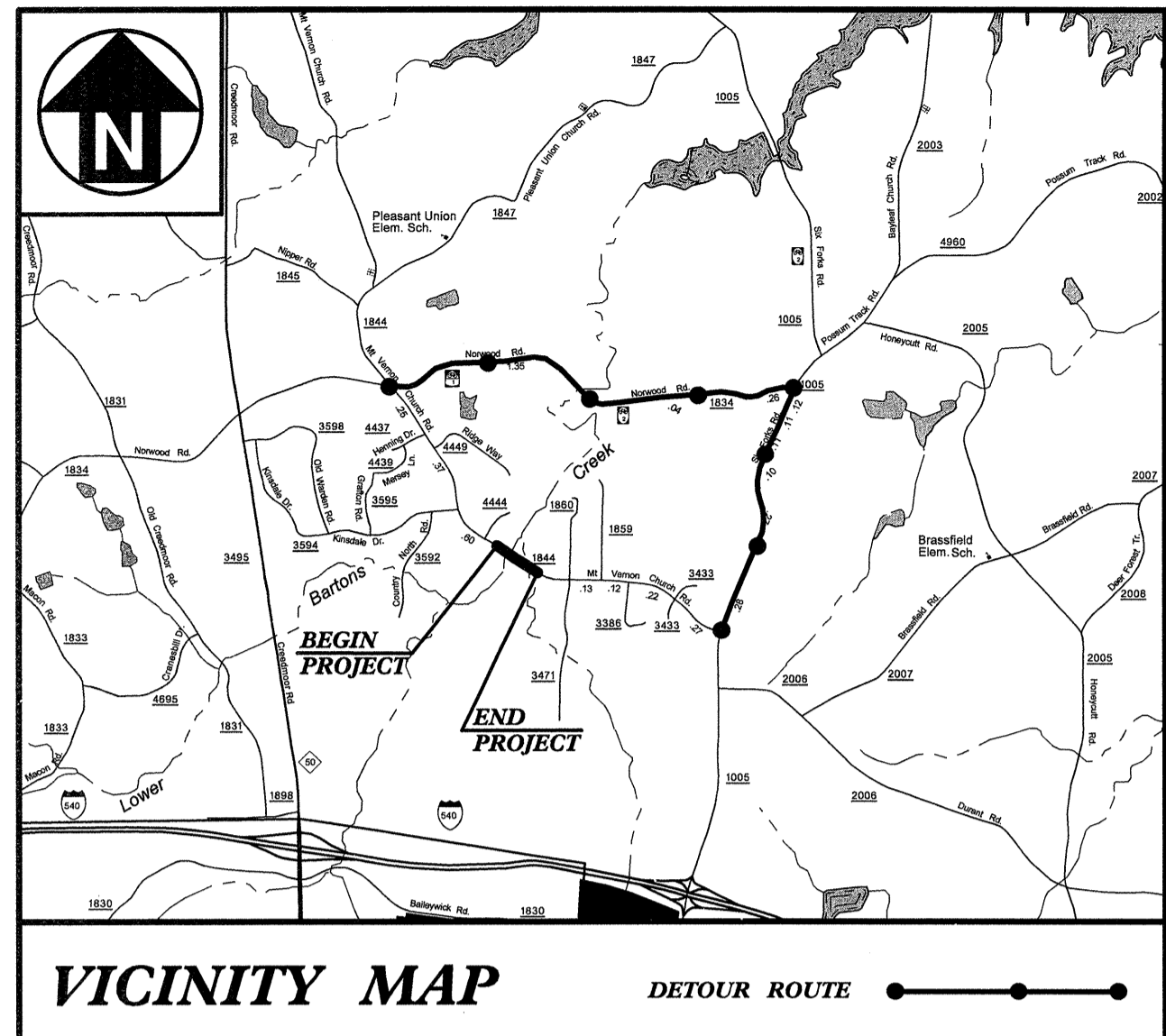


09/08/09

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



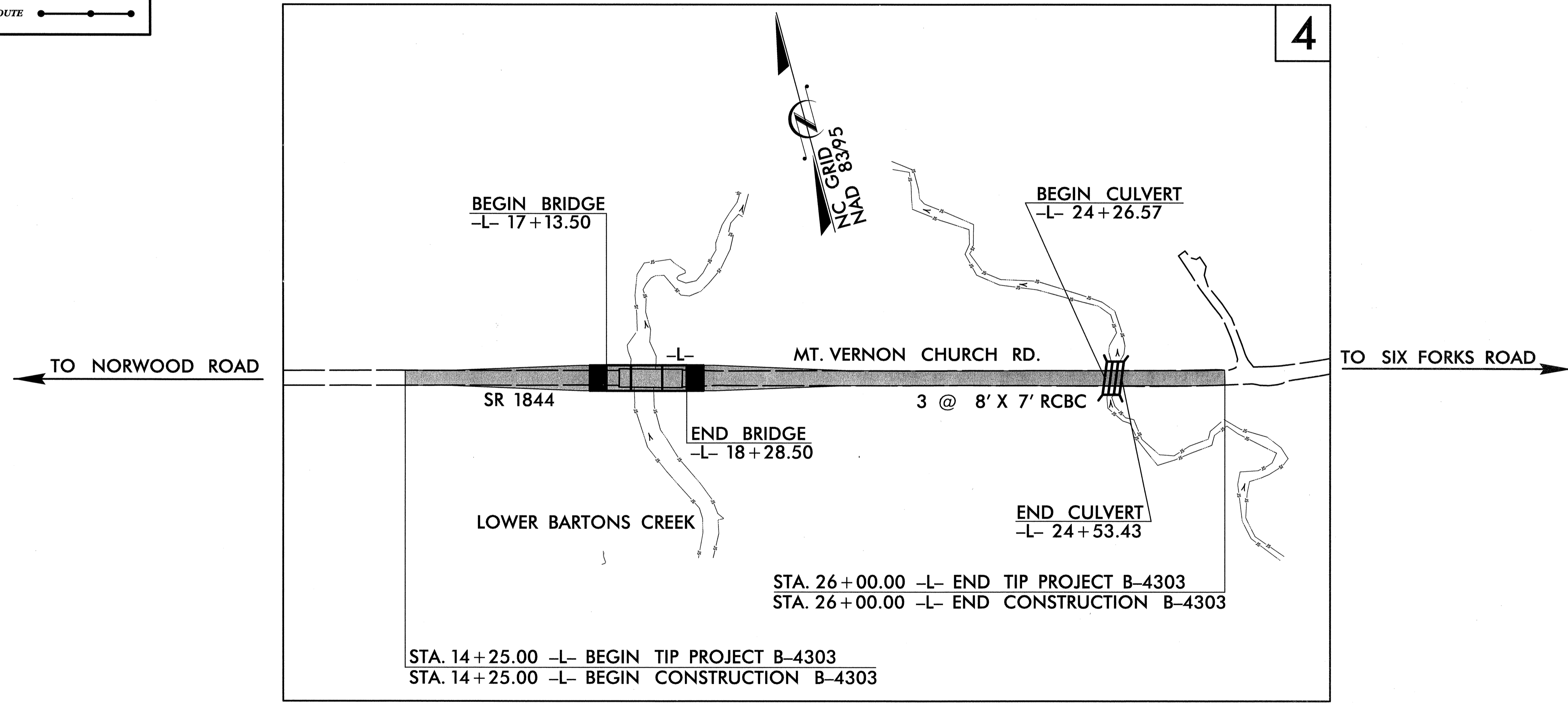
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4303	1	
WAS ELEMENT	F.A. PROJ. NO.	DESCRIPTION	
33640.1.1	BRZ-1844(1)	PE	
33640.2.1	BRZ-1844(1)	RW, UTL	
33640.3.1	BRZ-1844(1)	CONST.	

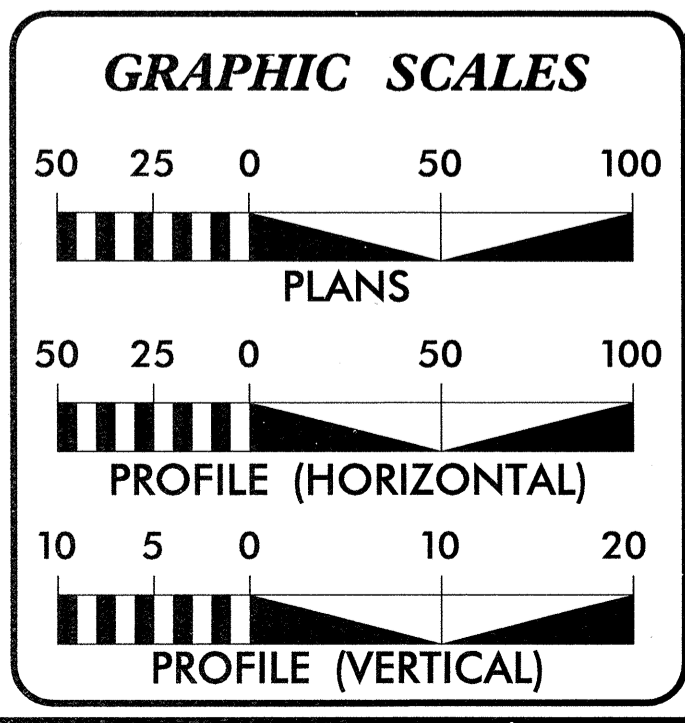
LOCATION: BRIDGE NO.102 OVER LOWER BARTONS CREEK ON SR 1844
TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURE AND CULVERT

TIP PROJECT: B-4303

CONTRACT: C202031



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(919) 851-1918 (FAX)
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DESIGN DATA

ADT 2008 = 6,800
ADT 2030 = 11,800
DHV = 12 %
D = 55 %
T = 3 %*
V = 50 MPH

* TTST 1% DUAL 2%
** Design Exception -
Lane Width
Func. Classification -
Rural Local

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4303 = .196 MILES
LENGTH STRUCTURE TIP PROJECT B-4303 = .027 MILES
TOTAL LENGTH TIP PROJECT B-4303 = .223 MILES

Prepared In the Office of:
MULKEY
ENGINEERS & CONSULTANTS
FOR THE NORTH CAROLINA DEPT. OF TRANSPORTATION
2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
DECEMBER 21, 2007

LETTING DATE:
DECEMBER 16, 2008

TIM JORDAN, PE
ROADWAY PROJECT ENGINEER

JEFF RECK, PE
HYDRAULIC PROJECT ENGINEER

DOUG TAYLOR, PE
NCDOT ROADWAY DESIGN PROJECT ENGINEER

HYDRAULIC ENGINEER

SEAL 028896
SHERREY L. RECK
9-15-09
SIGNATURE: 9/15/09

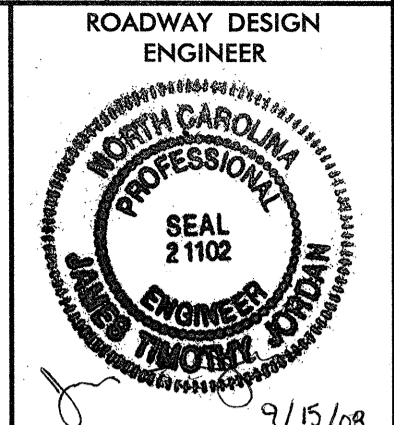
ROADWAY DESIGN

SEAL 21102
TIMOTHY J. JORDAN
9/15/08
SIGNATURE: 9/15/08

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER

9/12/2008
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Sheet #	Description	2006 ROADWAY ENGLISH STANDARD DRAWINGS	EFF. 07-18-06 REV. 01-02-07
1	Title Sheet	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:	
1-A	Index of Sheets, General Notes, & List of Standards		
1-B	Conventional Symbols		
1-C	Survey Control Sheet	STD.NO.	TITLE
2	Pavement Schedule, Wedging Detail & Typical Sections	DIVISION 2 - EARTHWORK	
2-A	Typical Sections	200.03	Method of Clearing - Method III
2-B thru 2-C	Detail of Guardrail Buried in Cut	225.02	Guide for Grading Subgrade - Secondary and Local
		225.04	Method of Obtaining Superelevation - Two Lane Pavement
2-D	Detail of Anchorage for Frames	DIVISION 3 - PIPE CULVERTS	
2-E	Rock Plating Detail	300.01	Method of Pipe Installation - Method 'A'
		310.10	Driveway Pipe Construction
3	Summary of Quantities	DIVISION 4 - MAJOR STRUCTURES	
3-A	List of Pipe, Endwalls, Etc. (For Pipe 48" & Under) & Guardrail Summary	422.10	Reinforce Bridge Approach Fills
3-B	Summary of Earthwork & Summary of Pavement Removal	DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
4	Plan	560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
5	Profile	DIVISION 8 - INCIDENTALS	
TCP-1 thru TCP-3	Traffic Control Plans	806.01	Concrete Right-of-Way Marker
SD1	Sign Designs	806.02	Granite Right-of-Way Marker
		840.29	Frames and Narrow Slot Flat Grates
EC-1 thru EC-5	Erosion Control Plans	840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame And Grates
		840.46	Traffic Bearing Precast Drainage Structure
RF-1	Refrestation Detail Sheet	840.66	Drainage Structure Steps
		846.01	Concrete Curb, Gutter and Curb & Gutter
SIGN-1 thru SIGN-3	Signing Plans	846.04	Drop Inlet Installation in Shoulder Berm Gutter
		862.01	Guardrail Placement
UO-1 thru UO-2	Utilities by Others Plans	862.02	Guardrail Installation
		862.03	Structure Anchor Units
X-1	Cross Section Summary Sheet	876.01	Rip Rap in Channels
X-2 thru X-7	Cross-Sections	876.04	Drainage Ditches with Class 'B' Rip Rap
C-1 thru C-5	Culvert Plans		
S-1 thru S-29	Structure Plans		

General Notes:

Grading and Surfacing or Resurfacing and Widening:
The grade lines shown denote the finished elevation of the proposed surfacing at grade points shown on the typical sections. Where no grade lines are shown, the profiles shown denote the top elevation of the existing pavement along the center line of survey on which the proposed resurfacing will be placed. Grade lines may be adjusted by the engineer in order to secure a proper tie-in.

Clearing:
Clearing on this project shall be performed to the limits established by Method III.

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.

Shoulder Construction:
Asphalt, earth, and concrete shoulder construction on the high side of superelevated curves shall be in accordance with Std. no. 560.01.

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.

Temporary Shoring:
Shoring required for the maintenance of traffic will be paid for as "Extra Work" in accordance with section 104-7.

Subsurface Plans:
No subsurface plans are available on this project. The contractor should make his own investigation as to the subsurface conditions.

End Bents:
The engineer shall check the structure end bent plans, details, and cross-section prior to setting of the slope stakes for the embankment or excavation approaching a bridge.

Utilities:
Utility owners on this project are Progress Energy, Public Service Company of NC, City of Raleigh, AT&T, Time Warner and MCI.
Any relocation of existing utilities will be accomplished by others.

Right-of-Way Markers:
All right-of-way markers on this project shall be placed by contract.

