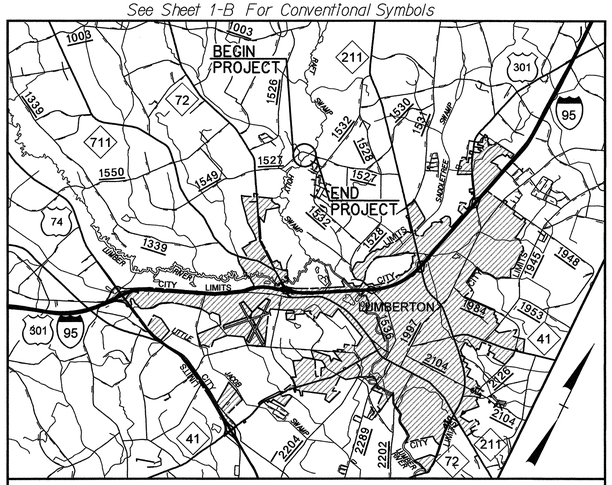

09/08/99

TIP PROJECT: B-3693

CONTRACT: C202549

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

VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ROBESON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3693	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33233.1.1	BRZ-1527(2)	P.E.
33233.2.1	BRZ-1527(2)	R/W & UTIL.
33233.3.2	BRZ-1527(6)	CONST.

LOCATION: BRIDGE NO. 207 OVER HOLLY SWAMP AND BRIDGE NOS. 210 AND 211 OVER RAFT SWAMP ON SR 1527

TYPE OF WORK: GRADING, DRAINAGE, PAVING & STRUCTURES

** DESIGN EXCEPTION REQUIRED FOR:
MIN. HORIZONTAL CURVE RADIUS AND BRIDGE WIDTH

NCDOT CONTACT: DOUG TAYLOR, P.E.
ROADWAY DESIGN - ENGINEERING COORDINATION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA
RURAL MINOR COLLECTOR

ADT 2010 = 10,570
ADT 2030 = 17,150
DHV = 10 %
D = 57 %
T = 4 % *
V = 60 MPH**
* (TTST 2% + DUAL 2%)
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-3693 = *0.337 MI.*
LENGTH STRUCTURES TIP PROJECT B-3693 = *0.061 MI.*
TOTAL LENGTH OF TIP PROJECT B-3693 = *0.398 MI.*

Prepared In the Office of:

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MAY 15, 2009

LETTING DATE:
JUNE 15, 2010

MICHAEL A. YOUNG, PE
PROJECT ENGINEER

DAVID C. WALLER, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SEAL 19732
SHIHCHEN FUH

SIGNATURE: P.E.
2-09-10

ROADWAY DESIGN ENGINEER

SEAL 022982
MICHAEL A. YOUNG

SIGNATURE: P.E.
2-9-10

***DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA***

Art McMillan P.E.
STATE HIGHWAY DESIGN ENGINEER

2/8/2010
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Ko & Associates, P.C.

PROJECT REFERENCE NO.	SHEET NO.
B-3693	1-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022982 ENGINEER MICHAEL A. YOUNG 3-19-10

INDEX OF SHEETS

SHEET NUMBER	DESCRIPTION
1	Title Sheet
1-A	Index of Sheets, General Notes and List of Standards
1-B	Conventional Symbols
1-C	Survey Control Sheet
1-D	Centerline Coordinate List
2 thru 2-B	Typical Sections, Wedging Detail and Pavement Schedule
2-C thru 2-D	Details of Temporary Detour
2-E	Anchorage for Frames Detail
2-F thru 2-G	Method of Pipe Installation Details
2-H thru 2-S	Temporary Shoring Details
3	Summary of Quantities
3-A	Summary of Earthwork
3-B	Summary of Pavement Removal
3-C	Drainage Summary and Guardrail Summary
3-D	Parcel Index Sheet
4 thru 5	Plan Sheets
6 thru 7	Profile Sheets
TCP-1 thru TCP-13	Traffic Control Plans
PMP-1 thru PMP-4	Pavement Marking Plans
EC-1 thru EC-11	Erosion Control Plans
RF-1	Reforestation Detail
SIGN-1 thru SIGN-4	Signing Plans
UC-1 thru UC-4	Utility Construction Plans
UO-1 thru UO-3	Utility by Other Plans
X-1	Cross Section Summary
X-2 thru X-15	Cross Sections
S-1 thru S-59	Structure Plans

GENERAL NOTES:

GENERAL NOTES:

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

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

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".

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
LUMBER RIVER EMC, ROBESON COUNTY, PIEDMONT NATURAL GAS, AT&T AND TIME WARNER CABLE.

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 OTHERS.

2006 ROADWAY STANDARD DRAWINGS

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

2006 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
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	
840.00	Concrete Base Pad for Drainage Structures
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
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
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets

8/17/99

3/19/2010
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Florence & Hutcheson, Inc.

09/08/09

PROJECT REFERENCE NO.	SHEET NO.
B-3693	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 Drainage / Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Wheel Chair Ramp — WCR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole — HH
- H-Frame Pole
- Recorded U/G Power Line — P
- Designated U/G Power Line (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Booth
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- Recorded U/G Telephone Cable — T
- Designated U/G Telephone Cable (S.U.E.*) — T
- Recorded U/G Telephone Conduit — TC
- Designated U/G Telephone Conduit (S.U.E.*) — TC
- Recorded U/G Fiber Optics Cable — T FO
- Designated U/G Fiber Optics Cable (S.U.E.*) — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- Recorded U/G Water Line — W
- Designated U/G Water Line (S.U.E.*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Satellite Dish
- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- Recorded U/G TV Cable — TV
- Designated U/G TV Cable (S.U.E.*) — TV
- Recorded U/G Fiber Optic Cable — TV FO
- Designated U/G Fiber Optic Cable (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- Recorded U/G Gas Line — G
- Designated U/G Gas Line (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

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

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line — PUTL
- 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.

SURVEY CONTROL SHEET B-3693

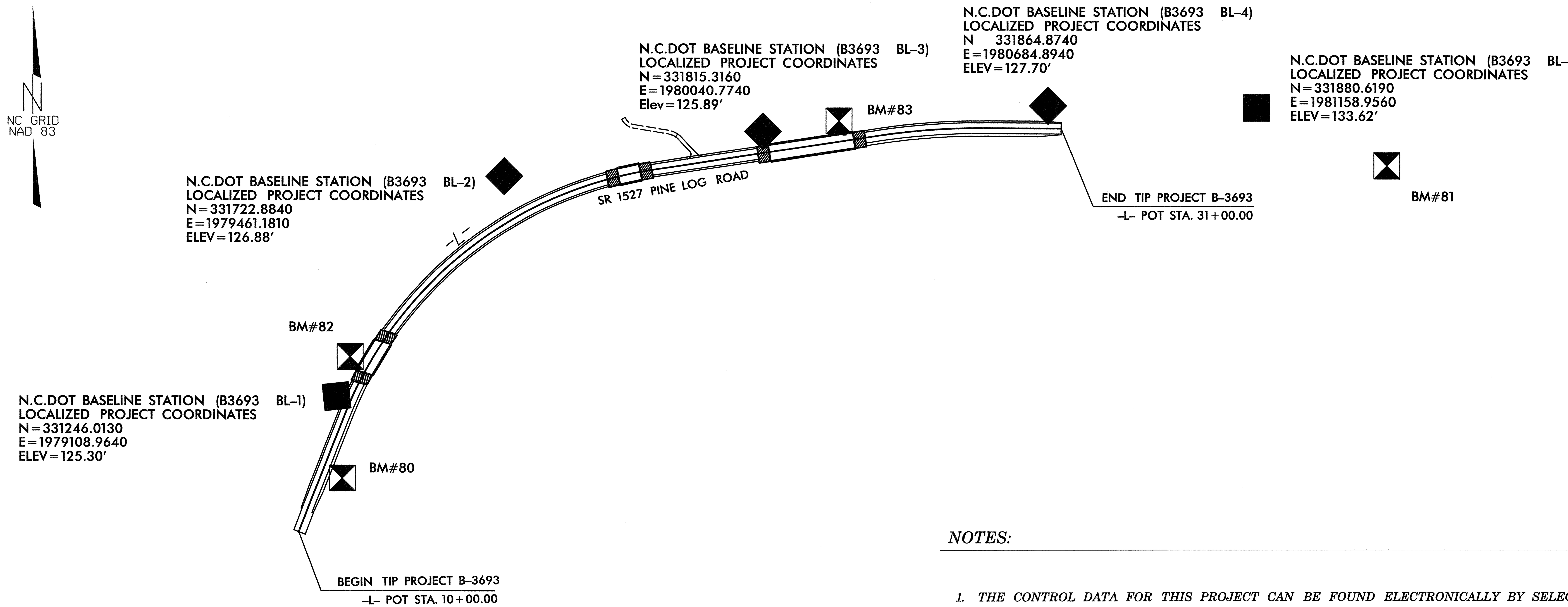
BL POINT	DESC.		NORTH	EAST	ELEVATION	L STATION	OFFSET
1	B3693	BL-1	331246.0130	1979108.9640	125.30	13+00.99	20.12 LT
2	B3693	BL-2	331722.8840	1979461.1810	126.88	18+69.33	79.46 LT
3	B3693	BL-3	331815.3160	1980040.7740	125.89	24+34.90	21.46 LT
4	B3693	BL-4	331864.8740	1980684.8940	127.70	30+79.42	16.64 LT
5	B3693	BL-5	331880.6190	1981158.9560	133.62	OUTSIDE PROJECT LIMITS	

BM80 ELEVATION = 122.95
N 331080 E 1979101
L STATION 11+44 34 RIGHT
RR SPIKE IN BASE OF 24IN GUM TREE

BM81 ELEVATION = 138.69
N 331834 E 1981289
L STATION 33+21
S 88° 04' 14.9" E DIST 362.70
RR SPIKE IN BASE OF 15IN OAK TREE

BM82 ELEVATION = 127.14
N 331330 E 1979147
L STATION 13+91 23 LEFT
CHISELED SQ IN BRIDGE CURB (NCGS BENCHMARK - ROB76 RM)

BM83 ELEVATION = 126.90
N 331838 E 1980226
L STATION 26+21 16 LEFT
MARK IS IN BRIDGE CURB (NCGS BENCHMARK - ROB76)



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY FOR MONUMENT "SEE"
WITH STATE PLANE GRID COORDINATES OF
NORTHING: 339754.5173(ft) EASTING: 1984874.0289(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999925560
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "SEE" TO -L- STATION 10+00 IS
S 33°39'37" W 10568.1099'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

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:
   B3693_LS_CONTROL_080930.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 EXISTING HARN MONUMENTATION
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

NOTE: DRAWING NOT TO SCALE

6/2/99
2/8/2010
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Ko & Associates, P.C.

PROJ. REFERENCE NO.	SHEET NO.
B-3693	1-D

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CENTERLINE COORDINATE LIST

Point #	Chain	Station	Northing (Y)	Easting (X)
1	L	10+00.00	330958.2829	1979016.4520
2	L	10+50.00	331004.7835	1979034.8286
3	L	11+00.00	331051.2841	1979053.2051
4	L	11+50.00	331097.7846	1979071.5816
5	L	12+00.00	331144.2852	1979089.9582
6	L	12+50.00	331190.7858	1979108.3347
7	L	13+00.00	331237.1485	1979127.0505
8	L	13+50.00	331282.5100	1979148.0661
9	L	14+00.00	331326.5972	1979171.6381
10	L	14+50.00	331369.2661	1979197.6895
11	L	15+00.00	331410.3777	1979226.1353
12	L	15+50.00	331449.7975	1979256.8827
13	L	16+00.00	331487.3969	1979289.8311
14	L	16+50.00	331523.0532	1979324.8732
15	L	17+00.00	331556.6500	1979361.8945
16	L	17+50.00	331588.0777	1979400.7741
17	L	18+00.00	331617.2335	1979441.3851
18	L	18+50.00	331644.0224	1979483.5950
19	L	19+00.00	331668.3569	1979527.2660
20	L	19+50.00	331690.1575	1979572.2554
21	L	20+00.00	331709.3531	1979618.4165
22	L	20+50.00	331725.8811	1979665.5986
23	L	21+00.00	331739.6874	1979713.6476
24	L	21+50.00	331750.7270	1979762.4067
25	L	22+00.00	331759.0355	1979811.7061
26	L	22+50.00	331766.4976	1979861.1462
27	L	23+00.00	331773.9598	1979910.5862
28	L	23+50.00	331781.4219	1979960.0262
29	L	24+00.00	331788.8841	1980009.4663
30	L	24+50.00	331796.3462	1980058.9063
31	L	25+00.00	331803.8084	1980108.3463
32	L	25+50.00	331811.2705	1980157.7863
33	L	26+00.00	331818.7327	1980207.2264
34	L	26+50.00	331826.1948	1980256.6664
35	L	27+00.00	331833.6433	1980306.1085
36	L	27+50.00	331840.0680	1980355.6916
37	L	28+00.00	331844.8366	1980405.4614
38	L	28+50.00	331847.9439	1980455.3624
39	L	29+00.00	331849.3864	1980505.3393
40	L	29+50.00	331849.2895	1980555.3381
41	L	30+00.00	331848.8830	1980605.3364
42	L	30+50.00	331848.4764	1980655.3348
43	L	31+00.00	331848.0699	1980705.3331
44	L	31+50.00	331847.6634	1980755.3315
45	L	32+00.00	331847.2569	1980805.3298
46	L	32+50.00	331846.8503	1980855.3282
47	L	33+00.00	331846.4438	1980905.3265
48	L	33+21.10	331846.2723	1980926.4248

Point #	Chain	Station	Northing (Y)	Easting (X)

Point #	Chain	Station	Northing (Y)	Easting (X)

Point #	Chain	Station	Northing (Y)	Easting (X)

Point #	Chain	Station	Northing (Y)	Easting (X)

PAVEMENT SCHEDULE

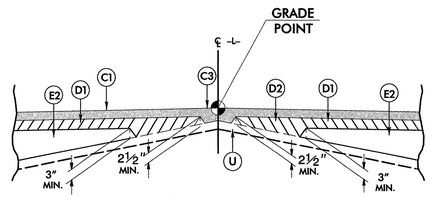
A	CONCRETE OVERLAY (STRUCTURE PAY ITEM)	E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	J	PROP. 8" AGGREGATE BASE COURSE.
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.	P	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YD.
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.	T	EARTH MATERIAL.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
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.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.		

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
B-3693	2

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 022982 ENGINEER MICHAEL A. YOUNG — 2-9-10

PAVEMENT DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 13308 ENGINEER JOHN-CHI CHEN — 2/23/10



Detail Showing Method of Wedging

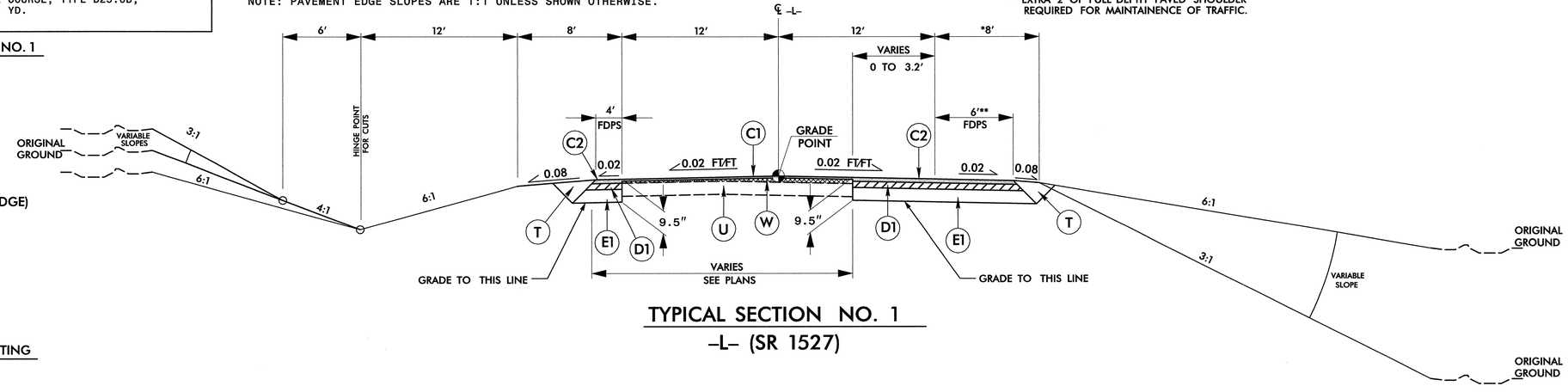
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

* ADD 3' WITH GUARDRAIL

** EXTRA 2' OF FULL DEPTH PAVED SHOULDER REQUIRED FOR MAINTAINENCE OF TRAFFIC.

TRANSITION FROM EXISTING TO T.S. NO. 1
–L– STA. 10+00.00 TO 10+50.00

USE TYPICAL SECTION NO. 1
–L– STA. 10+50.00 TO 13+80.23 (BRIDGE)
–L– STA. 27+00.00 TO 30+50.00

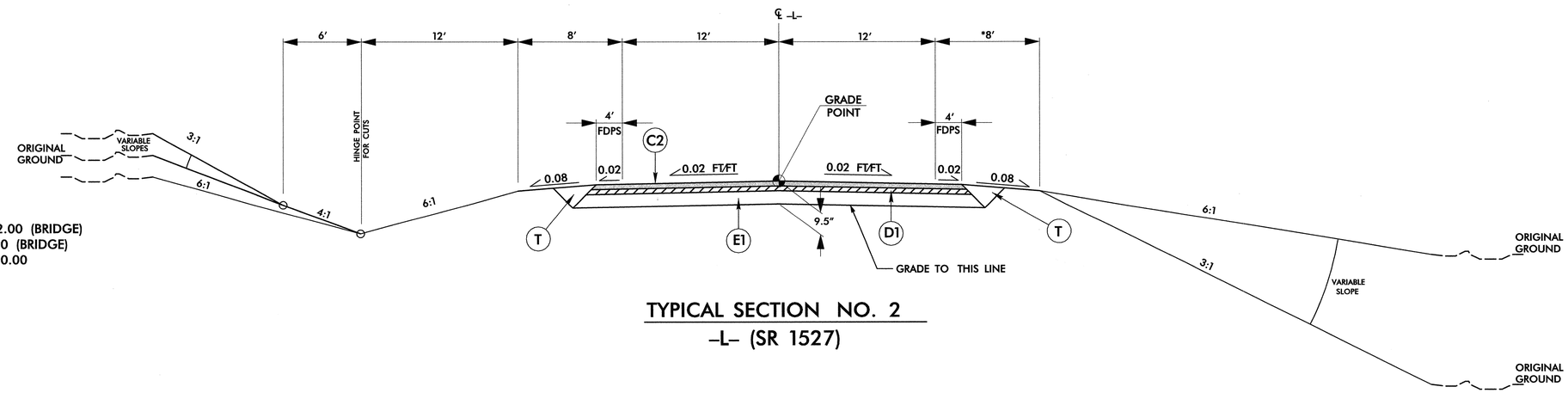


TYPICAL SECTION NO. 1
–L– (SR 1527)

TRANSITION FROM T.S. NO. 1 TO EXISTING
–L– STA. 30+50.00 TO 31+00.00

* ADD 3' WITH GUARDRAIL

USE TYPICAL SECTION NO. 2
–L– STA. 14+60.26 (BRIDGE) TO 21+12.00 (BRIDGE)
–L– STA. 21+62 (BRIDGE) TO 24+50.00 (BRIDGE)
–L– STA. 26+41.06 (BRIDGE) TO 27+00.00



TYPICAL SECTION NO. 2
–L– (SR 1527)

2/8/2010
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KD & Associates, P.A.

