



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAT L. MCCRORY
GOVERNOR

ANTHONY J. TATA
SECRETARY

July 15, 2014

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

ATTN: Mr. Steve Kichefski
NCDOT Coordinator

Subject: **Application for Section 404 Nationwide Permits 13, 23 and 33 and Section 401 Water Quality Certification** for the proposed replacement of Bridge No. 34 over Falling Creek on SR 1404 (29th Ave.) in Catawba County, Federal Aid Project No. BRZ-1404(13), Division 12, TIP No. B-5150, Debit \$240 from WBS 42311.1.1.

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 34 over Falling Creek on SR 1404 with a 10'x13' triple-barrel reinforced concrete box culvert (RCBC) on the existing alignment. The project will utilize an on-site detour, located downstream. The temporary detour structure will be 3 @ 120" diameter circular corrugated metal pipes (CMP).

There will be 166 linear feet (lf) of permanent stream impacts: 69 lf from the placement of the RCBC, 53 lf due to bank stabilization/floodplain benches at the inlet and outlet of the RCBC, and 44 lf due to bank stabilization that is to remain in place at the outlet of the temporary CMP. There will be 166 lf of temporary stream impacts associated with the project. An additional 53 lf of temporary impacts occur within the bank stabilization impacts, and thus were not included in the impact calculation in order to avoid double counting of impacts.

Please see enclosed copies of the Pre-Construction Notification (PCN), EEP acceptance letter, stormwater management plan, permit drawings and design plans for the above-referenced project. The Programmatic Categorical Exclusion (PCE) was completed in June 2013 and distributed shortly thereafter. Additional copies are available upon request.

This project calls for a letting date of February 17, 2015 and a review date of December 30, 2014; however, the let date may advance as additional funding becomes available.

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 Bill Barrett at (919) 707-6103.

Sincerely,



for

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

cc:

NCDOT Permit Application Standard Distribution List



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:	<input checked="" type="checkbox"/> Section 404 Permit	<input type="checkbox"/> Section 10 Permit
1b. Specify Nationwide Permit (NWP) number: 23 33 13 or General Permit (GP) number:		
1c. Has the NWP or GP number been verified by the Corps?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
1d. Type(s) of approval sought from the DWQ (check all that apply):		
<input checked="" type="checkbox"/> 401 Water Quality Certification – Regular <input type="checkbox"/> Non-404 Jurisdictional General Permit <input type="checkbox"/> 401 Water Quality Certification – Express <input type="checkbox"/> 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: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	For the record only for Corps Permit: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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.	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
1g. Is the project located in any of NC's twenty coastal counties. If yes, answer 1h below.	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
1h. Is the project located within a NC DCM Area of Environmental Concern (AEC)?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

2. Project Information

2a. Name of project:	Replacement of Bridge 34 over Falling Creek on SR 1404 (29 th Ave.)
2b. County:	Catawba
2c. Nearest municipality / town:	Hickory
2d. Subdivision name:	<i>not applicable</i>
2e. NCDOT only, T.I.P. or state project no.:	B-5150

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) 707-6103
3g. Fax no.:	(919) 212-5785
3h. Email address:	wabarrett@ncdot.gov

4. Applicant Information (if different from owner)	
4a. Applicant is:	<input type="checkbox"/> Agent <input type="checkbox"/> 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: 35.772560 (DD.DDDDDD) Longitude: - 81.320020 (-DD.DDDDDD)
1c. Property size:	0.70 acres
2. Surface Waters	
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	Falling Creek
2b. Water Quality Classification of nearest receiving water:	C
2c. River basin:	Catawba
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 in the vicinity of the project consists of approximately 60% residential, 30% forested land, and 10% agriculture.	
3b. List the total estimated acreage of all existing wetlands on the property: 0	
3c. List the total estimated linear feet of all existing streams (intermittent and perennial) on the property: 605	
3d. Explain the purpose of the proposed project: Example: To replace a structurally deficient (sufficiency rating of 13.1 out of 100) and functionally obsolete (deck geometry appraisal of 2 out of 9) bridge.	
3e. Describe the overall project in detail, including the type of equipment to be used: The project involves replacing a 100-foot bridge with a 10'X13' triple-barrel reinforced concrete box culvert (RCBC) on the existing alignment. This project will utilize an on-site detour, located downstream of the permanent structure. The temporary detour structure will be 3@120" diameter circular corrugated metal pipes (CMP). 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: only perennial streams - no JD needed prior.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown
4b. If the Corps made the jurisdictional determination, what type of determination was made?	<input type="checkbox"/> Preliminary <input type="checkbox"/> Final
4c. If yes, who delineated the jurisdictional areas? Name (if known): Brett Fuelner	Agency/Consultant Company: NCDOT Other:
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?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown
5b. If yes, explain in detail according to "help file" instructions.	
6. Future Project Plans	
6a. Is this a phased project?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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):						
<input type="checkbox"/> Wetlands		<input checked="" type="checkbox"/> Streams - tributaries		<input type="checkbox"/> Buffers		
<input type="checkbox"/> Open Waters		<input type="checkbox"/> 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 <input type="checkbox"/> P <input type="checkbox"/> T		Choose One	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ		
Site 2 <input type="checkbox"/> P <input type="checkbox"/> T		Choose One	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ		
Site 3 <input type="checkbox"/> P <input type="checkbox"/> T		Choose One	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ		
Site 4 <input type="checkbox"/> P <input type="checkbox"/> T		Choose One	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ		
Site 5 <input type="checkbox"/> P <input type="checkbox"/> T		Choose One	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ		
Site 6 <input type="checkbox"/> P <input type="checkbox"/> T		Choose One	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ		
2g. Total wetland impacts					0 Permanent 0 Temporary	
2h. Comments: No wetlands are located within the construction limits.						
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 <input checked="" type="checkbox"/> P <input type="checkbox"/> T	proposed culvert (RCBC)	Falling Creek	<input checked="" type="checkbox"/> PER <input type="checkbox"/> INT	<input checked="" type="checkbox"/> Corps <input type="checkbox"/> DWQ	25	69
Site 1 <input checked="" type="checkbox"/> P <input type="checkbox"/> T	Bank stab./ floodplain bench	Falling Creek	<input checked="" type="checkbox"/> PER <input type="checkbox"/> INT	<input checked="" type="checkbox"/> Corps <input type="checkbox"/> DWQ	25	53
Site 1 <input type="checkbox"/> P <input checked="" type="checkbox"/> T	Temp. Diversion/ Impervious Dikes	Falling Creek	<input checked="" type="checkbox"/> PER <input type="checkbox"/> INT	<input checked="" type="checkbox"/> Corps <input type="checkbox"/> DWQ	25	20* (0.02 ac.)
Site 2 <input type="checkbox"/> P <input checked="" type="checkbox"/> T	Temporary Pipes (CMP)	Falling Creek	<input checked="" type="checkbox"/> PER <input type="checkbox"/> INT	<input checked="" type="checkbox"/> Corps <input type="checkbox"/> DWQ	25	62 (0.03 ac.)
Site 3 <input checked="" type="checkbox"/> P <input type="checkbox"/> T	Bank stabilization	Falling Creek	<input checked="" type="checkbox"/> PER <input type="checkbox"/> INT	<input checked="" type="checkbox"/> Corps <input type="checkbox"/> DWQ	25	32
Site 4 <input type="checkbox"/> P <input checked="" type="checkbox"/> T	Temp. Detour Roadway	UT to Falling Creek	<input checked="" type="checkbox"/> PER <input type="checkbox"/> INT	<input checked="" type="checkbox"/> Corps <input type="checkbox"/> DWQ	3	84 (<0.01 ac.)
Site 4 <input checked="" type="checkbox"/> P <input type="checkbox"/> T	Bank Stabilization	UT to Falling Creek	<input checked="" type="checkbox"/> PER <input type="checkbox"/> INT	<input checked="" type="checkbox"/> Corps <input type="checkbox"/> DWQ	3	12
3h. Total stream and tributary impacts					166 Perm 166 Temp	

				(0.07 ac.)				
3i. Comments: * 53 LF of temporary impacts at Site 1 occur within the permanent bank stabilization impacts; therefore, they were not included in the impact calculation in order to avoid double counting of impacts.								
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 <input type="checkbox"/> P <input type="checkbox"/> T								
O2 <input type="checkbox"/> P <input type="checkbox"/> T								
O3 <input type="checkbox"/> P <input type="checkbox"/> T								
O4 <input type="checkbox"/> P <input type="checkbox"/> T								
4f. Total open water impacts					0 Permanent 0 Temporary			
4g. Comments: No Open Water impacts within construction limits.								
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	Flo ode d	Filled	Excavated	Flooded
P1								
P2								
5f. Total								
5g. Comments:								
5h. Is a dam high hazard permit required?				<input type="checkbox"/> Yes <input type="checkbox"/> 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?		<input type="checkbox"/> Neuse <input type="checkbox"/> Tar-Pamlico <input type="checkbox"/> Other: <input type="checkbox"/> Catawba <input type="checkbox"/> Randleman			
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 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> Yes <input type="checkbox"/> No		
B2 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> Yes <input type="checkbox"/> No		
B3 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> Yes <input type="checkbox"/> No		
6h. Total buffer impacts					
6i. Comments: This project is not located within a protected buffer area.					

D. Impact Justification and Mitigation		
1. Avoidance and Minimization		
1a. Specifically describe measures taken to avoid or minimize the proposed impacts in designing project. <p>The proposed triple-barrel RCBC will be located on the same alignment as the existing bridge. Floodplain benches at the inlet and outlet of the RCBC, along with 1-foot sills, will establish a high flow barrel and direct stream through the two base flow barrels.</p> <p>A temporary retaining wall will be utilized from STA. 14+25 to STA. 14+70 -DET-LT to contain fill slopes from the Detour (-DET-) alignment and minimize permanent stream impacts to the UT to Falling Creek.</p>		
1b. Specifically describe measures taken to avoid or minimize the proposed impacts through construction techniques. <p>Best Management Practices (BMPs) will be utilized during construction to attempt to reduce stormwater impacts to the receiving stream due to erosion and runoff. Roadway runoff will discharge through vegetated roadway shoulders/fill slopes to vegetated roadside ditches prior to entering the receiving stream.</p>		
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?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If no, explain:	
2b. If yes, mitigation is required by (check all that apply):	<input type="checkbox"/> DWQ <input checked="" type="checkbox"/> Corps	
2c. If yes, which mitigation option will be used for this project?	<input type="checkbox"/> Mitigation bank <input checked="" type="checkbox"/> Payment to in-lieu fee program <input type="checkbox"/> 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.	<input checked="" type="checkbox"/> Yes	
4b. Stream mitigation requested:	154 linear feet	
4c. If using stream mitigation, stream temperature:	<input checked="" type="checkbox"/> warm <input type="checkbox"/> cool <input type="checkbox"/> cold	
4d. Buffer mitigation requested (DWQ only):	0 square feet	
4e. Riparian wetland mitigation requested:	0 acres	
4f. Non-riparian wetland mitigation requested:	0 acres	
4g. Coastal (tidal) wetland mitigation requested:	0 acres	
4h. Comments: The NCDOT does not propose mitigation for the 12 linear feet of bank stabilization impacts to UT to Falling Creek. The bank stabilization impacts do not require fill in the stream bed and, therefore, under Section 404 of the Clean Water Act, do not constitute Loss of Waters of the U.S. and are not subject to compensatory mitigation.		
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.

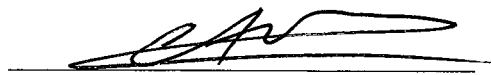
Zone	6c. Reason for impact	6d. Total impact (square feet)	Multiplier	6e. Required mitigation (square feet)
Zone 1			3 (2 for Catawba)	
Zone 2			1.5	
6f. Total buffer mitigation required:				

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?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
1b. If yes, then is a diffuse flow plan included? If not, explain why. Comments: If required from 1a, see attached buffer permit drawings.	<input type="checkbox"/> Yes <input type="checkbox"/> 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?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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?	<input type="checkbox"/> Certified Local Government <input type="checkbox"/> DWQ Stormwater Program <input checked="" type="checkbox"/> 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):	<input type="checkbox"/> Phase II <input type="checkbox"/> NSW <input type="checkbox"/> USMP <input type="checkbox"/> Water Supply Watershed <input type="checkbox"/> Other:
3c. Has the approved Stormwater Management Plan with proof of approval been attached?	<input type="checkbox"/> Yes <input type="checkbox"/> No
4. DWQ Stormwater Program Review	
4a. Which of the following state-implemented stormwater management programs apply (check all that apply):	<input type="checkbox"/> Coastal counties <input type="checkbox"/> HQW <input type="checkbox"/> ORW <input type="checkbox"/> Session Law 2006-246 <input type="checkbox"/> Other:
4b. Has the approved Stormwater Management Plan with proof of approval been attached?	<input type="checkbox"/> Yes <input type="checkbox"/> No n/a
5. DWQ 401 Unit Stormwater Review	
5a. Does the Stormwater Management Plan meet the appropriate requirements?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5b. Have all of the 401 Unit submittal requirements been met?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
2b. Is this an after-the-fact permit application?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
5b. Have you checked with the USFWS concerning Endangered Species Act impacts?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
5c. If yes, indicate the USFWS Field Office you have contacted.	<input type="checkbox"/> Raleigh	<input type="checkbox"/> Asheville
5d. What data sources did you use to determine whether your site would impact Endangered Species or Designated Critical Habitat? Regarding 5b.: checked with the USFWS website. Dwarf-flowered heartleaf and Schweinitz's sunflower are the only species listed for Catawba County. NCDOT biologists conducted surveys for both species in 2013, and no individuals of either species were observed. This project will have No Effect on any of the Catawba County Federally listed species.		
6. Essential Fish Habitat (Corps Requirement)		
6a. Will this project occur in or near an area designated as essential fish habitat?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> 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)?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> 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?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> 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		
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.)	7-16-14 Date



North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Michael Ellison, Director
Ecosystem Enhancement Program

John E. Skvarla, III
Secretary

July 15, 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-5150, Replace Bridge Number 34 over Falling Creek on SR 1404, Catawba County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory stream mitigation for the subject project. Based on the information supplied by you on July 14, 2014, the impacts are located in CU 03050102 of the Catawba River basin in the Central Piedmont (CP) Eco-Region, and are as follows:

Catawba 03050102 CP	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	0	0	154.0	0	0	0	0	0

This mitigation acceptance letter replaces the mitigation acceptance letter issued on July 1, 2014. This impact and associated mitigation need were under projected by the NCDOT in the 2014 impact data. EEP 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 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 Beth Harmon at 919-707-8420.

