this site.

Site 7

A jurisdictional stream right of stations 222+60 to 224+60 --L-REV is impacted by the construction of Ramp D and Loop D. Mr. Dalton stated that the stream will be conveyed under Ramp D by a proposed 66" RCP which will be buried 1 foot. The 66" RCP will drain to a riprap channel (on banks only) which will convey the flow to a 72" RCP. The 72" RCP will convey the flow along the south side of NC 49 to the south side of NC 73. This pipe outlets to an open channel that flows adjacent to NC 49. Due to right-of-way constraints, this channel is piped (72" RCP) for a short distance and outlets through the wingwall of the proposed box culvert. A discussion at the Field Inspection is anticipated in regards to obtaining additional right-of-way necessary to construct an open channel.

Meeting adjourned.

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: R-2533CC (Widening of NC 49 from East of NC 73 to East of SR2630)

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State:NC County/parish/borough: Cabarrus City: Mount Pleasant
Center coordinates of site (lat/long in degree decimal format): Lat. 35.38490° N, Long. 80.51714° W
Universal Transverse Mercator:

Name of nearest waterbody: Adams Creek

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Rocky River

Name of watershed or Hydrologic Unit Code (HUC): 03040105

[X] 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
[X] Relatively permanent waters2 (RPWs) that flow directly or indirectly into TNWs
[] Non-RPWs that flow directly or indirectly into TNWs
[X] 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: 900 linear feet: 4-15 width (ft) and/or acres.
Wetlands: 0.02 acres.

c. Limits (boundaries) of jurisdiction based on: Established by OHWM

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 waterbody⁴ 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 TNW⁵:

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
 OHWM⁶ (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:

⁶A 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.

⁷Ibid.

(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: Adams Creek is a perennial stream and its UTs have NCDWQ stream rating scores greater than 20.

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: **900** linear feet **4 - 15** width (ft).
 Other non-wetland waters: _____ acres.
Identify type(s) of waters: _____

3. **Non-RPWs⁸ 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: **Wetland has hydraulic connection to Adams Creek.**
 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: _____ 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 jurisdictional. 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:

⁸See Footnote # 3.

⁹To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰Prior 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.

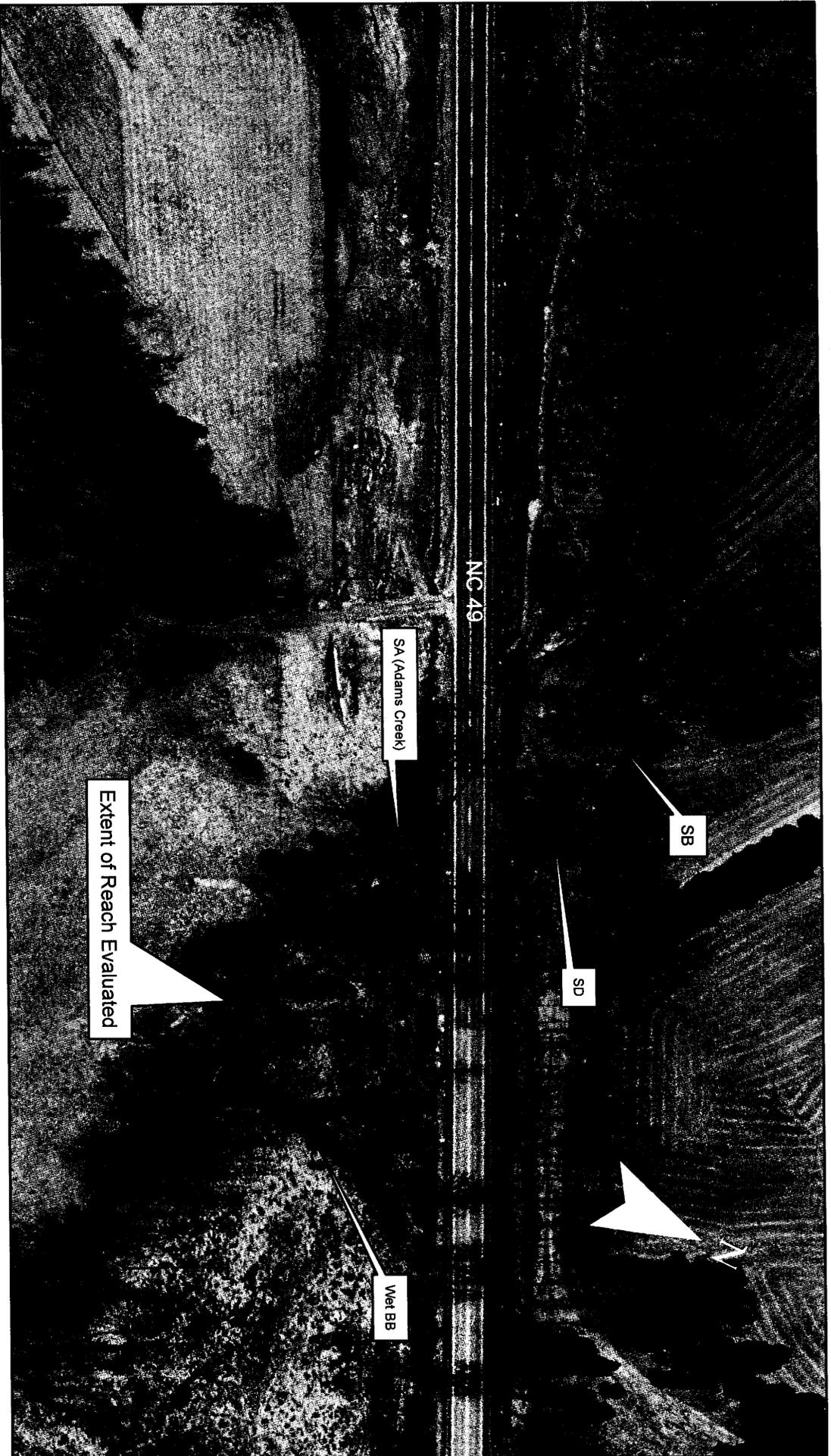
SECTION IV: DATA SOURCES.

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 Geodetic 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:

R-2533 CC Rapanos (Adams Creek)



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: R-2533CC (Widening of NC 49 from East of NC 73 to East of SR2630)

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: NC County/parish/borough: Cabarrus City: Mount Pleasant
 Center coordinates of site (lat/long in degree decimal format): Lat. 35.40528° N, Long. 80.45649° W.
 Universal Transverse Mercator:

Name of nearest waterbody: McAllister Creek

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Rocky River

Name of watershed or Hydrologic Unit Code (HUC): 03040105

- 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 waters² (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: 7500 linear feet: 2-20 width (ft) and/or acres.
 Wetlands: 0.20 acres.

c. Limits (boundaries) of jurisdiction based on: Established by OHWM

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 waterbody⁴ 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 TNW⁵:

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.

(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: 0.20 acres

Wetland type. Explain: Ephemeral wetland.

Wetland quality. Explain: 23.

Project wetlands cross or serve as state boundaries. Explain: No.

(b) General Flow Relationship with Non-TNW:

Flow is: **Ephemeral flow**. Explain: Drainage patterns and water stained leaves observed between wetland and McAllister Creek.

Surface flow is: **Discrete**

Characteristics:

Subsurface flow: **Unknown**. Explain findings:

- Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

Directly abutting

Not directly abutting

Discrete wetland hydrologic connection. Explain: Drainage pattern and water stained leaves.

Ecological connection. Explain:

Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW

Project wetlands are **10-15** river miles from TNW.

Project waters are **5-10** aerial (straight) miles from TNW.

Flow is from: **Wetland to navigable waters**.

Estimate approximate location of wetland as within the **50 - 100-year** 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: clear.

Identify specific pollutants, if known:

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

Riparian buffer. Characteristics (type, average width): 70 ft.

Vegetation type/percent cover. Explain: 100% forested/native vegetation.

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: 1

Approximately (0.20) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

<u>Directly abuts? (Y/N)</u>	<u>Size (in acres)</u>	<u>Directly abuts? (Y/N)</u>	<u>Size (in acres)</u>
N			0.20

Summarize overall biological, chemical and physical functions being performed: Wetland WA functions to treat runoff from the adjacent slope and roadway (NC49).

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: McAllister Creek is a perennial stream and its UTs have NCDWQ stream rating scores of 19 or greater.
 - 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: **7500** linear feet **2 - 20** width (ft).
 Other non-wetland waters: acres.
Identify type(s) of waters:

3. **Non-RPWs⁸ 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: **Wetland has hydraulic connection to Adams Creek.**
 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: 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 jurisdictional. 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:

⁸See Footnote # 3.

⁹To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰Prior 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.

Identify water body and summarize rationale supporting determination:

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.

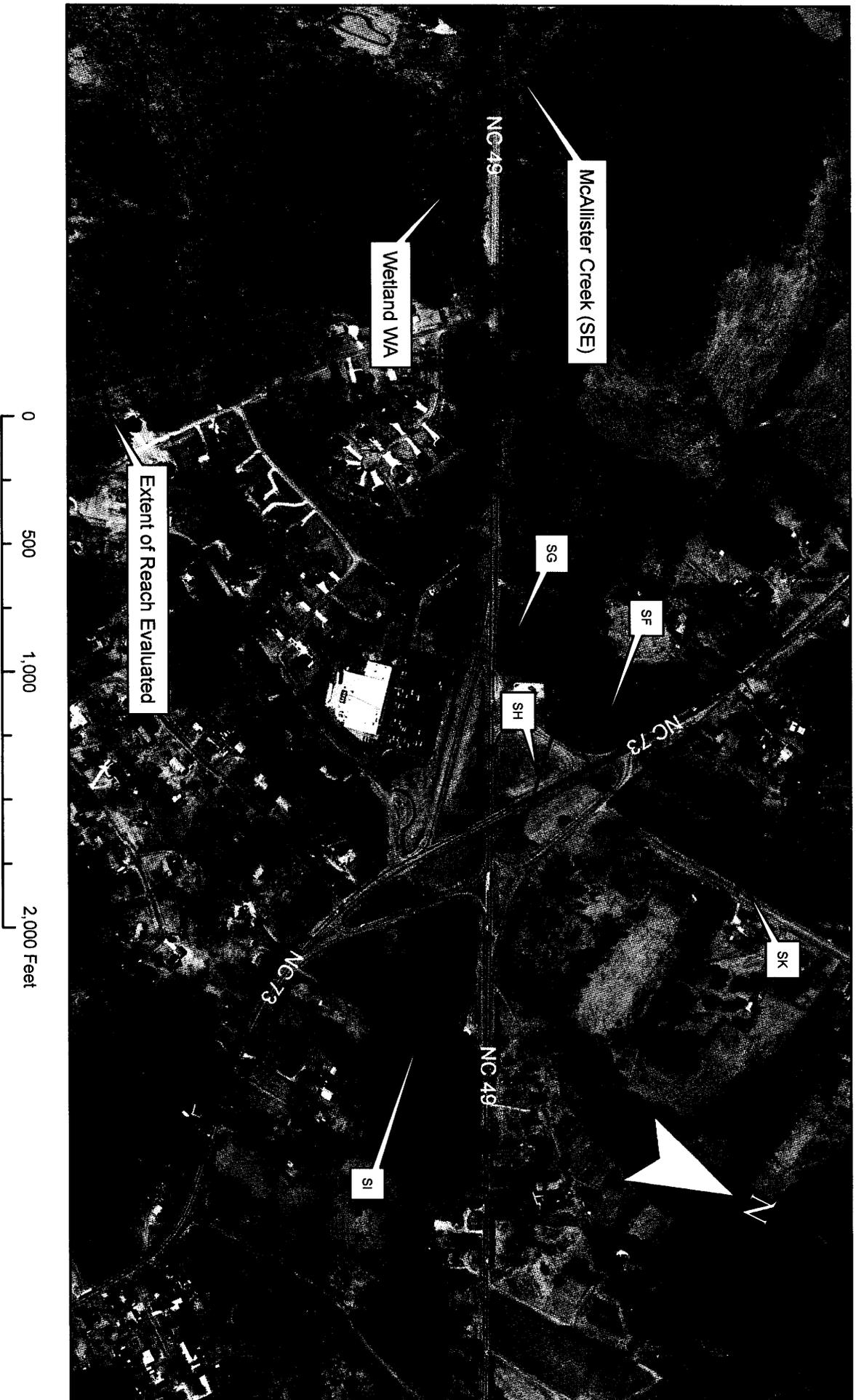
SECTION IV: DATA SOURCES.

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 Geodetic 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:

R-2533 CC Rapanos (McAllister Creek)



STORMWATER MANAGEMENT PLAN

Project: 34448.1.1
TIP No. R-2533CC
Cabarrus County

05/08/2009

Hydraulics Project Manager: W. Henry Wells Jr., P.E. (Sungate Design Group),
Marshall Clawson, P.E. (NCDOT Hydraulics Unit)

ROADWAY DESCRIPTION

The project R-2533CC consists of widening NC 49 from east of SR 2630 to east of SR 2421 in Cabarrus County. The total project length is 3.404 kilometers. The project creates impacts to Adams Creek, McAllister Creek, and two unnamed tributaries to McAllister Creek. The project drainage systems consist of grated inlets with associated pipe systems, and rip rap dissipaters at the pipe outlets.

Jurisdictional Streams: Adams Creek, McAllister Creek, UT to McAllister Creek

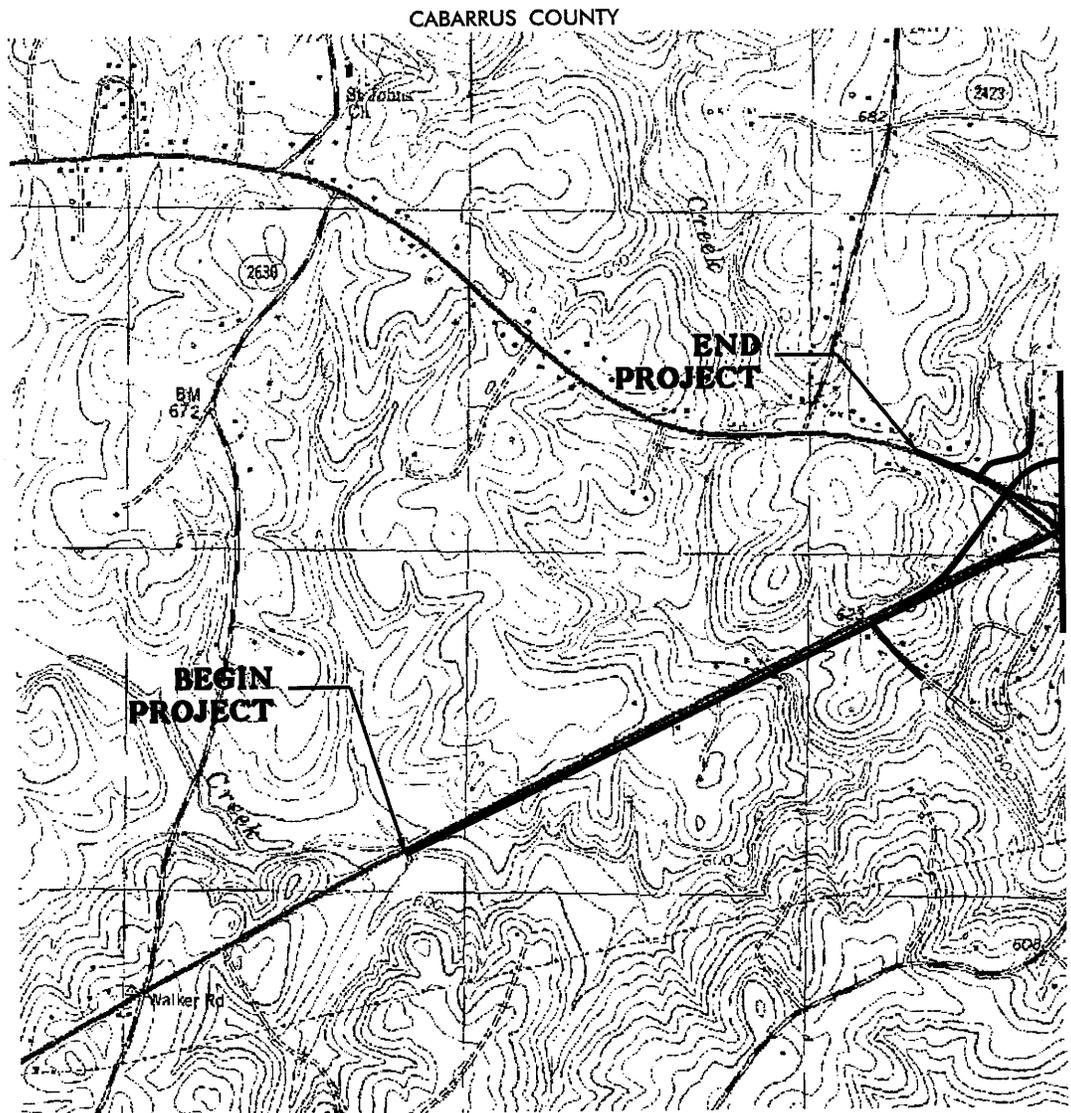
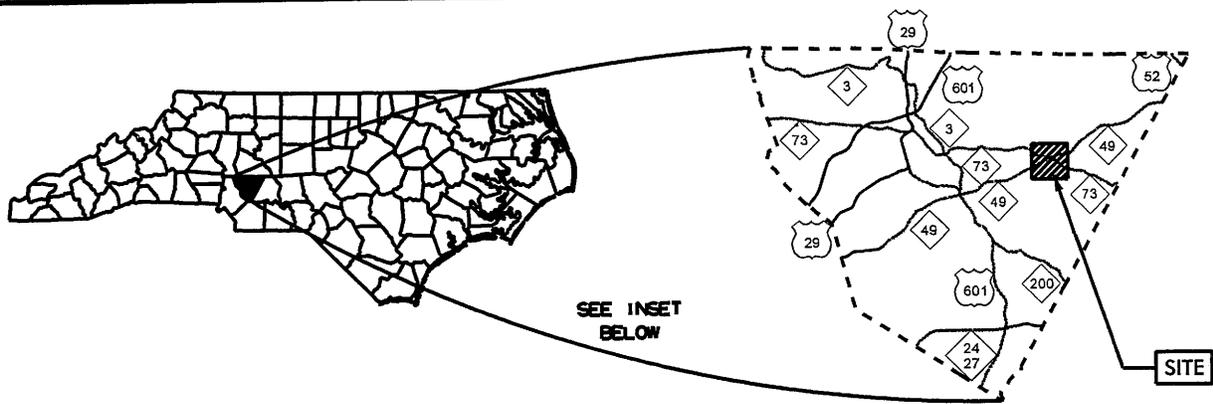
ENVIRONMENTAL DESCRIPTION

The project is located within the Yadkin River Basin in Cabarrus County, which is not a CAMA county. There are two wetlands located within the project limits and both have been considered "total takes" due to impacts from roadway fill. The Yadkin River Basin is not subject to buffer rules; however efforts have been taken to minimize buffer impacts where practicable. Rip rap dissipaters at pipe outlets have been specified and fill slopes have been limited to 2:1 (horizontal to vertical) adjacent to stream to reduce impacts.

BEST MANAGEMENT PRACTICES AND MAJOR STRUCTURES

The primary goal of Best Management Practices (BMPs) is to prevent degradation of the states surface waters by the location, construction and operation of the highway system. The BMPs are activities, practices and procedures taken to prevent or reduce stormwater pollution. The BMP measures used on this project to reduce stormwater impacts are:

- Rip rap dissipaters at pipe outlets.
- Bottomless culvert at McAllister Creek.
- Grass swales.



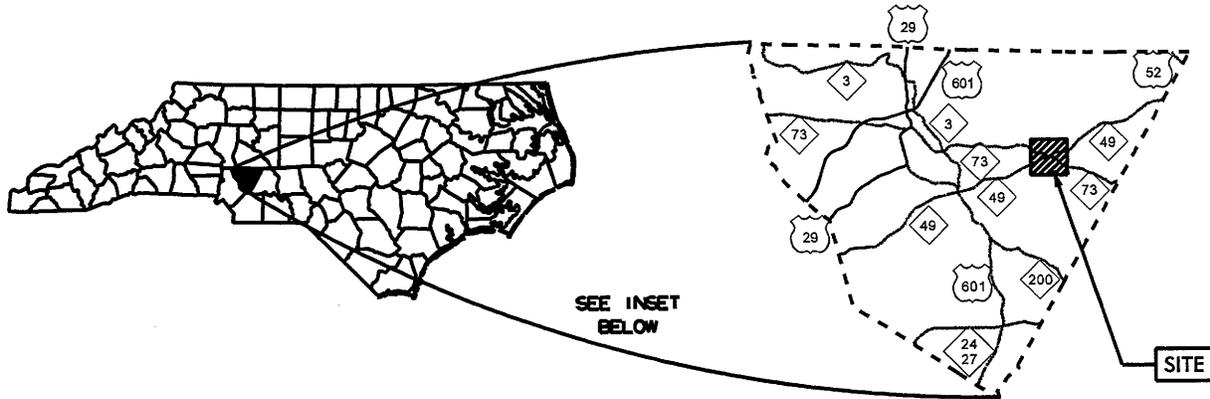
WETLAND/STREAM
IMPACTS
(1 OF 2)

**N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
CABARRUS COUNTY**

PROJECT: 34448.1.1 (R-2533CC)
NC 49 FROM EAST OF SR 2630
TO EAST OF SR 2421

SHEET ___ OF ___ 8-24-09

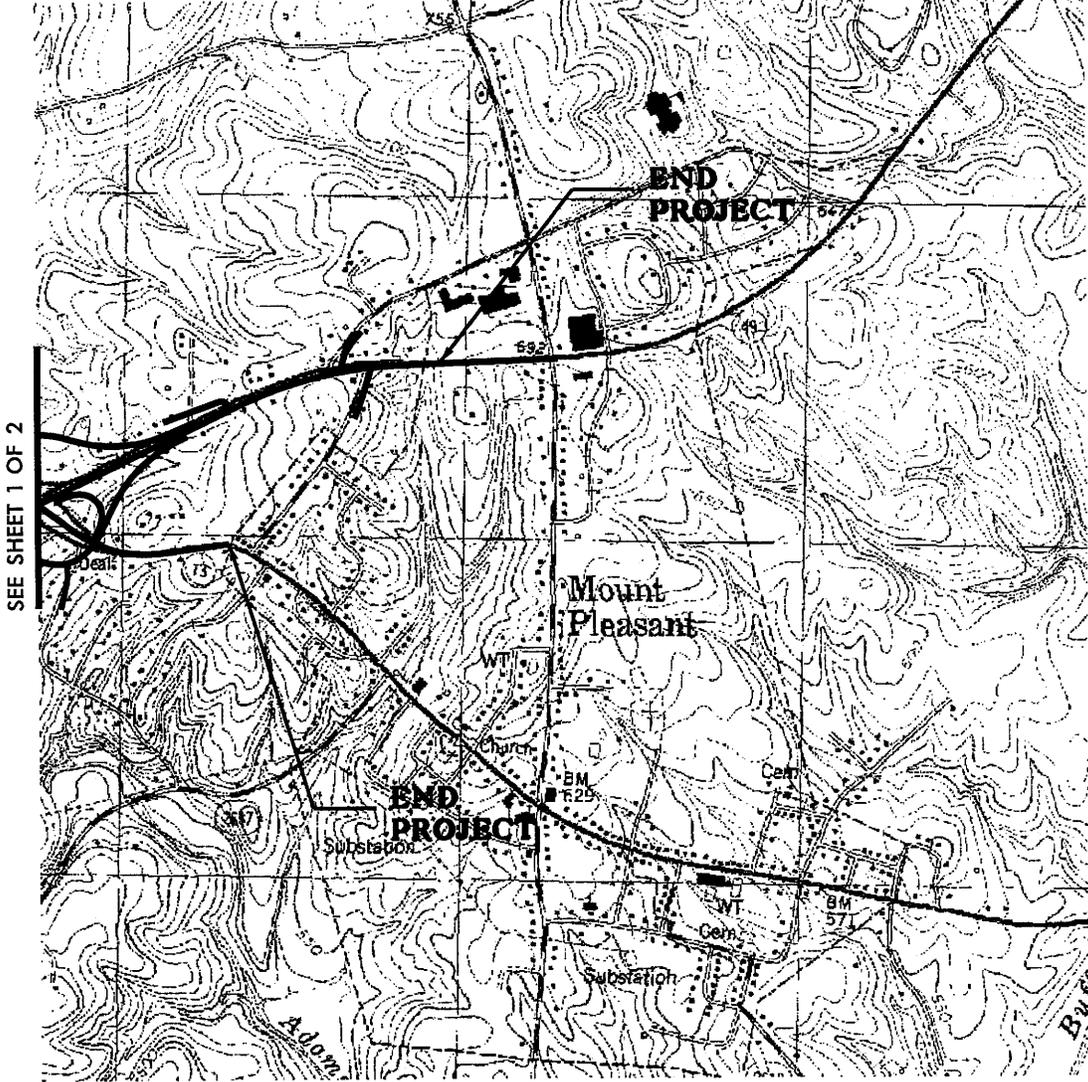
Permit Drawing
Sheet 1 of 4



SEE INSET BELOW

SITE

CABARRUS COUNTY



SEE SHEET 1 OF 2

WETLAND/STREAM
IMPACTS
(2 OF 2)

Permit Drawing
Sheet 2 of 40

**N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
CABARRUS COUNTY**

PROJECT:34448.1.1 (R-2533CC)
NC 49 FROM EAST OF SR 2630
TO EAST OF SR 2421

SHEET ___ OF ___

8-24-09

R-2533

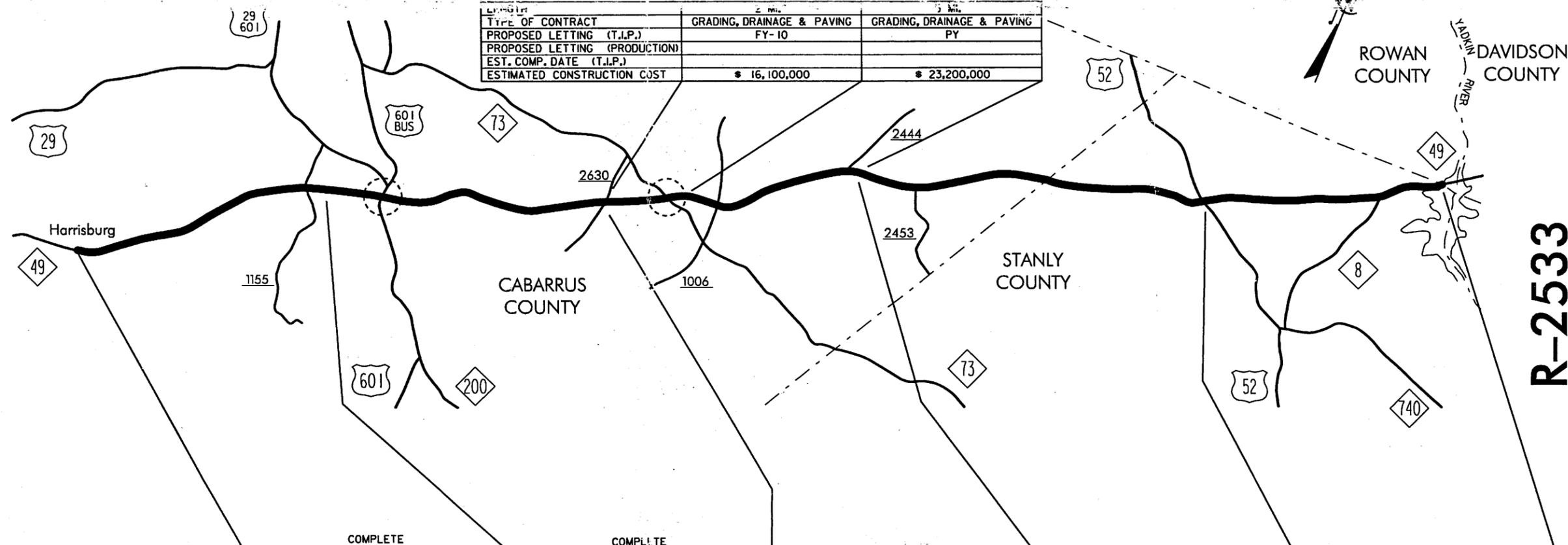
CABARRUS & STANLY COUNTIES

NC 49

PROJECT BREAKDOWN MAP

PROJECT SCHEDULES AND COSTS ARE ACCURATE AS OF DATE SHOWN

I.D. NO. / D.S.R. NO.	R-2533 CC	R-2533 CD
WBS	34448	34448
PROJECT ENGINEER	C. HOUSER	C. HOUSER
PROJECT DESCRIPTION	EAST OF SR 2630 TO EAST OF NC 73	EAST OF NC 73 TO EAST OF SR 2444
COUNTY / DIVISION	CABARRUS / DIV. 10	CABARRUS / DIV. 10
LENGTH	2 MI.	3 MI.
TYPE OF CONTRACT	GRADING, DRAINAGE & PAVING	GRADING, DRAINAGE & PAVING
PROPOSED LETTING (T.I.P.)	FY-10	PY
PROPOSED LETTING (PRODUCTION)		
EST. COMP. DATE (T.I.P.)		
ESTIMATED CONSTRUCTION COST	\$ 16,100,000	\$ 23,200,000



	COMPLETE	COMPLETE			
I.D. NO. / D.S.R. NO.	R-2533 A	R-2533 B	R-2533 CA	R-2533 CB	R-2533 D
WBS	34448	34448	34448	34448	34448
PROJECT ENGINEER	LASSITER	T. HOUSER	C. HOUSER	T. HOUSER	T. HOUSER
PROJECT DESCRIPTION	HARRISBURG TO EAST OF SR 1155	EAST OF SR 1155 TO EAST OF SR 2630	EAST OF SR 2630 TO EAST OF SR 2444	EAST OF SR 2444 TO US 52	US 52 TO YADKIN RIVER
COUNTY / DIVISION	CABARRUS / DIV. 10	CABARRUS / DIV. 10	CABARRUS / DIV. 10	STANLY / DIV. 10	STANLY / DIV. 10
LENGTH	5.57 MI.	6.15 MI.	7.29 MI.	6.16 MI.	5.2 MI.
TYPE OF CONTRACT	GRADING, DRAINAGE & PAVING	GRADING, DRAINAGE & PAVING	ROW ONLY	GRADING, DRAINAGE & PAVING	GRADING, DRAINAGE & PAVING
REMARKS					
BEGIN R/W ACQUISITION (T.I.P.)	2-97	11-99	10-02	PY	PY
BEGIN R/W ACQUISITION (PRODUCTION)					
PROPOSED LETTING (T.I.P.)	12-01	6-01		PY	PY
PROPOSED LETTING (PRODUCTION)					
EST. COMP. DATE (T.I.P.)	9-06	9-06			
ESTIMATED R/W COST	\$ 5,850,000	\$ 7,600,000	\$ 7,800,000	\$ 5,500,000	\$ 5,500,000
ESTIMATED CONSTRUCTION COST	\$ 26,800,000	\$ 25,400,000		\$ 34,100,000	\$ 24,700,000

R-2533

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
1	NED C. REESE	1103 ROGERS LK RD KANNAPLOIS, NC 28081
2	CLARENCE A. & HILDA R. ALLMAN	ADDRESSES
11	STEVEN B. COCHRANE	6851 HWY 49 MT. PLEASANT, NC 28124
12	ECB, LLC	ADDRESSES
16	LOUIS M. HELMS, JR	6910 HWY 49 NORTH MT. PLEASANT, NC 28124
13	JOHN RAY NOBLES, JR	577 COVINGTON MILL POND RD BENNETSVILLE, NC 29512
22	H. KENNETH WILLIS & DIANE M. WILLIS J.O. WILLIS & LLAGE HOYLE WILLIS	751 BRAFFORD DR CONCORD, NC 28025
26	GATHA G. AUSTIN	P.O. BOX 307 LOCUST, NC 28097
28	MARSHALL POPLIN	P.O. BOX 818 MT. PLEASANT, NC 28124
43	WILLIAM F. PULLIUM	116 11TH AVE NEW LONDON, NC 28127

WETLAND/ STREAM
IMPACTS

Permit Drawing
Sheet 4 of 40

NCDOT

**DIVISION OF HIGHWAYS
CABARRUS COUNTY**

PROJECT: 34448.1.1 (R-2533CC)
NC 49 FROM EAST OF SR 2630
TO EAST OF SR 2421

PROPERTY OWNERS
NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
44	FRANCES B. MEDLIN	43 UNION ST SOUTH CONCORD, NC 28025
46	PATRICIA P. HARRINGTON	3852 LAKE AIRE DR NASHVILLE, TN 37217

WETLAND/ STREAM
IMPACTS

Permit Drawing
Sheet 5 of 40

NCDOT
DIVISION OF HIGHWAYS
CABARRUS COUNTY
PROJECT: 34448.1.1 (R-2533CC)
NC 49 FROM EAST OF SR 2630
TO EAST OF SR 2421
SHEET 2 OF 2 8/24/09

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS					
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)	
1*	200+17/201+21-L-REV	3@3.7 x 3.7 RCBC Bank Stabilization	0.020						0.08	0.07	144	125	
2	212+13/212+79 -L-REV	1@11.0 x 2.7 BOTTOMLESS RCBC Bank Stabilization						0.01	0.12	46	184		
3*	213+52/214+02 -L-REV	Roadway Fill	0.200						20				
4	218+26/219+34 -L-REV	2@2.7 x 2.7 RCBC						0.08	0.01	315	62		
	Shopping Center Access	2@2.7 x 2.7 RCBC							26				
5	4+23/4+31 -RPB-REV	Bank Stabilization 1050mm RCP						<.01	52	10	144		
6	11+87/12+70 -Y1-REV	Bank Stabilization 2@2.7 x 2.7 RCBC						0.07	0.04	338			
	12+11.6 -Y16-REV	2@2.7 x 2.7 RCBC Bank Stabilization							30	902	43		
7	219+45/219+59 -L-REV	1 @ 1650mm RCP						0.13	0.01				
	220+00/220+28-L-REV LT	1 @ 1800mm RCP 450mm RCP						0.02		118			
8	11+06-Y16REV-RT	600 RCP						<.01		20			
TOTALS:			0.22					0.40	0.25	2129	558		

ENGLISH IMPACTS

* WETLAND CONSIDERED TOTAL TAKE.

Permit Drawing
Sheet 6 of 42

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CABARRUS COUNTY
WBS - 34448.1.1 (R-2533CC)

SHEET

3/10/2010

Metric Table

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS				SURFACE WATER IMPACTS							
			Permanent Fill In Wetlands (ha)	Temp. Fill In Wetlands (ha)	Excavation in Wetlands (ha)	Mechanized Clearing in Wetlands (ha)	Hand Clearing in Wetlands (ha)	Permanent SW impacts (ha)	Temp. SW impacts (ha)	Existing Channel Impacts Permanent (m)	Existing Channel Impacts Temp. (m)	Natural Stream Design (m)		
1 *	200+17/201+21-L-REV	3@3.7 x 3.7 RCBC Bank Stabilization	0.010							0.033	0.028	44	38	
2	212+13/212+79 -L-REV	1@11.0 x 2.7 BOTTOMLESS RCBC Bank Stabilization								0.006	0.049	14	56	
3 *	213+52/214+02 -L-REV	Roadway Fill	0.081									6		
4	218+26/219+34 -L-REV	2@2.7 x 2.7 RCBC								0.031	0.005	96	19	
	Shopping Center Access	2@2.7 x 2.7 RCBC										8		
5	4+23/4+31 -RPB-REV	Bank Stabilization 1050mm RCP								0.002		16		
6	11+87/12+70 -Y1-REV	Bank Stabilization								0.027	0.015	103	44	
	12+11.6 -Y16-REV	2@2.7 x 2.7 RCBC										9		
7	219+45/219+59 -L-REV	Bank Stabilization								0.053	0.005	275	13	
	220+00/220+28-L-REV LT	1 @ 1650mm RCP								0.008		36		
8	11+06-Y16REV-RT	450mm RCP 600 RCP								<0.001		6		
TOTALS:			0.091							0.160	0.102	649	170	

METRIC IMPACTS

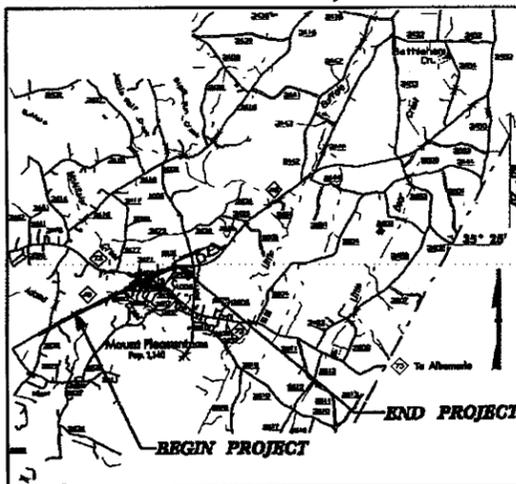
* WETLAND CONSIDERED A TOTAL TAKE.

