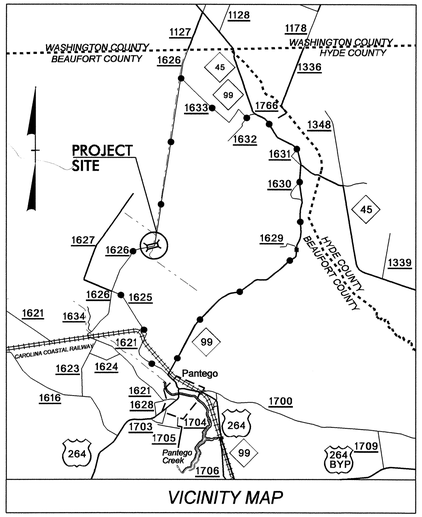
09/08/99

TIP PROJECT: B-4428

CONTRACT: C202377

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Symbology




VICINITY MAP

OFFSITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

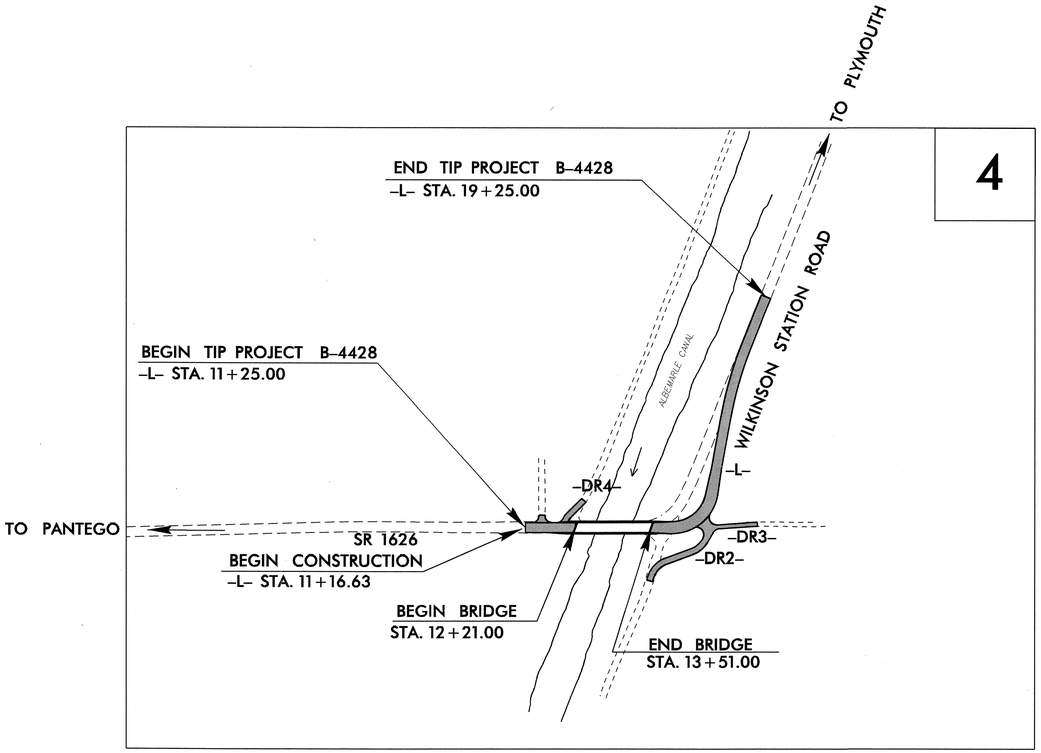
# BEAUFORT COUNTY

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| N.C. | B-4428 | 1 | |

| STATE PROJ. NO. | F. A. PROJ. NO. | DESCRIPTION |
|---|---|---|
| 33698.1.1 | BRZ-1616(6) | P.E. |
| 33698.2.1 | BRZ-1626(3) | ROW, UTIL |
| 33698.3.1 | BRZ-1626(3) | CONST |

***LOCATION: BRIDGE #140 OVER ALBEMARLE CANAL ON SR 1626 (WILKINSON STATION ROAD)***

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




NAD 83/95

***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 2010 = 505
ADT 2030 = 800
DHV = 10 %
D = 60 %
T = 3 % *
V = 20 MPH
FUNC CLASS = RURAL LOCAL
* (TTST 1% + DUAL 2%)
SUB-REGIONAL TIER

***PROJECT LENGTH***

LENGTH OF ROADWAY TIP PROJECT B-4428 = 0.127 MI
LENGTH OF STRUCTURES TIP PROJECT B-4428 = 0.025 MI
TOTAL LENGTH OF TIP PROJECT B-4428 = 0.152 MI

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

*2006 STANDARD SPECIFICATIONS*

***RIGHT OF WAY DATE:*** MAY 15, 2009

***LETTING DATE:*** MAY 18, 2010

BRENDA MOORE, P.E.
*PROJECT ENGINEER*

THAD F. DUNCAN, P.E.
*PROJECT DESIGN ENGINEER*

***HYDRAULICS ENGINEER***
NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIL
W. Galen Cail 2/10/10
SIGNATURE:

***ROADWAY DESIGN ENGINEER***
NORTH CAROLINA PROFESSIONAL SEAL 25477 ENGINEER THAD F. DUNCAN
Thad F. Duncan 2-17-10 P.E.
SIGNATURE:

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

8/17/99

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-4428 | 1-A |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25477 ENGINEER THAD F. DUNCAN

2-17-10

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 THRO 2-A | PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS |
| 2-B THRO 2-C | METHOD OF PIPE INSTALLATION DETAILS |
| 2-D | ANCHORAGE FOR FRAMES DETAILS |
| 3 | SUMMARY OF QUANTITIES |
| 3-A | SUMMARY OF DRAINAGE QUANTITIES |
| 3-B | SUMMARY OF EARTHWORK, GUARDRAIL SUMMARY, AND SUMMARY OF EXISTING ASPHALT PAVEMENT REMOVAL |
| 4 | PLAN SHEET |
| 5 | PROFILE SHEET |
| TCP-1 THRU TCP-2 | TRAFFIC CONTROL PLANS |
| RF-1 | REFORESTATION PLANS |
| EC-1 THRU EC-5 | EROSION CONTROL PLANS |
| UO-1 THRU UO-2 | UTILITIES BY OTHERS PLANS |
| X-1A | CROSS-SECTION SUMMARY |
| X-1 THRU X-8 | CROSS-SECTIONS |
| S-1 THRU S-27 | STRUCTURE PLANS |

GENERAL NOTES:

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

GRADE LINE:
GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

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.

