



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

December 10, 2004

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

Attention: Mr. Eric Alsmeyer,  
NCDOT Coordinator

Dear Sir:

SUBJECT: **NW 23 Permit Modification Request** for the replacement of Bridge No. 122 over Sandy Creek and Bridge No. 217 over a tributary to Sandy Creek on SR 1116 in Durham County, Federal Project No. BRSTP-1116 (4), State Project No. 8.2353001, Division 5, T.I.P. No. B-3450.

Reference: USACE 404 Nationwide 23; Permit Action ID No. 20021134 issued May 17, 2004.

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes to modify the construction for the above-mentioned project to provide for curb and gutter. The purpose of this letter is to request a modification to the Department of the Army Nationwide 23 Permit. The NCDOT is asking for an additional 0.03 acres of permanent wetland impacts at Site 1. The revised permit drawings (sheets 3, 4, and 8 of 8) and revised plan sheets (2, 2 (A, B, C), 4, 6, and 7) are attached.

The NCDOT proposes to replace Bridge No. 217 over an unnamed tributary to Sandy Creek and Bridge No. 122 over Sandy Creek. Bridge Nos. 217 (Site 1) and 122 (Site 2) will be replaced on existing alignments. Bridge No. 217 will be 90 feet long and will consist of two spans. Bridge No. 122 will be 110 feet long and will consist of three spans. Construction will be via the top down method eliminating temporary construction impacts. During construction traffic will be directed to an onsite bridge detour upstream.

The construction of Bridge No. 217 will require upgrades to the shoulder sections adjacent to the bridge for curb and gutter. The curb and gutter will require an 8-foot shoulder behind the curb for a sidewalk. These additions will impact 0.03 acres of wetland.

### Summary of Changes

**Background:** This project is located in the Cape Fear River Basin. The existing permit is for 0.14 acres of permanent wetland impacts, which consists of 0.03 acres of fill and 0.11 acres of mechanized clearing adjacent to Bridge No. 217 over the unnamed tributary.

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

TELEPHONE: 919-715-1500  
FAX: 919-715-1501

WEBSITE: [WWW.NCDOT.ORG](http://WWW.NCDOT.ORG)

**LOCATION:**  
2728 CAPITAL BLVD  
PLB SUITE 168  
RALEIGH NC 27604

Changes: Addition of curb and gutter to the project area has increased the permanent wetland impacts by 0.03 acres to 0.17 acres, which consists of 0.05 acres of fill and 0.12 acres of mechanized clearing. Revisions were made to the permit and roadway drawings in order to be consistent with new plans.

### MITIGATION

The NCDOT did not propose compensatory mitigation for the original 0.14 acres of wetland impacts, which was authorized under the previous NW 23 permit. However the additional wetland impacts of 0.03 acres of a jurisdictional wetland will be offset by compensatory mitigation provided by the EEP program (see attached EEP confirmation letter).

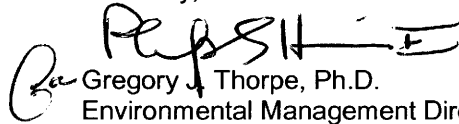
### REGULATORY APPROVALS

Section 404 Permit: The NCDOT requests that the referenced 404 Nationwide 23 be modified to reflect the revisions outlined in this letter.

Section 401 Permit: We anticipate 401 General Water Quality Certification (WQC) 3403 still applies to this project. The NCDOT will adhere to all general conditions of this WQC. Therefore, written concurrence from the NCDWQ is not required. In accordance with 15A NCAC 2H 0.0501(a) and 15A NCAC 2B 0.200 we are providing two copies of this application to the North Carolina Department of Environment and Natural Resources, Division of Water Quality, as notification.

A copy of this permit application will be posted on the NCDOT website at: <http://www.ncdot.org/planning/pe/naturalunit/Permit.html>. If you have any questions or need additional information please call Ms. Deanna Riffey at (919) 715-1409.

Sincerely,

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

Cc:

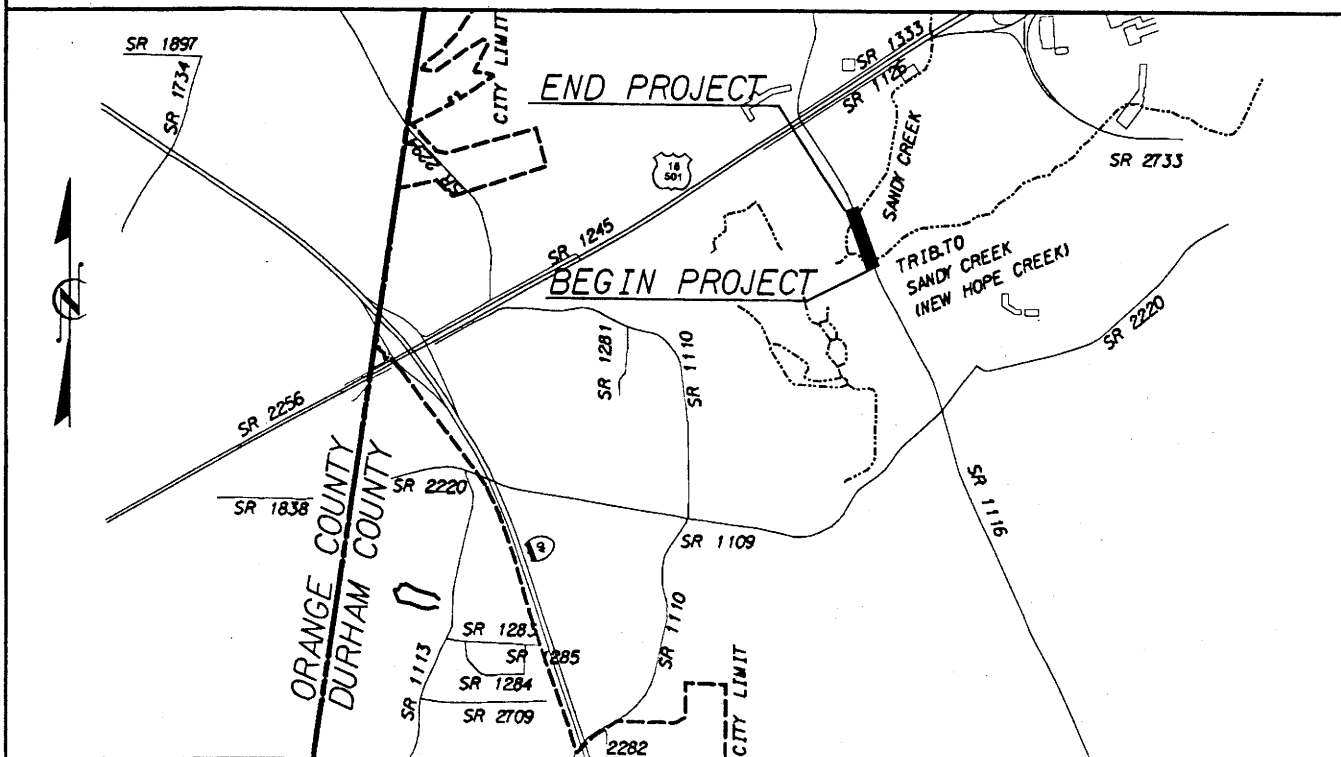
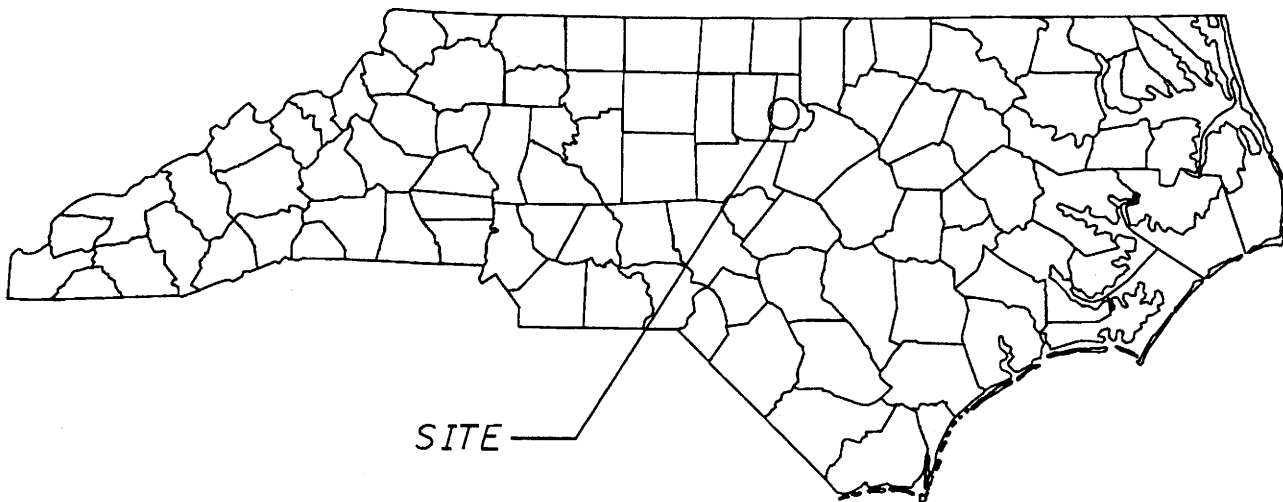
w/attachment

Mr. John Hennessy, Division of Water Quality (2 copies)  
Mr. Travis Wilson, NCWRC  
Mr. Gary Jordan, USFWS  
Dr. David Chang, P.E., Hydraulics  
Mr. Greg Perfetti, P.E., Structure Design  
Mr. Jon Nance, P.E. Division Engineer  
Mr. Chris Murray, DEO

w/o attachment

Mr. Jay Bennett, P.E., Roadway Design  
Mr. Omar Sultan, Programming and TIP  
Mr. Art McMillan, P.E., Highway Design  
Mr. Mark Staley, Roadside Environmental  
Ms. Stacy Baldwin, P.E., PDEA  
Mr. David Franklin, USACE, Wilmington  
Ms. Beth Harmon, EEP  
Mr. Carl Goode, PE

# NORTH CAROLINA

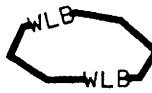


VICINITY  
MAPS

**NCDOT**  
DIVISION OF HIGHWAYS  
DURHAM COUNTY  
PROJECT: 8.2353001 (B-3450)  
BRIDGE NO. 122 & 217  
OVER SANDY CREEK  
TRIB. TO SANDY CREEK  
ON SR 2220

# WETLAND LEGEND

 WETLAND BOUNDARY

 WETLAND

 DENOTES FILL IN WETLAND

 DENOTES FILL IN SURFACE WATER

 DENOTES FILL IN SURFACE WATER (POND)


