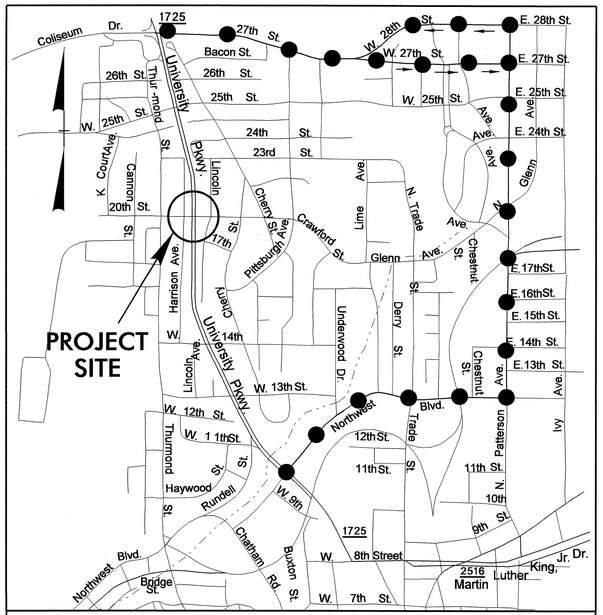
09/08/99

TIP PROJECT: B-4745

CONTRACT: C202427

See Sheet 1-A For Index of Sheets



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

FORSYTH COUNTY

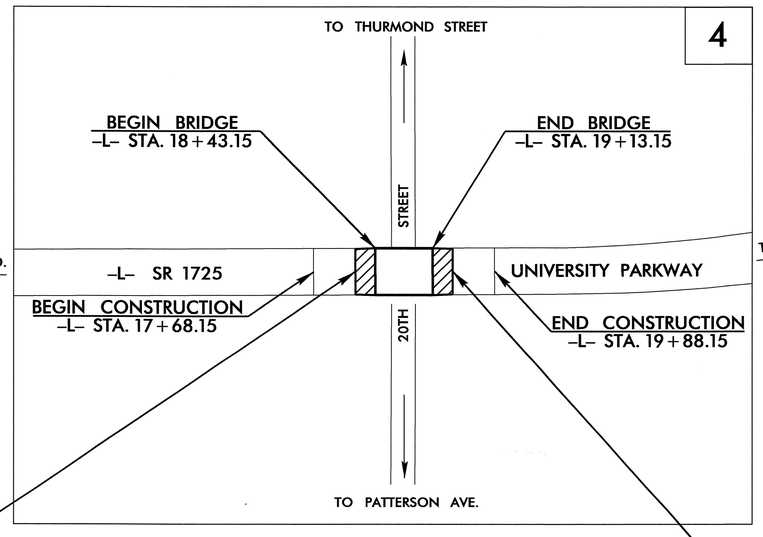
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4745	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33841.1.1	BRSTP-1725(2)	PE
33841.2.1	BRSTP-1725(2)	R/W, UTILITIES
33841.3.1	BRSTP-1725(2)	CONST

LOCATION: BRIDGE NO. 322 OVER 20TH STREET ON SR 1725 (UNIVERSITY PARKWAY) IN WINSTON-SALEM

TYPE OF WORK: GRADING, DRAINAGE AND STRUCTURE

NAD 83/95



GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2010 = 32,300
ADT 2030 = 53,300
DHV = 11 %
D = 60 %
T = 7 % *
V = 50 MPH

FUNC CLASS = ARTERIAL
* TTST 4% DUAL 3%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4745	=	0.009	MILE
LENGTH STRUCTURE TIP PROJECT B-4745	=	0.013	MILE
TOTAL LENGTH TIP PROJECT B-4745	=	0.022	MILE

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: AUGUST 21, 2009

LETTING DATE: DECEMBER 15, 2009

BRENDA MOORE, PE
PROJECT ENGINEER

REKHA PATEL, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 24097 ENGINEER JOHN W. TWISDALE, JR.

SIGNATURE: John W. Twisdale Jr. P.E. 10/7/09

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 16378 ENGINEER REKHA V. PATEL

10-7-09

SIGNATURE: Rekha V. Patel P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-4745	1-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 16378 ENGINEER REKHA V. PATEL

1-25-09

Rekha V. Patel

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	BRIDGE TYPICAL
2-A	ANCHORAGE FOR FRAMES
2-B	BRIDGE APPROACH FILLS
2-C THRU 2-D	METHOD OF PIPE INSTALLATION
3	SUMMARY OF QUANTITIES
3-A	LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)
3-B	SUMMARY OF EARTHWORK,SUMMARY OF EXISTING CONCRETE PAVEMENT REMOVAL, AND GUARDRAIL SUMMARY
4	PLAN SHEET
5	PROFILE SHEET
TCP-1 THRU TCP-13	TRAFFIC CONTROL PLANS
PM-1 THRU PM-3	PAVEMENT MARKING PLANS
EC-1 THRU EC-4	EROSION CONTROL PLANS
SD-1	SPECIAL SIGN DESIGN
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS
X-1A	CROSS-SECTION SUMMARY
X-1 THRU X-4	CROSS-SECTIONS
S-1 THRU S-38	STRUCTURE PLANS

GENERAL NOTES:

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

CLEARING:

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

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, A T & T, AND

THE CITY OF WINSTON SALEM.

