09/08/99

See Sheet 1-A For Index of Sheets

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4252	1	

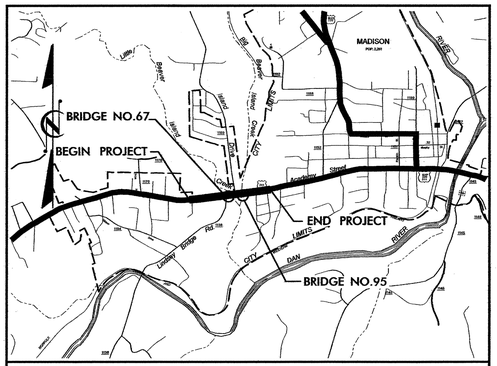
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33594.1.1	BRSTP-311(14)	P.E.
33594.2.1	BRSTP-311(14)	R/W & Utilities
33594.3.1	BRSTP-311(22)	CONST.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

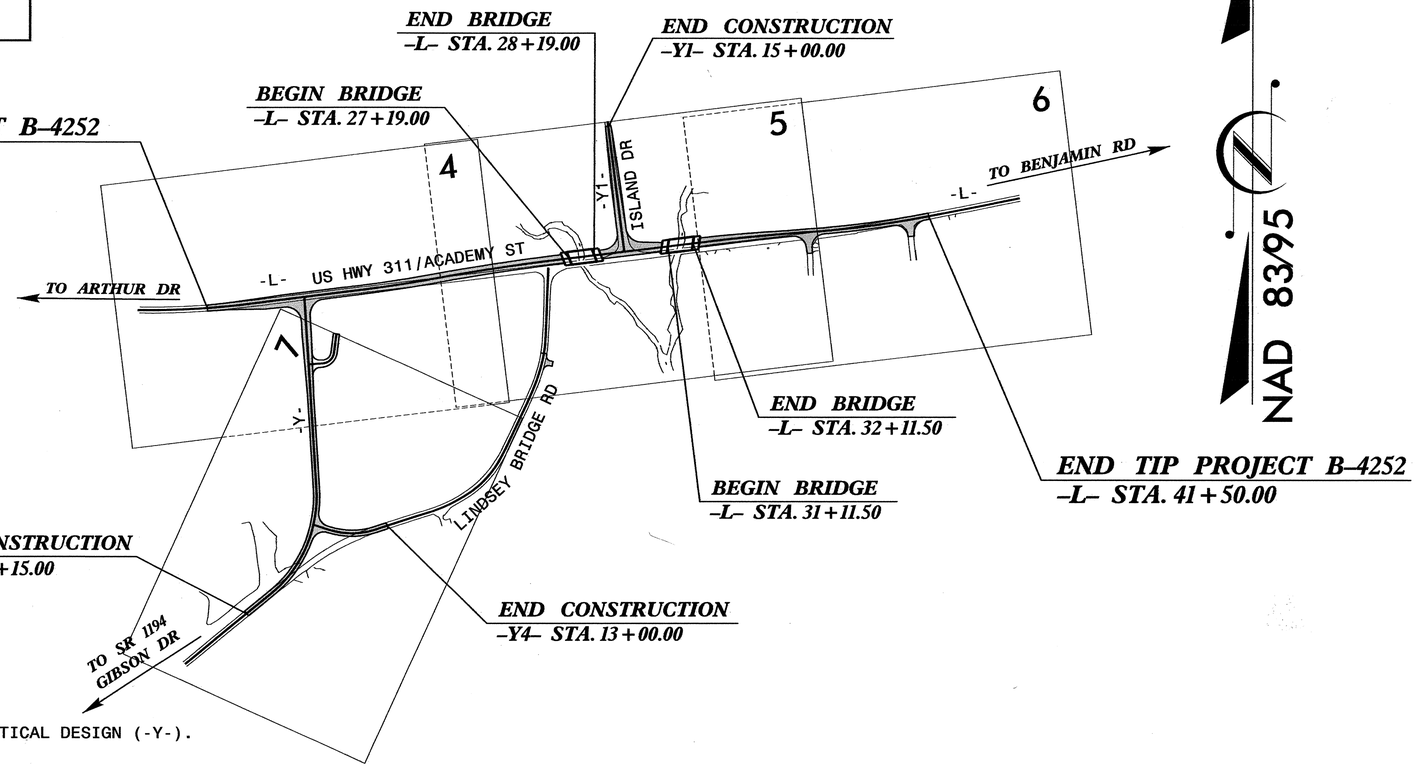
ROCKINGHAM COUNTY

LOCATION: BRIDGE NO. 95 OVER BIG BEAVER ISLAND CREEK ON US 311 AND BRIDGE NO. 67 OVER LITTLE BEAVER ISLAND CREEK ON US 311

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES AND SIGNALS



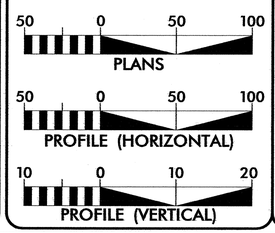
VICINITY MAP



** DESIGN EXCEPTION REQUIRED FOR HORIZONTAL & VERTICAL DESIGN (-Y-).

NCDOT CONTACT: CATHY HOUSER, P.E.
ROADWAY DESIGN - ENGINEERING COORDINATION

GRAPHIC SCALES



DESIGN DATA

ADT 2008	=	14160
ADT 2028	=	20560
DHV	=	10 %
D	=	65 %
T	=	3 % *
V	=	50 MPH

* TTST 1% DUAL 2%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4252	=	*0.507 MI.*
LENGTH STRUCTURES TIP PROJECT B-4252	=	*0.038 MI.*
TOTAL LENGTH OF TIP PROJECT B-4252	=	*0.545 MI.*

Prepared In the Office of:
KO & ASSOCIATES, P.C.
Consulting Engineers
5121 Kingdom Way, Suite 100, Raleigh NC 27607
(919) 851-6066

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JUNE 15, 2007

LETTING DATE:
AUGUST 19, 2008

BRIAN A. WILES, PE
PROJECT ENGINEER

DAVID C. WALLER, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 021162 ENGINEER W. HERBERT TURNER
SIGNATURE: W. Herbert Turner 2-15-08

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 16689 ENGINEER BRIAN ALLEN WILES
SIGNATURE: Brian Wiles 2/15/08

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

CONTRACT: C201855

TIP PROJECT: B-4252

2/12/2008
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K.O. & Associates, P.C.

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-4252	1-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 16069 ENGINEER JOHN ALLEN WILES

3/19/08

INDEX OF SHEETS

GENERAL NOTES:

GENERAL NOTES: 2006 SPECIFICATIONS
EFFECTIVE: 07-18-06
REVISED: 07-18-06

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01.

SIDE ROADS:

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

UNDERDRAINS:

UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.03 AT LOCATIONS DIRECTED BY THE ENGINEER.

GUARDRAIL:

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

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING" OR "TEMPORARY SHORING-BARRIER SUPPORTED" DEPENDING UPON THE LOCATION OF THE SHORING.

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 Town of Madison - water and sewer, Piedmont Natural Gas, Embark, Time Warner and Duke Energy.

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

RIGHT-OF-WAY MARKERS:

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

2006 ROADWAY STANDARD DRAWINGS

EFF. 07-18-06
REV. 01-02-07

2006 ROADWAY STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated July 18, 2006 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation - Method 'A'
310.10	Driveway Pipe Construction
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	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.03	Pipe Underdrain and Blind Drain
816.04	Markers for Drainage Structure and Concrete Pad
838.33	Reinforced Concrete Endwall - for Single 66" Pipe 90 Skew
838.63	Reinforced Brick Endwall - for Single 66" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.24	Frames and Narrow Slot Sag Grates
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.45	Precast Drainage Structure
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drainage Installation in Shoulder Berm Gutter
850.01	Concrete Paved Ditches
850.10	Guide for Berm Drain Outlet - 15" and 18" Pipe
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

3/18/2008
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KS & Associates, P.A.

3/15/06

PROJECT REFERENCE NO.	SHEET NO.
B-4252	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
- 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

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
- Proposed Wheel Chair Ramp Curb Cut — WCC
- Curb Cut for Future Wheel Chair Ramp — CCFR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — Vineyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole — PH
- 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 — PH
- 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
- 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 — PH
- 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.

12/01/2005

PROJECT REFERENCE NO.	SHEET NO.
B-4252	1C
Location and Surveys	

B-4252 SURVEY CONTROL SHEET

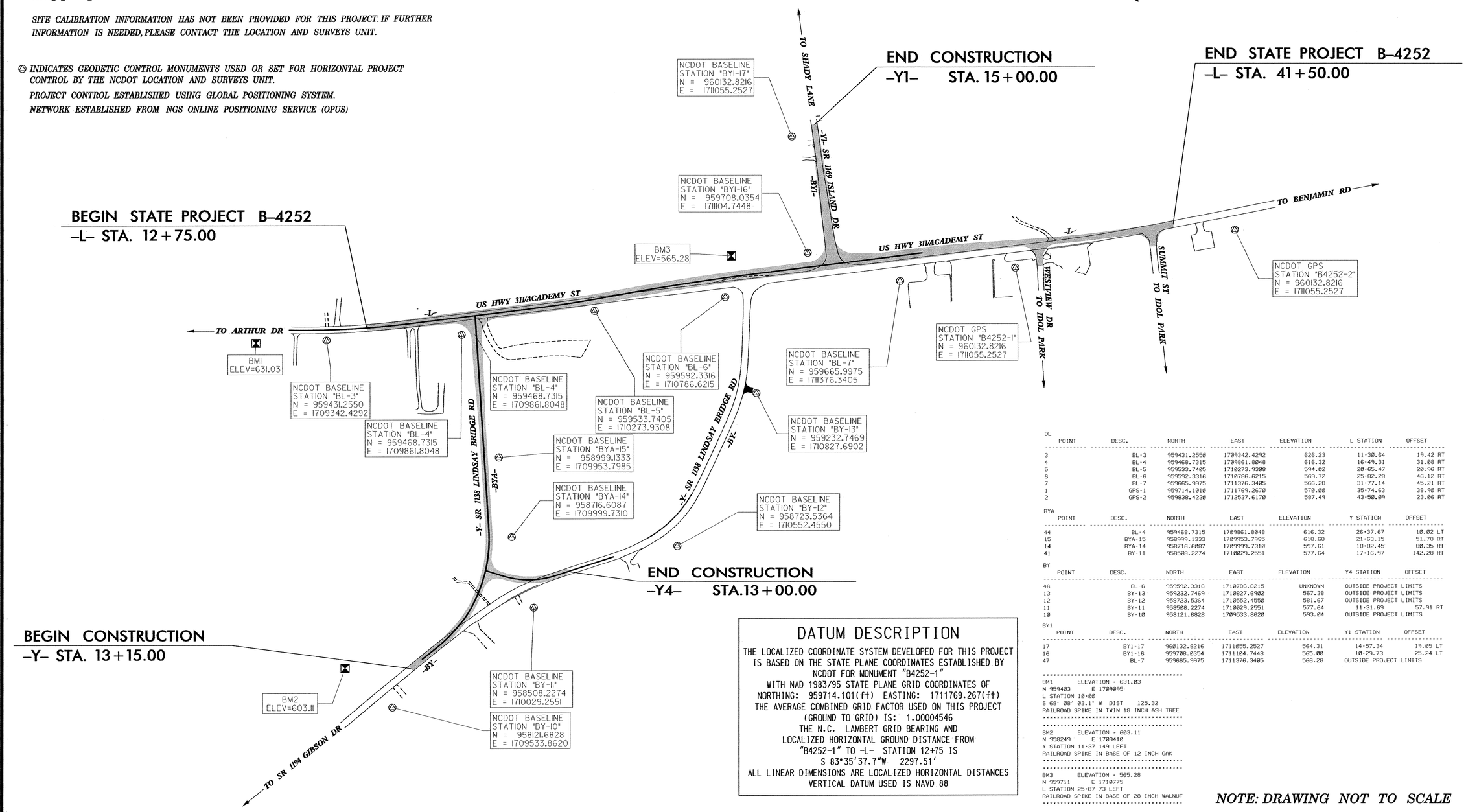
1. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:*
HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

THE FILES TO BE FOUND ARE AS FOLLOWS:
b4252_ls_control_060531.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)

NC GRID
NAD 83/95



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4252-1" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 959714.101(ft) EASTING: 1711769.267(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.00004546 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4252-1" TO -L- STATION 12+75 IS S 83°35'37.7"W 2297.51' ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
3	BL-3	959431.2550	1709342.4292	626.23	11+30.64	19.42 RT
4	BL-4	959468.7315	1709861.8048	616.32	16+49.31	31.08 RT
5	BL-5	959533.7405	1710273.9308	594.02	20+65.47	20.96 RT
6	BL-6	959592.3316	1710786.6215	569.72	25+82.28	46.12 RT
7	BL-7	959665.9975	1711376.3405	566.28	31+77.14	45.21 RT
1	GPS-1	959714.1010	1711769.2670	570.00	35+74.63	38.90 RT
2	GPS-2	959838.4230	1712537.6170	587.49	43+50.09	23.06 RT

BYA

POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
44	BL-4	959468.7315	1709861.8048	616.32	26+37.67	10.02 LT
15	BYA-15	958999.1333	1709953.7985	618.68	21+63.15	51.78 RT
14	BYA-14	958716.6087	1709999.7310	597.61	18+82.45	80.35 RT
41	BY-11	958508.2274	1710029.2551	577.64	17+16.97	142.28 RT

BY

POINT	DESC.	NORTH	EAST	ELEVATION	Y4 STATION	OFFSET
46	BL-6	959592.3316	1710786.6215	UNKNOWN	OUTSIDE PROJECT LIMITS	
13	BY-13	959232.7469	1710827.6902	567.38	OUTSIDE PROJECT LIMITS	
12	BY-12	958723.5364	1710552.4550	581.67	OUTSIDE PROJECT LIMITS	
11	BY-11	958508.2274	1710029.2551	577.64	11+31.69	57.91 RT
10	BY-10	958121.6828	1709533.8620	593.04	OUTSIDE PROJECT LIMITS	

BY1

POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
17	BY1-17	960132.8216	1711055.2527	564.31	14+57.34	19.05 LT
16	BY1-16	959708.0354	1711104.7448	565.00	10+29.73	25.24 LT
47	BL-7	959665.9975	1711376.3405	566.28	OUTSIDE PROJECT LIMITS	

BM1 ELEVATION - 631.03
N 959403 E 1709095
L STATION 10+00
S 68° 08' 03.1" W DIST 125.32
RAILROAD SPIKE IN TWIN 18 INCH ASH TREE

BM2 ELEVATION - 603.11
N 958249 E 1709410
Y STATION 11+37 149 LEFT
RAILROAD SPIKE IN BASE OF 12 INCH OAK

BM3 ELEVATION - 565.28
N 959711 E 1710775
L STATION 25+87 73 LEFT
RAILROAD SPIKE IN BASE OF 28 INCH WALNUT

NOTE: DRAWING NOT TO SCALE

2/12/2008
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Kevin Rose & Associates, P.A.

6/2/99

PAVEMENT SCHEDULE

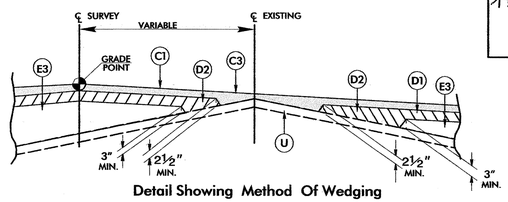
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E2	PROP. APPROX. 5½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E3	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.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	J	PROP. 8" AGGREGATE BASE COURSE.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	T	EARTH MATERIAL.
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.	U	EXISTING PAVEMENT.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	W	VARIABLE DEPTH ASPHALT PAVEMENT

KO & ASSOCIATES, P.C.
Consulting Engineers
5121 KINGDOM WAY, SUITE 100, RALEIGH, N.C. 27607
(919) 851-6066

PROJECT REFERENCE NO.	SHEET NO.
B-4252	2

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 16689 ENGINEER JONATHAN ALLEN WILES
3/14/08

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 22895 ENGINEER CLARK S. MORRISON
3/24/08