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

Tri-County Telecom-Telephone

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY 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 4 - MAJOR STRUCTURES | |
| 422.10 | Reinforced Bridge Approach Fills |
| DIVISION 5 - SUBGRADE, BASES AND SHOULDERS | |
| 560.01 | Method of Shoulder Construction - High Side of Superelevated Curve - Method I |
| DIVISION 8 - INCIDENTALS | |
| 815.03 | Pipe Underdrain and Blind Drain |
| 840.00 | Concrete Base Pad for Drainage Structures |
| 840.14 | Concrete Drop Inlet - 12" thru 30" Pipe |
| 840.15 | Brick Drop Inlet - 12" thru 30" Pipe |
| 840.16 | Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15 |
| 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 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 |

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3/15/06

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-4428 | 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

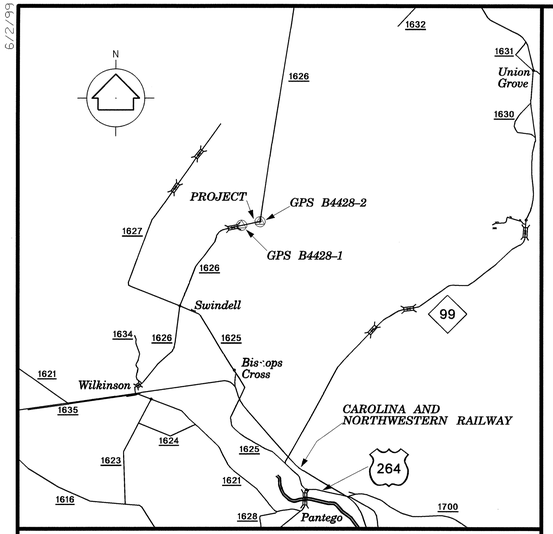
MISCELLANEOUS:

- 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-4428 | 1-C |
| Location and Surveys | |

# SURVEY CONTROL SHEET B-4428

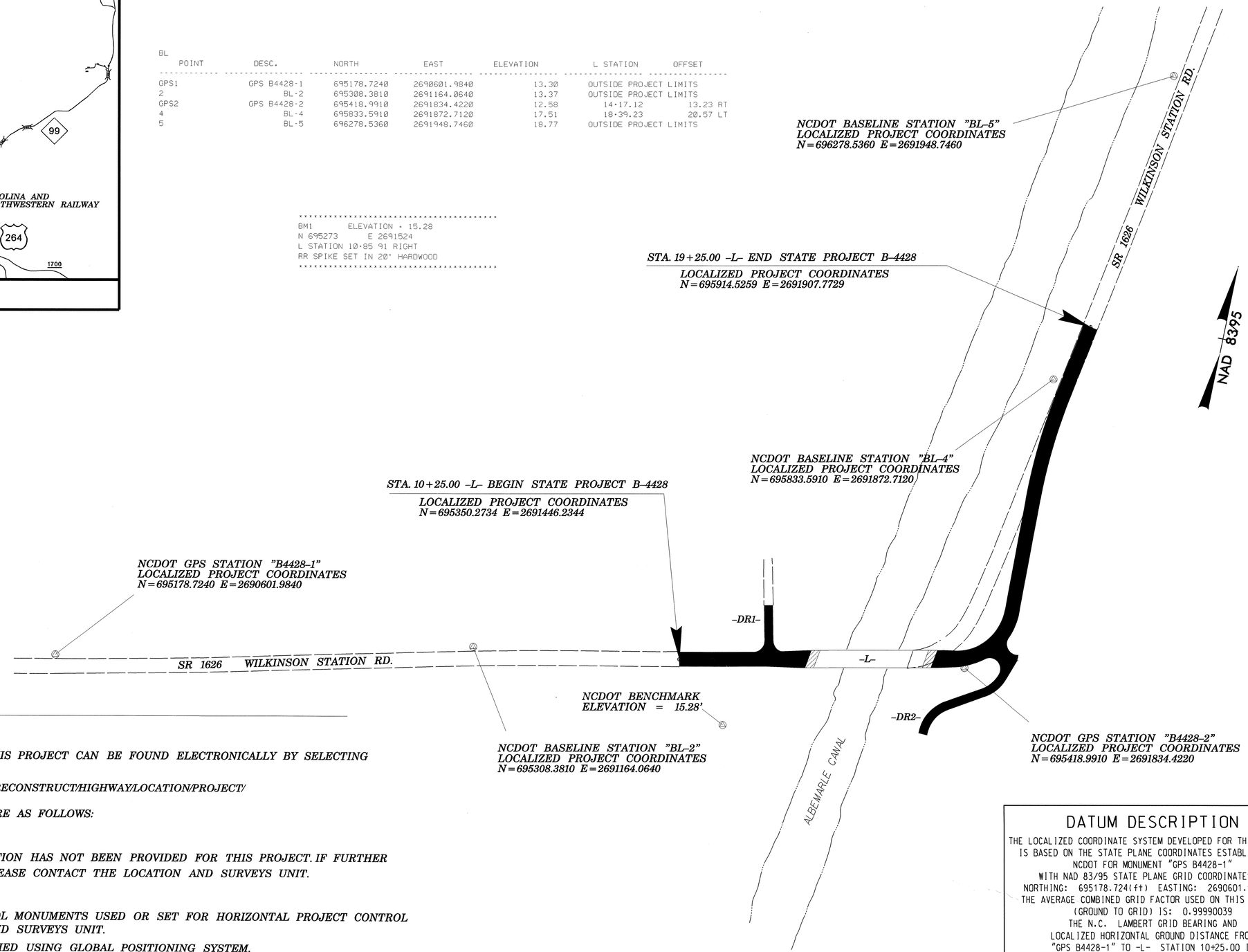



VICINITY MAP

BL

| POINT | DESC. | NORTH | EAST | ELEVATION | L STATION | OFFSET |
|---|---|---|---|---|---|---|
| GPS1 | GPS B4428-1 | 695178.7240 | 2690601.9840 | 13.30 | OUTSIDE PROJECT LIMITS | |
| 2 | BL-2 | 695308.3810 | 2691164.0640 | 13.37 | OUTSIDE PROJECT LIMITS | |
| GPS2 | GPS B4428-2 | 695418.9910 | 2691834.4220 | 12.58 | 14+17.12 | 13.23 RT |
| 4 | BL-4 | 695833.5910 | 2691872.7120 | 17.51 | 18+39.23 | 20.57 LT |
| 5 | BL-5 | 696278.5360 | 2691948.7460 | 18.77 | OUTSIDE PROJECT LIMITS | |

**********
BM1 ELEVATION = 15.28
N 695273 E 2691524
L STATION 10+85 91 RIGHT
RR SPIKE SET IN 20" HARDWOOD
**********




## 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:
   *b4428_ls_control_081023.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)

## DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "GPS B4428-1" WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 695178.724(ft) EASTING: 2690601.984(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99990039 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS B4428-1" TO -L- STATION 10+25.00 IS N 78°30'50.5" E 861.503 (ft) ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

05-JAN-2010 11:41 \\s4428_ls_lc.dgn
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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-4428 | 2 |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25477 ENGINEER HAD F. DUNCAN
2-17-10

