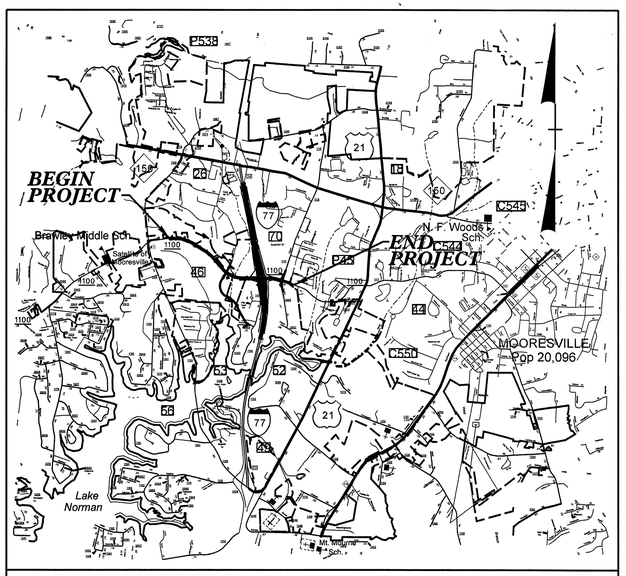
TIP PROJECT: R-3833B

CONTRACT: C202068

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

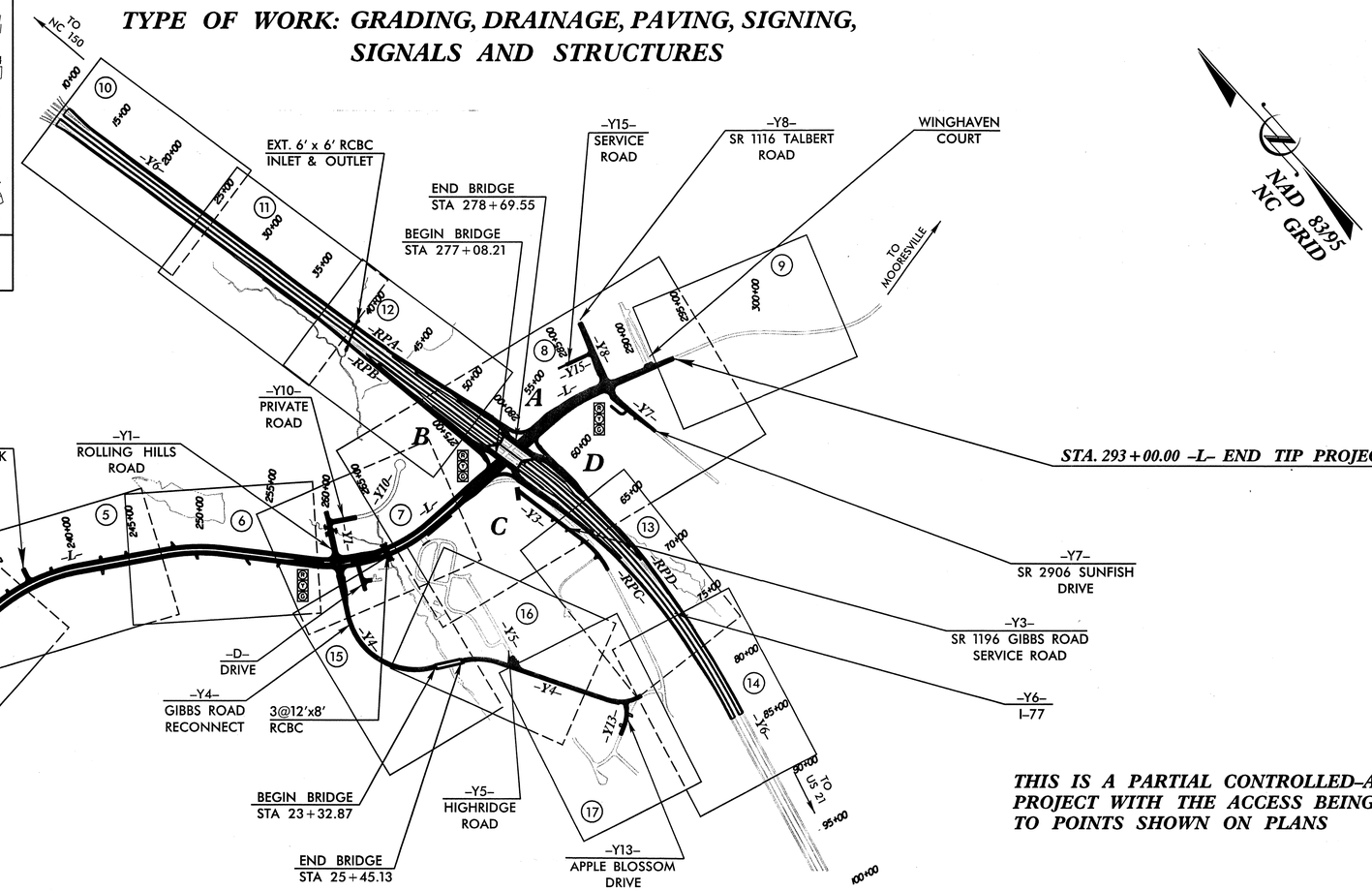
IREDELL COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-3833B	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34554.1.1	STP-150(11)	P.E.
34554.2.3	STP-1100(20)	R/W, UTL
34554.3.ST1	STM-1100(24)	CONST.

