



PAT McCRORY
Governor

NICHOLAS J. TENNYSON
Secretary

November 6, 2015

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

ATTN: Mr. David Bailey
NCDOT Coordinator

Subject: **Application for Section 404 Nationwide Permits 13, 33, and Jordan Lake Buffer Authorization** for the Proposed Replacement of Bridge 161 on SR 2821 over South Buffalo Creek in Guilford County, Federal Aid Project No. BRZ-2821(1); Division 7; TIP No. B-5344; \$240.00 debit WBS No. 46058.1.1.

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes to replace bridge number 161 on SR 2821 (Harvest Road) over South Buffalo Creek in Guilford County with a 105', single span, 39" box beam structure on a new alignment to the south. The existing bridge will be utilized as an onsite detour during construction. There will be 17 lf of permanent impacts to surface waters from bank stabilization for the project. There will be <0.01 acre of temporary impacts to surface waters resulting from this action. This project will result in 8,456 square feet of allowable impacts to the Jordan Lake Buffer from roadway fill. No mitigation is required for the permanent surface water impacts, nor for the buffer impacts for this project.

Please see enclosed copies of the Pre-Construction Notification (PCN), Stormwater Management Plan, Permit Drawings, and Roadway Plansheets. A Categorical Exclusion (CE) was completed in June 2014 and distributed shortly thereafter. Additional copies are available upon request.

This project calls for a letting date of May 17, 2016 and a review date of March 29, 2016; 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 Jeff Hemphill at (919) 707-6126.

Sincerely,

A handwritten signature in black ink, appearing to read 'R. Hancock', written over a horizontal line.

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

cc:
NCDOT Permit Application Standard Distribution List

Nothing ComparesSM



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:	<input checked="" type="checkbox"/> Section 404 Permit	<input type="checkbox"/> Section 10 Permit
1b. Specify Nationwide Permit (NWP) number: 13,33 or General Permit (GP) number:		
1c. Has the NWP or GP number been verified by the Corps?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
1d. Type(s) of approval sought from the DWQ (check all that apply):		
<input type="checkbox"/> 401 Water Quality Certification – Regular <input type="checkbox"/> Non-404 Jurisdictional General Permit <input type="checkbox"/> 401 Water Quality Certification – Express <input checked="" 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 type="checkbox"/> Yes	<input checked="" 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 161 over South Buffalo Creek on SR 2821 (Harvest Road)
2b. County:	Guilford
2c. Nearest municipality / town:	McLeansville
2d. Subdivision name:	<i>not applicable</i>
2e. NCDOT only, T.I.P. or state project no:	B-5344

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:	<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: 36.11276 (DD.DDDDDD) Longitude: - 79.67154 (-DD.DDDDDD)
1c. Property size:	2.2 acres
2. Surface Waters	
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	South Buffalo Creek
2b. Water Quality Classification of nearest receiving water:	C;NSW
2c. River basin:	Cape Fear
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: Forest communities, agriculture, and minor residential development	
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: 245'	
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 3 span, 82-foot timber deck on I beams bridge with a 105-foot, single span 39" box beam structure on a new alignment to the south with the existing bridge utilized as an onsite detour. Standard road building equipment, such as trucks, dozers, and cranes will be used.	
4. Jurisdictional Determinations	
4a. Have jurisdictional wetland or stream determinations by the Corps or State been requested or obtained for this property / project (including all prior phases) in the past? Comments:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown
4b. If the Corps made the jurisdictional determination, what type of determination was made?	<input checked="" type="checkbox"/> Preliminary <input type="checkbox"/> Final
4c. If yes, who delineated the jurisdictional areas? Name (if known): Richard Darling	Agency/Consultant Company: Other: Baker Engineering
4d. If yes, list the dates of the Corps jurisdictional determinations or State determinations and attach documentation. Thomas Brown on April 10, 2012 verified the project but the PJD has not been received from the Corps	
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 type="checkbox"/> Streams - tributaries		<input checked="" 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 (Corps - 404, 10 DWQ – non-404, other)	2f. Area of impact (acres)	
Site 1 <input type="checkbox"/> P <input type="checkbox"/> T			<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			<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			<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			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ		
Site 1 <input type="checkbox"/> P <input type="checkbox"/> T Utility Impacts			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ		
2g. Total wetland impacts						
2h. Comments:						
3. Stream Impacts						
If there are perennial or intermittent stream impacts (including temporary impacts) proposed on the site, then complete this question for all stream sites impacted.						
3a. Stream impact number - Permanent (P) or Temporary (T)	3b. Type of impact	3c. Stream name	3d. Perennial (PER) or intermittent (INT)?	3e. Type of jurisdiction (Corps - 404, 10 DWQ – non-404, other)	3f. Average stream width (feet)	3g. Impact length (linear feet)
Site 1 <input checked="" type="checkbox"/> P <input type="checkbox"/> T	Bank Stabilization	South Buffalo Creek	<input checked="" type="checkbox"/> PER <input type="checkbox"/> INT	<input checked="" type="checkbox"/> Corps <input type="checkbox"/> DWQ		7
Site 1 <input type="checkbox"/> P <input checked="" type="checkbox"/> T	Bank Stabilization	South Buffalo Creek	<input checked="" type="checkbox"/> PER <input type="checkbox"/> INT	<input checked="" type="checkbox"/> Corps <input type="checkbox"/> DWQ		17
Site 2 <input checked="" type="checkbox"/> P <input type="checkbox"/> T	Bank Stabilization	South Buffalo Creek	<input checked="" type="checkbox"/> PER <input type="checkbox"/> INT	<input checked="" type="checkbox"/> Corps <input type="checkbox"/> DWQ		10
Site 2 <input type="checkbox"/> P <input checked="" type="checkbox"/> T	Bank Stabilization	South Buffalo Creek	<input checked="" type="checkbox"/> PER <input type="checkbox"/> INT	<input checked="" type="checkbox"/> Corps <input type="checkbox"/> DWQ		20
Site 4 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> PER <input type="checkbox"/> INT	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ		
Site 5 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> PER <input type="checkbox"/> INT	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ		
3h. Total stream and tributary impacts						17 Perm 37 Temp
3i. Comments:						

4. Open Water Impacts

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

4a. Open water impact number – Permanent (P) or Temporary (T)	4b. Name of waterbody (if applicable)	4c. Type of impact	4d. Waterbody type	4e. Area of impact (acres)
O1 <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:

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?	<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"/> Catawba	<input type="checkbox"/> Tar-Pamlico <input type="checkbox"/> Randleman	<input checked="" type="checkbox"/> 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 <input checked="" type="checkbox"/> P <input type="checkbox"/> T	Bridge/Roadway Embankment	South Buffalo Creek	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	4,670	3,786
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				4,670	3,786
6i. Comments: Jordan Lake Buffer Rules					

D. Impact Justification and Mitigation		
1. Avoidance and Minimization		
1a. Specifically describe measures taken to avoid or minimize the proposed impacts in designing project. See Stormwater Management Plan. PSRM used in ditches instead of riprap when possible to provide treatment to the "maximum extent practicable", elimination of direct discharge, removal of interior bents and vegetative treatment of shoulder section discharges. Proposed ditches through buffers are replacing existing ditches. Grasses swales were not used because the longitudinal slope of the proposed ditches is too steep for any kind of treatment. The existing bridge will be utilized as an onsite detour.		
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?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
	<input type="checkbox"/> DWQ <input type="checkbox"/> Corps	
2c. If yes, which mitigation option will be used for this project?	<input type="checkbox"/> Mitigation bank <input 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 type="checkbox"/> Yes	
4b. Stream mitigation requested:	0 linear feet	
4c. If using stream mitigation, stream temperature:	<input 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:		
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?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1b. If yes, then is a diffuse flow plan included? If no, explain why. Comments:	<input checked="" 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.	
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): NA	<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 NA <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 NA
5. DWQ 401 Unit Stormwater Review	
5a. Does the Stormwater Management Plan meet the appropriate requirements?	<input type="checkbox"/> Yes <input type="checkbox"/> No NA
5b. Have all of the 401 Unit submittal requirements been met?	<input type="checkbox"/> Yes <input type="checkbox"/> No NA

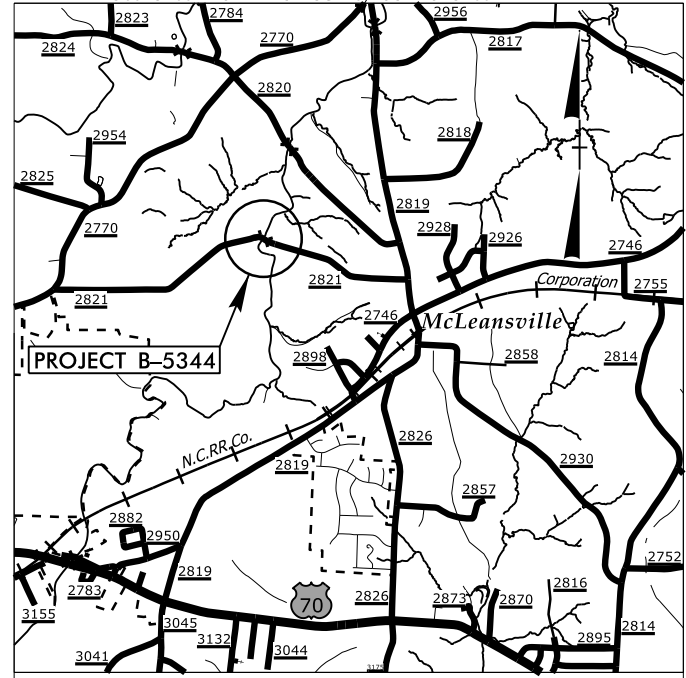
F. Supplementary Information	
1. Environmental Documentation (DWQ Requirement)	
1a. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1b. If you answered "yes" to 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 type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
5b. Have you checked with the USFWS concerning Endangered Species Act impacts?	<input type="checkbox"/> Yes	<input checked="" 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? N.C. Natural Heritage Program database; USFWS-website; biological surveys for protected species listed for Guilford County, which includes small whorled pogonia and bald eagle. Suitable habitat for small whorled pogonia is not present in the study area. The Mesic Mixed Hardwood Forest does not appear to include suitable persistent breaks. A review of North Carolina Natural Heritage Program (NCNHP) records on October 7, 2015, indicated no known occurrences within 1.0 mile of the study area. Habitat for the bald eagle (<i>Haliaeetus leucocephalus</i>) primarily consists of mature forest in proximity to large bodies of open water for foraging. Large, dominant trees are utilized for nesting sites, typically within 1.0 mile of open water. Suitable habitat for bald eagle does not exist within the study area and to a distance of 660 feet on all sides. Therefore, no surveys were conducted.		
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 checked="" type="checkbox"/> Yes	<input 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.)	11-06-2015 Date

		North Carolina Department of Transportation Highway Stormwater Program STORMWATER MANAGEMENT PLAN FOR NCDOT PROJECTS						
(Version 2.02; Released April 2015)								
WBS Element: 46058.1.1		TIP No.: B-5344	County(ies): Guilford		Page 1 of 1			
General Project Information								
WBS Element:	46058.1.1	TIP Number:	B-5344	Project Type:	Bridge Replacement	Date:	6/22/2015	
NCDOT Contact:	Charles Smith, PE		Contractor / Designer:	Michael Kelly				
	Address:	1020 Birch Ridge Dr. Raleigh, NC 27610		Address:	1020 Birch Ridge Dr. Raleigh, NC 27610			
	Phone:	919.707.6716		Phone:	919.707.6731			
	Email:	crsmith5@ncdot.gov		Email:	mkelly@ncdot.gov			
City/Town:				County(ies):	Guilford			
River Basin(s):	Cape Fear		CAMA County?	No				
Wetlands within Project Limits?	No							
Project Description								
Project Length (lin. miles or feet):	0.156mi	Surrounding Land Use:	Woods					
	Proposed Project			Existing Site				
Project Built-Upon Area (ac.)	0.4	ac.	0.4	ac.				
Typical Cross Section Description:	Two 10' travel lanes with 6.0' paved shoulders, shoulder berm gutter, 3' to 9' grassed shoulders and grassed side slopes.			Two 10' travel lanes with 4' grassed shoulders and side slopes.				
Annual Avg Daily Traffic (veh/hr/day):	Design/Future:	600	Year:	2040	Existing:	430	Year:	2016
General Project Narrative: (Description of Minimization of Water Quality Impacts)	<p>B-5344 is a Transportation Improvement Project to replace Bridge #0161 in Guilford County crossing South Buffalo Creek. The existing bridge is a three span timber deck on I-beams w/two rubble masonry/mass concrete interior bents and abutments. The new bridge will be a 105' single span 39"box beam structure. Minimization and avoidance measures incorporated into the design include PSRM used in ditches instead of riprap when possible to provide treatment to the "maximum extent practicable", elimination of direct discharge, removal of interior bents and vegetative treatment of shoulder section discharges. Proposed ditches through buffers are replacing existing ditches. Grasses swales were not used because the longitudinal slope of the proposed ditches is too steep for any kind of treatment.</p> <p>*NOTE: Buffer Restoration with the removal of the existing structure in Zone 1 is 803.1s.f., Zone 2 is 1104.2s.f.(total 0.04ac.)</p>							
Waterbody Information								
Surface Water Body (1):	South Buffalo Creek		NCDWR Stream Index No.:	16-11-14-2c				
NCDWR Surface Water Classification for Water Body	Primary Classification:	Water Supply V (WS-V)						
	Supplemental Classification:	Nutrient Sensitive Waters (NSW)						
Other Stream Classification:								
Impairments:	mercury (Hg)	copper (Cu)	zinc (Zn)					
Aquatic T&E Species?	No	Comments:						
NRTR Stream ID:				Buffer Rules in Effect:	Jordan Lake			
Project Includes Bridge Spanning Water Body?	Yes	Deck Drains Discharge Over Buffer?	No	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)							

