STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

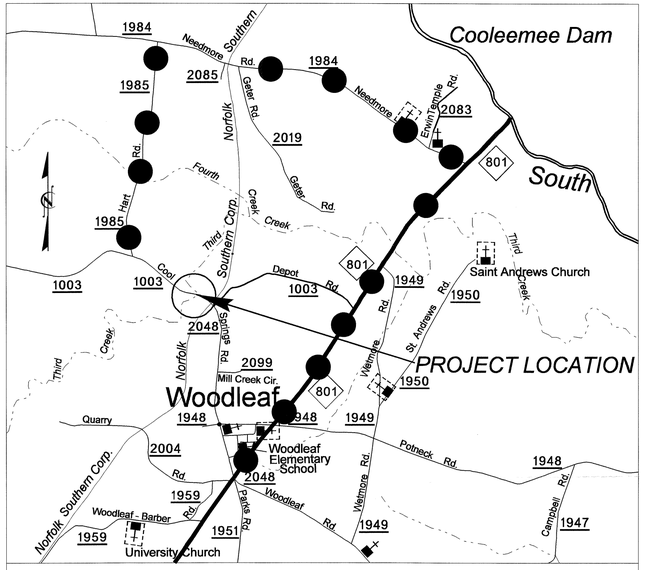
ROWAN COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–4627	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33802.1.1	BRZ–1003 (32)	PE
33802.2.1	BRZ–1003 (32)	R/W & UTIL
33802.3.1	BRZ–1003 (82)	CONST.

LOCATION: BRIDGE OVER THIRD CREEK AND APPROACHES ON SR. 1003 (COOL SPRINGS RD.)

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE



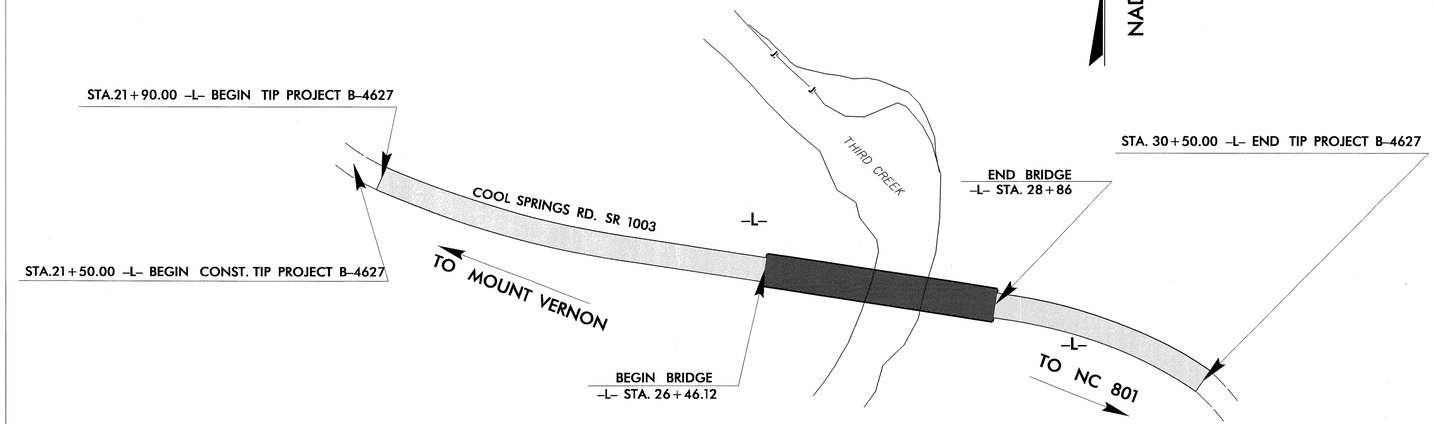
VICINITY MAP

DENOTES OFF–SITE DETOUR

DESIGN EXCEPTION REQUIRED FOR HORIZONTAL CURVE RADII, VERTICAL CURVE K–FACTOR AND THE ASSOCIATED STOPPING SIGHT DISTANCE. THESE PROPOSED DESIGN ELEMENTS SUPPORT A 40–MPH DESIGN.

4

NAD 83/95



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 2010 = 3525 vpd
ADT 2030 = 5600 vpd
DHV = 11 %
D = 60 %
T = 3 % *
V = 55 MPH
* TTST 1 % DUAL 2 %
FUNC. CLASS
MINOR RURAL COLLECTOR

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B–4627 = 0.118

LENGTH OF STRUCTURE TIP PROJECT B–4627 = 0.045

TOTAL LENGTH TIP PROJECT B–4627 = 0.163

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 16, 2009

LETTING DATE:
FEBRUARY 16, 2010

JIMMY GOODNIGHT PE
PROJECT ENGINEER

TIM GOINS
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 023090 ENGINEER AUDREY B. BURNETTE
SIGNATURE: Audrey B. Burnette P.E. 12-7-09

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 14493 ENGINEER JAMES STAFFORD GOODNIGHT, JR.
SIGNATURE: James S. Goodnight P.E. 12/02/09

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
P.E.
STATE HIGHWAY DESIGN ENGINEER

TIP PROJECT: B–4627

CONTRACT: C202271

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-4627	1-A

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 14493 ENGINEER JAMES STAFFORD GOODNIGHT, JR.
12-03-09

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, AND TYPICAL SECTIONS
2-A	DETAIL OF ANCHORAGE FOR FRAMES
2-B THRU 2-C	DETAIL OF METHOD OF PIPE INSTALLATION
2-D	DETAIL OF BRIDGE APPROACH FILLS
3	SUMMARY OF QUANTITIES
3A	SUMMARY OF EARTHWORK, PAVEMENT REMOVAL SUMMARY LIST OF PIPES, ENDWALLS, ETC. GUARDRAIL SUMMARY
4	PLAN SHEET
5	PROFILE SHEET
TCP-1 THRU TCP-3	TRAFFIC CONTROL PLANS
PMP-1 THRU PMP-3	PAVEMENT MARKING PLANS
RF-1	REFORESTATION PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
SD-1	SPECIAL SIGN DESIGN
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS
X-1A	CROSS SECTIONS SUMMARY SHEET
X-1 THRU X-10	CROSS-SECTIONS
S-1 THRU S-38	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.

