



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

January 2, 2008

U.S. Army Corps of Engineers
Regulatory Field Office
6508 Falls of Neuse Road
Suite 120
Raleigh, NC 27615

ATTENTION: Mr. Andrew Williams
NCDOT Coordinator

Dear Sir:

Subject: **Application for Section 404 Nationwide Permits 13, 14, and Section 401 Water Quality Certification** for replacement of Bridge No. 95 over Big Beaver Island Creek and Bridge No. 67 over Little Beaver Island Creek on US 311 in Rockingham County, Division 7. State Project No. 8.1512001, Federal Aid Project No. BRSTP-311(14), TIP No. B-4252; WBS Element No. 33594.1.1

Please see the enclosed Pre-Construction Notification (PCN), permit drawings, Rapanos forms, Ecosystem Enhancement (EEP) letter, and roadway design plans for the subject project.

The North Carolina Department of Transportation (NCDOT) plans to replace the 37-foot Bridge No. 67 and the 41-foot Bridge No. 95 with 100-foot long, 54-foot wide, one span steel plate girder bridges in both locations. The new bridges will be constructed approximately 25 feet north of the existing alignment and will span both creeks. The intersection of SR 1138 and US 311 will be moved west approximately 500 feet. One 80-foot long, 66-inch pipe, will be used to replace a 55-foot long, four by five foot, box culvert under SR 1138. This will enhance drainage and reduce flooding across SR 1138. US 311 will be widened to three lanes from Bridge No. 95 to the relocated intersection with SR 1138. An onsite detour will be provided using the existing structures and staged-construction. A Categorical Exclusion Document was signed on January 5, 2006 and distributed shortly thereafter. Additional copies are available upon request.

The Purpose of this project is to:

1. Improve safety and traffic operations through the intersections of US 311, SR 1169, and SR 1138.
2. Replace functionally obsolete bridges and inadequate structures.

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

TELEPHONE: 919-715-1334
FAX: 919-715-5501
WEBSITE: WWW.NCDOT.ORG

LOCATION:
2728 CAPITAL BLVD.
SUITE 240
RALEIGH NC 27604

IMPACT TO WATERS OF THE UNITED STATES

General Description: The project is located in the Roanoke River basin (Sub-basin 03-02-02, Hydrologic Unit 03010103). The jurisdictional resources in the project area are three perennial streams (Big Beaver Island Creek, Little Beaver Island Creek, and UT to Big Beaver Island Creek). The Division of Water Quality stream index number for Little Beaver Island Creek is 22-29-1 and for Big Beaver Island Creek is 22-29 both streams are classified as Class C.

Big Beaver Island Creek is approximately 24 feet wide and has an average depth of 12-24 inches. The substrate is composed of gravel and sand. Little Beaver Island Creek is approximately 24 feet wide and has an average depth of six to 24 inches. The substrate is composed of sand, gravel, and cobble. During the April 2004 site visit flow in both streams was moderate and water clarity was clear. UT to Big Beaver Island Creek is approximately five feet wide and has an average depth of six to 12 inches. The substrate is composed of sand and gravel. During the July 2006 field visit flow was low.

No Outstanding Resource Waters (ORW), High Quality Waters (HQW), WS-I, or WS-II Waters occur within 1.0 mile of the project study area. Big Beaver Island Creek, Little Beaver Island Creek, and UT to Big Beaver Island Creek are not listed on the Final 2006 303(d) list for North Carolina impaired waters nor are any streams within 1.0 miles of the project (NCDENR-DWQ, 2006).

Permanent Impacts: UT to Big Beaver Island Creek will have 222 feet of permanent stream impacts due to fill. These impacts will be caused by channel realignment and the replacement of a 4 x 5 foot box culvert with a 66-inch reinforced concrete pipe. This will enhance drainage, reduce erosion, and flooding across SR 1138. In addition, Big Beaver Island Creek and Little Beaver Island Creek will each have 20 feet of impacts (40 feet in total) due to rip rap placement along the stream bank from lateral base ditches for stabilization. The project will not impact any wetlands.

Temporary Impacts: UT to Big Beaver Island Creek will have 14 feet of temporary surface water impacts due to the placement of a 66-inch reinforced concrete pipe and removal of the 4 x 5 foot box culvert. There will be no temporary wetland impacts associated with this project.

Bridge Demolition: Bridge No. 67 was constructed in 1940 and has a reinforced concrete deck on I-beams and reinforced abutments. Overall length is 37 feet long and it has a clear deck width of 26 feet. Bridge No. 95 was constructed in 1940 and has a reinforced concrete deck on I-beams with cover plates and reinforced concrete abutments. Overall length is 41 feet and it has a clear deck width of 26 feet. Both bridges are approximately 18 feet above the creek bed.

Bridge No. 95 and No. 67 will be removed without dropping components into Waters of the United States. All guidelines for bridge demolition and removal will be followed. NCDOT's Best Management Practices for the Protection of Surface Waters and for Bridge Demolition and Removal will be followed.

Utility Impacts: There will be no jurisdictional resource impacts associated with utility relocation.

FEDERALLY PROTECTED SPECIES

Plants and animals with a federal classification of Endangered (E), Threatened (T), Proposed Endangered (PE) and Proposed Threatened (PT) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. The US Fish and Wildlife Service (USFWS) lists 2 federally-protected species, as of May 16, 2007 for Rockingham County. The species under federal protection are listed in Table 1.

Table 1. Federally Protected Species for Rockingham County

Common Name	Scientific Name	Federal Status	Habitat Present	Biological Conclusion
James spiny mussel	<i>Pleurobema collina</i>	Endangered	No	No Effect
Smooth Coneflower	<i>Echinacea laevigata</i>	Endangered	No	No Effect

Pleurobema collina (James spiny mussel)

Since Big Beaver Island Creek and Little Beaver Island Creek are within the Dan River Basin a mussel screening was conducted on April 22, 2004 by NCDOT biologists. The Big Beaver Island Creek and Little Beaver Island Creek crossing at US 311 contained runs, riffles, and pools behind snags with normal and unconsolidated substrate compactness. The substrate above and below the bridge on US 311 consists of sand, silt, cobble and gravel with medium current. Surveys were conducted by wading using a batiscope 100 meters upstream from project crossing and 100 meters past the confluence of Big Beaver Island Creek and Little Beaver Island Creek. No freshwater mussels were found in 4.5 man-hours of survey time. There were Asian clams present in both streams that were surveyed. The North Carolina Natural Heritage Program (NCNHP) documents no occurrences of James spiny mussel within five miles of the project area. This project will have no effect on James spiny mussel.

Echinacea laevigata (Smooth Coneflower)

Suitable habitat for smooth coneflower may exist within the project area. The approximately 10 acres of woodlands have open understories and a high proportion of maintained edge habitat. The NCNHP does not record any occurrences of smooth coneflower within five miles of the project area. Detailed surveys for smooth coneflower were conducted on August 18, 2004, July 25, 2006, and July 31, 2007. No specimens of smooth coneflower were found. This project will have no effect on this species.

AVOIDANCE, MINIMIZATION and MITIGATION

Avoidance and Minimization:

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts. Avoidance measures were taken during the planning and NEPA compliance stages; minimization measures were incorporated as part of the project design.

According to the Clean Water Act (CWA) §404(b)(1) guidelines, NCDOT must avoid, minimize, and mitigate, in sequential order, impacts to waters of the US. The following is a list of the project's jurisdictional stream avoidance/minimization activities proposed or completed by NCDOT:

Avoidance/Minimization

- The new bridges will be 63 and 59 feet longer than the existing bridges, increasing the floodplain under the bridges.
- The proposed project will completely span Big Beaver Island and Little Beaver Island Creeks, allowing for pre-project stream flows to maintain the current water quality, aquatic habitat, and flow regime.
- Temporary construction impacts due to erosion and sedimentation will be minimized through implementation of stringent erosion control schedule and use of Best Management Practices (BMPs).
- Use of preformed scour holes

Mitigation:

Unavoidable, permanent impacts to 222 feet of jurisdictional stream will be offset by compensatory mitigation provided by the EEP program. An acceptance letter dated November 14, 2007 from EEP is attached. Mitigation is not proposed for the 40 feet of impacts for bank stabilization because there will be no adverse effects to the stream nor will the project incur loss of Waters of the United States.

MORATORIUM

In an email dated December 11, 2007, Travis Wilson, Wildlife Resources Commission, rescinded a previously requested sunfish moratorium. Therefore, no moratoria are required for this project.

SCHEDULE

The project calls for a letting of June 17, 2008 (review date of May 6, 2008) with a date of availability of July 29, 2008. It is expected that the contractor will choose to start construction in July 2008.

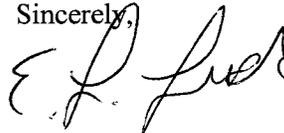
REGULATORY APPROVALS

Section 404 Permit: It is anticipated that impacts from construction of culvert replacement and channel realignment be authorized under Section 404 Nationwide Permit 14 and bank stabilization be authorized under Section 404 Nationwide Permit 13.

Section 401 Permit: NCDOT will adhere to all conditions of the General Water Quality Certifications (WQC) 3689 and 3704. Written concurrence from the North Carolina Div. of Water Quality (NCDWQ) is required. In accordance with 15A NCAC 2H, Section .0500(a) and 15A NCAC 2B .0200 we are providing five copies of this application to the NCDWQ for their review and approval.

Thank you for your time and assistance with this project. A copy of this permit application will be posted on the NCDOT website at <http://www.ncdot.org/doh/preconstruct/pe/neu/permit.html>. Please contact James Pflaum, at (919) 715-7217 or jrpflaum@dot.state.nc.us if you have any questions or need any additional information.

Sincerely,



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

w/attachment

Mr. Brian Wrenn, NCDWQ (5 Copies)
Mr. Travis Wilson, NCWRC
Mr. Gary Jordan, USFWS

w/o attachment (see permits website for attachments)

Dr. David Chang, P.E., Hydraulics
Mr. Greg Perfetti, P.E., Structure Design
Mr. Victor Barbour, P.E., Project Services Unit
Mr. Mark Staley, Roadside Environmental

Mr. J. M. Mills, P.E., Division 7 Engineer
Mr. Jerry Parker, Division 7 Environmental Officer
Mr. Jay Bennett, P.E., Roadway Design
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Stephen Kirby, PDEA
Mr. Scott McLendon, USACE, Wilmington
Ms. Beth Harmon, EEP
Mr. Todd Jones, NCDOT External Audit Branch

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: 13, 14

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: Greg J. Thorpe, Ph.D., Environmental Management Director
Mailing Address: North Carolina Department of Transportation
1598 Mail Service Center, Raleigh, NC 27699

Telephone Number: 919-733-3141 Fax Number: 919-715-5501

E-mail Address: _____

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: realignment and replacement of bridge No. 95 over Big Beaver Island Creek and Bridge No. 67 over Little Beaver Island Creek on US 311
2. T.I.P. Project Number or State Project Number (NCDOT Only): B-4252
3. Property Identification Number (Tax PIN): _____
4. Location
County: Rockingham Nearest Town: Madison
Subdivision name (include phase/lot number): _____
Directions to site (include road numbers/names, landmarks, etc.): US 311 crossing Big Beaver Island and Little Beaver Island Creek

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): _____°N _____°W
6. Property size (acres): Project Study Area is approximately 41.4 acres.
7. Name of nearest receiving body of water: Dan River
8. River Basin: Roanoke
(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: Rural crossroads with business and residential development.

10. Describe the overall project in detail, including the type of equipment to be used: Replacement of bridge No. 67 and 95 with 54-foot wide (three lanes) bridges and realignment of US 311 and SR 1138 intersection. Heavy duty excavation equipment will be used such as trucks, dozers, cranes and other various equipment necessary for roadway construction.

11. Explain the purpose of the proposed work: Improve safety and efficiency of overall traffic operations.

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.

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.

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: Fill 222 feet of perennial stream. Bank stabilization for 20 feet of Big Beaver Island Creek and 20 feet for Little Beaver Island Creek. _____

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)
Total Wetland Impact (acres)					

3. List the total acreage (estimated) of all existing wetlands on the property: < .001 acres
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)
Site 1	L Beaver Island	Bank Stabilization	Perennial	24 feet	20	<0.01
Site 2	B Beaver Island	Bank Stabilization	Perennial	24 feet	20	<0.01
Site 3	UT	Permanent Fill	Perennial	2-3 feet	222	0.01
Site 3	UT	Temporary Fill	Perennial	2-3 feet	14	<0.01
Total Stream Impact (by length and acreage)					276	0.02

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)
Total Open Water Impact (acres)				

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

Stream Impact (acres):	0.02
Wetland Impact (acres):	0
Open Water Impact (acres):	0
Total Impact to Waters of the U.S. (acres)	0.02
Total Stream Impact (linear feet):	276

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. New bridges will be approximately 60 feet longer than existing bridges, increasing floodplain size under the bridges. Both bridges will completely span Big Beaver Island and Little Beaver Island Creeks. Temporary construction impacts from sedimentation and erosion will be minimized through stringent erosion control measures and Best Management Practices (see cover letter). _____

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 (see DWQ website for most current version.).

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.

-
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://www.nceep.net/pages/inlieureplace.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): 222.0
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. _____
- _____
- _____

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. _____

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.

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

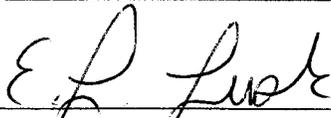
XIV. Cumulative Impacts (required by DWQ)

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).



12-31-07

Applicant/Agent's Signature

Date

(Agent's signature is valid only if an authorization letter from the applicant is provided.)



November 14, 2007

Mr. Andy Williams
U. S. Army Corps of Engineers
Raleigh Regulatory Field Office
6508 Falls of the Neuse Road, Suite 120
Raleigh, North Carolina 27615

Dear Mr. Williams:

Subject: EEP Mitigation Acceptance Letter:

B-4252, Replace Bridge Numbers 95 and 67 on US 311 over Big and Little Beaver Island Creeks, Rockingham County; Roanoke River Basin (Cataloging Unit 03010103); Central Piedmont (CP) Eco-Region

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the stream mitigation for the unavoidable impact associated with the above referenced project. As indicated in the NCDOT's mitigation request dated October 29, 2007, the stream mitigation from EEP is required for approximately 222 feet of warm stream impact.

Stream mitigation associated with this project will be provided in accordance with Section X of the Amendment No. 2 to the Memorandum of Agreement between the N. C. Department of Environment and Natural Resources, the N. C. Department of Transportation, and the U. S. Army Corps of Engineers fully executed on March 8, 2007 (Tri-Party MOA). EEP commits to implement sufficient 444 warm stream credits to offset the impacts associated with this project by the end of the MOA year in which this project is permitted. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from EEP.

If you have any questions or need additional information, please contact Ms. Beth Harmon at 919-715-1929.

Sincerely,

William D. Gilmore, P.E.
EEP Director

cc: Mr. Gregory J. Thorpe, Ph.D., NCDOT-PDEA
Mr. John Hennessy, Division of Water Quality, Wetlands/401 Unit
File: B-4252

Restoring... Enhancing... Protecting Our State



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:

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: NC County/parish/borough: Rockingham City: Madison
Center coordinates of site (lat/long in degree decimal format): Lat. 36.382825° N, Long. -79.980531° E
Universal Transverse Mercator:

Name of nearest waterbody: Big Beaver Island Creek, Little Beaver Island Creek

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Big and Little Beaver Island Creeks

Name of watershed or Hydrologic Unit Code (HUC): 03010103

- 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 **Pick List** "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 waters² (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: linear feet: 1600 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:

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: **Little and Big Beaver Island Creeks.**

Summarize rationale supporting determination: Both large perennial streams that directly connect with the Dan River less than 1 mile downstream.

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 waterbody⁴ 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: **Pick List**

Drainage area: **Pick List**

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 TNW⁵:

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.

Tributary stream order, if known:

(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):

- | | | |
|--|--|-----------------------------------|
| <input type="checkbox"/> Silts | <input type="checkbox"/> Sands | <input type="checkbox"/> Concrete |
| <input type="checkbox"/> Cobbles | <input type="checkbox"/> Gravel | <input type="checkbox"/> Muck |
| <input type="checkbox"/> Bedrock | <input type="checkbox"/> Vegetation. Type/% cover: | |
| <input type="checkbox"/> 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):

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

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

- | | |
|--|--|
| <input checked="" type="checkbox"/> High Tide Line indicated by: | <input checked="" type="checkbox"/> Mean High Water Mark indicated by: |
| <input type="checkbox"/> oil or scum line along shore objects | <input type="checkbox"/> survey to available datum; |
| <input type="checkbox"/> fine shell or debris deposits (foreshore) | <input type="checkbox"/> physical markings; |
| <input type="checkbox"/> physical markings/characteristics | <input type="checkbox"/> vegetation lines/changes in vegetation types. |
| <input type="checkbox"/> tidal gauges | |
| <input type="checkbox"/> 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:

⁶A 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.

⁷Ibid.

(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: linear feet 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:
 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:

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-RPWs⁸ 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 jurisdictional. 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: .

Identify water body and summarize rationale supporting determination: .

⁸See Footnote # 3.

⁹To 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.

