STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

February 13, 2009

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

ATTN: Mr. Monte Matthews
NCDOT Coordinator

Subject: **Application for Section 404 Nationwide Permit 33** for the proposed replacement of Bridge No. 334 over South Fork New River on SR 1351 (Castle Ford Road) in Ashe/Watauga Counties, Federal Aid Project No. BRZ-1351(1); Division 11; TIP No. B-3928

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 334 over South Fork New River on SR 1351. There will be 0.13 acre of temporary surface water impacts with this project.

Please see enclosed copies of the Pre-Construction Notification (PCN), permit drawings, design plans, and Rapanos jurisdictional determination form. The Categorical Exclusion (CE) was completed in April 2008 and distributed shortly thereafter. Additional copies are available upon request.

This project calls for a letting date of September 15, 2009 and a review date of July 28, 2009.

A copy of this permit application will be posted on the NCDOT Website at: http://www.ncdot.org/doh/preconstruct/pe/. If you have any questions or need additional information, please call Jason Dilday at (919) 413-6693.

Sincerely,

E. L. Lusk

for Gregory J. Thorpe, Ph.D.
Environmental Management Director

w/attachment
Mr. Brian Wrenn, NCDWQ (2 Copies)
Ms. Marla Chambers, NCWRC
Ms. Marella Buncick, USFWS

W/o attachment (see website for attachments)
Dr. David Chang, P.E., Hydraulics
Mr. Victor Barbour, P.E., Project Services Unit
Mr. Mark Staley, Roadside Environmental
Mr. Tom Koch, P.E., Structure Design
Mr. Michael A. Pettyjohn, P.E. Div. 11 Eng.
Mr. Heath Slaughter, Division 11 EO
Mr. Jay Bennett, P.E., Roadway Design
Mr. Majed Alghandour, P. E., Program. and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Greg Blakeney, PDEA Proj. Plan. Engineer
Mr. Scott McLendon, USACE, Wilmington

Office Use Only: Form Version March 05

USACE Action ID No. _____ **DWQ No.** _____

(If any particular item is not applicable to this project, please enter "Not Applicable" or "N/A".)

I. Processing

1. Check all of the approval(s) requested for this project:
   - ☒ Section 404 Permit
   - ☐ Section 10 Permit
   - ☐ 401 Water Quality Certification
   - ☐ Riparian or Watershed Buffer Rules
   - ☐ Isolated Wetland Permit from DWQ
   - ☐ Express 401 Water Quality Certification

2. Nationwide, Regional or General Permit Number(s) Requested: Nationwide 33

3. If this notification is solely a courtesy copy because written approval for the 401 Certification is not required, check here: ☒

4. If payment into the North Carolina Ecosystem Enhancement Program (NCEEP) is proposed for mitigation of impacts, attach the acceptance letter from NCEEP, complete section VIII, and check here: ☐

5. If your project is located in any of North Carolina's twenty coastal counties (listed on page 4), and the project is within a North Carolina Division of Coastal Management Area of Environmental Concern (see the top of page 2 for further details), check here: ☐

II. Applicant Information

1. Owner/Applicant Information
   Name: Gregory J. Thorpe, Ph.D., Environmental Management Director
   Mailing Address: 1598 Mail Service Center
   _____
   _____
   _____
   Telephone Number: (919) 733-3141 Fax Number: (919) 733-9794
   E-mail Address: jldilday@ncdot.gov

2. Agent/Consultant Information (A signed and dated copy of the Agent Authorization letter must be attached if the Agent has signatory authority for the owner/applicant.)
   Name: _____
   Company Affiliation: _____
   Mailing Address: _____
   _____
   _____
   _____
   Telephone Number: _____ Fax Number: _____
   E-mail Address: _____

III. Project Information

Attach a **vicinity map** clearly showing the location of the property with respect to local landmarks such as towns, rivers, and roads. Also provide a detailed **site plan** showing property boundaries and development plans in relation to surrounding properties. Both the vicinity map and site plan must include a scale and north arrow. The specific footprints of all buildings, impervious surfaces, or other facilities must be included. If possible, the maps and plans should include the appropriate USGS Topographic Quad Map and NRCS Soil Survey with the property boundaries outlined. Plan drawings, or other maps may be included at the applicant's discretion, so long as the property is clearly defined. For administrative and distribution purposes, the USACE requires information to be submitted on sheets no larger than 11 by 17-inch format; however, DWQ may accept paperwork of any size. DWQ prefers full-size construction drawings rather than a sequential sheet version of the full-size plans. If full-size plans are reduced to a small scale such that the final version is illegible, the applicant will be informed that the project has been placed on hold until decipherable maps are provided.

1. Name of project: Bridge No. 334 over South Fork New River

2. T.I.P. Project Number or State Project Number (NCDOT Only): B-3928

3. Property Identification Number (Tax PIN): N/A

4. Location
   County: Ashe/Watauga Nearest Town: Todd
   Subdivision name (include phase/lot number): N/A
   Directions to site (include road numbers/names, landmarks, etc.): SR1351 (Castle Ford Road)

5. Site coordinates (For linear projects, such as a road or utility line, attach a sheet that separately lists the coordinates for each crossing of a distinct waterbody.)
   Decimal Degrees (6 digits minimum): 36'16'41' °N -81'34'14' °W

6. Property size (acres): N/A

7. Name of nearest receiving body of water: South Fork New River – **Class C HQW**

8. River Basin: New River Basin
   (Note – this must be one of North Carolina's seventeen designated major river basins. The River Basin map is available at http://h2o.enr.state.nc.us/admin/maps/.)

9. Describe the existing conditions on the site and general land use in the vicinity of the project at the time of this application: Agricultural and floodplain communities

10. Describe the overall project in detail, including the type of equipment to be used: Bridge No. 334 replaced with a four span bridge on a new alignment approximately 40 feet north of the existing structure using standard bridge demolition and construction equipment.

11. Explain the purpose of the proposed work: Improve the safety of travelers and efficiency of travel along SR 1351 by replacing a structurally absolete bridge.

IV. Prior Project History

If jurisdictional determinations and/or permits have been requested and/or obtained for this project (including all prior phases of the same subdivision) in the past, please explain. Include the USACE Action ID Number, DWQ Project Number, application date, and date permits and certifications were issued or withdrawn. Provide photocopies of previously issued permits, certifications or other useful information. Describe previously approved wetland, stream and buffer impacts, along with associated mitigation (where applicable). If this is a NCDOT project, list and describe permits issued for prior segments of the same T.I.P. project, along with construction schedules. N/A

V. Future Project Plans

Are any future permit requests anticipated for this project? If so, describe the anticipated work, and provide justification for the exclusion of this work from the current application.
N/A

VI. Proposed Impacts to Waters of the United States/Waters of the State

It is the applicant's (or agent's) responsibility to determine, delineate and map all impacts to wetlands, open water, and stream channels associated with the project. Each impact must be listed separately in the tables below (e.g., culvert installation should be listed separately from riprap dissipater pads). Be sure to indicate if an impact is temporary. All proposed impacts, permanent and temporary, must be listed, and must be labeled and clearly identifiable on an accompanying site plan. All wetlands and waters, and all streams (intermittent and perennial) should be shown on a delineation map, whether or not impacts are proposed to these systems. Wetland and stream evaluation and delineation forms should be included as appropriate. Photographs may be included at the applicant's discretion. If this proposed impact is strictly for wetland or stream mitigation, list and describe the impact in Section VIII below. If additional space is needed for listing or description, please attach a separate sheet.

1. Provide a written description of the proposed impacts: 0.13 acres of temporary stream impacts to South Fork New River due to the use of causeways for removal of the existing bridge and construction of the new structure. <0.01 acres of permanent stream impacts to South Fork New River due to bridge piers.

2. Individually list wetland impacts. Types of impacts include, but are not limited to mechanized clearing, grading, fill, excavation, flooding, ditching/drainage, etc. For dams, separately list impacts due to both structure and flooding.

Wetland Impact Site Number (indicate on map)	Type of Impact	Type of Wetland (e.g., forested, marsh, herbaceous, bog, etc.)	Located within 100-year Floodplain (yes/no)	Distance to Nearest Stream (linear feet)	Area of Impact (acres)
No wetlands					
Total Wetland Impact (acres)					0

3. List the total acreage (estimated) of all existing wetlands on the property: 0

4. Individually list all intermittent and perennial stream impacts. Be sure to identify temporary impacts. Stream impacts include, but are not limited to placement of fill or culverts, dam construction, flooding, relocation, stabilization activities (e.g., cement walls, rip-rap, crib walls, gabions, etc.), excavation, ditching/straightening, etc. If stream relocation is proposed, plans and profiles showing the linear footprint for both the original and relocated streams must be included. To calculate acreage, multiply length X width, then divide by 43,560.

Stream Impact Number (indicate on map)	Stream Name	Type of Impact	Perennial or Intermittent?	Average Stream Width Before Impact	Impact Length (linear feet)	Area of Impact (acres)
-L- 13+36 to 14+48	South Fork New River	Temporary	Perennial	90	80	0.13
-L- 13+36 to 14+48	South Fork New River	Permanent (Bridge Piers)	Perennial	90	8	<0.01
Total Permanent Stream Impact (by length and acreage)					8	<0.01

5. Individually list all open water impacts (including lakes, ponds, estuaries, sounds, Atlantic Ocean and any other water of the U.S.). Open water impacts include, but are not limited to fill, excavation, dredging, flooding, drainage, bulkheads, etc.

Open Water Impact Site Number (indicate on map)	Name of Waterbody (if applicable)	Type of Impact	Type of Waterbody (lake, pond, estuary, sound, bay, ocean, etc.)	Area of Impact (acres)
No Impacts				
Total Open Water Impact (acres)				0

6. List the cumulative impact to all Waters of the U.S. resulting from the project:

Stream Impact (acres):	0.13 (temporary) <0.01 (permanent)
Wetland Impact (acres):	0
Open Water Impact (acres):	0
Total Impact to Waters of the U.S. (acres)	0.13 (temporary) <0.01 (permanent)
Total Stream Impact (linear feet):	80 (temporary) 8 (permanent)

7. Isolated Waters
Do any isolated waters exist on the property? ☐ Yes ☒ No
Describe all impacts to isolated waters, and include the type of water (wetland or stream) and the size of the proposed impact (acres or linear feet). Please note that this section only applies to waters that have specifically been determined to be isolated by the USACE.

_____

_____

8. Pond Creation
If construction of a pond is proposed, associated wetland and stream impacts should be included above in the wetland and stream impact sections. Also, the proposed pond should be described here and illustrated on any maps included with this application.
Pond to be created in (check all that apply): ☐ uplands ☐ stream ☐ wetlands
Describe the method of construction (e.g., dam/embankment, excavation, installation of draw-down valve or spillway, etc.):_____
Proposed use or purpose of pond (e.g., livestock watering, irrigation, aesthetic, trout pond, local stormwater requirement, etc.):_____
Current land use in the vicinity of the pond:_____
Size of watershed draining to pond:_____ Expected pond surface area:_____

VII. Impact Justification (Avoidance and Minimization)

Specifically describe measures taken to avoid the proposed impacts. It may be useful to provide information related to site constraints such as topography, building ordinances, accessibility, and

financial viability of the project. The applicant may attach drawings of alternative, lower-impact site layouts, and explain why these design options were not feasible. Also discuss how impacts were minimized once the desired site plan was developed. If applicable, discuss construction techniques to be followed during construction to reduce impacts. Traffic will be maintained on the existing bridge during construction. The only permanent impacts will occur from the placement of bridge piers for the new structure. Preformed scour holes will be used to treat stormwater from the new bridge before it enters the South Fork New River. Causeways will be phased so that no more than 50% of the channel will be obstructed at one time, with the exception of Causeway # 3. Causeway #3 will extend slightly farther than 50% of the channel due to the need for removal of an interior bent on the existing bridge. Pipes will be placed in the causeway to allow for normal hydraulic conveyance. South Fork New River is HQW waters, so "Design Standards for Sensitive Watersheds" will be used during all phases of construction.

VIII. Mitigation

DWQ - In accordance with 15A NCAC 2H .0500, mitigation may be required by the NC Division of Water Quality for projects involving greater than or equal to one acre of impacts to freshwater wetlands or greater than or equal to 150 linear feet of total impacts to perennial streams.

USACE – In accordance with the Final Notice of Issuance and Modification of Nationwide Permits, published in the Federal Register on January 15, 2002, mitigation will be required when necessary to ensure that adverse effects to the aquatic environment are minimal. Factors including size and type of proposed impact and function and relative value of the impacted aquatic resource will be considered in determining acceptability of appropriate and practicable mitigation as proposed. Examples of mitigation that may be appropriate and practicable include, but are not limited to: reducing the size of the project; establishing and maintaining wetland and/or upland vegetated buffers to protect open waters such as streams; and replacing losses of aquatic resource functions and values by creating, restoring, enhancing, or preserving similar functions and values, preferable in the same watershed.

If mitigation is required for this project, a copy of the mitigation plan must be attached in order for USACE or DWQ to consider the application complete for processing. Any application lacking a required mitigation plan or NCEEP concurrence shall be placed on hold as incomplete. An applicant may also choose to review the current guidelines for stream restoration in DWQ's Draft Technical Guide for Stream Work in North Carolina, available at http://h2o.enr.state.nc.us/ncwetlands/strmgide.html.

1. Provide a brief description of the proposed mitigation plan. The description should provide as much information as possible, including, but not limited to: site location (attach directions and/or map, if offsite), affected stream and river basin, type and amount (acreage/linear feet) of mitigation proposed (restoration, enhancement, creation, or preservation), a plan view, preservation mechanism (e.g., deed restrictions, conservation easement, etc.), and a

description of the current site conditions and proposed method of construction. Please attach a separate sheet if more space is needed.

The only permanent impacts associated with this project is from the placement of bridge piers with the new structure. No mitigation is proposed.

2. Mitigation may also be made by payment into the North Carolina Ecosystem Enhancement Program (NCEEP). Please note it is the applicant's responsibility to contact the NCEEP at (919) 715-0476 to determine availability, and written approval from the NCEEP indicating that they are will to accept payment for the mitigation must be attached to this form. For additional information regarding the application process for the NCEEP, check the NCEEP website at http://h2o.enr.state.nc.us/wrp/index.htm. If use of the NCEEP is proposed, please check the appropriate box on page five and provide the following information:

Amount of stream mitigation requested (linear feet): 0
Amount of buffer mitigation requested (square feet): 0
Amount of Riparian wetland mitigation requested (acres): 0
Amount of Non-riparian wetland mitigation requested (acres): 0
Amount of Coastal wetland mitigation requested (acres): 0

IX. Environmental Documentation (required by DWQ)

1. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land? Yes ☒ No ☐

2. If yes, does the project require preparation of an environmental document pursuant to the requirements of the National or North Carolina Environmental Policy Act (NEPA/SEPA)? Note: If you are not sure whether a NEPA/SEPA document is required, call the SEPA coordinator at (919) 733-5083 to review current thresholds for environmental documentation. Yes ☒ No ☐

3. If yes, has the document review been finalized by the State Clearinghouse? If so, please attach a copy of the NEPA or SEPA final approval letter. Yes ☒ No ☐

X. Proposed Impacts on Riparian and Watershed Buffers (required by DWQ)

It is the applicant's (or agent's) responsibility to determine, delineate and map all impacts to required state and local buffers associated with the project. The applicant must also provide justification for these impacts in Section VII above. All proposed impacts must be listed herein, and must be clearly identifiable on the accompanying site plan. All buffers must be shown on a map, whether or not impacts are proposed to the buffers. Correspondence from the DWQ Regional Office may be included as appropriate. Photographs may also be included at the applicant's discretion.

1. Will the project impact protected riparian buffers identified within 15A NCAC 2B .0233 (Neuse), 15A NCAC 2B .0259 (Tar-Pamlico), 15A NCAC 02B .0243 (Catawba) 15A NCAC 2B .0250 (Randleman Rules and Water Supply Buffer Requirements), or other (please identify_____)? Yes ☐ No ☒

2. If "yes", identify the square feet and acreage of impact to each zone of the riparian buffers. If buffer mitigation is required calculate the required amount of mitigation by applying the buffer multipliers.

Zone*	Impact (square feet)	Multiplier	Required Mitigation
1		3 (2 for Catawba)	
2		1.5	
Total			

* Zone 1 extends out 30 feet perpendicular from the top of the near bank of channel; Zone 2 extends an additional 20 feet from the edge of Zone 1.

3. If buffer mitigation is required, please discuss what type of mitigation is proposed (i.e., Donation of Property, Riparian Buffer Restoration / Enhancement, or Payment into the Riparian Buffer Restoration Fund). Please attach all appropriate information as identified within 15A NCAC 2B .0242 or .0244, or .0260. N/A

XI. Stormwater (required by DWQ)

Describe impervious acreage (existing and proposed) versus total acreage on the site. Discuss stormwater controls proposed in order to protect surface waters and wetlands downstream from the property. If percent impervious surface exceeds 20%, please provide calculations demonstrating total proposed impervious level. Impervious surfaces will increase only slightly due to the new alignment of the road.

XII. Sewage Disposal (required by DWQ)

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.
N/A

XIII. Violations (required by DWQ)

Is this site in violation of DWQ Wetland Rules (15A NCAC 2H .0500) or any Buffer Rules?
Yes ☐ No ☒

Is this an after-the-fact permit application? Yes ☐ No ☒

XIV. Cumulative Impacts (required by DWQ)

Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality? Yes ☐ No ☒
If yes, please submit a qualitative or quantitative cumulative impact analysis in accordance with the most recent North Carolina Division of Water Quality policy posted on our website at http://h2o.enr.state.nc.us/ncwetlands. If no, please provide a short narrative description:

XV. Other Circumstances (Optional):

It is the applicant's responsibility to submit the application sufficiently in advance of desired construction dates to allow processing time for these permits. However, an applicant may choose to list constraints associated with construction or sequencing that may impose limits on work schedules (e.g., draw-down schedules for lakes, dates associated with Endangered and Threatened Species, accessibility problems, or other issues outside of the applicant's control).
Biological conclusions for all protected species remains "No Effect". An updated survey for Virginia spiraea was conducted on June 18, 2008. No individuals of the species were found.

E. L. Lusk 2-13-09

Applicant/Agent's Signature **Date**
(Agent's signature is valid only if an authorization letter from the applicant is provided.)

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: B-3928 (Replacement of Bridge No. 334 on SR 1351)

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State:NC County/parish/borough: Ashe/Watauga City: Todd

Center coordinates of site (lat/long in degree decimal format): Lat. 36'16'41"° N, Long. 81'34'14° W.

Universal Transverse Mercator:

Name of nearest waterbody: South Fork New River

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

Name of watershed or Hydrologic Unit Code (HUC): 05050001

☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

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

☐ Office (Desk) Determination. Date:

☐ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Appear to be no** *"navigable waters of the U.S."* within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]

☐ Waters subject to the ebb and flow of the tide.

☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
Explain: .

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are** *"waters of the U.S."* within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
      ☒ TNWs, including territorial seas
      ☐ Wetlands adjacent to TNWs
      ☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
      ☐ Non-RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
      ☐ Impoundments of jurisdictional waters
      ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
      Non-wetland waters: 500 linear feet: 90 width (ft) and/or acres.
      Wetlands: acres.

   c. **Limits (boundaries) of jurisdiction** based on: **Established by OHWM.**
      Elevation of established OHWM (if known): .

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   ☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
   Explain: .

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[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.

[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**
   Identify TNW: **South Fork New River.**

   Summarize rationale supporting determination: The South Fork New River is a favored route of recreational canoers .

2. **Wetland adjacent to TNW**
   Summarize rationale supporting conclusion that wetland is "adjacent": .

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

   (i) General Area Conditions:
   Watershed size: **square miles**
   Drainage area: **square miles**
   Average annual rainfall: inches
   Average annual snowfall: inches

   (ii) Physical Characteristics:
   (a) Relationship with TNW:
   ☐ Tributary flows directly into TNW.
   ☐ Tributary flows through **Pick List** tributaries before entering TNW.

   Project waters are **Pick List** river miles from TNW.
   Project waters are **Pick List** river miles from RPW.
   Project waters are **Pick List** aerial (straight) miles from TNW.
   Project waters are **Pick List** aerial (straight) miles from RPW.
   Project waters cross or serve as state boundaries. Explain: .