Sincerely,

James B. Stanfill
EEP Asset Management Supervisor

cc: Mr. Steve Kichowski, USACE – Asheville Regulatory Field Office
Mr. Alan Johnson, NCDWQ – Mooresville Regional Office
Ms. Linda Fitzpatrick, NCDOT – PDEA
File: B-5150 Revised



North Carolina Department of Transportation
Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
 FOR LINEAR ROADWAY PROJECTS



(Version 1.2; Released July 2012)

Project/TIP No.: B-5150

County(ies): CATAWBA

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General Project Information

Project No.:	B-5150	Project Type:	Bridge To Culvert Replacement	Date:	5/21/2014
NCDOT Contact:	BILL ZERMAN JR., PE	Contractor / Designer:	GREGORY BRICKHAM, PE		
Address:	DEPARTMENT OF TRANSPORTATION 1000 BIRCH RIDGE DRIVE RALEIGH, NC 27610	Address:	MOFFATT & NICHOL 1616 E MILLBROOK RD STE 160 RALEIGH, NC 27609		
	Phone: 919-707-6755		Phone: 919-781-4626		
	Email: BZERMAN@NCDOT.GOV		Email: GBRICKHAM@MOFFATTNICHOL.COM		
City/Town:	Hickory	County(ies):	Catawba		
River Basin(s):	Catawba	CAMA County?	No		
Primary Receiving Water:	FALLING CREEK	NCDWQ Stream Index No.:	DWQ INDEX# 11-60		
NCDWQ Surface Water Classification for Primary Receiving Water	Primary:	Class C	None		
	Supplemental:	None			
Other Stream Classification:	None				
303(d) Impairments:	None				
Buffer Rules in Effect	N/A				

Project Description

Project Length (lin. Miles or feet):	0.14	Surrounding Land Use:	URBAN		
	Proposed Project		Existing Site		
Project Built-Up Area (ac.)	0.70 ac.		0.60 ac.		
Typical Cross Section Description:	12' TRAVEL LANES WITH 4'-0" PAVED SHOULDER AT CULVERT		10' TRAVEL LANES; NO SHOULDER; 24' OUT TO OUT		
Average Daily Traffic (veh/hr/day):	Design/Future: ADT 2015 = 14024 / ADT 2035 = 24100 (Design)	Existing:	ADT 2009 = 11000		

General Project Narrative:

The project will replace Catawba County Bridge #17-0034 and its approaches with a culvert. The proposed replacement structure is a 3-cell, 10'x13' RCBC. This structure provides 2 – 12' travel lanes with 4' foot shoulders. The project will utilize an onsite detour, located just downstream of the proposed -L- alignment. The temporary detour structure will be 3 @ 120" diameter circular CMP.

There are no wetlands present within the proposed limits of construction. Buffer rules do not apply. There will be a total of 166 linear feet of permanent stream impact at the project site. This includes 69 linear feet of permanent stream impacts due to the placement of the proposed culvert, 53 linear feet of permanent stream impact due to the bank stabilization/floodplain benches at the inlet and outlet of the permanent culvert, and 44 linear feet of permanent stream impact from the bank stabilization at the outlet of the detour pipes (CMP). There will be a total of 166 linear feet of temporary stream impact at the project site. This includes 20 linear feet of temporary impact resulting from the temporary diversion channel and impervious dikes, 62 linear feet due to placement of the temporary detour pipes (CMP), and 84 linear feet due to the placement of fill from the temporary detour roadway. 53 LF of temporary impacts for Site 1 occur within permanent bank stabilization impacts, and thus were not included in the impact calculation in order to avoid double counting of impacts.

STORMWATER CONTROLS: The proposed culvert project does not utilize deck drains. Roadway runoff will discharge through vegetated roadway shoulders/fills slopes to vegetated roadside ditches prior to entering the stream. Vegetated treatment swales are not required for this project.

References



North Carolina Department of Transportation
Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
 FOR LINEAR ROADWAY PROJECTS



(Version 1.2; Released July 2012)

Project/TIP No.: B-5150 **County(ies):** CATAWBA **Page** 2 **of** 3

Project Environmental Summary

Surface Water Impacts

Sheet No.	Station (From / To)	Feature Impacted	Water / Wetland / Buffer Type	Receiving Surface Water Name	NRTR Map ID	NCDWQ Stream Index	NCDWQ Surface Water Classification	303(d) Impairments	Type of Impact	Existing SCM	Proposed SCM
4/5	14+58 -L-	Stream	Perennial	Falling Creek		DWQ INDEX# 11-60	C	None	Culvert	N/A	
	14+87 -L-										
4/5	14+56 -L-	Stream	Perennial	Falling Creek		DWQ INDEX# 11-60	C	None	Stabilization	N/A	
	14+92 -L-										
4/5	14+55 -L-	Stream	Perennial	Falling Creek		DWQ INDEX# 11-60	C	None	Diversion	N/A	
	14+94 -L-										
6/7	14+74 -DET-	Stream	Perennial	Falling Creek		DWQ INDEX# 11-60	C	None	Pipes (CMP)	N/A	
	15+12 -DET-										
6/7	14+65 -DET-	Stream	Perennial	Falling Creek		DWQ INDEX# 11-60	C	None	Stabilization	N/A	
	15+02 -DET-										
6/7	11+31 -DET-	Stream	Perennial	Unnamed Tributary (UT) to Falling Creek		DWQ INDEX# 11-60	C	None	Roadway Excavation/Fill	N/A	
	12+16 -DET-										
6/7	14+59 -DET-	Stream	Perennial	Unnamed Tributary (UT) to Falling Creek		DWQ INDEX# 11-60	C	None	Stabilization	N/A	
	14+71 -DET-										

* List all stream and surface water impact locations regardless of jurisdiction or size.
 Equalizer Pipes to be noted as a minimization of impacts.
 All proposed SCMs listed must also be listed under Swales, Prefomed Sour Holes and other Energy Dissipators, or Other Stormwater Control Measures.

Description of Minimization of Impacts or Mitigation

A temporary retaining wall was utilized from STA. 14+25 to STA. 14+70 -DET- LT to contain fill slopes from the -DET- alignment and minimize stream impacts to "Unnamed Tributary to Falling Creek".

References



Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
 FOR LINEAR ROADWAY PROJECTS

(Version 1.2; Released July 2012)

Project/TIP No.: B-5150

County(ies): CATAWBA

Page 3 of 3

Swales

Sheet No.	Station (From / To)	Stream Crossing Station	Base Width (ft)	Front Slope (H:V)	Back Slope (H:V)	Drainage Area (ac)	Recommended Treatment Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used
							0							
							0							
							0							
							0							
							0							
							0							
							0							
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							0							
							0							
							0							

YES NO

Have minimum design criteria, as presented in the NCDOT Best Management Practices Toolbox, Version 1 (March 2008), been met and verified? If No, provide further explanation of why design criteria was not met.

Additional Comments

Vegetated treatment swales are not required for this project. Roadside ditches are proposed to convey roadway runoff to the receiving stream.

09.08/99

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

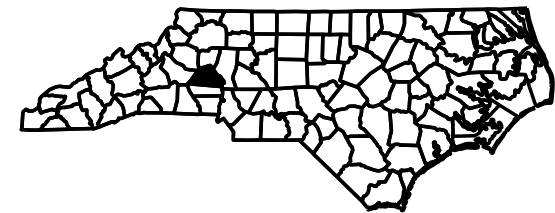
CATAWBA COUNTY

LOCATION: BRIDGE No. 34 ON SR 1404 (29th Ave.) OVER FALLING CREEK.

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

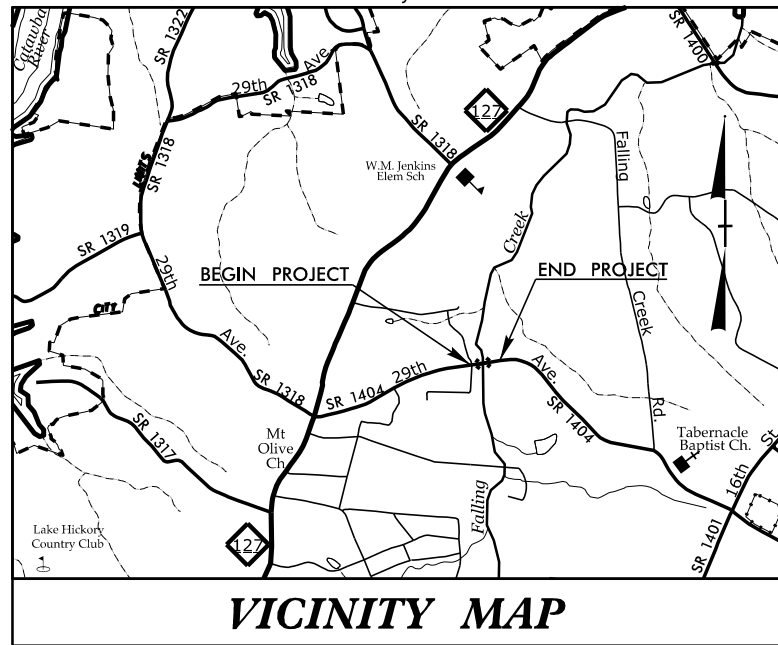
**WETLAND AND SURFACE
WATER IMPACTS PERMIT**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5150	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
42311.1.1	BRZ-1404(13)	PE	
42311.2.1	BRZ-1404(13)	RW, UTIL	
42311.3.1	BRZ-1404(13)	CONST	



PERMIT DRAWING
SHEET 1 OF 8

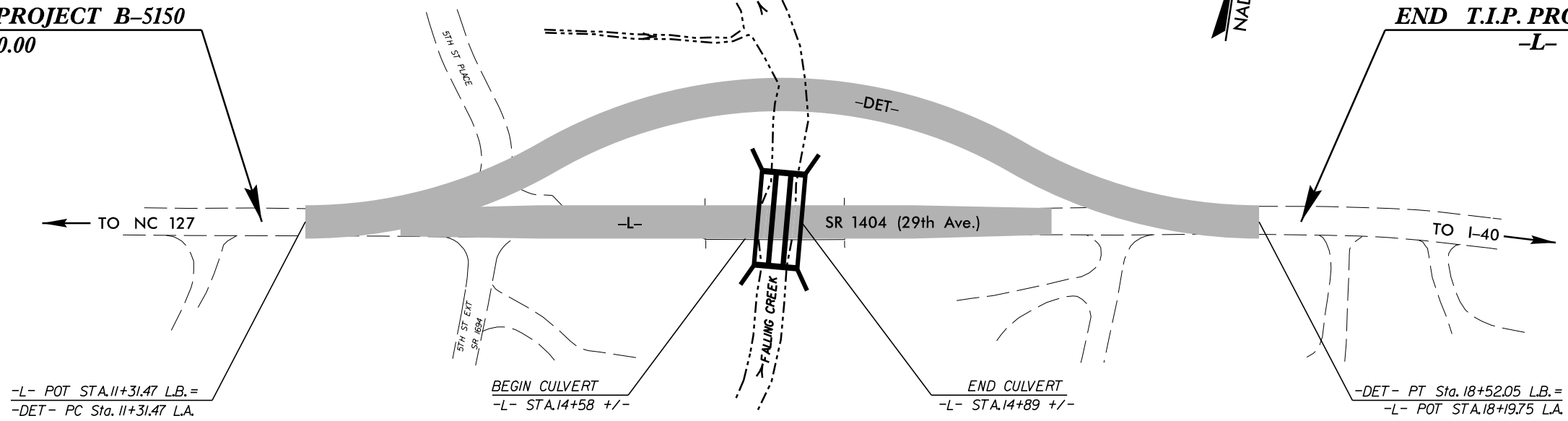
TIP PROJECT: B-5150



VICINITY MAP

BEGIN T.I.P. PROJECT B-5150
-L- STA. 11+00.00

END T.I.P. PROJECT B-5150
-L- STA. 18+50.00



-L- POT STA. 11+31.47 L.B. =
-DET- PC Sta. 11+31.47 L.A.

BEGIN CULVERT
-L- STA. 14+58 +/-

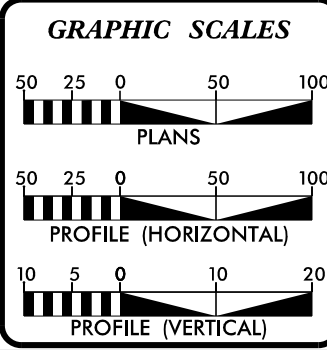
END CULVERT
-L- STA. 14+89 +/-

-DET- PT Sta. 18+52.05 L.B. =
-L- POT STA. 18+19.75 L.A.

ON SITE DETOUR ON PLAN SHEET 5
THIS PROJECT IS WITHIN THE HICKORY CITY LIMITS
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONTRACT:



DESIGN DATA

ADT 2015 =	14,024
ADT 2035 =	24,100
DHV =	10 %
D =	55 %
T =	4 % *
V =	50 MPH
* TTST = 1% DUAL 3%	
FUNC CLASS =	LOCAL
SUBREGIONAL TIER	

PROJECT LENGTH

LENGTH OF ROADWAY T.I.P. PROJECT B-5150 =	0.136 MI
LENGTH OF STRUCTURE T.I.P. PROJECT B-5150 =	0.006 MI
TOTAL LENGTH OF T.I.P. PROJECT B-5150 =	0.142 MI

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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 21, 2014

LETTING DATE:
FEBRUARY 17, 2015

JASON MOORE, PE
PROJECT ENGINEER

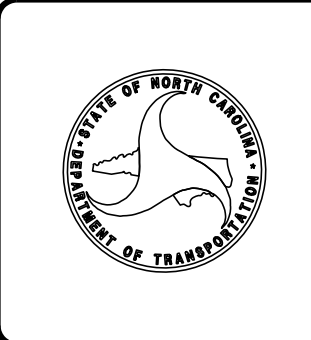
JEANIE TYSON
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.



