



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

July 27, 2017

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

ATTN: Ms. Loretta Beckwith
NCDOT Coordinator

Subject: Application for Section 404 Nationwide Permits 13, 23 & 33 and 401 Water Quality Certification for the Proposed Replacement of Bridge 67 on SR 1513 over Rabbit Creek in Macon County, Federal Aid Project No. BRZ-1513(7); TIP B-5406, Division 14; Debit \$240.00 from Work Order WBS Element 46121.1.1.

Dear Madam:

The North Carolina Department of Transportation (NCDOT) proposes to replace bridge number 67 on SR 1513 (Rabbit Creek Road) over Rabbit Creek in Macon County with a single span, 70 foot long cored slab bridge upstream (north) of the existing alignment. The existing bridge will be utilized as an onsite detour during construction. This action will result in 98 lf of permanent impacts resulting from outlet protection (10 lf) and energy dissipaters/roadway fill (88 lf) and there will be < 0.01 acres (25 lf) of temporary impacts to surface waters from bank stabilization installation and temporary dewatering. Mitigation has been acquired from NCDMS for the 98 lf of roadway fill.

Please see enclosed copies of the Pre-Construction Notification (PCN), Stormwater Management Plan, NCDMS Acceptance Letter, Permit Drawings, and Roadway Plansheets. A Categorical Exclusion (CE) was completed in October 2015 and distributed shortly thereafter. Additional copies are available upon request.

This project is located in a trout watershed; therefore comments from the NCWRC will be required prior to authorization by the Corps of Engineers. By copy of this letter and attachment, NCDOT hereby requests NCWRC Review. NCDOT requests that NCWRC forward their comments to the Corps of Engineers and the NCDOT within 30 calendar days of receipt of this application.

This project calls for a letting date of February 20, 2018 and a review date of January 2, 2018.

A copy of this permit application and its distribution list will be posted on the NCDOT Website at: <http://connect.ncdot.gov/resources/Environmental>. If you have any questions or need additional information, please call Jeff Hemphill at (919) 707-6126.

Sincerely,

A handwritten signature in black ink, appearing to read 'P. Harris', with a long horizontal flourish extending to the right.

for Philip S. Harris, P.E., Manager
Environmental Analysis Unit

cc:

NCDOT Permit Application Standard Distribution List



Office Use Only:
Corps action ID no. _____
DWQ project no. _____
Form Version 1.3 Dec 10 2008

Pre-Construction Notification (PCN) Form

A. Applicant Information

1. Processing

1a. Type(s) of approval sought from the Corps:	☒ Section 404 Permit	☐ Section 10 Permit
1b. Specify Nationwide Permit (NWP) number: 13, 23, 33 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 67 over Rabbit Creek on SR 1513 (Rabbit Creek Road)
2b. County:	Macon
2c. Nearest municipality / town:	Franklin
2d. Subdivision name:	<i>not applicable</i>
2e. NCDOT only, T.I.P. or state project no:	B-5406

3. Owner Information

3a. Name(s) on Recorded Deed:	North Carolina Department of Transportation
3b. Deed Book and Page No.	<i>not applicable</i>
3c. Responsible Party (for LLC if applicable):	<i>not applicable</i>
3d. Street address:	1598 Mail Service Center
3e. City, state, zip:	Raleigh, NC 27699-1598
3f. Telephone no.:	(919) 707-6126
3g. Fax no.:	(919) 212-5785
3h. Email address:	jhemphill@ncdot.gov

4. Applicant Information (if different from owner)	
4a. Applicant is:	☐ Agent ☐ Other, specify:
4b. Name:	<i>not applicable</i>
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:	<i>not applicable</i>
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):	<i>not applicable</i>	
1b. Site coordinates (in decimal degrees):	Latitude: 35.20919 (DD.DDDDDD)	Longitude: - 83.34155 (-DD.DDDDDD)
1c. Property size:	1.2 acres	
2. Surface Waters		
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	Rabbit Creek	
2b. Water Quality Classification of nearest receiving water:	C;Tr	
2c. River basin:	Little Tennessee	
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: Pasture land, rural residential.		
3b. List the total estimated acreage of all existing wetlands on the property: 0.0 acre		
3c. List the total estimated linear feet of all existing streams (intermittent and perennial) on the property: 250 lf		
3d. Explain the purpose of the proposed project: To replace a structurally deficient and functionally obsolete bridge.		
3e. Describe the overall project in detail, including the type of equipment to be used: The project involves replacing a three span 58-foot timber deck & steel I beam bridge with a single span, 70-foot cored slab bridge on a new alignment to the north. The existing bridge will be utilized as an onsite detour for this project. 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:	☐ 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):	Agency/Consultant Company: Other: NCDOT	
4d. If yes, list the dates of the Corps jurisdictional determinations or State determinations and attach documentation.		
5. Project History		
5a. Have permits or certifications been requested or obtained for this project (including all prior phases) in the past?	☐ Yes ☒ No ☐ Unknown	
5b. If yes, explain in detail according to "help file" instructions.		
6. Future Project Plans		
6a. Is this a phased project?	☐ Yes ☒ No	
6b. If yes, explain.		

C. Proposed Impacts Inventory						
1. Impacts Summary						
1a. Which sections were completed below for your project (check all that apply):						
☐ Wetlands ☒ Streams - tributaries ☐ Buffers ☐ Open Waters ☐ Pond Construction						
2. Wetland Impacts						
If there are wetland impacts proposed on the site, then complete this question for each wetland area impacted.						
2a. Wetland impact number – Permanent (P) or Temporary (T)	2b. Type of impact	2c. Type of wetland (if known)	2d. Forested	2e. Type of jurisdiction (Corps - 404, 10 DWQ – non-404, other)	2f. Area of impact (acres)	
Site ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ		
Site ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ		
Site ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ		
Site ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ		
Site ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ		
2g. Total wetland impacts						
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	Outfall Protection	Rabbit Creek	☒ PER ☐ INT	☒ Corps ☒ DWQ	2	10
Site 1 ☐ P ☒ T	Dewatering/ Installation	Rabbit Creek	☒ PER ☐ INT	☒ Corps ☒ DWQ	2	20
Site 2 ☒ P ☐ T	Pipe/RipRap	UT to Rabbit Creek	☒ PER ☐ INT	☒ Corps ☒ DWQ	17	88
Site 2 ☐ P ☒ T	Dewatering	UT to Rabbit Creek	☒ PER ☐ INT	☒ Corps ☒ DWQ	17	5
3h. Total stream and tributary impacts						98 If Perm 25 If temp
. 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				
O1 ☐ P ☐ T				
O3 ☐ P ☐ T				
O4 ☐ P ☐ T				
4f. Total open water impacts				Permanent 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			☐ Yes ☐ No						
B2 ☐ P ☐ T			☐ Yes ☐ No						
B3 ☐ P ☐ T			☐ Yes ☐ No						
6h. Total buffer impacts									
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.		
1. See Stormwater Management Plan. The proposed bridge will provide more hydraulic opening than the existing bridge. One stormwater outfall is proposed near the end of the bridge and will be placed at a distance to minimize disturbance to the adjacent jurisdictional stream. A Rip Rap pad will be used to dissipate the energy. There is also a proposed cross pipe with Rip Rap outlet pad that will convey flow from UT to Rabbit Creek across Y1. The Rip Rap pad will be used to dissipate the energy before the flow drains into Rabbit Creek. The new bridge spans the creek. A NCWRC Letter dated July 30, 2013 stated 'a moratorium prohibiting in-stream work and land disturbance within the 25-foot trout buffer is recommended from January 1 to April 15 to protect the egg and fry stages of Rainbow trout. Sediment and erosion control measures should adhere to the Design Standards in Sensitive Watersheds'.		
1b. Specifically describe measures taken to avoid or minimize the proposed impacts through construction techniques. Best Management Practices for Surface Waters will be used during all phases of construction.		
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	
	☐ 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:	98 linear feet	
4c. If using stream mitigation, stream temperature:	☐ warm ☐ cool ☒ cold	
4d. Buffer mitigation requested (DWQ only):	0 square feet	
4e. Riparian wetland mitigation requested:		
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				
Zone 2				
	6f. Total buffer mitigation required:			
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).				
6h. Comments:				

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

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? N.C. Natural Heritage Program database; USFWS-website; biological surveys for protected species listed for Macon County. A bat survey report dated July 7, 2017 found no roosting habitat nor nearby occurrences for Gray bat or Indiana bat - NLEB is 4(d) compliant (email sent to USFWS 07/25/17). An aquatic screening for Appalachian elktoe, turquoise shiner and little-wing pearlymussel was conducted in 2013 and determined that no suitable mussel habitat was present in Rabbit Creek. No effect – no habitat for all other federally listed T&E species for Macon County.		
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		
AS Phillip S. Harris III, P.E., C.P.M. Applicant/Agent's Printed Name	 Applicant/Agent's Signature (Agent's signature is valid only if an authorization letter from the applicant is provided.)	07-27-2017 Date



ROY COOPER
Governor

July 18, 2017

Mr. Philip S. Harris, III, P.E., CPM
Project Development and Environmental Analysis Unit
North Carolina Department of Transportation
1598 Mail Service Center
Raleigh, North Carolina 27699-1598

Dear Mr. Harris:

Subject: Mitigation Acceptance Letter:

B-5406, Replace Bridge Number 67 over Rabbit Creek on SR 1513, Macon County

The purpose of this letter is to notify you that the Division of Mitigation Services (DMS) will provide the compensatory stream mitigation for the subject project. Based on the information supplied by you on July 12, 2017, the impacts are located in CU 06010202 of the Little Tennessee River basin in the Southern Mountains (SM) Eco-Region, and are as follows:

Little Tennessee 06010202 SM	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	98.0	0	0	0	0	0	0	0

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

The impacts and associated mitigation needs were under projected by the NCDOT in the 2017 impact data. DMS will commit to implement sufficient compensatory stream mitigation credits to offset the impacts associated with this project as determined by the regulatory agencies using the delivery timeline listed in Section F.3.c.iii of the 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 DMS.

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

Sincerely,

James B. Stanfill
Credit Management Supervisor

cc: Mr. Lori Beckwith, USACE – Asheville Regulatory Field Office
Ms. Amy Chapman, NCDWR
File: B-5406





North Carolina Department of Transportation

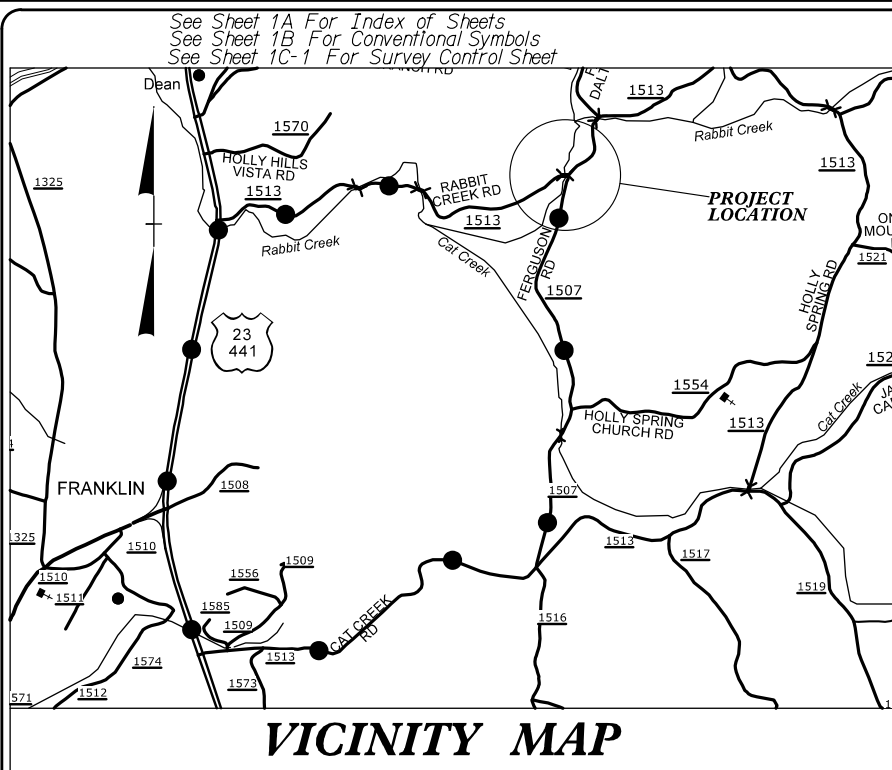
Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR NCDOT PROJECTS

(Version 2.06; Released June 2016)