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.

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 Duke Energy, AT&T

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

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

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 3 - PIPE CULVERTS	
310.10	Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.03	Pipe Underdrain and Blind Drain
840.29	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
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets

03-DEC-2009 08:44
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$$$$USERNAME$$$$

3/15/06

PROJECT REFERENCE NO.	SHEET NO.
B-4627	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 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-4627	1C
Location and Surveys	

SURVEY CONTROL SHEET B-4627

B4627-1
N = 745667.941
E = 1525159.079
ELEV. = 732.49

-L- POT STA. 10+00.00

TO NC 80

S 49° 11' 28.7" E

-L-

BM-1
N = 745056
E = 1525588
ELEV. = 697.14

NC GRID
NAD 83/95

-L- PC STA. 19+74.83

THIRD CREEK

B4627-2
N = 744729.760
E = 1526226.492
ELEV. = 676.95

-L- STA. 26+47 +/-
BEGIN BRIDGE

-L- POT STA. 19+00.00
BEGIN TIP PROJECT B-4627

COOL SPRINGS RD.
SR 1003

BRIDGE #26

S 81° 18' 00.7" E

-L- PT STA. 25+07.22

BM-2
N = 744451
E = 1526456
ELEV. = 664.64

-L- PC STA. 28+96.81

-L- PCC STA. 30+72.97

-L- STA. 28+87 +/-
END BRIDGE

-L- POC STA. 31+25.00
END TIP PROJECT B-4627

-L- PT STA. 31+30.20

DEPOT RD. SR 1003

BM-3
N = 744098
E = 1527352
ELEV. = 716.33

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
B4627-1	GPS-1	745667.9410	1525159.0790	732.49	OUTSIDE PROJECT LIMITS	
BL3	BL-3	745193.5390	1525663.4203	706.67	14+43.30	14.19 RT
B4627-2	GPS-2	744729.7600	1526226.4920	676.95	21+70.35	17.66 RT
BL4	BL-4	744598.7956	1526685.5053	674.30	26+44.78	17.49 RT
BL5	BL-5	744525.1467	1527140.4775	698.84	31+01.44	23.83 LT
BL6	BL-6	744209.2570	1527454.8212	717.32	OUTSIDE PROJECT LIMITS	
BL7	BL-7	743914.4626	1527641.3744	731.84	OUTSIDE PROJECT LIMITS	

BY

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
BY8	BY-8	744284.4834	1527580.4495	722.53	OUTSIDE PROJECT LIMITS	
BY9	BY-9	744209.2570	1527454.8212	717.32	OUTSIDE PROJECT LIMITS	

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4627-1" WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 745667.941(ft) EASTING: 1525159.079(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99988635 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4627-1" TO -L- STATION 10+00.00 IS N 45°40'22" W 248.94 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

```
**********************************************
BM#1       ELEVATION = 697.14
N 745056       E 1525588
L STATION 14+76 168' RIGHT
8" SPIKE SET IN ROOT OF DOUBLE BEECH TREE
**********************************************

**********************************************
BM#2       ELEVATION = 664.64
N 744451       E 1526456
L STATION 24+52 200' RIGHT
8" SPIKE SET IN ROOT OF 30" BIRCH TREE
**********************************************
```

```
**********************************************
BM#3       ELEVATION = 716.33
N 744098       E 1527352
S 27° 23' 07.7" E  DIST    439.41'
8" SPIKE SET IN ROOT OF 18" BEECH TREE
**********************************************
```

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: B4627_LS_CONTROL_080617.HTML

   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)
   SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

27-OCT-2009 10:30
E:\Control\Proj\b4627_ls_1c_080625.dgn
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$$$$CFGNAME$$$$

6/2/99

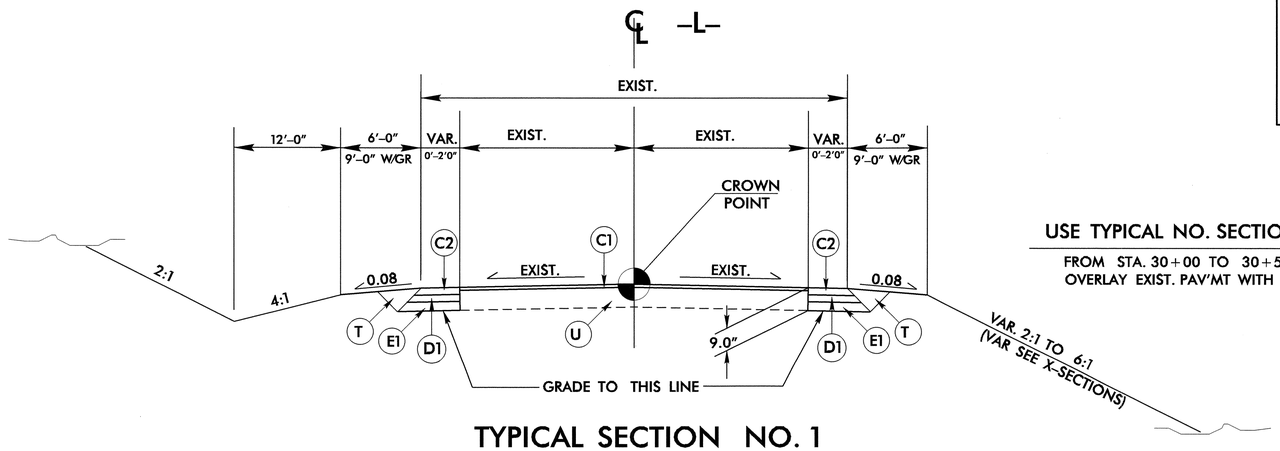
PROJECT REFERENCE NO.	SHEET NO.
B-4627	2

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 14493 ENGINEER JAMES STAFFORD BOONWIGHT, JR. 12-9-09

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK S. MORRISON 12/8/09

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1¼" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.50 LBS. PER SQ. YD.
C2	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.50 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.

