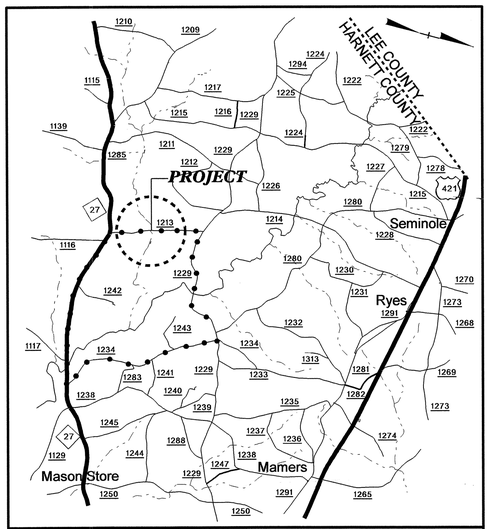
09/03/99

TIP PROJECT: B–4542

CONTRACT: C202732

See Sheet 1-A For Index of Sheets
See sheet 1-B for Symbology Sheet
See sheet 1-C for Survey Control Sheet



VICINITY MAP
OFFSITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HARNETT COUNTY

LOCATION: BRIDGE NO. 40 OVER BARBEQUE CREEK ON SR 1213 (BUIE ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

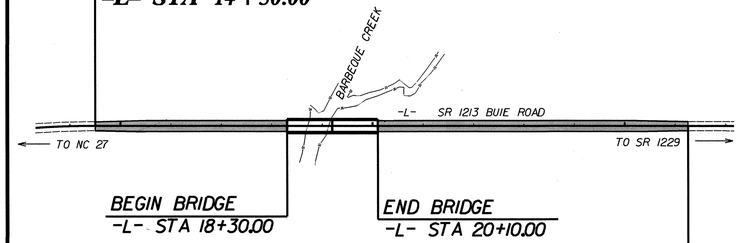
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–4542	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33757.1.1	BRSTP–1213(7)	PE
33757.2.1	BRSTP–1213(7)	R/W
33757.3.1	BRSTP–1213(7)	CONST

NAD 83/95

4

BEGIN TIP PROJECT B–4542
–L– STA 14+50.00



END TIP PROJECT B–4542
–L– STA 26+25.00

GRAPHIC SCALES

PLANS: 50 25 0 50 100
PROFILE (HORIZONTAL): 50 25 0 50 100
PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2011 = 1037
ADT 2031 = 1630
DHV = 10 %
D = 60 %
T = 3 % *
V = 60 MPH
MINOR COLLECTOR
* TTST 1% DUAL 2%
SUB–REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B–4542 = 0.189 MILES
LENGTH STRUCTURE TIP PROJECT B–4542 = 0.034 MILES
TOTAL LENGTH OF TIP PROJECT B–4542 = 0.223 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MARCH 19, 2010

LETTING DATE: NOVEMBER 15, 2011

GARY LOVERING, PE
PROJECT ENGINEER

ANTHONY WEST
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33246 ENGINEER LINDA M. JOHNS
SIGNATURE:

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 25873 ENGINEER GARY F. LOVERING
SIGNATURE:

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA
STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·
art McMillan
STATE HIGHWAY DESIGN ENGINEER

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-4542	1-A

ROADWAY DESIGN ENGINEER

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 SHEET
2	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAIL
2-A TO 2-B	DETAIL FOR METHOD OF PIPE INSTALLATION - METHOD A
2-C	DETAIL OF ANCHORAGE FOR FRAMES
2-D	DETAIL OF SUB REGIONAL BRIDGE APPROACH FILL
3	SUMMARY OF QUANTITIES
3-A	SUMMARY OF PAVEMENT REMOVAL, SUMMARY OF PAVEMENT BREAKUP, SUMMARY OF SHOULDER BERM GUTTER, SUMMARY OF EARTHWORK AND GUARDRAIL SUMMARY
3-B	DRAINAGE SUMMARY
4	PLAN SHEET
5	PROFILE SHEET
TMP-1 THRU TMP-2	TRAFFIC CONTROL PLANS
SD-1	SIGN DESIGN PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
X-0	CROSS SECTION SUMMARY SHEET
X-1 THRU X-6	CROSS-SECTIONS
S-1 THRU S-22	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.

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

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.

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 1
DIVISION 8 - INCIDENTALS	
815.03	Pipe Underdrain and Blind Drain
840.00	Concrete Base Pad for Drainage Structures
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
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

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04/16/11

PROJECT REFERENCE NO.	SHEET NO.
B-4542	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
- 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 — 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 Aerial Utility Easement — AUE
- 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 Curb Ramp — CR
- Curb Cut Future Ramp — CCFR
- 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
- 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
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

SURVEY CONTROL SHEET B-4542

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
101	BL-101	583005.2810	1998507.7050	201.94	10+67.79	13.54 LT
102	BL-102	583747.3370	1998267.5610	199.87	18+46.98	14.50 LT
103	BL-103	584700.2290	1998047.2100	249.69	28+24.63	13.13 RT

202 ELEVATION = 199.74
N 582989 E 1998500
L STATION 10+57 28 LEFT
BM #1 RR SPIKE IN BASE OF 22" TWIN POPLAR

201 ELEVATION = 197.10
N 583689 E 1998332
L STATION 17+75 33 RIGHT
BM #2 RR SPIKE IN BASE OF 15" OAK

200 ELEVATION = 256.04
N 584703 E 1997995
L STATION 28+37
S 79° 42' 43.6" W DIST 36.84
BM #3 RR SPIKE IN BASE OF 18" OAK

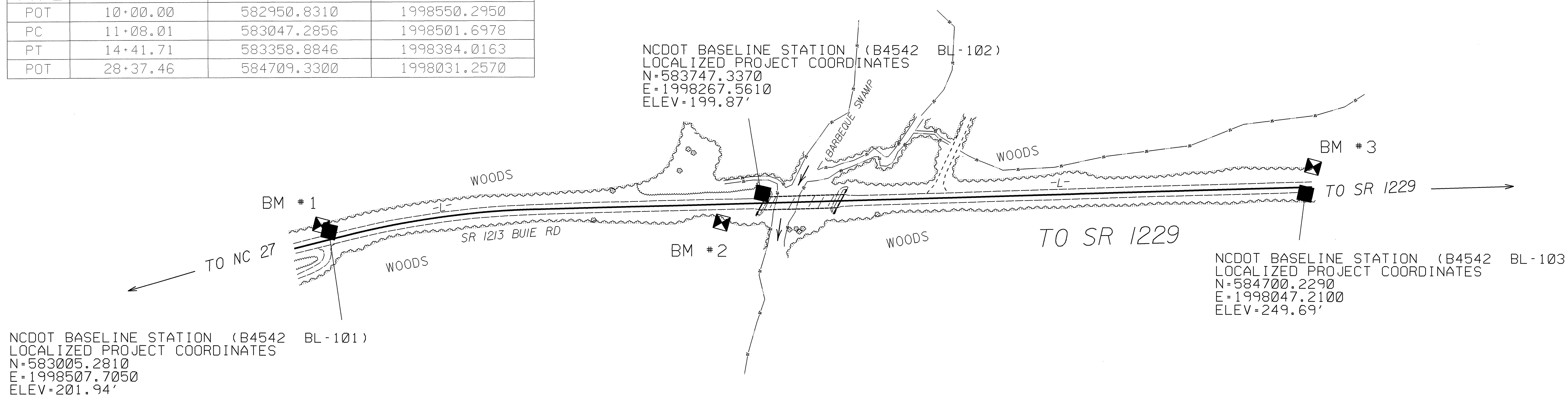
NC GRID
NAD 83/95

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	17+75.00	29.72	583688.8698	1998328.5376
L	17+75.00	45.00	583692.7312	1998343.3198
L	17+75.00	-30.28	583673.7053	1998270.4841
L	17+75.00	-45.00	583669.9849	1998256.2417
L	25+00.00	30.11	584390.4318	1998145.6827
L	25+00.00	45.00	584394.1942	1998160.0858
L	21+00.00	-30.30	583988.1484	1998188.3224
L	21+00.00	-45.00	583984.4338	1998174.1023

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	582950.8310	1998550.2950
PC	11+08.01	583047.2856	1998501.6978
PT	14+41.71	583358.8846	1998384.0163
POT	28+37.46	584709.3300	1998031.2570



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:
B4542_LS_CONTROL_090427.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 USER SERVICE (OPUS)

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "BUNNLEVEL" WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 567444.954 (FT) EASTING: 2065238.648 (FT)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99986834
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "BUNNLEVEL" TO -L- STATION 10+00.00 IS N 76°54'38 W 68467.28 FT
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

