CONTRACT: C201737 TIP PROJECT: R-2809A

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbology
See Sheet 1C & 1D For Survey Control Sheets

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

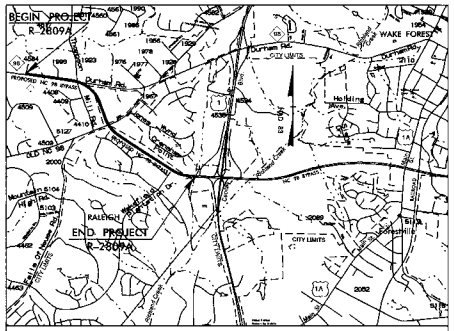
METRIC
ALL DIMENSIONS IN THESE PLANS ARE IN METERS OR MILLIMETERS UNLESS OTHERWISE SHOWN

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2809A	1	

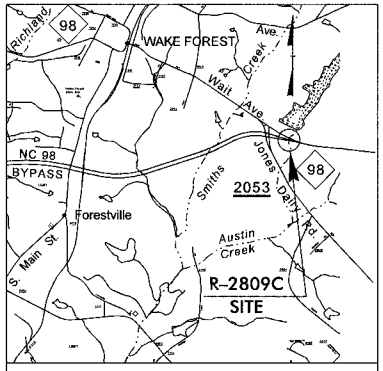
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34503.1.1	STP-98(1)	PE
34503.2.5	STP-98(2)	R/W & UTIL
34503.3.7	STP-98(23)	CONST.

LOCATION: NC 98 (WAKE FOREST BYPASS) FROM WEST OF SR 1923 (THOMPSON MILL ROAD) TO WEST OF US 1 (CAPITAL BLVD.) AND SUPPLEMENTAL WORK FOR R-2809C EAST OF SR 2053 (JONES DAIRY ROAD)

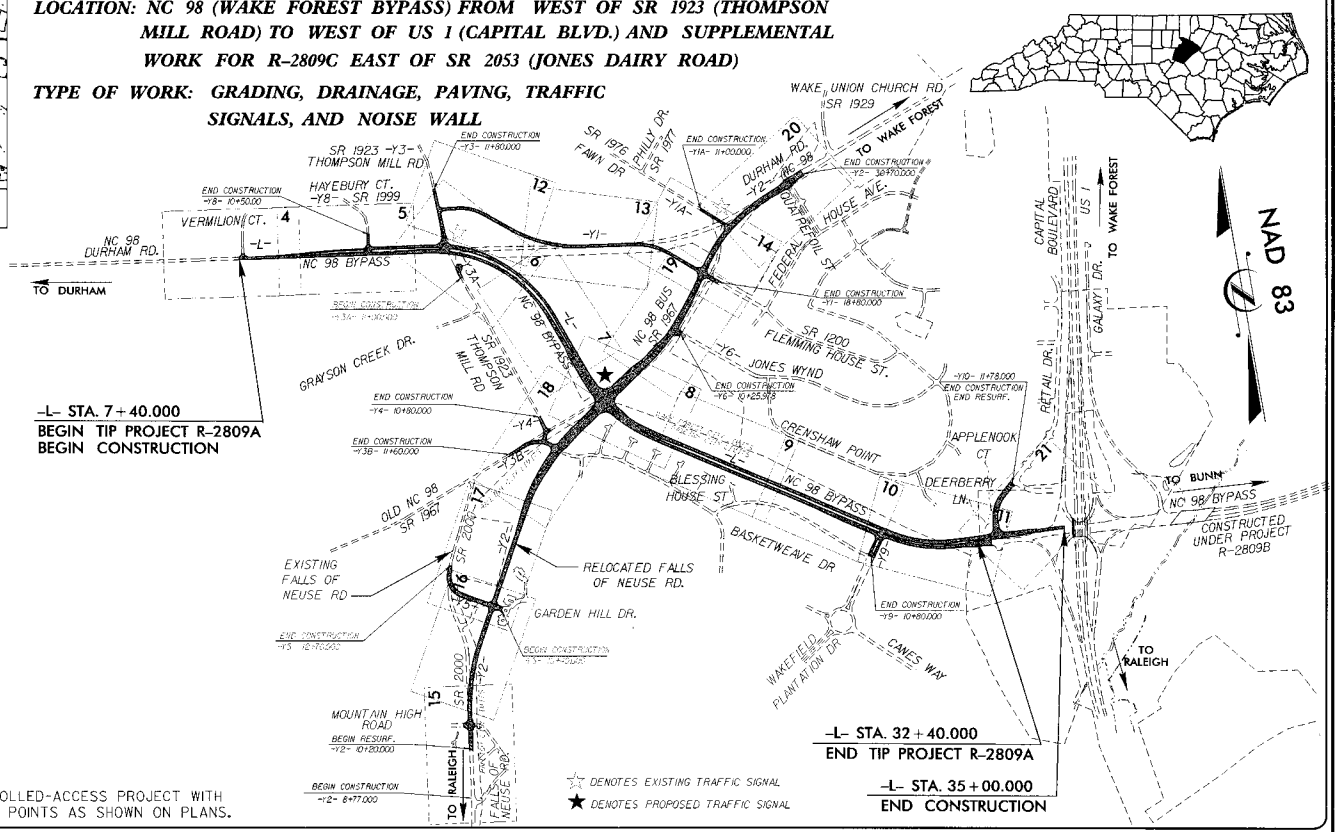
TYPE OF WORK: GRADING, DRAINAGE, PAVING, TRAFFIC SIGNALS, AND NOISE WALL



VICINITY MAP



VICINITY MAP
R-2809C SUPPLEMENTAL WORK SITE



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

GRAPHIC SCALES
PLANS 5 0 10
PROFILE (HORIZONTAL) 5 0 10
PROFILE (VERTICAL) 1 0 2

DESIGN DATA
ADT 2007 = 24,100
ADT 2025 = 36,500
DHV = 10 %
D = 60 %
T = 6 % *
V = 100 km/h
* (TTST 2% & DUAL 4%)

PROJECT LENGTH
LENGTH ROADWAY TIP PROJECT R-2809A = 2.500 km
TOTAL LENGTH OF TIP PROJECT R-2809A = 2.500 km

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

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JUNE 30, 2005
LETTING DATE: JANUARY 15, 2008

JASON MOORE, PE
PROJECT ENGINEER
KEVIN E. MOORE, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
SIGNATURE: P.E. 9/28/07
ROADWAY DESIGN ENGINEER
SIGNATURE: Kevin E. Moore P.E. 9-21-07

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
STATE HIGHWAY DESIGN ENGINEER

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	1-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 24812 ENGINEER RALPH E. MOORE 10-25-07

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C & 1-D	SURVEY CONTROL SHEET
1-E	CENTERLINE COORDINATE LIST
2 THRU 2-E	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS AND UNDERCUT DETAILS
2-F	DRAINGE DITCH DETAILS
2-G	DETAIL OF LATERAL SWALE / DITCH WITH ROCK CHECKS
2-H THRU 2-K	NOISE WALL ENVELOPE AND DETAILS
2-L THRU 2-R	SUPPLEMENTAL WORK FOR R-2809C
2-S	DETAIL FOR GUIDE FOR GRADING SUBGRADE
2-T	DETAIL FOR ASPHALT SHOULDERS MILLED RUMBLE STRIPS
2-U	DETAIL FOR DRIVEWAY TURNOUT (DRIVEWAY GRADES)
2-V THUR 2-W	DETAIL FOR WHEELCHAIR RAMPS
2-X THUR 2-AA	DETAIL FOR GUARDRAIL INSTALATION
2-BB	DETAIL OF CONVERSION OF DI OR JB TO CB
3 (2 sheets)	SUMMARY OF QUANTITIES
3-A THRU 3-F	SUMMARY OF DRAINAGE QUANTITIES
3-G	SUMMARY OF GUARDRAIL
3-H	SUMMARY OF WOVEN WIRE FENCE, SUMMARY OF ASPHALT PAVEMENT REMOVAL AND SUMMARY OF INCIDENTAL MILLING EXISTING ASPHALT
3-I	SUMMARY OF EARTHWORK (ALTERNATE1) & SUMMARY OF EARTHWORK (ALTERNATE 2)
3-J	PARCEL INDEX SHEET
4 THRU 21	PLAN SHEET
22 THRU 33	PROFILE SHEET
TCP-1 THRU TCP-38	TRAFFIC CONTROL PLANS
PM-1 THRU PM- 13	PAVEMENT MARKING PLANS
EC-1 THRU EC-41	EROSION CONTROL PLANS
RF-1 THRU RF-3	REFORESTATION PLANS
SIGN-1 THRU SIGN-16	SIGNING PLANS
SIG-1 THRU SIG-29	SIGNAL PLANS
UC-1 THRU UC-6	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-18	UTILITIES BY OTHERS PLANS
X-1 THRU X-107	CROSS-SECTIONS

GENERAL NOTES:

2002 SPECIFICATIONS
EFFECTIVE: 07-18-06
REVISED: 07-18-06

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

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

SUPERELEVATION:
ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 AND NO. 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 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 DETAILS IN THE PLANS USING 900 MM RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS 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 WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

UTILITIES:
UTILITY OWNERS ON THIS PROJECT ARE PSNC ENERGY, EMBARQ, PROGRESS ENERGY (POWER TRANSMISSION), TOWN OF WAKE FOREST (POWER DISTRIBUTION), WAKE ELECTRIC MEMBERSHIP CORP. (POWER DISTRIBUTION), CITY OF RALEIGH (WATER), TIME WARNER CABLE. ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:
RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY OTHERS AND BY CONTRACT IN ACCORDANCE WITH DESIGNATED SYMBOLLS.

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

2002 ROADWAY METRIC STANDARD DRAWINGS

EFF. 01-15-02
REV.11-23-04

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January 15, 2002 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
225.01	Guide for Grading Subgrade - Interstate and Freeway (Begin August 2003 Let Use Detail in Lieu of Standard)
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'
300.02	Method of Pipe Installation - Method 'B'
310.10	Driveway Pipe Construction
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
665.01	Milled Rumble Strips - Asphalt Pavements (Beg. March 2005 Let Use Detail in Lieu of Standard)
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.03	Pipe Underdrain and Blind Drain
816.04	Markers for Drainage Structure and Concrete Pad
820.04	Drain Installation in Shoulder Berm Gutter
838.01	Conc. Endwall for Single and Double Pipe Culverts - 375mm thru 1200mm Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 375mm thru 1200mm Pipe 90 Skew
838.80	Precast Endwalls - 300mm thru 1800mm Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 300mm thru 1350mm Pipe
840.02	Concrete Catch Basin - 300mm thru 1350mm Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.04	Concrete Catch Basin with Single and Multiple Pipes - 300mm thru 1200mm Pipe
840.05	Brick Catch Basin with Single and Multiple Pipes - 300mm thru 1200mm Pipe
840.14	Concrete Drop Inlet - 300mm thru 750mm Pipe
840.15	Brick Drop Inlet - 300mm thru 750mm Pipe
840.16	Drop Inlet Frame and Grates - for Use with Std. Dwg 840.14 and 840.15
840.17	Concrete Median Drop Inlet Type 'A' - 300mm thru 1800mm Pipe
840.18	Concrete Median Drop Inlet Type 'B' - 300mm thru 900mm Pipe
840.19	Concrete Median Drop Inlet Type 'D' - 300mm thru 900mm Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.24	Frames and Narrow Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete
840.26	Brick Median Drop Inlet Type 'A' - 300mm thru 1800mm Pipe
840.27	Brick Median Drop Inlet Type 'B' - 300mm thru 900mm Pipe
840.28	Brick Median Drop Inlet Type 'D' - 300mm thru 900mm Pipe
840.31	Concrete Junction Box - 300mm thru 1650mm Pipe
840.32	Brick Junction Box - 300mm thru 1650mm Pipe
840.34	Traffic Bearing Junction Box - For Use with Pipes 1050mm and Under
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.02	Driveway Turnout - Radius Type (Beg. April 2003 Let Use Detail in Lieu of Standard)
848.04	Street Turnout
848.05	Wheelchair Ramp - Curb Cut (Beg. October 2003 Let Use Detail in Lieu of Standard)
850.01	Concrete Paved Ditches
850.10	Guide for Berm Drainage Outlet - 400mm and 450mm Pipe
850.11	Guide for Berm Drainage Outlet - 600mm and 800mm Pipe
852.01	Concrete Islands
852.05	Median Curb for Catch Basin - for Use with 450mm Curb and Gutter
852.06	Method for Placement of Drop Inlets in Concrete Islands
862.01	Guardrail Placement
862.02	Guardrail Installation (Beg. September 2003 Let Use Detail in Lieu of Standard)
866.02	Woven Wire Fence - with Wood Post
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJ. REFERENCE NO.	SHEET NO.
R-2809A	1 - B

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 — PM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary
- Proposed Wetland Boundary
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign
- Well
- 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 — CCR
- 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
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole
- 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 — FO
- Designated U/G Fiber Optics Cable (S.U.E.*) — 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
- 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:

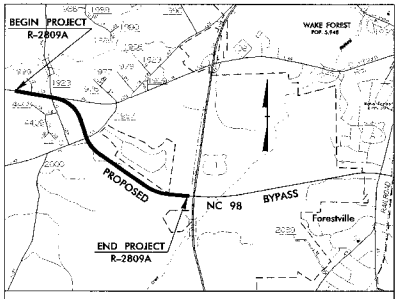
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — TS
- Utility Unknown U/G Line — ?U
- U/G Tank; Water, Gas, Oil
- A/G Tank; Water, Gas, Oil
- U/G Test Hole (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	1-C
Location and Surveys	

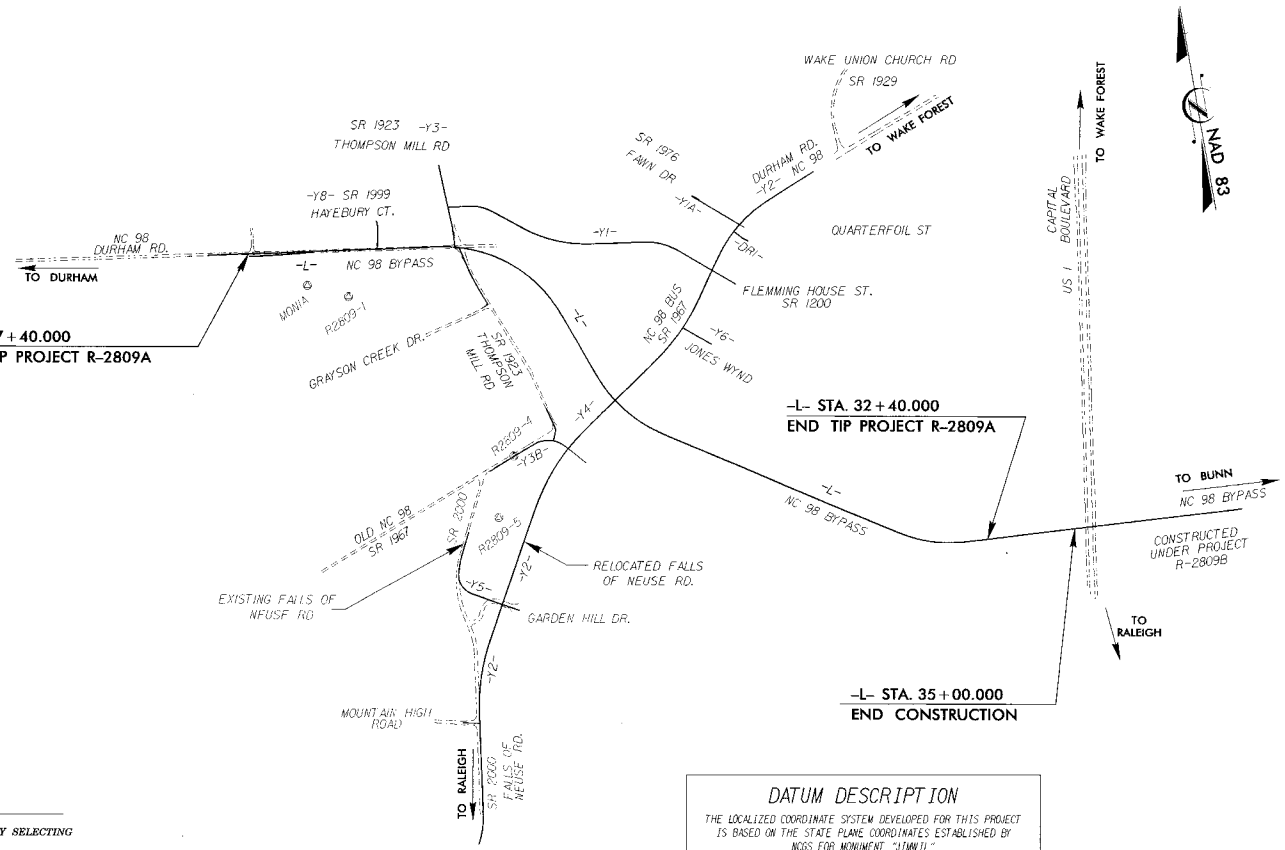
R-2809A

SURVEY CONTROL SHEET R-2809A
WAKE COUNTY

LOCATION: NC 98 (WAKE FOREST BYPASS) FROM WEST OF SR 1923 (THOMPSON MILL ROAD) TO WEST OF US 1 (CAPITAL BLVD.)



VICINITY MAP



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "JIMWIL"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 245977.127(m) EASTING: 653107.221(m)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99993779
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "JIMWIL" TO -L- STATION 7+40 IS
N76° 11' 16.6"W 4640.186 m
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.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT

r2809a_ls_control_060810.txt

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

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.

NOTE: DRAWING NOT TO SCALE

R-2809A

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	1-D
Location and Surveys	

SURVEY CONTROL SHEET R-2809A

WAKE COUNTY

LOCATION: NC 98 (WAKE FOREST BYPASS) FROM WEST OF SR 1923 (THOMPSON MILL ROAD) TO WEST OF US 1 (CAPITAL BLVD.)

BASELINE DATA

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
100	BL-100	247035.372	648853.537	104.489	9+96.750	14.155 RT
101	BL-101	246980.158	649210.662	108.457	12+60.253	15.146 RT
102	BL-102	246923.726	649307.202	111.332	14+76.226	27.521 RT
103	BL-103	246901.153	649338.942	114.102	15+20.053	27.428 RT
104	BL-104	246849.762	649392.658	111.631	15+90.595	26.044 RT
105	BL-105	246805.600	649424.220	112.216	16+57.958	26.347 RT
106	BL-106	246752.733	649451.590	105.222	17+21.859	25.826 RT
107	BL-107	246697.459	649474.900	111.907	17+82.382	23.453 RT
108	BL-108	246636.901	649492.161	110.757	18+45.692	27.934 RT
109	BL-109	246579.476	649510.911	119.216	19+06.067	29.944 RT
110	BL-110	246522.443	649531.021	117.394	19+64.932	31.652 RT
111	BL-111	246464.590	649560.557	119.371	20+25.594	31.206 RT
112	BL-112	246411.811	649647.533	119.556	21+17.599	5.894 LT
113	BL-113	246350.070	649725.607	118.258	22+18.747	6.809 LT
114	BL-114	246291.206	649820.691	120.933	23+30.686	8.993 LT
115	BL-115	246259.032	649866.632	103.988	23+80.728	6.764 LT
116	BL-116	246216.389	649928.518	105.279	24+61.845	4.347 LT
117	BL-117	246155.585	650023.083	105.624	25+74.271	4.322 LT
118	BL-118	246124.564	650071.437	105.050	26+31.720	4.365 LT
119	BL-119	246066.804	650158.467	100.234	27+36.162	2.820 LT
120	BL-120	245995.573	650276.307	101.233	28+73.906	6.609 LT
121	BL-121	245939.555	650359.746	97.906	29+74.402	4.262 LT
122	BL-122	245901.681	650449.786	92.789	30+73.694	7.566 LT
123	BL-123	245866.076	650508.291	89.775	31+35.001	7.627 LT
124	BL-124	245873.483	650617.773	75.526	32+45.928	1.280 LT
125	BL-125	245869.397	650698.995	88.523	33+27.252	1.681 LT
126	BL-126	245865.191	650818.700	93.308	34+47.009	3.879 LT
127	BL-127	245838.560	650873.954	94.659	35+03.627	19.706 RT
16	NOT SET	245836.923	650915.286	UNKNOWN	35+44.989	19.214 RT
176	BL-176	245835.707	650943.127	94.463	35+72.850	18.826 RT
128	BL-128	245833.600	651003.847	79.510	36+33.594	17.635 RT
129	BL-129	245828.526	651143.191	71.122	37+73.009	15.172 RT
17	NOT SET	245823.629	651271.557	UNKNOWN	39+01.402	13.118 RT
130	BL-130	245822.428	651302.909	71.039	39+32.823	12.617 RT
131	BL-131	245821.031	651366.524	85.737	39+96.195	10.958 RT
132	BL-132	245821.586	651459.554	87.237	40+88.370	11.260 RT
133	BL-133	245829.602	651550.556	94.676	41+78.925	10.768 RT
134	BL-134	245838.380	651603.006	93.766	42+32.189	9.940 RT
135	BL-135	245916.561	651995.558	97.994	45+33.372	12.229 RT
136	BL-136	245966.901	652111.916	90.291	47+56.940	16.631 RT
137	BL-137	245989.042	652270.448	95.097	49+18.275	21.240 RT
138	BL-138	245999.611	652401.196	98.919	50+50.727	24.303 RT
139	BL-139	245997.450	652497.256	104.101	51+47.037	31.721 RT
140	BL-140	245998.903	652674.896	106.259	53+27.733	29.377 RT
141	BL-141	245993.830	652768.675	111.741	54+22.837	28.529 RT
142	BL-142	245980.952	652892.756	116.297	55+49.156	27.549 RT
143	BL-143	245965.366	652957.632	118.934	56+15.485	32.287 RT
144	BL-144	245941.894	653093.347	122.384	57+55.997	29.521 RT
145	BL-145	245944.987	653220.369	119.216	58+79.134	1.806 LT
18	NOT SET	245940.088	653260.647	UNKNOWN	59+19.312	6.798 LT
146	BL-146	245931.766	653350.347	118.036	60+09.789	17.889 LT
147	BL-147	245906.620	653482.202	109.127	61+44.231	20.742 LT
148	BL-148	245877.781	653783.278	97.642	64+49.995	2.463 LT
149	BL-149	245892.644	653881.064	92.604	65+49.189	3.709 LT
19	NOT SET	245905.509	653947.646	UNKNOWN	66+17.178	2.411 LT
150	BL-150	245919.831	654021.770	87.546	66+92.412	3.650 RT
151	BL-151	245935.904	654082.390	97.936	67+55.014	0.755 RT
152	BL-152	245989.173	654237.994	93.152	69+19.447	3.585 RT
153	BL-153	246032.509	654363.024	97.891	70+51.739	0.532 RT
154	BL-154	246130.151	654558.609	93.534	72+58.639	4.102 LT
155	BL-155	246144.283	654626.494	86.866	73+94.020	6.746 LT
156	BL-156	246175.199	654774.925	80.132	74+80.491	3.673 LT
157	BL-157	246197.945	654842.780	90.242	75+59.210	4.485 RT
158	BL-158	246211.927	654885.097	93.544	76+03.325	10.744 RT
159	BL-159	246259.196	655023.880	96.109	77+48.662	30.039 RT
160	BL-160	246291.870	655146.920	97.412	78+81.383	40.776 RT
161	BL-161	246333.652	655294.727	102.591	80+44.436	62.597 RT
162	BL-162	246299.317	655359.303	103.644	81+16.859	65.335 RT
163	BL-163	246292.868	655420.400	100.029	81+93.496	61.574 RT
177	BL-177	246298.303	655467.857	97.296	82+34.229	57.747 RT
164	BL-164	246282.056	655525.217	94.236	82+91.586	51.334 RT
165	BL-165	246272.303	655623.330	90.672	OUTSIDE PROJECT LIMITS	
166	BL-166	246255.906	655718.504	81.309	OUTSIDE PROJECT LIMITS	
167	BL-167	246239.388	655820.808	89.949	OUTSIDE PROJECT LIMITS	

BY1

POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
A101	BL-101	246980.158	649210.680	108.457	10+18.357	135.356 RT
1	MONIA GPS	246976.108	649241.311	106.408	10+49.032	134.108 RT
2	R2849-1 GPS	246936.318	649553.819	104.984	13+97.032	10.305 RT
40	BY1-40	246923.832	649797.775	107.253	16+42.519	1.459 RT
39	BY1-39	246921.985	649892.344	109.552	17+17.080	45.598 LT
38	BY1-38	246919.217	650229.980	112.675	18+11.607	147.836 LT
37	BY1-37	246991.866	650191.558	113.364	19+94.193	300.203 LT
36	BY1-36	247050.788	650360.117	110.993	OUTSIDE PROJECT LIMITS	

BASELINE DATA

BY2

POINT	DESC.	NORTH	EAST	ELEVATION	Y2 STATION	OFFSET
27	BY2-27	246371.355	649319.787	122.023	18+78.947	33.594 LT
28	BY2-28	246410.079	649421.433	122.244	19+87.162	52.624 LT
29	BY2-29	246452.207	649544.795	120.359	21+27.993	14.947 LT
A111	BL-111	246464.580	649560.557	119.371	21+29.062	16.429 LT
30	BY2-30	246519.264	649690.590	115.260	22+56.443	10.961 RT
31	BY2-31	246572.786	649776.632	111.537	23+56.662	16.965 RT
32	BY2-32	246624.551	649835.090	112.323	24+42.402	17.203 RT
33	BY2-33	246824.189	650005.009	114.570	27+22.913	32.947 RT
36	BY1-36	247050.798	650360.117	110.993	OUTSIDE PROJECT LIMITS	

BY2A

POINT	DESC.	NORTH	EAST	ELEVATION	Y2 STATION	OFFSET
300		245790.1550	649055.0990	120.012	12+03.612	26.507 LT
201		245782.2361	649082.1384	120.411	12+86.886	2.532 LT
202		245847.4916	649126.4150	123.277	13+65.447	5.761 RT
203		245888.4506	649125.1224	122.470	14+05.021	2.410 LT
204		245944.2070	649170.0003	117.309	14+71.191	1.181 RT
205		245984.6577	649199.7299	113.022	15+16.129	1.115 LT
206		246020.7797	649212.0304	110.887	15+58.034	1.503 RT
207		246054.4343	649220.7472	113.340	15+96.135	2.686 LT
208		246089.0328	649247.2493	113.719	15+35.314	1.182 LT
209		246118.2200	649264.2052	112.452	16+69.300	2.447 LT
210		246156.7105	649286.6077	116.932	17+13.504	2.569 RT
211		246189.7084	649326.9294	117.697	17+52.321	2.342 RT
212		246234.2074	649330.6829	120.113	18+02.861	2.232 LT
213		246271.1150	649359.6148	119.359	18+49.683	1.579 RT
214		246302.8745	649394.3131	116.030	18+89.939	2.195 RT
215		246343.1764	649419.2883	120.255	19+43.107	2.926 LT
216		246385.5618	649474.2650	119.858	20+12.331	2.218 LT
217		246399.8098	649498.8215	119.223	20+40.616	2.558 RT
218		246419.7130	649519.2355	120.197	20+60.710	2.322 LT
301		246464.5800	649560.5570	119.371	21+28.050	15.408 LT

BY3

POINT	DESC.	NORTH	EAST	ELEVATION	Y2 STATION	OFFSET
42	BY3-42	246774.644	649283.598	119.562	OUTSIDE PROJECT LIMITS	
41	BY3-41	246907.436	649234.140	112.429	OUTSIDE PROJECT LIMITS	
B101	BL-101	246960.159	649210.680	108.457	OUTSIDE PROJECT LIMITS	
43	BY3-43	247063.945	649206.052	103.912	10+57.219	3.091 LT
44	BY3-44	247221.504	649197.525	93.400	12+25.095	4.378 LT

BY3

POINT	DESC.	NORTH	EAST	ELEVATION	Y3A STATION	OFFSET
42	BY3-42	246774.644	649283.588	119.562	OUTSIDE PROJECT LIMITS	
41	BY3-41	246907.438	649234.140	112.429	11+01.372	0.289 LT
B101	BL-101	246980.159	649210.680	108.457	11+77.397	10.754 LT
43	BY3-43	247063.945	649206.052	103.812	OUTSIDE PROJECT LIMITS	
44	BY3-44	247221.504	649197.526	93.400	OUTSIDE PROJECT LIMITS	

BY4

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
11	BL-167	244977.817	650049.096	85.703	36+25.73	875.111 RT
6	R2029-2 GPS	245465.551	650076.194	72.362	35+25.992	391.051 RT
A16	NOT SET	245836.830	650915.286	UNKNOWN	35+44.989	19.213 RT
5	R2029-4 GPS	245931.347	650925.265	67.510	35+49.838	75.725 LT
13	BY4-13	246306.727	650979.192	98.198	35+83.372	453.403 LT
14	BY4-14	246610.996	651023.040	103.218	36+10.692	759.649 LT
15	BY4-15	246919.256	651067.215	108.209	36+38.118	1069.048 LT

BY5

POINT	DESC.	NORTH	EAST	ELEVATION	Y2 STATION	OFFSET
20	BY5-20	245497.894	649015.640	115.946	9+94.351	6.788 LT
21	BY5-21	245790.155	649055.099	120.012	12+03.612	28.507 LT
22	BY5-22	245856.668	649055.300	121.488	13+40.884	57.124 LT
23	BY5-23	245955.396	649034.107	120.963	14+15.303	123.193 LT
24	BY5-24	246036.556	649043.109	121.150	14+90.716	154.534 LT
25	BY5-25	246115.615	649073.684	122.420	15+74.705	165.579 LT

BY6

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
78	BY6-78	246357.006	651025.490	99.330	36+20.625	507.321 LT
77	BY6-77	246563.776	651057.138	120.887	36+47.023	719.337 LT

BY7

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
69	BY7-69	245609.147	653068.445	117.889	58+25.889	390.118 RT
68	BY7-68	245863.441	653036.161	119.945	57+95.499	147.238 RT
4144	BL-144	245941.894	653093.347	122.384	57+58.597	29.521 RT
70	BY7-70	246145.382	653160.245	123.174	57+75.956	183.759 LT
71	BY7-71	246281.567	653197.516	121.914	57+51.934	324.825 LT

BASELINE DATA

BY8

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
74	BY8-74	245769.087	653245.067	114.374	59+42.417	164.163 RT
A18	NOT SET	245940.088	653260.647	UNKNOWN	59+19.312	6.798 LT
73	BY8-73	246122.221	653277.091	116.279	58+94.924	187.225 LT

BY9

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
53	BY9-53	246012.262	655568.824	82.270	OUTSIDE PROJECT LIMITS	
52	BY9-52	246126.257	655529.225	90.167	83+10.022	287.025 RT
51	BY9-51	246223.936	655472.445	96.606	82+52.773	119.562 RT
4177	BL-177	246298.323	655467.857	97.289	82+34.229	57.747 RT
50	BY9-50	246340.263	655464.331	97.225	82+19.433	7.782 RT
461	BY10-61	246470.723	655456.526	100.315	81+86.703	118.346 LT

BY10

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
63	BY10-63	246673.764	655152.756	88.080	79+80.375	321.386 LT
62	BY10-62	246541.916	655349.009	101.632	80+93.072	176.132 LT
61	BY10-61	246470.723	655456.538	100.316	81+86.703	118.346 LT
60	BY10-60	246387.095	655580.612	92.215	83+22.723	63.271 LT
59	BY10-59	246312.283	655719.579	83.200	OUTSIDE PROJECT LIMITS	
58	BY10-58	246255.659	655874.790	91.040	OUTSIDE PROJECT LIMITS	
57	BY10-57	246224.691	656010.209	100.920	OUTSIDE PROJECT LIMITS	
56	BY10-56	246209.864	656134.130	108.385	OUTSIDE PROJECT LIMITS	

BY10

POINT	DESC.	NORTH	EAST	ELEVATION	LDET STATION	OFFSET
63	BY10-63	246673.764	655152.756	88.080	OUTSIDE PROJECT LIMITS	
62	BY10-62	246541.916	655349.009	101.032	OUTSIDE PROJECT LIMITS	
61	BY10-61	246470.723	655456.538	100.315	OUTSIDE PROJECT LIMITS	
60	BY10-60	246387.095	655580.612	90.215	OUTSIDE PROJECT LIMITS	
59	BY10-59	246312.283	655719.579	83.282	11+19.102	1.141 LT
58	BY10-58	246255.655	655874.790	91.040	12+87.175	24.620 RT
57	BY10-57	246224.691	656010.209	100.922	14+27.709	4.720 LT
56	BY10-56	246209.864	656134.130	108.385	OUTSIDE PROJECT LIMITS	

BENCHMARK DATA

310 ELEVATION = 106.784
N 247101 E 648933
L STATION 11+26 70 LEFT
(BM10) RR SPIKE IN 10" MAPLE

315 ELEVATION = 77.920
N 246133 E 652053
L STATION 47+34 150 LEFT
(BM15) RR SPIKE IN 24" OAK

311 ELEVATION = 116.619
N 246753 E 649387
L STATION 16+91 84 RIGHT
(BM11) RR SPIKE IN 12" OAK

316 ELEVATION = 119.487
N 246019 E 652487
L STATION 56+37 25 LEFT
(BM16) RR SPIKE IN 20" PINE

312 ELEVATION = 107.828
N 246203 E 649961
L STATION 24+53 78 LEFT
(BM12) RR SPIKE IN 14" OAK

317 ELEVATION = 97.730
N 245755 E 653750
L STATION 64+10 117 RIGHT
(BM17) RR SPIKE IN 30" HICKORY

313 ELEVATION = 76.276
N 245794 E 650575
L STATION 32+07 82 RIGHT
(BM13) RR SPIKE IN 14" OAK

318 ELEVATION = 89.364
N 246071 E 654622
L STATION 73+10 43 RIGHT
(BM18) RR SPIKE IN 14" PINE

314 ELEVATION = 73.776
N 245916 E 651238
L STATION 38+55 77 LEFT
(BM14) RR SPIKE IN 16" PINE

321 ELEVATION = 114.772
N 246776 E 649373
Y2 STATION 20+43 30 RIGHT
(BM21) RR SPIKE IN 25" MAPLE

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "JIMWIL"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 245977.127(m) EASTING: 653107.221(m)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99993779
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "JIMWIL" TO -L- STATION 7+40 IS
N76° 11' 16.6"W 4,640.186 m
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.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT
r2809a_ls_control_050810.txt

SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT.
IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

NOTE: DRAWING NOT TO SCALE

PROJ. REFERENCE NO.	SHEET NO.
R-2809A	1-E

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CENTERLINE COORDINATE LIST

Point #	Chain	Station	Northing (Y)	Easting (X)
1	L	6+20.000	247101.5290	648482.3659
2	L	6+60.000	247095.9912	648521.9807
3	L	7+00.000	247090.4534	648561.5955
4	L	7+40.000	247084.9156	648601.2103
5	L	7+80.000	247079.3778	648640.8251
6	L	8+20.000	247073.8400	648680.4399
7	L	8+60.000	247068.3022	648720.0547
8	L	9+00.000	247062.7644	648759.6695
9	L	9+40.000	247057.2266	648799.2843
10	L	9+80.000	247051.6888	648838.8991
11	L	10+20.000	247046.1510	648878.5139
12	L	10+60.000	247040.6132	648918.1287
13	L	11+00.000	247035.0754	648957.7435
14	L	11+40.000	247029.5376	648997.3583
15	L	11+80.000	247023.9998	649036.9731
16	L	12+20.000	247018.4620	649076.5879
17	L	12+60.000	247012.9242	649116.2027
18	L	13+00.000	247007.1189	649155.7785
19	L	13+40.000	246999.6721	649195.0724
20	L	13+80.000	246989.0186	649233.6107
21	L	14+20.000	246974.5424	649270.8810
22	L	14+60.000	246956.3726	649306.4959
23	L	15+00.000	246934.6953	649340.0935
24	L	15+40.000	246909.7328	649371.3265
25	L	15+80.000	246881.7407	649399.8760
26	L	16+20.000	246851.0059	649425.4495
27	L	16+60.000	246817.8432	649447.7849
28	L	17+00.000	246782.5924	649466.6533
29	L	17+40.000	246745.7230	649482.1408
30	L	17+80.000	246708.1846	649495.9551
31	L	18+20.000	246670.5944	649509.6289
32	L	18+60.000	246633.0042	649523.3028
33	L	19+00.000	246595.4139	649536.9766
34	L	19+40.000	246557.9038	649550.8670
35	L	19+80.000	246520.9767	649566.2259
36	L	20+20.000	246485.4151	649584.5040
37	L	20+60.000	246451.8691	649606.2595
38	L	21+00.000	246420.6943	649631.2947
39	L	21+40.000	246392.2101	649659.3532
40	L	21+80.000	246366.6786	649690.1248
41	L	22+20.000	246343.6465	649722.8213
42	L	22+60.000	246321.8552	649756.3638
43	L	23+00.000	246300.2300	649790.0142
44	L	23+40.000	246278.5047	649823.6646
45	L	23+80.000	246256.9795	649857.3150
46	L	24+20.000	246235.3543	649890.9654
47	L	24+60.000	246213.7291	649924.6158
48	L	25+00.000	246192.1039	649958.2662
49	L	25+40.000	246170.4786	649991.9166
50	L	25+80.000	246148.8534	650025.5670
51	L	26+20.000	246127.2282	650059.2174
52	L	26+60.000	246105.6030	650092.8678
53	L	27+00.000	246083.9777	650126.5182
54	L	27+40.000	246062.3525	650160.1686
55	L	27+80.000	246040.7273	650193.8190
56	L	28+20.000	246019.1021	650227.4694
57	L	28+60.000	245997.4769	650261.1198
58	L	29+00.000	245975.8516	650294.7702
59	L	29+40.000	245954.2265	650328.4207
60	L	29+80.000	245933.0308	650362.3407
61	L	30+20.000	245914.1331	650397.5783
62	L	30+60.000	245898.8351	650434.5189
63	L	31+00.000	245887.3499	650472.8167
64	L	31+40.000	245879.7951	650512.0794
65	L	31+80.000	245875.8788	650551.8783
66	L	32+20.000	245873.6024	650591.8132
67	L	32+60.000	245871.4378	650631.7546
68	L	33+00.000	245869.2731	650671.6960
69	L	33+40.000	245867.1085	650711.6374
70	L	33+80.000	245864.9438	650751.5788
71	L	34+20.000	245862.7791	650791.5202
72	L	34+60.000	245860.6145	650831.4615
73	L	35+00.000	245858.4498	650871.4029
74	Y8	10+00.000	247032.0948	648979.0653
75	Y8	10+20.000	247051.6751	648983.1409
76	Y8	10+40.000	247071.2555	648987.2165
77	Y8	10+60.000	247090.8963	648990.9521
78	Y8	10+80.000	247110.8547	648991.0816
79	Y8	10+82.639	247113.4750	648990.7675
80	Y3	10+00.000	246996.8901	649206.6756

Point #	Chain	Station	Northing (Y)	Easting (X)
81	Y3	10+20.000	247016.8541	649207.8742
82	Y3	10+40.000	247036.8226	649208.9899
83	Y3	10+60.000	247056.8184	649209.2816
84	Y3	10+80.000	247076.8069	649208.6390
85	Y3	11+00.000	247096.7890	649207.7927
86	Y3	11+20.000	247116.7711	649206.9464
87	Y3	11+40.000	247136.7532	649206.1002
88	Y3	11+60.000	247156.7353	649205.2539
89	Y3	11+80.000	247176.7174	649204.4077
90	Y3	12+00.000	247196.6995	649203.5614
91	Y3	12+20.000	247216.6816	649202.7152
92	Y3	12+40.000	247236.6637	649201.8689
93	Y3	12+48.733	247245.3885	649201.4994
94	Y2	7+20.000	245230.9443	648963.4296
95	Y2	7+40.000	245248.7524	648972.5321
96	Y2	7+60.000	245266.9905	648980.7311
97	Y2	7+80.000	245285.7343	648987.6970
98	Y2	8+00.000	245304.9005	648993.3986
99	Y2	8+20.000	245324.4039	648997.8109
100	Y2	8+40.000	245344.1553	649000.9342
101	Y2	8+60.000	245363.9757	649003.5089
102	Y2	8+80.000	245383.7960	649006.2835
103	Y2	9+00.000	245403.6164	649008.9582
104	Y2	9+20.000	245423.4367	649011.6329
105	Y2	9+40.000	245443.2571	649014.3075
106	Y2	9+60.000	245463.0774	649016.9822
107	Y2	9+80.000	245482.8978	649019.6569
108	Y2	10+00.000	245502.7181	649022.3315
109	Y2	10+20.000	245522.5385	649025.0062
110	Y2	10+40.000	245542.3588	649027.6809
111	Y2	10+60.000	245562.1792	649030.3555
112	Y2	10+80.000	245581.9995	649033.0302
113	Y2	11+00.000	245601.8198	649035.7054
114	Y2	11+20.000	245621.6299	649038.4543
115	Y2	11+40.000	245641.3970	649041.4950
116	Y2	11+60.000	245661.0762	649045.0580
117	Y2	11+80.000	245680.6272	649049.2681
118	Y2	12+00.000	245700.0269	649054.1274
119	Y2	12+20.000	245719.2539	649059.6305
120	Y2	12+40.000	245738.2869	649065.7713
121	Y2	12+60.000	245757.1046	649072.5431
122	Y2	12+80.000	245775.6862	649079.9382
123	Y2	13+00.000	245794.0110	649087.9485
124	Y2	13+20.000	245812.0587	649096.5650
125	Y2	13+40.000	245829.8358	649105.7275
126	Y2	13+60.000	245847.4278	649115.2415
127	Y2	13+80.000	245864.9428	649124.8967
128	Y2	14+00.000	245882.4522	649134.5622
129	Y2	14+20.000	245899.9615	649144.2278
130	Y2	14+40.000	245917.4709	649153.8933
131	Y2	14+60.000	245934.9802	649163.5589
132	Y2	14+80.000	245952.4895	649173.2244
133	Y2	15+00.000	245969.9989	649182.8900
134	Y2	15+20.000	245987.5082	649192.5555
135	Y2	15+40.000	246005.0176	649202.2211
136	Y2	15+60.000	246022.5269	649211.8866
137	Y2	15+80.000	246040.0363	649221.5522
138	Y2	16+00.000	246057.5456	649231.2177
139	Y2	16+20.000	246075.0550	649240.8833
140	Y2	16+40.000	246092.5643	649250.5488
141	Y2	16+60.000	246110.0736	649260.2144
142	Y2	16+80.000	246127.5830	649269.8799
143	Y2	17+00.000	246145.0923	649279.5455
144	Y2	17+20.000	246162.6017	649289.2110
145	Y2	17+40.000	246180.1060	649298.8856
146	Y2	17+60.000	246197.5352	649308.6946
147	Y2	17+80.000	246214.7694	649318.8416
148	Y2	18+00.000	246231.6886	649329.5048
149	Y2	18+20.000	246248.2431	649340.7259
150	Y2	18+40.000	246264.4144	649352.4924
151	Y2	18+60.000	246280.1846	649364.7914
152	Y2	18+80.000	246295.5361	649377.6090
153	Y2	19+00.000	246310.4520	649390.9312
154	Y2	19+20.000	246324.9155	649404.7431
155	Y2	19+40.000	246338.9106	649419.0294
156	Y2	19+60.000	246352.4221	649433.7741
157	Y2	19+80.000	246365.4345	649448.9608
158	Y2	20+00.000	246377.9336	649464.5730
159	Y2	20+20.000	246389.9375	649480.5692
160	Y2	20+40.000	246401.5504	649496.8519
161	Y2	20+60.000	246412.8967	649513.3218

Point #	Chain	Station	Northing (Y)	Easting (X)
162	Y2	20+80.000	246424.1050	649529.8860
163	Y2	21+00.000	246435.2877	649546.4675
164	Y2	21+20.000	246446.4704	649563.0491
165	Y2	21+40.000	246457.6531	649579.6306
166	Y2	21+60.000	246468.8358	649596.2121
167	Y2	21+80.000	246480.0185	649612.7937
168	Y2	22+00.000	246491.2012	649629.3752
169	Y2	22+20.000	246502.3839	649645.9567
170	Y2	22+40.000	246513.5666	649662.5382
171	Y2	22+60.000	246524.7493	649679.1198
172	Y2	22+80.000	246535.9320	649695.7013
173	Y2	23+00.000	246547.1358	649712.2686
174	Y2	23+20.000	246558.4689	649728.7476
175	Y2	23+40.000	246570.0602	649745.0457
176	Y2	23+60.000	246582.0344	649761.0642
177	Y2	23+80.000	246594.4991	649776.7037
178	Y2	24+00.000	246607.4778	649791.9193
179	Y2	24+20.000	246620.9565	649806.6938
180	Y2	24+40.000	246634.9201	649821.0111
181	Y2	24+60.000	246649.3530	649834.8550
182	Y2	24+80.000	246664.2393	649848.2102
183	Y2	25+00.000	246679.5525	649861.0618
184	Y2	25+20.000	246695.2980	649873.4052
185	Y2	25+40.000	246711.3837	649885.3163
186	Y2	25+60.000	246727.6563	649896.9157
187	Y2	25+80.000	246744.0795	649908.3296
188	Y2	26+00.000	246760.5442	649919.6835
189	Y2	26+20.000	246777.0102	649931.0357
190	Y2	26+40.000	246793.4760	649942.3881
191	Y2	26+60.000	246809.9078	649953.7896
192	Y2	26+80.000	246826.1952	649965.3961
193	Y2	27+00.000	246842.2118	649977.3728
194	Y2	27+20.000	246857.8195	649989.8768
195	Y2	27+40.000	246872.8660	650003.0497
196	Y2	27+60.000	246887.2403	650016.9527
197	Y2	27+80.000	246900.9019	650031.5568
198	Y2	28+00.000	246913.8164	650046.8254
199	Y2	28+20.000	246925.9518	650062.7204
200	Y2	28+40.000	246937.2775	650079.2021
201	Y2	28+60.000	246947.7653	650096.2292
202	Y2	28+80.000	246957.3963	650113.7553
203	Y2	29+00.000	246966.2566	650131.6842
204	Y2	29+20.000	246974.5179	650149.8976
205	Y2	29+40.000	246982.3629	650168.2944
206	Y2	29+60.000	246989.9807	650186.7868
207	Y2	29+80.000	246997.5456	650205.3009
208	Y2	30+00.000	247005.1103	650223.8151
209	Y2	30+20.000	247012.6750	650242.3293
210	Y2	30+40.000	247020.2397	650260.8435
211	Y2	30+60.000	247027.8044	650279.3577
212	Y2	30+73.920	247033.0694	650292.2436
213	Y9	10+00.000	245947.9816	650338.1723
214	Y9	10+20.000	245931.5003	650326.8424
215	Y9	10+40.000	245915.0190	650315.5125
216	Y9	10+60.000	245898.5377	650304.1826
217	Y9	10+80.000	245882.0564	650292.8527
218	Y9	11+00.000	245865.5751	650281.5227
219	Y9	11+09.994	245857.3395	650275.8613
220	Y10	10+00.000	245869.2731	650671.6960
221	Y10	10+20.000	245889.2438	650672.7763
222	Y10	10+40.000	245909.2145	650673.8607
223	Y10	10+60.000	245929.1640	650675.2125
224	Y10	10+80.000	245948.6154	650679.7193
225	Y10	11+00.000	245966.7837	650688.0007
226	Y10	11+20.000	245982.9445	650699.7265
227	Y10	11+40.000	245996.7814	650714.1505
228	Y10	11+60.000	246010.2063	650728.9752
229	Y10	11+80.000	246023.6312	650743.7999
230	Y10	12+00.000	246037.0561	650758.6246
231	Y10	12+20.000	246050.4810	650773.4493
232	Y10	12+40.000	246063.9060	650788.2740
233	Y10	12+60.000	246077.3309	650803.0987
234	Y10	12+64.652	246080.4536	650806.5470
235	Y5	10+20.005	245908.4920	649204.3815
236	Y5	10+40.005	245918.1576	649186.8721
237	Y5	10+60.005	245927.8231	649169.3628
238	Y5	10+80.005	245937.4887	649151.8534
239	Y5	11+00.005	245947.1542	649134.3441
240	Y5	11+20.005	245956.8198	649116.8347

Point #	Chain	Station	Northing (Y)	Easting (X)
241	Y5	11+40.005	245966.4853	649099.3254
242	Y5	11+60.005	245976.1509	649081.8161
243	Y5	11+80.005	245987.7538	649065.6254
244	Y5	12+00.005	246003.9568	649054.0595
245	Y5	12+20.005	246023.0523	649048.4317
246	Y5	12+40.005	246042.9381	649049.3617
247	Y5	12+60.005	246062.1321	649054.9589
248	Y5	12+80.005	246080.8613	649061.9622
249	Y5	13+00.005	246099.0451	649070.2801
250	Y5	13+20.005	246116.9733	649079.1445
251	Y5	13+40.005	246134.9016	649088.0089
252	Y5	13+60.005	246152.8299	649096.8733
253	Y5	13+68.236	246160.2084	649100.5215
254	Y3A	10+00.000	246613.6710	649273.9455
255	Y3A	10+20.000	246632.2488	649266.5385
256	Y3A	10+40.000	246650.8267	649259.1314
257	Y3A	10+60.000	246669.4706	649251.8945
258	Y3A	10+80.000	246688.3748	649245.3694
259	Y3A	11+00.000	246907.5248	649239.6054
260	Y3A	11+20.000	246926.8888	649234.6067
261	Y3A	11+40.000	246946.3300	649229.9121
262	Y3A	11+60.000	246965.7712	649225.2174
263	Y3A	11+80.000	246985.2124	649220.5228
264	Y3A	11+88.729	246993.6974	649218.4738
265	Y3B	10+00.000	246352.4221	649433.7741
266	Y3B	10+20.000	246367.1309	649420.2351
267	Y3B	10+40.000	246378.7776	649404.0402
268	Y3B	10+60.000	246386.0556	649385.4674
269	Y3B	10+80.000	246388.5123	649365.6713
270	Y3B	11+00.000	246385.9950	649345.8828
271	Y3B	11+20.000	246379.2311	649327.0786
272	Y3B	11+40.000	246371.8770	649308.4797
273	Y3B	11+60.000	246364.5230	649289.8808
274	Y3B	11+80.000	246357.1689	649271.2820
275	Y3B	12+00.000	246349.8149	649252.6831
276	Y3B	12+20.000	246342.4609	649234.0842
277	Y3B	12+40.000	246335.1068	649215.4853
278	Y3B	12+60.000	246327.7528	649196.8865
279	Y3B	12+63.730	246326.3812	649193.4177
280	Y4	10+00.000	246382.9978	649384.9815
281	Y4	10+20.000	246401.6191	649402.2785
282	Y4	10+40.000	246421.0350	649405.6863
283	Y4	10+60.000	246440.4021	649400.7236
284	Y4	10+80.000	246459.7228	649395.5556
285	Y4	11+00.000	246479.0436	649390.3875
286	Y4	11+00.780	246479.7969	649390.1860
287	Y6	10+00.000	246644.3206	649830.1324
288	Y6	10+20.000	246631.4461	649845.4375
289	Y6	10+40.000	246618.5716	649860.7426
290	Y6	10+60.000	246605.6971	649876.0478
291	Y6	10+80.000	246592.8226	649891.3529
292	Y6	11+00.000	246579.9481	649906.6580
293	Y1	10+00.000	247116.7023	649206.9494
294	Y1	10+20.000	247114.5567	649226.8340
295	Y1	10+40.000	247112.4111	649246.7186
296	Y1	10+60.000	247110.2431	649266.6006
297	Y1	10+80.000	247106.2759	649286.1845
298	Y1	11+00.000	247099.4615	649304.9684
299	Y1	11+20.000	247089.9492	649322.5406
300	Y1	11+40.000	247078.0557	649338.6054
301	Y1	11+60.000	247065.5925	649354.2473
302	Y1	11+80.000	247053.1292	649369.8892
303	Y1	12+00.000	247040.6660	649385.5311
304	Y1	12+20.000	247028.2028	649401.1729
305	Y1	12+40.000	247015.7735	649416.8415
306	Y1	12+60.000	247003.9419	649432.9639
307	Y1	12+80.000	246992.9309	649449.6574
308	Y1	13+00.000	246982.7679	649466.8804
309	Y1	13+20.000	246973.4785	649484.5898
310	Y1	13+40.000	246965.0857	649502.7413
311	Y1	13+60.000	246957.6107	649521.2896
312	Y1	13+80.000	246951.0720	649540.1884
313	Y1	14+00.000	246945.4860	649559.3903
314	Y1	14+20.000	246940.8667	649578.8474
315	Y1	14+40.000	246937.2256	649598.5111
316	Y1	14+60.000	246934.3768	649618.3068
317	Y1	14+80.000	246931.5966	649638.1126

Point #	Chain	Station	Northing (Y)	Easting (X)
318	Y1	15+00.000	246928.8164	649657.9184
319	Y1	15+20.000	246926.0362	649677.7243
320	Y1	15+40.000	246923.2560	649697.5301
321	Y1	15+60.000	246920.4758	649717.3359
322	Y1	15+80.000	246917.6956	649737.1417
323	Y1	16+00.000	246914.9154	649756.9476
324	Y1	16+20.000	246911.4556	649776.6385
325	Y1	16+40.000	246906.0303	649795.8794
326	Y1	16+60.000	246898.6635	649814.4639
327	Y1	16+80.000	246889.4327	649832.1964
328	Y1	17+00.000	246878.4349	649848.8906
329	Y1	17+20.000	246865.8616	649864.4370
330	Y1	17+40.000	246852.9125	649879.6791
331	Y1	17+60.000	246839.9634	649894.9212
332	Y1	17+80.000	246827.0143	649910.1633
333	Y1	18+00.000	246814.0653	649925.4054
334	Y1	18+20.000	246801.1162	649940.6475
335	Y1	18+40.000	246788.1671	649955.8895
336	Y1	18+60.000	246775.2180	649971.1316
337	Y1	18+80.000	246762.2689	649986.3737
338	Y1	19+00.000	246749.3198	650001.6158
339	Y1	19+07.423	246744.5135	650007.2732
340	Y1A	10+00.000	246915.3905	650048.7964
341	Y1A	10+20.000	246928.5797	650033.7616
342	Y1A	10+40.000	246941.7689	650018.7268
343	Y1A	10+60.000	246954.9580	650003.6920
344	Y1A	10+80.000	246968.1472	649988.6572
345	Y1A	11+00.000	246981.3364	649973.6224
346	Y1A	11+20.000	246994.5256	649958.5876
347	Y1A	11+40.000	247007.7148	649943.5527
348	Y1A	11+60.000	247020.9040	649928.5179
349	Y1A	11+65.972	247024.8422	649924.0286
350	_TRANS	7+40.000	247076.8936	648500.0889
351	_TRANS	7+60.000	247074.1247	648519.8963
352	_TRANS	7+80.000	247071.4440	648539.7157
353	_TRANS	8+00.000	247068.9357	648559.5578
354	_TRANS	8+20.000	247066.6001	648579.4209
355	_TRANS	8+40.000	247064.4373	648699.3035
356	_TRANS	8+60.000	247062.4474	648719.2042
357	_TRANS	8+80.000	247060.6307	648739.1215
358	_TRANS	9+00.000	247058.9873	648759.0538
359	_TRANS	9+20.000	247057.5172	648778.9996
360	_TRANS	9+40.000	247056.1775	648798.9547
361	_TRANS	9+60.000	247054.7081	648818.9005
362	_TRANS	9+80.000	247053.0653	648838.8329
363	_TRANS	10+00.000	247051.2492	648858.7502
364	_TRANS	10+20.000	247049.2600	648878.6510
365	_TRANS	10+40.000	247047.0978	648898.5337
366	_TRANS	10+60.000	247044.7628	648918.3969
367	_TRANS	10+80.000	247042.2552	648938.2390
368	_TRANS	11+00.000	247039.5751	648958.0585
369	_TRANS	11+00.311	247039.5321	648958.3665

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

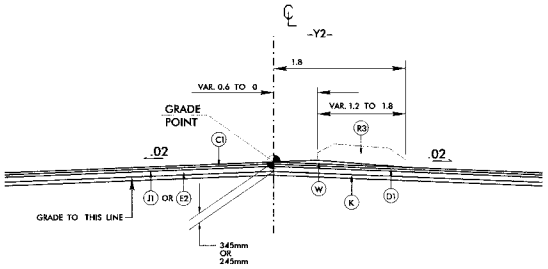
METRIC

PAVEMENT SCHEDULE

C1	PROP. APPROX. 80 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 96 kg PER SQ. METER IN EACH OF TWO LAYERS.	E7	PROP. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 2.45 kg PER SQ. METER PER 1 mm DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 75 mm IN DEPTH OR GREATER THAN 140 mm IN DEPTH.
C2	PROP. APPROX. 80 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 96 kg PER SQ. METER IN EACH OF TWO LAYERS.	J1	PROP. 200 mm AGGREGATE BASE COURSE.
C3	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 2.40 kg PER SQ. METER PER 1 mm DEPTH, TO BE PLACED IN LAYERS NOT TO EXCEED 50 mm IN DEPTH.	J2	PROP. 250 mm AGGREGATE BASE COURSE.
C4	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 2.40 kg PER SQ. METER PER 1 mm DEPTH, TO BE PLACED IN LAYERS NOT TO EXCEED 50 mm IN DEPTH.	K	SUBBASE TO BE TREATED WITH LIME TO A DEPTH OF 200mm, AT A RATE OF 11 KG. PER SQ. METER, AS DIRECTED BY THE ENGINEER. OR SUBBASE TO BE TREATED WITH CEMENT TO A DEPTH OF 180mm, AT A RATE OF 30 KG. PER SQ. METER, AS DIRECTED BY THE ENGINEER. OR SUBBASE TO BE TREATED WITH AGGREGATE AT A RATE OF 135 KG.PER SQ. METER AND CEMENT AT A RATE OF 30 KG.PER SQ.METER TO A DEPTH OF 180mm, AS DIRECTED BY THE ENGINEER.
D1	PROP. APPROX. 65 mm ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 159.25 kg PER SQ. METER.		
D2	PROP. APPROX. 100 mm ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B AT AN AVERAGE RATE OF 245 kg PER SQ. METER.		
D3	PROP. APPROX. 100 mm ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C AT AN AVERAGE RATE OF 245 kg PER SQ. METER.	R1	450 mm CONCRETE CURB AND GUTTER.
D4	PROP. VAR.DEPTH ASPHALT CONC. INTERMEDIATE COURSE I19.0B AT AN AVERAGE RATE OF 2.45 kg PER SQ. METER PER 1mm DEPTH, TO BE PLACED IN LAYER NOT LESS THAN 65mm IN DEPTH OR GREATER THAN 110mm IN DEPTH.	R2	750 mm CONCRETE CURB AND GUTTER.
D5	PROP. VAR.DEPTH ASPHALT CONC. INTERMEDIATE COURSE I19.0C AT AN AVERAGE RATE OF 2.45 kg PER SQ. METER PER 1mm DEPTH, TO BE PLACED IN LAYER NOT LESS THAN 65mm IN DEPTH OR GREATER THAN 110mm IN DEPTH.	R3	125 mm CONCRETE MONOLITHIC ISLAND.
E1	PROP. APPROX. 75 mm ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 183.75 kg PER SQ. METER.	R4	SHOULDER BERM GUTTER.
E2	PROP. APPROX. 100 mm ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 245 kg PER SQ. METER.	S	100 mm CONCRETE SIDEWALK.
E3	PROP. APPROX. 110 mm ASPHALT CONC. BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 269.5 kg PER SQ. METER.	T	EARTH MATERIAL.
E4	PROP. APPROX. 130 mm ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 318.5 kg PER SQ. METER.	U	EXISTING PAVEMENT.
E5	PROP. APPROX. 190 mm ASPHALT CONC. BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 232.75 kg PER SQ. METER IN EACH OF TWO LAYERS.	V	MILLED RUMBLE STRIPS
E6	PROP. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 2.45 kg PER SQ. METER PER 1 mm DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 75 mm IN DEPTH OR GREATER THAN 140 mm IN DEPTH.	W	WEDGING.