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

State Line	_____
County Line	_____
Township Line	_____
City Line	_____
Reservation Line	_____
Property Line	_____
Existing Iron Pin	○ EIP
Property Corner	_____
Property Monument	□ ECM
Parcel/Sequence Number	⑩ 23
Existing Fence Line	—x—x—x—
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	--- WLB
Proposed Wetland Boundary	--- WLB
Existing Endangered Animal Boundary	--- EAB
Existing Endangered Plant Boundary	--- EPB

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○ S
Well	○ W
Small Mine	⋈
Foundation	▭
Area Outline	▭
Cemetery	▭
Building	▭
School	▭
Church	▭
Dam	▭

HYDROLOGY:

Stream or Body of Water	_____
Hydro, Pool or Reservoir	▭
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	○ MILEPOST 35
Switch	□ SWITCH
RR Abandoned	_____
RR Dismantled	_____

RIGHT OF WAY:

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	_____
Proposed Right of Way Line	_____
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	— E
Proposed Temporary Construction Easement	— E
Proposed Temporary Drainage Easement	— TDE
Proposed Permanent Drainage Easement	— PDE
Proposed Permanent Utility Easement	— PUE

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	_____
Existing Curb	_____
Proposed Slope Stakes Cut	--- C
Proposed Slope Stakes Fill	--- F
Proposed Wheel Chair Ramp	○ WCR
Proposed Wheel Chair Ramp Curb Cut	○ WCC
Curb Cut for Future Wheel Chair Ramp	○ CCFR
Existing Metal Guardrail	— T
Proposed Guardrail	— T
Existing Cable Guiderail	— T
Proposed Cable Guiderail	— T
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	⊕
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	⊕
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	—
Designated U/G Water Line (S.U.E.*)	---
Above Ground Water Line	— A/G Water

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

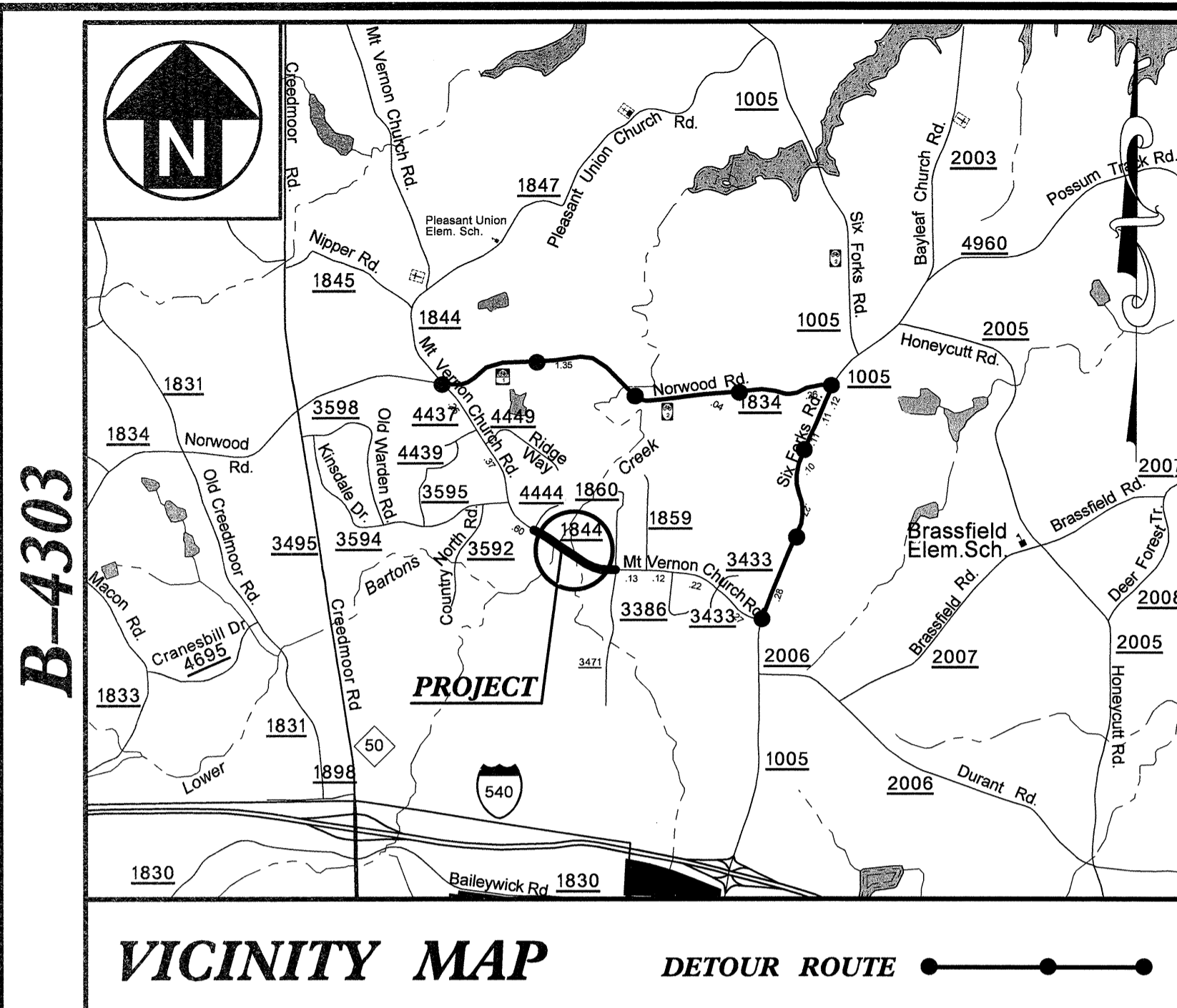
Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊕
Utility Unknown U/G Line	— UTIL
U/G Tank; Water, Gas, Oil	▭
A/G Tank; Water, Gas, Oil	▭
U/G Test Hole (S.U.E.*)	⊕
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

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SURVEY CONTROL SHEET B-4303

WAKE COUNTY

**LOCATION: BRIDGE NO. 102 OVER LOWER BARTONS CREEK
AND APPROACHES ON SR 1844 (MT. VERNON CHURCH ROAD)**



VICINITY MAP

DETOUR ROUTE

NCDOT GPS STATION B4303-2
LOCALIZED PROJECT COORDINATES

N=797006.4101
E=2097509.3445

NCDOT GPS STATION B4303-1
LOCALIZED PROJECT COORDINATES

N=796449.9392
E=2097826.9001

BL-101

TO NORWOOD ROAD

BY-200

BL-102

BY-201

BL-103

BM 51

SR 1844 MT. VERNON CHURCH RD.

-L-

BM 52

BL-104

BM 53

BL-105

TO SIX FORKS ROAD

STA. 14+25.00 -L- BEGIN TIP PROJECT B-4303

STA. 26+00.00 -L- END TIP PROJECT B-4303

CONTROL DATA

BASELINE

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
101	BL-101	795461.3195	2098070.4829	351.61	OUTSIDE PROJECT LIMITS	
102	BL-102	795116.4101	2098492.9934	309.66	11+14.90	31.54 RT
103	BL-103	794802.5813	2099016.6189	288.87	17+24.94	13.96 RT
104	BL-104	794321.0889	2099757.8964	293.26	26+07.96	21.41 RT
105	BL-105	794182.8628	2100442.2502	337.76	33+04.60	24.66 RT

BY

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
200	BY-200	795241.4251	2098577.6470	315.82	11+18.13	119.41 LT
102	BL-102	795116.4101	2098492.9934	309.66	11+14.90	31.54 RT
201	BY-201	794932.3978	2098463.4276	309.22	11+88.88	202.42 RT

BENCHMARK DATA

51	ELEVATION = 284.36	53	ELEVATION = 338.68
N 794794	E 2098956	N 794270	E 2100413
L STATION 16+79 54 RIGHT		L STATION 32+73 62 LEFT	
RR SPIKE IN 11 INCH TWIN SWEET GUM		RR SPIKE IN 17 INCH PINE	
52	ELEVATION = 289.00		
N 794372	E 2099629		
L STATION 24+73 47 RIGHT			
RR SPIKE IN 18 INCH POPLAR			

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4303-1" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 796449.9392(ft) EASTING: 2097826.9001(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99993133 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4303-1" TO -L- STATION 14+25.00 IS S 32°38'54.9" E 1750.72' ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

NOTES:

THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCTHIGHWAYLOCATIONPROJECT/B4303_ls_control_070525.txt](http://www.doh.dot.state.nc.us/preconstructhighwaylocationproject/B4303_ls_control_070525.txt)

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

NOTE: DRAWING NOT TO SCALE

6/2/09 B-4303 8/17/2008 c:\surveys\B4303_1s_1c_070525.dgn

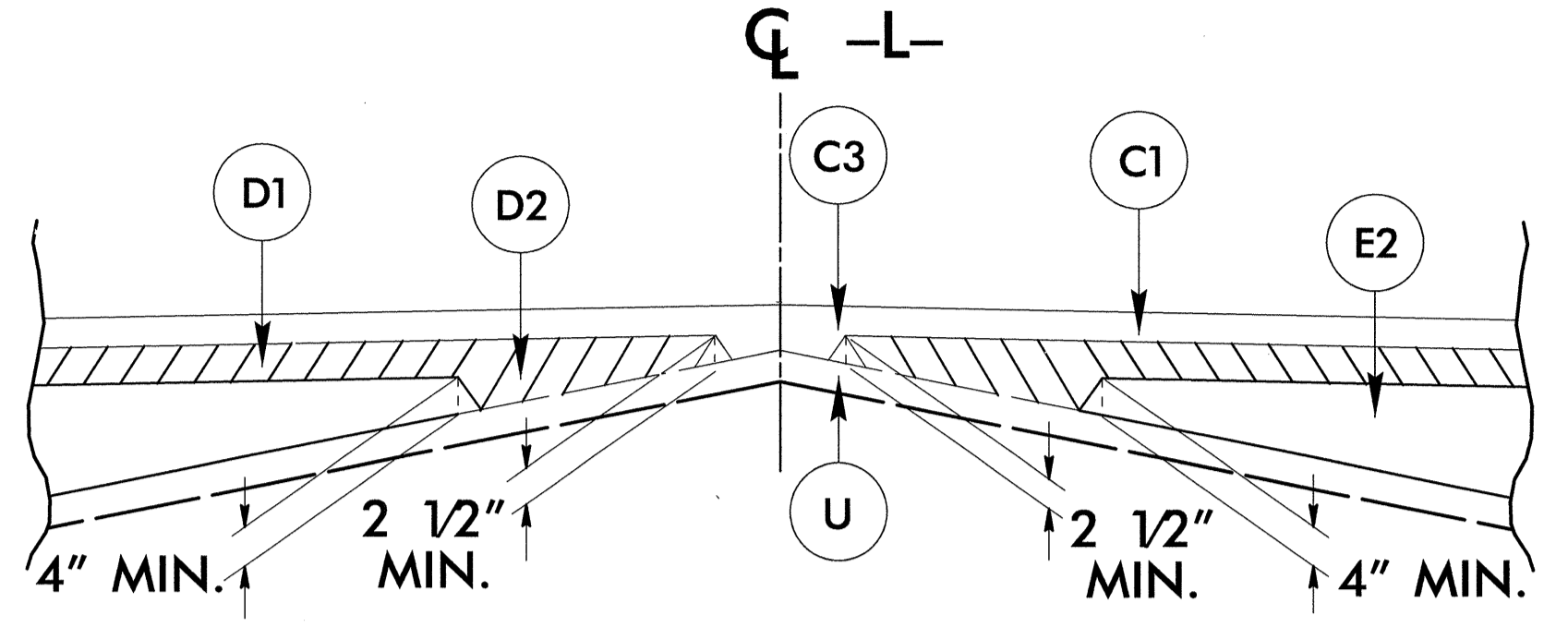
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RALEIGH, N.C. 27636
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(919) 851-1012 FAX
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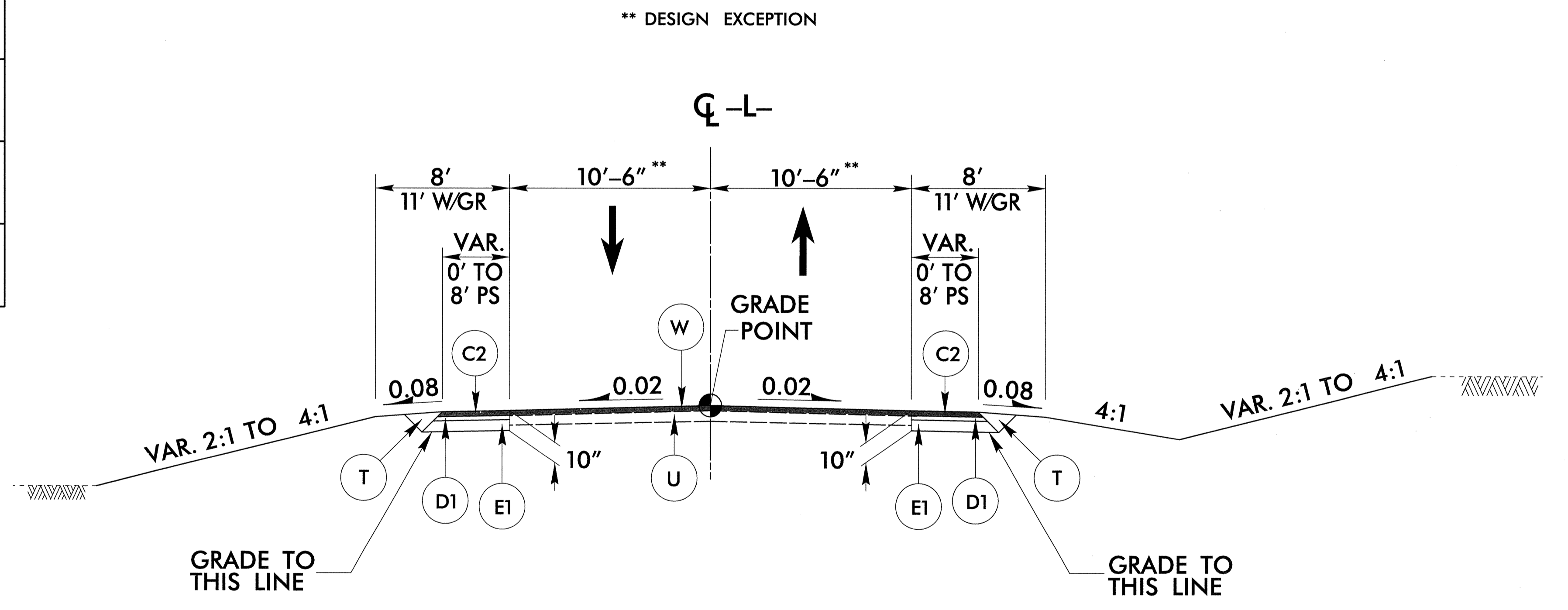
PROJECT REFERENCE NO. B-4303	SHEET NO. 2
RW SHEET NO.	
PAVEMENT DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22896 CLARK S. MORRISON 9/15/08	ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21102 TIMOTHY D. DUNN 9/15/08

PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
A	CONCRETE WEARING SURFACE (STRUCTURE PAY ITEM)
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1½" IN DEPTH OR GREATER THAN 2" IN DEPTH.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
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.
E1	PROP. APPROX. 4½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 4" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL)

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



DETAIL SHOWING METHOD OF WEDGING
USE IN CONJUNCTION WITH TYPICAL SECTION NO. 1



TYPICAL SECTION NO. 1

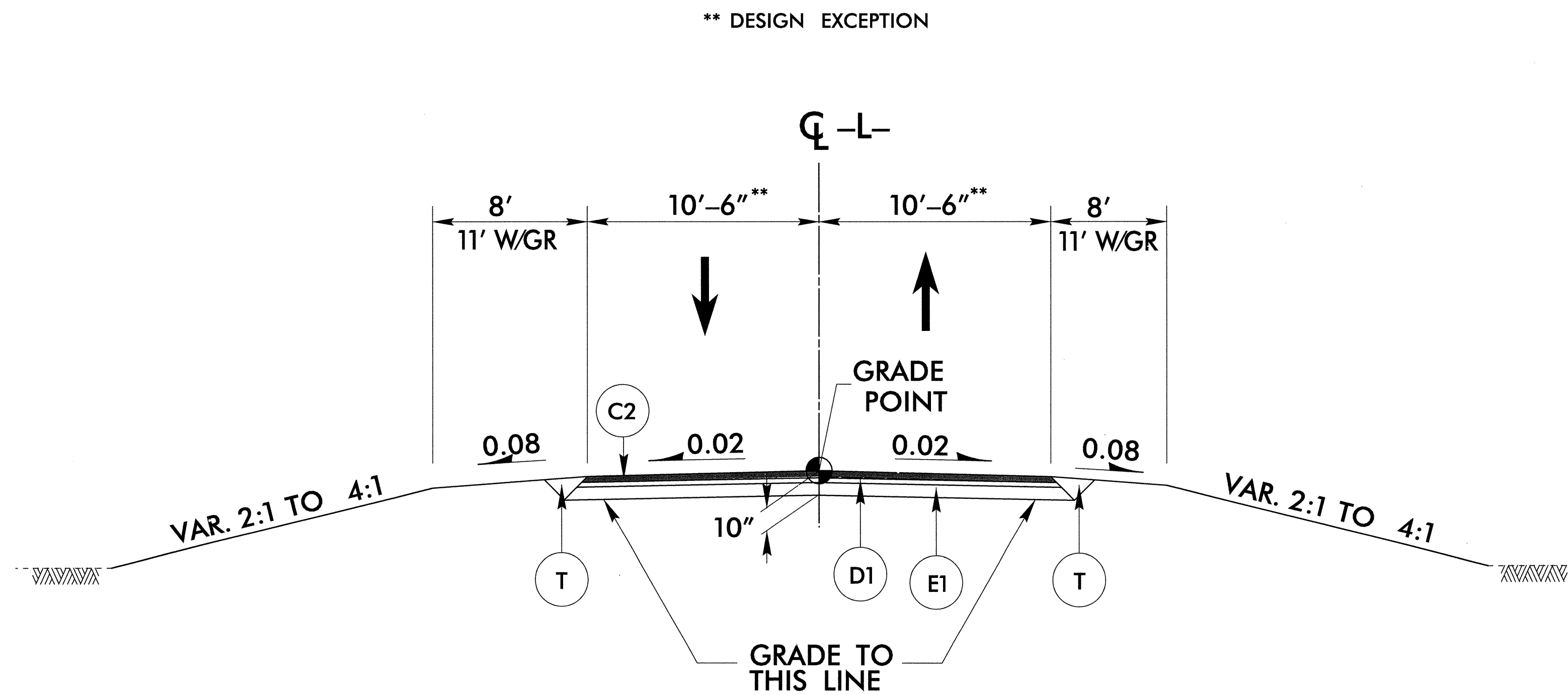
- USE TYPICAL SECTION NO. 1 AT THE FOLLOWING LOCATIONS
- TRANSITION FROM EXISTING TO T.S. NO. 1 FROM
 - L- STA. 14+25.00 TO STA. 14+75.00
 - L- STA. 14+75.00 TO STA. 17+13.50 (BEGIN BRIDGE)
 - L- STA. 18+28.50 (END BRIDGE) TO STA. 21+00.00
 - L- STA. 23+50.00 TO STA. 24+05.00
 - L- STA. 24+75.00 TO STA. 25+50.00
 - TRANSITION FROM T.S. NO. 1 TO EXISTING
 - L- STA. 25+50.00 TO STA. 26+00.00
 - OVERLAY WITH C1 FROM
 - L- STA. 21+00.00 TO STA. 23+50.00

