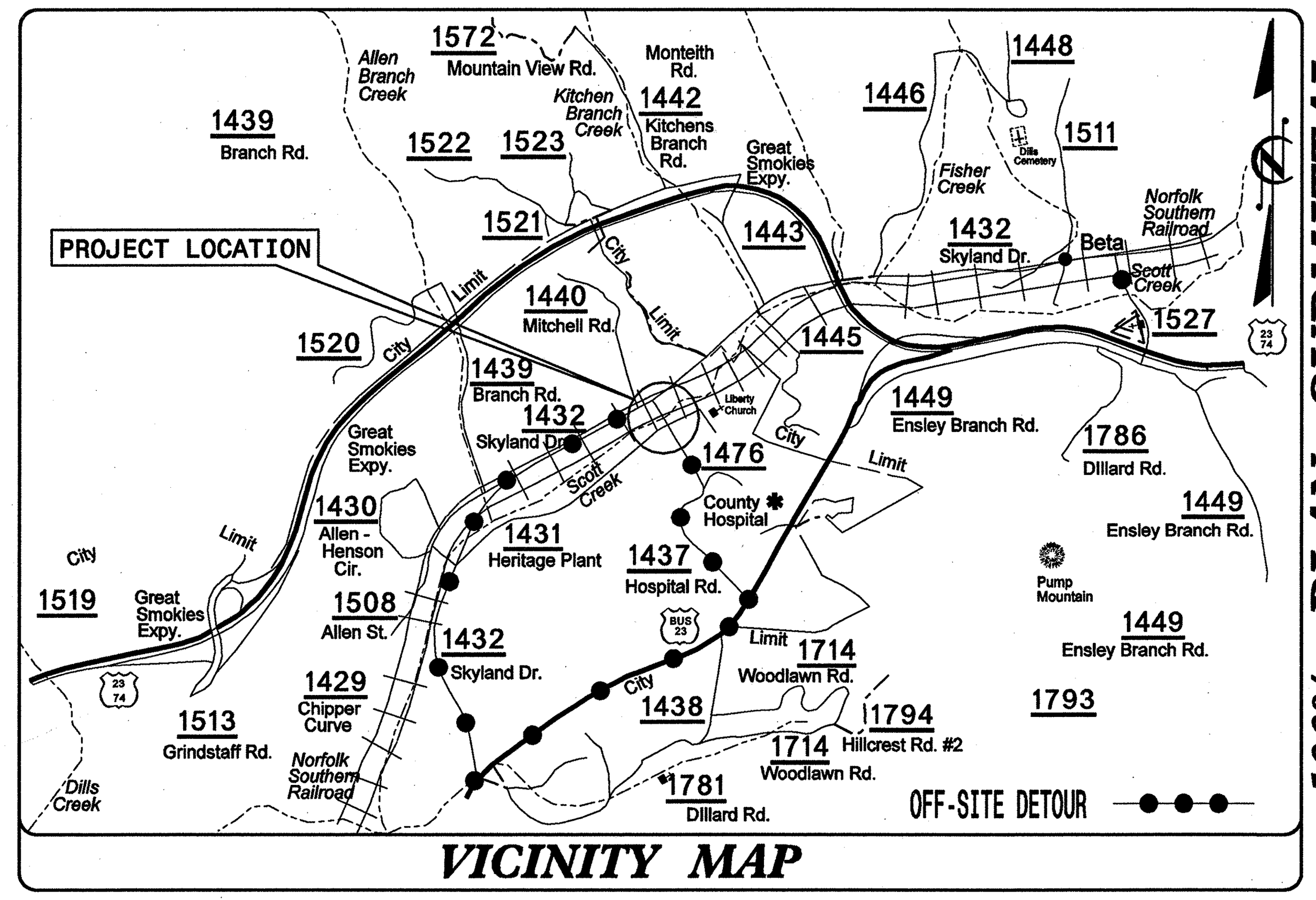
See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Plan Sheet Symbols



VICINITY MAP

100% PLAN SUBMITTAL

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

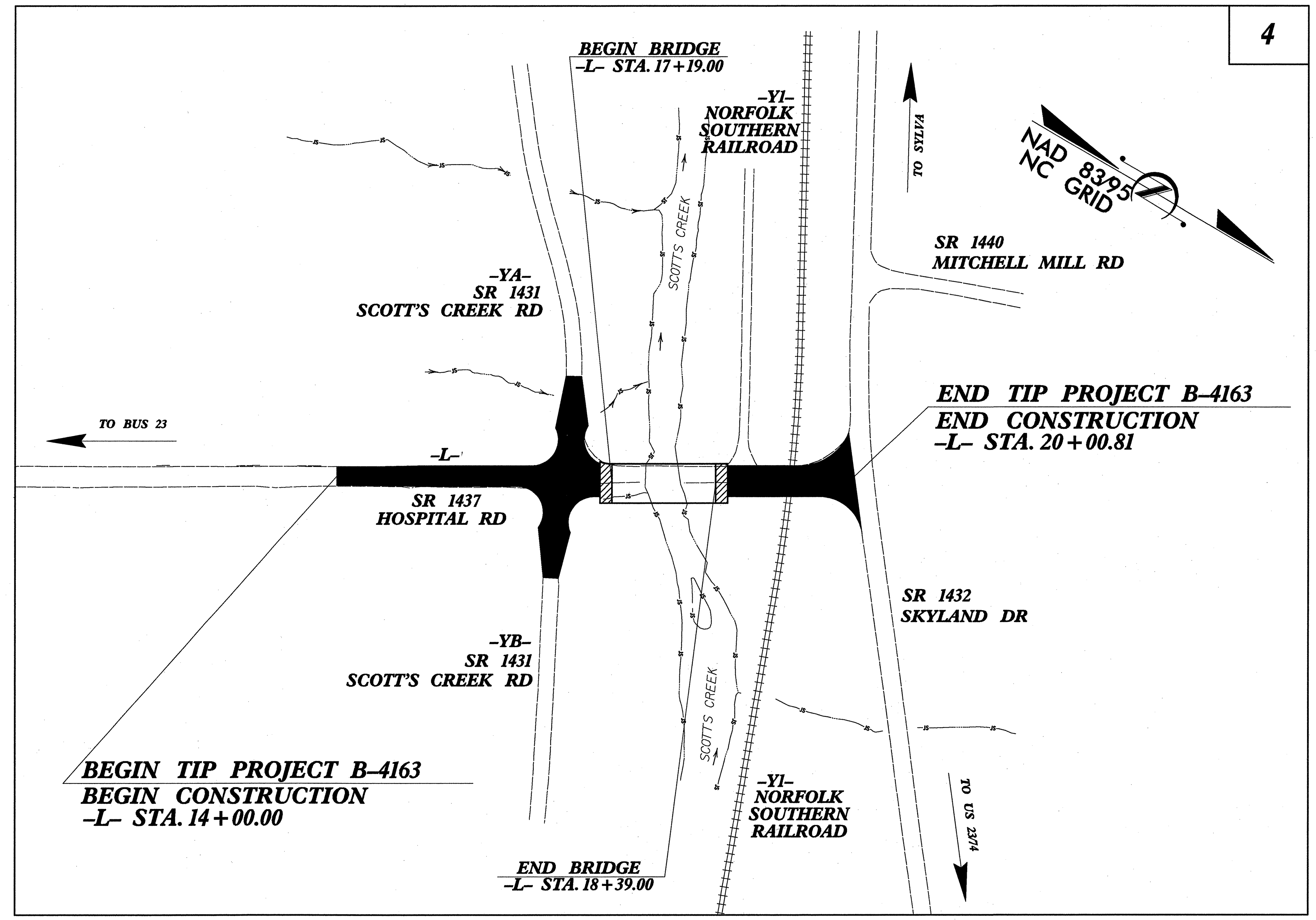
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4163	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
33511.1.1	BRZ-1437(3)	PE
33511.2.1	BRZ-1437(3)	R/W & UTIL.
33511.3.1	BRZ-1437(3)	CONST.

JACKSON COUNTY

LOCATION: BRIDGE NO. 123 OVER SCOTTS CREEK ON SR 1437 (HOSPITAL RD.)

TYPE OF WORK: GRADING, PAVING, DRAINAGE & STRUCTURE



SUNGATE DESIGN GROUP, P.A.
915 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 FAX (919) 859-6258

TIP PROJECT: B-4163

CONTRACT: C202090

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 2009 = 2830
ADT 2029 = 4045
DHV = 10 %
D = 60 %
T = 5 % *
V = 35 MPH
* TTST 2 DUAL 3
CLASS. – URBAN LOCAL SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4163	=	0.091 MILES
LENGTH STRUCTURE TIP PROJECT B-4163	=	0.023 MILES
TOTAL LENGTH TIP PROJECT B-4163	=	0.114 MILES

Prepared for the North Carolina Department Of Transportation In the Office of:

WETHERILL ENGINEERING
559 Jones Franklin Rd., Suite 164
Raleigh, N.C. 27606
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN
BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS -
CONSTRUCTION OBSERVATION

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
APRIL 1, 2008

LETTING DATE:
MARCH 16, 2010

EDWARD G. WETHERILL, PE
PROJECT ENGINEER

BOB A. MAY, PE
PROJECT DESIGN ENGINEER

NCDOT CONTACT — B. DOUG TAYLOR, PE
ENGINEERING COORDINATION SECTION ENGINEER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 09334 ENGINEER W. HENRY WELLS JR.
SIGNATURE: 12/17/09

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 21116 ENGINEER BOB A. MAY
SIGNATURE: 12/17/2009

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

3:38:26 PM
P:\B-4163\Roadway\Proj\B4163_Rdy_tsh.dgn
12/16/2009

09/08/99

8/17/99

GENERAL NOTES

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 II.

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.

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.03 AT LOCATIONS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.

STREET TURNOUT:

STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADII NOTED ON PLANS.

GUARDRAIL:

THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

SUBSURFACE PLANS:

NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

END BENTS:

THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS–SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE
Duke Energy
Verizon

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.