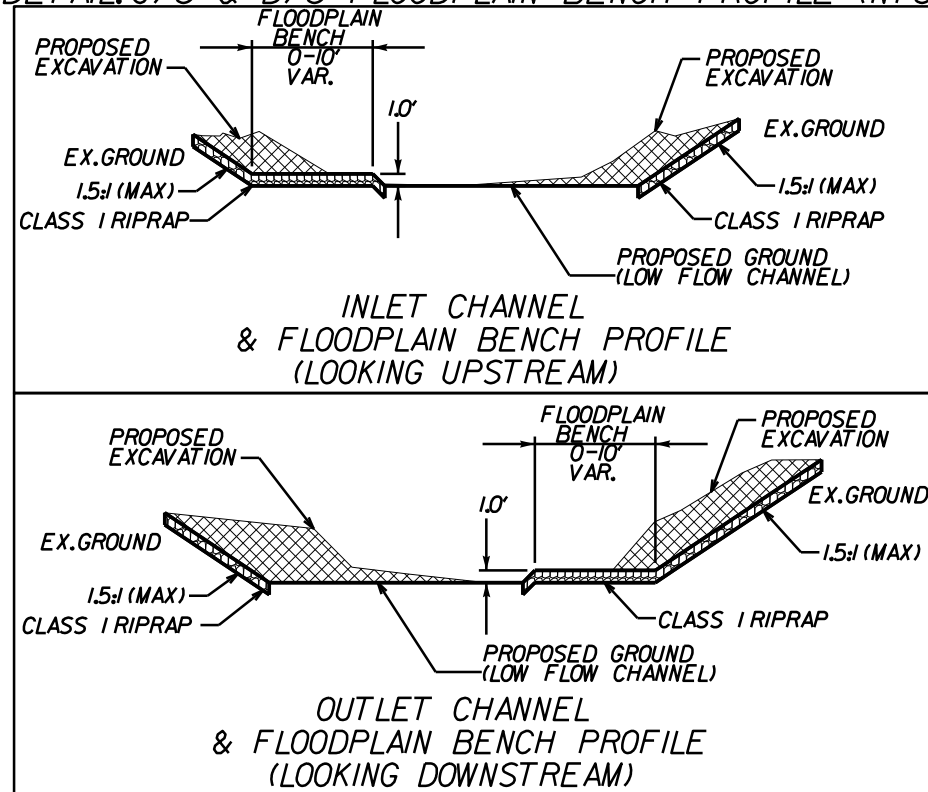
4/21/2014 R:\Hydraulics\PERMITS_Environmental\Drawings\B5150_HYD_PRM_PSH01.dgn gbrickham

PROJECT REFERENCE NO.	SHEET NO.
B-5150	2-C
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

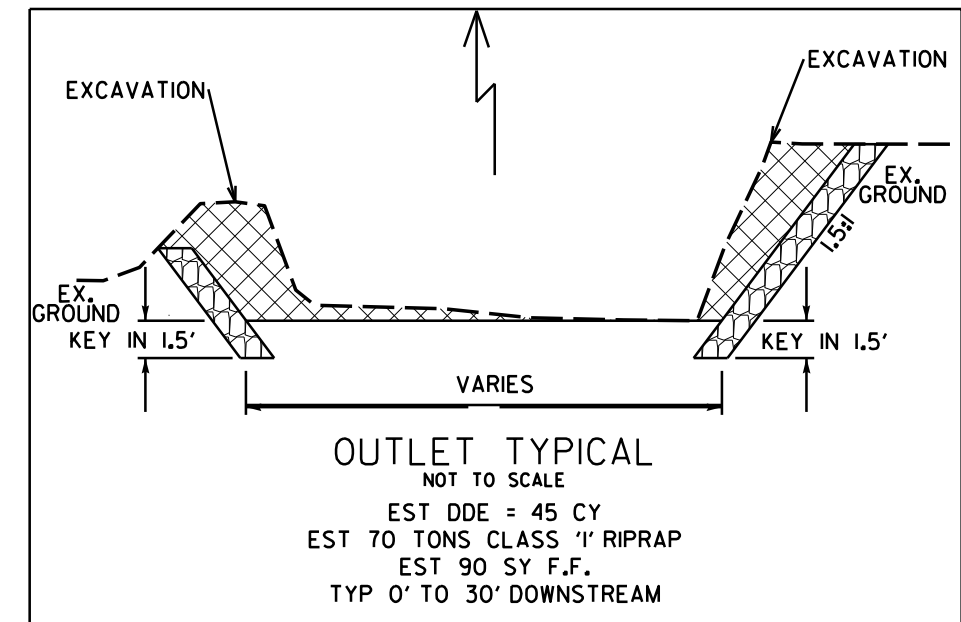
PERMIT DRAWING
SHEET 2 OF 8

DETAIL H
CHANNEL IMPROVEMENTS

DETAIL: U/S & D/S FLOODPLAIN BENCH PROFILE (NTS)



DETAIL I
RIPRAP AT OUTLET OF
TEMPORARY DETOUR PIPES



CULVERT BACKFILL NOTE:

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARRELS. RIP RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARREL. IF RIP RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL, NATIVE MATERIAL SHALL BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

REVISIONS

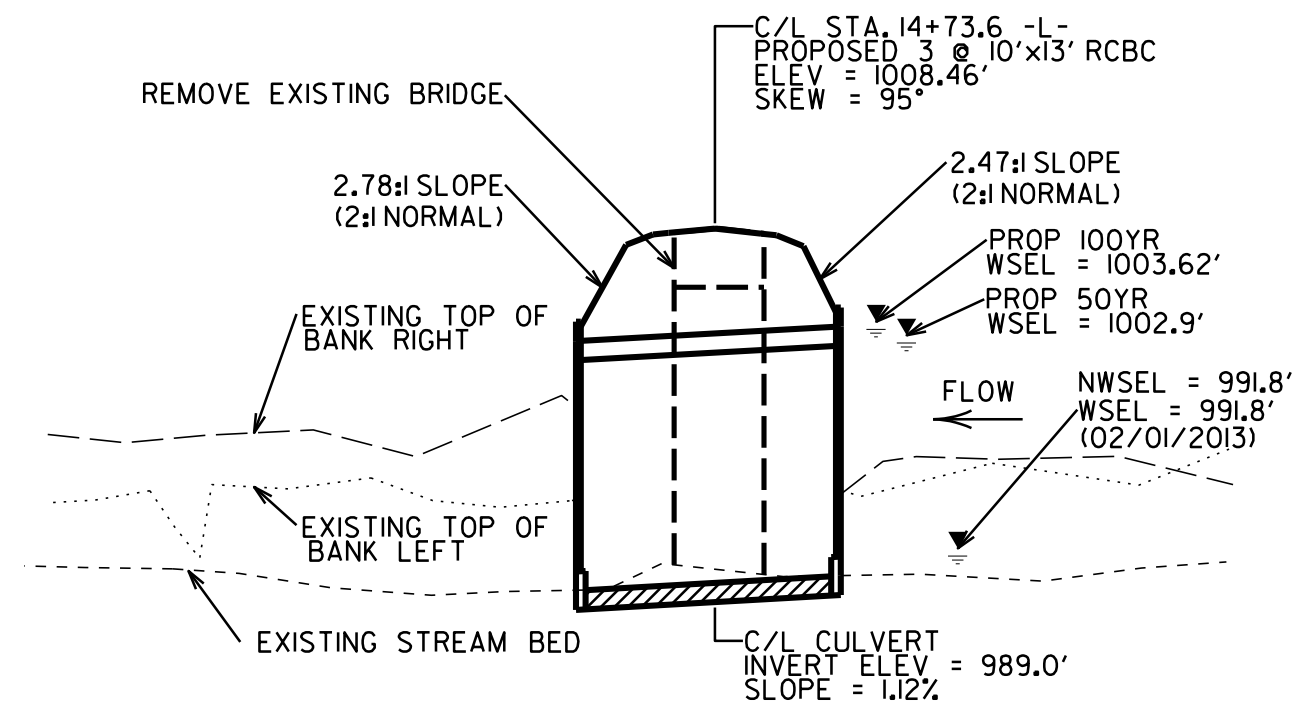
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4/21/2014
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WETLAND AND SURFACE WATER IMPACTS PERMIT

PROJECT REFERENCE NO. B-5150	SHEET NO. PRM-3
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

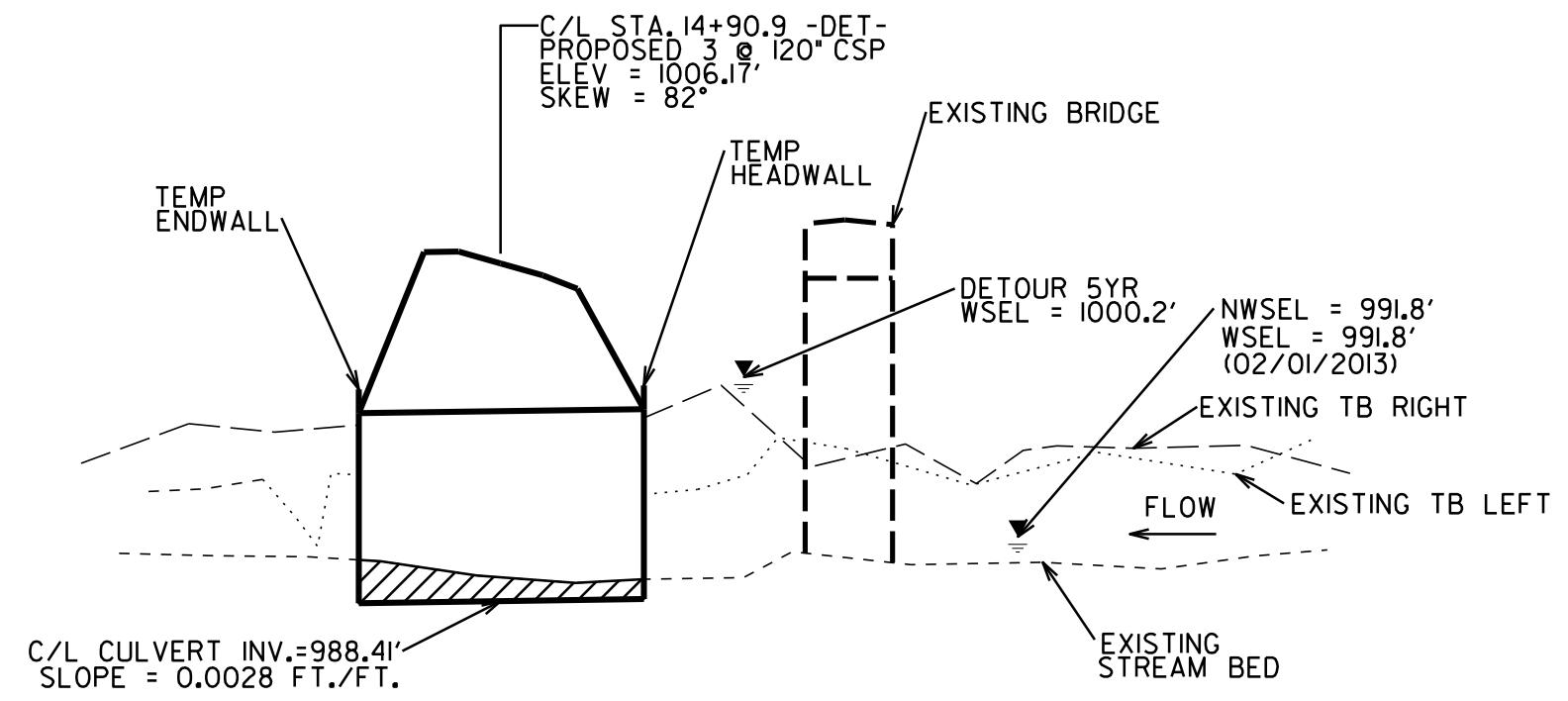
PERMIT DRAWING
SHEET 3 OF 8

SCALE:
1" = 50' H
1" = 10' V



PROFILE VIEW ALONG PROPOSED STRUCTURE

SCALE:
1" = 50' H
1" = 10' V



PROFILE VIEW ALONG DETOUR STRUCTURE

REVISIONS
 8/17/99
 4/21/2014
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8/17/99

TS **TS** DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S **S** DENOTES IMPACTS IN SURFACE WATER

Do not disturb existing SS on north side, except as noted on the utility plans to adjust manhole cover elevations. Access to SS through manholes should be maintained at all times.

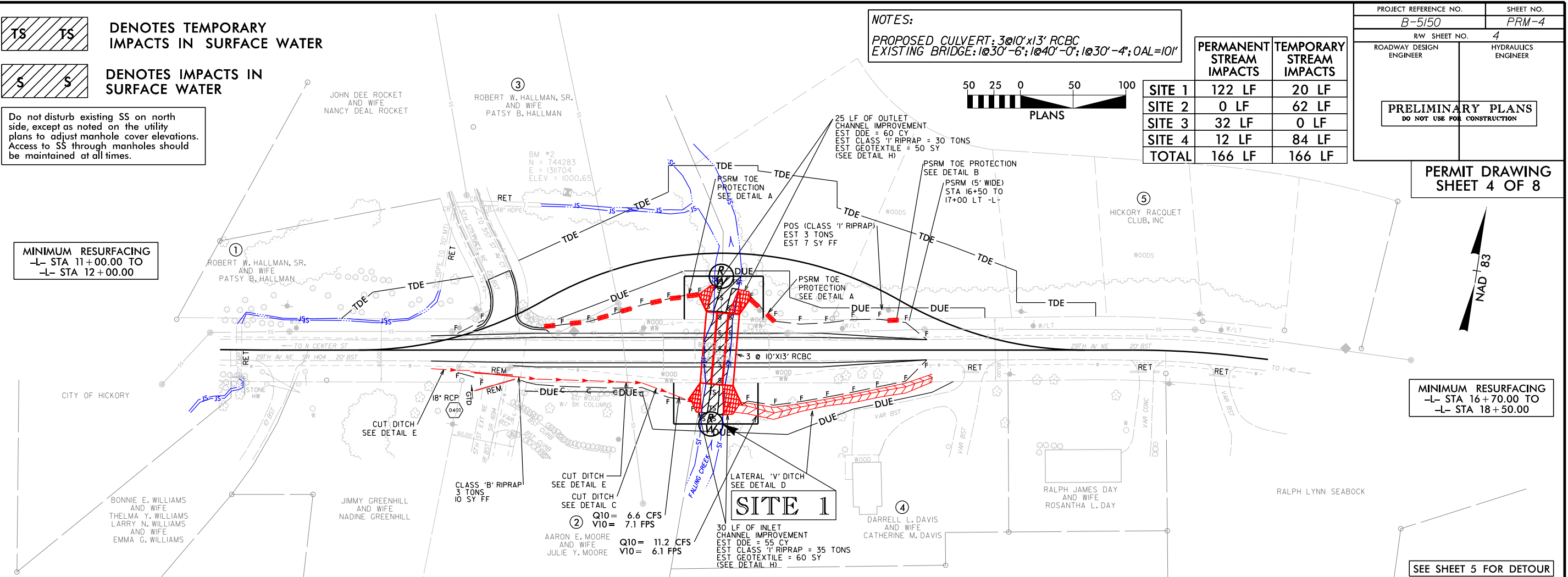
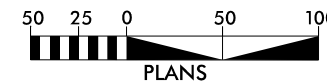
MINIMUM RESURFACING
-L- STA 11+00.00 TO
-L- STA 12+00.00

PERMIT DRAWING
SHEET 4 OF 8

NOTES:
PROPOSED CULVERT: 3@10'x13' RCBC
EXISTING BRIDGE: 1@30'-6"; 1@40'-0"; 1@30'-4"; 0AL=10'