Permit Drawing
Sheet 7 of 42

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CABARRUS COUNTY
WBS - 34448.1.1 (R-2533CC)

TIP: R-2533CC

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



VICINITY MAP OF PROJECT R-2533CC

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS CABARRUS COUNTY

LOCATION: NC 49 FROM EAST OF SR 2630 TO EAST OF SR 2421

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



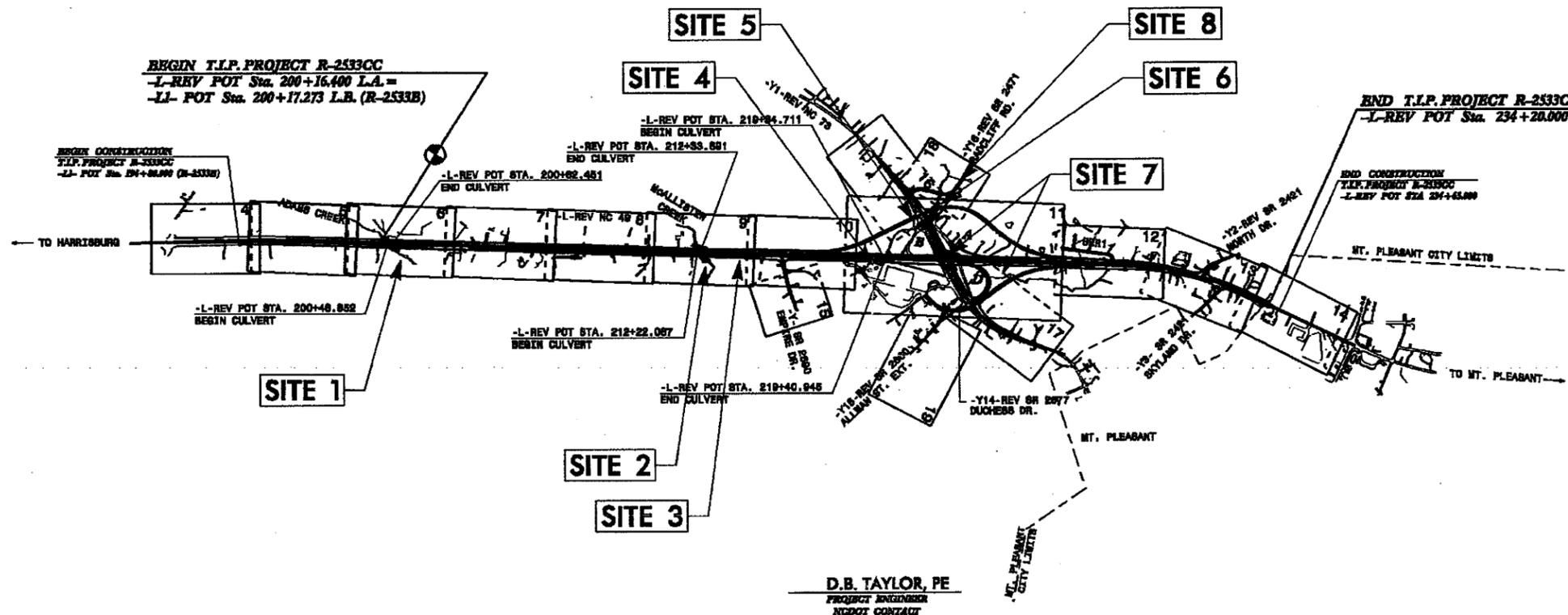
ALL DIMENSIONS IN THESE PLANS ARE IN METERS AND /OR MILLIMETERS UNLESS OTHERWISE NOTED

STATE	STATE PROJECT REFERENCE NO.	PROJECT NO.	SHEET NO.
N.C.	R-2533CC	1	1
STATE PROJECT REFERENCE NO.	F.A. NUMBER	DESCRIPTION	
34448.1.1	NHF-28-1(5)	PE	
34448.3.9	NHS-0049(26)	RW, UTIL CONST	

Permit Drawing Sheet 8 of 40



WETLAND/STREAM IMPACTS

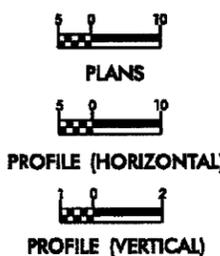


D.B. TAYLOR, PE
PROJECT ENGINEER
NCDOT CONTACT

CONTROL OF ACCESS IS SHOWN ON PLANS
AT THE NC 49 - NC 73 INTERCHANGE

CONTRACT:

GRAPHIC RATIO



DESIGN DATA

ADT 2011 = 10,685
ADT 2031 = 13,531
DHV = 11 %
D = 60 %
T = 13 %
(TTST 7% + DUALS 6%)
-L-REV NBL V = 100 km/h
-L-REV SBL V = 90 km/h
RRR - DESIGN GUIDELINES
FUNCT. CLASS. - ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY PROJECT R-2533CC = 3.370 Km
LENGTH STRUCTURES PROJECT R-2533CC = 0.034 Km
TOTAL LENGTH STATE PROJECT R-2533CC = 3.404 Km

**PLANS PREPARED FOR NCDOT
DIVISION OF HIGHWAYS**

2006 STANDARD SPECIFICATIONS
RIGHT OF WAY DATE: October 18, 2002
LETTING DATE: April 19, 2011
K. M. HAUGHEY, PE
NORTH TOWN PROJECT MANAGER
N. J. DEAN, PE
PROJECT DESIGN ENGINEER

Prepared in the Office of:

NC FIRM LICENSE No: F-0342
701 Corporate Center Dr.
Suite 475
Raleigh, N.C. 27607
(919)-854-6200
FAX (919)-854-6259

HYDRAULICS ENGINEER



SIGNATURE:

ROADWAY DESIGN



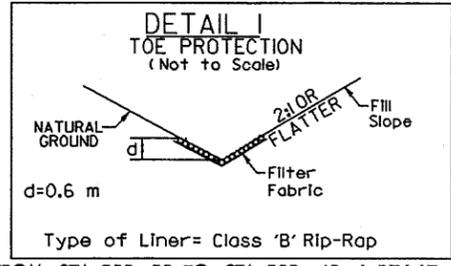
SIGNATURE:

**DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA**

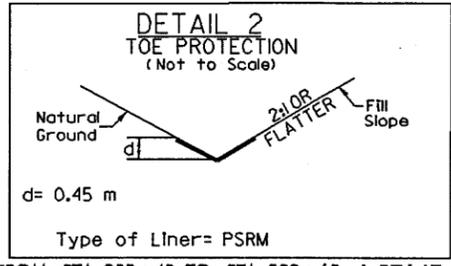


STATE HIGHWAY DESIGN ENGINEER

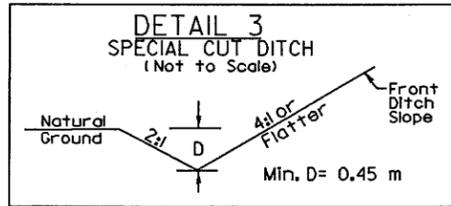
PROJ. REFERENCE NO. R-2533CC	SHEET NO. 2-J
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
	
Prepared in the Office of:  NC PERM. LICENSE NO. F-0342 701 Corporate Center Drive, Suite 475 Raleigh, NC 27609 (919) 854-6200 - (919) 854-6259(FAX)	



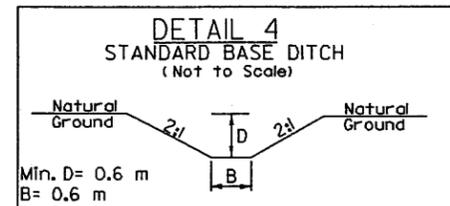
FROM STA. 200+80 TO STA. 202+40 -L-REV LT
FROM STA. 233+30 TO STA. 234+30 -L-REV LT



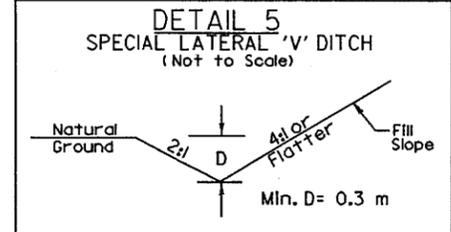
FROM STA. 202+40 TO STA. 202+60 -L-REV LT
FROM STA. 204+25 TO STA. 204+80 -L-REV LT
FROM STA. 212+20 TO STA. 212+47 -L-REV RT



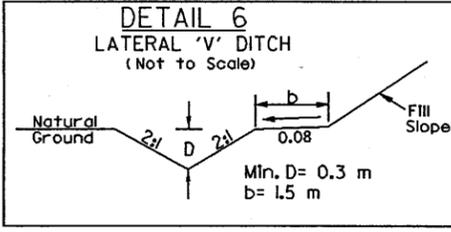
FROM STA. 204+98 TO STA. 206+60 -L-REV LT
FROM STA. 206+00 TO STA. 206+28 -L-REV RT
FROM STA. 206+80 TO STA. 207+81 -L-REV LT
FROM STA. 9+85 TO STA. 10+72 -SER1- LT



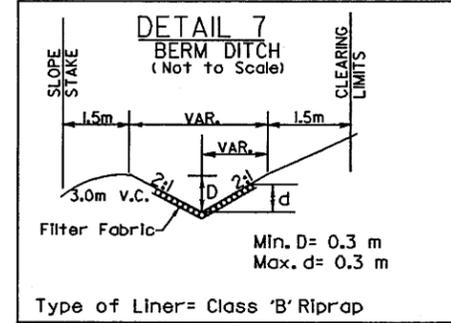
STA. 206+32 -L-REV RT
STA. 207+66 -L-REV RT



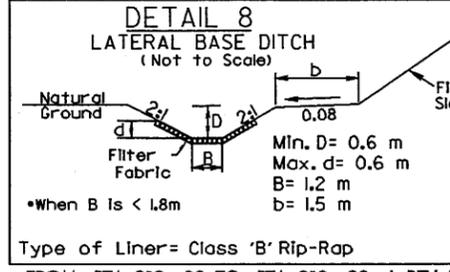
FROM STA. 208+40 TO STA. 208+80 -L-REV LT
FROM STA. 228+60 TO STA. 229+40 -L-REV LT
FROM STA. 16+40 TO STA. 17+00 -Y1-REV RT
FROM STA. 5+50 TO STA. 6+16 RAMP A LT
FROM STA. 0+45 TO STA. 1+20 LOOP D RT



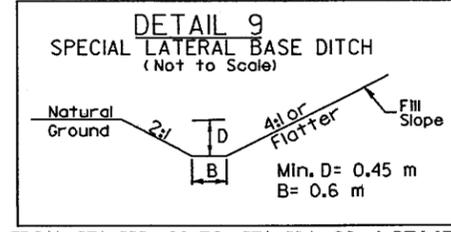
FROM STA. 208+80 TO STA. 210+85 -L-REV LT
FROM STA. 228+13 TO STA. 228+60 -L-REV LT
FROM STA. 11+19 TO STA. 11+40 -SER1- LT



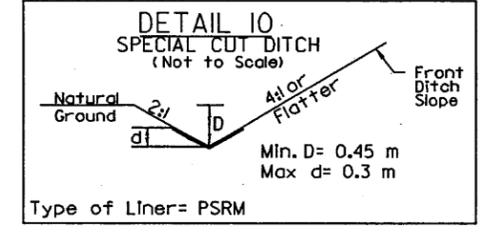
FROM STA. 211+60 TO STA. 211+95 -L-REV RT
FROM STA. 3+40 TO STA. 3+60 RAMP B LT



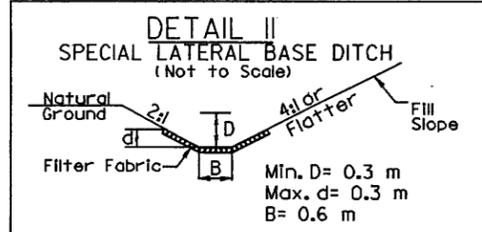
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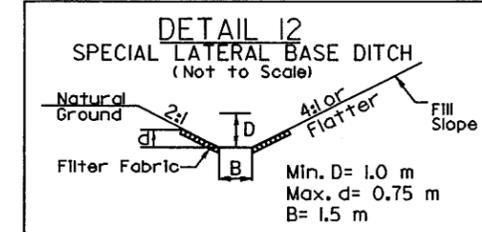
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FROM STA. 218+20 TO STA. 219+00 -L-REV LT



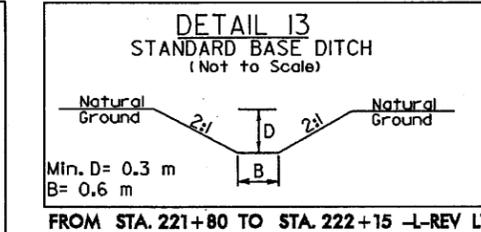
FROM STA. 214+00 TO STA. 214+60 -L-REV LT
FROM STA. 16+53 TO STA. 18+00 -Y1-REV RT
FROM STA. 10+05 TO STA. 10+86 -Y14-REV LT
FROM STA. 11+40 TO STA. 11+83 -Y15-REV LT
FROM STA. 11+60 TO STA. 11+84 -Y15-REV RT



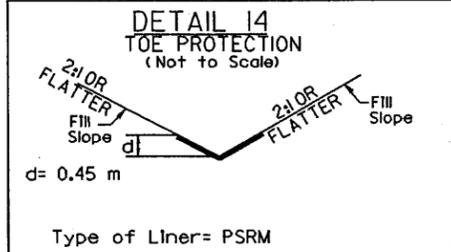
FROM STA. 11+20 TO STA. 12+00 -Y1-REV RT
FROM STA. 12+80 TO STA. 13+60 -Y1-REV LT
FROM STA. 3+60 TO STA. 4+40 -RAMP B- LT



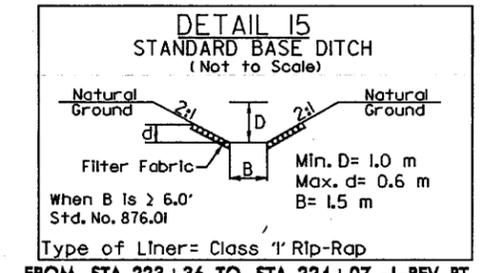
FROM STA. 219+80 TO STA. 221+00 -L-REV RT



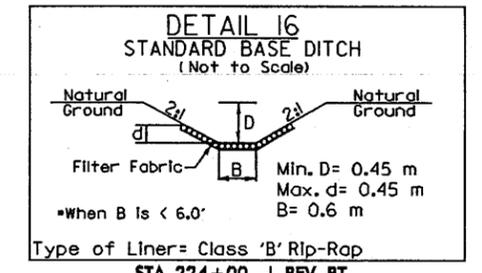
FROM STA. 221+80 TO STA. 222+15 -L-REV LT
FROM STA. 222+74 TO STA. 222+85 -L-REV LT
STA. 3+40 RAMP A LT
STA. 2+40 RAMP B RT
STA. 12+07 -Y14- LT



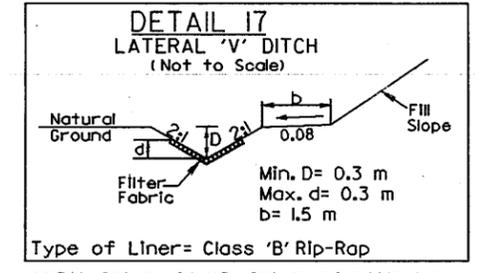
FROM STA. 1+40 TO STA. 1+80 -LOOP D- LT



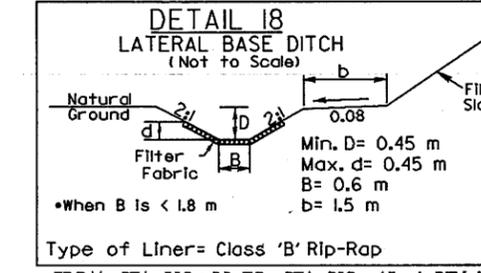
FROM STA. 223+36 TO STA. 224+07 -L-REV RT



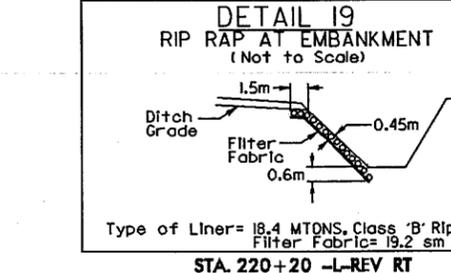
STA. 224+00 -L-REV RT
STA. 18+50 -Y1-REV RT
STA. 18+60 -Y1-REV LT



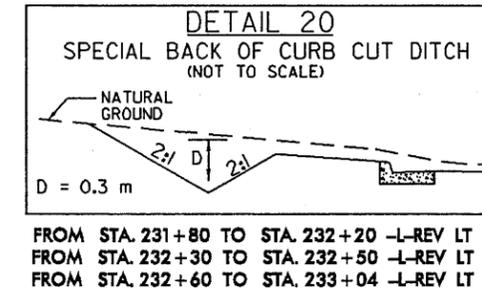
FROM STA. 5+64 TO STA. 5+96 RAMP A RT



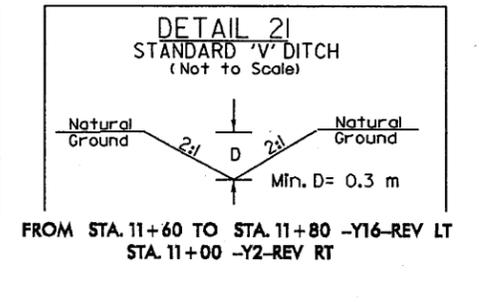
FROM STA. 219+00 TO STA. 219+45 -L-REV LT
FROM STA. 233+71 TO STA. 233+97 -L-REV RT
FROM STA. 11+55 TO STA. 12+10 -Y1-REV LT
FROM STA. 6+03 TO STA. 6+45 -RAMP A- RT



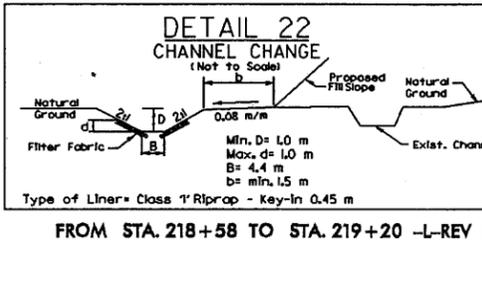
STA. 220+20 -L-REV RT



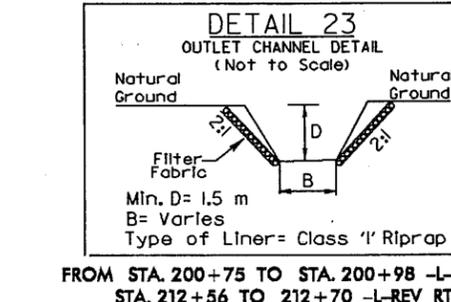
FROM STA. 231+80 TO STA. 232+20 -L-REV LT
FROM STA. 232+30 TO STA. 232+50 -L-REV LT
FROM STA. 232+60 TO STA. 233+04 -L-REV LT



FROM STA. 11+60 TO STA. 11+80 -Y16-REV LT
STA. 11+00 -Y2-REV RT

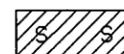


FROM STA. 218+58 TO STA. 219+20 -L-REV RT



FROM STA. 200+75 TO STA. 200+98 -L-REV RT
STA. 212+56 TO 212+70 -L-REV RT
STA. 12+12 -Y16-REV LT

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USER: #105000
PLOT: 04/20/05

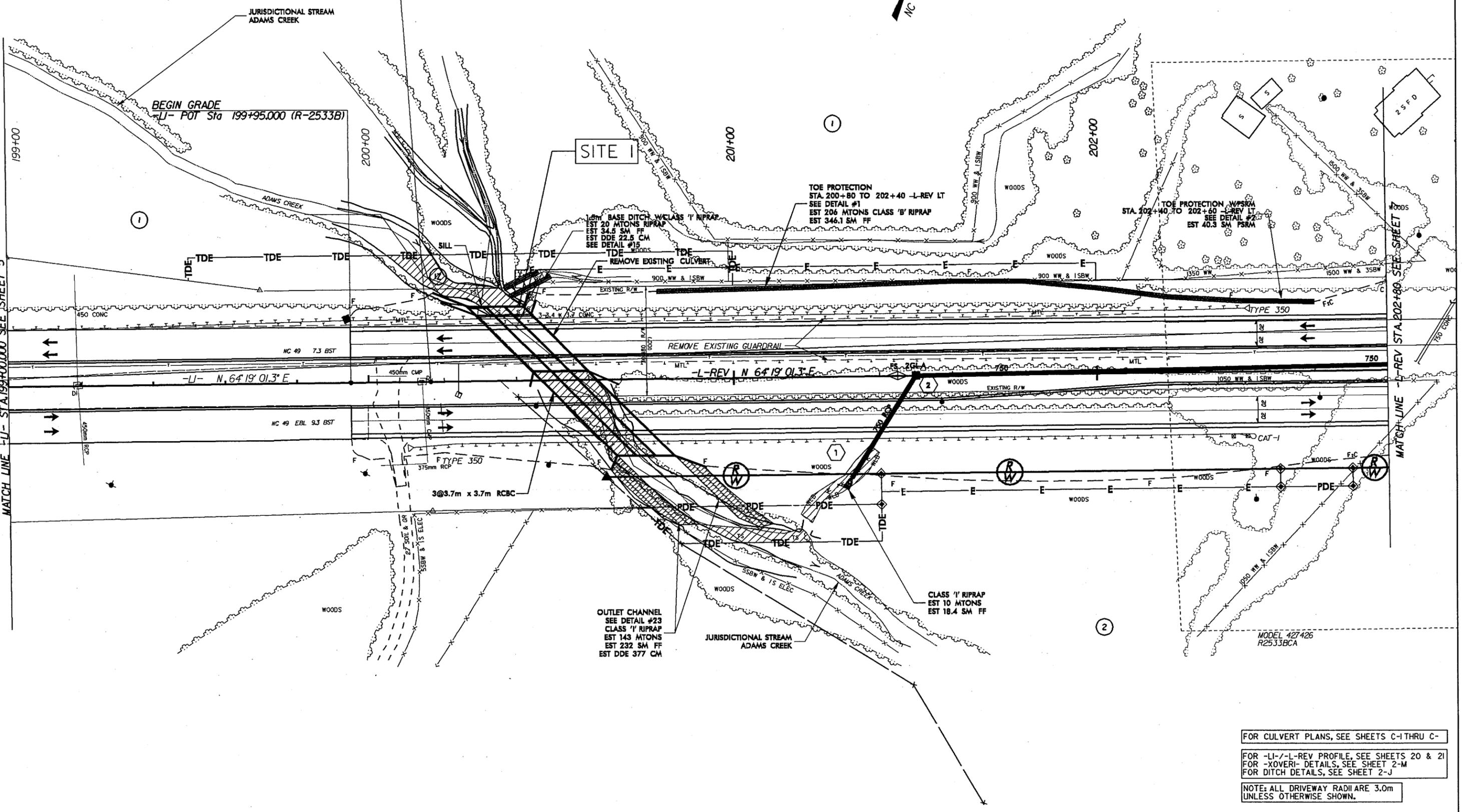
-  DENOTES IMPACTS IN SURFACE WATER
-  DENOTES TEMPORARY IMPACTS IN SURFACE WATER
-  DENOTES FILL IN WETLAND

Permit Drawing
Sheet 10 of 40

PROJ. REFERENCE NO. R-2533CC		SHEET NO. 6	
HIGHWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
Prepared in the Office of:		AECOM	
CONST. REV.		NC FIRM LICENSE NO. 0342 701 Corporate Center Drive, Suite 475 Raleigh, NC 27603 (919) 854-6200 / (919) 854-6259(FAX)	
R/W REV.			

BEGIN T.J.P. PROJECT R-2533CC
-L-REV POT Sta 200+16.400 LA=
-L- POT Sta 200+17.273 L.B. (R-2533B)

R/W REV.
 1) REVISED OWNER NAME PARCEL 2 JMD 10/15/03
 2) REVISED OWNER NAME PARCEL 2 K.V. 7/8/04
 3) ADDED PIE TO PARCEL FOR DRAINAGE REV. 05/07/09
 4) REMOVED PIE & ADDED TDE TO PARCEL 1 FOR EROSION CONTROL. CMR 07/20/08
 MATCH LINE -L- STA 199+00.000 SEE SHEET 5



FOR CULVERT PLANS, SEE SHEETS C-1 THRU C-
 FOR -L-/-L-REV PROFILE, SEE SHEETS 20 & 21
 FOR -X-OVER- DETAILS, SEE SHEET 2-M
 FOR DITCH DETAILS, SEE SHEET 2-J
 NOTE: ALL DRIVEWAY RADII ARE 3.0m UNLESS OTHERWISE SHOWN.

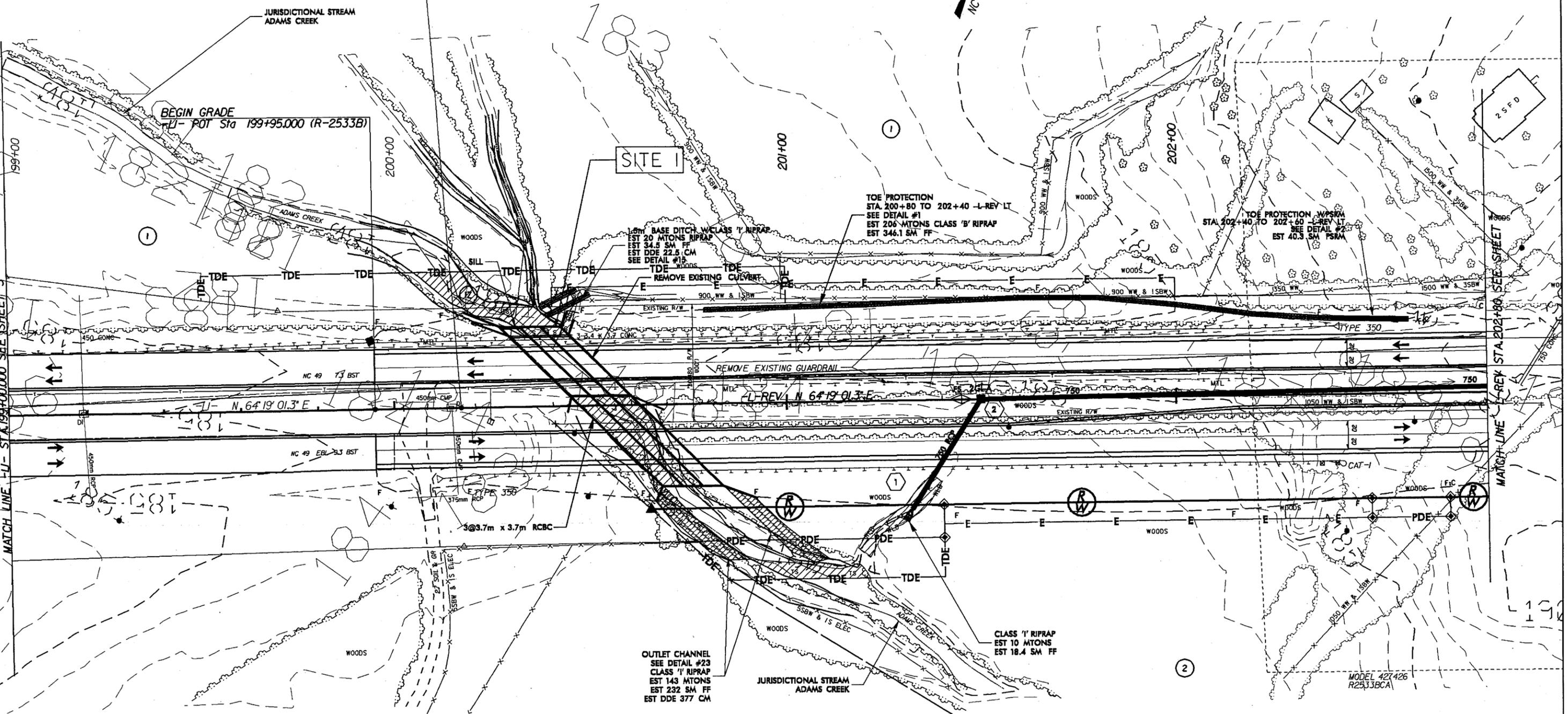
-  DENOTES IMPACTS IN SURFACE WATER
-  DENOTES TEMPORARY IMPACTS IN SURFACE WATER
-  DENOTES FILL IN WETLAND

Permit Drawing
 est 11 of 40

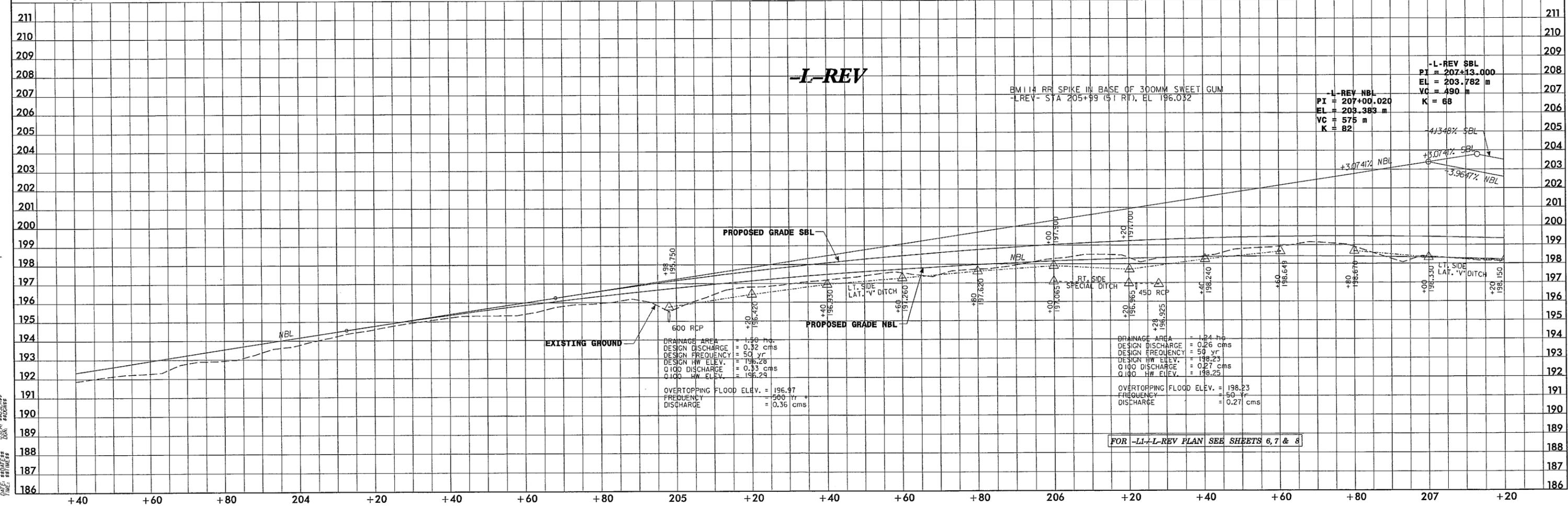
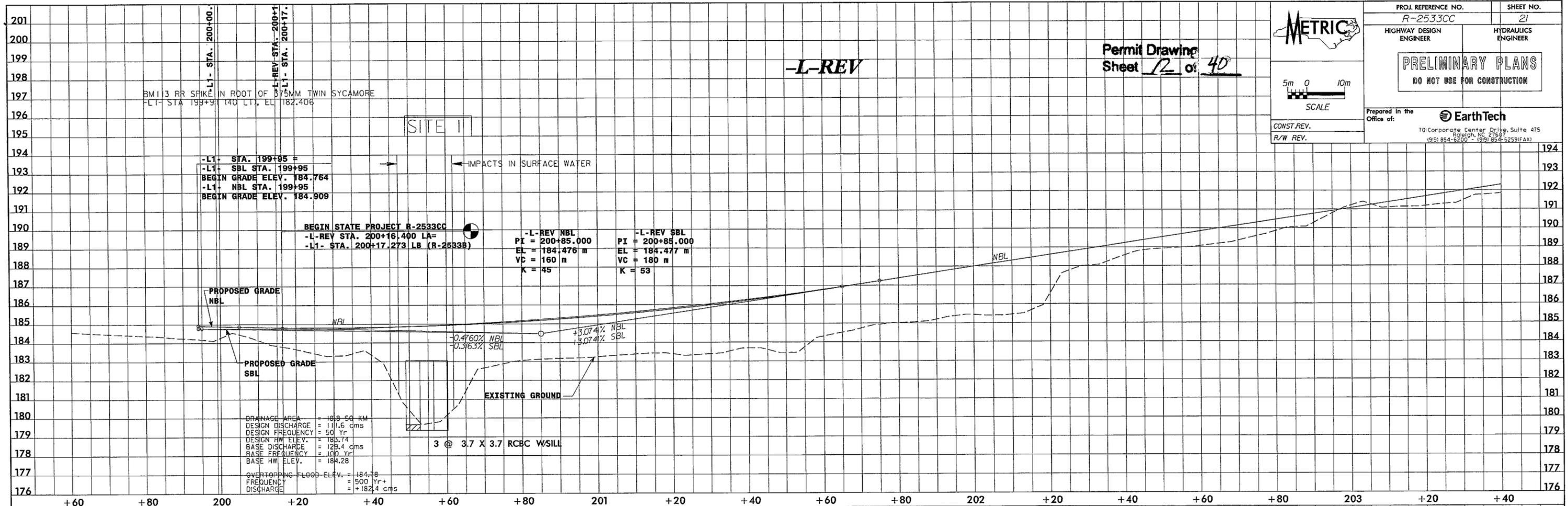
	PROJ. REFERENCE NO. R-2533CC	SHEET NO. 6
	HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
Prepared in the Office of:		AECOM <small>NC REG. LICENSE NO. P-0342 701 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-6200 • (919) 854-6259(FAX)</small>
CONST. REV.		
R/W REV.		

BEGIN T.J.P. PROJECT R-2533CC
 -L-REV POT Sta 200+16.400 LA=
 -U- POT Sta 200+17.273 LB. (R-2533B)

R/W REV.
 1) REVISED OWNER NAME PARCEL 2 JMW 10/15/03
 2) REVISED OWNER NAME PARCEL 2 RW 7/8/04
 3) ADDED PIE TO PARCEL 1 FOR DRAINAGE REV. 05/07/05
 4) REMOVED PIE & ADDED TDE TO PARCEL 1 FOR EMISSION CONTROL CMR 01/20/05
 MATCH LINE -U- STA 199+00.000 SEE SHEET 5

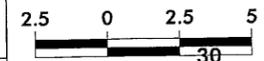


FOR CULVERT PLANS, SEE SHEETS C-1 THRU C-
 FOR -LI/-L-REV PROFILE, SEE SHEETS 20 & 21
 FOR -XOVER- DETAILS, SEE SHEET 2-M
 FOR DITCH DETAILS, SEE SHEET 2-J
 NOTE: ALL DRIVEWAY RADII ARE 3.0m UNLESS OTHERWISE SHOWN.



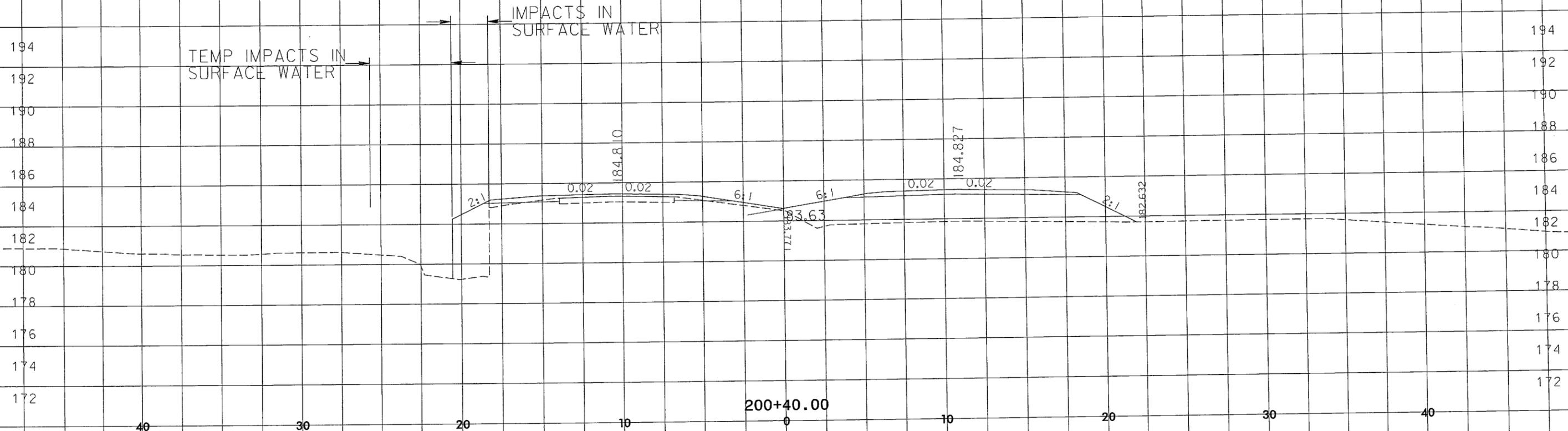
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10/26/28



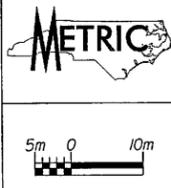
PROJECT REFERENCE NO. R-25330C	SHEET NO. X-13
40	50

Permit Drawing
Sheet 13 of 40



-L-REV

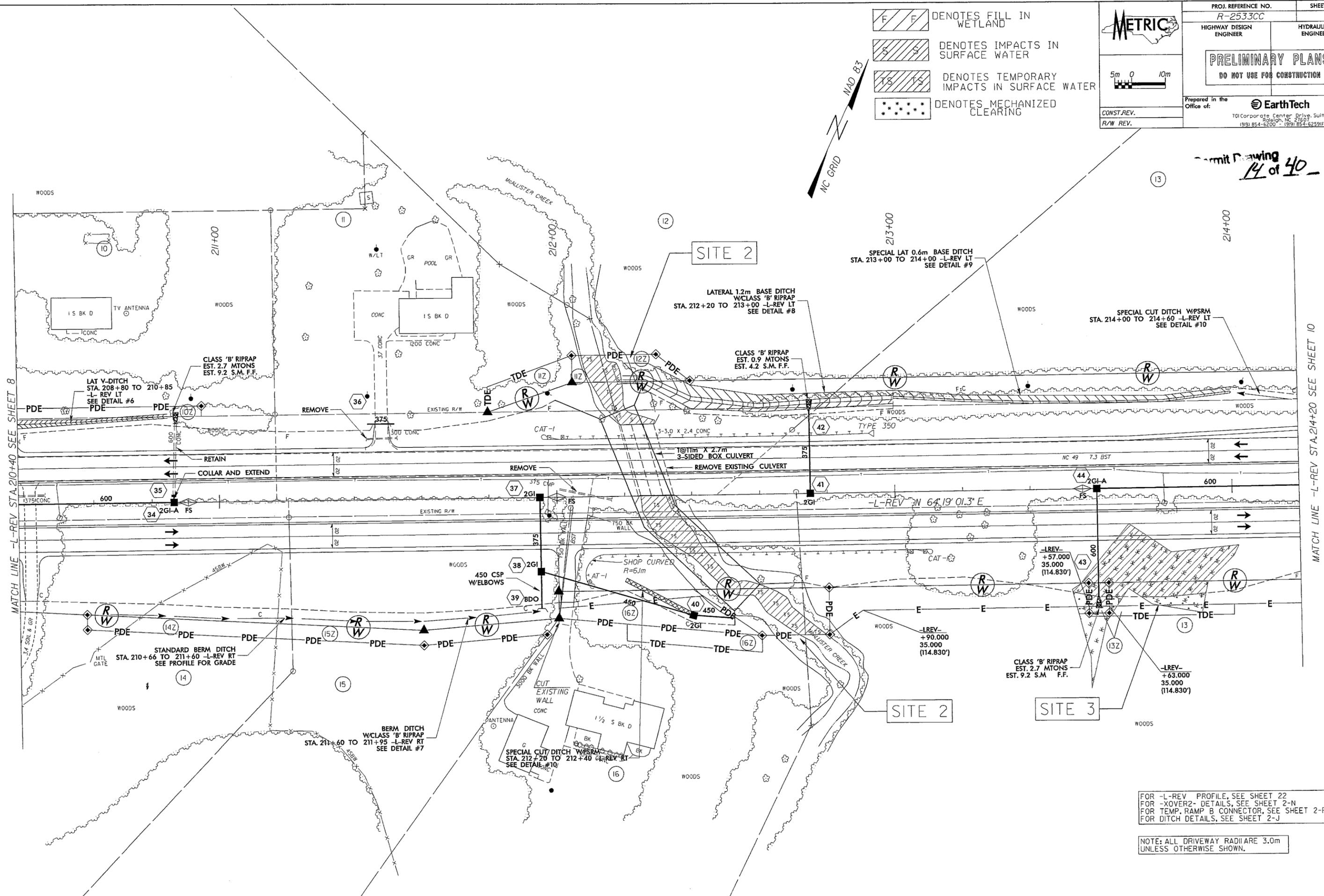
PROPERTY LINE
ADJACENT TO
ROADWAY



- DENOTES FILL IN WETLAND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING

Permit Drawing 14 of 40

EST. 20 ADT IN



MATCH LINE -L-REV STA. 210+40 SEE SHEET 8

MATCH LINE -L-REV STA. 214+20 SEE SHEET 10

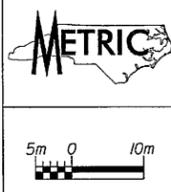
FOR -L-REV PROFILE, SEE SHEET 22
 FOR -XOVER2- DETAILS, SEE SHEET 2-N
 FOR TEMP. RAMP B CONNECTOR, SEE SHEET 2-R
 FOR DITCH DETAILS, SEE SHEET 2-J

NOTE: ALL DRIVEWAY RADII ARE 3.0m
 UNLESS OTHERWISE SHOWN.

