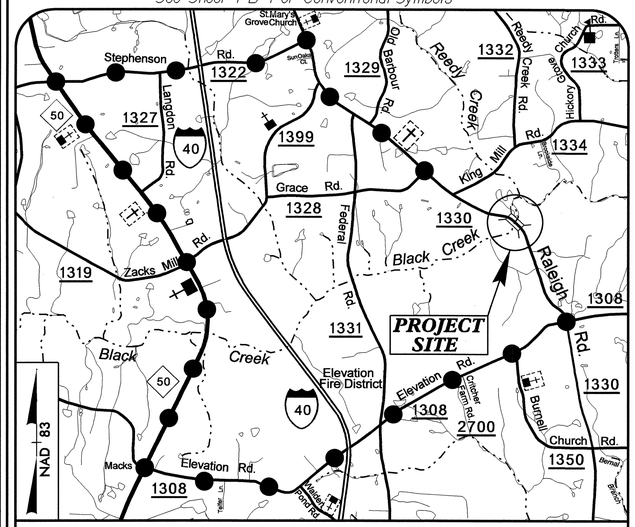
09/08/99

TIP PROJECT: B–4559

CONTRACT: C202469

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

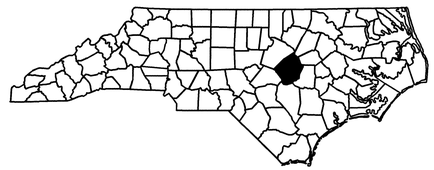
JOHNSTON COUNTY

LOCATION: BRIDGE NO. 84 OVER BLACK CREEK ON SR 1330 (RALEIGH ROAD)

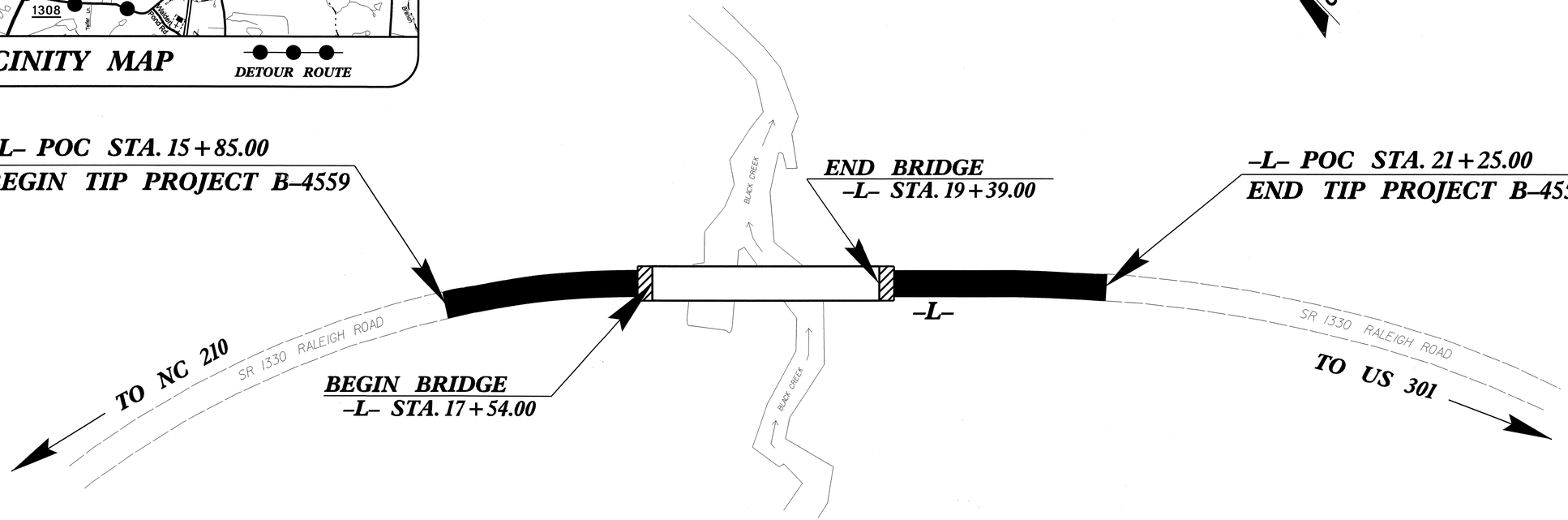
TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–4559	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33770.1.1	BRZ–1330(7)	P.E.
33770.2.1	BRZ–1330(7)	ROW & UTIL
33770.3.1	BRZ–1330(7)	CONST.



NAD 83



GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2008	=	1400
ADT 2030	=	2600
DHV	=	11 %
D	=	60 %
T	=	4 % *
V	=	55 MPH
* TTST 1%	=	DUAL 3%
FUNC CLASS	=	LOCAL
SUB–REGIONAL TIER		

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B–4559 = 0.067 MI
LENGTH STRUCTURE TIP PROJECT B–4559 = 0.035 MI
TOTAL LENGTH TIP PROJECT B–4559 = 0.102 MI

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: APRIL 14, 2009

LETTING DATE: April 20, 2010

ROGER D. THOMAS, PE
PROJECT ENGINEER

BRIAN P. ROBINSON
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026480 ENGINEER LARRY D. ROBINSON 1-24-10

SIGNATURE:

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19849 ENGINEER ROGER D. THOMAS

1/26/10 P.E.

SIGNATURE:

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION

art mcmillan P.E.

STATE HIGHWAY DESIGN ENGINEER

22-JAN-2010 09:38
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$$$$USERNAME$$$$

8/17/99

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

INDEX OF SHEETS

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.

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.

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: WATER-JOHNSTON COUNTY.

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY OTHERS.

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

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
840.00	Concrete Base Pad for Drainage Structures
840.18	Concrete Grated Drop Inlet Type 'B'-12" thru 36" Pipe
840.24	Frames and Narrow Slot Sag Grates
840.27	Brick Grated Drop Inlet Type 'B'-12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet-for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Crub, 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
862.04	Anchoring End of Guardrail- B-77 and B-83 Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets

09/08/09

PROJECT REFERENCE NO.	SHEET NO.
B-4559	1-B

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 — 123
- Existing Fence Line
- 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 — FLOW
- False Sump

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- 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 — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite Marker — RW
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage / Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

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
- 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 — 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 — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole — HH
- 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 — T
- Telephone Booth
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- 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 — W
- Water Meter
- Water Valve
- Water Hydrant
- Recorded U/G Water Line — W
- Designated U/G Water Line (S.U.E.*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Satellite Dish
- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- 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 — S
- Utility Unknown U/G Line — ?UTL
- 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

PROJECT REFERENCE NO.	SHEET NO.
B-4559	1C
Location and Surveys	

SURVEY CONTROL SHEET B-4559

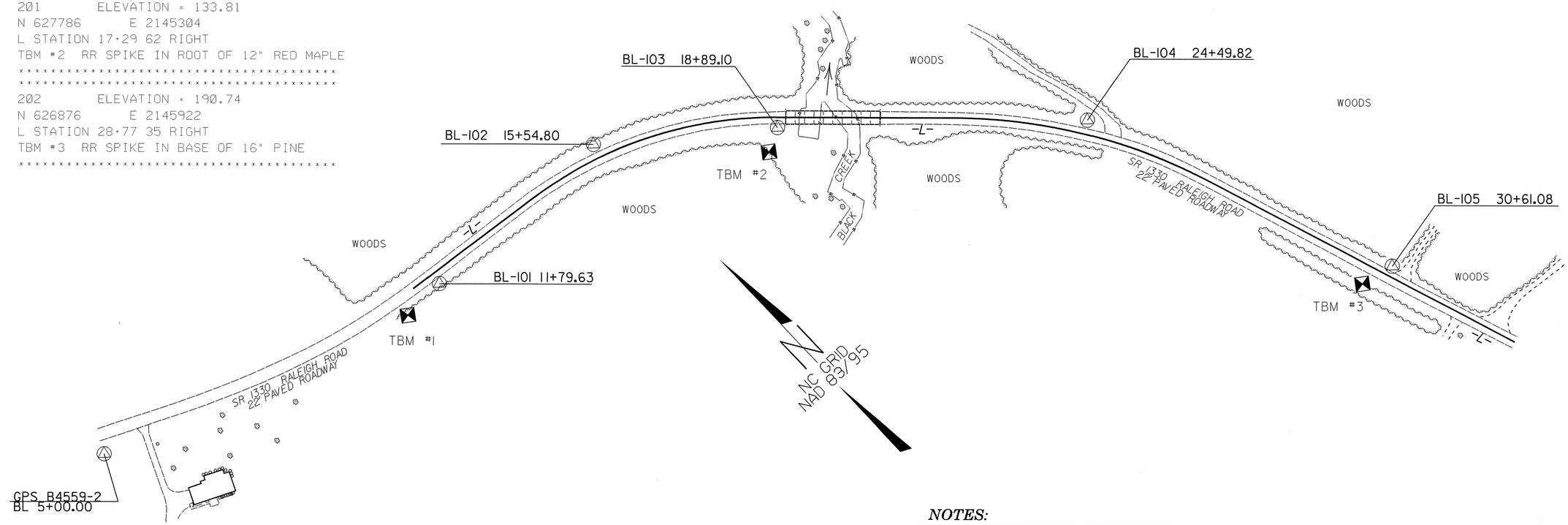
BENCHMARK DATA

```
**********************************************
200       ELEVATION = 136.52
N 628017      E 2144626
L STATION 10+00
S 54° 08' 36.6" W  DIST     49.72
TBM #1  RR SPIKE IN BASE OF 8" GUM
**********************************************
**********************************************
201       ELEVATION = 133.81
N 627786      E 2145304
L STATION 17+29 62 RIGHT
TBM #2  RR SPIKE IN ROOT OF 12" RED MAPLE
**********************************************
**********************************************
202       ELEVATION = 190.74
N 626876      E 2145922
L STATION 28+77 35 RIGHT
TBM #3  RR SPIKE IN BASE OF 16" PINE
**********************************************
```

BASELINE DATA

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
2	GPS B4559-2	628212.2110	2144054.5890	145.41	OUTSIDE PROJECT LIMITS	
101	BL-101	628020.8970	2144706.7310	138.27	10+43.35	21.15 RT
102	BL-102	628012.9330	2145081.8240	139.07	14+12.99	25.81 LT
103	BL-103	627807.2690	2145345.3650	143.22	17+45.63	18.30 RT
104	BL-104	627432.5040	2145762.4500	173.32	23+02.36	25.70 LT
105	BL-105	626862.3860	2145982.9270	185.82	29+09.40	18.52 LT