	PERMANENT STREAM IMPACTS	TEMPORARY STREAM IMPACTS
SITE 1	122 LF	20 LF
SITE 2	0 LF	62 LF
SITE 3	32 LF	0 LF
SITE 4	12 LF	84 LF
TOTAL	166 LF	166 LF

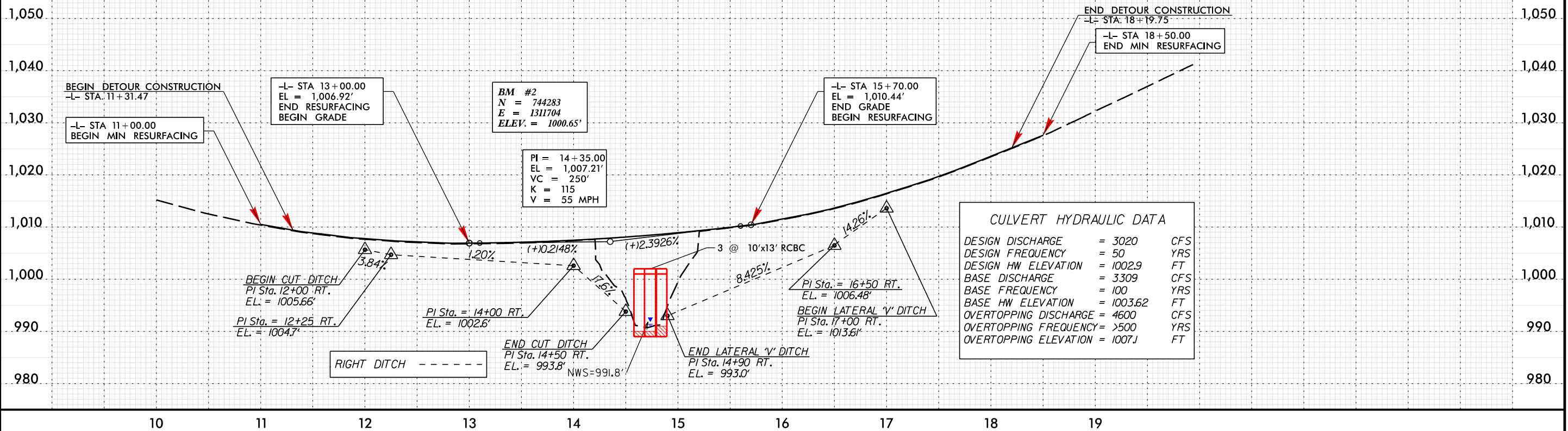
PROJECT REFERENCE NO. B-5150	SHEET NO. PRM-4
RW SHEET NO. 4	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



MINIMUM RESURFACING
-L- STA 16+70.00 TO
-L- STA 18+50.00

SEE SHEET 5 FOR DETOUR

-L- SR 1404 (29th Ave. NE)



DESIGN DISCHARGE	= 3020	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 1002.9	FT
BASE DISCHARGE	= 3309	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 1003.62	FT
OVERTOPPING DISCHARGE	= 4600	CFS
OVERTOPPING FREQUENCY	= >500	YRS
OVERTOPPING ELEVATION	= 1007.1	FT

REVISIONS

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TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

Do not disturb existing SS on north side, except as noted on the utility plans to adjust manhole cover elevations. Access to SS through manholes should be maintained at all times.

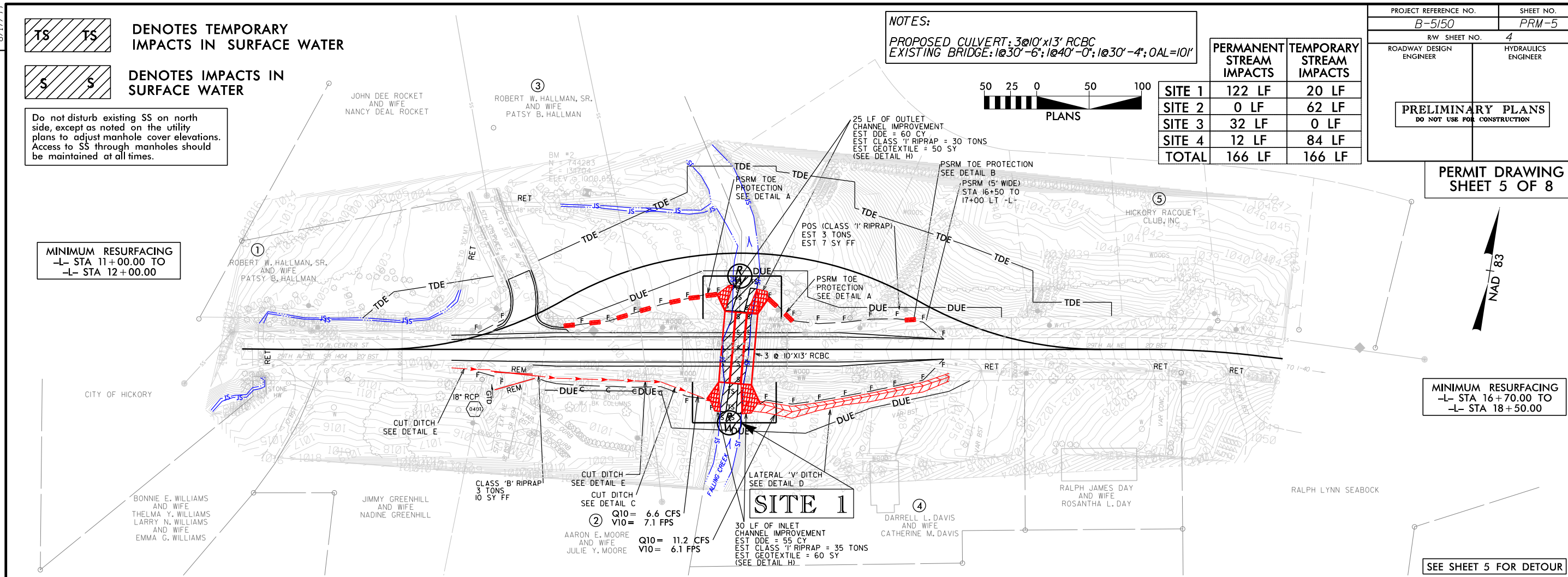
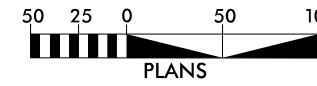
MINIMUM RESURFACING
-L- STA 11+00.00 TO
-L- STA 12+00.00

PERMIT DRAWING
SHEET 5 OF 8

NOTES:
PROPOSED CULVERT: 3@10'x13' RCBC
EXISTING BRIDGE: 1@30'-6"; 1@40'-0"; 1@30'-4"; 0AL=10'

	PERMANENT STREAM IMPACTS	TEMPORARY STREAM IMPACTS
SITE 1	122 LF	20 LF
SITE 2	0 LF	62 LF
SITE 3	32 LF	0 LF
SITE 4	12 LF	84 LF
TOTAL	166 LF	166 LF

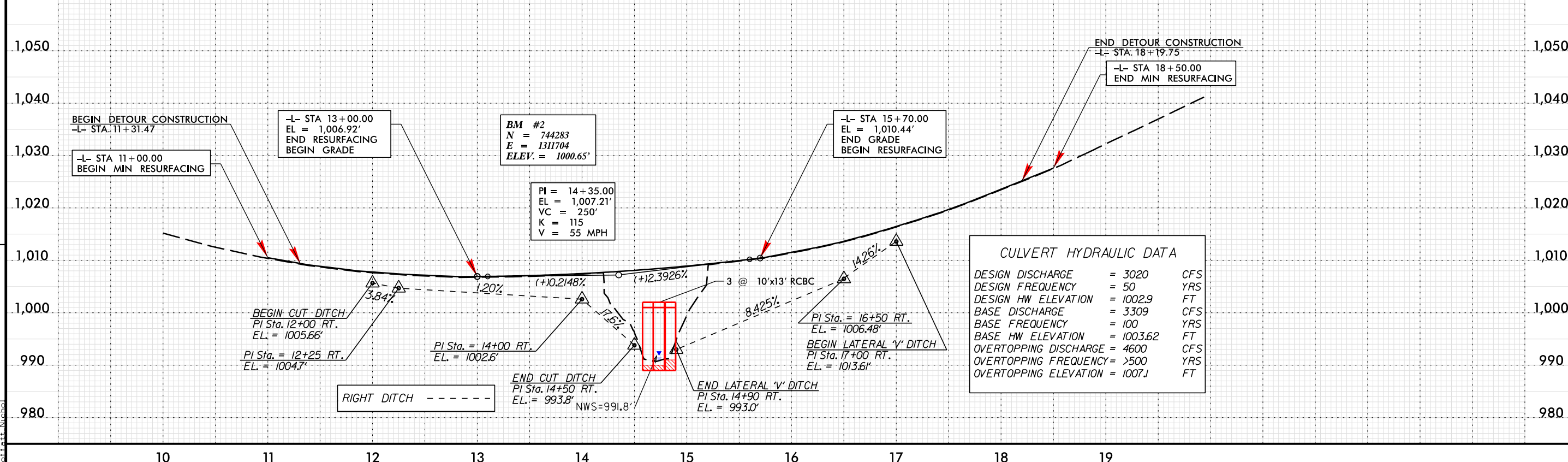
PROJECT REFERENCE NO. B-5150	SHEET NO. PRM-5
RW SHEET NO. 4	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



MINIMUM RESURFACING
-L- STA 16+70.00 TO
-L- STA 18+50.00

SEE SHEET 5 FOR DETOUR

-L- SR 1404 (29th Ave. NE)



DESIGN DISCHARGE	= 3020	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 1002.9	FT
BASE DISCHARGE	= 3309	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 1003.62	FT
OVERTOPPING DISCHARGE	= 4600	CFS
OVERTOPPING FREQUENCY	= >500	YRS
OVERTOPPING ELEVATION	= 1007.1	FT

BM #2
N = 744283
E = 1311704
ELEV. = 1000.65'

PI = 14+35.00
EL = 1,007.21'
VC = 250'
K = 115
V = 55 MPH

BEGIN CUT DITCH
PI Sta. = 12+00 RT.
EL. = 1005.66'
PI Sta. = 12+25 RT.
EL. = 1004.7'

PI Sta. = 14+00 RT.
EL. = 1002.6'

END CUT DITCH
PI Sta. 14+50 RT.
EL. = 993.8' NWS=991.8'

PI Sta. = 16+50 RT.
EL. = 1006.48'
BEGIN LATERAL 'V' DITCH
PI Sta. 17+00 RT.
EL. = 1013.61'

END LATERAL 'V' DITCH
PI Sta. 14+90 RT.
EL. = 993.0'

END DETOUR CONSTRUCTION
-L- STA. 18+19.75
-L- STA 18+50.00
END MIN RESURFACING

BEGIN DETOUR CONSTRUCTION
-L- STA. 11+31.47
-L- STA 11+00.00
BEGIN MIN RESURFACING

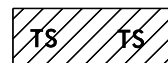
-L- STA 13+00.00
EL = 1,006.92'
END RESURFACING
BEGIN GRADE

-L- STA 15+70.00
EL = 1,010.44'
END GRADE
BEGIN RESURFACING

REVISIONS

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8/17/99



DENOTES TEMPORARY IMPACTS IN SURFACE WATER



DENOTES IMPACTS IN SURFACE WATER

Do not disturb existing SS on north side, except as noted on the utility plans to adjust manhole cover elevations. Access to SS through manholes should be maintained at all times.

SITE 4

SITE 3

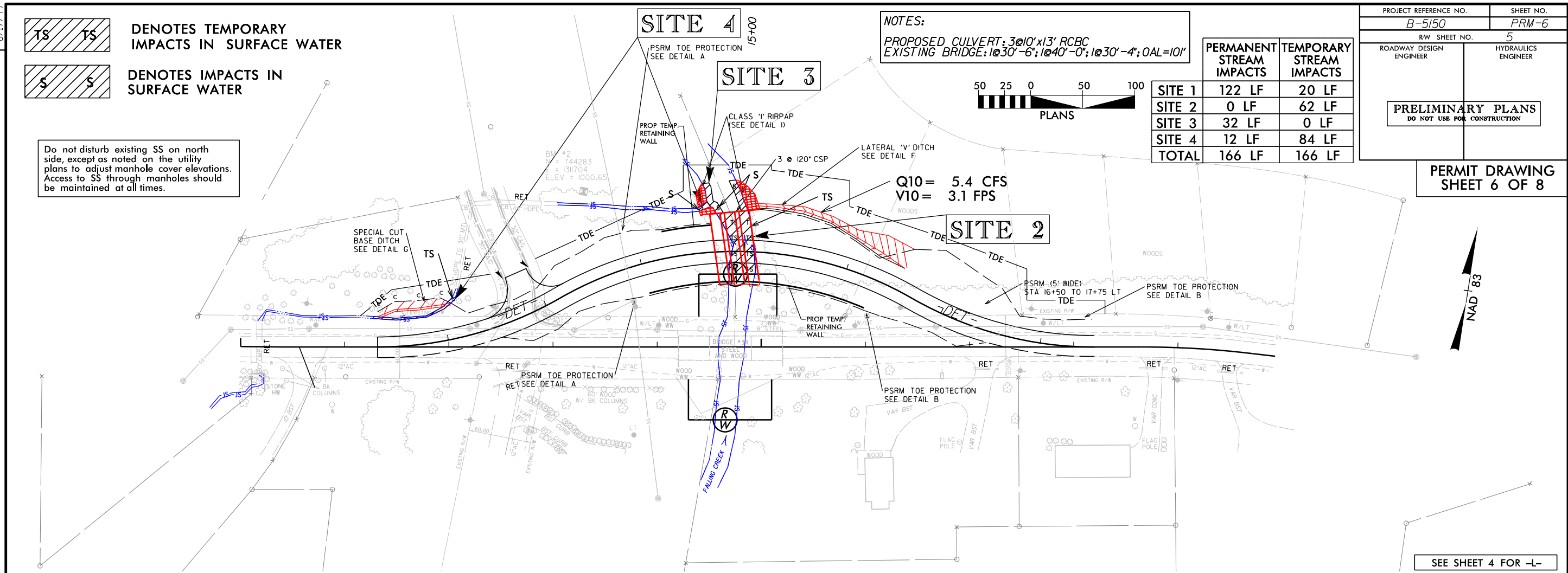
SITE 2

NOTES:
PROPOSED CULVERT: 3@10'x13' RCBC
EXISTING BRIDGE: 1@30'-6"; 1@40'-0"; 1@30'-4"; 0AL=101'