 DENOTES TEMPORARY FILL IN WETLAND

 DENOTES EXCAVATION IN WETLAND

 DENOTES TEMPORARY FILL IN SURFACE WATER


 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

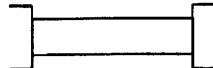
 EXIST. ENDANGERED PLANT BOUNDARY

 WATER SURFACE


 LIVE STAKES


 BOULDER

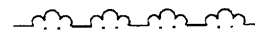
 CORE FIBER ROLLS

 PROPOSED BRIDGE

 PROPOSED BOX CULVERT

 PROPOSED PIPE CULVERT  
 (DASHED LINES DENOTE EXISTING STRUCTURES)  
 12"-48" PIPES  
 54" PIPES & ABOVE


 SINGLE TREE

 WOODS LINE

 DRAINAGE INLET

 ROOTWAD

 RIP RAP

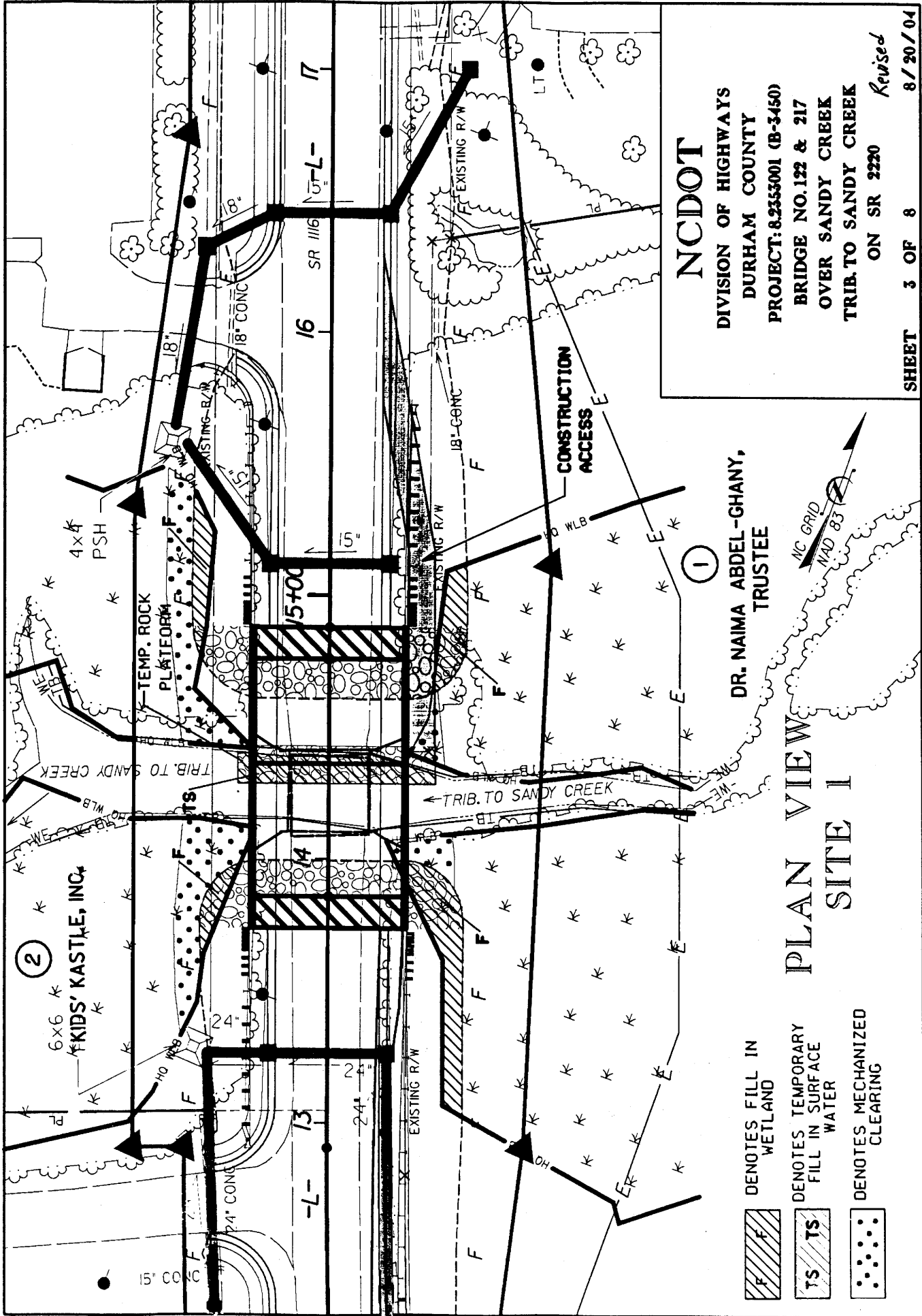
 ADJACENT PROPERTY OWNER OR PARCEL NUMBER IF AVAILABLE

 PREFORMED SCOUR HOLE WITH LEVEL SPREADER (PSH)

 LEVEL SPREADER (LS)

 GRASS SWALE

N. C. DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 DURHAM COUNTY  
 PROJECT: 8.2353001 (B-3450)  
 BRIDGE NO. 122 & 217  
 OVER SANDY CREEK  
 TRIB. TO SANDY CREEK  
 ON SR 2220



**NCDOT**

**DIVISION OF HIGHWAYS  
 DURHAM COUNTY  
 PROJECT: 82353001 (B-3450)  
 BRIDGE NO. 122 & 217  
 OVER SANDY CREEK  
 TRIB. TO SANDY CREEK**

**ON SR 2220**


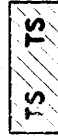
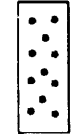
*Revised*

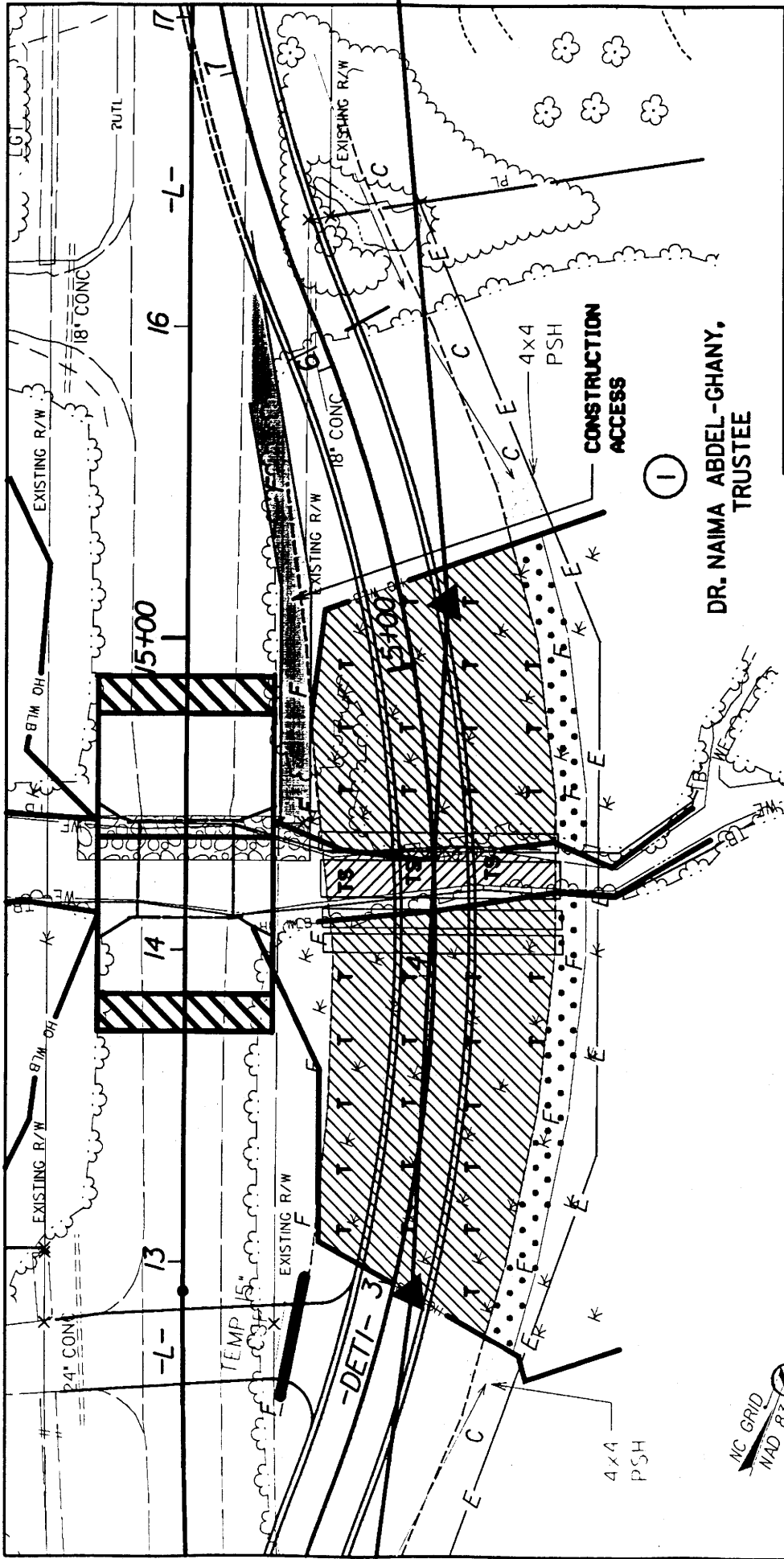
**SHEET 3 OF 8 8/20/04**

**DR. NAIMA ABDEL-GHANY,  
 TRUSTEE**

**PLAN VIEW  
 SITE 1**



-  DENOTES FILL IN WETLAND
-  DENOTES TEMPORARY FILL IN SURFACE WATER
-  DENOTES MECHANIZED CLEARING



**NCDOT**

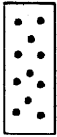
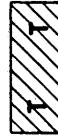

DIVISION OF HIGHWAYS  
 DURHAM COUNTY  
 PROJECT: 82353001 (B-3450)  
 BRIDGE NO. 122 & 217  
 OVER SANDY CREEK  
 TRIB. TO SANDY CREEK

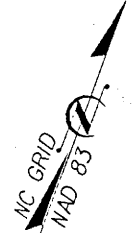
ON SR 2220

SHEET 4 OF 8  
 8/20/04  
*Revised*

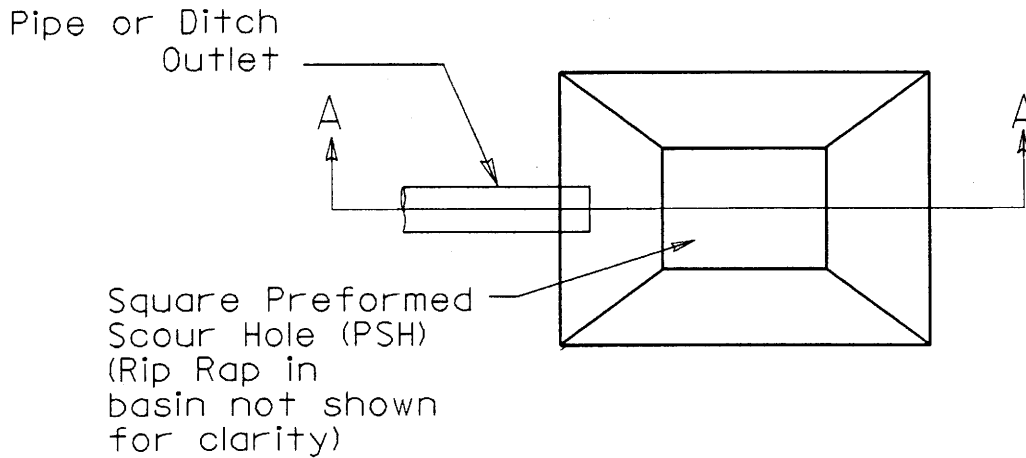
DR. NAIMA ABDEL-CHANY,  
 TRUSTEE

**PLAN VIEW  
 SITE 1**

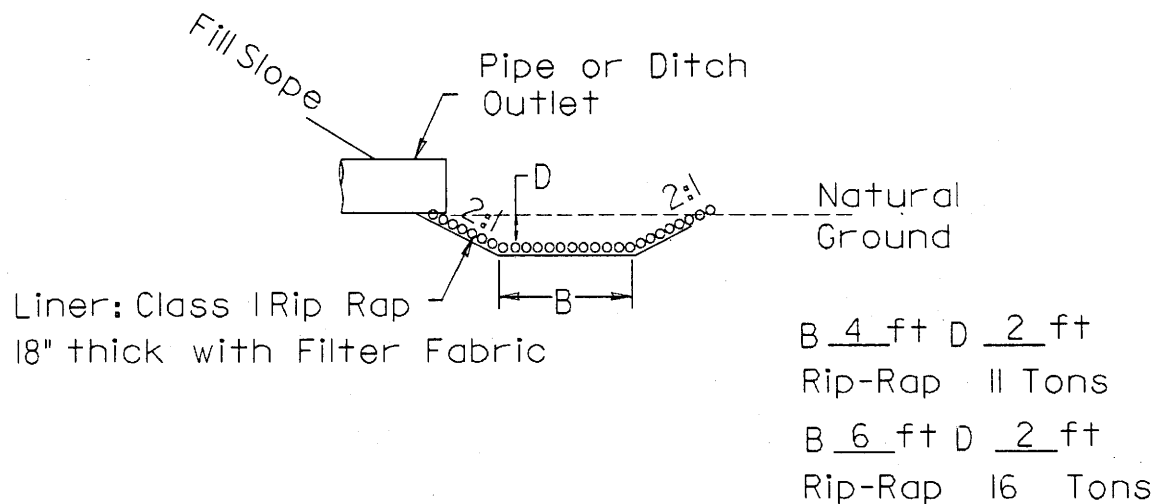
-  DENOTES MECHANIZED CLEARING
-  DENOTES TEMPORARY FILL IN WETLAND
-  DENOTES TEMPORARY FILL IN SURFACE WATER