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RALEIGH, N.C. 27636
919 851-1912
919 851-1912 (FAX)
WWW.MULKEY.EDM

PROJECT REFERENCE NO. B-4303	SHEET NO. 2-A
RW SHEET NO.	
PAVEMENT DESIGN ENGINEER CLARK S. MORRISON SEAL 22886 1/17/08	ROADWAY DESIGN ENGINEER SEAL 21102 9/15/08

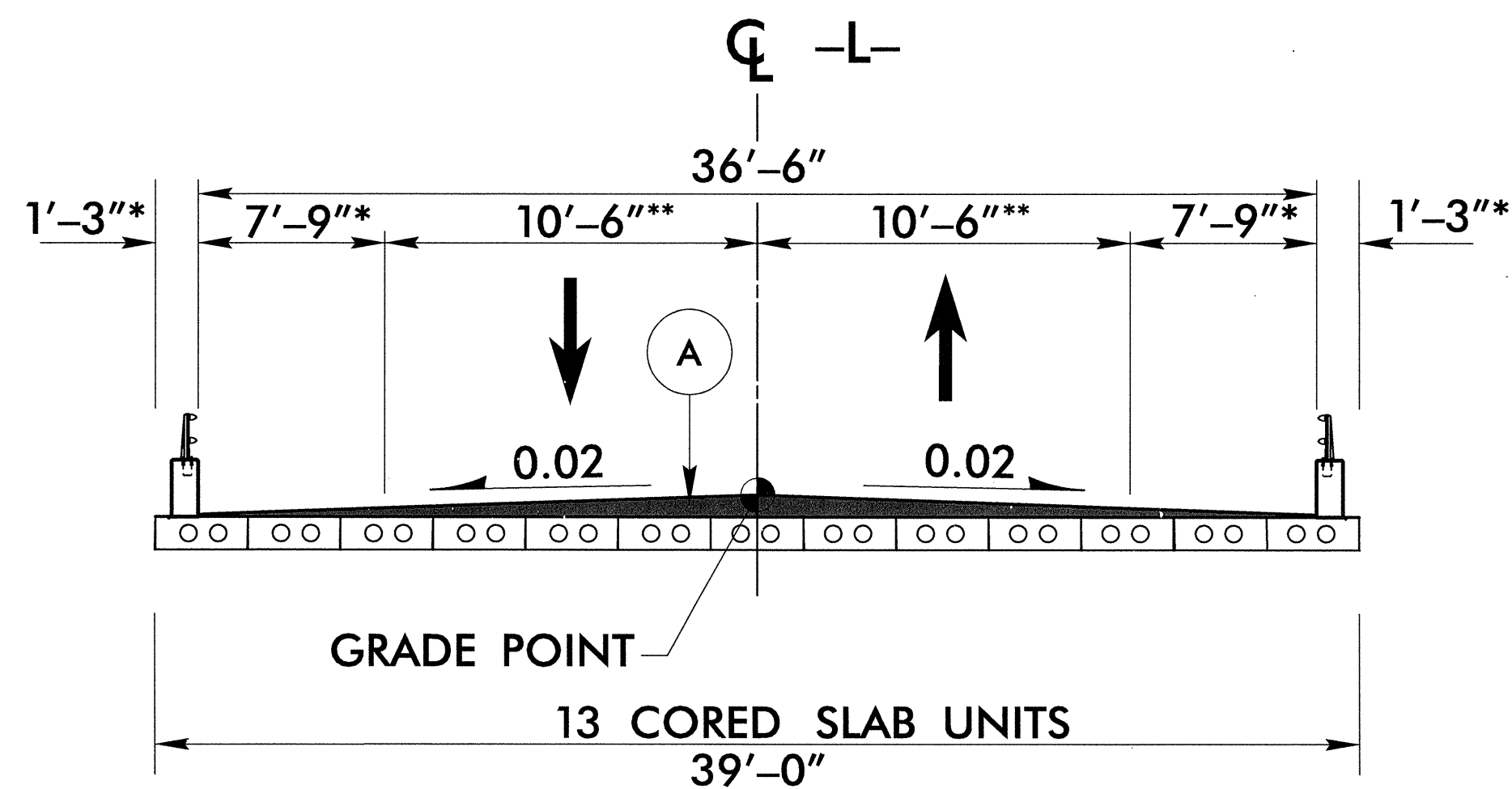


TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2
AT THE FOLLOWING LOCATIONS

-L- STA. 24+05.00 TO STA. 24+75.00

NOTE: SAW CUT AT -L- STA. 24+05.00 AND -L- STA. 24+75.00 FOR PAVEMENT REMOVAL



DETAIL OF BRIDGE

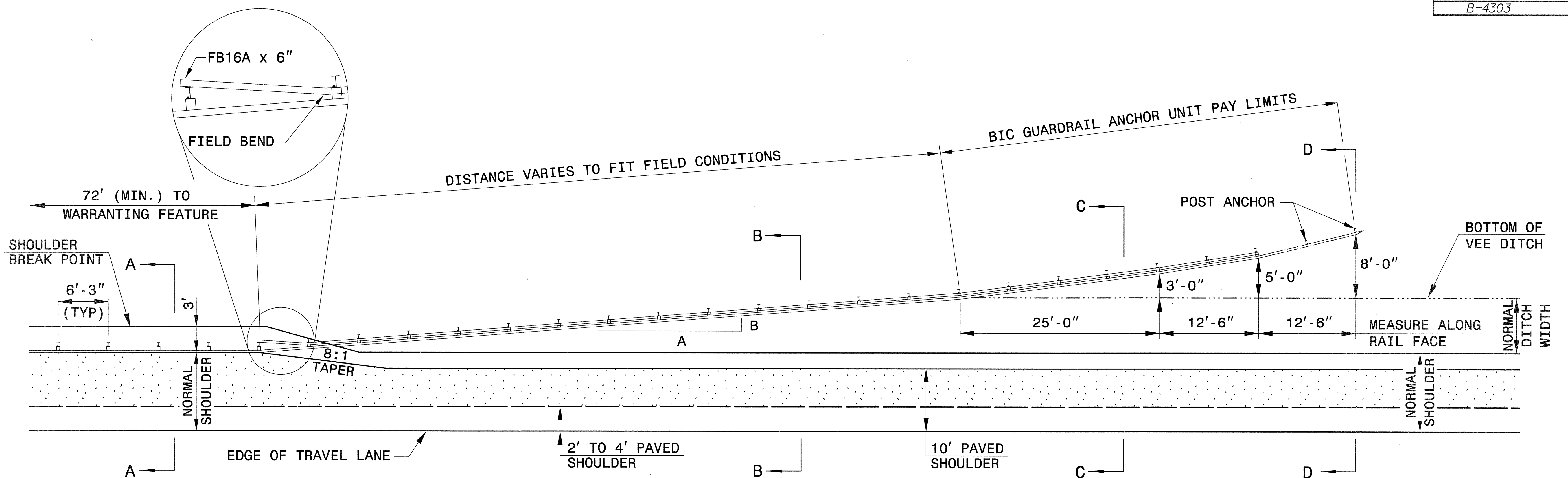
-L- STA 17+13.50 TO STA 18+28.50

SEE STRUCTURE PLANS FOR CONCRETE OVERLAY

* BRIDGE WIDENED FOR HYDRAULIC SPREAD
& FUTURE 12' LANES

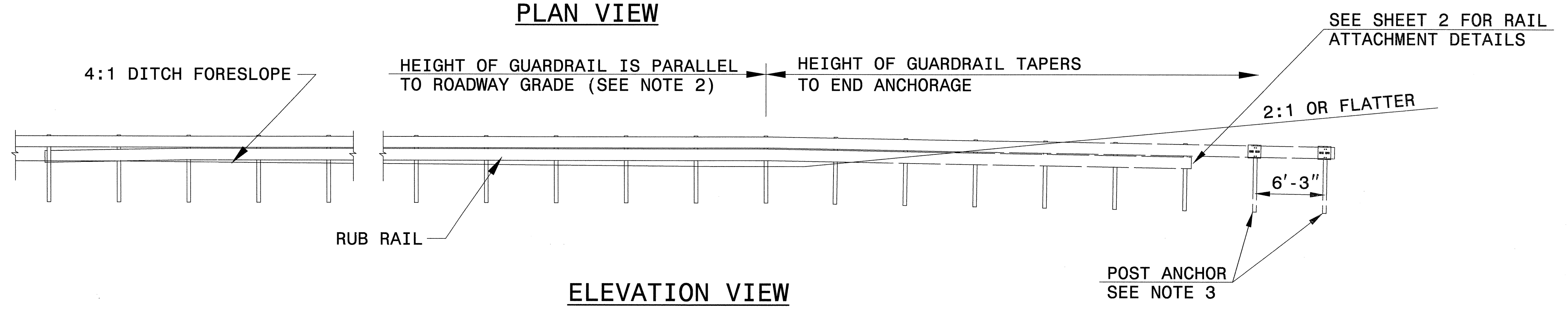
PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
A	CONC. WEAR SURF.
C2	3" S9.5B
C3	VAR. S9.5B
D1	2½" I19.0B
E1	4½" B25.0B
T	EARTH MATERIAL

8/17/2008
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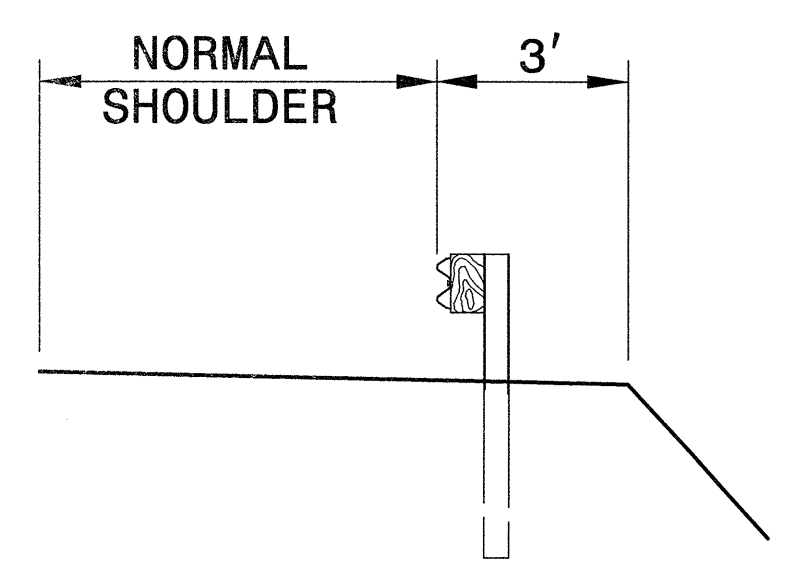


PLAN VIEW

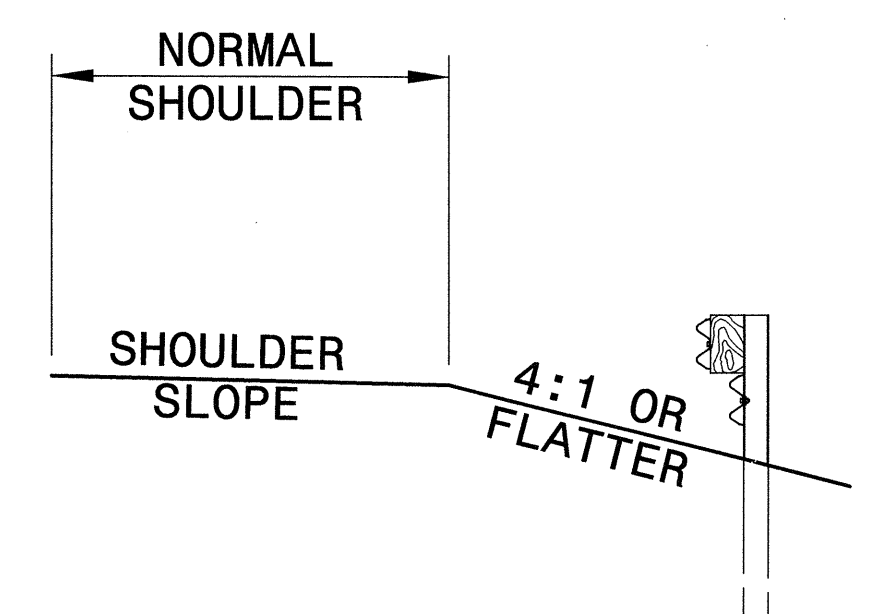
DESIGN SPEED mph	A:B
> 60	13:1
55	12:1
50	11:1
45	10:1
40	9:1
30 or less	7:1



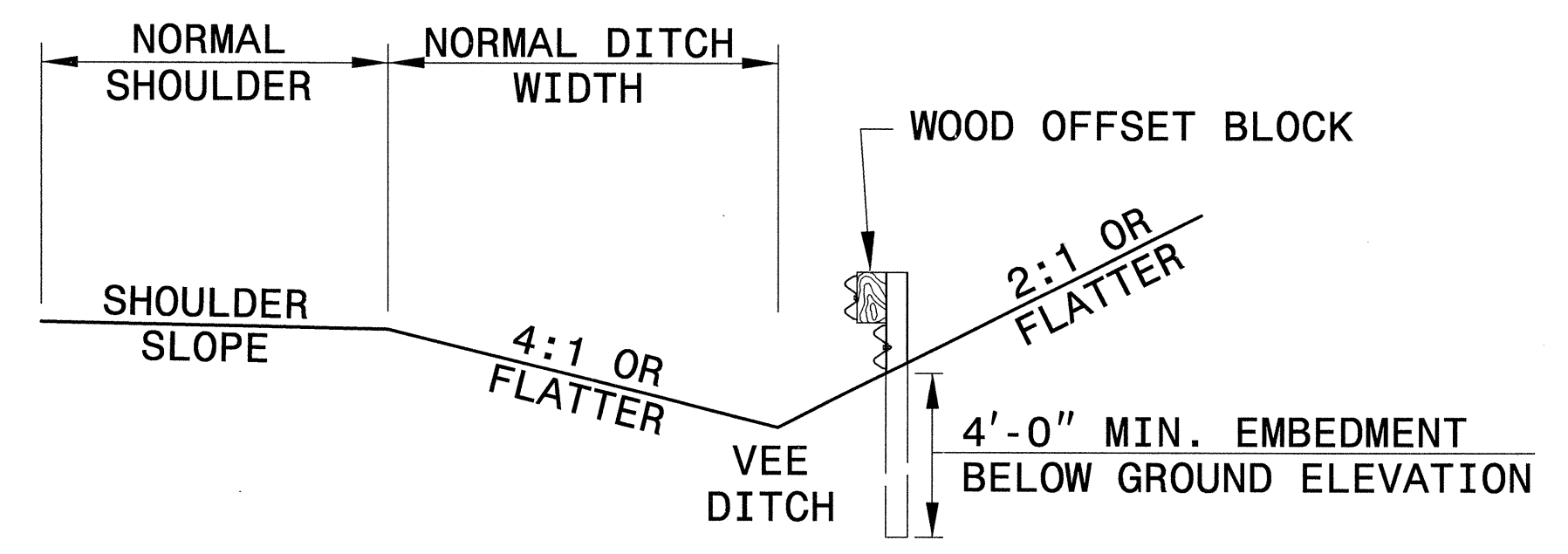
ELEVATION VIEW



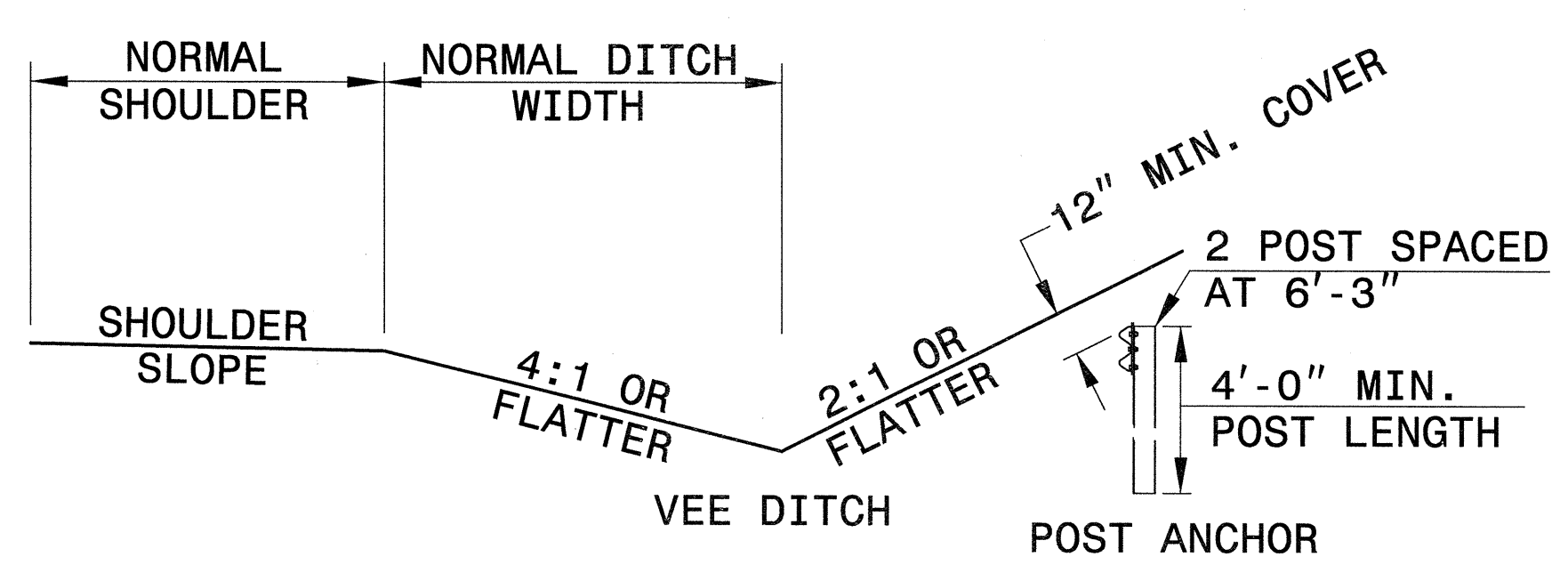
SECTION A-A



**SECTION B-B
(WITH RUBRAIL)**



**SECTION C-C
(WITH RUBRAIL)**



SECTION D-D

NOTES:

- VARIABLE DITCH OFFSETS MAY BE USED TO FIT FIELD CONDITINS.
- HEIGHT OF GUARDRAIL MAY BE TAPERED DOWN IN ELEVATION TO MAINTAIN 3'-9" MAXIMUM HEIGHT.
- ALL POSTS ARE 8'-0" IN LENGTH FROM WHERE THE GUARDRAIL FLARES AWAY FROM THE SHOULDER BACK TO THE DITCH FLOW LINE. GUARDRAIL POSTS BEYOND THE DITCH FLOW LINE MAY BE SHORTENED AS LONG AS A MINIMUM OF 4 FT. EMBEDMENT REMAINS BELOW THE EXISTING GROUND LINE. POST FOR POST ANCHOR MAY BE REDUCED TO 4 FT., ALL OF WHICH WILL BE BELOW GROUND.
- REFER TO NCDOT STANDARD DRAWINGS 862.02 FOR GUARDRAIL INSTALLATION NOT COVERED IN THIS DETAIL.
- INSTALL GUARDRAIL IN ACCORDANCE NCDOT STANDARD SPECIFICATION 862
- PAYMENT FOR ANY RUBRAIL INSTALLATION BEYOND BIC GUARDRAIL ANCHOR UNIT PAY LIMITS WILL BE INCIDENTAL TO PAYMENT FOR BIC ANCHOR UNIT.

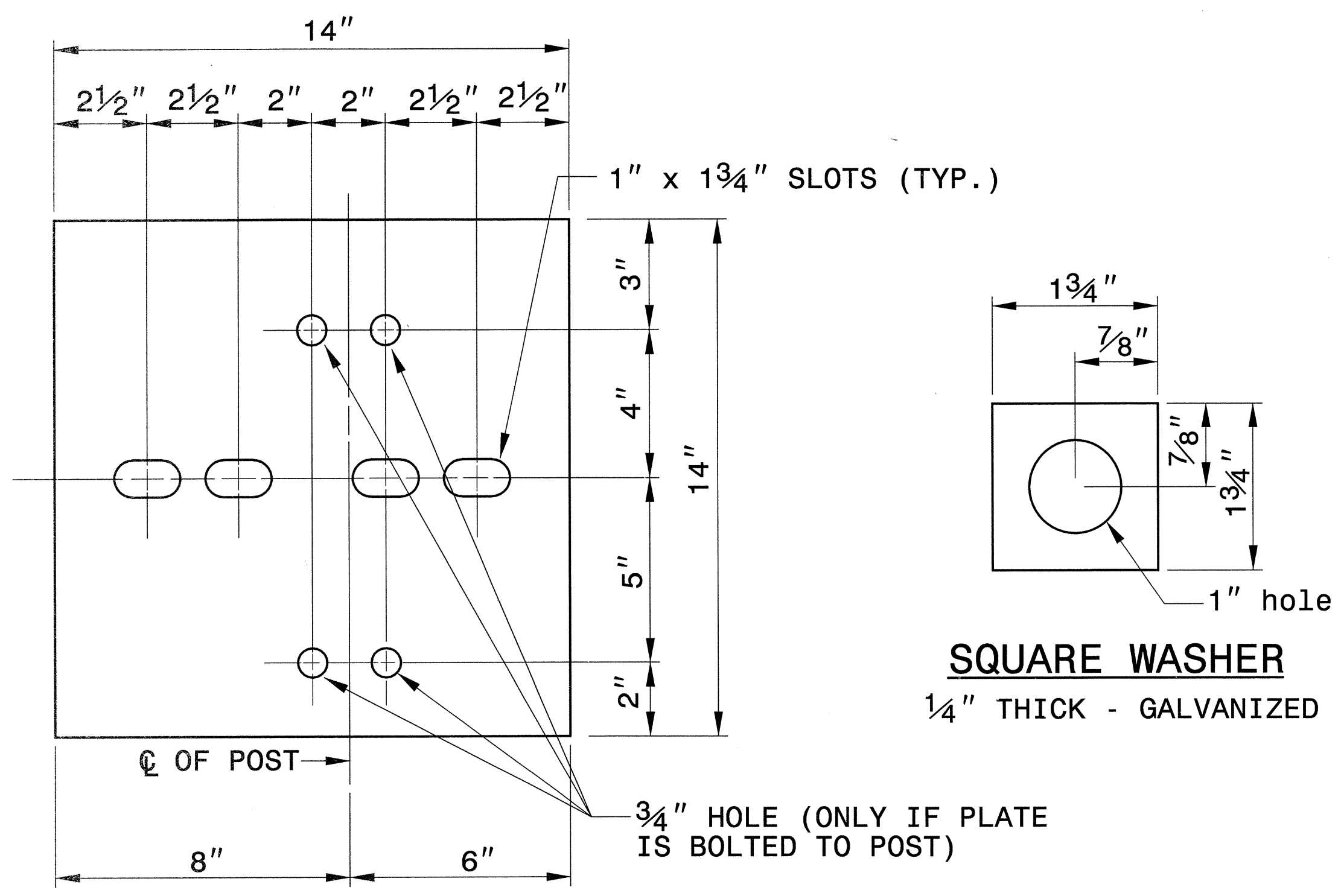


**DESIGN SERVICES UNIT
STANDARDS AND SPECIAL DESIGN**
Office 919-250-4128 FAX 919-250-4119

**DETAIL OF GUARDRAIL
BURIED IN CUT (BIC)**

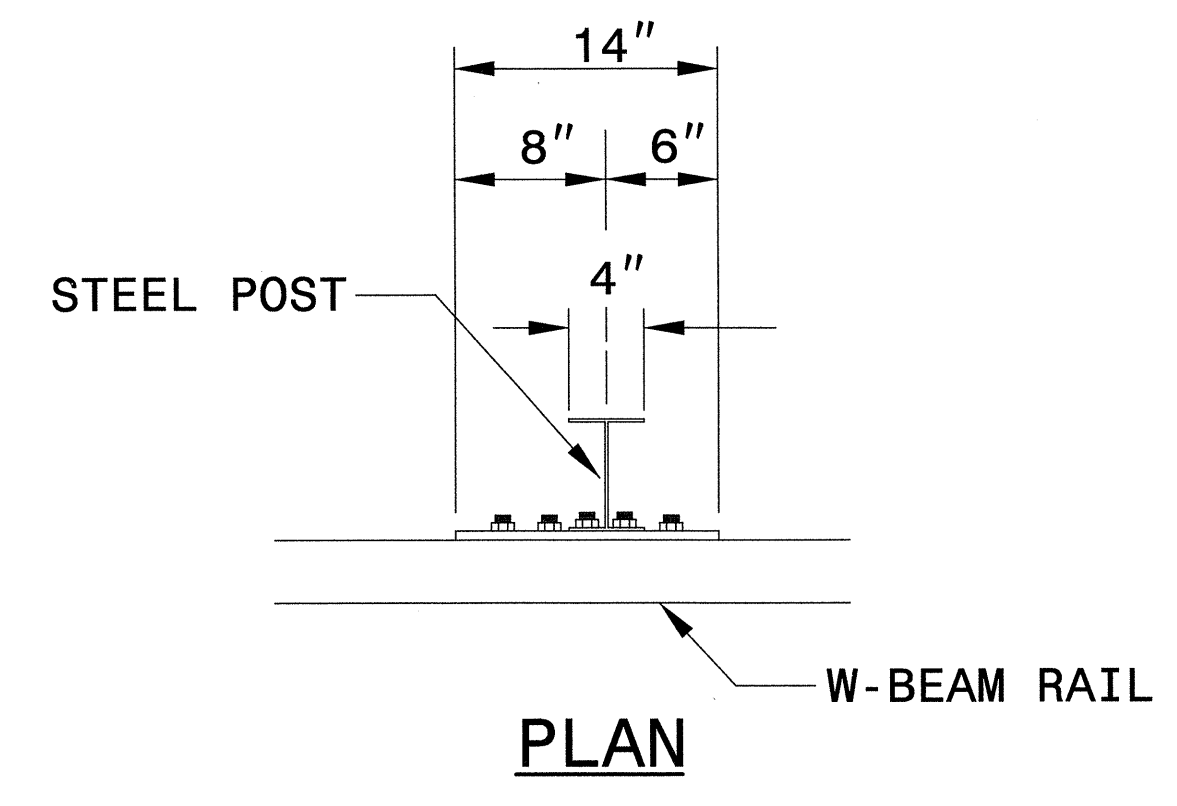
ORIGINAL BY: FHWA-G4 SYSTEM DATE: 8-13-98
MODIFIED BY: E.E. WARD DATE: 12-7-01
CHECKED BY: DATE:
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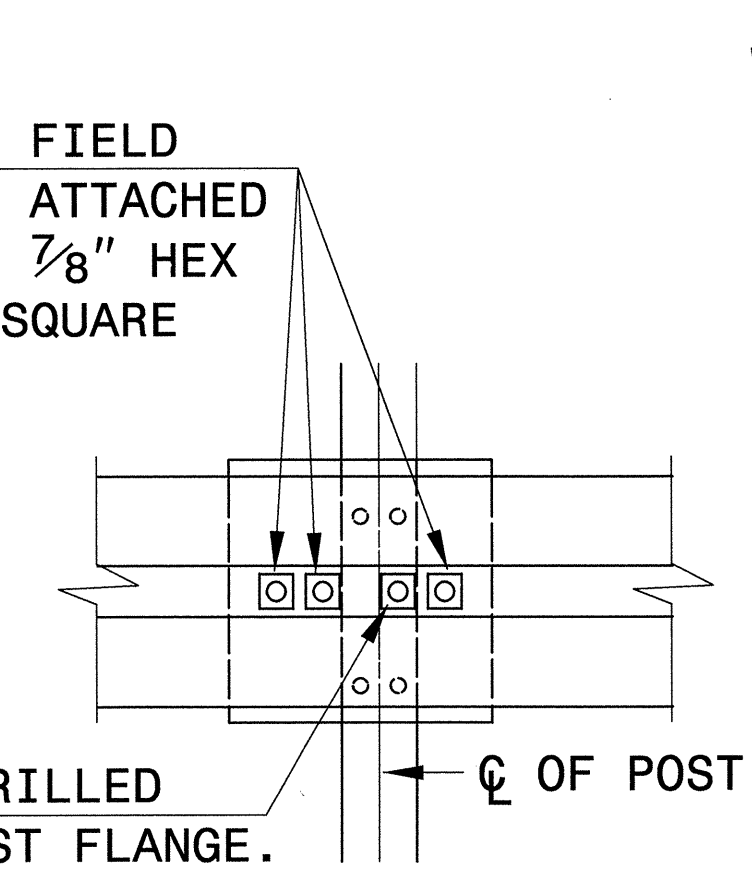


STEEL PLATE - 1/2"
GALVANIZED
WELDED OR BOLTED TO POST

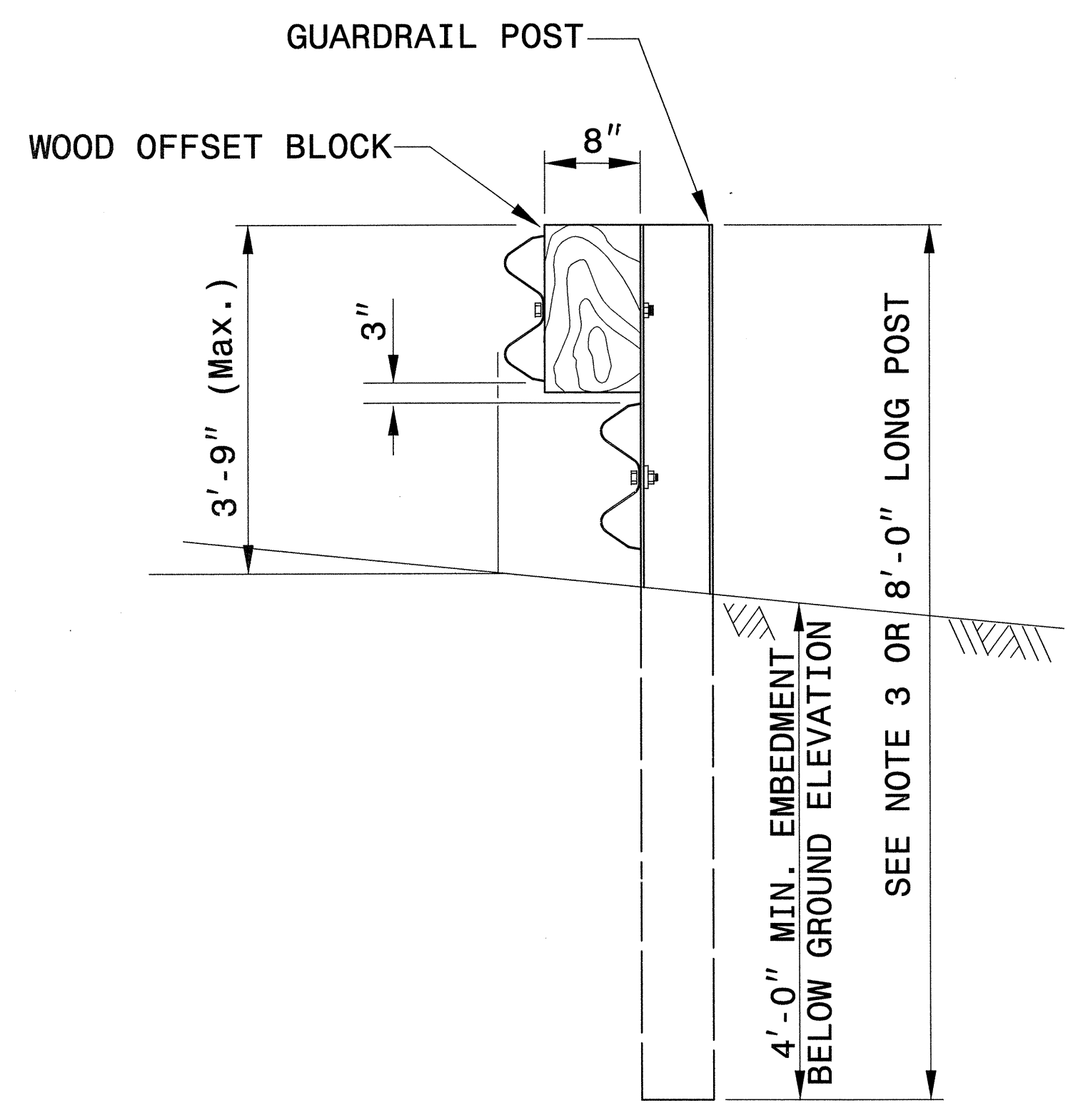
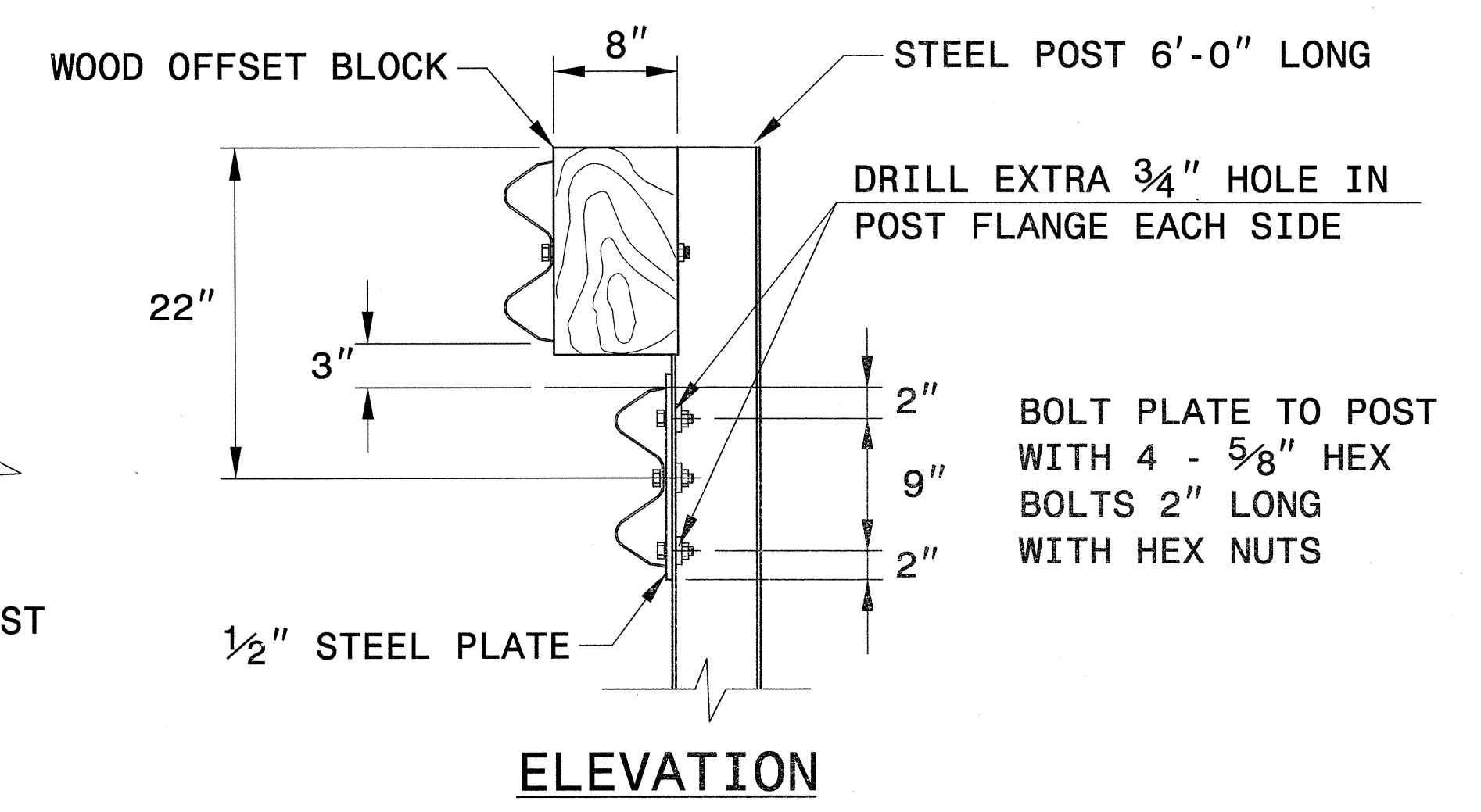
SQUARE WASHER
1/4" THICK - GALVANIZED