09/08/99

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



VICINITY MAP

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

GUILFORD COUNTY

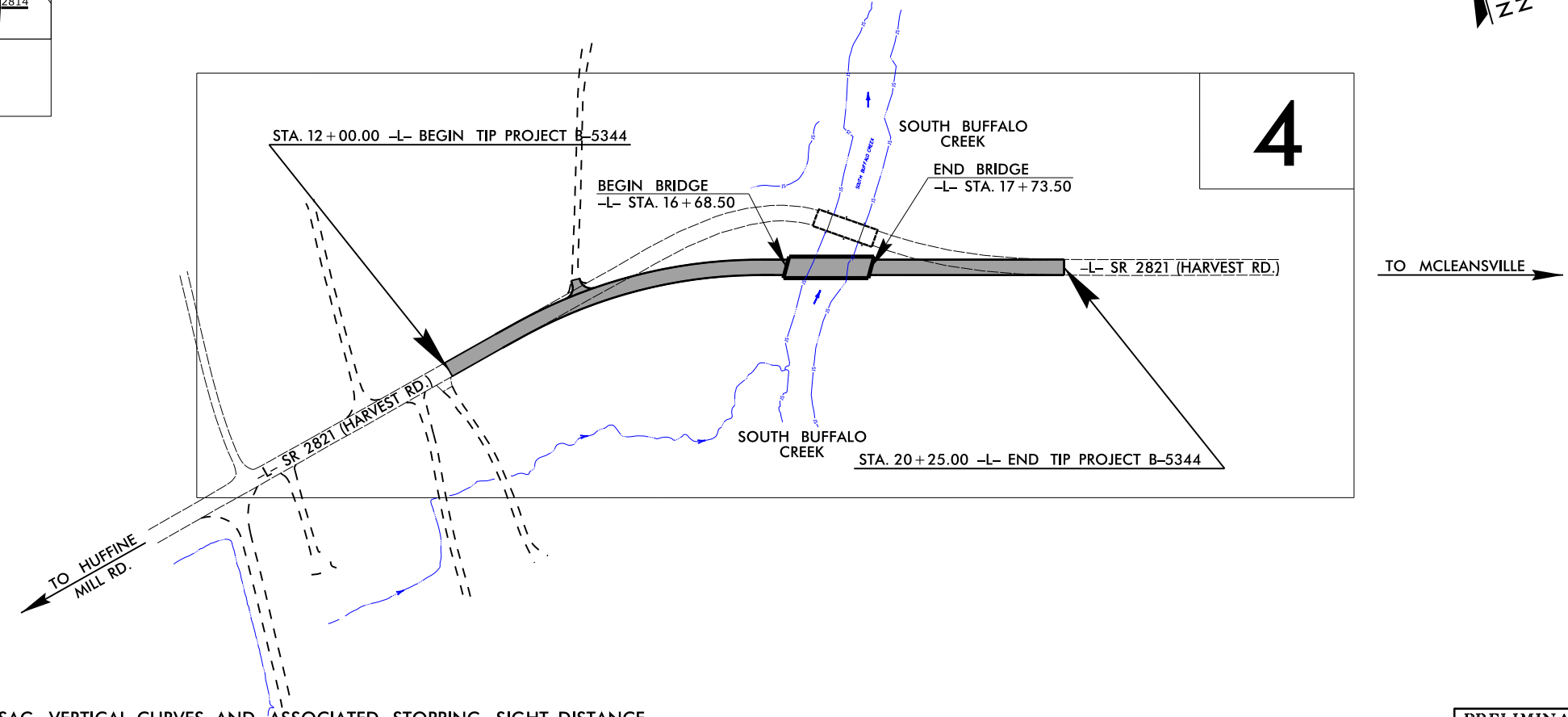
LOCATION: BRIDGE NO. 161 OVER SOUTH BUFFALO CREEK
 ON SR 2821 (HARVEST ROAD)

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5344	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
46058.1.1	BRZ-2821(1)	PE	
46058.2.1	BRZ-2821(1)	R/W & UTILITIES	
46058.3.1	BRZ-2821(1)	CONST.	

PERMIT DRAWING
 SHEET 1 OF 6

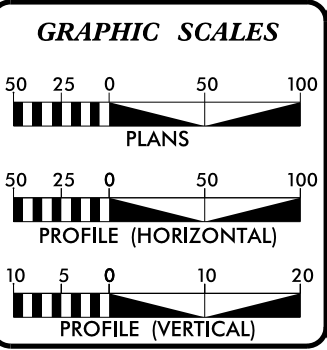
WETLAND AND SURFACE WATER IMPACTS PERMIT



4

DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED, SAG VERTICAL CURVES, AND ASSOCIATED STOPPING SIGHT DISTANCE.
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 CLEARING ON THIS PROJECT SHALL BE PREPARED TO THE LIMITS ESTABLISHED BY METHOD II.

PRELIMINARY PLANS
 DO NOT USE FOR CONSTRUCTION



DESIGN DATA

ADT 2016 =	430
ADT 2040 =	600
K =	12 %
D =	55 %
T =	7 % *
V =	40 MPH
* TTST 1% DUAL 6%	
FUNC CLASS = LOCAL SUBREGIONAL TIER	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-5344	= 0.136 MILES
LENGTH STRUCTURE TIP PROJECT B-5344	= 0.020 MILES
TOTAL LENGTH OF TIP PROJECT B-5344	= 0.156 MILES

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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MAY 28, 2015

LETTING DATE: MAY 17, 2016

JAMES A. SPEER, PE
 PROJECT ENGINEER

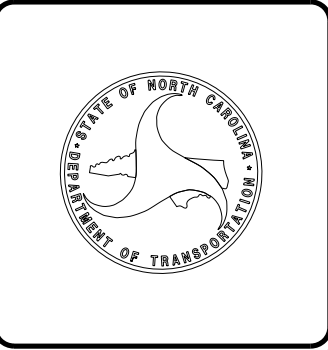
DANIEL W. GARDNER, JR., PE
 PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.



7/8/2015
 mkelley
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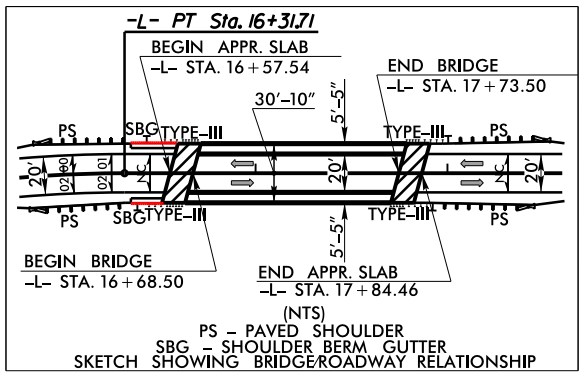
TIP PROJECT: B-5344

CONTRACT: C203728

8/17/99

PROJECT REFERENCE NO. B-5344	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

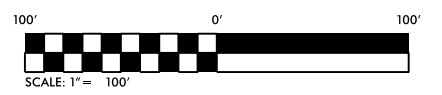
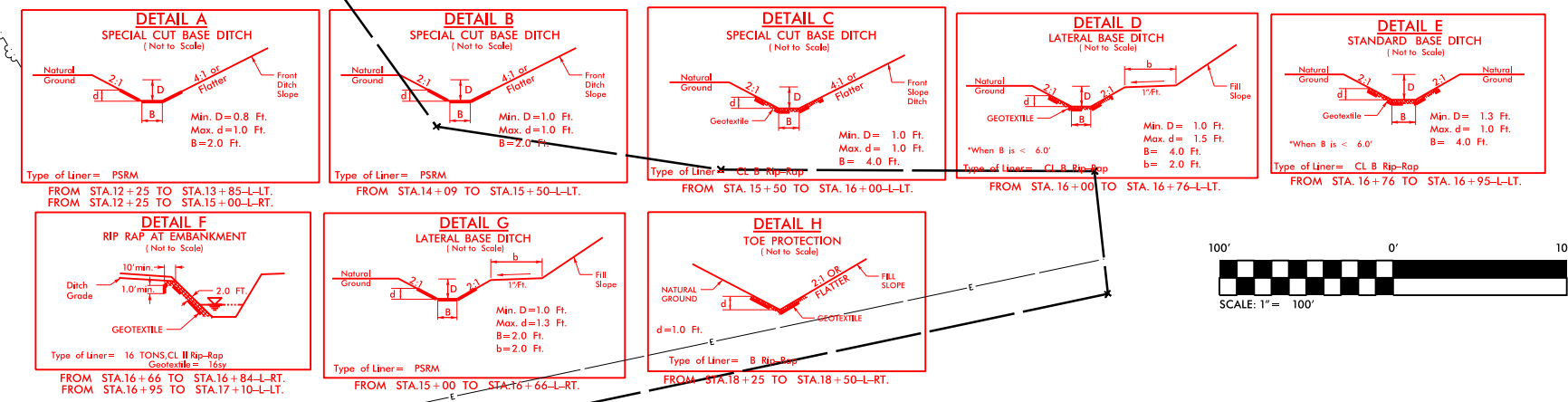
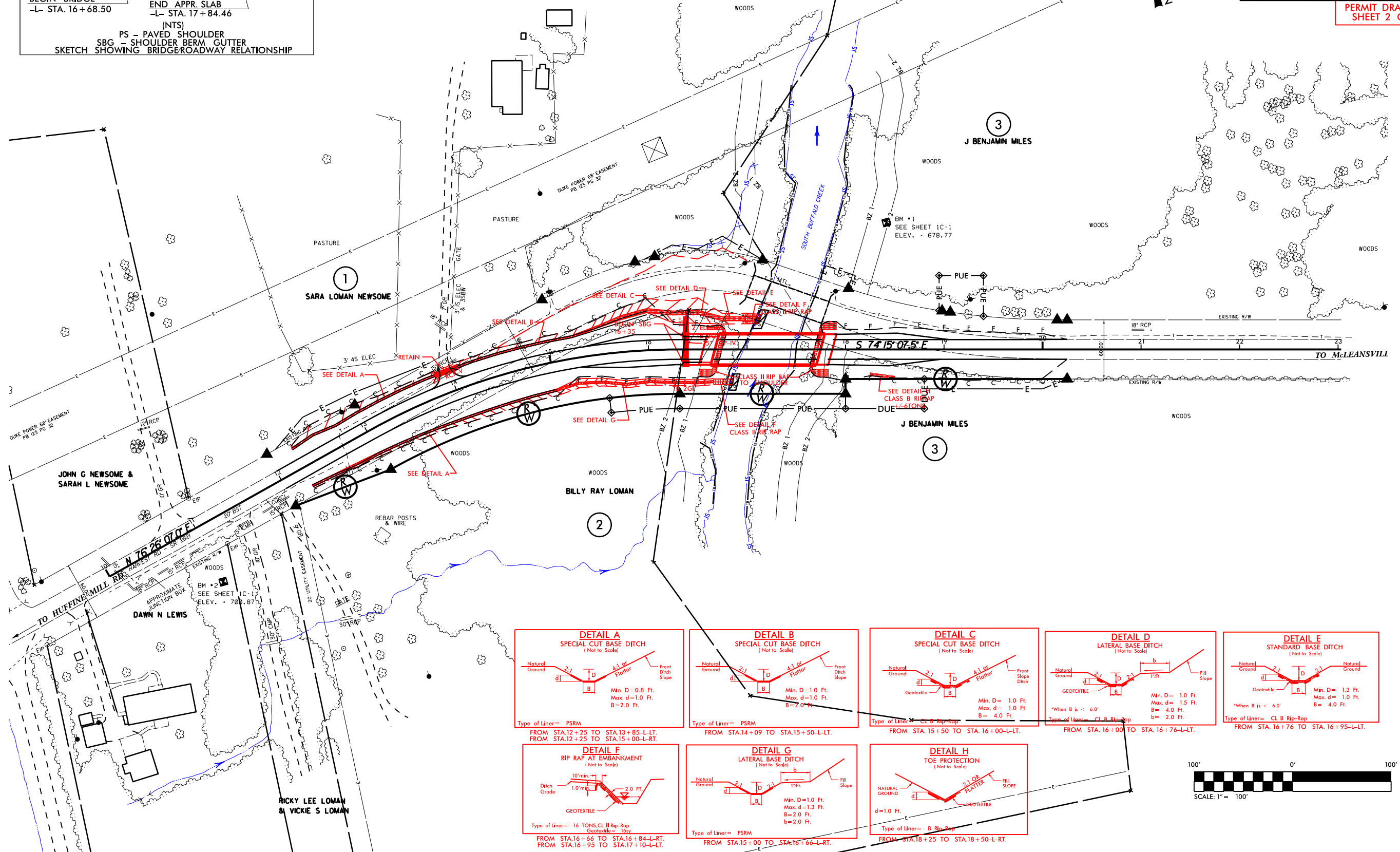
PERMIT DRAWING
SHEET 2 OF 6



DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER

NAD 83 N 83° 15' 07.5" E 2007



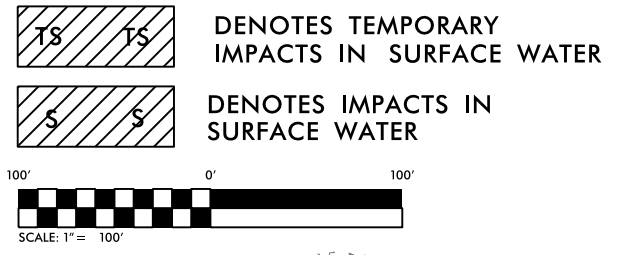
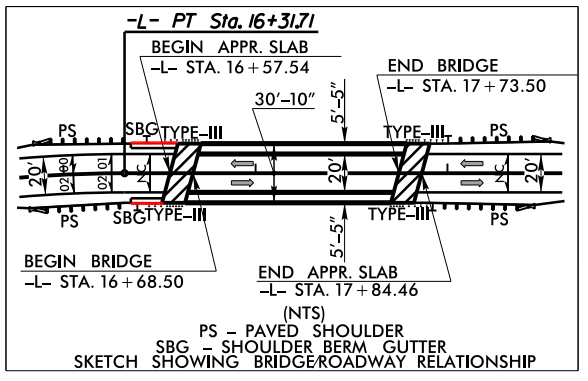
SEE SHEET 5 FOR -L- PROFILE
SEE SHEETS S-1 THRU S-2 FOR STRUCTURE PLANS

REVISIONS
7/8/2015 mckelly R:\Hydraulics\PERMITS_Environmental\Drawings\Wellford\B5344_Hyd_perm_wat_per04.dgn

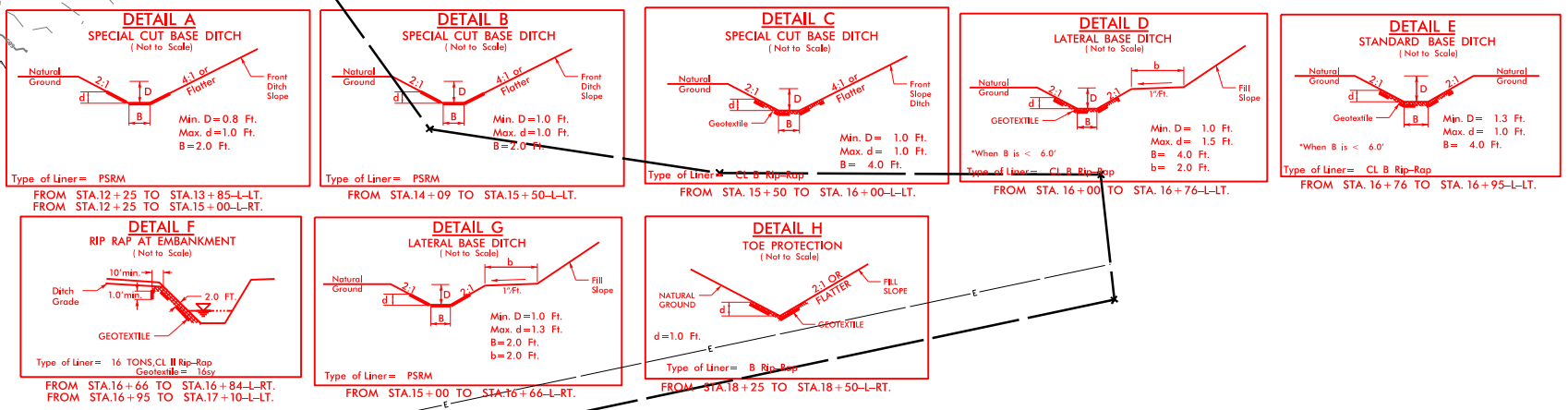
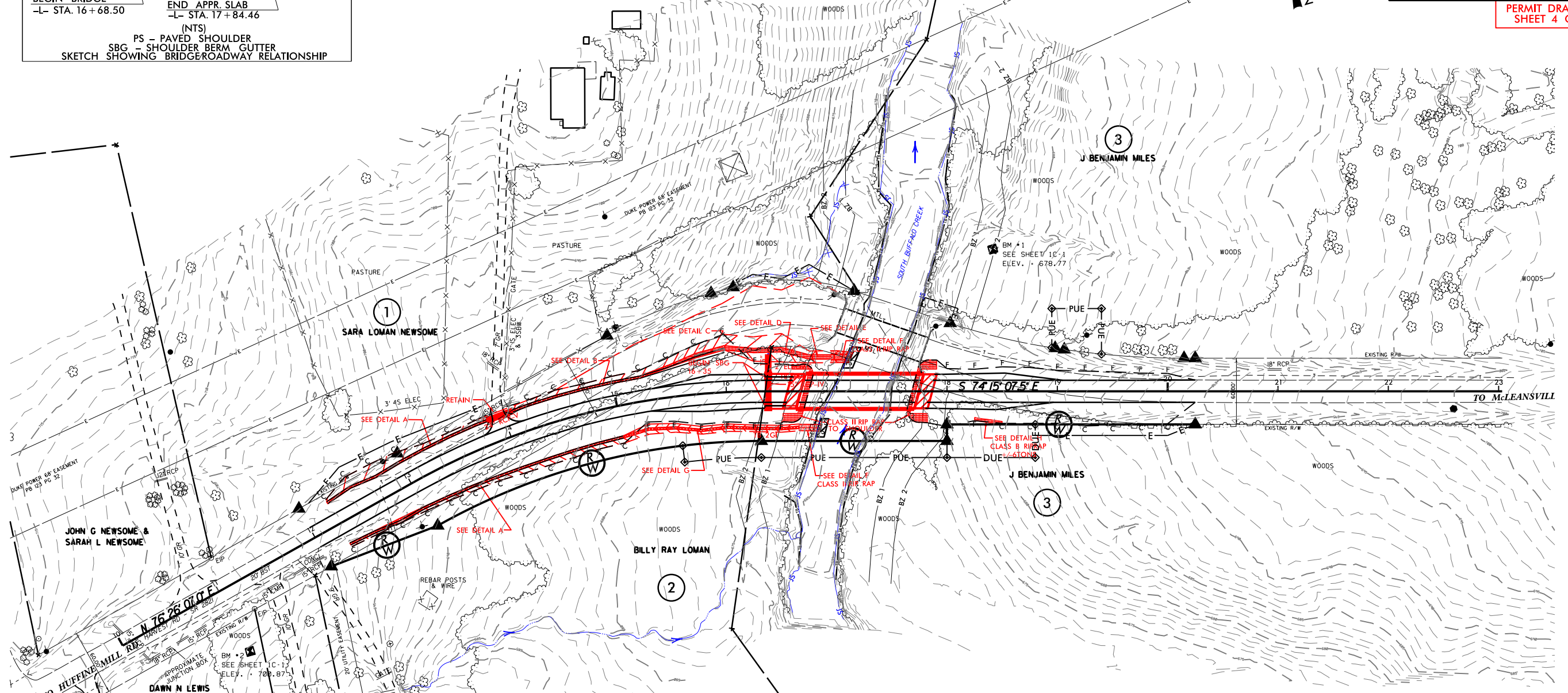
8/17/99

PROJECT REFERENCE NO. B-5344	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

PERMIT DRAWING
SHEET 4 OF 6



NAD 83 NSRS 2007



SEE SHEET 5 FOR -L- PROFILE
SEE SHEETS S-1 THRU S-2 FOR STRUCTURE PLANS

REVISIONS
7/8/2015 mckelly
8/1/2015 Hydraulic PERMITS Environmental Drawings Wellford.B5344_Hydr_perm_wat_per01.dwg

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)
SITE 1	16+84-L- RT.	BANK STABILIZATION						< 0.01	< 0.01	7	17	
SITE 2	17+11-L- LT.	BANK STABILIZATION						< 0.01	< 0.01	10	20	
TOTALS*:								< 0.01	< 0.01	17	37	0

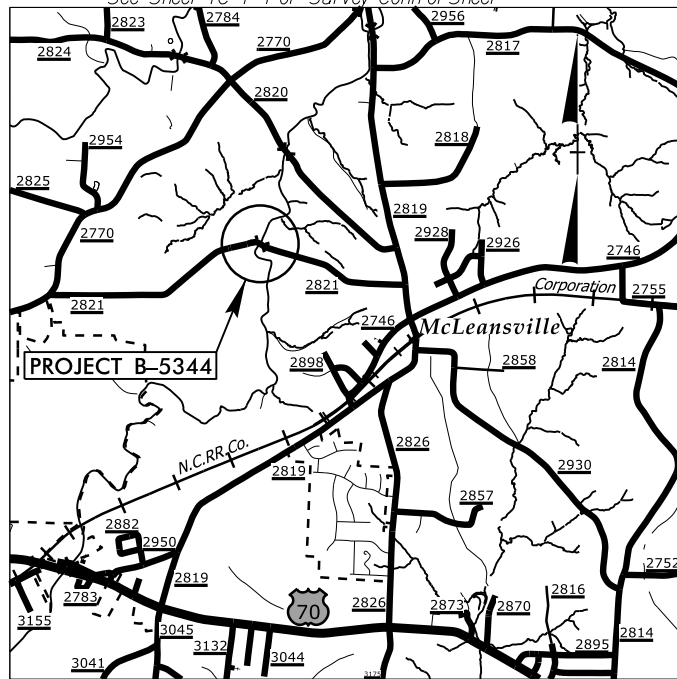
*Rounded totals are sum of actual impacts

NOTES:
 Temporary surface water impacts for bent removal station 17+23-L-LT. 0.0035ac/ 33', station 17+60-L-LT. 0.0038ac / 33'

NC DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 06/24/15
 Guilford County
 B-5344
 46058.1.1
 SHEET 6 OF 6

09/08/99

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

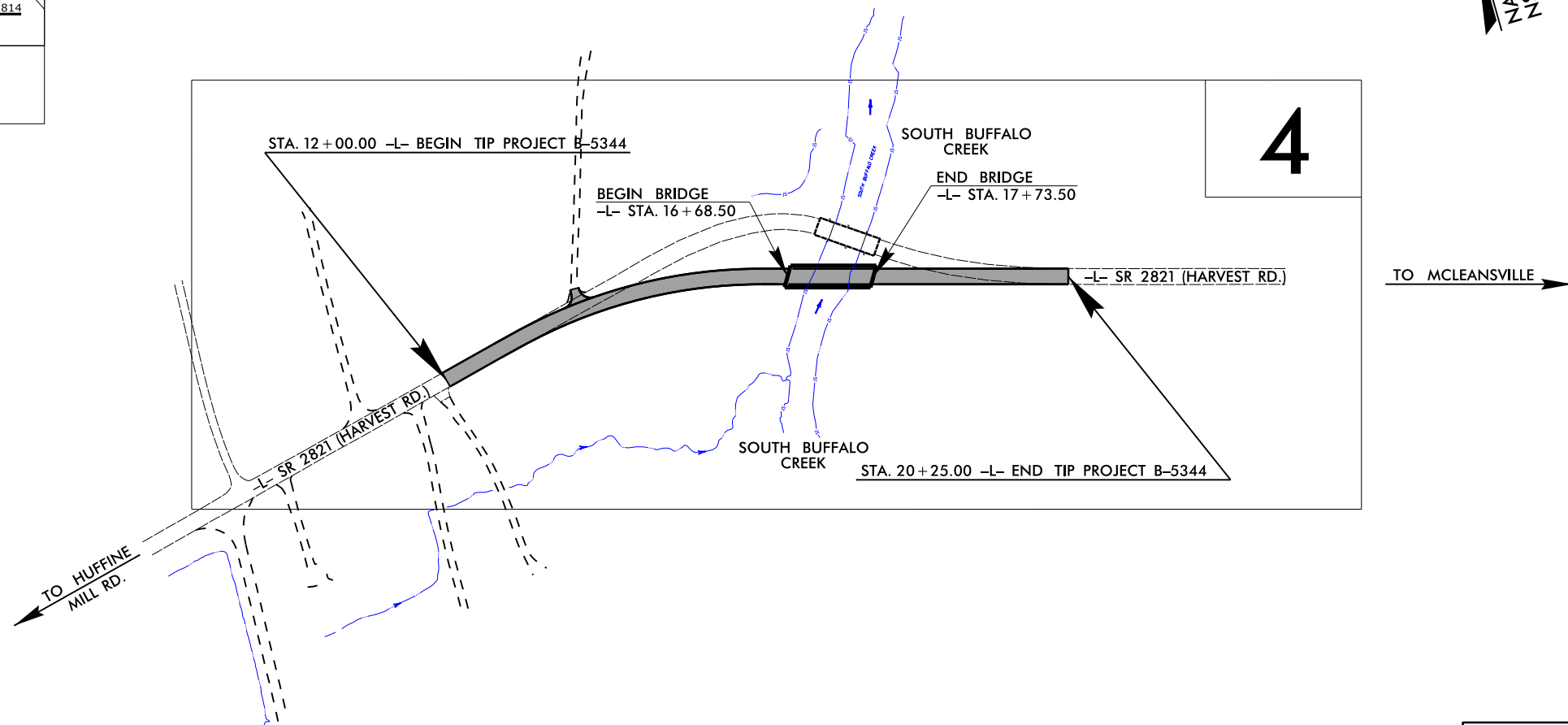
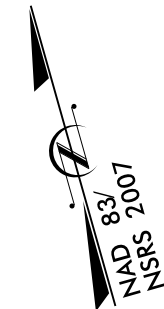
LOCATION: BRIDGE NO. 161 OVER SOUTH BUFFALO CREEK
ON SR 2821 (HARVEST ROAD)

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

BUFFER IMPACTS PERMIT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5344	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
46058.1.1	BRZ-2821(1)	PE	
46058.2.1	BRZ-2821(1)	RW & UTILITIES	
46058.3.1	BRZ-2821(1)	CONST.	