WBS Element:	46121.1.1	TIP No.:	B-5406	County(ies):	Macon	Page	1	of	1
General Project Information									
WBS Element:	46121.1.1	TIP Number:	B-5406	Project Type:	Bridge Replacement	Date:	3/13/2017		
NCDOT Contact:	William (Bill) H. Elam Jr., PE			Contractor / Designer:	Brandon Barham, PE				
	Address:	1020 Birch Ridge Road				Address:	1151 SE Cary Parkway		
		Raleigh, NC 27610					Suite 101		
	Phone:	909-707-6718				Phone:	919-557-0929		
	Email:	belam@ncdot.gov				Email:	bbarham@ecologicaleng.com		
City/Town:	Franklin			County(ies):	Macon				
River Basin(s):	Little Tennessee			CAMA County?	No				
Wetlands within Project Limits?	No								
Project Description									
Project Length (lin. miles or feet):	0.1 Miles		Surrounding Land Use:	Rural area with forest and agricultural land uses					
	Proposed Project			Existing Site					
Project Built-Up Area (ac.)	0.5 ac.			0.4 ac.					
Typical Cross Section Description:	2@ 10' lane with 6'-0" shoulders; 9'-0" with guardrail			2@9' lane with 2'-6" shoulders					
Annual Avg Daily Traffic (veh/hr/day):	Design/Future:	945	Year:	2038	Existing:	645	Year:	2018	
General Project Narrative: (Description of Minimization of Water Quality Impacts)	State Project B-5406 involves the replacement of the existing NCDOT Bridge # 550067 on SR 1513 over Rabbit Creek. The existing bridge consists of 1@19'-7", 1@20'-4", 1@19'-0" structure with timber floor on I-beams on timber abutments and caps with concrete footers. The proposed bridge will be relocated just upstream and will consist of a 1@70' 24" Cored Slab with 4'-0" caps. Given the relocation of the bridge there will be some realignment work done at the intersection of SR 1501 and SR 1513 near the existing bridge 550067. The proposed bridge is located in Zone AE of FIRM MAP number 3700750500J. The proposed bridge will provide more hydraulic opening than the existing bridge. One stormwater outfall is proposed near the end of the bridge and will be placed at a distance to minimize disturbance to the adjacent jurisdictional stream. A Rip Rap pad will be used to dissipate the energy. There is also a proposed cross pipe with Rip Rap outlet pad that will convey flow from UT to Rabbit Creek across Y1. The Rip Rap pad will be used to dissipate the energy before the flow drains into Rabbit Creek.								
Waterbody Information									
Surface Water Body (1):	Rabbit Creek			NCDWR Stream Index No.:	2-23				
NCDWR Surface Water Classification for Water Body	Primary Classification:	Class C							
	Supplemental Classification:	Tr (UNDESIGNATED)							
Other Stream Classification:	None								
Impairments:	fecal coliform			Benthos Poor					
Aquatic T&E Species?	Comments:								
NRTR Stream ID:	Stream 1			Buffer Rules in Effect:			N/A		
Project Includes Bridge Spanning Water Body?	Yes	Deck Drains Discharge Over Buffer?			N/A	Dissipator Pads Provided in Buffer?			N/A
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)			(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)				
(If yes, provide justification in the General Project Narrative)									

09/28/19

TIP PROJECT: B-5406



VICINITY MAP

●●●●● OFF-SITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

MACON COUNTY

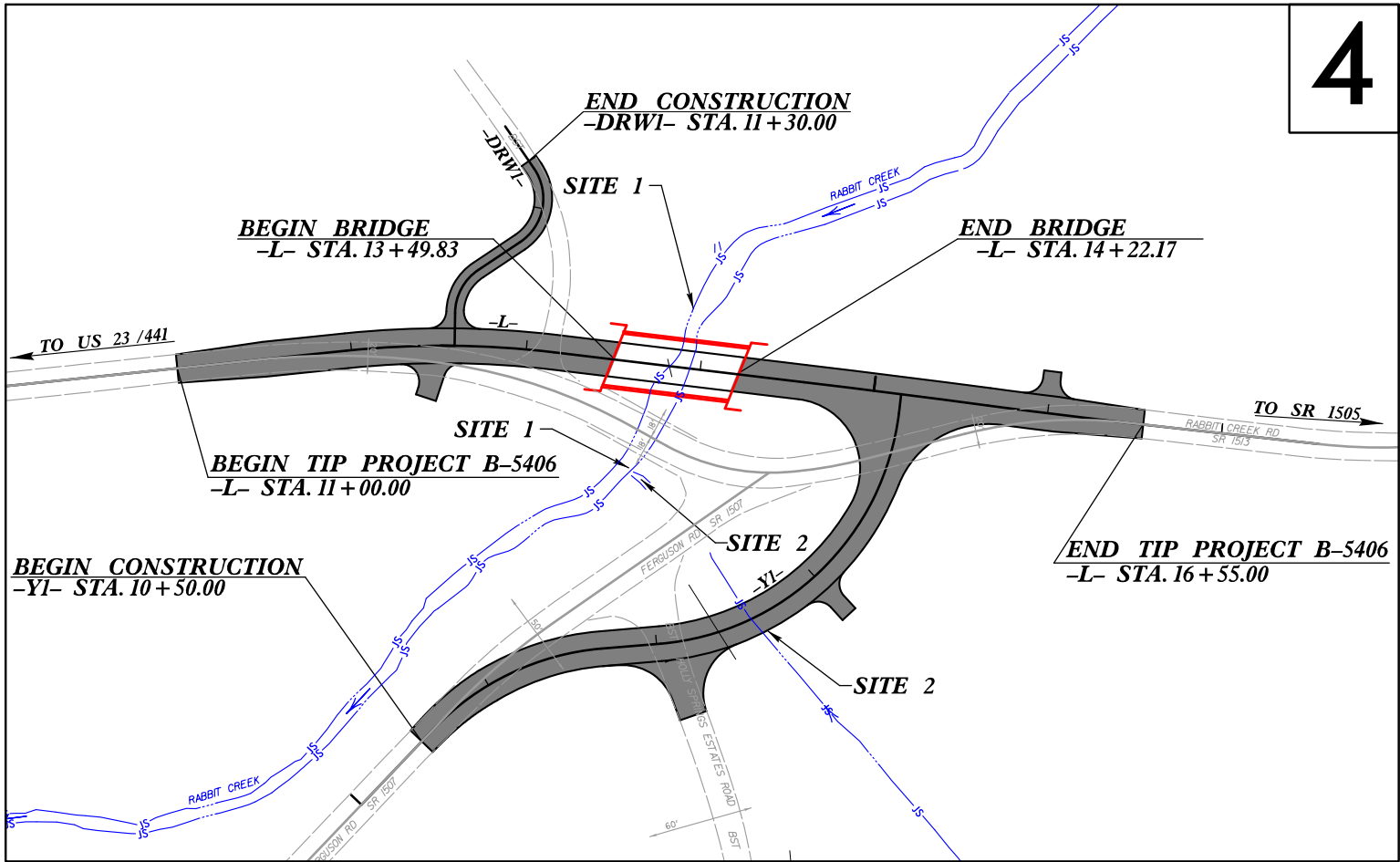
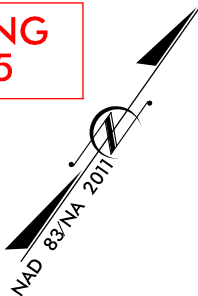
LOCATION: REPLACE BRIDGE NO. 67 OVER RABBIT CREEK
ON SR 1513 (RABBIT CREEK ROAD)

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

WETLAND AND SURFACE WATER IMPACTS PERMIT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5406	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
46121.1.1	BRZ-1513(7)	PE	
46121.2.1		RW, UTIL.	

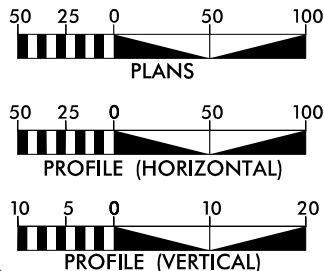
PERMIT DRAWING
SHEET 1 OF 5



THIS IS NOT A CONTROL OF ACCESS PROJECT
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARY

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



DESIGN DATA

ADT 2018 = 645
ADT 2038 = 945
K = 10 %
D = 65 %
T = 4 % *
V = 40 MPH
* TTST = 1% + DUALS = 3%
FUNC CLASS =
RURAL LOCAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY T.I.P. PROJECT B-5406 = 0.091
LENGTH STRUCTURE T.I.P. PROJECT B-5406 = 0.014
TOTAL LENGTH OF T.I.P. PROJECT B-5406 = 0.105

Prepared In the Office of:

LOCHNER
TH. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
(919) 571-2711
NC License Number F-0159

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 17, 2017

LETTING DATE:
FEBRUARY 20, 2018

BRIAN K. EASON, PE
PROJECT ENGINEER

WILLIAM C. BOLLMAN
PROJECT DESIGN ENGINEER

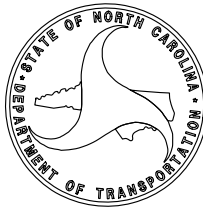
BRYAN KEY, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN
ENGINEER

SIGNATURE: _____ P.E.



4/10/2017 4:48:20 PM
R:\Hydraulics\PERMITS_Environmental\Drawings\B-5406_rdy_psh_01.tsh.dgn
BrandonBarham

BEGIN BRIDGE
-L- STA.13+49.83

END BRIDGE
-L- STA.14+22.17

GRAU 350 TL-2 TYPE-III

04 03 02

30'-6"

10' 10'

6° 44' 52.3" E

TYPE-III

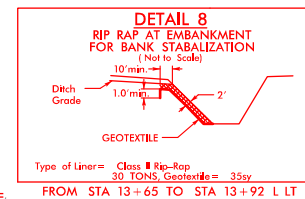
TYPE-III

GRAU 350 TL-2 TYPE-III

BEGIN APPROACH SLAB
-L- STA.13+38.99

END APPROACH SLAB
-L- STA.14+33.01

BRIDGE NO. 67

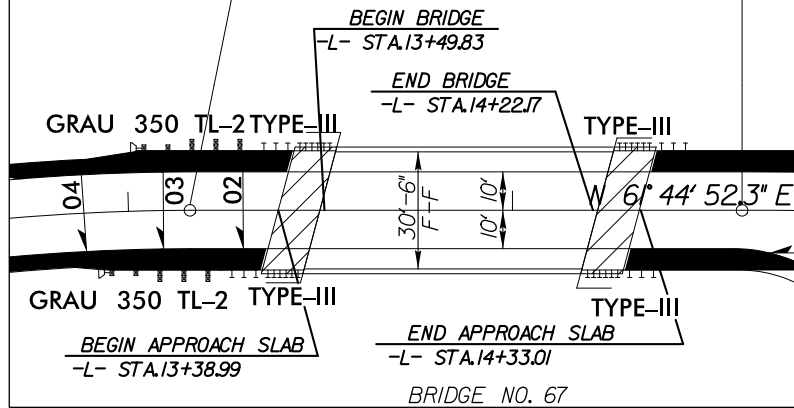


NC FIRM LICENSE No: F-1148
1151 SE Cary Parkway
Suite 101
Cary, NC 27518
(919) 557-0929

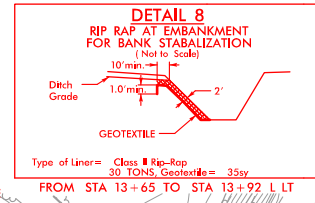
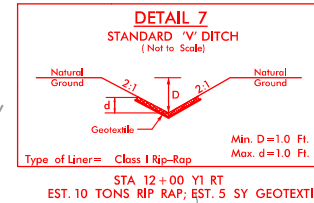
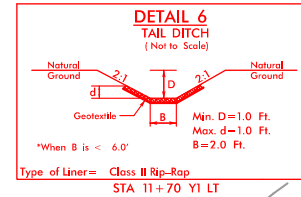
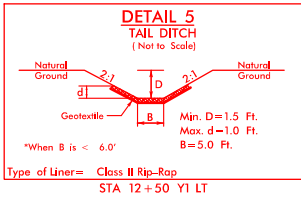
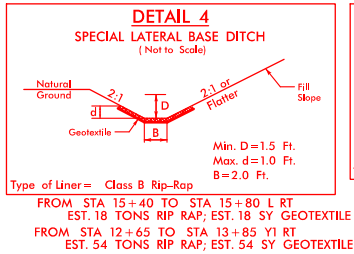
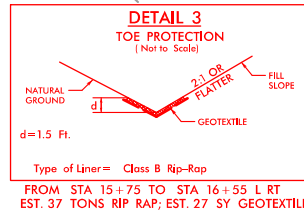
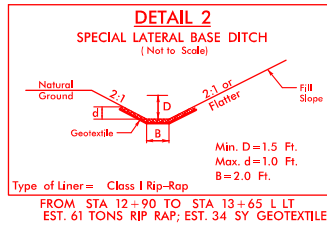
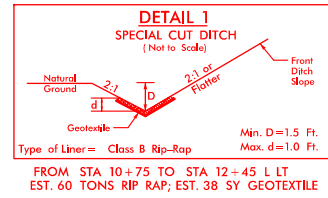
**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