PAVEMENT DESIGN ENGINEER

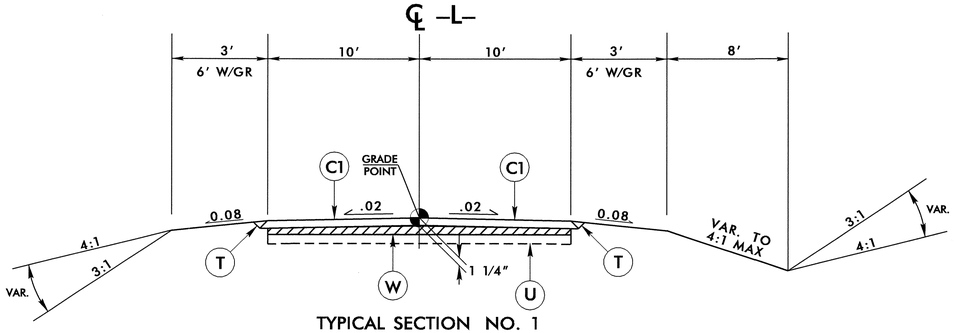
NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK S. MORRISON
2/16/10

## PAVEMENT SCHEDULE

*(FINAL PAVEMENT DESIGN)*

| | |
|---|---|
| C1 | PROP. APPROX. 1¼" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. |
| C2 | 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. |
| C3 | PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH. |
| D1 | PROP. APPROX. 3¼" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 370.5 LBS. PER SQ. YD. |
| E1 | PROP. APPROX. 5½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 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. |
| J1 | PROP. 6" AGGREGATE BASE COURSE. |
| T | EARTH MATERIAL. |
| U | EXISTING PAVEMENT. |
| W | VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET No.2) |

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

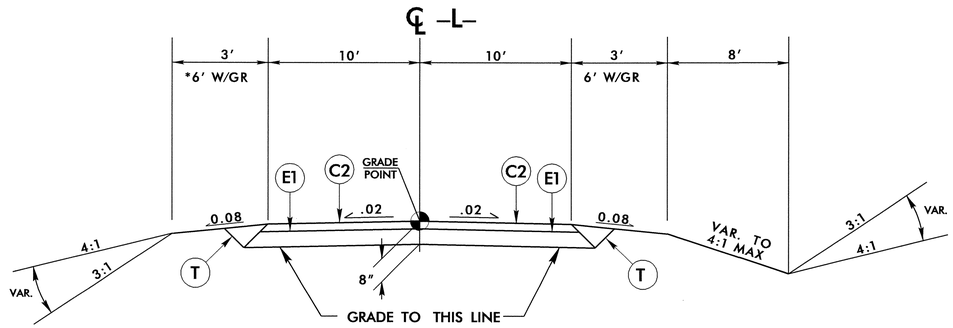



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

–L– STA. 11+25.00 TO –L– STA. 11+70.00

–L– STA. 18+25.26 TO –L– STA. 19+25.00




TYPICAL SECTION NO. 2

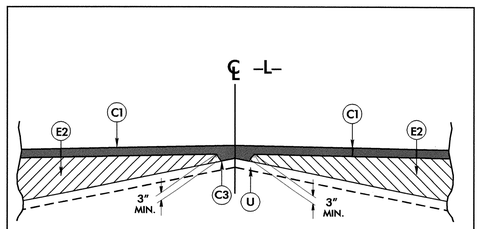
USE TYPICAL SECTION NO. 2

–L– STA. 11+70.00 TO –L– STA. 12+21.00 (BEGIN BRIDGE)

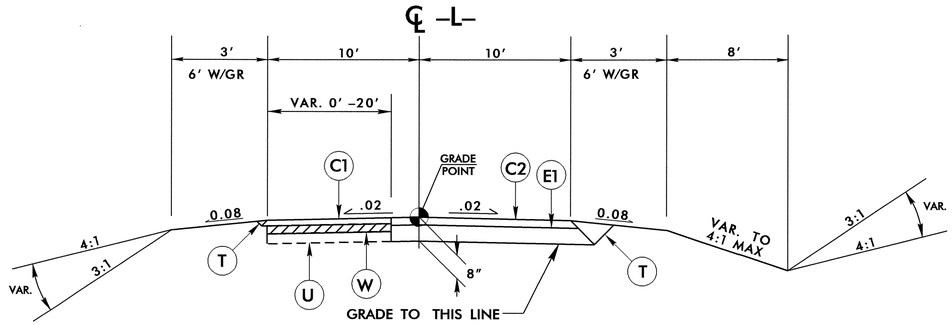
–L– STA. 13+51.00 (END BRIDGE) TO –L– STA. 16+48.24

* USE 8′ W/GR FROM –L– STA. 11+73.00 LT TO –L– STA. 14+22.00 LT.

NOTE:
MAINTAIN 2′ OF SHOULDER BEHIND M–350 ANCHOR UNIT.




Detail Showing Method of Wedging
Use with Typical Sections No. 1 & No. 3




TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

–L– STA. 16+48.24 TO –L– STA. 18+25.26

6/2/99

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6/2/99

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-4428 | 2-A |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25477 ENGINEER THAD F. DUNCAN

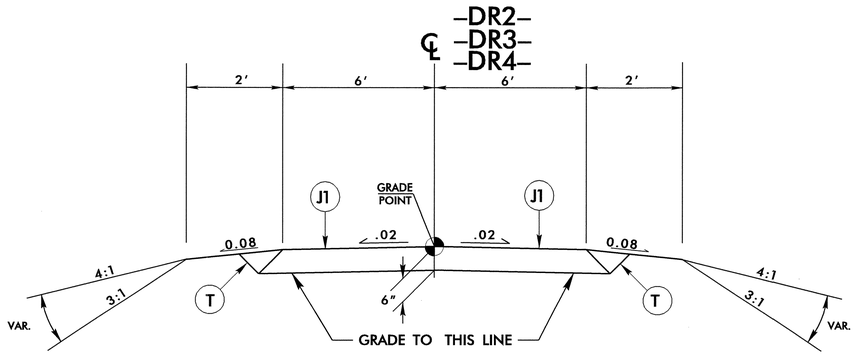
2-17-10

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK S. MORRISON

2/16/10

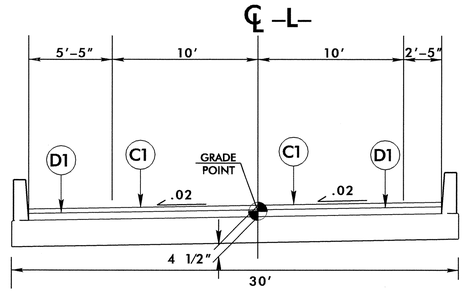
| | |
|---|---|
| C1 | 1¼" SF9.5A. |
| D1 | 3¼" I19.0B. |
| J1 | 6" ABC |
| T | EARTH MATERIAL. |




TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4

–DR2– STA. 10+10.00 TO –DR2– STA. 11+90.00
–DR3– STA. 10+06.19 TO –DR3– STA. 11+25.00
–DR4– STA. 10+00.00 TO –DR4– STA. 10+54.20