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

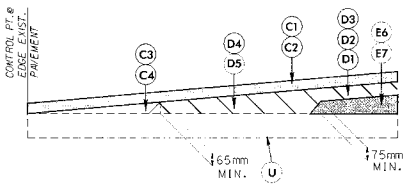
RUMBLE STRIPS TO BE PLACED IN ACCORDANCE WITH STD. 665.01



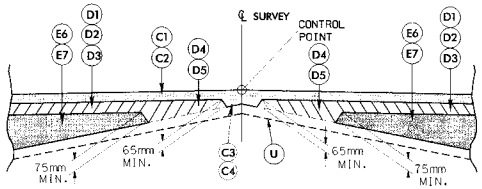
DETAIL OF WEDGING AT CONCRETE MONOLITIC ISLAND

USE DETAIL WITH TYPICAL SECTION NO. 9A

-Y2- STA. 22+00.00 TO 22+48.020

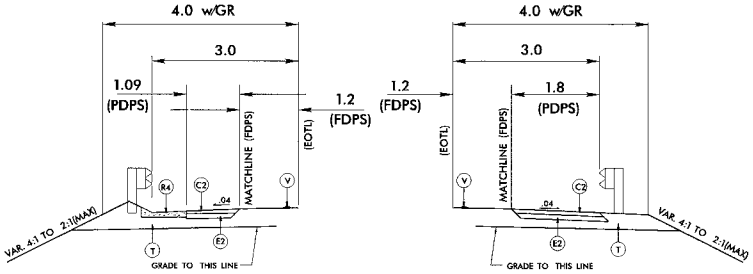


DETAIL SHOWING METHOD OF WEDGING WHERE EXIST. E.O.P. ELEV. CONTROLS



DETAIL SHOWING METHOD OF WEDGING WHERE CENTERLINE ELEV. CONTROLS

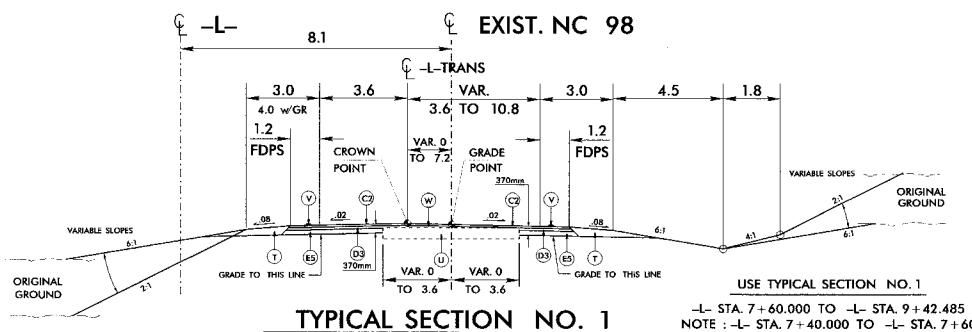
PARTIAL DEPTH PORTION OF PAVED SHOULDER AT GUARDRAIL LOCATIONS



TYPICAL SECTION NO. 1A TYPICAL SECTION NO. 1B

USE TYPICAL SECTIONS NO. 1A & 1B IN CONJUNCTION WITH TYPICAL SECTIONS NO. 1 & 2 AT GUARDRAIL LOCATIONS

T.S. # 1B -L- LT STA. 7+80.00 TO 11+00.00
T.S. # 1B -L- RT STA. 7+80.000 TO 8+60.000
T.S. # 1A -L- RT STA. 8+60.000 TO 11+00.000
T.S. # 1B -L- RT STA. 11+00.000 TO 11+20.000
T.S. # 1B -L- LT STA. 13+80.000 TO 18+20.000
T.S. # 1B -L- RT STA. 16+39.000 TO 16+70.000
T.S. # 1A -L- RT STA. 16+70.000 TO 18+00.000
T.S. # 1B -L- RT STA. 18+00.000 TO 18+10.000
T.S. # 1B -L- RT STA. 23+22.5000 TO 23+40.000
T.S. # 1A -L- RT STA. 23+40.000 TO 24+40.000
T.S. # 1B -L- RT STA. 24+40.000 TO 24+50.000
T.S. # 1B -L- RT STA. 31+00.000 TO 31+90.000
T.S. # 1B -L- LT STA. 31+78.000 TO 31+90.000



TYPICAL SECTION NO. 1

FDPS = FULL DEPTH PAVED SHOULDERS

USE TYPICAL SECTION NO. 1

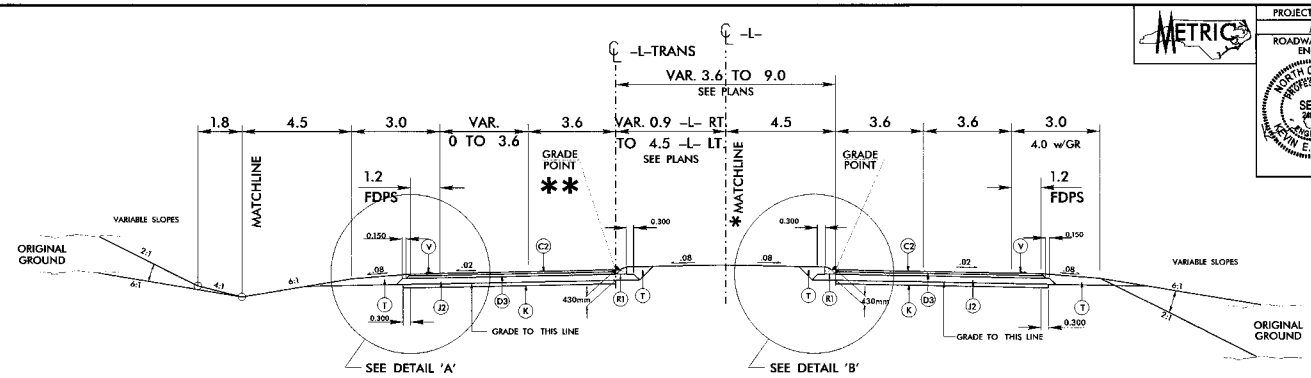
-L- STA. 7+60.000 TO -L- STA. 9+42.485

NOTE : -L- STA. 7+40.000 TO -L- STA. 7+60.000

USE MIN. RESURFACING AND WIDENING RT.

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	2-A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

METRIC



TYPICAL SECTION NO. 2

FDPS = FULL DEPTH PAVED SHOULDERS

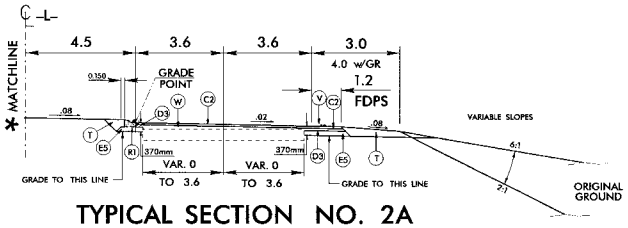
USE TYPICAL SECTION NO. 2

-L- STA. 9+42.485 TO STA. 31+90.000

** USE -L- TRANS GRADE STA. 9+42.485 TO STA. 11+00.000

** USE -L- LT LN GRADE STA. 16+82.000 TO STA. 23+18.000

NOTE : PLACE FINAL LAYER PAVEMENT -L- STA. 31+90.00 TO STA. 32+80.00



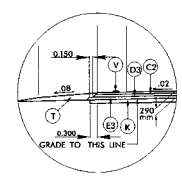
TYPICAL SECTION NO. 2A

FDPS = FULL DEPTH PAVED SHOULDERS

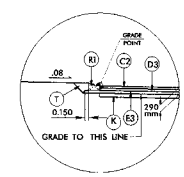
USE TYPICAL SECTION NO. 2A

-L- STA. 9+42.485 TO STA. 13+80+/-

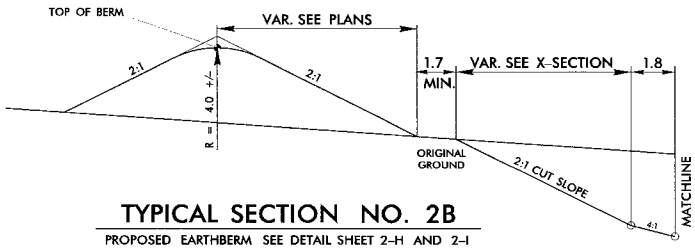
NOTE : USE T.S. # 2A IN CONJUNCTION WITH T.S. # 2.



ALTERNATE PAVEMENT DESIGN DETAIL 'A'



ALTERNATE PAVEMENT DESIGN DETAIL 'B'



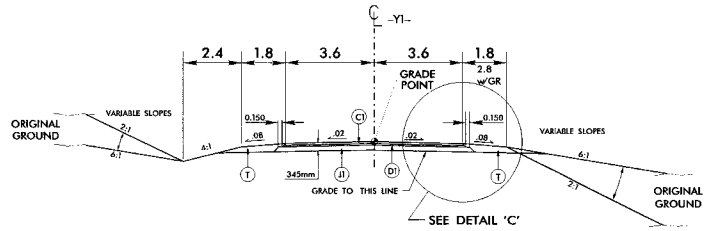
TYPICAL SECTION NO. 2B

PROPOSED EARTHBERM SEE DETAIL SHEET 2-H AND 2-I

USE TYPICAL SECTION NO. 2B

-L- STA. 23+90 +/- TO STA. 30+60 +/-

NOTE : USE T.S. # 2B IN CONJUNCTION WITH T.S. # 2.



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

-Y1- STA. 10+18.131 TO STA. 13+71 +/-

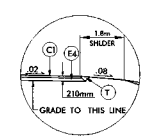
-Y1- STA. 16+50 +/- TO STA. 17+98.071

NOTE : -Y1- STA. 13+71 +/- TO -Y1- STA. 14+35 +/-

TRANSITION FROM T.S. # 3 TO T.S. # 4.

-Y1- STA. 15+75+/- TO STA. 16+50 +/-

TRANSITION FROM T.S. # 4 TO T.S. # 3.



ALTERNATE PAVEMENT DESIGN DETAIL 'C'

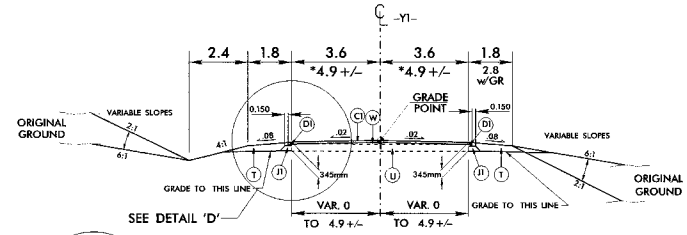
PAVEMENT SCHEDULE	
C1	80mm S9.5B
C2	80mm S9.5C
C3	VAR. DEPTH S9.5B
C4	VAR. DEPTH S9.5C
D1	65mm I19.0B
D2	100mm I19.0B
D3	100mm I19.0C
D4	VAR. DEPTH I19.0B
D5	VAR. DEPTH I19.0C
E1	75mm B25.0B
E2	100mm B25.0B
E3	110mm B25.0C
E4	130mm B25.0B
E5	190mm B25.0C
E6	VAR. DEPTH B25.0B
E7	VAR. DEPTH B25.0C
J1	200mm ABC
J2	250mm ABC
K	LIME OR CEMENT OR AGGREGATE STAB.
R1	450mm CONC C&G
R2	750mm CONC C&G
R3	125mm CONC ISLAND
R4	SHLD. BERM GUTTER
T	EARTH MAT.
U	EXIST. PAV'T
V	RUMBLE STRIPS
W	WEDGING

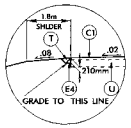
PROJECT REFERENCE NO.	SHEET NO.
R-2809A	2-B

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 24612 ENGINEER KEVIN E. MOORE 10-1-07

PAVEMENT DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER JOHN CHI CHEN 10/3/07

METRIC





ALTERNATE PAVEMENT DESIGN DETAIL 'D'

TYPICAL SECTION NO. 4

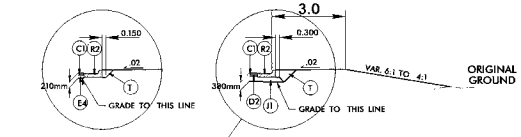
USE TYPICAL SECTION NO. 4

-Y1- STA. 14+35+/- TO STA. 15+75 +/-

*-Y1- STA. 18+52+/- TO STA. 18+80.000

NOTE : -Y1- STA. 18+67 +/- TO STA. 18+80.000

RETAIN EXISTING CURB & GUTTER



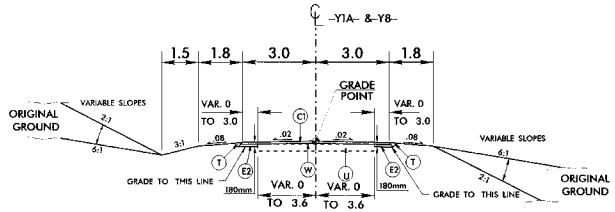
ALTERNATE PAVEMENT DESIGN DETAIL 'E'

SEE DETAIL 'E'

TYPICAL SECTION NO. 4A

USE TYPICAL SECTION NO. 4A

-Y1- STA. 18+52+/- TO STA. 18+67+/-

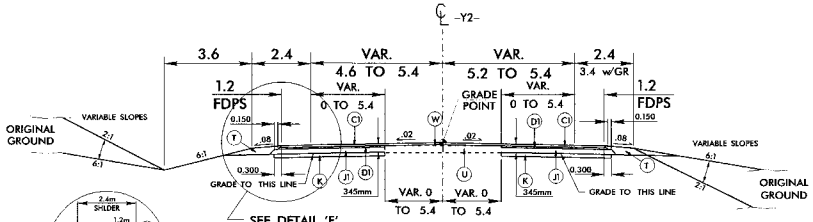


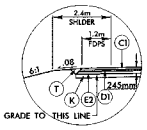
TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5

-Y1A- STA. 10+23.429 TO STA. 10+80.000

-Y8- STA. 10+27.955 TO STA. 10+40.000





ALTERNATE PAVEMENT DESIGN DETAIL 'F'

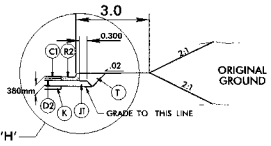
TYPICAL SECTION NO. 6

FDPS = FULL DEPTH PAVED SHOULDERS

USE TYPICAL SECTION NO. 6

-Y2- STA. 10+20.000 TO 12+00 +/-

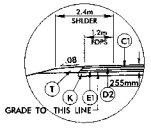
-Y2- STA. 14+49 +/- TO 14+64 +/-



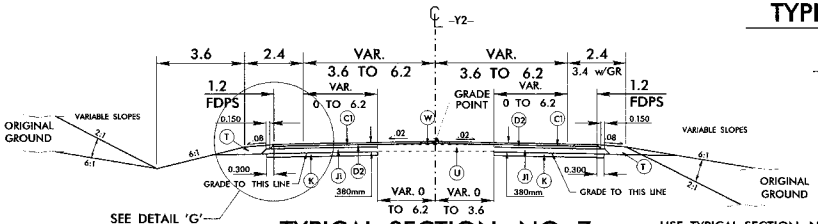
TYPICAL SECTION NO. 7A

USE TYPICAL SECTION NO. 7A

-Y2- STA. 28+75 +/- TO STA. 30+70



ALTERNATE PAVEMENT DESIGN DETAIL 'G'

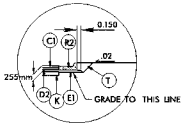


TYPICAL SECTION NO. 7

FDPS = FULL DEPTH PAVED SHOULDERS

USE TYPICAL SECTION NO. 7

-Y2- STA. 28+75 +/- TO 30+70.000



ALTERNATE PAVEMENT DESIGN DETAIL 'H'

PAVEMENT SCHEDULE

C1	80mm S9.5B
C2	80mm S9.5C
C3	VAR. DEPTH S9.5B
C4	VAR. DEPTH S9.5C
D1	65mm I19.0B
D2	100mm I19.0B
D3	100mm I19.0C
D4	VAR. DEPTH I19.0B
D5	VAR. DEPTH I19.0C
E1	75mm B25.0B
E2	100mm B25.0B
E3	110mm B25.0C
E4	130mm B25.0B
E5	190mm B25.0C
E6	VAR. DEPTH B25.0B
E7	VAR. DEPTH B25.0C
J1	200mm ABC
J2	250mm ABC
K	LIME OR CEMENT OR AGGREGATE STAB.
R1	450mm CONC C&G
R2	750mm CONC C&G
R3	125mm CONC ISLAND
R4	SHLD. BERM GUTTER
T	EARTH MAT.
U	EXIST. PAV'T
V	RUMBLE STRIPS
W	WEDGING

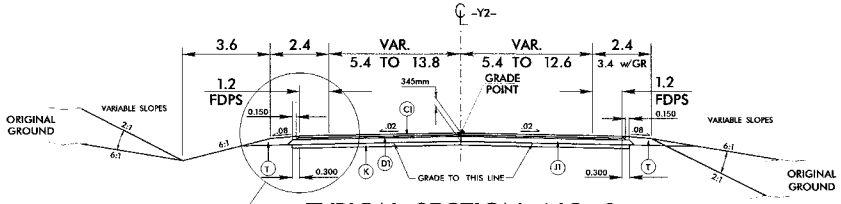
PROJECT REFERENCE NO.	SHEET NO.
R-2809A	2-C

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 24910 ENGINEER ERVIN E. MOORE 10-1-07

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER DONALD CHEN 10/3/07



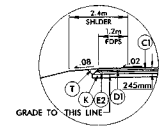
SEE DETAIL 'I'

TYPICAL SECTION NO. 8

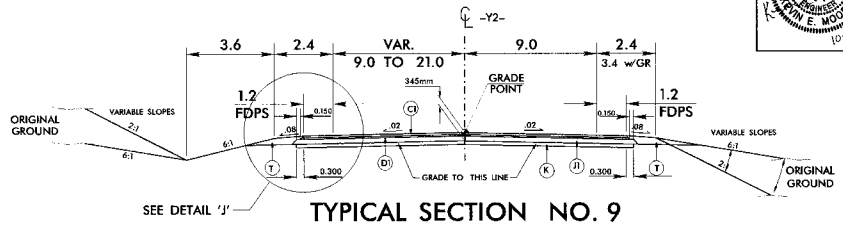
FDPS = FULL DEPTH PAVED SHOULDERS

USE TYPICAL SECTION NO. 8

-Y2- STA. 12+00 +/- TO 14+49 +/-
-Y2- STA. 14+64 +/- TO 21+18.403



ALTERNATE PAVEMENT DESIGN DETAIL 'I'



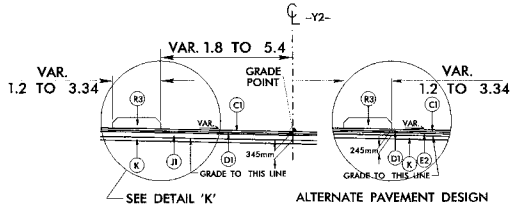
SEE DETAIL 'J'

TYPICAL SECTION NO. 9

FDPS = FULL DEPTH PAVED SHOULDERS

USE TYPICAL SECTION NO. 9

-Y2- STA. 22+06.897 TO STA. 24+60.000



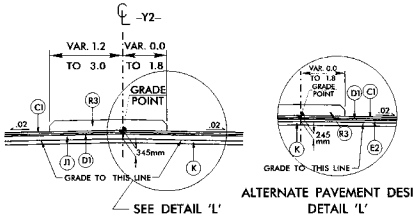
SEE DETAIL 'K'

ALTERNATE PAVEMENT DESIGN DETAIL 'K'

TYPICAL SECTION NO. 8A

USE TYPICAL SECTION NO. 8A

-Y2- STA. 19+30 +/- TO 21+26 +/-



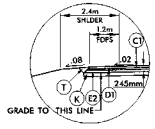
SEE DETAIL 'L'

ALTERNATE PAVEMENT DESIGN DETAIL 'L'

TYPICAL SECTION NO. 9A

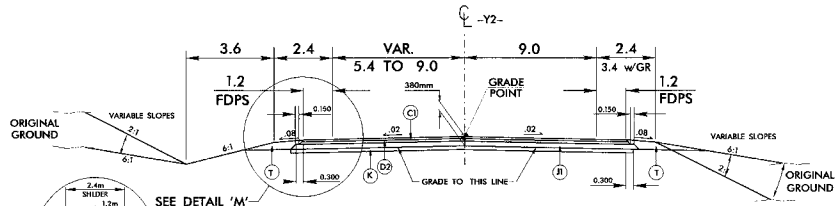
USE TYPICAL SECTION NO. 9A

-Y2- STA. 22+00 +/- TO 23+83 +/-

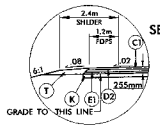


ALTERNATE PAVEMENT DESIGN DETAIL 'J'

PAVEMENT SCHEDULE	
C1	80mm S9.5B
C2	80mm S9.5C
C3	VAR. DEPTH S9.5B
C4	VAR. DEPTH S9.5C
D1	65mm I19.0B
D2	100mm I19.0B
D3	100mm I19.0C
D4	VAR. DEPTH I19.0B
D5	VAR. DEPTH I19.0C
E1	75mm B25.0B
E2	100mm B25.0B
E3	110mm B25.0C
E4	130mm B25.0B
E5	190mm B25.0C
E6	VAR. DEPTH B25.0B
E7	VAR. DEPTH B25.0C
J1	200mm ABC
J2	250mm ABC
K	LIME OR CEMENT OR AGGREGATE STAB.
R1	450mm CONC C&G
R2	750mm CONC C&G
R3	125mm CONC ISLAND
R4	SHLD. BERM GUTTER
T	EARTH MAT.
U	EXIST. PAV'T
V	RUMBLE STRIPS
W	WEDGING



SEE DETAIL 'M'



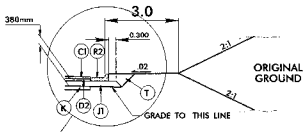
ALTERNATE PAVEMENT DESIGN DETAIL 'M'

TYPICAL SECTION NO. 10

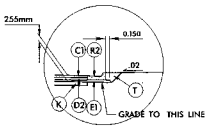
FDPS = FULL DEPTH PAVED SHOULDERS

USE TYPICAL SECTION NO. 10

-Y2- STA. 24+60.000 TO STA. 28+75 +/-



SEE DETAIL 'N'



ALTERNATE PAVEMENT DESIGN DETAIL 'N'

TYPICAL SECTION NO. 10A

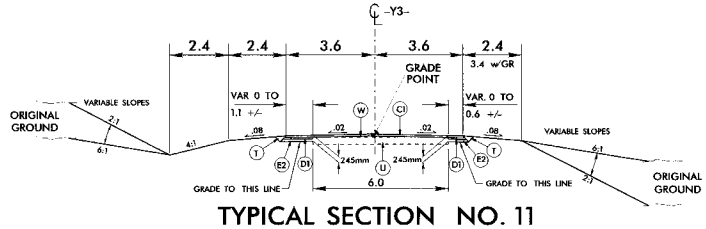
USE TYPICAL SECTION NO. 10A

-Y2- STA. 24+60 +/- TO STA. 28+75+/-

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	2-D

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 24912 ENGINEER — KEVIN E. MOORE — 10-1-07

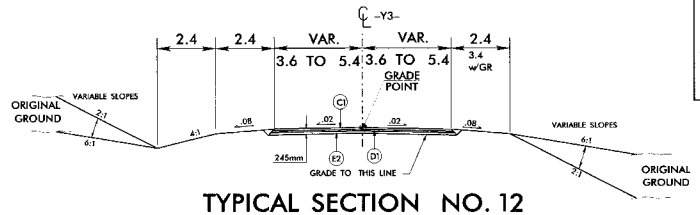
PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 13958 — 10/3/09



TYPICAL SECTION NO. 11

USE TYPICAL SECTION NO. 11

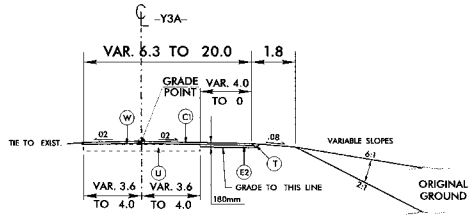
-Y3- STA. 11+00.000 TO STA. 11+80.000



TYPICAL SECTION NO. 12

USE TYPICAL SECTION NO. 11

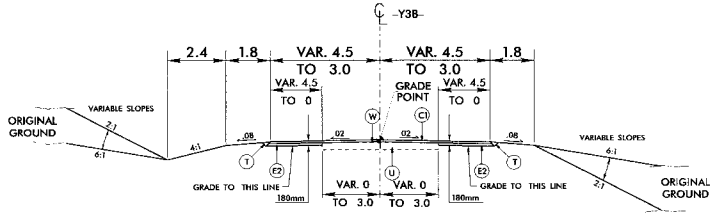
-Y3- STA. 10+41.348 TO STA. 11+00.000



TYPICAL SECTION NO. 13

USE TYPICAL SECTION NO. 13

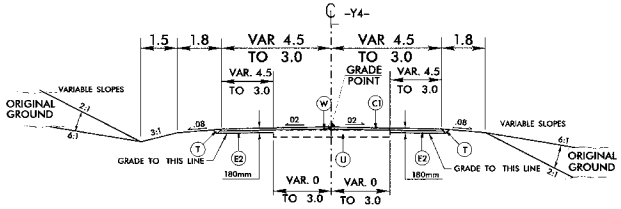
-Y3A- STA. 11+00.000 TO STA. 11+40.000



TYPICAL SECTION NO. 14

USE TYPICAL SECTION NO. 14

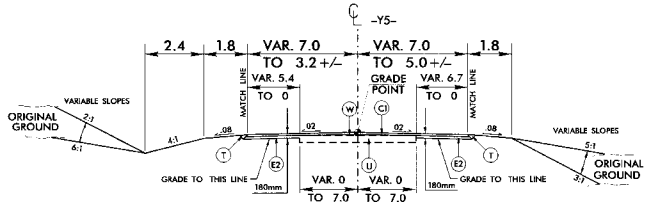
-Y3B- STA. 10+33.912 TO STA. 11+40.000



TYPICAL SECTION NO. 15

USE TYPICAL SECTION NO. 15

-Y4- STA. 10+13.381 TO STA. 10+80.000

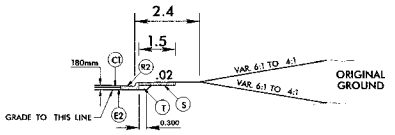


TYPICAL SECTION NO. 16

USE TYPICAL SECTION NO. 16

-Y5- STA. 10+40.000 TO STA. 10+48.900

-Y5- STA. 12+02.000 TO STA. 12+70.000



TYPICAL SECTION NO. 16A

USE TYPICAL SECTION NO. 16A

-Y5- STA. 10+40.000 TO STA. 10+50+/-

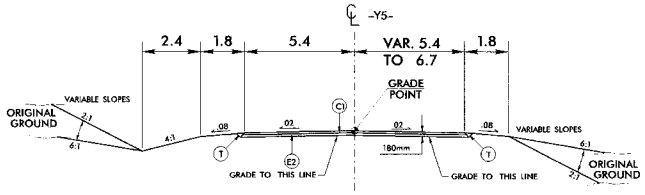
PAVEMENT SCHEDULE	
C1	80mm S9.5B
C2	80mm S9.5C
C3	VAR. DEPTH S9.5B
C4	VAR. DEPTH S9.5C
D1	65mm I19.0B
D2	100mm I19.0B
D3	100mm I19.0C
D4	VAR. DEPTH I19.0B
D5	VAR. DEPTH I19.0C
E1	75mm B25.0B
E2	100mm B25.0B
E3	110mm B25.0C
E4	130mm B25.0B
E5	190mm B25.0C
E6	VAR. DEPTH B25.0B
E7	VAR. DEPTH B25.0C
J1	200mm ABC
J2	250mm ABC
K	LIME OR CEMENT OR AGGREGATE STAB.
R1	450mm CONC C&G
R2	750mm CONC C&G
R3	125mm CONC ISLAND
R4	SHLD. BERM GUTTER
T	EARTH MAT.
U	EXIST. PAV'T
V	RUMBLE STRIPS
W	WEDGING

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	2-E

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 24012 ENGINEER KEVIN E. MOORE 10-3-07

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 13958 ENGINEER DONG CHI CHEN 10/3/07

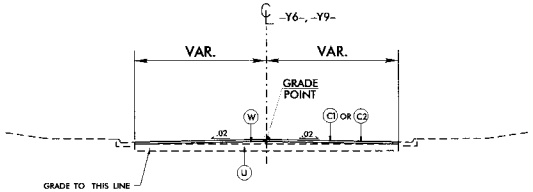
METRIC



TYPICAL SECTION NO. 17

USE TYPICAL SECTION NO. 17

-Y5- STA. 10+88.945 TO STA. 12+02.000

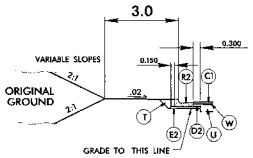


TYPICAL SECTION NO. 18

USE TYPICAL SECTION NO. 18

-Y6- STA. 10+23.380 TO 10+25.978 (USE "C1")

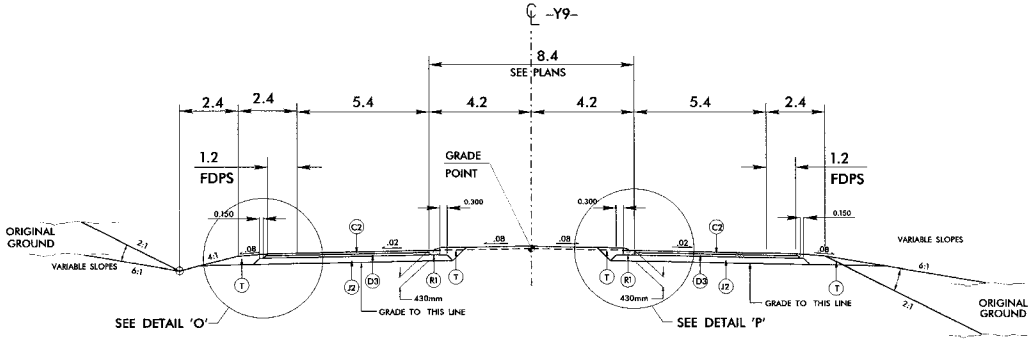
-Y9- STA. 10+70.000 TO 10+80.000 (USE "C2")



TYPICAL SECTION NO. 18A

USE TYPICAL SECTION NO. 18A

-Y6- LT. IN RADIUS

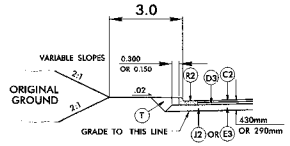


TYPICAL SECTION NO. 19

FDPS = FULL DEPTH PAVED SHOULDERS

USE TYPICAL SECTION NO. 19

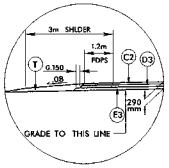
-Y9- STA. 10+24.500 TO STA. 10+70.000



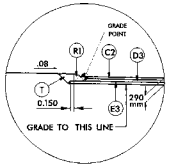
TYPICAL SECTION NO. 19A

USE TYPICAL SECTION NO. 19A

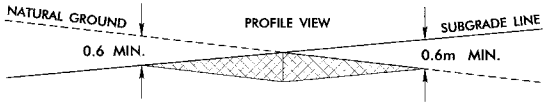
-Y9- STA 10+60.000 TO 10+70.000 LT. & RT.



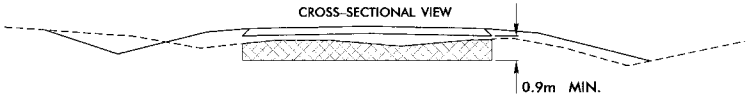
ALTERNATE PAVEMENT DESIGN DETAIL 'O'



ALTERNATE PAVEMENT DESIGN DETAIL 'P'



DETAIL OF UNDERCUT AT GRADE POINT



DETAIL OF UNDERCUT LIMITS

PAVEMENT SCHEDULE	
C1	80mm S9.5B
C2	80mm S9.5C
C3	VAR. DEPTH S9.5B
C4	VAR. DEPTH S9.5C
D1	65mm I19.0B
D2	100mm I19.0B
D3	100mm I19.0C
D4	VAR. DEPTH I19.0B
D5	VAR. DEPTH I19.0C
E1	75mm B25.0B
E2	100mm B25.0B
E3	110mm B25.0C
E4	130mm B25.0B
E5	190mm B25.0C
E6	VAR. DEPTH B25.0B
E7	VAR. DEPTH B25.0C
J1	200mm ABC
J2	250mm ABC
K	LIME OR CEMENT OR AGGREGATE STAB.
R1	450mm CONC C&G
R2	750mm CONC C&G
R3	125mm CONC ISLAND
R4	SHLD. BERM GUTTER
T	EARTH MAT.
U	EXIST. PAV'T
V	RUMBLE STRIPS
W	WEDGING

METRIC

PROJECT REFERENCE NO. | SHEET NO.

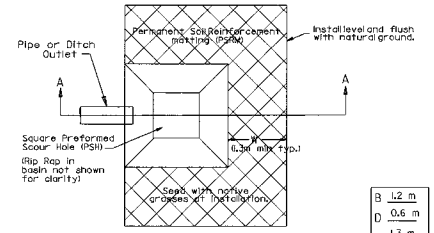
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL ENGINEER HENRY WELLS

9/12/07

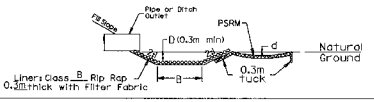
PREFORMED SCOUR HOLE

PLAN VIEW



B	1.2 m
D	0.6 m
W	1.3 m
d	0.15 m

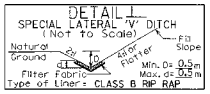
SECTION A-A



4/4/02

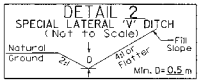
STA. 9+50 -L- LT
STA. 9+99 -L- RT
STA. 13+75 -L- LT
STA. 14+30 -L- LT
STA. 18+73 -L- LT
STA. 19+95 -L- LT

DETAIL 1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



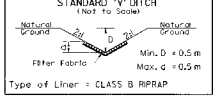
STA. 10+70 TO 11+11 -L- LT
STA. 11+20 TO 11+60 -L- RT
STA. 19+40 TO 19+80 -L- RT
STA. 23+60 TO 23+90 -L- LT
STA. 18+82 TO 19+00 -Y2- RT

DETAIL 2
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



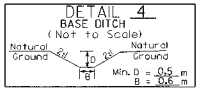
STA. 15+40 TO 15+76 -L- RT
STA. 18+80 TO 19+20 -L- RT
STA. 30+80 TO 31+20 -L- LT
STA. 11+06 TO 11+60 -Y2- LT
STA. 19+20 TO 19+46 -Y2- RT
STA. 26+60 TO 27+00 -Y2- LT
STA. 10+70 TO 10+40 -Y3B- RT
STA. 10+20 TO 10+50 -Y4- LT

DETAIL 3
STANDARD 'V' DITCH
(Not to Scale)



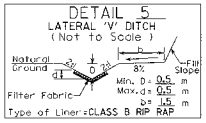
STA. 27+00 TO 27+17 -Y2- LT
STA. 27+17 TO 27+70 -Y2- LT

DETAIL 4
BASE DITCH
(Not to Scale)



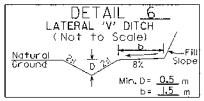
STA. 15+73 -L- LT
STA. 15+78 -L- RT
STA. 17+35 TO 17+55 -L- RT
STA. 24+55 -L- LT
STA. 15+30 -Y2- LT
STA. 12+04 -Y5- LT

DETAIL 5
LATERAL 'V' DITCH
(Not to Scale)



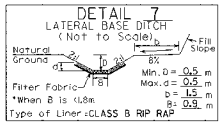
STA. 17+00 TO 17+80 -L- LT
STA. 24+20 TO 24+40 -L- RT
STA. 24+60 TO 25+20 -L- LT
STA. 11+40 TO 11+69 -Y3- LT
STA. 15+20 TO 16+00 -Y2- LT
STA. 16+20 TO 16+80 -Y2- LT

DETAIL 6
LATERAL 'V' DITCH
(Not to Scale)



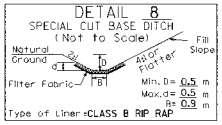
STA. 16+70 TO 17+33 -L- RT
STA. 25+80 TO 28+20 -L- LT

DETAIL 7
LATERAL BASE DITCH
(Not to Scale)



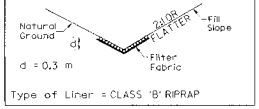
STA. 16+42 TO 17+00 -L- LT

DETAIL 8
SPECIAL CUT BASE DITCH
(Not to Scale)



STA. 23+00 TO 23+60 -L- LT

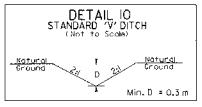
DETAIL 9
TOE PROTECTION
(Not to Scale)



Type of Liner = CLASS 'B' RIPRAP

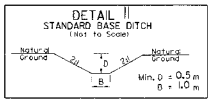
STA 8+35 TO STA 8+50 -L- RT.
STA 9+20 TO STA 9+80 -L- LT.
STA. 23+60 TO 24+10 -L- RT
STA. 12+60 TO 13+00 -Y1- RT
STA. 15+30 TO 17+20-Y1- RT
STA. 26+80 TO 27+20 -Y2- RT

DETAIL 10
STANDARD 'V' DITCH
(Not to Scale)



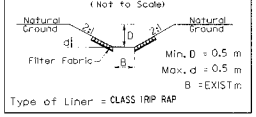
STA. 10+30 -Y1A- RT

DETAIL 11
STANDARD BASE DITCH
(Not to Scale)



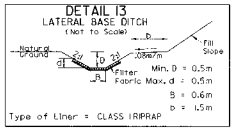
STA. 16+42 -Y2- RT

DETAIL 12
OUTLET PROTECTION
(Not to Scale)



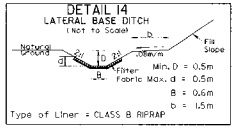
STA. 9+15 -L- LT
STA. 13+95 -L- LT
STA. 11+50 -Y3- RT

DETAIL 13
LATERAL BASE DITCH
(Not to Scale)



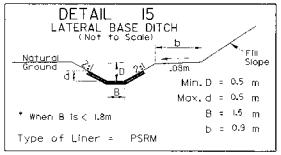
STA. 9+00 TO 9+12 -L- LT

DETAIL 14
LATERAL BASE DITCH
(Not to Scale)



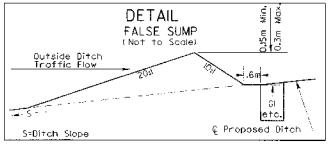
STA. 9+80 TO 10+70 -L- LT

DETAIL 15
LATERAL BASE DITCH
(Not to Scale)

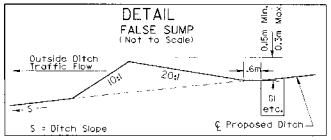


STA. 31+00 TO 31+38 -L- RT

DETAIL
FALSE SUMP
(Not to Scale)



DETAIL
FALSE SUMP
(Not to Scale)



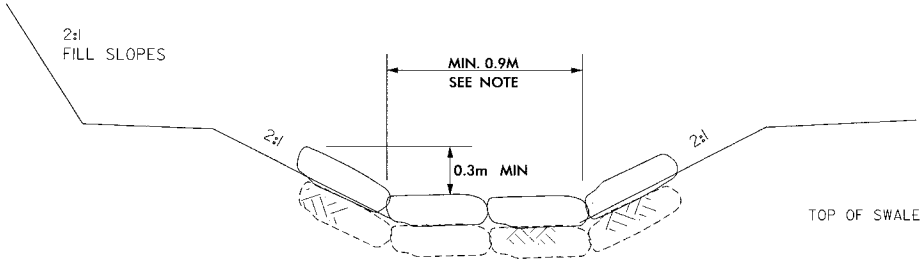
PROJECT REFERENCE NO.	SHEET NO.
R-2809A	2-G

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 035 ENGINEER HENRY WELLS, JR.

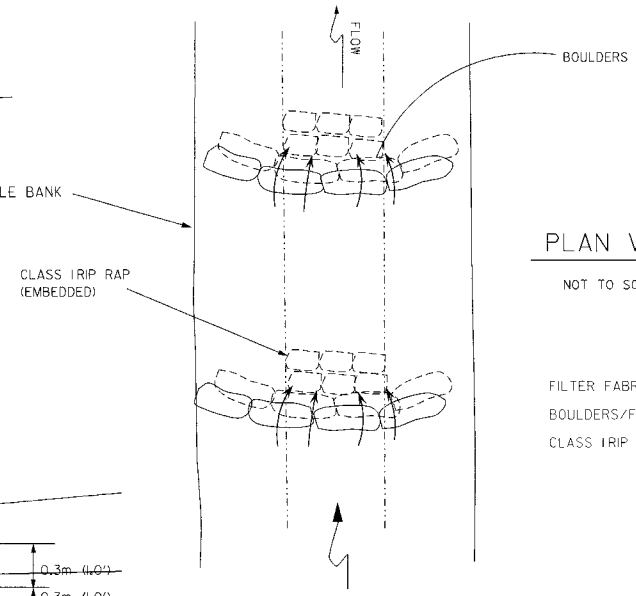
7/12/07

LATERAL SWALE/DITCH W/ROCK CHECKS STA 31+16 TO 31+38 -L- RT



TYPICAL CROSS SECTION

NOT TO SCALE



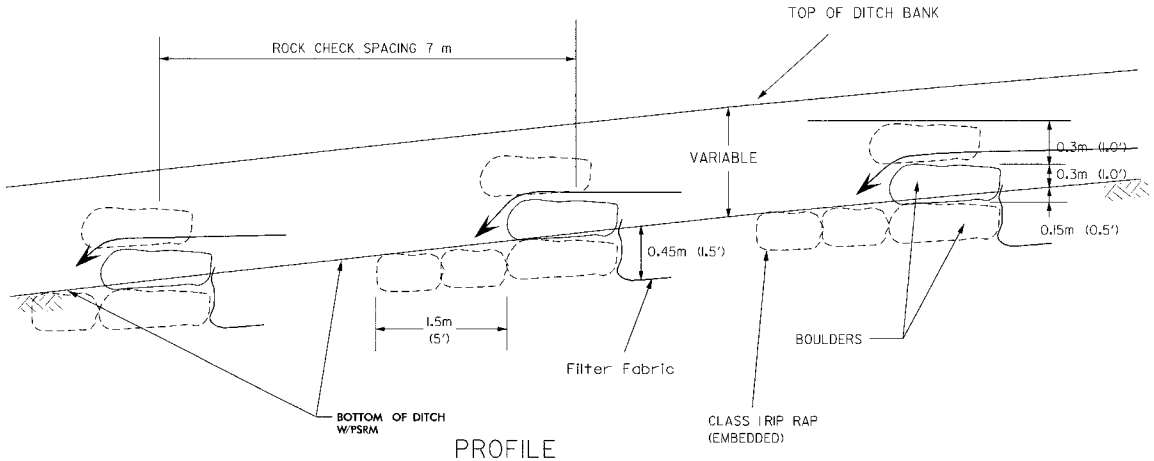
PLAN VIEW

NOT TO SCALE

FILTER FABRIC = $20m^2$

BOULDERS/FOOTER ROCK = 60 MTN

CLASS I RIP RAP = 5 MTN



PROFILE

NOT TO SCALE

NOTE:

BOULDERS SHOULD BE ANGULAR AND OBLONG WITH APPROXIMATE DIMENSIONS OF 0.6m x 0.45m x 0.45m (2' x 1.5' x 1.5'). ROCK SHOULD FIT TIGHTLY TOGETHER WITH MINIMAL VOIDS. STAGGER BOULDER JOINTS.

ROCK CHECK SPACING IS DEPENDENT ON DITCH GRADES AT 1' DROP INTERVALS OR SLOPE CONTROL.

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	2-H

ROADWAY DESIGN ENGINEER

METRIC

5 0 10

CONST.REV.

R /W REV.

NORTH CAROLINA PROFESSIONAL SEAL 24872 ENGINEER ERWIN E. MOORE 9-21-07

EARTHBERM

-L- STA. 23+80.00 TO 27+00.000 LT.

-L- STA. 24+20.000
OFF -35.847m
PROP. BERM
EL = 113.051 m

-L- STA. 24+60.000
OFF -36.222m
PROP. BERM
EL = 111.447 m

-L- STA 25+00.000
OFF -39.314 m
PROP.BERM
EL = 112.145 m

-L- STA. 25+40.000
OFF -44.151 m
PROP. BERM
EL = 112.899 m

-L- STA. 25+80.000
OFF -43.881 m
PROP. BERM
EL = 111.303 m

-L- STA. 26+40.000
OFF -45.350 m
PROP. BERM
EL = 110.027 m

-L- STA. 26+60.000
OFF - 43.981 m
PROP. BERM
EL = 108.794 m

-L- STA.26+20.000
OFF - 46.335 m
PROP. BERM
EL = 111.077 m

-L- STA. 24+00.000
OFF -34.691m
PROP BERM
EL = 111.346 m

-L- STA. 26+80.000
OFF - 43.181 m
PROP. BERM
EL = 107.885 m

107.45

106.943

-L- STA. 25+20.000
OFF -44.356m
PROP. BERM
EL = 113.869 m

-L- STA. 24+40.000
OFF -36.964m
PROP. BERM
EL = 112.059 m

-L- STA. 25+60.000
OFF -43.820 m
PROP. BERM
EL = 112.087 m

PI = 26+00.000
OFF -45.734 m
PROP. BERM
EL = 111.444 m

-L- STA.27+00.000
OFF -42.082 m
PROP. BERM
EL = 106.943 m

-L- STA. 24+80.000
OFF -36.043 m
PROP. BERM
EL = 110.811 m

BEGIN PROP. BERM
-L- STA. 23+90.000
OFF -34.691m

SEE SHEETS 9 & 10 FOR PLANS

110 109 108 107 106 105 104 103 102 101 100

+80 24 +20 +40 +60 +80 25 +20 +40 +60 +80 26 +20 +40 +60 +80 27

EARTHBERM

-L- STA. 27+00.00 TO 30+60.000 LT.

PI = 27+20.000
OFF - 41.143 m
PROP. BERM
EL = 108.067 m

-L- STA. 28+00.000
OFF - 44.465 m
PROP. BERM
EL = 106.122 m

-L- STA. 30+60.000
OFF - 38.341 m
PROP. BERM
EL = 96.061 m

-L- STA. 27+60.000
OFF - 40.054 m
PROP. BERM
EL = 104.748 m

106.943

PI = 28+60.000
OFF - 47.290 m
PRPP. BERM
EL = 106.278 m

-L- STA. 29+00.000
OFF - 44.507 m
PROP. BERM
EL = 103.994 m

-L- STA. 29+60.000
OFF - 39.438 m
PROP. BERM
EL = 100.272 m

-L- STA. 30+20.000
OFF - 38.923 m
PROP. BERM
EL = 98.496 m

-L- STA. 29+40.000
OFF - 40.190 m
PROP. BERM
EL = 100.965 m

-L- STA. 30+00.000
OFF - 39.119 m
PROP. BERM
EL = 99.194 m

-L- STA. 30+40.000
OFF - 38.341 m
PROP. BERM
EL = 97.631 m

98.496

-L- STA.27+00.000
OFF -42.082 m
PROP. BERM
EL = 106.943 m

-L- STA. 28+20.000
OFF - 47.408 m
PROP. BERM
EL = 107.183 m

-L- STA.27+40.000
OFF - 40.302 M
PROP. BERM
EL = 105.267 m

-L- STA. 27+80.000
OFF - 42.132 m
PROP. BERM
EL = 105.375 m

-L- STA. 28+40.000
OFF - 47.938 m
PROP. BERM
EL = 107.020 m

PI = 28+80.000
OFF - 46.264 m
PROP. BREM
EL = 105.325 m

-L- STA. 29+20.000
OFF - 41.803 m
PROP. BERM
EL = 102.235 m

PI = 29+80.000
OFF - 38.147 m
PROP. BERM
EL = 99.227 m

SEE SHEETS 10 & 11 FOR PLANS
SEE SHEETS 2-I FOR NOISEWALL ENVELOPE & EARTHBERM

110 109 108 107 106 105 104 103 102 101 100 99 98 97 96 95 94 93 92 91 90

27 +20 +40 +60 +80 28 +20 +40 +60 +80 29 +20 +40 +60 +80 30 +20 +40 +60

9 SEP 2007 6:43
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$$$$USER$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	2-I

METRIC

5 0 10

CONST. REV.

R/W REV.

