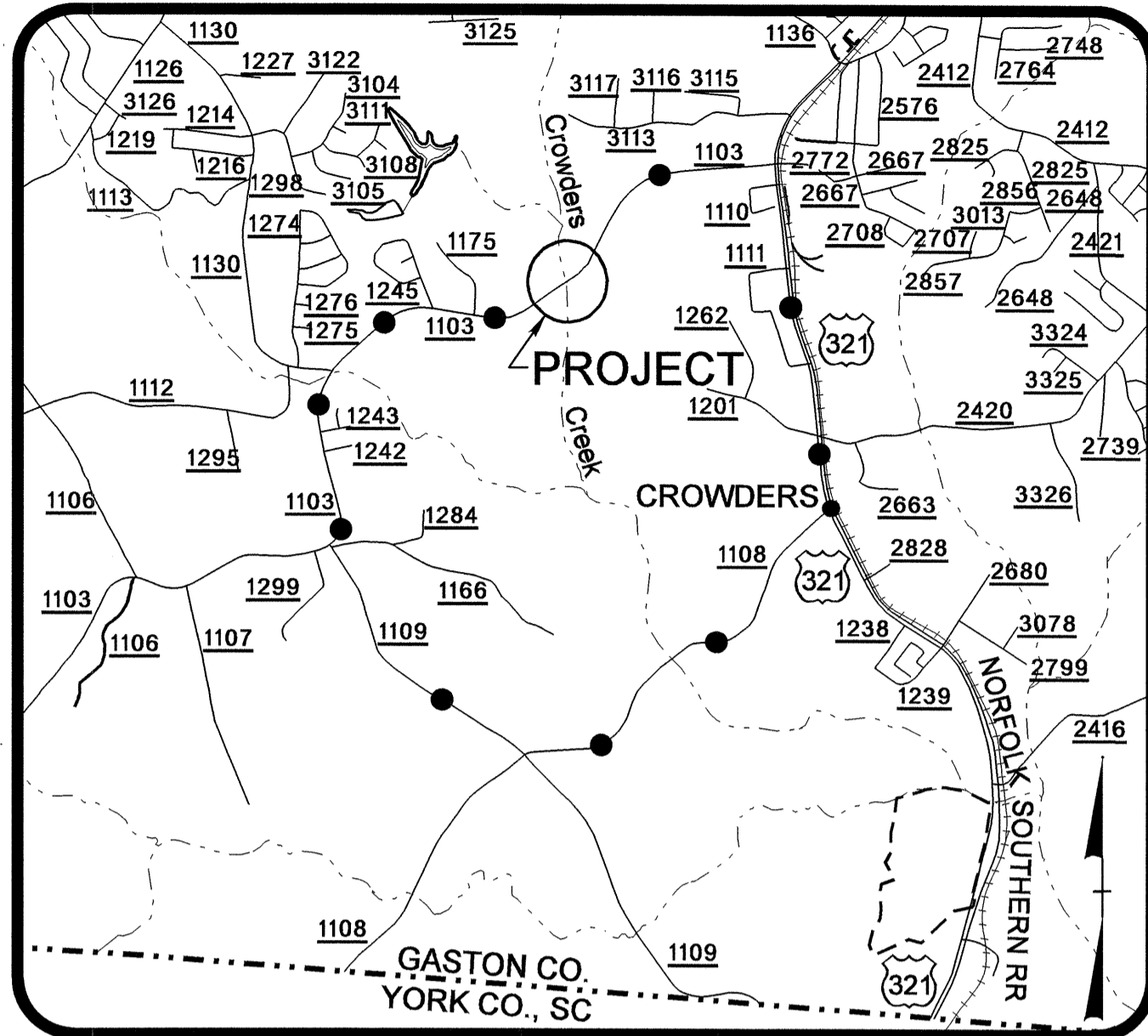


09/08/09

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



VICINITY MAP

● ● ● ● ● DETOUR ROUTE

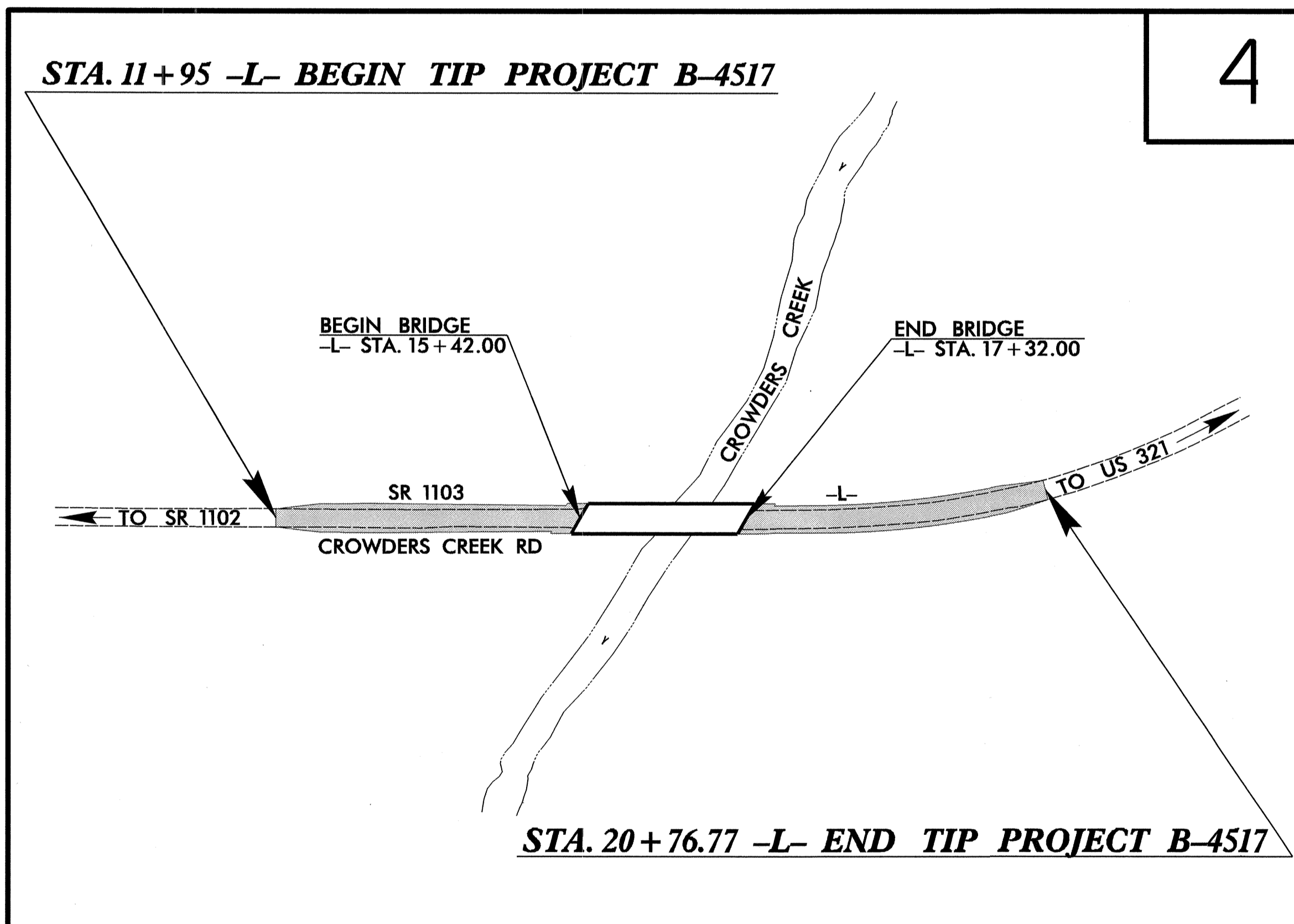
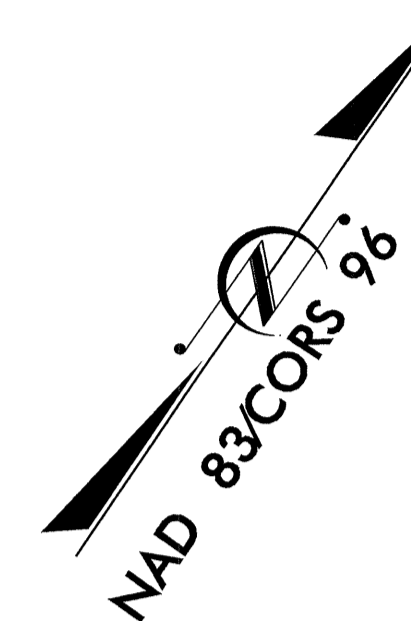
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**GASTON COUNTY**

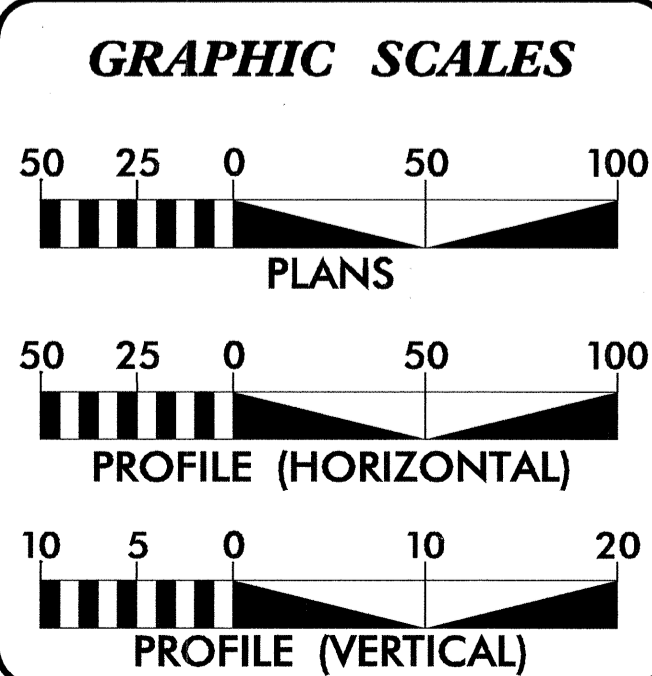
**LOCATION: BRIDGE NO. 49 OVER CROWDERS CREEK  
ON SR 1103**

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4517	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33741.1.1	BRSTP-1103(15)	PE	
33741.2.1	BRSTP-1103(15)	R/W & UTIL	
33741.3.1	BRSTP-1103(15)	CONST.	



