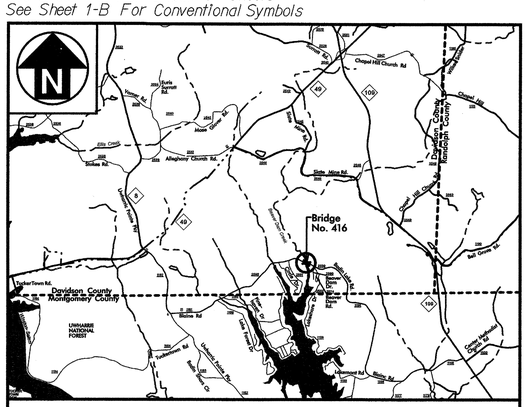
09/08/99

TIP PROJECT: B-4103

CONTRACT: C201713

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

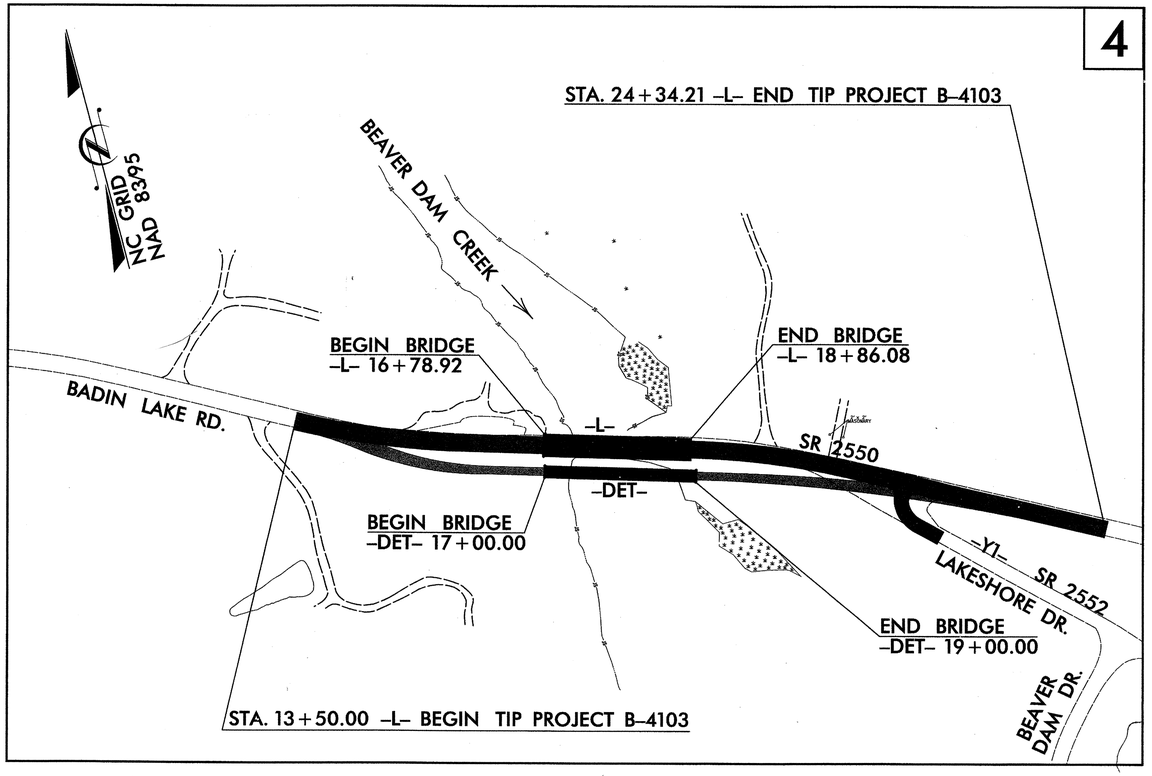
DAVIDSON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4103	1	

W.B.S. ELEMENT	F. A. PROJ. NO.	DESCRIPTION
33459.1.1	BRZ-2550(1)	P.E .
33459.2.1	BRZ-2550(1)	R/W & UTL.
33459.3.1	BRZ-2550(1)	CONST.

LOCATION: ***BRIDGE NO. 416 OVER BEAVER DAM CREEK ON SR 2550 (BADIN LAKE ROAD)***

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



MULKEY
ENGINEERS & CONSULTANTS
PO Box 33127
Raleigh, N.C. 27636
(919) 851-1912
(919) 851-1918 (FAX)
WWW.MULKEYINC.COM

GRAPHIC SCALES

PLANS: 50 25 0 50 100

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2007	=	700
ADT 2027	=	1,050
DHV	=	12 %
D	=	55 %
T	=	4 %*
V	=	60 MPH

* TTST 1% DUAL 3%

** DESIGN EXCEPTION for SAG VERT. CURVE K SUPERELEVATION

FUNC. CLASSIFICATION: RURAL LOCAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4103	=	0.166 MILES
LENGTH STRUCTURE TIP PROJECT B-4103	=	0.039 MILES
TOTAL LENGTH TIP PROJECT B-4103	=	0.205 MILES

Prepared In the Office of:
MULKEY
ENGINEERS & CONSULTANTS
FOR THE NORTH CAROLINA DEPT. OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JUNE 16, 2006

LETTING DATE: APRIL 15, 2008

TIM JORDAN, PE
ROADWAY PROJECT ENGINEER

KEVIN ALFORD, PE
HYDRAULIC PROJECT ENGINEER

CATHY S. HOUSER, PE
NCDOT ROADWAY DESIGN PROJECT ENGINEER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD
SIGNATURE: P.E. 8-21-07

ROADWAY DESIGN
NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER JAMES TIMOTHY JORDAN
SIGNATURE: P.E. 8/21/07

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

art mcmillan
STATE HIGHWAY DESIGN ENGINEER P.E.

8/21/2007
R:\Roadway\Proj\b4103_rdy_tsh.dgn
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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-4103	1-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER JAMES TIMOTHY JORDAN

8/21/07

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARDS

INDEX OF SHEETS

Sheet #	Description
1	Title Sheet
1-A	Index of Sheets, General Notes, and List of Standards
1-B	Conventional Symbols
1-C	Survey Control Sheet
2	Pavement Schedule, Wedging Detail, and Typical Sections
2-A	Typical Sections
2-B	Detour
2-C	Temporary Shoring Detail
2-D	Detail of Anchorage for Frames
3	Summary of Quantities
3-A	List of Pipe, Endwalls, Etc. (For Pipes 48" & Under)
3-B	Guardrail Summary,Summary of Earthwork & Summary of Pavement Removal
4	Plan
5	Profile
TCP-1 thru TCP-7	Traffic Control Plans
PM-1	Pavement Marking Plan
EC-1 thru EC-6	Erosion Control Plans
SIGN-1 thru SIGN-3	Signing Plans
SIG-1 thru SIG-4	Signal Plans
UC-1 thru UC- 2	Utility Construction Plans
UO-1 thru UO-2	Utilities by Others Plans
X-1	Cross-Section Summary Sheet
X-2 thru X-13	Cross-Sections
S-1 thru S-32	Structure Plans

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

GRADE LINE:
GRADING AND SURFACING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

BERM DITCHES:

BERM DITCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 240.01 AT LOCATIONS SHOWN ON THE PLANS OR AS 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.

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 Energy United (Power), Randolph TMC (Telephone)

Randolph TMC (CATV)

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

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

EFF. 07-18-06

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
240.01	Guide for Berm Ditch Construction
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 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
840.00	Concrete Base Pad for Drainage Structures
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.22	Frames and Wide Slot Sag Grates
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
850.01	Concrete Paved Ditches
850.10	Guide for Berm Drainage 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
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

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3/15/06

PROJECT REFERENCE NO.	SHEET NO.
B-4103	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
- Proposed Right of Way Line with Iron Pin and Cap Marker
- Proposed Right of Way Line with Concrete or Granite Marker
- 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

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-4103	1-C
Location and Surveys	

SURVEY CONTROL SHEET B-4103

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
5	BL-5	643415.6669	1671659.9575	552.64	OUTSIDE PROJECT LIMITS	
4	BL-4	643195.3641	1672043.2426	532.41	13+31.39	17.30 RT
1	B4103-1	643109.3280	1672389.7560	514.93	16+86.45	25.40 LT
3	BL-3	642956.1593	1672779.2873	521.08	21+02.47	13.43 LT
2	B4103-2	642638.7251	1673398.2646	560.69	OUTSIDE PROJECT LIMITS	

BY

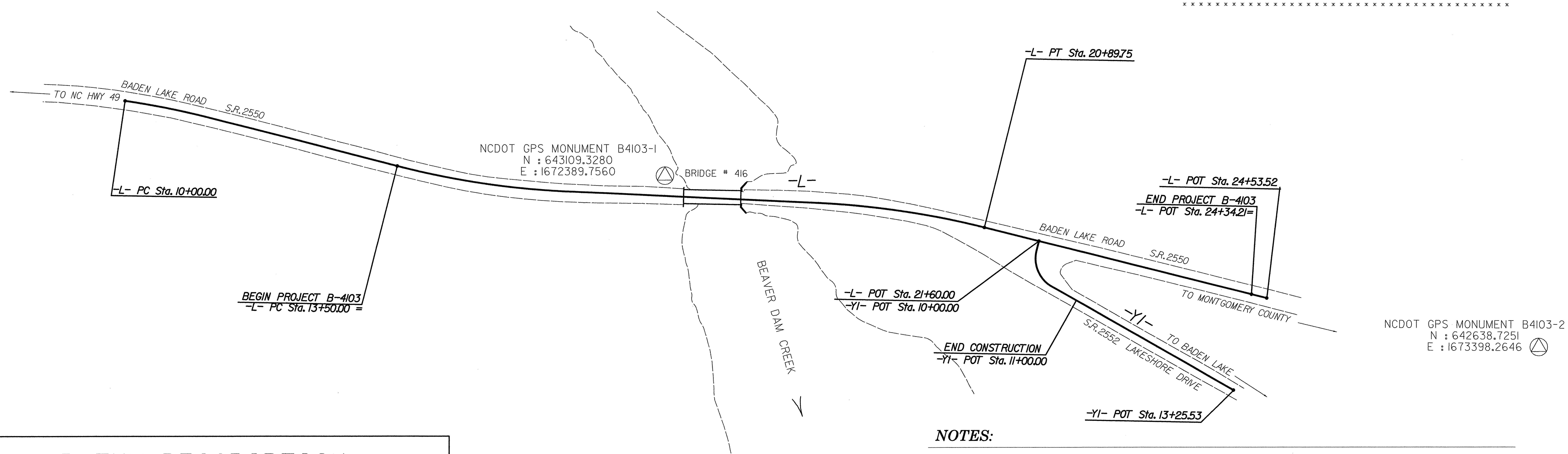
POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
13	BL-3	642956.1593	1672779.2873	521.08	OUTSIDE PROJECT LIMITS	
6	BY1-6	642666.8788	1673046.3911	531.30	OUTSIDE PROJECT LIMITS	

BM 1 ELEVATION = 559.24
N 643451 E 1671683
L STATION 10+00
N 40° 00' 19.1" W DIST 115.36

R/R SPIKE SET IN BASE OF 24" OAK, 48' NORTH OF EDGE OF BADEN LAKE RD.

BM 2 ELEVATION = 544.83
N 642667 E 1673046
L STATION 24+54
S 18° 11' 40.9" W DIST 118.52

R/R SPIKE SET IN BASE OF 24" OAK, 34' NORTH OF EDGE OF LAKESHORE DR.



