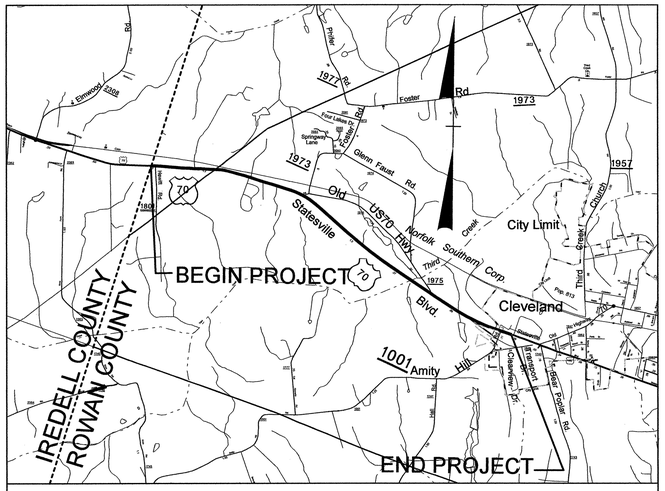
09/08/99

TIP PROJECT: R-2911B

CONTRACT: C201932

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



VICINITY MAP FOR TIP PROJECT R-2911B

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ROWAN COUNTY

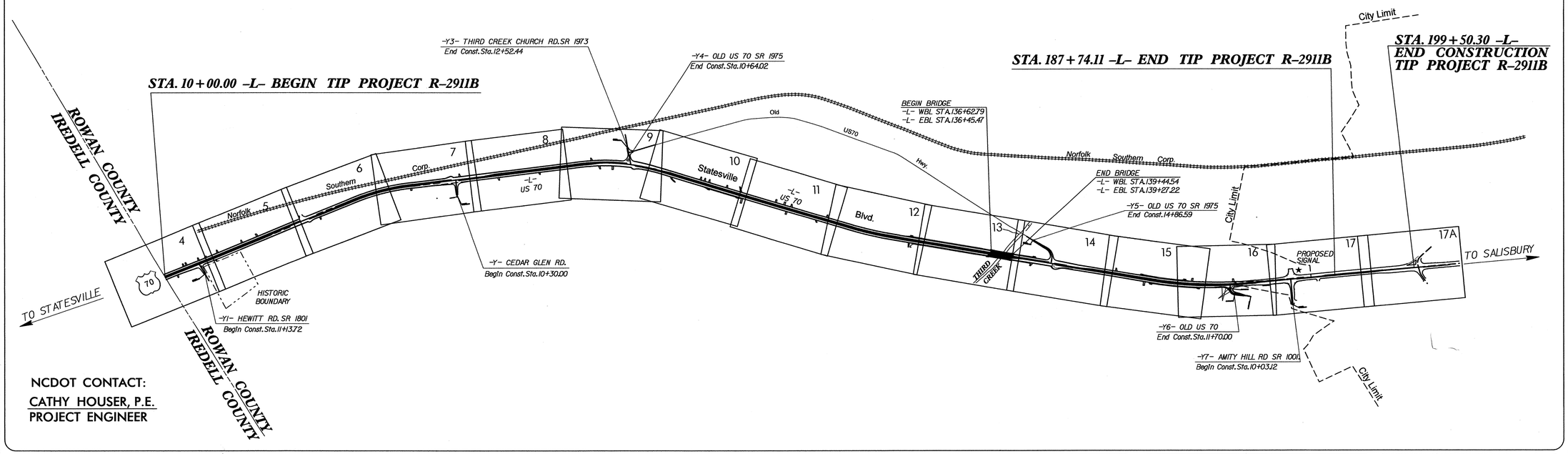
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2911B	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34517.1.1	STP-70(39)	P.E.
34517.2.7	STP-70(81)	R/W & UTIL.
34517.3.9	STP-70(81)	CONST.

LOCATION: US 70 FROM IREDELL COUNTY LINE TO EAST OF SR 1001 (AMITY HILL ROAD)

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

NAD 83



NCDOT CONTACT:
CATHY HOUSER, P.E.
PROJECT ENGINEER

GRAPHIC SCALES

50′ 25′ 0 50′ 100′
PLANS

50′ 25′ 0 50′ 100′
PROFILE (HORIZONTAL)

10′ 5′ 0 10′ 20′
PROFILE (VERTICAL)

DESIGN DATA

ADT 2008 = 13,700
ADT 2030 = 23,500
DHV = 11 %
D = 55 %
T = 20 % *

V = 60 MPH SHOULDER SECTION

V = 50 MPH CURB & GUTTER SECTION

* TTST 14% DUAL 6%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2911B = 3.313 Miles
LENGTH STRUCTURES TIP PROJECT R-2911B = 0.053 Miles
TOTAL LENGTH STATE TIP PROJECT R-2911B = 3.366 Miles

THIS IS A PARTIAL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS SHOWN ON THE PLANS.

Prepared in the Office of:
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
October 30, 2004

LETTING DATE:
September 16, 2008

Stephen Browde, P.E.
PROJECT ENGINEER

Brian K. Eason, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALLEN

SIGNATURE: 7-10-08 P.E.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON

SIGNATURE: 7-10-08 P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

P.E.
STATE HIGHWAY DESIGN ENGINEER

02-JUL-2008 11:47
R:\Roadway Proj\r2911b_rdy_tsh.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	1-A

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON
Brian K. Eason 7-22-08

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, & STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C THRU 1-D	SURVEY CONTROL SHEETS
1-E	CENTERLINE COORDINATE LIST
2 THRU 2-C	PAVEMENT SCHEDULE, TYPICALS, AND DETAILS SHOWING METHOD OF WEDGING
2-D THRU 2-F	INTERSECTION DETAILS
2-G	DETAIL OF MEDIAN CROSS-OVER
2-H	DETAIL OF RIP-RAPPED ENERGY DISSIPATOR BASIN
2-I	DETAIL OF TEMPORARY ANCHOR UNIT TYPE W-BEAM
2-J	DETAIL OF ANCHORAGE FOR FRAMES
2-K	DETAIL OF 1'-6" TO 2'-9" CURB & GUTTER TRANSITION SECTION
2-L	DETAIL TO CONVERT EXISTING DROP INLET OR CATCH BASIN TO JUNCTION BOX (MANHOLE OPTIONAL)
2-M	DETAIL CONVERSION OF DROP INLET OR JUNCTION BOX TO CATCH BASIN
2-N	DETAIL CONVERSION OF MANHOLE TO CATCH BASIN
2-O	DETAIL OF STANDARD TEMPORARY SHORING
2-P THRU 2-Z	DETAIL STANDARD TEMPORARY MSE WALLS
3	SUMMARY OF QUANTITIES
3-A THRU 3-G	DRAINAGE SUMMARY
3-H	SUMMARY OF WIRE WOVEN FENCE, BARBED WIRE FENCE, EXISTING ASPHALT PAVEMENT REMOVAL, AND BREAKING
3-I	GUARDRAIL SUMMARY
3-J	EARTHWORK SUMMARY
3-K	PARCEL INDEX SHEET
4 THRU 17A	PLAN SHEETS
18 THRU 26	PROFILE SHEETS
TCP-1 THRU TCP-29	TRAFFIC CONTROL PLANS
SD-1	SPECIAL SIGN DESIGN
PM-1 THRU PM-8	PAVEMENT MARKING PLANS
EC-1 THRU EC-31	EROSION CONTROL PLANS
RF-1	REFORESTATION PLAN
SIGN-1 THRU SIGN-14	SIGNING PLANS
SIG-1 THRU SIG-21	SIGNAL PLANS
UC-1 THRU UC-10	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-15	UTILITIES BY OTHERS
X-A	CROSS SECTION INDEX
X-B THRU X-D	EARTHWORK CROSS SECTION SUMMARY
X-1 THRU X-129	CROSS SECTIONS
S-1 THRU S-77	STRUCTURE PLANS

GENERAL NOTES:

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

GRADE LINE:
GRADING AND SURFACING:

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

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 & 225.05 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 AND STD. NO. 560.02.

SIDE ROADS:

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

BERM DITCHES:

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

UNDERDRAINS:

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

DRIVEWAYS:

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

STREET TURNOUT:

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

GUARDRAIL:

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

TEMPORARY SHORING:

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

END BENTS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE CITY OF SALISBURY.

SALISBURY ROWAN UTILITIES, **Duke Energy, ATT, Piedmont Natural Gas, Time Warner**

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

RIGHT-OF-WAY MARKERS:

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

WHEELCHAIR RAMPS:

WHEELCHAIR RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS. THE CONSTRUCTION OF ALL WHEELCHAIR RAMPS SHALL BE IN ACCORDANCE WITH DETAILS IN PLANS.

2006 ROADWAY ENGLISH STANDARD DRAWINGS

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

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.05	Method of Obtaining Superelevation - Divided Highways
225.06	Method of Grading Sight Distance at Intersections
240.01	Guide for Berm Ditch Construction
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation - Method 'A'
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.10	Reinforced Bridge Approach Fills
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
560.02	Method of Shoulder Construction - High Side of Superelevated Curve - Method II
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.03	Pipe Underdrain and Blind Drain
816.04	Markers for Drainage Structures And Concrete Pad
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.39	Reinforced Concrete Endwall - for Single 72" Pipe 90 Skew
838.45	Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40
838.69	Reinforced Brick Endwall - for Single 72" Pipe 90 Skew
838.75	Notes for Reinforced Brick Endwall - Std. Dwg 838.51 thru 838.70
838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.28	Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.34	Traffic Bearing Junction Box- for use with Pipes 42" and Under
840.45	Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
846.02	Drop Inlet Installation in Expressway Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
848.03	Driveway Turnout - Drop Curb Type
848.04	Street Turnout
848.05	Wheelchair Ramp - Curb Cut
850.01	Concrete Paved Ditches
850.10	Guide for Berm Drainage Outlet - 15" and 18" Pipe
850.11	Guide for Berm Drainage Outlet - 24" and 30" Pipe
852.01	Concrete Islands
852.05	Median Curb for Catch Basin - for Use with 1'-6" Curb and Gutter
852.06	Method for Placement of Drop Inlets in Concrete Islands
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
866.02	Woven Wire Fence - with Wood Post
866.04	Barbed Wire Fence - with Wood Posts (2-7 Strands)
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

3/15/06

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	1-B

Note: Not to Scale

****S.U.E. = Subsurface Utility Engineering***

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream — JS
- Buffer Zone 1 — BZ 1
- Buffer Zone 2 — BZ 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite Marker — RW
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Utility Easement — PUE

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

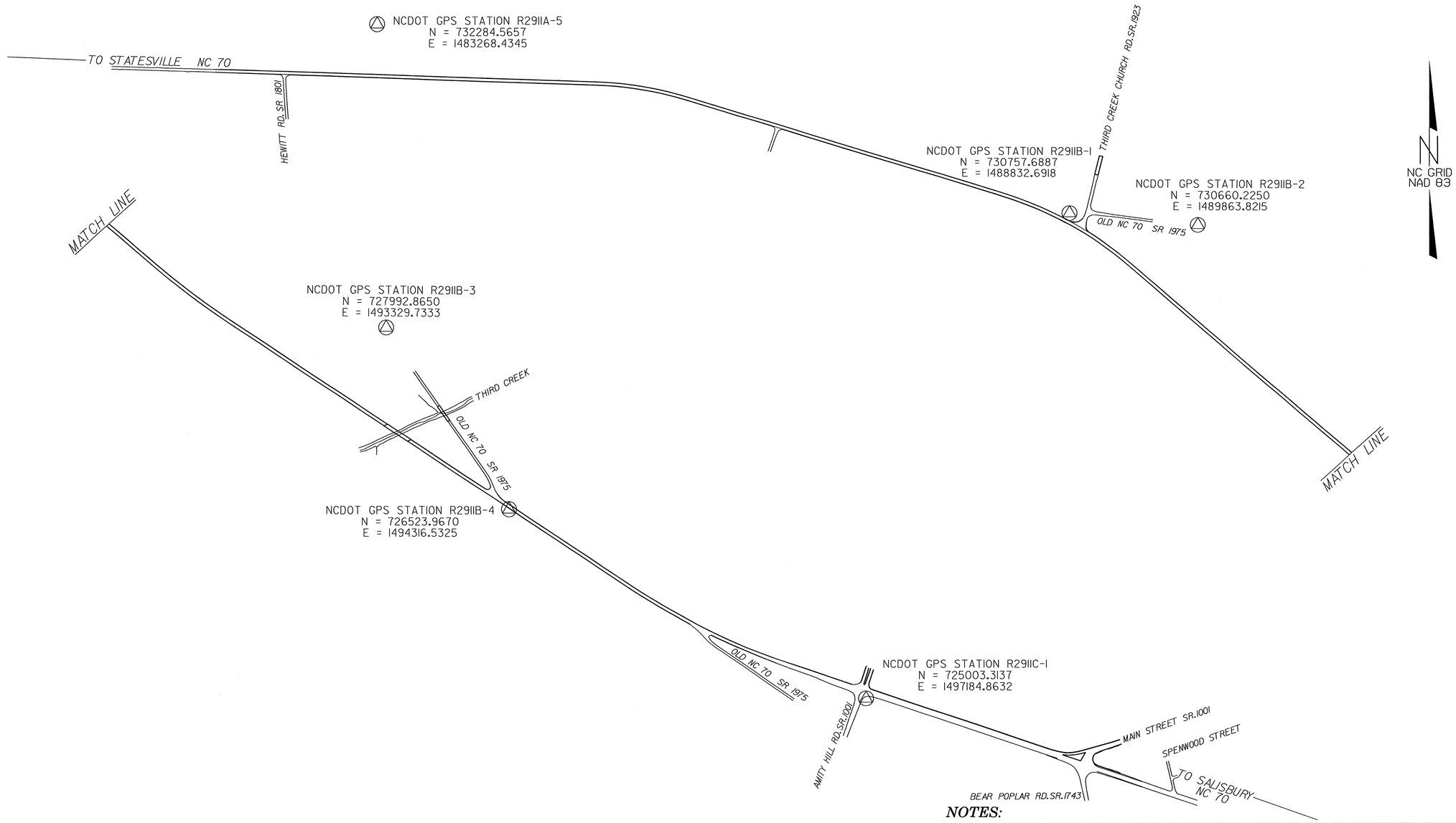
- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- Recorded SS Forced Main Line — FSS
- Designated SS Forced Main Line (S.U.E.*) — FSS

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line — ?UTL
- U/G Tank; Water, Gas, Oil
- A/G Tank; Water, Gas, Oil
- U/G Test Hole (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	1-C
Location and Surveys	

SURVEY CONTROL SHEET R-2911B



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "384 JAS"
WITH STATE PLANE GRID COORDINATES OF
NORTHING: 724643.8657(ft) EASTING: 1507152.2547(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999873400
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "384 JAS" TO -L- STATION 5+00.00 IS
N 74°13'20.46" W 26,688.816'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

NOTES:

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 R2911B_LS_CONTROL_040212.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.

NOTE: DRAWING NOT TO SCALE

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PROJECT REFERENCE NO.	SHEET NO.
R-2911B	1-D
Location and Surveys	

SURVEY CONTROL SHEET R-2911B

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
R2911A BL-89	BL-89	731914.3000	1481296.0640	841.87	OUTSIDE PROJECT LIMITS	
R2911A BL-90	BL-90	731870.9950	1482489.4560	835.20	15+20.91	4.96 LT
R2911A BL-91	BL-91	731839.6840	1483471.8590	829.92	25+03.81	7.01 LT
R2911A BL-92	BL-92	731809.7730	1484283.1600	831.21	33+15.66	4.65 LT
R2911A BL-93	BL-93	731773.4270	1485215.2140	815.35	42+48.12	6.60 LT
R2911B BL5	BL-5	731681.4980	1485715.6440	816.10	47+56.15	9.63 LT
R2911B BL-6	BL-6	731430.1250	1486506.2960	827.56	55+85.55	0.20 LT
R2911B BL-7	BL-7	731069.6390	1487697.7840	808.82	68+30.37	5.37 LT
R29911B-1	GPS-1	730757.6890	1488832.6800	797.21	79+91.62	96.84 LT
R2911B BL-8	BL-8	729930.8760	1489756.8150	790.71	92+15.41	1.84 LT
R2911B BL-9	BL-9	729193.3000	1490619.2960	795.99	103+50.26	4.59 LT
R2911B BL10	BL-10	728459.9140	1491452.2960	773.77	114+59.98	8.83 RT
R9111B BL-11	BL-11	727908.9200	1492221.3160	727.98	124+06.21	2.37 LT
R2911B BL-12	BL-12	727204.6380	1493296.4720	716.65	136+91.47	10.43 LT
R2911B-4	GPS-4	726523.9660	1494316.5300	729.48	149+17.78	7.68 LT
R2911B BL-13	BL-13	725943.3970	1495172.8950	749.83	159+52.34	2.23 RT
R2911B BL-14	BL-14	725479.6460	1495994.2880	769.79	168+96.41	0.73 RT
R2911C-1	GPS-1	725003.3140	1497184.8650	779.67	181+78.00	36.07 RT
R2911C BL-1	BL-1	724819.0310	1497786.9140	783.13	188+07.33	16.93 RT
R2911C BL-2	BL-2	724455.0010	1498821.2980	798.15	199+03.84	28.94 RT
R2911C BL-3	BL-3	724068.4150	1500029.0660	815.19	OUTSIDE PROJECT LIMITS	

BY1

POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
R2911A BL-90	BL-90	731870.9950	1482489.4560	835.36	OUTSIDE PROJECT LIMITS	
R2911A BY13-162	BY13-162	731588.2820	1482518.6710	827.76	10+20.20	19.05 LT

BY2

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
R2911B BY2-15	BY2-15	731944.2630	1485224.2050	823.64	42+40.65	177.50 LT
R2911A BL-93	BL-93	731773.4270	1485215.2140	815.41	42+48.12	6.60 LT

BY3

POINT	DESC.	NORTH	EAST	ELEVATION	Y3 STATION	OFFSET
R2911B GPS-1	GPS-1	730757.6890	1488832.6800	797.21	11+40.51	137.15 LT
R2911B BY3-16	BY3-16	730583.3570	1488948.6100	789.35	OUTSIDE PROJECT LIMITS	

BY4

POINT	DESC.	NORTH	EAST	ELEVATION	Y4 STATION	OFFSET
R2911B GPS-2	GPS-2	730660.2260	1489863.8190	807.96	OUTSIDE PROJECT LIMITS	
R2911B BY4-17	BY4-17	730773.9180	1489064.2400	799.08	10+86.73	21.47 LT
R2911B GPS-1	GPS-1	730757.6890	1488832.6800	797.21	OUTSIDE PROJECT LIMITS	

BY5

POINT	DESC.	NORTH	EAST	ELEVATION	Y5 STATION	OFFSET
R2911B BY5-18	BY5-18	727358.0550	1493737.3670	713.94	OUTSIDE PROJECT LIMITS	
R2911B GPS-4	GPS-4	726523.9660	1494316.5300	729.48	10+07.68	367.77 RT

BY6

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
R2911B BL-14	BL-14	725479.6460	1495994.2880	769.79	168+96.41	0.73 RT
R2991B BY6-19	BY6-19	725240.3900	1496228.0050	779.72	172+02.38	127.89 RT

BY7

POINT	DESC.	NORTH	EAST	ELEVATION	Y7 STATION	OFFSET
R2911C GPS-1	GPS-1	725003.3140	1497184.8650	779.67	13+45.68	57.86 RT
R2911B BY7-20	BY7-20	724742.5560	1497063.4000	778.31	10+59.52	28.57 RT

****
BM 1 ELEVATION = 836.06
CHISLED X IN A CONCRETE HEADWALL FOR AN
18" CONC PIPE @ THE ENTRANCE TO A CATTLE
FARM
N 732168 E 1484192
L STATION 32+13 360 LEFT

****
****
BM 2 ELEVATION = 820.66
RAILROAD SPIKE IN BASE OF 42" OAK
N 731964 E 1485731
L STATION 47+00 286 LEFT

****
****
BM 3 ELEVATION = 821.68
CHISLED X IN THE EAST END OF AN 18" CONC.
PIPE UNDER AN ACCESS ROAD TO A TOBACCO
FIELD
N 731622 E 1486590
L STATION 56+09 208 LEFT

****
****
BM 4 ELEVATION = 802.89
RAILROAD SPIKE IN THE WESTERN MOST ROOT
OF A 6" GUM, 33.6' FROM THE CENTERLINE
OF OLD US 70 (SR 1975
N 730584 E 1490067
L STATION 90+25 700 LEFT

****
****
BM 5 ELEVATION = 778.17
RAILROAD SPIKE SET IN NORTHERN ROOT OF
A 54" SWEETGUM
N 728417 E 1491102
L STATION 112+22 270 RIGHT

****
****
BM 7 ELEVATION = 771.62
RAILROSD SPIKE SET IN ROOT OF 15"WALLNUT
BY THE ENTRANCE TO A FISHING HOLE
N 725329 E 1495981
L STATION 169+47 143 RIGHT

****
****
CLEVELAND ELEVATION = 819.05
THE MARK IS FLUSH W/ THE GROUND AND
THE DISK IS STAMPED "CLEVELAND 1948"
N 726045 E 1501615
L STATION 200+15
N 59° 10' 38.0" E DIST 3119.82

****

****
384 JAS ELEVATION = 802.19
THE STATION IS A STANDARD USGS DISK
STAMPED "384 JAS 1965" SET INTO THE TOP
OF A SQUARE CONCRETE MON.
N 724644 E 1507152
L STATION 200+15
N 88° 37' 32.6" E DIST 8219.03

****
****
ELMWOOD RESET 1983 ELEVATION = 845.03
THE MARK IS 8" ABOVE THE GROUND AND
STAMPED "ELMWOOD 1948 RESET 1983"
N 732427 E 1482078
L STATION 10+91 547 LEFT

****
****
CHECK 1 ELEVATION = 734.46
THE MARK IS STAMPED "MONUMENT #1
CHECK L-932'' SET IN THE TOP OF THE SE
END OF THE SW CONC. RETAINING WALL
ON THE RAILROAD BRIDGE OVER THIRD CREEK
N 727962 E 1494801
L STATION 145+26 1474 LEFT

****

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "384 JAS"
WITH STATE PLANE GRID COORDINATES OF
NORTHING: 724643.8657(ft) EASTING: 1507152.2547(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999873400
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "384 JAS" TO -L- STATION 5+00.00 IS
N 74°13'20.46" W 26,688.816'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

NOTES:

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

R2911B_LS_CONTROL_040212.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.*

NOTE: DRAWING NOT TO SCALE

6/2/99
02-JUL-2008 11:48
R:\LocationSurveys\r2911b_ls_ld_040212.dgn
$$$$USERNAME$$$$

PROJ. REFERENCE NO.	SHEET NO.
R-2911B	1-E

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CENTERLINE COORDINATE LIST

Point #	Chain	Station	Northing (Y)	Easting (X)
1	L	10+00.00	731883.7171	1481968.6747
2	L	11+00.00	731880.3234	1482068.6171
3	L	12+00.00	731876.9297	1482168.5595
4	L	13+00.00	731873.5360	1482268.5019
5	L	14+00.00	731870.1423	1482368.4443
6	L	15+00.00	731866.7486	1482468.3867
7	L	16+00.00	731863.3549	1482568.3291
8	L	17+00.00	731859.9611	1482668.2715
9	L	18+00.00	731856.5674	1482768.2139
10	L	19+00.00	731853.1737	1482868.1563
11	L	20+00.00	731849.7800	1482968.0987
12	L	21+00.00	731846.3863	1483068.0411
13	L	22+00.00	731842.9926	1483167.9835
14	L	23+00.00	731839.5989	1483267.9259
15	L	24+00.00	731836.2052	1483367.8683
16	L	25+00.00	731832.8115	1483467.8107
17	L	26+00.00	731829.4177	1483567.7531
18	L	27+00.00	731826.0240	1483667.6955
19	L	28+00.00	731822.6303	1483767.6379
20	L	29+00.00	731819.2366	1483867.5803
21	L	30+00.00	731815.8429	1483967.5227
22	L	31+00.00	731812.4492	1484067.4651
23	L	32+00.00	731809.0555	1484167.4074
24	L	33+00.00	731805.6618	1484267.3498
25	L	34+00.00	731802.2681	1484367.2922
26	L	35+00.00	731798.8743	1484467.2346
27	L	36+00.00	731795.4806	1484567.1770
28	L	37+00.00	731792.0869	1484667.1194
29	L	38+00.00	731788.6932	1484767.0618
30	L	39+00.00	731785.2995	1484867.0042
31	L	40+00.00	731781.8896	1484966.9461
32	L	41+00.00	731777.7454	1485066.8592
33	L	42+00.00	731771.2095	1485166.6410
34	L	43+00.00	731761.2637	1485266.1401
35	L	44+00.00	731747.8516	1485365.2315
36	L	45+00.00	731730.9893	1485463.7944
37	L	46+00.00	731710.6976	1485561.7088
38	L	47+00.00	731687.0010	1485658.8554
39	L	48+00.00	731660.0817	1485755.1603
40	L	49+00.00	731631.1830	1485850.8929
41	L	50+00.00	731601.8285	1485946.4875
42	L	51+00.00	731572.4723	1486042.0815
43	L	52+00.00	731543.1161	1486137.6755
44	L	53+00.00	731513.7599	1486233.2695
45	L	54+00.00	731484.4037	1486328.8635
46	L	55+00.00	731455.0474	1486424.4575
47	L	56+00.00	731425.6912	1486520.0515
48	L	57+00.00	731396.3350	1486615.6455
49	L	58+00.00	731366.9788	1486711.2395
50	L	59+00.00	731337.6226	1486806.8335
51	L	60+00.00	731308.2664	1486902.4275
52	L	61+00.00	731278.9102	1486998.0215
53	L	62+00.00	731249.5540	1487093.6155
54	L	63+00.00	731220.1978	1487189.2095
55	L	64+00.00	731190.8416	1487284.8035
56	L	65+00.00	731161.4854	1487380.3975
57	L	66+00.00	731132.1292	1487475.9915
58	L	67+00.00	731102.7730	1487571.5855
59	L	68+00.00	731073.4167	1487667.1795
60	L	69+00.00	731044.0605	1487762.7735
61	L	70+00.00	731014.7043	1487858.3675
62	L	71+00.00	730985.3481	1487953.9615
63	L	72+00.00	730955.9919	1488049.5555
64	L	73+00.00	730926.6357	1488145.1495
65	L	74+00.00	730897.1996	1488240.7189
66	L	75+00.00	730866.6545	1488335.9378
67	L	76+00.00	730833.4440	1488430.2568
68	L	77+00.00	730796.9727	1488523.3634
69	L	78+00.00	730757.2742	1488615.1404
70	L	79+00.00	730714.3970	1488705.4760
71	L	80+00.00	730668.3932	1488794.2603
72	L	81+00.00	730619.3190	1488881.3849
73	L	82+00.00	730567.2340	1488966.7438
74	L	83+00.00	730512.2018	1489050.2329
75	L	84+00.00	730454.2893	1489131.7506
76	L	85+00.00	730393.5672	1489211.1975
77	L	86+00.00	730330.2506	1489288.5946
78	L	87+00.00	730265.4028	1489364.7173
79	L	88+00.00	730200.2269	1489440.5599
80	L	89+00.00	730135.0503	1489516.4019
81	L	90+00.00	730069.8737	1489592.2439
82	L	91+00.00	730004.6971	1489668.0860

Point #	Chain	Station	Northing (Y)	Easting (X)
83	L	92+00.00	729939.5206	1489743.9280
84	L	93+00.00	729874.3440	1489819.7700
85	L	94+00.00	729809.1674	1489895.6121
86	L	95+00.00	729743.9908	1489971.4541
87	L	96+00.00	729678.8143	1490047.2961
88	L	97+00.00	729613.6377	1490123.1382
89	L	98+00.00	729548.4611	1490198.9802
90	L	99+00.00	729483.2845	1490274.8222
91	L	100+00.00	729418.1080	1490350.6643
92	L	101+00.00	729352.9314	1490426.5063
93	L	102+00.00	729287.7548	1490502.3483
94	L	103+00.00	729222.5782	1490578.1904
95	L	104+00.00	729157.4017	1490654.0324
96	L	105+00.00	729092.2251	1490729.8744
97	L	106+00.00	729027.0485	1490805.7165
98	L	107+00.00	728961.8719	1490881.5585
99	L	108+00.00	728896.6954	1490957.4005
100	L	109+00.00	728831.5188	1491033.2426
101	L	110+00.00	728766.3422	1491109.0846
102	L	111+00.00	728701.1656	1491184.9266
103	L	112+00.00	728635.9891	1491260.7687
104	L	113+00.00	728570.8125	1491336.6107
105	L	114+00.00	728505.6400	1491412.4563
106	L	115+00.00	728440.7219	1491488.5194
107	L	116+00.00	728376.6903	1491565.3292
108	L	117+00.00	728313.9756	1491643.2177
109	L	118+00.00	728252.6299	1491722.1888
110	L	119+00.00	728192.6717	1491802.2186
111	L	120+00.00	728134.1194	1491883.2826
112	L	121+00.00	728076.9890	1491965.3549
113	L	122+00.00	728021.0694	1492048.2579
114	L	123+00.00	727965.6983	1492131.5287
115	L	124+00.00	727910.3790	1492214.8341
116	L	125+00.00	727855.0598	1492298.1394
117	L	126+00.00	727799.7406	1492381.4448
118	L	127+00.00	727744.4214	1492464.7502
119	L	128+00.00	727689.1022	1492548.0556
120	L	129+00.00	727633.7830	1492631.3609
121	L	130+00.00	727578.4638	1492714.6663
122	L	131+00.00	727523.1446	1492797.9717
123	L	132+00.00	727467.8254	1492881.2771
124	L	133+00.00	727412.5062	1492964.5824
125	L	134+00.00	727357.1870	1493047.8878
126	L	135+00.00	727301.8678	1493131.1932
127	L	136+00.00	727246.5486	1493214.4986
128	L	137+00.00	727191.2294	1493297.8039
129	L	138+00.00	727135.9102	1493381.1093
130	L	139+00.00	727080.5910	1493464.4147
131	L	140+00.00	727025.2718	1493547.7201
132	L	141+00.00	726969.9526	1493631.0254
133	L	142+00.00	726914.6334	1493714.3308
134	L	143+00.00	726859.3142	1493797.6362
135	L	144+00.00	726803.9949	1493880.9416
136	L	145+00.00	726748.6757	1493964.2469
137	L	146+00.00	726693.3565	1494047.5523
138	L	147+00.00	726638.0373	1494130.8577
139	L	148+00.00	726582.7181	1494214.1631
140	L	149+00.00	726527.3989	1494297.4685
141	L	150+00.00	726472.0797	1494380.7738
142	L	151+00.00	726416.7605	1494464.0792
143	L	152+00.00	726361.4413	1494547.3846
144	L	153+00.00	726306.1221	1494630.6900
145	L	154+00.00	726250.8029	1494713.9953
146	L	155+00.00	726195.4837	1494797.3007
147	L	156+00.00	726140.1645	1494880.6061
148	L	157+00.00	726084.8453	1494963.9115
149	L	158+00.00	726029.5261	1495047.2168
150	L	159+00.00	725974.2069	1495130.5222
151	L	160+00.00	725918.9405	1495213.8626
152	L	161+00.00	725864.2288	1495297.5676
153	L	162+00.00	725810.7546	1495382.0676
154	L	163+00.00	725758.7615	1495467.4870
155	L	164+00.00	725708.2671	1495553.8007
156	L	165+00.00	725659.2868	1495640.9826
157	L	166+00.00	725611.8355	1495729.0060
158	L	167+00.00	725565.9276	1495817.8441
159	L	168+00.00	725521.5771	1495907.4699
160	L	169+00.00	725478.7976	1495997.8561
161	L	170+00.00	725437.6021	1496088.9751
162	L	171+00.00	725398.0031	1496180.7992
163	L	172+00.00	725360.0127	1496273.3004
164	L	173+00.00	725323.6424	1496366.4506

Point #	Chain	Station	Northing (Y)	Easting (X)
165	L	174+00.00	725288.9033	1496460.2213
166	L	175+00.00	725255.6945	1496554.5453
167	L	176+00.00	725223.3652	1496649.1750
168	L	177+00.00	725191.2031	1496743.8619
169	L	178+00.00	725159.0409	1496838.5487
170	L	179+00.00	725126.8788	1496933.2355
171	L	180+00.00	725094.7167	1497027.9224
172	L	181+00.00	725062.5545	1497122.6092
173	L	182+00.00	725030.3924	1497217.2961
174	L	183+00.00	724998.2303	1497311.9829
175	L	184+00.00	724966.0682	1497406.6697
176	L	185+00.00	724933.9060	1497501.3566
177	L	186+00.00	724901.7439	1497596.0434
178	L	187+00.00	724869.5818	1497690.7303
179	L	188+00.00	724837.4197	1497785.4171
180	Y5	10+00.00	726721.0112	1494005.9071
181	Y5	10+50.00	726762.6639	1494033.5667
182	Y5	11+00.00	726806.3441	1494057.5805
183	Y5	11+50.00	726855.2774	1494066.6617
184	Y5	12+00.00	726904.4886	1494059.2324

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

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

PAVEMENT DESIGN SCHEDULE

C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	J1	PROP. 6" AGGREGATE BASE COURSE.
C2	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	J2	PROP. 10" AGGREGATE BASE COURSE.
C3	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.	J3	PROP. 6" INCIDENTAL STONE.
C4	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	K	BASE TO BE TREATED WITH LIME TO A DEPTH OF 8" AT A RATE OF 20 LBS. PER SQ. YD. AS DIRECTED BY THE ENGINEER. OR BASE TO BE TREATED WITH CEMENT TO A DEPTH OF 7" AT A RATE OF 55 LBS. PER SQ. YD. AS DIRECTED BY THE ENGINEER.
C5	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*	R1	2'-6" CONCRETE CURB AND GUTTER.
C6	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH*	R2	1'-6" CONCRETE CURB AND GUTTER.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R3	EXPRESSWAY GUTTER.
D2	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R4	SHOULDER BERM GUTTER.
D3	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.	R5	9"x12" ASPHALT CURBING. (PAVEMENT TYPE = I19.0C)
D4	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, 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.	T	EARTH MATERIAL.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
E2	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.	V	MILLING OF EXISTING PAVEMENT 4" IN DEPTH.
E3	PROP. APPROX. 8" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	W1	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL No. 1)
E4	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.	W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL No. 2)
E5	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, 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.	W3	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL No. 3)

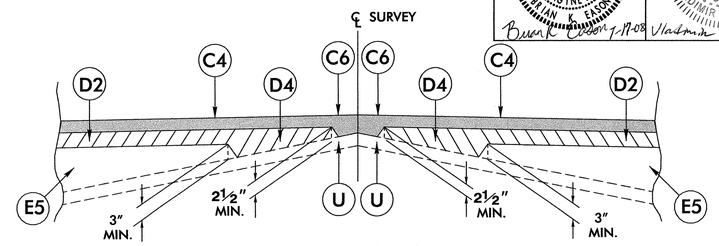
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

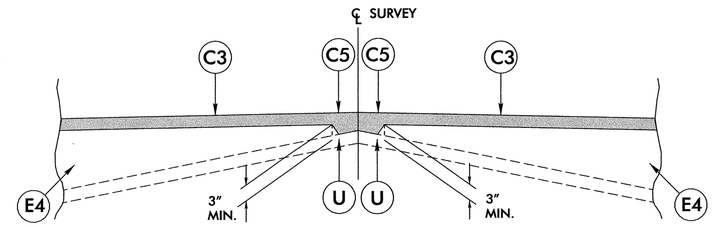
PROJECT REFERENCE NO.	SHEET NO.
R-2911B	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON — 7-17-08

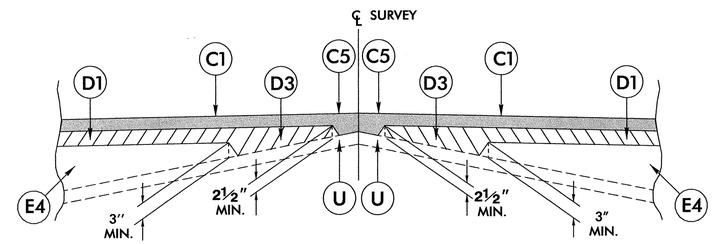
NORTH CAROLINA PROFESSIONAL SEAL 031484 ENGINEER VLADIMIR G. MITCHEV — 07/11/08



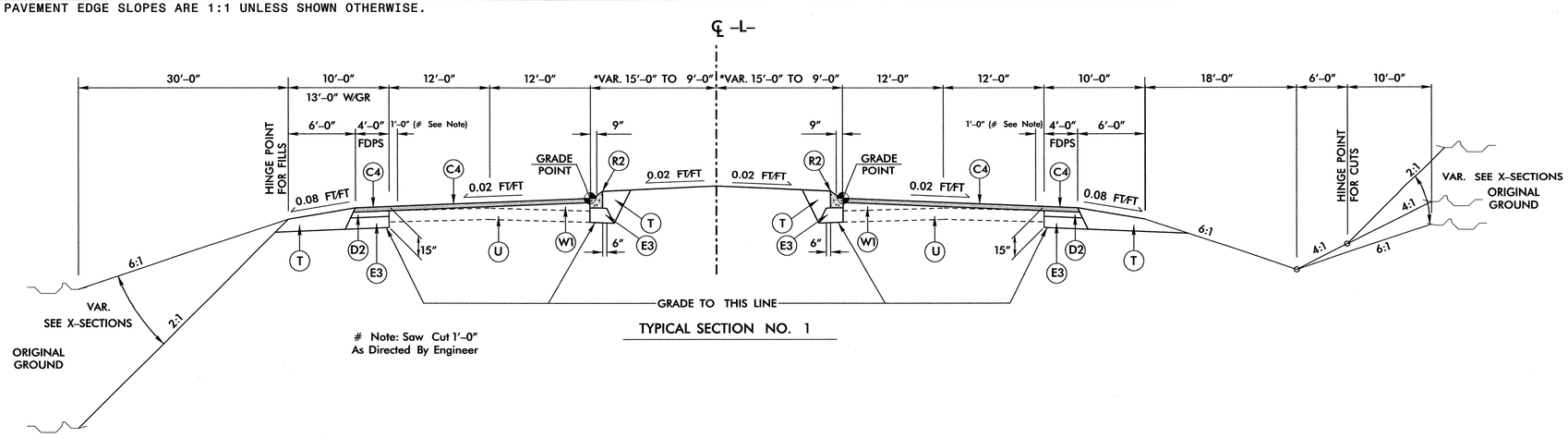
Wedging Detail No. 1



Wedging Detail No. 2



Wedging Detail No. 3



Note: Saw Cut 1'-0"
As Directed By Engineer

TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
-L- STA. 10+00.00 TO -L- STA. 14+65.00

6/2/99

17-JUL-2008 15:17
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$$$$USERNAME$$$$

6/2/99

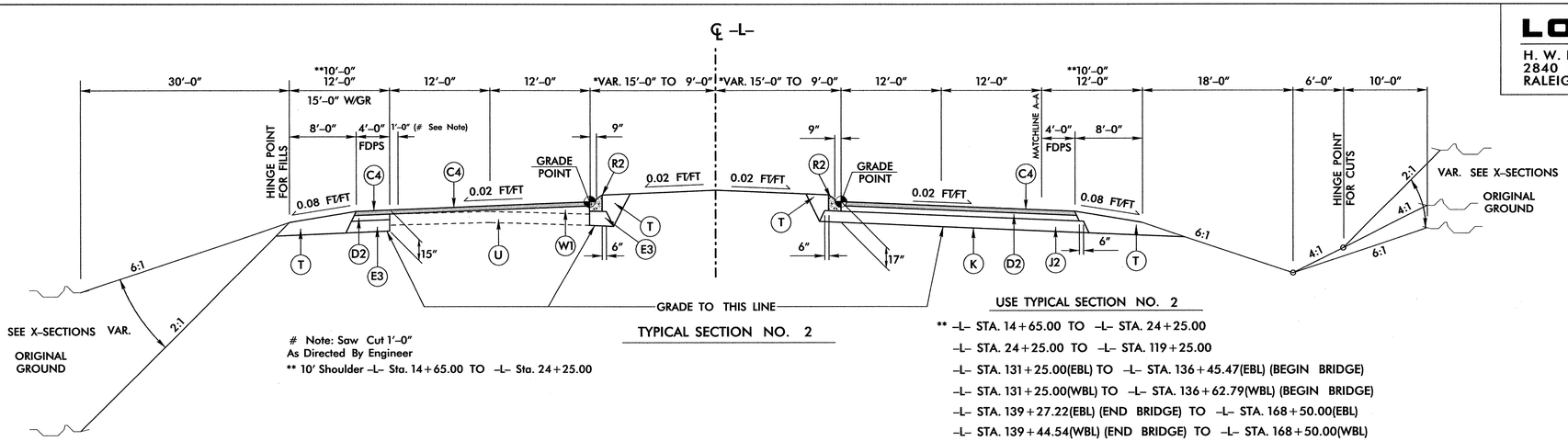
LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	2-A

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON — 7-17-08

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 031484 ENGINEER VLADIMIR G. MITCHELL — 7/21/08

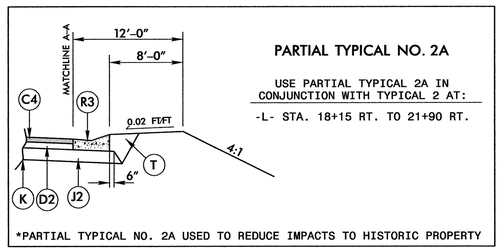


Note: Saw Cut 1'-0"
As Directed By Engineer
** 10' Shoulder -L- Sta. 14+65.00 TO -L- Sta. 24+25.00

TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

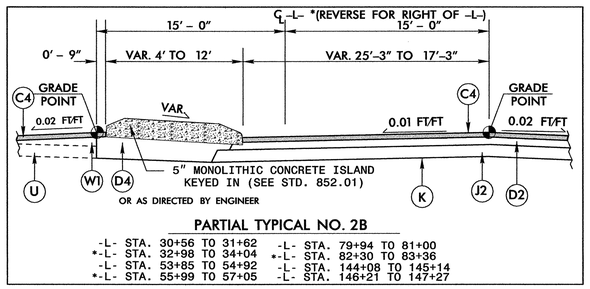
** -L- STA. 14+65.00 TO -L- STA. 24+25.00
-L- STA. 24+25.00 TO -L- STA. 119+25.00
-L- STA. 131+25.00(EBL) TO -L- STA. 136+45.47(EBL) (BEGIN BRIDGE)
-L- STA. 131+25.00(WBL) TO -L- STA. 136+62.79(WBL) (BEGIN BRIDGE)
-L- STA. 139+27.22(EBL) (END BRIDGE) TO -L- STA. 168+50.00(EBL)
-L- STA. 139+44.54(WBL) (END BRIDGE) TO -L- STA. 168+50.00(WBL)
* -L- STA. 168+50.00 TO -L- STA. 173+50.00



PARTIAL TYPICAL NO. 2A

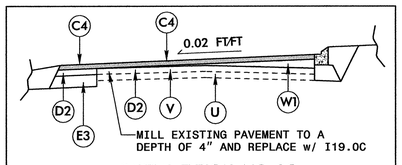
USE PARTIAL TYPICAL 2A IN CONJUNCTION WITH TYPICAL 2 AT:
-L- STA. 18+15 RT. TO 21+90 RT.

*PARTIAL TYPICAL NO. 2A USED TO REDUCE IMPACTS TO HISTORIC PROPERTY



PARTIAL TYPICAL NO. 2B

-L- STA. 30+56 TO 31+62 -L- STA. 79+94 TO 81+00
*-L- STA. 32+98 TO 34+04 *-L- STA. 82+30 TO 83+36
-L- STA. 53+85 TO 54+92 -L- STA. 144+08 TO 145+14
*-L- STA. 55+99 TO 57+05 -L- STA. 146+21 TO 147+27

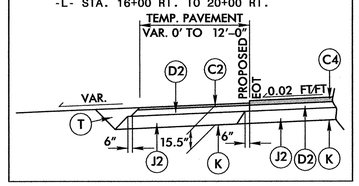


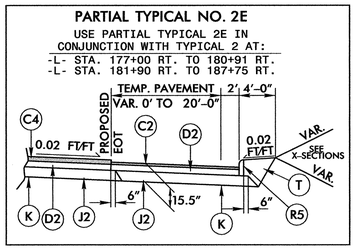
PARTIAL TYPICAL NO. 2C

USE PARTIAL TYPICAL 2C IN CONJUNCTION WITH TYPICAL 2 AT:
-L- STA. 84+70 LT. TO 119+25 LT.
-L- STA. 131+25 LT. TO 170+00 LT.

PARTIAL TYPICAL NO. 2D

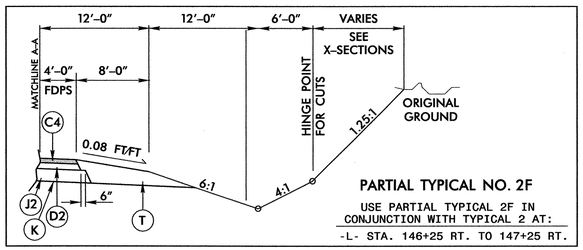
USE PARTIAL TYPICAL 2D IN CONJUNCTION WITH TYPICAL 2 AT:
-L- STA. 16+00 RT. TO 20+00 RT.





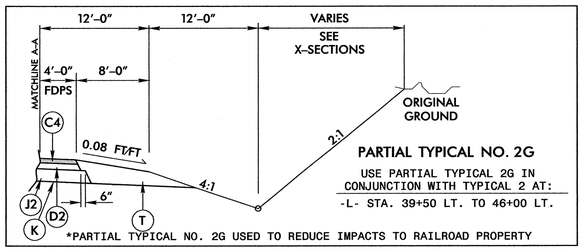
PARTIAL TYPICAL NO. 2E

USE PARTIAL TYPICAL 2E IN CONJUNCTION WITH TYPICAL 2 AT:
-L- STA. 177+00 RT. TO 180+91 RT.
-L- STA. 181+90 RT. TO 187+75 RT.



PARTIAL TYPICAL NO. 2F

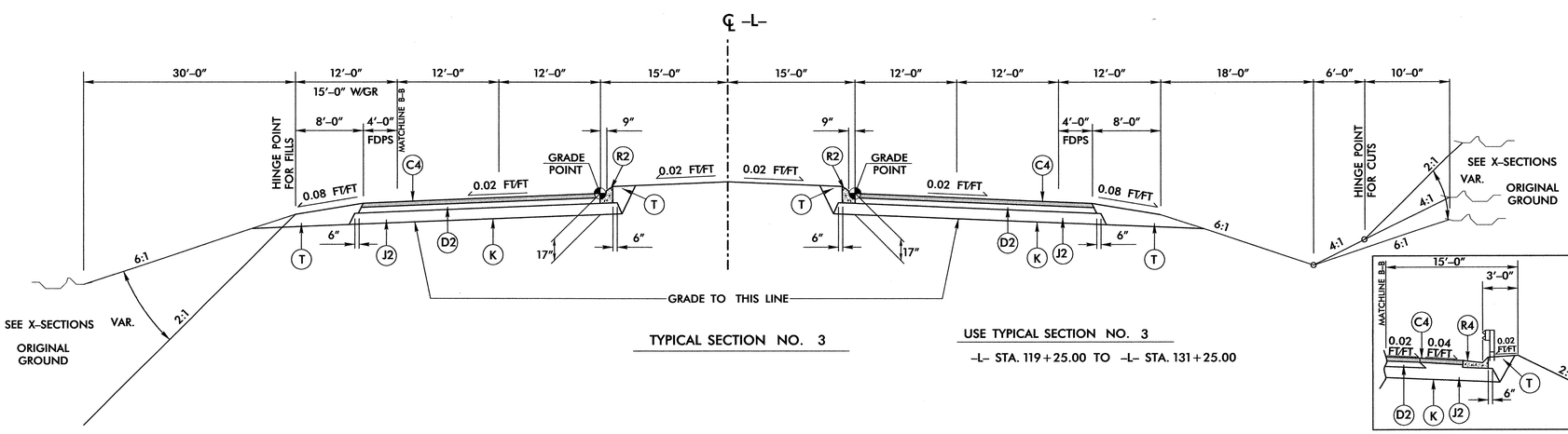
USE PARTIAL TYPICAL 2F IN CONJUNCTION WITH TYPICAL 2 AT:
-L- STA. 146+25 RT. TO 147+25 RT.