**TIP PROJECT: B-4517**  
**CONTRACT: C202378**



**DESIGN DATA**

ADT 2010 =	8,674
ADT 2030 =	14,600
DHV =	10 %
D =	60 %
T =	4 % *
V =	60 MPH
* TTST 1% DUAL 3%	
FUNC. CLASS =	URBAN COLLECTOR
SUB REGIONAL TIER	

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-4517	=	0.131 MILES
LENGTH STRUCTURE TIP PROJECT B-4517	=	0.036 MILES
TOTAL LENGTH TIP PROJECT B-4517	=	0.167 MILES

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

2006 STANDARD SPECIFICATIONS

<b>RIGHT OF WAY DATE:</b> MAY 13, 2009	<b>GARY LOVERING, PE</b> PROJECT ENGINEER
<b>LETTING DATE:</b> APRIL 20, 2010	<b>RON McCOLLUM, PE</b> PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

*Signature: Larry D. Robinson*

**ROADWAY DESIGN ENGINEER**

*Signature: Ron McCollum*

**DIVISION OF HIGHWAYS**  
STATE OF NORTH CAROLINA

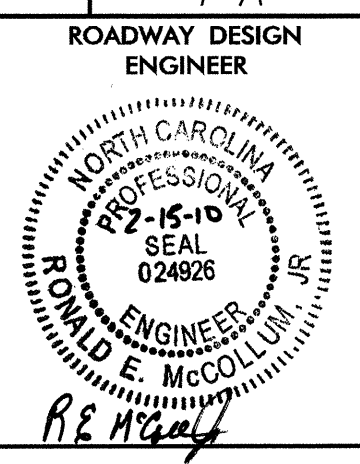
*Signature: Art McMillan*

**STATE HIGHWAY DESIGN ENGINEER**

15-FEB-2010 09:42  
RAYDON\p01\104517\_rdy\_tsh.dgn  
\$\$\$\$\$USERNAME\$\$\$\$\$

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**INDEX OF SHEETS, GENERAL NOTES, & LIST OF STANDARD DRAWINGS**



<p>SHEET NUMBER</p> <p>1</p> <p>1-A</p> <p>1-B</p> <p>1-C</p> <p>2</p> <p>2-A THRU 2-B</p> <p>2-C</p> <p>2-D</p> <p>3</p> <p>3-A</p> <p>4</p> <p>5</p> <p>TCP-1 THRU TCP-2</p> <p>SD-1</p> <p>PMP-1 THRU PMP-2</p> <p>EC-1 THRU EC-4</p> <p>SIG-1 THRU SIG-3</p> <p>UC-1 THRU UC-2</p> <p>UO-1 THRU UO-2</p> <p>X-1A</p> <p>X-1 THRU X-5</p> <p>S-1 THRU S-31</p>	<p>INDEX OF SHEETS</p> <p>SHEET</p> <p>TITLE SHEET</p> <p>INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS</p> <p>CONVENTIONAL SYMBOLS</p> <p>SURVEY CONTROL SHEET</p> <p>PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAIL</p> <p>DETAIL FOR METHOD OF PIPE INSTALLATION</p> <p>DETAIL FOR ANCHORAGE FOR FRAMES</p> <p>DETAIL FOR BRIDGE APPROACH FILLS, SUB REGIONAL TIER</p> <p>SUMMARY OF QUANTITIES</p> <p>SUMMARY OF DRAINAGE QUANTITIES SUMMARY OF GUARDRAIL, EARTHWORK SUMMARY, ASPHALT PAVEMENT REMOVAL SUMMARY, SHOULDER BERM GUTTER SUMMARY, AND SUMMARY OF RIP RAP</p> <p>PLAN SHEET</p> <p>PROFILE SHEET</p> <p>TRAFFIC CONTROL PLANS</p> <p>SIGN DESIGN</p> <p>PAVEMENT MARKING PLANS</p> <p>EROSION CONTROL PLANS</p> <p>SIGNAL PLANS</p> <p>UTILITY CONSTRUCTION PLANS</p> <p>UTILITIES BY OTHERS PLANS</p> <p>CROSS-SECTION SUMMARY SHEET</p> <p>CROSS-SECTIONS</p> <p>STRUCTURE PLANS</p>	<p>GENERAL NOTES:</p> <p>2006 SPECIFICATIONS EFFECTIVE: 07-18-06 REVISED: 07-30-08</p> <p>GRADE LINE: GRADING AND SURFACING:</p> <p>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.</p> <p>CLEARING:</p> <p>CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.</p> <p>SUPERELEVATION:</p> <p>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.</p> <p>SHOULDER CONSTRUCTION:</p> <p>ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01.</p> <p>GUARDRAIL:</p> <p>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.</p> <p>TEMPORARY SHORING:</p> <p>SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.</p> <p>END BENTS:</p> <p>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.</p> <p>UTILITIES:</p> <p>UTILITY OWNERS ON THIS PROJECT ARE</p> <p>City of Gastonia (Sewer)</p> <p>Duke Power (Electric Power)</p> <p>AT&amp;T of North Carolina (Telephone)</p> <p>ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.</p> <p>RIGHT-OF-WAY MARKERS:</p> <p>ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY OTHERS.</p>	<p>2006 ROADWAY ENGLISH STANDARD DRAWINGS</p> <p>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:</p> <table border="0"> <tr> <td>STD. NO.</td> <td>TITLE</td> </tr> <tr> <td colspan="2">DIVISION 2 - EARTHWORK</td> </tr> <tr> <td>200.03</td> <td>Method of Clearing - Method III</td> </tr> <tr> <td>225.02</td> <td>Guide for Grading Subgrade - Secondary and Local</td> </tr> <tr> <td>225.04</td> <td>Method of Obtaining Superlevation - Two Lane Pavement</td> </tr> <tr> <td colspan="2">DIVISION 5 - SUBGRADE, BASES AND SHOULDERS</td> </tr> <tr> <td>560.01</td> <td>Method of Shoulder Construction - High Side of Superelevated Curve - Method I</td> </tr> <tr> <td colspan="2">DIVISION 6 - ASPHALT BASES AND PAVEMENTS</td> </tr> <tr> <td>654.01</td> <td>Pavement Repairs</td> </tr> <tr> <td colspan="2">DIVISION 8 - INCIDENTALS</td> </tr> <tr> <td>840.00</td> <td>Concrete Base Pad for Drainage Structures</td> </tr> <tr> <td>840.29</td> <td>Frames and Narrow Slot Flat Grates</td> </tr> <tr> <td>840.35</td> <td>Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates</td> </tr> <tr> <td>840.46</td> <td>Traffic Bearing Precast Drainage Structure</td> </tr> <tr> <td>840.66</td> <td>Drainage Structure Steps</td> </tr> <tr> <td>846.01</td> <td>Concrete Curb, Gutter and Curb &amp; Gutter</td> </tr> <tr> <td>846.04</td> <td>Drop Inlet Installation in Shoulder Berm Gutter</td> </tr> <tr> <td>862.01</td> <td>Guardrail Placement</td> </tr> <tr> <td>862.02</td> <td>Guardrail Installation</td> </tr> <tr> <td>862.03</td> <td>Structure Anchor Units</td> </tr> </table>	STD. 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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	○
Property Corner	✕
Property Monument	□
Parcel/Sequence Number	(23)
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	-----

## 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 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 Wheel Chair 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:

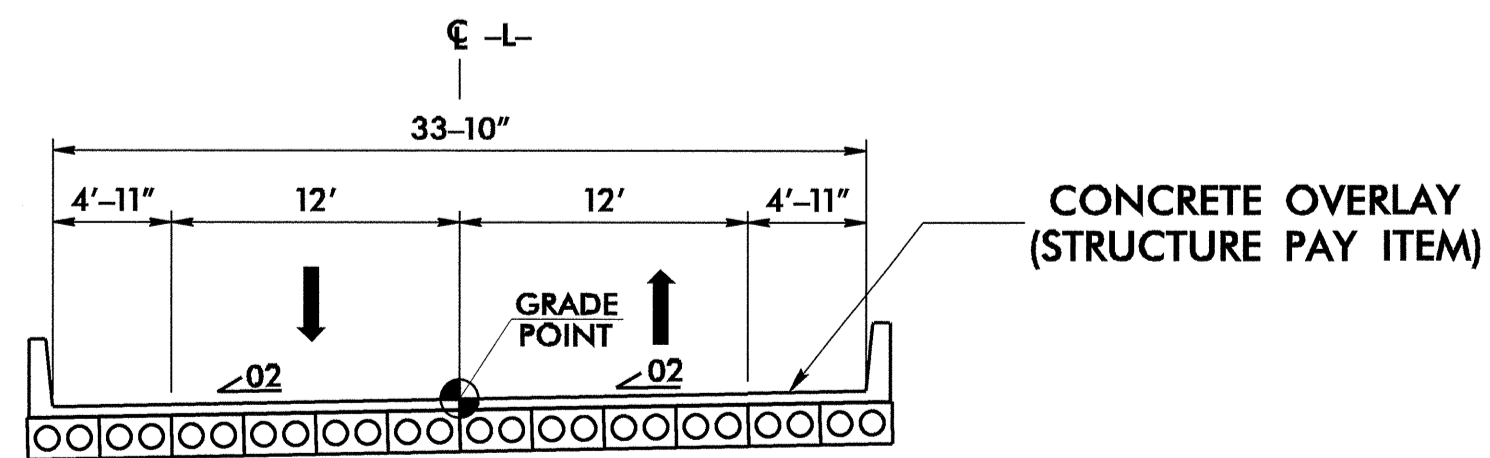
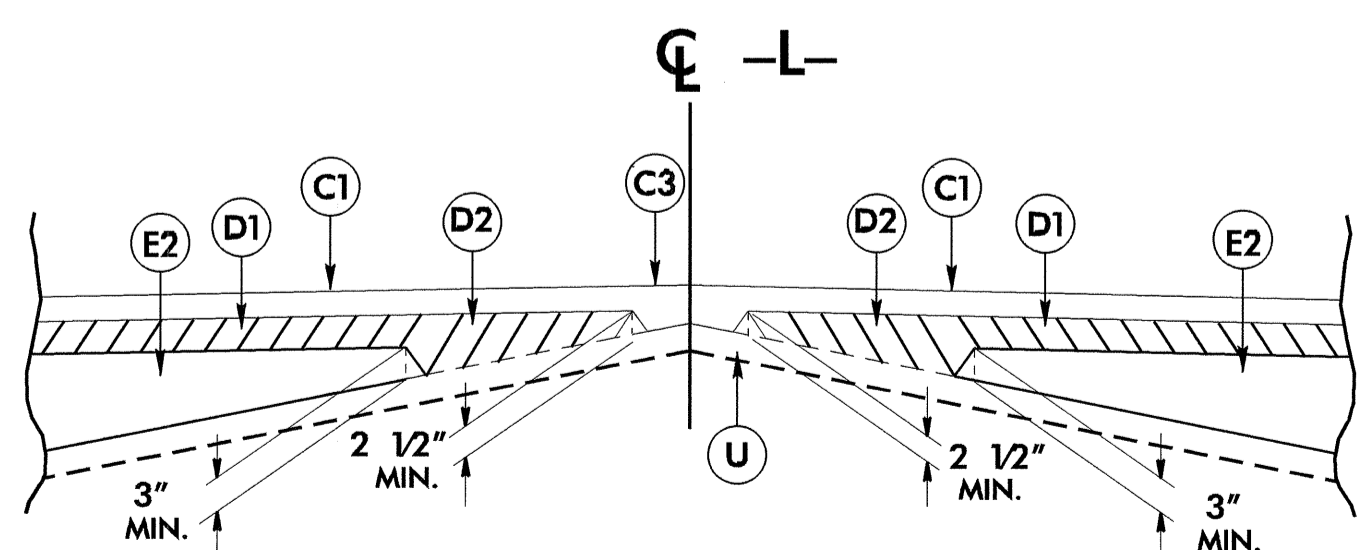
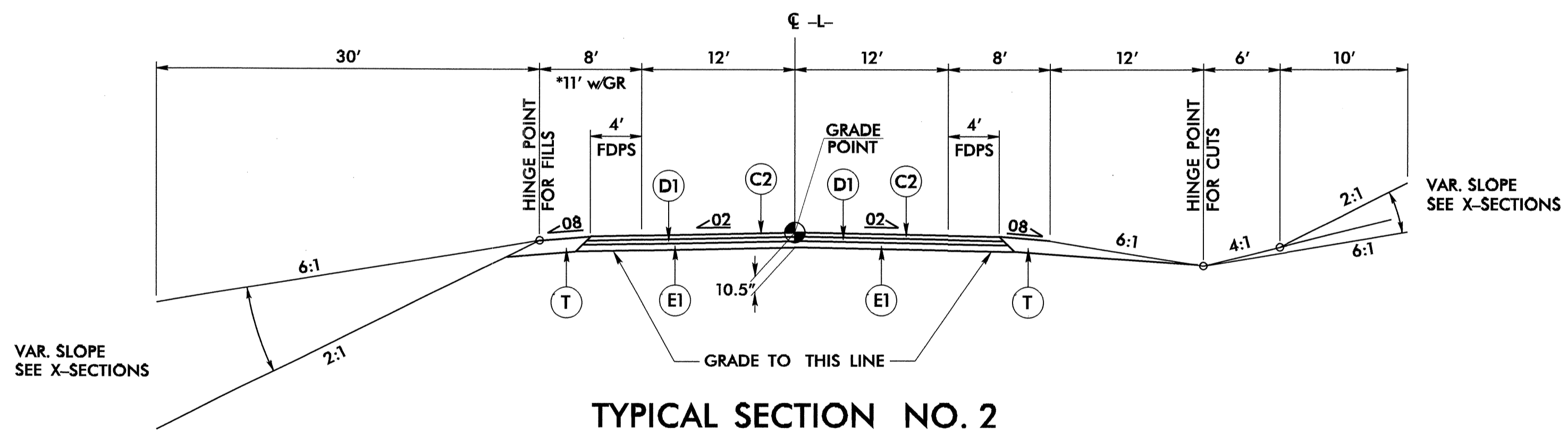
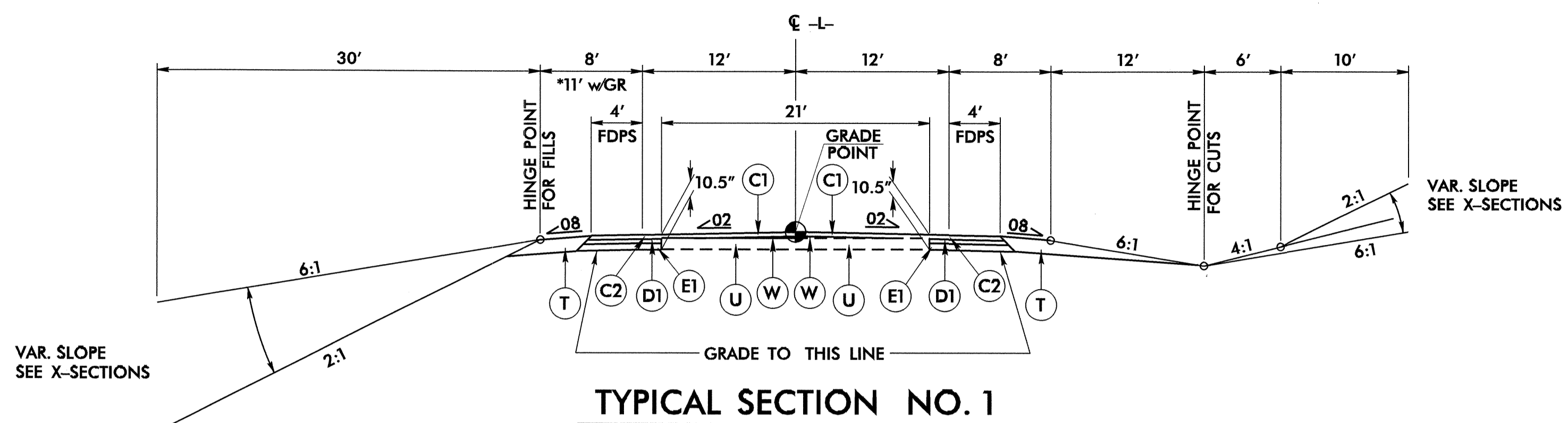
Utility Pole	○
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	□
Utility Unknown U/G Line	-----
U/G Tank; Water, Gas, Oil	□
A/G Tank; Water, Gas, Oil	□
U/G Test Hole (S.U.E.*)	○
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.