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

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
DIVISION 7 - CONCRETE PAVEMENTS AND SHOULDERS	
700.01	Concrete Pavement Joints - Construction and Contraction Joints (Beg. July 2006 Let Use Detail in Lieu of Standard)
700.02	Expansion Joint Layout - for Rigid Doweled Pavement at Bridges
DIVISION 8 - INCIDENTALS	
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
840.13	Concrete Bridge Approach Drop Inlet - 12" thru 24" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.45	Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
852.01	Concrete Islands
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units

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3/15/06

PROJECT REFERENCE NO.	SHEET NO.
B-4745	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:

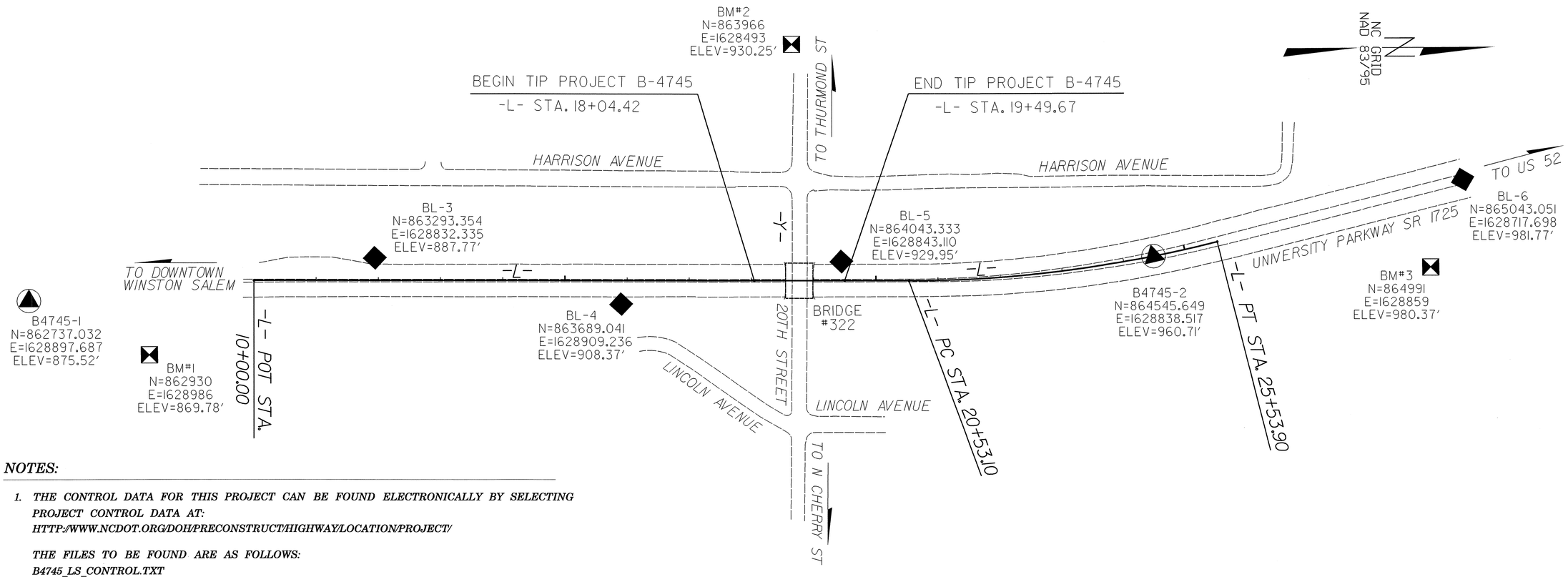
- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- Recorded SS Forced Main Line — FSS
- Designated SS Forced Main Line (S.U.E.*) — FSS

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.

PROJECT REFERENCE NO.	SHEET NO.
B-4745	1-C
Location and Surveys	

SURVEY CONTROL SHEET B-4745



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:
   B4745_LS_CONTROL.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)
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4745-2" WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 864545.6490(ft) EASTING: 1628838.5170(ft) ELEVATION: 960.71(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999946300
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4745-2" TO -L- STATION 10+00.00 IS S 1°08'15.3"E 1446.85'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
B4745-1	GPS-1	862737.0320	1628897.6870	875.52	OUTSIDE PROJECT LIMITS	
B4745-2	GPS-2	864545.6490	1628838.5170	960.71	24+48.87	0.19 RT
3	BL-3	863293.3540	1628832.3350	887.77	11+94.02	36.27 LT
4	BL-4	863689.0410	1628909.2360	908.37	15+90.23	37.86 RT
5	BL-5	864043.3330	1628843.1100	929.95	19+44.05	30.74 LT
6	BL-6	865043.0510	1628717.6980	981.77	OUTSIDE PROJECT LIMITS	
7	BY1-7	863995.7620	1628472.4590	933.09	18+93.89	401.05 LT
8	BY1-8	863960.0890	1628727.0980	914.15	18+60.00	146.17 LT
9	BY1-9	863955.2670	1629119.9070	915.99	18+57.93	246.67 RT
10	BY1-10	863983.8190	1629338.4710	923.93	18+88.01	465.03 RT
11	BY2-11	864743.0970	1628730.9680	972.58	OUTSIDE PROJECT LIMITS	
12	BY2-12	864439.0740	1628704.7170	965.25	23+63.17	149.71 LT
13	BY2-13	863570.4530	1628690.2400	909.07	14+70.11	180.30 LT
14	BY2-14	863057.7230	1628715.7030	912.98	OUTSIDE PROJECT LIMITS	
15	BY3-15	864176.8260	1629088.8790	925.93	20+76.73	214.24 RT
16	BY4-16	863741.3600	1628957.3290	907.19	16+42.89	85.59 RT

