STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAT L. MCCRORY
GOVERNOR

ANTHONY J. TATA
SECRETARY

June 27, 2014

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

ATTN: Mr. Eric Alsmeyer
NCDOT Division 5 Project Coordinator

Subject: **Application for Section 404 Nationwide Permit Nos. 23 and 13, Section 401 Water Quality Certification, and Neuse River Riparian Buffer Authorization** for the replacement of Bridge No. 157 over Smith Creek on SR 1942 (Oak Grove Church Road), Wake County, North Carolina. Federal Aid Project No. BRZ-1942(1), TIP No. B-5113.

Debit $240.00 from WBS Element No. 42251.1.1

Please find enclosed the Pre-Construction Notification (PCN) form, Preliminary Jurisdictional Determination (JD), North Carolina Ecosystem Enhancement Program (EEP) Mitigation Acceptance Letter, stormwater management plan, permit drawings, buffer drawings, and roadway design plans for the above referenced project. A Programmatic Categorical Exclusion (PCE) was completed for this project on August 22, 2013.

The proposed let date for the project is January 20, 2015 with a review date of December 2, 2014. However, the let date may advance as additional funds become available.

A copy of this permit application and its distribution list will be posted on the NCDOT website at https://connect.ncdot.gov/resources/Environmental/Pages/default.aspx under *Quick Links > Permit Applications*. A copy of the PCE is also available at the above website address under *Quick Links > Environmental Documents*. Thank you for your time and assistance with this project. Please contact Deanna Riffey at either driffey@ncdot.gov or (919) 707-6151 if you have any questions or need additional information.

Sincerely,

for Richard W. Hancock, P.E. Manager
Project Development and Environmental Analysis Unit

Cc: NCDOT Permit Application Standard Distribution List

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

TELEPHONE: 919-707-6100

FAX: 919-212-5785

WEBSITE: WWW.NCDOT.ORG

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

Office Use Only:
Corps action ID no. _____
DWQ project no. _____
Form Version 1.4 January 2009

Pre-Construction Notification (PCN) Form

A. Applicant Information

1. Processing

1a. Type(s) of approval sought from the Corps:	☒ Section 404 Permit	☐ Section 10 Permit
1b. Specify Nationwide Permit (NWP) number: 13 23	or General Permit (GP) number:	
1c. Has the NWP or GP number been verified by the Corps?	☐ Yes	☒ No

1d. Type(s) of approval sought from the DWQ (check all that apply):

☒ 401 Water Quality Certification – Regular ☐ Non-404 Jurisdictional General Permit

☐ 401 Water Quality Certification – Express ☒ Riparian Buffer Authorization

1e. Is this notification solely for the record because written approval is not required?	For the record only for DWQ 401 Certification: ☐ Yes ☒ No	For the record only for Corps Permit: ☐ Yes ☐ No
1f. Is payment into a mitigation bank or in-lieu fee program proposed for mitigation of impacts? If so, attach the acceptance letter from mitigation bank or in-lieu fee program.	☒ Yes	☐ No
1g. Is the project located in any of NC's twenty coastal counties. If yes, answer 1h below.	☐ Yes	☒ No
1h. Is the project located within a NC DCM Area of Environmental Concern (AEC)?	☐ Yes	☒ No

2. Project Information

2a. Name of project:	Replacement of Bridge 157 over Smith Creek on SR 1942 (Oak Grove Church Rd)
2b. County:	Wake
2c. Nearest municipality / town:	Wake Forest
2d. Subdivision name:	*not applicable*
2e. NCDOT only, T.I.P. or state project no:	B-5113

3. Owner Information

3a. Name(s) on Recorded Deed:	North Carolina Department of Transportation
3b. Deed Book and Page No.	*not applicable*
3c. Responsible Party (for LLC if applicable):	*not applicable*
3d. Street address:	1598 Mail Service Center
3e. City, state, zip:	Raleigh, NC 27699-1598
3f. Telephone no.:	(919) 707-6151
3g. Fax no.:	(919) 212-5785
3h. Email address:	driffey@ncdot.gov

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

B. Project Information and Prior Project History	
1. Property Identification	
1a. Property identification no. (tax PIN or parcel ID):	*not applicable*
1b. Site coordinates (in decimal degrees):	Latitude: 35.9831 (DD.DDDDDD) Longitude: - 78.4760 (-DD.DDDDDD)
1c. Property size:	acres
2. Surface Waters	
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	Smith Creek
2b. Water Quality Classification of nearest receiving water:	WSIII; HQW; NSW; CA
2c. River basin:	Neuse
3. Project Description	
3a. Describe the existing conditions on the site and the general land use in the vicinity of the project at the time of this application: Land use within the vicinity includes Forested Land, Water-supply Watershed, and Residential.	
3b. List the total estimated acreage of all existing wetlands on the property: 0.20 acres	
3c. List the total estimated linear feet of all existing streams (intermittent and perennial) on the property: 122 linear feet	
3d. Explain the purpose of the proposed project: To replace a structurally deficient (and/ or) functionally obsolete bridge.	
3e. Describe the overall project in detail, including the type of equipment to be used: The project involves replacing a 35-foot single span bridge with a 52-foot single span bridge on the existing alignment with an off-site detour. Standard road building equipment, such as trucks, dozers, and cranes will be used.	
4. Jurisdictional Determinations	
4a. Have jurisdictional wetland or stream determinations by the Corps or State been requested or obtained for this property / project (including all prior phases) in the past? Comments: SAW-2009-0120	☒ Yes ☐ No ☐ Unknown
4b. If the Corps made the jurisdictional determination, what type of determination was made?	☒ Preliminary ☐ Final
4c. If yes, who delineated the jurisdictional areas? Name (if known): Richard Darling	Agency/Consultant Company: Baker Engineering Other:
4d. If yes, list the dates of the Corps jurisdictional determinations or State determinations and attach documentation. June 24, 2009	
5. Project History	
5a. Have permits or certifications been requested or obtained for this project (including all prior phases) in the past?	☐ Yes ☒ No ☐ Unknown
5b. If yes, explain in detail according to "help file" instructions.	
6. Future Project Plans	
6a. Is this a phased project?	☐ Yes ☒ No
6b. If yes, explain.	

C. Proposed Impacts Inventory

1. Impacts Summary

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

☒ Wetlands ☒ Streams - tributaries ☒ Buffers

☐ Open Waters ☐ Pond Construction

2. Wetland Impacts

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

2a. Wetland impact number – Permanent (P) or Temporary (T)	2b. Type of impact	2c. Type of wetland (if known)	2d. Forested	2e. Type of jurisdiction	2f. Area of impact (acres)
Site 1 ☒ P ☐ T	Fill	Headwater Wetland	☒ Yes ☐ No	☒ Corps ☒ DWQ	0.03
Site 1 ☒ P ☐ T	Mechanized Clearing	Headwater Wetland	☒ Yes ☐ No	☒ Corps ☒ DWQ	0.11
Site 3 ☐ P ☐ T		Choose One	☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 4 ☐ P ☐ T		Choose One	☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 5 ☐ P ☐ T		Choose One	☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 6 ☐ P ☐ T		Choose One	☐ Yes ☐ No	☐ Corps ☐ DWQ	
				2g. **Total wetland impacts**	0.14 Permanent 0 Temporary

2h. Comments:

3. Stream Impacts

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

3a. Stream impact number - Permanent (P) or Temporary (T)	3b. Type of impact	3c. Stream name	3d. Perennial (PER) or intermittent (INT)?	3e. Type of jurisdiction (Corps - 404, 10 DWQ – non-404, other)	3f. Average stream width (feet)	3g. Impact length (linear feet)
Site 1 ☒ P ☐ T	Bank Stabilization	Smith Creek	☒ PER ☐ INT	☒ Corps ☒ DWQ	12	57
Site 1 ☐ P ☒ T	Bank Stabilization	Smith Creek	☒ PER ☐ INT	☒ Corps ☒ DWQ	12	24
Site 3 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
Site 4 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
Site 5 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
Site 6 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
					3h. **Total stream and tributary impacts**	57 Perm 24 Temp

3i. Comments:

4. Open Water Impacts

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

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

4g. Comments:

5. Pond or Lake Construction

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

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

5g. Comments:

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

6. Buffer Impacts (for DWQ)

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

6a. Project is in which protected basin?			☒ Neuse ☐ Catawba	☐ Tar-Pamlico ☐ Randleman	☐ Other:
6b. Buffer impact number – Permanent (P) or Temporary (T)	6c. Reason for impact	6d. Stream name	6e. Buffer mitigation required?	6f. Zone 1 impact (square feet)	6g. Zone 2 impact (square feet)
B1 ☒ P ☐ T	Bridge	Smith Creek	☐ Yes ☒ No	294	0
B1 ☒ P ☐ T	Road Crossing	Smith Creek	☐ Yes ☒ No	1984	1486
B2 ☒ P ☐ T	Parallel	Smith Creek	☒ Yes ☐ No	2041	414
B3 ☒ P ☐ T	Parallel	UT Smith Creek	☒ Yes ☐ No	1725	62
		6h. **Total buffer impacts**		6044	1962
6i. Comments:					

D. Impact Justification and Mitigation

1. Avoidance and Minimization

1a. Specifically describe measures taken to avoid or minimize the proposed impacts in designing project.

The new bridge will be longer. Drainage systems outlet to rip rap pads. System in NW quad outlet to proposed ditch. Toe protection with CL B rip rap in proposed ditch will be used. A special cut ditch B with CL B rip rap will be placed in NW section. Grass shoulders will be maintained. A off-site detour will be employed.

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

NCDOT Best Management Practices for Construction and Maintenance Activities and Best Management Practices for the Protection of Surface Waters will be employed. Due to the project being in a buffer basin , Desgin Standards in Sensitive Watersheds will aso be employed.

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

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

3. Complete if Using a Mitigation Bank

3a. Name of Mitigation Bank: not applicable

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

3c. Comments:

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

4a. Approval letter from in-lieu fee program is attached.	☒ Yes
4b. Stream mitigation requested:	0 linear feet
4c. If using stream mitigation, stream temperature:	☒ warm ☐ cool ☐ cold
4d. Buffer mitigation requested (DWQ only):	7,782 square feet
4e. Riparian wetland mitigation requested:	0.28 acres
4f. Non-riparian wetland mitigation requested:	0 acres
4g. Coastal (tidal) wetland mitigation requested:	0 acres

4h. Comments:

5. Complete if Using a Permittee Responsible Mitigation Plan

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

6. Buffer Mitigation (State Regulated Riparian Buffer Rules) – required by DWQ

6a. Will the project result in an impact within a protected riparian buffer that requires buffer mitigation?	☐ Yes ☐ No

6b. If yes, then identify the square feet of impact to each zone of the riparian buffer that requires mitigation. Calculate the amount of mitigation required.

Zone	6c. Reason for impact	6d. Total impact (square feet)	Multiplier	6e. Required mitigation (square feet)
Zone 1	Parallel	2,356	3 (2 for Catawba)	7,068
Zone 2	Parallel	476	1.5	714
		6f. **Total buffer mitigation required:**		7,782

6g. If buffer mitigation is required, discuss what type of mitigation is proposed (e.g., payment to private mitigation bank, permittee responsible riparian buffer restoration, payment into an approved in-lieu fee fund).

Payment into an approved in-lieu fund.

6h. Comments: 1,410 sq.ft wetlands in buffers for Site 3 for Zone 1. Site 3: 1,725 sq. ft - 1410 sq. ft = 315 sq. ft. Zone1 = 2,041 (Site 1) + 315 (Site 3) = 2,536 sq ft.

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

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

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

for Richard W. Hancock, P.E. Applicant/Agent's Printed Name	Applicant/Agent's Signature (Agent's signature is valid only if an authorization letter from the applicant is provided.)	6-27-14 Date

P Baum

RECEIVED
JUN 25 2009
DIVISION OF HIGHWAYS
PDEA-OFFICE OF NATURAL ENVIRONMENT

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PRELIMINARY JURISDICTIONAL DETERMINATION (JD): 6/24/2009

B. NAME AND ADDRESS OF PERSON REQUESTING PRELIMINARY JD:
Richard Darling; Michael Baker Engineering; 8000 Regency Parkway, Suite 200; Cary, NC 27518; Phone 919-459-9009 - Agent for NCDOT Div. of Highways.