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 Geodetic 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:

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:

C. PROJECT LOCATION AND BACKGROUND INFORMATION: B-4252

State: NC

County/parish/borough: Rockingham

City: Madison

Center coordinates of site (lat/long in degree decimal format): Lat. 36.379406° N, Long. -79.980531° E.

Universal Transverse Mercator:

Name of nearest waterbody: Little Beaver Island Creek

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Little Beaver Island Creek

Name of watershed or Hydrologic Unit Code (HUC): 03010103

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 **Are** "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 waters² (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: linear feet: 650 width (ft) and/or acres.

Wetlands: <.01 acres.

c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual

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:

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:

Summarize rationale supporting determination:

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 waterbody⁴ 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: 147579.574 **acres**

Drainage area: 24215 **acres**

Average annual rainfall: 46.9 inches

Average annual snowfall: 9.1 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 **1 (or less)** 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 TNW⁵: Flows from nearby pond into Little Beaver Island Creek.

Tributary stream order, if known: 1.

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: 5.0 feet
Average depth: 1 feet
Average side slopes: **3:1**.

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: **Meandering**

Tributary gradient (approximate average slope): 5-10 %

(c) Flow:

Tributary provides for: **Seasonal flow**

Estimate average number of flow events in review area/year: **20 (or greater)**

Describe flow regime: Perennial.

Other information on duration and volume:

Surface flow is: **Discrete**. Characteristics:

Subsurface flow: **Unknown**. Explain findings:

Dye (or other) test performed:

Tributary has (check all that apply):

Bed and banks
 OHWM⁶ (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: water color is clear.

Identify specific pollutants, if known:

⁶A 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.

⁷Ibid.

(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:

<u>Directly abuts? (Y/N)</u>	<u>Size (in acres)</u>	<u>Directly abuts? (Y/N)</u>	<u>Size (in acres)</u>
------------------------------	------------------------	------------------------------	------------------------

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: linear feet 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: Provides consistent year round flow from pond.
- 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:

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-RPWs⁸ 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 jurisdictional. 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: .

Identify water body and summarize rationale supporting determination: .

⁸See Footnote # 3.

⁹To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰Prior 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.

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.

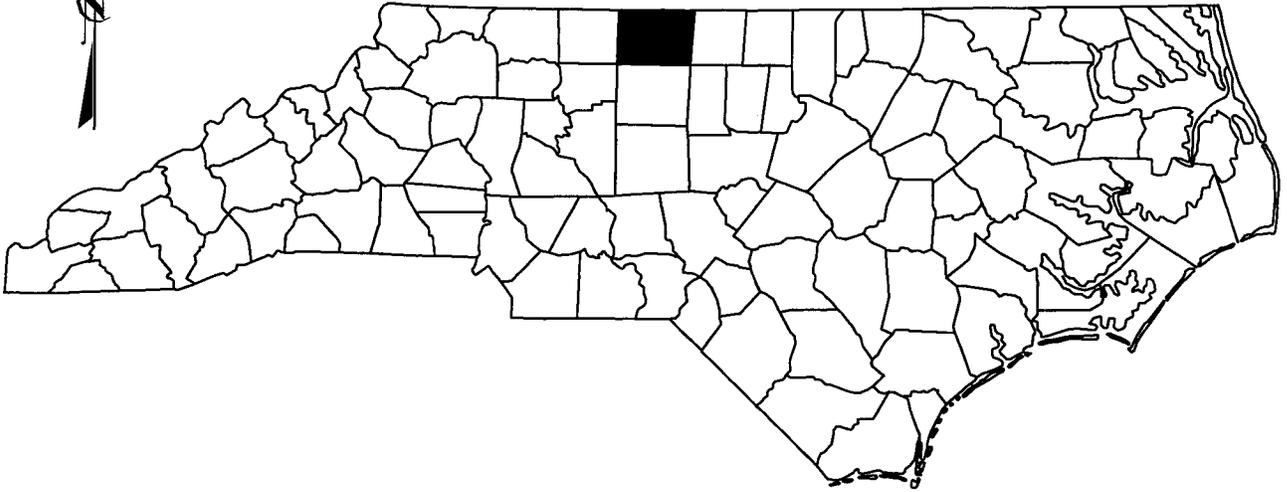
SECTION IV: DATA SOURCES.

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 Geodetic 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):

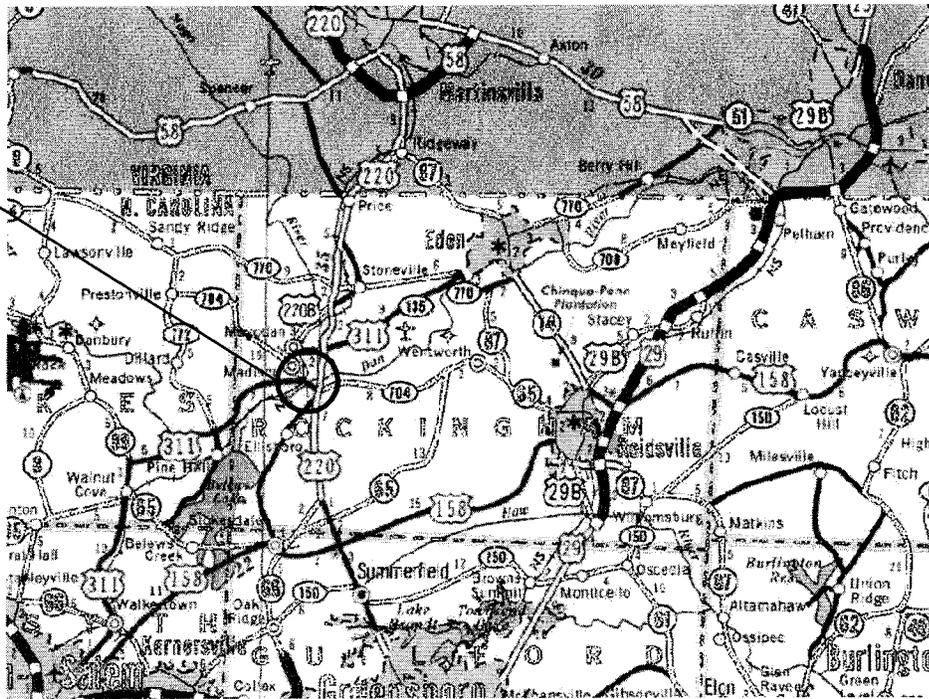
B. ADDITIONAL COMMENTS TO SUPPORT JD:

NORTH CAROLINA



Permit Drawing
Sheet 1 of 14

PROJECT
SITE



VICINITY MAP

NCDOT
DIVISION OF HIGHWAYS
ROCKINGHAM COUNTY
PROJECT: 33594.1.1 (B-4252)
BRIDGE 95 OVER BIG BEAVER
ISLAND CREEK AND
BRIDGE 67 OVER LITTLE
BEAVER ISLAND CREEK
ON US 311

SHEET

8/16/07

SUMMARY OF AFFECTED PROPERTY OWNERS

TRACT NO.	PROPERTY OWNER	ADDRESS	SITE NO.
6	HUGH D. FALLIN III & LYNDA G. FALLIN	503 WESTVIEW DR. MADISON, NC 27025	1
7	GAYLE N. BROWN	249 ISLAND DRIVE MADISON, NC 27025	1
8	THOMAS V. & CAROLYN M. CARDWELL	411 W DECATUR STREET MADISON, NC 27025	1
9	J.B.M. SALES & RENTALS, INC.	1007 W ACADEMY STREET MADISON, NC 27025	1, 2
10	BELLWOOD VILLAGE INC. & BLANCHE W. BELL	5143 N CHURCH STREET GREENSBORO, NC 27455	2
11	CATHY C. TUCKER, TRUSTEE	143 SARDIS CHURCH ROAD MADISON, NC 27025	2
5	NEW VISION FELLOWSHIP, INC.	710 CHIEF MARTIN STREET MADISON, NC 27025	3
15	JOYCE B. WALL	1165 W. ACADEMY STREET MADISON, NC 27025	3
16	CHANDLER CONCRETE/ PIEDMONT	PO BOX 131 BURLINGTON, NC	3

Permit Drawing
Sheet 3 of 14

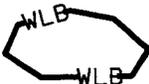
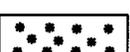
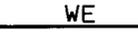
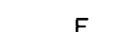
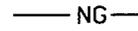
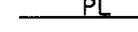
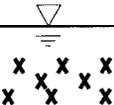
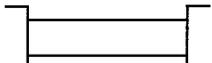
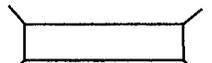
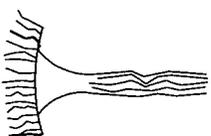
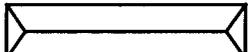
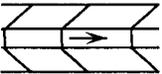


NCDOT
 DIVISION OF HIGHWAYS
 ROCKINGHAM COUNTY
 PROJECT: 33594.1.1 (B-4252)
 BRIDGE 95 OVER BIG BEAVER
 ISLAND CREEK AND
 BRIDGE 67 OVER LITTLE
 BEAVER ISLAND CREEK
 ON US 311

SHEET . 8/16/07

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WETLAND LEGEND

-  WETLAND BOUNDARY
-  WETLAND
-  DENOTES FILL IN WETLAND
-  DENOTES PERMANENT SURFACE WATER IMPACT
-  DENOTES PERMANENT SURFACE WATER IMPACT (POND)
-  DENOTES TEMPORARY FILL IN WETLAND
-  DENOTES EXCAVATION IN WETLAND
-  DENOTES TEMPORARY SURFACE WATER IMPACT
-  DENOTES MECHANIZED CLEARING
-  FLOW DIRECTION
-  TOP OF BANK
-  EDGE OF WATER
-  PROP. LIMIT OF CUT
-  PROP. LIMIT OF FILL
-  PROP. RIGHT OF WAY
-  NATURAL GROUND
-  PROPERTY LINE
-  TEMP. DRAINAGE EASEMENT
-  PERMANENT DRAINAGE EASEMENT
-  EXIST. ENDANGERED ANIMAL BOUNDARY
-  EXIST. ENDANGERED PLANT BOUNDARY
-  WATER SURFACE
-  LIVE STAKES
-  BOULDER
-  COIR FIBER ROLLS
-  PROPOSED BRIDGE
-  PROPOSED BOX CULVERT
-  PROPOSED PIPE CULVERT
12"-48" PIPES
54" PIPES & ABOVE
-  (DASHED LINES DENOTE EXISTING STRUCTURES)
-  SINGLE TREE
-  WOODS LINE
-  DRAINAGE INLET
-  ROOTWAD
-  RIP RAP
-  ADJACENT PROPERTY OWNER OR PARCEL NUMBER IF AVAILABLE
-  PREFORMED SCOUR HOLE
-  LEVEL SPREADER (LS)
-  DITCH / GRASS SWALE

Permit Drawing
Sheet 4 of 14

NCDOT
DIVISION OF HIGHWAYS
ROCKINGHAM COUNTY
PROJECT: 33594.1.1 (B-4252)
BRIDGE 95 OVER BIG BEAVER
ISLAND CREEK AND
BRIDGE 67 OVER LITTLE
BEAVER ISLAND CREEK
ON US 311

SHEET **8/16/07**

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WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS						SURFACE WATER IMPACTS					
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)		
1	-L- 27+45 to 27+61 LT	Single-Span Bridge - 100 ft	---	---	---	---	---	---	---	---	---	20	---	---
2	-L- 31+40 to 31+57 RT	Single-Span Bridge - 100 ft	---	---	---	---	---	---	---	---	---	20	---	---
3	-Y- 15+22 to 16+49	66" RCP	---	---	---	---	---	---	---	0.01	< 0.01	222	14	---
TOTALS:										0.02	< 0.01	262	14	

NC DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ROCKINGHAM COUNTY
 WBS - 33594.1.1 (B-4252)

Permit Drawing
Sheet 5 of 14

7/25/2007

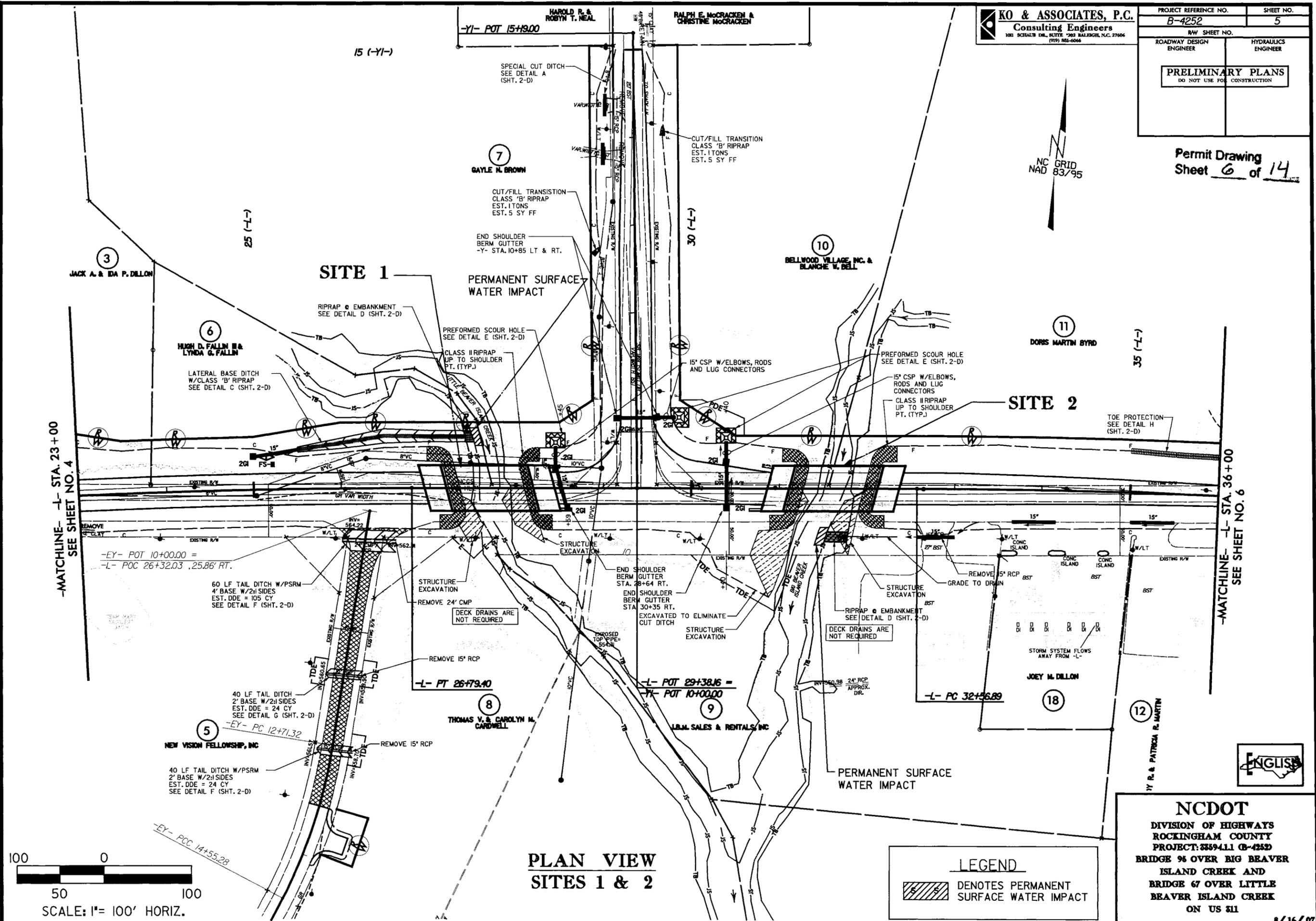
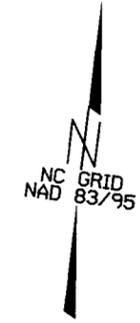
Perennial & Intermittent Total - Mitigation Req'd:
 Intermittent Total - Not Requiring Mitigation:

8/17/99

KO & ASSOCIATES, P.C.
Consulting Engineers
101 SCHULTZ DR., SUITE 202 RALEIGH, N.C. 27604
(919) 842-6666

PROJECT REFERENCE NO. B-4252	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

Permit Drawing
Sheet 6 of 14



PLAN VIEW SITES 1 & 2

LEGEND

DENOTES PERMANENT SURFACE WATER IMPACT

NCDOT
DIVISION OF HIGHWAYS
ROCKINGHAM COUNTY
PROJECT: 33594.11 (B-4252)
BRIDGE 98 OVER BIG BEAVER
ISLAND CREEK AND
BRIDGE 67 OVER LITTLE
BEAVER ISLAND CREEK
ON US 311