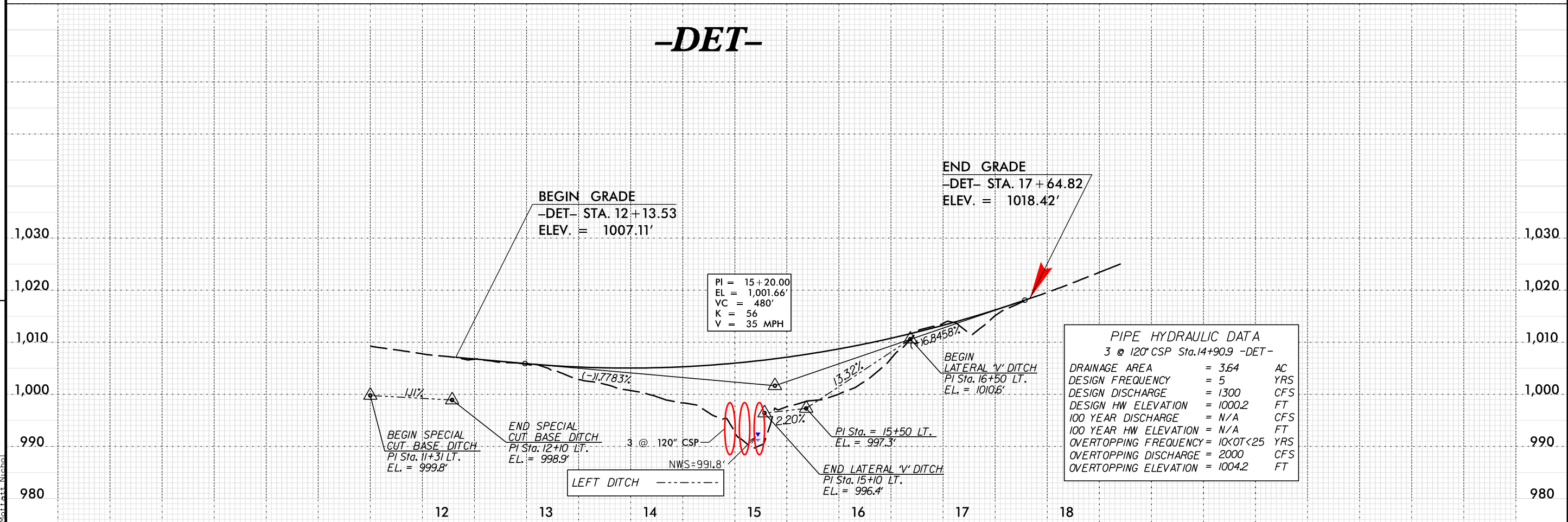
	PERMANENT STREAM IMPACTS	TEMPORARY STREAM IMPACTS
SITE 1	122 LF	20 LF
SITE 2	0 LF	62 LF
SITE 3	32 LF	0 LF
SITE 4	12 LF	84 LF
TOTAL	166 LF	166 LF

PROJECT REFERENCE NO. B-5150	SHEET NO. PRM-6
RW SHEET NO. 5	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

PERMIT DRAWING SHEET 6 OF 8



-DET-



PIPE HYDRAULIC DATA
3 @ 120" CSP Sta. 14+90.9 -DET-

DRAINAGE AREA	= 3.64	AC
DESIGN FREQUENCY	= 5	YRS
DESIGN DISCHARGE	= 1300	CFS
DESIGN HW ELEVATION	= 1000.2	FT
100 YEAR DISCHARGE	= N/A	CFS
100 YEAR HW ELEVATION	= N/A	FT
OVERTOPPING FREQUENCY	= 10<OT<25	YRS
OVERTOPPING DISCHARGE	= 2000	CFS
OVERTOPPING ELEVATION	= 1004.2	FT

REVISIONS

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Mod: Matt Nichol

8/17/99

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

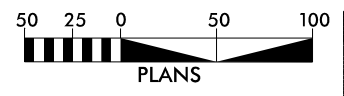
Do not disturb existing SS on north side, except as noted on the utility plans to adjust manhole cover elevations. Access to SS through manholes should be maintained at all times.

SITE 4

SITE 3

SITE 2

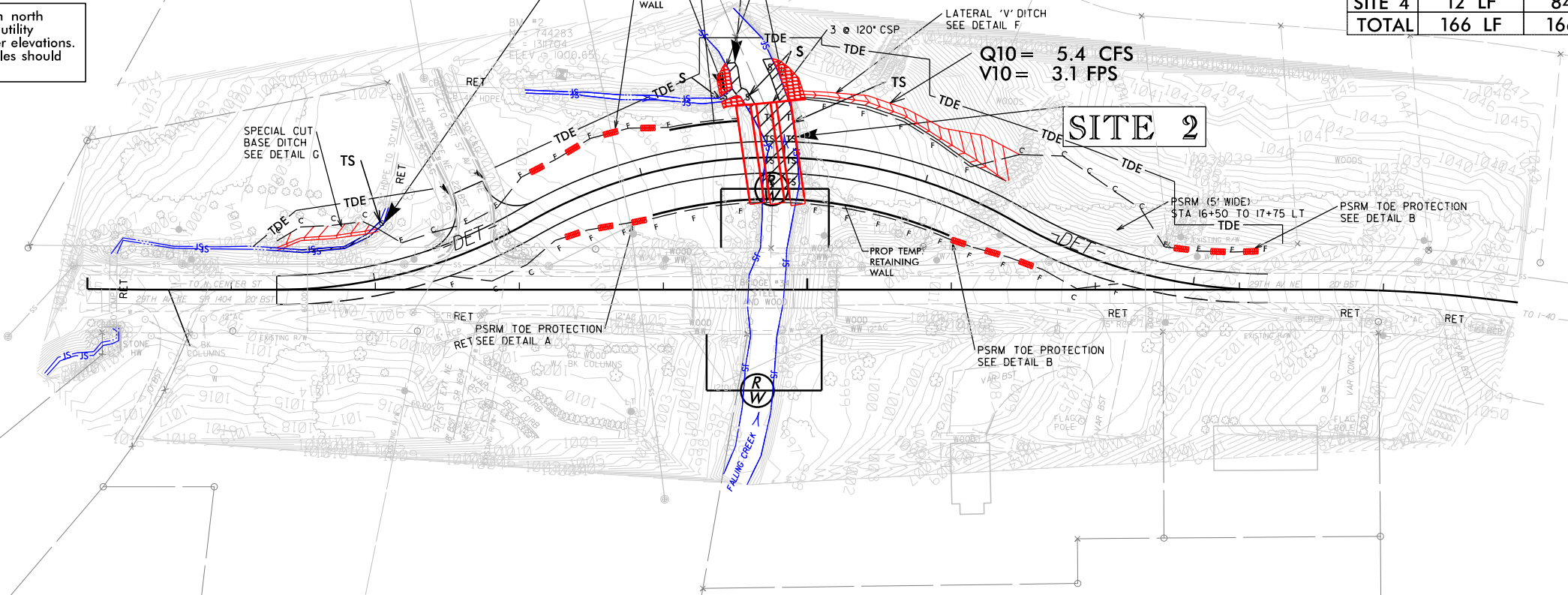
NOTES:
 PROPOSED CULVERT: 3@10'x13' RCBC
 EXISTING BRIDGE: 1@30'-6"; 1@40'-0"; 1@30'-4"; 0AL=10'



	PERMANENT STREAM IMPACTS	TEMPORARY STREAM IMPACTS
SITE 1	122 LF	20 LF
SITE 2	0 LF	62 LF
SITE 3	32 LF	0 LF
SITE 4	12 LF	84 LF
TOTAL	166 LF	166 LF

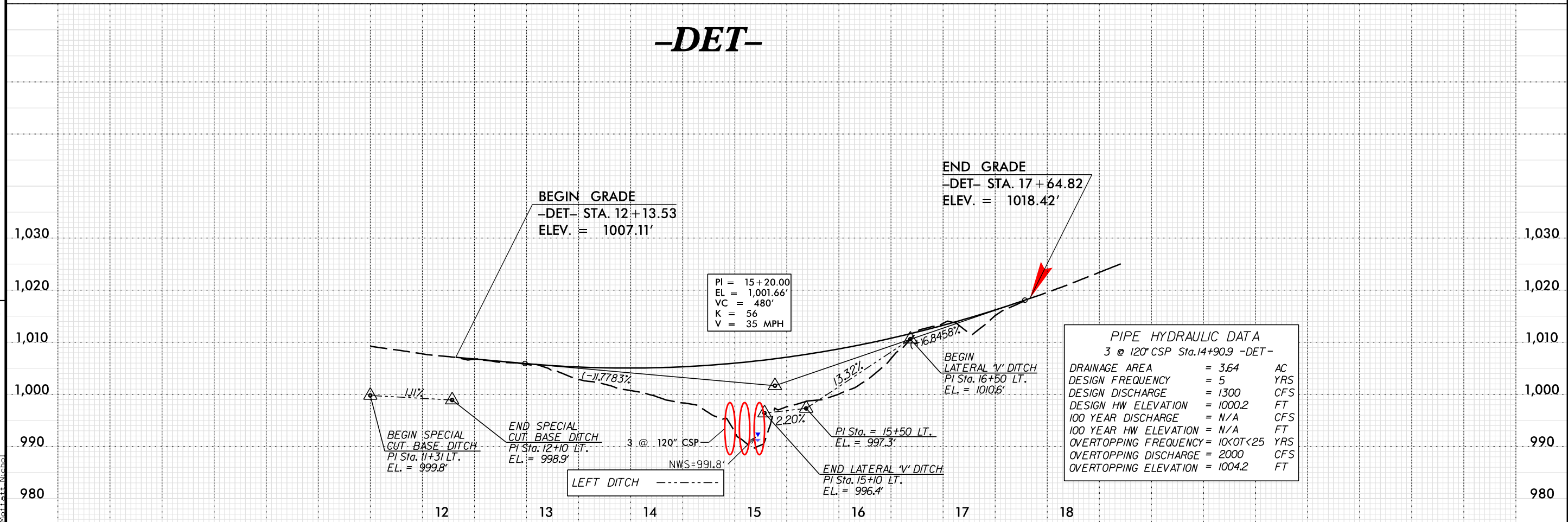
PROJECT REFERENCE NO. B-5150	SHEET NO. PRM-7
RW SHEET NO. 5	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

PERMIT DRAWING SHEET 7 OF 8



SEE SHEET 4 FOR -L-

-DET-



REVISIONS

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 8/21/2014
 Mod: Matt Nichol

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	14+58 to 14+87 LT/RT -L-	Proposed Culvert						0.04		69		
1	14+56 to 14+92 LT/RT -L-	Bank Stabilization/Floodplain Bench						0.02		53		
*1	14+55 to 14+94 LT/RT -L-	Temporary Diversion/Temp. Impervious Dikes							0.02		20	
2	14+74 to 15+12 LT/RT -DET-	Temporary Pipes (CMP)							0.03		62	
3	14+65 to 15+02 LT -DET-	Bank Stabilization						0.01		32		
4	11+31 to 12+16 LT -DET-	Temporary Detour Roadway							<0.01		84	
4	14+59 to 14+71 LT -DET-	Bank Stabilization						<0.01	<0.01	12		
TOTALS:								0.07	0.07	166	166	

*53 LF of temporary impacts for Site 1 occur within permanent bank stabilization impacts, and thus were not included in the impact calculation in order to avoid double counting of impacts.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Catawba County
PROJECT: B-5150
Replacement of Bridge #17-0034 with Culvert

09/08/09

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

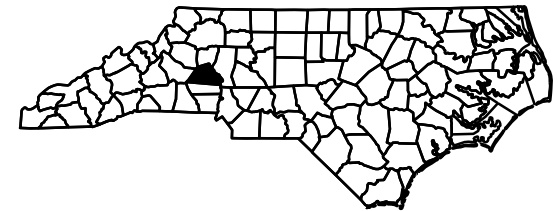
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CATAWBA COUNTY

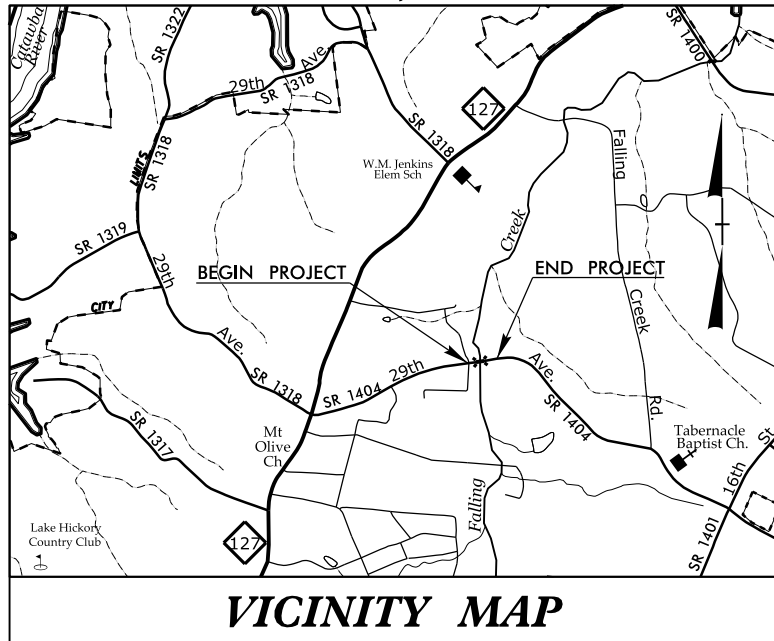
LOCATION: BRIDGE No. 34 ON SR 1404 (29th Ave.) OVER FALLING CREEK.