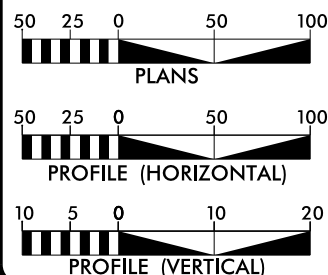
BUFFER DRAWING
SHEET 1 OF 4



DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED, SAG VERTICAL CURVES, AND ASSOCIATED STOPPING SIGHT DISTANCE.
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PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES



DESIGN DATA

ADT 2016 = 430
ADT 2040 = 600
K = 12 %
D = 55 %
T = 7 % *
V = 40 MPH
* TTST 1% DUAL 6%
FUNC CLASS = LOCAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-5344 = 0.136 MILES
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TOTAL LENGTH OF TIP PROJECT B-5344 = 0.156 MILES

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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MAY 28, 2015

LETTING DATE:
MAY 17, 2016

JAMES A. SPEER, PE
PROJECT ENGINEER

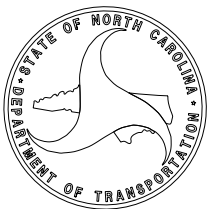
DANIEL W. GARDNER, JR., PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN
ENGINEER

SIGNATURE: _____ P.E.



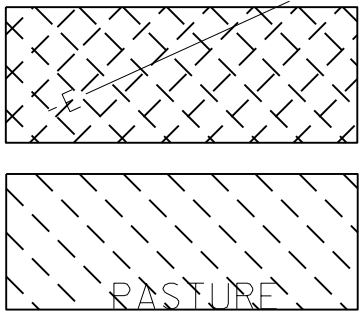
7/8/2015
mkelly
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TIP PROJECT: B-5344

CONTRACT: C203728

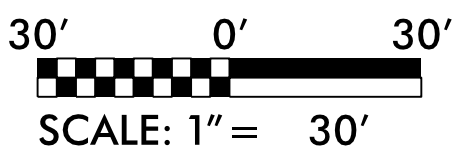
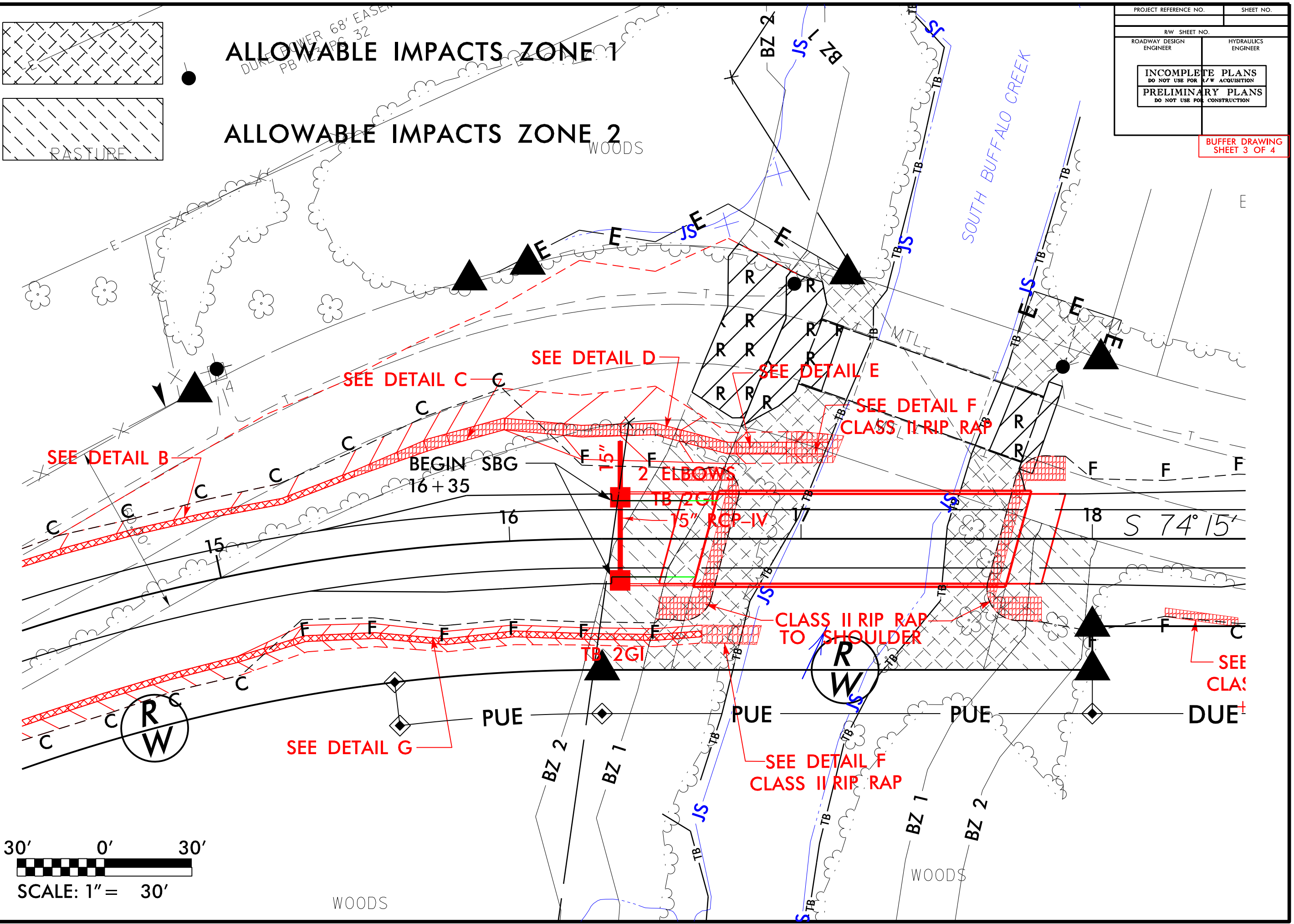
PROJECT REFERENCE NO.	SHEET NO.
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

BUFFER DRAWING
SHEET 3 OF 4



ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

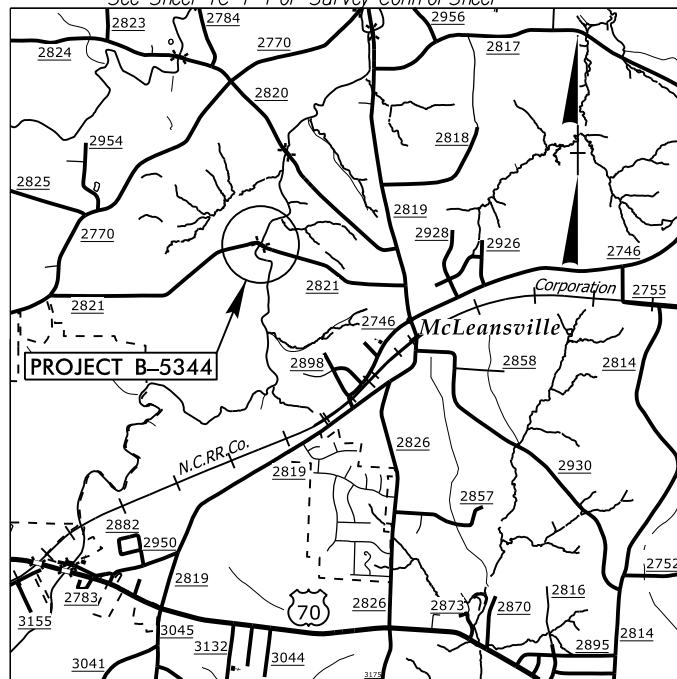


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 mkelly
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 REVISIONS

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 \$\$\$\$\$\$DESIGN\$\$\$\$\$\$
 \$\$\$\$\$\$DATE\$\$\$\$\$\$

09/08/99

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Plan Sheet Symbols
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VICINITY MAP

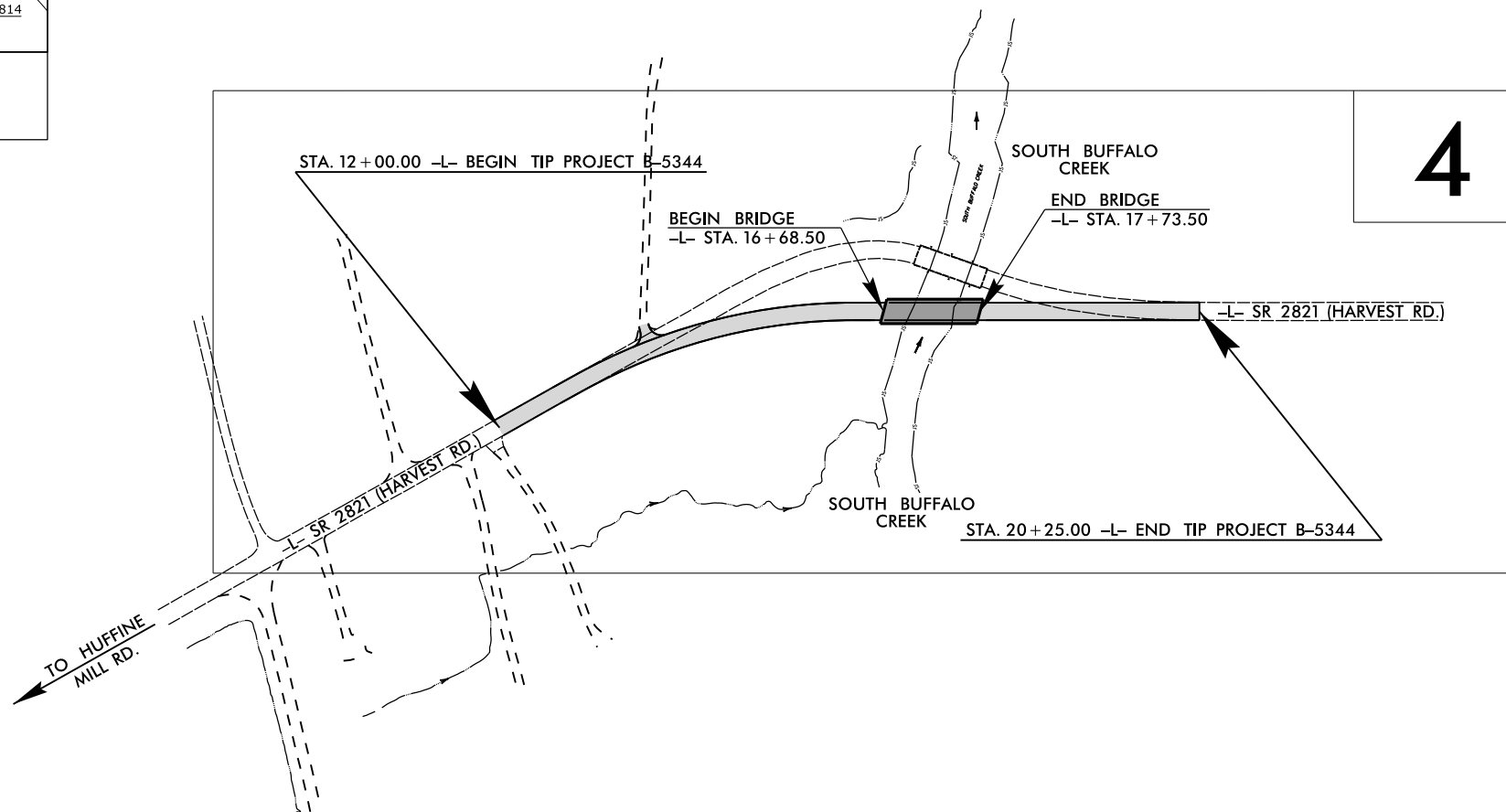
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

LOCATION: BRIDGE NO. 161 OVER SOUTH BUFFALO CREEK
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TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE

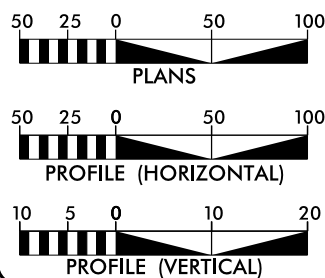
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5344	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
46058.1.1	BRZ-2821(1)	PE	
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GRAPHIC SCALES



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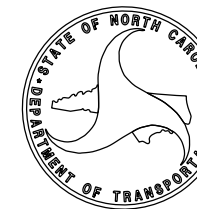
DANIEL W. GARDNER, JR., PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN
ENGINEER

SIGNATURE: _____ P.E.