C. DISTRICT OFFICE, FILE NAME, AND NUMBER: SAW, NCDOT/B-5113/SR1942/BR157, 2009-01201

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION: (TIP B-5113)
(USE THE ATTACHED TABLE TO DOCUMENT MULTIPLE WATERBODIES AT DIFFERENT SITES)

State: NC County/parish/borough: Wake City: Wake Forest

Center coordinates of site (lat/long in degree decimal format):
Lat. 35.982868 N, Long. 78.475599 W.
Universal Transverse Mercator: _____

Name of nearest waterbody: Smith Creek

Identify (estimate) amount of waters in the review area:
Non-wetland waters: 495 linear feet, 11 width (ft), and/or 0.00 acres.
Cowardin Class: Riverine
Stream Flow: Perennial
Wetlands: 0.75 acres.
Cowardin Class: Forested

Name of any water bodies on the site that have been identified as Section 10 waters:
Tidal: _____
Non-Tidal: _____

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☒ Office (Desk) Determination. Date: 6/24/2009
☐ Field Determination. Date(s): _____

SUPPORTING DATA.

Data reviewed for preliminary JD (check all that apply - checked items should be included in case file and, where checked and requested, appropriately reference sources below):

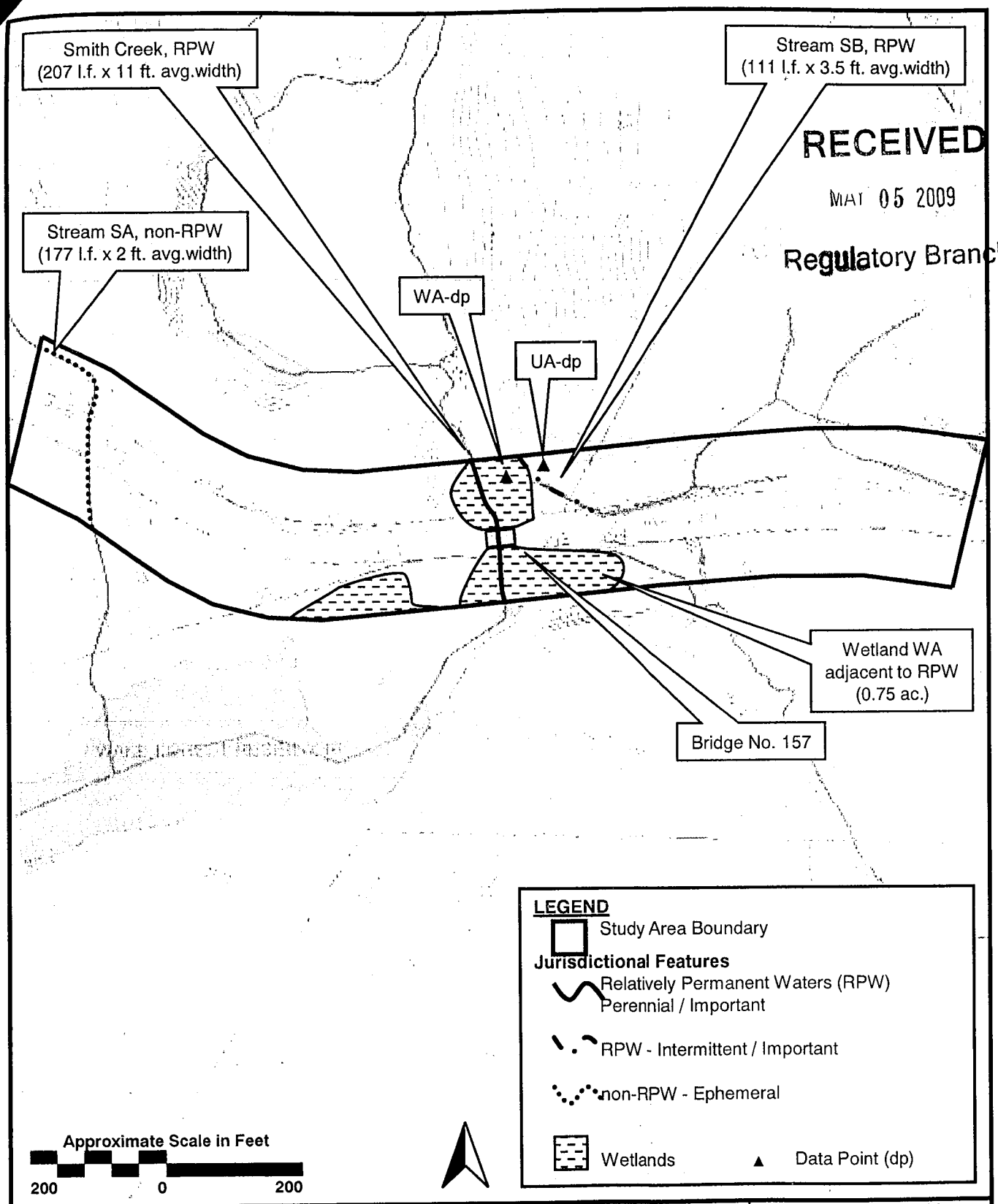
- ☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:
- ☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☐ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets 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: 7.5' Rolesville, NC.
- ☒ USDA Natural Resources Conservation Service Soil Survey. Citation: Wake Co.
- ☒ National wetlands inventory map(s). Cite name: Rolesville.
- ☐ State/Local wetland inventory map(s): _____.
- ☒ FEMA/FIRM maps: Panel 1851.
- ☐ 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: _____.
- ☒ Other information (please specify): 2/23/09 field delin. by Baker Engr.

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Eric C Alsmeyer 6/24/2009
Signature and date of Eric C. Alsmeyer
Regulatory Project Manager
(REQUIRED)

Richard Darling 5/4/09
Signature and date of
person requesting preliminary JD
(REQUIRED, unless obtaining
the signature is impracticable)

CF: NCDOT, Div. of Highways - ATTN: G. Thorpe, 1598 Mail Service Center
Baker Engineer., ATTN: R. Darling. 3



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Project Development and Environmental Analysis Branch
Natural Environment Unit

Replace Bridge No. 157
SR 1942 over Smith Creek
Wake County

TIP B-5113
FAP
WBS 42251.1.1

Natural Resources Technical Report

Figure 3. Jurisdictional Features Map

Wake Co. GIS, 2-foot contours

February 28, 2009

North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Michael Ellison, Director
Ecosystem Enhancement Program

John E. Skvarla, III
Secretary

June 18, 2014

Mr. Richard W. Hancock, P.E.
Project Development and Environmental Analysis Unit
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, North Carolina 27699-1598

Dear Mr. Hancock:

Subject: EEP Mitigation Acceptance Letter:

B-5113, Replace Bridge Number 157 on SR 1942 (Oak Grove Church Road) over Smith Creek, Wake County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the riparian wetland mitigation and buffer mitigation for the subject project. Based on the information supplied by you on June 17, 2014, the impacts are located in CU 03020201 of the Neuse River in the Central Piedmont (CP) Eco-Region, and are as follows:

Stream and Wetlands	River Basin	CU Location	Eco-Region	Stream			Wetlands		
				Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh
Impacts	Neuse	03020201	CP	0	0	0	0.14	0	0

*Some of the stream and wetland impacts may be proposed to be mitigated at a 1:1 mitigation ratio. See permit application for details.

All buffer mitigation requests and approvals are administrated through the Riparian Restoration Buffer Fund. The NCDOT will be responsible to ensure that appropriate compensation for the buffer mitigation will be provided in the agreed upon method of fund transfer. Upon receipt of the NCDWQ's Buffer Authorization Certification, EEP will transfer funds from the NCDOT 2984 Fund into the Riparian Restoration Buffer Fund. Upon completion of transfer payment, NCDOT will have completed its riparian buffer mitigation responsibility for TIP Number B-5113. Subsequently, EEP will conduct a review of current NCDOT ILF Program mitigation projects in the river basin to determine if available buffer mitigation credits exist. If there are buffer mitigation credits available, then the Riparian Restoration Buffer Fund will purchase the appropriate amount of buffer mitigation credits from NCDOT ILF Program.

Buffer	River Basin	CU	Eco-Region	Buffer Impacts		
				Zone 1	Zone 2	TOTAL
Impacts	Neuse	03020201	CP	3,766.0	476.0	4,242.0

EEP commits to implementing sufficient compensatory riparian wetland mitigation credits to offset the impacts associated with this project as determined by the regulatory agencies in accordance with the N.C. Department of Environment and Natural Resources' Ecosystem Enhancement Program In-Lieu Fee Instrument dated July 28, 2010. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from EEP.

If you have any questions or need additional information, please contact Ms. Beth Harmon at 919-707-8420.

Sincerely,

James B. Stanfill
EEP Asset Management Supervisor

Cc: Mr. Eric Alsmeyer, USACE – Raleigh Regulatory Field Office
Mr. Rob Ridings, NC Division of Water Quality – Raleigh
File: B-5113

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR LINEAR ROADWAY PROJECTS

(Version 1.2; Released September 2011)

General Project Information

Project No.:	B-5113		**Project Type:**	Bridge Replacement	**Date:** 5/1/2014
NCDOT Contact:	Binod Yadav		**Contractor / Designer:**	Binod Yadav	
	Address: 1020 Birch Ridge Dr Raleigh, NC 27610			**Address:** 1020 Birch Ridge Dr Raleigh, NC 27610	
	Phone: 919-707-6758			**Phone:**	
	Email: bkyadav@ncdot.gov			**Email:**	
City/Town:	Youngsville		**County(ies):**	Wake	
River Basin(s):	Neuse		**CAMA County?**	No	
Primary Receiving Water:	Wake Forest Reservoir		**NCDWQ Stream Index No.:**	27-23-(1.5)	
NCDWQ Surface Water Classification for Primary Receiving Water	**Primary:**		WS-II, HQW, NSW, CA		
	Supplemental:				
Other Stream Classification:					
303(d) Impairments:					
Buffer Rules in Effect					

Project Description

Project Length (lin. Miles or feet):	0.144 Miles	**Surrounding Land Use:**	Woods
	Proposed Project		**Existing Site**
Project Built-Upon Area (ac.)	0.48 ac.		0.33 ac.
Typical Cross Section Description:			
Average Daily Traffic (veh/hr/day):	Design/Future: 5970		Existing: 1662

General Project Narrative:

The project consists of replacing Bridge# 157 on SR 1942 (Oak Grove Church Road) over Smith Creek. The approach work will consist of raising the existing roadway grade and providing grass shoulders and guardrails. Bridge #157 existing 1@35' span with timber deck on steel floor beams (35' total length) will be replaced with a single span @ 50', 21" cored slab, vertical abutment bridge with 2'-6" cap.

Best Mgmt. Practices:
-Drainage systems outlet to rip rap pads. Eliminate direct discharge from existing condition. System in NW quad outlets to proposed ditch.
-Toe protection with CL B rip rap in proposed ditch.
-Special cut ditch B with CL B rip rap at NW.
-Grass shoulders maintained.

References

09/08/99

TIP PROJECT: B-5113

CONTRACT: C203517

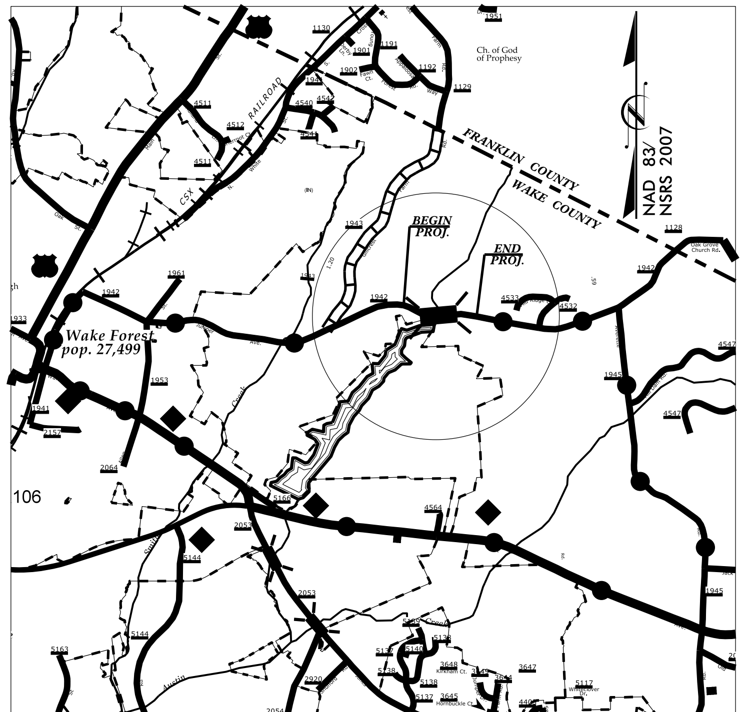
See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5113	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
42251.1.FD1	BRZ-1942(1)	P.E.
42251.2.FD1	BRZ-1942(1)	ROW & UTIL