BENCHMARKS (NAVD 88)

BM#1 ELEVATION = 869.78'
N 862930 E 1628986
OUTSIDE OF PROJECT LIMITS
R/R SPIKE IN SEAM OF CONC GUTTER & PAVEMENT

BM#2 ELEVATION = 930.25'
N 863966 E 1628493
L STATION 18+65 380 LEFT
CHISELED SQUARE IN CONCRETE CURB

BM#3 ELEVATION = 980.37'
N 864991 E 1628859
OUTSIDE OF PROJECT LIMITS
R/R SPIKE IN PAVEMENT

NOTE: DRAWING NOT TO SCALE

NOTE: DRAWING NOT TO SCALE

6/2/9

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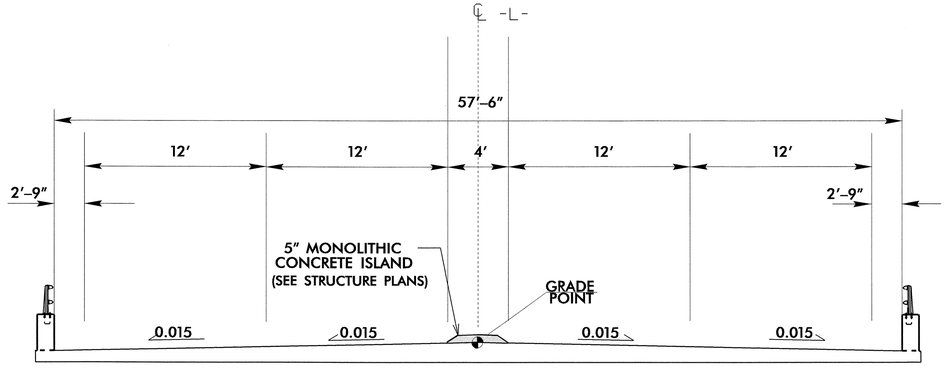
PROJECT REFERENCE NO.	SHEET NO.
B-4745	2

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 16378 ENGINEER R. KHADKA, V. CHALISE



NOTE: TRANSITION APPROACH SLAB CURB TO MATCH ROADWAY CURB LINE.

TYPICAL SECTION ON STRUCTURE

-L- STA. 18+43.15 TO -L- STA. 19+13.15

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PROJECT REFERENCE NO.	SHEET NO.
B-4745	2-A

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

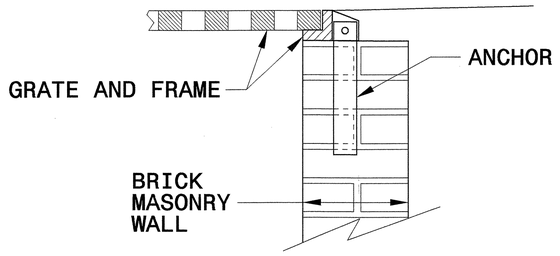
ENGLISH DETAIL DRAWING FOR

ANCHORAGE FOR FRAMES

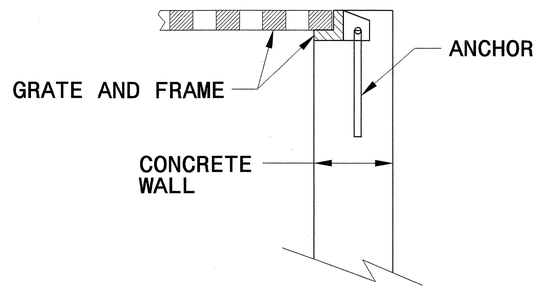
BRICK/CONCRETE/PRECAST CONCRETE

SHEET 1 OF 1

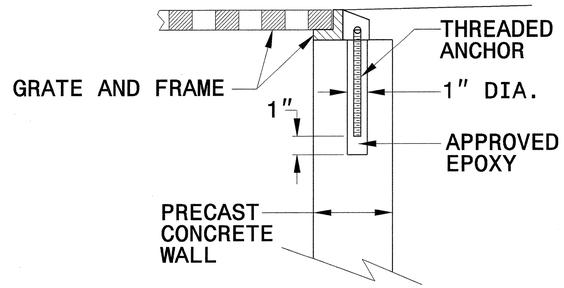
840D25



BRICK MASONRY CONSTRUCTION



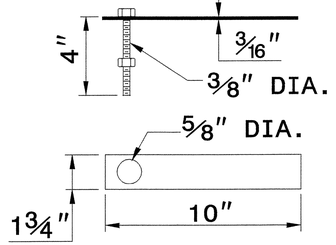
CONCRETE CONSTRUCTION



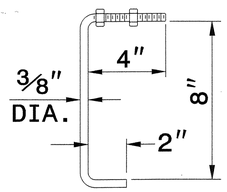
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

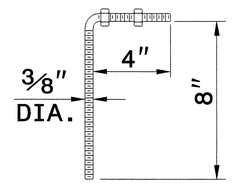
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