PARTIAL TYPICAL NO. 2G

USE PARTIAL TYPICAL 2G IN CONJUNCTION WITH TYPICAL 2 AT:
-L- STA. 39+50 LT. TO 46+00 LT.

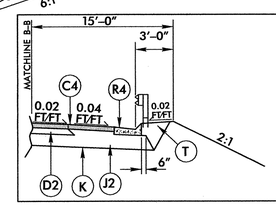
*PARTIAL TYPICAL NO. 2G USED TO REDUCE IMPACTS TO RAILROAD PROPERTY



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

-L- STA. 119+25.00 TO -L- STA. 131+25.00



PARTIAL TYPICAL NO. 3A

USE PARTIAL TYPICAL 3A IN CONJUNCTION WITH TYPICAL 3 AT:
-L- STA. 93+75 RT. TO 98+00 RT.
-L- STA. 125+15 RT. TO 136+05.76 RT.
-L- STA. 124+75 LT. TO 136+56.54 LT.
-L- STA. 139+33.50 RT. TO 139+72 RT.
-L- STA. 139+86.53 LT. TO 140+07 LT
-L- STA. 159+77.05 LT. TO 164+99.85 LT.

PAVEMENT SCHEDULE	
C1	1½" TYPE S9.5B
C2	1½" TYPE S9.5C
C3	3" TYPE S9.5B
C4	3" TYPE S9.5C
C5	VAR. TYPE S9.5B
C6	VAR. TYPE S9.5C
D1	4" TYPE I19.0B
D2	4" TYPE I19.0C
D3	VAR. TYPE I19.0B
D4	VAR. TYPE I19.0C
E1	4" TYPE B25.0B
E2	5" TYPE B25.0B
E3	8" TYPE B25.0C
E4	VAR. TYPE B25.0B
E5	VAR. TYPE B25.0C
J1	6" ABC
J2	10" ABC
J3	6" INCIDENTAL STONE
K	8" LIME BASE (OR) 7" CEMENT BASE
R1	2'-6" C & G
R2	1'-6" C& G
R3	EXPRESSWAY GUTTER
R4	SHOULDER BERM GUTTER
R5	9"x12" ASPH. CURBING
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	4" MILLING
W1	WEDGING SEE DETAIL 1
W2	WEDGING SEE DETAIL 2
W3	WEDGING SEE DETAIL 3

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6/2/99

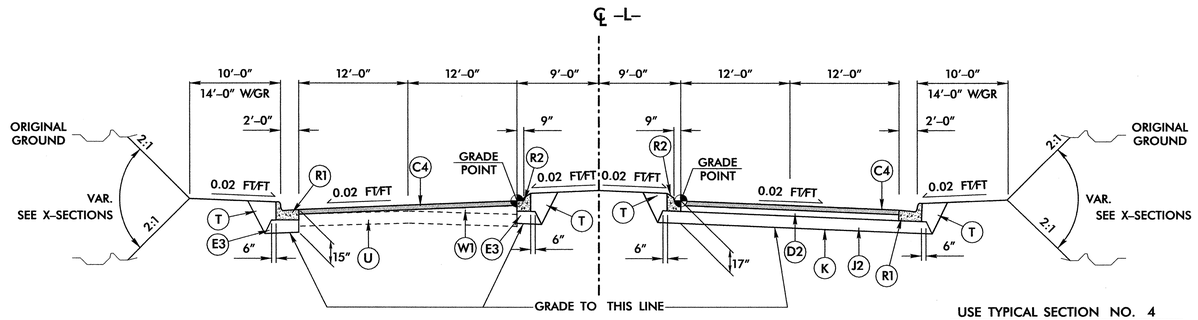
LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	2-B
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON 7-17-08

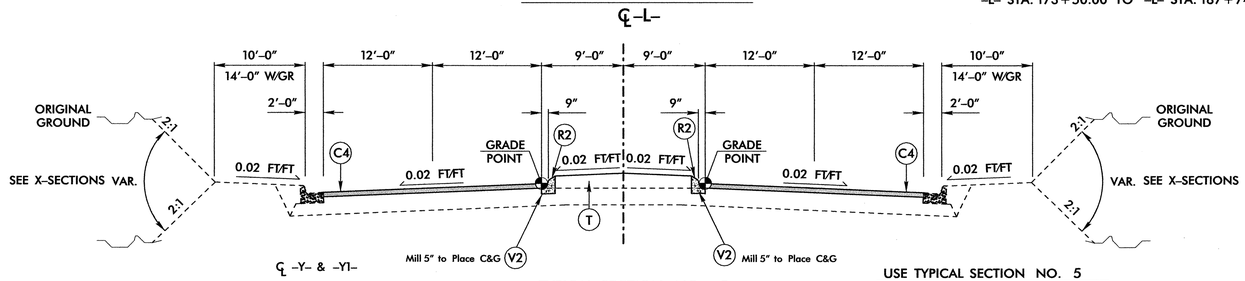
NORTH CAROLINA PROFESSIONAL SEAL 031484 ENGINEER VLADIMIR G. MITCHELL 07/21/08



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4

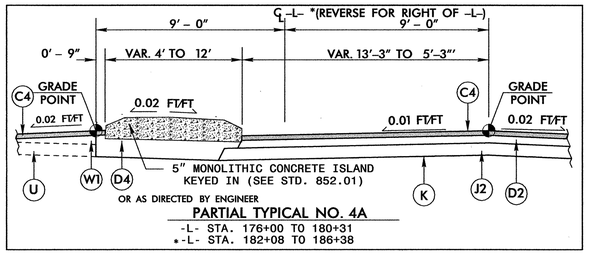
-L- STA. 173+50.00 TO -L- STA. 187+74.11



TYPICAL SECTION NO. 5

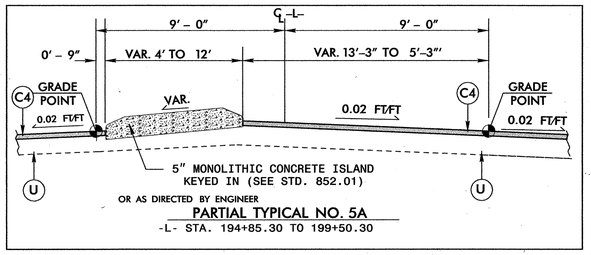
USE TYPICAL SECTION NO. 5

-L- STA. 187+74.11 TO -L- STA. 199+50.30



PARTIAL TYPICAL NO. 4A

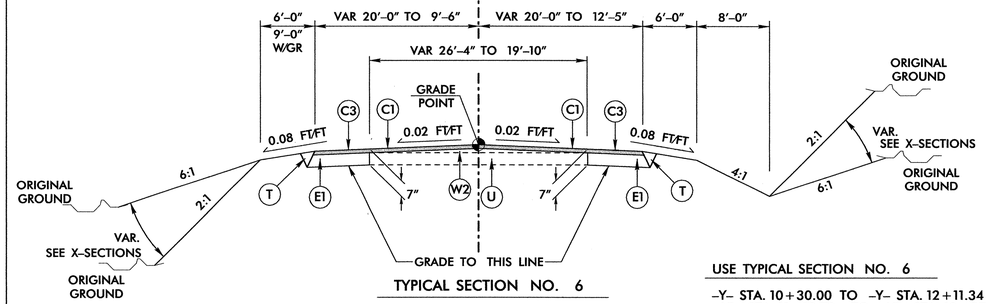
-L- STA. 176+00 TO 180+31
*-L- STA. 182+08 TO 186+38



PARTIAL TYPICAL NO. 5A

-L- STA. 194+85.30 TO 199+50.30

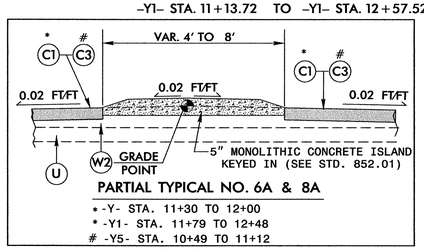
PAVEMENT SCHEDULE	
C1	1½" TYPE S9.5B
C2	1½" TYPE S9.5C
C3	3" TYPE S9.5B
C4	3" TYPE S9.5C
C5	VAR. TYPE S9.5B
C6	VAR. TYPE S9.5C
D1	4" TYPE I19.0B
D2	4" TYPE I19.0C
D3	VAR. TYPE I19.0B
D4	VAR. TYPE I19.0C
E1	4" TYPE B25.0B
E2	5" TYPE B25.0B
E3	8" TYPE B25.0C
E4	VAR. TYPE B25.0B
E5	VAR. TYPE B25.0C
J1	6" ABC
J2	10" ABC
J3	6" INCIDENTAL STONE
K	8" LIME BASE (OR) 7" CEMENT BASE
R1	2'-6" C & G
R2	1'-6" C& G
R3	EXPRESSWAY GUTTER
R4	SHOULDER BERM GUTTER
R5	9"x12" ASPH. CURBING
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	4" MILLING
W1	WEDGING SEE DETAIL 1
W2	WEDGING SEE DETAIL 2
W3	WEDGING SEE DETAIL 3



TYPICAL SECTION NO. 6

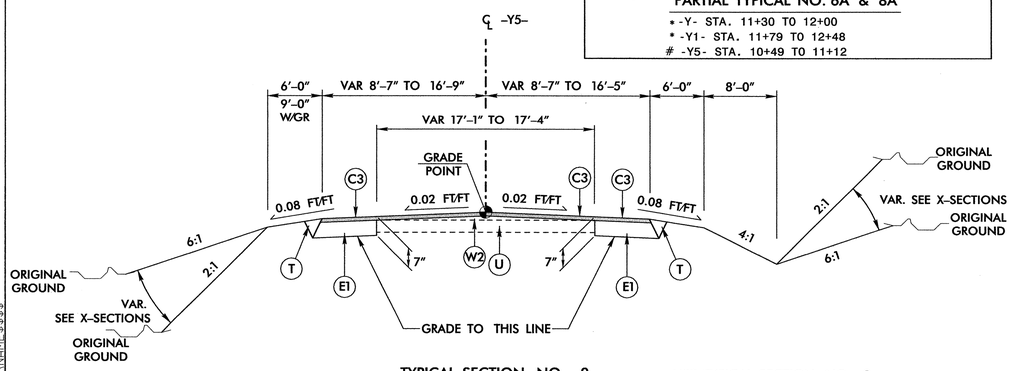
USE TYPICAL SECTION NO. 6

-Y- STA. 10+30.00 TO -Y- STA. 12+11.34
-Y1- STA. 11+13.72 TO -Y1- STA. 12+57.52



PARTIAL TYPICAL NO. 6A & 8A

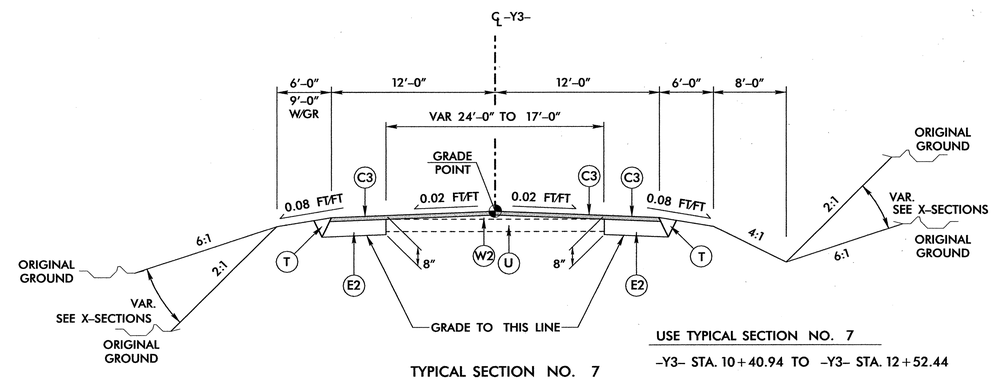
* -Y- STA. 11+30 TO 12+00
* -Y1- STA. 11+79 TO 12+48
# -Y5- STA. 10+49 TO 11+12



TYPICAL SECTION NO. 8

USE TYPICAL SECTION NO. 8

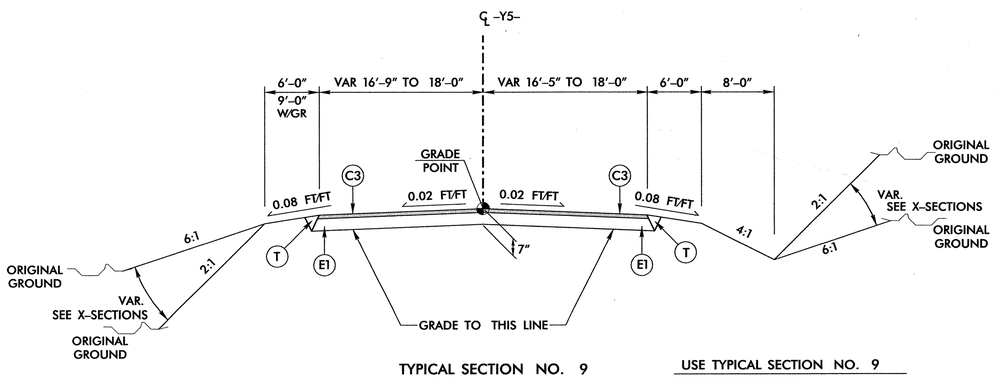
-Y5- STA. 11+60.00 TO -Y5- STA. 14+86.59



TYPICAL SECTION NO. 7

USE TYPICAL SECTION NO. 7

-Y3- STA. 10+40.94 TO -Y3- STA. 12+52.44



TYPICAL SECTION NO. 9

USE TYPICAL SECTION NO. 9

-Y5- STA. 10+39.00 TO -Y5- STA. 11+60.00

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LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

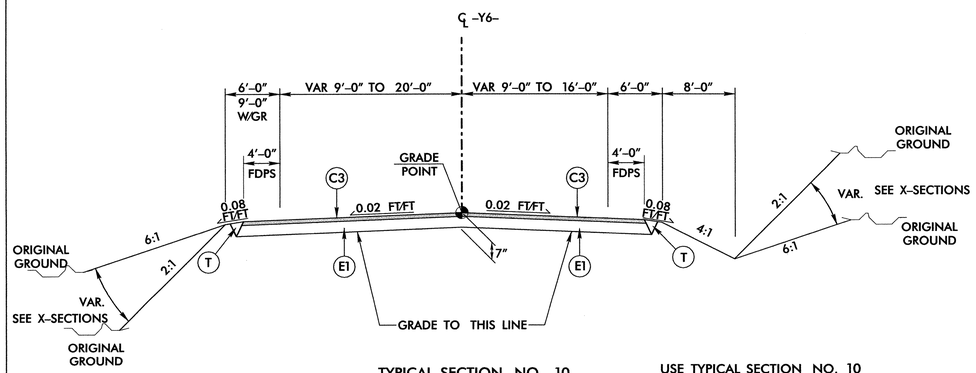
PROJECT REFERENCE NO.	SHEET NO.
R-2911B	2-C

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. ZELSON
7-10-08

PAVEMENT DESIGN ENGINEER

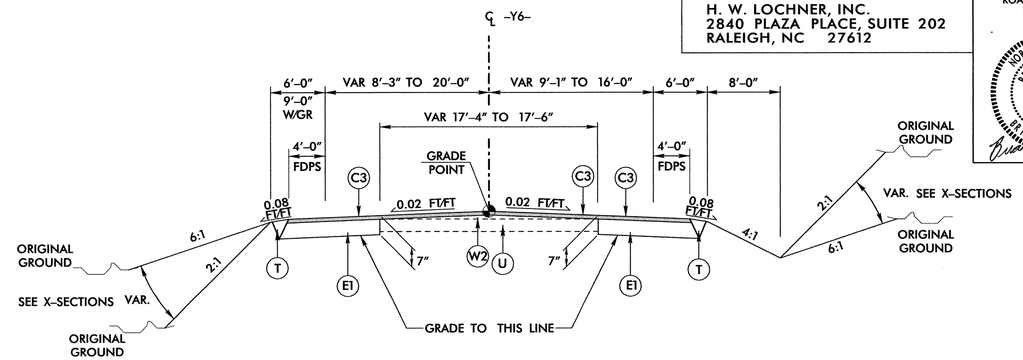
NORTH CAROLINA PROFESSIONAL SEAL 031484 ENGINEER VLADIMIR G. MITCHELL
07/21/08



TYPICAL SECTION NO. 10

USE TYPICAL SECTION NO. 10

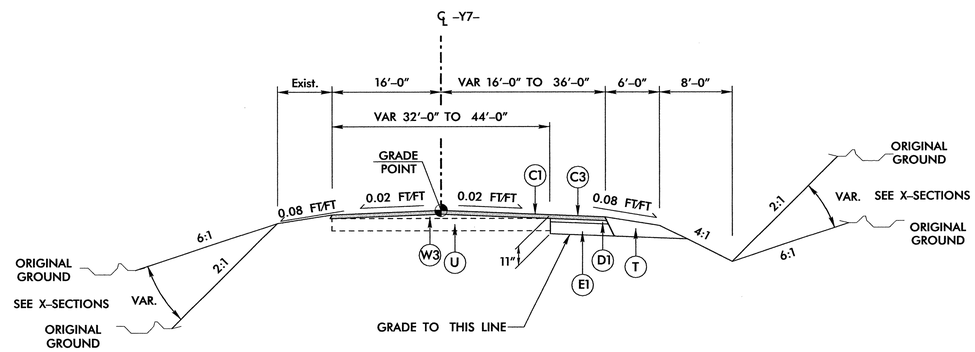
-Y6- STA. 10+34.54 TO -Y6- STA. 11+66.30



TYPICAL SECTION NO. 11

USE TYPICAL SECTION NO. 11

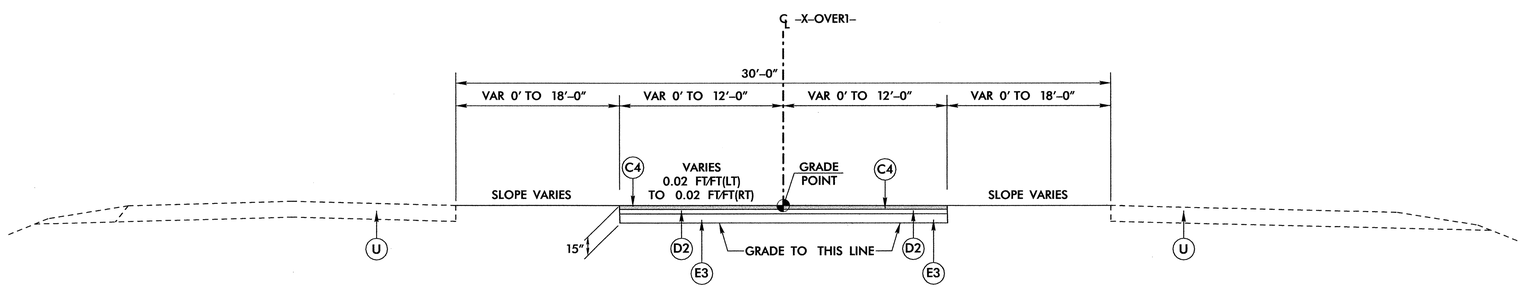
-Y6- STA. 11+66.30 TO -Y6- STA. 13+06.30



TYPICAL SECTION NO. 12

USE TYPICAL SECTION NO. 12

-Y7- STA. 10+03.12 TO -Y7- STA. 12+26.41

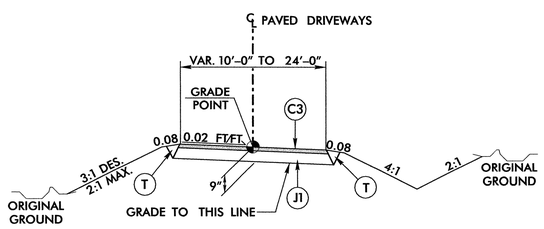


TYPICAL SECTION NO. 13

USE TYPICAL SECTION NO. 13

-X-OVER1- STA. 13+79.54 TO -X-OVER1- STA. 17+59.31

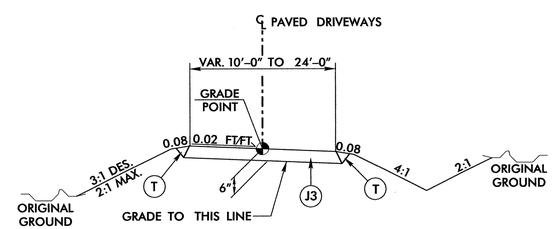
TRANSITION TO EXISTING
-X-OVER1- STA. 10+00.00 TO -X-OVER1- STA. 16+09.45
-X-OVER1- STA. 17+59.31 TO -X-OVER1- STA. 22+01.71



TYPICAL SECTION NO. 14

USE TYPICAL SECTION NO. 14

PAVED DRIVEWAYS (AS DIRECTED BY THE ENGINEER)



TYPICAL SECTION NO. 15

USE TYPICAL SECTION NO. 15

PAVED DRIVEWAYS (AS DIRECTED BY THE ENGINEER)

PAVEMENT SCHEDULE	
C1	1½" TYPE S9.5B
C2	1½" TYPE S9.5C
C3	3" TYPE S9.5B
C4	3" TYPE S9.5C
C5	VAR. TYPE S9.5B
C6	VAR. TYPE S9.5C
D1	4" TYPE I19.0B
D2	4" TYPE I19.0C
D3	VAR. TYPE I19.0B
D4	VAR. TYPE I19.0C
E1	4" TYPE B25.0B
E2	5" TYPE B25.0B
E3	8" TYPE B25.0C
E4	VAR. TYPE B25.0B
E5	VAR. TYPE B25.0C
J1	6" ABC
J2	10" ABC
J3	6" INCIDENTAL STONE
K	8" LIME BASE (OR) 7" CEMENT BASE
R1	2'-6" C & G
R2	1'-6" C& G
R3	EXPRESSWAY GUTTER
R4	SHOULDER BERM GUTTER
R5	9"x12" ASPH. CURBING
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	4" MILLING
W1	WEDGING SEE DETAIL 1
W2	WEDGING SEE DETAIL 2
W3	WEDGING SEE DETAIL 3

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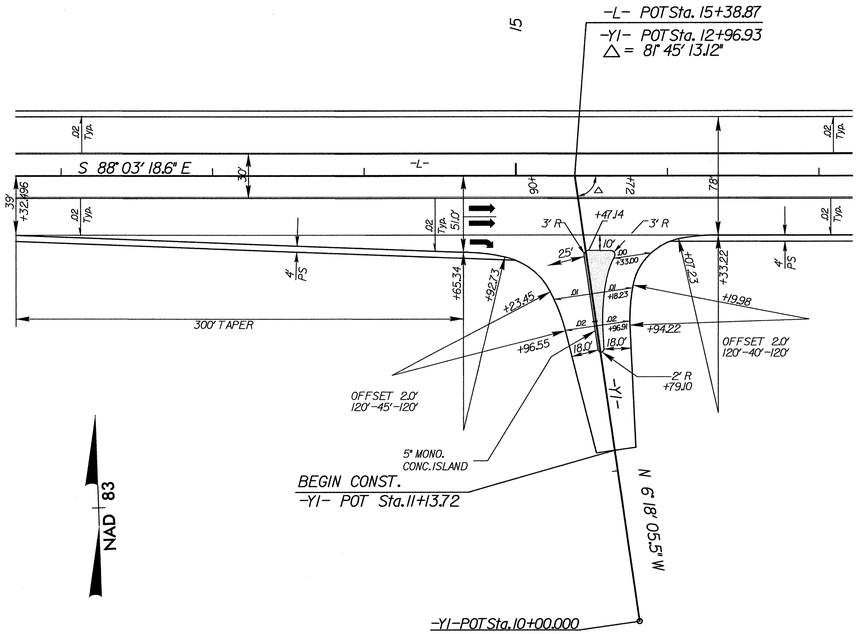
PROJECT REFERENCE NO.	SHEET NO.
R-2911B	2-D
R/W SHEET NO.	

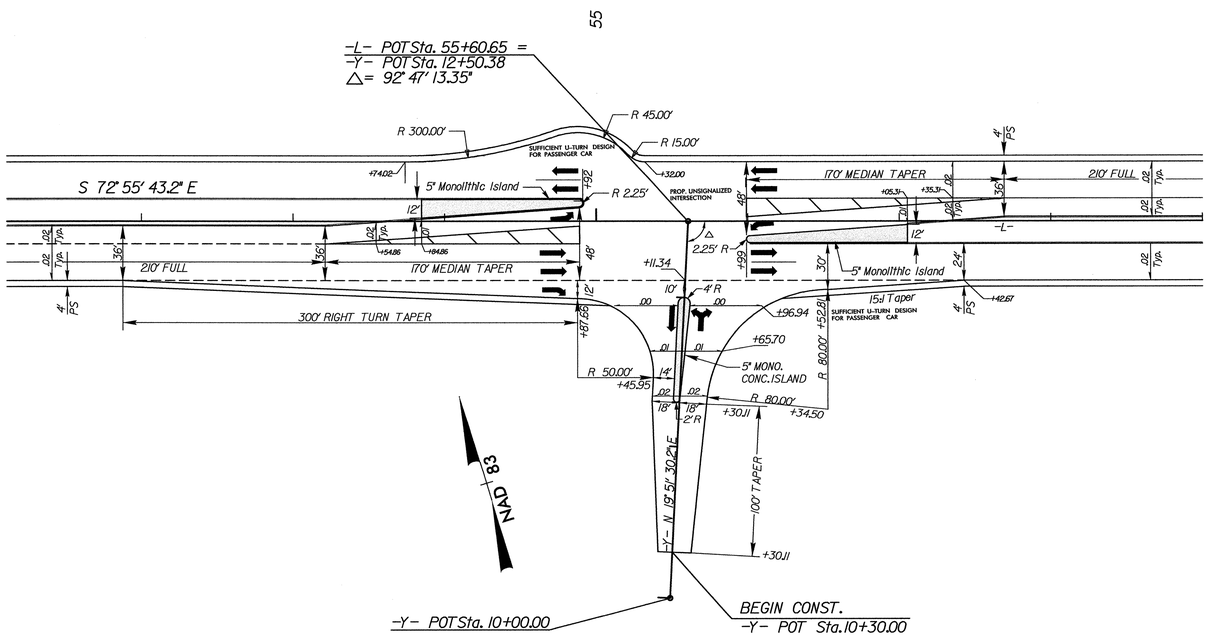
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EATON

7-10-08



INTERSECTION OF -Y1- AT -L-
SEE SHEET 4 FOR ROADWAY PLAN VIEW



INTERSECTION OF -Y- AT -L-
SEE SHEET 7 FOR ROADWAY PLAN VIEW

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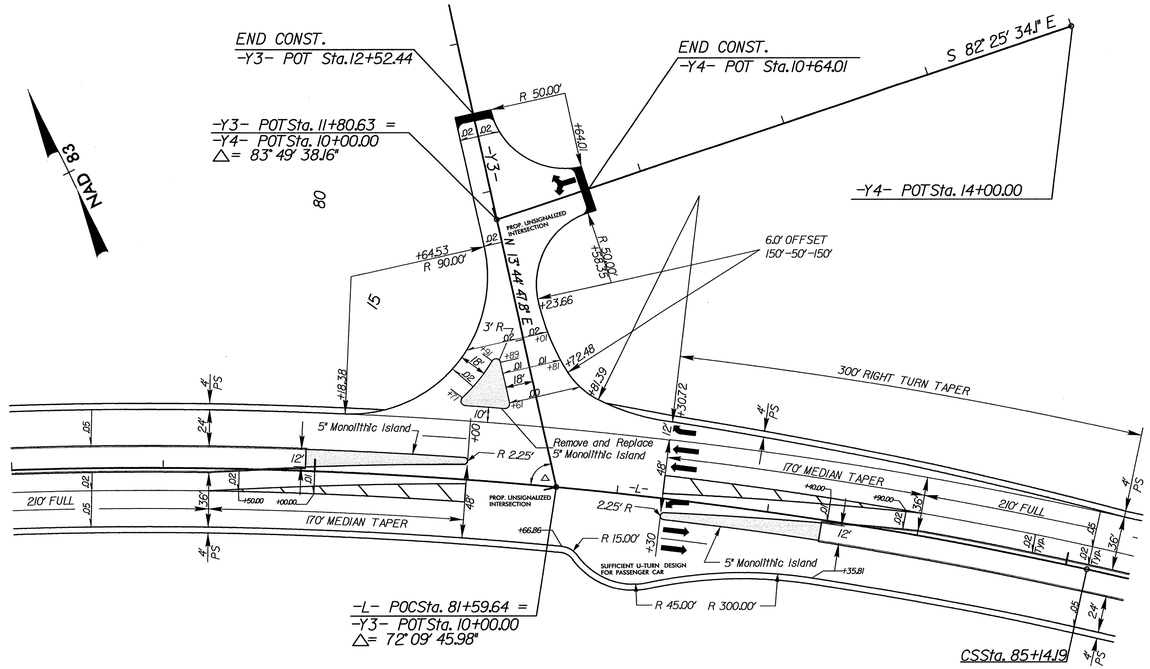
PROJECT REFERENCE NO.	SHEET NO.
R-2911B	2-E
R/W SHEET NO.	

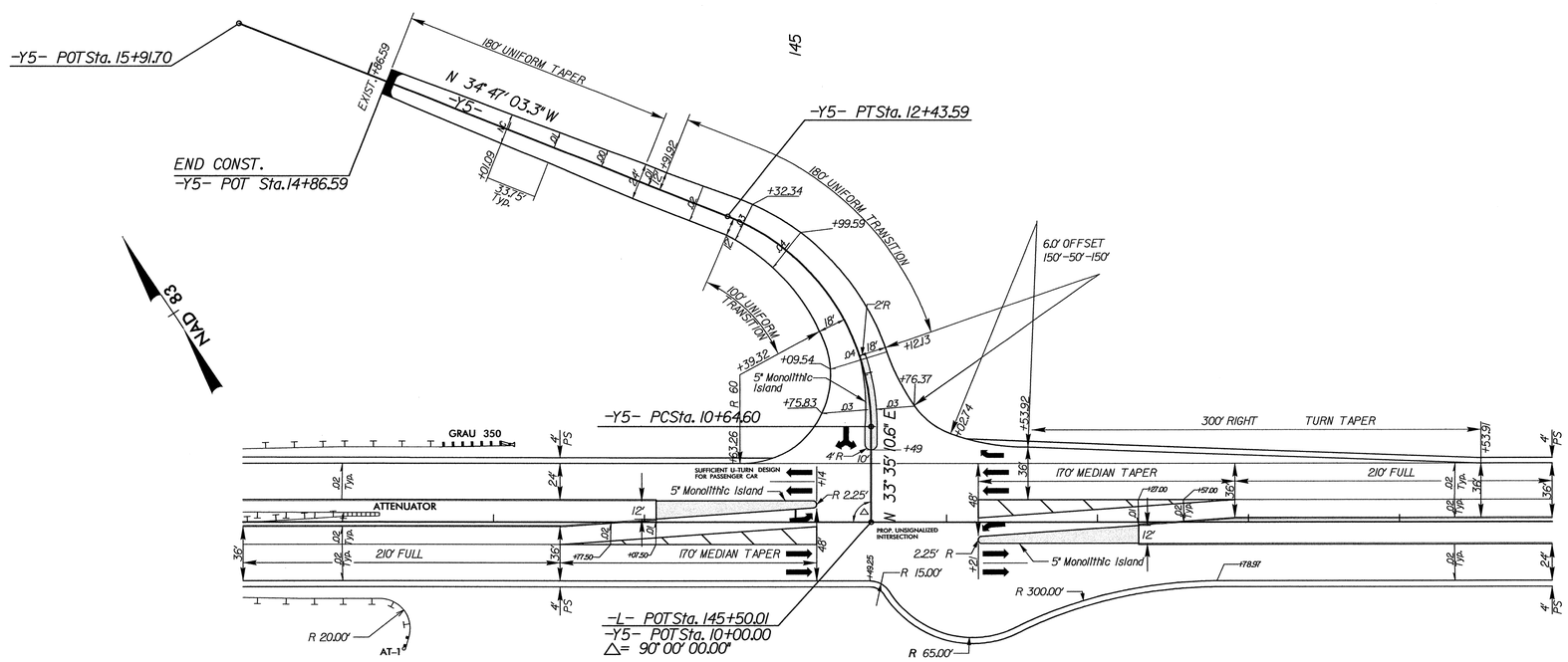
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EAKIN

7-10-08



INTERSECTION OF -Y3- & -Y4- AT -L-
SEE SHEET 9 FOR ROADWAY PLAN VIEW



INTERSECTION OF -Y5- AT -L-
SEE SHEET 14 FOR ROADWAY PLAN VIEW

8/17/99

03-JUL-2008 16:17
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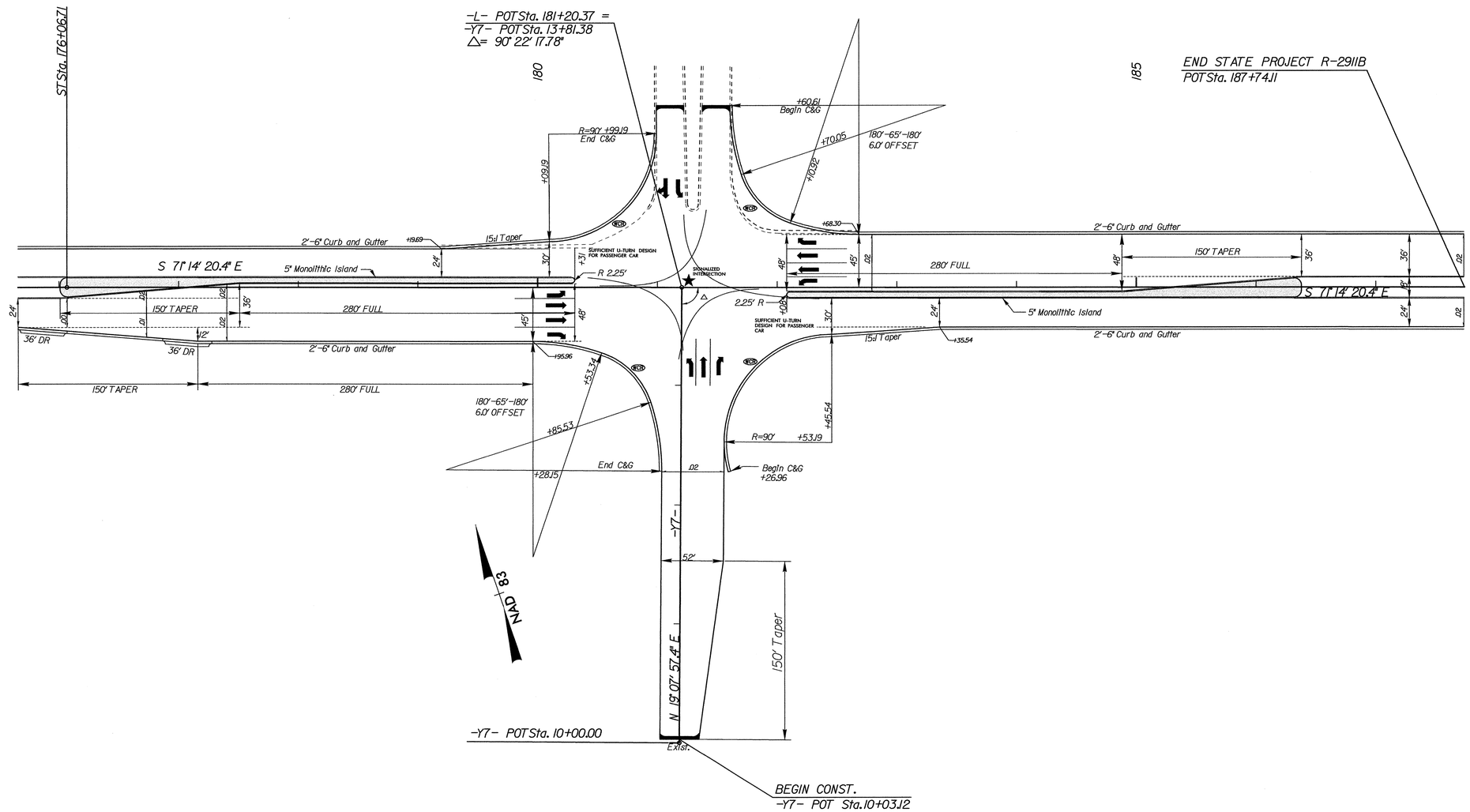
PROJECT REFERENCE NO.	SHEET NO.
R-2911B	2-F
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON

7-10-08



INTERSECTION OF -Y7- AT -L-
SEE SHEET 17 FOR ROADWAY PLAN VIEW

8/17/99

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$$$$USERNAME$$$$

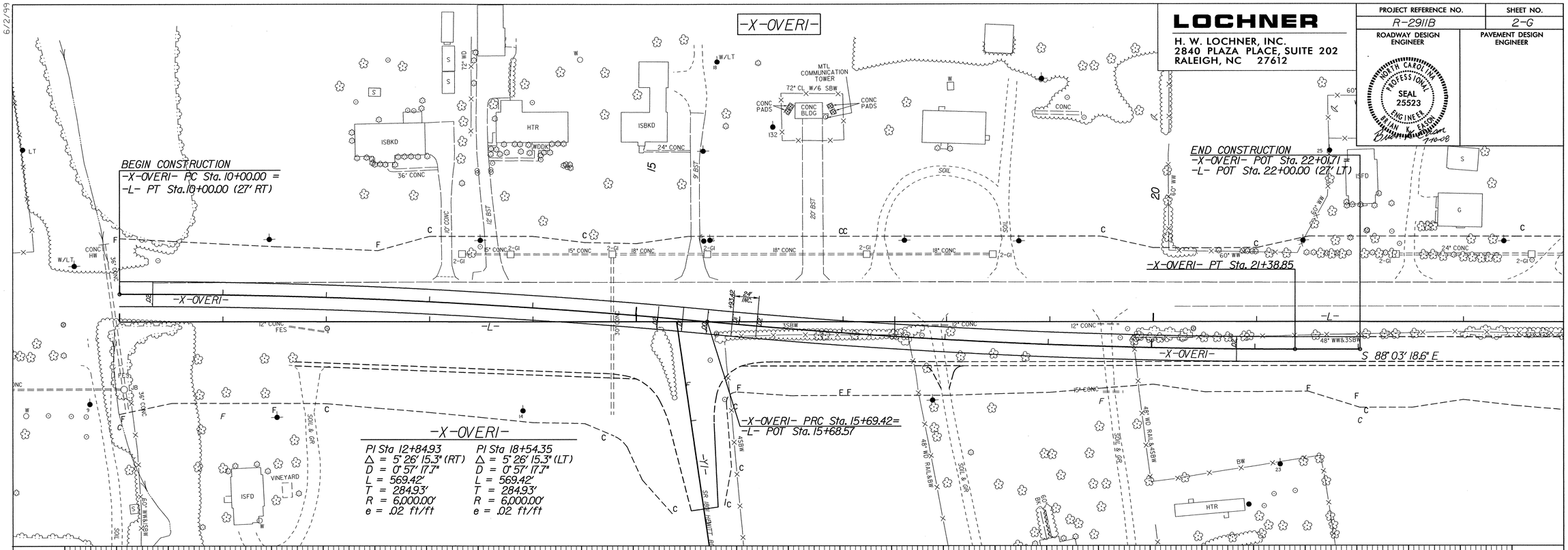
6/2/99

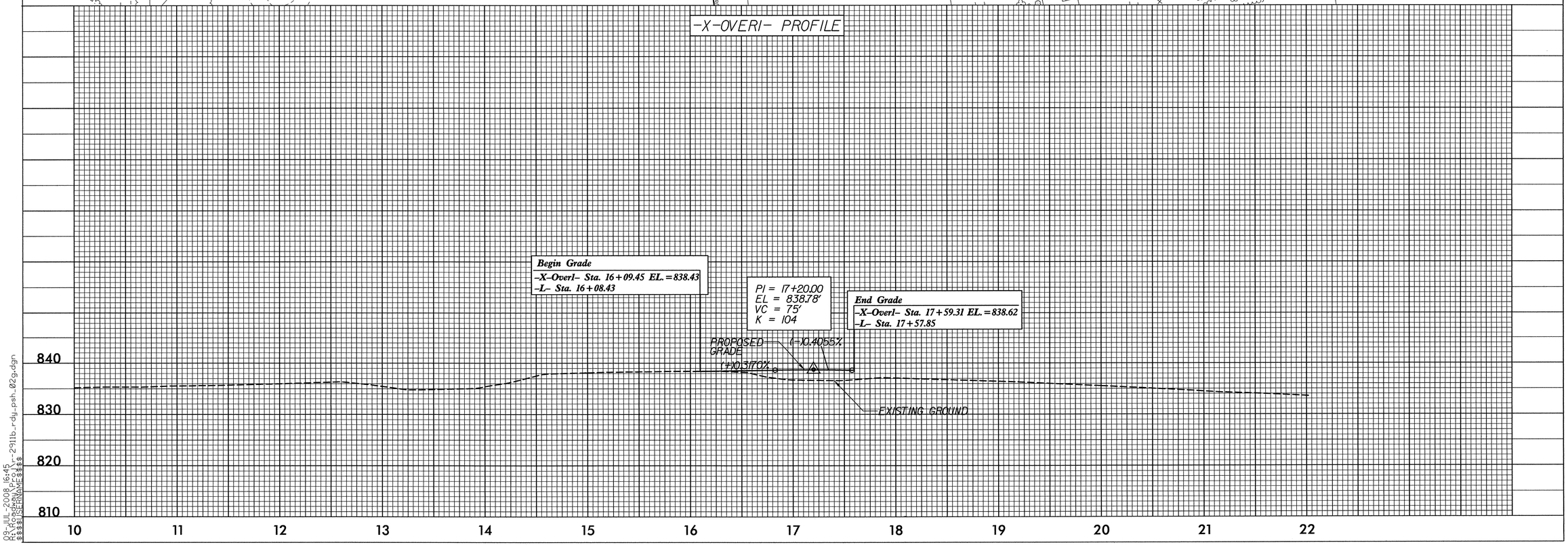
LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	2-G
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON
7-10-08





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6/2/99

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	2-H

HYDRAULIC DESIGN ENGINEER

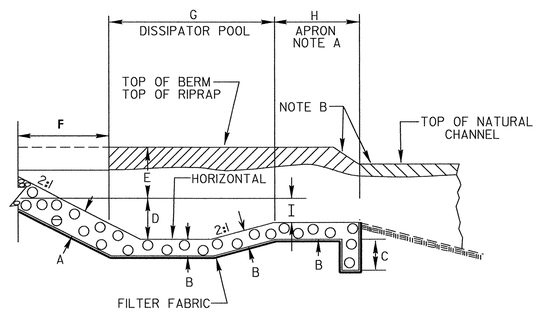
NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD

K.B. Alford 7-10-08

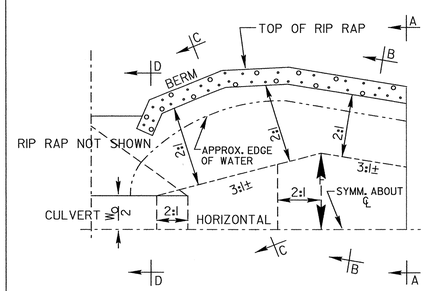
NOTE A IF EXIT VELOCITY OF BASIN IS SPECIFIED, EXTEND BASIN AS REQUIRED TO OBTAIN SUFFICIENT CROSS SECTIONAL AREA AT SECTION A-A SUCH THAT Q_{des} /(CROSS SECTION AREA AT SEC. A-A) = SPECIFIED EXIT VELOCITY.

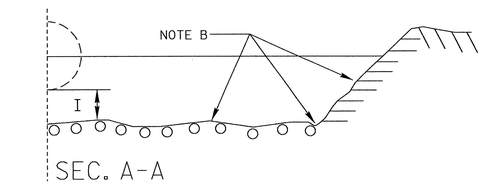
NOTE B WARP BASIN TO CONFORM TO NATURAL STREAM CHANNEL. TOP OF RIPRAP IN FLOOR OF BASIN SHOULD BE AT SAME ELEVATION OR LOWER THAN NATURAL CHANNEL BOTTOM AT SEC. A-A. PROVIDE SMOOTH TRANSITION FROM END OF APRON TO NATURAL CHANNEL WIDTH.