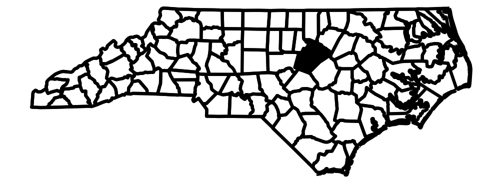


OFFSITE DETOUR

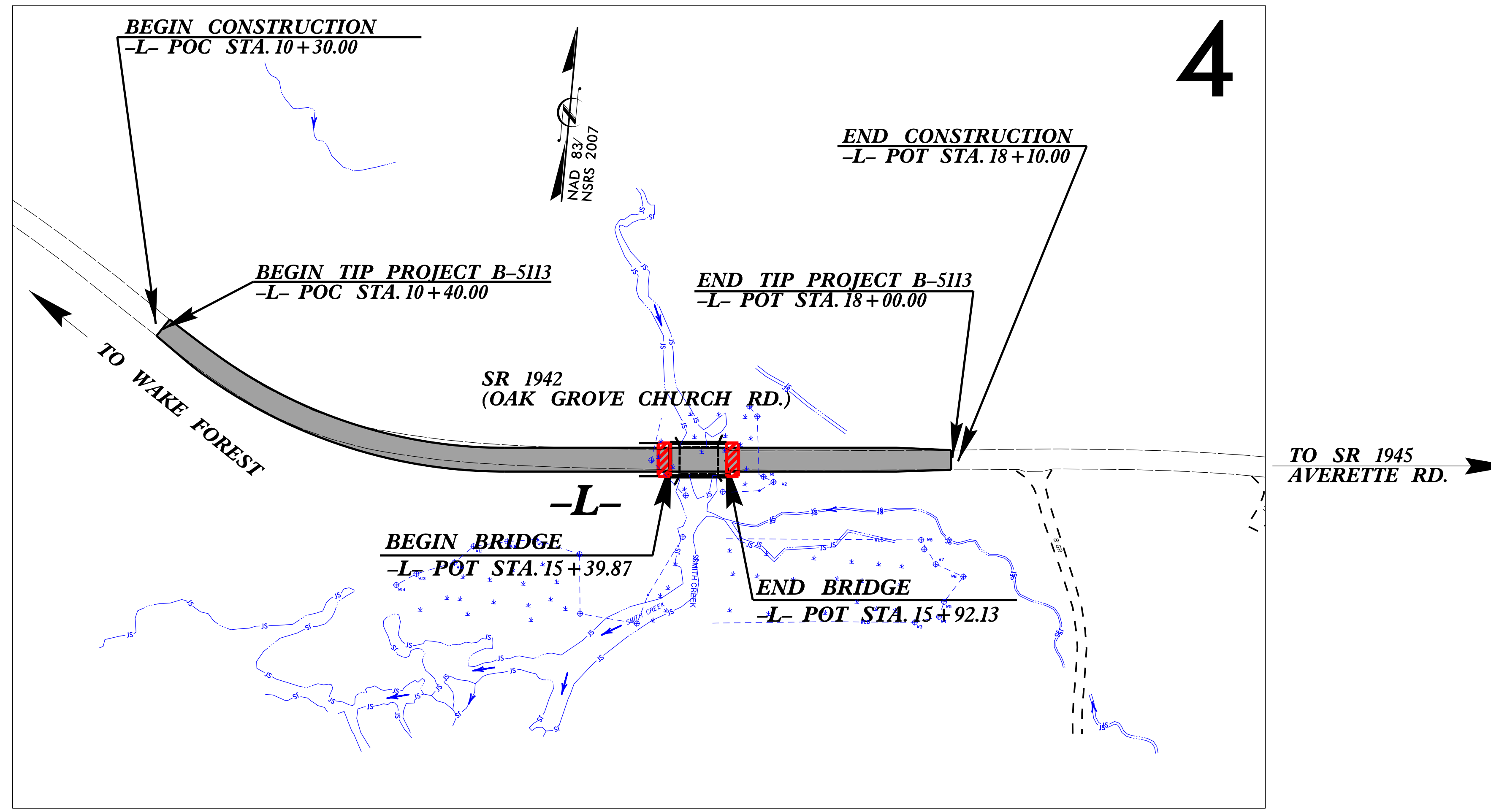
VICINITY MAP SHOWING LOCATION OF PROJECT B-5113

LOCATION: BRIDGE NO. 157 ON SR 1942 (OAK GROVE CHURCH ROAD) OVER SMITH CREEK

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



WETLAND AND SURFACE WATER IMPACTS PERMIT



THERE IS NO CONTROL OF ACCESS ON THIS PROJECT
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2013 = 1,662
ADT 2033 = 5,970
DHV = 10 %
D = 75 %
T = 3 % *
V = 40 MPH
* TTST 1 DUAL 2
FUNC CLASS = LOCAL
SUB REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-5113	=0.134 MILES
LENGTH STRUCTURE TIP PROJECT B-5113	=0.010 MILES
TOTAL LENGTH TIP PROJECT B-5113	=0.144 MILES

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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 28, 2014

LETTING DATE:
JANUARY 20, 2015

TONY HOUSER, P.E.
PROJECT ENGINEER

LEE ANN MOORE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE:

ROADWAY DESIGN ENGINEER

SIGNATURE:

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PERMIT DRAWING
SHEET 1 OF 6

6/3/2014
smquadri
R:\Hydraulics\PERMITS_Environmental\Drawings\Wetland Permit\B-5113_Hyd_prm_wet_TSH.dgn
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$$$$$$$$$$$DGN$$$$$$$$$$$$$$
$$$USERNAME$$$$


PROJECT REFERENCE NO.
B-5113
SHEET NO.
4
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
NAD 83/NSRS 2007
100' 0' 100' 200' 300'
GRAPHIC SCALE
DETAIL SHOWING PAVEMENT AND BRIDGE RELATIONSHIP
(NOT TO SCALE)
WOODS
OAK GROVE CHURCH ROAD
SR 1942 (PAVED 18')
CLASS II RIP RAP
STRUCTURE PAY ITEM
SPECIAL CUT DITCH
w/CL B RIP RAP
SEE DETAIL 1
V10 = 1.5 fps
Q10 = 2.5 cfs
TOE PROTECTION
w/CL B RIP RAP
SEE DETAIL 2
45.00'
30.40'
PDE
15" RCP-V
TB 2GI
BRIDGE
No. 157
CENTURYLINK
SMITH CREEK
FILL IN WETLANDS
DENOTES IMPACTS IN SURFACE WATER
DENOTES MECHANIZED CLEARING
DENOTES FILL IN WETLAND
0' 100'
PERMIT DRAWING
SHEET 2 OF 6
PAVED SHOULDER
SEE SHEET 5 FOR PROFILE
SEE SHEETS S-? THRU S-? FOR STRUCTURE PLANS
6/11/2014
R:\Hydraulics\PERMITS_Environmental\Drawings\Wetland Permit\B-5113_Hyd_PSH_wet.dgn

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-5113	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83/NSRS 2007

100' 0' 100' 200' 300'
GRAPHIC SCALE

DETAIL SHOWING PAVEMENT AND BRIDGE RELATIONSHIP
(NOT TO SCALE)

WOODS

OAK GROVE CHURCH ROAD
SR 1942 (PAVED) (BY)

CLASS II RIP RAP
STRUCTURE PAY ITEM

SPECIAL CUT DITCH
w/CL B RIP RAP
SEE DETAIL 1

V10 = 1.5 fps
Q10 = 2.5 cfs

TOE PROTECTION
w/CL B RIP RAP
SEE DETAIL 2

45.00'
30.40'

PDE

15" RCP-V
TB 2GI

BRIDGE
No. 157

CENTERLINE

EIP

SMITH CREEK

FILL IN WETLANDS

BZ 1
BZ 2

DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

0' 100'
APHIC SCALE

PAVED SHOULDER

PERMIT DRAWING
SHEET 3 OF 6

SEE SHEET 5 FOR PROFILE
SEE SHEETS S-? THRU S-? FOR STRUCTURE PLANS

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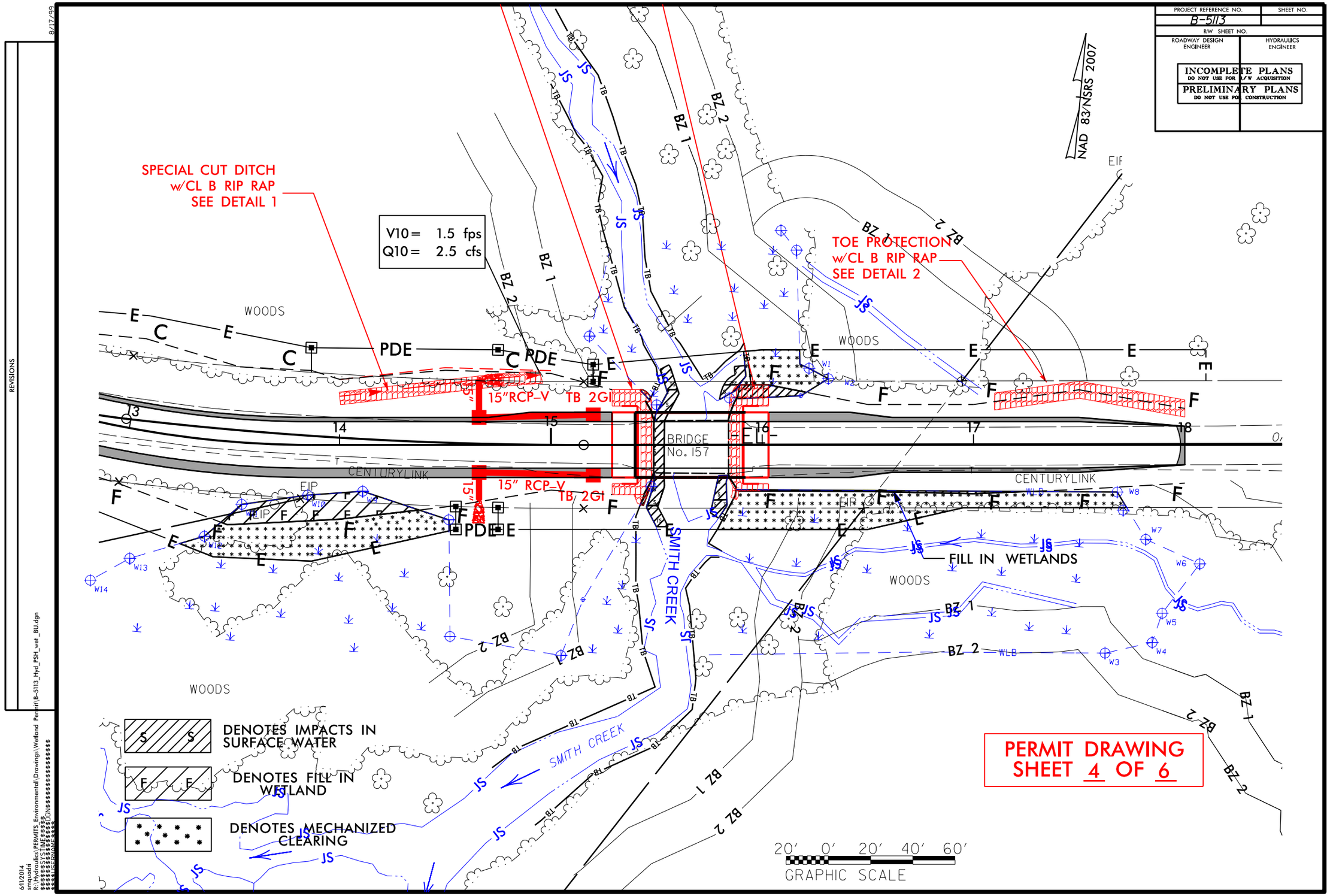
PROJECT REFERENCE NO.
B-5113
SHEET NO.
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
NAD 83/NSRS 2007
SPECIAL CUT DITCH
w/CL B RIP RAP
SEE DETAIL 1
V10 = 1.5 fps
Q10 = 2.5 cfs
TOE PROTECTION
w/CL B RIP RAP
SEE DETAIL 2
15"RCP-V
TB 2GI
15" RCP-V
TB 2GI
BRIDGE
No. 157
WOODS
CENTURYLINK
FILL IN WETLANDS
SMITH CREEK
PDE
EIP
WLB
DENOTES IMPACTS IN SURFACE WATER
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
20' 0' 20' 40' 60'
GRAPHIC SCALE
PERMIT DRAWING
SHEET 4 OF 6
REVISIONS
8/17/99
6/11/2014
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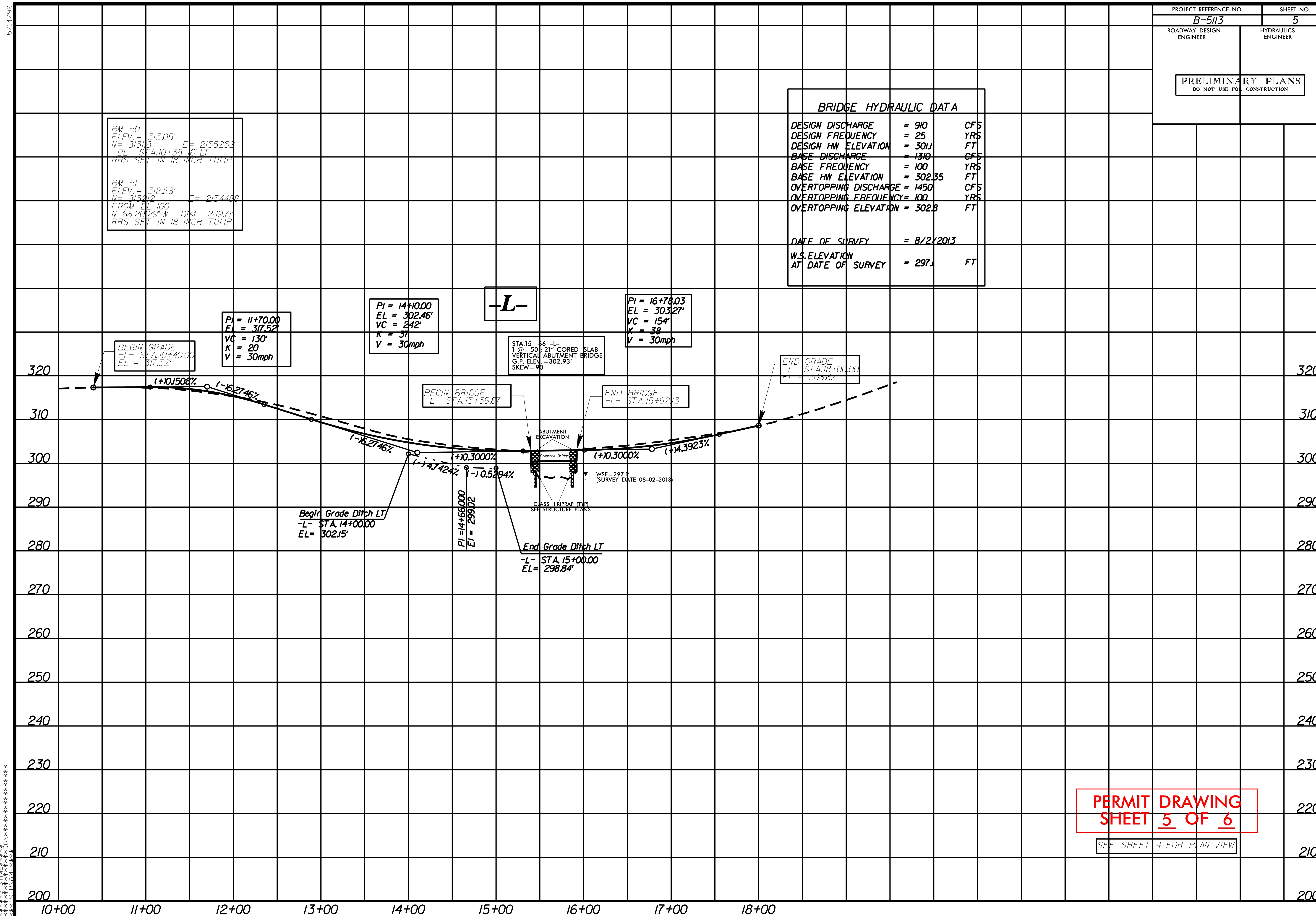
5/14/99