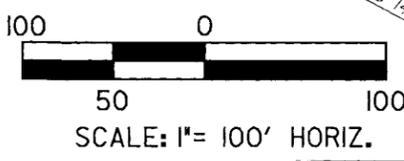
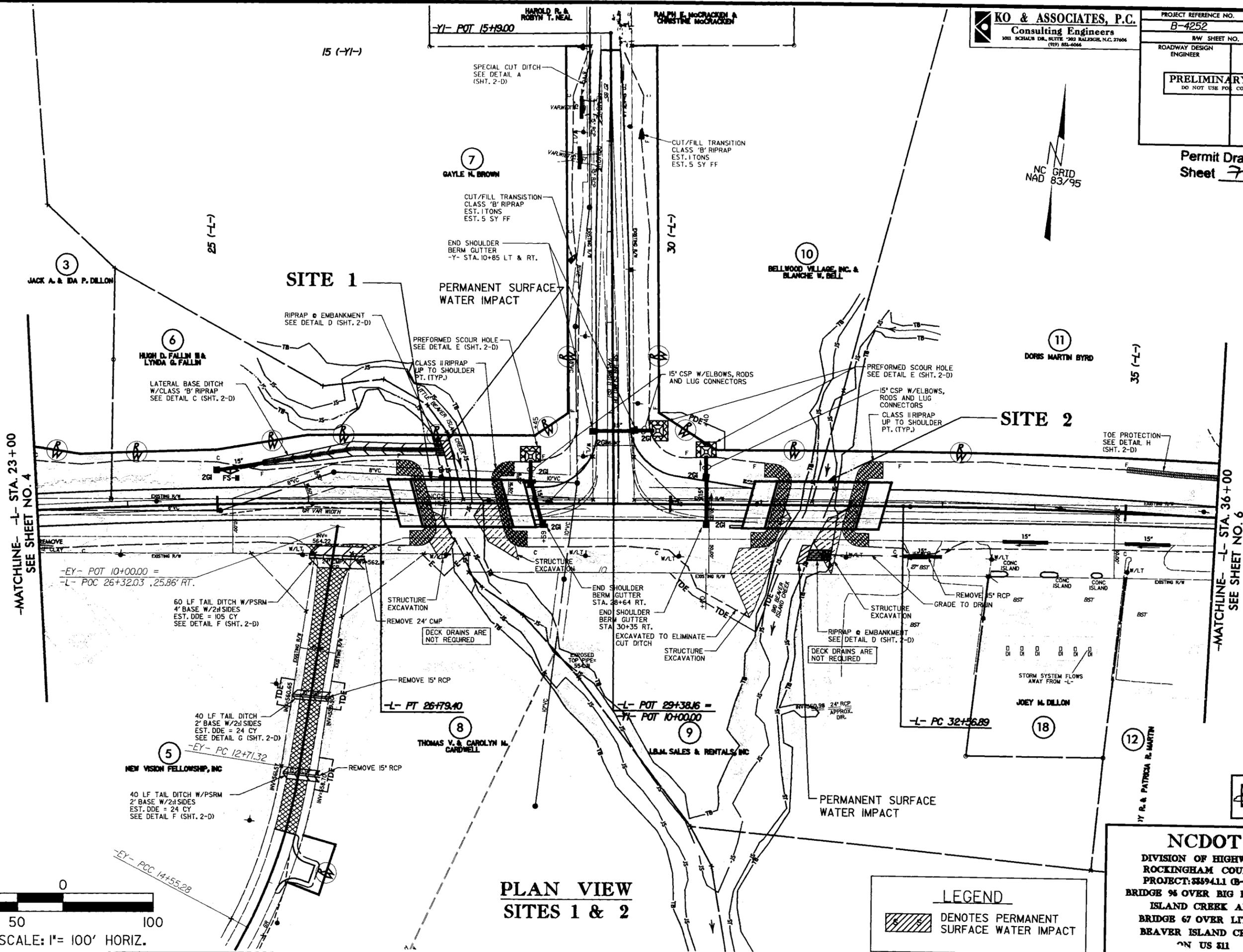
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KO & ASSOCIATES, P.C.
Consulting Engineers
1001 SCHUBB DR., SUITE 202 RALEIGH, N.C. 27606
(919) 851-4066

PROJECT REFERENCE NO. B-4252	SHEET NO. 5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

Permit Drawing
Sheet 7 of 14



PLAN VIEW SITES 1 & 2

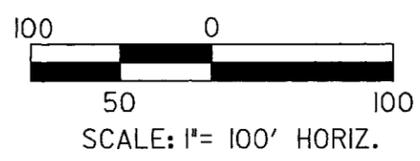
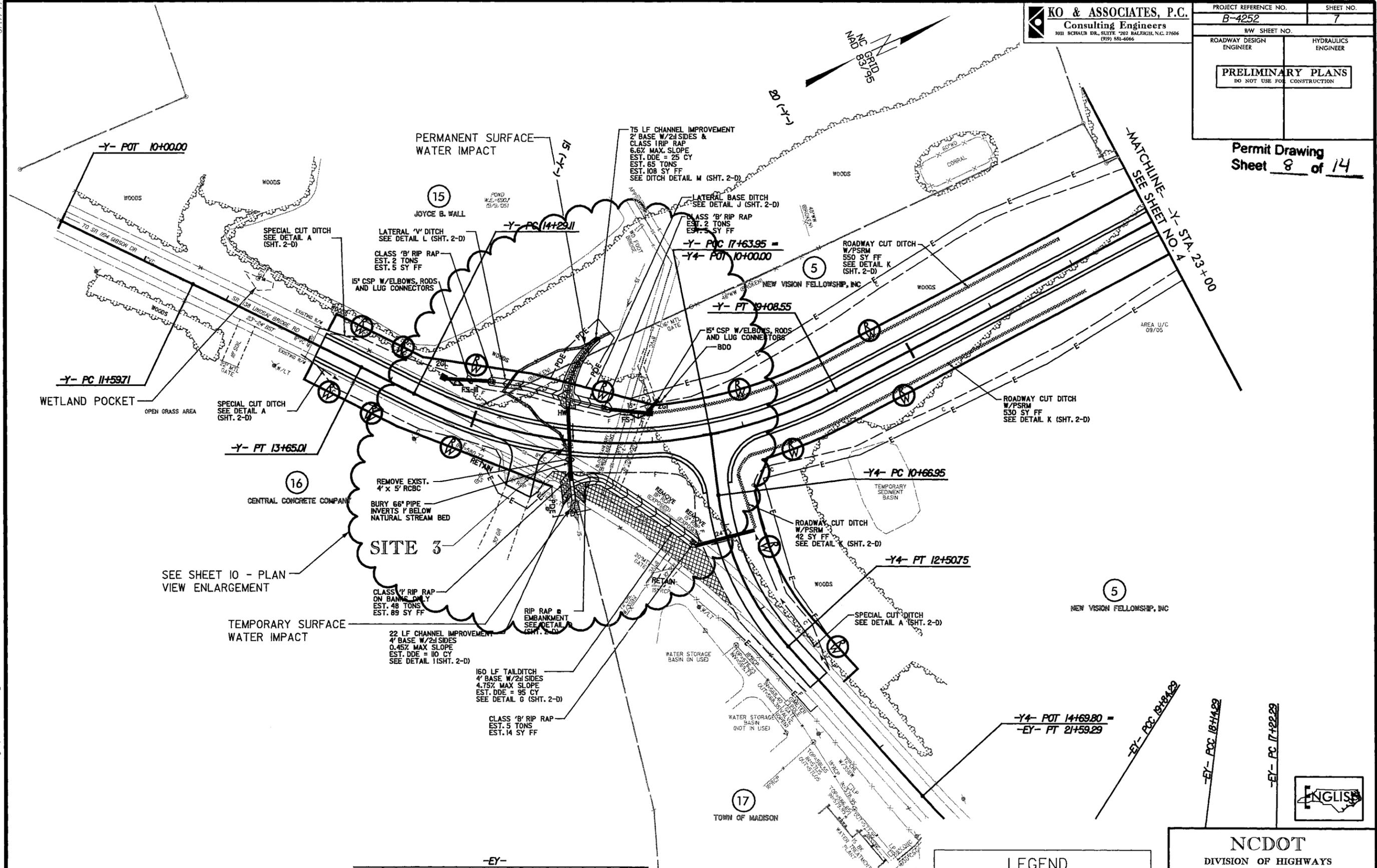
LEGEND	
	DENOTES PERMANENT SURFACE WATER IMPACT

NCDOT
DIVISION OF HIGHWAYS
ROCKINGHAM COUNTY
PROJECT: 33394.11 (B-4252)
BRIDGE 96 OVER BIG BRAVER
ISLAND CREEK AND
BRIDGE 67 OVER LITTLE
BEAVER ISLAND CREEK
ON US 311



PROJECT REFERENCE NO. B-4252	SHEET NO. 7
RAW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

Permit Drawing
 Sheet 8 of 14



**PLAN VIEW
 SITE 3**

LEGEND

	DENOTES TEMPORARY SURFACE WATER IMPACT
	DENOTES PERMANENT SURFACE WATER IMPACT

NCDOT
 DIVISION OF HIGHWAYS
 ROCKINGHAM COUNTY
 PROJECT: 33594.1.1 (B-4252)
 BRIDGE 95 OVER BIG BEAVER
 ISLAND CREEK AND
 BRIDGE 67 OVER LITTLE
 BEAVER ISLAND CREEK
 ON US 311



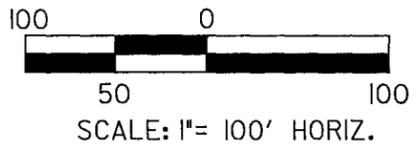
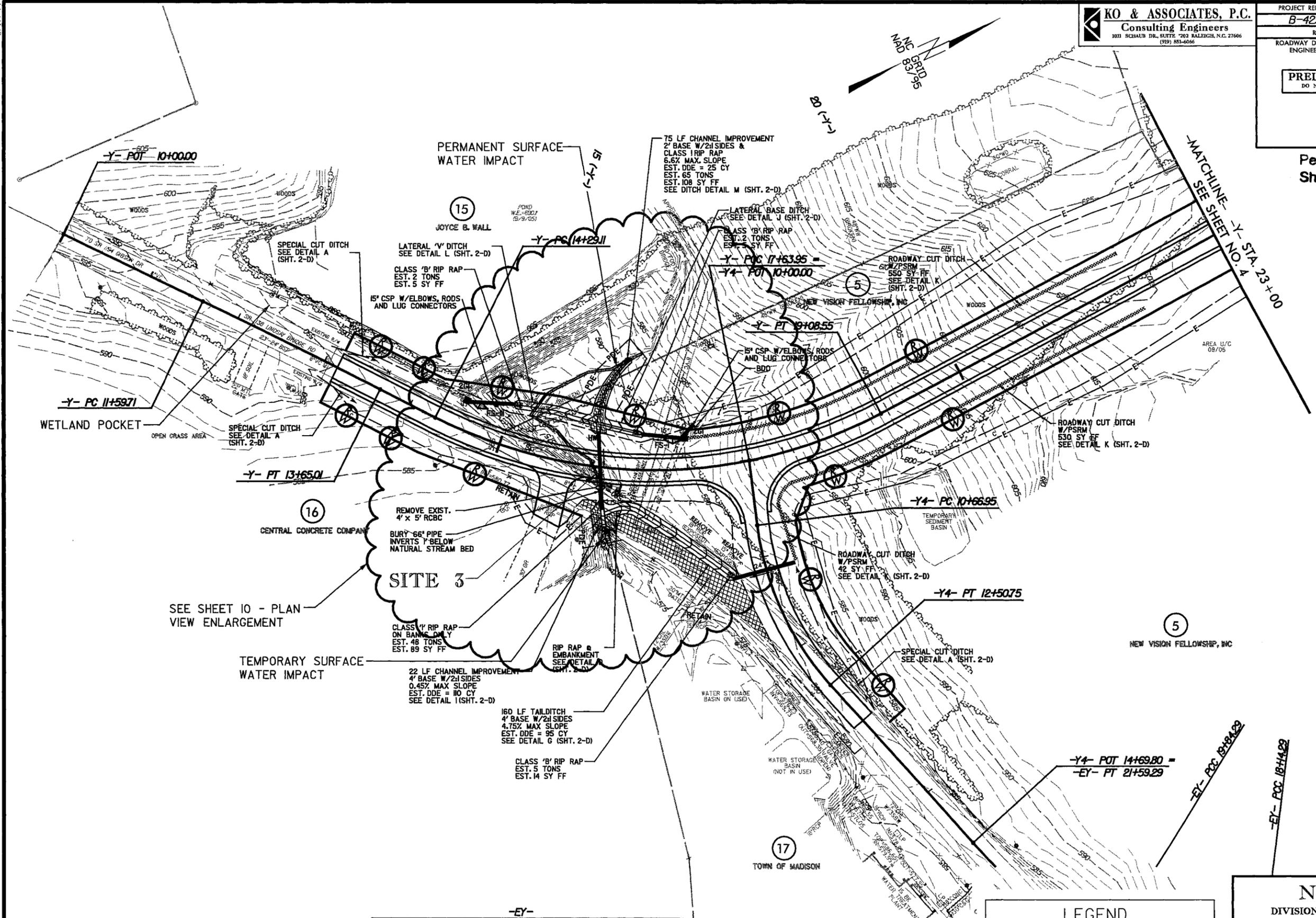
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KO & ASSOCIATES, P.C.
 Consulting Engineers
 1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606
 (919) 853-6566

PROJECT REFERENCE NO. B-4252	SHEET NO. 7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

Permit Drawing
 Sheet 9 of 14



**PLAN VIEW
 SITE 3**

LEGEND

	DENOTES TEMPORARY SURFACE WATER IMPACT
	DENOTES PERMANENT SURFACE WATER IMPACT

NCDOT
 DIVISION OF HIGHWAYS
 ROCKINGHAM COUNTY
 PROJECT: 33594.11 (B-4252)
 BRIDGE 95 OVER BIG BEAVER
 ISLAND CREEK AND
 BRIDGE 67 OVER LITTLE
 BEAVER ISLAND CREEK
 ON US 311

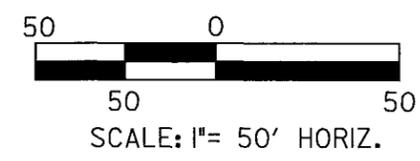
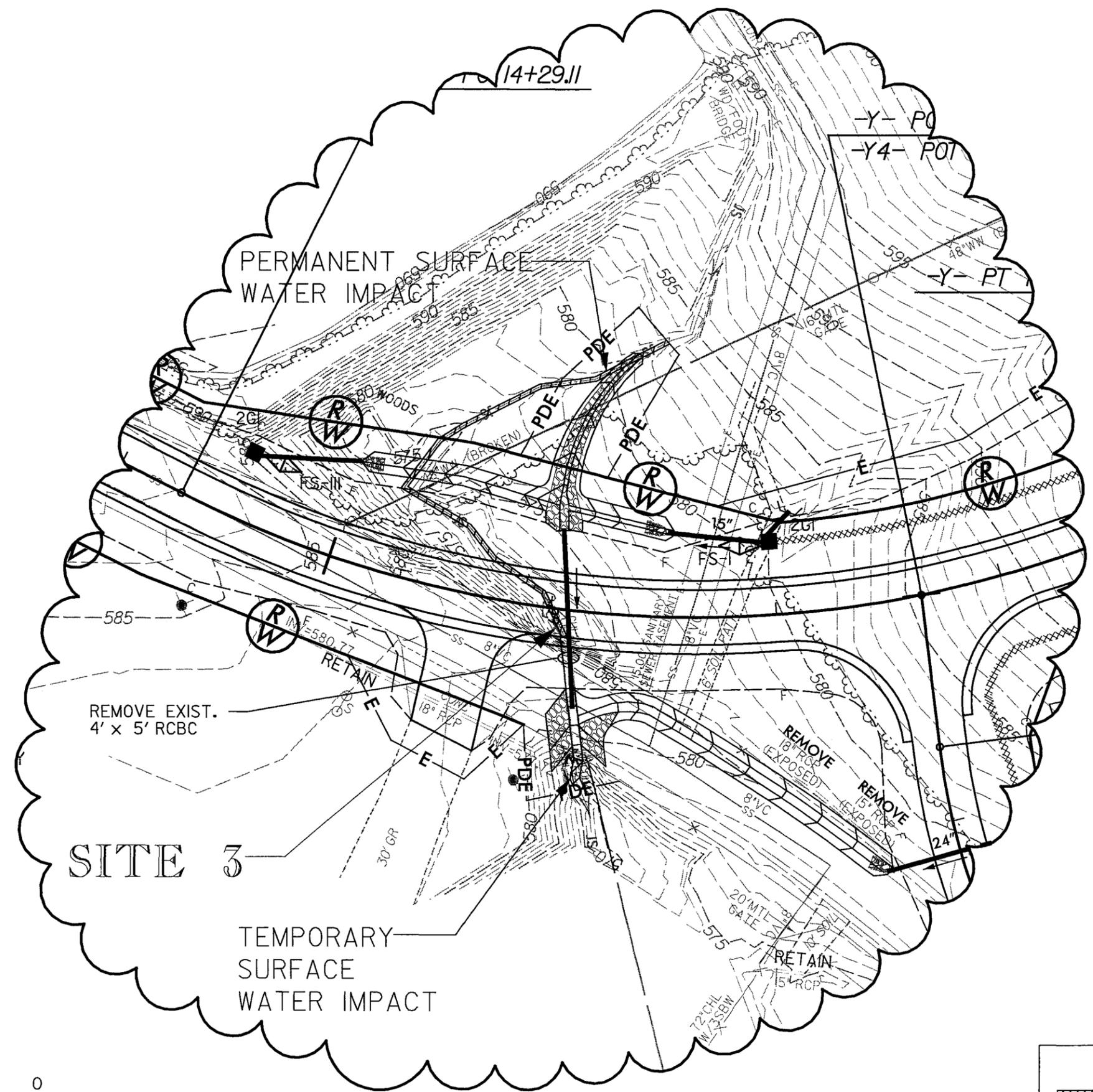
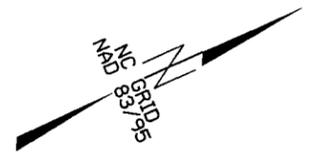


8/17/99

KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUER DR., SUITE 202 RALEIGH, N.C. 27606
(919) 851-6065

PROJECT REFERENCE NO. B-4252	SHEET NO. 7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

Permit Drawing
Sheet 11 of 14



PLAN VIEW ENLARGEMENT SITE 3

LEGEND	
	DENOTES TEMPORARY SURFACE WATER IMPACT
	DENOTES PERMANENT SURFACE WATER IMPACT

NCDOT
DIVISION OF HIGHWAYS
ROCKINGHAM COUNTY
PROJECT: 33594.1.1 (B-4252)
BRIDGE 95 OVER BIG BEAVER
ISLAND CREEK AND
BRIDGE 67 OVER LITTLE
BEAVER ISLAND CREEK
ON US 311

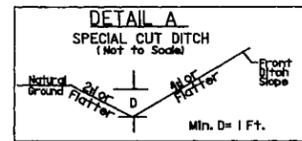


9/16/2007
C:\Hydraulics\vdgn\Permits\Surface Water\4252\hyd_prm_wet_07_scaleup.dgn

/2007... KO & ASSOCIATES, P.C. ...