6/2/99

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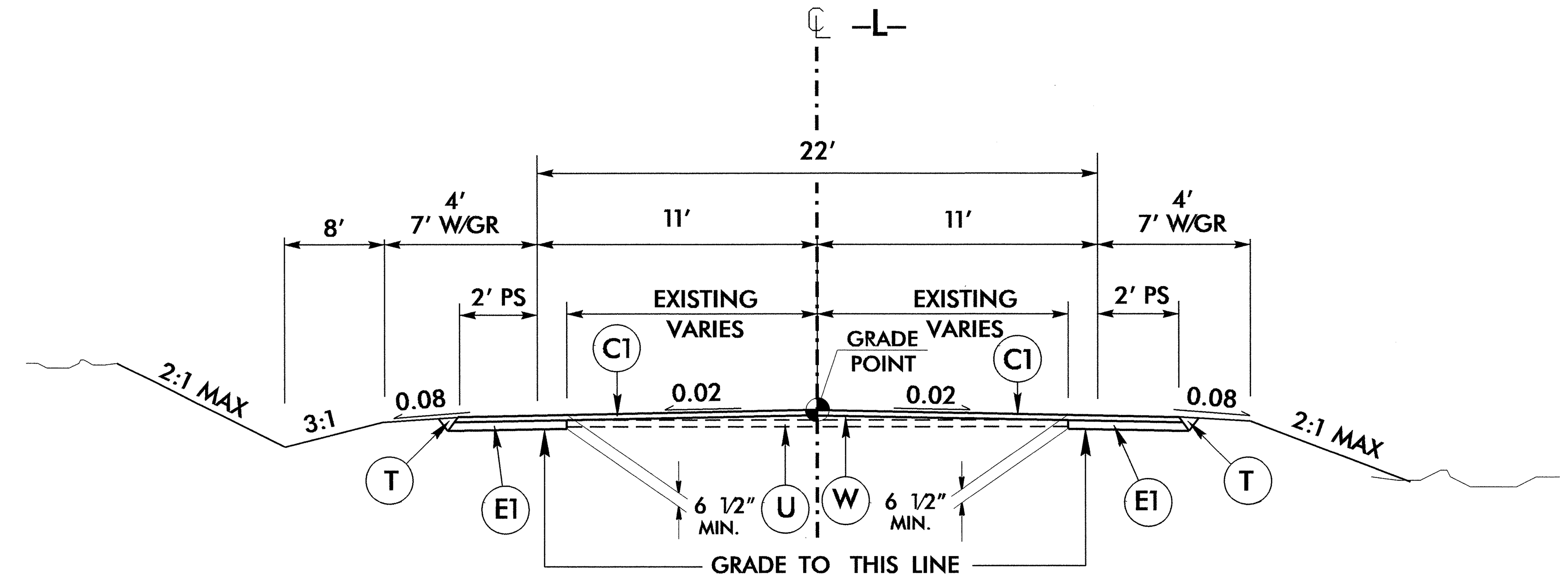
PROJECT REFERENCE NO.	SHEET NO.
B-4542	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PAVEMENT SCHEDULE

FINAL PAVEMENT DESIGN

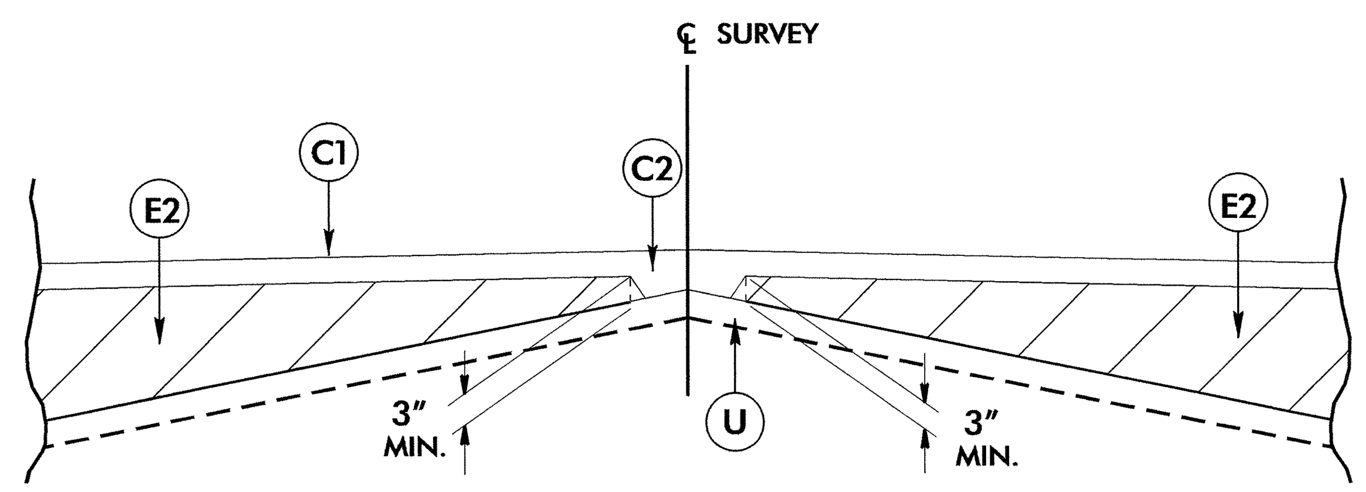
C1	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.
E1	PROP. APPROX. 4" 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 5½" IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL)