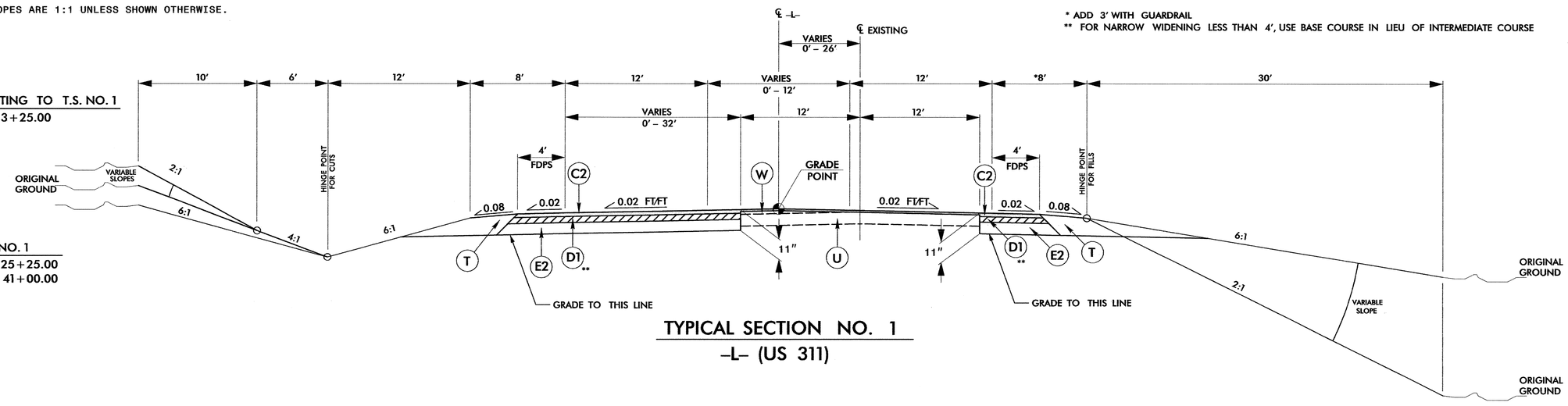
Detail Showing Method Of Wedging

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

* ADD 3' WITH GUARDRAIL
** FOR NARROW WIDENING LESS THAN 4', USE BASE COURSE IN LIEU OF INTERMEDIATE COURSE

TRANSITION FROM EXISTING TO T.S. NO. 1
–L– STA. 12+75.00 TO 13+25.00

USE TYPICAL SECTION NO. 1
–L– STA. 13+25.00 TO 25+25.00
–L– STA. 35+25.00 TO 41+00.00

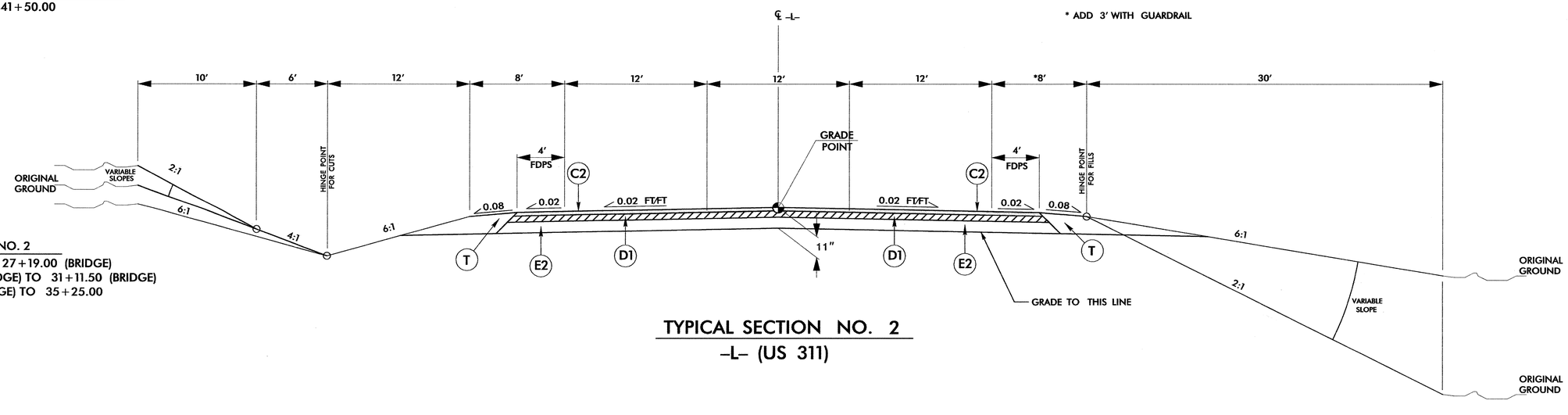


TYPICAL SECTION NO. 1
–L– (US 311)

TRANSITION FROM T.S. NO. 1 TO EXISTING
–L– STA. 41+00.00 TO 41+50.00

USE TYPICAL SECTION NO. 2
–L– STA. 25+25.00 TO 27+19.00 (BRIDGE)
–L– STA. 28+19.00 (BRIDGE) TO 31+11.50 (BRIDGE)
–L– STA.32+11.50 (BRIDGE) TO 35+25.00

* ADD 3' WITH GUARDRAIL



TYPICAL SECTION NO. 2
–L– (US 311)

3/18/2008
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KO & Associates, P.A.

6/2/99

PAVEMENT SCHEDULE

C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E2	PROP. APPROX. 5½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
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C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	J	PROP. 8" AGGREGATE BASE COURSE.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	T	EARTH MATERIAL.
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.	U	EXISTING PAVEMENT.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	W	VARIABLE DEPTH ASPHALT PAVEMENT

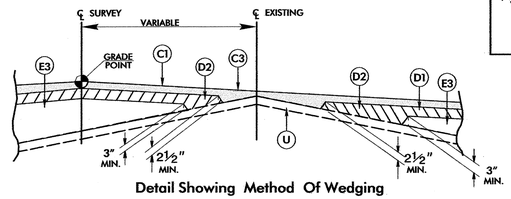
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

KO & ASSOCIATES, P.C.
Consulting Engineers
5121 KINGDOM WAY, SUITE 100, RALEIGH, N.C. 27607
(919) 851-6066

PROJECT REFERENCE NO.	SHEET NO.
B-4252	2-A

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 16689 ENGINEER BRIAN ALLEN WILES
2/15/08

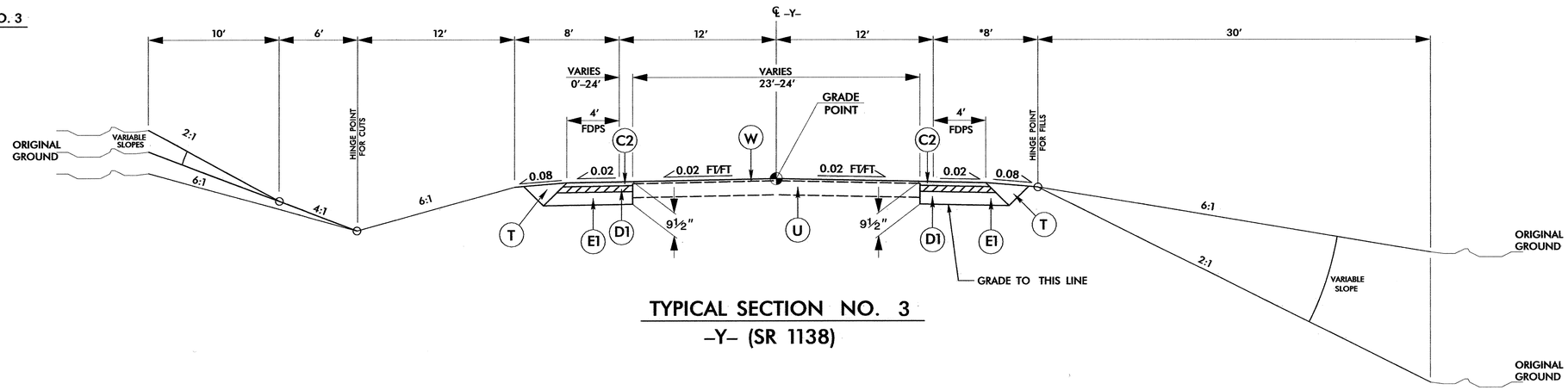
PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK S. MORRISON
2/14/08



Detail Showing Method Of Wedging

* ADD 3' WITH GUARDRAIL

TRANSITION FROM EXISTING TO T.S. NO. 3
–Y– STA. 13+15.00 TO 13+65.00

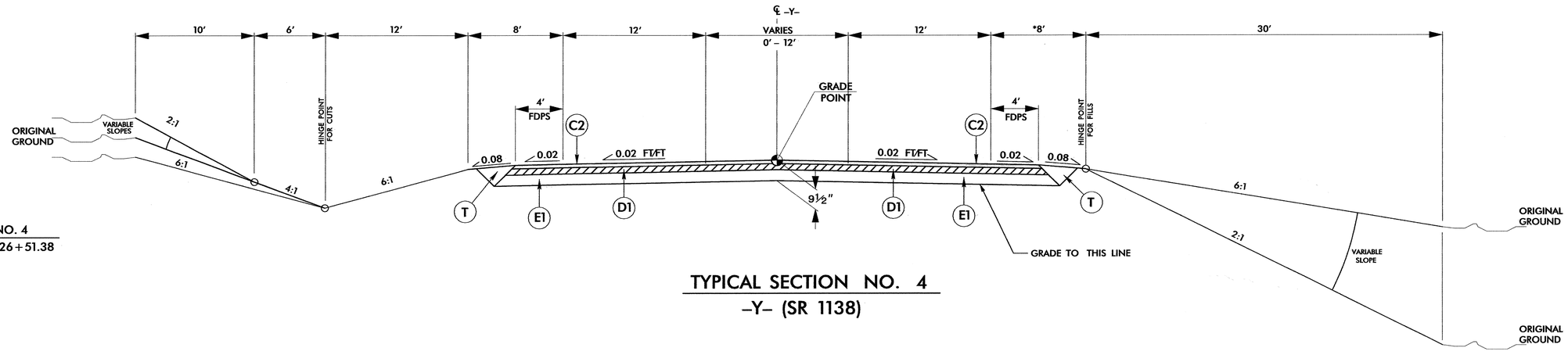


USE TYPICAL SECTION NO. 3
–Y– STA. 13+65.00 TO 15+75.00

TYPICAL SECTION NO. 3
–Y– (SR 1138)

* ADD 3' WITH GUARDRAIL

USE TYPICAL SECTION NO. 4
–Y– STA. 15+75.00 TO 26+51.38



TYPICAL SECTION NO. 4
–Y– (SR 1138)

2/12/2008
R:\Roadway\Proj\b4252_rdy_typ.dgn
KO & Associates, P.A.

6/2/99

PAVEMENT SCHEDULE

C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E2	PROP. APPROX. 5½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E3	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.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	J	PROP. 8" AGGREGATE BASE COURSE.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	T	EARTH MATERIAL.
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.	U	EXISTING PAVEMENT.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	W	VARIABLE DEPTH ASPHALT PAVEMENT

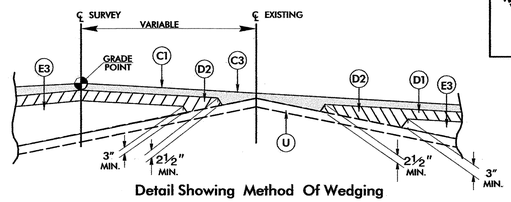
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

KO & ASSOCIATES, P.C.
Consulting Engineers
5121 KINGDOM WAY, SUITE 100, RALEIGH, N.C. 27607
(919) 851-6066

PROJECT REFERENCE NO.	SHEET NO.
B-4252	2-B

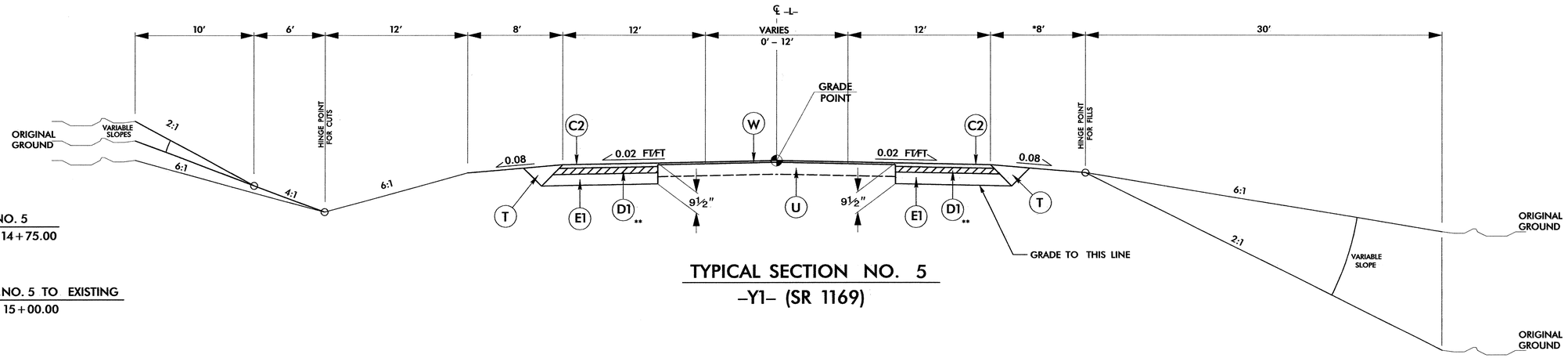
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 16689 ENGINEER ADRIAN ALLEN WILES
2/15/08

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 22886 ENGINEER CLARK S. MORRISON
3/24/08



Detail Showing Method Of Wedging

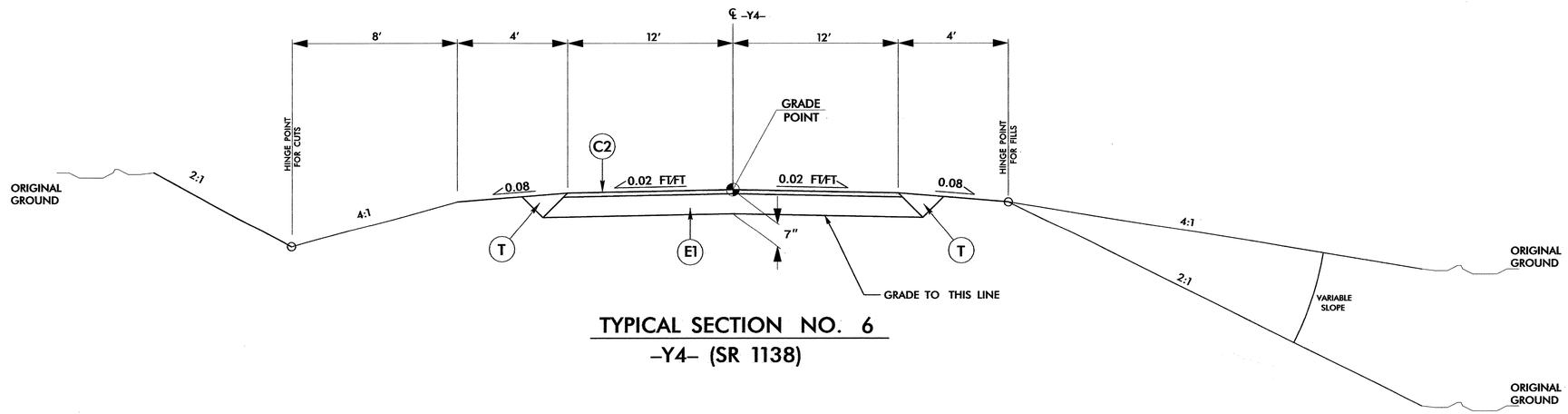
* ADD 3' WITH GUARDRAIL
** FOR NARROW WIDENING LESS THAN 4', USE BASE COURSE IN LIEU OF INTERMEDIATE COURSE



USE TYPICAL SECTION NO. 5
–Y1– STA. 10+18.00 TO 14+75.00

TRANSITION FROM T.S. NO. 5 TO EXISTING
–Y1– STA. 14+75.00 TO 15+00.00

TYPICAL SECTION NO. 5
–Y1– (SR 1169)



USE TYPICAL SECTION NO. 6
–Y4– STA. 10+63.00 TO 11+50.00

TYPICAL SECTION NO. 6
–Y4– (SR 1138)

2/18/2008
N:\Roadway\Proj\b4252_rdy_typ.dgn
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6/2/99

PAVEMENT SCHEDULE

C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E2	PROP. APPROX. 5½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E3	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.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	J	PROP. 8" AGGREGATE BASE COURSE.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	T	EARTH MATERIAL.
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.	U	EXISTING PAVEMENT.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	W	VARIABLE DEPTH ASPHALT PAVEMENT

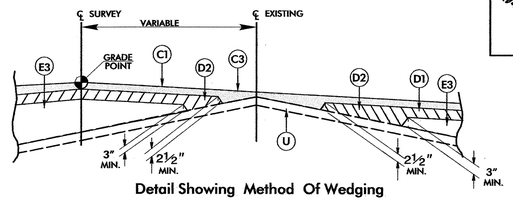
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

KO & ASSOCIATES, P.C.
Consulting Engineers
5121 KINGDOM WAY, SUITE 100, RALEIGH, N.C. 27607
(919) 851-6066

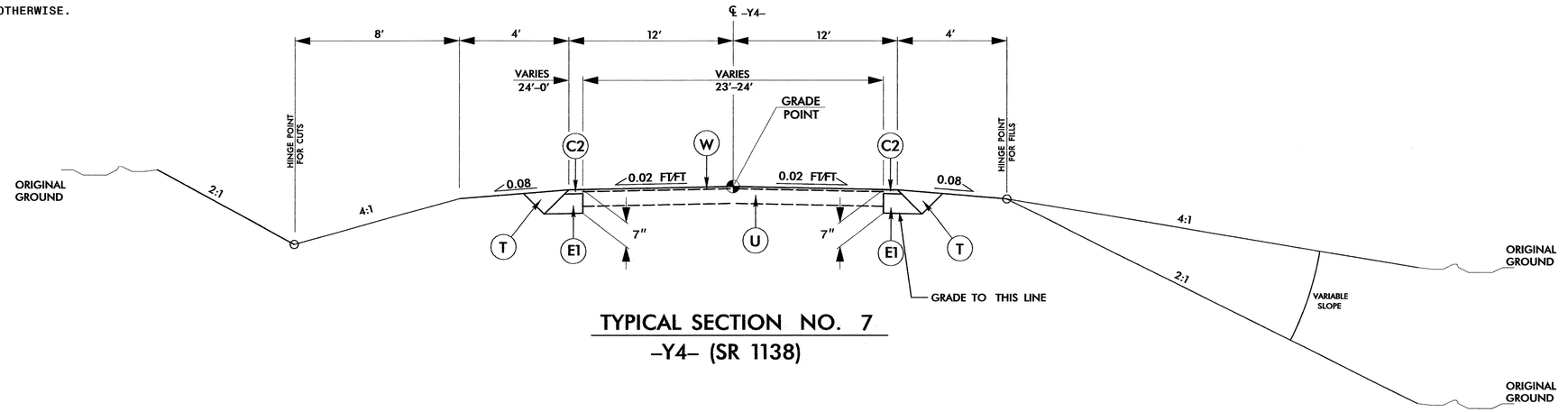
PROJECT REFERENCE NO.	SHEET NO.
B-4252	2-C

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18689 ENGINEER BRIAN ALLEN WILKS
2/15/08

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK S. MORRISON
3/2/08



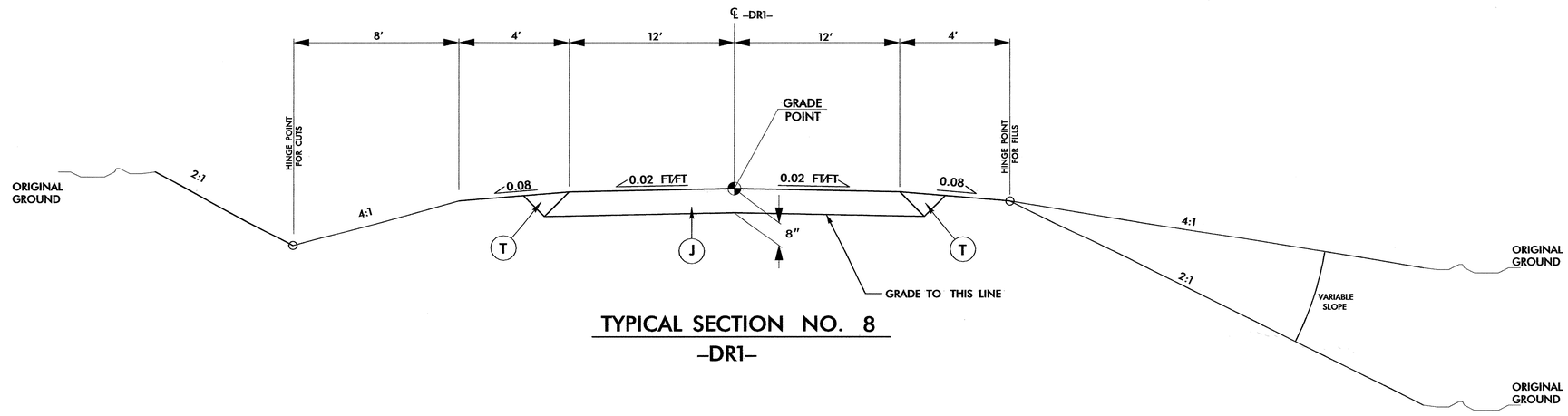
Detail Showing Method Of Wedging



USE TYPICAL SECTION NO. 7
–Y4– STA. 11+50.00 TO 12+60.00

TRANSITION FROM T.S. NO. 7 TO EXISTING
–Y4– STA. 12+60.00 TO 13+00.00

TYPICAL SECTION NO. 7
–Y4– (SR 1138)



USE TYPICAL SECTION NO. 8
–DR1– STA. 10+15.10 TO 11+98.68

TYPICAL SECTION NO. 8
–DR1–

2/12/2008
R:\Roadway\Proj\b4252_rdy_typ.dgn
K&K Associates, P.A.