PROJECT REFERENCE NO. B-4252	SHEET NO. 2-D
RAW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

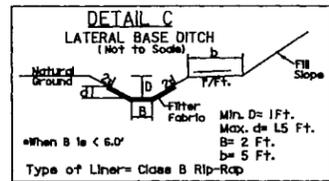
Permit Drawing
 Sheet 12 of 14



DETAIL A
SPECIAL CUT DITCH
(Not to Scale)

Min. D = 1 Ft.

SHEET	RDWY	STATION	- STATION	SIDE
4	-L-	12+50	TO 13+00	RT.
4	-L-	12+50	TO 13+00	LT.
4	-L-	13+50	TO 14+08	RT.
4	-L-	13+50	TO 14+08	LT.
4	-L-	15+50	TO 16+10	RT.
4	-Y-	25+00	TO 26+23	RT.
4	-DRI-	10+35	TO 11+75	LT.
5	-YI-	14+50	TO 15+00	LT.
6	-L-	36+25	TO 37+50	LT.
6	-L-	41+00	TO 41+50	LT.
7	-Y-	13+00	TO 13+50	LT.
7	-Y-	13+00	TO 13+50	RT.
7	-Y4-	11+13	TO 13+00	LT.



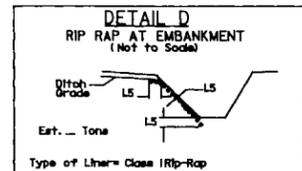
DETAIL C
LATERAL BASE DITCH
(Not to Scale)

Min. D = 1 Ft.
 Max. d = 1.5 Ft.
 B = 2 Ft.
 b = 5 Ft.

When B is < 6.0'

Type of Liner = Class B Rip-Rap

SHEET	RDWY	STATION	- STATION	SIDE
5	-L-	25+50	TO 27+41	LT.

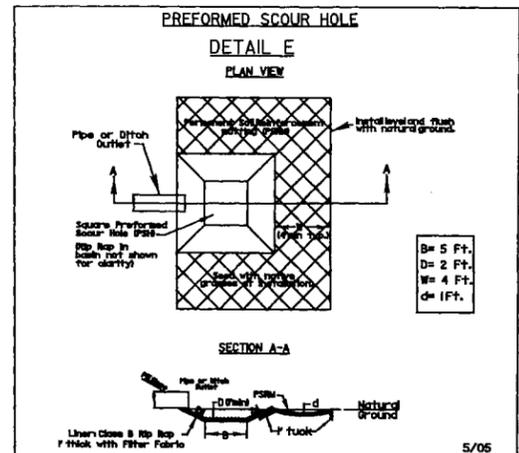


DETAIL D
RIP RAP AT EMBANKMENT
(Not to Scale)

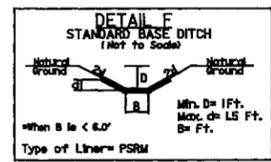
Est. - Tons

Type of Liner = Class B Rip-Rap

SHEET	RDWY	STATION	SIDE	TONS
5	-L-	27+41	LT.	EST. 10
5	-L-	31+78	RT.	EST. 30
7	-Y-	16+20	RT.	EST. 10



SHEET	RDWY	STATION	SIDE
5	-L-	28+45	LT.
5	-L-	30+40	LT.
5	-YI-	10+80	RT.



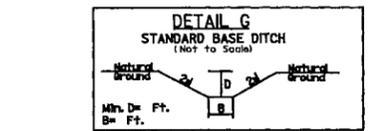
DETAIL F
STANDARD BASE DITCH
(Not to Scale)

Min. D = 1 Ft.
 Max. d = 1.5 Ft.
 B = Ft.

When B is < 6.0'

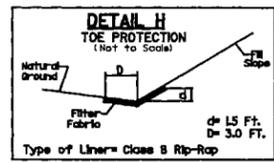
Type of Liner = PSRM

SHEET	RDWY	STATION	SIDE	B
5	-L-	25+91	RT.	2
5	-L-	26+32	RT.	4



DETAIL G
STANDARD BASE DITCH
(Not to Scale)

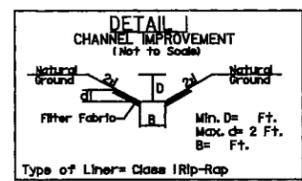
SHEET	RDWY	STATION	SIDE	D	B
5	-L-	26+03	RT.	1'	2'
7	-Y-	16+06 TO 11+13	-Y4-	RT.	1' 4'



DETAIL H
TOE PROTECTION
(Not to Scale)

Type of Liner = Class B Rip-Rap

SHEET	RDWY	STATION	- STATION	SIDE
5,6	-L-	35+00	TO 36+50	LT.

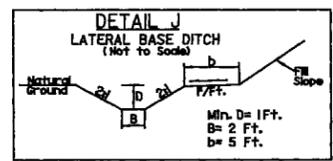


DETAIL I
CHANNEL IMPROVEMENT
(Not to Scale)

Min. D = Ft.
 Max. d = 2 Ft.
 B = Ft.

Type of Liner = Class B Rip-Rap

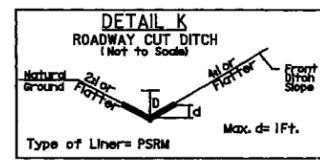
SHEET	RDWY	STATION	SIDE	D	B
7	-Y-	16+10	RT.	4'	4'



DETAIL J
LATERAL BASE DITCH
(Not to Scale)

Min. D = 1 Ft.
 B = 2 Ft.
 b = 5 Ft.

SHEET	RDWY	STATION	- STATION	SIDE
7	-Y-	16+00	TO 16+50	LT.

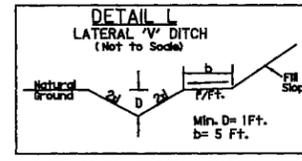


DETAIL K
ROADWAY CUT DITCH
(Not to Scale)

Max. d = 1 Ft.

Type of Liner = PSRM

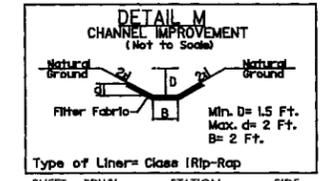
SHEET	RDWY	STATION	- STATION	SIDE
7	-Y-	18+00	TO 22+00	RT.
7	-Y-	16+99	TO 22+00	LT.
7	-Y4-	10+50	TO 11+13	LT.



DETAIL L
LATERAL V DITCH
(Not to Scale)

Min. D = 1 Ft.
 b = 5 Ft.

SHEET	RDWY	STATION	- STATION	SIDE
7	-Y-	15+00	TO 16+00	LT.

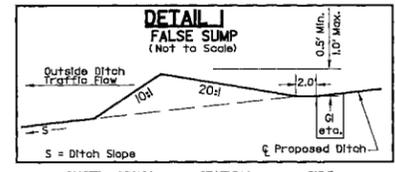


DETAIL M
CHANNEL IMPROVEMENT
(Not to Scale)

Min. D = 1.5 Ft.
 Max. d = 2 Ft.
 B = 2 Ft.

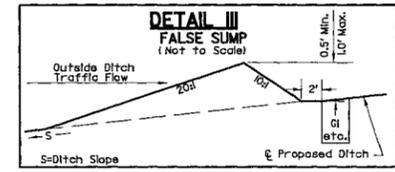
Type of Liner = Class B Rip-Rap

SHEET	RDWY	STATION	SIDE
7	-Y-	16+00	LT.



DETAIL N
FALSE SUMP
(Not to Scale)

SHEET	RDWY	STATION	SIDE
4	-Y-	26+10	LT.
7	-Y-	16+99	LT.



DETAIL O
FALSE SUMP
(Not to Scale)

SHEET	RDWY	STATION	- STATION	SIDE
5	-L-	25+00	LT.	
7	-Y-	14+50	LT.	

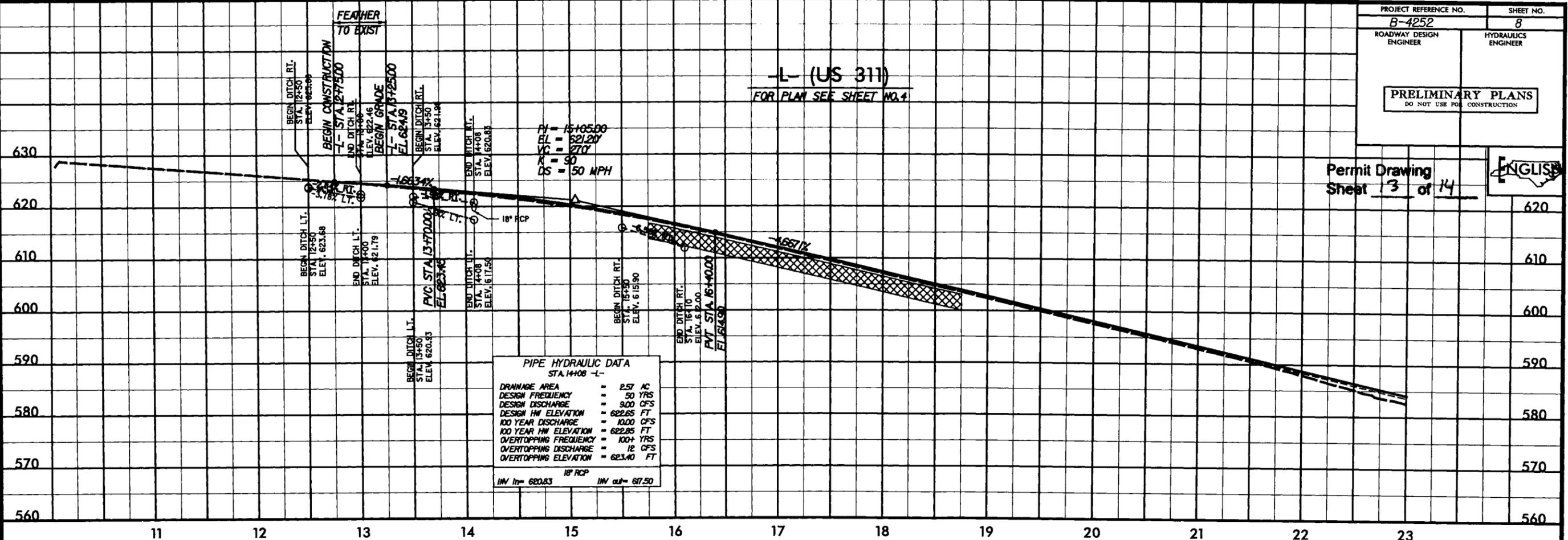


NC DOT
 DIVISION OF HIGHWAYS
 ROCKINGHAM COUNTY
 PROJECT: 33594.1.1 (B-4252)
 BRIDGE 95 OVER BIG BEAVER
 ISLAND CREEK AND
 BRIDGE 67 OVER LITTLE
 BEAVER ISLAND CREEK
 ON US 311

Permit Drawing Sheet 3 of 14

ENGLISH

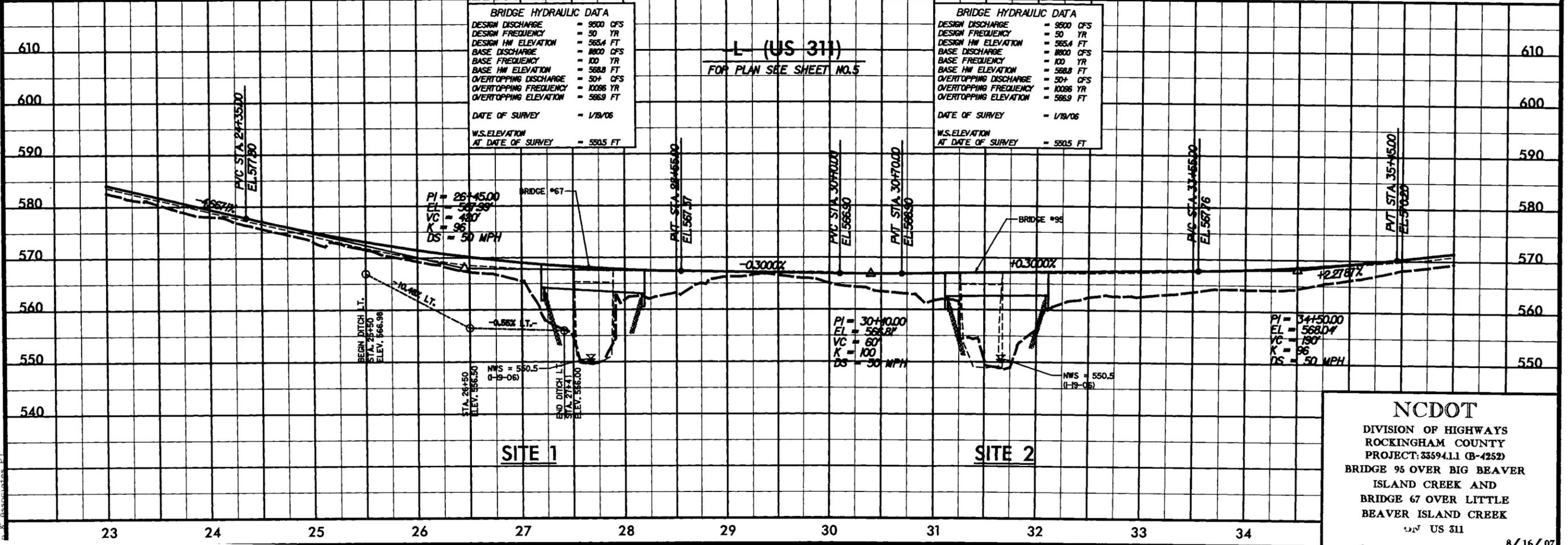
5/28/09
1/16/2009
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PIPE HYDRAULIC DATA
STA. 14+08 -L-

DRAINAGE AREA	= 257 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 900 CFS
DESIGN HW ELEVATION	= 622.65 FT
100 YEAR DISCHARGE	= 1000 CFS
100 YEAR HW ELEVATION	= 622.85 FT
OVERTOPPING FREQUENCY	= 100+ YRS
OVERTOPPING DISCHARGE	= 12 CFS
OVERTOPPING ELEVATION	= 623.40 FT

18" RCP
INV. I₁ = 620.83 INV. O₁ = 617.50



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 900 CFS
DESIGN FREQUENCY	= 50 YR
DESIGN HW ELEVATION	= 565.4 FT
BASE DISCHARGE	= 1800 CFS
BASE FREQUENCY	= 100 YR
BASE HW ELEVATION	= 568.8 FT
OVERTOPPING DISCHARGE	= 30+ CFS
OVERTOPPING FREQUENCY	= 1000+ YR
OVERTOPPING ELEVATION	= 566.9 FT