LOCATION: SR 1100 (BRAWLEY SCHOOL ROAD) FROM EAST OF SR 1109 (WILLIAMSON ROAD) TO EAST OF WINGHAVEN COURT

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



DESIGN EXCEPTION

SAG VERTICAL CURVE (K-VALUE & VERTICAL SSD)

PROPOSED SIGNAL

NCDOT CONTACT: B. DOUG TAYLOR, P.E.

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

GRAPHIC SCALES

50 25 0 50 100 — PLANS

50 25 0 50 100 — PROFILE (HORIZONTAL)

10 5 0 10 20 — PROFILE (VERTICAL)

DESIGN DATA

ADT 2009 = 24,880
ADT 2029 = 33,790
DHV = 9 %
D = 60 %
T = 9 % *
V = 50 MPH

* (TTST 3% + DUAL 6%)

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-3833B = 1.166 MI

LENGTH STRUCTURES TIP PROJECT R-3833B = 0.037 MI

TOTAL LENGTH OF TIP PROJECT R-3833B = 1.203 MI

Prepared for NCDOT In the Office of:
MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MAY 19, 2006

LETTING DATE: OCTOBER 20, 2009

TIM R. REID, P.E.
PROJECT ENGINEER

TRENT E. HUFFMAN, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
SDG
Sungate Design Group, P.A.
Engineering - Landscape Architecture - Environmental
915-A Jones Franklin Rd.
Raleigh, N.C. 27606
P.E.
SIGNATURE: 7/16/09
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS, JR.

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SIGNATURE: J. R. Reid 7/16/09
NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. REID

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

7/15/2009
R:\Roadway\Proj\r3833b_rdy_tsh.dgn
thuffman

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	1-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID 8/10/09