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

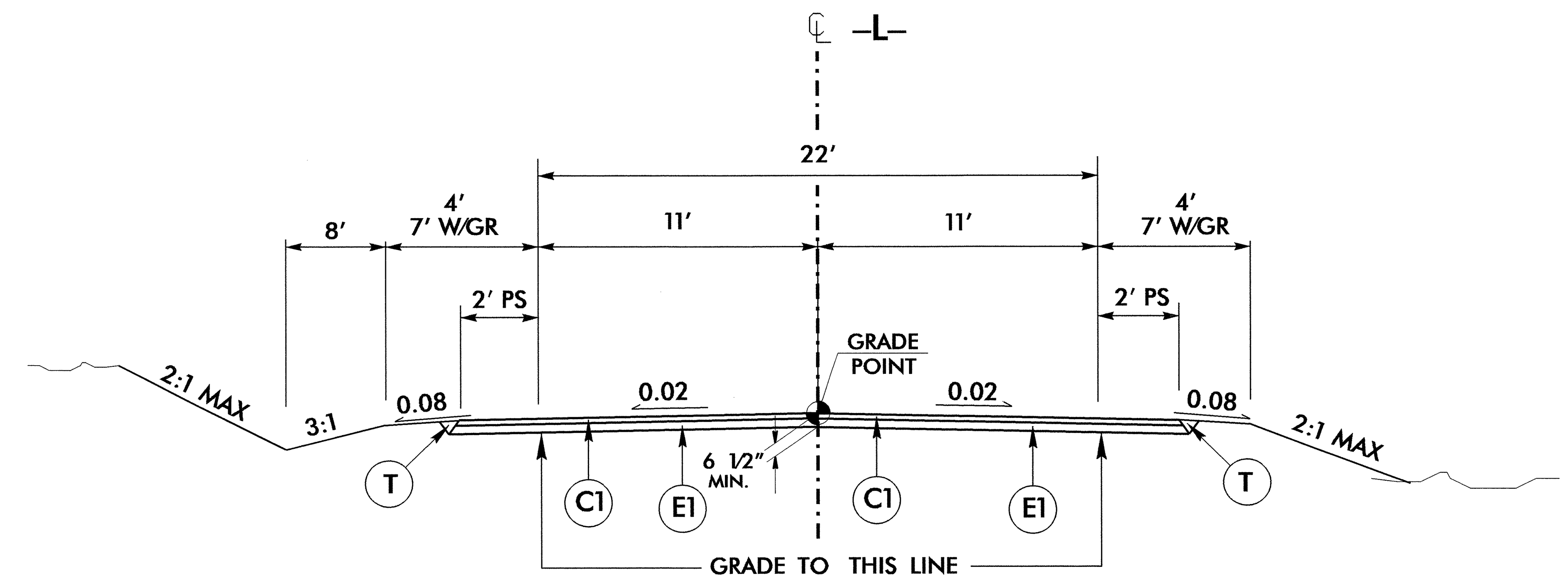


TYPICAL SECTION NO. 1

-L- STA 14+50.00 TO STA 17+50.00
-L- STA 25+00.00 TO STA 26+25.00

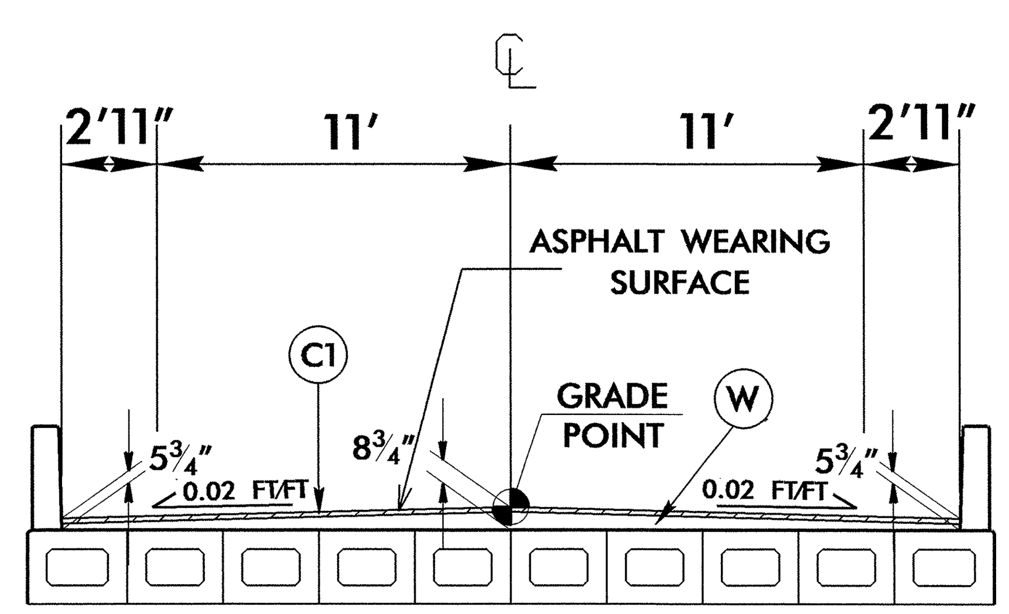


Detail Showing Method of Wedging



TYPICAL SECTION NO. 2

-L- STA 17+50.00 TO STA 18+30.00 (BEGIN BRIDGE)
-L- STA 20+10.00 (END BRIDGE) TO STA 25+00.00



BRIDGE TYPICAL

BRIDGE #40 -L- STA 18+30.00 TO STA 20+10.00

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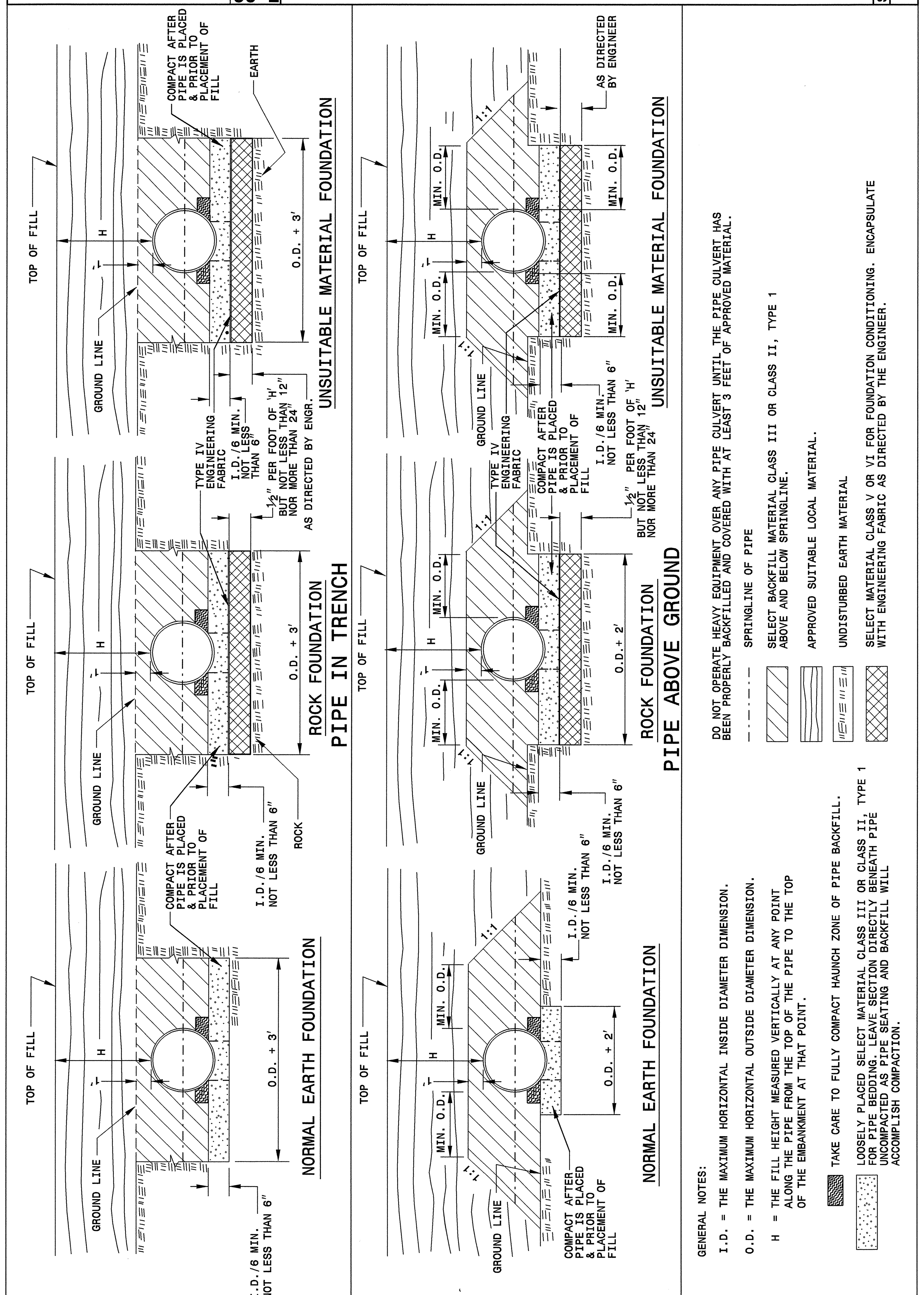
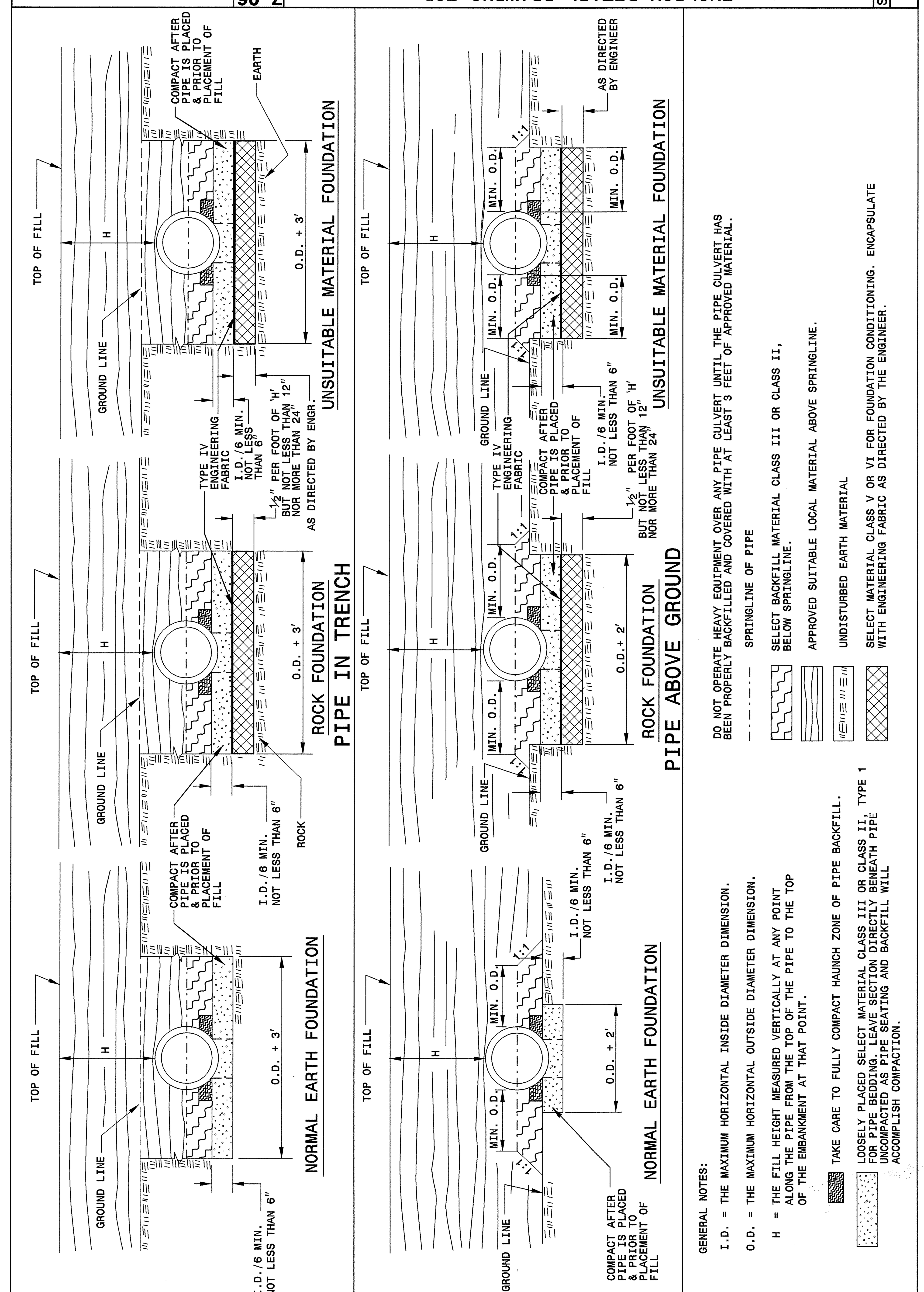
PROJECT REFERENCE NO.	SHEET NO.
B-4542	2-A