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4103-1"
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF
NORTHING: 643109.3280(ft) EASTING: 1672389.7560(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999863040
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4103-1" TO -L- STATION 10+00.00 IS
N 68°10'39.25" W 681.43'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

NOTES:

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

THE FILES TO BE FOUND ARE AS FOLLOWS:
TIP####_LS_CONTROL_DATE.HTML

SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

△ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING SERVICE (OPUS)
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

6/2/99

8/2/2007
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PROJECT REFERENCE NO.	SHEET NO.
B-4103	2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER JAMES TIMOTHY JORDAN 8/31/07

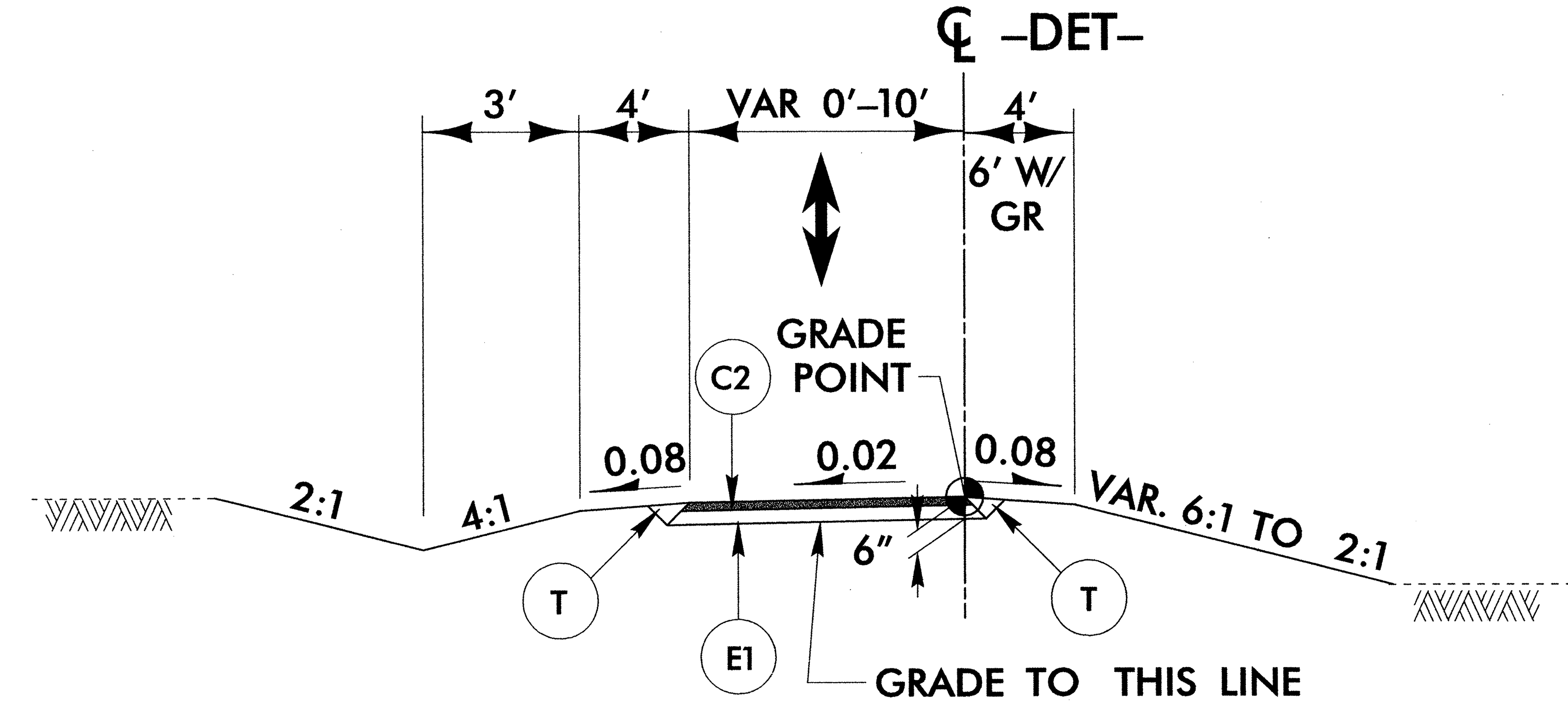
NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK S. MORRISON 8/31/07

5/14/99

PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

C1	PROP. APPROX. 1¼" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD.
C2	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C4	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1" IN DEPTH OR GREATER THAN 2" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
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.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL)

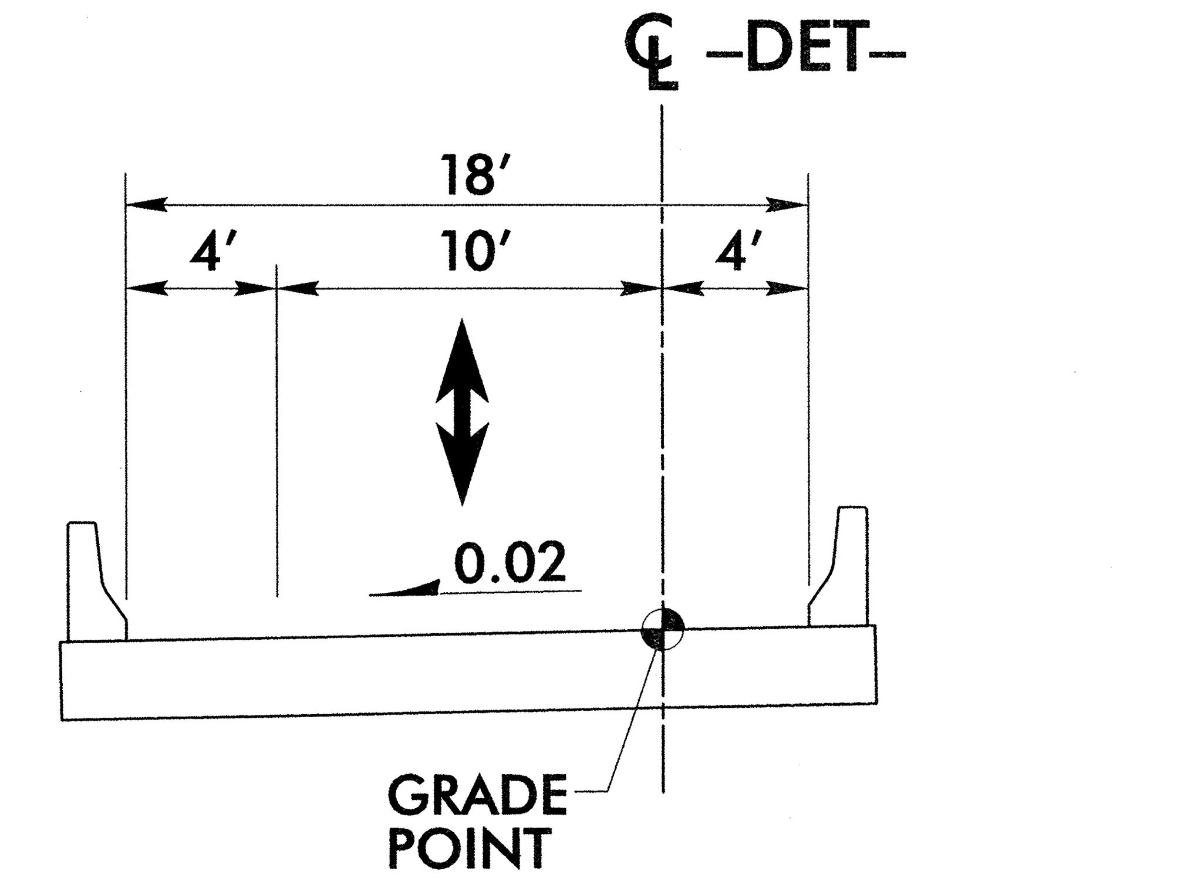
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