8/17/99

REVISIONS

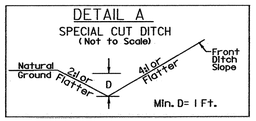
KO & ASSOCIATES, P.C.
Consulting Engineers
5121 KINGDOM WAY, SUITE 100, RALEIGH, N.C. 27607
(919) 851-6066

PROJECT REFERENCE NO.	SHEET NO.
B-4252	2-D
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 16689 ENGINEER JONATHAN ALLEN WILES
2/15/08

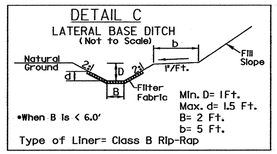
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 021162 ENGINEER W. HERBERT TURNER, JR.
2-15-08

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



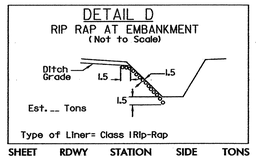
SHEET	RDWY	STATION – STATION	SIDE
4	–L–	12+50 TO 13+00	RT.
4	–L–	12+50 TO 13+00	LT.
4	–L–	13+50 TO 14+08	RT.
4	–L–	13+50 TO 14+08	LT.
4	–L–	15+50 TO 16+10	RT.
5	–Y1–	14+50 TO 15+00	LT.
6	–L–	36+25 TO 37+50	LT.
6	–L–	41+00 TO 41+50	LT.
7	–Y–	13+15 TO 13+50	LT.
7	–Y–	13+15 TO 13+50	RT.
7	–Y4–	11+13 TO 13+00	LT.

DETAIL C
LATERAL BASE DITCH
(Not to Scale)



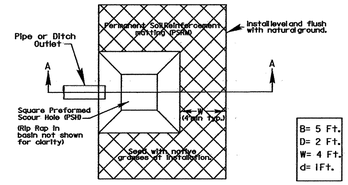
SHEET	RDWY	STATION – STATION	SIDE
5	–L–	25+50 TO 27+41	LT.
7	–Y–	16+00 TO 16+50	LT.

DETAIL D
RIP RAP AT EMBANKMENT
(Not to Scale)

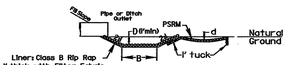


SHEET	RDWY	STATION	SIDE	TONS
5	–L–	27+41	LT.	EST. 10
5	–L–	31+78	RT.	EST. 30
7	–Y–	16+20	RT.	EST. 10

PREFORMED SCOUR HOLE
DETAIL E
PLAN VIEW



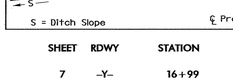
SECTION A-A



5/05

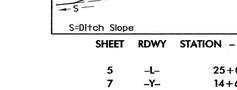
SHEET	RDWY	STATION	SIDE
5	–L–	28+45	LT.
5	–L–	30+40	LT.
5	–Y1–	10+80	RT.

DETAIL F
STANDARD BASE DITCH
(Not to Scale)



SHEET	RDWY	STATION	SIDE	B
5	–EY–	12+75	CL	2
5	–EY–	10+35	CL	4

DETAIL G
STANDARD BASE DITCH
(Not to Scale)



SHEET	RDWY	STATION	SIDE	D	B
5	–EY–	11+90	CL	1'	2'
7	–Y–	16+06 TO 11+13 –Y4–	RT.	1'	4'

DETAIL H
TOE PROTECTION
(Not to Scale)

SHEET	RDWY	STATION – STATION	SIDE
5, 6	–L–	35+00 TO 36+50	LT.

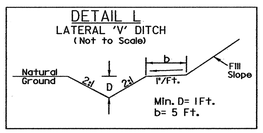
DETAIL I
CHANNEL IMPROVEMENT
(Not to Scale)

SHEET	RDWY	STATION	SIDE	D	B
7	–Y–	16+15	RT.	4'	4'

DETAIL K
ROADWAY CUT DITCH
(Not to Scale)

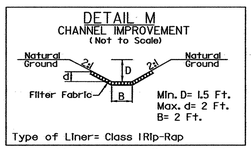
SHEET	RDWY	STATION – STATION	SIDE
7	–Y–	18+00 TO 22+00	RT.
7	–Y–	17+00 TO 22+00	LT.
7	–Y4–	10+50 TO 11+13	LT.

DETAIL L
LATERAL 'V' DITCH
(Not to Scale)



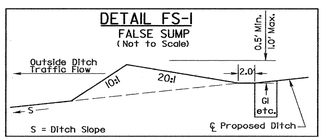
SHEET	RDWY	STATION – STATION	SIDE
7	–Y–	15+00 TO 16+00	LT.

DETAIL M
CHANNEL IMPROVEMENT
(Not to Scale)



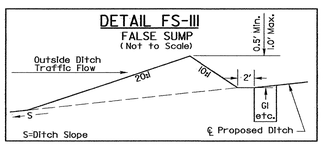
SHEET	RDWY	STATION	SIDE
7	–Y–	16+00	LT.

DETAIL FS-I
FALSE SUMP
(Not to Scale)

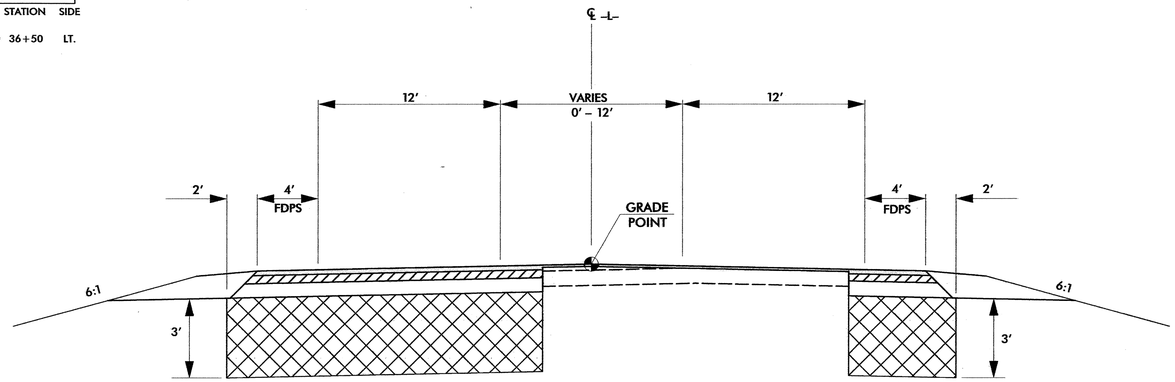


SHEET	RDWY	STATION	SIDE
7	–Y–	16+99	LT.

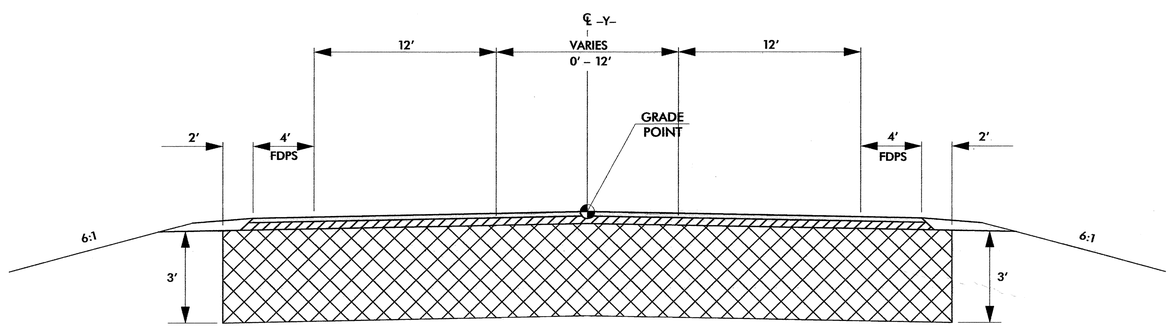
DETAIL FS-III
FALSE SUMP
(Not to Scale)



SHEET	RDWY	STATION – STATION	SIDE
5	–L–	25+00	LT.
7	–Y–	14+60	LT.



UNDERCUT DETAIL NO. 1
–L– STA. 15+75.00 TO 18+75..00



UNDERCUT DETAIL NO. 2
–Y– STA. 19+25.00 TO 21+25.00
–Y– STA. 23+25.00 TO 26+45.00

2/12/2008
R:\Drainage\b4252_hyd_ditch_det.dgn
KO & Associates, P.A.

KO & ASSOCIATES, P.C.
Consulting Engineers
5121 KINGDOM WAY, SUITE 100, RALEIGH, N.C. 27607
(919) 851-6066

PROJECT REFERENCE NO.	SHEET NO.
B-4252	2-E
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 16689 BRIAN ALLEN WILES 2/15/08

TEMPORARY GUARDRAIL LOCATIONS

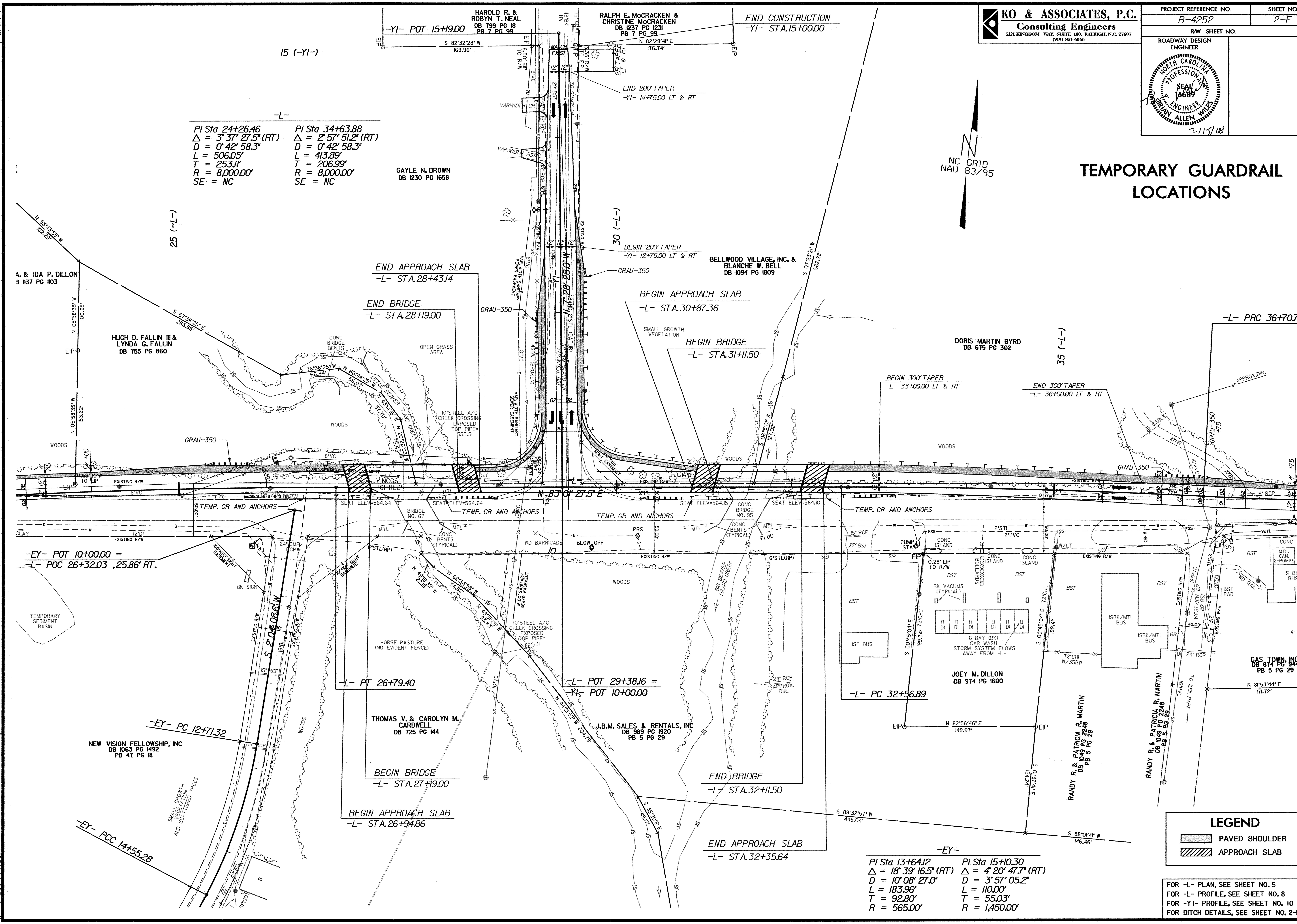
REVISIONS

-L-

PI Sta 24+26.46	PI Sta 34+63.88
Δ = 3° 37' 27.5" (RT)	Δ = 2° 57' 51.2" (RT)
D = 0° 42' 58.3"	D = 0° 42' 58.3"
L = 506.05'	L = 413.89'
T = 253.11'	T = 206.99'
R = 8,000.00'	R = 8,000.00'
SE = NC	SE = NC

-EY-

PI Sta 13+64.12	PI Sta 15+10.30
Δ = 18° 39' 16.5" (RT)	Δ = 4° 20' 47.7" (RT)
D = 10° 08' 27.0"	D = 3° 57' 05.2"
L = 183.96'	L = 110.00'
T = 92.80'	T = 55.03'
R = 565.00'	R = 1,450.00'



LEGEND

- PAVED SHOULDER
- APPROACH SLAB

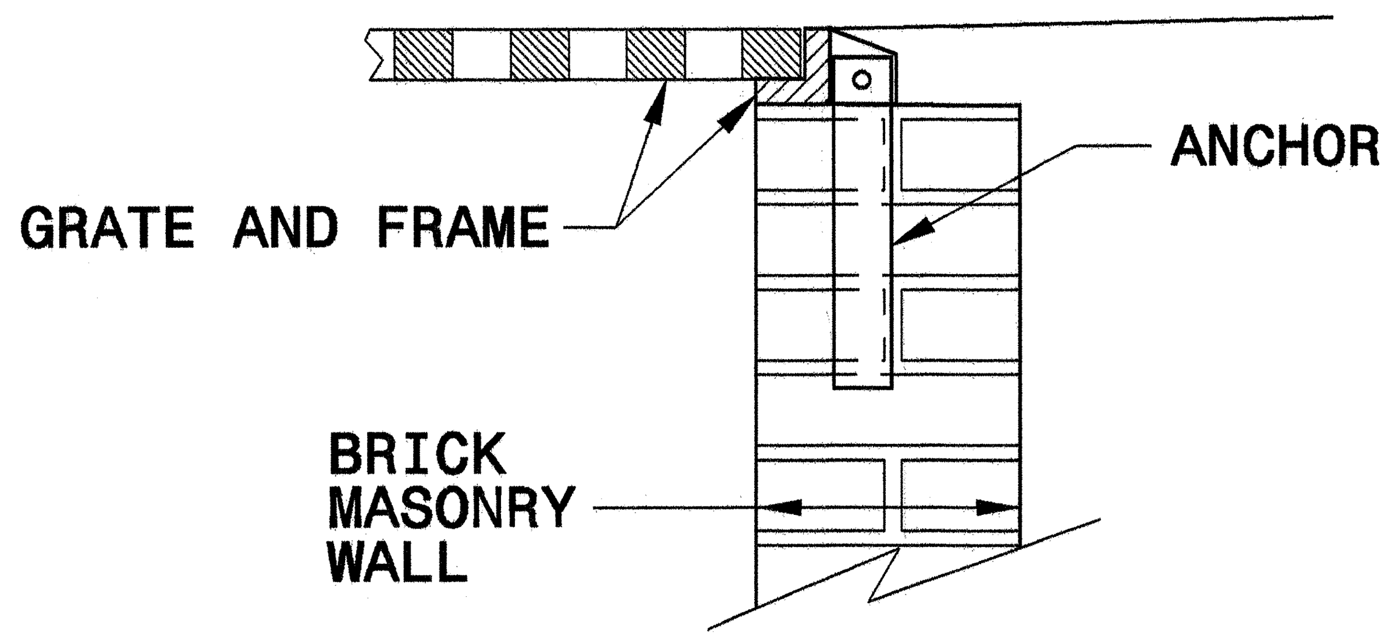
FOR -L- PLAN, SEE SHEET NO. 5
FOR -L- PROFILE, SEE SHEET NO. 8
FOR -YI- PROFILE, SEE SHEET NO. 10
FOR DITCH DETAILS, SEE SHEET NO. 2-D