DATE OF SURVEY = 1/19/06
W.S. ELEVATION AT DATE OF SURVEY = 590.5 FT

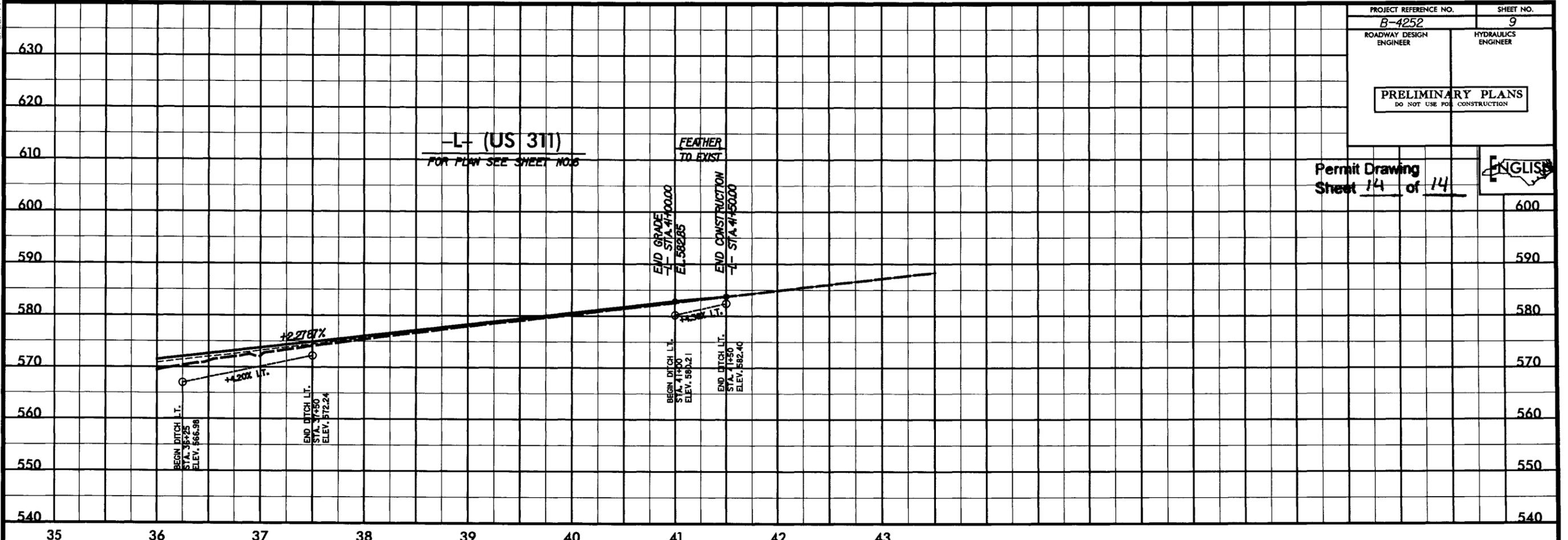
BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 900 CFS
DESIGN FREQUENCY	= 50 YR
DESIGN HW ELEVATION	= 565.4 FT
BASE DISCHARGE	= 1800 CFS
BASE FREQUENCY	= 100 YR
BASE HW ELEVATION	= 568.8 FT
OVERTOPPING DISCHARGE	= 30+ CFS
OVERTOPPING FREQUENCY	= 1000+ YR
OVERTOPPING ELEVATION	= 566.9 FT

DATE OF SURVEY = 1/19/06
W.S. ELEVATION AT DATE OF SURVEY = 590.5 FT

NCDOT
DIVISION OF HIGHWAYS
ROCKINGHAM COUNTY
PROJECT: 33594.1.1 (B-4252)
BRIDGE 95 OVER BIG BEAVER
ISLAND CREEK AND
BRIDGE 67 OVER LITTLE
BEAVER ISLAND CREEK
ON US 311

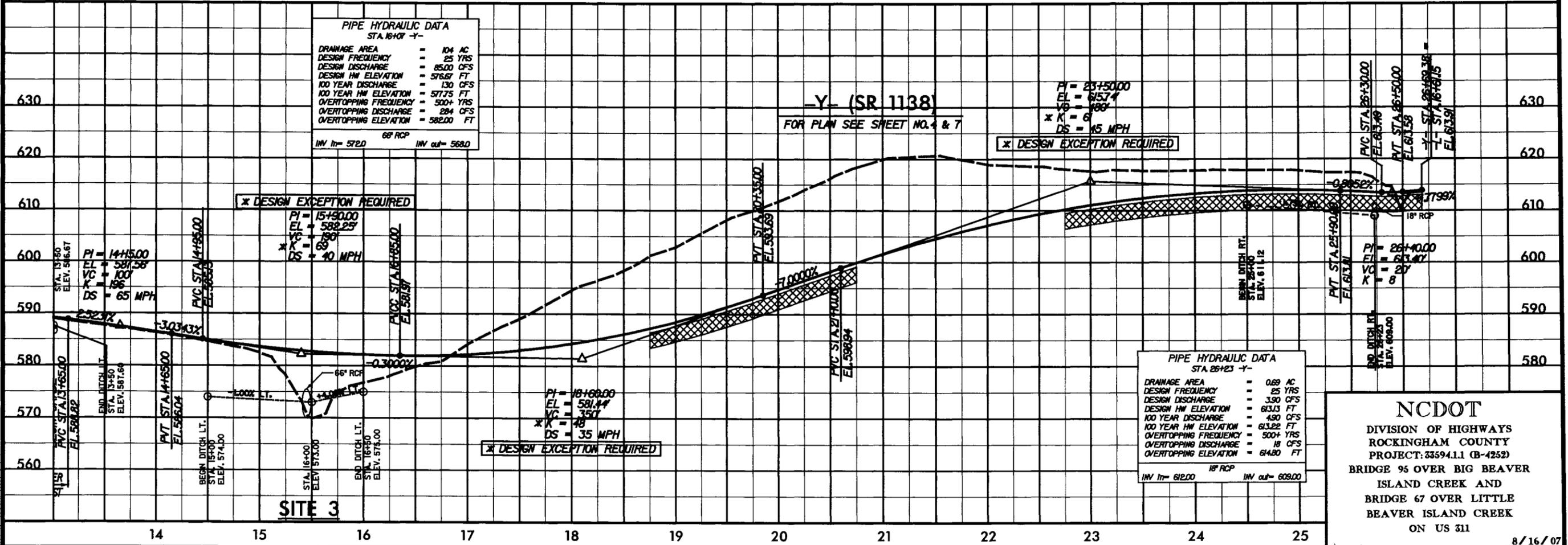
Permit Drawing
Sheet 14 of 14



PIPE HYDRAULIC DATA
STA 16+01 -Y-

DRAINAGE AREA	=	104 AC
DESIGN FREQUENCY	=	25 YRS
DESIGN DISCHARGE	=	85.00 CFS
DESIGN HW ELEVATION	=	576.67 FT
100 YEAR DISCHARGE	=	130 CFS
100 YEAR HW ELEVATION	=	577.75 FT
OVERTOPPING FREQUENCY	=	500+ YRS
OVERTOPPING DISCHARGE	=	284 CFS
OVERTOPPING ELEVATION	=	582.00 FT

66" RCP
INV in = 572.0 INV out = 568.0



* DESIGN EXCEPTION REQUIRED

PI	=	15+90.00
EL	=	582.25'
VC	=	100'
DS	=	40 MPH

* DESIGN EXCEPTION REQUIRED

PI	=	18+60.00
EL	=	581.44'
VC	=	350'
DS	=	35 MPH

* DESIGN EXCEPTION REQUIRED

PI	=	23+50.00
EL	=	615.74'
VC	=	180'
DS	=	15 MPH

PIPE HYDRAULIC DATA
STA 26+23 -Y-

DRAINAGE AREA	=	0.69 AC
DESIGN FREQUENCY	=	25 YRS
DESIGN DISCHARGE	=	3.90 CFS
DESIGN HW ELEVATION	=	613.33 FT
100 YEAR DISCHARGE	=	4.90 CFS
100 YEAR HW ELEVATION	=	613.22 FT
OVERTOPPING FREQUENCY	=	500+ YRS
OVERTOPPING DISCHARGE	=	18 CFS
OVERTOPPING ELEVATION	=	614.80 FT

18" RCP
INV in = 612.00 INV out = 608.00

NCDOT
DIVISION OF HIGHWAYS
ROCKINGHAM COUNTY
PROJECT: 33594.1.1 (B-4252)
BRIDGE 95 OVER BIG BEAVER
ISLAND CREEK AND
BRIDGE 67 OVER LITTLE
BEAVER ISLAND CREEK
ON US 311

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See Sheet 1-A For Index of Sheets

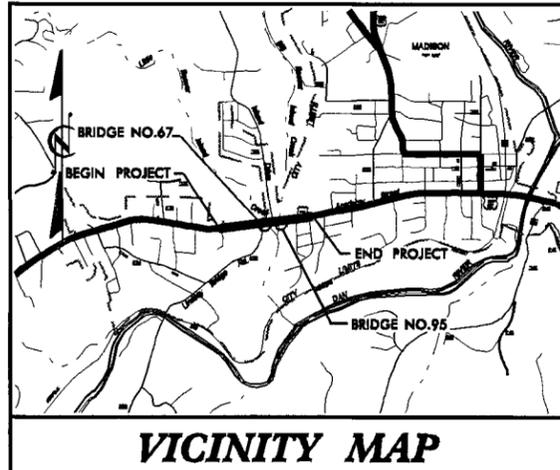
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ROCKINGHAM COUNTY

LOCATION: BRIDGE NO. 95 OVER BIG BEAVER ISLAND CREEK ON US 311 AND BRIDGE NO. 67 OVER LITTLE BEAVER ISLAND CREEK ON US 311
TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES AND SIGNALS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4252	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33594.1.1	BRSTP-311(14)	P.E.	
33594.2.1	BRSTP-311(14)	RW & Utilities	

TIP PROJECT: B-4252



VICINITY MAP

(THIS PROJECT IS IN THE MUNICIPAL BOUNDARIES OF MADISON.)

RW Plans

BEGIN TIP PROJECT B-4252
-L- STA. 12+75.00

BEGIN BRIDGE
-L- STA. 27+19.00

END BRIDGE
-L- STA. 28+19.00

END CONSTRUCTION
-YI- STA. 15+00.00

BEGIN CONSTRUCTION
-Y- STA. 13+15.00

END BRIDGE
-L- STA. 32+11.50

BEGIN BRIDGE
-L- STA. 31+11.50

END CONSTRUCTION
-Y4- STA. 13+00.00

END TIP PROJECT B-4252
-L- STA. 41+50.00



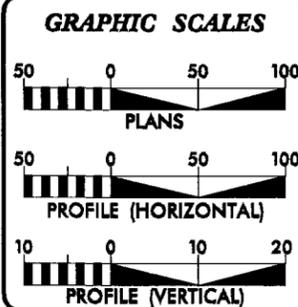
** DESIGN EXCEPTION REQUIRED FOR HORIZONTAL & VERTICAL DESIGN (-Y-).

NCDOT CONTACT: CATHY HOUSER, P.E.
ROADWAY DESIGN - ENGINEERING COORDINATION

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONTRACT:



DESIGN DATA

ADT 2008 =	14160
ADT 2028 =	20560
DHV =	10 %
D =	65 %
T =	3 % *
V =	50 MPH
* TTST 1%	DUAL 2%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4252	=	0.507 MI.
LENGTH STRUCTURES TIP PROJECT B-4252	=	0.038 MI.
TOTAL LENGTH OF TIP PROJECT B-4252	=	0.545 MI.

Prepared in the Office of:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 Schaub Dr. Suite 202 Raleigh NC 27606
(919) 851-4000

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: **JUNE 15, 2007**

LETTING DATE: **JUNE 17, 2008**

DAVID C. WALLER, PE
PROJECT ENGINEER

BRIAN A. WILES, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER

20-AUG-2007 13:13
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\$\$\$\$\$USERNAME\$\$\$\$\$

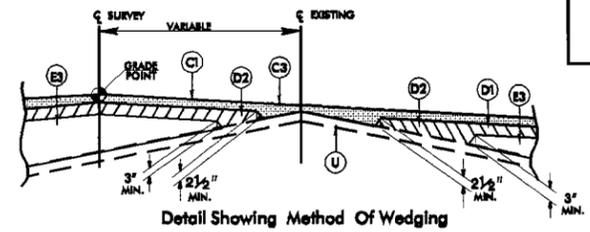
6/2/09

PAVEMENT SCHEDULE

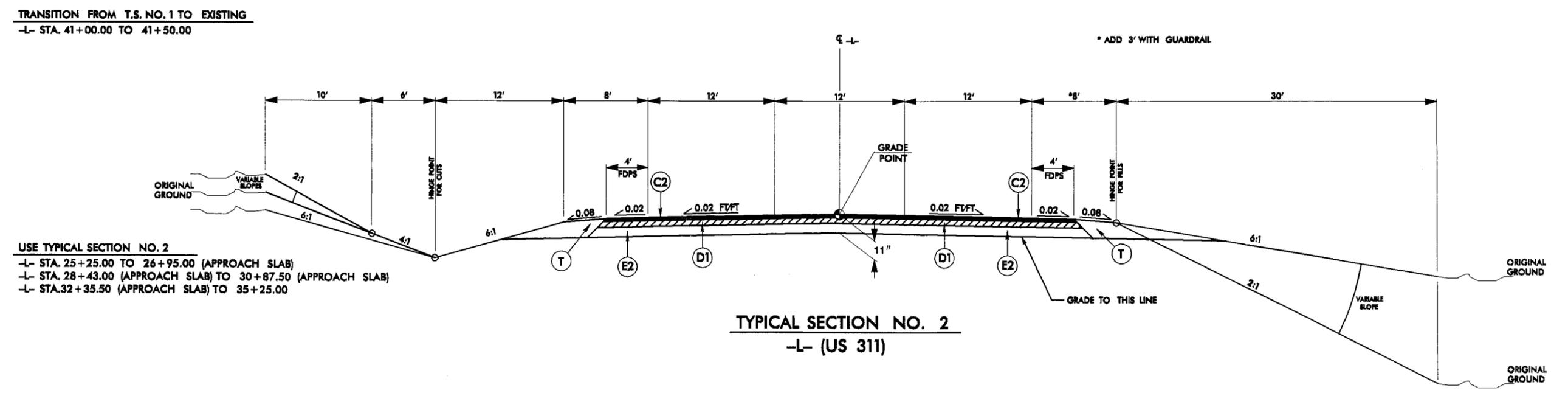
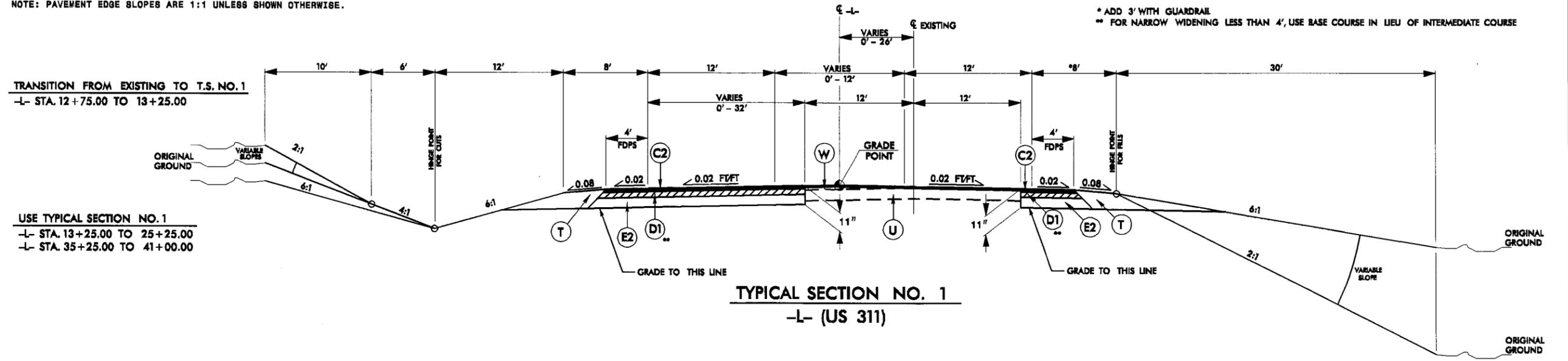
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE 89.5B, AT AN AVERAGE RATE OF 188 LBS. PER SQ. YD.	E2	PROP. APPROX. 6½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 827 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE 89.5B, AT AN AVERAGE RATE OF 188 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E3	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 6½" IN DEPTH.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE 89.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	J	PROP. 8" AGGREGATE BASE COURSE.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 288 LBS. PER SQ. YD.	T	EARTH MATERIAL.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	U	EXISTING PAVEMENT.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	W	VARIABLE DEPTH ASPHALT PAVEMENT

KO & ASSOCIATES, P.C.
 Consulting Engineers
 3011 NORALE DR., SUITE 202 RALEIGH, N.C. 27604
 (919) 881-6066

PROJECT REFERENCE NO. B-4252	SHEET NO. 2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



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



20-AUG-2007 13:13 P:\projects\B-4252\plan\typ.dgn

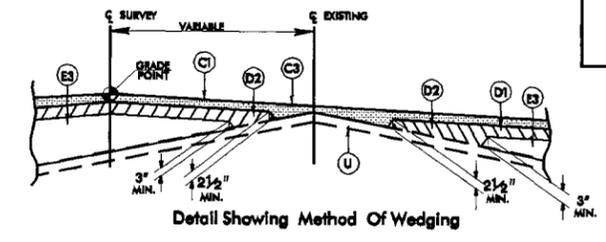
6/2/99
20-AUG-2007 13:44
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I:\4252_r.dwg

PAVEMENT SCHEDULE

C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE 89.5B, AT AN AVERAGE RATE OF 188 LBS. PER SQ. YD.	E2	PROP. APPROX. 5 1/2" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE 89.5B, AT AN AVERAGE RATE OF 188 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E3	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 6 1/2" IN DEPTH.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE 89.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	J	PROP. 8" AGGREGATE BASE COURSE.
D1	PROP. APPROX. 2 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	T	EARTH MATERIAL.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2 1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH.	U	EXISTING PAVEMENT.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 486 LBS. PER SQ. YD.	W	VARIABLE DEPTH ASPHALT PAVEMENT