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "GPS B4559-2" WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 628212.2114(ft) EASTING: 2144054.5889(ft) ELEVATION: 145.41(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998751

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS B4559-2" TO -L- STATION 10+00.00 IS S 74°50'30.2" E 633.36 (ft)

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES

VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

NOTES:

1. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT: HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/*

   THE FILES TO BE FOUND ARE AS FOLLOWS: B4559_LS_CONTROL_081212.TXT

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

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

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING SERVICE (OPUS)

06-JAN-2010 09:14
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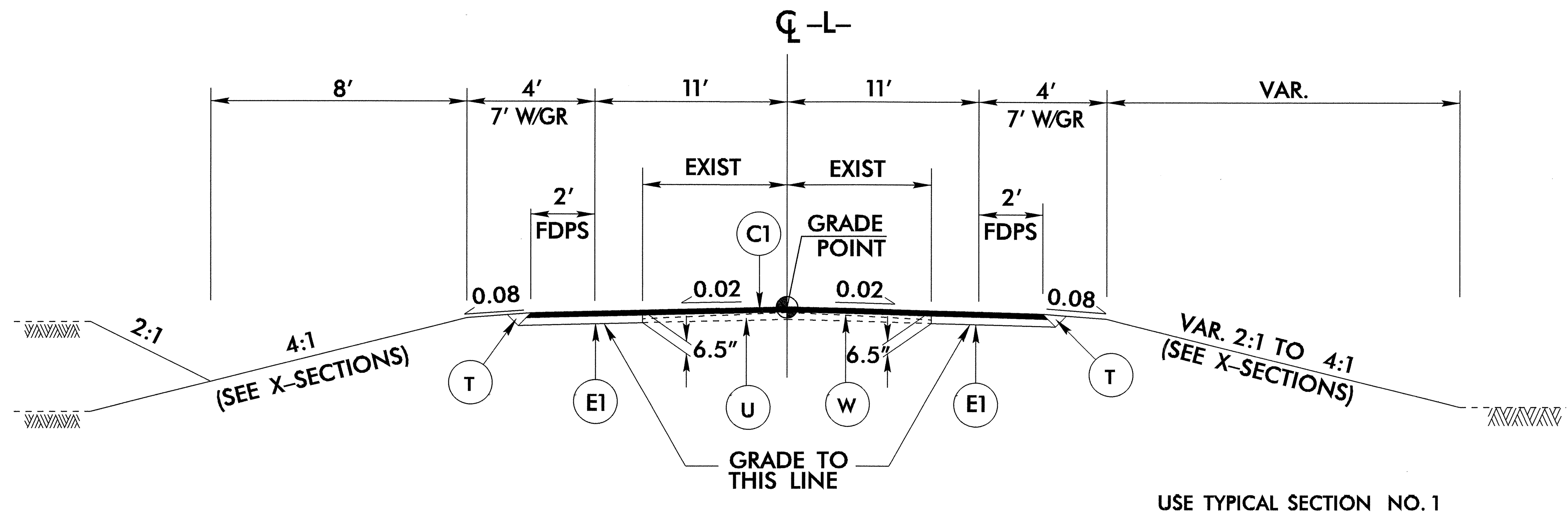
PROJECT REFERENCE NO.	SHEET NO.
B-4559	2

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19849 ROGER D. THOMAS 1/26/10

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22896 CLARK S. MORRISON 1/26/2010



TYPICAL SECTION NO. 1

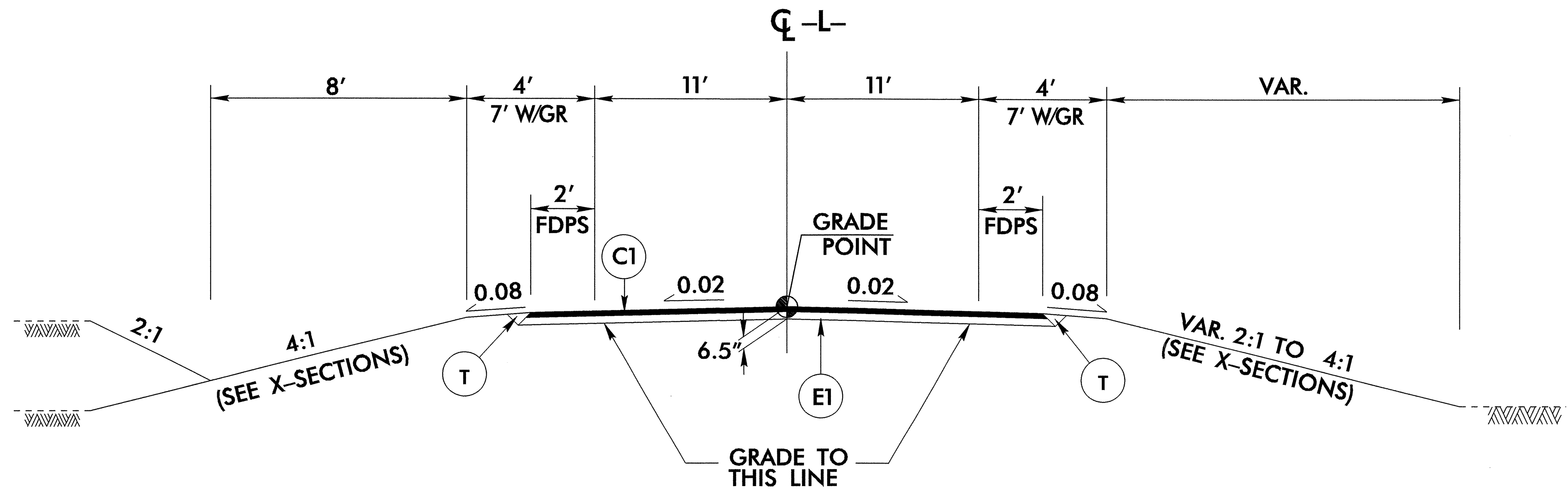
USE TYPICAL SECTION NO. 1
-L- STA. 16+10.00 TO STA. 17+00.00
-L- STA. 19+90.00 TO STA. 21+00.00

NOTE: OVERLAY EXISTING PAVEMENT WITH (C1)
-L- STA. 15+85.00 TO STA. 16+10.00
-L- STA. 21+00.00 TO STA. 21+25.00

PAVEMENT SCHEDULE

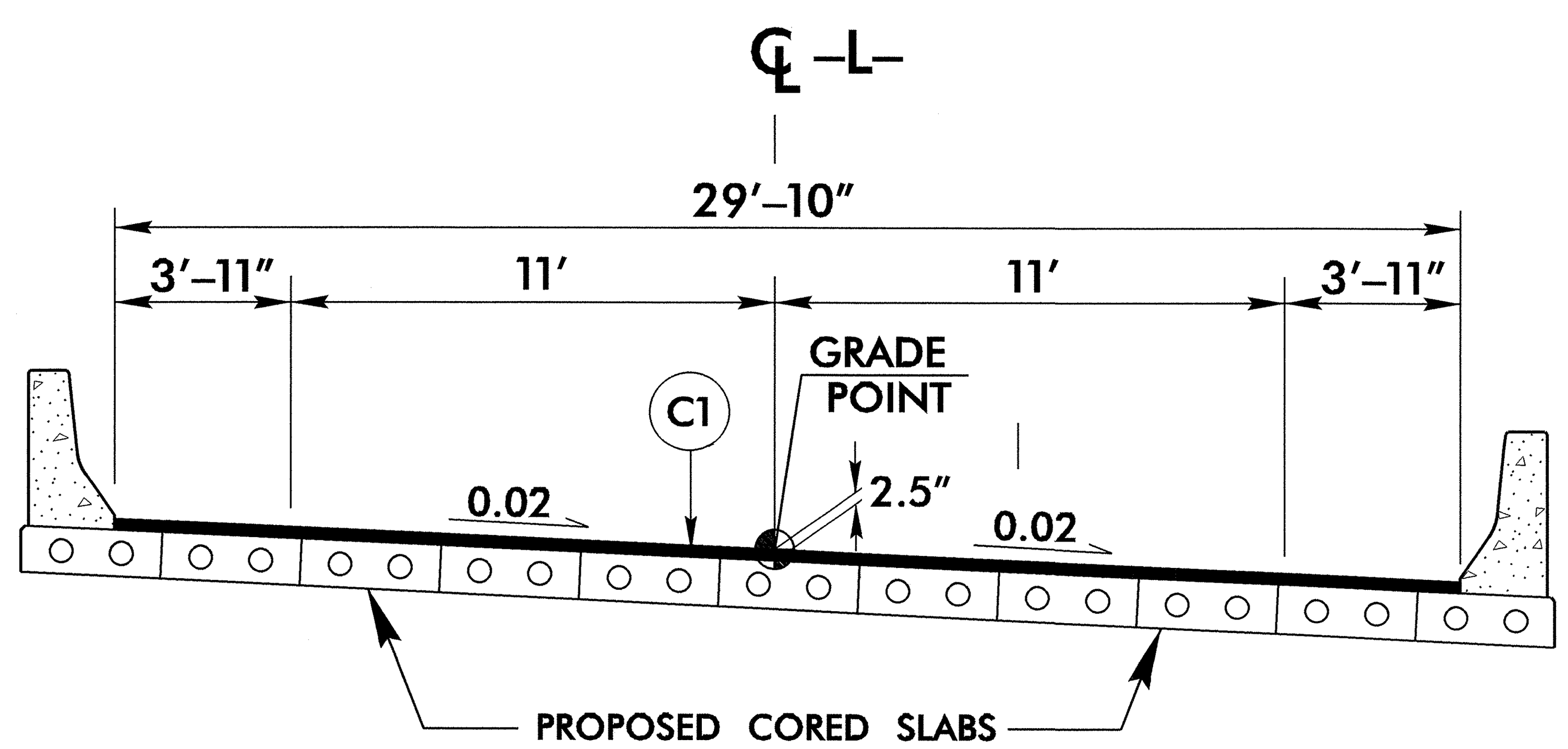
C1	PROP. APPROX. 2.5" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1.0" IN DEPTH OR GREATER THAN 1.5" IN DEPTH.
E1	PROP. APPROX. 4.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 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 5.5" 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.