6/3/2014
smquadri
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$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$$

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS						SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	CAMA Permanent Fill In Wetlands (ac)	404 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	-L- 15+87 LT	Bank Stabilization							< 0.01	< 0.01	57	24	
	13+30 To 17+25	Roadway Fill		0.03			0.11						
TOTALS:			0.00	0.03	0.00	0.00	0.11	0.00	<0.01	0.00	57	24.00	0.00

N.C.D.O.T.
DIVISION OF HIGHWAYS
WAKE COUNTY
PROJECT: 42251.2FD1 (B-5113)
BRIDGE #157 on
SR 1942 (Oak Grove Church Rd)
over Smith Creek
SHEET 6 of 6 (06/03/2014)

ATN Revised 3/31/05

TIP PROJECT: B-5113

CONTRACT: C203517

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

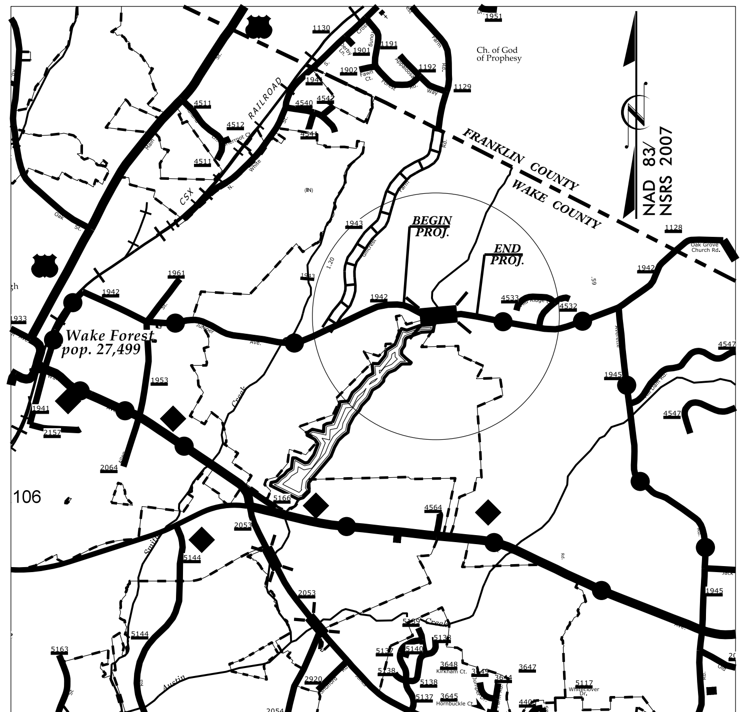
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5113	1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
42251.1.FD1	BRZ-1942(1)	P.E.	
42251.2.FD1	BRZ-1942(1)	ROW & UTIL	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

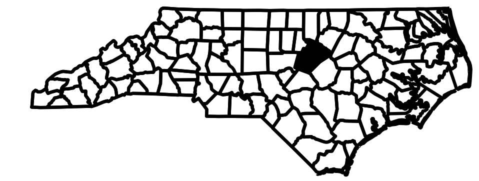
LOCATION: BRIDGE NO. 157 ON SR 1942 (OAK GROVE CHURCH ROAD) OVER SMITH CREEK

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

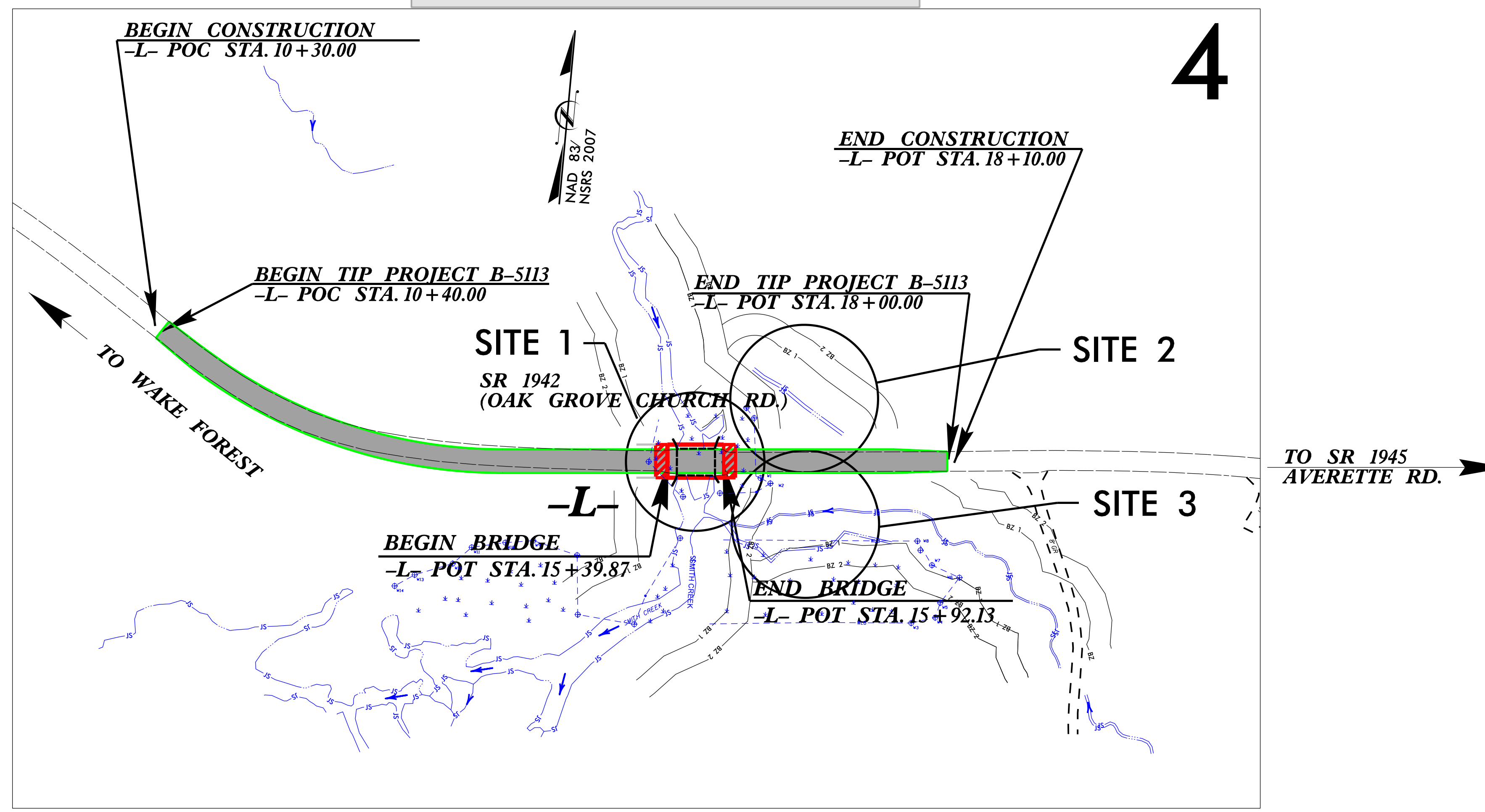


OFFSITE DETOUR

VICINITY MAP SHOWING LOCATION OF PROJECT B-5113



BUFFER IMPACTS PERMIT



THERE IS NO CONTROL OF ACCESS ON THIS PROJECT
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2013 = 1,662
ADT 2033 = 5,970
DHV = 10 %
D = 75 %
T = 3 % *
V = 40 MPH
* TTST 1 DUAL 2
FUNC CLASS = LOCAL
SUB REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-5113	=0.134 MILES
LENGTH STRUCTURE TIP PROJECT B-5113	=0.010 MILES
TOTAL LENGTH TIP PROJECT B-5113	=0.144 MILES

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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 28, 2014

