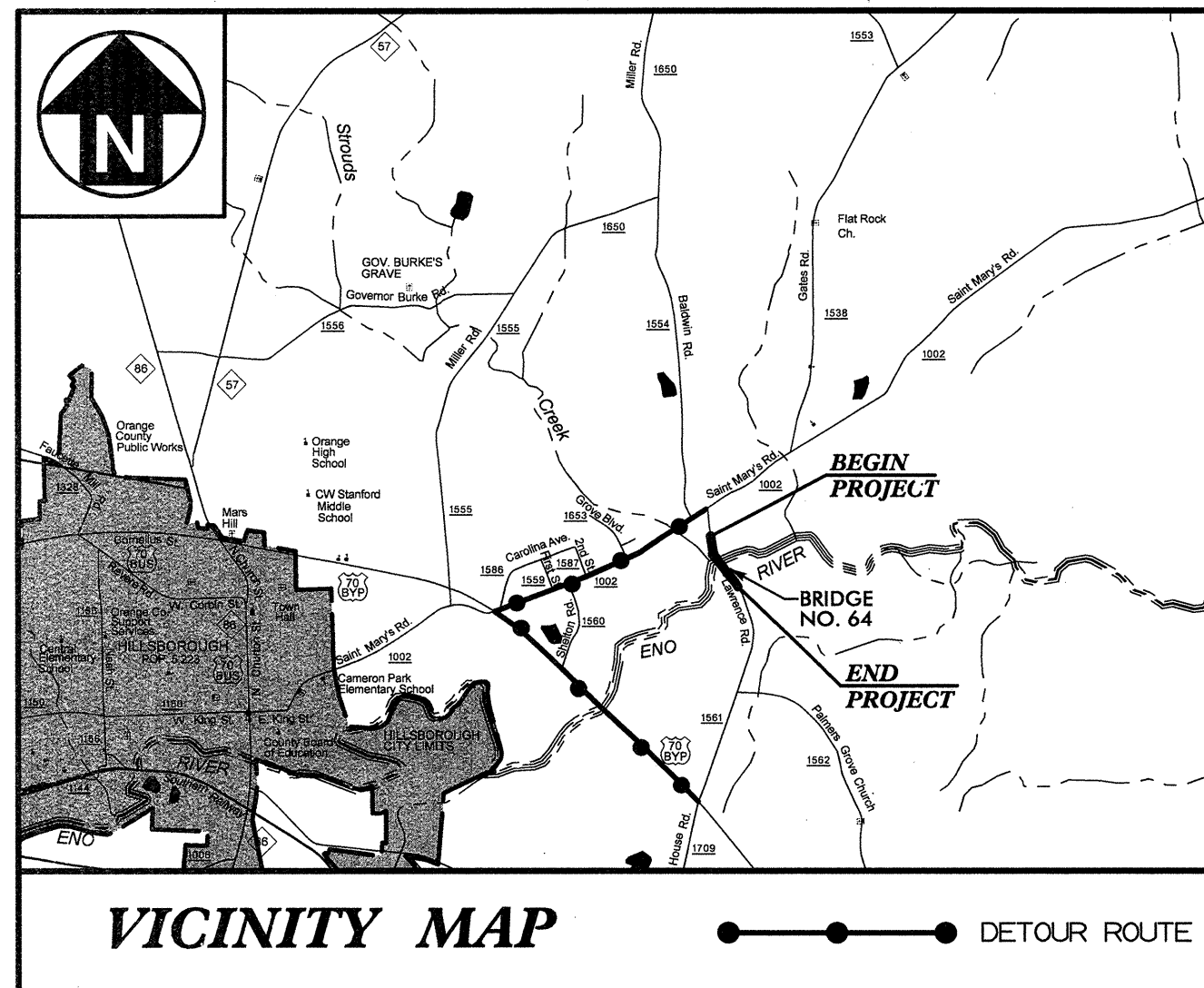


See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols



VICINITY MAP

—●—●—●— DETOUR ROUTE

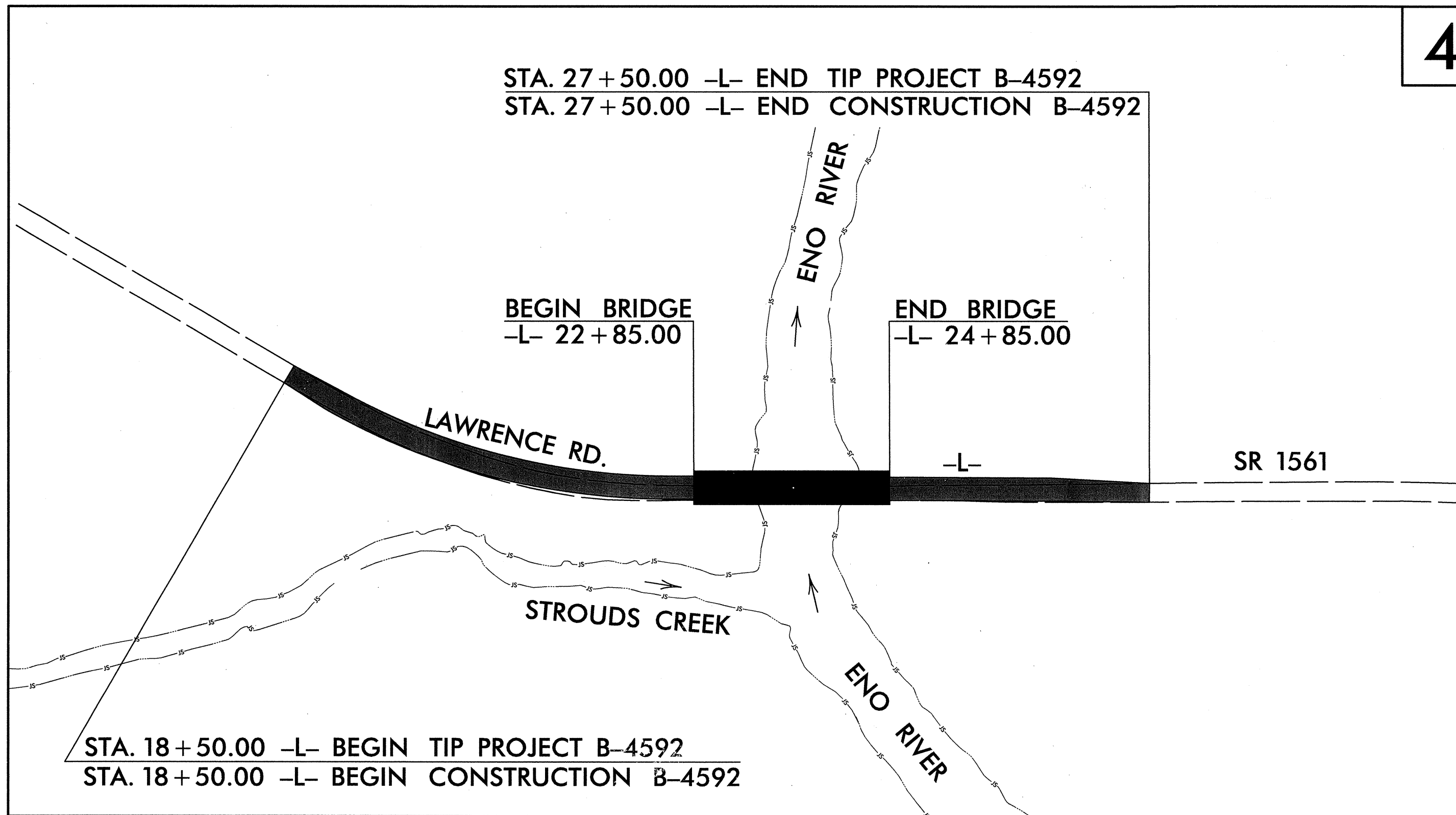
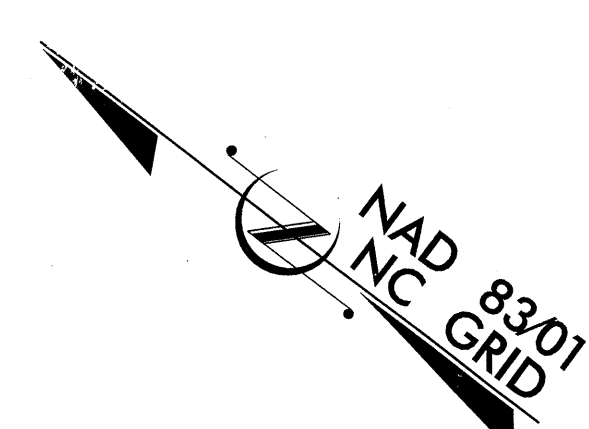
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ORANGE COUNTY

LOCATION: BRIDGE NO. 64 OVER ENO RIVER ON SR 1561

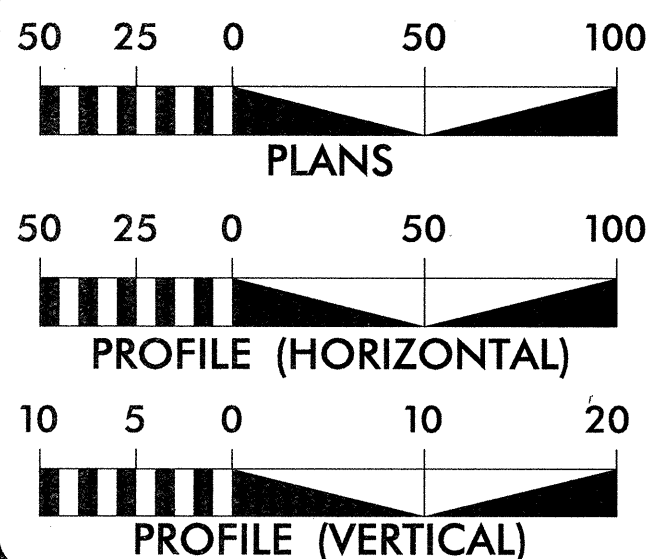
TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4592	1	
W.B.S. ELEMENT	F.A. PROJ. NO.	DESCRIPTION	
33790.1.1	BRZ-1561(5)	P.E.	
33790.2.1	BRZ-1561(5)	RW, UTL.	
33790.3.1	BRZ-1561(5)	CONST.	