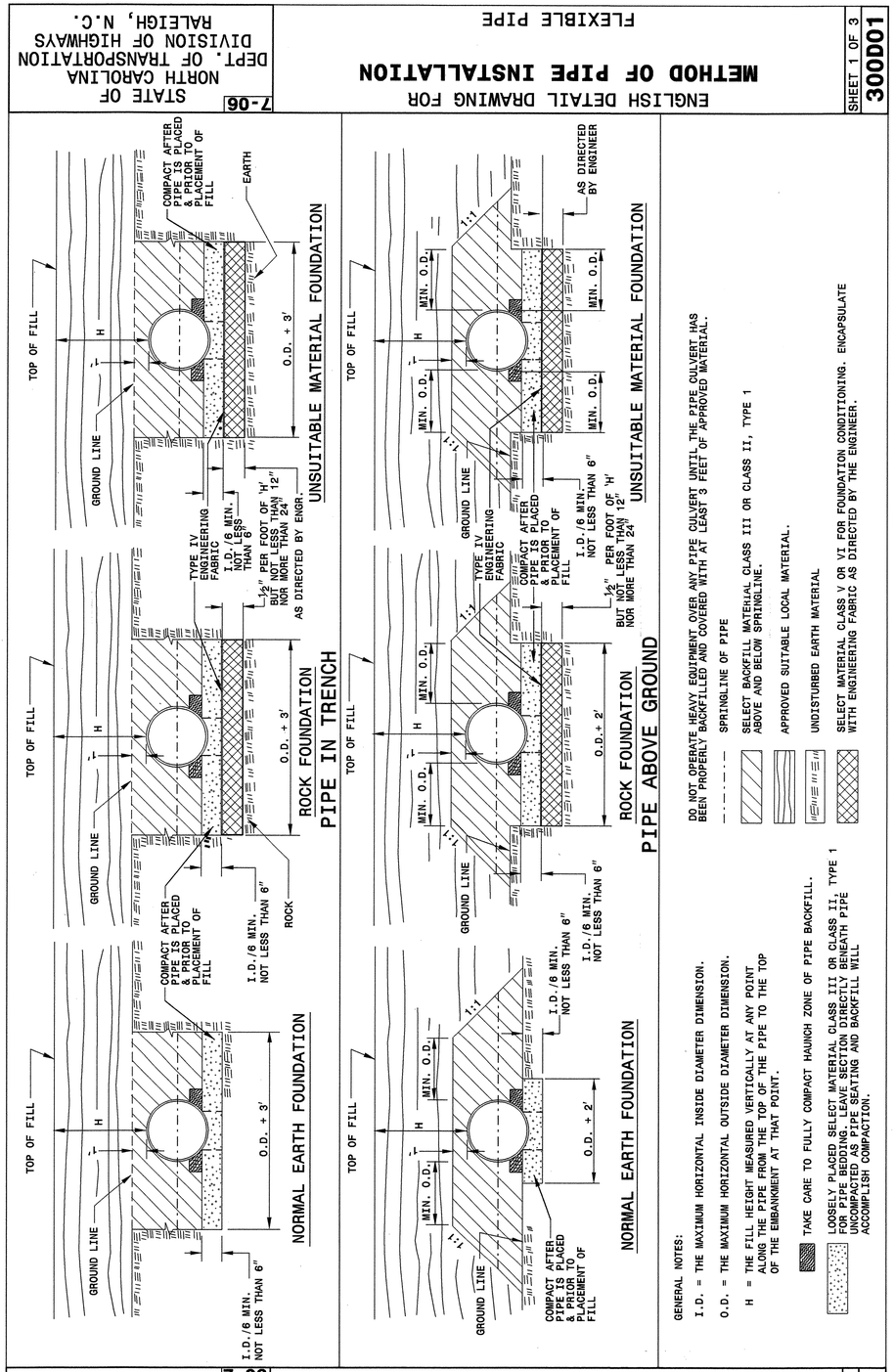



TYPICAL BRIDGE DETAIL NO. 1

–L– STA. 12+21.00 TO –L– STA. 13+51.00

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-4428 | 2-B |

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

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

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: 7/8/09
FILE SPEC: c:/projects\special details\ericward\stds\06\stds to special details\30001\0300d01.dgn

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**

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

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022566 JOHN E. HOWERTON 2/11/10

ORIGINAL BY: KMempf DATE: 5-15-09
MODIFIED BY: DATE:
CHECKED BY: DATE: 7/9/09
FILE SPEC: /ericward/stds/stdstodetails/30001/0300d01.dgn

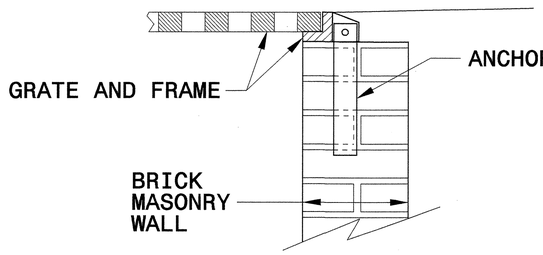
**SEE PLATE FOR TITLE**

PROJECT REFERENCE NO. B-4428
SHEET NO. 2-C

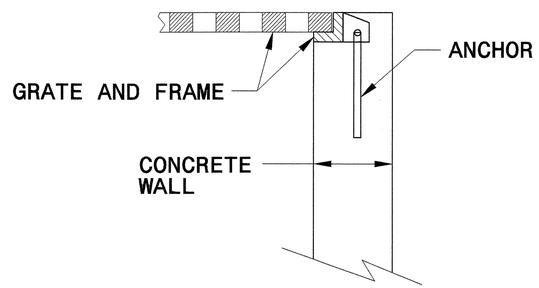
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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

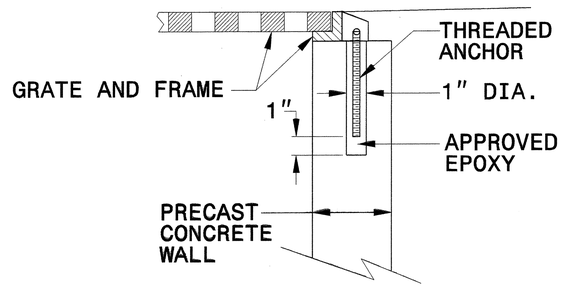
SHEET 1 OF 1
**840D25**




**BRICK MASONRY CONSTRUCTION**



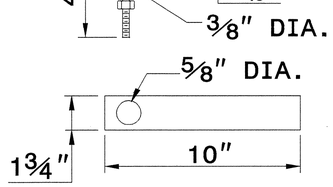

**CONCRETE CONSTRUCTION**



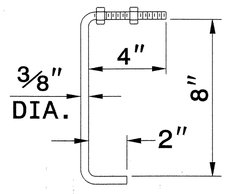

**PRECAST CONCRETE CONSTRUCTION**

## DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

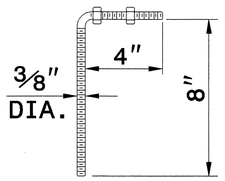
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