TYPICAL SECTION NO. 1

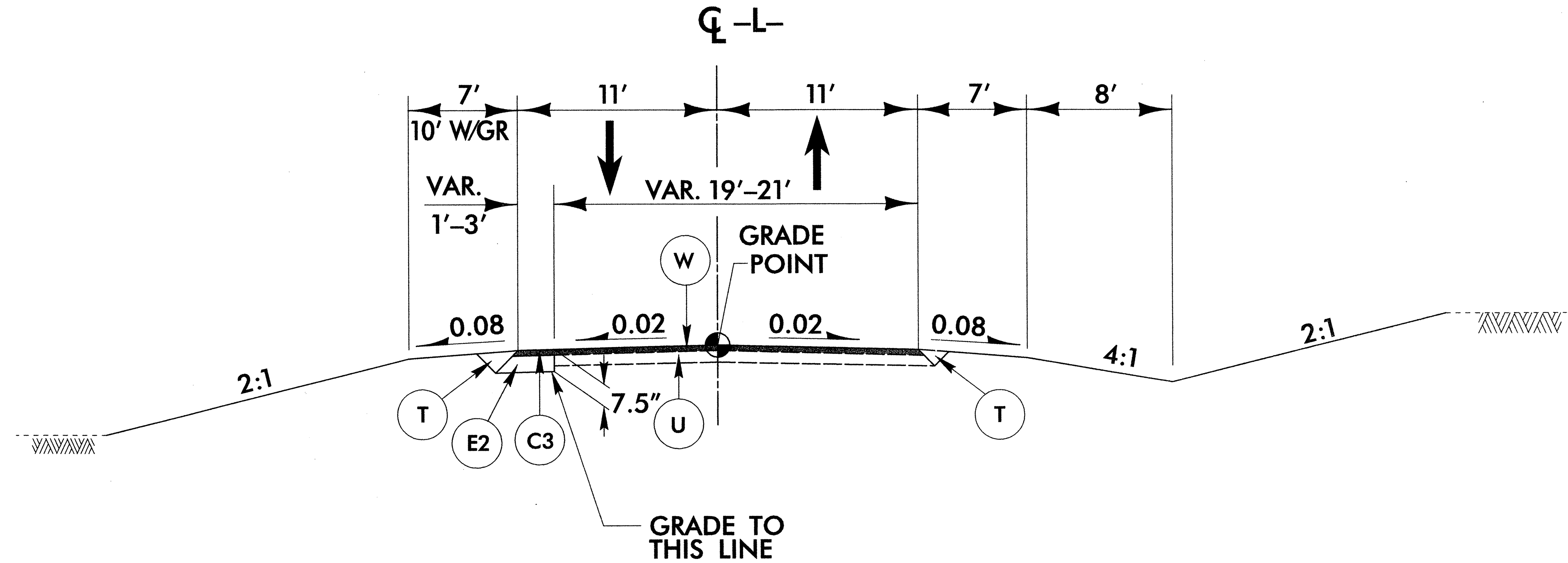
USE TYPICAL SECTION NO. 1
AT THE FOLLOWING LOCATIONS

-DET- STA. 14+38.07 TO STA. 17+00.00 (BEGIN BRIDGE)
-DET- STA. 19+00.00 (END BRIDGE) TO STA. 21+87.71



DETAIL OF DETOUR BRIDGE

-DET- STA 17+00.00 TO STA 19+00.00



TYPICAL SECTION NO. 2

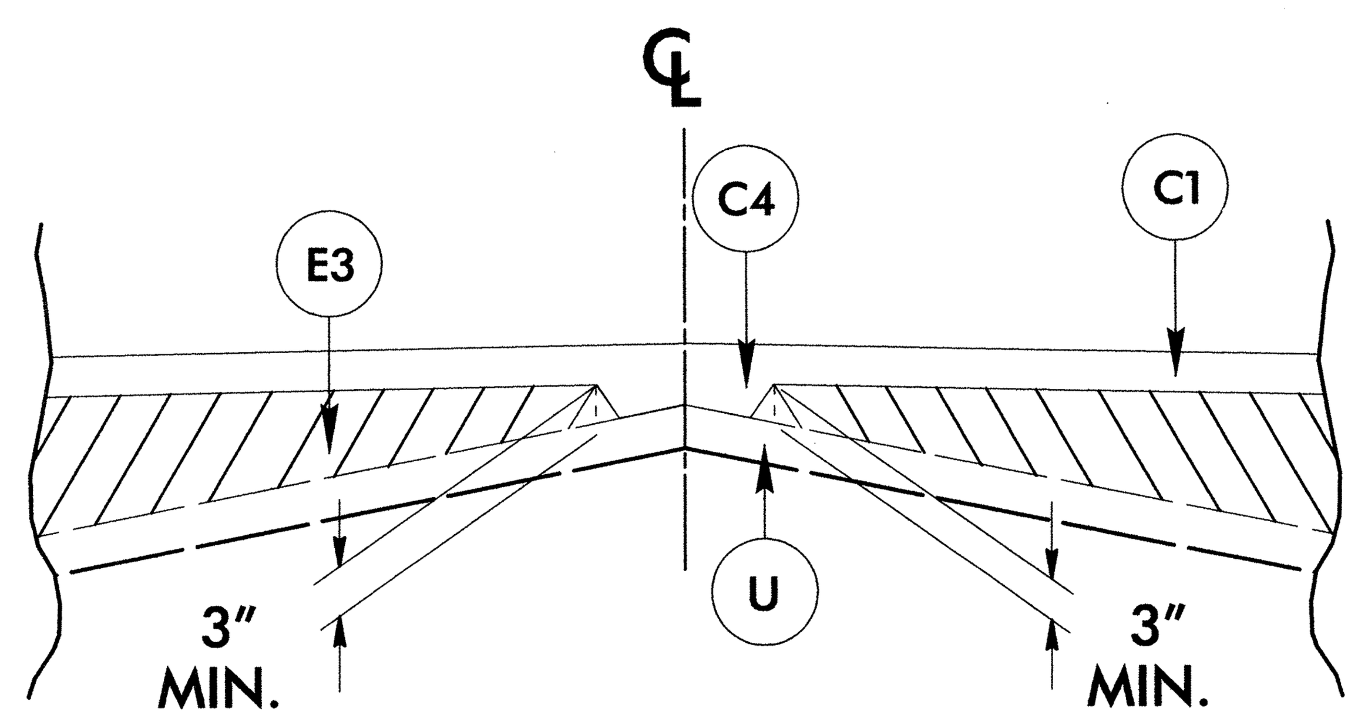
USE TYPICAL SECTION NO. 2
AT THE FOLLOWING LOCATIONS

TRANSITION FROM EXISTING TO T.S. NO. 2 FROM
-L- STA. 13+50.00 TO STA. 14+00.00

-L- STA. 14+00.00 TO STA. 15+25.00
-L- STA. 21+35.00 TO STA. 21+75.00

TRANSITION FROM T.S. NO. 2 TO EXISTING
-L- STA. 21+75.00 TO STA. 22+25.00

NOTE: OVERLAY EXISTING PAVEMENT WITH (C1) FROM:
-L- STA. 22+25.00 TO STA. 24+34.21



DETAIL SHOWING METHOD OF WEDGING

USE IN CONJUCTION WITH TYPICAL SECTION NO. 2 AND NO. 4

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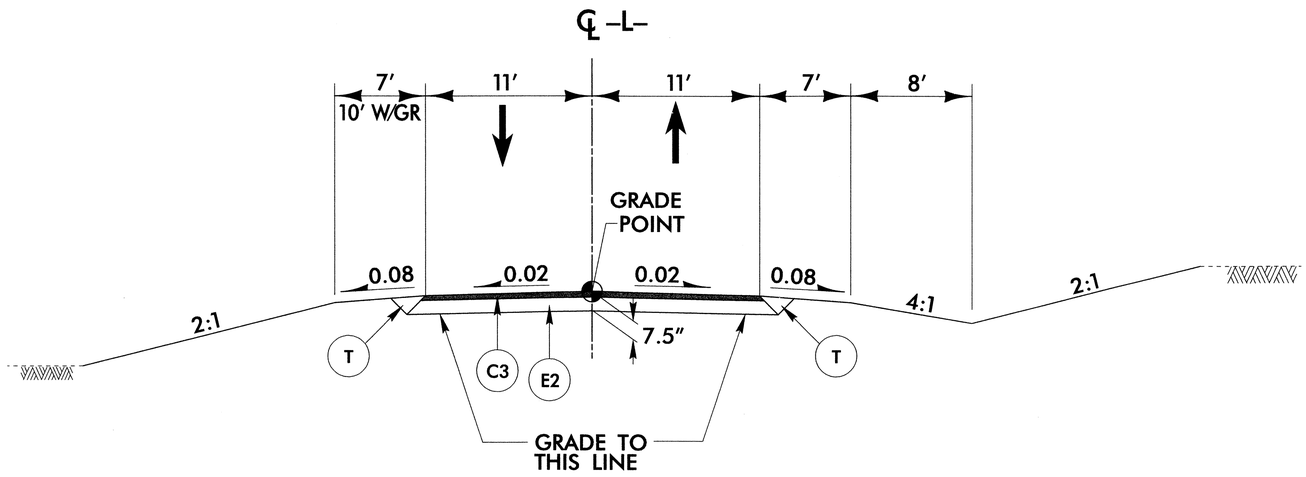
PROJECT REFERENCE NO.	SHEET NO.
B-4103	2-A
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER JAMES TIMOTHY SPEARS
8/21/07

PAVEMENT DESIGN ENGINEER

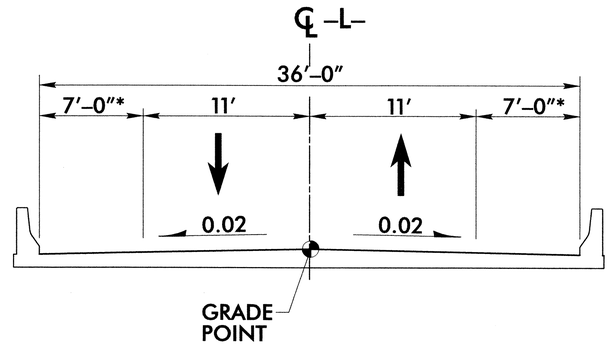
NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK S. MORRISON
8/31/07



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3
AT THE FOLLOWING LOCATIONS

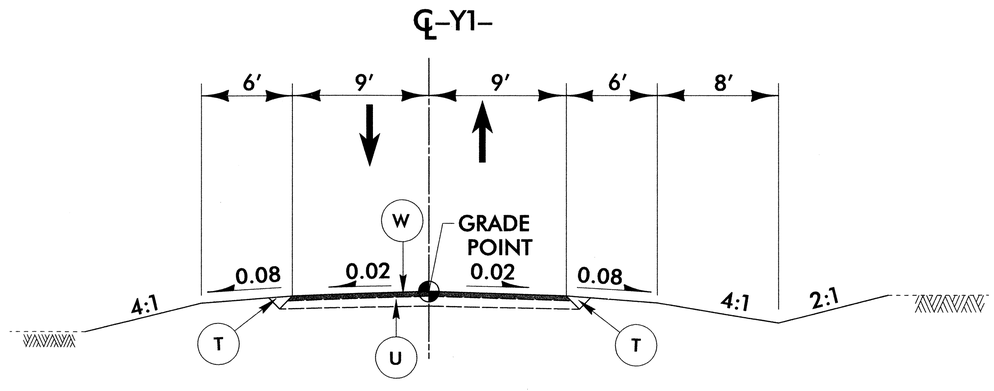
–L– STA. 15+25.00 TO STA. 16+78.92 (BEGIN BRIDGE)
–L– STA. 18+86.08 (END BRIDGE) TO STA. 21+35.00



DETAIL OF BRIDGE

–L– STA 16+78.92 TO STA 18+86.08

* WIDENED FOR HYDRAULIC SPREAD ON STRUCTURE



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4
AT THE FOLLOWING LOCATIONS

–Y1– STA. 10+11.00 TO STA. 11+00.00

PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
C3	2½″ SF9.5A
E2	5″ B25.0B
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING

8/21/2007
R:\Roadway\Proj\b4103_rdy_typ.dgn
10:27:12 AM

5/14/99

-L-

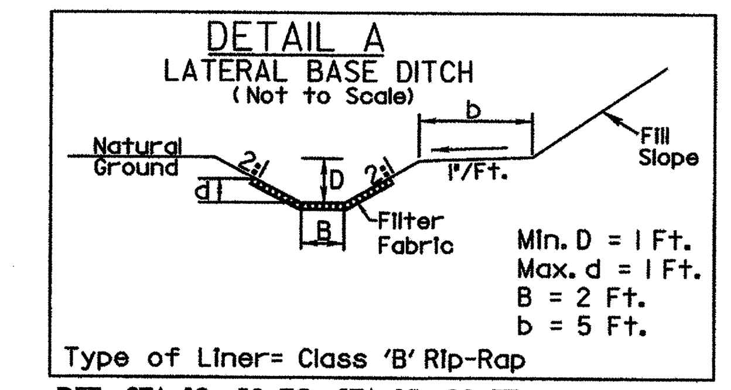
PI Sta 10+60.40	PI Sta 14+59.62	PI Sta 19+83.83	PI Sta 24+71.48
Δ = 6° 01' 12.2" (RT)	Δ = 11° 45' 11.4" (LT)	Δ = 11° 26' 02.6" (RT)	Δ = 0° 12' 09.6" (LT)
D = 4° 59' 32.0"	D = 5° 22' 47.6"	D = 5° 22' 47.6"	D = 0° 26' 14.4"
L = 120.59'	L = 218.47'	L = 212.53'	L = 46.34'
T = 60.35'	T = 109.62'	T = 106.62'	T = 23.17'
R = 1,147.70'	R = 1,065.00'	R = 1,065.00'	R = 13,100.80'
	**SE = 04	**SE = 03	
	DS = 50 mph	DS = 50 mph	

-Y1-

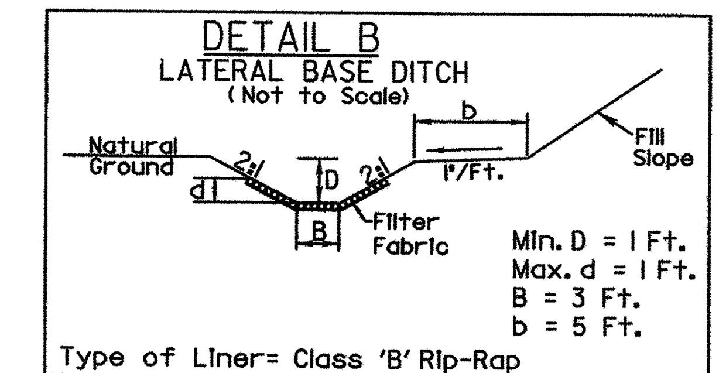
PI Sta 10+42.94
Δ = 74° 27' 59.9" (LT)
D = 143° 14' 22.0"
L = 51.99'
T = 30.40'
R = 40.00'

-DET-

PI Sta 13+94.20	PI Sta 15+26.66	PI Sta 21+87.28
Δ = 12° 00' 52.1" (RT)	Δ = 23° 49' 14.9" (LT)	Δ = 11° 29' 14.0" (RT)
D = 13° 38' 30.7"	D = 13° 38' 30.7"	D = 2° 17' 30.6"
L = 88.07'	L = 174.62'	L = 501.22'
T = 44.20'	T = 88.59'	T = 251.46'
R = 420.00'	R = 420.00'	R = 2,500.00'
SE = 04	SE = 04	SE = 04
DS = 35 mph	DS = 35 mph	DS = 35 mph