MULKEY
ENGINEERS & CONSULTANTS
PO BOX 33127
RALEIGH, N.C. 27636
(919) 851-1912
(919) 851-1918 (FAX)
WWW.MULKEYINC.COM

GRAPHIC SCALES



DESIGN DATA

ADT 2008 = 3,970
ADT 2030 = 7,400
DHV = 13 %
D = 75 %
T = 2 %*
V = 50 MPH
* TTST 1% DUAL 1%
FUNCTIONAL CLASSIFICATION
LOCAL RURAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4592 = 0.132 MILES
LENGTH STRUCTURE TIP PROJECT B-4592 = 0.038 MILES
TOTAL LENGTH TIP PROJECT B-4592 = 0.170 MILES

Prepared In the Office of:

MULKEY
ENGINEERS & CONSULTANTS

FOR THE NORTH CAROLINA DEPT. OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 18, 2008

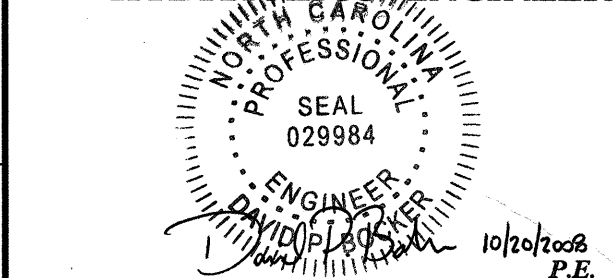
LETTING DATE:
JANUARY 20, 2009

TIM JORDAN, PE
ROADWAY PROJECT ENGINEER

DAVID BOCKER, PE
HYDRAULIC PROJECT ENGINEER

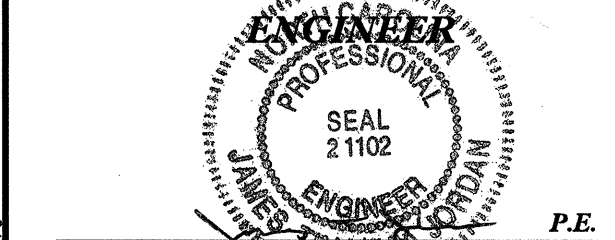
DOUG TAYLOR, PE
NCDOT ROADWAY DESIGN PROJECT ENGINEER

HYDRAULIC ENGINEER



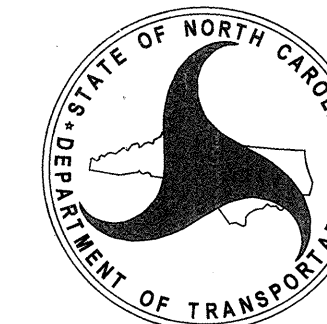
SIGNATURE: [Signature]

ROADWAY DESIGN



SIGNATURE: [Signature]

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

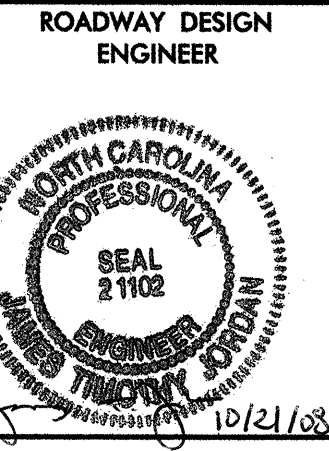


[Signature] P.E.
STATE HIGHWAY DESIGN ENGINEER

TIP PROJECT: B-4592

CONTRACT: C202047

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS



INDEX OF SHEETS, GENERAL NOTES & LIST OF STANDARDS

<u>Sheet #</u>	<u>Description</u>	<u>2006 ROADWAY ENGLISH STANDARD DRAWINGS</u>	EFF. 07-18-06 REV. 01-02-07	General Notes:	2006 Specifications Effective: 07-18-06 Revised: 07-18-06
1	Title Sheet				
1-A	Index of Sheets, General Notes, & List of Standards	The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated July 18, 2006 are applicable to this project and by reference hereby are considered a part of these plans:		Grading and Surfacing:	The grade lines shown denote the finished elevation of the proposed surfacing at grade points shown on the typical sections. Grade lines may be adjusted at their beginning and ending and at structures as directed by the engineer in order to secure a proper tie-in.
1-B	Conventional Symbols			Clearing:	Clearing on this project shall be performed to the limits established by method III.
1-C	Survey Control Sheet			Superelevation:	All curves on this project shall be superelevated in accordance with Std. no. 225.04 using the rate of superelevation and runoff shown on the plans. Superelevation is to be revolved about the grade points shown on the typical sections.
2	Pavement Schedule & Typical Sections			Shoulder Construction:	Asphalt, earth, and concrete shoulder construction on the high side of superelevated curves shall be in accordance with Std. no. 560.01.
2-A	Detail of Anchorage for Frames			Guardrail:	The guardrail locations shown on the plans may be adjusted during construction as directed by the engineer. The contractor should consult with the engineer prior to ordering guardrail material.
2-B	Rock Plating Detail			Temporary Shoring:	Shoring required for the maintenance of traffic will be paid for as "Extra Work" in accordance with section 104-7.
2-C	Bridge Approach Fill Detail			Utilities:	Utility owners on this project are Duke Power.
3	Summary of Quantities			Right-of-Way Markers:	All right-of-way markers on this project shall be placed by contract.
3-A	List of Pipe, Endwalls, Etc. (For Pipe 48" & Under)				
3-B	Guardrail Summary, Summary of Earthwork & Summary of Pavement Removal				
4	Plan				
5	Profile				
TCP-1 thru TCP-3	Traffic Control Plans				
SD-1	Special Sign Design				
EC-1 thru EC-5	Erosion Control Plans				
RF-1	Reforestation Detail Sheet				
X-1	Cross Section Summary Sheet				
X-2 thru X-9	Cross-Sections				
S-1 thru S-24	Structure Plans				

10/25/05
10/17/2008
R:\170808\Projects\104592_rdy_tsh.dgn
10:08:28 AM

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.
B-4592
SHEET NO.
1-B

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

State Line	———
County Line	- - - - -
Township Line	- · - · - ·
City Line	- · - · - ·
Reservation Line	⊖
Property Line	⊖
Existing Iron Pin	○
Property Corner	×
Property Monument	□
Parcel/Sequence Number	(23)
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	-o-o-o-
Proposed Chain Link Fence	-□-□-□-
Proposed Barbed Wire Fence	-◇-◇-◇-
Existing Wetland Boundary	-·-·-·-
Proposed Wetland Boundary	-·-·-·-
Existing Endangered Animal Boundary	-EAB-
Existing Endangered Plant Boundary	-EPB-

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	⊙
Well	⊙
Small Mine	⊗
Foundation	■
Area Outline	▭
Cemetery	⊕
Building	▭
School	▭
Church	⊕
Dam	▭

HYDROLOGY:

Stream or Body of Water	———
Hydro, Pool or Reservoir	⊖
Jurisdictional Stream	JS
Buffer Zone 1	BZ 1
Buffer Zone 2	BZ 2
Flow Arrow	→
Disappearing Stream	→
Spring	○
Wetland	·
Proposed Lateral, Tail, Head Ditch	▭
False Sump	▽

RAILROADS:

Standard Gauge	———
RR Signal Milepost	⊕
Switch	□
RR Abandoned	- - - - -
RR Dismantled	---

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	CONC
Bridge Wing Wall, Head Wall and End Wall	CONC WW
MINOR:	
Head and End Wall	CONC HW
Pipe Culvert	———
Footbridge	———
Drainage Box: Catch Basin, DI or JB	CB
Paved Ditch Gutter	———
Storm Sewer Manhole	⊕
Storm Sewer	S

UTILITIES:

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

TELEPHONE:

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

WATER:

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

TV:

TV Satellite Dish	⊕
TV Pedestal	⊕
TV Tower	⊕
U/G TV Cable Hand Hole	PH
Recorded U/G TV Cable	TV
Designated U/G TV Cable (S.U.E.*)	TV
Recorded U/G Fiber Optic Cable	TV FO
Designated U/G Fiber Optic Cable (S.U.E.*)	TV FO

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

12/01/2005

B-4592 SURVEY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
B-4592	1C
Location and Surveys	

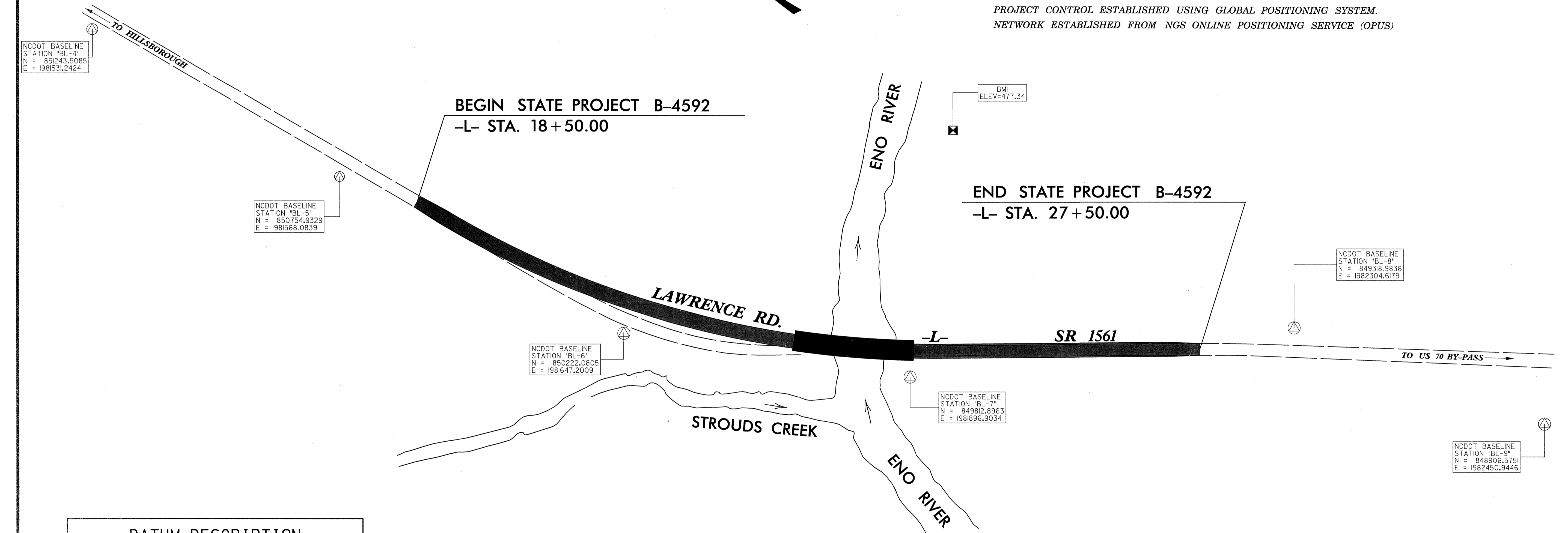
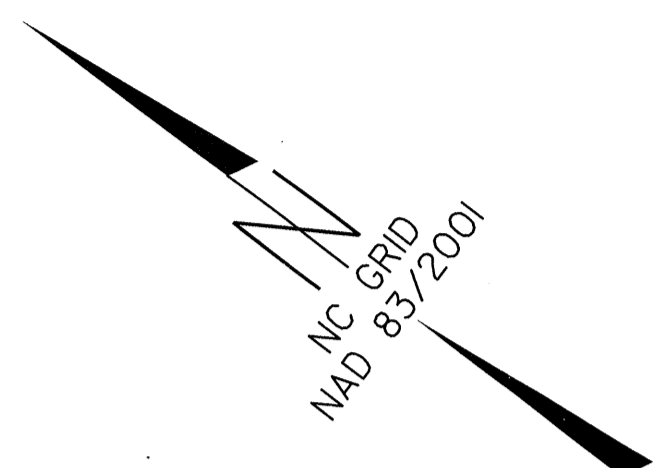
1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.doh.dot.state.nc.us/preconstruct/highway/location/project/)