WHEELCHAIR RAMPS:

WHEELCHAIR RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS. THE CONSTRUCTION OF ALL WHEELCHAIR RAMPS SHALL BE IN ACCORDANCE WITH STD. NO. 848.06

11:23:54 AM
P:\B4163\Roadway\Proj\B4163_Rdy_tsh.dgn
12/7/2009

PROJECT REFERENCE NO.	SHEET NO.
B-4163	1-A

WETHERILL ENGINEERING
559 Jones Franklin Rd. Suite 164
Raleigh, N.C. 27606
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN – BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN – GIS/GPS – CONSTRUCTION OBSERVATION

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21116 ENGINEER BOB A. MAY

12/11/09

INDEX OF SHEETS

LIST OF ROADWAY STANDARDS

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	
200.02	Method of Clearing – Method II
225.02	Guide for Grading Subgrade – Secondary and Local
225.04	Method of Obtaining Superelevation – Two Lane Pavement
225.06	Method of Grading Sight Distance at Intersections
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
816.01	Concrete Pads – for Shoulder Drain Installation
838.18	Brick Endwall for Single Pipe Culverts – 40"x31" thru 66"x51" Pipe Arch
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin – 12" thru 54" Pipe
840.02	Concrete Catch Basin – 12" thru 54" Pipe
840.03	Frame, Grates and Hood – for Use on Standard Catch Basin
840.18	Concrete Grated Drop Inlet Type 'B' – 12" Thru 36"
840.24	Frames and Narrow Slot Sag Grates
840.27	Brick Grated Drop Inlet Type 'B' – 12" thru 36" Pipe
840.31	Concrete Junction Box – 12" thru 66" Pipe
840.32	Brick Junction Box – 12" thru 66" Pipe
840.34	Traffic Bearing Junction Box – for Use with Pipes 42" and Under
840.45	Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.03	Driveway Turnout – Drop Curb Type
848.04	Street Turnout
848.05	Wheelchair Ramp – Curb Cut
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets

3/15/06

PROJECT REFERENCE NO.	SHEET NO.
B-4163	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 — 23
- 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.

PROJECT REFERENCE NO.	SHEET NO.
B-4163	1-C
Location and Surveys	

SURVEY CONTROL SHEET B-4163

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	BL-1	622451.3590	747264.3770	2122.53	10+33.46	13.80 LT
2	BL-2	623029.8780	746960.7760	2090.97	16+86.04	17.84 RT
3	BL-3	623313.8940	746773.7890	2092.40	OUTSIDE PROJECT LIMITS	

BY

POINT	DESC.	NORTH	EAST	ELEVATION	YB STATION	OFFSET
4	BY-4	622808.4230	746667.4160	2096.10	OUTSIDE PROJECT LIMITS	
22	BL-2	623029.8780	746960.7760	2090.97	10+14.72	28.75 LT
5	BY-5	623163.1460	747315.2720	2094.16	OUTSIDE PROJECT LIMITS	

BY1

POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
6	BY1-6	623001.7130	746378.8620	2086.47	10+14.59	11.02 LT
7	BY1-7	623212.3770	746766.9180	2091.55	14+55.68	9.63 LT
8	BY1-8	623376.8620	747243.0650	2093.19	19+58.58	14.08 RT

BY2

POINT	DESC.	NORTH	EAST	ELEVATION	Y2 STATION	OFFSET
9	BY2-9	623038.1840	746362.1070	2086.11	10+19.88	18.33 RT
33	BL-3	623313.8940	746773.7890	2092.40	15+15.80	13.64 LT
10	BY2-10	623613.2240	747200.1550	2094.65	20+36.41	13.84 RT

BY3

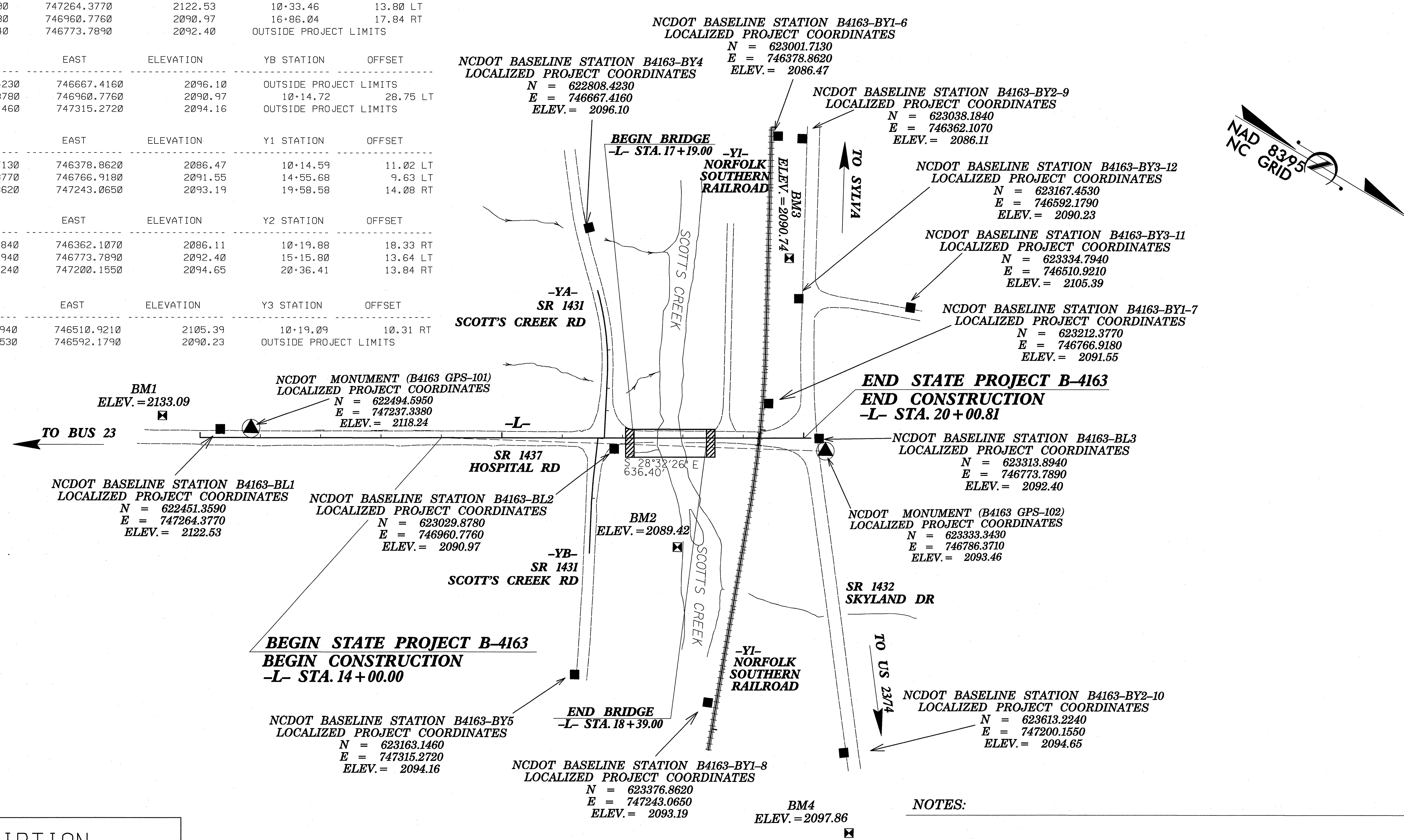
POINT	DESC.	NORTH	EAST	ELEVATION	Y3 STATION	OFFSET
11	BY3-11	623334.7940	746510.9210	2105.39	10+19.09	10.31 RT
12	BY3-12	623167.4530	746592.1790	2090.23	OUTSIDE PROJECT LIMITS	

BM1 ELEVATION = 2133.09
N 622358 E 747294
BL STATION 5+00
S 17° 32' 19.5' E DIST 98.22
6 INCH SPIKE SET IN ROOT OF 36 INCH DOUBLE LOCUST.

BM2 ELEVATION = 2089.42
N 623203 E 747048
BY STATION 10+10 131 LEFT
8 INCH SPIKE IN BASE OF 18 INCH MAPLE TREE.

BM3 ELEVATION = 2090.74
N 623120 E 746543
BY2 STATION 6+96 33 RIGHT
FROM BY3-12 GOING WEST 70'. 23' FROM EP. CHISLED SQUARE NW CORNER.

BM4 ELEVATION = 2097.86
N 623688 E 747310
BY2 STATION 15+16
N 55° 36' 36.8' E DIST 133.16
8 INCH SPIKE IN BASE OF POWER POLE.



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4163 GPS 102"
WITH NAD 83/95 STATE PLANE GRID COORDINATES OF
NORTHING: 623333.3440(ft) EASTING: 746786.3710(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 999774730
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS 102" TO -L- STATION 14+00.00 IS
S 28°32'26"E 636.40
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

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:
TIPB4163_LS_CONTROL_071114.TXT
TIPB4163_LS_1C_071114.DGN

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)

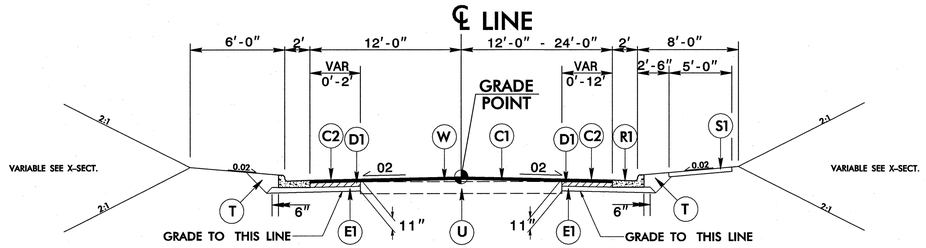
NOTE: DRAWING NOT TO SCALE

WETHERILL ENGINEERING
559 Jones Franklin Rd. Suite 164
Raleigh, N.C. 27606
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

PROJECT REFERENCE NO.	SHEET NO.
B-4163	2

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 21116 ENGINEER ROB A. MAY
2/19/09

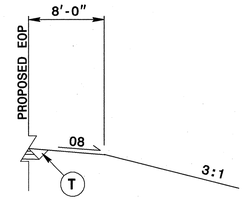
PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK S. MORRISON
12/18/09



TYPICAL SECTION NO. 1

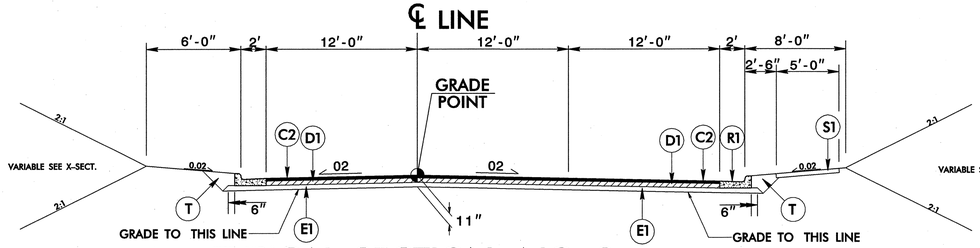
NOTE: TRANSITION FROM EXIST. PAVEMENT TO TYPICAL SECTION NO. 1
-L- STA. 14+00.00 TO -L- STA. 14+50.00

USE TYPICAL SECTION NO. 1
-L- STA. 14+50.00 TO 17+00.00
-L- STA. 18+89.00 TO 19+20.50
-L- STA. 19+38.50 TO 20+00.81



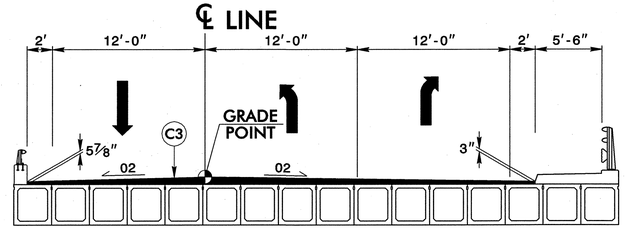
TYPICAL SECTION NO. 1A

USE TYPICAL NO. 1A IN CONJUCTION WITH TYPICAL NOS. 1 & 2
-L- STA. 19+14.44 TO -L- STA.20+00.81 LT.
-L- STA. 19+10.48 TO -L- STA. 20+00.81 RT.