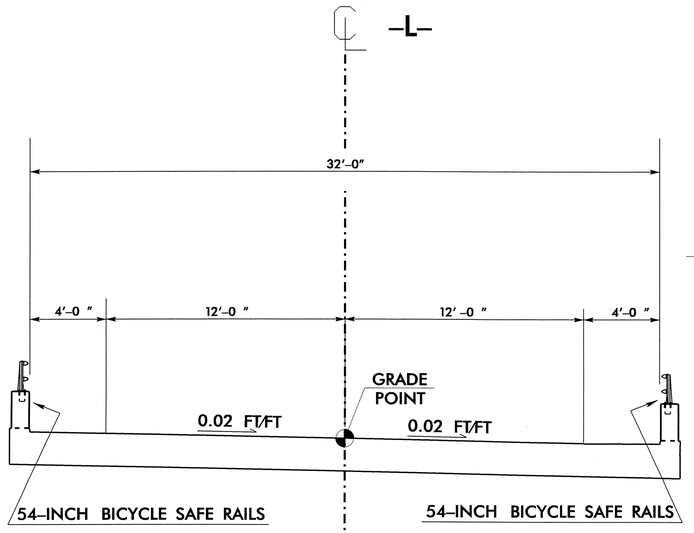
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



TYPICAL SECTION NO. 1

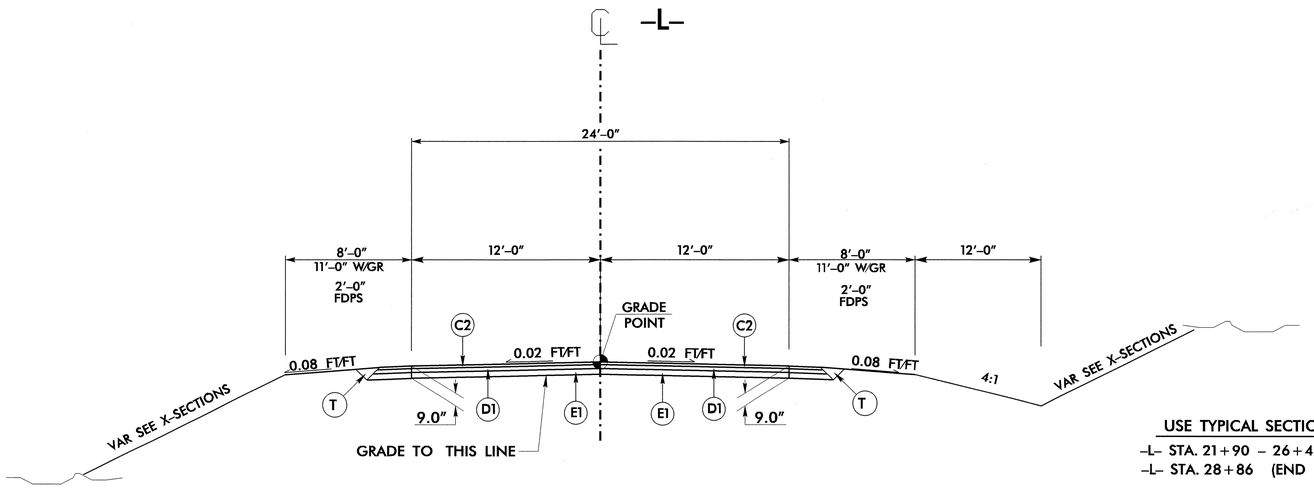
USE TYPICAL NO. SECTION NO. 1

FROM STA. 30+00 TO 30+50
OVERLAY EXIST. PAV'MT WITH 1 1/4" (SF9.5A)



TYPICAL SECTION ON BRIDGE

–L– STA. 26+46.12 TO 28+86



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

–L– STA. 21+90 – 26+46.12 (BEG. BRDG)
–L– STA. 28+86 (END BRDG) – 30+00

01-DEC-2009 16:42
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PROJECT REFERENCE NO.	SHEET NO.
B-4627	2-A