MOFFATT & NICHOL
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SHEET NUMBER	INDEX OF SHEETS
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C THRU 1-E	SURVEY CONTROL SHEETS
1-F	CENTERLINE COORDINATE SHEETS
2 THRU 2-E	PAVEMENT SCHEDULE, TYPICAL SECTIONS, WEDGING DETAILS
2-F	BRIDGE SKETCH DETAILS
2-G THRU 2-L	INTERSECTION DETAILS
2-M	DITCH DETAILS
2-N	PREFORMED SCOUR HOLE AND HAZARDOUS SPILL BASIN DETAILS
2-O	DETAIL OF OUTLET CONTROL STRUCTURE
2-P	DETAIL OF REBAR TRASH RACK
2-Q THRU 2-S	MEDIAN CROSS OVER DETOUR PLAN AND PROFILE SHEETS
2-T THRU 2-AE	STANDARD SHORING DETAILS
2-AF	DETAIL FOR ANCHORAGE OF FRAMES
2-AG	CONVERT DROP INLET OR CATCH BASIN TO JUNCTION BOX
2-AH	REINFORCED CONCRETE ENDWALL - FOR DOUBLE OR TRIPLE 60" PIPE 60 OR 120 SKEW
2-AI THRU 2-AJ	METHOD OF PIPE INSTALLATION
3 (3 SHEETS)	SUMMARY OF QUANTITIES
3-A THRU 3-J	DRAINAGE SUMMARY
3-K	GUARDRAIL SUMMARY
3-L	ASPHALT PAVEMENT REMOVAL SUMMARY, SUMMARY OF BREAKING EXISTING ASPHALT PAVEMENT, SHOULDER BERM GUTTER SUMMARY AND EXPRESSWAY GUTTER SUMMARY
3-M	EARTHWORK SUMMARY
3-N	PARCEL INDEX SHEETS
4 THRU 17	PLAN SHEETS
18 THRU 35	PROFILE SHEETS
TCP-1 THRU TCP-27	TRAFFIC CONTROL PLANS
PM-1 THRU PM-10	PAVEMENT MARKING PLANS
E-1 THRU E-4	ELECTRICAL / LIGTHING PLANS
EC-1 THRU EC-32	EROSION CONTROL PLANS
RF-1	REFORESTATION DETAIL
SIGN-1 THRU SIGN-33	SIGNING PLANS
SIG-1 THUR SIG-35	SIGNAL PLANS
UC-1 THRU UC-15	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-9	UTILITY BY OTHERS PLANS
X	INDEX OF CROSS SECTIONS
X-A THRU X-C	CROSS SECTION SUMMARY SHEETS
X-1 THRU X-136	CROSS SECTIONS
C-1 THRU C-10	CULVERT PLANS
S-1 THRU S-107	STRUCTURE PLANS
W-1 THRU W-7	WALL PLANS

GENERAL NOTES:

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

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 & 225.05, USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01 & 560.02.

SIDE ROADS:

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

BERM DITCHES:

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

UNDERDRAINS:

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

DRIVEWAYS:

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

STREET TURNOUT:

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

GUARDRAIL:

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

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

END BENTS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

Town of Mooresville (Water & Sanitary Sewer)

Duke Energy (Power), Windstream Communication (Telephone)

Time Warner Cable, PSNC Energy

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

RIGHT-OF-WAY MARKERS:

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

WHEELCHAIR RAMPS:

WHEELCHAIR RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS. THE CONSTRUCTION OF ALL WHEELCHAIR RAMPS SHALL BE IN ACCORDANCE WITH STD. NO. 848.05

2006 ROADWAY ENGLISH STANDARD DRAWINGS

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

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.01	Guide for Grading Subgrade - Interstate and Freeway
225.02	Guide for Grading Subgrade - Secondary and Local
225.03	Deceleration and Acceleration Lanes
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
225.09	Guide for Shoulder and Ditch Transition at Grade Separations
240.01	Guide for Berm Ditch Construction
DIVISION 3 - PIPE CULVERTS	
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.10	Reinforced Bridge Approach Fills
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
560.02	Method of Shoulder Construction - High Side of Superelevated Curve - Method II
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
610.01	Guide for Paving Shoulders Under Bridges - Method I
654.01	Pavement Repairs
665.01	Milled Rumble Strips - Asphalt Pavements
DIVISION 8 - INCIDENTALS	
815.03	Pipe Underdrain and Blind Drain
816.04	Markers for Drainage Structure and Concrete Pad
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.02	Concrete Endwall and Sluice Gate - 15" thru 36" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.21	Reinforced Concrete Endwall - for Single 54" Pipe 90 Skew
838.45	Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40
838.51	Reinforced Brick Endwall - for Single 54" Pipe 90 Skew
838.75	Notes for Reinforced Brick Endwall - Std. Dwg 838.51 thru 838.70
838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.04	Concrete Open Throat Catch Basin - 12" thru 48" Pipe
840.05	Brick Open Throat Catch Basin - 12" thru 48" Pipe
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.24	Frames and Narrow Slot Sag Grates
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.28	Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
840.51	Brick Manhole - 12" thru 36" Pipe
840.53	Precast Manhole with Masonry Base - 12" thru 42" Pipe
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
846.02	Drop Inlet Installation in Expressway Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
848.01	Concrete Sidewalk
848.03	Driveway Turnout - Drop Curb Type
848.04	Street Turnout
848.05	Wheelchair Ramp - Curb Cut
850.01	Concrete Paved Ditches
850.10	Guide for Berm Drainage Outlet - 15" and 18" Pipe
850.11	Guide for Berm Drainage Outlet - 24" and 30" Pipe
852.01	Concrete Islands
852.05	Median Curb for Catch Basin - for Use with 1'-6" Curb and Gutter
852.06	Method for Placement of Drop Inlets in Concrete Islands
857.01	Precast Reinforced Concrete Barrier - 41" Single Faced
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
866.01	Chain Link Fence - 4', 5' and 6' High Fence
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