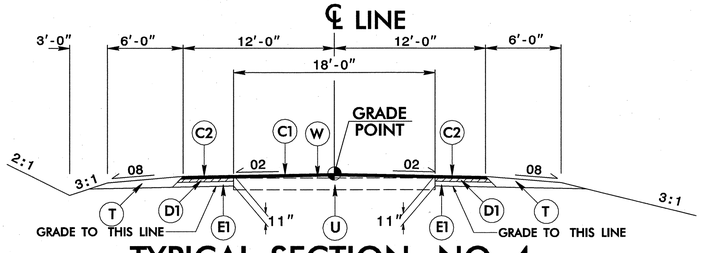
TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2
-L- STA. 17+00.00 TO 17+19.00 (BEGIN BRIDGE)
-L- STA. 18+39.00 (END BRIDGE) TO 18+89.00
-L- STA. 19+20.50 TO 19+38.50



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3
-L- STA. 17+19.00 TO 18+39.00



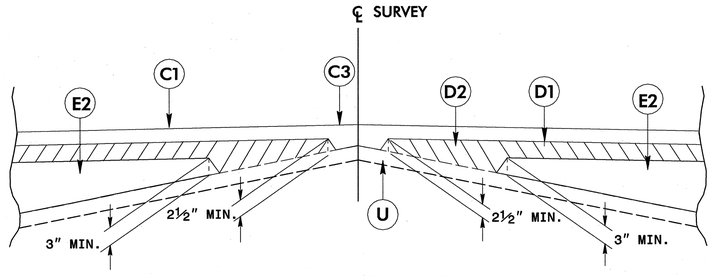
TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4
-YA- STA. 12+32.78 TO 11+29.61
-YB- STA. 10+24.15 TO 11+18.66

PAVEMENT SCHEDULE

C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 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. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" 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.
R1	2'-6" CONCRETE CURB AND GUTTER.
S1	4" CONCRETE SIDEWALK.
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.

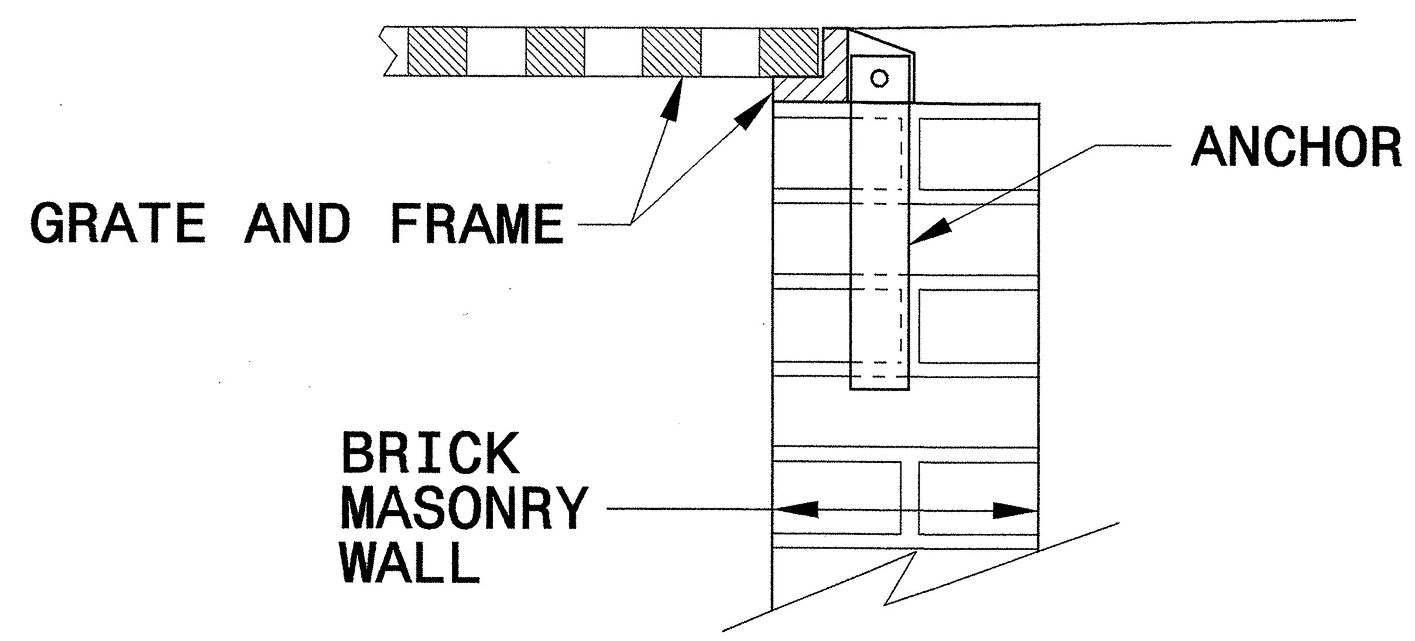


Detail Showing Method of Wedging

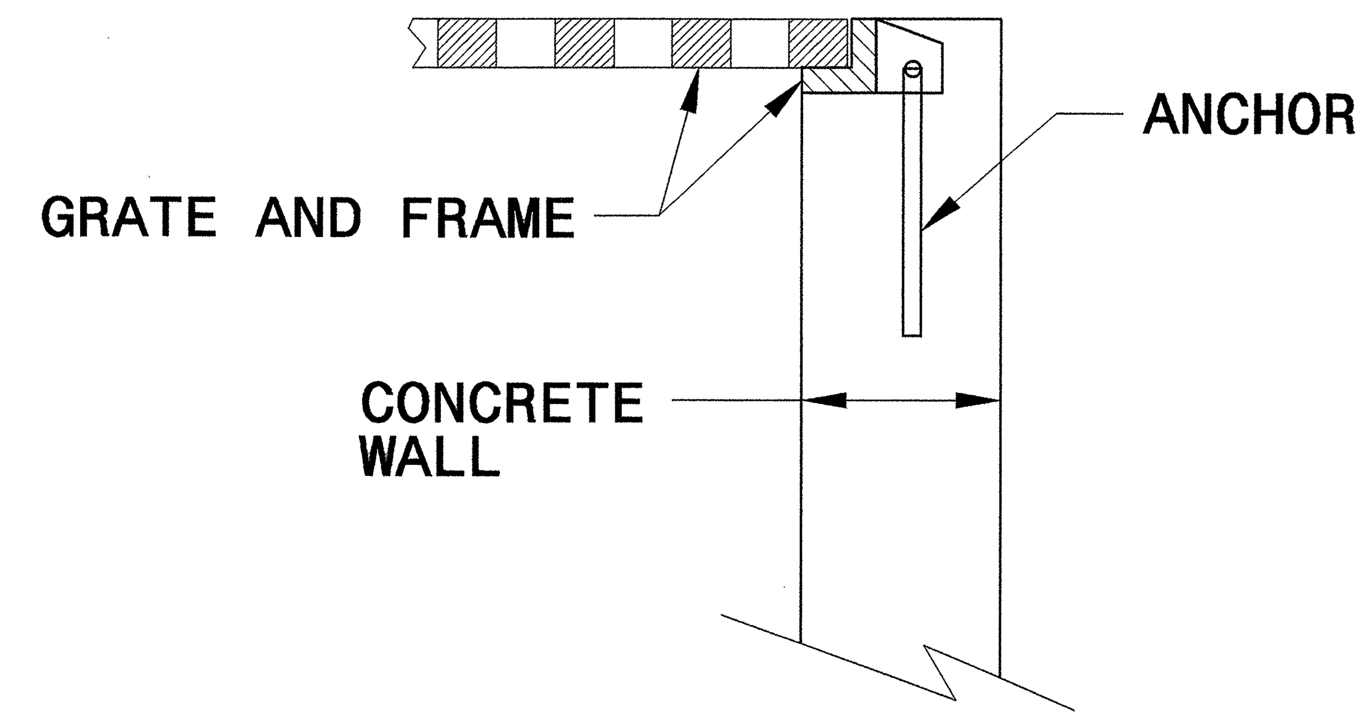
PROJECT REFERENCE NO.	SHEET NO.
B-4163	2-A