24-JUN-2015 14:39
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\$\$\$\$\$USERNAME\$\$\$\$\$

TIP PROJECT: B-5344

CONTRACT: C203728

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	□ EDM
Parcel/Sequence Number	②③
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	----- WLB
Proposed Wetland Boundary	----- WLB
Existing Endangered Animal Boundary	----- EAB
Existing Endangered Plant Boundary	----- EPB
Existing Historic Property Boundary	----- HPB
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	○
Well	○
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 RW Marker	○
Proposed Control of Access Line with Concrete CA Marker	○
Existing Control of Access	○
Proposed Control of Access	○
Existing Easement Line	----- E
Proposed Temporary Construction Easement	----- E
Proposed Temporary Drainage Easement	----- TDE
Proposed Permanent Drainage Easement	----- PDE
Proposed Permanent Drainage / Utility Easement	----- DUE
Proposed Permanent Utility Easement	----- PUE
Proposed Temporary Utility Easement	----- TUE
Proposed Aerial Utility Easement	----- AUE
Proposed Permanent Easement with Iron Pin and Cap Marker	◇

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	----- C
Proposed Slope Stakes Fill	----- F
Proposed Curb Ramp	-----
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equality Symbol	⊕
Pavement Removal	-----
Single Tree	☼
Single Shrub	☼
Hedge	-----
Woods Line	-----

VEGETATION:

Orchard	☼
Vineyard	□

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	----- CONC
Bridge Wing Wall, Head Wall and End Wall	----- CONC WW
MINOR:	
Head and End Wall	----- CONC HW
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	□ CB
Paved Ditch Gutter	-----
Storm Sewer Manhole	⊕
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	⊗
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	----- TC
Designated U/G Telephone Conduit (S.U.E.*)	----- TC
Recorded U/G Fiber Optics Cable	----- T FO
Designated U/G Fiber Optics Cable (S.U.E.*)	----- T FO

WATER:

Water Manhole	⊕
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	----- TV
Designated U/G TV Cable (S.U.E.*)	----- TV
Recorded U/G Fiber Optic Cable	----- TV FO
Designated U/G Fiber Optic Cable (S.U.E.*)	----- TV FO

GAS:

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

SANITARY SEWER:

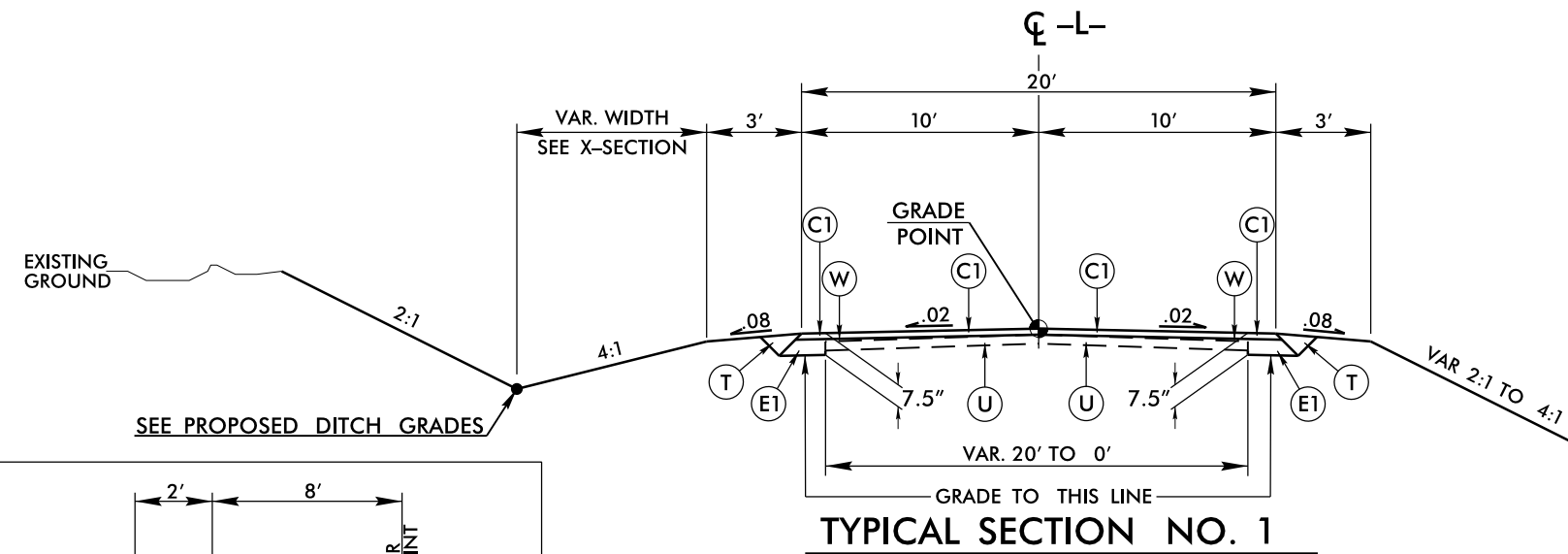
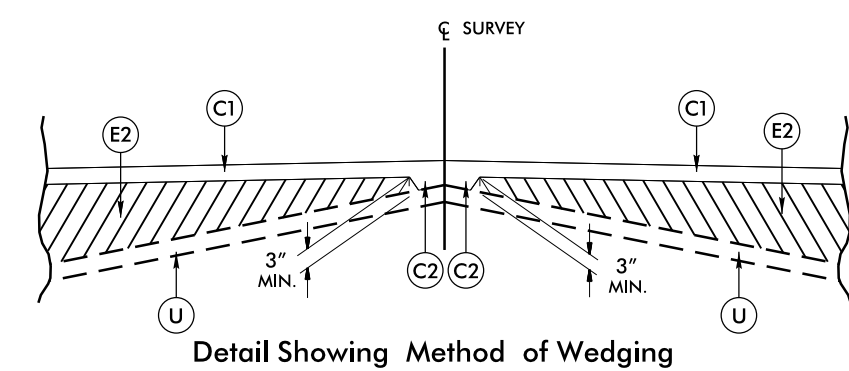
Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	----- SS
Above Ground Sanitary Sewer	----- A/G Sanitary Sewer
Recorded SS Forced Main Line	----- FSS
Designated SS Forced Main Line (S.U.E.*)	----- FSS

MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊕
Utility Unknown U/G Line	----- TUTL
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.

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 2 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT TO EXCEED 1 1/2" IN DEPTH.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
E2	PROP. 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 5 1/2" IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL).

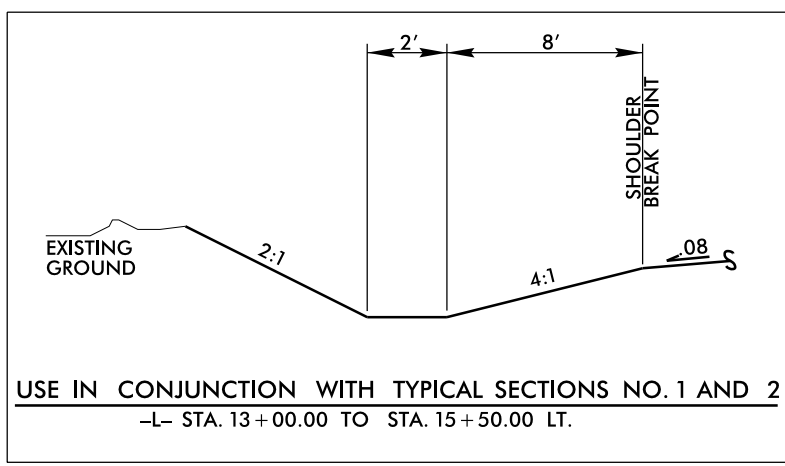
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



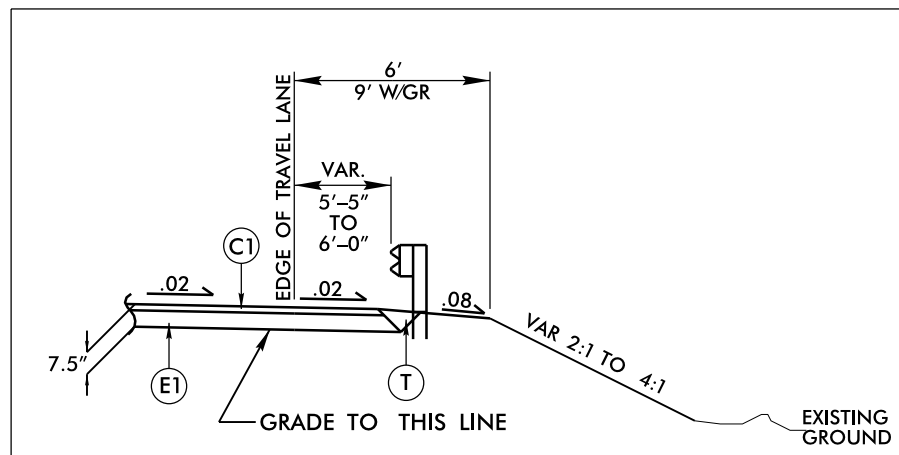
NOTE: TRANSITION SUPERELEVATION FROM EXISTING TO TYPICAL SECTION NO. 1
-L- STA. 12+00.00 TO STA. 12+75.00

USE TYPICAL SECTION NO. 1
-L- STA. 12+75.00 TO STA. 14+67.00
-L- STA. 18+36.00 TO STA. 20+25.00

NOTE: MILLING REQUIRED FOR PAVEMENT TIE-IN



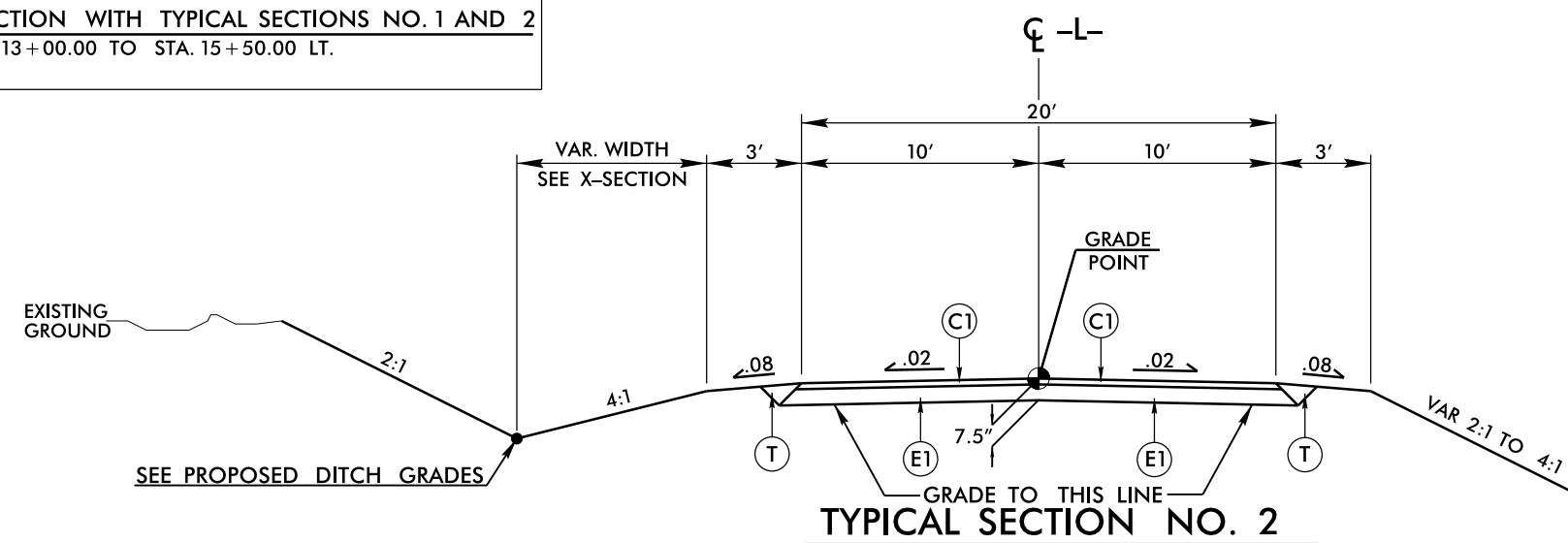
USE IN CONJUNCTION WITH TYPICAL SECTIONS NO. 1 AND 2
-L- STA. 13+00.00 TO STA. 15+50.00 LT.



USE IN CONJUNCTION WITH GUARDRAIL LOCATIONS

-L- STA. 15+85.13 TO STA. 16+72.63 LT.
-L- STA. 15+76.87 TO STA. 16+64.37 RT.
-L- STA. 17+77.63 TO STA. 18+52.63 LT.
-L- STA. 17+69.37 TO STA. 18+44.37 RT.

