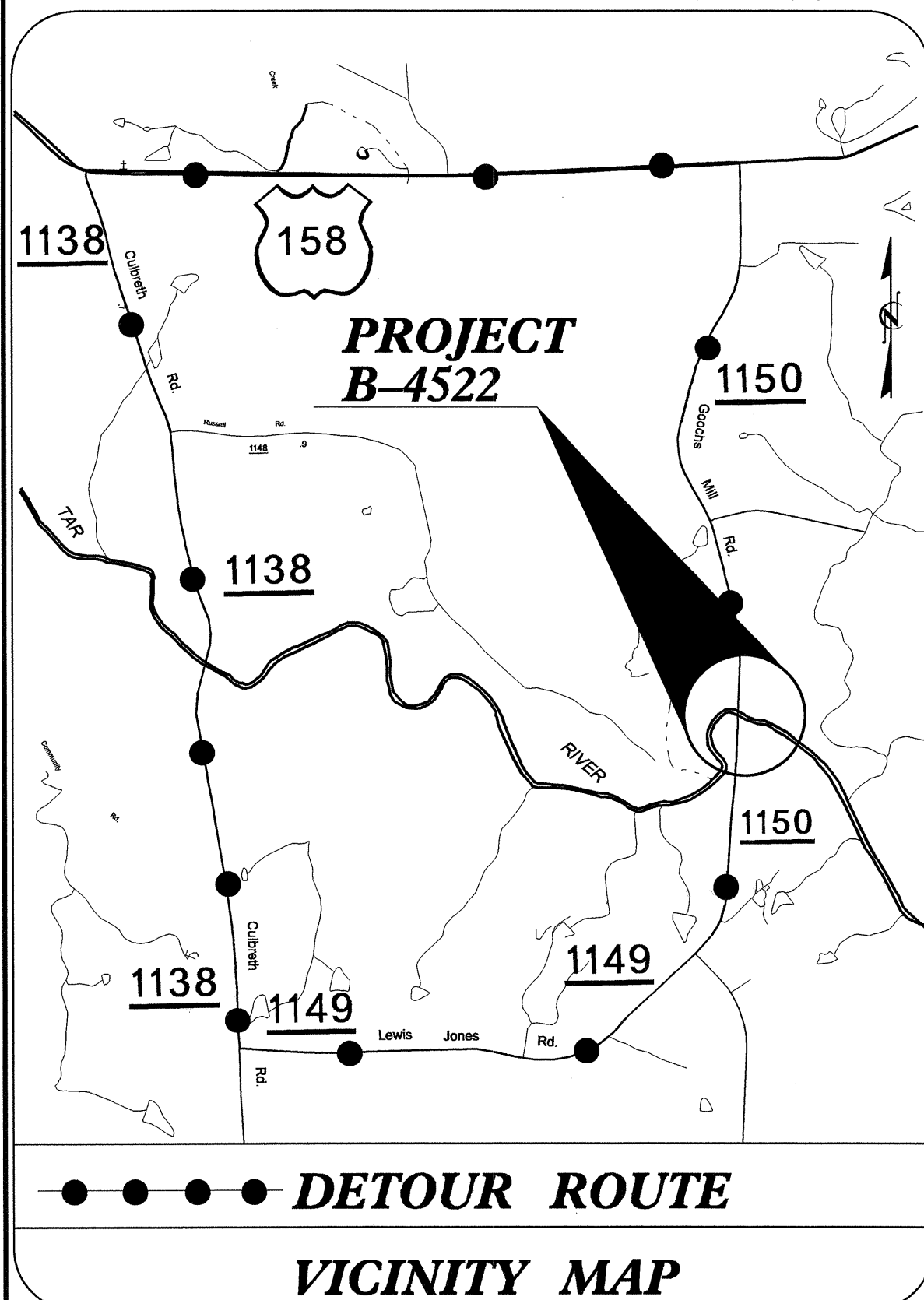


09/08/09

See Sheet 1-A For Index of Sheets



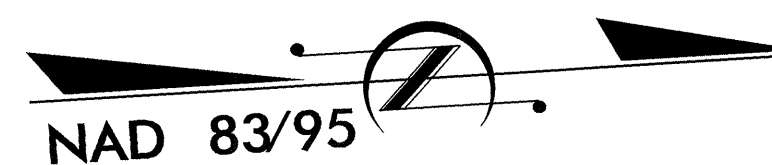
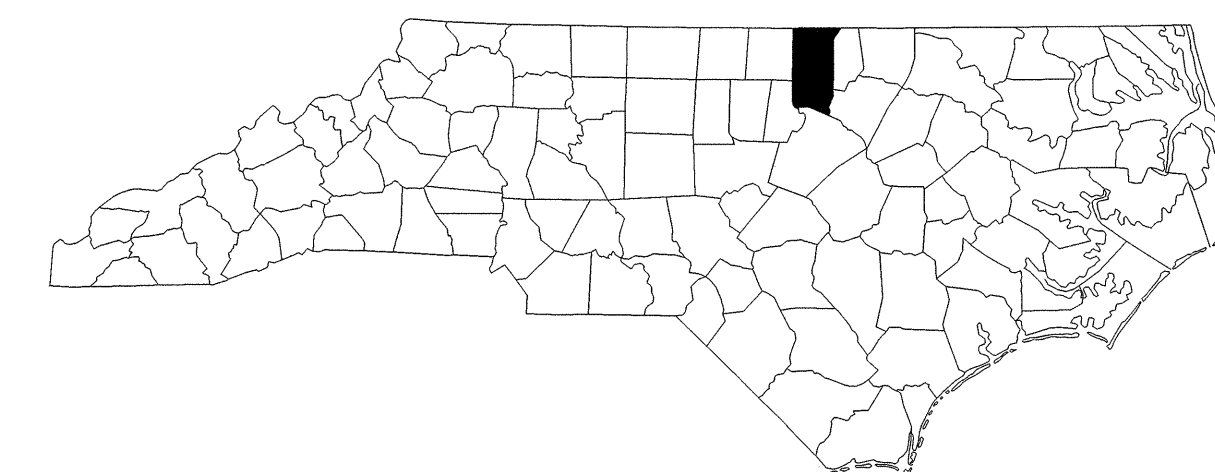
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GRANVILLE COUNTY

**LOCATION: BRIDGE 102 OVER THE TAR RIVER
ON SR 1150**

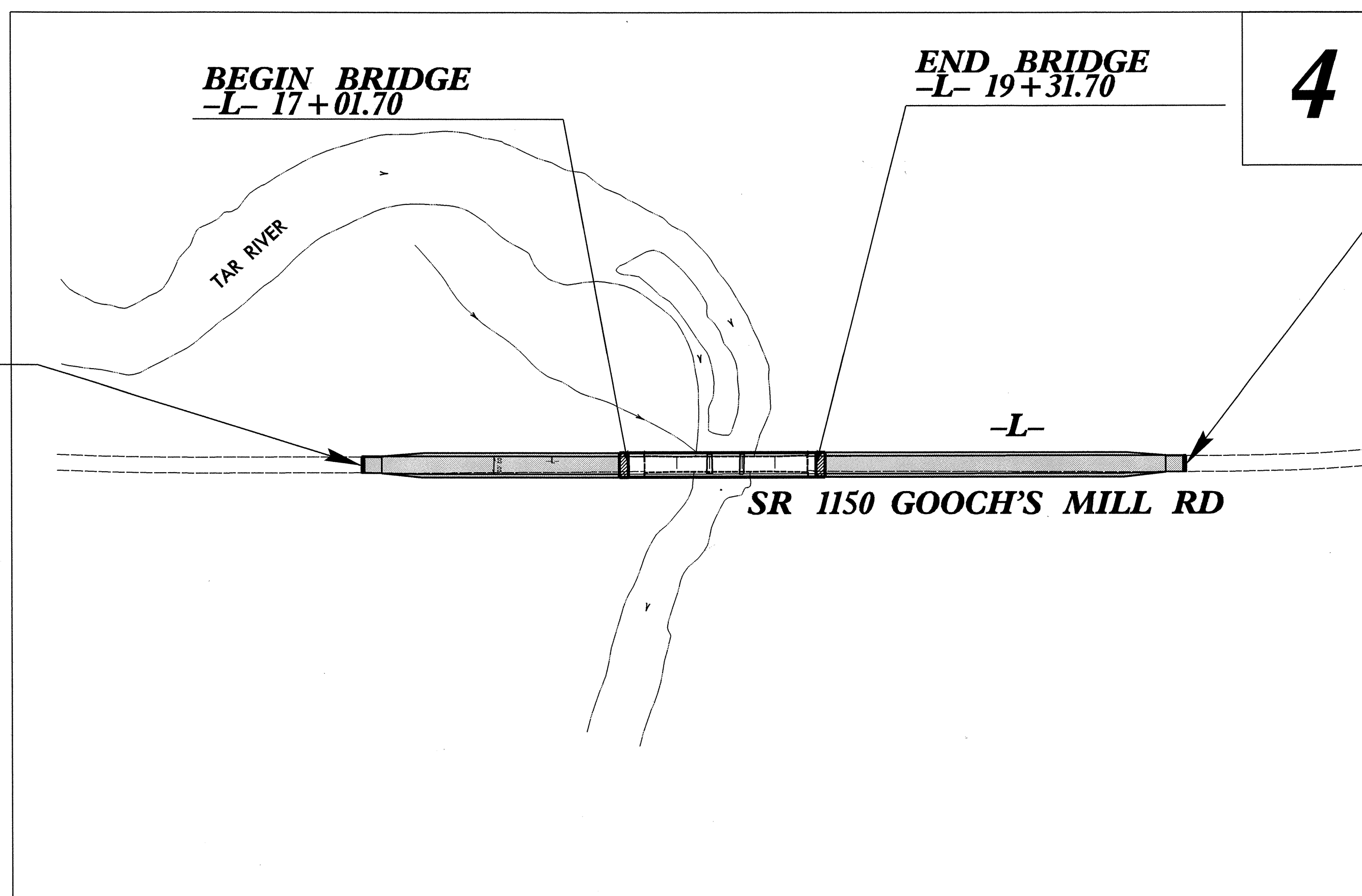
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4522	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33746.1.1	BRZ - 1150(7)	P.E.	
33746.2.1	BRZ-1150(7)	RW, UTIL	
33746.3.1	BRZ-1150(7)	CONST.	



**-L- STA 13+75.00 BEGIN
TIP PROJECT B-4522**

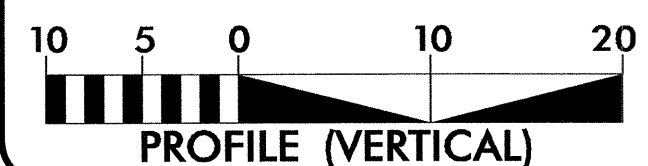
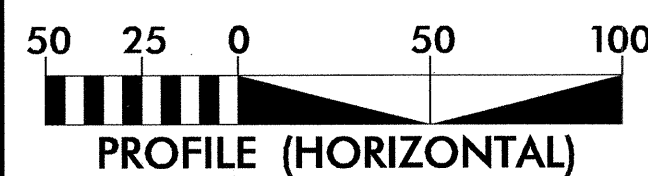
TO SR 1138



**SUB-REGIONAL TIER GUIDELINES
WERE USED ON THIS PROJECT.**

**THERE IS NO CONTROL OF ACCESS ON
THIS PROJECT.**

GRAPHIC SCALES



DESIGN DATA

ADT 2011 = 802
ADT 2030 = 1400
DHV = 13 %
D = 60 %
T = 3 % *
V = 60 MPH
* TTST 1 % DUAL 2%
FUNC CLASS = LOCAL

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4522 = 0.147 mi.
LENGTH OF STRUCTURE TIP PROJECT B-4522 = 0.044 mi.
TOTAL LENGTH OF TIP PROJECT B-4522 = 0.191 mi.

Prepared In the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2006 STANDARD SPECIFICATIONS

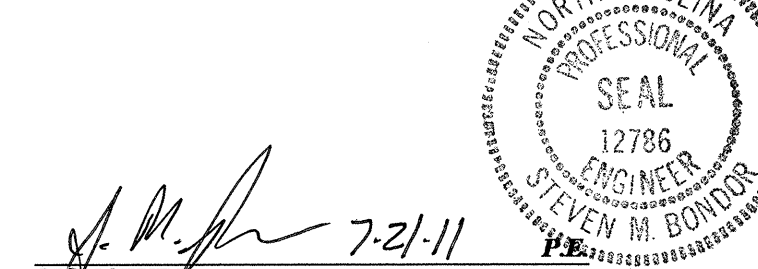
RIGHT OF WAY DATE:
OCTOBER 21, 2010

LETTING DATE:
OCTOBER 18, 2011

JIMMY GOODNIGHT, P.E.
PROJECT ENGINEER

MARK HUSSEY
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

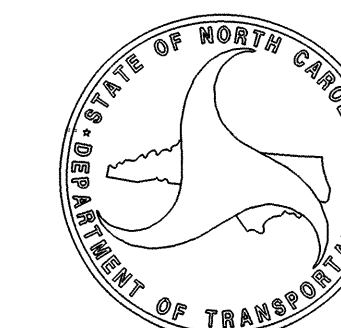


7-21-11

ROADWAY DESIGN ENGINEER

James S. Goodnight
7-20-11

**DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA**

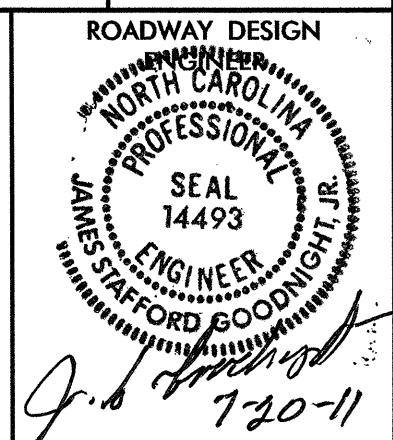


Art McMillan
STATE HIGHWAY DESIGN ENGINEER

TIP PROJECT: B-4522

CONTRACT: C202660

19-JUL-2011 13:25
P:\poc\dwg\p\01\1b4522_rdy_tsh.dgn
\$\$\$\$USERNAME\$\$\$\$



INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C	SURVEY CONTROL DATA SHEET
2	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
2A	DETAIL OF ROCK PLATING
2B THRU 2C	DETAIL OF METHOD OF PIPE INSTALLATION
2D	DETAIL OF SUB-REGIONAL BRIDGE APPROACH FILLS
2E	DETAIL OF ANCHORAGE OF FRAMES
3	SUMMARY OF QUANTITIES
3A	SUMMARY OF DRAINAGE QUANTITIES, SUMMARY OF GUARDRAIL, EARTHWORK SUMMARY, SHOULDER BERM GUTTER, AND ASPHALT PAVEMENT REMOVAL AND/OR BREAKING SUMMARY
4	PLAN SHEET
5	PROFILE SHEET
TMP-1 THRU TMP-3	TRAFFIC MANAGEMENT PLANS
PM-1 THRU PM-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
RF-1	REFORESTATION PLAN
SIGN-1 THRU SIGN-2	SIGNING PLANS
UD-1 THRU UD-2	UTILITIES BY OTHERS PLANS
X-1	EARTHWORK VOLUME SUMMARY SHEET
X-2 THRU X-15	CROSS-SECTIONS
S-1 THRU S-29	STRUCTURE PLANS

GENERAL NOTES: 2006 SPECIFICATIONS
EFFECTIVE: 07-18-06
REVISED: 07-30-08

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.