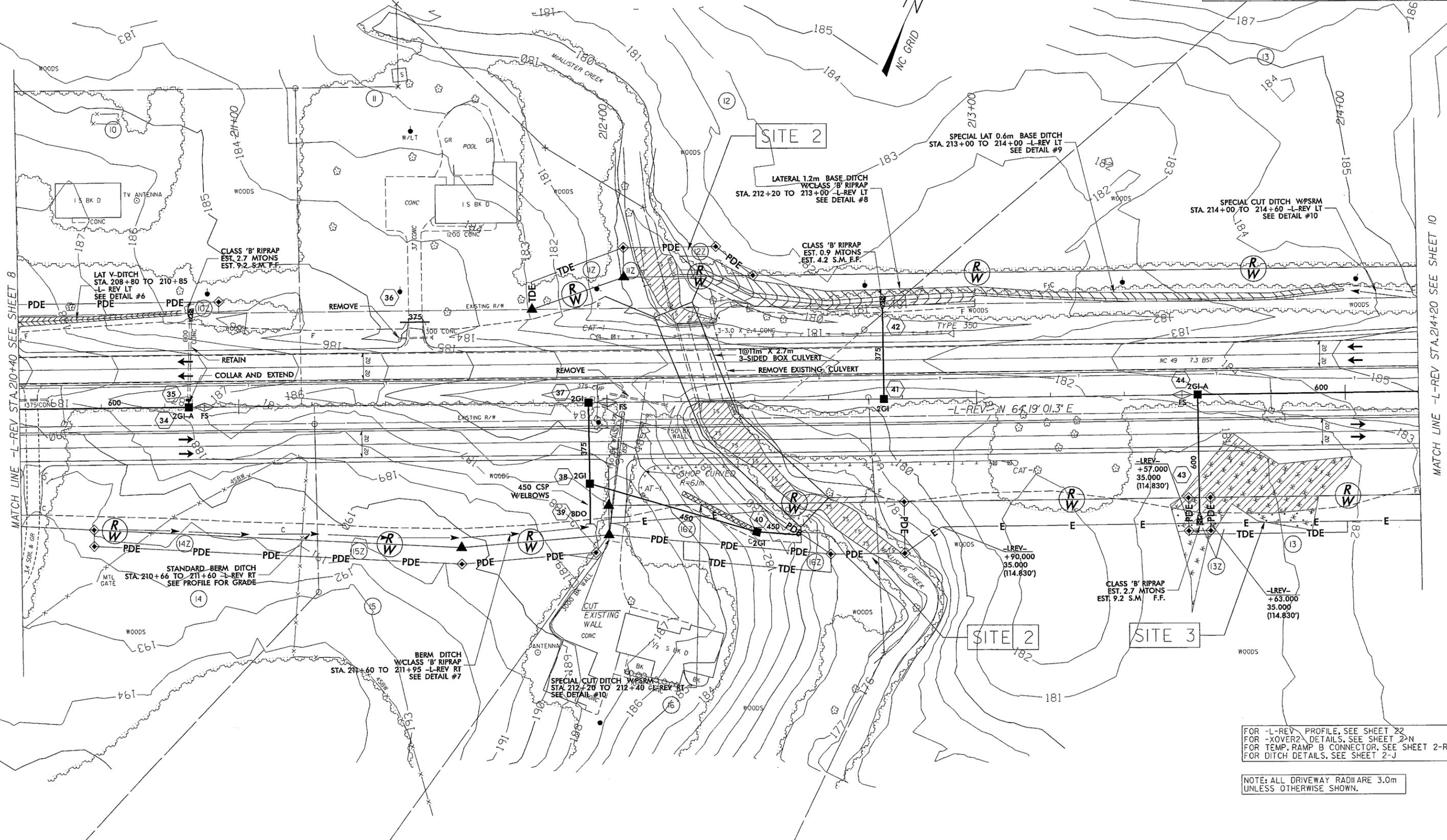
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 DATE: #DATE#
 TIME: #TIME#

Permit Drawing
Sheet 15 of 40

- DENOTES FILL IN WETLAND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING



PROJ. REFERENCE NO. R-2533CC	SHEET NO. 9
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS	
DO NOT USE FOR CONSTRUCTION	
Prepared in the Office of:	
EarthTech	
<small>701 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-6200 • (919) 854-6258(FAX)</small>	



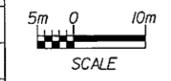
MATCH LINE - L-REV STA. 210+40 SEE SHEET 8

MATCH LINE - L-REV STA. 214+20 SEE SHEET 10

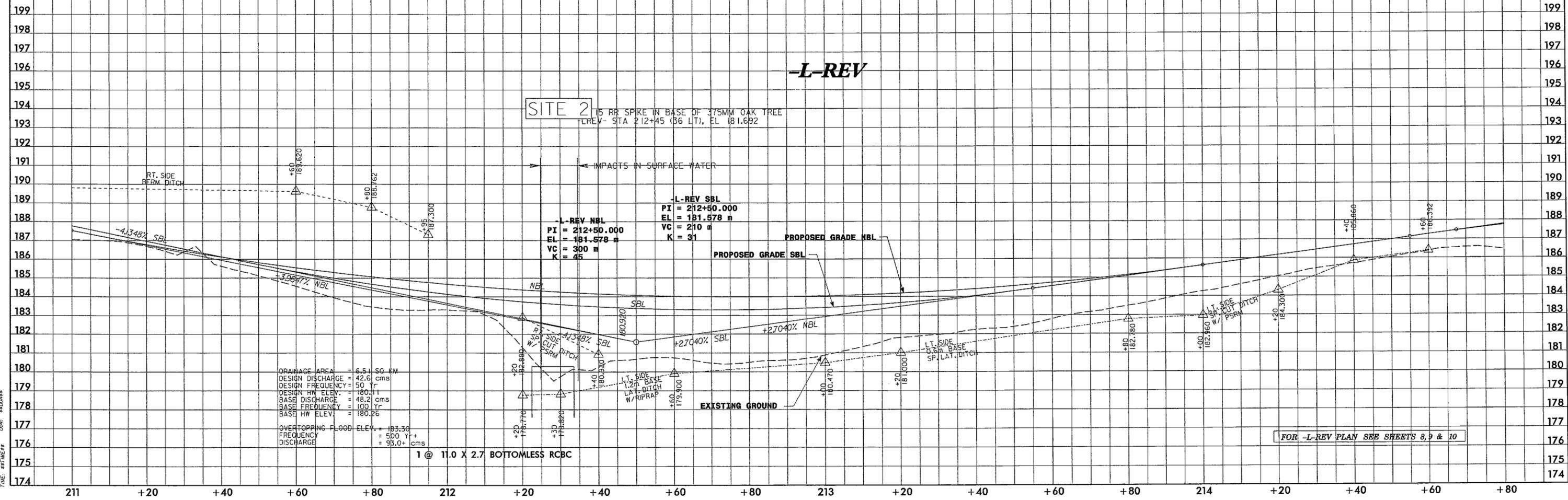
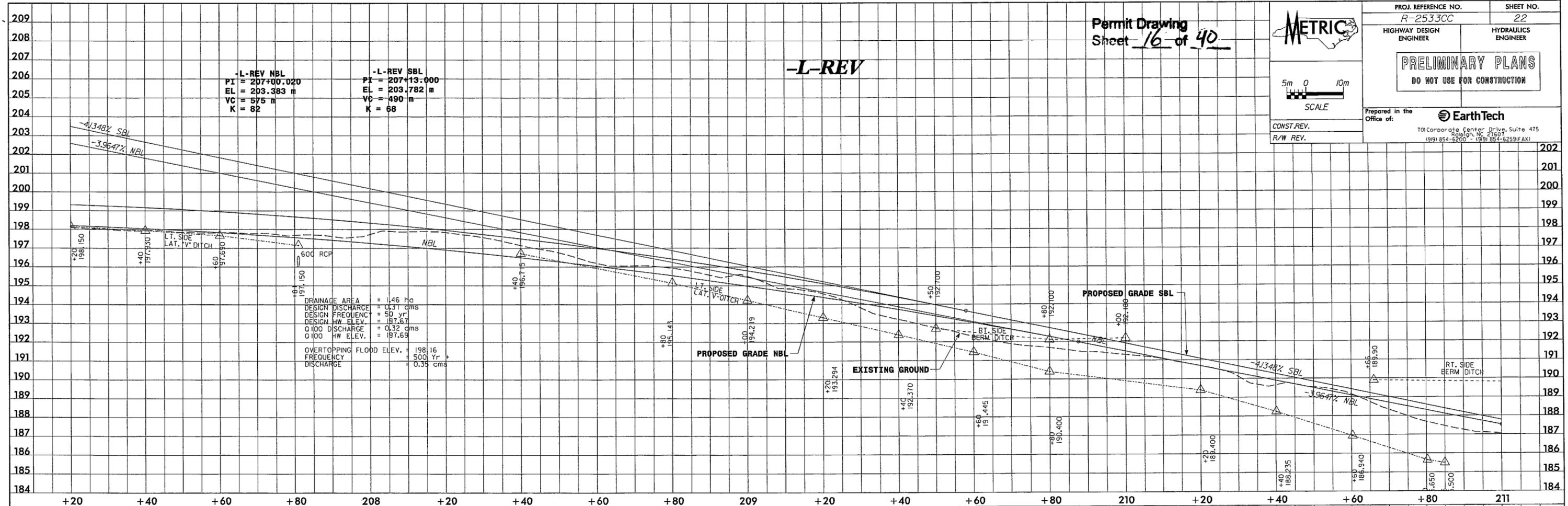
FOR -L-REV PROFILE, SEE SHEET 22
 FOR -XOVER2- DETAILS, SEE SHEET 2-N
 FOR TEMP. RAMP B CONNECTOR, SEE SHEET 2-R
 FOR DITCH DETAILS, SEE SHEET 2-J

NOTE: ALL DRIVEWAY RADII ARE 3.0m
 UNLESS OTHERWISE SHOWN.

USDA: 88424588
 DATE: 8/24/2011
 TIME: 10:40:00 AM

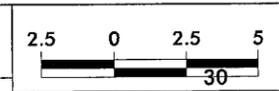


CONST. REV.
R/W REV.



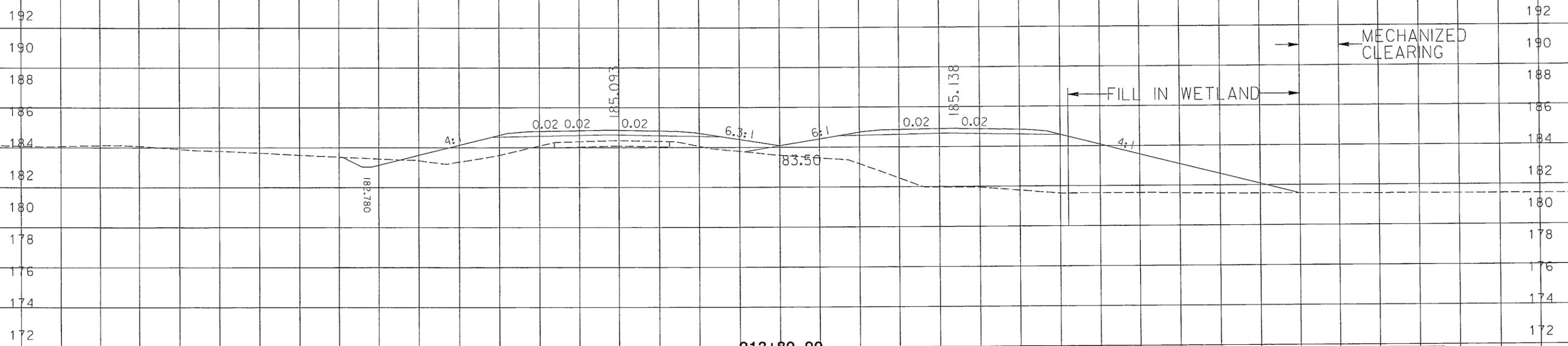
DATE: 04/05/05
 USER: JMW/MS
 TIME: 09:00 AM
 CON: 000000

10/26/98



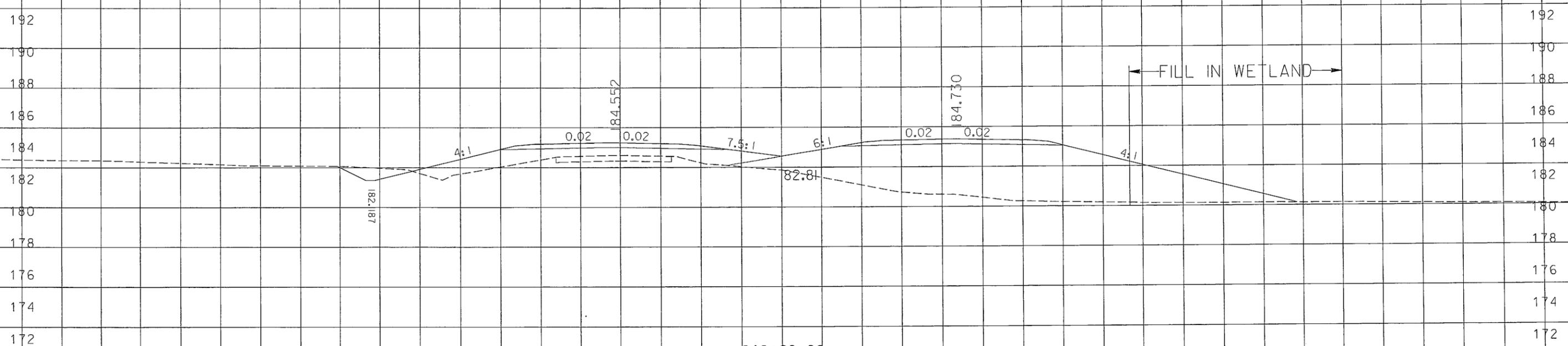
Permit Drawing
18 of 40

SITE 3



213+80.00

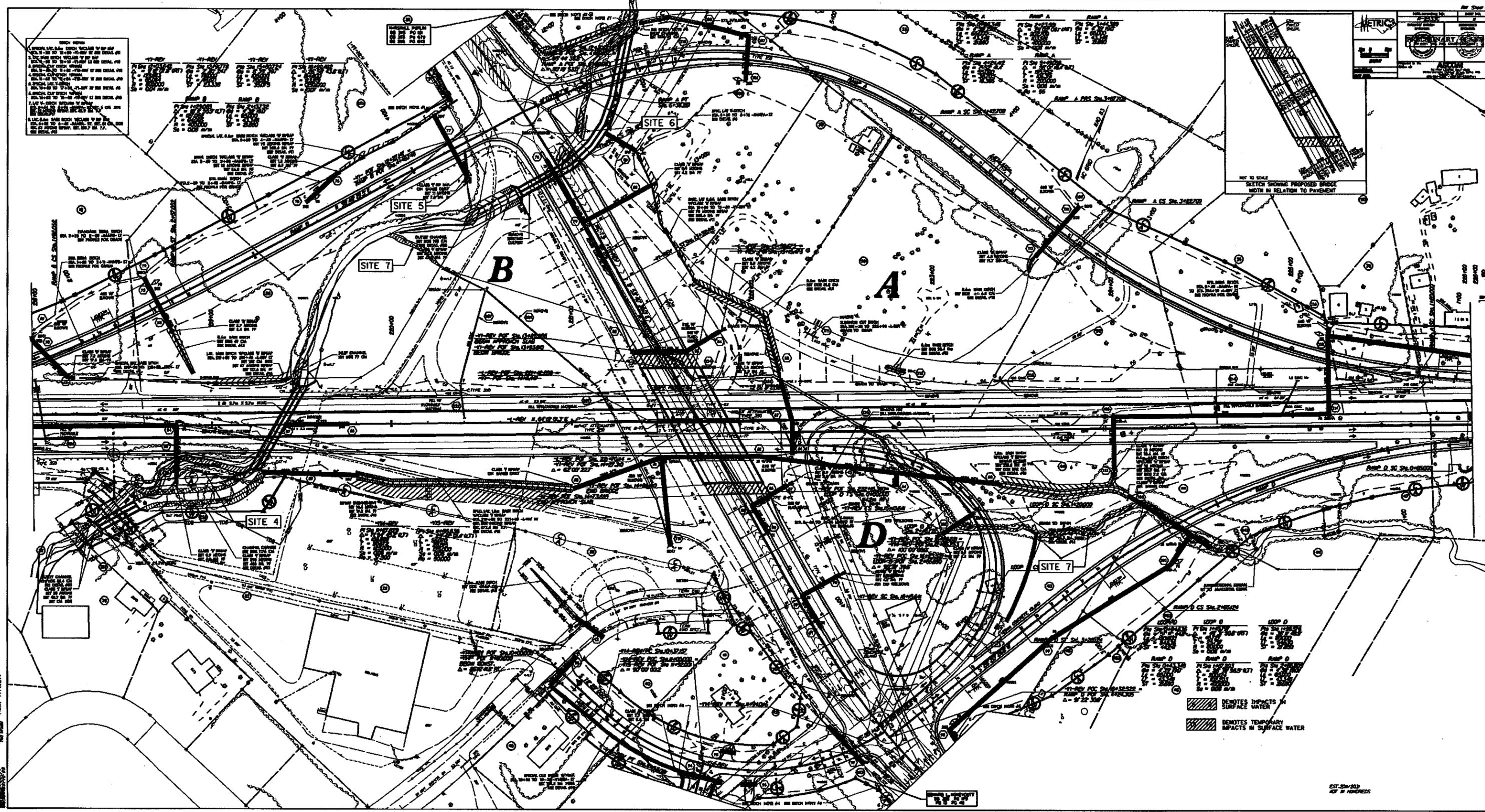
SITE 3



213+60.00

-L-REV

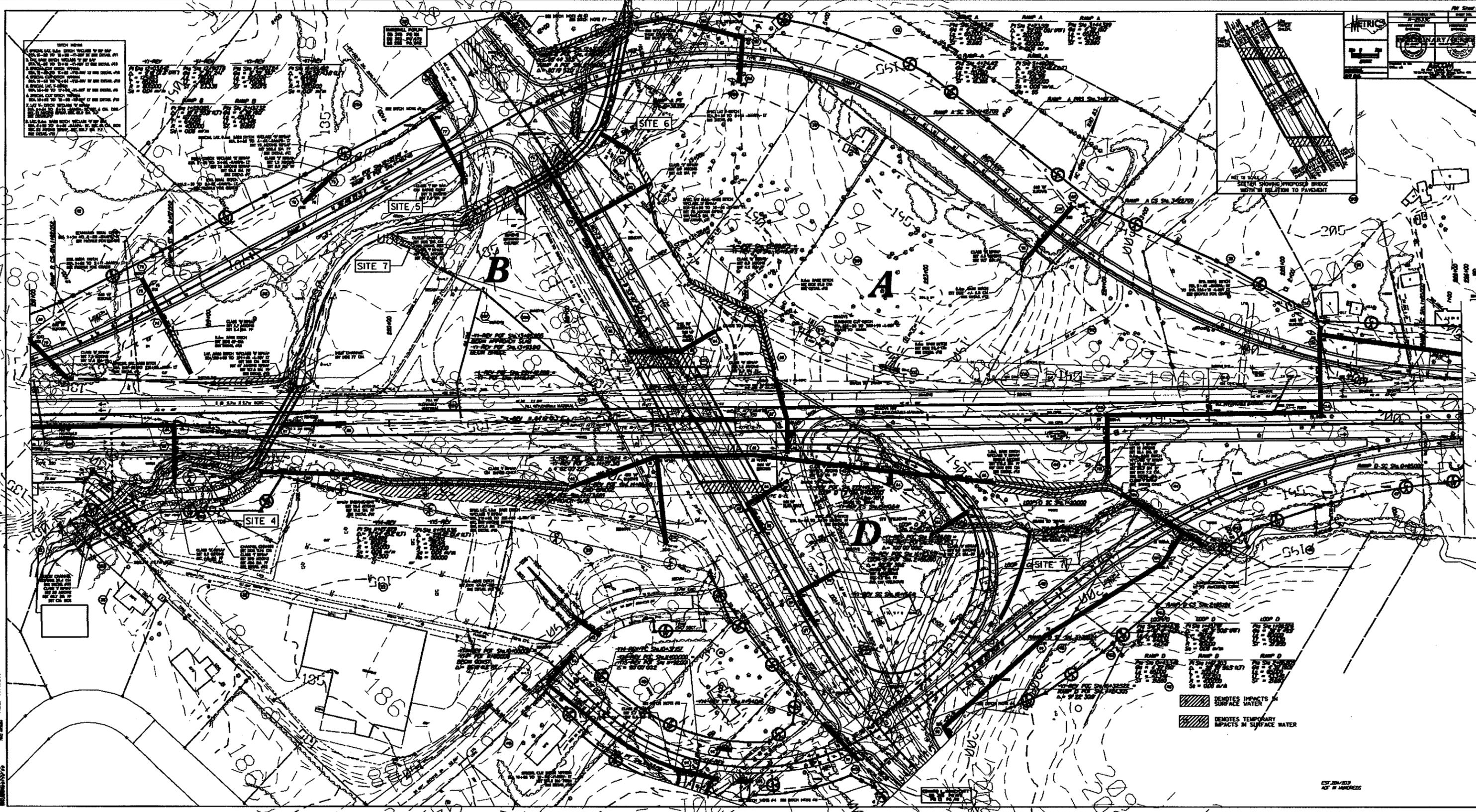
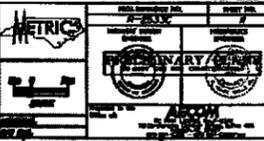
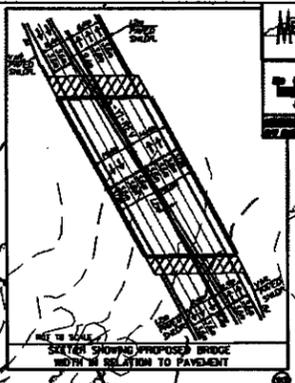
PROPERTY LINE
CONSTRUCTION
PERMITS



SEE SHEET 18 FOR CONTINUED

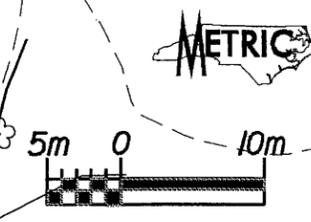
EST. 2014/2015
BY: [Signature]

NOTICE
GENERAL: ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITIONS OF THE CALIFORNIA STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, LATEST EDITIONS OF THE CALIFORNIA STANDARD SPECIFICATIONS FOR BRIDGE CONSTRUCTION, AND THE LATEST EDITIONS OF THE CALIFORNIA STANDARD SPECIFICATIONS FOR STRUCTURAL STEEL CONSTRUCTION. ALL WORK SHALL BE SUBJECT TO THE SUPERVISOR'S INSPECTION AND APPROVAL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL ADJACENT PROPERTIES AND UTILITIES AT ALL TIMES. ALL WORK SHALL BE COMPLETED WITHIN THE SPECIFIED TIME FRAME. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITIES AND STRUCTURES. ALL WORK SHALL BE SUBJECT TO THE SUPERVISOR'S INSPECTION AND APPROVAL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL ADJACENT PROPERTIES AND UTILITIES AT ALL TIMES. ALL WORK SHALL BE COMPLETED WITHIN THE SPECIFIED TIME FRAME. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITIES AND STRUCTURES.

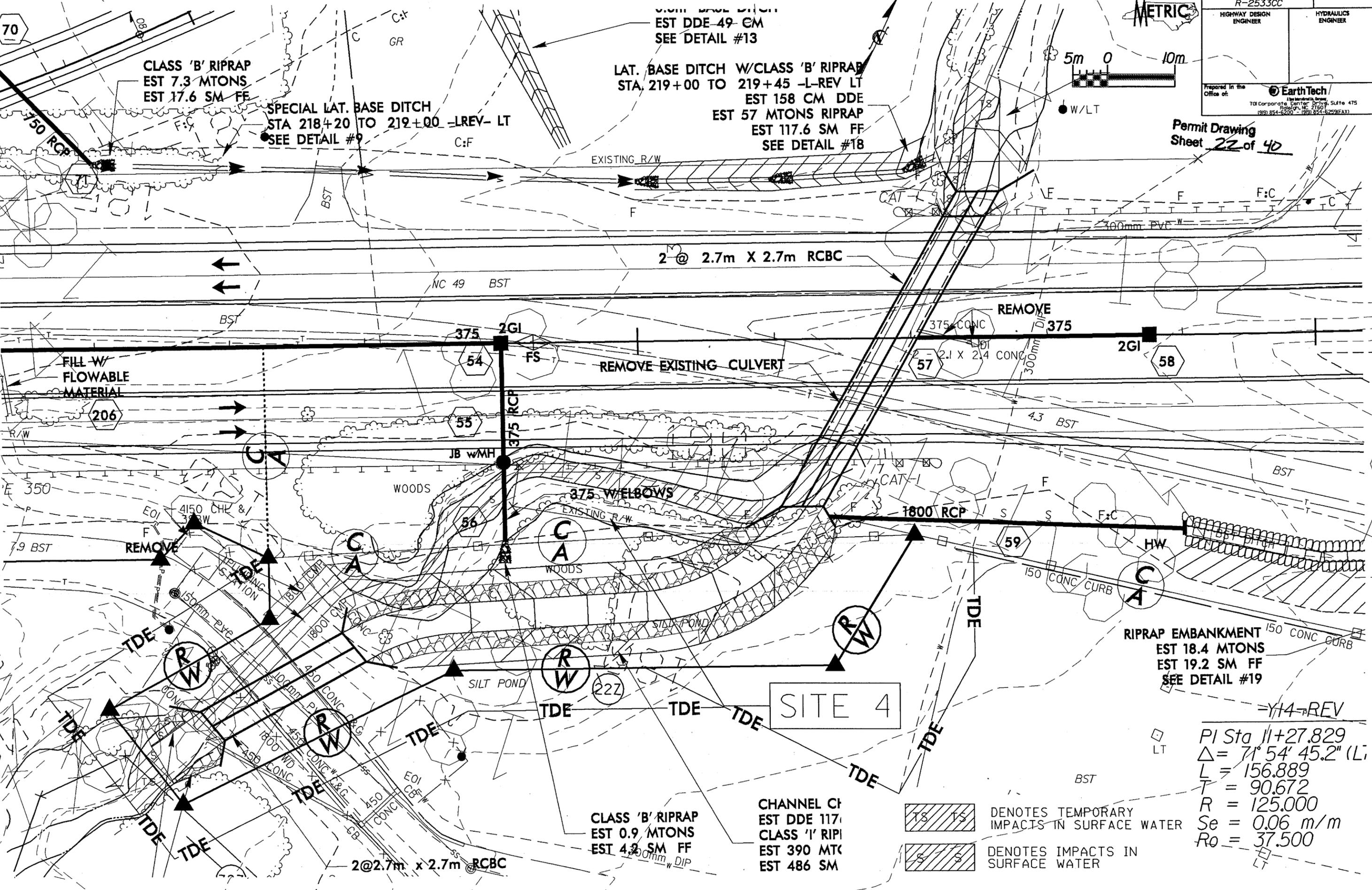


DEMOTES IMPACTS IN SURFACE WATER
DEMOTES TEMPORARY IMPACTS IN SURFACE WATER

DATE: 10/15/10



Permit Drawing
Sheet 22 of 40



CLASS 'B' RIPRAP
EST 7.3 MTONS
EST 17.6 SM FF
SEE DETAIL #9

LAT. BASE DITCH W/CLASS 'B' RIPRAP
STA. 219+00 TO 219+45 -L-REV LT
EST 158 CM DDE
EST 57 MTONS RIPRAP
EST 117.6 SM FF
SEE DETAIL #18

SPECIAL LAT. BASE DITCH
STA 218+20 TO 219+00 -LREV- LT
SEE DETAIL #9

FILL W/
FLOWABLE
MATERIAL

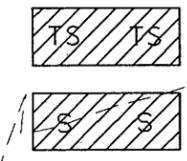
REMOVE EXISTING CULVERT

REMOVE

RIPRAP EMBANKMENT
EST 18.4 MTONS
EST 19.2 SM FF
SEE DETAIL #19

CLASS 'B' RIPRAP
EST 0.9 MTONS
EST 4.2 SM FF
SEE DETAIL #13

CHANNEL C
EST DDE 117
CLASS 'I' RIPRAP
EST 390 MTONS
EST 486 SM

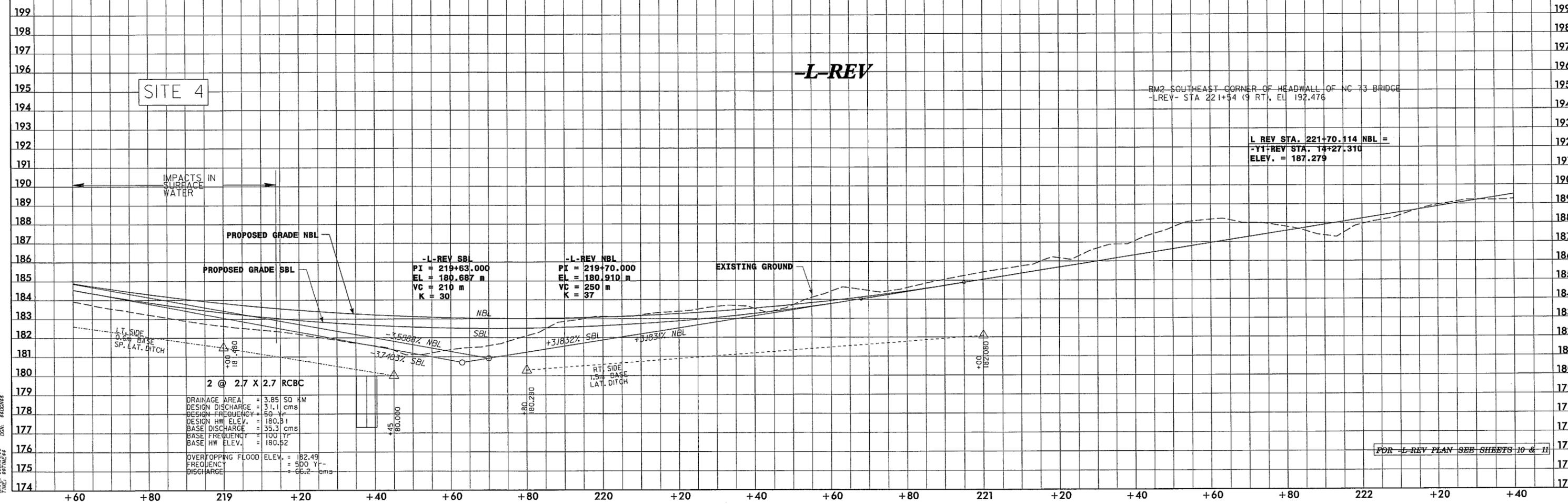
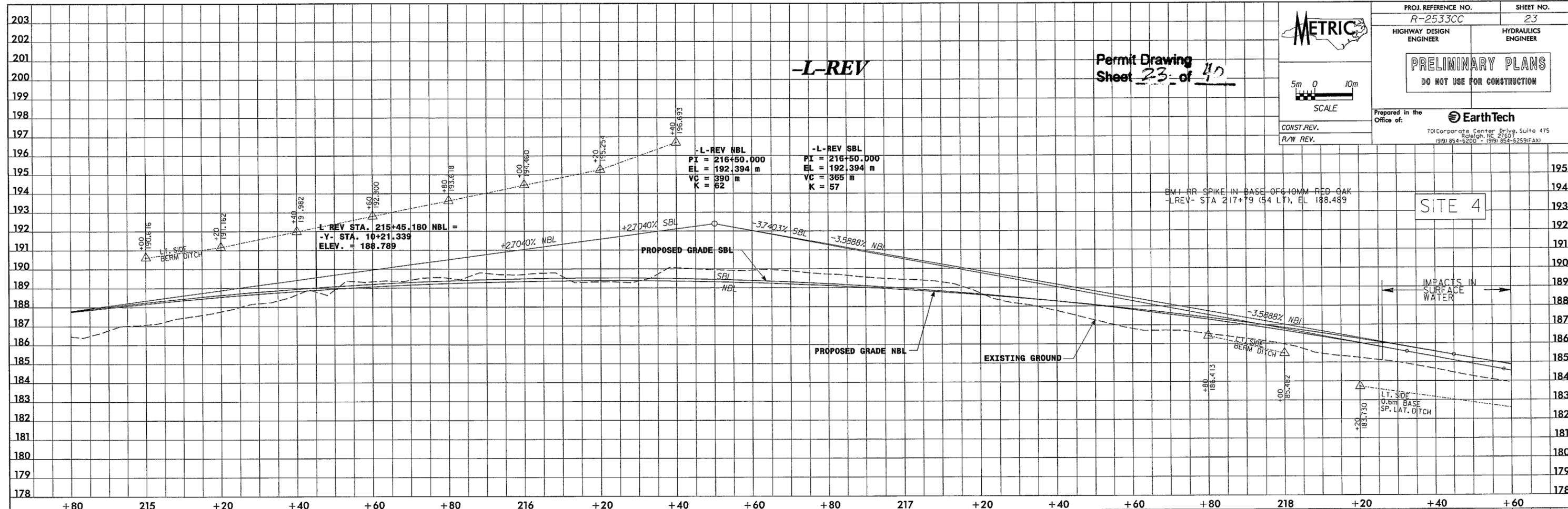


DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN
SURFACE WATER

PI Sta 11+27.829
 $\Delta = 71^\circ 54' 45.2''$ (L)
 $L = 156.889$
 $T = 90.672$
 $R = 125.000$
 $Se = 0.06 \text{ m/m}$
 $Ro = 37.500$

SITE 4

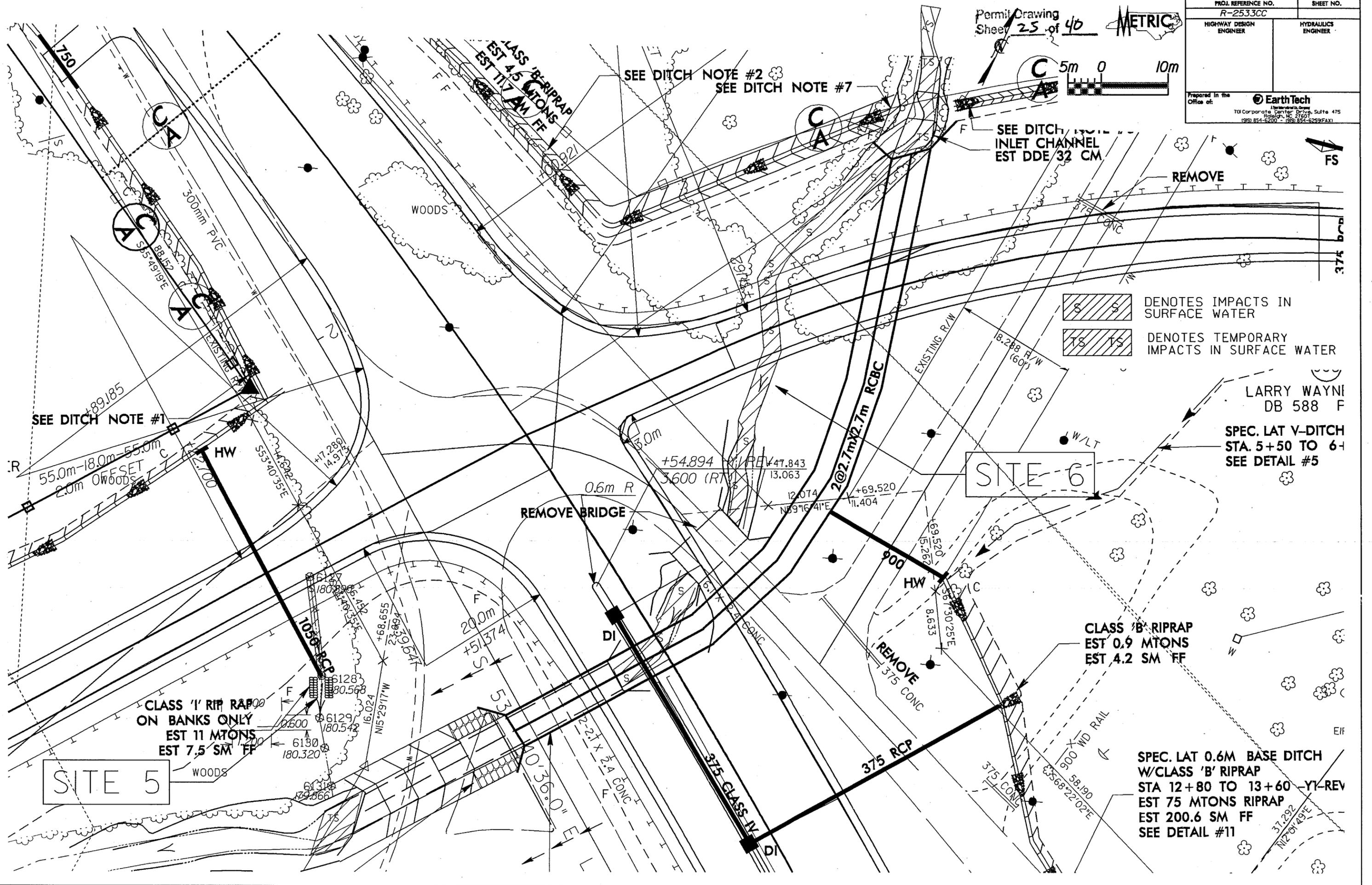
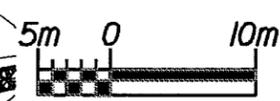