THE FILE(S) TO BE FOUND ARE AS FOLLOWS:
 B4592_LS_CONTROL_060706.TXT

SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

⊕ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
 NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING SERVICE (OPUS)



DATUM DESCRIPTION
 THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4216-2"
 WITH NAD 1983/2001 STATE PLANE GRID COORDINATES OF
 NORTHING: 849950.5481(ft) EASTING: 1979550.411(ft)
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99995696
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4216-2" TO -L- STATION 18+50 IS
 N78°27'29.38"E 2131.0502 (ft)
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
 VERTICAL DATUM USED IS NAVD 88

BL	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
4		BL-4	851243.5085	1981531.2424	518.15	OUTSIDE PROJECT LIMITS	
5		BL-5	850754.9329	1981568.0839	510.86	14+66.35	25.19 RT
6		BL-6	850222.0805	1981647.2009	497.50	20+02.16	19.43 RT
7		BL-7	849812.8963	1981896.9034	488.98	24+78.00	18.12 RT
8		BL-8	849318.9836	1982304.6179	501.11	31+16.90	16.29 LT
9		BL-9	848906.5751	1982450.9446	528.75	OUTSIDE PROJECT LIMITS	

 BM1 ELEVATION = 477.34
 N 849988 E 1982246
 L STATION 25+47 366 LEFT
 BM1

NOTE: DRAWING NOT TO SCALE

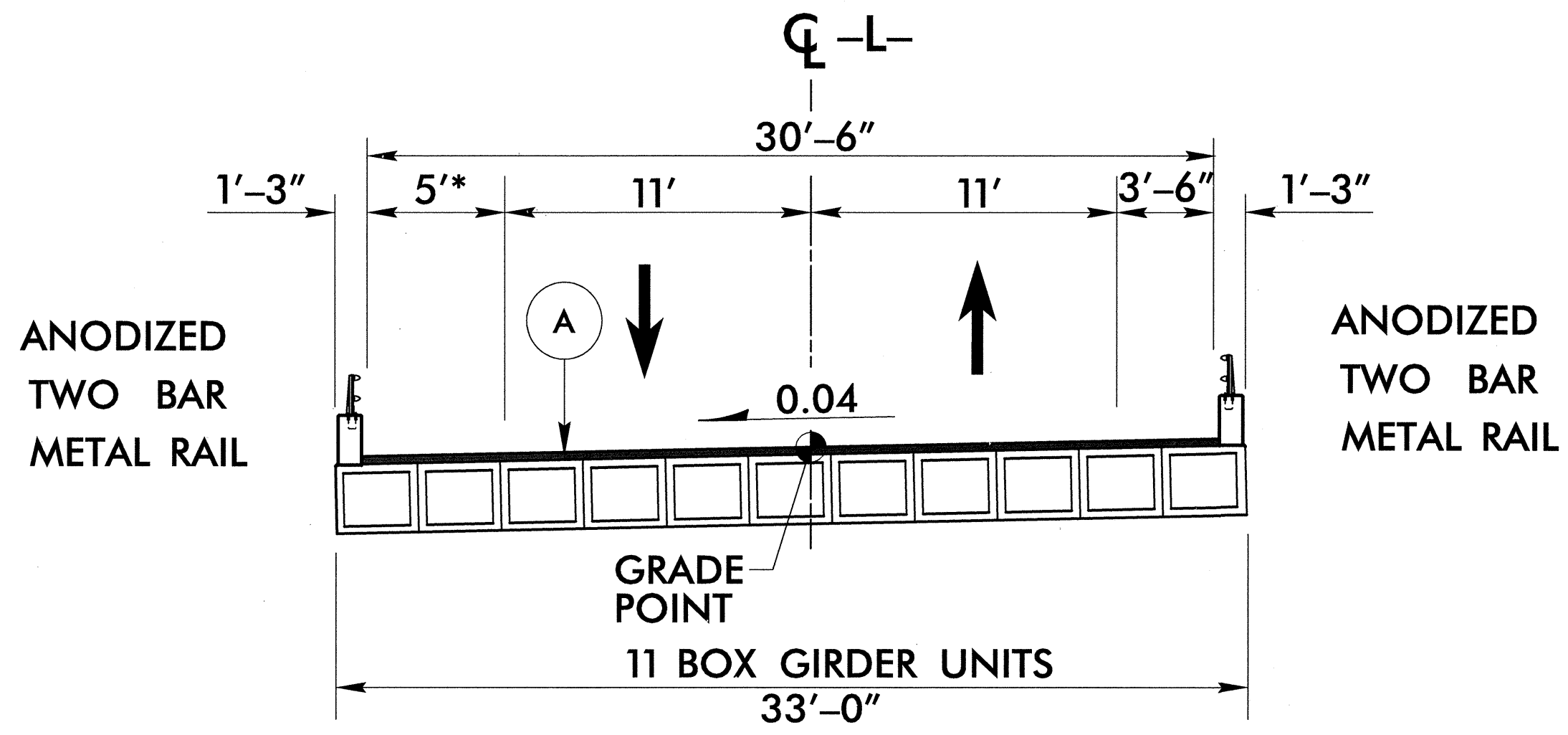
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5/14/99

PROJECT REFERENCE NO. B-4592	SHEET NO. 2
RW SHEET NO.	
PAVEMENT DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22896 CLARK S. MORRISON 12/10/08	ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21102 12/13/08

PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
A	CONCRETE WEARING SURFACE (STRUCTURE PAY ITEM)
C1	PROP. APPROX. 2 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
E1	PROP. APPROX. 7 1/2" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 427.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
T	EARTH MATERIAL.

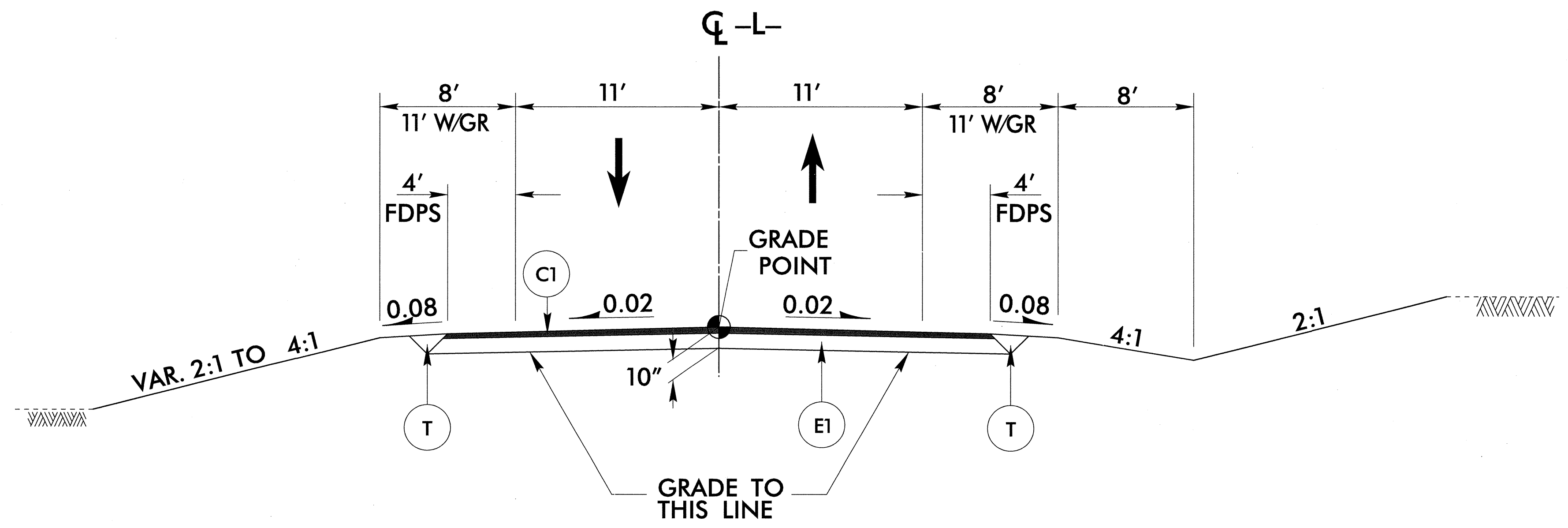
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



DETAIL OF BRIDGE

-L- STA 22+85.00 (BEGIN BRIDGE) TO STA 24+85.00 (END BRIDGE)