LETTING DATE:
JANUARY 20, 2015

TONY HOUSER, P.E.
PROJECT ENGINEER

LEE ANN MOORE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

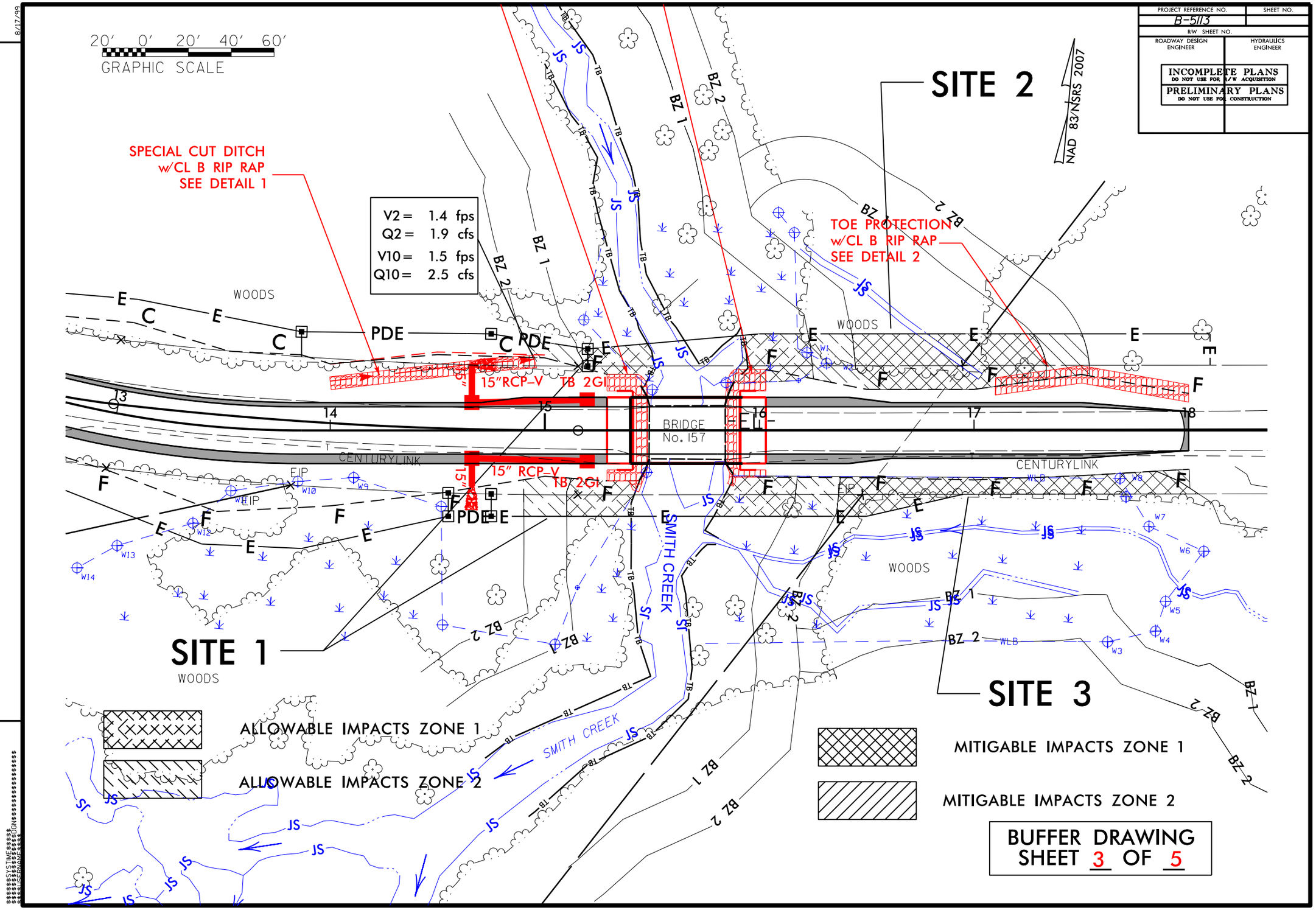
SIGNATURE:

ROADWAY DESIGN ENGINEER

SIGNATURE:

BUFFER DRAWING
SHEET 1 OF 5


PROJECT REFERENCE NO.
B-5113
SHEET NO.
4
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
NAD 83/NSRS 2007
TYPE-III
TYPE-III
TYPE-III
TYPE-III
DETAIL SHOWING PAVEMENT AND BRIDGE RELATIONSHIP
(NOT TO SCALE)
WOODS
OAK GROVE CHURCH ROAD
SR 1942 (PAVED 18')
CLASS II RIP RAP
STRUCTURE PAY ITEM
SPECIAL CUT DITCH
w/CL B RIP RAP
SEE DETAIL 1
V2 = 1.4 fps
Q2 = 1.9 cfs
V10 = 1.5 fps
Q10 = 2.5 cfs
PDE
15"RCP-V
TB 2GI
15" RCP-V
BRIDGE
No. 157
CENTURYLINK
SITE 2
TOE PROTECTION
w/CL B RIP RAP
SEE DETAIL 2
45.00'
30.40'
SITE 1
SITE 3
SMITH CREEK
BZ 1
BZ 2
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
100' 0' 100' 200' 300'
GRAPHIC SCALE
PAVED SHOULDER
BUFFER DRAWING
SHEET 2 OF 5
SEE SHEET 5 FOR PROFILE
SEE SHEETS S-? THRU S-? FOR STRUCTURE PLANS


20' 0' 20' 40' 60'
GRAPHIC SCALE
PROJECT REFERENCE NO.
B-5113
SHEET NO.
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
NAD 83/NSRS 2007
SITE 2
SITE 1
SITE 3
SPECIAL CUT DITCH
w/CL B RIP RAP
SEE DETAIL 1
TOE PROTECTION
w/CL B RIP RAP
SEE DETAIL 2
V2 = 1.4 fps
Q2 = 1.9 cfs
V10 = 1.5 fps
Q10 = 2.5 cfs
15"RCP-V
TB 2GI
15" RCP-V
TB 2GI
BRIDGE
No. 157
WOODS
CENTURYLINK
SMITH CREEK
BZ 1
BZ 2
PDE
EIP
WLB
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
BUFFER DRAWING
SHEET 3 OF 5
REVISIONS
8/17/99

BUFFER IMPACTS SUMMARY

			IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
1	Bridge	15+40 to 15+90 RT LT		X		294	0	294					
	Road	14+90 to 15+40 & 15+90 to 16+50 RT LT	X			1984	1486	3470					
2	Roadway Fill	16+50 to 17+50 LT			X				2041	414	2455		
3	Roadway Fill	16+50 to 18+00 RT			X				1725	62	1787		
TOTAL:						2278	1486	3764	3766	476	4242		

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY
PROJECT: 42251.2.FD1 (B-5113)
Bridge #157 on SR 1942 (Oak Grove Church Rd)
over Smith Creek
6/3/2014
SHEET 4 OF 5

Rev. May 2006

WETLANDS IN BUFFER IMPACTS SUMMARY

SITE NO.	STATION (FROM/TO)		WETLANDS IN BUFFERS ZONE 1 (ft^2)	WETLANDS IN BUFFERS ZONE 2 (ft^2)
1	14+90 to 16+50 RT LT		1506	411
3	16+50 to 18+00 RT		1410	0
TOTAL:			2916	411

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY
PROJECT: 42251.2.FD1 (B-5113)
Bridge #157 on SR 1942 (Oak Grove Church Rd)
over Smith Creek
6/3/2014
SHEET 5 OF 5

Rev. Jan 2009

09/08/99

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

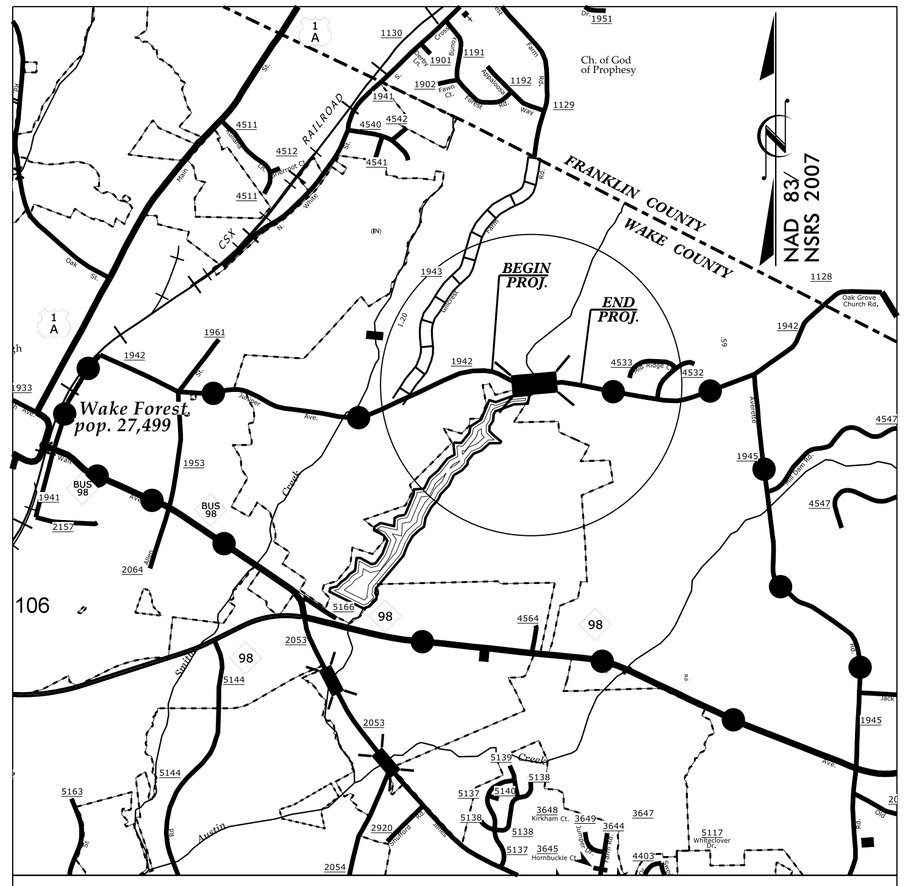
WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–5113	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
42251.1.FD1	BRZ–1942(1)	P.E.
42251.2.FD1	BRZ–1942(1)	ROW & UTIL

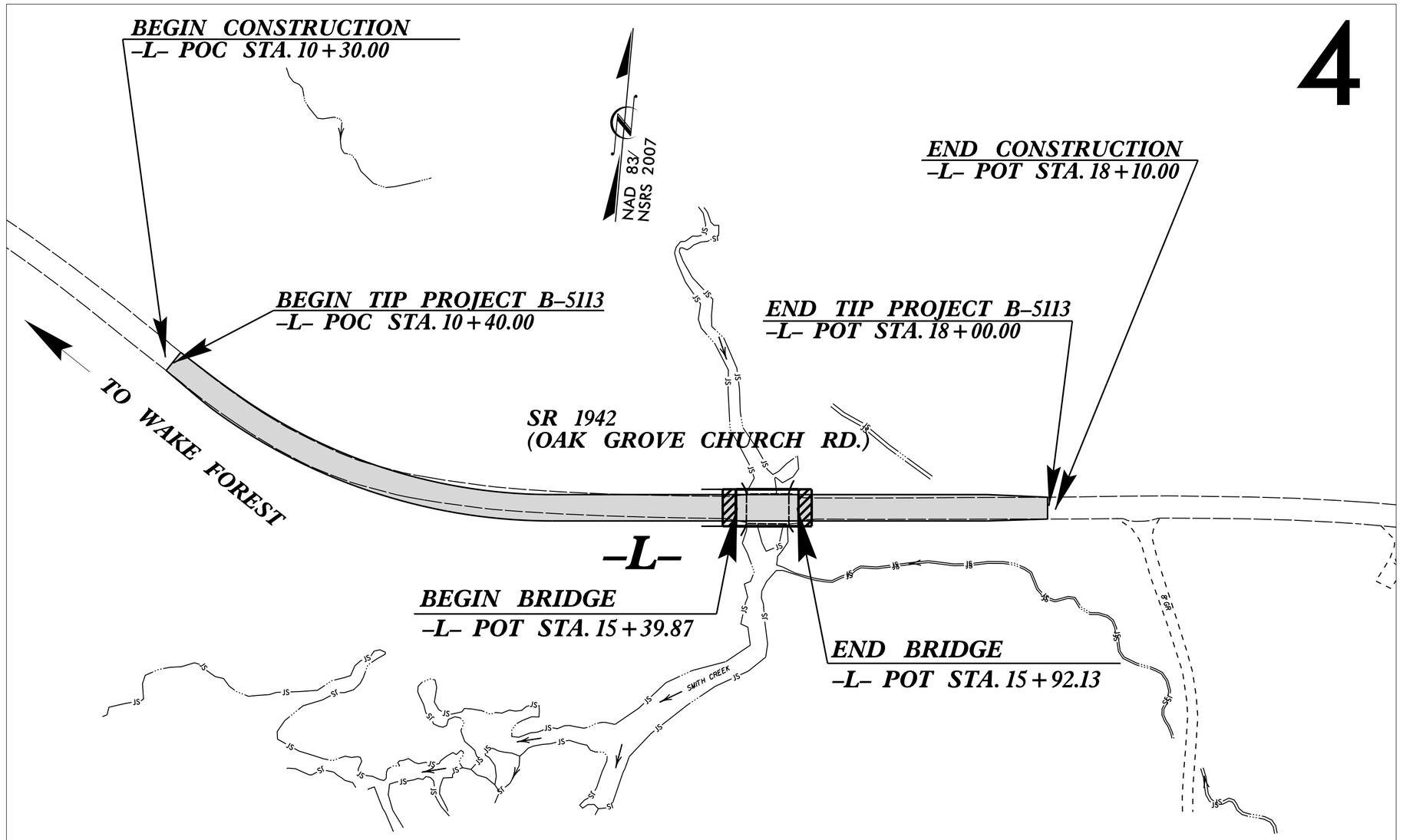
LOCATION: BRIDGE NO. 157 ON SR 1942 (OAK GROVE CHURCH ROAD) OVER SMITH CREEK

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



OFFSITE DETOUR

VICINITY MAP SHOWING LOCATION OF PROJECT B–5113



4

THERE IS NO CONTROL OF ACCESS ON THIS PROJECT
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

TIP PROJECT: B–5113

CONTRACT: C203517

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2013 = 1,662
ADT 2033 = 5,970
DHV = 10 %
D = 75 %
T = 3 % *
V = 40 MPH
* TTST 1 DUAL 2
FUNC CLASS = LOCAL
SUB REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B–5113	= 0.134 MILES
LENGTH STRUCTURE TIP PROJECT B–5113	= 0.010 MILES
TOTAL LENGTH TIP PROJECT B–5113	= 0.144 MILES