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

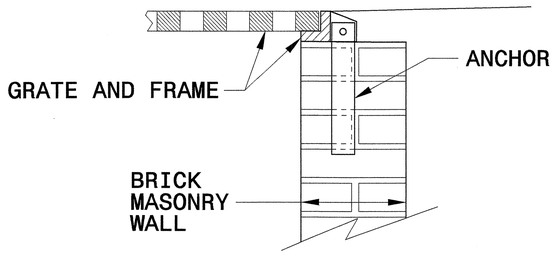
ENGLISH DETAIL DRAWING FOR

ANCHORAGE FOR FRAMES

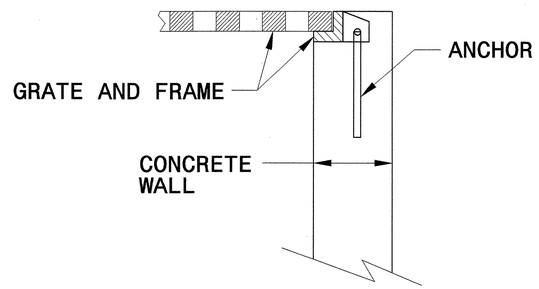
BRICK/CONCRETE/PRECAST CONCRETE

SHEET 1 OF 1

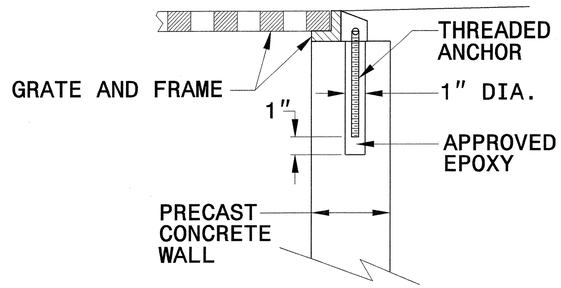
840D25



BRICK MASONRY CONSTRUCTION



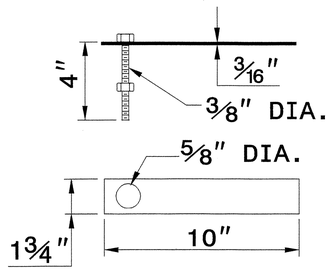
CONCRETE CONSTRUCTION



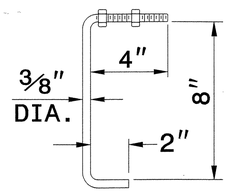
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

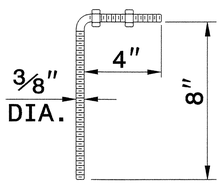
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



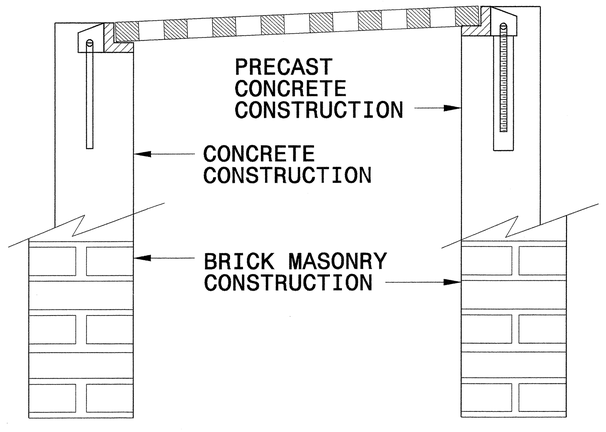
MASONRY ANCHOR
3/8" DIA. BOLT WITH PLATE



CONCRETE ANCHOR
3/8" DIA. BENT BAR



PRECAST CONCRETE ANCHOR
3/8" DIA. BENT BAR



FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS

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

ENGLISH DETAIL DRAWING FOR

ANCHORAGE FOR FRAMES

BRICK/CONCRETE/PRECAST CONCRETE

SHEET 1 OF 1

840D25

NORTH CAROLINA PROFESSIONAL SEAL 022566 ENGINEER JOEL S. HOWERTON
12/7/09

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: 11/13/06
FILE SPEC.:

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$$$$$$ORIGDGN$$$$$$
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30-JUL-2009 08:48
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jhowerton AT PS237501

5/14/99

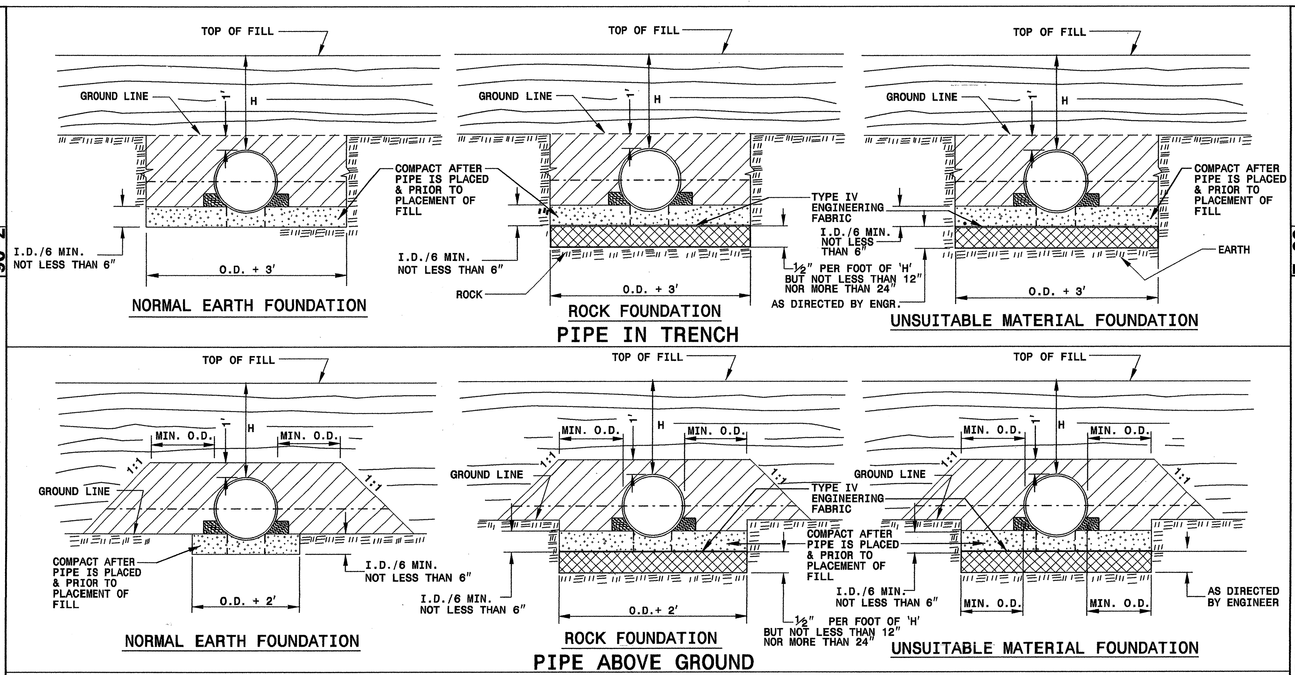
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

7-06

ENGLISH DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

FLEXIBLE PIPE



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.