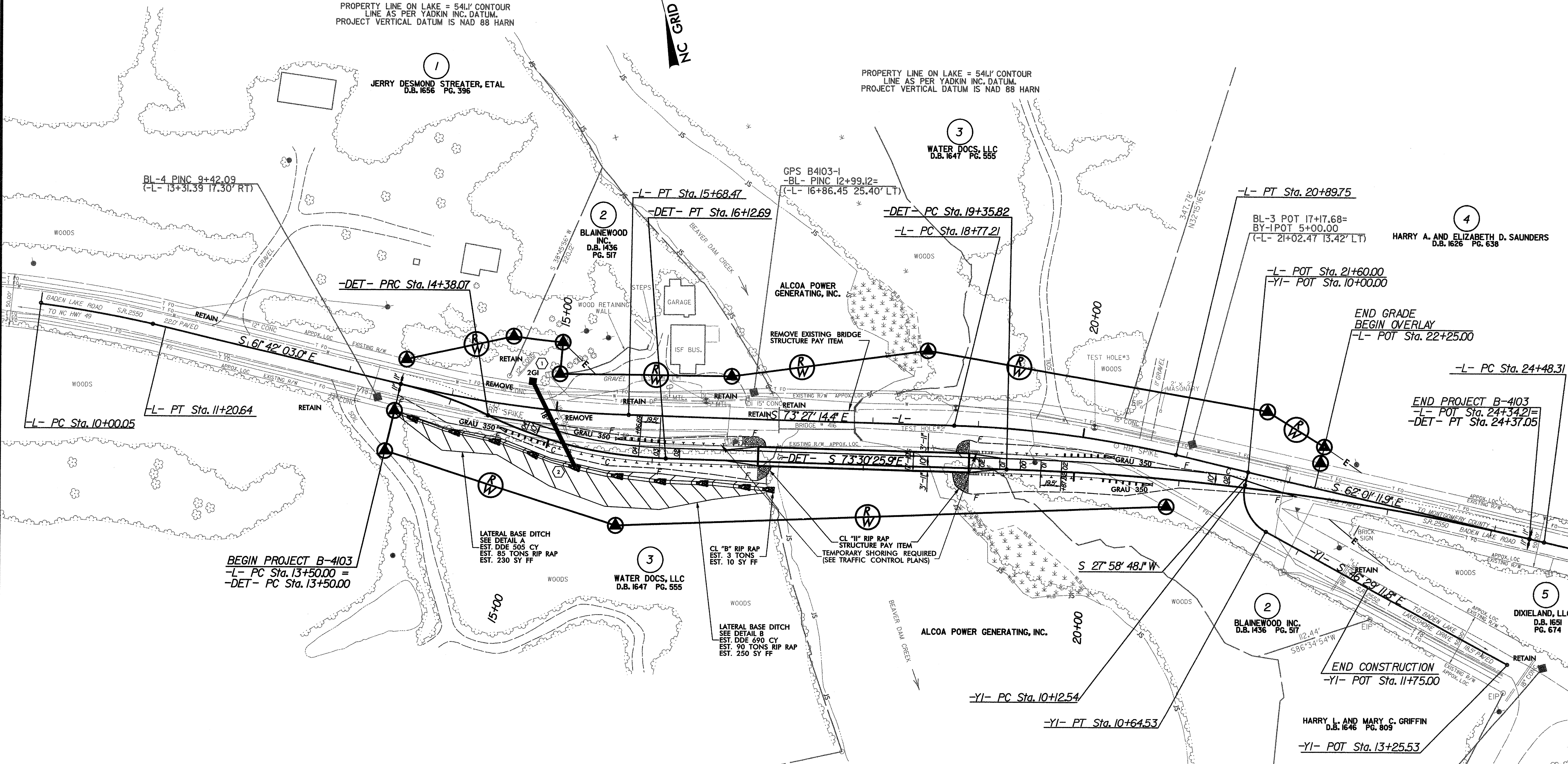
-DET- STA. 13+50 TO STA. 15+30 RT



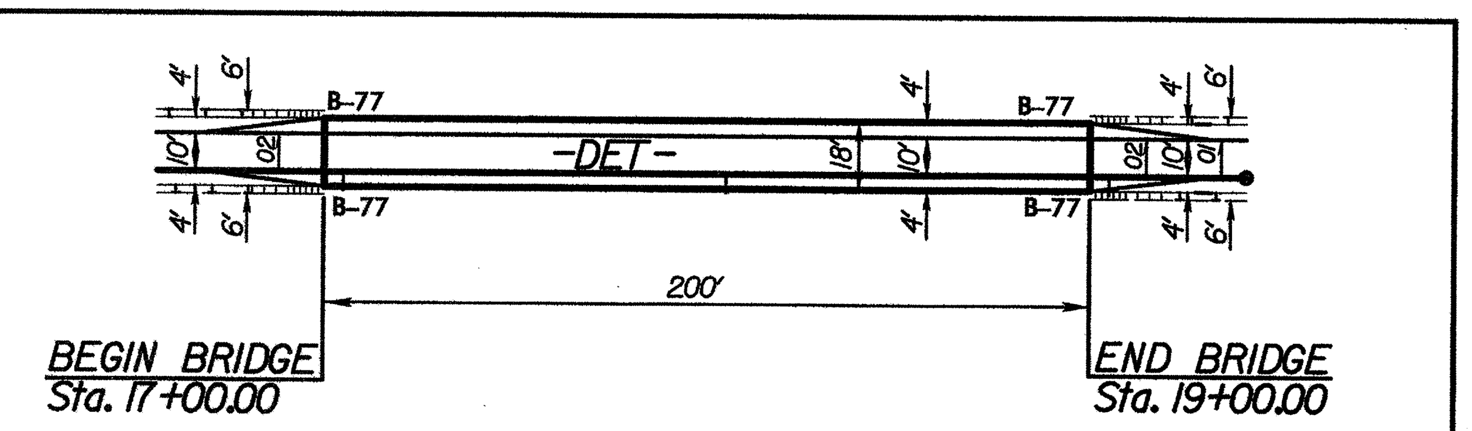
-DET- STA. 15+30 TO STA. 17+07.78 RT

PROJECT REFERENCE NO.	SHEET NO.
B-4103	2-B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21102 JAMES TIMOTHY JORDAN 8/21/07	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 31977 KEVIN B. ALFORD K.B.A. 8-21-07

FOR -DET- PROFILE SEE SHEET 5



NC GRID NAD 83/95
PROPERTY LINE ON LAKE = 541.1' CONTOUR LINE AS PER YADKIN INC. DATUM. PROJECT VERTICAL DATUM IS NAD 88 HARN
1 JERRY DESMOND STREATER, ETAL D.B. 1656 PG. 396
2 BLAINEWOOD INC. D.B. 1436 PG. 517
3 WATER DOCS, LLC D.B. 1647 PG. 555
4 HARRY A. AND ELIZABETH D. SAUNDERS D.B. 1626 PG. 638
5 DIXIELAND, LLC D.B. 1651 PG. 674
ALCOA POWER GENERATING, INC.
HARRY L. AND MARY C. GRIFFIN D.B. 1646 PG. 809
BL-4 PINC 9+42.09 (-L- 13+31.39 17.30' RT)
GPS B4103-1 -BL- PINC 12+99.12= (-L- 16+86.45 25.40' LT)
-L- PT Sta. 15+68.47
-DET- PT Sta. 16+12.69
-DET- PC Sta. 19+35.82
-L- PC Sta. 18+77.21
-L- PT Sta. 20+89.75
BL-3 POT 17+17.68= BY-1POT 5+00.00 (-L- 21+02.47 13.42' LT)
-L- POT Sta. 21+60.00
-Y1- POT Sta. 10+00.00
END GRADE BEGIN OVERLAY -L- POT Sta. 22+25.00
-L- PC Sta. 24+48.31
END PROJECT B-4103 -L- POT Sta. 24+34.21= -DET- PT Sta. 24+37.05
-DET- PRC Sta. 14+38.07
-L- PC Sta. 10+00.05
-L- PT Sta. 11+20.64
S 61° 42' 03.0" E
S 73° 27' 14.4" E
-DET- S 73°30'25.9" E
S 62° 01' 11.9" E
S 27° 58' 48.1" W
S 46° 29' 11.8" E
BADEN LAKE ROAD S.R.2550 TO NC HWY 49
TO MONTGOMERY COUNTY S.R.2550 BADEN LAKE ROAD
LAKESHORE DRIVE
REMOVE EXISTING BRIDGE STRUCTURE PAY ITEM
BEAVER DAM CREEK
GARAGE
ISF BUS.
WOOD RETAINING WALL
STEPS
WOODS
GRAVEL
RETAIN
REMOVE
TEST HOLE*3
LATERAL BASE DITCH SEE DETAIL A EST. DDE 505 CY EST. 85 TONS RIP RAP EST. 230 SY FF
CL "B" RIP RAP EST. 3 TONS EST. 10 SY FF
CL "II" RIP RAP STRUCTURE PAY ITEM TEMPORARY SHORING REQUIRED (SEE TRAFFIC CONTROL PLANS)
LATERAL BASE DITCH SEE DETAIL B EST. DDE 690 CY EST. 90 TONS RIP RAP EST. 250 SY FF
BEGIN PROJECT B-4103 -L- PC Sta. 13+50.00 = -DET- PC Sta. 13+50.00
END CONSTRUCTION -Y1- POT Sta. 11+75.00
-Y1- PC Sta. 10+12.54
-Y1- PT Sta. 10+64.53
-Y1- POT Sta. 13+25.53
BY-6 POT 8+93.74
N 87°17'48" W 296.77'
15+00
20+00
GRAU 350
BRIDGE * 416



SKETCH SHOWING RELATIONSHIP OF BRIDGE TO PAVEMENT AND SHOULDERS

REVISIONS

8/21/2007 R:\Roadway\Proj\b4103_rdy_psh02.dgn

PROJECT REFERENCE NO.	SHEET
B-4103	2-C

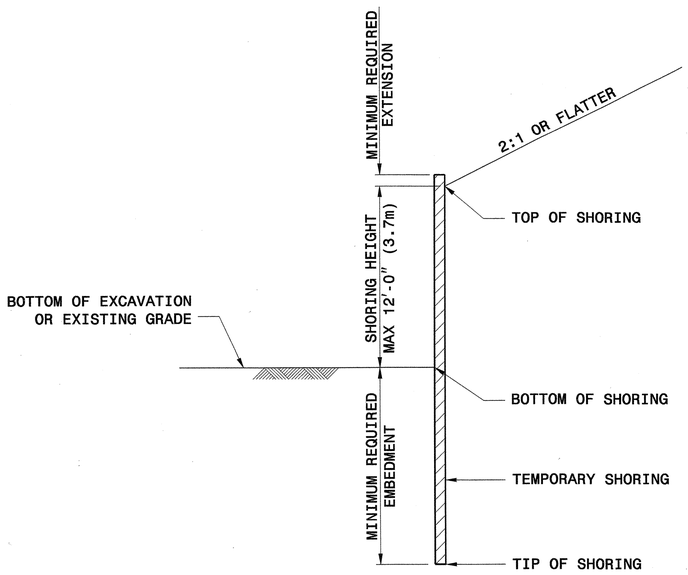
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

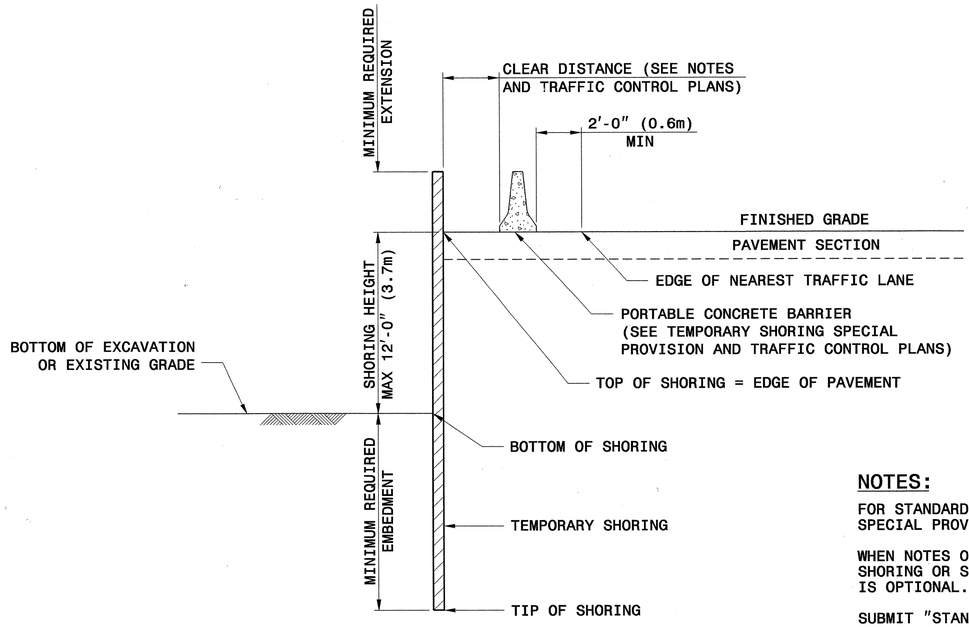
Scott A. Hidden 3/29/07
SIGNATURE DATE

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

GEC221427 3/29/2007 std no 1801 shidden GE-Oce34bond

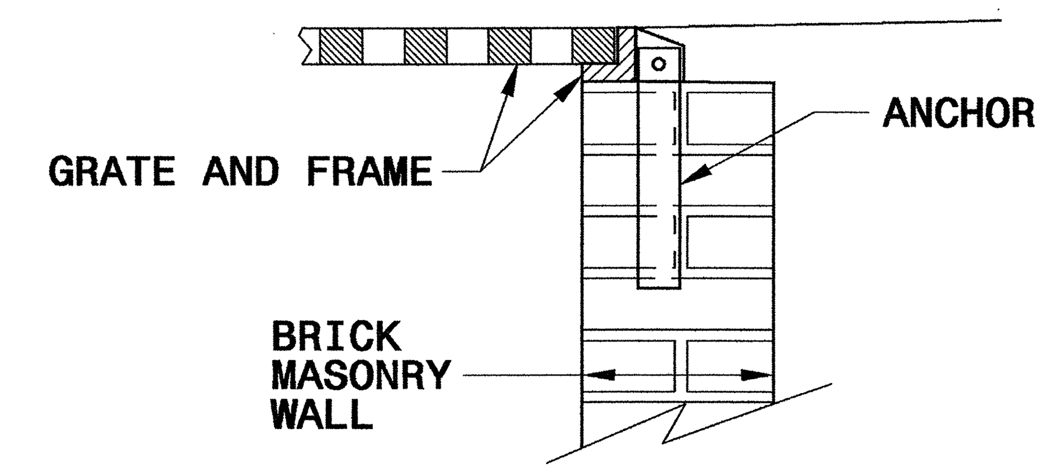
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4103	2-D
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

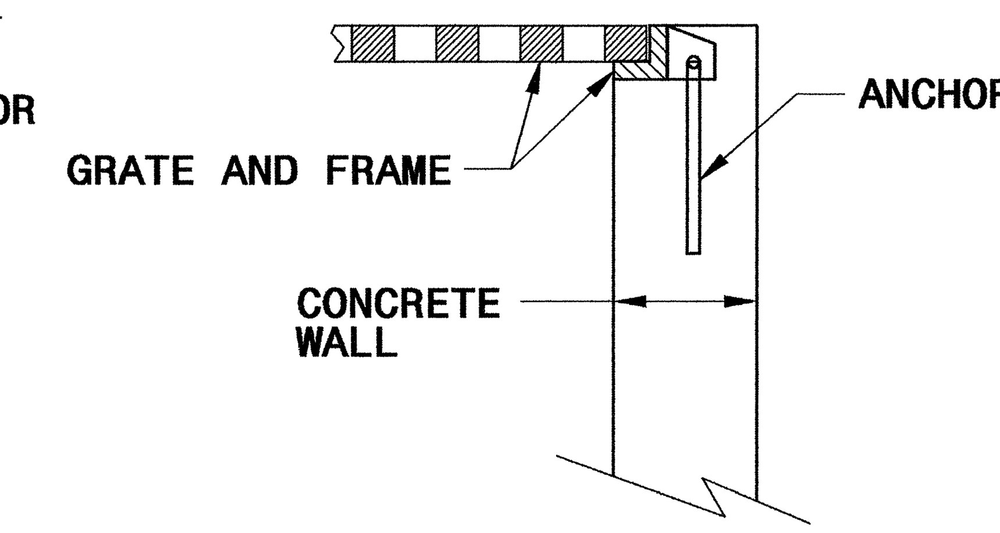
PROJECT REFERENCE NO.	SHEET NO.