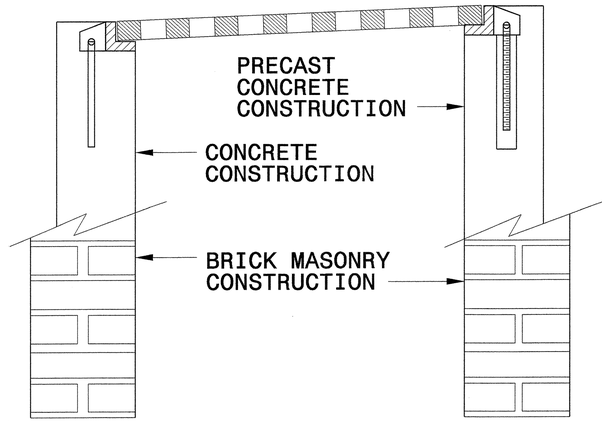
MASONRY ANCHOR
3/8" DIA. BOLT WITH PLATE



CONCRETE ANCHOR
3/8" DIA. BENT BAR



PRECAST CONCRETE ANCHOR
3/8" DIA. BENT BAR



FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS

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

ENGLISH DETAIL DRAWING FOR

ANCHORAGE FOR FRAMES

BRICK/CONCRETE/PRECAST CONCRETE

SHEET 1 OF 1

840D25

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER VIDEL S. HOWERTON
9/6/09

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

SEE PLATE FOR TITLE

ORIGINAL BY: 2006 STD 840.25 DATE: 07/18/06
MODIFIED BY: E.E. WARD DATE: 9/25/06
CHECKED BY: DATE: 11/3/08
FILE SPEC.:

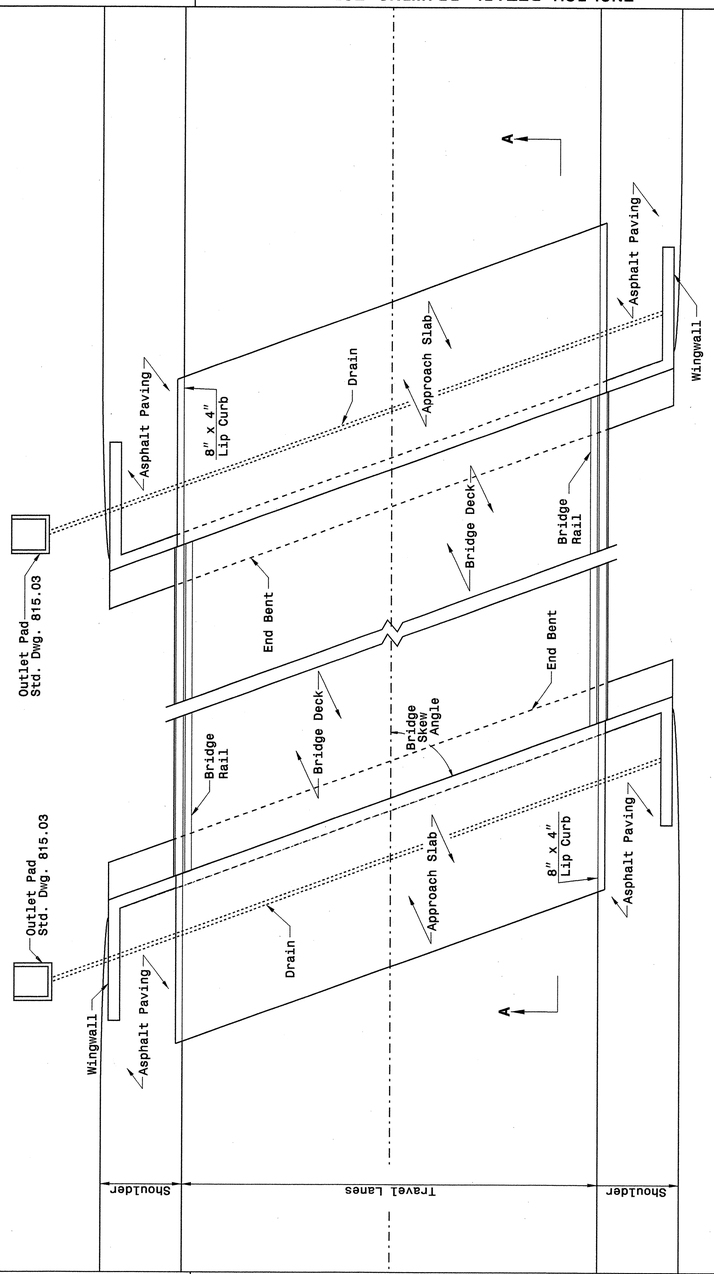
$$$$SYSTIME$$$$
$$$$DGN$$$$
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-4745	2-B