NORMAL EARTH FOUNDATION
ROCK FOUNDATION
PIPE IN TRENCH
UNSUITABLE MATERIAL FOUNDATION
NORMAL EARTH FOUNDATION
ROCK FOUNDATION
PIPE ABOVE GROUND
UNSUITABLE MATERIAL FOUNDATION
TOP OF FILL
GROUND LINE
COMPACT AFTER PIPE IS PLACED & PRIOR TO PLACEMENT OF FILL
I.D./6 MIN. NOT LESS THAN 6"
O.D. + 3'
O.D. + 2'
TYPE IV ENGINEERING FABRIC
½" PER FOOT OF 'H' BUT NOT LESS THAN 12" NOR MORE THAN 24"
AS DIRECTED BY ENGR.
AS DIRECTED BY ENGINEER
EARTH
ROCK
MIN. O.D.
1:1
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** FLEXIBLE PIPE	SHEET 1 OF 3 **300D01**



NORMAL EARTH FOUNDATION
ROCK FOUNDATION
PIPE IN TRENCH
UNSUITABLE MATERIAL FOUNDATION
NORMAL EARTH FOUNDATION
ROCK FOUNDATION
PIPE ABOVE GROUND
UNSUITABLE MATERIAL FOUNDATION
TOP OF FILL
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COMPACT AFTER PIPE IS PLACED & PRIOR TO PLACEMENT OF FILL
I.D./6 MIN. NOT LESS THAN 6"
O.D. + 3'
O.D. + 2'
TYPE IV ENGINEERING FABRIC
½" PER FOOT OF 'H' BUT NOT LESS THAN 12" NOR MORE THAN 24"
AS DIRECTED BY ENGR.
AS DIRECTED BY ENGINEER
EARTH
ROCK
MIN. O.D.
1:1
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.
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SELECT BACKFILL MATERIAL CLASS III OR CLASS II, BELOW SPRINGLINE.
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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**

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

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 — 8/15/11

30-JUL-2009 08:48
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jhowerton AT PS23750I

5/14/99

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

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

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

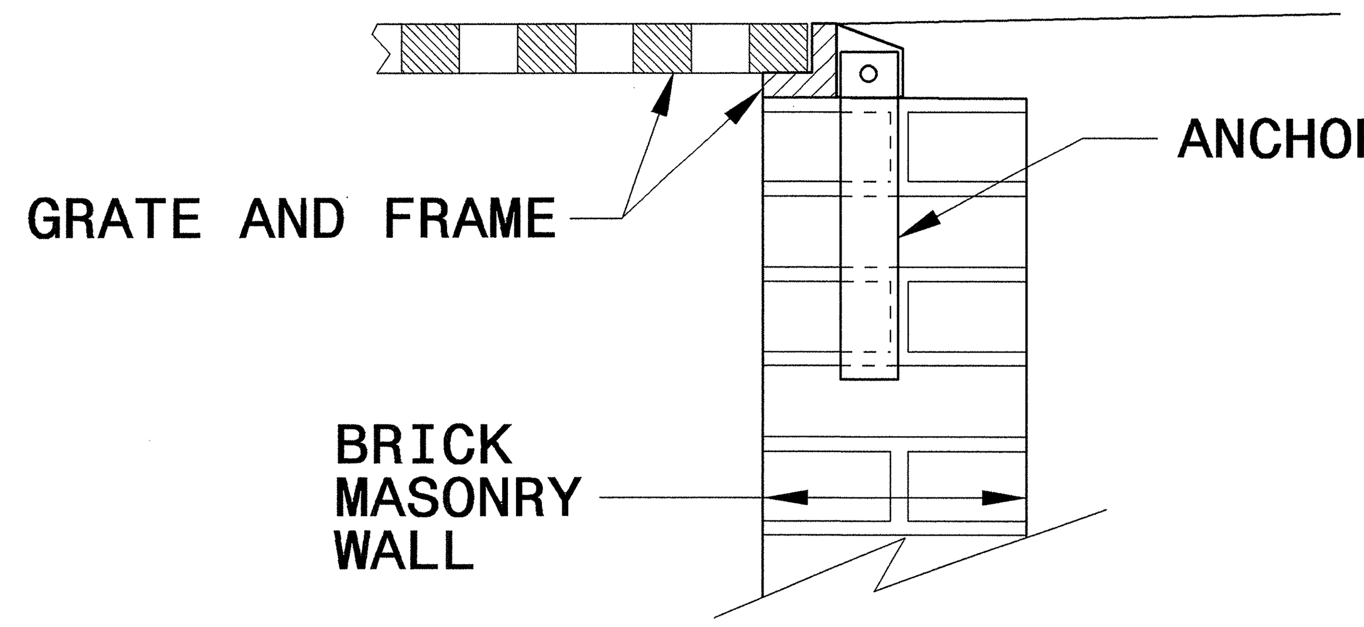
SEE PLATE FOR TITLE

ORIGINAL BY: KKnapp DATE: 5-15-09
MODIFIED BY: DATE:
CHECKED BY: DATE: 7/15/09
FILE SPEC: /projects/stds/stdstodetails/3000/0300d01.dgn

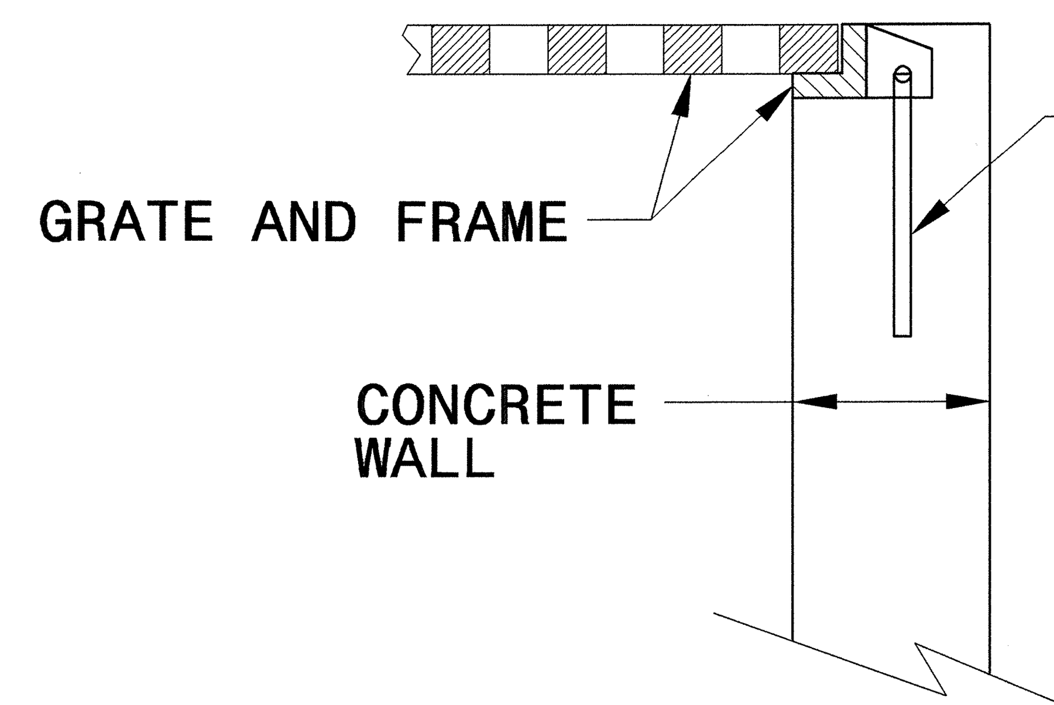
PROJECT REFERENCE NO. B-4542
SHEET NO. 2-B