* WIDENED FOR HYDRAULIC SPREAD ON STRUCTURE



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
AT THE FOLLOWING LOCATIONS

TRANSITION FROM EXISTING TO T.S. NO. 1 FROM
-L- STA. 18+50.00 TO STA. 19+00.00

-L- STA. 19+00.00 TO STA. 22+85.00 (BEGIN BRIDGE)
-L- STA. 24+85.00 (END BRIDGE) TO STA. 26+50.00

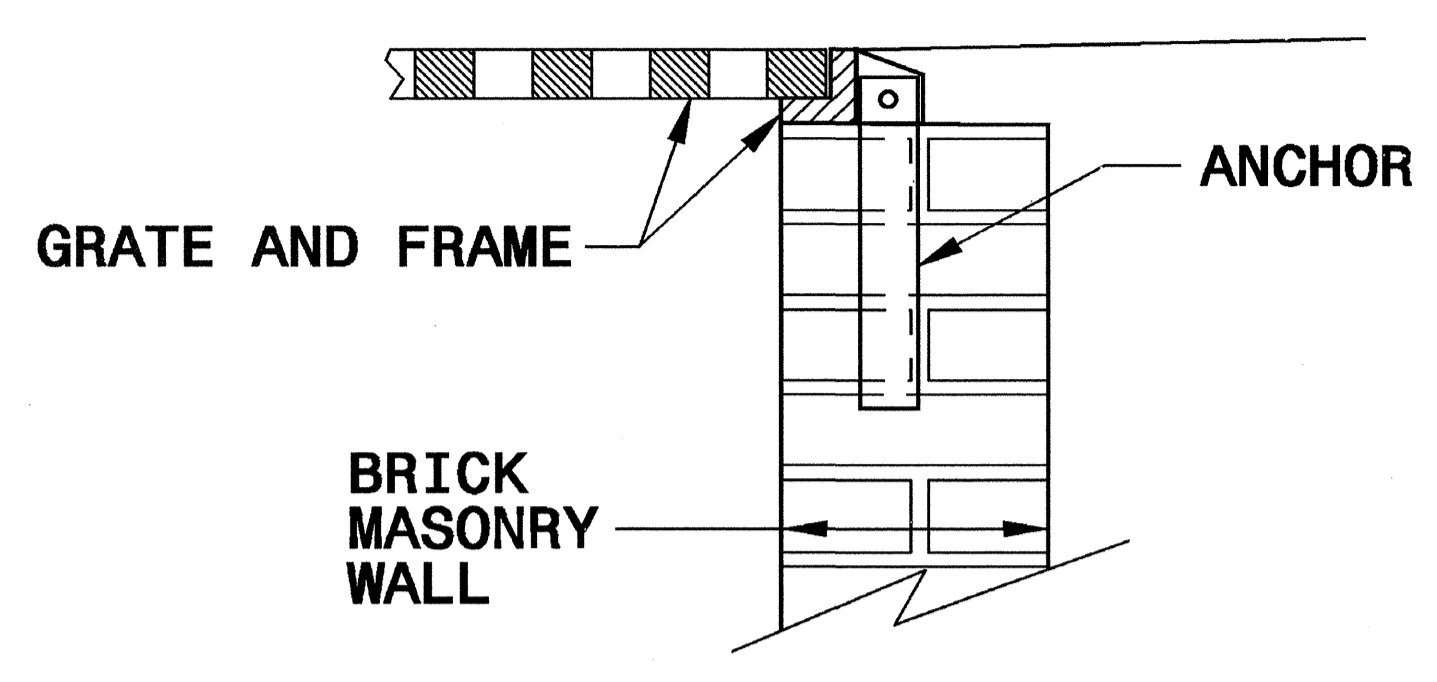
TRANSITION FROM T.S. NO. 1 TO EXISTING
-L- STA. 26+50.00 TO STA. 27+50.00

12/7/2008 9:55:19 AM \\proj\64592_rdy_typ.dgn

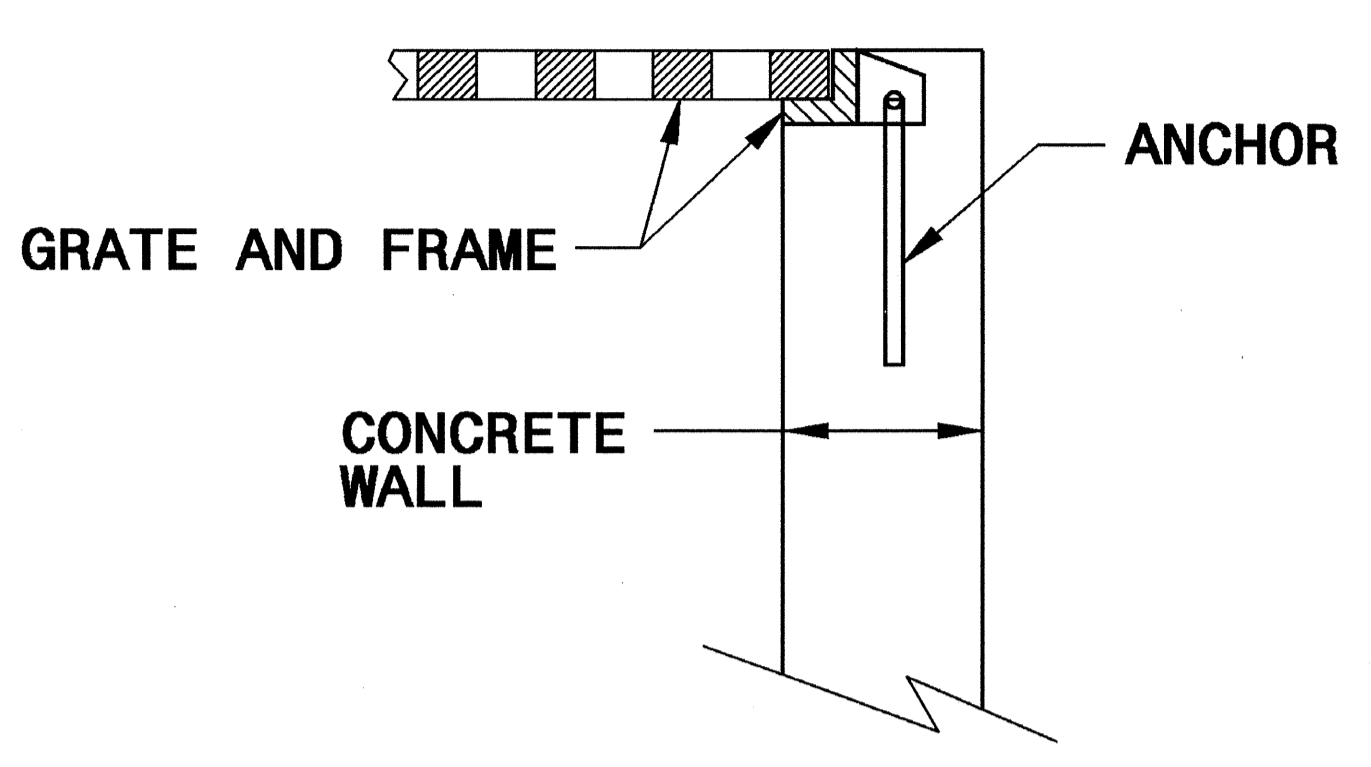
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
ANCHORAGE FOR FRAMES
BRICK/CONCRETE/PRECAST CONCRETE

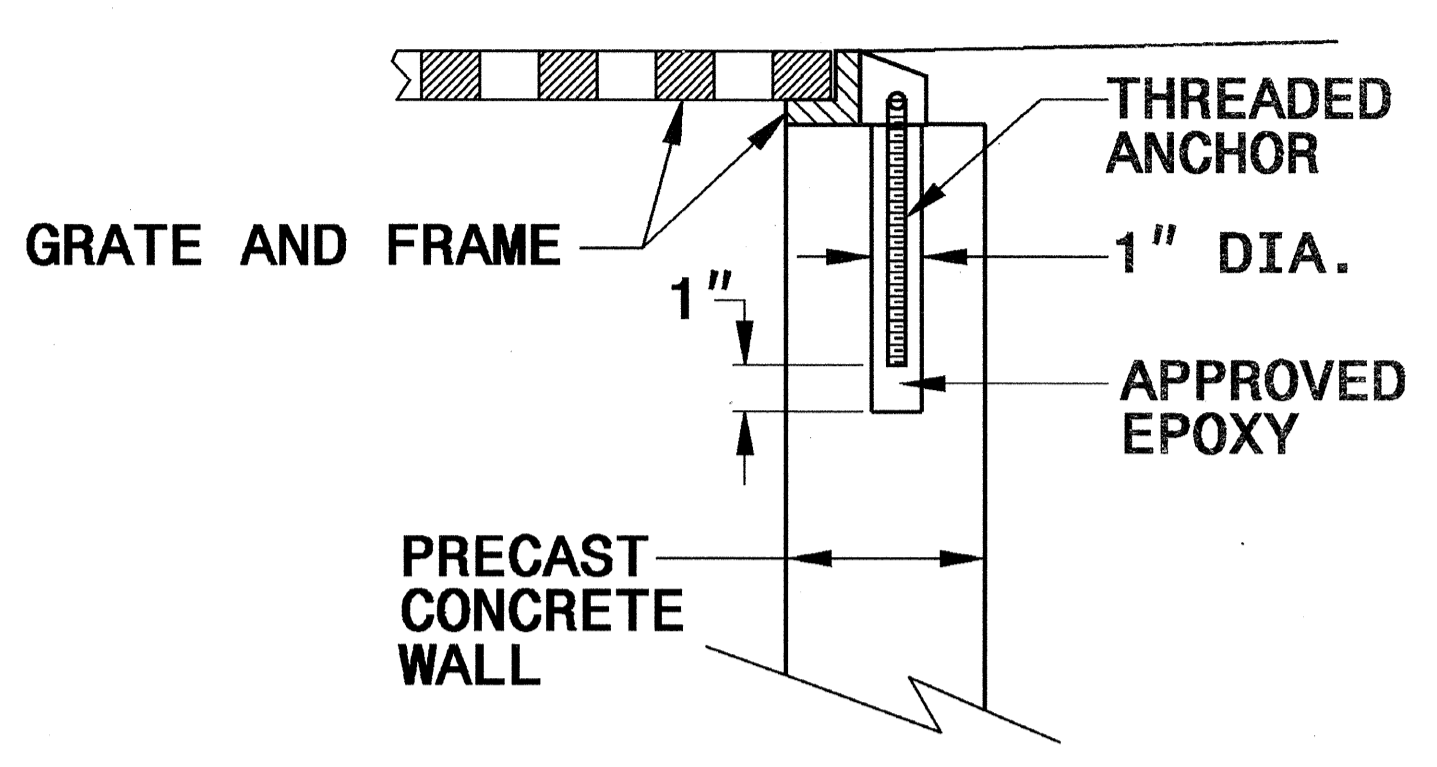
SHEET 1 OF 1
840D25



BRICK MASONRY CONSTRUCTION



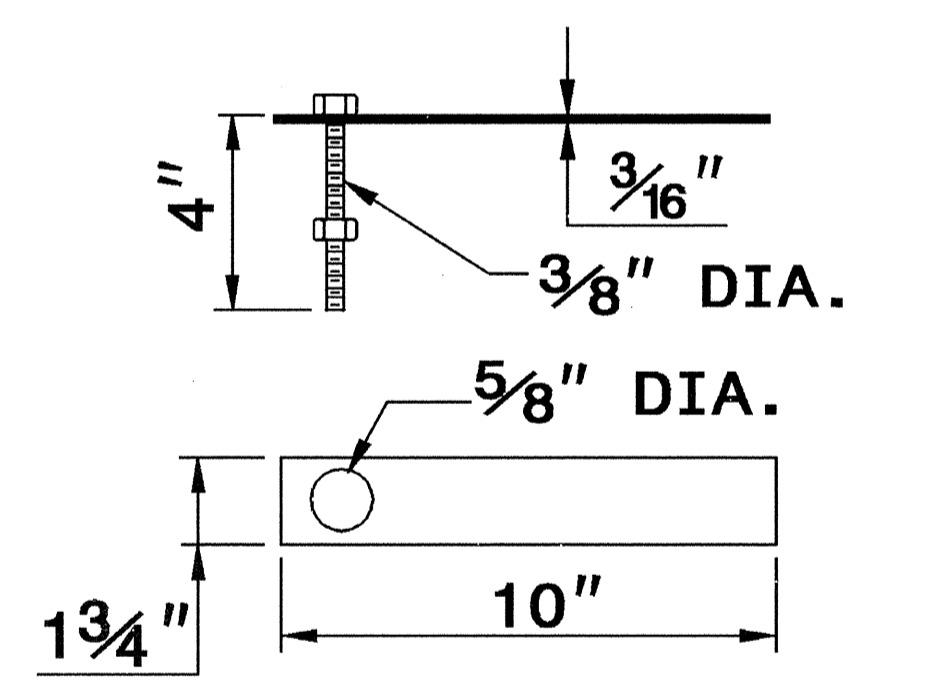
CONCRETE CONSTRUCTION



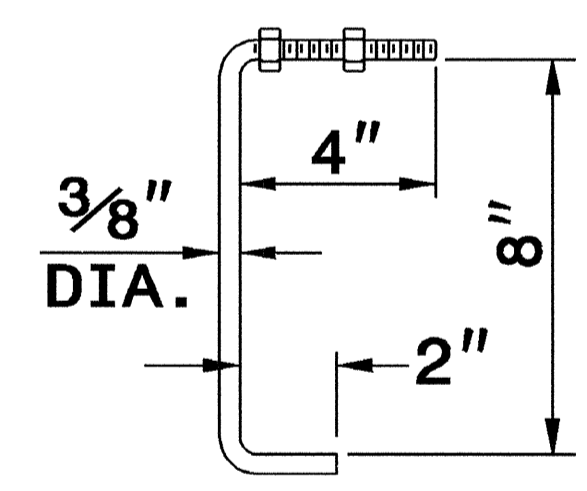
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