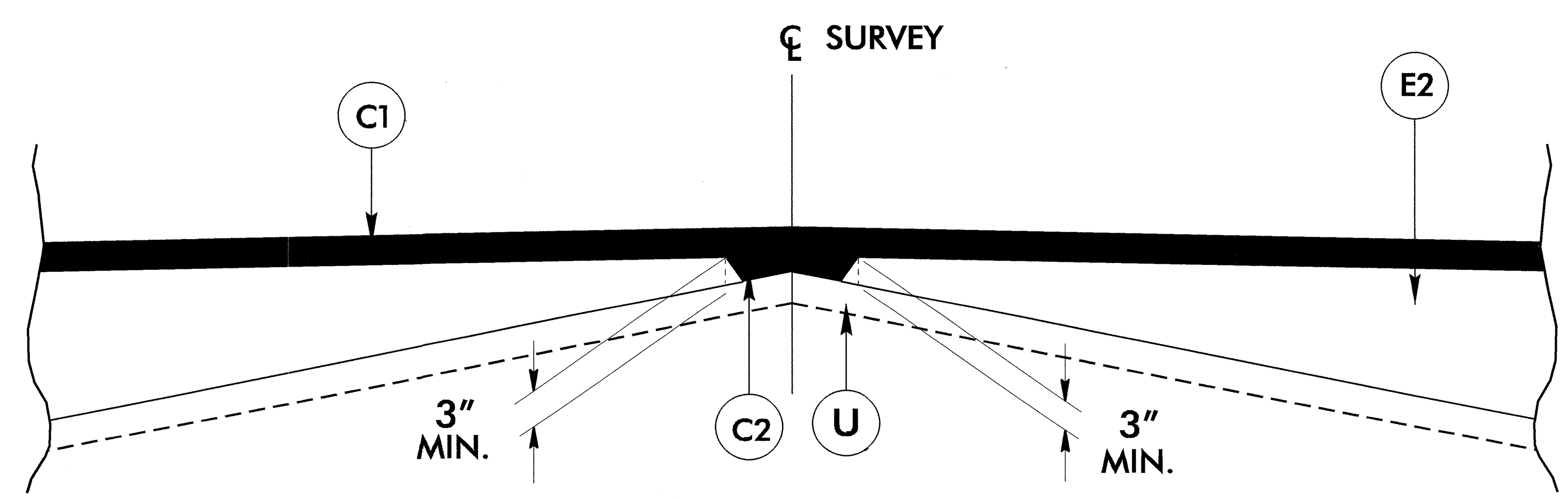
TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2
-L- STA. 17+00.00 TO STA. 17+54.00 (BEGIN BRIDGE)
-L- STA. 19+39.00 (END BRIDGE) TO STA. 19+90.00



TYPICAL SECTION ON STRUCTURE
(SEE STRUCTURE PLANS)

USE TYPICAL ON STRUCTURE
-L- STA. 17+54.00 (BEGIN BRIDGE)
TO 19+39.00 (END BRIDGE)



DETAIL SHOWING METHOD OF WEDGING

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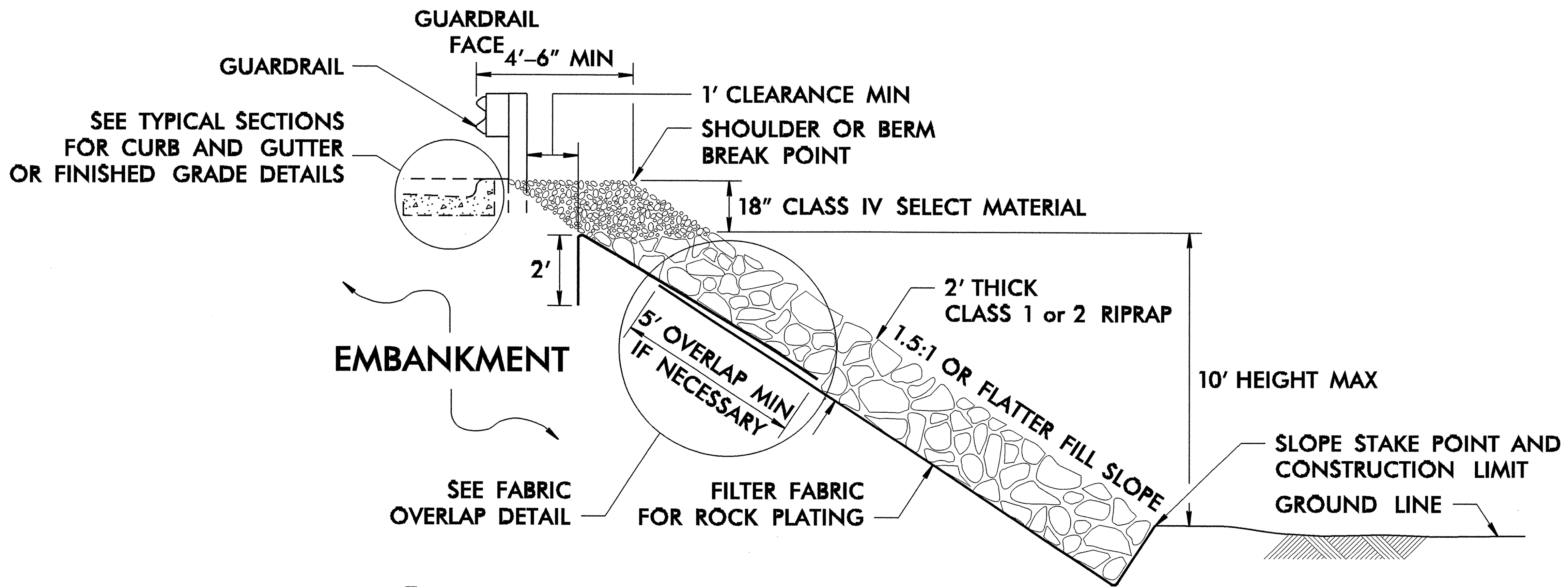
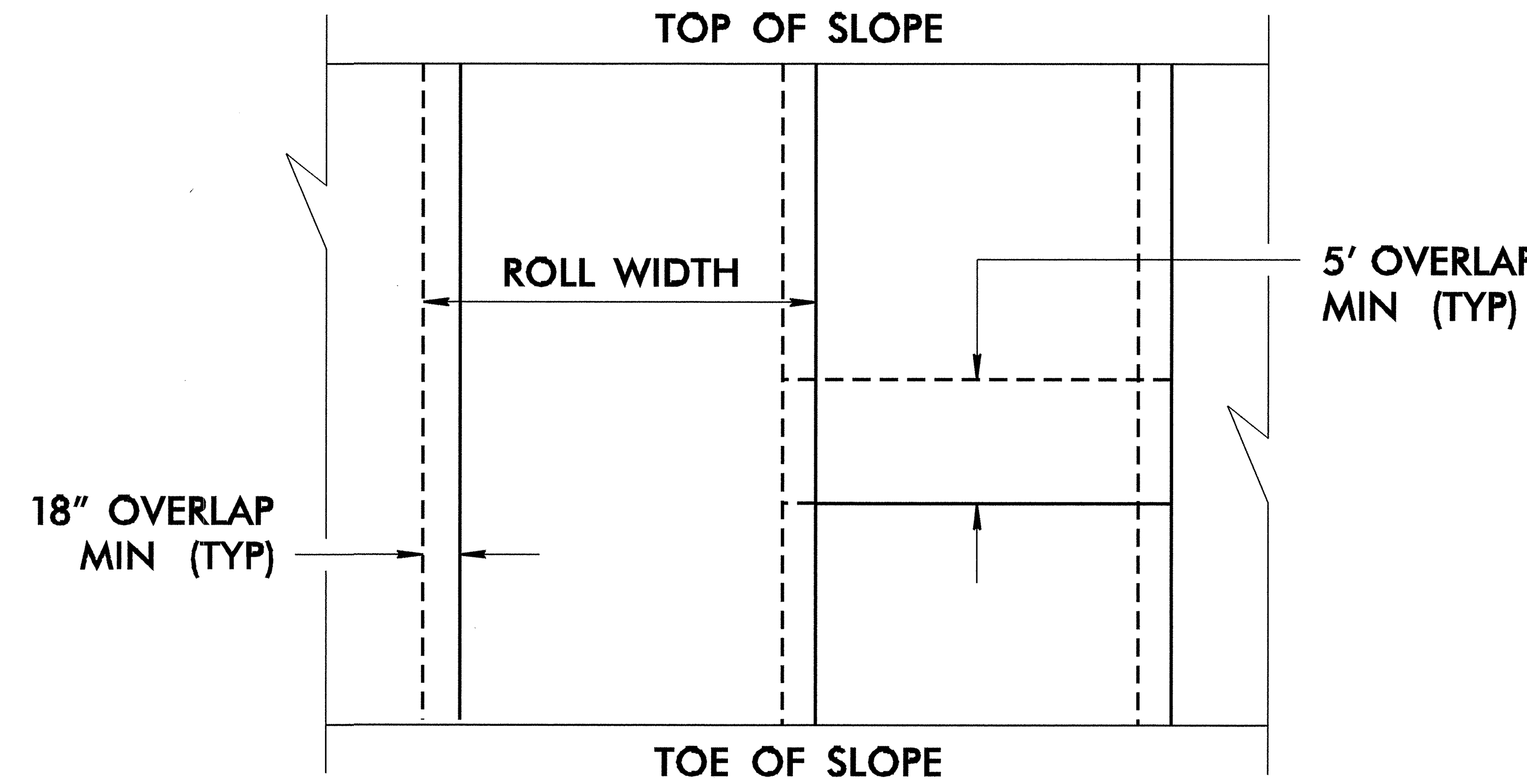
PROJECT REFERENCE NO.	SHEET NO.
B-4559	2-A
R/W SHEET NO.	

ROCK PLATING



ROCK PLATING DETAIL NO. 1



FABRIC OVERLAP DETAIL
(PLAN VIEW)

USE ROCK PLATING DETAIL NO. 1
AT THE FOLLOWING LOCATIONS:

–L– STA 19+43.75 ± TO –L– STA 19+66 ± (RIGHT)
AND EXTEND ROCK PLATING LIMITS DOWN THE SIDE SLOPE TO ELEVATION 141.0 FT.

–L– STA 19+66 ± TO –L– STA 19+98 ± (RIGHT)
AND EXTEND ROCK PLATING LIMITS TO 2:1 (H:V) SLOPE

ESTIMATED QUANTITIES:

ROCK PLATING ------------------ 100 SQ. YD.