SHEET 1 OF 3

300D01

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

7-06

ENGLISH DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

FLEXIBLE PIPE

SHEET 1 OF 3

300D01

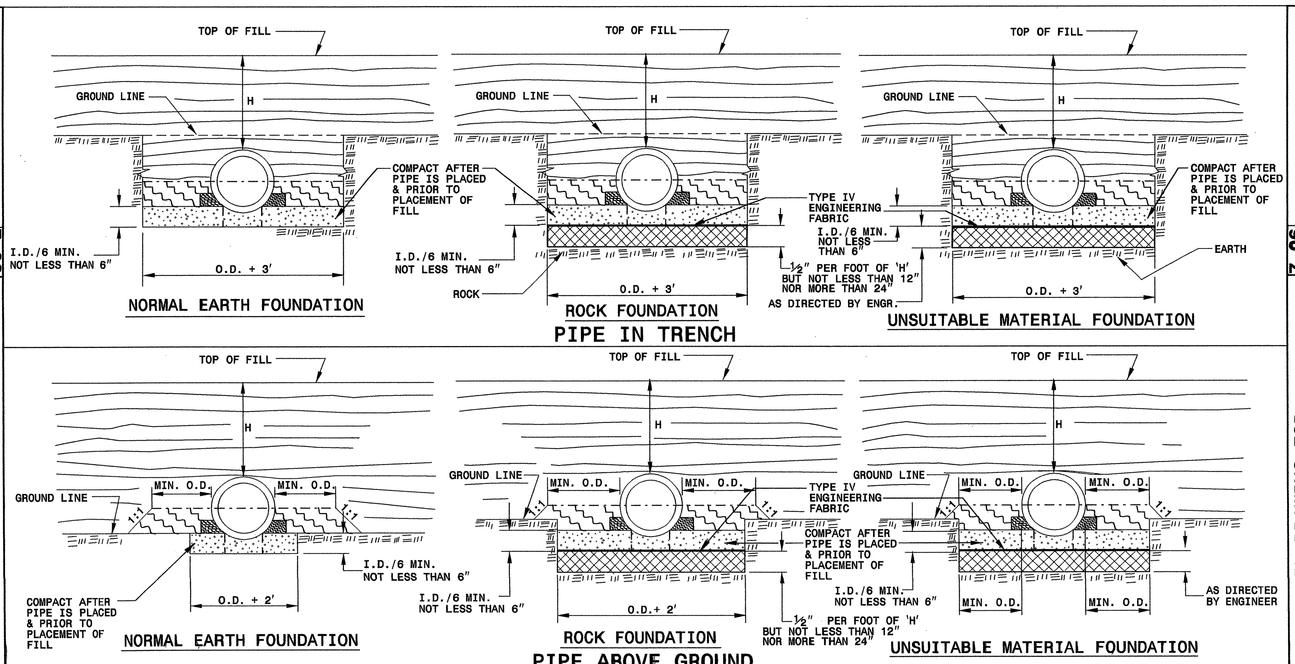
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

7-06

ENGLISH DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

RIGID PIPE



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.

SHEET 2 OF 3

300D01

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

7-06

ENGLISH DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

RIGID PIPE

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
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NORTH CAROLINA PROFESSIONAL SEAL 022566 ENGINEER JOSEPH HENDRICK

PROJECT REFERENCE NO. B-4627
SHEET NO. 2-8

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)	(Ga)	Maximum Height of Cover (feet) 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)	(Ga)	Maximum Height of Cover (feet) 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

ORIGINAL BY: KKrempf DATE: 5-15-09
MODIFIED BY: DATE:
CHECKED BY: DATE: 7/9/09
FILE SPEC: s:\contracts\contracts\special details\ericward\stds\06stdstodetails\30001\0300d01.dgn

SEE PLATE FOR TITLE

PROJECT REFERENCE NO. B-4627
SHEET NO. 2-C

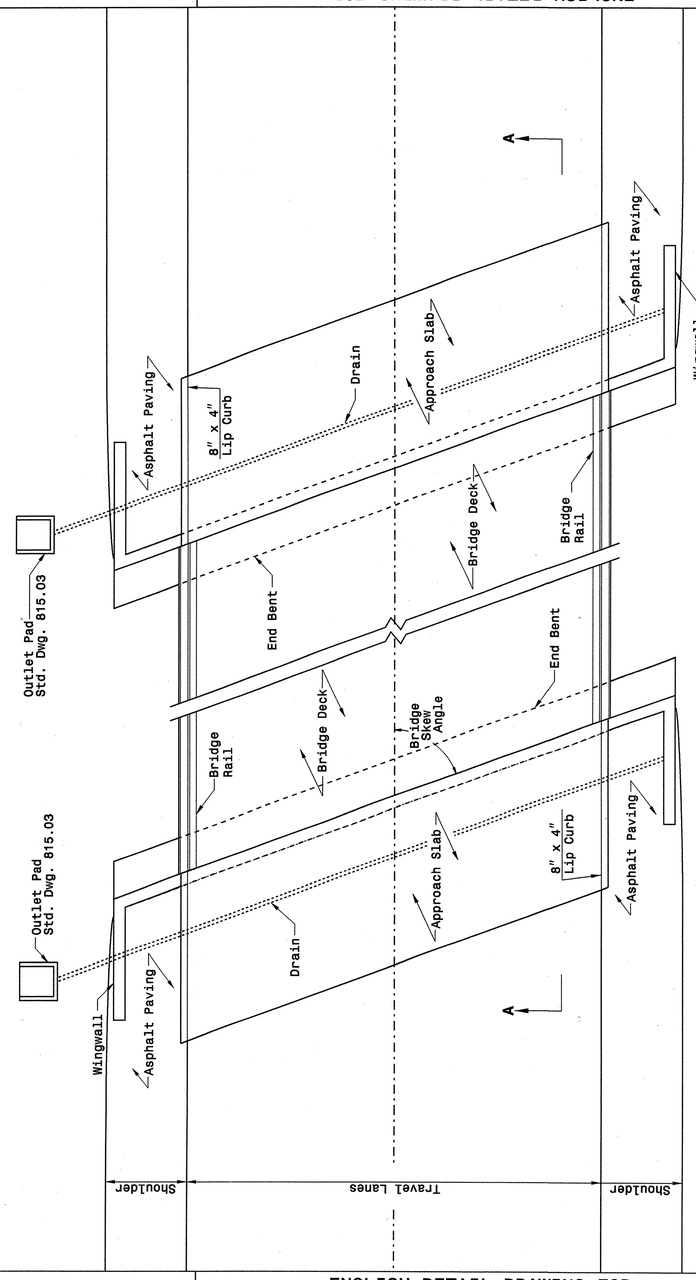
PROJECT REFERENCE NO.	SHEET NO.
B-4627	2-D