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5150	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
42311.1.1	BRZ-1404(13)	PE	
42311.2.FD1	BRZ-1404(13)	RW, UTIL	
42311.3.FD1	BRZ-1404(13)	CONST	



TIP PROJECT: B-5150

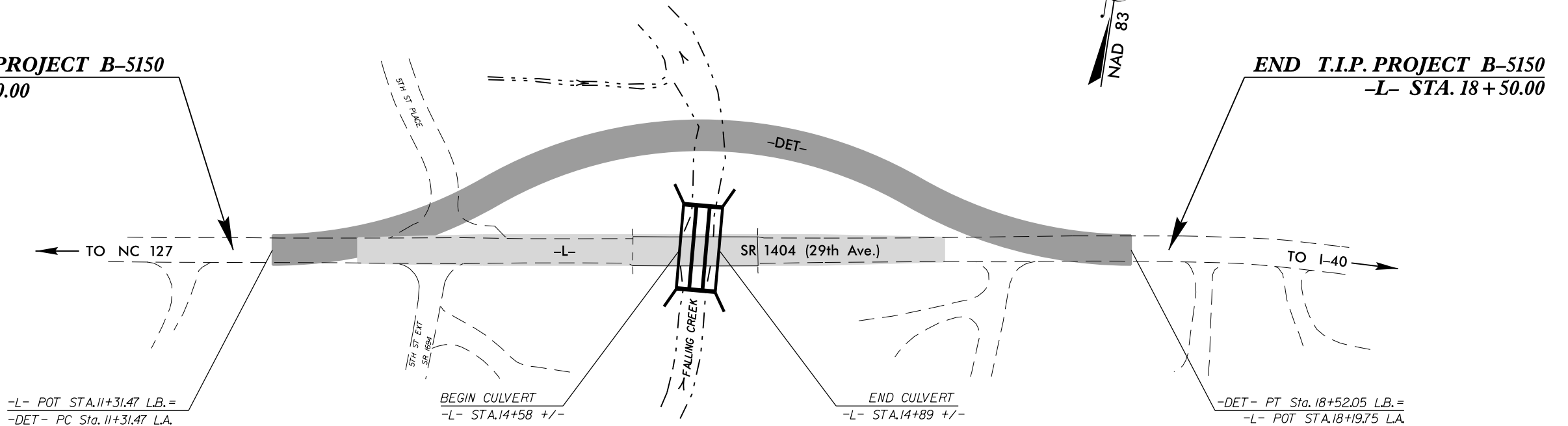


BEGIN T.I.P. PROJECT B-5150

-L- STA. 11+00.00

END T.I.P. PROJECT B-5150

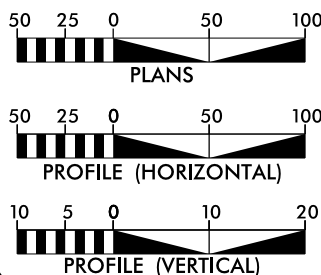
-L- STA. 18+50.00



ON SITE DETOUR ON PLAN SHEET 5.
THIS PROJECT IS WITHIN THE HICKORY CITY LIMITS.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES



DESIGN DATA

ADT 2015 = 14,024
ADT 2035 = 24,100
DHV = 10 %
D = 55 %
T = 4 % *
V = 50 MPH
* TTST = 1% DUAL 3%
FUNC CLASS = LOCAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY T.I.P. PROJECT B-5150 = 0.136 MI
LENGTH OF STRUCTURE T.I.P. PROJECT B-5150 = 0.006 MI
TOTAL LENGTH OF T.I.P. PROJECT B-5150 = 0.142 MI

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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 21, 2014

LETTING DATE:
FEBRUARY 17, 2015

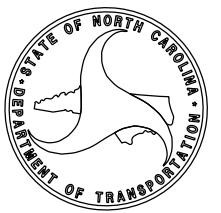
JASON MOORE, PE
PROJECT ENGINEER

JEANIE TYSON
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.
ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.



06-MAY-2014 12:01
R:\Roadway\Proj\B5150_Rdy_tsh.dgn
\$\$\$\$\$USERNAME\$\$\$\$

CONTRACT:

SHEET NUMBER	SHEET
	INDEX OF SHEETS
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C THRU 1-D	SURVEY CONTROL SHEETS
2 THRU 2-A	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
2-B	DITCH DETAILS
2-C	CHANNEL IMPROVEMENTS AND RIPRAP AT TEMPORARY DETOUR PIPES
3	SUMMARY OF QUANTITIES
3A	SUMMARY OF DRAINAGE QUANTITIES
3B	SUMMARY OF EARTHWORK QUANTITIES, ASPHALT PAVEMENT REMOVAL, AND GUARDRAIL
4 THRU 5	PLAN AND PROFILE SHEETS
TCP-1 THRU TCP-	TRAFFIC CONTROL PLANS
PM-1 THRU PM-	PAVEMENT MARKING PLANS
L-1 THRU L-	LANDSCAPE PLANS
EC-1 THRU EC-	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-	SIGNING PLANS
U-1 THRU U-	UTILITIES PLANS
X-1 THRU X-8	CROSS-SECTIONS
S-1 THRU S-	STRUCTURE PLANS

12/05/11

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	○ EP
Property Corner	-----
Property Monument	□ ECM
Parcel/Sequence Number	Ⓣ
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	MLB
Proposed Wetland Boundary	MLB
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	-----
False Sump	-----

RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○
Switch	□
RR Abandoned	-----
RR Dismantled	-----

RIGHT OF WAY:

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	-----
Proposed Right of Way Line with Iron Pin and Cap Marker	-----
Proposed Right of Way Line with Concrete or Granite R/W Marker	-----
Proposed Control of Access Line with Concrete C/A Marker	-----
Existing Control of Access	-----
Proposed Control of Access	-----
Existing Easement Line	-----
Proposed Temporary Construction Easement	-----
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	-----
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	○
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	□ CB
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	-----
Recorded U/G Power Line	-----
Designated U/G Power Line (S.U.E.*)	-----

TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊙
Telephone Booth	□
Telephone Pedestal	□
Telephone Cell Tower	⊙
U/G Telephone Cable Hand Hole	□
Recorded U/G Telephone Cable	-----
Designated U/G Telephone Cable (S.U.E.*)	-----
Recorded U/G Telephone Conduit	-----
Designated U/G Telephone Conduit (S.U.E.*)	-----
Recorded U/G Fiber Optics Cable	-----
Designated U/G Fiber Optics Cable (S.U.E.*)	-----

WATER:

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

TV:

TV Satellite Dish	⊙
TV Pedestal	□
TV Tower	⊗
U/G TV Cable Hand Hole	□
Recorded U/G TV Cable	-----
Designated U/G TV Cable (S.U.E.*)	-----
Recorded U/G Fiber Optic Cable	-----
Designated U/G Fiber Optic Cable (S.U.E.*)	-----

GAS:

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

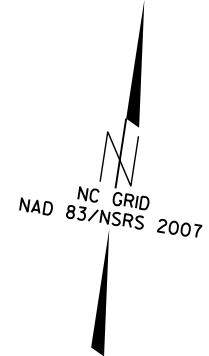
SANITARY SEWER:

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

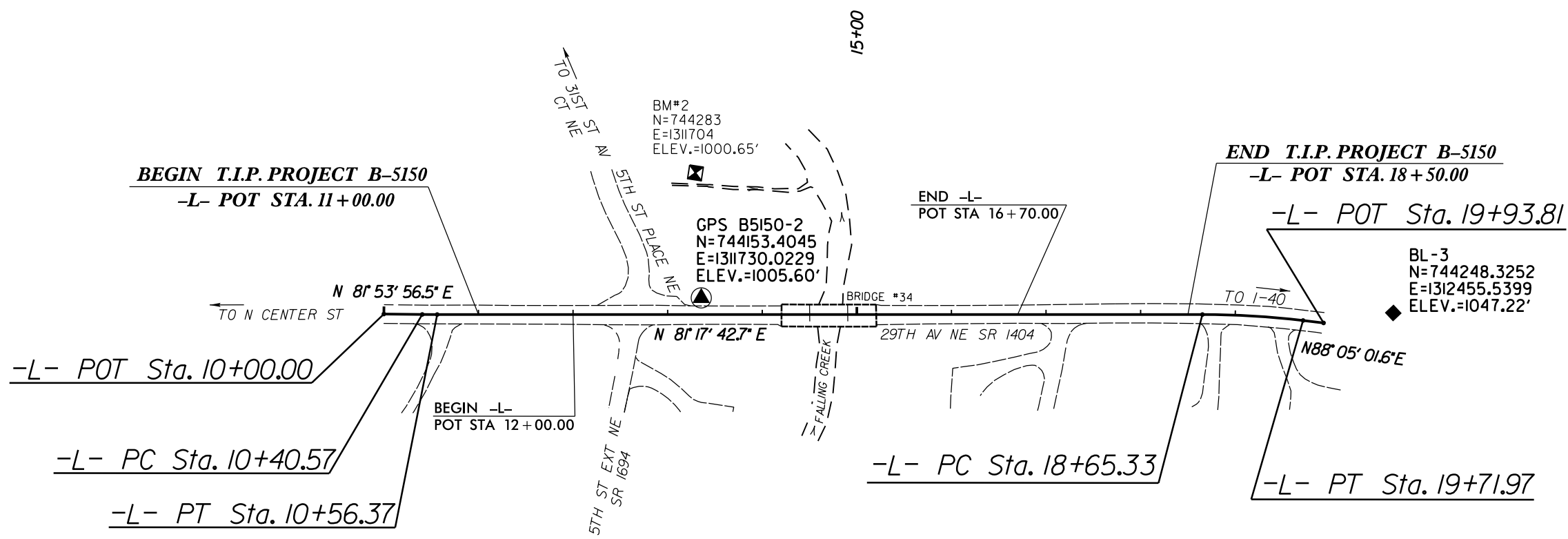
MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊠
Utility Unknown U/G Line	-----
U/G Tank; Water, Gas, Oil	□
Underground Storage Tank, Approx. Loc.	⊕
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.

SURVEY CONTROL SHEET B-5150



GPS B5150-1
N=743916.6909
E=1310663.4655
ELEV.=1068.06'



BL	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1			743916.6909	1310663.4655	1068.06	OUTSIDE PROJECT LIMITS	
2			744153.4045	1311730.0229	1005.60	13+35.52	17.60 LT
3			744248.3252	1312455.5399	1047.22	OUTSIDE PROJECT LIMITS	

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B5150-2" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 744153.404(±) EASTING: 1311730.023(±) ELEVATION: 1005.60(±)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99986932

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B5150-2" TO -L- STATION 10+00.00 IS
S 78° 22' 48.3" W 335.95'

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

```

.....
BM1-B5150-1  ELEVATION = 1068.06'
N 743917      E 1310663
L STATION 10+00.00
S 79° 47' 6.15" W DIST 756.61'
.....
BM2          ELEVATION = 1000.65'
N 744283      E 1311704
L STATION 13+29.00 150 LEFT
R/R SPIKR SET IN BASE OF 28" FORKED
SYCAMORE 79' FROM EASTERLY EP OF 5TH
ST PL NE AND 140' FROM NORTH EP OF
29TH AV NE
.....
BM3-BL-3     ELEVATION = 1047.22'
N 744248      E 1312456
L STATION 19+93.81
N 73° 10' 16.72" E DIST 74.39'
.....

```

NOTES:

- 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:
B5150_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.

SURVEY CONTROL SHEET B-5150

PRELIMINARY

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	12+89.00	39.05	744090.3739	1311692.6067
L	13+20.00	-29.37	744162.6978	1311712.8947
L	14+05.00	40.00	744106.9862	1311807.4150
L	14+25.00	75.00	744075.4162	1311832.4817
L	14+40.00	-75.00	744225.9585	1311824.6074
L	15+38.00	80.00	744087.5756	1311944.9368
L	15+40.00	-75.00	744241.0929	1311923.4555
L	15+40.00	-40.00	744206.4960	1311928.7525
L	16+00.00	56.00	744120.6825	1312002.5904
L	16+52.00	45.00	744139.4256	1312052.3266
L	16+75.00	40.00	744147.8489	1312074.3050
L	16+95.00	29.80	744160.9608	1312092.5305
L	17+25.00	-40.00	744234.4946	1312111.6216
L	17+25.00	-30.61	744225.2145	1312113.0424

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	744085.7366	1311400.9516
PC	10+40.57	744091.4530	1311441.1126
PT	10+56.37	744093.7631	1311456.7512
PC	18+65.33	744216.1940	1312256.3929
PT	19+71.97	744226.0576	1312362.5077
POT	19+93.81	744226.7879	1312384.3339

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B5150-2"

WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
 NORTHING: 744153.404(±) EASTING: 1311730.023(±)
 ELEVATION: 1005.60(±)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99986932

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 S 78° 22' 48.3"W 335.95'

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
 VERTICAL DATUM USED IS NAVD 88

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:
 B5150_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.

NOTE: DRAWING NOT TO SCALE

6/2/99

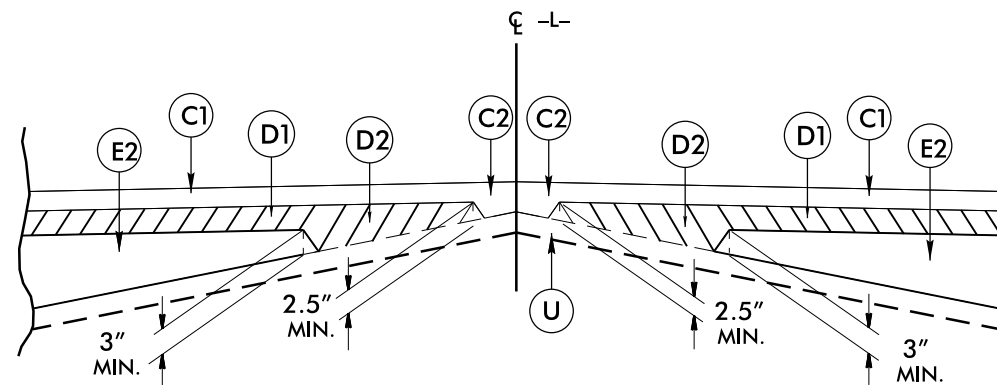
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6/2/99

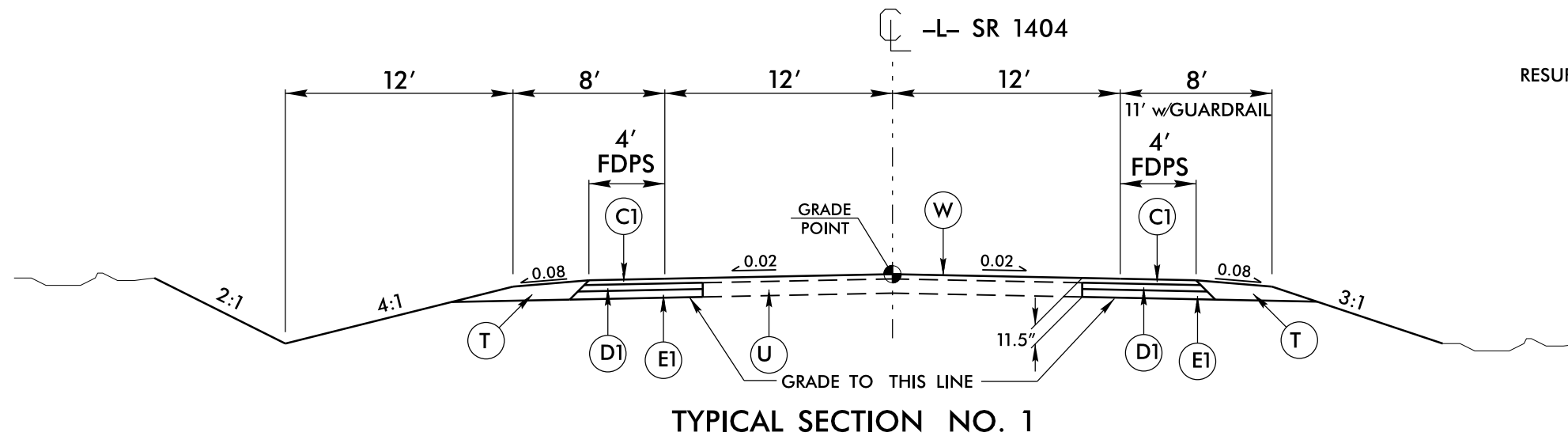
PROJECT REFERENCE NO. B-5150	SHEET NO. 2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