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

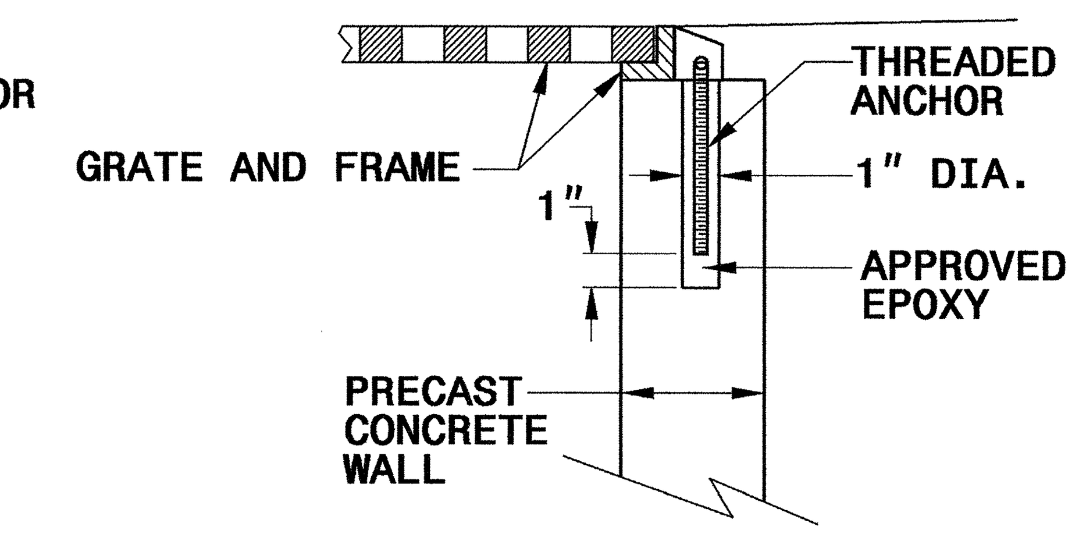
ENGLISH DETAIL DRAWING FOR
ANCHORAGE FOR FRAMES
BRICK/CONCRETE/PRECAST CONCRETE



BRICK MASONRY CONSTRUCTION



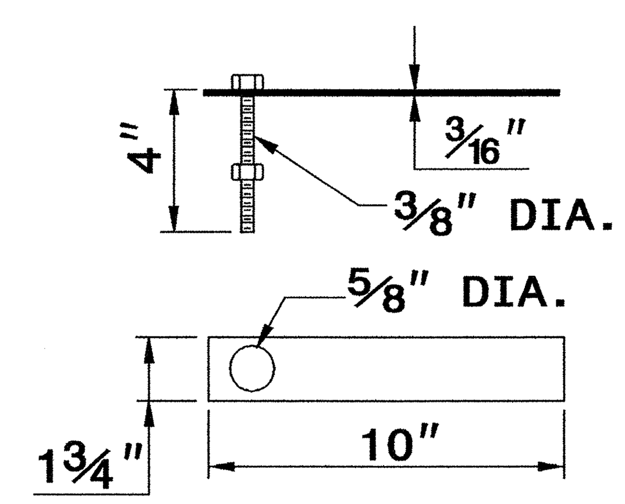
CONCRETE CONSTRUCTION



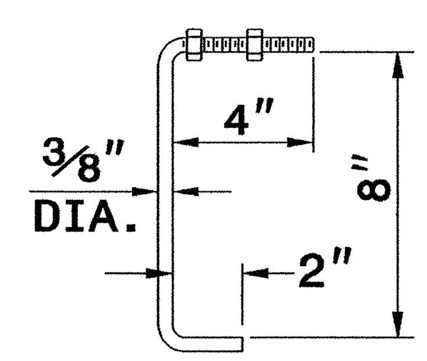
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

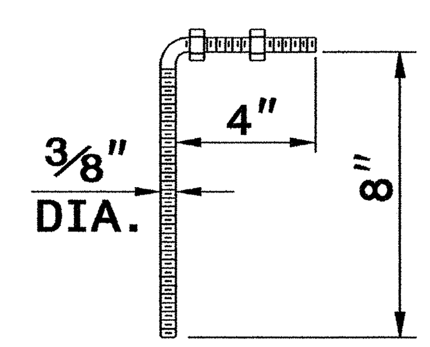
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



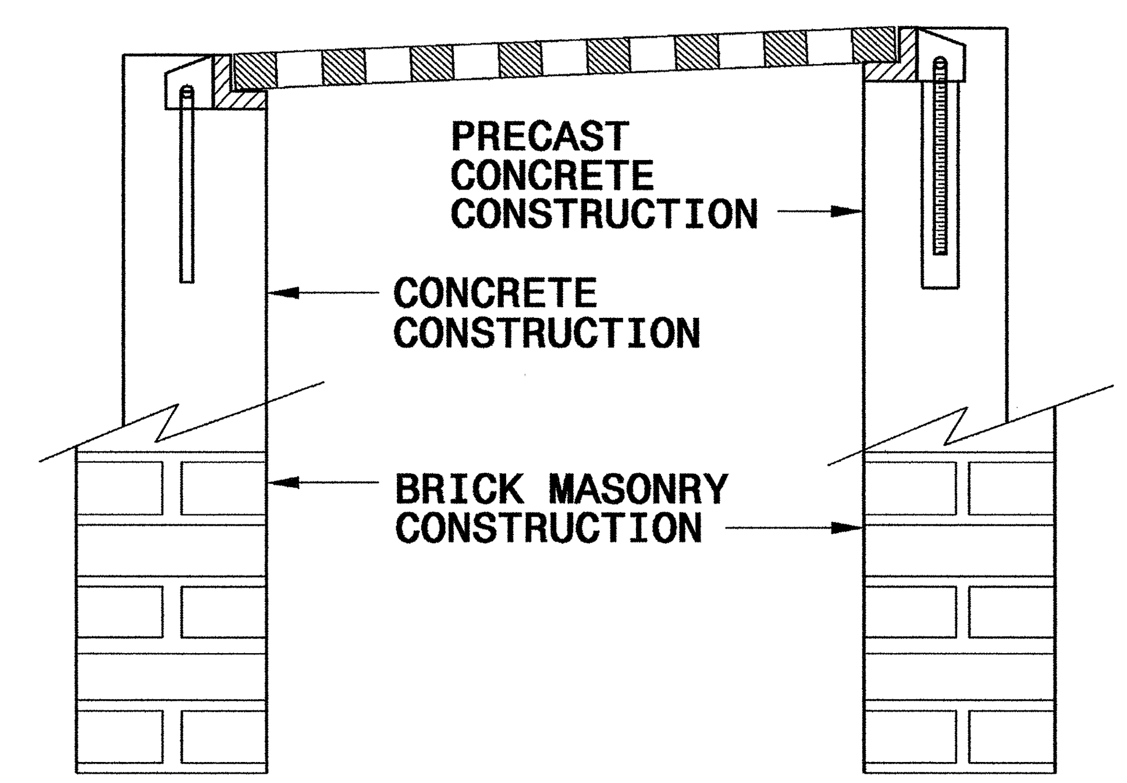
MASONRY ANCHOR
3⁄8" DIA. BOLT WITH PLATE



CONCRETE ANCHOR
3⁄8" DIA. BENT BAR



PRECAST CONCRETE ANCHOR
3⁄8" DIA. BENT BAR



FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS

SHEET 1 OF 1
840D25

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

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

SHEET 1 OF 1
840D25

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\Standards\Special Details\ericward\stds\06' Stds to Special Details\84025 Anchorage for Frames\0840d25.dgn
ericward AT PS22293