8/10/2009
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thuffman

10/25/05

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	1-B

Note: Not to Scale

S.U.E. = Subsurface Utility Engineering

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream — JS
- Buffer Zone 1 — BZ 1
- Buffer Zone 2 — BZ 2
- Flow Arrow
- Disappearing Stream
- Spring
- Swamp Marsh
- 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
- Curb Cut for Future Wheel Chair Ramp — CCFR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

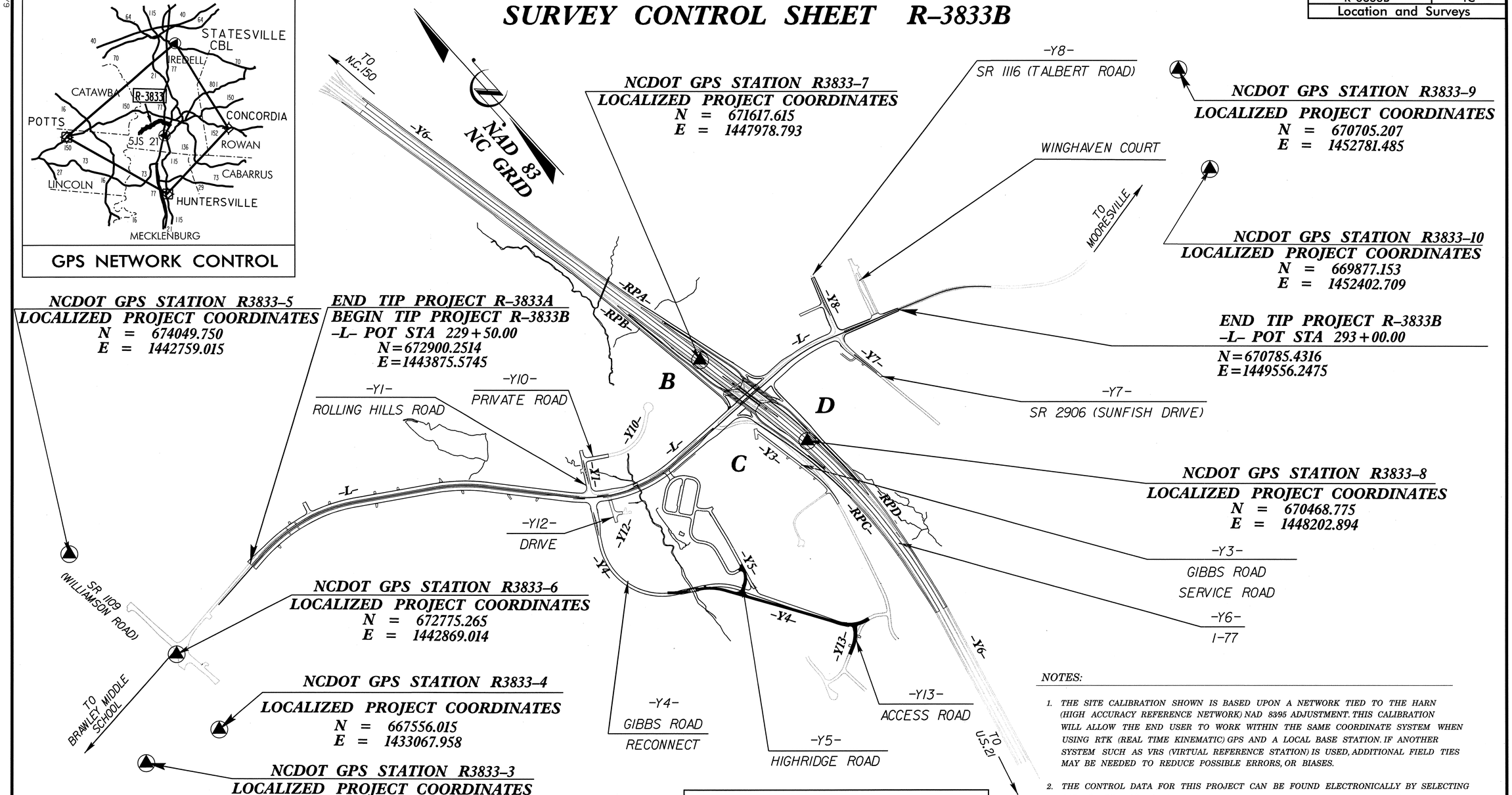
MISCELLANEOUS:

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

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	1C
Location and Surveys	

SURVEY CONTROL SHEET R-3833B

GPS NETWORK CONTROL



NCDOT GPS STATION R3833-7
LOCALIZED PROJECT COORDINATES
N = 671617.615
E = 1447978.793

NCDOT GPS STATION R3833-9
LOCALIZED PROJECT COORDINATES
N = 670705.207
E = 1452781.485

NCDOT GPS STATION R3833-10
LOCALIZED PROJECT COORDINATES
N = 669877.153
E = 1452402.709

END TIP PROJECT R-3833B
-L- POT STA 293+00.00
N=670785.4316
E=1449556.2475

NCDOT GPS STATION R3833-5
LOCALIZED PROJECT COORDINATES
N = 674049.750
E = 1442759.015

END TIP PROJECT R-3833A
BEGIN TIP PROJECT R-3833B
-L- POT STA 229+50.00
N=672900.2514
E=1443875.5745

NCDOT GPS STATION R3833-8
LOCALIZED PROJECT COORDINATES
N = 670468.775
E = 1448202.894

NCDOT GPS STATION R3833-6
LOCALIZED PROJECT COORDINATES
N = 672775.265
E = 1442869.014

NCDOT GPS STATION R3833-4
LOCALIZED PROJECT COORDINATES
N = 667556.015
E = 1433067.958

NCDOT GPS STATION R3833-3
LOCALIZED PROJECT COORDINATES
N = 668158.121
E = 1432055.775

NCDOT GPS STATION R3833-2
LOCALIZED PROJECT COORDINATES
N = 661778.872
E = 1427521.006

NCDOT GPS STATION R3833-1
LOCALIZED PROJECT COORDINATES
N = 661098.014
E = 1426587.503

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "SCHOOL"
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF
NORTHING: 672252.7040(ft) EASTING: 1442140.3605(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999851370
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "SCHOOL" TO -L- STATION 229+50.00 IS
N 69°32'08" E 1852.10'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

NOTES:

1. THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 8395 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.

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

THE FILES TO BE FOUND ARE AS FOLLOWS:
R3833B_LS_GPSCALIB_080924.HTML
R3833B_LS_WGS84_080924.TXT
R3833B_LS_LOCAL_080924.TXT
R3833B_LS_CONTROL_080924.TXT

THE WGS84 AND LOCAL FILES ARE COMMA DELIMITED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

▲ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

6/2/99

11/24/2008
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PROJECT REFERENCE NO.	SHEET NO.
R-3833B	1 D
Location and Surveys	

SURVEY CONTROL SHEET R-3833B

GPS CALIBRATION REPORT

PROJECT : R3833RTK

TIP NUMBER R-3833B

USER NAME	TBOVENDER	DATE & TIME	9:43:22 AM 10/20/2005
COORDINATE SYSTEM	US STATE PLANE 1983	ZONE	NORTH CAROLINA 3200
HORIZONTAL DATUM	NAD 1983 (CONUS)		
VERTICAL DATUM		GEOID MODEL	GEOID03 (CONUS) NC SUB GRID
COORDINATE UNITS	US SURVEY FEET		
DISTANCE UNITS	US SURVEY FEET		
HEIGHT UNITS	US SURVEY FEET		

LOCAL SITE INFORMATION
LOCALIZED AROUND

LATITUDE	35°34'57.49760"N
LONGITUDE	80°52'34.83502"W
SITE SCALE FACTOR	1.00014865
HEIGHT	867.570SFT

THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION USES A LOCALIZED COORDINATE SYSTEM WHICH IS VERY SIMILAR TO NORTH CAROLINA ZONE 3200 FROM WHICH IT IS DERIVED.
PLEASE TAKE CARE IN UTILIZING THESE COORDINATES TO ELIMINATE CONFUSION OF THE TWO SYSTEMS.
THIS FILE IS TO AID IN THE USE OF REAL TIME KINEMATIC (RTK) GPS DURING CONSTRUCTION LAYOUT.