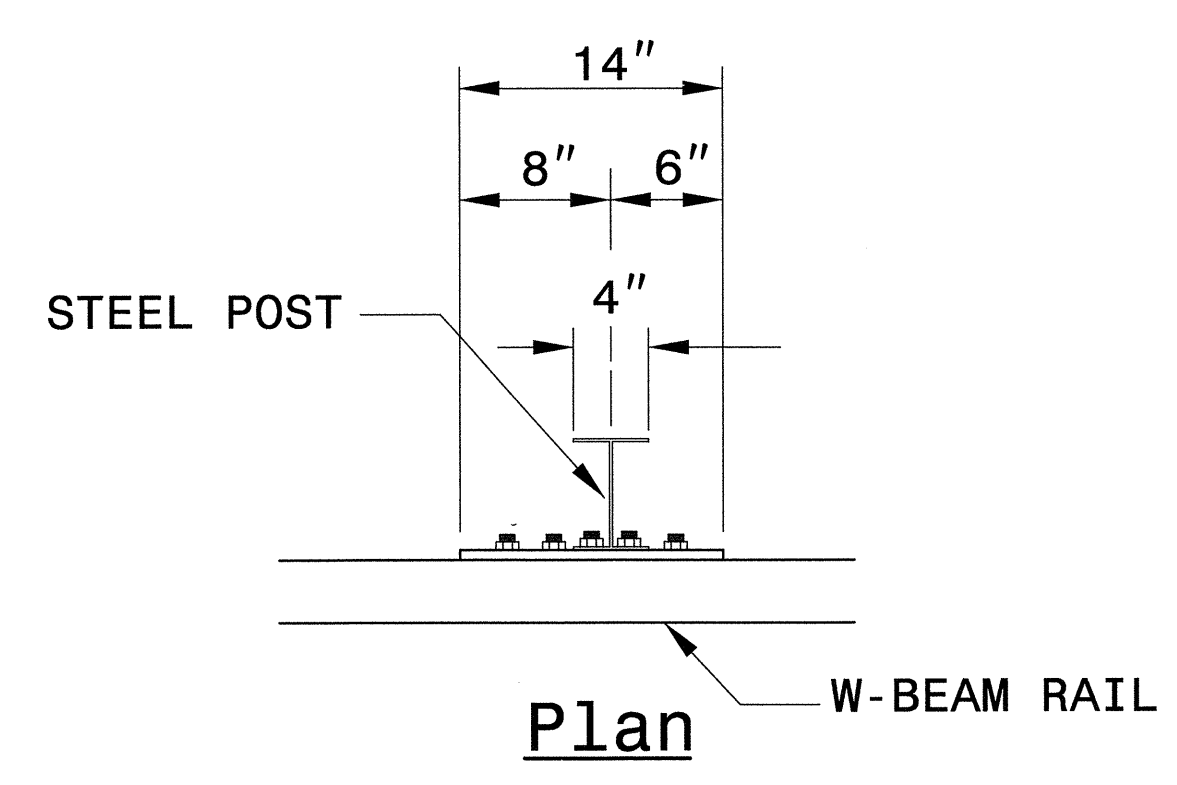
3 - 7/8" HOLES TO BE FIELD DRILLED IN RAIL AND ATTACHED TO STEEL PLATE WITH 7/8" HEX BOLTS 2" LONG WITH SQUARE WASHER



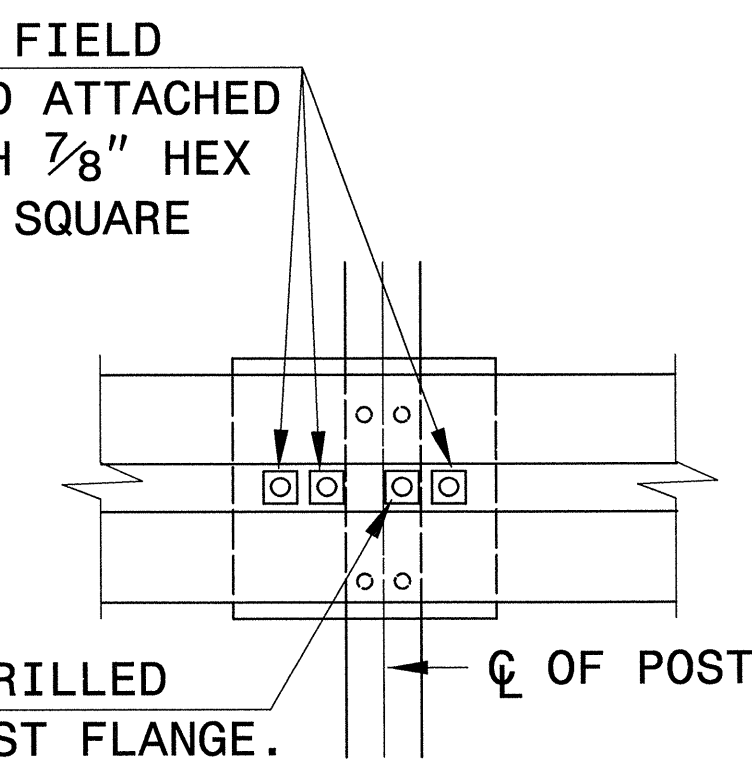
RUBRAIL ANCHOR DETAILS



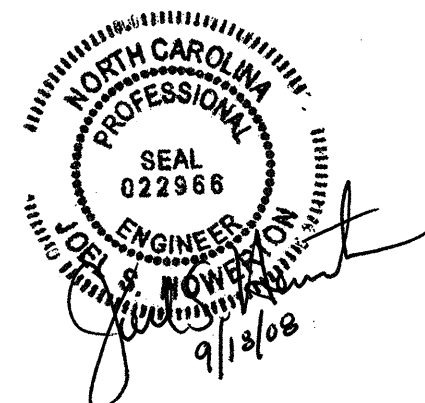
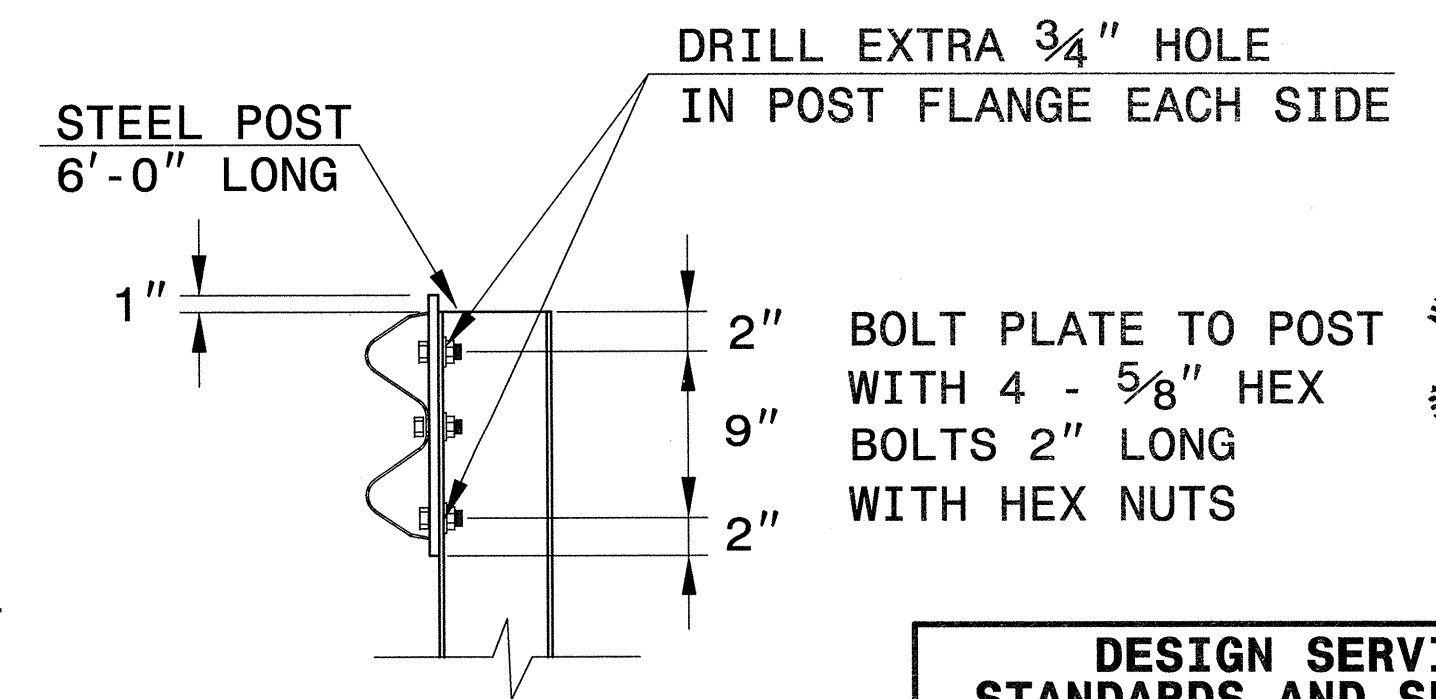
RAIL ATTACHMENT DETAIL



3 - 1" HOLES TO BE FIELD DRILLED IN RAIL AND ATTACHED TO STEEL PLATE WITH 7/8" HEX BOLTS 2" LONG WITH SQUARE WASHER



POST ANCHOR DETAILS



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

DETAIL OF GUARDRAIL BURIED IN CUT (BIC)

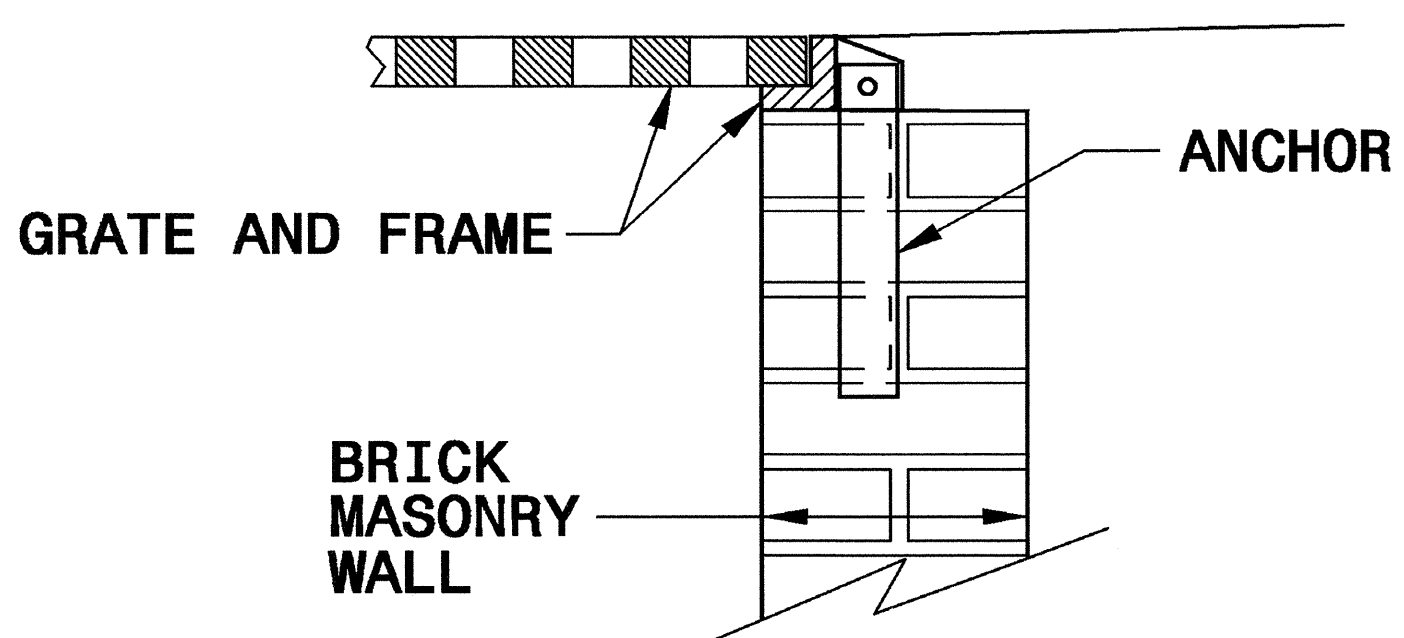
ORIGINAL BY: FHWA-G4 SYSTEM DATE: 8-13-98
MODIFIED BY: E.E. WARD DATE: 12-7-01
CHECKED BY: DATE:
FILE SPEC.: ericward/misc_guardrail/BIC.dgn