   Identify flow route to TNW[5]: .
   Tributary stream order, if known: .

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[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☐ Natural
☐ Artificial (man-made). Explain: .
☐ Manipulated (man-altered). Explain: .

Tributary properties with respect to top of bank (estimate):
Average width: feet
Average depth: feet
Average side slopes: **Pick List.**

Primary tributary substrate composition (check all that apply):
☐ Silts ☐ Sands ☐ Concrete
☐ Cobbles ☐ Gravel ☐ Muck
☐ Bedrock ☐ Vegetation. Type/% cover:
☐ Other. Explain: .

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: .
Presence of run/riffle/pool complexes. Explain: .
Tributary geometry: **Pick List**
Tributary gradient (approximate average slope): %

(c) Flow:
Tributary provides for: **Pick List**
Estimate average number of flow events in review area/year: **Pick List**
Describe flow regime: .
Other information on duration and volume: .

Surface flow is: **Pick List.** Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .
☐ Dye (or other) test performed: .

Tributary has (check all that apply):
☐ Bed and banks
☐ OHWM[6] (check all indicators that apply):
☐ clear, natural line impressed on the bank ☐ the presence of litter and debris
☐ changes in the character of soil ☐ destruction of terrestrial vegetation
☐ shelving ☐ the presence of wrack line
☐ vegetation matted down, bent, or absent ☐ sediment sorting
☐ leaf litter disturbed or washed away ☐ scour
☐ sediment deposition ☐ multiple observed or predicted flow events
☐ water staining ☐ abrupt change in plant community
☐ other (list):
☐ Discontinuous OHWM.[7] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
☐ High Tide Line indicated by: ☐ Mean High Water Mark indicated by:
☐ oil or scum line along shore objects ☐ survey to available datum;
☐ fine shell or debris deposits (foreshore) ☐ physical markings;
☐ physical markings/characteristics ☐ vegetation lines/changes in vegetation types.
☐ tidal gauges
☐ other (list):

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: .
Identify specific pollutants, if known: .

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[6]A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7]Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- ☐ Riparian corridor. Characteristics (type, average width): .
- ☐ Wetland fringe. Characteristics: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size: acres

Wetland type. Explain: .

Wetland quality. Explain: .

Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:

Flow is: **Pick List**. Explain: .

Surface flow is: **Pick List**

Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .

☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:

- ☐ Directly abutting
- ☐ Not directly abutting
  - ☐ Discrete wetland hydrologic connection. Explain: .
  - ☐ Ecological connection. Explain: .
  - ☐ Separated by berm/barrier. Explain: .

(d) Proximity (Relationship) to TNW

Project wetlands are **Pick List** river miles from TNW.

Project waters are **Pick List** aerial (straight) miles from TNW.

Flow is from: **Pick List.**

Estimate approximate location of wetland as within the **Pick List** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: .

Identify specific pollutants, if known: .

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

- ☐ Riparian buffer. Characteristics (type, average width): .
- ☐ Vegetation type/percent cover. Explain: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: **Pick List**

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

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

Summarize overall biological, chemical and physical functions being performed: .

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☒ TNWs: 500 linear feet 90 width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: North Muddy Creek and its UT have NCDWQ stream rating scores greater than 30 (North Pacolet River).
   - ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: UT to North Pacolet River contained water on numerous site visits. UT contained various species of macrobenthos and salamanders.

Provide estimates for jurisdictional waters in the review area (check all that apply):
- ☐ Tributary waters: linear feet width (ft).
- ☐ Other non-wetland waters: acres.
  Identify type(s) of waters: .

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
   ☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional waters within the review area (check all that apply):
   - ☐ Tributary waters: linear feet width (ft).
   - ☐ Other non-wetland waters: acres.
     Identify type(s) of waters: .

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
   - ☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

   - ☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
   ☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[9]**
   As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
   - ☐ Demonstrate that impoundment was created from "waters of the U.S.," or
   - ☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
   - ☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]
- ☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
- ☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
- ☐ which are or could be used for industrial purposes by industries in interstate commerce.
- ☐ Interstate isolated waters. Explain: .
- ☐ Other factors. Explain: .

---

[8]See Footnote # 3.
[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.*

Identify water body and summarize rationale supporting determination: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
- ☐ Tributary waters: linear feet width (ft).
- ☐ Other non-wetland waters: acres.
  - Identify type(s) of waters: .
- ☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
- ☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- ☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
  - ☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- ☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
- ☐ Other: (explain, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
- ☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- ☐ Lakes/ponds: acres.
- ☐ Other non-wetland waters: acres. List type of aquatic resource: .
- ☐ Wetlands: acres.

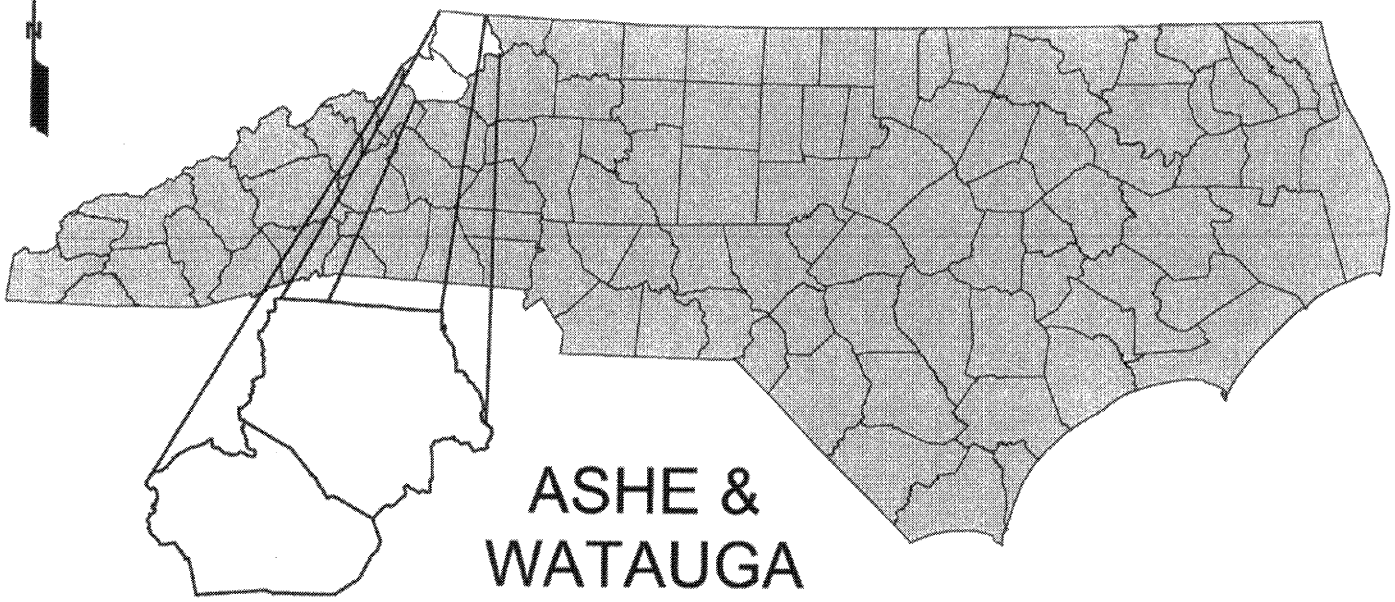
Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
- ☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
- ☐ Lakes/ponds: acres.
- ☐ Other non-wetland waters: acres. List type of aquatic resource: .
- ☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

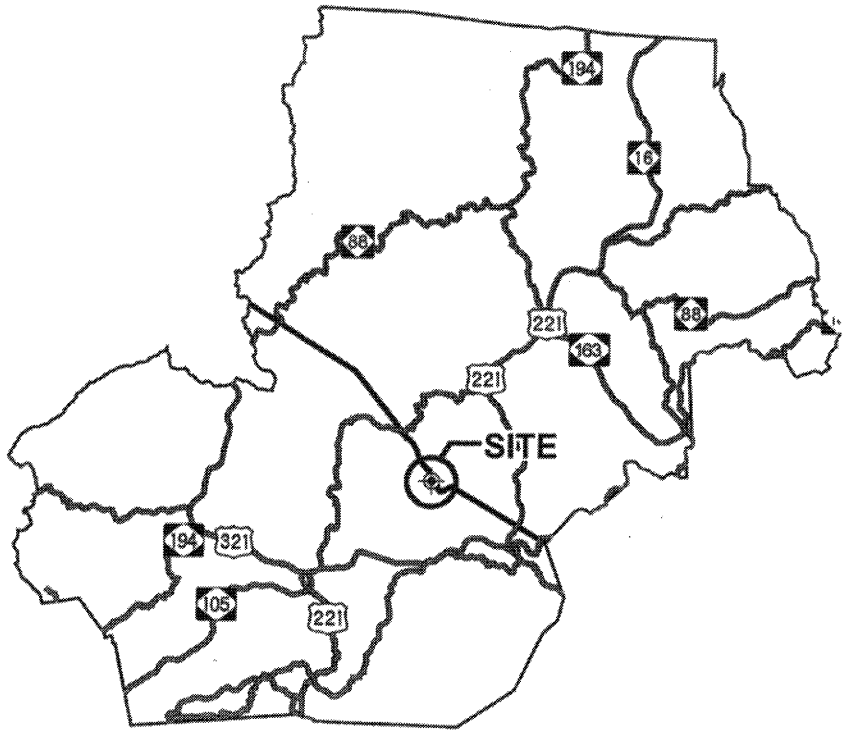
A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
- ☐ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: .
- ☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☐ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps: .
- ☐ Corps navigable waters' study: .
- ☐ U.S. Geological Survey Hydrologic Atlas: .
  - ☐ USGS NHD data.
  - ☐ USGS 8 and 12 digit HUC maps.
- ☐ U.S. Geological Survey map(s). Cite scale & quad name: .
- ☐ USDA Natural Resources Conservation Service Soil Survey. Citation: .
- ☐ National wetlands inventory map(s). Cite name: .
- ☐ State/Local wetland inventory map(s): .
- ☐ FEMA/FIRM maps: .
- ☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- ☐ Photographs: ☐ Aerial (Name & Date): .
  - or ☐ Other (Name & Date): .
- ☐ Previous determination(s). File no. and date of response letter: .
- ☐ Applicable/supporting case law: .
- ☐ Applicable/supporting scientific literature: .
- ☐ Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD: .

NORTH CAROLINA



ASHE &
WATAUGA



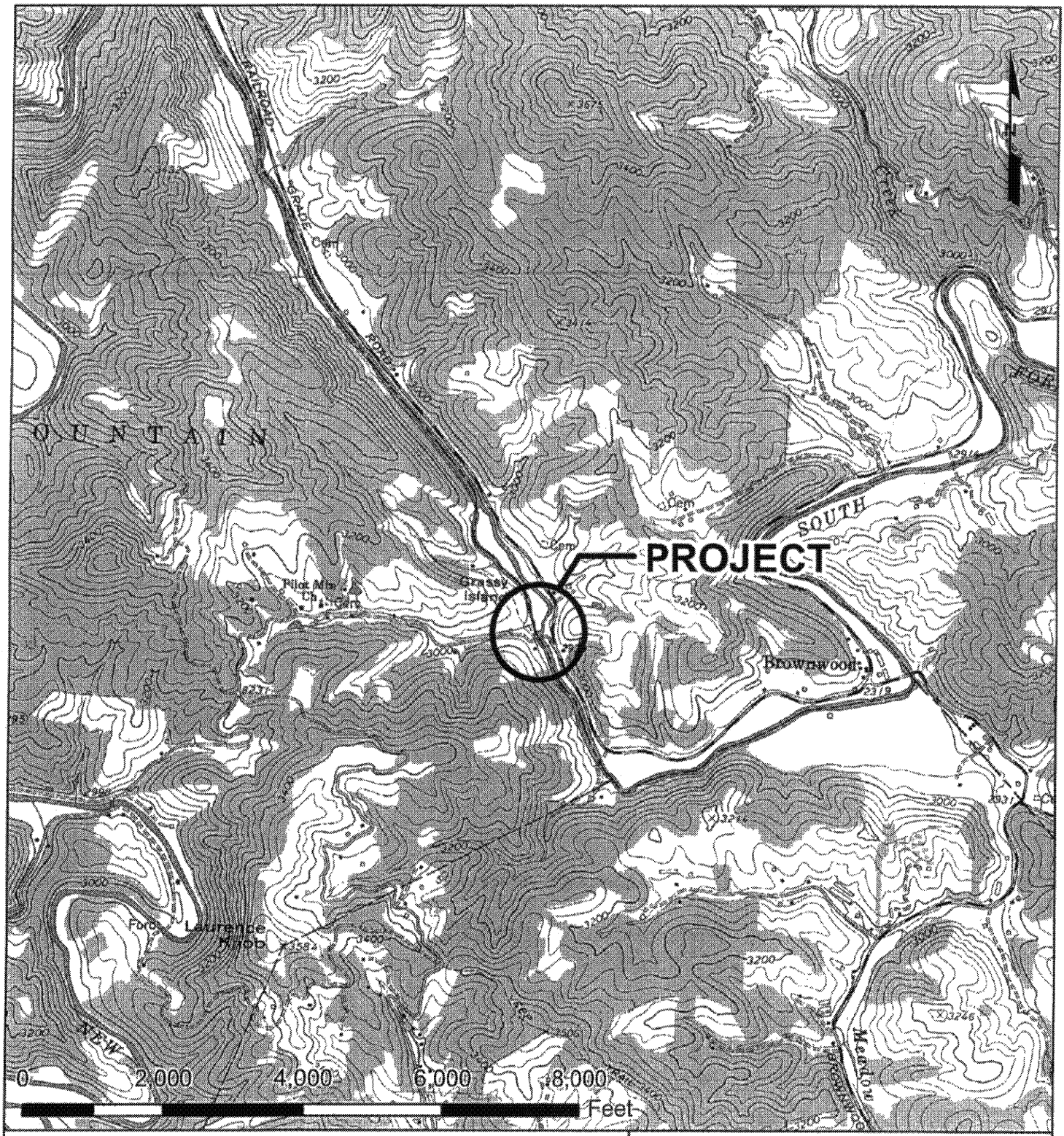
VICINITY MAPS

Permit Drawing
Sheet 1 of 12

NCDOT

DIVISION OF HIGHWAYS
ASHE & WATAUGA COUNTIES
PROJECT: 33361.1.1 (B-3928)
REPLACEMENT OF BRIDGE NO. 334
OVER SOUTH FORK OF NEW RIVER
ON SR 1351

OCTOBER 2008



1 inch equals 2,000 feet

LOCATION

Permit Drawing
Sheet 2 of 12

NCDOT

DIVISION OF HIGHWAYS
ASHE & WATAUGA COUNTIES
PROJECT: 33361.1.1 (B-3928)
REPLACEMENT OF BRIDGE NO. 334
OVER SOUTH FORK OF NEW RIVER
ON SR 1351

OCTOBER 2008

Source: USGS 7.5 Minute Todd, Garner, NC

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	WETLAND IMPACTS: Temp. Fill In Wetlands (ac)	WETLAND IMPACTS: Excavation in Wetlands (ac)	WETLAND IMPACTS: Mechanized Clearing in Wetlands (ac)	WETLAND IMPACTS: Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	SURFACE WATER IMPACTS: Temp. SW impacts (ac)	SURFACE WATER IMPACTS: Existing Channel Impacts Permanent (ft)	SURFACE WATER IMPACTS: Existing Channel Impacts Temp. (ft)	SURFACE WATER IMPACTS: Natural Stream Design (ft)
1	-L- 13+36 - 14+48	Roadway							0.13		80	
TOTALS:					0.00		0.00		0.13		80	

Permanent Pier Impact= 60 sq.ft.

Permit Drawing
Sheet 3 of 12

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ASHE AND WATAUGA COUNTIES
PROJECT: 33361.1.1 (B-3928)

BRIDGE REPLACEMENT # 334 OVER
SOUTH FORK NEW RIVER ON SR 1351

ATN Revised 3/31/05
R:/z-misc/Hydro/Permits/New_wetland_Summary.xls

PROP. NO.	PROPERTY OWNER NAME	PROP. OWNER ADDRESS
1	Ethel Jones	6201 Castleford Rd., Todd, NC 28684
2	Todd Community Preservation Organization	P.O. Box 234, Todd, NC 28684

Permit Drawing
Sheet 4 of 12

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

ASHE AND WATAUGA COUNTIES
PROJECT: 33361.1.1 (B-3928)

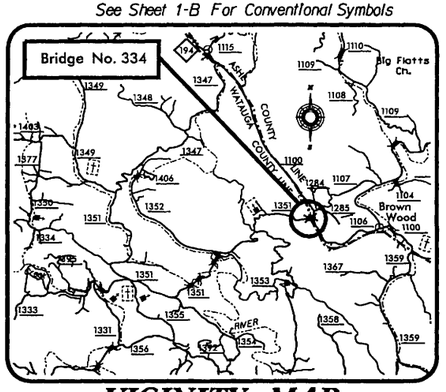
BRIDGE REPLACEMENT # 334 OVER
SOUTH FORK NEW RIVER ON SR 1351

R:/z-misc/Hydro/Permits/Wetprop.xls

PROJECT: B-3928

CONTRACT:

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



VICINITY MAP

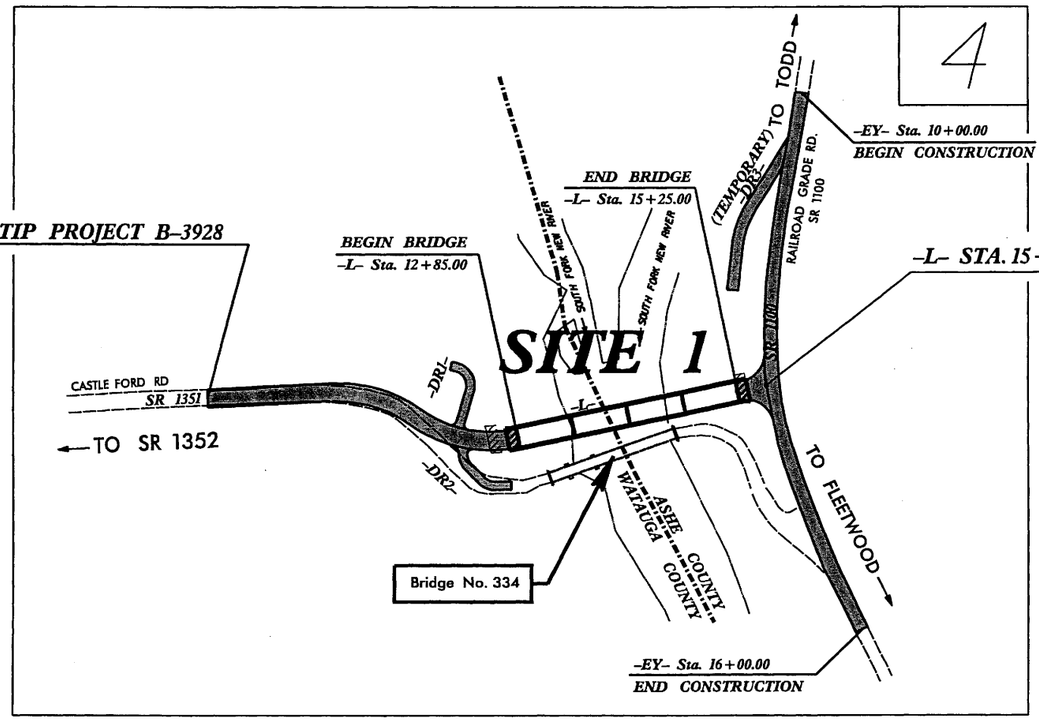
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WATAUGA /ASHE COUNTIES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3928	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33361.1.1	BRZ-1351(1)	PE	
33361.2.2	BRZ-1351(1)	R/W, UTILITY	

LOCATION: *Bridge No. 334 over South Fork New River on SR 1351 (Castle Ford Road).*

TYPE OF WORK: GRADING, DRAINAGE, PAVING & STRUCTURE



Permit Drawing
Sheet 5 of 12

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NOTES: THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

GRAPHIC SCALES

PLANS: 50 0 50 100
PROFILE (HORIZONTAL): 50 0 50 100
PROFILE (VERTICAL): 10 0 10 20

DESIGN DATA

ADT 2008 = 194
ADT 2029 = 330
DHV = 13 %
D = 60 %
* T = 3 %
V = 20 MPH
* (1 % TTST & 2% DUAL)
FUNC CLASS = LOCAL

PROJECT LENGTH

Length Roadway TIP Project B-3928..... 0.070mi.