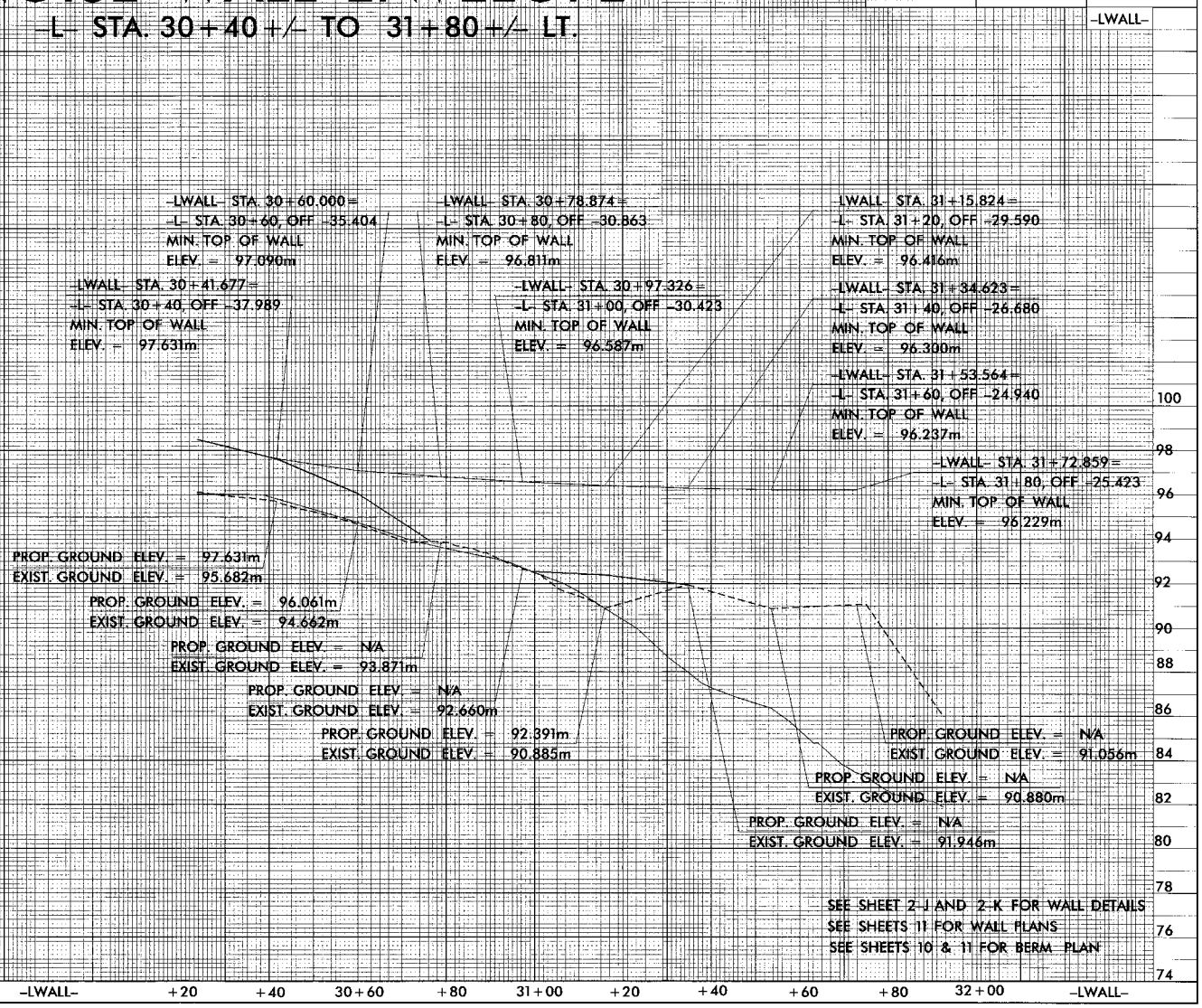
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 24910 ENGINEER KEVIN E. MOORE

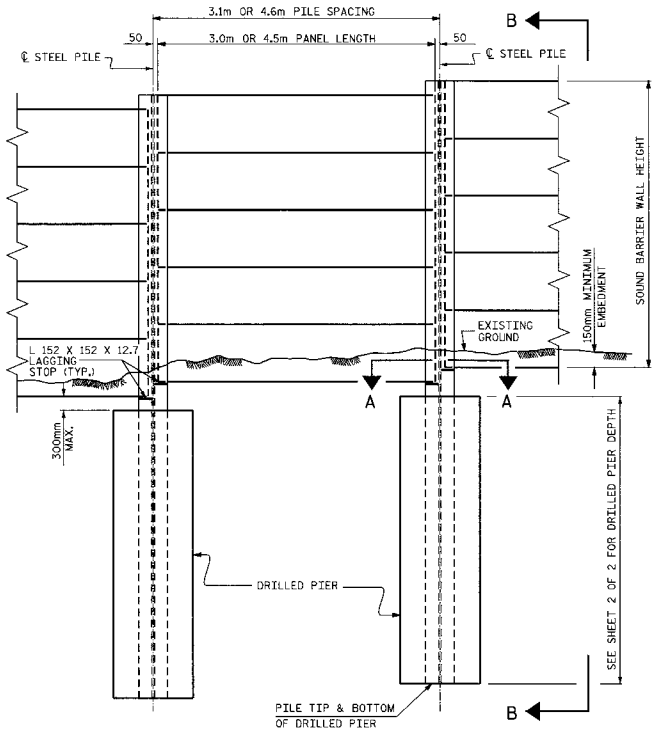
9-21-07

NOISE WALL ENVELOPE

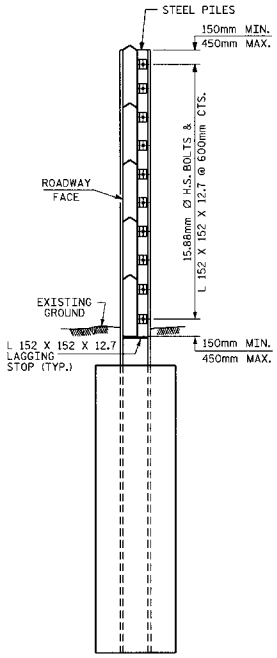
-L- STA. 30+40 +/- TO 31+80 +/- LT.



SEE SHEET 2-J AND 2-K FOR WALL DETAILS
SEE SHEETS 11 FOR WALL PLANS
SEE SHEETS 10 & 11 FOR BERM PLAN



ELEVATION



SECTION B-B

NOTES

ALL DIMENSIONS ARE SHOWN IN MILLIMETERS UNLESS OTHERWISE NOTED.

FOR SOUND BARRIER WALL, SEE SPECIAL PROVISIONS.

FOR METRIC STRUCTURAL STEEL, SEE SPECIAL PROVISIONS.

SOUND BARRIER WALL SHALL BE CONSTRUCTED TO THE LINE AND GRADE AS SHOWN ON THE ROADWAY PLANS.

THE BASE OF EACH BOTTOM PANEL SHALL BE FLAT.

PILES, ANGLES, PLATES, AND LAGGING STOPS SHALL BE AASHTO M270 GRADE 345 GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. BOLTS, NUTS, AND WASHERS SHALL ALSO BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. ANY DAMAGE DONE TO GALVANIZATION DUE TO DRILLING, WELDING, OR OTHER OPERATION SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ENGINEER WILL VERIFY LOCATION OF UNDERGROUND UTILITIES BEFORE DRILLING SHAFTS TO ENSURE SUFFICIENT CLEARANCE IS AVAILABLE.

IN LIEU OF LAGGING STOPS, THE CONTRACTOR MAY USE A NON-SHRINK NON-METALLIC GROUT AS APPROVED BY THE ENGINEER BETWEEN THE FLANGES OF THE STEEL PILES FROM THE TOP OF THE DRILLED PIER CONCRETE TO THE ELEVATION REQUIRED TO SUPPORT THE BOTTOM PANEL.

THE TOP AND BOTTOM OF DRILLED PIER ELEVATIONS SHALL BE ADJUSTED TO MAINTAIN 150mm MINIMUM EMBEDMENT OF BOTTOM PANEL.

CONCRETE FOR PANELS SHALL BE CLASS AA. CONCRETE FOR DRILLED PIERS SHALL BE CLASS A.

ALL PLATES AND ANGLES USED TO SECURE PANELS SHALL BE 150mm IN LENGTH AS MEASURED ALONG THE PILE.

THE CONTRACTOR MAY USE EITHER 'W' PILES OR 'HP' PILES, PROVIDED THEY SATISFY THE MINIMUM PILE SIZE REQUIRED IN THE TABLE. PILES SMALLER THAN W310 OR HP310 ARE NOT PERMITTED. AT TURNS, ONLY W310 OR HP310 PILES ARE PERMITTED IN THE 914mm DIAMETER DRILLED PIERS.

AT THE CONTRACTOR'S OPTION, PILE SPACING MAY BE 3.1m OR 4.6m.

SPLICING OF PILES IS NOT PERMITTED.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

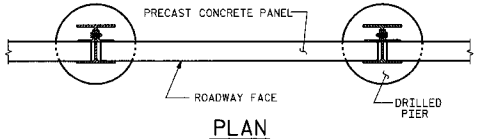
AT THE CONTRACTOR'S OPTION, THE DRILLED PIER DIAMETER MAY BE 762mm OR 610mm.

AT THE CONTRACTOR'S OPTION, USE CONTINUOUS FLIGHT AUGER PILES IN LIEU OF PILE EXCAVATION FOR SOUND BARRIER WALL FOUNDATION. SEE CONTINUOUS FLIGHT AUGER PILES FOR SOUND BARRIER WALLS SPECIAL PROVISION.

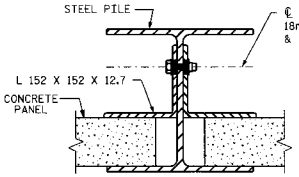
EXPOSURE CATEGORY B

DESIGN WIND PRESSURE =
0.958 kpa (0m < H ≤ 4.27m); 1.197 kpa (4.27m < H ≤ 8.84m)

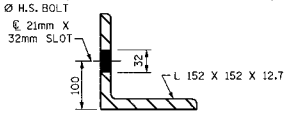
PILE SPACING	MAXIMUM WALL HEIGHT (H)	MINIMUM W SIZE STEEL PILES	MINIMUM HP SIZE STEEL PILES
3.1	H ≤ 8.84m	W 310 X 60 W 360 X 72	HP 310 X 79 HP 360 X 108
4.6	H ≤ 7.62m	W 310 X 60 W 360 X 72	HP 310 X 79 HP 360 X 108
	7.62m < H ≤ 8.84m	W 310 X 74 W 360 X 72	HP 310 X 79 HP 360 X 108



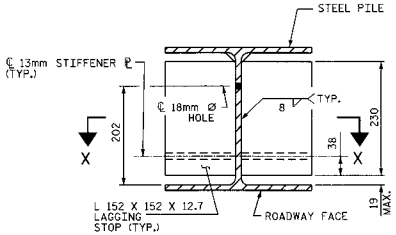
PLAN



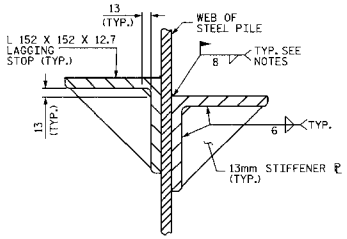
CONNECTION DETAIL



ANGLE DETAIL



SECTION A-A



SECTION X-X

PROJECT NO. R-2809A
WAKE COUNTY
STATION: 30+40.000 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SOUND BARRIER WALL

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER
10-23-07

ASSEMBLED BY : S.B. WILLIAMS	DATE : 7/31/07
CHECKED BY : M.G. CHEEK	DATE : 8/7/07

DRAWN BY : JAD 5/01	REV. 2/4/03	RWW/CVC
CHECKED BY : RDR 5/01	REV. 5/7/03	RWW/JTE
	REV. 5/1/06	TLA/GM

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			2-J
1			3					TOTAL SHEETS
2			4					

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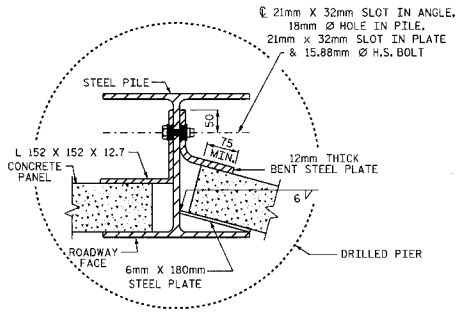
vnguyen

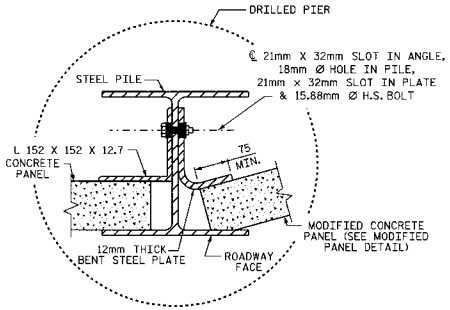
SBW1SM

BILL OF MATERIAL	
SOUND BARRIER WALL	583.5 SQ. M.
QUANTITIES PROVIDED ARE APPROXIMATE AND ARE FOR BID PURPOSES ONLY.	



TYPICAL WALL TURN DETAIL

(USE ONLY FOR TURNS 15° OR LESS, CONCAVE TOWARD ROADWAY)

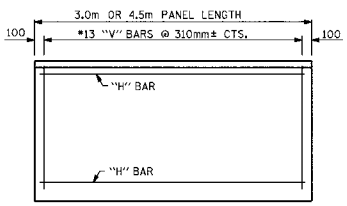


TYPICAL WALL TURN DETAIL

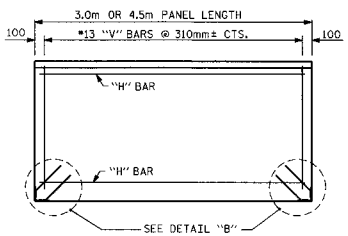
(USE ONLY FOR TURNS 15° OR LESS, CONVEX TOWARD ROADWAY)

DRILLED PIER DEPTH CHART

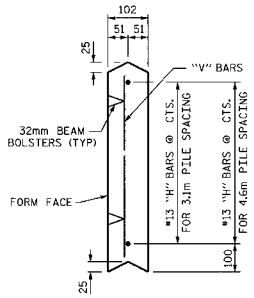
STATION	DRILLED PIER Ø	DRILLED PIER SPACING	DEPTH
STA. 30+41.677 -LWALL- TO STA. 30+60.000 -LWALL-	610mm	3.10m	2.00m
	610mm	4.60m	2.30m
	762mm	3.10m	1.80m
	762mm	4.60m	2.10m
STA. 30+60.000 -LWALL- TO STA. 30+97.326 -LWALL-	610mm	3.10m	2.70m
	610mm	4.60m	3.20m
	762mm	3.10m	2.50m
	762mm	4.60m	2.90m
STA. 30+97.326 -LWALL- TO STA. 31+34.623 -LWALL-	610mm	3.10m	4.60m
	610mm	4.60m	5.50m
	762mm	3.10m	4.20m
	762mm	4.60m	5.00m
STA. 31+34.623 -LWALL- TO STA. 31+72.859 -LWALL-	610mm	3.10m	5.20m
	610mm	4.60m	6.20m
	762mm	3.10m	4.80m
	762mm	4.60m	5.70m



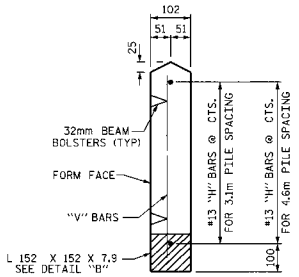
FRONT ELEVATION OF UPPER PRECAST PANELS



FRONT ELEVATION OF BOTTOM PRECAST PANEL

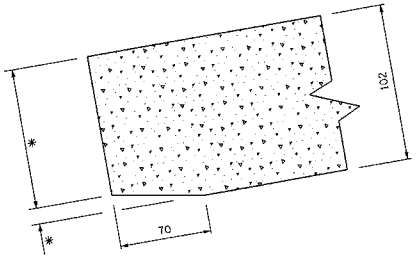


UPPER PANEL



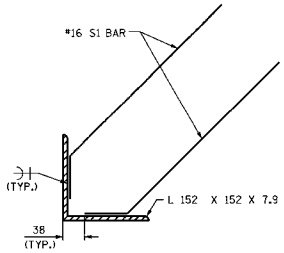
BOTTOM PANEL

SECTION THROUGH PRECAST PANELS



MODIFIED PANEL DETAIL

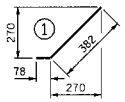
(USE ONLY FOR TURNS 15° OR LESS, CONVEX TOWARD ROADWAY)
* TO BE DETERMINED BY THE CONTRACTOR



DETAIL "B"

ADDITIONAL BARS FOR ONE BOTTOM PANEL					
NO.	BAR	SIZE	TYPE	LENGTH	WEIGHT (kg)
4	S1	*16	1	460	3

BAR TYPE



QUANTITIES FOR ONE PRECAST PANEL (FOR 3.1m PILE SPACING)														
PANEL HEIGHT	CLASS AA CONCRETE	BAR TYPES												
		HORIZONTAL						VERTICAL						
	C.M.	NO.	BAR	SIZE	TYPE	LENGTH	WEIGHT (kg)	NO.	BAR	SIZE	TYPE	LENGTH	WEIGHT (kg)
610	0.19	3	H1	*13	STR	2900	9	10	V1	*13	STR	500	5
910	0.28	4	H2	*13	STR	2900	12	10	V2	*13	STR	800	8
1220	0.37	5	H3	*13	STR	2900	14	10	V3	*13	STR	1120	11

QUANTITIES FOR ONE PRECAST PANEL (FOR 4.6m PILE SPACING)														
PANEL HEIGHT	CLASS AA CONCRETE	BAR TYPES												
		HORIZONTAL						VERTICAL						
	C.M.	NO.	BAR	SIZE	TYPE	LENGTH	WEIGHT (kg)	NO.	BAR	SIZE	TYPE	LENGTH	WEIGHT (kg)
910	0.42		H1	*13	STR	4400		15	V1	*13	STR	800	12
1220	0.56		H2	*13	STR	4400		15	V2	*13	STR	1120	17
1520	0.70		H3	*13	STR	4400		15	V3	*13	STR	1420	21
1830	0.84		H4	*13	STR	4400		15	V4	*13	STR	1720	26

PROJECT NO. R-2809A
WAKE COUNTY
STATION: 30+40.000 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SOUND BARRIER WALL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	2-K
1			3			TOTAL SHEETS
2			4			

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER
10-23-07

SBW2SM

ASSEMBLED BY : S.B. WILLIAMS	DATE : 7/31/07	
CHECKED BY : M.G. CHEEK	DATE : 8/7/07	
DRAWN BY : JAD 5/01	REV. 7/10/01	RWW/LES
CHECKED BY : RDR 5/01	REV. 5/7/03	RWW/JTE
	REV. 5/1/06	TLA/GM

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REVISIONS

	SHEET NO.
R-2809A	2-L

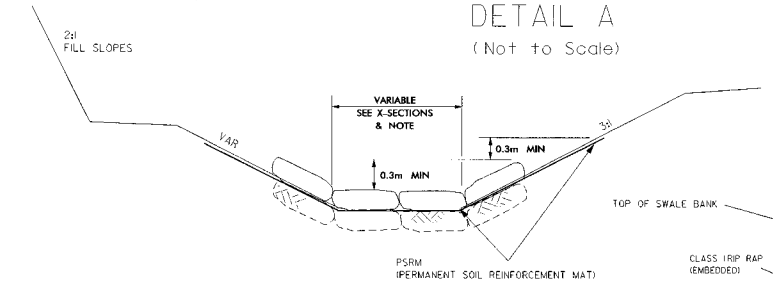
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 034 ENGINEER HENRY WELLS, JR.

9/22/07

LATERAL SWALE/DITCH W/ROCK CHECKS
STA 82+21 TO 82+95 -L- RT
& STA 83+80 TO STA 84+20 -L- LT

DETAIL A
(Not to Scale)

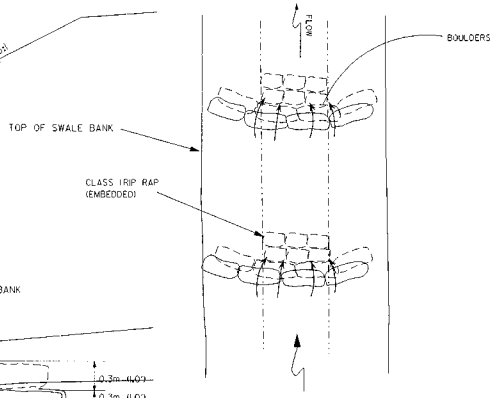


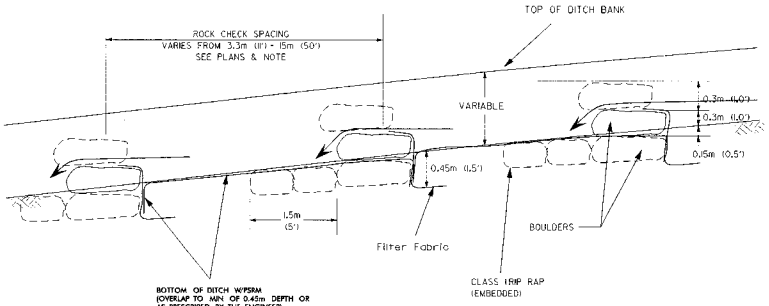
TYPICAL CROSS SECTION

NOT TO SCALE

PLAN VIEW

NOT TO SCALE





PROFILE

NOT TO SCALE

NOTE:

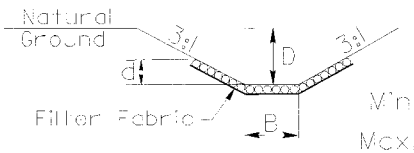
BOULDERS SHOULD BE ANGULAR AND OBLONG WITH APPROXIMATE DIMENSIONS OF 0.6m x 0.45m x 0.45m (2' x 1.5' x 1.5'). ROCK SHOULD FIT TIGHTLY TOGETHER WITH MINIMAL VOIDS. STAGGER BOULDER JOINTS.

ROCK CHECK SPACING IS DEPENDENT ON DITCH GRADES AT 1' DROP INTERVALS OR SLOPE CONTROL.

DITCH WIDTHS VARY. WIDEN TO EXTENT PRACTICAL WITHIN R/W LIMITS. SEE X-SECTIONS.

STANDARD BASE DITCH
STA 85+36 TO 85+51 -L- LT
STA 85+80 TO 86+36 -L- LT

DETAIL B
STANDARD BASE DITCH
(Not to Scale)



Min. D = 0.6 m

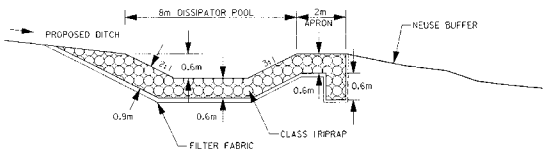
Max. d = 0.6 m

* When B is < 1.8m B - 1.5-2.4 m

Type of Liner = CLASS IRIP RAP

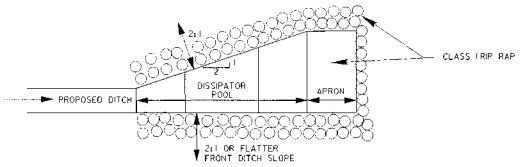
NOT TO SCALE

DETAIL C
ENERGY DISSIPATOR



PROFILE

NOT TO SCALE



PLAN VIEW

NOT TO SCALE

Sta 84+30-L-LT.

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	2-M
R/W SHEET NO.	

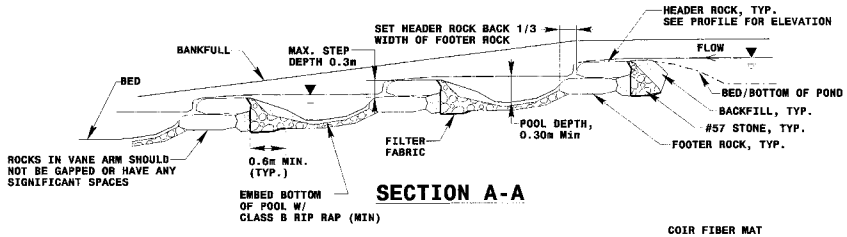
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19920 ENGINEER RICHARD WELLS JR.

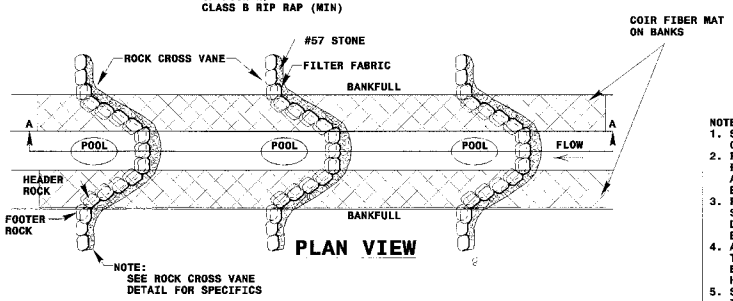
9/25/07

R-2809C
Sta 84+63 to 84+80 -L- Lt

STEP POOL DETAIL
NOT TO SCALE



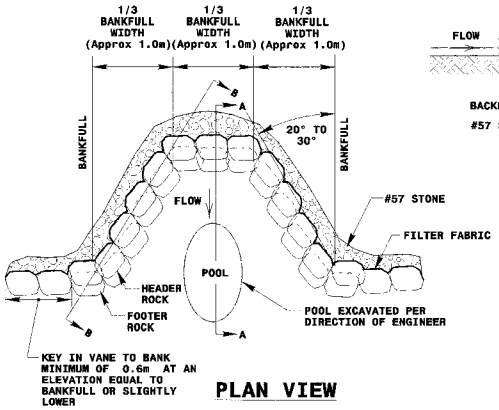
SECTION A-A



PLAN VIEW

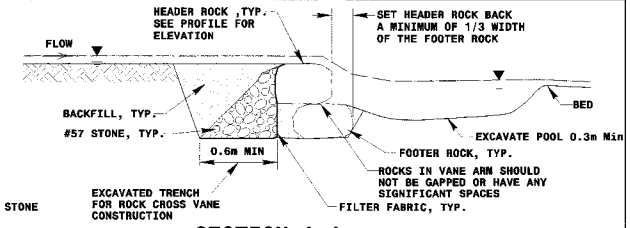
NOTES:
1. STEPS TO BE SHORT, FREQUENT, AND CLOSELY SPACED.
2. POOL SPACING SHALL BE INVERSELY PROPORTIONAL TO STREAM SLOPE, AND DIRECTLY PROPORTIONAL TO BANKFULL WIDTH.(APPROX 6.4m)
3. POOL DEPTHS AT BANKFULL ELEVATION SHALL BE TYPICALLY 2 TO 3 TIMES DEEPER THAN STEP DEPTHS AT BANKFULL ELEVATION.
4. ADEQUATE NUMBER OF FOOTER BOULDERS TO BE USED IN ORDER TO HOLD UP THE BOULDERS AT HEAD OF STEPS DURING HIGH ENERGY/HIGH FLOW EVENTS.
5. STEP POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.

ROCK CROSS VANE DETAIL FOR STEP POOL
NOT TO SCALE

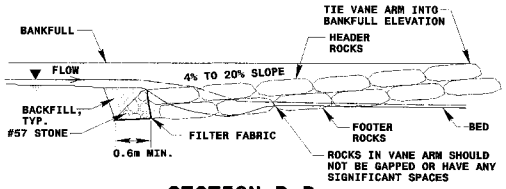


PLAN VIEW

	BOULDER DIMENSIONS (meters)		
STATION	HEIGHT	LENGTH	WIDTH
PER VANE	0.6m	0.9m	0.6m



SECTION A-A



SECTION B-B

NOTES:
1. DEEPEST PART OF POOL TO BE IN LINE WITH WHERE VANE ARM TIES INTO BANKFULL.
2. DO NOT EXCAVATE POOL TOO CLOSE TO FOOTER BOULDERS.
3. CLASS "A" STONE CAN BE USED TO REDUCE VOIDS BETWEEN HEADERS AND FOOTERS.
4. COMPACT BANKFULL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.
5. POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	2-N

METRIC

CONST.REV.

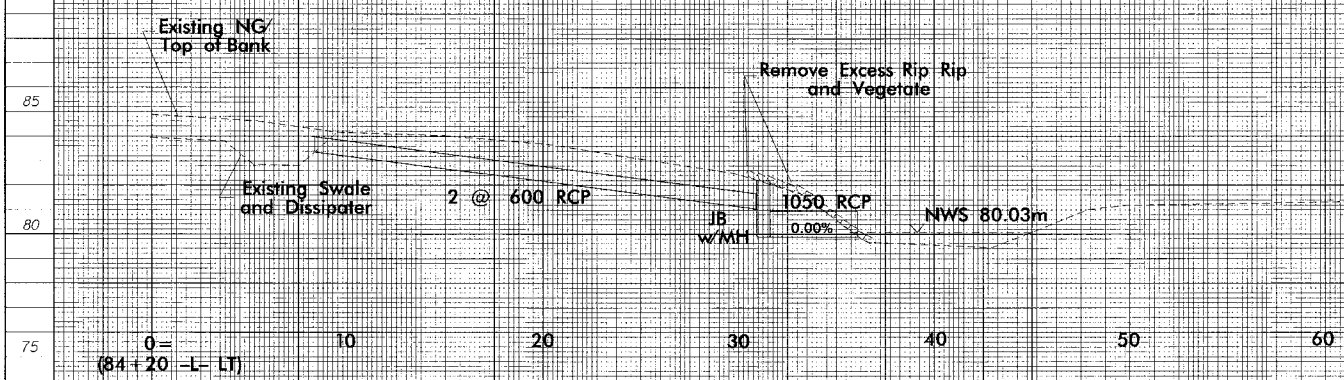
R/W REV.

HYDRAULICS ENGINEER

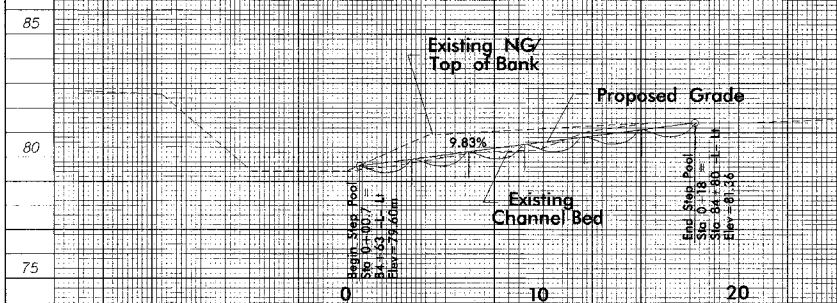
NORTH CAROLINA REGISTERED PROFESSIONAL SEAL 1834 ENGINEER W. HENRY WELLS, JR.

9/28/07

Section at West Bank Drainage System



Stream Step Pool Profile



REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	2-0
R/W SHEET NO.	

METRIC 5 0 10

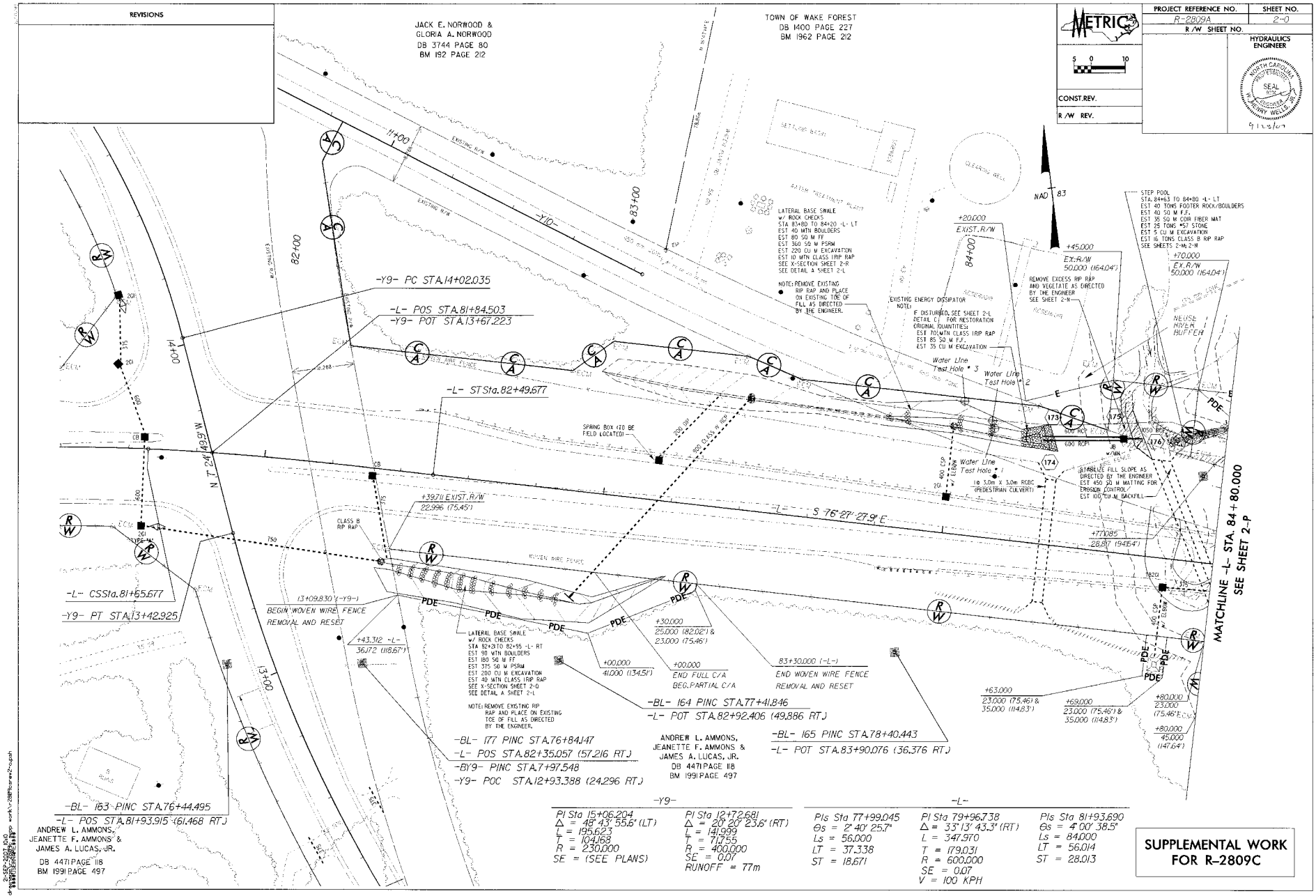
CONST. REV.

R/W REV.

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19761 ENGINEER R. HERVEY WELLS, JR.

9/12/07



-Y9-

PI Sta 15+06.204	PI Sta 12+72.681
Δ = 48° 43' 55.6" (LT)	Δ = 20° 20' 23.6" (RT)
L = 195.623	L = 141.999
T = 104.168	T = 71.755
R = 230.000	R = 400.000
SE = (SEE PLANS)	SE = 0.07
	RUNOFF = 77m

-L-

Pls Sta 77+99.045	PI Sta 79+96.738	Pls Sta 81+93.690
Θs = 2° 40' 25.7"	Δ = 33° 13' 43.3" (RT)	Θs = 4° 00' 38.5"
Ls = 56.000	L = 347.970	Ls = 84.000
LT = 37.338	T = 179.031	LT = 56.014
ST = 18.671	R = 600.000	ST = 28.013
	SE = 0.07	
	V = 100 KPH	

SUPPLEMENTAL WORK FOR R-2809C

2-SEP-2007 10:10
n:\dpw\projects\R2809A\R2809Barnes2-0.psh

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	2-P
R/W SHEET NO.	

METRIC

5 0 10

CONST. REV.

R/W REV.

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 23324 ENGINEER R. KUNZWEILER

9/28/01

NAD 83

THOMAS K. BOLUS, et al
DB 1002 PAGE 18
BM 1962 PAGE 212

TOWN OF WAKE FOREST
DB 1400 PAGE 227
BM 1962 PAGE 212

-BY10- 58 PINC STA.13+38.059
-L- POT STA.86+38.442 (6.326 LT.)

-BY10- 57 PINC STA.14+77.052
-L- POC STA.87+77.845 (4.731 LT.)

-L-
PI Sta. 87+63.322
Δ = 6° 55' 49.0" (LT)
L = 149.493
T = 74.838
R = 1,235.925
SE = 0.04
V = 100 KPH

MATCHLINE -L- STA. 84+80.000
SEE SHEET 2-O

STABILIZE AND REBUILD ERODED STREAM BANKS AS DIRECTED BY THE ENGINEER
EST 30 SQ M COIR FIBER MAT

NEUSE RIVER BUFFER

EXCAVATE FLOODPLAIN MATERIAL TO PREPROJECT NG ELEVATIONS AS DIRECTED BY THE ENGINEER
EST 150 CU M EXCAVATION

CLASS I RIP RAP
EST 4 MTONS
CLASS I RIP RAP
EST 7 SQ M FF

PRE-PROJECT STREAM

STREAM LOCATED 6/05

STANDARD 1.5m BASE DITCH
STA 85+80 TO 86+36 -L- LT
EST 210 MTONS CLASS I RIP RAP
EST 340 SQ M FF
EST 140 CU M EXCAVATION
SEE DETAIL B SHEET 2-L

TRANSITION TO 2.4m BASE DITCH
STA 85+36 TO 85+51 -L- LT
EST 45 MTONS CLASS I RIP RAP
EST 70 SQ M FF
EST 15 CU M EXCAVATION
SEE DETAIL B
SHEET 2-L

THOMAS K. BOLUS, et al
DB 11963 PAGE 2138

SUE WRIGHT
DB 3982 PAGE 357

DAVID J. KIMBERL
DB 4

-L- S 76° 27' 27.9" E

ANDREW L. AMMONS,
JEANNETTE F. AMMONS &
JAMES A. LUCAS, JR.
DB 4471 PAGE 118
BM 1991 PAGE 497

CLARENCE H. BUNN &
RUTH H. BUNN
DB 2712 PAGE 140
BM 1978 PAGE 911

WILLIAM W. JOYNER
DB 6275 PAGE 48
BM 1978 PAGE 911

WILLIAM C. KLOSE &
LINDA J. KLOSE
DB 3071 PAGE 399
BM 1978 PAGE 911

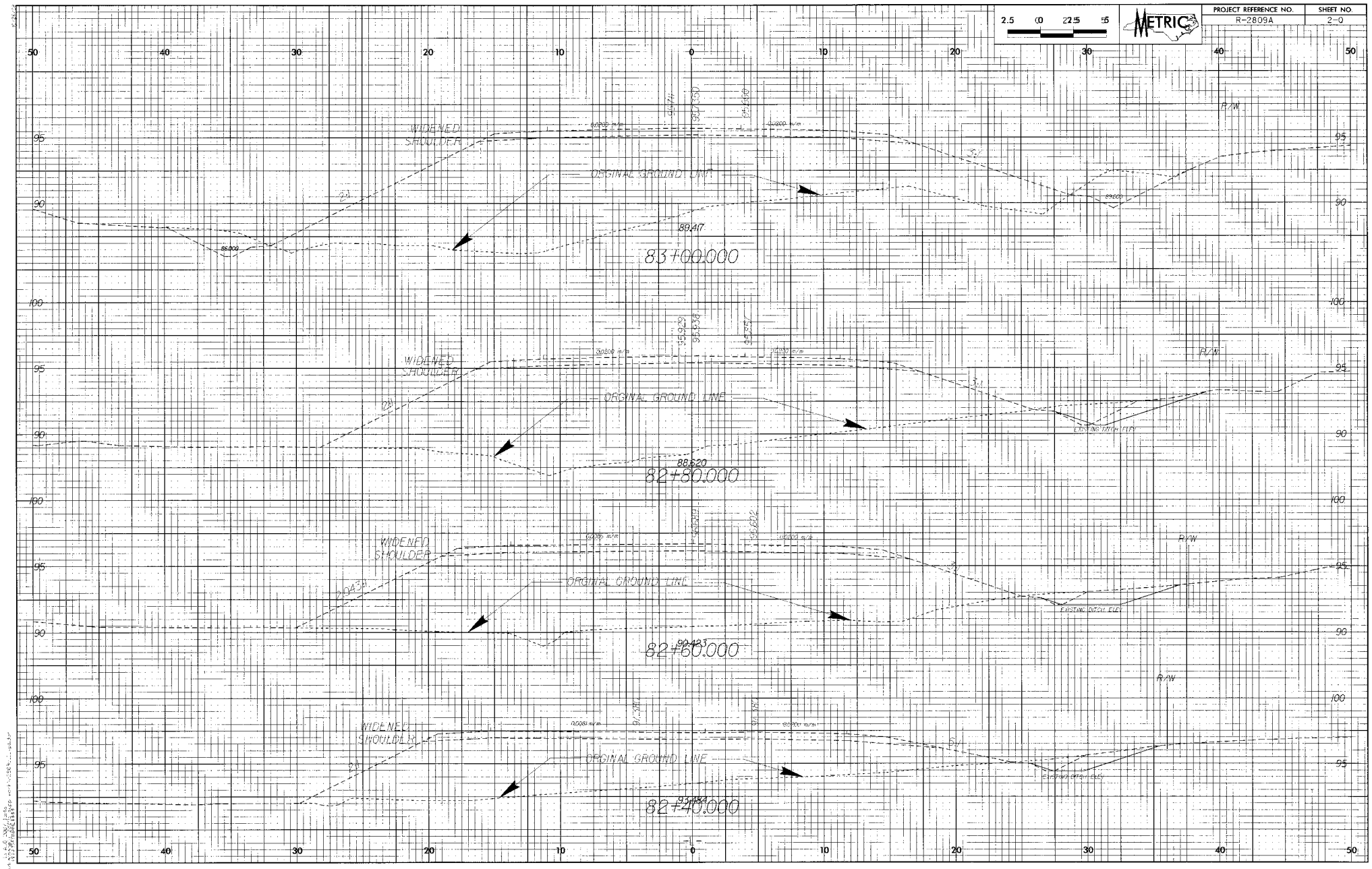
-BL- 166 PINC STA.79+37.019
-L- POT STA.84+86.443 (30.031 RT.)

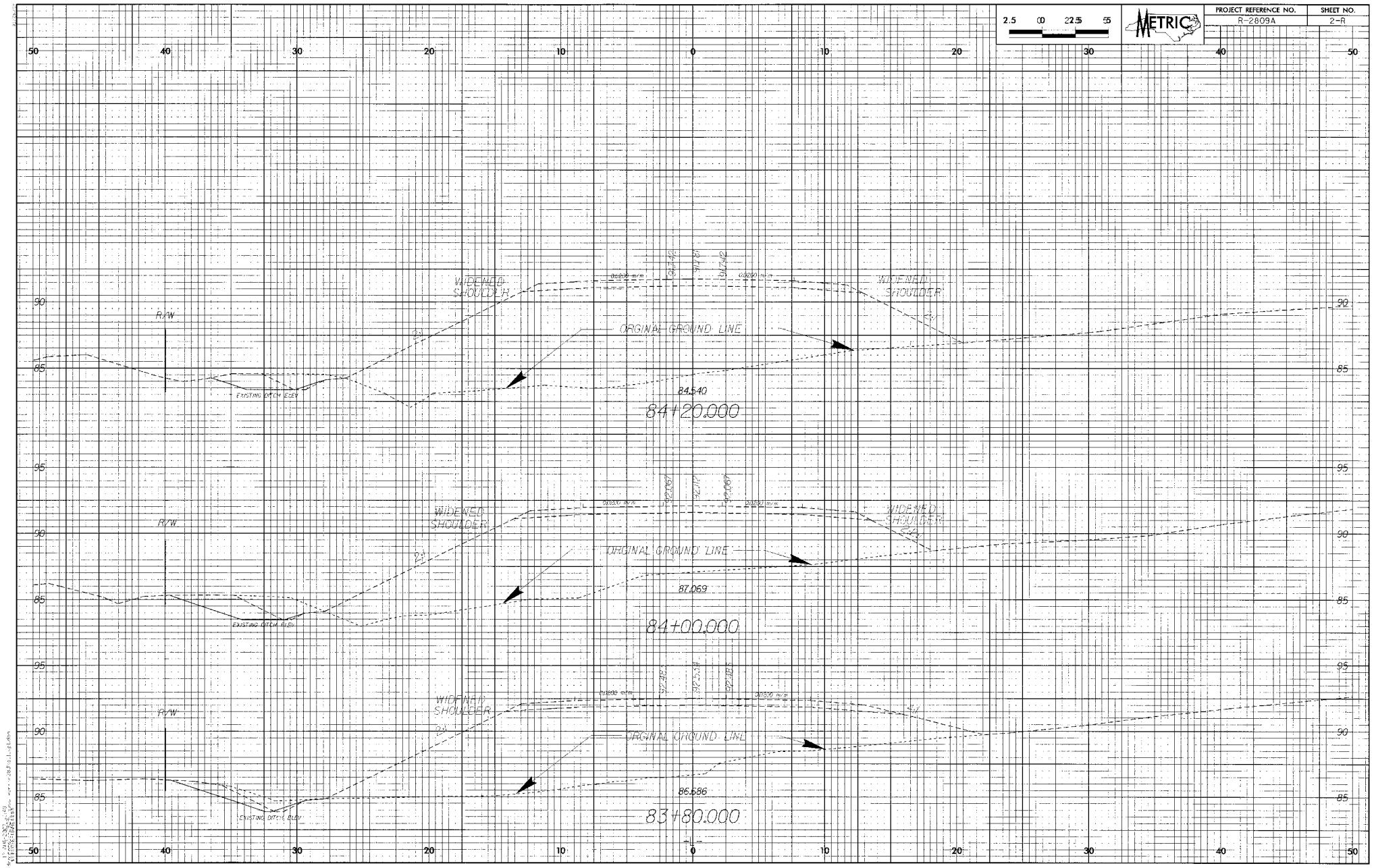
-BL- 167 PINC STA.80+49.602
-L- POT STA.85+98.579 (20.012 RT.)

-L- PCSta.86+88.484

-L- PTSta.88+37.977

SUPPLEMENTAL WORK
FOR R-2809C


METRIC
PROJECT REFERENCE NO.
R-2809A
SHEET NO.
2-Q
WIDENED SHOULDER
ORIGINAL GROUND LINE
R/W
EXISTING DITCH ELEV
83+00.000
82+80.000
82+60.000
82+40.000



2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
R-2809A
SHEET NO.
2-R
WIDENED SHOULDER
ORIGINAL GROUND LINE
R/W
EXISTING DITCH ELEV
84.540
84+20.000
87.069
84+00.000
86.686
83+80.000

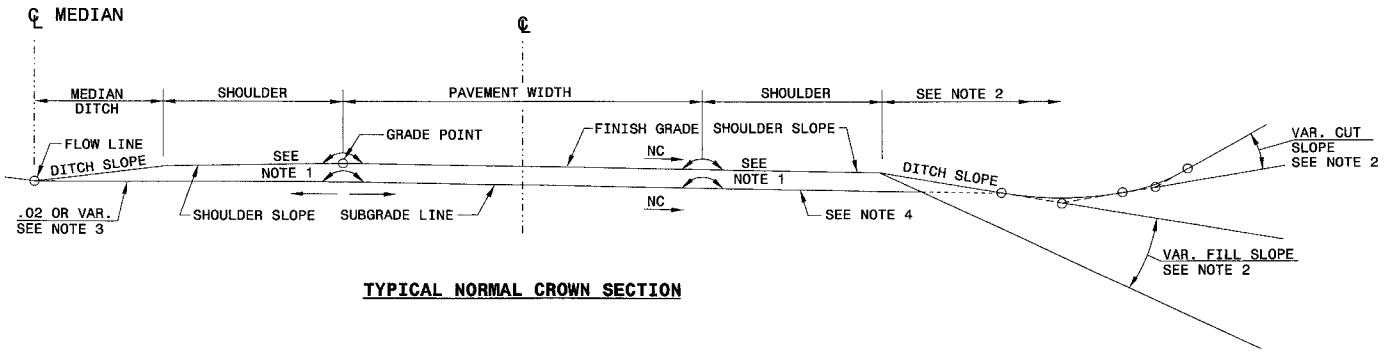
PROJECT REFERENCE NO.	SHEET NO.
R-2809A	2-S

METRIC

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

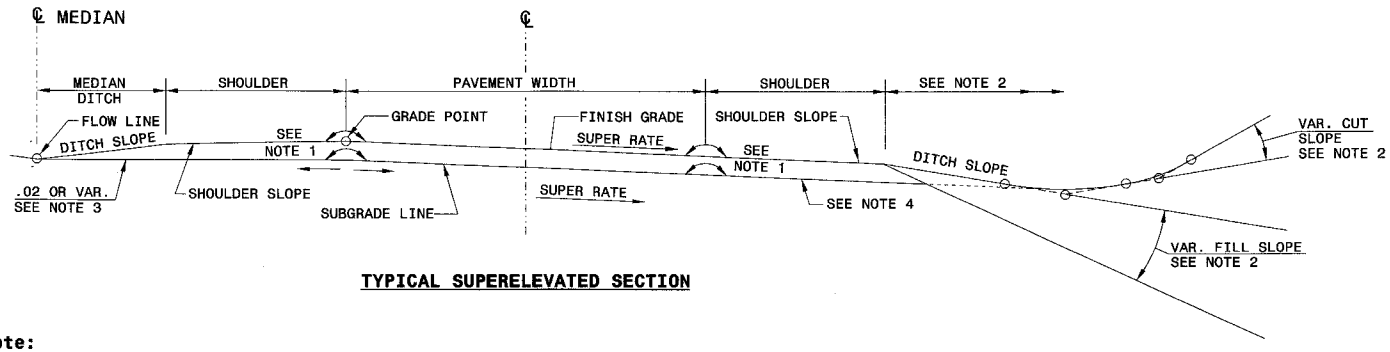
METRIC DETAIL DRAWING FOR
GUIDE FOR GRADING SUBGRADE
INTERSTATE AND FREEWAY
(ROUND BOTTOM DITCH & MEDIAN DITCH)

SHEET 1 OF 1
225D01



TYPICAL NORMAL CROWN SECTION

1. SEE TYPICAL SECTION FOR LATERAL LOCATION OF ROLLOVER.
2. SEE PLANS FOR METHOD OF CONSTRUCTING CUT AND FILL SLOPES.
3. SUBGRADE LINE WILL NOT UNDERCUT DITCH GRADE AT ANY POINT.
4. OUTSIDE SHOULDER SUBGRADES ARE THE SAME RATE OF SLOPE AS THE ADJACENT TRAVEL LANE SUBGRADES **UNLESS** CONSTRUCTED ON THE HIGH SIDE OF SUPERELEVATION OR CONSIST OF 3.0m AND WIDER FULL DEPTH PAVEMENT (SEE STDS. 560.01 AND 560.02).



TYPICAL SUPERELEVATED SECTION

Note:
This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

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

METRIC DETAIL DRAWING FOR
GUIDE FOR GRADING SUBGRADE
INTERSTATE AND FREEWAY
(ROUND BOTTOM DITCH & MEDIAN DITCH)

SHEET 1 OF 1
225D01

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON
9/25/07

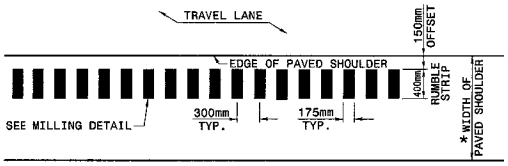
PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

SEE PLATE FOR TITLE

ORIGINAL BY: 2002 STANDARDS DATE: 01-15-02
MODIFIED BY: E.E. WARD DATE: 04-07-03
CHECKED BY: DATE: 10/23/04
FILE SPEC.: stds/02stdstodetails/metric/225d01.dgn

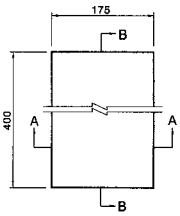
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

METRIC DETAIL DRAWING FOR
ASPHALT SHOULDERS
MILLED RUMBLE STRIPS

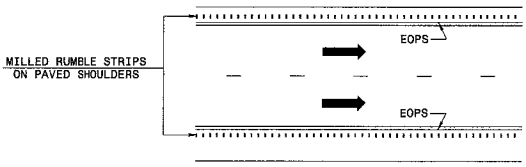


*FOR WIDTHS SEE TYPICAL SECTIONS AND PLAN SHEETS

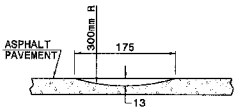
PLAN VIEW
PAVED SHOULDER



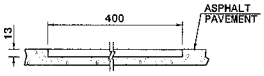
PLAN VIEW
MILLING DETAIL



LANE TREATMENT



SECTION A-A



SECTION B-B

Note:
This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

SHEET 1 OF 2
665D01

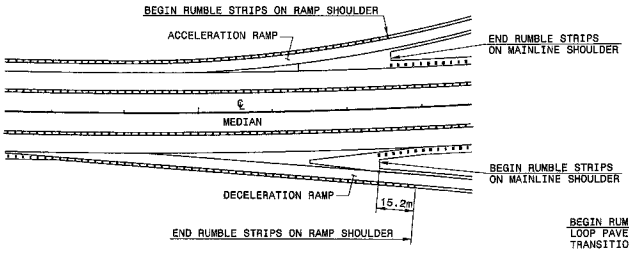
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

METRIC DETAIL DRAWING FOR
ASPHALT SHOULDERS
MILLED RUMBLE STRIPS

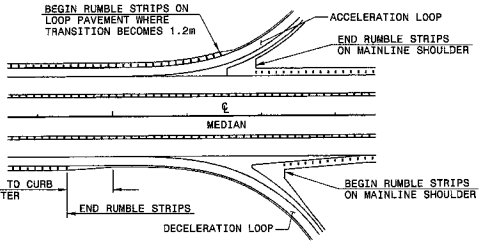
SHEET 1 OF 2
665D01

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

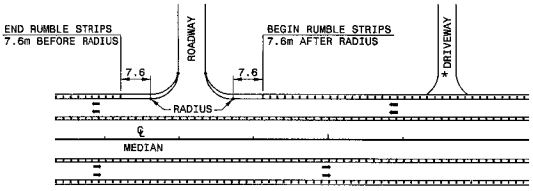
METRIC DETAIL DRAWING FOR
ASPHALT SHOULDERS
MILLED RUMBLE STRIPS



TREATMENT AT RAMP TERMINALS



TREATMENT AT LOOP TERMINALS



TREATMENT AT INTERSECTIONS
(ROADWAY OR DRIVEWAY)

*TERMINATE AT DRIVEWAYS AS DIRECTED BY THE ENGINEER.

Note:
This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

SHEET 2 OF 2
665D01

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

METRIC DETAIL DRAWING FOR
ASPHALT SHOULDERS
MILLED RUMBLE STRIPS

SHEET 2 OF 2
665D01

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

SEE PLATE FOR TITLE

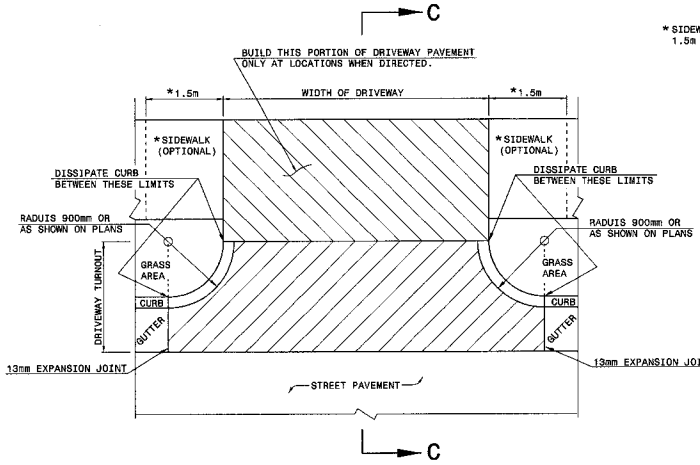
ORIGINAL BY: 2002 STANDARDS DATE: 01-15-02
MODIFIED BY: E.E. WARD DATE: 09-16-04
CHECKED BY: DATE: 11/2/04
FILE SPEC.: sdss/02standsfinderals/metric/665d01.dgn

NORTH CAROLINA PROFESSIONAL SEAL 027996 ENGINEER
STATE HIGHWAY ADMINISTRATOR
1/25/07

PROJECT REFERENCE NO. R-2609A
SHEET NO. 2-T

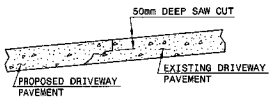
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

METRIC DETAIL DRAWING FOR
DRIVEWAY TURNOUT
RADIUS TYPE



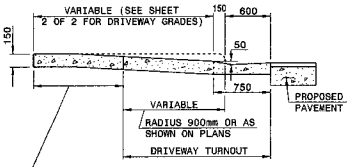
*SIDEWALK TAPERS DOWN 1.5m BACK FROM DRIVEWAY.

PLAN
DETAIL OF DRIVEWAY



METHOD OF TIE IN

WHEN EXISTING DRIVEWAY PAVEMENT IS CONCRETE, SAW CUT 50mm DEEP JOINT AT THE POINT OF TIE-IN. SAW JOINT PERPENDICULAR TO EDGE OF EXISTING DRIVEWAY PAVEMENT.