FOR ROCK PLATING,
SEE ROCK PLATING SPECIAL PROVISION.

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 12/01/09 AND SEALED BY A PROFESSIONAL ENGINEER, JAMES R. BATTS, JR. , LICENSE # 18899.

8/17/99

25-JAN-2010 16:14
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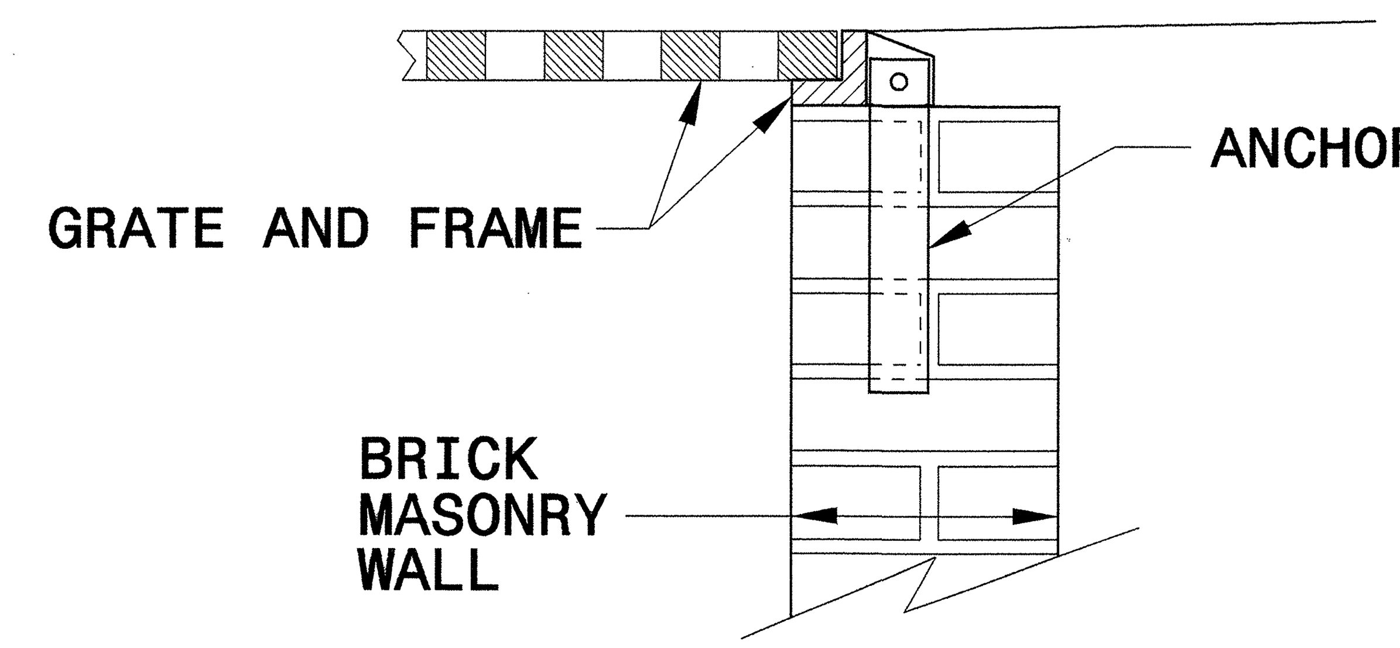
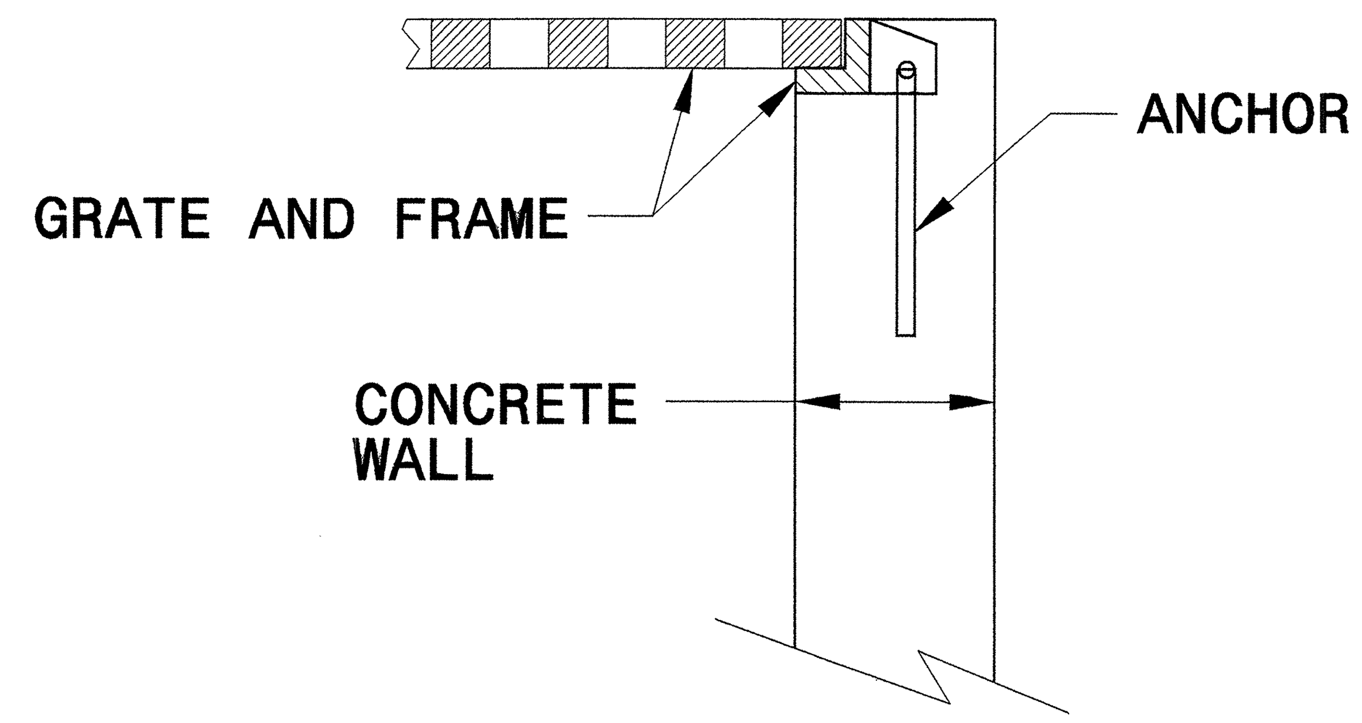
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