Length Structure TIP Project B-3928..... 0.045 mi.

Ttotal Length of TIP Project B-3928 ..... 0.115 mi.

PLANS PREPARED BY :
RUMMEL, KLEPPER AND KAHL, LLP
consulting engineers
300 Ridgefield Drive - Suite 350
Raleigh, North Carolina 27609
(919)-878-9560
FOR
DIVISION OF HIGHWAYS

2006 STANDARD SPECIFICATIONS
RIGHT OF WAY DATE: September 19, 2008
LETTING DATE: September 15, 2009

J. T. Peacock, Jr., P.E.
PROJECT ENGINEER

Michael T. Merritt, P.E.
PROJECT DESIGN ENGINEER

NCDOT CONTACT: B. Doug Tayor, P.E.
Roadway Design: Engineering Coordination Section Engineer

HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

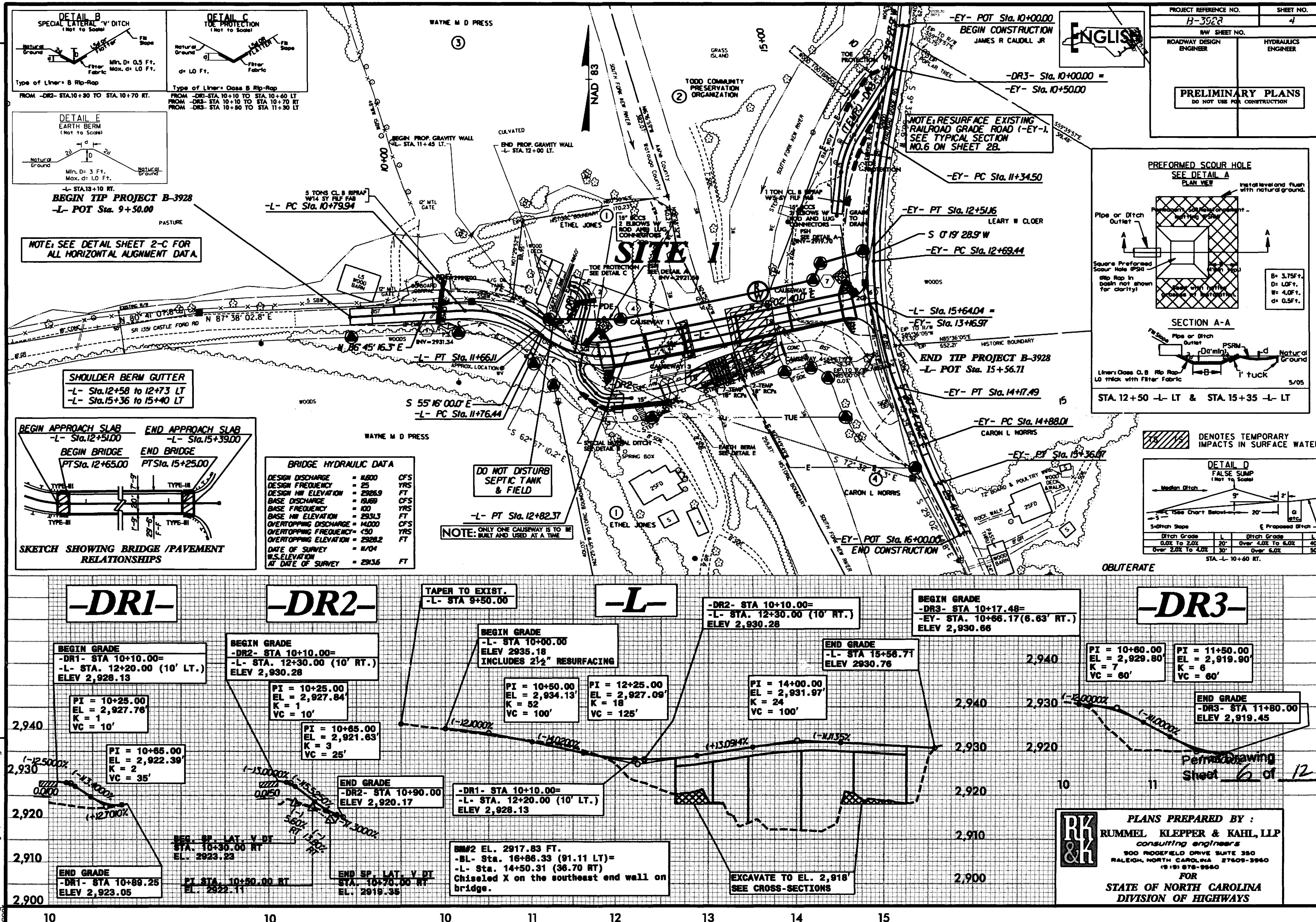
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER *P.E.*

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR *DATE*

09\30\08 152407
r:\highways\b3928_hyd_permit_tsh.dgn


PROJECT REFERENCE NO. B-3928
SHEET NO. 4
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
ENGLISH
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
DETAIL B
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Type of Liner= B Rip-Rap
FROM -DR2- STA.10+30 TO STA. 10+70 RT.
DETAIL C
TOE PROTECTION
(Not to Scale)
Type of Liner= Class B Rip-Rap
FROM -DR1-STA. 10+10 TO STA. 10+60 LT
FROM -DR3- STA 10+10 TO STA 10+70 RT
FROM -DR3- STA 10+80 TO STA 11+30 LT
DETAIL E
EARTH BERM
(Not to Scale)
Min. D= 3 Ft.
Max. d= 1.0 Ft.
-L- STA.13+10 RT.
BEGIN TIP PROJECT B-3928
-L- POT Sta. 9+50.00
NOTE: SEE DETAIL SHEET 2-C FOR ALL HORIZONTAL ALIGNMENT DATA.
SHOULDER BERM GUTTER
-L- Sta.12+58 to 12+73 LT
-L- Sta.15+36 to 15+40 LT
BEGIN APPROACH SLAB -L- Sta.12+51.00
END APPROACH SLAB -L- Sta.15+39.00
BEGIN BRIDGE PT Sta. 12+65.00
END BRIDGE PT Sta. 15+25.00
SKETCH SHOWING BRIDGE /PAVEMENT RELATIONSHIPS
BRIDGE HYDRAULIC DATA
DESIGN DISCHARGE = 11,600 CFS
DESIGN FREQUENCY = 25 YRS
DESIGN HW ELEVATION = 2926.9 FT
BASE DISCHARGE = 19,169 CFS
BASE FREQUENCY = 100 YRS
BASE HW ELEVATION = 2931.3 FT
OVERTOPPING DISCHARGE = 14,000 CFS
OVERTOPPING FREQUENCY = <50 YRS
OVERTOPPING ELEVATION = 2928.2 FT
DATE OF SURVEY = 11/04
W.S. ELEVATION AT DATE OF SURVEY = 2913.6 FT
SITE 1
-EY- POT Sta. 10+00.00 BEGIN CONSTRUCTION
-DR3- Sta. 10+00.00 = -EY- Sta. 10+50.00
NOTE: RESURFACE EXISTING RAILROAD GRADE ROAD (-EY-). SEE TYPICAL SECTION NO.6 ON SHEET 2B.
-EY- PC Sta. 11+34.50
-EY- PT Sta. 12+51.16
S 0°19' 28.9" W
-EY- PC Sta. 12+69.44
-L- Sta. 15+64.04 = -EY- Sta. 13+16.97
END TIP PROJECT B-3928
-L- POT Sta. 15+56.71
-EY- PT Sta. 14+17.49
-EY- PC Sta. 14+88.01
-EY- PT Sta. 15+36.07
-EY- POT Sta. 16+00.00 END CONSTRUCTION
-L- PC Sta. 10+79.94
-L- PT Sta. 11+66.11
S 55°16' 00.0" E
-L- PC Sta. 11+76.44
-L- PT Sta. 12+82.37
DO NOT DISTURB SEPTIC TANK & FIELD
NOTE: ONLY ONE CAUSEWAY IS TO BE BUILT AND USED AT A TIME
WAYNE M D PRESS
TODD COMMUNITY PRESERVATION ORGANIZATION
ETHEL JONES
LEARY W CLOER
CARON L NORRIS
JAMES R CAUDILL JR
PREFORMED SCOUR HOLE
SEE DETAIL A
PLAN VIEW
SECTION A-A
B= 3.75Ft. D= 1.0Ft. W= 4.0Ft. d= 0.5Ft.
STA. 12+50 -L- LT & STA. 15+35 -L- LT
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DETAIL D
FALSE SUMP
(Not to Scale)
STA. -L- 10+60 RT.
-DR1-
-DR2-
-L-
-DR3-
BEGIN GRADE -DR1- STA 10+10.00= -L- STA. 12+20.00 (10' LT.) ELEV 2,928.13
PI = 10+25.00 EL = 2,927.76' K = 1 VC = 10'
PI = 10+65.00 EL = 2,922.39' K = 2 VC = 35'
END GRADE -DR1- STA 10+89.25 ELEV 2,923.05
BEGIN GRADE -DR2- STA 10+10.00= -L- STA. 12+30.00 (10' RT.) ELEV 2,930.28
PI = 10+25.00 EL = 2,927.84' K = 1 VC = 10'
PI = 10+65.00 EL = 2,921.63' K = 3 VC = 25'
END GRADE -DR2- STA 10+90.00 ELEV 2,920.17
BEG. SP. LAT. V DT STA. 10+30.00 RT EL. 2923.23
PI STA. 10+50.00 RT EL. 2922.11
END SP. LAT. V DT STA. 10+70.00 RT EL. 2919.35
TAPER TO EXIST. -L- STA 9+50.00
BEGIN GRADE -L- STA 10+00.00 ELEV 2935.18 INCLUDES 2½" RESURFACING
PI = 10+50.00 EL = 2,934.13' K = 52 VC = 100'
PI = 12+25.00 EL = 2,927.09' K = 18 VC = 125'
-DR1- STA 10+10.00= -L- STA. 12+20.00 (10' LT.) ELEV 2,928.13
-DR2- STA 10+10.00= -L- STA. 12+30.00 (10' RT.) ELEV 2,930.28
PI = 14+00.00 EL = 2,931.97' K = 24 VC = 100'
END GRADE -L- STA 15+56.71 ELEV 2930.76
BM#2 EL. 2917.83 FT. -BL- Sta. 16+86.33 (91.11 LT)= -L- Sta. 14+50.31 (36.70 RT) Chiseled X on the southeast end wall on bridge.
EXCAVATE TO EL. 2,918' SEE CROSS-SECTIONS
BEGIN GRADE -DR3- STA 10+17.48= -EY- STA. 10+66.17(6.63' RT.) ELEV 2,930.66
PI = 10+60.00 EL = 2,929.80' K = 7 VC = 60'
PI = 11+50.00 EL = 2,919.90' K = 6 VC = 60'
END GRADE -DR3- STA 11+80.00 ELEV 2,919.45
Permit Drawing Sheet 6 of 12
PLANS PREPARED BY : RUMMEL KLEPPER & KAHL, LLP consulting engineers 900 RIDGEFIELD DRIVE SUITE 350 RALEIGH, NORTH CAROLINA 27609-3960 (919) 878-9560 FOR STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-3928	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ENGLISH

DETAIL B
SPECIAL LATERAL "V" DITCH
(Not to Scale)

Type of Liners B Rip-Rap
FROM -DR2- STA.10+30 TO STA. 10+70 RT.

DETAIL C
TOE PROTECTION
(Not to Scale)

Type of Liner: Class B Rip-Rap
FROM -DR1- STA. 10+10 TO STA. 10+60 LT
FROM -DR3- STA 10+10 TO STA 10+70 RT
FROM -DR3- STA 10+50 TO STA 11+30 LT

DETAIL E
EARTH BERM
(Not to Scale)

-L- STA.13+10 RT.

BEGIN TIP PROJECT B-3928
-L- POT Sta. 9+50.00

NOTE: SEE DETAIL SHEET 2-C FOR ALL HORIZONTAL ALIGNMENT DATA.

SHOULDER BERM GUTTER
-L- Sta.12+58 to 12+73 LT
-L- Sta.15+36 to 15+40 LT

BEGIN APPROACH SLAB
-L- Sta.12+51.00
BEGIN BRIDGE
PT Sta. 12+65.00
END APPROACH SLAB
-L- Sta.15+39.00
END BRIDGE
PT Sta. 15+25.00

SKETCH SHOWING BRIDGE /PAVEMENT RELATIONSHIPS

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 4800	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 2985.9	FT
BASE DISCHARGE	= 1989	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 2983.3	FT
OVERTOPPING DISCHARGE	= 14000	CFS
OVERTOPPING FREQUENCY	= <50	YRS
OVERTOPPING ELEVATION	= 2988.2	FT
DATE OF SURVEY	= N/A	
W.S. ELEVATION W/ DATE OF SURVEY	= 2936	FT

DO NOT DISTURB SEPTIC TANK & FIELD

NOTE: ONLY ONE CAUSEWAY IS TO BE BUILT AND USED AT A TIME

-L- PT Sta. 12+82.37

-L- PC Sta. 10+79.94

BEGIN PROP. GRAVITY WALL -L- STA. 11+45 LT.

END PROP. GRAVITY WALL -L- STA. 12+00 LT.

5 TONS CL.B RIPRAP W/14 ST FILTER FAB

1 TON CL.B RIPRAP W/6 ST FILTER FAB

15" RCCS 2 ELBOWS W/ ROD AND LUG CONNECTORS

FSH SEE DETAIL A INV=2917.70

SITE 1

TOE PROTECTION SEE DETAIL C

SEE DETAIL A INV=2921.09

CAUSEWAY 1 40.0' R/W

CAUSEWAY 2 40.0' R/W

CAUSEWAY 3 40.0' R/W

-L- PT Sta. 11+66.11

S 55° 18' 00.0" E
-L- PC Sta. 11+76.44

-L- Sta. 15+64.04 =
-EY- Sta. 13+45.97

END TIP PROJECT B-3928
-L- POT Sta. 15+56.71

-EY- PT Sta. 14+17.49

-EY- PC Sta. 14+88.01

-EY- PT Sta. 15+36.07

-EY- POT Sta. 16+00.00
END CONSTRUCTION

-DR3- Sta. 10+00.00 =
-EY- Sta. 10+50.00

-EY- POT Sta. 10+00.00
BEGIN CONSTRUCTION
JAMES R CAUDILL JR

NOTE: RESURFACE EXISTING RAILROAD GRADE ROAD (-EY-). SEE TYPICAL SECTION NO.6 ON SHEET 2B.

-EY- PC Sta. 11+34.50

-EY- PT Sta. 12+51.16

S 01° 19' 28.9" W

-EY- PC Sta. 12+69.44

LEARY M CLDER

TODD COMMUNITY PRESERVATION ORGANIZATION

GRASS ISLAND

TOE PROTECTION

WAYNE M D PRESS

ETHEL JONES

CARON L NORRIS

HISTORIC BOUNDARY

SOUTH FORK NEW RIVER

NAD 83

Watauga County

N 87° 38' 02.8" E

N 80° 41' 01.8" E

N 36° 45' 16.3" E

SR 1551 CASTLE FORD RD

PREFORMED SCOUR HOLE
SEE DETAIL A

PLAN VIEW

Install level and flush with natural ground.

Pipe or Ditch Outlet

Square Preformed Scour Hole (PSH)

Rip Rap in basin not shown for clarity!

Reinforcement - Bottom Mat

Reinforcement - Top Mat

B= 3.75Ft.
D= 1.0Ft.
W= 4.0Ft.
d= 0.5Ft.

SECTION A-A

Pipe or Ditch Outlet

Fill Slope

PSRM

Da'min

d

Natural Ground

Liners: Class G, B Rip Rap 1.0 thick with Filter Fabric

B

1' tuck

5/05

STA. 12+50 -L- LT & STA. 15+35 -L- LT

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DETAIL D
FALSE SUMP
(Not to Scale)

Median Ditch

9'

2'

See Chart Below

20'

5

5-Ditch Slope

℄ Proposed Ditch

Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

STA. -L- 10+60 RT.

OBLITERATE

-DR1-

BEGIN GRADE
-DR1- STA 10+10.00=
-L- STA. 12+20.00 (10' LT.)
ELEV 2,928.13

PI = 10+25.00
EL = 2,927.76'
K = 1
VC = 10'

PI = 10+65.00
EL = 2,922.39'
K = 2
VC = 35'

(-)12.5000%
0.0000
(-)3.2000%
(+)12.7000%

END GRADE
-DR1- STA 10+89.25
ELEV 2,923.05

-DR2-

BEGIN GRADE
-DR2- STA 10+10.00=
-L- STA. 12+30.00 (10' RT.)
ELEV 2,930.28

PI = 10+25.00
EL = 2,927.84'
K = 1
VC = 10'

PI = 10+65.00
EL = 2,921.63'
K = 3
VC = 25'

(-)13.0000%
0.0050
(-)16.5500%
(-)7.3000%
(-)5.601% RT
(-)1.80% RT

END GRADE
-DR2- STA 10+90.00
ELEV 2,920.17

REG. SP. LAT. V DT
STA. 10+30.00 RT
EL. 2923.23

PI STA. 10+50.00 RT
EL. 2922.11

END SP. LAT. V DT
STA. 10+70.00 RT
EL. 2919.35

-L-

TAPER TO EXIST.
-L- STA 9+50.00

BEGIN GRADE
-L- STA 10+00.00
ELEV 2935.18
INCLUDES 2½" RESURFACING

PI = 10+50.00
EL = 2,934.13'
K = 52
VC = 100'

PI = 12+25.00
EL = 2,927.09'
K = 18
VC = 125'

PI = 14+00.00
EL = 2,931.97'
K = 24
VC = 100'

(-)12.0000%
(-)4.0200%
(+)13.0934%
(-)4.1135%

-DR1- STA 10+10.00=
-L- STA. 12+20.00 (10' LT.)
ELEV 2,928.13

-DR2- STA 10+10.00=
-L- STA. 12+30.00 (10' RT.)
ELEV 2,930.28

END GRADE
-L- STA 15+56.71
ELEV 2930.76

BM#2 EL. 2917.83 FT.
-BL- Sta. 16+86.33 (91.11 LT)=
-L- Sta. 14+50.31 (36.70 RT)
Chiseled X on the southeast end wall on bridge.