USER: #AUSER#
 DATE: #DATE#
 TIME: #TIME#
 DGN: #DGN#

FOR -L-REV PLAN SEE SHEETS 10 & 11

PROJ. REFERENCE NO. R-2533CC	SHEET NO.
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Prepared in the Office of:	
<small>100 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-5200 - (919) 854-5250(FAX)</small>	

Permit Drawing
Sheet 25 of 40
METRIC



DENOTES IMPACTS IN SURFACE WATER
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER

LARRY WAYNE
 DB 588 F
 SPEC. LAT V-DITCH
 STA. 5+50 TO 6+1
 SEE DETAIL #5

CLASS 'I' RIP RAP
 ON BANKS ONLY
 EST 11 MTONS
 EST 7.5 SM² FF

CLASS 'B' RIPRAP
 EST 0.9 MTONS
 EST 4.2 SM² FF

SPEC. LAT 0.6M BASE DITCH
 W/CLASS 'B' RIPRAP
 STA 12+80 TO 13+60 -Y1-REV
 EST 75 MTONS RIPRAP
 EST 200.6 SM² FF
 SEE DETAIL #11

SITE 5

SITE 6

REMOVE BRIDGE

REMOVE

SEE DITCH INLET CHANNEL
EST DDE 32 CM

SEE DITCH NOTE #2
SEE DITCH NOTE #7

SEE DITCH NOTE #1

750

300mm PVC

1050 RCP

375 CLASS 'A' RCBC

375 RCP

2@2.7m@2.7m RCBC

EXISTING R/W

EXISTING R/W

WALT

900 X 58.190
83568°22'02"E

37.292
N12°01'49"E

0.6m R

+54.894
3.600 (RT)
+47.843
13.063

12.074
N89°16'41"E

+69.520
11.404

169.520
15.266

1567.3025'E

8.633

375 CONC

REMOVE

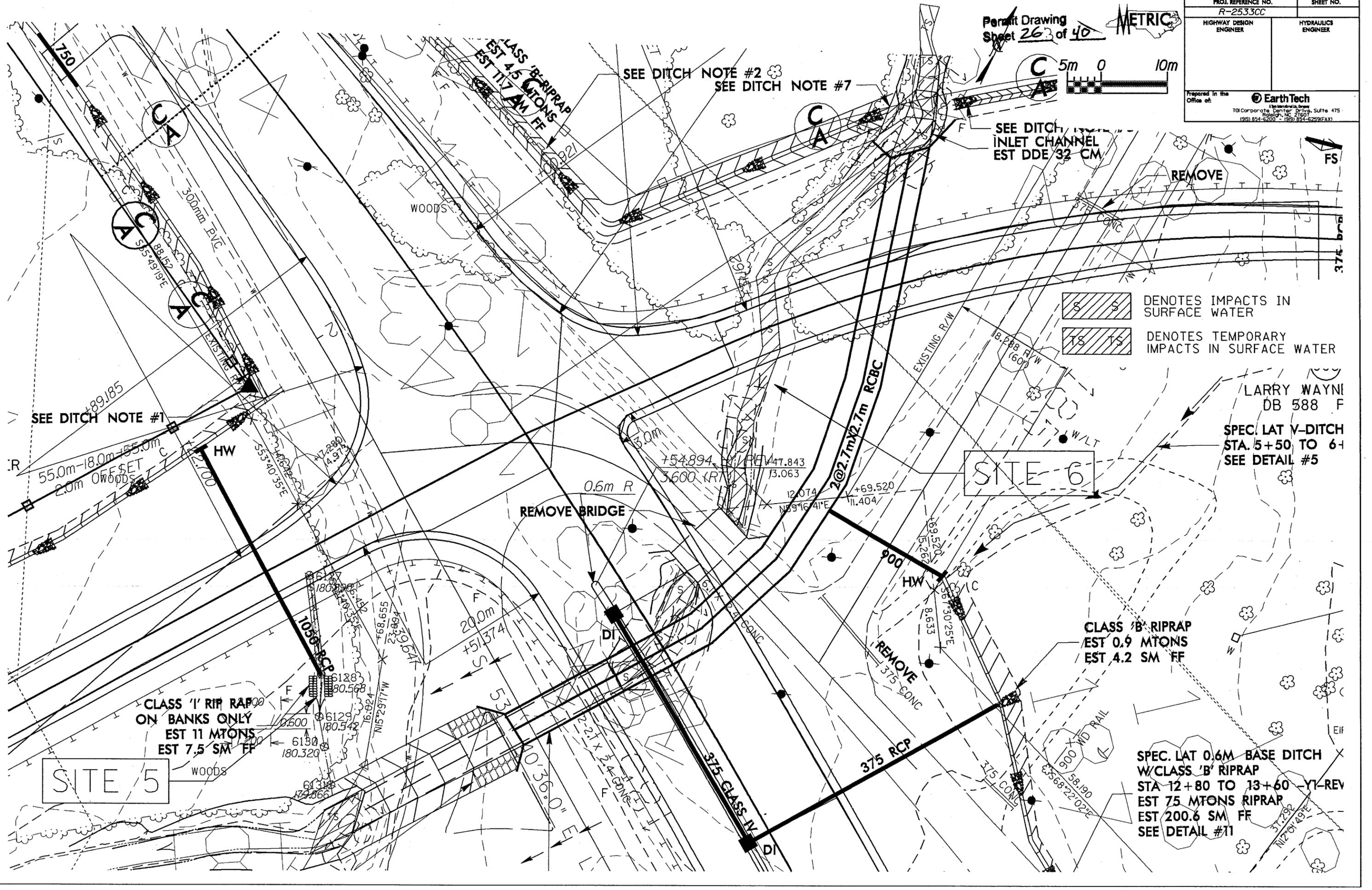
375 CONC

PROJ. REFERENCE NO. R-2533CC	SHEET NO.
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Prepared in the Office of:	
 701 Corporate Center Drive, Suite 475 Houston, TX 77060 (936) 854-6200 • (936) 854-6205 (FAX)	

Permit Drawing
Sheet 263 of 40

METRIC

5m 0 10m



DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

LARRY WAYNE
DB 588 F

SPEC. LAT V-DITCH
STA. 5+50 TO 6+1
SEE DETAIL #5

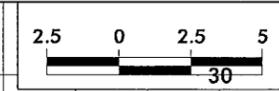
CLASS 'I' RIP RAP
ON BANKS ONLY
EST 11 MTONS
EST 7.5 SM FF

SPEC. LAT 0.6M BASE DITCH
W/CLASS 'B' RIPRAP
STA 12+80 TO 13+60 -Y1-REV
EST 75 MTONS RIPRAP
EST 200.6 SM FF
SEE DETAIL #11

SITE 5

SITE 6

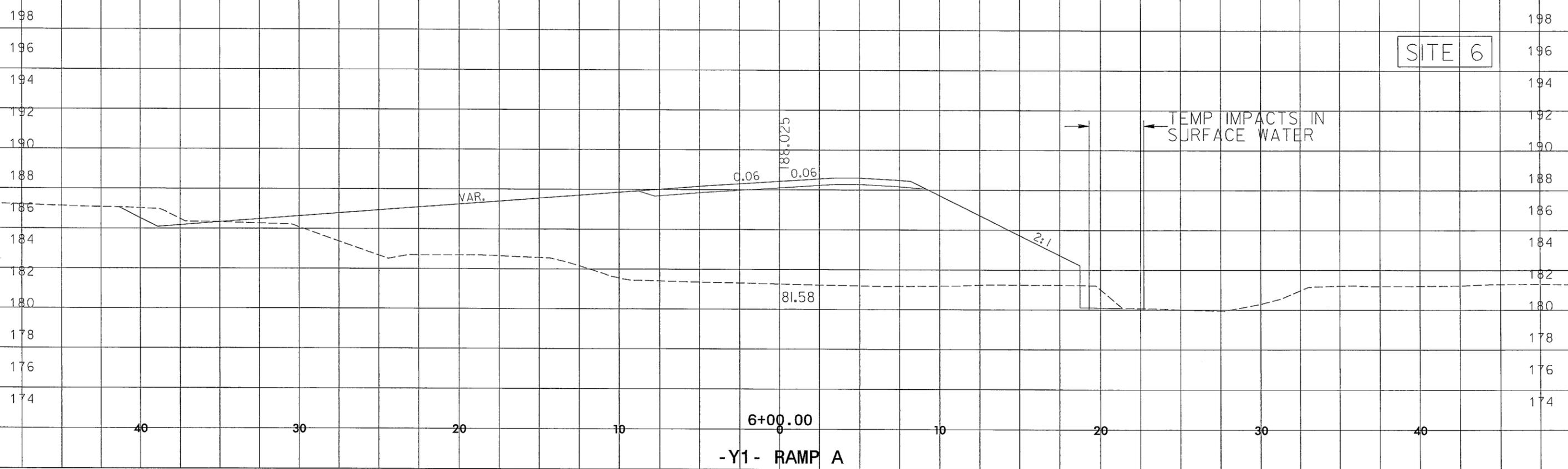
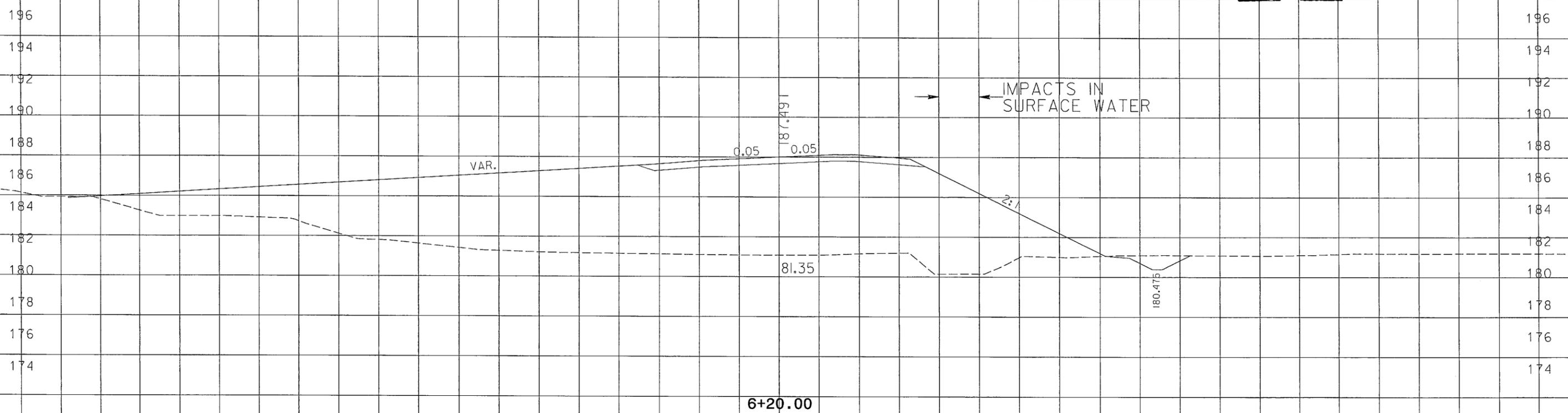
00/26/99



PROJECT REFERENCE NO. R-2533CC	SHEET NO. X-145
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Permit Drawing
Sheet 27 of 40

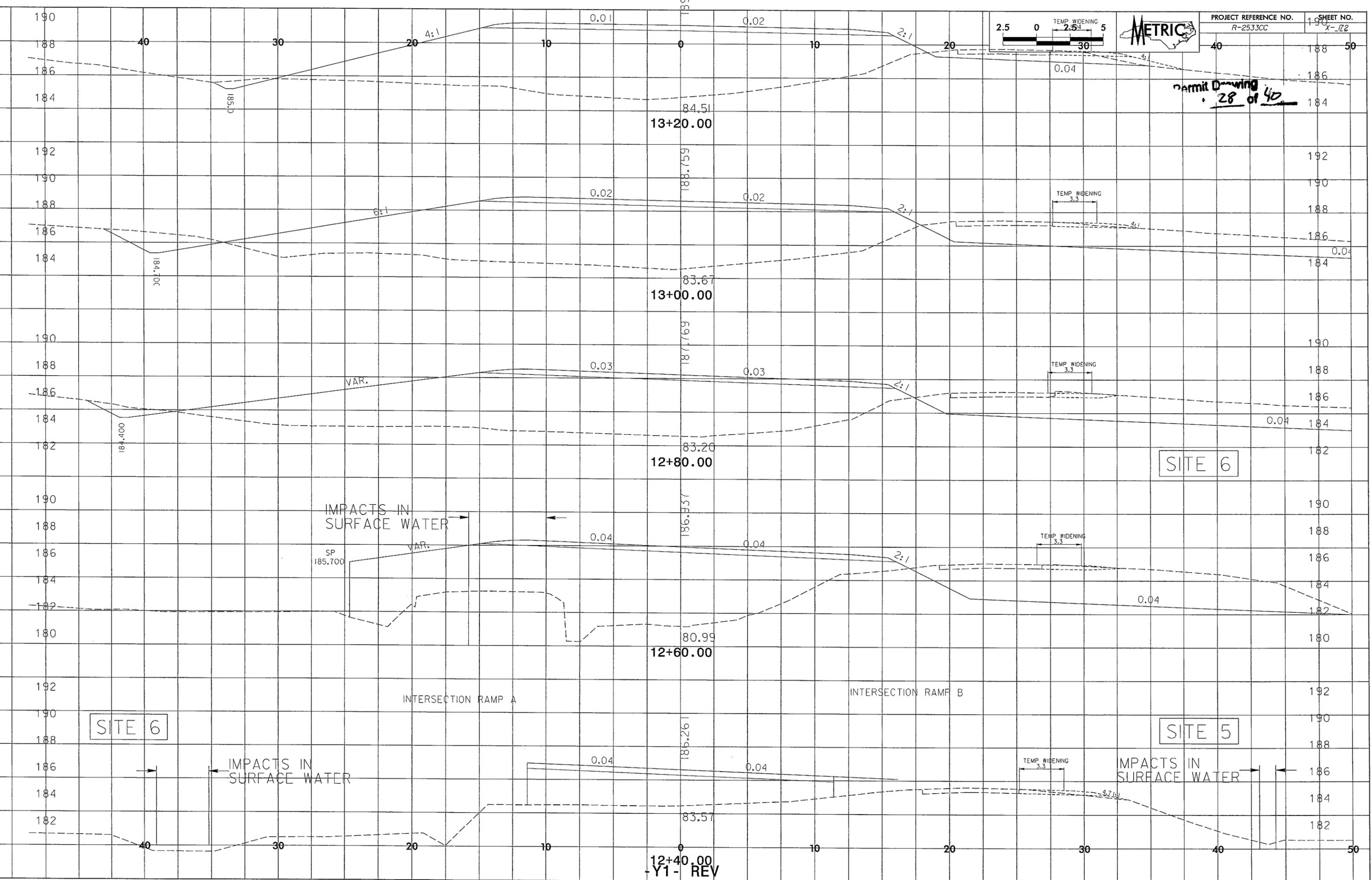
SITE 6



-Y1- RAMP A

00/26/99

10/26/2018
11:46:58 AM
C:\Users\jgibson\OneDrive\Documents\2018\10\10-26-18\10-26-18.dwg



PROJECT REFERENCE NO. R-2533CC SHEET NO. 190 X-172

Permit Drawing
28 of 40

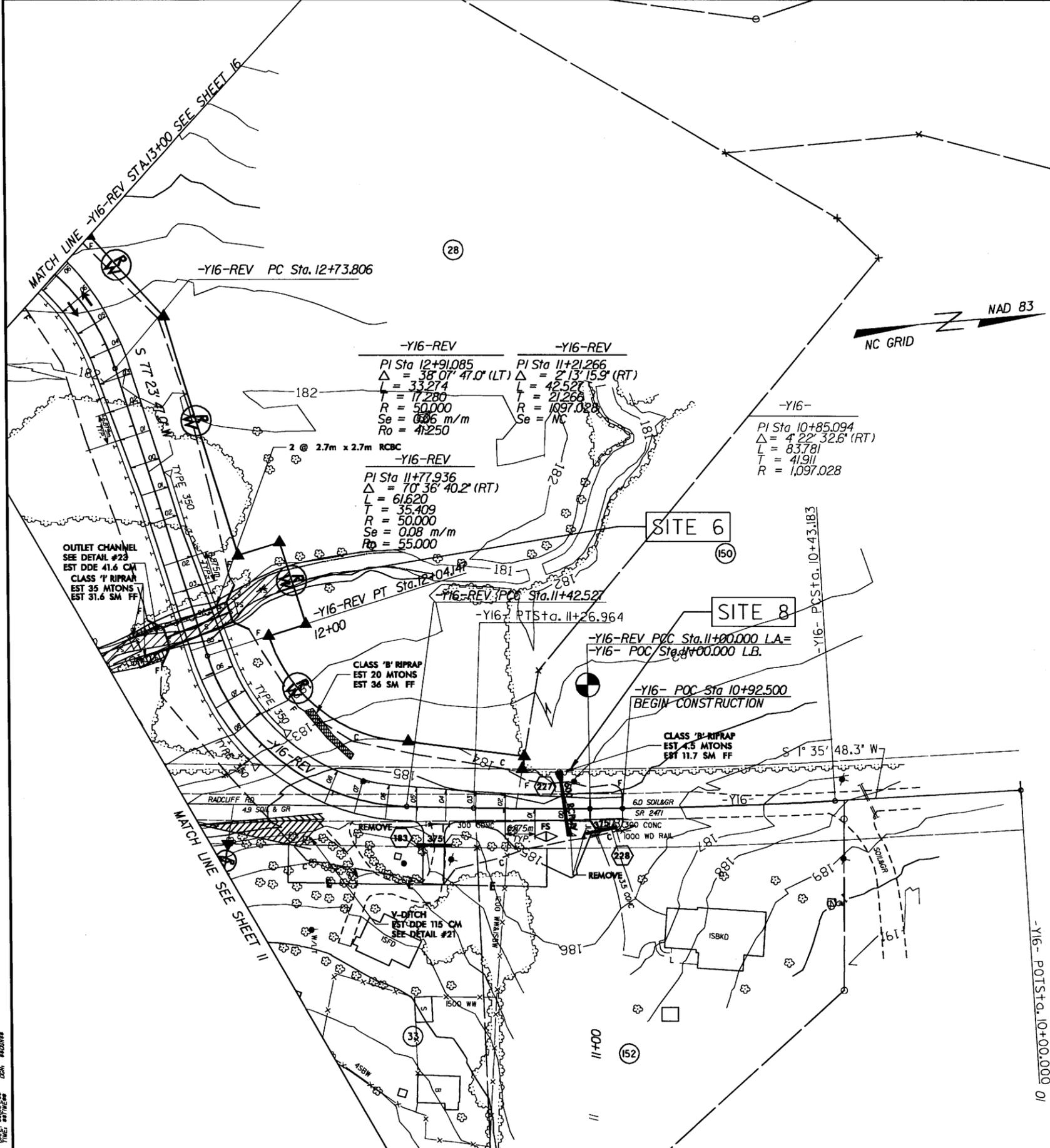
SITE 6

SITE 5

12+40.00
-Y1- REV

	PROJ. REFERENCE NO. R-2533CC	SHEET NO. 18
	HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
Prepared in the Office at:		
CONST. REV.		NC PERM. LICENSE NO. F-0342 701 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-6200 - (919) 854-6259(FAX)
RW REV.		

Permit Drawing
Sheet 30 of 40



- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

FOR -Y16-REV PROFILE, SEE SHEET 32
FOR DITCH DETAILS, SEE SHEET 2-J

NOTE: ALL DRIVEWAY RADII ARE 3.0m
UNLESS OTHERWISE SHOWN.

DATE: 04/15/08
USER: JWB
DRAWN: JWB

RAMP A STA. 0+00.000 =
 -L-REV STA. 226+90.000 14.2m LT
 BEGIN GRADE ELEV 205.998 m

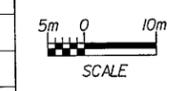
PI = 0+48.000
 EL = 204.282 m
 VC = 96 m
 K = 113

RAMP A @ -YI-REV

Permit Drawing
 Sheet 31 of 40

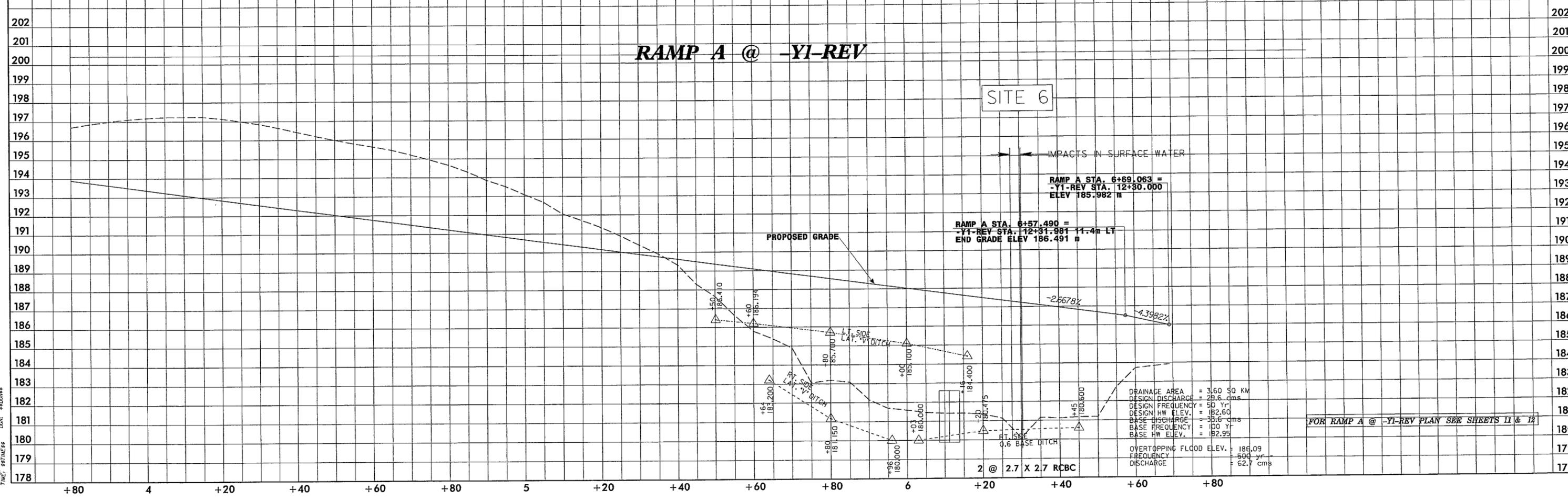
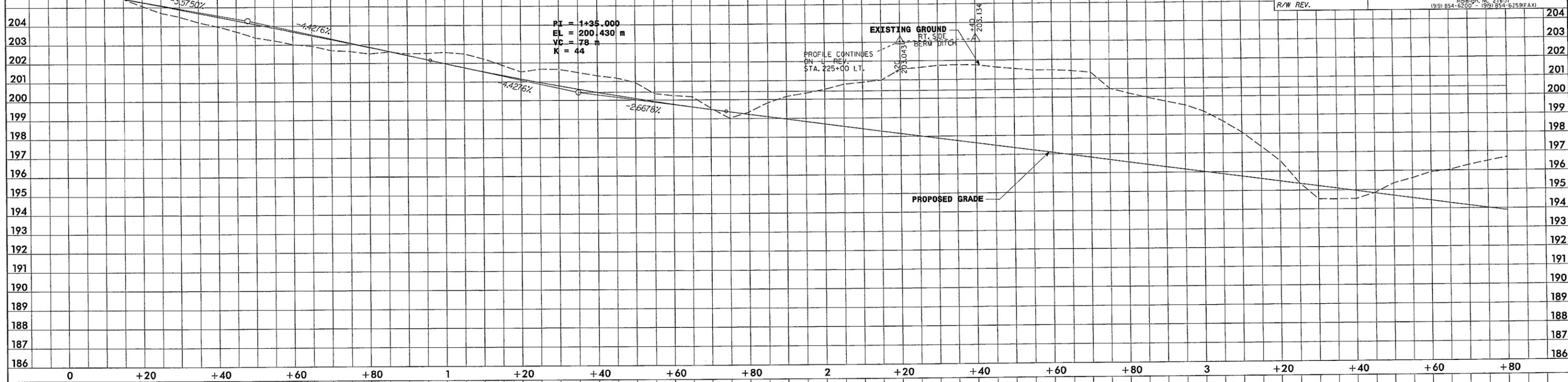


PROJ. REFERENCE NO. R-2533CC	SHEET NO. 27
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS	
DO NOT USE FOR CONSTRUCTION	



CONST. REV.
 R/W REV.

Prepared in the Office of:
EarthTech
 701 Corporate Center Drive, Suite 475
 Raleigh, NC 27671
 (919) 854-6200 (919) 854-6250(FAX)

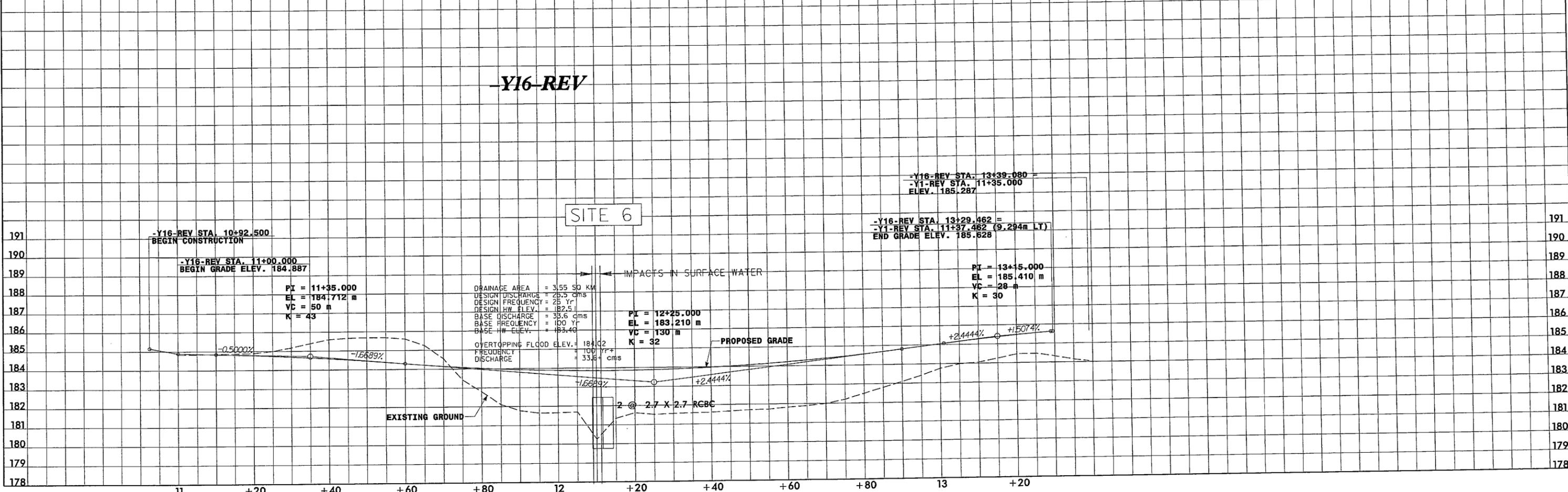
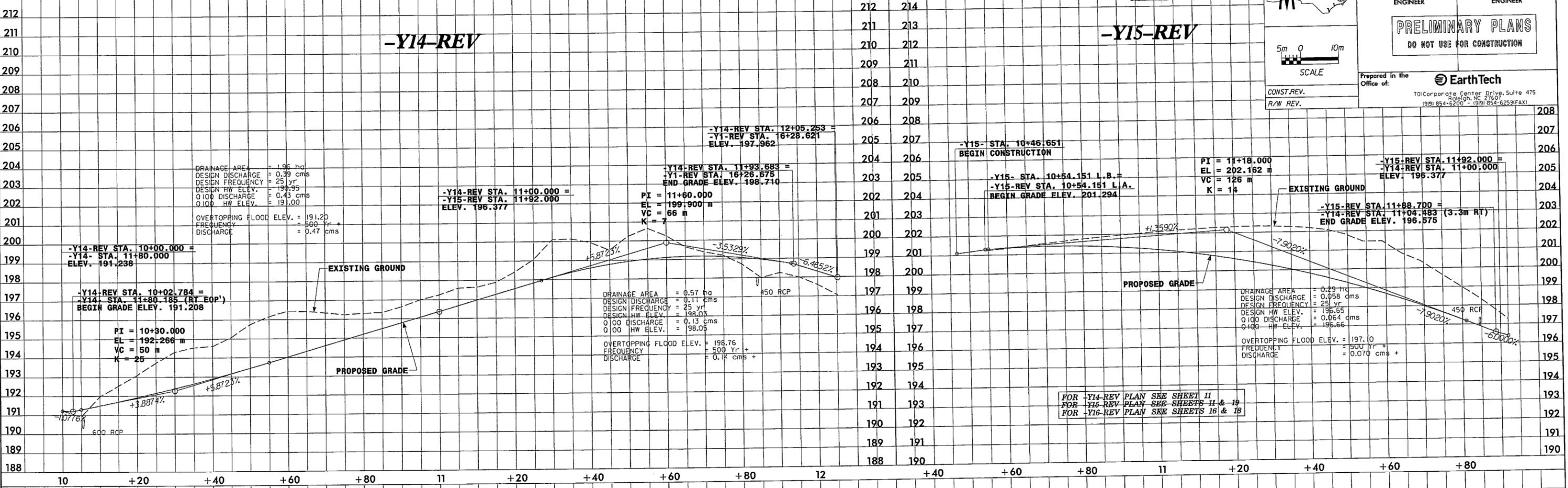
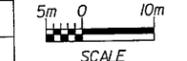


DRAINAGE AREA = 3.60 SQ KM
 DESIGN DISCHARGE = 29.6 cms
 DESIGN FREQUENCY = 50 Yr
 DESIGN HW ELEV. = 182.60
 BASE DISCHARGE = 38.6 cms
 BASE FREQUENCY = 100 Yr
 BASE HW ELEV. = 182.95

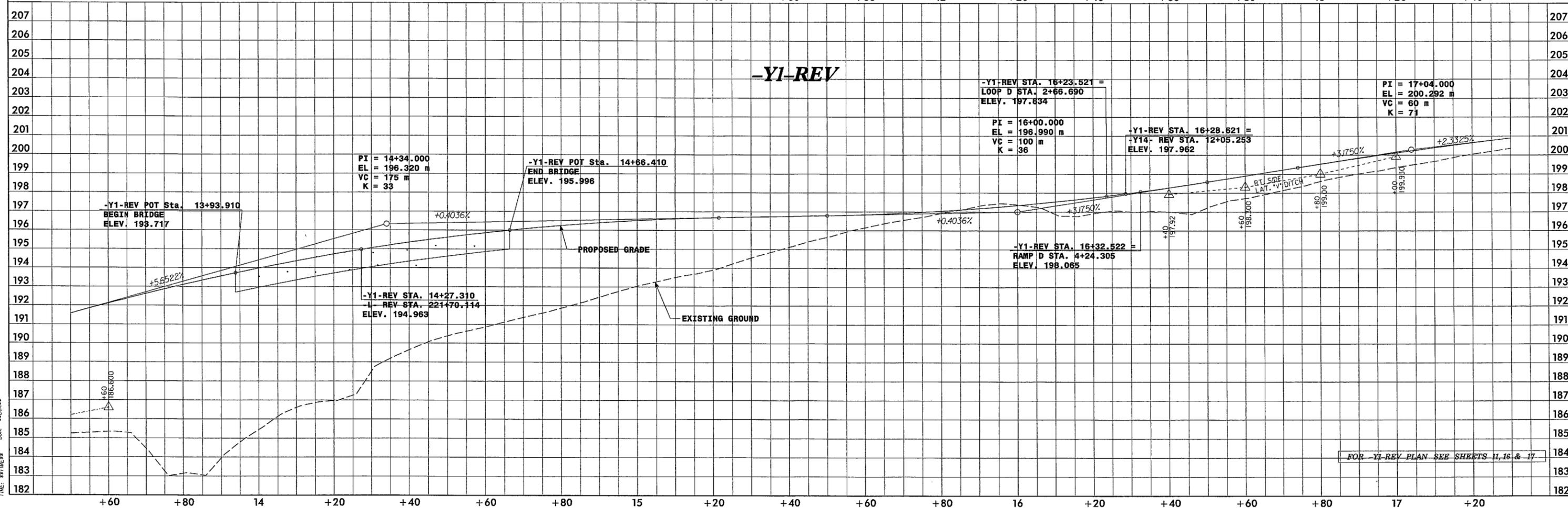
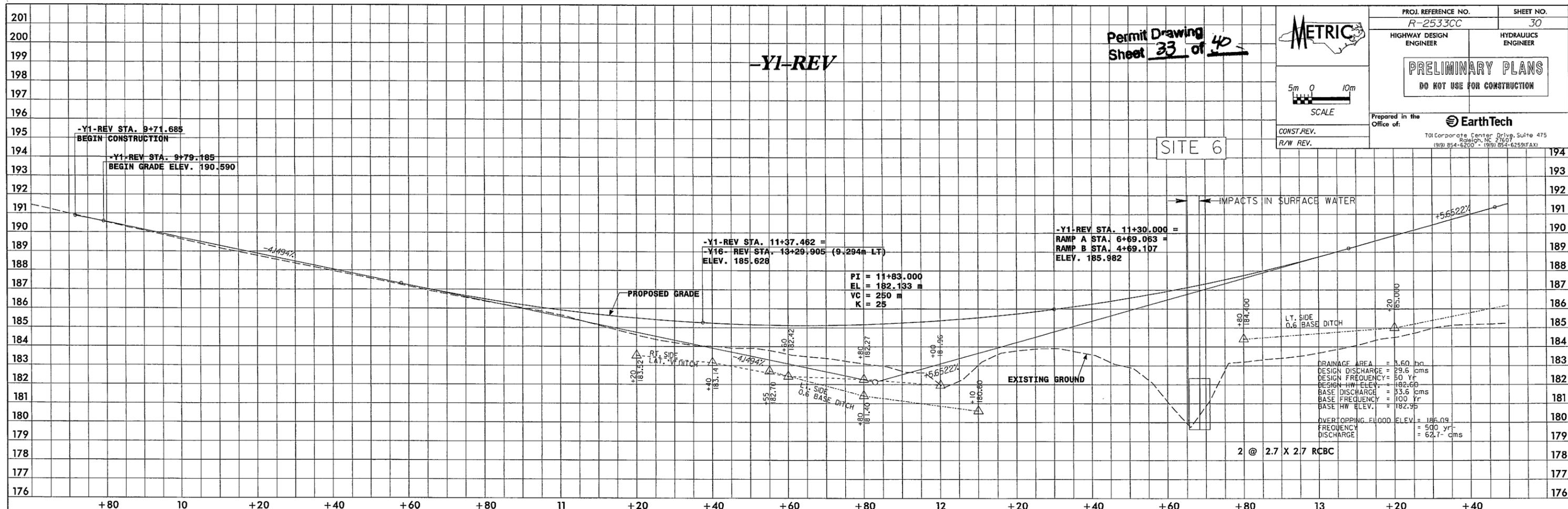
OVERTOPPING FLOOD ELEV. = 186.09
 FREQUENCY = 500 yr
 DISCHARGE = 62.7 cms

FOR RAMP A @ -YI-REV PLAN SEE SHEETS 11 & 12

USER: #105158**
 DOR: #105158**
 DATE: 8/20/03
 TIME: 8:27 AM



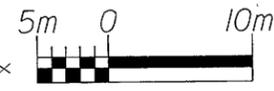
DATE: \$DATE\$ USER: \$USER\$ TIME: \$TIME\$