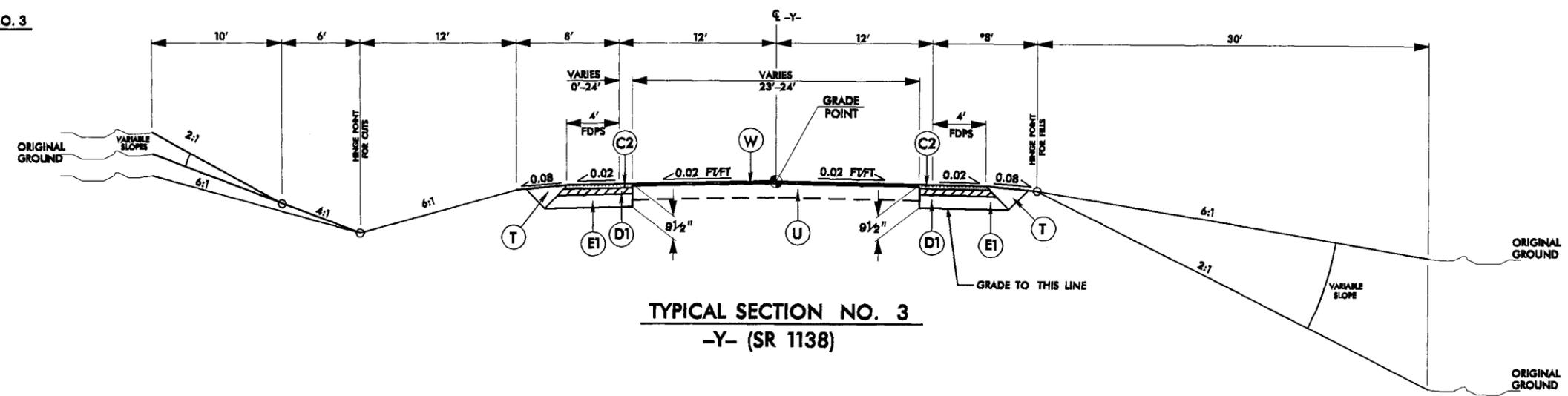
KO & ASSOCIATES, P.C.
Consulting Engineers
3811 WOODLAWN DR., SUITE 202 BALTIMORE, M.D. 21206
(410) 881-6066

PROJECT REFERENCE NO. B-4252	SHEET NO. 2-A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



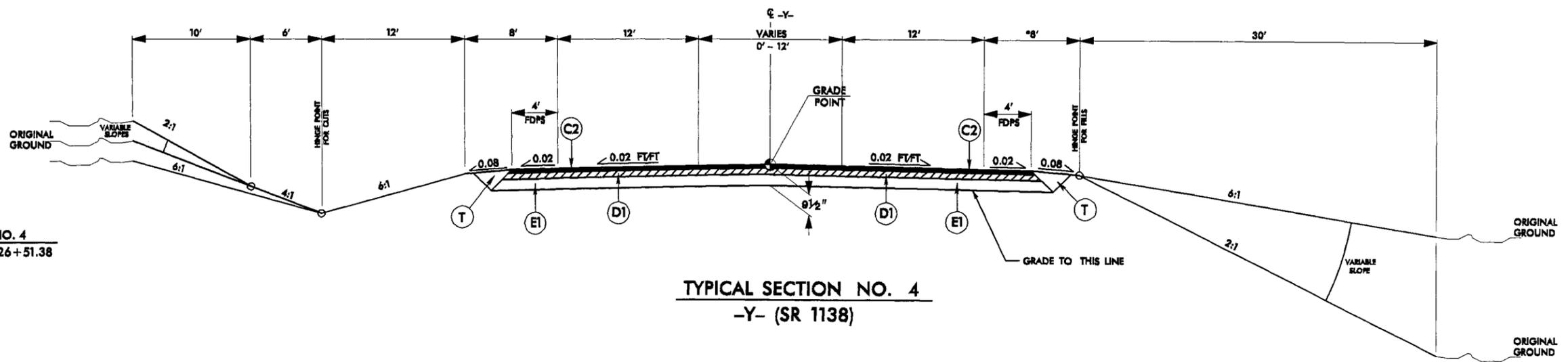
* ADD 3' WITH GUARDRAIL

TRANSITION FROM EXISTING TO T.S. NO. 3
-Y- STA. 13+15.00 TO 13+65.00



USE TYPICAL SECTION NO. 3
-Y- STA. 13+65.00 TO 15+75.00

USE TYPICAL SECTION NO. 4
-Y- STA. 15+75.00 TO 26+51.38



TYPICAL SECTION NO. 4
-Y- (SR 1138)

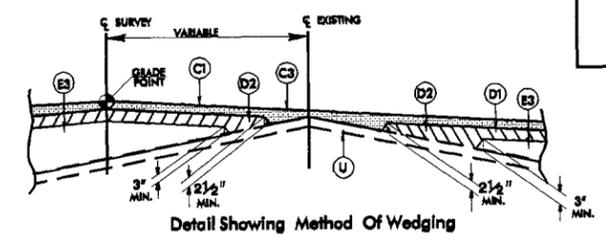
6/2/99

PAVEMENT SCHEDULE

C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE 89.5B, AT AN AVERAGE RATE OF 188 LBS. PER SQ. YD.	E2	PROP. APPROX. 5 1/2" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 827 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE 89.5B, AT AN AVERAGE RATE OF 188 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E3	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 6 1/2" IN DEPTH.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE 89.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	J	PROP. 8" AGGREGATE BASE COURSE.
D1	PROP. APPROX. 2 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 288 LBS. PER SQ. YD.	T	EARTH MATERIAL.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 2 1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH.	U	EXISTING PAVEMENT.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 488 LBS. PER SQ. YD.	W	VARIABLE DEPTH ASPHALT PAVEMENT

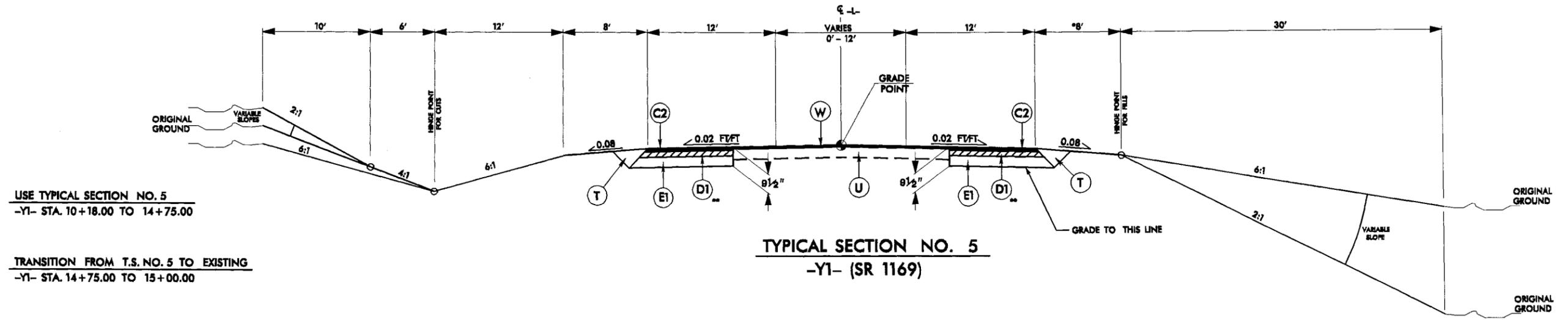
KO & ASSOCIATES, P.C.
 Consulting Engineers
 201 SCHULTZ DR., SUITE 200, RALEIGH, N.C. 27604
 (919) 883-6046

PROJECT REFERENCE NO. B-4252	SHEET NO. 2-B
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



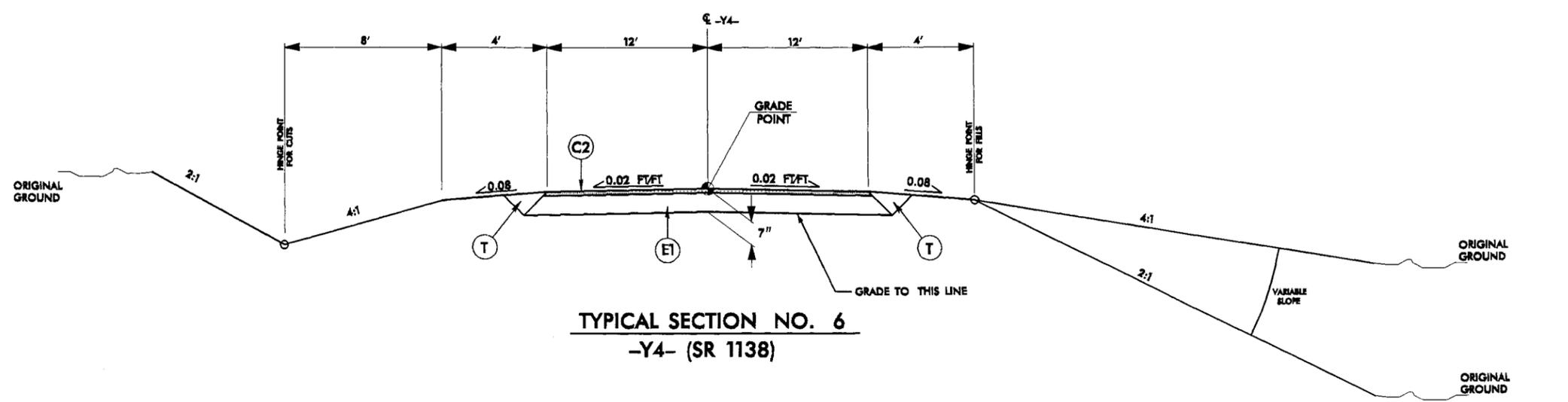
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

* ADD 3' WITH GUARDRAIL
 ** FOR NARROW WIDENING LESS THAN 4', USE BASE COURSE IN LIEU OF INTERMEDIATE COURSE



USE TYPICAL SECTION NO. 5
 -Y1- STA. 10+18.00 TO 14+75.00

TRANSITION FROM T.S. NO. 5 TO EXISTING
 -Y1- STA. 14+75.00 TO 15+00.00



USE TYPICAL SECTION NO. 6
 -Y4- STA. 10+63.00 TO 11+50.00

TYPICAL SECTION NO. 6
 -Y4- (SR 1138)

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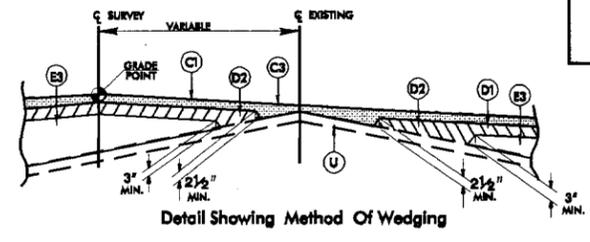
6/2/99

PAVEMENT SCHEDULE

C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE 89.5B, AT AN AVERAGE RATE OF 188 LBS. PER SQ. YD.	E2	PROP. APPROX. 5½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 827 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE 89.5B, AT AN AVERAGE RATE OF 188 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E3	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE 89.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	J	PROP. 8" AGGREGATE BASE COURSE.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	T	EARTH MATERIAL.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	U	EXISTING PAVEMENT.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 486 LBS. PER SQ. YD.	W	VARIABLE DEPTH ASPHALT PAVEMENT

KO & ASSOCIATES, P.C.
 Consulting Engineers
 3011 SCHEIDT DR., SUITE 200 BALAHORE, N.C. 27804
 (757) 985-6065

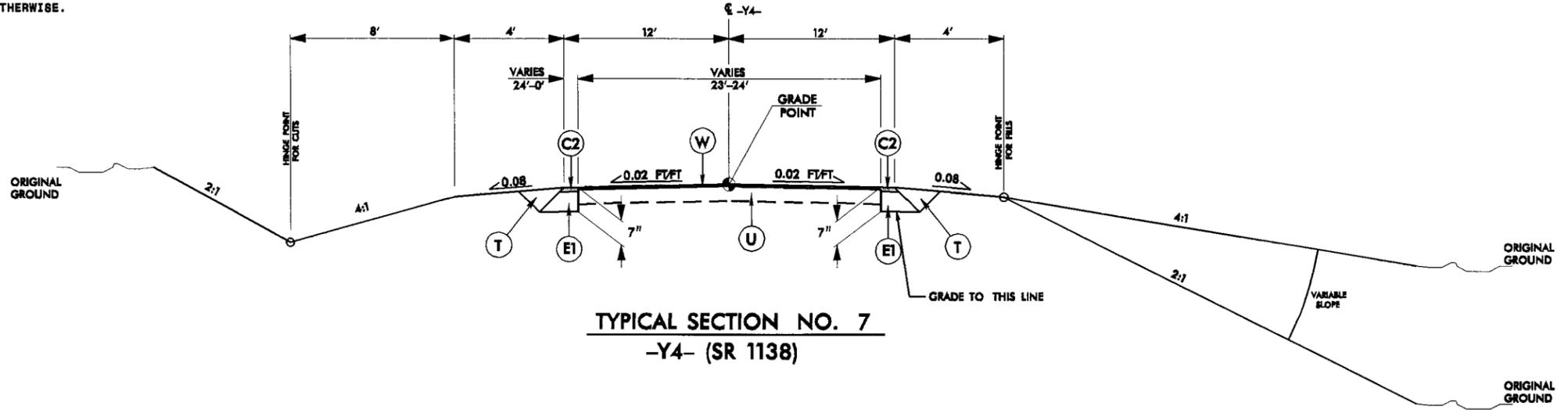
PROJECT REFERENCE NO. B-4252	SHEET NO. 2-C
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



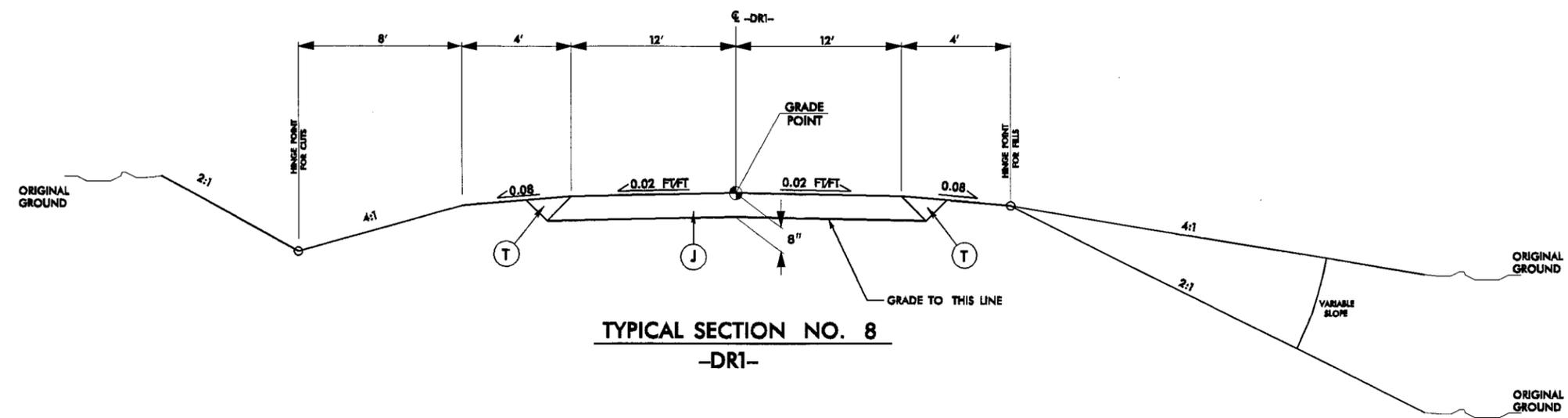
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