8/17/99
2/12/2008 R:\Roadway\Proj\b4252_rdy_psh_02e.dgn

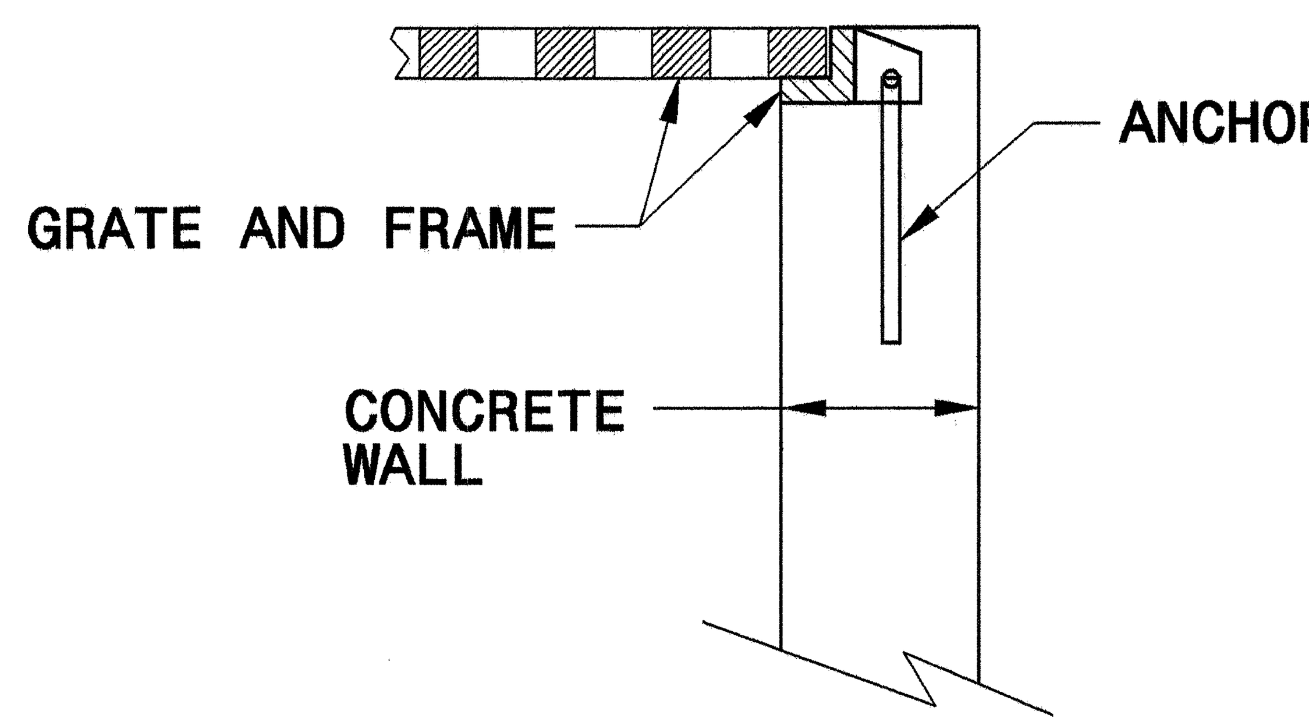
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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

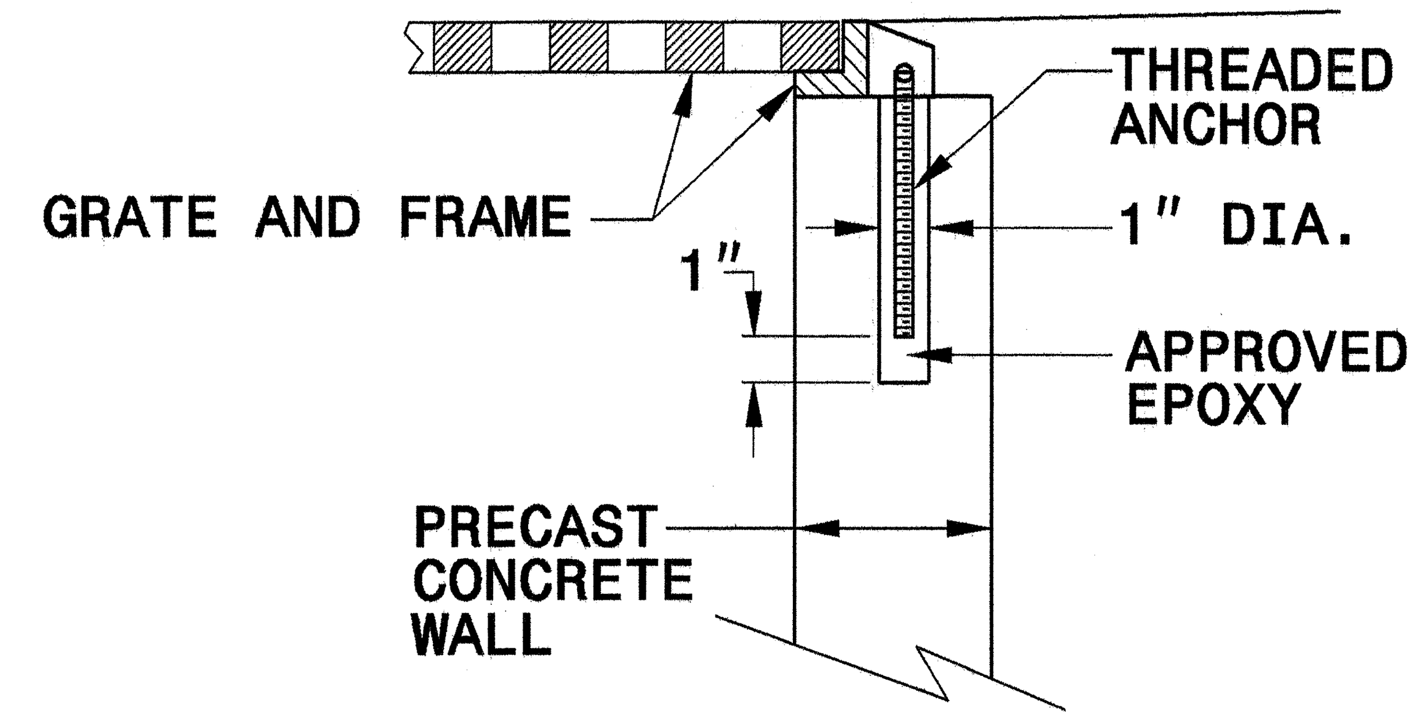
SHEET 1 OF 1
840D25



BRICK MASONRY CONSTRUCTION



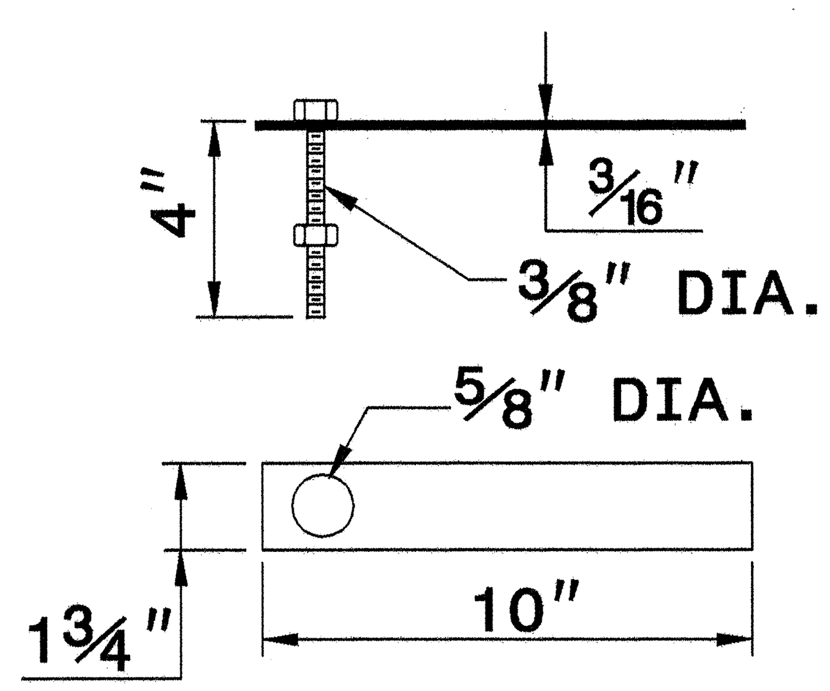
CONCRETE CONSTRUCTION



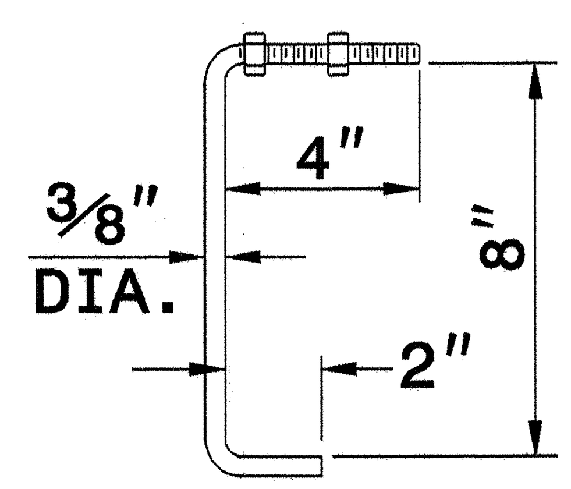
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

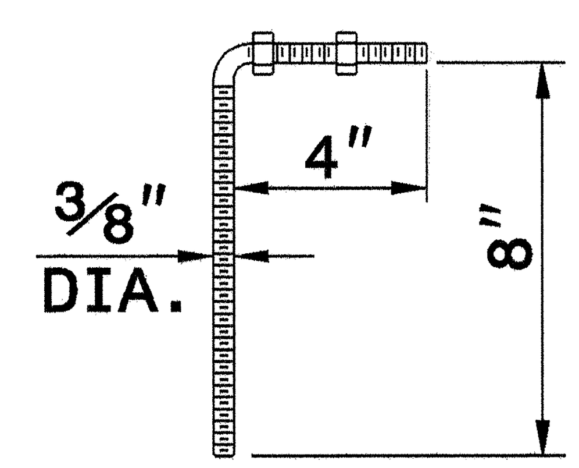
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



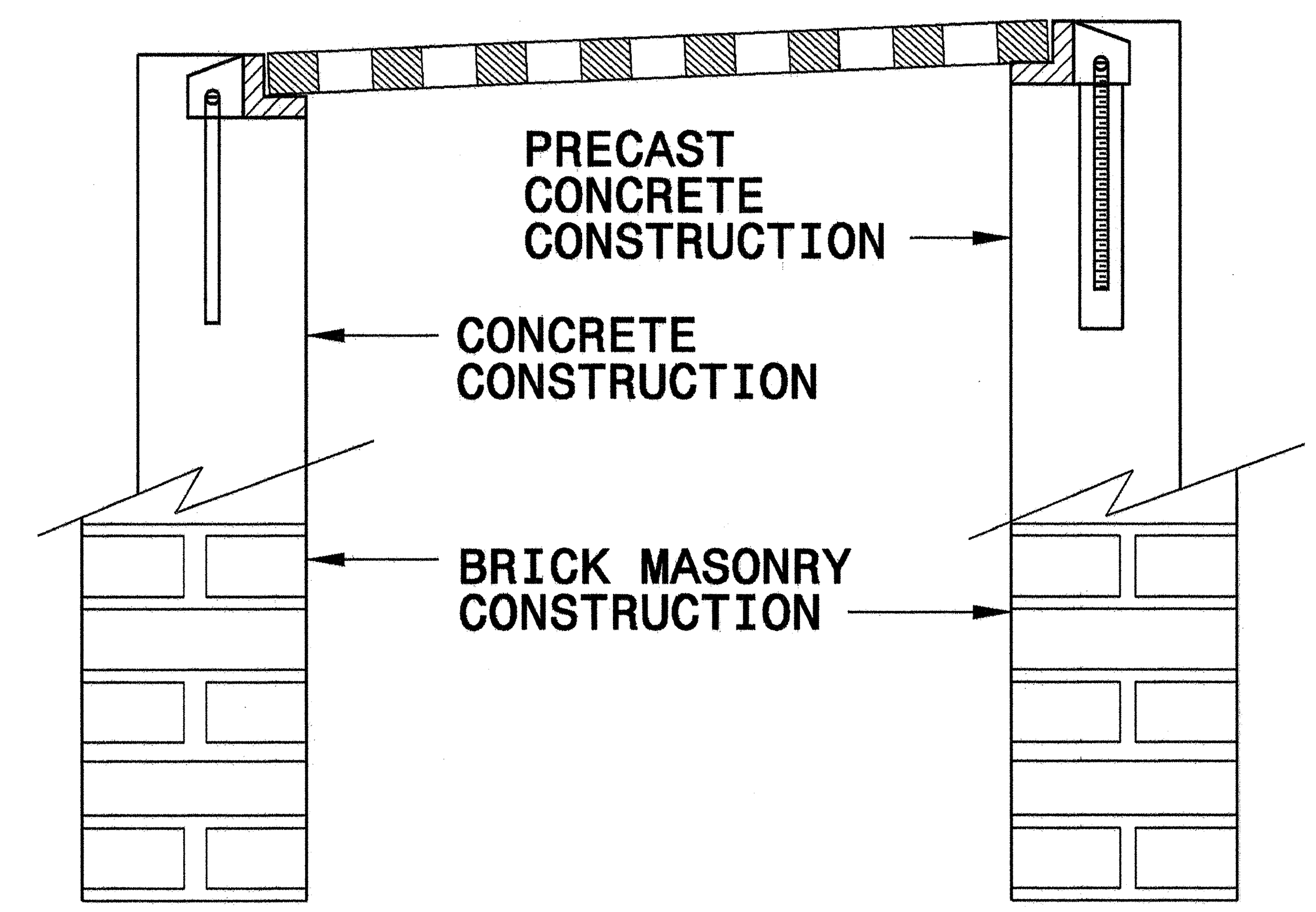
MASONRY ANCHOR
3⁄8" DIA. BOLT WITH PLATE



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 022366 ENGINEER JOEL S. HOWERTON
3/25/08

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

SEE PLATE FOR TITLE

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

27-SEP-2006 08:59
S:\Contracts\Contracts\Special Details\ricward\stds\06'Stds to Special Details\84025 Anchorage for Frames\0840d25.dgn
ricward AT PS222293

PROJECT REFERENCE NO.	SHEET
B-4252	2-G

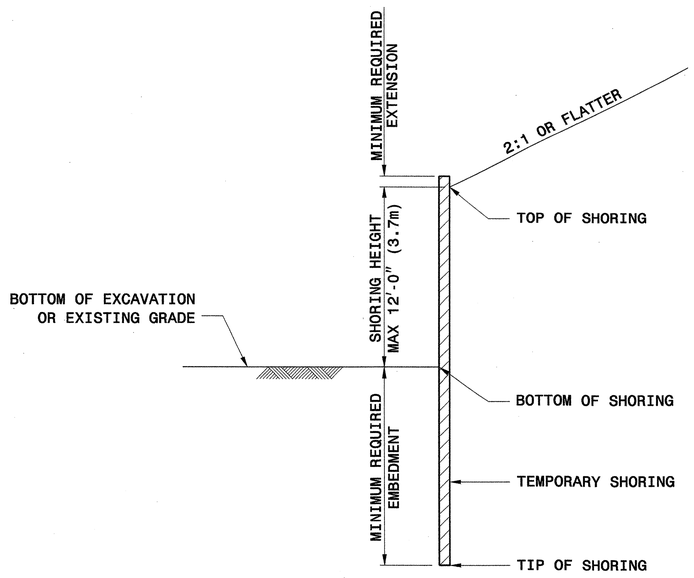
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A HIDDEN