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

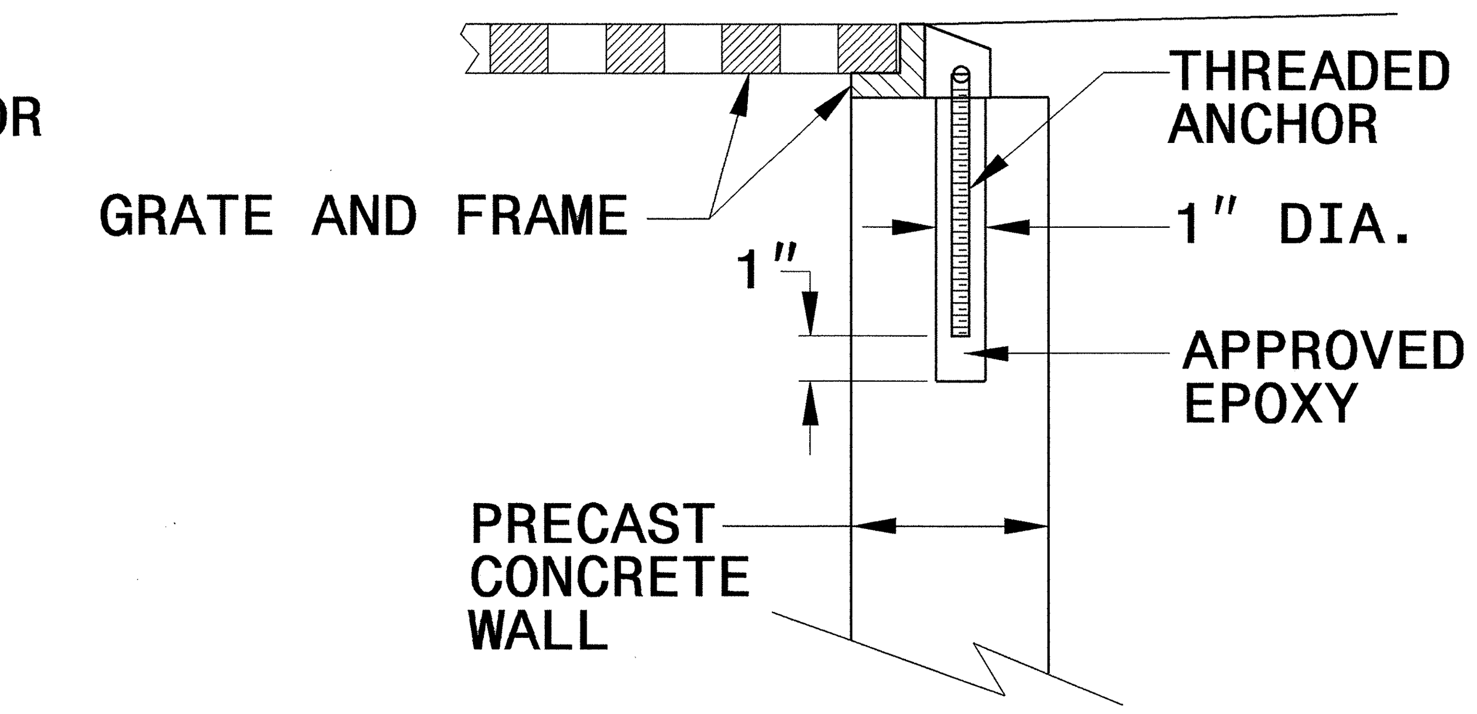
ENGLISH DETAIL DRAWING FOR
ANCHORAGE FOR FRAMES
BRICK/CONCRETE/PRECAST CONCRETE



BRICK MASONRY CONSTRUCTION



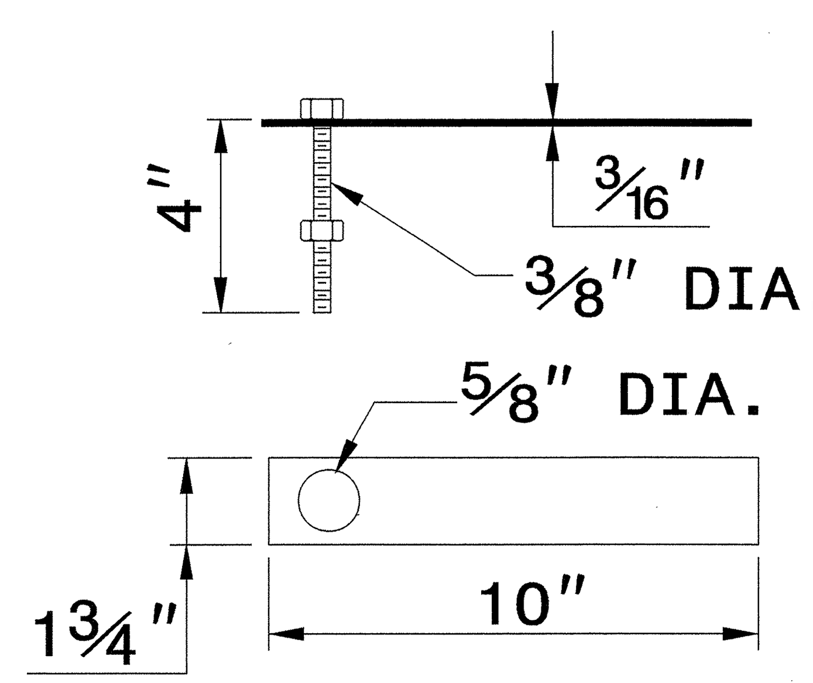
CONCRETE CONSTRUCTION



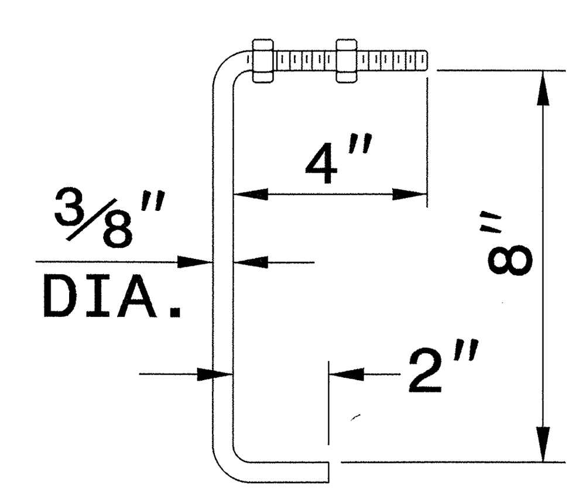
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

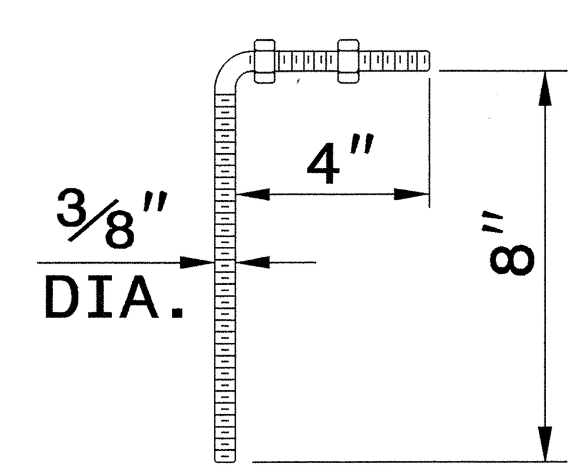
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



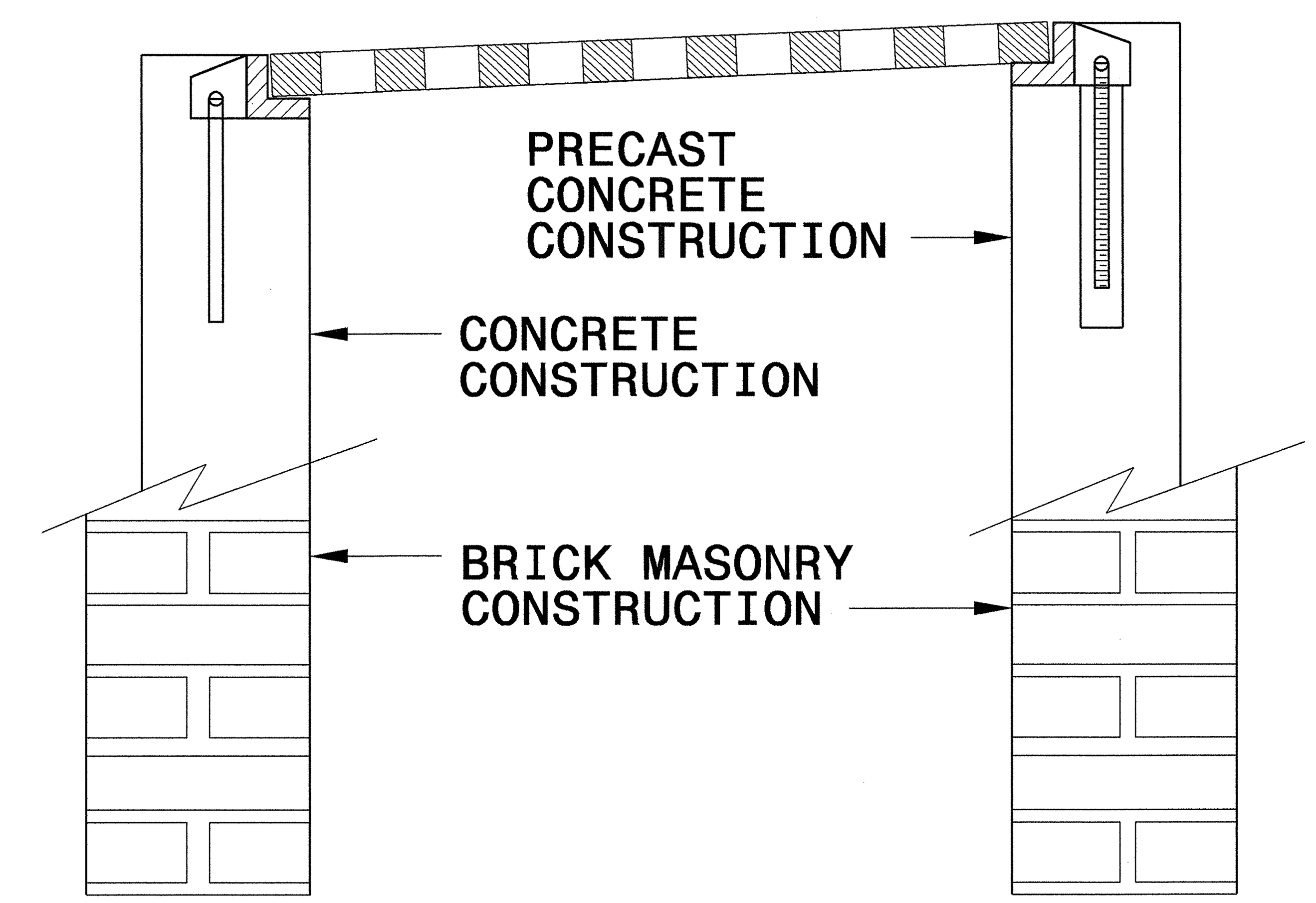
MASONRY ANCHOR
3⁄8″ DIA. BOLT WITH PLATE