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

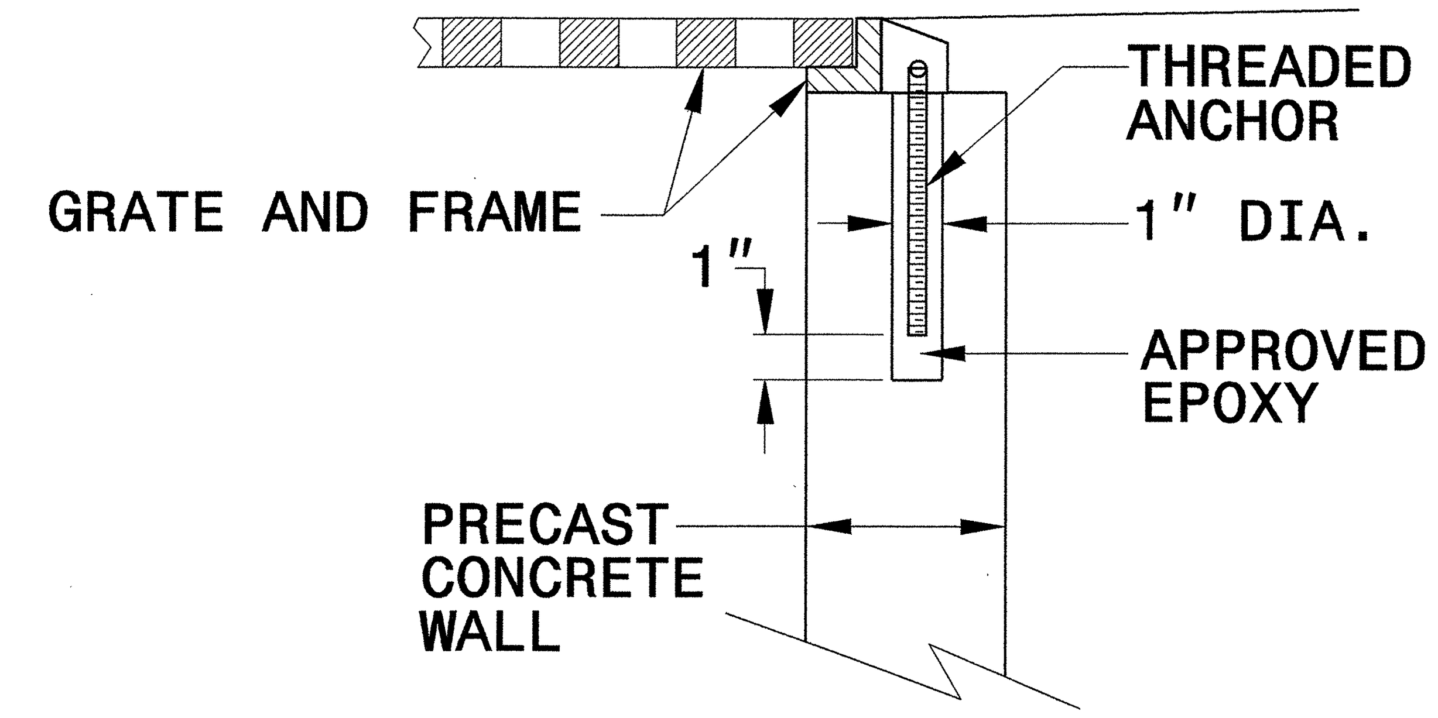
ENGLISH DETAIL DRAWING FOR
ANCHORAGE FOR FRAMES
BRICK/CONCRETE/PRECAST CONCRETE



BRICK MASONRY CONSTRUCTION



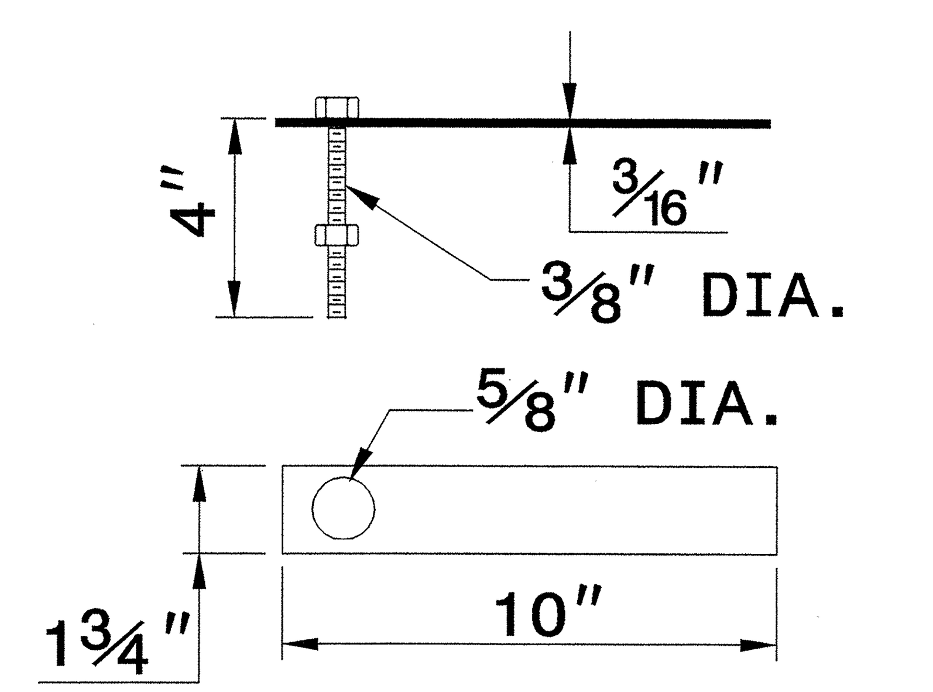
CONCRETE CONSTRUCTION



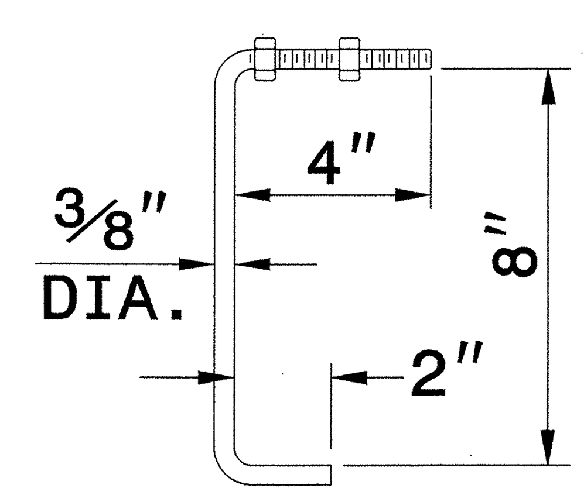
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

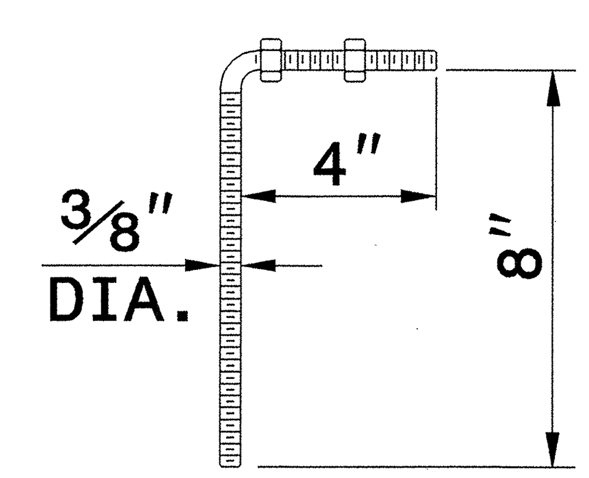
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



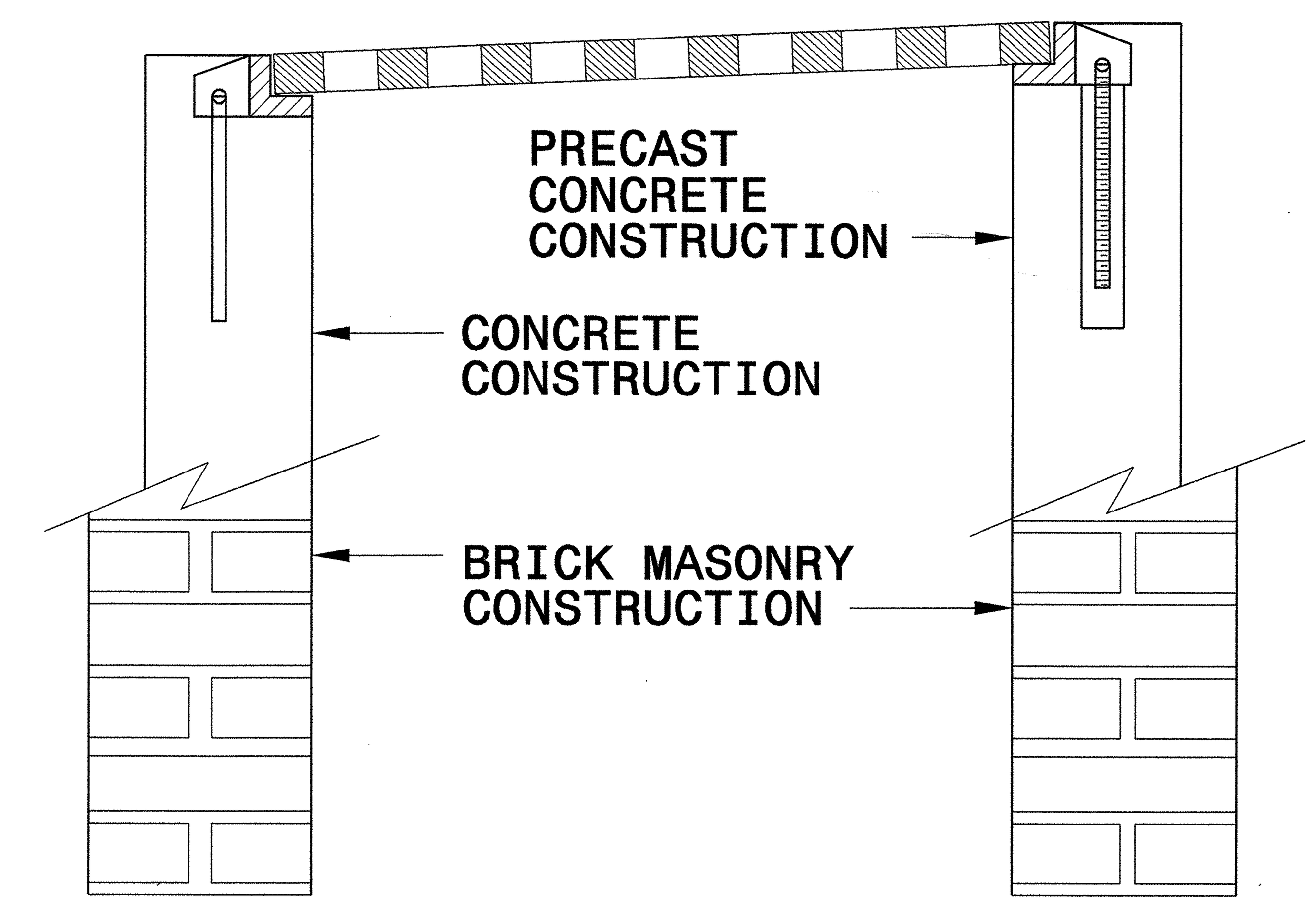
MASONRY ANCHOR
3⁄8" DIA. BOLT WITH PLATE