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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JANUARY 17, 2014

LETTING DATE: JANUARY 20, 2015

TONY HOUSER, P.E.
PROJECT ENGINEER

LEE ANN MOORE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE:

ROADWAY DESIGN ENGINEER

SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

27-JAN-2014 14:38
R:\Roadway_Proj\b5113_rdy_tsh.dgn
$$$$USERNAME$$$$

12/05/11

PROJECT REFERENCE NO.	SHEET NO.
B-5113	1B

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Known Soil Contamination: Area or Site
- Potential Soil Contamination: Area or Site

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

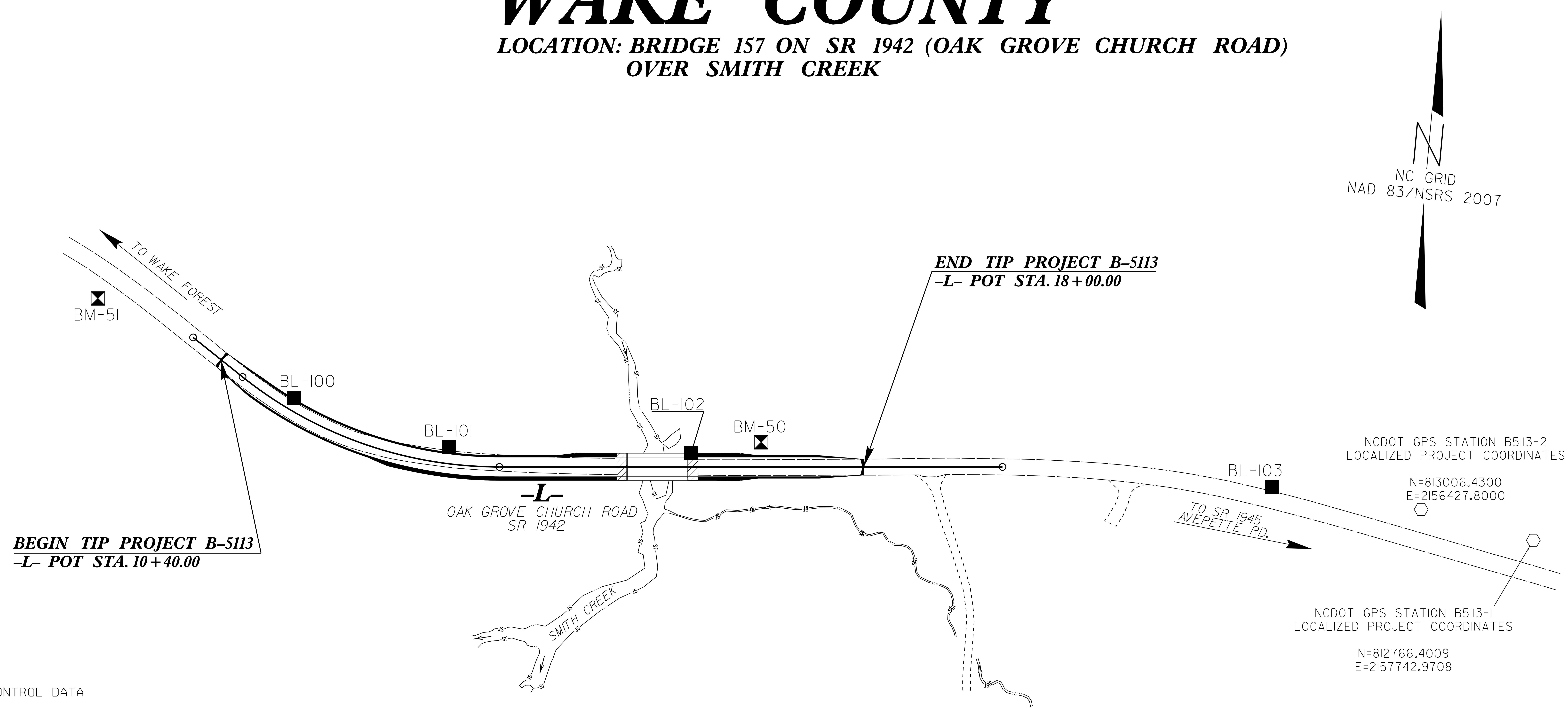
- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- Recorded SS Forced Main Line — FSS
- Designated SS Forced Main Line (S.U.E.*) — FSS

MISCELLANEOUS:

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

PROJECT REFERENCE NO.	SHEET NO.
B-5113	1C
Location and Surveys	

SURVEY CONTROL SHEET B-5113
WAKE COUNTY
LOCATION: BRIDGE 157 ON SR 1942 (OAK GROVE CHURCH ROAD) OVER SMITH CREEK



CONTROL DATA

BASELINE

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
100	BL-100	813119.8081	2154719.5869	315.59	11+34.50	13.76 LT
101	BL-101	813080.6505	2154899.4704	308.18	13+26.58	19.08 LT
102	BL-102	813099.1683	2155174.0996	302.12	16+04.37	16.08 LT
103	BL-103	813121.0064	2155833.9271	339.31	OUTSIDE PROJECT LIMITS	

BENCHMARK DATA

****

50 ELEVATION = 313.05
N 813118 E 2155252
L STATION 16+84.00 28 LEFT
RRS SET IN 18 INCH TULIP

****

****

51 ELEVATION = 312.28
N 813212 E 2154488
FROM BL-100
N 68°20'29" W DIST 249.71
RRS SET IN 18 INCH TULIP

****

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B5113-2"
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
NORTHING: 813006.4300(ft) EASTING: 2156427.8000(ft)
ELEVATION: 365.40(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99994103
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B5113-2" TO -L- STATION 10+40.00 IS
N 85°14'39.8" W 1801.45'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

NOTES:

1. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING NCDOT PROJECT CONTROL DATA AT: HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/PAGES/DEFAULT.ASPX*

   THE FILES TO BE FOUND ARE AS FOLLOWS: B5113_LS_CONTROL.TXT

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

⬡ *INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.*
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING SERVICE (OPUS)
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

6/2/99
27-JAN-2014 14:39
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-5113	2

ROADWAY DESIGN ENGINEER

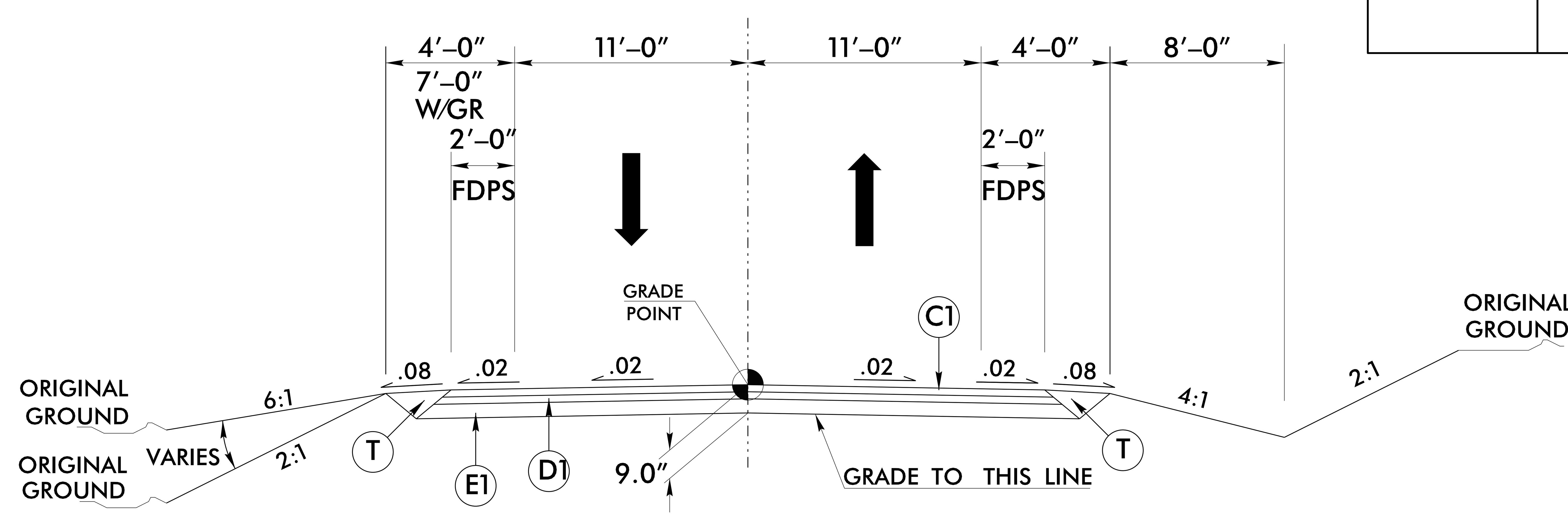
PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PAVEMENT SCHEDULE

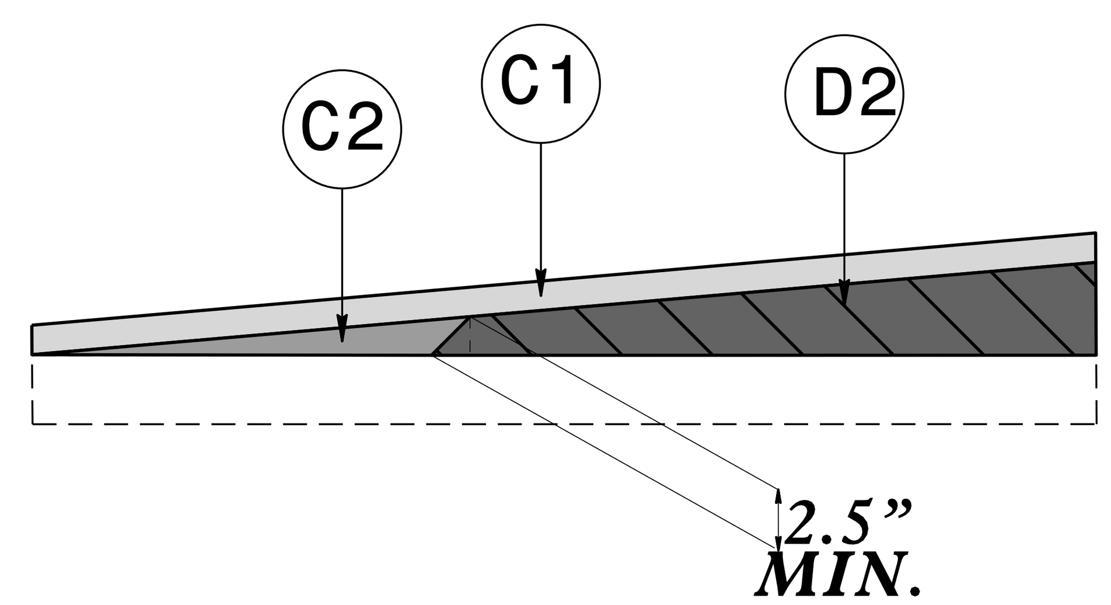
C1	PROP. APPROX. 3.0" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF 2 LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS, PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT TO EXCEED 1.5" IN DEPTH.
D1	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS, PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2.5" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
T	EARTH MATERIAL.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)