℄ SECTION

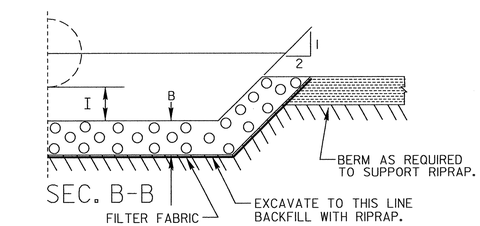


HALF PLAN

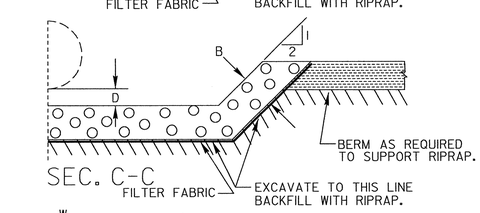




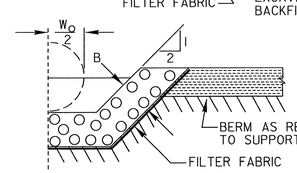
SEC. A-A



SEC. B-B



SEC. C-C



SEC. D-D

NOTE:
W_o = DIAMETER FOR PIPE CULVERT
W_o = BARREL WIDTH FOR BOX CULVERT
W_o = SPAN OF PIPE-ARCH CULVERT

DIM.	RIP RAP BASIN # 1	2	3	4	5	6	7	8
A	2							
B	2							
C	2							
D	2							
E	0							
F	4							
G	10.5							
H	5.5							
I	0.5							

ALL DIMENSIONS APPROXIMATE

BASIN #	LOCATION (AT OUTLET)
1	-L- Sta. 39+30 Rt.
2	
3	
4	
5	
6	
7	
8	

DETAIL OF RIP-RAPPED ENERGY DISSIPATOR BASIN

10-JUL-2008 08:17
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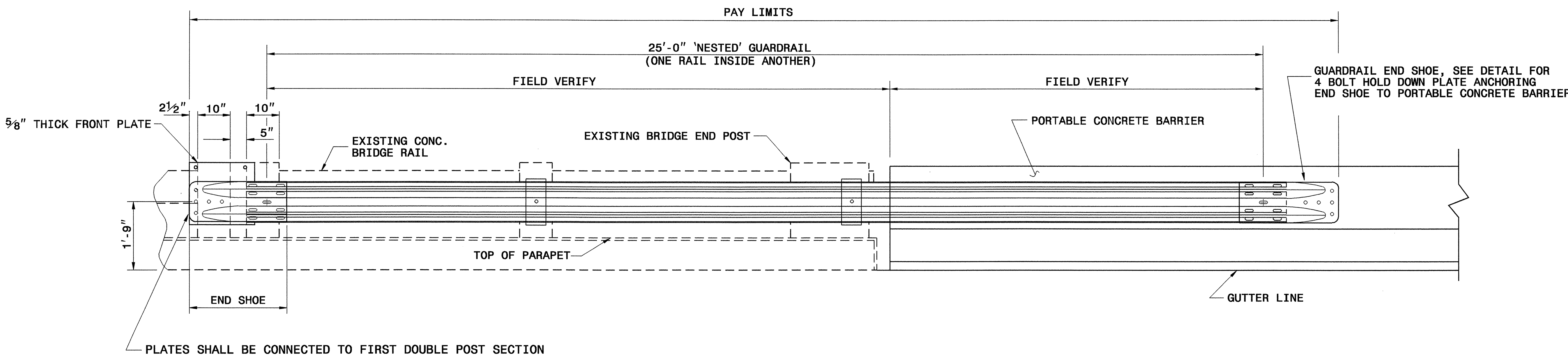
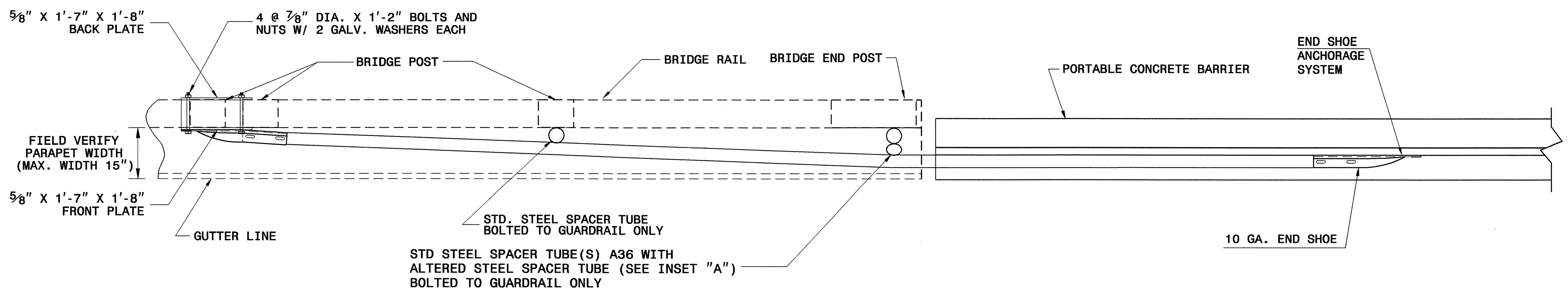
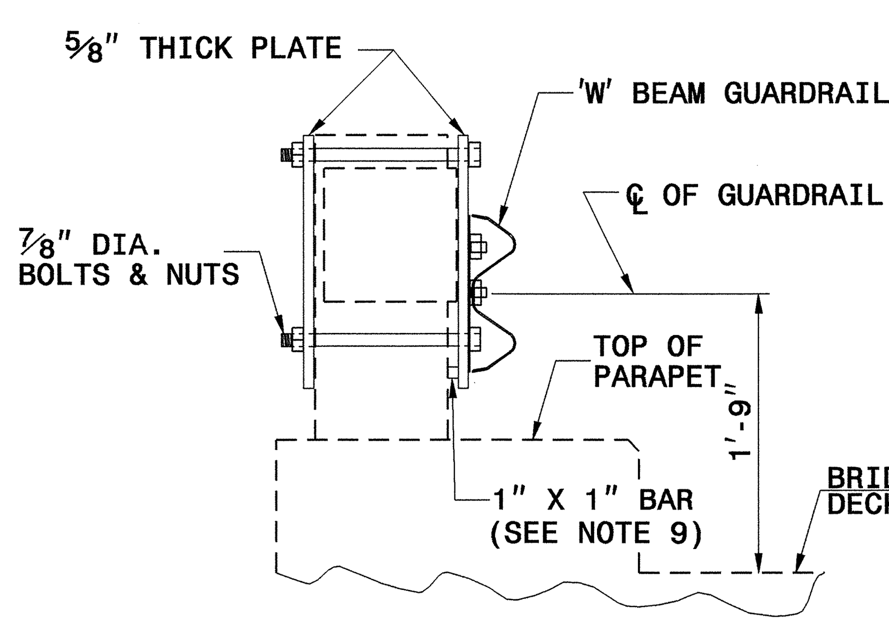
PROJECT REFERENCE NO.	SHEET NO.
R-2911B	2-I



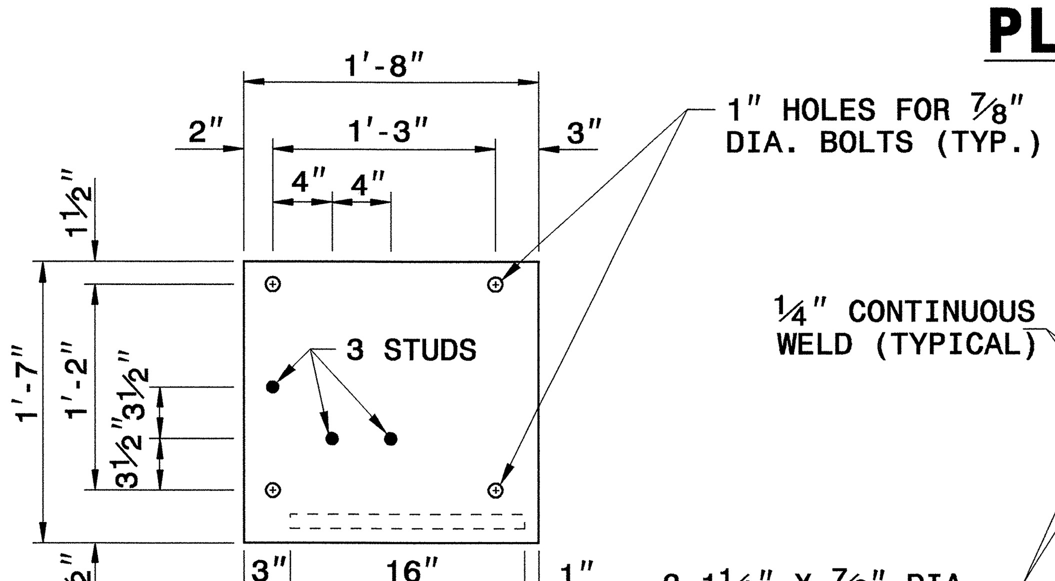
ELEVATION VIEW

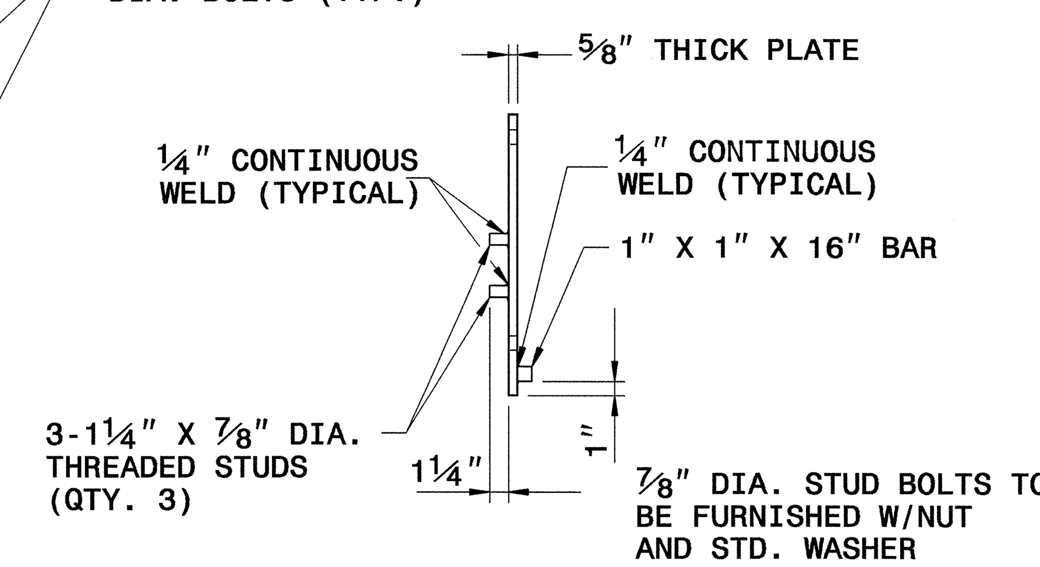


PLAN VIEW



SECTION VIEW

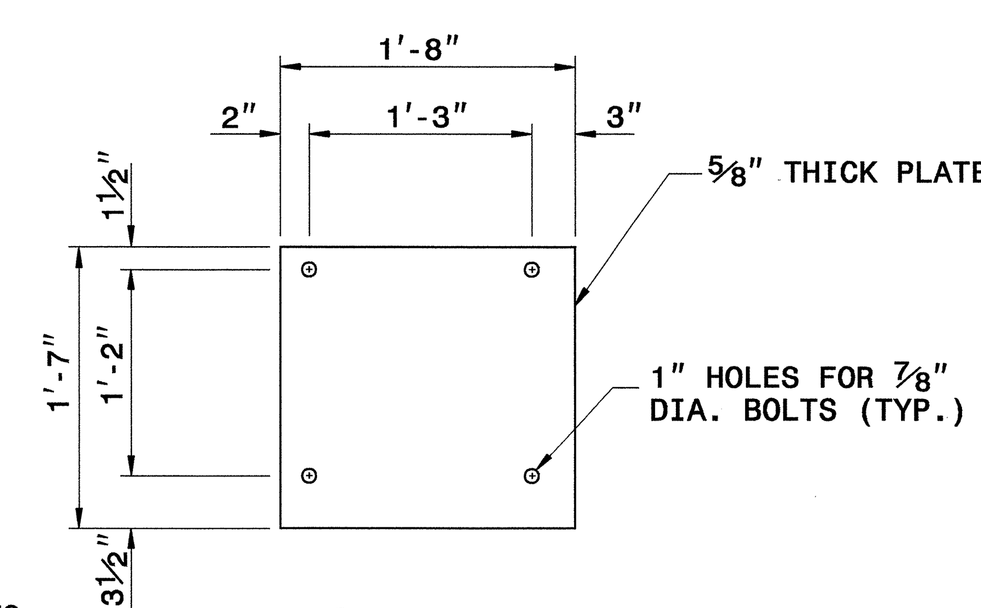




STUDS MAY BE ADJUSTED TO MEET FIELD CONDITIONS

FRONT VIEW **SIDE VIEW**

FRONT PLATE



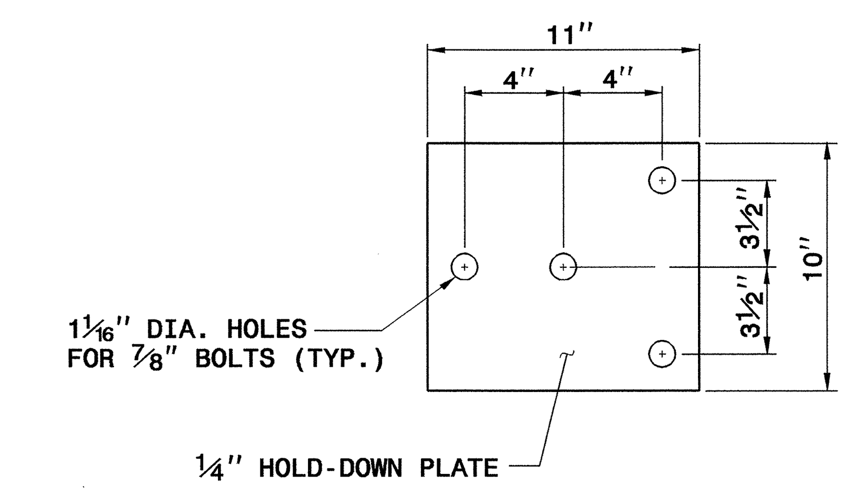
BACK PLATE

NOTES FOR 4 BOLT HOLD DOWN PLATE

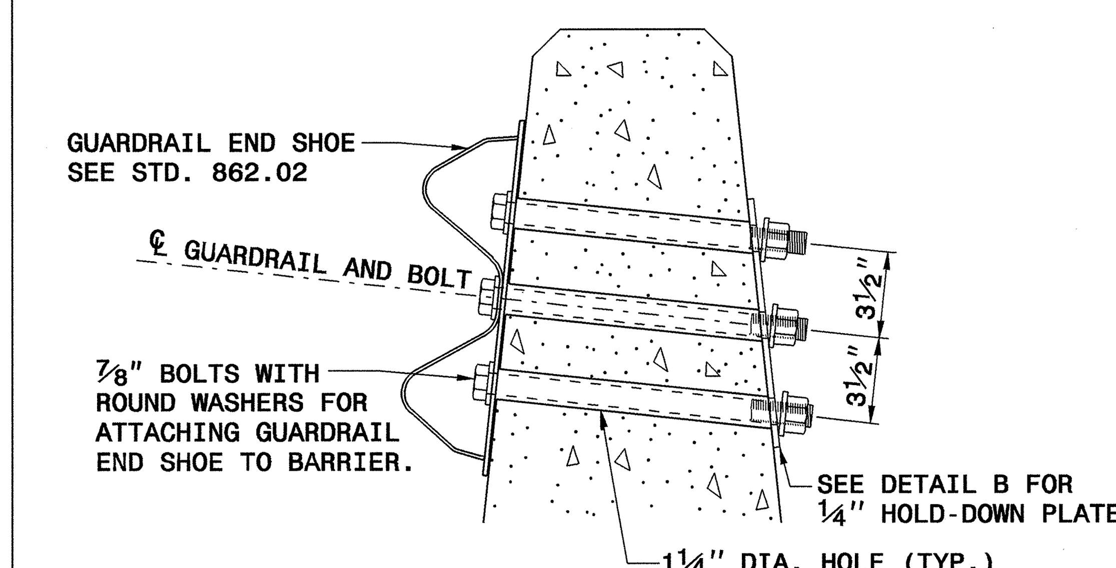
THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A ¼" HOLD DOWN PLATE AND 4 - ⅞" DIA. BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL. THE 1¼" DIA. HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

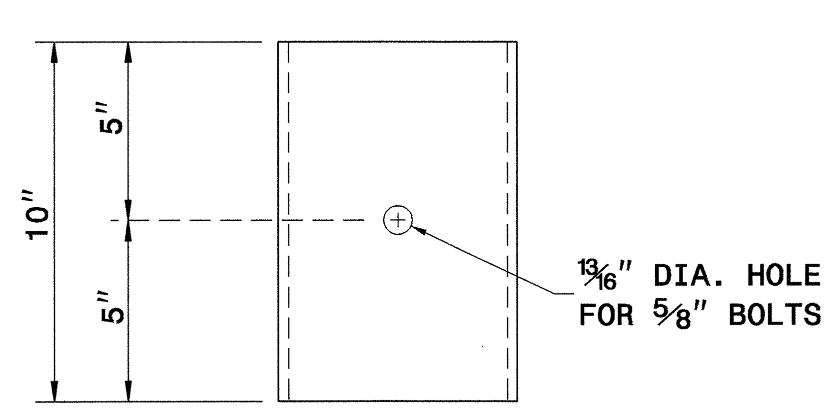


4 BOLT HOLD DOWN PLATE

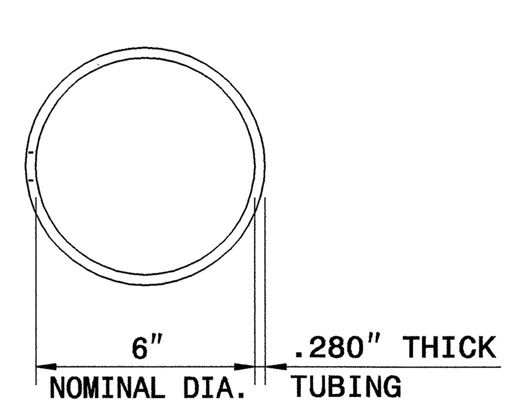


PART SECTION OF BARRIER OR RAIL

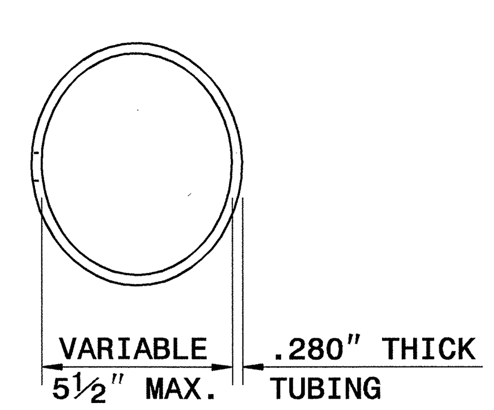
THRU END SHOE SECTION AND
4 BOLT HOLD DOWN PLATE



FRONT VIEW



PLAN VIEW



PLAN VIEW INSET "A"

STEEL SPACER TUBE

GENERAL NOTES:
1. USE NUTS, BOLTS, AND WASHERS CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-307 AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF STAND. SPECS.
2. TAP NUTS FOR THE ⅞" DIA. STUDS AND BOLTS AFTER GALVANIZING SEE A.S.T.M. A-563.
3. USE PLATES AND TUBES CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-36 AND GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH SECTION 1076 OF STAND. SPECS.
4. ADDITIONAL FIELD HOLES MAY BE DRILLED IN STEEL RAIL AS DIRECTED BY THE ENGINEER.
5. INSTALL FACE OF GUARDRAIL AS NEAR AS POSSIBLE TO PLUMB WITH THE PARAPET FACE AT BRIDGE END POST SPACER TUBE LOCATION BY USING STANDARD OR ALTERED SPACER TUBES OR A COMBINATION THEREOF OR AS DIRECTED BY THE ENGINEER. FOR VERY SMALL PARAPET WIDTHS, GUARDRAIL MAY BE INSTALLED AGAINST BRIDGE RAIL WITHOUT SPACER TUBES.
6. DO NOT DRILL BRIDGE RAIL IN ORDER TO INSTALL GUARDRAIL ANCHOR UNIT.
7. KEEP TOE OF PORTABLE CONCRETE BARRIER FLUSH WITH FACE OF PARAPET.
8. ATTACH 1" X 1" BAR AND THREADED STUDS TO PLATE WITH ¼" WELDS ALL AROUND.
9. 1" X 1" BAR MAY NOT BE NEEDED ON BRIDGE RAILS WHERE FACE OF RAIL DOES NOT PROJECT BEYOND FACE OF POST.

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON
7/24/08

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

TEMPORARY ANCHOR UNIT TYPE W-BEAM

ORIGINAL BY: E.E. WARD DATE: 4-03
MODIFIED BY: E.E. WARD DATE: 6-04
CHECKED BY: DATE: 6/24/08
FILE SPEC.: \usr\details\stand\862stds\anc.dgn

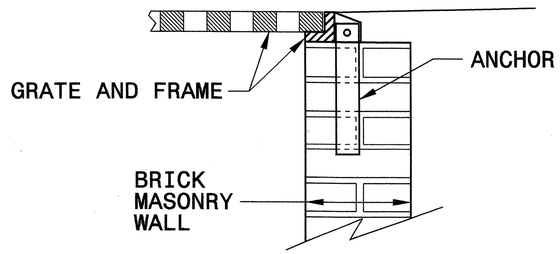
$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2911 B	2-J

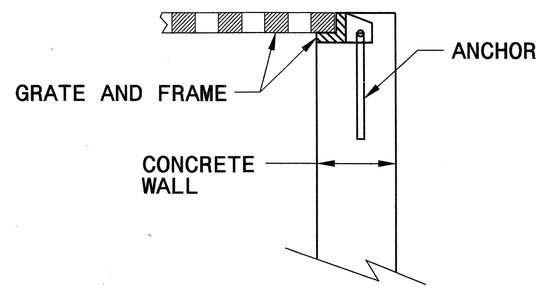
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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

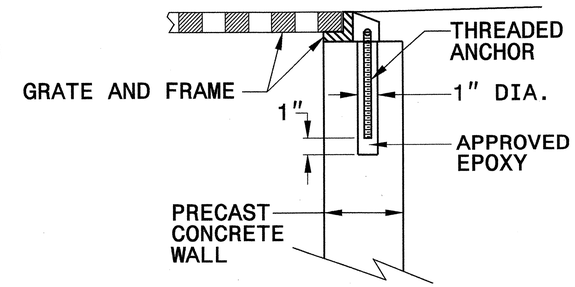
SHEET 1 OF 1
840D25



BRICK MASONRY CONSTRUCTION



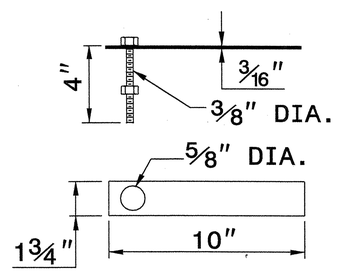
CONCRETE CONSTRUCTION



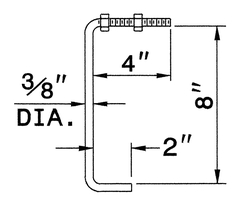
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

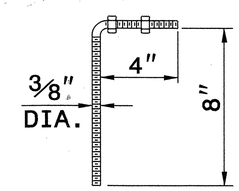
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



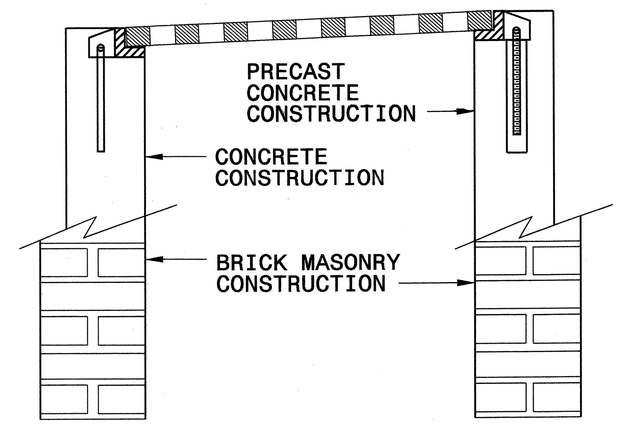
MASONRY ANCHOR
3/8" DIA. BOLT WITH PLATE



CONCRETE ANCHOR
3/8" DIA. BENT BAR



PRECAST CONCRETE ANCHOR
3/8" DIA. BENT BAR



FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS

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

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

SHEET 1 OF 1
840D25

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON
7/24/08

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

SEE PLATE FOR TITLE

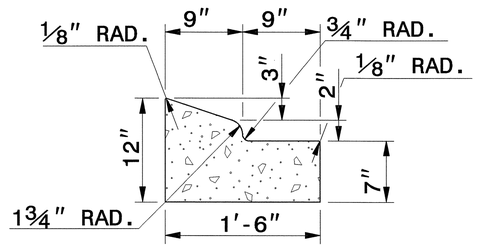
ORIGINAL BY: 2006 STD 840.25 DATE: 07/18/06
MODIFIED BY: E.E. WARD DATE: 9/25/06
CHECKED BY: DATE:
FILE SPEC.:

01-MAR-2007 09:04
s:\contracts\contracts\special details\ericward\stds\06' stds to special details\84025 anchorage for frames\0840d25.dgn
jhowerton AT PS21260

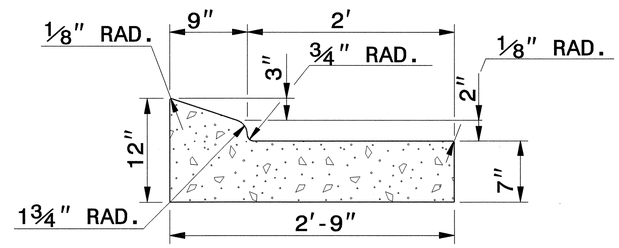
PROJECT REFERENCE NO.	SHEET NO.
R-2911B	2-K

NOTE: SEE STD. DWG. 846.01 FOR ADDITIONAL CURB AND GUTTER INFORMATION.

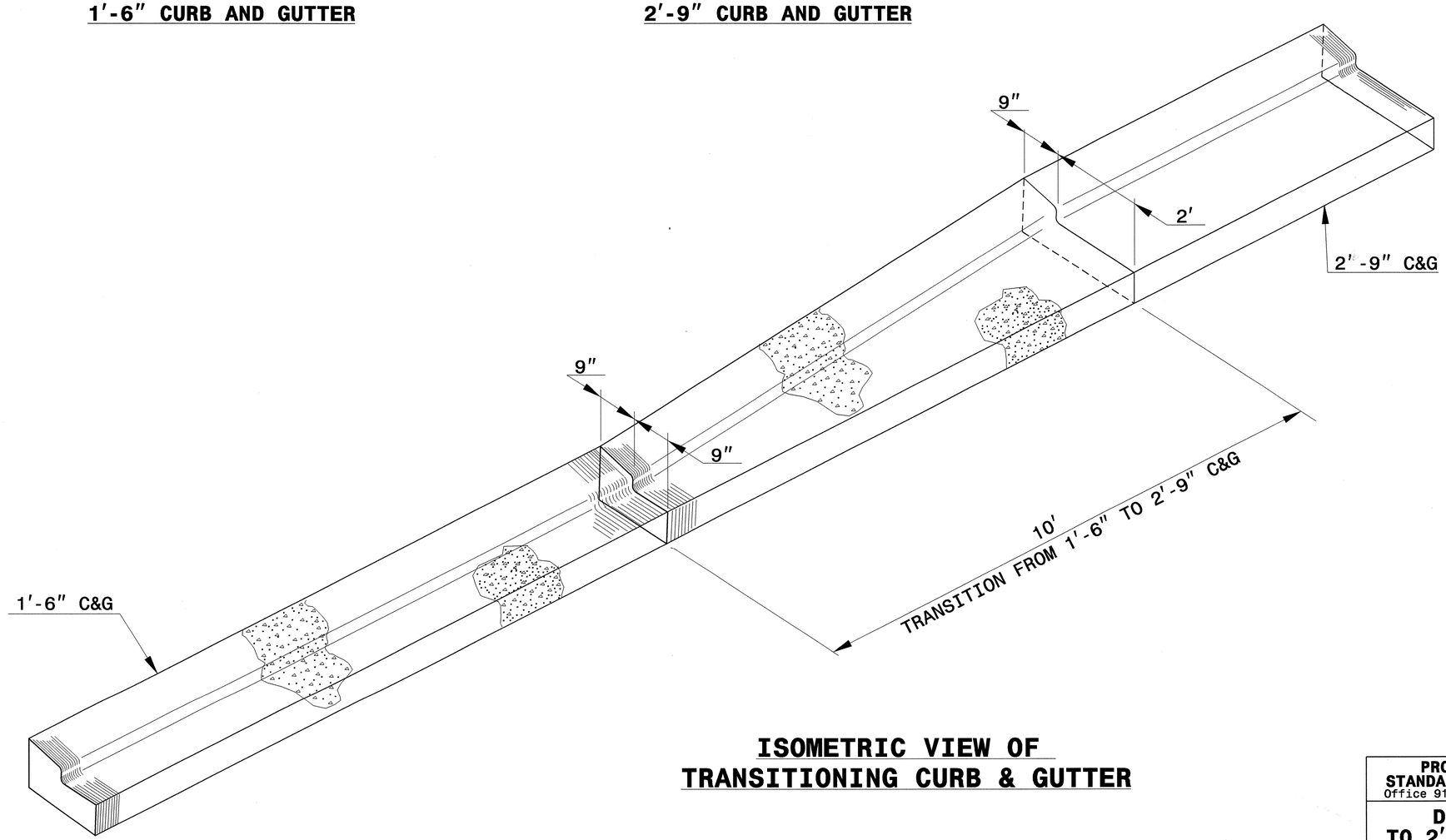
SEE ROADWAY PLANS FOR LOCATION OF CURB TRANSITION.



1'-6" CURB AND GUTTER



2'-9" CURB AND GUTTER



ISOMETRIC VIEW OF TRANSITIONING CURB & GUTTER

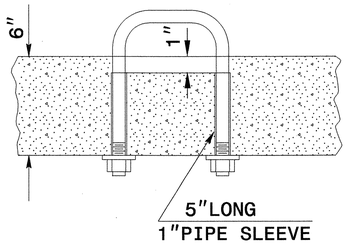
NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON
7/24/08

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

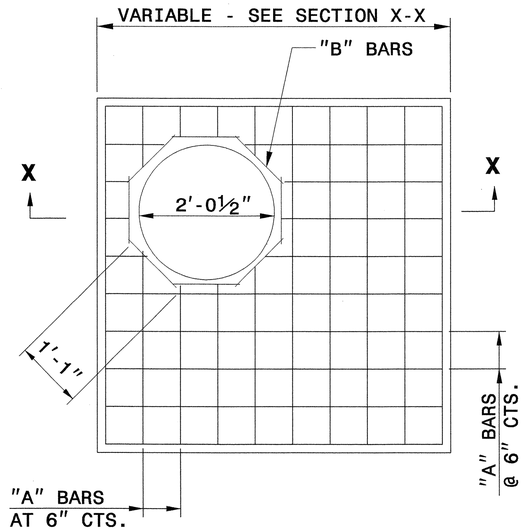
DETAIL OF 1'-6" TO 2'-9" CURB & GUTTER TRANSITION SECTION

ORIGINAL BY:	T.S.SPELL	DATE:	NOV. 26, 2001
MODIFIED BY:	T.S.SPELL	DATE:	FEB. 12, 2007
CHECKED BY:		DATE:	3/17/08
FILE SPEC.:	usr/eric/details/stand/cgtransit.dgn		

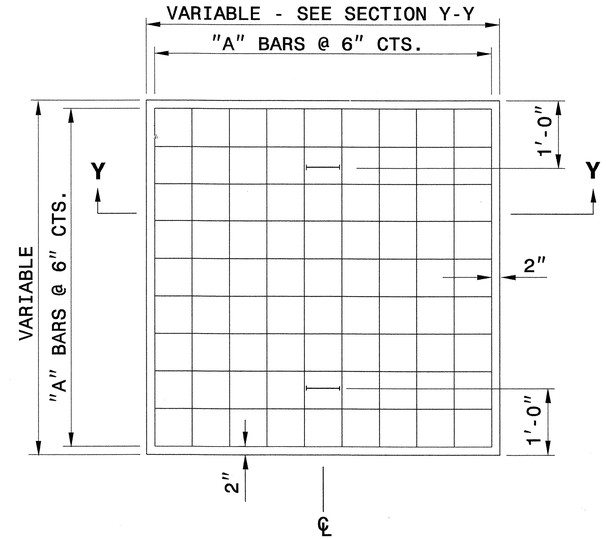
6/10/2008
$$$$SYSTIME$$$$
$$$$TIME$$$$
$$$$USERNAME$$$$
$$$$DGN$$$$



PARTIAL SECTION



PLAN



PLAN

GENERAL NOTES:

CONSTRUCT IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.

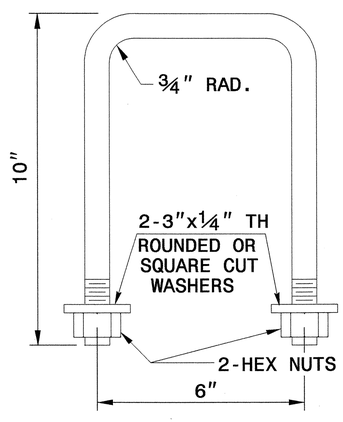
FIELD VERIFY THE DIMENSIONS FOR THE EXISTING BOXES

DETAIL INTENDED FOR NON-TRAFFIC BEARING DRAINAGE STRUCTURES.

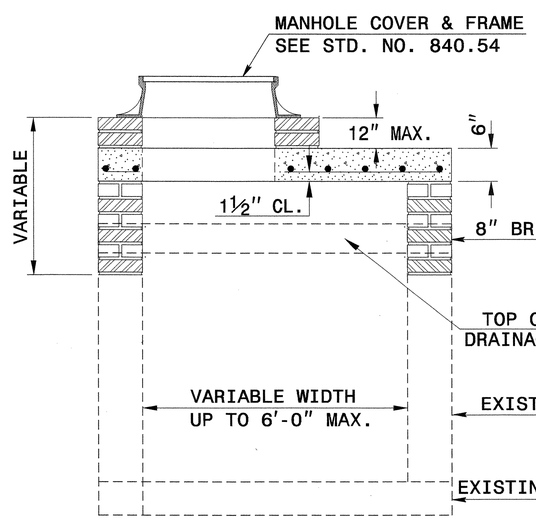
BILL OF MATERIALS				
REINFORCING STEEL				
CODE	SIZE	QTY.	LENGTH	REINF. STEEL LBS.
A	#4	20	4'-6"	60.12
B	#4	8	1'-1"	5.79
TOTAL				65.91 *

MASONRY	CU YDS
TOP SLAB CONCRETE CLASS "B"	.433 *
BRICK MASONRY PER FT HT (MIN)	.4111

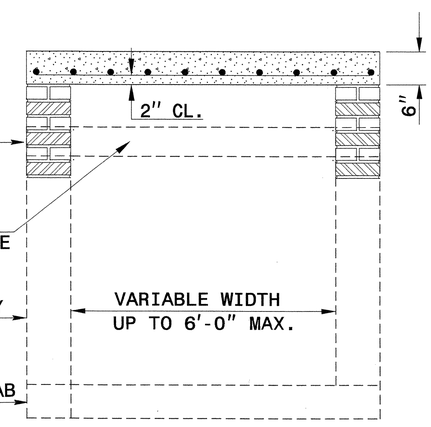
* NOTE:
QUANTITIES BASED ON 3'-6" X 3'-6" DRAINAGE STRUCTURE. ADJUST QUANTITIES FOR LARGER STRUCTURES AND MANHOLE CONSTRUCTION.



DETAIL OF HANDLE



SECTION X-X



SECTION Y-Y

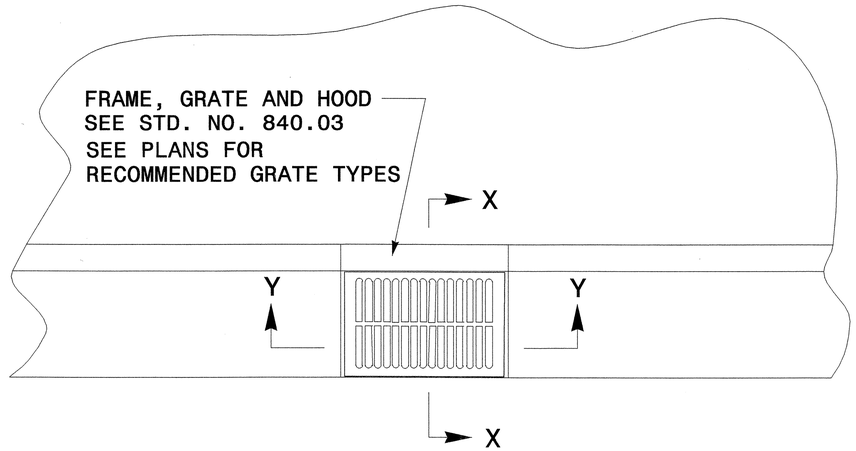
NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOHN S. HOWERTON
7/24/08

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

DETAIL TO CONVERT EXISTING DROP INLET OR CATCH BASIN TO JUNCTION BOX (MANHOLE OPTIONAL)

ORIGINAL BY: T.S.S. DATE: NOV.1997
MODIFIED BY: E.W. DATE: 8-28-02
CHECKED BY: DATE: 12/11/07
FILE SPEC.: usr/details/stand/boxtojbe.dgn

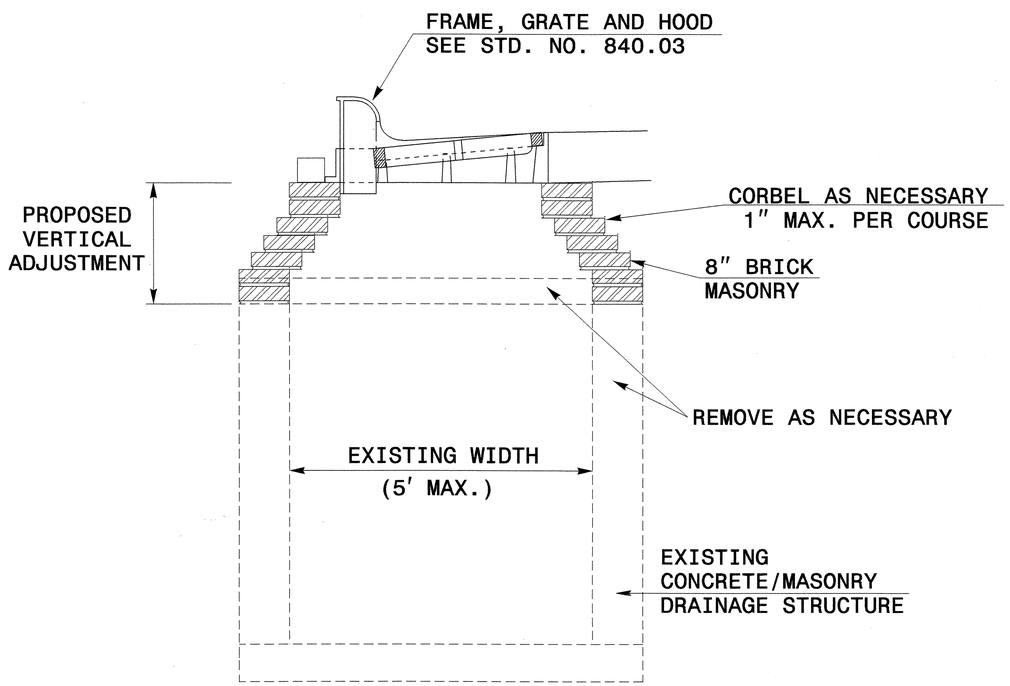
$$$$SYSTIME$$$$ $$$$DGN$$$$ $$$$USERNAME$$$$



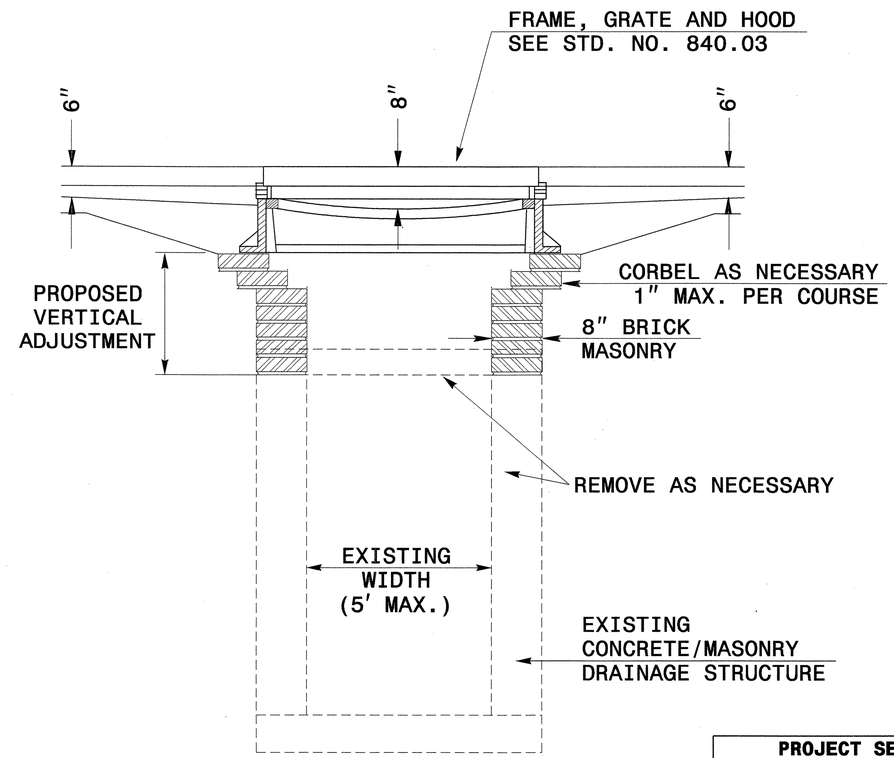
PLAN

GENERAL NOTES:

- THE ROADWAY PLANS INDICATE STRUCTURES TO BE CONVERTED.
- AFTER REMOVAL, STORE GRATES AND FRAMES AS DIRECTED BY THE ENGINEER.
- 4″ SOLID CLAY BRICK, JUMBO BRICK, CONCRETE, OR 4″ SOLID CONCRETE BLOCK MAY BE USED FOR VERTICAL ADJUSTMENT OF THE STRUCTURE.
- CONVERT IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.



SECTION X-X



SECTION Y-Y

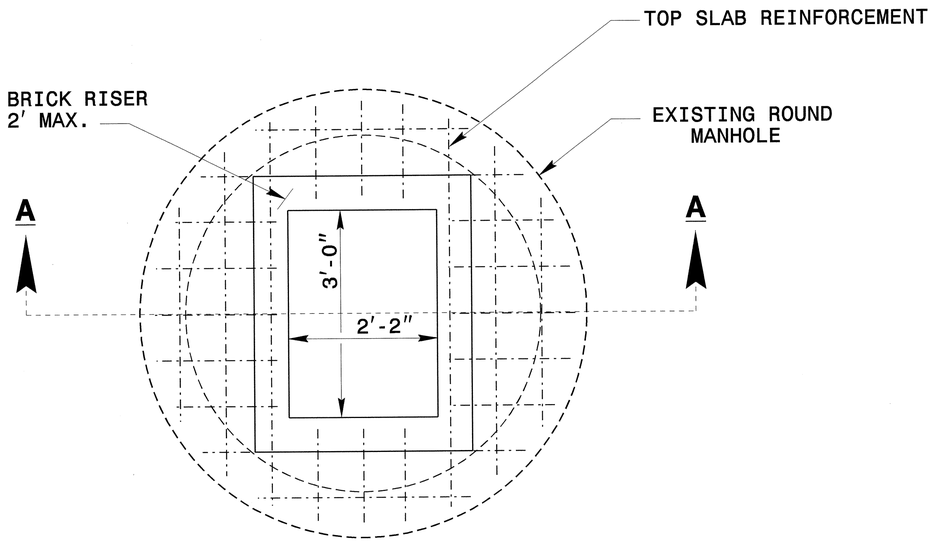
NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOHN S. HOWERTON
7/24/08

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

CONVERSION OF DROP INLET OR JUNCTION BOX TO CATCH BASIN

ORIGINAL BY: E.E. WARD DATE: 11-97
MODIFIED BY: DATE:
CHECKED BY: DATE: 12/11/07
FILE SPEC.: 0937:usr\details\stand\jbtocb.dgn

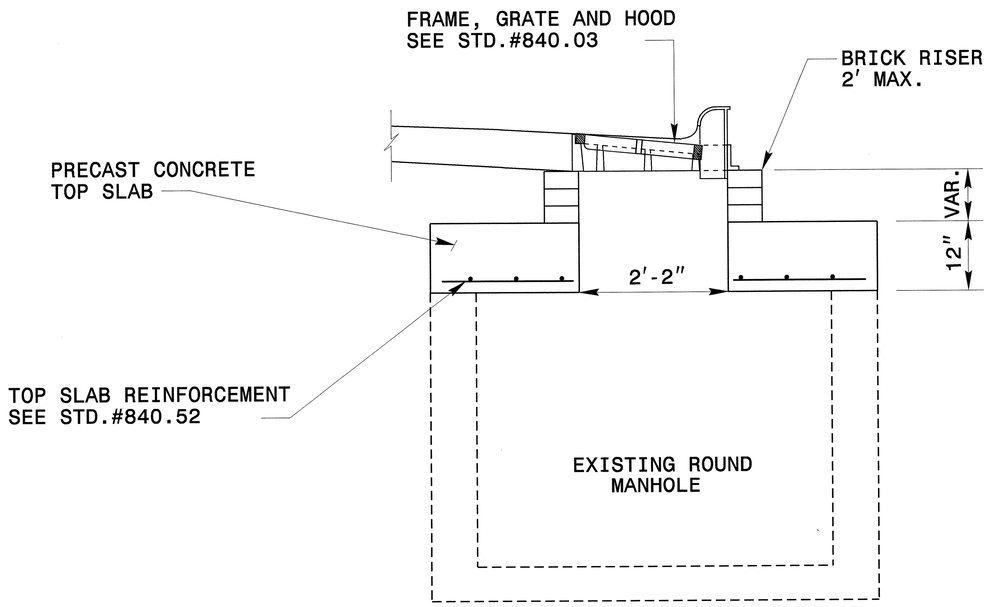
PROJECT REFERENCE NO.	SHEET NO.
R-2911B	2-N



PLAN VIEW

GENERAL NOTES:

1. FIELD VERIFY THE SIZE OF THE EXISTING MANHOLE.
2. REFER TO STD.#840.52 FOR TOP SLAB REINFORCEMENT PLACMENT AND SIZING.
3. HEIGHT OF BRICK RISER SHOULD NOT EXCEED 2'.



SECTION A-A

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON
7/24/08

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

CONVERT EXISTING ROUND MANHOLE JUNCTION BOX TO CATCH BASIN

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: nbritt DATE: 07/09/08
CHECKED BY: DATE: 7/24/08
FILE SPEC.: detail/nbritt/english/rural/r2911b jbtocb.dgn

5/14/99

09-JUL-2008 07:17
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nbritt

PROJECT REFERENCE NO.	SHEET
R-2911B	2-0

GEOTECHNICAL ENGINEER

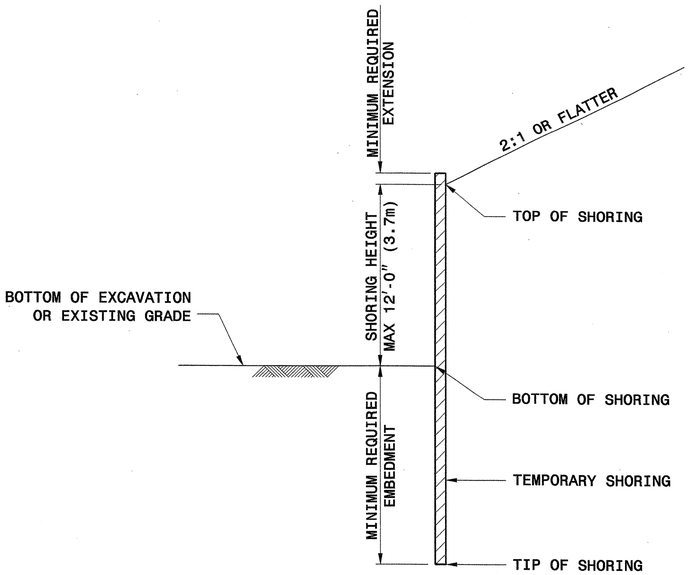
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

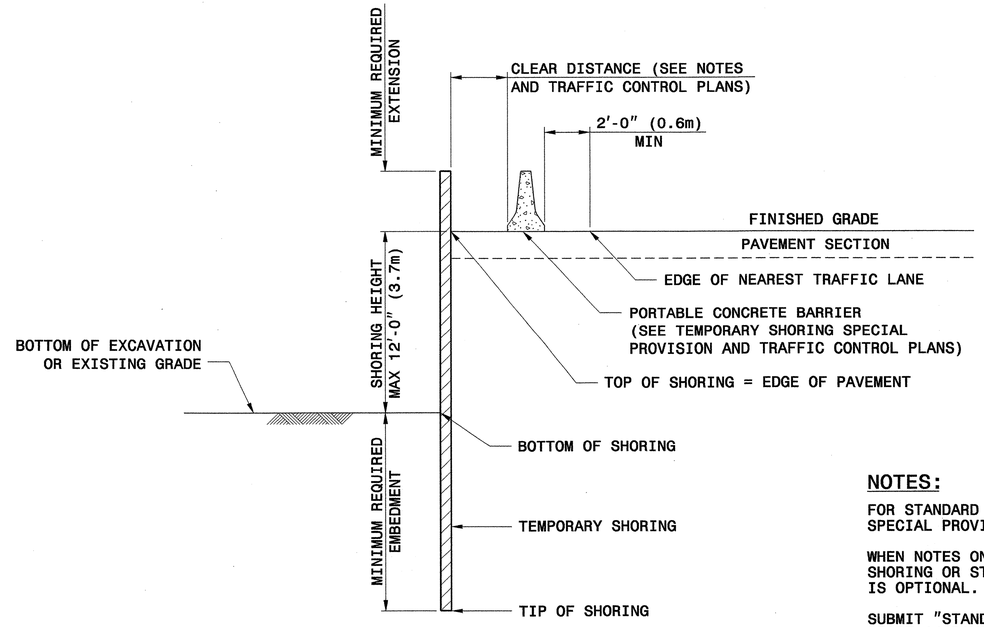
SIGNATURE DATE

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
R-2911B	2-P

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.

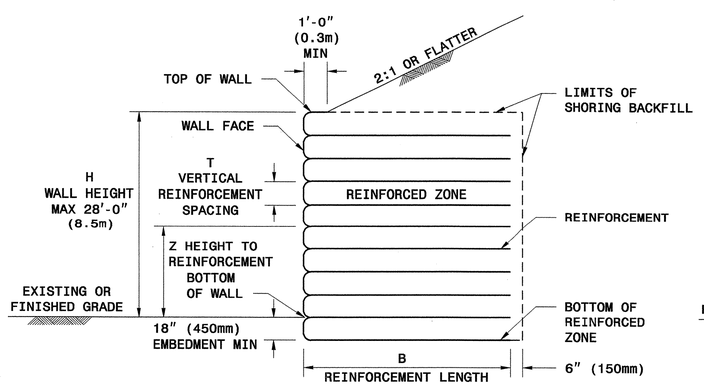
PLACE SHORING BACKFILL IN 8″ TO 10″ (200mm to 250mm) THICK LIFTS AND COMPACT IN ACCORDANCE WITH SUBARTICLE 235-4(C) OF THE STANDARD SPECIFICATIONS. USE ONLY HAND OPERATED COMPACTION EQUIPMENT WITHIN 3′-0″ (1m) OF THE WALL FACE.