SECTION C-C

Note:
This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

SHEET 1 OF 2
848D02

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

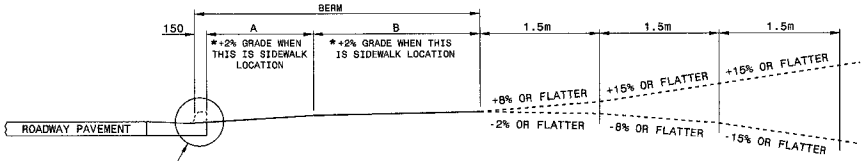
METRIC DETAIL DRAWING FOR
DRIVEWAY TURNOUT
RADIUS TYPE

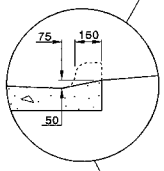
SHEET 1 OF 2
848D02

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

METRIC DETAIL DRAWING FOR
DRIVEWAY TURNOUT
DRIVEWAY GRADES

DESIRABLE DRIVEWAY GRADES

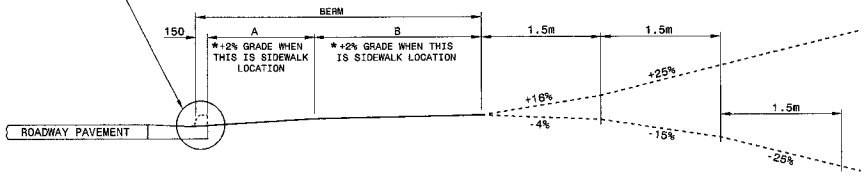




*SIDEWALK LOCATION (DO NOT PLACE SIDEWALK ON BERMS LESS THAN 1.8m WIDE.)

DESIRABLE OR MAXIMUM DRIVEWAY GRADES				
BERM WIDTH	A		B	
	DIST.	GRADE	DIST.	GRADE
2.4m OR LESS	1.50m	+2%*	0.75m	+5%
2.4m OR LESS	0.60m	+6%	1.65m	+2%*
3.0m	1.20m	+4%	1.65m	+2%*
3.6m & OVER	1.35m	+4%	2.10m	+2%*

MAXIMUM DRIVEWAY GRADES



Note:
This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

SHEET 2 OF 2
848D02

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

METRIC DETAIL DRAWING FOR
DRIVEWAY TURNOUT
DRIVEWAY GRADES

SHEET 2 OF 2
848D02

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

SEE PLATE FOR TITLE

ORIGINAL BY: 2002 STD. 848.02 DATE: ____
MODIFIED BY: F.E. WARD DATE: 03-27-03
CHECKED BY: [illegible] DATE: [illegible]
FILE SPEC.: [illegible]

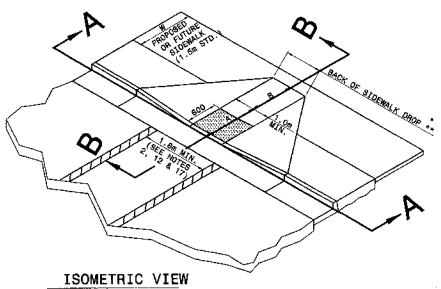
JOHN CAROLINA PROFESSIONAL ENGINEER SEAL 22596

PROJECT REFERENCE NO.	SHEET NO.
R-2509A	2-U

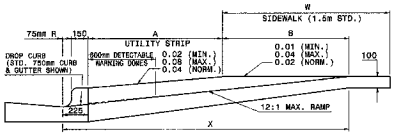
METRIC

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

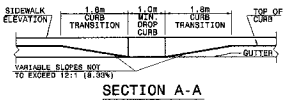
METRIC DETAIL DRAWING FOR
WHEELCHAIR RAMP
CURB CUT



ISOMETRIC VIEW

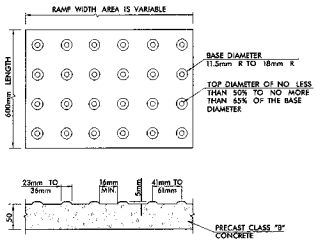


SECTION B-B



SECTION A-A

NOTES:
1. DETECTABLE WARNING DOMES SHALL COVER 600mm LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.
2. OBTAIN 70% CONTRAST VISIBILITY WITH ADJOINING SURFACE, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT SEQUENCE COVERING THE ENTIRE RAMP.



DETECTABLE WARNING DOMES

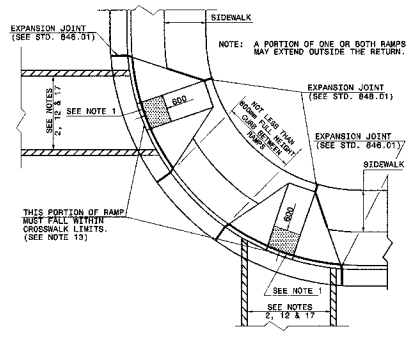
Note:
This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

ROADWAY PLAN SYMBOL
CCFR
CURB CUT FOR FUTURE RAMP

ROADWAY PLAN SYMBOL
WCR
FOR PROPOSED WHEELCHAIR RAMP

W	A	W+A+230mm	X	B
1.5m	0	1.8m	1.8m	1.5m*
1.8m	0	2.1m	2.1m	1.8m**
2.1m	0	2.4m	2.2m	2.0m**
2.4m	0	2.7m	2.2m	2.0m**
1.5m	0.6m	2.4m	2.4m	1.5m
1.5m	0.7m	2.5m	2.5m	1.5m
1.5m	0.9m	2.7m	2.6m	1.3m
1.5m	1.1m	2.8m	2.8m	1.3m
1.5m	1.2m	3.0m	2.6m	1.2m
1.5m	1.4m	3.1m	2.7m	1.0m
1.5m	1.5m	3.3m	2.7m	0.9m

B = X-(A+230mm)
B = DISTANCE FROM FRONT EDGE OF SIDEWALK TO BACK POINT OF 12:1 (8.33%) SLOPE.
* BACK OF SIDEWALK DROP REQUIRED FOR ALL SIDEWALK SLOPES.
** BACK OF SIDEWALK DROP REQUIRED FOR SIDEWALK SLOPES 0.04.



PLAN VIEW
DUAL RAMPS
ANY RADII
(1.0m MIN. FLOOR WIDTH)

SHEET 1 OF 4
848D05

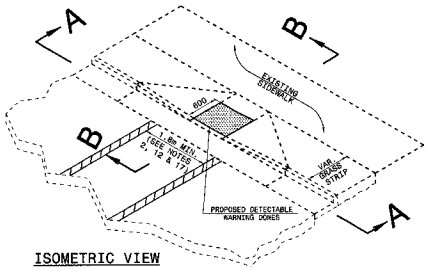
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

METRIC DETAIL DRAWING FOR
WHEELCHAIR RAMP
CURB CUT

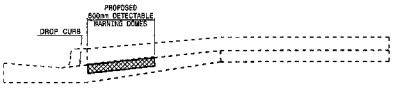
SHEET 1 OF 4
848D05

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

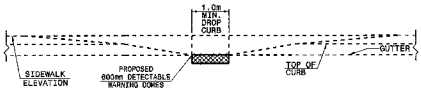
METRIC DETAIL DRAWING FOR
RETROFITTING DETECTABLE WARNING DOMES ONTO EXISTING WHEELCHAIR RAMP
CURB CUT



ISOMETRIC VIEW

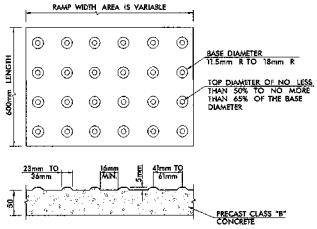


SECTION B-B



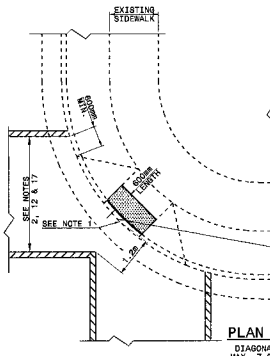
SECTION A-A

NOTES:
1. DETECTABLE WARNING DOMES SHALL COVER 600mm LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.
2. OBTAIN 70% CONTRAST VISIBILITY WITH ADJOINING SURFACE, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT SEQUENCE COVERING THE ENTIRE RAMP.

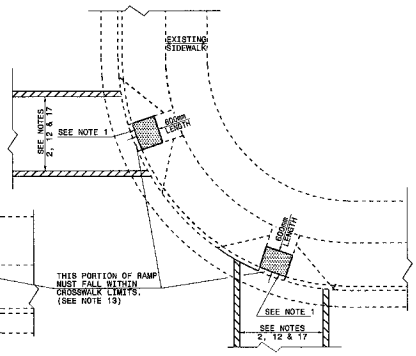


DETECTABLE WARNING DOMES

Note:
This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.



PLAN VIEW
DIAGONAL RAMP
MAX. 7.6m RADII
(1.5m MIN. FLOOR WIDTH)



PLAN VIEW
DUAL RAMPS
ANY RADII
(1.0m MIN. FLOOR WIDTH)

SHEET 2 OF 4
848D05

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

METRIC DETAIL DRAWING FOR
RETROFITTING DETECTABLE WARNING DOMES ONTO EXISTING WHEELCHAIR RAMP
CURB CUT

SHEET 2 OF 4
848D05

ORIGINAL BY: 2002 STD.848.DGN DATE:
MODIFIED BY: E.F. WARD DATE: 09-06-05
CHECKED BY: DATE:
FILE SPEC.: /dgn/stds/roadway/metric/848D05.dgn

SEE PLATE FOR TITLE

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

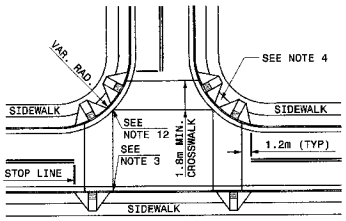
NORTH CAROLINA PROFESSIONAL SEAL 022956 ENGINEER
JOHN D. HOWARD
1/5/07

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	2-V

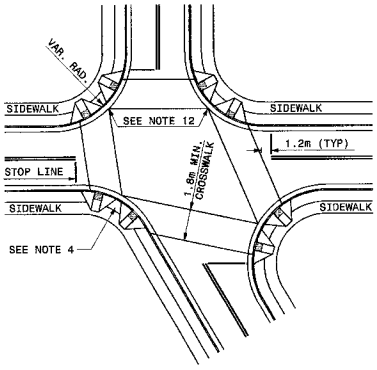
METRIC

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

METRIC DETAIL DRAWING FOR
WHEELCHAIR RAMP
CURB CUT



DETAIL SHOWING TYPICAL LOCATION OF WHEELCHAIR RAMPS, PEDESTRIAN CROSSWALKS AND STOP LINES FOR TEE INTERSECTIONS



DETAIL SHOWING TYPICAL LOCATION OF WHEELCHAIR RAMPS, PEDESTRIAN CROSSWALKS AND STOP LINES

Note:
This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

PROPOSED WHEELCHAIR RAMP
PROPOSED OR FUTURE SIDEWALK

ALLOWABLE LOCATIONS
DUAL RAMP RADII.....ANY

SHEET 3 OF 4
848D05

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

METRIC DETAIL DRAWING FOR
WHEELCHAIR RAMP
CURB CUT

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

METRIC DETAIL DRAWING FOR
WHEELCHAIR RAMP
CURB CUT

NOTES:

1. CONSTRUCT THE WALKING SURFACE WITH SLIP RESISTANTANCE AND A 70% CONTRASTING COLOR TO THE SIDEWALK.
2. CROSSWALK WIDTHS AND CONFIGURATION VARY BUT MUST CONFORM TO TRAFFIC DESIGN STANDARDS.
3. NORTH CAROLINA GENERAL STATUTE 136-44.14 REQUIRES THAT ALL STREET CURBS BEING CONSTRUCTED OR RECONSTRUCTED FOR MAINTENANCE PROCEDURES, TRAFFIC OPERATIONS, REPAIRS, CORRECTION OF UTILTIES OR ALTERED FOR ANY REASON AFTER SEPTEMBER 1, 1973 SHALL PROVIDE WHEELCHAIR RAMPS FOR THE PHYSICALLY DISABLED AT ALL INTERSECTIONS WHERE BOTH CURB AND GUTTER AND SIDEWALKS ARE PROVIDED AND AT OTHER POINTS OF PEDESTRIAN FLOW.

   IN ADDITION, SECTION 228 OF THE 1973 FEDERAL AID HIGHWAY SAFETY ACT REQUIRES PROVISION OF CURB RAMPS ON ANY CURB CONSTRUCTION AFTER JULY 1,1976 WHETHER A SIDEWALK IS PROPOSED INITIALLY OR IS PLANNED FOR A FUTURE DATE.

   THE AMERICANS WITH DISABILITIES ACT (ADA) OF 1990 EXTENDS TO INDIVIDUALS WITH DISABILITIES. COMPREHENSIVE CIVIL RIGHTS PROTECTIONS SIMILIAR TO THOSE PROVIDED TO PERSONS ON THE BASIS OF RACE, SEX, NATIONAL ORIGIN AND RELIGION UNDER THE CIVIL RIGHTS ACT OF 1964. THESE CURB RAMPS HAVE BEEN DESIGNED TO COMPLY WITH THE CURRENT ADA STANDARDS.
4. PROVIDE WHEELCHAIR RAMPS AT LOCATIONS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. LOCATE WHEELCHAIR RAMPS AS DIRECTED BY THE ENGINEER WHERE EXISTING LIGHT POLES, FIRE HYDRANTS, DROP INLETS, ETC. AFFECT PLACEMENT. WHERE TWO RAMPS ARE INSTALLED, PLACE NOT LESS THAN 600mm OF FULL HEIGHT CURB BETWEEN THE RAMPS. PLACE DUAL RAMPS AS NEAR PERPENDICULAR TO THE TRAVEL LANE BEING CROSSED AS POSSIBLE.
5. PAY FOR ALL VARIABLE DEPTH CONCRETE USED FOR CONSTRUCTION OF WHEELCHAIR RAMPS AS CONCRETE WHEELCHAIR RAMPS. (SQ. METERS.)
6. PAY FOR ALL DEPRESSED CURBS AT WHEELCHAIR RAMPS AS THE TYPE CURB AND GUTTER USED ADJACENT TO DEPRESSED CURB. (LN. METERS.)
7. SUCH PRICES AND PAYMENTS IS CONSIDERED FULL COMPENSATION FOR ALL MATERIALS, LABOR, EQUIPMENT, TOOLS AND INCIDENTALS NECESSARY TO SATISFACTORILY COMPLETE THE WORK.
8. DO NOT EXCEED 0.08 (12:1) SLOPE ON THE WHEELCHAIR RAMP IN RELATIONSHIP TO THE GRADE OF THE STREET.
9. CONSTRUCT WHEELCHAIR RAMPS 1.0m OR GREATER FOR DUAL RAMPS.
10. USE CLASS "B" CONCRETE WITH A SIDEWALK FINISH IN ORDER TO OBTAIN A ROUGH NON-SKID TYPE SURFACE.
11. PLACE A 13mm EXPANSION JOINT WHERE THE CONCRETE WHEELCHAIR RAMP JOINS THE CURB AND AS SHOWN ON STD. DWG. 848.01.
12. PLACE THE INSIDE PEDESTRIAN CROSSWALK LINES NO CLOSER IN THE INTERSECTION BY BISECTING THE INTERSECTION RADII, WITH ALLOWANCE OF A 1.0m CLEAR ZONE IN THE VEHICULAR TRAVELWAY WHEN ONE RAMP IS INSTALLED. (SEE NOTE 17)
13. COORDINATE THE CURB CUT AND THE PEDESTRIAN CROSSWALK LINES SO THE FLOOR OF THE WHEELCHAIR RAMP WILL FALL WITHIN THE PEDESTRIAN CROSSWALK LINES. PLACE DIAGONAL RAMPS WITH FLARED SIDES SO 600mm OF FULL HEIGHT CURB FALLS WITHIN THE CROSSWALK MARKINGS ON EACH SIDE OF THE FLARES.
14. CONSTRUCT THE PEDESTRIAN CROSSWALK A MINIMUM OF 1.8m. A CROSSWALK WIDTH OF 3.0m OR GREATER IS DESIRABLE.
15. USE STOP LINES, NORMALLY PERPENDICULAR TO THE LANE LINES, WHERE IT IS IMPORTANT TO INDICATE THE POINT BEHIND WHICH VEHICLES ARE REQUIRED TO STOP IN COMPLIANCE WITH A TRAFFIC SIGNAL, STOP SIGN OR OTHER LEGAL REQUIREMENT. AN UNUSUAL APPROACH SKEW MAY REQUIRE THE PLACEMENT OF THE STOP LINE PARALLEL TO THE INTERSECTING ROADWAY.
16. TERMINATE PARKING A MINIMUM OF 6.0m BACK OF PEDESTRIAN CROSSWALK.
17. PLACE ALL PAVEMENT MARKINGS IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION AND THE NORTH CAROLINA SUPPLEMENT TO THE MUTCD.

Note:
This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

SHEET 4 OF 4
848D05

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

METRIC DETAIL DRAWING FOR
WHEELCHAIR RAMP
CURB CUT

SHEET 4 OF 4
848D05

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

NORTH CAROLINA PROFESSIONAL SEAL 012146 ENGINEER
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
9/25/09

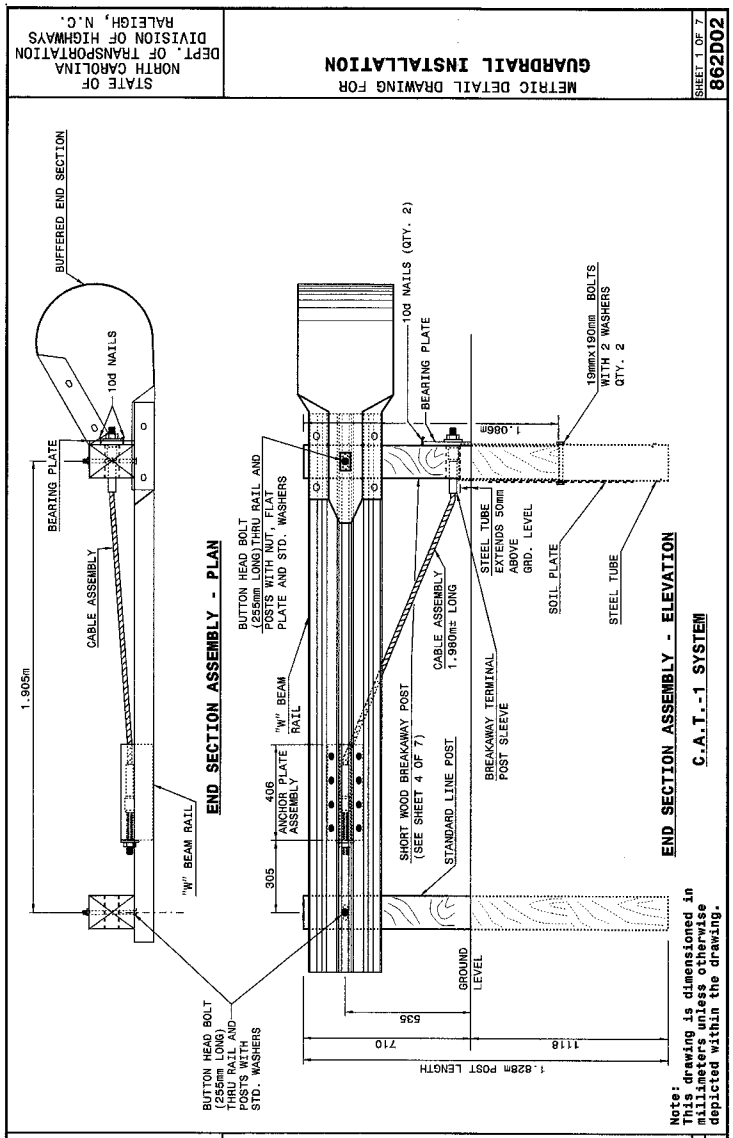
ORIGINAL BY: 2002 STD.848.0DATE: 09-06-05
WORKED BY: DATE:
CHECKED BY: DATE: 4/5/06
FILE SPEC.: //jbr/stds/02indrtail/metric/848D05/848D05.dgn

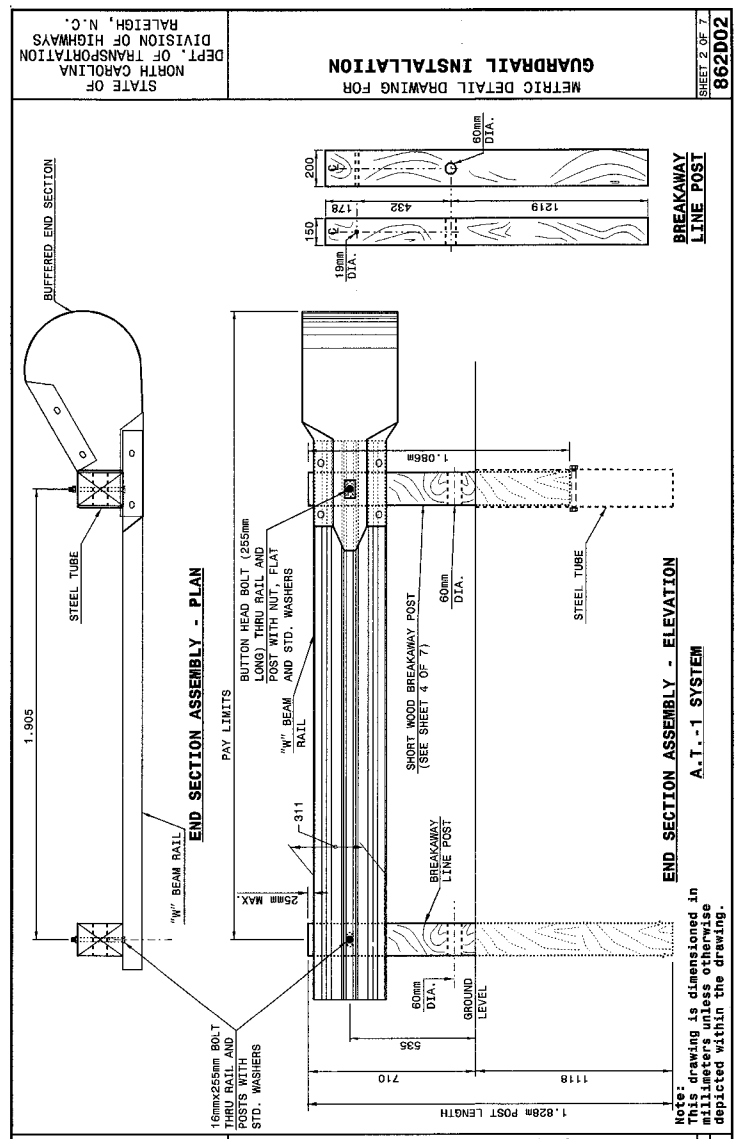
SEE PLATE FOR TITLE

PROJECT REFERENCE NO. R-2809A
SHEET NO. 2-W

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	2-X

METRIC





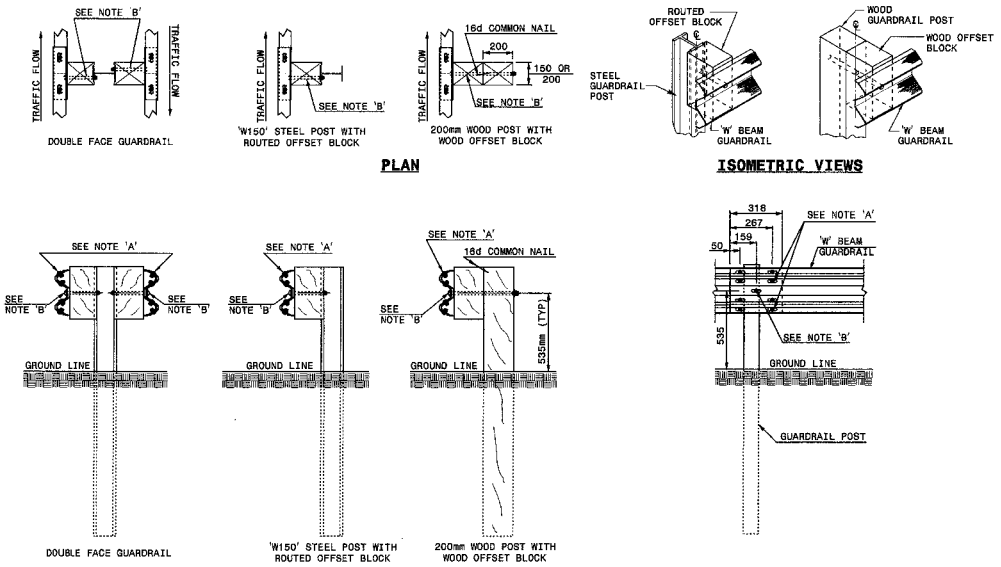
PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

SEE PLATE FOR TITLE

ORIGINAL BY: 2002 STD.862.02 DATE:
MODIFIED BY: E.E. WARD DATE: 02-09-03
CHECKED BY: [signature] DATE: 10/22/04
FILE SPEC.: /ugr/stds/02todetail/metric/86202/862002m.dgn

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

METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION



NOTES:
A - 16mm DIA. BUTTON HEAD SPLICE BOLT 32mm LONG WITH STD. WASHER UNDER NUT (8 REQ. PER SPLICE JOINT).
B - 16mm DIA. BUTTON HEAD BOLT 190mm/228mm LONG WITH NUT FOR BOLTING 150mm/200mm ROUTED OFFSET BLOCK TO STEEL POSTS OR 16mm DIA. BUTTON HEAD BOLT 457mm LONG WITH STD. WASHER UNDER NUT FOR BOLTING TO WOOD POSTS (1 REQ. PER LOCATION)
C - FIELD PUNCH HOLES INTO THE GUARDRAIL AS DIRECTED BY THE ENGINEER.

Note:
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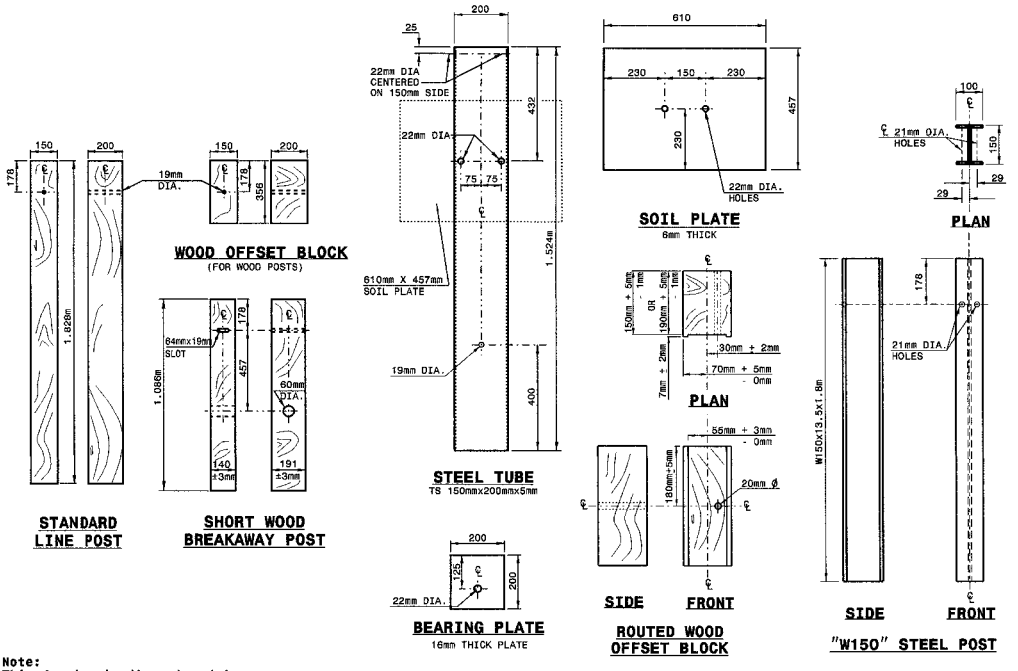
TYPICAL GUARDRAIL AND GUARDRAIL POST ALTERNATIVES

SHEET 3 OF 7
862D02

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

METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION



Note:
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SYSTEM PARTS

SHEET 4 OF 7
862D02

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

METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SEE PLATE FOR TITLE

ORIGINAL BY: 2002 STD. 862.02 DATE:
MODIFIED BY: E. C. YARD DATE: 02-09-03
CHECKED BY: DATE:
FILE SPEC.: /gk/1165/ncdot/gr/11mm/862d02/862d02s.dgn

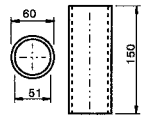
PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

NORTH CAROLINA PROFESSIONAL SEAL 032966 ENGINEER
9/5/07

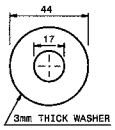
PROJECT REFERENCE NO. R-2809A
SHEET NO. 2-Y
METRIC

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

METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

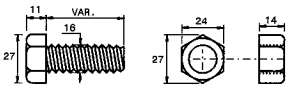


BREAKAWAY TERMINAL POST SLEEVE

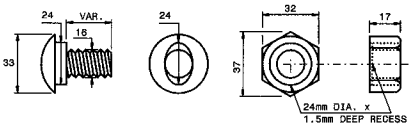


DETAIL OF STANDARD WASHER

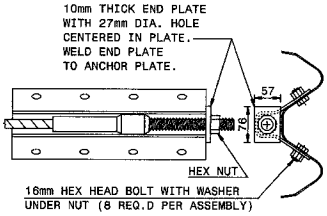
STANDARD WASHER: TYPICAL USE UNDER NUT WITH WOOD POST



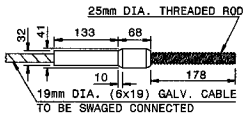
DETAIL OF STANDARD HEX BOLT AND NUT



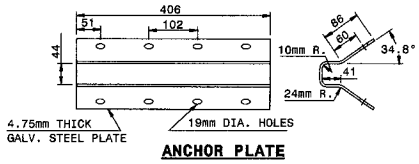
DETAIL OF BUTTON HEAD BOLT AND NUT



ANCHOR PLATE ASSEMBLY



SWAGED CABLE



ANCHOR PLATE

CABLE ASSEMBLY

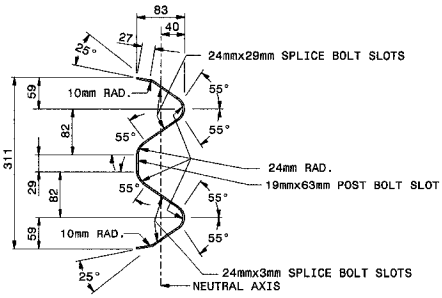
Note:
This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

SYSTEM PARTS

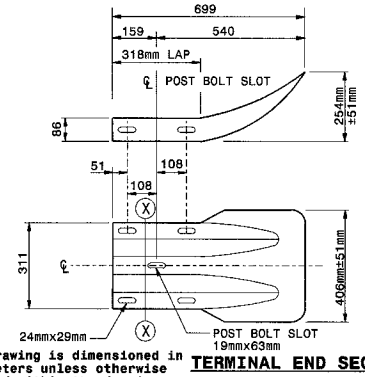
SHEET 5 OF 7
862D02

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

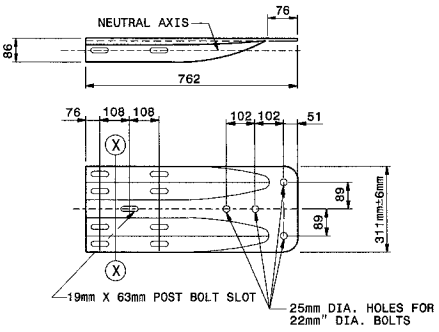
METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION



SECTION X-X



TERMINAL END SECTION



TYPICAL END SHOE

Note:
This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

SYSTEM PARTS - GENERAL USE

SHEET 6 OF 7
862D02

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

METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SEE PLATE FOR TITLE

ORIGINAL BY: 2002 STD. 862.02 DATE: 02-09-03
MODIFIED BY: E.L. WARD DATE: 10/09/08
CHECKED BY: DATE: 10/09/08
FILE SPEC.: //gpfiles02/cons/milnet:1/862D/862D02.dgn

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

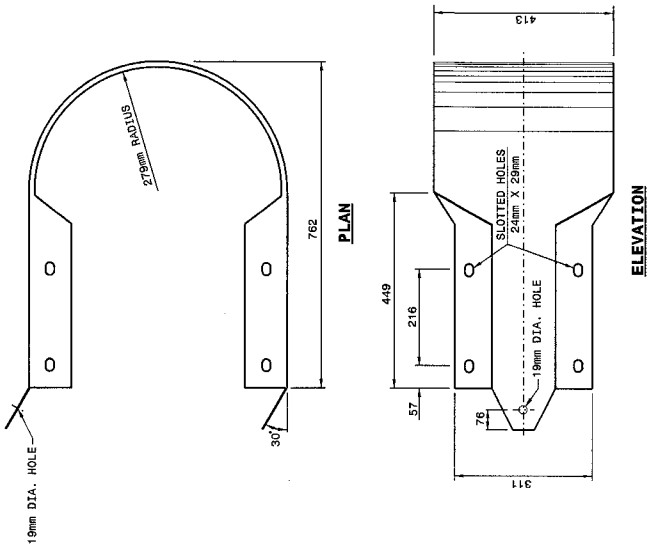
NORTH CAROLINA PROFESSIONAL SEAL 019 ENGINEER

PROJECT REFERENCE NO. R-2609A
SHEET NO. 2-2

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	2-AA

METRIC



BUFFERED END SECTION

Note:
This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

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

METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 7 OF 7
862D02

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

METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 7 OF 7
862D02

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWARD
9/25/07

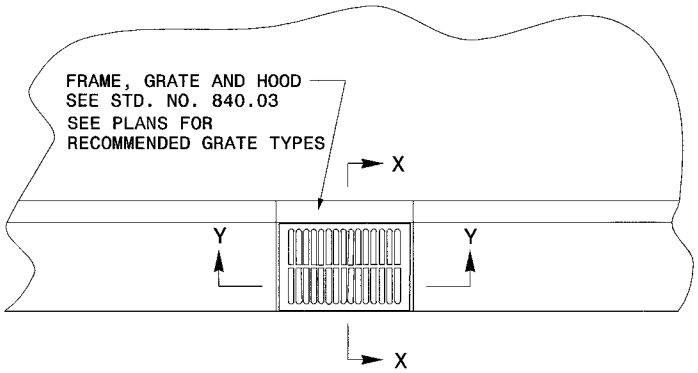
PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

SEE PLATE FOR TITLE

ORIGINAL BY: 2002 STD.862.02 DATE:
MODIFIED BY: E.E. WARD DATE: 02-09-03
CHECKED BY: [signature] DATE: 10/22/04
FILE SPEC.: /dgn/stds/02toodetail/metric/862D2/862d02m.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	2-BB

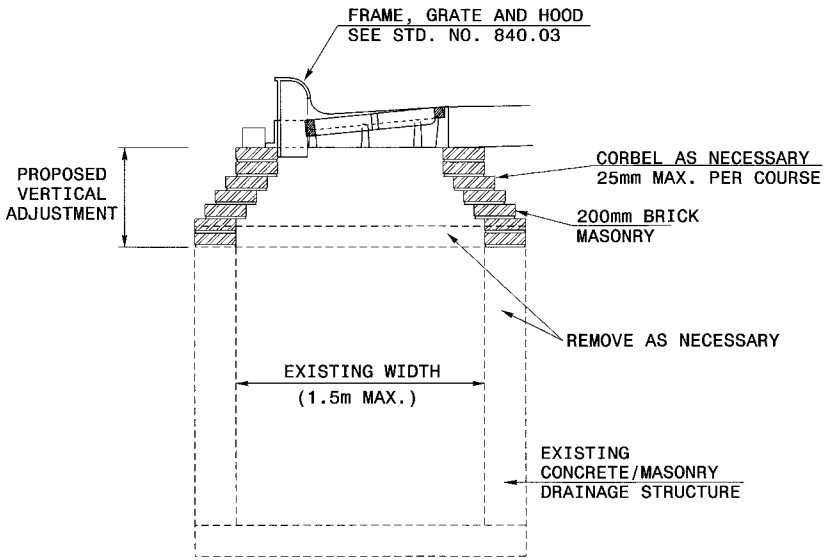
METRIC



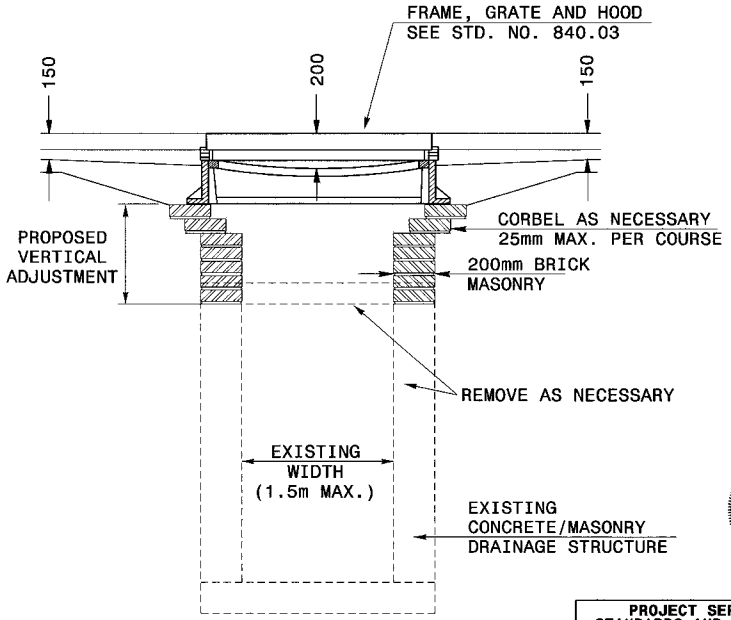
PLAN

GENERAL NOTES:

- THE ROADWAY PLANS INDICATE STRUCTURES TO BE CONVERTED.
- AFTER REMOVAL, STORE GRATES AND FRAMES AS DIRECTED BY THE ENGINEER.
- 100mm SOLID CLAY BRICK, JUMBO BRICK, CONCRETE, OR 100mm 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

Note:
This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER CARLOS KONDRATIEFF
9/25/07

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: 9/23/07
FILE SPEC.: USR:usr\details\stand\jbtocb.dgn

COMPUTED BY: ____________ DATE: ____________
CHECKED BY: ____________ DATE: ____________

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	3
	sheet 1 of 2

METRIC

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C201737

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0001000000-M	200	Lump Sum		CLEARING & GRUBBING ... HECTARE(S)
0008000000-M	200	1.2	HA	SUPPLEMENTARY CLEARING & GRUBBING
0080000000-M	SP	500	MTN	CLASS IV SUBGRADE STABILIZATION
0134000000-M	240	3,420	M3	DRAINAGE DITCH EXCAVATION
0141000000-M	240	300	M	BERM DITCH CONSTRUCTION
0156000000-M	250	16,890	M2	REMOVAL OF EXISTING ASPHALT PAVEMENT
0177000000-M	250	910	M2	BREAKING OF EXISTING ASPHALT PAVEMENT
0192000000-N	260	14	HR	PROOF ROLLING
0195000000-M	265	7,200	M3	SELECT GRANULAR MATERIAL
0196000000-M	270	7,200	M2	FABRIC FOR SOIL STABILIZATION
0318000000-M	300	1,250	MTN	FOUNDATION CONDITIONING MATERIAL, MINOR STRS
0343000000-M	310	14.4	M	375MM SIDE DRAIN PIPE
0378000000-M	310	482.4	M	600MM RC PIPE CULVERTS, CLASS III
0384000000-M	310	43.2	M	750MM RC PIPE CULVERTS, CLASS III
0390000000-M	310	98.4	M	900MM RC PIPE CULVERTS, CLASS III
0396000000-M	310	4.8	M	1050MM RC PIPE CULVERTS, CLASS III
0402000000-M	310	20.4	M	1200MM RC PIPE CULVERTS, CLASS III
0448000000-M	310	105.6	M	****MM RC PIPE CULVERTS, CLASS IV (750MM)
0708000000-M	310	219.6	M	400MM BIT COAT CS PIPE CULVERTS, TYPE B 1.63MM THICK
0714000000-M	310	81.6	M	450MM BIT COAT CS PIPE CULVERTS, TYPE B 1.63MM THICK
0720000000-M	310	43.2	M	600MM BIT COAT CS PIPE CULVERTS, TYPE B 1.63MM THICK
0726000000-M	310	60	M	800MM BIT COAT CS PIPE CULVERTS, TYPE B 2.01MM THICK
0732000000-M	310	115.2	M	900MM BIT COAT CS PIPE CULVERTS, TYPE B 2.01MM THICK
0804000000-M	310	2	EA	***MM BIT COAT CS PIPE ELBOWS, TYPE B ****MM THICK (900MM, 2.01MM)
0806000000-M	310	12	EA	400MM BIT COAT CS PIPE ELBOWS, TYPE B 1.63MM THICK
0809000000-M	310	2	EA	800MM BIT COAT CS PIPE ELBOWS, TYPE B 2.01MM THICK
0995000000-M	340	260	M	PIPE REMOVAL
1011000000-N	500	Lump Sum		FINE GRADING
1044000000-M	501	40,030	M2	LIME TREATED SOIL (SLURRY METHOD)
1066000000-M	501	441	MTN	LIME FOR LIME TREATED SOIL
1077000000-M	SP	25	MTN	#57 STONE
1110000000-M	510	1,000	MTN	STABILIZER AGGREGATE
1176000000-M	542	40,030	M2	***MM SOIL CEMENT BASE (180MM)
1187000000-M	542	1,201	MTN	PORTLAND CEMENT FOR SOIL CEMENT BASE
1198000000-M	SP	350	MTN	AGGREGATE FOR SOIL CEMENT BASE
1209000000-M	543	54,450	L	ASPHALT CURING SEAL
1220000000-M	545	500	MTN	INCIDENTAL STONE BASE
1330000000-M	607	3,530	M2	INCIDENTAL MILLING
1503000000-M	610	12,768	MTN	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C
1523000000-M	610	11,099	MTN	ASPHALT CONC SURFACE COURSE, TYPE S9.5C
1565000000-M	620	666	MTN	ASPHALT BINDER FOR PLANT MIX, GRADE PG 70-22
1693000000-M	654	270	MTN	ASPHALT PLANT MIX PAVEMENT REPAIR
1840000000-M	665	4,510	M	MILLED RUMBLE STRIPS
2000000000-N	806	89	EA	RIGHT OF WAY MARKERS
2022000000-M	815	420	M3	SUBDRAIN EXCAVATION
2033000000-M	815	210	M3	SUBDRAIN FINE AGGREGATE
2044000000-M	815	500	M	150MM PERFORATED SUBDRAIN PIPE
2055000000-M	815	50	EA	150MM SUBDRAIN PIPE WYES, TEES, & ELBOWS
2066000000-N	815	4	EA	CONCRETE PAD FOR SUBDRAIN PIPE OUTLET
2077000000-M	815	8	M	150MM OUTLET PIPE (SUBDRAINS)
2143000000-M	818	20	MTN	BLOTTING SAND
2209000000-M	838	11	M3	ENDWALLS
2253000000-M	840	4	M3	PIPE COLLARS
2275000000-M	SP	7	M3	FLOWABLE FILL
2286000000-N	840	95	EA	MASONRY DRAINAGE STRUCTURES
2308000000-M	840	11	M	MASONRY DRAINAGE STRUCTURES
2364000000-N	840	10	EA	FRAME WITH TWO GRATES, STD 840.16
2364200000-N	840	6	EA	FRAME WITH TWO GRATES, STD 840.20
2365000000-N	840	22	EA	FRAME WITH TWO GRATES, STD 840.22
2366000000-N	840	21	EA	FRAME WITH TWO GRATES, STD 840.24
2374000000-N	840	5	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)
2374000000-N	840	6	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)
2374000000-N	840	19	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)
2396000000-N	840	5	EA	FRAME WITH COVER, STD 840.54
2440000000-N	840	15	EA	CONCRETE APRON FOR CATCH BASIN
2451000000-N	840	10	EA	CONCRETE APRON FOR DROP INLETS
2542000000-M	846	3,900	M	450MM CONCRETE CURB & GUTTER
2549000000-M	846	653	M	750MM CONCRETE CURB & GUTTER
2556000000-M	846	470	M	SHOULDER BERM GUTTER
2591000000-M	848	29	M2	100MM CONCRETE SIDEWALK
2605000000-N	SP	4	EA	WHEELCHAIR RAMPS
2612000000-M	848	9	M2	150MM CONCRETE DRIVEWAY
2619000000-M	850	49	M2	100MM CONCRETE PAVED DITCH
2647000000-M	852	1,315	M2	125MM MONOLITHIC CONCRETE ISLANDS (SURFACE MOUNTED)
2920000000-N	SP	1	EA	CONVERT EXISTING DROP INLET TO CATCH BASIN
3030000000-M	862	2,560.32	M	STEEL BM GUARDRAIL
3045000000-M	862	57.15	M	STEEL BM GUARDRAIL, SHOP CURVED
3150000000-N	862	10	EA	ADDITIONAL GUARDRAIL POSTS
3210000000-N	862	8	EA	GUARDRAIL ANCHOR UNITS, TYPE CAT-1
3270000000-N	SP	20	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3360000000-M	863	1,660	M	REMOVE EXISTING GUARDRAIL
3503000000-M	866	4,030	M	WOVEN WIRE FENCE, 1200MM FABRIC
3509000000-M	866	820	EA	100MM TIMBER FENCE POSTS, 2.30M LONG
3515000000-M	866	230	EA	125MM TIMBER FENCE POSTS, 2.50M LONG
3557000000-M	866	150	M	ADDITIONAL BARBED WIRE
3566000000-M	867	110	M	WOVEN WIRE FENCE RESET
3628000000-M	876	840	MTN	PLAIN RIP RAP, CLASS I
3649000000-M	876	1,440	MTN	PLAIN RIP RAP, CLASS B
3651000000-M	SP	230	MTN	BOULDERS
3656000000-M	876	7,000	M2	FILTER FABRIC FOR DRAINAGE
3659000000-N	SP	7	EA	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON
3984000000-M	SP	583.5	M2	GENERIC WALL ITEM SOUND BARRIER WALL
4048000000-M	902	7	M3	REINFORCED CONCRETE SIGN FOOTINGS
4060000000-M	903	3,142	KG	SUPPORTS, BREAKAWAY STEEL BEAM
4072000000-M	903	589	M	SUPPORTS, 4.5KG STEEL U-CHANNEL
4096000000-N	904	3	EA	SIGN ERECTION, TYPE D
4102000000-N	904	85	EA	SIGN ERECTION, TYPE E
4108000000-N	904	24	EA	SIGN ERECTION, TYPE F
4109000000-N	904	3	EA	SIGN ERECTION, TYPE *** (OVERHEAD) (A)
4110000000-N	904	8	EA	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (A)
4115000000-N	904	2	EA	SIGN ERECTION, OVERLAY (OVERHEAD)
4116000000-N	904	8	EA	SIGN ERECTION, OVERLAY (GROUND MOUNTED)
4129000000-N	906	2	EA	RELOCATE SIGN, TYPE ***** (D)
4129000000-N	906	2	EA	RELOCATE SIGN, TYPE ***** (F)
4152000000-N	907	5	EA	DISPOSAL OF SIGN SYSTEM, STEEL BEAM
4155000000-N	907	37	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4192000000-N	907	2	EA	DISPOSAL OF SUPPORT, U-CHANNEL
4238000000-N	907	2	EA	DISPOSAL OF SIGN, D, E OR F
4412000000-M	SP	163	M2	WORK ZONE SIGNS (STATIONARY)
4412100000-M	SP	44	M2	WORK ZONE SIGNS (PORTABLE)
4412200000-M	SP	32	M2	WORK ZONE SIGNS (BARRICADE MOUNTED)
4415000000-N	1115	1	EA	FLASHING ARROW PANELS, TYPE C
4420000000-N	1120	1	EA	CHANGEABLE MESSAGE SIGN
4430000000-N	1130	471	EA	DRUMS
4435000000-N	1135	250	EA	CONES
4446100000-M	SP	126	M	BARRICADES (TYPE III)
4455000000-N	1150	240	MD	FLAGGER
4465000000-N	1160	4	EA	TEMPORARY CRASH CUSHIONS
4470000000-N	1160	2	EA	RESET TEMPORARY CRASH CUSHIONS
4485000000-M	1170	515	M	PORTABLE CONCRETE BARRIER
4500000000-M	1170	195	M	RESET PORTABLE CONCRETE BARRIER
4615000000-M	1205	99	M	REMOVABLE TAPE PAVEMENT MARKING LINES (100MM)
4650000000-N	1251	458	EA	TEMPORARY RAISED PAVEMENT MARKERS
4685000000-M	1205	13,204	M	THERMOPLASTIC PAVEMENT MARKING LINES (100MM, 2.3MM)
4686000000-M	1205	12,492	M	THERMOPLASTIC PAVEMENT MARKING LINES (100MM, 3.1MM)
4695000000-M	1205	600	M	THERMOPLASTIC PAVEMENT MARKING LINES (200MM, 2.3MM)
4710000000-M	1205	282	M	THERMOPLASTIC PAVEMENT MARKING LINES (600MM, 3.1MM)
4721000000-M	1205	40	EA	THERMOPLASTIC PAVEMENT MARKING CHARACTER (3.1MM)
4725000000-M	1205	276	EA	THERMOPLASTIC PAVEMENT MARKING SYMBOL (2.3MM)
4810000000-M	1205	29,101	M	PAINT PAVEMENT MARKING LINES (100MM)
4820000000-M	1205	108	M	PAINT PAVEMENT MARKING LINES (200MM)
4835000000-M	1205	150	M	PAINT PAVEMENT MARKING LINES (600MM)
4840000000-N	1205	16	EA	PAINT PAVEMENT MARKING CHARACTER
4845000000-N	1205	126	EA	PAINT PAVEMENT MARKING SYMBOL
4850000000-M	1205	2,378	M	REMOVAL OF PAVEMENT MARKING LINES (100MM)
4855000000-M	1205	3	M	REMOVAL OF PAVEMENT MARKING LINES (150MM)
4860000000-M	1205	56	M	REMOVAL OF PAVEMENT MARKING LINES (200MM)
4870000000-M	1205	12	M	REMOVAL OF PAVEMENT MARKING LINES (600MM)
4875000000-N	1205	19	EA	REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS
4900000000-N	1252	1,206	EA	PERMANENT RAISED PAVEMENT MARKERS

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STATE OF NORTH CAROLINA
SUMMARY OF QUANTITIES

PROJECT REFERENCE No.	SHEET No.
R-2809A	3

Sheet 2 of 2

ItemNumber	Sec #	Quantity	Unit	Description
4915000000-M	1264	3	EA	2.1M U-CHANNEL POSTS
4955000000-N	1261	3	EA	OBJECT MARKERS (END OF ROAD)
5300000000-M	1505	75.5	MTN	FOUNDATION CONDITIONING MATERIAL, UTILITIES CLASS ******** (V)
5306000000-M	SP	75.5	MTN	BEDDING MATERIAL, UTILITIES CLASS ********** (V)
5310000000-M	1505	2.95	MTN	PAVEMENT REPAIR FOR UTILITY WORK
5360000000-M	1510	6	M	150MM DI WATER PIPE, PC 2.41MPA
5378000000-M	1510	334	M	300MM DI WATER PIPE, PC 2.41MPA
5384000000-M	1510	139	M	400MM DI WATER PIPE, PC ***MPA (2.41MPA)
5414000000-M	1510	5	M	20MM COPPER WATER PIPE, TYPE K
5480000000-M	1510	1,880.2	KG	DUCTILE IRON WATER PIPE FITTINGS, 1.72MPA MIN WP
5510000000-M	1510	1	EA	20MM CORPORATION STOP
5540000000-M	1510	4	EA	150MM GATE VALVE & VALVE BOX, 1.38MPA WP (1.38MPA WP)
5550000000-M	1510	2	EA	300MM GATE VALVE & VALVE BOX, ****MPA WP (1.38MPA WP)
5648000000-N	1510	1	EA	REPLACE EXISTING WATER METER
5666000000-M	1510	4	EA	FIRE HYDRANT, ****MPA WP (1.03MPA WP)
5798000000-M	1530	387	M	FILL OR REMOVE ABANDONED ***MM PIPE, ********** (300MM, DI WATER)
5798000000-M	1530	126	M	FILL OR REMOVE ABANDONED ***MM PIPE, ********** (150MM, DI WATER)
5882000000-N	SP	2	EA	GENERIC UTILITY ITEM 400MM BUTTERFLY VALVE & MANHOLE
6000000000-M	1605	4,800	M	TEMPORARY SILT FENCE
6006000000-M	1610	1,575	MTN	STONE FOR EROSION CONTROL, CLASS A
6009000000-M	1610	7,950	MTN	STONE FOR EROSION CONTROL, CLASS B
6012000000-M	1610	3,950	MTN	SEDIMENT CONTROL STONE
6015000000-M	1615	28.5	HA	TEMPORARY MULCHING
6018000000-M	1620	1,075	KG	SEED FOR TEMPORARY SEEDING
6021000000-M	1620	8.5	MTN	FERTILIZER FOR TEMPORARY SEEDING
6024000000-M	1622	500	M	TEMPORARY SLOPE DRAINS
6027000000-N	1622	29	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
6029000000-M	SP	650	M	SAFETY FENCE
6030000000-M	1630	20,350	M3	SILT EXCAVATION
6036000000-M	1631	36,000	M2	MATTING FOR EROSION CONTROL
6037000000-M	SP	580	M2	COIR FIBER MAT
6038000000-M	SP	2,220	M2	PERMANENT SOIL REINFORCEMENT MAT
6042000000-M	1632	350	M	6.4MM HARDWARE CLOTH
6070000000-N	SP	2	EA	SPECIAL STILLING BASINS
6083000000-M	1660	33	HA	SEEDING & MULCHING
6087000000-M	1660	16	HA	MOWING
6090000000-M	1661	275	KG	SEED FOR REPAIR SEEDING
6093000000-M	1661	1.25	MTN	FERTILIZER FOR REPAIR SEEDING
6096000000-M	1662	725	KG	SEED FOR SUPPLEMENTAL SEEDING
6100000000-M	1665	55	MTN	FERTILIZER TOPDRESSING
6110000000-N	SP	19.5	HR	SPECIALIZED HAND MOWING
6120000000-M	1670	0.8	HA	REFORESTATION
6126000000-M	SP	0.04	HA	STREAMBANK REFORESTATION
6132000000-N	SP	5	EA	GENERIC EROSION CONTROL ITEM 102MM SKIMMER
6132000000-N	SP	23	EA	GENERIC EROSION CONTROL ITEM 38MM SKIMMER
6132000000-N	SP	19	EA	GENERIC EROSION CONTROL ITEM 51MM SKIMMER
6132000000-N	SP	14	EA	GENERIC EROSION CONTROL ITEM 63MM SKIMMER
6132000000-N	SP	5	EA	GENERIC EROSION CONTROL ITEM 76MM SKIMMER
6132000000-N	SP	20	EA	GENERIC EROSION CONTROL ITEM FITTED FILTER ASSEMBLY
6132000000-N	SP	10	EA	GENERIC EROSION CONTROL ITEM MAIN HOUSING
6132000000-N	SP	108	EA	GENERIC EROSION CONTROL ITEM RESPONSE FOR EROSION CONTROL
6147000000-M	SP	400	M	GENERIC EROSION CONTROL ITEM BELTED SILT FENCE
6147000000-M	SP	1,300	M	GENERIC EROSION CONTROL ITEM COIR FIBER BAFFLES
6147000000-M	SP	600	M	GENERIC EROSION CONTROL ITEM STRAW WATTLES
7000000000-M	1705	~~400~~ 1485	M	SIGNAL CABLE
7120000000-M	1705	~~20~~ 34	EA	VEHICLE SIGNAL HEAD (300MM, 3 SECTION)
7132000000-M	1705	1	EA	VEHICLE SIGNAL HEAD (300MM, 4 SECTION)
7144000000-M	1705	8	EA	VEHICLE SIGNAL HEAD (300MM, 5 SECTION)
7252000000-M	1710	1,181	M	MESSENGER CABLE (6.35MM)
7264000000-M	1710	~~200~~ 231	M	MESSENGER CABLE (9.52MM)
7279000000-M	1715	973	M	TRACER WIRE
7300000000-M	1715	~~1,000~~ 1989	M	TRENCHING (UNPAVED)
7301000000-M	SP	127	M	DIRECTIONAL DRILL POLYETHYLENE CONDUIT, ****MM (** CONDUIT) (50MM, 1 CONDUIT)
7301000000-M	SP	220	M	DIRECTIONAL DRILL POLYETHYLENE CONDUIT, ****MM (** CONDUIT) (50MM, 2 CONDUITS)
7324000000-N	1716	21	EA	JUNCTION BOX (STANDARD SIZE)
7348000000-N	1716	6	EA	JUNCTION BOX (OVER-SIZED, HEAVY DUTY)
7360000000-N	1720	~~16~~ 16	EA	WOOD POLE
7372000000-N	1721	~~18~~ 18	EA	GUY ASSEMBLY
7400000000-M	1722	1	EA	25MM RISER WITH WEATHERHEAD
7420000000-M	1722	~~2~~ 4	EA	50MM RISER WITH WEATHERHEAD
7437000000-M	1722	2	EA	50MM RISER WITH HEAT SHRINK TUBING
7444000000-M	1725	~~1,500~~ 1,630	M	INDUCTIVE LOOP SAWCUT
7456000000-M	1726	~~2,000~~ 2,300	M	LEAD-IN CABLE
7516000000-M	1730	2,471	M	COMMUNICATIONS CABLE (**FIBER) (12)
7552000000-N	1731	3	EA	INTERCONNECT CENTER
7566000000-N	1733	8	EA	DELINEATOR MARKER
7574000000-N	SP	1	EA	FURNISH FIBER-OPTIC TRANSCEIVER
7613000000-N	SP	7	EA	SOIL TEST
7636000000-N	1745	~~10~~ 10	EA	SIGN FOR SIGNALS
7684000000-N	1750	2	EA	SIGNAL CABINET FOUNDATION
7686000000-N	SP	1	EA	CONDUIT ENTRANCE INTO EXISTING FOUNDATION
7756000000-N	1751	2	EA	CONTROLLER WITH CABINET (TYPE 2070L, BASE MOUNTED)
7780000000-N	SP	~~20~~ 26	EA	DETECTOR CARD (TYPE 2070L)
7918000000-K	SP	1	EA	TRAFFIC SIGNAL REMOVAL
7980000000-N	SP	2	EA	GENERIC SIGNAL ITEM CABINET BASE EXTENDER
7980000000-N	SP	3	EA	GENERIC SIGNAL ITEM FIBER-OPTIC TRANSCEIVER SELF-HEALING RING
7980000000-N	SP	7	EA	GENERIC SIGNAL ITEM MAST ARM WITH METAL POLE DESIGN
7980000000-K	SP	1	EA	GENERIC SIGNAL ITEM METAL POLE WITH DUAL MAST ARM
7980000000-N	SP	6	EA	GENERIC SIGNAL ITEM METAL POLE WITH SINGLE MAST ARM
7992000000-M	SP	35	M3	GENERIC SIGNAL ITEM DRILLED PIER FOUNDATION