*NOTE: TRANSITION FROM 3' TO 9' SHOULDERS IN THE AREAS OF THE 8:1 TAPERS

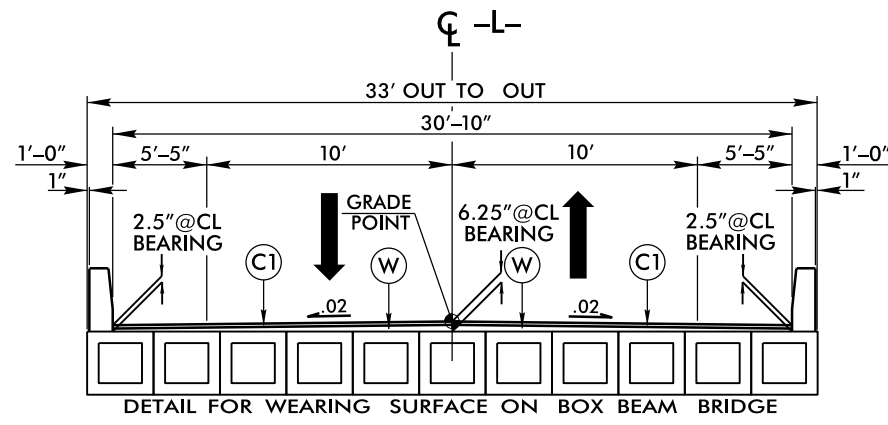


USE TYPICAL SECTION NO. 2

-L- STA. 14+67.00 TO STA. 16+68.50 (BEGIN BRIDGE)
-L- STA. 17+73.50 (END BRIDGE) TO STA. 18+36.00

6/2/09 24-JUN-2015 14:39 P:\ROADS\B5344_Rdy_tjw.dgn

PROJECT REFERENCE NO. B-5344	SHEET NO. 2A-2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
C1	PROP. 2½" SF9.5A
C2	PROP. VAR. DEPTH 2½" SF9.5A
E1	PROP. 5" B25.0B
E2	PROP. VAR. DEPTH B25.0B
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VAR. DEPTH WEDGING



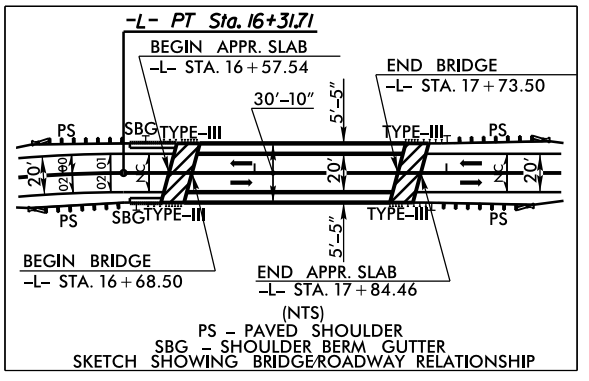
TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

-L- STA. 16 + 68.50 (BEGIN BRIDGE) TO STA. 17 + 73.50 (END BRIDGE)

6/2/99

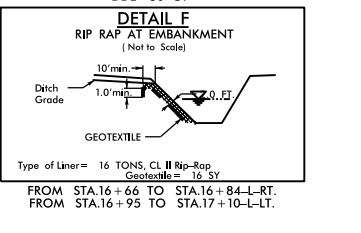
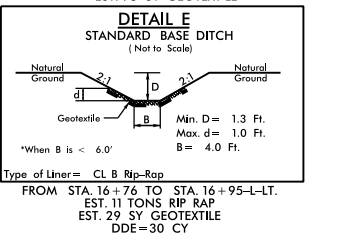
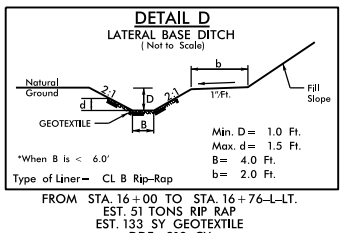
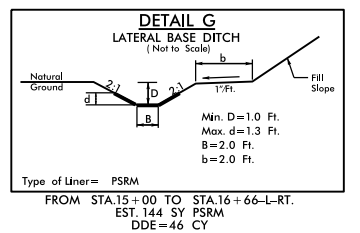
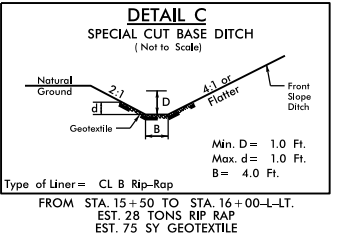
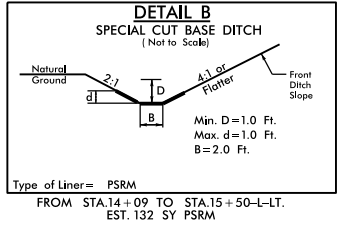
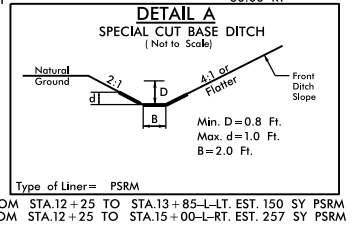
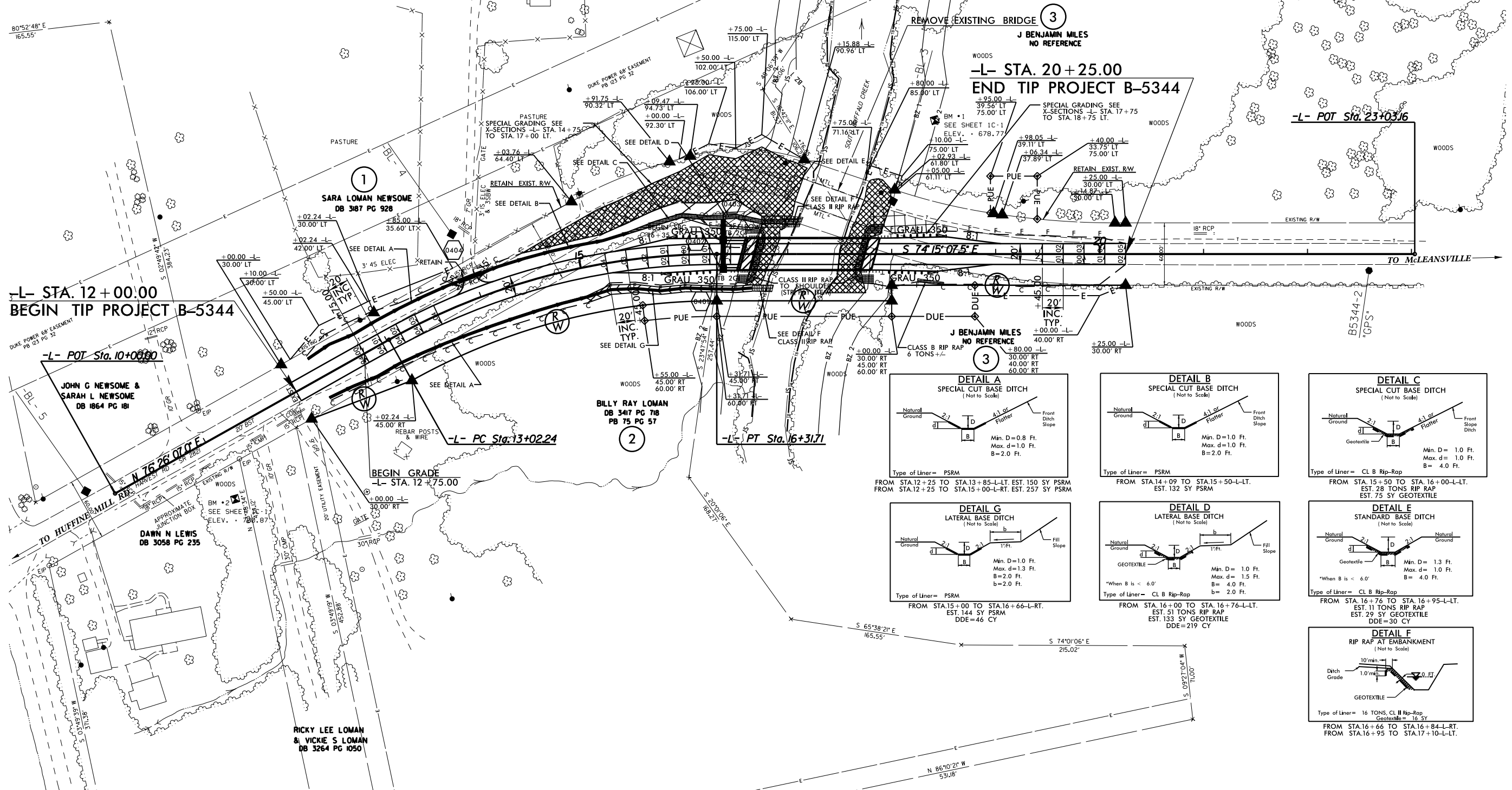
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\$\$\$\$\$



-L-

PI Sta 14+70.66
 $\Delta = 29' 18'' 45.5''$ (RT)
 $D = 8' 53'' 48.7''$
 $L = 329.47'$
 $T = 168.43'$
 $R = 644.00'$
 SE = SEE PLANS

NOTE: OVERLAY AND WEDGE PAVEMENT TO TRANSITION SUPERELEVATION FROM EXISTING AT -L- STA. 12+00.00 TO BEGIN GRADE AT -L- STA. 12+75.00.



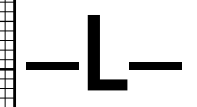
REVISIONS

8/17/99

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5/14/99

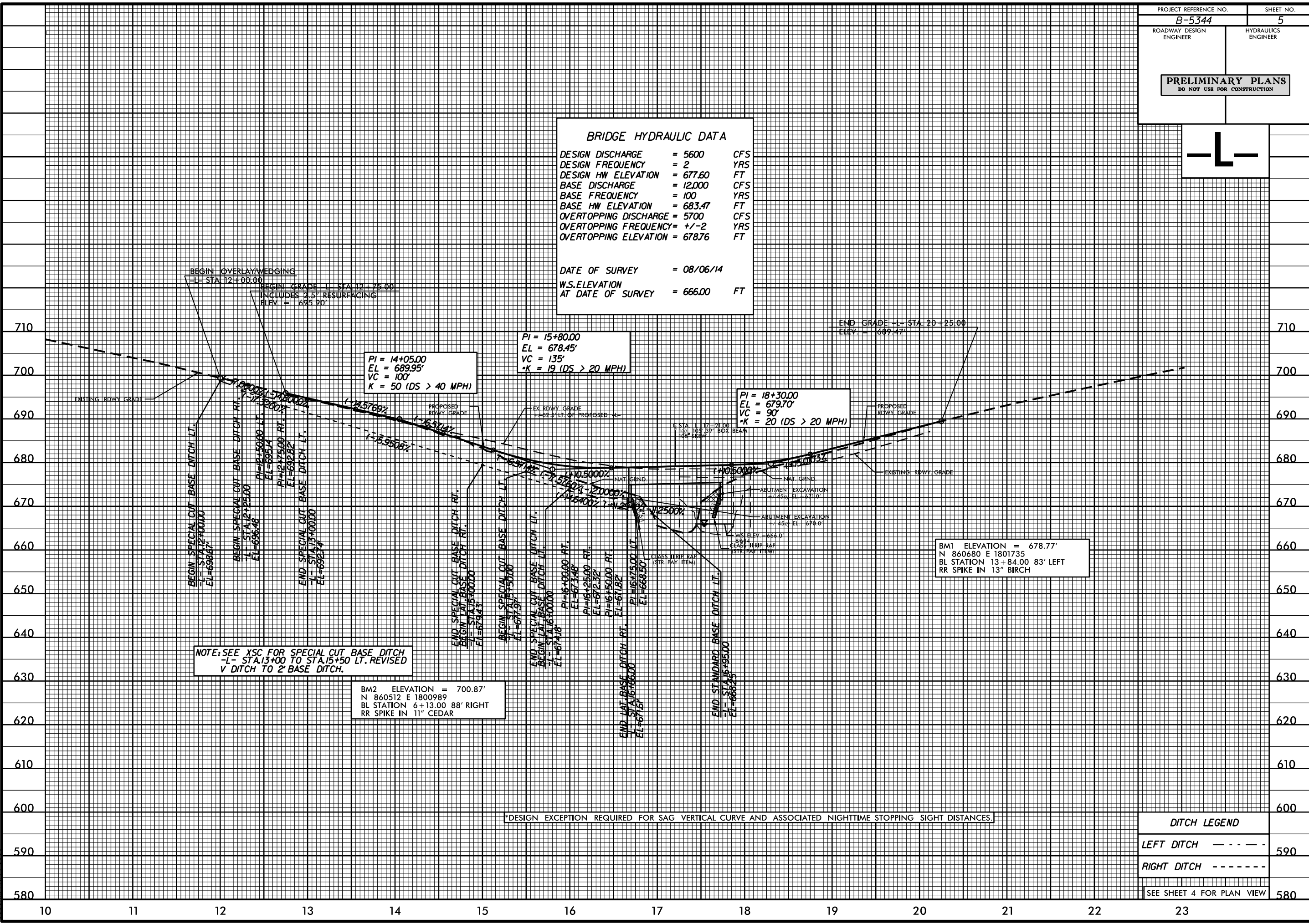
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE = 5600 CFS
 DESIGN FREQUENCY = 2 YRS
 DESIGN HW ELEVATION = 677.60 FT
 BASE DISCHARGE = 12000 CFS
 BASE FREQUENCY = 100 YRS
 BASE HW ELEVATION = 683.47 FT
 OVERTOPPING DISCHARGE = 5700 CFS
 OVERTOPPING FREQUENCY = +/- 2 YRS
 OVERTOPPING ELEVATION = 678.76 FT

DATE OF SURVEY = 08/06/14
 W.S. ELEVATION AT DATE OF SURVEY = 666.00 FT



PI = 14+05.00
 EL = 689.95'
 VC = 100'
 K = 50 (DS > 40 MPH)

PI = 15+80.00
 EL = 678.45'
 VC = 135'
 K = 19 (DS > 20 MPH)

PI = 18+30.00
 EL = 679.70'
 VC = 90'
 K = 20 (DS > 20 MPH)

BM1 ELEVATION = 678.77'
 N 860680 E 1801735
 BL STATION 13+84.00 83' LEFT
 RR SPIKE IN 13" BIRCH

BM2 ELEVATION = 700.87'
 N 860512 E 1800989
 BL STATION 6+13.00 88' RIGHT
 RR SPIKE IN 11" CEDAR

NOTE: SEE XSC FOR SPECIAL CUT BASE DITCH
 L- STA. 13+00 TO STA. 15+50 LT. REVISED
 V DITCH TO 2' BASE DITCH.