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9/15/2008 N:\proj\64303_r\dj_tup.dgn
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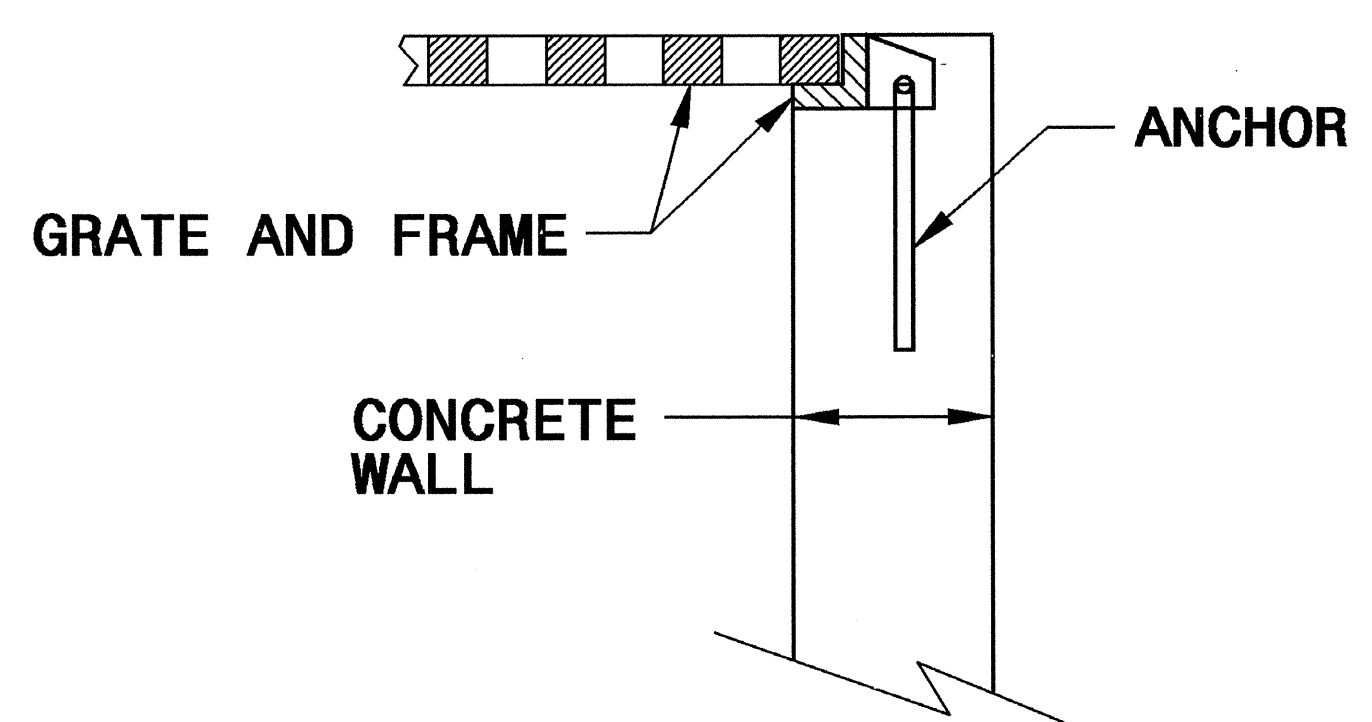
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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

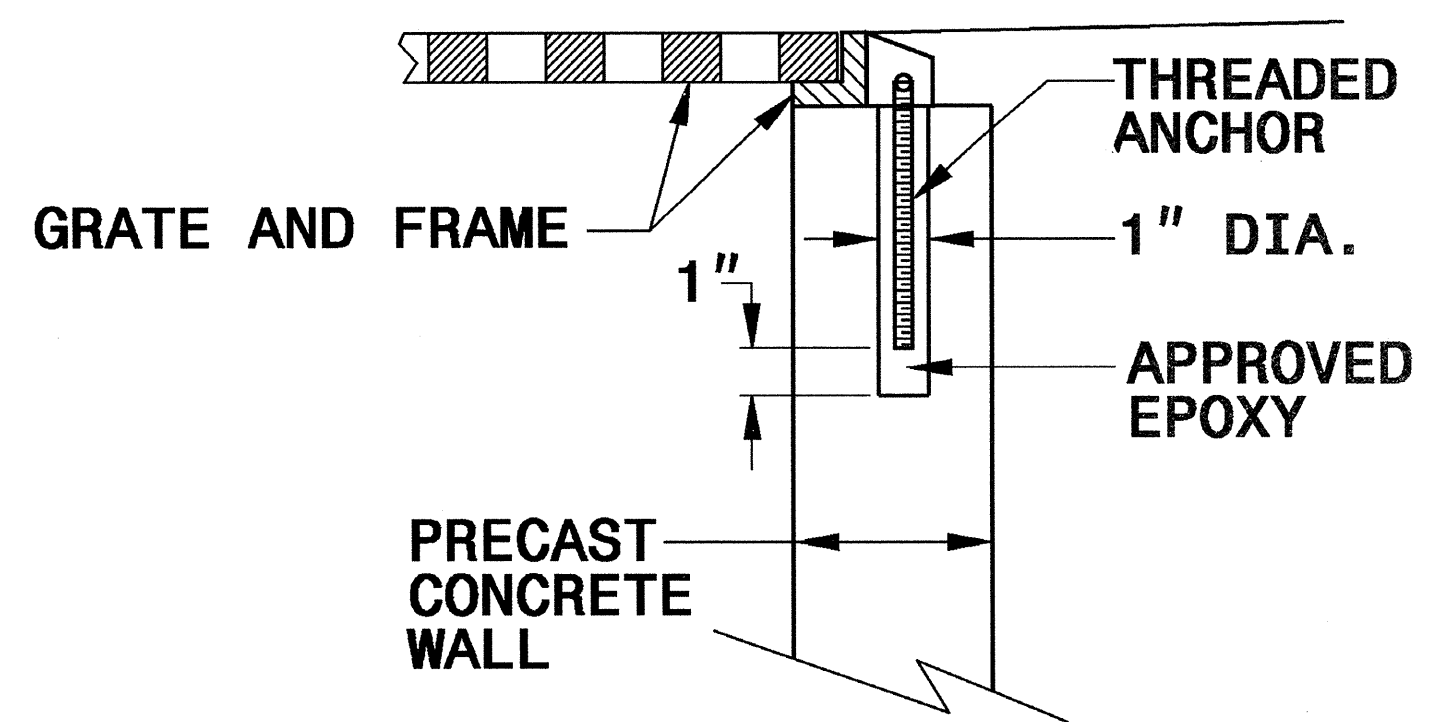
SHEET 1 OF 1
840D25



BRICK MASONRY CONSTRUCTION



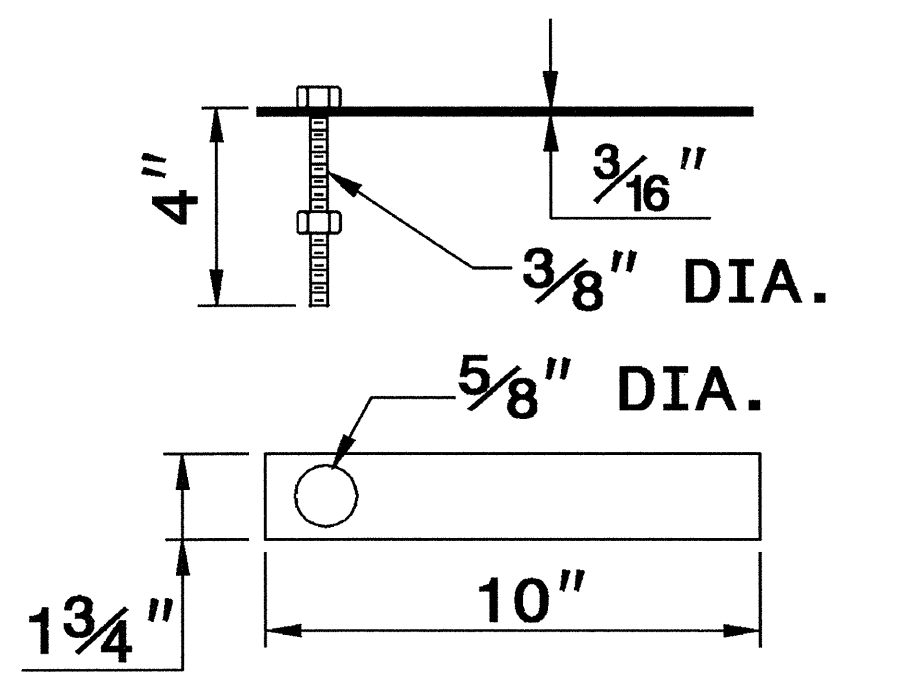
CONCRETE CONSTRUCTION



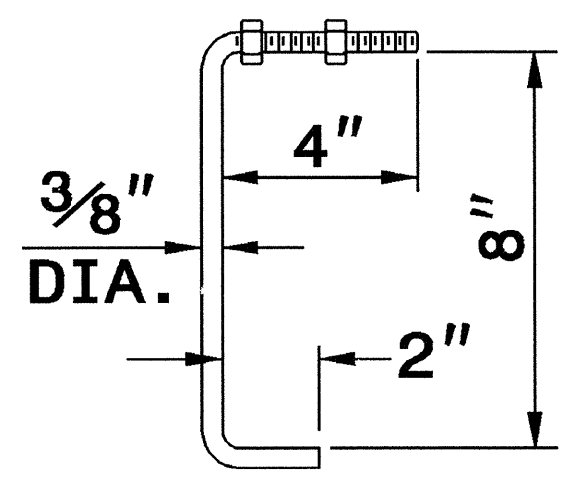
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

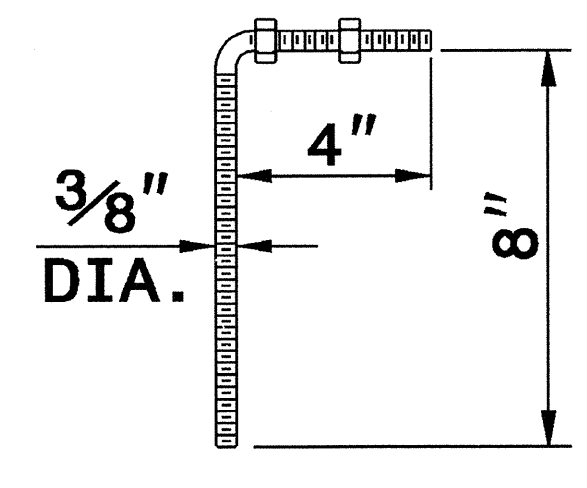
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



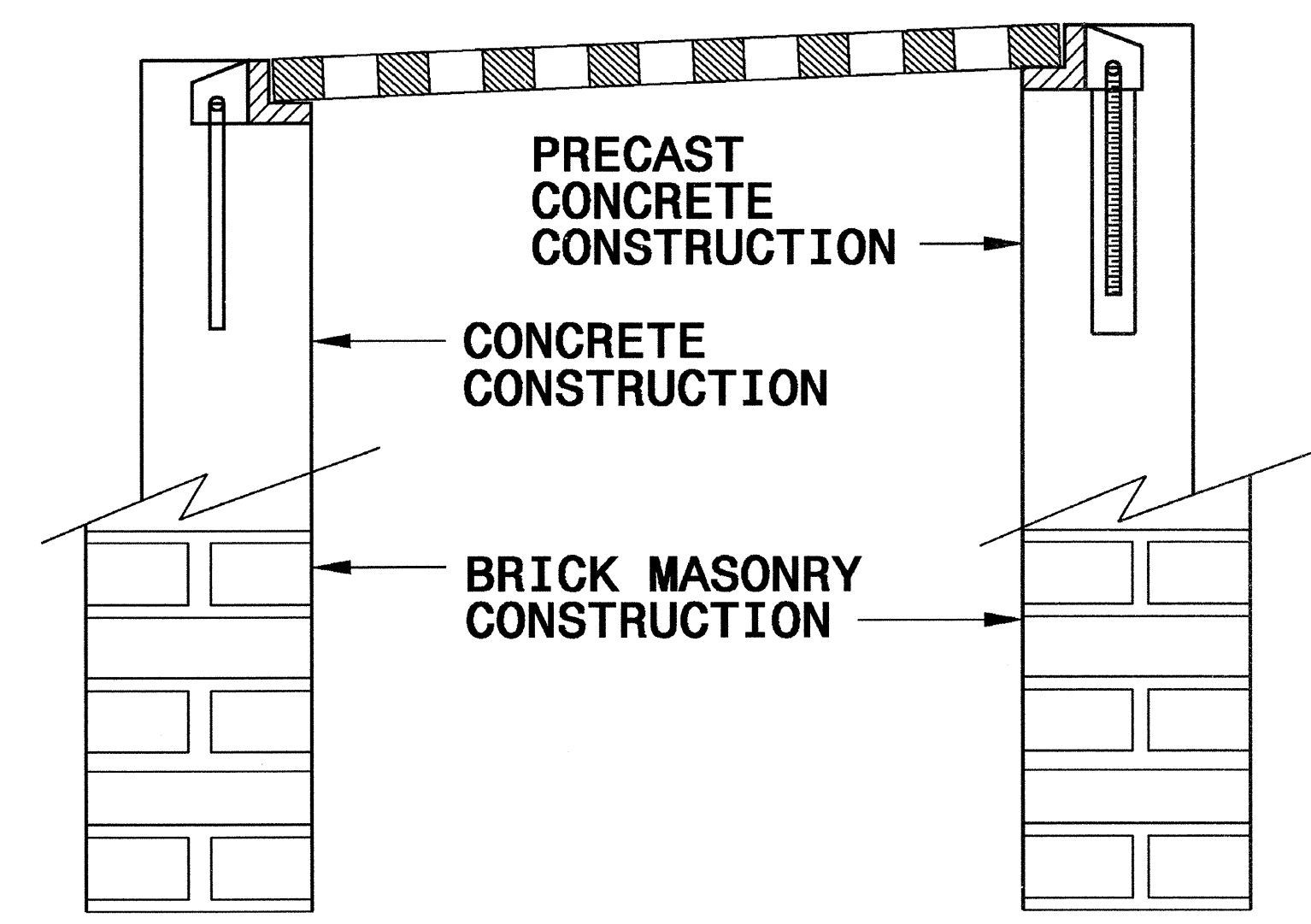
MASONRY ANCHOR
3/8" DIA. BOLT WITH PLATE



CONCRETE ANCHOR
3/8" DIA. BENT BAR



PRECAST CONCRETE ANCHOR
3/8" DIA. BENT BAR



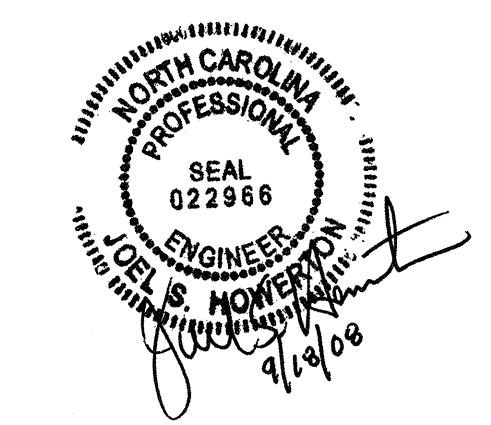
FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS

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

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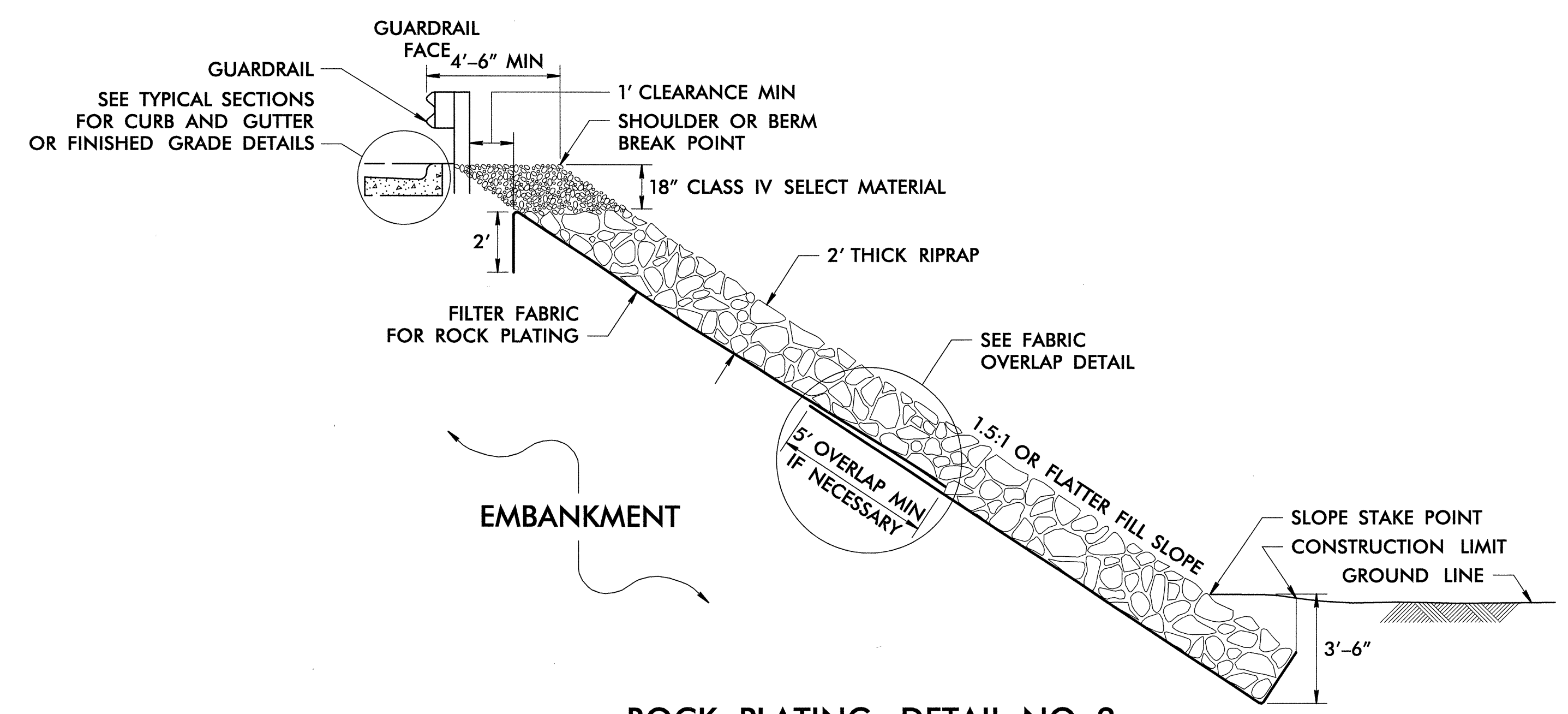


PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

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.:

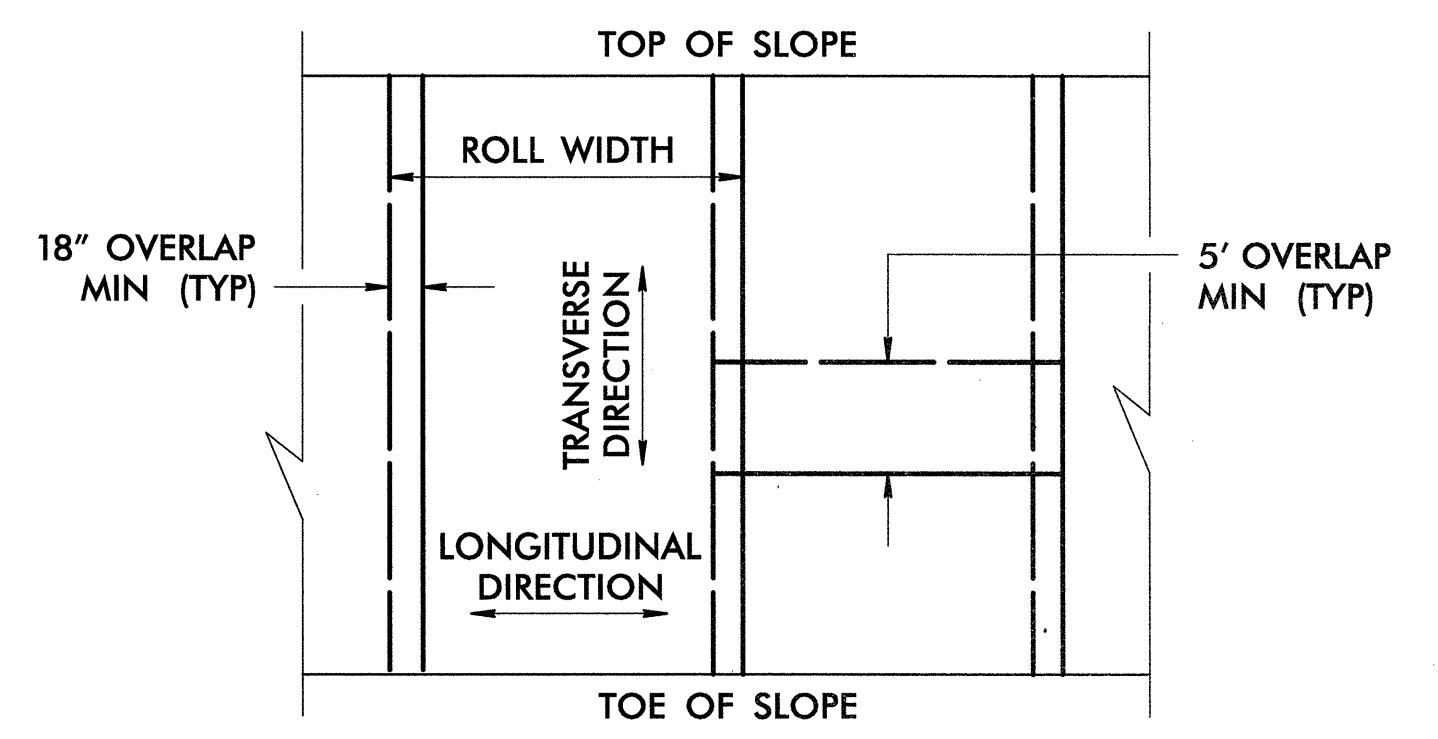
FOR ROCK PLATING,
SEE ROCK PLATING SPECIAL PROVISION.



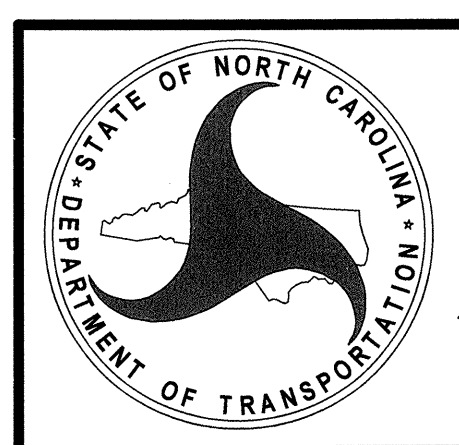
ROCK PLATING DETAIL NO. 2

USE ROCK PLATING DETAIL NO. 2
AT THE FOLLOWING LOCATIONS:

-L- STA 24+50 ± TO -L- STA 25+25 ± RT
EXTEND ROCK PLATING LIMITS TO 1.5:1 SLOPES.



**FABRIC OVERLAP DETAIL
(PLAN VIEW)**



**GEOTECHNICAL
ENGINEERING UNIT**

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1802.01

STANDARD
ROCK PLATING
DETAILS

DATE: 3-18-08

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 MAY 29, 2008 AND SEALED BY A PROFESSIONAL ENGINEER, CHARLES A. GOVE, LICENSE #029413.

5/14/99

8/17/2008
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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202031					STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202031					STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202031				
ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION	3180000000-N	862	1	EA	GUARDRAIL ANCHOR UNITS, TYPE ***** (BIC)	6021000000-E	1620	1.25	TON	FERTILIZER FOR TEMPORARY SEEDING
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ***** (17+71.00)	3215000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE III	6029000000-E	SP	700	LF	SAFETY FENCE
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING	3270000000-N	SP	7	EA	GUARDRAIL ANCHOR UNITS, TYPE 350	6030000000-E	1630	700	CY	SILT EXCAVATION
0057000000-E	226	400	CY	UNDERCUT EXCAVATION	3628000000-E	876	200	TON	RIP RAP, CLASS I	6036000000-E	1631	1,550	SY	MATTING FOR EROSION CONTROL
0063000000-N	SP	Lump Sum		GRADING	3649000000-E	876	69	TON	RIP RAP, CLASS B	6037000000-E	SP	20	SY	COIR FIBER MAT
0106000000-E	230	1,500	CY	BORROW EXCAVATION	3656000000-E	876	808	SY	FILTER FABRIC FOR DRAINAGE	6038000000-E	SP	270	SY	PERMANENT SOIL REINFORCEMENT MAT
0134000000-E	240	280	CY	DRAINAGE DITCH EXCAVATION	3659000000-N	SP	1	EA	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON	6042000000-E	1632	50	LF	1/4" HARDWARE CLOTH
0195000000-E	265	400	CY	SELECT GRANULAR MATERIAL	4072000000-E	903	40	LF	SUPPORTS, 3-LB STEEL U-CHANNEL	6045000000-E	SP	100	LF	*** TEMPORARY PIPE (15")
0196000000-E	270	400	SY	FABRIC FOR SOIL STABILIZATION	4102000000-N	904	3	EA	SIGN ERECTION, TYPE E	6070000000-N	SP	3	EA	SPECIAL STILLING BASINS
0241000000-E	SP	100	SY	GENERIC GRADING ITEM ROCK PLATING	4155000000-N	907	9	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	6071030000-E	SP	120	LF	COIR FIBER BAFFLES
0318000000-E	300	6	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS	4400000000-E	1110	355	SF	WORK ZONE SIGNS (STATIONARY)	6071050000-E	SP	2	EA	*** SKIMMER (1-1/2")
0366000000-E	310	48	LF	15" RC PIPE CULVERTS, CLASS III	4410000000-E	1110	94	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)	6084000000-E	1660	10	ACR	SEEDING & MULCHING
0995000000-E	340	20	LF	PIPE REMOVAL	4445000000-E	1145	64	LF	BARRICADES (TYPE III)	6087000000-E	1660	1.5	ACR	MOWING
1220000000-E	545	100	TON	INCIDENTAL STONE BASE	4685000000-E	1205	2,120	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)	6090000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
1489000000-E	610	230	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B	4686000000-E	1205	2,120	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)	6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
1498000000-E	610	125	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE 119.0B	4770000000-E	1205	460	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (III)	6096000000-E	1662	50	LB	SEED FOR SUPPLEMENTAL SEEDING
1519000000-E	610	580	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	4900000000-N	1251	30	EA	PERMANENT RAISED PAVEMENT MARKERS	6108000000-E	1665	1.25	TON	FERTILIZER TOPDRESSING
1560000000-E	620	51	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22	6000000000-E	1605	200	LF	TEMPORARY SILT FENCE	6111000000-E	SP	100	LF	IMPERVIOUS DIKE
2000000000-N	806	18	EA	RIGHT OF WAY MARKERS	6006000000-E	1610	80	TON	STONE FOR EROSION CONTROL, CLASS A	6114000000-N	SP	5	HR	SPECIALIZED HAND MOWING
2286000000-N	840	2	EA	MASONRY DRAINAGE STRUCTURES	6009000000-E	1610	260	TON	STONE FOR EROSION CONTROL, CLASS B	6117000000-N	SP	27	EA	RESPONSE FOR EROSION CONTROL
2367000000-N	840	2	EA	FRAME WITH TWO GRATES, STD 840.29	6012000000-E	1610	130	TON	SEDIMENT CONTROL STONE	6123000000-E	1670	0.25	ACR	REFORESTATION
2556000000-E	846	35	LF	SHOULDER BERM GUTTER	6015000000-E	1615	2	ACR	TEMPORARY MULCHING					
3030000000-E	862	625	LF	STEEL BM GUARDRAIL	6018000000-E	1620	100	LB	SEED FOR TEMPORARY SEEDING					
3150000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS										



SUMMARY OF EARTHWORK
IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
-L-					
14+25 TO 17+13.50	54		762	708	
18+28.50 TO 21+00	6		476	470	
23+50 TO 26+00	39		245	206	
SUBTOTAL	99		1483	1384	
TOTAL	99		1483	1384	
LOSS DUE TO CLEARING AND GRUBBING					
EST. SHOULDER MATERIAL					
WASTE TO REPLACE BORROW					
PROJECT TOTAL	99		1483	1384	
5% TO REPLACE BORROW				69	
GRAND TOTAL	99			1453	
SAY	100			1500	

EST. DDE = 280 CY
 EST. UNDERCUT EXCAVATION = 400 CY
 EST. SELECT GRANULAR MATERIAL = 400 CY
 EST. FABRIC FOR SOIL STABILIZATION = 400 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.

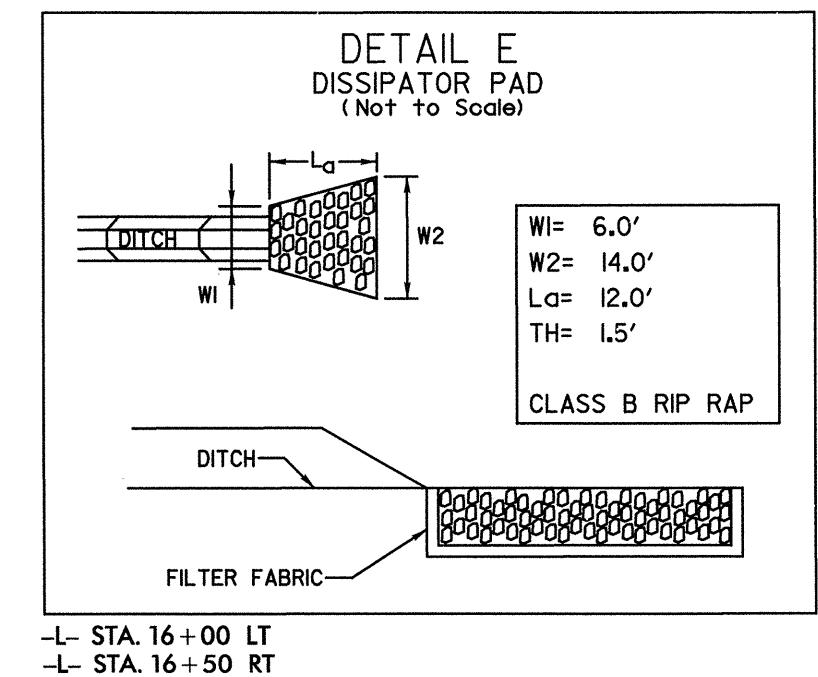
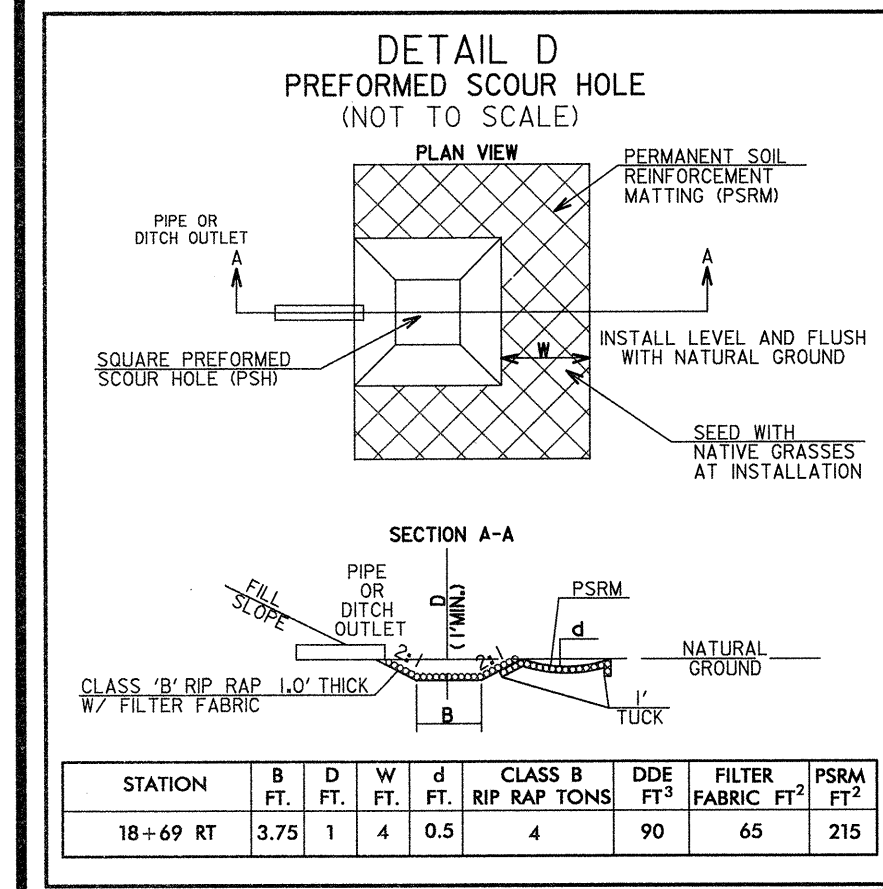
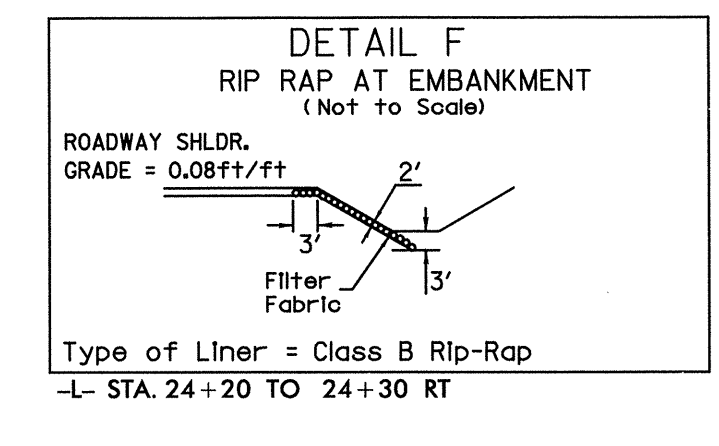
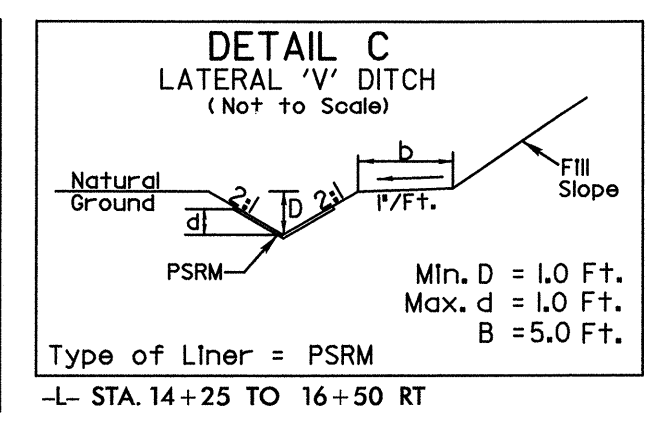
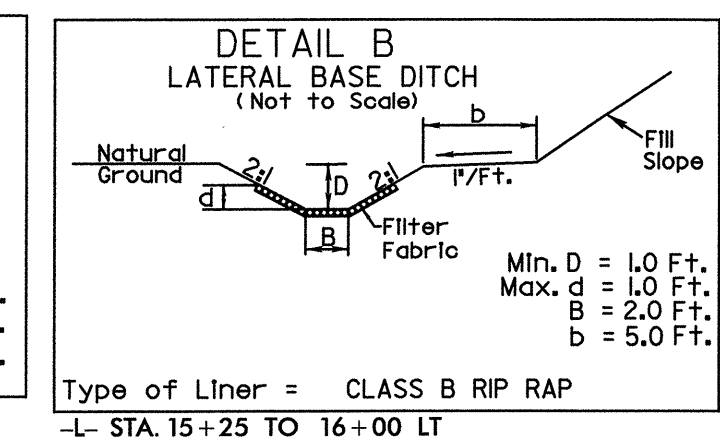
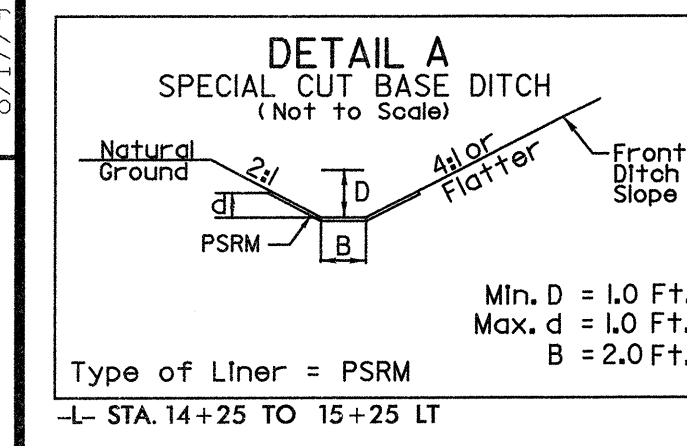
SUMMARY OF PAVEMENT REMOVAL
IN SQUARE YARDS