## PLAN VIEW



## SECTION A-A



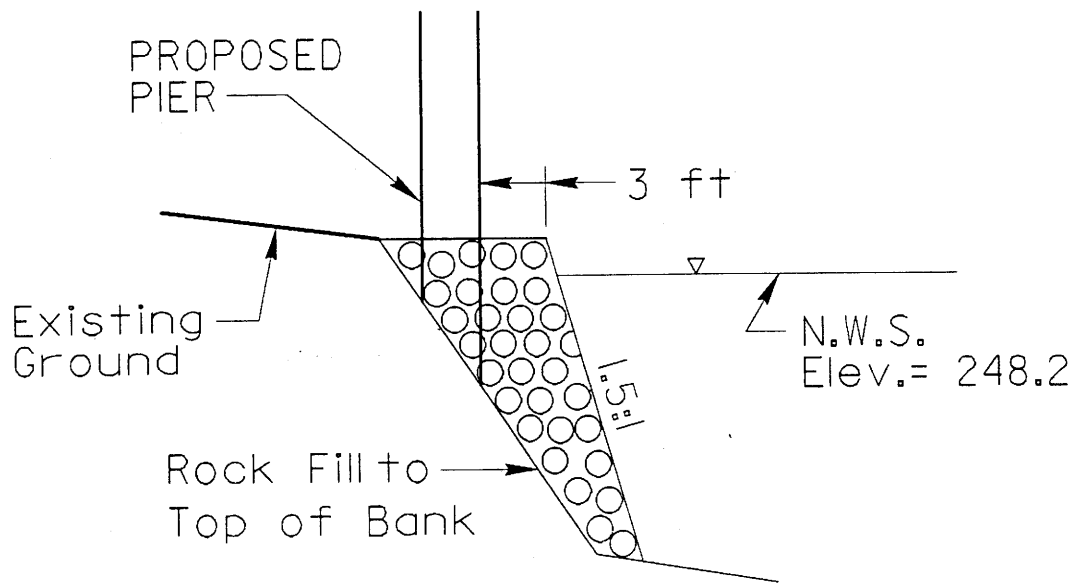
### PERFORMED SCOUR HOLE (PSH)

(Not to scale)

**NCDOT**  
DIVISION OF HIGHWAYS  
DURHAM COUNTY  
PROJECT: 8.2353001 (B-3450)  
BRIDGE NO. 122 & 217  
OVER SANDY CREEK  
TRIB. TO SANDY CREEK  
ON SR 2220

# TEMPORARY ROCK PLATFORM

(Not to Scale)



**NCDOT**  
DIVISION OF HIGHWAYS  
DURHAM COUNTY  
PROJECT: 8.2353001 (B-3450)  
BRIDGE NO. 122 & 217  
OVER SANDY CREEK  
TRIB. TO SANDY CREEK  
ON SR 2220

SHEET 6 OF 8 8/20/04



# PROPERTY OWNERS

## NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
① DB 2640 PG 765 PB 132 PG 219	DR. NAIMA ABDEL-GHANY, TRUSTEE	1717 COUNTRY CLUB DRIVE LYNN HAVEN, FL 32444-1983
② DB 2314 PG 485 PB 136 PG 28	KIDS' KASTLE, INC.	37500 EDEN CHAPEL HILL, NC 27514

**NCDOT**

**DIVISION OF HIGHWAYS**

**DURHAM COUNTY**

**PROJECT: 8.2353001 (B-3450)**

**BRIDGE NO. 122 & 217**

**OVER SANDY CREEK**

**TRIB. TO SANDY CREEK**

**ON SR 2220**

**IMPACT SUMMARY**

Site No.	Station (From/To)	Structure Size	WETLAND IMPACTS					SURFACE WATER IMPACTS					BUFFER IMPACTS					
			Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation In Wetlands (ac)	Mechanized Clearing (Method II) (ac)	Fill In SW (Natural) (ac)	Fill In SW (Pond) (ac)	Temp. Fill In SW (ac)	Existing Channel Impacted (ft)	Relocated Channel (ft)	Zone 1 (ac)	Zone 2 (ac)	Mech Clear (ac)				
1	13+00 TO 17+00 -L-	N/A	0.045			0.061					0.0168							
	3+00 TO 5+20 -DET1-			0.338		0.060					0.021							
TOTALS			0.045	0.338	0	0.121	0	0	0	0	0.0378	0	0	0	0	0	0	0

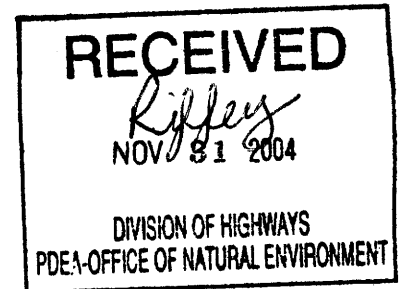
N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS

DURHAM COUNTY  
PROJECT: 8.2353001 (B-3450)  
BRIDGE NO. 122 & 217 OVER SANDY CREEK  
AND TRIB TO SANDY CREEK ON SR 2220  
*Revised*  
08/20/04

SHEET 8 OF 8



November 30, 2004



Mr. Gregory J. Thorpe, Ph.D.  
Environmental Management Director  
Project Development and Environmental Analysis Branch  
North Carolina Department of Transportation  
1548 Mail Service Center  
Raleigh, NC 27699-1548

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

**B-3450**, Bridge 122 over Sandy Creek and Bridge 217 over a  
Tributary to Sandy Creek, Durham County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide wetland mitigation for the subject project. Based on the information supplied by you in a letter dated November 22, 2004, the impacts are located in CU 03030002 of the Cape Fear River Basin in the Central Piedmont Eco-Region, and are as follows:

Riverine Wetland: 0.03 acre

As stated in your letter, the subject project is listed in Exhibit 2 of the Memorandum of Agreement among the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U. S. Army Corps of Engineers, Wilmington District dated July 22, 2003. The wetland mitigation for the subject project will be provided in accordance with this agreement.

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

Sincerely,

William D. Gilmore, P.E.  
Transition Manager

cc: Eric Alsmeyer, USACE-Raleigh  
John Hennessy, Division of Water Quality, Wetlands/401 Unit  
File: B-3450

*Restoring... Enhancing... Protecting Our State*





November 30, 2004

Mr. Eric Alsmeyer  
US Army Corps of Engineers  
Raleigh Regulatory Field Office  
6508 Falls of the Neuse Road, Suite 120  
Raleigh, North Carolina 27615

Dear Mr. Alsmeyer:

Subject: EEP Mitigation Acceptance Letter:

**B-3450**, Bridge 122 over Sandy Creek and Bridge 217 over a tributary to Sandy Creek on SR 1116, Durham County; Cape Fear River Basin (Cataloging Unit 03030002); Central Piedmont Eco-Region

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide 0.3 acres of riverine wetland preservation as compensatory mitigation at a 10:1 ratio for the 0.03-acre of unavoidable riverine wetland impacts of the subject project. The preservation site that will be debited for this mitigation is:

Allen Site (Wake County)                      0.30 acres

The subject TIP project is listed in Exhibit 2 of the Memorandum of Agreement among the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U. S. Army Corps of Engineers, Wilmington District dated July 22, 2003. The compensatory mitigation for the project will be provided in accordance with Section IX, EEP Transition Period, of the Agreement.

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

Sincerely,

William D. Gilmore, P.E.  
Transition Manager

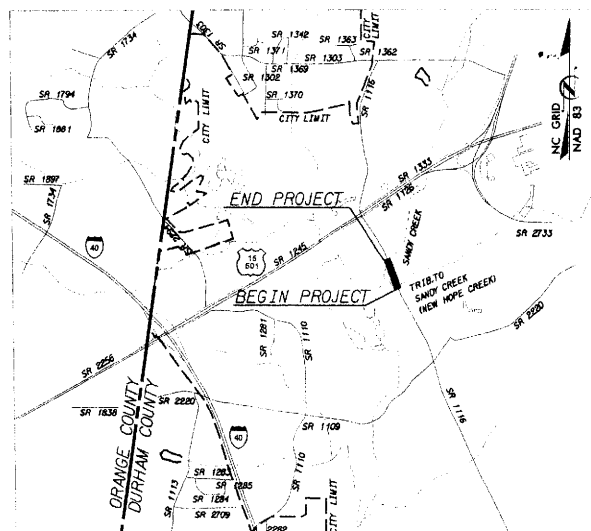
cc: Phil Harris, Office of Natural Environment, NCDOT  
John Hennessy, Division of Water Quality, Wetlands/401 Unit  
File: B-3450

*Restoring... Enhancing... Protecting Our State*



CONTRACT: C200841 TIP PROJECT: B-3450

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



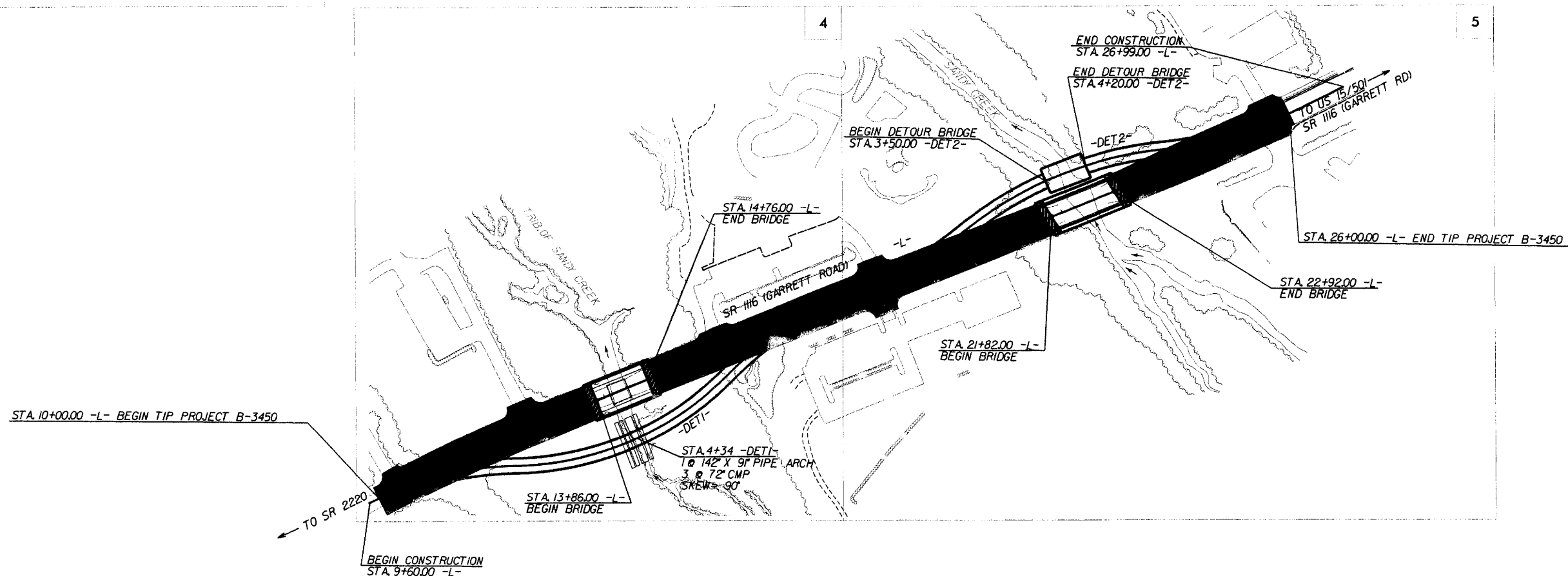
VICINITY MAP

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**DURHAM COUNTY**

**LOCATION: BRIDGE NO. 217 OVER TRIBUTARY OF SANDY CREEK  
AND BRIDGE NO. 122 OVER SANDY CREEK  
AND APPROACHES ON SR 1116**

**TYPE OF WORK: GRADING, DRAINAGE, PAVING, GUARDRAIL, AND STRUCTURES**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3450	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33070.1.1	BRSTP-1116 (4)	PE	
33070.2.2	BRSTP-1116 (4)	RW, UTILITIES	
33070.3.1	BRSTP-1116 (6)	CONST.	