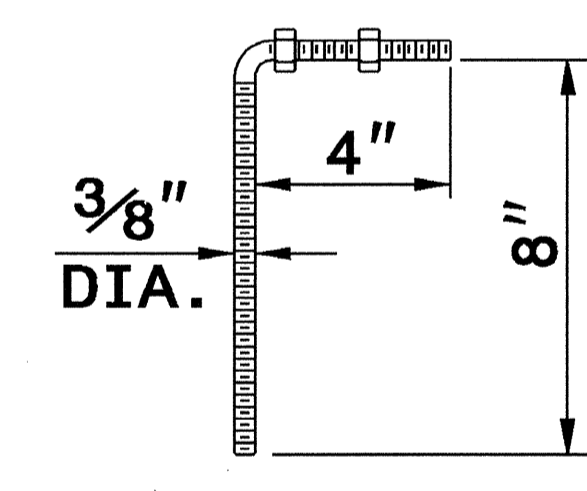
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



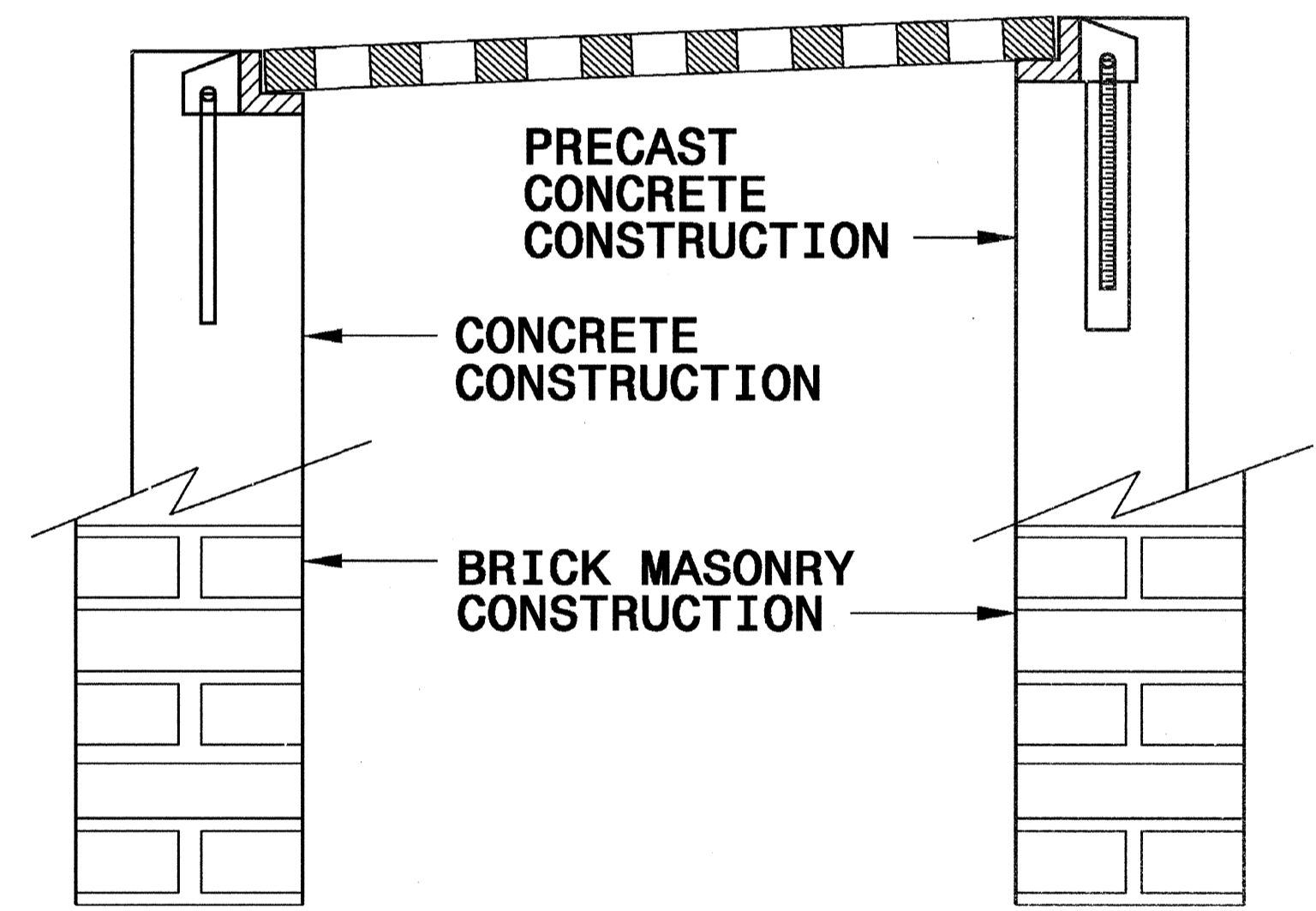
MASONRY ANCHOR
3/8" DIA. BOLT WITH PLATE



CONCRETE ANCHOR
3/8" DIA. BENT BAR



PRECAST CONCRETE ANCHOR
3/8" DIA. BENT BAR



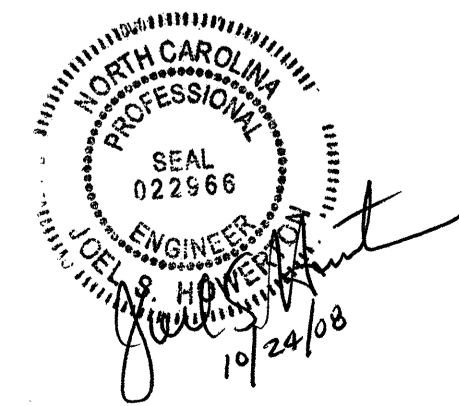
FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
ANCHORAGE FOR FRAMES
BRICK/CONCRETE/PRECAST CONCRETE

SHEET 1 OF 1
840D25

87-SEP-2006 08:59
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 enward

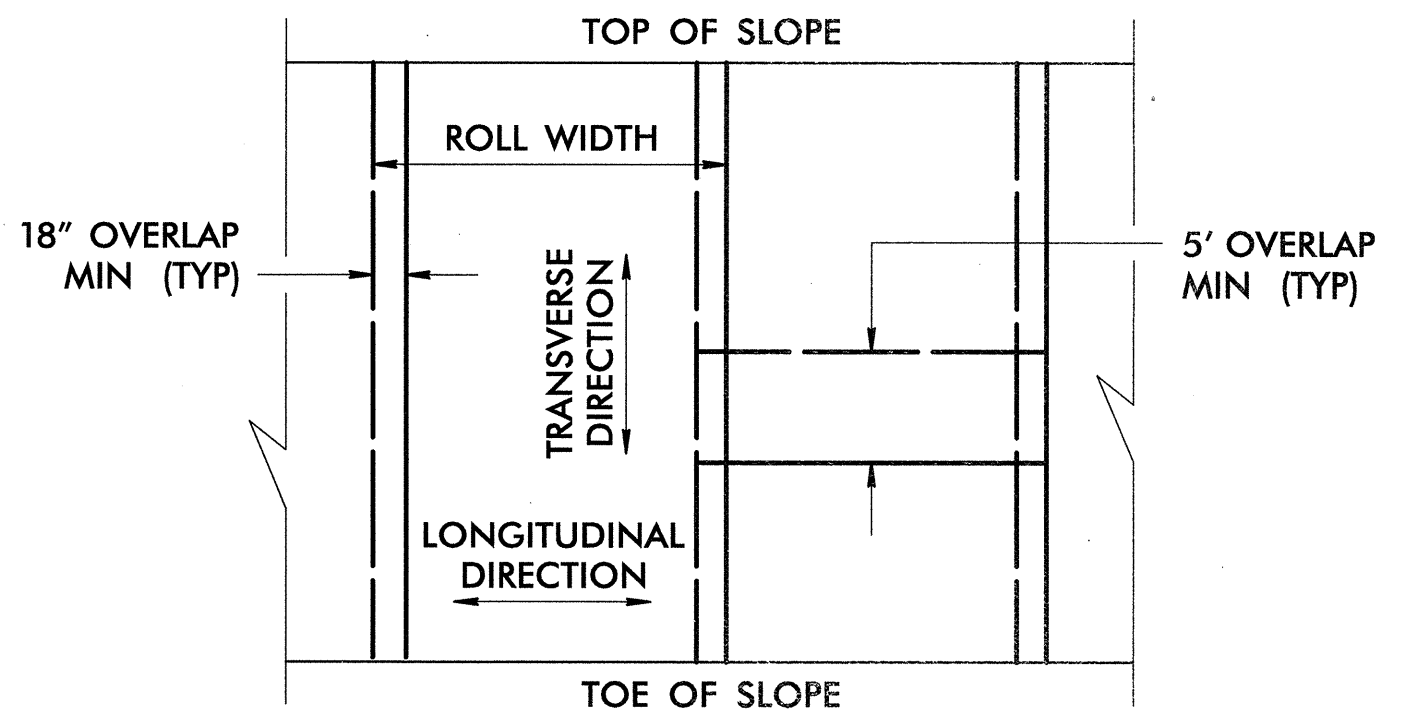
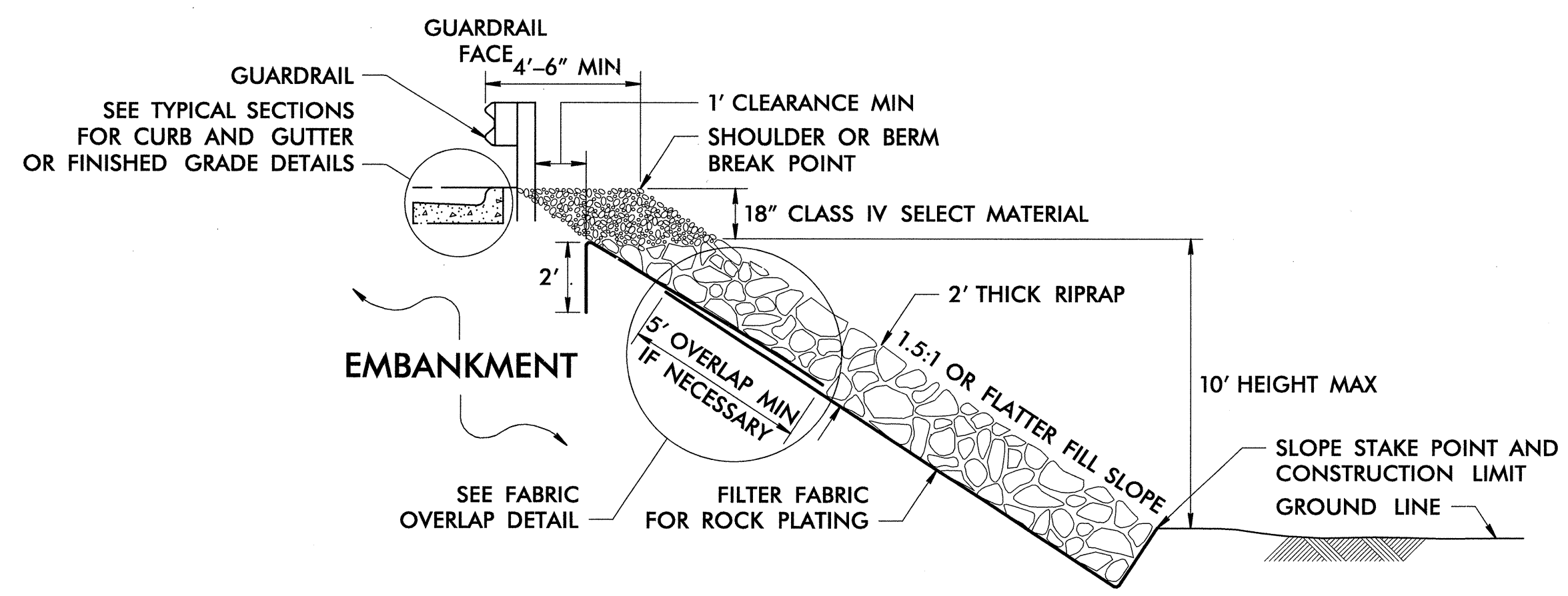


**PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN**
Office 919-250-4128 FAX 919-250-4119

SEE PLATE FOR TITLE

ORIGINAL BY: 2006 STD 840.25 DATE: 07/18/06
 MODIFIED BY: E.E. WARD DATE: 9/25/06
 CHECKED BY: DATE:
 FILE SPEC.:

FOR ROCK PLATING,
SEE ROCK PLATING SPECIAL PROVISION.



FABRIC OVERLAP DETAIL
(PLAN VIEW)

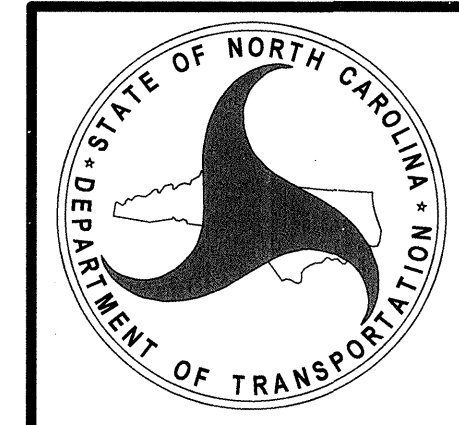
ROCK PLATING DETAIL NO. 1

USE ROCK PLATING DETAIL NO. 1
AT THE FOLLOWING LOCATIONS:
-L- STA 20+25 ± TO -L- STA 20+75 ± RT
EXTEND ROCK PLATING LIMITS TO 1.75:1 SLOPES.

5/14/99

10/17/2008 N:\proj\B-4592-r.dwg typ.dgn

ROCK PLATING DETAIL(S) AND LOCATION(S) WERE PROVIDED THROUGH A SEALED DOCUMENT FROM THE GEOTECHNICAL ENGINEERING UNIT. THE DOCUMENT WAS SUBMITTED TO THE ROADWAY DESIGN UNIT ON SEPTEMBER 23, 2008 AND SEALED BY A PROFESSIONAL ENGINEER, THEIR TUN ZAN, LICENSE #30943.



**GEOTECHNICAL
ENGINEERING UNIT**

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1802.01

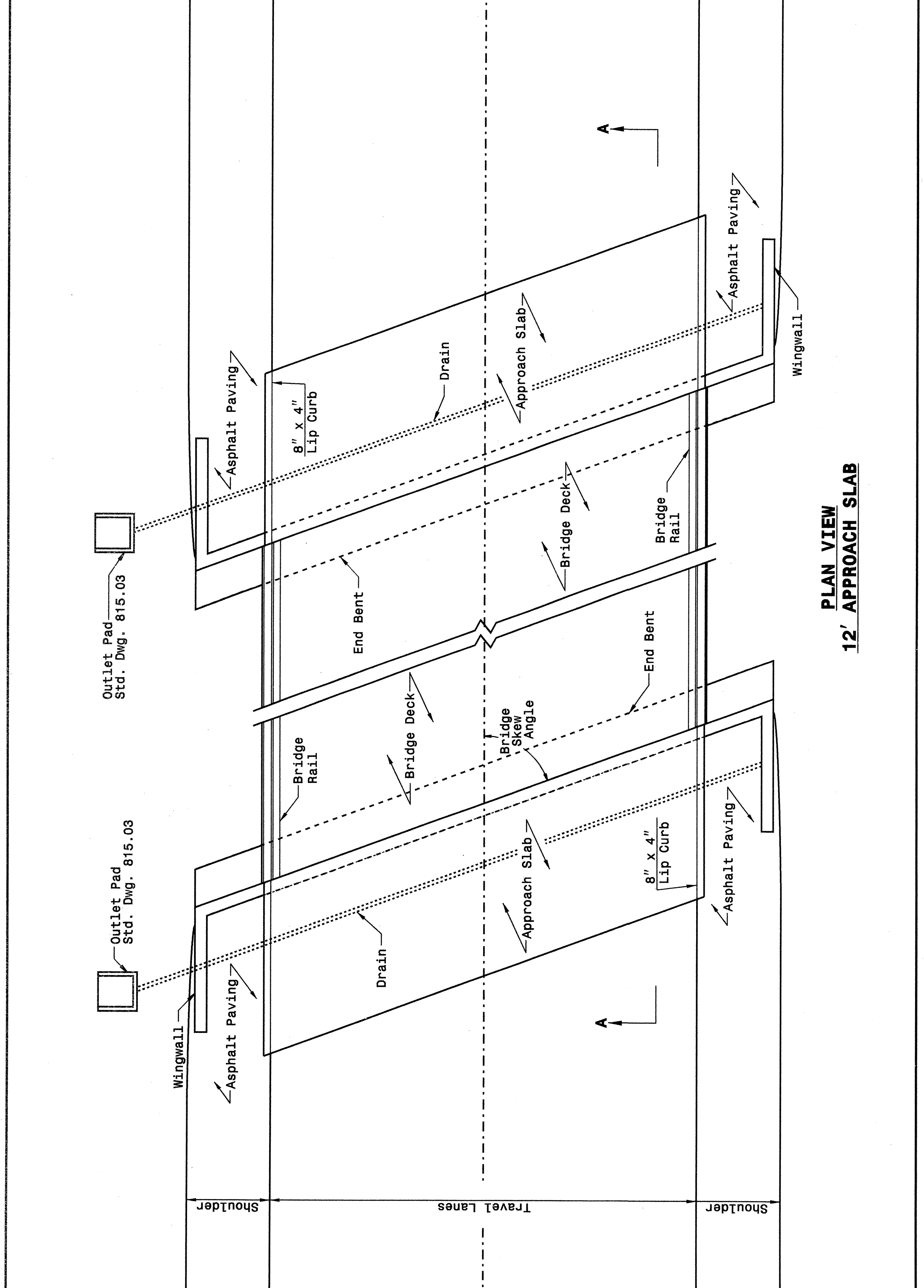
STANDARD
ROCK PLATING
DETAILS

DATE: 3-18-08

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
BRIDGE APPROACH FILLS
CORED SLAB & BOX BEAM BRIDGES
SUB REGIONAL TIER