EXCAVATE TO EL. 2,918'
SEE CROSS-SECTIONS

-DR3-

BEGIN GRADE
-DR3- STA 10+17.48=
-EY- STA. 10+66.17(6.63' RT.)
ELEV 2,930.66

PI = 10+60.00
EL = 2,929.80'
K = 7
VC = 60'

PI = 11+50.00
EL = 2,919.90'
K = 6
VC = 60'

(-)12.0000%
(-)4.0000%
(-)4.5000%

END GRADE
-DR3- STA 11+80.00
ELEV 2,919.45

2,940
2,930
2,920
2,910
2,900

10 11 12 13 14 15

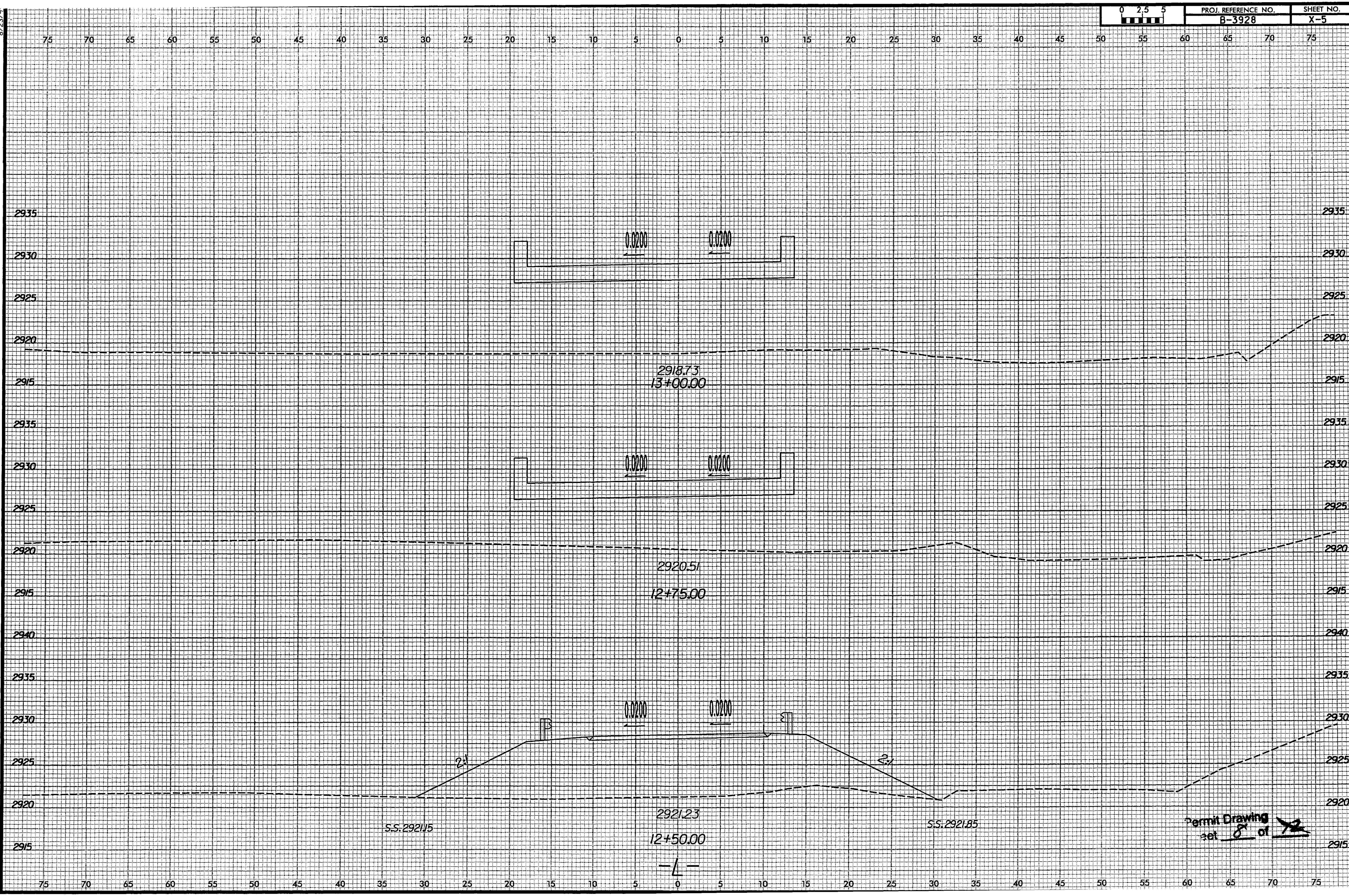
Permit Drawing Sheet 12 of 12

RK&K

PLANS PREPARED BY :
RUMMEL KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

REVISIONS

RIVHydraulics\b3928_hyd_prm_con_wet04.dgn 08/28/09 14:21:56


PROJ. REFERENCE NO.
B-3928
SHEET NO.
X-5
0.0200
0.0200
2918.73
13+00.00
0.0200
0.0200
2920.51
12+75.00
0.0200
0.0200
2:1
2:1
S.S.2921.15
2921.23
12+50.00
S.S.2921.85
-L-
Permit Drawing
Sheet 8 of 12

8/23/95

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-3928	X-6

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

2935
2930
2925
2920
2915
2910
2905

0.0200 0.0200

2912.57
13+50.00

0.0200 0.0200

2915.64
13+25.00

—L—

Permit Drawing
Sheet 2 of 17

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

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mcook

8/23/91

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-3928	X-7

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

2940
2935
2930
2925
2920
2915
2910
2905

0.0200 0.0200

2909.78
14+00.00

0.0200 0.0200

2911.07
13+75.00

-L-

Permit Drawing
Sheet 10 of 12

09\30\08 15:14:56
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mcook

8/23/95

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-3928	X-8

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

2935 2930 2925 2920 2915 2910 2905

0.0200 0.0200

2919.41
14+75.00

0.0200 0.0200

2913.82
14+50.00

0.0200 0.0200

2911.78
14+25.00

-L-

Permit Drawing
Sheet 11 of 12

8/23/05

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-3928	X-9

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

2940
2935
2930
2925
2920
2915

S.S. 2930.30

0.0200 0.0200

2%

2928.85

S.S. 2924.87

15+50.00

0.0200 0.0200

2930
2925
2920
2915

2918.24
15+25.00

0.0200 0.0200

2930
2925
2920
2915

2918.81
15+00.00

Permit Drawing
Sheet 12 of 12

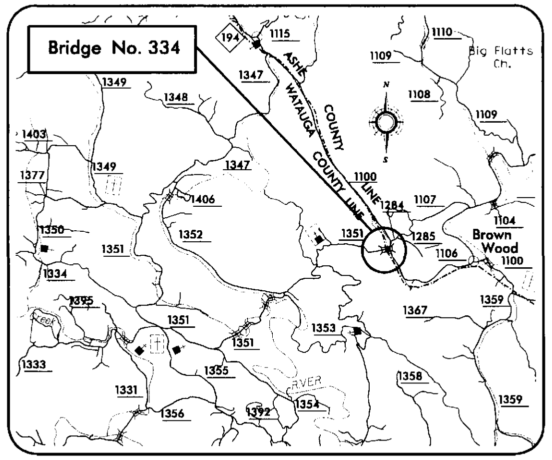
-L-

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

09\30\08 15:15:20
r:\Roadway\Xsc\b3928_rdy_xpl1.dgn
mcook

CONTRACT: PROJECT: B-3928

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WATAUGA /ASHE COUNTIES

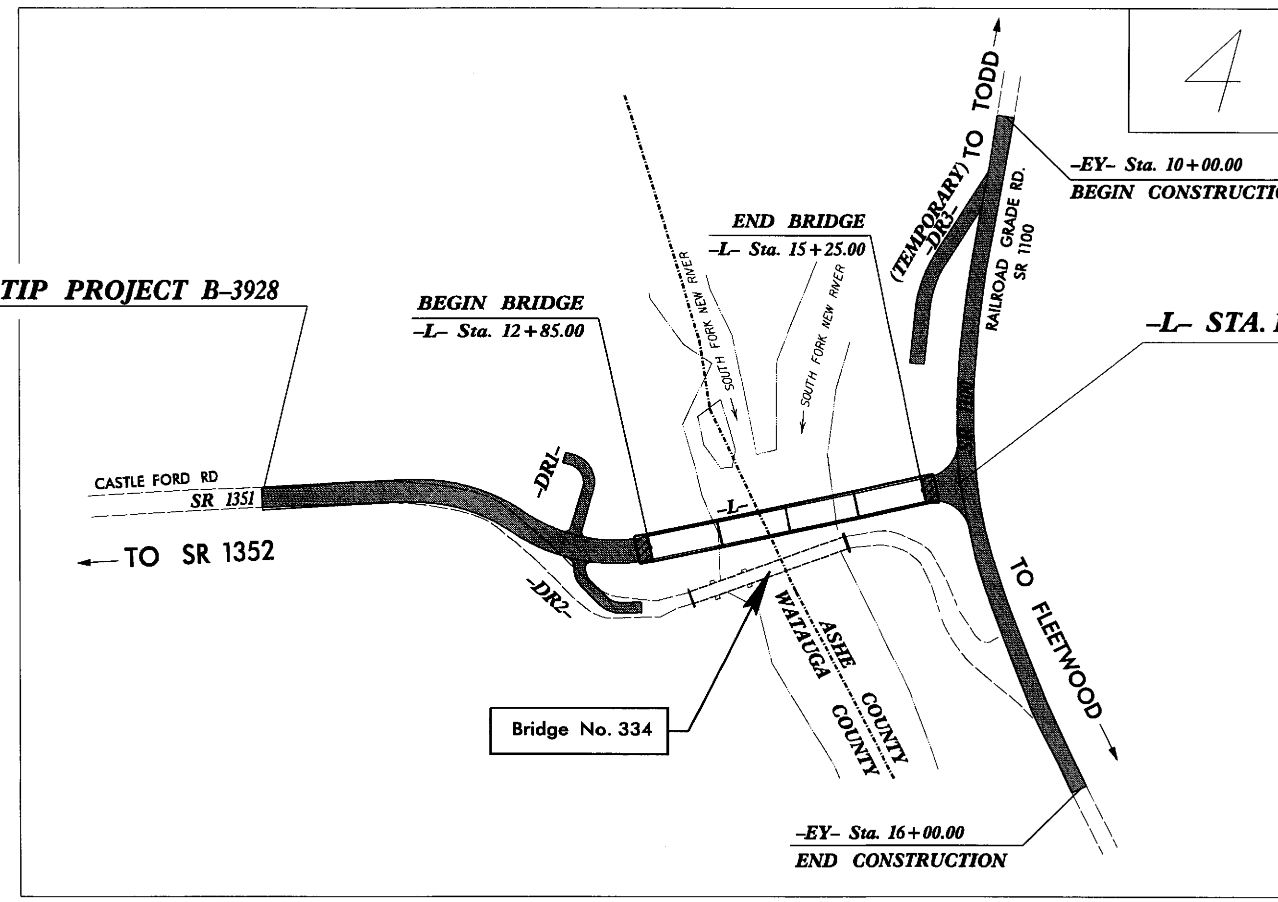
LOCATION: Bridge No. 334 over South Fork New River on SR 1351 (Castle Ford Road).

TYPE OF WORK: GRADING, DRAINAGE, PAVING & STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3928	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
33361.1.1	BRZ-1351(1)	PE
33361.2.2	BRZ-1351(1)	R/W, UTILITY

NAD 83



PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NOTES: THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

GRAPHIC SCALES

50 0 50 100 PLANS
50 0 50 100 PROFILE (HORIZONTAL)
10 0 10 20 PROFILE (VERTICAL)

DESIGN DATA

ADT 2008 = 194
ADT 2029 = 330
DHV = 13 %
D = 60 %
* T = 3 %
V = 20 MPH
* (1 % TTST & 2% DUAL)
FUNC CLASS = LOCAL

PROJECT LENGTH

Length Roadway TIP Project B-3928....... 0.070mi.

Length Structure TIP Project B-3928....... 0.045 mi.

Ttotal Length of TIP Project B-3928 .... 0.115 mi.

PLANS PREPARED BY :
RUMMEL, KLEPPER AND KAHL, LLP
consulting engineers
900 Ridgefield Drive - Suite 350
Raleigh, North Carolina 27609
(919)-878-9560
FOR
DIVISION OF HIGHWAYS

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: September 19, 2008

LETTING DATE: September 15, 2009

J. T. Peacock, Jr., P.E.
PROJECT ENGINEER

Michael T. Merritt, P.E.
PROJECT DESIGN ENGINEER

NCDOT CONTACT: B. Doug Tayor, P.E.
Roadway Design: Engineering Coordination Section Engineer

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR DATE

COMPUTED BY:	DATE:
CHECKED BY:	DATE:

PROJECT REFERENCE NO.	SHEET NO.
B-4010	1-A

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

INDEX OF SHEETS

PROJECT REFERENCE NO.	SHEET NO.
B-3928	1B

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing High Quality Wetland Boundary
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB

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
- River Basin Buffer — RBB
- Flow Arrow
- Disappearing Stream
- Spring
- Swamp Marsh
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

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

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite Marker — RW
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Utility Easement — PUE

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Wheel Chair Ramp — WCR
- Curb Cut for Future Wheel Chair Ramp — CCFR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equaility Symbol
- Pavement Removal

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

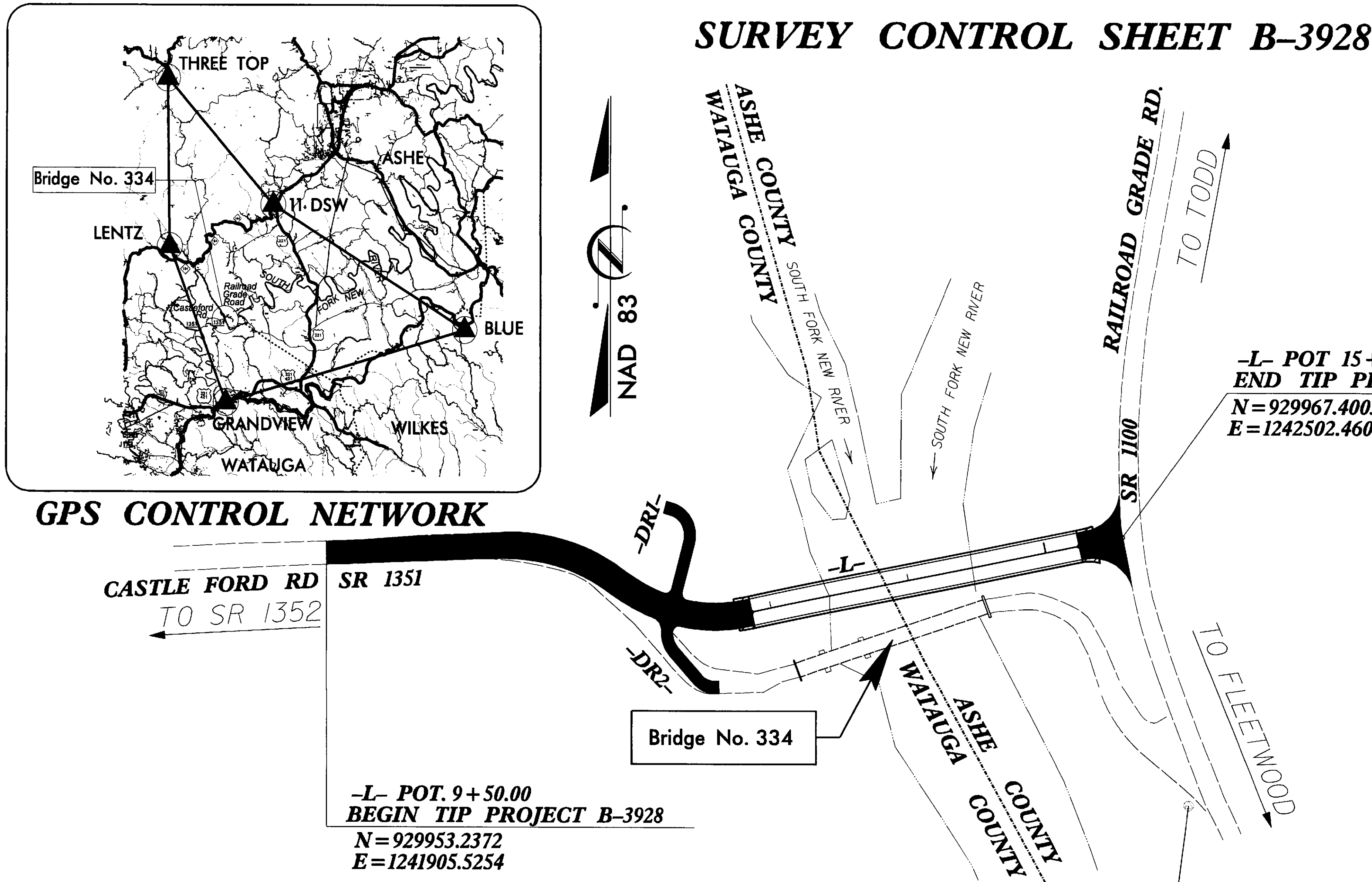
- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- Recorded SS Forced Main Line — FSS
- Designated SS Forced Main Line (S.U.E.*) — FSS

MISCELLANEOUS:

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

PROJECT REFERENCE NO.	SHEET NO.
B-3928	1C
Location and Surveys	

SURVEY CONTROL SHEET B-3928



GPS CONTROL NETWORK

NOTES:

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

THE FILES TO BE FOUND ARE AS FOLLOWS:
TIP B3928_LS_CONTROL_051011.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.

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
3	(BL-3)	929872.1098	1241224.3143	2962.30'	OUTSIDE PROJECT LIMITS	
4	(BL-4)	929955.6476	1241733.6404	2940.16'	OUTSIDE PROJECT LIMITS	
5	(BL-5)	929968.4324	1242043.2806	2932.26'	10+87.62	10.10' LT
6	(BL-6)	929852.6292	1242269.8953	2918.38'	13+13.38	64.10' RT
2	(GPS B3928-2)	929766.5960	1242543.5640	2930.00'	15+63.29	204.96' RT

BY

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
7	(BY-7)	930328.6317	1242546.5874	2931.54'	OUTSIDE PROJECT LIMITS	
8	(BY-8)	929990.2324	1242489.6272	2929.93'	15+56.81	24.80' LT
10	(GPS B3928-2)	929766.5960	1242543.5640	2930.00'	15+63.29	204.96' RT
9	(BY-9)	929258.1935	1242825.9072	2928.73'	OUTSIDE PROJECT LIMITS	
1	(GPS B3928-1)	928870.5898	1243200.1780	2926.97'	OUTSIDE PROJECT LIMITS	

BM*1 ELEVATION = 2955.91'
N 929875 E 1241500
OUTSIDE PROJECT LIMITS
8" SPIKE IN THE ROOT OF 18" WHITE PINE

BM*2 ELEVATION = 2917.83'
N 929907 E 1242398
L STATION 14+50 37' RIGHT
CHISELED X ON THE SOUTHEAST END WALL ON BRIDGE (RM22)

BM*3 ELEVATION = 2932.31'
N 930297 E 1242561
OUTSIDE PROJECT LIMITS
8" SPIKE IN ROOT OF 15' LOCUST

NC DOT GPS STATION B3928-2
LOCALIZED PROJECT COORDINATES
N=929766.5960
E=1242543.5640

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B3928-1"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 928870.5898(ft) EASTING: 1243000.1780(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99989964
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B3928-1" TO -L- L STATION 9+50.00 IS
S 45°18'57" E 1539.61'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NC DOT GPS STATION B3928-1
LOCALIZED PROJECT COORDINATES
N=928870.5898
E=1243000.1780

NOTE: DRAWING NOT TO SCALE

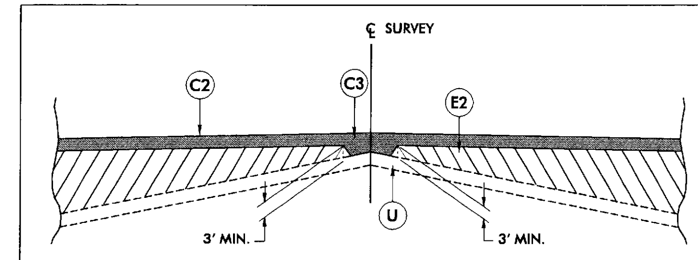
PROJECT REFERENCE NO.	SHEET NO.
B-3928	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

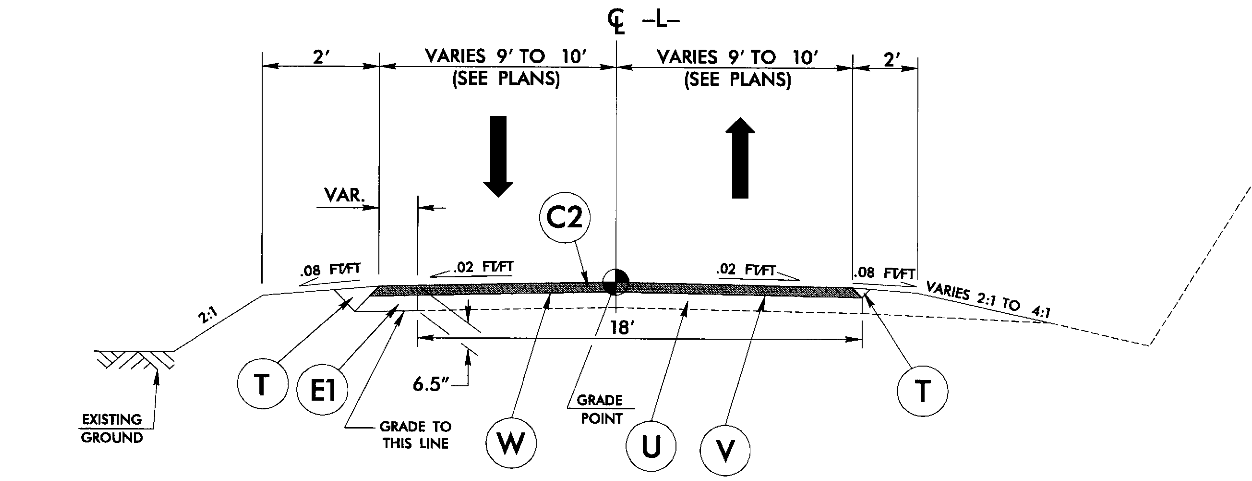
PAVEMENT SCHEDULE

ITEM	DESCRIPTION	ITEM	DESCRIPTION
C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.	J1	PROP. 6" AGGREGATE BASE COURSE
C2	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 2 LAYERS.	T	EARTH MATERIAL
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT TO EXCEED 1.5" IN DEPTH.	U	EXISTING PAVEMENT
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	V	VARIABLE MILLING
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 GREATER THAN 5.5" IN DEPTH OR LESS THAN 3" IN DEPTH.	W	WEDGING (SEE DETAIL)