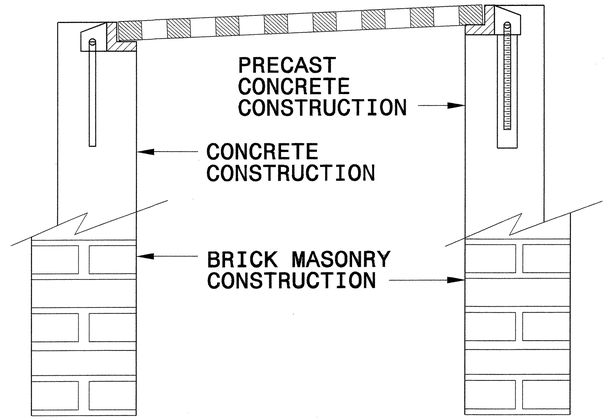

**MASONRY ANCHOR**
3/8" DIA. BOLT WITH PLATE




**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 022966 ENGINEER JOEL I. HOWERTON
2/7/10

**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: | | DATE: 11/1/06 |
| FILE SPEC.: | | |

5/28/99

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-4428 | 3 |

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

# *SUMMARY OF QUANTITIES*

**STATE OF NORTH CAROLINA**
**DIVISION OF HIGHWAYS**
**ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202377**

| ItemNumber | Sec # | Quantity | Unit | Description |
|---|---|---|---|---|
| 0000100000-N | 800 | Lump Sum | | MOBILIZATION |
| 0000400000-N | 801 | Lump Sum | | CONSTRUCTION SURVEYING |
| 0029000000-N | SP | Lump Sum | | REINFORCED BRIDGE APPROACH FILL, STATION ********** (12+86.00) |
| 0036000000-E | 225 | 700 | CY | UNDERCUT EXCAVATION |
| 0043000000-N | 226 | Lump Sum | | GRADING |
| 0050000000-E | 226 | 1 | ACR | SUPPLEMENTARY CLEARING & GRUBBING |
| 0194000000-E | SP | 700 | CY | SELECT GRANULAR MATERIAL, CLASS III |
| 0196000000-E | 270 | 700 | SY | FABRIC FOR SOIL STABILIZATION |
| 0320000000-E | SP | 60 | SY | FOUNDATION CONDITIONING FABRIC |
| 0330000000-E | SP | 20 | TON | GENERIC DRAINAGE ITEM FOUNDATION CONDITIONING MATERIAL, MINOR STRS |
| 0335200000-E | SP | 12 | LF | 15" DRAINAGE PIPE |
| 0335400000-E | SP | 76 | LF | 24" DRAINAGE PIPE |
| 0335850000-E | SP | 1 | EA | "" DRAINAGE PIPE ELBOWS (24") |
| 0448200000-E | SP | 80 | LF | 15" RC PIPE CULVERTS, CLASS IV |
| 0995000000-E | 340 | 32 | LF | PIPE REMOVAL |
| 1121000000-E | 520 | 200 | TON | AGGREGATE BASE COURSE |
| 1220000000-E | 545 | 200 | TON | INCIDENTAL STONE BASE |
| 1489000000-E | 610 | 370 | TON | ASPHALT CONC BASE COURSE, TYPE B25.0B |
| 1498000000-E | 610 | 90 | TON | ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B |
| 1525000000-E | 610 | 260 | TON | ASPHALT CONC SURFACE COURSE, TYPE SF9.5A |
| 1560000000-E | 620 | 40 | TON | ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22 |
| 2022000000-E | 815 | 33.6 | CY | SUBDRAIN EXCAVATION |
| 2033000000-E | 815 | 16.8 | CY | SUBDRAIN FINE AGGREGATE |
| 2044000000-E | 815 | 100 | LF | 6" PERFORATED SUBDRAIN PIPE |
| 2055000000-E | 815 | 3 | EA | 6" SUBDRAIN PIPE WYES, TEES, & ELBOWS |
| 2066000000-N | 815 | 1 | EA | CONCRETE PAD FOR SUBDRAIN PIPE OUTLET |
| 2077000000-E | 815 | 6 | LF | 6" OUTLET PIPE (SUBDRAINS) |
| 2286000000-N | 840 | 4 | EA | MASONRY DRAINAGE STRUCTURES |
| 2364000000-N | 840 | 1 | EA | FRAME WITH TWO GRATES, STD 840.16 |
| 2367000000-N | 840 | 3 | EA | FRAME WITH TWO GRATES, STD 840.29 |
| 2556000000-E | 846 | 95 | LF | SHOULDER BERM GUTTER |
| 3030000000-E | 862 | 75 | LF | STEEL BM GUARDRAIL |
| 3150000000-N | 862 | 5 | EA | ADDITIONAL GUARDRAIL POSTS |
| 3165000000-N | SP | 2 | EA | GUARDRAIL ANCHOR UNITS, TYPE ********** (350, TL-2) |
| 3215000000-N | 862 | 3 | EA | GUARDRAIL ANCHOR UNITS, TYPE III |
| 3285000000-N | SP | 1 | EA | GUARDRAIL ANCHOR UNITS, TYPE M-350 |
| 3628000000-E | 876 | 35 | TON | RIP RAP, CLASS I |
| 3649000000-E | 876 | 1 | TON | RIP RAP, CLASS B |
| 3656000000-E | 876 | 510 | SY | FILTER FABRIC FOR DRAINAGE |
| 4400000000-E | 1110 | 427 | SF | WORK ZONE SIGNS (STATIONARY) |
| 4405000000-E | 1110 | 96 | SF | WORK ZONE SIGNS (PORTABLE) |
| 4410000000-E | 1110 | 94 | SF | WORK ZONE SIGNS (BARRICADE MOUNTED) |
| 4435000000-N | 1135 | 40 | EA | CONES |
| 4445000000-E | 1145 | 64 | LF | BARRICADES (TYPE III) |
| 4455000000-N | 1150 | 20 | MD | FLAGGER |
| 6000000000-E | 1605 | 2,500 | LF | TEMPORARY SILT FENCE |
| 6006000000-E | 1610 | 250 | TON | STONE FOR EROSION CONTROL, CLASS A |
| 6009000000-E | 1610 | 20 | TON | STONE FOR EROSION CONTROL, CLASS B |
| 6012000000-E | 1610 | 80 | TON | SEDIMENT CONTROL STONE |
| 6015000000-E | 1615 | 2.5 | ACR | TEMPORARY MULCHING |
| 6018000000-E | 1620 | 100 | 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 | 4 | EA | INLET PROTECTION AT TEMPORARY SLOPE DRAINS |
| 6029000000-E | SP | 1,400 | LF | SAFETY FENCE |
| 6030000000-E | 1630 | 25 | CY | SILT EXCAVATION |
| 6036000000-E | 1631 | 1,750 | SY | MATTING FOR EROSION CONTROL |
| 6037000000-E | SP | 450 | SY | COIR FIBER MAT |
| 6042000000-E | 1632 | 350 | LF | 1/4" HARDWARE CLOTH |
| 6048000000-E | SP | 125 | SY | FLOATING TURBIDITY CURTAIN |
| 6071010000-E | SP | 40 | LF | WATTLE |
| 6071020000-E | SP | 9 | LB | POLYACRYLAMIDE (PAM) |
| 6071030000-E | SP | 45 | LF | COIR FIBER BAFFLES |
| 6084000000-E | 1660 | 3 | ACR | SEEDING & MULCHING |
| 6087000000-E | 1660 | 3 | ACR | MOWING |
| 6090000000-E | 1661 | 50 | LB | SEED FOR REPAIR SEEDING |
| 6093000000-E | 1661 | 0.25 | TON | FERTILIZER FOR REPAIR SEEDING |
| 6096000000-E | 1662 | 50 | LB | SEED FOR SUPPLEMENTAL SEEDING |
| 6108000000-E | 1665 | 1.25 | TON | FERTILIZER TOPDRESSING |
| 6114500000-N | SP | 10 | MHR | SPECIALIZED HAND MOWING |
| 6117000000-N | SP | 12 | EA | RESPONSE FOR EROSION CONTROL |
| 6123000000-E | 1670 | 0.1 | ACR | REFORESTATION |