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.

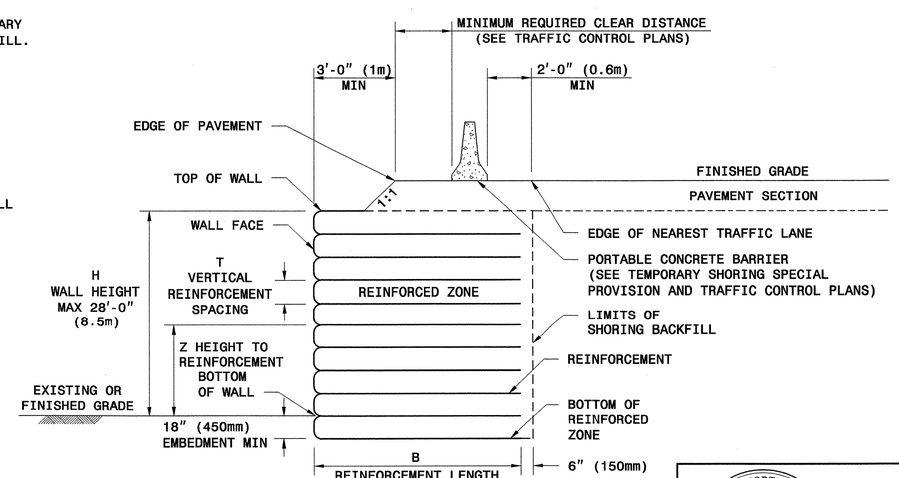
COVER REINFORCING AND RETENTION FABRIC WITH AT LEAST 3″ (75mm) OF SHORING BACKFILL. PLACE TOP REINFORCEMENT LAYER BETWEEN 4″ AND 24″ (100mm and 600mm) BELOW TOP OF WALL DEPENDING ON WALL OPTION.

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

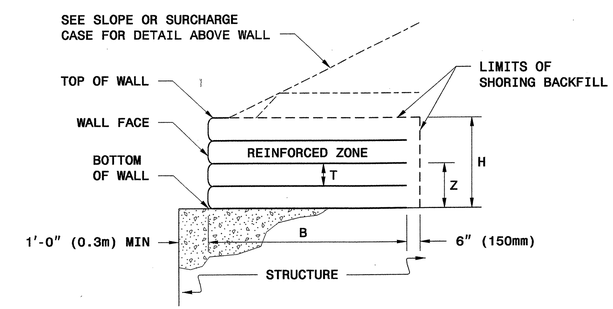
IF THE TOP OF WALL IS WITHIN 5′-0″ (1.5m) OF FINISHED GRADE, REMOVE TOP FORM OR FACING AND INCORPORATE THE TOP REINFORCEMENT LAYER INTO THE FILL WHEN PLACING FILL IN FRONT OF THE WALL. STANDARD TEMPORARY MSE WALLS REMAIN IN PLACE PERMANENTLY UNLESS REQUIRED OTHERWISE.



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
R-2911B	2-Q

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	18
							11	11	11	14	15	15	16.5
						11	11	11	14	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	16	10.5
			11	11	11	11	15	15	15	15	15	16	9
		11	11	11	11	14	15	15	15	15	16	16	7.5
		11	11	11	11	14	15	15	15	16	16	16	6
	11	11	11	11	15	15	15	15	15	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	15	16	16	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	11	22.5
									11	11	11	15	21
								11	11	11	11	15	19.5
							11	11	11	11	15	15	18
						11	11	11	11	15	15	15	16.5
					11	11	11	11	15	15	15	15	15
				11	11	11	11	15	15	15	15	15	13.5
				11	11	11	15	15	15	15	15	15	12
			11	11	11	11	15	15	15	15	15	15	10.5
		11	11	11	11	15	15	15	15	15	15	15	9
	11	11	11	11	15	15	15	15	15	15	15	15	7.5
	11	11	11	11	15	15	15	15	15	15	15	15	6
11	11	11	11	15	15	15	15	15	15	15	15	15	4.5
11	11	11	11	15	15	15	15	15	15	15	15	15	3
11	11	11	15	15	15	15	15	15	15	15	15	15	1.5
11	11	11	15	15	15	15	15	15	15	15	15	15	0
11	11	11	15	15	15	15	15	15	15	15	15	15	-1.5

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	9.5	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	7.0	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	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	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	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	N/A	7.0	1
7.0	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	7.0	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

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	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	3X2	6 -10
3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	5 - 2
3X1	3X2	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

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′.

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STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY MSE WALL REINFORCEMENT TABLES - ENGLISH UNITS

SHEET 2 OF 11 DATE: 2-20-07

PROJECT REFERENCE NO.	SHEET
R-2911B	2-R

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

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ENGINEER

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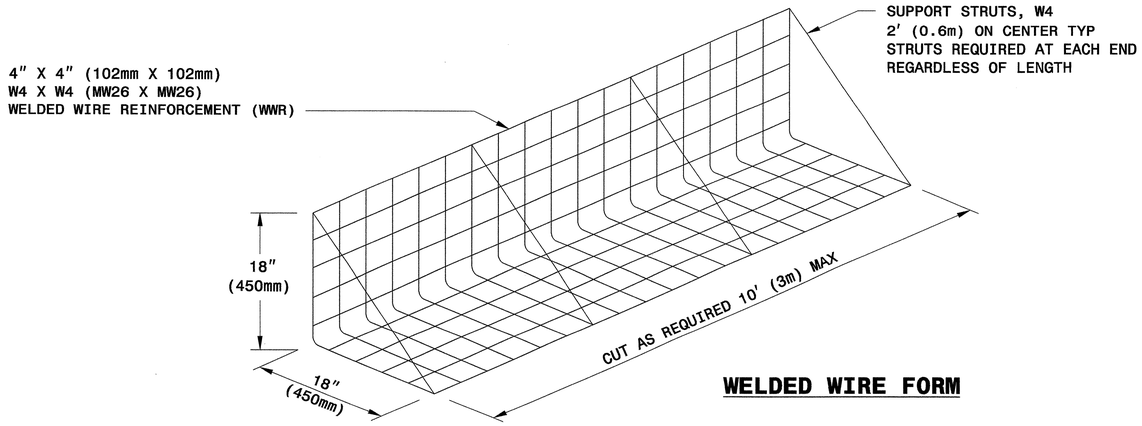
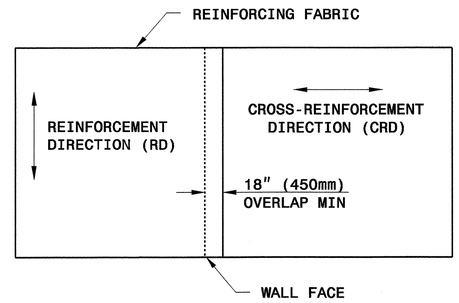
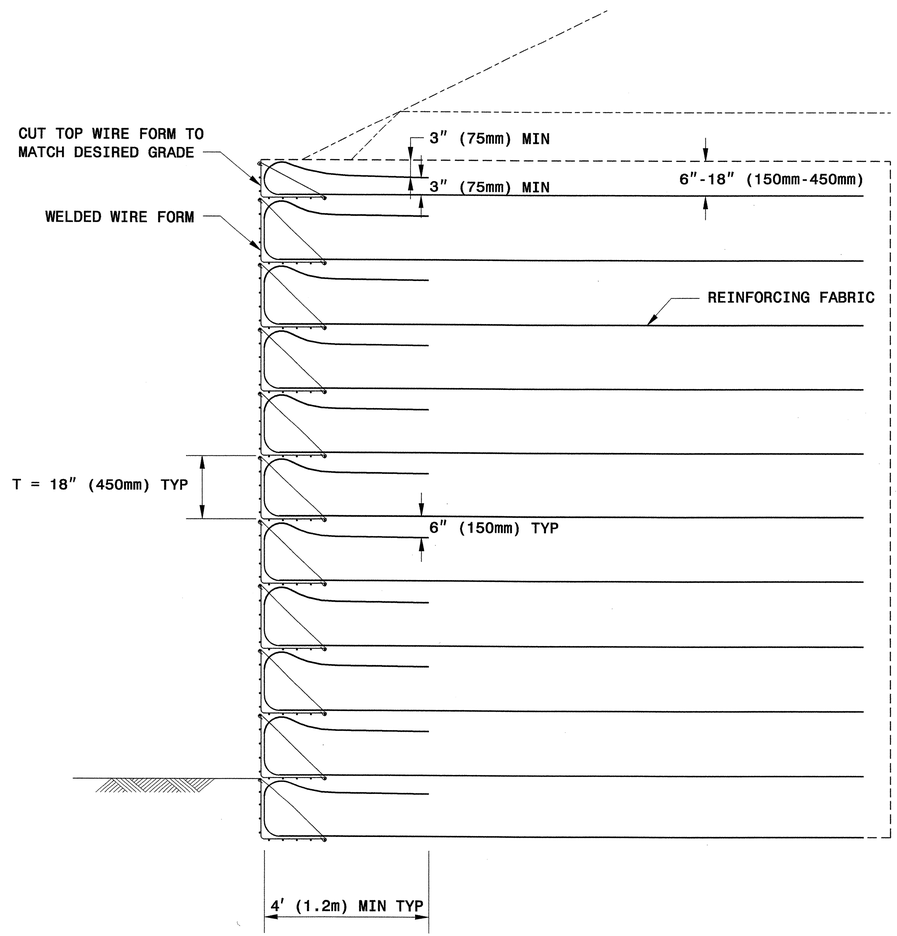


WELDED WIRE FORM



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

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TEMPORARY FABRIC WALL

SHEET 3 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
R-2911B	2-S

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

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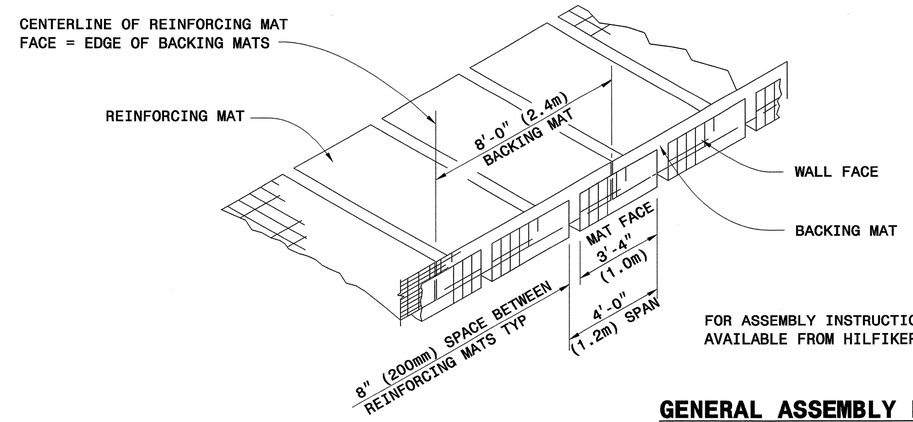
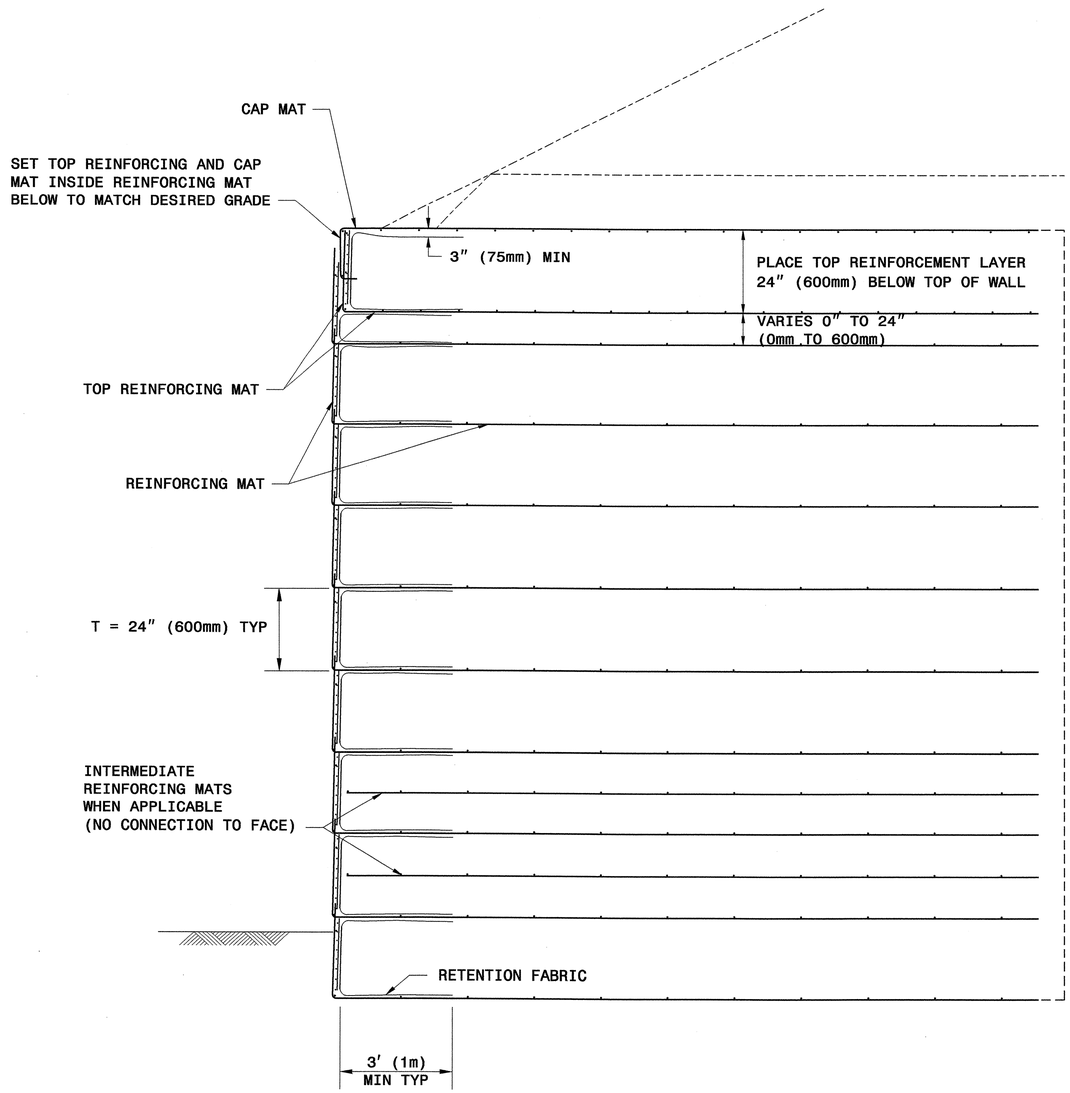
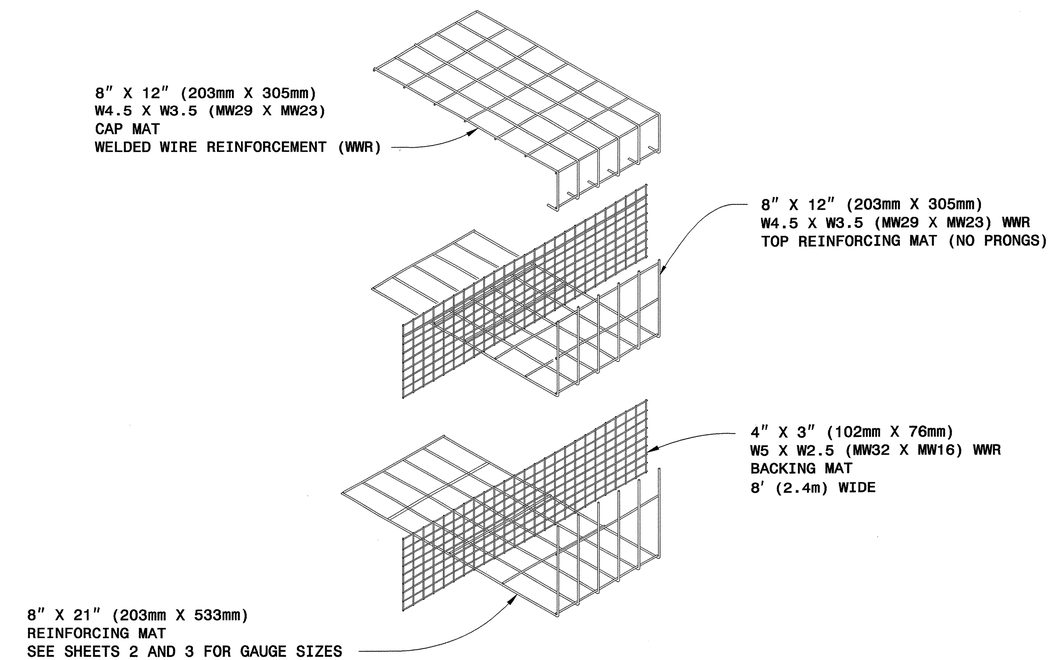


FOR ASSEMBLY INSTRUCTIONS, SEE WELDED WIRE WALL CONSTRUCTION GUIDE AVAILABLE FROM HILFIKER WEBSITE AT WWW.HILFIKER.COM/WWW

GENERAL ASSEMBLY DETAIL



TYPICAL SECTION



WALL COMPONENTS

HILFIKER RETAINING WALLS

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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
R-2911B	2-T

GEOTECHNICAL ENGINEER

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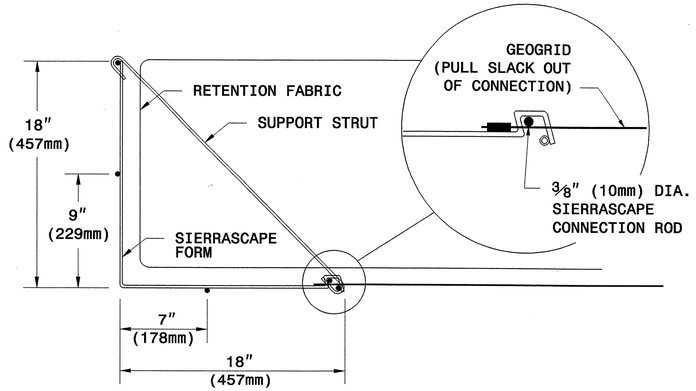
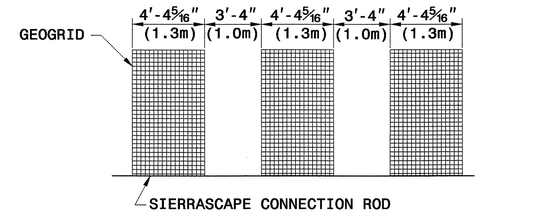
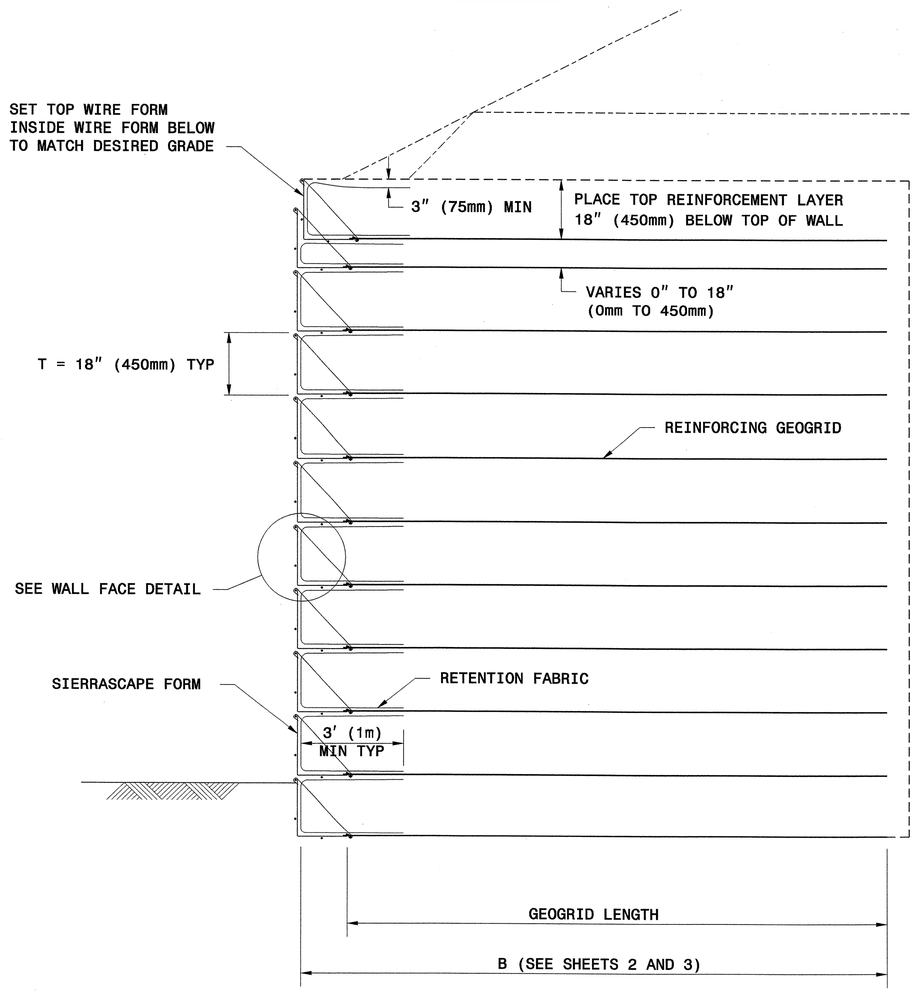


WALL FACE DETAIL

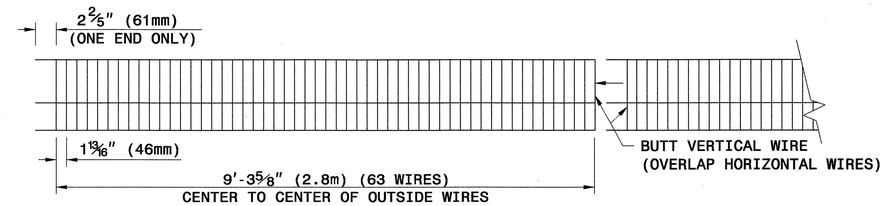


PLACE ALTERNATE LAYERS OF GEOGRID IN STAGGERED PATTERN SUCH THAT THE LAYER ABOVE IS CENTERED OVER SPACE BELOW

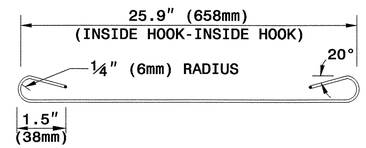
TYPICAL GEOGRID COVERAGE



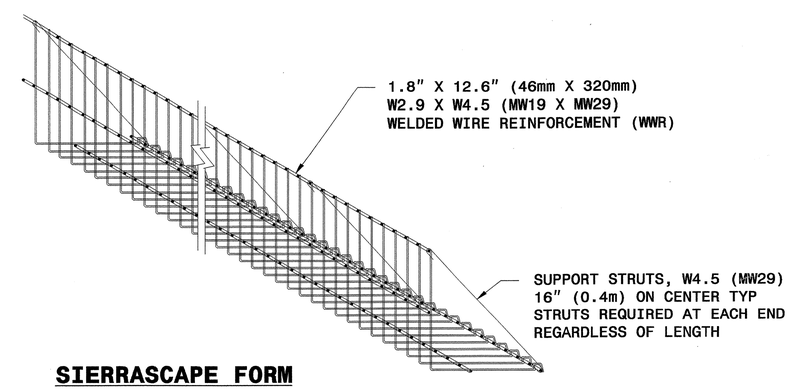
TYPICAL SECTION



ELEVATION VIEW



SUPPORT STRUT



SIERRASCAPE FORM

WALL COMPONENTS

TENSAR®
TENSAR EARTH TECHNOLOGIES, INC.

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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

PROJECT REFERENCE NO.	SHEET
R-2911B	2-U

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

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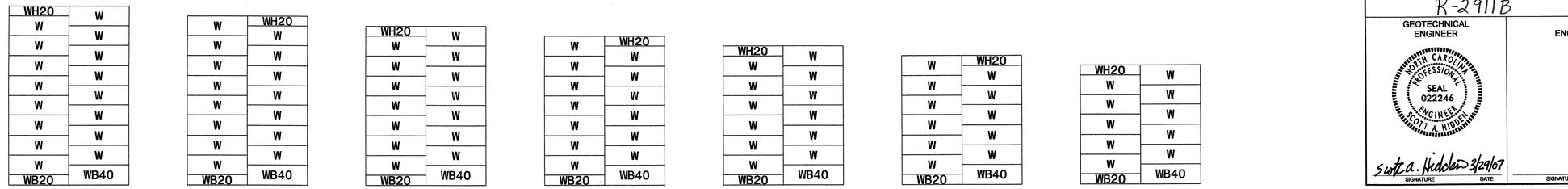
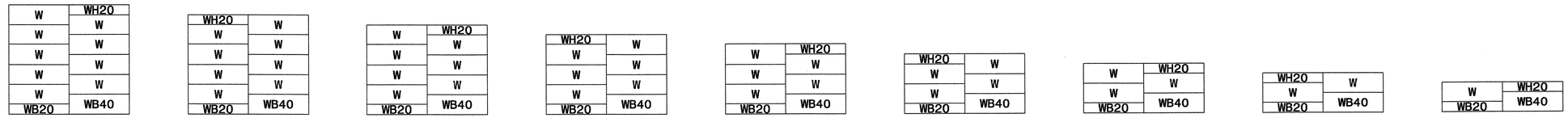
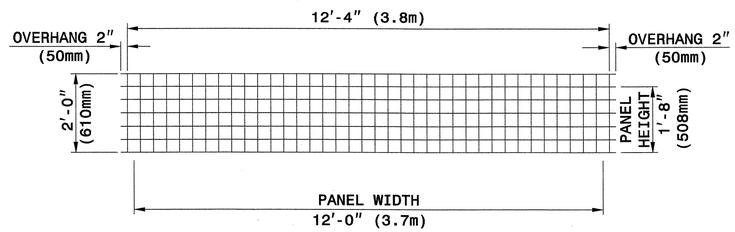
PANEL LAYOUTS



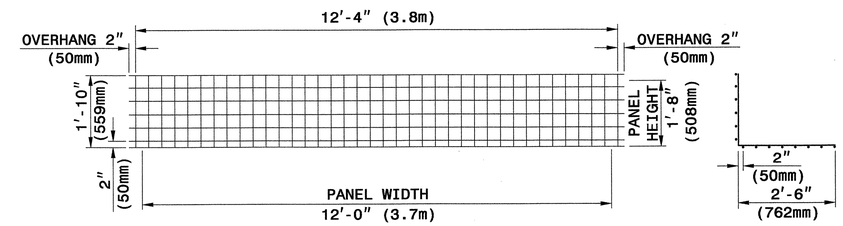
H - WALL HEIGHT							
(FEET-INCHES)	< 28 - 0	< 27 - 0	< 25 - 4	< 23 - 8	< 22 - 0	< 20 - 4	< 18 - 8
(METER)	< 8.5	< 8.2	< 7.7	< 7.2	< 6.7	< 6.2	< 5.7



(FEET-INCHES)	< 17 - 0	< 15 - 4	< 13 - 8	< 12 - 0	< 10 - 4	< 8 - 8	< 7 - 0	< 5 - 4	< 3 - 8
(METER)	< 5.2	< 4.7	< 4.2	< 3.7	< 3.2	< 2.6	< 2.1	< 1.6	< 1.1

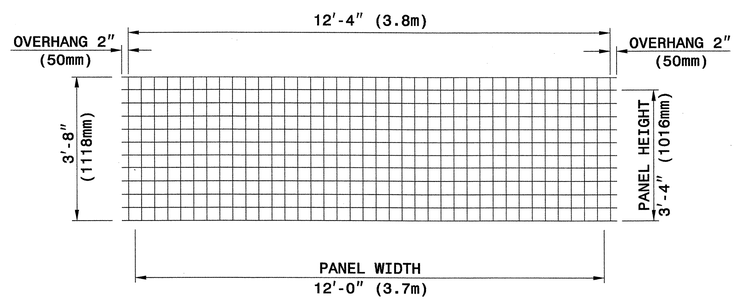


TYPE WH20



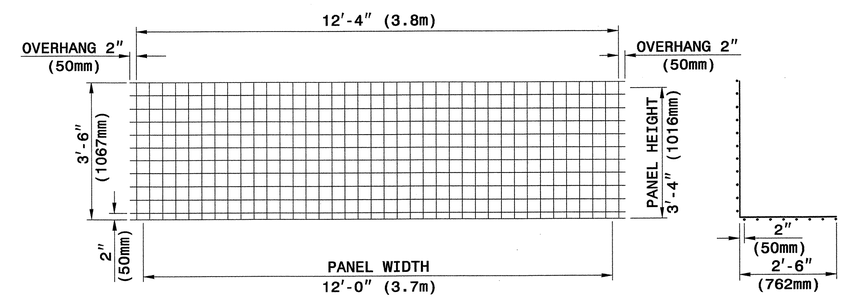
TYPE WB20

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)

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STANDARD DRAWING NO. 1801.02

RETAINED EARTH TEMPORARY WALL

SHEET 6 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
R-2911B	2-V

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

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ENGINEER

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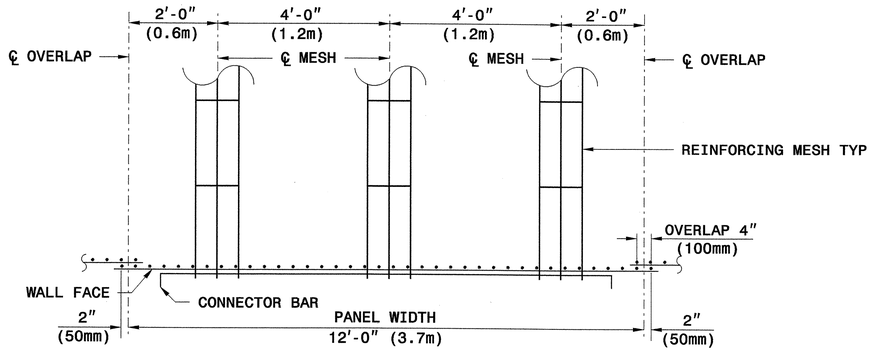
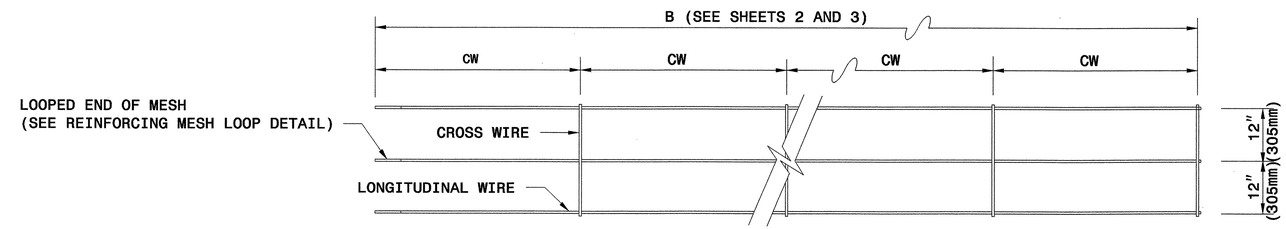


REINFORCING MESH PLACEMENT DETAIL
(PLAN VIEW)

½" (13mm) DIA. BAR

CONNECTOR BAR



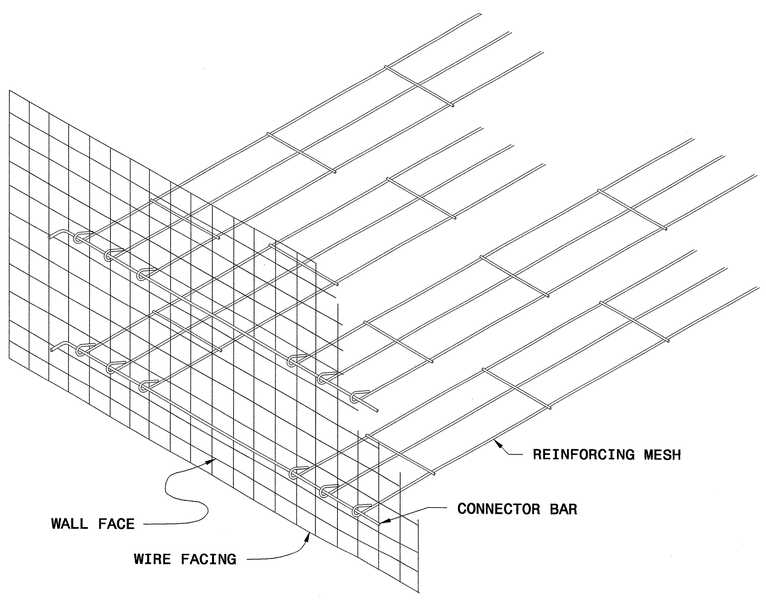
IF REINFORCEMENT LENGTH IS NOT AN INCREMENT OF 2'-0" (610mm) MAKE CW EQUAL TO 12" (305mm) AT THE END OF THE REINFORCING MESH OPPOSITE THE LOOPED END

3W8 X W8 x 2.0' (3MW52 X MW52 X 610mm)

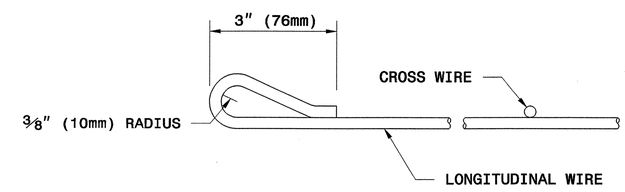
NO. OF LONGITUDINAL WIRES
GAUGE OF LONGITUDINAL WIRES
GAUGE OF CROSS WIRES
SPACING OF CROSS WIRES IN FT (mm), CW

REINFORCING MESH DESIGNATION

REINFORCING MESH



GENERAL ASSEMBLY DETAIL



REINFORCING MESH LOOP DETAIL

The Reinforced Earth Company

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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
R-2911B	2-W

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

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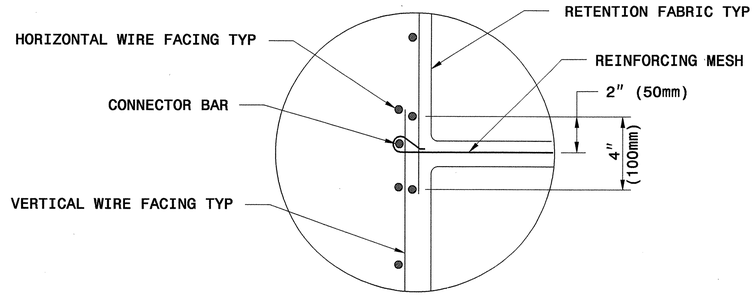
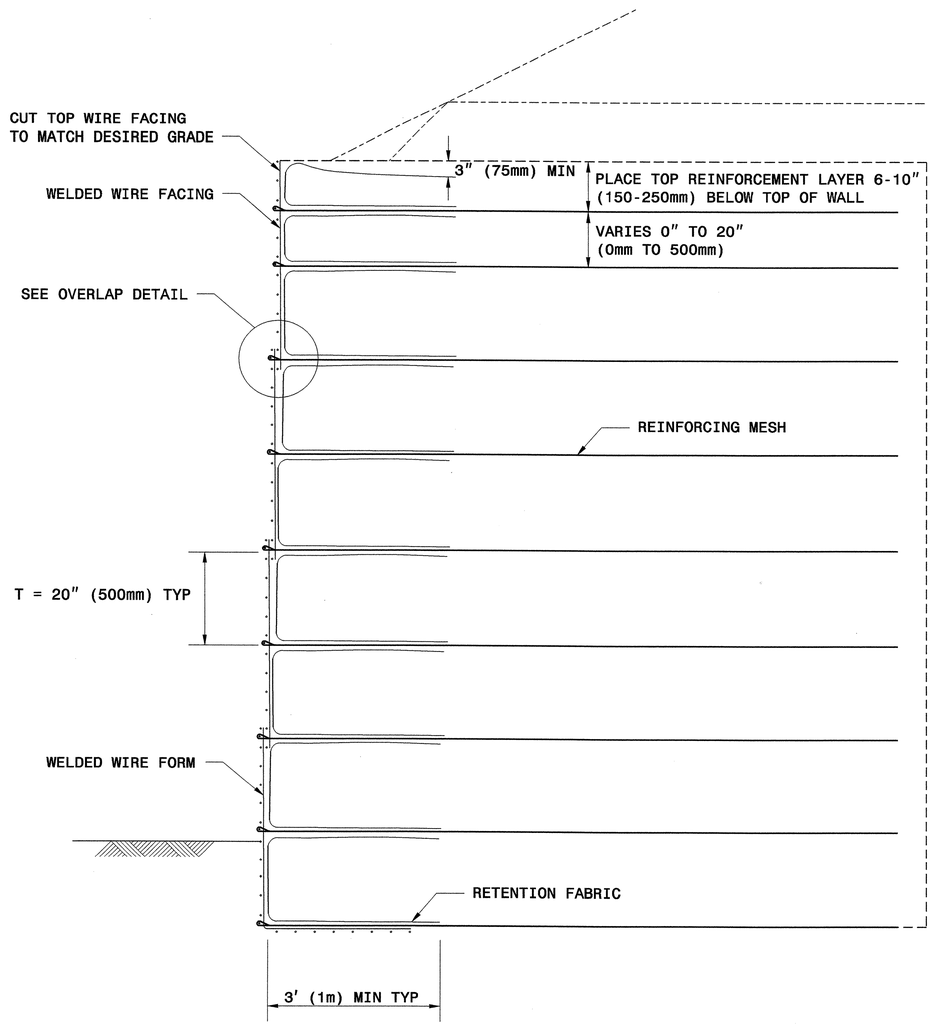
ENGINEER

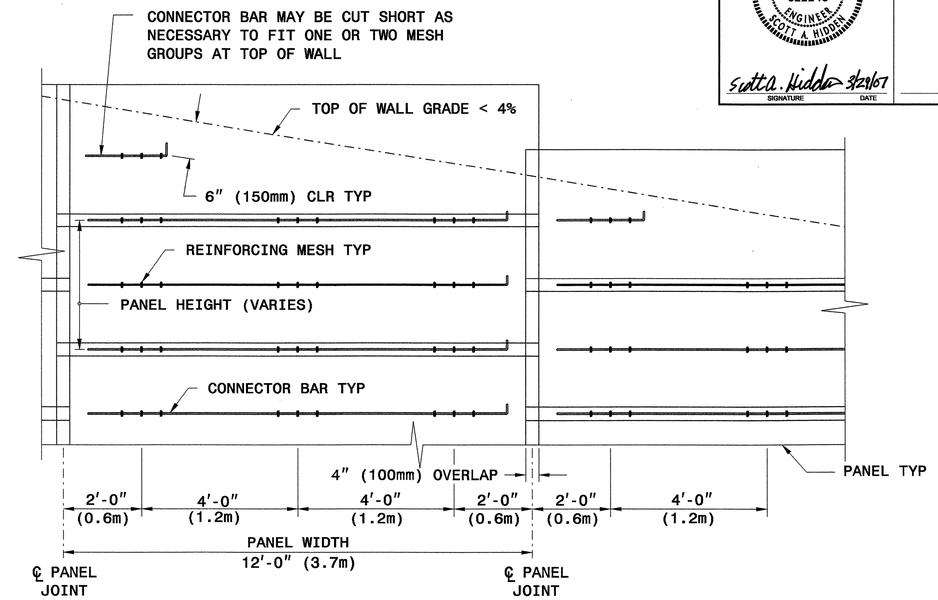
SIGNATURE DATE



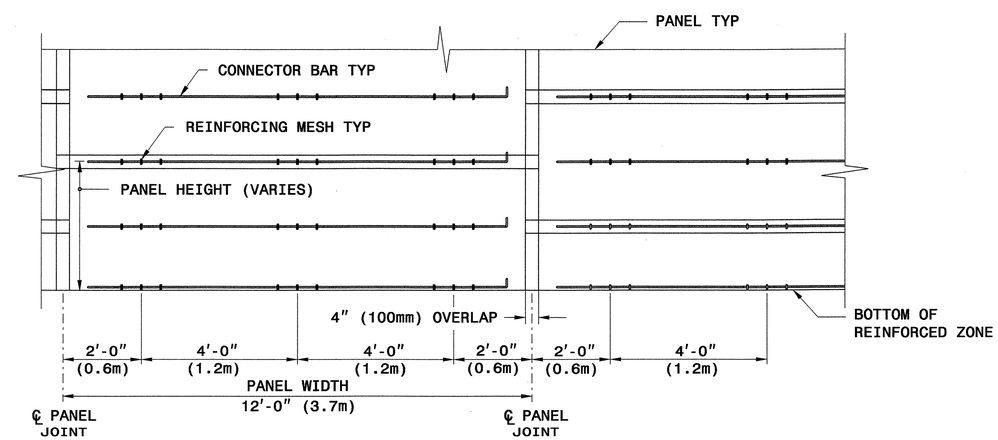
OVERLAP DETAIL



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

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 8 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
R-2911B	2-X

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

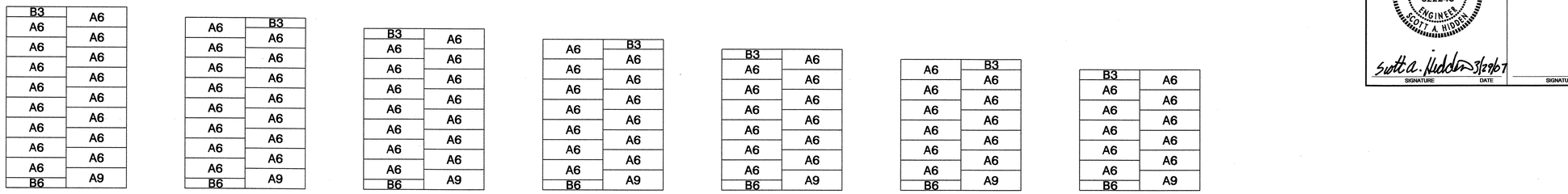
Scott A. Hidden 3/29/07

SIGNATURE DATE

ENGINEER

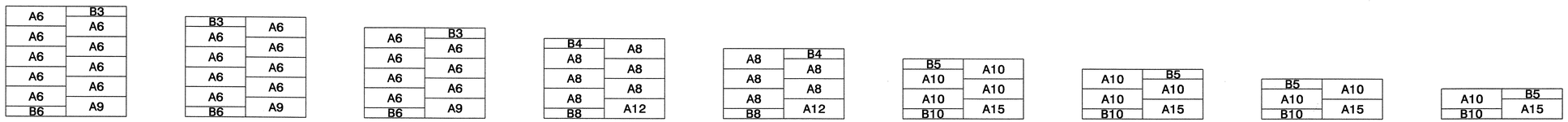
SIGNATURE DATE

PANEL LAYOUTS

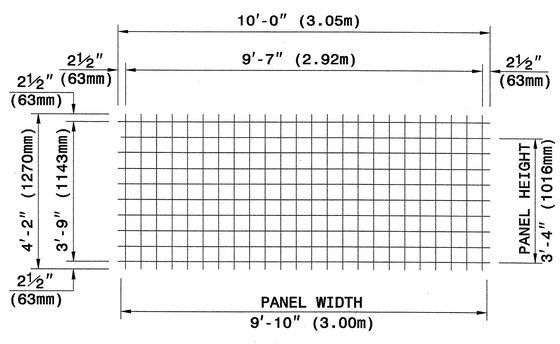


H - WALL HEIGHT

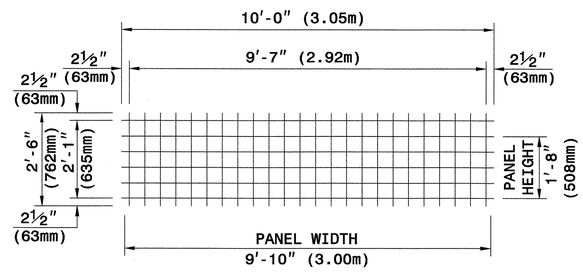
(FEET-INCHES)	< 28 - 0	< 27 - 8	< 26 - 0	< 24 - 4	< 22 - 8	< 21 - 0	< 19 - 4
(METER)	< 8.5	< 8.4	< 7.9	< 7.4	< 6.9	< 6.4	< 5.9



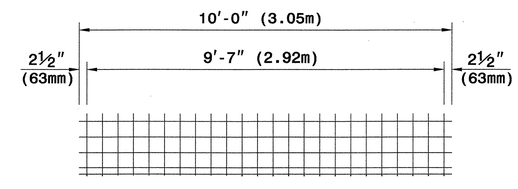
(FEET-INCHES)	< 17 - 8	< 16 - 0	< 14 - 4	< 12 - 8	< 11 - 0	< 9 - 4	< 7 - 8	< 6 - 0	< 4 - 4
(METER)	< 5.4	< 4.9	< 4.4	< 3.9	< 3.4	< 2.8	< 2.3	< 1.8	< 1.3



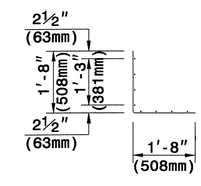
TYPE A



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

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 9 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
R-2911B	2-Y

GEOTECHNICAL ENGINEER

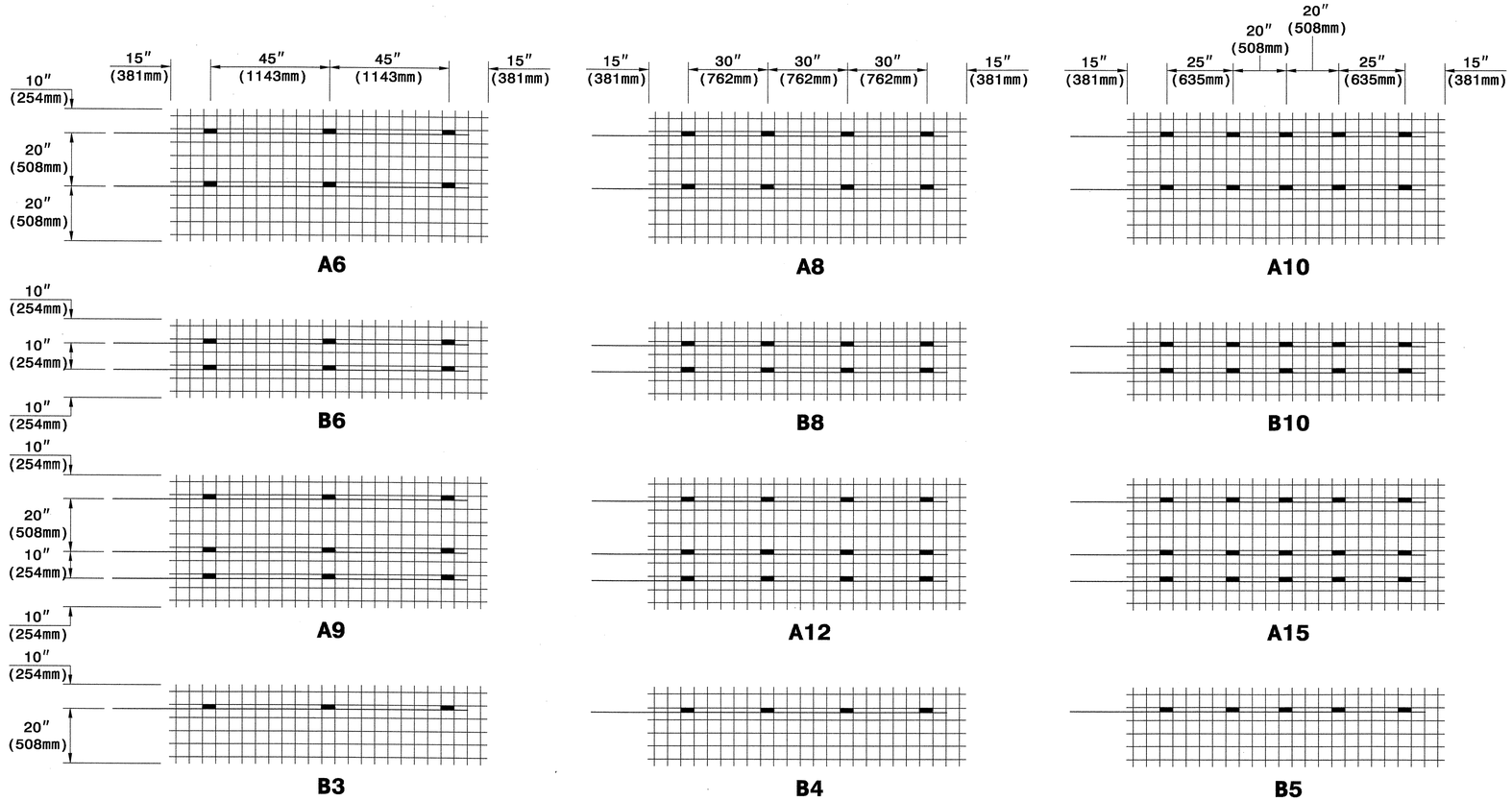
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