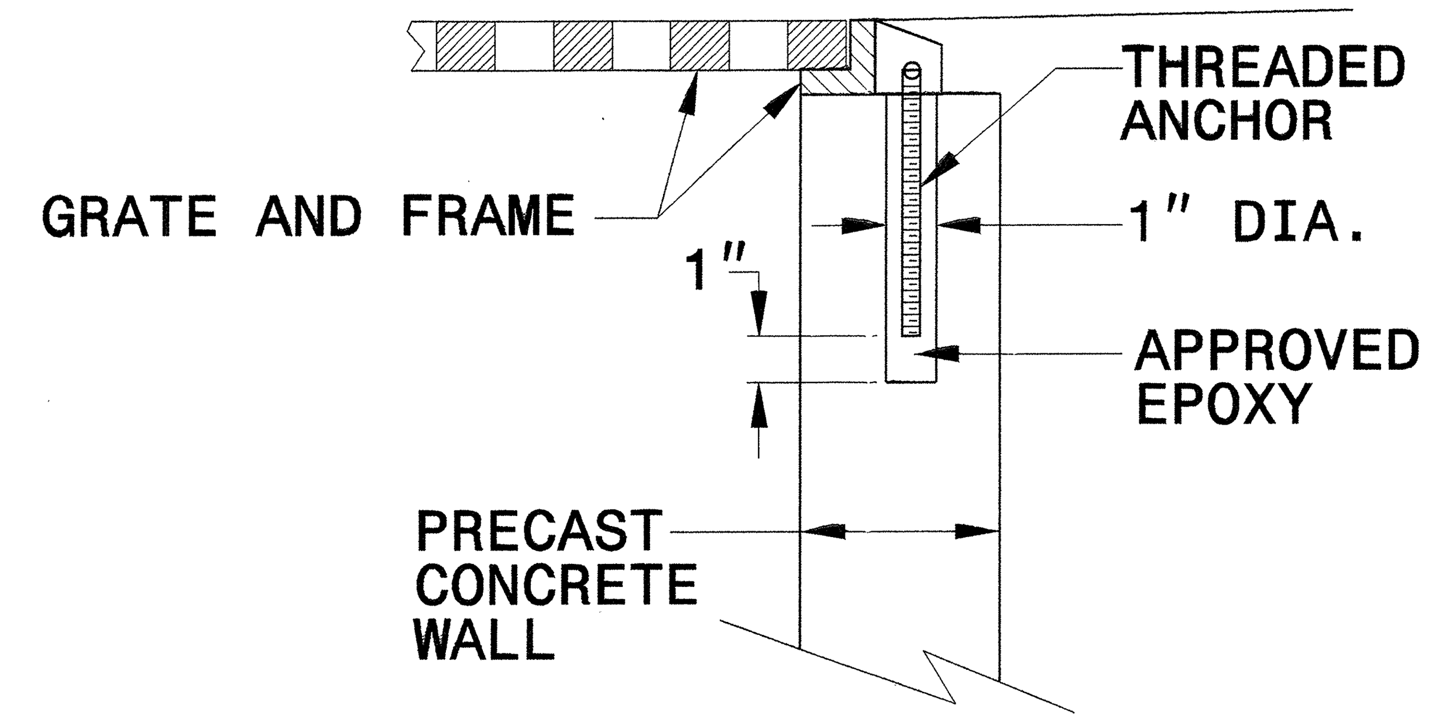
ENGLISH DETAIL DRAWING FOR
ANCHORAGE FOR FRAMES
BRICK/CONCRETE/PRECAST CONCRETE



BRICK MASONRY CONSTRUCTION



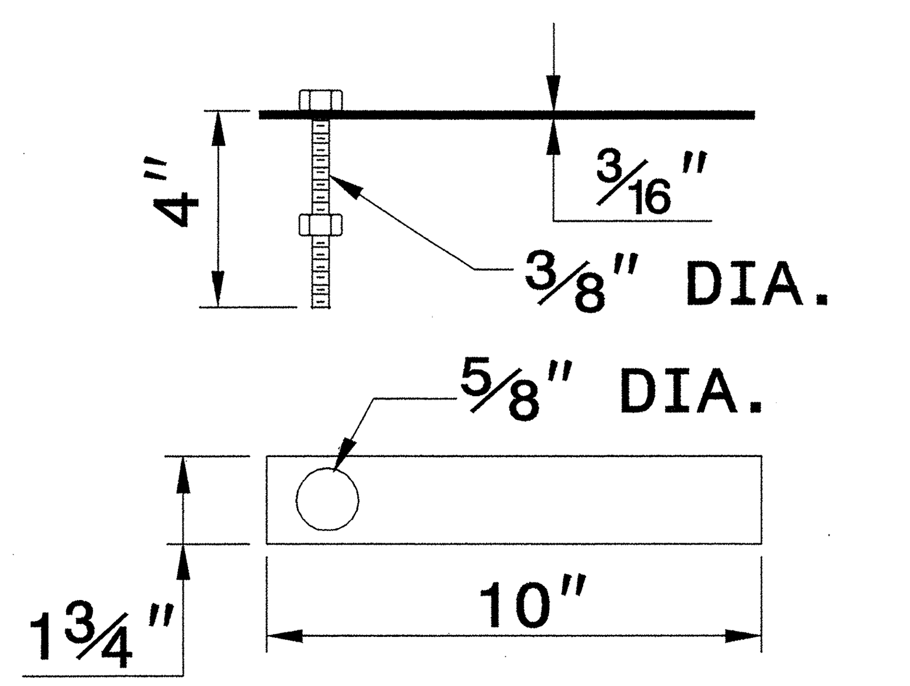
CONCRETE CONSTRUCTION



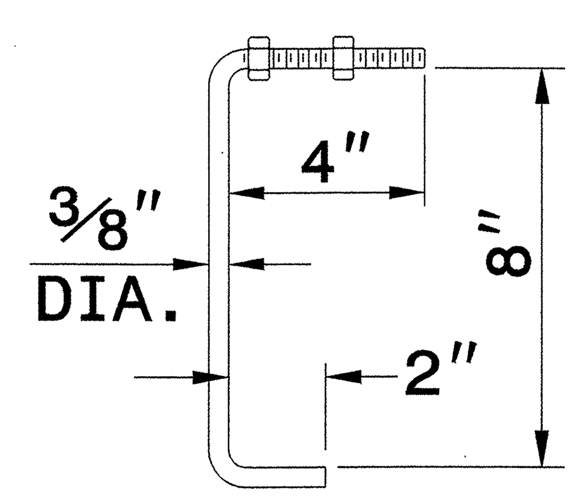
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

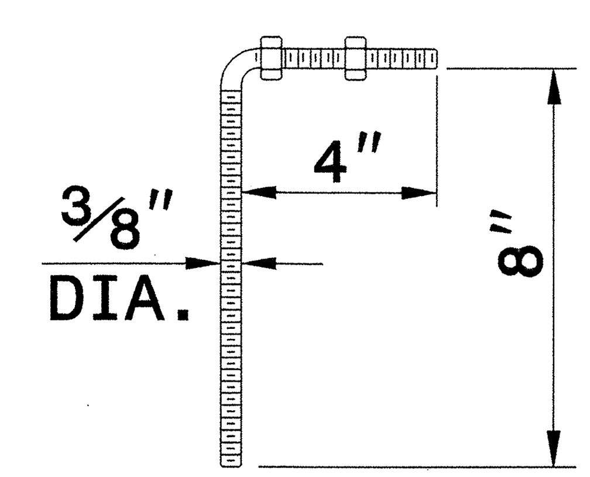
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



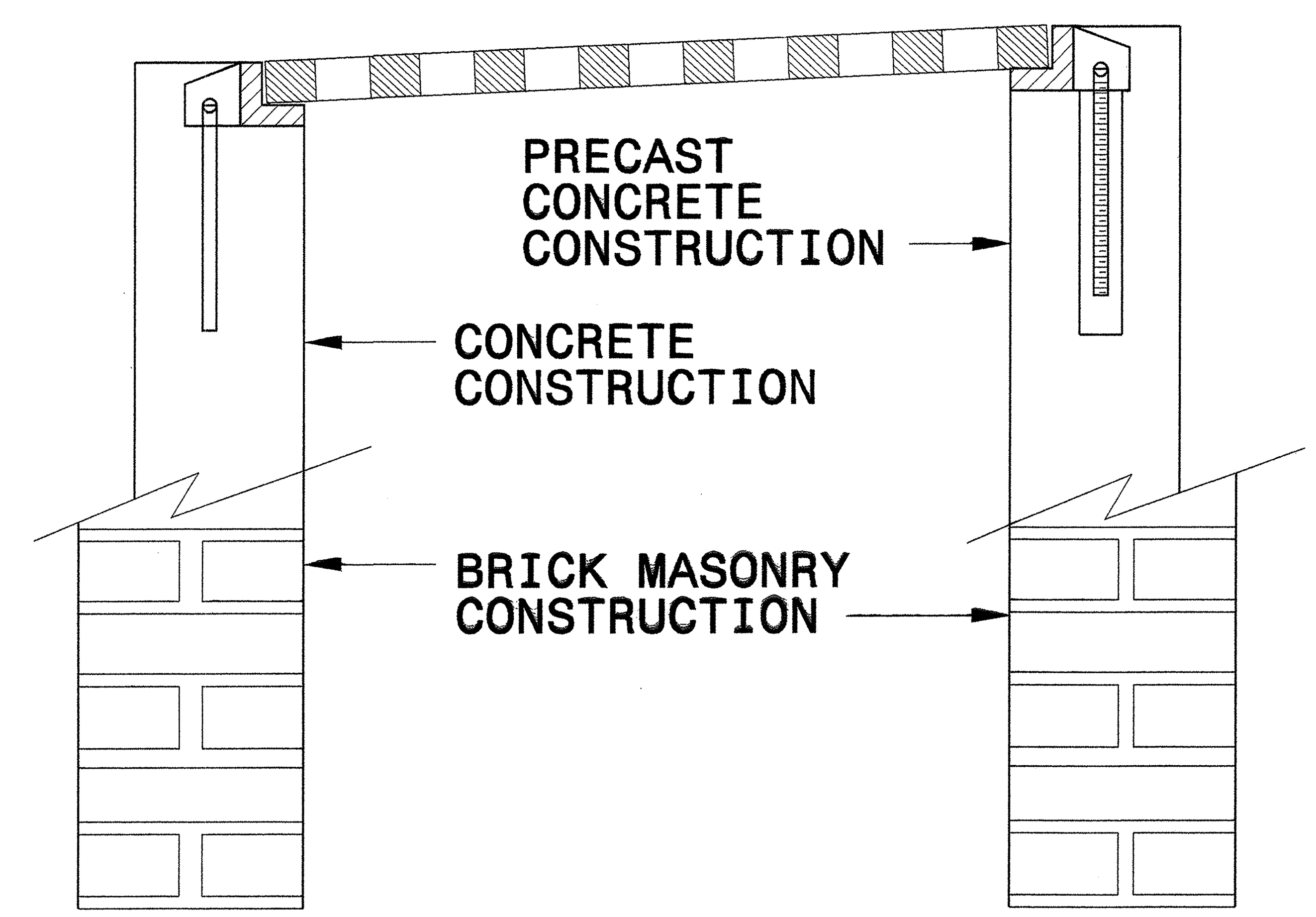
MASONRY ANCHOR
3/8" DIA. BOLT WITH PLATE



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

SHEET 1 OF 1
840D25

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

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON 1/29/10

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: [signature] DATE: 11/13/08
FILE SPEC.:

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$DGN$$$$$$$$$$$$$$$
$$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-4559	2-C

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

7-06

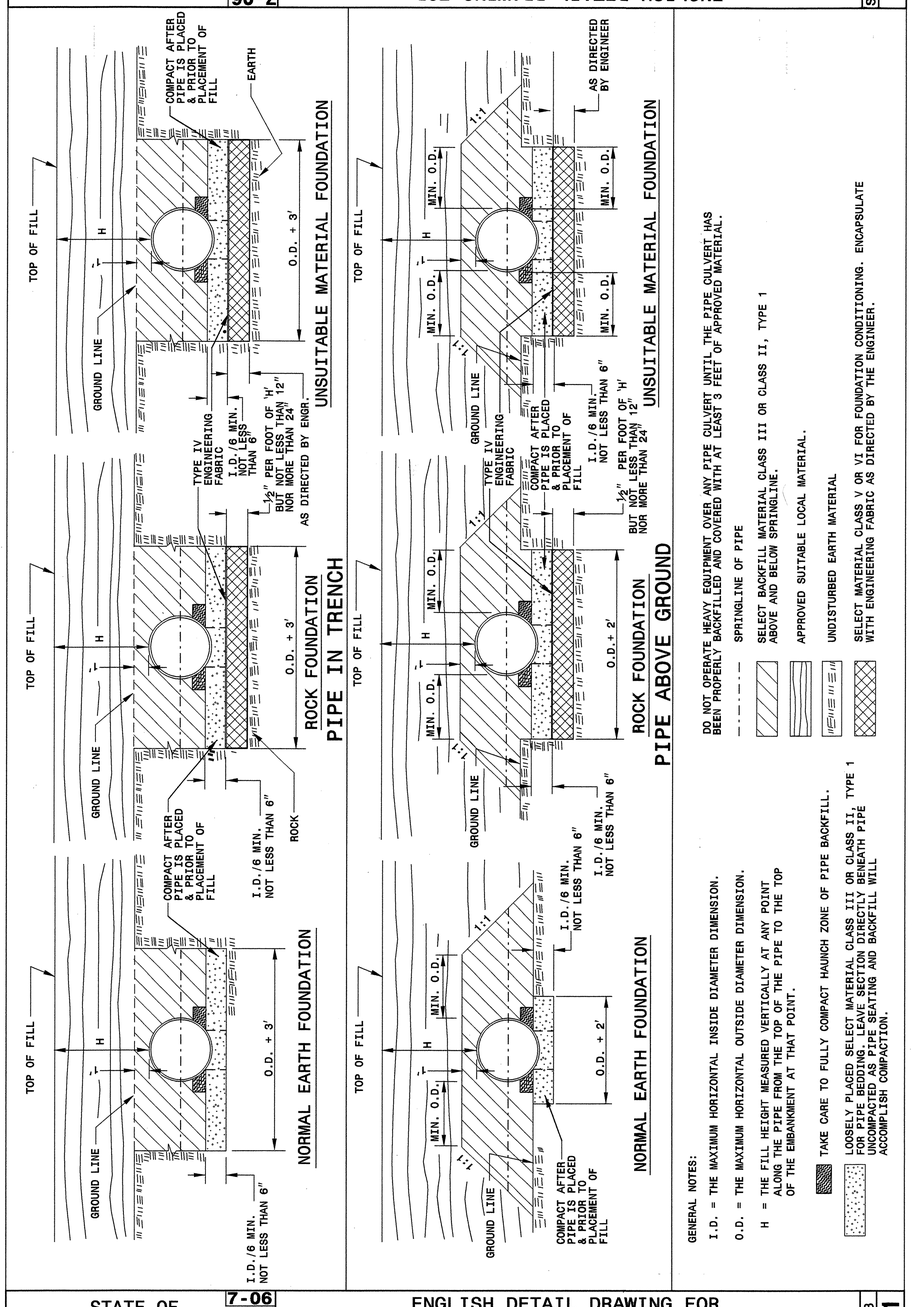
ENGLISH DETAIL DRAWING FOR

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 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE 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