*DESIGN EXCEPTION REQUIRED FOR SAG VERTICAL CURVE AND ASSOCIATED NIGHTTIME STOPPING SIGHT DISTANCES.

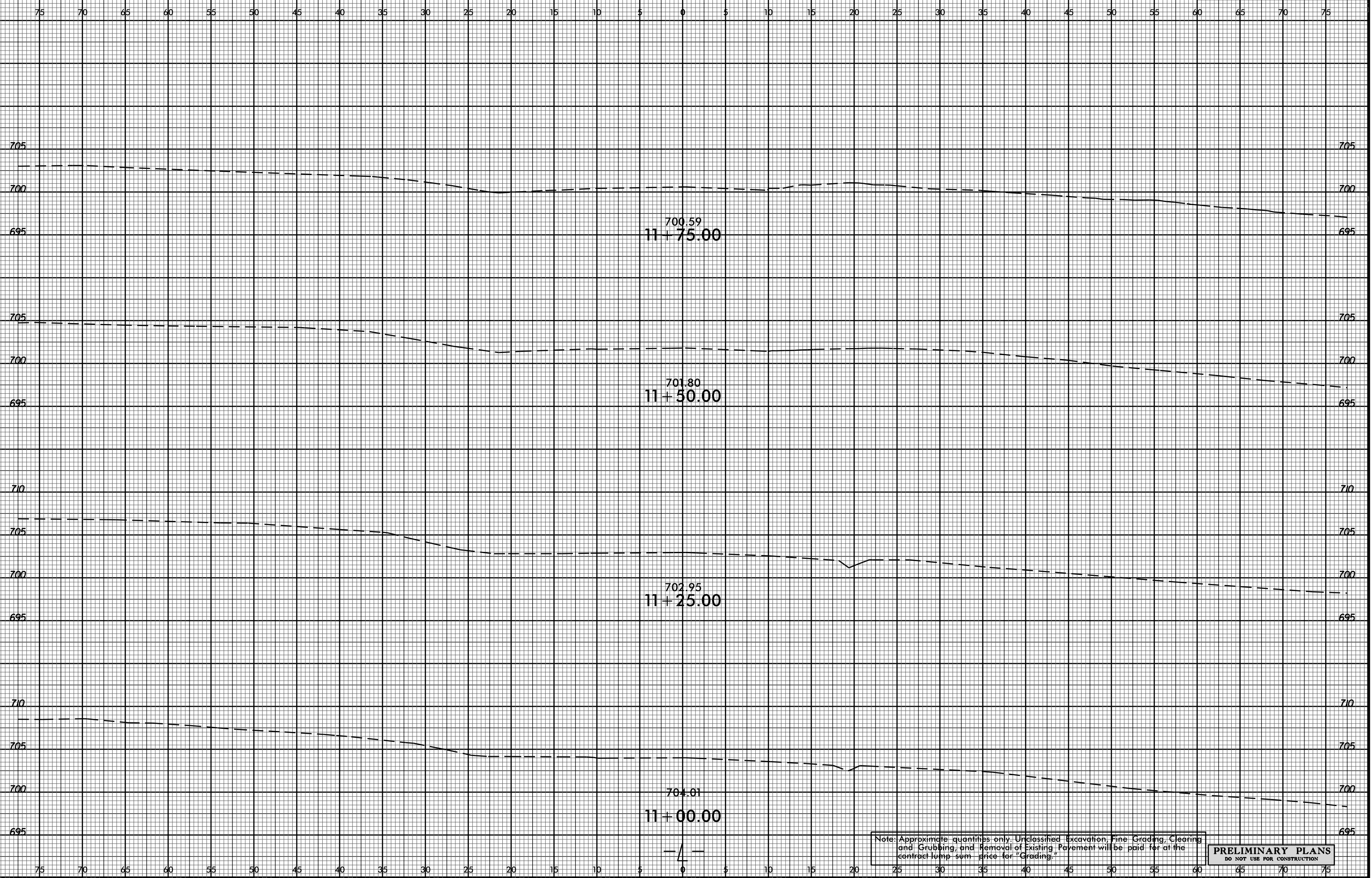
DITCH LEGEND

LEFT DITCH - - - - -

RIGHT DITCH - - - - -

SEE SHEET 4 FOR PLAN VIEW

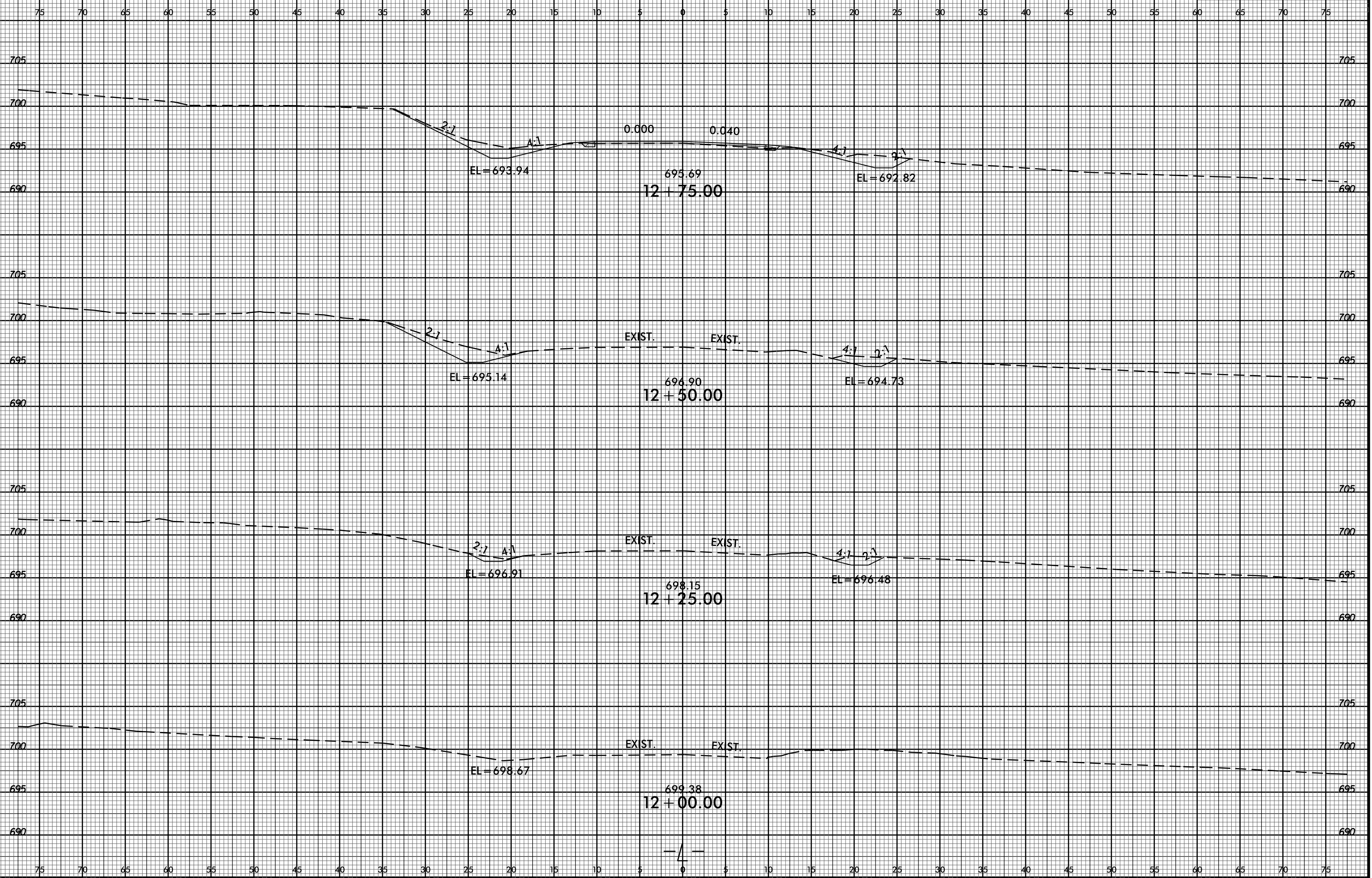
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Note: Approximate quantities only. Unclassified Excavation, Fine Grading, Clearing and Grubbing, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

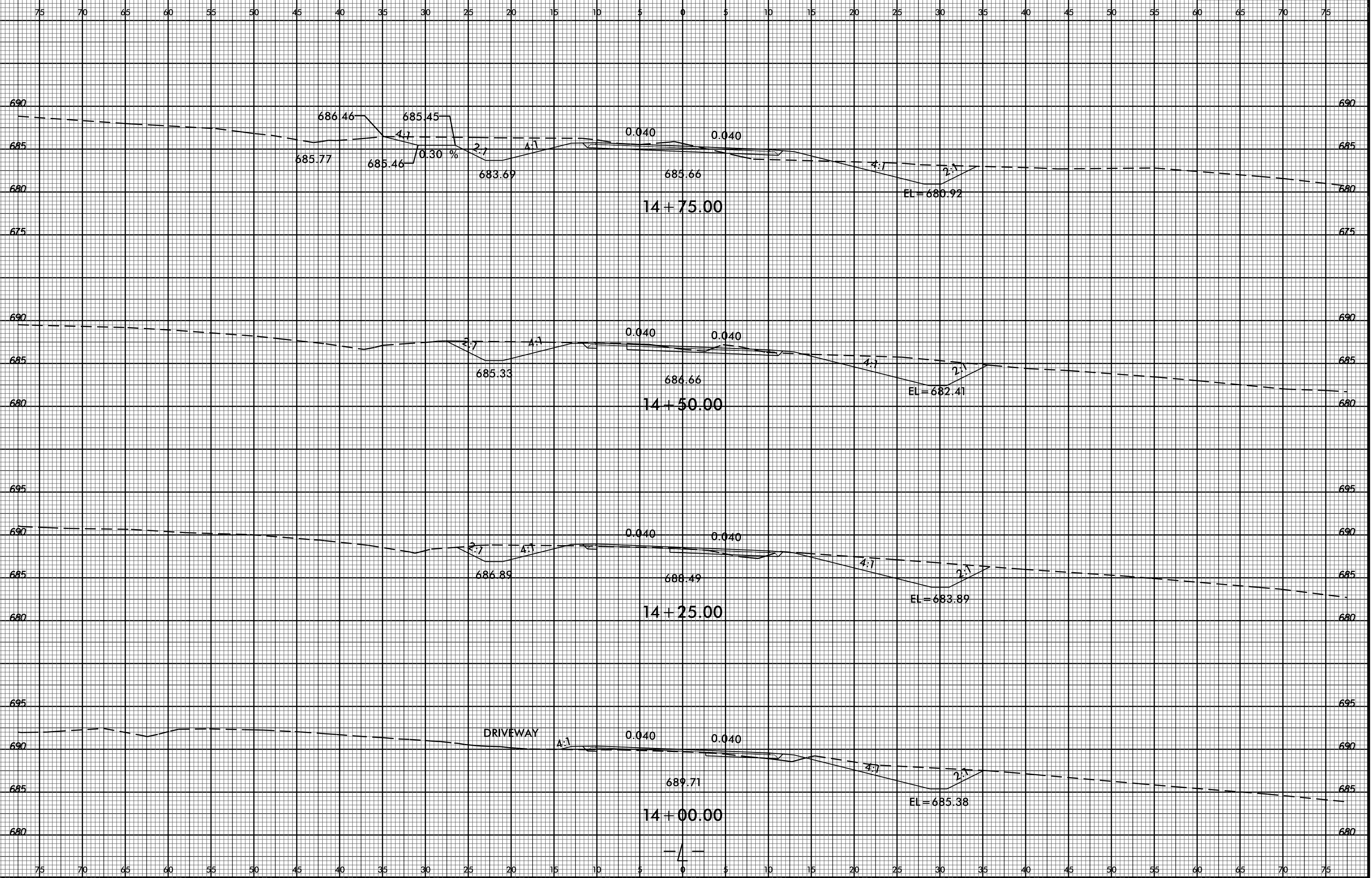
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