5/14/99

BRIDGE DETAIL / PAVEMENT RELATIONSHIP SKETCH



PERMIT DRAWING
SHEET 3 OF 5



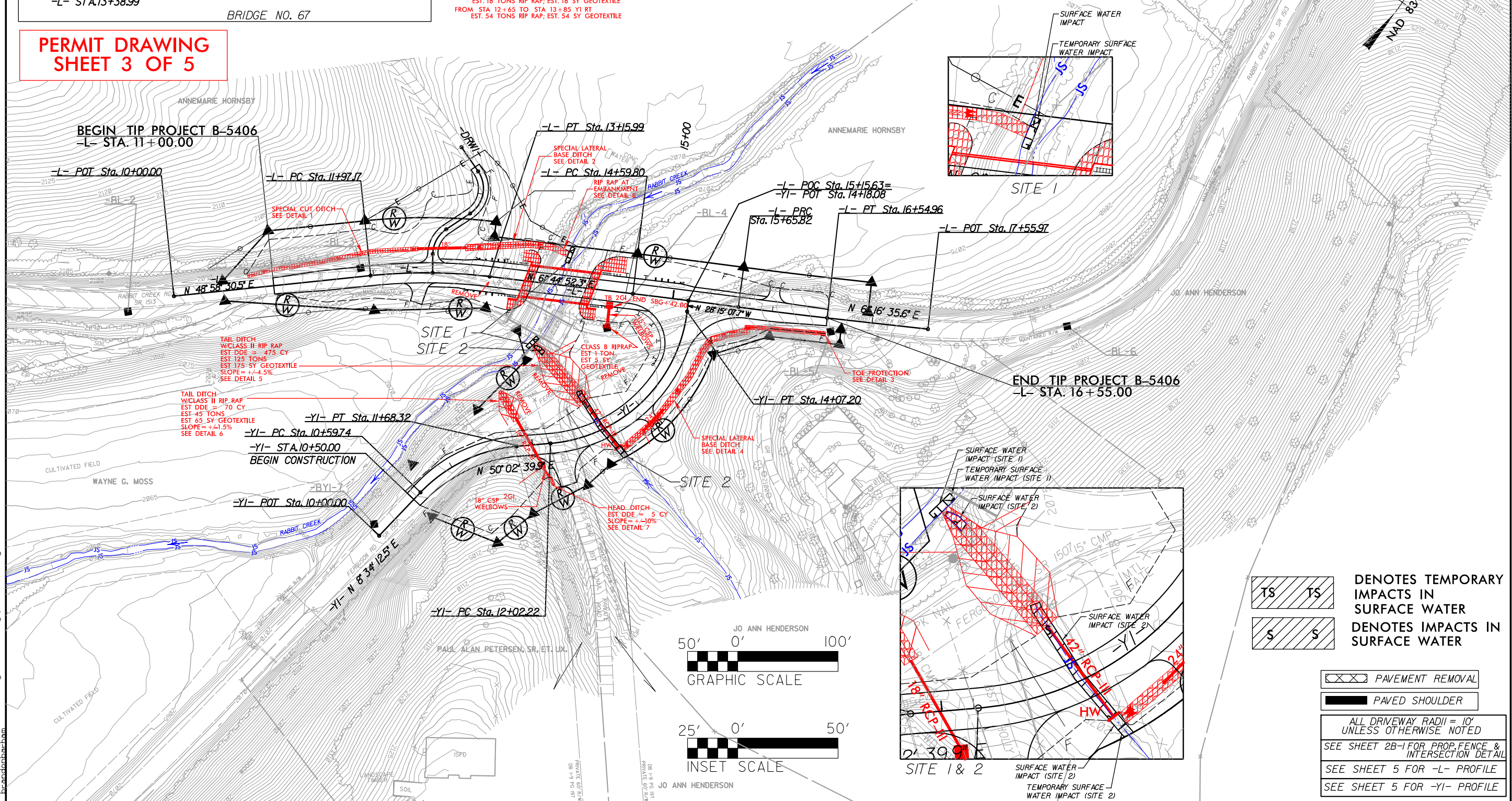
LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
(919)-571-7111



NC License
Number F-0159
NC FIRM LICENSE No F-1148
1151 SR Cary Parkway
Suite 101
Cary, NC 27518
(919) 557-0929

PROJECT REFERENCE NO.		SHEET NO.
B-5406		4
RW SHEET NO.		HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		



5/28/99

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
(919) 571-7111



NC License
Number F-0159
NC FIRM LICENSE No: F-1148
1151 SR Cary Parkway
Suite 101
Cary, NC 27518
(919) 557-0929

PROJECT REFERENCE NO.

B-5406

SHEET NO.

5

ROADWAY DESIGN
ENGINEER

HYDRAULICS
ENGINEER

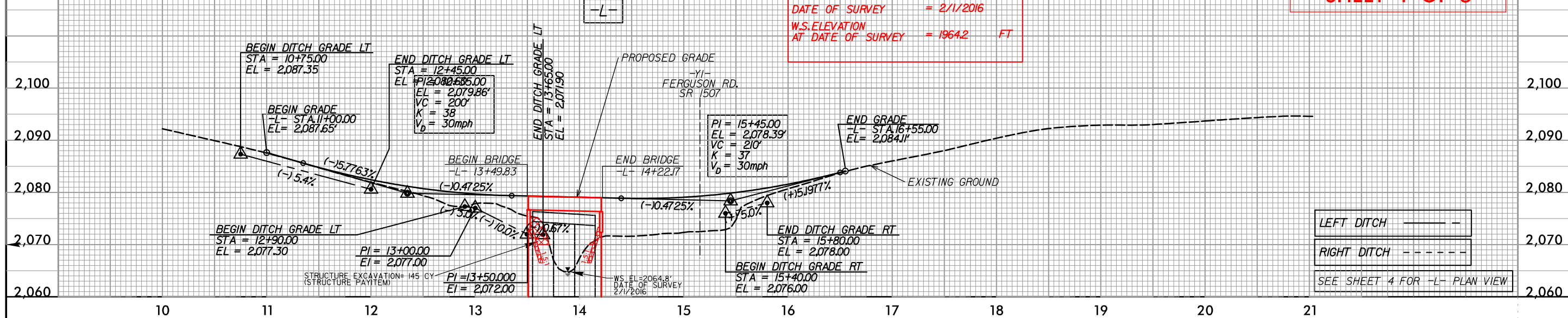
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE = 1200 CFS
DESIGN FREQUENCY = 25 YR
DESIGN HW ELEVATION = 2072.2 FT
BASE DISCHARGE = 2000 CFS
BASE FREQUENCY = 100 YR
BASE HW ELEVATION = 2073.29 FT
OVERTOPPING DISCHARGE = 619 CFS
OVERTOPPING FREQUENCY = 500+ YR
OVERTOPPING ELEVATION = 2079.1 FT

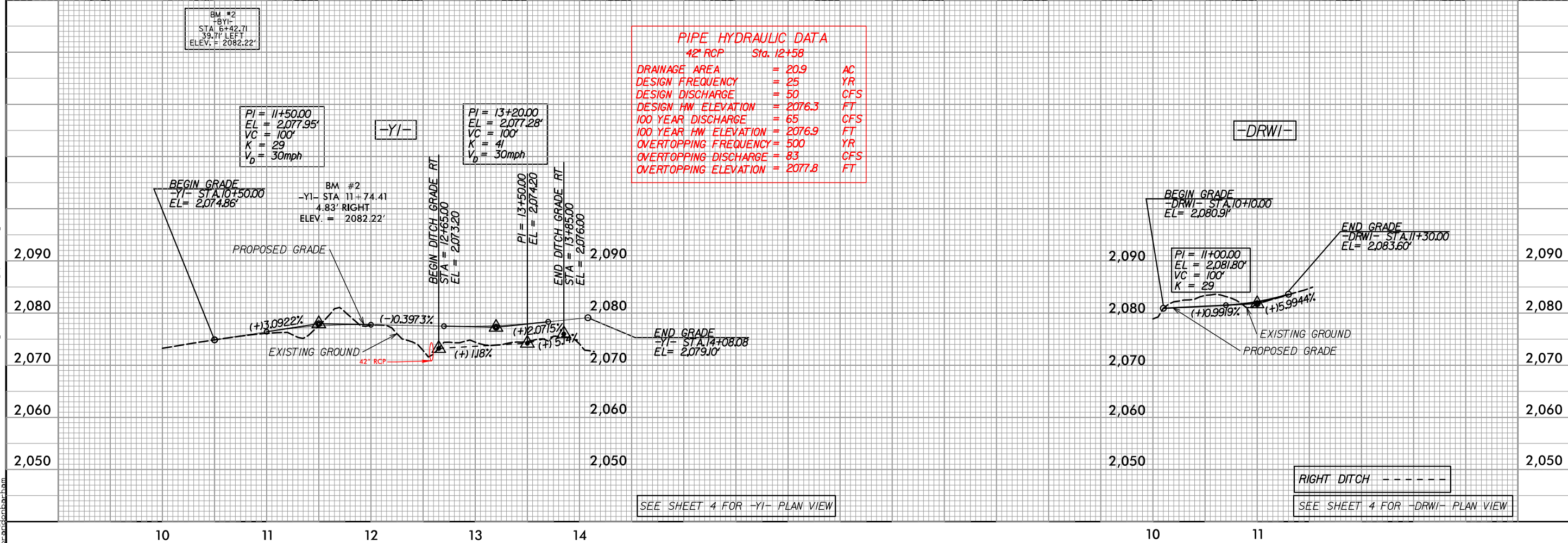
DATE OF SURVEY = 2/1/2016
W.S. ELEVATION
AT DATE OF SURVEY = 1964.2 FT

PERMIT DRAWING
SHEET 4 OF 5



PIPE HYDRAULIC DATA

42" RCP Sta. 12+58
DRAINAGE AREA = 20.9 AC
DESIGN FREQUENCY = 25 YR
DESIGN DISCHARGE = 50 CFS
DESIGN HW ELEVATION = 2076.3 FT
100 YEAR DISCHARGE = 65 CFS
100 YEAR HW ELEVATION = 2076.9 FT
OVERTOPPING FREQUENCY = 500 YR
OVERTOPPING DISCHARGE = 83 CFS
OVERTOPPING ELEVATION = 2077.8 FT