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

SHEET 1 OF 2 — 422D11

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

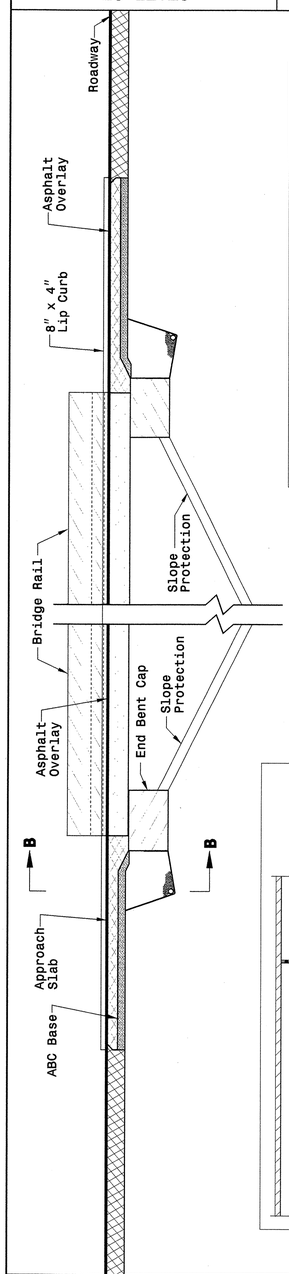


PLAN VIEW
12' APPROACH SLAB

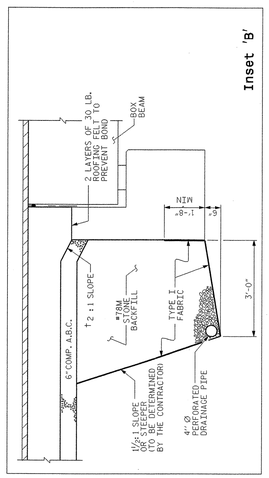
ENGLISH DETAIL DRAWING FOR
BRIDGE APPROACH FILLS
CORED SLAB & BOX BEAM BRIDGES
SUB REGIONAL TIER

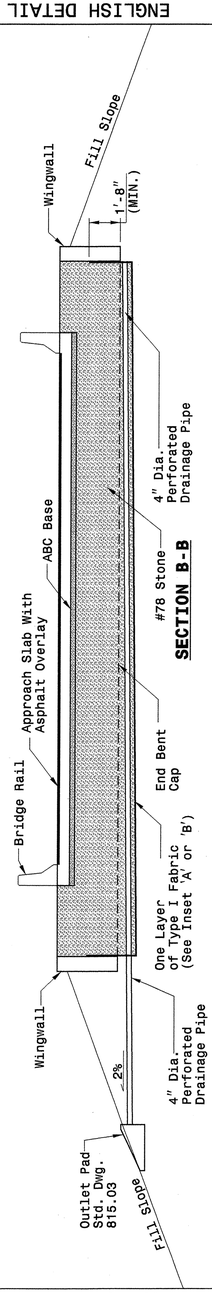
SHEET 2 OF 2 — 422D11

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



SECTION A-A





SECTION B-B

12' APPROACH SLAB

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

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

SHEET 2 OF 2 — 422D11

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

BRIDGE APPROACH FILLS
CORED SLAB & BOX BEAM BRIDGES
SUB REGIONAL TIER

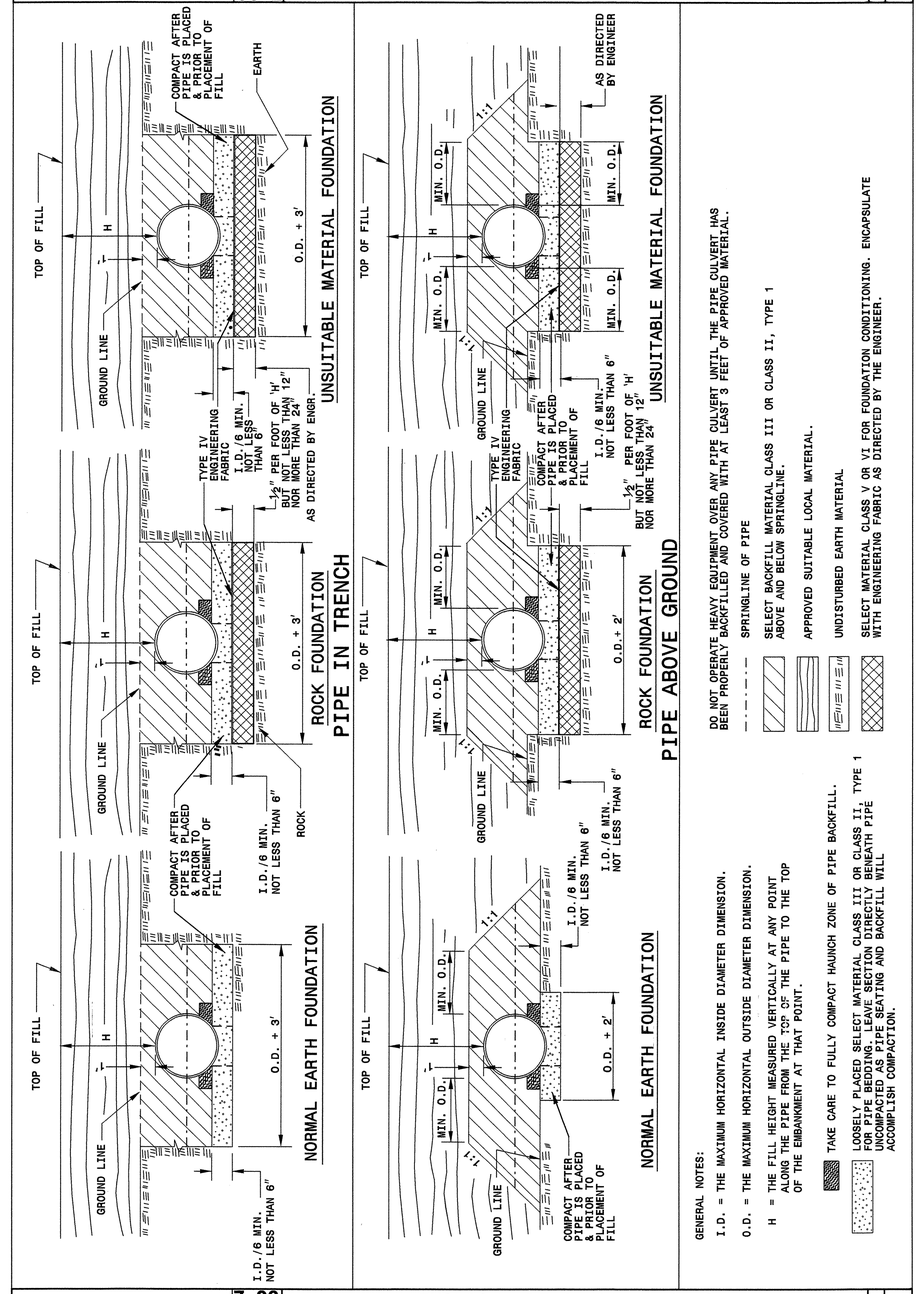
ORIGINAL BY: K. A. Kempf DATE: 6-10-08
MODIFIED BY: DATE:
CHECKED BY: DATE: 2/16/09
FILE SPEC.: Kkempf\english\bridge approach fills.dgn