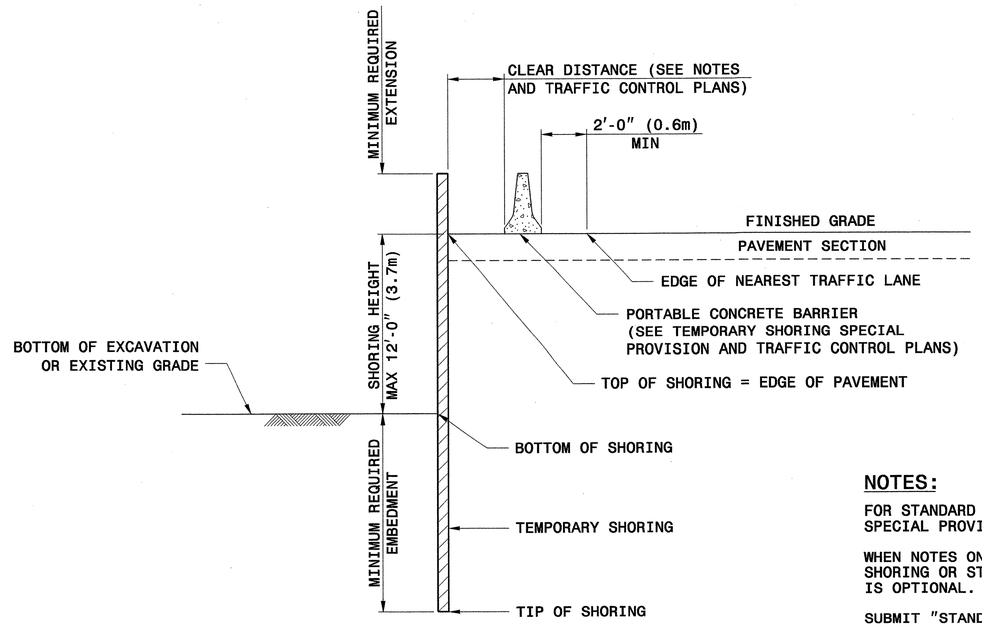
Scott A. Hidden 3/29/07
SIGNATURE DATE

ENGINEER

SIGNATURE DATE



SLOPE CASE



SURCHARGE CASE

GROUNDWATER CONDITION	SHORING HEIGHT FT (m)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H PILES WITH TIMBER LAGGING			SHEET PILES		H PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT FT (m)	MINIMUM REQUIRED SECTION MODULUS IN^3/FT (cm^3/m)	MINIMUM REQUIRED EMBEDMENT FT (m)			MINIMUM REQUIRED EMBEDMENT FT (m)	MINIMUM REQUIRED SECTION MODULUS IN^3/FT (cm^3/m)	MINIMUM REQUIRED EMBEDMENT FT (m)		
				HP 10x42 (HP 250x62)	HP 12x53 (HP 310x79)	HP 14x73 (HP 360x108)			HP 10x42 (HP 250x62)	HP 12x53 (HP 310x79)	HP 14x73 (HP 360x108)
GROUNDWATER ELEVATION BELOW TIP OF SHORING	< 6 (1.8)	7.5 (2.3)	3.0 (161)	8.0 (2.4)	8.0 (2.4)	8.0 (2.4)	11.0 (3.4)	10.0 (538)	9.5 (2.9)	9.5 (2.9)	9.5 (2.9)
	7 (2.1)	8.5 (2.6)	4.5 (242)	9.5 (2.9)	9.5 (2.9)	9.5 (2.9)	12.0 (3.7)	12.0 (645)	10.5 (3.2)	10.5 (3.2)	10.5 (3.2)
	8 (2.4)	10.0 (3.0)	6.5 (349)	10.5 (3.2)	10.5 (3.2)	10.5 (3.2)	12.5 (3.8)	14.0 (753)	11.5 (3.5)	11.5 (3.5)	11.5 (3.5)
	9 (2.7)	11.0 (3.4)	9.5 (511)	--	12.0 (3.7)	12.0 (3.7)	13.5 (4.1)	16.5 (887)	--	12.5 (3.8)	12.5 (3.8)
	10 (3.0)	12.5 (3.8)	13.0 (699)	--	--	13.5 (4.1)	14.0 (4.3)	19.5 (1048)	--	13.5 (4.1)	13.5 (4.1)
	11 (3.4)	13.5 (4.1)	17.0 (914)	--	--	14.5 (4.4)	15.0 (4.6)	22.5 (1210)	--	--	14.5 (4.4)
	12 (3.7)	15.0 (4.6)	21.5 (1156)	--	--	16.0 (4.9)	16.0 (4.9)	25.5 (1371)	--	--	15.5 (4.7)
GROUNDWATER ELEVATION BEWTEEN BOTTOM OF SHORING AND TIP OF SHORING	< 6 (1.8)	11.5 (3.5)	4.5 (242)	11.5 (3.5)	11.5 (3.5)	11.5 (3.5)	16.0 (4.9)	12.0 (645)	13.0 (4.0)	13.0 (4.0)	13.0 (4.0)
	7 (2.1)	13.0 (4.0)	7.0 (376)	13.0 (4.0)	13.0 (4.0)	13.0 (4.0)	17.0 (5.2)	14.5 (780)	14.5 (4.4)	14.5 (4.4)	14.5 (4.4)
	8 (2.4)	15.0 (4.6)	10.0 (538)	--	15.0 (4.6)	15.0 (4.6)	18.0 (5.5)	17.0 (914)	--	15.5 (4.7)	15.5 (4.7)
	9 (2.7)	17.0 (5.2)	14.0 (753)	--	17.0 (5.2)	17.0 (5.2)	19.0 (5.8)	20.0 (1075)	--	17.0 (5.2)	17.0 (5.2)
	10 (3.0)	18.5 (5.6)	19.5 (1048)	--	--	18.5 (5.6)	20.0 (6.1)	23.5 (1263)	--	--	18.5 (5.6)
	11 (3.4)	20.5 (6.3)	26.0 (1398)	--	--	--	21.0 (6.4)	28.0 (1505)	--	--	20.0 (6.1)
	12 (3.7)	22.5 (6.9)	33.0 (1774)	--	--	--	22.0 (6.7)	33.0 (1774)	--	--	21.5 (6.6)

NOTE: MINIMUM REQUIRED EXTENSION IS 6" (150mm) FOR "SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT" AND 32" (800 mm) FOR "SURCHARGE CASE WITH TRAFFFIC IMPACT".

NOTES:

FOR STANDARD TEMPORARY SHORING, SEE TEMPORARY SHORING SPECIAL PROVISION.

WHEN NOTES ON PLANS DO NOT PROHIBIT STANDARD TEMPORARY SHORING OR STANDARD SHORING, STANDARD TEMPORARY SHORING IS OPTIONAL.

SUBMIT "STANDARD TEMPORARY SHORING SELECTION FORM" AT LEAST 14 DAYS BEFORE BEGINNING SHORING CONSTRUCTION. UP TO THREE LOCATIONS MAY BE INCLUDED ON EACH SELECTION FORM.

STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING CONDITIONS:
1) MAXIMUM SHORING HEIGHT IS 12'-0" (3.7m).
2) TRAFFIC SURCHARGE IS 240 PSF (11.5 KPA) MAXIMUM OR BACKSLOPE IS 2:1 (H:V) OR FLATTER.
3) BOTTOM OF EXCAVATION OR EXISTING GRADE IN FRONT OF SHORING IS 6:1 (H:V) SLOPE OR FLATTER.
4) H PILE SPACING IS 6'-0" (1.8m).
5) H PILE EMBEDMENT DEPTHS ARE FOR DRIVEN PILES.
6) TIMBER LAGGING IS A MINIMUM OF 3" (75mm) THICK.

STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
TOTAL UNIT WEIGHT = 120 PCF (18.8 KN/M^3)
FRICTION ANGLE = 30 DEGREES
COHESION = 0 PSF (0 KPA)
GROUNDWATER IS ASSUMED TO BE BELOW BOTTOM OF SHORING.

DO NOT USE STANDARD TEMPORARY SHORING WHEN THE ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE OR GROUNDWATER IS ABOVE THE BOTTOM OF SHORING.

DO NOT USE STANDARD TEMPORARY SHORING WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS PRESENT WITHIN THE EMBEDMENT DEPTH.

VERIFY GROUNDWATER ELEVATION BEFORE BEGINNING SHORING CONSTRUCTION.

IF THE CLEAR DISTANCE AVAILABLE IS LESS THAN THE MINIMUM REQUIRED IN ACCORDANCE WITH THE TRAFFIC CONTROL PLANS, SET THE BARRIER AGAINST THE TRAFFIC SIDE OF THE SHORING AND USE THE "SURCHARGE CASE WITH TRAFFIC IMPACT".

AT THE CONTRACTOR'S OPTION, H PILE EMBEDMENT DEPTHS FOR PILES SET IN DRILLED HOLES MAY BE REDUCED BY 25%. FOR PILE EXCAVATION, SEE TEMPORARY SHORING SPECIAL PROVISION.

CONTROL DRAINAGE DURING CONSTRUCTION IN THE VICINITY OF THE SHORING. COLLECT AND DIRECT RUNOFF AWAY FROM SHORING.

CONTACT THE ENGINEER IF MINIMUM REQUIRED EMBEDMENT IS NOT ACHIEVED.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.01

STANDARD TEMPORARY SHORING

DATE: 2-20-07

PROJECT REFERENCE NO.	SHEET NO.
B-4252	3

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C201855

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0022000000-E	225	52,800	CY	UNCLASSIFIED EXCAVATION
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ********** (27+69.00)
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ********** (31+61.50)
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING
0057000000-E	226	3,400	CY	UNDERCUT EXCAVATION
0063000000-N	SP	Lump Sum		GRADING
0134000000-E	240	690	CY	DRAINAGE DITCH EXCAVATION
0195000000-E	265	300	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	300	SY	FABRIC FOR SOIL STABILIZATION
0199000000-E	SP	2,250	SF	TEMPORARY SHORING
0318000000-E	300	335	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS
0343000000-E	310	216	LF	15" SIDE DRAIN PIPE
0344000000-E	310	40	LF	18" SIDE DRAIN PIPE
0372000000-E	310	128	LF	18" RC PIPE CULVERTS, CLASS III
0378000000-E	310	72	LF	24" RC PIPE CULVERTS, CLASS III
0420000000-E	310	80	LF	66" RC PIPE CULVERTS, CLASS III
0708000000-E	310	120	LF	15" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
0806000000-E	310	10	EA	15" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK
0995000000-E	340	434	LF	PIPE REMOVAL
0996000000-N	350	1	EA	PIPE CLEAN-OUT
1121000000-E	520	269	TON	AGGREGATE BASE COURSE
1220000000-E	545	500	TON	INCIDENTAL STONE BASE
1489000000-E	610	4,350	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1498000000-E	610	2,600	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
1519000000-E	610	2,650	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
1560000000-E	620	469	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
1693000000-E	654	10	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
2000000000-N	806	65	EA	RIGHT OF WAY MARKERS
2022000000-E	815	1,400	CY	SUBDRAIN EXCAVATION
2033000000-E	815	700	CY	SUBDRAIN FINE AGGREGATE
2044000000-E	815	4,150	LF	6" PERFORATED SUBDRAIN PIPE
2055000000-E	815	125	EA	6" SUBDRAIN PIPE WYES, TEES, & ELBOWS
2066000000-N	815	9	EA	CONCRETE PAD FOR SUBDRAIN PIPE OUTLET
2077000000-E	815	54	LF	6" OUTLET PIPE (SUBDRAINS)
2190000000-N	828	2	EA	TEMPORARY STEEL PLATE COVERS FOR MASONRY DRAINAGE STRUCTURE
2220000000-E	838	6.3	CY	REINFORCED ENDWALLS
2253000000-E	840	0.893	CY	PIPE COLLARS
2286000000-N	840	9	EA	MASONRY DRAINAGE STRUCTURES
2366000000-N	840	3	EA	FRAME WITH TWO GRATES, STD 840.24
2367000000-N	840	6	EA	FRAME WITH TWO GRATES, STD 840.29
2556000000-E	846	337	LF	SHOULDER BERM GUTTER
2619000000-E	850	11	SY	4" CONCRETE PAVED DITCH
3030000000-E	862	1,487.5	LF	STEEL BM GUARDRAIL
3045000000-E	862	212.5	LF	STEEL BM GUARDRAIL, SHOP CURVED
3105000000-N	862	2	EA	STEEL BM GUARDRAIL TERMINAL SECTIONS
3150000000-N	862	10	EA	ADDITIONAL GUARDRAIL POSTS
3195000000-N	862	1	EA	GUARDRAIL ANCHOR UNITS, TYPE AT-1
3270000000-N	SP	7	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3317000000-N	862	8	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77
3360000000-E	863	320	LF	REMOVE EXISTING GUARDRAIL
3380000000-E	862	225	LF	TEMPORARY STEEL BM GUARDRAIL
3387000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE ********** TEMPORARY (B-77)
3389100000-N	SP	4	EA	GUARDRAIL ANCHOR UNITS, TYPE 350 TEMPORARY
3533000000-E	866	45	LF	CHAIN LINK FENCE, **' FABRIC (72")
3539000000-E	866	4	EA	METAL LINE POSTS FOR **' CHAIN LINK FENCE (72")
3545000000-E	866	1	EA	METAL TERMINAL POSTS FOR **' CHAIN LINK FENCE (72")
3628000000-E	876	165	TON	RIP RAP, CLASS I
3649000000-E	876	180	TON	RIP RAP, CLASS B
3656000000-E	876	1,225	SY	FILTER FABRIC FOR DRAINAGE
3659000000-N	SP	3	EA	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON
4072000000-E	903	361	LF	SUPPORTS, 3-LB STEEL U-CHANNEL
4096000000-N	904	2	EA	SIGN ERECTION, TYPE D
4102000000-N	904	15	EA	SIGN ERECTION, TYPE E
4108000000-N	904	1	EA	SIGN ERECTION, TYPE F
4155000000-N	907	33	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4400000000-E	1110	643	SF	WORK ZONE SIGNS (STATIONARY)
4405000000-E	1110	256	SF	WORK ZONE SIGNS (PORTABLE)
4410000000-E	1110	218	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4430000000-N	1130	113	EA	DRUMS
4435000000-N	1135	30	EA	CONES
4445000000-E	1145	332	LF	BARRICADES (TYPE III)
4450000000-N	1150	1,380	HR	FLAGGER
4465000000-N	1160	4	EA	TEMPORARY CRASH CUSHIONS
4480000000-N	1165	1	EA	TMIA
4485000000-E	1170	320	LF	PORTABLE CONCRETE BARRIER
4490000000-E	1170	320	LF	PORTABLE CONCRETE BARRIER (ANCHORED)
4510000000-N	SP	60	HR	POLICE
4516000000-N	1180	60	EA	SKINNY DRUM
4650000000-N	1251	283	EA	TEMPORARY RAISED PAVEMENT MARKERS
4770000000-E	1205	1,900	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (IV)
4780000000-E	1205	46	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (8") (IV)
4805000000-N	1205	2	EA	COLD APPLIED PLASTIC PAVEMENT MARKING SYMBOL, TYPE ** (IV)
4810000000-E	1205	82,856	LF	PAINT PAVEMENT MARKING LINES (4")
4820000000-E	1205	534	LF	PAINT PAVEMENT MARKING LINES (8")
4835000000-E	1205	808	LF	PAINT PAVEMENT MARKING LINES (24")
4845000000-N	1205	66	EA	PAINT PAVEMENT MARKING SYMBOL
4847000000-E	1205	22,744	LF	POLYUREA PAVEMENT MARKING LINES (4", **********) (STANDARD GLASS BEADS)
4847110000-E	1205	259	LF	POLYUREA PAVEMENT MARKING LINES (8", **********) (STANDARD GLASS BEADS)
4847140000-E	1205	227	LF	POLYUREA PAVEMENT MARKING LINES (24", **********) (STANDARD GLASS BEADS)
4847220000-N	1205	23	EA	POLYUREA PAVEMENT MARKING SYMBOL (**********) (STANDARD GLASS BEADS)
4850000000-E	1205	15,868	LF	REMOVAL OF PAVEMENT MARKING LINES (4")
4870000000-E	1205	100	LF	REMOVAL OF PAVEMENT MARKING LINES (24")
4900000000-N	1251	139	EA	PERMANENT RAISED PAVEMENT MARKERS
4915000000-E	1264	4	EA	7' U-CHANNEL POSTS
4955000000-N	1264	4	EA	OBJECT MARKERS (END OF ROAD)
5319000000-E	1505	5.5	CY	CLASS B CONCRETE FOR ENCASING UTILITY LINES
5325200000-E	1510	186	LF	2" WATER LINE
5325400000-E	1510	42	LF	4" WATER LINE
5325800000-E	1510	819	LF	8" WATER LINE
5326200000-E	1510	780	LF	12" WATER LINE
5326600000-E	1510	1,447	LF	16" WATER LINE
5538000000-E	1515	1	EA	4" VALVE
5546000000-E	1515	3	EA	8" VALVE
5558000000-E	1515	1	EA	12" VALVE
5558600000-E	1515	1	EA	16" VALVE
5606000000-E	1515	1	EA	2" BLOW OFF
5648000000-N	1515	2	EA	RELOCATE WATER METER
5649000000-N	1515	2	EA	RECONNECT WATER METER
5672000000-N	1515	5	EA	RELOCATE FIRE HYDRANT
5691100000-E	1520	28	LF	4" SANITARY GRAVITY SEWER
5691300000-E	1520	1,534	LF	8" SANITARY GRAVITY SEWER
5691400000-E	1520	268	LF	10" SANITARY GRAVITY SEWER
5775000000-E	1525	9	EA	4' DIA UTILITY MANHOLE
5781000000-E	1525	14	LF	UTILITY MANHOLE WALL, 4' DIA
5801000000-E	1530	2,333	LF	ABANDON 8" UTILITY PIPE
5802000000-E	1530	152	LF	ABANDON 10" UTILITY PIPE
5804000000-E	1530	803	LF	ABANDON 12" UTILITY PIPE
5810000000-E	1530	1,413	LF	ABANDON 16" UTILITY PIPE
5828000000-N	1530	7	EA	REMOVE UTILITY MANHOLE
5871900000-E	1550	275	LF	TRENCHLESS INSTALLATION OF 16" IN SOIL
5871910000-E	1550	250	LF	TRENCHLESS INSTALLATION OF 16" NOT IN SOIL
5876000000-N	SP	2	EA	STEEL PILE PIERS
6000000000-E	1605	5,530	LF	TEMPORARY SILT FENCE
6006000000-E	1610	310	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	970	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	400	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	12.5	ACR	TEMPORARY MULCHING
6018000000-E	1620	550	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	2.75	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	130	LF	TEMPORARY SLOPE DRAINS
6027000000-N	1622	3	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
6029000000-E	SP	900	LF	SAFETY FENCE
6030000000-E	1630	7,140	CY	SILT EXCAVATION
6036000000-E	1631	4,630	SY	MATTING FOR EROSION CONTROL
6037000000-E	SP	60	SY	COIR FIBER MAT
6038000000-E	SP	4,620	SY	PERMANENT SOIL REINFORCEMENT MAT
6042000000-E	1632	180	LF	1/4" HARDWARE CLOTH
6071010000-E	SP	540	LF	WATTLE
6071020000-E	SP	240	LB	POLYACRYLAMIDE (PAM)
6071030000-E	SP	1,560	LF	COIR FIBER BAFFLES
6071050000-E	SP	5	EA	**" SKIMMER (1-1/2")
6071050000-E	SP	3	EA	**" SKIMMER (2")
6071050000-E	SP	2	EA	**" SKIMMER (2-1/2")
6084000000-E	1660	16	ACR	SEEDING & MULCHING
6087000000-E	1660	9	ACR	MOWING
6090000000-E	1661	150	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	0.5	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	350	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	10.5	TON	FERTILIZER TOPDRESSING
6114000000-N	SP	4.5	HR	SPECIALIZED HAND MOWING
6117000000-N	SP	27	EA	RESPONSE FOR EROSION CONTROL
6123000000-E	1670	0.25	ACR	REFORESTATION
7060000000-E	1705	1,040	LF	SIGNAL CABLE
7120000000-E	1705	6	EA	VEHICLE SIGNAL HEAD (12", 3 SECTION)
7144000000-E	1705	6	EA	VEHICLE SIGNAL HEAD (12", 5 SECTION)
7252000000-E	1710	1,900	LF	MESSENGER CABLE (1/4")
7264000000-E	1710	590	LF	MESSENGER CABLE (3/8")
7300000000-E	1715	1,260	LF	UNPAVED TRENCHING (**********) (1, 2")
7324000000-N	1716	8	EA	JUNCTION BOX (STANDARD SIZE)
7360000000-N	1720	8	EA	WOOD POLE
7372000000-N	1721	18	EA	GUY ASSEMBLY
7408000000-E	1722	2	EA	1" RISER WITH WEATHERHEAD
7420000000-E	1722	8	EA	2" RISER WITH WEATHERHEAD
7432000000-E	1722	2	EA	2" RISER WITH HEAT SHRINK TUBING
7444000000-E	1725	1,100	LF	INDUCTIVE LOOP SAWCUT
7456000000-E	1726	2,430	LF	LEAD-IN CABLE (**********) (14-2)
7516000000-E	1730	2,050	LF	COMMUNICATIONS CABLE (**FIBER) (12)
7552000000-N	1731	2	EA	INTERCONNECT CENTER
7564000000-N	1732	2	EA	FIBER-OPTIC TRANSCEIVER, DROP & REPEAT
7568000000-N	SP	1	EA	FURNISH FIBER-OPTIC RESTORATION KIT
7574000000-N	SP	1	EA	FURNISH FIBER-OPTIC TRANSCEIVER
7684000000-N	1750	2	EA	SIGNAL CABINET FOUNDATION
7756000000-N	1751	2	EA	CONTROLLER WITH CABINET (TYPE 2070L, BASE MOUNTED)
7780000000-N	1751	10	EA	DETECTOR CARD (TYPE 2070L)
7901000000-N	1753	2	EA	CABINET BASE EXTENDER
8056000000-N	402	Lump Sum		REMOVAL OF EXISTING STRUCTURE AT STATION ********** (STATION -Y- 16+07)