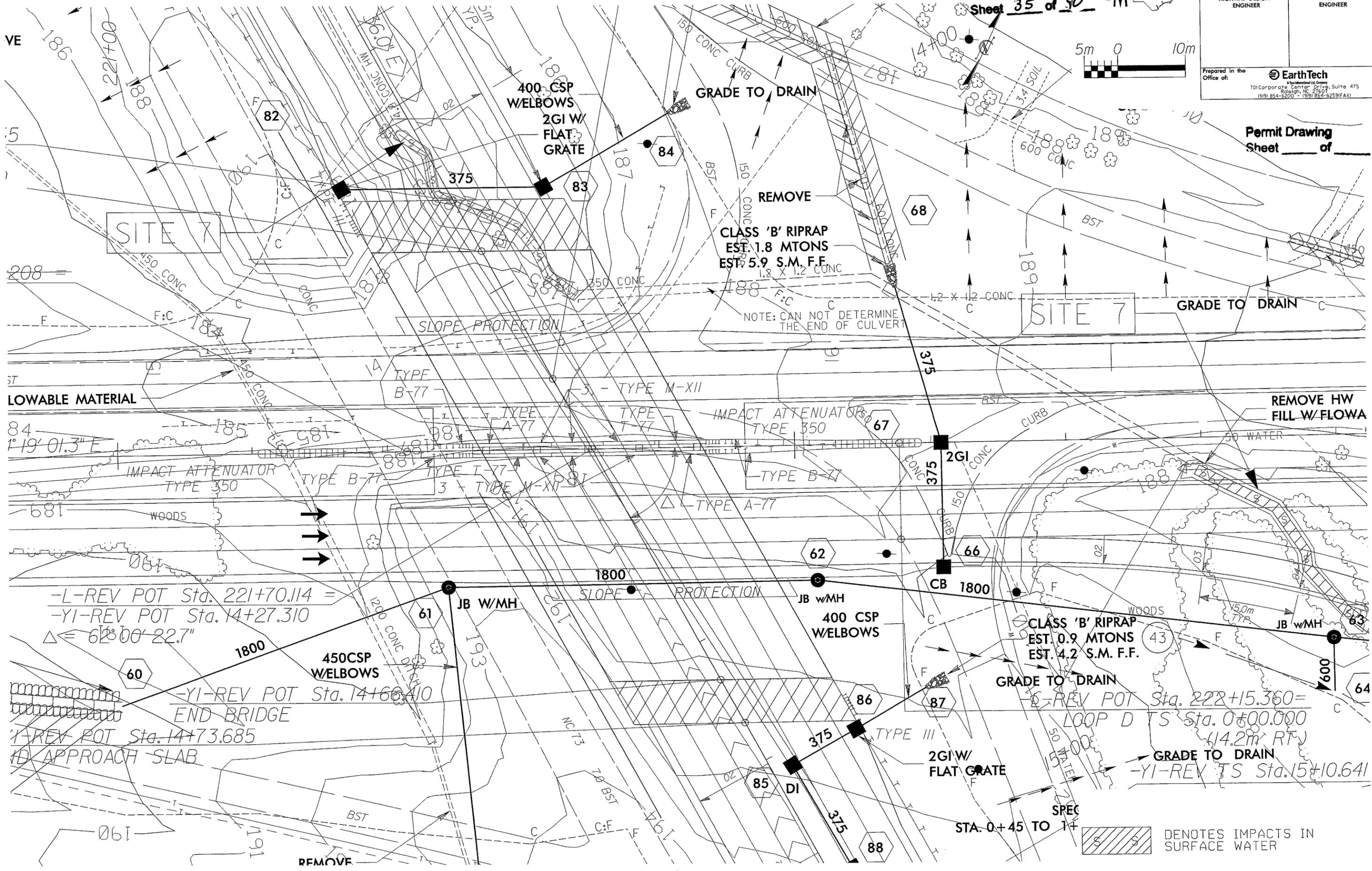
DATE: 08/15/08
DRAWN: J. WILSON
CHECKED: J. WILSON



Permit Drawing Sheet **35** of **40**



Permit Drawing Sheet _____ of _____



NOTE: CAN NOT DETERMINE THE END OF CULVERT

-L-REV POT Sta. 221+70.114 =
-YI-REV POT Sta. 14+27.310
 $\Delta \leq 62^{\circ}00'22.7''$

-YI-REV POT Sta. 14+66.410
END BRIDGE

CLASS 'B' RIPRAP
EST. 0.9 MTONS
EST. 4.2 S.M. F.F.
E-REV POT Sta. 222+15.360 =
LOOP D T/S Sta. 0+00.000
(14.2m RT)

-YI-REV T/S Sta. 15+10.641

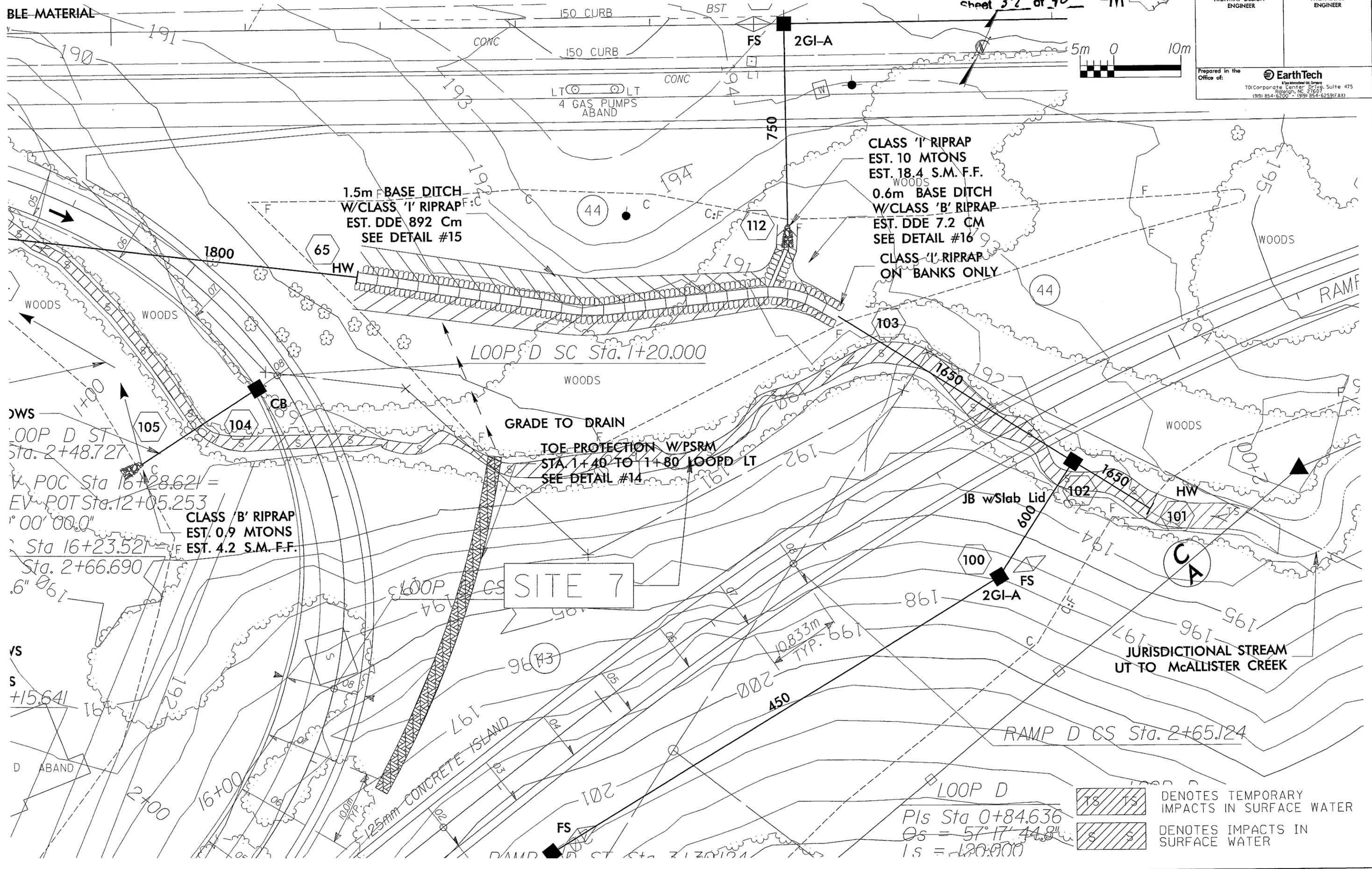
STRA. 0+45 TO 14
 DENOTES IMPACTS IN SURFACE WATER

BLE MATERIAL

Permit Drawing
Sheet 37 of 40



PROJ. REFERENCE NO. R-2533CC	SHEET NO.
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Prepared in the Office of: EarthTech 101 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-6200 • (919) 854-6259(FAX)	



1.5m BASE DITCH
W/CLASS '1' RIPRAP
EST. DDE 892 Cm
SEE DETAIL #15

CLASS '1' RIPRAP
EST. 10 MTONS
EST. 18.4 S.M. F.F.
0.6m BASE DITCH
W/CLASS 'B' RIPRAP
EST. DDE 7.2 CM
SEE DETAIL #16
CLASS '1' RIPRAP
ON BANKS ONLY

CLASS 'B' RIPRAP
EST. 0.9 MTONS
EST. 4.2 S.M. F.F.

POC Sta 16+28.621 =
EV POT Sta. 12+05.253
00' 00.0"
Sta 16+23.521 =
Sta. 2+66.690 /
6" 051

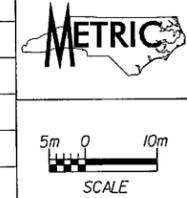
GRADE TO DRAIN
TOE PROTECTION W/PSRM
STA 1+40 TO 1+80 LOOPD LT
SEE DETAIL #14

SITE 7

JURISDICTIONAL STREAM
UT TO McALLISTER CREEK

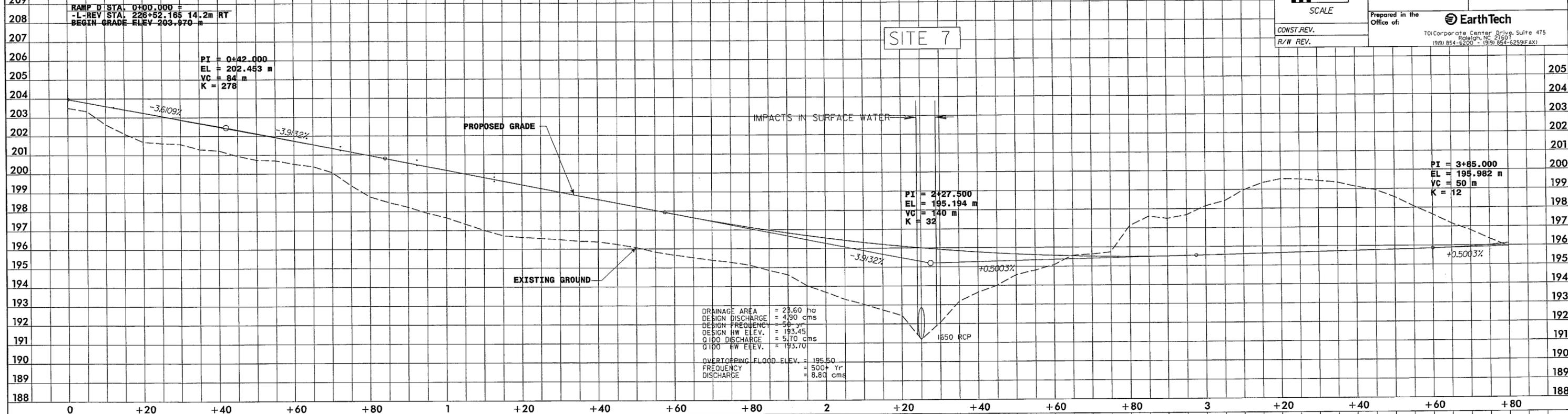
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
 DENOTES IMPACTS IN SURFACE WATER

Pls Sta 0+84.636
Os = 57° 17' 44.8"
Is = 120.000



RAMP D @ -YI-REV

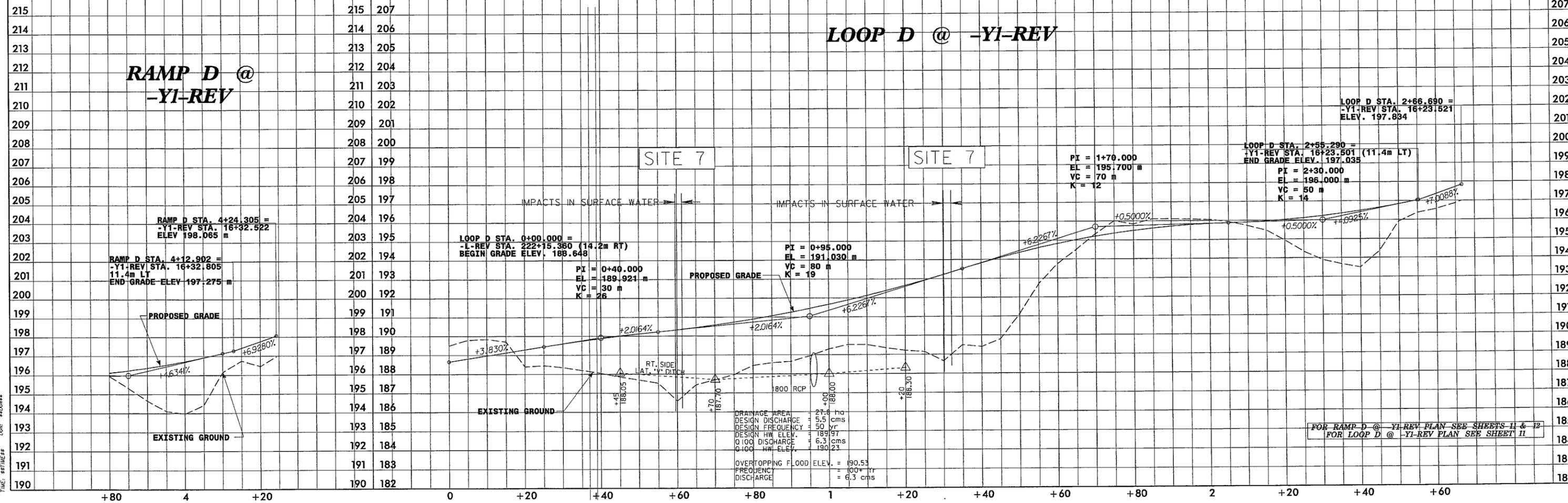
SITE 7



LOOP D @ -YI-REV

SITE 7

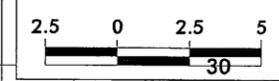
SITE 7



FOR RAMP D @ -YI-REV PLAN SEE SHEETS 11 & 12
FOR LOOP D @ -YI-REV PLAN SEE SHEET 11

DATE: 04/25/08
USER: JCS
COR: 060808

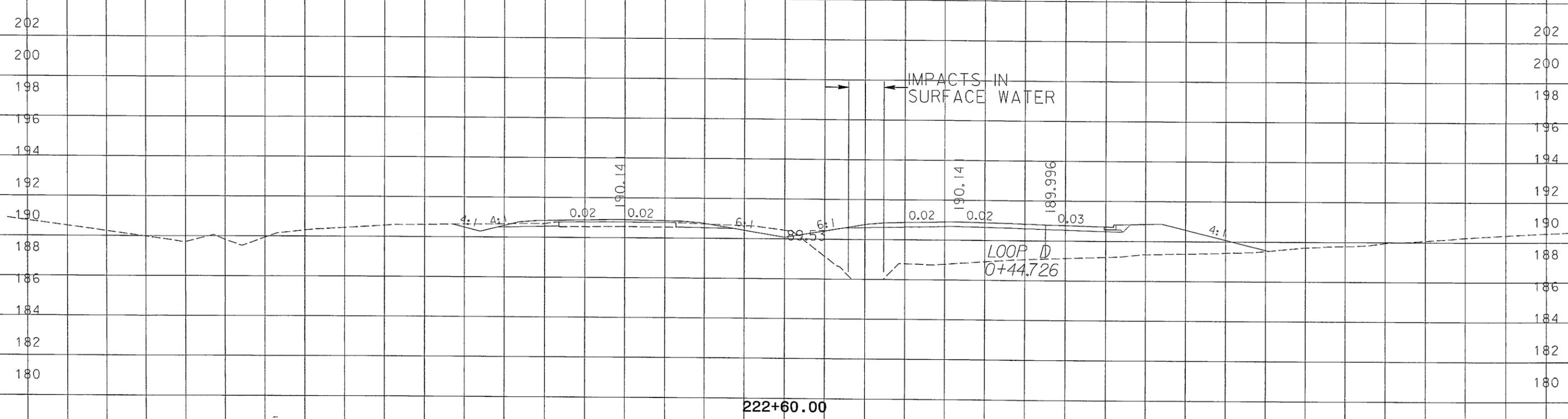
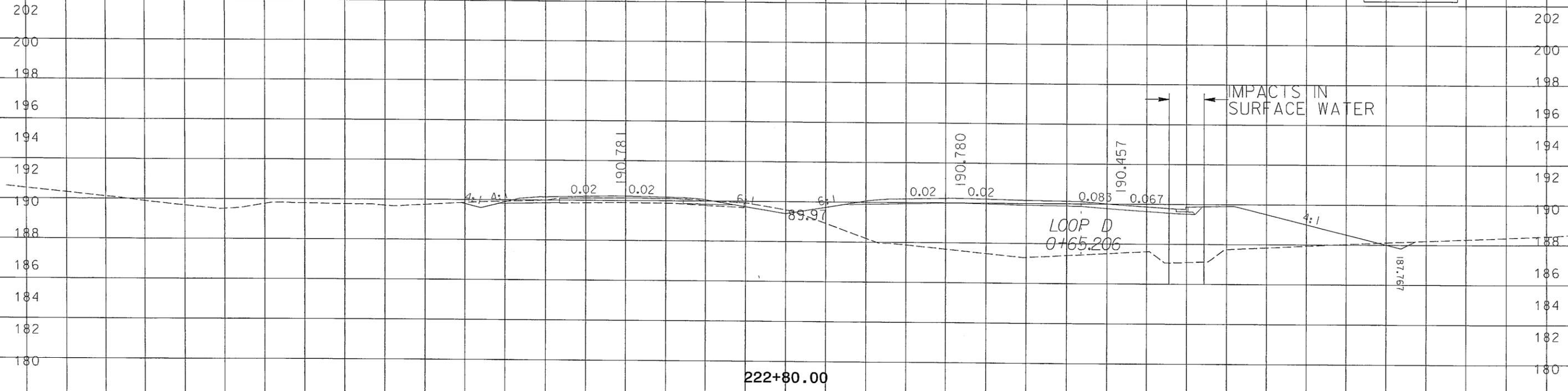
10/26/09



PROJECT REFERENCE NO. R-2533CC	SHEET NO. X-83
-----------------------------------	-------------------

Permit Drawing
set 39 of 40

SITE 7



-L-REV

 10/26/09

02/26/08

40

30

20

10

0

10

20



PROJECT REFERENCE NO.
R-2533CC

SHEET NO.
X-157

Permit Drawing
Sheet 40 of 40

SITE 7

222

222

220

220

218

218

216

216

214

214

212

212

210

210

208

208

206

206

204

204

202

202

200

200

198

198

196

196

194

194

192

192

190

190

188

188

40

30

20

10

2+40.00

10

20

30

40

50

-Y1- RAMP D

IMPACTS IN
SURFACE WATER

2:1

4:1

6:1

0.08

0.08

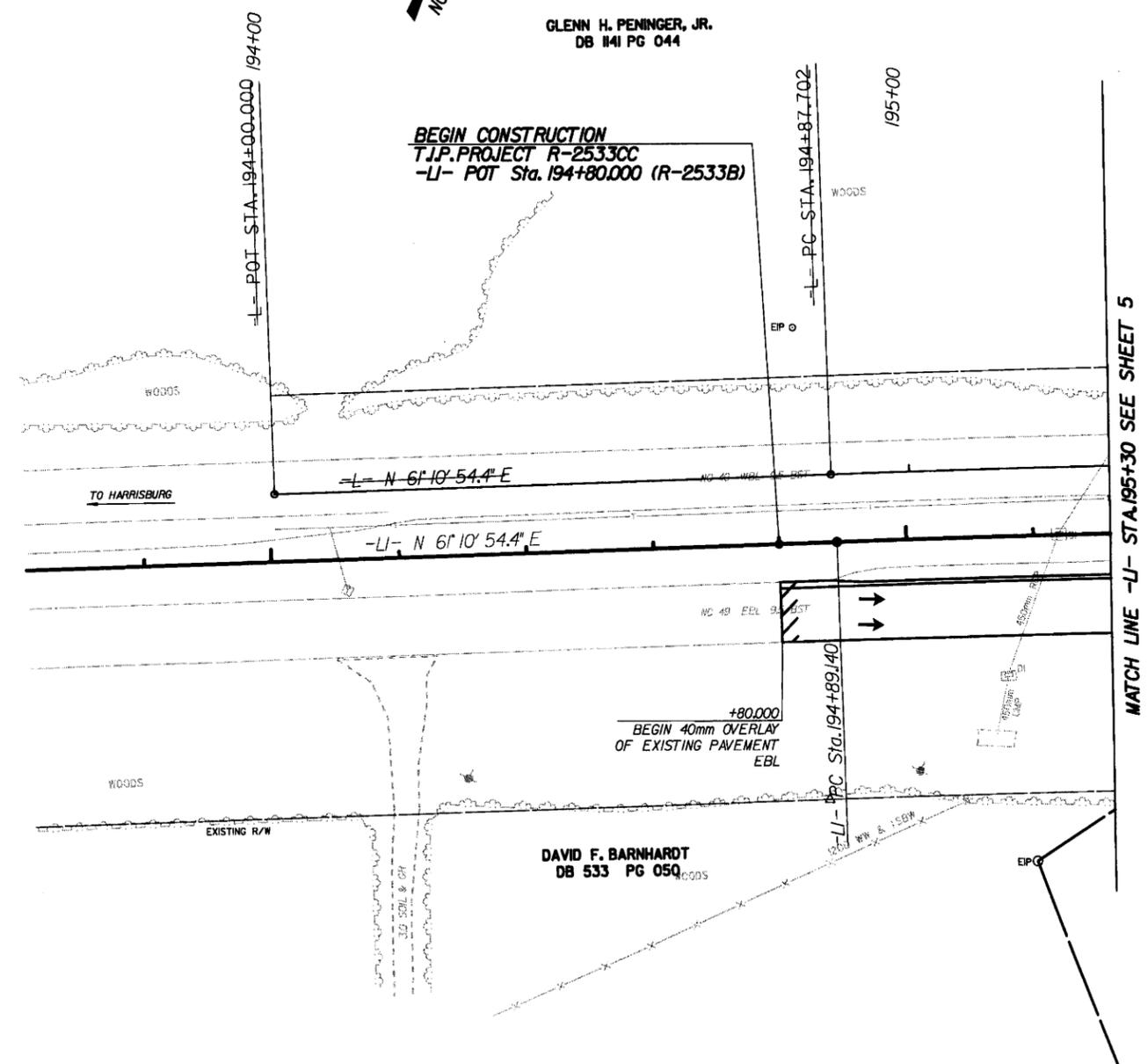
95.78

93.65

4:1

08/26/08

	PROJ. REFERENCE NO. R-2533CC	SHEET NO. 4
	HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
Prepared in the Office of:		
701 Corporate Center Drive, Suite 475 Raleigh, NC 27601 (919) 854-8200 • (919) 854-8258(FAX)		



-L-
 PI Sta 195+84.083
 $\Delta = 3' 08' 06.3''$ (RT)
 $L = 189.8375$
 $T = 94.9424$
 $R = 3,469.4000$

FOR -L- PROFILE, SEE SHEET 20
 FOR -XOVER- DETAILS, SEE SHEET 2-M
 NOTE: ALL DRIVEWAY RADII ARE 3.0m
 UNLESS OTHERWISE SHOWN.

DATE: 9/2/2009
 TIME: 10:56:08 AM
 USER: jh
 CDR: jh

	PROJ. REFERENCE NO. R-2533CC	SHEET NO. 6
	HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
CONST. REV. R/W REV.	Prepared in the Office of: 	
701 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-8200 - (919) 854-8259 (FAX)		

BM 113 EL=182.406, N 183847 E 475753
 LI STA 199+91.40 LT
 RR SPIKE IN BASE OF 375MM TWIN SYCAMORE TREE



BEGIN T.J.P. PROJECT R-2533CC
 -L-REV POT Sta 200+16.400 LA=
 -LI- POT Sta 200+17.273 LB.(R-2533B)

BEGIN GRADE
 -LI- POT Sta 199+95.000 (R-2533B)

BL-1302 -BL- PNC 9+60.070 =
 -LI- Sta 199+93.942 (17.588 LT)
 EL 184.287

-LREV-
 +50.000
 28.716 & 35.000
 (94.214' & 114.829')

①
 NED C. REECE
 DB 496 PG 151
 DB 794 PG 162

+95.00 -LI-
 END 40mm OVERLAY
 OF EXISTING PAVEMENT
 NBL & SBL

-LREV-
 +40.000
 25.637 & 30.500
 (84.175' & 100.066')

-LREV-
 +00.000
 25.637 & 35.000
 (84.112' & 114.829')

①
 NED C. REECE
 DB 496 PG 151
 DB 794 PG 162

TOE PROTECTION
 STA 200+80 TO 202+40 -L-REV LT
 SEE DETAIL #1

TOE PROTECTION -WPSRM
 STA 202+40 TO 202+60 -L-REV LT
 SEE DETAIL #2

-LREV-
 +00.000
 25.605 & 30.500
 (84.004' & 100.066')

+33.453 -LI-
 TIE TO EXISTING GUARDRAIL

1.5m BASE DITCH
 EST. DDE 22.5 CM
 SEE DETAIL #15

TDE REMOVE EXISTING
 CULVERT

-L- N 64° 20' 09.0" E 3.6m

-L-REV N 64° 19' 01.3" E

-LI- N 64° 19' 01.3" E

fs 2GL-A

60m TAPER

GEORGE S. MOORE
 DB 600 PG 638

-LREV-
 +64.577
 27.000
 (88.582')

-LREV-
 +73.754
 35.500
 (116.470')

-LREV-
 +84.730
 45.667
 (149.825')

-LREV-
 +40.000
 32.000
 35.500
 (104.986')

-LREV-
 +40.000
 27.000 & 45.667
 (88.582' & 149.825')

-LREV-
 +50.000
 27.000 & 32.000
 (88.582' & 104.986')

-LREV-
 +70.000
 27.000 & 32.000
 (88.582' & 104.986')

OUTLET CHANNEL
 SEE DETAIL #23
 CLASS 'I' RIPRAP
 EST. 143 MTONS

CLASS 'I' RIPRAP
 EST. 10 MTONS
 EST. 18.4 S.M. F.F.

②
 CLARENCE A. ALLMAN
 & wife HILDA R.

FOR -LI-/-L-REV PROFILE, SEE SHEETS 20 & 21
 FOR -XOVER- DETAILS, SEE SHEET 2-M
 FOR DITCH DETAILS, SEE SHEET 2-J

NOTE: ALL DRIVEWAY RADII ARE 3.0m
 UNLESS OTHERWISE SHOWN.

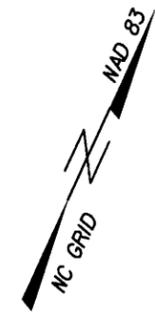
R/W REV. 01/20/09
 1) ADDED PDE TO PARCEL 1 FOR DRAINAGE REV. 05/07/09
 2) REVISED OWNER NAME PARCEL 2 AND R/W 01/20/09
 3) REVISED OWNER NAME PARCEL 2 AND R/W 11/20/09 FOR EROSION CONTROL CHGR 07/20/09

USER: N10
 DATE: 02/20/09
 TIME: 08:27 AM

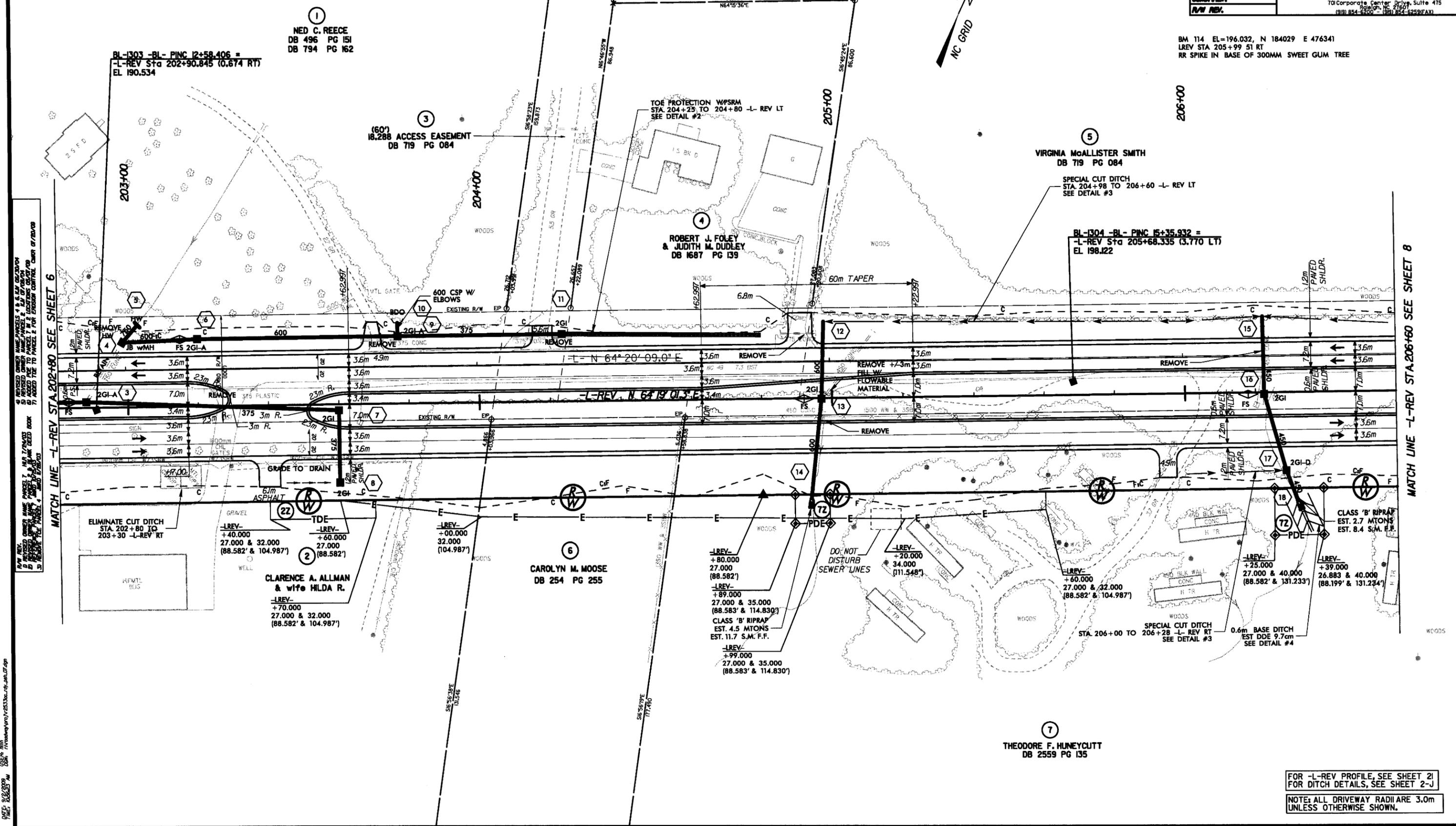
MATCH LINE -LI- STA 199+00.000 SEE SHEET 5

MATCH LINE -L-REV STA 202+80 SEE SHEET 7

	PROJ. REFERENCE NO. R-2533CC	SHEET NO. 7
	HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
Prepared in the Office of: 	70 Corporate Center Drive, Suite 415 Raleigh, NC 27607 (919) 854-5200 - (919) 854-5255(FAX)	



BM 114 EL=196.032, N 184029 E 476341
 LREV STA 205+99.51 RT
 RR SPIKE IN BASE OF 300MM SWEET GUM TREE



1. REVISED OWNER NAME PARCELS 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

MATCH LINE -L-REV STA 206+60 SEE SHEET 8

FOR -L-REV PROFILE, SEE SHEET 2-I
 FOR DITCH DETAILS, SEE SHEET 2-J
 NOTE: ALL DRIVEWAY RADII ARE 3.0m
 UNLESS OTHERWISE SHOWN.

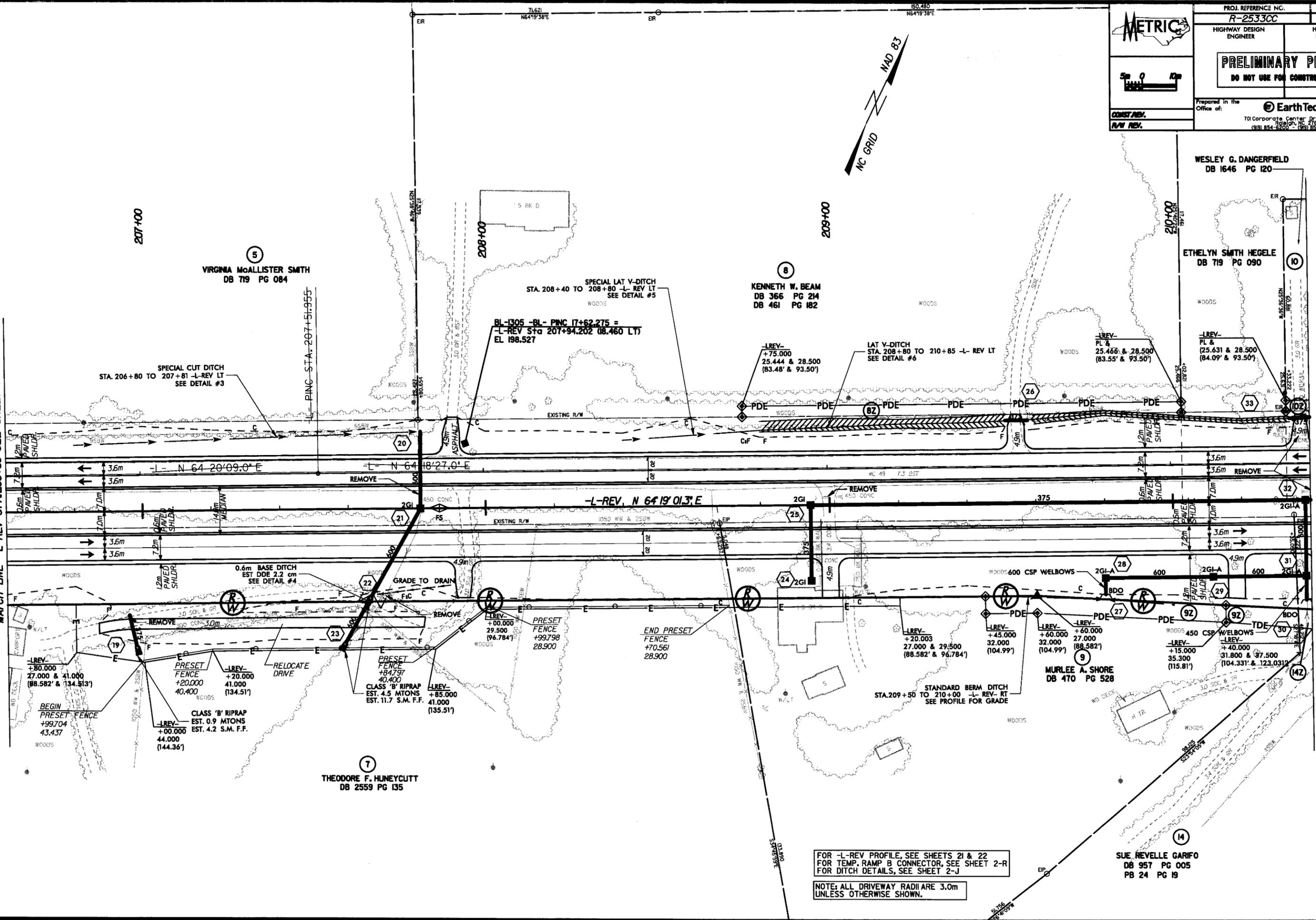
PROJ. REFERENCE NO. **R-2533CC** SHEET NO. **B**

HIGHWAY DESIGN ENGINEER HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: **EarthTech**
701 Corporate Center Drive, Suite 475
Raleigh, NC 27601
(919) 854-8200 • (919) 854-8255(FAX)

1. REVISED OWNER NAME PARCEL 10, KLV 05/20/04
 2. REVISED OWNER NAME PARCELS 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.



MATCH LINE -L-REV STA. 210+40 SEE SHEET 9

FOR -L-REV PROFILE, SEE SHEETS 21 & 22
 FOR TEMP. RAMP B CONNECTOR, SEE SHEET 2-R
 FOR DITCH DETAILS, SEE SHEET 2-J

NOTE: ALL DRIVEWAY RADII ARE 3.0m
 UNLESS OTHERWISE SHOWN.