NCDOT CONTACT: MS. CATHY S. HOUSER, PE, PROJECT ENGINEER

<p><b>GRAPHIC SCALES</b></p> <p>50 25 0 50 100 PLANS</p> <p>50 25 0 50 100 PROFILE (HORIZONTAL)</p> <p>10 5 0 10 20 PROFILE (VERTICAL)</p>	<p><b>DESIGN DATA</b></p> <p>ADT 2003 = 11,800 VPD ADT 2023 = 18,900 VPD DHV = 10% D = 55% T = 7% * V = 45 MPH * TTST 3% + DUAL 4%</p>	<p><b>PROJECT LENGTH</b></p> <p>LENGTH ROADWAY TIP PROJECT B-3450 = 0.265 MILE LENGTH STRUCTURE TIP PROJECT B-3450 = 0.038 MILE TOTAL LENGTH OF TIP PROJECT B-3450 = 0.303 MILE</p>	<p>Prepared for NCDOT In the Office of: <b>KCI Associates</b> of North Carolina, P.A. RALEIGH OFFICE ENGINEERS • PLANNERS • ENV. CONSULTANTS</p> <p>2002 STANDARD SPECIFICATIONS</p> <p><b>RIGHT OF WAY DATE:</b> MARCH 21, 2003 <b>LETTING DATE:</b> APRIL 19, 2005</p> <p><b>MICHELLE R. BRAME, P.E.</b> PROJECT ENGINEER</p> <p><b>JENNIFER M. SPOHN</b> PROJECT DESIGN ENGINEER</p>	<p><b>HYDRAULICS ENGINEER</b></p> <p><i>[Signature]</i> P.E.</p> <p><b>ROADWAY DESIGN</b></p> <p><i>[Signature]</i> P.E.</p>	<p><b>DIVISION OF HIGHWAYS</b> STATE OF NORTH CAROLINA</p> <p>STATE DESIGN ENGINEER <b>DEPARTMENT OF TRANSPORTATION</b> FEDERAL HIGHWAY ADMINISTRATION</p> <p>APPROVED DIVISION ADMINISTRATOR DATE</p>
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STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

CONVENTIONAL SYMBOLS

\*S.U.E = SUBSURFACE UTILITY ENGINEER

ROADS & RELATED ITEMS

Edge of Pavement	-----
Curb	-----
Prop. Slope Stakes Cut	-----C-----
Prop. Slope Stakes Fill	-----F-----
Prop. Woven Wire Fence	-----○-----
Prop. Chain Link Fence	-----□-----
Prop. Barbed Wire Fence	-----◇-----
Prop. Wheelchair Ramp	-----WCR-----
Curb Cut for Future Wheelchair Ramp	-----CCFR-----
Exist. Guardrail	-----
Prop. Guardrail	-----
Equality Symbol	-----⊕-----
Pavement Removal	-----X-----

RIGHT OF WAY

Baseline Control Point	-----◆-----
Existing Right of Way Marker	-----△-----
Exist. Right of Way Line w/Marker	-----△-----
Prop. Right of Way Line with Proposed	-----▲-----
R/W Marker (Iron Pin & Cap)	-----▲-----
Prop. Right of Way Line with Proposed	-----▲-----
(Concrete or Granite) RW Marker	-----⊙-----
Exist. Control of Access Line	-----⊙-----
Prop. Control of Access Line	-----⊙-----
Exist. Easement Line	-----E-----
Prop. Temp. Construction Easement Line	-----E-----
Prop. Temp. Drainage Easement Line	-----TDE-----
Prop. Perm. Drainage Easement Line	-----PDE-----

HYDROLOGY

Stream or Body of Water	-----
River Basin Buffer	-----BZ-----
Flow Arrow	----->-----
Disappearing Stream	----->-----
Spring	-----○-----
Swamp Marsh	-----
Shoreline	-----
Falls, Rapids	-----
Prop Lateral, Tail, Head Ditches	-----

STRUCTURES

MAJOR	
Bridge, Tunnel, or Box Culvert	-----CONC-----
Bridge Wing Wall, Head Wall and End Wall	-----CONC WR-----

MINOR	
Head & End Wall	-----CONC HW-----
Pipe Culvert	-----
Footbridge	-----
Drainage Boxes	-----CB-----
Paved Ditch Gutter	-----

UTILITIES

Exist. Pole	-----●-----
Exist. Power Pole	-----○-----
Prop. Power Pole	-----○-----
Exist. Telephone Pole	-----○-----
Prop. Telephone Pole	-----○-----
Exist. Joint Use Pole	-----○-----
Prop. Joint Use Pole	-----○-----
Telephone Pedestal	-----
UG Telephone Cable Hand Hold	-----
Cable TV Pedestal	-----
UG TV Cable Hand Hold	-----
UG Power Cable Hand Hold	-----
Hydrant	-----
Satellite Dish	-----
Exist. Water Valve	-----
Sewer Clean Out	-----
Power Manhole	-----
Telephone Booth	-----
Cellular Telephone Tower	-----
Water Manhole	-----
Light Pole	-----
H-Frame Pole	-----
Power Line Tower	-----
Pole with Base	-----
Gas Valve	-----
Gas Meter	-----
Telephone Manhole	-----
Power Transformer	-----
Sanitary Sewer Manhole	-----
Storm Sewer Manhole	-----
Tank; Water, Gas, Oil	-----
Water Tank With Legs	-----
Traffic Signal Junction Box	-----
Fiber Optic Splice Box	-----
Television or Radio Tower	-----
Utility Power Line Connects to Traffic	-----TS-----
Signal Lines Cut Into the Pavement	-----TS-----

Recorded Water Line	-----W-----
Designated Water Line (S.U.E.*)	-----W-----
Sanitary Sewer	-----SS-----
Recorded Sanitary Sewer Force Main	-----FSS-----
Designated Sanitary Sewer Force Main(S.U.E.*)	-----FSS-----
Recorded Gas Line	-----G-----
Designated Gas Line (S.U.E.*)	-----G-----
Storm Sewer	-----S-----
Recorded Power Line	-----P-----
Designated Power Line (S.U.E.*)	-----P-----
Recorded Telephone Cable	-----T-----
Designated Telephone Cable (S.U.E.*)	-----T-----
Recorded U/G Telephone Conduit	-----TC-----
Designated U/G Telephone Conduit (S.U.E.*)	-----TC-----
Unknown Utility (S.U.E.*)	-----?UTL-----
Recorded Television Cable	-----TV-----
Designated Television Cable (S.U.E.*)	-----TV-----
Recorded Fiber Optics Cable	-----FO-----
Designated Fiber Optics Cable (S.U.E.*)	-----FO-----
Exist. Water Meter	-----○-----
UG Test Hole (S.U.E.*)	-----⊙-----
Abandoned According to U/G Record	-----ATTUR-----
End of Information	-----E.O.I.-----

BOUNDARIES & PROPERTIES

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Property Line Symbol	-----
Exist. Iron Pin	-----
Property Corner	-----
Property Monument	-----
Property Number	-----
Parcel Number	-----
Fence Line	-----
Existing Wetland Boundaries	-----WW & ISBW-----
High Quality Wetland Boundary	-----HLB-----
Medium Quality Wetland Boundaries	-----MQ WLB-----
Low Quality Wetland Boundaries	-----LO WLB-----
Proposed Wetland Boundaries	-----WLB-----
Existing Endangered Animal Boundaries	-----EAB-----
Existing Endangered Plant Boundaries	-----EPB-----

BUILDINGS & OTHER CULTURE

Buildings	-----
Foundations	-----
Area Outline	-----
Gate	-----
Gas Pump Vent or U/G Tank Cap	-----
Church	-----
School	-----
Park	-----
Cemetery	-----
Dam	-----
Sign	-----
Well	-----
Small Mine	-----
Swimming Pool	-----

TOPOGRAPHY

Loose Surface	-----
Hard Surface	-----
Change in Road Surface	-----
Curb	-----
Right of Way Symbol	-----R/W-----
Guard Post	-----G.P.-----
Paved Walk	-----
Bridge	-----
Box Culvert or Tunnel	-----
Ferry	-----
Culvert	-----
Footbridge	-----
Trail, Footpath	-----
Light House	-----

VEGETATION

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

RAILROADS

Standard Gauge	-----
RR Signal Milepost	-----
Switch	-----



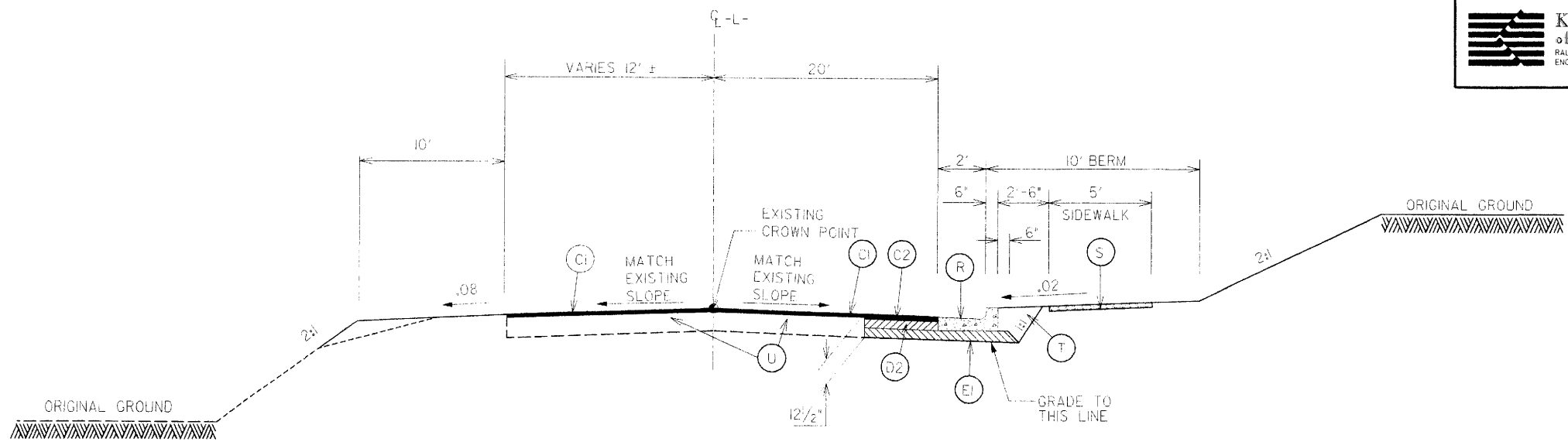
**KCI Associates**  
of North Carolina, P.A.  
RALEIGH OFFICE  
ENGINEERS • PLANNERS • ECOLOGISTS

SUITE 200, LANDMARK CENTER I  
450 SIX FORKS RD.  
RALEIGH, N.C. 27609-5200  
(919) 783-9214

PROJECT REFERENCE NO. B-3450 SHEET NO. 2

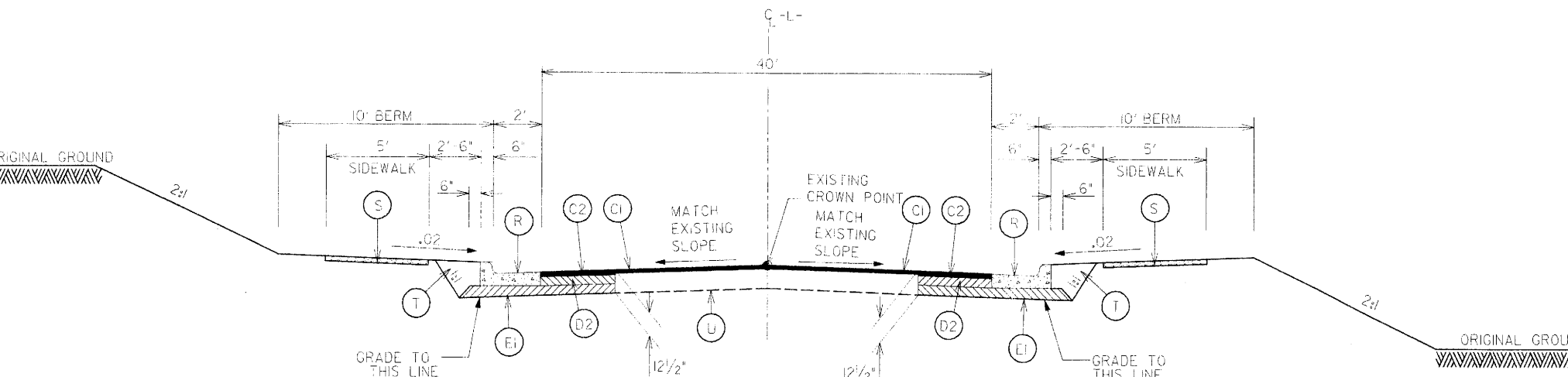
RW SHEET NO.