******* BEGIN SCHEDULE AA *******
******* (3 ALTERNATES) *******

0366000000-E AA1	310	308	LF	15" RC PIPE CULVERTS, CLASS III
*** OR ***				
0366000000-E AA2	310	216	LF	15" RC PIPE CULVERTS, CLASS III
0536000000-E AA2	SP	92	LF	***" HDPE PIPE CULVERTS (15")
*** OR ***				
0366000000-E AA3	310	216	LF	15" RC PIPE CULVERTS, CLASS III
0540000000-E AA3	SP	92	LF	***" ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, ****" THICK (15", 0.064")

******* END SCHEDULE AA *******

8/12/2008

D8D9R341-BRIAN,2/12/2008,R:\Roadway\Proj\Drainage_summaries.xls

D8D9R341-BRIAN

COMPUTED BY:	BAW	DATE:	1/15/2008
CHECKED BY:	MAY	DATE:	1/25/2008

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
B-4252	3-A

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

Line	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) 12"	15"	18"	24"	30"	36"	42"	48"	Bituminous Coated C.S. Pipe Type B (Unless Noted Otherwise) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	Class III R.C. Pipe or C.S. Pipe, Type IR Aluminized or HDPE, Type S or D 12"	15"	18"	24"	30"	36"	42"	48"	15" Side Drain Pipe	18" Side Drain Pipe	24" Side Drain Pipe
L	14+10	R	1			620.0	EX				16																								
L	14+10	L	2			EX	617.8				8																								
L	14+50	R	3			—	—																										20		
Y	26+20	C	4			611.0	608.0				104																								
Y	24+00	R	5			612.0	611.1			64																									
L	25+00	L	6		572.2	569.5																													
L	25+25	L	6	OUT	572.2	569.5	567.0																			48									
EY	10+35	C	7			—	—																												
EY	11+90	C	8			—	—																												
EY	12+75	C	9			—	—																												
L	28+60	R	10		566.4	563.6																													
L	28+52	C	10	11		563.6	563.4			48																									
L	28+45	L	11		566.4	563.4																													
L	28+45	L	11	OUT		563.4	557.0											24																	
Y1	10+80	L	12		565.1	561.1																													
Y1	10+80	C	12	13		561.1	560.9			48																									
Y1	10+80	R	13		565.1	560.9																													
Y1	10+80	R	13	OUT		560.9	557.0											16																	
L	30+40	R	14		566.2	562.2																													
L	30+40	C	14	15		562.2	561.9			56																									
L	30+40	L	15		565.9	561.9																													
L	30+40	L	15	OUT		561.9	557.0											20																	
L	32+75	R	16			—	—																										52		
L	33+90	R	17			—	—																										48		
L	35+30	R	18			—	—																										48		
Y1	13+80	L	19			—	—																										24		
Y1	14+40	L	20			—	—																										24		
L	37+00	L	21			—	—																											40	
Y	14+50	L	22		583.4	580.6																													
Y	14+70	L	22	OUT		580.6	573.5											48																	
Y	17+00	L	24		580.4	576.2																													
Y	16+80	L	24	OUT	580.4	576.2	575.0																			44									
Y	17+08	L	25		582.0	582.0																													
Y	17+04	L	25	24	582.0	582.0	576.2											12																	
Y4	11+10	C	26			577.8	577.0					72																							
	SHEET TOTALS									216	128	72						120								92							216	40	

Station	Structure No. From	Structure No. To	Endwalls Std. 838.01 or Std. 838.11 (Unless Noted Otherwise) Cu. Yards R.C.P.	C.S.P.	Quanities 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	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	G.D.I. (N.S.) Frame with Two Grates Std. 840.29	Manhole Std. 840.51	M.H. Std. 840.51 or 840.53	M.H. Frame and Cover Std. 840.54	Berm Drain Outlet Std. 850.10	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
14+10	1																											0.4465		112	PIPE CLEANOUT
14+10	2																											0.4465			
14+50	3																														
26+20	4																													50	
24+00	5																														
25+00	6				1										1					1											
25+25	6	OUT																													
10+35	7																													60	
11+90	8																													42	
12+75	9																													38	
28+60	10				1										1							1									
28+52	10	11																													
28+45	11				1										1							1									
28+45	11	OUT																									2-15"				
10+80	12				1										1							1									
10+80	12	13																													
10+80	13				1										1							1									
10+80	13	OUT																									2-15"				
30+40	14				1										1							1									
30+40	14	15																													
30+40	15				1										1							1									
30+40	15	OUT																									2-15"				
32+75	16																														
33+90	17																														
35+30	18																														
13+80	19																													20	
14+40	20																													22	
37+00	21																													28	
14+50	22				1										1					1											
14+70	22	OUT																									2-15"				
17+00	24				1										1					1											
16+80	24	OUT																													
17+08	25																									1					
17+04	25	24																									2-15"				
11+10	26																													62	
SHEET TOTALS					9										9					3		6				1	10-15"	0.893		434	

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

4/04/06

COMPUTED BY: BAW DATE: 1/21/2008
CHECKED BY: MAY DATE: 1/25/2008

PROJECT REFERENCE NO.	SHEET NO.
B-4252	3-B

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 54" & OVER)

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: 54"	60"	66"	72"	78"	84"	BITUMINOUS COATED C.S. PIPE TYPE B SIZE: 54"	54" SHOP ELONGATED	60"	66"	72"	STRUCTURAL PLATE PIPE SIZE: 60"	66"	72"	REINFORCED ENDWALLS WITH R.C. - C.Y.	REINFORCED ENDWALLS WITH C.S. - C.Y.	MASONARY DRAINAGE STRUCTURES CUBIC YARDS	REINF. CONC. FLARED END SECTIONS NO. & SIZE	CORR. STEEL FLARED END SECTIONS NO. & SIZE	REINF. CONC. ELBOWS NO. & SIZE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD 840.72	PIPE REMOVAL LIN.FT.	REMARKS
THICKNESS OR GAUGE														.109	.138	.168	.138	.168	.138	.168	.138	.168	.138	.168	12	10	12	10	12	10									
–Y– 16+07	C	23			571.0	568.0				80															6.3												
TOTAL										80															6.3												

ABBREVIATIONS

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

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS XI MOD	B-77	GRAU 350	AT-1	XIII	CAT-1	VI MOD	BIC	TERM. END SECTION	IMPACT ATTENUATOR TYPE 350 EA	G	NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
–L–	25+30.78	27+12.03	LT	181.25			26+30	27+12.03	8	11	50		1			1	1											39		
–L–	25+00.97	27+25.97	RT	225.00			27+25.97		8	11	50		1			1	1											38		
–L–	28+25.97	31+04.53	RT	287.50			28+25.97	31+04.53	8	11						2												81		
–L–	28+12.03	–Y1– 12+00.00	LT	175.00	87.50		–Y1– 11+00		8	11	50		1			1	1											40		
–Y1–	11+50.00	–L– 31+18.47	LT	275.00	75.00			–Y1– 11+50	8	11		50		1		1	1											41		
–L–	32+18.47	36+74.72	LT	462.50			32+18.47	35+25	8	11		50		1		1	1											41		
–L–	32+04.53	32+35.00	RT	37.50	50.00		32+04.53		8	11	50		1			1		1										40		
–Y–	14+00.00	17+25.00	LT	325.00			15+00	16+25	8	11	50	50	1	1			2													
–EY–	13+40.00			25.00																			2							
		SUB TOTALS		1993.75	212.50											8	7	1					2					320		
		ANCHOR DEDUCTIONS:																												
		B-77	8 x 18.75'	–150.00																										
		GRAU-350	7 x 50'	–350.00																										
		AT-1	1 x 6.25'	–6.25																										
		TOTALS		1487.50	212.50																							320		
				ADDITIONAL POSTS – 10 EA.																										

"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

TEMPORARY GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	TEMPORARY ANCHORS XI MOD	B-77	GRAU 350	AT-1	XIII	CAT-1	VI MOD	BIC	TERM. END SECTION	IMPACT ATTENUATOR TYPE 350 EA	G	NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
–L–	25+77.10	27+45.85	LT OF EX. PVMT	168.75												1	1												
–L–	27+82.70	28+63.95	LT OF EX. PVMT	81.25												1	1												
–L–	30+27.15	31+33.40	LT OF EX. PVMT	106.25												1	1												
–L–	31+75.20	33+18.95	LT OF EX. PVMT	143.75												1	1												
		SUB TOTALS		500.00												4	4												
		B-77	4 x 18.75'	–75.00																										
		GRAU-350	4 x 50'	–200.00																										
		TOTALS		225.00																										

6/4/99

COMPUTED BY: BAW DATE: 1/21/2008
CHECKED BY: MAY DATE: 1/25/2008

PROJECT REFERENCE NO.	SHEET NO.
B-4252	3-C

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
SUMMARY NO. 1					
–L– 12+75 TO 27+19 (BRIDGE)	12388	1075	3695		9768
–Y– 13+15 TO 26+00	31308	2108	5402		28014
–Y4– 10+50 TO 13+00	336		1013	667	
–DR1– 10+20 TO 11+98.68	1411		0		1411
TOTAL SUMMARY NO. 1	45443	3183	10110	667	39193
SUMMARY NO. 2					
–L– 28+19 (BRIDGE) TO 31+11.50 (BRIDGE)	702		3578	2876	
–Y1– 10+50 TO 15+00	140		1424	1386	
TOTAL SUMMARY NO. 2	842	0	5002	4262	
SUMMARY NO. 3					
–L– 32+11.50 (BRIDGE) TO 41+50	6962		6663		299
TOTAL SUMMARY NO. 3	6962	0	6663		299
SUB–TOTAL SUMMARY NOS. 1 THRU 3	53247	3183	21775	4939	39594
EST. LOSS DUE TO CLEARING & GRUBBING	–450				–450
ADDITIONAL UNDRCUT		200	240	240	200
EARTH WASTE TO REPLACE BORROW				–5179	–5179
PROJECT TOTALS	52797	3383	22015	0	34165
SAY	52800	3400			34175

ESTIMATE DRAINAGE DITCH EXCAVATION = 690 CY
ESITMATE SHOULDER BORROW = 1400 CY
SELECT GRANULAR MATERIAL = 300 CY

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

2/13/2008
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COMPUTED BY: BAW DATE: 1/21/2008
CHECKED BY: MAY DATE: 1/25/2008

PROJECT REFERENCE NO.	SHEET NO.
B-4252	3-D

SUMMARY OF PAVEMENT REMOVAL

SURVEY LINE	STATION TO STATION	LOCATION	ASPHALT REMOVAL (SY)
–L–	22+00 TO 27+50	RT	1,111
–L–	27+90 TO 31+20	RT	1,211
–L–	31+70 TO 39+50	RT	1,350
–Y–	15+75 TO –Y4– 12+00	RT	861
–EY–	10+30 TO 13+40		875
	TOTAL		5,408
	SAY		5,410

2/12/2008
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kb & dsanders

10/26/98

PROJECT REFERENCE NO.	SHEET NO.
B-4252	3-E

PARCEL INDEX SHEET

PARCEL NO.	R/W SHEET NO.	PROPERTY OWNERS NAME
1	4	James D. Hodges & Linda Hodges
2	4	Leon W. & Joyce B. Wall
3	4,5	Jack A. & Ida P. Dillon
4	4	Wanda G. Grim
5	4,5,7	New Vision Fellowship, Inc.
6	5	Hugh D. Fallin III & Lynda G. Fallin
7	5	Gayle N. Brown
8	5	Thomas V. & Carolyn M. Cardwell
9	5	J.B.M. Sales & Rentals, Inc.
10	5	Bellwood Village, Inc. & Blanche W. Bell
11	5,6	Doris Martin Byrd
12	5,6	Randy R. & Patricia R. Martin
13	6	Gas Town, Inc.
14	6	John K. Lewis
15	7	Joyce B. Wall
16	7	Central Concrete Company
17	7	Town of Madison
18	5	Joey M. Dillion

2/12/2008
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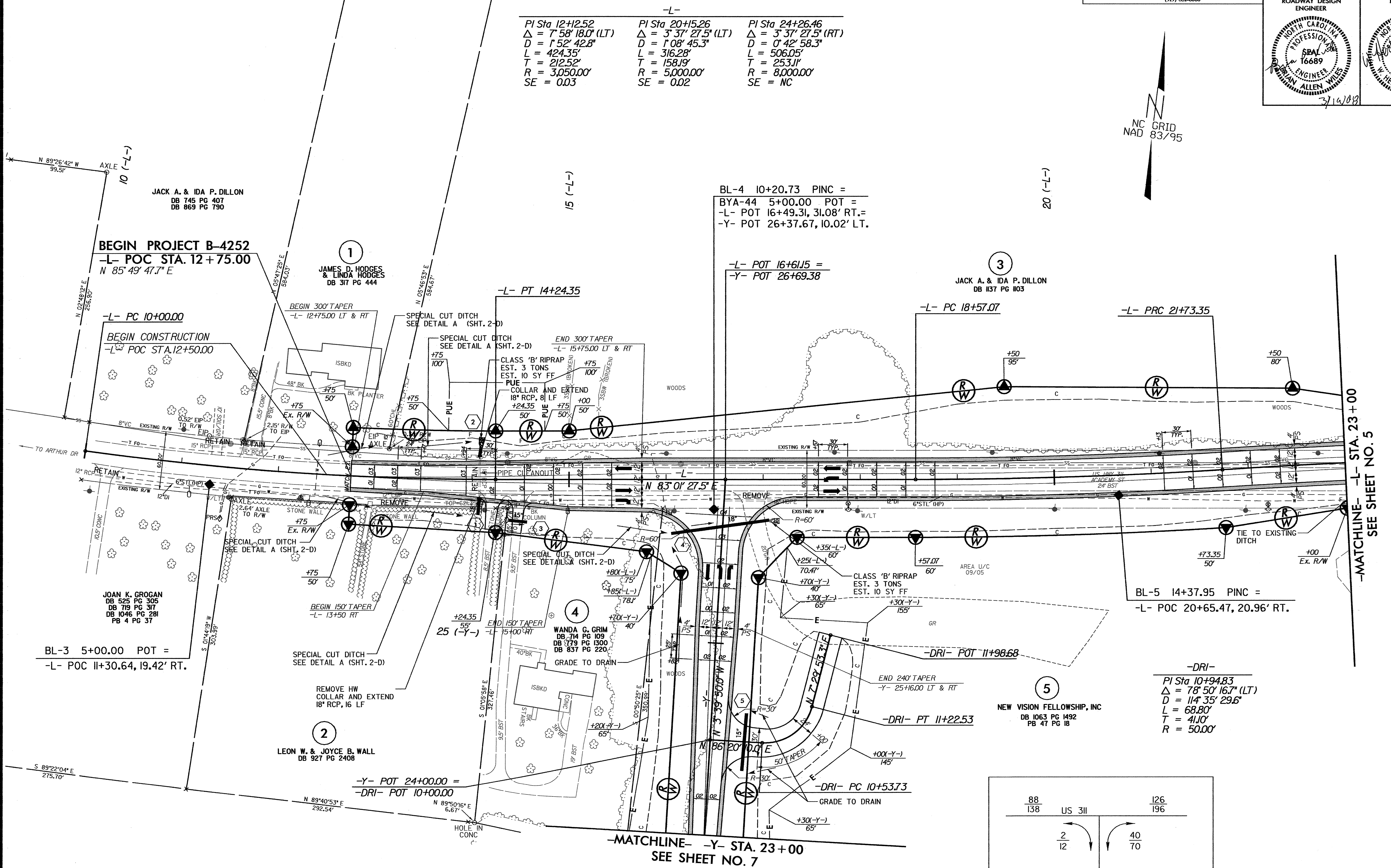
Ko & Associates, P.A.