ItemNumber	Sec #	Quantity	Unit	Description
		******* BEGIN SCHEDULE AA ******* (2 ALTERNATES) *******		
0022000000-M AA1	225	235,500	M3	UNCLASSIFIED EXCAVATION
0036000000-M AA1	225	13,800	M3	UNDERCUT EXCAVATION
0106000000-M AA1	230	128,800	M3	BORROW EXCAVATION
1121000000-M AA1	530	48,060	MTN	AGGREGATE BASE COURSE
1489000000-M AA1	610	3,470	MTN	ASPHALT CONC BASE COURSE, TYPE B25.0B
1491000000-M AA1	610	2,928	MTN	ASPHALT CONC BASE COURSE, TYPE B25.0C
1498000000-M AA1	610	7,184	MTN	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
1519000000-M AA1	610	16,283	MTN	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
1560000000-M AA1	620	1,830	MTN	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
		*** OR ***		
0022000000-M AA2	225	227,100	M3	UNCLASSIFIED EXCAVATION
0036000000-M AA2	225	13,700	M3	UNDERCUT EXCAVATION
0106000000-M AA2	230	139,600	M3	BORROW EXCAVATION
1489000000-M AA2	610	12,568	MTN	ASPHALT CONC BASE COURSE, TYPE B25.0B
1491000000-M AA2	610	15,809	MTN	ASPHALT CONC BASE COURSE, TYPE B25.0C
1498000000-M AA2	610	6,307	MTN	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
1519000000-M AA2	610	10,305	MTN	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
1560000000-M AA2	620	2,736	MTN	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
		******* END SCHEDULE AA *******		
		******* BEGIN SCHEDULE AB ******* (2 ALTERNATES) *******		
0366000000-M AB1	310	2,910	M	375MM RC PIPE CULVERTS, CLASS III
0372000000-M AB1	310	666	M	450MM RC PIPE CULVERTS, CLASS III
		*** OR ***		
0366000000-M AB2	310	1,606.8	M	375MM RC PIPE CULVERTS, CLASS III
0372000000-M AB2	310	338	M	450MM RC PIPE CULVERTS, CLASS III
0986000000-M AB2	SP	403.2	M	GENERIC PIPE ITEM 400MM ALUMINIZED PIPE CULVERTS
0986000000-M AB2	SP	348	M	GENERIC PIPE ITEM 450MM ALUMINIZED PIPE CULVERTS
		*** OR ***		
0366000000-M AB3	310	1,606.8	M	375MM RC PIPE CULVERTS, CLASS III
0372000000-M AB3	310	348	M	450MM RC PIPE CULVERTS, CLASS III
0986000000-M AB3	SP	403.2	M	GENERIC PIPE ITEM 375MM HDPE PIPE CULVERTS
0986000000-M AB3	SP	348	M	GENERIC PIPE ITEM 450MM HDPE PIPE CULVERTS
		******* END SCHEDULE AB *******		

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RD226353

COMPUTED BY:	DJC	DATE:	5/24/2006
CHECKED BY:	KEM	DATE:	8/23/2007

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS

METRIC

PROJECT NO.	SHEET NO.
R-2809A	3-A

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 1200mm & 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) 375	450	600	750	750 CLASS IV	900	1050	1200	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300 (1.63)	400 (1.63)	450 (1.63)	600 (1.63)	600	800 (2.01)	800	900 (2.01)	900	1000 (2.01)	1000	1200 (2.01)	1200	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 300	375 OR 400	450	600	800	900	1000	1200	375mm SIDE DRAIN PIPE	450mm SIDE DRAIN PIPE	600mm SIDE DRAIN PIPE
SIZE / THICKNESS OR GAUGE																																							
-L- 8+34	RT	1			93.60	EXIST													1.2																				
-L- 8+68	LT	2		93.40	92.20																																		
		2	3		92.24	85.20													37.2																				
-L- 8+98	LT	3			85.20																																		
-L- 8+60	RT	4		102.60	101.76																																		
		4	5		101.76	95.60											15.6																						
-L- 8+60	RT	5				95.60																																	
-L- 9+80	RT	6				93.10																																	
		6	7		93.10	85.70				46.8																													
-L- 9+35	RT	7		87.65	85.70																																		
		7	8		85.70	84.70									20.4																								
-L- 10+00	LT	9		105.65	104.73																																		
		9	10		104.73	103.73		49.2																															
-L- 9+50	RT	10		104.65	103.73																																		
		10	11		103.73	86.30											45.6																						
-L- 9+49	LT	11			86.30																																		
-L- 10+00	RT	12		105.30	104.46																																		
		12	13		104.46	90.50											27.6																						
-L- 10+00	RT	13			90.50																																		
-Y8- 10+28	RT	14		106.00	105.16																																		
		14	15		105.16	103.70		19.2																															
-Y8- 10+06																																							
		16	17		105.90	106.16																									18.0									
-L- 11+80	RT	17		107.00	106.16																																		
		17	18		106.16	107.36																									98.4									
-L- 12+80	RT	18		108.20	107.36																																		
-L- 12+11	RT																																						
		18	19		107.36	108.28		24.0																															
-L- 12+80	LT	19		109.20	108.28																																		
		19	20		108.28	108.40		21.6																															
-L- 13+00	LT	20		109.32	108.40																																		
-Y3- 10+19	LT	21	22		106.64	105.70		40.8																															
-L- 13+60	LT	23		107.72	107.10																																		
-L- 13+70	LT	23	24		107.10	108.75		14.4																															
-L- 13+91	LT	25		109.67	108.83																																		
		25	26		108.83	108.77		15.6																															
-L- 13+75	LT	26		109.61	108.77																																		
		26	27		108.77	106.50		21.6																															
-L- 13+76	LT	27				106.50																																	
-L- 13+95	RT	28		108.60	107.76																																		
		28	31		107.76	107.13																									14.4									
-L- 13+95	RT	31																																					
SHEET TOTALS								206.4	0.0	46.8	0.0	0.0	0.0	0.0	20.4	0.0	88.8	0.0	38.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	130.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

STATION	FROM	TO	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. METERS R.C.P.	C.S.P.	QUANTIES FOR DRAINAGE STRUCTURES PER EACH (0 THRU 1.50)	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B') METERS A 1.5 THRU 3.00	B 3.00 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 GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	M.D.I. FRAME WITH GRATE STD. 840.22	MANHOLE STD. 840.51	M.H. STD. 840.51 OR 840.53	M.H. FRAME AND COVER STD. 840.54	CONC. APRON FOR CATCH BASIN STD. 852.05	CONC. APRON FOR DROP INLET STD. 852.06	CONVERT DI TO CB (SEE DETAIL 2-BB)	TRAFFIC BEARING JB STD. 840.34												FLOWABLE FILL, M^3	BERM DRAINAGE OUTLET(BDO)	PREFORMED SCOUR HOLE(PSH, SEE SHT. 2-F)	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" M^3 STD. 840.72	CONC. & BRICK PIPE PLUG, M^3 STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
-L- 8+34	1			1.2																																								0.40			REMOVE/REPLACE HEADWALL
-L- 8+68	2				1																	1																										JB
	2	3																																														
-L- 8+98	3			1.2																																											ENDWALL
-L- 8+60	4				1											1		1																													2 GI w/FLAT GRATE
	4	5																																									2@400				
-L- 8+60	5																																									1					
-L- 9+80	6																																								1						BDO SEE STD. 850.11
	6	7																																													
-L- 9+35	7				1	0.45																1				1																						JB / MH
	7	8																																													
-L- 10+00	9				1			1			1																1																					CB
	9	10																																													
-L- 9+50	10				1			1			1																1																					CB
	10	11																																									2@400				
-L- 9+49	11																																									1					
-L- 10+00	12				1											1		1																													2 GI W/FLAT GRATE
	12	13																																									2@400				
-L- 10+00	13																																									1					
-Y8- 10+28	14				1											1					1																										2 GI
	14	15																																													
-Y8- 10+06																																														18.4	450mm RCP PIPE REMOVAL
	16	17																																													
-L- 11+80	17				1											1			1																												2 GI W/FALSE SUMP (FS)
	17	18																																													
-L- 12+80	18				1											1			1																												2 GI W/FALSE SUMP (FS)
-L- 12+11																																														9.3	375mm RCP PIPE REMOVAL
	18	19																																													
-L- 12+80	19				1			1			1																1																					CB
	19	20																																													
-L- 13+00	20				1			1			1																1																					CB
-Y3- 10+19	21	22																																										0.29			COLLAR & EXTEND 375 RCP
-L- 13+60	23				1												1		1																												2 GI TYPE D
-L- 13+70	23	24																																							1						BDO SEE STD. 850.10
-L- 13+91	25				1			1			1																1																					CB
	25	26																																													
-L- 13+75	26				1			1			1																1																					CB
	26	27																																													
-L- 13+76	27																																									1					
-L- 13+95	28				1											1					1																										2 GI
	28	31																																													
-L- 13+95	31																																													14.8	REMOVE 375mm RCP
SHEET TOTALS			0	2.4	15	0.45	0.00	6	0	0	6	0	0	0	6	1	2	3	0	2	2	0	0	0	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	6@400	0.69	0	42.5	

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: DJC DATE: 5/24/2006

CHECKED BY: KEM DATE: 8/23/2007

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS

METRIC

PROJECT NO. R-2809A

SHEET NO. 3-B

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 1200mm & 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) 375	450	600	750	750 CLASS IV	900	1050	1200	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300 (1.63)	400 (1.63)	450 (1.63)	600 (1.63)	600	800 (2.01)	800	900 (2.01)	900	1000 (2.01)	1000	1200 (2.01)	1200
-L- 14+60	RT	29				108.70																						
		29	30		108.70	107.58											4.8											
-L- 14+60	RT	30		108.50	107.58																							
		30	31		107.58	107.13																						
-L- 13+95	RT	31		108.20	107.13																							
		31	32		107.13	105.00				46.8																		
-L- 13+97	LT	32		106.50	103.42																							
		32	33		103.42	103.42													4.8									
-L- 13+94	LT	33				101.00																						
-L- 14+11																												
-L- 14+30	LT	34		109.93	109.09																							
		34	35		109.09	108.400		25.2																				
-L- 14+28	LT	35				108.400																						
-L- 15+70	LT	36		111.91	111.07																							
		36	37		111.07	109.00		31.2																				
-L- 15+74		38	39		108.8	105.20			60.0																			
-L- 16+00	RT	40		111.3	110.46																							
		40	41		110.46	108.30																						
-L- 16+70	LT	42		114.62	113.71																							
		42	43		113.71	113.16		19.2																				
-L- 16+70	RT	43		114	113.16																							
		13	44		113.16	110.40											10.8											
-L- 17+16		45	46		108.9	108.30						79.2																
-L- 18+73	LT	47		118.53	117.56																							
		47	48		117.56	116.00		18.0																				
-L- 18+73	LT	48				116.00																						
-L- 19+20	LT	49		118.74	117.77																							
		49	50		117.77	116.61		26.4																				
-L- 19+20	RT	50		117.45	116.61																							
		50	51		116.61	116.50																						
-L- 19+76	CL	52	53		115.20	110.00				73.2																		
-L- 20+20	CL	54		119.90	118.93																							
		54	55		118.93	118.16		24.00																				
-L- 20+16	RT	55		119.00	118.16																							
		55	56		118.16	117.65		38.4																				
-L- 19+94	LT	56		118.62	117.65																							
		56	57		117.65	114.60											30.0											
-L- 19+94	LT	57				114.60																						
-L- 20+29	LT																											
-L- 21+40	RT	58		116.97	116.00																							
		58	59		116.00	115.00		49.2																				
-L- 21+89	RT	59		115.92	115.00																							
		59	60		115.00	114.02		30.0																				
-L- 22+20	RT	60		114.94	114.02																							
SHEET TOTALS								261.6	60.0	120.0	0.0	79.2	0.0	0.0	0.0	0.0	45.6	0.0	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

STATION	FROM	TO	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 300	375 OR 400	450	600	800	900	1000	1200	375mm SIDE DRAIN PIPE	450mm SIDE DRAIN PIPE	600mm SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. METERS R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0 THRU 1.50)	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5 THRU 3.00	B 3.00 AND ABOVE
-L- 14+60	29																	
	29	30																
-L- 14+60	30															1		
	30	31			58.8													
-L- 13+95	31															1		
	31	32																
-L- 13+97	32															1	1.50	0.08
	32	33																
-L- 13+94	33														1.2			
-L- 14+11																		
-L- 14+30	34															1		
	34	35																
-L- 14+28	35																	
-L- 15+70	36															1		
	36	37																
-L- 15+74	38	39																
-L- 16+00	40															1		
	40	41		22.8														
-L- 16+70	42															1		
	42	43																
-L- 16+70	43															1		
	13	44																
-L- 17+16	45	46																
-L- 18+73	47															1		
	47	48																
-L- 18+73	48																	
-L- 19+20	49															1		
	49	50																
-L- 19+20	50															1		
	50	51		19.2														
-L- 19+76	52	53																
-L- 20+20	54															1		
	54	55																
-L- 20+16	55															1		
	55	56																
-L- 19+94	56															1		
	56	57																
-L- 19+94	57																	
-L- 20+29																		
-L- 21+40	58															1		
	58	59																
-L- 21+89	59															1		
	59	60																
-L- 22+20	60															1		
SHEET TOTALS			0.0	42.0	58.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	17	1.50	0.08

STATION	FROM	TO	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 GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	M.D.I. FRAME WITH GRATE STD. 840.22	MANHOLE STD. 840.51	M.H. STD. 840.51 OR 840.53	M.H. FRAME AND COVER STD. 840.54	CONC. APRON FOR CATCH BASIN STD. 852.05	CONC. APRON FOR DROP INLET STD. 852.06	CONVERT DI TO CB (SEE DETAIL 2-BB)	TRAFFIC BEARING JB STD. 840.34												FLOWABLE FILL, M^3	BERM DRAINAGE OUTLET(BDO)	PREFORMED SCOUR HOLE(PSH, SEE SHT. 2-F)	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" M^3 STD. 840.72	CONC. & BRICK PIPE PLUG, M^3 STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
-L- 14+60	29																																			1						BDO SEE STD. 850.10
	29	30																																								
-L- 14+60	30									1			1																													2 GI W/FASLE SUMP (FS)
	30	31																																								
-L- 13+95	31									1			1																													2 GI W/FALSE SUMP (FS)
	31	32																																								
-L- 13+97	32																1				1																					JB / MH
	32	33																																								
-L- 13+94	33																																									ENDWALL / SEE DETAIL #12
-L- 14+11																																			6.2							FILL 450mm RCP W/ FLOWABLE FILL
-L- 14+30	34		1			1																1																				CB
	34	35																																								
-L- 14+28	35																																				1					
-L- 15+70	36		1			1																1																				CB
	36	37																																								
-L- 15+74	38	39																																								
-L- 16+00	40									1			1																													2GI W/FALSE SUMP(FS)
	40	41																																								
-L- 16+70	42		1			1																1																				CB
	42	43																																								
-L- 16+70	43									1		1																														2 GI W/FLAT GRATE
	13	44																																				2@400				
-L- 17+16	45	46																																								CLASS IV
-L- 18+73	47						1	1															1																			DI
	47	48																																								
-L- 18+73	48																																				1					
-L- 19+20	49						1	1															1																			DI
	49	50																																								
-L- 19+20	50									1			1																													2GI W/FALSE SUMP (FS)
	50	51																																								
-L- 19+76	52	53																																								
-L- 20+20	54						1	1															1																			DI
	54	55																																								
-L- 20+16	55									1			1																													2 GI
	55	56																																								
-L- 19+94	56						1	1															1																			DI
	56	57																																								
-L- 19+94	57																																				1					
-L- 20+29																																									11.5	REMOVE 450mm RCP
-L- 21+40	58						1	1															1																			DI
	58	59																																								
-L- 21+89	59		1			1																1																				CB
	59	60																																								
-L- 22+20	60		1			1																1																				CB
SHEET TOTALS			5	0	0	5	5	5	0	6	0	1	5	0	0	1	0	0	0	1	5	5	0	0	0	0	0	0	0	0	0	0	0	6.2	1	3	2@400	0.00	0.0	11.5	

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: DJC DATE: 5/24/2006
CHECKED BY: KEM DATE: 8/23/2007

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS

METRIC

PROJECT NO. R-2809A SHEET NO. 3-C

RD226353

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 1200mm & UNDER)

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

STATION	LOCATION (LT, RT, OR CLT)	STRUCTURE NO.		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE)								BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE)													CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D								375mm SIDE DRAIN PIPE	450mm SIDE DRAIN PIPE	600mm SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. METERS		QUANTITIES FOR DRAINAGE STRUCTURES	"TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B')" METERS		C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE			D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME 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 GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	M.D.I. FRAME WITH GRATE STD. 840.22	MANHOLE STD. 840.51	M.H. STD. 840.51 OR 840.53	M.H. FRAME AND COVER STD. 840.54	CONC. APRON FOR CATCH BASIN STD. 852.05	CONC. APRON FOR DROP INLET STD. 852.06	CONVERT DI TO CB (SEE DETAIL 2-BB)	TRAFFIC BEARING JB STD. 840.34												FLOWABLE FILL, M^3	BERM DRAINAGE OUTLET (BDO)	PREFORMED SCOUR HOLE (PSH, SEE SHT. 2-F)	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" M^3 STD. 840.72	CONC. & BRICK PIPE PLUG, M^3 STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
SIZE		FROM	TO					375	450	600	750	750	900	1050	1200	300	400	450	600		800		900		1000		1200		300	375 OR 400	450	600	800	900	1000	1200				R.C.P.	C.S.P.	PER EACH (0 THRU 1.50)	A 1.5 THRU 3.00	B 3.00 AND ABOVE		E	F	G																																				
THICKNESS OR GAUGE												CLASS IV				1.63	1.63	1.63	1.63		2.01		2.01		2.01		2.01																																																												
		60	62		114.02	113.41		16.8																																																																														
-L- 22+37	RT	61		113.6	113.01																																					1										1			1																														2 GI W/FASLE SUMP (FS)
		61	62		113.01	112.96	YES	14.4																																																																														
-L- 22+37	RT	62		114.33	112.96																																					1			1			1															1																									CB
		62	63		112.96	111.76		32.4																																																																														
-L- 22+60	LT	63		112.6	111.76																																					1										1			1																														2 GI W/FALSE SUMP (FS)
		63	64		111.76	106.80												43.2																																																																	
-L- 23+61	LT	65																																						2.6																																														ENDWALL : 900 RCP
		65	66		104.5	100.80							87.6																																																																						
-L- 24+40	RT	67		106.55	105.71																																					1										1		1																															2 GI W/FLAT GRATE
		67	68		105.71	102.00											12.0																																																															2@400				
		69	70		101.7	103.33				50.4																																																																										
-L- 24+76	LT	70		104.4	103.33																																					1										1			1																														2 GI W/FALSE SUMP (FS)
		70	71		103.33	105.50				34.8																																																																									
-L- 26+60	RT	72		98.00	97.19																																					1										1			1																														2 GI W/FALSE SUMP (FS)
		72	73		97.19	97.07		38.4																																																																														
-L- 26+60	LT	73		98.00	97.07																																					1										1			1																														2 GI W/FALSE SUMP (FS)
		73	74		97.07	94.74		110.4																						110.4																																																							
-L- 27+70	LT	74		95.67	94.74																																					1										1			1																														2 GI W/FALSE SUMP (FS)
		75	74		105.5	94.74											31.2																																																																2@400				
-L- 27+70	RT	76		95.67	94.86																																					1										1			1																														2 GI W/FALSE SUMP (FS)
-L- 27+70	RT	76	74		94.88	94.74		38.4																																																																											
		74	77		95.67	94.74																									230.4																																																			
-L- 30+00	LT	77		90.37	89.80																																					1										1			1																														2 GI W/FALSE SUMP (FS)
		77	78		89.80	89.66				22.8																																																																								
-L- 30+00	RT	78		92.21	89.66																																					1	1.05		1			1															1																									CB
-L- 29+20	RT	169		92.80	91.96																																					1										1			1																														2GI
		169	79		91.96	91.00		80.4																																																																														
-L- 30+00	RT	79		91.81	91.00																																					1										1			1																														2GI W/FALSE SUMP (FS)
-L- 30+00	RT	79	78		91.00	89.66		14.4																																																																											
		78	80		89.66	87.97				102.0																																																																								
-L- 31+02	RT	80		90.59	87.97																																					1	1.12		1			1															1																									CB
-L- 30+02	LT	81		88.85	88.04																																					1										1			1																														2GI
		81	80		88.04	87.97		22.8																																																																														
		80	82		88.04	87.2					27.6																																																																							
-L- 30+80	RT	83		90.6	89.76																																					1										1			1																														2 GI W/FALSE SUMP (FS)
		83	84		89.76	87.8											20.4																																																																			
-L- 31+38	RT	85			86.60																																				2.7																																														HEADWALL FOR 900 CSP
		85	86		86.60	80.20																	42.0																																																															
-L- 31+77	RT	86		81.85	80.20																																					1	0.15									1			1																														2GI
		86	87		80.20	74.90																	30.0																																																											2@900				
-L- 32+02	RT	87		76.4	73.38																																					1	1.50	0.02								1			1																														2GI
	RT	87	87A		73.38	73.38							10.8																																																																						
-L- 31+58	RT	88A		90.43	89.59																																					1										1		1																															
		88A	88		89.59	EXIST		10.8																																																																														
																																																																															4@400				
SHEET TOTALS								379.2	0.0	210.0	27.6	0.0	98.4	0.0	0.0	0	63.6	43.2	0.0	0.0	0.0	0.0	72.0	0.0	0.0	0.0	0.0	0.0	0.0	110.4	230.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	2.7	19	3.82	0.02	3	0	0	3	0	0	0	16	0	2	14	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2@900	0.00	0	0	

RD226353

COMPUTED BY: DJC DATE: 5/24/2006

CHECKED BY: KEM DATE: 8/23/2007

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS

METRIC

PROJECT NO.: R-2809A | SHEET NO.: 3-D

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 1200mm & 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) 375	450	600	750	750 CLASS IV	900	1050	1200
-L- 31+58	RT	88		90.10		EXIST									
-L- 32+04	RT	88B		90.20	89.36										
	RT	88B	89		89.36	EXIST		21.6							
-Y3- 11+70	LT	90	91		93.30	EXIST					4.8				
-Y3- 11+74	RT	92	93		EXIST	91.50					4.8				
-Y1- 11+00	LT	94		101.45	100.61										
		94	95		100.61	99.56		18.0							
-Y1- 10+90	RT	95		100.35	99.51										
		95	96		99.51	95.8		60.0							
-Y1- 10+27	RT	96		98.30	95.55										
		96	97		95.55	95.72					6.0				
		96	98		95.55	93.78						26.4			
		99	100		101.8	100.29		18.0							
-Y1- 12+94	RT	100		101.44	100.29										
		100	101		100.29	98.45				25.2					
-Y1- 13+39	LT	102	103		97.21	96.3									
-Y1- 17+62	CL	104	105		107.5	104.1			44.4						
-Y2- 26+14	RT	157		114.6	113.68										
		157	158		113.68	113.64		8.4							
-Y2- 26+22	RT	158		114.59	113.64										
		158	159		113.64	113.43		42.0							
-Y2- 26+62	RT	159		114.62	113.43										
		159	160		113.43	112.81		36.0							
		106	160		113.5	112.81									
-Y2- 27+00	RT	160		114.38	112.81										
		160	107		112.81	108.36									
-Y2- 27+51	RT	161			EXIST										
		161	162		EXIST	113.05									
-Y2- 27+51	RT	162		113.85	113.05										
		162	163		113.05	112.57									
-Y2- 27+51	RT	163		113.57	112.57										
		163	109		112.57	111.55			28.8						
-Y2- 27+80	RT	109		113.30	111.55										
		109	110		111.55	111.22			32.4						
-Y2- 29+80	RT	164		113.48	112.56										
		164	165		112.56	112.36	YES	40.8							
-Y2- 29+400	RT	165		113.73	112.36										
		165	166		112.36	111.96	YES	78.0							
-Y2- 28+60	RT	166		113.48	111.96										
		166	167		111.96	111.76	YES	40.8							
-Y2- 28+20	RT	167		113.32	111.76										
		167	168		111.76	111.64	YES	24.0							
-Y2- 27+96	RT	168		113.25	111.55										
		168	109		111.64	111.55	YES		16.8						
SHEET TOTALS								387.6	122.4	25.2	15.6	26.4	0.0	0.0	0.0

STATION	FROM	TO	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300 (1.63)	400 (1.63)	450 (1.63)	600 (1.63)	600	800 (2.01)	800	900 (2.01)	900	1000 (2.01)	1000	1200 (2.01)	1200	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 300	375 OR 400	450	600	800	900	1000	1200	375mm SIDE DRAIN PIPE	450mm SIDE DRAIN PIPE	600mm SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. METERS R.C.P.	C.S.P.
-Y1- 13+39	102	103						15.6																				
	106	160			6.0																							
	160	107			32.4																							
	161	162																3.6										
	162	163																7.2										
SHEET TOTALS			0	0.0	38.4	0.0	0.0	15.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

STATION	FROM	TO	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0 THRU 1.50)	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. "A" + (1.3 X COL "B") METERS A 1.5 THRU 3.00	B 3.00 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 GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	M.D.I. FRAME WITH GRATE STD. 840.22	MANHOLE STD. 840.51	M.H. STD. 840.51 OR 840.53	M.H. FRAME AND COVER STD. 840.54	CONC. APRON FOR CATCH BASIN STD. 852.05	CONC. APRON FOR DROP INLET STD. 852.06	CONVERT DI TO CB (SEE DETAIL 2-BB)	TRAFFIC BEARING JB STD. 840.34
-L- 31+58	88						1																	1		1	
-L- 32+04	88B		1										1		1												
-Y1- 11+00	94		1										1					1									
-Y1- 10+90	95		1										1					1									
-Y1- 10+27	96		1	1.25															1				1				
-Y1- 12+94	100		1																				1				1
-Y2- 26+14	157		1			1			1																		
-Y2- 26+22	158		1			1			1																		
-Y2- 26+62	159		1			1	1																				
-Y2- 27+00	160		1	0.07		1		1																			
-Y2- 27+51	162		1										1					1									
-Y2- 27+51	163		1			1		1																			
-Y2- 27+80	109		1			1		1																			
-Y2- 29+80	164		1			1		1																			
-Y2- 29+400	165		1			1		1																			
-Y2- 28+60	166		1	0.02		1			1																		
-Y2- 28+20	167		1	0.06		1			1																		
-Y2- 27+96	168		1	0.20		1	1																				
SHEET TOTALS			17	1.60	0	11	3	5	4	0	0	0	4	0	1	0	0	3	1	0	0	0	2	1	0	1	1

STATION	FROM	TO												FLOWABLE FILL, M^3	BERM DRAINAGE OUTLET(BDO)	PREFORMED SCOUR HOLE(PSH, SEE SHT. 2-F)	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" M^3 STD. 840.72	CONC. & BRICK PIPE PLUG, M^3 STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
-L- 31+58	88																				CONVERT DI TO CB SEE DETAIL 2-BB
-Y3- 11+70	90	91																0.48			COLLAR & EXTEND W/750
-Y3- 11+74	92	93																0.48			COLLAR & EXTEND W/750
-Y1- 11+00	94																				2 GI W/FALSE SUMP (FS)
-Y1- 10+90	95																				2 GI W/FALSE SUMP (FS)
-Y1- 10+27	96																				JB W/MH
	99	100																			METHOD B INSTALLATION
-Y1- 12+94	100																				TBJB
-Y1- 13+39	102	103															2@800	0.48			800 CS W/ELBOWS
-Y2- 26+14	157																				CB
-Y2- 26+22	158																				CB
-Y2- 26+62	159																				CB
-Y2- 27+00	160																				CB
-Y2- 27+51	161																	0.33			COLLAR AND EXTEND W/450 RCP
-Y2- 27+51	162																			14.0	2GI / REMOVE 375mm CSP
-Y2- 27+51	163																				CB
-Y2- 27+80	109																				CB
-Y2- 29+80	164																				CB
-Y2- 29+400	165																				CB
-Y2- 28+60	166																				CB
-Y2- 28+20	167																				CB
-Y2- 27+96	168																				CB
SHEET TOTALS			0	0	0	0	0	0	0	0	0	0	0	0	0	0	2@800	1.77	0	14	

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

RD226353

COMPUTED BY: DJC DATE: 5/24/2006
CHECKED BY: KEM DATE: 8/23/2007

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS

METRIC

PROJECT NO.	SHEET NO.
R-2809A	3-E

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 1200mm & 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) 375	450	600	750	750 CLASS IV	900	1050	1200
-Y1A- 10+21															
-Y1A- 10+30															
-Y1A- 10+42	LT	111	112		111.77	EXIST			15.6						
-Y2- 10+77	RT														
-Y2- 11+11	RT	113		115.3	114.71										
		113	114		114.71	EXIST		33.6							
-Y2- 10+78	RT	114		115.5	EXIST										
-Y2- 11+11															
-Y2- 14+40	RT	115		115.85	115.04										
		115	116		115.04	115	YES	12.0							
-Y5- 10+49	LT	116		115.94	115										
		116	117		115	114.94	YES	14.4							
-Y5- 10+49	RT	117		115.94	115										
		117	118		115	113.92		3.6							
-Y5- 10+45	RT	118		116.2	113.92										
-Y5- 10+54															
		IN	117					12.0							
-Y5- 10+95	LT	119		115.25	114.41										
		119	120		114.41	114.26		20.4							
-Y5- 10+95	RT	120		115.1	114.26										
		120	121		114.26	113.91									
-Y2- 15+00	LT	121		114.75	113.91										
		121	122		113.91	111.5									
-Y2- 15+44	CL	123	124		110.5	105.8									
-Y2- 16+50	CL	125	126		107.8	111.5									
-Y5- 11+98		127	128		118.5	117.6			24.0						
-Y2- 18+20	LT	129		119.57	118.6										
		129	130		118.6	118.41	YES	14.4							
-Y2- 18+20	LT	130		119.25	118.41										
	LT	130	131		118.41	116.77									
-Y2- 17+60	LT	131		118.1	116.77										
-Y2- 17+60	RT	132		117.7	116.86										
-Y2- 17+60	LC	132	131		116.86	116.77	YES	26.4							
-Y2- 17+00	LT	133		116.32	115.48										
		131	133		116.77	115.48		60.0							
		133	134		115.48	114									
-Y2- 19+80	LT	135		119.8	118.83										
		135	136		118.83	118.66	YES	13.2							
-Y2- 19+80	LT	136		119.5	118.66										
		136	137		118.66	118.54	YES	38.4							
-Y2- 19+42	LT	137		119.45	118.54										
		137	138		118.54	118.73	YES	13.2							
-Y2- 19+42	LT	138		119.7	118.73										
		138	139		118.73	118.82	YES	24.0							
-Y2- 19+20	LT	139		119.79	118.82										
		137	140		118.54	118.28									
SHEET TOTALS								285.6	39.6	0.0	0.0	0.0	0.0	0.0	0.0

STATION	FROM	TO	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300 (1.63)	400 (1.63)	450 (1.63)	600 (1.63)	600	800 (2.01)	800	900 (2.01)	900	1000 (2.01)	1000	1200 (2.01)	1200	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 300	375 OR 400	450	600	800	900	1000	1200
-Y1A- 10+21																							
-Y1A- 10+30																							
-Y1A- 10+42	111	112																					
-Y2- 10+77																							
-Y2- 11+11	113																						
	113	114																					
-Y2- 10+78	114																						
-Y2- 11+11																							
-Y2- 14+40	115																						
	115	116																					
-Y5- 10+49	116																						
	116	117																					
-Y5- 10+49	117																						
	117	118																					
-Y5- 10+45	118																						
-Y5- 10+54																							
	IN	117																					
-Y5- 10+95	119																						
	119	120																					
-Y5- 10+95	120																						
	120	121																37.2						
-Y2- 15+00	121																						
	121	122		21.6																			
-Y2- 15+44	123	124						44.4															
-Y2- 16+50	125	126								43.2													
-Y5- 11+98	127	128																					
-Y2- 18+20	129																						
	129	130																					
-Y2- 18+20	130																						
	130	131																62.4						
-Y2- 17+60	131																						
-Y2- 17+60	132																						
-Y2- 17+60	132	131																					
-Y2- 17+00	133																						
	131	133																					
	133	134																20.4						
-Y2- 19+80	135																						
	135	136																					
-Y2- 19+80	136																						
	136	137																					
-Y2- 19+42	137																						
	137	138																					
-Y2- 19+42	138																						
	138	139																					
-Y2- 19+20	139																						
	137	140																	44.4					
SHEET TOTALS			0.0	21.6	0.0	0.0	0.0	44.4	0.0	43.2	0.0	0.0	0.0	0.0	0.0	0.0	120.0	44.4	0.0	0.0	0.0	0.0	0.0

STATION	FROM	TO	375mm SIDE DRAIN PIPE	450mm SIDE DRAIN PIPE	600mm SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. METERS R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0 THRU 1.50)	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5 THRU 3.00	B 3.00 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 GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	M.D.I. FRAME WITH GRATE STD. 840.22	MANHOLE STD. 840.51	M.H. STD. 840.51 OR 840.53	M.H. FRAME AND COVER STD. 840.54	CONC. APRON FOR CATCH BASIN STD. 852.05	CONC. APRON FOR DROP INLET STD. 852.06	CONVERT DI TO CB (SEE DETAIL 2-BB)	TRAFFIC BEARING JB STD. 840.34
-Y1A- 10+21																																
-Y1A- 10+30																																
-Y1A- 10+42	111	112																														
-Y2- 10+77																																
-Y2- 11+11	113							1										1					1									
	113	114																														
-Y2- 10+78	114							1										1					1									
-Y2- 11+11																																
-Y2- 14+40	115							1										1					1									
	115	116																														
-Y5- 10+49	116							1			1	1																				
	116	117																														
-Y5- 10+49	117							1			1	1																				
	117	118																														
-Y5- 10+45	118							1	0.78															1				1				
-Y5- 10+54																																
	IN	117																														
-Y5- 10+95	119							1										1					1									
	119	120																														
-Y5- 10+95	120							1										1					1									
	120	121																														
-Y2- 15+00	121							1										1					1									
	121	122																														
-Y2- 15+44	123	124																														
-Y2- 16+50	125	126					2.1																									
-Y5- 11+98	127	128																														
-Y2- 18+20	129							1							1	1														1		
	129	130																														
-Y2- 18+20	130							1										1					1									
	130	131																														
-Y2- 17+60	131							1										1					1									
-Y2- 17+60	132							1										1					1									
-Y2- 17+60	132	131																														
-Y2- 17+00	133							1										1					1									
	131	133																														
	133	134																														
-Y2- 19+80	135							1							1	1														1		
	135	136																														
-Y2- 19+80	136							1										1					1									
	136	137																														
-Y2- 19+42	137							1										1					1									
	137	138																														
-Y2- 19+42	138							1							1	1														1		
	138	139																														
-Y2- 19+20	139							1							1	1														1		
	137	140																														
SHEET TOTALS			0.0	0	0	0.0	2.1	19	0.78	0.00	2	2	0	0	4	4	0	12	0	0	0	0	12	1	0	0	0	1	0	4	0	0

STATION	FROM	TO												FLOWABLE FILL, M^3	BERM DRAINAGE OUTLET(BDO)	PREFORMED SCOUR HOLE(PSH, SEE SHT. 2-F)	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" M^3 STD. 840.72	CONC. & BRICK PIPE PLUG, M^3 STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
-Y1A- 10+21																				31.1	450mm RCP PIPE REMOVAL
-Y1A- 10+30																				51.6	450mm RCP PIPE REMOVAL
-Y1A- 10+42	111	112																0.33			COLLAR & EXTEND W/450 RCP
-Y2- 10+77																				2.4	REMOVE 450mm RCP & DI
-Y2- 11+11	113																				2 GI
	113	114																			
-Y2- 10+78	114																				2 GI RETAIN EXIST. 450mm RCP
-Y2- 11+11																					
-Y2- 14+40	115																				2 GI
	115	116																		5.1	REMOVE 375 mm RCP & DI
-Y5- 10+49	116																				CB
	116	117																			
-Y5- 10+49	117																				CB
	117	118																		8.2	REMOVE 375mm RCP & CB
-Y5- 10+45	118																				JB W/MH
-Y5- 10+54																				15.2	REMOVE 375mm RCP & CB
	IN	117																			
-Y5- 10+95	119																				2 GI
	119	120																			
-Y5- 10+95	120																				2 GI
	120	121																			
-Y2- 15+00	121																				2 GI
	121	122																			
-Y2- 15+44	123	124																			
-Y2- 16+50	125	126																			
-Y5- 11+98	127	128																		18.9	REMOVE 450mm RCP
-Y2- 18+20	129																				DI
	129	130																			
-Y2- 18+20	130																				2 GI
	130	131																			
-Y2- 17+60	131																				2 GI W/FALSE SUMP (FS)
-Y2- 17+60	132																				2 GI W/FALSE SUMP (FS)
-Y2- 17+60	132	131																			
-Y2- 17+00	133																				2 GI W/FALSE SUMP (FS)
	131	133																			
	133	134																			
-Y2- 19+80	135																				DI
	135	136																			
-Y2- 19+80	136																				2 GI
	136	137																			
-Y2- 19+42	137																				2 GI
	137	138																			
-Y2- 19+42	138																				DI
	138	139																			
-Y2- 19+20	139																				DI
	137	140																			
SHEET TOTALS			0	0	0	0	0	0	0	0	0	0	0	0	0	0		0.33	0	132.5	

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

RD226353,9/24/2007,R:\Drainage\R-2809a Drainage_sum.xls

RD226353

COMPUTED BY:	DJC	DATE:	5/24/2006
CHECKED BY:	KEM	DATE:	8/23/2007

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS

METRIC

PROJECT NO.	SHEET NO.
R-2809A	3-F

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 1200mm & UNDER)

Class III R.C. pipe (unless noted otherwise):

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	375	450	600	750	750 CLASS IV	900	1050	1200	REMARKS
-Y2- 19+00	LT	140		119.20	118.28											2 GI
		140	141		118.28	119.40										
-Y2- 19+00	LT	141			119.40											BDO SEE STD. 850.11
		140	142		118.28	116.20			45.6							
-Y2- 19+20	RT	143		118.00	117.16											2 GI
		143	144		117.16	116.19			20.4							
-Y3B- 11+23	RT	145	146													REMOVE 375mm RCP
-Y3B- 10+95		147	148													REMOVE 375mm RCP
-Y2- 23+60	RT	149		110.95	110.11											2 GI W/FALSE SUMP (FS)
		149	150		110.11	108.99		36.0								
-Y2- 23+60	LT	150		109.83	108.99											2 GI W/FALSE SUMP (FS)
		150	151		108.99	107.30		20.4								
-Y2- 23+80	RT	152														COLLAR & EXTEND 600 RCP
		152	153		EXIST					6.0						
-Y2- 23+80	LT	153		110.99	108.23											DI
		153	154		108.23	106.70				28.8						
-Y6- 10+16	CL	155	156		111.94	111.33			30.00							REMOVE 450mm RCP
-Y9- 10+60	RT	170		94.38	93.46											CB
		170	171		93.46	93.36		19.2								
-Y9- 10+60	LT	171		94.28	93.36											CB
		171	172		93.36	93.30		10.8								
R-2809C																
		173	175		83.40	81.00				22.8						
		174	175		83.40	81.00				22.8						
-L- 84+50	LT	175		82.20	79.90											
		175	176		79.90	79.90	YES							4.8		
								86.4	96.0	80.4	0.0	0.0	0.0	4.8	0.0	
SHEET TOTAL																
PROJECT TOTAL								1606.8	318.0	482.4	43.2	105.6	38.4	4.8	20.4	
SAY																

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:

STATION	FROM	TO	BCCSP 300 (1.63)	400 (1.63)	450 (1.63)	600 (1.63)	600	800 (2.01)	800	900 (2.01)	900	1000 (2.01)	1000	1200 (2.01)	1200	ALUM. 300	375 OR 400	450	600	800	900	1000	1200
	140	141																3.6					
(sheet total)			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0
PROJECT TOTAL			0.0	219.6	81.6	43.2	0.0	60.0	0.0	115.2	0.0	0.0	0.0	0.0	0.0	0.0	403.2	348.0	0.0	0.0	0.0	0.0	0.0

Side drain pipe, endwalls, quantities for drainage structures, frame, grates and hood:

STATION	FROM	TO	375mm SIDE DRAIN PIPE	450mm SIDE DRAIN PIPE	600mm SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. METERS R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. PER EACH (0 THRU 1.50)	METERS A 1.5 THRU 3.00	METERS B 3.00 AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G
-Y2- 19+00	140							1						
-Y2- 19+20	143							1						
-Y3B- 11+23	145	146	7.2											
-Y3B- 10+95	147	148	7.2											
-Y2- 23+60	149							1						
-Y2- 23+60	150							1						
-Y2- 23+80	153							1	1.26					
-Y9- 10+60	170							1			1			1
-Y9- 10+60	171							1			1		1	
-L- 84+50	175							1	0.80					
(sheet total)			14.4	0.0	0.0	0	0	8	2.06	0	2	0	1	1
									10.2	0.1				
PROJECT TOTAL			14.4	0.0	0.0	2.6	8.4	95	10.3		29	5	6	19
SAY						11			11.0					

Drainage structures:

STATION	FROM	TO	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 GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	M.D.I. FRAME WITH GRATE STD. 840.22	MANHOLE STD. 840.51	M.H. STD. 840.51 OR 840.53	M.H. FRAME AND COVER STD. 840.54	CONC. APRON FOR CATCH BASIN STD. 852.05	CONC. APRON FOR DROP INLET STD. 852.06	CONVERT DI TO CB (SEE DETAIL 2-BB)	TRAFFIC BEARING JB STD. 840.34
-Y2- 19+00	140					1					1									
-Y2- 19+20	143					1					1									
-Y2- 23+60	149					1					1									
-Y2- 23+60	150					1					1									
-Y2- 23+80	153		1	1														1		
-L- 84+50	175											1			1					
(sheet total)			1	1	0	4	0	0	0	0	4	1	0	0	1	0	0	1	0	0
PROJECT TOTAL			10	10	0	48	1	6	22	0	21	6	0	0	1	5	15	10	1	1

Other items:

STATION	FROM	TO											FLOWABLE FILL, M^3	BERM DRAINAGE OUTLET(BDO)	PREFORMED SCOUR HOLE(PSH, SEE SHT. 2-F)	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" M^3 STD. 840.72	CONC. & BRICK PIPE PLUG, M^3 STD. 840.71	PIPE REMOVAL (METERS)
-Y2- 19+00	141													1					
-Y3B- 11+23	145	146																	6.0
-Y3B- 10+95	147	148																	8.1
-Y2- 23+80	152																0.40		
-Y6- 10+16	155	156																	37.0
(sheet total)			0	0	0	0	0	0	0	0	0	0	0	1	0		0.40	0	51.1
																12@400			
PROJECT TOTAL			0	0	0	0	0	0	0	0	0	0	6.2	4	7	2@800	3.19	0	251.6
SAY													7.0			2@900	4.00		260.0

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

RD212460

COMPUTED BY:	DJC	DATE:	6/24/05
CHECKED BY:	HLE	DATE:	8/13/07

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
GUARDRAIL SUMMARY

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	3-G

"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	XI MOD	XI	GRAU 350	M-350	XIII	CAT-1	VI MOD	BIC		G	NG				
-L-	7+46.582	12+02.256	RT																								456.250		REMOVE EXISTING GUARDRAIL
-L-	7+67.577	11+12.162	LT																								344.500		REMOVE EXISTING GUARDRAIL
-L-	7+80.000	11+20.000	RT	340.003			8+17.500	11+20.000	3.000	4.000	15.240	N/A	0.300	N/A			1			1									
-L-	7+80.000	11+00.000	LT	320.063			10+62.500	8+17.500	3.000	4.000	15.240	15.240	0.300	0.300			2												
-L-	16+40.000	18+10.000	RT	169.803			16+77.500	18+10.000	3.000	4.000	15.240	N/A	0.300	N/A			1			1									
-L-	13+80.000	18+20.000	LT	454.200			17+82.500	13+80.000	3.000	4.000	15.240	N/A	0.300	N/A			1			1									
-L-	23+20.000	24+50.000	RT	127.503			23+57.500	24+50.000	3.000	4.000	15.240	N/A	0.300	N/A			1			1									
-L-	31+00.000	32+40.000	RT	143.569			31+37.500	N/A	3.000	4.000	15.240	N/A	0.300	N/A			1												TIE TO EXIST. GUARDRIAL PLACE UNDER R-2809B
-L-	31+77.672	31+90.000	LT	12.112			N/A	31+77.672	3.000	4.000	N/A	N/A	N/A	A/A						1									TIE TO EXIST. GUARDRAIL PLACE UNDER R-2809B
-L-	31+89.300		CL																								33.000		REMOVE EXISTING GUARDRAIL BARRICADE
-Y2-	14+90.000	17+30.000	RT	240.003			15+20.000	17+30.00	2.400	3.400	15.240	N/A	0.300	N/A			1			1									
-Y2-	15+00.000	17+10.000	LT	200.201			16+80.000	15+00.000	2.400	3.400	15.240	N/A	0.300	N/A			1			1									
-Y2-/-Y1-	26+20.000	17+30.000	LT/RT	76.036	26.463		17+60.000	26+20 -Y2-	2.4/1.8	3.4/2.8	15.240	N/A	0.300	N/A			1			1									SHOP CURVE RADIUS = 18.000m
-Y1-/-Y2-	16+90.000	27+70.000	LT/LT	208.852	29.803		17+20.00	27+40.000	1.8/2.4	2.8/3.4	15.240	15.240	0.300	0.300			2												SHOP CURVE RADIUS = 18.000m
-Y1-	14+50.000	15+90.000	RT	337.546			14+80.000	15+60.000	1.800	2.800	15.240	15.240	0.300	0.300			2												
-Y1-	12+50.000	15+90.00	LT	140.006			15+60.000	12+80.000	1.800	2.800	15.240	15.240	0.300	0.300			2												
-Y1-	13+89.186	17+83.373	RT																								443.750		REMOVE EXISTING GUARDRAIL
-Y1-	14+39.392	17+61.523	LT																								378.250		REMOVE EXISTING GUARDRAIL
-Y1-	10+13.620	10+70.000	LT	56.894			10+40.000	10+40.000	1.800	2.800	15.240	15.24	0.300	0.300			2												
-Y1-	10+18.041	10+70.000	RT	51.443			10+40.000	10+40.000	1.800	2.800	15.240	15.24	0.300	0.300			2												
	SHEET TOTALS			2878.2346	56.266																								
	LESS ANCHOR DEDUCTIONS =			-320.040																									
																	---			---							---		
	PROJECT TOTALS			**2558.195**	**56.266**												**20**			**8**							**1655.750**		
	SAY			**2560.320**	**57.150**												@15.240			@1.905									
	ADDITIONAL GUARDRAIL POSTS = 10 EA.												ANCHOR LENGTH DEDUCTIONS =				304.800			15.240							**1660.000**		
													TOTAL ANCHOR DEDUCTIONS =		320.040														

COMPUTED BY:	HLE	DATE:	7/12/07
CHECKED BY:	TRM	DATE:	7/24/07

PROJECT NO.	SHEET NO.
R-2809A	3-H

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF WOVEN WIRE FENCE

LINE	SIDE	STATION	STATION	FABRIC 1200 mm (METERS)	LINE POST (100 mm)	TERMINAL POST (125 mm)
-L- / -Y3-	LT.	12+76.535	11+20.000	126.248	26	7
-Y3- / -Y2-	RT. / LT.	11+00.000	20+40.000	834.088	157	70
-Y2- / -L-	RT. / LT.	20+40.000	30+87.423	1034.308	216	49
-L- / -Y2-	RT. / LT.	12+76.535	19+69.625	872.164	178	49
-Y2- / -L-	RT. / RT.	20+90.000	29+26.026	937.332	198	40
-L-	RT.	29+00.000	31+41.700	204.497	44	7
PROJECT TOTALS:				4008.637	819	222
SAY				4030.0	820	230
				METERS	EA	EA

ADDITIONAL BARBED WIRE : 150.0 METERS

SUMMARY OF EXISTING ASPHALT PAVEMENT REMOVAL & BREAK-UP

LINE	Station	Station	LOC LT/RT/CL	PAVEMENT REMOVAL M²	PAVEMENT BREAK-UP M²
L / Y1	13+60.000	14+32.783	LT / RT	3286.0	
Y3	10+02.663	11+00.000	LT / RT		908.6
Y3	10+80.000	11+00.000	LT / RT	122.4	
Y2 / Y5	11+70.000	12+40.000	RT	3191.1	
Y2	20+81.000	24+48.000	LT / RT	2227.8	
Y2	24+62.000	26+37.667	RT	1108.8	
Y2	26+47.508	27+94.495	LT / RT	1511.5	
Y1 / Y2	15+62.000	29+10.000	LT	3827.9	
Y3A	11+30.000	11+88.000	LT / RT	692.1	
Y1A	10+30.000	10+52.632	LT / RT	208.4	
Y3B	10+55.000	10+93.000	RT	256.8	
Y5	10+75.180	11+14.627	LT / RT	453.5	
			TOTAL:	16886.3	908.6
			SAY	16890.0	910.0

SUMMARY OF INCIDENTAL MILLING EXISTING ASPHALT

LINE	STATION	STATION	LOC LT/RT/CL	M²
-L-	7+40.000	7+60.000	CL	286.4
-L-	32+81.292	33+18.949	LT	686.3
-L-	34+80.000	35+00.000	LT	168.0
-Y8-	10+40.000	10+50.000	CL	53.4
-Y3-	11+60.000	11+80.000	CL	122.0
-Y3A-	11+00.000	11+40.000	CL	281.4
-Y2-	10+20.000	10+40.000	CL	196.6
-Y2-	30+10.717	30+39.506	CL	36.0
-Y2-	29+99.363	30+34.957	CL	151.6
-Y2-	30+60.000	30+70.000	CL	173.7
-Y5-	10+40.000	10+45.000	CL	67.9
-Y5-	12+60.000	12+70.000	CL	86.4
-Y3B-	11+40.000	11+60.000	CL	118.5
-Y4-	10+24.327	10+80.000	CL	518.3
-Y6-	10+20.978	10+25.978	CL	65.2
-Y1-	18+60.000	18+80.000	CL	196.7
-Y1A-	10+80.000	11+00.000	CL	118.4
-Y9-	10+70.000	10+80.000	CL	193.7
			TOTAL:	3520.5
			SAY:	3530

SUMMARY OF WOVEN WIRE FENCE REMOVE AND RESET

LINE	STATION	STATION	LOC LT/RT/CL	METERS
-Y9-	13+69.830	13+25.103	RT	13.786
-L-	82+39.236	83+30.000	RT	90.740
				0.000
			TOTAL:	104.526
			SAY:	110.0

R-2809C SUPPLEMENT WORK (SEE SHEET 2-O)

R0214565

COMPUTED BY:	HLE	DATE:	6/1/07
CHECKED BY:	TRM	DATE:	8/1/07

METRIC

PROJECT NO.	SHEET NO.
R-2809A	3-I

RD214565

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK
(ALTERNATE 1)

LINE	Station	Station	Uncl. Excav.	Undercut Excav.	Embank. +%	Borrow	Waste
-L - (LT)	7+40.000	13+60.000	88	0	44797	44709	0
-L - (RT)	7+40.000	13+60.000	2709	0	4500	1791	0
-L-	13+60.000	15+60.000	8572	0	9647	1075	0
-Y8-	10+20.000	10+50.000	29	0	50	21	0
-Y3-	10+00.000	12+40.000	54	0	6529	6475	0
-Y1-	10+00.000	18+40.000	8853	0	25735	20835	3953
-Y1-	18+40.000	19+00.000	19	0	290	271	0
-Y3A-	11+00.000	11+50.000	719	0	8	0	711
SUBTOTALS: NO 1			21043	0	91556	75177	4664
-L-	15+60.000	24+00.000	19193	1072	103861	91362	7766
-Y2- (LT)	8+60.000	12+00.000	324	0	196	0	128
-Y2- (RT)	8+60.000	12+00.000	775	0	18	0	757
-Y2-	12+00.000	21+40.000	33297	2436	20741	0	14992
-Y2-	21+80.000	28+60.000	16494	0	19807	3313	0
-Y2- (LT)	28+60.000	30+73.920	26	0	162	136	0
-Y2- (RT)	28+60.000	30+73.920	101	0	158	57	0
-Y5-	10+20.000	10+60.000	121	0	28	0	93
-Y5-	10+80.000	12+70.000	1975	152	1415	1128	1840
-Y3B-	10+20.000	11+60.000	1393	0	214	0	1179
-Y4-	10+04.500	10+80.000	559	0	47	0	512
-Y6-	10+15.000	10+25.000	3	0	6	3	0
-Y1A-	10+20.000	11+00.000	87	0	468	381	0
SUBTOTALS: NO 2			74348	3660	147121	96380	27267
-L-	24+00.000	32+60.000	146169	0	9144	0	137025
-L- (BERM)	23+80.000	31+40.000	0	0	29600	29600	0
-Y9-	10+25.000	10+70.000	1501	0	10	0	1491
SUBTOTALS: NO 3			147670	0	38754	29600	138516
-L- (LT)	84+64	R-2809C	0	0	120	120	0
SUBTOTALS: NO 4			0	0	120	120	0
PROJECT SUBTOTALS:			243061	3660	277551	201277	170447
LOSS DUE TO CLEAR, GRUB.			-7700			7700	0
ADDITIONAL UNDERCUT EXCAV.				10050	12060	12060	10050
EST. FOR DRIVEWAYS			100		0	0	100
EST. FOR PAVT REMOVAL					1884	1884	
ROCK TO REPLACE BORROW			0		0	0	
ADJUST FOR ROCK WASTE					0	0	
WASTE INLIEU OF BORROW			0			-111695	-111695
SHOULDER CONSTRUCTION					11100	11100	
LESS SELECT GRANURAL MATL							
ROADSIDE ENVIRONMENTAL			0		324	324	
PROJECT TOTALS:			235461	13710	302919	122650	68902
REPLACE TOP SOIL BORROW PITS						6133	
GRAND TOTALS:			235461	13710		128783	
SAY:			**235500**	**13800**		**128800**	

PAVEMENT STRUCTURE VOLUME =	**20727**	CUBIC METERS
DRAINAGE DITCH EXCAVATION =	**3420**	CUBIC METERS

SUMMARY OF EARTHWORK
(ALTERNATE 2)

LINE	Station	Station	Uncl. Excav.	Undercut Excav.	Embank. +%	Borrow	Waste
-L - (LT)	7+40.000	13+60.000	88	0	45618	45530	0
-L - (RT)	7+40.000	13+60.000	2701	0	4547	1846	0
-L-	13+60.000	15+60.000	8208	0	10286	2078	0
-Y8-	10+20.000	10+50.000	29	0	50	21	0
-Y3-	10+00.000	12+40.000	54	0	6529	6475	0
-Y1-	10+00.000	18+40.000	8264	0	27043	22732	3953
-Y1-	18+40.000	19+00.000	16	0	328	312	0
-Y3A-	11+00.000	11+50.000	719	0	8	0	711
SUBTOTALS: NO 1			20079	0	94409	78994	4664
-L-	15+60.000	24+00.000	17991	1040	106950	95465	7546
-Y2- (LT)	8+60.000	12+00.000	264	0	182	0	82
-Y2- (RT)	8+60.000	12+00.000	441	0	19	0	422
-Y2-	12+00.000	21+40.000	31478	2401	21794	0	12085
-Y2-	21+80.000	28+60.000	15465	0	21176	5711	0
-Y2- (LT)	28+60.000	30+73.920	7	0	221	214	0
-Y2- (RT)	28+60.000	30+73.920	44	0	192	148	0
-Y5-	10+20.000	10+60.000	121	0	28	0	93
-Y5-	10+80.000	12+70.000	1975	152	1415	1128	1840
-Y3B-	10+20.000	11+60.000	1393	0	214	0	1179
-Y4-	10+04.500	10+80.000	559	0	47	0	512
-Y6-	10+15.000	10+25.000	3	0	6	3	0
-Y1A-	10+20.000	11+00.000	87	0	468	381	0
SUBTOTALS: NO 2			69828	3593	152712	103050	23759
-L-	24+00.000	32+60.000	143352	0	9776	0	133576
-L- (BERM)	23+80.000	31+40.000	0	0	29600	29600	0
-Y9-	10+25.000	10+70.000	1382	0	10	0	1372
SUBTOTALS: NO 3			144734	0	39386	29600	134948
-L- (LT)	84+64	R-2809C	0	0	120	120	0
SUBTOTALS: NO 4			0	0	120	120	0
PROJECT SUBTOTALS:			234641	3593	286627	211764	163371
LOSS DUE TO CLEAR, GRUB.			-7700			7700	0
ADDITIONAL UNDERCUT EXCAV.				10050	12060	12060	10050
EST. FOR DRIVEWAYS			100		0	0	100
EST. FOR PAVT REMOVAL					1884	1884	
ROCK TO REPLACE BORROW			0		0	0	0
ADJUST FOR ROCK WASTE					0	0	
WASTE INLIEU OF BORROW			0			-105305	-105305
SHOULDER CONSTRUCTION					4500	4500	
LESS SELECT GRANURAL MATL						0	
ROADSIDE ENVIRONMENTAL			0		324	324	0
PROJECT TOTALS:			227041	13643	305395	132927	68216
REPLACE TOP SOIL BORROW PITS						6646	
GRAND TOTALS:			227041	13643		139573	
SAY:			**227100**	**13700**		**139600**	

PAVEMENT STRUCTURE VOLUME =	**13103**	CUBIC METERS
DRAINAGE DITCH EXCAVATION =	**3420**	CUBIC METERS

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.