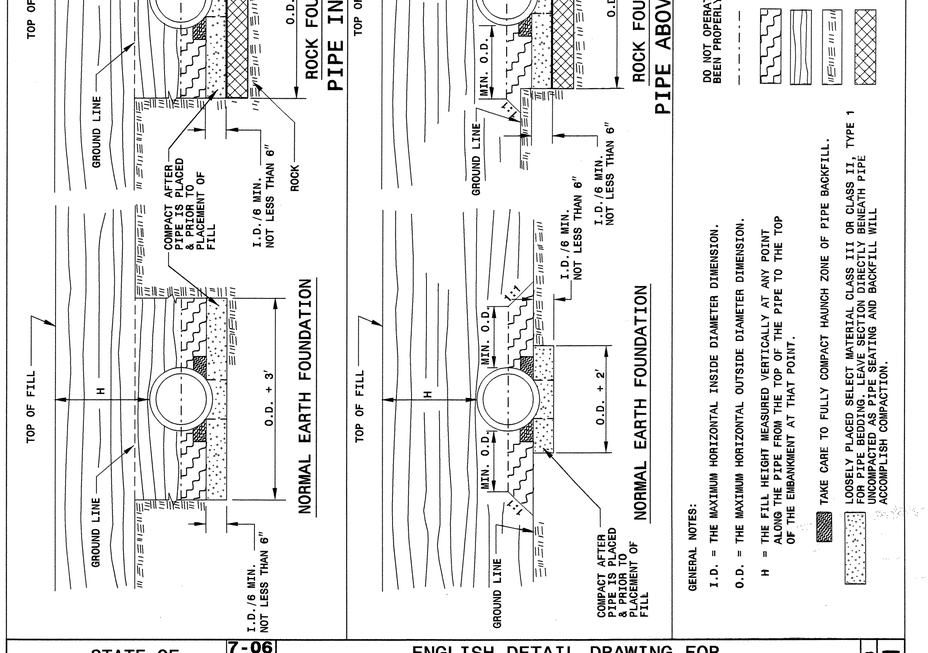
ENGLISH DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

RIGID PIPE

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 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE 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, 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:
CHECKED BY: DATE: 7/30/09
FILE SPEC: c:/ericward/stds/stdstodetails/30001/0300d01.dgn

30-JUL-2009 08:49
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jhowerton AT PS237501

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4559	2-D

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

7-06

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 ½ corrugation **

Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet) (Ga) 16	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	91
78	12					81
84	12					69

Round Corrugated Aluminum Pipe
2 2/3 x ½ corrugation **

Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet) (Ga) 16	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
72	12					41

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

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

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.
7-06
ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
FILL HEIGHT TABLES
SHEET 3 OF 3
300D01

NORTH CAROLINA PROFESSIONAL SEAL 022366 ENGINEER JOEL S. HOWERTON
1/29/10

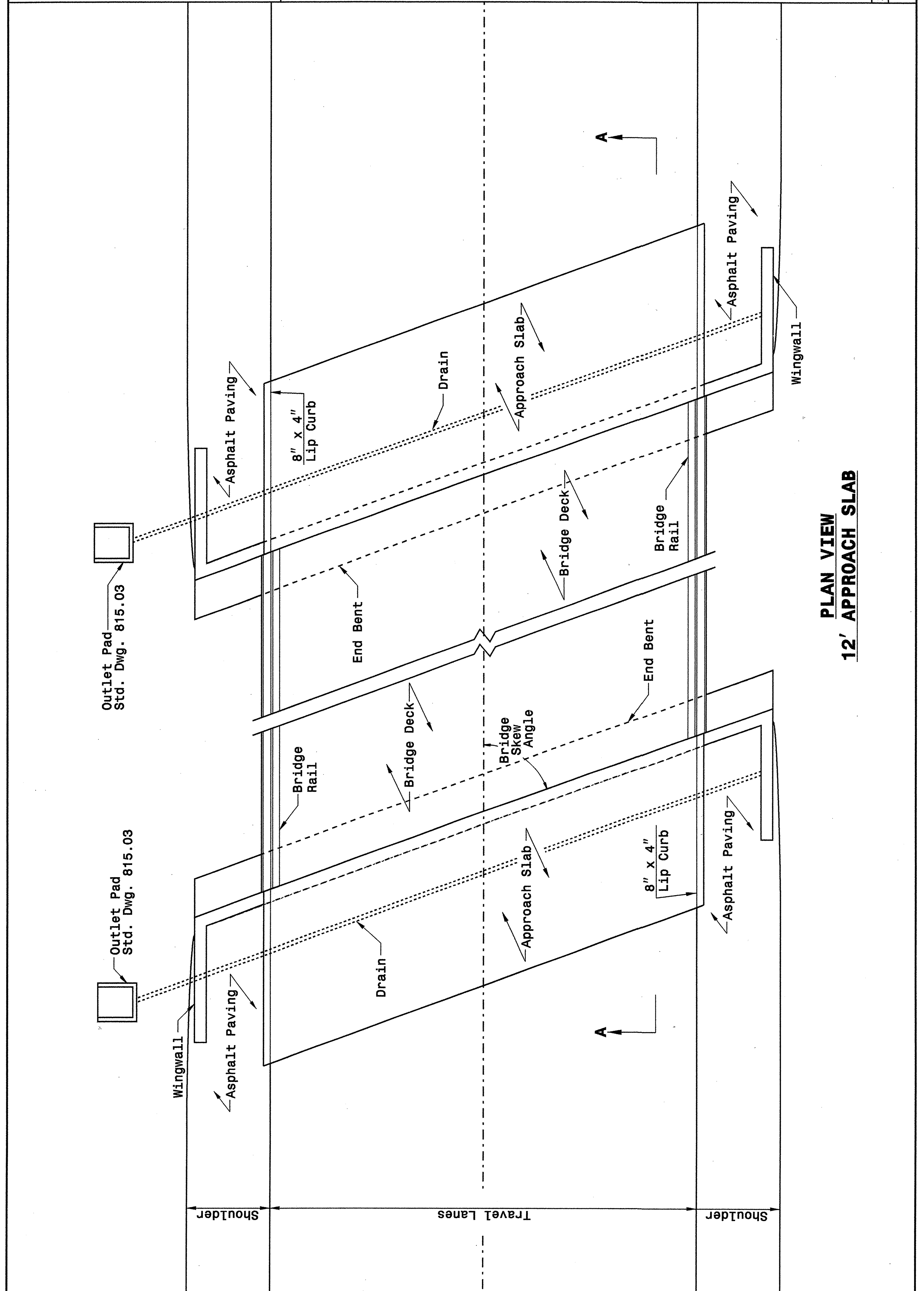
PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

SEE PLATE FOR TITLE

ORIGINAL BY: KKempf DATE: 5-15-09
MODIFIED BY: DATE:
CHECKED BY: [signature] DATE: 7/30/09
FILE SPEC: /ericward/stds/stdstodetails/30001/0300d01.dgn