ROADWAY DESIGN ENGINEER PAVEMENT DESIGN ENGINEER



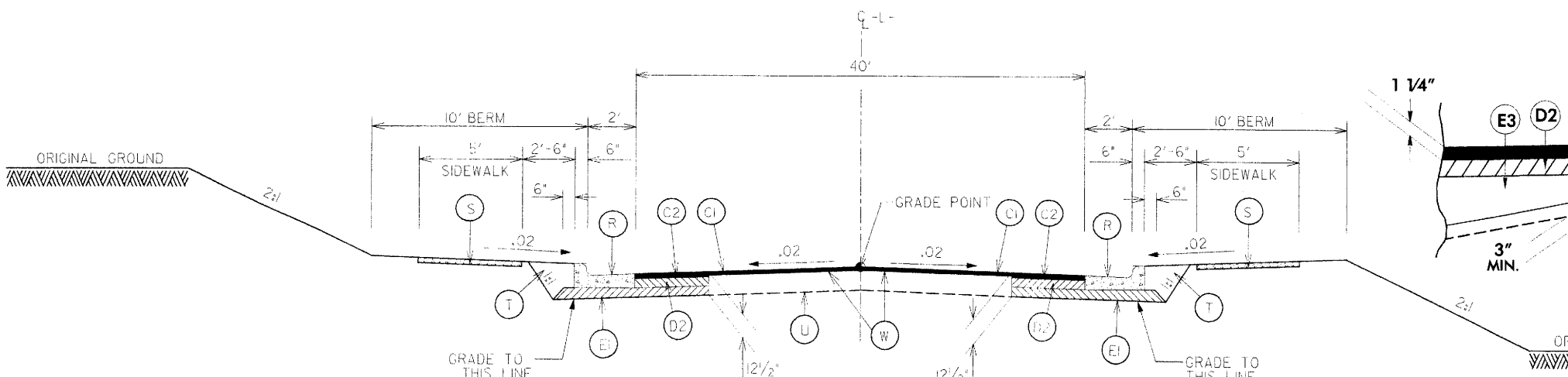
**TYPICAL SECTION NO.1**

-L- STA. 10+00.00 TO STA. 10+42.00



**TYPICAL SECTION NO.2**

-L- STA. 10+42.00 TO STA. 10+70.00



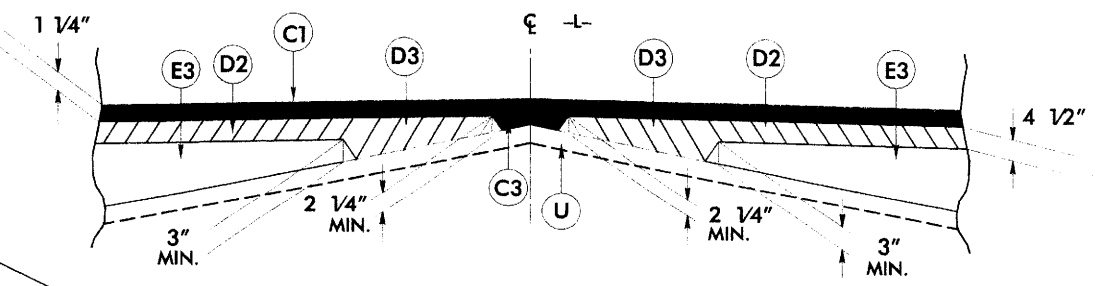
**TYPICAL SECTION NO.3**

-L- STA. 10+70.00 TO STA. 13+00.00  
L STA. 15+50.00 TO STA. 20+50.00

**PAVEMENT SCHEDULE**

CODE	DESCRIPTION
C1	PROP. APPROX. 1 1/4" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 140 LBS PER SQ. YARD.
C2	PROP. APPROX. 2 1/2" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 140 LBS PER SQ. YARD IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS PER SQ. YARD PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 1 1/2" IN DEPTH.
D1	PROP. APPROX. 2 1/2" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I9.0B, AT AN AVERAGE RATE OF 265 LBS PER SQ. YARD.
D2	PROP. APPROX. 4 1/2" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I9.0B, AT AN AVERAGE RATE OF 256.5 LBS PER SQ. YARD IN EACH OF TWO LAYERS.
D3	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I9.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2 1/4" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 5 1/2" ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS PER SQ. YARD.
E2	PROP. APPROX. 3" ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 342 LBS PER SQ. YARD.
E3	PROP. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT GREATER THAN 5 1/2" IN DEPTH OR LESS THAN 3" IN DEPTH.
R	2'-6" CONCRETE CURB AND GUTTER.
S	4" CONCRETE SIDEWALK.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT MATERIAL.
V	MILLING BITUMINOUS PAVEMENT, 1 1/4" DEPTH.
W	VAR. DEPTH ASPHALT PAVEMENT. (SEE WEDGING DETAIL)

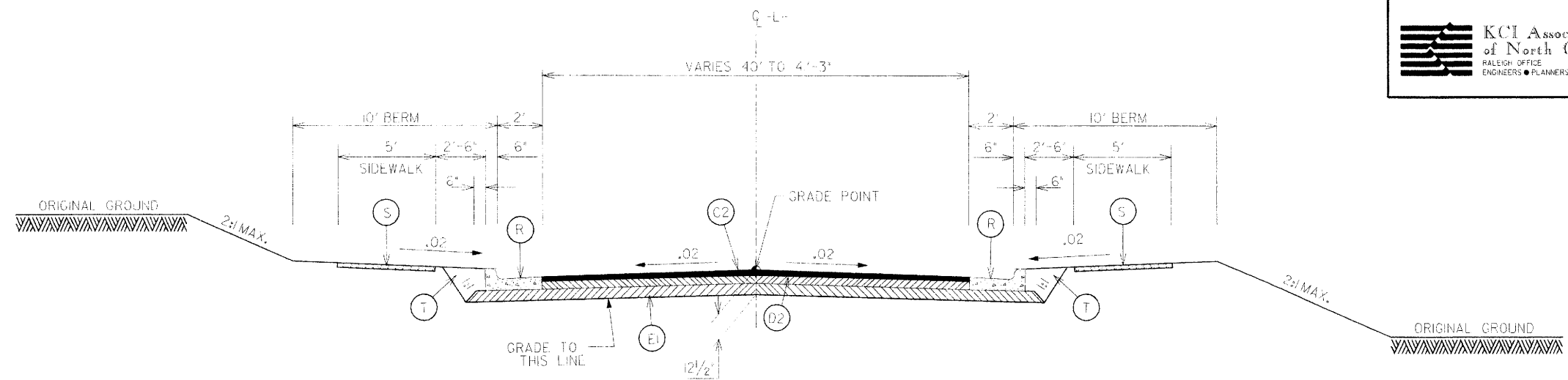
USE 1/4" PAVEMENT EDGE SLOPES UNLESS OTHERWISE NOTED



**WEDGING DETAIL**

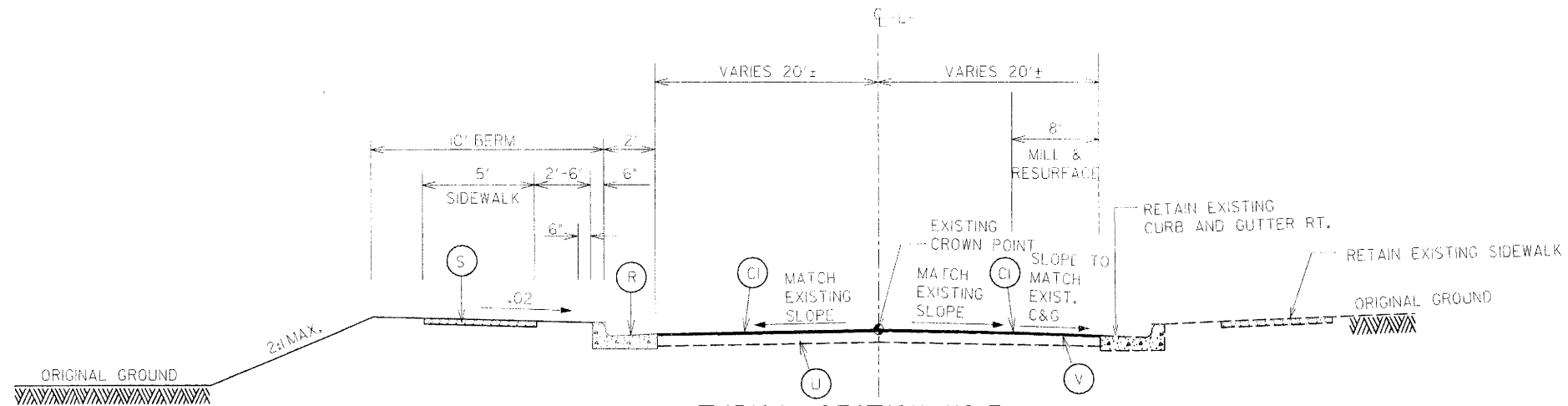
WEDGE AS REQUIRED TO ACHIEVE DESIRED CROSS SLOPE AS DIRECTED BY ENGINEER

Revised 9/27/04



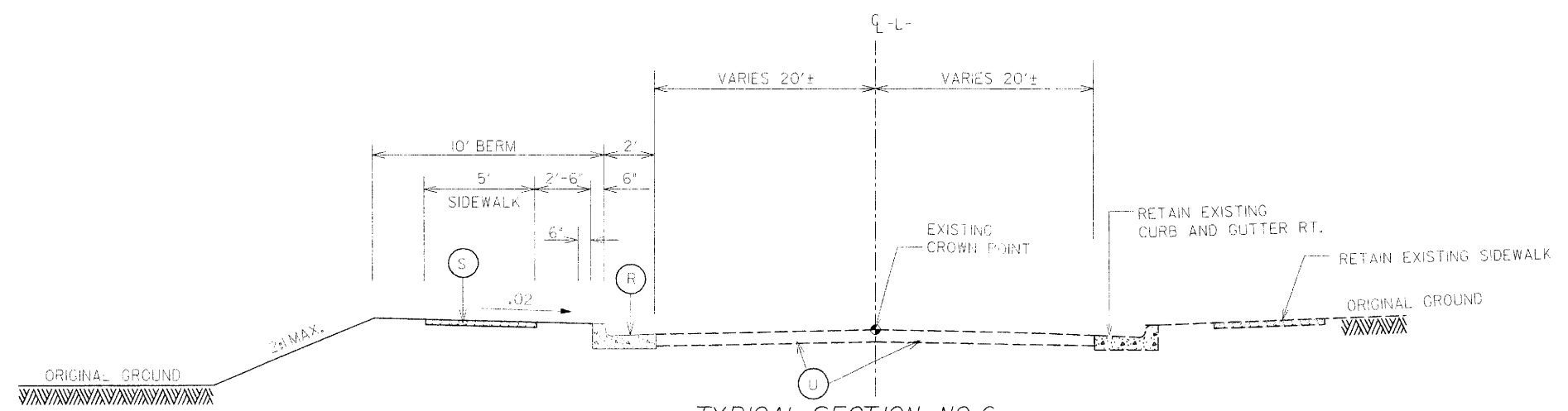
**TYPICAL SECTION NO.4**

-L- STA. 13+00.00 TO STA. 13+86.00 (BEGIN BRIDGE)  
-L- STA. 14+76.00 (END BRIDGE) TO STA. 15+50.00  
-L- STA. 20+50.00 TO STA. 21+82.00 (BEGIN BRIDGE)  
-L- STA. 22+92.00 (END BRIDGE) TO STA. 24+00.00