PROJ. REFERENCE NO.	SHEET NO.
R-2809A	3-J

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	12 13 14	PRISCILLA B. ROLLS & VIRGINIA ROLLS
1A	6 12	PRISCILLA B. ROLLS & VIRGINIA ROLLS
1B	12	PRISCILLA B. ROLLS & VIRGINIA ROLLS
1C	12	PRISCILLA B. ROLLS & VIRGINIA ROLLS
1D	12 13 14	PRISCILLA B. ROLLS & VIRGINIA ROLLS
1E	12	PROPOSED DURHAM ROAD ACCESS
2	6 7 8 13 14 19	CAROLINA PRINCESS, LLC
3	8 9	CAROLINA PRINCESS, LLC
4	7	PAUL C. GOLDSMITH & JILL F. GOLDSMITH
5	15	JAMES J. SMITH & AGNES R.
6	15 16	THOMAS M. FLANAGAN & SUE
9	14 20	BRYAN T. KENNEDY & CAROLYN B. KENNEDY
10	14 20	HECTOR H. HERNANDEZ & MARIA L.
13	17 18	TOURNAMENT PLAYERS CLUB OF RALEIGH, LLC
14	17 18	SANDLER AT WAKEFIELD
14A	17 18	SANDLER AT WAKEFIELD
30	6 12	DONALD WINSTEAD & KAREN K.
40	18	LEON G. KEITH
41	18	MARJORIE A. KEITH ET AL
42	18	MARJORIE A. KEITH ET AL
43	18	ANDREW DUKE LYONS
44	18	BRYAN B. SMITH & THERESA A.
45	8 18	JUDITH M. LOWERY
46	8 19	JUDITH U. GOULD
47	19	NORA K. BARNHILL
65	16 17	WAKEFIELD D2 INVESTMENT, LLC
65A	17	WAKEFIELD GLEN, LLC
67	17	LAWRENCE D. BRANDON, JR & NANCY H. BRANDON
68	17	LYNN M. LOWERY, et vir
69	17	FRANK D. BRANDON, et ux (FORMERLY NANNIE B. BRANDON)
70	17	FRANK D. BRANDON & LISA C. BRANDON
71	6 7	JOHN WALTER ROLLS, JR. & IRIS DALTON
72	7	JOHN WALTER ROLLS, SR. & PRISCILLA BENNETT ROLLS
73	6 7 14 19	CLM ASSOCIATES LLC
94	18	SANDLER AT WAKEFIELD, LLC CEDAR GROVE, PHASE 1
14AZ	10	SANDLER AT WAKEFIELD LLC
88Z	11	TOURNAMENT PLAYERS CLUB OF RALEIGH, LLC

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	4
R/W SHEET NO.	

METRIC

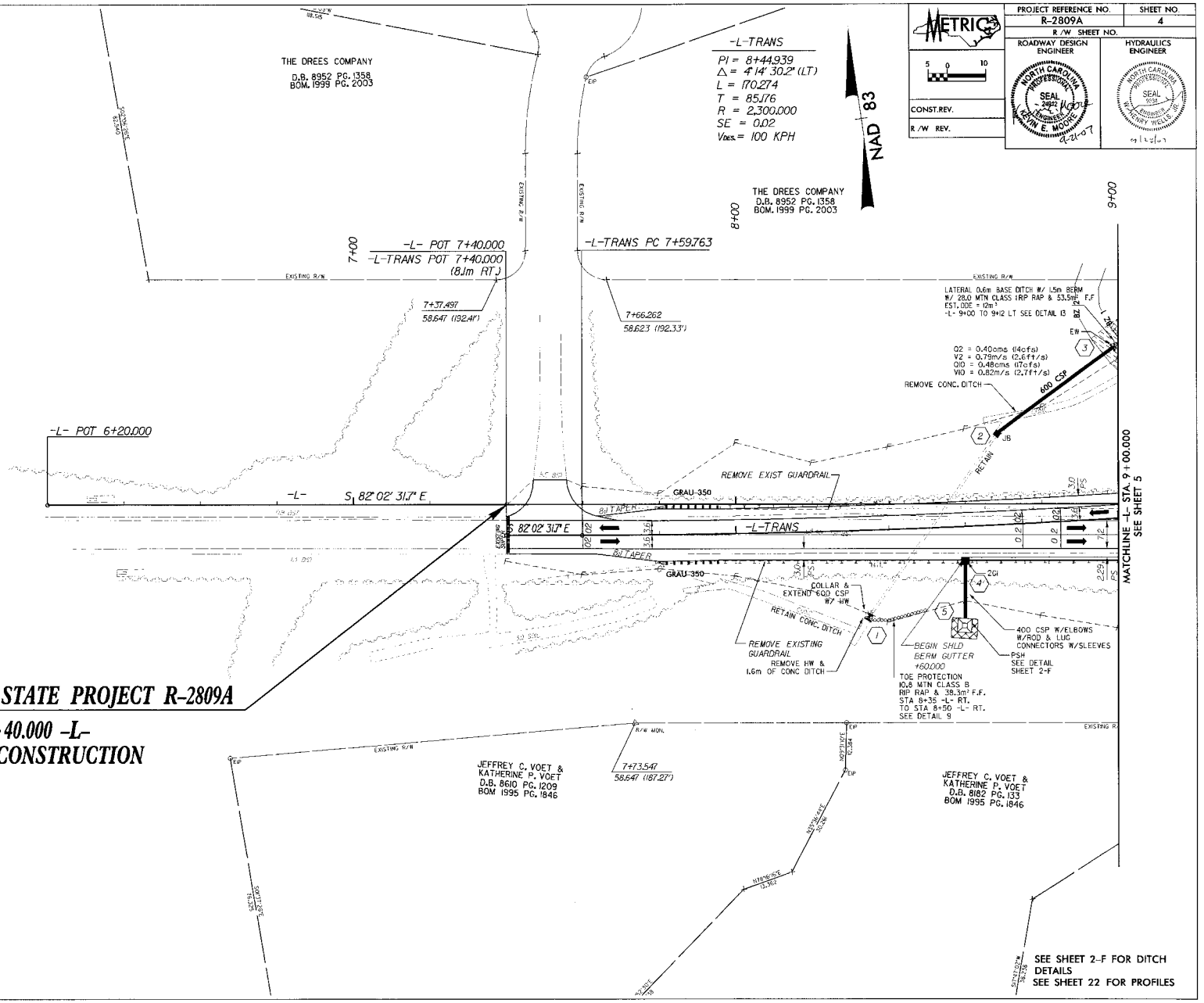
5 0 10

CONST. REV.

R/W REV.

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 24892 ENGINEER KEVIN E. MOORE 8-21-07

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 6634 ENGINEER J. HENRY YIELLA JR. 9/12/07



BEGIN STATE PROJECT R-2809A

STA. 7+40.000 -L-
BEGIN CONSTRUCTION

SEE SHEET 2-F FOR DITCH DETAILS
SEE SHEET 22 FOR PROFILES

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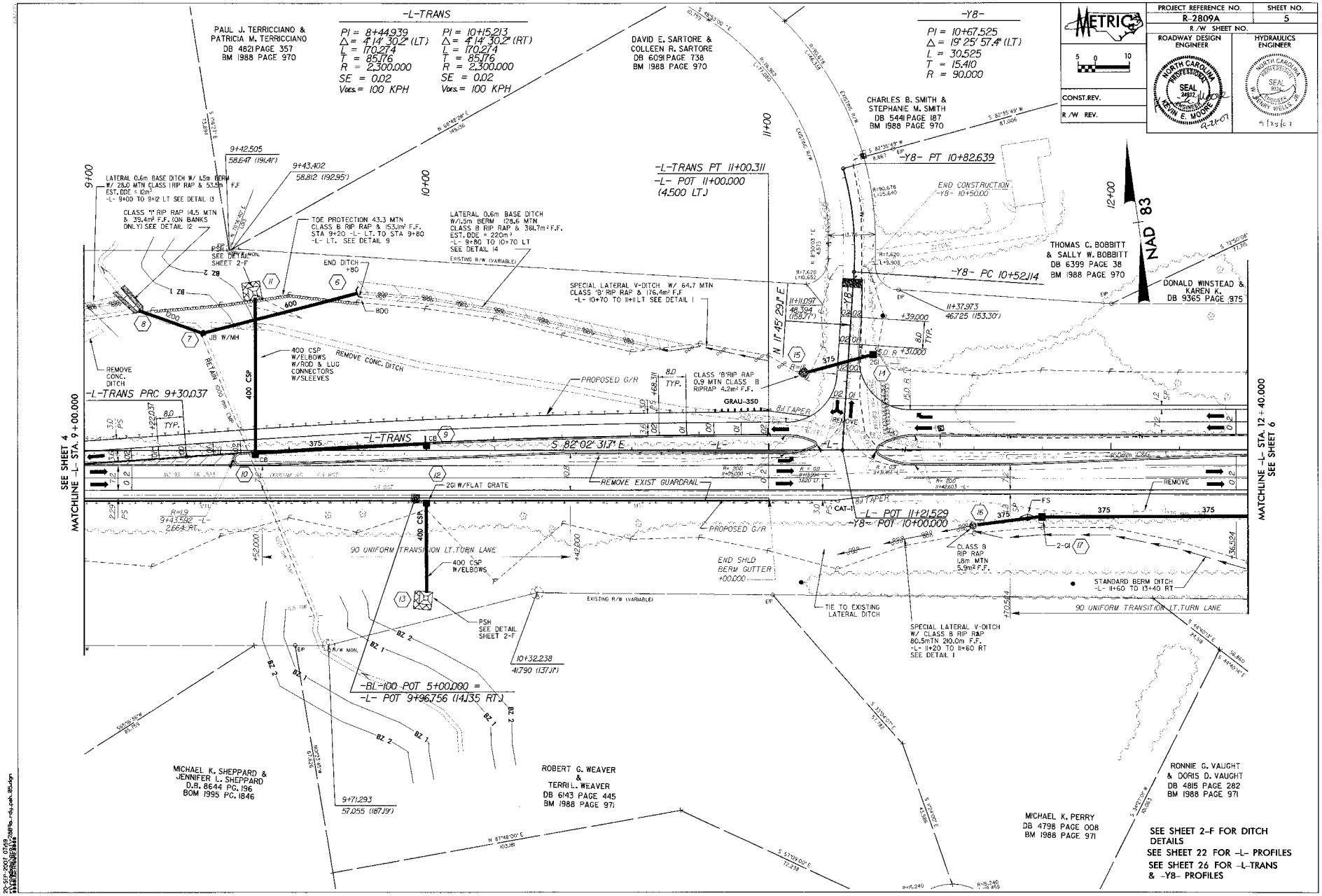


PROJECT REFERENCE NO.
R-2809A
SHEET NO.
5
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
METRIC
CONST.REV.
R/W REV.
-L-TRANS
PI = 8+44.939
Δ = 4° 14' 30.2" (LT)
L = 170.274
T = 85.176
R = 2,300.000
SE = 0.02
VDES. = 100 KPH
PI = 10+15.213
Δ = 4° 14' 30.2" (RT)
L = 170.274
T = 85.176
R = 2,300.000
SE = 0.02
VDES. = 100 KPH
-Y8-
PI = 10+67.525
Δ = 19° 25' 57.4" (LT)
L = 30.525
T = 15.410
R = 90.000
PAUL J. TERRICCIANO & PATRICIA M. TERRICCIANO
DB 4821 PAGE 357
BM 1988 PAGE 970
DAVID E. SARTORE & COLLEEN R. SARTORE
DB 6091 PAGE 738
BM 1988 PAGE 970
CHARLES B. SMITH & STEPHANIE M. SMITH
DB 5441 PAGE 187
BM 1988 PAGE 970
THOMAS C. BOBBITT & SALLY W. BOBBITT
DB 6399 PAGE 38
BM 1988 PAGE 970
DONALD WINSTEAD & KAREN K.
DB 9365 PAGE 975
NAD 83
-L-TRANS PT 11+00.311
-L- POT 11+00.000
(4.500 LT.)
-Y8- PT 10+82.639
-Y8- PC 10+52.114
-L-TRANS PRC 9+30.037
-L-TRANS
S 82° 02' 31.7" E
-L- POT 11+21.529
-Y8- POT 10+00.000
-BL-100 POT 5+00.000 =
-L- POT 9+96.756 (14.135 RT.)
LATERAL 0.6m BASE DITCH W/ 1.5m BERM W/ 28.0 MTN CLASS I RIP RAP & 53.5m² F.F. EST. DDE = 12m³ -L- 9+00 TO 9+12 LT SEE DETAIL 13
CLASS "I" RIP RAP 14.5 MTN & 39.4m² F.F. (ON BANKS ONLY) SEE DETAIL 12
TOE PROTECTION 43.3 MTN CLASS B RIP RAP & 153.1m² F.F. STA 9+20 -L- LT. TO STA 9+80 -L- LT. SEE DETAIL 9
LATERAL 0.6m BASE DITCH W/1.5m BERM 128.6 MTN CLASS B RIP RAP & 361.7m² F.F. EST. DDE = 220m³ -L- 9+80 TO 10+70 LT SEE DETAIL 14
SPECIAL LATERAL V-DITCH W/ 64.7 MTN CLASS 'B' RIP RAP & 176.4m² F.F. -L- 10+70 TO 11+11 LT SEE DETAIL 1
CLASS 'B' RIP RAP 0.9 MTN CLASS B RIPRAP 4.2m² F.F.
400 CSP W/ELBOWS W/ROD & LUG CONNECTORS W/SLEEVES
REMOVE CONC. DITCH
PROPOSED G/R
GRAU-350
REMOVE EXIST GUARDRAIL
2GI W/FLAT GRATE
90 UNIFORM TRANSITION LT. TURN LANE
400 CSP W/ELBOWS
END SHLD BERM GUTTER +00.000
TIE TO EXISTING LATERAL DITCH
SPECIAL LATERAL V-DITCH W/ CLASS B RIP RAP 80.5mTN 210.0m F.F. -L- 11+20 TO 11+60 RT SEE DETAIL 1
CLASS B RIP RAP 1.8m MTN 5.9m² F.F.
STANDARD BERM DITCH -L- 11+60 TO 13+40 RT
END CONSTRUCTION -Y8- 10+50.00
PSH SEE DETAIL SHEET 2-F
SEE SHEET 4
MATCHLINE -L- STA. 9+00.000
MATCHLINE -L- STA. 12+40.000
SEE SHEET 6
MICHAEL K. SHEPPARD & JENNIFER L. SHEPPARD
D.B. 8644 PG. 196
BOM 1995 PG. 1846
ROBERT G. WEAVER & TERRI L. WEAVER
DB 6143 PAGE 445
BM 1988 PAGE 971
MICHAEL K. PERRY
DB 4798 PAGE 008
BM 1988 PAGE 971
RONNIE G. VAUGHT & DORIS D. VAUGHT
DB 4815 PAGE 282
BM 1988 PAGE 971
SEE SHEET 2-F FOR DITCH DETAILS
SEE SHEET 22 FOR -L- PROFILES
SEE SHEET 26 FOR -L-TRANS & -Y8- PROFILES

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC 5 0 10

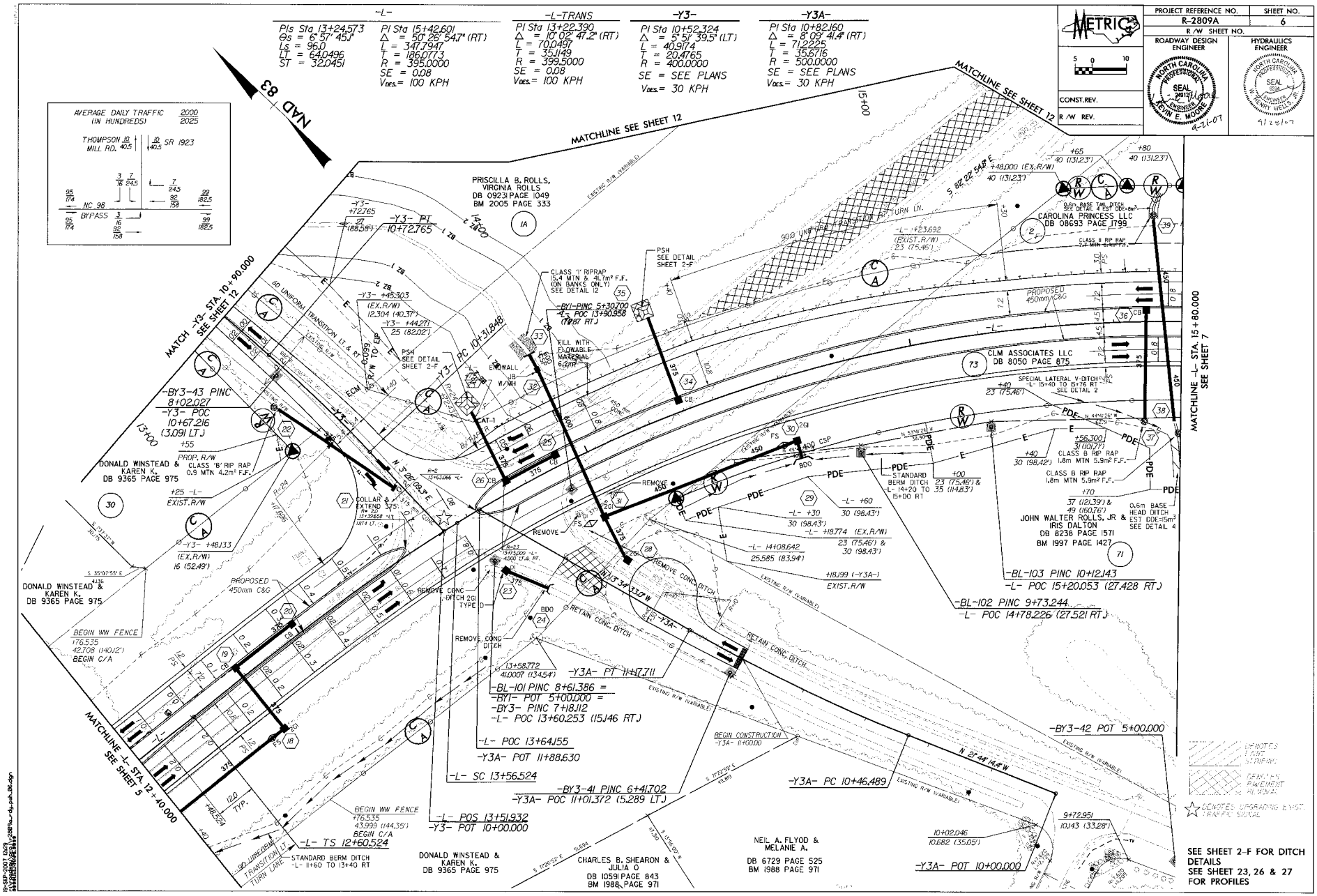
CONST. REV.

R/W REV.

NORTH CAROLINA PROFESSIONAL SEAL 29172 ENGINEER KEVIN E. MOORE 9-21-07

NORTH CAROLINA PROFESSIONAL SEAL 5334 ENGINEER TIMOTHY WELLS 9/25/07

-L-	-L-TRANS	-Y3-	-Y3A-
PIs Sta 13+24.573	PI Sta 13+22.390	PI Sta 10+52.324	PI Sta 10+82.160
θs = 6°57'45.1"	Δ = 10°02'47.2" (RT)	Δ = 5°51'39.5" (LT)	Δ = 8°09'41.4" (RT)
Ls = 96.0	L = 70.0497	L = 40.9174	L = 71.2225
LT = 64.0496	T = 35.1149	T = 20.4765	T = 35.6716
ST = 32.0451	R = 399.5000	R = 400.0000	R = 500.0000
	SE = 0.08	SE = SEE PLANS	SE = SEE PLANS
	Vdes = 100 KPH	Vdes = 30 KPH	Vdes = 30 KPH



SEE SHEET 2-F FOR DITCH DETAILS
SEE SHEET 23, 26 & 27 FOR PROFILES

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PROJECT REFERENCE NO.	SHEET NO.
R-2809A	7
R/W SHEET NO.	

METRIC 5 0 10

CONST. REV.

R/W REV.

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 29812 ENGINEER KEVIN E. MOORE 4/22/07

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 029 ENGINEER JERRY W. VIELLEY 4/22/07

NAD 83

MATCHLINE SEE SHEET 13

MATCHLINE SEE SHEET 13

MATCHLINE -L- STA. 15+80.000 SEE SHEET 6

MATCHLINE -L- 19+20.000 SEE SHEET 8

CAROLINA PRINCESS LLC
DB 08693 PAGE 1799

CAROLINA PRINCESS LLC
DB 08693 PAGE 1799

CLM ASSOCIATES LLC
DB 8050 PAGE 875

CLM ASSOCIATES LLC
DB 8050 PAGE 875

JOHN W. ROLLS, SR & PRISCILLA BENNETT ROLLS
DB 10310 PAGE 897
BM 1997 PAGE 1427

PAUL C. GOLDSMITH & JILL F. GOLDSMITH
DB 4991 PAGE 938
BM 1991 PAGE 796

BRENDA L. HIGGINS
DB 5575 PAGE 446
BM 1991 PAGE 796

ROY E. BENNETT & WALTRAUD BENNETT
DB 6304 PAGE 756
BM 1991 PAGE 796

ROBERT C. LARRISON, JR & KATRINA LARRISON
DB 5516 PAGE 269
BM 1991 PAGE 796

-L- CS 17+04.318

-L- ST 17+68.318

-L- TS 19+02.549

LATERAL 0.9m BASE DITCH W/ 1.5m BERM W/ CLASS B RIP RAP 9L2m MTN 250.5m² F.F EST. DDE= 553m³ -L- 16+42 TO 17+00 LT SEE DETAIL 7

LATERAL V DITCH W/ 1.5m BERM W/ CLASS B RIP RAP 9L6 MTN 274.9m² F.F. EST. DDE= 362m³ -L- 17+00 TO 17+80 LT SEE DETAIL 5

CLASS B RIP RAP 7.3m TN 17.8m F.F

PROPOSED G/R

GRAU-350

BL TAPER

PROP. R/W

PROP. 450mm CMP

2GI W/ FLAT GRATE

400 CSP W/ ELBOWS

750 CLASS IV W/ METHOD B INSTALLATION

+00 BEGIN PROPOSED SHOULDER BERM GUTTER

+00 END PROPOSED SHOULDER BERM GUTTER

CAT-I

CLASS B RIP RAP 2.7 MTN 8.4m² F.F.

LATERAL V DITCH W/ 1.5m BERM EST. DDE=170m³ -L- 16+70 TO 17+33 RT SEE DETAIL 6

CLASS 'B' RIP RAP EST +/-7 MTN 30.0m² F.F

0.6m BASE HEAD DITCH-CLEANOUT SEE DETAIL 4 EST DDE= 39m³

CLASS B RIP RAP 1.8m TN 5.9m² F.F.

0.6m BASE HEAD DITCH EST DDE=15m³ SEE DETAIL 4

30m UNIFORM TRANSITION LT. TURN LANE

30m UNIFORM TRANSITION RT. TURN LANE

90.0m UNIFORM TRANSITION (LT LN)

PL CORNER

PSH SEE DETAIL SHEET 2-F

SPECIAL DITCH -L- 18+80 TO 19+20 RT SEE PROFILE FOR GRADE SEE DETAIL 2

-BL-104 PINC 10+85.053
-L- POC 15+98.595 (28.044 RT.)

-BL-105 PINC 11+40.303
-L- POC 16+57.958 (26.347 RT.)

-BL-106 PINC 12+00.080
-L- POS 17+21.859 (25.826 RT.)

-BL-107 PINC 12+60.068
-L- POT 17+82.882 (23.453 RT.)

-BL-108 PINC 13+23.038
-L- POT 18+45.692 (27.924 RT.)

-BL-109 PINC 13+83.446
-L- POS 19+06.062 (29.944 RT.)

-L-

PIs = 13+24.573	PI = 15+42.601	PIs = 17+25.665
Θs = 6° 57' 45.1"	Δ = 50° 26' 54.7" (RT)	Θs = 4° 38' 30.1"
Ls = 96.0	L = 347.7947	Ls = 64.0
LT = 64.0496	T = 186.0773	LT = 42.6813
ST = 32.0451	R = 395.000	ST = 21.3467
	SE = 0.08	
	$V_{DES.}$ = 100 KPH	

-L-

PIs = 19+66.599	PI = 20+80.202
Θs = 6° 57' 45.1"	Δ = 23° 21' 32.3" (LT)
Ls = 96.0	L = 161.0380
LT = 64.0496	T = 81.6531
ST = 32.0451	R = 395.000
	SE = 0.08
	$V_{DES.}$ = 100 KPH

SEE SHEET 2-F FOR DITCH DETAILS
SEE SHEET 23 FOR PROFILE

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S:\ENGINEERING\STRUCTURES\R-2809A_rdy_psh_07.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	8
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

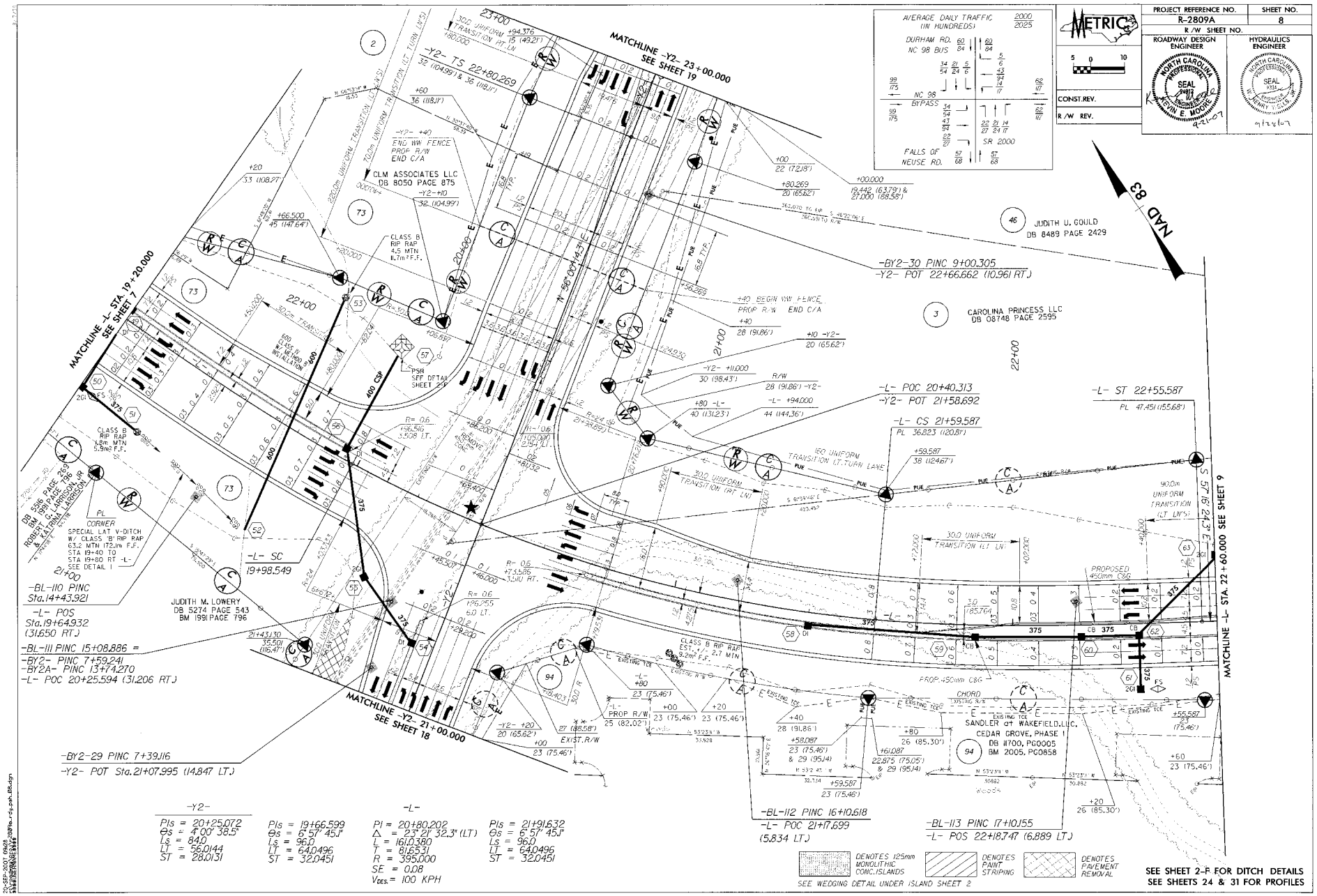
5 0 10

CONST.REV.

R /W REV.

AVERAGE DAILY TRAFFIC (IN HUNDREDS) 2000 / 2025

DURHAM RD. 60/84 — 82/84
NC 98 BUS 34/54, 21/24, 5/6 — 5/6, 14/24, 14/17
99/175 — 162/171
NC 98 BYPASS 99/175 — 162/171
SR 2000 22/27, 21/24, 14/17
FALLS OF NEUSE RD. 67/68 — 57/68



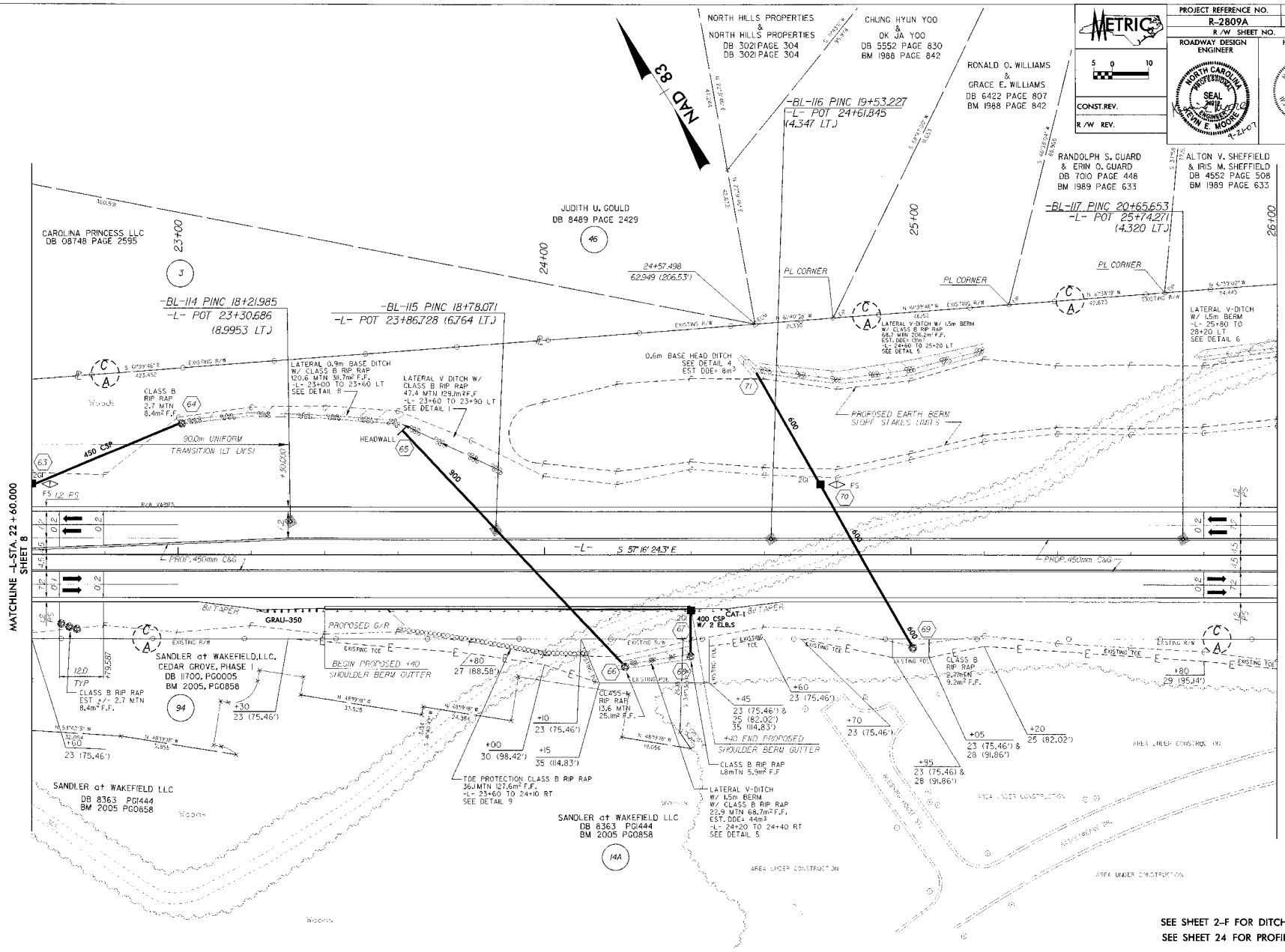
-Y2-

PIs = 20+25.072	PIs = 19+66.599	PI = 20+80.202	PIs = 21+91.632
Θs = 4°00'38.5"	Θs = 6°57'45.1"	Δ = 23°21'32.3" (LT)	Θs = 6°57'45.1"
Ls = 84.0	Ls = 96.0	L = 161.0380	Ls = 96.0
LT = 56.0144	LT = 64.0496	T = 81.6531	LT = 64.0496
ST = 28.0131	ST = 32.0451	R = 395.000	ST = 32.0451
		SE = 0.08	
		$V_{DES.}$ = 100 KPH	

-L-

SEE SHEET 2-F FOR DITCH DETAILS
SEE SHEETS 24 & 31 FOR PROFILES

20-SEP-2007 09:28
R2809A_DD_SHEET_08.dgn



PROJECT REFERENCE NO.
R-2809A
SHEET NO.
9
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R/W REV.
METRIC
NAD 83
NORTH HILLS PROPERTIES & NORTH HILLS PROPERTIES DB 3021 PAGE 304 DB 3021 PAGE 304
CHUNG HYUN YOO & OK JA YOO DB 5552 PAGE 830 BM 1988 PAGE 842
RONALD O. WILLIAMS & GRACE E. WILLIAMS DB 6422 PAGE 807 BM 1988 PAGE 842
RANDOLPH S. GUARD & ERIN O. GUARD DB 7010 PAGE 448 BM 1989 PAGE 633
ALTON V. SHEFFIELD & IRIS M. SHEFFIELD DB 4552 PAGE 508 BM 1989 PAGE 633
JUDITH U. GOULD DB 8489 PAGE 2429
CAROLINA PRINCESS LLC DB 08748 PAGE 2595
-BL-116 PINC 19+53.227 -L- POT 24+61.845 (4.347 LT.)
-BL-117 PINC 20+65.653 -L- POT 25+74.271 (4.320 LT.)
-BL-114 PINC 18+21.985 -L- POT 23+30.686 (8.9953 LT.)
-BL-115 PINC 18+78.071 -L- POT 23+86.728 (6.764 LT.)
24+57.498 62.949 (206.53')
PL CORNER
LATERAL V-DITCH W/ 1.5m BERM W/ CLASS B RIP RAP 68.7 MTN 206.2m² F.F. EST. DDE= 13m³ -L- 24+60 TO 25+20 LT SEE DETAIL 5
LATERAL V-DITCH W/ 1.5m BERM -L- 25+80 TO 28+20 LT SEE DETAIL 6
LATERAL 0.9m BASE DITCH W/ CLASS B RIP RAP 120.6 MTN 311.7m² F.F. -L- 23+00 TO 23+60 LT SEE DETAIL 8
LATERAL V DITCH W/ CLASS B RIP RAP 47.4 MTN 129.1m² F.F. -L- 23+60 TO 23+90 LT SEE DETAIL 1
0.6m BASE HEAD DITCH SEE DETAIL 4 EST DDE= 8m³
PROPOSED EARTH BERM STOPE STAKES LIMITS
CLASS B RIP RAP 2.7 MTN 8.4m² F.F.
90.0m UNIFORM TRANSITION (LT LN'S)
HEADWALL
450 CSP
900
600
FS 1.2 PS
R/W VARIES
-L- S 57° 16' 24.3" E
PROP. 450mm C&G
MATCHLINE -L-STA. 22+60.000 SHEET 8
MATCHLINE -L-STA. 26+00.000 SHEET 10
GRAU-350
PROPOSED G/R
BEGIN PROPOSED +40 SHOULDER BERM GUTTER
400 CSP W/ 2 ELBS
CAT-1
SANDLER at WAKEFIELD, LLC. CEDAR GROVE, PHASE I DB 11700, PG0005 BM 2005, PG0858
CLASS B RIP RAP EST +/- 2.7 MTN 8.4m² F.F.
CLASS B RIP RAP 2.7MTN 9.2m² F.F.
CLASS B RIP RAP 13.6 MTN 25.1m² F.F.
+40 END PROPOSED SHOULDER BERM GUTTER
CLASS B RIP RAP 1.8MTN 5.9m² F.F.
TOE PROTECTION CLASS B RIP RAP 36.1MTN 127.6m² F.F. -L- 23+60 TO 24+10 RT SEE DETAIL 9
LATERAL V-DITCH W/ 1.5m BERM W/ CLASS B RIP RAP 22.9 MTN 68.7m² F.F. EST. DDE= 44m³ -L- 24+20 TO 24+40 RT SEE DETAIL 5
SANDLER at WAKEFIELD LLC DB 8363 PG1444 BM 2005 PG0858
SANDLER at WAKEFIELD LLC DB 8363 PG1444 BM 2005 PG0858
AREA UNDER CONSTRUCTION
SEE SHEET 2-F FOR DITCH DETAILS
SEE SHEET 24 FOR PROFILE

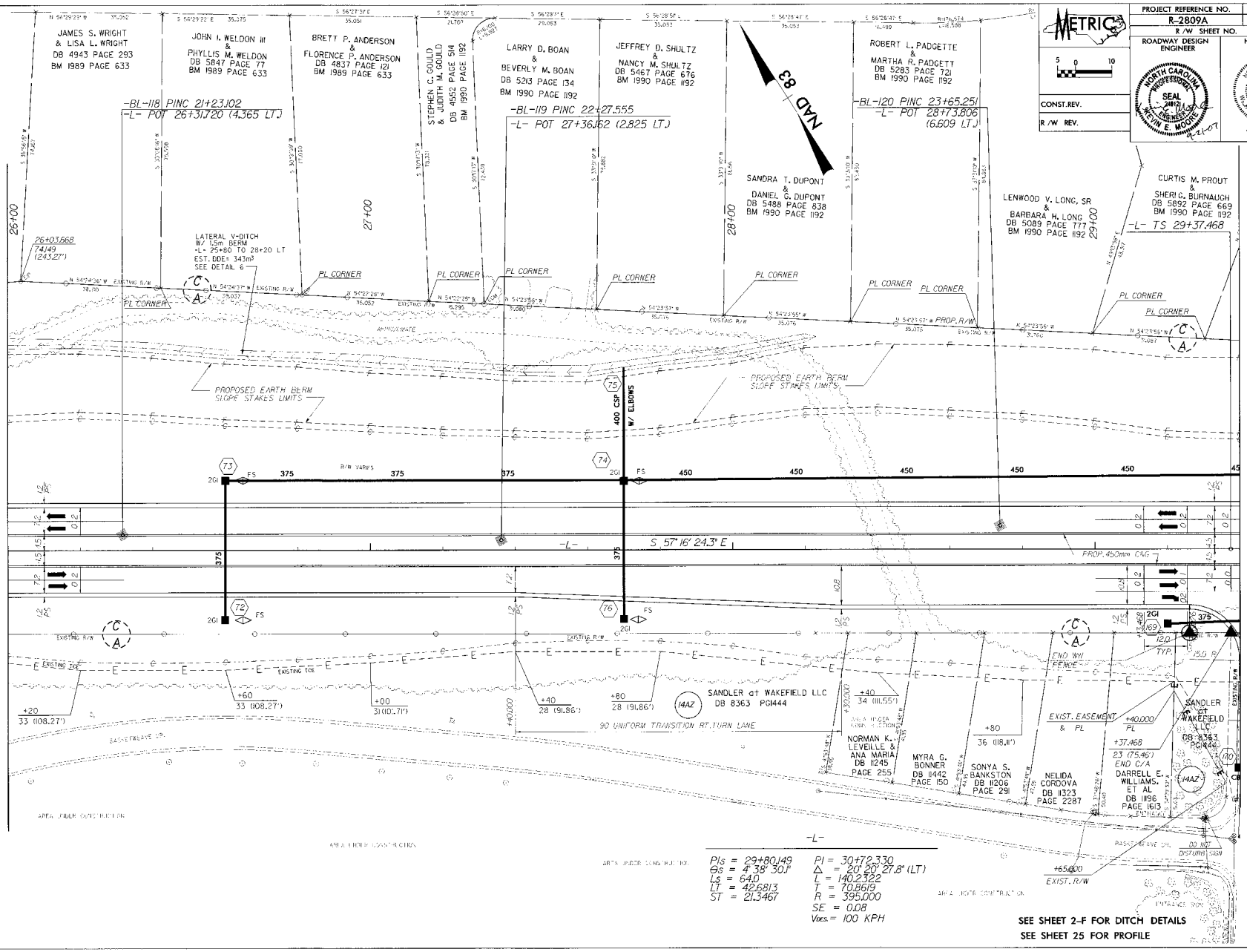
PROJECT REFERENCE NO.	SHEET NO.
R-2809A	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

CONST. REV.

R/W REV.



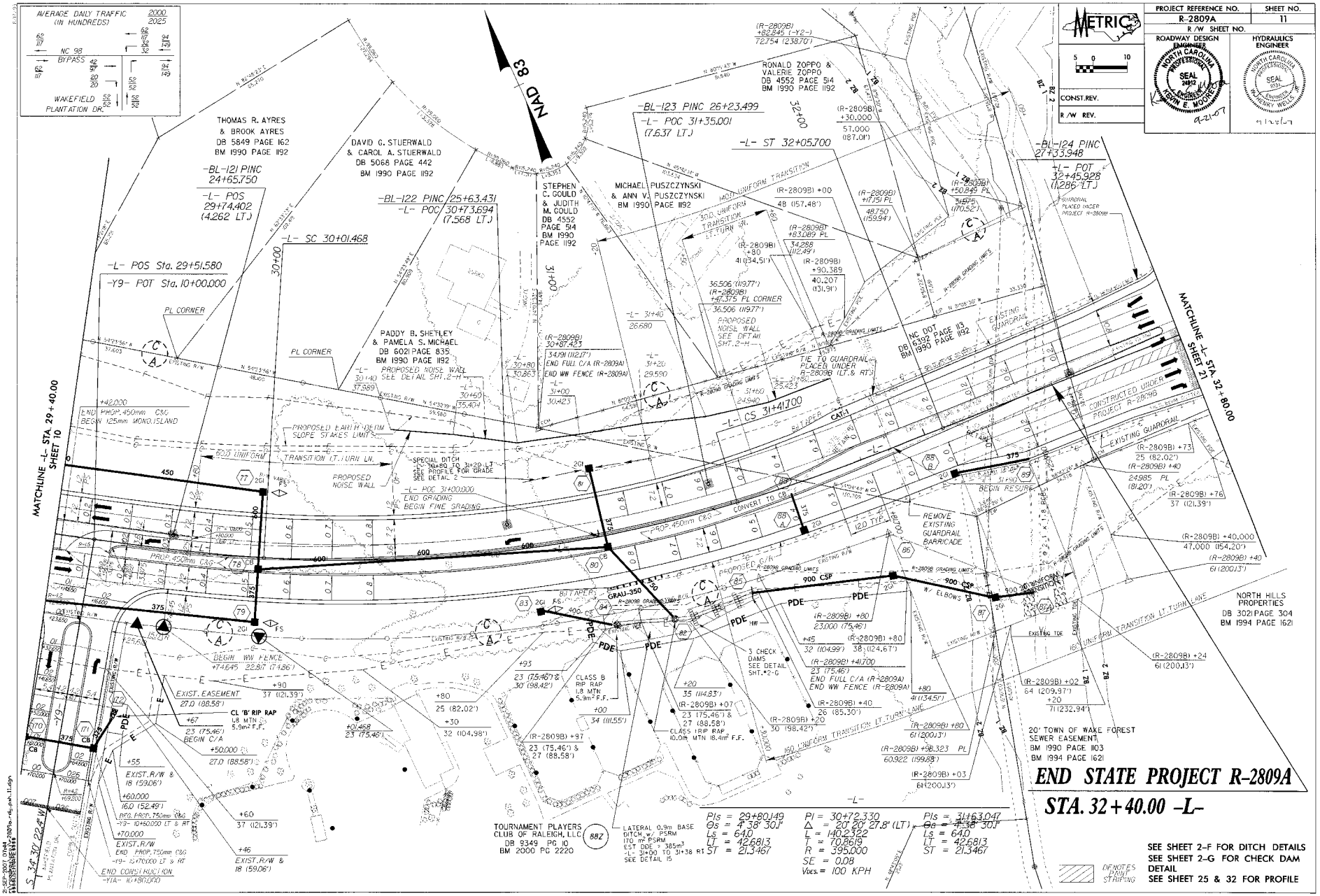
-L-

Pls = 29+80.149
θs = 4° 38' 30.1"
Ls = 64.0
LT = 42.6813
ST = 21.3467

PI = 30+72.330
Δ = 20° 20' 27.8" (LT)
L = 140.2322
T = 70.8619
R = 395.000
SE = 0.08
Vdes = 100 KPH

SEE SHEET 2-F FOR DITCH DETAILS
SEE SHEET 25 FOR PROFILE

25-SEP-2007 07:43



PROJECT REFERENCE NO.
R-2809A
SHEET NO.
11
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
METRIC
CONST.REV.
R/W REV.
AVERAGE DAILY TRAFFIC (IN HUNDREDS) 2000 2025
NC 98 BYPASS
WAKEFIELD PLANTATION DR.
NAD 83
THOMAS R. AYRES & BROOK AYRES DB 5849 PAGE 162 BM 1990 PAGE 1192
DAVID G. STUERWALD & CAROL A. STUERWALD DB 5068 PAGE 442 BM 1990 PAGE 1192
STEPHEN C. GOULD & JUDITH M. GOULD DB 4552 PAGE 514 BM 1990 PAGE 1192
MICHAEL PUSZCZYNSKI & ANN V. PUSZCZYNSKI BM 1990 PAGE 1192
RONALD ZOPPO & VALERIE ZOPPO DB 4552 PAGE 514 BM 1990 PAGE 1192
PADDY B. SHEFLEY & PAMELA S. MICHAEL DB 6021 PAGE 835 BM 1990 PAGE 1192
NC DOT DB 6392 PAGE 113 BM 1990 PAGE 1192
NORTH HILLS PROPERTIES DB 3021 PAGE 304 BM 1994 PAGE 1621
20' TOWN OF WAKE FOREST SEWER EASEMENT BM 1990 PAGE 1103 BM 1994 PAGE 1621
TOURNAMENT PLAYERS CLUB OF RALEIGH, LLC DB 9349 PG 10 BM 2000 PG 2220
MATCHLINE -L- STA. 29+40.00 SHEET 10
MATCHLINE -L- STA. 32+80.00 SHEET 21
-L- POS Sta. 29+51.580
-Y9- POT Sta. 10+00.000
-L- POC 31+00.000 END GRADING BEGIN FINE GRADING
-L- CS 31+41.700
-L- ST 32+05.700
-L- POC 31+35.001 (7.637 LT.)
-BL-121 PINC 24+65.750
-L- POS 29+74.402 (4.262 LT.)
-BL-122 PINC 25+63.431
-L- POC 30+73.694 (7.568 LT.)
-BL-123 PINC 26+23.499
-L- POC 31+35.001 (7.637 LT.)
-BL-124 PINC 27+33.948
-L- POT 32+45.928 (1.286 LT.)
-L- SC 30+01.468
PL CORNER
PROPOSED NOISE WALL SEE DETAIL SHT.2-H
PROPOSED EARTH DERM SLOPE STAKES LIMITS
SPECIAL DITCH -L- 30+80 TO 31+20 LT SEE PROFILE FOR GRADE SEE DETAIL 2
CONVERT TO CB
REMOVE EXISTING GUARDRAIL BARRICADE
CONSTRUCTED UNDER PROJECT R-2809B
EXISTING GUARDRAIL
BEGIN RESURF
BEGIN WW FENCE
EXIST. EASEMENT
CL 'B' RIP RAP 1.8 MTN 5.9m² F.F.
CLASS B RIP RAP 1.8 MTN 5.9m² F.F.
CLASS I RIP RAP 10.0m MTN 18.4m² F.F.
3 CHECK DAMS SEE DETAIL SHT.#2-G
END FULL C/A (R-2809A) END WW FENCE (R-2809A)
END PROP. 450mm C&G BEGIN 125mm MONO.ISLAND
END CONSTRUCTION -Y1A- 10+80.000
LATERAL 0.9m BASE DITCH w/ PSRM 170 m² PSRM EST DDE = 385m³ -L- 31+00 TO 31+38 RT SEE DETAIL 15
PIs = 29+80.149 Θs = 4° 38' 30.1" Ls = 64.0 LT = 42.6813 ST = 21.3467
PI = 30+72.330 Δ = 20° 20' 27.8" (LT) L = 140.2322 T = 70.8619 R = 395.000 SE = 0.08 Vdes. = 100 KPH
PIs = 31+63.047 Θs = 4° 38' 30.1" Ls = 64.0 LT = 42.6813 ST = 21.3467
DENOTES PAINT STRIPING
END STATE PROJECT R-2809A
STA. 32+40.00 -L-
SEE SHEET 2-F FOR DITCH DETAILS
SEE SHEET 2-G FOR CHECK DAM DETAIL
SEE SHEET 25 & 32 FOR PROFILE

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

CONST.REV.

R/W REV.

NORTH CAROLINA PROFESSIONAL SEAL 24092 ENGINEER KEVIN E. MOORE 9-21-07

NORTH CAROLINA PROFESSIONAL SEAL 9/12/07

-Y3-

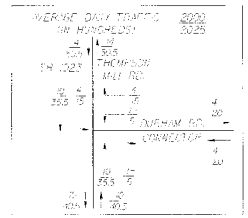
PI = 10+52.324
Δ = 5° 51' 39.5" (LT)
L = 40.9174
T = 20.4765
R = 400.000
SE = RC
$V_{DES.}$ = 30 KPH

-Y1-

PI = 10+96.735
Δ = 32° 23' 19.6" (RT)
L = 76.3143
T = 39.2068
R = 135.000
SE = 0.03
$V_{DES.}$ = 30 KPH

PI = 13+43.392
Δ = 30° 33' 24.3" (LT)
L = 213.3264
T = 109.2654
R = 400.000
SE = 0.08
$V_{DES.}$ = 80 KPH

PRISCILLA B. ROLLS, VIRGINIA ROLLS
DB 09231 PAGE 1049
BM 1997 PAGE 62



NAD 83

-Y3- POT 12+48.733
-BY3-44 POT 9+59.876
-Y3- POT 12+25.098 (4.978 LT.)