6/2/99

PAVEMENT SCHEDULE FINAL DESIGN	
C1	PROP. APPROX. 1 1/2" 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 TO EXCEED 2" IN DEPTH.
D1	PROP. APPROX. 2 1/2" 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 2 1/2" IN DEPTH OR GREATER THAN 4" 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 WEDGING DETAIL)

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



PROJECT REFERENCE NO. B-4517	SHEET NO. 2
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 024926 RONALD E. MCCOLLUM, JR.	PAVEMENT DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 22696 CLARK S. MORRISON

**USE TYPICAL SECTION NO. 1**

-L- STA. 11+95.00 TO -L- STA. 14+92.00  
-L- STA. 18+00.00 TO -L- STA. 20+76.77  
\*NOTE: SEE ROCK PLATING DETAIL NO. 1 ON SHEET 4

**USE TYPICAL SECTION NO. 2**

-L- STA. 14+92.00 TO -L- STA. 15+42.00 (BEGIN BRIDGE)  
-L- STA. 17+32.00 (END BRIDGE) TO -L- STA. 18+00.00  
\*NOTE: SEE ROCK PLATING DETAIL NO. 1 ON SHEET 4

**USE TYPICAL SECTION ON STRUCTURE**

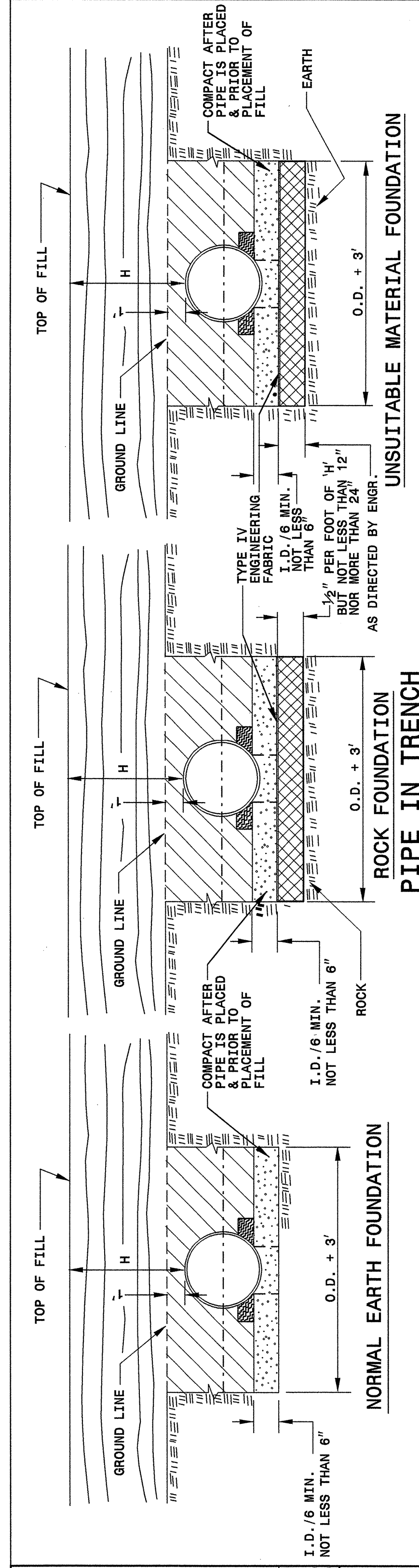
-L- STA. 15+42.00 (BEGIN BRIDGE)  
TO -L- STA. 17+32.00 (END BRIDGE)

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5/14/99

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

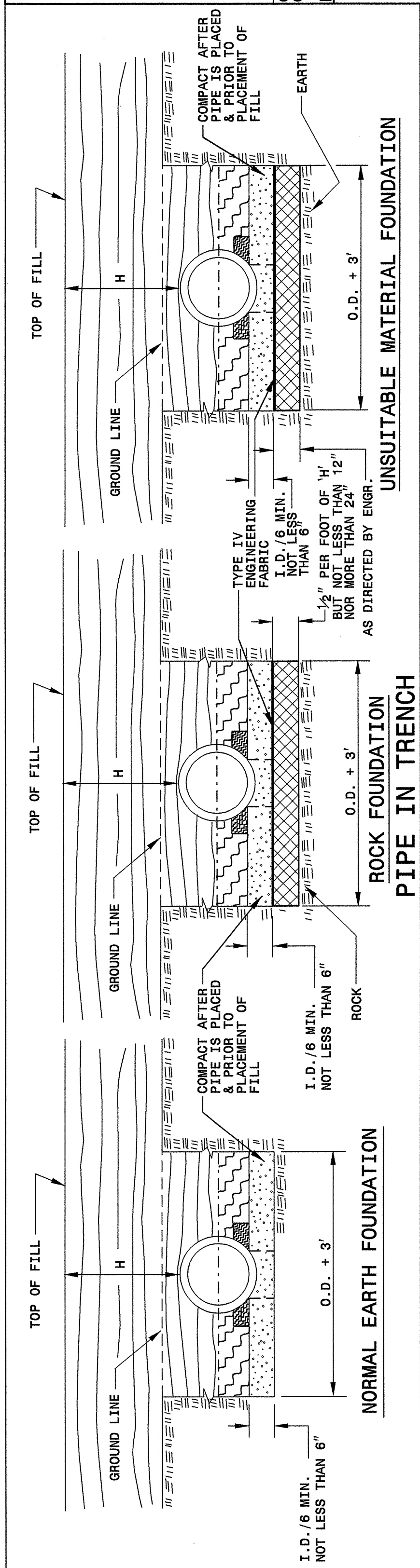
STATE OF NORTH CAROLINA  
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 RALEIGH, N.C.

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 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH UNCOMPACTED AS 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.

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

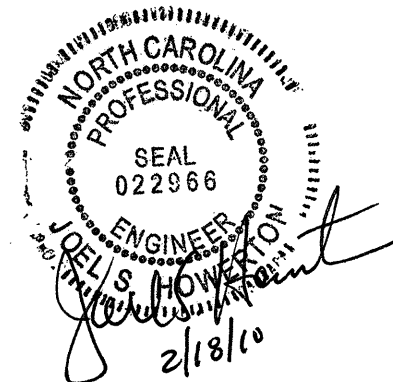
SHEET 2 OF 3  
**300D01**

**GENERAL NOTES:**  
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 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.