8/2/2007
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2:18:30 PM

MULKEY
ENGINEERS & CONSULTANTS
P.O. Box 33127
Raleigh, NC 27636
(919) 851-1912
(919) 851-1918 (FAX)
WWW.MULKEYINC.COM

PROJECT REFERENCE NO.	SHEET NO.
B-4103	3

5/28/99

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C201713

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ********** (17+82.50)
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING
0057000000-E	226	400	CY	UNDERCUT EXCAVATION
0063000000-N	SP	Lump Sum		GRADING
0106000000-E	230	4,500	CY	BORROW EXCAVATION
0134000000-E	240	1,260	CY	DRAINAGE DITCH EXCAVATION
0141000000-E	240	50	LF	BERM DITCH CONSTRUCTION
0195000000-E	265	1,000	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	1,000	SY	FABRIC FOR SOIL STABILIZATION
0199000000-E	SP	350	SF	TEMPORARY SHORING
0318000000-E	300	30	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS
0343000000-E	310	56	LF	15" SIDE DRAIN PIPE
0372000000-E	310	92	LF	18" RC PIPE CULVERTS, CLASS III
0708000000-E	310	52	LF	15" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
0806000000-E	310	4	EA	15" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK
0995000000-E	340	232	LF	PIPE REMOVAL
1220000000-E	545	200	TON	INCIDENTAL STONE BASE
1330000000-E	607	125	SY	INCIDENTAL MILLING
1489000000-E	610	610	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1525000000-E	610	400	TON	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A
1560000000-E	620	55	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
1693000000-E	654	10	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
2000000000-N	806	13	EA	RIGHT OF WAY MARKERS
2286000000-N	840	5	EA	MASONRY DRAINAGE STRUCTURES
2352000000-N	840	2	EA	FRAME WITH GRATE, STD 840.**** (840.16)
2365000000-N	840	1	EA	FRAME WITH TWO GRATES, STD 840.22
2367000000-N	840	2	EA	FRAME WITH TWO GRATES, STD 840.29
2619000000-E	850	11	SY	4" CONCRETE PAVED DITCH
3030000000-E	862	437.5	LF	STEEL BM GUARDRAIL
3045000000-E	862	12.5	LF	STEEL BM GUARDRAIL, SHOP CURVED
3150000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS
3195000000-N	862	1	EA	GUARDRAIL ANCHOR UNITS, TYPE AT-1
3270000000-N	SP	3	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3317000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77
3380000000-E	862	425	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
3628000000-E	876	2	TON	RIP RAP, CLASS I
3649000000-E	876	331	TON	RIP RAP, CLASS B
3656000000-E	876	1,531	SY	FILTER FABRIC FOR DRAINAGE
4025000000-E	901	14.75	SF	CONTRACTOR FURNISHED, TYPE *** SIGN (E)
4072000000-E	903	29	LF	SUPPORTS, 3-LB STEEL U-CHANNEL
4102000000-N	904	3	EA	SIGN ERECTION, TYPE E
4155000000-N	907	10	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4400000000-E	1110	198	SF	WORK ZONE SIGNS (STATIONARY)
4405000000-E	1110	144	SF	WORK ZONE SIGNS (PORTABLE)
4410000000-E	1110	20	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4420000000-N	1120	2	EA	CHANGEABLE MESSAGE SIGN
4430000000-N	1130	55	EA	DRUMS
4435000000-N	1135	52	EA	CONES
4445000000-E	1145	48	LF	BARRICADES (TYPE III)
4450000000-N	1150	1,050	HR	FLAGGER
4480000000-N	1165	2	EA	TMIA
4516000000-N	1180	104	EA	SKINNY DRUM
4650000000-N	1251	220	EA	TEMPORARY RAISED PAVEMENT MARKERS
4685000000-E	1205	2,070	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)
4686000000-E	1205	1,827	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)
4710000000-E	1205	10	LF	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)
4770000000-E	1205	828	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (I)
4770000000-E	1205	828	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (IV)
4810000000-E	1205	14,391	LF	PAINT PAVEMENT MARKING LINES (4")
4835000000-E	1205	82	LF	PAINT PAVEMENT MARKING LINES (24")
4850000000-E	1205	1,200	LF	REMOVAL OF PAVEMENT MARKING LINES (4")
4870000000-E	1205	10	LF	REMOVAL OF PAVEMENT MARKING LINES (24")
5325800000-E	1510	812	LF	8" WATER LINE
5546000000-E	1515	1	EA	8" VALVE
5648000000-N	1515	1	EA	RELOCATE WATER METER
5801000000-E	1530	764	LF	ABANDON 8" UTILITY PIPE
6000000000-E	1605	1,175	LF	TEMPORARY SILT FENCE
6006000000-E	1610	290	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	265	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	430	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	2.5	ACR	TEMPORARY MULCHING
6018000000-E	1620	100	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	0.5	TON	FERTILIZER FOR TEMPORARY SEEDING
6029000000-E	SP	250	LF	SAFETY FENCE
6030000000-E	1630	1,360	CY	SILT EXCAVATION
6036000000-E	1631	705	SY	MATTING FOR EROSION CONTROL
6042000000-E	1632	40	LF	1/4" HARDWARE CLOTH
6070000000-N	SP	8	EA	SPECIAL STILLING BASINS
6071030000-E	SP	330	LF	COIR FIBER BAFFLES
6084000000-E	1660	2.5	ACR	SEEDING & MULCHING
6087000000-E	1660	1.5	ACR	MOWING
6090000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	50	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	1.75	TON	FERTILIZER TOPDRESSING
6114000000-N	SP	3	HR	SPECIALIZED HAND MOWING
6117000000-N	SP	18	EA	RESPONSE FOR EROSION CONTROL
7060000000-E	1705	1,425	LF	SIGNAL CABLE
7120000000-E	1705	6	EA	VEHICLE SIGNAL HEAD (12", 3 SECTION)
7264000000-E	1710	1,190	LF	MESSENGER CABLE (3/8")
7360000000-N	1720	6	EA	WOOD POLE
7372000000-N	1721	7	EA	GUY ASSEMBLY
7408000000-E	1722	1	EA	1" RISER WITH WEATHERHEAD
7420000000-E	1722	4	EA	2" RISER WITH WEATHERHEAD
7444000000-E	1725	420	LF	INDUCTIVE LOOP SAWCUT
7456000000-E	1726	1,600	LF	LEAD-IN CABLE (**********) (14-2)
7636000000-N	1745	4	EA	SIGN FOR SIGNALS
7768000000-N	1751	1	EA	CONTROLLER WITH CABINET (TYPE 2070L, POLE MOUNTED)
7780000000-N	1751	3	EA	DETECTOR CARD (TYPE 2070L)
				******* BEGIN SCHEDULE AA ******* ******* (3 ALTERNATES) *******
0366000000-E AA1	310	84	LF	15" RC PIPE CULVERTS, CLASS III
				*** OR ***
0366000000-E AA2	310	28	LF	15" RC PIPE CULVERTS, CLASS III
0536000000-E AA2	SP	56	LF	*** HDPE PIPE CULVERTS (15")
				*** OR ***
0366000000-E AA3	310	28	LF	15" RC PIPE CULVERTS, CLASS III
0540000000-E AA3	SP	56	LF	*** ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, **** THICK (15", 0.064")
				******* END SCHEDULE AA *******

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PROJECT REFERENCE NO.	SHEET NO.
B-4103	3-A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO.		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE)								BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE)													CLASS III R.C. PIPE OR C.S. PIPE OR TYPE IR ALUMINIZED OR HDPE PIPE, TYPE S OR D								15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS.		QUANTITIES FOR DRAINAGE STRUCTURES * TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B')			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE				D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME & GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	J.B. STD. 840.31 OR 840.32	TRAFFIC BEARING DROP INLET STD. 840.35	M.D.I. ANGLED VANE FRAME WITH GRATE STD. 840.33		BERM DRAINAGE 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
SIZE		FROM	TO					12"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"		30"		36"		42"		48"		12"	15"	18"	24"	30"	36"	42"	48"				R.C.P.	C.S.P.	PER EACH (0' THRU 5.0')	LIN. *FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE		E	F	G																								
THICKNESS OR GAUGE																.064	.064	.064	.064		.079		.079		.109		.109																																												
14+75 -L-	LT	1		521.6	518.6																																					1											1			1														24	
14+90 -L-	CL	1	2		518.6	518.2				92																																																												48	
14+75 -L-	LT	3			529.0																																																										1								
14+75 -L-	LT	3	4		529.0	518.6											28																																																		2@15"			24	ROD & LUG CONNECTORS AND SLEEVE GASKETS
16+30 -L-	LT	5		517.0	515.1																																					1								1	1																			44	REMOVE DI
16+55 -L-	LT	5	6		515.1	512.9																								36																																								40	REMOVE DI
16+75 -L-	LT	6		514.9	512.9																																					1								1	1																				
16+90 -L-	LT	6	7		512.9	508.5																								20																																								28	REMOVE DI
19+05 -L-	RT	8		518.6	515.5																																					1																1		1											
19+05 -L-	CL	8	9		515.5	515.3			28																																																														
19+05 -L-	LT	9		518.6	515.3																																					1																1		1											
19+05 -L-	LT	9	10		515.3	511.4											24																																																		2@15"				ROD & LUG CONNECTORS AND SLEEVE GASKETS
20+20 -L-	LT	11																																			28																																			
20+60 -L-	LT	12																																			28																																	24	
TOTAL									28	92							52													56							56					5								2	2		1			1		2		2							4@15"			232	

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

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PROJECT REFERENCE NO.	SHEET NO.
B-4103	3-B

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

"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			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350						REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GRAU 350	B-77	AT-1						EA	G	NG				
-L-	15+41.42	16+78.92	LT	137.50'				16+78.92	7'	10'					1	1													
-L-	13+91.42	16+78.92	RT	287.50'			16+78.92		7'	10'					1	1													
-L-	18+86.08	19+86.08	LT	100.00'	12.50'		18+86.08		7'	10'						1	1												BREAK FOR DRIVE
-L-	18+86.08	20+23.58	RT	137.50'				18+86.08	7'	10'					1	1													
		LESS ANCHOR DEDUCTIONS																											
		GRAU-350 3 @ 50' =		- 150.00'																									
		AT-1 1 @ 6.25' =		- 6.25'																									
		B-77 4 @ 18.75' =		- 75.00'																									
		TOTAL		431.25'											3	4	1												
		SAY		437.5'			(5 ADDITIONAL GUARDRAIL POSTS)																							

"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			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GRAU 350	B-77						AT-1	EA	G	NG				
-DET-	15+62.50	17+00.00	LT	137.50'			17+00.00		4'	6'					1	1													
-DET-	14+50.00	17+00.00	RT	250.00'			15+25.00	17+00.00	4'	6'					1	1													
-DET-	19+00.00	20+37.50	LT	137.50'			19+00.00		4'	6'					1	1													
-DET-	19+00.00	20+75.00	RT	175.00'			19+00.00	20+50.00	4'	6'					1	1													BREAK FOR EXISTING ROAD (-Y1-)
		LESS ANCHOR DEDUCTIONS																											
		GRAU-350 4 @ 50' =		-200.00'																									
		B-77 4 @ 18.75' =		-75.00'																									
		TOTAL		425.00'											4	4													
		SAY		425.00'																									

SUMMARY OF EARTHWORK
IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
-DET- 13+50 TO 17+00	8		941	933	
-DET- 19+00 TO 24+37.05	2		1591	1589	
SUBTOTAL	10		2532	2522	
-L- 13+50 TO 16+80	85		840	755	
-L- 18+85 TO 22+25	262		1204	942	
-Y1- 10+11 TO 11+00	92		30		62
SUBTOTAL	439		2074	1697	62
-L- 13+50 TO 17+00 (DETOUR REMOVAL)	61		50		11
-L- 18+90 TO 24+37.05 (DETOUR REMOVAL)	78		31		47
SUBTOTAL	139		81		58
TOTAL	588		4687	4219	120
LOSS TO CLEARING & GRUBBING	-85			85	
WASTE TO REPLACE BORROW				-62	-62
PROJECT TOTAL	503		4687	4242	58
5% TO REPLACE BORROW				213	
GRAND TOTAL	503		4687	4455	58
SAY	600			4500	

EST. DDE = 1,260 CY
EST. UNDERCUT = 400 CY (CONTINGENCY FROM GEOTECHNICAL & DIVISION)
EST. SELECT GRANULAR MATERIAL = 1,000 CY (CLASS II AND/OR CLASS III)
EST. FABRIC FOR SOIL STABILIZATION = 1,000 SY

SUMMARY OF PAVEMENT REMOVAL
IN SQUARE YARDS

LOCATION	ASPHALT REMOVAL	ASPHALT BREAK UP	CONCRETE REMOVAL	CONCRETE BREAK UP
-L- 15+25 TO 15+67	107.64			
-L- 15+67 TO 17+10.40		342.01		
-L- 17+82.23 TO 20+75		671.05		
-L- 20+75 TO 21+35	146.67			
-Y1- 10+11 TO 10+64.50	293.44			
-Y1- 10+11 TO 10+88.30	88.22			
-DET- 14+38.07 TO 17+00	305.26			
-DET- 19+00 TO 21+87.71	333.90			
TOTAL	1,275.13	1,013.06		
SAY	1,290	1,025		

NOTE: Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

NOTE: Approximate quantities only.
Unclassified excavation, Fine Grading, Clearing and Grubbing, Breaking of Existing Pavement and Removal of Existing Pavement will be paid for at the contract Lump Sum price for "Grading".

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REVISIONS

-L-

PI Sta 10+60.40
Δ = 6° 01' 12.2" (RT)
D = 4° 59' 32.0"
L = 120.59'
T = 60.35'
R = 1,147.70'

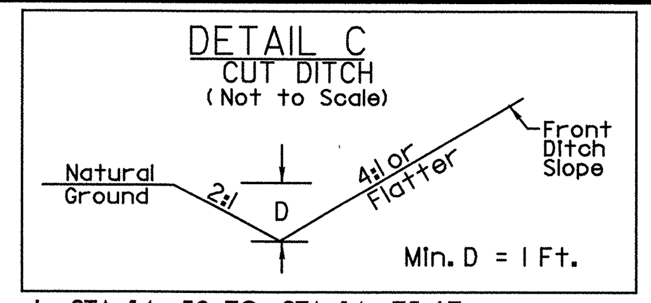
PI Sta 14+59.62
Δ = 11° 45' 11.4" (LT)
D = 5° 22' 47.6"
L = 218.47'
T = 109.62'
R = 1,065.00'
**SE = .04
DS = 50 mph

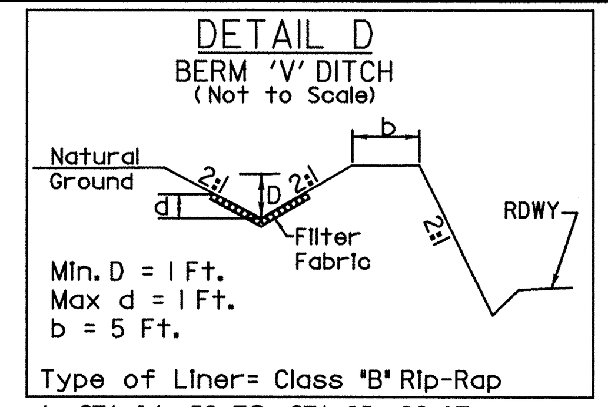
PI Sta 19+83.83
Δ = 11° 26' 02.6" (RT)
D = 5° 22' 47.6"
L = 212.53'
T = 106.62'
R = 1,065.00'
**SE = .03
DS = 50 mph

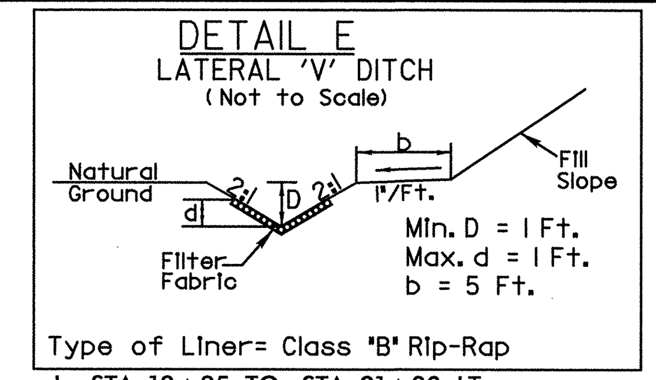
PI Sta 24+71.48
Δ = 0° 12' 09.6" (LT)
D = 0° 26' 14.4"
L = 46.34'
T = 23.17'
R = 13,100.80'