USE TYPICAL SECTION NO. 7
 -Y4- STA. 11+50.00 TO 12+60.00

TRANSITION FROM T.S. NO. 7 TO EXISTING
 -Y4- STA. 12+60.00 TO 13+00.00

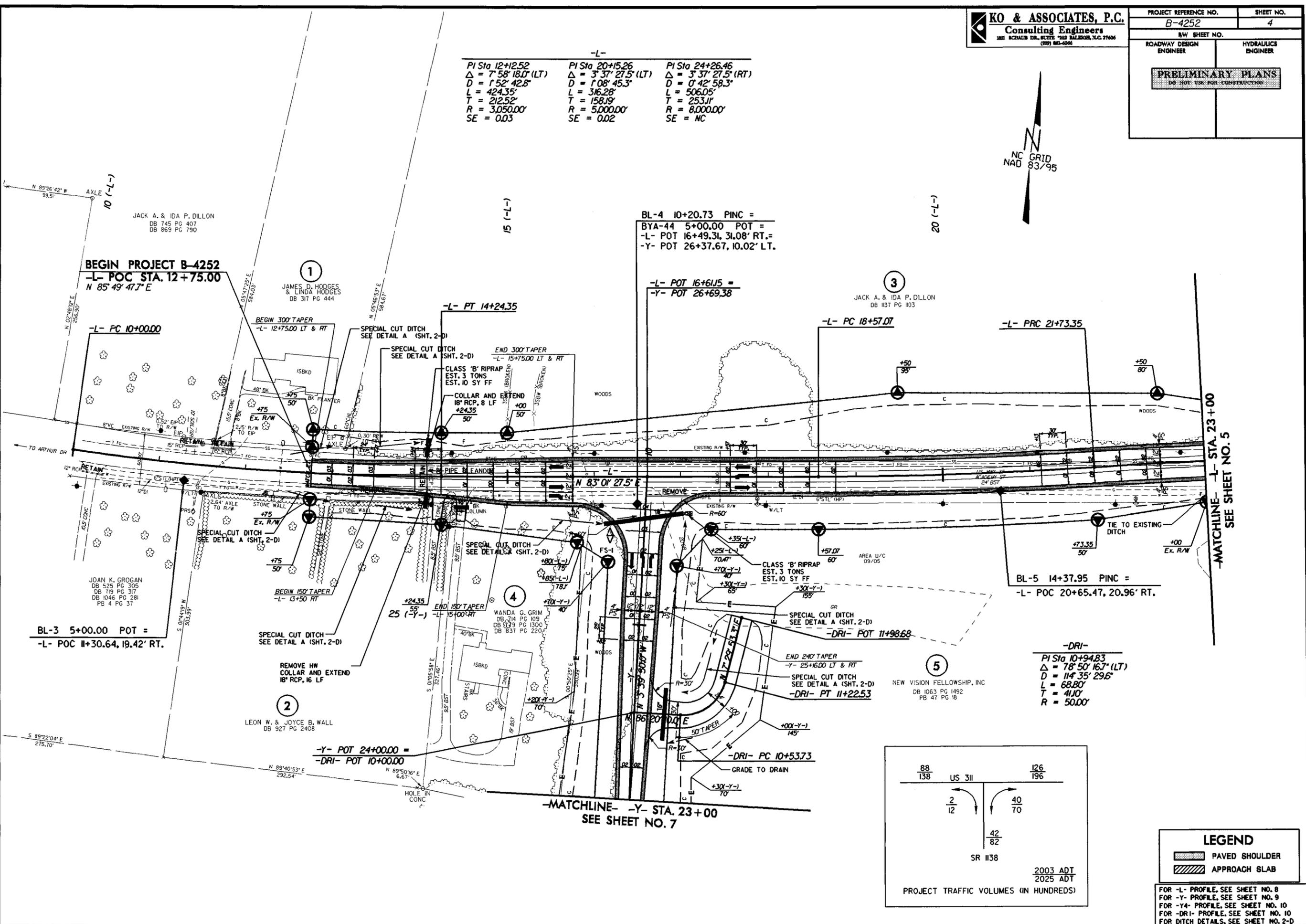


USE TYPICAL SECTION NO. 8
 -DR1- STA. 10+15.10 TO 11+98.68



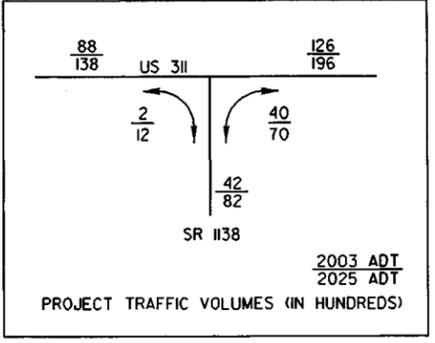
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 \$\$\$\$ UNRENDERED \$\$\$

-L-		
PI Sta 12+12.52 Δ = 7° 58' 18.0" (LT) D = 152' 42.8" L = 424.35' T = 212.52' R = 3,050.00' SE = 0.03	PI Sta 20+15.26 Δ = 3° 37' 27.5" (LT) D = 108' 45.3" L = 316.28' T = 158.19' R = 5,000.00' SE = 0.02	PI Sta 24+26.46 Δ = 3° 37' 27.5" (RT) D = 0' 42' 58.3" L = 506.05' T = 253.11' R = 8,000.00' SE = NC



-MATCHLINE- -Y- STA. 23+00
SEE SHEET NO. 7

-MATCHLINE- -L- STA. 23+00
SEE SHEET NO. 5



LEGEND

- PAVED SHOULDER
- APPROACH SLAB

FOR -L- PROFILE, SEE SHEET NO. 8
 FOR -Y- PROFILE, SEE SHEET NO. 9
 FOR -Y4- PROFILE, SEE SHEET NO. 10
 FOR -DRI- PROFILE, SEE SHEET NO. 10
 FOR DITCH DETAILS, SEE SHEET NO. 2-D

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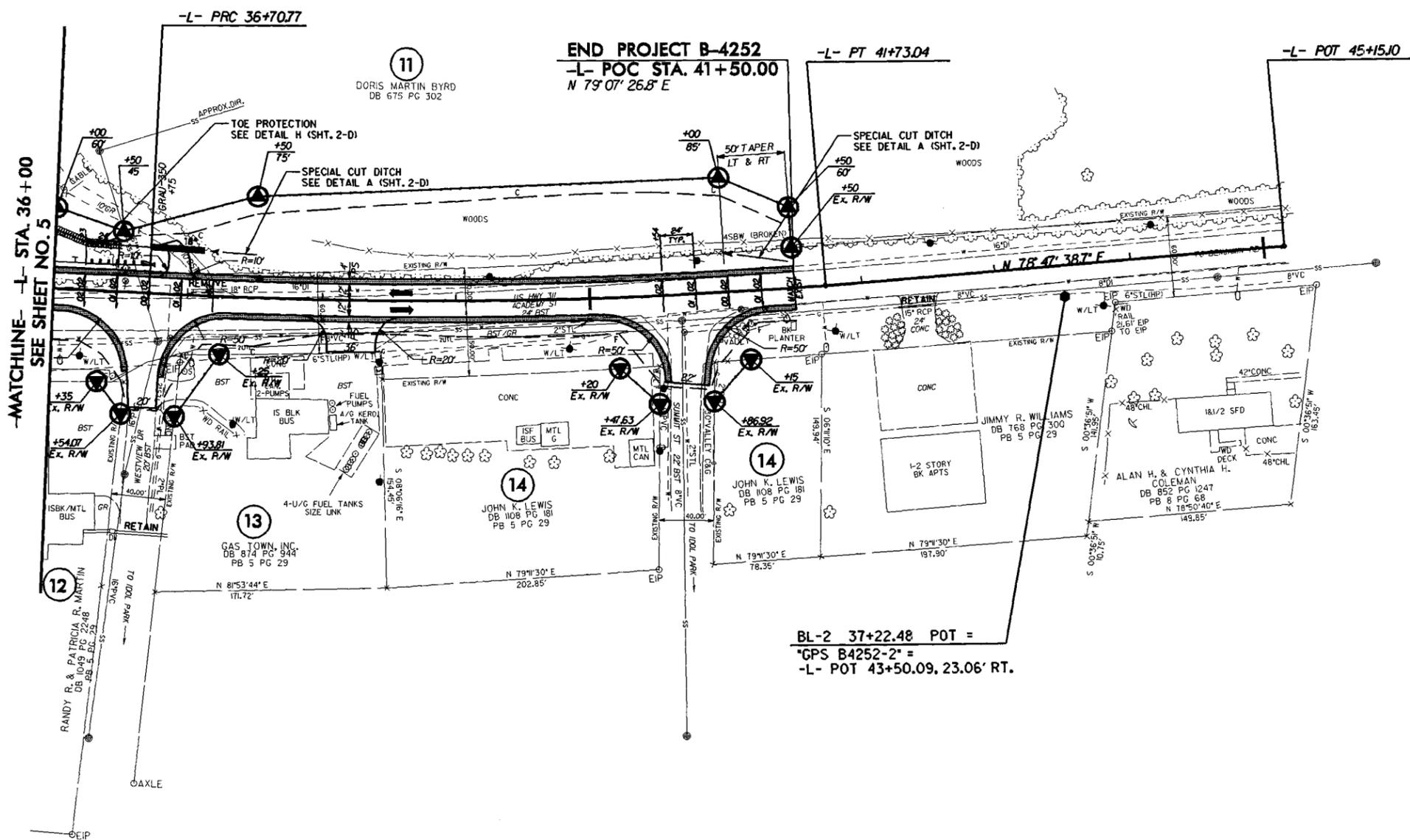
8/17/99

KO & ASSOCIATES, P.C.
Consulting Engineers
101 SCRIPPS DR., SUITE 203 BALDWIN, N.C. 27606
(919) 863-6066

PROJECT REFERENCE NO. B-4252		SHEET NO. 6	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			

-L-

PI Sta 34+63.88	PI Sta 39+22.24
$\Delta = 2^{\circ} 57' 51.2" (RT)$	$\Delta = 7^{\circ} 11' 40.1" (LT)$
$D = 0^{\circ} 42' 58.3"$	$D = 1^{\circ} 25' 56.6"$
$L = 413.89'$	$L = 502.27'$
$T = 206.99'$	$T = 251.46'$
$R = 8,000.00'$	$R = 4,000.00'$
SE = NC	SE = 0.02



-MATCHLINE- L- STA. 36+00
SEE SHEET NO. 5

BL-2 37+22.48 POT =
GPS B4252-2 =
-L- POT 43+50.09, 23.06' RT.

LEGEND

	PAVED SHOULDER
	APPROACH SLAB

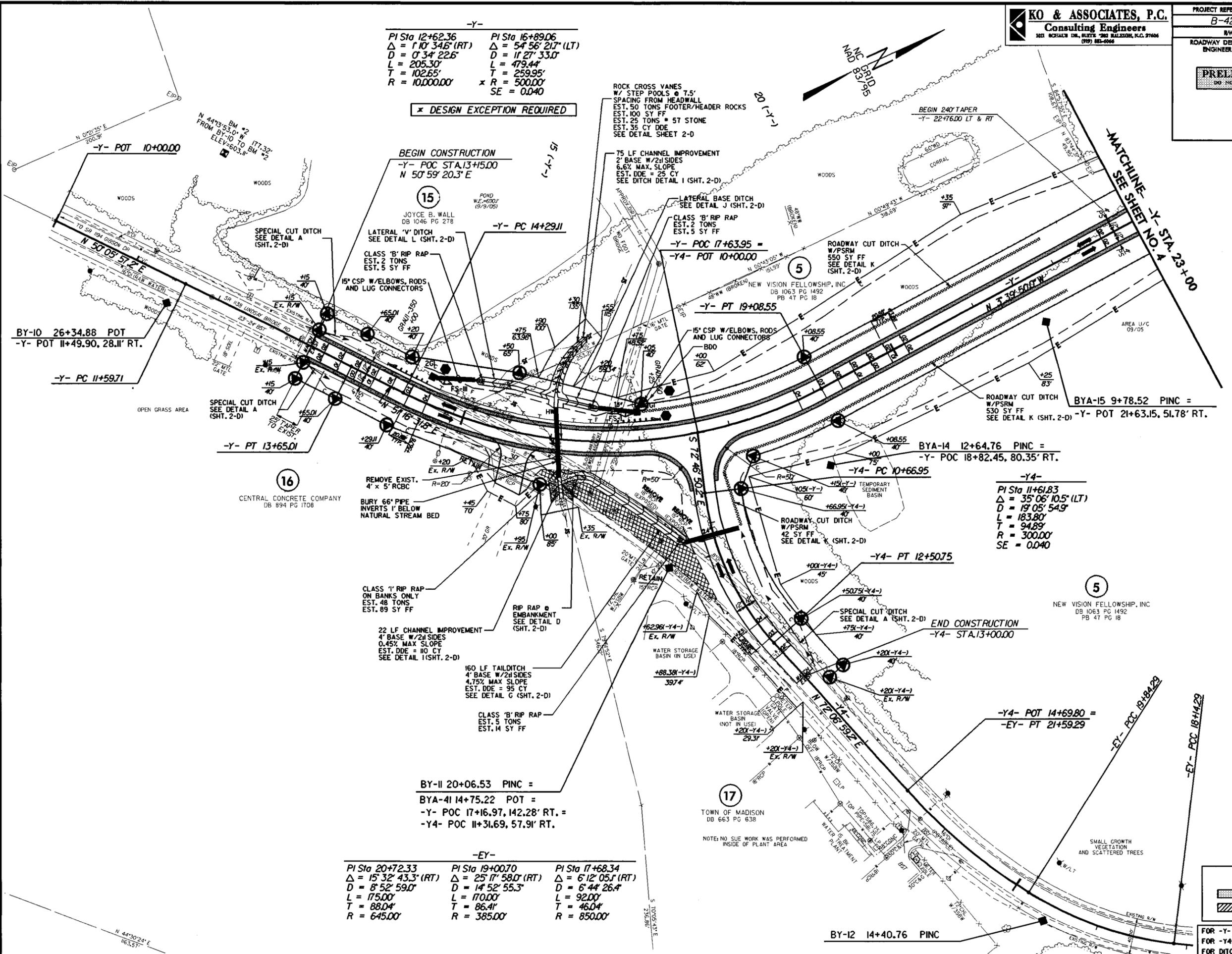
FOR -L- PROFILE, SEE SHEET NO. 9
FOR DITCH DETAILS, SEE SHEET NO. 2-D

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-Y-

PI Sta 12+62.36	PI Sta 16+89.06
$\Delta = 110' 34.6"$ (RT)	$\Delta = 54' 56' 21.7"$ (LT)
D = 0' 34' 22.6"	D = 11' 27' 33.0"
L = 205.30'	L = 479.44'
T = 102.65'	T = 259.95'
R = 10,000.00'	$\times R = 500.00'$
	SE = 0.040

*** DESIGN EXCEPTION REQUIRED**



BY-10 26+34.88 POT
 -Y- POT 11+49.90, 28.11' RT.

-Y- PC 11+59.71

-Y- PT 13+65.01

16
 CENTRAL CONCRETE COMPANY
 DB 894 PG 1708

REMOVE EXIST.
 4' x 5' RCBC

BURY 66" PIPE
 INVERTS 1' BELOW
 NATURAL STREAM BED

CLASS '1' RIP RAP
 ON BANKS ONLY
 EST. 48 TONS
 EST. 89 SY FF

22 LF CHANNEL IMPROVEMENT
 4' BASE W/2 SIDES
 0.45% MAX SLOPE
 EST. DDE = 10 CY
 SEE DETAIL I (SHT. 2-D)

160 LF TAILDITCH
 4' BASE W/2 SIDES
 4.75% MAX SLOPE
 EST. DDE = 95 CY
 SEE DETAIL G (SHT. 2-D)

CLASS 'B' RIP RAP
 EST. 5 TONS
 EST. 14 SY FF

BY-11 20+06.53 PINC =
 BYA-41 14+75.22 POT =
 -Y- POC 17+16.97, 142.28' RT. =
 -Y4- POC 11+31.69, 57.91' RT.

-EY-

PI Sta 20+72.33	PI Sta 19+00.70	PI Sta 17+68.34
$\Delta = 15' 32' 43.3"$ (RT)	$\Delta = 25' 17' 58.0"$ (RT)	$\Delta = 6' 12' 05.1"$ (RT)
D = 8' 52' 59.0"	D = 14' 52' 55.3"	D = 6' 44' 26.4"
L = 175.00'	L = 170.00'	L = 92.00'
T = 88.04'	T = 86.41'	T = 46.04'
R = 645.00'	R = 385.00'	R = 850.00'

ROCK CROSS VANS
 W/ STEP POOLS @ 7.5'
 SPACING FROM HEADWALL
 EST. 50 TONS FOOTER/HEADER ROCKS
 EST. 100 SY FF
 EST. 25 TONS @ 5T STONE
 EST. 35 CY DDE
 SEE DETAIL SHEET 2-D

75 LF CHANNEL IMPROVEMENT
 2' BASE W/2 SIDES
 6.6% MAX. SLOPE
 EST. DDE = 25 CY
 SEE DETAIL I (SHT. 2-D)

LATERAL BASE DITCH
 SEE DETAIL J (SHT. 2-D)

CLASS 'B' RIP RAP
 EST. 2 TONS
 EST. 5 SY FF

-Y- POC 17+63.95 =
 -Y4- POT 10+00.00

-Y- PT 19+08.55

15' CSP W/ELBOWS, RODS
 AND LUG CONNECTORS

ROADWAY CUT DITCH
 W/PSRM
 550 SY FF
 SEE DETAIL K (SHT. 2-D)

15' CSP W/ELBOWS, RODS
 AND LUG CONNECTORS

ROADWAY CUT DITCH
 W/PSRM
 42 SY FF
 SEE DETAIL K (SHT. 2-D)

-Y4- PT 12+50.75

ROADWAY CUT DITCH
 W/PSRM
 42 SY FF
 SEE DETAIL K (SHT. 2-D)

-Y4- POT 14+69.80 =
 -EY- PT 21+59.29

17
 TOWN OF MADISON
 DB 663 PG 638

NOTE: NO SUE WORK WAS PERFORMED
 INSIDE OF PLANT AREA

BY-12 14+40.76 PINC

ROADWAY CUT DITCH
 W/PSRM
 530 SY FF
 SEE DETAIL K (SHT. 2-D)

BYA-14 12+64.76 PINC =
 -Y- POC 18+82.45, 80.35' RT.

-Y4-
 PI Sta 11+61.83
 $\Delta = 35' 06' 10.5"$ (LT)
 D = 19' 05' 54.9"
 L = 183.80'
 T = 94.89'
 R = 300.00'
 SE = 0.040

-Y4- PC 10+66.95

ROADWAY CUT DITCH
 W/PSRM
 42 SY FF
 SEE DETAIL K (SHT. 2-D)

SPECIAL CUT DITCH
 SEE DETAIL A (SHT. 2-D)

END CONSTRUCTION
 -Y4- STA. 13+00.00

5
 NEW VISION FELLOWSHIP, INC.
 DB 1063 PG 1492
 PB 41 PG 18

BYA-15 9+78.52 PINC =
 -Y- POT 21+63.15, 51.78' RT.