**TYPICAL SECTION NO.5**

-L- STA. 24+00.00 TO STA. 26+00.00



**TYPICAL SECTION NO.6**

-L- STA. 26+00.00 TO STA. 26+99.00

**PAVEMENT SCHEDULE**

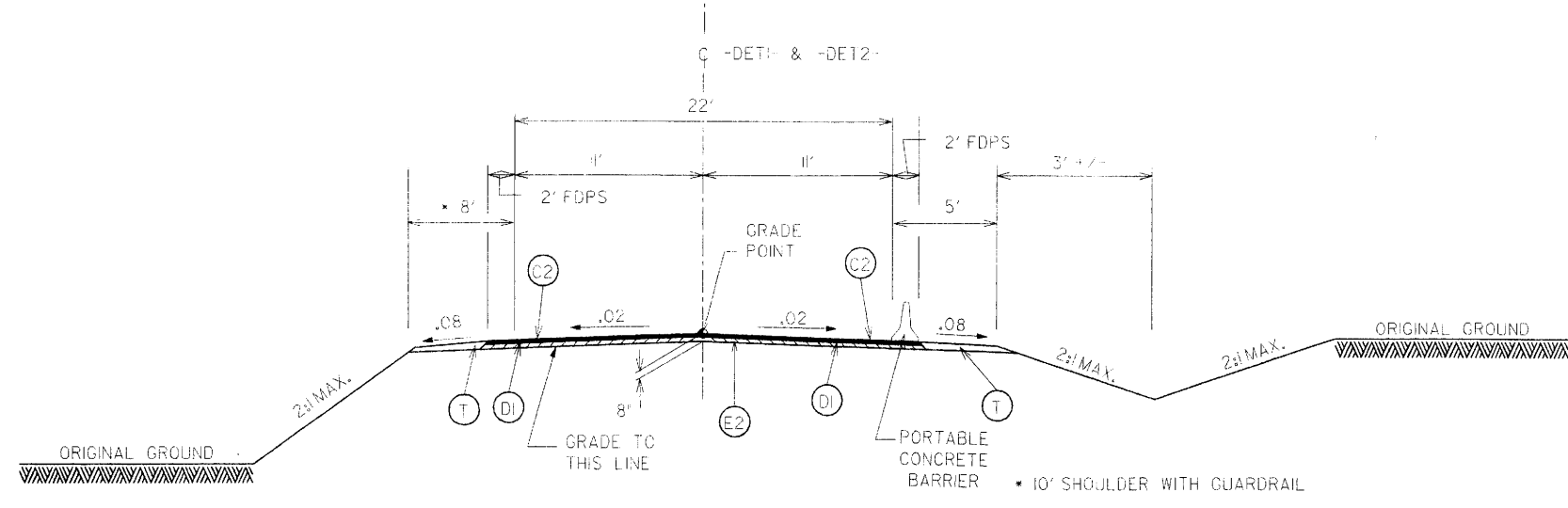
CODE	DESCRIPTION
(C1)	PROP. APPROX. 1/4" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 140 LBS PER SQ. YARD.
(C2)	PROP. APPROX. 2 1/2" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 40 LBS PER SQ. YARD IN EACH OF TWO LAYERS.
(C3)	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 62 LBS PER SQ. YARD PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 1/2" IN DPTH.
(D1)	PROP. APPROX. 2 1/2" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS PER SQ. YARD.
(D2)	PROP. APPROX. 4 1/2" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 256.5 LBS PER SQ. YARD IN EACH OF TWO LAYERS.
(D3)	PROP. VAR. DEPTH ASPHALT CONC. 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 1/4" IN DEPTH OR GREATER THAN 4" IN DEPTH.
(E1)	PROP. APPROX. 5 1/2" ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS PER SQ. YARD.
(E2)	PROP. APPROX. 3" ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 342 LBS PER SQ. YARD.
(E3)	PROP. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS PER SQ. YARD PER 1" DEPTH, TO BE PLACED IN LAYERS NOT GREATER THAN 5 1/2" IN DEPTH OR LESS THAN 3" IN DEPTH.
(R)	2'-6" CONCRETE CURB AND GUTTER.
(S)	4" CONCRETE SIDEWALK.
(T)	EARTH MATERIAL.
(U)	EXISTING PAVEMENT MATERIAL.
(V)	MILLING BITUMINOUS PAVEMENT, 1/4" DEPTH.
(W)	VAR. DEPTH ASPHALT PAVEMENT. (SEE WEDGING DETAIL)

USE 1/4" PAVEMENT EDGE SLOPES UNLESS OTHERWISE NOTED

REVISIONS

Revised 9/27/09



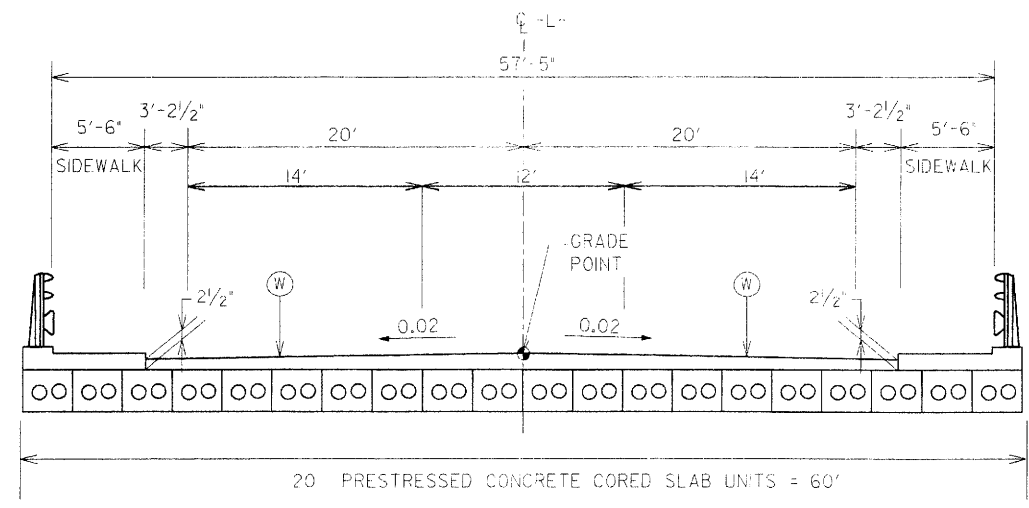


**TYPICAL SECTION NO.7**

-DET1- STA. 1+2.19 TO STA. 6+84.08  
-DET2- STA. 1+48.07 TO STA. 3+50.00 (BEGIN BRIDGE)  
-DET2- STA. 4+20.00 (END BRIDGE) TO STA. 5+86.05

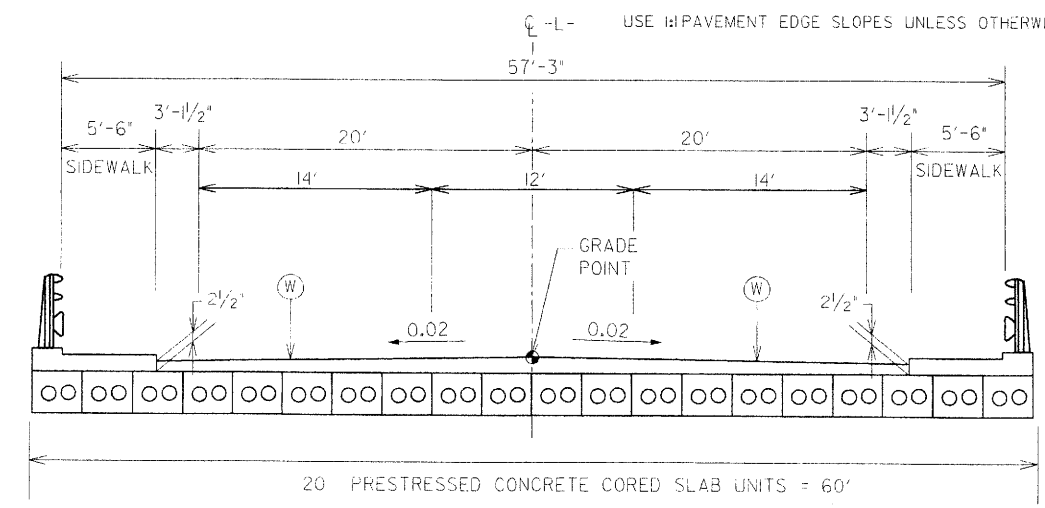
**PAVEMENT SCHEDULE**

CODE	DESCRIPTION
(C1)	PROP. APPROX. 1 1/4" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 140 LBS PER SQ. YARD.
(C2)	PROP. APPROX. 2 1/2" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 140 LBS PER SQ. YARD IN EACH OF TWO LAYERS.
(C3)	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS PER SQ. YARD PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 1 1/2" IN DEPTH.
(D1)	PROP. APPROX. 2 1/2" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I9.0B, AT AN AVERAGE RATE OF 285 LBS PER SQ. YARD.
(D2)	PROP. APPROX. 4 1/2" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I9.0B, AT AN AVERAGE RATE OF 256.5 LBS PER SQ. YARD IN EACH OF TWO LAYERS.
(D3)	PROP. VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE I9.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2 1/4" IN DEPTH OR GREATER THAN 4" IN DEPTH.
(E1)	PROP. APPROX. 5 1/2" ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS PER SQ. YARD.
(E2)	PROP. APPROX. 3" ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 342 LBS PER SQ. YARD.
(E3)	PROP. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS PER SQ. YARD PER 1" DEPTH, TO BE PLACED IN LAYERS NOT GREATER THAN 5 1/2" IN DEPTH OR LESS THAN 3" IN DEPTH.
(R)	2'-6" CONCRETE CURB AND GUTTER.
(S)	4' CONCRETE SIDEWALK.
(T)	EARTH MATERIAL.
(U)	EXISTING PAVEMENT MATERIAL.
(V)	MILLING BITUMINOUS PAVEMENT, 1 1/4" DEPTH.
(W)	VAR. DEPTH ASPHALT PAVEMENT. (SEE WEDGING DETAIL)



**TYPICAL SECTION NO.8**

-L- STA. 13+86.00 TO STA. 14+76.00



**TYPICAL SECTION NO.9**

-L- STA. 21+82.00 TO STA. 22+92.00

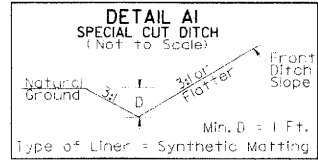
Revised 9/27/04

REVISIONS

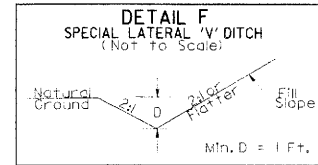
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PROJECT REFERENCE NO. B-3450	SHEET NO. 2-C
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