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

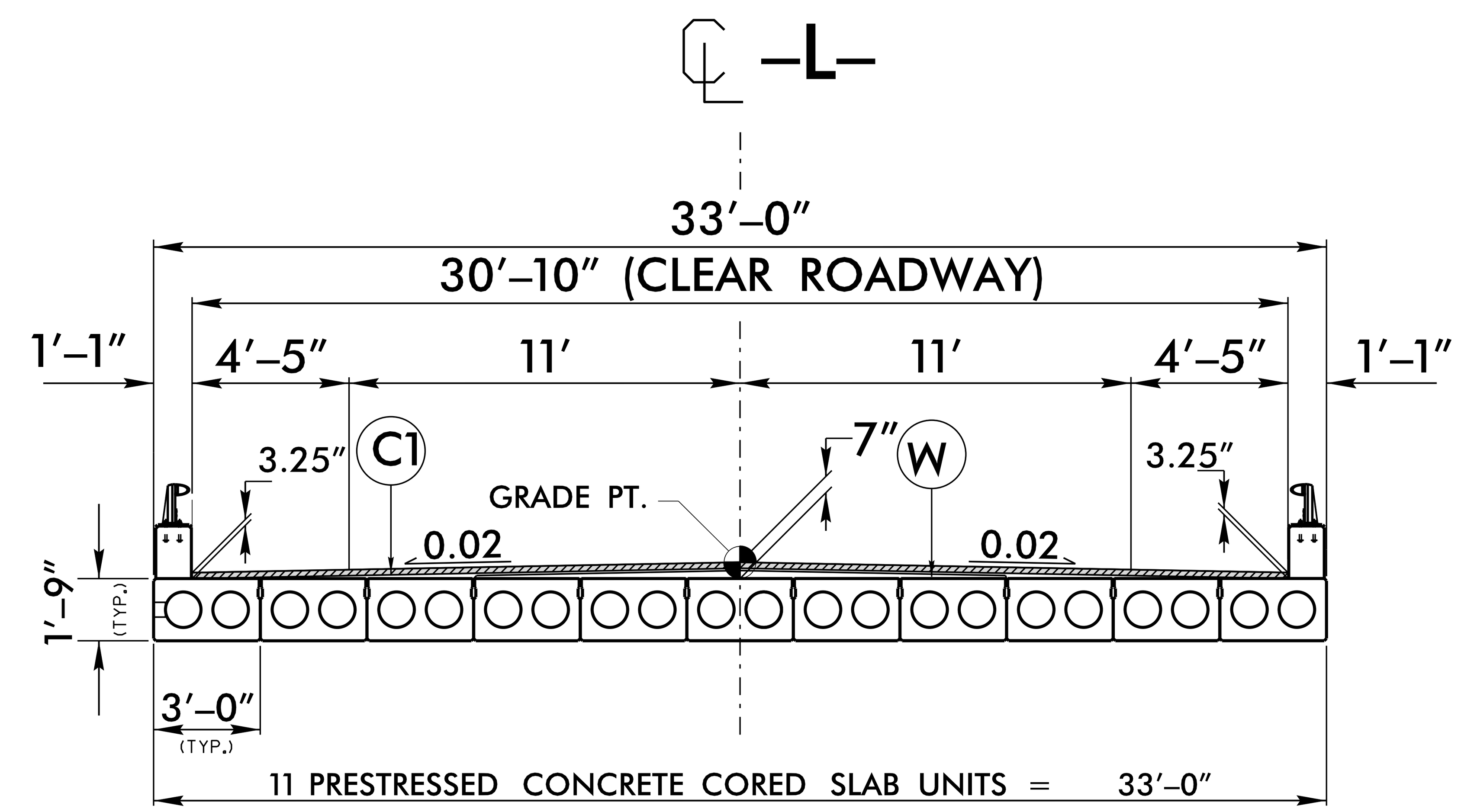


TYPICAL SECTION NO. 1

-L- STA. 10+40.00 TO STA. 15+39.87 (BEGIN BRIDGE)
-L- STA. 15+92.13 (END BRIDGE) TO STA. 18+00.00

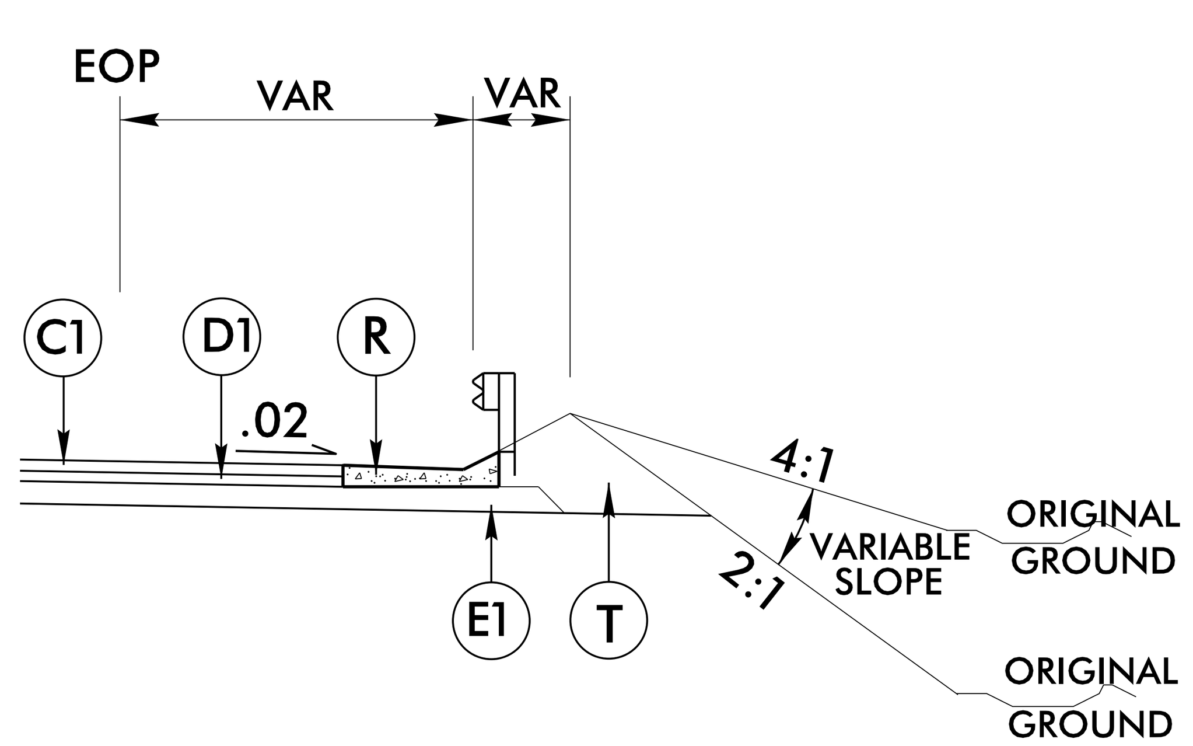


WEDGING DETAIL ON BRIDGE



TYPICAL SECTION ON BRIDGE

-L- STA. 15+39.87 (BEGIN BRIDGE) TO
STA. -L- 15+92.13 (END BRIDGE)



SHOULDER BERM GUTTER DETAIL:

-L- STA. 15+11.00 TO STA. 15+28.87 LT. (Begin Approach Slab)
-L- STA. 15+11.00 TO STA. 15+28.87 RT. (Begin Approach Slab)

6/2/99

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12/06/07

COMPUTED BY: EAD DATE: 11-18-2013
CHECKED BY: _____ DATE: _____

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-5113	3-A

SUMMARY OF EARTHWORK

(IN CUBIC YARDS)

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
-L- STA. 10+40.00	-L- STA. 15+41.00	995	359		636
-L- STA. 15+41.00	-L- STA. 18+00.00	248	43		205
	SUBTOTALS	1243	402		841
TOTAL		1243	402		841
WASTE IN LIEU OF BORROW					
PROJECT TOTALS		1243			841
GRAND TOTALS		1243			841
SAY		1250			

Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing and Grubbing, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LOC LT /RT	UNCL. EXCAV.
-L-	15+15.00	15+28.87	LT	18
-L-	15+15.00	15+28.87	RT	18
			TOTAL	36
			SAY	40

REMOVAL OF EXISTING ASPHALT PAVEMENT

LINE	STATION	STATION	LOCATION	LENGTH OR AREA	WIDTH	SQUARE YARDS
-L-	10+40	15+41	LT & RT	9717.75		1079.75
-L-	15+91	18+00	LT & RT	3934.91		437.21
					TOTAL	1519.96
					SAY	1520

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH: STRAIGHT	LENGTH: SHOP CURVED	LENGTH: DOUBLE FACED	WARRANT POINT: APPROACH END	WARRANT POINT: TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH: APPROACH END	FLARE LENGTH: TRAILING END	W: APPROACH END	W: TRAILING END	ANCHORS: XI MOD	XI	GRAU 350 TL2	M-350	XIII	CAT-1	VI MOD	BIC	TYPE III	IMPACT ATTENUATOR TYPE 350: G	IMPACT ATTENUATOR TYPE 350: NG	SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING GUARDRAIL	REMARKS
-L-	12+64.87	15+39.87(BR)	RT	275			13+50.00(FILL)		4	4							1						1						
-L-	15+92.13(BR)	16+42.13	RT	50				15+92.13(BR)	4	4							1						1						
-L-	14+89.87	15+39.87(BR)	LT	50			15+39.87(BR)		4	4							1						1						
-L-	15+92.13(BR)	16+42.13	LT	50				15+92.13(BR)	4	4							1						1						
			Subtotal	425																									
		Anchor Deduction		175											Anchor Deduction														
			TOTAL	250																									
			SAY	250																									
															Grau-350-TL2			4	@25=100'										
															TYPE III			4	@18.75=75'										
															TOTAL ANCHORS				175'										
															ADDITIONAL POSTS				=5										

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-5113	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

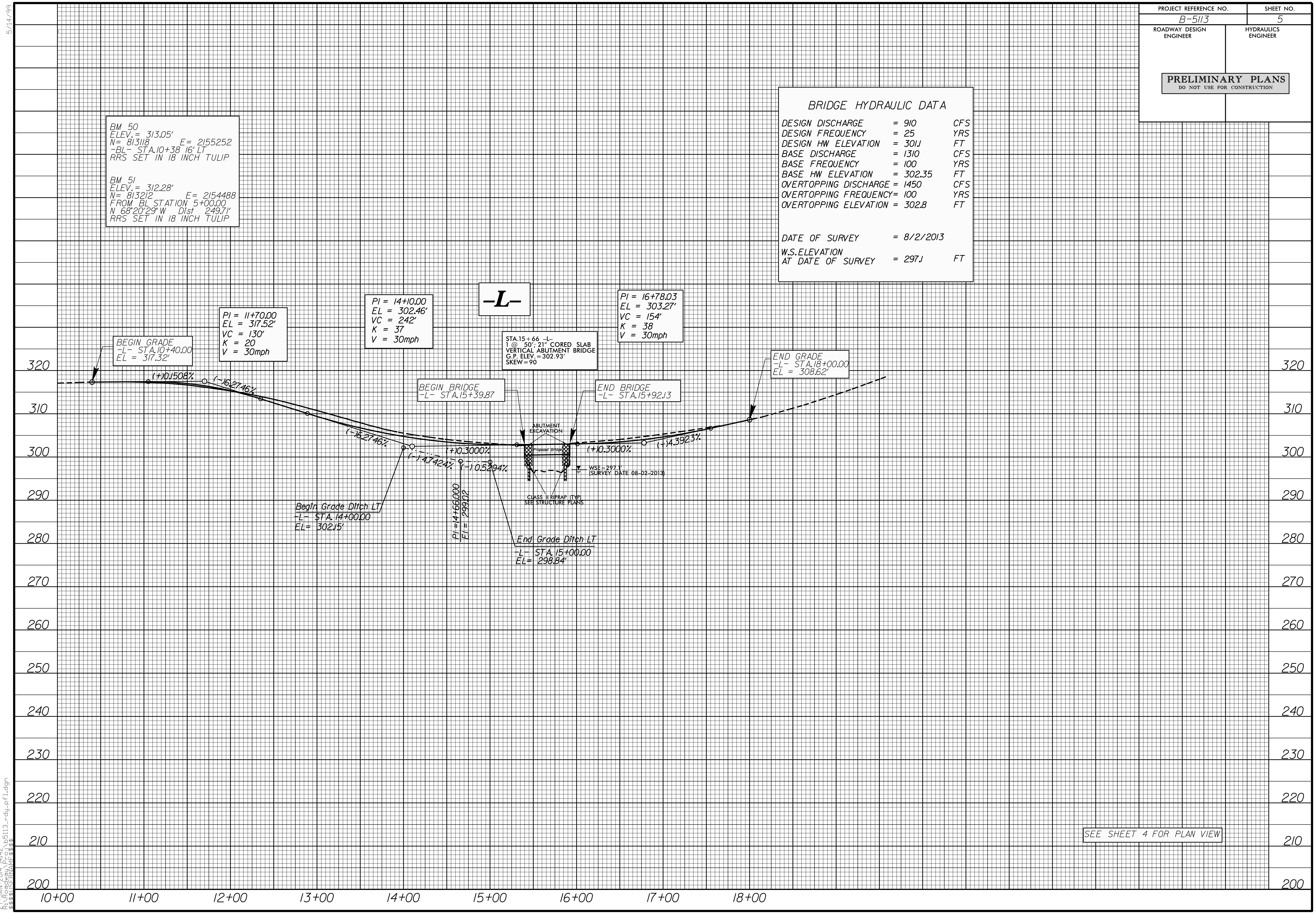
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PAVED SHOULDER