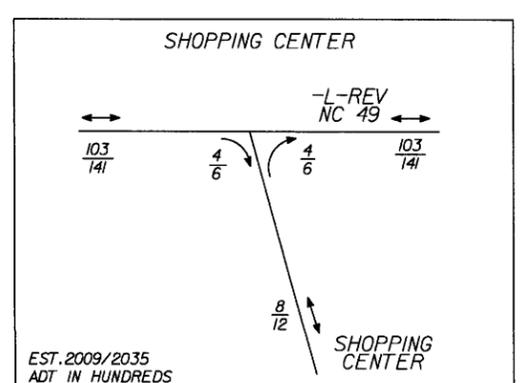
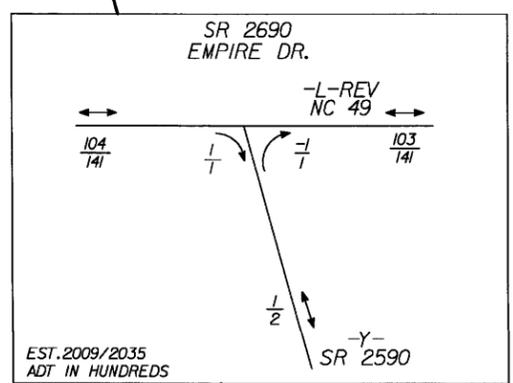
USER: WJD
 DATE: 02/02/04
 TIME: 02:02 PM
 C:\working\proj\2533\plan_08.dwg

PROJ. REFERENCE NO. R-2533CC SHEET NO. 10

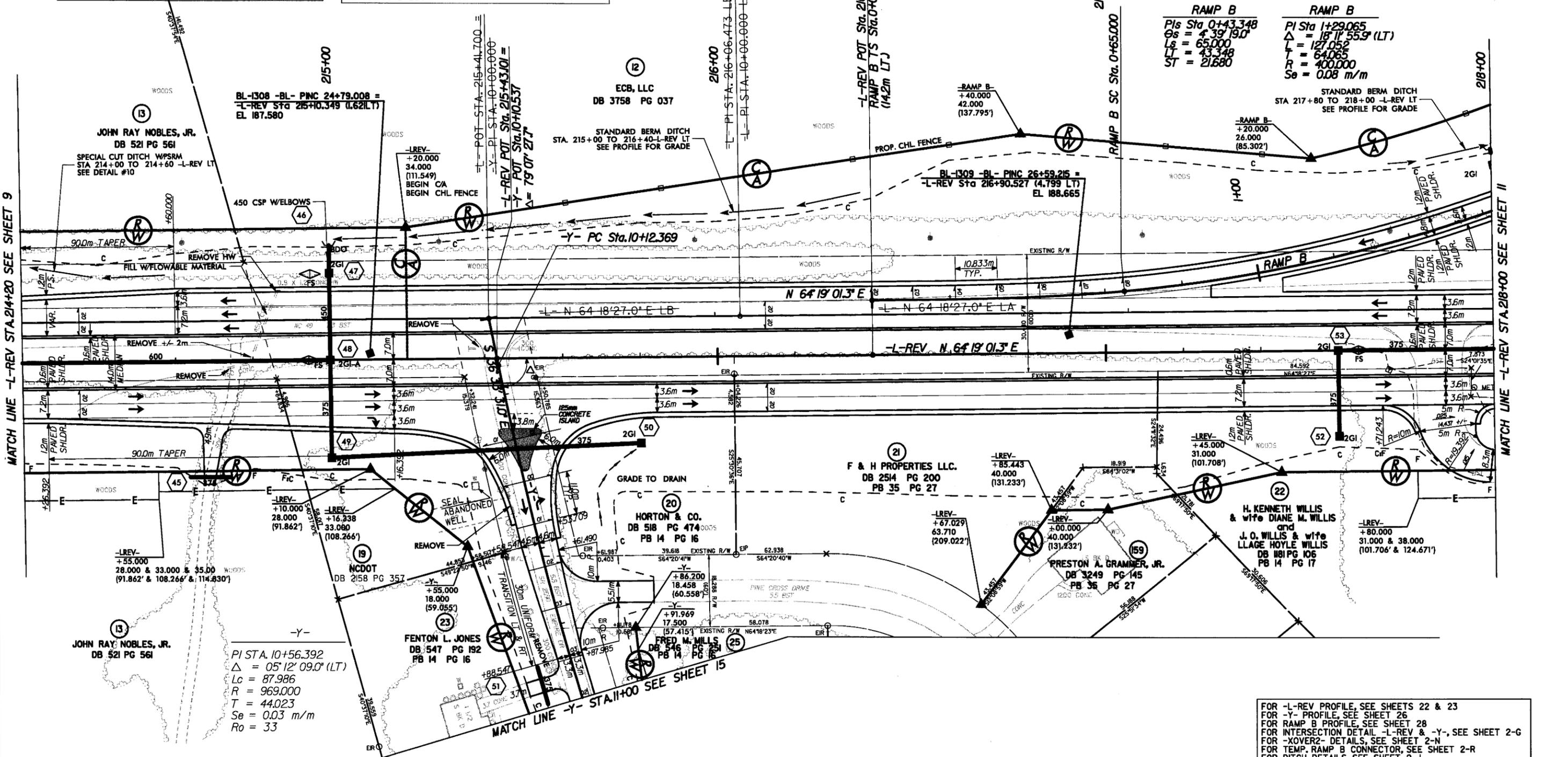
HIGHWAY DESIGN ENGINEER HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: **EarthTech**
70 Corporate Center Drive, Suite 475
Raleigh, NC 27601
(919) 854-5200 (919) 854-6253(FAX)



BM 1 EL=188.489, N 184635 E 477358
LREV STA 217+79.54 LT
RR SPIKE IN BASE OF 610MM RED OAK



RAMP B		RAMP B	
PIs Sta 0+43.348	PI Sta 1+29.065		
Gs = 4.39/190'	Δ = 18 11' 55.9" (LT)		
Ls = 65.000	L = 127.052		
LT = 43.348	T = 64.065		
ST = 21.680	R = 400.000		
	Se = 0.08 m/m		

STANDARD BERM DITCH
STA 217+80 TO 218+00 -L-REV LT
SEE PROFILE FOR GRADE

PI STA. 10+56.392
Δ = 05°12'09.0" (LT)
Lc = 87.986
R = 969.000
T = 44.023
Se = 0.03 m/m
Ro = 33

FOR -L-REV PROFILE, SEE SHEETS 22 & 23
FOR -Y- PROFILE, SEE SHEET 26
FOR RAMP B PROFILE, SEE SHEET 28
FOR INTERSECTION DETAIL -L-REV & -Y-, SEE SHEET 2-G
FOR -XOVER2- DETAILS, SEE SHEET 2-N
FOR TEMP. RAMP B CONNECTOR, SEE SHEET 2-R
FOR DITCH DETAILS, SEE SHEET 2-J

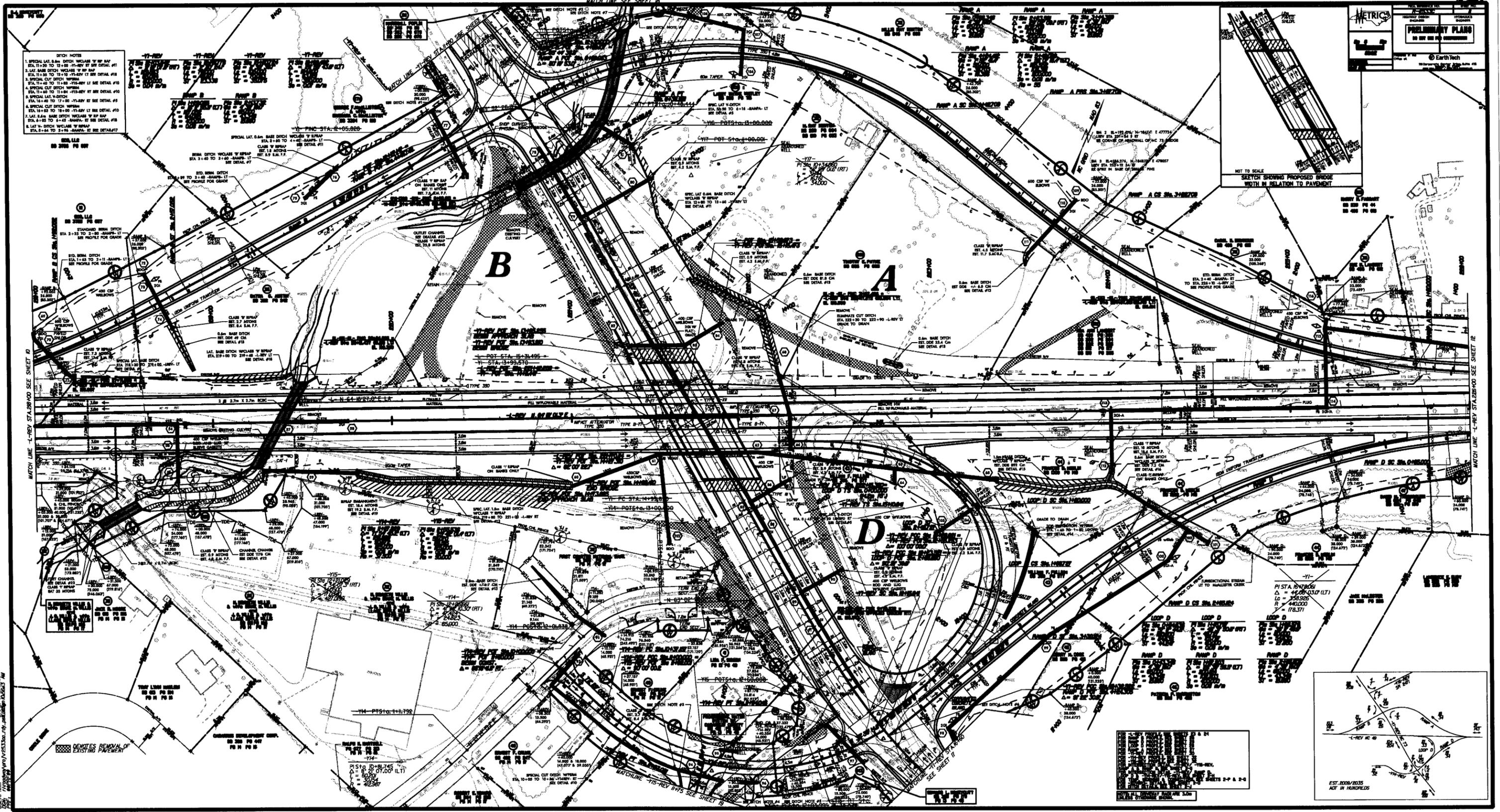
NOTE: ALL DRIVEWAY RADII ARE 3.0m
UNLESS OTHERWISE SHOWN.

MATCH LINE -L-REV STA.214+20 SEE SHEET 9

MATCH LINE -L-REV STA.218+00 SEE SHEET 11

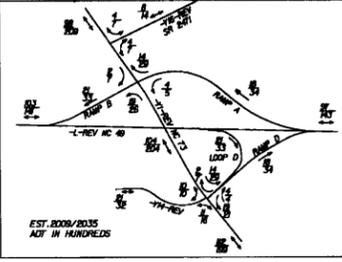
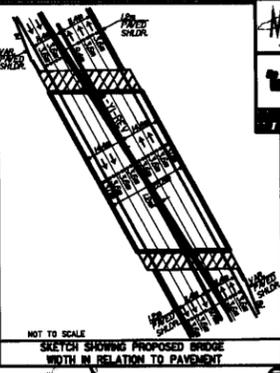
MATCH LINE -Y- STA.11+00 SEE SHEET 15

USER: N/A DATE: 02/28/2009



DITCH NOTES
1. SPECIAL LAT. BASE DITCH W/SPRAY
STA. 11+30 TO 12+00 - 7'-REV BY SEE DETAIL #11
2. LAT. BASE DITCH W/SPRAY
STA. 11+30 TO 12+00 - 7'-REV BY SEE DETAIL #11
3. SPECIAL CUT DITCH W/SPRAY
STA. 11+40 TO 11+80 - 7'-REV BY SEE DETAIL #10
4. SPECIAL CUT DITCH W/SPRAY
STA. 11+40 TO 11+80 - 7'-REV BY SEE DETAIL #10
5. SPECIAL CUT DITCH W/SPRAY
STA. 11+40 TO 11+80 - 7'-REV BY SEE DETAIL #10
6. SPECIAL CUT DITCH W/SPRAY
STA. 11+40 TO 11+80 - 7'-REV BY SEE DETAIL #10
7. LAT. BASE DITCH W/SPRAY
STA. 11+40 TO 11+80 - 7'-REV BY SEE DETAIL #11
8. LAT. V. DITCH W/SPRAY
STA. 11+40 TO 11+80 - 7'-REV BY SEE DETAIL #11

METRICS
PRELIMINARY PLAN
EarthTech
10000 W. 10th Ave., Suite 100
Denver, CO 80202
Tel: 303.755.1000
Fax: 303.755.1001
www.earthtech.com

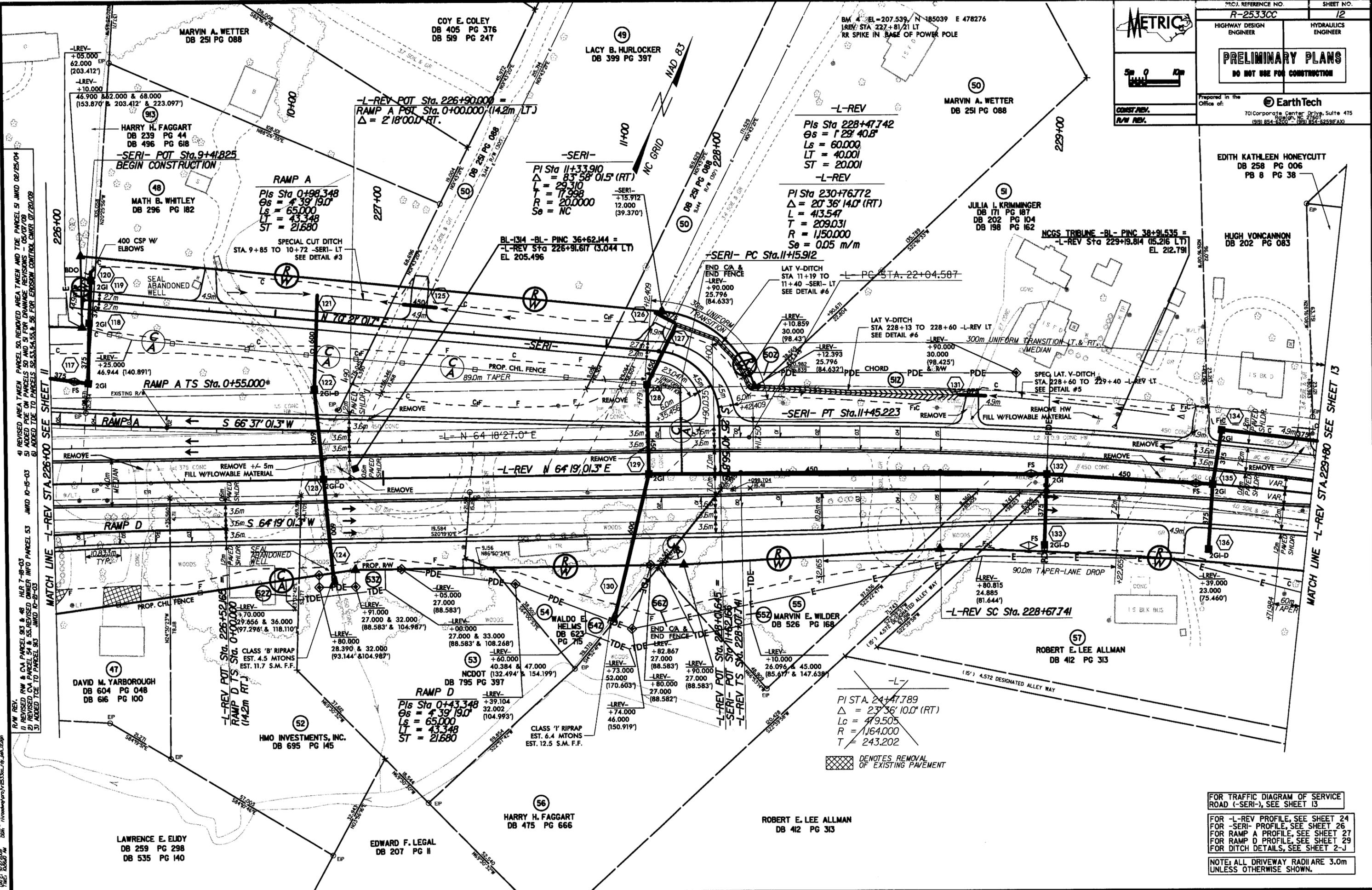


PROJECT REFERENCE NO. **R-2533CC** SHEET NO. **12**

HIGHWAY DESIGN ENGINEER HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: **EarthTech**
70 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-3400 • (919) 854-5255(FAX)



RAW REV. HMO INVESTMENTS, INC. DB 695 PG 145

4) REVISED AREA TAKEN PARCEL 50 REMOVED AREA TAKEN AND TIE PARCEL 51 JMD 02/25/04

5) REVISED RW & CA PARCEL 93 & 48 HUR 7-18-03

6) REVISED CA PARCEL 54 & 55 REVISED OWNER INFO PARCEL 53 JMD 10-15-03

7) REVISED CA PARCEL 54 & 55 REVISED OWNER INFO PARCEL 53 JMD 10-15-03

8) ADDED TIE TO PARCEL 53 JMD 10-15-03

9) ADDED TIE TO PARCEL 53 JMD 10-15-03

10) ADDED TIE TO PARCEL 53 JMD 10-15-03

11) ADDED TIE TO PARCEL 53 JMD 10-15-03

12) ADDED TIE TO PARCEL 53 JMD 10-15-03

13) ADDED TIE TO PARCEL 53 JMD 10-15-03

14) ADDED TIE TO PARCEL 53 JMD 10-15-03

15) ADDED TIE TO PARCEL 53 JMD 10-15-03

16) ADDED TIE TO PARCEL 53 JMD 10-15-03

17) ADDED TIE TO PARCEL 53 JMD 10-15-03

18) ADDED TIE TO PARCEL 53 JMD 10-15-03

19) ADDED TIE TO PARCEL 53 JMD 10-15-03

20) ADDED TIE TO PARCEL 53 JMD 10-15-03

21) ADDED TIE TO PARCEL 53 JMD 10-15-03

22) ADDED TIE TO PARCEL 53 JMD 10-15-03

23) ADDED TIE TO PARCEL 53 JMD 10-15-03

24) ADDED TIE TO PARCEL 53 JMD 10-15-03

25) ADDED TIE TO PARCEL 53 JMD 10-15-03

26) ADDED TIE TO PARCEL 53 JMD 10-15-03

27) ADDED TIE TO PARCEL 53 JMD 10-15-03

28) ADDED TIE TO PARCEL 53 JMD 10-15-03

29) ADDED TIE TO PARCEL 53 JMD 10-15-03

30) ADDED TIE TO PARCEL 53 JMD 10-15-03

31) ADDED TIE TO PARCEL 53 JMD 10-15-03

32) ADDED TIE TO PARCEL 53 JMD 10-15-03

33) ADDED TIE TO PARCEL 53 JMD 10-15-03

34) ADDED TIE TO PARCEL 53 JMD 10-15-03

35) ADDED TIE TO PARCEL 53 JMD 10-15-03

36) ADDED TIE TO PARCEL 53 JMD 10-15-03

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98) ADDED TIE TO PARCEL 53 JMD 10-15-03

99) ADDED TIE TO PARCEL 53 JMD 10-15-03

100) ADDED TIE TO PARCEL 53 JMD 10-15-03

PI STA. 24+47.789
 $\Delta = 23' 36" 10.0'$ (RT)
 $L_c = 479.505$
 $R = 1164.000$
 $T = 243.202$

■ DENOTES REMOVAL OF EXISTING PAVEMENT

FOR TRAFFIC DIAGRAM OF SERVICE ROAD (-SERI-), SEE SHEET 13

FOR -L-REV PROFILE, SEE SHEET 24

FOR -SERI- PROFILE, SEE SHEET 26

FOR RAMP A PROFILE, SEE SHEET 27

FOR RAMP D PROFILE, SEE SHEET 29

FOR DITCH DETAILS, SEE SHEET 2-J

NOTE: ALL DRIVEWAY RADII ARE 3.0m UNLESS OTHERWISE SHOWN.

HUGH VONCANNON
DB 202 PG 083

-L-
PI STA. 24+47.789
Δ = 23°36'10.0" (RT)
Lc = 419.505
R = 1164.000
T = 243.202

-L-REV
PI Sta 230+76.772
Δ = 20°36'14.0" (RT)
L = 413.547
T = 209.031
R = 1150.000
Se = 0.05 m/m

-Y2-REV
PI Sta 10+65.358
Δ = 9°19'15.9" (LT)
L = 39.369
T = 19.728
R = 242.000

-Y2-REV
PI Sta 11+22.399
Δ = 32°05'59.4" (LT)
L = 72.832
T = 37.399
R = 130.000
Se = 0.06 m/m
Ro = 30

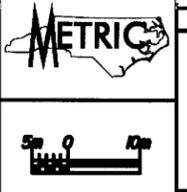
-Y2-
PI STA. 10+85.460
Δ = 18°41'33.0" (LT)
Lc = 78.952
R = 242.000
T = 39.830

60
THYRA E. DRYE
DB 549 PG 184
PB 8 PG 14

BEGIN CONSTRUCTION
-Y2-REV POC Sta.10+52.500

JOHN J. HILL
DB 508 PG 618
PB 8 PG 14

VANCE E. MILLER
DB 409 PG 243
PB 8 PG 14



PROJ. REFERENCE NO.	R-2533CC	SHEET NO.	13
HIGHWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS			
DO NOT USE FOR CONSTRUCTION			

Prepared in the Office of:
EarthTech
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-5300 (Fax) (919) 854-5250 (Fax)

RETHR FRICK
DB 157 PG 072
PB 8 PG 14

JEFFERY LEE ALLMAN
DB 862 PG 008
PB 8 PG 14

JENNIFER R. & HYORICK STONE
DB 2566 PG 320
PB 8 PG 14

BARBARA K. MCLESTER
DB 349 PG 98
PB 8 PG 14

EDITH H. EAGLE
DB 199 PG 52
PB 8 PG 38

EDITH KATHLEEN HONEYCUTT
DB 258 PG 006
PB 8 PG 38

JAMES D. HONEYCUTT
DB 240 PG 335
PB 8 PG 38

WILLIAM R. HONEYCUTT, JR.
DB 258 PG 008
PB 8 PG 38

ROBERT E. LEE ALLMAN
DB 412 PG 313

ROBERT E. ALLMAN
DB 282 PG 069
PB 8 PG 14

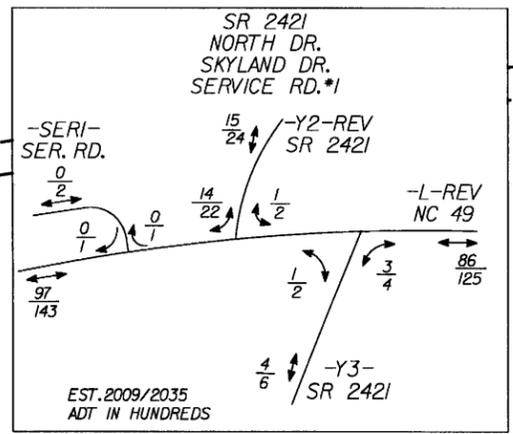
ROBERT E. ALLMAN
DB 899 PG 89
PB 8 PG 14

OLA MAE MCLESTER
DB 342 PG 244

DOUGLAS H. STEADMAN
DB 2187 PG 220
PB 8 PG 14

DOUGLAS H. STEADMAN
DB 2187 PG 220
PB 8 PG 14

FOR -L-REV PROFILE, SEE SHEETS 24 & 25
FOR -Y2-REV PROFILE, SEE SHEET 31
FOR -Y3- PROFILE, SEE SHEET 31
FOR INTERSECTION DETAIL -L-REV/ -Y2-REV
& -L-REV/ -Y3- SEE SHEET 2-I
FOR DITCH DETAILS, SEE SHEET 2-J
NOTE: ALL DRIVEWAY RADII ARE 3.0m
UNLESS OTHERWISE SHOWN.



DATE: 08/26/2009 11:26:28 AM USER: MJD DRAWN: MJD CHECKED: VMC

MATCH LINE -L-REV STA 229+80 SEE SHEET 12

MATCH LINE -L-REV STA 233+40 SEE SHEET 14

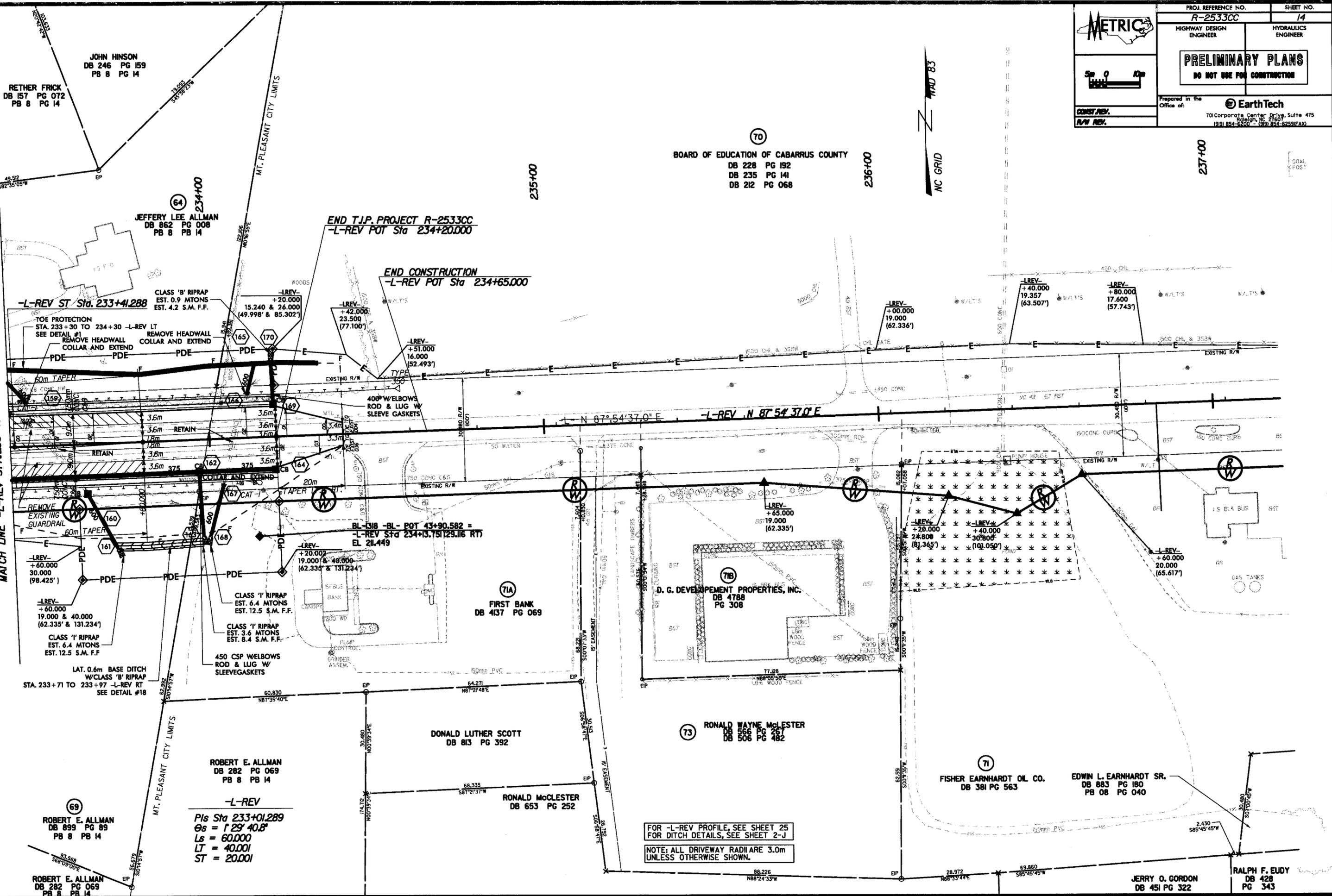
PROJ. REFERENCE NO. **R-2533CC** SHEET NO. **14**

HIGHWAY DESIGN ENGINEER
HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of:
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70 Corporate Center Drive, Suite 475
Raleigh, NC 27609
(919) 854-6200 - (919) 854-6259(FAX)

5) REVISED PARCEL MAP/REVISED TIE ADJUSTED TO PARCEL TO JMD 03/18/04
 6) REVISED TIE PARCEL TO JMD 03/18/04
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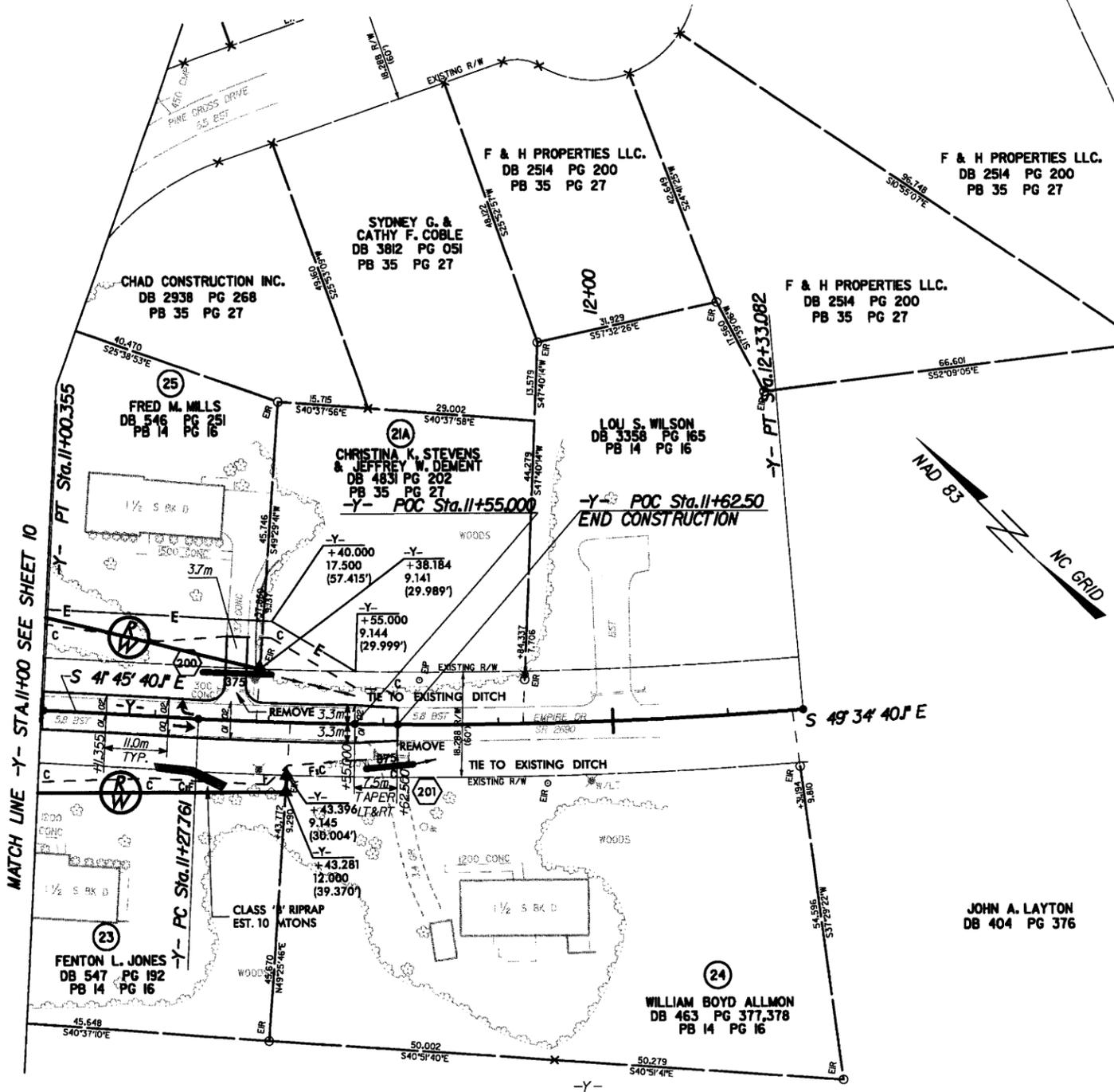


FOR -L-REV PROFILE, SEE SHEET 25
 FOR DITCH DETAILS, SEE SHEET 2-J
 NOTE: ALL DRIVEWAY RADII ARE 3.0m
 UNLESS OTHERWISE SHOWN.

-L-REV
 PIs Sta 233+01.289
 Gs = 1' 29" 40.8"
 Ls = 60.000
 LT = 40.001
 ST = 20.001

DATE: 9/2/2009
 USER: Wm
 PLOT: R2533CC.dwg

	PROJ. REFERENCE NO. R-2533CC	SHEET NO. 15
	HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
Prepared in the Office of:		
70 Corporate Center Drive, Suite 415 Raleigh, NC 27607 (919) 854-8200 • (919) 854-5259(FAX)		



-Y-
 PI STA. 11+80.504
 $\Delta = 07^{\circ} 49' 00.0''$ (LT)
 $Lc = 105.321$
 $R = 772.000$
 $T = 52.743$

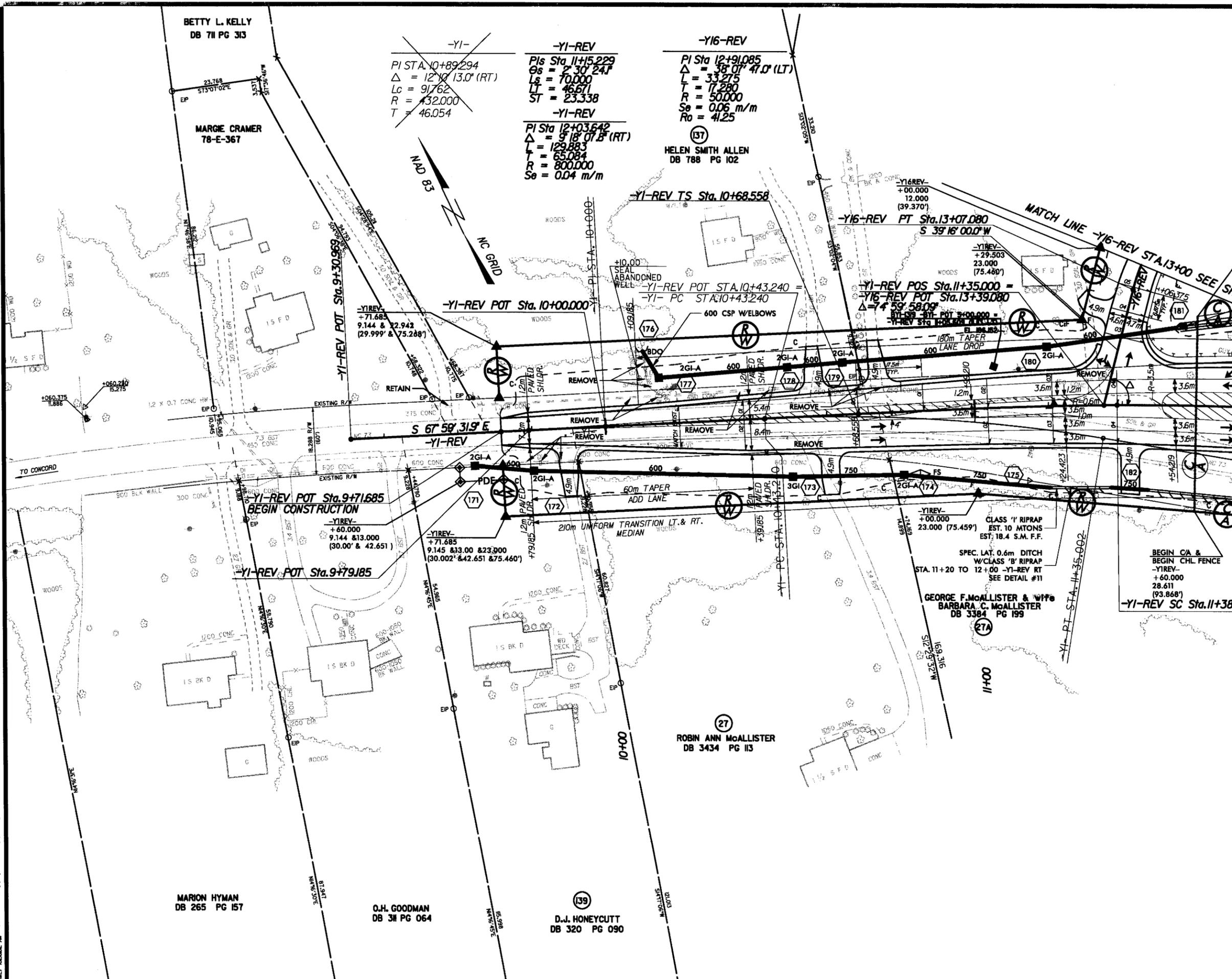
JOHN RAY NOBLES, JR.
 DB 521 PG 561

FOR -Y- PROFILE, SEE SHEET 26
 FOR DITCH DETAILS, SEE SHEET 2-J

NOTE: ALL DRIVEWAY RADII ARE 3.0m
 UNLESS OTHERWISE SHOWN.

DATE: 9/2/2009 TIME: 10:56:04 AM USER: J:\workspace\proj\2533cc\ray_nobles.jrn

PROJ. REFERENCE NO. R-2533CC		SHEET NO. 16	
HIGHWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS			
DO NOT USE FOR CONSTRUCTION			
Prepared in the Office of:		EarthTech	
		701 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-8200 • (919) 854-6258(FAX)	



-YI-
 PI STA. 10+89.294
 $\Delta = 12^\circ 10' 13.0''$ (RT)
 Lc = 91.762
 R = 432.000
 T = 46.054

-YI-REV
 PI Sta. 11+5.229
 $\Delta = 2^\circ 30' 24''$
 Ls = 70.000
 Lt = 46.671
 ST = 23.338

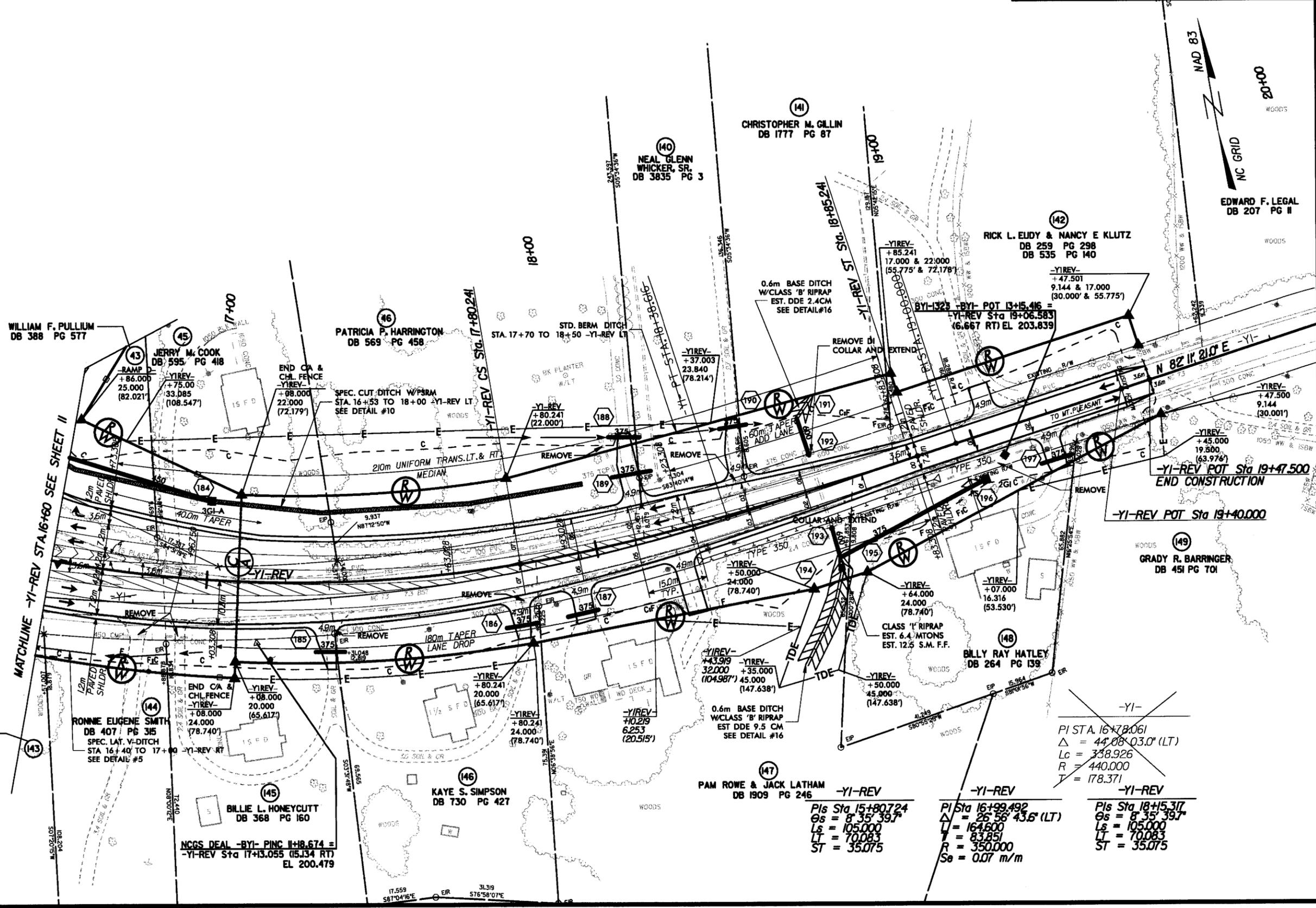
-YI-REV
 PI Sta. 12+03.642
 $\Delta = 9^\circ 18' 07.5''$ (RT)
 L = 129.883
 T = 65.084
 R = 800.000
 Se = 0.04 m/m

-YI6-REV
 PI Sta. 12+91.085
 $\Delta = 38^\circ 07' 47.0''$ (LT)
 L = 33.275
 T = 17.280
 R = 50.000
 Se = 0.06 m/m
 Ro = 41.25

FOR -YI-REV PROFILE, SEE SHEET 30
 FOR -YI6-REV PROFILE, SEE SHEET 32
 FOR INTERSECTION DETAIL -YI-REV/ -YI6-REV,
 SEE SHEET 2-G
 FOR DITCH DETAILS, SEE SHEET 2-J

NOTE: ALL DRIVEWAY RADII ARE 3.0m
 UNLESS OTHERWISE SHOWN.