NOTE: ALL PAVEMENT EDGE SLOPES ARE 1:1

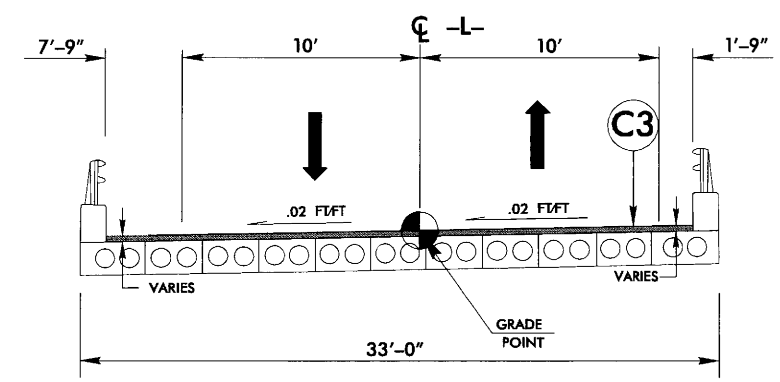


Detail Showing Method of Wedging



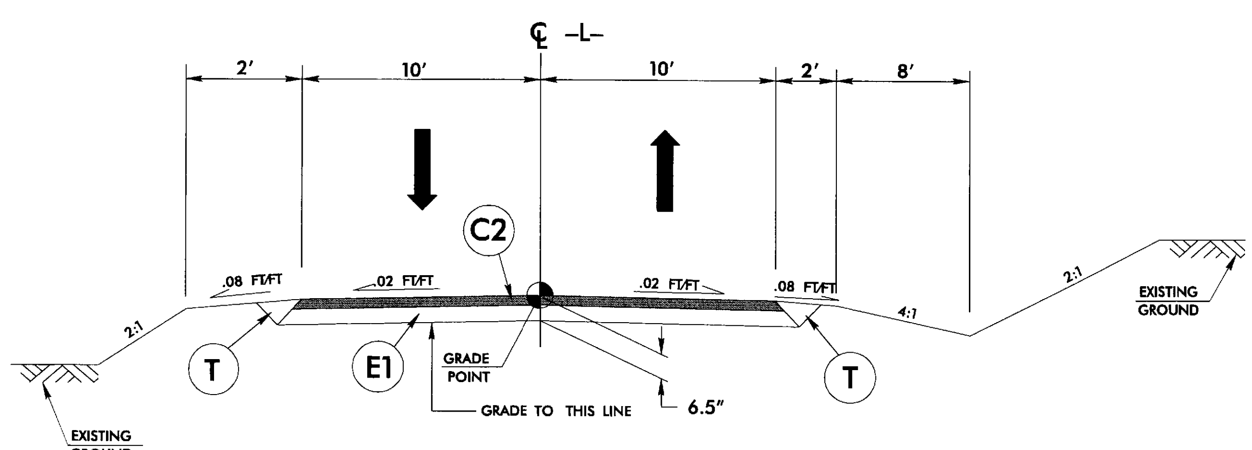
TYPICAL SECTION No. 1

USE TYPICAL SECTION No. 1
-L- STA. 9+50.00 TO 11+50.00



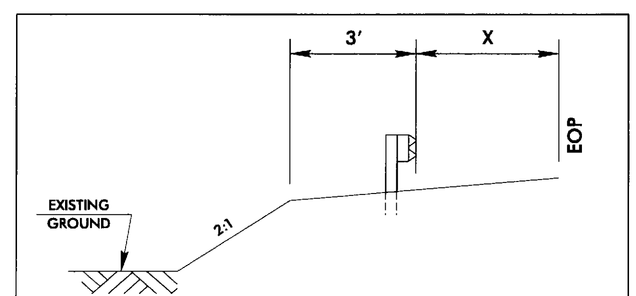
TYPICAL SECTION No. 3

USE TYPICAL SECTION No. 3
-L- STA. 12+85.00 TO 15+25.00



TYPICAL SECTION No. 2

USE TYPICAL SECTION No. 2
-L- STA. 11+50.00 TO 12+85.00 (Begin Bridge)
-L- STA. 15+25.00 (End Bridge) TO 15+56.71



X=2' : -L- STA. 12+43 TO 12+75 RT. (BRIDGE)
X=4' : -L- STA. 10+32 TO 12+00 LT.
X=7'-9' : -L- STA. 12+40 TO 12+78 LT. (BRIDGE)

DETAIL FOR PLACEMENT OF PROPOSED GUARDRAIL

Note:
For Typical Sections 1, 2, 3, 4 & 6, place top 1.5" layer of C2 Asphalt after completion of all construction.

PLANS PREPARED BY :
RUMMEL KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

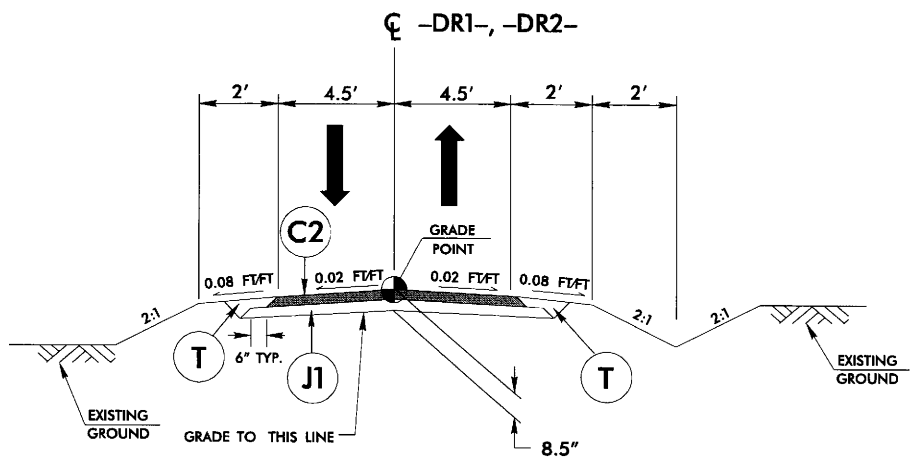
PROJECT REFERENCE NO.	SHEET NO.
B-3928	2B
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PAVEMENT SCHEDULE

ITEM	DESCRIPTION	ITEM	DESCRIPTION
C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.	J1	PROP. 6" AGGREGATE BASE COURSE
C2	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 2 LAYERS.	T	EARTH MATERIAL
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT TO EXCEED 1.5" IN DEPTH.	U	EXISTING PAVEMENT
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	V	VARIABLE MILLING
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 GREATER THAN 5.5" IN DEPTH OR LESS THAN 3" IN DEPTH.	W	WEDGING (SEE DETAIL)

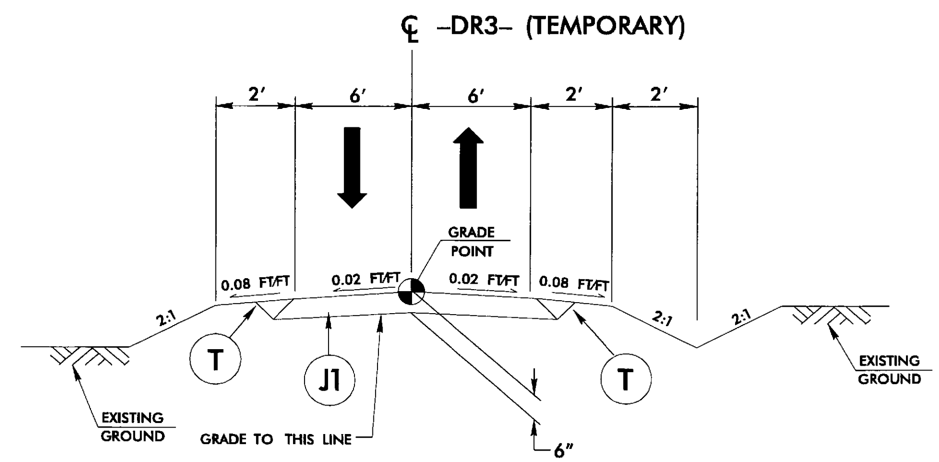
NOTE: ALL PAVEMENT EDGE SLOPES ARE 1:1



TYPICAL SECTION No. 4

USE TYPICAL SECTION No. 4

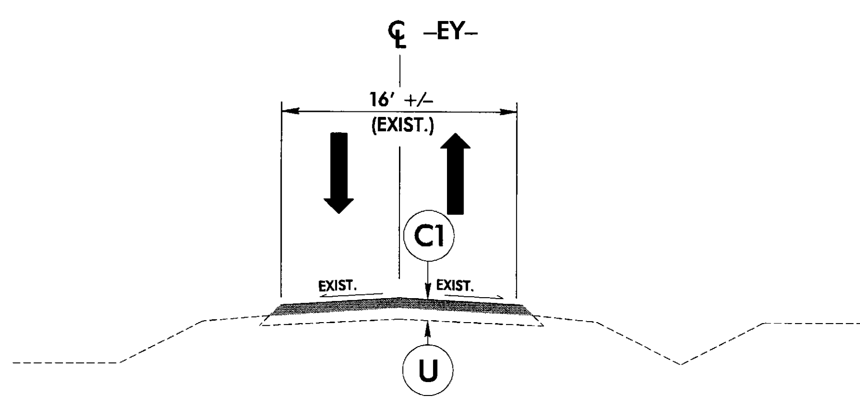
-DR1- STA. 10+10.00 TO 10+89.25
-DR2- STA. 10+10.00 TO 10+80.00



TYPICAL SECTION No. 5

USE TYPICAL SECTION No. 5

-DR3- STA. 10+20.00 TO 11+80.00



TYPICAL SECTION No. 6

USE TYPICAL SECTION No. 6

-DR3- STA. 10+00.00 TO 16+00.00

Note:
For Typical Sections 1, 2, 3, 4 & 6, place top 1.5" layer of C2 Asphalt after completion of all construction.

PLANS PREPARED BY :
RUMMEL KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-3928	2-C

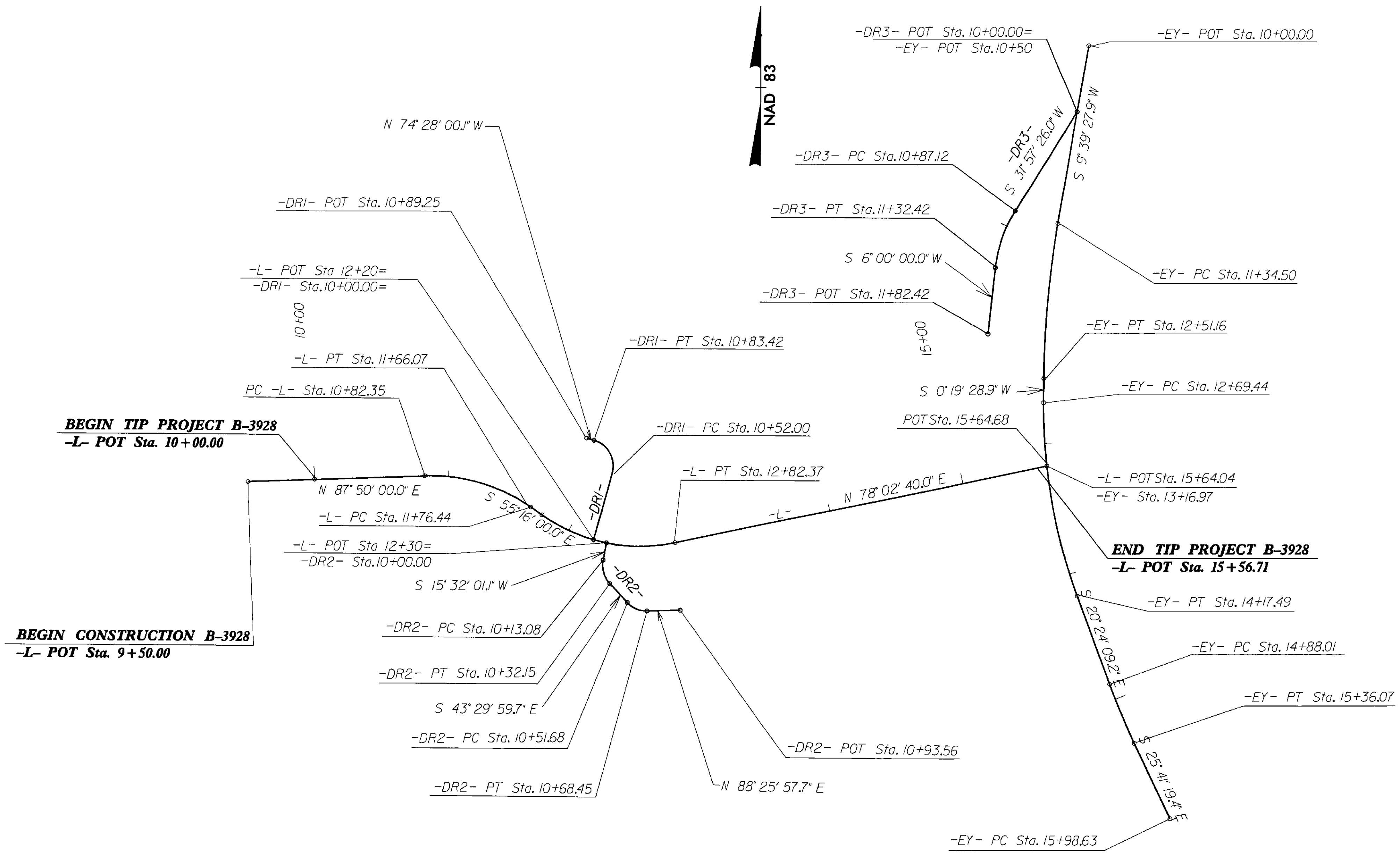
R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

DETAIL OF THE ALIGNMENTS AND CURVE DATA FOR -DR1-, -DR2-, and -DR3-



-EY-

PI Sta 11+92.96	PI Sta 13+44.29	PI Sta 15+12.06
Δ = 9° 19′ 59.1″ (LT)	Δ = 20° 43′ 38.1″ (LT)	Δ = 5° 17′ 10.2″ (LT)
D = 8° 00′ 00.0″	D = 14° 00′ 00.0″	D = 11° 00′ 00.0″
L = 116.66′	L = 148.05′	L = 48.06′
T = 58.46′	T = 74.84′	T = 24.05′
R = 716.20′	R = 409.26′	R = 520.87′
Se = Exist.	Se = Exist.	Se = Exist.

-L-

PI Sta 11+24.68	PI Sta 12+32.54
Δ = 37° 58′ 43.7″ (RT)	Δ = 46° 41′ 20.0″ (LT)
D = 44° 04′ 25.2″	D = 44° 04′ 25.2″
L = 86.17′	L = 105.93′
T = 44.74′	T = 56.11′
R = 130.00′	R = 130.00′
Se = 0.02	Se = 0.02
Runoff = See Plans	Runoff = See Plans

-DR1-

PI Sta 10+72.00
Δ = 90° 00′ 01.2″ (LT)
D = 286° 28′ 44.0″
L = 31.42′
T = 20.00′
R = 20.00′
Se = NC

-DR2-

PI Sta 10+23.41	PI Sta 10+60.59
Δ = 54° 37′ 34.3″ (LT)	Δ = 48° 04′ 02.5″ (LT)
D = 286° 28′ 44.0″	D = 286° 28′ 44.0″
L_o = 19.07′	L = 16.78′
T^o = 10.33′	T = 8.92′
R = 20.00′	R = 20.00′
Se = NC	Se = NC

-DR3-

PI Sta 11+10.17
Δ = 25° 57′ 26.0″ (LT)
D = 57° 17′ 44.8″
L = 45.30′
T = 23.05′
R = 100.00′
Se = NC

PLANS PREPARED BY :
RK&K
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

COMPUTED BY:	JLB	DATE:	04.14.03
CHECKED BY:	SER	DATE:	04.15.03

PROJECT REFERENCE NO.	SHEET NO.
B-4010	3

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SUMMARY OF QUANTITIES

COMPUTED BY: MTM	DATE: 11/27/2006
CHECKED BY: AMP	DATE: 11/27/2006
REVISED BY:	DATE:

PROJECT REFERENCE NO.	SHEET NO.
B-3928	3-A

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
SUMMARY #1					
-L- Sta. 10+00.00 TO 12+85.00	2		1,334	1,332	
-DR1- Sta. 10+10.00 TO 10+89.25	8		271	263	
-DR2- Sta. 10+10.00 TO 10+80.00	6		143	137	
SUMMARY SUBTOTAL	16		1,748	1,732	0
SUMMARY #2					
-L- Sta. 15+25.00 TO 15+56.71	7		83	76	
-DR3- Sta. 10+20.00 TO 10+80.00	8		498	490	
SUMMARY SUBTOTAL	15		581	566	0
PROJECT SUBTOTAL	31		2,329	2,298	
REMOVE TEMPORARY DRIVE (-DR3-)	490				490
EST. LOSS DUE TO CLEARING & GRUBBING					
EARTH WASTE TO REPLACE BORROW					
PROJECT SUBTOTAL	521		2,329	2,298	0
EST. 5% FOR REPLACING TOPSOIL ON BORROW PIT				115	
PROJECT GRAND TOTAL	521			2,413	0
SAY	550			2,500	500

APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, BORROW EXCAVATION, FINE GRADING CLEARING AND GRUBBING, BREAKING OF EXISTING PAVEMENT, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "GRADING".

PAVEMENT REMOVAL

IN SQUARE YARDS

LINE	LT/RT	STATION TO STATION	SQ. YDS
-L-	RT	14+50 TO 15+00	70
		PROJECT TOTAL	70
		SAY	100

SUMMARY OF SHOULDER BERM GUTTER

LINE	LT/RT	STATION TO STATION	FT.
-L-	LT	12+58 TO 12+73	15
-L-	LT	15+36 TO 15+40	4
		PROJECT TOTAL	19
		SAY	25

COMPUTED BY:	DATE:
CHECKED BY:	DATE:
	DATE:

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-3928	3-B

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	TO	TOP ELEVATION / H.S.B.	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 24"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) ✱ UNCOATED 24" .064	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) ✱STD.838.02 CU. YDS. R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	LIN. *FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	M.D.I. TYPE "B" STD. 840.18 OR 840.27	M.D.I. (N.S.) FRAME WITH FLAT GRATE STD. 840.29	M.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	T.B.D.I. STD. 840.35	PREFORMED SCOUR HOLE	ROD & LUG W/SLEEVE GASKET CONNECTORS	CORR. STEEL ELBOWS NO. & SIZE	PIPE REMOVAL LIN.FT.	REMARKS
-L- 10+50	CL	1			2931.3	2929.0		40'																							
-DR1- 10+60	CL	2										24'																			
-L- 12+33	LT	3		2927.9											1							1	1								
-L- 12+33	LT	3	4		2925.2	2921.5			24'																	1	2	2@24			
-DR2- 11+00	RT	5								64'																					
-L- 15+43	LT	6		2930.6											1							1	1								
-L- 15+43	LT	6	7		2927.8	2919.7			16'																	1	2	2@24			
GRAND TOTAL:								40'	40'	64'		24'			2							2	2			2	4	4@24			
								52'	52'	68'		28'			2							2	2			2	4	4@24			

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
M.D.I.	MEDIAN DROP INLET
M.D.I. (N.S.)	MEDIAN DROP INLET (NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUCTION BOX
H.S.B.	HAZARDOUS SPILL BASIN

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.