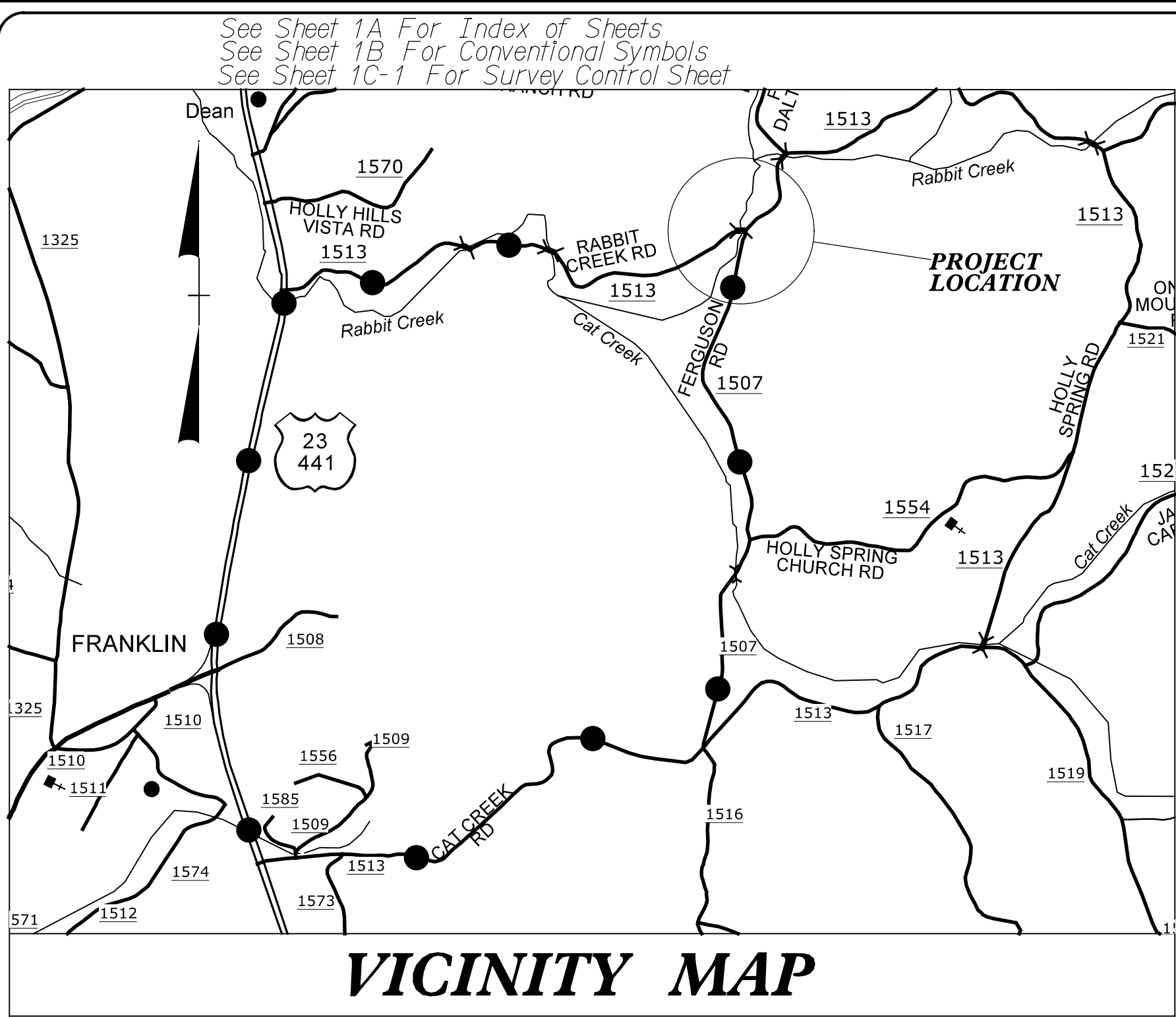
WETLAND PERMIT IMPACT SUMMARY												
Surface and Wetland Package:			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	13+90 to 13+93 -L- LT	Outfall Protection						<0.01	<0.01	6	10	
1	13+60 to 13+72 -L-	Outfall Protection						<0.01	<0.01	4	10	
2	12+45 to 12+65 -Y1-	42" RCP Cross						<0.01	<0.01	76	5	
2	11+93 to 12+01 -Y1- LT	Pipe Rip Rap Ditch						<0.01		12		
TOTALS:								0.01	<0.01	98.0	25.0	

NC DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 03/27/2017
 Macon County
 B5406
 46121.1.1
 SHEET 5 OF 5

09/08/2017
2/15/2017
B-5406_rdy_psh_01.tsh.dgn
CROKELLEY

TIP PROJECT: B-5406

CONTRACT:



●●●●● OFF-SITE DETOUR

R/W PLANS

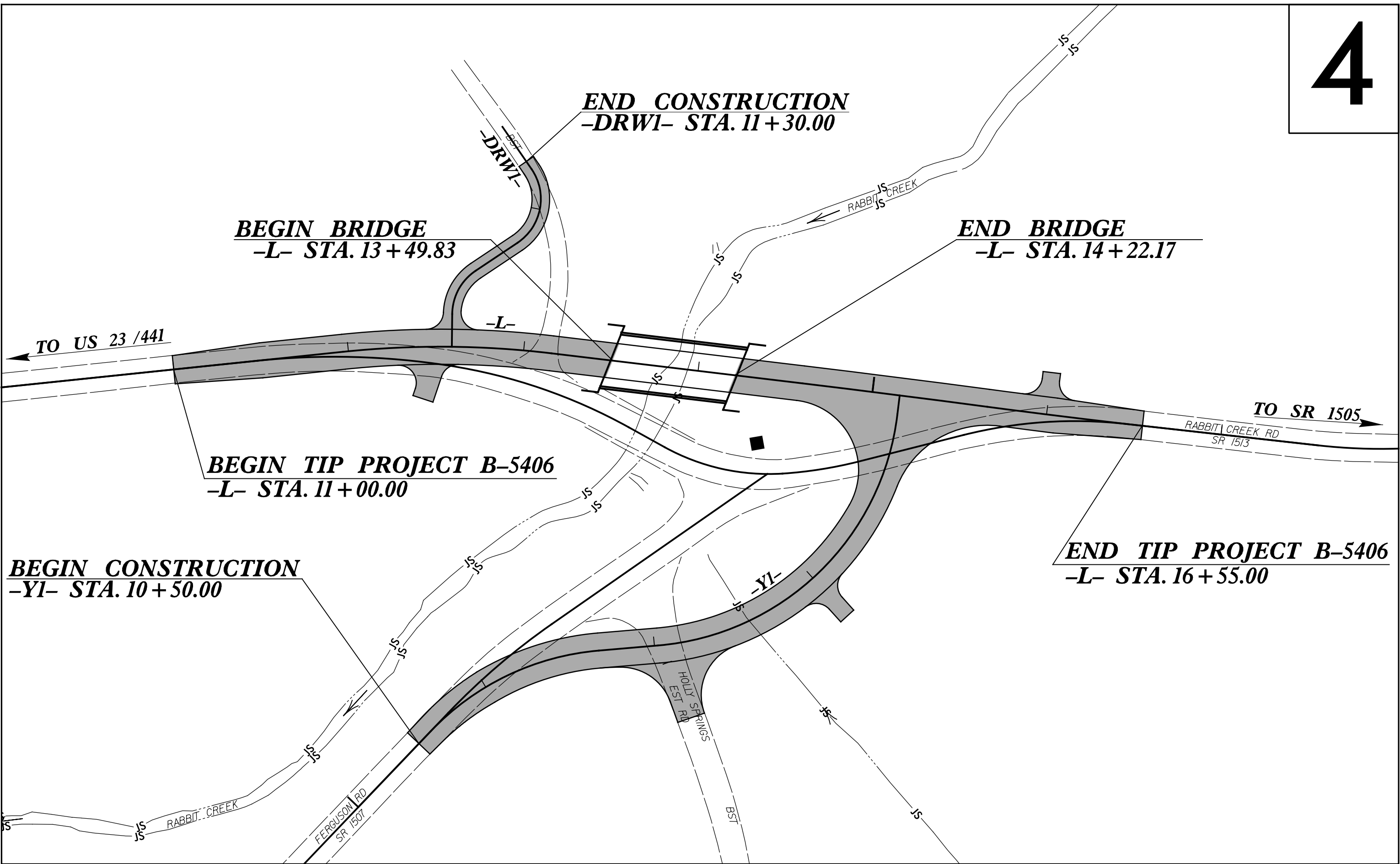
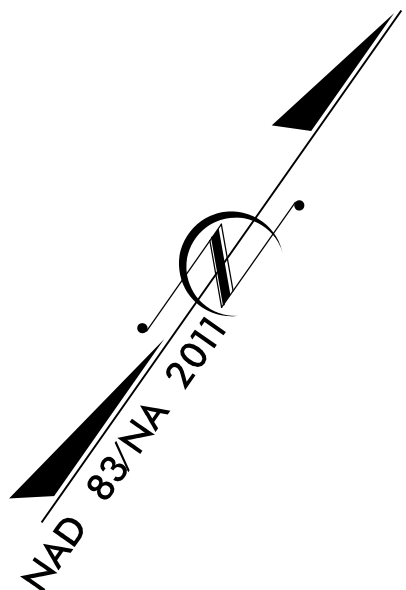
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

MACON COUNTY

LOCATION: REPLACE BRIDGE NO. 67 OVER RABBIT CREEK
ON SR 1513 (RABBIT CREEK ROAD)

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5406	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
46121.1.1	BRZ-1513(7)	PE	
46121.2.1		RW, UTIL.	



THIS IS NOT A CONTROL OF ACCESS PROJECT
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARY
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



PLANS



PROFILE (HORIZONTAL)



PROFILE (VERTICAL)

DESIGN DATA

ADT 2018 = 645
ADT 2038 = 945
K = 10 %
D = 65 %
T = 4 % *
V = 40 MPH
* TTST = 1% + DUALS = 3%
FUNC CLASS =
RURAL LOCAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY T.I.P. PROJECT B-5406 = 0.091
LENGTH STRUCTURE T.I.P. PROJECT B-5406 = 0.014
TOTAL LENGTH OF T.I.P. PROJECT B-5406 = 0.105

Prepared in the Office of:

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
(919) 571-7111
NC License Number F-0159

ECOLOGICAL ENGINEERING
NC FIRM LICENSE No. F-1148
1151 SE Cary Parkway
Suite 101
Cary, NC 27518
(919) 557-4929

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 17, 2017

LETTING DATE:
FEBRUARY 20, 2018

BRIAN K. EASON, PE
PROJECT ENGINEER

WILLIAM C. BOLLMAN
PROJECT DESIGN ENGINEER

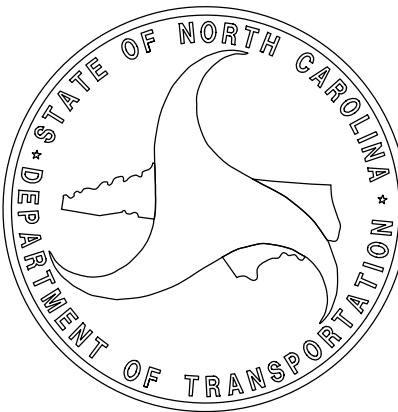
BRYAN KEY, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN
ENGINEER

SIGNATURE: P.E.



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	
Computed Property Corner	
Property Monument	
Parcel/Sequence Number	
Existing Fence Line	
Proposed Woven Wire Fence	
Proposed Chain Link Fence	
Proposed Barbed Wire Fence	
Existing Wetland Boundary	
Proposed Wetland Boundary	
Existing Endangered Animal Boundary	
Existing Endangered Plant Boundary	
Existing Historic Property Boundary	
Known Contamination Area: Soil	
Potential Contamination Area: Soil	
Known Contamination Area: Water	
Potential Contamination Area: Water	
Contaminated Site: Known or Potential	

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

Standard Gauge	
RR Signal Milepost	
Switch	
RR Abandoned	
RR Dismantled	

RIGHT OF WAY & PROJECT CONTROL:

Secondary Horiz and Vert Control Point	
Primary Horiz Control Point	
Primary Horiz and Vert Control Point	
Exist Permanent Easment Pin and Cap	
New Permanent Easement Pin and Cap	
Vertical Benchmark	
Existing Right of Way Marker	
Existing Right of Way Line	
New Right of Way Line	
New Right of Way Line with Pin and Cap	
New Right of Way Line with Concrete or Granite R/W Marker	
New Control of Access Line with Concrete C/A Marker	
Existing Control of Access	
New Control of Access	
Existing Easement Line	
New Temporary Construction Easement	
New Temporary Drainage Easement	
New Permanent Drainage Easement	
New Permanent Drainage /Utility Easement	
New Permanent Utility Easement	
New Temporary Utility Easement	
New Aerial Utility Easement	

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	
Existing Curb	
Proposed Slope Stakes Cut	
Proposed Slope Stakes Fill	
Proposed Curb Ramp	
Existing Metal Guardrail	
Proposed Guardrail	
Existing Cable Guiderail	
Proposed Cable Guiderail	
Equality Symbol	
Pavement Removal	

VEGETATION:

Single Tree	
Single Shrub	

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

Hedge	
Woods Line	
Orchard	
Vineyard	

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	
Bridge Wing Wall, Head Wall and End Wall	
MINOR:	
Head and End Wall	
Pipe Culvert	
Footbridge	
Drainage Box: Catch Basin, DI or JB	
Paved Ditch Gutter	
Storm Sewer Manhole	
Storm Sewer	

UTILITIES:

POWER:	
Existing Power Pole	
Proposed Power Pole	
Existing Joint Use Pole	
Proposed Joint Use Pole	
Power Manhole	
Power Line Tower	
Power Transformer	
U/G Power Cable Hand Hole	
H-Frame Pole	
U/G Power Line LOS B (S.U.E.*)	
U/G Power Line LOS C (S.U.E.*)	
U/G Power Line LOS D (S.U.E.*)	

TELEPHONE:

Existing Telephone Pole	
Proposed Telephone Pole	
Telephone Manhole	
Telephone Pedestal	
Telephone Cell Tower	
U/G Telephone Cable Hand Hole	
U/G Telephone Cable LOS B (S.U.E.*)	
U/G Telephone Cable LOS C (S.U.E.*)	
U/G Telephone Cable LOS D (S.U.E.*)	
U/G Telephone Conduit LOS B (S.U.E.*)	
U/G Telephone Conduit LOS C (S.U.E.*)	
U/G Telephone Conduit LOS D (S.U.E.*)	
U/G Fiber Optics Cable LOS B (S.U.E.*)	
U/G Fiber Optics Cable LOS C (S.U.E.*)	
U/G Fiber Optics Cable LOS D (S.U.E.*)	

WATER:

Water Manhole	
Water Meter	
Water Valve	
Water Hydrant	
U/G Water Line LOS B (S.U.E.*)	
U/G Water Line LOS C (S.U.E.*)	
U/G Water Line LOS D (S.U.E.*)	
Above Ground Water Line	

TV:

TV Pedestal	
TV Tower	
U/G TV Cable Hand Hole	
U/G TV Cable LOS B (S.U.E.*)	
U/G TV Cable LOS C (S.U.E.*)	
U/G TV Cable LOS D (S.U.E.*)	
U/G Fiber Optic Cable LOS B (S.U.E.*)	
U/G Fiber Optic Cable LOS C (S.U.E.*)	
U/G Fiber Optic Cable LOS D (S.U.E.*)	

GAS:

Gas Valve	
Gas Meter	
U/G Gas Line LOS B (S.U.E.*)	
U/G Gas Line LOS C (S.U.E.*)	
U/G Gas Line LOS D (S.U.E.*)	
Above Ground Gas Line	

SANITARY SEWER:

Sanitary Sewer Manhole	
Sanitary Sewer Cleanout	
U/G Sanitary Sewer Line	
Above Ground Sanitary Sewer	
SS Forced Main Line LOS B (S.U.E.*)	
SS Forced Main Line LOS C (S.U.E.*)	
SS Forced Main Line LOS D (S.U.E.*)	

MISCELLANEOUS:

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

SURVEY CONTROL SHEET B-5406
-PRELIMINARY-

PROJECT REFERENCE NO.	SHEET NO.
B-5406	1C-1
Location and Surveys	

BL	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1		BL-1	559053.2460	703030.1670	2104.35	OUTSIDE PROJECT LIMITS	
2		BL-2	559184.2330	703247.1720	2094.60	OUTSIDE PROJECT LIMITS	
3		BL-3	559353.1310	703411.9260	2082.60	11+87.96	8.61 LT
4		BL-4	559445.4000	703647.1590	2073.70	14+38.15	36.90 RT
5		BL-5	559570.4870	703831.7690	2083.94	16+59.88	13.22 RT
6		BL-6	559710.3360	704021.5900	2093.00	OUTSIDE PROJECT LIMITS	

BY1	POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
44		BL-4	559445.4000	703647.1590	2073.70	13+55.88	73.01 LT
7		BY1-7	559151.8720	703569.7280	2072.89	10+04.83	11.61 LT

ALIGN	STATION	OFFSET	NORTH	EAST
Y1	10+71.80	-30.58	559223.25297	703561.88617
Y1	11+37.33	-47.46	559304.22620	703582.55769
Y1	11+84.00	-75.67	559365.14004	703604.81523
Y1	13+72.24	35.00	559481.38063	703749.82546
Y1	12+50.00	35.00	559336.35123	703728.28596
Y1	12+27.70	47.34	559306.15184	703721.52524
Y1	11+79.00	67.96	559251.83084	703693.22058
Y1	11+00.00	88.00	559207.25224	703681.05256
Y1	10+50.00	30.00	559190.33910	703617.60347

NCDOT BASELINE MONUMENT (BL-1)
LOCALIZED PROJECT COORDINATES
N=559,053.2460
E=703,030.1670
ELEV.=2,104.35'

NCDOT BASELINE MONUMENT (BL-2)
LOCALIZED PROJECT COORDINATES
N=559,184.2330
E=703,247.1720
ELEV.=2,094.60'

NCDOT BASELINE MONUMENT (BL-3)
LOCALIZED PROJECT COORDINATES
N=559,353.1310
E=703,411.9260
ELEV.=2,082.60'

NCDOT BASELINE MONUMENT (BL-4)
LOCALIZED PROJECT COORDINATES
N=559,445.4000
E=703,647.1590
ELEV.=2,073.70'

NCDOT BASELINE MONUMENT (BL-5)
LOCALIZED PROJECT COORDINATES
N=559,570.4870
E=703,831.7690
ELEV.=2,083.94'

NCDOT BASELINE MONUMENT (BL-6)
LOCALIZED PROJECT COORDINATES
N=559,710.3360
E=704,021.5900
ELEV.=2,093.00'

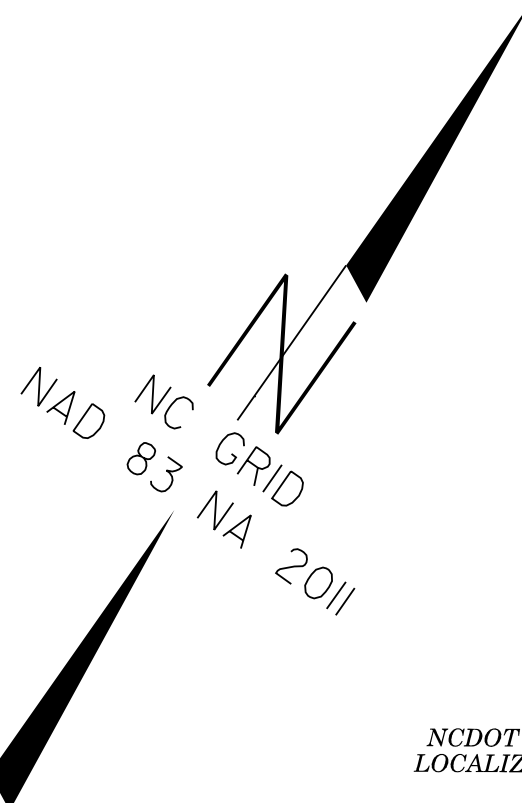
BM1 ELEVATION = 2107.53'
N 558885.80 E 702683.92
BL STATION 5+00.00
S 64°11'28.9" W DIST 384.61'
8 INCH SPIKE IN BASE OF 18 INCH WALNUT TREE

BM2 ELEVATION = 2082.22'
N 559297.28 E 703649.16
BY1 STATION 6+42.71 39.71' LEFT
8 INCH SPIKE IN BASE OF 36 INCH PINE TREE

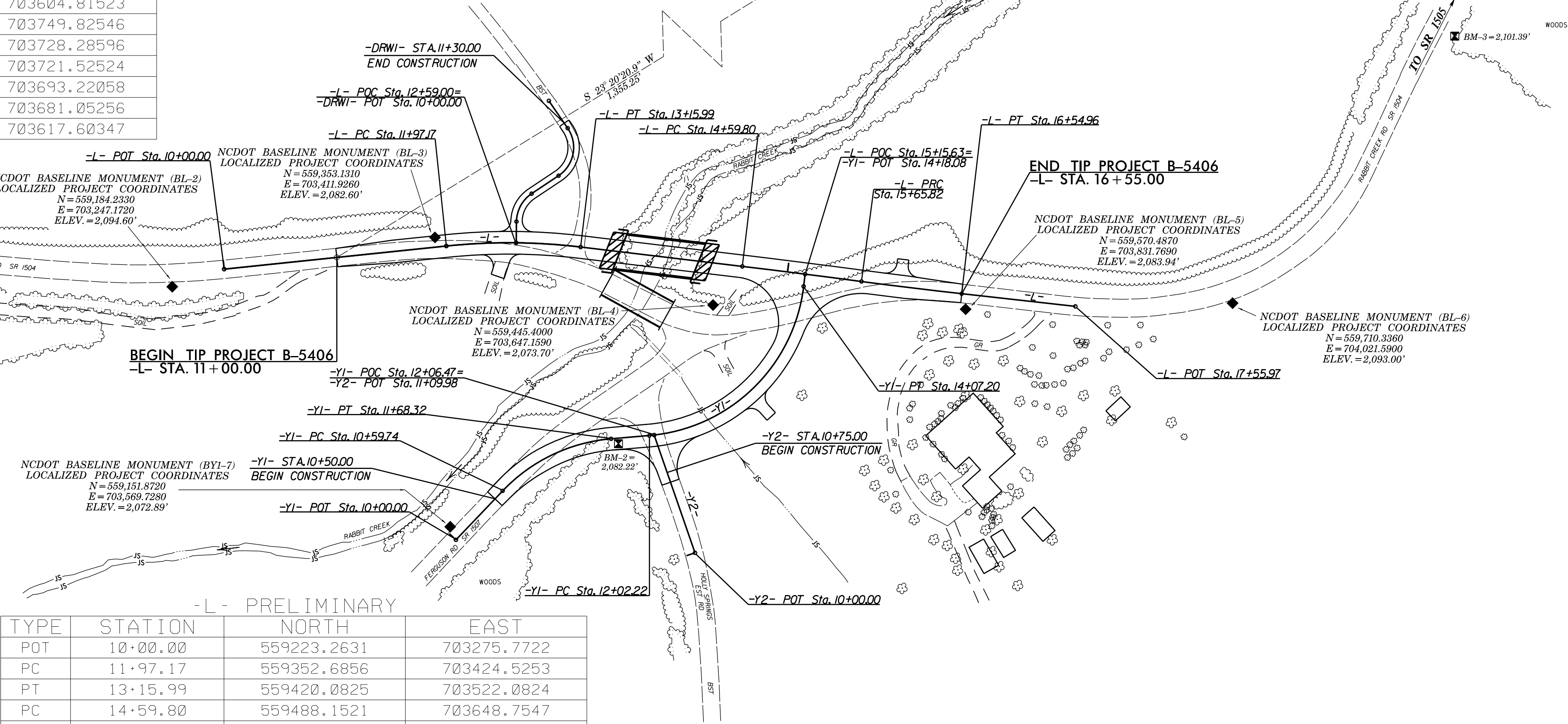
BM3 ELEVATION = 2101.39'
N 560015.97 E 704046.71
BL STATION 17+00.87
N 04°41'53.5" E DIST 306.67'
8 INCH SPIKE IN BASE OF 30 INCH CEDAR TREE

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "GPS-102"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 560533.2580(±) EASTING: 703888.1270(±)
ELEVATION: 2091.08(±)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99977748
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"GPS-102" TO -L- STATION 11+00.00 IS
S 23°20'20.9" W 1355.25'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88



-PRELIMINARY- ROW MARKER IRON PIN AND CAP-E				
ALIGN	STATION	OFFSET	NORTH	EAST
L	10+50.00	-30.00	559278.71521	703293.80187
L	11+00.00	-55.00	559330.39515	703315.11345
L	11+97.17	-55.00	559394.17893	703388.42402
L	13+15.99	-55.00	559468.53051	703496.04798
L	13+15.99	-40.00	559455.31742	703503.14827
L	14+59.80	-40.00	559523.38701	703629.82061
L	15+65.82	-40.00	559573.20060	703724.01151
L	16+95.00	-40.00	559634.03495	703836.99246
L	16+95.00	-30.00	559625.26545	703841.79829
L	17+55.97	30.00	559601.95012	703924.10180
L	16+45.61	30.01	559548.88103	703827.26325
L	15+65.87	45.57	559497.31643	703763.55647
L	13+50.00	63.03	559380.66117	703581.87127
L	12+52.63	40.38	559353.79311	703491.37483
L	11+47.79	30.00	559297.64067	703406.96362
L	10+00.00	30.00	559200.63039	703295.46382



TYPE	STATION	NORTH	EAST
POT	10+00.00	559223.2631	703275.7722
PC	11+97.17	559352.6856	703424.5253
PT	13+15.99	559420.0825	703522.0824
PC	14+59.80	559488.1521	703648.7547
PRC	15+65.82	559537.7178	703742.4770
PT	16+54.96	559579.7130	703821.1000
POT	17+55.97	559628.2586	703909.6843

TYPE	STATION	NORTH	EAST
POT	10+00.00	559145.3680	703580.4874
PC	10+59.74	559204.4373	703589.3893
PT	11+68.32	559297.0656	703641.3854
PC	12+02.22	559318.8374	703667.3729
PT	14+07.20	559504.8216	703703.1748
POT	14+18.08	559514.4067	703698.0241