USER: M:\Projects\2533\Drawings\2533-16.dwg
 DATE: 11/15/2007 10:52:00 AM
 PLOT: 11/15/2007 10:52:00 AM



DATE: 9/2/2009
 USER: WFL
 PLOT: 200800 AM

FOR -YI-REV PROFILE, SEE SHEETS 30 & 31
 FOR DITCH DETAILS, SEE SHEET 2-J
 NOTE: ALL DRIVEWAY RADII ARE 3.0m
 UNLESS OTHERWISE SHOWN.

-YI-REV	-YI-REV	-YI-REV
PIs Sta 15+80.724 Δs = 8° 35' 39.7" Ls = 105.000 LT = 70.083 ST = 35.075	PIs Sta 16+99.492 Δ = 26° 58' 43.6" (LT) L = 164.600 LT = 83.851 R = 350.000 Se = 0.07 m/m	PIs Sta 18+15.317 Δs = 8° 35' 39.7" Ls = 105.000 LT = 70.083 ST = 35.075

PI STA. 16+78.061
 Δ = 44° 08' 03.0" (LT)
 Lc = 338.926
 R = 440.000
 T = 178.371

NCGS DEAL -BYI- PINC II#B.674 =
 -YI-REV Sta 17+13.055 (15.134 RT)
 EL 200.479

METRIC

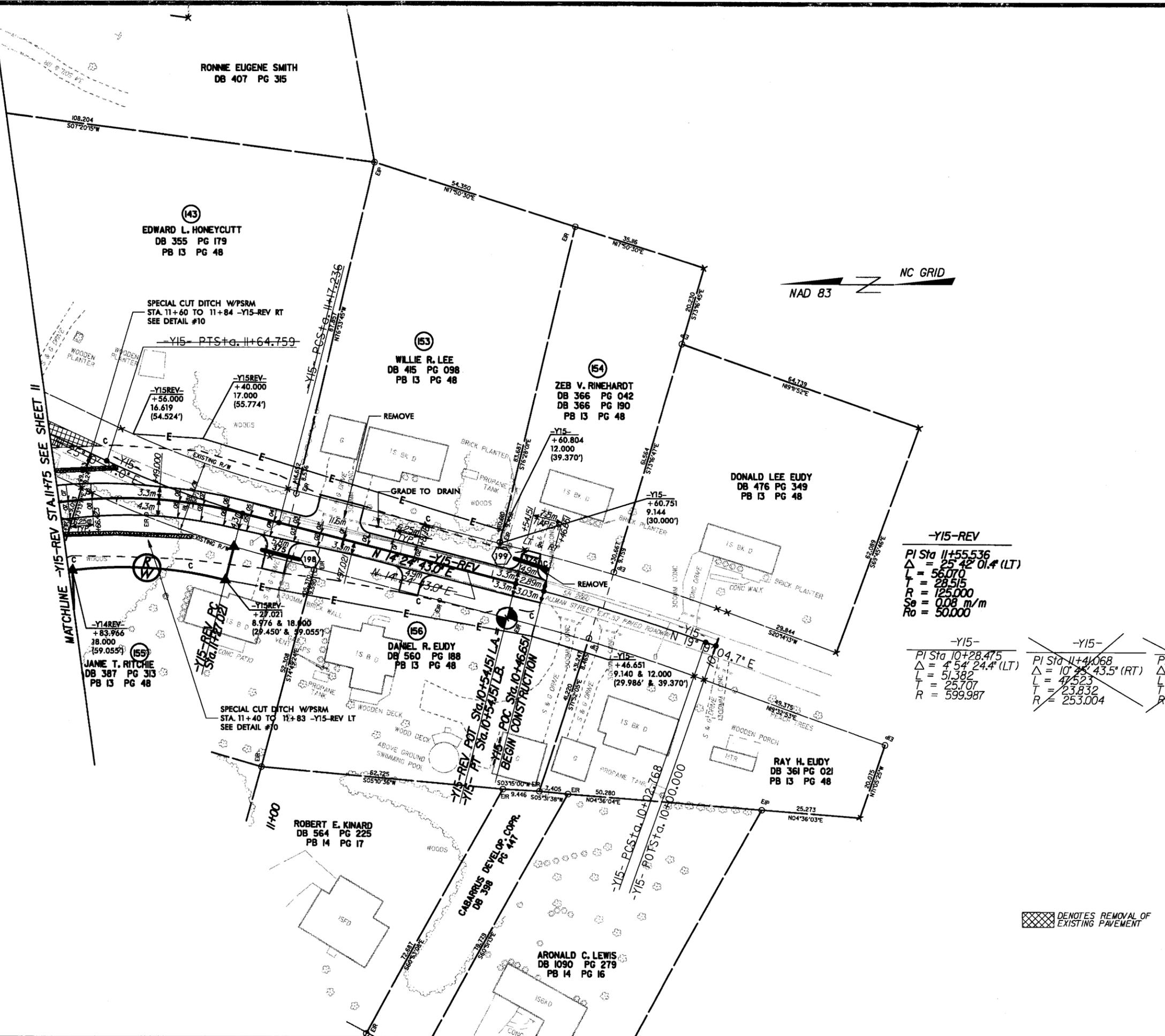
CONST. REV.
REV. REV.

PROJ. REFERENCE NO. **R-2533CC** SHEET NO. **19**

HIGHWAY DESIGN ENGINEER HYDRAULICS ENGINEER

PRELIMINARY PLANS
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Raleigh, NC 27607
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-Y15-REV
 PI Sta 11+55.536
 $\Delta = 25.42' 01.4" (LT)$
 $L = 56.070$
 $T = 28.515$
 $R = 125.000$
 $S_0 = 0.08 \text{ m/m}$
 $R_0 = 50.000$

-Y15-
 PI Sta 10+28.475
 $\Delta = 4' 54" 24.4" (LT)$
 $L = 51.382$
 $T = 25.707$
 $R = 599.987$

~~**-Y15-**
 PI Sta 11+41.068
 $\Delta = 10' 48" 43.5" (RT)$
 $L = 47.523$
 $T = 23.832$
 $R = 253.004$~~

~~**-Y15-**
 PI Sta 12+21.029
 $\Delta = 4' 34" 07.3" (RT)$
 $L = 34.050$
 $T = 17.034$
 $R = 427.020$~~

DENOTES REMOVAL OF EXISTING PAVEMENT

FOR -Y15-REV PROFILE, SEE SHEET 32
FOR DITCH DETAILS, SEE SHEET 2-J

NOTE: ALL DRIVEWAY RADII ARE 3.0m UNLESS OTHERWISE SHOWN.

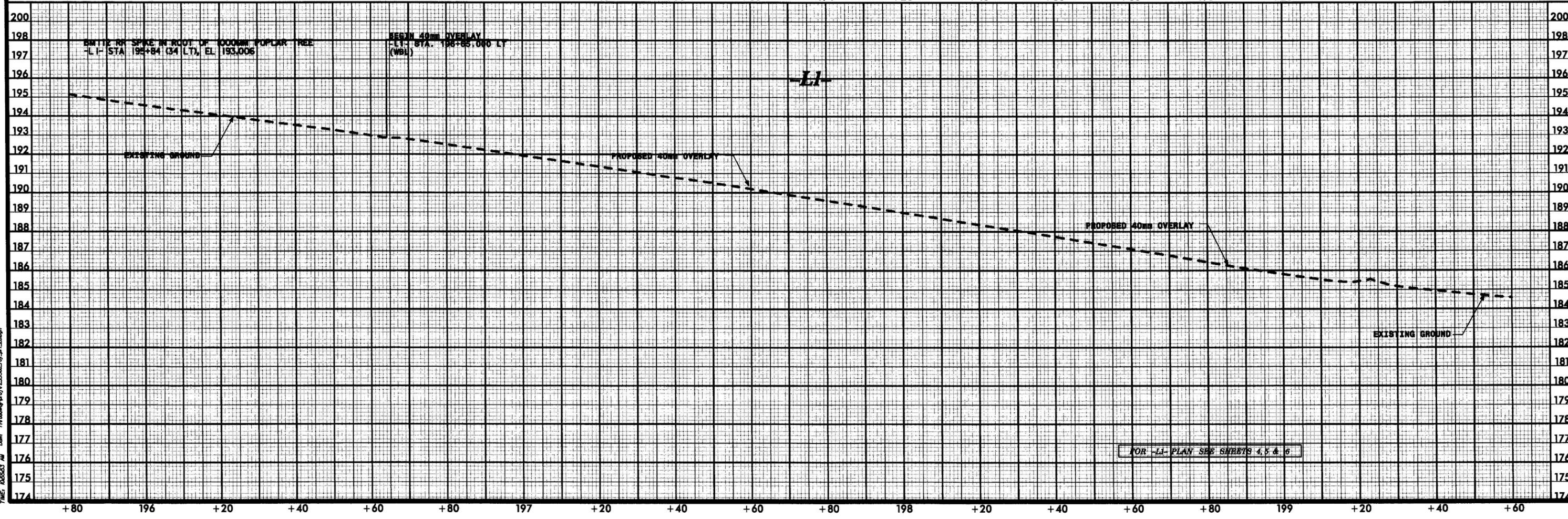
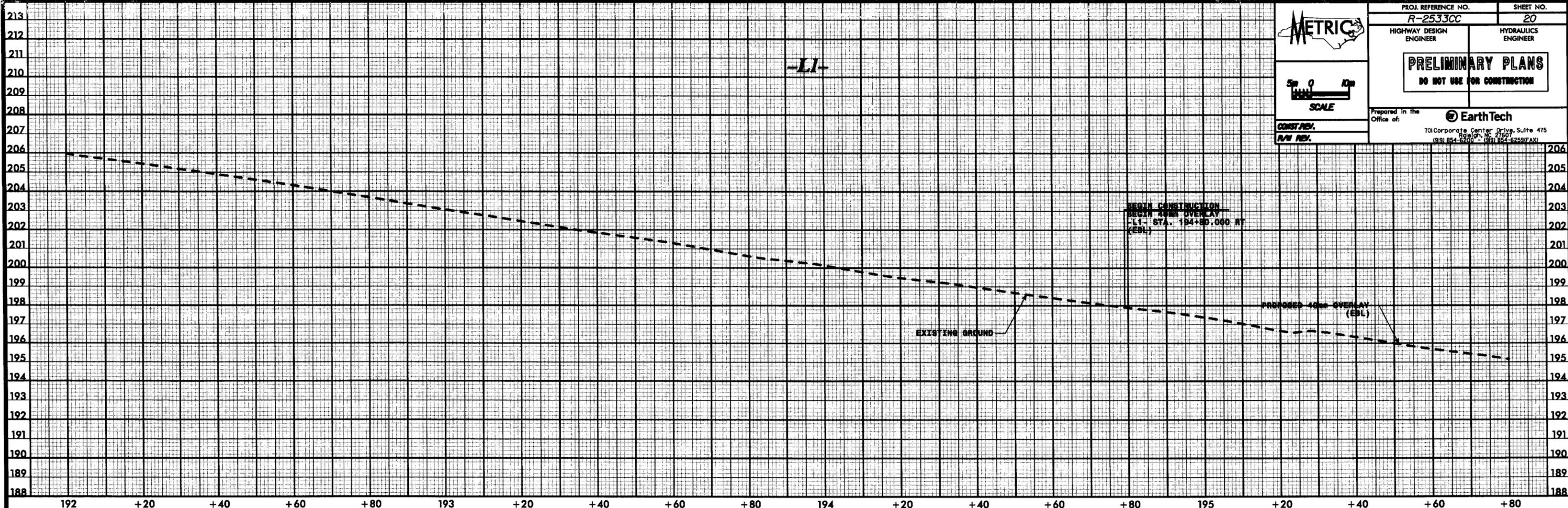
DATE: 02/20/2019 USER: M/M PROJECT: R-2533CC SHEET: 19



PROJ. REFERENCE NO. R-2533CC	SHEET NO. 20
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS	
DO NOT USE FOR CONSTRUCTION	
Prepared in the Office of:	
EarthTech	
<small>70 Corporate Center Drive, Suite 475 Raleigh, NC 27603 (919) 854-3200 (919) 854-8288(FAX)</small>	



CONST. REV.
PLAN REV.



DATE: 8/28/03
 FILE: 2533CC.dwg
 USER: [unreadable]
 PLOT: [unreadable]



PROJ. REFERENCE NO. R-2533CC	SHEET NO. 21
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS	
DO NOT USE FOR CONSTRUCTION	
Prepared in the Office of:	
EarthTech	
70 Corporate Center Drive, Suite 475 Raleigh, NC 27601 (919) 854-6200 (919) 854-6253(FAX)	



CONST. REV.
R/W REV.

BM 13 RR SPIKE IN ROOT OF 515MM TWIN SYCAMORE
-L1- STA. 199+99 (40 LT), EL. 184.406

-L-REV

-L1 STA. 199+95
-L1 SBL STA. 199+95
BEGIN GRADE ELEV. 184.764
-L1 NBL STA. 199+95
BEGIN GRADE ELEV. 184.999

BEGIN STATE PROJECT R-2533CC
-L-REV STA. 200+16.460 LA=
-L1 STA. 200+17.273 LB (R-2533B)

-L-REV NBL
PX = 200+85.000
EL = 184.476 m
VC = 180 m
K = 45

-L-REV SBL
PX = 200+85.000
EL = 184.477 m
VC = 180 m
K = 55

PROPOSED GRADE NBL

PROPOSED GRADE SBL

EXISTING GROUND

DRAINAGE AREA = 10.6 SQ KM
DESIGN DISCHARGE = 111.6 cms
DESIGN FREQUENCY = 50 Yr
DESIGN HW ELEV. = 182.74
BASE DISCHARGE = 122.4 cms
BASE FREQUENCY = 100 Yr
BASE HW ELEV. = 184.28

OVERTOPPING FLOOD ELEV. = 184.78
FREQUENCY = 500 Yr+
DISCHARGE = 182.4 cms

3 @ 3.7 X 3.7 RCFC WSILL

+60 +80 200 +20 +40 +60 +80 201 +20 +40 +60 +80 202 +20 +40 +60 +80 203 +20 +40

USER: M10
DATE: 02/02/00
SCALE: 1:1000

-L-REV

BM 14 RR SPIKE IN BASE OF 300MM SWEET GUM
-LREV- STA 205+99 (51 RD), EL. 196.032

-L-REV NBL
PI = 207+90.020
EL = 203.383 m
VC = 575 m
K = 82

-L-REV SBL
PI = 207+93.000
EL = 203.782 m
VC = 480 m
K = 68

PROPOSED GRADE SBL

PROPOSED GRADE NBL

EXISTING GROUND

600 RCP
DRAINAGE AREA = 1.50 ha
DESIGN DISCHARGE = 0.32 cms
DESIGN FREQUENCY = 50 Yr
DESIGN HW ELEV. = 196.28
0.100 DISCHARGE = 0.33 cms
0.100 HW ELEV. = 196.29

OVERTOPPING FLOOD ELEV. = 196.37
FREQUENCY = 300 Yr+
DISCHARGE = 0.36 cms

450 RCP
DRAINAGE AREA = 1.24 ha
DESIGN DISCHARGE = 0.26 cms
DESIGN FREQUENCY = 50 Yr
DESIGN HW ELEV. = 196.23
0.100 DISCHARGE = 0.27 cms
0.100 HW ELEV. = 196.25

OVERTOPPING FLOOD ELEV. = 196.23
FREQUENCY = 50 Yr+
DISCHARGE = 0.27 cms

FOR -L1-L-REV PLAN SEE SHEETS 6.7 & 6

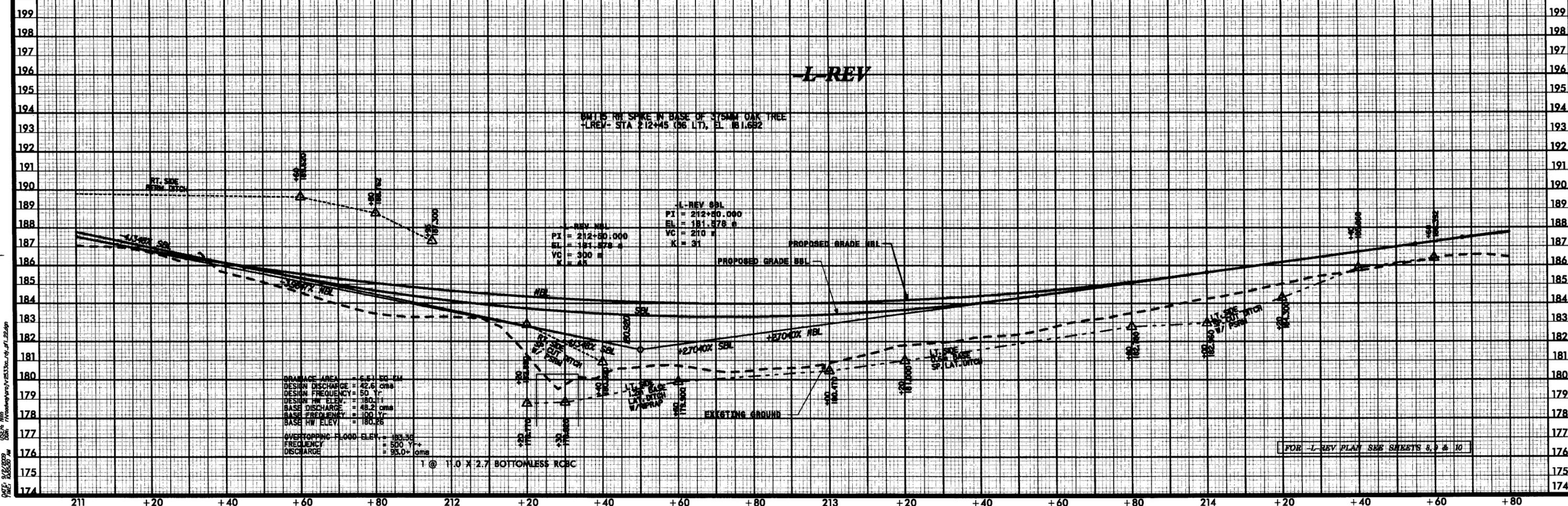
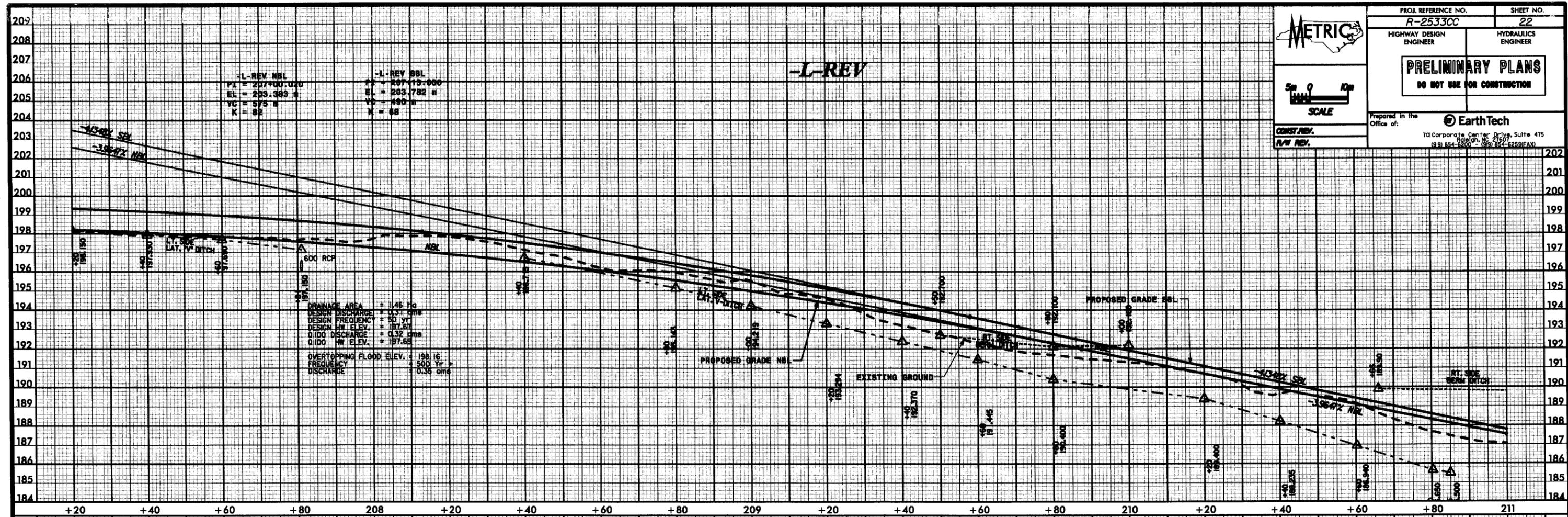
+40 +60 +80 204 +20 +40 +60 +80 205 +20 +40 +60 +80 206 +20 +40 +60 +80 207 +20 +40



PROJ. REFERENCE NO. R-25330C	SHEET NO. 22
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS	
DO NOT USE FOR CONSTRUCTION	
Prepared in the Office of:	
EarthTech	
<small>701 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-5200 • (919) 854-5250(FAX)</small>	



CONST. REV.
R/W REV.



FOR -L-REV PLAN SEE SHEETS 8, 9 & 10

DATE: 9/26/07
 FILE: R-25330C.dwg
 USER: JLD
 PLOT: 9/26/07 10:53 AM



PROJ. REFERENCE NO. R-2533CC SHEET NO. 23

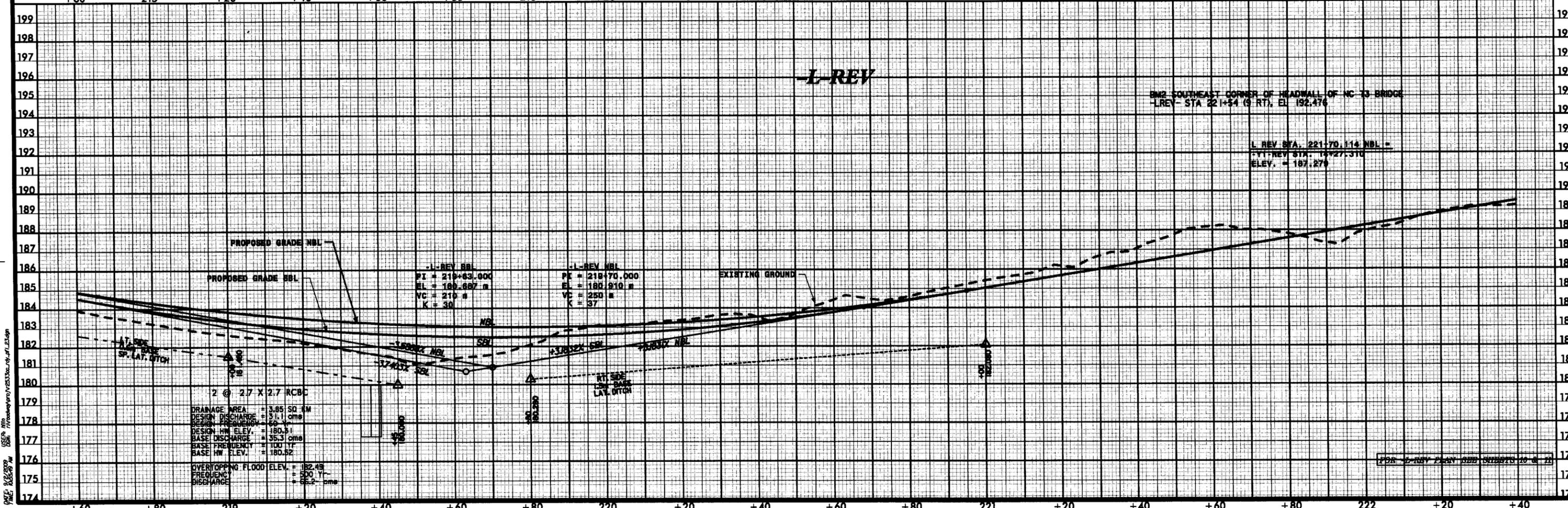
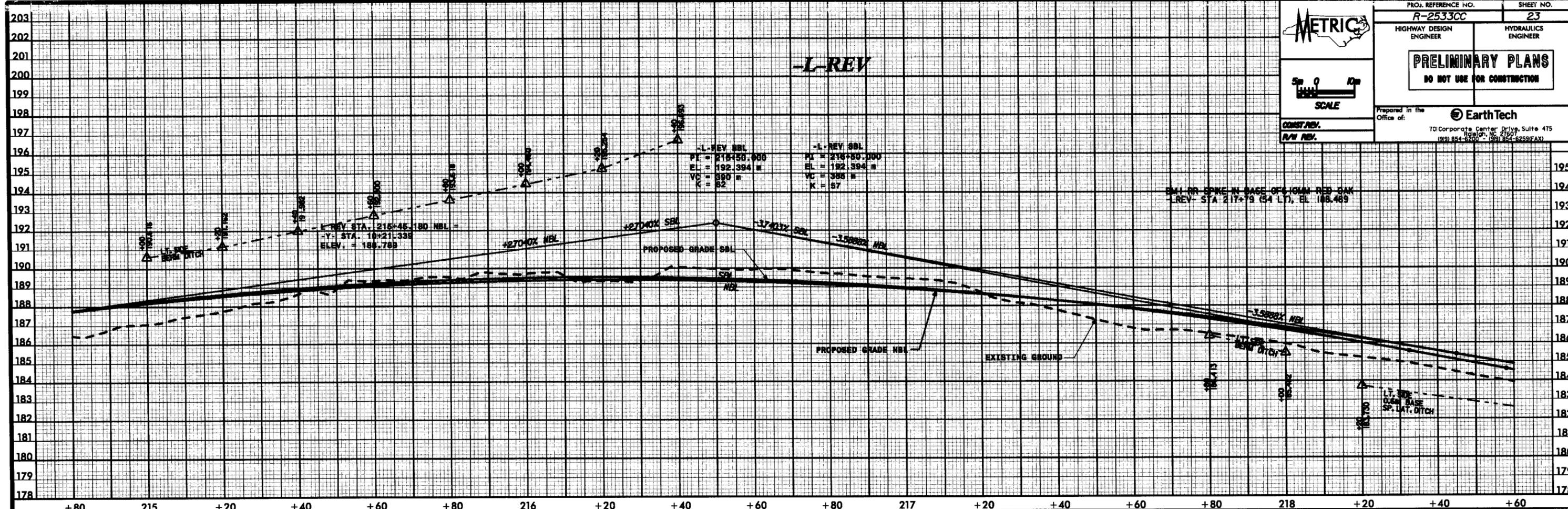
HIGHWAY DESIGN ENGINEER HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



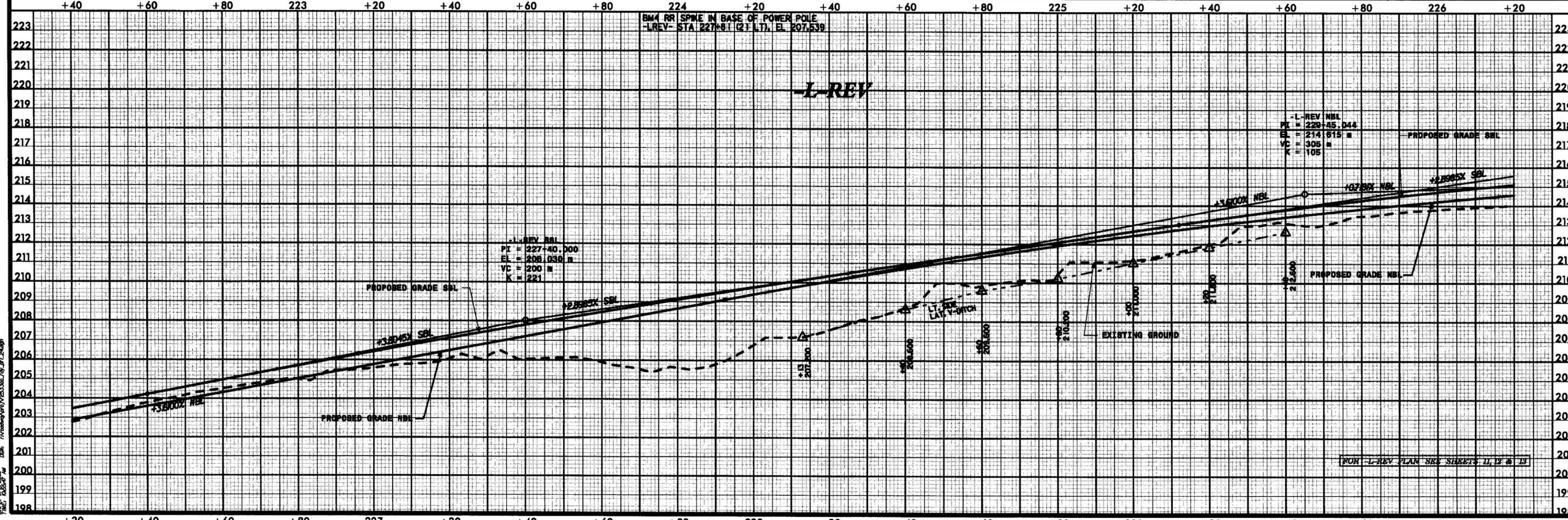
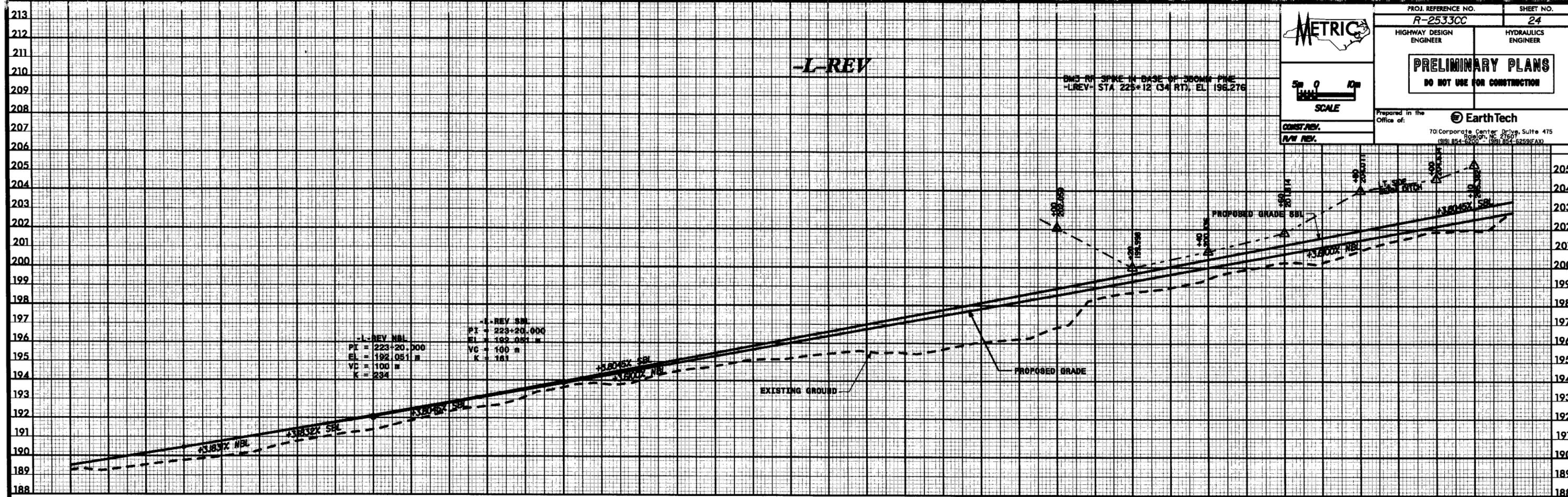
CONST. REV.
R/W NBL

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Raleigh, NC 27607
(919) 854-5200 (919) 854-5250(FAX)



DATE 8/26/09 BY GSE/ [unreadable]

FOR L-REV PLAN 08/26/09 10 @ 23



USER: H10
 DATE: 9/28/2009
 TIME: 9:55:47 AM
 FILE: P:\roadwork\proj\2533cc\pl_24.dwg