KO & ASSOCIATES, P.C.
Consulting Engineers
5121 KINGDOM WAY, SUITE 100, RALEIGH, N.C. 27607
(919) 851-6066

PROJECT REFERENCE NO.	SHEET NO.
B-4252	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 16689 — BRIAN ALLEN WILES — 3/19/08	SEAL 021162 — W. HERBERT TURNER, JR. — 3/19/08

-L-

PI Sta 12+12.52	PI Sta 20+15.26	PI Sta 24+26.46
△ = 7° 58′ 18.0″ (LT)	△ = 3° 37′ 27.5″ (LT)	△ = 3° 37′ 27.5″ (RT)
D = 1° 52′ 42.8″	D = 1° 08′ 45.3″	D = 0° 42′ 58.3″
L = 424.35′	L = 316.28′	L = 506.05′
T = 212.52′	T = 158.19′	T = 253.11′
R = 3,050.00′	R = 5,000.00′	R = 8,000.00′
SE = 0.03	SE = 0.02	SE = NC



-DRI-

PI Sta 10+94.83
△ = 78° 50′ 16.7″ (LT)
D = 114° 35′ 29.6″
L = 68.80′
T = 41.10′
R = 50.00′

US 311: 88/138 — 126/196
2/12 — 40/70
SR 1138: 42/82

2003 ADT
2025 ADT

PROJECT TRAFFIC VOLUMES (IN HUNDREDS)

LEGEND

- PAVED SHOULDER
- APPROACH SLAB

FOR -L- PROFILE, SEE SHEET NO. 8
FOR -Y- PROFILE, SEE SHEET NO. 9
FOR -Y4- PROFILE, SEE SHEET NO. 10
FOR -DRI- PROFILE, SEE SHEET NO. 10
FOR DITCH DETAILS, SEE SHEET NO. 2-D

3/18/2008
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8/17/99


KO & ASSOCIATES, P.C.
Consulting Engineers
5121 KINGDOM WAY, SUITE 100, RALEIGH, N.C. 27607
(919) 851-6066
PROJECT REFERENCE NO. B-4252
SHEET NO. 5
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 16689 ENGINEER BRIAN ALLEN WILES
NORTH CAROLINA PROFESSIONAL SEAL 021162 ENGINEER HERBERT TURNER, JR.
3/6/08
PAVEMENT - BRIDGE RELATIONSHIP SKETCH
TYPE B-77
* GUARDRAIL ANCHORS
SR 1169
US 311
2003 ADT
2025 ADT
PROJECT TRAFFIC VOLUMES (IN HUNDREDS)
NC GRID NAD 83/95
-YI- POT 15+19.00
END CONSTRUCTION -YI- STA.15+00.00
BYI-17 5+00.00 POT = -YI- POT 14+57.34, 19.05' LT.
-L-
PI Sta 24+26.46 Δ = 3°37' 27.5" (RT) D = 0°42' 58.3" L = 506.05' T = 253.11' R = 8,000.00' SE = NC
PI Sta 34+63.88 Δ = 2°57' 51.2" (RT) D = 0°42' 58.3" L = 413.89' T = 206.99' R = 8,000.00' SE = NC
BYI-16 9+27.66 PINC = -L- POT 29+12.66, 29.50' LT. = -YI- POT 10+29.73, 25.24' LT.
END APPROACH SLAB -L- STA.28+43.14
END BRIDGE -L- STA.28+19.00
BEGIN APPROACH SLAB -L- STA.30+87.36
BEGIN BRIDGE -L- STA.31+11.50
-L- PT 26+79.40
BEGIN BRIDGE -L- STA.27+19.00
BEGIN APPROACH SLAB -L- STA.26+94.86
END BRIDGE -L- STA.32+11.50
END APPROACH SLAB -L- STA.32+35.64
-EY- POT 10+00.00 = -L- POC 26+32.03, 25.86' RT.
BL-6 19+53.98 PINC = BY-46 5+00.00 POT = -L- POC 25+82.28, 46.12' RT.
BL-7 25+48.28 PINC = BYI-47 12+02.49 POT = -L- POT 31+77.14, 45.21' RT.
-L- POT 29+38.16 = -YI- POT 10+00.00
-EY- PC 12+71.32
-EY- POCC 14+55.28
BY-13 8+61.92 PINC -L- POC 25+74.59, 407.97' RT.
-L- PC 32+56.89
BL-1 29+44.14 PINC = "GPS B4252-1" = -L- POC 35+74.63, 38.90' RT.
-MATCHLINE- -L- STA. 23+00 SEE SHEET NO. 4
-MATCHLINE- -L- STA. 36+00 SEE SHEET NO. 6
N 83°01' 27.5" E
3 JACK A. & IDA P. DILLON DB 1137 PG 1103
6 HUGH D. FALLIN III & LYNDA G. FALLIN DB 755 PG 860
7 GAYLE N. BROWN DB 1230 PG 1658
HAROLD R. & ROBYN T. NEAL DB 799 PG 18 PB 7 PG 99
RALPH E. McCRACKEN & CHRISTINE McCRACKEN DB 1237 PG 1231 PB 7 PG 99
10 BELLWOOD VILLAGE, INC. & BLANCHE W. BELL DB 1094 PG 1809
11 DORIS MARTIN BYRD DB 675 PG 302
5 NEW VISION FELLOWSHIP, INC DB 1063 PG 1492 PB 47 PG 18
8 THOMAS V. & CAROLYN M. CARDWELL DB 725 PG 144
9 J.B.M. SALES & RENTALS, INC DB 989 PG 1920 PB 5 PG 29
18 JOEY M. DILLON DB 974 PG 1600
12 RANDY R. & PATRICIA R. MARTIN DB 1049 PG 2248 PB 5 PG 29
LATERAL BASE DITCH W/CLASS 'B' RIPRAP EST. 86 TONS EST. 242 FF EST. DDE 160 CY SEE DETAIL C (SHT. 2-D)
CL 'I' RIPRAP @ EMBANKMENT EST. 10 TONS EST. 16 SY FF SEE DETAIL D (SHT. 2-D)
PREFORMED SCOUR HOLE SEE DETAIL E (SHT. 2-D)
CLASS II RIPRAP UP TO SHOULDER PT. (TYP.) (STR. PAY ITEM)
SPECIAL CUT DITCH SEE DETAIL A (SHT. 2-D)
CUT/FILL TRANSISTION CLASS 'B' RIPRAP EST. 1 TON EST. 5 SY FF
END SHOULDER BERM GUTTER -YI- STA. 10+85 LT & RT.
END 200' TAPER -YI- 14+75.00 LT & RT
BEGIN 200' TAPER -YI- 12+75.00 LT & RT
15" CSP W/ELBOWS, RODS AND LUG CONNECTORS
BEGIN 300' TAPER -L- 33+00.00 LT & RT
END 300' TAPER -L- 36+00.00 LT & RT
TOE PROTECTION EST. 53 TONS CL 'B' EST. 133 SY FF SEE DETAIL H (SHT. 2-D)
60 LF TAIL DITCH W/PSRM 4' BASE W/2:1 SIDES EST. 72 SY EST. DDE 105 CY SEE DETAIL F (SHT. 2-D)
40 LF TAIL DITCH 2' BASE W/2:1 SIDES EST. DDE 24 CY SEE DETAIL G (SHT. 2-D)
40 LF TAIL DITCH W/PSRM 2' BASE W/2:1 SIDES EST. 39 SY EST. DDE 24 CY SEE DETAIL F (SHT. 2-D)
STRUCTURE EXCAVATION
REMOVE 24' CMP
REMOVE 15" RCP
DECK DRAINS ARE NOT REQUIRED
END SHOULDER BERM GUTTER STA. 28+64 RT.
END SHOULDER BERM GUTTER STA 30+35 RT.
EXCAVATED TO ELIMINATE CUT DITCH
CL 'I' RIPRAP @ EMBANKMENT EST. 30 TONS EST. 48 SY FF SEE DETAIL D (SHT. 2-D)
GRADE TO DRAIN
REMOVE 60' OF 72" CHAIN LINK FENCE PAVE BETWEEN PARKING LOTS AS DIRECTED PLACE 45' OF 72" CHAIN LINK FENCE
HORSE PASTURE (NO EVIDENT FENCE)
TEMPORARY SEDIMENT BASIN
6-BAY (BK) CAR WASH STORM SYSTEM FLOWS AWAY FROM -L-
-EY-
PI Sta 13+64.12 Δ = 18°39' 16.5" (RT) D = 10°08' 27.0" L = 183.96' T = 92.80' R = 565.00'
PI Sta 15+10.30 Δ = 4°20' 47.7" (RT) D = 3°57' 05.2" L = 110.00' T = 55.03' R = 1,450.00'
LEGEND
PAVED SHOULDER
APPROACH SLAB
FOR TEMP. GUARDRAIL LOCATION, SEE SHEET NO. 2-E
FOR -L- PROFILE, SEE SHEET NO. 8
FOR -YI- PROFILE, SEE SHEET NO. 10
FOR DITCH DETAILS, SEE SHEET NO. 2-D
REVISIONS
8/17/99
3/6/2008

8/17/99

KO & ASSOCIATES, P.C.
Consulting Engineers
5121 KINGDOM WAY, SUITE 100, RALEIGH, N.C. 27607
(919) 851-6066

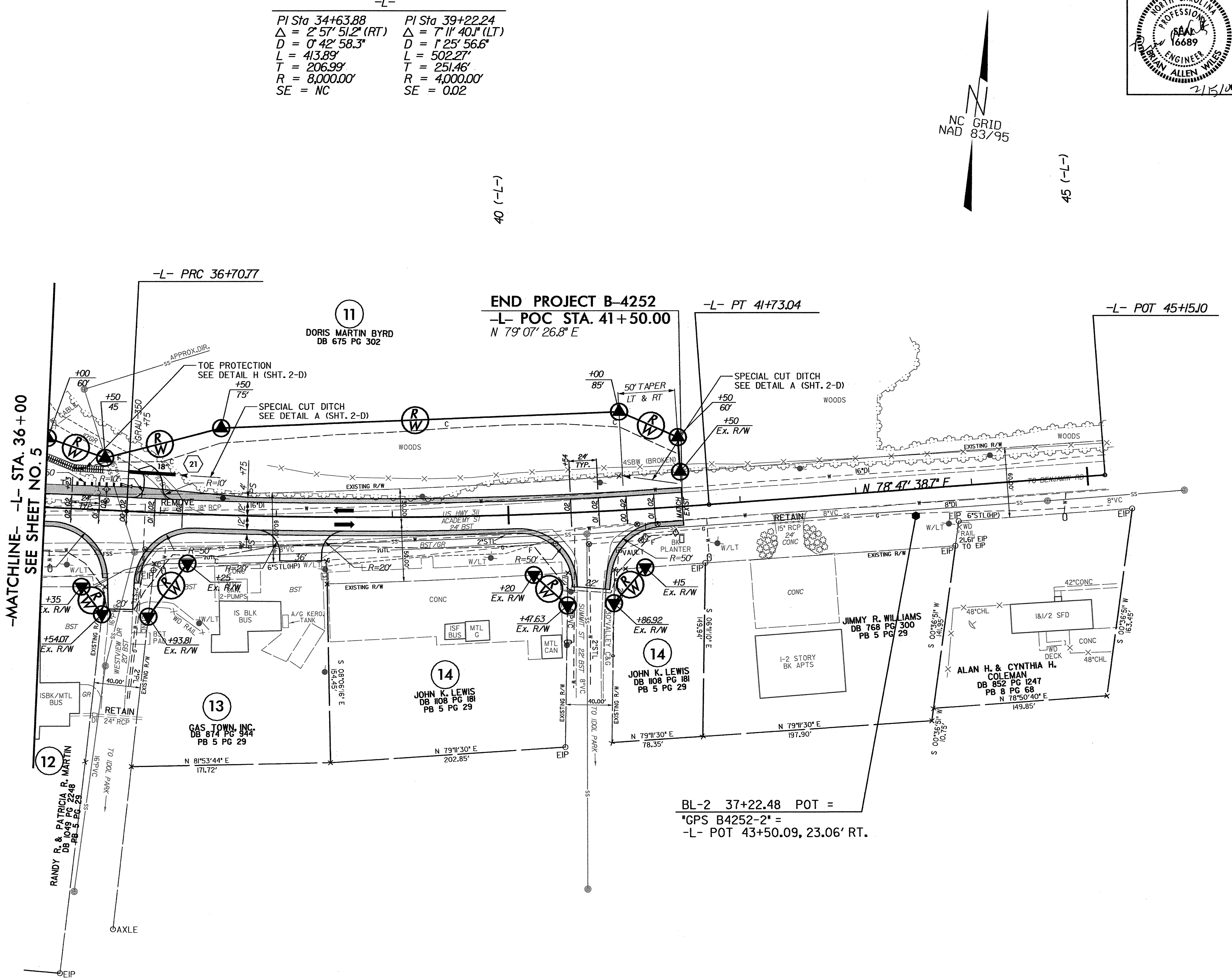
PROJECT REFERENCE NO.	SHEET NO.
B-4252	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 16689 BRIAN ALLEN WILES 2/15/08

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 021162 W. HERBERT TURNER, JR. 2-15-08

-L-

PI Sta 34+63.88	PI Sta 39+22.24
Δ = 2° 57′ 51.2″ (RT)	Δ = 7° 11′ 40.1″ (LT)
D = 0° 42′ 58.3″	D = 1° 25′ 56.6″
L = 413.89′	L = 502.27′
T = 206.99′	T = 251.46′
R = 8,000.00′	R = 4,000.00′
SE = NC	SE = 0.02



LEGEND

PAVED SHOULDER

APPROACH SLAB

FOR -L- PROFILE, SEE SHEET NO. 9
FOR DITCH DETAILS, SEE SHEET NO. 2-D

2/12/2008
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Ko & Associates, P.C.

8/17/99

REVISIONS

KO & ASSOCIATES, P.C.
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5121 KINGDOM WAY, SUITE 100, RALEIGH, N.C. 27607
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PROJECT REFERENCE NO.	SHEET NO.
B-4252	7
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 16689 ENGINEER BRIAN ALLEN WILES — 2/15/08

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 021162 ENGINEER HERBERT TURNER JR. — 2-15-08

NAD 83 GRID 83/95

-Y-
PI Sta 12+62.36
Δ = 1° 10' 34.6" (RT)
D = 0° 34' 22.6"
L = 205.30'
T = 102.65'
R = 10,000.00'

PI Sta 16+89.06
Δ = 54° 56' 21.7" (LT)
D = 11° 27' 33.0"
L = 479.44'
T = 259.95'
* R = 500.00'
SE = 0.040

* DESIGN EXCEPTION REQUIRED

-Y- POT 10+00.00

N 01°21'35" E 200.31'

N 44°13' BM #2 33.0' W FROM BY-10 TO BM #2 ELEV=603.11' 177.32'

BEGIN CONSTRUCTION
-Y- POC STA.13+15.00
N 50° 59' 20.3" E

-Y- PC 14+29.11

-Y- PC 11+59.71

BY-10 26+34.88 POT
-Y- POT 11+49.90, 28.11' RT.

-Y- PT 13+65.01

-Y- PT 19+08.55

-Y- POC 17+63.95 =
-Y4- POT 10+00.00

BEGIN 240' TAPER
-Y- 22+76.00 LT & RT

-MATCHLINE- -Y- STA. 23+00
SEE SHEET NO. 4

BYA-15 9+78.52 PINC =
-Y- POT 21+63.15, 51.78' RT.

BYA-14 12+64.76 PINC =
-Y- POC 18+82.45, 80.35' RT.

-Y4- PC 10+66.95

-Y4-
PI Sta 11+61.83
Δ = 35° 06' 10.5" (LT)
D = 19° 05' 54.9"
L = 183.80'
T = 94.89'
R = 300.00'
SE = 0.040

-Y4- PT 12+50.75

END CONSTRUCTION
-Y4- STA.13+00.00

-Y4- POT 14+69.80 =
-EY- PT 21+59.29

-EY- POC 19+84.29

-EY- POC 18+14.29

-EY- PC 17+22.29

BY-11 20+06.53 PINC =
BYA-41 14+75.22 POT =
-Y- POC 17+16.97, 142.28' RT. =
-Y4- POC 11+31.69, 57.91' RT.