CONCRETE ANCHOR
3⁄8" DIA. BENT BAR



PRECAST CONCRETE ANCHOR
3⁄8" DIA. BENT BAR



FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS

SHEET 1 OF 1
840D25

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

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

SHEET 1 OF 1
840D25

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL B. HOWERTON 12/22/07

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: F.E. WARD DATE: 9/25/06
CHECKED BY: [signature] DATE: 11/1/06
FILE SPEC.:

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

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4163	2-B

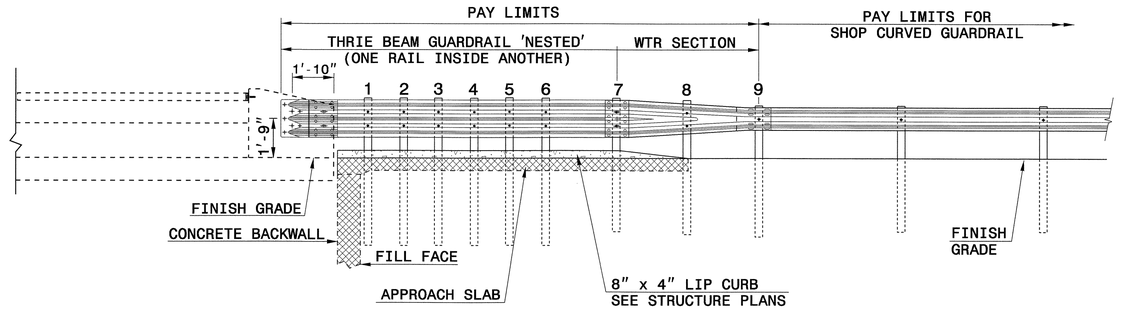
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR

TYPE III - SHOP CURVED STRUCTURE ANCHOR UNIT

SHEET 1 OF 1

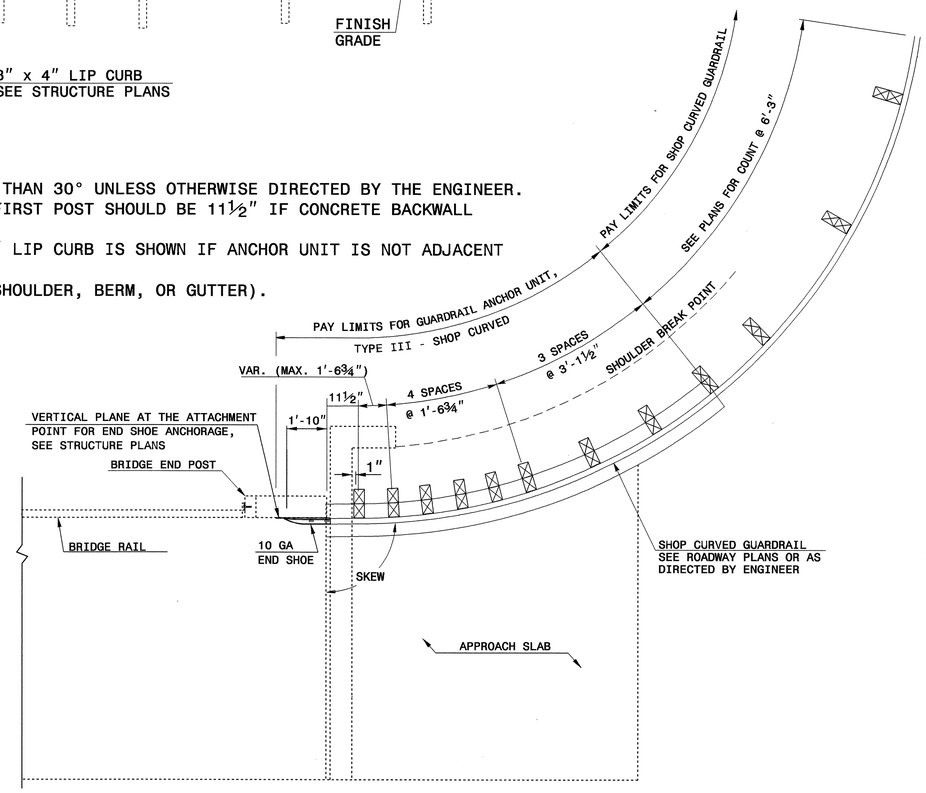
TYPE III SC



ELEVATION

SEE ROADWAY PLANS FOR END TREATMENT

NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-USE NO STEEL POSTS WITHIN THE GUARDRAIL ANCHOR UNIT LIMITS.
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE STANDARD 862.03 SHEET 4 FOR POST SECTIONS 1 THRU 9.



PLAN VIEW

GUARDRAIL ANCHOR UNIT, TYPE III - SHOP CURVED FOR ATTACHMENT TO RAIL ON BRIDGE

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

ENGLISH DETAIL DRAWING FOR

TYPE III - SHOP CURVED STRUCTURE ANCHOR UNIT

SHEET 1 OF 1

TYPE III SC

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOHN S. HOWINGTON
12/22/09

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

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ORIGINAL BY: E.E. WARD DATE: 4-4-02
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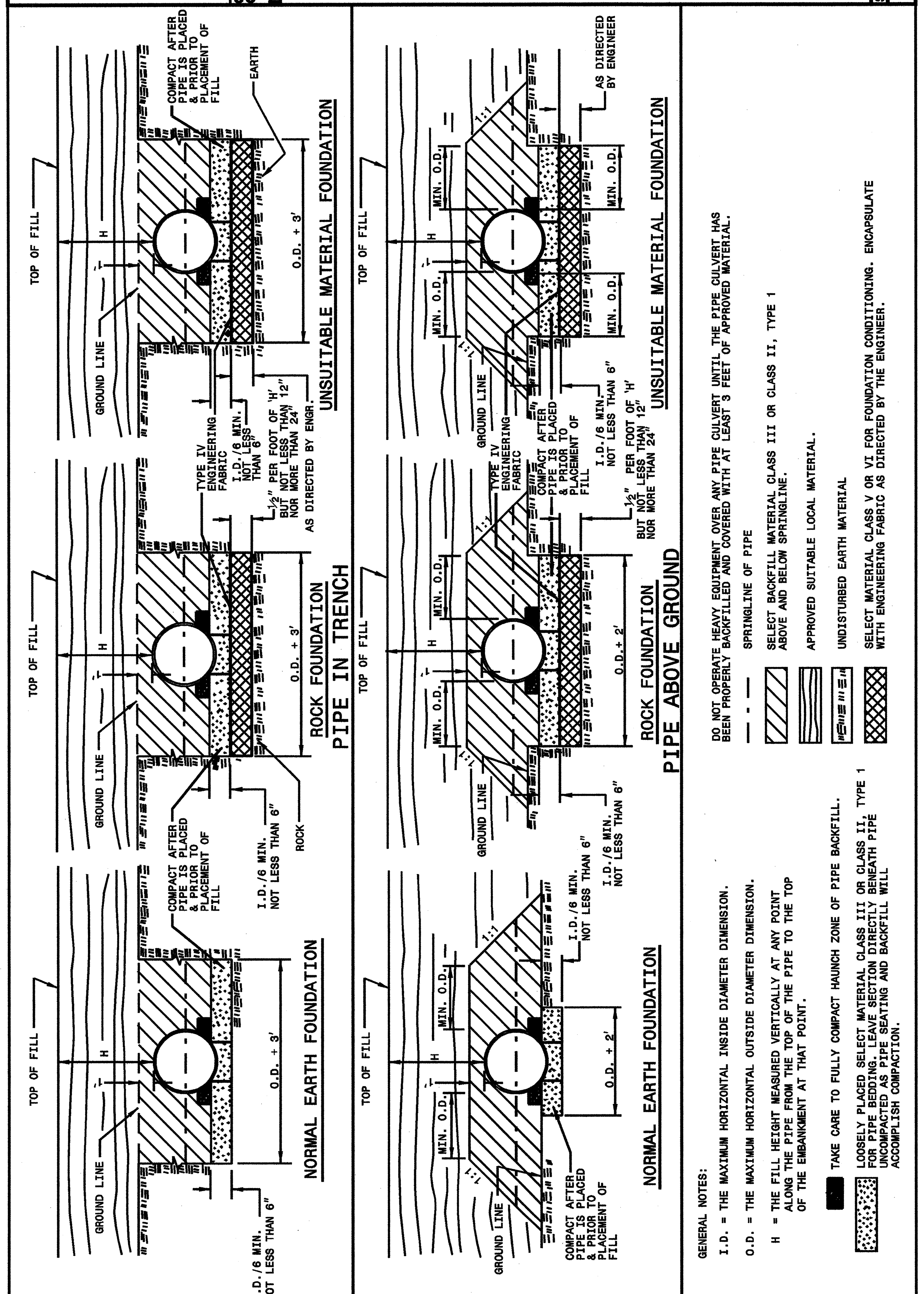
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-4163	2-C

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. 7-06
ENGLISH DETAIL DRAWING FOR METHOD OF PIPE INSTALLATION
FLEXIBLE PIPE
SHEET 1 OF 3 300D01