TYPE	STATION	NORTH	EAST
POT	10+00.00	559257.3167	703759.8157
POT	11+09.98	559321.6148	703670.5942

GEOID MODEL: G12NC
NOTE: DRAWING NOT TO SCALE

NOTES:

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/](https://connect.ncdot.gov/resources/location/)

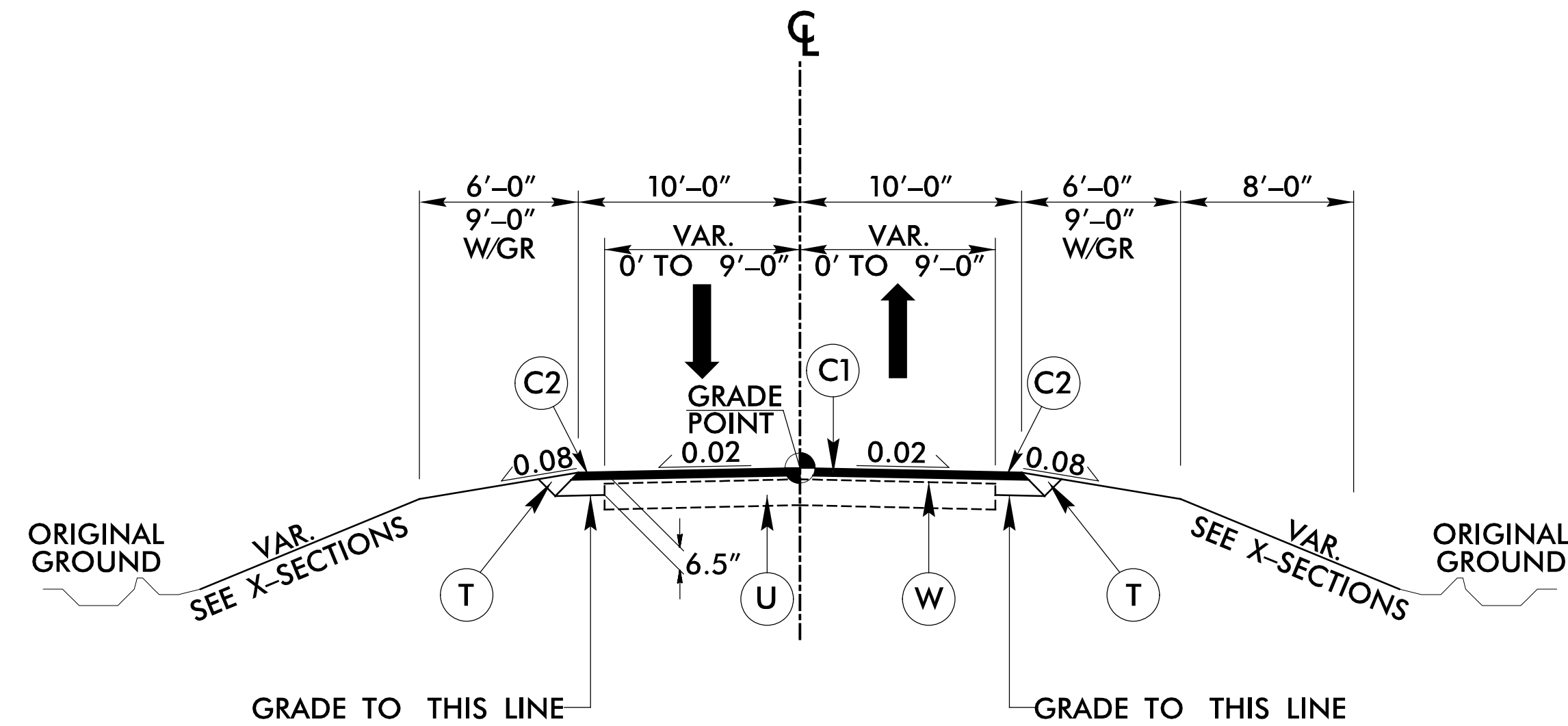
THE FILES TO BE FOUND ARE AS FOLLOWS:
B-5406_LS_CONTROL.TXT

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.

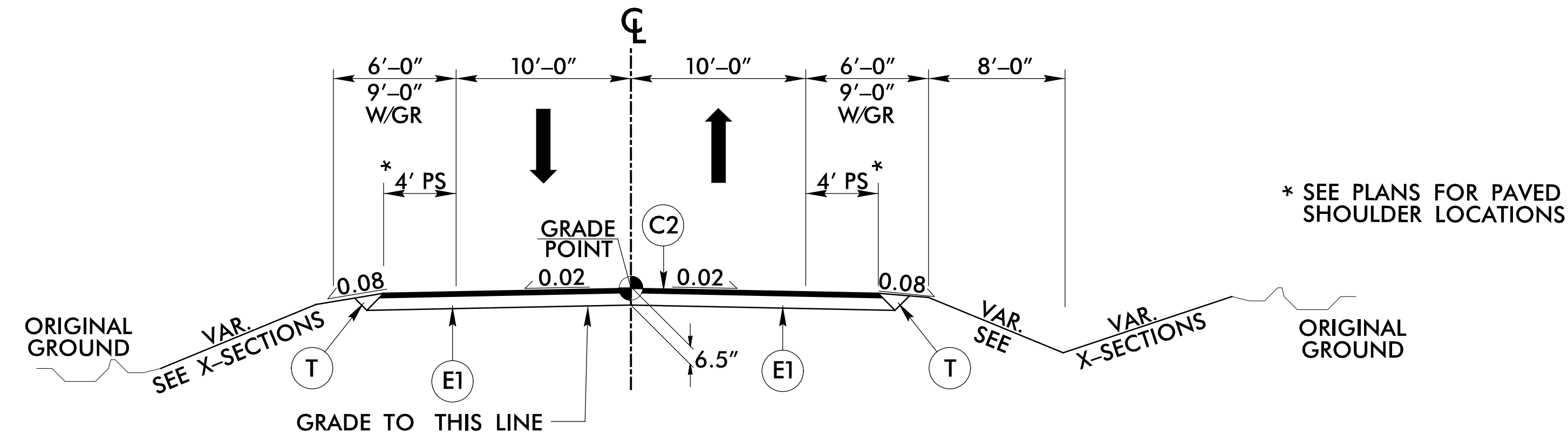
5/14/99
2/15/2017
B5406_rdy_psh_02.txdgn
C:\K11\B5406_rdy_psh_02.txdgn

FINAL PAVEMENT SCHEDULE			
C1	PROP. APPROX. 1.25" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD.	E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
C2	PROP. APPROX. 2.5" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	T	EARTH MATERIAL.
C3	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 1/2" IN DEPTH	U	EXISTING PAVEMENT.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	V	MILLING (VARIABLE DEPTH-SEE DETAIL)
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.		W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
-L- STA. 11+00.00 TO STA. 12+73.72
-L- STA. 15+93.54 TO STA. 16+55.00



TYPICAL SECTION NO. 2

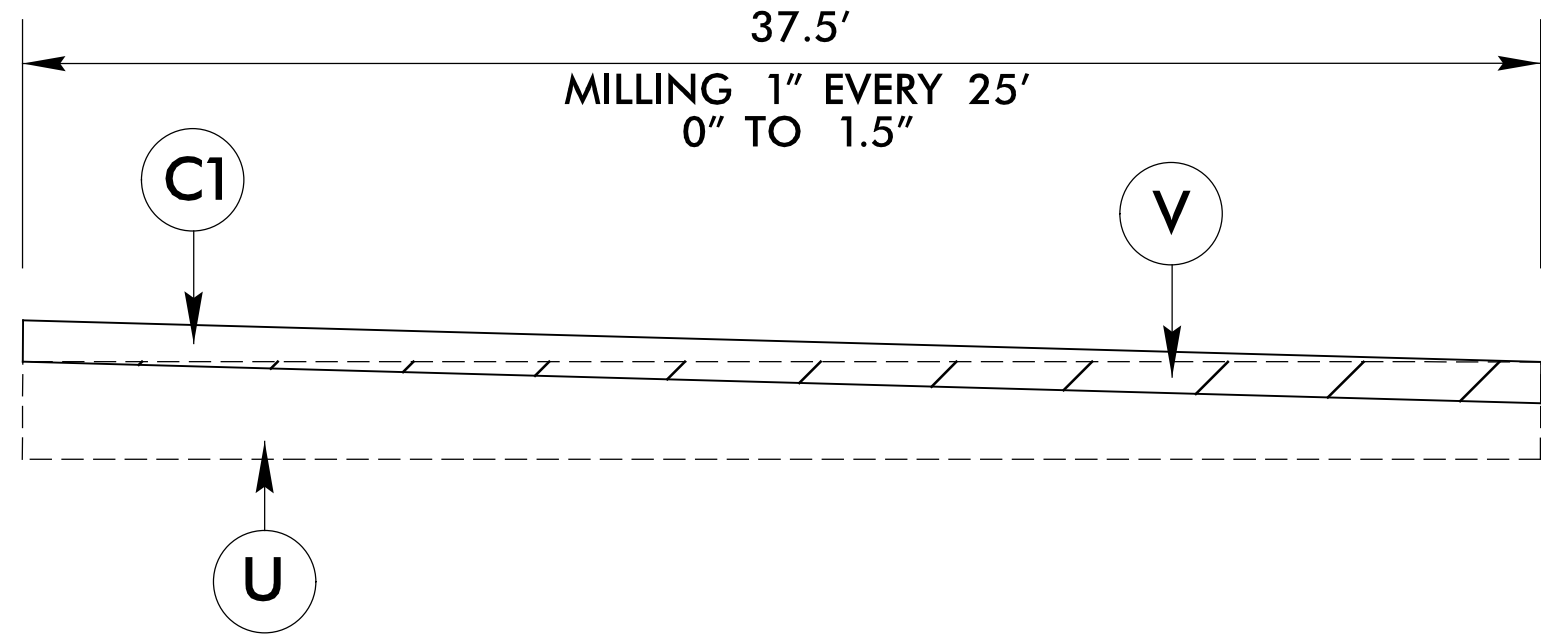
USE TYPICAL SECTION NO. 2
-L- STA. 12+73.72 TO STA. 13+49.83 (BEG. BRIDGE)
-L- STA. 14+22.17 (END BRIDGE) TO STA. 15+93.54

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
(919)-571-7111

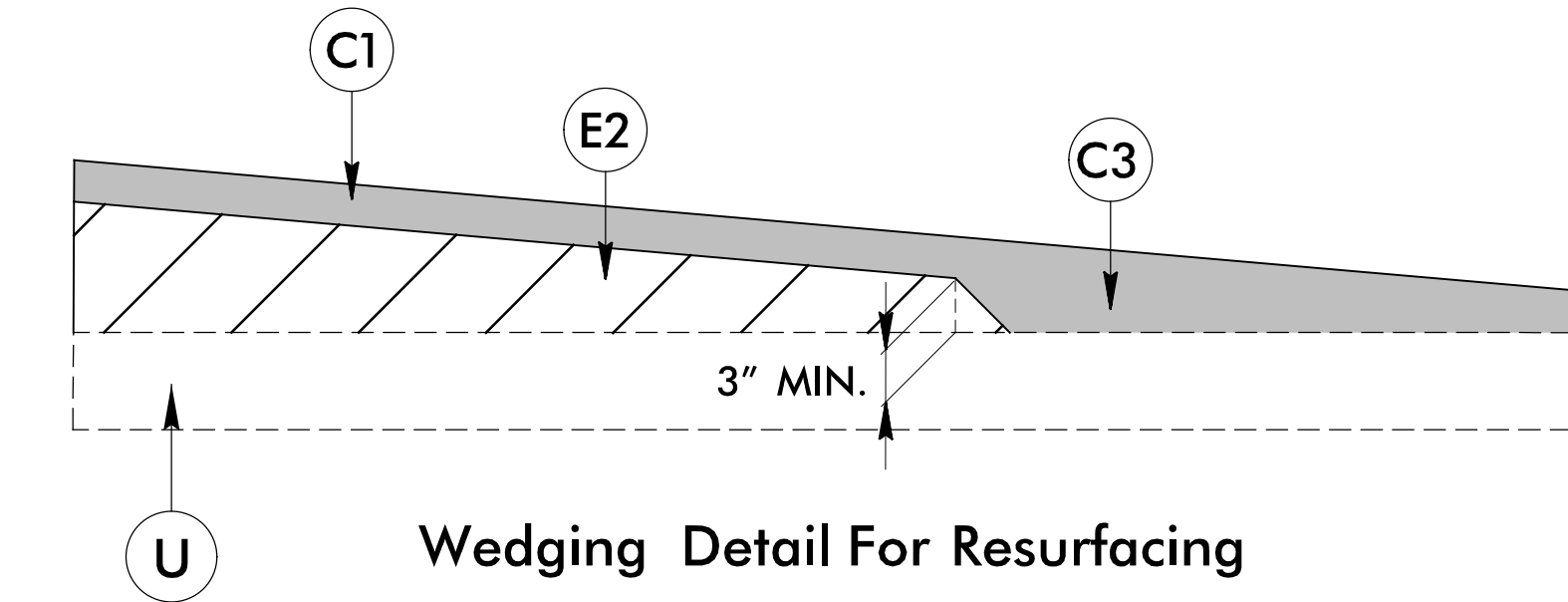
NC License
Number F-0159

PROJECT REFERENCE NO.		SHEET NO.
B-5406		2A-1
RW SHEET NO.		
ROADWAY DESIGN ENGINEER		PAVEMENT DESIGN ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		