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COMPUTED BY: RWB DATE: 1/5/2010

CHECKED BY: TFD DATE: 1/5/2010

| PROJECT NO. | SHEET NO. |
|---|---|
| B-4428 | 3-A |

# NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
## DIVISION OF HIGHWAYS
## *SUB-REGIONAL & REGIONAL*
## *LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & 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) SIZE 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | DRAINAGE PIPE THICKNESS OR GAUGE DO NOT USE RCP | DO NOT USE CSP | DO NOT USE CAAP | DO NOT USE HDPE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | | 11.0' | 11.0' | | 12' | | | | | | | | | | | |
| 11+47 | RT | 2 | | 14.2' | | | | | | | | | | | | | | | |
| | | 2 | 3 | | 11.0' | 11.4' | | | | | | | | | | | | | |
| 11+99 | RT | 3 | | 14.3' | | | | | | | | | | | | | | | |
| | | 3 | 4 | | 11.4' | 11.5' | | | | | | | | | | | | | |
| 12+10 | LT | 4 | | 14.3' | | | | | | | | | | | | | | | |
| | | 6 | 7 | | 5.0' | 6.8' | | | | | 76' | | | | | X | | | |
| 11+86 | LT | 7 | | 11.1' | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| SHEET TOTALS | | | | | | | | 12' | | | 76' | | | | | | | | |

| C.S. PIPE SIZE 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | C.S. PIPE THICKNESS OR GAUGE .064 | .064 | .064 | .064 | .079 | .079 | .109 | .109 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | |

| R.C. PIPE (CLASS III) SIZE 15" | 18" | 24" | 30" | 36" | 42" | 48" |
|---|---|---|---|---|---|---|
| | | | | | | |
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| | | | | | | |
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| | | | | | | |

| R.C. PIPE (CLASS IV) SIZE 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | 52' | | | | | | |
| | | | | | | | |
| | 28' | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | 80' | | | | | | |

| *** R.C. PIPE (CLASS V) | **** RC PIPE CULVERTS, CONTRACTOR DESIGN | ***** RC PIPE CULVERTS, CONTRACTOR DESIGN | 15" SIDE DRAIN PIPE | 18" SIDE DRAIN PIPE | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P. | C.S.P. |
|---|---|---|---|---|---|---|
| | | | | | | |
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| QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0') | LIN. FT. 5.0' THRU 10.0' A | 10.0' AND ABOVE B | "TOTAL L.F. FOR PAY QUANTITY" SHALL BE COL. "A" + (1.3 X COL. "B") | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E | F | G |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| 1 | | | | | | | |
| | | | | | | | |
| 1 | | | | | | | |
| | | | | | | | |
| 1 | | | | | | | |
| | | | | | | | |
| 1 | | | | | | | |
| | | | | | | | |
| 4 | | | | | | | |

| CONCRETE TRANSITIONAL SECTION DROP INLET | CATCH BASIN | T.B.G.I. STD. 840.35 | FRAMES AND N.S. FLAT GRATES STD. 840.29 | D.I. STD. 840.14 OR STD. 840.15 | FRAME WITH TWO GRATES STD. 840.16 | DRAINAGE PIPE ELBOWS | CONC. COLLARS CL. "B" C.Y. STD. 840.72 | CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71 | PIPE REMOVAL LIN. FT. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| | | 1 | 1 | | | | | | 32' | |
| | | | | | | | | | | |
| | | 1 | 1 | | | | | | | |
| | | | | | | | | | | |
| | | 1 | 1 | | | | | | | |
| | | | | | | 1 @ 24" | | | | |
| | | | | 1 | 1 | | | | | |
| | | | | | | | | | | |
| | | 3 | 3 | 1 | 1 | 1 @ 24" | | | 32' | |

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.) (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

ABBREVIATIONS

COMPUTED BY: rwb DATE: 2/18/09
CHECKED BY: tfd DATE: 2/18/09

| PROJECT NO. | SHEET NO. |
|---|---|
| B-4428 | 3-B |

RD226355

# STATE OF NORTH CAROLINA
# DIVISION OF HIGHWAYS

## SUMMARY OF EARTHWORK

IN CUBIC YARDS

| Station | Station | Uncl. Excav. | Embank. +% | Borrow | Waste |
|---|---|---|---|---|---|
| -L- | | | | | |
| 11+25.00 | 12+21 (BEG BR) | 9 | 27 | 18 | |
| 13+51 (END BR) | 19+25.00 | 161 | 1,139 | 978 | |
| | | | | | |
| DRIVES | | | | | |
| -DR2- 10+10.00 | -DR2- 10+90.00 | 1 | 465 | 464 | |
| -DR3- 10+06.19 | -DR3- 11+25.00 | 1 | 195 | 194 | |
| -DR4- 10+00.00 | -DR4- 10+54.20 | 2 | 99 | 97 | |
| | | | | | |
| | | | | | |
| PROJECT TOTALS: | | 174 | 1,925 | 1,751 | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| EST. 5% TO REPL. BORROW PIT | | | | 88 | |
| | | | | | |
| GRAND TOTALS: | | 174 | 1,925 | 1,839 | |
| SAY: | | 200 CY | | 1,900 CY | |
| | | | | | |
| | | | | | |
| | | | | | |

Estimated Undercut = 700 CY

## SUMMARY OF EXISTING ASPHALT PAVEMENT REMOVAL

IN SQUARE YARDS

| LINE | Station | Station | LOC LT/RT/CL | AREA SY |
|---|---|---|---|---|
| REMOVAL OF EXISTING ASPHALT PAVEMENT | | | | |
| -L- | 11+70 | 12+27 | CL | 151 |
| -L- | 13+42 | 18+25 | LT,CL | 775 |
| | | | | |
| | | | TOTAL: | 926 |
| | | | | |
| | | | SAY: | 950 SY |

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."