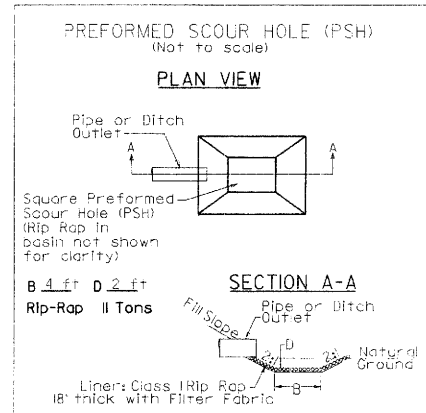
# DETOUR I



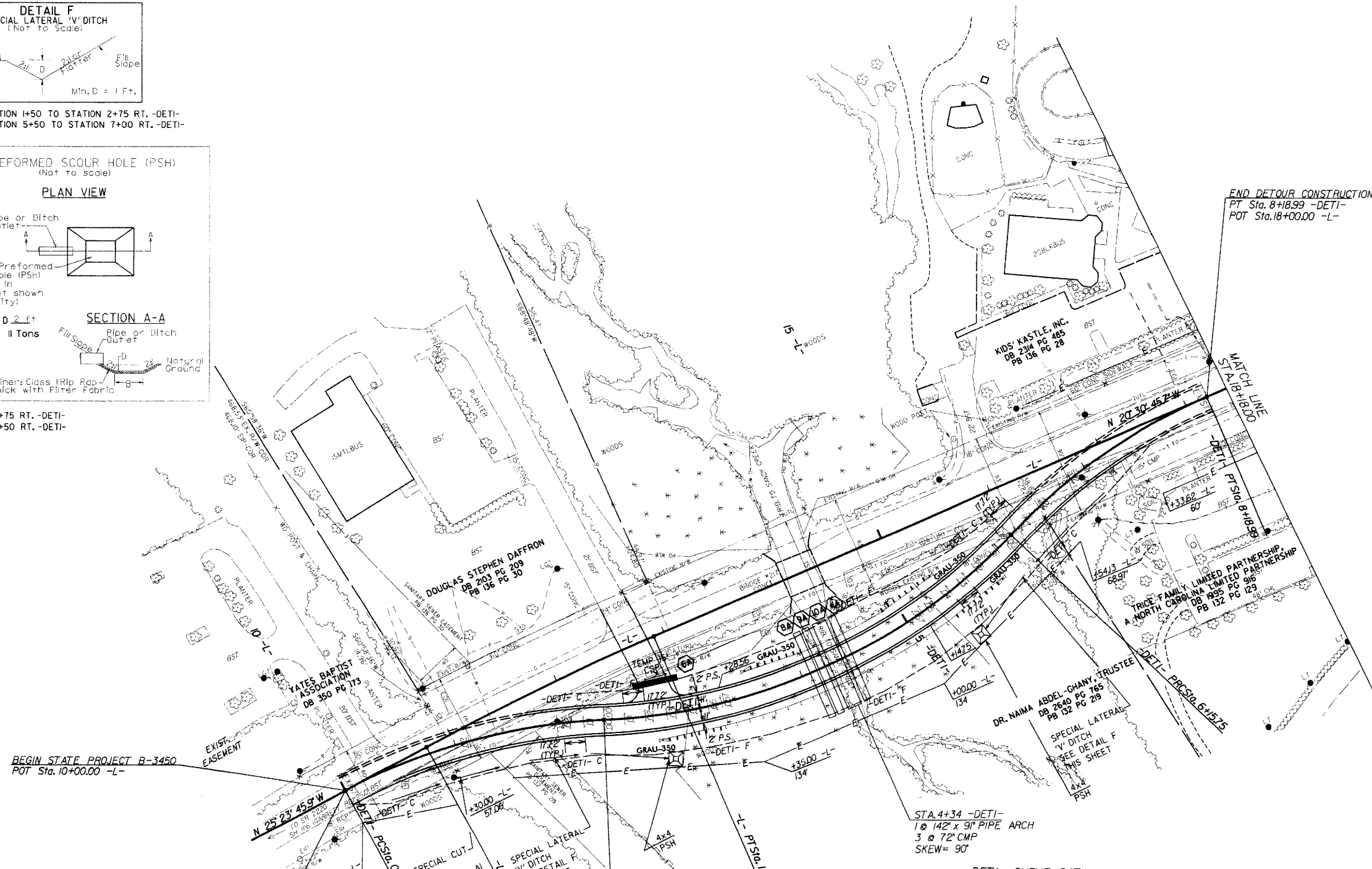
FROM STATION 0+25 TO STATION 1+50 RT. -DETI-



FROM STATION 1+50 TO STATION 2+75 RT. -DETI-  
FROM STATION 5+50 TO STATION 7+00 RT. -DETI-



STATION 2+75 RT. -DETI-  
STATION 5+50 RT. -DETI-



**-DETI- CURVE DATA**

PI Sta	Delta	D	L	T	R	SE	Runoff	V
1+15.79	26° 04' 35.3" (RT)	11' 27' 33.0"	227.56'	115.79'	500.00'	0.057	SEE PLANS	35 MPH
4+32.03	44° 28' 59.1" (LT)	11' 27' 33.0"	388.19'	204.47'	500.00'	0.057	SEE PLANS	35 MPH
7+18.79	23° 17' 23.9" (RT)	11' 27' 33.0"	203.24'	103.04'	500.00'	0.057	SEE PLANS	35 MPH

**-L- CURVE DATA**

PI Sta	Delta	D	L	T	R	SE	Runoff	V
11+84.04	4° 53' 00.2" (RT)	2' 17' 30.6"	213.08'	106.60'	2500.00'	0.03	SEE PLANS	45 MPH

**NOTES:**  
1. SEE SHEET 6 FOR -L- GRADE & PROFILE & SHEET 7 FOR -DETI- GRADE & PROFILE.  
2. ALL PROPOSED DRIVEWAY RADIUS 25 FT UNLESS OTHERWISE SHOWN.  
3. FLAT GRATES TO BE USED ON ENTIRE PROJECT.

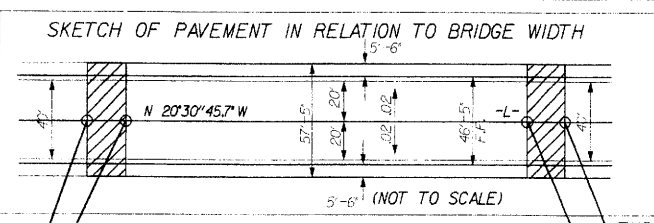
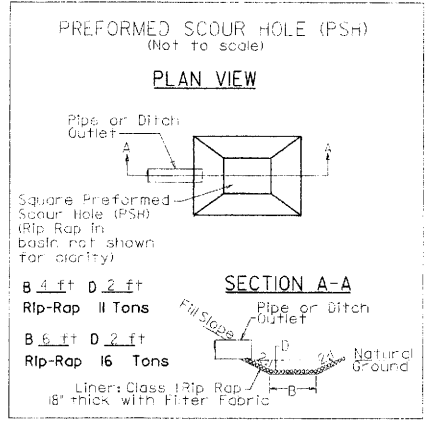
Revised 9/27/04

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-3450	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

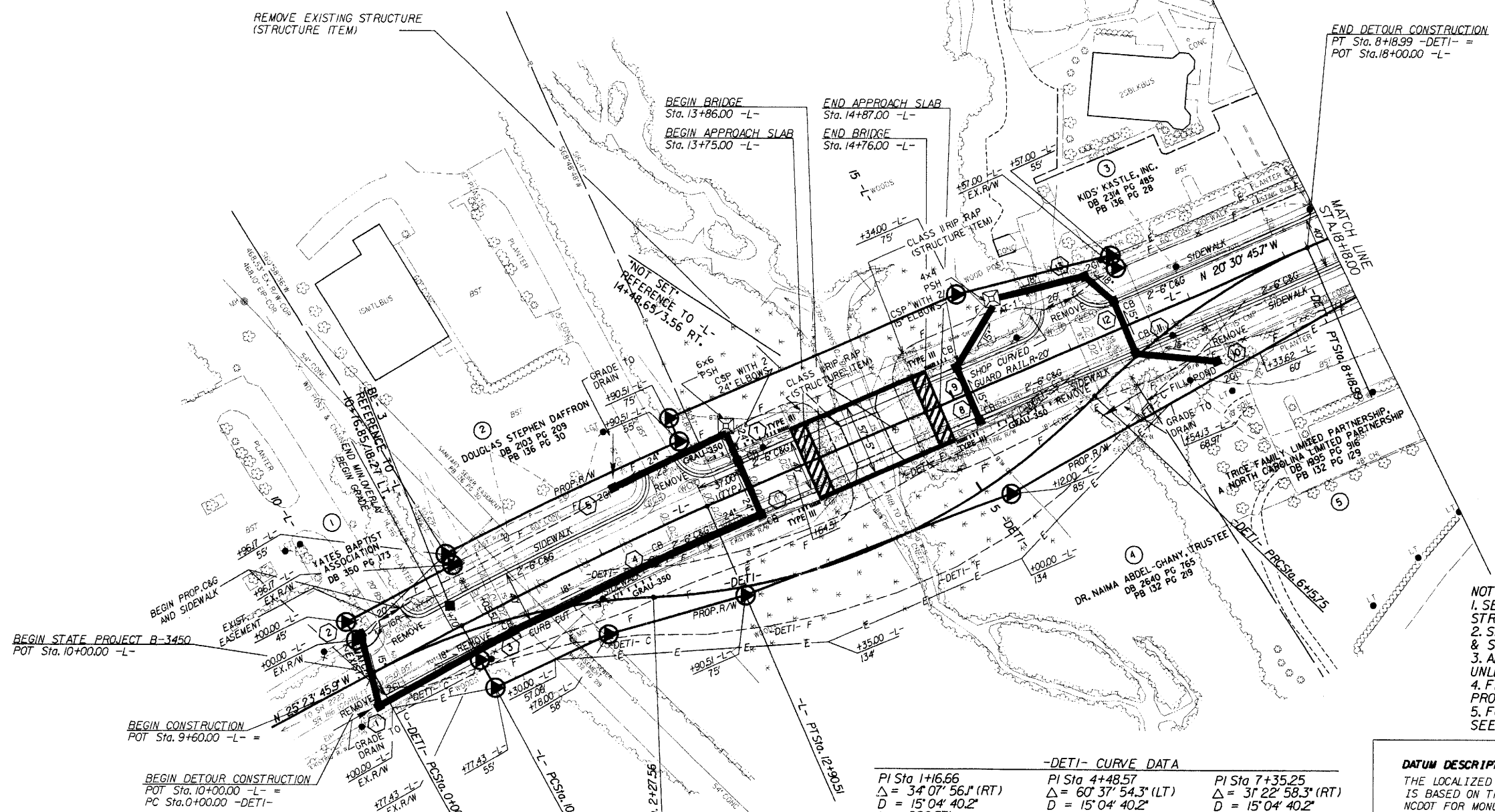
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(919) 783-9214




STATION 13+30 LT.  
STATION 15+57 LT.

BEGIN APPROACH SLAB Sta. 13+75.00 -L-  
END APPROACH SLAB Sta. 14+87.00 -L-  
BEGIN BRIDGE Sta. 13+86.00 -L-  
END BRIDGE Sta. 14+76.00 -L-



END DETOUR CONSTRUCTION  
PT Sta. 8+18.99 -DETI- =  
POT Sta. 18+00.00 -L-

- NOTES:**
- SEE SHEETS S-1 THRU S-24 FOR STRUCTURE PLANS.
  - SEE SHEET 6 FOR -L- GRADE & PROFILE & SHEET 7 FOR -DETI- GRADE & PROFILE.
  - ALL PROPOSED DRIVEWAY RADII 25 FT UNLESS OTHERWISE SHOWN.
  - FLAT GRATES TO BE USED ON ENTIRE PROJECT.
  - FOR ACCURATE APPROACH SLAB LOCATIONS SEE STRUCTURE PLAN SHEETS S-23 AND S-24.

 DENOTES APPROACH SLAB

**-L- CURVE DATA**

PI Sta 11+84.04 Δ = 4° 53' 00.2" (RT) D = 2' 17" 30.6" L = 213.08' T = 106.60' R = 2500.00' SE = 0.03 RUNOFF = SEE PLANS V = 45 MPH	PI Sta 4+48.57 Δ = 60° 37' 54.3" (LT) D = 15' 04" 40.2" L = 402.12' T = 222.20' R = 380.00' SE = 0.06 RUNOFF = SEE PLANS V = 35 MPH	PI Sta 7+35.25 Δ = 31° 22' 58.3" (RT) D = 15' 04" 40.2" L = 208.14' T = 106.75' R = 380.00' SE = SEE PLANS RUNOFF = SEE PLANS V = 35 MPH
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**-DETI- CURVE DATA**

PI Sta 1+16.66 Δ = 34° 07' 56.1" (RT) D = 15' 04" 40.2" L = 226.37' T = 116.66' R = 380.00' SE = SEE PLANS RUNOFF = SEE PLANS V = 35 MPH	PI Sta 4+48.57 Δ = 60° 37' 54.3" (LT) D = 15' 04" 40.2" L = 402.12' T = 222.20' R = 380.00' SE = 0.06 RUNOFF = SEE PLANS V = 35 MPH	PI Sta 7+35.25 Δ = 31° 22' 58.3" (RT) D = 15' 04" 40.2" L = 208.14' T = 106.75' R = 380.00' SE = SEE PLANS RUNOFF = SEE PLANS V = 35 MPH
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**DATUM DESCRIPTION**

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B3450-1" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 803058.6063(FH) EASTING: 2007856.2841(FH). THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99994845.