SMALL GROWTH
 VEGETATION
 AND SCATTERED TREES

LEGEND

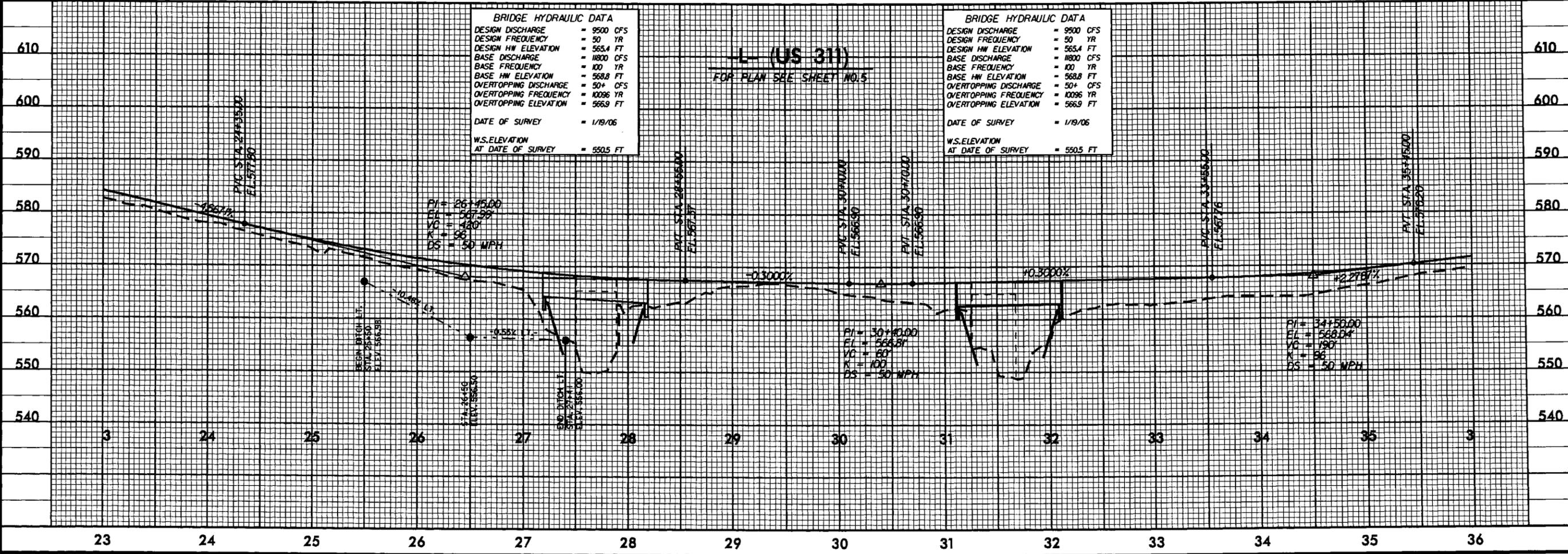
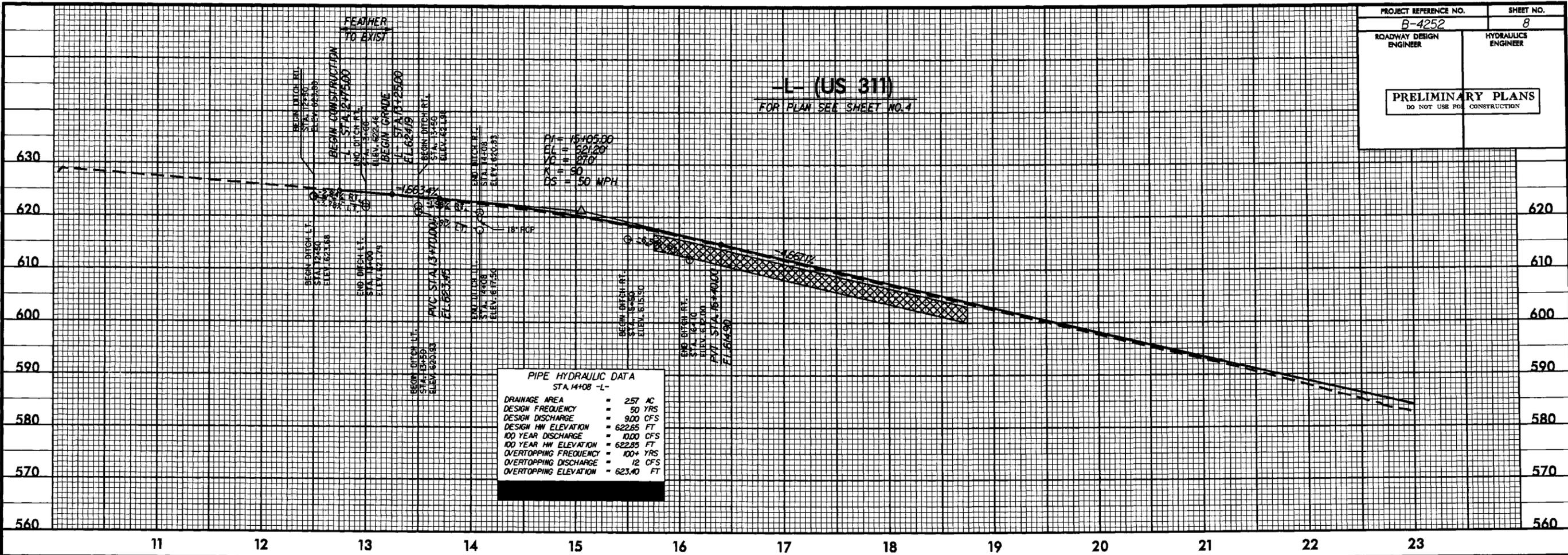
 PAVED SHOULDER
 APPROACH SLAB

FOR -Y- PROFILE, SEE SHEET NO. 9
 FOR -Y4- PROFILE, SEE SHEET NO. 10
 FOR DITCH DETAILS, SEE SHEET NO. 2-D

24-AUG-2007 08:35
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 8/17/99

5/28/09

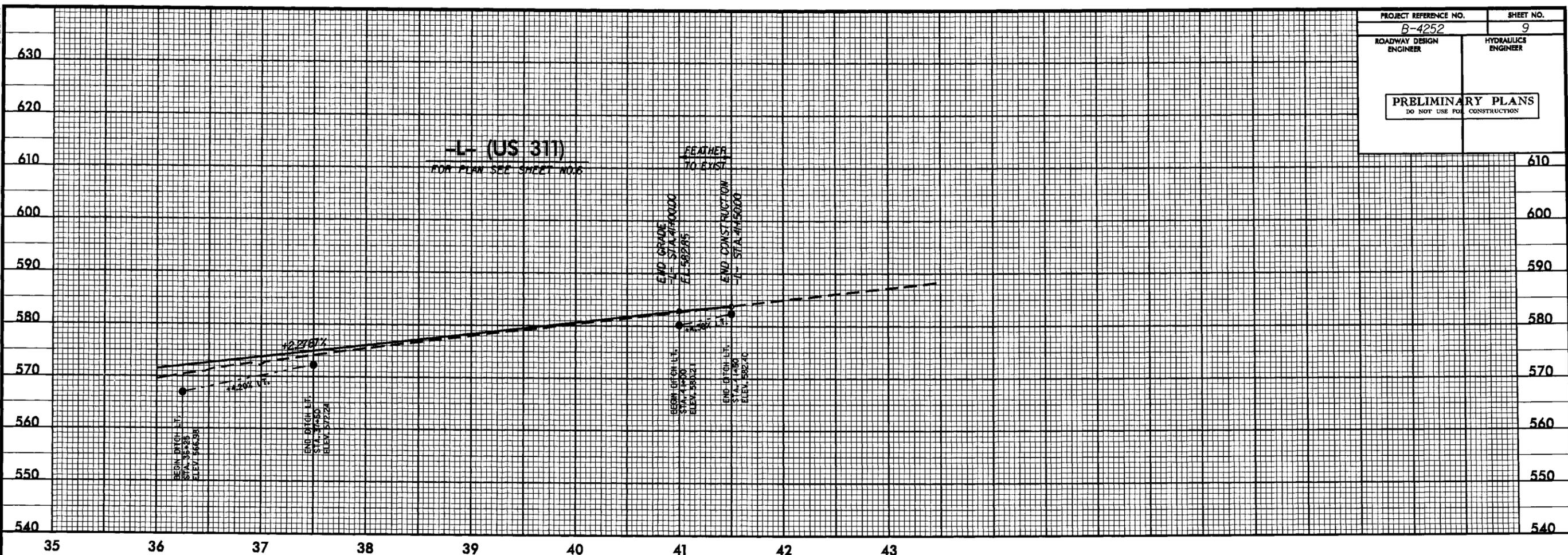
PROJECT REFERENCE NO. B-4252	SHEET NO. 8
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



20-AUG-2007 3:17 b4252-rdy-pl1.sheets.dgn

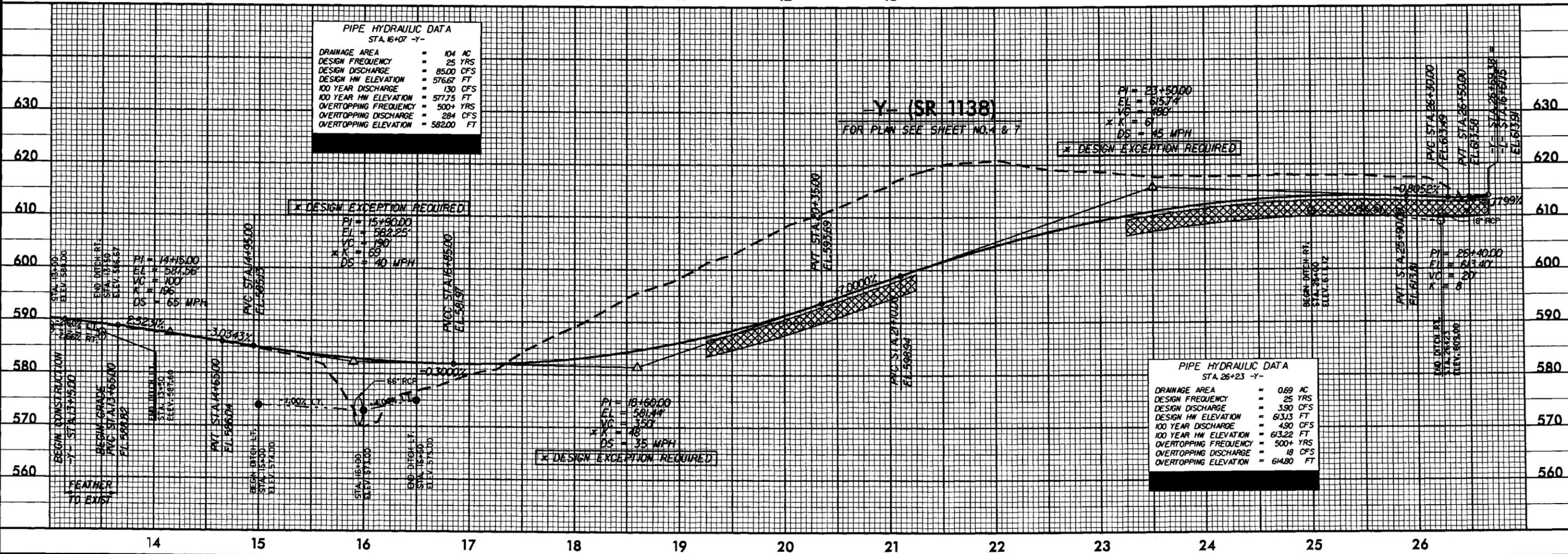
5/28/09

PROJECT REFERENCE NO. B-4252	SHEET NO. 9
ROADWAY DESIGN ENGINEER	HYDRAULICE ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



PIPE HYDRAULIC DATA
STA. 16+07 -Y-

DRAINAGE AREA	= 104 AC
DESIGN FREQUENCY	= 25 YRS
DESIGN DISCHARGE	= 85.00 CFS
DESIGN HW ELEVATION	= 576.67 FT
100 YEAR DISCHARGE	= 130 CFS
100 YEAR HW ELEVATION	= 577.75 FT
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING DISCHARGE	= 284 CFS
OVERTOPPING ELEVATION	= 582.00 FT



PIPE HYDRAULIC DATA
STA. 26+23 -Y-

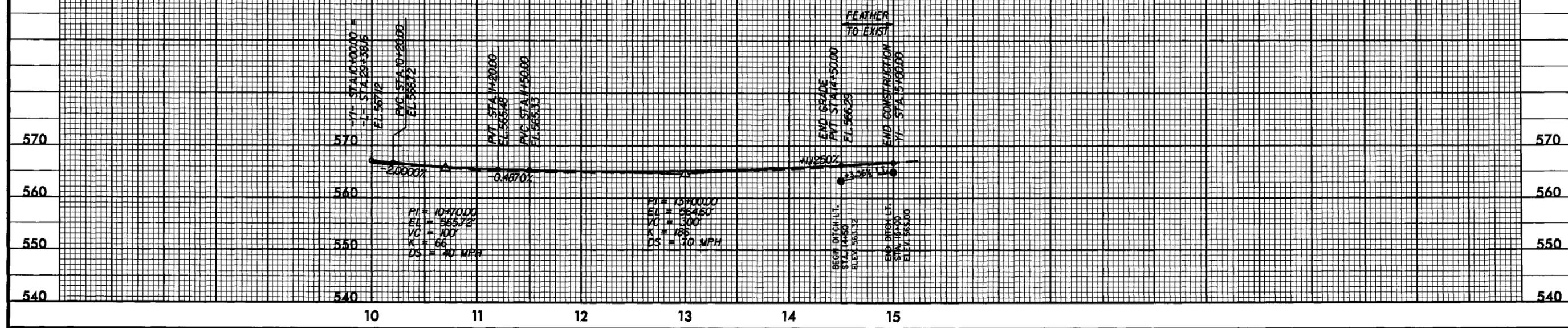
DRAINAGE AREA	= 0.69 AC
DESIGN FREQUENCY	= 25 YRS
DESIGN DISCHARGE	= 3.90 CFS
DESIGN HW ELEVATION	= 613.33 FT
100 YEAR DISCHARGE	= 4.90 CFS
100 YEAR HW ELEVATION	= 613.22 FT
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING DISCHARGE	= 18 CFS
OVERTOPPING ELEVATION	= 614.80 FT

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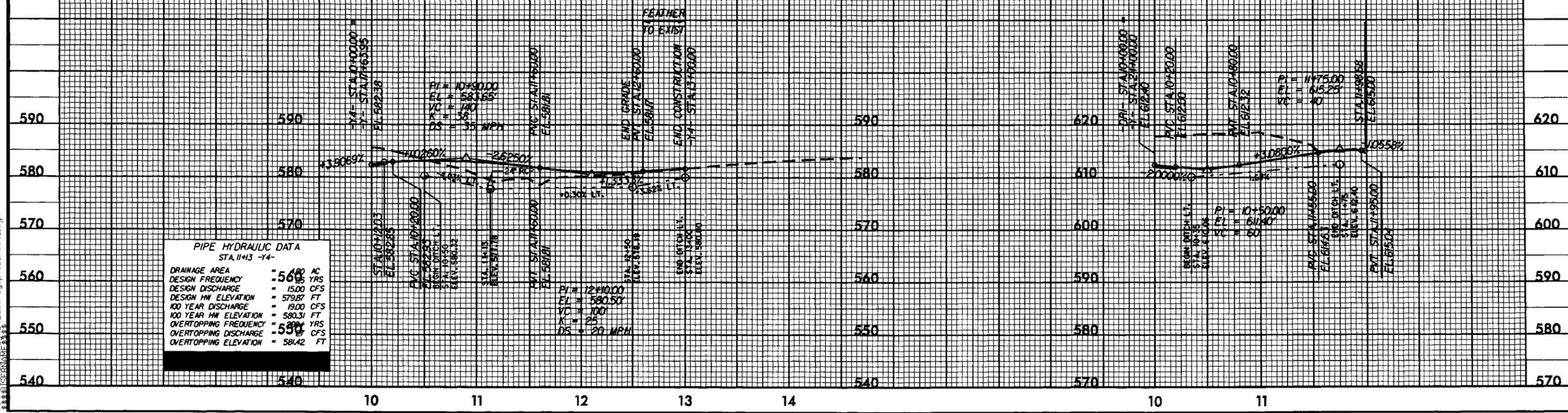
PROJECT REFERENCE NO. B-4252	SHEET NO. 10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

-Y1- (SR 1169)
FOR PLAN SEE SHEET NO. 5



-Y4- (SR 1138)
FOR PLAN SEE SHEET NO. 7

-DRI-
FOR PLAN SEE SHEET NO. 4



PIPE HYDRAULIC DATA
STA. 11+3 -Y4-

DRAINAGE AREA	= 56.00 AC
DESIGN FREQUENCY	= 5 YRS
DESIGN DISCHARGE	= 15.00 CFS
DESIGN HW ELEVATION	= 579.87 FT
100 YEAR DISCHARGE	= 19.00 CFS
100 YEAR HW ELEVATION	= 580.31 FT
OVERTOPPING FREQUENCY	= 50 YRS
OVERTOPPING DISCHARGE	= 53.00 CFS
OVERTOPPING ELEVATION	= 581.42 FT

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