PROJECT REFERENCE NO.	SHEET NO.
B-4559	2-E

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



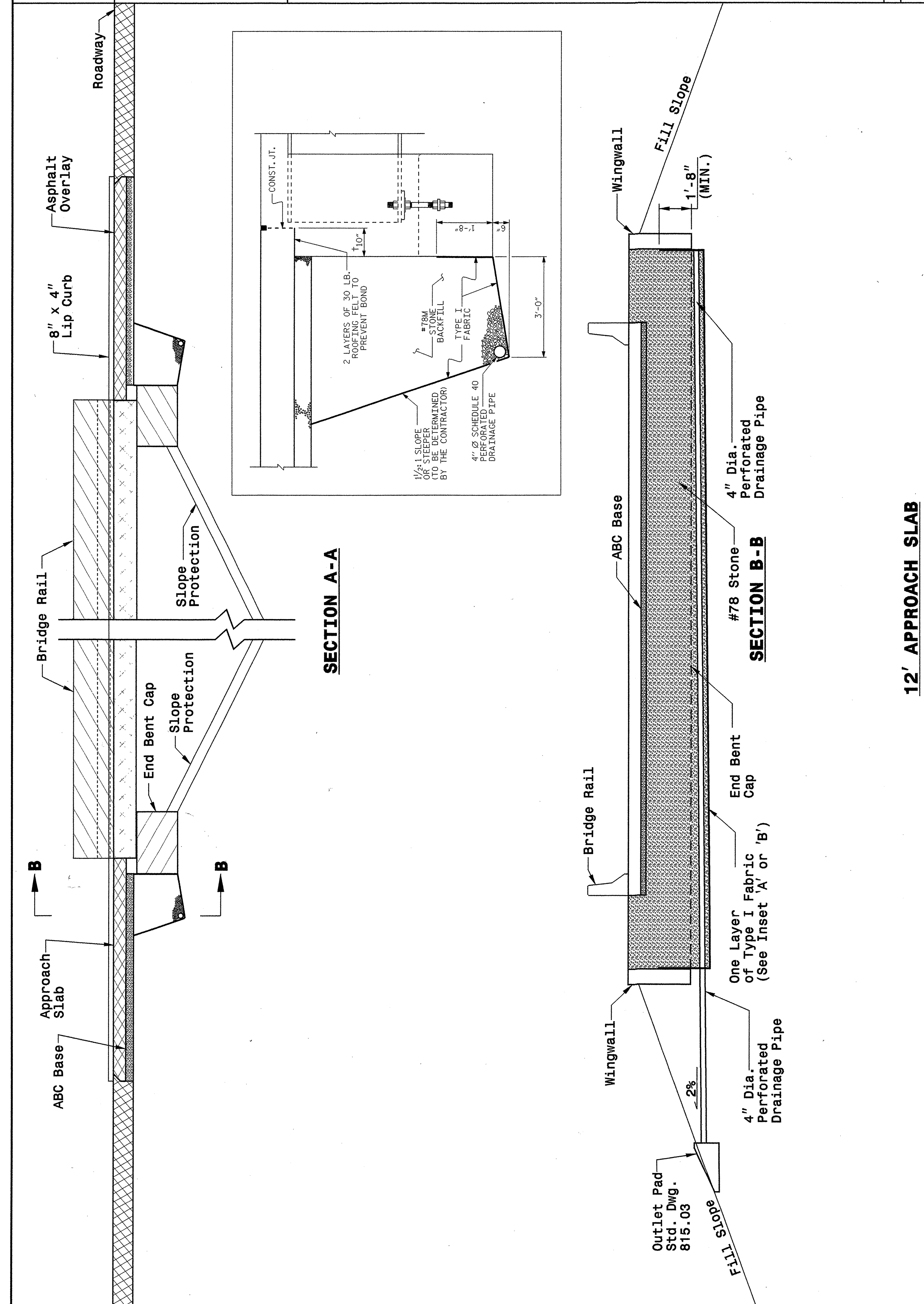
PLAN VIEW
12' APPROACH SLAB

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



SECTION A-A

SECTION B-B

12' APPROACH SLAB

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

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON 1/29/10

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: 1/7/10
FILE SPEC.: kkempf\english\bridge approach fills.dgn

$$$$$$SYSTIME$$$$$
$$$$$$DATE$$$$$$$$DGN$$$$$$$$$$$$$$$$$$
$$$USERNAME$$$$

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-4559	3

SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202469

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0001000000-E	200	Lump Sum		CLEARING & GRUBBING .. ACRE(S)
0008000000-E	200	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING
0022000000-E	225	100	CY	UNCLASSIFIED EXCAVATION
0030000000-N	SP	Lump Sum		BRIDGE APPROACH FILL - SUB REGIONAL TIER, STATION ******* (18+46.50)
0036000000-E	225	200	CY	UNDERCUT EXCAVATION
0106000000-E	230	100	CY	BORROW EXCAVATION
0156000000-E	250	300	SY	REMOVAL OF EXISTING ASPHALT PAVEMENT
0196000000-E	270	200	SY	FABRIC FOR SOIL STABILIZATION
0223000000-E	SP	100	SY	ROCK PLATING
0234000000-E	SP	200	CY	GENERIC GRADING ITEM SELECT GRANULAR MATERIAL
0320000000-E	SP	40	SY	FOUNDATION CONDITIONING FABRIC
0330000000-E	SP	20	TON	GENERIC DRAINAGE ITEM FOUNDATION CONDITIONING MATERIAL, MINOR STRS
0335200000-E	SP	96	LF	15" DRAINAGE PIPE
0335850000-E	SP	4	EA	**" DRAINAGE PIPE ELBOWS (15")
1011000000-N	500	Lump Sum		FINE GRADING
1489000000-E	610	160	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1525000000-E	610	260	TON	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A
1560000000-E	620	25	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
2000000000-N	806	12	EA	RIGHT OF WAY MARKERS
2286000000-N	840	3	EA	MASONRY DRAINAGE STRUCTURES
2366000000-N	840	1	EA	FRAME WITH TWO GRATES, STD 840.24
2367000000-N	840	2	EA	FRAME WITH TWO GRATES, STD 840.29
2556000000-E	846	100	LF	SHOULDER BERM GUTTER
3030000000-E	862	125	LF	STEEL BM GUARDRAIL
3150000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS
3270000000-N	SP	4	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3317000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77
3649000000-E	876	3	TON	RIP RAP, CLASS B
3656000000-E	876	10	SY	FILTER FABRIC FOR DRAINAGE
3659000000-N	SP	1	EA	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON
4400000000-E	1110	114	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	4,322	LF	PAINT PAVEMENT MARKING LINES (4")
4900000000-N	1251	10	EA	PERMANENT RAISED PAVEMENT MARKERS
5325000000-E	1510	320	LF	**" WATER LINE (14")
5326200000-E	1510	120	LF	12" WATER LINE
5558000000-E	1515	1	EA	12" VALVE
5672000000-N	1515	1	EA	RELOCATE FIRE HYDRANT
5804000000-E	1530	436	LF	ABANDON 12" UTILITY PIPE
5871800000-E	1550	320	LF	TRENCHLESS INSTALLATION OF 14" IN SOIL
6000000000-E	1605	1,300	LF	TEMPORARY SILT FENCE
6006000000-E	1610	225	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	150	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	100	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	0.5	ACR	TEMPORARY MULCHING
6018000000-E	1620	50	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	0.25	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	200	LF	TEMPORARY SLOPE DRAINS
6027000000-N	1622	5	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
6029000000-E	SP	1,000	LF	SAFETY FENCE
6030000000-E	1630	225	CY	SILT EXCAVATION
6036000000-E	1631	2,000	SY	MATTING FOR EROSION CONTROL
6037000000-E	SP	250	SY	COIR FIBER MAT
6038000000-E	SP	200	SY	PERMANENT SOIL REINFORCEMENT MAT
6042000000-E	1632	225	LF	1/4" HARDWARE CLOTH
6071010000-E	SP	20	LF	WATTLE
6071020000-E	SP	40	LB	POLYACRYLAMIDE (PAM)
6071030000-E	SP	10	LF	COIR FIBER BAFFLES
6084000000-E	1660	0.5	ACR	SEEDING & MULCHING
6087000000-E	1660	0.5	ACR	MOWING
6090000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	50	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	0.25	TON	FERTILIZER TOPDRESSING
6114500000-N	SP	15	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	12	EA	RESPONSE FOR EROSION CONTROL
6123000000-E	1670	0.1	ACR	REFORESTATION

4/04/06

COMPUTED BY: JBJ	DATE: 01-05-2010
CHECKED BY: WPW	DATE: 01-07-2010

PROJECT REFERENCE NO.	SHEET NO.
B-4559	3-A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE
17+00	RT	1		143.7	140.7													
17+00	RT	1	2		140.7	135.7		28							X			
19+63	LT	3		155.0	152.2													
19+63	CL	3	4		152.2	151.8	X	36								X	X	
19+63	RT	4		155.6	151.8													
19+63	RT	4	5		151.8	139.7		32							X			
TOTAL								96										

SIZE / THICKNESS OR GAUGE

STATION	LOCATION	FROM	TO	C.S. PIPE 12" .064	15" .064	18" .064	24" .064	36" .079	42" .109	48" .109	R.C. PIPE (CLASS III) 15"	18"	24"	30"	36"	42"	48"	R.C. PIPE (CLASS IV) 12"	15"	18"	24"	30"	36"	42"	48"
17+00	RT	1																							
17+00	RT	1	2																						
19+63	LT	3																							
19+63	CL	3	4																						
19+63	RT	4																							
19+63	RT	4	5																						
TOTAL																									

STATION	LOCATION	FROM	TO	**" R. C. PIPE (CLASS V)	**" R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	**" R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	* TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. *FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	T.B.D.I. STD. 840.35	DRAINAGE PIPE ELBOWS NO. & SIZE	REMARKS
17+00	RT	1									1											1	1		TBDI
17+00	RT	1	2																					2@15"	
19+63	LT	3									1									1	1				2GI
19+63	CL	3	4																						
19+63	RT	4									1											1	1		TBDI
19+63	RT	4	5																					2@15"	
TOTAL											3									1	1	2	2	4@15"	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I. (N.S.)	GRATED DROP INLET (NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

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

GUARDRAIL SUMMARY

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 GRAU 350	TYPE B-77	IMPACT ATTENUATOR TYPE 350 NO.	PERMITTED G	NG	REMARKS
-L-	16+41.5	17+54	RT	112.50'			BRIDGE		3.92'	VAR.	50.00'		1.00'		1	1				
-L-	19+39	20+65	RT	125.00'				BRIDGE	3.92'	VAR.		50.00'		1.00'	1	1				
-L-	16+79	17+54	LT	75.00'				BRIDGE	3.92'	VAR.		50.00'		1.00'	1	1				
-L-	19+39	20+14	LT	75.00'			BRIDGE		3.92'	VAR.	50.00'		1.00'		1	1				
SUB-TOTAL				387.50'										TOTAL	4	4				
DEDUCTIONS FOR ANCHORS				-275.00'										DEDUCTIONS FOR ANCHORS:						
TOTAL				112.50'										(GRAU 350) 4 @ 50' = 200'						
SAY				125.00'										(TYPE B-77) 4 @ 18.75' = 75'						
ADDITIONAL GUARDRAIL POST = 5 EACH														TOTAL = 275'						

SUMMARY OF EARTHWORK
IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
-L-					
16+10.00 to 17+54.00 (BEGIN BRIDGE)	5		75	70	
19+39.00 (END BRIDGE) to 21+00.00	44		34		10
PROJECT TOTAL	49		109	70	10
LOSS DUE TO C & G	0			0	
WASTE TO REPLACE BORROW				-10	-10
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				3	
GRAND TOTAL	49			63	
SAY	100			100	

EST. UNDERCUT EXCAVATION (FURNISHED BY GEOTECH) = 200 CY

REMOVAL OF EXISTING ASPHALT PAVEMENT

LINE	BEGIN STATION	END STATION	LOCATION	SQ. YD.
-L-	17+00.00	17+60.11	CL	145.67
-L-	19+31.84	19+90.00	CL	144.05
			TOTAL	289.72
			SAY	300.00

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.