LOCATION	ASPHALT REMOVAL	ASPHALT BREAK UP	CONCRETE REMOVAL	CONCRETE BREAK UP
-L- 24+05 TO 24+75	1470			
TOTAL	1470			
SAY	1500			

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

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8/17/99



MULKEY ENGINEERS & CONSULTANTS

PROJECT REFERENCE NO. **B-4303**
SHEET NO. **4**

ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER

SEAL 21102
TIMOTHY JORDAN
9/15/08

SEAL 026696
TIMOTHY J. BECKWITH
9-15-08

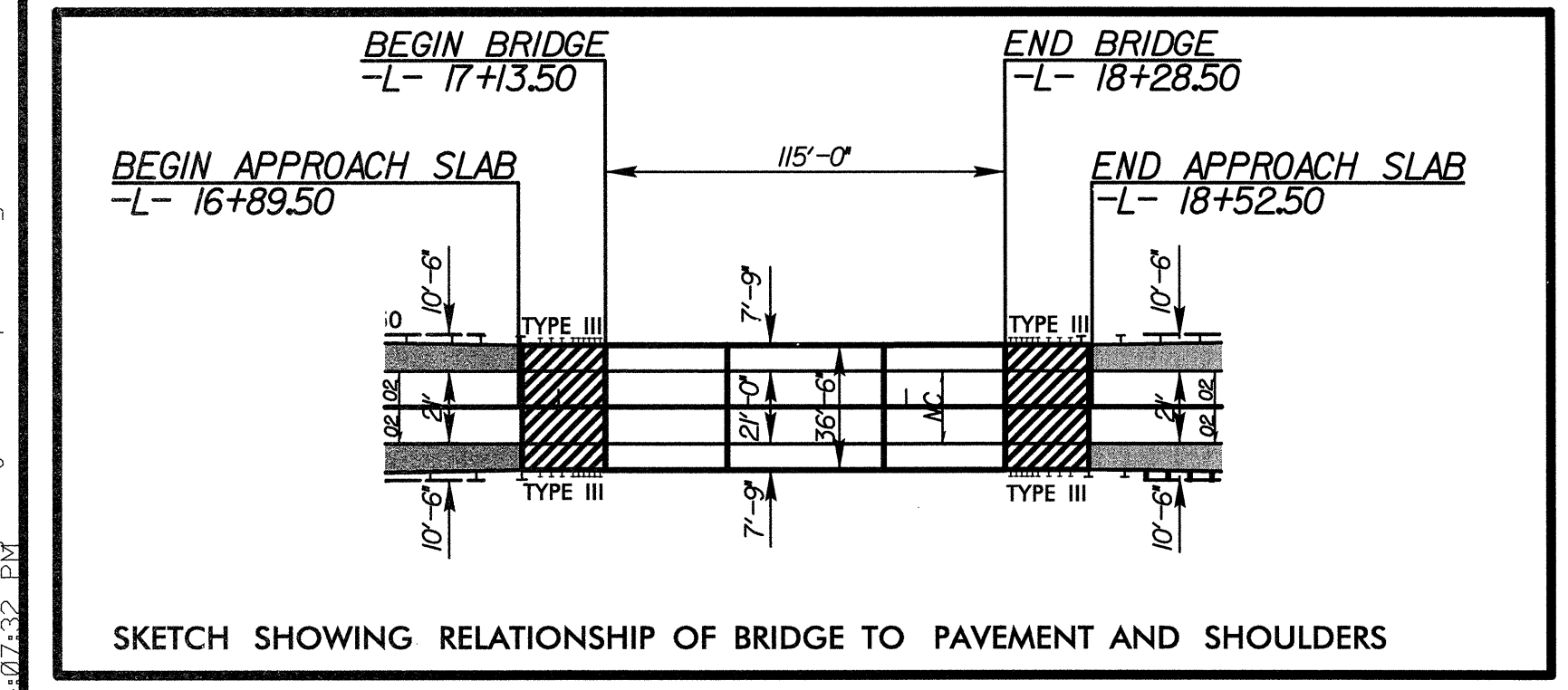
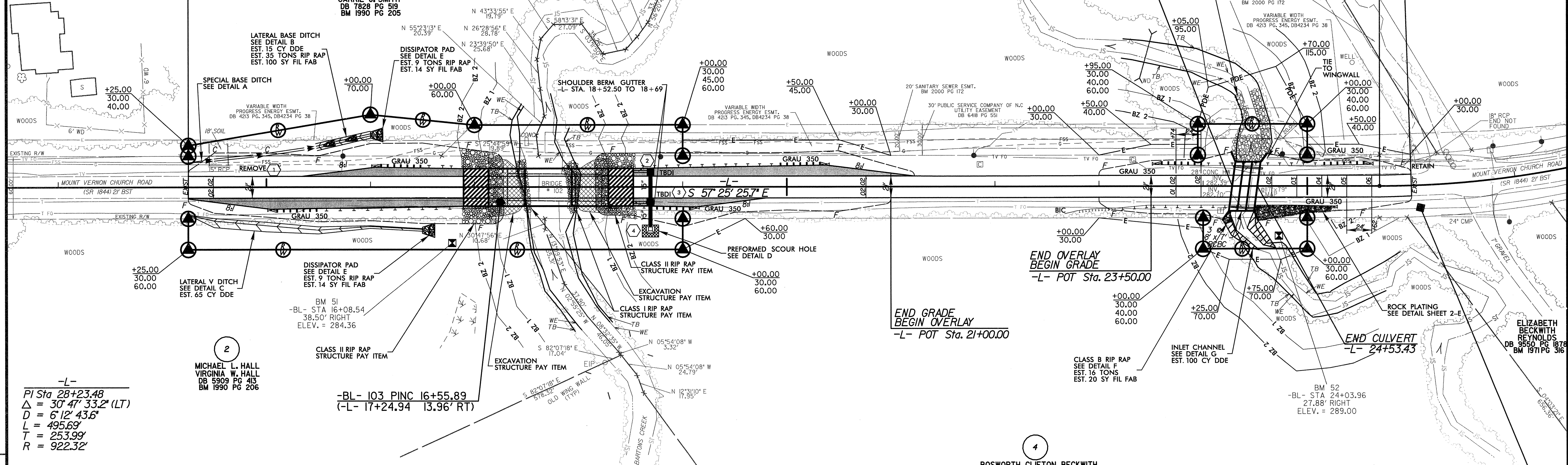
FOR -L- PROFILE SEE SHEET 5

NOTE: USE ROCK PLATING AT THE FOLLOWING LOCATION:
-L- STA. 24+50 TO 25+25 RT
SEE DETAIL SHEET 2-E

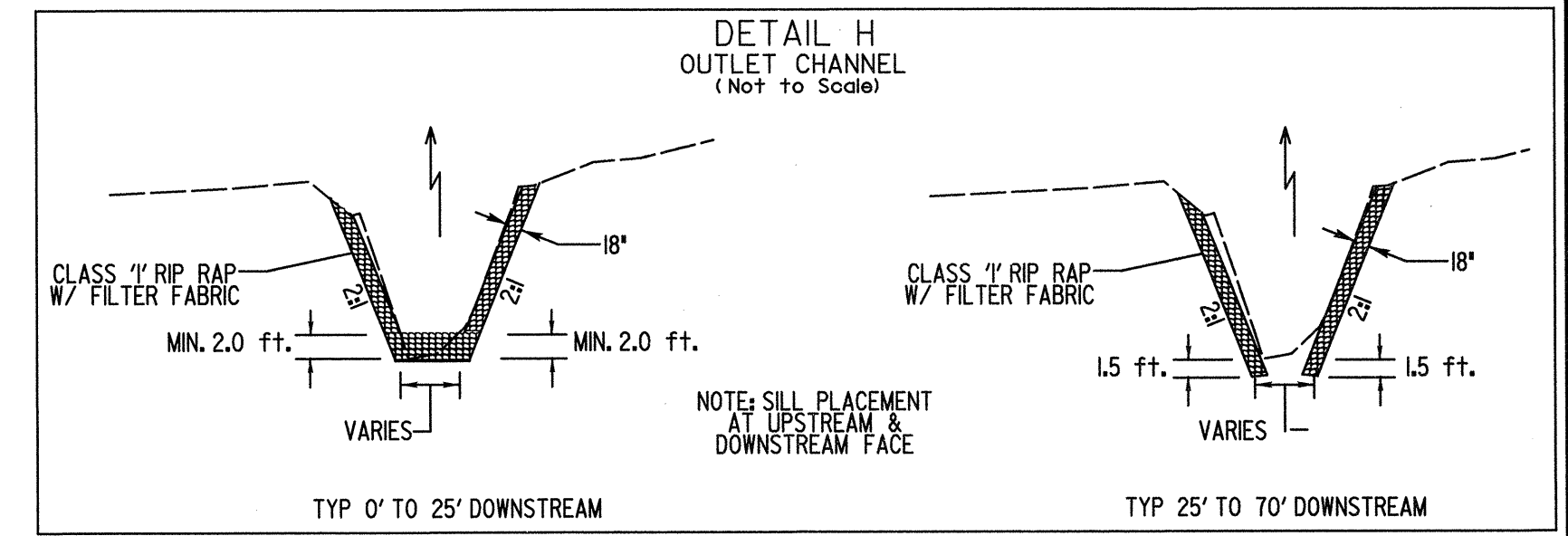
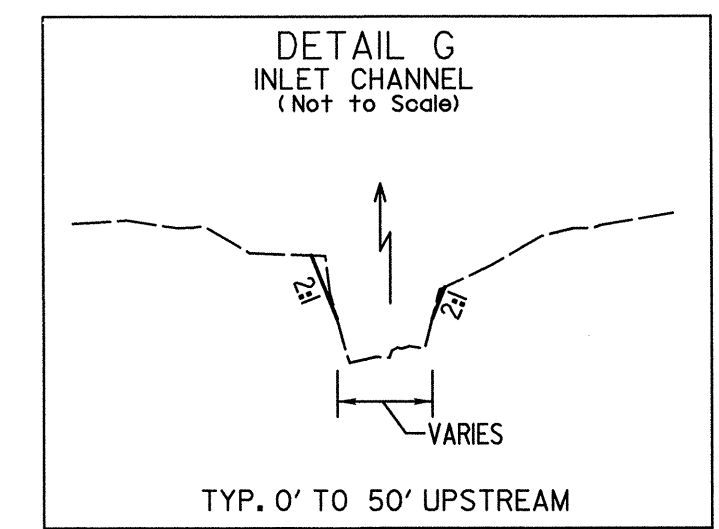
**JACK R. CARROLL
NANCY T. CARROLL**
DB 3894 PG 867
BM 2001 PG 388

**BEGIN PROJECT B-4303
BEGIN CONSTRUCTION**
-L- POT Sta. 14+25.00

**END PROJECT B-4303
END CONSTRUCTION**
-L- POT Sta. 26+00.00



FOR CULVERT PLANS SEE SHEETS C-1 THRU C-5
FOR STRUCTURE PLANS SEE SHEETS S-1 THRU S-29



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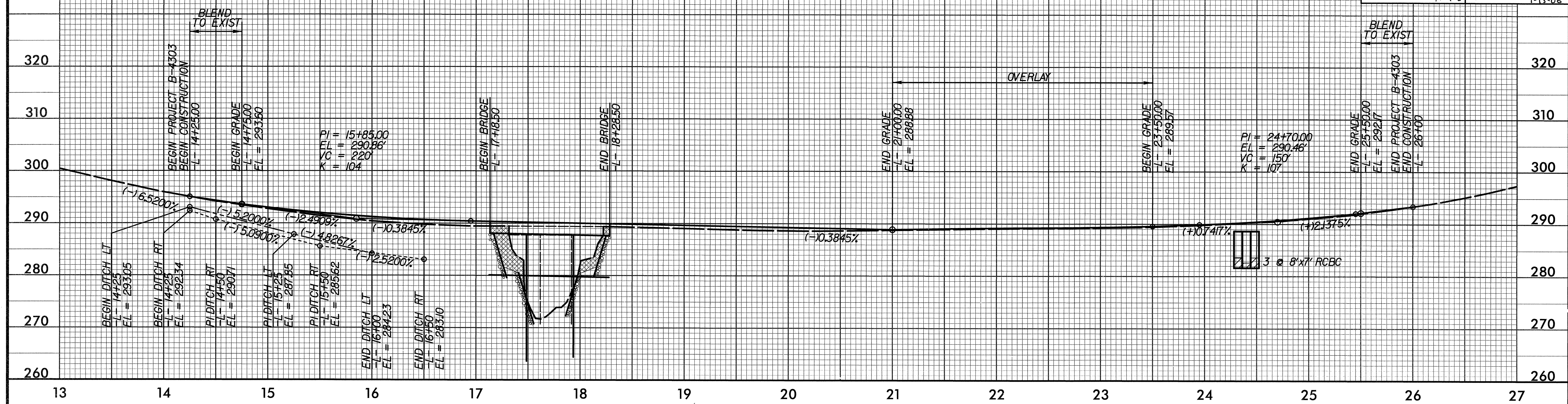
BM-51
RAILROAD SPIKE IN 1" TWIN SWEET GUM
-BL- STA 16+09 38' RIGHT
EL = 284.36'
-L- STA 16+78.72 53.80' RIGHT

BM-52
RAILROAD SPIKE IN 18" POPLAR
-BL- STA 24+04 28' RIGHT
EL = 289.00'
-L- STA 24+72.78 47.45' RIGHT



PROJECT REFERENCE NO. B-4303	SHEET NO. 5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
9/15/08	9-15-08

FOR -L- PLAN VIEW SEE SHEET 4



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE = 2600 CFS
 DESIGN FREQUENCY = 25 YRS
 DESIGN HW ELEVATION = 287.9 FT
 BASE DISCHARGE = 3300 CFS
 BASE FREQUENCY = 100 YRS
 BASE HW ELEVATION = 288.6 FT
 OVERTOPPING DISCHARGE = 3700 CFS
 OVERTOPPING FREQUENCY = 100+ YRS
 OVERTOPPING ELEVATION = 288.9 FT

DATE OF SURVEY = 6-21-06
 W.S. ELEVATION AT DATE OF SURVEY = 279.0 FT

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE = 900 CFS
 DESIGN FREQUENCY = 25 YRS
 DESIGN HW ELEVATION = 289.0 FT
 BASE DISCHARGE = 1200 CFS
 BASE FREQUENCY = 100 YRS
 BASE HW ELEVATION = 290.2 FT
 OVERTOPPING DISCHARGE = 1125 CFS
 OVERTOPPING FREQUENCY = 50 +/- YRS
 OVERTOPPING ELEVATION = 290.0 FT

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