UNDERDRAINS:
UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.03 AT LOCATIONS DIRECTED BY THE ENGINEER.

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 Embark Telephone
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.

2006 ROADWAY ENGLISH STANDARD DRAWINGS

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:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.03	Pipe Underdrain and Blind Drain
840.00	Concrete Base Pad for Drainage Structures
840.13	Concrete Bridge Approach Drop Inlet - 12" thru 24" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.41	Spring Box - Concrete or Brick
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.01	Rip Rap in Channels
876.04	Drainage Ditches with Class 'B' Rip Rap

EFF. 07-18-06
REV. 01-02-07

8/17/99

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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

04/16/11

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	⑫③
Existing Fence Line	-----
Proposed Woven Wire Fence	-----
Proposed Chain Link Fence	-----
Proposed Barbed Wire Fence	-----
Existing Wetland Boundary	-----
Proposed Wetland Boundary	-----
Existing Endangered Animal Boundary	-----
Existing Endangered Plant Boundary	-----
Known Soil Contamination: Boundary or Site	☠
Potential Soil Contamination: Boundary or Site	☠

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	-----
Buffer Zone 1	-----
Buffer Zone 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	-----
Proposed Temporary Drainage Easement	-----
Proposed Permanent Drainage Easement	-----
Proposed Permanent Drainage / Utility Easement	-----
Proposed Permanent Utility Easement	-----
Proposed Temporary Utility Easement	-----
Proposed Aerial Utility Easement	-----
Proposed Permanent Easement with Iron Pin and Cap Marker	-----

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	-----
Proposed Slope Stakes Fill	-----
Proposed Curb Ramp	-----
Curb Cut Future Ramp	-----
Existing Metal Guardrail	-----
Proposed Guardrail	-----
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	-----
Bridge Wing Wall, Head Wall and End Wall	-----
MINOR:	
Head and End Wall	-----
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	-----
Paved Ditch Gutter	-----
Storm Sewer Manhole	-----
Storm Sewer	-----

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	-----
Designated U/G Power Line (S.U.E.*)	-----
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	-----
Designated U/G Telephone Cable (S.U.E.*)	-----
Recorded U/G Telephone Conduit	-----
Designated U/G Telephone Conduit (S.U.E.*)	-----
Recorded U/G Fiber Optics Cable	-----
Designated U/G Fiber Optics Cable (S.U.E.*)	-----

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	-----

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

Utility Pole	-----
Utility Pole with Base	-----
Utility Located Object	-----
Utility Traffic Signal Box	-----
Utility Unknown U/G Line	-----
U/G Tank; Water, Gas, Oil	-----
Underground Storage Tank, Approx. Loc.	-----
A/G Tank; Water, Gas, Oil	-----
Geoenvironmental Boring	-----
U/G Test Hole (S.U.E.*)	-----
Abandoned According to Utility Records	-----
End of Information	-----

11/25/2008 k.tg

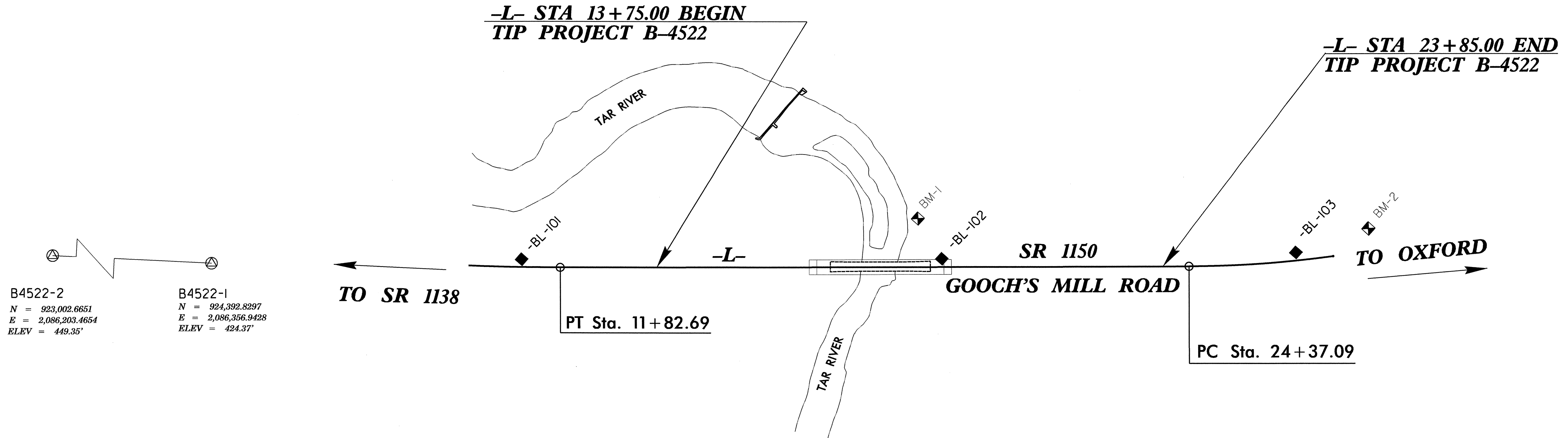
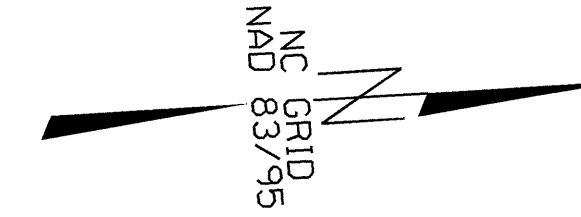
B-4522

PROJECT REFERENCE NO.	SHEET NO.
B-4522	1C
Location and Surveys	

SURVEY CONTROL SHEET B-4522

GRANVILLE COUNTY

**LOCATION: BRIDGE 102 OVER THE TAR RIVER
ON SR 1150 (GOOCH'S MILL ROAD)**



B4522-2
N = 923,002.6651
E = 2,086,203.4654
ELEV = 449.35'

B4522-1
N = 924,392.8297
E = 2,086,356.9428
ELEV = 424.37'

TYPE	STATION	NORTH	EAST
POT	10+00.00	924904.6460	2086391.5480
PC	10+38.02	924942.4945	2086395.1551
PT	11+82.69	925086.7283	2086406.2478
PC	24+37.09	926338.9803	2086479.5819
PT	27+09.90	926611.5929	2086477.7221
POT	27+25.61	926627.2621	2086476.5898

ROW MARKER CONCRETE OR GRANITE				
ALIGN	STATION	OFFSET	NORTH	EAST
L	16+40.00	80.00	925538.5814	2086512.8462
L	16+40.00	-80.00	925547.9353	2086353.1198
L	16+40.00	-30.77	925545.0570	2086402.2704
L	16+40.00	29.23	925541.5493	2086462.1678
L	20+00.00	80.00	925897.9657	2086533.8924
L	20+00.00	-80.00	925907.3196	2086374.1660
L	22+50.00	-30.37	926153.9905	2086438.3274
L	23+85.00	29.90	926285.2361	2086506.3860

PERMANENT EASEMENT				
ALIGN	STATION	OFFSET	NORTH	EAST
L	16+97.00	80.00	925595.4840	2086516.1785
L	17+24.00	99.00	925621.3270	2086536.7245
L	17+38.00	80.00	925636.4138	2086518.5765

BASELINE DATA

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
101	BL-101	925010.9950	2086385.1400	406.79	11+05.54	15.90 LT
102	BL-102	925847.4010	2086433.9680	400.36	19+43.68	16.80 LT
103	BL-103	926553.3600	2086464.8850	443.33	26+52.29	16.21 LT

BENCHMARK DATA

BM1	ELEVATION - 384.20	BM2	ELEVATION - 459.70
N 925805	E 2086352	N 926701	E 2086426
L STATION 18+96 96 LEFT		L STATION 27+26	
RR SPIKE SET IN 16' GUM		N 34° 17' 34.8" W DIST 89.05	
		RR SPIKE SET IN 14' OAK	

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "B4522-1"

WITH NAD 83/95 STATE PLANE GRID COORDINATES OF
NORTHING: 924,392.8297(±ft) EASTING: 2,086,356.9428(±ft)
ELEVATION: 424.37(±ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.00002004

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4522-1" TO -L- STATION 13+75 IS
N 3°54'35.8" E 887.95'

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

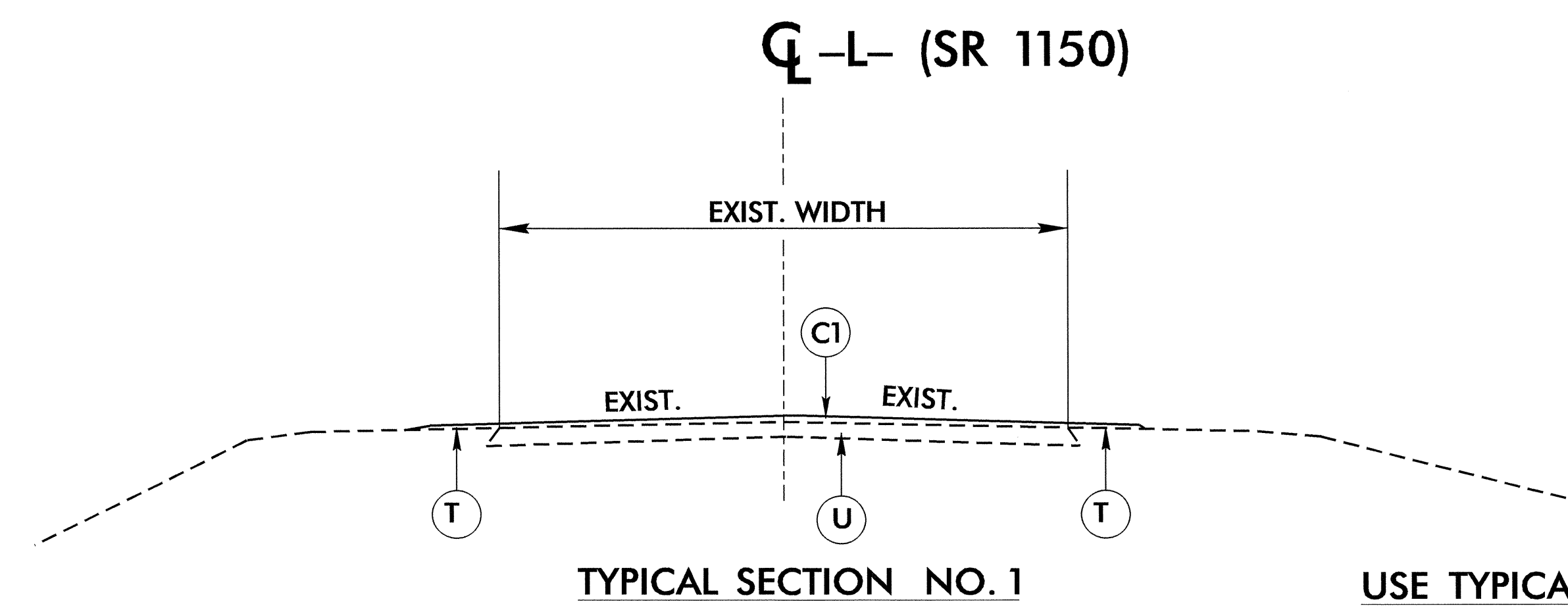
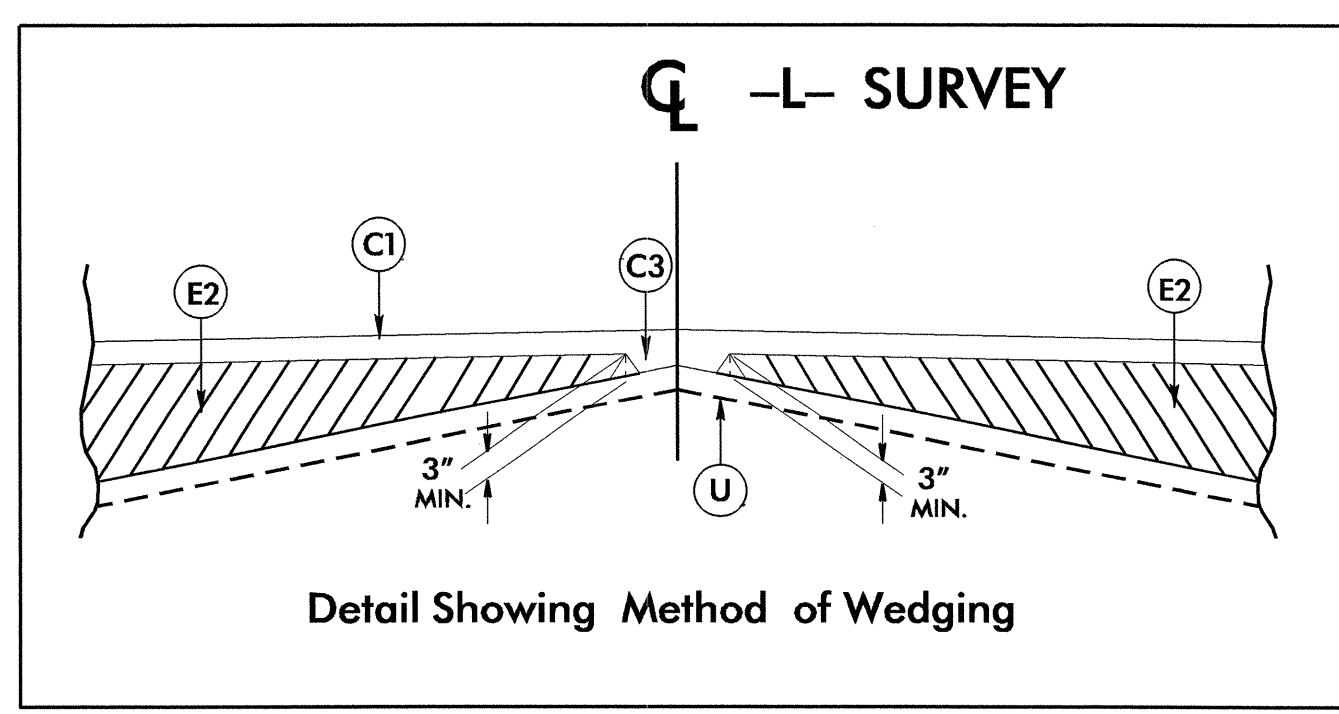
NOTES:

- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.NCDOT.ORG/DOH/RECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.org/DOH/RECONSTRUCT/HIGHWAY/LOCATION/PROJECT/)
THE FILES TO BE FOUND ARE AS FOLLOWS:
B4522_LS_CONTROL_081125.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 EXISTING HARN MONUMENTATION
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

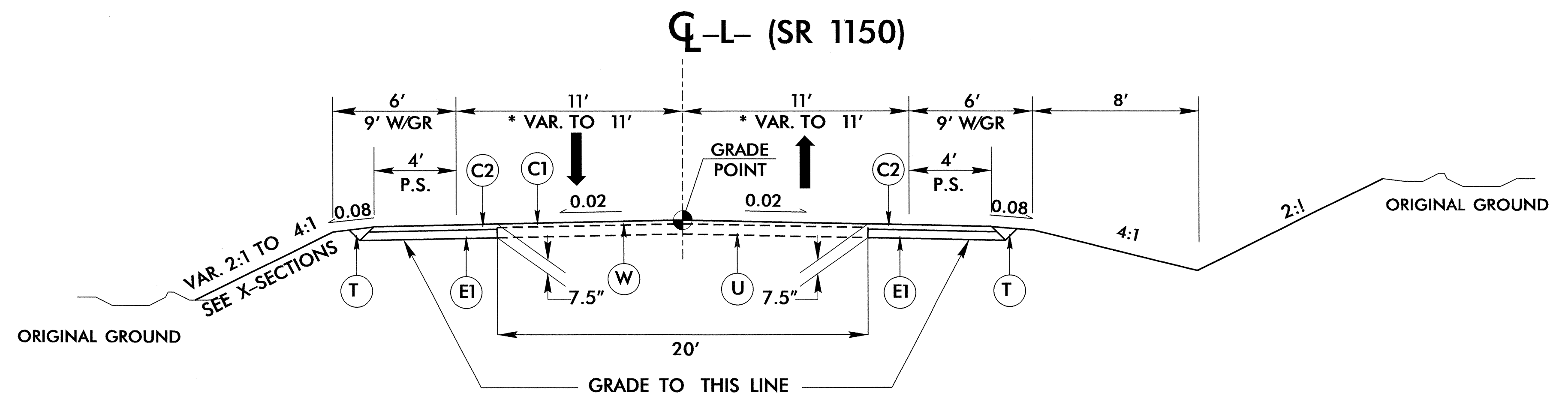
NOTE: DRAWING NOT TO SCALE

PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
C1	PROP. APPROX. 1 1/4" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD.
C2	PROP. APPROX. 2 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1 1/2" IN DEPTH.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 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 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL).

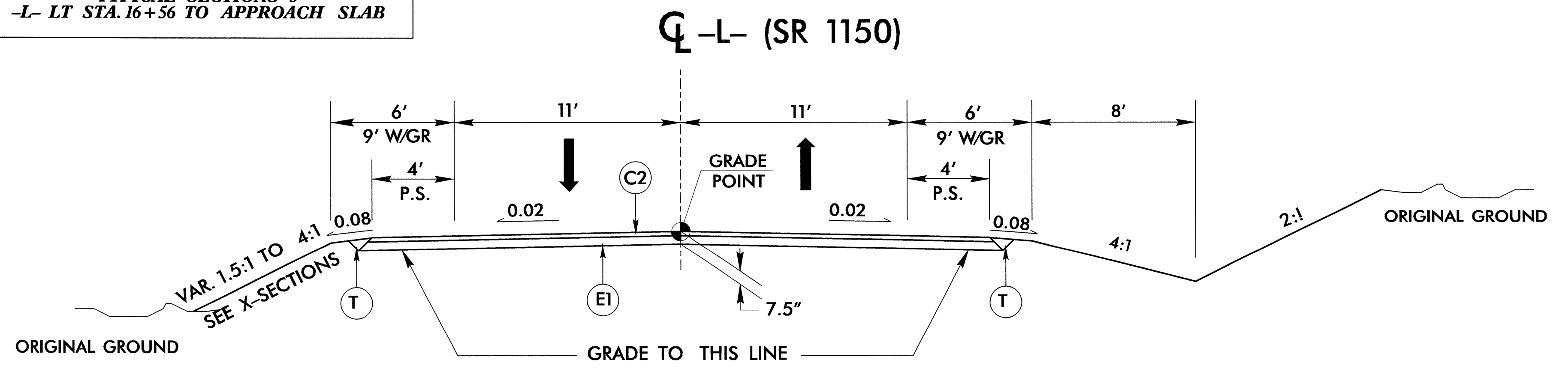
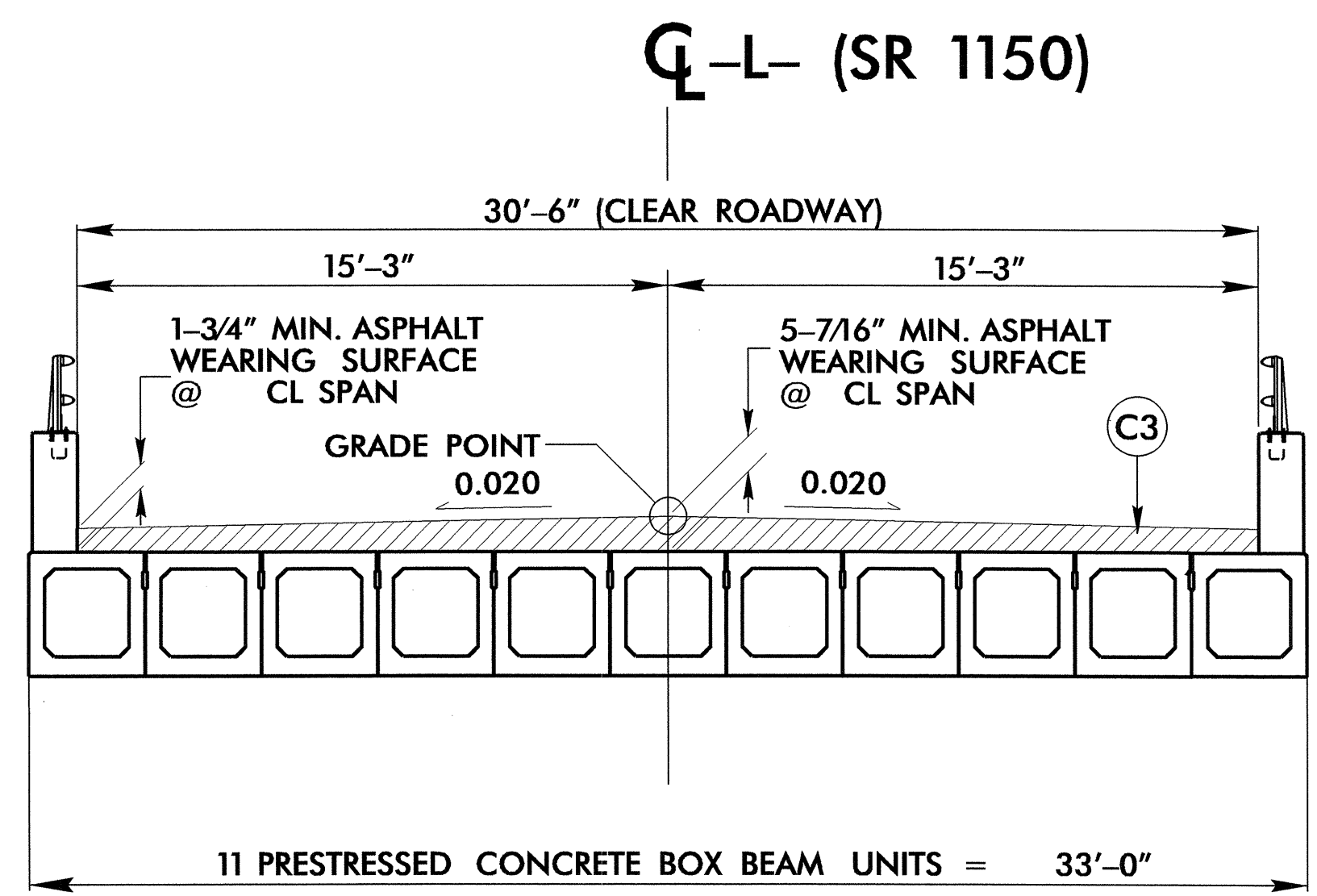
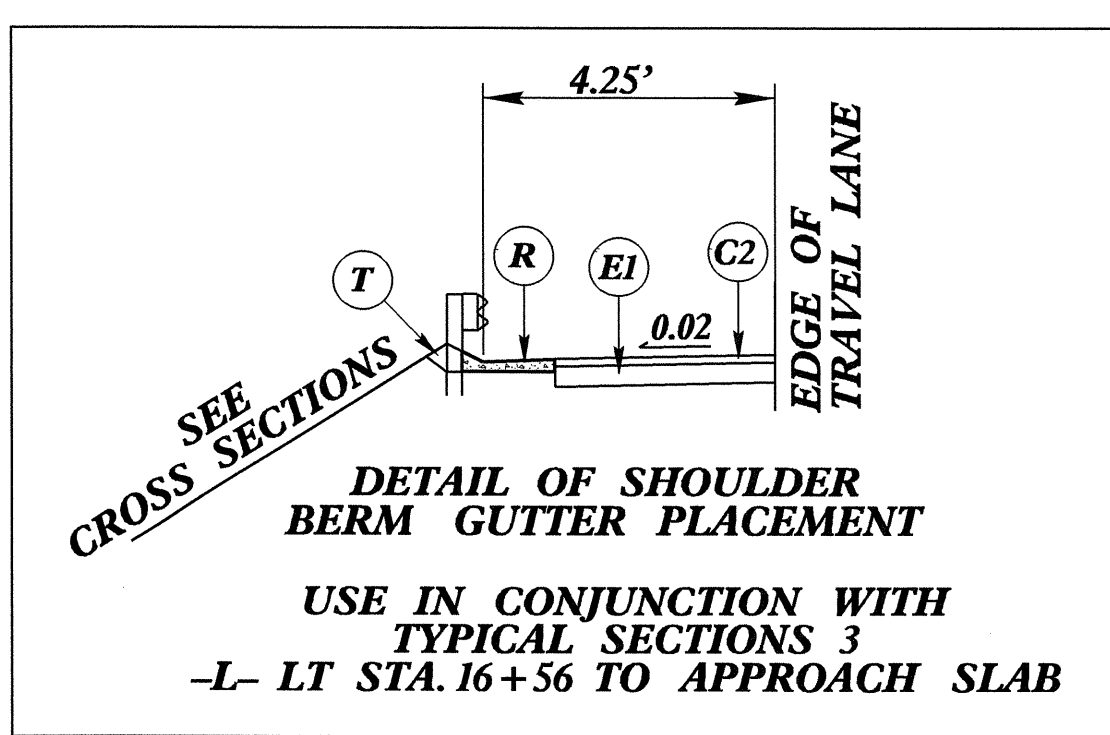
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



USE TYPICAL SECTION NO.1 AS FOLLOWS
 -L- STA. 13+75.00 TO 14+00.00
 -L- STA. 23+60.00 TO 23+85.00

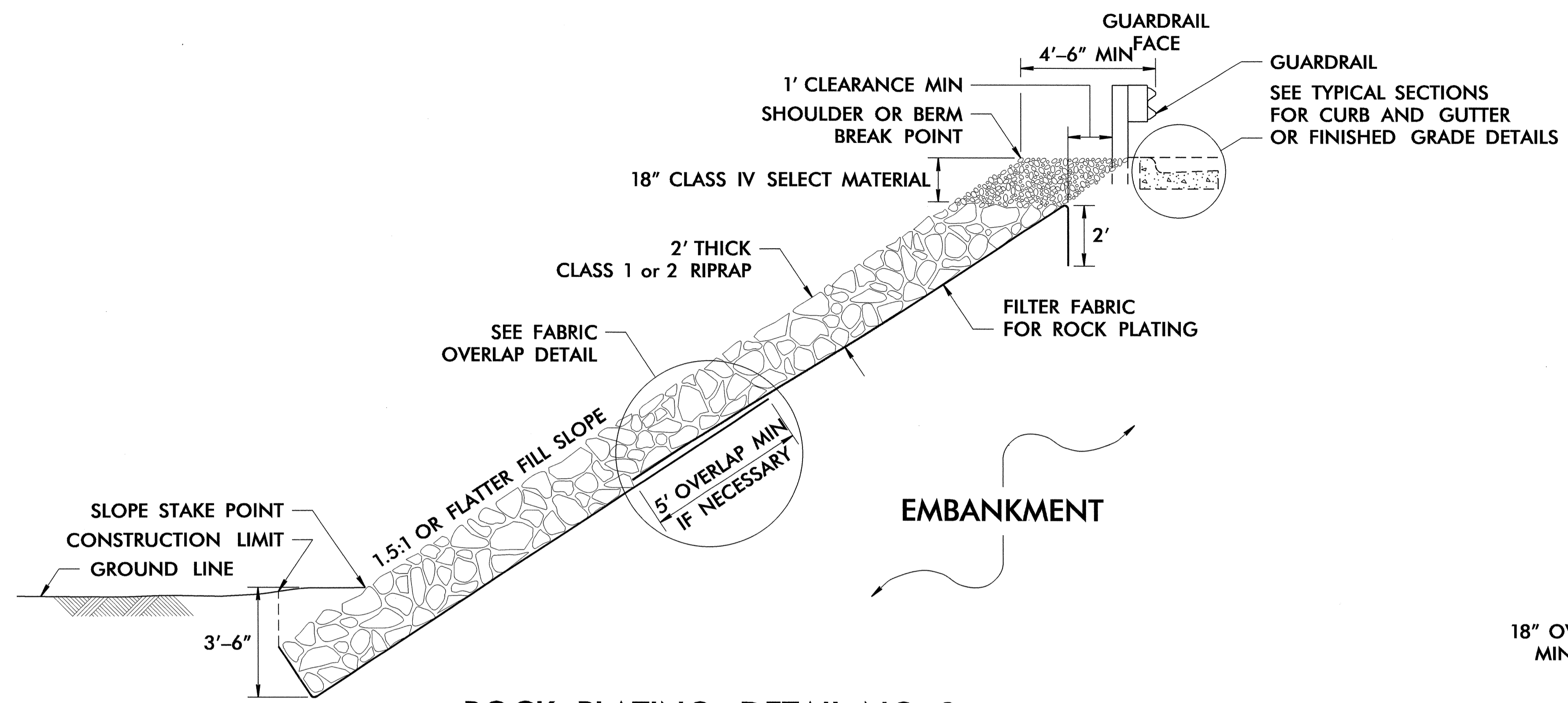


USE TYPICAL SECTION NO.2 AS FOLLOWS
 * STA. 14+00.00 TO 14+50.00
 -L- STA. 14+50.00 TO 16+40
 -L- STA. 22+50.00 TO STA. 23+10.00
 * STA. 23+10.00 TO 23+60.00