**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: DATE: 7/20/09  
 CHECKED BY: DATE: 7/20/09  
 FILE SPEC:\erward\stds\stdstodetails\30001\0300d01.dgn



**FLEXIBLE PIPE**

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

Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet)			
		16	14	12	10
12	12	204	256	12	8
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
48	12	48	61	87	113
54	12	42	54	77	100
60	12	37	48	69	111
66	12	32	42	61	100
72	12	27	36	54	91
78	12	22	30	47	81
84	12	17	24	40	69

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

Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet)			
		16	14	12	10
12	12	123	155	216	281
15	12	98	123	174	224
18	12	81	102	144	187
21	12	69	87	123	160
24	12	60	76	108	139
27	12	53	67	95	123
30	12	47	60	85	111
36	12	40	50	71	92
42	12	34	43	60	78
48	12	29	36	52	68
54	12	24	30	46	50
60	12	20	25	40	46
66	12	16	20	34	38
72	12	13	16	28	31

HDPE - \* (Minimum fill) 2' for pipe diameters ≥ 12" and ≤ 60"  
 \* (Maximum fill) 20' for pipe diameters ≤ 24"  
 17' for pipe diameters ≥ 30" and ≤ 60"

PVC - \* (Minimum fill) 2' for pipe diameters ≥ 12" and ≤ 36"  
 \* (Maximum fill) 30' for pipe diameters ≥ 12" and ≤ 36"

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

**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

\*\* 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

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ENGLISH DETAIL DRAWING FOR  
**METHOD OF PIPE INSTALLATION**  
 FILL HEIGHT TABLES

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

ENGLISH DETAIL DRAWING FOR  
**METHOD OF PIPE INSTALLATION**  
 FILL HEIGHT TABLES

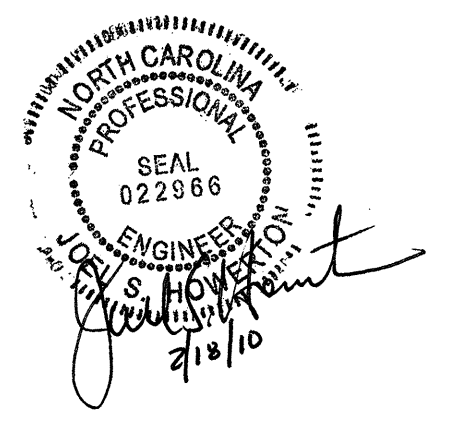
SHEET 3 OF 3  
**300D01**

SHEET 3 OF 3  
**300D01**

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**SEE PLATE FOR TITLE**

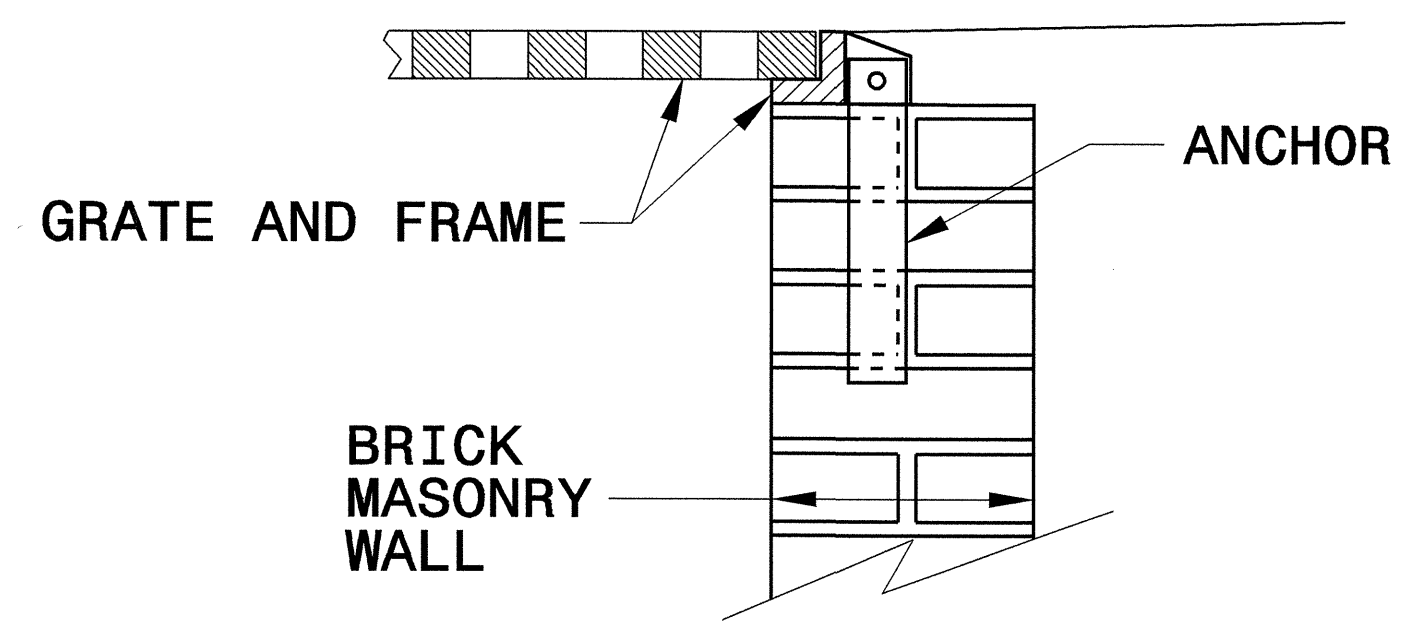
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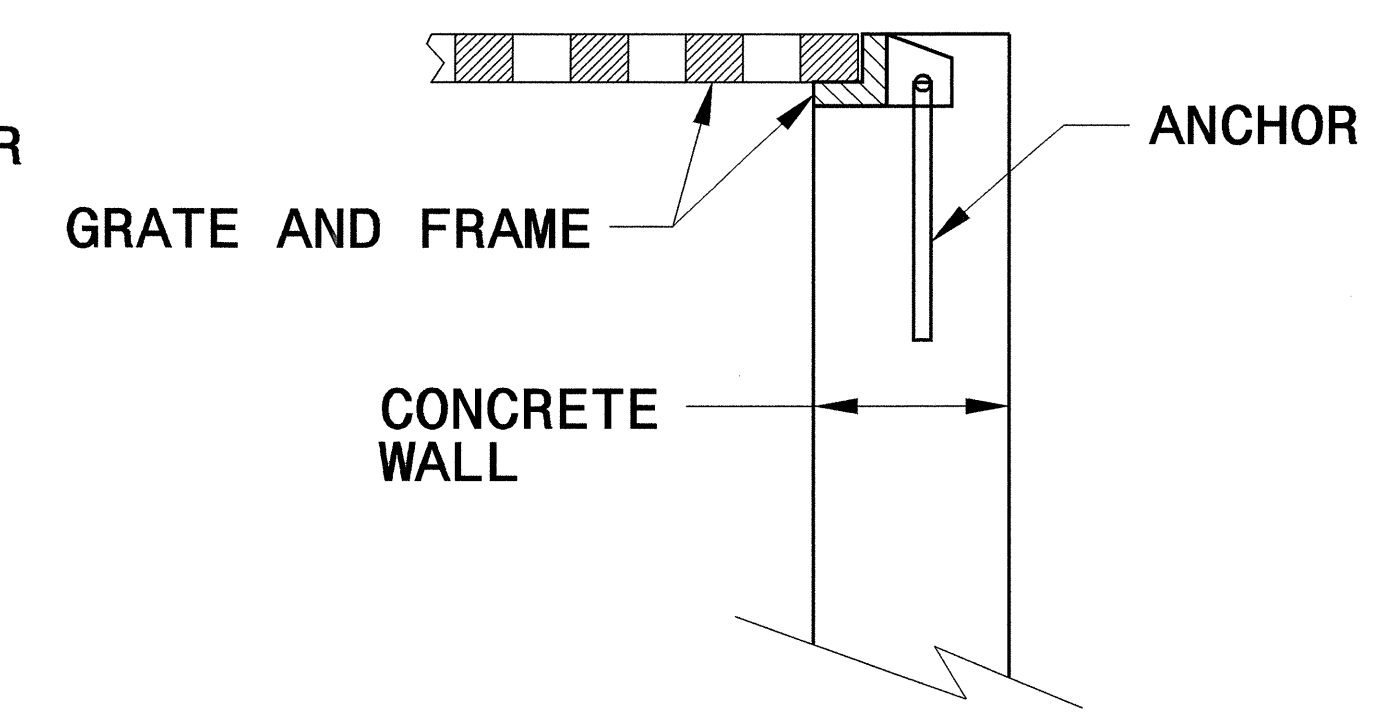
STATE OF  
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DIVISION OF HIGHWAYS  
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ENGLISH DETAIL DRAWING FOR  
**ANCHORAGE FOR FRAMES**  
BRICK/CONCRETE/PRECAST CONCRETE