6/2/99

A	CONC. OVERLAY
C1	1½" S9.5B
C2	3" S9.5B
C3	VAR. S9.5B
D1	2½" I19.0B
D2	VAR. I19.0B
E1	4" B25.0B
E2	VAR. B25.0B
J2	8" ABC
P1	.35 PRIME COAT
T	EARTH MATERIAL
U	EX PAVEMENT
W	WEDGING

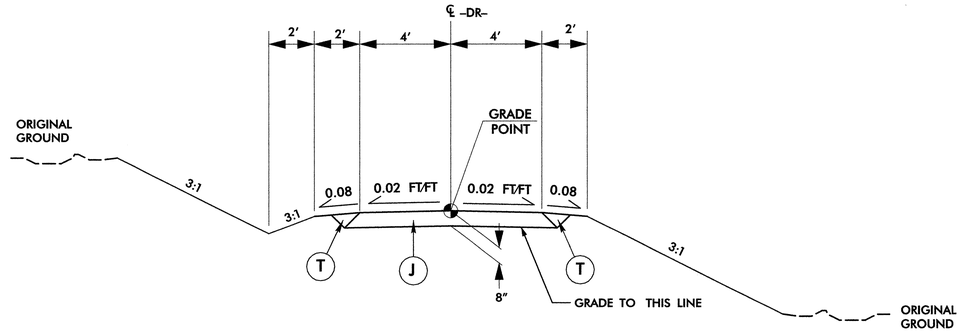
NOTE:
PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
B-3693	2-A

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 022982 ENGINEER MICHAEL A. YOUNG
3-19-10

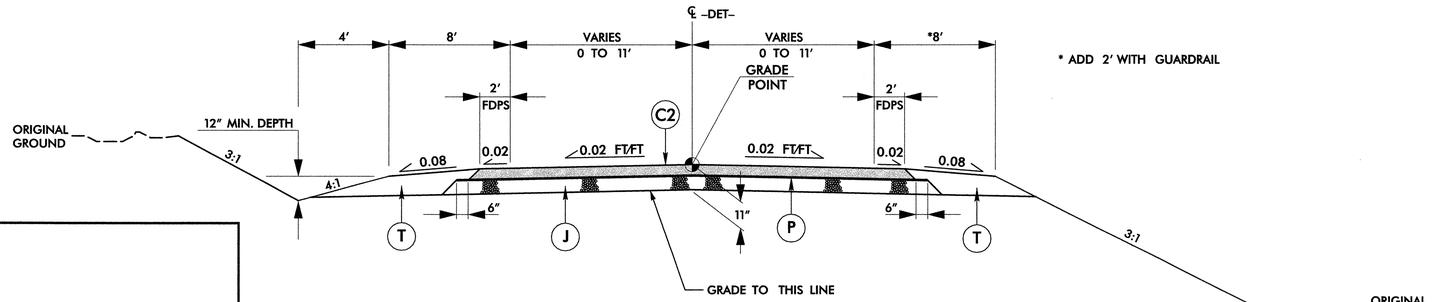
PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 13268 ENGINEER JOHN-CHI CHEN
3/23/10



USE TYPICAL SECTION NO. 3
–DR– STA. 10+13.00 TO 11+60.00

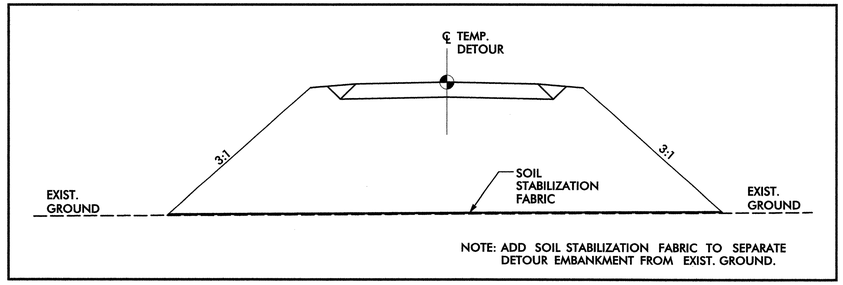
TYPICAL SECTION NO. 3
–DR– (DRIVE)

USE TYPICAL SECTION NO. 4
–DET– STA. 10+00.00 TO 13+95.00 (BRIDGE)
–DET– STA. 14+50.00 (BRIDGE) TO 22+10.00 (BRIDGE)
–DET– STA. 22+50.00 (BRIDGE) TO 25+55.00 (BRIDGE)
–DET– STA. 27+10.00 (BRIDGE) TO 31+05.24



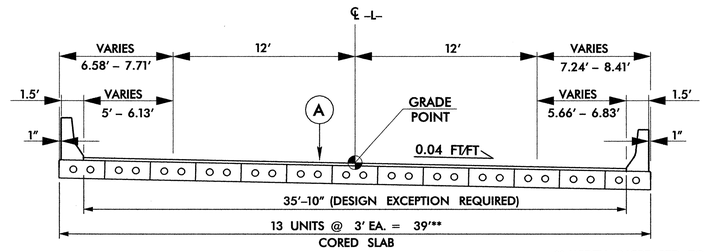
* ADD 2′ WITH GUARDRAIL

TYPICAL SECTION NO. 4
–DET– (TEMP. DETOUR)



USE DETAIL IN CONJUNCTION WITH TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 5
–L– STA. 13+80.23 TO 14+60.26



** WIDTH INCREASED TO CONSTRUCT A TANGENT BRIDGE ON A CURVED ALIGNMENT

TYPICAL SECTION NO. 5
–L– (SR 1527)

3/19/2010
R:\Roadway\Proj\B3693_Rdy_typ.dgn
florence & hutcheson, inc.

6/2/99

A	CONC. OVERLAY
C1	1½" S9.5B
C2	3" S9.5B
C3	VAR. S9.5B
D1	2½" I19.0B
D2	VAR. I19.0B
E1	4" B25.0B
E2	VAR. B25.0B
J2	8" ABC
P1	.35 PRIME COAT
T	EARTH MATERIAL
U	EX PAVEMENT
W	WEDGING

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

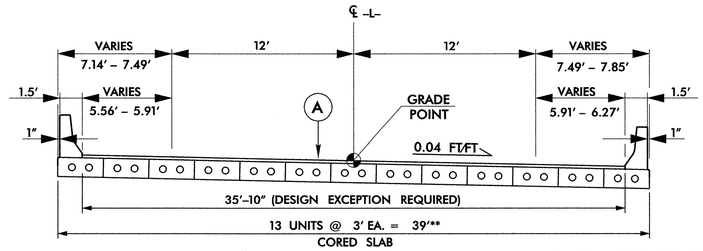
Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
B-3693	2-B

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022980 ENGINEER MICHAEL W. YOUNG 3-19-10

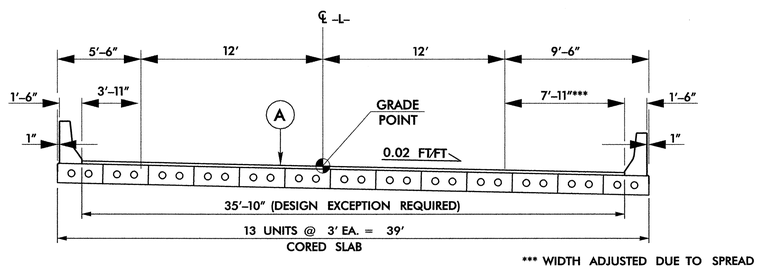
~~PAVEMENT DESIGN ENGINEER~~



** WIDTH INCREASED TO CONSTRUCT A TANGENT BRIDGE ON A CURVED ALIGNMENT

TYPICAL SECTION NO. 6
–L– (SR 1527)

USE TYPICAL SECTION NO. 6
–L– STA. 21+12.00 TO 21+62.00



*** WIDTH ADJUSTED DUE TO SPREAD

TYPICAL SECTION NO. 7
–L– (SR 1527)

USE TYPICAL SECTION NO. 7
–L– STA. 24+50.00 TO 26+41.06

3/18/2010
H:\Roadway\Proj\B3693_Rdy_typ.dgn
Florence & Hutcheson, Inc.

PROJECT REFERENCE NO.	SHEET NO.
B-3693	2-C
R/W SHEET NO.	

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 022982 ENGINEER MICHAEL A. YOUNG 2-9-10

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 19732 ENGINEER SHIHCHEN FUH 2-09-10

TEMPORARY DETOUR

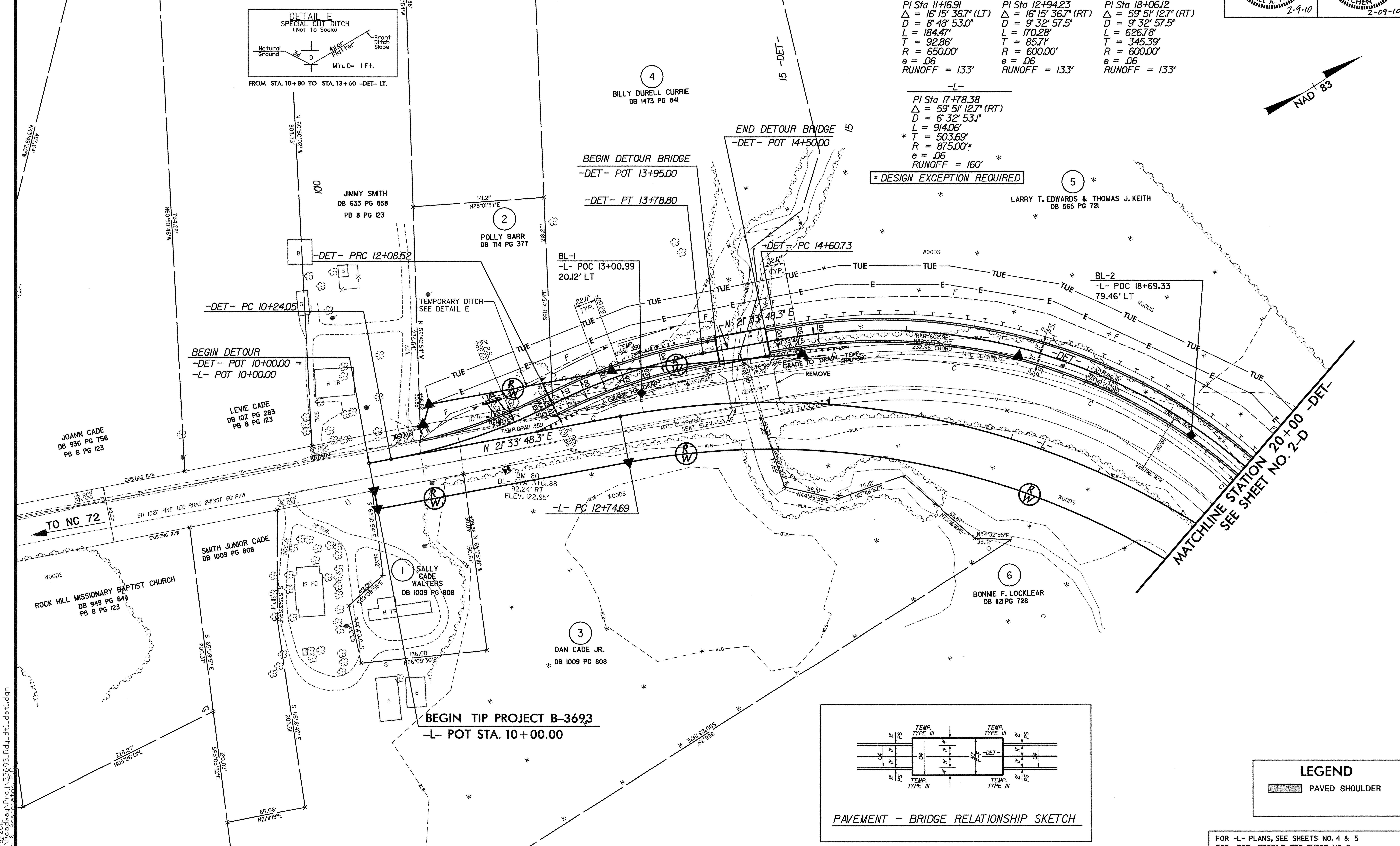
-DET-

PI Sta 11+16.91	PI Sta 12+94.23	PI Sta 18+06.12
Δ = 16° 15' 36.7" (LT)	Δ = 16° 15' 36.7" (RT)	Δ = 59° 51' 12.7" (RT)
D = 8° 48' 53.0"	D = 9° 32' 57.5"	D = 9° 32' 57.5"
L = 184.47'	L = 170.28'	L = 626.78'
T = 92.86'	T = 85.71'	T = 345.39'
R = 650.00'	R = 600.00'	R = 600.00'
e = .06	e = .06	e = .06
RUNOFF = 133'	RUNOFF = 133'	RUNOFF = 133'

-L-

PI Sta 17+78.38
Δ = 59° 51' 12.7" (RT)
D = 6° 32' 53.1"
L = 914.06'
T = 503.69'
R = 875.00'*
e = .06
RUNOFF = 160'

* DESIGN EXCEPTION REQUIRED



DETAIL E
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground
Front Ditch Slope
Min. D= 1 Ft.
FROM STA. 10+80 TO STA. 13+60 -DET- LT.
NAD 83
BILLY DURELL CURRIE DB 1473 PG 841
END DETOUR BRIDGE -DET- POT 14+50.00
BEGIN DETOUR BRIDGE -DET- POT 13+95.00
-DET- PT 13+78.80
LARRY T. EDWARDS & THOMAS J. KEITH DB 565 PG 721
JIMMY SMITH DB 633 PG 858 PB 8 PG 123
POLLY BARR DB 714 PG 377
-DET- PRC 12+08.52
BL-1 -L- POC 13+00.99 20.12' LT
-DET- PC 14+60.73
BL-2 -L- POC 18+69.33 79.46' LT
TEMPORARY DITCH SEE DETAIL E
-DET- PC 10+24.05
BEGIN DETOUR -DET- POT 10+00.00 = -L- POT 10+00.00
N 21° 33' 48.3" E
LEVIE CADE DB 102 PG 283 PB 8 PG 123
JOANN CADE DB 936 PG 756 PB 8 PG 123
SR 1527 PINE LOG ROAD 24' BST 60' R/W
TO NC 72
BM 80 BL-1 STA 3+61.88 92.24' RT ELEV. 122.95'
-L- PC 12+74.69
MATCHLINE STATION 20+00 -DET- SEE SHEET NO. 2-D
SMITH JUNIOR CADE DB 1009 PG 808
ROCK HILL MISSIONARY BAPTIST CHURCH DB 949 PG 644 PB 8 PG 123
SALLY CADE WALTERS DB 1009 PG 808
DAN CADE JR. DB 1009 PG 808
BONNIE F. LOCKLEAR DB 1121 PG 728
BEGIN TIP PROJECT B-3693 -L- POT STA. 10+00.00

PAVEMENT - BRIDGE RELATIONSHIP SKETCH

LEGEND
PAVED SHOULDER

FOR -L- PLANS, SEE SHEETS NO. 4 & 5
FOR -DET- PROFILE, SEE SHEET NO. 7

8/17/99
2/8/2010
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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-3693	2-D
R/W SHEET NO.	

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 022982 ENGINEER MICHAEL A. YOUNG
2-9-10

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19732 ENGINEER HHICHEN FUH
2-09-10

TEMPORARY DETOUR

-L-
PI Sta 17+78.38
△ = 59° 51' 12.7" (RT)
D = 6° 32' 53.1"
L = 914.06'
T = 503.69'
R = 875.00'*
e = .06
RUNOFF = 160'

PI Sta 28+12.28
△ = 9° 02' 56.1" (RT)
D = 3° 49' 11.0"
L = 236.90'
T = 118.70'
R = 1,500.00'
e = .06
RUNOFF = 160'

* DESIGN EXCEPTION REQUIRED

-DET-
PI Sta 28+56.66
△ = 20° 43' 01.3" (RT)
D = 8° 48' 53.0"
L = 235.03'
T = 118.81'
R = 650.00'
e = .06
RUNOFF = 133'

PI Sta 30+39.29
△ = 11° 40' 05.2" (LT)
D = 8° 48' 53.0"
L = 132.37'
T = 66.41'
R = 650.00'
e = .06
RUNOFF = 133'

-DR-
PI Sta 10+25.43
△ = 58° 56' 11.4" (LT)
D = 127° 19' 26.2"
L = 46.29'
T = 25.43'
R = 45.00'

PI Sta 11+41.03
△ = 51° 28' 21.1" (RT)
D = 181° 04' 16.6"
L = 31.74'
T = 17.35'
R = 31.64'

NAD 83

MATCHLINE STATION 20+00 -DET-
SEE SHEET NO. 2-C

BEGIN DETOUR BRIDGE
-DET- POT STA. 22+10.00

END CONSTRUCTION
-DR- 11+60.00
N 23° 04' 00.3" W

-DR- PT 11+55.42

-DET- PT 20+87.52

-L- PT 21+88.75

END DETOUR BRIDGE
-DET- POT STA. 22+50.00

-DR- PC 11+23.68

-DR- PT 10+46.29

BL-3
-L- POT 24+34.90
21.46' LT

-DR- PC 10+00.00 =
-L- STA. 23+54.74

N 81° 32' 21.4" W

N 81° 25' 01.0" E

-L- SR 1527 PINE LOG ROAD (24' BST)

BEGIN DETOUR BRIDGE
-DET- POT STA. 25+55.00

-DET-

-DET- PC 27+37.85

-L- PC 26+93.58

END DETOUR BRIDGE
-DET- POT STA. 27+10.00

-DET- PRC 29+72.87

-L- PT 29+30.48

END TIP PROJECT B-3693
-L- POT STA. 31+00.00

END DETOUR
-DET- PT 31+05.24 =
-L- POT 30+08.69

BL-4
-L- POT 30+79.42
16.64' LT

S 89° 32' 02.9" E

FROM THIS LOCATION TO END OF PROJECT, UTILITIES SHOWN ARE ACCORDING TO RECORDS

TO NC 211

RUN OF RAFT SWAMP

RAFT SWAMP

5
LARRY T. EDWARDS & THOMAS J. KEITH
DB 565 PG 721

6
BONNIE F. LOCKLEAR
DB 1121 PG 728

7
DELMAR SPAULDING
DB 1639 PG 149

8
WOODROW WILSON BECK JR.
DB 710 PG 286

WOODS
GRAVEL
GRASS ISLAND
BRIDGE #211
SEAT ELEV.=124.83
SEAT ELEV.=124.64
MTL. GUARDRAIL
GRADE TO DRAIN
REMOVE
CONC/BST
EXISTING R/W
28' GRAVEL DR.
15" RCP
TEMP. GRAD 350
TEMP. TYPE III

PAVEMENT - BRIDGE RELATIONSHIP SKETCH

PAVEMENT - BRIDGE RELATIONSHIP SKETCH

LEGEND
PAVED SHOULDER

FOR -L- PLANS, SEE SHEETS 4 & 5
FOR -DET- PROFILE, SEE SHEET NO. 7
FOR -DR- PROFILE, SEE SHEET NO. 7

2/8/2010
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Kimley-Horn & Associates, P.C.

PROJECT REFERENCE NO.	SHEET NO.
B-3693	2-E

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

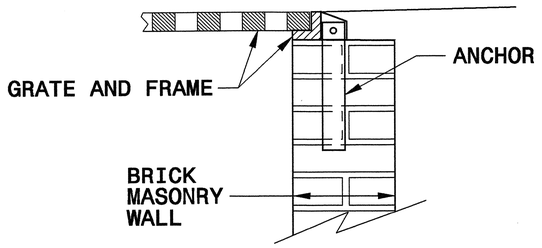
ENGLISH DETAIL DRAWING FOR

ANCHORAGE FOR FRAMES

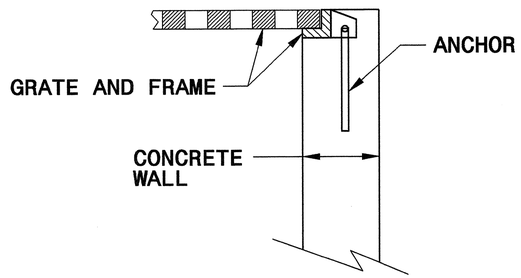
BRICK/CONCRETE/PRECAST CONCRETE

SHEET 1 OF 1

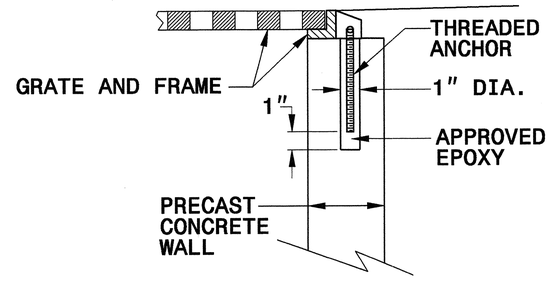
840D25



BRICK MASONRY CONSTRUCTION



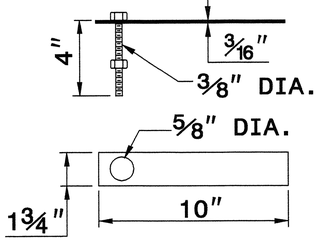
CONCRETE CONSTRUCTION



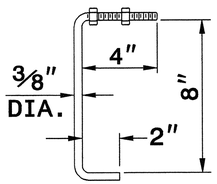
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

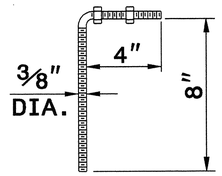
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



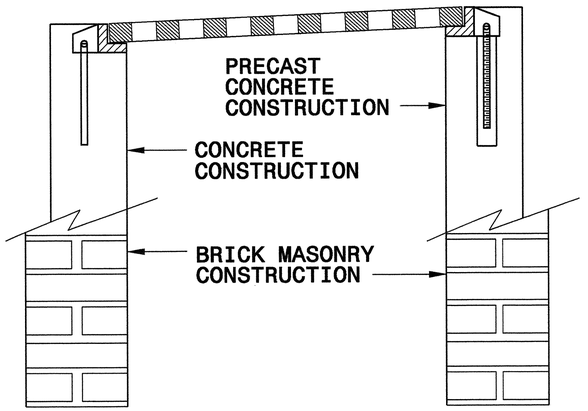
MASONRY ANCHOR
3/8" DIA. BOLT WITH PLATE



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

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.:			

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eriward AT PSC22293

30-JUL-2009 08:48
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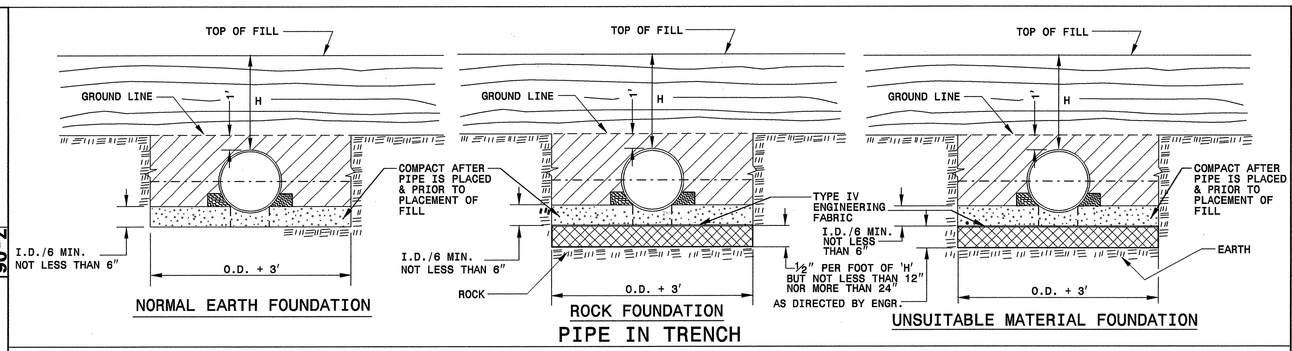
jhowerton AT PS237501

5/14/99

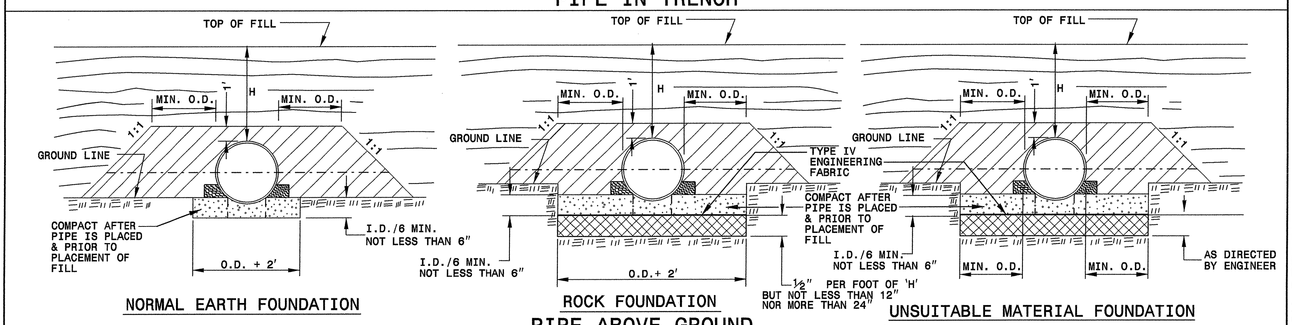
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

7-06

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
FLEXIBLE PIPE



PIPE IN TRENCH



PIPE ABOVE GROUND

GENERAL NOTES:

I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.