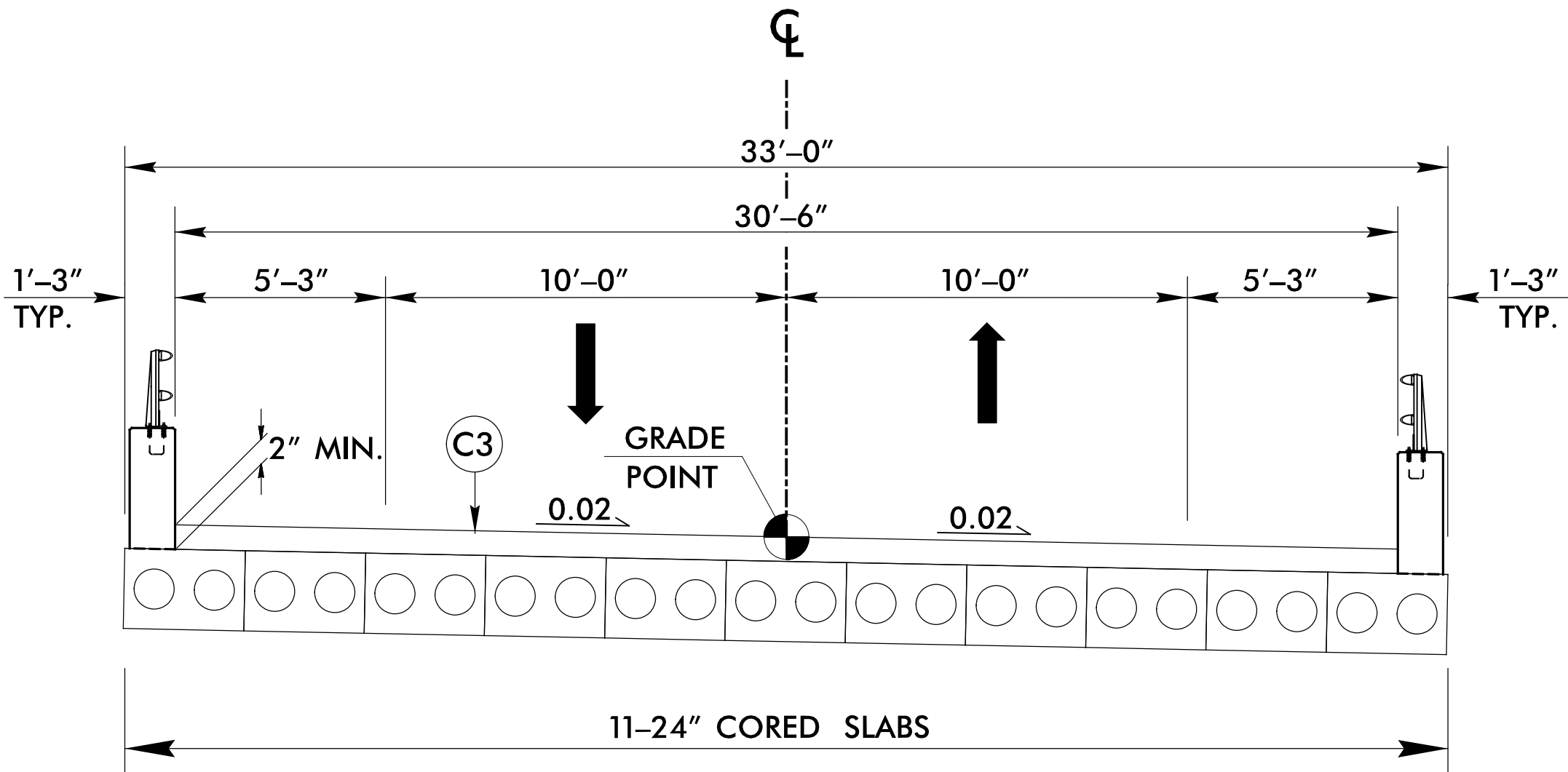
MILLING DETAIL

USE MILLING DETAIL AT RESURFACING TIES



Wedging Detail For Resurfacing

WEDGING DETAIL



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3
-L- STA. 13+49.83 (BEGIN BRIDGE) TO STA. 14+22.17 (END BRIDGE)

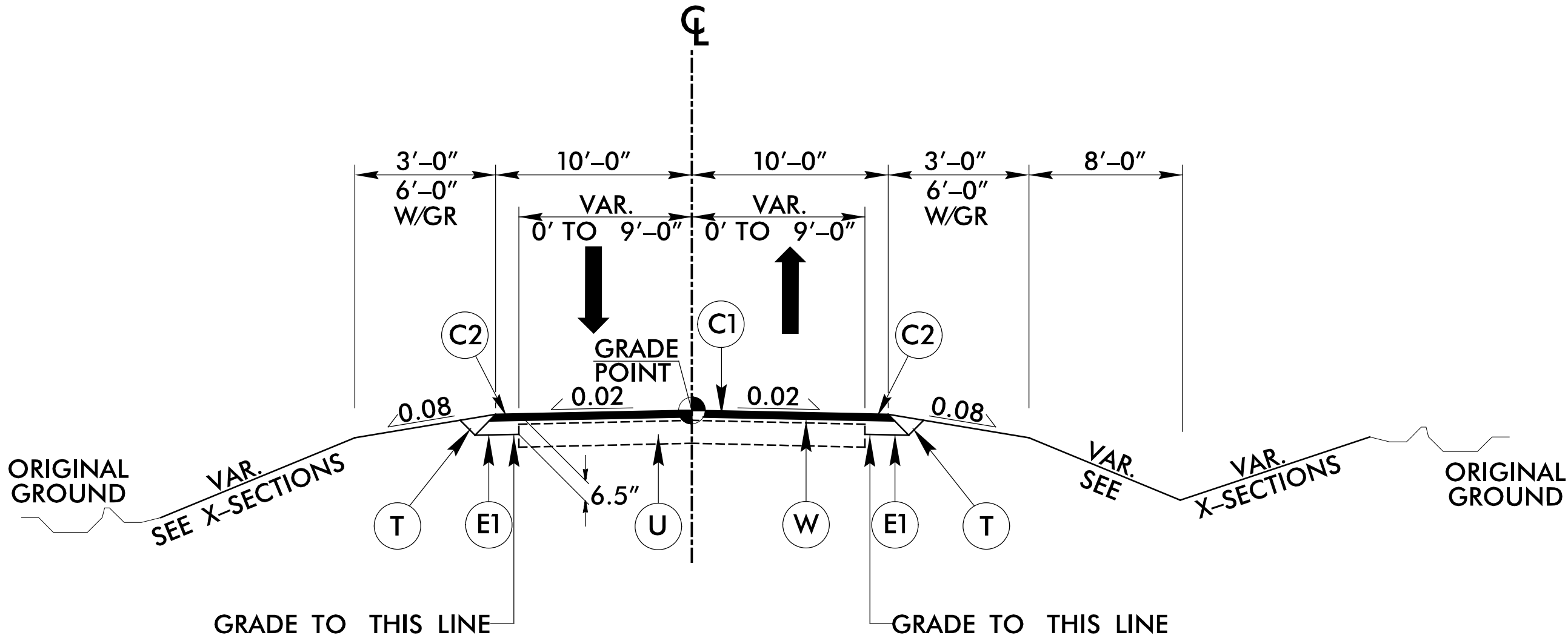
5/14/99

2/15/2007
B-5406-rdy_psh_02.txdgn
C:\K11\B-5406-rdy_psh_02.txdgn

LOCHNER

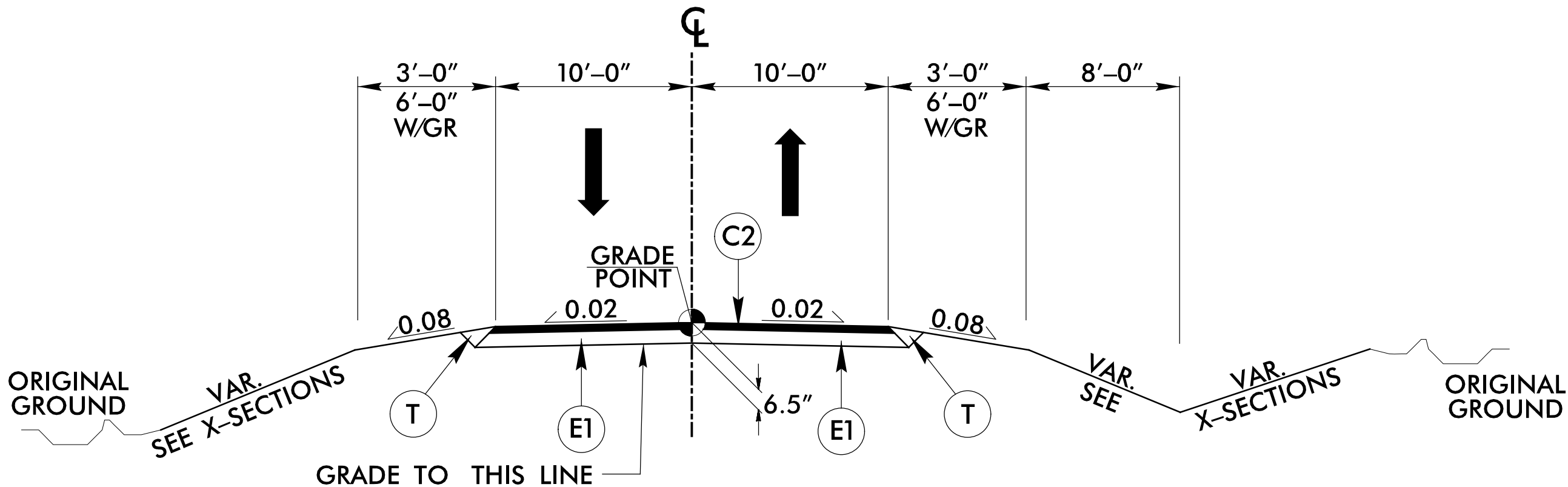
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
(919) 571-7111
NC License
Number F-0159