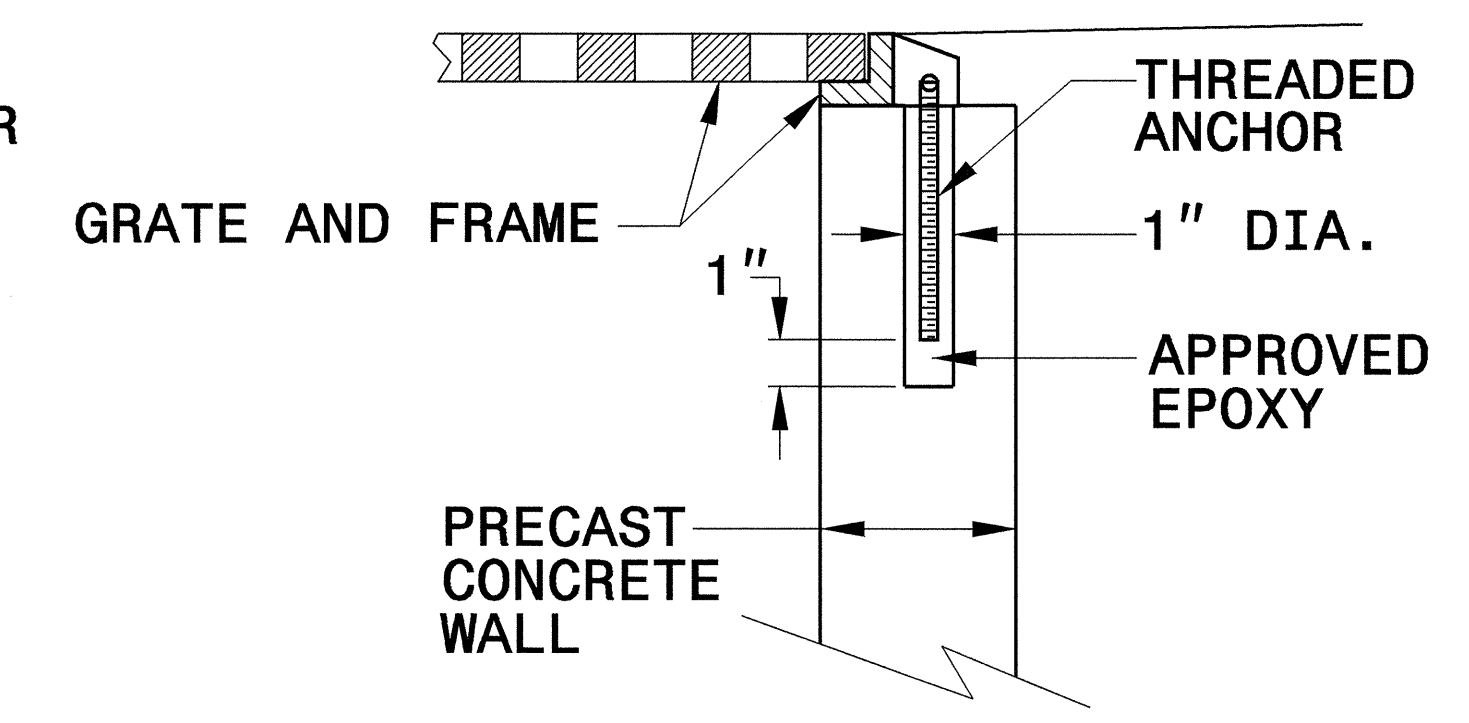
SHEET 1 OF 1  
**840D25**



**BRICK MASONRY  
CONSTRUCTION**



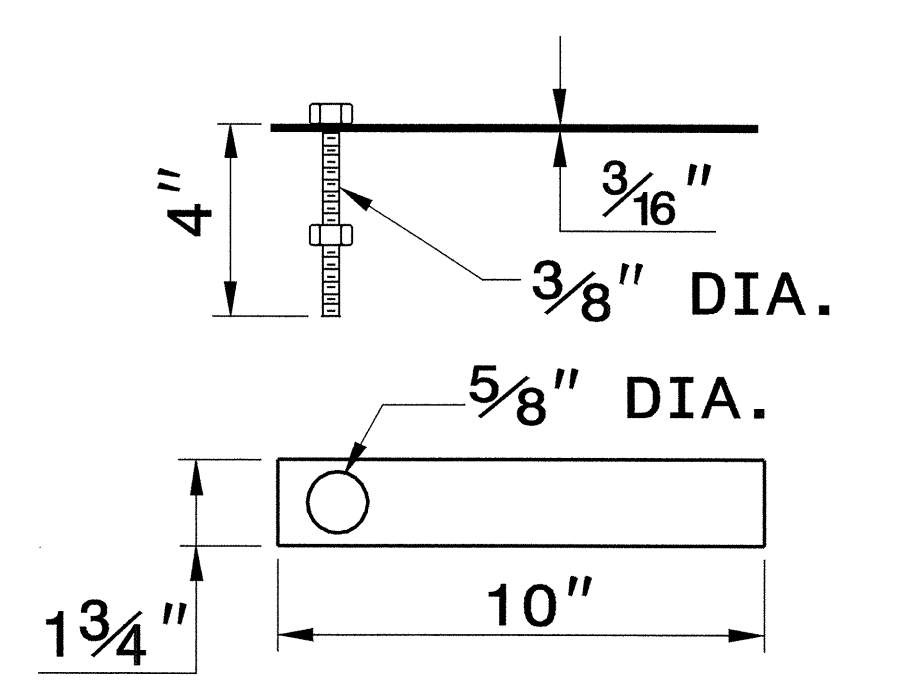
**CONCRETE  
CONSTRUCTION**



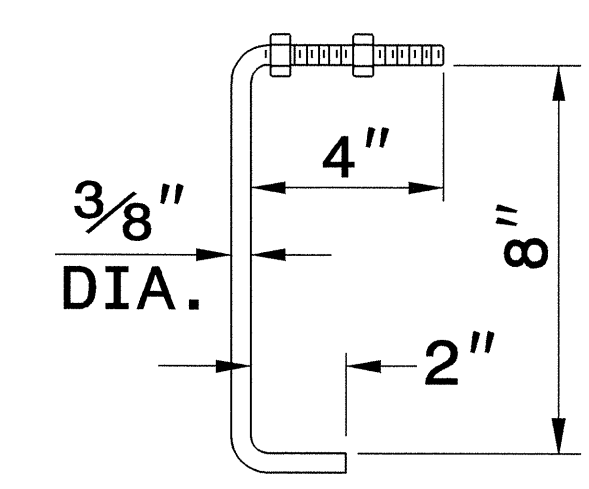
**PRECAST CONCRETE  
CONSTRUCTION**

**DETAIL SHOWING ANCHORAGE OF  
FRAME FOR GRATED DROP INLET**

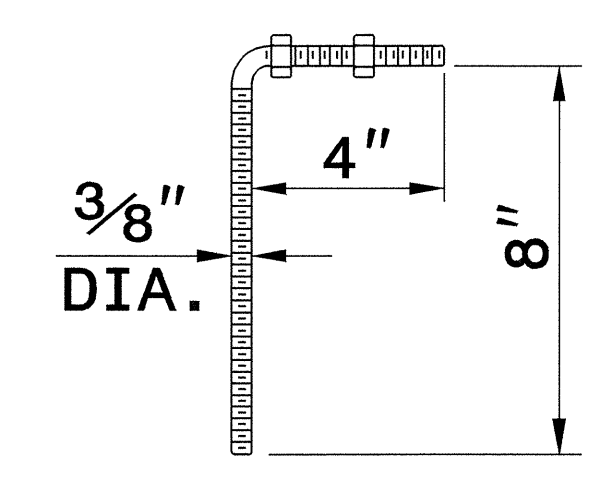
NOTE:  
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL  
OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



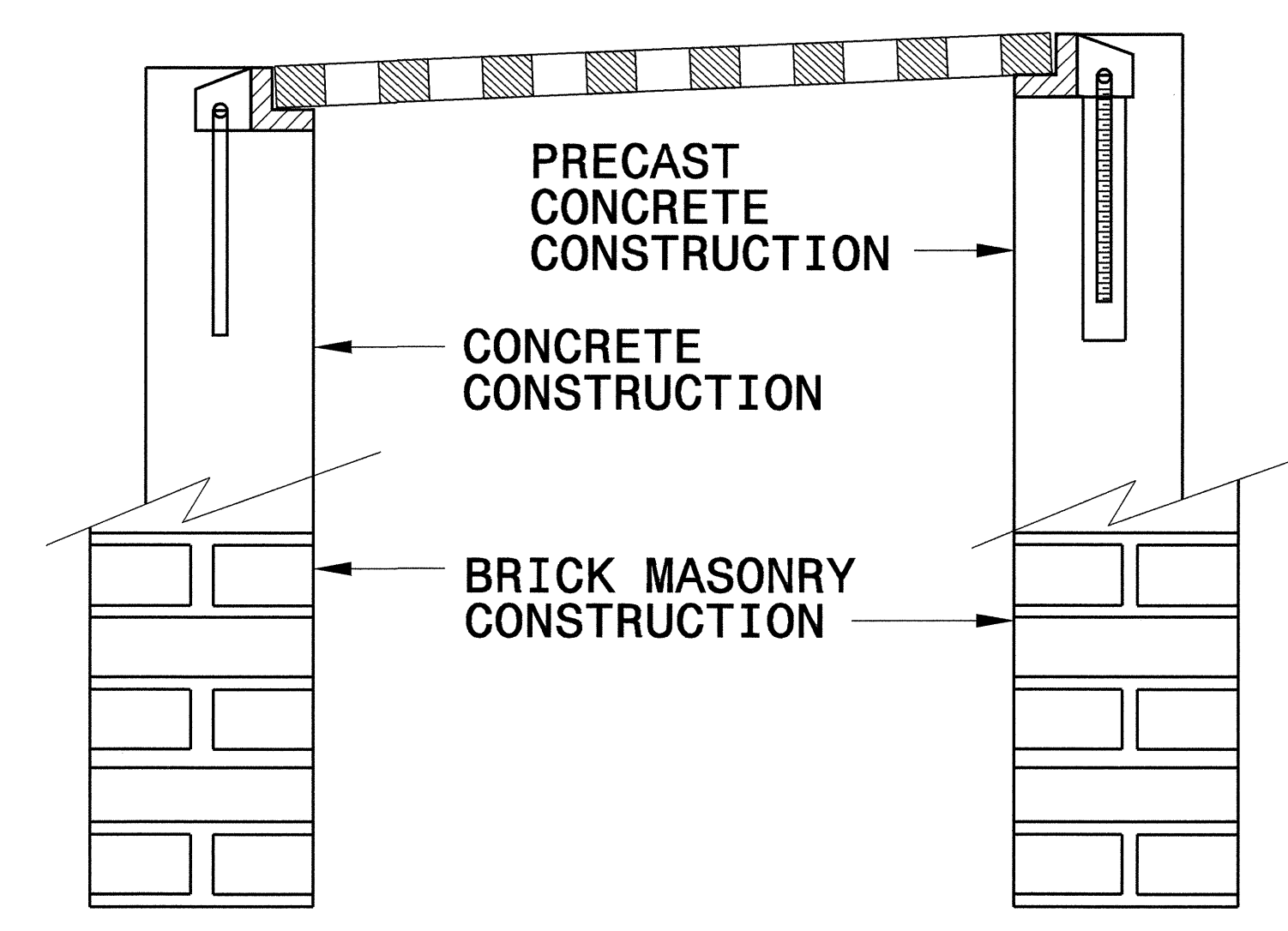
**MASONRY ANCHOR**  
3/8" DIA. BOLT WITH PLATE



**CONCRETE ANCHOR**  
3/8" DIA. BENT BAR



**PRECAST  
CONCRETE ANCHOR**  
3/8" DIA. BENT BAR



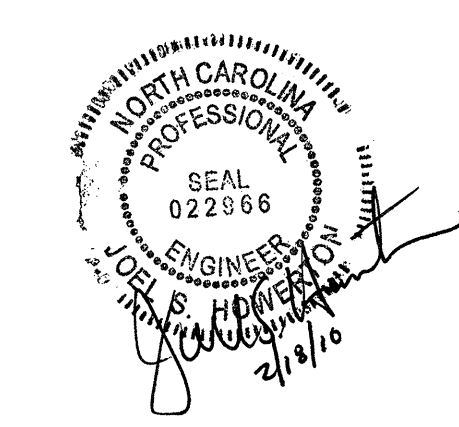
**FRAME AND GRATE INSTALLATION  
FOR NORMAL CROWN AND  
SUPERELEVATED SECTIONS**

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

SHEET 1 OF 1  
**840D25**

06-JAN-2006 08:56  
s:\contracts\contract\special\_details\english\hydro\copy of 0840d25 frame anchors.dgn  
\$\$\$\$\$USERNAME\$\$\$\$\$



**PROJECT SERVICES UNIT  
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**SEE PLATE FOR TITLE**

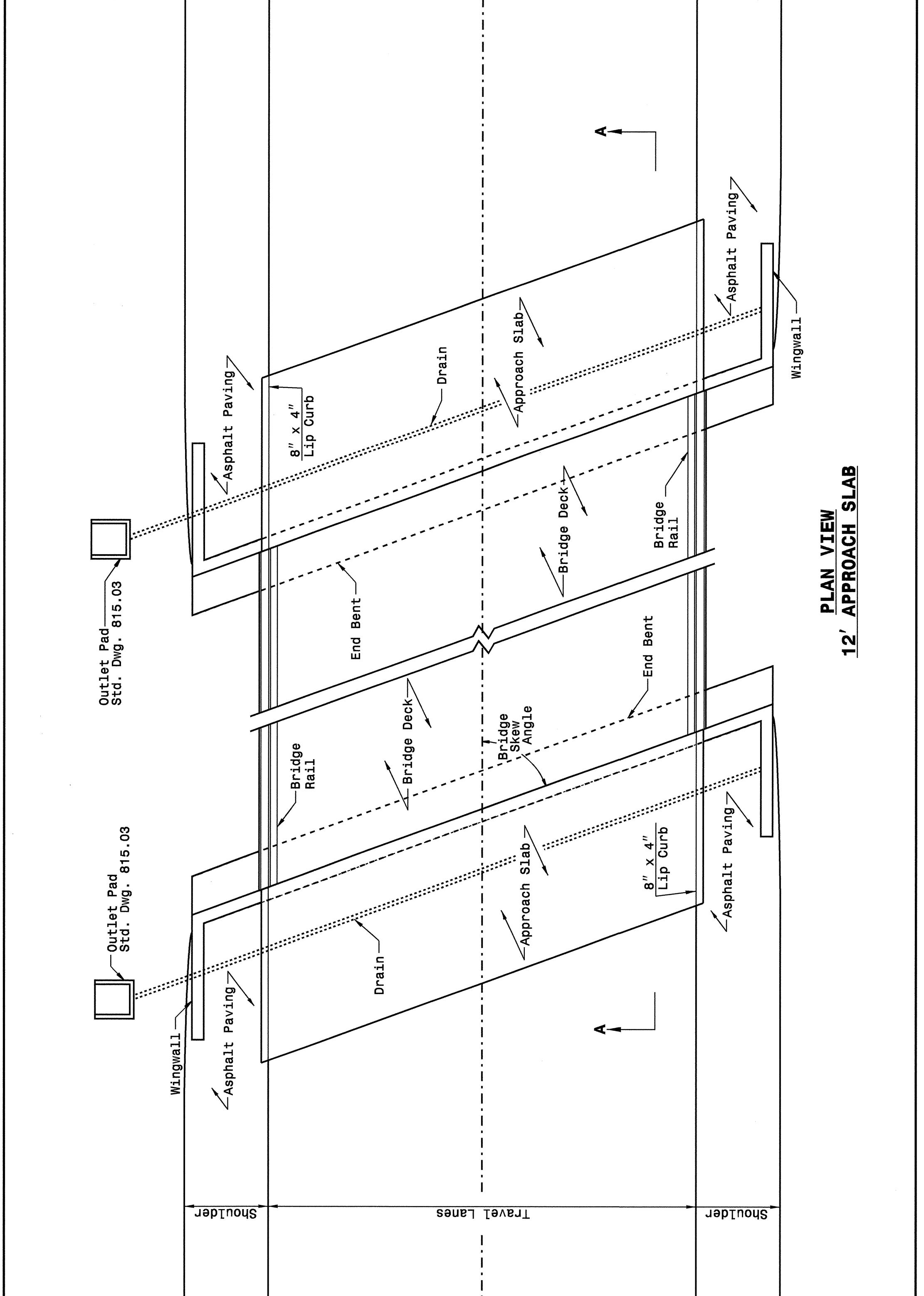
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 MODIFIED BY: E.E. WARD DATE: 9/25/06  
 CHECKED BY: DATE:  
 FILE SPEC.:



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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  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

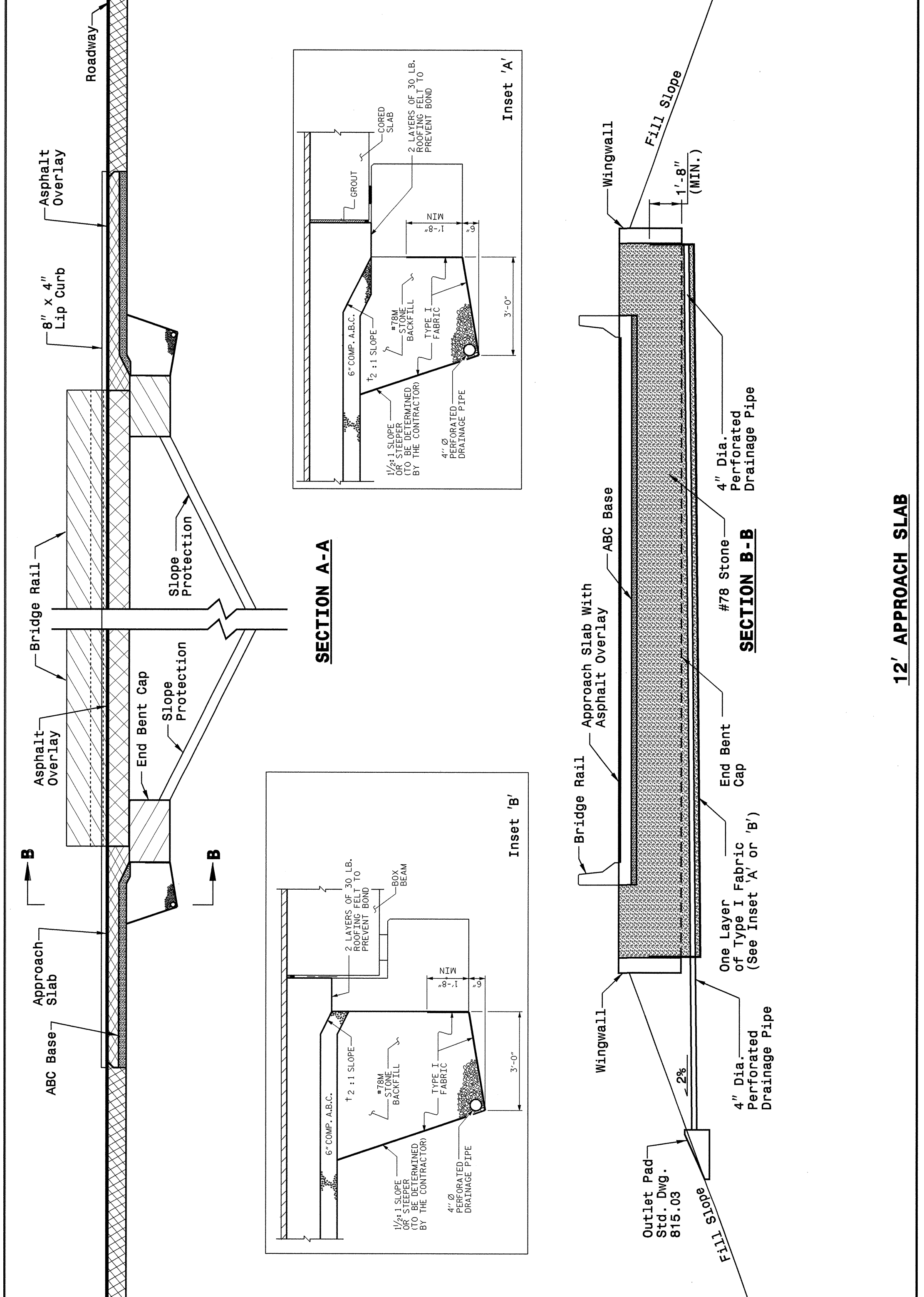
ENGLISH DETAIL DRAWING FOR  
**BRIDGE APPROACH FILLS**  
CORED SLAB & BOX BEAM BRIDGES  
SUB REGIONAL TIER

SHEET 1 OF 2  
**422D11**

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RALEIGH, N.C.

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

SHEET 2 OF 2  
**422D11**

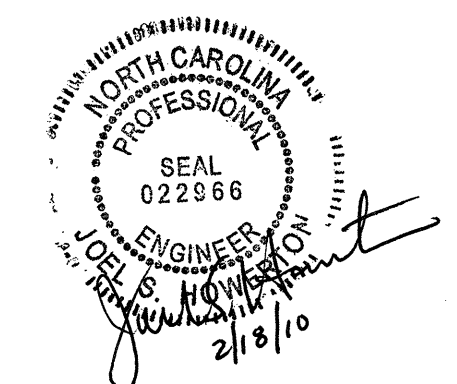


STATE OF NORTH CAROLINA  
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DIVISION OF HIGHWAYS  
RALEIGH, N.C.

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

SHEET 2 OF 2  
**422D11**

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 \$\$\$USERNAME\$\$\$



**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:  
 FILE SPEC.: kkempf/english/bridge approach fills.dgn

5/14/99

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202378

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0030000000-N	SP	Lump Sum		BRIDGE APPROACH FILL - SUB REGIONAL TIER, STATION ***** (16+37)
0036000000-E	225	250	CY	UNDERCUT EXCAVATION
0038000000-E	SP	100	CY	SHALLOW UNDERCUT
0043000000-N	226	Lump Sum		GRADING
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUB-BING
0080000000-E	SP	200	TON	CLASS IV SUBGRADE STABILIZATION
0196000000-E	270	750	SY	FABRIC FOR SOIL STABILIZATION
0223000000-E	SP	160	SY	ROCK PLATING
0234000000-E	SP	1,000	CY	GENERIC GRADING ITEM SELECT GRANULAR MATERIAL
0320000000-E	SP	60	SY	FOUNDATION CONDITIONING FABRIC
0330000000-E	SP	20	TON	GENERIC DRAINAGE ITEM FOUNDATION CONDITIONING MATERIAL, MINOR STRS
0335200000-E	SP	52	LF	15" DRAINAGE PIPE
0448200000-E	SP	108	LF	15" RC PIPE CULVERTS, CLASS IV
1220000000-E	545	50	TON	INCIDENTAL STONE BASE
1489000000-E	610	390	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1498000000-E	610	220	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE 119.0B
1519000000-E	610	390	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
1560000000-E	620	51	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
1693000000-E	654	8	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
2286000000-N	840	5	EA	MASONRY DRAINAGE STRUCTURES
2308000000-E	840	6.7	LF	MASONRY DRAINAGE STRUCTURES
2367000000-N	840	5	EA	FRAME WITH TWO GRATES, STD 840.29
2556000000-E	846	620	LF	SHOULDER BERM GUTTER
3030000000-E	862	787.5	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
3649000000-E	876	20	TON	RIP RAP, CLASS B
3656000000-E	876	500	SY	FILTER FABRIC FOR DRAINAGE
3659000000-N	SP	3	EA	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON
4400000000-E	1110	352	SF	WORK ZONE SIGNS (STATIONARY)
4410000000-E	1110	94	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4445000000-E	1145	96	LF	BARRICADES (TYPE III)
4810000000-E	1205	7,056	LF	PAINT PAVEMENT MARKING LINES (4")
5801000000-E	1530	630	LF	ABANDON 8" UTILITY PIPE
5828000000-N	1530	4	EA	REMOVE UTILITY MANHOLE
5882000000-N	SP	1	EA	GENERIC UTILITY ITEM BREAKDOWN & REBUILD EXISTING MANHOLE
6000000000-E	1605	950	LF	TEMPORARY SILT FENCE
6006000000-E	1610	250	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	150	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	200	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	2.5	ACR	TEMPORARY MULCHING
6018000000-E	1620	100	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	1.25	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	325	LF	TEMPORARY SLOPE DRAINS
6027000000-N	1622	5	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
6029000000-E	SP	1,500	LF	SAFETY FENCE
6030000000-E	1630	350	CY	SILT EXCAVATION