PRISCILLA B. ROLLS, VIRGINIA ROLLS
DB 09231 PAGE 1049
BM 1997 PAGE 62
(NO CLAIM)

PRISCILLA B. ROLLS, VIRGINIA ROLLS
DB 09231 PAGE 1049
BM 2005 PAGE 333

-Y1- PT 11+33.843
-Y1- PC 12+34.127
-Y1- PC 10+57.529
-Y1- POT 11+19.931
-Y1- POT 10+00.000

PROPOSED DURHAM ROAD ACCESS
PROPOSED GUARDRAIL
CLASS B RIP RAP 4.5m TN 13.4m² F.F.
CLASS B RIP RAP EST 2.7 MTN 8.4m² F.F.
CLASS I RIP RAP 8.6 MTN 23.2m² F.F. (ON BANKS ONLY) SEE DETAIL 12
CLASS I RIP RAP 3.6 MTN 10.0m F.F.
CLASS I RIP RAP 28.9 MTN 102.1m² F.F. STA. 12+60 TO 13+00 -Y1- R1 SEE DETAIL 9
LATERAL V-DITCH W/1.5m BERM W/ CLASS B RIP RAP 33.2 MTN 99.6m² F.F EST. DDE = 14m³ -Y3- 11+40 TO 11+69 LT SEE DETAIL 5
TOE PROTECTION
REMOVE CONC DITCH
BERM CONSTRUCTION -Y3- 11+80.00
COLLAR & EXT. W/ 750
CAMILLE E. WINSTON
DB 4829 PAGE 83
BM 1989 PAGE 1241
DONALD WINSTEAD & KAREN K.
DB 9365 PAGE 975
END W/W FENCE
END C/A
MATCHLINE -Y3- STA. 10+90.000 SHEET 6
MATCHLINE SEE SHEET 6
MATCHLINE -Y1- STA. 13+00.000 SHEET 13
N 2° 26' 30.2" W
S 83°50' 39.4" E
S 0°44' 28" E 109.8m

DENOTES PAVEMENT REMOVAL

SEE SHEET 2-F FOR DITCH DETAILS
SEE SHEET 27 FOR PROFILES

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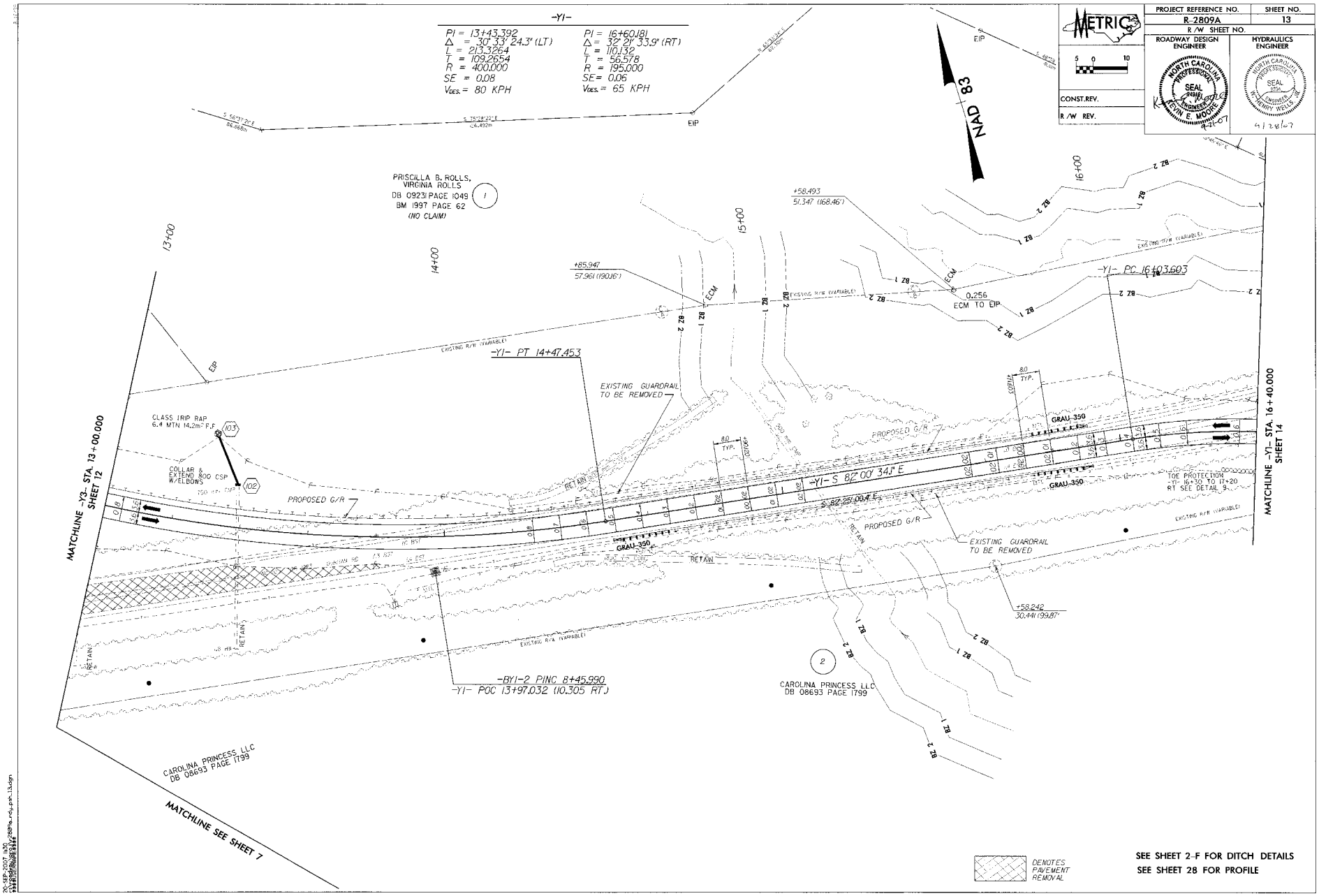


-Y1-
PI = 13+43.392
Δ = 30° 33' 24.3" (LT)
L = 213.3264
T = 109.2654
R = 400.000
SE = 0.08
VDES. = 80 KPH
PI = 16+60.181
Δ = 32° 21' 33.9" (RT)
L = 110.132
T = 56.578
R = 195.000
SE = 0.06
VDES. = 65 KPH
METRIC
PROJECT REFERENCE NO.
R-2809A
SHEET NO.
13
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R/W REV.
NAD 83
PRISCILLA B. ROLLS, VIRGINIA ROLLS
DB 09231 PAGE 1049
BM 1997 PAGE 62
(NO CLAIM)
+58.493
51.347 (168.46')
+85.947
57.961 (190.16')
-Y1- PC 16+03.603
0.256
ECM TO EIP
-Y1- PT 14+47.453
EXISTING GUARDRAIL TO BE REMOVED
CLASS IRIP RAP
6.4 MTN 14.2m² F.F
COLLAR & EXTEND 800 CSP W/ELBOWS
PROPOSED G/R
-Y1- S 82° 00' 34.1" E
S 82° 25' 00.4" E
GRAU 350
TOE PROTECTION
-Y1- 16+30 TO 17+20
RT SEE DETAIL 9
+58.242
30.441 (99.87')
-BY1-2 PINC 8+45.990
-Y1- POC 13+97.032 (10.305 RT)
CAROLINA PRINCESS LLC
DB 08693 PAGE 1799
MATCHLINE -Y3- STA. 13+00.000
SHEET 12
MATCHLINE -Y1- STA. 16+40.000
SHEET 14
MATCHLINE SEE SHEET 7
DENOTES PAVEMENT REMOVAL
SEE SHEET 2-F FOR DITCH DETAILS
SEE SHEET 28 FOR PROFILE

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	14
R /W SHEET NO.	

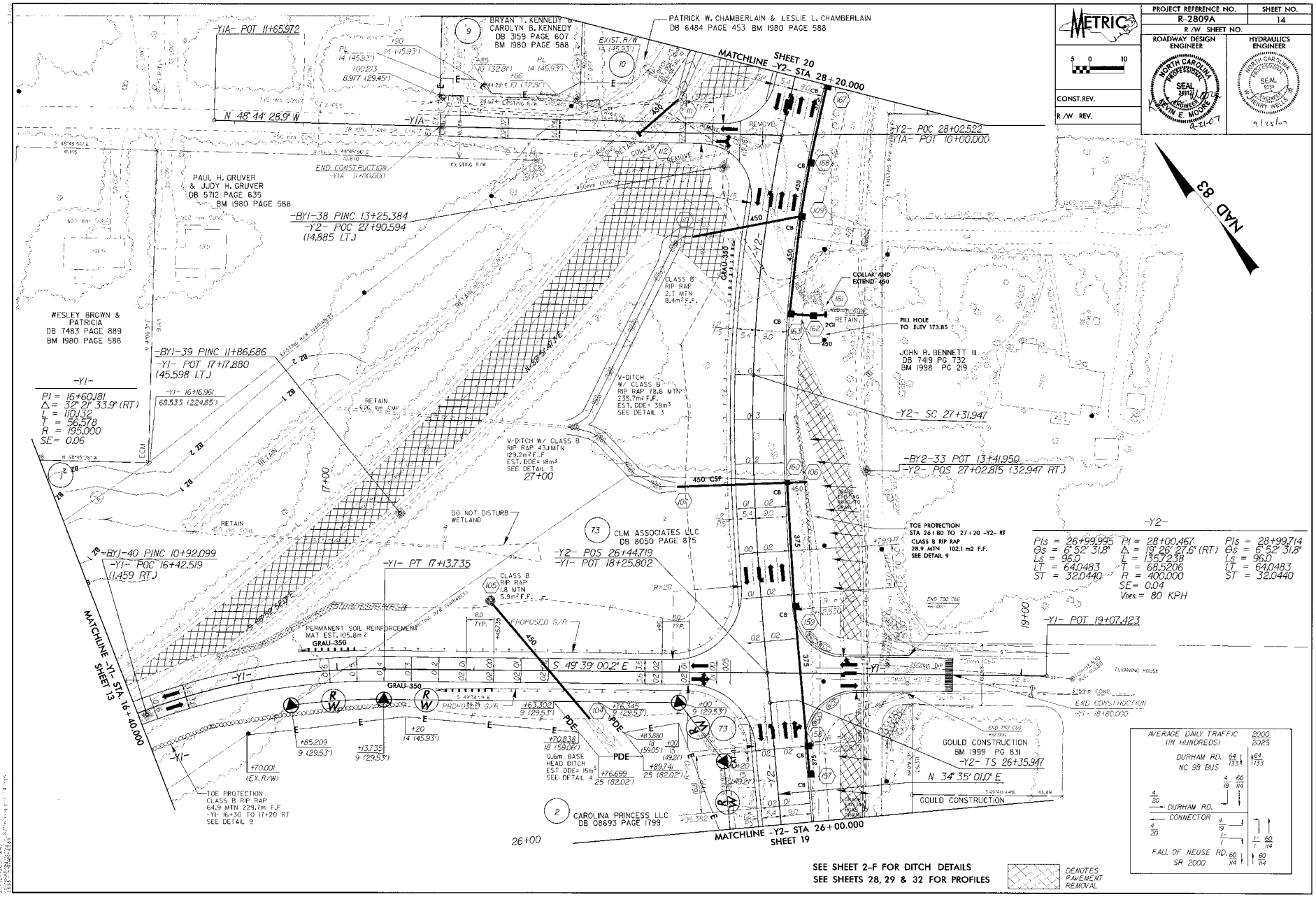
ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 29912 KEVIN E. MOORE 4-21-07

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 6574 JEFFREY INGLE 4/25/07

METRIC 5 0 10

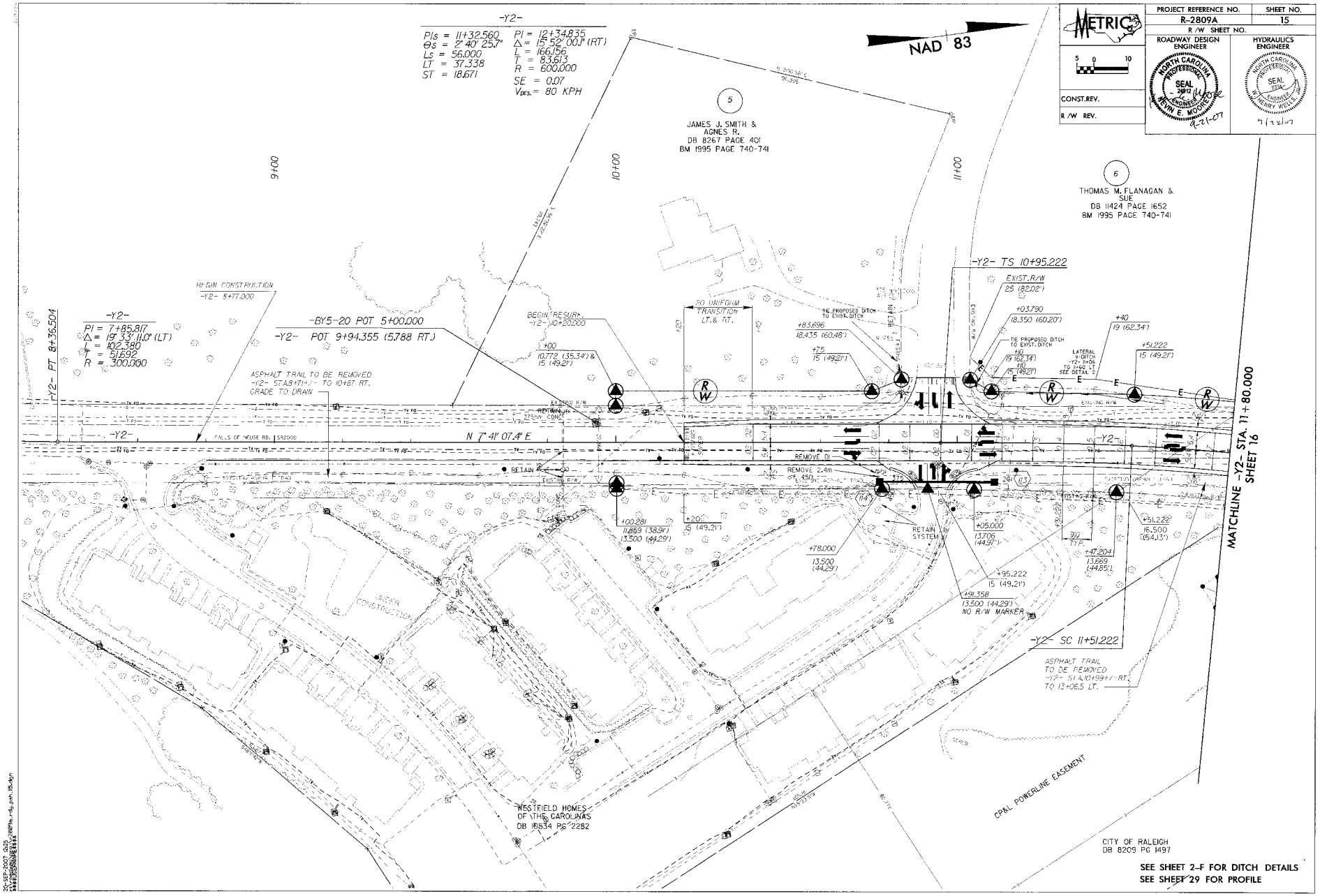
CONST.REV.

R /W REV.



SEE SHEET 2-F FOR DITCH DETAILS

SEE SHEETS 28, 29 & 32 FOR PROFILES



-Y2-
PIs = 11+32.560
Θs = 2° 40' 25.7"
Ls = 56.000
LT = 37.338
ST = 18.671
PI = 12+34.835
Δ = 15° 52' 00.1" (RT)
L = 166.156
T = 83.613
R = 600.000
SE = 0.07
VDES. = 80 KPH
NAD 83
METRIC
PROJECT REFERENCE NO.
R-2809A
SHEET NO.
15
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R/W REV.
JAMES J. SMITH & AGNES R.
DB 8267 PAGE 401
BM 1995 PAGE 740-741
THOMAS M. FLANAGAN & SUE
DB 11424 PAGE 1652
BM 1995 PAGE 740-741
-Y2- TS 10+95.222
EXIST. R/W
25 (82.02')
+03.790
18.350 (60.20')
+40
19 (62.34')
+51.222
15 (49.21')
-Y2-
PI = 7+85.817
Δ = 19° 33' 11.0" (LT)
L = 102.380
T = 51.692
R = 300.000
-Y2- PT 8+36.504
BEGIN CONSTRUCTION
-Y2- 8+77.000
-BY5-20 POT 5+00.000
-Y2- POT 9+94.355 (5.788 RT.)
BEGIN RESURF.
-Y2- 10+20.000
20 UNIFORM TRANSITION LT. & RT.
+83.696
18.435 (60.48')
+75
15 (49.21')
+00
10.772 (35.34') &
15 (49.21')
ASPHALT TRAIL TO BE REMOVED
-Y2- STA.8+71+/- TO 10+87 RT.
GRADE TO DRAIN
N 7° 41' 07.4" E
REMOVE DI
REMOVE 2.4m OF 450
RETAIN
RETAIN SYSTEM
+00.281
11.859 (38.91')
13.500 (44.29')
+20
15 (49.21')
+78.000
13.500
(44.29')
+05.000
13.706
(44.97')
+95.222
15 (49.21')
+91.358
13.500 (44.29')
NO R/W MARKER
+47.204
13.669
(44.85')
+51.222
16.500
(54.13')
-Y2- SC 11+51.222
ASPHALT TRAIL
TO BE REMOVED
-Y2- STA.10+99+/- RT.
TO 13+06.5 LT.
MATCHLINE -Y2- STA. 11+80.000
SHEET 16
UNDER CONSTRUCTION
WESTFIELD HOMES OF THE CAROLINAS
DB 10534 PG 2282
CP&L POWERLINE EASEMENT
CITY OF RALEIGH
DB 8209 PG 1497
SEE SHEET 2-F FOR DITCH DETAILS
SEE SHEET 29 FOR PROFILE

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	16
R/W SHEET NO.	

METRIC

5 0 10

CONST. REV.

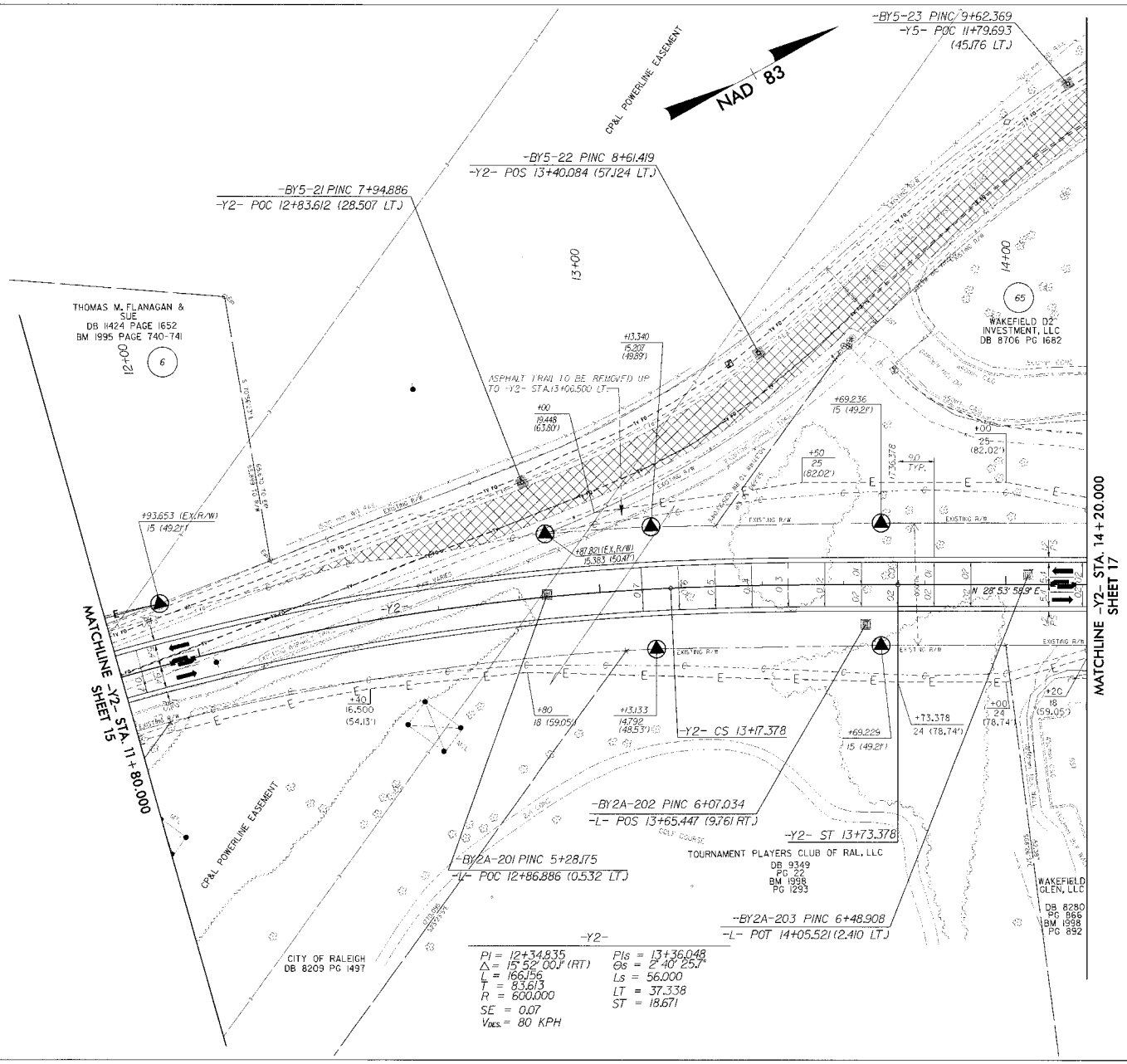
R/W REV.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 24873 ENGINEER KEVIN E. MOORE 9-21-07

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032 ENGINEER W. HENRY LEWIS III 9/25/07



DENOTES PAVEMENT REMOVAL

SEE SHEETS 29 & 30 FOR PROFILE

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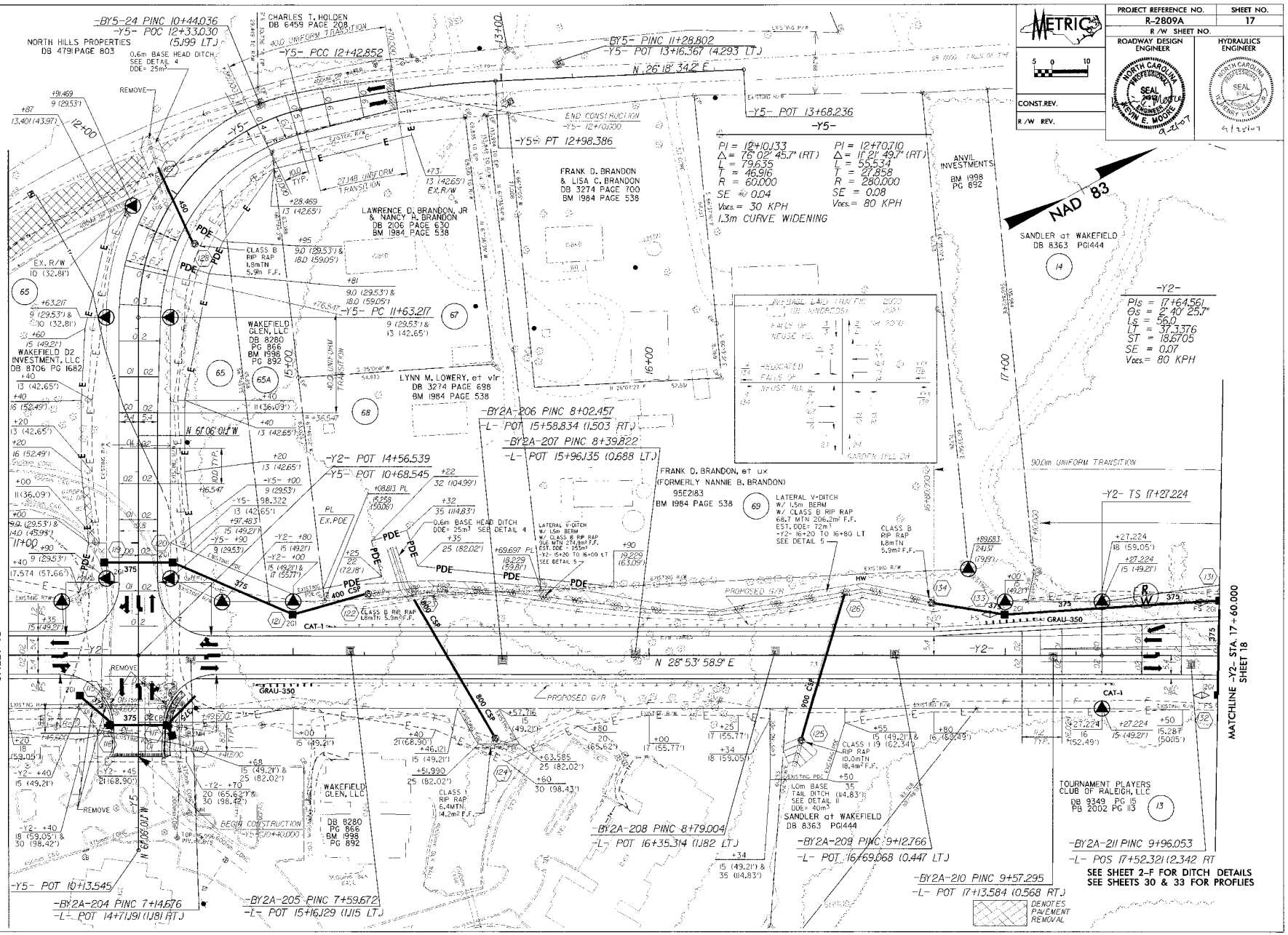
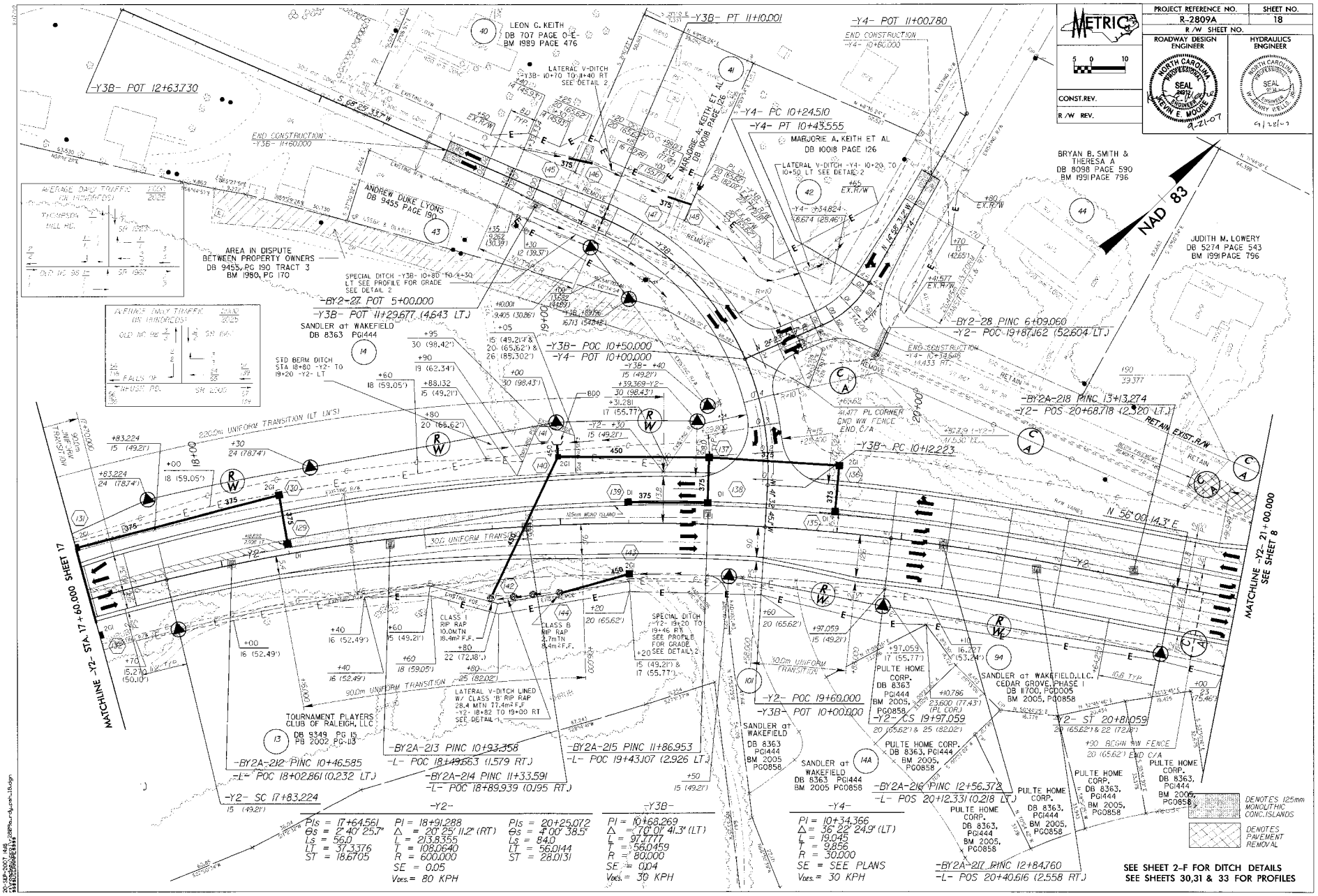


PROJECT REFERENCE NO.
R-2809A
SHEET NO.
17
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
METRIC
CONST.REV.
R/W REV.
NAD 83
NORTH HILLS PROPERTIES
DB 4791 PAGE 803
CHARLES T. HOLDEN
DB 6459 PAGE 208
FRANK D. BRANDON & LISA C. BRANDON
DB 3274 PAGE 700
BM 1984 PAGE 538
LAWRENCE D. BRANDON, JR & NANCY H. BRANDON
DB 2106 PAGE 630
BM 1984 PAGE 538
WAKEFIELD GLEN, LLC
DB 8280 PG 866
BM 1998 PG 892
WAKEFIELD D2 INVESTMENT, LLC
DB 8706 PG 1682
LYNN M. LOWERY, et vir
DB 3274 PAGE 698
BM 1984 PAGE 538
FRANK D. BRANDON, et ux
(FORMERLY NANNIE B. BRANDON)
95E2183
BM 1984 PAGE 538
ANVIL INVESTMENTS
BM 1998 PG 892
SANDLER at WAKEFIELD
DB 8363 PG1444
TOURNAMENT PLAYERS CLUB OF RALEIGH, LLC
DB 9349 PG 15
PB 2002 PG 113
MATCHLINE -Y2- STA. 14+20.000 SHEET 16
MATCHLINE -Y2- STA. 17+60.000 SHEET 18
SEE SHEET 2-F FOR DITCH DETAILS
SEE SHEETS 30 & 33 FOR PROFLIES
DENOTES PAVEMENT REMOVAL

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 24 ENGINEER KEVIN E. MOORE 9-21-07	NORTH CAROLINA PROFESSIONAL SEAL 20 ENGINEER HARRY PELLETIER 9/12/07
CONST.REV.	
R/W REV.	

METRIC 5 0 10



-Y2-

PIs = 17+64.561
Θs = 2°40'25.7"
Ls = 56.0
LT = 37.3376
ST = 18.6705

PI = 18+91.288
Δ = 20°25'11.2" (RT)
L = 213.8355
T = 108.0640
R = 600.000
SE = 0.05
VDES. = 80 KPH

PIs = 20+25.072
Θs = 4°00'38.5"
Ls = 84.0
LT = 56.0144
ST = 28.0131

-Y3B-

PI = 10+68.269
Δ = 70°01'41.3" (LT)
L = 97.7777
T = 56.0459
R = 80.000
SE = 0.04
VDES. = 30 KPH

-Y4-

PI = 10+34.366
Δ = 36°22'24.9" (LT)
L = 19.045
T = 9.856
R = 30.000
SE = SEE PLANS
VDES. = 30 KPH

SEE SHEET 2-F FOR DITCH DETAILS
SEE SHEETS 30,31 & 33 FOR PROFILES

20-SEP-2007 14:16

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

CONST.REV.

R/W REV.

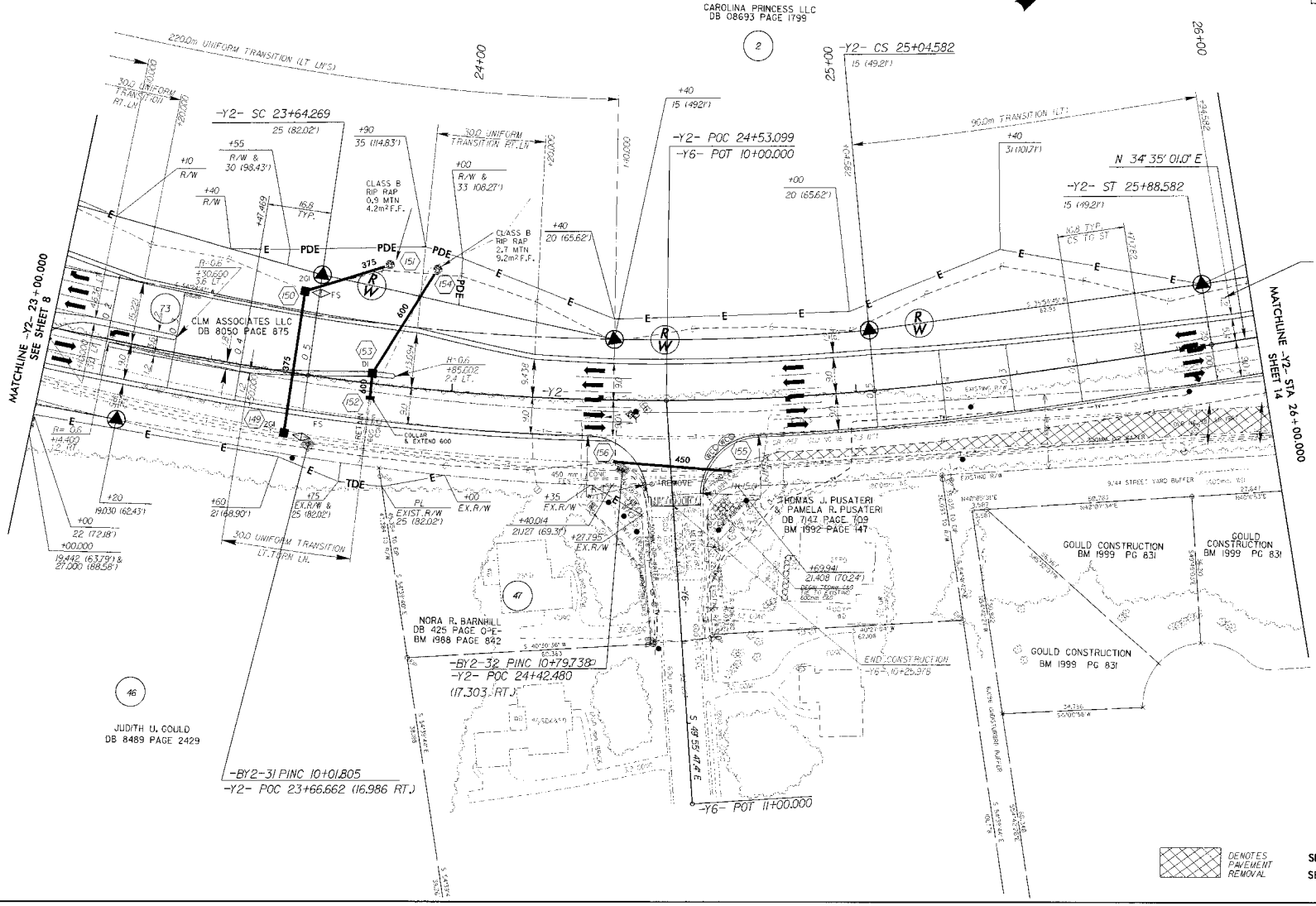
NORTH CAROLINA PROFESSIONAL SEAL 24931 ENGINEER KELVIN E. MOORE 4-27-07

NORTH CAROLINA PROFESSIONAL SEAL 19824 ENGINEER H. TIMOTHY WELLS JR. 4/25/07

-Y2-

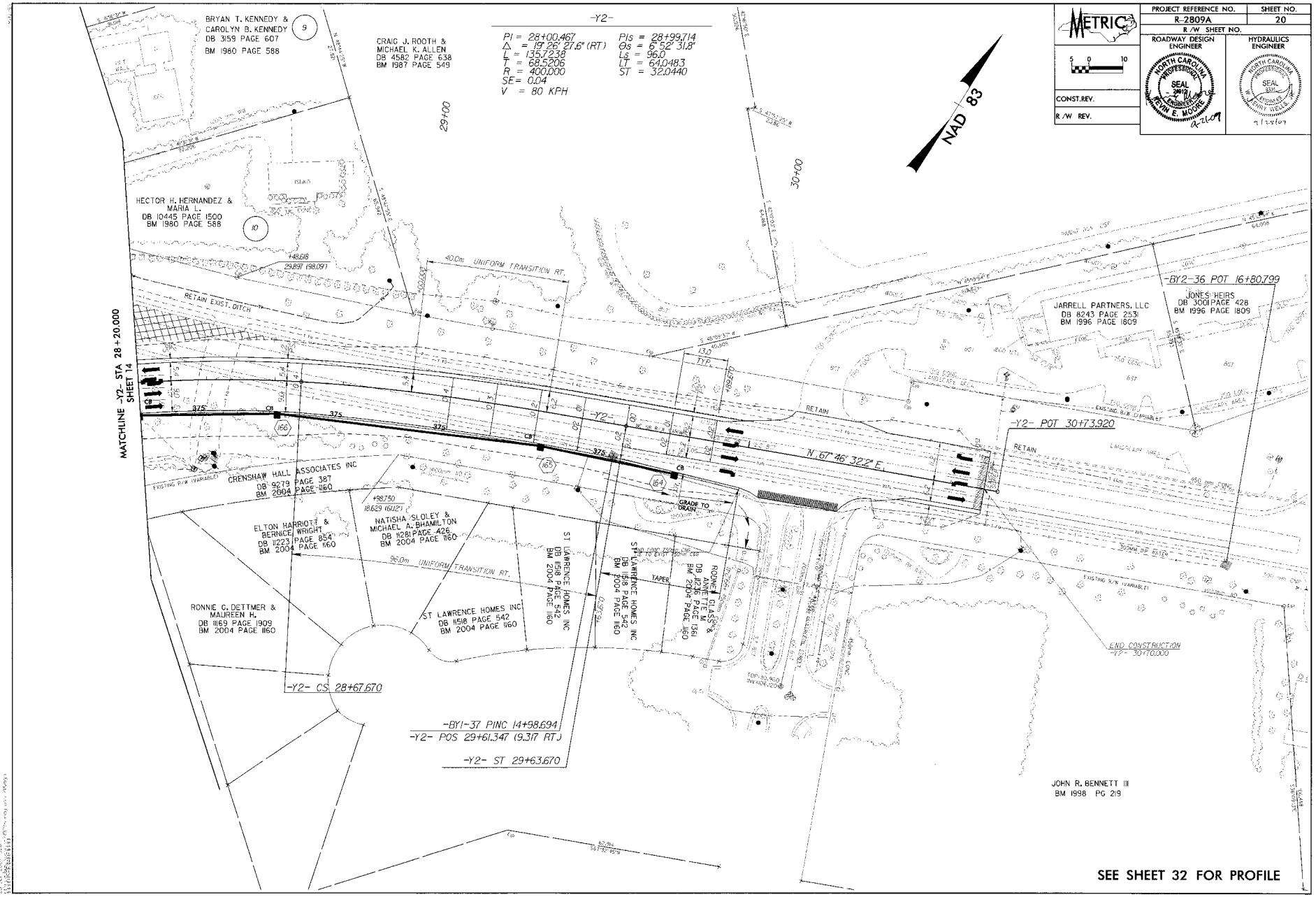
PIs = 23+36.283	PI = 24+34.747	PIs = 25+32.595	PIs = 26+99.995
Θs = 4°00' 38.5"	Δ = 13° 23' 56.2" (LT)	Θs = 4°00' 38.5"	Θs = 6°52' 31.8"
Ls = 84.0	L = 140.3136	Ls = 84.0	Ls = 96.0
LT = 56.0144	T = 70.4783	LT = 56.0144	LT = 64.0483
ST = 28.0131	R = 600.000	ST = 28.0131	ST = 32.0440
	SE = 0.05		SE = 0.04
	Vdes.= 80 KPH		Vdes.= 80 KPH

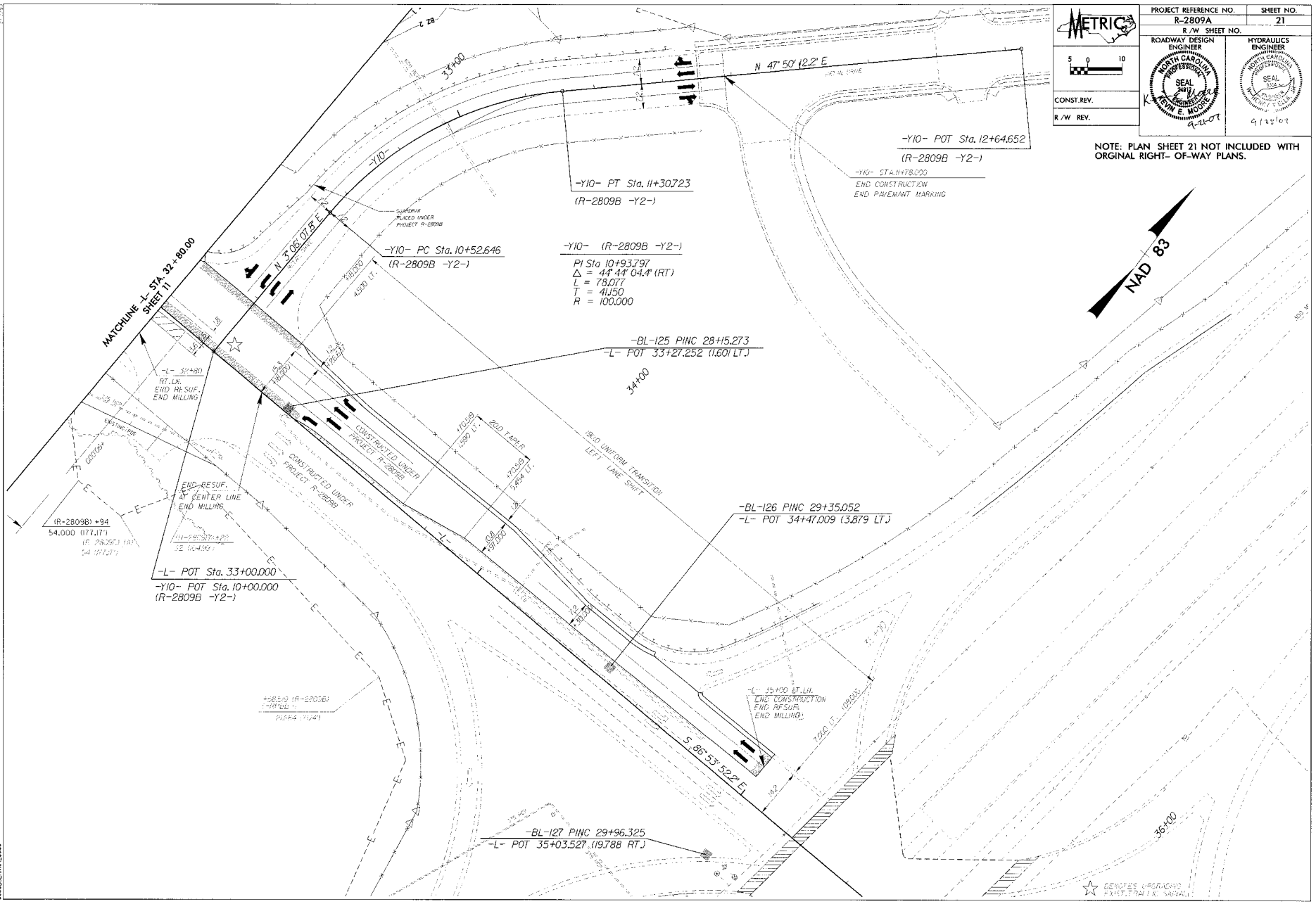
NAD 83



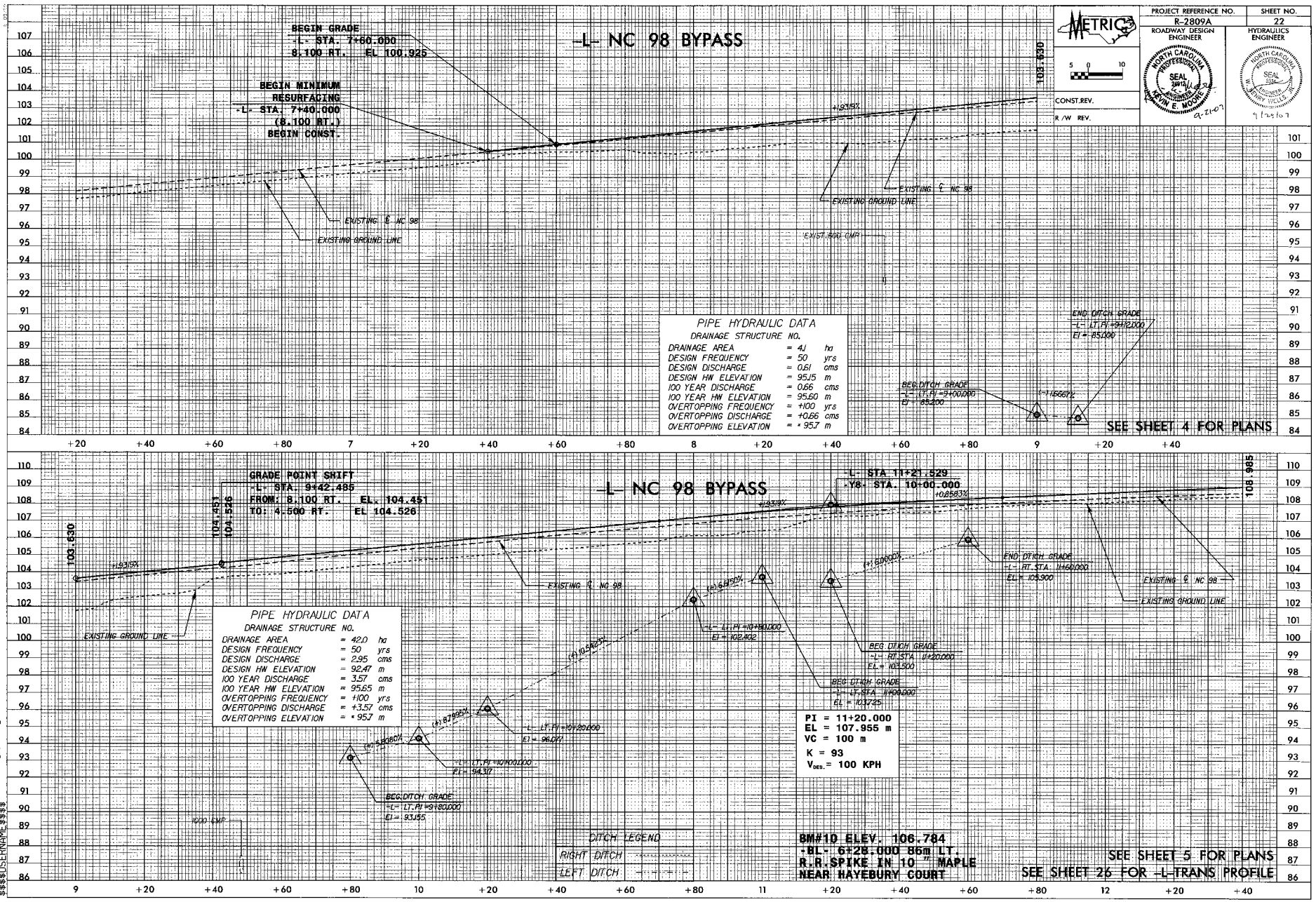
SEE SHEET 2-F FOR DITCH DETAILS

SEE SHEETS 31 & 32 FOR PROFILE


METRIC
PROJECT REFERENCE NO.
R-2809A
SHEET NO.
20
R /W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R /W REV.
-Y2-
PI = 28+00.467
Δ = 19° 26' 27.6" (RT)
L = 135.72.38
T = 68.5206
R = 400.000
SE= 0.04
V = 80 KPH
PIs = 28+99.714
Θs = 6° 52' 31.8"
Ls = 96.0
LT = 641.048.3
ST = 32.0440
NAD 83
BRYAN T. KENNEDY & CAROLYN B. KENNEDY
DB 3159 PAGE 607
BM 1980 PAGE 588
CRAIG J. ROOTH & MICHAEL K. ALLEN
DB 4582 PAGE 638
BM 1987 PAGE 549
HECTOR H. HERNANDEZ & MARIA L.
DB 10445 PAGE 1500
BM 1980 PAGE 588
MATCHLINE -Y2- STA 28+20.000
SHEET 14
40.0m UNIFORM TRANSITION RT.
RETAIN EXIST. DITCH
JARRELL PARTNERS, LLC
DB 8243 PAGE 2531
BM 1996 PAGE 1809
JONES HEIRS
DB 3001 PAGE 428
BM 1996 PAGE 1809
-BY2-36 POT 16+80.799
-Y2- POT 30+73.920
N 61° 46' 32.2" E
CRENSHAW HALL ASSOCIATES INC
DB 9279 PAGE 387
BM 2004 PAGE 1160
ELTON HARRIOTT & BERNICE WRIGHT
DB 11223 PAGE 854
BM 2004 PAGE 1160
NATISHA SLOLEY & MICHAEL A. BHAMILTON
DB 11281 PAGE 426
BM 2004 PAGE 1160
96.0m UNIFORM TRANSITION RT.
RONNIE G. DETTMER & MAUREEN H.
DB 11169 PAGE 1909
BM 2004 PAGE 1160
ST LAWRENCE HOMES INC
DB 11518 PAGE 542
BM 2004 PAGE 1160
GRADE TO DRAIN
TAPER
RODNEY GLASS & ANNETTE M.
DB 1236 PAGE 1361
BM 2004 PAGE 1160
END CONSTRUCTION
-Y2- 30+70.000
-Y2- CS 28+67.670
-BY1-37 PINC 14+98.694
-Y2- POS 29+61.347 (9.317 RT)
-Y2- ST 29+63.670
JOHN R. BENNETT III
BM 1998 PG 219
SEE SHEET 32 FOR PROFILE



METRIC
PROJECT REFERENCE NO.
R-2809A
SHEET NO.
21
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R/W REV.
NOTE: PLAN SHEET 21 NOT INCLUDED WITH ORGINAL RIGHT- OF-WAY PLANS.
NAD 83
MATCHLINE -L- STA. 32+80.00 SHEET 11
N 47° 50' 12.2" E
N 3° 06' 07.8" E
S 86° 53' 52.2" E
-Y10- POT Sta. 12+64.652
(R-2809B -Y2-)
-Y10- STA.11+78.000
END CONSTRUCTION
END PAVEMENT MARKING
-Y10- PT Sta. 11+30.723
(R-2809B -Y2-)
-Y10- PC Sta. 10+52.646
(R-2809B -Y2-)
-Y10- (R-2809B -Y2-)
PI Sta 10+93.797
Δ = 44° 44' 04.4" (RT)
L = 78.077
T = 41.150
R = 100.000
-BL-125 PINC 28+15.273
-L- POT 33+27.252 (1.601 LT.)
-BL-126 PINC 29+35.052
-L- POT 34+47.009 (3.879 LT.)
-BL-127 PINC 29+96.325
-L- POT 35+03.527 (19.788 RT.)
-L- POT Sta. 33+00.000
-Y10- POT Sta. 10+00.000
(R-2809B -Y2-)
(R-2809B) +94
54.000 (177.17')
CONSTRUCTED UNDER PROJECT R-2809B
20.0 TAPER
190.0 UNIFORM TRANSITION LEFT LANE SHIFT
END RESUF. AT CENTER LINE END MILLING
-L- 32+80 RT.LN. END RESUF. END MILLING
-L- 35+00 LT.LN. END CONSTRUCTION END RESUF. END MILLING
33+00
34+00
36+00
DENOTES UPGRADING EXIST. TRAFFIC SIGNAL


-L- NC 98 BYPASS
BEGIN GRADE
-L- STA. 7+60.000
8.100 RT. EL 100.925
BEGIN MINIMUM RESURFACING
-L- STA. 7+40.000
(8.100 RT.)
BEGIN CONST.
EXISTING ℄ NC 98
EXISTING GROUND LINE
EXIST.800 CMP
END DITCH GRADE
-L- LT.PI =9+12.000
El = 85.000
BEG.DITCH GRADE
-L- LT.PI =9+00.000
El = 85.200
SEE SHEET 4 FOR PLANS
PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.
DRAINAGE AREA = 4.1 ha
DESIGN FREQUENCY = 50 yrs
DESIGN DISCHARGE = 0.61 cms
DESIGN HW ELEVATION = 95.15 m
100 YEAR DISCHARGE = 0.66 cms
100 YEAR HW ELEVATION = 95.60 m
OVERTOPPING FREQUENCY = +100 yrs
OVERTOPPING DISCHARGE = +0.66 cms
OVERTOPPING ELEVATION = + 95.7 m
METRIC
CONST.REV.
R/W REV.
PROJECT REFERENCE NO.
R-2809A
SHEET NO.
22
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
-L- NC 98 BYPASS
GRADE POINT SHIFT
-L- STA. 9+42.485
FROM: 8.100 RT. EL. 104.451
TO: 4.500 RT. EL 104.526
-L- STA 11+21.529
-Y8- STA. 10+00.000
END DITCH GRADE
-L- RT.STA. 11+60.000
EL = 105.900
EXISTING ℄ NC 98
EXISTING GROUND LINE
-L- LT.PI =10+80.000
El = 102.402
BEG DITCH GRADE
-L- RT.STA. 11+20.000
EL = 103.500
BEG DITCH GRADE
-L- LT.STA. 11+00.000
EL = 101.745
PI = 11+20.000
EL = 107.955 m
VC = 100 m
K = 93
V DES. = 100 KPH
-L- LT.PI =10+20.000
El = 96.071
-L- LT.PI =10+00.000
El = 94.317
BEG.DITCH GRADE
-L- LT.PI =9+80.000
El = 93.155
1000 CMP
PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.
DRAINAGE AREA = 42.0 ha
DESIGN FREQUENCY = 50 yrs
DESIGN DISCHARGE = 2.95 cms
DESIGN HW ELEVATION = 92.47 m
100 YEAR DISCHARGE = 3.57 cms
100 YEAR HW ELEVATION = 95.65 m
OVERTOPPING FREQUENCY = +100 yrs
OVERTOPPING DISCHARGE = +3.57 cms
OVERTOPPING ELEVATION = + 95.7 m
DITCH LEGEND
RIGHT DITCH
LEFT DITCH
BM#10 ELEV. 106.784
-BL- 6+28.000 86m LT.
R.R.SPIKE IN 10" MAPLE
NEAR HAYEBURY COURT
SEE SHEET 5 FOR PLANS
SEE SHEET 26 FOR -L-TRANS PROFILE
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PROJECT REFERENCE NO.	SHEET NO.
R-2809A	23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

CONST.REV.