CONCRETE ANCHOR
3⁄8″ DIA. BENT BAR



PRECAST CONCRETE ANCHOR
3⁄8″ DIA. BENT BAR



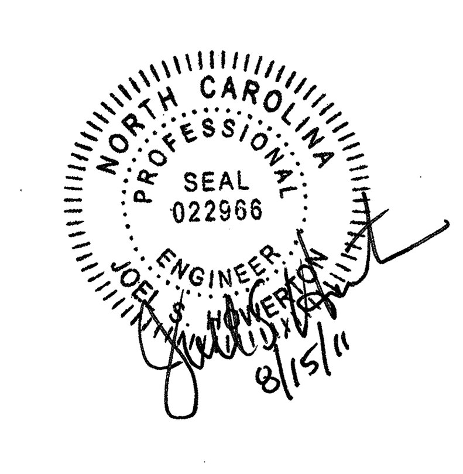
FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS

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



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.:

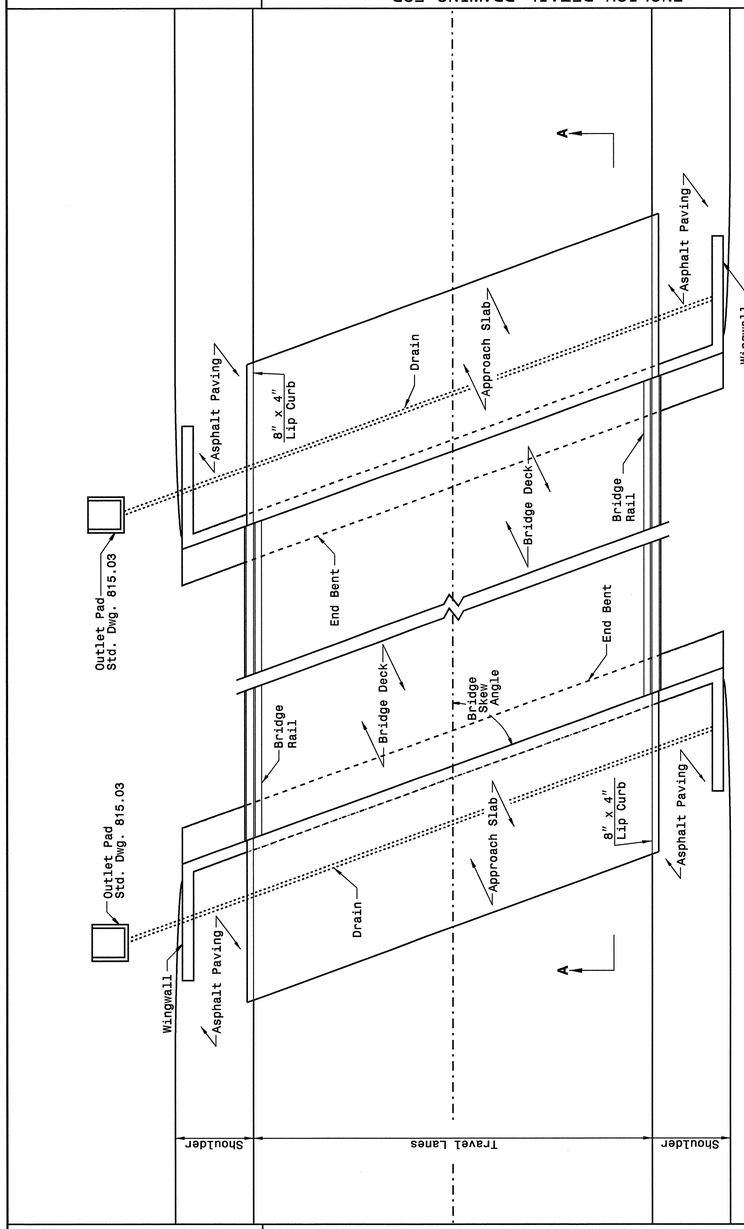
$$$$$$SYSTIME$$$$$ $$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$ $$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-4542	2-D

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

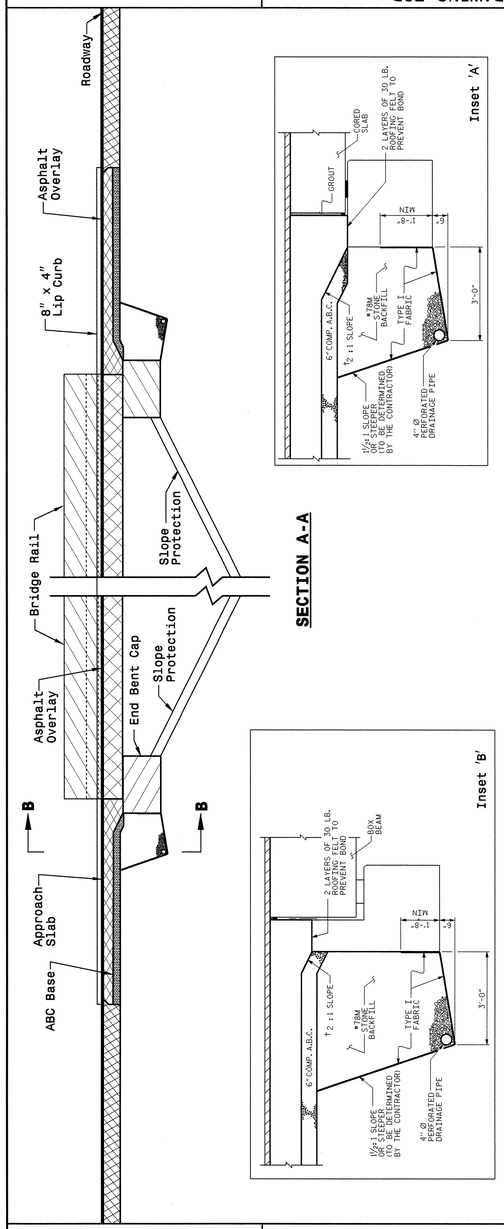


PLAN VIEW
12' APPROACH SLAB

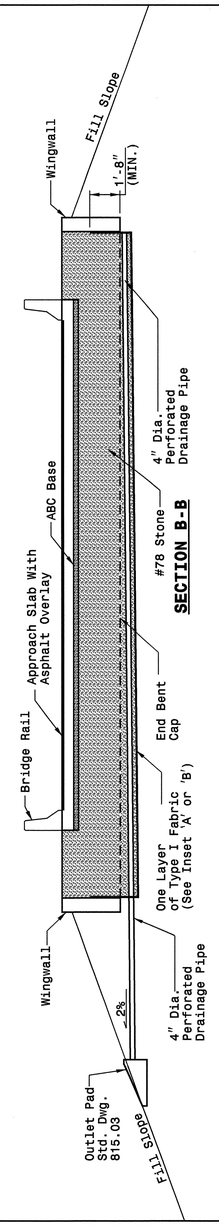
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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