O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.

H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

SPRINGLINE OF PIPE

SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE 1 ABOVE AND BELOW SPRINGLINE.

APPROVED SUITABLE LOCAL MATERIAL.

UNDISTURBED EARTH MATERIAL

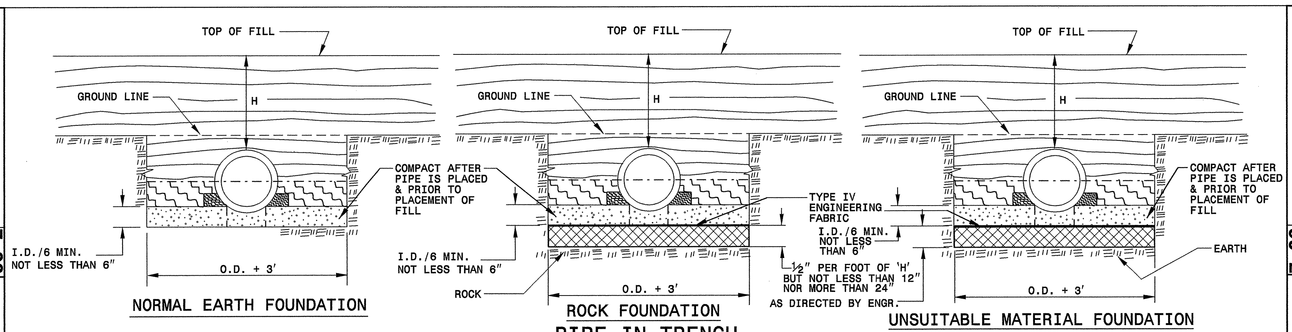
SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.

SHEET 1 OF 3
300D01

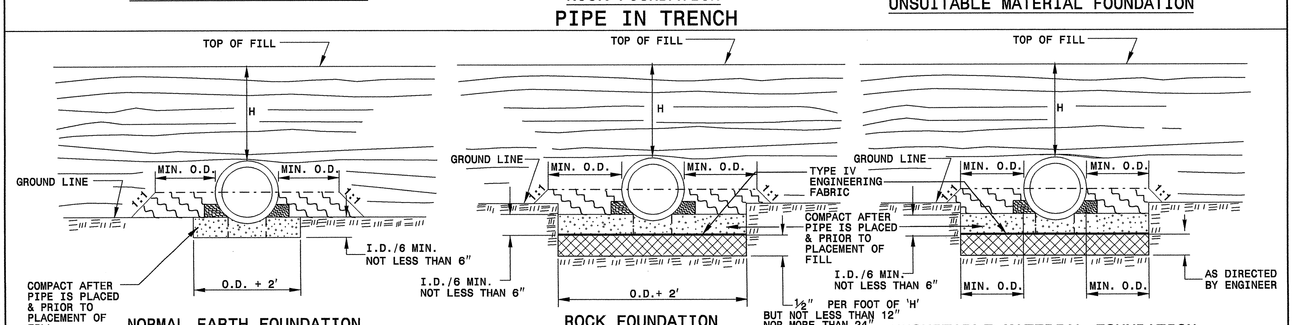
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

7-06

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
RIGID PIPE



PIPE IN TRENCH



PIPE ABOVE GROUND

GENERAL NOTES:

I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.

O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.

H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

SPRINGLINE OF PIPE

SELECT BACKFILL MATERIAL CLASS III OR CLASS II, BELOW SPRINGLINE.

APPROVED SUITABLE LOCAL MATERIAL ABOVE SPRINGLINE.

UNDISTURBED EARTH MATERIAL

SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.

SHEET 2 OF 3
300D01

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

ORIGINAL BY: Kkoenpf DATE: 5-15-09
MODIFIED BY: DATE:
CHECKED BY: DATE: 7/8/09
FILE SPEC: d:\ericward\stds\stdstoderaila\30001\0300d01.dgn

SEE PLATE FOR TITLE

PROJECT REFERENCE NO. B-3693
SHEET NO. 2-F

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.jhowerton AT PS23750I

5/14/99

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

7-06

ENGLISH DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

FILL HEIGHT TABLES

SHEET 3 OF 3

300D01

FLEXIBLE PIPE

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

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

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

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

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

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

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

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

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

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

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

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

RIGID PIPE

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

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

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

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

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

RCP - AASHTO M170

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

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

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

7-06

ENGLISH DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

FILL HEIGHT TABLES

SHEET 3 OF 3

300D01

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

SEE PLATE FOR TITLE

ORIGINAL BY: KKempf DATE: 5-15-09
MODIFIED BY: DATE:
CHECKED BY: DATE: 7/30/09
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 025856 JOHN S. HOWERTON 3/24/10

PROJECT REFERENCE NO. B-3693
SHEET NO. 2-G

PROJECT REFERENCE NO.	SHEET
B-3693	2-4

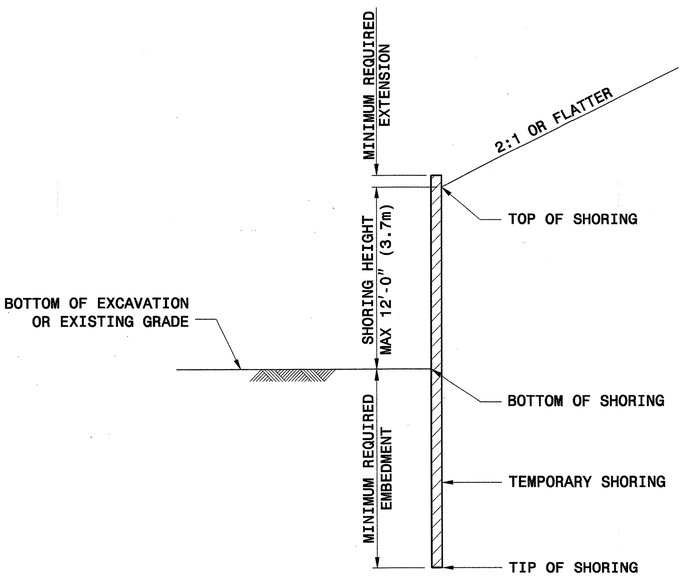
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

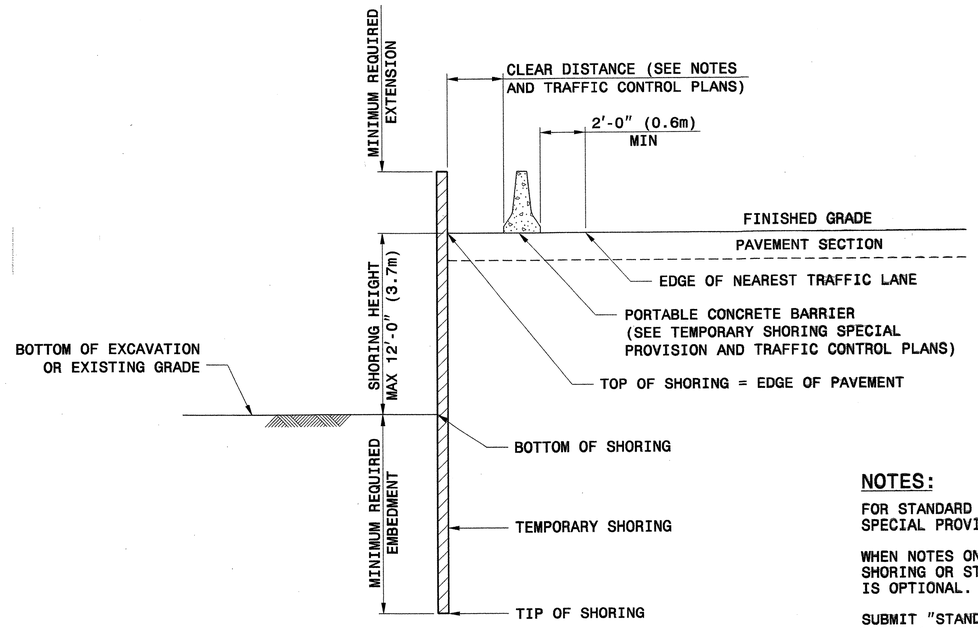
Scott A. Hidden 3/29/07
SIGNATURE DATE

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
B-3693	2-I

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

STANDARD TEMPORARY MSE WALL OPTIONS

TEMPORARY MSE WALL OPTION	VENDOR	CONTACT INFORMATION	REINFORCEMENT TYPE	SHEETS
TEMPORARY FABRIC WALL	N/A	N/A	POLYESTER OR POLYPROPYLENE FABRIC	3
HILFIKER TEMPORARY WALL	HILFIKER RETAINING WALLS	1902 HILFIKER LANE, EUREKA, CA 95503-5711 707-443-5093 WWW.HILFIKER.COM	WELDED WIRE MAT	4
SIERRASCAPE TEMPORARY WALL	TENSAR EARTH TECHNOLOGIES, INC	5883 GLENRIDGE DRIVE, SUITE 200 ATLANTA, GA 30328-5363 404-250-1290 WWW.TENSARCORP.COM	GEOGRID	5
RETAINED EARTH TEMPORARY WALL	THE REINFORCED EARTH COMPANY	8614 WESTWOOD CENTER DRIVE, SUITE 1100 VIENNA, VA 22182-2233 703-749-4325 WWW.REINFORCEDEARTH.COM	WELDED WIRE MESH	6-8
TERRATREL TEMPORARY WALL	THE REINFORCED EARTH COMPANY	8614 WESTWOOD CENTER DRIVE, SUITE 1100 VIENNA, VA 22182-2233 703-749-4325 WWW.REINFORCEDEARTH.COM	RIBBED STEEL STRIPS	9-11

FOR STANDARD TEMPORARY MSE WALLS, SEE TEMPORARY SHORING SPECIAL PROVISION.

WHEN NOTES ON PLANS DO NOT PROHIBIT TEMPORARY MSE WALLS OR STANDARD SHORING, STANDARD TEMPORARY MSE WALLS ARE OPTIONAL.

WHEN NOTES ON PLANS REQUIRE TEMPORARY MSE WALLS, USE STANDARD TEMPORARY MSE WALLS OR CONTRACTOR DESIGNED TEMPORARY MSE WALLS.

WHEN THE ALIGNMENT OF STANDARD TEMPORARY MSE WALLS RESULTS IN AN INTERIOR ANGLE LESS THAN 90 DEGREES, SUBMIT AN ACUTE CORNER DETAIL FOR THE SPECIFIC SITUATION IN ACCORDANCE WITH THE WALL VENDOR RECOMMENDATIONS. ALSO, SUBMIT A "STANDARD TEMPORARY MSE WALL SELECTION FORM" FOR EACH TEMPORARY MSE WALL LOCATION. SUBMIT THESE ITEMS AT LEAST 14 DAYS BEFORE BEGINNING WALL CONSTRUCTION.

STANDARD TEMPORARY MSE WALLS ARE BASED ON THE FOLLOWING CONDITIONS:
1) MAXIMUM WALL HEIGHT IS 28'-0" (8.5m).
2) TRAFFIC SURCHARGE IS 240 PSF (11.5 KPA) MAXIMUM OR BACKSLOPE IS 2:1 (H:V) OR FLATTER.
3) EXISTING OR FINISHED GRADE IN FRONT OF WALL IS 6:1 (H:V) SLOPE OR FLATTER.
4) THE GRADE OF THE TOP OF WALL IS LESS THAN 4% FOR RETAINED EARTH AND TERRATREL TEMPORARY WALLS.
5) DESIGN SERVICE LIFE IS 3 YEARS.
6) MATERIAL IN REINFORCED ZONE IS SHORING BACKFILL.
7) MAXIMUM APPLIED BEARING PRESSURE IS 1 TSF (100 KPA) FOR WALL HEIGHTS UP TO 8'-0" (2.4m), 2 TSF (195 KPA) FOR WALL HEIGHTS BETWEEN 8'-0" AND 18'-0" (2.4m AND 5.5m) AND 3 TSF (290 KPA) FOR WALL HEIGHTS OVER 18'-0" (5.5m).

STANDARD TEMPORARY MSE WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMMED 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 REINFORCED ZONE.

DO NOT USE STANDARD TEMPORARY MSE WALLS WHEN THE ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE OR VERY LOOSE OR SOFT SOIL OR MUCK IS PRESENT BELOW THE BOTTOM OF REINFORCED ZONE.

CONTROL DRAINAGE DURING CONSTRUCTION IN THE VICINITY OF STANDARD TEMPORARY MSE WALLS. COLLECT AND DIRECT RUNOFF AWAY FROM WALLS AND SHORING BACKFILL.

EXCAVATE AS NECESSARY FOR STANDARD TEMPORARY MSE WALLS IN ACCORDANCE WITH THE FOLLOWING FOR THE WALL OPTION CHOSEN:
1) MINIMUM EMBEDMENT OF 18" (450mm) UNLESS WALL BEARS ON ROCK, CONCRETE OR PAVEMENT AS DETERMINED BY THE ENGINEER
2) VERTICAL STEPS IN INCREMENTS EQUAL TO THE VERTICAL REINFORCEMENT SPACING
3) WITH THE EXCEPTION OF EITHER THE FIRST OR LAST SECTION OF WALL, HORIZONTAL SECTION LENGTHS IN INCREMENTS EQUAL TO THE FOLLOWING:

STANDARD TEMPORARY MSE WALL OPTION	INCREMENT
TEMPORARY FABRIC WALL	9'-0" (2.7m) MIN (VARIES)
HILFIKER TEMPORARY WALL	10'-0" (3.0m) MIN (VARIES)
SIERRASCAPE TEMPORARY WALL	18'-7¼" (5.7m)
RETAINED EARTH TEMPORARY WALL	24'-0" (7.3m)
TERRATREL TEMPORARY WALL	19'-8" (6.0m)

DO NOT PLACE SHORING BACKFILL OR FIRST REINFORCEMENT LAYER UNTIL OBTAINING APPROVAL OF THE EXCAVATION DEPTH AND FOUNDATION MATERIAL.

IF APPLICABLE, INSTALL FOUNDATIONS LOCATED WITHIN THE REINFORCED ZONE BEFORE BEGINNING WALL CONSTRUCTION UNLESS DIRECTED OTHERWISE BY THE ENGINEER.

ERECT AND MAINTAIN FACINGS AND FORMS AS SHOWN ON THE STANDARD TEMPORARY MSE WALL DETAILS. STAGGER VERTICAL JOINTS OF FACINGS AND FORMS TO CREATE A RUNNING BOND WHEN POSSIBLE UNLESS SHOWN OTHERWISE ON THESE DETAILS.

PLACE FACINGS AND FORMS AS NEAR TO VERTICAL AS POSSIBLE WITH NO NEGATIVE BATTER. CONSTRUCT STANDARD TEMPORARY MSE WALLS WITH A VERTICAL AND HORIZONTAL TOLERANCE OF 3" (75mm) WHEN MEASURED WITH A 10'-0" (3m) STRAIGHT EDGE AND AN OVERALL VERTICAL PLUMBNESS (BATTER) AND HORIZONTAL ALIGNMENT OF LESS THAN 6" (150mm).

PLACE REINFORCEMENT AT LOCATIONS AND ELEVATIONS SHOWN ON THE STANDARD TEMPORARY MSE WALL DETAILS AND IN SLIGHT TENSION FREE OF KINKS, FOLDS, WRINKLES OR CREASES.

DO NOT SPLICE REINFORCEMENT IN THE REINFORCEMENT DIRECTION (RD), i.e., PARALLEL TO THE WALL FACE. SEAMS ARE ALLOWED IN THE CROSS-REINFORCEMENT DIRECTION (CRD).

CONTACT THE ENGINEER WHEN EXISTING OR FUTURE STRUCTURES SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT. TO AVOID STRUCTURES, DELFECT, SKEW AND MODIFY REINFORCEMENT.

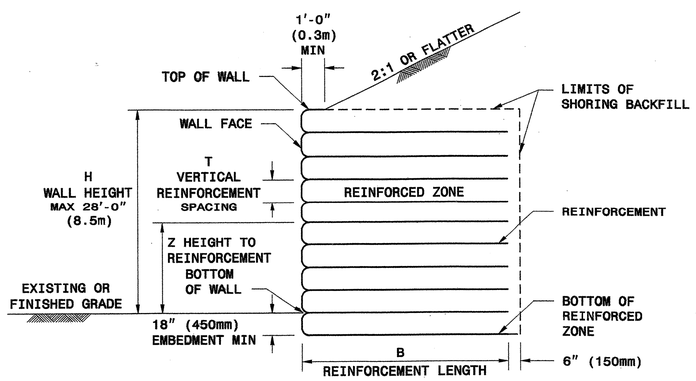
PLACE SHORING BACKFILL IN 8" TO 10" (200mm to 250mm) THICK LIFTS AND COMPACT IN ACCORDANCE WITH SUBARTICLE 235-4(C) OF THE STANDARD SPECIFICATIONS. USE ONLY HAND OPERATED COMPACTION EQUIPMENT WITHIN 3'-0" (1m) OF THE WALL FACE.

DO NOT DAMAGE REINFORCEMENT WHEN PLACING AND COMPACTING SHORING BACKFILL. DO NOT OPERATE HEAVY EQUIPMENT ON REINFORCEMENT UNTIL IT IS COVERED WITH AT LEAST 10" (250mm) OF SHORING BACKFILL. DO NOT USE SHEEPSFOOT, GRID ROLLERS OR OTHER TYPES OF COMPACTION EQUIPMENT WITH FEET.

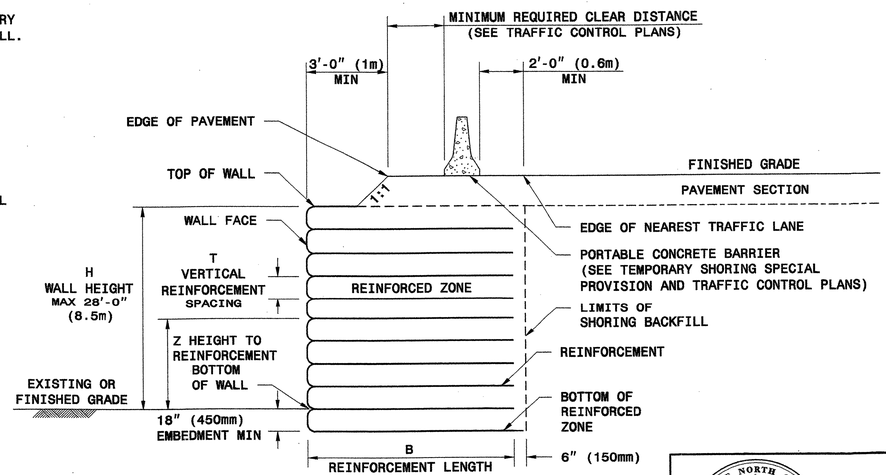
COVER REINFORCING AND RETENTION FABRIC WITH AT LEAST 3" (75mm) OF SHORING BACKFILL. PLACE TOP REINFORCEMENT LAYER BETWEEN 4" AND 24" (100mm and 600mm) BELOW TOP OF WALL DEPENDING ON WALL OPTION.

BENCH STANDARD TEMPORARY MSE WALLS INTO THE SIDES OF EXCAVATIONS WHERE APPLICABLE.

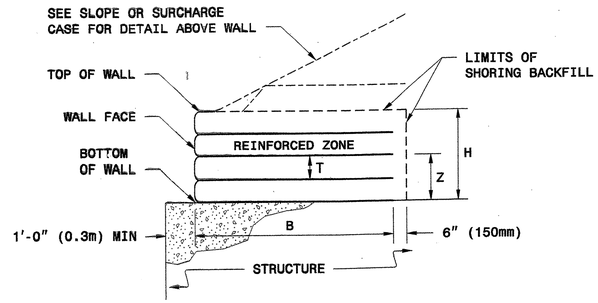
IF THE TOP OF WALL IS WITHIN 5'-0" (1.5m) OF FINISHED GRADE, REMOVE TOP FORM OR FACING AND INCORPORATE THE TOP REINFORCEMENT LAYER INTO THE FILL WHEN PLACING FILL IN FRONT OF THE WALL. STANDARD TEMPORARY MSE WALLS REMAIN IN PLACE PERMANENTLY UNLESS REQUIRED OTHERWISE.