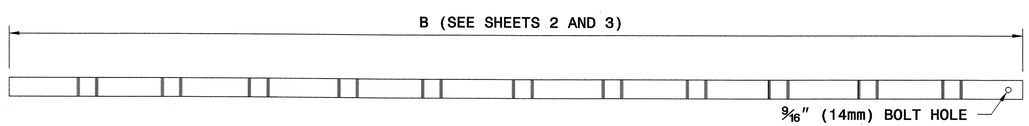


KEY: A8

NUMBER OF REINFORCING STRIPS

PANEL TYPE

CONNECTOR ROD AND REINFORCING STRIP PLACEMENT DIAGRAMS



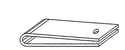
REINFORCING STRIP - 2″ X 5/32″ (50mm X 4mm)

1/2″ (13mm) DIA. ROD

CONNECTOR ROD

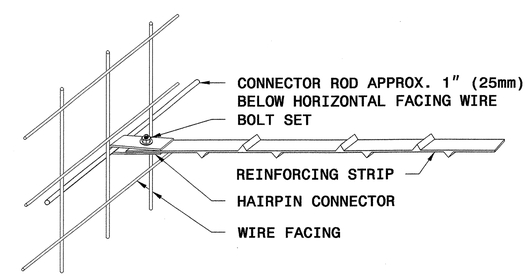
1/2″ (13mm) BOLT WITH NUT AND WASHER

BOLT SET



HAIRPIN CONNECTOR

WALL COMPONENTS



STRIP TO FACING CONNECTION

The Reinforced Earth Company

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

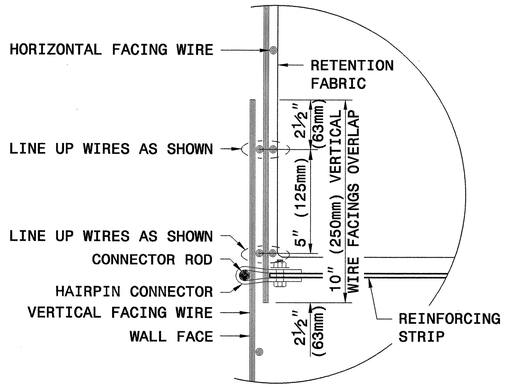
TERRATREL TEMPORARY WALL

SHEET 10 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
R-2911B	2-Z

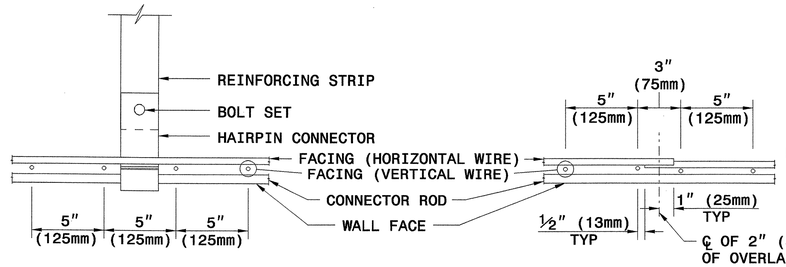
GEOTECHNICAL ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN — Scott A. Hidden 3/29/07 (SIGNATURE, DATE)

ENGINEER (SIGNATURE, DATE)

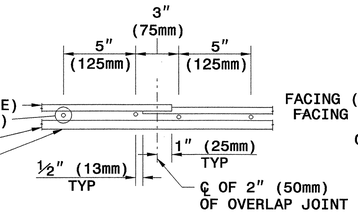


OVERLAP FACINGS VERTICALLY ONE FULL 5" (125mm) WIRE SQUARE DISREGARDING HALF SQUARES AT EDGES

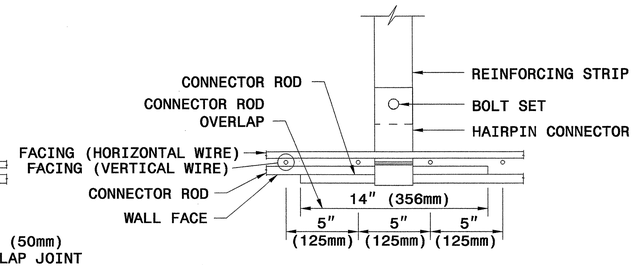
VERTICAL OVERLAP DETAIL



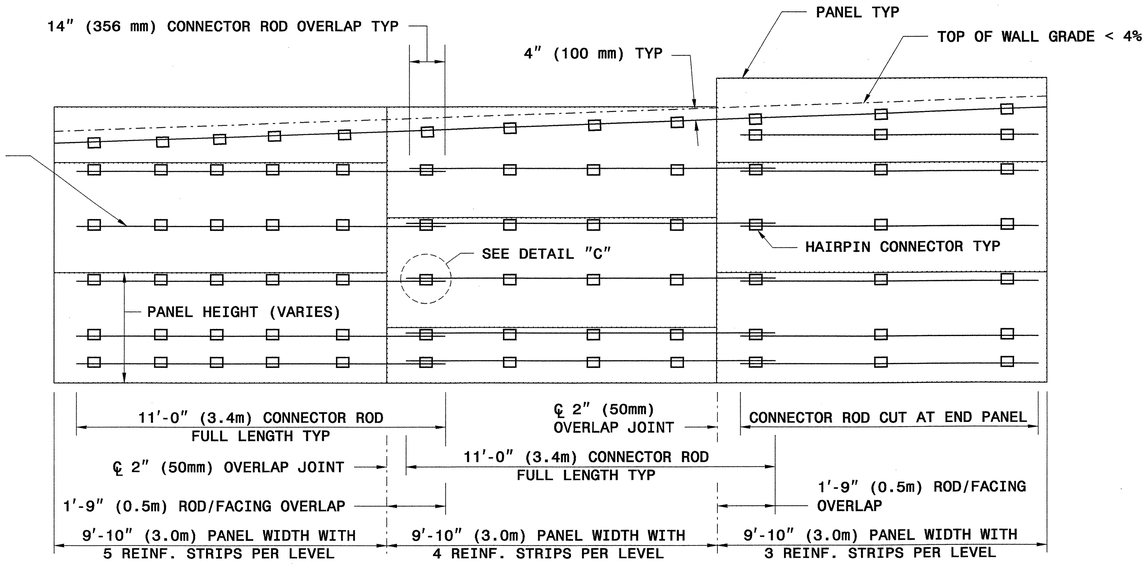
PLAN DETAIL 'A'
STRIP CONNECTION



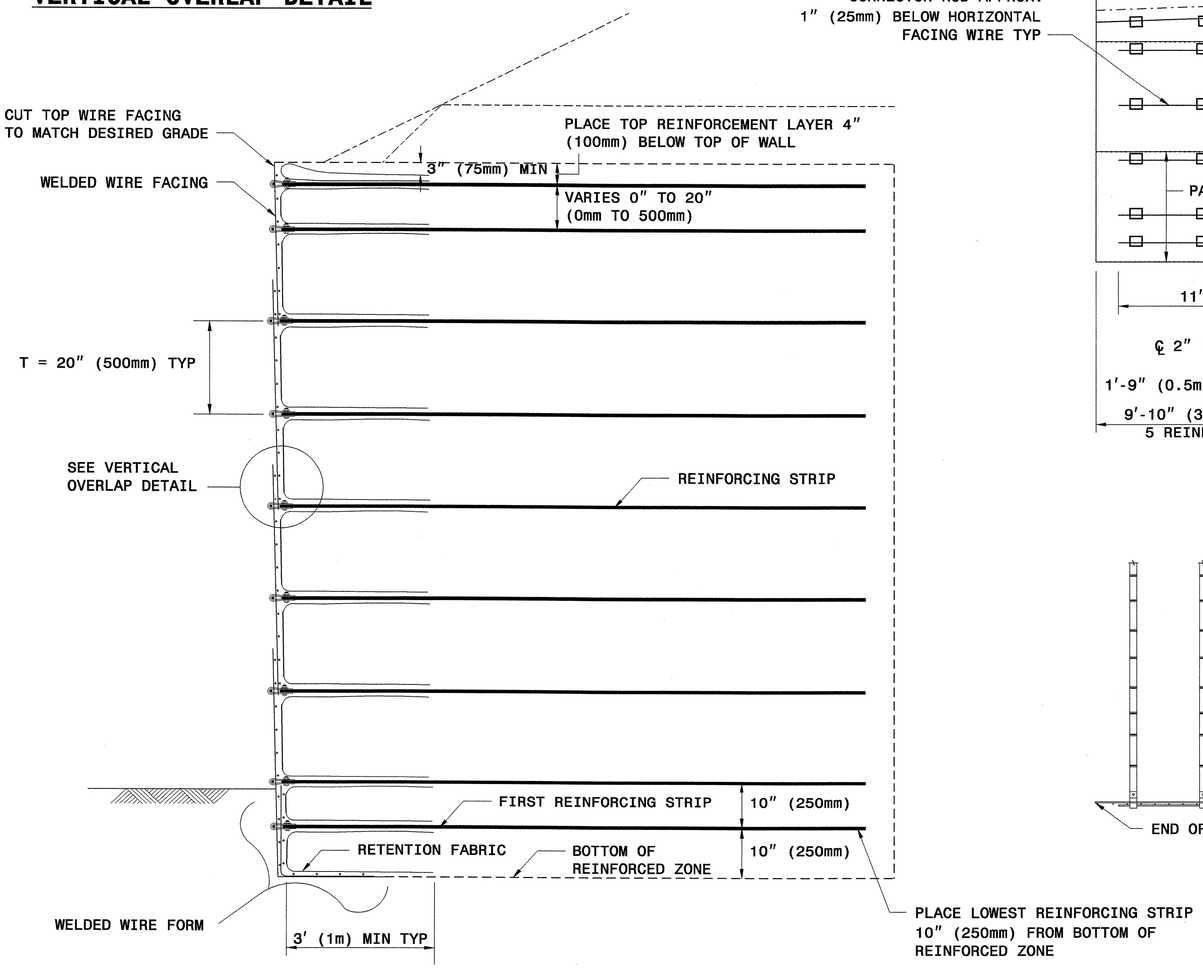
PLAN DETAIL 'B'
HORIZONTAL OVERLAP DETAIL



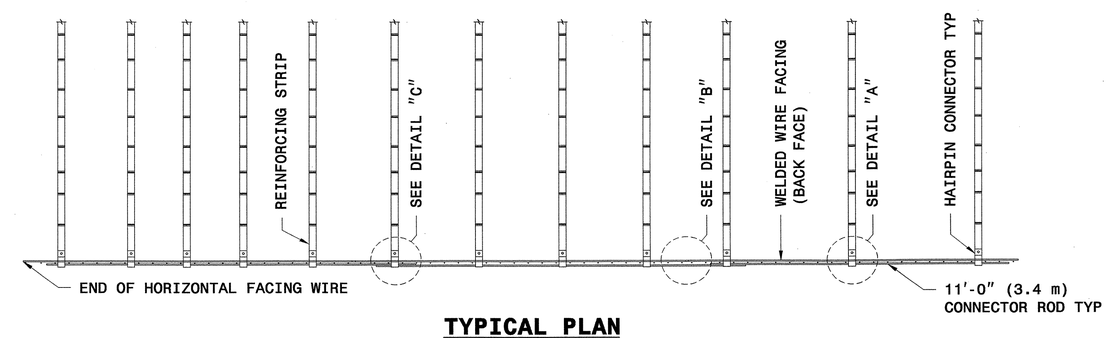
PLAN DETAIL 'C'
STRIP CONNECTION WITH HORIZONTAL OVERLAP DETAIL



TYPICAL ELEVATION
(WIRES NOT SHOWN FOR CLARITY)



TYPICAL SECTION



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

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	3

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C201932

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0000950000-E	SP	4,000	SF	GENERIC MISCELLANEOUS ITEM SLOPE STABILIZATION
0001000000-E	200	Lump Sum		CLEARING & GRUBBING .. ACRE(S)
0008000000-E	200	2	ACR	SUPPLEMENTARY CLEARING & GRUB-BING
0015000000-N	205	1	EA	SEALING ABANDONED WELLS
0022000000-E	225	150,600	CY	UNCLASSIFIED EXCAVATION
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ************ (137+86.34)
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ************ (138+03.66)
0036000000-E	225	4,000	CY	UNDERCUT EXCAVATION
0080000000-E	SP	2,500	TON	CLASS IV SUBGRADE STABILIZA-TION
0106000000-E	230	62,600	CY	BORROW EXCAVATION
0134000000-E	240	6,840	CY	DRAINAGE DITCH EXCAVATION
0141000000-E	240	2,200	LF	BERM DITCH CONSTRUCTION
0156000000-E	250	2,560	SY	REMOVAL OF EXISTING ASPHALT PAVEMENT
0177000000-E	250	34,000	SY	BREAKING OF EXISTING ASPHALT PAVEMENT
0192000000-N	260	20	HR	PROOF ROLLING
0195000000-E	265	3,000	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	6,000	SY	FABRIC FOR SOIL STABILIZATION
0199000000-E	SP	1,320	SF	TEMPORARY SHORING
0318000000-E	300	1,780	TON	FOUNDATION CONDITIONING MATE-RIAL, MINOR STRS
0384000000-E	310	224	LF	30" RC PIPE CULVERTS, CLASS III
0426000000-E	310	76	LF	72" RC PIPE CULVERTS, CLASS III
0708000000-E	310	836	LF	15" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
0714000000-E	310	40	LF	18" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
0720000000-E	310	268	LF	24" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
0726000000-E	310	40	LF	30" BIT COAT CS PIPE CULVERTS, TYPE B 0.079" THICK
0806000000-E	310	28	EA	15" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK
0807000000-E	310	2	EA	18" BIT COAT CS PIPE ELBOWS, T YPE B 0.064" THICK
0808000000-E	310	6	EA	24" BIT COAT CS PIPE ELBOWS, T YPE B 0.064" THICK
0809000000-E	310	2	EA	30" BIT COAT CS PIPE ELBOWS, T YPE B 0.079" THICK
0973100000-E	330	63	LF	**" WELDED STEEL PIPE IN SOIL (24")
0973100000-E	330	117	LF	**" WELDED STEEL PIPE IN SOIL (72")
0973300000-E	330	21	LF	**" WELDED STEEL PIPE NOT IN SOIL (24")
0973300000-E	330	39	LF	**" WELDED STEEL PIPE NOT IN SOIL (72")
0995000000-E	340	1,984	LF	PIPE REMOVAL
1011000000-N	500	Lump Sum		FINE GRADING
1044000000-E	501	56,480	SY	LIME TREATED SOIL (SLURRY METHOD)
1066000000-E	501	570	TON	LIME FOR LIME TREATED SOIL
1110000000-E	510	500	TON	STABILIZER AGGREGATE
1121000000-E	520	43,700	TON	AGGREGATE BASE COURSE
1176000000-E	542	18,830	SY	SOIL CEMENT BASE
1187000000-E	542	518	TON	PORTLAND CEMENT FOR SOIL CE-MENT BASE
1198000000-E	SP	290	TON	AGGREGATE FOR SOIL CEMENT BASE
1209000000-E	543	11,300	GAL	ASPHALT CURING SEAL
1220000000-E	545	10,000	TON	INCIDENTAL STONE BASE
1275000000-E	600	15,295	GAL	PRIME COAT
1297000000-E	607	24,300	SY	MILLING ASPHALT PAVEMENT, ***" DEPTH (4")
1297000000-E	607	1,400	SY	MILLING ASPHALT PAVEMENT, ***" DEPTH (5")

ItemNumber	Sec #	Quantity	Unit	Description
1489000000-E	610	780	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1491000000-E	610	12,940	TON	ASPHALT CONC BASE COURSE, TYPE B25.0C
1498000000-E	610	140	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
1503000000-E	610	24,710	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C
1519000000-E	610	1,340	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
1523000000-E	610	25,530	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5C
1560000000-E	620	1,840	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
1565000000-E	620	1,535	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 70-22
1693000000-E	654	440	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
2000000000-N	806	117	EA	RIGHT OF WAY MARKERS
2022000000-E	815	504	CY	SUBDRAIN EXCAVATION
2033000000-E	815	252	CY	SUBDRAIN FINE AGGREGATE
2044000000-E	815	1,500	LF	6" PERFORATED SUBDRAIN PIPE
2055000000-E	815	45	EA	6" SUBDRAIN PIPE WYES, TEES, & ELBOWS
2066000000-N	815	3	EA	CONCRETE PAD FOR SUBDRAIN PIPE OUTLET
2077000000-E	815	18	LF	6" OUTLET PIPE (SUBDRAINS)
2143000000-E	818	20	TON	BLOTTING SAND
2209000000-E	838	4.9	CY	ENDWALLS
2220000000-E	838	14.2	CY	REINFORCED ENDWALLS
2253000000-E	840	10.155	CY	PIPE COLLARS
2264000000-E	840	2.134	CY	PIPE PLUGS
2275000000-E	SP	150	CY	FLOWABLE FILL
2286000000-N	840	113	EA	MASONRY DRAINAGE STRUCTURES
2308000000-E	840	44.2	LF	MASONRY DRAINAGE STRUCTURES
2364000000-N	840	5	EA	FRAME WITH TWO GRATES, STD 840.16
2364200000-N	840	11	EA	FRAME WITH TWO GRATES, STD 840.20
2365000000-N	840	64	EA	FRAME WITH TWO GRATES, STD 840.22
2374000000-N	840	7	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)
2374000000-N	840	14	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)
2374000000-N	840	12	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)
2396000000-N	840	3	EA	FRAME WITH COVER, STD 840.54
2542000000-E	846	31,700	LF	1'-6" CONCRETE CURB & GUTTER
2549000000-E	846	3,000	LF	2'-6" CONCRETE CURB & GUTTER
2556000000-E	846	3,300	LF	SHOULDER BERM GUTTER
2577000000-E	846	400	LF	CONCRETE EXPRESSWAY GUTTER
2605000000-N	848	8	EA	CONCRETE WHEELCHAIR RAMPS
2612000000-E	848	200	SY	6" CONCRETE DRIVEWAY
2619000000-E	850	130	SY	4" CONCRETE PAVED DITCH
2655000000-E	852	1,875	SY	5" MONOLITHIC CONCRETE ISLANDS (KEYED IN)
2752000000-E	SP	1,000	LF	GENERIC PAVING ITEM TEMPORARY 9" X 12" ASPHALT CURBING
2920000000-N	SP	1	EA	CONVERT EXISTING DROP INLET TO CATCH BASIN
2938000000-N	SP	1	EA	CONVERT EXISTING DROP INLET TO JUNCTION BOX WITH MANHOLE COVER
2965000000-N	SP	4	EA	CONVERT EXISTING JUNCTION BOX TO CATCH BASIN
2995000000-N	SP	1	EA	GENERIC DRAINAGE ITEM CONVERT EXISTING MANHOLE TO CATCH BASIN
3000000000-N	SP	2	EA	IMPACT ATTENUATOR UNIT, TYPE 350

ItemNumber	Sec #	Quantity	Unit	Description
3030000000-E	862	5,200	LF	STEEL BM GUARDRAIL
3045000000-E	862	150	LF	STEEL BM GUARDRAIL, SHOP CURVED
3150000000-N	862	10	EA	ADDITIONAL GUARDRAIL POSTS
3195000000-N	862	2	EA	GUARDRAIL ANCHOR UNITS, TYPE AT-1
3270000000-N	SP	8	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3317000000-N	862	8	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77
3380000000-E	862	350	LF	TEMPORARY STEEL BM GUARDRAIL
3389100000-N	SP	4	EA	GUARDRAIL ANCHOR UNITS, TYPE 350 TEMPORARY
3503000000-E	866	28,400	LF	WOVEN WIRE FENCE, 47" FABRIC
3509000000-E	866	1,775	EA	4" TIMBER FENCE POSTS, 7'-6" LONG
3515000000-E	866	475	EA	5" TIMBER FENCE POSTS, 8'-0" LONG
3557000000-E	866	500	LF	ADDITIONAL BARBED WIRE
3559000000-E	866	5,900	LF	** STRAND BARBED WIRE FENCE WITH POSTS (4)
3564000000-E	866	4	EA	SINGLE GATES, **" HIGH, **' WIDE, **' OPENING (48", 16', 16')
3575000000-E	SP	500	LF	GENERIC FENCING ITEM TEMP 4 STRAND BARBED WIRE FENCE WITH POSTS
3595000000-E	869	325	LF	RELAPPING GUARDRAIL
3628000000-E	876	440	TON	RIP RAP, CLASS I
3649000000-E	876	880	TON	RIP RAP, CLASS B
3656000000-E	876	4,605	SY	FILTER FABRIC FOR DRAINAGE
4048000000-E	902	1	CY	REINFORCED CONCRETE SIGN FOUN-DATIONS
4060000000-E	903	348	LB	SUPPORTS, BREAKAWAY STEEL BEAM
4072000000-E	903	1,410	LF	SUPPORTS, 3-LB STEEL U-CHANNEL
4096000000-N	904	3	EA	SIGN ERECTION, TYPE D
4102000000-N	904	93	EA	SIGN ERECTION, TYPE E
4108000000-N	904	3	EA	SIGN ERECTION, TYPE F
4116100000-N	904	1	EA	SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (A)
4116100000-N	904	2	EA	SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (E)
4141000000-N	907	1	EA	DISPOSAL OF SUPPORT, WOOD
4155000000-N	907	35	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4192000000-N	907	2	EA	DISPOSAL OF SUPPORT, U-CHANNEL
4400000000-E	1110	688	SF	WORK ZONE SIGNS (STATIONARY)
4405000000-E	1110	436	SF	WORK ZONE SIGNS (PORTABLE)
4410000000-E	1110	143	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4415000000-N	1115	2	EA	FLASHING ARROW PANELS, TYPE C
4420000000-N	1120	4	EA	CHANGEABLE MESSAGE SIGN
4430000000-N	1130	704	EA	DRUMS
4435000000-N	1135	115	EA	CONES
4445000000-E	1145	550	LF	BARRICADES (TYPE III)
4450000000-N	1150	1,266	HR	FLAGGER
4465000000-N	1160	2	EA	TEMPORARY CRASH CUSHIONS
4480000000-N	1165	1	EA	TMIA
4485000000-E	1170	368	LF	PORTABLE CONCRETE BARRIER
4510000000-N	SP	40	HR	POLICE
4516000000-N	1180	100	EA	SKINNY DRUM
4600000000-N	SP	17	EA	GENERIC TRAFFIC CONTROL ITEM WARNING FLAGS
4650000000-N	1251	757	EA	TEMPORARY RAISED PAVEMENT MARKERS
4685000000-E	1205	34,322	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)
4686000000-E	1205	15,122	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)

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beason AT WSRAL-0505A

STATE OF NORTH CAROLINA
SUMMARY OF QUANTITIES

PROJECT REFERENCE No.	SHEET No.
R-2911B	3

Sheet 2 of 2

ItemNumber	Sec #	Quantity	Unit	Description
4695000000-E	1205	3,771	LF	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)
4710000000-E	1205	339	LF	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)
4715000000-E	1205	288	LF	THERMOPLASTIC RUMBLE STRIP (4" 240 MILS)
4721000000-E	1205	8	EA	THERMOPLASTIC PAVEMENT MARKING CHARACTER (120 MILS)
4725000000-E	1205	103	EA	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)
4770000000-E	1205	1,580	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (III)
4770000000-E	1205	1,140	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (IV)
4810000000-E	1205	242,895	LF	PAINT PAVEMENT MARKING LINES (4")
4820000000-E	1205	2,296	LF	PAINT PAVEMENT MARKING LINES (8")
4835000000-E	1205	1,680	LF	PAINT PAVEMENT MARKING LINES (24")
4840000000-N	1205	16	EA	PAINT PAVEMENT MARKING CHARACTER
4845000000-N	1205	222	EA	PAINT PAVEMENT MARKING SYMBOL
4850000000-E	1205	39,231	LF	REMOVAL OF PAVEMENT MARKING LINES (4")
4870000000-E	1205	86	LF	REMOVAL OF PAVEMENT MARKING LINES (24")
4905000000-N	1253	679	EA	SNOWPLOWABLE PAVEMENT MARKERS
5325600000-E	1510	16	LF	6" WATER LINE
5325800000-E	1510	162	LF	8" WATER LINE
5326600000-E	1510	2,266	LF	16" WATER LINE
5540000000-E	1515	1	EA	6" VALVE
5546000000-E	1515	1	EA	8" VALVE
5672000000-N	1515	4	EA	RELOCATE FIRE HYDRANT
5801000000-E	1530	162	LF	ABANDON 8" UTILITY PIPE
5900000000-E	SP	150	TON	GENERIC UTILITY ITEM FOUNDATION CONDITIONING MATERIAL
6000000000-E	1605	5,300	LF	TEMPORARY SILT FENCE
6006000000-E	1610	2,675	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	3,875	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	4,510	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	78.5	ACR	TEMPORARY MULCHING
6018000000-E	1620	3,100	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	13.25	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	800	LF	TEMPORARY SLOPE DRAINS
6027000000-N	1622	17	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
6029000000-E	SP	1,250	LF	SAFETY FENCE
6030000000-E	1630	46,070	CY	SILT EXCAVATION
6036000000-E	1631	46,000	SY	MATTING FOR EROSION CONTROL
6037000000-E	SP	135	SY	COIR FIBER MAT
6038000000-E	SP	3,590	SY	PERMANENT SOIL REINFORCEMENT MAT
6042000000-E	1632	1,215	LF	1/4" HARDWARE CLOTH
6070000000-N	SP	24	EA	SPECIAL STILLING BASINS
6071010000-E	SP	360	LF	WATTLE
6071020000-E	SP	225	LB	POLYACRYLAMIDE (PAM)
6071030000-E	SP	5,235	LF	COIR FIBER BAFFLES
6071050000-E	SP	5	EA	**" SKIMMER (1-1/2")
6071050000-E	SP	14	EA	**" SKIMMER (2")
6071050000-E	SP	3	EA	**" SKIMMER (2-1/2")
6084000000-E	1660	84	ACR	SEEDING & MULCHING
6087000000-E	1660	48.5	ACR	MOWING

ItemNumber	Sec #	Quantity	Unit	Description
6090000000-E	1661	700	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	1.75	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	1,950	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	58	TON	FERTILIZER TOPDRESSING
6114000000-N	SP	12	HR	SPECIALIZED HAND MOWING
6117000000-N	SP	54	EA	RESPONSE FOR EROSION CONTROL
6123000000-E	1670	0.25	ACR	REFORESTATION
7060000000-E	1705	1,600	LF	SIGNAL CABLE
7120000000-E	1705	13	EA	VEHICLE SIGNAL HEAD (12", 3 SECTION)
7144000000-E	1705	5	EA	VEHICLE SIGNAL HEAD (12", 5 SECTION)
7264000000-E	1710	1,170	LF	MESSENGER CABLE (3/8")
7300000000-E	1715	770	LF	UNPAVED TRENCHING (**********) (1, 2")
7324000000-N	1716	6	EA	JUNCTION BOX (STANDARD SIZE)
7360000000-N	1720	4	EA	WOOD POLE
7372000000-N	1721	8	EA	GUY ASSEMBLY
7408000000-E	1722	1	EA	1" RISER WITH WEATHERHEAD
7420000000-E	1722	4	EA	2" RISER WITH WEATHERHEAD
7444000000-E	1725	3,770	LF	INDUCTIVE LOOP SAWCUT
7456000000-E	1726	5,410	LF	LEAD-IN CABLE (**********) (14-2)
7575142000-N	SP	2	EA	900MHZ WIRELESS RADIO SYSTEM
7576000000-N	SP	4	EA	METAL STRAIN SIGNAL POLE
7613000000-N	SP	4	EA	SOIL TEST
7614100000-E	SP	24	CY	DRILLED PIER FOUNDATION
7684000000-N	1750	1	EA	SIGNAL CABINET FOUNDATION
7756000000-N	1751	1	EA	CONTROLLER WITH CABINET (TYPE 2070L, BASE MOUNTED)
7780000000-N	1751	7	EA	DETECTOR CARD (TYPE 2070L)
7901000000-N	1753	1	EA	CABINET BASE EXTENDER

ItemNumber	Sec #	Quantity	Unit	Description
7980000000-N	SP	2	EA	GENERIC SIGNAL ITEM FURNISH WIRELESS LIGHTNING ARRESTORS
7980000000-N	SP	1	EA	GENERIC SIGNAL ITEM FURNISH WIRELESS RADIO MODEMS
******* BEGIN SCHEDULE AA ******* ******* (3 ALTERNATES) *******				
0366000000-E AA1	310	10,612	LF	15" RC PIPE CULVERTS, CLASS III
0372000000-E AA1	310	2,460	LF	18" RC PIPE CULVERTS, CLASS III
0378000000-E AA1	310	2,096	LF	24" RC PIPE CULVERTS, CLASS III
0390000000-E AA1	310	40	LF	36" RC PIPE CULVERTS, CLASS III
*** OR ***				
0366000000-E AA2	310	6,060	LF	15" RC PIPE CULVERTS, CLASS III
0372000000-E AA2	310	1,744	LF	18" RC PIPE CULVERTS, CLASS III
0378000000-E AA2	310	972	LF	24" RC PIPE CULVERTS, CLASS III
0390000000-E AA2	310	24	LF	36" RC PIPE CULVERTS, CLASS III
0536000000-E AA2	SP	4,552	LF	***" HDPE PIPE CULVERTS (15")
0536000000-E AA2	SP	716	LF	***" HDPE PIPE CULVERTS (18")
0536000000-E AA2	SP	1,124	LF	***" HDPE PIPE CULVERTS (24")
0536000000-E AA2	SP	16	LF	***" HDPE PIPE CULVERTS (36")
*** OR ***				
0366000000-E AA3	310	6,060	LF	15" RC PIPE CULVERTS, CLASS III
0372000000-E AA3	310	1,744	LF	18" RC PIPE CULVERTS, CLASS III
0378000000-E AA3	310	972	LF	24" RC PIPE CULVERTS, CLASS III
0390000000-E AA3	310	24	LF	36" RC PIPE CULVERTS, CLASS III
0540000000-E AA3	SP	4,552	LF	***" ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, ****" THICK (15", 0.064")
0540000000-E AA3	SP	716	LF	***" ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, ****" THICK (18", 0.064")
0540000000-E AA3	SP	1,124	LF	***" ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, ****" THICK (24", 0.064")
0540000000-E AA3	SP	16	LF	***" ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, ****" THICK (36", 0.079")
******* END SCHEDULE AA *******				

COMPUTED BY: WCB DATE: 5/14/2008

CHECKED BY: KA (Mulkey, Inc.) DATE: 5/14/2008

WSRAL-0407A

WSRAL-0407A

PROJECT NO.	SHEET NO.
R-2911B	3-A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 12"	15"	18"	24"	30"	36"	42"	48"
SIZE / THICKNESS OR GAUGE																															
L 14+77	RT	1A	1B		826.1	826.1						16																			
L 21+90	RT	1		833.8	831.0																										
L 21+90	RT	1	2		831.0	828.3																			28						
L 21+90	RT	2		831.0	828.3																										
L 21+90	RT	2	3		828.3	827.1																			108						
L 23+00	RT	3		829.9	827.1																										
L 23+00	RT	3	4		827.1	826.1																			52						
L 26+09	CL	5		831.8	822.3																										
L 26+09	RT	5	6		822.3	827.6																			108						
L 27+20	RT	6		830.9	827.6																										
L 27+20	RT	6	7		827.6	828.0			64																						
L 27+85	CL	7		831.0	828.0																										
L 26+09	RT	8	9		821.9	819.7																							16		
L 26+09	LT	10		826.4	822.7																										
L 26+09	LT	10	11		822.7	824.9																			288						
L 29+00	LT	11		827.6	824.9																										
L 34+43	RT	12		829.1	826.3																										
L 34+43	RT	12	13		826.3	821.4			232																						
L 36+75	RT	13		824.2	821.4																										
L 36+75	RT	13	14		821.4	825.1			68																						
L 36+75	RT	13	15		821.4	825.1																			172						
L 36+75	CL	14		828.1	825.1																										
L 38+50	RT	15		820.8	818.1																										
L 38+50	RT	15	16		818.1	816.5																			60						
L 39+15	CL	17	18		819.9	816.3				156																					
L 42+50	RT	19		811.7	809.9																										
L 42+50	RT	19	20		808.9	808.4																			48						
L 43+50	LT	21		815.2	811.5																										
L 43+50	LT	21	22		811.5	808.8	0.022		108																						
L 44+60	LT	22		814.6	808.8																										
L 44+60	LT	22	23		808.8	809.7	0.010		52																						
L 44+60	LT	22	24		808.8	801.6	0.067			120																					
L 44+60	CL	22	25		808.8	810.8	0.067		24																						
L 44+82	LT	23		812.5	809.7																										
L 44+84	LT	25		814.6	810.8																										
L 44+84	LT	25	26		810.8	811.9	0.012		92																						
L 45+75	LT	26		814.9	811.9																										
L 45+75	LT	26	27		811.9	814.1			176																						
L 47+50	LT	27		817.1	814.1																										
L 47+00	RT	28	29		809.2	809.7	0.011																		52						
L 47+50	RT	29		812.4	809.7																										
L 47+50	RT	29	30		809.7	811.4	0.011		152																						
L 49+05	RT	30		815.7	811.4																										
L 49+05	RT	30	31		811.4	811.8	0.010																		44						
L 49+50	RT	31		816.4	811.8																										
L 49+50	RT	31	32		811.8	813.5	0.010																		156						
L 51+05	RT	32		818.8	813.5																										
L 51+05	CL	32	33		813.5	815.4	0.010		68																						
L 51+05	RT	32	35		813.5	817.5	0.010																		400						
L 51+05	CL	33		823.0	815.4																										
L 51+05	CL	33	34		815.4	816.1	0.010		60																						
L 51+05	LT	34		818.8	816.1																										
SHEET TOTALS									1096	276		16													1516				16		

STATION	STRUCTURE NO. FROM	STRUCTURE NO. TO	24" SMOOTH STEEL PIPE w/ TRENCHLESS CONSTRUCTION	15" SIDE DRAIN PIPE	30" SIDE DRAIN PIPE	36" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO FLAT GRATES STD. 840.20	G.D.I. FRAME WITH TWO SAG GRATES STD. 840.22	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.34	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING D.I. TO J.B. w/ M.H. (SEE SHEET 2-L)	CONVERT EXISTING D.I. OR J.B. TO C.B. (SEE SHEET 2-M)	CONVERT EXISTING M.H. TO C.B. (SEE SHEET 2-N)	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN. FT.	REMARKS
L 14+77	1A	1B																												0.656			
L 21+90	1								1										1		1											40	REMOVE FES & 1-12" RCP -L- Sta. 11+64 RT
L 21+90	1	2																														68	REMOVE 2-12" RCP & 1-15" RCP -L- Sta. 18+00 RT
L 21+90	2								1										1			1											
L 21+90	2	3																															
L 23+00	3								1										1			1											
L 23+00	3	4																															
L 26+09	5																								1	1							CONVERT TO JB W/ MH COVER
L 26+09	5	6																															
L 27+20	6								1			1	1																				
L 27+20	6	7																															
L 27+85	7								1			1		1																			
L 26+09	8	9																												0.764			TIE INTO EXISTING SYSTEM
L 26+09	10								1										1			1											TIE INTO EXISTING SYSTEM;REMOVE 2GI
L 26+09	10	11																															TIE INTO EXISTING SYSTEM
L 29+00	11								1										1			1											TIE INTO EXISTING SYSTEM
L 34+43	12								1										1			1											
L 34+43	12	13																														48	REMOVE 2-12" RCP AND 2 FES
L 36+75	13								1										1			1											
L 36+75	13	14																															
L 36+75	13	15																															
L 36+75	14								1			1		1																			
L 38+50	15								1										1			1											
L 38+50	15	16																															
L 39+15	17	18																														64	REMOVE HW, FES, & 1-18" RCP
L 42+50	19								1										1			1											
L 42+50	19	20																															
L 43+50	21								1			1		1																			
L 43+50	21	22																															
L 44+60	22								1	0.8		1	1																				
L 44+60	22	23																													0.232		REMOVE HW & FES\PLUG 24" RCP(2 PLACES)
L 44+60	22	24																															
L 44+60	22	25																															
L 44+82	23								1										1			1											
L 44+84	25								1			1	1																				
L 44+84	25	26																															
L 45+75	26								1			1			1																		
L 45+75	26	27																															
L 47+50	27								1			1			1																		
L 47+00	28	29																															
L 47+50	29								1										1			1											
L 47+50	29	30																														24	REMOVE 1-12" RCP
L 49+05	30								1										1			1											
L 49+05	30	31																														20	REMOVE 1-12" RCP
L 49+50	31								1										1			1											
L 49+50	31	32																															
L 51+05	32								1	0.3									1			1											
L 51+05	32	33																															
L 51+05	32	35																															
L 51+05	33								1	2.6		1		1																			
L 51+05	33	34																															
L 51+05	34								1										1			1											
SHEET TOTALS									24	3.7		9	3	4	2				15		1	14			1	1				1.42	0.232	264	

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

COMPUTED BY: WCB	DATE: 5/14/2008	PROJECT NO.	SHEET NO.
CHECKED BY: KA (Mulkey, Inc.)	DATE: 5/14/2008	R-2911B	3-B

WSRAL-0407A

WSRAL-0407A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C.P. (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 12"	15"	18"	24"	30"	36"	42"	48"	24" SMOOTH STEEL PIPE w/ TRENCHLESS CONSTRUCTION	15" SIDE DRAIN PIPE	30" SIDE DRAIN PIPE	36" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO FLAT GRATES STD. 840.20	G.D.I. FRAME WITH TWO SAG GRATES STD. 840.22	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.34	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING D.I. TO J.B. w/ M.H. (SEE SHEET 2-L)	CONVERT EXISTING D.I. OR J.B. TO C.B. (SEE SHEET 2-M)	CONVERT EXISTING M.H. TO C.B. (SEE SHEET 2-N)	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN. FT.	REMARKS
L 55+05	RT	35		824.0	817.5																																	1	1.5									1			1											
L 55+05	RT	35	38		817.5	818.3			88																																																				72	REMOVE 1-18" RCP
Y 10+50	LT	36		822.1	819.4																																	1										1			1											
Y 10+50	CL	36	37		819.4	818.8	0.010		52																																																					
Y 10+50	RT	37		822.1	818.8																																	1										1			1											
Y 10+50	RT	37	38		818.8	818.3	0.005																		112																																					
L 55+93	RT	38		824.6	818.3																																	1	1.3									1			1											
L 55+93	RT	38	39		818.3	825.6	0.010		80																																																				
L 56+07	RT	39		828.7	825.6																																	1							1	1																
L 63+00	LT	40		813.6	810.9																																	1										1			1											
L 63+00	LT	40	41		810.9	797.2																			700																																			40	REMOVE 2-12" RCP
L 70+03	LT	41		803.4	797.2																																	1	1.2									1			1											
L 70+03	CL	41	42		797.2	795.6	0.011				160																																																			REMOVE HW
L 70+03	LT	41	43		797.2	799.0	0.010																		96																																					
L 71+00	LT	43		801.7	799.0																																	1										1			1											
L 71+00	LT	43	44		799.0	804.7											20																																									1 @ 15"				BDO (STD. 850.10)
L 75+00	LT	45	46		806.0	793.7											28																																									1 @ 15"				BDO (STD. 850.10)
L 75+00	LT	46		796.5	793.7																																	1										1			1											
L 75+00	LT	46	47		793.7	792.7																			68																																					
L 75+65	LT	47		795.5	792.7																																	1										1			1											
L 75+65	LT	47	48		792.7	785.0			284																																																				276	REM. HW, BOX, 3-18", & 2-15" PIPES
L 78+45	LT	48		789.1	784.7																																	1										1			1											
L 78+45	LT	48	49		784.7	784.1	0.010			64																																																				
L 78+45	LT	48	54		785.0	786.8	0.009																		208																																			88	REMOVE EXISTING DI & 1-18" RCP
L 78+45	LT	49		793.2	784.1																																	1	4.1		1		1																			
L 78+45	CL	49	50		784.1	782.0	0.026			80																																																				
L 78+45	RT	50		785.0	781.5																																	1									1				1											
L 78+45	RT	50	51		782.3	787.6			160																																																					
L 78+45	RT	50	52		781.5	775.5	0.038				156																																																	
L 76+82	RT	51		790.4	787.6																																	1										1			1											
L 80+08	RT	52		785.0	775.5																																	1	4.5													1		1								
L 80+08	RT	52	53		775.5	759.7	0.075																				208																																			
L 80+50	LT	54		789.5	786.8																																	1										1			1											
L 80+50	LT	54	55		786.8	788.3			72																																																					
L 80+95	LT	55		791.4	788.3																																	1							1	1																
L 84+00	LT	56	57		785.5	777.8																					44																																	16	REMOVE 1-15" RCP
L 84+45	LT	57		787.2	777.8																																	1	4.4								1				1											
L 84+45	CL	57	58		777.8	774.0	0.024				160																																																0.232		REMOVE FES\PLUG 24" RCP(2 PLACES)
L 84+45	LT	57	59		777.8	778.6	0.010																				72																																			
L 85+13	LT	59		786.4	778.6																																	1	2.8								1				1											
L 85+13	CL	60	60A		782.9	774.6	0.090		92																																																					
L 85+13	CL	59	61		779.4	781.3	0.010																		224																																			28	REMOVE 1-12" RCP
L 85+13	CL	60		788.2	782.9																																	1	0.3		1	1																				
L 87+35	LT	61		786.4	781.3																																	1	0.1									1			1											
L 87+35	LT	61	62		781.3	788.3											24																																									1 @ 15"				BDO (STD. 850.10)
L 87+35	LT	61	63		781.3	785.7	0.090		496																																																					
L 92+30	LT	63		788.9	785.7																																	1										1			1											
L 92+30	LT	63	64		785.7	786.3	0.010		60																																																			20	REMOVE 1-12" RCP
L 92+90	LT	64		789.3	786.3																																	1										1			1											
L 92+90	LT	64	65		786.3	787.0	0.010		68																																																				20	REMOVE 1-12" RCP
SHEET TOTALS									1452	144	476						72								1408		324											23	20.2		2	1	1		2	2	3	15			18	1		1				3 @ 15"		0.232	560	

ABBREVIATIONS

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

COMPUTED BY: WCB DATE: 5/14/2008

CHECKED BY: KA (Mulkey, Inc.) DATE: 5/14/2008

WSRAL-0407A

WSRAL-0407A

PROJECT NO.	SHEET NO.
R-2911B	3-C

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE)								BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE)								CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D							
SIZE								12"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"	30"	36"	42"	48"
THICKNESS OR GAUGE																.064	.064	.064	.064	.079	.079	.109	.109								
L 93+60	LT	65		789.7	787.0																										
L 88+29	RT	66	67		783.1	782.3			44																						
L 88+76	RT	67		785.0	783.1																										
L 93+50	RT	68		787.2	784.4																										
L 93+78	RT	68	69		784.4	784.0																			28						
L 95+50	RT	70		793.2	790.5																										
L 95+50	RT	70	71		790.5	777.0											44														
L 96+73	LT	72	73		781.8	781.0					20																				
L 96+73	CL	73	74		781.0	778.0																									
L 96+73	RT	74	75		778.0	775.3					76																				
L 97+50	LT	76	77		784.1	785.3			40																						
L 97+90	LT	77		788.0	785.3																										
L 97+90	LT	77	78		785.3	787.3			40																						
L 98+30	LT	78		790.0	787.3																										
L 98+65	RT	79	80		784.1	787.0			28																						
L 98+95	RT	80		790.0	787.0																										
L 103+55	LT	81		793.4	790.7																										
L 103+55	LT	81	82		790.7	789.4	0.010		132																						
L 104+87	LT	82		792.4	789.4																										
L 104+87	LT	82	83		789.4	788.2			108																						
L 105+98	LT	83		790.9	788.2																										
L 105+98	LT	83	84		788.2	781.4			300																						
L 109+00	LT	84		784.7	781.7																										
L 109+00	LT	84	85		781.7	781.4																			52						
L 105+50	RT	86		791.6	788.9																										
L 105+50	RT	86	87		788.9	779.3			468																						
L 110+18	RT	87		782.0	779.3																										
L 110+18	RT	87	88		779.3	779.0			44																						
L 111+89	CL	89	90		777.3	769.0					204																				
L 113+50	LT	91		774.7	772.0																										
L 113+50	LT	91	92		772.0	781.5											24														
L 113+50	LT	91	93		772.0	754.3																			444						
L 118+00	LT	93		757.0	754.3																										
L 118+00	LT	93	94		754.3	736.6																			444						
L 122+50	LT	94		739.3	736.3																										
L 122+50	LT	94	95		736.6	752.2											32														
L 122+50	LT	94	96		736.3	728.9																				148					
L 124+00	LT	96		733.1	728.4																										
L 124+00	LT	96	97		728.4	705.0													204												
L 117+50	RT	98		760.5	757.8																										
L 117+50	RT	98	99		757.8	760.5			60																						
L 117+50	RT	98	100		757.8	747.5																			252						
L 117+50	RT	99		763.5	760.5																										
L 120+00	RT	100		750.5	747.8																										
L 120+00	RT	100	101		747.5	750.0			56																						
L 120+00	RT	100	102		747.5	737.1																			252						
L 120+00	RT	101		753.5	750.5																										
L 122+50	RT	102		739.9	737.1																										
L 122+50	RT	102	103		737.1	740.5			56																						
L 122+50	RT	102	105	739.9	737.1																				100						
SHEET TOTALS									1376		300						100		204						1572	148					

STATION	24" SMOOTH STEEL PIPE w/ TRENCHLESS CONSTRUCTION	15" SIDE DRAIN PIPE	30" SIDE DRAIN PIPE	36" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	ENDWALLS CU. YARDS C.S.P.	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	LIN. FT. B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO FLAT GRATES STD. 840.20	G.D.I. FRAME WITH TWO SAG GRATES STD. 840.22	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.34	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING D.I. TO J.B. w/ M.H. (SEE SHEET 2-L)	CONVERT EXISTING D.I. OR J.B. TO C.B. (SEE SHEET 2-M)	CONVERT EXISTING M.H. TO C.B. (SEE SHEET 2-N)	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN. FT.	REMARKS
L 93+60							1										1			1											
L 88+29																															
L 88+76							1											1		1											
L 93+50							1										1			1											
L 93+78																															
L 95+50							1										1		1												
L 95+50																											2 @ 15"				
L 96+73																															
L 96+73	84																											1.105		124	REMOVE 2 FES & 1-24" RCP
L 96+73																															
L 97+50																														20	REMOVE 1-12" RCP
L 97+90							1										1			1											
L 97+90																														24	REMOVE 1-12" RCP
L 98+30							1										1			1											
L 98+65																															
L 98+95							1										1			1											
L 103+55							1										1			1											
L 103+55																														20	REMOVE 1-12" RCP
L 104+87							1										1			1											
L 104+87																														20	REMOVE 1-12" RCP
L 105+98							1										1			1											
L 105+98																														24	REMOVE 1-15" RCP
L 109+00							1										1			1											
L 109+00																															
L 105+50							1										1			1										32	REMOVE 2-12" RCP
L 105+50																														20	REMOVE 1-15" RCP
L 110+18							1										1			1											
L 110+18																															
L 111+89																														76	REMOVE 2 FES & 1-24" RCP
L 113+50							1										1			1											
L 113+50																											1 @ 15"				BDO (STD. 850.10)
L 113+50																															
L 118+00							1										1			1											
L 118+00																													0.13		REMOVE HW\PLUG 18" RCP(2 PLACES)
L 122+50							1										1			1											
L 122+50																															BDO (STD. 850.10)
L 122+50																															
L 124+00							1									1				1											
L 124+00						1.4																					2 @ 24"				
L 117+50							1										1			1											
L 117+50																															
L 117+50																															
L 117+50							1			1			1																		
L 120+00							1										1			1											
L 120+00																															
L 120+00																															
L 120+00							1			1			1																		
L 122+50							1										1			1											
L 122+50																															
L 122+50																															
SHEET TOTALS	84					1.4	22			2			2			1	18	1	1	19							3 @ 15" 2 @ 24"	1.105	0.13	360	