PAVEMENT SCHEDULE Final Design	
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
D1	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 5.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 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.
J1	PROP. 8" AGGREGATE BASE COURSE.
P1	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YD.
R1	2'-6" CONCRETE CURB & GUTTER.
U	EXISTING PAVEMENT.
T	EARTH MATERIAL.
W	WEDGING

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



Detail Showing Method of Wedging



RESURFACING FROM -L- STA 11+00.00 TO 12+00.00
AND FROM -L- STA 16+70.00 TO 18+50.00

USE TYPICAL SECTION NO. 1

-L- STA 13+00.00 TO 13+70.00

TRANSITION FROM EXISTING TO T.S. No. 1
-L- STA. 12+00.00 TO 13+00.00

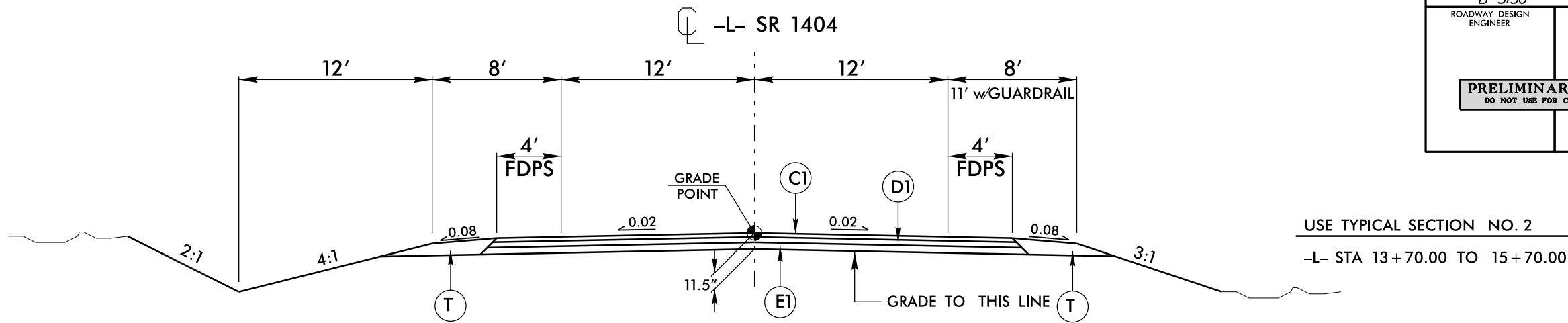
TRANSITION FROM T.S. No. 1 TO EXISTING
-L- STA. 15+70.00 TO 16+70.00

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B5150.RDY

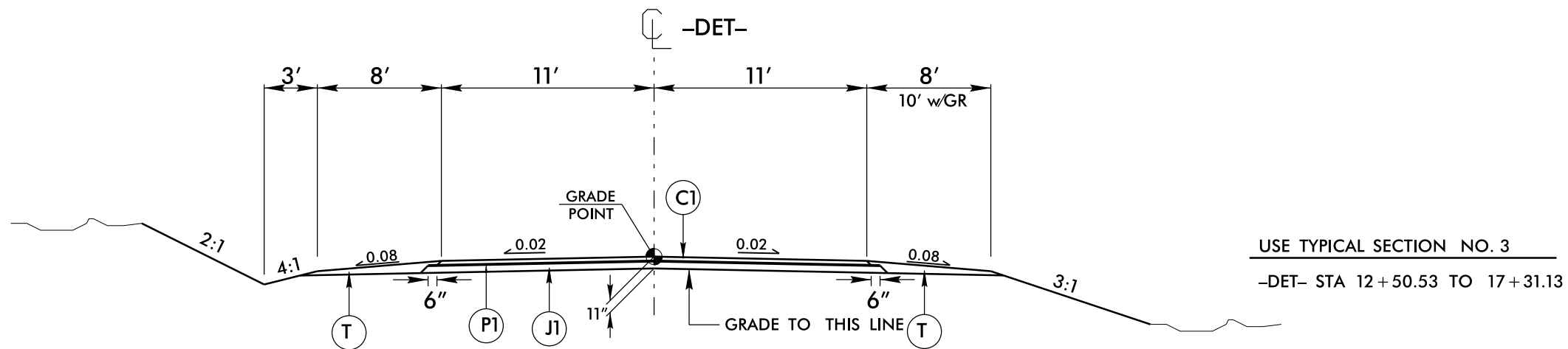
6/2/99

PAVEMENT SCHEDULE	
C1	3" S9.5B
D1	3" I19.0B
E1	5.5" B25.0B
J1	8" ABC
P1	.35 PRIME COAT
R1	CONC CURB & GUTTER.
T	EARTH MATERIAL.
U	EXISTING PVMT.

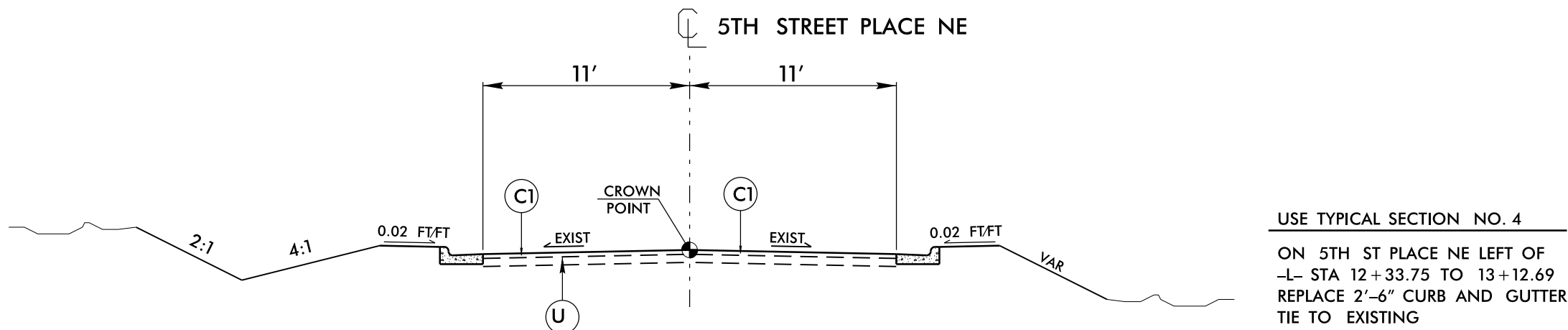
PROJECT REFERENCE NO. B-5150	SHEET NO. 2-A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



TYPICAL SECTION NO. 2



TYPICAL SECTION NO. 3

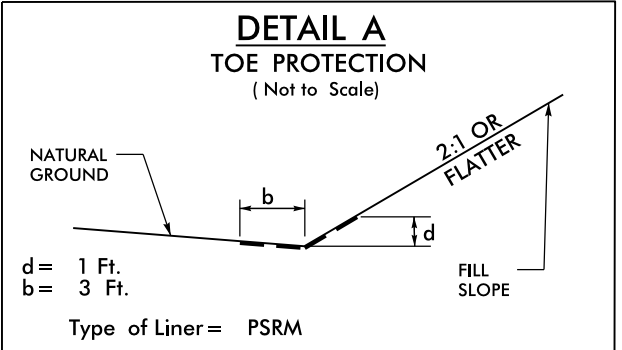


TYPICAL SECTION NO. 4

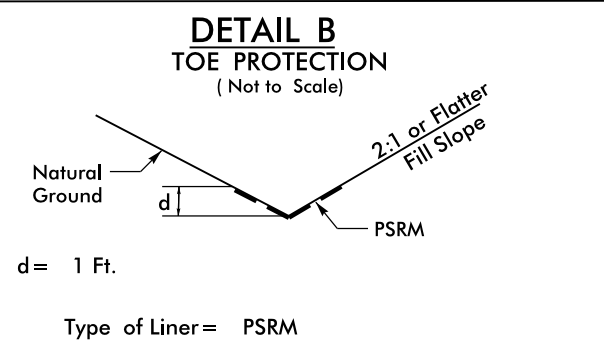
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SSS\SPR\RAM\FSS

PROJECT REFERENCE NO.	SHEET NO.
B-5150	2-B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

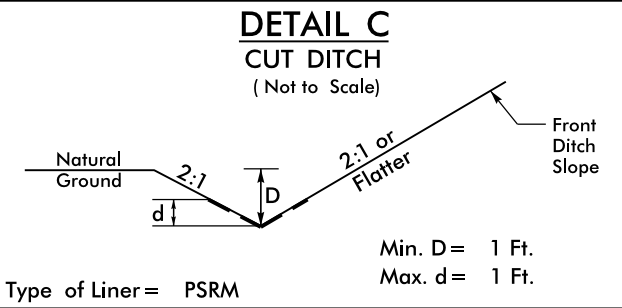
REVISIONS



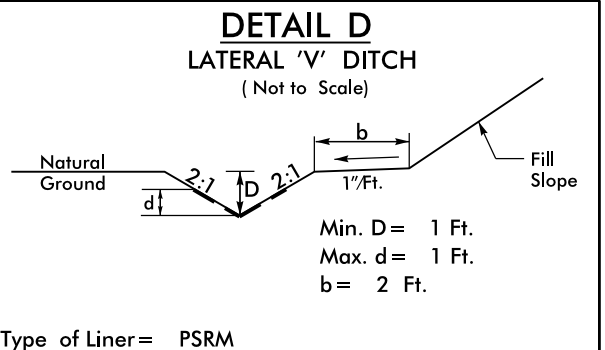
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FROM STA. 15+02 TO STA. 15+25 LT -L-
FROM STA. 13+25 TO STA. 14+25 LT -DET-
FROM STA. 13+25 TO STA. 14+00 RT -DET-



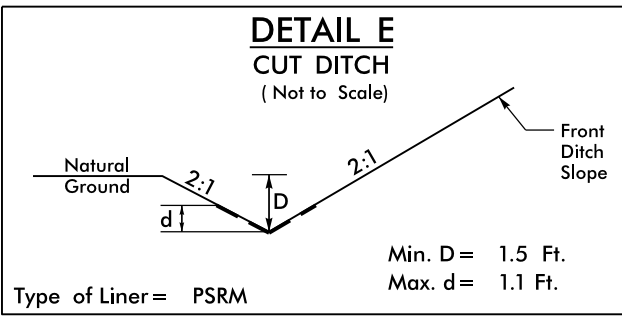
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FROM STA. 17+75 TO STA. 18+50 LT -DET-
FROM STA. 16+30 TO STA. 17+00 RT -DET-