SLOPE CASE



SURCHARGE CASE



TEMPORARY MSE WALL ON STRUCTURE

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY MECHANICALLY STABILIZED EARTH (MSE) WALLS

SHEET 1 OF 11 DATE: 2-20-07

PROJECT REFERENCE NO.	SHEET
B-3693	2-J

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

HOW TO USE THIS SHEET:

- FOR ALL WALL OPTIONS, DETERMINE MINIMUM REQUIRED REINFORCEMENT LENGTH (B) FROM TABLE AT RIGHT BASED ON WALL HEIGHT (H) AND SLOPE OR SURCHARGE CASE
- FOR STANDARD TEMPORARY FABRIC WALL, SEE SHEET 3 FOR FABRIC STRENGTH REQUIREMENTS BASED ON WALL HEIGHT (H)
- FOR ALL OTHER WALL OPTIONS, DETERMINE REINFORCEMENT TYPE FROM TABLES BELOW FOR EACH HEIGHT TO REINFORCEMENT (Z) BASED ON WALL HEIGHT (H) AND SLOPE OR SURCHARGE CASE

MINIMUM REQUIRED REINFORCEMENT LENGTH B (FT)

(FOR ALL WALL OPTIONS)

WALL HEIGHT H (FT)	<8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28
SLOPE CASE	8	11	13	14	16	18	20	22	24	25	27
SURCHARGE CASE	8	9	11	12	14	15	16	18	19	21	22

TERRATREL TEMPORARY WALL (STRIPS PER LEVEL PER PANEL)

H (FT)

<4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28	Z (FT-INCHES)
												3	27 - 8
											3	3	26 -10
											3	3	25 - 2
										3	3	3	23 - 6
									3	3	3	3	21 -10
								3	3	3	3	3	20 - 2
							3	3	3	3	3	3	18 - 6
						3	3	3	3	3	3	3	16 -10
						3	3	3	3	3	3	3	15 - 2
					4	3	3	3	3	3	3	3	13 - 6
				4	4	3	3	3	3	3	3	3	11 -10
			5	4	4	3	3	3	3	3	3	3	10 - 2
		5	5	4	4	3	3	3	3	3	3	3	8 - 6
	5	5	5	4	4	3	3	3	3	3	3	3	6 -10
	5	5	5	4	4	3	3	3	3	3	3	3	5 - 2
5	5	5	5	4	4	3	3	3	3	3	3	3	3 - 6
5	5	5	5	4	4	3	3	3	3	3	3	3	1 -10
5	5	5	5	4	4	3	3	3	3	3	3	3	0 - 2
5	5	5	5	4	4	3	3	3	3	3	3	3	-0 - 8

SLOPE AND SURCHARGE CASES

SIERRASCAPE TEMPORARY WALL (GEOGRID TYPE)

11 = UX1100MSE
14 = UX1400MSE
15 = UX1500MSE
16 = UX1600MSE
17 = UX1700MSE

H (FT)

<4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28	Z (FT)
												11	26.5
											11	11	25.5
											11	11	24
										11	11	11	22.5
									11	11	11	15	21
								11	11	11	14	15	19.5
							11	11	11	14	15	15	18
						11	11	11	11	14	15	15	16.5
					11	11	11	11	14	15	15	15	15
				11	11	11	11	15	15	15	15	15	13.5
				11	11	11	15	15	15	15	15	16	12
			11	11	11	11	15	15	15	15	15	16	10.5
		11	11	11	11	15	15	15	15	15	16	16	9
	11	11	11	11	14	15	15	15	15	16	16	16	7.5
	11	11	11	11	14	15	15	15	16	16	16	16	6
11	11	11	11	15	15	15	15	16	16	16	16	17	4.5
11	11	11	11	14	15	15	15	15	16	16	16	17	3
11	11	11	11	14	15	15	15	16	16	16	17	17	1.5
11	11	11	14	15	15	15	15	16	16	17	17	17	0
11	11	11	14	15	15	15	16	16	17	17	17	17	-1.5

SLOPE CASE

H (FT)

<4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28	Z (FT)
												11	26.5
												11	25.5
											11	11	24
											11	11	22.5
										11	11	11	21
									11	11	11	11	19.5
								11	11	11	11	15	18
							11	11	11	11	15	15	16.5
						11	11	11	11	15	15	15	15
					11	11	11	11	15	15	15	15	13.5
					11	11	11	15	15	15	15	15	12
				11	11	11	11	15	15	15	15	15	10.5
			11	11	11	11	15	15	15	15	15	16	9
		11	11	11	11	15	15	15	15	15	16	16	7.5
		11	11	11	11	15	15	15	15	16	16	16	6
	11	11	11	11	15	15	15	15	16	16	16	16	4.5
	11	11	11	11	14	15	15	15	15	16	16	16	3
11	11	11	11	11	14	15	15	15	15	16	16	16	1.5
11	11	11	11	15	15	15	15	15	15	16	16	16	0
11	11	11	14	15	15	15	15	15	15	16	16	17	-1.5
11	11	11	14	15	15	15	15	15	15	16	16	17	-1 - 6

SURCHARGE CASE

HILFIKER TEMPORARY WALL (WELDED WIRE MAT TYPE)

4.5 = W4.5 x W3.5
7.0 = W7.0 x W3.5
9.5 = W9.5 x W4.0

H (FT)

<4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28	Z (FT)
												4.5	26
											4.5	7.0	24
										4.5	7.0	7.0	22
									4.5	7.0	7.0	7.0	20
								4.5	7.0	7.0	7.0	7.0	18
							4.5	7.0	7.0	7.0	7.0	7.0	16
						4.5	7.0	7.0	7.0	7.0	7.0	9.5	14
					4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	12
				4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	10
			4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	8
		4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	6
	4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	4
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3
4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	7.0	2
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.0	7.0	1
7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	7.0	7.0	0
7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	-1.5

SLOPE CASE

H (FT)

<4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28	Z (FT)
												4.5	26
											4.5	7.0	24
										4.5	7.0	7.0	22
									4.5	7.0	7.0	7.0	20
								4.5	7.0	7.0	7.0	7.0	18
							4.5	7.0	7.0	7.0	7.0	7.0	16
						4.5	7.0	7.0	7.0	7.0	7.0	9.5	14
					4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	12
				4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	10
			4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	8
		4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	6
	4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	4
4.5	7.0	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	2
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.0	1
7.0	7.0	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	0
7.0	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	9.5	-1.5

SURCHARGE CASE

NOTES FOR HILFIKER TEMPORARY WALL

1) CAP MAT AT TOP OF WALL IS NOT INCLUDED IN TABLES.
2) REINFORCEMENT IS NOT REQUIRED AT 1' LEVEL FOR SLOPE CASE UNTIL WALL HEIGHT (H) IS GREATER THAN 24'.
3) REINFORCEMENT IS NOT REQUIRED AT 3' LEVEL FOR SLOPE CASE UNTIL WALL HEIGHT (H) IS GREATER THAN 26'.
4) REINFORCEMENT IS NOT REQUIRED AT 1' LEVEL FOR SURCHARGE CASE UNTIL WALL HEIGHT (H) IS GREATER THAN 26'.

RETAINED EARTH TEMPORARY WALL (WELDED WIRE MESH TYPE)

3X1 = 3W8 x W8 x 1.0'
3X2 = 3W8 x W8 x 2.0'

H (FT)

<4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28	Z (FT-INCHES)
												3X1	27 - 6
												3X1	26 -10
											3X1	3X2	25 - 2
										3X1	3X1	3X2	23 - 6
									3X1	3X1	3X2	3X2	21 -10
								3X1	3X1	3X2	3X2	3X2	20 - 2
							3X1	3X1	3X2	3X2	3X2	3X2	18 - 6
						3X1	3X2	3X2	3X2	3X2	3X2	3X2	16 -10
						3X1	3X2	3X2	3X2	3X2	3X2	3X2	15 - 2
					3X1	3X1	3X2	3X2	3X2	3X2	3X2	3X2	13 - 6
				3X1	3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	11 -10
			3X1	3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	10 - 2
		3X1	3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	8 - 6
		3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	6 -10
	3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	5 - 2
3X1	3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3 - 6
3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	1 -10
3x2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	0 - 2
3x2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	-1 - 6

SLOPE AND SURCHARGE CASES

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY MSE WALL REINFORCEMENT TABLES - ENGLISH UNITS

SHEET 2 OF 11 DATE: 2-20-07

EC221427 3/29/2007 std no 1801 shidden GE-Oce34bond

PROJECT REFERENCE NO.	SHEET
B-3693	2-K

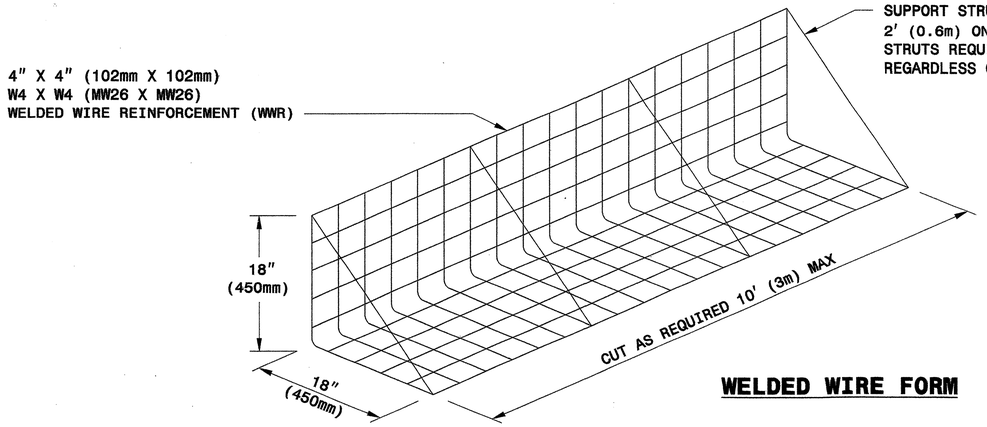
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A HIDDEN

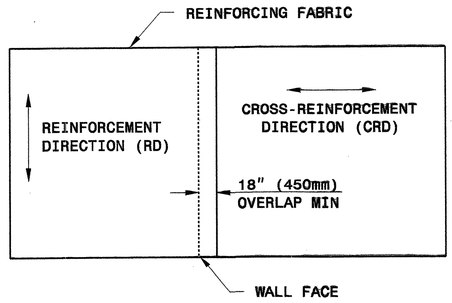
Scott A. Hidden 3/29/07
SIGNATURE DATE

ENGINEER

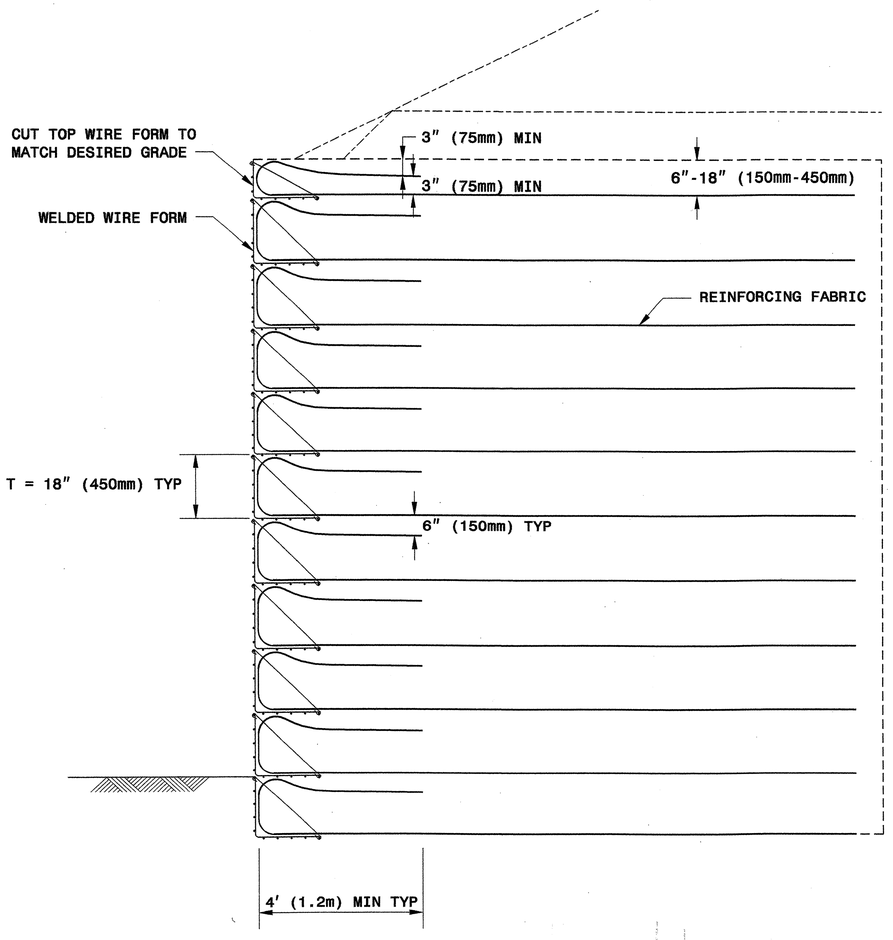
SIGNATURE DATE



WELDED WIRE FORM



PLAN VIEW OF FABRIC OVERLAP



TYPICAL SECTION

MINIMUM REQUIRED REINFORCING FABRIC STRENGTH FOR RD*
(SLOPE AND SURCHARGE CASES)

WALL HEIGHT H FEET (M)	POLYESTER WIDE WIDTH TENSILE STRENGTH @ ULTIMATE LB/INCH (KN/M)	POLYPROPYLENE WIDE WIDTH TENSILE STRENGTH @ ULTIMATE LB/INCH (KN/M)
4 (1.2)	200 (35)	200 (35)
6 (1.8)	200 (35)	200 (35)
8 (2.4)	200 (35)	200 (35)
10 (3.0)	200 (35)	230 (40)
12 (3.7)	220 (39)	264 (46)
14 (4.3)	248 (43)	297 (52)
16 (4.9)	276 (48)	330 (58)
18 (5.5)	304 (53)	364 (64)
20 (6.1)	332 (58)	397 (70)
22 (6.7)	359 (63)	431 (76)
24 (7.3)	387 (68)	464 (81)
26 (7.9)	415 (73)	497 (87)
28 (8.5)	443 (78)	531 (93)

*RD = REINFORCEMENT DIRECTION

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

TEMPORARY
FABRIC WALL

SHEET 3 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
B-3693	2-L

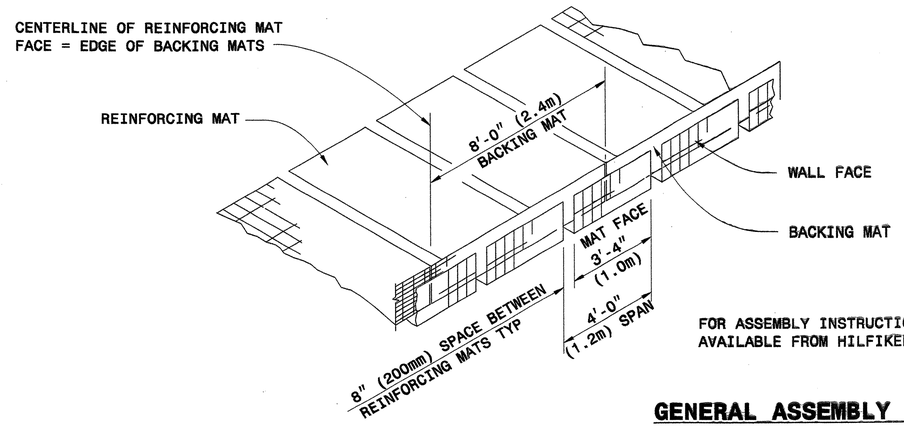
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07
SIGNATURE DATE

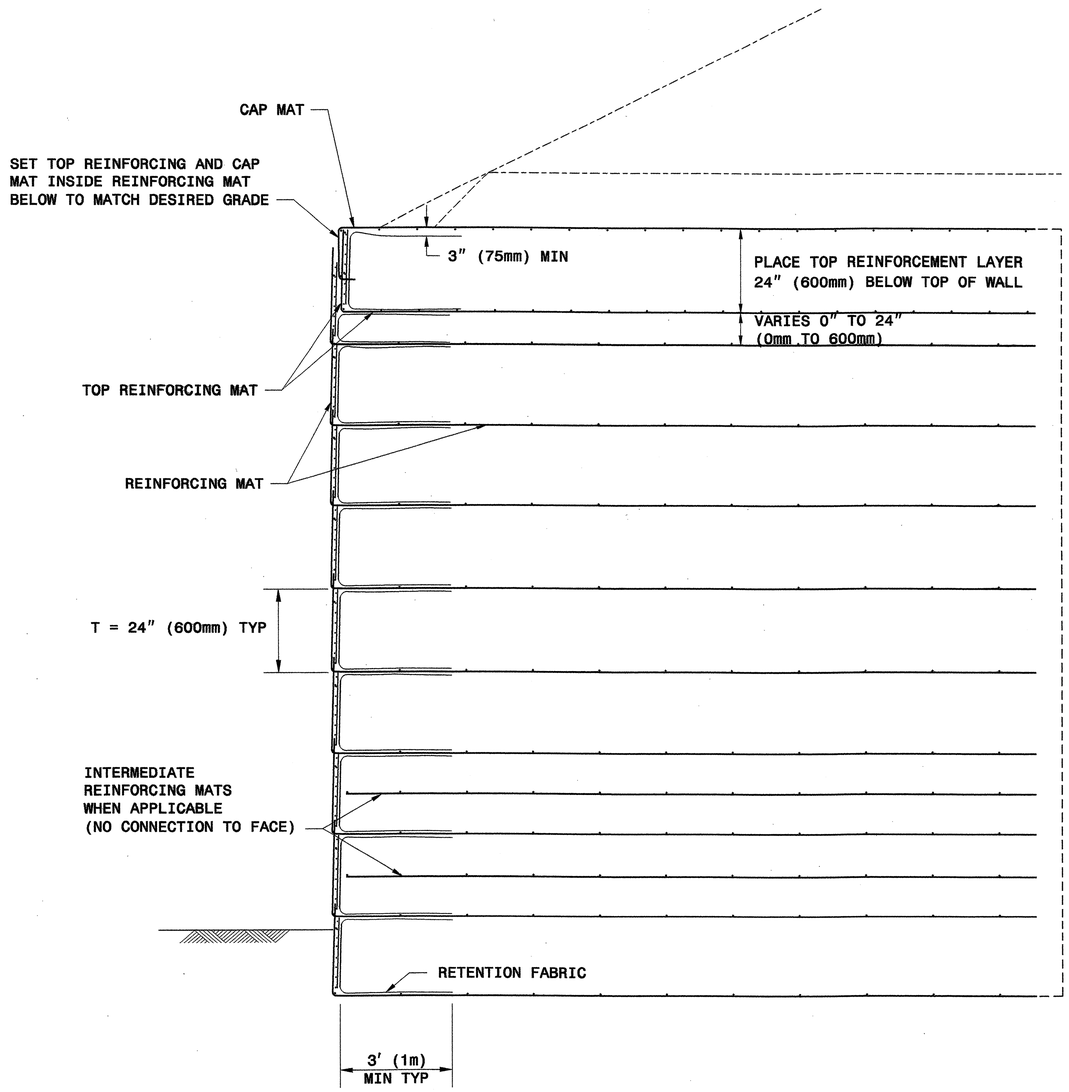
ENGINEER

SIGNATURE DATE

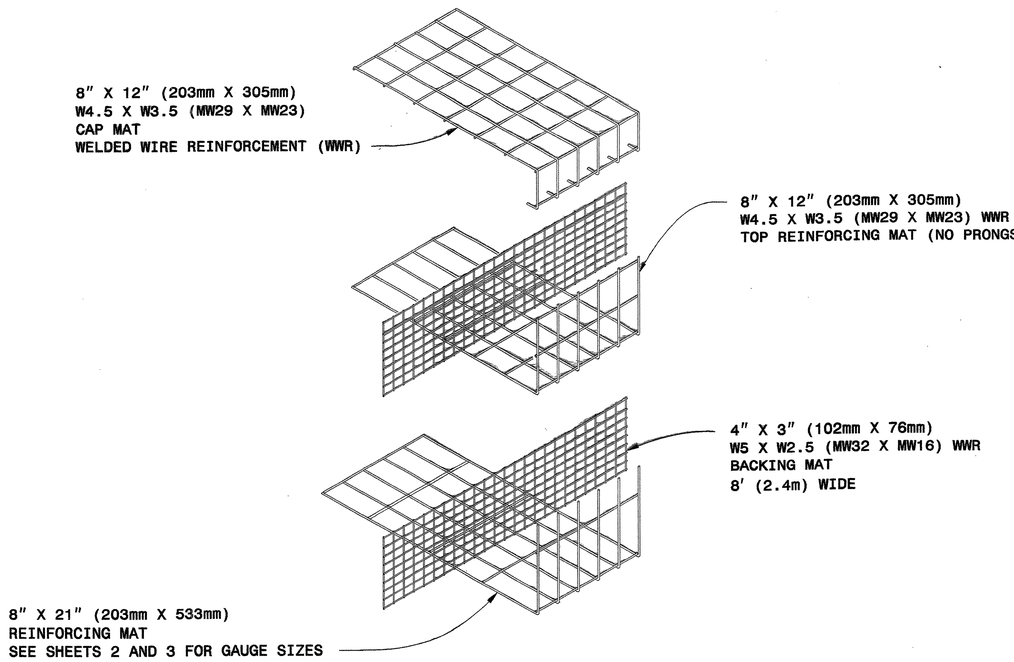


FOR ASSEMBLY INSTRUCTIONS, SEE WELDED WIRE WALL CONSTRUCTION GUIDE AVAILABLE FROM HILFIKER WEBSITE AT WWW.HILFIKER.COM/WWW