ABBREVIATIONS

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

COMPUTED BY: WCB DATE: 5/14/2008

CHECKED BY: KA (Mulkey, Inc.) DATE: 5/14/2008

WSRAL-0407A

WSRAL-0407A

PROJECT NO.	SHEET NO.
R-2911B	3-D

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) SIZE 12"	15"	18"	24"	30"	36"	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) SIZE 12"	15"	18"	24"	30"	36"	42"	48"	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D SIZE 12"	15"	18"	24"	30"	36"	42"	48"	24" SMOOTH STEEL PIPE w/ TRENCHLESS CONSTRUCTION	15" SIDE DRAIN PIPE	30" SIDE DRAIN PIPE	36" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.
THICKNESS OR GAUGE																.064	.064	.064	.064	.079	.079	.109	.109														
L 122+50	RT	103		743.5	740.5																																
L 122+50	RT	103	104		740.5	743.5			76																												
L 121+75	RT	104		746.5	743.5																																
L 123+50	RT	105		735.3	732.5																																
L 123+50	RT	105	106		732.5	727.8																			48												
L 123+90	RT	106		730.5	727.8																																
L 123+90	RT	106	107		727.8	719.1											80																				
L 129+00	LT	108		719.6	716.9																																
L 129+00	LT	108	109		716.9	701.0											56																				
L 129+00	RT	110		719.6	716.9																																
L 129+00	RT	110	111		716.9	700.1											48																				
L 131+45	LT	112		717.4	714.6																																
L 131+45	LT	112	113		714.6	700.0											56																				
L 131+45	RT	114		717.4	714.6																																
L 131+45	RT	114	115		714.6	699.9											48																				
L 135+90	RT	116		718.6	715.9																																
L 135+90	RT	116	117		715.9	698.7											52																				
L 136+28	LT	118		718.5	715.8																																
L 136+28	LT	118	119		715.8	698.2											64																				
L 136+92	RT	120	121		697.8	697.6							24																								
L 137+97	LT	122	123		695.6	695.5					28																										
L 139+65	RT	124		717.5	714.4																																
L 139+65	RT	124	125		714.4	699.7											52																				
L 140+00	LT	126		717.0	714.3																																
L 140+00	LT	126	127		714.3	700.9											40																				
L 140+75	RT	128	129		700.8	704.0	0.043																		84												
L 141+40	RT	129		717.6	704.0																																
L 141+40	CL	129	130		704.3	715.0			48																												
L 141+40	RT	129	131		704.0	710.9				160																											
L 141+40	CL	130		718.0	715.0																																
L 143+00	RT	131		715.8	710.9																																
L 143+00	RT	131	132		710.9	717.9	0.018																		400												
L 147+00	RT	132		723.5	717.9																																
L 147+00	RT	132	133		717.9	735.8												40																			
L 142+00	LT	134	135		703.2	713.0											100																				0.7
L 143+00	LT	135		715.8	713.0																																
L 143+00	LT	135	136		713.0	718.0			296																												
L 145+95	LT	136		720.7	718.0																																
L 145+95	CL	136	137		718.0	722.0			100																												
L 146+35	RT	137		725.1	722.0																																
L 150+50	RT	138		729.7	724.5																																
L 150+50	CL	138	139		724.5	723.6					180																										
L 150+50	RT	138	140		724.5	742.7														40																	
L 150+50	RT	138	141		725.0																					500											
L 155+50	RT	141		739.7	735.0																																
L 155+50	CL	141	142		735.7	737.0			136																												
L 155+50	RT	141	143		735.0	740.0																				248											
L 155+50	LT	142		739.7	737.0																																
L 158+00	RT	143		744.7	740.0																																
L 158+00	RT	143	144		740.0	749.4													24																		
SHEET TOTALS									656	160	208	24				596	40	24		40					48	484	748										0.7

STATION	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	LIN. FT. A 5.0' THRU 10.0'	LIN. FT. B 10.0' AND ABOVE	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B')	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.19 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO FLAT GRATES STD. 840.20	G.D.I. FRAME WITH TWO SAG GRATES STD. 840.22	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.34	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING D.I. TO J.B. w/ M.H. (SEE SHEET 2-L)	CONVERT EXISTING D.I. OR J.B. TO C.B. (SEE SHEET 2-M)	CONVERT EXISTING M.H. TO C.B. (SEE SHEET 2-N)	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN. FT.	REMARKS
L 122+50	1				1			1																	
L 122+50																									
L 121+75	1				1			1																	
L 123+50	1											1			1										
L 123+50																									
L 123+90	1											1			1										
L 123+90																								12	REMOVE 1-18" RCP
L 129+00	1											1		1											
L 129+00																					2 @ 15"				
L 129+00	1											1		1											
L 129+00																					2 @ 15"				
L 131+45	1											1		1											
L 131+45																					2 @ 15"				
L 131+45	1											1		1											
L 131+45																					2 @ 15"				
L 135+90	1											1		1											
L 135+90																					2 @ 15"				
L 136+28	1											1		1											
L 136+28																					2 @ 15"				
L 136+92																								64	REMOVE 1-18" & 1-24" METAL PIPES
L 137+97																									
L 139+65	1											1		1											
L 139+65																					2 @ 15"				
L 140+00	1											1		1											
L 140+00																					2 @ 15"				
L 140+75																									
L 141+40	1	5	3.6												1	1									
L 141+40																									
L 141+40																								28	REMOVE 1-12" RCP
L 141+40	1				1	1																			
L 143+00	1											1		1											
L 143+00																									
L 147+00	1	0.6										1		1											
L 147+00																					2 @ 18"		0.232		BDO (STD. 850.10)/PLUG 24" RCP(2 Places)
L 142+00																					2 @ 15"				
L 143+00	1											1		1											
L 143+00																									
L 145+95	1											1		1											
L 145+95																									
L 146+35	1								1	1															
L 150+50	1	0.2									1			1											
L 150+50																									
L 150+50																					2 @ 30"				BDO (STD. 850.11)
L 150+50																									
L 155+50	1										1			1											
L 155+50																								24	REMOVE 1-12" RCP
L 155+50																									
L 155+50	1											1		1											
L 158+00	1										1			1											
L 158+00																					2 @ 24"				BDO (STD. 850.11)
SHEET TOTALS	23	5.8	3.6		3	1		2	1	1	3	15		8	10		1	1			18 @ 15"		0.232	128	
																					2 @ 18"				
																					2 @ 24"				
																					2 @ 30"				

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

WSRAL-0407A

COMPUTED BY: WCB DATE: 5/14/2008

CHECKED BY: KA (Mulkey, Inc.) DATE: 5/14/2008

PROJECT NO.	SHEET NO.
R-2911B	3-E

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 12"	15"	18"	24"	30"	36"	42"	48"	24" SMOOTH STEEL PIPE w/ TRENCHLESS CONSTRUCTION	15" SIDE DRAIN PIPE	30" SIDE DRAIN PIPE	36" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.
L 159+34	RT	145	146		750.3	750.6			48																												
L 160+25	LT	147		752.2	749.5																																
L 160+25	CL	147	148		749.5	749.1	0.005		56																												
L 160+25	RT	148		753.4	749.1																																
L 160+25	RT	148	149		749.1	747.3	0.037		124																												
L 161+50	RT	149		755.9	747.3																																
L 161+50	RT	149	150		747.3	737.0	0.082		48																												
L 161+50	RT	150	150A														28																				
L 162+49	LT	151	152																																		
L 162+96	CL	152	153																																		
L 163+46	RT	153	154																																		
L 163+75	LT	155	156		730.0	752.9													40																		2.8
L 164+51	LT	157	158		754.2	754.7	0.010																				52										
L 165+00	LT	158		758.2	754.7																																
L 165+00	LT	158	159		754.7	758.9	0.021				196																										
L 167+00	LT	159		762.4	758.9																																
L 167+00	LT	159	160		759.4	768.0				592																											
L 173+00	LT	160		777.0	768.0																																
L 173+00	LT	160	161		768.0	769.8																				60											
L 173+55	LT	161		775.5	769.8																																
L 173+55	CL	161	162		770.0	773.0			40																												
L 173+55	LT	161	163		769.8	772.0	0.006			400																											
L 173+55	RT	162		776.0	773.0																																
L 177+55	LT	163		778.0	772.0																																
L 177+55	LT	163	164		772.3	772.8			28																												
L 177+55	LT	164		778.3	772.8																																
L 177+55	CL	164	165		772.8	773.1	0.006		52																												
L 177+55	RT	165		777.8	773.1																																
L 177+55	RT	165	166		773.1	773.7	0.006		100																												
L 178+55	RT	166		778.3	773.7																																
L 167+75	RT	167		768.3	765.3																																
L 167+75	RT	167	168		765.3	755.1			48																												
L 167+75	RT	168	168A														40																				
Y6 10+69	CL	169	170		769.5	772.0				172																											
Y7 12+30	LT	171	172		775.7	775.6	0.016		12																												
Y7 12+30	LT	172		778.8	775.6																																
Y7 12+30	CL	172	173		775.6	775.2	0.008		60																												
Y7 12+30	RT	173		778.4	775.2																																
Y7 12+30	RT	173	174		775.2	774.0	0.033		16																												
Y7 10+14	RT	175	176		777.1	775.9			88																												
Y7 13+00	RT	177	178		773.6	773.4	0.007																				24											
L 182+05	RT	178		779.5	773.4																																
L 182+05	RT	178	180		773.4	773.5																			8												
L 182+05	RT	178	181		773.4	776.1			48																												
L 182+02	LT	179		780.0	771.6																																
L 182+50	RT	181		780.7	776.1																																
L 182+50	RT	181	182		776.1	777.9			36																												
L 182+50	RT	181	183		776.1	778.2			324																												
L 182+50	RT	182		781.1	777.9																																
L 185+55	RT	183		782.8	778.2																																
L 182+97	LT	184		781.0	776.6																																
L 182+97	LT	184	185		776.6	779.3	0.014		196																												
L 184+94	LT	185		782.3	779.3																																
L 184+94	LT	185	186		779.3	780.0			156																												
L 187+58	LT	186		783.0	780.0																																
SHEET TOTALS									1480	1164	196						68		40						8	84	52										2.8

STATION	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	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO FLAT GRATES STD. 840.20	G.D.I. FRAME WITH TWO SAG GRATES STD. 840.22	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.34	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING D.I. TO J.B. w/ M.H. (SEE SHEET 2-L)	CONVERT EXISTING D.I. OR J.B. TO C.B. (SEE SHEET 2-M)	CONVERT EXISTING M.H. TO C.B. (SEE SHEET 2-N)	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN. FT.	REMARKS
L 159+34																									
L 160+25	1										1		1												
L 160+25																									
L 160+25	1			1		1																			
L 160+25																									
L 161+50	1	3.6		1		1																			
L 161+50																						0.399			
L 161+50																					2 @ 15"				
L 162+49																									SEE SHEET 3-G
L 162+96																									SEE SHEET 3-G
L 163+46																									SEE SHEET 3-G
L 163+75																					2 @ 24"				
L 164+51																									
L 165+00	1									1				1											
L 165+00																								48	REMOVE 1-15" RCP
L 167+00	1									1				1											
L 167+00																								40	REMOVE 1-15" RCP
L 173+00	1	4.0									1			1											
L 173+00																									
L 173+55	1	0.7		1		1																			
L 173+55																									
L 173+55																								128	REMOVE 2-15" RCP
L 173+55	1			1		1																			
L 177+55	1	1.0		1		1																			
L 177+55																									
L 177+55	1	0.5						1	1																
L 177+55																									2-GI WILL CONVERT TO CB IN TC PHASE III
L 177+55							1												1						
L 177+55																									
L 178+55	1						1									1			1						TBJB WILL CONVERT TO CB IN TC PHASE III
L 167+75	1			1		1																			
L 167+75																						0.399		64	REMOVE 1-18" RCP
L 167+75																					2 @ 15"				
Y6 10+69																								28	REMOVE 1-15" RCP
Y7 12+30																									
Y7 12+30	1			1	1																				
Y7 12+30																							0.130		PLUG 18" RCP(2 PLACES)
Y7 12+30	1			1			1																		
Y7 12+30																									
Y7 10+14																								88	REMOVE 2 FES
Y7 13+00																									
L 182+05	1	1.1					1									1			1						TBJB WILL CONVERT TO CB IN TC PHASE III
L 182+05																						0.447			REMOVE FES
L 182+05																									
L 182+02					1															1					
L 182+50	1						1									1			1						TBJB WILL CONVERT TO CB IN TC PHASE III
L 182+50																									
L 182+50																								80	REMOVE 1-15" RCP
L 182+50	1							1	1																
L 185+55	1						1									1			1						TBJB WILL CONVERT TO CB IN TC PHASE III
L 182+97	1			1		1																			REMOVE EXISTING CB
L 182+97																								196	REMOVE 1-15" RCP
L 184+94	1			1		1																			REMOVE EXISTING CB
L 184+94																									
L 187+58	1			1		1																			
SHEET TOTALS	21	10.9		11	2	9	6	2	2	2	2		1	3		4			5	1	4 @ 15" 2 @ 24"	1.245	0.130	672	

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

COMPUTED BY: WCB DATE: 5/14/2008

CHECKED BY: KA (Mulkey, Inc.) DATE: 5/14/2008

WSRAL-0407A

WSRAL-0407A

PROJECT NO.	SHEET NO.
R-2911B	3-F

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109
SHEET 3-A TOTAL									1096	276		16											
SHEET 3-B TOTAL									1452	144	476						72						
SHEET 3-C TOTAL									1376		300						100		204				
SHEET 3-D TOTAL									656	160		208	24				596	40	24	40			
SHEET 3-E TOTAL									1480	1164	196						68		40				
SHEET TOTALS									6060	1744	972	224	24				836	40	268	40			

STATION	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 12"	15"	18"	24"	30"	36"	42"	48"	24" SMOOTH STEEL PIPE w/ TRENCHLESS CONSTRUCTION	15" SIDE DRAIN PIPE	30" SIDE DRAIN PIPE	36" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.
SHEET 3-A TOTAL		1516				16								
SHEET 3-B TOTAL		1408		324										
SHEET 3-C TOTAL		1572	148						84					1.4
SHEET 3-D TOTAL		48	484	748										0.7
SHEET 3-E TOTAL		8	84	52										2.8
SHEET TOTALS		4552	716	1124		16			84					4.9

STATION	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO FLAT GRATES STD. 840.20	G.D.I. FRAME WITH TWO SAG GRATES STD. 840.22	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.34	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING D.I. TO J.B. w/ M.H. (SEE SHEET 2-L)	CONVERT EXISTING D.I. OR J.B. TO C.B. (SEE SHEET 2-M)	CONVERT EXISTING M.H. TO C.B. (SEE SHEET 2-N)
SHEET 3-A TOTAL	24	3.7		9	3	4	2				15		1	14			1	1		
SHEET 3-B TOTAL	23	20.2		2	1	1		2	2	3	15			18	1		1			
SHEET 3-C TOTAL	22			2			2			1	18	1	1	19						
SHEET 3-D TOTAL	23	5.8	3.6	3	1		2	1	1	3	15		8	10		1	1			
SHEET 3-E TOTAL	21	10.9		11	2	9	6	2	2	2	2		1	3		4			5	1
SHEET TOTALS	113	40.6	3.6	27	7	14	12	5	5	9	65	1	11	64	1	5	3	1	5	1

STATION	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN. FT.	REMARKS
SHEET 3-A TOTAL		1.420	0.232	264	
SHEET 3-B TOTAL	3 @ 15"		0.232	560	
SHEET 3-C TOTAL	3 @ 15"	1.105	0.130	360	
	2 @ 24"				
SHEET 3-D TOTAL	18 @ 15"		0.232	128	
	2 @ 18"				
	2 @ 24"				
	2 @ 30"				
SHEET 3-E TOTAL	4 @ 15"	1.245	0.130	672	
	2 @ 24"				
SHEET TOTALS	28 @ 15"	3.770	0.956	1984	
	2 @ 18"				
	6 @ 24"				
	2 @ 30"				

ABBREVIATIONS

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

COMPUTED BY: WCB	DATE: 5/14/2008
CHECKED BY: KA (Mulkey, Inc.)	DATE: 5/14/2008

WSRAL-0407A

WSRAL-0407A

PROJECT NO.	SHEET NO.
R-2911B	3-G

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 54"	60"	66"	72"	78"	84"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 54" .109	54" .138	54" .168	54" SHOP ELON-GATED .138	54" SHOP ELON-GATED .168	60" .138	60" .168	66" .138	66" .168	72" .139	72" .168	WELDED STEEL PIPE 60" 12	60" 10	66" 12	66" 10	72" 12	72" 10	REINFORCED ENDWALLS WITH R.C. - C.Y.	REINFORCED ENDWALLS WITH C.S. - C.Y.	MASONRY DRAINAGE STRUCTURES CUBIC YARDS	C.B. STD. 840.01 OR 840.02	FRAMES, GRATES & HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	REINF. CONC. FLARED END SECTIONS NO. & SIZE	CORR. STEEL FLARED END SECTIONS NO. & Size	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN. FT.	REMARKS
L 162+49	LT	151	152		720.5	720.7					16																				7.1													
L 162+96	CL	152	153		720.7	722.4																							156												6.385	1.178		PLUG 54" MTL(2 PLACES)
L 163+46	RT	153	154		722.4	723.0					60																				7.1													
SHEET TOTALS											76																		156		14.2										6.385	1.178		

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

COMPUTED BY: D.M. WHEATLEY DATE: 01-03-08
CHECKED BY: W.C. BOLLMAN DATE: 01-04-08

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	3-H

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WIRE WOVEN FENCE SUMMARY

LINE	LOCATION	BEGIN STATION	END STATION	LINEAR FEET	4" POST	5" POST
L	LT	9+89.98	11+95.00	205.02	13	4
L	RT	10+11.40	11+55.00	143.70	8	4
L@Y1	RT	12+15.00	10+00.00(Y1)	454.37	27	10
L	LT	17+00.00	18+30.00	130.00	7	4
Y1@L	RT	10+00.00(Y1)	17+74.23	399.58	25	7
L	LT	18+90.00	21+53.50	263.60	17	4
L	RT	19+87.27	33+20.00	1352.73	86	19
L	LT	22+82.00	24+25.00	143.00	8	4
L	LT	25+10.00	31+70.00	660.00	42	10
L	LT	32+30.00	41+23.35	921.64	59	13
L	LT	50+21.35	55+90.00	570.54	37	7
L	RT	34+69.29	37+00.00	230.71	14	4
L	RT	37+60.00	48+57.85	1090.02	66	22
L@Y	RT	49+18.16	10+27.30(Y)	702.10	43	13
Y@L	RT	10+28.17(Y)	61+83.10	696.80	43	13
L	LT	56+50.00	75+34.01	1891.86	121	25
L	RT	62+43.10	67+95.00	551.78	36	7
L	RT	68+55.00	72+00.00	385.00	19	16
L	RT	72+60.00	76+90.00	421.43	26	7
L	LT	76+11.36	78+09.35	208.82	11	7
L@Y3	LT	78+64.78	13+00.00(Y3)	197.99	10	7
L	RT	79+30.00	83+50.00	409.20	24	10
Y4@Y3	LT	11+50.00(Y4)	13+00.00(Y3)	101.67	2	10
Y4@L	RT	11+50.00(Y4)	90+60.40	1045.18	63	22
L	RT	84+66.15	88+40.00	367.48	22	7
L	RT	89+00.00	91+40.00	240.13	15	4
L	RT	92+00.00	98+50.00	651.02	43	7
L	LT	94+25.20	95+85.00	159.80	9	4
L	LT	96+45.00	97+80.00	135.52	8	4
L	LT	98+40.00	100+60.00	221.85	14	4
L	RT	99+72.19	103+07.00	335.36	22	4
L	LT	101+20.00	103+20.00	200.00	12	4
L	LT	106+75.00	111+40.00	465.53	28	10
L	RT	107+30.00	109+48.64	218.64	13	4
L	RT	110+90.00	124+00.54	1323.52	86	16
L	RT	124+60.54	136+19.50	1187.87	76	16
L	LT	112+00.00	136+78.50	2546.38	165	31
L	RT	139+11.50	142+10.00	322.27	19	7
L@Y5	LT	139+70.50	12+55.27(Y5)	648.54	38	16
L	RT	142+70.00	159+24.18	1676.86	111	16
Y5@L	RT	12+55.27(Y5)	153+50.00	931.64	58	16
L	LT	155+30.00	166+30.00	1100.52	72	13
L	RT	159+84.18	172+00.00	1255.36	81	16
L	LT	166+96.00	169+98.33	297.47	19	4
L	LT	170+58.33	172+35.00	173.86	10	4
L	LT	172+95.00	175+36.70	238.60	15	4
L	RT	172+87.00	175+37.22	254.24	16	4
Y7@L	RT	11+00.00(Y7)	182+25.00	201.58	12	4
	TOTALS			28330.77	1771	468
	SAY			28400	1775	475

4 STRAND BARBED WIRE FENCE SUMMARY

LINE	LOCATION	BEGIN STATION	END STATION	LINEAR FEET
L	LT	108+53.47	111+51.72	298.25
L	LT	111+68.00	124+50.00	1268.65
L	LT	124+50.00	125+80.00	133.69
L	LT	125+80.00	138+16.81	1236.81
L	LT\RT	138+16.81	136+81.60	293.06
L	RT	110+17.51	110+57.34	40.68
L	RT	110+72.97	110+89.38	16.41
L	RT	110+89.38	124+21.54	1332.16
L	RT	124+37.20	136+81.60	1244.40
TOTALS				5864.11
SAY				5900
* TEMPORARY 4 STRAND BARBED WIRE				
L	LT	34+69.29	37+00.00	200.00
L	LT	37+60.00	48+57.85	76.34
L	RT	107+30.00	109+48.64	176.22
TOTALS				452.56
SAY				500

ASPHALT PAVEMENT BREAKING SUMMARY

LINE	LOCATION	BEGIN STATION	END STATION	YD^2
L	LT	119+25.00	131+25.00	33,600
TOTALS				33,600
SAY				34,000

ASPHALT PAVEMENT REMOVAL SUMMARY

LINE	LOCATION	BEGIN STATION	END STATION	YD^2
Y5	RT	10+75.00	11+65.00	339.84
L	RT	170+16.33	172+14.05	236.47
X-OVER1	CL	10+32.02	21+37.64	430.77
TEMP. PAVING				
L	RT	165+44.23	176+05.56	319.30
L	RT	165+44.23	176+05.56	383.64
L	RT	165+44.23	176+05.56	796.56
TOTALS				2,506.58
SAY				2,560

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WSRAL-N

COMPUTED BY:	BKE	DATE:	May 7, 2008
CHECKED BY:	WCB	DATE:	May 8, 2008

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
GUARDRAIL SUMMARY

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	3-I

"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 BEGIN

G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL WIDTH	FLARE LENGTH		W		ANCHORS									IMPACT ATTENUATOR TYPE 350		SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GRAU 350	M-350	CAT-1	AT-1	Type III	B-77	B-83	TEMP GRAU 350	BIC	G	NG				
L	93+25.00	98+50.00	RT	525.00			94+50.00	98+00.00	12	15	50	50	1	1	2														
L	124+50.75	136+27.86	RT	1112.50	87.50		125+00.00	136+27.86	12	15	6.25		1					1		1									DRIVEWAY AT APPROACH
L	124+25.00	136+82.14	LT	1262.50			136+82.14	125+50.00	12	15		50		1	1					1									GRAU-350 USED DUE TO TRAFFIC PHASING
L	134+66.19	134+87.19	MED.						13.75	15															1				
L	134+87.19	136+48.65	MED. RT	175.00				136+48.65	4	13.75	175		4							1									
L	134+87.19	136+61.35	MED. LT	175.00			136+61.35		4	13.75		175		4						1									✓
L	139+07.86	142+43.62	RT	325.00	50.00		139+07.86	141+50.00	12	15	6		4					1		1									GUARDRAIL EXTENDED TO DRIVEWAY
L	139+28.65	141+02.81	MED. RT	175.00			139+28.65		4	13.75		175		4						1									
L	139+41.35	141+02.81	MED. LT	175.00				139+41.35	4	13.75	175		4							1									
L	139+62.14	143+15.00	LT	362.50			141+88.94	139+62.14	12	15	50		1		1					1									
L	141+02.81	141+23.81	MED.						13.75	15															1				
L	159+25.00	165+50.00	LT	625.00			164+25.00	160+50.00	12	15	50	50	1	1	2														
L	160+25.00	167+75.00	RT	750.00			161+50.00	166+00.00	12	15	50	50	1	1	2														
		SUB-TOTAL		5662.50	137.50										8			2		8					2				
LESS ANCHORS:																													
GRAU 350		8	@ 50.00'	-400																									
B-77		8	@18.75'	-150																									
AT-1		2	@6.25'		-12.50																								
		TOTAL		5112.50	125.00																								
		SAY		5200.00	150.00										8			2		8					2				
			ADDITIONAL POSTS= 10 EA																										
TEMPORARY GUARDRAIL FROM TRAFFIC CONTROL PLANS																													
L	122+25.00	126+50.00	MED. LT	425.00																		2							TEMP. GUARDRAIL, (Guardrail to Be Relapped)
L	134+37.19	134+87.19	MED. LT																			1							TEMP. ANCHORS
L	141+02.81	141+52.81	MED. LT																			1							TEMP. ANCHORS
																													NO DEDUCTIONS FOR 2 TEMP. GRAU-350
		SUB-TOTAL		425.00																		4					0.00		
LESS ANCHORS:																													
GRAU 350		2	@ 50.00'	-100																									
		TOTAL		325.00																									
		SAY		350.00																		4					0.00		

COMPUTED BY: W. C. BOLLMAN DATE: 12-27-07
CHECKED BY: B. K. EASON DATE: 01-03-08

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	3-J

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.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	BEGIN STATION	END STATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
SUMMARY NO. 1							
-L- (Right Side)	10+00.00	40+00.00	3,101		8,624	5,523	
-Y1-	11+13.72	12+57.52	60		380	320	
SUBTOTAL # 1			3,161		9,004	5,843	
SUMMARY NO. 2							
-L- (Right Side)	40+00.00	70+00.00	3,459		15,026	11,567	
-Y-	10+30.00	12+11.34	188		86		102
SUBTOTAL # 2			3,647		15,112	11,567	102
SUMMARY NO. 3							
-L- (Right Side)	70+00.00	100+00.00	10,678		33,970	23,292	
SUBTOTAL # 3			10,678		33,970	23,292	
SUMMARY NO. 4							
-L- (Right Side)	100+00.00	130+00.00	25,087		39,341	14,254	
SUBTOTAL # 4			25,087		39,341	14,254	
SUMMARY NO. 5							
-L- (Right Side)	130+00.00	136+55.00 Beg. Bridge			24,834	24,834	
SUBTOTAL # 5					24,834	24,834	
SUMMARY NO. 6							
-L- (Right Side)	139+35.00 End Bridge	169+00.00	54,296		43,002		11,294
SUBTOTAL # 6			54,296		43,002		11,294
SUMMARY NO. 7							
-L- (Right Side)	169+00.00	199+50.30	5,595		1,543		4,052
-Y7-	10+03.12	13+36.38	598		101		497
-Y6-	10+34.41	13+06.30	307		215		92
SUBTOTAL # 7			6,500		1,859		4,641
Right Side Summary Totals			103,369		167,122	79,790	16,037

LOCATION	BEGIN STATION	END STATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
SUMMARY NO. 8							
-L- (Left Side)	10+00.00	40+00.00	4,648		1,108		3,540
-X-OVER1-	16+09.45	17+59.31	49		29	20	
SUBTOTAL # 8			4,697		1,137	20	3,540
SUMMARY NO. 9							
-L- (Left Side)	40+00.00	70+00.00	3,592		1,734		1,858
SUBTOTAL # 9			3,592		1,734		1,858
SUMMARY NO. 10							
-L- (Left Side)	70+00.00	100+00.00	9,494		1,816		7,678
-Y3-	10+40.94	12+52.44	323				323
SUBTOTAL # 10			9,817		1,816		8,001
SUMMARY NO. 11							
-L- (Left Side)	100+00.00	130+00.00	15,382		16,902	1,520	
SUBTOTAL # 11			15,382		16,902	1,520	
SUMMARY NO. 12							
-L- (Left Side)	130+00.00	136+55.00 Beg. Bridge	22		1,867	1,845	
SUBTOTAL # 12			22		1,867	1,845	
SUMMARY NO. 13							
-L- (Left Side)	139+35.00 End Bridge	169+00.00	14,144		2,802		11,342
-Y5-	10+39.00	14+86.59	2,816		116		2,700
SUBTOTAL # 13			16,960		2,918		14,042
SUMMARY NO. 14							
-L- (Left Side)	169+00.00	199+50.3	3,161		1,676		1,485
SUBTOTAL # 14			3,141		1,676		1,485
Left Side Summary Totals			53,631		28,050	3,365	28,946
Project Subtotals			157,000		195,172	83,155	44,983
Estimate Loss Due to Clearing & Grubbing			-7,850			7,850	
Waste in Lieu of Borrow						-44,983	-44,983
SHOULDER MATERIAL					15,000	15,000	
Add. Uncl. Exc. (R-2911A)			1,434			-1,434	
Project Subtotals			150,584		210,172	59,588	0
Est. 5% to Replace Topsoil on Borrow Pits						2,979	
Project Totals			150,584		210,172	62,567	
SAY			150,600			62,600	

EST. UNDERCUT = 4,000 CY
EST. CLASS IV SUBGRADE STABILIZER = 2,500 TONS
-L- PAVEMENT STRUCTURE VOLUME = 26,100 CY
EST. SELECT GRANULAR MATERIAL = 3,000 CY

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PROJECT REFERENCE NO.	SHEET NO.
R-2911B	3-K

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	5, 6	SHAVER WOOD PRODUCTS, INC.
2	6, 7	JOHN STRICKLAND AND WIFE, KATHRYN H.
3	6, 7	SOUTHERN RAILROAD
5	7, 8, 9	JAMES M. REDMOND, JR.
6	7, 8, 9	BOBBY G. DAVIS AND WIFE LAURA J. DAVIS
7	7	JAMES M. REDMOND, JR.
8	8, 9	MRS. H.B. THOMPSON HEIRS
9	9	DENNIS W. MCCALL
10	9	HENRY P. STOCKTON & WIFE
11	9	KATHLEEN HAYNES PHIFER
11A	9	VICTOR D. BRAWLEY & WIFE ALBERTA M. BRAWLEY
11B	9	HENRY STOCKTON
12	9	CHARLES W. BARBER
12A	9	AARON CORNELL STOCKTON
13	9	LAURA B. BARBER
14	9, 10	ROGER PHILLIP SPILLMAN
14A	9, 10	ROGER P. SPILLMAN
15	9, 10	ANDERSON PHIFER HEIRS
16	10, 11	EARL C. WANZER
17	10	WILLIE PHIFER AND WIFE FANNIE, PHIFER
18	10	RAY F. EBERHART
19	10	SONYA Y. SIMMONS
20	10	JEFFERSON DAVIS HERRING AND WIFE, ESSIE F. HERRING
21	10	LINDA K. BARBER
22	10, 11	ROBERT E. HOGUE
23	10, 11	MARTHA C. COWAN
24	10, 11	LILLIE MAE ROLAND
25	11	LINDA K. BARBER; JOE D. HOUPE AND WIFE ANNIE HOUPE
25A	11	LINDA K. BARBER
26	11	MAMIE MITCHELL COWAN
27	11	HEIRS TO EULA SMITH
28	11	OBRA ROZZELL COWAN
29	11	ANDREW LEE TABOR SR & WIFE

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
30	11	SHIRLY TABOR
31	11	WILLIAM EDWARD PHIFER ETAL
32	11	ROY P. CARR AND WIFE, MARGERET C. CARR
33	11, 12, 13	GRAHAM ENTERPRISES
33A	11	VMC INVESTMENT II LIMITED PARTNERSHIP
34	13, 14	BRIAN JAMES MOERMAN
35	14	P. LUTHER BROWN, JR.
36	15	CONNOR R. HUTCHIISON JR.
37	15	JAMES W. PHELPS AND WIFE ELIZABETH S.
37A	15, 16	WILLIAM E. RUSSELL
38 & 38Z	15, 16	P. ARTHUR BROWN
38A & 38AZ	16	P. ARTHUR BROWN
39 & 39Z	16	SHRI HANUMAN, INC.
40	16, 17	SOUTHEASTERN CONSORTIUM PROPERTIES CLEVELAND, LLC
103Z	4	AMARYLLIS P. FLEMING LIMITED PARTNERSHIP
104Z	4	RUTH SOUTHER BOST
105Z	4	JERRY D. OGLESBY
106Z	4	PATRICIA M. MARTIN & RICHARD W. MARTIN (FORMER PROPERTY OF RICHARD BRADLEY SHAVER)
106Z	4, 5	CITY OF STATESVILLE (FORMER PROPERTY OF RICHARD BRADLEY SHAVER)
107Z	4, 5, 6	AMARYLLIS P. FLEMING LIMITED PARTNERSHIP
108Z	5	MOLLIE McLAUGHLIN
109Z	5	MICHAEL PALUMBO & WIFE SHAWN PALUMBO
110Z	5	JAMES F. TAYLOR

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REVISIONS

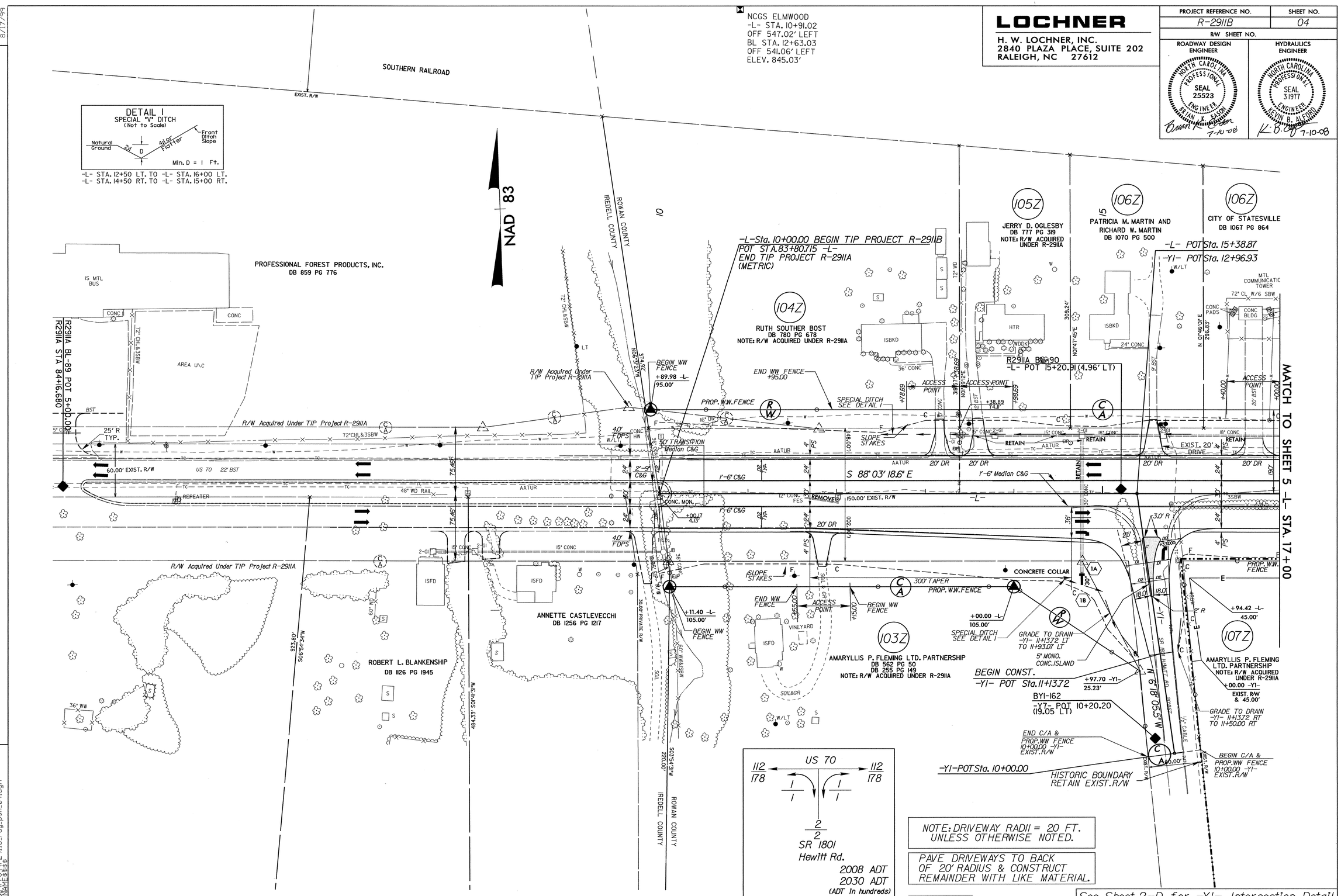
LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	04
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN X. EASON — 7-10-08

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD — 7-10-08



See Sheet 2-D for -Y1- Intersection Detail
See Sheet 18 for -L- Profile
See Sheet 25 for -Y1- Profile

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PROJECT REFERENCE NO.	SHEET NO.
R-2911B	05
R/W SHEET NO.	

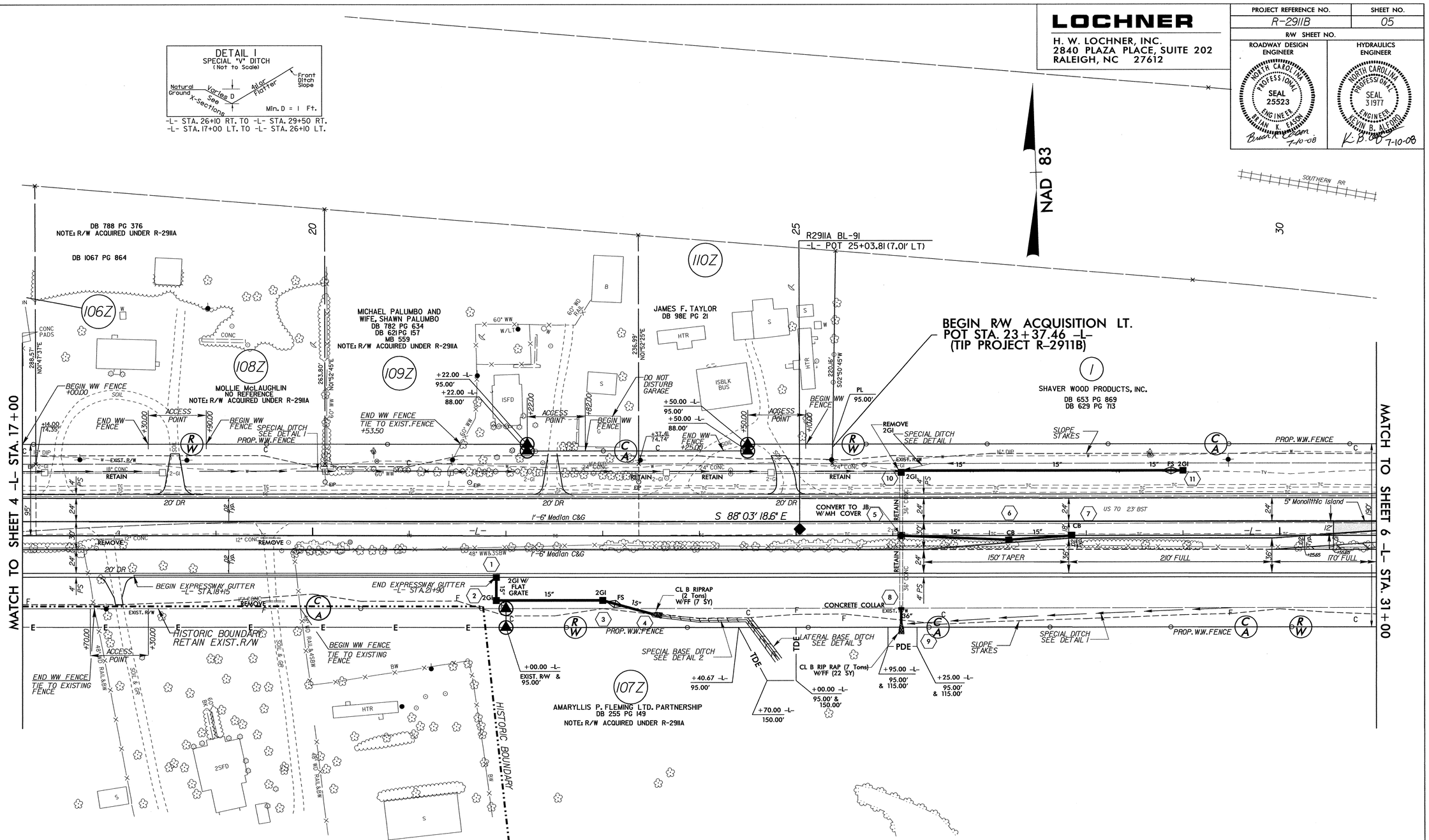
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON — 7-10-08

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD — 7-10-08

REVISIONS

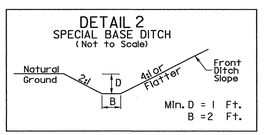
8/17/99



DETAIL 1
SPECIAL "V" DITCH
(Not to Scale)

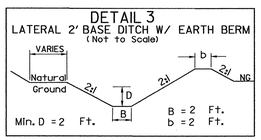
-L- STA. 26+10 RT. TO -L- STA. 29+50 RT.
-L- STA. 17+00 LT. TO -L- STA. 26+10 LT.

DETAIL 2
SPECIAL BASE DITCH
(Not to Scale)



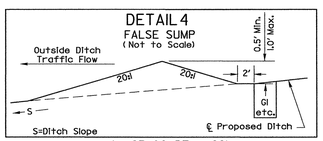
-L- STA. 23+50 RT. TO -L- STA. 24+50 RT.

DETAIL 3
LATERAL 2' BASE DITCH W/ EARTH BERM
(Not to Scale)



-L- STA. 24+50 RT. TO -L- STA. 24+83 RT.
DDE = 10 CY

DETAIL 4
FALSE SUMP
(Not to Scale)



-L- 23+00 RT 2GI
-L- 29+00 LT 2GI
-L- 30+00 RT 2GI

HISTORIC BOUNDARY

NOTE: DRIVEWAY RADII = 20 FT. UNLESS OTHERWISE NOTED.

PAVE DRIVEWAYS TO BACK OF 20' RADIUS & CONSTRUCT REMAINDER WITH LIKE MATERIAL.

See Sheet 18 for -L- Profile

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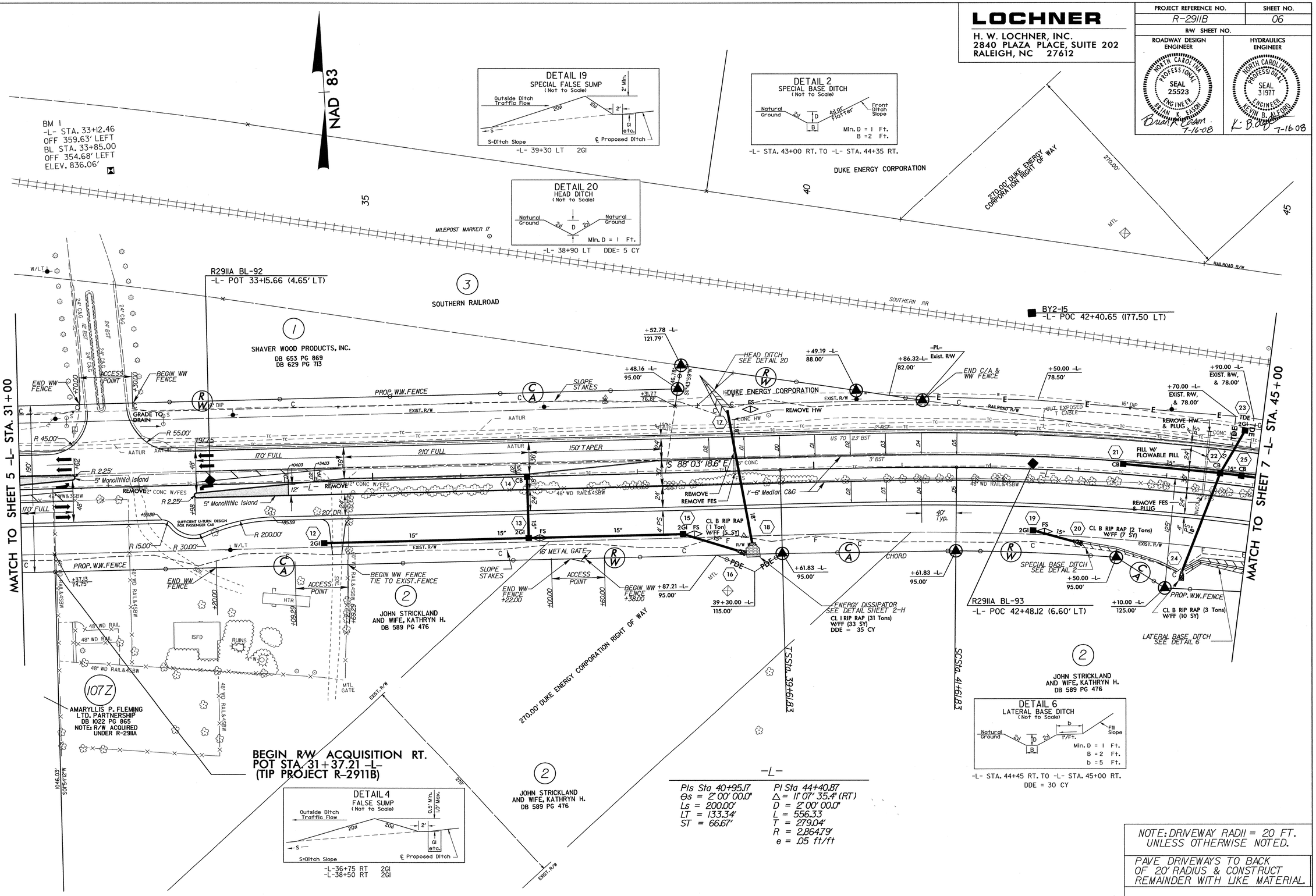
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	06
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON — Brian K. Eason 7-16-08

NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD — K. B. Alford 7-16-08



NOTE: DRIVEWAY RADII = 20 FT. UNLESS OTHERWISE NOTED.

PAVE DRIVEWAYS TO BACK OF 20' RADIUS & CONSTRUCT REMAINDER WITH LIKE MATERIAL.