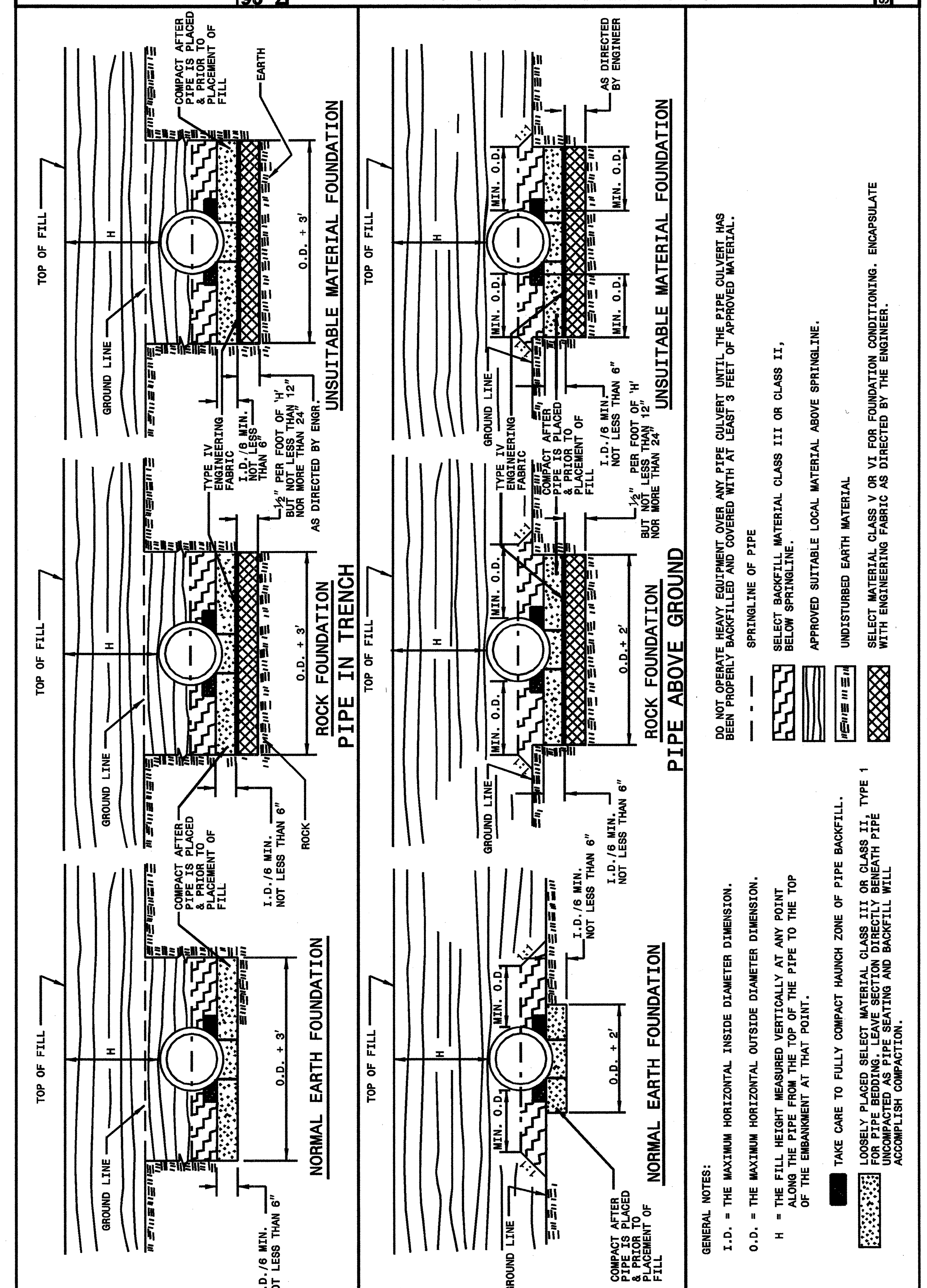

NORMAL EARTH FOUNDATION
ROCK FOUNDATION
PIPE IN TRENCH
UNSUITABLE MATERIAL FOUNDATION
NORMAL EARTH FOUNDATION
ROCK FOUNDATION
PIPE ABOVE GROUND
UNSUITABLE MATERIAL FOUNDATION
TOP OF FILL
GROUND LINE
COMPACT AFTER PIPE IS PLACED & PRIOR TO PLACEMENT OF FILL
I.D./6 MIN. NOT LESS THAN 6"
O.D. + 3'
O.D.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

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


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'
MIN. O.D.
ROCK
EARTH
TYPE IV ENGINEERING FABRIC
1/2" PER FOOT OF 'H' BUT NOT LESS THAN 12" NOR MORE THAN 24"
AS DIRECTED BY ENGR.
AS DIRECTED BY ENGINEER
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.

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

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 JOEL S. HOWERTON
12/22/09

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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FILE SPEC: c:/ericward/stds/stdstodetails/300D1/0300d01.dgn

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jhowerton AT PS237301

5/14/99

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jhowerton AT PS237501

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4163	2-D

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

7-06
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
FILL HEIGHT TABLES

SHEET 3 OF 3
300D01

7-06
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
FILL HEIGHT TABLES

SHEET 3 OF 3
300D01

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON
12/22/09

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

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ORIGINAL BY: KKempf DATE: 5-15-09
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PROJECT REFERENCE NO.	SHEET NO.
B-4163	3

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202090

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ********** (17+79.00)
0038000000-E	SP	70	CY	SHALLOW UNDERCUT
0043000000-N	226	Lump Sum		GRADING
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING
0057000000-E	226	100	CY	UNDERCUT EXCAVATION
0080000000-E	SP	125	TON	CLASS IV SUBGRADE STABILIZATION
0134000000-E	240	120	CY	DRAINAGE DITCH EXCAVATION
0195000000-E	265	100	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	100	SY	FABRIC FOR SOIL STABILIZATION
0320000000-E	SP	145	SY	FOUNDATION CONDITIONING FABRIC
0330000000-E	SP	46	TON	GENERIC DRAINAGE ITEM FOUNDATION CONDITIONING MATERIAL, MINOR STRS
0335300000-E	SP	200	LF	18" DRAINAGE PIPE
0335600000-E	SP	112	LF	36" DRAINAGE PIPE
0448200000-E	SP	112	LF	15" RC PIPE CULVERTS, CLASS IV
0995000000-E	340	222	LF	PIPE REMOVAL
1220000000-E	545	20	TON	INCIDENTAL STONE BASE
1489000000-E	610	220	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1498000000-E	610	270	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
1525000000-E	610	580	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	21	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
2022000000-E	815	25	CY	SUBDRAIN EXCAVATION
2033000000-E	815	20	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)
2190000000-N	828	6	EA	TEMPORARY STEEL PLATE COVERS FOR MASONRY DRAINAGE STRUCTURE
2286000000-N	840	7	EA	MASONRY DRAINAGE STRUCTURES
2308000000-E	840	5	LF	MASONRY DRAINAGE STRUCTURES
2366000000-N	840	2	EA	FRAME WITH TWO GRATES, STD 840.24
2374000000-N	840	2	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)
2374000000-N	840	1	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)
2374000000-N	840	1	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)
2396000000-N	840	1	EA	FRAME WITH COVER, STD 840.54
2549000000-E	846	645	LF	2'-6" CONCRETE CURB & GUTTER
2591000000-E	848	170	SY	4" CONCRETE SIDEWALK
2605000000-N	848	4	EA	CONCRETE WHEELCHAIR RAMPS
2612000000-E	848	60	SY	6" CONCRETE DRIVEWAY
2845000000-N	858	10	EA	ADJUSTMENT OF METER BOXES OR VALVE BOXES
2860000000-N	859	1	EA	CONVERT EXISTING CATCH BASIN TO JUNCTION BOX
2893000000-N	SP	1	EA	CONVERT EXISTING CATCH BASIN TO JUNCTION BOX WITH MANHOLE COVER
3045000000-E	862	62.5	LF	STEEL BM GUARDRAIL, SHOP CURVED
3150000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS
3180000000-N	862	2	EA	GUARDRAIL ANCHOR UNITS, TYPE ********** (III, SHOP CURVED)
3195000000-N	862	2	EA	GUARDRAIL ANCHOR UNITS, TYPE AT-1
3628000000-E	876	60	TON	RIP RAP, CLASS I
3649000000-E	876	4	TON	RIP RAP, CLASS B
3656000000-E	876	930	SY	FILTER FABRIC FOR DRAINAGE
4025000000-E	901	1.5	SF	CONTRACTOR FURNISHED, TYPE *** SIGN (E)
4102000000-N	904	1	EA	SIGN ERECTION, TYPE E
4400000000-E	1110	396	SF	WORK ZONE SIGNS (STATIONARY)
4405000000-E	1110	192	SF	WORK ZONE SIGNS (PORTABLE)
4410000000-E	1110	154	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4430000000-N	1130	34	EA	DRUMS
4435000000-N	1135	34	EA	CONES
4445000000-E	1145	160	LF	BARRICADES (TYPE III)
4450000000-N	1150	3,840	HR	FLAGGER
4516000000-N	1180	48	EA	SKINNY DRUM
4810000000-E	1205	8,096	LF	PAINT PAVEMENT MARKING LINES (4")
4830000000-E	1205	540	LF	PAINT PAVEMENT MARKING LINES (16")
4835000000-E	1205	640	LF	PAINT PAVEMENT MARKING LINES (24")
4840000000-N	1205	24	EA	PAINT PAVEMENT MARKING CHARACTER
4845000000-N	1205	16	EA	PAINT PAVEMENT MARKING SYMBOL
5540000000-E	1515	1	EA	6" VALVE
5546000000-E	1515	2	EA	8" VALVE
5648000000-N	1515	2	EA	RELOCATE WATER METER
5672000000-N	1515	1	EA	RELOCATE FIRE HYDRANT
5801000000-E	1530	191	LF	ABANDON 8" UTILITY PIPE
5882000000-N	SP	2	EA	GENERIC UTILITY ITEM STEEL H PILE PIERS
5888000000-E	SP	60	LF	GENERIC UTILITY ITEM 8" DUCTILE IRON RIGID RESTRAINED JOINT WATER PIPE
5889000000-E	1510	98	LF	GENERIC UTILITY ITEM 6" WATER LINE RESTRAINED JOINT DUCTILE IRON
5889000000-E	1510	184	LF	GENERIC UTILITY ITEM 8" WATER LINE RESTRAINED JOINT DUCTILE IRON
5889000000-E	1510	81	LF	GENERIC UTILITY ITEM 8" WATER LINE RESTRAINED JOINT DUCTILE IRON CLASS 56
6000000000-E	1605	1,500	LF	TEMPORARY SILT FENCE
6006000000-E	1610	200	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	150	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	225	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	1	ACR	TEMPORARY MULCHING
6018000000-E	1620	50	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	1.25	TON	FERTILIZER FOR TEMPORARY SEEDING
6029000000-E	SP	750	LF	SAFETY FENCE
6030000000-E	1630	355	CY	SILT EXCAVATION
6036000000-E	1631	925	SY	MATTING FOR EROSION CONTROL
6037000000-E	SP	10	SY	COIR FIBER MAT
6042000000-E	1632	260	LF	1/4" HARDWARE CLOTH
6070000000-N	SP	6	EA	SPECIAL STILLING BASINS
6071010000-E	SP	40	LF	WATTLE
6071020000-E	SP	12	LB	POLYACRYLAMIDE (PAM)
6071030000-E	SP	60	LF	COIR FIBER BAFFLES
6071050000-E	SP	1	EA	**" SKIMMER (1-1/2")
6084000000-E	1660	5	ACR	SEEDING & MULCHING
6087000000-E	1660	0.5	ACR	MOWING
6090000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	50	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	0.5	TON	FERTILIZER TOPDRESSING
6114500000-N	SP	5	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	12	EA	RESPONSE FOR EROSION CONTROL