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# SUMMARY OF QUANTITIES

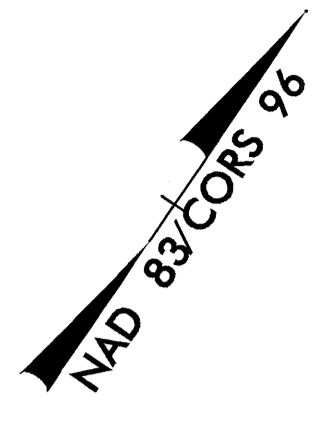
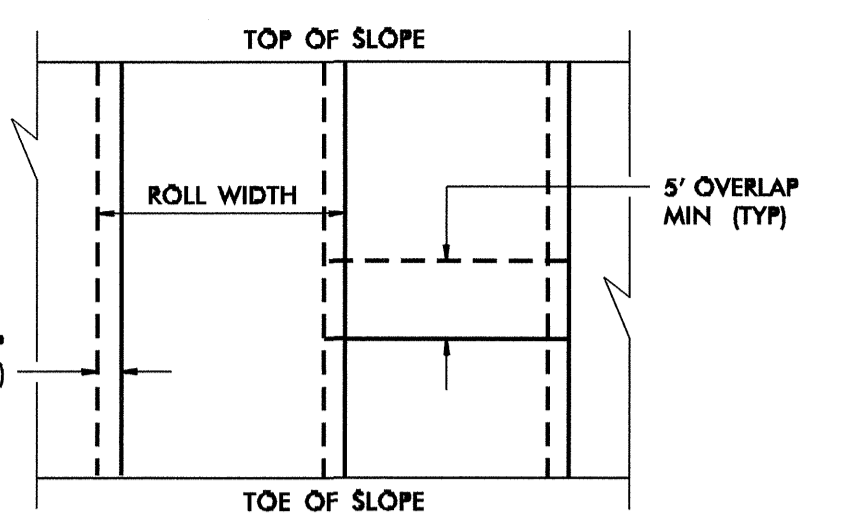
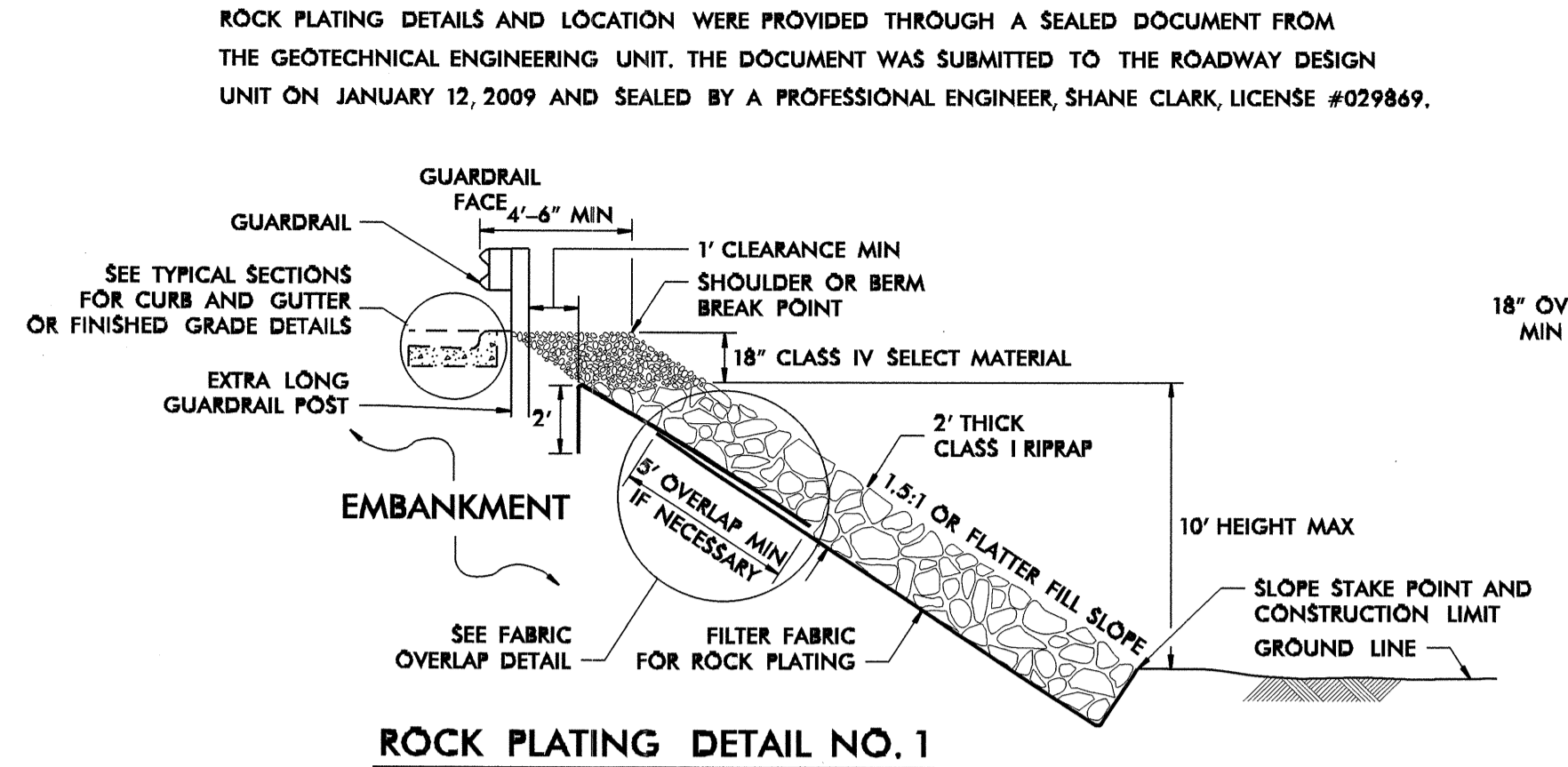
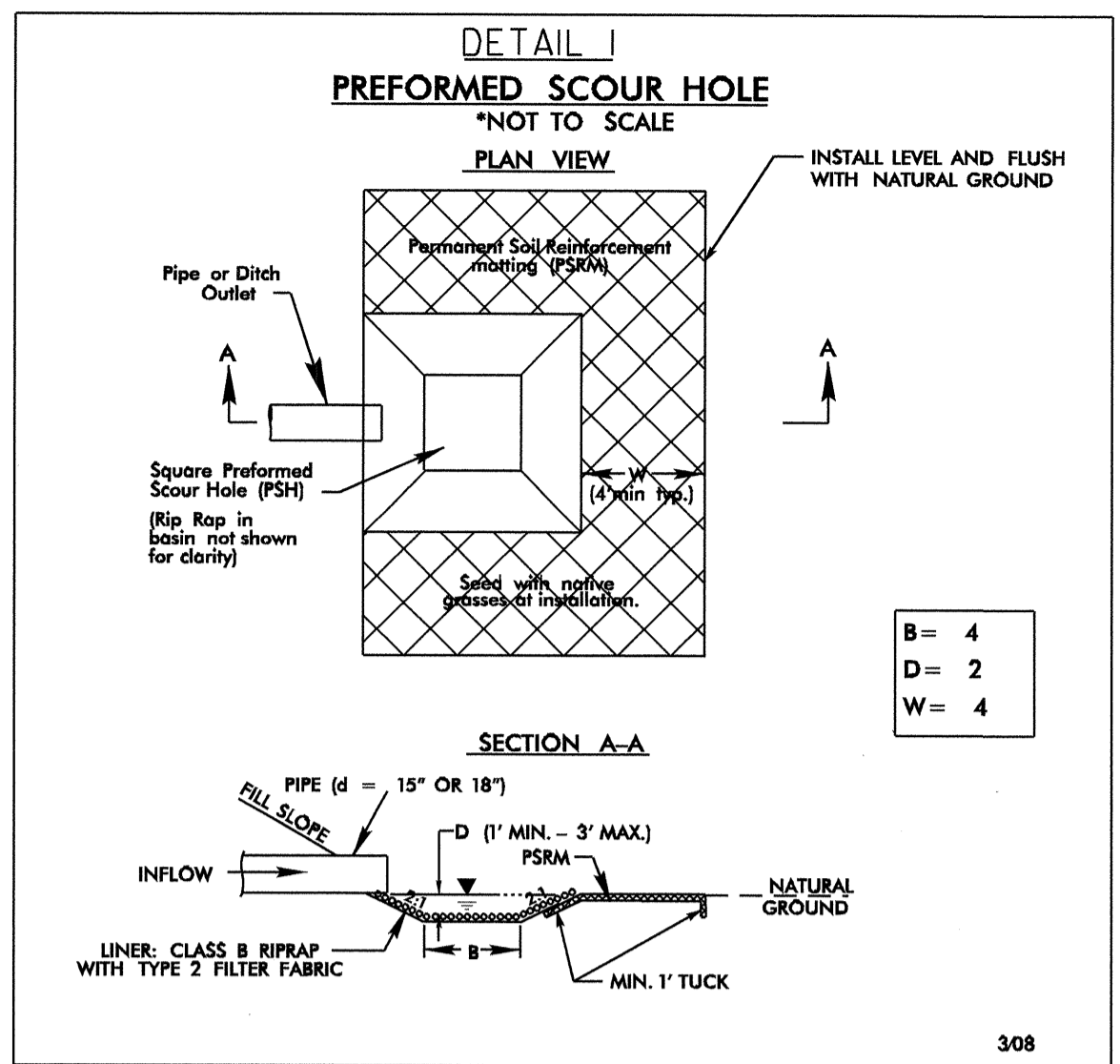
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6036000000-E	1631	9,400	SY	MATTING FOR EROSION CONTROL
6037000000-E	SP	50	SY	COIR FIBER MAT
6038000000-E	SP	560	SY	PERMANENT SOIL REINFORCEMENT MAT
6042000000-E	1632	750	LF	1/4" HARDWARE CLOTH
6071010000-E	SP	100	LF	WATTLE
6071020000-E	SP	25	LB	POLYACRYLAMIDE (PAM)
6071030000-E	SP	285	LF	COIR FIBER BAFFLES
6071050000-E	SP	4	EA	*** SKIMMER (1-1/2")
6084000000-E	1660	3	ACR	SEEDING & MULCHING
6087000000-E	1660	3	ACR	MOWING
6090000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	50	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	1.5	TON	FERTILIZER TOPDRESSING
6114500000-N	SP	10	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	12	EA	RESPONSE FOR EROSION CONTROL
7060000000-E	1705	980	LF	SIGNAL CABLE
7120000000-E	1705	8	EA	VEHICLE SIGNAL HEAD (12", 3 SECTION)
7144000000-E	1705	1	EA	VEHICLE SIGNAL HEAD (12", 5 SECTION)
7264000000-E	1710	480	LF	MESSENGER CABLE (3/8")
7360000000-N	1720	4	EA	WOOD POLE
7372000000-N	1721	8	EA	GUY ASSEMBLY
7408000000-E	1722	1	EA	1" RISER WITH WEATHERHEAD
7420000000-E	1722	4	EA	2" RISER WITH WEATHERHEAD
7444000000-E	1725	690	LF	INDUCTIVE LOOP SAWCUT
7456000000-E	1726	2,800	LF	LEAD-IN CABLE (***** (14-2)
7768000000-N	1751	1	EA	CONTROLLER WITH CABINET (TYPE 2070L, POLE MOUNTED)
7780000000-N	1751	5	EA	DETECTOR CARD (TYPE 2070L)
7948000000-N	SP	1	EA	TRAFFIC SIGNAL REMOVAL