SEE SHEET 5 FOR PROFILE
SEE SHEETS S-? THRU S-? FOR STRUCTURE PLANS

PROJECT REFERENCE NO.	SHEET NO.
B-5113	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	910	CFS
DESIGN FREQUENCY	=	25	YRS
DESIGN HW ELEVATION	=	301.1	FT
BASE DISCHARGE	=	1310	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	302.35	FT
OVERTOPPING DISCHARGE	=	1450	CFS
OVERTOPPING FREQUENCY	=	100	YRS
OVERTOPPING ELEVATION	=	302.8	FT
DATE OF SURVEY	=	8/2/2013	
W.S.ELEVATION AT DATE OF SURVEY	=	297.1	FT

SEE SHEET 4 FOR PLAN VIEW

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-5113	X-1

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

325 320 315 310

2:1 4:1 0.060 0.044 4:1 2:1

314.47 317.28 315.95

11+00.00

325 320 315 310

2:1 4:1 0.060 0.030 4:1 2:1

314.42 317.37 315.66

10+71.80

320 315 310

2:1 4:1 0.049 0.019 4:1 2:1

314.49 317.34 315.41

10+50.00

BEGIN GRADE
–L– 10+40.00

320 315 310

2:1 4:1 0.040 0.010 4:1 2:1

314.56 317.32 315.11

10+40.00

BEGIN CONSTRUCTION
–L– 10+30.00

320 315 310

317.08

10+00.00

Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Shoulder Borrow, Fine Grading, Clearing and Grubbing, Breaking of Existing Pavement, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

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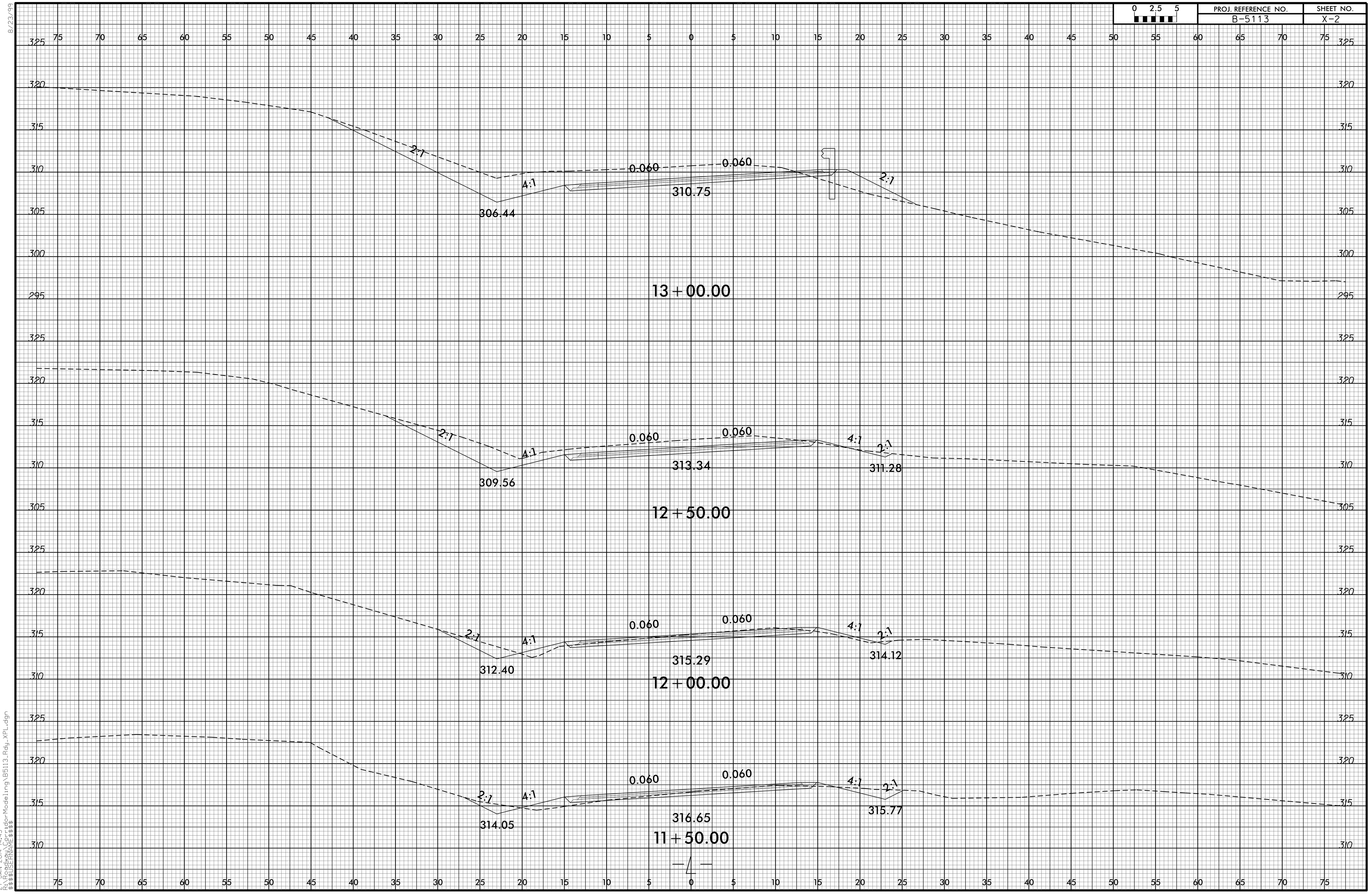
8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-5113	X-2



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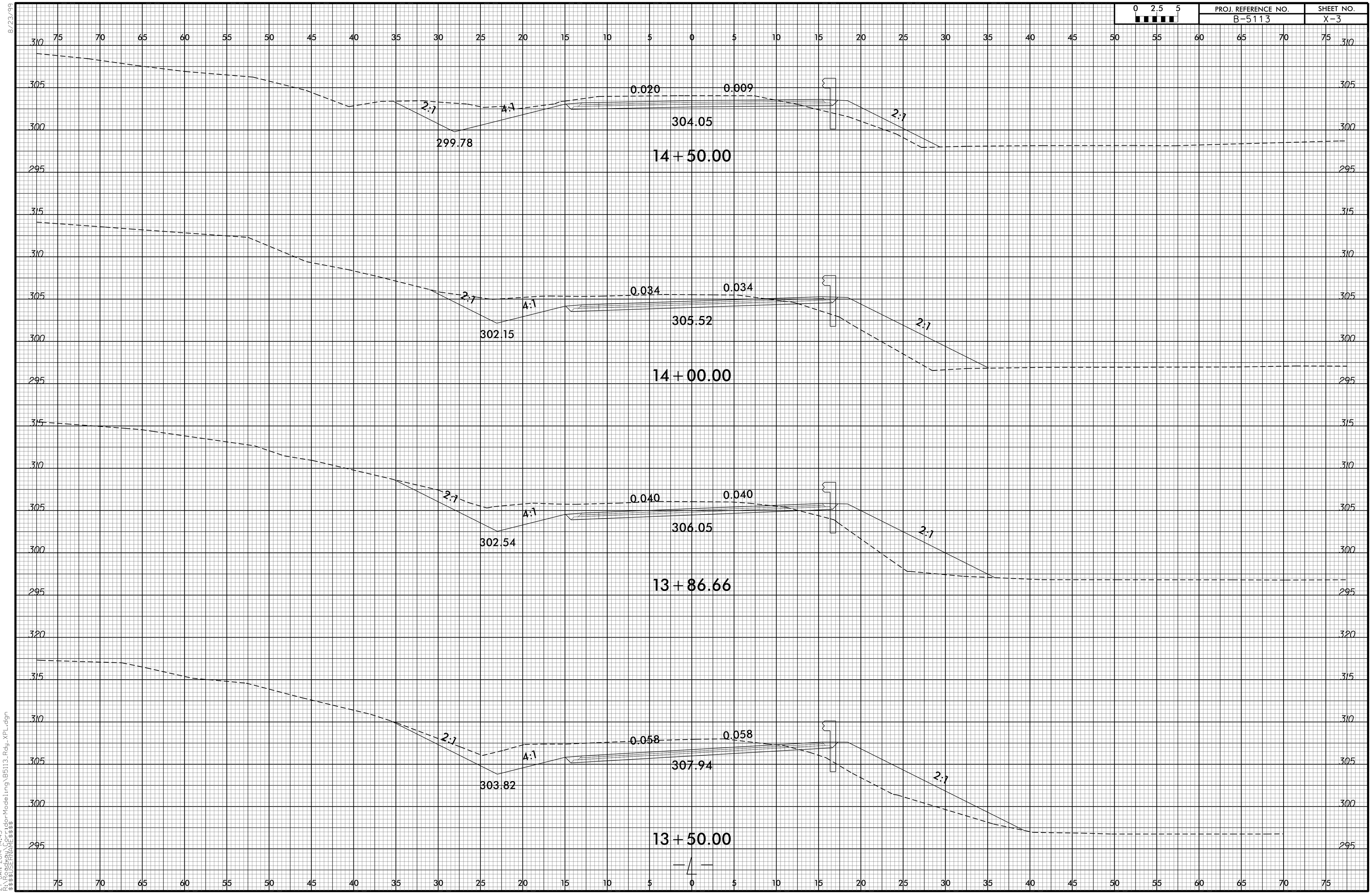
8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-5113	X-3



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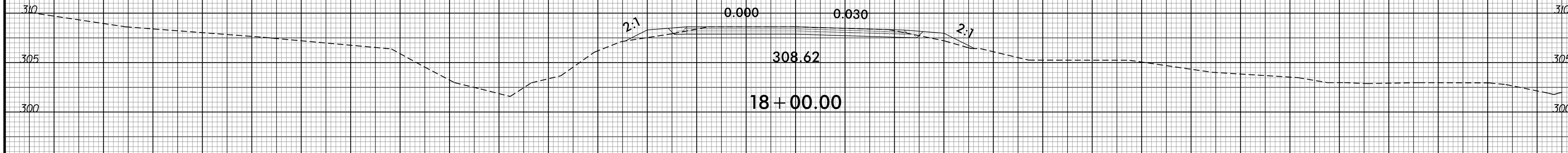
0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
B-5113	X-5

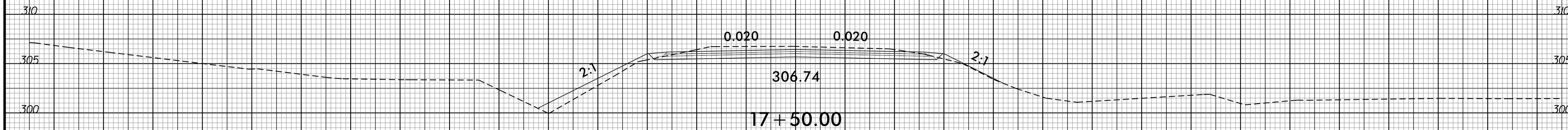
75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

315 310 305 300 295

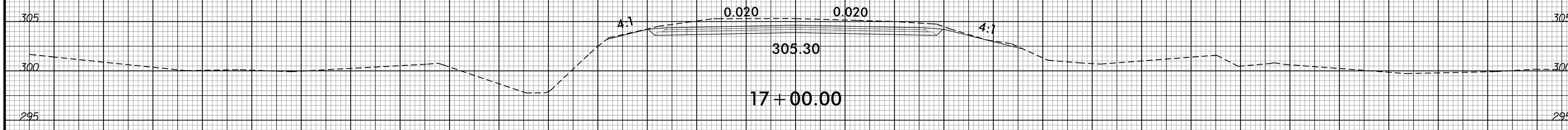
END CONSTRUCTION
–L– 18+10.00
END GRADE
–L– 18+00.00



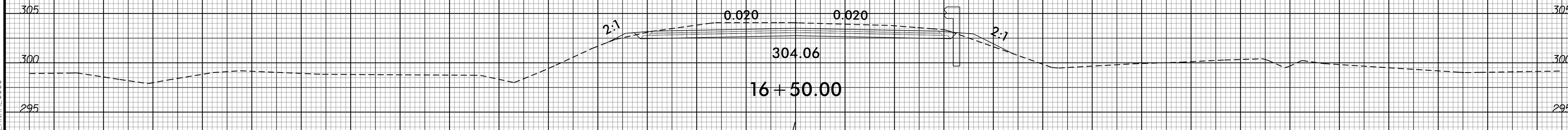
18+00.00



17+50.00



17+00.00



16+50.00