GENERAL ASSEMBLY DETAIL



TYPICAL SECTION



WALL COMPONENTS

HILFIKER RETAINING WALLS

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

HILFIKER TEMPORARY WALL

SHEET 4 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
B-3693	2-M

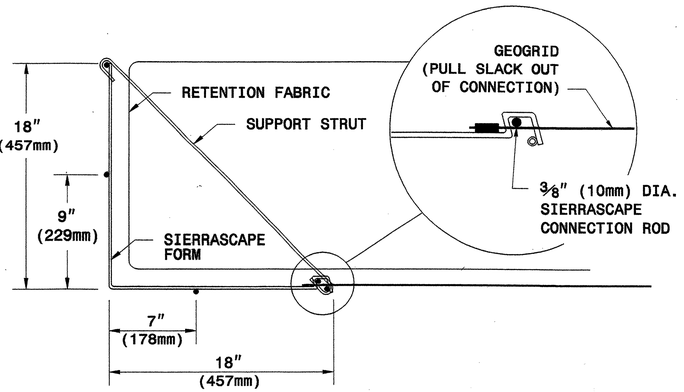
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

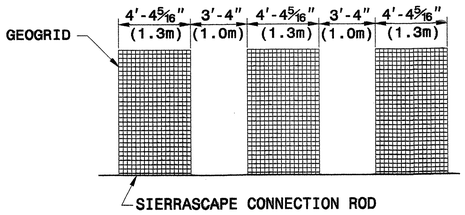
Scott A. Hidden 3/29/07
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

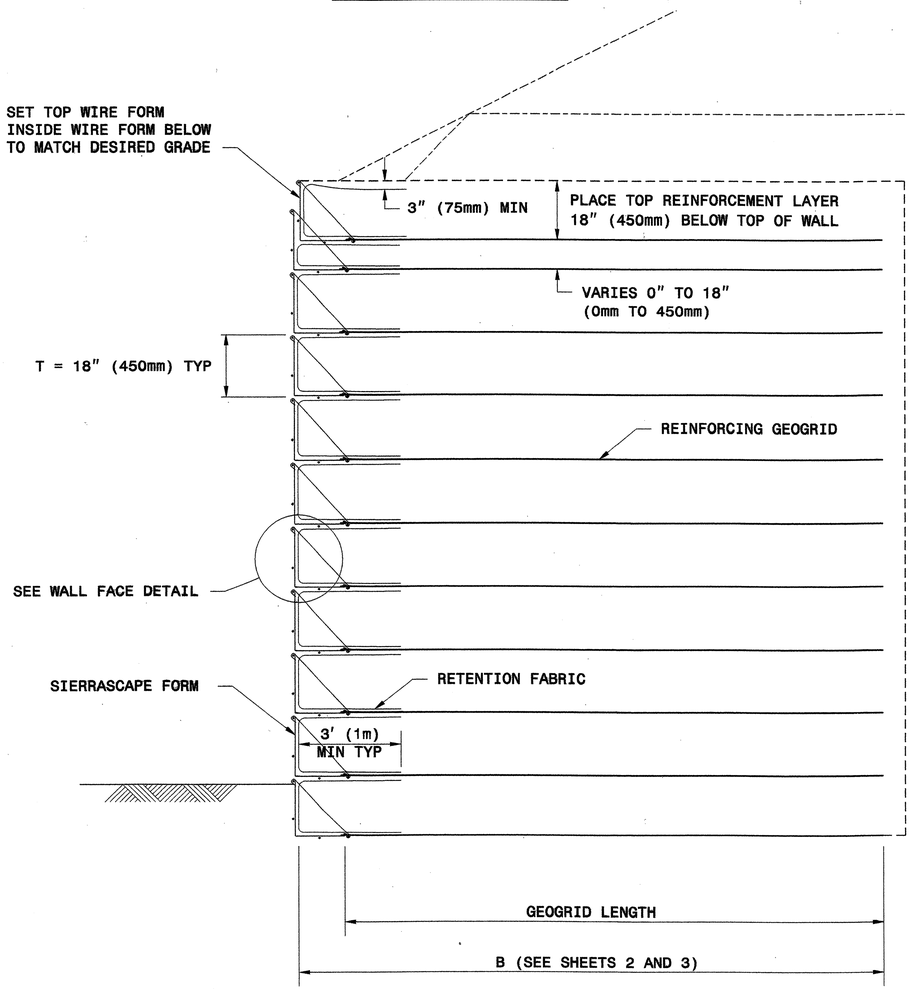


WALL FACE DETAIL

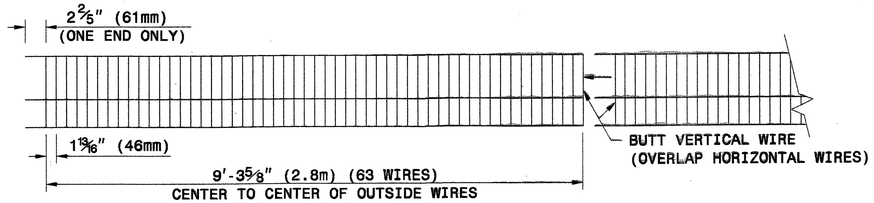


PLACE ALTERNATE LAYERS OF GEOGRID IN STAGGERED PATTERN SUCH THAT THE LAYER ABOVE IS CENTERED OVER SPACE BELOW

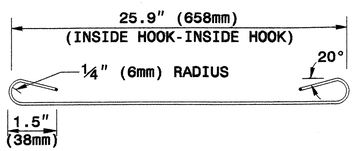
TYPICAL GEOGRID COVERAGE



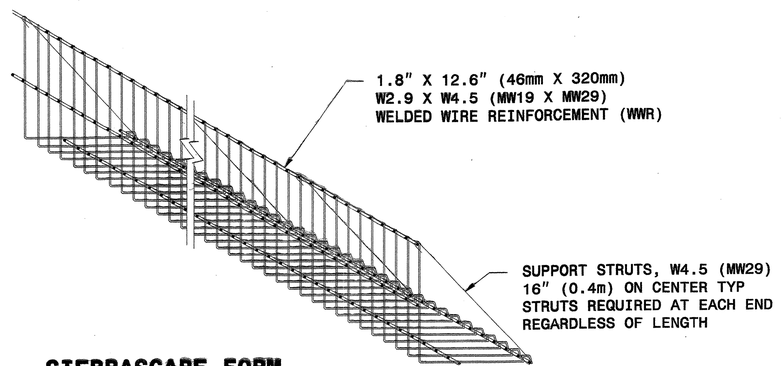
TYPICAL SECTION



ELEVATION VIEW



SUPPORT STRUT



SIERRASCAPE FORM

WALL COMPONENTS

TENSAR®
TENSAR EARTH TECHNOLOGIES, INC.

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

SIERRASCAPE
TEMPORARY WALL

SHEET 5 OF 11 DATE: 12-19-06

EC221427 12/5/2007 std no 1801 shidden GE-Oce34bond

PROJECT REFERENCE NO.	SHEET
B-3693	2-N

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

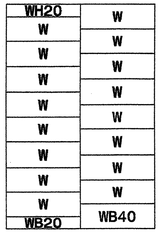
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

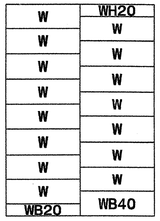
PANEL LAYOUTS

H - WALL HEIGHT



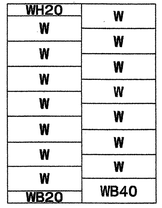
(FEET-INCHES) < 28 - 0

(METER) < 8.5



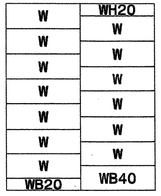
< 27 - 0

< 8.2



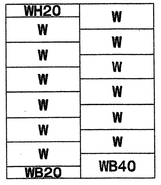
< 25 - 4

< 7.7



< 23 - 8

< 7.2



< 22 - 0

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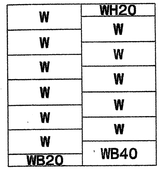
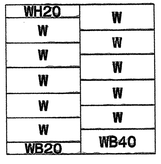


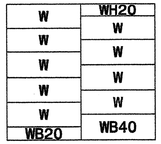
< 20 - 4

< 6.2



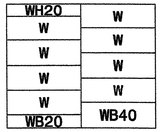
< 18 - 8

< 5.7



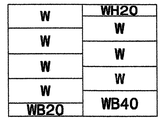
(FEET-INCHES) < 17 - 0

(METER) < 5.2



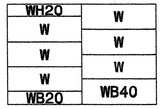
< 15 - 4

< 4.7



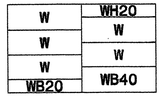
< 13 - 8

< 4.2



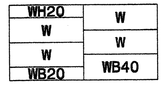
< 12 - 0

< 3.7



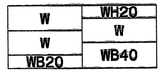
< 10 - 4

< 3.2



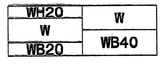
< 8 - 8

< 2.6



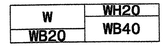
< 7 - 0

< 2.1



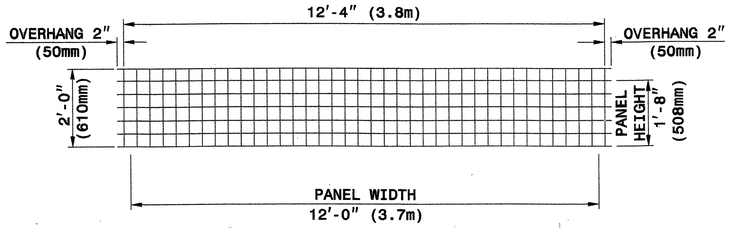
< 5 - 4

< 1.6

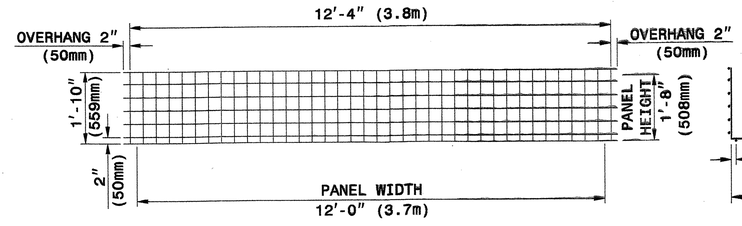


< 3 - 8

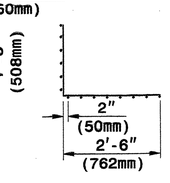
< 1.1



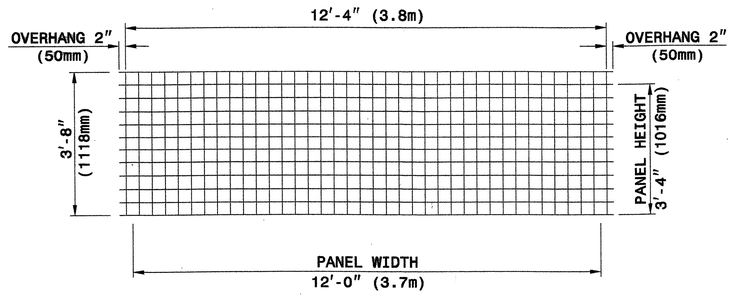
TYPE WH20



TYPE WB20

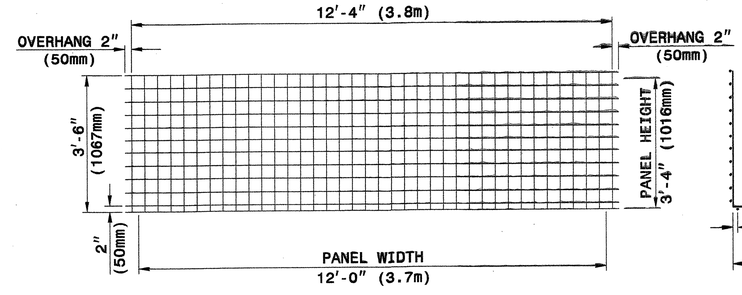


SECTION

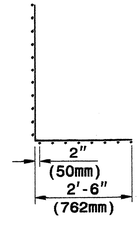


TYPE W

WELDED WIRE FACINGS



TYPE WB40



SECTION

WELDED WIRE FORMS

PANEL TYPES (WELDED WIRE FACINGS AND FORMS)

4" X 4" (100mm X 100mm), W8 X W8 (MW52 X MW52) WELDED WIRE REINFORCEMENT (WWR)

The Reinforced Earth Company

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

RETAINED EARTH TEMPORARY WALL

SHEET 6 OF 11 DATE: 12-19-06

EC221427 3/29/2007 std no 1801 shidden GE-Oce34bond

PROJECT REFERENCE NO.	SHEET
B-3693	2-0

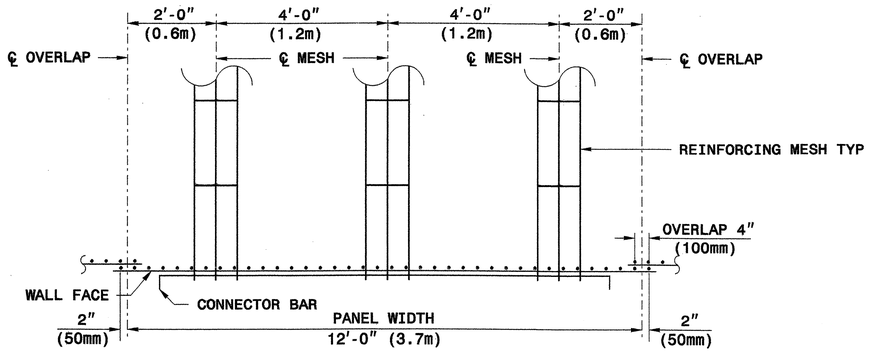
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07
SIGNATURE DATE

ENGINEER

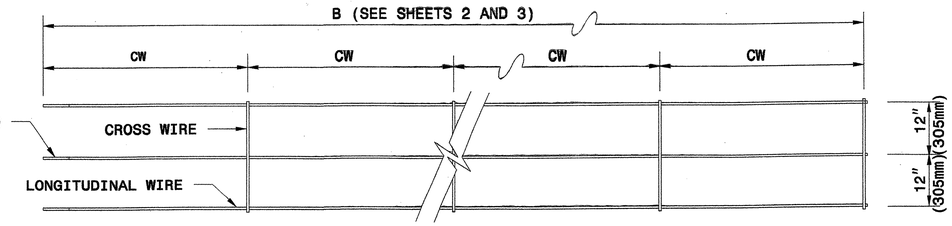
SIGNATURE DATE



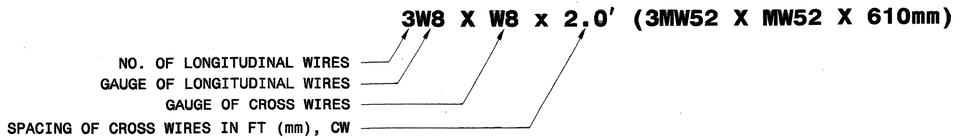
REINFORCING MESH PLACEMENT DETAIL
(PLAN VIEW)

½" (13mm) DIA. BAR

CONNECTOR BAR

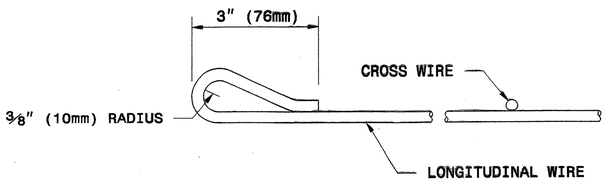


IF REINFORCEMENT LENGTH IS NOT AN INCREMENT OF 2'-0" (610mm) MAKE CW EQUAL TO 12" (305mm) AT THE END OF THE REINFORCING MESH OPPOSITE THE LOOPED END

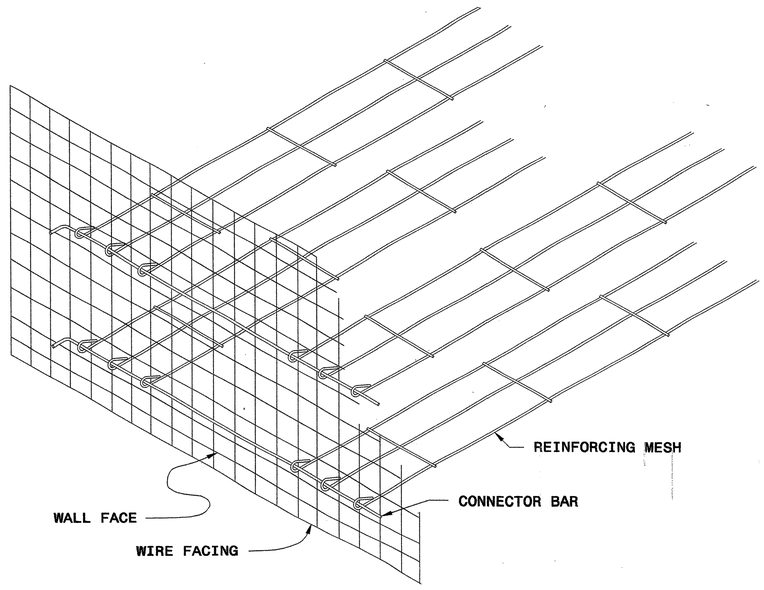


REINFORCING MESH DESIGNATION

REINFORCING MESH



REINFORCING MESH LOOP DETAIL



GENERAL ASSEMBLY DETAIL

The Reinforced Earth Company

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

RETAINED EARTH TEMPORARY WALL

SHEET 7 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
B-3693	2-P

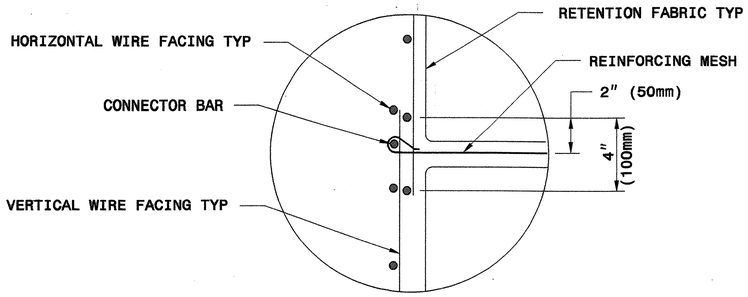
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

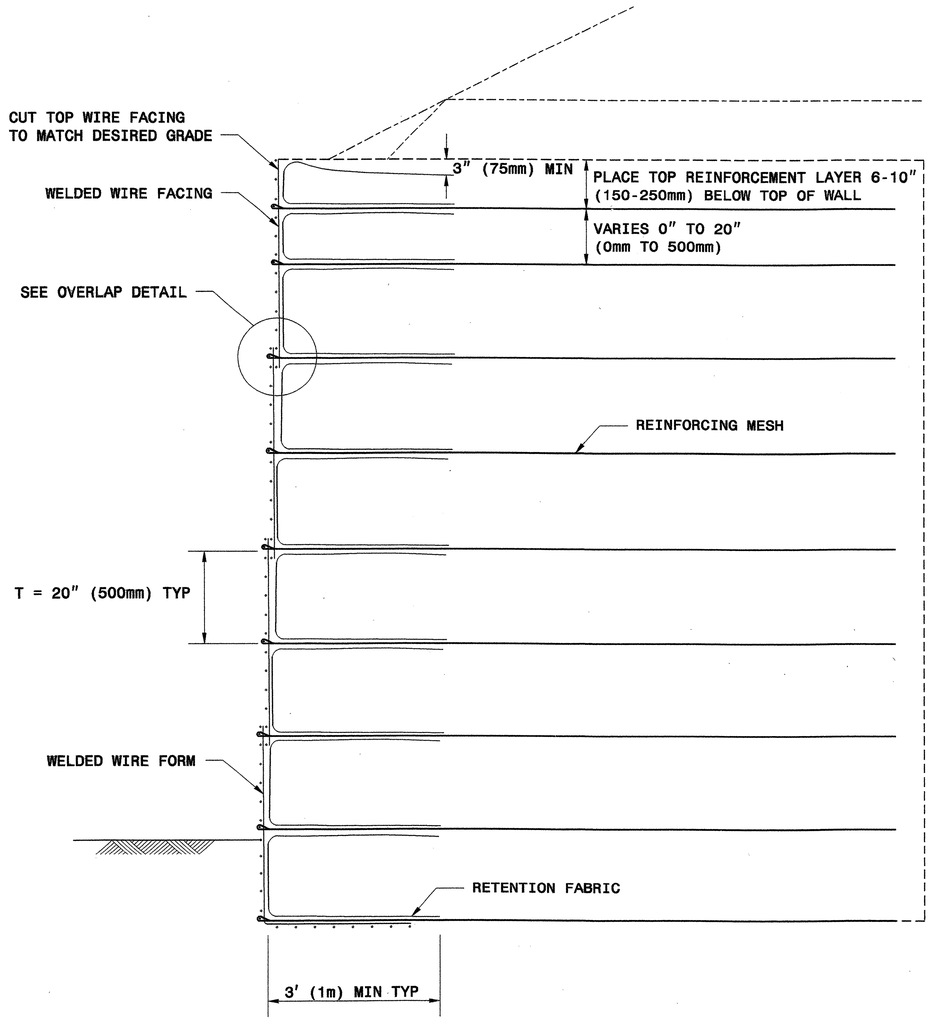
Scott A. Hidden 3/29/07
SIGNATURE DATE

ENGINEER

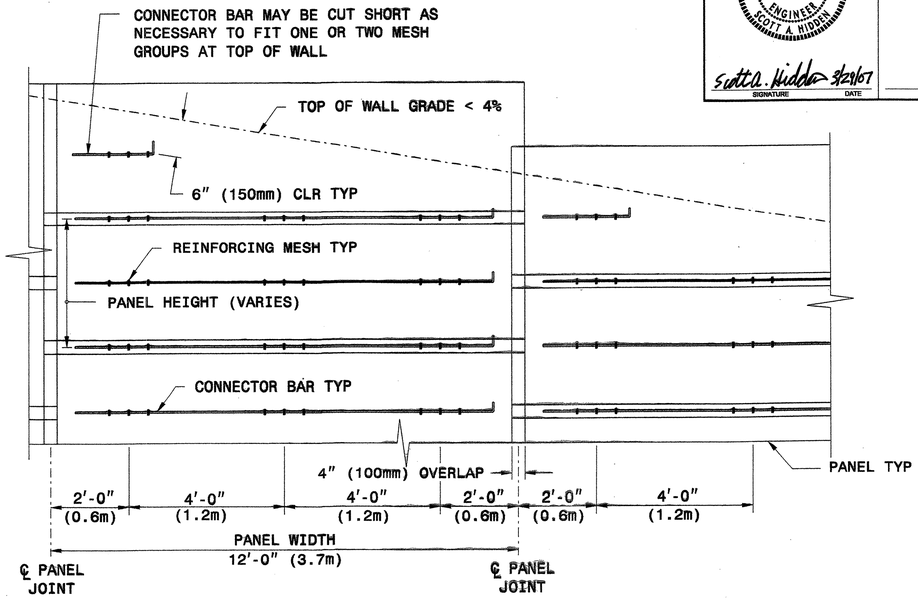
SIGNATURE DATE



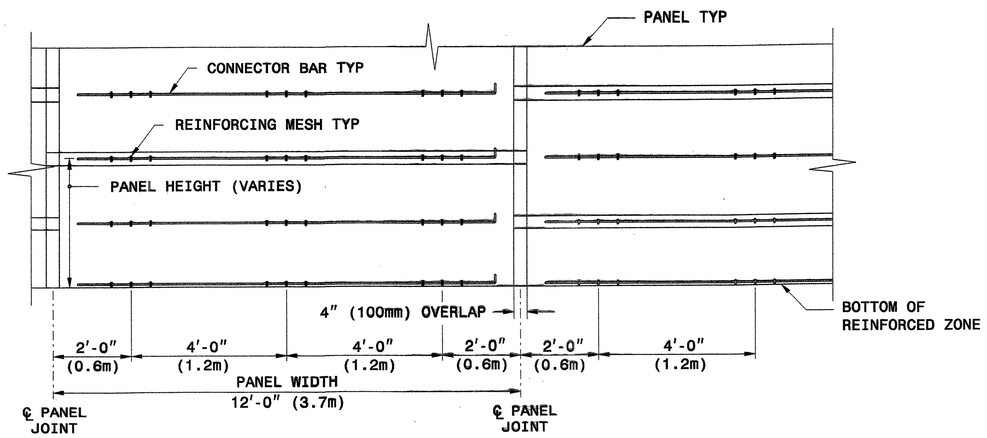
OVERLAP DETAIL



TYPICAL SECTION



TYPICAL ELEVATION @ TOP OF WALL
(WIRES NOT SHOWN FOR CLARITY)