6/21/00

COMPUTED BY: BAM	DATE: 03/05/2008
CHECKED BY: abp	DATE: 10/13/2008

SUMMARY OF EARTHWORK
IN CUBIC YARDS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-4163	3-A

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
SUMMARY 1					
-L- 14+50.00 TO 17+19.00 (BEGIN BRIDGE)	63		242	179	
-YA- 13+66.79 TO 14+69.96	15		77	62	
-YB- 10+12.08 TO 11+18.66	151		8		143
SUBTOTAL SUMARY 1	229		327	241	143
SUMMARY 2					
-L- 18+39.00 (END BRIDGE) TO 20+00.81	31		160	129	
SUBTOTAL SUMMARY 2	31		160	129	
PROJECT SUBTOTAL	260		487	370	143
WASTE IN LIEU OF BORROW				(-) 143	(-) 143
5% TO REPLACE TOPSOIL ON BORROW PIT				11	
PROJECT TOTAL	260		639	238	0
SAY	300			300	
CONTINGENCY UNDERCUT = 100 CY					

NOTE: EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

NOTE: APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, BORROW EXCAVATION, SHOULDER BORROW, FINE GRADING, CLEARING & GRUBBING, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "GRADING".

PAVEMENT REMOVAL SUMMARY
IN SQUARE YARDS

LOCATION	REMOVAL OF EXIST. ASPHALT PAVEMENT	BREAKING OF EXIST. ASPHALT PAVEMENT
-L- STA. 17+00.00 TO EX. BRIDGE	120.30	
EX. BRIDGE TO -L- STA. 18+89.00	181.81	
PROJECT SUBTOTAL	302.11	
SAY	350.00	

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

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	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"
-L- 14+38.00	LT	1		2093.9											
		1	2		2091.1	2090.0									
-L- 14+50.00	RT	2		2093.9											
-L- 14+86.00	RT	3													
-L- 15+92.00	LT	4		2091.6											
		4	5		2088.6	2088.4									
-L- 15+92.00	RT	5		2091.6											
-L- 16+38.56	RT	6		2092.1											
		7	6		2089.1	2085.4				92'					
-L- 17+00.00	LT	8		2092.5											
		8	9		2089.5	2089.0									
-L- 17+00.00	RT	9		2092.2											
		6	9		2085.1	2084.5							64'		
		9	10		2084.5	2084.2							36'		
-YA- 11+64.76		11	12		2084.2	2083.6				60'					
		12	13		2083.6	2082.1				16'					
TOTAL										168'			100'		
SAY										200'			112'		

STATION	STRUCTURE NO. FROM	TO	C.S. PIPE (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	24"	30" .079	30"	36" .079	36"	42" .109	42"	48" .109	48"	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 15"	15" CLASS IV	18"	24"	30"	36"	42"	48"	** " CONTRACTOR DESIGN PIPE	** " CONTRACTOR DESIGN PIPE	** " CONTRACTOR DESIGN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.
-L- 14+38.00	1																											
	1	2															32'											
-L- 14+50.00	2																											
-L- 14+86.00	3																											
-L- 15+92.00	4																											
	4	5															28'											
-L- 15+92.00	5																											
-L- 16+38.56	6																											
	7	6																										
-L- 17+00.00	8																											
	8	9															44'											
-L- 17+00.00	9																											
	6	9																										
	9	10																										
-YA- 11+64.76	11	12																										
	12	13																										
TOTAL																	104'											
SAY																	112'											

STATION	STRUCTURE NO. FROM	TO	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 TRANSITIOANL SECTION DROP INLET	CATCH BASIN	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. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	CONV. EXIST. CB TO T.B.J.B.	M.H. FRAME & COVER STD. 840.54	CONV. EXIST. CB TO T.B.J.B. W/MH	DO NOT USE PVC	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	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- 14+38.00	1		1													1		1																
	1	2																																
-L- 14+50.00	2		1													1		1																
-L- 14+86.00	3																			1													30'	REMOVE CB
-L- 15+92.00	4		1			1	1																											
	4	5																																
-L- 15+92.00	5		1			1	1																											
-L- 16+38.56	6			1.7																	1	1											28'	REMOVE CB
	7	6																															82'	
-L- 17+00.00	8		1			1		1																										
	8	9																																
-L- 17+00.00	9		1	2.7		1			1																									
	6	9																															70'	
	9	10																																
-YA- 11+64.76	11	12	1																1															
	12	13																																
TOTAL			7	4.4		4	2	1	1							2		2	1	1	1	1											210'	
SAY				5.0																													222'	

ABBREVIATIONS

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

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	SHOP CURVED	DOUBLE FACED	WARRANT POINT APPROACH END	TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	TRAILING END	W APPROACH END	TRAILING END	ANCHORS XI MOD	XI	GRAU 350	TEST LEVEL 2	TYPE III	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-	16+93.10	17+19.00	LT		62.50'		17+19.00		2'	6'									1				1							SEE DETAIL FOR SHOP CURVED TYPE III ANCHOR UNIT
-L-	18+39.00	18+56.94	LT		50.00'		18+39.00		2'	6'									1				1							SEE DETAIL FOR SHOP CURVED TYPE III ANCHOR UNIT
TOTAL					112.50'														2				2							
			LESS ANCHORS		(-) 50.00'																									
GRAND TOTAL					62.50'																									
SAY					62.50'																									

DEDUCTIONS FOR ANCHOR UNITS 2 TYPE III @ 18.75' = 37.50'
2 AT-1 @ 6.25' = 12.50'
= 50.00'

ADDITIONAL GUARDRAIL POSTS = 5 EA.

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12/16/2009

PROJECT REFERENCE NO.	SHEET NO.
B-4163	4

R/W SHEET NO.

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21116 BOB A. MAY 12/17/09

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 09334 W. HENRY WELLS, JR. 12/17/09

WETHERILL ENGINEERING
559 Jones Franklin Rd. Suite 164
Raleigh, N.C. 27606
Bus: 919 851 8077
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

SUNGATE DESIGN GROUP, P.A.
915 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 FAX (919) 859-6258

5/14/99

-YI-

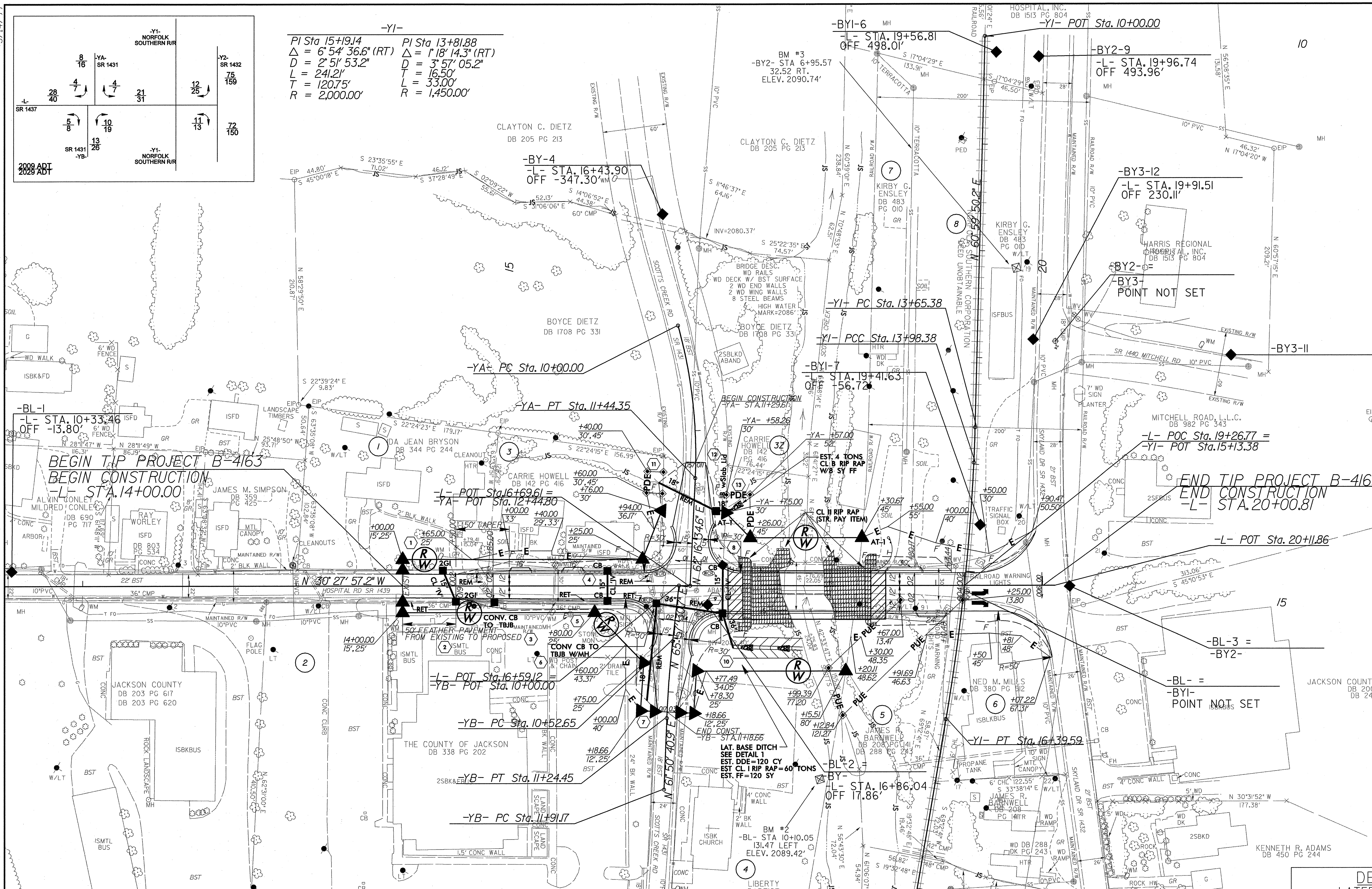
PI Sta 15+19.14	PI Sta 13+81.88
Δ = 6° 54' 36.6" (RT)	Δ = 1° 18' 14.3" (RT)
D = 2° 51' 53.2"	D = 3° 57' 05.2"
L = 241.21'	L = 16.50'
T = 120.75'	T = 33.00'
R = 2,000.00'	R = 1,450.00'