PROJECT REFERENCE NO.	SHEET NO.
B-4542	3

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202732

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING
0030000000-N	SP	Lump Sum		BRIDGE APPROACH FILL - SUB REGIONAL TIER, STATION ******* (19+20.00-L-)
0043000000-N	226	Lump Sum		GRADING
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUB-BING
0057000000-E	226	300	CY	UNDERCUT EXCAVATION
0195000000-E	SP	300	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	400	SY	FABRIC FOR SOIL STABILIZATION
0318000000-E	SP	10	TON	FOUNDATION CONDITIONING MATE-RIAL, MINOR STRS
0320000000-E	SP	20	SY	FOUNDATION CONDITIONING FABRIC
0335200000-E	SP	10	LF	15" DRAINAGE PIPE
0448200000-E	SP	24	LF	15" RC PIPE CULVERTS, CLASS IV
1489000000-E	610	600	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1525000000-E	610	420	TON	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A
1575000000-E	SP	55	TON	ASPHALT BINDER FOR PLANT MIX
2022000000-E	SP	45	CY	SUBDRAIN EXCAVATION
2033000000-E	SP	34	CY	SUBDRAIN FINE AGGREGATE
2044000000-E	SP	200	LF	6" PERFORATED SUBDRAIN PIPE
2070000000-N	SP	1	EA	SUBDRAIN PIPE OUTLETS
2077000000-E	SP	6	LF	6" OUTLET PIPE (SUBDRAINS)
2286000000-N	840	2	EA	MASONRY DRAINAGE STRUCTURES
2367000000-N	840	2	EA	FRAME WITH TWO GRATES, STD 840.29
2556000000-E	846	100	LF	SHOULDER BERM GUTTER
3030000000-E	862	75	LF	STEEL BM GUARDRAIL
3150000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS
3215000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE III

ItemNumber	Sec #	Quantity	Unit	Description
3270000000-N	SP	4	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3656000000-E	876	375	SY	FILTER FABRIC FOR DRAINAGE
3659000000-N	SP	1	EA	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON
4400000000-E	1110	329	SF	WORK ZONE SIGNS (STATIONARY)
4410000000-E	1110	57	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4445000000-E	1145	80	LF	BARRICADES (TYPE III)
4810000000-E	1205	9,400	LF	PAINT PAVEMENT MARKING LINES (4")
4900000000-N	1251	15	EA	PERMANENT RAISED PAVEMENT MARKERS
6000000000-E	1605	2,350	LF	TEMPORARY SILT FENCE
6006000000-E	1610	160	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	50	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	60	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	1	ACR	TEMPORARY MULCHING
6018000000-E	1620	100	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	1.25	TON	FERTILIZER FOR TEMPORARY SEED-ING
6024000000-E	1622	100	LF	TEMPORARY SLOPE DRAINS
6027000000-N	1622	4	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
6029000000-E	SP	400	LF	SAFETY FENCE
6030000000-E	1630	120	CY	SILT EXCAVATION
6036000000-E	1631	2,100	SY	MATTING FOR EROSION CONTROL
6037000000-E	SP	510	SY	COIR FIBER MAT
6038000000-E	SP	250	SY	PERMANENT SOIL REINFORCEMENT MAT
6042000000-E	1632	150	LF	1/4" HARDWARE CLOTH
6048000000-E	SP	75	SY	FLOATING TURBIDITY CURTAIN
6071010000-E	SP	170	LF	WATTLE

ItemNumber	Sec #	Quantity	Unit	Description
6071012000-E	SP	120	LF	COIR FIBER WATTLE
6071020000-E	SP	25	LB	POLYACRYLAMIDE (PAM)
6071030000-E	SP	55	LF	COIR FIBER BAFFLE
6071050000-E	SP	1	EA	**" SKIMMER (1-1/2")
6084000000-E	1660	3	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	1.25	TON	FERTILIZER TOPDRESSING
6114500000-N	SP	30	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	25	EA	RESPONSE FOR EROSION CONTROL

5/28/99

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$$$$$USERNAME$$$$

SUMMARY OF EARTHWORK
(CUBIC YARDS)

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
-L-					
14+50	18+30 BEGIN BRIDGE	14	85	71	0
20+10 END BRIDGE	26+25	668	2278	1610	0
SUBTOTALS:		682	2363	1681	0
TOTALS:		682	2363	1681	0
LOSS DUE TO CLEARING AND GRUBBING		-500		500	
PROJECT TOTALS:		182	2363	2181	
5% TO REPLACE TOP SOIL ON BORROW PIT				109	
GRAND TOTALS:		182	2363	2290	0
SAY:		200		2300	
CONTINGENCY UNDERCUT:		300			

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.

PAVEMENT REMOVAL SUMMARY
(SQUARE YARDS)

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD^2
-L-	17+50	18+49	CL	204
	19+90	20+21	CL	68
	24+00	25+00	CL	201
			TOTAL:	473
			SAY:	500

PAVEMENT BREAKUP SUMMARY
(SQUARE YARDS)

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD^2
-L-	20+21	24+00	CL	762
			TOTAL:	762
			SAY:	775

SHOULDER BERM GUTTER SUMMARY
(LINEAR FEET)

SURVEY LINE	STATION	STATION	LENGTH
-L-	17+92	18+19	27'
	17+92	18+19	27'
	20+21	20+41	20'
	20+21	20+41	20'
		TOTAL:	94'
		SAY:	100'

Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing and Grubbing, Breaking of Existing Pavement, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

"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			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS									IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	XI	GRAU 350	TYPE III	XIII	CAT-1	VI MOD	BIC	AT-1	EA	G	NG				
-L-	17+42	18+30	RT	88'			18+30 BEGIN BRIDGE		2.92'	7'	50'		1'				1	1												
	17+42	18+30	LT	88'				18+30 BEGIN BRIDGE	2.92'	7'		50'		1'			1	1												
	20+10	20+91	RT	81'				20+10 END BRIDGE	2.92'	7'		50'		1'			1	1												
	20+10	20+91	LT	81'			20+10 END BRIDGE		2.92'	7'	50'		1'				1	1												
																			ANCHOR DEDUCTIONS:											
			TOTAL:	338'													4	4	GRAU 350 (4 X 50'):			200'								
			ANCHOR DEDUCTIONS:	-275'															TYPE III (4 X 18.75'):			75'								
			GRAND TOTAL:	63'															TOTAL:			275'								
			SAY:	75'			ADDITIONAL POSTS: 5																							

RD244542

COMPUTED BY: MJD DATE: 8/12/2009

CHECKED BY: ACW DATE: 8/2/2011

DRAINAGE PIPE
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
B-4542	3-B

STATION / SIZE / THICKNESS OR GAUGE	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) 12"	15"	18"	24"	30"	36"	42"	48"	C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	CLASS IV R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS 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 DROP INLET	CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	J.B. STD. 840.31 OR 840.32	T.B.G.I. STD. 840.35	MANHOLE STD. 840.51	M.H. STD. 840.51 OR 840.53	M.H. FRAME AND COVER STD. 840.54	PREFORMED SCOUR HOLE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN. FT.	REMARKS
-L-																																																													
17+97	LT	1		200.69																														1																	1		1									
		1	2		197.71	197.60																			24																																					CLASS IV RCP ONLY
	RT	2		200.69																														1																	1		1									
		2	3		197.60	197.20			10																																																1					
SHEET TOTALS									10																24									2																	2		2				1					

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

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4542	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25873 ENGINEER GARY R. GROVER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 30245 ENGINEER LINDA M. JOHNS

9-12-11

NAD 8395

15

20

25

BEGIN TIP PROJECT B-4542
-L- STA 14+50.00

END TIP PROJECT B-4542
-L- STA 26+25.00

1

LEONARD KARP & WIFE
MARIA KARP
DB 1115 PG 973

BL-102

END SBG
-L- STA 18+19.00
RT/LT

BEGIN SBG
-L- STA 17+92.00
RT/LT

+75.00
45'
EX.R/W

UNCLASSIFIED STRUCTURE EXCAVATION (STRUCTURE PAY ITEM)

END SBG
-L- STA 20+41.00
RT/LT

JS PROPERTY LINE

JOHNNY C. RAY
DB 1532 PG 698
PC F PG 232B

4

+00.00
45'
EX.R/W

+50.00
45'
EX.R/W

65' ACCESS EASEMENT

24" CORRUGATED PLASTIC PIPE

TO NC 27

SR 1229

18' BST SR 1213 BUIE RD

24" RCP

27' INC.