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
9/16/09

USER NAME = kkempf
PLOT SCALE = 1.0000 '/ IN
PLOT DATE = 9/16/2009

PROJECT REFERENCE NO.	SHEET NO.
B-4745	2-C

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
RIGID PIPE

SHEET 2 OF 3 | 300D01

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

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
FLEXIBLE PIPE

SHEET 1 OF 3 | 300D01

30-JUL-2009 08:48
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jhowerton
AT PS23760

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

SEE PLATE FOR TITLE

ORIGINAL BY: KKempf DATE: 5-15-09
MODIFIED BY: DATE:
CHECKED BY: DATE: 7/30/09
FILE SPEC: c:/eriward/stds/stdstodetails/30001/0300d01.dgn

5/14/99

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

7-06

ENGLISH DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

FILL HEIGHT TABLES

SHEET 3 OF 3

300D01

FLEXIBLE PIPE

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

Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet) (Ga) 16	14	12	10	8
12	12	204	256			
15	12	162	204			
18	12	135	169	239		
21	12	115	145	204		
24	12	100	126	178		
30	12	79	100	142		
36	12	65	83	117	152	
42	12	55	70	100	130	160
48	12	48	61	87	113	139
54	12		54	77	100	123
60	12			69	90	111
66	12				81	100
72	12				74	91
78	12					81
84	12					69

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

Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet) (Ga) 16	14	12	10	8
12	12	123	155	218	281	344
15	12	98	123	174	224	275
18	12	81	102	144	187	228
21	12	69	87	123	160	195
24	12	60	76	108	139	171
27	12		67	95	123	151
30	12		60	85	111	136
36	12		50	71	92	113
42	12			60	78	96
48	12			52	68	84
54	12			46	50	74
60	12				50	62
66	12					51
72	12					41

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

HDPE - * (Minimum fill) 2′ for pipe diameters ≥ 12″ and ≤ 60″
* (Maximum fill) 20′ for pipe diameters ≤ 24″
17′ for pipe diameters ≥ 30″ and ≤ 60″

PVC - * (Minimum fill) 2′ for pipe diameters ≥ 12″ and ≤ 36″
* (Maximum fill) 30′ for pipe diameters ≥ 12″ and ≤ 36″

* FILL HEIGHT IS MEASURED FROM THE TOP OF THE PIPE TO THE BOTTOM OF THE PAVEMENT STRUCTURE

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

CSP - AASHTO M36
CAAP - AASHTO M196
HDPE - AASHTO M294
PVC - ASTM F949 or AASHTO M304

NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

1′ MINIMUM COVER FOR ALL SIDE DRAIN PIPE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

RIGID PIPE

RCP - * (Minimum fill) 1′ for Class IV & CLASS V
2′ for Class III & Class II

* (Maximum fill) 10′ - Class II pipe
20′ - Class III pipe
30′ - Class IV pipe
40′ - Class V pipe

(For fills > 40′ & < 80′ use LRFD Direct Design Method)

* FILL HEIGHT IS MEASURED FROM THE TOP OF THE PIPE TO THE BOTTOM OF THE PAVEMENT STRUCTURE

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

RCP - AASHTO M170

NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

1′ MINIMUM COVER FOR ALL SIDE DRAIN PIPE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

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

7-06

ENGLISH DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

FILL HEIGHT TABLES

SHEET 3 OF 3

300D01

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

SEE PLATE FOR TITLE

ORIGINAL BY: KKempf DATE: 5-15-09
MODIFIED BY: DATE:
CHECKED BY: DATE: 7/8/09
FILE SPEC: s:\contracts\contracts\special details\ericward\stds\stdstodetails\30001\0300d01.dgn