See Sheet 19 for -L- Profile

REVISIONS

8/17/99

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REVISIONS

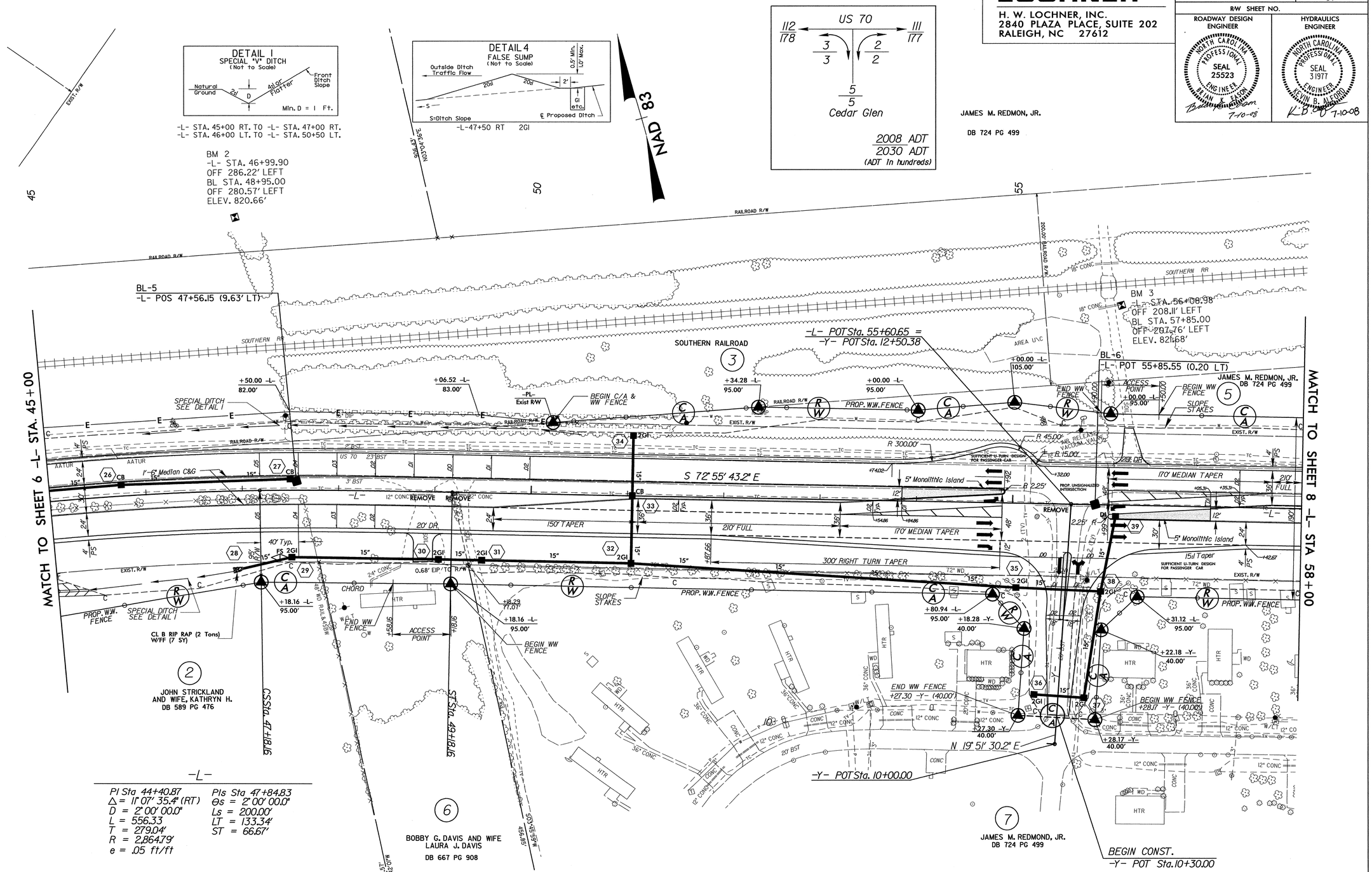
LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	07
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON 7-10-08

NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD 7-10-08



NOTE: DRIVEWAY RADII = 20 FT. UNLESS OTHERWISE NOTED.

PAVE DRIVEWAYS TO BACK OF 20' RADIUS & CONSTRUCT REMAINDER WITH LIKE MATERIAL.

See Sheet 2-D for -Y- Intersection Detail
See Sheet 19 for -L- Profile
See Sheet 25 for -Y- Profile

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8/17/99

REVISIONS

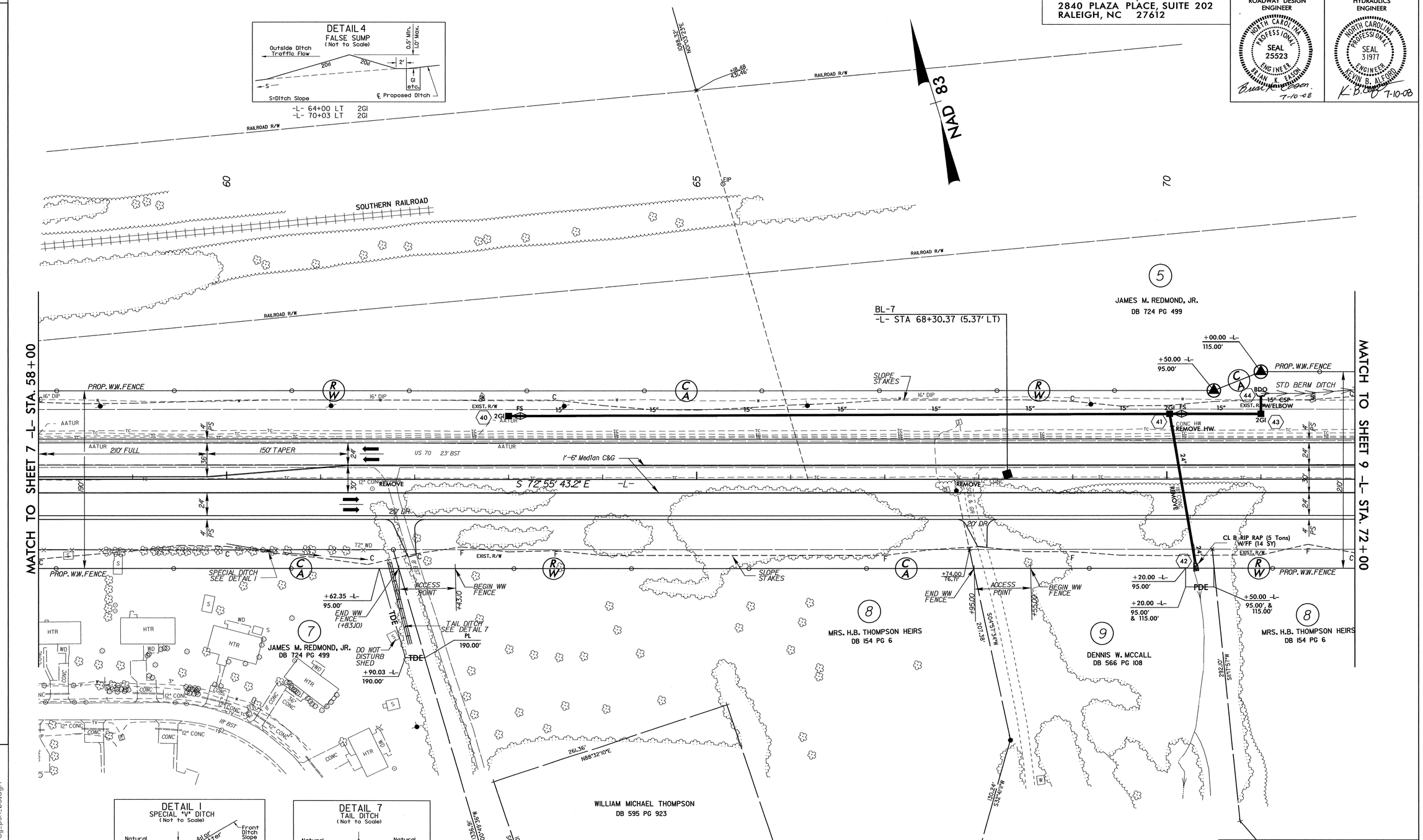
LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	08
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON — 7-10-08

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. MEADORS — 7-10-08



NOTE: DRIVEWAY RADII = 20 FT. UNLESS OTHERWISE NOTED.

PAVE DRIVEWAYS TO BACK OF 20' RADIUS & CONSTRUCT REMAINDER WITH LIKE MATERIAL.

See Sheet 20 for -L- Profile

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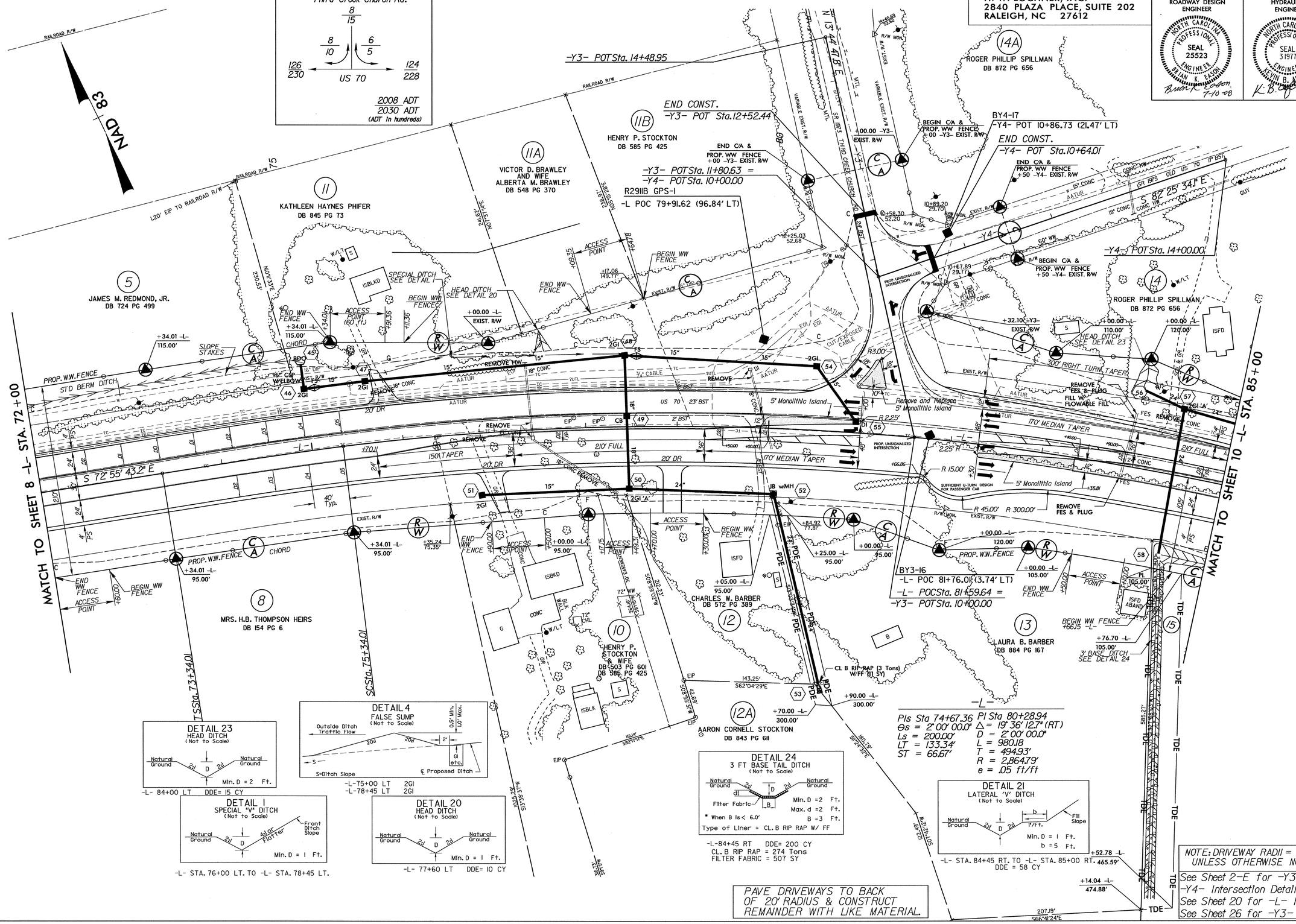
REVISIONS

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	09
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON 7-10-08	NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD 7-10-08



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LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	10
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON — Brian K. Eason 7-10-08

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD — K. B. Alford 7-10-08

REVISIONS

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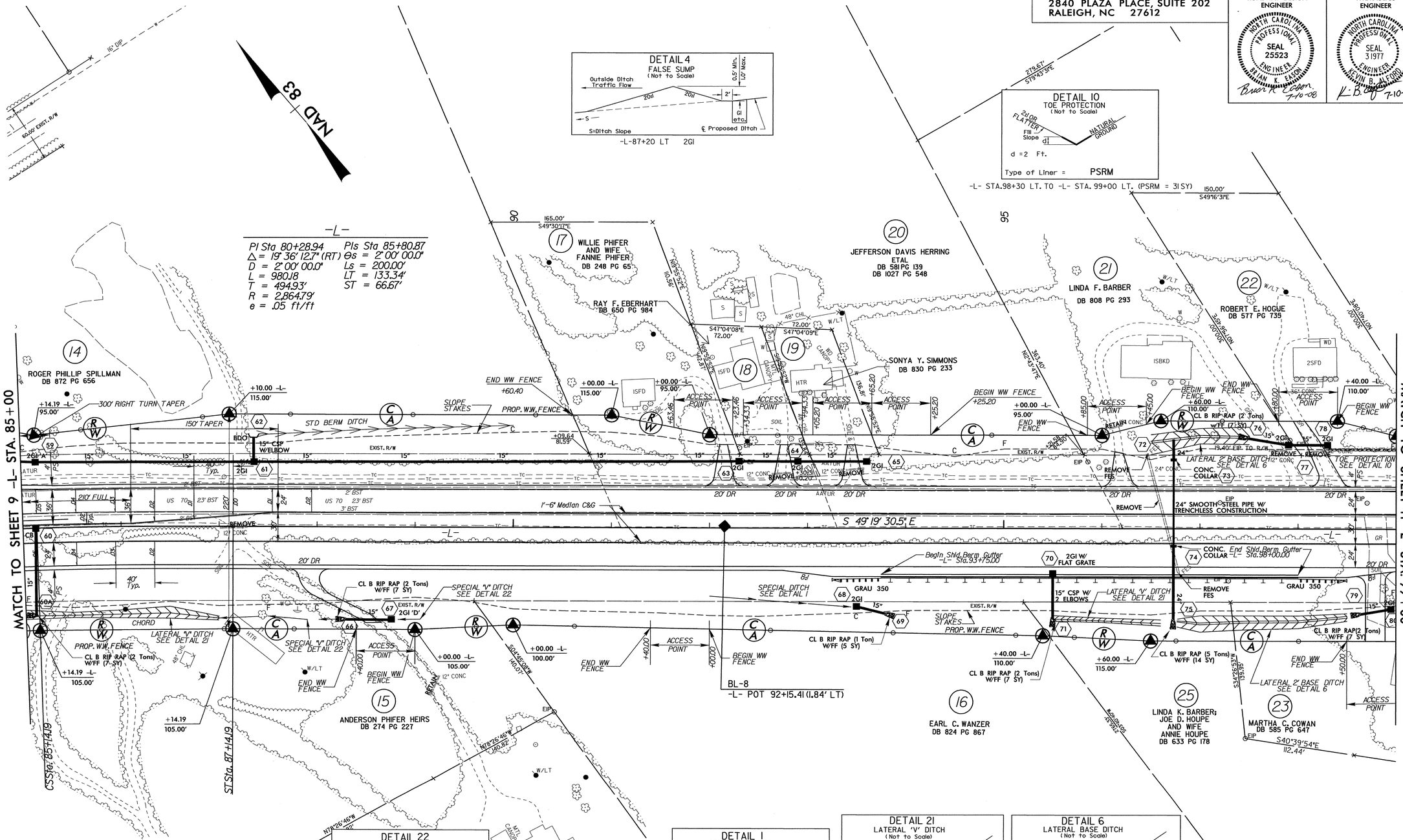

NOTE: DRIVEWAY RADII = 20 FT. UNLESS OTHERWISE NOTED.

PAVE DRIVEWAYS TO BACK OF 20' RADIUS & CONSTRUCT REMAINDER WITH LIKE MATERIAL.

See Sheet 21 for -L- Profile

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LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

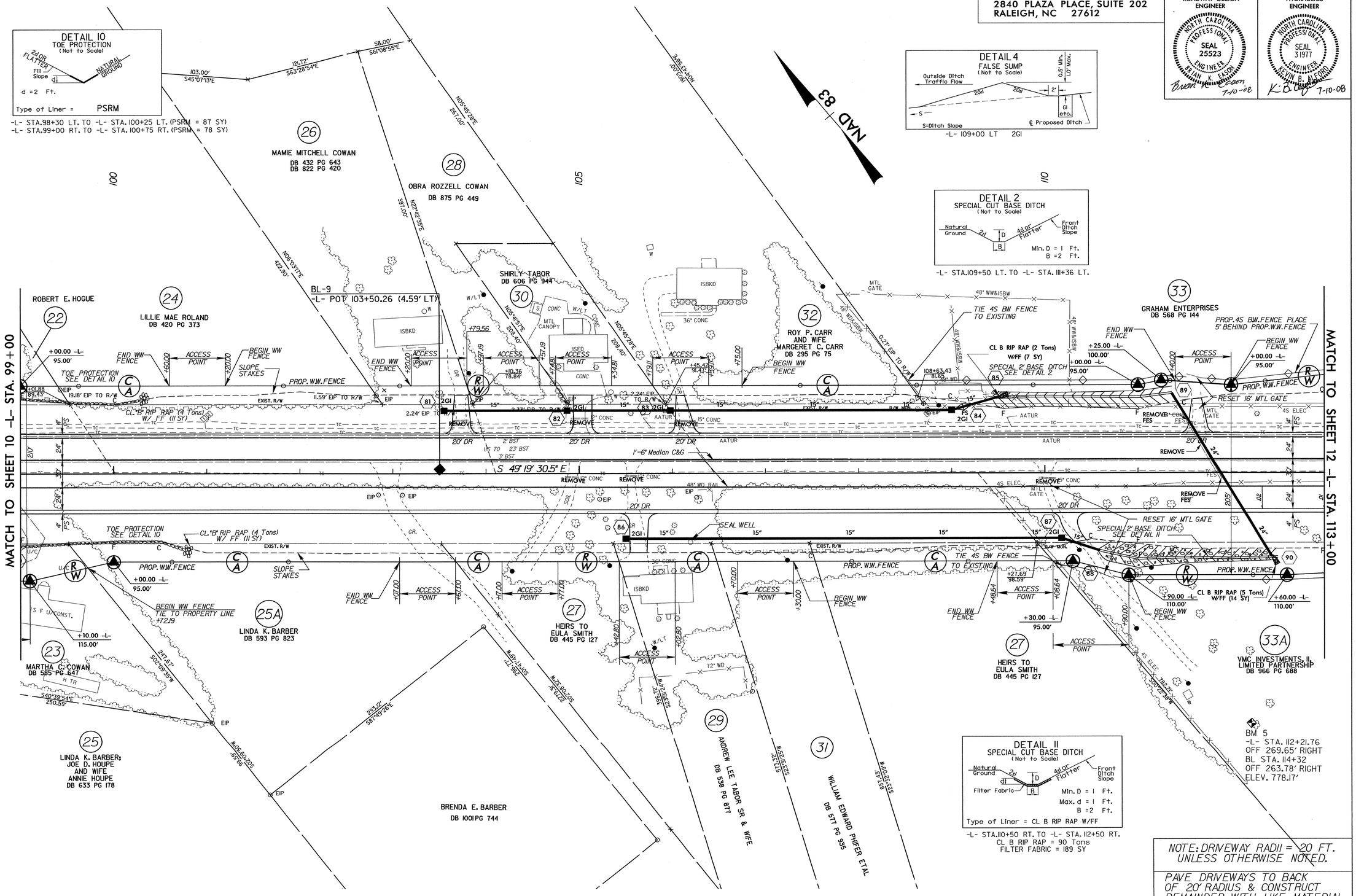
PROJECT REFERENCE NO.	SHEET NO.
R-2911B	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON 7-10-08

NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD 7-10-08

REVISIONS

8/17/99



NOTE: DRIVEWAY RADII = 20 FT. UNLESS OTHERWISE NOTED.

PAVE DRIVEWAYS TO BACK OF 20' RADIUS & CONSTRUCT REMAINDER WITH LIKE MATERIAL.

See Sheet 21 for -L- Profile

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LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

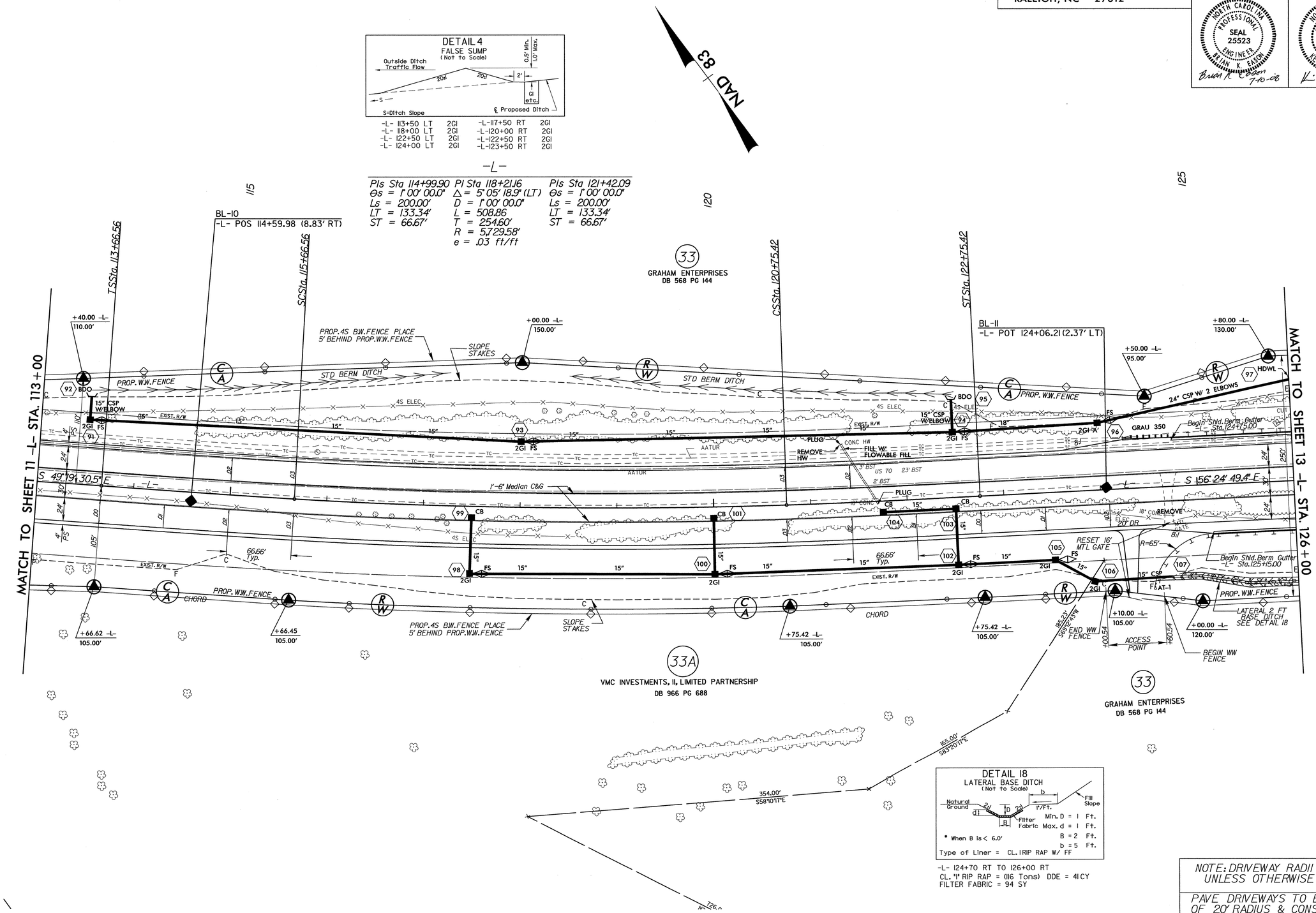
PROJECT REFERENCE NO.	SHEET NO.
R-2911B	12
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON — Brian K. Eason 7-10-08

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD — K. B. Alford 7-10-08

8/17/99

REVISIONS



NOTE: DRIVEWAY RADII = 20 FT. UNLESS OTHERWISE NOTED.

PAVE DRIVEWAYS TO BACK OF 20' RADIUS & CONSTRUCT REMAINDER WITH LIKE MATERIAL.

See Sheet 22 for -L- Profile

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8/17/99

REVISIONS

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	13
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. CARSON — 7-14-08

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD — 7-16-08

NAD 83

DETAIL 18
LATERAL BASE DITCH (Not to Scale)

Natural Ground, 2:1, D, 2:1, b, 1'/Ft., Fill Slope, d1, d, B, Filter Fabric
Min. D = 1 Ft.
Max. d = 1 Ft.
B = 2 Ft.
b = 5 Ft.
* When B Is < 6.0'
Type of Liner = CL.I RIP RAP W/ FF

-L- 126+00 RT TO 127+00 RT
CL. "I" RIP RAP = (89 Tons) DDE = 30 CY
FILTER FABRIC = 72 SY

DETAIL 14
LATERAL BASE DITCH (Not to Scale)

Natural Ground, 2:1, D, 2:1, b, 1'/Ft., Fill Slope, B
Min. D = 1 Ft.
B = 3 Ft.
b = 5 Ft.

-L- 126+00 LT TO 127+00 LT
DDE = 117 CY

DETAIL 15
LATERAL BASE DITCH (Not to Scale)

Natural Ground, 2:1, D, 2:1, b, 1'/Ft., Exist. Slope, B
Min. D = 2 Ft.
B = 3 Ft.
b = 5 Ft.

-L- 130+00 LT TO 135+00 LT
DDE = 1116 CY

DETAIL 16
LATERAL BASE DITCH (Not to Scale)

Natural Ground, 2:1, D, 2:1, b, 1'/Ft., Fill Slope, B
Min. D = 2 Ft.
B = 3 Ft.
b = 5 Ft.

-L- 127+00 LT TO 130+00 LT DDE = 336 CY
-L- 135+50 LT TO 137+00 LT DDE = 400 CY
-L- 127+00 RT TO 136+50 RT DDE = 1170 CY

DETAIL 19
BASE DITCH (Not to Scale)

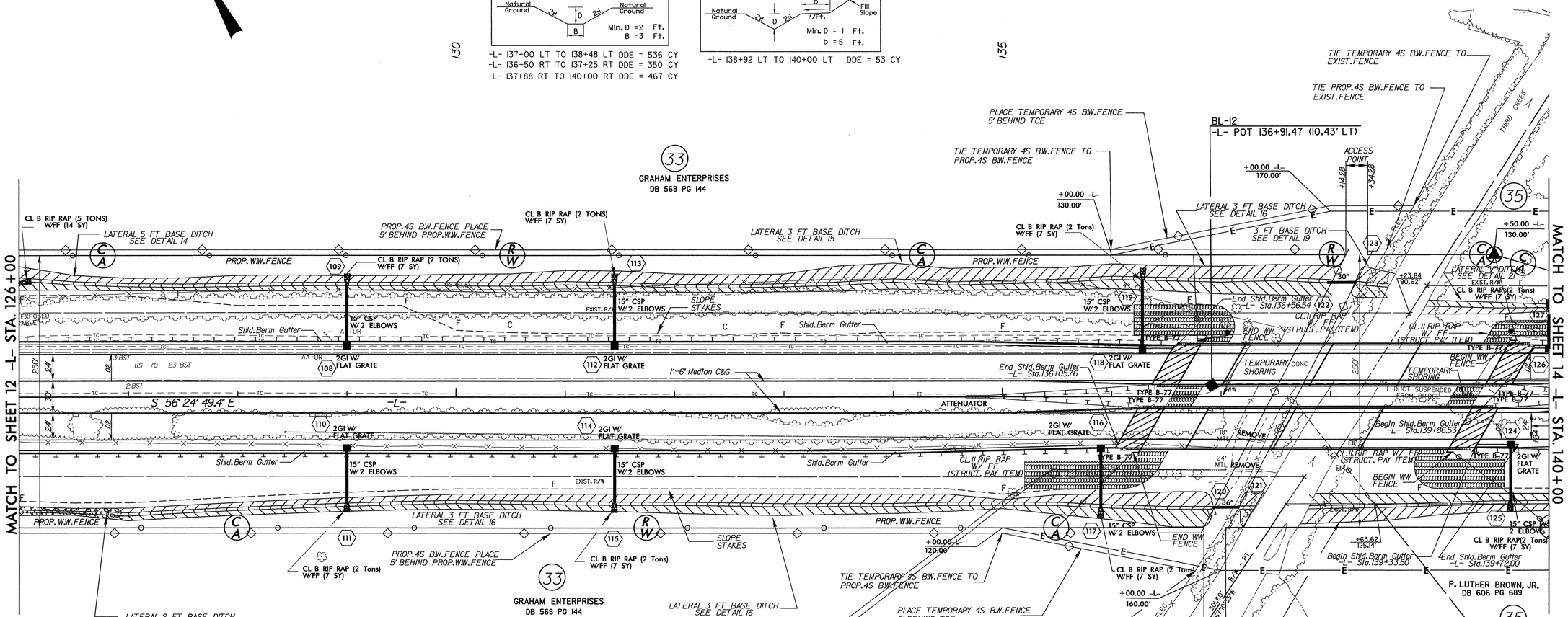
Natural Ground, 2:1, D, 2:1, Natural Ground, B
Min. D = 2 Ft.
B = 3 Ft.

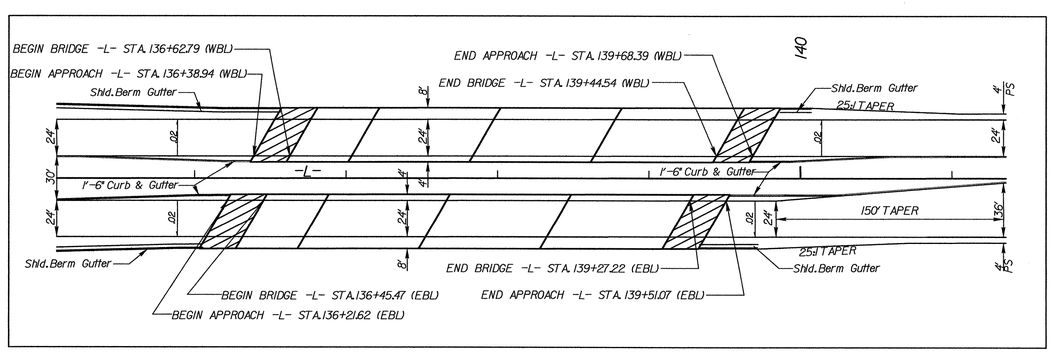
-L- 137+00 LT TO 138+48 LT DDE = 536 CY
-L- 136+50 RT TO 137+25 RT DDE = 350 CY
-L- 137+88 RT TO 140+00 RT DDE = 467 CY

DETAIL 21
LATERAL 'V' DITCH (Not to Scale)

Natural Ground, 2:1, D, 2:1, b, 1'/Ft., Fill Slope
Min. D = 1 Ft.
b = 5 Ft.

-L- 138+92 LT TO 140+00 LT DDE = 53 CY





RELATIONSHIP OF PAVEMENT TO PROPOSED BRIDGE

DETAIL 6
LATERAL BASE DITCH (Not to Scale)

Natural Ground, 2:1, D, 2:1, b, 1'/Ft., Fill Slope, B
Min. D = 1 Ft.
B = 3 Ft.
b = 5 Ft.

-L- 137+88 RT TO 140+00 RT DDE = 467 CY

BRIDGE APPROACH SLAB

NOTE: DRIVEWAY RADII = 20 FT. UNLESS OTHERWISE NOTED.

PAVE DRIVEWAYS TO BACK OF 20' RADIUS & CONSTRUCT REMAINDER WITH LIKE MATERIAL.

See Sheet S-1 Thru S-77 for Structure Plans
See Sheet 22 for -L- Profile

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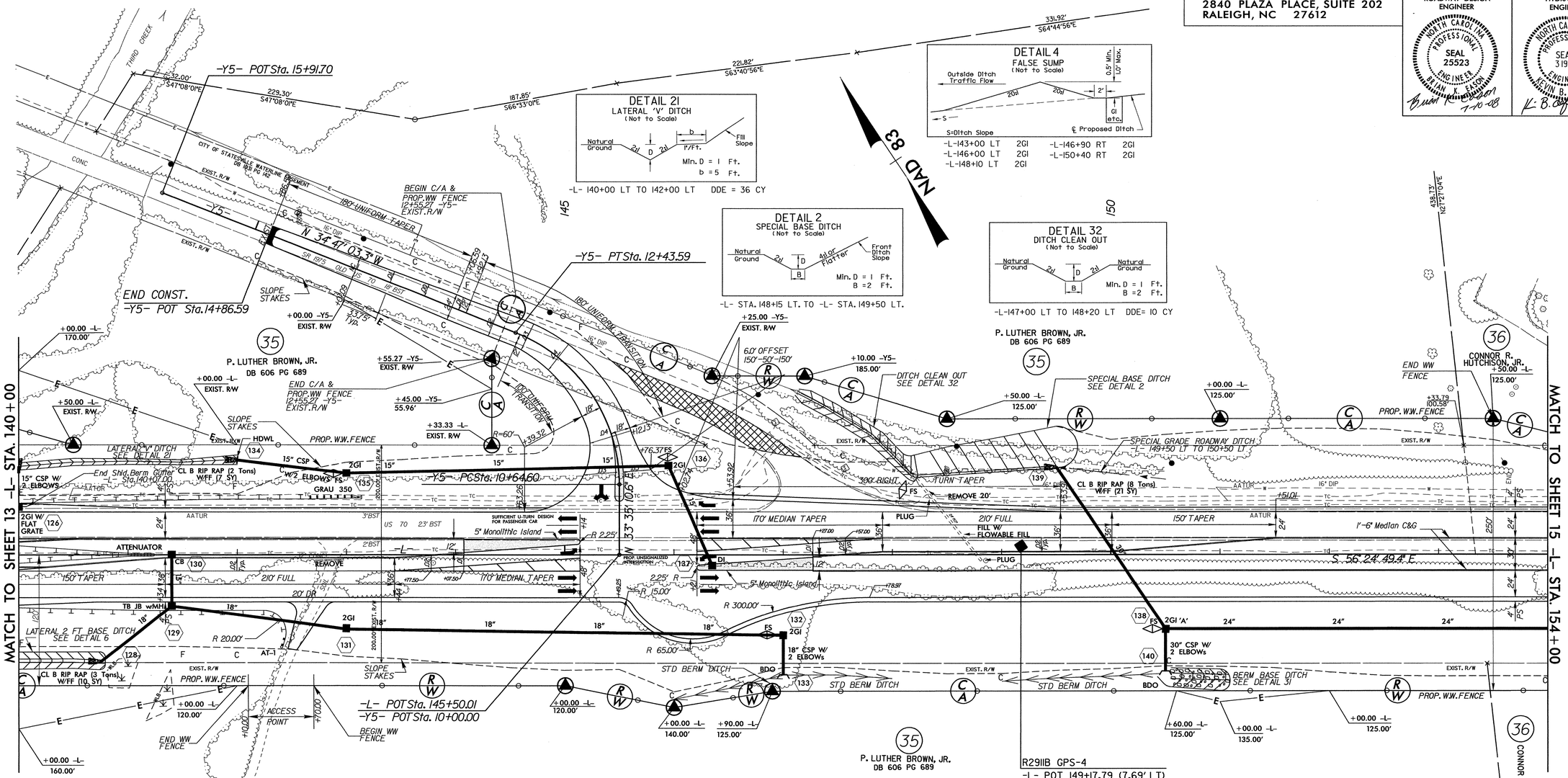
LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	14
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON 7-10-08

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD 7-10-08

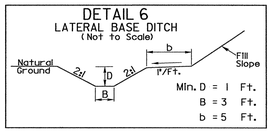


-L- 140+00 LT TO 142+00 LT DDE = 36 CY

-L-143+00 LT	2GI	-L-146+90 RT	2GI
-L-146+00 LT	2GI	-L-150+40 RT	2GI
-L-148+10 LT	2GI		

-L- STA. 148+15 LT. TO -L- STA. 149+50 LT.

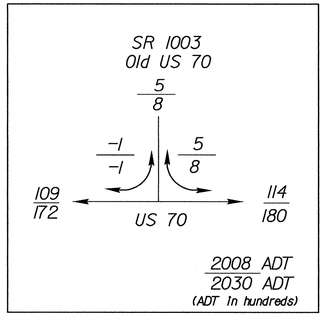
-L-147+00 LT TO 148+20 LT DDE= 10 CY

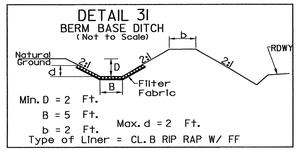


-L- 140+00 RT TO 140+75 RT DDE = 78 CY

-Y5-

PI Sta 11+66.48
Δ = 68° 22' 13.9" (LT)
D = 38° 11' 49.9"
L = 178.99'
T = 101.88'
R = 150.00'
e = .04 ft/ft





-L- STA. 150+50 RT. TO -L- STA. 151+00 RT.
CL "B" RIP RAP = 41 Tons DDE = 45 CY
FILTER FABRIC = 36 SY

NOTE: DRIVEWAY RADII = 20 FT. UNLESS OTHERWISE NOTED.

PAVE DRIVEWAYS TO BACK OF 20' RADIUS & CONSTRUCT REMAINDER WITH LIKE MATERIAL.

See Sheet 2-E for -Y5- Intersection Detail
See Sheet 23 for -L- Profile
See Sheet 26 for -Y5- Profile

REVISIONS

8/17/99

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8/17/99

REVISIONS

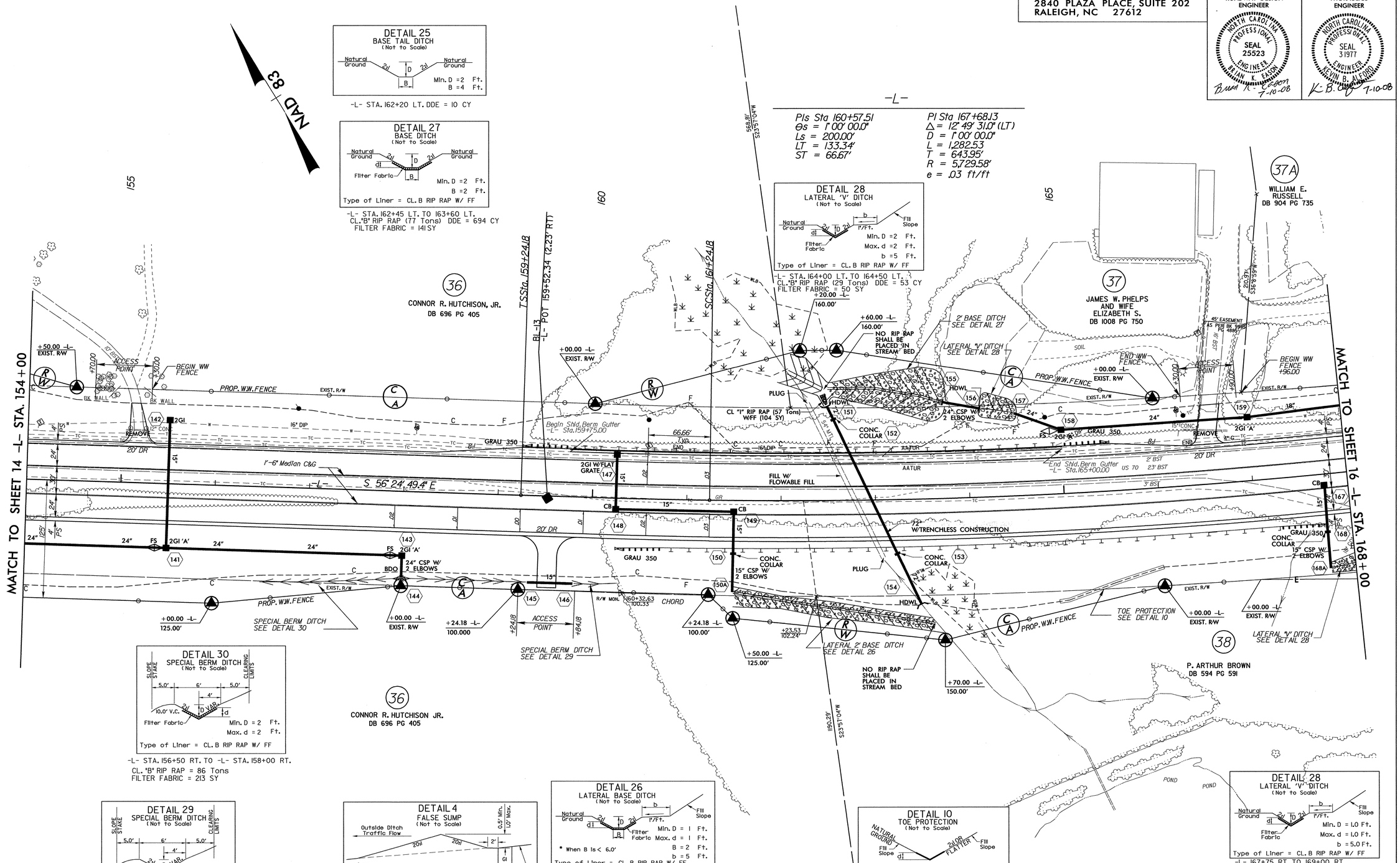
LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	15
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON — Brian K. Eason 7-10-08

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD — K. B. Alford 7-10-08



DETAIL 25
BASE TAIL DITCH
(Not to Scale)
Natural Ground, 2:1, D, 2:1, Natural Ground, B
Min. D = 2 Ft.
B = 4 Ft.
-L- STA. 162+20 LT. DDE = 10 CY

DETAIL 27
BASE DITCH
(Not to Scale)
Natural Ground, 2:1, D, 2:1, Natural Ground, d, Filter Fabric, B
Min. D = 2 Ft.
B = 2 Ft.
Type of Liner = CL. B RIP RAP W/ FF
-L- STA. 162+45 LT. TO 163+60 LT.
CL. "B" RIP RAP (77 Tons) DDE = 694 CY
FILTER FABRIC = 141 SY

DETAIL 28
LATERAL 'V' DITCH
(Not to Scale)
Natural Ground, 2:1, D, 2:1, d, b, 1'/Ft., Fill Slope, Filter Fabric
Min. D = 2 Ft.
Max. d = 2 Ft.
b = 5 Ft.
Type of Liner = CL. B RIP RAP W/ FF
-L- STA. 164+00 LT. TO 164+50 LT.
CL. "B" RIP RAP (29 Tons) DDE = 53 CY
FILTER FABRIC = 50 SY

DETAIL 30
SPECIAL BERM DITCH
(Not to Scale)
SLOPE STAKE, CLEARING LIMITS, 5.0', 6', 5.0', 4', 10.0' V.C., 2:1, D VAR., d, Filter Fabric
Min. D = 2 Ft.
Max. d = 2 Ft.
Type of Liner = CL. B RIP RAP W/ FF
-L- STA. 156+50 RT. TO -L- STA. 158+00 RT.
CL. "B" RIP RAP = 86 Tons
FILTER FABRIC = 213 SY

DETAIL 29
SPECIAL BERM DITCH
(Not to Scale)
SLOPE STAKE, CLEARING LIMITS, 5.0', 6', 5.0', 4', 10.0' V.C., 2:1, D VAR.
Min. D = 2 Ft.
-L- STA. 158+00 RT. TO -L- STA. 160+25 RT.

DETAIL 4
FALSE SUMP
(Not to Scale)
Outside Ditch Traffic Flow, 20GI, 20GI, 2', 0.5' Min., 1.0' Max., GI etc., S=Ditch Slope, ℄ Proposed Ditch
-L-155+40 RT 2GI
-L-157+90 RT 2GI
-L-164+90 LT 2GI

DETAIL 26
LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 2:1, D, 2:1, d, b, 1'/Ft., Fill Slope, Filter Fabric, R
Min. D = 1 Ft.
Max. d = 1 Ft.
B = 2 Ft.
b = 5 Ft.
* When B is < 6.0'
Type of Liner = CL. B RIP RAP W/ FF
-L- STA. 161+50 RT. TO -L- STA. 163+40 RT.
CL. "B" RIP RAP = 85 Tons DDE = 259 CY
FILTER FABRIC = 137 SY

DETAIL 10
TOE PROTECTION
(Not to Scale)
NATURAL GROUND, Fill Slope, d, 2:1 OR FLATTER, Fill Slope
d = 1 Ft.
Type of Liner = PSRM
-L- STA. 164+90 RT. TO -L- STA. 166+00 RT. (PSRM = 49 SY)

DETAIL 28
LATERAL 'V' DITCH
(Not to Scale)
Natural Ground, 2:1, D, 2:1, d, b, 1'/Ft., Fill Slope, Filter Fabric
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
b = 5.0 Ft.
Type of Liner = CL. B RIP RAP W/ FF
-L- 167+75 RT TO 169+00 RT
CL "B" RIP RAP = 44 Tons DDE = 288 CY
FILTER FABRIC = 63 SY

NOTE: DRIVEWAY RADII = 20 FT. UNLESS OTHERWISE NOTED.

PAVE DRIVEWAYS TO BACK OF 20' RADIUS & CONSTRUCT REMAINDER WITH LIKE MATERIAL.

See Sheet 23 for -L- Profile

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8/17/99

REVISIONS

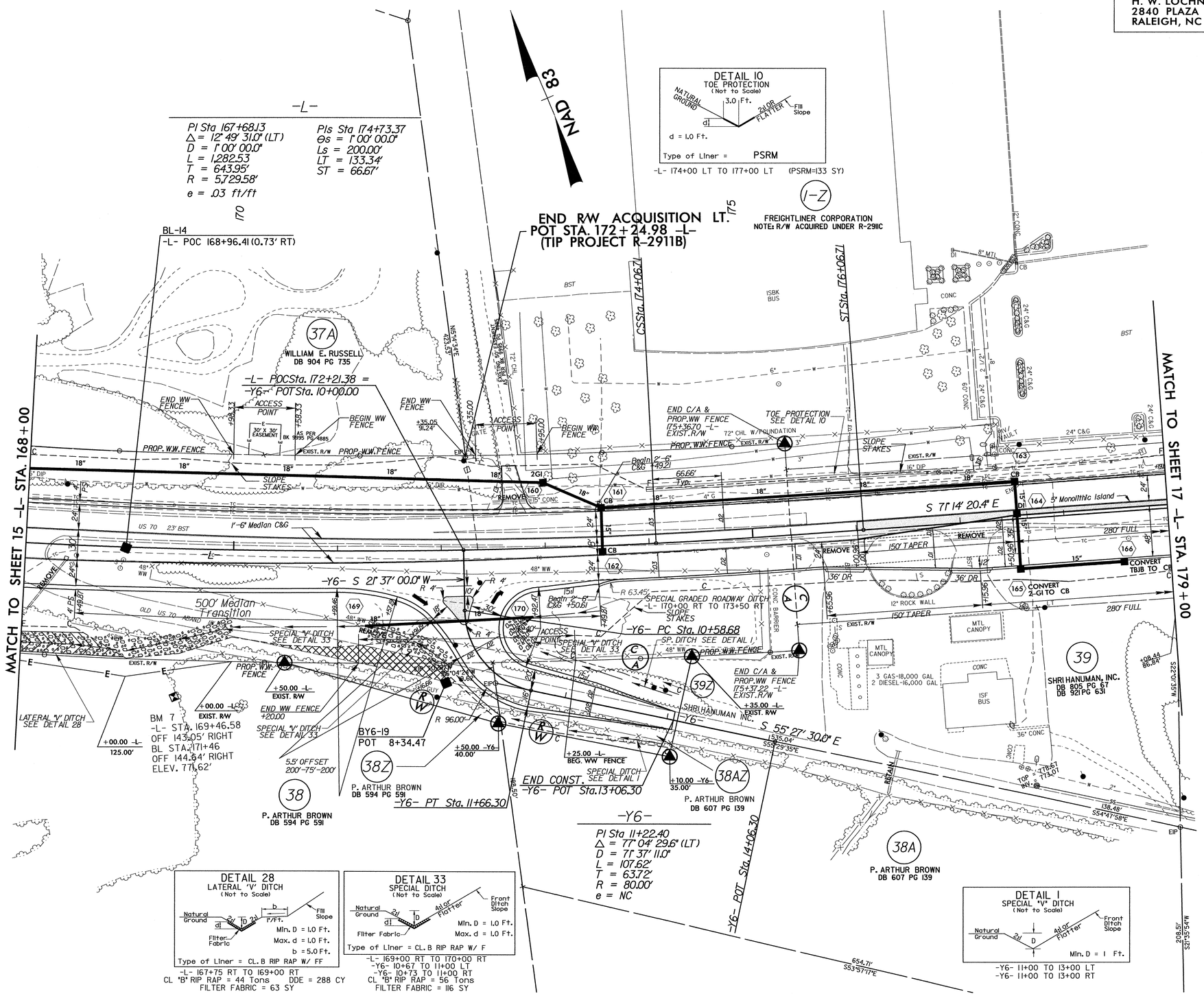
LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	16
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON — 8-4-08

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. LAFORD — 8-4-08



NOTE: DRIVEWAY RADII = 20 FT. UNLESS OTHERWISE NOTED.