ENGLISH DETAIL DRAWING FOR

BRIDGE APPROACH FILLS

SUB REGIONAL TIER

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



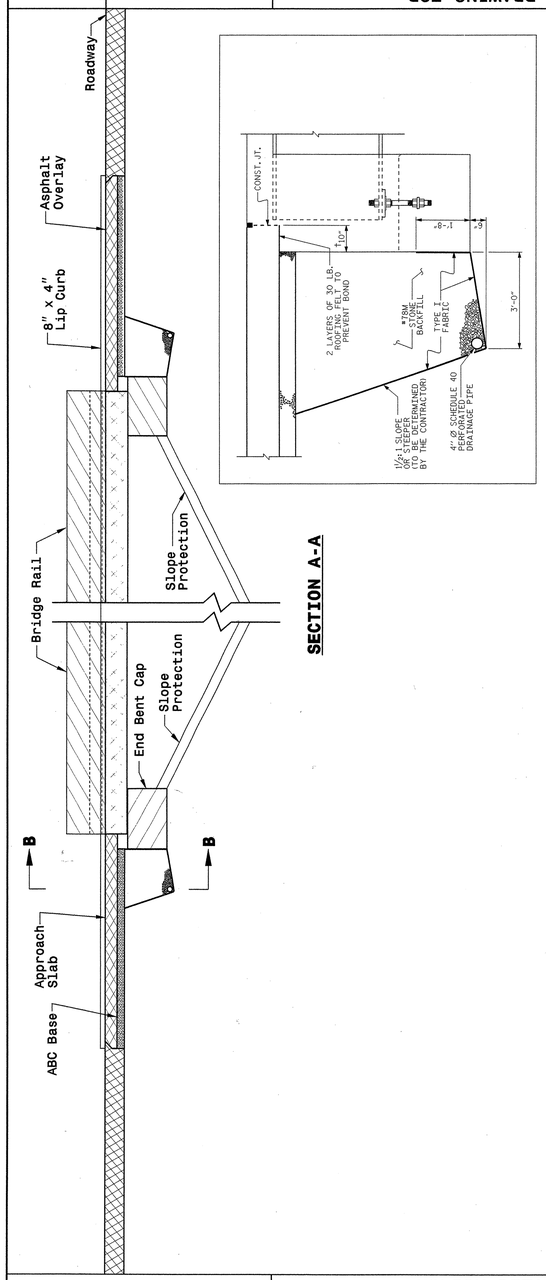
PLAN VIEW
12' APPROACH SLAB

ENGLISH DETAIL DRAWING FOR

BRIDGE APPROACH FILLS

SUB REGIONAL TIER

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



SECTION A-A

SECTION B-B

12' APPROACH SLAB

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWARD
12/7/09

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:
FILE SPEC.: kkempf\english\bridge approach fills.dgn