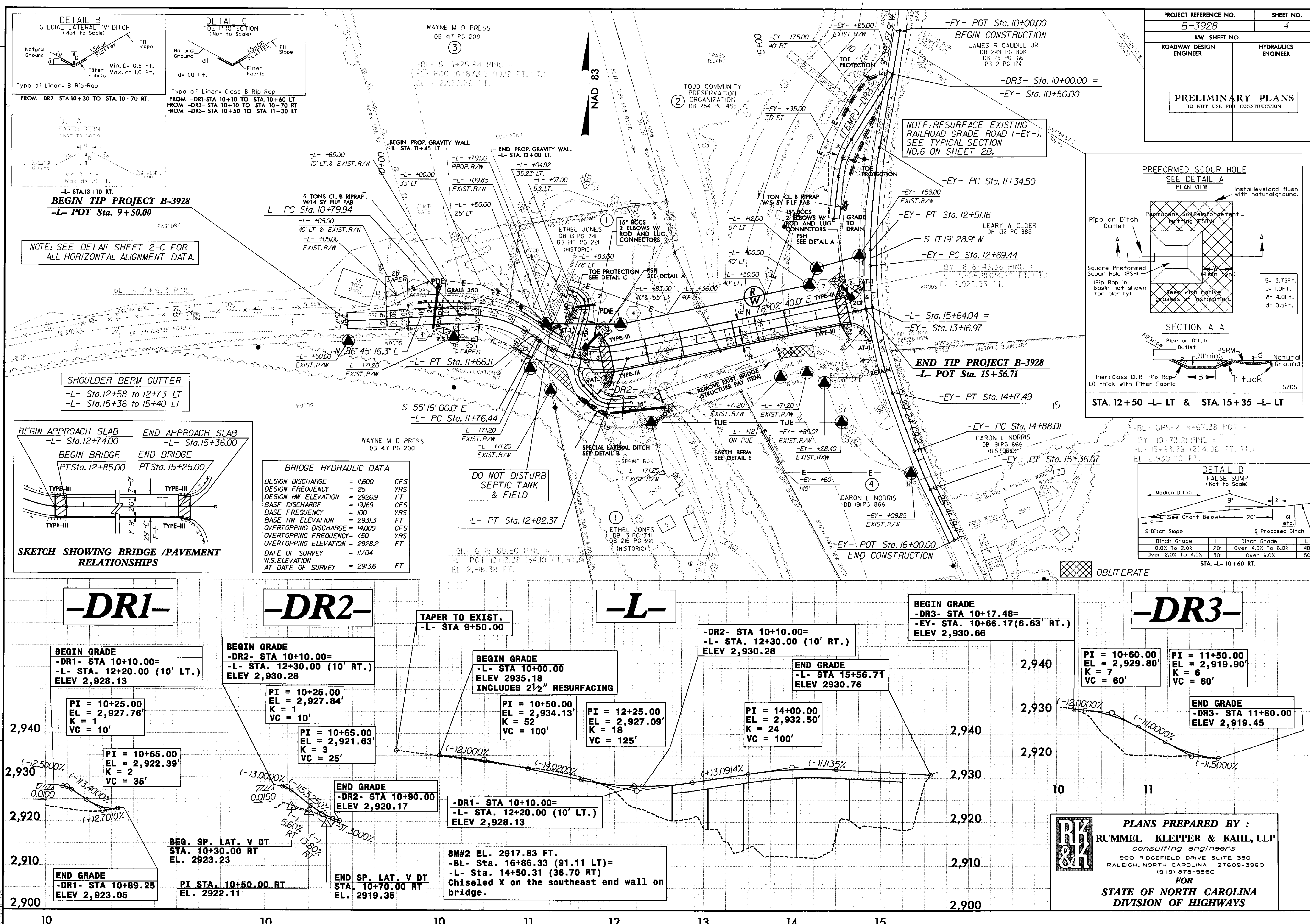
GUARDRAIL SUMMARY

W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS III MOD	III	GRAU 350	B-77	XIII	CAT-1	VI MOD	BIC	AT-1	IMPACT ATTENUATOR TYPE 350 EA	G	NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
-L-	10+37.5	12+00	LT.	162.5'													1													
-L-	12+00		LT.		37.5'																		1							
-L-	12+37		LT.		37.5'																		1							
-L-	12+37	12+62.5	LT.	25'												1														
-L-	15+25	15+60	LT.		37.5'											1							1							
-L-	15+41.5		RT.		37.5'																		1							
-L-	15+41.5	12+66.5	RT.	25'												1														
-L-	15+25	15+62.5	RT.		37.5'											1							1							
			SUB-TOTALS:	212.5'	187.5'																									
LESS ANCHOR DEDUCTIONS:		GRAU 350	1 @ 50'	-50'																										
		TYPE III	4 @ 18.75'	-75'																										
		AT-1	5 @ 6.25'		-31.25'																									
			ANCHOR TOTAL DEDUCTION:	-125'	-31.25'																									
			GRAND TOTALS:	87.5'	156.25'																									
			SAY:	100'	175'	ADDITIONAL GUARDRAIL POSTS: 5										4	1						5							

09/16/08 15:30:31
r:\roadway\proj\b3928_rdy_sum.dgn

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

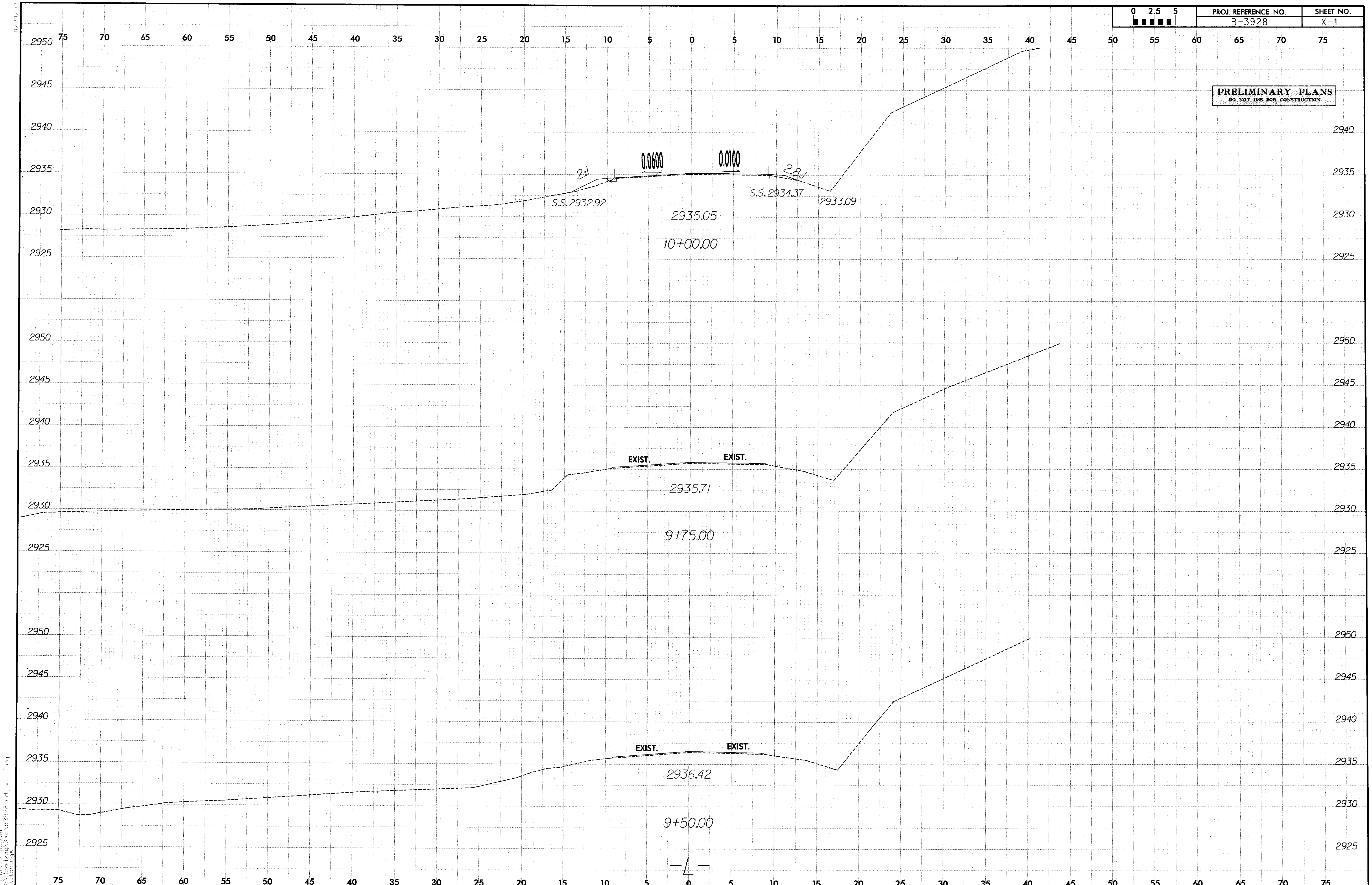

DETAIL B
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Type of Liner= B Rip-Rap
FROM -DR2- STA.10+30 TO STA. 10+70 RT.
DETAIL C
TOE PROTECTION
(Not to Scale)
Type of Liner= Class B Rip-Rap
FROM -DR1-STA. 10+10 TO STA. 10+60 LT
FROM -DR3- STA 10+10 TO STA 10+70 RT
FROM -DR3- STA 10+50 TO STA 11+30 LT
DETAIL E
EARTH BERM
-L- STA.13+10 RT.
BEGIN TIP PROJECT B-3928
-L- POT Sta. 9+50.00
NOTE: SEE DETAIL SHEET 2-C FOR ALL HORIZONTAL ALIGNMENT DATA.
SHOULDER BERM GUTTER
-L- Sta.12+58 to 12+73 LT
-L- Sta.15+36 to 15+40 LT
BEGIN APPROACH SLAB -L- Sta.12+74.00
END APPROACH SLAB -L- Sta.15+36.00
BEGIN BRIDGE PT Sta. 12+85.00
END BRIDGE PT Sta. 15+25.00
SKETCH SHOWING BRIDGE /PAVEMENT RELATIONSHIPS
WAYNE M D PRESS DB 417 PG 200
NAD 83
TODD COMMUNITY PRESERVATION ORGANIZATION DB 254 PG 485
ETHEL JONES DB 131 PG 741 DB 216 PG 221 (HISTORIC)
DO NOT DISTURB SEPTIC TANK & FIELD
-L- PT Sta. 12+82.37
-L- PC Sta. 10+79.94
-L- PT Sta. 11+66.11
-L- PC Sta. 11+76.44
N 86° 45' 16.3" E
S 55° 16' 00.0" E
N 78° 02' 40.0" E
-EY- POT Sta. 10+00.00
BEGIN CONSTRUCTION
JAMES R CAUDILL JR DB 248 PG 808 DB 75 PG 166 PB 2 PG 174
-DR3- Sta. 10+00.00 = -EY- Sta. 10+50.00
NOTE: RESURFACE EXISTING RAILROAD GRADE ROAD (-EY-). SEE TYPICAL SECTION NO.6 ON SHEET 2B.
-EY- PC Sta. 11+34.50
-EY- PT Sta. 12+51.16
LEARY W CLOER DB 132 PG 988
S 0° 19' 28.9" W
-EY- PC Sta. 12+69.44
-L- Sta. 15+64.04 = -EY- Sta. 13+16.97
END TIP PROJECT B-3928
-L- POT Sta. 15+56.71
-EY- PT Sta. 14+17.49
-EY- PC Sta. 14+88.01
CARON L NORRIS DB 191 PG 866 (HISTORIC)
-EY- PT Sta. 15+36.07
-EY- POT Sta. 16+00.00
END CONSTRUCTION
PREFORMED SCOUR HOLE
SEE DETAIL A
PLAN VIEW
SECTION A-A
B= 3.75Ft. D= 1.0Ft. W= 4.0Ft. d= 0.5Ft.
STA. 12+50 -L- LT & STA. 15+35 -L- LT
DETAIL D
FALSE SUMP
(Not to Scale)
STA. -L- 10+60 RT.
OBLITERATE
-DR1-
-DR2-
-L-
-DR3-
BEGIN GRADE -DR1- STA 10+10.00= -L- STA. 12+20.00 (10' LT.) ELEV 2,928.13
PI = 10+25.00 EL = 2,927.76' K = 1 VC = 10'
PI = 10+65.00 EL = 2,922.39' K = 2 VC = 35'
END GRADE -DR1- STA 10+89.25 ELEV 2,923.05
BEGIN GRADE -DR2- STA 10+10.00= -L- STA. 12+30.00 (10' RT.) ELEV 2,930.28
PI = 10+25.00 EL = 2,927.84' K = 1 VC = 10'
PI = 10+65.00 EL = 2,921.63' K = 3 VC = 25'
END GRADE -DR2- STA 10+90.00 ELEV 2,920.17
BEG. SP. LAT. V DT STA. 10+30.00 RT EL. 2923.23
PI STA. 10+50.00 RT EL. 2922.11
END SP. LAT. V DT STA. 10+70.00 RT EL. 2919.35
TAPER TO EXIST. -L- STA 9+50.00
BEGIN GRADE -L- STA 10+00.00 ELEV 2935.18 INCLUDES 2½" RESURFACING
PI = 10+50.00 EL = 2,934.13' K = 52 VC = 100'
PI = 12+25.00 EL = 2,927.09' K = 18 VC = 125'
PI = 14+00.00 EL = 2,932.50' K = 24 VC = 100'
-DR2- STA 10+10.00= -L- STA. 12+30.00 (10' RT.) ELEV 2,930.28
END GRADE -L- STA 15+56.71 ELEV 2930.76
-DR1- STA 10+10.00= -L- STA. 12+20.00 (10' LT.) ELEV 2,928.13
BM#2 EL. 2917.83 FT. -BL- Sta. 16+86.33 (91.11 LT)= -L- Sta. 14+50.31 (36.70 RT) Chiseled X on the southeast end wall on bridge.
BEGIN GRADE -DR3- STA 10+17.48= -EY- STA. 10+66.17(6.63' RT.) ELEV 2,930.66
PI = 10+60.00 EL = 2,929.80' K = 7 VC = 60'
PI = 11+50.00 EL = 2,919.90' K = 6 VC = 60'
END GRADE -DR3- STA 11+80.00 ELEV 2,919.45

BRIDGE HYDRAULIC DATA

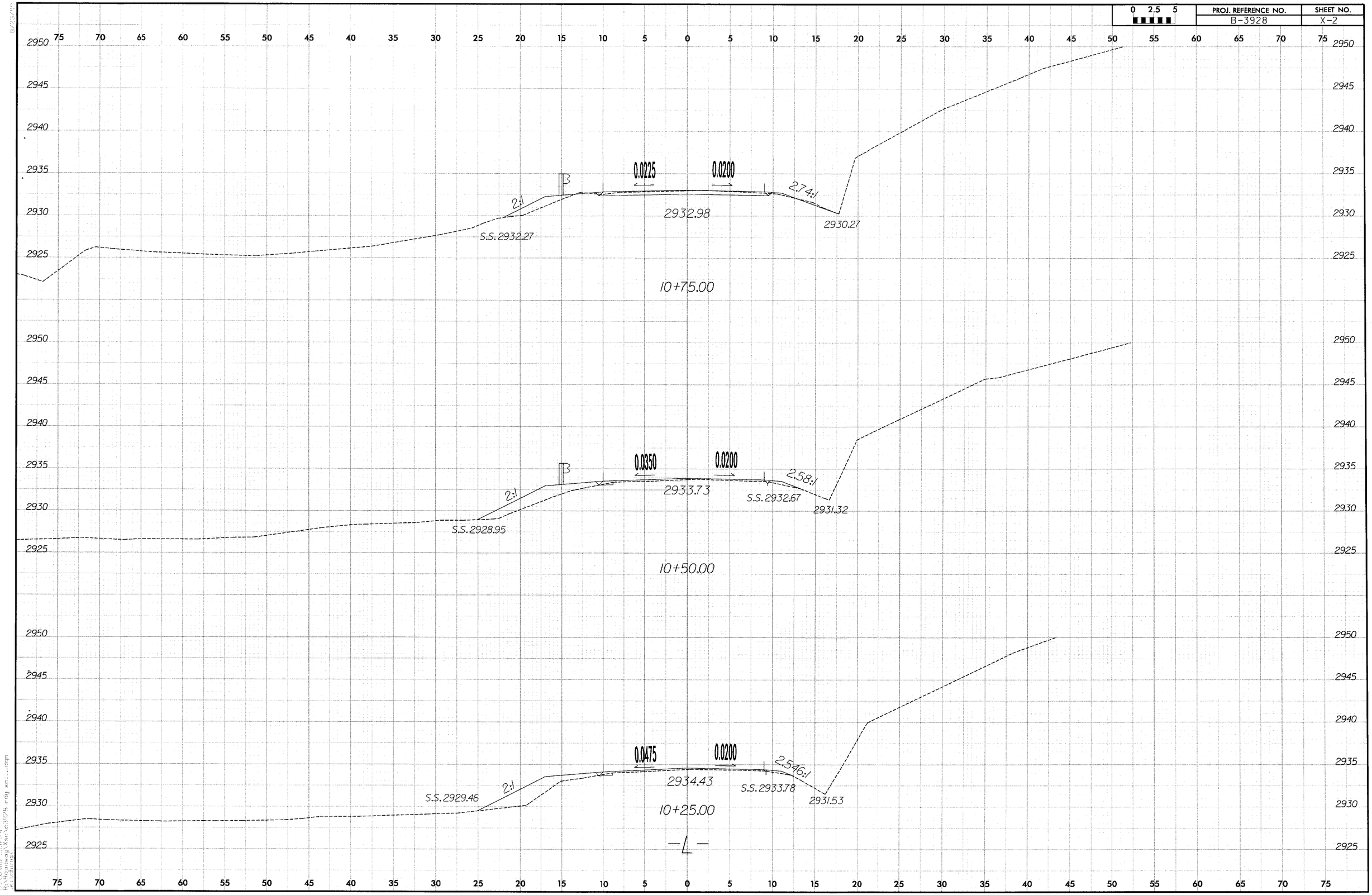
DESIGN DISCHARGE	=	11,600	CFS
DESIGN FREQUENCY	=	25	YRS
DESIGN HW ELEVATION	=	2926.9	FT
BASE DISCHARGE	=	19,169	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	2931.3	FT
OVERTOPPING DISCHARGE	=	14,000	CFS
OVERTOPPING FREQUENCY	=	<50	YRS
OVERTOPPING ELEVATION	=	2928.2	FT
DATE OF SURVEY	=	11/04	
W.S. ELEVATION AT DATE OF SURVEY	=	2913.6	FT