BY-12 14+40.76 PINC

-EY-
PI Sta 20+72.33
Δ = 15° 32' 43.3" (RT)
D = 8° 52' 59.0"
L = 175.00'
T = 88.04'
R = 645.00'

PI Sta 19+00.70
Δ = 25° 17' 58.0" (RT)
D = 14° 52' 55.3"
L = 170.00'
T = 86.41'
R = 385.00'

PI Sta 17+68.34
Δ = 6° 12' 05.1" (RT)
D = 6° 44' 26.4"
L = 92.00'
T = 46.04'
R = 850.00'

75 LF CHANNEL IMPROVEMENT
2' BASE W/2:1 SIDES &
CLASS 'I' RIPRAP
8.0% MAX. SLOPE
EST. 65 TONS
EST. 108 SY FF
EST. DDE 25 CY
SEE DITCH DETAIL M (SHT. 2-D)

LATERAL BASE DITCH
W/ CL 'B' RIPRAP
EST. 22 TONS
EST. 63 SY FF
EST. DDE 77 CY
SEE DETAIL C (SHT. 2-D)

CLASS 'B' RIPRAP
EST. 2 TONS
EST. 5 SY FF

LATERAL 'Y' DITCH
EST. DDE 65 CY
SEE DETAIL L (SHT. 2-D)
CLASS 'B' RIPRAP
EST. 2 TONS
EST. 5 SY FF

SPECIAL CUT DITCH
SEE DETAIL A
(SHT. 2-D)

15" CSP W/ELBOWS, RODS AND LUG CONNECTORS

ROADWAY CUT DITCH
W/PSRM
EST. 567 SY
SEE DETAIL K
(SHT. 2-D)

ROADWAY CUT DITCH
W/PSRM
EST. 454 SY
SEE DETAIL K (SHT. 2-D)

ROADWAY CUT DITCH
W/PSRM
EST. 87 SY
SEE DETAIL K (SHT. 2-D)

SPECIAL CUT DITCH
SEE DETAIL A
(SHT. 2-D)

BDO

REMOVE EXIST.
4' x 5' RCBC

BURY 66" PIPE
INVERTS 1' BELOW
NATURAL STREAM BED

CLASS 'I' RIPRAP
ON BANKS ONLY
EST. 48 TONS
EST. 89 SY FF

CL 'I' RIPRAP @
EMBANKMENT
EST. 10 TONS
EST. 16 SY FF
SEE DETAIL D
(SHT. 2-D)

22 LF CHANNEL IMPROVEMENT
4' BASE W/2:1 SIDES
0.45% MAX SLOPE
EST. DDE 110 CY
SEE DETAIL I (SHT. 2-D)

160 LF TAILDITCH
4' BASE W/2:1 SIDES
4.75% MAX SLOPE
EST. DDE 95 CY
SEE DETAIL G (SHT. 2-D)

CLASS 'B' RIPRAP
EST. 5 TONS
EST. 14 SY FF

TEMPORARY SEDIMENT BASIN

WATER STORAGE BASIN (IN USE)

WATER STORAGE BASIN (NOT IN USE)

NOTE: NO SITE WORK WAS PERFORMED INSIDE OF PLANT AREA

SMALL GROWTH VEGETATION AND SCATTERED TREES

AREA U/C 09/05

(15) JOYCE B. WALL DB 1046 PG 278

(16) CENTRAL CONCRETE COMPANY DB 894 PG 1708

(5) NEW VISION FELLOWSHIP, INC DB 1063 PG 1492 PB 47 PG 18

(17) TOWN OF MADISON DB 663 PG 638

LEGEND
PAVED SHOULDER
PAVEMENT REMOVAL

FOR -Y- PROFILE, SEE SHEET NO. 9
FOR -Y4- PROFILE, SEE SHEET NO. 10
FOR DITCH DETAILS, SEE SHEET NO. 2-D

2/12/2008
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KO & ASSOCIATES, P.C.
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5121 KINGDOM WAY, SUITE 100, RALEIGH, N.C. 27607
(919) 851-6066

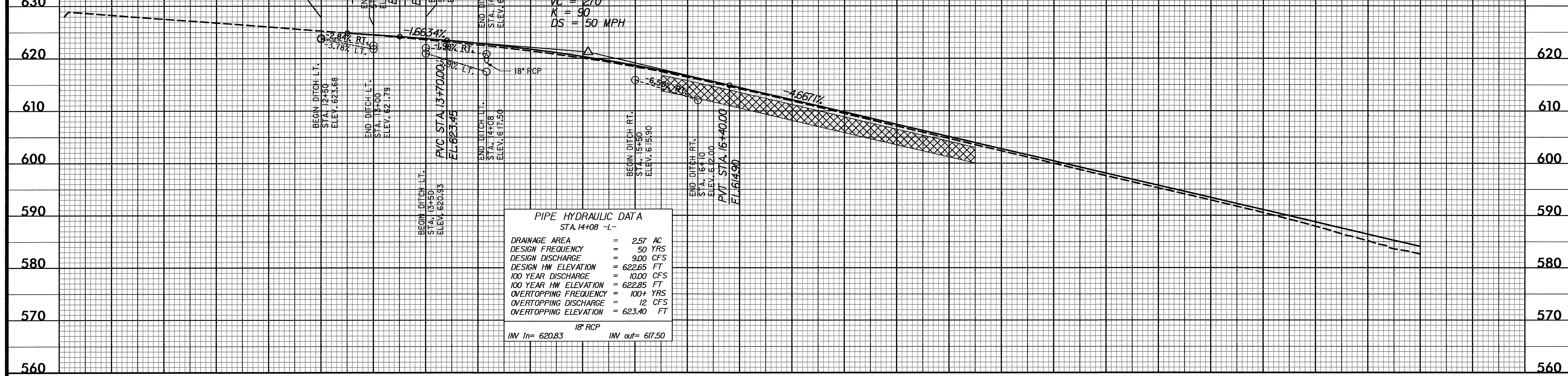
PROJECT REFERENCE NO.	SHEET NO.
B-4252	8

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 16889 BRIAN ALLEN WILES — 2/15/08

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 021162 W. HERBERT TURNER, JR — 2-15-08

-L- (US 311)

FOR PLAN SEE SHEET NO.4



PIPE HYDRAULIC DATA
STA. 14+08 -L-

DRAINAGE AREA	=	2.57	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	9.00	CFS
DESIGN HW ELEVATION	=	622.65	FT
100 YEAR DISCHARGE	=	10.00	CFS
100 YEAR HW ELEVATION	=	622.85	FT
OVERTOPPING FREQUENCY	=	100+	YRS
OVERTOPPING DISCHARGE	=	12	CFS
OVERTOPPING ELEVATION	=	623.40	FT

18" RCP
INV In= 620.83 INV out= 617.50

-L- (US 311)

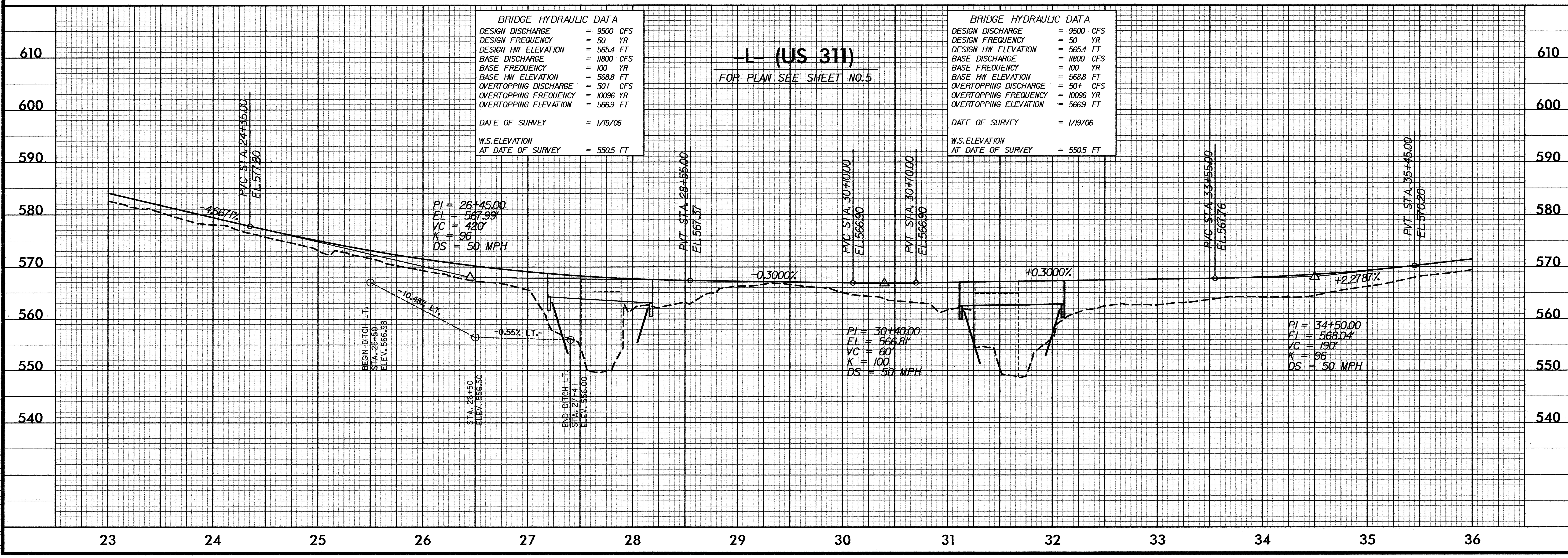
FOR PLAN SEE SHEET NO.5

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	9500	CFS
DESIGN FREQUENCY	=	50	YR
DESIGN HW ELEVATION	=	565.4	FT
BASE DISCHARGE	=	11800	CFS
BASE FREQUENCY	=	100	YR
BASE HW ELEVATION	=	568.8	FT
OVERTOPPING DISCHARGE	=	50+	CFS
OVERTOPPING FREQUENCY	=	10096	YR
OVERTOPPING ELEVATION	=	566.9	FT
DATE OF SURVEY	=	1/19/06	
W.S.ELEVATION AT DATE OF SURVEY	=	550.5	FT

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	9500	CFS
DESIGN FREQUENCY	=	50	YR
DESIGN HW ELEVATION	=	565.4	FT
BASE DISCHARGE	=	11800	CFS
BASE FREQUENCY	=	100	YR
BASE HW ELEVATION	=	568.8	FT
OVERTOPPING DISCHARGE	=	50+	CFS
OVERTOPPING FREQUENCY	=	10096	YR
OVERTOPPING ELEVATION	=	566.9	FT
DATE OF SURVEY	=	1/19/06	
W.S.ELEVATION AT DATE OF SURVEY	=	550.5	FT



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5/28/99

REVISIONS

R/W Revision 12/19/07 Revised Grade for -Y-, -Y4- & -DRI-. Revised R/W on Parcels 5 and 15. Revised Easements on Parcels 4 and 5

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5121 KINGDOM WAY, SUITE 100, RALEIGH, N.C. 27607
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PROJECT REFERENCE NO.	SHEET NO.
B-4252	9

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 16689 ENGINEER BRIAN ALLEN WILES
2/15/08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 021162 ENG. HERBERT TURNER, JR.
2-19-08

-L- (US 311)
FOR PLAN SEE SHEET NO.6

FEATHER TO EXIST

END GRADE -L- STA.41+00.00 EL.582.85

END CONSTRUCTION -L- STA.41+50.00

+2.27867%

+4.20% LT.

+4.38% LT.

BEGIN DITCH LT. STA. 36+25 ELEV. 566.38

END DITCH LT. STA. 37+50 ELEV. 572.24

BEGIN DITCH LT. STA. 41+00 ELEV. 580.21

END DITCH LT. STA. 41+50 ELEV. 582.40

PIPE HYDRAULIC DATA
STA. 16+07 -Y-

DRAINAGE AREA	=	104 AC
DESIGN FREQUENCY	=	25 YRS
DESIGN DISCHARGE	=	85.00 CFS
DESIGN HW ELEVATION	=	577.70 FT
100 YEAR DISCHARGE	=	130 CFS
100 YEAR HW ELEVATION	=	576.79 FT
OVERTOPPING FREQUENCY	=	500+ YRS
OVERTOPPING DISCHARGE	=	327 CFS
OVERTOPPING ELEVATION	=	584.15 FT

66" RCP
INV In= 571.0 INV out= 568.0

-Y- (SR 1138)
FOR PLAN SEE SHEET NO. 4 & 7

PI = 23+50.00
EL = 617.50'
VC = 100'
* K = 47
DS = 40 MPH
* DESIGN EXCEPTION REQUIRED

PVT STA.26+10.00 EL.613.53

PVT STA.26+50.00 EL.613.58

-L- STA.26+63.38 = -Y- STA.26+61.15 EL.613.91

(-)1.5250%

(+)1.7718%

18" RCP

PI = 14+15.00
EL = 587.56'
VC = 70'
K = 150
DS = 60 MPH

BEGIN DITCH LT. STA. 13+15 ELEV. 588.60

END DITCH LT. STA. 13+50 ELEV. 587.60

BEGIN DITCH RT. STA. 13+15 ELEV. 587.67

END DITCH RT. STA. 13+50 ELEV. 586.67

2.86% LT.

2.86% RT.

(-)12.5231%

(-)12.9886%

BEGIN CONSTRUCTION -Y- STA.13+15.00

BEGIN GRADE STA.13+50.00 EL.586.20

PVC STA.13+80.00 EL.586.44

PVRC STA.14+50.00 EL.586.51

66" RCP

-1.50% LT.

+5.00% LT.

PI = 17+65.00
EL = 577.10
VC = 630'
* K = 64
DS = 40 MPH
* DESIGN EXCEPTION REQUIRED

BEGIN DITCH LT. STA. 15+40 ELEV. 573.30

STA. 15+00 ELEV. 572.00

END DITCH LT. STA. 16+50 ELEV. 575.00

PVT STA.20+90.00 EL.598.85

PVC STA.21+50.00 EL.603.89

PVT STA.23+50.00 EL.614.45

PI = 26+30.00
EL = 613.25'
VC = 40'
K = 12

PIPE HYDRAULIC DATA
STA. 26+23 -Y-

DRAINAGE AREA	=	0.69 AC
DESIGN FREQUENCY	=	25 YRS
DESIGN DISCHARGE	=	3.90 CFS
DESIGN HW ELEVATION	=	612.13 FT
100 YEAR DISCHARGE	=	4.90 CFS
100 YEAR HW ELEVATION	=	612.22 FT
OVERTOPPING FREQUENCY	=	500+ YRS
OVERTOPPING DISCHARGE	=	15 CFS
OVERTOPPING ELEVATION	=	614.20 FT

18" RCP
INV In= 611.00 INV out= 608.00

FEATHER TO EXIST

2/12/2008
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PROJECT REFERENCE NO.	SHEET NO.
B-4252	10

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 16889 ENGINEER JOHN ALLEN WILES
2/14/08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 021162 ENGINEER HERBERT TURNER, JR.
2-19-08

REVISIONS

5/28/99 R/W Revision 12/19/07 Revised Grade for -Y-, -Y4- & -DR1-. Revised R/W on Parcels 5 and 15. Revised Easements on Parcels 4 and 5

-Y1- (SR 1169)

FOR PLAN SEE SHEET NO.5

-Y1- STA.10+00.00 = -L- STA.29+38.16
EL. 567.12
PVC STA.10+20.00
EL. 566.72
PVT STA.11+20.00
EL. 565.48
PVC STA.11+50.00
EL. 565.33
-2.0000%
-0.4870%
PI = 10+70.00
EL = 565.72'
VC = 100'
K = 66
DS = 40 MPH
PI = 13+00.00
EL = 564.60'
VC = 300'
K = 186
DS = 70 MPH
FEATHER TO EXIST
END GRADE
PVT STA.14+50.00
EL. 566.29
+1.1250%
+3.36% LT.
END CONSTRUCTION
-Y1- STA.15+00.00
BEGIN DITCH LT.
STA. 14+50
ELEV. 563.32
END DITCH LT.
STA. 15+00
ELEV. 565.00

-Y4- (SR 1138)

FOR PLAN SEE SHEET NO.7

-Y4- STA.10+00.00 = -Y- STA.17+63.95
EL. 584.87
(+)3.8446%
(+)0.5329%
PI = 10+90.00
EL = 585.75'
VC = 130'
K = 30
DS = 35 MPH
PVC STA.11+55.00
EL. 583.32
(-)13.7407%
-1.70% LT.
24" RCP
+0.7% LT.
PI = 12+25.00
EL = 580.70'
VC = 140'
K = 28
DS = 25 MPH
PVT STA.12+95.00
EL. 581.63
(-)3.3333%
+2.50% LT.
END GRADE
END CONSTRUCTION
-Y4- STA.13+00.00
EL. 581.70
STA.10+12.03
EL. 585.33
PVC STA.10+25.00
EL. 585.40
BEGIN DITCH L.T.
STA. 10+50
ELEV. 582.63
STA. 11+13
ELEV. 577.78
PVT STA.11+55.00
EL. 583.32
STA. 12+50
ELEV. 578.76
END DITCH L.T.
STA. 13+00
ELEV. 580.00
PI = 12+10.00
EL = 580.50'
VC = 100'
K = 25
DS = 20 MPH

PIPE HYDRAULIC DATA
STA. 11+13 -Y4-

DRAINAGE AREA	=	4.80 AC
DESIGN FREQUENCY	=	25 YRS
DESIGN DISCHARGE	=	15.00 CFS
DESIGN HW ELEVATION	=	579.87 FT
100 YEAR DISCHARGE	=	19.00 CFS
100 YEAR HW ELEVATION	=	580.31 FT
OVERTOPPING FREQUENCY	=	200+ YRS
OVERTOPPING DISCHARGE	=	27 CFS
OVERTOPPING ELEVATION	=	581.42 FT

24" RCP
INV In= 577.78 INV out= 577.00

-DR1-

FOR PLAN SEE SHEET NO.4

-DR1- STA.10+00.00 = -Y- STA.24+00.00
EL. 614.37
STA.10+15.10
EL. 614.06
PVC STA.10+20.00
EL. 613.97
PVT STA.10+80.00
EL. 613.84
(-)12.0000%
(-)11.9026%
(+)1.4800%
PI = 11+75.00
EL = 615.25'
VC = 40'
K = 16
(+)1.4806%
(-)1.0558%
STA.11+98.88
EL. 615.00
PI = 10+50.00
EL = 613.40'
VC = 60'
K = 18
PVC STA.11+55.00
EL. 614.95
PVT STA.11+95.00
EL. 615.04

2/12/2008
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