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
B-4627	3

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202271

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 ******* (27+66.5 -L-)
0043000000-N	226	Lump Sum		GRADING
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING
0057000000-E	226	425	CY	UNDERCUT EXCAVATION
0080000000-E	SP	350	TON	CLASS IV SUBGRADE STABILIZATION
0134000000-E	240	130	CY	DRAINAGE DITCH EXCAVATION
0196000000-E	270	500	SY	FABRIC FOR SOIL STABILIZATION
0320000000-E	SP	20	SY	FOUNDATION CONDITIONING FABRIC
0330000000-E	SP	10	TON	GENERIC DRAINAGE ITEM FOUNDATION CONDITIONING MATERIAL, MINOR STRS
0986000000-E	SP	32	LF	GENERIC PIPE ITEM 15" CS PIPE CULVERTS, 0.064" THICK
0986000000-E	SP	20	LF	GENERIC PIPE ITEM 15" SIDE DRAIN PIPE
0992000000-E	SP	2	EA	GENERIC PIPE ITEM 15" CS PIPE ELBOWS, 0.064" THICK
0995000000-E	340	40	LF	PIPE REMOVAL
1220000000-E	545	300	TON	INCIDENTAL STONE BASE
1489000000-E	610	490	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1498000000-E	610	310	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
1525000000-E	610	300	TON	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A
1560000000-E	620	60	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
1693000000-E	654	10	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
2000000000-N	806	14	EA	RIGHT OF WAY MARKERS
2286000000-N	840	1	EA	MASONRY DRAINAGE STRUCTURES
2367000000-N	840	1	EA	FRAME WITH TWO GRATES, STD 840.29
2556000000-E	846	45	LF	SHOULDER BERM GUTTER
3030000000-E	862	537.5	LF	STEEL BM GUARDRAIL
3045000000-E	862	87.5	LF	STEEL BM GUARDRAIL, SHOP CURVED
3150000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS
3195000000-N	862	1	EA	GUARDRAIL ANCHOR UNITS, TYPE AT-1
3215000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE III
3270000000-N	SP	3	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3649000000-E	876	24	TON	RIP RAP, CLASS B
3656000000-E	876	1,095	SY	FILTER FABRIC FOR DRAINAGE
4400000000-E	1110	586	SF	WORK ZONE SIGNS (STATIONARY)
4410000000-E	1110	139	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4445000000-E	1145	144	LF	BARRICADES (TYPE III)
4685000000-E	1205	1,240	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)
4686000000-E	1205	1,240	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)
4705000000-E	1205	40	LF	THERMOPLASTIC PAVEMENT MARKING LINES (16", 120 MILS)
4710000000-E	1205	24	LF	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)
4721000000-E	1205	2	EA	THERMOPLASTIC PAVEMENT MARKING CHARACTER (120 MILS)
4770000000-E	1205	960	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (TYPE 2)
6000000000-E	1605	500	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	250	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	2.5	ACR	TEMPORARY MULCHING
6018000000-E	1620	125	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	1.5	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	200	LF	TEMPORARY SLOPE DRAINS
6027000000-N	1622	4	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
6029000000-E	SP	650	LF	SAFETY FENCE
6030000000-E	1630	385	CY	SILT EXCAVATION
6036000000-E	1631	9,250	SY	MATTING FOR EROSION CONTROL
6037000000-E	SP	50	SY	COIR FIBER MAT
6038000000-E	SP	200	SY	PERMANENT SOIL REINFORCEMENT MAT
6042000000-E	1632	235	LF	1/4" HARDWARE CLOTH
6070000000-N	SP	8	EA	SPECIAL STILLING BASINS
6071010000-E	SP	235	LF	WATTLE
6071020000-E	SP	60	LB	POLYACRYLAMIDE (PAM)
6071030000-E	SP	225	LF	COIR FIBER BAFFLES
6071050000-E	SP	4	EA	**" SKIMMER (1-1/2")
6084000000-E	1660	6	ACR	SEEDING & MULCHING
6087000000-E	1660	1	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	12	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	12	EA	RESPONSE FOR EROSION CONTROL
6123000000-E	1670	0.35	ACR	REFORESTATION

6/21/00

COMPUTED BY: JBW		DATE: 02/27/09	
CHECKED BY: TDG		DATE: 10/28/09	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-4627	3-A

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
SUMMARY NO.1					
-L- STA.21+90 TO 26+46.12	48		2885	2837	
BRIDGE---26+46.12 TO 28+86					
-L- STA.28+86 TO 30+50	854		65		789
SUBTOTAL	902		2950	2837	789
WASTE TO REPLACE BORROW				-789	-789
LOSS DUE TO CLEAR.& GRUBB.	-150			150	
PROJECT TOTALS	752		2950	2198	0
5% REP.TOP SOIL ON BORR.PIT				110	
SAY	780			2310	0

DRAINAGE DITCH EXCAVATION	130				
ESTIMATED UNDERCUT		425			

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.

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

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

STATION	STATION	LOCATION	ASPHALT REMOVAL	ASPHALT BREAKUP	CONCRETE REMOVAL	CONCRETE BREAKUP
21+90 -L-	26+52 -L-	C/L	1232.48			
28+75 -L-	30+50 -L-	C/L	465.47			
	TOTAL		1697.95			
	SAY		1700.00			

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)								C.S. PIPE (UNLESS NOTED OTHRWISE)								CLASS III R.C. PIPE (UNLESS OTHERWISE NOTED)							
SIZE								12"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"	30"	36"	42"	48"
THICKNESS OR GAUGE																.064	.064	.064	.064	.079	.079	.109	.109								
-L- 26+00.00	RT	1	2	674.50'	671.80'	662.90'											32'														
-L- 22+15.00	RT	3			675.10'	674.40'																									
TOTALS																	32'														

STATION	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" 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	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME & 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. 840.22	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. 840.24	J.B. STD. 840.31 OR 840.32	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	T.B.D.I. STD. 840.35				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- 26+00.00						1																				1	1				2@15"				
-L- 22+15.00	20'																																	40'	REMOVE 12" RCP
TOTALS	20'					1																				1	1				2@15"			40'	

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	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS XI MOD	XI	GRAU 350	TYPE III	XIII	CAT-1	VI MOD	BIC	AT-1	IMPACT ATTENUATOR TYPE 350 EA	G	NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
-L-	24+65.75	26+47 (Beg. Brdg.)	LT	181.25'				25+50	4	11		112.50'		2.25'			1	1												
-L-	28+86 (End Brdg.)	30+08.30	LT	100'	87.50'		31+00		4	11	100'		2.00'					1		ANCHOR UNIT DEDUCTIONS			1							
-L-	22+40.75	26+47 (Beg. Brdg.)	RT	406.25'			23+25		4	11	337.50'		4.00'				1	1		4 TYPE-III @ 18.75' ea.										
-L-	28+86 (End Brdg.)	29+67.25	RT	81.25'				28+86	4	11		12.50'		0.25'			1	1		3 GRAU 350 @ 50.00' ea.										
TOTALS				768.75'	87.50'												3	4		1 AT-1 @ 6.25' ea.										
LESS ANCHOR UNITS				231.25'																TOTAL = 231.25'										
SAY				537.50'	87.50'																									
ADDITIONAL GUARDRAIL POSTS	5 each																													

03-DEC-2009 09:31
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-4627	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 14493 ENGINEER JAMES STAFFORD GOODNIGHT, JR. — 12-7-09

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 023090 ENGINEER AUDREY B. BURNETTE — 12-7-09