TYPICAL ELEVATION @ BOTTOM OF WALL
(WIRES NOT SHOWN FOR CLARITY)

The Reinforced Earth Company

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

RETAINED EARTH TEMPORARY WALL

SHEET 8 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
B-3693	2-Q

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

SIGNATURE DATE

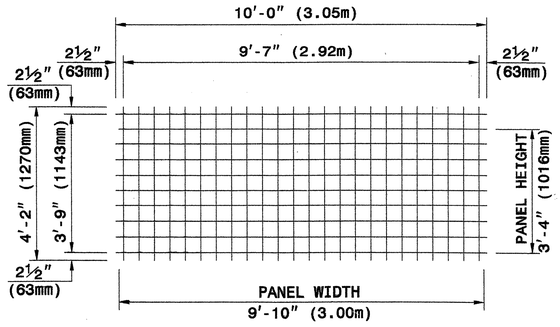
ENGINEER

SIGNATURE DATE

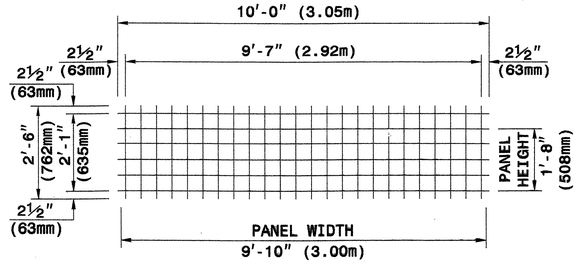
PANEL LAYOUTS

H - WALL HEIGHT							
(FEET-INCHES)	< 28 - 0	< 27 - 8	< 26 - 0	< 24 - 4	< 22 - 8	< 21 - 0	< 19 - 4
(METER)	< 8.5	< 8.4	< 7.9	< 7.4	< 6.9	< 6.4	< 5.9

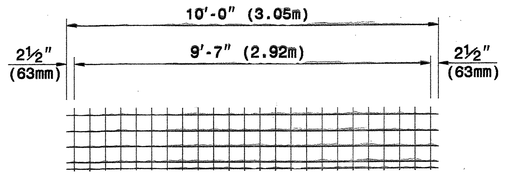
(FEET-INCHES)	< 17 - 8	< 16 - 0	< 14 - 4	< 12 - 8	< 11 - 0	< 9 - 4	< 7 - 8	< 6 - 0	< 4 - 4
(METER)	< 5.4	< 4.9	< 4.4	< 3.9	< 3.4	< 2.8	< 2.3	< 1.8	< 1.3



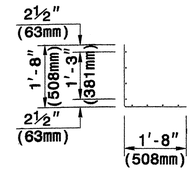
TYPE A



TYPE B



WELDED WIRE FORM



SECTION

WELDED WIRE FACINGS

PANEL TYPES (WELDED WIRE FACINGS AND FORM

5″ X 5″ (125mm X 125mm), W5 X W5 (MW32 X MW32) WELDED WIRE REINFORCEMENT (WWR)

The Reinforced Earth Company

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

TERRATREL TEMPORARY WALL

SHEET 9 OF 11 DATE: 12-19-06

EC221427 3/29/2007 std no 1801 shidden GE-Oce34bond

PROJECT REFERENCE NO.	SHEET
B-3693	2-R

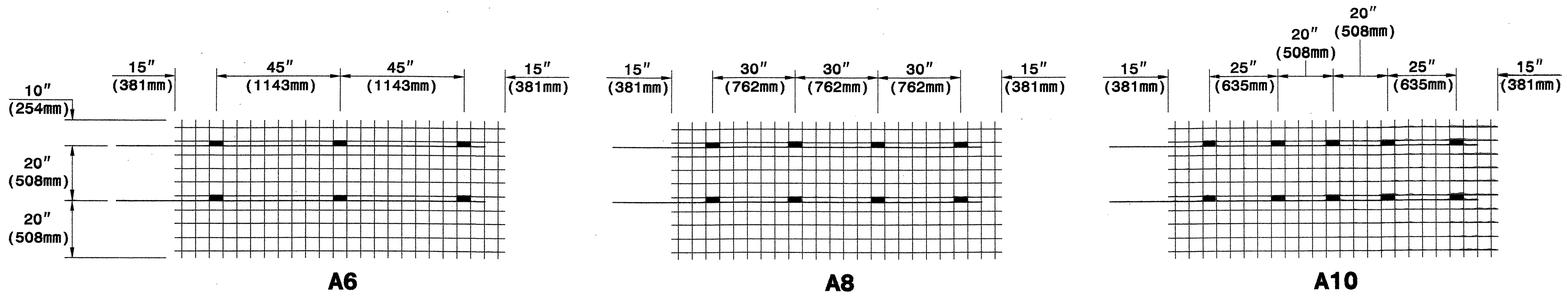
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A HIDDEN

Scott A. Hidden 3/29/07
SIGNATURE DATE

ENGINEER

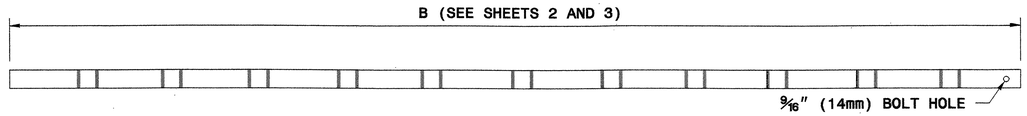
SIGNATURE DATE



KEY: A8

NUMBER OF REINFORCING STRIPS
PANEL TYPE

CONNECTOR ROD AND REINFORCING STRIP PLACEMENT DIAGRAMS



REINFORCING STRIP - 2" X 5/32" (50mm X 4mm)

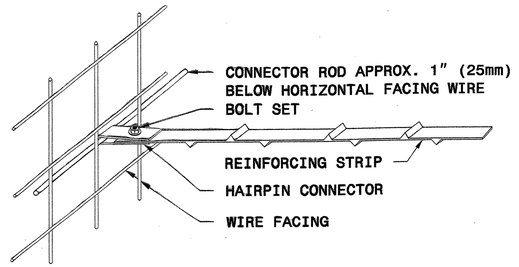
½" (13mm) DIA. ROD

CONNECTOR ROD

½" (13mm) BOLT WITH NUT AND WASHER

BOLT SET

HAIRPIN CONNECTOR



STRIP TO FACING CONNECTION

WALL COMPONENTS

The Reinforced Earth Company

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

TERRATREL TEMPORARY WALL

 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
B-3693	2-5

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 12/21/07
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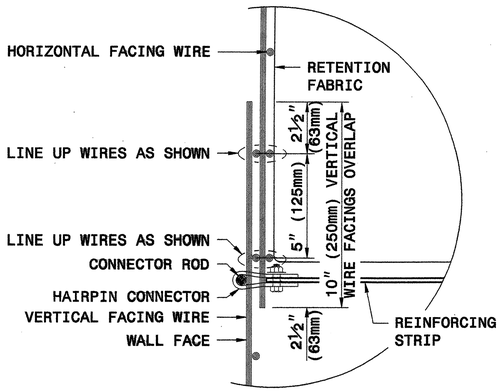
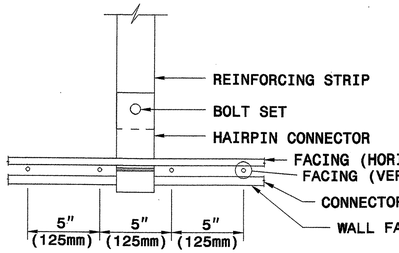
SIGNATURE DATE

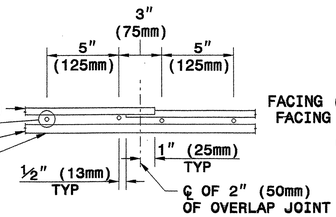


OVERLAP FACINGS VERTICALLY ONE FULL 5" (125mm) WIRE SQUARE DISREGARDING HALF SQUARES AT EDGES

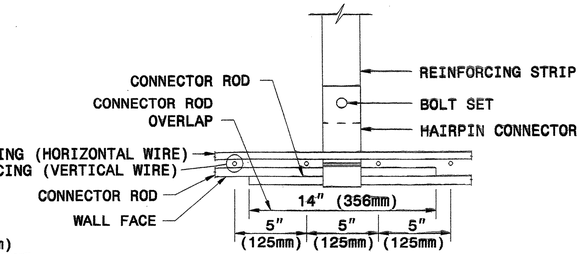
VERTICAL OVERLAP DETAIL



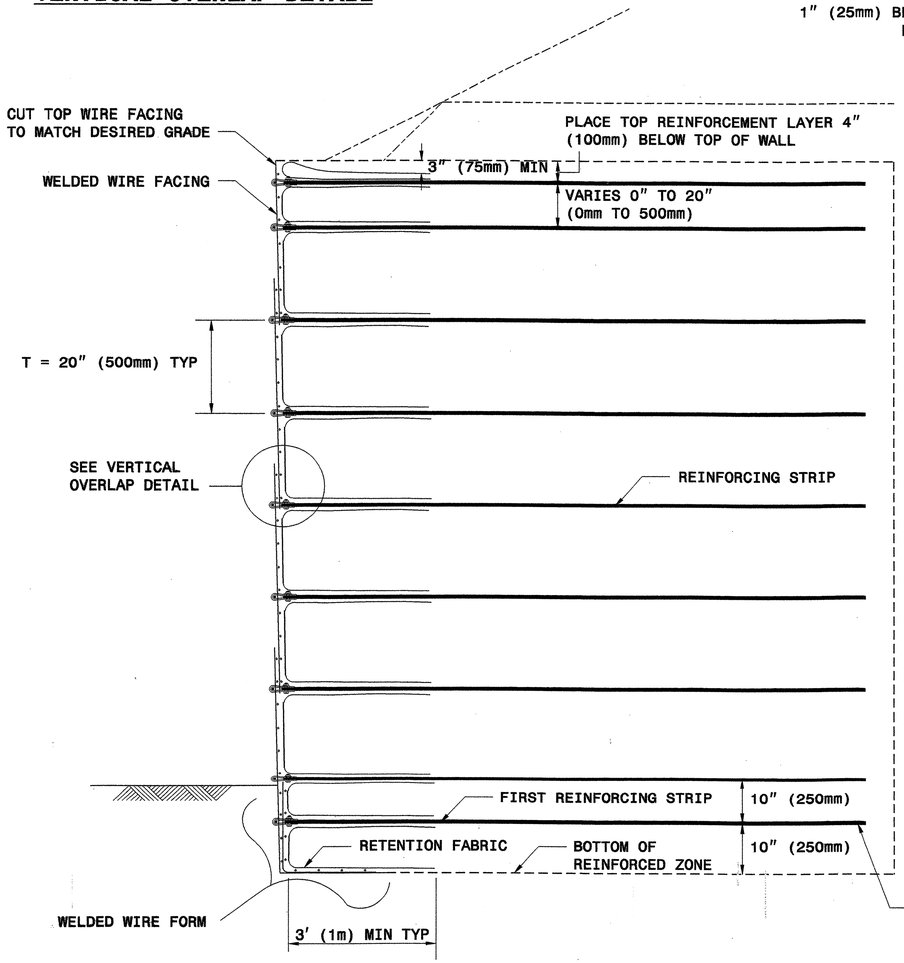
PLAN DETAIL 'A'
STRIP CONNECTION



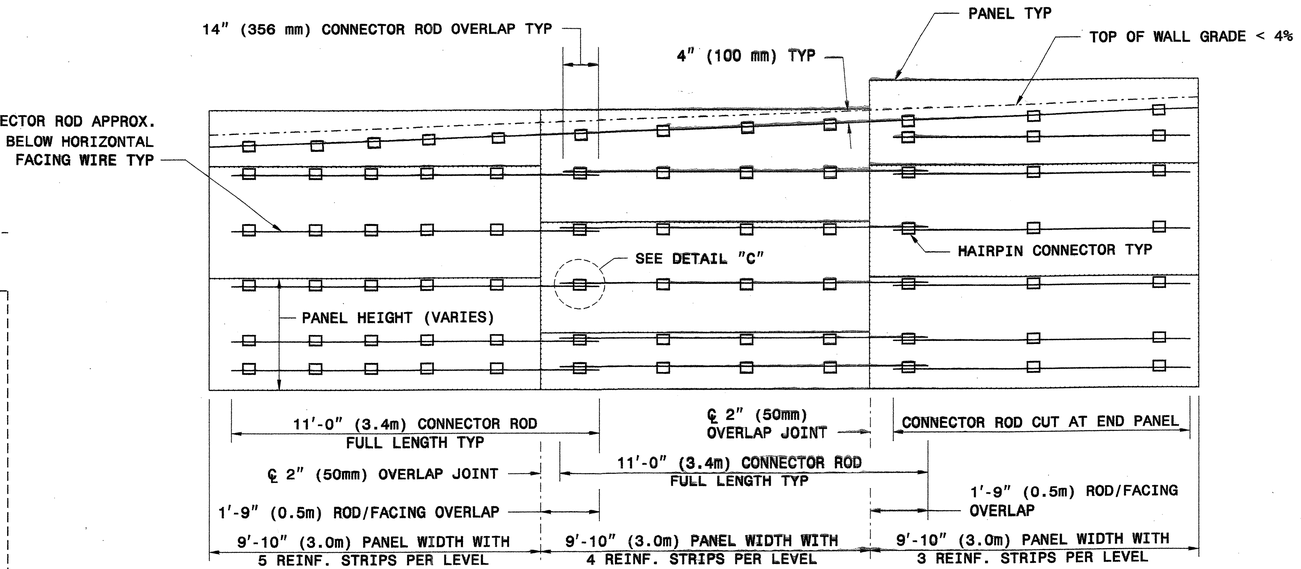
PLAN DETAIL 'B'
HORIZONTAL OVERLAP DETAIL



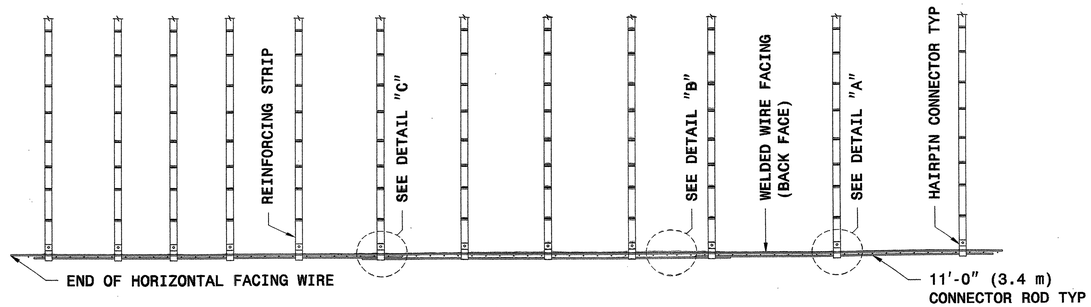
PLAN DETAIL 'C'
STRIP CONNECTION WITH HORIZONTAL OVERLAP DETAIL



TYPICAL SECTION



TYPICAL ELEVATION
(WIRES NOT SHOWN FOR CLARITY)



TYPICAL PLAN

The Reinforced Earth Company

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

TERRATREL TEMPORARY WALL

SHEET 11 OF 11 DATE: 12-19-06

EC221427 3/29/2007 std no 1801 shidden GE-Oce34bond

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-3693	3

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202549

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ********** (14+20.00)
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ********** (21+37.00)
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ********** (25+45.00)
0043000000-N	226	Lump Sum		GRADING
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING
0057000000-E	226	900	CY	UNDERCUT EXCAVATION
0134000000-E	240	10	CY	DRAINAGE DITCH EXCAVATION
0196000000-E	270	6,200	SY	FABRIC FOR SOIL STABILIZATION
0199000000-E	SP	165	SF	TEMPORARY SHORING
0234000000-E	SP	900	CY	GENERIC GRADING ITEM SELECT GRANULAR MATERIAL
0320000000-E	SP	530	SY	FOUNDATION CONDITIONING FABRIC
0330000000-E	SP	160	TON	GENERIC DRAINAGE ITEM FOUNDATION CONDITIONING MATERIAL, MINOR STRS
0335200000-E	SP	52	LF	15" DRAINAGE PIPE
0986000000-E	SP	20	LF	GENERIC PIPE ITEM 18" SIDE DRAIN PIPE
0995000000-E	340	24	LF	PIPE REMOVAL
1121000000-E	520	2,350	TON	AGGREGATE BASE COURSE
1220000000-E	545	200	TON	INCIDENTAL STONE BASE
1275000000-E	600	1,729	GAL	PRIME COAT
1330000000-E	607	50	SY	INCIDENTAL MILLING
1489000000-E	610	1,260	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1498000000-E	610	740	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
1519000000-E	610	1,800	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
1560000000-E	620	200	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
2286000000-N	840	3	EA	MASONRY DRAINAGE STRUCTURES
2367000000-N	840	3	EA	FRAME WITH TWO GRATES, STD 840.29
2556000000-E	846	220	LF	SHOULDER BERM GUTTER
3030000000-E	862	1,550	LF	STEEL BM GUARDRAIL
3045000000-E	862	50	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	9	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3317000000-N	862	12	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77
3360000000-E	863	2,000	LF	REMOVE EXISTING GUARDRAIL
3380000000-E	862	1,512.5	LF	TEMPORARY STEEL BM GUARDRAIL
3387000000-N	862	12	EA	GUARDRAIL ANCHOR UNITS, TYPE ********** TEMPORARY (III)
3389100000-N	SP	8	EA	GUARDRAIL ANCHOR UNITS, TYPE 350 TEMPORARY
3649000000-E	876	5	TON	RIP RAP, CLASS B
3656000000-E	876	1,515	SY	FILTER FABRIC FOR DRAINAGE
3659000000-N	SP	1	EA	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON
4072000000-E	903	42	LF	SUPPORTS, 3-LB STEEL U-CHANNEL
4102000000-N	904	3	EA	SIGN ERECTION, TYPE E
4155000000-N	907	8	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4158000000-N	907	2	EA	DISPOSAL OF SIGN SYSTEM, WOOD
4400000000-E	1110	148	SF	WORK ZONE SIGNS (STATIONARY)
4405000000-E	1110	96	SF	WORK ZONE SIGNS (PORTABLE)
4410000000-E	1110	36	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4430000000-N	1130	50	EA	DRUMS
4435000000-N	1135	50	EA	CONES
4445000000-E	1145	50	LF	BARRICADES (TYPE III)
4450000000-N	1150	528	HR	FLAGGER
4465000000-N	1160	4	EA	TEMPORARY CRASH CUSHIONS
4480000000-N	1165	1	EA	TMIA
4485000000-E	1170	700	LF	PORTABLE CONCRETE BARRIER
4495000000-E	1170	80	LF	PORTABLE CONCRETE BARRIER (DRAINAGE)
4516000000-N	1180	50	EA	SKINNY DRUM
4650000000-N	1251	162	EA	TEMPORARY RAISED PAVEMENT MARKERS
4685000000-E	1205	3,558	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)
4686000000-E	1205	3,558	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)
4770000000-E	1205	1,284	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (II)
4810000000-E	1205	38,252	LF	PAINT PAVEMENT MARKING LINES (4")
4850000000-E	1205	3,200	LF	REMOVAL OF PAVEMENT MARKING LINES (4")
4900000000-N	1251	26	EA	PERMANENT RAISED PAVEMENT MARKERS
5325800000-E	1510	1,495	LF	8" WATER LINE
5326000000-E	1510	550	LF	10" WATER LINE
5546000000-E	1515	2	EA	8" VALVE
5589200000-E	1515	1	EA	2" AIR RELEASE VALVE
5801000000-E	1530	2,121	LF	ABANDON 8" UTILITY PIPE
5871600000-E	1550	550	LF	TRENCHLESS INSTALLATION OF 10" IN SOIL
6000000000-E	1605	14,000	LF	TEMPORARY SILT FENCE
6006000000-E	1610	675	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	725	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	550	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	10	ACR	TEMPORARY MULCHING
6018000000-E	1620	250	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	2	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	1,350	LF	TEMPORARY SLOPE DRAINS
6027000000-N	1622	12	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
6029000000-E	SP	6,000	LF	SAFETY FENCE
6030000000-E	1630	585	CY	SILT EXCAVATION
6036000000-E	1631	9,000	SY	MATTING FOR EROSION CONTROL
6037000000-E	SP	10	SY	COIR FIBER MAT
6042000000-E	1632	1,150	LF	1/4" HARDWARE CLOTH
6071010000-E	SP	600	LF	WATTLE
6071020000-E	SP	175	LB	POLYACRYLAMIDE (PAM)
6071030000-E	SP	1,150	LF	COIR FIBER BAFFLES
6071050000-E	SP	1	EA	**" SKIMMER (1-1/2")
6084000000-E	1660	12	ACR	SEEDING & MULCHING
6087000000-E	1660	6	ACR	MOWING
6090000000-E	1661	100	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	225	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	6.75	TON	FERTILIZER TOPDRESSING
6114500000-N	SP	20	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	15	EA	RESPONSE FOR EROSION CONTROL
6129000000-E	1670	4.6	ACR	WETLAND REFORESTATION
6135000000-E	SP	4.6	ACR	GENERIC EROSION CONTROL ITEM DISKING
6135000000-E	SP	4.6	ACR	GENERIC EROSION CONTROL ITEM RIPPING