8:1 TAPER

GRAU 350

TYPE III

TB 2G

BRIDGE NO: 40

N 14° 38' 22.2" W

-L-

100' TAPER RT/LT

PT Sta. 14+41.71

BM#2

+75.00
45'
EX.R/W

PSH,
SEE DETAIL

CL II RIP RAP (STRUCTURE PAY ITEM)

BANK STABILIZATION CLASS II RIP RAP (STRUCTURE PAY ITEM)
SEE DETAIL C

BARBECUE CREEK

BEGIN SBG
-L- STA 20+21.00
RT/LT

END APPROACH SLAB
-L- STA 20+21.00

END BRIDGE
-L- STA 20+10.00

GRADE TO DRAIN

SPECIAL LATERAL 'V' DITCH
SEE DETAIL A

SPECIAL LATERAL 'V' DITCH
PSRM LINED
SEE DETAIL B

+00.00
45'

+50.00
75'

+00.00
75'

+00.00
45'
EX.R/W

100' TAPER RT/LT

3

EDWARD H. MCCORMICK
DB 948 PG 720
DB 948 PG 726
DB 641PG 483
DB 959 PG 369

ROSCOE FRIZZELLE & WIFE
BENITA C.
DB 2431PG 233

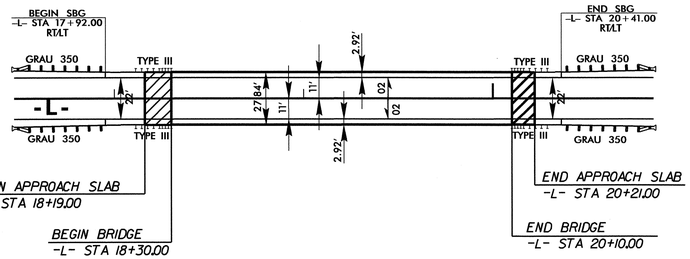
2

-L-
PI Sta 12+75.48
Δ = 12° 06' 03.7" (RT)
D = 3° 37' 34.7"
L = 333.70'
T = 167.47'
R = 1,580.00'

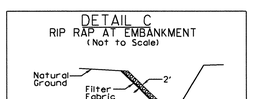
BEGIN APPROACH SLAB
-L- STA 18+19.00

BEGIN BRIDGE
-L- STA 18+30.00

SKETCH OF BRIDGE NO. 40 IN RELATION TO PAVEMENT
SCALE: 1" = 40'



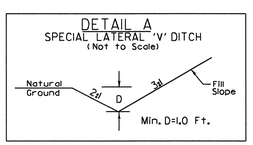
DETAIL C
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner= 75 TONS CL II Rip-Rap
Filter Fabric=100sy

-L- STA. 19+07, 19' RT. TO STA. 19+27, 31' LT.

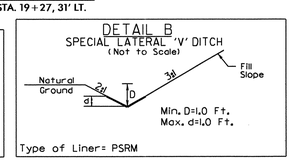
DETAIL A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D=1.0 Ft.

-L- STA. 22+50 TO STA. 23+00 RT.

DETAIL B
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



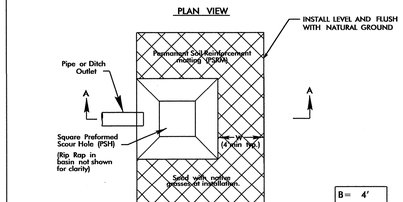
Min. D=1.0 Ft.
Max. D=1.0 Ft.

Type of Liner= PSRM

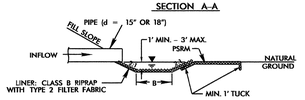
-L- STA. 23+00 TO STA. 24+50 RT.

PREFORMED SCOUR HOLE
*NOT TO SCALE

PLAN VIEW



SECTION A-A



308

-L- STA. 17+99, 30' RT.

FOR -L- PROFILE, SEE SHEET 5
FOR STRUCTURE PLANS, SEE SHEETS S-1 TO S-22

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$$USERNAME$$

5/1499

PROJECT REFERENCE NO.	SHEET NO.
B-4542	5

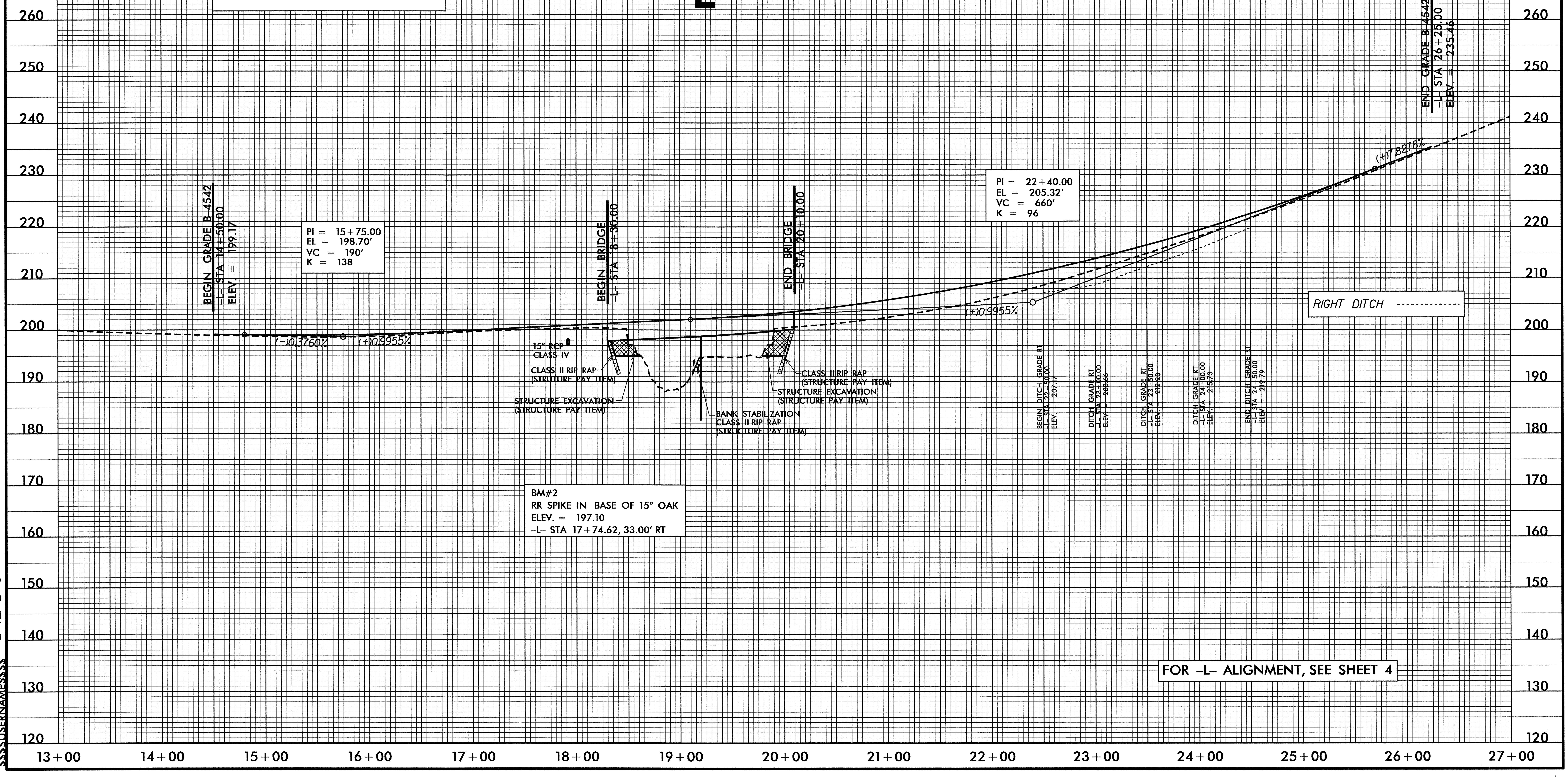
ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 25873 ENGINEER

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 33246 ENGINEER LINDA M. JOHNS

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 2700	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 199.5	FT
BASE DISCHARGE	= 4144	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 200.7	FT
OVERTOPPING DISCHARGE	= 4000	CFS
OVERTOPPING FREQUENCY	= -100	YRS
OVERTOPPING ELEVATION	= 198.96	FT
DATE OF SURVEY	= 06/06/06	
W.S. ELEVATION AT DATE OF SURVEY	= 192.0	FT

-L-



END GRADE B-4542
-L- STA 26+25.00
ELEV. = 235.46
BEGIN GRADE B-4542
-L- STA 14+50.00
ELEV. = 199.17
PI = 15+75.00
EL = 198.70'
VC = 190'
K = 138
BEGIN BRIDGE
-L- STA 18+30.00
END BRIDGE
-L- STA 20+10.00
PI = 22+40.00
EL = 205.32'
VC = 660'
K = 96
(+)7.8276%
(-)0.3760%
(+)0.9955%
(+)0.9955%
RIGHT DITCH
15" RCP
CLASS IV
CLASS II RIP RAP
(STRUTURE PAY ITEM)
STRUCTURE EXCAVATION
(STRUCTURE PAY ITEM)
BANK STABILIZATION
CLASS II RIP RAP
(STRUCTURE PAY ITEM)
CLASS II RIP RAP
(STRUCTURE PAY ITEM)
STRUCTURE EXCAVATION
(STRUCTURE PAY ITEM)
BEGIN DITCH GRADE RT
-L- STA 22+50.00
ELEV. = 207.17
DITCH GRADE RT
-L- STA 23+00.00
ELEV. = 208.66
DITCH GRADE RT
-L- STA 23+50.00
ELEV. = 212.20
DITCH GRADE RT
-L- STA 24+00.00
ELEV. = 215.73
END DITCH GRADE RT
-L- STA 24+50.00
ELEV. = 219.79
BM#2
RR SPIKE IN BASE OF 15" OAK
ELEV. = 197.10
-L- STA 17+74.62, 33.00' RT
260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00
21+00
22+00
23+00
24+00
25+00
26+00
27+00

FOR -L- ALIGNMENT, SEE SHEET 4

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