R/W REV.

NORTH CAROLINA PROFESSIONAL SEAL ENGINEER KEVIN E. MOORE 9-21-07

NORTH CAROLINA PROFESSIONAL SEAL ENGINEER HENRY WELLS JR. 9/21/07

-L- NC 98 BYPASS

PI = 13+00.000
EL = 109.500 m
VC = 120 m
K = 230
$V_{DES.}$ = 100 KPH

PI = 15+00.000
EL = 110.174 m
VC = 160 m
K = 67
$V_{DES.}$ = 100 KPH

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 1.4	ha
DESIGN FREQUENCY	= 50	yrs
DESIGN DISCHARGE	= 0.32	cms
DESIGN HW ELEVATION	= 109.48	m
100 YEAR DISCHARGE	= 0.347	cms
100 YEAR HW ELEVATION	= 109.52	m
OVERTOPPING FREQUENCY	= +100	yrs
OVERTOPPING DISCHARGE	= +0.347	cms
OVERTOPPING ELEVATION	= +109.69	m

108.985 — +0.8583% — +0.3366% — -L- 13+51.922 = Y3- 10+00.000 — -L- 13+64.155 = Y3A- 11+88.729 — +0.3368% — +2.7113% — (-) 2.5400% — (-) 5.6250% — 45C — 112.347

BEG.RT.DITCH GRADE -L- RT.PI = 15+40.000 EL = 109.688

-L- RT.PI = 15+60.000 EL = 109.600

END RT.DITCH GRADE -L- RT.PI = 15+160.000 EL = 105.000

SEE SHEET 6 FOR PLANS

-L- NC 98 BYPASS

BM#11 ELEV. 116.619
-BL- 11+70.080 57m RT.
R.R.SPIKE IN 12" OAK

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 5.0	ha
DESIGN FREQUENCY	= 50	yrs
DESIGN DISCHARGE	= 1.02	cms
DESIGN HW ELEVATION	= 109.91	m
100 YEAR DISCHARGE	= 1.08	cms
100 YEAR HW ELEVATION	= 109.95	m
OVERTOPPING FREQUENCY	= +500	yrs
OVERTOPPING DISCHARGE	= +1.84	cms
OVERTOPPING ELEVATION	= +112.4	m

112.347 — +2.7113% — (-) 1.0300% — 118.955 (RT. LN.) — 118.682 (LT. LN.)

-L- LT LN GRADE STA 16+82.000 TO 23+18.000

BEG.RT.DITCH GRADE -L- RT.PI = 18+80.000 EL = 117.608

END.RT.DITCH GRADE -L- RT.PI = 19+20.000 EL = 117.488

BEG.LT.DITCH GRADE -L- LT.PI = 16+40.000 EL = 105.500

-L- LT.PI = 16+60.000 EL = 106.267

(+) 4.2611% — (+) 3.8600% — (+) 1.5000% — (-) 1.2500% — (-) 3.9000% — (-) 11.8500% — (-) 0.3846% — 750 — (+) 2.9550% — (+) 5.19 5% — (-) 3.8051%

-L- LT.PI = 16+80.000 EL = 108.000

-L- LT.PI = 17+00.000 EL = 108.300

-L- RT.PI = 17+20.000 EL = 108.000

-L- LT.PI = 17+20.000 EL = 110.646

END RT.DITCH GRADE -L- RT.PI = 17+33.000 RT. EL = 108.950

-L- LT.PI = 17+40.000 EL = 111.260

END LT.DITCH GRADE -L- LT.PI = 17+80.000 EL = 113.316

PI = 16+80.000 EL = 108.000

PI = 20+00.000 (LT LANE)
EL = 123.760 m
VC = 636 m
K = 98
$V_{DES.}$ = 100 KPH
GRADE AHEAD = -3.8051%

PI = 20+00.000
EL = 123.760 m
VC = 600 m
K = 92
$V_{DES.}$ = 100 KPH
GRADE AHEAD = -3.8051%

DITCH LEGEND
RIGHT DITCH
LEFT DITCH

SEE SHEET 7 FOR PLANS

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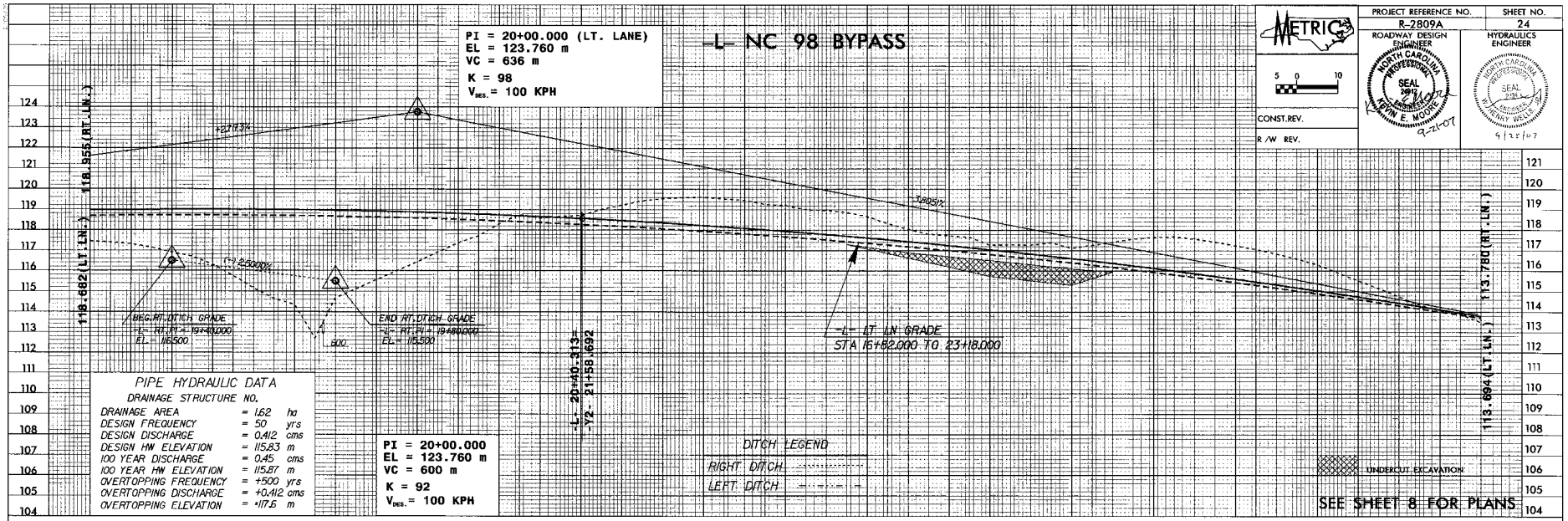

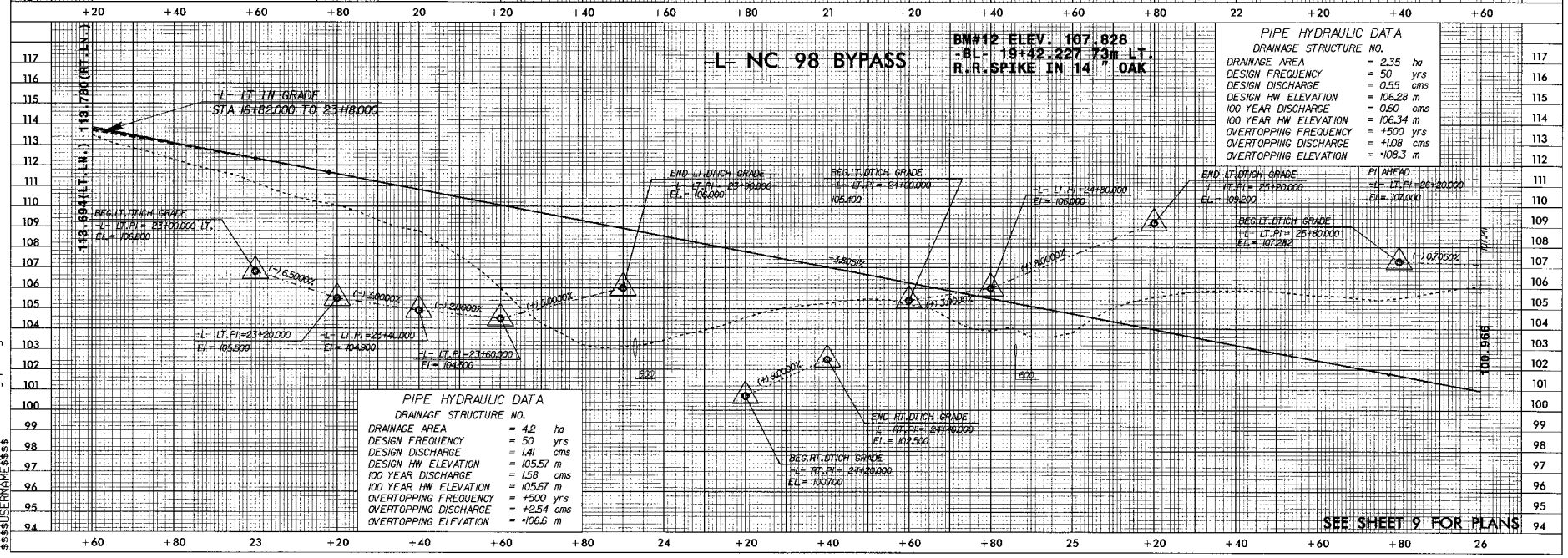

METRIC

CONST.REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 24912 ENGINEER KEVIN E. MOORE 9-21-07

NORTH CAROLINA PROFESSIONAL SEAL 2134 ENGINEER W. HENRY WELLS 9/25/07

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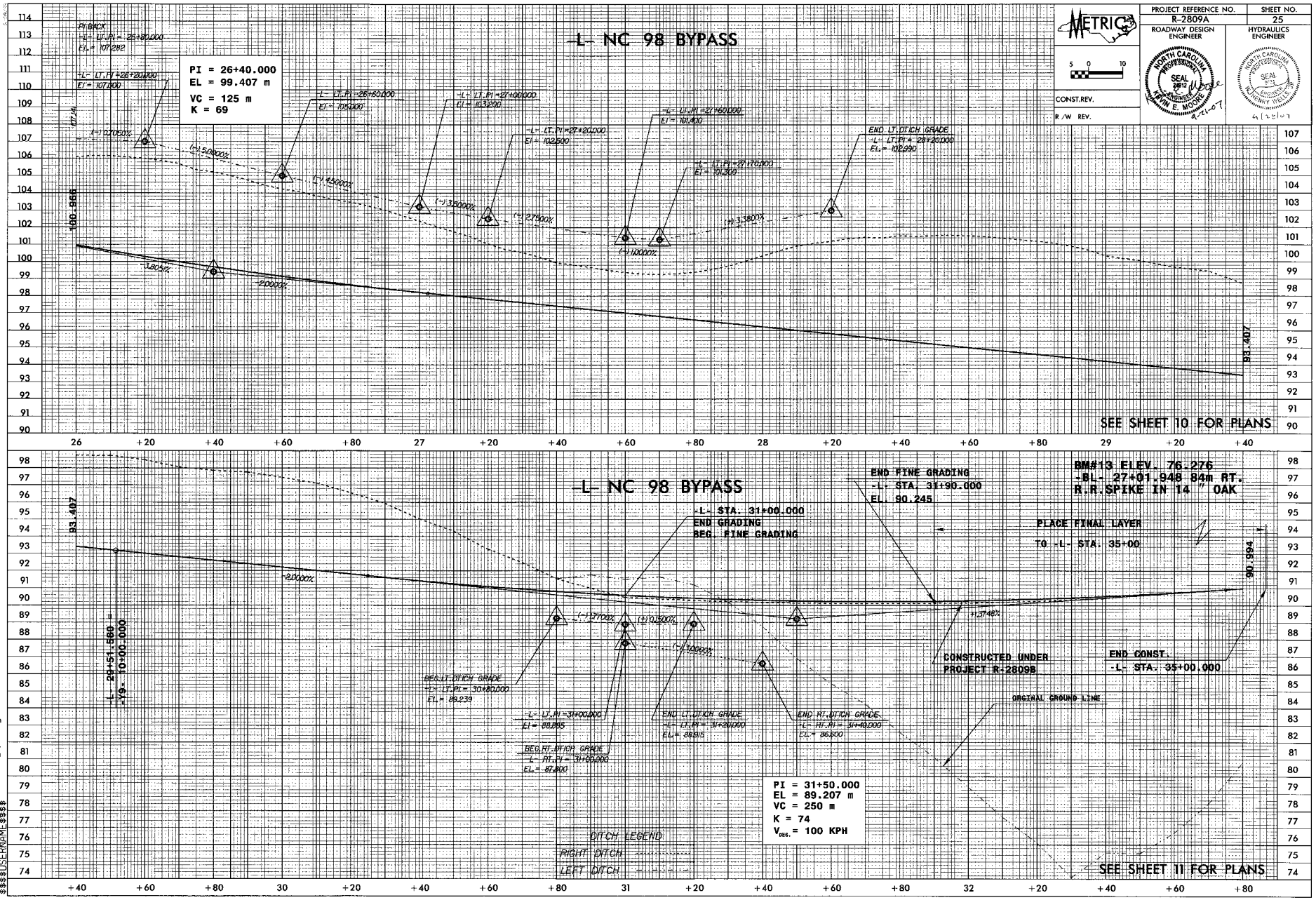

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2809A	25
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CONST.REV.

R/W REV.

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PROJECT REFERENCE NO.	SHEET NO.
R-2809A	26
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

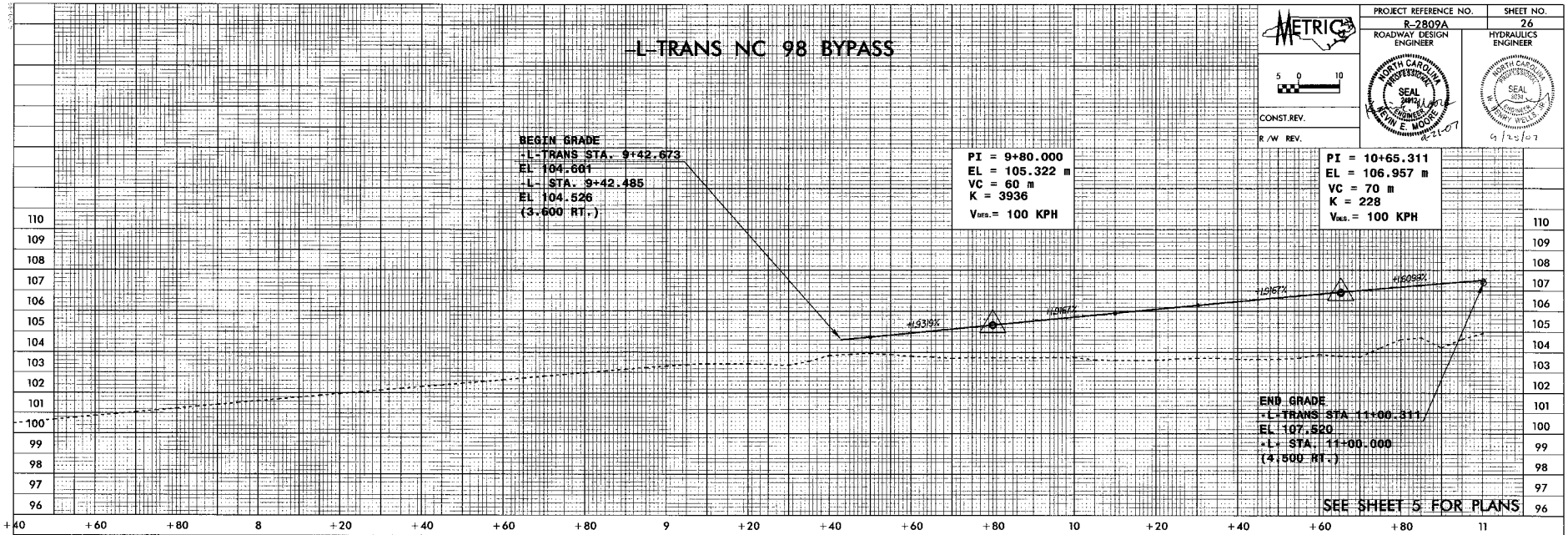
5 0 10

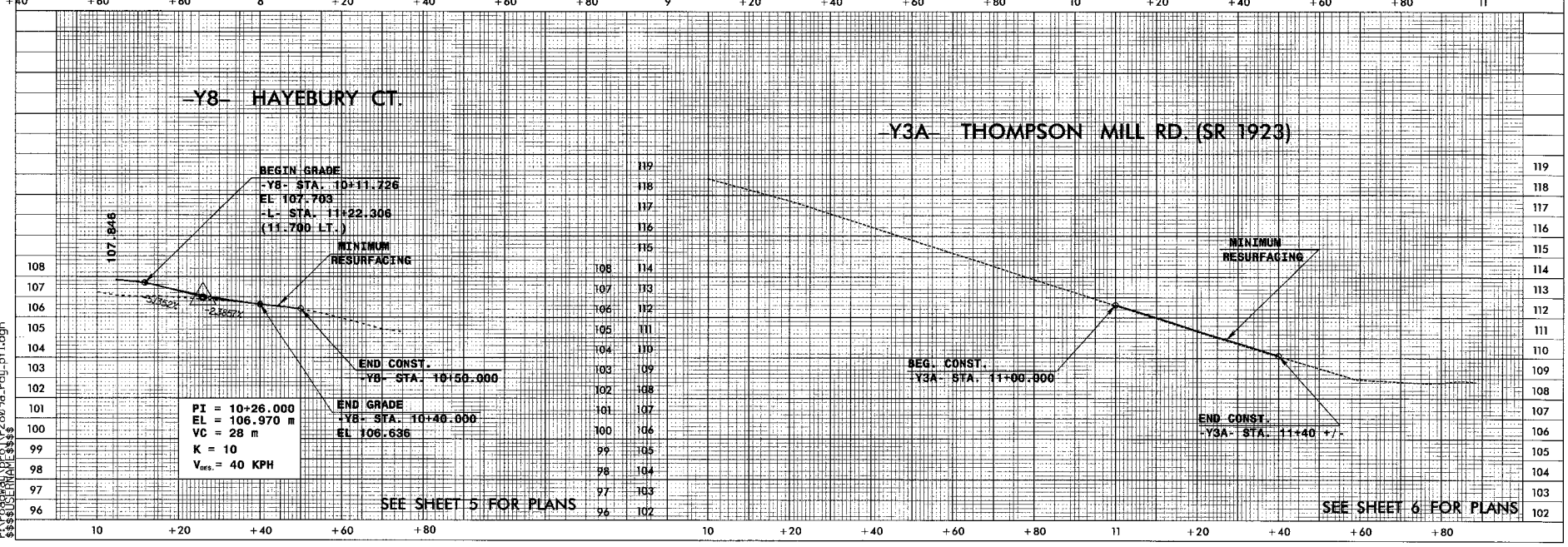
CONST.REV.

R/W REV.

NORTH CAROLINA PROFESSIONAL SEAL 24912 ENGINEER KEVIN E. MOORE 4-21-07

NORTH CAROLINA PROFESSIONAL SEAL 5034 ENGINEER W. HENRY WELLS, JR. 9/25/07





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PROJECT REFERENCE NO.	SHEET NO.
R-2809A	27

ROADWAY DESIGN ENGINEER — HYDRAULICS ENGINEER

METRIC 5 0 10

CONST.REV.

R /W REV.

NORTH CAROLINA PROFESSIONAL SEAL 26913 ENGINEER KEVIN E MOORE 9-21-07

NORTH CAROLINA PROFESSIONAL SEAL 8326 ENGINEER W. HENRY WELLS 11/13/07

-Y3- THOMPSON MILL RD. SR 1923

PI = 10+30.000
EL = 110.493 m
VC = 36 m
K = 3
$V_{DES.}$ = 30 KPH

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.
-Y3- 11+19.931
-Y1- 10+00.000

DRAINAGE AREA	= 1.8	ha
DESIGN FREQUENCY	= 25	yrs
DESIGN DISCHARGE	= 0.347	cms
DESIGN HW ELEVATION	= 93.81	m
100 YEAR DISCHARGE	= 0.40	cms
100 YEAR HW ELEVATION	= 93.86	m
OVERTOPPING FREQUENCY	= +500	yrs
OVERTOPPING DISCHARGE	= +0.66	cms
OVERTOPPING ELEVATION	= +94.2	m

BEGIN GRADE
-Y3- STA. 10+11.907
EL. 110.220

END GRADE
-Y3- STA. 11+60.000
EL. 97.068

MINIMUM RESURFACING

END CONST
-Y3- STA. 11+80.000

PI = 11+15.000
EL = 99.697 m
VC = 90 m
K = 13
$V_{DES.}$ = 50 KPH

DES.DITCH GRADE
-Y3- LT.PI=11+40.000
EL. 96.500

END DITCH GRADE
-Y3- LT.PI=11+64.000
EL. 93.300

SEE SHEETS 6 & 12 FOR PLANS

-Y1- THOMPSON MILL RD./NC 98 BUS. CONNECTOR

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 3.7	ha
DESIGN FREQUENCY	= 25	yrs
DESIGN DISCHARGE	= 0.65	cms
DESIGN HW ELEVATION	= 97.14	m
100 YEAR DISCHARGE	= 0.79	cms
100 YEAR HW ELEVATION	= 97.23	m
OVERTOPPING FREQUENCY	= +500	yrs
OVERTOPPING DISCHARGE	= +1.3	cms
OVERTOPPING ELEVATION	= +99.8	m

PI = 11+20.000
EL = 102.954 m
VC = 100 m
K = 43
$V_{DES.}$ = 80 KPH

PI = 13+20.000
EL = 106.652 m
VC = 230 m
K = 70
$V_{DES.}$ = 80 KPH
GRADE AHEAD = -1.4400%

BEGIN GRADE
-Y1- STA. 10+03.641
EL. 99.997

PI = 10+40.000
EL = 99.610 m
VC = 60 m
K = 11

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 2.0	ha
DESIGN FREQUENCY	= 25	yrs
DESIGN DISCHARGE	= 0.43	cms
DESIGN HW ELEVATION	= 103.18	m
100 YEAR DISCHARGE	= 0.50	cms
100 YEAR HW ELEVATION	= 103.37	m
OVERTOPPING FREQUENCY	= +500	yrs
OVERTOPPING DISCHARGE	= +0.83	cms
OVERTOPPING ELEVATION	= +104.4	m

SEE SHEET 12 FOR PLANS

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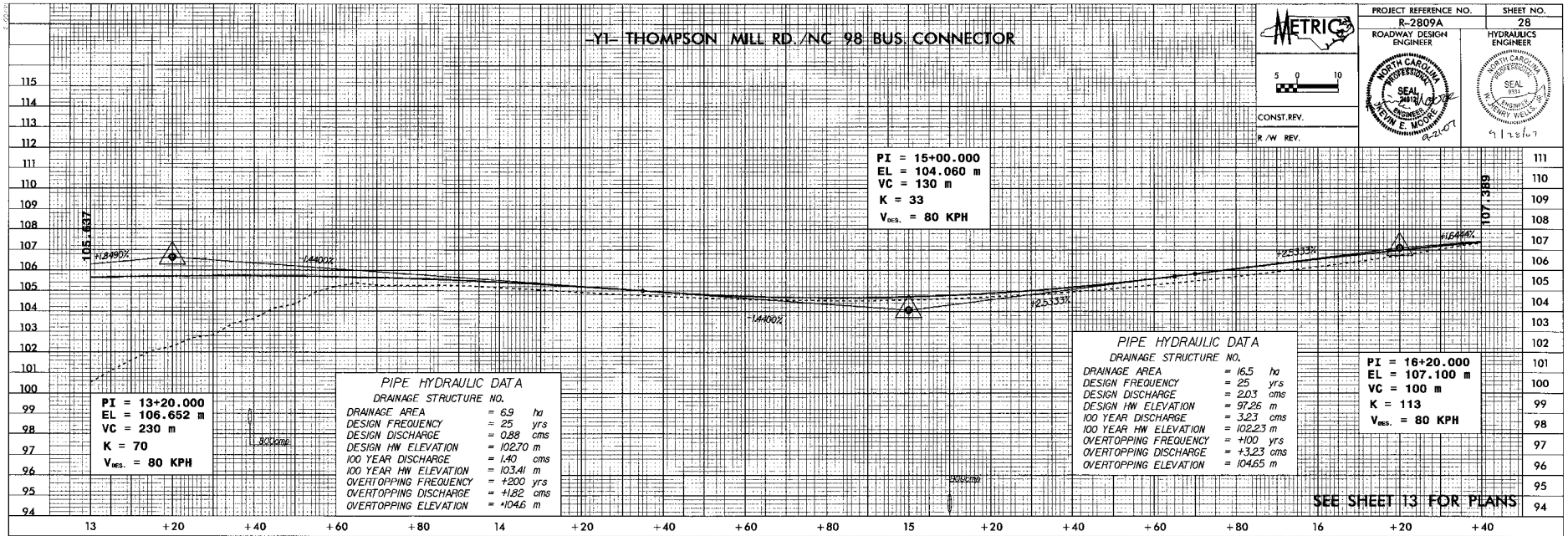
PROJECT REFERENCE NO.	SHEET NO.
R-2809A	28

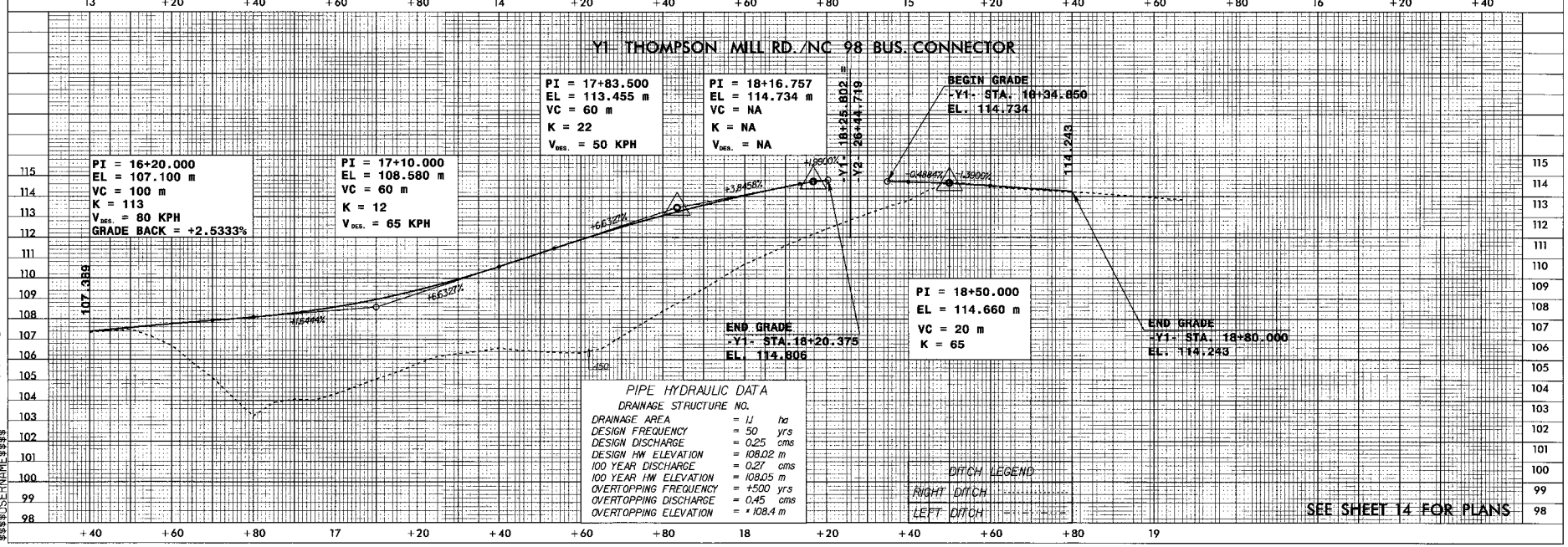
ROADWAY DESIGN ENGINEER — HYDRAULICS ENGINEER

METRIC

CONST. REV.

R/W REV.





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PROJECT REFERENCE NO.	SHEET NO.
R-2809A	29

ROADWAY DESIGN ENGINEER — HYDRAULICS ENGINEER

METRIC

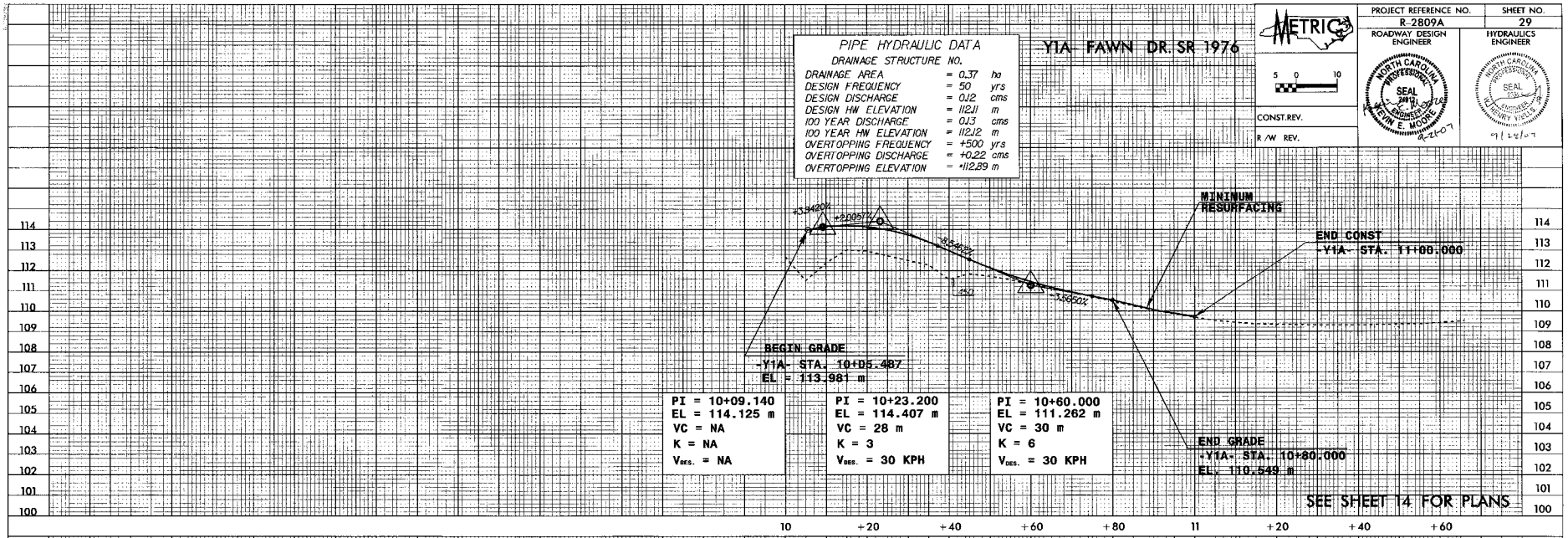
CONST.REV.

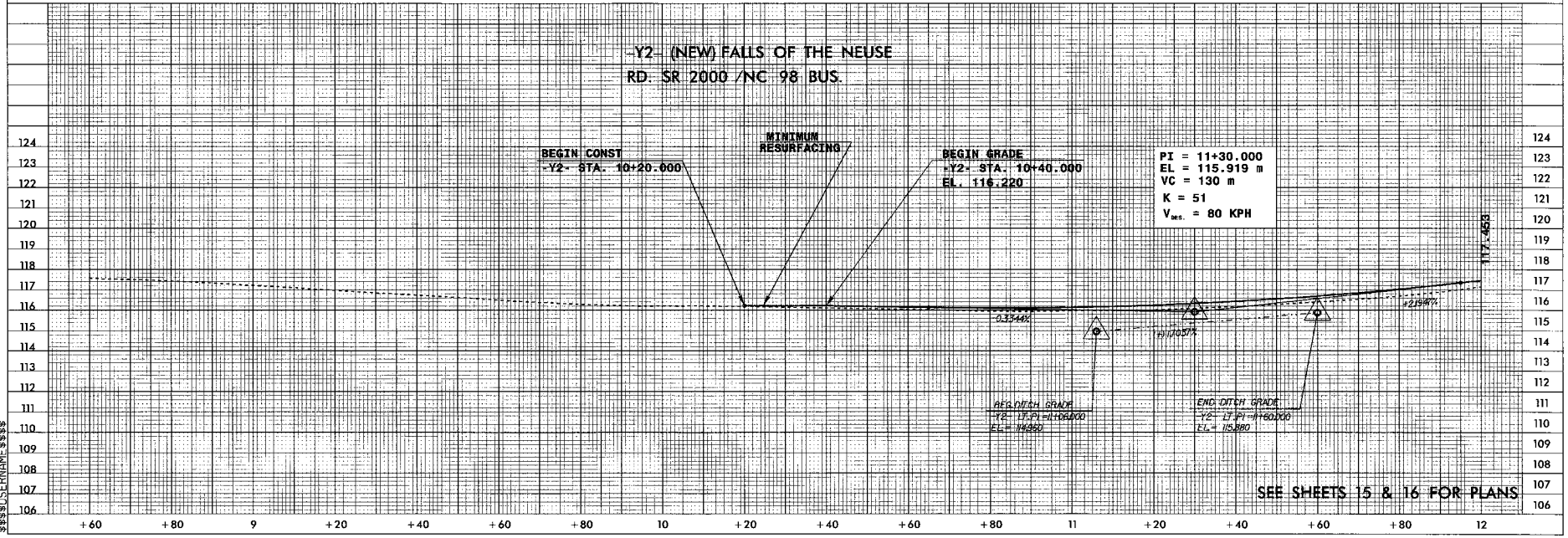
R/W REV.

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 0.37	ha
DESIGN FREQUENCY	= 50	yrs
DESIGN DISCHARGE	= 0.12	cms
DESIGN HW ELEVATION	= 112.11	m
100 YEAR DISCHARGE	= 0.13	cms
100 YEAR HW ELEVATION	= 112.12	m
OVERTOPPING FREQUENCY	= +500	yrs
OVERTOPPING DISCHARGE	= +0.22	cms
OVERTOPPING ELEVATION	= +112.89	m





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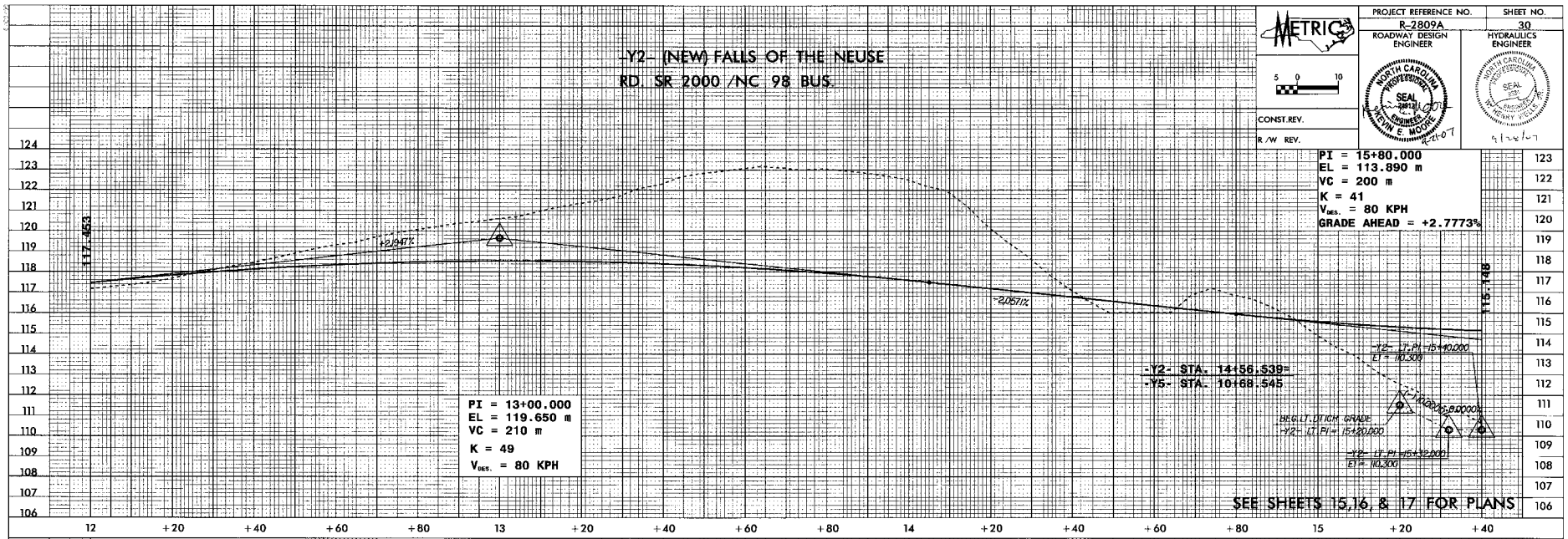
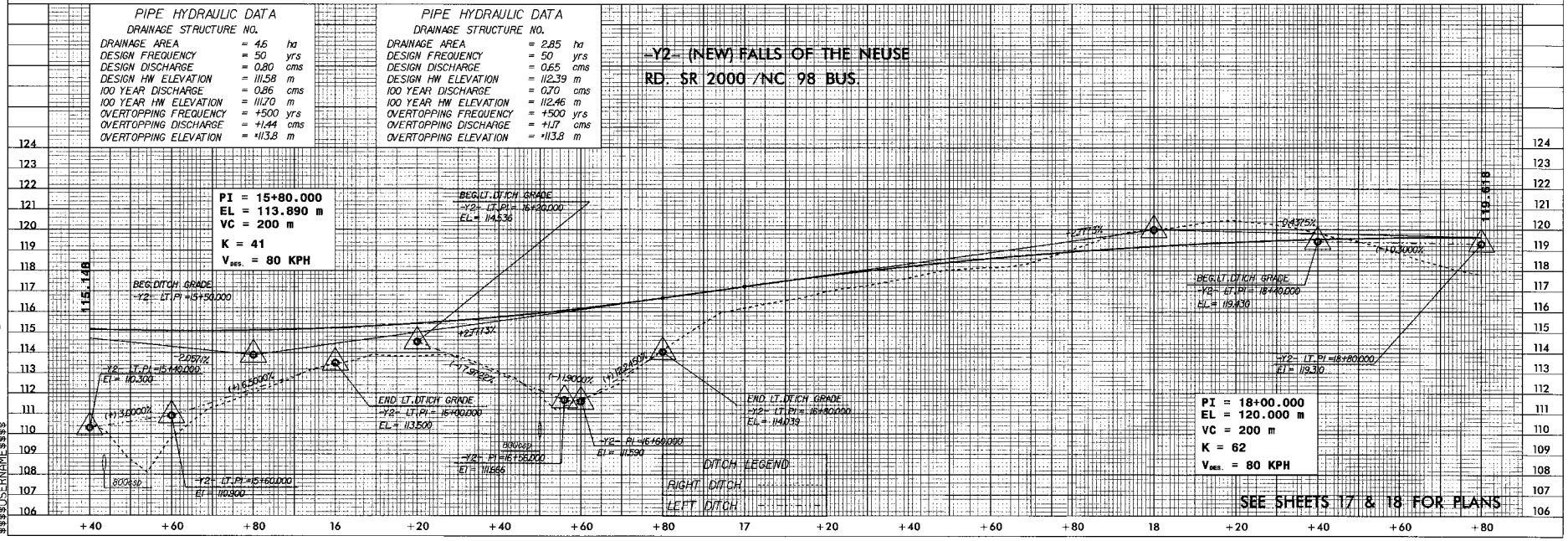
PROJECT REFERENCE NO.	SHEET NO.
R-2809A	30
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

CONST.REV.

R/W REV.





PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 4.6	ha
DESIGN FREQUENCY	= 50	yrs
DESIGN DISCHARGE	= 0.80	cms
DESIGN HW ELEVATION	= 111.58	m
100 YEAR DISCHARGE	= 0.86	cms
100 YEAR HW ELEVATION	= 111.70	m
OVERTOPPING FREQUENCY	= +500	yrs
OVERTOPPING DISCHARGE	= +1.44	cms
OVERTOPPING ELEVATION	= +113.8	m

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 2.85	ha
DESIGN FREQUENCY	= 50	yrs
DESIGN DISCHARGE	= 0.65	cms
DESIGN HW ELEVATION	= 112.39	m
100 YEAR DISCHARGE	= 0.70	cms
100 YEAR HW ELEVATION	= 112.46	m
OVERTOPPING FREQUENCY	= +500	yrs
OVERTOPPING DISCHARGE	= +1.17	cms
OVERTOPPING ELEVATION	= +113.8	m

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PROJECT REFERENCE NO.	SHEET NO.
R-2809A	31
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

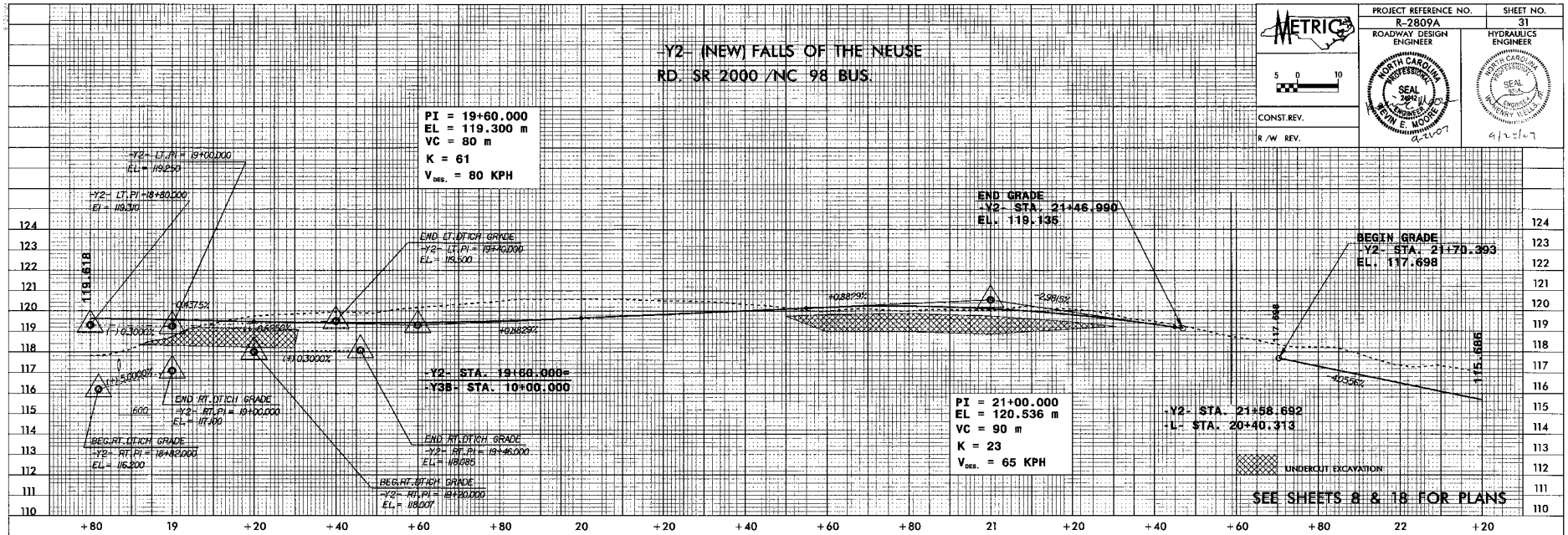
5 0 10

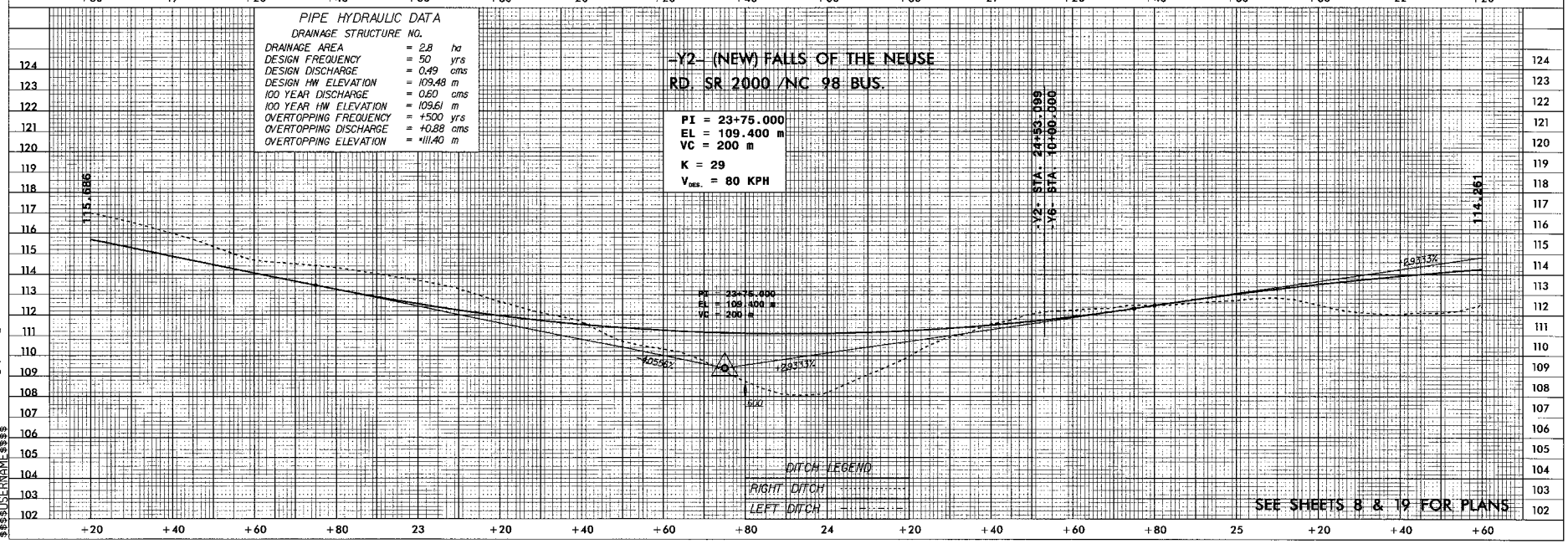
CONST.REV.

R/W REV.

NORTH CAROLINA PROFESSIONAL SEAL 24842 ENGINEER KEVIN E. MOORE 9-21-07

NORTH CAROLINA PROFESSIONAL SEAL 18135 ENGINEER MATTHEW D. ELLIS 9/12/07





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PROJECT REFERENCE NO.	SHEET NO.
R-2809A	32

ROADWAY DESIGN ENGINEER

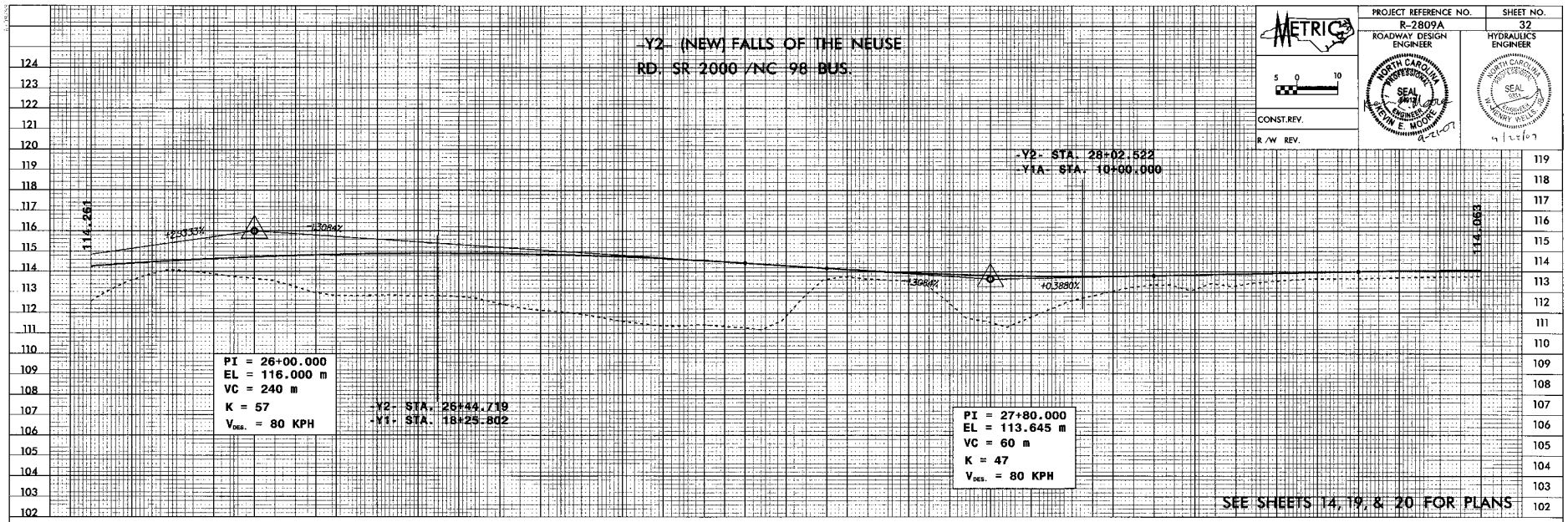
HYDRAULICS ENGINEER

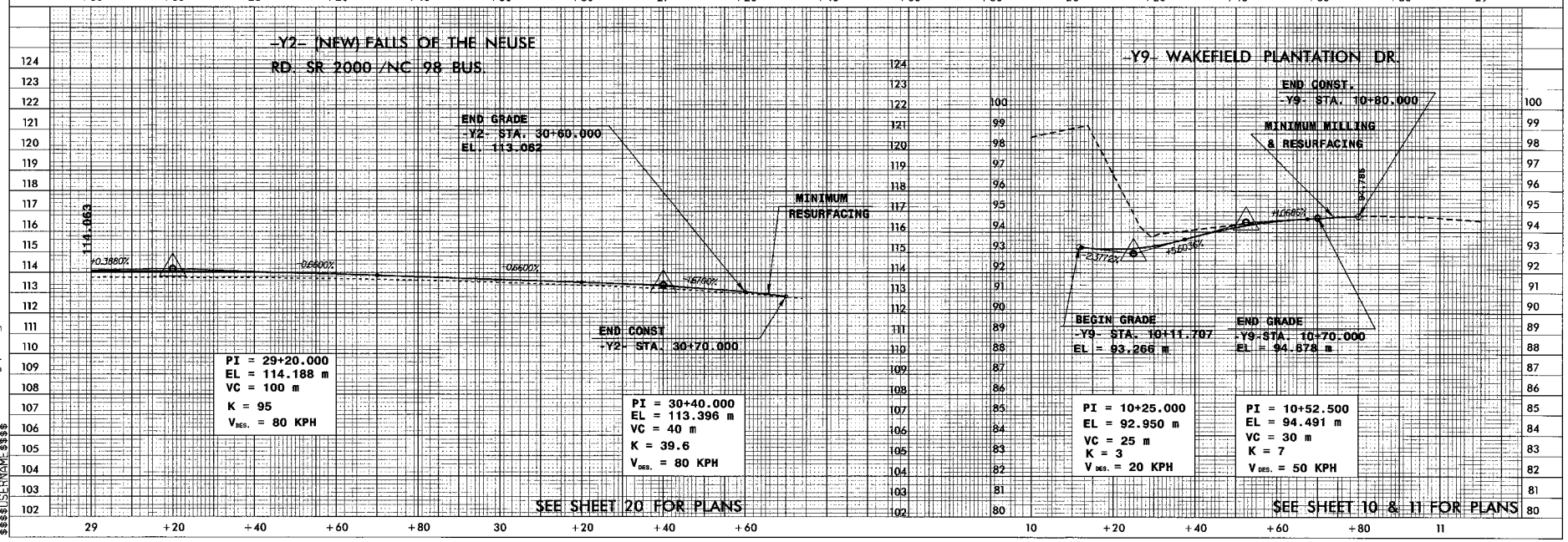
METRIC

5 0 10

CONST.REV.

R /W REV.





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PROJECT REFERENCE NO.	SHEET NO.
R-2809A	33

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

METRIC

5 0 10

CONST.REV.

R/W REV.

-Y5- (OLD) FALLS OF THE NEUSE RD. SR 2000

PI = 10+50.000
EL = 116.050 m
VC = 20 m
K = 7
$V_{DES.}$ = 30 KPH

PI = 11+20.000
EL = 115.270 m
VC = 90 m
K = 11
$V_{DES.}$ = 30 KPH

PI = 12+20.000
EL = 121.250 m
VC = 80 m
K = 18
$V_{DES.}$ = 30 KPH

MINIMUM RESURFACING

BEGIN GRADE
-Y5- STA. 10+40.000
EL. 116.142

END GRADE
PI = 10+63.145
EL = 116.430 m

BEGIN GRADE
-Y5- STA. 10+73.945
EL. 116.322 m

END GRADE
-Y5- STA. 12+60.000
EL. 121.830

END CONST
-Y5- STA. 12+70.000

-0.920% -0.2693% -0.2242% +1.4500% +5.5800%

-Y5- 10+68.555
-Y12- 14+56.555

UNDERCUT EXCAVATION

SEE SHEET 17 FOR PLANS

-Y3B- OLD NC 98 SR 1967

BEGIN GRADE
-Y3B- STA. 10+13.800
EL. 120.122

BEG.LT.DITCH GRADE
-Y3B- LT.PI = 10+80.000
EL = 121.865

PI = 10+75.000
EL = 123.182 m
VC = 60 m
K = 10
$V_{DES.}$ = 50 KPH

-Y3B- LT.PI = 10+90.000
EL = 121.970

PI = 11+22.000
EL = 122.751 m
VC = 34 m
K = 63
$V_{DES.}$ = 130 KPH

END LT.DITCH GRADE
-Y3B- LT.PI = 11+30.000
EL = 122.094

END GRADE
-Y3B- STA. 11+40.000
EL. 122.683

MINIMUM RESURFACING

END CONST
-Y3B- STA. 11+60.000

119.432

+5.0000% -0.9170% (+) 0.3100% (+) 1.0500% (+) 0.3750% (+) 1.0000% (+) 3.3333% -0.3778%

-Y3B- 10+50.000
-Y4- 10+00.000

BEGIN RT.DITCH GRADE
-Y3B- RT.PI = 10+70.000
EL = 120.287

-Y3B- RT.PI = 11+00.000
EL = 120.400

-Y3B- RT.PI = 11+40.000
EL = 120.560

END RT.DITCH GRADE
-Y3B- RT.PI = 11+40.000
EL = 121.500

DITCH LEGEND
RIGHT DITCH
LEFT DITCH

SEE SHEET 18 FOR PLANS

-Y4- THOMPSON MILL RD. SR 1923

BEGIN GRADE
-Y4- STA. 10+04.500
EL. 122.099

PI = 10+50.000
EL = 121.770 m
VC = 18 m
K = 5
$V_{DES.}$ = 30 KPH

PI = 10+25.000
EL = 122.919 m
VC = 18 m
K = 2
$V_{DES.}$ = 30 KPH

END GRADE
-Y4- STA. 10+60.000
EL. 121.690

MINIMUM RESURFACING

+4.0000% -4.5960% (-) 0.3333% -0.8000%

BEG.LT.DITCH GRADE
-Y4- LT.PI = 10+20.000
EL = 120.200

END LT.DITCH GRADE
-Y4- LT.PI = 10+50.000
EL = 120.400

END CONST
-Y4- STA. 10+80.000

SEE SHEET 18 FOR PLANS

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