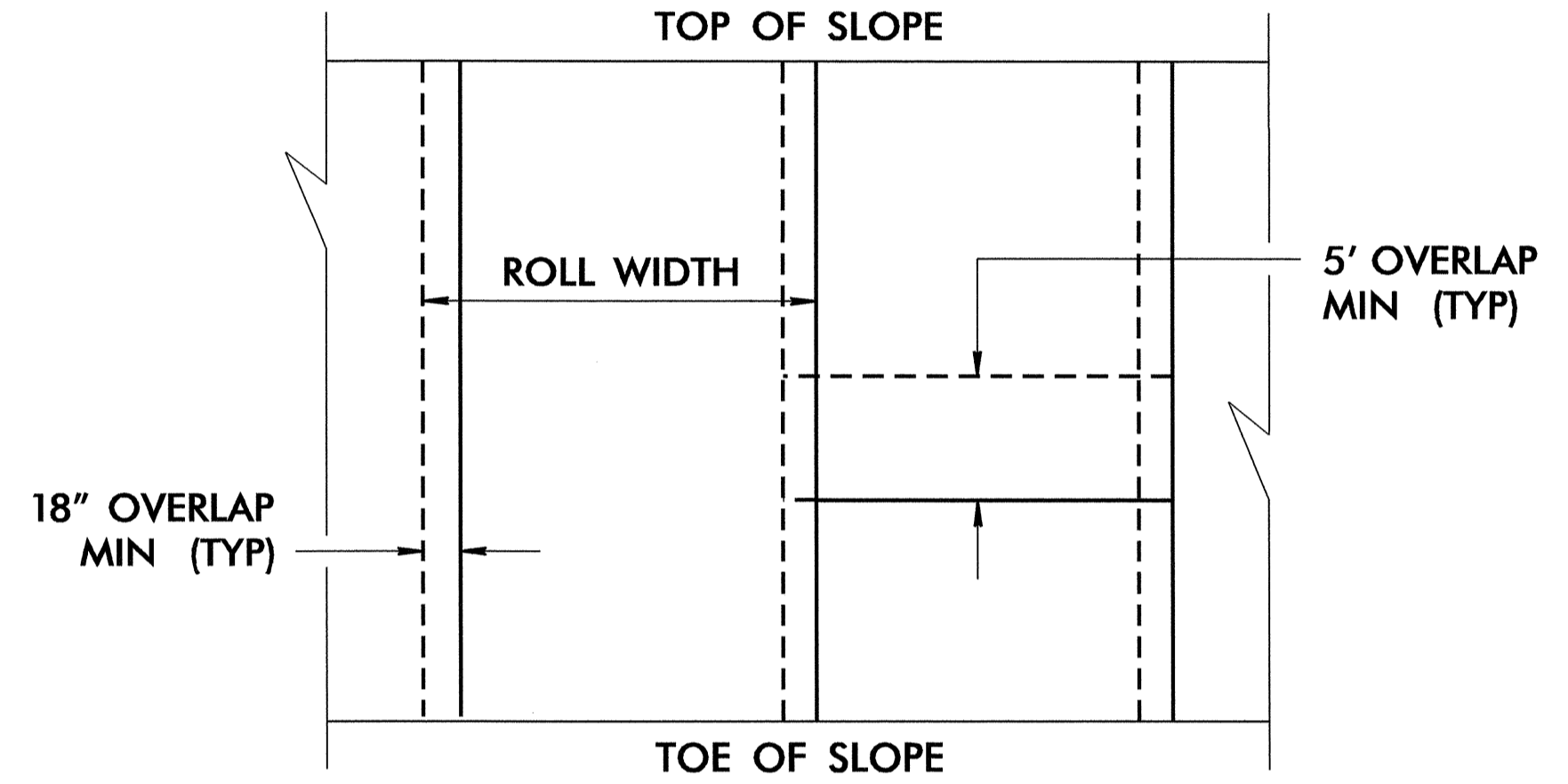
USE TYPICAL SECTION NO.3 AS FOLLOWS
 -L- STA. 16+40.00 TO BEG BRIDGE APP. STA. 16+90.70
 -L- END BRIDGE APP. STA. 19+42.70 TO STA. 22+50.00

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ROCK PLATING DETAIL NO. 2

USE ROCK PLATING DETAIL NO. 2
AT THE FOLLOWING LOCATIONS:
-L- STA 19+60 TO -L- STA 19+85
EXTEND ROCK PLATING LIMITS TO 2:1 SLOPES.
FOR ROCK PLATING,
SEE ROCK PLATING SPECIAL PROVISION.



**FABRIC OVERLAP DETAIL
(PLAN VIEW)**

<i>ESTIMATED QUANTITIES:</i>	
ROCK PLATING	----- 90 SQ. YD.

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 12/15/2008 AND SEALED BY A PROFESSIONAL ENGINEER, THEIN TUN ZAN, LICENSE #30943.

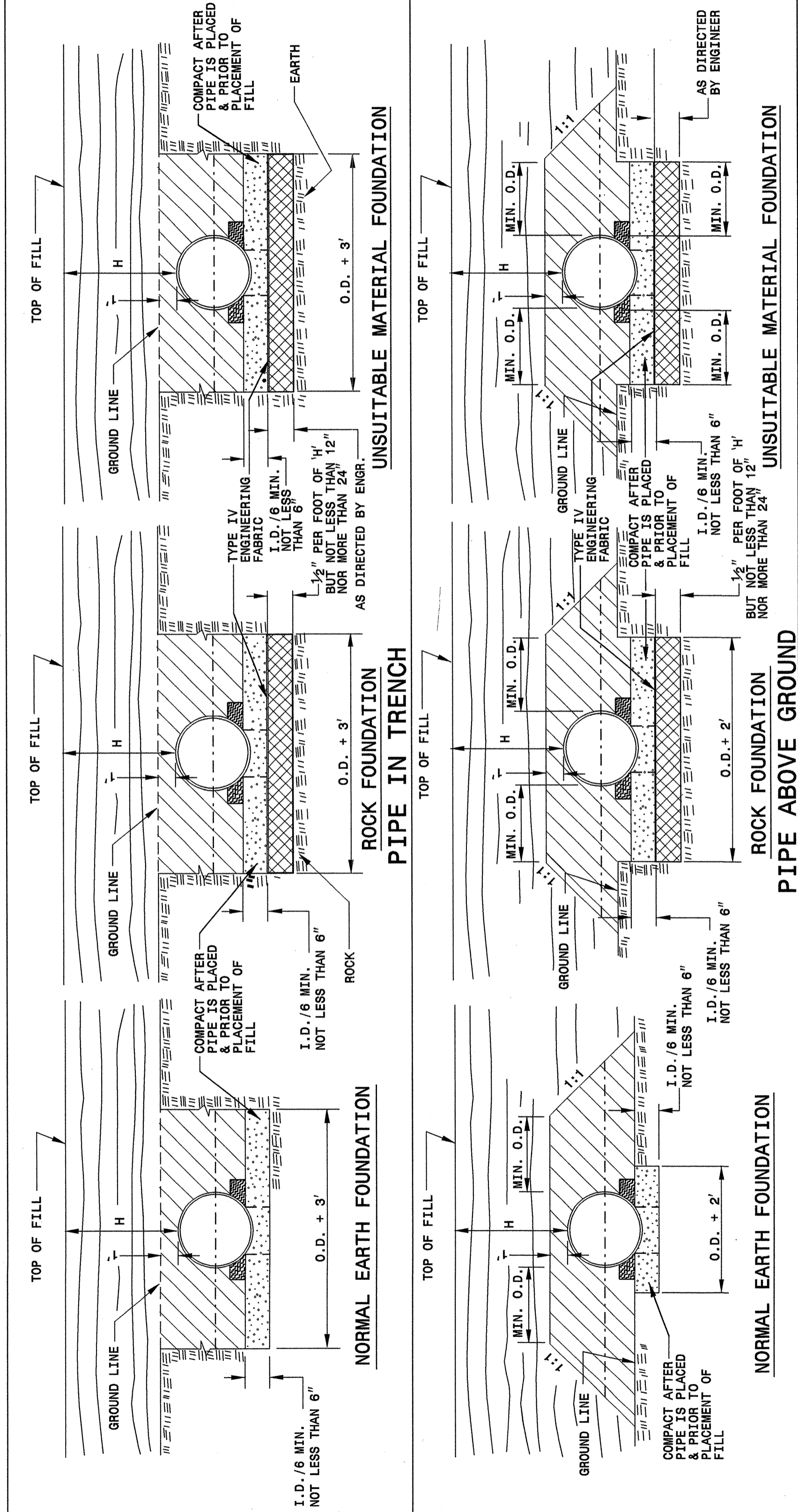
6/2/09
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STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.

7-06

ENGLISH DETAIL DRAWING FOR
 METHOD OF PIPE INSTALLATION

FLEXIBLE PIPE



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

7-06

ENGLISH DETAIL DRAWING FOR
 METHOD OF PIPE INSTALLATION

FLEXIBLE PIPE

SHEET 1 OF 3
300D01

GENERAL NOTES:
 I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.
 O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.
 H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.
 TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.
 LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 DIRECTLY BENEATH PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.
 SPRINGLINE OF PIPE
 SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE 1 ABOVE AND BELOW SPRINGLINE.
 APPROVED SUITABLE LOCAL MATERIAL.
 UNDISTURBED EARTH MATERIAL
 SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.

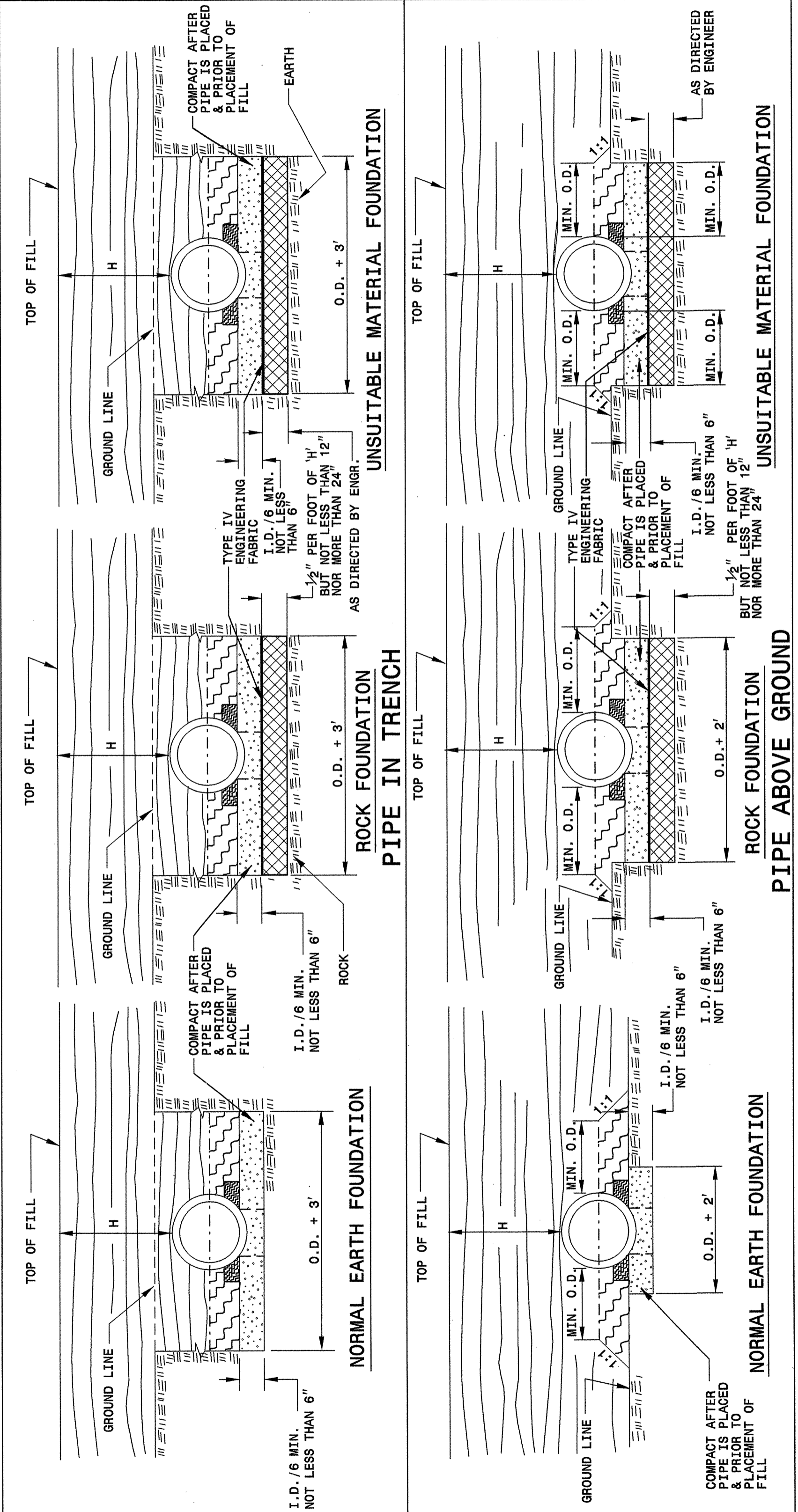
SHEET 1 OF 3
300D01

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

7-06

ENGLISH DETAIL DRAWING FOR
 METHOD OF PIPE INSTALLATION

RIGID PIPE



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

7-06

ENGLISH DETAIL DRAWING FOR
 METHOD OF PIPE INSTALLATION

RIGID PIPE

SHEET 2 OF 3
300D01

GENERAL NOTES:
 I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.
 O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.
 H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.
 TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.
 LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 DIRECTLY BENEATH PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

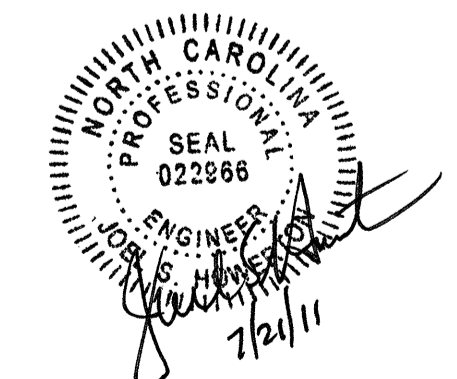
DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.
 SPRINGLINE OF PIPE
 SELECT BACKFILL MATERIAL CLASS III OR CLASS II, BELOW SPRINGLINE.
 APPROVED SUITABLE LOCAL MATERIAL ABOVE SPRINGLINE.
 UNDISTURBED EARTH MATERIAL
 SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.