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.

"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

| LINE | BEG. STA. | END STA. | LOC. | LENGTH | | | | WARRANT POINT | | "N" DIST. FROM E.O.L. | TOTAL SHLDR WIDTH | FLARE LENGTH | | W | | ANCHORS | | | | | | | ADDITIONAL GUARDRAIL POSTS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | STRAIGHT | TEMP STRAIGHT | SHOP CURVED | TEMP SHOP CURVED | APPR. END | TRAIL. END | | | APPR. END | TRAIL. END | APPR. END | TRAIL. END | TYPE III | Type M-350 | TYPE TL-2 | | | | | | |
| -L- | 11+16.63 | 12+16.63 | RIGHT | 100.00' | | | | | 12+16.63 | 2'-5" | 6' | 25' | | 1' | | 1 | | 1 | | | | | | |
| -L- | 13+46.63 | 13+96.63 | RIGHT | 50.00' | | | | 13+46.63 | | 2'-5" | 6' | | 25' | | 1' | 1 | | 1 | | | | | | |
| -L- | 13+56.46 | 14+18.96 | LEFT | 62.50' | | | | | 13+56.46 | 5'-5" | 8' | 37.5' | | 4' | | 1 | 1 | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| SUBTOTAL: | | | | 212.50' | | | | | | | | | | | | 3 | 1 | 2 | | | | | | |
| ADDITIONS: | | | | | | | | | | | | | | | | | | | | | | | 5 | |
| LESS ANCHORS DEDUCTIONS: | | | | | | | | | | | | | | | | | | | | | | | | |
| TYPE TL-2 | 2 @ 25' = 50' | | | -50.00' | | | | | | | | | | | | | | | | | | | | |
| TYPE III | 3 @ 18.75' = 56.25' | | | -56.25' | | | | | | | | | | | | | | | | | | | | |
| TYPE M-350 | 1@ 37.5' = 37.5' | | | -37.50' | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| ANCHOR TOTALS: | | | | -143.75' | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| GRAND TOTAL: | | | | 68.75' | | | | | | | | | | | | 3 | 1 | 2 | | | | | 5 | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| SAY: | | | | 75.00' | | | | | | | | | | | | 3 | 1 | 2 | | | | | 5 | |

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-4428 | 4 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25477 ENGINEER THAD F. DUNCAN

2-17-10

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022201 ENGINEER GALEN CAIN

2/16/10

REVISIONS 8/17/99

15-FEB-2010 11:48
r:\roadway\pro\b4428_rdy_psh.dgn
USER: FNGMF

-L-

| | |
|---|---|
| PI Sta 14+72.38 | PI Sta 17+50.78 |
| △ = 79° 25' 46.4" (LT) | △ = 11° 10' 34.5" (RT) |
| D = 70° 44' 07.9" | D = 7° 28' 47.5" |
| L = 112.29' | L = 149.42' |
| T = 67.28' | T = 74.95' |
| R = 81.00' | R = 766.00' |
| RO = 102' | RO = 76' |
| SE = .06 | SE = .04 |
| V = 20mph | V= 30mph |

-DR2-

| | |
|---|---|
| PI Sta 10+62.91 | PI Sta 11+66.50 |
| △ = 111° 50' 46.7" (RT) | △ = 55° 43' 46.7" (LT) |
| D = 163° 42' 08.0" | D = 114° 35' 29.6" |
| L = 68.32' | L = 48.63' |
| T = 51.74' | T = 26.43' |
| R = 35.00' | R = 50.00' |
| SE = SEE PLANS | SE = SEE PLANS |

-DR4-

PI Sta 10+41.02
△ = 41° 30' 48.1" (LT)
D = 272° 50' 13.4"
L = 17.41'
T = 9.24'
R = 21.00'
SE = SEE PLANS

-DR3-

PI Sta 11+04.53
△ = 4° 22' 15.1" (RT)
D = 11° 27' 33.0"
L = 38.14'
T = 19.08'
R = 500.00'
SE = SEE PLANS

STA. 19+25.00 -L- END STATE PROJECT B-4428

STA. 11+25.00 -L- BEGIN STATE PROJECT B-4428

BONNER B. ALLEN, ET U
DB 909 PG 797
PLAT CAB B SLIDE 153

POT Sta. 19+98.03

-BL- 4
-L- 18+39.23
20.57 LT

NAD 83/95

PT Sta. 18+25.26

BONNER B. ALLEN, ET UX
DB 704 PG 535
MB 23 PG 75

PC Sta. 16+75.84

ALBEMARLE DRAINAGE DISTRICT
DB 515 PG 191

ROMICO INC.
DB 478 PG 483
DB 351 PG 625

FLOYD R. MCCLOUD
DB 1006 PG 453

PC Sta. 10+31.78

PT Sta. 10+49.19
BRG. AH = S 11° 47' 54.8" E

-L- POT Sta.11+99.46
-DR4- POT Sta.10+64.20

POT Sta. 10+00.00

N 78° 11' 20.3" E

-DR4- Sta. 10+00.00
BEGIN CONST.
BRG. AH = S 35° 42' 53.3" E

-BL- 3
-L- 14+17.12
13.23 RT

PC Sta. 14+05.10

BEGIN BRIDGE
-L- STA. 12+21.00

END APPROACH SLAB
-L- STA. 13+61.94

REMOVE & REPLACE W/ 24" W/ELBOW

REMOVE DI & 12' OF 15"

RETAIN 15" RCP

EMBANKMENT RIP RAP SEE DETAIL A TYPE M380 TYPE III

PT Sta. 15+17.39

-L- POC Sta.14+63.61
-DR2- POT Sta. 10+00.00
PC Sta. 10+11.17
BRG. BACK = S 53° 12' 01.2" E

POT Sta. 11+92.16
BRG. BACK = N 78° 48' 04.3" E

END CONSTRUCTION -DR3- STA.11+25.00

PT Sta. 11+23.59

PC Sta. 10+85.44

-DR2- POC Sta. 10+24.63
-DR3- POT Sta. 10+00.00
BRG. AH = N 74° 25' 49.2" E

PT Sta. 10+79.49
BRG. AH = S 58° 38' 45.5" W

PC Sta. 11+40.06

PT Sta. 11+88.70

END CONSTRUCTION -DR2- Sta.11+90.00

POT Sta. 12+30.00
BRG.BK = S 2° 54' 58.8" W

BEGIN CONST. -L- STA.11+16.63

BEGIN APPROACH SLAB
-L- STA. 12+10.06

END BRIDGE
-L- STA. 13+51.00

SHARON A. GREIG
DB 829 PG 636
DB 717 PG 211

WILLIAM I. WILLIAMS, ET UX
DB 892 PG 800

LUTIE B. JENNETTE, et al
DB 760 PG 283
DB 1006 PG 450
DB 604 PG 166

BONNER B. ALLEN
DB 1441 PG 357
MB 23 PG 75

OREN M BENSON
TORRENS BK 11 PG 133

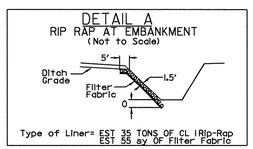
-BL- STA 14+26
93' RT
ELEV= 15.28

CLASS B RIP RAP
EST 1 TONS
EST 5 SY FF

CLASS II RIP RAP (STRUCTURE PAY ITEM)