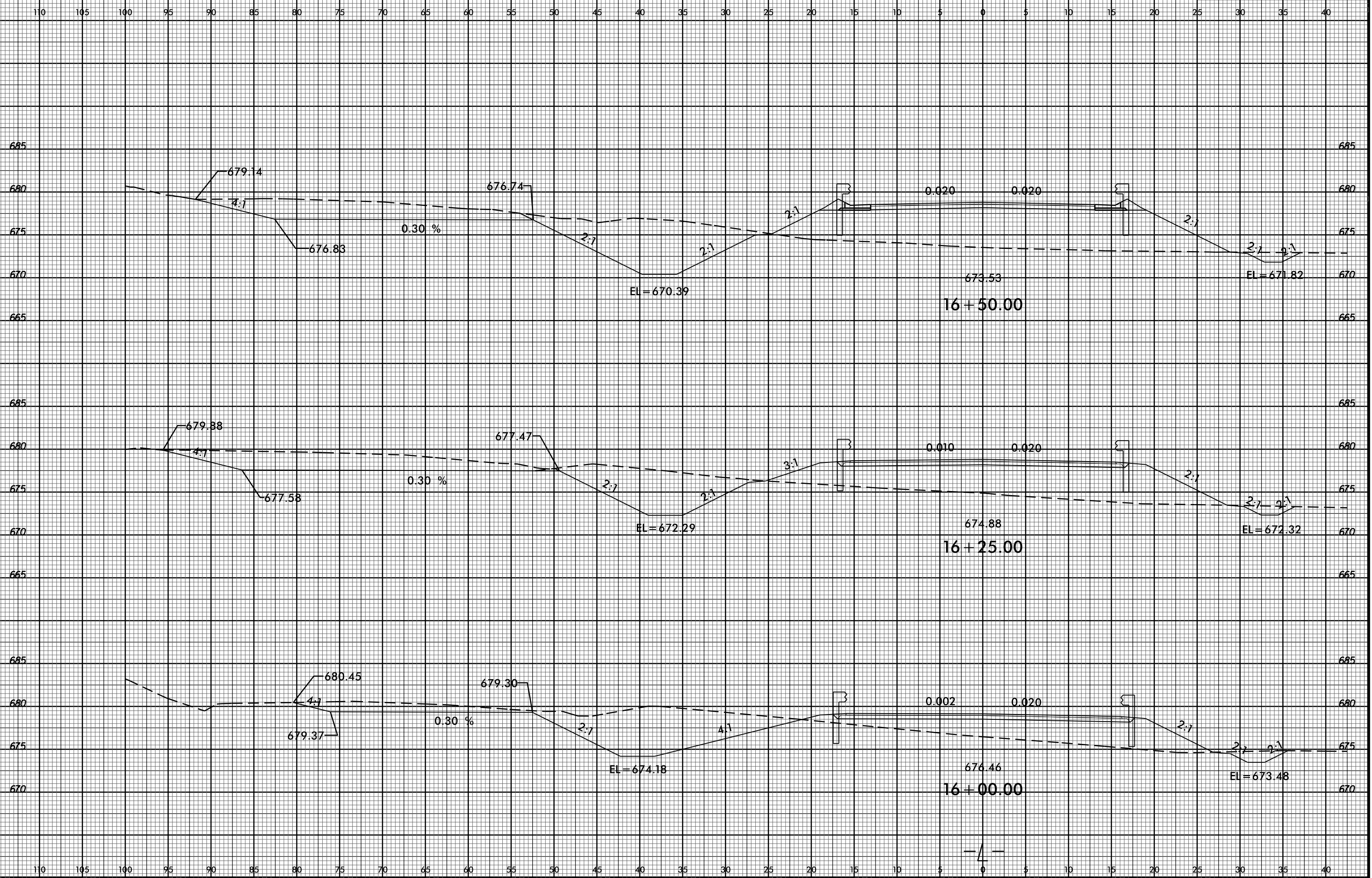
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PROJ. REFERENCE NO. B-5344 SHEET NO. X-5



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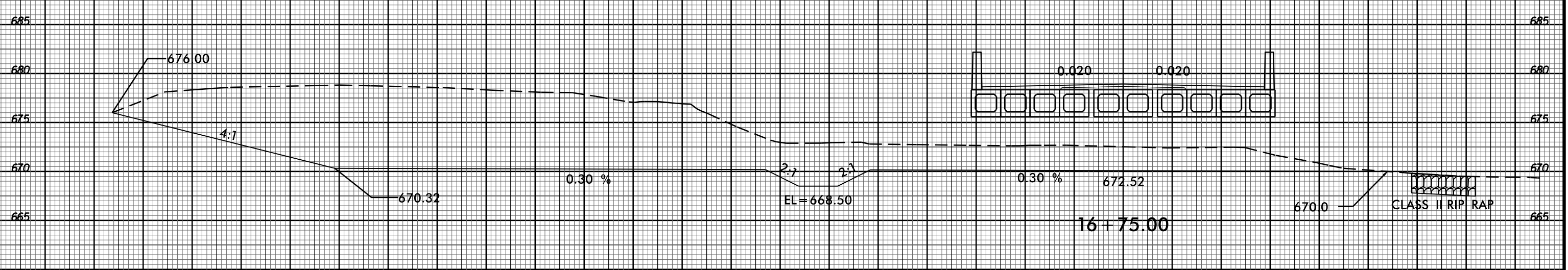
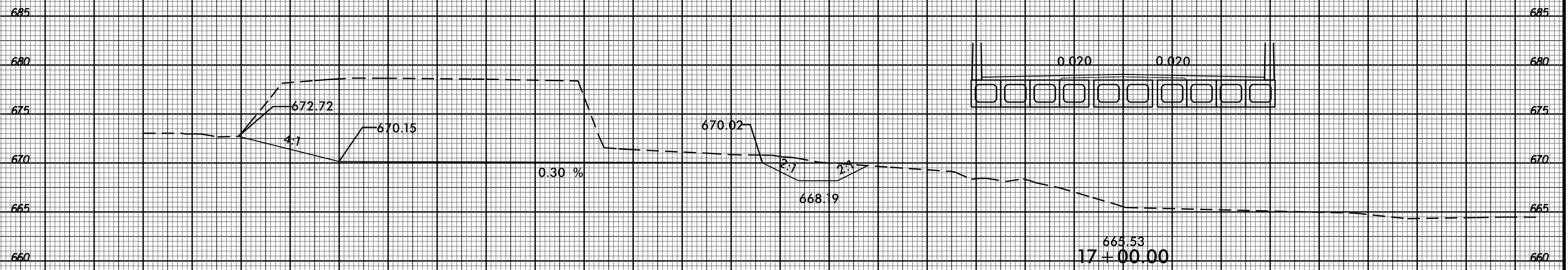
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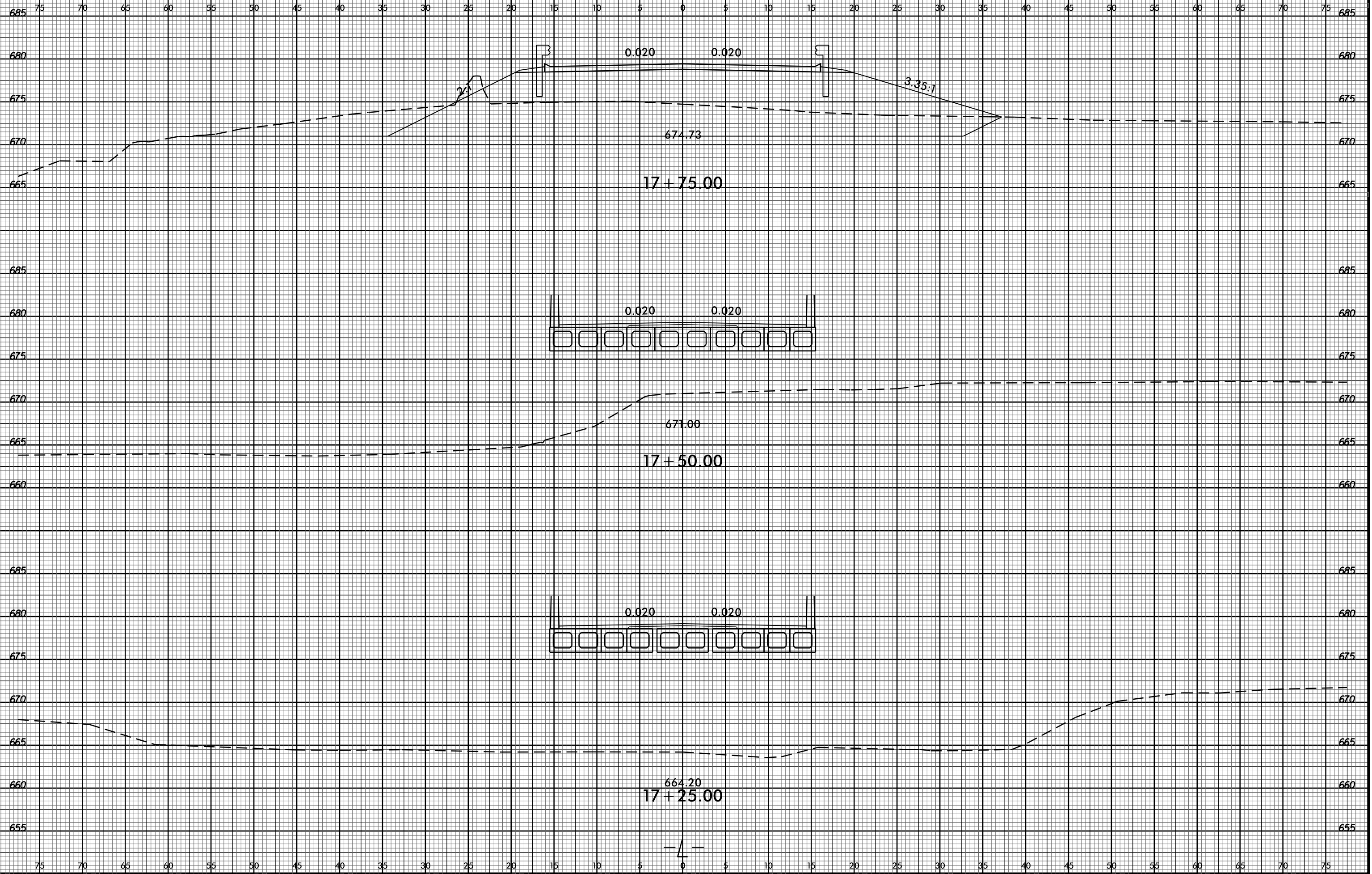
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X-8

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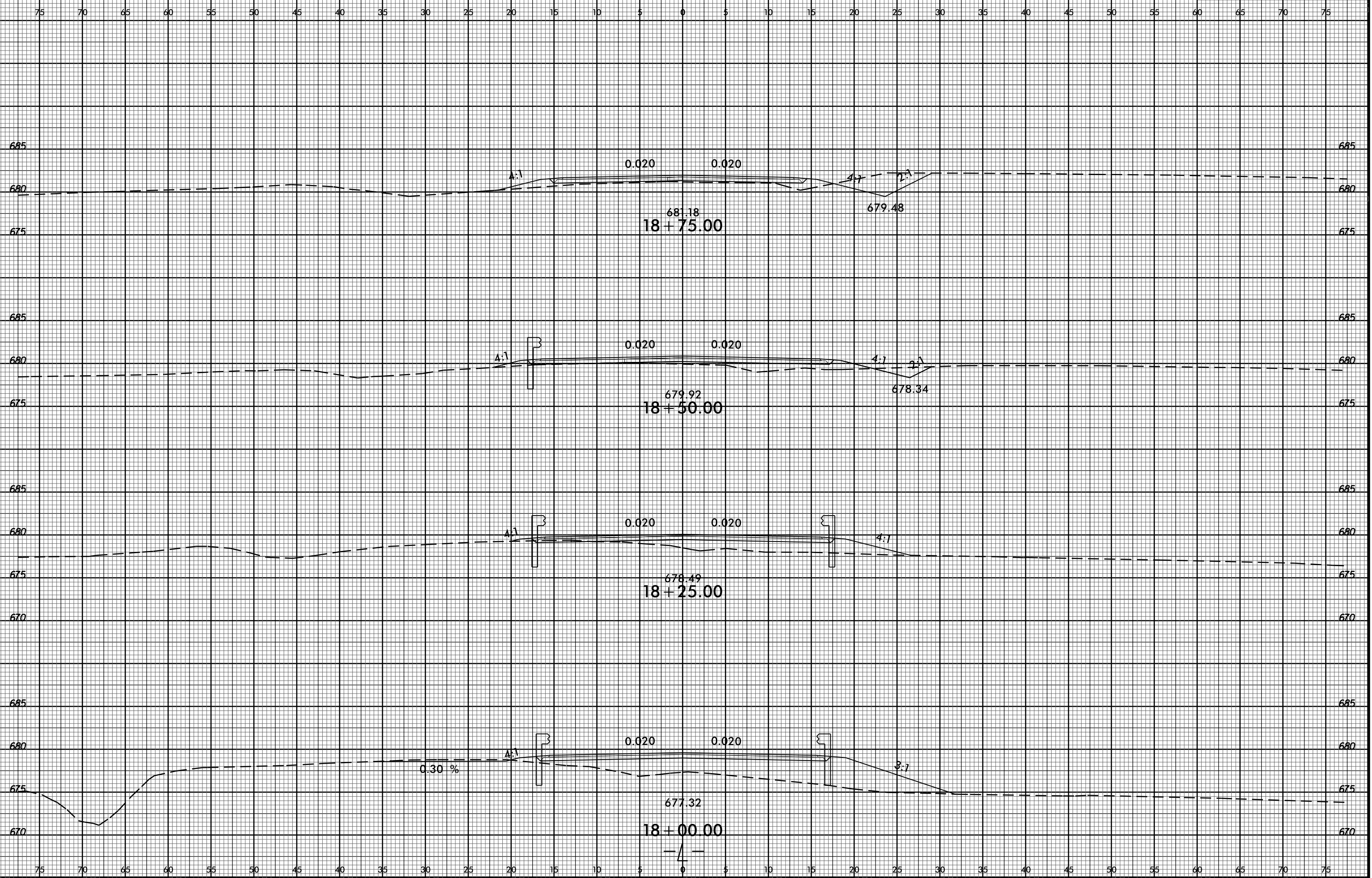


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PROJ. REFERENCE NO.
B-5344

SHEET NO.
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