SHEET 1 OF 2
422D11



STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

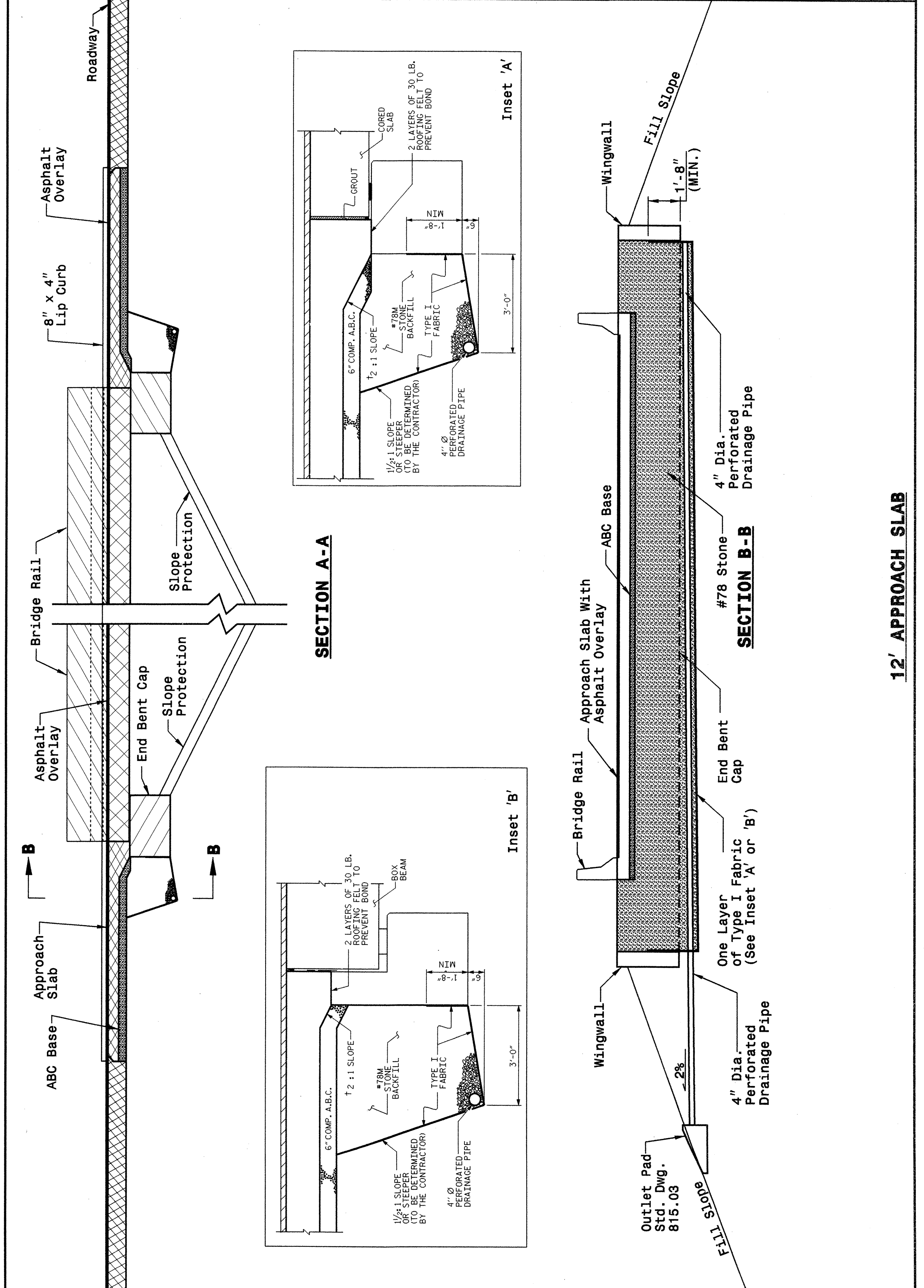
ENGLISH DETAIL DRAWING FOR
BRIDGE APPROACH FILLS
CORED SLAB & BOX BEAM BRIDGES
SUB REGIONAL TIER

SHEET 1 OF 2
422D11

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
BRIDGE APPROACH FILLS
CORED SLAB & BOX BEAM BRIDGES
SUB REGIONAL TIER

SHEET 2 OF 2
422D11



STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
BRIDGE APPROACH FILLS
CORED SLAB & BOX BEAM BRIDGES
SUB REGIONAL TIER

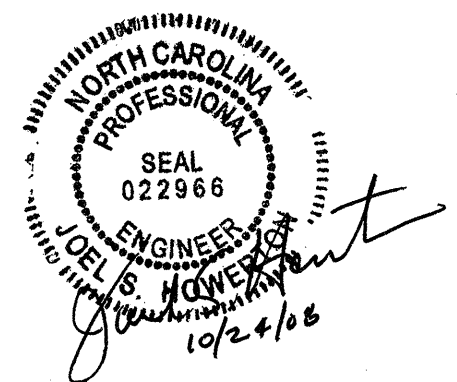
SHEET 2 OF 2
422D11

26 JUN-2008 15:32 ktempf\special_details\ktempf\english\bridge_approach_fill.dgn

PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

BRIDGE APPROACH FILLS
CORED SLAB & BOX BEAM BRIDGES
SUB REGIONAL TIER

ORIGINAL BY: K. A. Kempf DATE: 6-10-08
MODIFIED BY: DATE:
CHECKED BY: DATE: 4/27/09
FILE SPEC.: ktempf\english\bridge_approach_fill.dgn





STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

Table with columns: ItemNumber, Sec #, Quantity, Unit, Description. Includes items like MOBILIZATION, ROCK PLATING, BRIDGE APPROACH FILL, etc.

Table with columns: ItemNumber, Sec #, Quantity, Unit, Description. Includes items like ADDITIONAL GUARDRAIL POSTS, GUARDRAIL ANCHOR UNITS, RIP RAP, etc.

Table with columns: ItemNumber, Sec #, Quantity, Unit, Description. Includes items like MATTING FOR EROSION CONTROL, COIR FIBER MAT, 1/4" HARDWARE CLOTH, etc.

COMPUTED BY: JTJ DATE: 2/13/08
 CHECKED BY: PJJ DATE: 5/27/08



PROJECT REFERENCE NO. B-4592 SHEET NO. 3-B

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

GUARDRAIL SUMMARY

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
 TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
 FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
 W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
 G = GATING IMPACT ATTENUATOR TYPE 350
 NG = NON-GATING IMPACT ATTENUATOR TYPE 350

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS						IMPACT ATTENUATOR TYPE 350			REMARKS						
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GRAU 350	TYPE III	AT-1								EA	G	NG			
-L-	19+10.00	22+85.00	RT	375'			20+00	22+85	8'	11'																			BREAK FOR DRIVE	
-L-	21+97.50	22+85.00	LT	87.50'			22+85		8'	11'																				
-L-	24+85.00	26+60.00	RT	175'			24+85	25+50	8'	11'																				
-L-	24+85.00	26+97.50	LT	212.50'				24+85	8'	11'																				
LESS ANCHOR DEDUCTIONS																														
GRAU-350 4 @ 50' =				-200.00'																										
TYPE III 4 @ 18.75' =				-75.00'																										
TOTAL				575.00'																										
SAY				575.00'			(5 ADDITIONAL GUARDRAIL POSTS)																							

**SUMMARY OF EARTHWORK
 IN CUBIC YARDS**

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
-L-					
18+50 TO 22+85	932		1824	892	
24+85 TO 27+50	61		922	861	
SUBTOTAL	993		2746	1753	
TOTAL	993		2746	1753	
LOSS DUE TO CLEARING AND GRUBBING					
EST. SHOULDER MATERIAL					
WASTE TO REPLACE BORROW					
PROJECT TOTAL	993		2746	1753	
5% TO REPLACE BORROW				88	
GRAND TOTAL	993		2746	1841	
SAY	1050			1900	

**SUMMARY OF PAVEMENT REMOVAL
 IN SQUARE YARDS**

LOCATION	ASPHALT REMOVAL	ASPHALT BREAK UP	CONCRETE REMOVAL	CONCRETE BREAK UP
-L- 19+00 TO 20+50	333.33			
-L- 20+50 TO 22+95.05		544.56		
-L- 24+70.98 TO 25+50		175.60		
-L- 25+50 TO 27+00	333.33			
TOTAL	666.66	720.16		
SAY	675	725		

NOTE: Approximate quantities only. Unclassified excavation, Fine Grading, Clearing and Grubbing, Breaking of Existing Pavement and Removal of Existing Pavement will be paid for at the contract Lump Sum price for "Grading".

EST. DDE = 0 CY
 EST. UNDERCUT EXCAVATION = 450 CY
 EST. SELECT GRANULAR MATERIAL = 300 CY
 EST. FABRIC FOR SOIL STABILIZATION = 300 SY

NOTE: Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

5/28/09

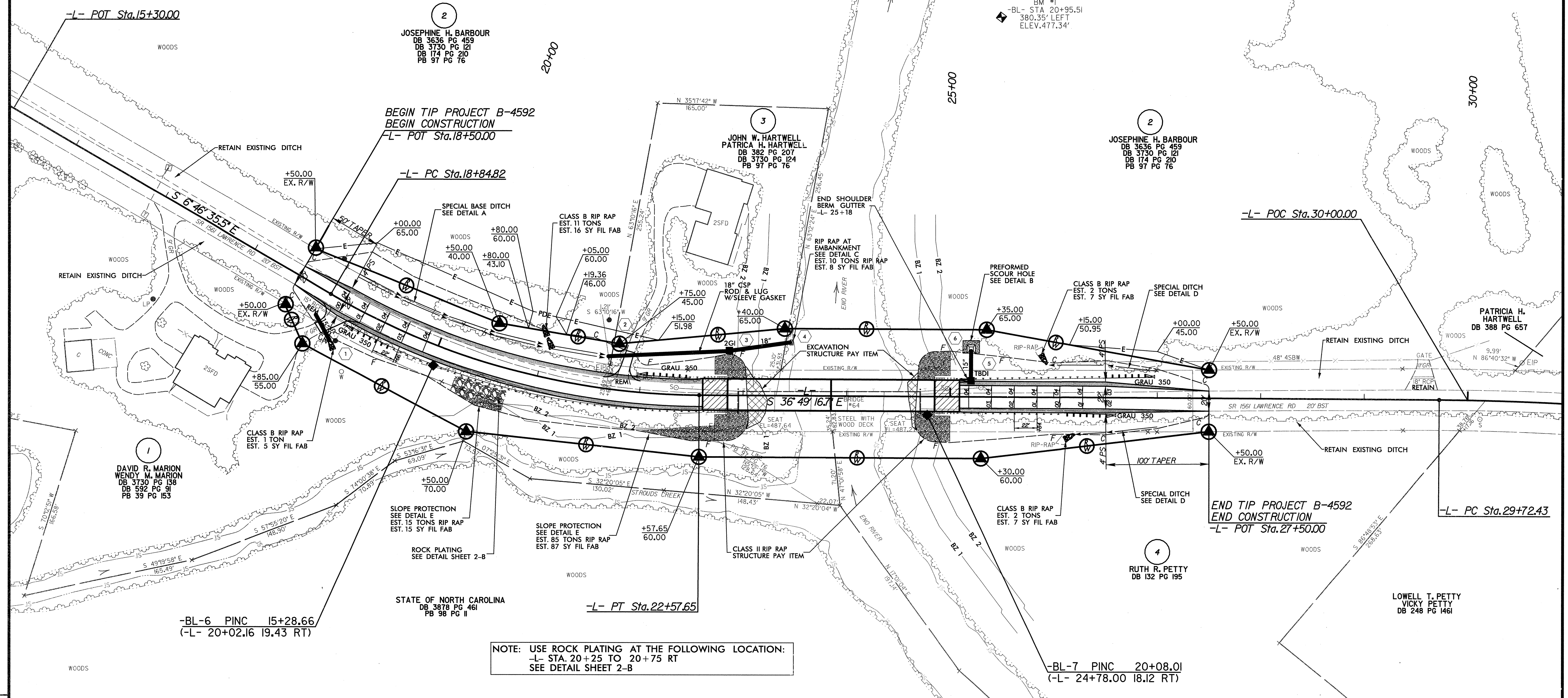
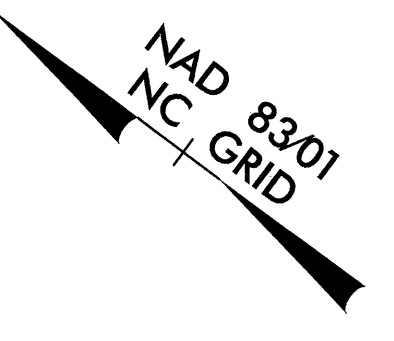
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B-17/99