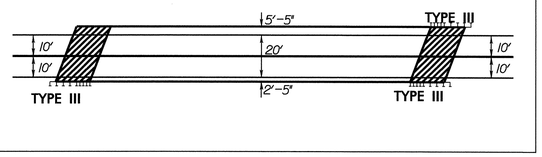
SBG: SHOULDER BERM GUTTER
BEGIN SBG STA 12+07 LT
END SBG BEGIN BRIDGE LT
BEGIN SBG STA 11+42 RT
END SBG BEGIN BRIDGE RT

DETAIL A
RIP RAP AT EMBANKMENT
(Not to Scale)




Type of Liner= EST 35 TONS OF CL I Rip-Rap
EST 55 sy OF Filter Fabric
FROM STA. 12+15 TO STA. 12+53 -L- RT
FROM STA. 13+20 TO STA. 13+62 -L- LT

SKETCH OF BRIDGE IN RELATIONSHIP TO PAVEMENT




NOTE: MAINTAIN 2' OF SHOULDER BEHIND M-350 ANCHOR UNIT.

NOTE: ALL DRIVEWAY RADII ARE 15 FT. UNLESS OTHERWISE LABELED.

FOR -L- PROFILE SEE SHEET 5
FOR -DR2- PROFILE SEE SHEET 5
FOR -DR3- PROFILE SEE SHEET 5
FOR -DR4- PROFILE SEE SHEET 5
FOR STRUCTURE SEE SHEETS S-1 TO S-27

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-4428 | 5 |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25477 ENGINEER THAD F. DUNCAN

2-17-10

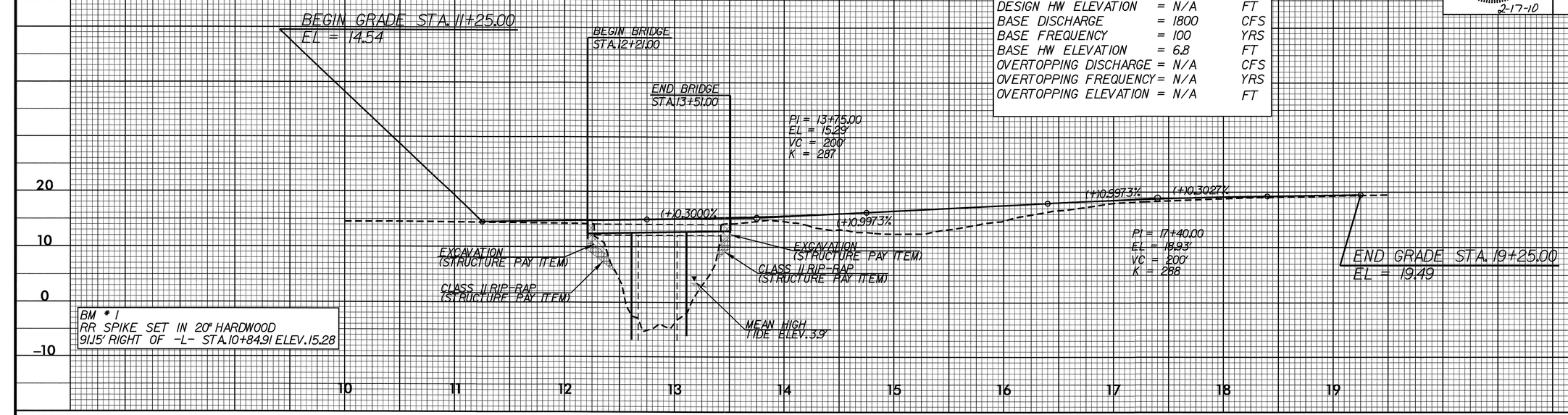
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022040 ENGINEER W. GALEN CARLSON

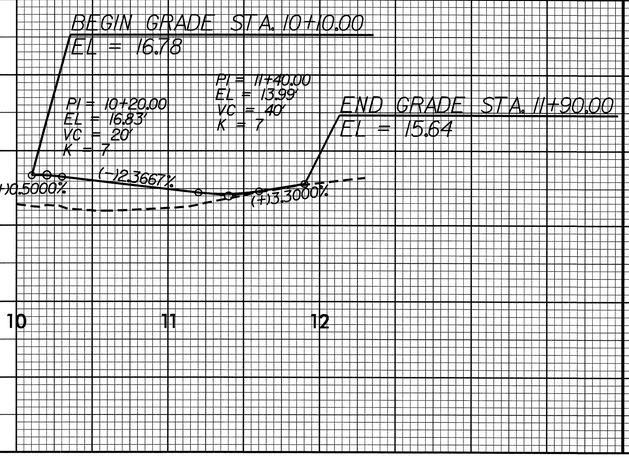
2-17-10

## STRUCTURE HYDRAULIC DATA

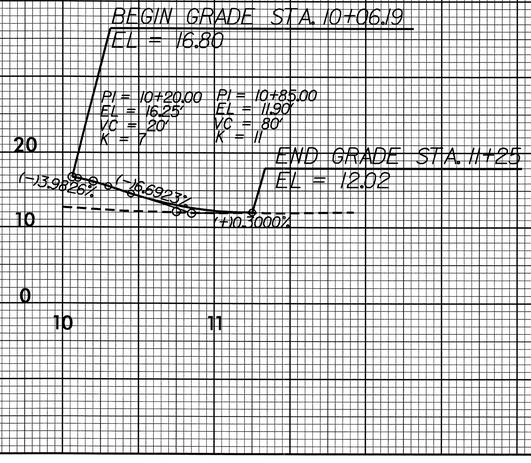
| | | |
|---|---|---|
| DESIGN DISCHARGE | = N/A | CFS |
| DESIGN FREQUENCY | = N/A | YRS |
| DESIGN HW ELEVATION | = N/A | FT |
| BASE DISCHARGE | = 1800 | CFS |
| BASE FREQUENCY | = 100 | YRS |
| BASE HW ELEVATION | = 6.8 | FT |
| OVERTOPPING DISCHARGE | = N/A | CFS |
| OVERTOPPING FREQUENCY | = N/A | YRS |
| OVERTOPPING ELEVATION | = N/A | FT |




# -DR2-




# -DR3-




# -DR4-