22-JAN-2010 11:41
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$$$$USERNAME$$$$

8/17/99

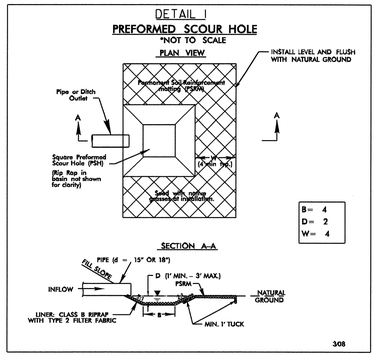
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-4559	4
RW SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19839 ENGINEER HERBERT D THOMAS
11/26/10

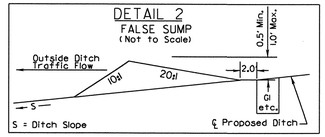
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 026480 ENGINEER HARRY D ROBINSON, JR.
1-29-10

DETAIL 1
PREFORMED SCOUR HOLE
*NOT TO SCALE



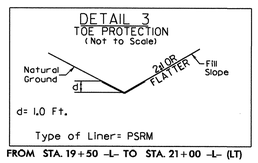
STA. 16+90 -L- (RT)

DETAIL 2
FALSE SUMP
(Not to Scale)



STA. 19+55 -L- (LT)

DETAIL 3
TOE PROTECTION
(Not to Scale)



FROM STA. 19+50 -L- TO STA. 21+00 -L- (LT)

-L-

PI Sta 15+15.15	PI Sta 23+10.36
Δ = 37° 16' 07.1" (RT)	Δ = 27° 36' 02.2" (RT)
D = 7° 54' 10.3"	D = 5° 40' 22.3"
L = 471.58'	L = 486.54'
T = 244.47'	T = 248.09'
R = 725.00'	R = 1,010.00'
SE= SEE PLANS	SE= SEE PLANS

15+00

20+00

25+00

NAD 83

PL TIES INTO CREEK

3
JANE AUSTIN LEE & JEAN AUSTIN PATTERSON
DB 2832 PG 163

2
H. DEAN & DEBORAH M. BARBOUR
DB 1050 PG 228

BEGIN BRIDGE
-L- Sta. 17+54.00

-L- PT Sta. 17+42.26

BEGIN PROJECT B-4559
-L- POC Sta. 15+85.00

GRACE COATS BARBOUR
DB 1539 PG 411

END BRIDGE
-L- Sta. 19+39.00

END PROJECT B-4559
-L- POC Sta. 21+25.00

-BL- 104 24+49.82 PINC
-L- Sta. 23+02.36
(25.70' LT)

-BL- 102 15+54.80 PINC
-L- Sta. 14+12.99
(25.81' LT)

CLASS II RIP RAP
EST 50 TONS
EST 110 SY FF
(STRUCTURE PAY ITEM)

FALSE SUMP
SEE DETAIL 2

INSTALL TOE PROTECTION
EST 100 SY PSRM
SEE DETAIL 3

50' TAPER LT & RT

25' INC.

+42.26 45' LT

+62.28 45' LT

+00 45' LT 29.83' LT

+10 45' LT 30' LT

+10 60' RT 30' RT

+00 60' RT 30.17' RT

+42.26 60' RT

TYPE B-77

10'-SPAN WOOD & CONC WITH 4 WOODEN WING WALLS

GRAU 350

15' W/ ELBOWS

PREFORMED SCOUR HOLE
OUTLET PROTECTION
CLASS 'B' RIP RAP
EST 5 TONS
EST 8 SYFF
EST 25 SY PSRM
SEE DETAIL 1

BM#2
-BL- STA. 18+69.74
42.24' RT
ELEV.=133.81'

INSTALL SHOULDER BERM GUTTER FROM STA.17+00 TO 17+39 -L- (RT)

-BL- 103 18+89.10 PINC
-L- Sta. 17+45.63
(18.30' RT)

ROCK PLATING
1.5:1 SLOPES
SEE ROCK PLATING DETAIL SHEET 2-A

OUTLET PROTECTION
CLASS 'B' RIP RAP
EST 2 TONS
EST 7 SYFF

INSTALL SHOULDER BERM GUTTER FROM STA.19+59 TO 20+10 -L- (RT)

-L- PC Sta. 20+62.28

-L- PC Sta. 12+70.68

-L- PT Sta. 25+48.82

DOWARD L. GREGORY
DB 630 PG 52
1

JUNE P. & THOMAS L. RAYNOR
DB 2949 PG 836
4

JANE AUSTIN LEE & JEAN AUSTIN PATTERSON
DB 2832 PG 163

22' BST, SR1330 RALEIGH ROAD

12"PVC

WOODS

CULTIVATED

BLACK CREEK

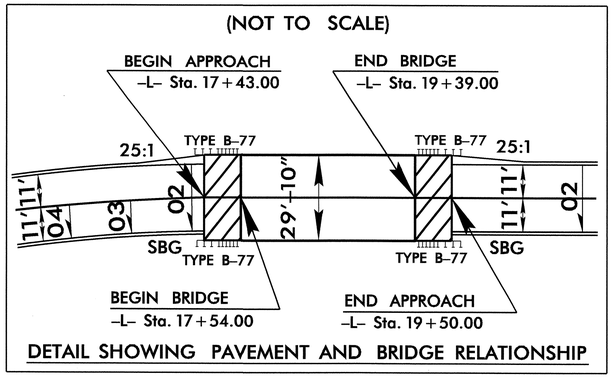
RUN OF CREEK IS PL

15' GRAVEL DR

S 83° 48' 28.3" E

S 18° 56' 19.0" E

(NOT TO SCALE)



DETAIL SHOWING PAVEMENT AND BRIDGE RELATIONSHIP

ROCK PLATING

USE ROCK PLATING AT STATION 19+43.75+/- -L- TO STATION 19+66+/- -L- (RIGHT) AND EXTEND ROCK PLATING LIMITS DOWN THE SIDE SLOPE TO ELEVATION 141.0 FT. SEE ROCK PLATING DETAIL SHEET 2-A.

USE ROCK PLATING AT STATION 19+66+/- -L- TO STATION 19+98+/- -L- (RIGHT) AND EXTEND ROCK PLATING LIMITS TO 2:1 (H:V) SLOPE. SEE ROCK PLATING DETAIL SHEET 2-A.

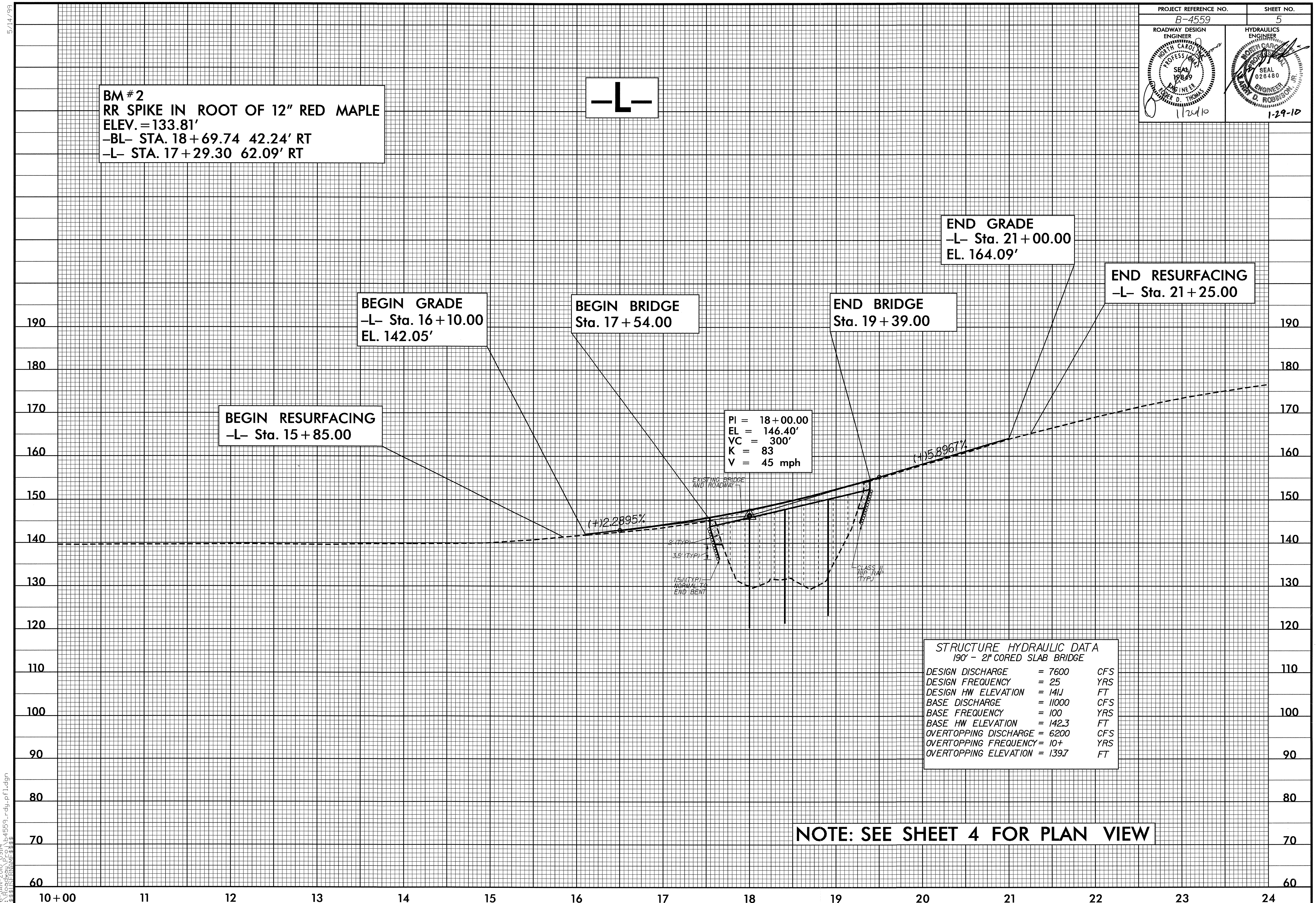
NOTE: SEE SHEET 5 FOR -L- PROFILE
NOTE: SEE SHEETS S-1 THRU S-22 FOR STRUCTURE PLANS

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4559	5

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19849 ENGINEER ROGER D. THOMAS
1/26/10

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 026480 ENGINEER LARRY D. ROBINSON, JR.
1-29-10



STRUCTURE HYDRAULIC DATA
190' - 21" CORED SLAB BRIDGE

DESIGN DISCHARGE	=	7600	CFS
DESIGN FREQUENCY	=	25	YRS
DESIGN HW ELEVATION	=	141.1	FT
BASE DISCHARGE	=	11000	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	142.3	FT
OVERTOPPING DISCHARGE	=	6200	CFS
OVERTOPPING FREQUENCY	=	10+	YRS
OVERTOPPING ELEVATION	=	139.7	FT

06-JAN-2010 09:14
R:\Roadway\Proj\b4559_rdy_pfl.dgn
$$$$USERNAME$$$$