PAVE DRIVEWAYS TO BACK OF 20' RADIUS & CONSTRUCT REMAINDER WITH LIKE MATERIAL.

See Sheet 24 for -L- Profile
See Sheet 26 for -Y6_ Profile

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LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

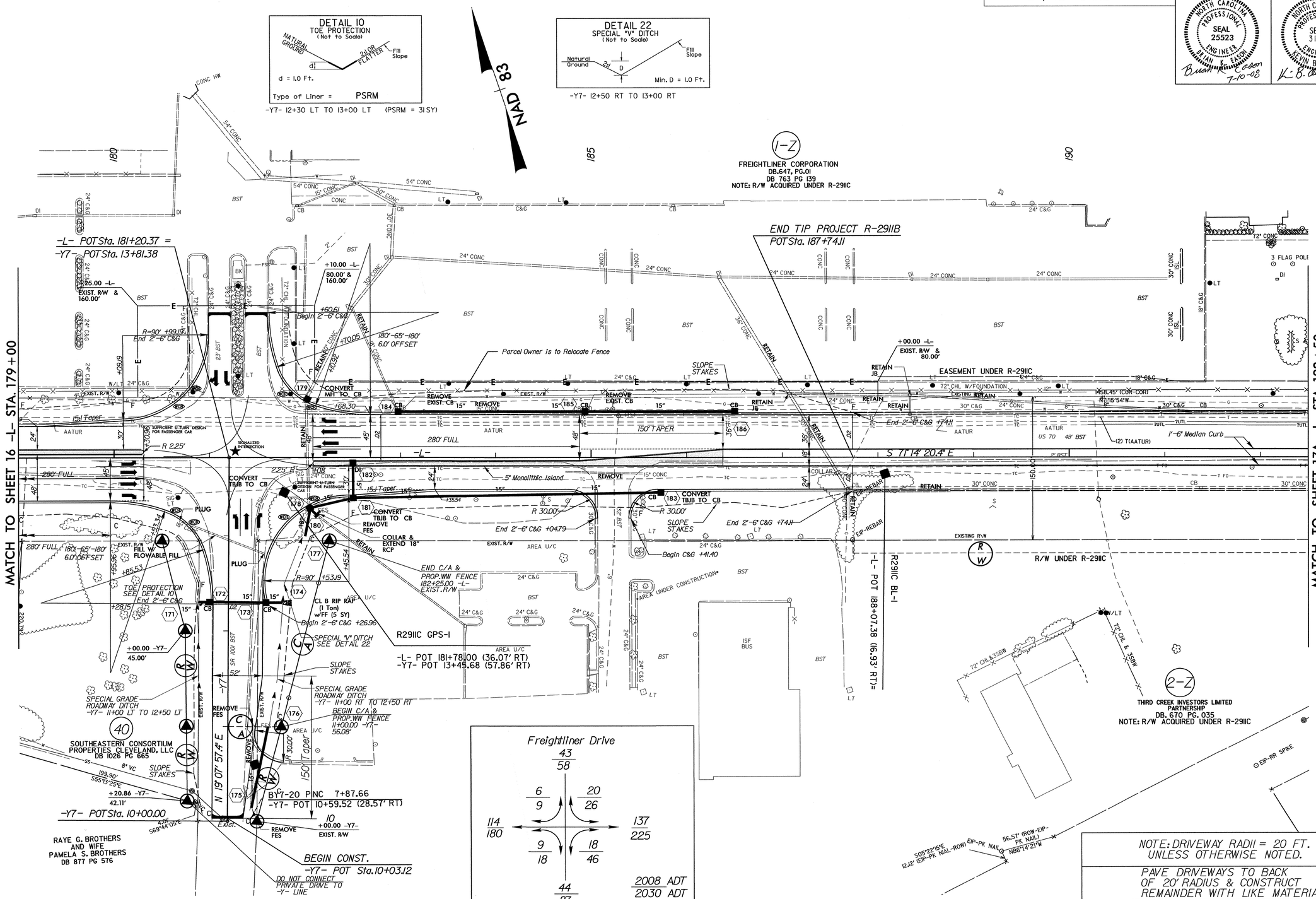
PROJECT REFERENCE NO.	SHEET NO.
R-2911B	17
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON — Brian K. Eason 7-10-08

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD — K. B. Alford 7-10-08

REVISIONS

8/17/99



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LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

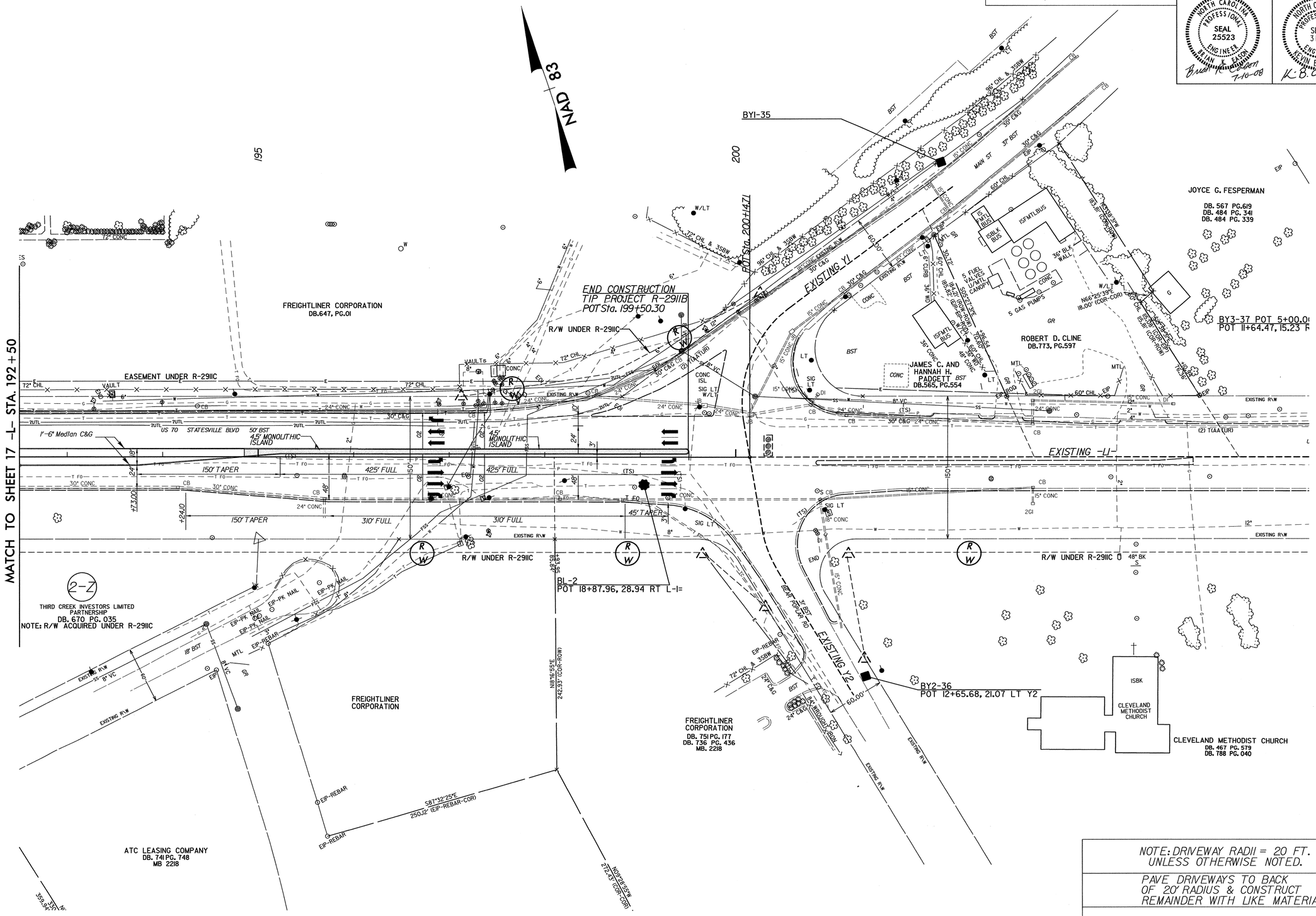
PROJECT REFERENCE NO.	SHEET NO.
R-2911B	17A
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON — 7-10-08

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD — 7-10-08

REVISIONS

8/17/99



NOTE: DRIVEWAY RADII = 20 FT. UNLESS OTHERWISE NOTED.

PAVE DRIVEWAYS TO BACK OF 20' RADIUS & CONSTRUCT REMAINDER WITH LIKE MATERIAL.

See Sheet 25 for -L- Profile

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LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	18

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON 7-10-08

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD 7-10-08

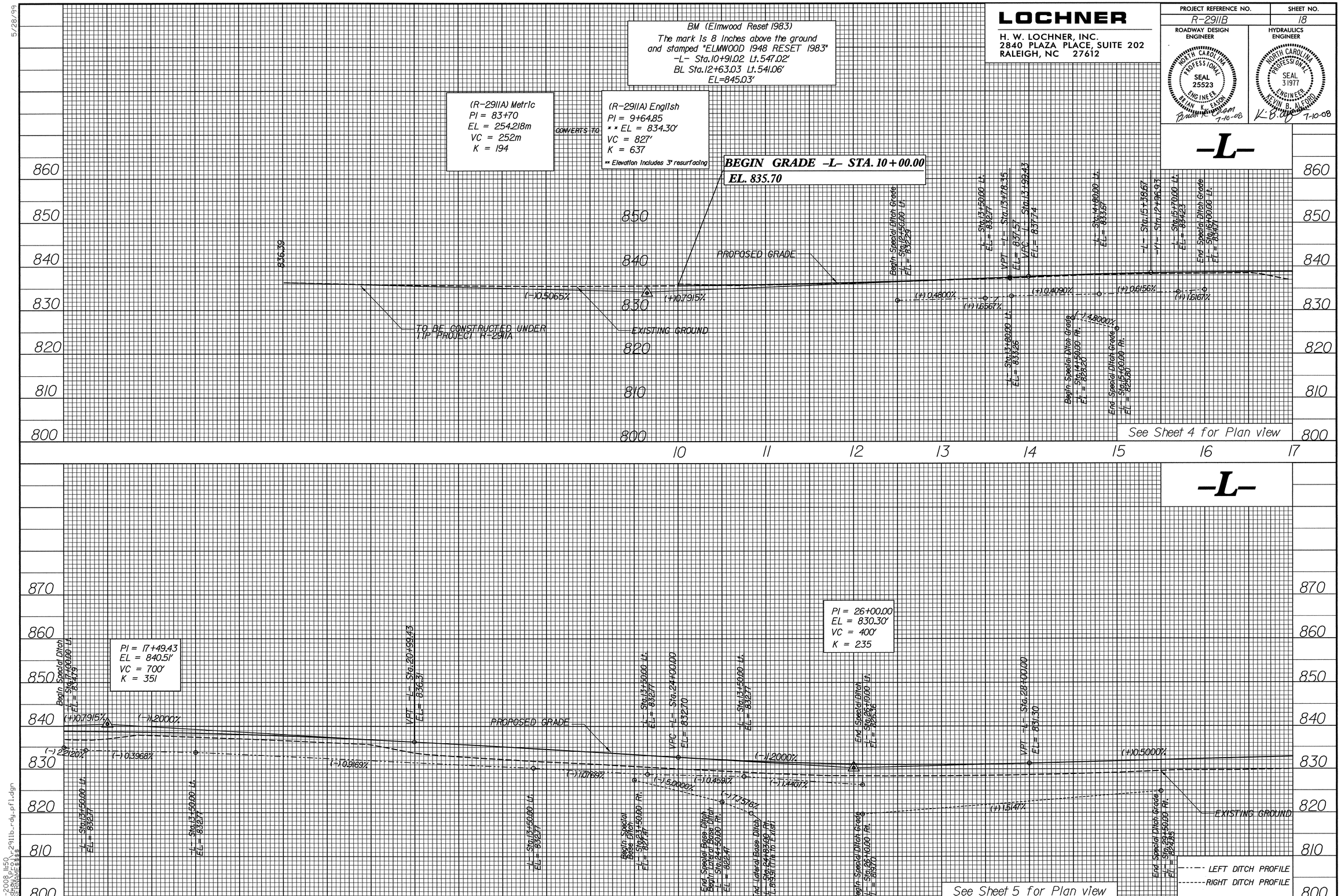
BM (Elmwood Reset 1983)
The mark is 8 inches above the ground and stamped "ELMWOOD 1948 RESET 1983"
-L- Sta.10+91.02 Lt.547.02'
BL Sta.12+63.03 Lt.541.06'
EL=845.03'

(R-2911A) Metric
PI = 83+70
EL = 254.218m
VC = 252m
K = 194

CONVERTS TO

(R-2911A) English
PI = 9+64.85
** EL = 834.30'
VC = 827'
K = 637
** Elevation includes 3" resurfacing

BEGIN GRADE -L- STA. 10+00.00
EL. 835.70



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5/28/99

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	19

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON — Brian K. Eason 5-10-08

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD — K. B. Alford 7-10-08

-L-

BM * 1
Chiseled X In a Concrete Headwall for an 18" concrete pipe at the entrance to a cattle farm.
-L- Sta.33+12.46 Lt.359.63'
BL Sta.33+85.00 Lt.354.68'
EL=836.06'

PI = 33+70.00
EL = 834.15'
VC = 370'
K = 154

PI = 39+50.00
EL = 823.13'
VC = 200'
K = 667

PI = 44+50.00
EL = 812.13'
VC = 540'
K = 138

VPC -L- Sta.31+85.00
EL = 833.22

VPT -L- Sta.35+55.00
EL = 830.63

VPC -L- Sta.38+50.00
EL = 825.03

VPT -L- Sta.40+50.00
EL = 820.53

VPC -L- Sta.41+90.00
EL = 818.07

(+)0.5000%

(-)1.9000%

(-)1.5000%

(-)2.2000%

(-)2.2000%

(+)1.7000%

(-)6.500%

(+)2.3091%

(-)1.00000%

EXISTING GROUND

PROPOSED GRADE

18" RCP
CL EL = 818.26

End Special Base Ditch
-L- Sta.44+35.00 Rt.
El = 801.55

Begin Special Base Ditch
-L- Sta.43+00.00 Rt.
EL = 800.45

-L- Sta.44+00.00 Rt.
El = 801.90

Begin Lateral Base Ditch
-L- Sta.44+45.00 Rt.
EL = 800.93

End Lateral Base Ditch
-L- Sta.45+00.00 Rt.
EL = 802.16

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO. 15

DRAINAGE AREA	= 4.28	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 7.82	CFS
DESIGN HW ELEVATION	= 821.55	FT
100 YEAR DISCHARGE	= 8.65	CFS
100 YEAR HW ELEVATION	= 821.63	FT
OVERTOPPING FREQUENCY	= >100X500	YRS
OVERTOPPING DISCHARGE	= >100X500	CFS
OVERTOPPING ELEVATION	= 821.90	FT

LEFT DITCH PROFILE
RIGHT DITCH PROFILE

See Sheet 6 for Plan view

-L-

BM * 3
Chiseled X In the east end of an 18" concrete pipe under an access road to a tobacco field.
-L- Sta.56+08.98 Lt.208.11'
BL Sta.57+85.00 Lt.207.76'
EL=821.68'

BM * 2
Railroad spike In the base of a 42" Black Oak
-L- Sta.46+99.90 Lt.286.22'
BL STA.48+95.00 Lt.280.57'
EL=820.66'

PI = 49+80.00
EL = 821.14'
VC = 200'
K = 1000

PI = 56+30.00
EL = 830.89'
VC = 500'
K = 156

Begin Special 1/4" Ditch
-L- Sta.46+00.00 Lt.
EL = 812.34

VPT -L- Sta.47+20.00
EL = 816.72

-L- Sta.47+50.00 Lt.
EL = 818.50

VPC -L- Sta.48+80.00
EL = 819.44

-L- Sta.49+50.00 Lt.
EL = 818.50

End Special 1/4" Ditch
-L- Sta.50+50.00 Lt.
EL = 817.98

VPT -L- Sta.50+80.00
EL = 822.64

VPC -L- Sta.53+80.00
EL = 827.14

-L- Sta.55+60.52
-Y- Sta.12+50.38

(+)0.3700%

(+)3.5050%

(+)1.00000%

(+)1.7000%

(+)1.5000%

(+)2.4800%

(+)1.5000%

(-)1.7000%

PROPOSED GRADE

EXISTING GROUND

Begin Special 1/4" Ditch
-L- Sta.45+00.00 Rt.
EL = 802.16

End Special 1/4" Ditch
-L- Sta.47+00.00 Rt.
EL = 816.71

LEFT DITCH PROFILE
RIGHT DITCH PROFILE

See Sheet 7 for Plan view

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5/28/99

LOCHNER

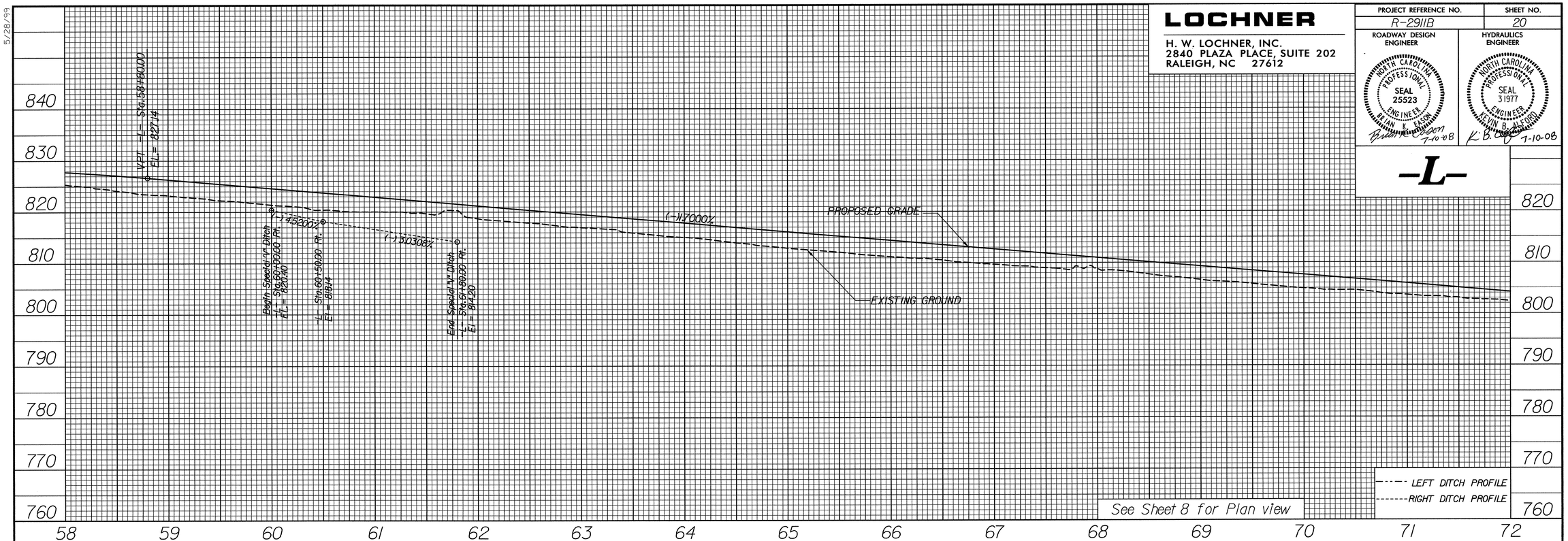
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	20

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON 7-10-08

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD 7-10-08

-L-



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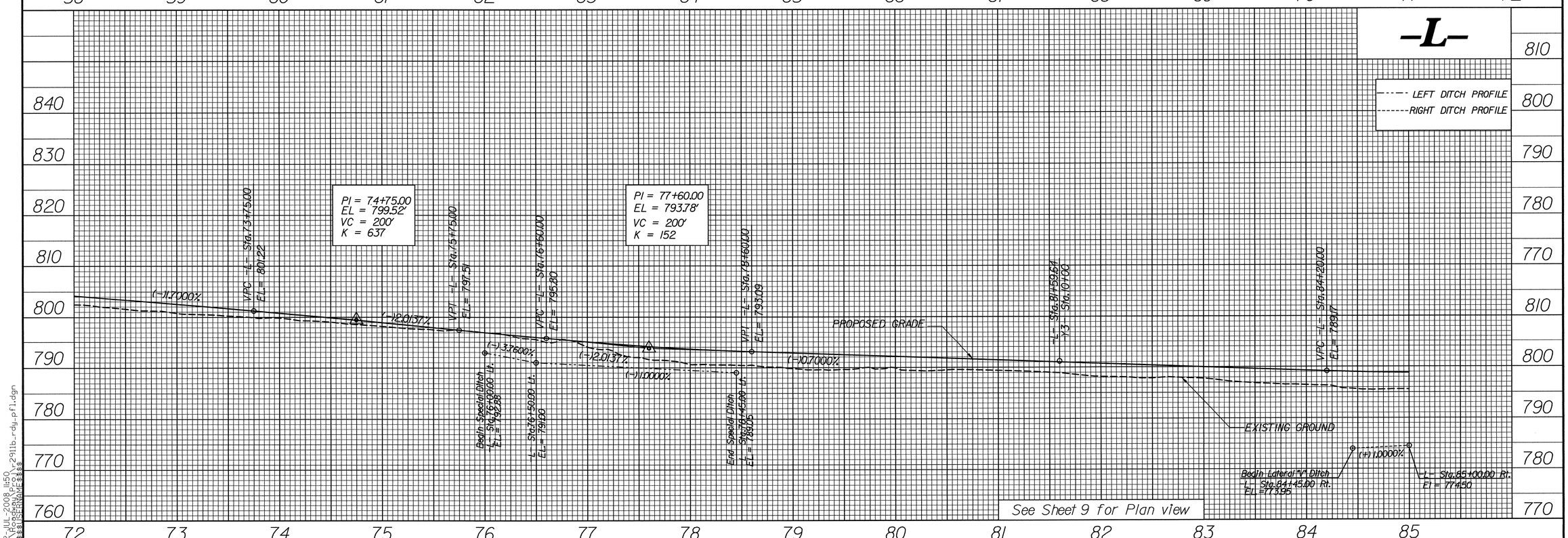

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5/28/99

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	21

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON — 7-10-08

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD — 7-10-08

-L-

BM * 4
Railroad spike in the western most root of a 6" gum, 33.6' from the centerline of Old US 70 SR 1975.
-L- Sta. 90+24.93 Lt. 699.76'
BL Sta. 92+18.00 Lt. 693.97'
EL=802.89'

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO. 64

DRAINAGE AREA	= 8.39	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 16.55	CFS
DESIGN HW ELEVATION	= 784.03	FT
100 YEAR DISCHARGE	= 18.11	CFS
100 YEAR HW ELEVATION	= 784.21	FT
OVERTOPPING FREQUENCY	= >100<500	
OVERTOPPING DISCHARGE	= >100<500	
OVERTOPPING ELEVATION	= >100<500	

----- LEFT DITCH PROFILE
------- RIGHT DITCH PROFILE

PI = 85+20.00
EL = 788.47'
VC = 200'
K = 148

VPT -L- Sta. 86+20.00 EL = 785.12

PROPOSED GRADE

(-)0.7000% (+)0.6500% (+)0.6500% (-)1.0000%

End Lateral "V" Ditch -L- Sta. 85+00.00 Rt. El = 774.50
Begin Special "V" Ditch -L- Sta. 87+00.00 Rt. EL = 779.00
End Special "V" Ditch -L- Sta. 88+32.00 Rt. El = 782.96
(+) 3.0000%
(+) 2.3333%
Begin Special "V" Ditch -L- Sta. 88+80.00 Rt. EL = 785.04
End Special "V" Ditch -L- Sta. 89+00.00 Rt. EL = 785.50
Begin Special Ditch -L- Sta. 92+00.00 Rt. EL = 788.69
End Special Ditch -L- Sta. 93+50.00 Rt. EL = 787.19
EXISTING GROUND
End Special Ditch -L- Sta. 96+60.00 Rt. El = 775.25
(-) 1.0000%
(+) 3.0000%
(+) 6.1000%
(-) 1.5909%
(+) 1.0000%
(+) 6.0000%
L- Sta. 86+50.00 Rt. El = 776.00
Begin Special Ditch -L- Sta. 95+50.00 Rt. EL = 777.00
Begin Lateral Base Ditch -L- Sta. 96+80.00 Rt. EL 775.25
24" RCP CL EL = 778.95
End Lateral Base Ditch -L- Sta. 98+65.00 Rt. EL = 786.55
Begin Lateral Base Ditch -L- Sta. 96+50.00 Lt. EL = 782.00
-L- Sta. 96+47.5 Lt. EL = 781.77
End Lateral Base Ditch -L- Sta. 97+50.00 Lt. EL = 784.08

See Sheet 10 for Plan view

-L-

BM * 5
Railroad spike in the northern root of a 54" Sweetgum.
-L- Sta. 112+21.76 Rt. 269.65'
BL Sta. 114+32.00 Rt. 263.78'
EL=778.17'

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO. 78

DRAINAGE AREA	= 8.12	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 16.09	CFS
DESIGN HW ELEVATION	= 779.52	FT
100 YEAR DISCHARGE	= 17.73	CFS
100 YEAR HW ELEVATION	= 779.7	FT
OVERTOPPING FREQUENCY	= >100<500	
OVERTOPPING DISCHARGE	= >100<500	
OVERTOPPING ELEVATION	= 779.9	FT

----- LEFT DITCH PROFILE
------- RIGHT DITCH PROFILE

PI = 101+50.00
EL = 799.06'
VC = 400'
K = 296

PI = 105+70.00
EL = 796.12'
VC = 300'
K = 200

VPC -L- Sta. 99+50.00 EL = 797.76
VPT -L- Sta. 103+50.00 EL = 797.66
VPC -L- Sta. 104+20.00 EL = 797.17
VPT -L- Sta. 107+20.00 EL = 792.82
(+)0.6500% (-)0.7000% (-)0.7000% (-)12.2000%

PROPOSED GRADE

EXISTING GROUND

Begin Special Base Ditch -L- Sta. 109+50.00 Lt. EL = 781.41
VPC -L- Sta. 109+80.00 EL = 781.10
End Special Base Ditch -L- Sta. 112+50.00 Lt. EL = 779.23
(-) 2.2204%
(-) 12.2000%
Begin Special Base Ditch -L- Sta. 110+50.00 Rt. EL = 778.99
(-) 8.0000%
24" RCP CL EL = 773.80
(-) 2.0000%
-L- Sta. 111+50.00 Rt. El = 771.00
End Special Base Ditch -L- Sta. 112+50.00 Rt. EL = 769.00

See Sheet 11 for Plan view

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LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	22

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON 7-10-08

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. BLAFORD 7-10-08

-L-

PI = 113+80.00
EL = 778.30'
VC = 800'
K = 444

(-)12.2000%
(-)14.0000%
VPT -L- Sta.117+80.00
EL = 762.30
EXISTING GROUND
PROPOSED GRADE
(-)14.0000%
-L- Sta.126+00.00 Rt.
El = 705.51
Begin Lateral Base Ditch
-L- Sta.124+70.00 Rt.
El = 719.08
(-)13.8800%
(-)4.9200%
-L- Sta.125+50.00 Rt.
El = 707.97

LEFT DITCH PROFILE
RIGHT DITCH PROFILE

See Sheet 12 for Plan view

-L-

PI = 129+00.00
EL = 717.50'
VC = 600'
K = 136

(-)14.0000%
(+)0.4000%
VPT -L- Sta.132+00.00
EL = 718.70
VPC -L- Sta.134+50.00
EL = 719.70
PI = 135+50.00
EL = 720.10'
VC = 200'
K = 222
(+)0.4000%
(-)10.5000%
VPT -L- Sta.136+50.00
EL = 719.60
VPC -L- Sta.139+60.00
EL = 716.05
PROPOSED GRADE
Class "II" Rip Rap w/ FF
THIRD CREEK
Class "II" Rip Rap w/ FF
-L- Sta.140+00.00 Lt.
El = 700.85
EXISTING GROUND
(-)1.8000% (Lt)
(-)4.5200% (Rt)
(-)0.3000% (Rt)
(-)0.4200% (Lt)
(-)0.1028% (Rt)
(-)0.1028% (Rt)
(-)0.4200% (Lt)
(-)0.3000% (Lt)
(-)0.8412% (Rt)
(-)0.3000% (Lt)
(-)0.1297% (Lt)
(+)2.0000% (Lt)
(+)1.0000% (Rt)
-L- Sta.126+00.00 Rt.
El = 705.51
-L- Sta.126+00.00 Lt.
El = 706.00
Begin Lateral Base Ditch
-L- Sta.127+00.00 Rt.
El = 700.59
-L- Sta.128+00.00 Lt.
El = 701.41
-L- Sta.128+50.00 Rt.
El = 700.14
-L- Sta.134+50.00 Lt.
El = 699.68
-L- Sta.134+92.00 Rt.
El = 699.48
PI = 137+00.000
El = 697.93
End Lateral Base Ditch
-L- Sta.137+25.00 Rt.
El = 697.52
Begin Lateral Base Ditch
-L- Sta.137+88.00 Rt.
El = 697.28
End Base Ditch
-L- Sta.138+48.00 Lt.
El = 697.49
Begin Lateral Base Ditch
-L- Sta.138+92.00 Lt.
El = 698.89
-L- Sta.140+00.00 Rt.
El = 700.00

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 10,100 CFS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 713.6 FT
BASE DISCHARGE	= 12,000 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 715.1 FT
OVERTOPPING DISCHARGE	= 14650 CFS
OVERTOPPING FREQUENCY	= 100 +YRS
OVERTOPPING ELEVATION	= 717.1 FT
	= FT
DATE OF SURVEY	= 1/15/03
W.S. ELEVATION AT DATE OF SURVEY	= 695.10 FT

Denotes Area To Be Excavated (Structure Pay Item)

LEFT DITCH PROFILE
RIGHT DITCH PROFILE

See Sheet 13 for Plan view

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LOCHNER

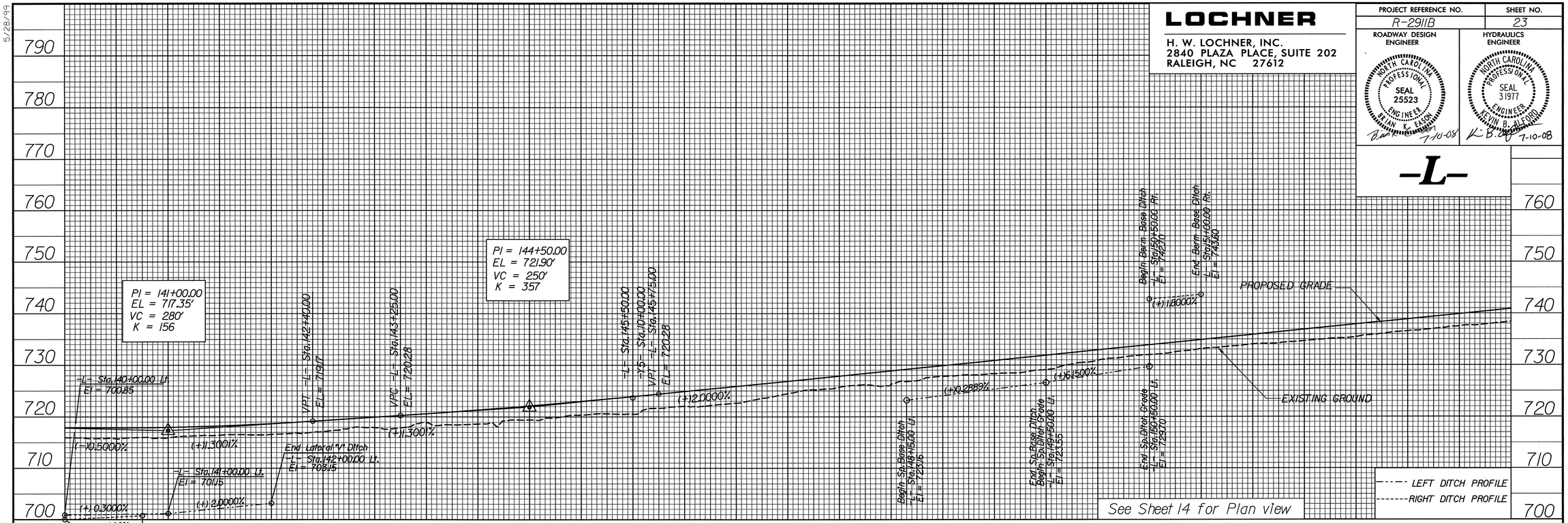
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	23

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN C. EASON — 7-10-08

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD — 7-10-08

-L-



PIPE HYDRAULIC DATA

DRAINAGE AREA	= 111.0	ACR
DESIGN DISCHARGE	= 259	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 729.66	FT
BASE DISCHARGE	= 301	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 730.5	FT
OVERTOPPING DISCHARGE	= 790	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 750	FT

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LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	24

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. CARSON 7-10-08

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD 7-10-08

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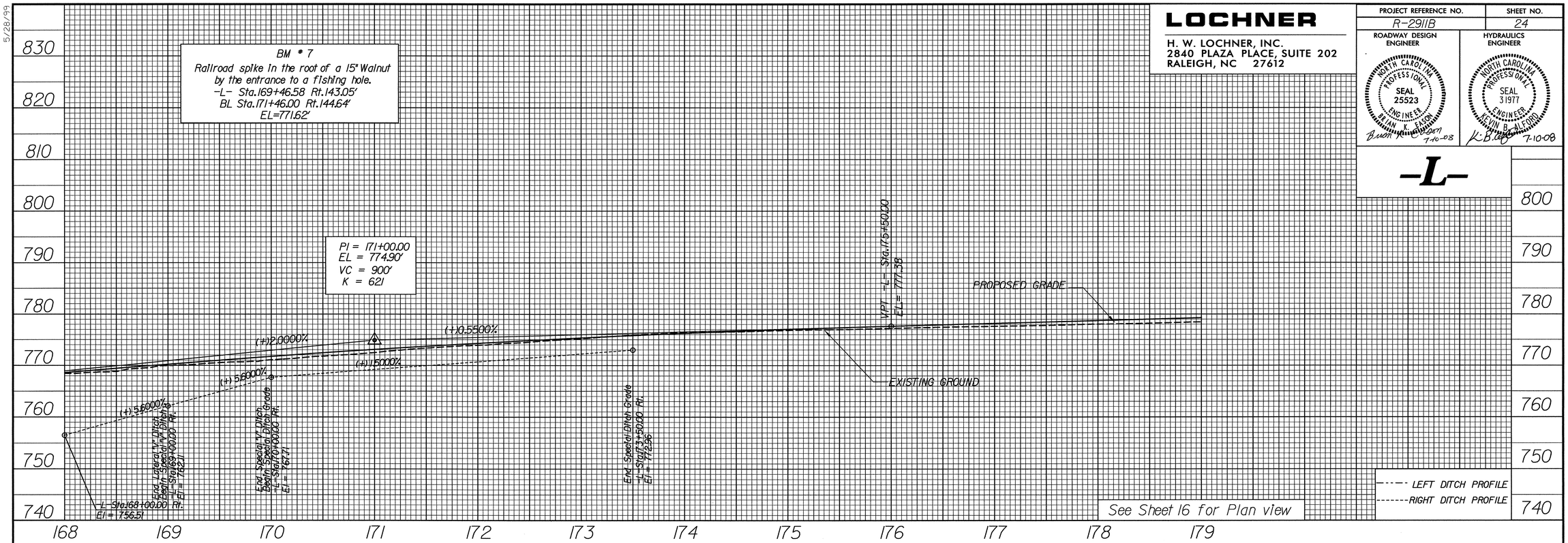

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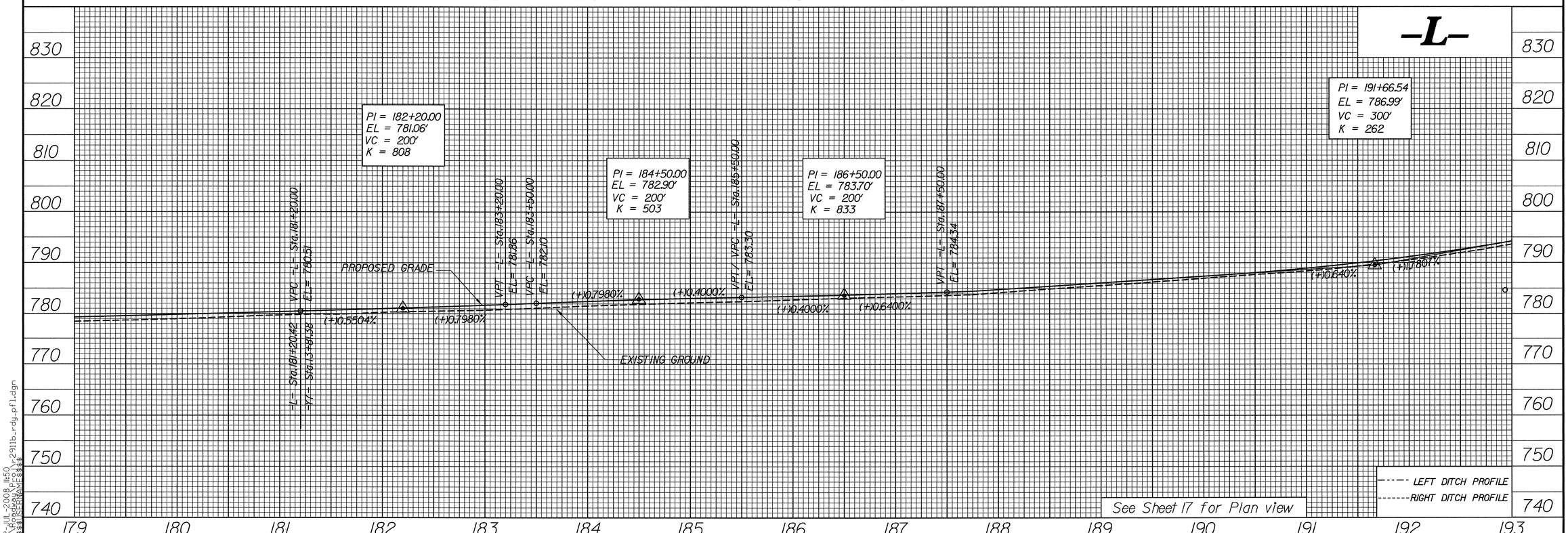

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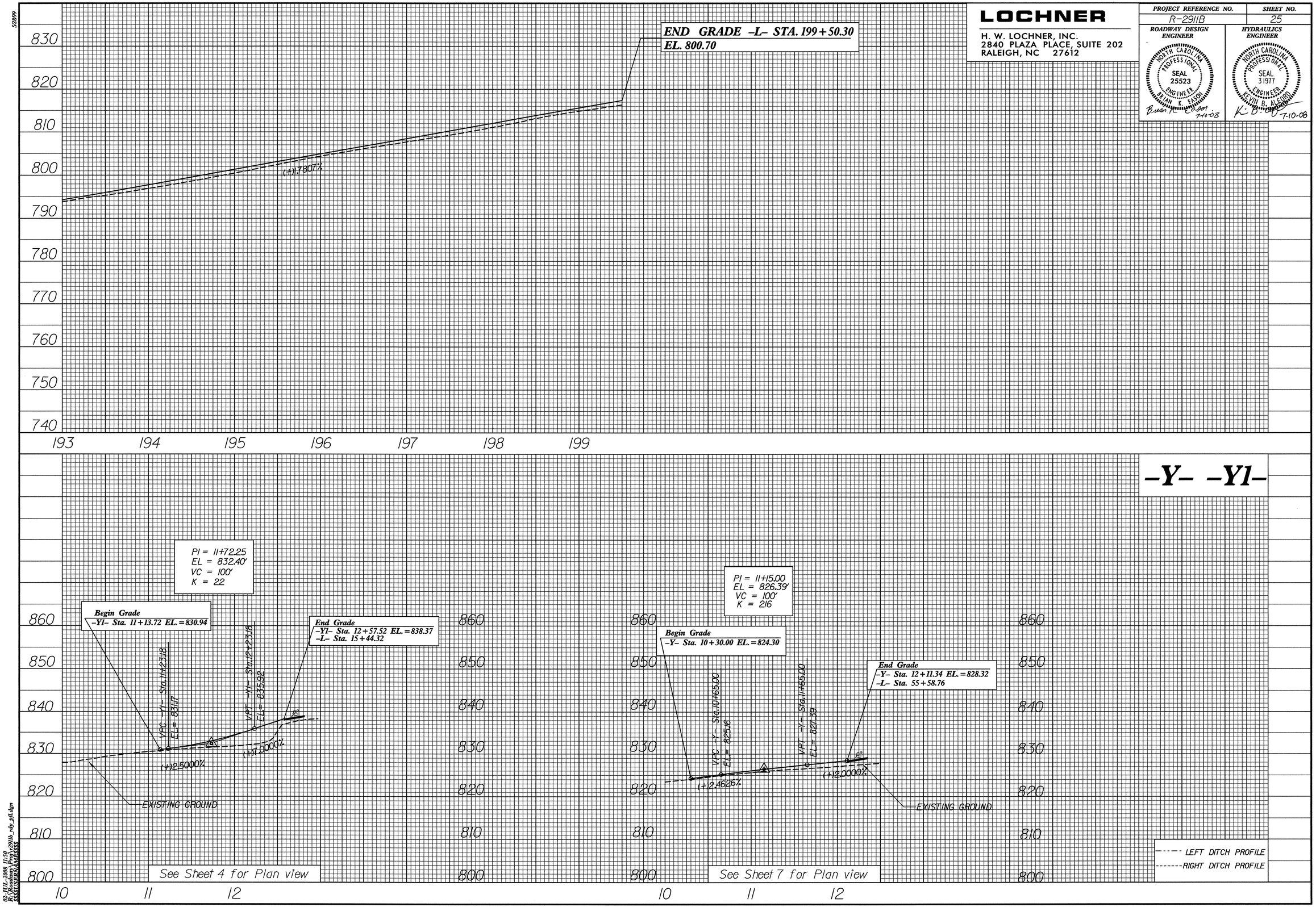
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	25

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON — 7-10-08

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD — 7-10-08



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H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2911B	26

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON — 7-10-08

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD — 7-10-08

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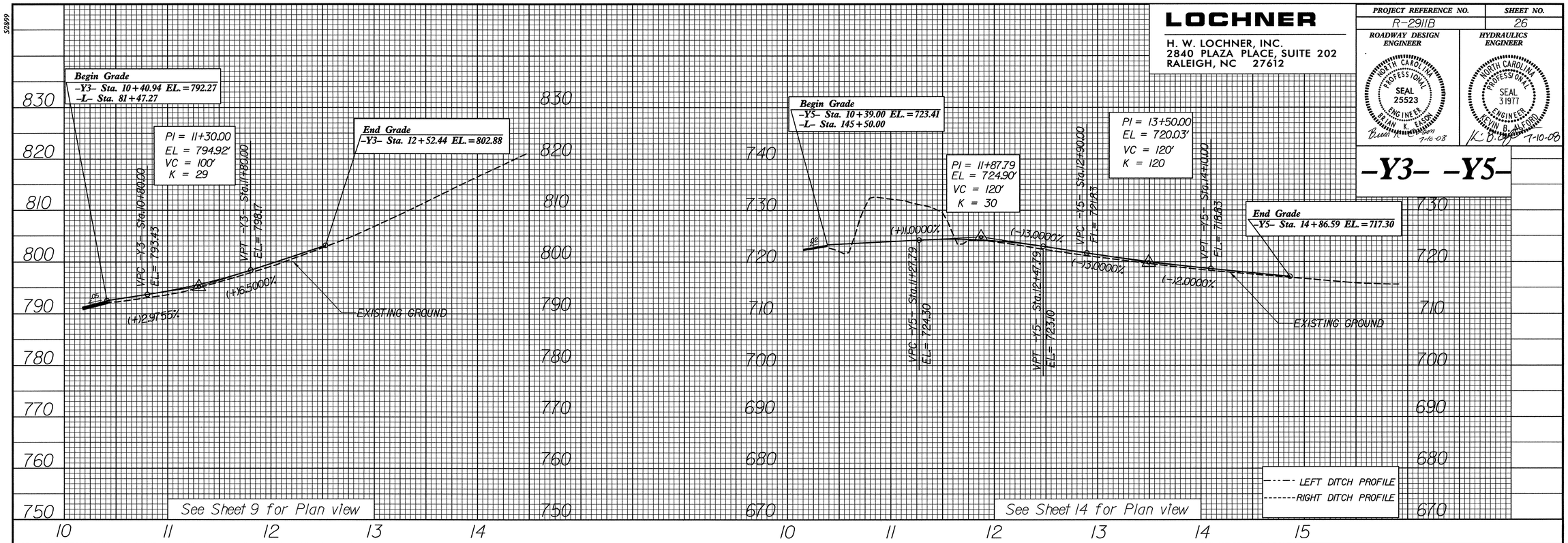

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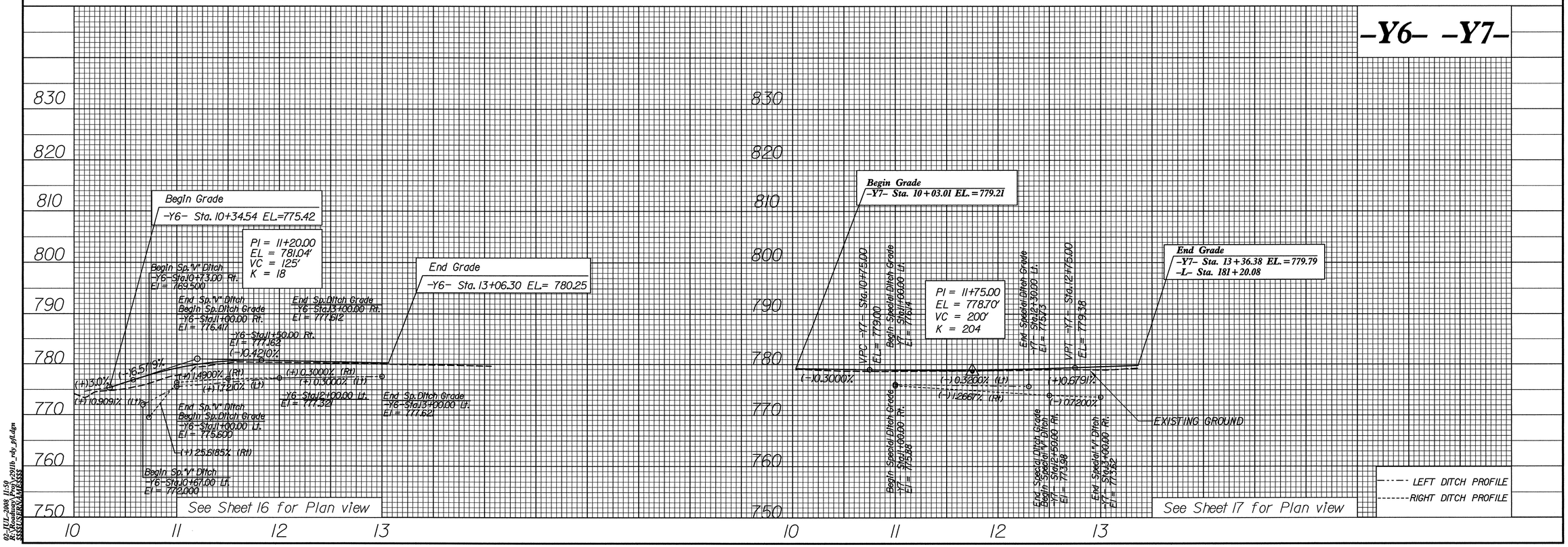

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