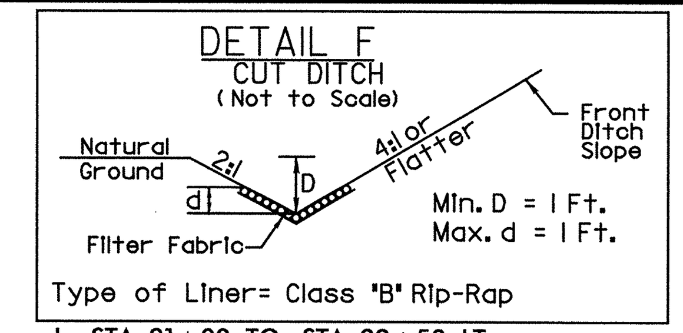
-Y1-

PI Sta 10+42.94
Δ = 74° 27' 59.9" (LT)
D = 143° 14' 22.0"
L = 51.99'
T = 30.40'
R = 40.00'









PROJECT REFERENCE NO.	SHEET NO.
B-4103	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

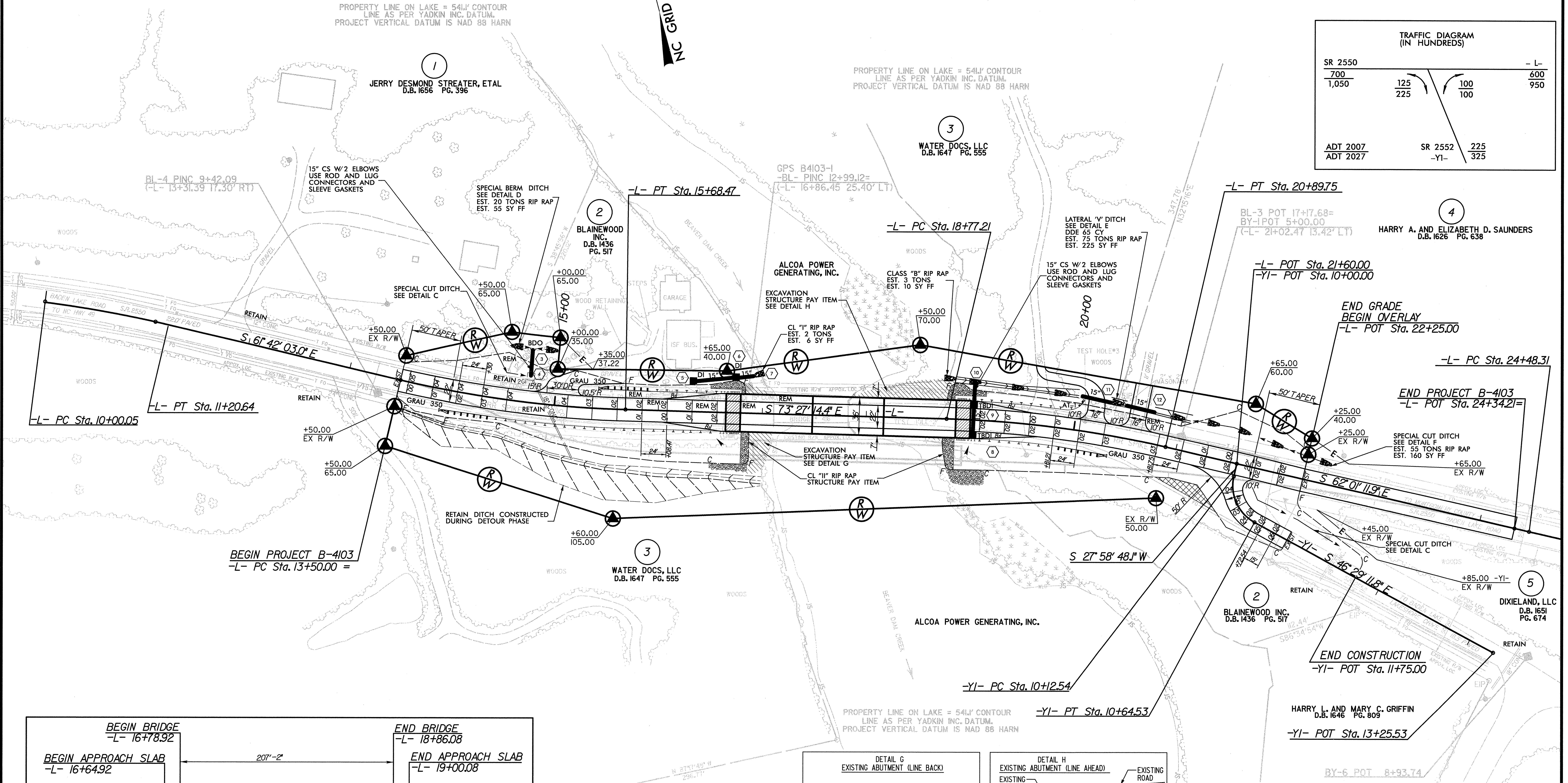
NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER JAMES TIMOTHY JORDAN 1/28/08

NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD 1-28-08

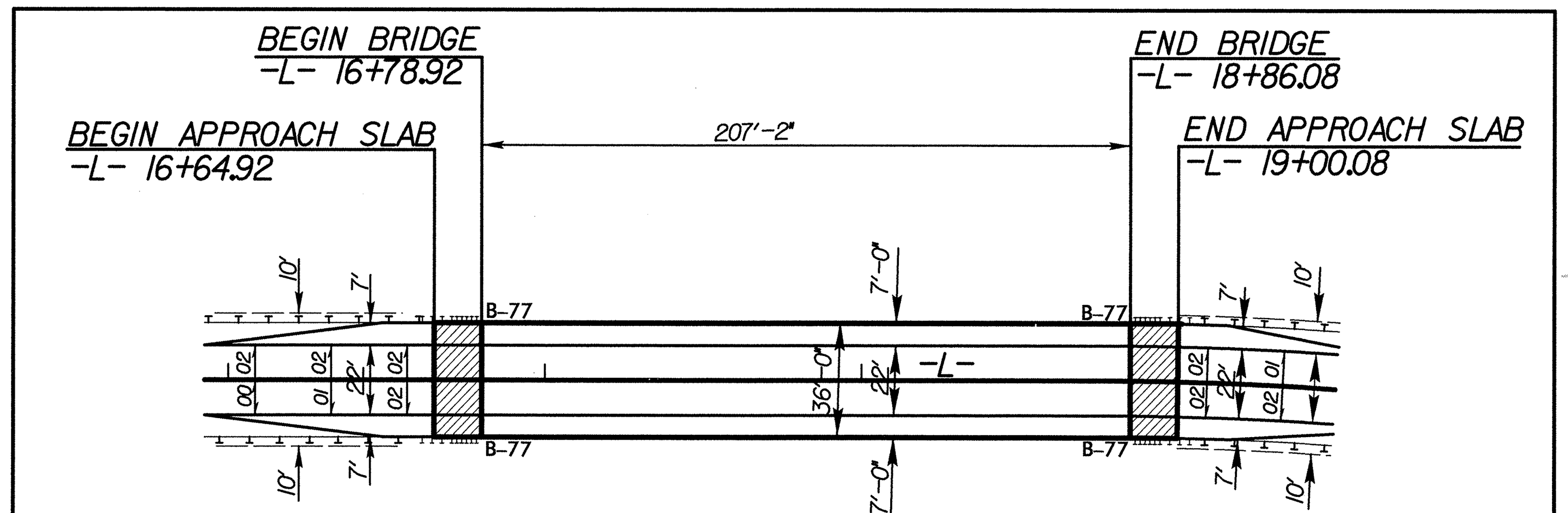
FOR -L- PROFILE SEE SHEET 5
FOR -Y1- PROFILE SEE SHEET 5

TRAFFIC DIAGRAM
(IN HUNDREDS)

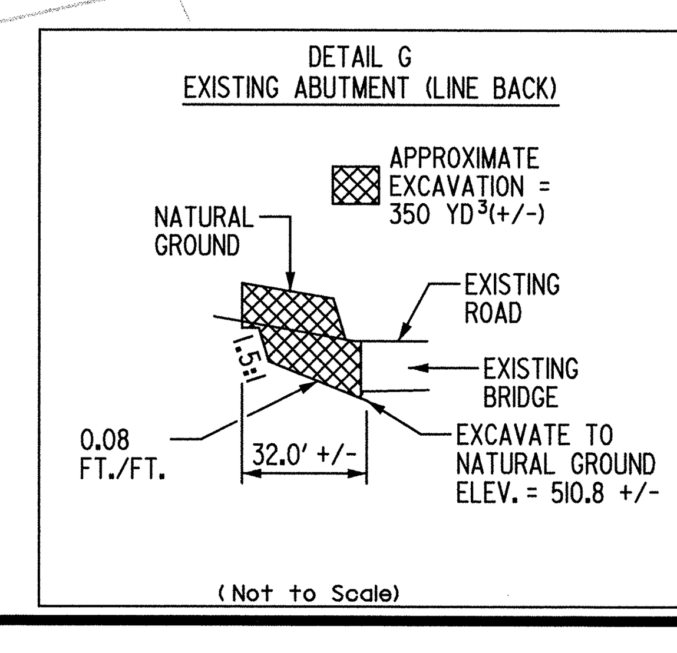
SR 2550: 700 / 1,050; 125 / 225; 100 / 100; -L-: 600 / 950
ADT 2007 / ADT 2027; SR 2552 -Y1-: 225 / 325

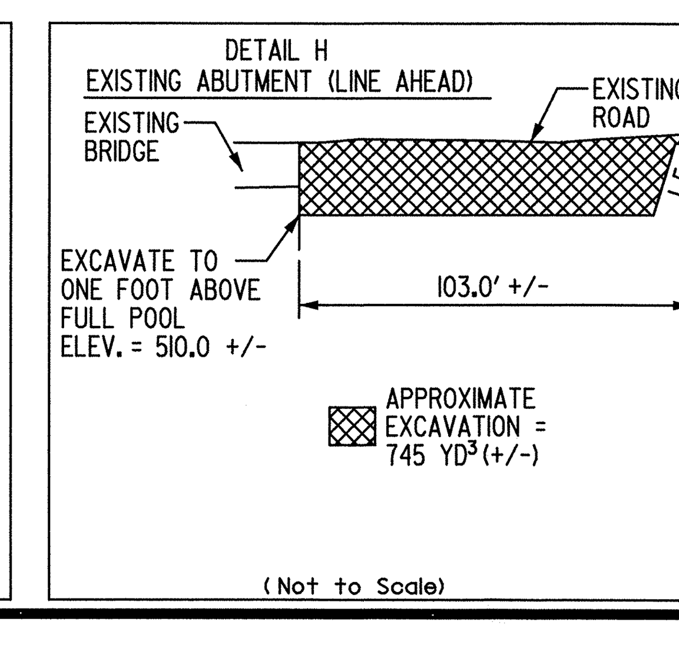


NC GRID NAD 83/95
PROPERTY LINE ON LAKE = 541.1' CONTOUR LINE AS PER YADKIN INC. DATUM. PROJECT VERTICAL DATUM IS NAD 88 HARN
1
JERRY DESMOND STREATER, ETAL
D.B. 1656 PG. 396
2
BLAINEWOOD INC.
D.B. 1436 PG. 517
3
WATER DOCS, LLC
D.B. 1647 PG. 555
4
HARRY A. AND ELIZABETH D. SAUNDERS
D.B. 1626 PG. 638
5
DIXIELAND, LLC
D.B. 1651 PG. 674
HARRY L. AND MARY C. GRIFFIN
D.B. 1646 PG. 809
ALCOA POWER GENERATING, INC.
BL-4 PINC 9+42.09
(-L- 13+31.39 17.30' RT)
GPS B4103-1
-BL- PINC 12+99.12=
(-L- 16+86.45 25.40' LT)
BL-3 POT 17+17.68=
BY-1 POT 5+00.00
(-L- 21+02.47 13.42' LT)
15" CS W/2 ELBOWS USE ROD AND LUG CONNECTORS AND SLEEVE GASKETS
SPECIAL BERM DITCH SEE DETAIL D EST. 20 TONS RIP RAP EST. 55 SY FF
SPECIAL CUT DITCH SEE DETAIL C
-L- PT Sta. 15+68.47
-L- PC Sta. 18+77.21
-L- PT Sta. 20+89.75
-L- POT Sta. 21+60.00
-Y1- POT Sta. 10+00.00
END GRADE
BEGIN OVERLAY
-L- POT Sta. 22+25.00
-L- PC Sta. 24+48.31
END PROJECT B-4103
-L- POT Sta. 24+34.21=
LATERAL 'V' DITCH SEE DETAIL E DDE 65 CY EST. 75 TONS RIP RAP EST. 225 SY FF
EXCAVATION STRUCTURE PAY ITEM SEE DETAIL H
CLASS "B" RIP RAP EST. 3 TONS EST. 10 SY FF
CL "I" RIP RAP EST. 2 TONS EST. 6 SY FF
EXCAVATION STRUCTURE PAY ITEM SEE DETAIL G
CL "II" RIP RAP STRUCTURE PAY ITEM
S 61° 42' 03.0" E
S 73° 27' 14.4" E
S 62° 01' 11.9" E
S 27° 58' 48.1" W
-Y1- S 46° 29' 11.8" E
-L- PC Sta. 10+00.05
-L- PT Sta. 11+20.64
BEGIN PROJECT B-4103
-L- PC Sta. 13+50.00 =
RETAIN DITCH CONSTRUCTED DURING DETOUR PHASE
SPECIAL CUT DITCH SEE DETAIL F EST. 55 TONS RIP RAP EST. 160 SY FF
-Y1- PC Sta. 10+12.54
-Y1- PT Sta. 10+64.53
END CONSTRUCTION
-Y1- POT Sta. 11+75.00
-Y1- POT Sta. 13+25.53
BY-6 POT 8+93.74
15+00
20+00
50' TAPER



SKETCH SHOWING RELATIONSHIP OF BRIDGE TO PAVEMENT AND SHOULDERS





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PROJECT REFERENCE NO.	SHEET NO.
B-4103	5

R/W SHEET NO.