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 02986 JOEL H. HOWERTON

PROJECT REFERENCE NO. B-4745
SHEET NO. 2-D

PROJECT REFERENCE NO.	SHEET NO.
B-4745	3

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202427

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING
0030000000-N	SP	Lump Sum		BRIDGE APPROACH FILL - SUB REGIONAL TIER, STATION ******* (18+77.15 -L-)
0043000000-N	226	Lump Sum		GRADING
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING
0057000000-E	226	30	CY	UNDERCUT EXCAVATION
0080000000-E	SP	60	TON	CLASS IV SUBGRADE STABILIZATION
0195000000-E	265	20	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	30	SY	FABRIC FOR SOIL STABILIZATION
0318000000-E	300	12	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS
0320000000-E	SP	36	SY	FOUNDATION CONDITIONING FABRIC
0366000000-E	310	108	LF	15" RC PIPE CULVERTS, CLASS III
2286000000-N	840	3	EA	MASONRY DRAINAGE STRUCTURES
2308000000-E	840	1.85	LF	MASONRY DRAINAGE STRUCTURES
2367000000-N	840	2	EA	FRAME WITH TWO GRATES, STD 840.29
2374000000-N	840	1	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)
2549000000-E	846	50	LF	2'-6" CONCRETE CURB & GUTTER
2591000000-E	848	40	SY	4" CONCRETE SIDEWALK
3030000000-E	862	25	LF	STEEL BM GUARDRAIL
3150000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS
3215000000-N	862	2	EA	GUARDRAIL ANCHOR UNITS, TYPE III
3270000000-N	SP	2	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3574000000-E	867	300	LF	GENERIC FENCING ITEM REMOVE & RESET BLACK IRON FENCE
3656000000-E	876	400	SY	FILTER FABRIC FOR DRAINAGE

ItemNumber	Sec #	Quantity	Unit	Description
4400000000-E	1110	1,815	SF	WORK ZONE SIGNS (STATIONARY)
4410000000-E	1110	328	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4415000000-N	1115	3	EA	FLASHING ARROW PANELS, TYPE C
4420000000-N	1120	9	EA	CHANGEABLE MESSAGE SIGN
4422000000-N	1120	120	DAY	CHANGEABLE MESSAGE SIGN (SHORT TERM)
4430000000-N	1130	100	EA	DRUMS
4445000000-E	1145	208	LF	BARRICADES (TYPE III)
4770000000-E	1205	532	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (III)
4900000000-N	1251	4	EA	PERMANENT RAISED PAVEMENT MARKERS
6000000000-E	1605	450	LF	TEMPORARY SILT FENCE
6006000000-E	1610	250	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	5	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	50	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	1	ACR	TEMPORARY MULCHING
6018000000-E	1620	75	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	0.5	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	200	LF	TEMPORARY SLOPE DRAINS
6027000000-N	1622	4	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
6036000000-E	1631	6,500	SY	MATTING FOR EROSION CONTROL
6042000000-E	1632	225	LF	1/4" HARDWARE CLOTH
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

ItemNumber	Sec #	Quantity	Unit	Description
6108000000-E	1665	0.75	TON	FERTILIZER TOPDRESSING
6114500000-N	SP	10	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	6	EA	RESPONSE FOR EROSION CONTROL

COMPUTED BY:	RVP	DATE:	6/15/2009
CHECKED BY:	KNW	DATE:	8/31/2009

PROJECT NO.	SHEET NO.
B-4745	3-A

R0244542

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)*	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) SIZE	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) THICKNESS OR GAUGE	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) SIZE	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) THICKNESS OR GAUGE	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D SIZE	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1-3 X COL.'B') LIN. FT. A: 5.0' THRU 10.0'	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1-3 X COL.'B') LIN. FT. B: 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE m	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE F	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE G	CONCRETE TRANSITIONAL SECTION DROP INLET	CONCRETE TRANSITIONAL SECTION CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	MANHOLE STD. 840.51	M.H. STD. 840.51 OR 840.53	M.H. FRAME AND COVER STD. 840.54	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	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- 19+30	LT	1		928.59	925.84															1																	1	1				
-L- 19+30	CL	1	2		925.84	925.68		15"	56																																	
-L- 19+30	RT	2		928.59	925.68															1																	1	1				
-L- 19+30	RT	2	3		925.68	925.03		15"	52																																	
-L- 19+80	RT	3		931.88	925.03															1	1.85		1			1															REMOVE AND REPLACE EXIST. CB
TOTALS								15"	108											3	1.85		1			1											2	2				

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

COMPUTED BY:	RVP	DATE:	4/28/2009
CHECKED BY:	KNW	DATE:	9/24/2009

PROJECT NO.	SHEET NO.
B-4745	3-B

RD244542

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

(IN CUBIC YARDS)

Station To Station	Uncl. Excav.	Embank. +%	Borrow	Waste
-L- STA. 18+19.28 TO STA. 18+43.15	64	20		44
-L- STA. 19+13.15 TO STA. 19+37.03	55	3		52
PROJECT TOTALS:	**119**	**23**		**96**
GRAND TOTALS:	**119**	**23**		**96**
SAY:	**125**			

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

* 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.