PI Sta 20+75.63 Δ = 30°02'41.2" (LT) D = 8'03'30.5" L = 372.83' T = 190.81' R = 711.00' SE = 04 RO = 88' DS = 45 mph	PI Sta 30+47.14 Δ = 3°17'30.4" (RT) D = 2'12'13.3" L = 149.38' T = 74.71' R = 2,600.00' SE = 04 RO = 88' DS = 45 mph	PI Sta 32+81.63 Δ = 15°57'34.8" (RT) D = 5'14'48.7" L = 304.18' T = 153.08' R = 1,092.00' SE = 04 RO = 88' DS = 45 mph
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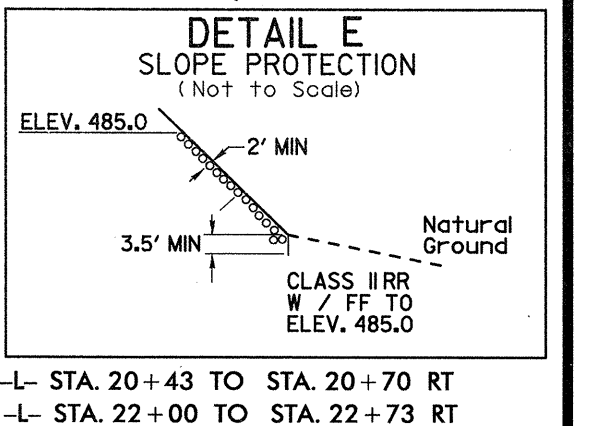
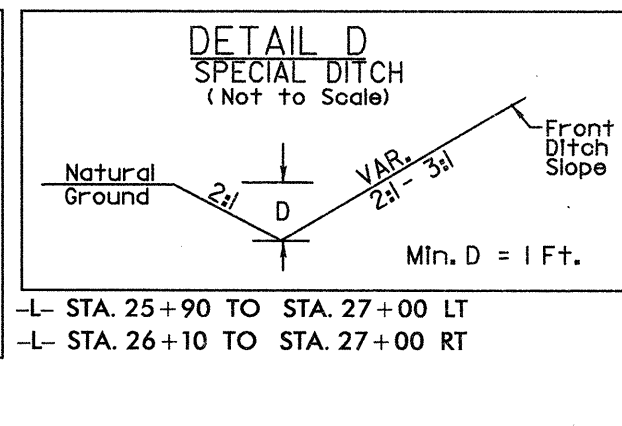
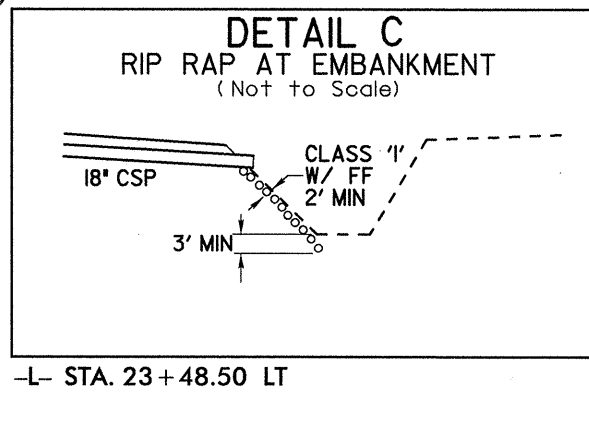
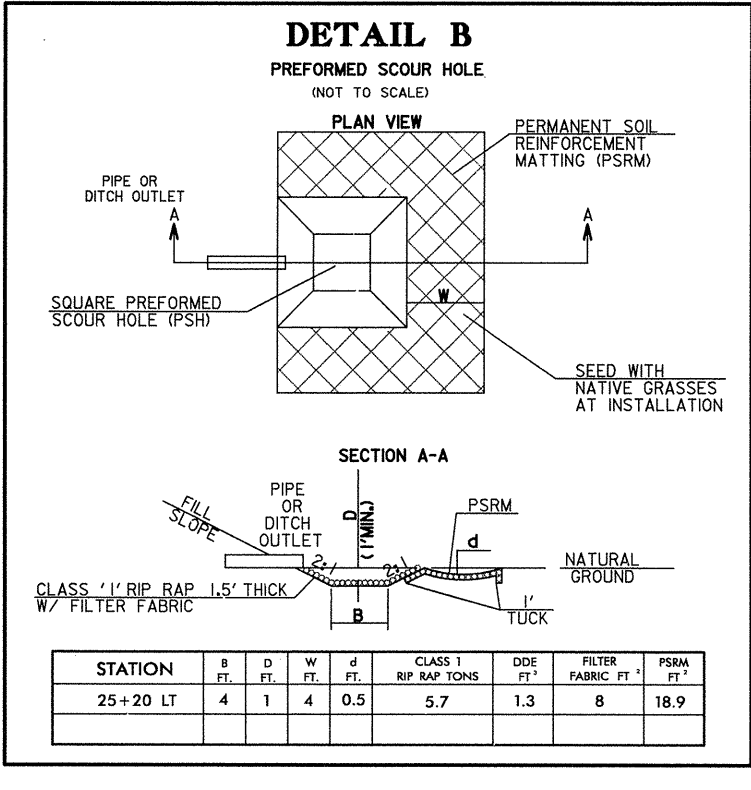
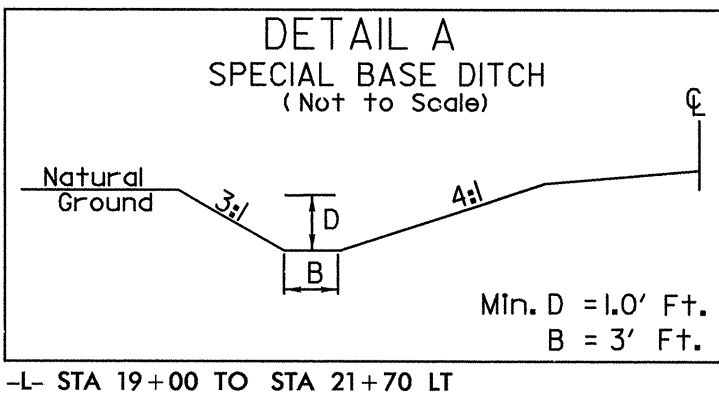
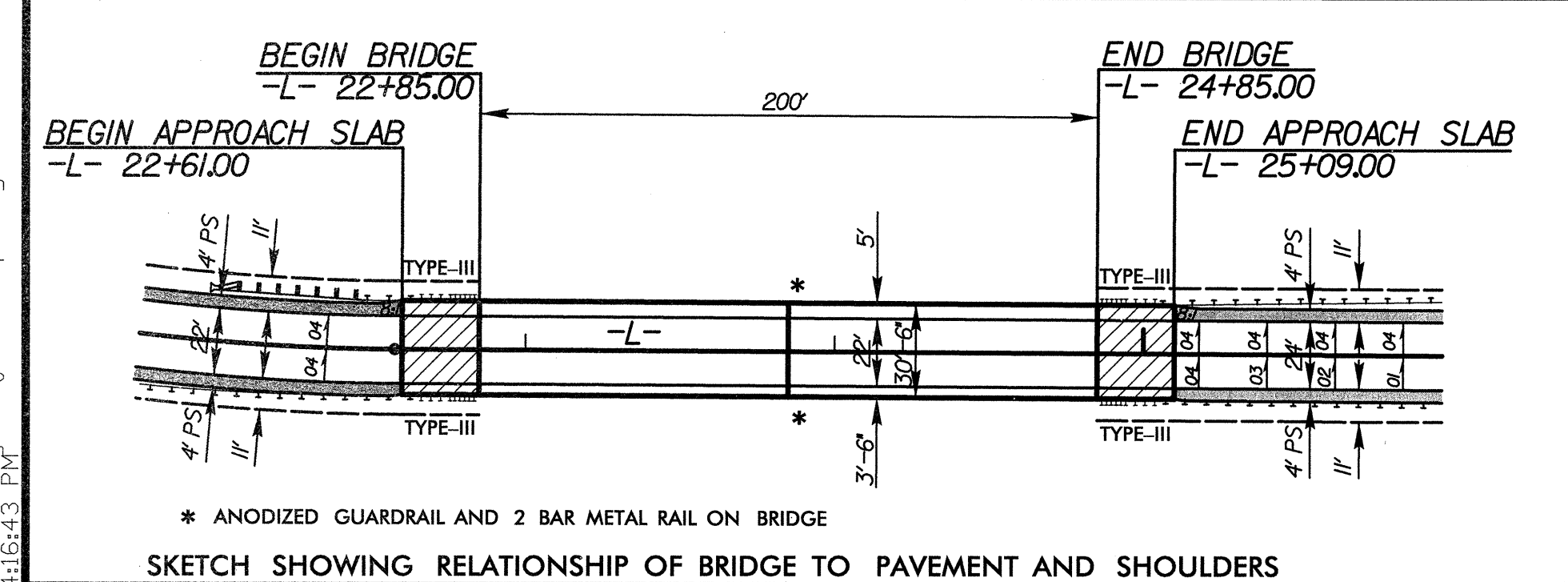


PROJECT REFERENCE NO. B-4592	SHEET NO. 4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DAVID R. MARION WENDY M. MARION DB 3730 PG 138 DB 592 PG 91 PB 39 PG 153	JOSEPHINE H. BARBOUR DB 3636 PG 459 DB 3730 PG 121 DB 174 PG 210 PB 97 PG 76
FOR -L- PROFILE SEE SHEET 5	



NOTE: USE ROCK PLATING AT THE FOLLOWING LOCATION:
-L- STA. 20+25 TO 20+75 RT
SEE DETAIL SHEET 2-B

FOR STRUCTURE PLANS SEE SHEETS S-1 THRU S-24



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BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 8350 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 483.6 FT
BASE DISCHARGE	= 11,400 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 485.6 FT
OVERTOPPING DISCHARGE	= 21,300 CFS
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING ELEVATION	= 491.2 FT
W.S. ELEVATION AT DATE OF SURVEY	= 470.5 FT
DATE OF SURVEY	= 4/20/06

-BL-6
EL = 497.50

-BL-7
EL = 488.98

BM-#1
RAILROAD SPIKE IN 15' OAK TREE
-L- STA 25+47.36 365.95' LEFT
EL = 477.34'

MULKEY ENGINEERS & CONSULTANTS
PO BOX 32127
 RALEIGH, N.C. 27636
 (919) 871-1212 (FAX)
 WWW.MULKEYINC.COM

PROJECT REFERENCE NO.	B-4592	SHEET NO.	5
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	

-L-

FOR -L- PLAN VIEW SEE SHEET 4

-BL-8
EL = 501.11