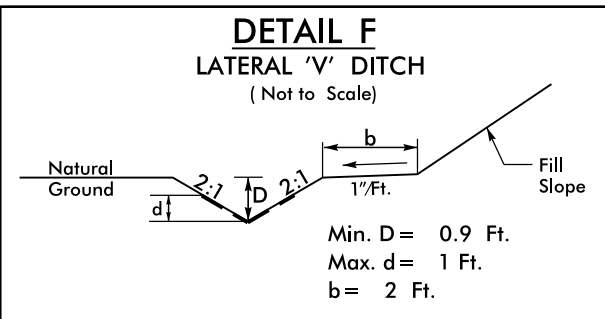
FROM STA. 14+00 TO STA. 14+50 RT -L-



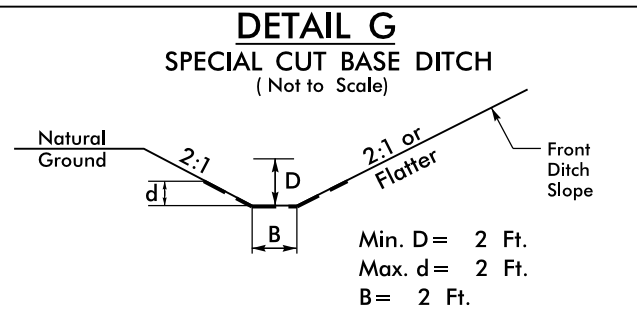
FROM STA. 14+90 TO STA. 17+00 RT -L-



FROM STA. 12+00 TO STA. 14+00 RT -L-



FROM STA. 15+10 TO STA. 16+50 LT -DET-



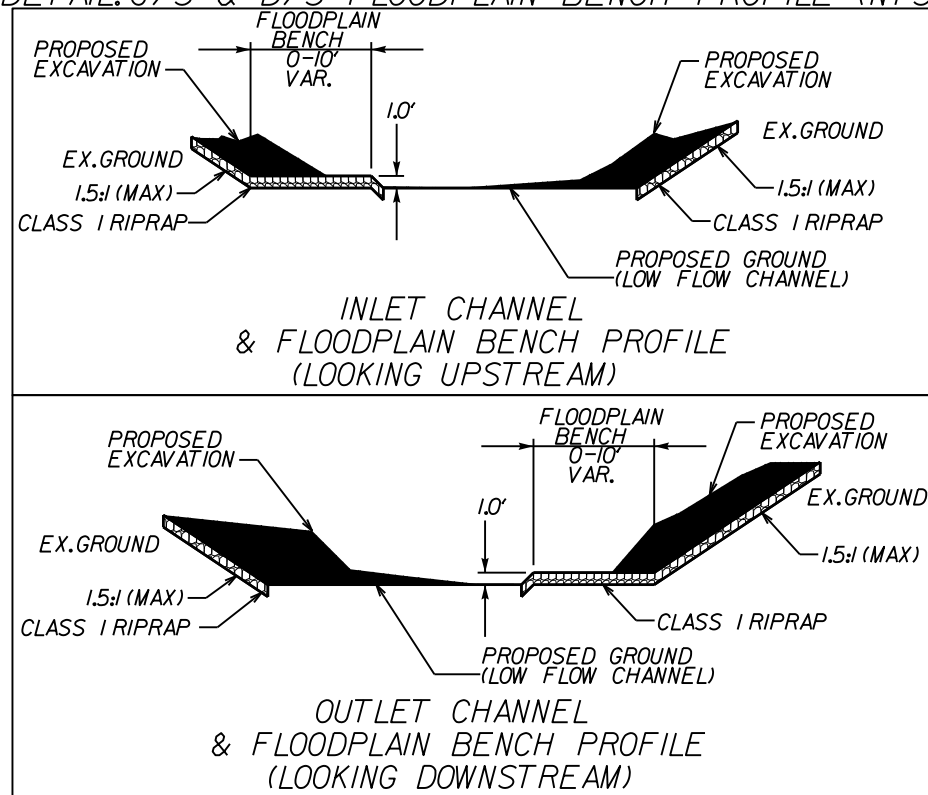
FROM STA. 11+31 TO STA. 12+10 LT -DET-

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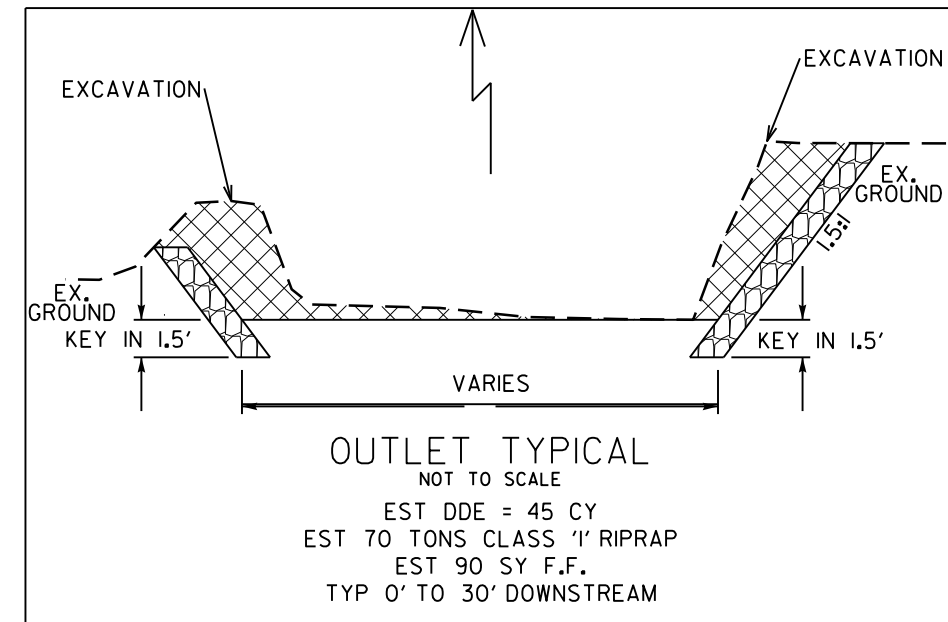
PROJECT REFERENCE NO.	SHEET NO.
B-5150	2-C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

**DETAIL H
CHANNEL IMPROVEMENTS**

DETAIL: U/S & D/S FLOODPLAIN BENCH PROFILE (NTS)



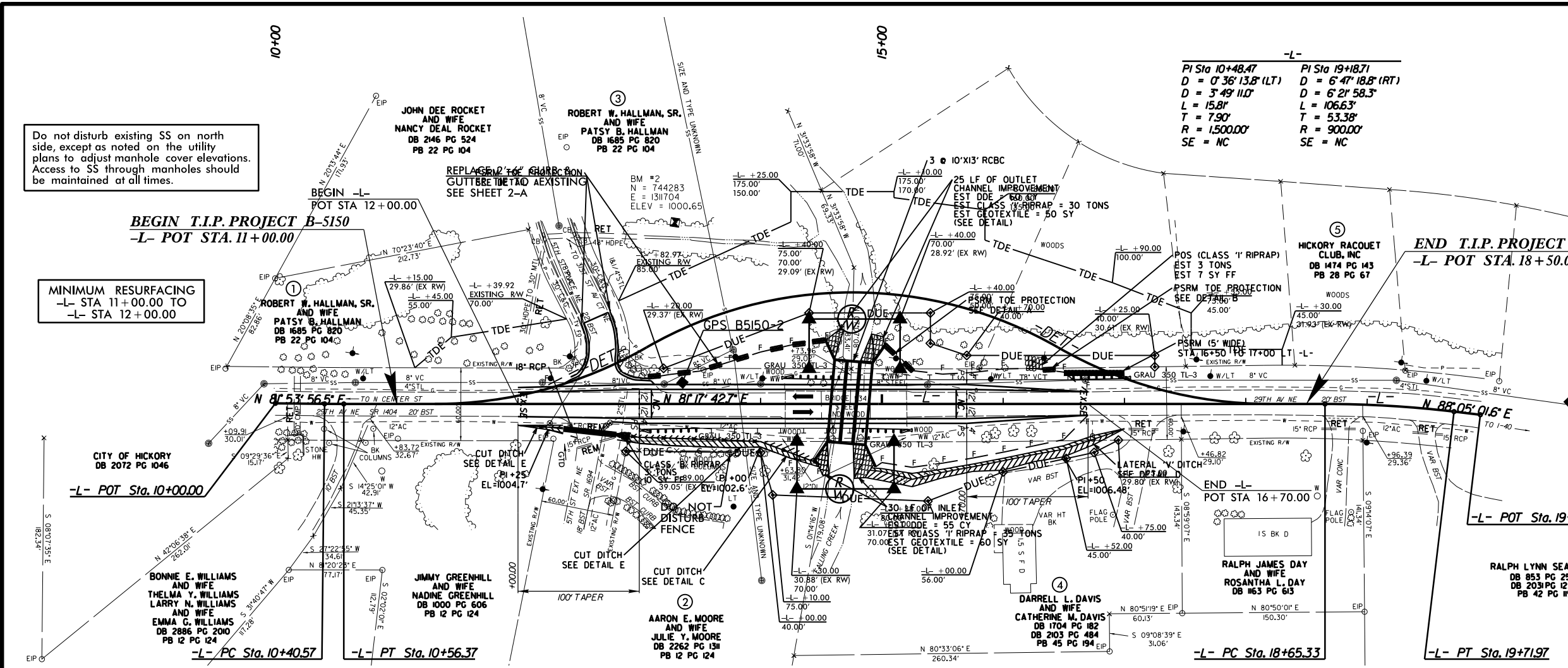
**DETAIL I
RIPRAP AT OUTLET OF
TEMPORARY DETOUR PIPES**



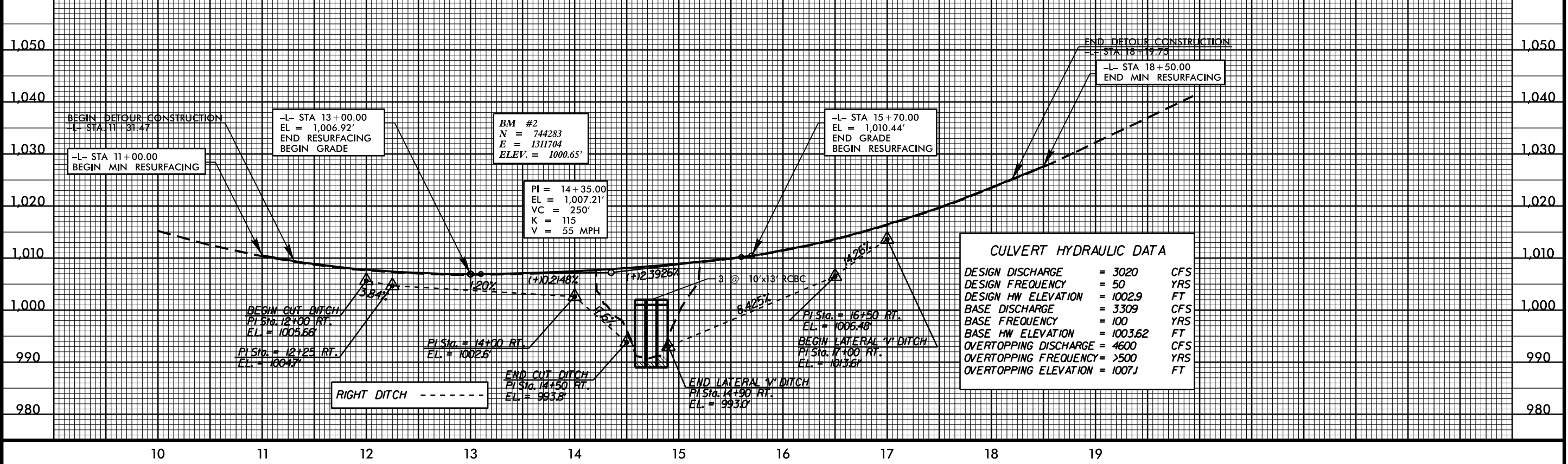
REVISIONS

8/17/99

06-MAY-2014 12:01 R:\D:\projects\B-5150-RDY-DITCH DETAILS.dgn



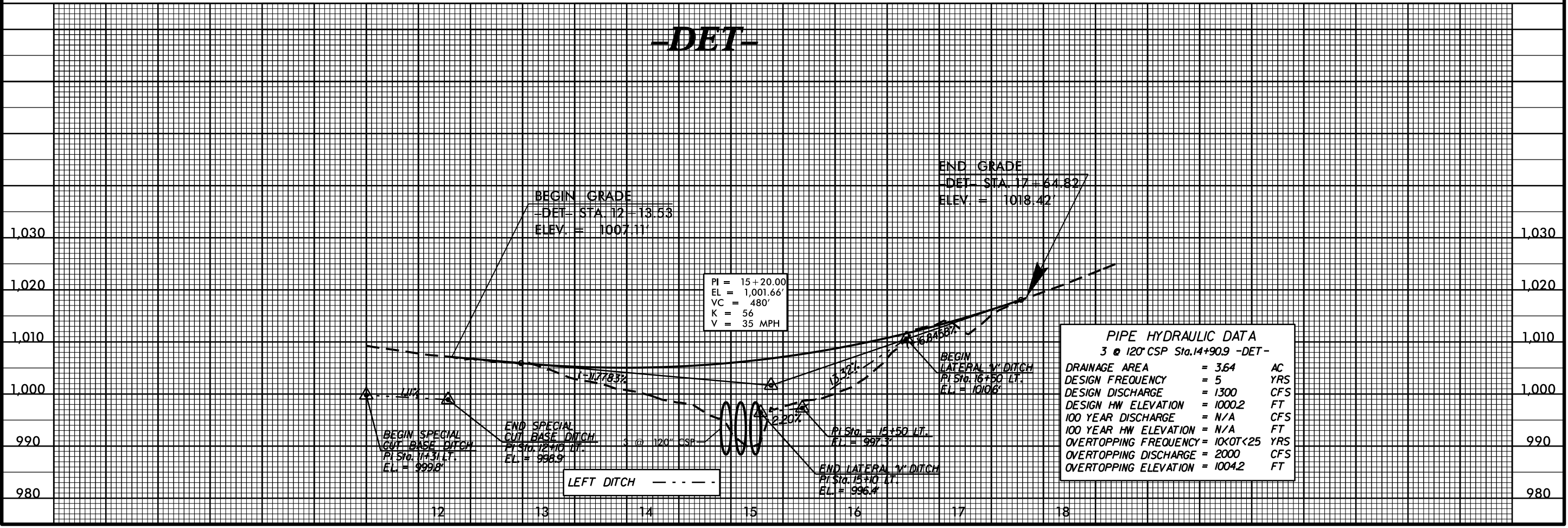
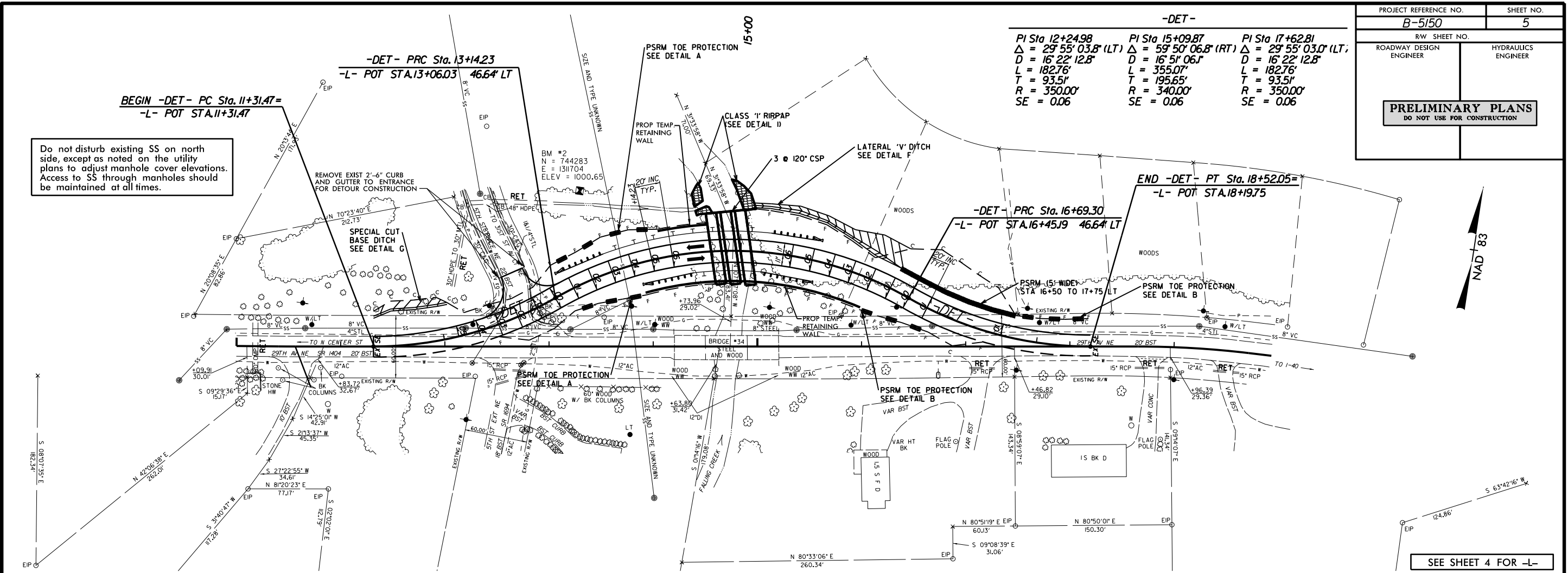
-L- SR 1404 (29th Ave. NE)



R/W REVISION: ADJUSTED PROPOSED PERMANENT DRAINAGE UTILITY EASEMENT FROM -L- STA. 14+00.00 TO 14+00.00 RT - SEC 4/11/14

06-MAY-2014 12:01 R:\Roadway\Projects\B5150_Rdy_psh_4.dgn

-DET-		
PI Sta 12+24.98 Δ = 29° 55' 03.8" (LT) D = 16' 22' 12.8" L = 182.76' T = 93.5' R = 350.00' SE = 0.06	PI Sta 15+09.87 Δ = 59° 50' 06.8" (RT) D = 16' 51' 06.1" L = 355.07' T = 195.65' R = 340.00' SE = 0.06	PI Sta 17+62.81 Δ = 29° 55' 03.0" (LT) D = 16' 22' 12.8" L = 182.76' T = 93.5' R = 350.00' SE = 0.06



REVISIONS

8/17/99

06-MAY-2014 12:02
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B5150.dwg