SUMMARY OF EXISTING CONCRETE PAVEMENT REMOVAL

Station	LOC LT/RT/CL	YD^2
-L- STA. 18+19.28 TO STA. 18+55.79	CL	212
-L- STA. 18+98.49 TO STA. 19+37.03	CL	223
	TOTAL:	**435**
	SAY:	**450**

"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	TOTAL	FLAIR LENGTH		W		ANCHORS						IMP. ATTEN. TYPE 350			REMOVE	ADDITIONAL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPR. END	TRAIL. END	FROM E.O.L.	SHLDR WIDTH	APPR. END	TRAIL. END	APPR. END	TRAIL. END	XI MOD	TYPE III	GRAU 350	M-350	XII	CAT-1	VI MOD	EA	G	NG	EXISTING GRDRAIL	GUARDRAIL POSTS	
-L-	17+68.15	18+43.15	RT	75.00			18+43.15		2	10	50		1			1	1									
-L-	19+13.15	19+88.15	LT	75.00			19+13.15		2	10	50		1			1	1									
	LESS ANCHOR REDUCTIONS:																									
	GRAU-350 2 @ 50.00'			-100.00																						
	TYPE III 2 @ 18.75'			-37.50																						
TOTAL				**12.50**												**2**	**2**								**5**	
SAY				**25.00**																						

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-4745	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 16378 ENGINEER RAKHA V. PATEL

10-27-09

HYDRAULICS ENGINEER

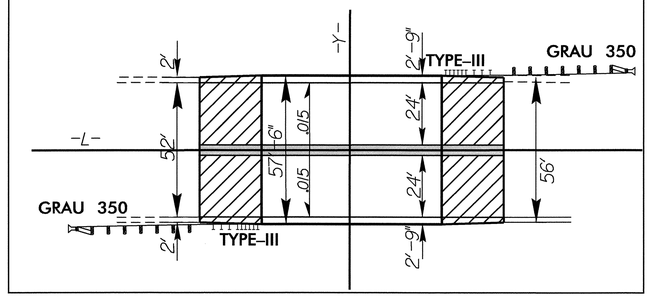
NORTH CAROLINA PROFESSIONAL SEAL 24897 ENGINEER JOHN W. TWISDALE, JR.

10-27-09

FOR -L- PROFILE SEE SHEET 5
FOR STRUCTURE DESIGNS SEE SHEETS SI-S38

NAD 83/95

RELATIONSHIP OF BRIDGE TO PROPOSED PAVEMENT
(NOT TO SCALE)



-BYI-7
-L- 18+93.89, 401.05' LT

BM 2

-Y- POT Sta. 10+00.00

-BL-5
-L- 19+44.05, 30.74' LT

-L- PT Sta. 25+53.90

-L- PC Sta. 20+53.10

-BYI-8
-L- 18+57.58
EXIST. R/W

CITY OF WINSTON-SALEM DB 785 PG 224

CITY OF WINSTON-SALEM DB 758 PG 408

CITY OF WINSTON-SALEM DB 766 PG 66

DB 760 PG 466

THE WILLIAM E. SCHONALD, SR. FAMILY TRUST DB 2158 PG 1943

S 89°22'07"E -Y-

REMOVE AND RESET EXISTING FENCE

REMOVE AND RESET EXISTING FENCE

GRAU 350 RETAIN

CITY OF WINSTON-SALEM RETAIN 18" RCP DB 767 PG 215 DB 831 PG 466

REMOVE EXIST. RETAIN

GPS-2 -L- 24+48.87, 0.19' RT

-BL-4
-L- 15+90.48, 36.54' RT

BEGIN CONSTRUCTION
- L- Sta.17+68.15

-Y- PT Sta. 15+11.77

BEGIN BRIDGE
-L- Sta.18+43.15

STA 18+19.28 -L- BEGIN TIP B-4745
BEGIN APPROACH SLAB

END CONSTRUCTION
- L- Sta.19+88.15

STA 19+37.03 -L- END TIP B-4745
END APPROACH SLAB

END BRIDGE
-L- Sta.19+13.15

-BYI-9

-BYI-10

-Y- POT Sta. 16+97.31

-L- POT Sta.18+77.40=
-Y- POT Sta.13+44.60

-L-	-Y-
PI Sta 23+04.82	PI Sta 14+61.77
Δ = 14° 20' 47.9" (LT)	Δ = 0° 32' 39.8" (RT)
D = 2° 51' 53.2"	D = 0° 32' 39.8"
L = 500.79'	L = 100.00'
T = 251.71'	T = 50.00'
R = 2,000.00'	R = 10,524.69'

26-OCT-2009 15:13
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5/28/99

BM # 2 ELEVATION = 930.25'
N 863966 E 1626493
-L- STATION 18+65.05 379.85' LT
CHISELED SQUARE IN CONCRETE CURB

PROJECT REFERENCE NO.	SHEET NO.
B-4745	5

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 037163 ENGINEER REMA V. PATEL

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 24897 ENGINEER JOHN W. TWISDALE, JR.

9/16/09

-L-

970 960 950 940 930 920 910 900 890 880

BEGIN GRADE STA. 18+19.15
ELEV. = 922.21

(+)6.076%

END GRADE STA. 19+37.15
ELEV. = 929.38

BEGIN BRIDGE
STA. 18+43.15

END BRIDGE
STA. 19+13.15

12 13 14 15 16 17 18 19 20 21 22 23 24 25

-Y-

930 920 910 900

11 12 13 14 15 16

08-SEP-2009 10:05
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