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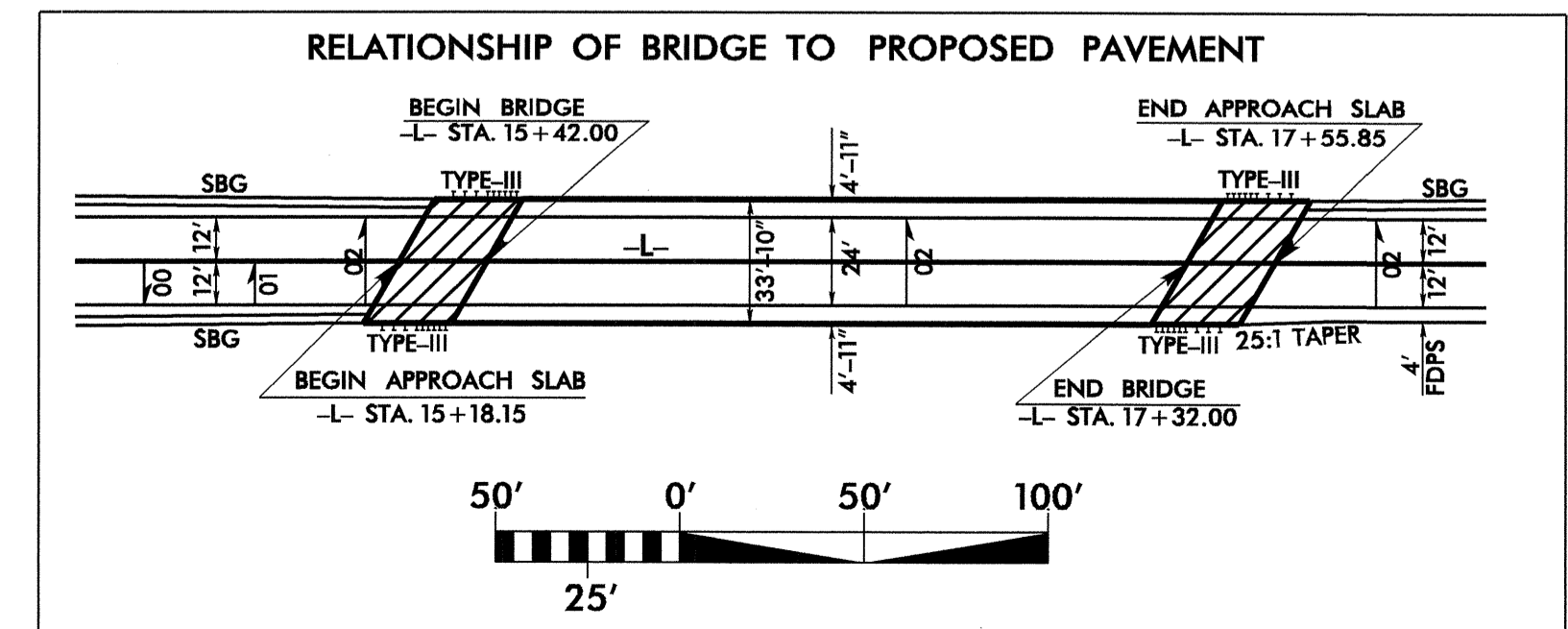
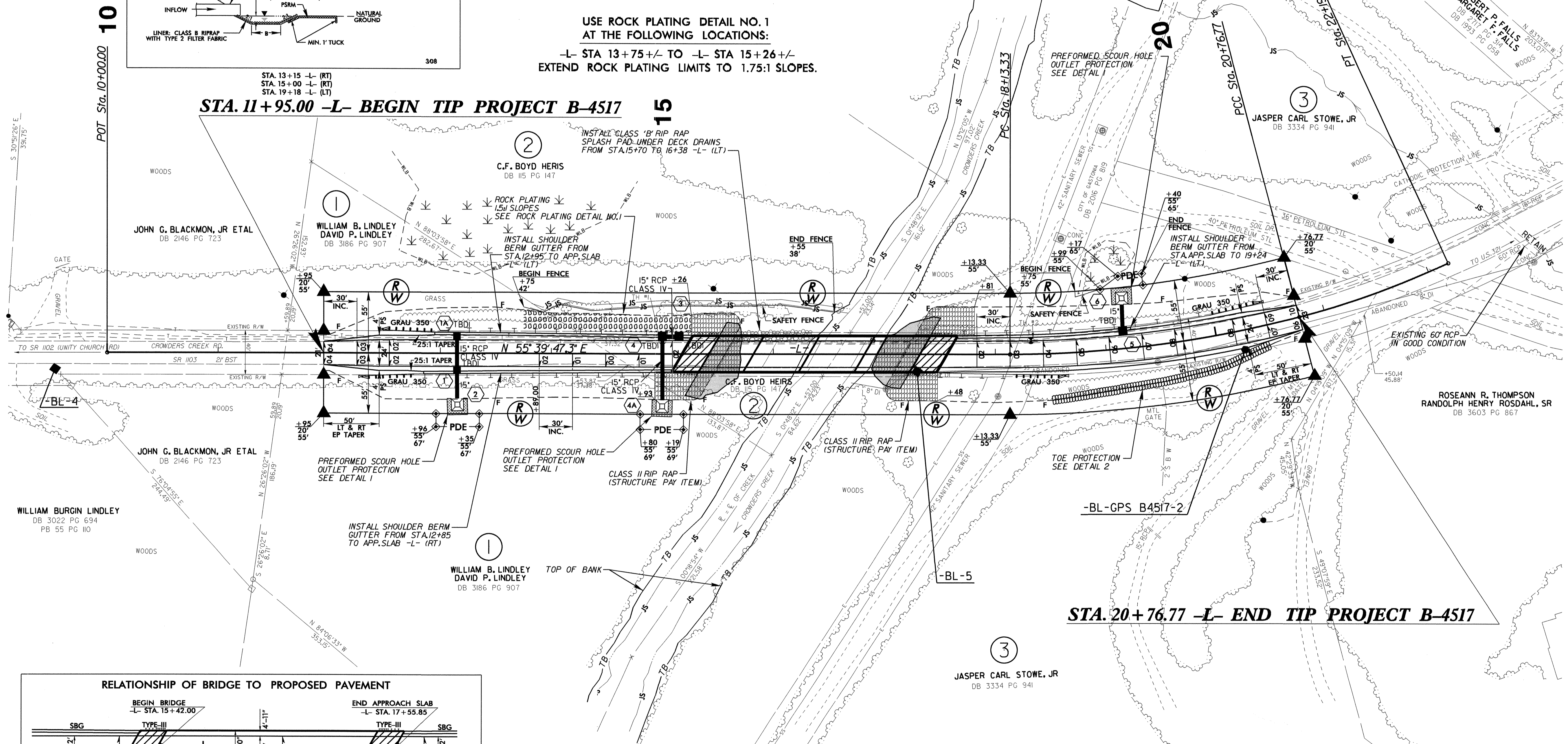
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RW SHEET NO.	
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 024826 ROBERT E. MCCOLLUM, JR.	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 026480 LARRY D. ROBINSON



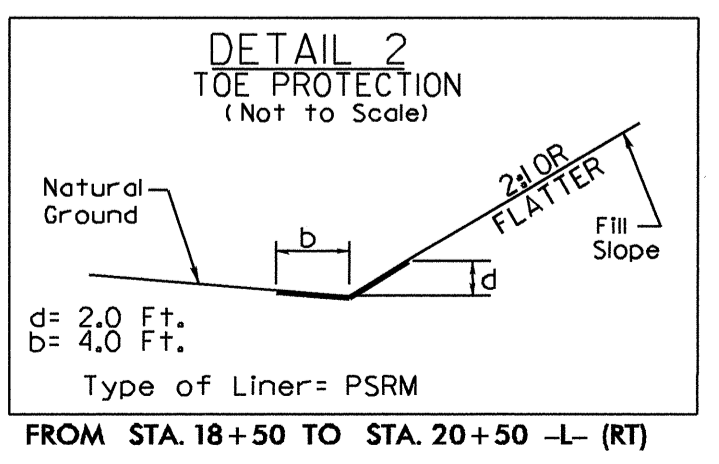
SEE SHEETS S-1 THRU S-31 FOR STRUCTURE PLANS

FOR -L- PROFILE SEE SHEET 5  
 BRIDGE APPROACH SLAB  
 UNCLASSIFIED STRUCTURE EXCAVATION (STRUCTURE PAY ITEM)

**ROCK PLATING DETAIL NO. 1**  
 USE ROCK PLATING DETAIL NO. 1 AT THE FOLLOWING LOCATIONS:  
 -L- STA 13+75 +/- TO -L- STA 15+26 +/-  
 EXTEND ROCK PLATING LIMITS TO 1.75:1 SLOPES.



-L-  
 PI Sta 19+45.78 Δ = 14° 43' 32.9" (LT) Δ = 9° 59' 04.6" (LT)  
 D = 5' 35" 23.4" D = 7' 00" 00.0"  
 L = 263.44' L = 142.64'  
 T = 132.45' T = 71.50'  
 R = 1,025.00' R = 818.5'  
 SE = SEE PLANS



REVISIONS

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5/14/99

PROJECT REFERENCE NO. B-4517	SHEET NO. 5
ROADWAY DESIGN ENGINEER DONALD E. MCCOLLUM, JR. NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 024926 2-18-90	HYDRAULICS ENGINEER LARRY D. ROBINSON NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026480 2-18-90

-L-

UNCLASSIFIED STRUCTURE EXCAVATION  
(STRUCTURE PAY ITEM, SEE STRUCTURE PLANS)

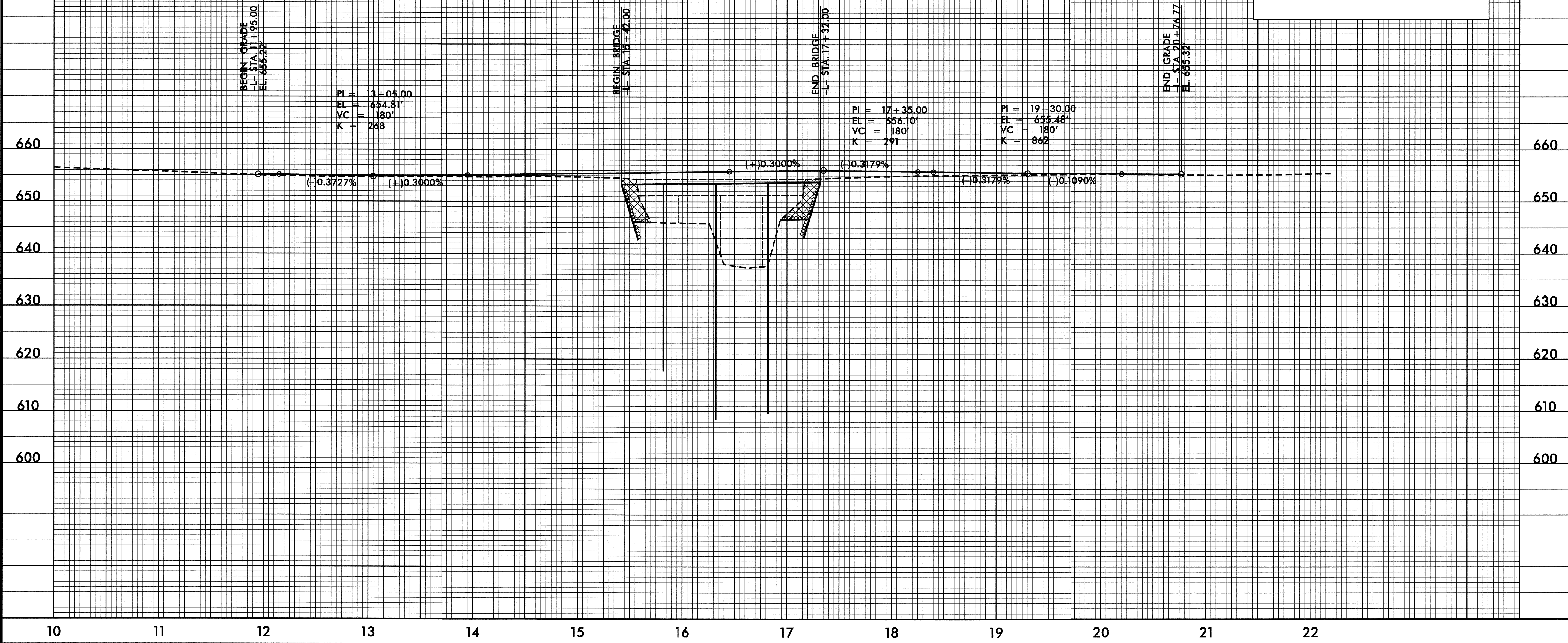
BM #1 8" SPIKE IN BASE OF POWER POLE  
OUTSIDE PROJECT LIMITS  
ELEV. = 668.88'

BM #2 CHISELED SQUARE IN S.W. CORNER  
ON TOP OF CONC. FORCED SEWER BOX  
197' LEFT OF -L- STA. 19+08  
ELEV. = 647.93'

BM #3 CHISELED SQUARE IN S.W. CORNER  
OF CONC. FOUNDATION OF A POWER BOX  
OUTSIDE PROJECT LIMITS  
ELEV. = 663.75'

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 8300	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 653.3	FT
BASE DISCHARGE	= 9100	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 653.9	FT
OVERTOPPING DISCHARGE	= 15000 +/-	CFS
OVERTOPPING FREQUENCY	= 500 +/-	YRS
OVERTOPPING ELEVATION	= 655.0	FT
EST. NORM. W.S. ELEV.	= 637.89	FT
DATE OF SURVEY	= Sept. 3, 2008	
W.S. ELEVATION AT DATE OF SURVEY	= 637.89	FT



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4517.dwg