8/17/99

REVISIONS

NAD 83/95

PLACE DECK DRAINS AT THE FOLLOWING LOCATIONS:
L 26+60
L 26+78
L 26+96
L 27+14
L 27+32
L 28+25
L 28+43
L 28+61
L 28+79

NOTE: OUTLET HAS DETACHED FROM MAIN PIPE. MAINTENANCE NEEDED: COLLAR AND REATTACH PIPE SECTION, PLACE RIPRAP AT THE OUTLET. (WILL BE ADDRESSED BY COUNTY MAINTENANCEAND WILL NOT BE PART OF THE TIP PROJECT)

DETAIL B
RIP RAP PAD
(Not to Scale)
NATURAL GROUND — 1.0' — CLASS B RIPRAP — 10' — FILTER FABRIC
STA. 28+74 RT

DETAIL A
LATERAL 'V' DITCH
(Not to Scale)
Natural Ground — 2H — D — 2H — 1'/Ft. — Fill Slope
Min. D= 1.0 Ft.
b= 2.0 Ft.

FROM -L- STA. 21+50 TO STA. 26+00 RT
DDE 130 cu yds.

PC Sta. 19+74.83

BEGIN CONSTRUCTION STA. 21+50.00
(PROPOSED LATERAL V DITCH)

BERNARD T. SMITH
DIANNE M. SMITH
DB 552 PG 425
DB 594 PG 193

JOSEPH LAFAVE
PATRICIA D. LAFAVE
DB 1028 PG 850
DB 1028 PG 848

-BL- GPS B4627-2 19+21.88 PINC
17.66 RT. -L- 21+70.35

BEGIN APPROACH SLAB
-L- STA. 26+22.12

-BL-4 23+99.21 PINC
17.49 RT. -L- 26+44.78

PT Sta. 25+07.22

END APPROACH SLAB
-L- STA. 29+10

END BRIDGE
-L- STA. 28+86

STA. 30+50.00 -L- END TIP PROJECT B-4627

-BL-5 28+60.11 PINC
23.83 LT. -L- 31+01.44

SUSAN R. THOMAS
GEORGE W. RATLEDGE
PATRICIA R. DUFF
DB 1053 PG 644
DB 0620 PG 331

STA. 21+90.00 -L- BEGIN TIP PROJECT B-4627
BEGIN GRADE

END GRADE
-L- STA. 30+00

PC Sta. 28+96.81

PT Sta. 31+30.20

PCC Sta. 30+72.97

MICHAEL A. FROST
MARIEL A. FROST
DB 1002 PG 0203

WILLIAM V. GODLEY, JR
DB 584 PG 404
DB 444 PG 413

PI Sta 22+48.22	PI Sta 29+85.87	PI Sta 31+01.66
Δ = 32° 06' 32.0" (LT)	Δ = 20° 48' 38.1" (RT)	Δ = 10° 09' 31.4" (RT)
D = 6° 01' 52.1"	D = 11° 48' 48.8"	D = 17° 45' 00.0"
L = 532.39'	L = 176.16'	L = 57.23'
T = 273.39'	T = 89.06'	T = 28.69'
R = 950.00'	R = 485.00'	R = 322.79'
RO = SEE PLANS	RO = SEE PLANS	RO = SEE PLANS
SE = 6%	SE = 6%	SE = 6%

PROP. APPROACH SLAB

SKETCH OF PAVEMENT IN RELATION TO BRIDGE WIDTH

DESIGN EXCEPTION REQUIRED FOR
HORIZONTAL CURVE RADII, VERTICAL CURVE
K-FACTOR AND THE ASSOCIATED STOPPING
SIGHT DISTANCE.
THESE PROPOSED DESIGN ELEMENTS SUPPORT A 40-MPH DESIGN.

NOTE: SEE SHEET 5 FOR -L- PROFILE

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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4627	5

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 14493 ENGINEER JAMES STAFFORD GOODNIGHT, JR.

12-3-09

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 023090 ENGINEER AUDREY B. BURNETTE

12-7-09

DESIGN EXCEPTION REQUIRED FOR HORIZONTAL CURVE RADII, VERTICAL CURVE K-FACTOR AND THE ASSOCIATED STOPPING SIGHT DISTANCE. THESE PROPOSED DESIGN ELEMENTS SUPPORT A 40-MPH DESIGN.

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 9300	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 669.3	FT
BASE DISCHARGE	= 13000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 671.2	FT
OVERTOPPING DISCHARGE	= 16000	CFS
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING ELEVATION	= 672.6	FT
DATE OF SURVEY	= 01/29/08	
W.S. ELEVATION AT DATE OF SURVEY	= 651.3	FT

BM#2 ELEVATION = 664.64
N 744451 E 1526456
BL STATION 22+19 205 RIGHT
8" SPIKE IN ROOT OF 30" BIRCH TREE
-L- STA. 24+51.57 200.09' RIGHT

END GRADE
-L- STA. 30+00.00
ELEV. 694.19

PI = 29+50.00
EL = 691.58'
VC = 100'
K = 192

PI = 25+00.00
EL = 665.70'
VC = 620'
K = 66

BEGIN GRADE
-L- STA. 21+90.00
ELEV. 676.96

BEGIN BRIDGE
-L- STA. 26+46.12

END BRIDGE
-L- STA. 28+86

694.19

(+)5.2290%

(-)3.6332%

(+)5.7501%

(-) 4.9610%

(-) 1.5000%

BEGIN LAT. V DITCH
STA. 21+50.00 RT
EL. 676.534'

STA. 23+50.00 RT
EL. 666.612'

END LAT.V DITCH
STA. 26+00.00 RT
EL. 662.862'

NOTE: SEE SHEET 4 FOR -L- DESIGN

710
700
690
680
670
660
650

18 19 20 21 22 23 24 25 26 27 28 29 30 31

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