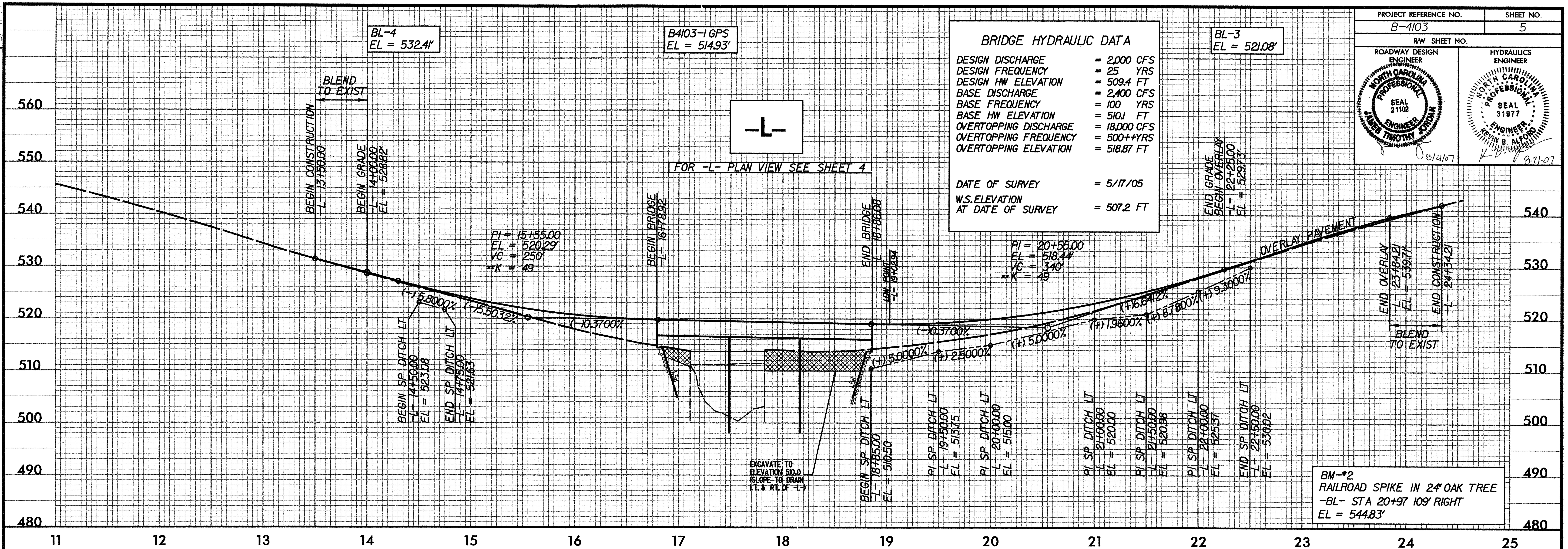
ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21102 JAMES TIMOTHY JORDAN 8/21/07

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 31977 KEVIN B. ALFORD 8-21-07

REVISIONS

-L-

FOR -L- PLAN VIEW SEE SHEET 4



BL-4
EL = 532.41'
B4103-1 GPS
EL = 514.93'
BL-3
EL = 521.08'
BLEND TO EXIST
BEGIN CONSTRUCTION -L- 13+50.00
BEGIN GRADE -L- 14+00.00 EL = 528.82'
PI = 15+55.00
EL = 520.29'
VC = 250'
**K = 49
(-) 5.8000%
(-)5.5032%
(-)0.3700%
BEGIN BRIDGE -L- 16+78.92
END BRIDGE -L- 18+88.08
LOW POINT -L- 18+02.94
BEGIN SP DITCH LT -L- 14+50.00 EL = 523.08
END SP DITCH LT -L- 14+75.00 EL = 521.63
EXCAVATE TO ELEVATION 510.0 (SLOPE TO DRAIN LT. & RT. OF -L-)
BEGIN SP DITCH LT -L- 18+85.00 EL = 510.50
(+) 5.0000%
(+) 2.5000%
(+) 5.0000%
(-)0.3700%
PI = 20+55.00
EL = 518.44'
VC = 340'
**K = 49
(+) 1.9600%
(+)6.6412%
(+) 8.7800%
(+) 9.3000%
PI SP DITCH LT -L- 19+50.00 EL = 513.75
PI SP DITCH LT -L- 20+00.00 EL = 515.00
PI SP DITCH LT -L- 21+00.00 EL = 520.00
PI SP DITCH LT -L- 21+50.00 EL = 520.98
PI SP DITCH LT -L- 22+00.00 EL = 525.37
END SP DITCH LT -L- 22+50.00 EL = 530.02
END GRADE BEGIN OVERLAY -L- 22+25.00 EL = 529.73'
OVERLAY PAVEMENT
END OVERLAY -L- 23+84.21 EL = 539.71'
END CONSTRUCTION -L- 24+34.21
BLEND TO EXIST
560
550
540
530
520
510
500
490
480
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	2,000 CFS
DESIGN FREQUENCY	=	25 YRS
DESIGN HW ELEVATION	=	509.4 FT
BASE DISCHARGE	=	2,400 CFS
BASE FREQUENCY	=	100 YRS
BASE HW ELEVATION	=	510.1 FT
OVERTOPPING DISCHARGE	=	18,000 CFS
OVERTOPPING FREQUENCY	=	500++YRS
OVERTOPPING ELEVATION	=	518.87 FT
DATE OF SURVEY	=	5/17/05
W.S. ELEVATION AT DATE OF SURVEY	=	507.2 FT

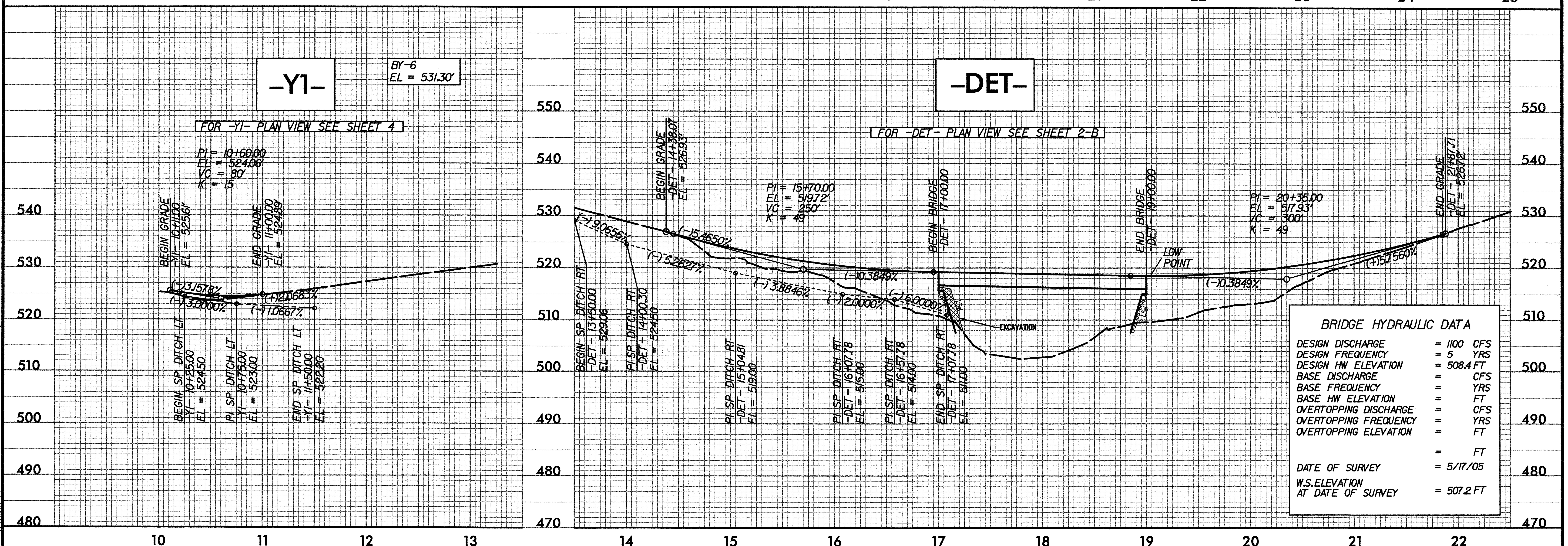
BM-#2
RAILROAD SPIKE IN 24" OAK TREE
-BL- STA 20+97 109' RIGHT
EL = 544.83'

-Y1-

FOR -Y1- PLAN VIEW SEE SHEET 4

-DET-

FOR -DET- PLAN VIEW SEE SHEET 2-B



BY-6
EL = 531.30'
PI = 10+60.00
EL = 524.06'
VC = 80'
K = 15
BEGIN GRADE -Y1- 10+11.00 EL = 525.61'
END GRADE -Y1- 11+00.00 EL = 524.89
(-)3.1578%
(-) 3.0000%
(+)2.0683%
(-) 1.0667%
BEGIN SP DITCH LT -Y1- 10+25.00 EL = 524.50
PI SP DITCH LT -Y1- 10+75.00 EL = 523.00
END SP DITCH LT -Y1- 11+50.00 EL = 522.20
BEGIN GRADE -DET- 14+38.07 EL = 526.93'
PI = 15+70.00
EL = 519.72'
VC = 250'
K = 49
(-)9.0656%
(-)5.4650%
(-) 5.2627%
(-) 3.8846%
(-)0.3849%
(-)2.0000%
(-)6.0000%
BEGIN BRIDGE -DET- 17+00.00
END BRIDGE -DET- 19+00.00
LOW POINT
EXCAVATION
PI = 20+35.00
EL = 517.93'
VC = 300'
K = 49
(-)0.3849%
(+)5.7560%
END GRADE -DET- 21+87.71 EL = 526.72
BEGIN SP DITCH RT -DET- 13+50.00 EL = 529.06
PI SP DITCH RT -DET- 14+00.30 EL = 524.50
PI SP DITCH RT -DET- 15+04.81 EL = 519.00
PI SP DITCH RT -DET- 16+07.78 EL = 515.00
PI SP DITCH RT -DET- 16+57.78 EL = 514.00
END SP DITCH RT -DET- 17+07.78 EL = 511.00
540
530
520
510
500
490
480
550
470
10
11
12
13
14
15
16
17
18
19
20
21
22

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	1100 CFS
DESIGN FREQUENCY	=	5 YRS
DESIGN HW ELEVATION	=	508.4 FT
BASE DISCHARGE	=	CFS
BASE FREQUENCY	=	YRS
BASE HW ELEVATION	=	FT
OVERTOPPING DISCHARGE	=	CFS
OVERTOPPING FREQUENCY	=	YRS
OVERTOPPING ELEVATION	=	FT
	=	FT
DATE OF SURVEY	=	5/17/05
W.S. ELEVATION AT DATE OF SURVEY	=	507.2 FT

5/14/99

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