COMPUTED BY: MAY DATE: 2/2/2010
CHECKED BY: DCW DATE: 2/2/2010

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
DETOUR (–DET–)					
–DET– 10+00.00 TO 13+95.00 (BRIDGE)	55		1,218	1,163	
SUBTOTAL	55		1,218	1,163	
–DET– 14+50.00 (BRIDGE) TO 22+10.00 (BRIDGE)	363		7,666	7,303	
SUBTOTAL	363		7,666	7,303	
–DET– 22+50.00 (BRIDGE) TO 25+55.00 (BRIDGE)			5,181	5,181	
–DR– 10+00.00 TO 11+60.00			424	424	
SUBTOTAL			5,605	5,605	
–DET– 27+10.00 (BRIDGE) TO 31+05.24	72		2,291	2,219	
SUBTOTAL	72		2,291	2,219	
DETOUR SHOULDER MATERIAL			575	575	
PHASE 1 SUBTOTAL	490		17,355	16,865	
SR 1527 (–L–)					
–L– 10+00.00 TO 13+80.23 (BRIDGE)	10		570	560	
SUBTOTAL	10		570	560	
–L– 14+60.26 (BRIDGE) TO 21+12.00 (BRIDGE)	9		4,816	4,807	
SUBTOTAL	9		4,816	4,807	
–L– 21+62.00 (BRIDGE) TO 24+50.00 (BRIDGE)	4		1,581	1,577	
SUBTOTAL	4		1,581	1,577	
–L– 26+41.06 (BRIDGE) TO 31+00.00	114		753	639	
SUBTOTAL	114		753	639	
PHASE 2 SUBTOTAL	137		7,720	7,583	
DETOUR REMOVAL (–DET–)					
–DET– 10+00.00 TO 13+95.00 (BRIDGE)	873				873
SUBTOTAL	873				873
–DET– 14+50.00 (BRIDGE) TO 22+10.00 (BRIDGE)	6,134				6,134
SUBTOTAL	6,134				6,134
–DET– 22+50.00 (BRIDGE) TO 25+55.00 (BRIDGE)	3,723				3,723
SUBTOTAL	3,723				3,723
–DET– 27+10.00 (BRIDGE) TO 31+05.24	1,805				1,805
SUBTOTAL	1,805				1,805
REMOVAL OF EXIST. ROAD BED (–L–)					
–L– 14+60.26 (BRIDGE) TO 21+12.00 (BRIDGE)	5,795				5,795
SUBTOTAL	5,795				5,795
DETOUR SHOULDER REMOVAL	420				420
PHASE 3 SUBTOTAL	18,750				18,750
TOTAL (PHASES 1 – 3)	19,377		25,075	24,448	18,750
PROJECT TOTAL	19,377		25,075	24,448	18,750
EST. 5% FOR REPLACING TOPSOIL IN BORROW PITS				1,222	
GRAND TOTAL	19,377		25,075	25,670	18,750
SAY	19,500			25,800	

ESTIMATE DDE = 10 CY
ESTIMATE UNDERCUT EXCAVATION = 900 CY
ESTIMATE SELECT GRANULAR MATERIAL = 900 CY

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, Borrow Excavation, Fine Grading, Clearing and Grubbing, and Removal of Existing Asphalt Pavement will be paid for at the contract lump sum price for "Grading."

PROJECT REFERENCE NO. B-3693
SHEET NO. 3-A

6/21/00

COMPUTED BY: MAY DATE: 12/14/2009
CHECKED BY: DCW DATE: 12/14/2009

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-3693	3-B

SUMMARY OF PAVEMENT REMOVAL

SURVEY LINE	STATION TO STATION	LOCATION	ASPHALT REMOVAL (SY)
-L-	13+57 TO 13+95	CL	116.7
-L-	14+47 TO 21+18	LT	2,173.4
-L-	21+54 TO 24+67	CL	830.2
-L-	26+22 TO 26+65	CL	110.9
-DET-	10+61 TO 13+95	CL	599.7
-DET-	14+50 TO 22+10	CL	1,857.8
-DET-	22+50 TO 25+50	CL	745.6
-DET-	27+10 TO 30+47	CL	666.6
	TOTAL		7,100.9
	SAY		7,110

2/8/2010
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Ko & Associates, P.C.

62100

COMPUTED BY:	MAY	DATE:	2/1/2010
CHECKED BY:	DCW	DATE:	2/2/2010

PROJECT REFERENCE NO.	SHEET NO.
B-3693	3-C

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE
-DET- 11+50	LT	1																	
-L- 15+49	RT	2		124.4															
-L- 15+49	RT	2	3		121.7	121.4			12										
-L- 20+00	RT	4		125.9															
-L- 20+00	RT	4	5		123.2	120.3			20							X			
-L- 27+23	RT	6		126.1															
-L- 27+23	RT	6	7		123.3	121.0			20							X			
TOTALS									52										

STATION (SIZE / THICKNESS OR GAUGE)	C.S. PIPE 12" .064	15" .064	18" .064	24" .064	36" .079	42" .109	48" .109	R.C. PIPE (CLASS III) 15"	18"	24"	30"	36"	42"	48"	R.C. PIPE (CLASS IV) 12"	15"	18"	24"	30"	36"	42"	48"
-DET- 11+50																						
-L- 15+49																						
-L- 15+49																						
-L- 20+00																						
-L- 20+00																						
-L- 27+23																						
-L- 27+23																						
TOTALS																						

STATION	**" R. C. PIPE (CLASS V)	**" R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	**" R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	* TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. *FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G		CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET	G.D.I. TYPE "B" STD. 840.18 OR 840.27	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	PREFORMED SCOUR HOLES	CONC. COLLARS CL. "B" C.Y. STD 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN.FT.	REMARKS
-DET- 11+50					20																						24	
-L- 15+49								1										1				1						
-L- 15+49																												
-L- 20+00								1										1				1						
-L- 20+00																												
-L- 27+23								1										1				1						
-L- 27+23																								1				
TOTALS					20			3										3				3		1			24	

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

TEMPORARY GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	SHOP CURVED	DOUBLE FACED	WARRANT POINT APPROACH END	TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	TRAILING END	W APPROACH END	TRAILING END	TEMPORARY ANCHORS XI MOD	B-77	GRAU 350	M-350	TYPE III	CAT-1	VI MOD	BIC	AT-1	IMPACT ATTENUATOR TYPE 350 EA	G	NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
-DET-	11+82.50	13+95.00	RT	212.50			13+95		4	10	193.75		3.88				1		1											TEMPORARY
-DET-	13+07.50	13+95.00	LT	87.50				13+95	4	10		68.75		1.38			1		1											TEMPORARY
-DET-	14+50.00	15+37.50	RT	87.50				14+50	4	10		68.75		1.38			1		1											TEMPORARY
-DET-	14+50.00	22+10.00	LT	760.00			14+50	22+10	4	10	200.00	200.00	4.00	4.00					2											TEMPORARY
-DET-	19+97.50	22+10.00	RT	212.50			22+10		4	10	193.75		3.88				1		1											TEMPORARY
-DET-	22+50.00	25+55.00	RT	305.00			22+50	25+55	4	10	0	0	0	0					2											TEMPORARY
-DET-	22+50.00	23+25.00	LT	75.00			22+50		4	10	56.25		1.13				1		1											TEMPORARY
-DET-	24+67.50	25+55.00	LT	87.50				25+55	4	10		68.75		1.38			1		1											TEMPORARY
-DET-	27+10.00	27+97.50	RT	87.50				27+10	4	10		68.75		1.38			1		1											TEMPORARY
-DET-	27+10.00	29+22.50	LT	212.50			27+10		4	10	193.75		3.88				1		1											TEMPORARY
		SUB TOTALS		2,127.50							ANCHOR DEDUCTIONS:																			
		ANCHOR DEDUCTIONS		625.00							TYPE III 12 x 18.75' = 225.00																			
		TOTALS		1,502.50							GRAU-350 8 x 50' = 400.00																			
		SAY		1512.50							TOTAL = 625.00						8		12											

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	SHOP CURVED	DOUBLE FACED	WARRANT POINT APPROACH END	TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	TRAILING END	W APPROACH END	TRAILING END	ANCHORS XI MOD	B-77	GRAU 350	M-350	XIII	CAT-1	VI MOD	BIC	AT-1	IMPACT ATTENUATOR TYPE 350 EA	G	NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
-L-	10+84.29	13+84.29	RT	300.00			13+80.23		6.1	11	95.00		1.90			1	1											137		
-L-	12+38.82	13+76.32	LT	137.50				13+80.23	6.1	11		118.75		2.38		1	1											92		
-L-	14+54.77	17+54.77	LT	300.00			14+60.26		5.7	11	115.00		2.30			1	1											733		
-L-	14+65.98	16+03.48	RT	137.50				14+60.26	5.7	11		118.75		2.30		1	1											103		
-L-	18+11.48	21+11.48	RT	300.00			21+12		5.9	11	105.00		2.10			1	1											144		
-L-	19+75.00	21+12.50	LT	137.50				21+12	5.9	11		105.00		2.10		2														
-L-	21+62.50	24+50.00	RT	287.50			21+12	24+50	5.9	11	0	0	0	0		1	1											314		
-L-	21+61.50	22+54.00	LT	75.00	50.00		21+62		5.9	11	56.25		1.13			1							1					105		
-L-	23+37.50	24+50.00	LT	112.50				24+50	3.92	11	93.75		1.88			1	1											132		
-L-	26+41.06	27+78.56	RT	137.50				26+41.06	7.92	11		118.75		2.38		1	1											119		
-L-	26+41.06	29+41.06	LT	300.00			26+41.06		3.92	11		200.00		4.00		1	1											121		
											ANCHOR DEDUCTIONS:																			
		SUB TOTALS		2,225.00	50.00						AT-1 1 x 6.25' = 6.25																			
		ANCHOR DEDUCTIONS		681.25							B-77 12 x 18.75' = 225.00																			
		TOTALS		1,543.75							GRAU-350 9 x 50' = 450.00																			
		SAY		1,550.00	50.00		ADDITIONAL POSTS - 5 EA.				TOTAL = 681.25					12	9						1					2000		

2/9/2010
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PROJECT REFERENCE NO.	SHEET NO.
B-3693	3-D

PARCEL INDEX SHEET

PARCEL NO.	R/W SHEET NO.	PROPERTY OWNERS NAME
1	4	Sally Cade Walters
2	4	Polly Barr
3	4	Dan Cade, Jr.
4	4	Billy Durell Currie
5	4,5	Larry T. Edwards & Thomas J. Keith
6	4,5	Bonnie F. Locklear
7	5	Delmar Spaulding
8	5	Woodrow Wilson Beck, Jr.

8/17/99

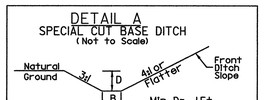
Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
B-3693	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 032482 ENGINEER MICHAELIA YOUNG — 3-19-10

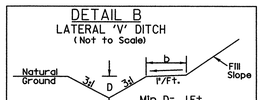
HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 19732 ENGINEER MIN-CHEN FU — 3-19-10

DETAIL A
SPECIAL CUT BASE DITCH
(Not to Scale)



FROM STA. 10+70 TO STA. 12+75 -L- LT.

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



DDE = 5.6 CY

FROM STA. 10+50 TO STA. 11+20 -L- RT.

-DET-

PI Sta 11+16.91	PI Sta 12+94.23	PI Sta 18+06.12
Δ = 16° 15' 36.7" (LT)	Δ = 16° 15' 36.7" (RT)	Δ = 59° 51' 12.7" (RT)
D = 8° 48' 53.0"	D = 9° 32' 57.5"	D = 9° 32' 57.5"
L = 184.47'	L = 170.28'	L = 626.78'
T = 92.86'	T = 85.71'	T = 345.39'
R = 650.00'	R = 600.00'	R = 600.00'
e = .06	e = .06	e = .06
RUNOFF = 133'	RUNOFF = 133'	RUNOFF = 133'

-L-

PI Sta 17+78.38
Δ = 59° 51' 12.7" (RT)
D = 6° 32' 53.1"
L = 914.06'
T = 503.69'
R = 875.00'*
e = .06
RUNOFF = 160'

* DESIGN EXCEPTION REQUIRED

REMOVE EXISTING ROADBED AND FILLS TO NATURAL GROUND.

NAD 83

4 BILLY DURELL CURRIE
DB 1473 PG 841

JIMMY SMITH
DB 633 PG 858
PB 8 PG 123

2 POLLY BARR
DB 714 PG 377

5 LARRY T. EDWARDS & THOMAS J. KEITH
DB 565 PG 721

JOANN CADE
DB 936 PG 756
PB 8 PG 123

LEVIE CADE
DB 102 PG 283
PB 8 PG 123

SMITH JUNIOR CADE
DB 1009 PG 808

ROCK HILL MISSIONARY BAPTIST CHURCH
DB 949 PG 648
PB 8 PG 123

1 SALLY CADE WALTERS
DB 1009 PG 808

3 DAN CADE JR.
DB 1009 PG 808

6 BONNIE F. LOCKLEAR
DB 1121 PG 728

BEGIN BRIDGE
-L- POC STA.13+80.23

-DET- PT 13+78.80

BEGIN APPROACH SLAB
-L- POC STA.13+56.26

-DET- PRC 12+08.52

-DET- PC 10+24.05

BEGIN DETOUR
-DET- POT 10+00.00 =
-L- POT 10+00.00

-DET- PC 14+60.73

TEMPORARY DETOUR

BL-1
-L- POC 13+00.99
20.12' LT

BL-2
-L- POC 18+69.33
79.46' LT

SPECIAL CUT 2' BASE DITCH SEE DETAIL A

RETAIN 18" CONSTRUCTED FOR TEMP. DETOUR

LATERAL V DITCH SEE DETAIL B

CLASS IIRIRAP UP TO ELEV. 126.0 (TYP) (STRUCTURE PAY ITEM)

DECK DRAINS ARE NOT REQUIRED

CLASS B RIP RAP
EST. 2 TONS
EST. 7 SY FF

END APPROACH SLAB
-L- POC STA.14+84.21

END BRIDGE
-L- POC STA.14+60.26

-L- PC 12+74.69

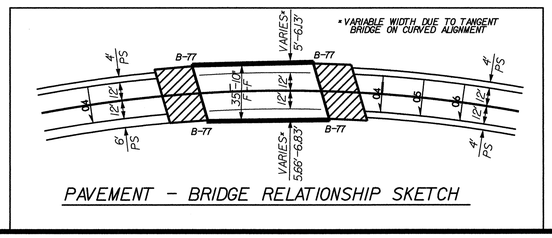
BM 80
BL- STA 3+61.88
92.24' RT
ELEV. 122.95'

TO NC 72

SR 1527 PINE LOG ROAD 24'BST 60' R/W

MATCHLINE STATION 19+00 -L-
SEE SHEET NO. 5

BEGIN TIP PROJECT B-3693
-L- POT STA. 10+00.00



PAVEMENT - BRIDGE RELATIONSHIP SKETCH

LEGEND
PAVED SHOULDER
APPROACH SLAB

FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-59
FOR -L- PROFILE, SEE SHEET NO. 6
FOR -DET- PLANS, SEE SHEETS NO. 2-C & 2-D

3/19/2010
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Florence & Hutcheson

CONSULTING ENGINEERS

5121 Kingdom Way, Suite 100 Raleigh, NC 27607

NC License No: F-0258

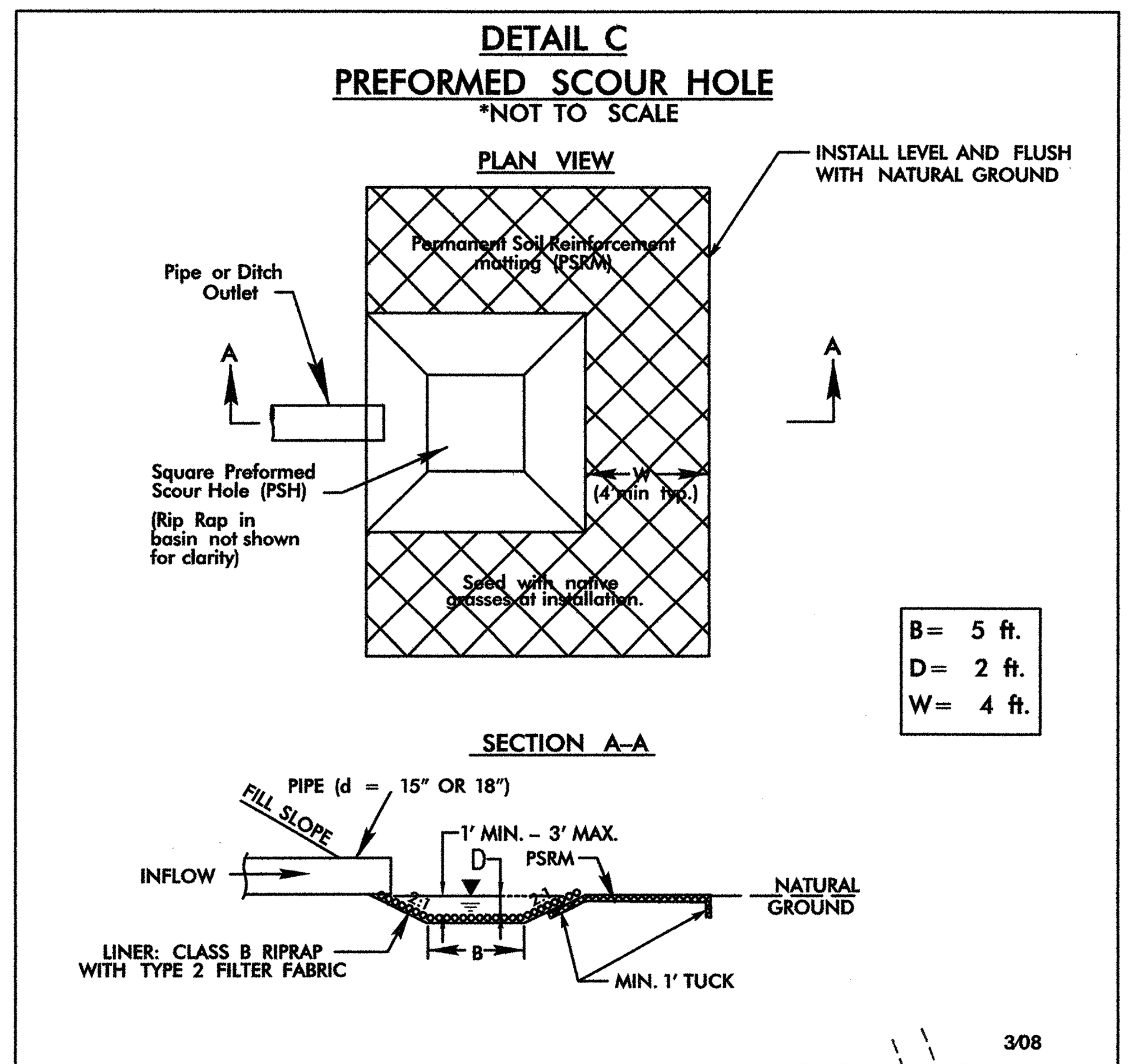
PROJECT REFERENCE NO.	SHEET NO.
B-3693	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022982 MICHAEL A. YOUNG 3-19-10

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19732 SHINCHEN FUH 3-19-10

8/17/99

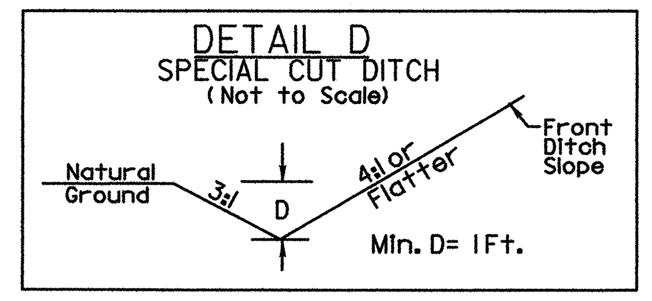
DETAIL C
PREFORMED SCOUR HOLE
(*NOT TO SCALE)



PLAN VIEW
INSTALL LEVEL AND FLUSH WITH NATURAL GROUND
Pipe or Ditch Outlet
Square Preformed Scour Hole (PSH)
(Rip Rap in basin not shown for clarity)
B= 5 ft.
D= 2 ft.
W= 4 ft.
SECTION A-A
PIPE (d = 15" OR 18")
FILL SLOPE
INFLOW
NATURAL GROUND
LINER: CLASS B RIPRAP WITH TYPE 2 FILTER FABRIC
MIN. 1' TUCK
308

STA. 27+70 -L- RT.