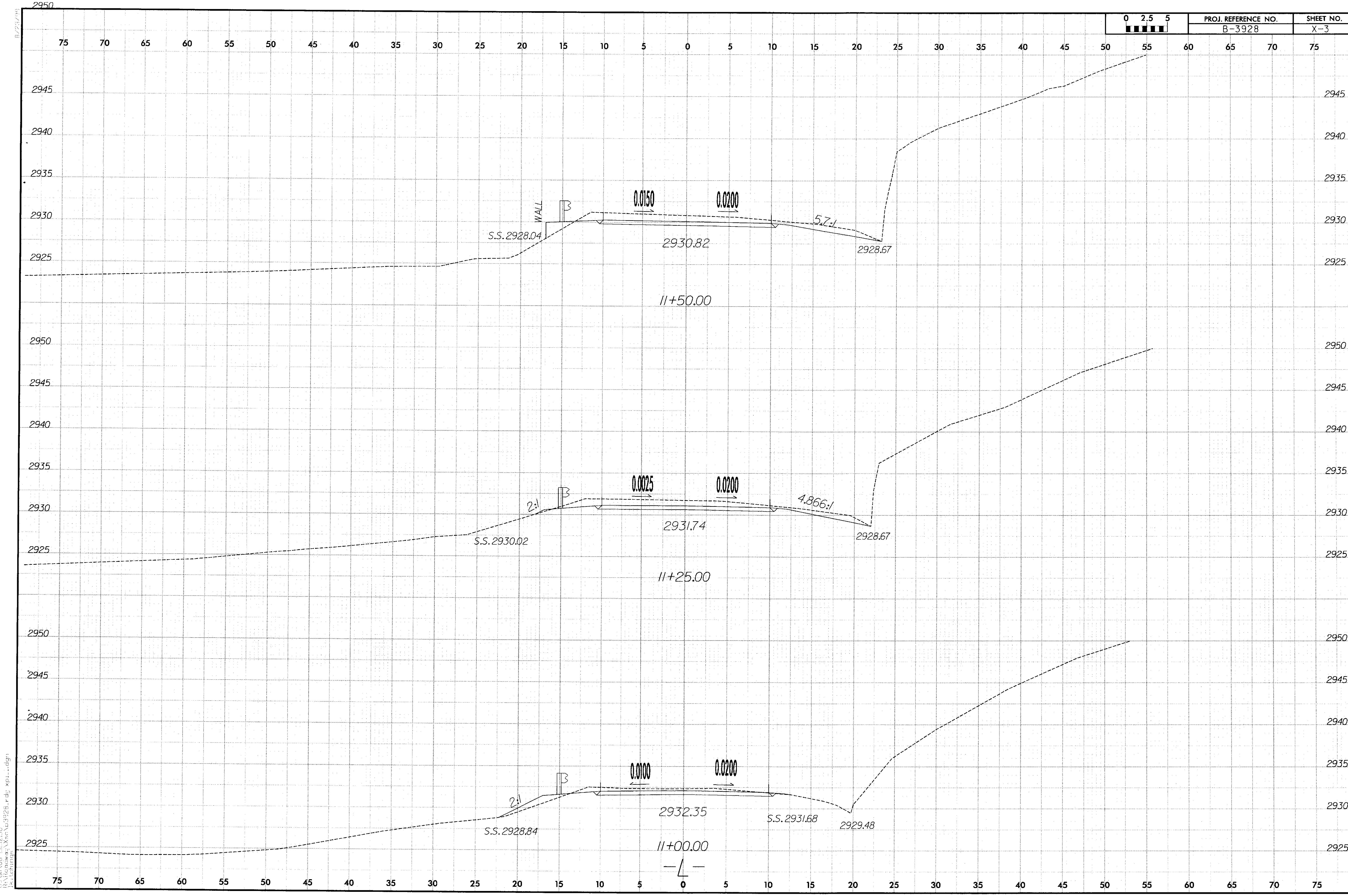
Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

PLANS PREPARED BY :
RUMMEL KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

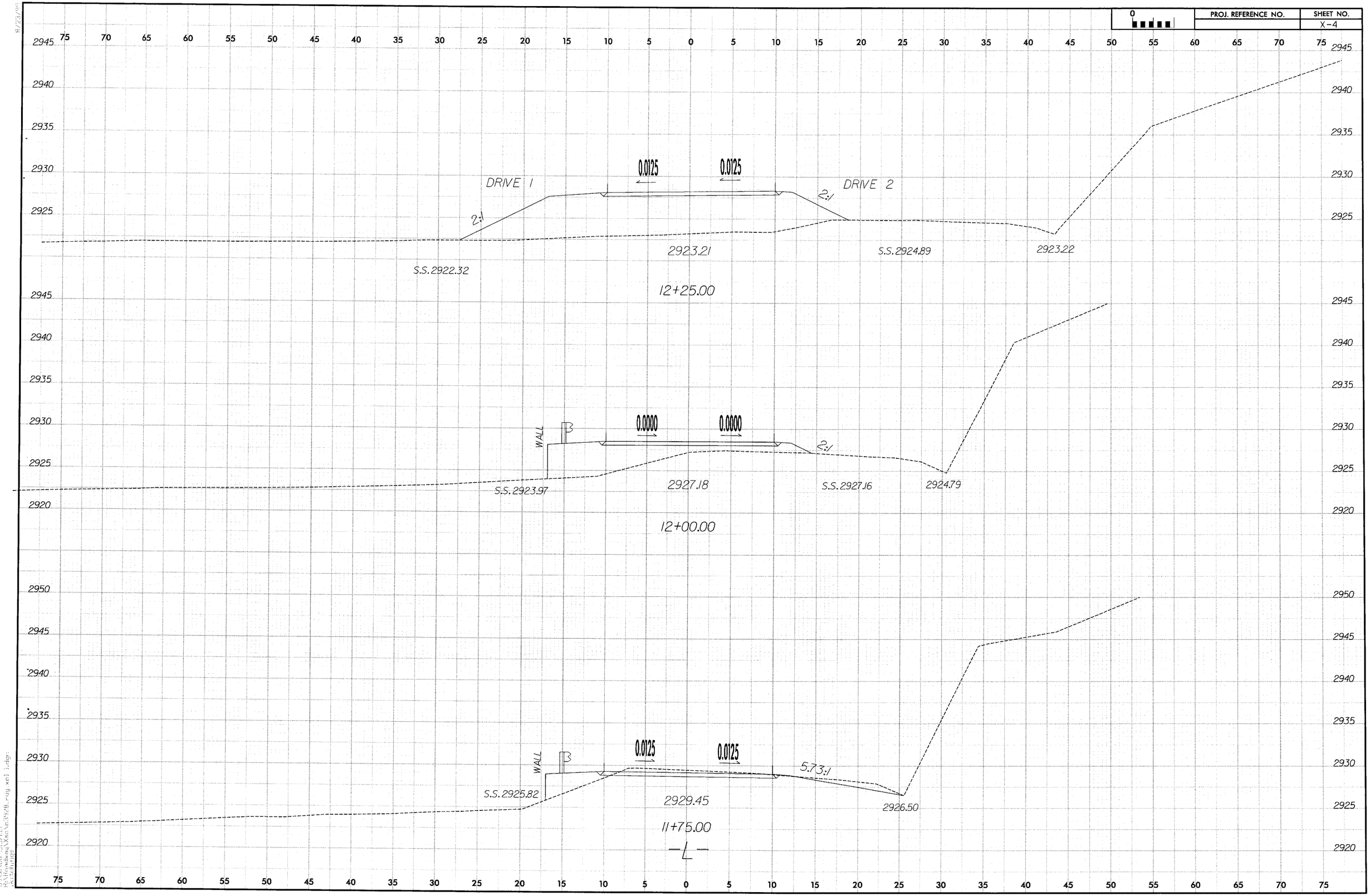

PROJ. REFERENCE NO.
B-3928
SHEET NO.
X-1
0 2.5 5
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
2:1
0.0600
0.0100
2.8:1
S.S. 2932.92
S.S. 2934.37
2933.09
2935.05
10+00.00
EXIST.
EXIST.
2935.71
9+75.00
EXIST.
EXIST.
2936.42
9+50.00
-L-

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-3928	X-2

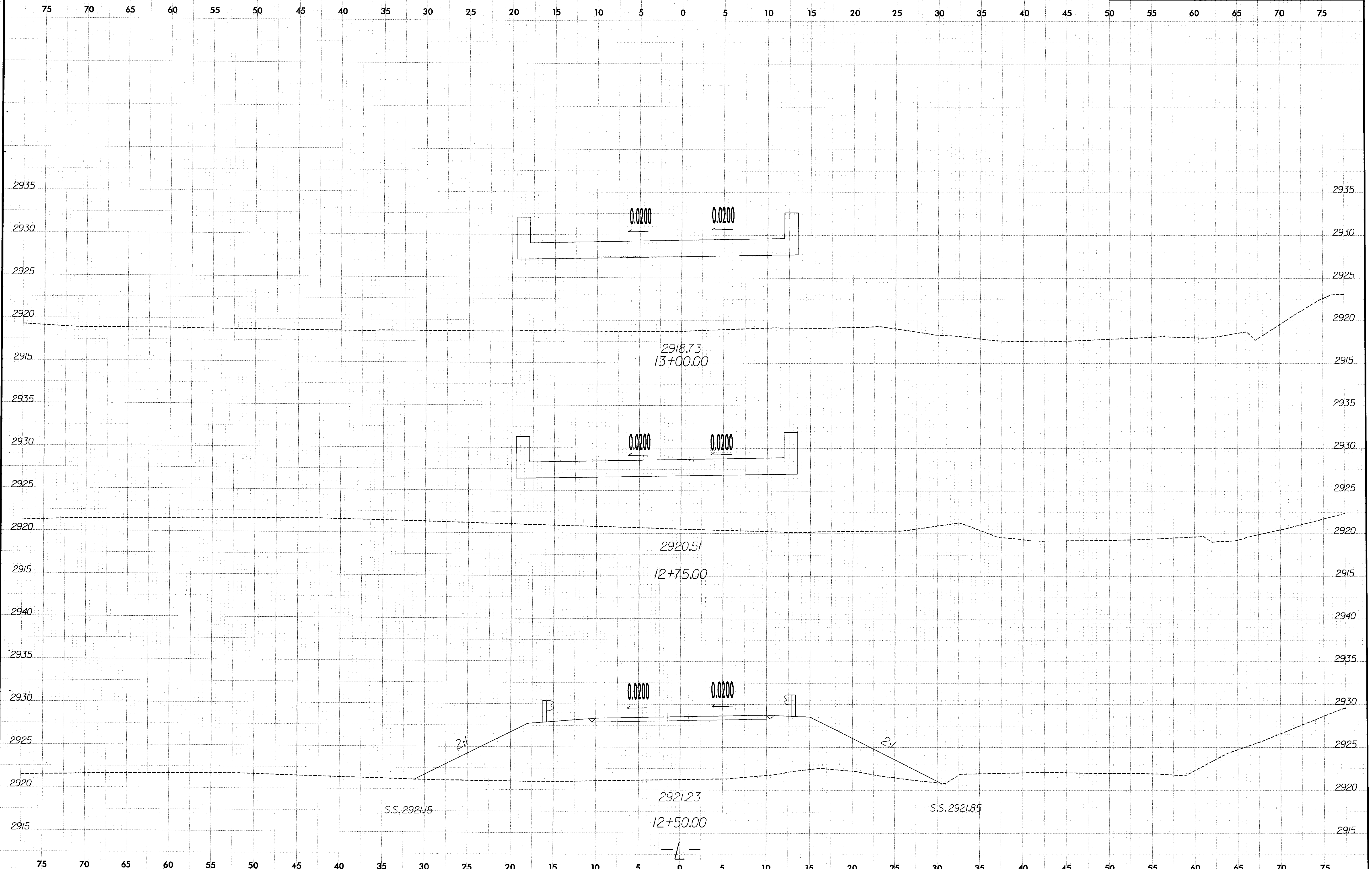



PROJ. REFERENCE NO.
B-3928
SHEET NO.
X-3
0 2.5 5
WALL
S.S. 2928.04
0.0150
0.0200
5.7:1
2930.82
2928.67
11+50.00
2:1
S.S. 2930.02
0.0025
0.0200
4.866:1
2931.74
2928.67
11+25.00
2:1
S.S. 2928.84
0.0100
0.0200
2932.35
S.S. 2931.68
2929.48
11+00.00
2950
2945
2940
2935
2930
2925
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0

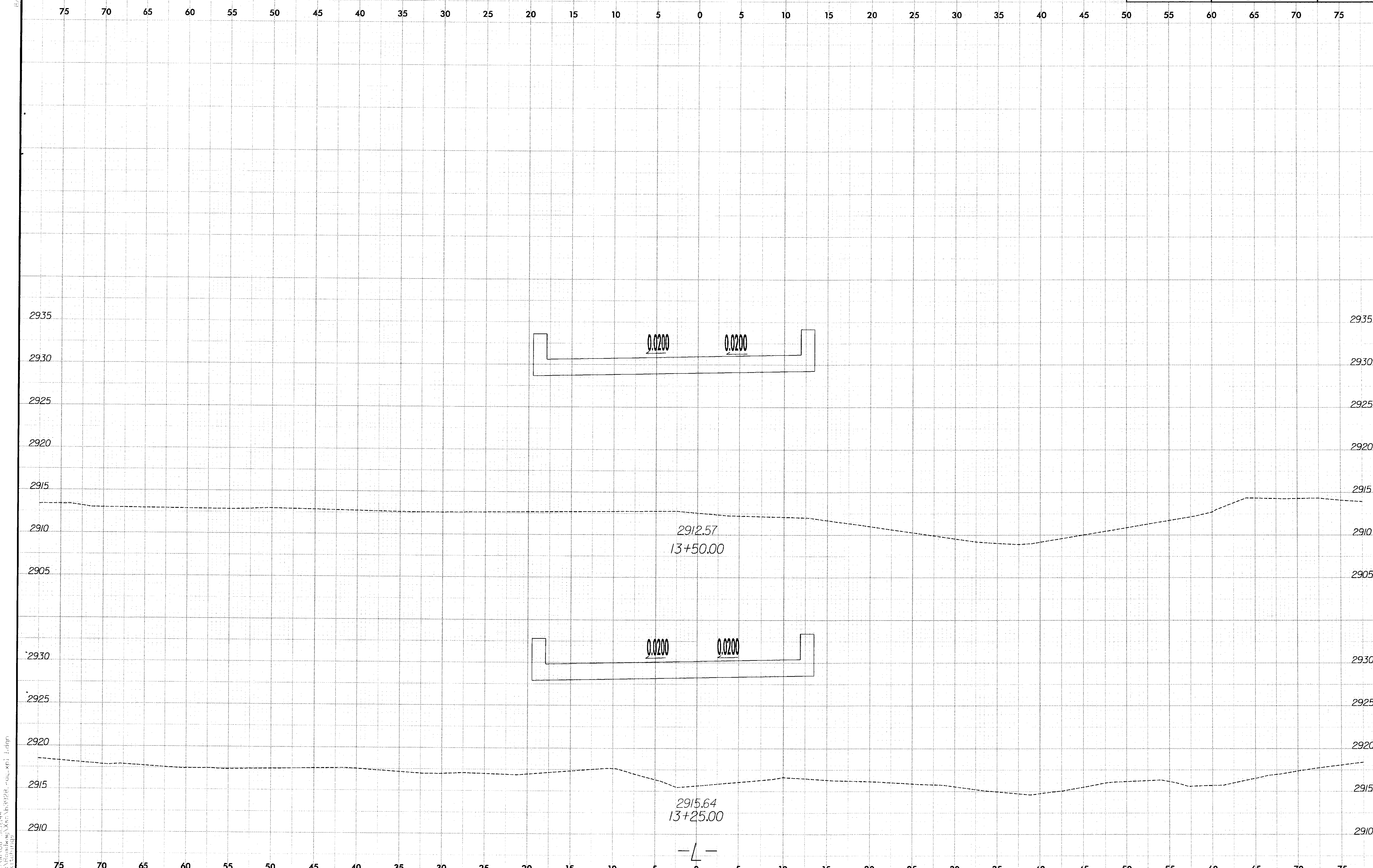
PROJ. REFERENCE NO.	SHEET NO.
	X-4



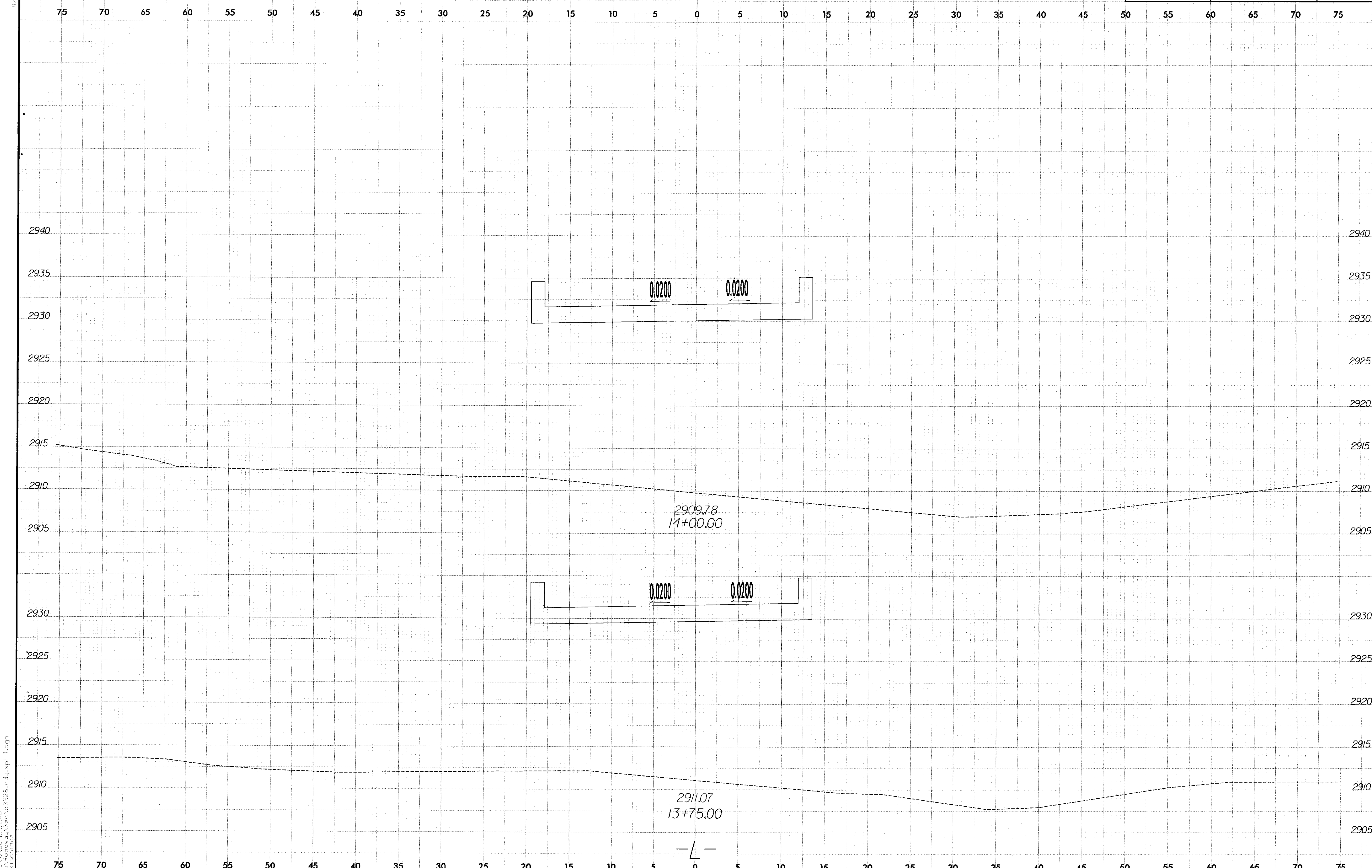
PROJ. REFERENCE NO.	SHEET NO.
B-3928	X-5