SHEET 2 OF 3
300D01

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

SEE PLATE FOR TITLE

ORIGINAL BY: KKempf DATE: 5-15-09
 MODIFIED BY: KKempf DATE: 5-15-09



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

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION

FILL HEIGHT TABLES

SHEET 3 OF 3
300D01

FLEXIBLE PIPE

Round Corrugated Steel Pipe
 2 2/3 x 1/2 corrugation **

Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet)				
		16 (Ga)	14	12	10	8
12	12	204	256			
15	12	162	204			
18	12	135	169	239		
21	12	115	145	204		
24	12	100	126	178		
30	12	79	100	142		
36	12	65	83	117	152	
42	12	55	70	100	130	160
48	12	48	61	87	113	139
54	12		54	77	100	123
60	12			69	90	111
66	12				81	100
72	12				74	
78	12				81	
84	12				69	

Round Corrugated Aluminum Pipe
 2 2/3 x 1/2 corrugation **

Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet)				
		16 (Ga)	14	12	10	8
12	12	123	155	218	281	344
15	12	98	123	174	224	275
18	12	81	102	144	187	228
21	12	69	87	123	160	195
24	12	60	76	108	139	171
27	12		67	95	123	151
30	12		60	85	111	136
36	12		50	71	92	113
42	12			60	78	96
48	12			52	68	84
54	12			46	50	74
60	12				50	62
66	12				51	51
72	12				41	

** FOR DIFFERENT CORRUGATIONS AND ARCH PIPES REFER TO ROADWAY DESIGN MANUAL OR MANUFACTURERS SPECIFICATION.

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

- CSP - AASHTO M36
- CAAP - AASHTO M196
- HDPE - AASHTO M294
- PVC - ASTM F949 or AASHTO M304

NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS
 1' MINIMUM COVER FOR ALL SIDE DRAIN PIPE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

RIGID PIPE

RCP - * (Minimum fill) 1' for Class IV & CLASS V
 2' for Class III & Class II

- * (Maximum fill) 10' - Class II pipe
- 20' - Class III pipe
- 30' - Class IV pipe
- 40' - Class V pipe

(For fills > 40' & < 80' use LRFD Direct Design Method)

* FILL HEIGHT IS MEASURED FROM THE TOP OF THE PIPE TO THE BOTTOM OF THE PAVEMENT STRUCTURE

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

- RCP - AASHTO M170

NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS
 1' MINIMUM COVER FOR ALL SIDE DRAIN PIPE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

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

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION

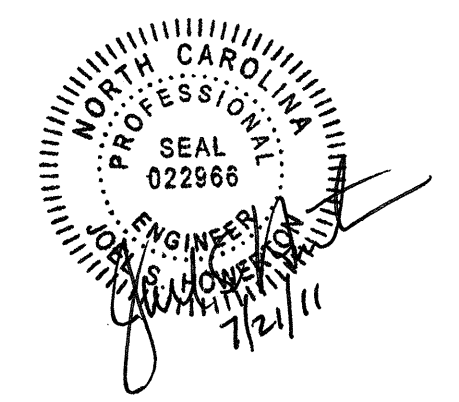
FILL HEIGHT TABLES

SHEET 3 OF 3
300D01

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

SEE PLATE FOR TITLE

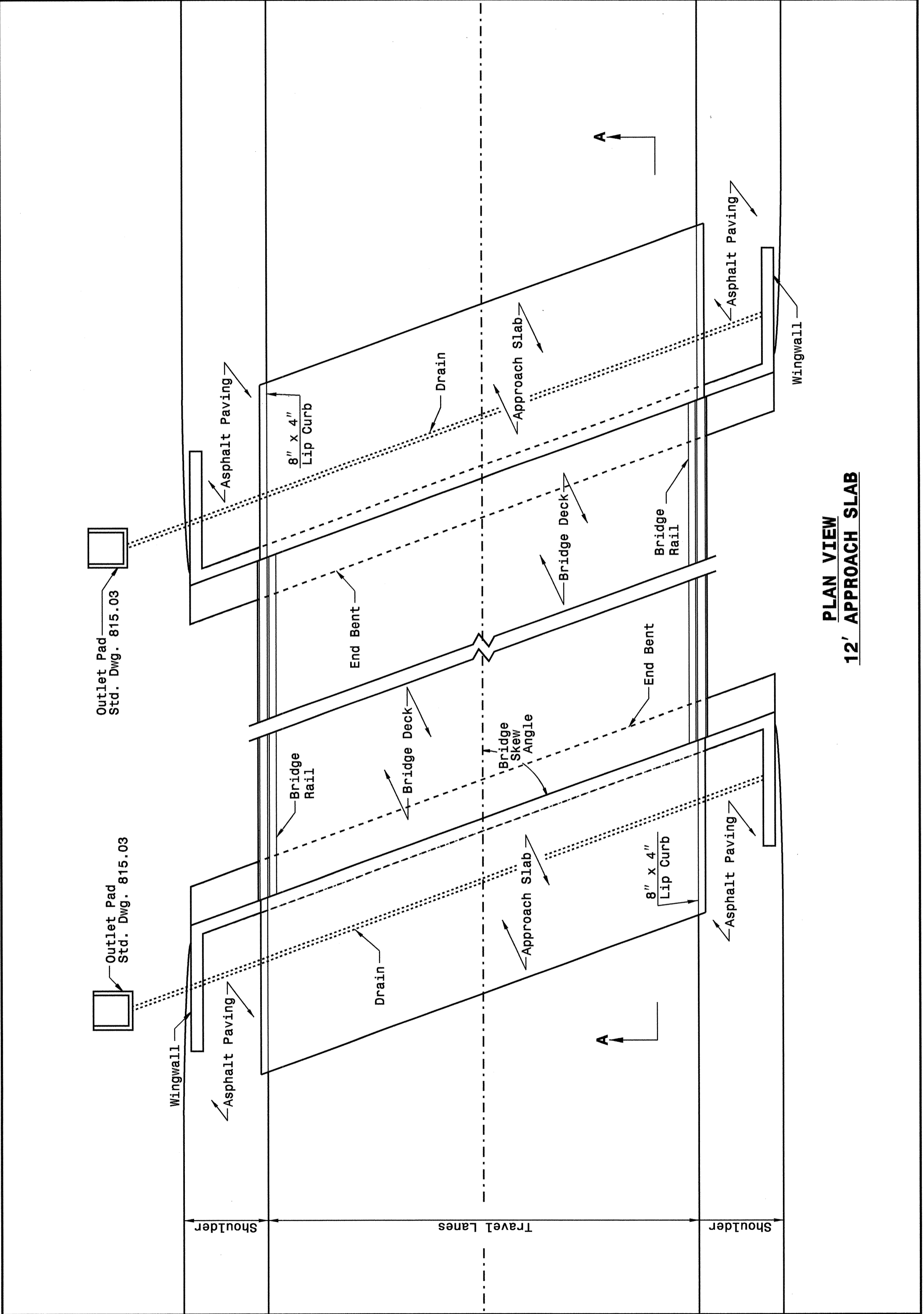
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STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
BRIDGE APPROACH FILLS
SUB REGIONAL TIER

SHEET 1 OF 2
422D11



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

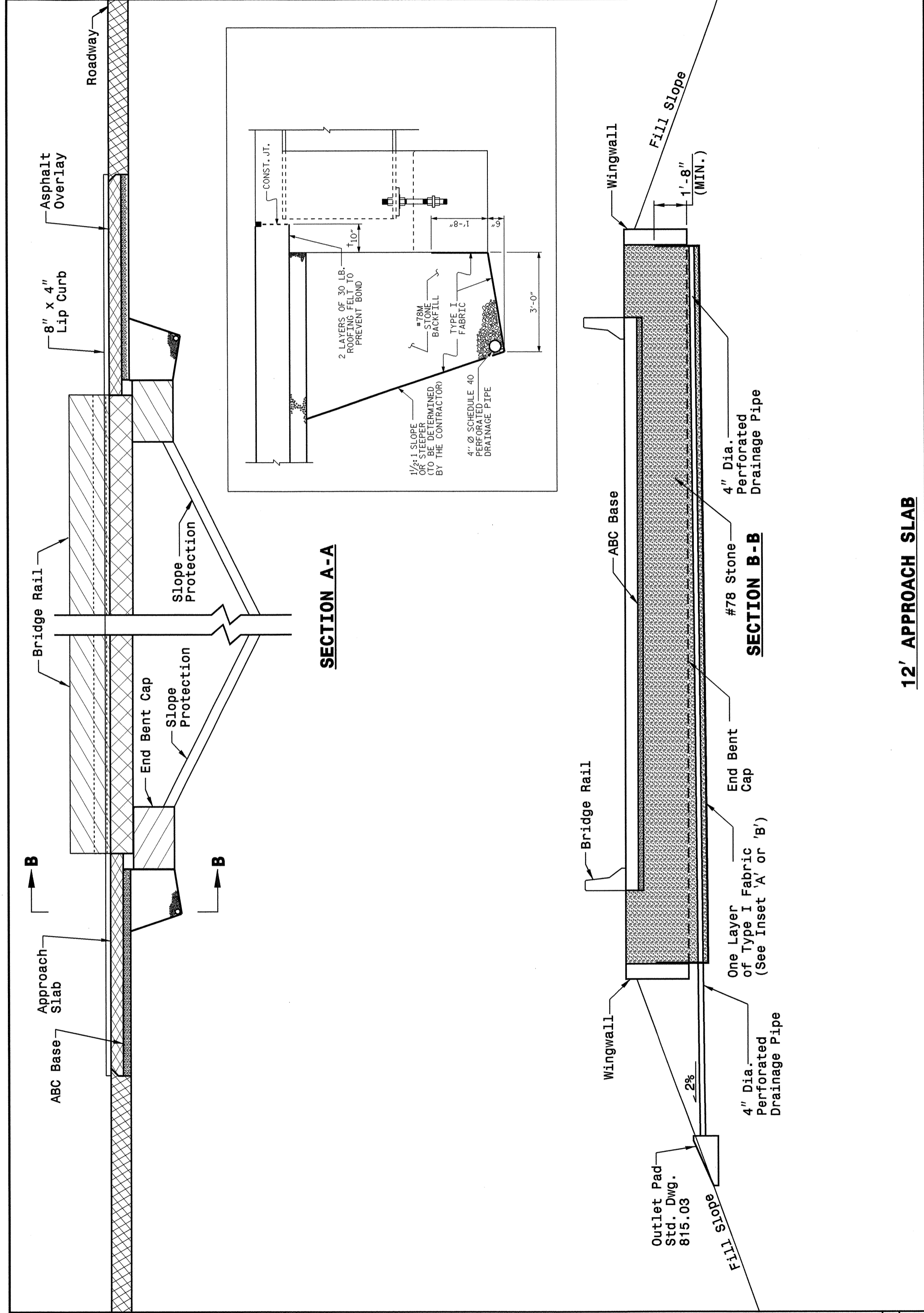
ENGLISH DETAIL DRAWING FOR
BRIDGE APPROACH FILLS
SUB REGIONAL TIER

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
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
SUB REGIONAL TIER

SHEET 2 OF 2
422D11



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

BRIDGE APPROACH FILLS
SUB REGIONAL TIER

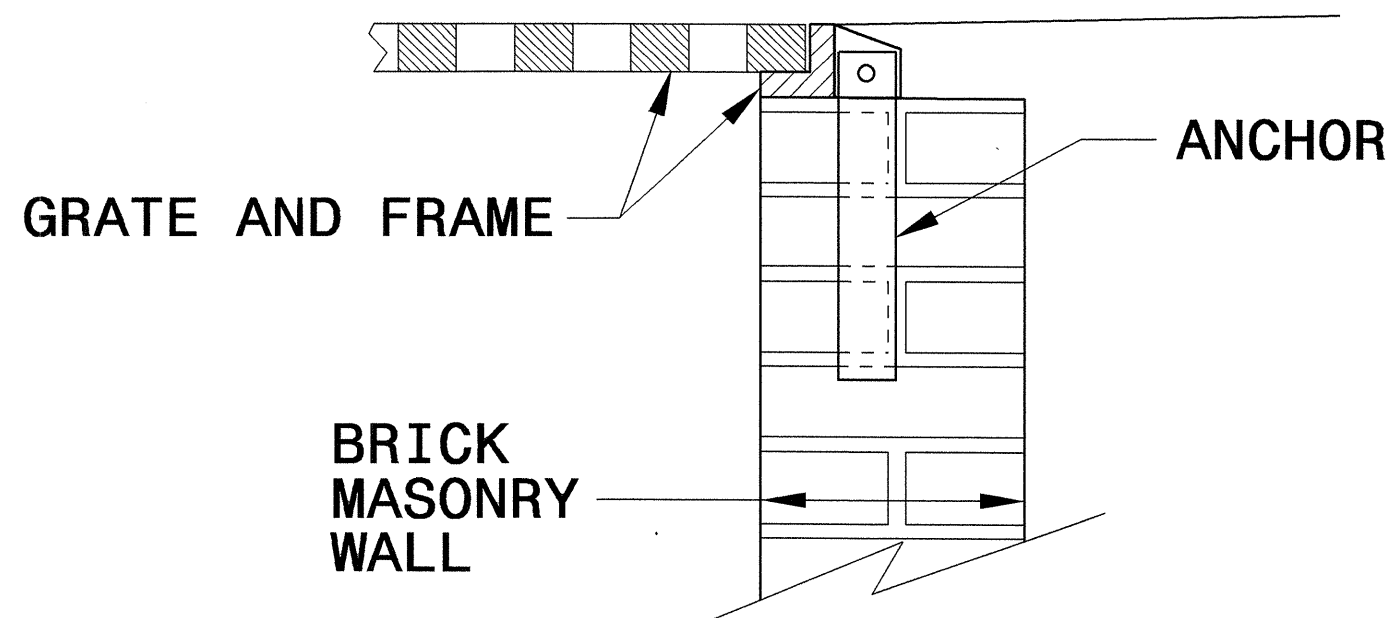
ORIGINAL BY: K. A. Kempf DATE: 6-10-08
MODIFIED BY: DATE:
CHECKED BY: DATE:

JAN-2010 09:33
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\$\$\$\$\$USERNAME\$\$\$\$\$

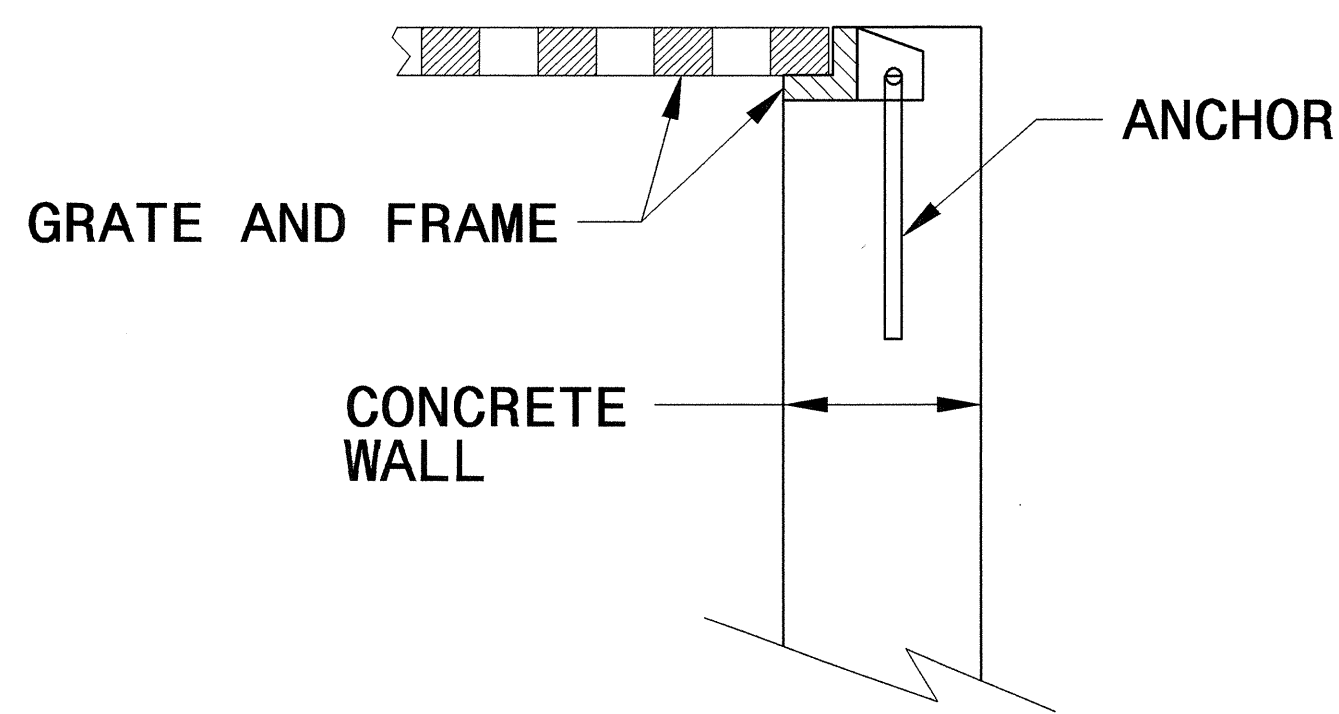
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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

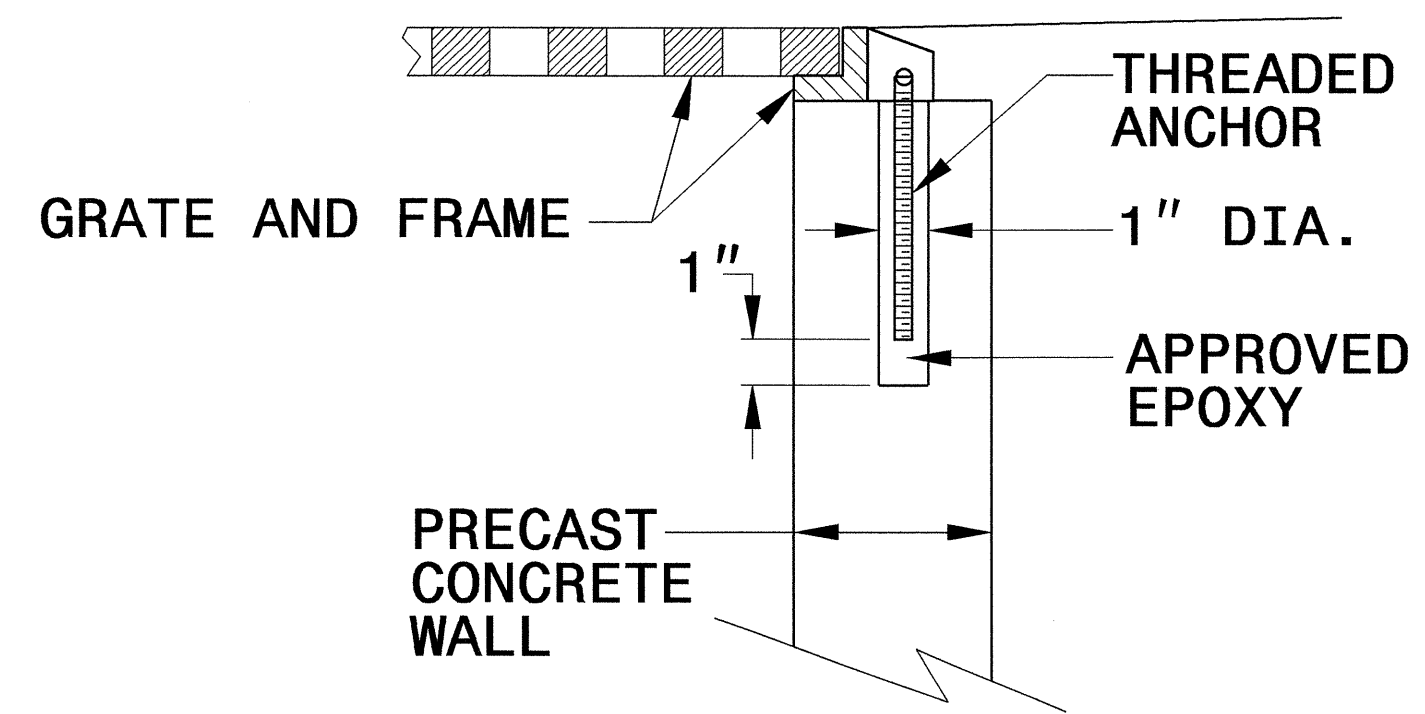
SHEET 1 OF 1
840D25



BRICK MASONRY CONSTRUCTION



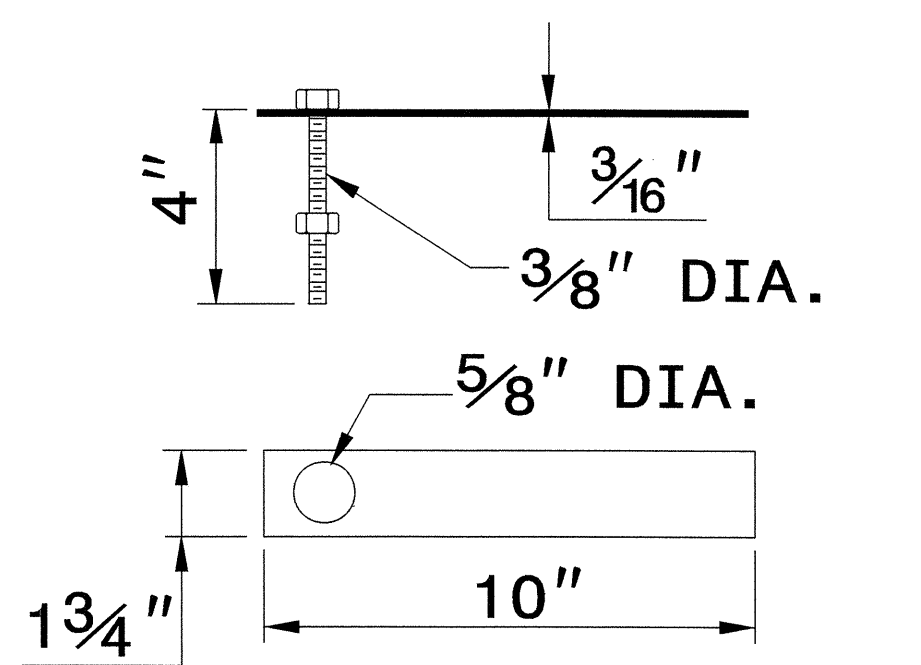
CONCRETE CONSTRUCTION



PRECAST CONCRETE CONSTRUCTION

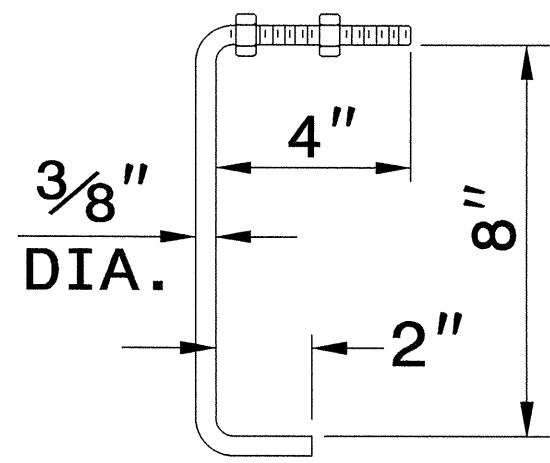
DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

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



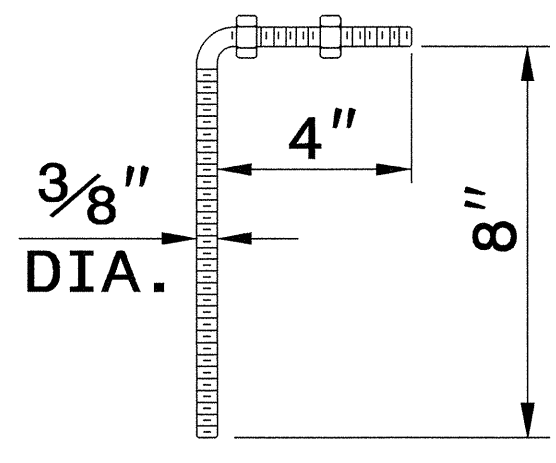
MASONRY ANCHOR

3/8" DIA. BOLT WITH PLATE



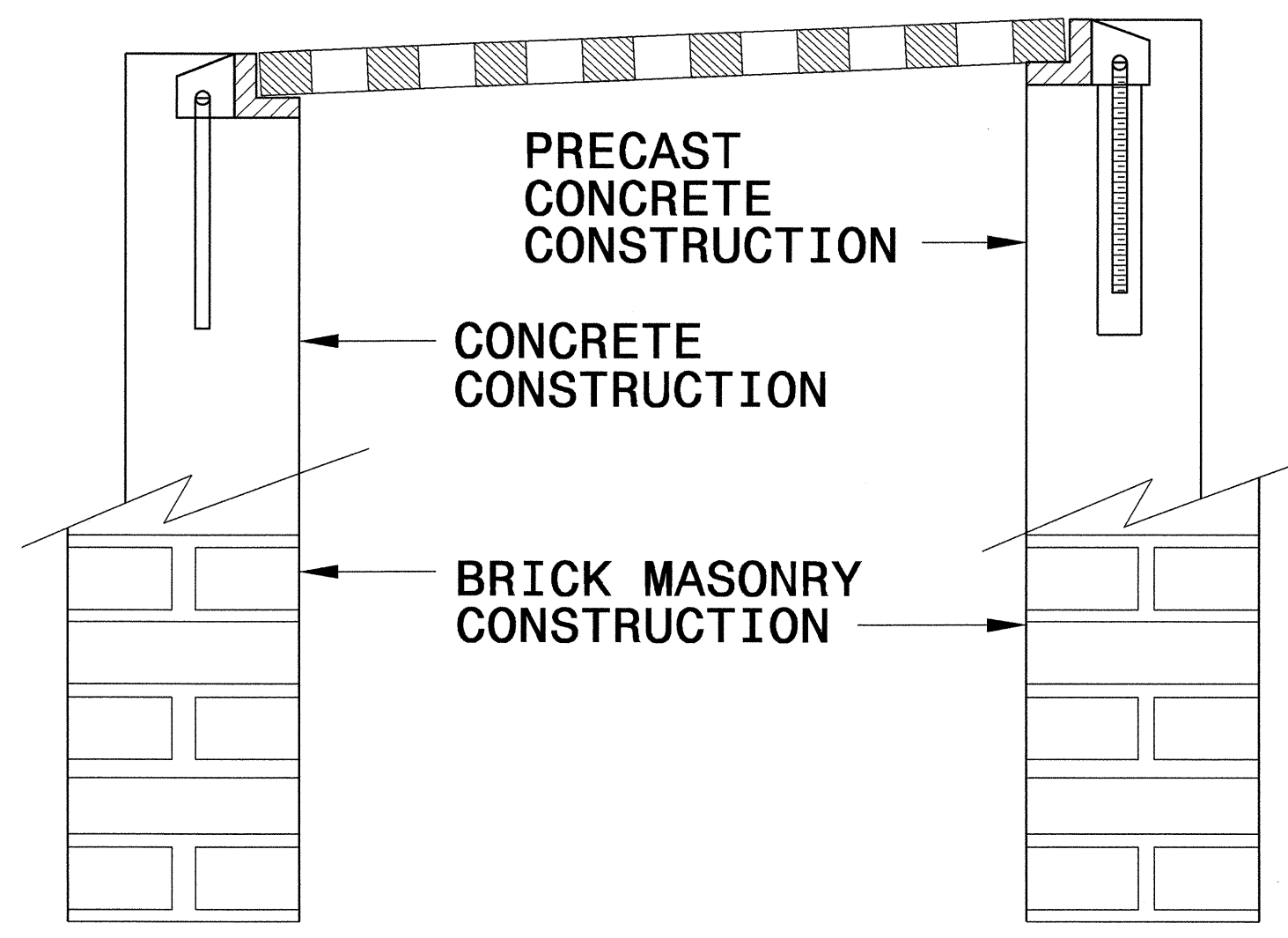
CONCRETE ANCHOR

3/8" DIA. BENT BAR



PRECAST CONCRETE ANCHOR

3/8" DIA. BENT BAR



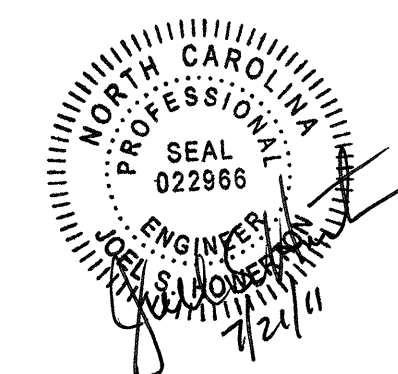
FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS

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

SYSTEMS
CUSTOMER SERVICE



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: _____

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202660

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0030000000-N	SP	Lump Sum		BRIDGE APPROACH FILL - SUB REGIONAL TIER, STATION ***** (18+16.70-L-)
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING
0057000000-E	226	450	CY	UNDERCUT EXCAVATION
0063000000-N	SP	Lump Sum		GRADING
0106000000-E	230	3,830	CY	BORROW EXCAVATION
0134000000-E	240	530	CY	DRAINAGE DITCH EXCAVATION
0195000000-E	SP	450	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	650	SY	FABRIC FOR SOIL STABILIZATION
0223000000-E	SP	90	SY	ROCK PLATING
0318000000-E	SP	20	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS
0320000000-E	SP	40	SY	FOUNDATION CONDITIONING FABRIC
0335200000-E	SP	72	LF	15" DRAINAGE PIPE
0582000000-E	SP	36	LF	15" CS PIPE CULVERTS, 0.064" THICK
0636000000-E	SP	2	EA	*** CS PIPE ELBOWS, ***** THICK (15", 0.064")
0986000000-E	SP	50	LF	GENERIC PIPE ITEM 4" PVC PIPE
1220000000-E	545	80	TON	INCIDENTAL STONE BASE
1489000000-E	610	585	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1525000000-E	610	545	TON	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A
1575000000-E	SP	65	TON	ASPHALT BINDER FOR PLANT MIX
2000000000-N	806	8	EA	RIGHT OF WAY MARKERS
2022000000-E	SP	16.8	CY	SUBDRAIN EXCAVATION
2033000000-E	SP	12.6	CY	SUBDRAIN FINE AGGREGATE
2044000000-E	SP	75	LF	6" PERFORATED SUBDRAIN PIPE
2070000000-N	SP	1	EA	SUBDRAIN PIPE OUTLETS

ItemNumber	Sec #	Quantity	Unit	Description
2077000000-E	SP	6	LF	6" OUTLET PIPE (SUBDRAINS)
2286000000-N	840	4	EA	MASONRY DRAINAGE STRUCTURES
2367000000-N	840	3	EA	FRAME WITH TWO GRATES, STD 840.29
2556000000-E	846	40	LF	SHOULDER BERM GUTTER
3030000000-E	862	425	LF	STEEL BM GUARDRAIL
3150000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS
3215000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE III
3270000000-N	SP	4	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3360000000-E	863	760	LF	REMOVE EXISTING GUARDRAIL
3635000000-E	876	230	TON	RIP RAP, CLASS II
3649000000-E	876	360	TON	RIP RAP, CLASS B
3656000000-E	876	2,255	SY	FILTER FABRIC FOR DRAINAGE
3659000000-N	SP	1	EA	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON
4072000000-E	903	61	LF	SUPPORTS, 3-LB STEEL U-CHANNEL
4096000000-N	904	2	EA	SIGN ERECTION, TYPE D
4155000000-N	907	10	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4400000000-E	1110	278	SF	WORK ZONE SIGNS (STATIONARY)
4410000000-E	1110	144	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4445000000-E	1145	112	LF	BARRICADES (TYPE III)
4810000000-E	1205	8,080	LF	PAINT PAVEMENT MARKING LINES (4")
6000000000-E	1605	1,450	LF	TEMPORARY SILT FENCE
6006000000-E	1610	225	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	450	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	490	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	2.5	ACR	TEMPORARY MULCHING
6018000000-E	1620	100	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	2.5	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	250	LF	TEMPORARY SLOPE DRAINS
6027000000-N	1622	4	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
6029000000-E	SP	700	LF	SAFETY FENCE
6030000000-E	1630	700	CY	SILT EXCAVATION
6036000000-E	1631	8,600	SY	MATTING FOR EROSION CONTROL
6037000000-E	SP	500	SY	COIR FIBER MAT
6042000000-E	1632	520	LF	1/4" HARDWARE CLOTH
6070000000-N	SP	12	EA	SPECIAL STILLING BASINS
6071020000-E	SP	110	LB	POLYACRYLAMIDE (PAM)
6071030000-E	SP	300	LF	COIR FIBER BAFFLE
6071050000-E	SP	5	EA	*** SKIMMER (1-1/2")
6084000000-E	1660	2.5	ACR	SEEDING & MULCHING
6087000000-E	1660	2.5	ACR	MOWING
6090000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	75	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	1.75	TON	FERTILIZER TOPDRESSING
6114500000-N	SP	10	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	25	EA	RESPONSE FOR EROSION CONTROL
6123000000-E	1670	0.5	ACR	REFORESTATION
6141000000-E	SP	60	SY	GENERIC EROSION CONTROL ITEM LIVE STAKING

4/04/06

COMPUTED BY: M.R. HUSSEY DATE: 3/02/09
CHECKED BY: J. JOHNSON DATE: 6/12/01

PROJECT REFERENCE NO. B-4522
SHEET NO. 3-A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUB-REGIONAL TIER GUIDELINES

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

NOTE: Invert Elevations are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".

Main table with columns for STATION, LOCATION, STRUCTURE NO., DRAINAGE PIPE, C.S. PIPE, R.C. PIPE (CLASS III), R.C. PIPE (CLASS IV), ENDWALLS, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES AND HOOD STANDARD 840.03, CONCRETE TRANSITIONAL SECTION, CORR. STEEL ELBOWS, PIPE REMOVAL LIN.FT., and REMARKS.

GUARDRAIL SUMMARY

Table with columns for SURVEY LINE, BEG. STA., END STA., LOCATION, LENGTH (STRAIGHT, SHOP CURVED, DOUBLE FACED), WARRANT POINT (APPROACH END, TRAILING END), "N" DIST. FROM E.O.L., TOTAL SHOULDER WIDTH, FLARE LENGTH (APPROACH END, TRAILING END), W (APPROACH END, TRAILING END), ANCHORS (TYPE 350, TYPE III), IMPACT ATTENUATOR TYPE 350 (NO., G., NG.), REMOVE EXISTING GUARDRAIL, and REMARKS.

SUMMARY OF PAVEMENT REMOVAL/BREAKING IN SQUARE YARDS

Table with columns for STATION TO STATION, PAVEMENT REMOVAL (LENGTH, WIDTH, SQUARE YARDS), and PAVEMENT BREAKING (LENGTH, WIDTH, SQUARE YARDS).

SUMMARY OF EARTHWORK IN CUBIC YARDS

Table with columns for LOCATION, UNCLASSIFIED EXCAVATION, UNDERCUT, EMBT + %, BORROW, and WASTE.

SHOULDER BERM GUTTER SUMMARY

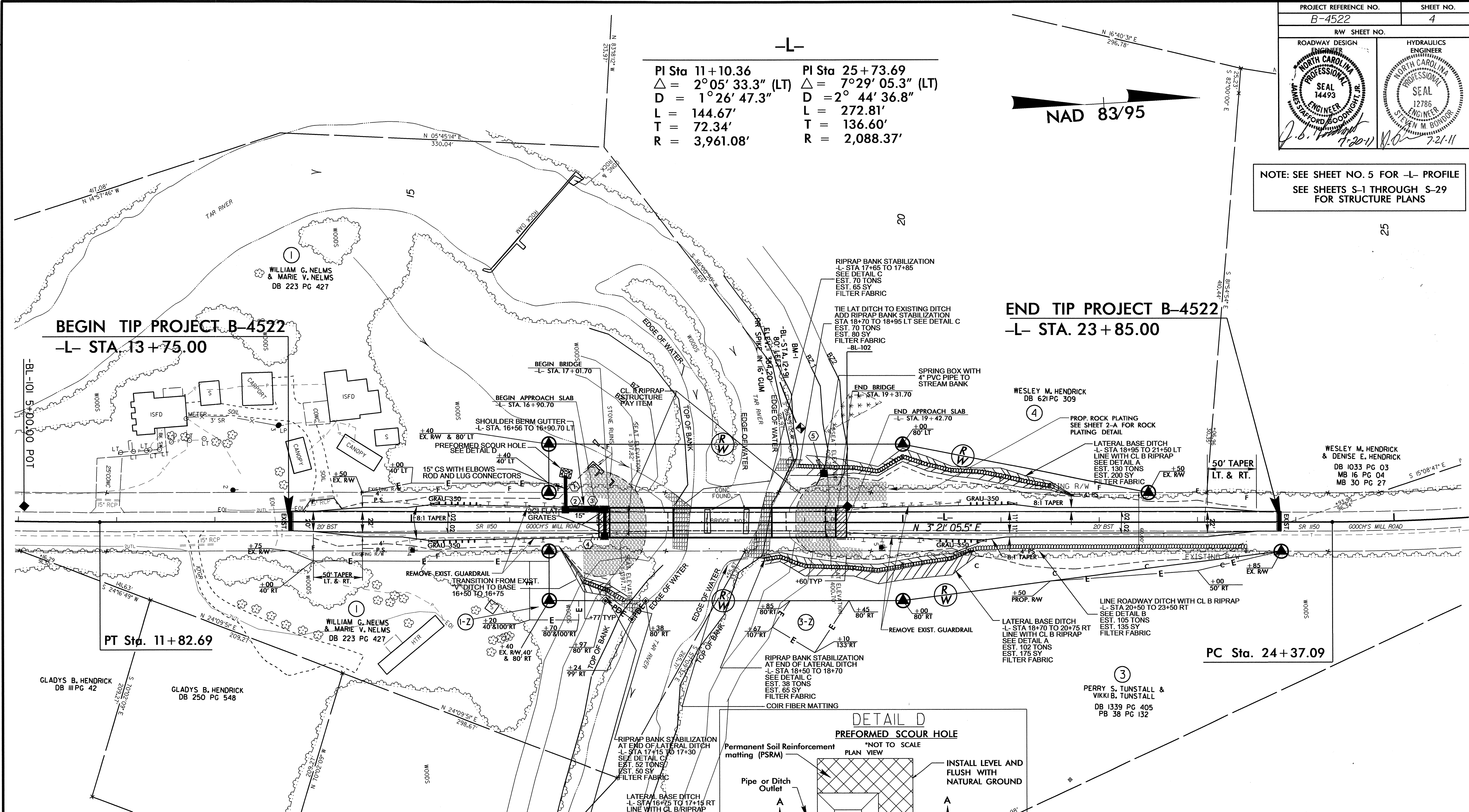
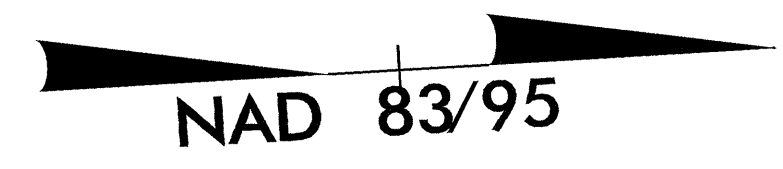
Table with columns for SURVEY LINE, STATION, STATION, LENGTH, and SAY.

GEOTECH REC'S dated December 15, 2008
UNDERCUT = 450 CY
FABRIC for SOIL STABILIZATION = 450 SY
UNDERDRAINS = 75 LF
SELECT GRANULAR MATERIAL = 450 CY
EST DDE = 530 CY
NOTE: APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, FINE GRADING, CLEARING AND GRUBBING, PAVEMENT REMOVAL AND BREAKING OF EXISTING PAVEMENT WILL BE PAID FOR AT THE LUMP SUM PRICE OF GRADING.
NOTE: EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL UNIT.

22-JUL-2011 09:29
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NOTE: SEE SHEET NO. 5 FOR -L- PROFILE
SEE SHEETS S-1 THROUGH S-29 FOR STRUCTURE PLANS

-L-
 PI Sta 11+10.36 PI Sta 25+73.69
 $\Delta = 2^{\circ}05'33.3''$ (LT) $\Delta = 7^{\circ}29'05.3''$ (LT)
 $D = 1^{\circ}26'47.3''$ $D = 2^{\circ}44'36.8''$
 $L = 144.67'$ $L = 272.81'$
 $T = 72.34'$ $T = 136.60'$
 $R = 3,961.08'$ $R = 2,088.37'$