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B3450-1" TO -L- STATION 10+00.00 IS N 20° 11' 06" W, 968.50'

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

Revised 9/27/04

REVISIONS

BM\*2 = RR SPIKE SET IN 14' GUM 140.82' RT OF @  
STA 8+18.5 ELEV.=250.12'.N 803140.0 E 2008173J

BM\*3 = RR SPIKE SET IN 15' BEECH 178' LT OF @  
STA 15+67.9 ELEV.=250.58'.N 803140.0 E 2007621J

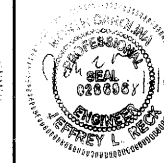
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PROJECT REFERENCE NO. B-3450 SHEET NO. 6

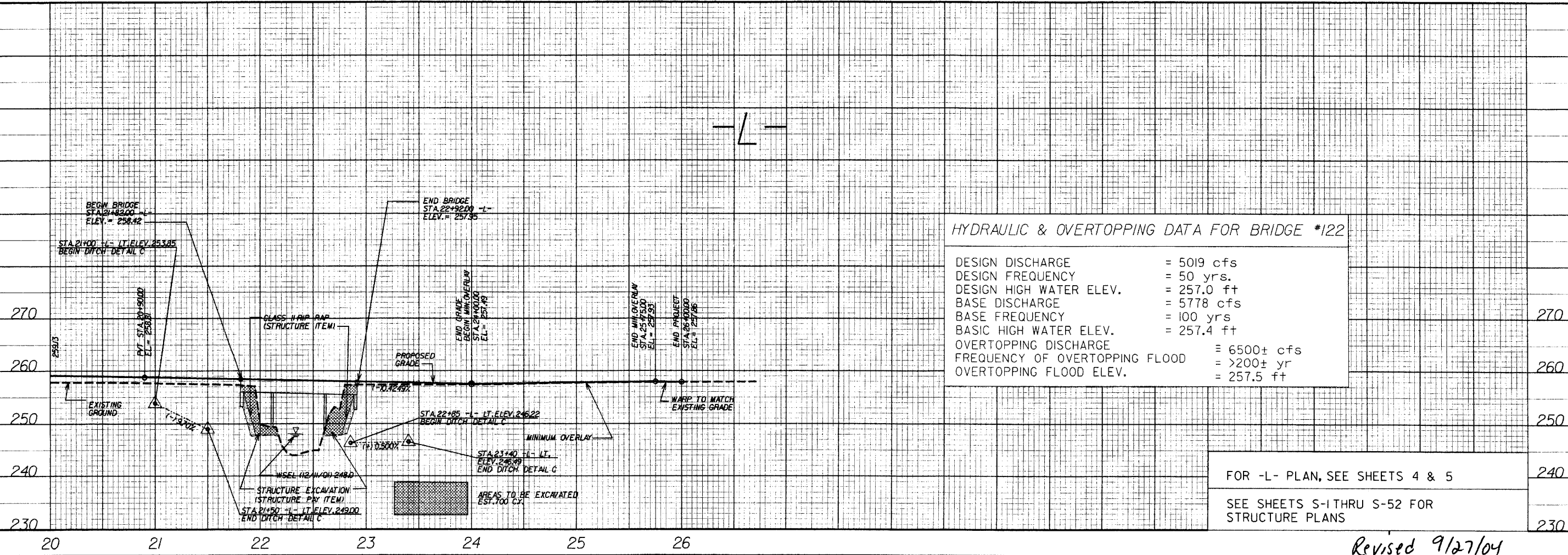
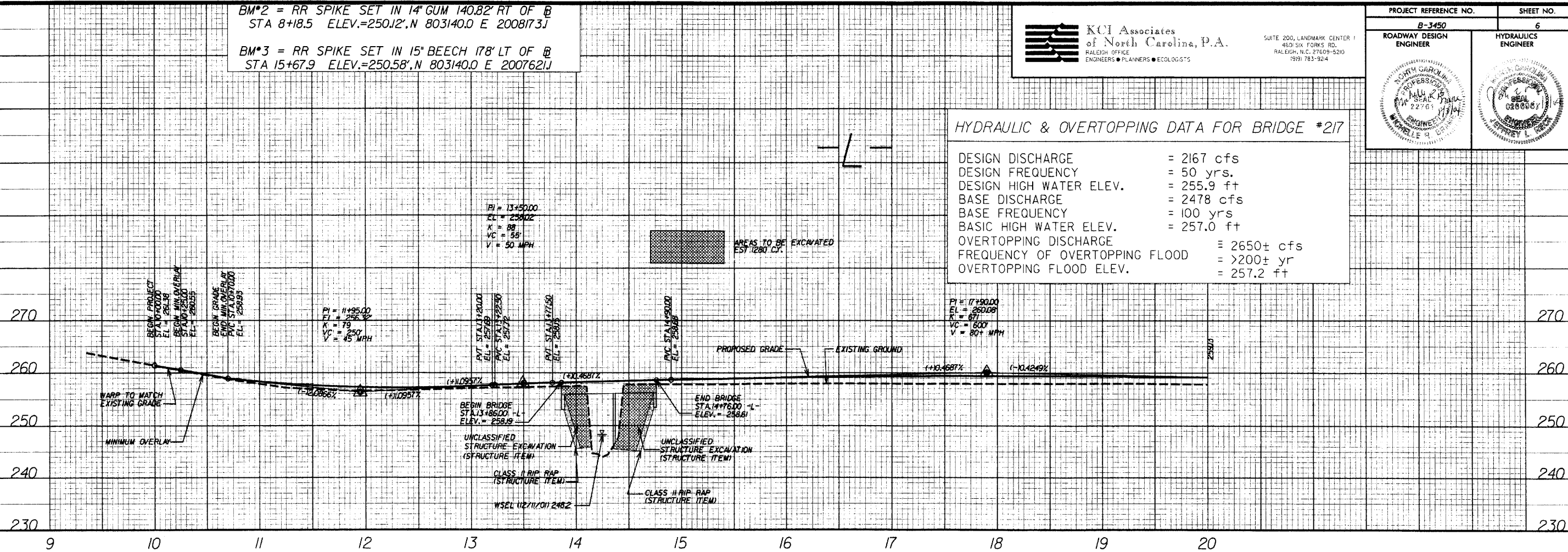
ROADWAY DESIGN  
ENGINEER

HYDRAULICS  
ENGINEER



HYDRAULIC & OVERTOPPING DATA FOR BRIDGE #217

DESIGN DISCHARGE = 2167 cfs  
DESIGN FREQUENCY = 50 yrs.  
DESIGN HIGH WATER ELEV. = 255.9 ft  
BASE DISCHARGE = 2478 cfs  
BASE FREQUENCY = 100 yrs  
BASIC HIGH WATER ELEV. = 257.0 ft  
OVERTOPPING DISCHARGE = 2650± cfs  
FREQUENCY OF OVERTOPPING FLOOD = >200± yr  
OVERTOPPING FLOOD ELEV. = 257.2 ft



HYDRAULIC & OVERTOPPING DATA FOR BRIDGE #122

DESIGN DISCHARGE = 5019 cfs  
DESIGN FREQUENCY = 50 yrs.  
DESIGN HIGH WATER ELEV. = 257.0 ft  
BASE DISCHARGE = 5778 cfs  
BASE FREQUENCY = 100 yrs  
BASIC HIGH WATER ELEV. = 257.4 ft  
OVERTOPPING DISCHARGE = 6500± cfs  
FREQUENCY OF OVERTOPPING FLOOD = >200± yr  
OVERTOPPING FLOOD ELEV. = 257.5 ft

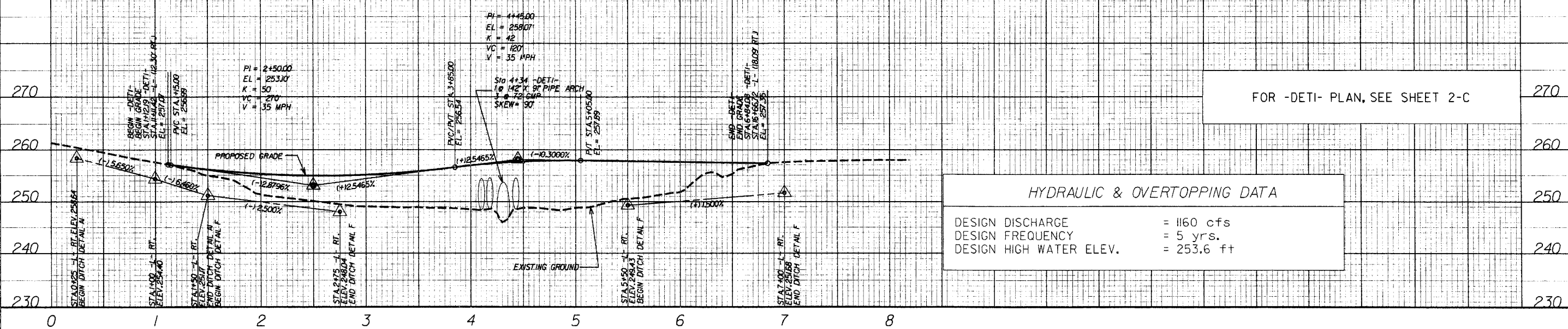
FOR -L- PLAN, SEE SHEETS 4 & 5

SEE SHEETS S-1 THRU S-52 FOR  
STRUCTURE PLANS

Revised 9/27/04



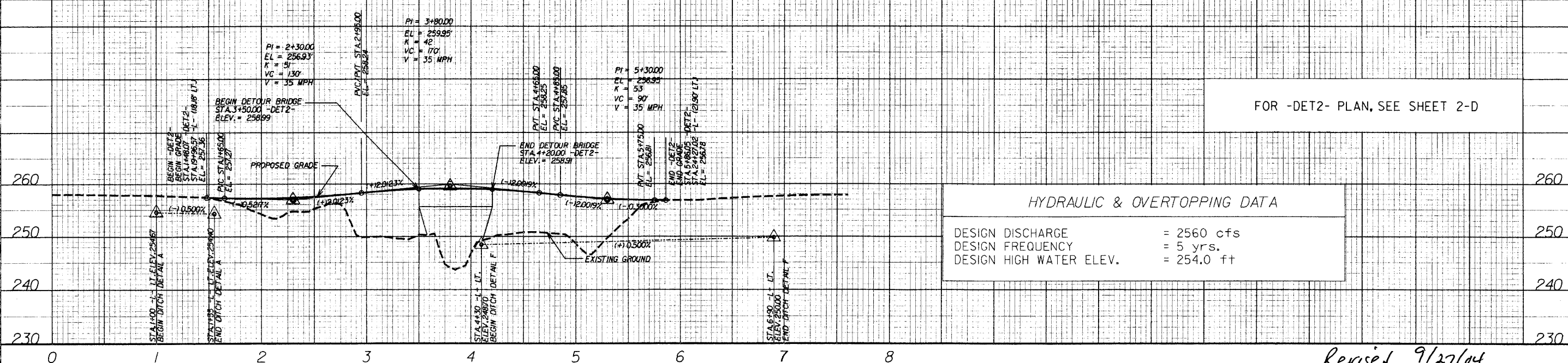
# -DET1-



FOR -DET1- PLAN, SEE SHEET 2-C

HYDRAULIC & OVERTOPPING DATA	
DESIGN DISCHARGE	= 1160 cfs
DESIGN FREQUENCY	= 5 yrs.
DESIGN HIGH WATER ELEV.	= 253.6 ft

# -DET2-



FOR -DET2- PLAN, SEE SHEET 2-D

HYDRAULIC & OVERTOPPING DATA	
DESIGN DISCHARGE	= 2560 cfs
DESIGN FREQUENCY	= 5 yrs.
DESIGN HIGH WATER ELEV.	= 254.0 ft

Revised 9/27/04