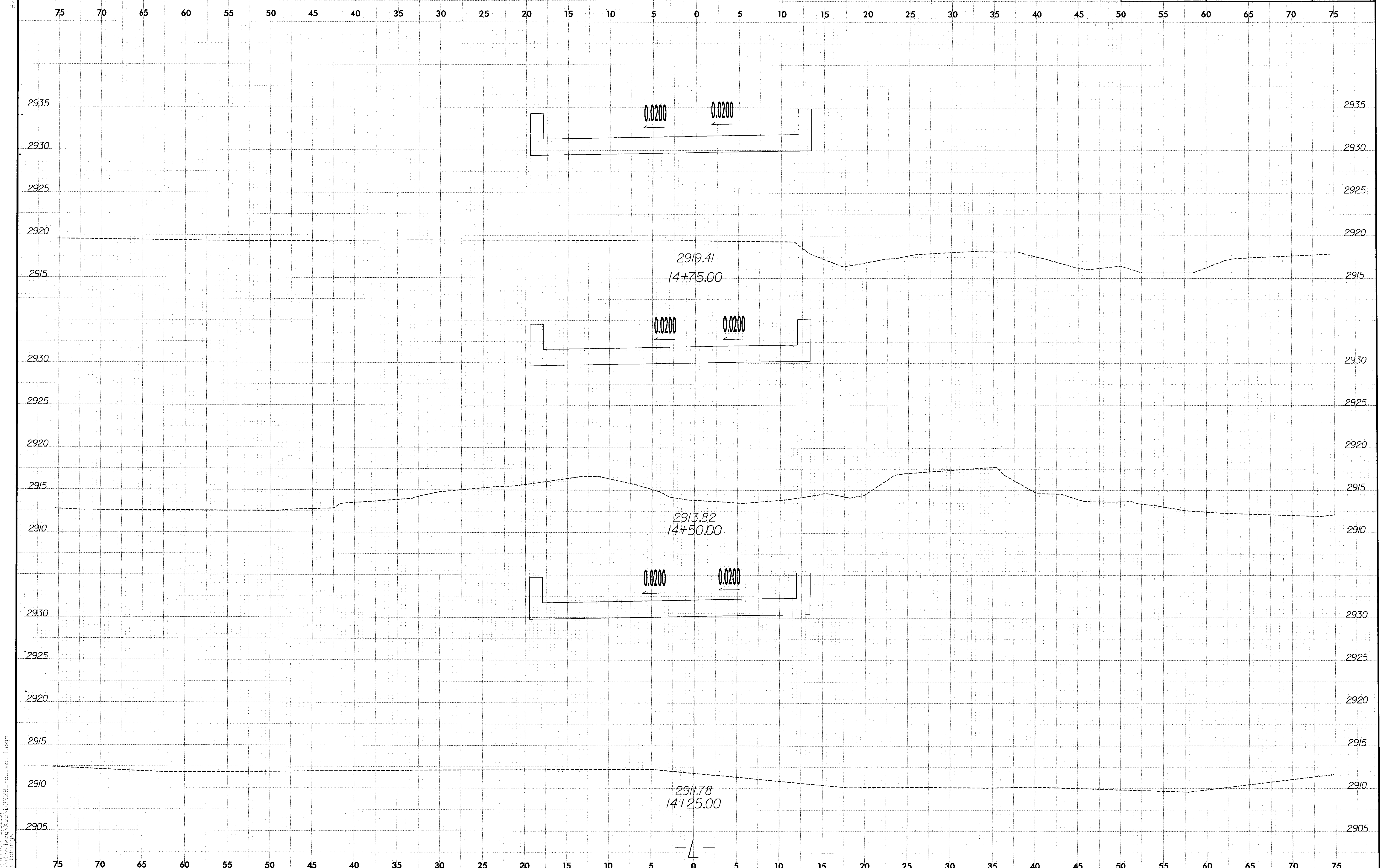
PROJ. REFERENCE NO.	SHEET NO.
B-3928	X-6



PROJ. REFERENCE NO.	SHEET NO.
B-3928	X-7



PROJ. REFERENCE NO.	SHEET NO.
B-3928	X-8



0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-3928	X-9

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

2940
2935
2930
2925
2920
2915

S.S. 2930.30

0.0200 0.0200

2:1

2928.85

S.S. 2924.87

15+50.00

0.0200 0.0200

2918.24
15+25.00

0.0200 0.0200

2918.81
15+00.00

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

2940
2935
2930
2925
2920
2915

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-3928	X-10

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

2935 2930 2925 2920 2915

0.0200 0.0200

2:1 2:1

S.S. 2922.57 2922.13 S.S. 2921.78

10+50.00

0.0150 0.0150

2:1 2:1

S.S. 2922.84 2922.30 S.S. 2921.53

10+40.00

0.0100 0.0100

2:1 2:1

S.S. 2923.31 2922.54 S.S. 2921.21

10+30.00

0.0050 0.0050

2:1 2:1

S.S. 2923.86 2922.76 S.S. 2921.39

10+20.00

-DRI-

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

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-3928	X-11

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

2935
2930
2925
2920
2915
2910

S.S. 2923.081

15:1 0.0200 0.0200 2:1

2922.65

10+80.00

S.S. 2922.531

S.S. 2922.661

2:1 0.0200 0.0200 2:1

2922.32

10+70.00

S.S. 2922.015

2:1 0.0200 0.0200 2:1

S.S. 2922.48

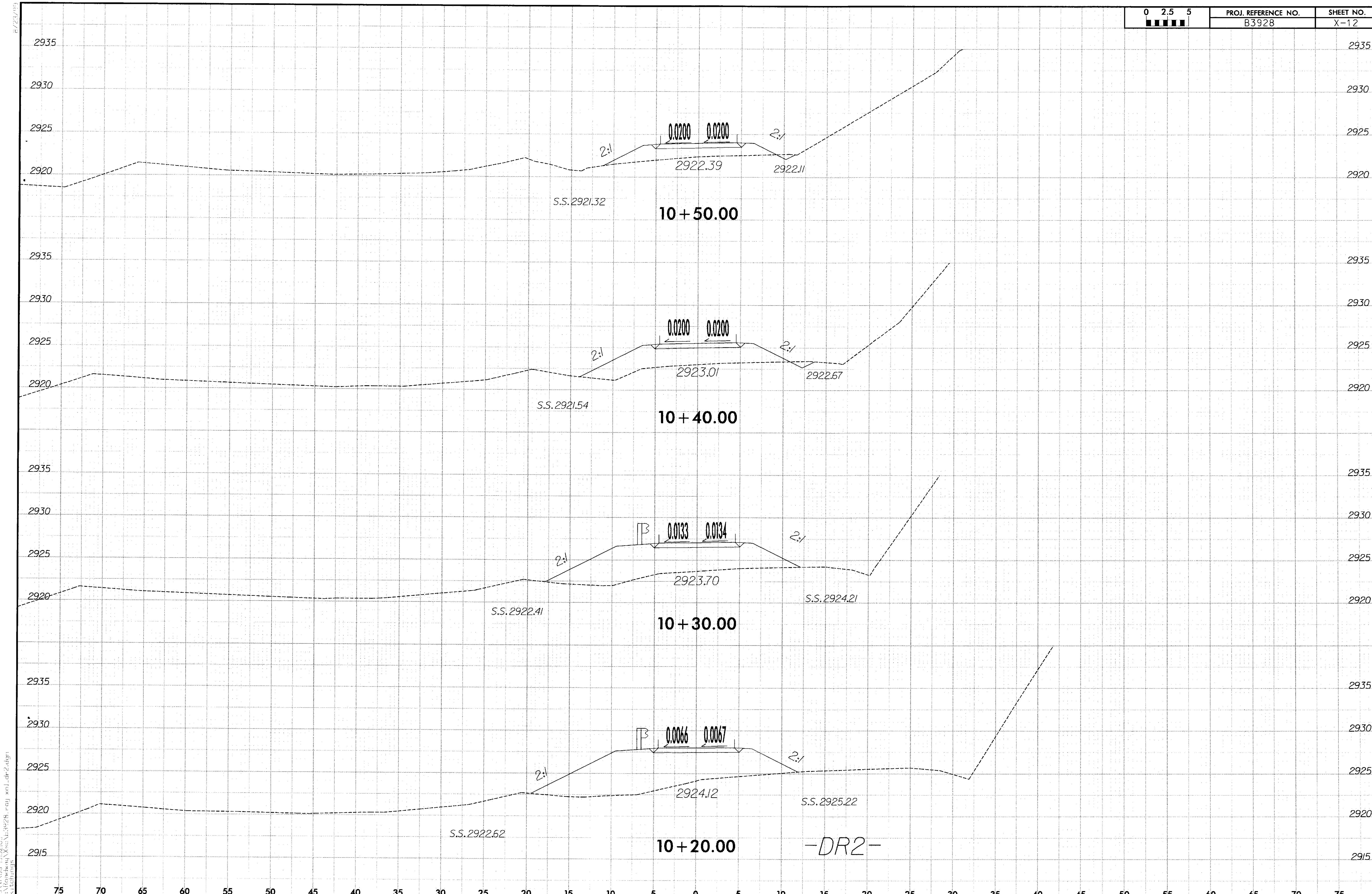
2922.11

10+60.00

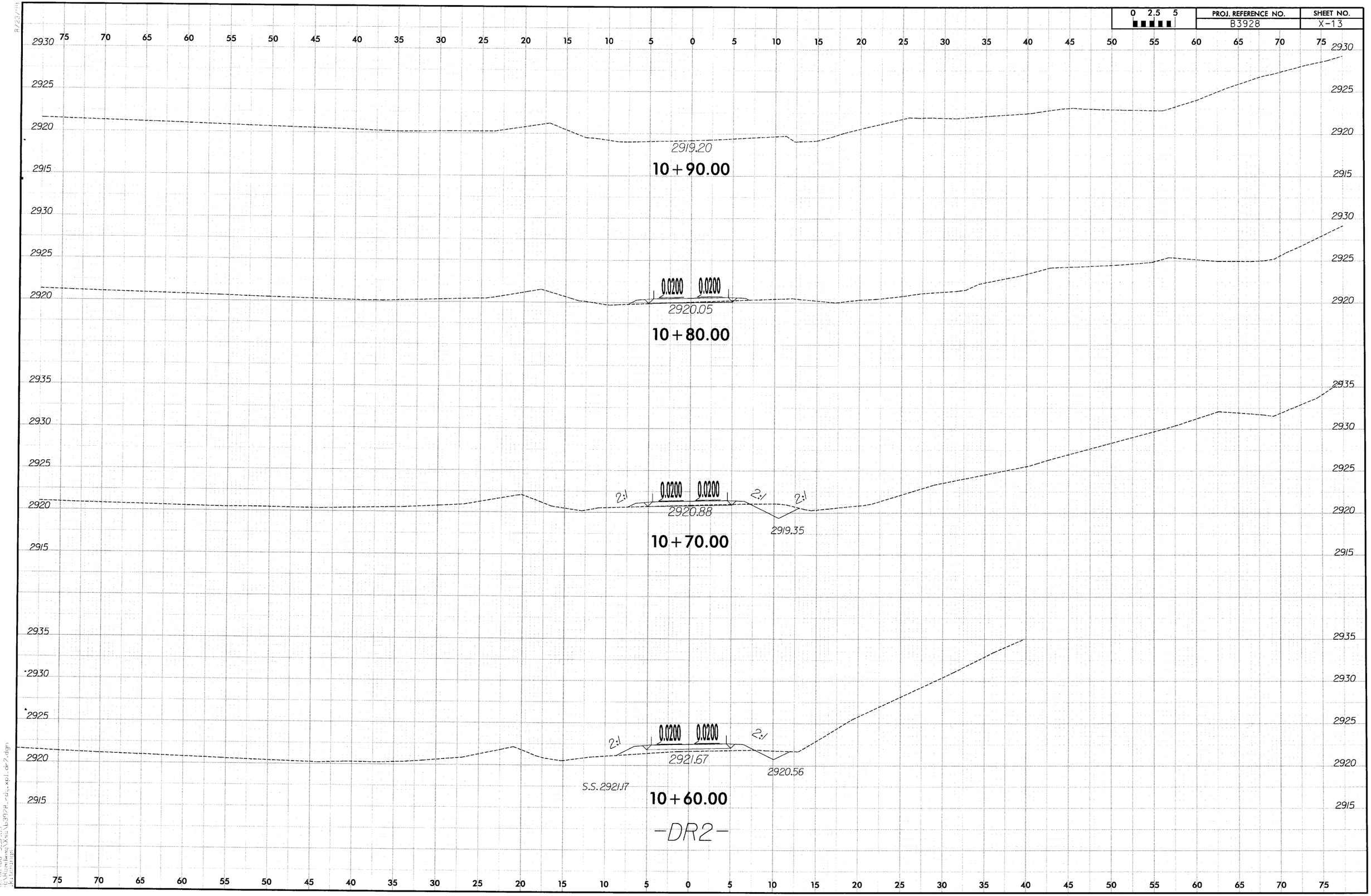
S.S. 2921.87

-DRI-

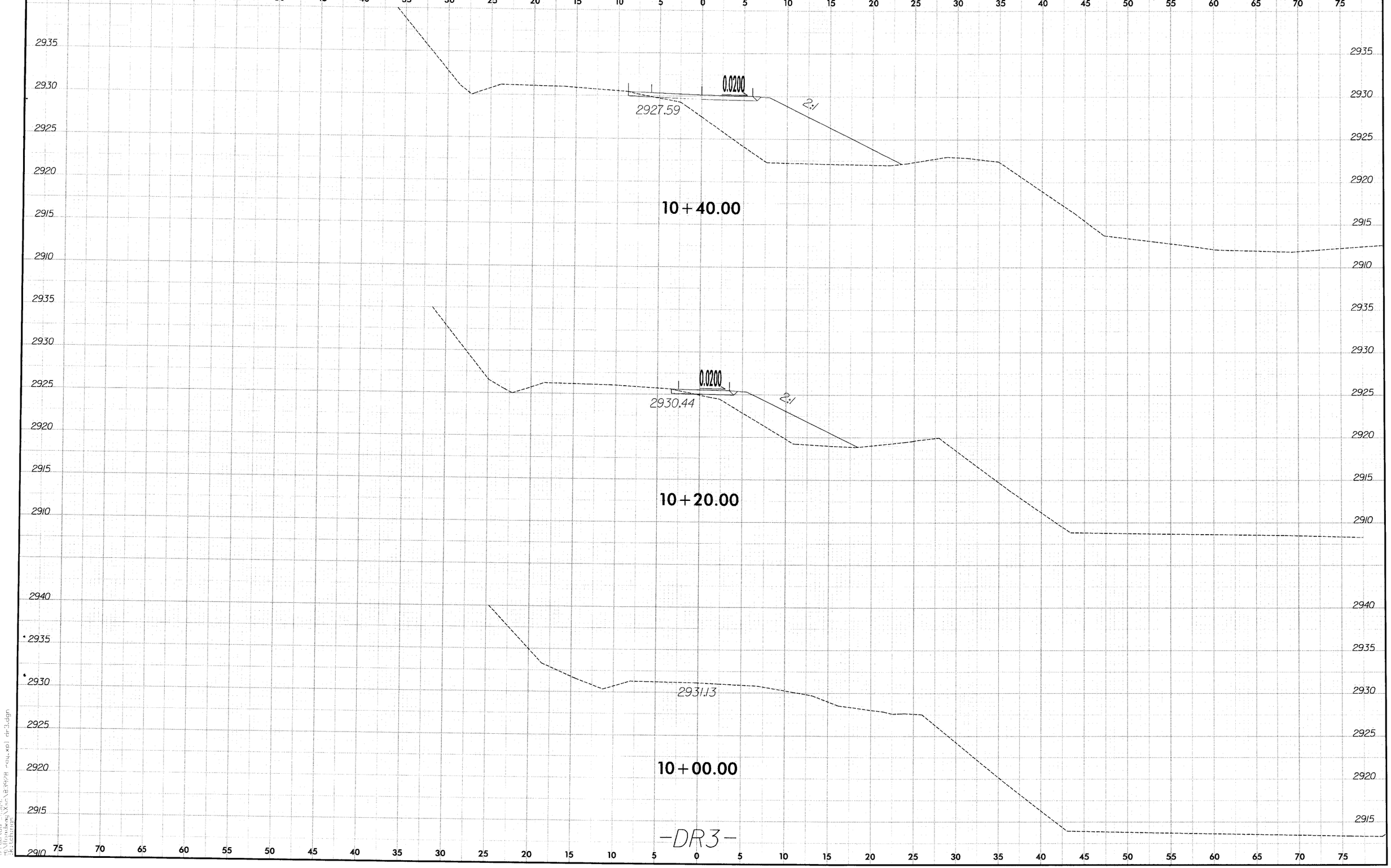
75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

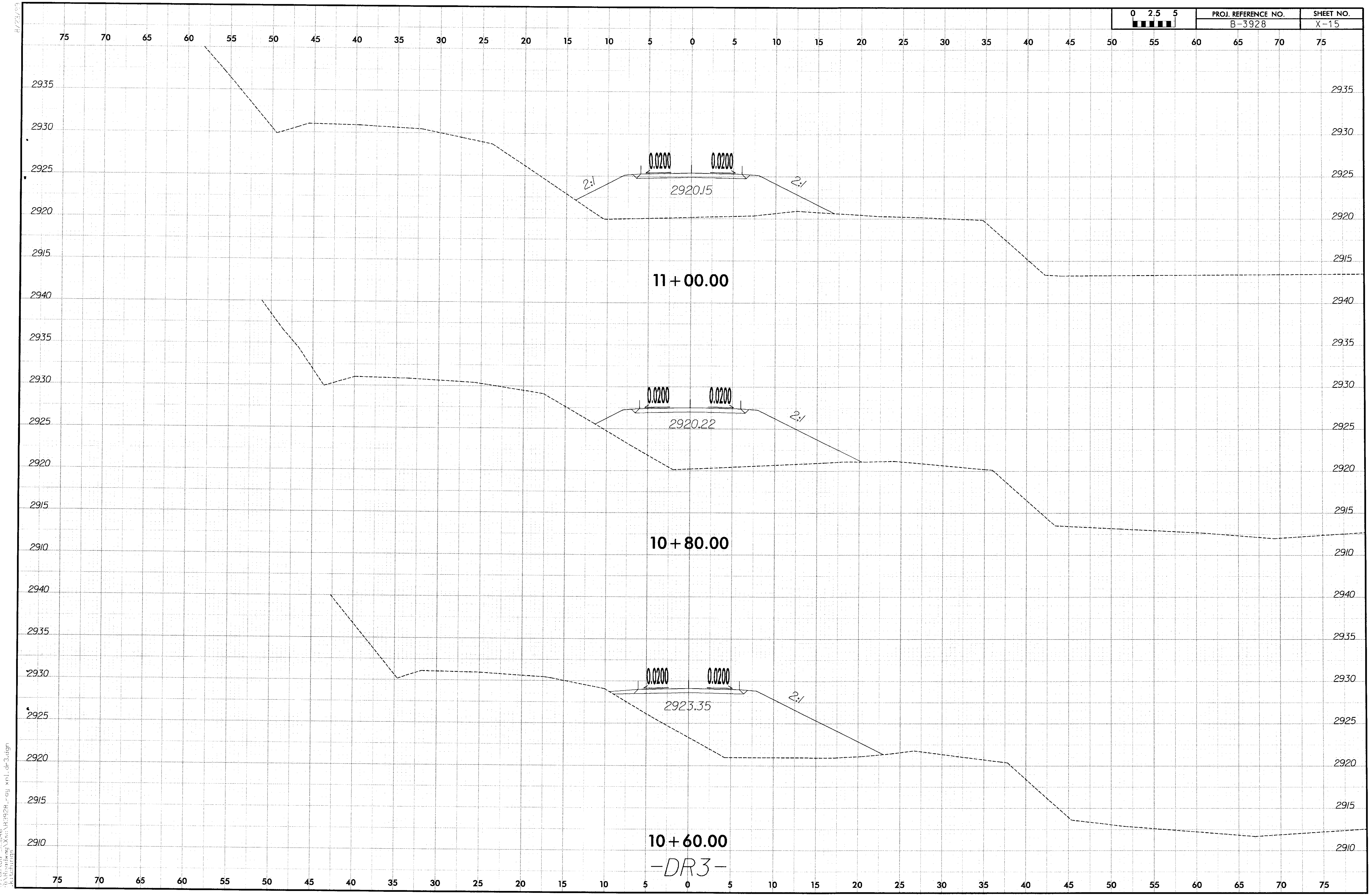

0 2.5 5
PROJ. REFERENCE NO.
B3928
SHEET NO.
X-12
0.0200 0.0200
2:1
2:1
2922.39
2922.11
S.S. 2921.32
10 + 50.00
0.0200 0.0200
2:1
2:1
2923.01
2922.67
S.S. 2921.54
10 + 40.00
0.0133 0.0134
2:1
2:1
2923.70
S.S. 2922.41
S.S. 2924.21
10 + 30.00
0.0066 0.0067
2:1
2:1
2924.12
S.S. 2922.62
S.S. 2925.22
10 + 20.00
-DR2-
2935
2930
2925
2920
2915
75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B3928	X-13



0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-3928	X-14




PROJ. REFERENCE NO.
B-3928
SHEET NO.
X-15
0 2.5 5
0.0200
0.0200
2:1
2:1
2920.15
11+00.00
0.0200
0.0200
2:1
2920.22
10+80.00
0.0200
0.0200
2:1
2923.35
10+60.00
-DR3-

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-3928	X-16

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

2935 2930 2925 2920 2915 2910

0.0200 0.0200

2919.78

11+60.00

2935 2930 2925 2920 2915 2910

2:1 0.0200 0.0200 2:1

2920.00

11+40.00

2935 2930 2925 2920 2915 2910

2:1 0.0200 0.0200 2:1

2919.95

11+20.00

-DR3-

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

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-3928	X-17

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

2975
2970
2965
2960
2955
2950
2945
2940
2935
2930
2925
2920
2915
2910

0.0200 0.0200

2919.44

11+80.00

-DR3-

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