PROJECT REFERENCE NO.		SHEET NO.
B-5406		2A-2
R/W SHEET NO.		
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		



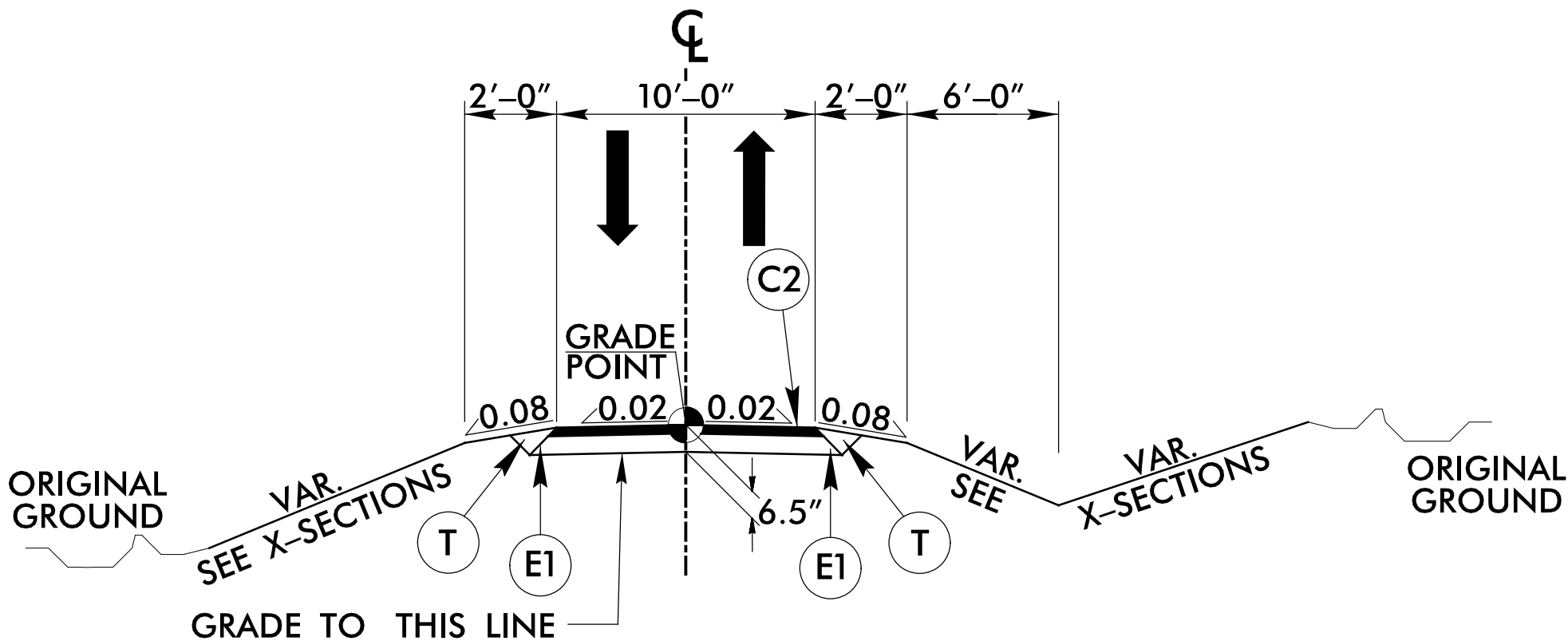
TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4
-Y1- STA. 10+50.00 TO STA. 11+20.00



TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5
-Y1- STA. 11+20.00 TO STA. 14+08.08



TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 6
-DRW1- STA. 10+10.00 TO STA. 11+30.00

PAVEMENT
SCHEDULE

C1	1.25" TYPE SF9.5A
C2	2.5" TYPE SF9.5A
C3	VAR. TYPE SF9.5A
E1	4" TYPE B25.0B
E2	VAR. TYPE B25.0B
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING (VARIABLE DEPTH SEE DETAIL)
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)

5/14/99

USE SHEET 2B-1 AS FOLLOWS: PROPOSED FENCING LOCATION DETAIL INTERSECTION DIMENSIONING DETAIL -DRW1- ALIGNMENT DETAIL

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
(919) 571-7111



ECOLOGICAL
ENGINEERING

NC License
Number F-0159
NC FIRM LICENSE No: F-1148
1151 SE Cary Parkway
Suite 101
Cary, NC 27518
(919) 557-0929

PROJECT REFERENCE NO.

B-5406

SHEET NO.

2B-1

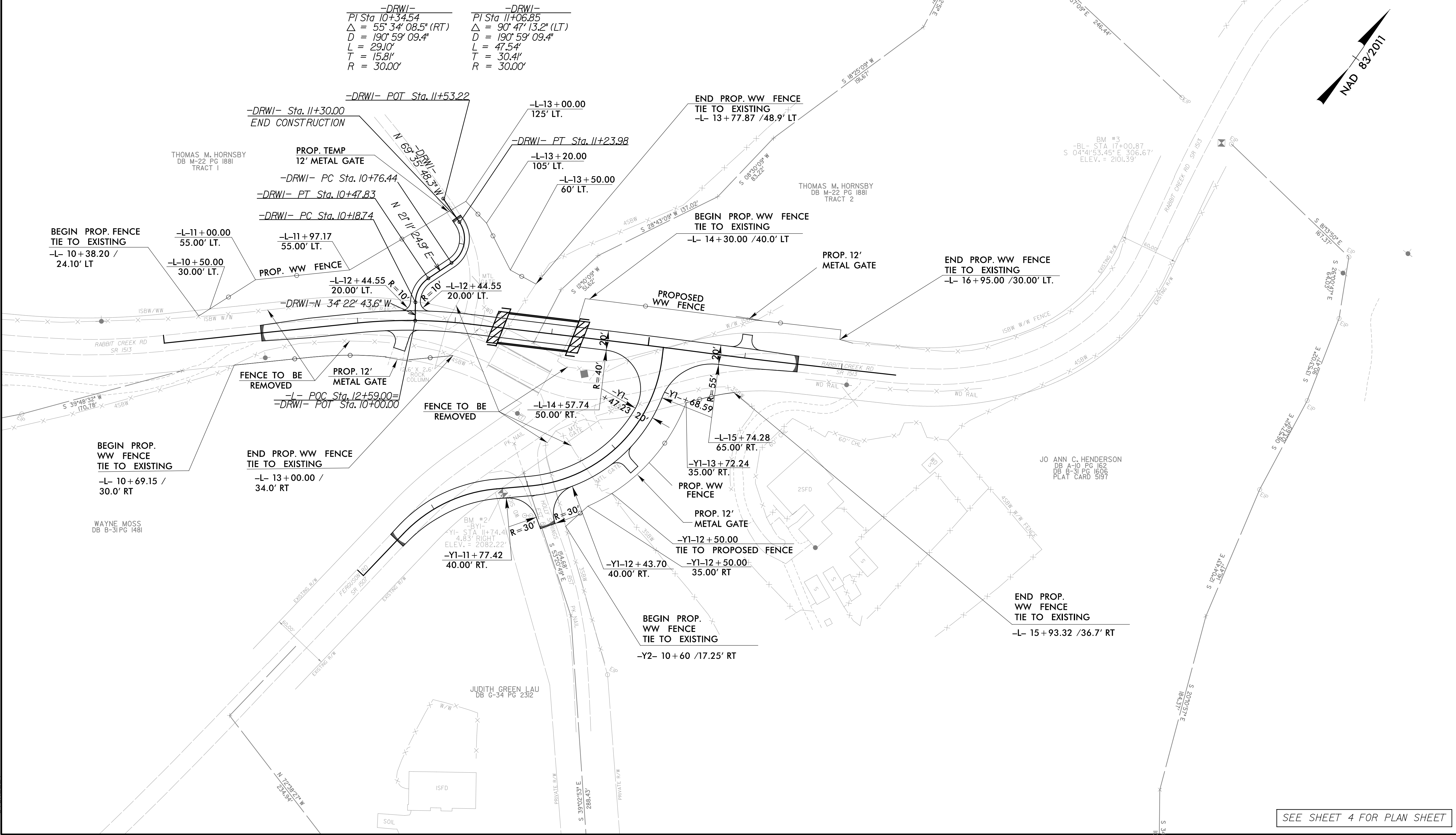
R/W SHEET NO.

ROADWAY DESIGN
ENGINEER

HYDRAULICS
ENGINEER

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

NAD 83/2011



SEE SHEET 4 FOR PLAN SHEET

2/15/2017
B-5406-rdy-psh-2B-FENCE.dgn
C:\K111\1

5/28/99

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
(919) 571-7111

NC License
Number F-0159



NC FIRM LICENSE No: F-1148
1151 SR Cary Parkway
Suite 101
Cary, NC 27518
(919) 557-0929

PROJECT REFERENCE NO.

B-5406

SHEET NO.

5

ROADWAY DESIGN
ENGINEER

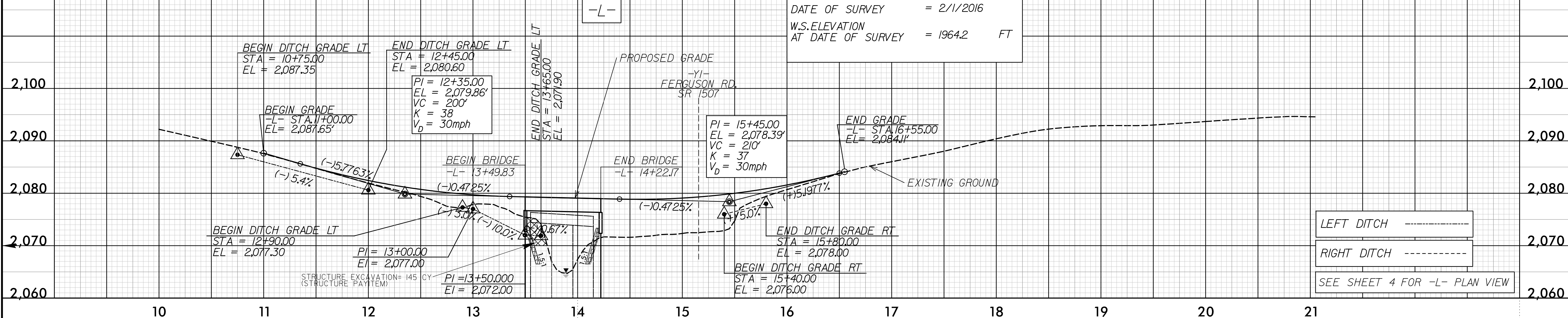
HYDRAULICS
ENGINEER

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE = 1200 CFS
DESIGN FREQUENCY = 25 YR
DESIGN HW ELEVATION = 2072.2 FT
BASE DISCHARGE = 2000 CFS
BASE FREQUENCY = 100 YR
BASE HW ELEVATION = 2073.29 FT
OVERTOPPING DISCHARGE = 619 CFS
OVERTOPPING FREQUENCY = 500+ YR
OVERTOPPING ELEVATION = 2079.1 FT

DATE OF SURVEY = 2/1/2016
W.S. ELEVATION AT DATE OF SURVEY = 1964.2 FT



BM #2
-BYI-
STA 6+42.71
39.71' LEFT
ELEV. = 2082.22'

PI = 11+50.00
EL = 2,077.95'
VC = 100'
K = 29
V_d = 30mph

-YI-

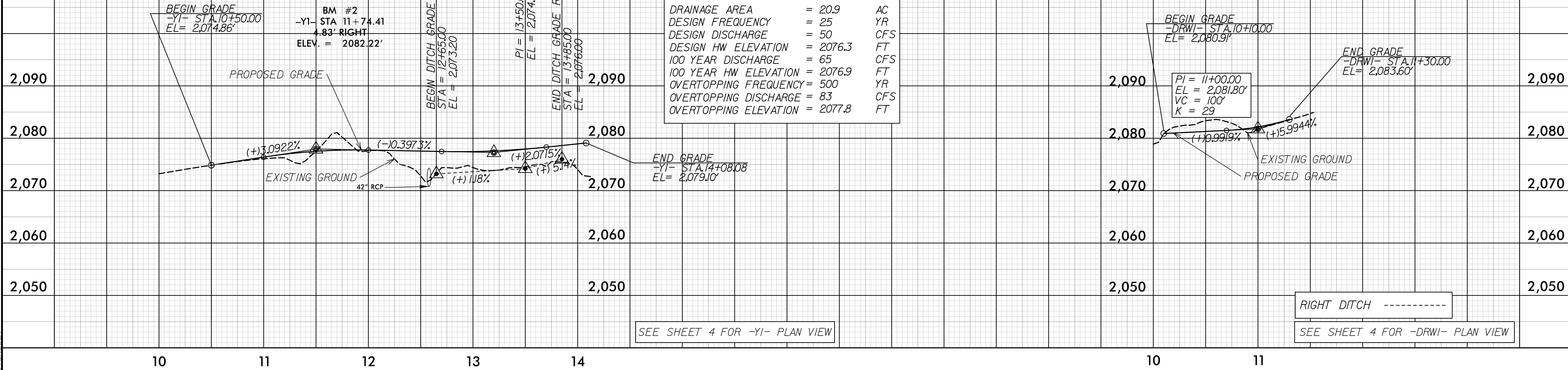
PI = 13+20.00
EL = 2,077.28'
VC = 100'
K = 41
V_d = 30mph

PIPE HYDRAULIC DATA

42" RCP Sta. 12+58

DRAINAGE AREA = 20.9 AC
DESIGN FREQUENCY = 25 YR
DESIGN DISCHARGE = 50 CFS
DESIGN HW ELEVATION = 2076.3 FT
100 YEAR DISCHARGE = 65 CFS
100 YEAR HW ELEVATION = 2076.9 FT
OVERTOPPING FREQUENCY = 500 YR
OVERTOPPING DISCHARGE = 83 CFS
OVERTOPPING ELEVATION = 2077.8 FT

-DRWI-



RIGHT DITCH -----

SEE SHEET 4 FOR -DRWI- PLAN VIEW

B:\5\2017\B-5406\cadd\psh_05.dgn
PLOT DATE: 5/28/99