FOR -L-REV PLAN SEE SHEETS L12 & L13

PROJECT REFERENCE NO. R-2533CC SHEET NO. 26

METRIC
HIGHWAY DESIGN ENGINEER

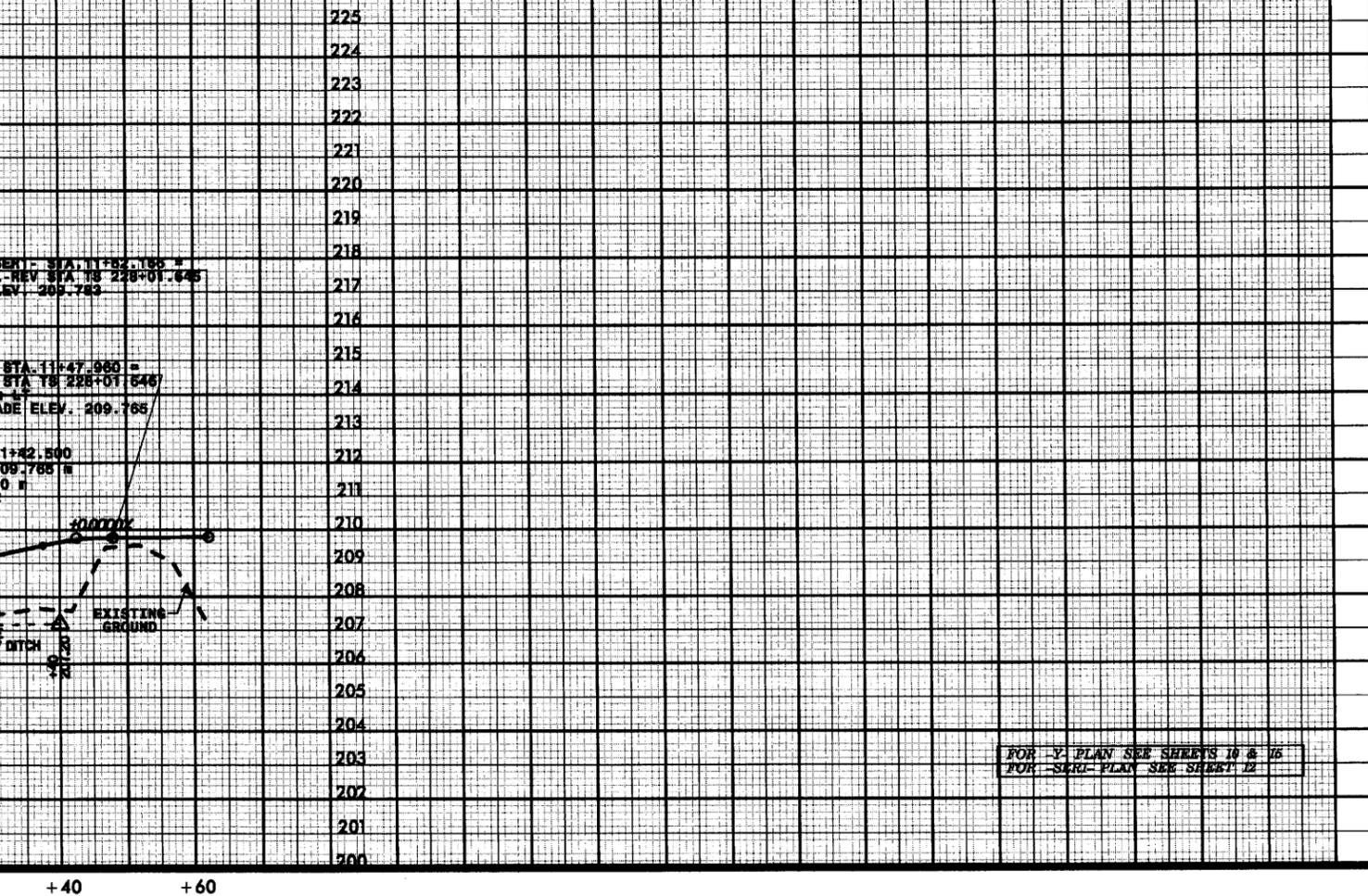
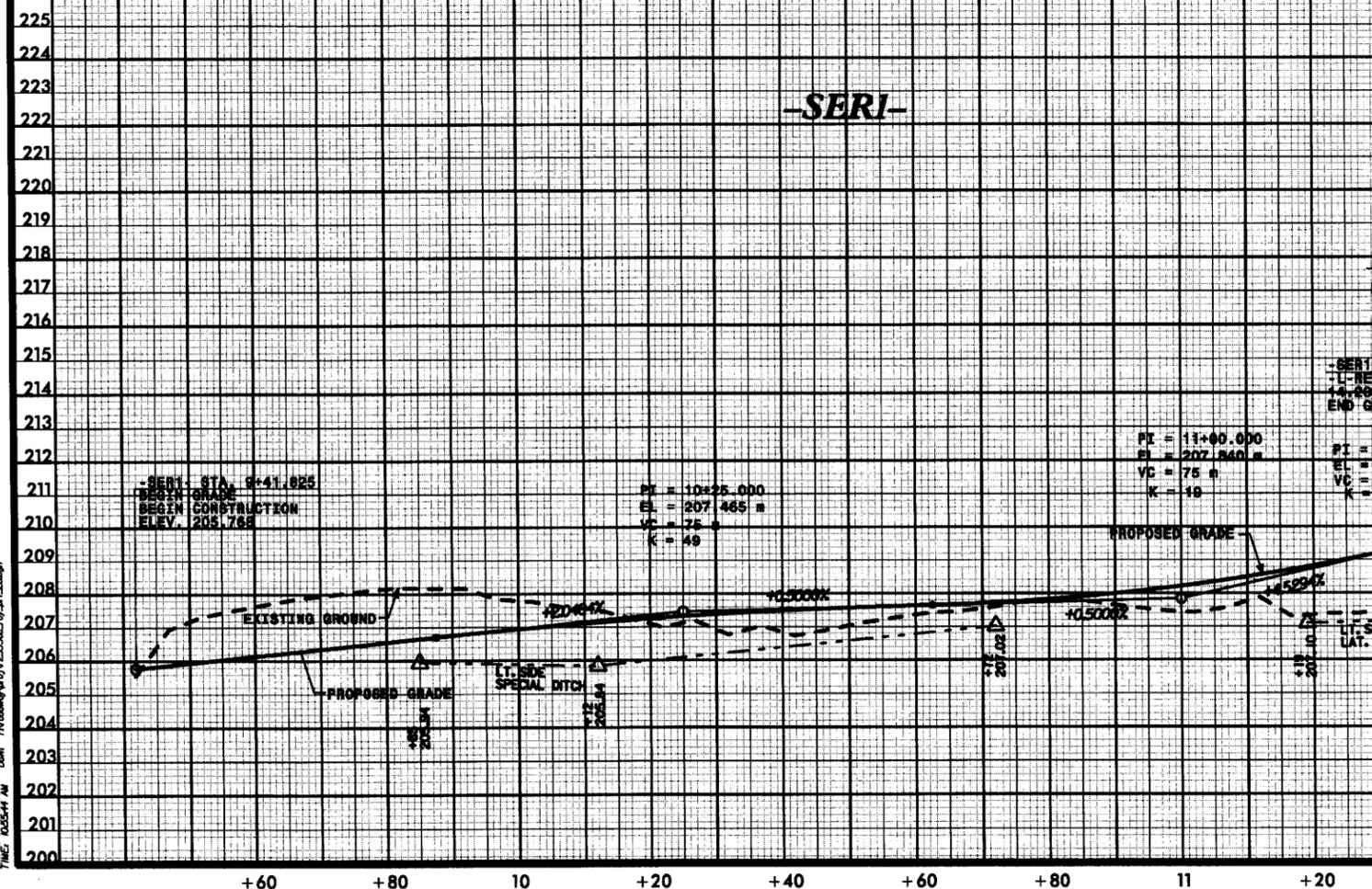
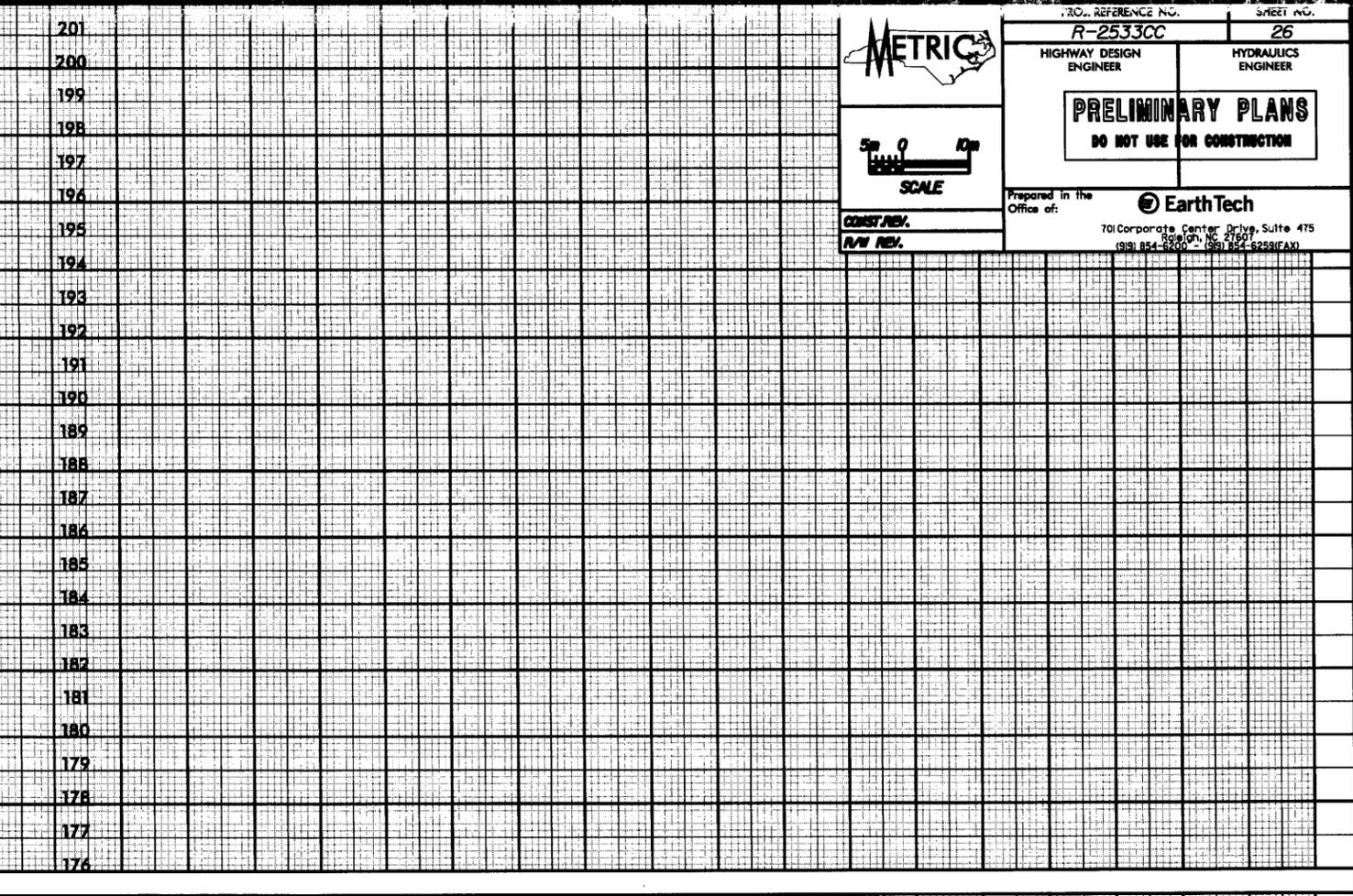
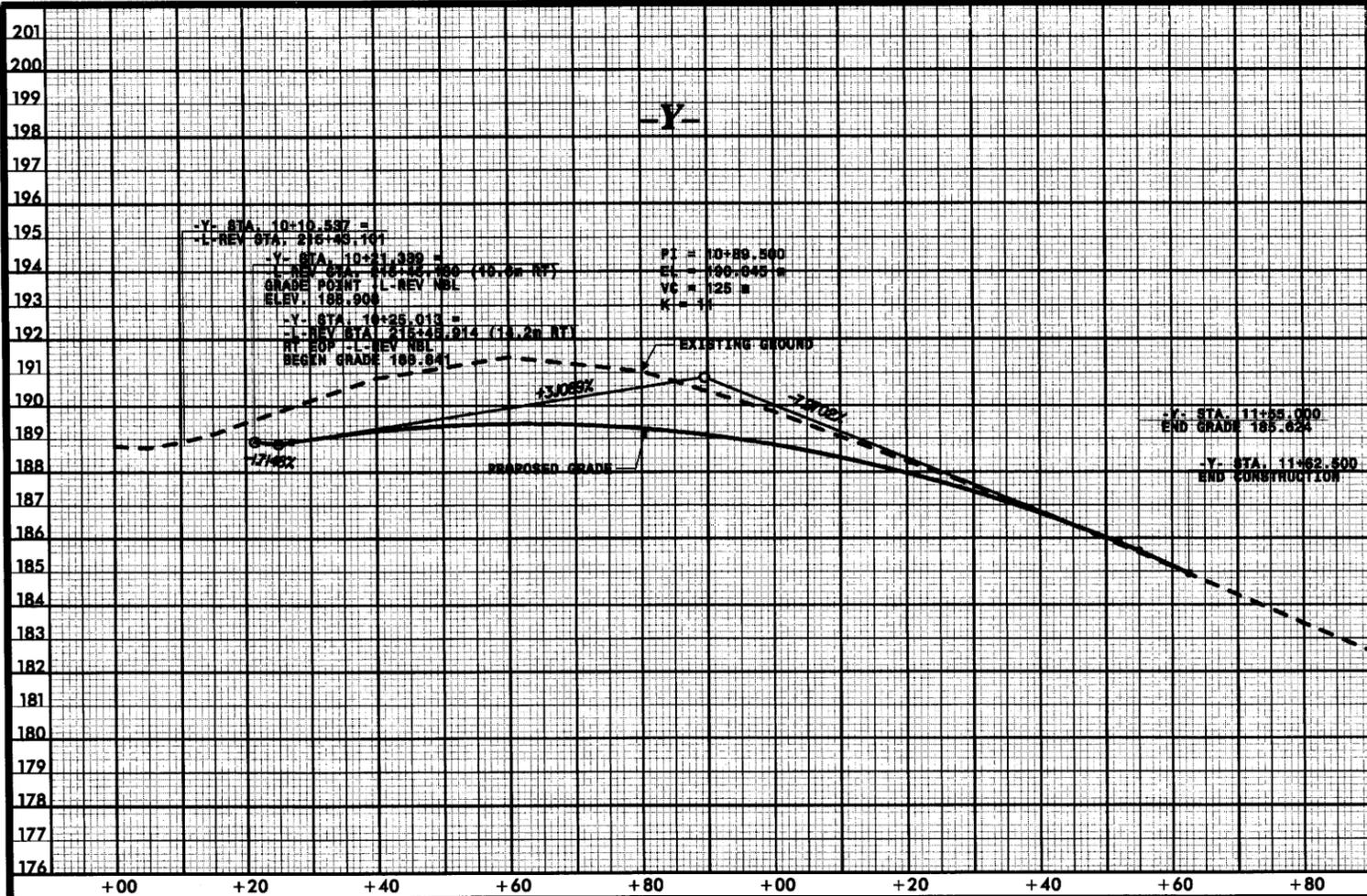
HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SCALE: 5m 0 10m

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CONST. REV.
REV. REV.



FOR Y PLAN SEE SHEETS 10 & 15
FOR SERRI PLAN SEE SHEET 12

DATE: 9/2/2009 TIME: 10:44 AM USER: jh/m/10/25/2009/2533cc/10/17/26.dgn

RAMP A STA. 0+00.000 =
 L-REV STA. 225+00.000 14.2m LT
 BEGIN GRADE ELEV 205.308 m

PI = 0+46.000
 EL = 204.282 m
 VC = 98 m
 K = 113

PE = 1+26.000
 EL = 200.430 m
 VC = 78 m
 K = 44

RAMP A @ -Y1-REV



PROJ. REFERENCE NO.
R-2533CC

HIGHWAY DESIGN ENGINEER

SHEET NO.
27

HYDRAULICS ENGINEER

PRELIMINARY PLANS
 DO NOT USE FOR CONSTRUCTION

SCALE



5m 10m

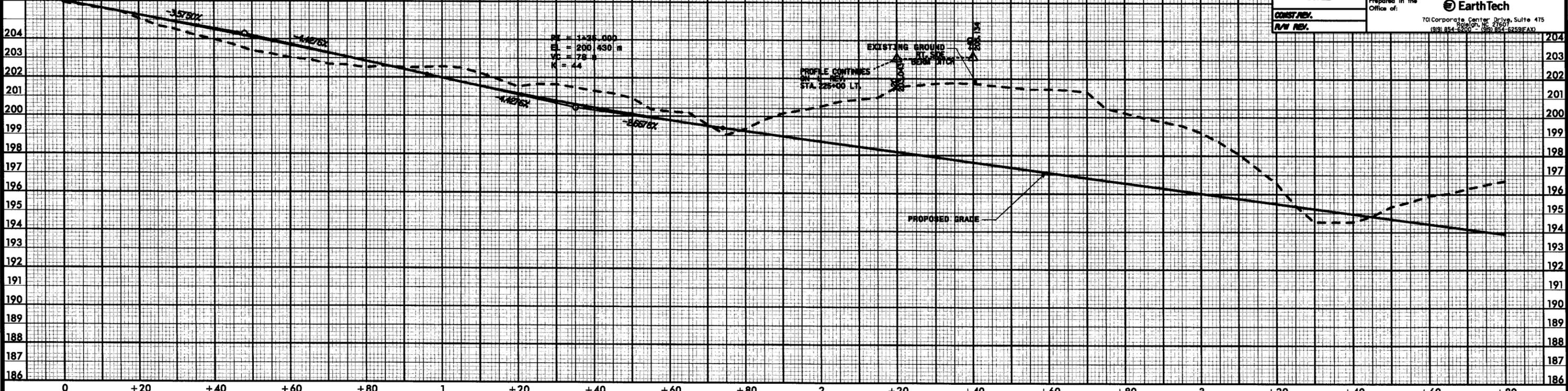
Prepared in the Office of:



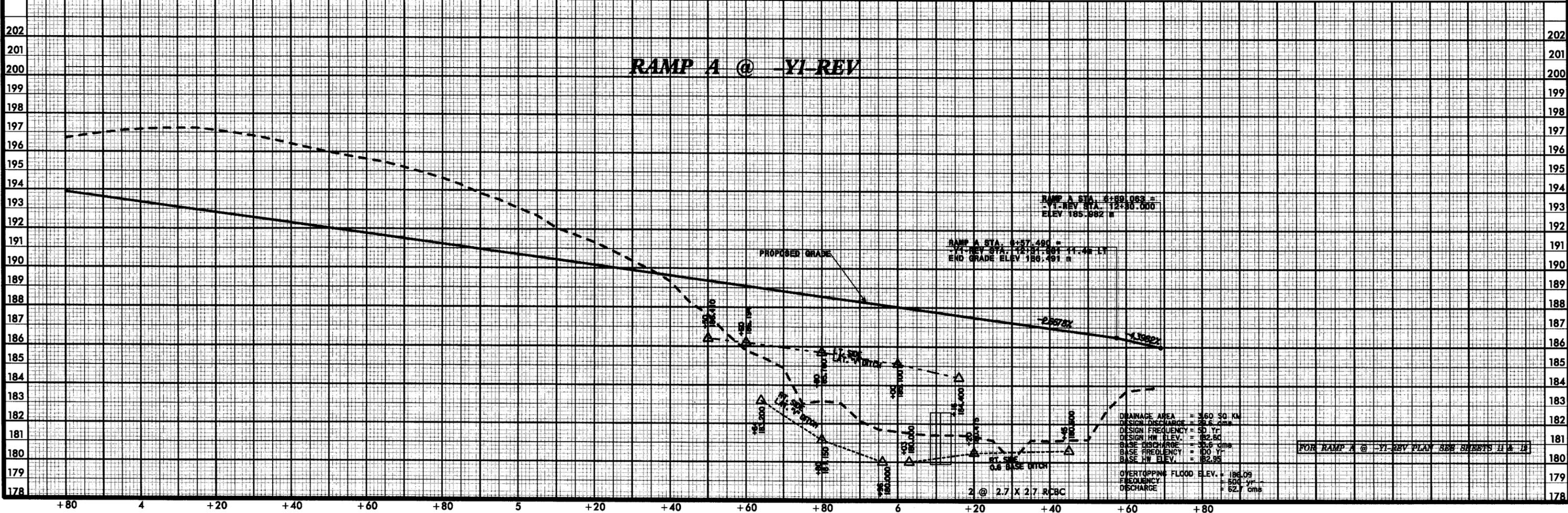
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CONST. REV.
R/W REV.

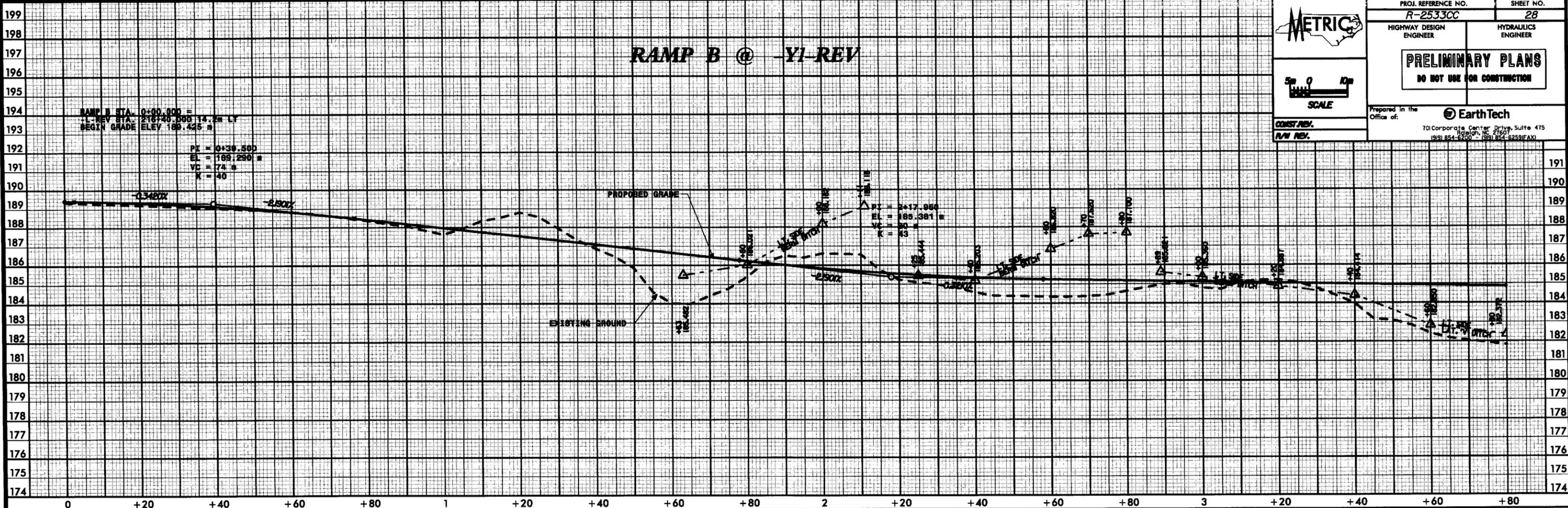


RAMP A @ -Y1-REV

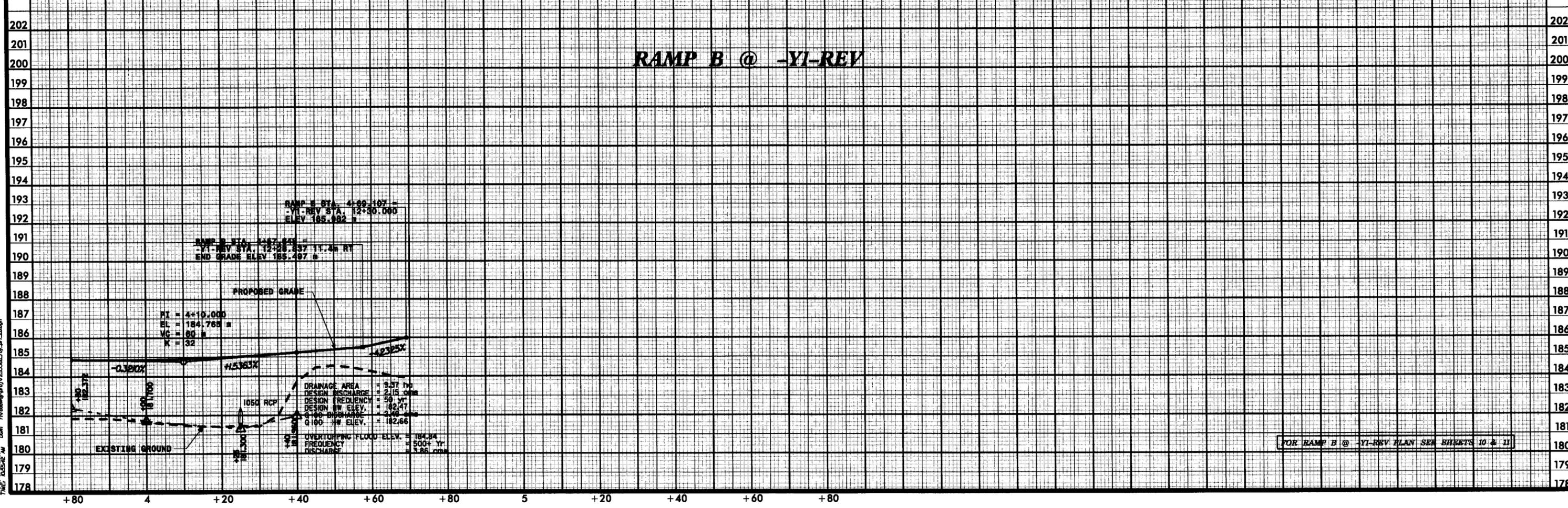


USFA 9/2/2009
 DATE: 06/23/09
 USER: N/A
 TIME: 10:53 AM
 PROJECT: R-2533CC-01-17.dwg

RAMP B @ -YI-REV



RAMP B @ -YI-REV

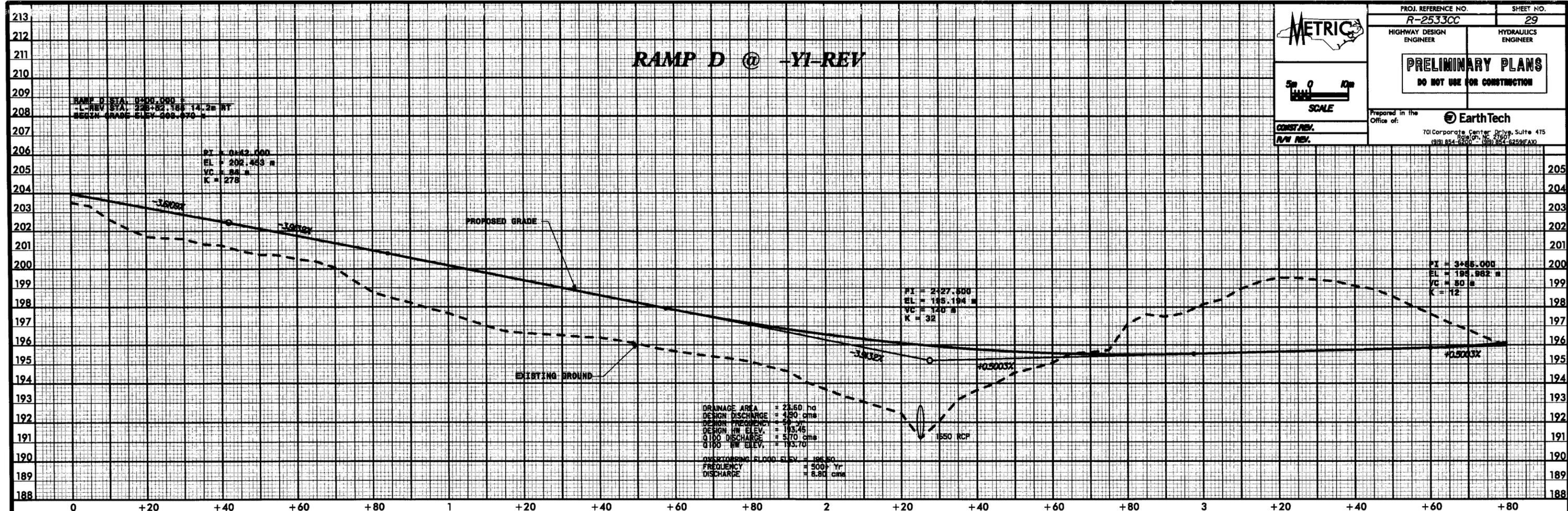


FOR RAMP B @ -YI-REV PLAN SEE SHEETS 10 & 11

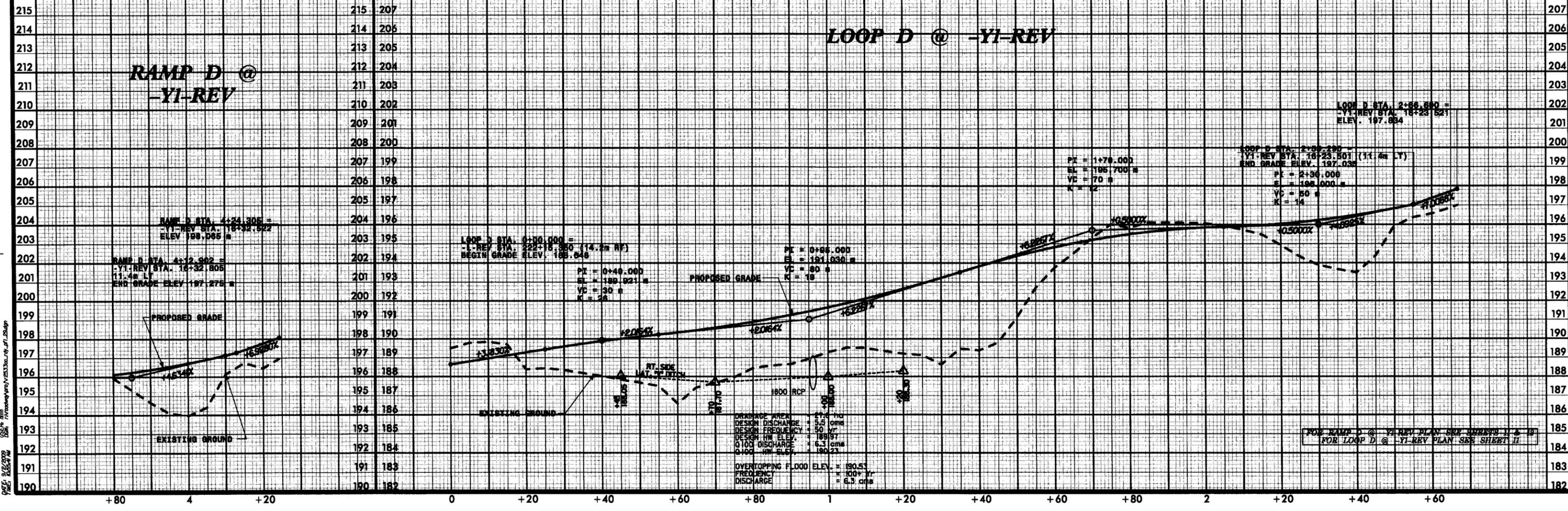
DATE: 9/2/2009
 TIME: 10:42:42 AM
 USER: rchase@vrsi.com
 FILE: R-25330C.dwg



RAMP D @ -YI-REV

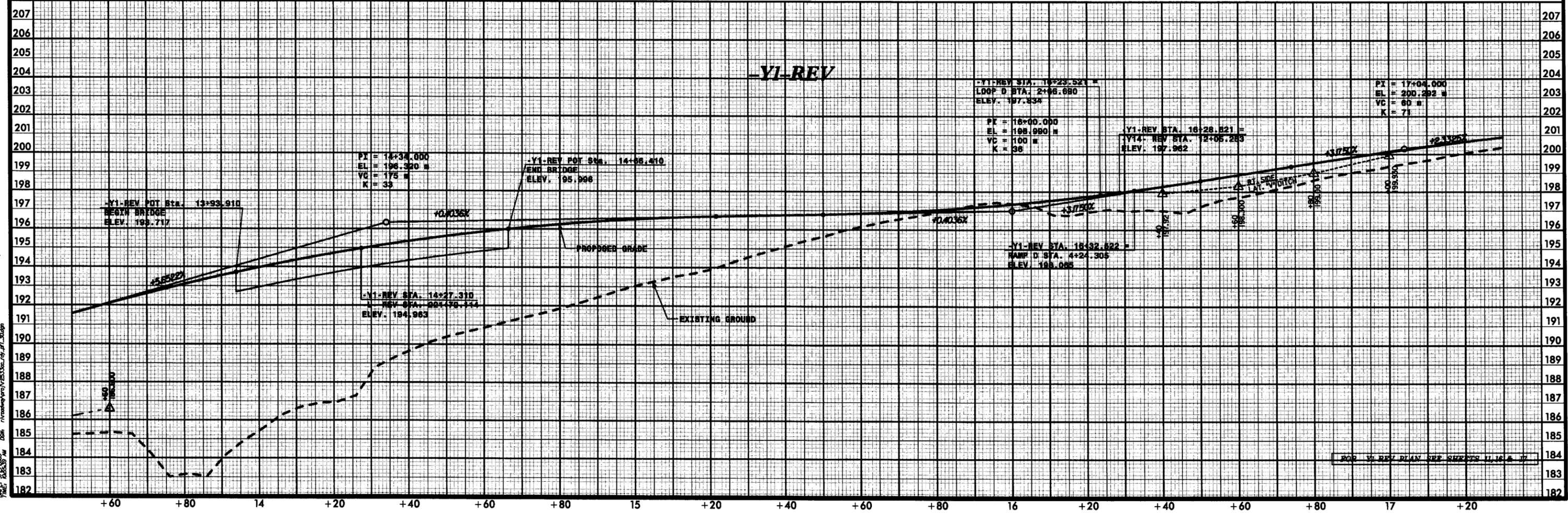
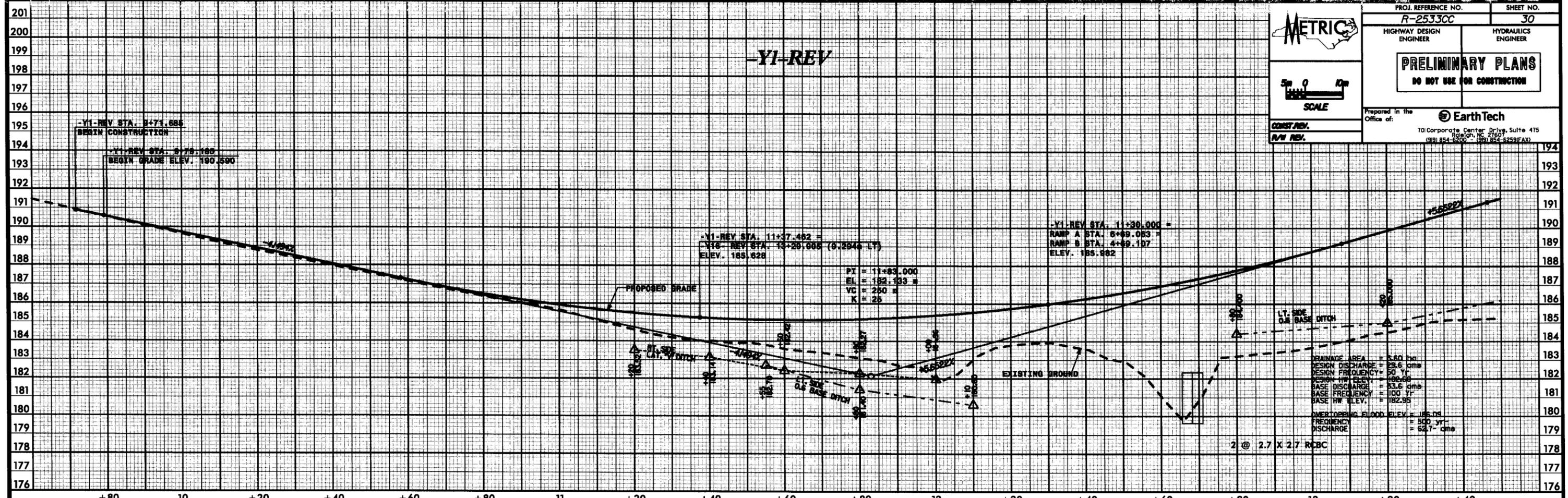


LOOP D @ -YI-REV

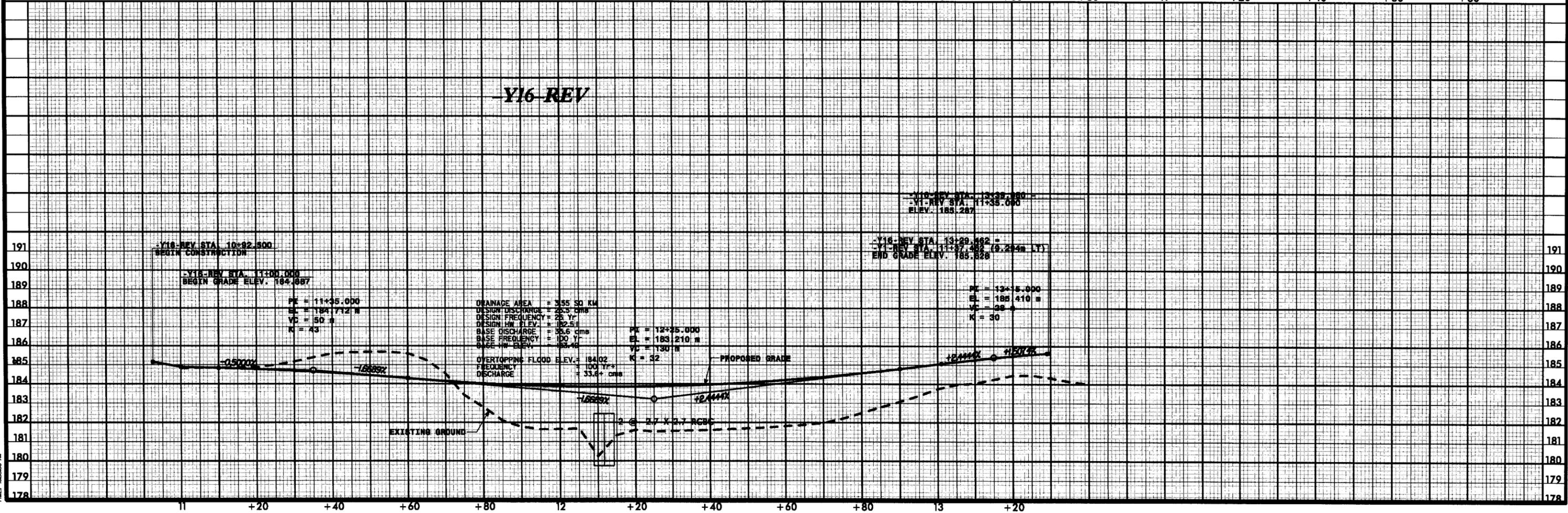
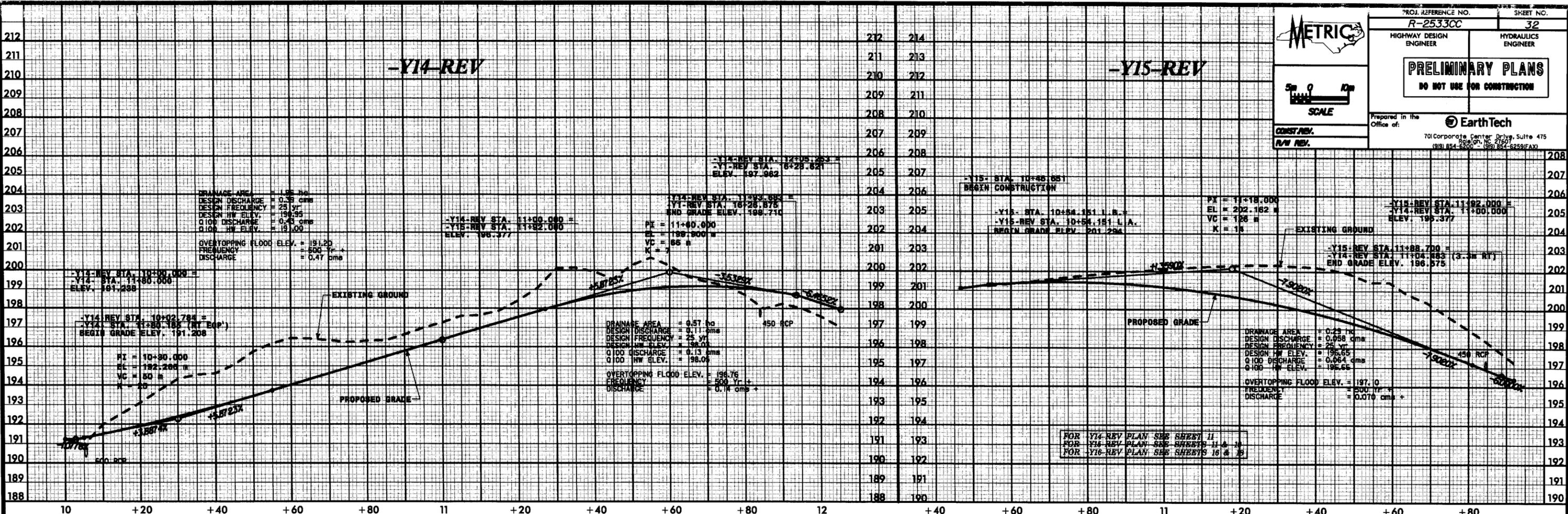
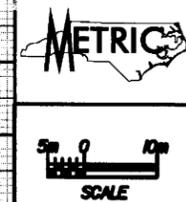


FOR RAMP D @ -YI-REV PLAN SEE SHEET 1 & 2
 FOR LOOP D @ -YI-REV PLAN SEE SHEET 11

DATE: 3/26/2010
 TIME: 10:00 AM
 USER: jwv



USER: M111
 DATE: 02/20/09
 TIME: 08:39 AM
 FILE: R2533CC.dwg



USER: N10
 DATE: 02/08/09
 TIME: 09:30 AM
 FILE: R:\Projects\Y16\Y2533CC.dwg