-YA-

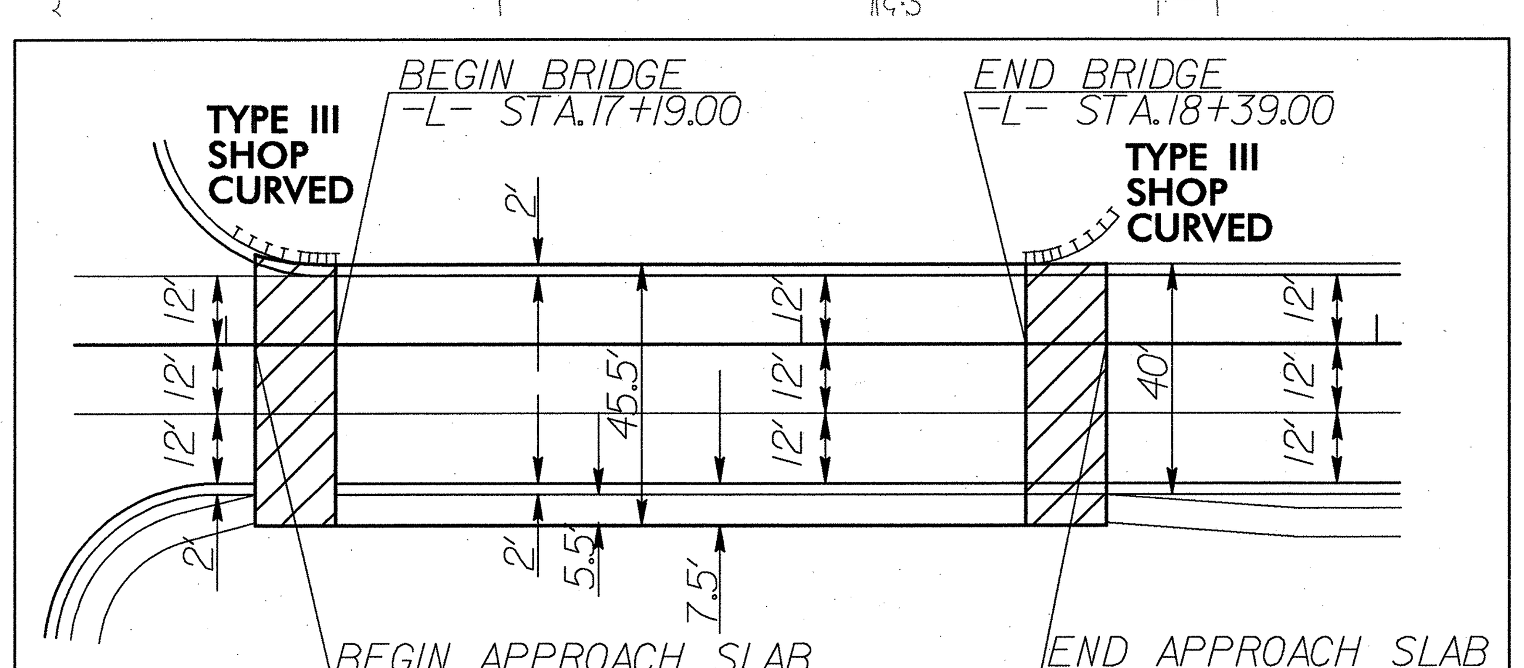
PI Sta 10+72.80
Δ = 18° 22' 44.0" (RT)
D = 12° 43' 56.6"
L = 144.35'
T = 72.80'
R = 450.00'

-YB-

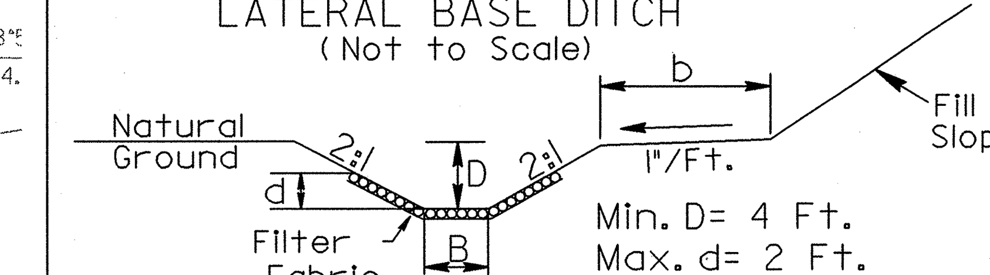
PI Sta 10+88.56
Δ = 4° 06' 49.6" (LT)
D = 5° 43' 46.5"
L = 71.80'
T = 35.92'
R = 1,000.00'



SKETCH SHOWING BRIDGE/PAVEMENT RELATIONSHIP



DETAIL #1
LATERAL BASE DITCH
(Not to Scale)



Min. D= 4 Ft.
Max. d= 2 Ft.
B= 3 Ft.
b= 5 Ft.

*When B is < 6.0'

Type of Liner= CL 'I' Rip-Rap

FROM STA. 17+10 TO STA. 17+75 RT.

SEE SHEET S-1 THRU S-__ FOR STRUCTURE PLANS

SEE SHEET 5 FOR PROFILES

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PROJECT REFERENCE NO.	SHEET NO.
B-4163	5

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21116 ENGINEER BOB A MAY

12/17/09

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 09334 ENGINEER W. HENRY WELLS JR.

12/17/09

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BM #2 N 623203.0740 E 747047.8840
EL = 2089.42'
8" SPIKE IN BASE OF 18" MAPLE TREE
-L- STA.17+91.16 OFF 180.739'

BM #3 N 623119.9910 E 746542.7000
EL = 2090.74'
CHISELED SQUARE NW CORNER OF SIDEWALK
-L- STA.19+75.69 OFF 296.8200' LEFT

-L-

BEGIN GRADE
-L- STA.14+50.00
EL = 2094.22

CL STA 17+79 -L-
1@75', 1@45' BOX BEAM (83") (120' OAL)
SKEW = 90

BEGIN BRIDGE
-L- STA.17+19.00

END BRIDGE
-L- STA.18+39.00

END GRADE
-L- STA.20+00.81
EOP -Y2- STA.15+12.57 OFF 11'
EL = 2092.80'

PI = 19+26.77
EL = 2,093.05'
VC = 10'
K = 7
V = <15

-L- STA.20+11.86
-Y2- STA.15+13.69
EL = 2092.86'

PI = 15+50.00
EL = 2,091.30'
VC = 200'
K = 49
V = 35

PI = 17+00.00
EL = 2,093.10'
VC = 60'
K = 68
V = 40

PI = 18+75.00
EL = 2,093.65'
VC = 40'
K = 27
V = 30

(-)13.1913%
(-)2.9200%
(+) 2000%
(+)10.3143%
(-)1.1590%
(+)10.2743%
(-)10.7778%
(+)10.4625%

50' FEATHER PAVEMENT FROM EXISTING TO PROPOSED

-YA- STA.12+44.80
-L- STA.16+69.61
EL = 2092.74'

-YB- STA.10+00.00
-L- STA.16+59.12
EL = 2092.61'

EX. BRIDGE (REMOVE)

(-)1.23%

3.5' MIN

PI = 19+45.00
EL = 2,093.10'
VC = 20'
K = 19
V = 30

PI = 19+90.00
EL = 2,092.75'
VC = 20'
K = 16
V = 15

BEGIN DITCH GRADE RT.
-L- STA.17+10.00
EL = 2,084.20

CL 'II' RIP RAP TO TOP OF BERM 1.5:1 NORMAL AND SKEW (STR. PAY ITEM)

CONSTRUCT BANK UNDER EXISTING BRIDGE W/2:1 SLOPES AND CL 'II' RIP RAP (STR. PAY ITEM)

CL 'II' RIP RAP TO TOP OF BERM 1.5:1 NORMAL AND SKEW (STR. PAY ITEM)

CONSTRUCT BANK UNDER EXISTING BRIDGE W/2:1 SLOPES AND CL 'II' RIP RAP (STR. PAY ITEM)

END DITCH GRADE RT.
-L- STA.17+75.00
EL = 2,083.40

NWSE AND WSWE ON 5-31-07 = 2080.1

SEE SHEET 4 FOR PLAN VIEW

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 3400	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 2089.9	FT
BASE DISCHARGE	= 4500	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 2090.7	FT
OVERTOPPING DISCHARGE	= 6100	CFS
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING ELEVATION	= 2092.4	FT
DATE OF SURVEY	= 5-31-07	
W.S. ELEVATION AT DATE OF SURVEY	= 2080.10	FT

-YA-

BEGIN GRADE
-YA- STA.11+29.61
EL = 2091.82'

END GRADE
-YA- STA.12+32.78
EOP -L- STA.16+70.18 OFF 12'
EL = 2092.50'

-YA- STA.12+44.80
-L- STA.16+69.61
EL = 2092.74'

(-)0.9011%
(-)0.5096%
(+)1.2029%
(+)1.9983%

18" RCP

PI = 11+62.50
EL = 2,091.65'
VC = 50'
K = 29
V = 25

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.11

DRAINAGE AREA	= 2.5	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 7.1	CFS
DESIGN HW ELEVATION	= 2086.0	FT
100 YEAR DISCHARGE	= 9.0	CFS
100 YEAR HW ELEVATION	= 2086.5	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 14.2+	CFS
OVERTOPPING ELEVATION	= 2091.74	FT

SEE SHEET 4 FOR PLAN VIEW

-YB-

-YB- STA.10+00.00
-L- STA.16+59.12
EL = 2092.61'

BEGIN GRADE
-YB- STA.10+24.15
EOP -L- STA.16+56.41 OFF 24'
EL = 2092.13'

END GRADE
-YB- STA.11+18.86
EL = 2090.68'

(-)4.9694%
(+)1.0809%
(+)1.0998%

PI = 10+65.00
EL = 2,090.10'
VC = 50'
K = 8
V = <15

SEE SHEET 4 FOR PLAN VIEW

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