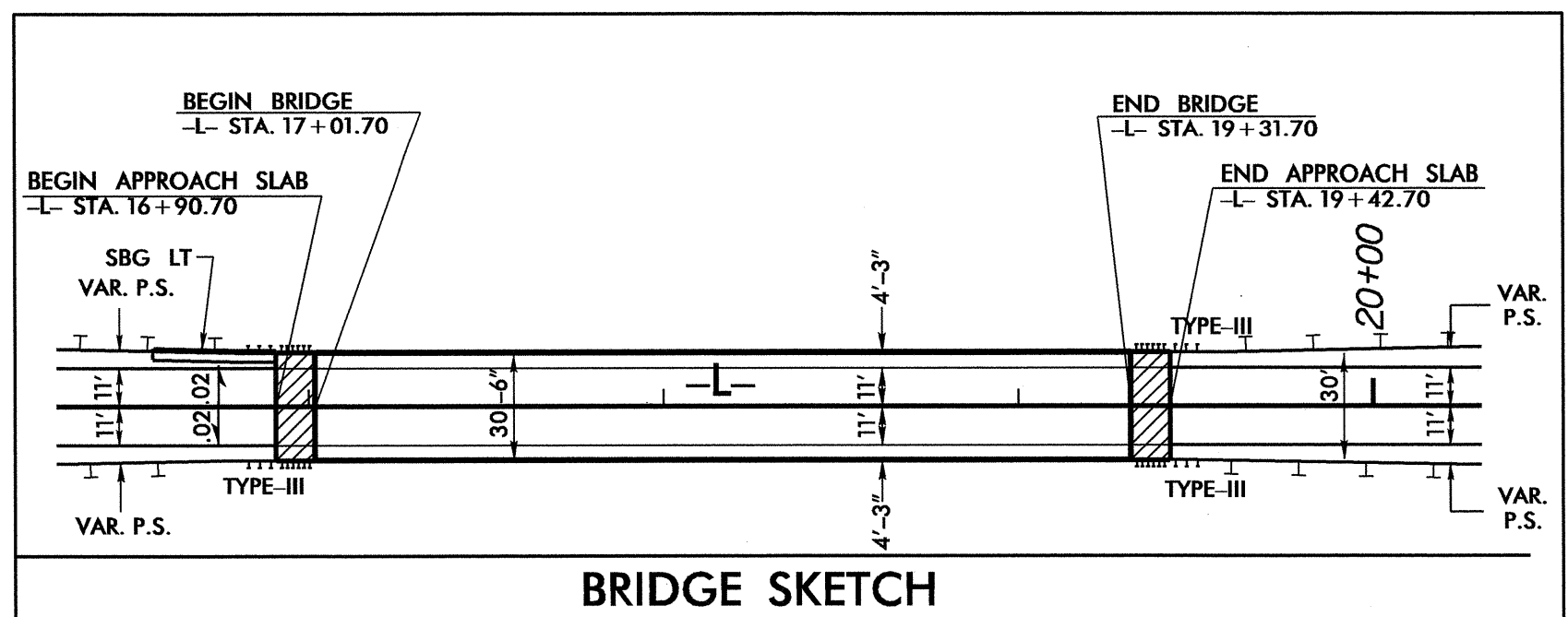
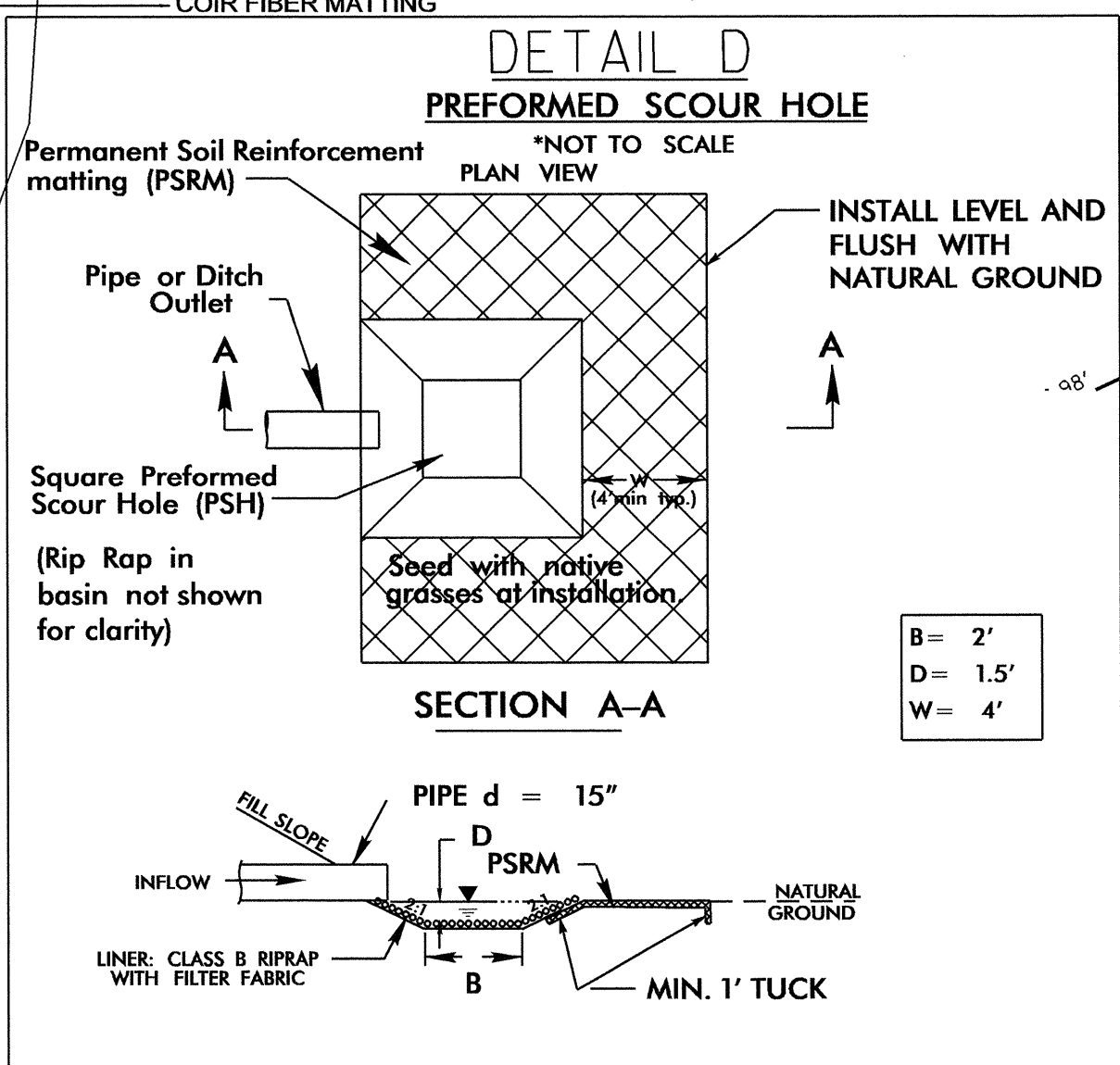
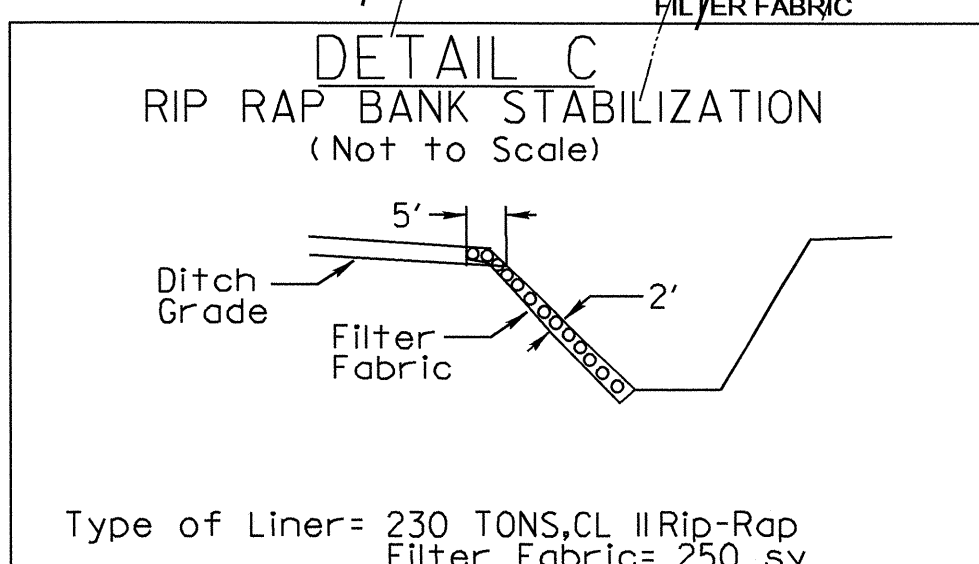
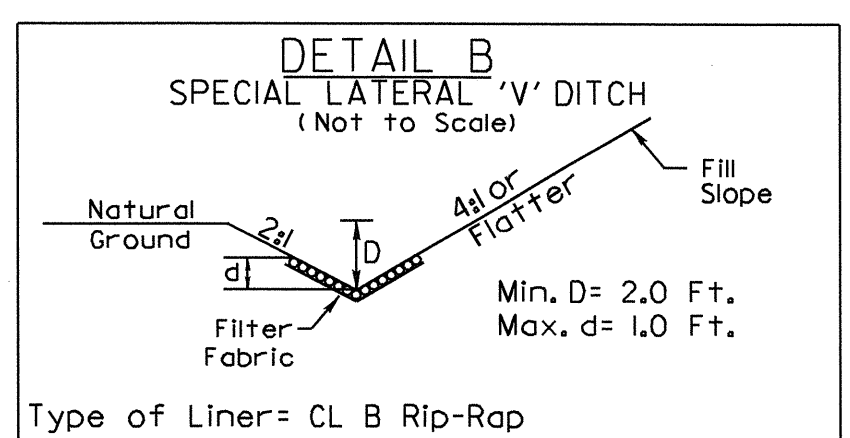
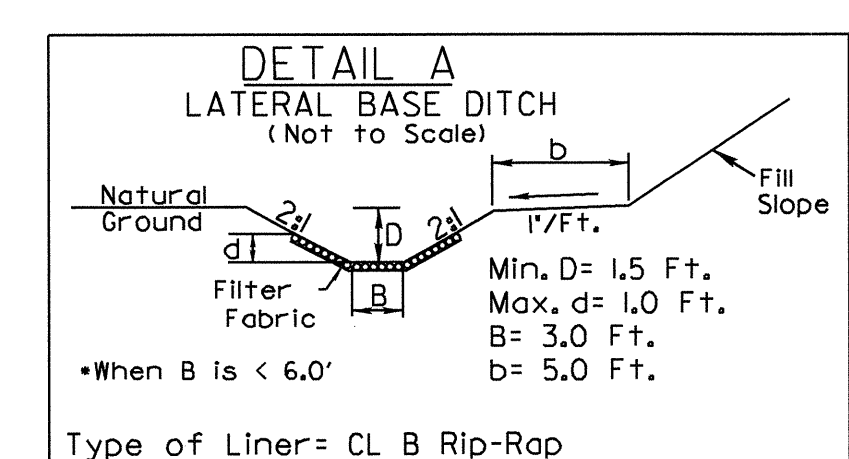


BEGIN TIP PROJECT B-4522
-L- STA. 13+75.00

END TIP PROJECT B-4522
-L- STA. 23+85.00

PT Sta. 11+82.69

PC Sta. 24+37.09



FROM -L- STA. 18+95 TO STA. 21+50 LT DDE=179 CY
 -L- STA. 18+50 TO STA. 20+75 RT DDE=323 CY
 -L- STA. 16+75 TO STA. 17+15 RT DDE=25 CY

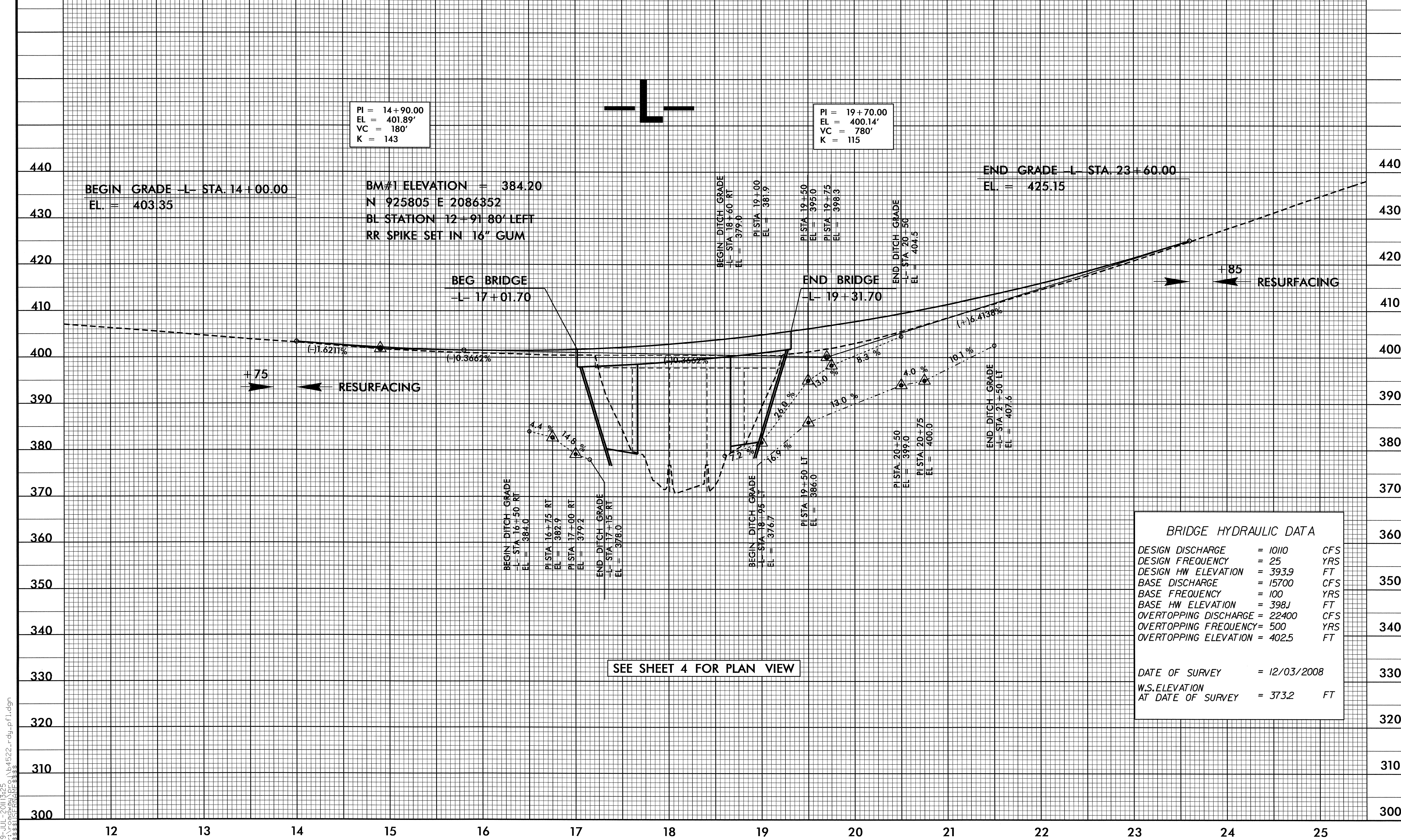
FROM -L- STA. 20+50 TO STA. 23+50 RT

FROM -L- STA. 17+65 TO -L- STA. 17+85 LT
 -L- STA. 18+50 TO -L- STA. 18+70 RT
 -L- STA. 18+70 TO -L- STA. 18+95 LT
 -L- STA. 17+15 TO 17+30 RT

STA. 16+57 LT

REVISIONS

8/17/99
 19-JUL-2011 14:01
 C:\Users\james\Documents\B-4522_r.dwg_psh04.dgn



PI = 14+90.00
EL = 401.89'
VC = 180'
K = 143

PI = 19+70.00
EL = 400.14'
VC = 780'
K = 115

BM#1 ELEVATION = 384.20
N 925805 E 2086352
BL STATION 12+91 80' LEFT
RR SPIKE SET IN 16" GUM

BRIDGE HYDRAULIC DATA		
DESIGN DISCHARGE	= 10110	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 393.9	FT
BASE DISCHARGE	= 15700	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 398J	FT
OVERTOPPING DISCHARGE	= 22400	CFS
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING ELEVATION	= 402.5	FT
DATE OF SURVEY	= 12/03/2008	
W.S. ELEVATION AT DATE OF SURVEY	= 373.2	FT

SEE SHEET 4 FOR PLAN VIEW