DETAIL D
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 27+00 TO STA. 29+50 -L- LT.

-L-

PI Sta 17+78.38	PI Sta 28+12.28
Δ = 59° 51' 12.7" (RT)	Δ = 9° 02' 56.1" (RT)
D = 6° 32' 53.1"	D = 3° 49' 11.0"
L = 914.06'	L = 236.90'
T = 503.69'	T = 118.70'
R = 875.00'*	R = 1,500.00'
e = .06	e = .06
RUNOFF = 160'	RUNOFF = 160'

* DESIGN EXCEPTION REQUIRED

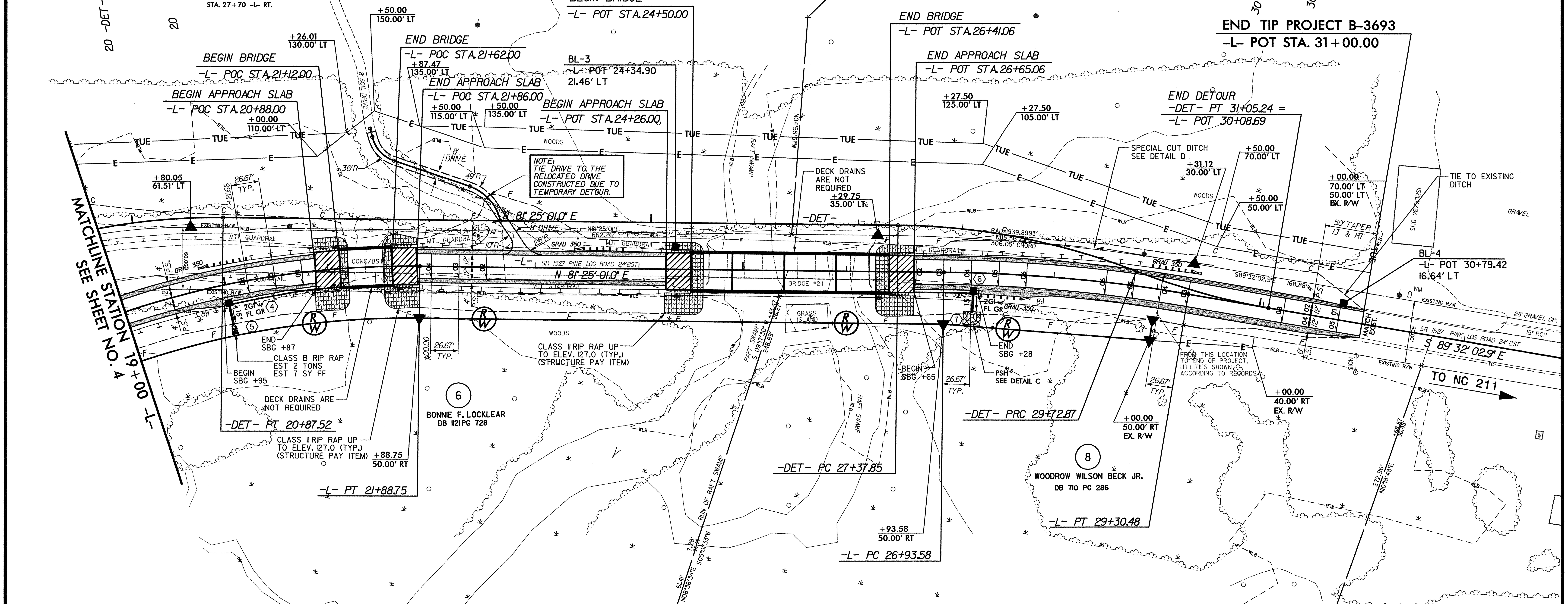
-DET-

PI Sta 28+56.66	PI Sta 30+39.29
Δ = 20° 43' 01.3" (RT)	Δ = 11° 40' 05.2" (LT)
D = 8° 48' 53.0"	D = 8° 48' 53.0"
L = 235.03'	L = 132.37'
T = 118.81'	T = 66.41'
R = 650.00'	R = 650.00'
e = .06	e = .06
RUNOFF = 133'	RUNOFF = 133'

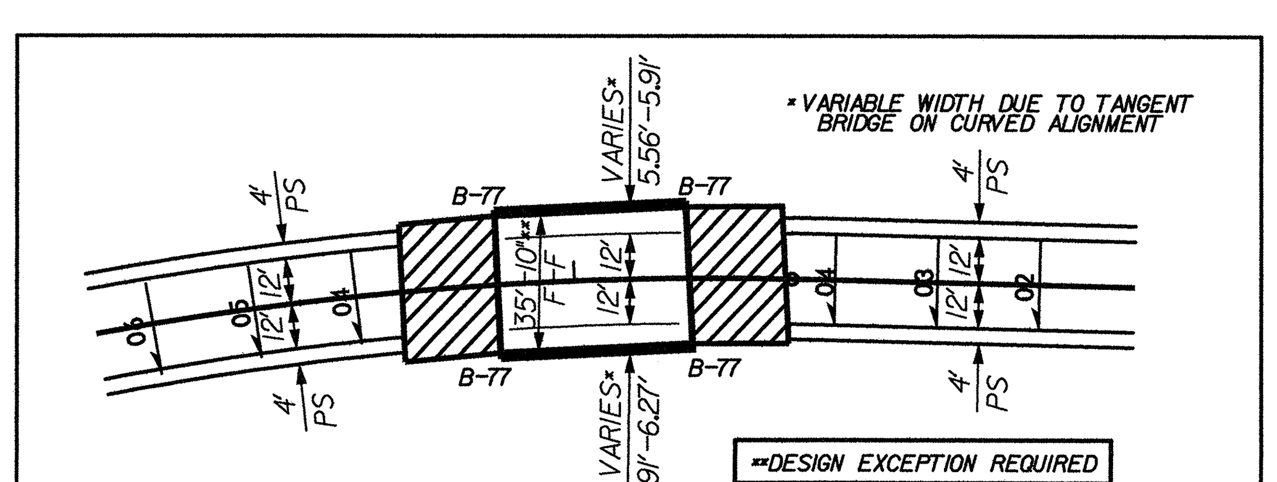
-DR-

PI Sta 10+25.43	PI Sta 11+41.03
Δ = 58° 56' 11.4" (LT)	Δ = 57° 28' 21.1" (RT)
D = 127° 19' 26.2"	D = 181° 04' 16.6"
L = 46.29'	L = 31.74'
T = 25.43'	T = 17.35'
R = 45.00'	R = 31.64'

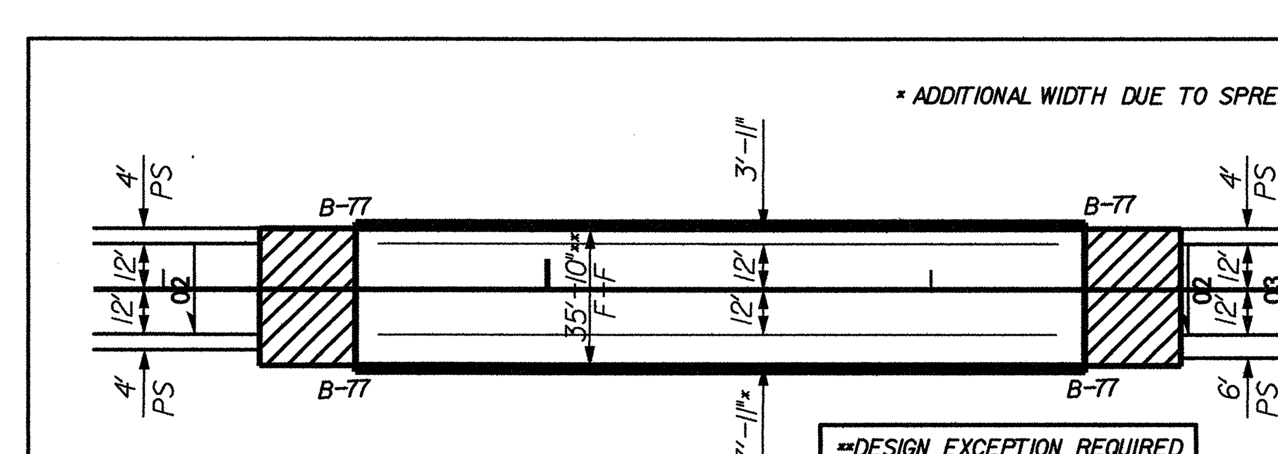
REMOVE EXISTING ROADBED AND FILLS TO NATURAL GROUND.



5
LARRY T. EDWARDS & THOMAS J. KEITH
DB 565 PG 721
NOTE: SEE SHEET NO. 2-D FOR RELOCATED DRIVE INFO.
7
DELMAR SPAULDING
DB 1639 PG 149
NAD 83
RUN OF RAFT SWAMP
END TIP PROJECT B-3693
-L- POT STA. 31+00.00
BEGIN BRIDGE
-L- POT STA. 24+50.00
END BRIDGE
-L- POT STA. 26+41.06
END APPROACH SLAB
-L- POT STA. 26+65.06
END BRIDGE
-L- POC STA. 21+62.00
END APPROACH SLAB
-L- POC STA. 21+86.00
BEGIN BRIDGE
-L- POC STA. 21+12.00
BEGIN APPROACH SLAB
-L- POC STA. 20+88.00
BEGIN APPROACH SLAB
-L- POT STA. 24+26.00
BL-3
-L- POT 24+34.90
21.46' LT
END DETOUR
-DET- PT 31+05.24 =
-L- POT 30+08.69
SPECIAL CUT DITCH SEE DETAIL D
TIE TO EXISTING DITCH
NOTE: TIE DRIVE TO THE RELOCATED DRIVE CONSTRUCTED DUE TO TEMPORARY DETOUR.
DECK DRAINS ARE NOT REQUIRED
N 81° 25' 01.0" E
SR 1527 PINE LOG ROAD 24' BST
BRIDGE #211
BL-4
-L- POT 30+79.42
16.64' LT
S 89° 32' 02.9" E
TO NC 211
MATCHLINE STATION 19+00 -L-
SEE SHEET NO. 4
CLASS B RIP RAP EST 2 TONS EST 7 SY FF
DECK DRAINS ARE NOT REQUIRED
-DET- PT 20+87.52
CLASS II RIP RAP UP TO ELEV. 127.0 (TYP.) (STRUCTURE PAY ITEM)
-L- PT 21+88.75
6
BONNIE F. LOCKLEAR
DB 1121 PG 728
-DET- PC 27+37.85
-L- PC 26+93.58
-DET- PRC 29+72.87
8
WOODROW WILSON BECK JR.
DB 710 PG 286
-L- PT 29+30.48
FROM THIS LOCATION TO END OF PROJECT, UTILITIES SHOWN ACCORDING TO RECORDS.
PSH SEE DETAIL C



PAVEMENT - BRIDGE RELATIONSHIP SKETCH



PAVEMENT - BRIDGE RELATIONSHIP SKETCH

LEGEND

- PAVED SHOULDER
- APPROACH SLAB

FOR -DET- PLANS, SEE SHEETS 2-C & 2-D
FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-59
FOR -L- PROFILE, SEE SHEET NO. 6

3/18/2010
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Florence & Hutcheson, Inc.

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingston Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

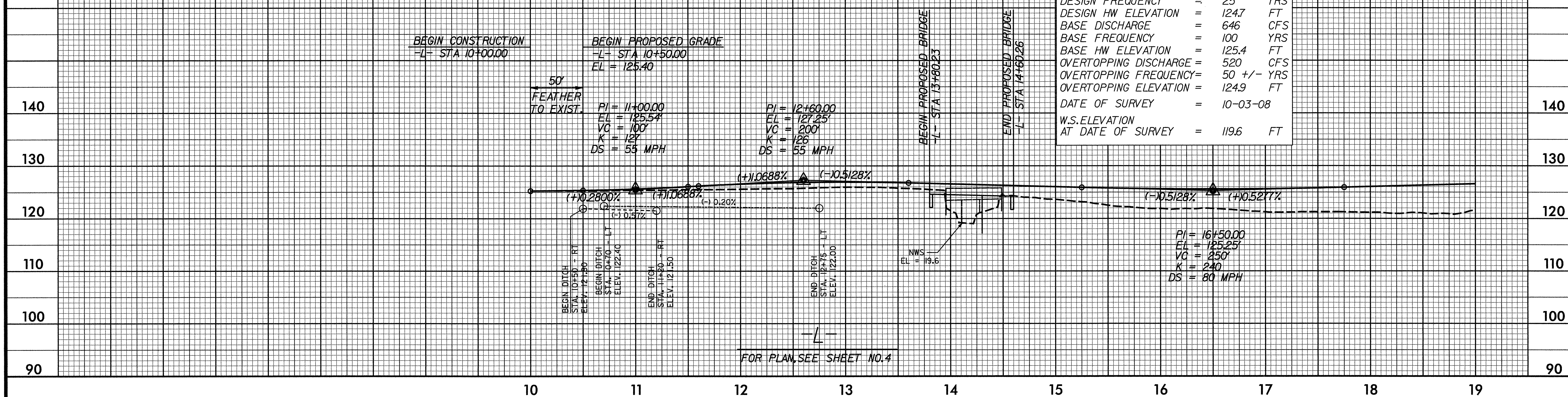
PROJECT REFERENCE NO.	SHEET NO.
B-3693	6

ROADWAY DESIGN ENGINEER — SEAL 022982 — MICHAEL A. YOUNG — 3-19-10
HYDRAULICS ENGINEER — SEAL 19732 — SHIHCHEN FUH — 3-19-10

B.M.*80 EL = 122.95
RR SPIKE IN BASE OF 24" GUM TREE
92.24' RT OF -BL- STA 3+61.88
33.94' RT OF -L- STA 11+44.40

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	450	CFS
DESIGN FREQUENCY	=	25	YRS
DESIGN HW ELEVATION	=	124.7	FT
BASE DISCHARGE	=	646	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	125.4	FT
OVERTOPPING DISCHARGE	=	520	CFS
OVERTOPPING FREQUENCY	=	50 +/-	YRS
OVERTOPPING ELEVATION	=	124.9	FT
DATE OF SURVEY	=	10-03-08	
W.S.ELEVATION AT DATE OF SURVEY	=	119.6	FT

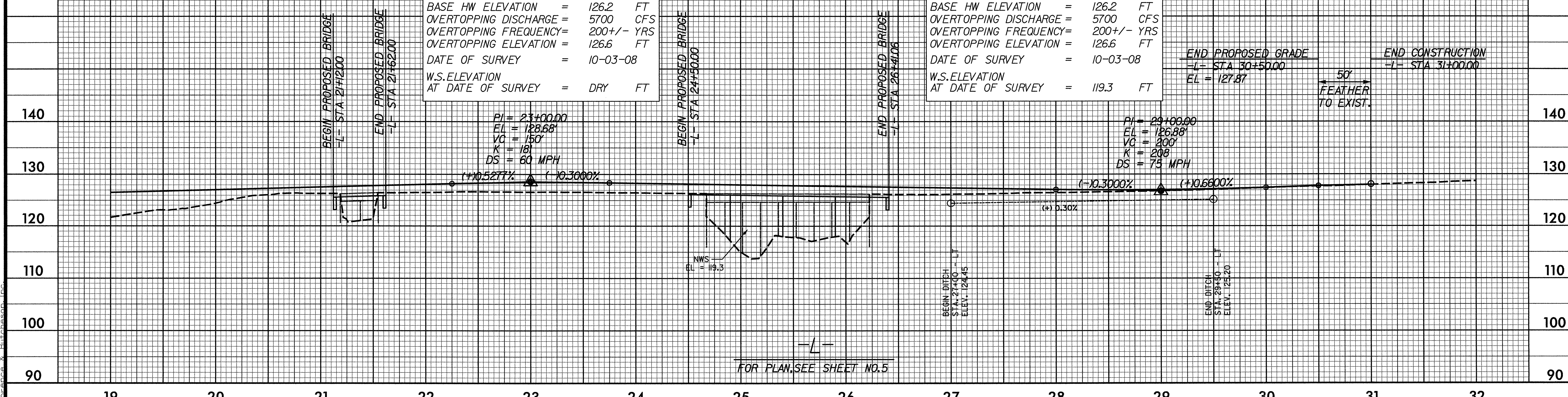


BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	3400	CFS
DESIGN FREQUENCY	=	25	YRS
DESIGN HW ELEVATION	=	125.5	FT
BASE DISCHARGE	=	4810	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	126.2	FT
OVERTOPPING DISCHARGE	=	5700	CFS
OVERTOPPING FREQUENCY	=	200+/-	YRS
OVERTOPPING ELEVATION	=	126.6	FT
DATE OF SURVEY	=	10-03-08	
W.S.ELEVATION AT DATE OF SURVEY	=	DRY	FT

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	3400	CFS
DESIGN FREQUENCY	=	25	YRS
DESIGN HW ELEVATION	=	125.5	FT
BASE DISCHARGE	=	4810	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	126.2	FT
OVERTOPPING DISCHARGE	=	5700	CFS
OVERTOPPING FREQUENCY	=	200+/-	YRS
OVERTOPPING ELEVATION	=	126.6	FT
DATE OF SURVEY	=	10-03-08	
W.S.ELEVATION AT DATE OF SURVEY	=	119.3	FT



5/28/99
3/19/2010 R:\Roadway\Proj\B3693_Rdy_pfl_06.dgn Florence & Hutcheson, Inc.

5/28/99

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

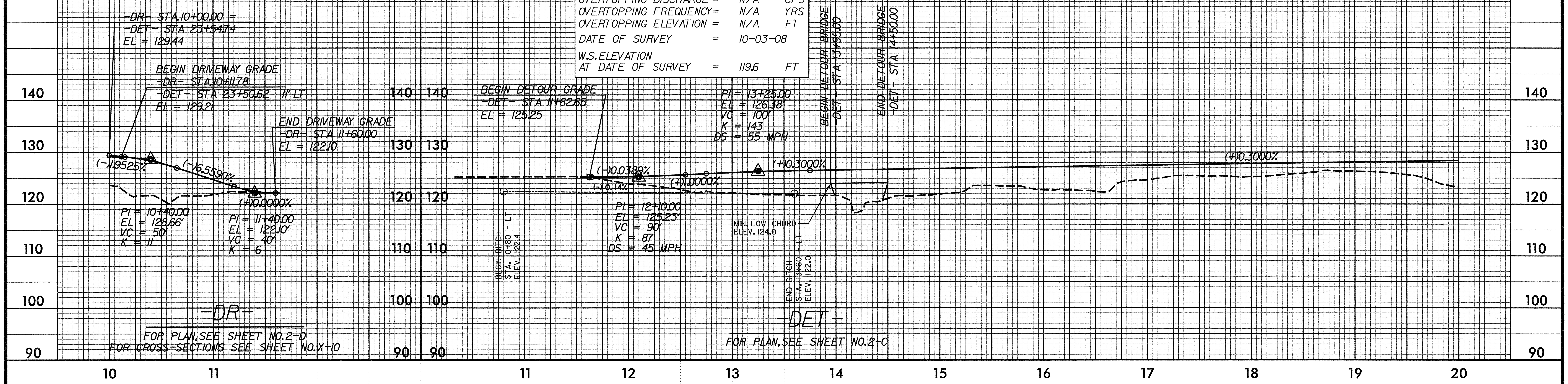
PROJECT REFERENCE NO.	SHEET NO.
B-3693	7

ROADWAY DESIGN ENGINEER — SEAL 022982, MICHAEL A. YOUNG, 2-9-10

HYDRAULICS ENGINEER — SEAL 19732, SHIHCHEN FUH, 2-09-10

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	260	CFS
DESIGN FREQUENCY	=	5	YRS
DESIGN HW ELEVATION	=	123.5	FT
BASE DISCHARGE	=	N/A	CFS
BASE FREQUENCY	=	N/A	YRS
BASE HW ELEVATION	=	N/A	FT
OVERTOPPING DISCHARGE	=	N/A	CFS
OVERTOPPING FREQUENCY	=	N/A	YRS
OVERTOPPING ELEVATION	=	N/A	FT
DATE OF SURVEY	=	10-03-08	
W.S.ELEVATION AT DATE OF SURVEY	=	119.6	FT



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	2000	CFS
DESIGN FREQUENCY	=	5	YRS
DESIGN HW ELEVATION	=	124.4	FT
BASE DISCHARGE	=	N/A	CFS
BASE FREQUENCY	=	N/A	YRS
BASE HW ELEVATION	=	N/A	FT
OVERTOPPING DISCHARGE	=	N/A	CFS
OVERTOPPING FREQUENCY	=	N/A	YRS
OVERTOPPING ELEVATION	=	N/A	FT
DATE OF SURVEY	=	10-03-08	
W.S.ELEVATION AT DATE OF SURVEY	=	DRY	FT

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	2000	CFS
DESIGN FREQUENCY	=	5	YRS
DESIGN HW ELEVATION	=	124.4	FT
BASE DISCHARGE	=	N/A	CFS
BASE FREQUENCY	=	N/A	YRS
BASE HW ELEVATION	=	N/A	FT
OVERTOPPING DISCHARGE	=	N/A	CFS
OVERTOPPING FREQUENCY	=	N/A	YRS
OVERTOPPING ELEVATION	=	N/A	FT
DATE OF SURVEY	=	10-03-08	
W.S.ELEVATION AT DATE OF SURVEY	=	119.3	FT