DATUM TRANSFORMATION PARAMETERS

DATUM TRANSFORMATION COMPUTATION NOT REQUESTED

UPDATED DEFAULT PROJECTION (TRANSVERSE MERCATOR) DEFINITION

UPDATED DEFAULT PROJECTION NOT REQUESTED

HORIZONTAL ADJUSTMENT PARAMETERS

NORTHING COORDINATE OF ROTATION CENTER	667348.563SFT
EASTING COORDINATE OF ROTATION CENTER	1442208.222SFT
ROTATION ABOUT THE CENTER POINT	0°00'00"
TRANSLATION NORTH	-0.729SFT
TRANSLATION EAST	0.011SFT
SCALE FACTOR	1.00014872

VERTICAL ADJUSTMENT PARAMETERS

NORTHING COORDINATE OF ORIGIN POINT	661098.014SFT
EASTING COORDINATE OF ORIGIN POINT	1426587.503SFT
VERTICAL SEPARATION AT ORIGIN	0.031SFT
SLOPE NORTH	1.892PPM
SLOPE EAST	-1.548PPM

GEOID MODEL DEFINITION

GEOID03 (CONUS) NC SUB GRID

RESIDUAL DIFFERENCES BETWEEN GPS (WGS84) AND LOCAL COORDINATES

SUMMARY

	MAXIMUM ERROR	ROOT MEAN SQUARE ERROR	POINT
HORIZONTAL	0.003SFT	0.000	R3833-9_WGS84
VERTICAL	0.069SFT	0.007	5 JS 21_WGS84
THREE-DIMENSIONAL	0.069SFT	0.007	5 JS 21_WGS84

POINT RESIDUALS

WGS84 COORDINATES	CALCULATED POINT FOR DISPLAY ONLY	LOCAL COORDINATES
POINT R3833-1_WGS84	NORTHING 661098.014SFT	POINT R3833-1_LOCAL
LATITUDE 35°33'04.25735"N	EASTING 1426587.503SFT	NORTHING 661098.014SFT
LONGITUDE 80°55'40.45948"W	ELEVATION 838.928SFT	EASTING 1426587.503SFT
HEIGHT 735.911SFT	HORZ ERROR 0.001SFT	ELEVATION 838.939SFT
	VERT ERROR 0.011SFT	UTILIZED HORZ AND VERT
	3D ERROR 0.011SFT	QUALITY SURVEY QUALITY
POINT R3833-2_WGS84	NORTHING 661778.872SFT	POINT R3833-2_LOCAL
LATITUDE 35°33'11.16854"N	EASTING 1427521.006SFT	NORTHING 661778.872SFT
LONGITUDE 80°55'29.32477"W	ELEVATION 835.605SFT	EASTING 1427521.006SFT
HEIGHT 732.584SFT	HORZ ERROR 0.000SFT	ELEVATION 835.616SFT
	VERT ERROR 0.011SFT	UTILIZED HORZ AND VERT
	3D ERROR 0.011SFT	QUALITY SURVEY QUALITY
POINT R3833-3_WGS84	NORTHING 668158.121SFT	POINT R3833-3_LOCAL
LATITUDE 35°34'15.11015"N	EASTING 1432055.774SFT	NORTHING 668158.121SFT
LONGITUDE 80°54'35.94241"W	ELEVATION 839.839SFT	EASTING 1432055.775SFT
HEIGHT 736.713SFT	HORZ ERROR 0.001SFT	ELEVATION 839.831SFT
	VERT ERROR 0.008SFT	UTILIZED HORZ AND VERT
	3D ERROR 0.008SFT	QUALITY SURVEY QUALITY
POINT R3833-4_WGS84	NORTHING 667556.014SFT	POINT R3833-4_LOCAL
LATITUDE 35°34'09.34916"N	EASTING 1433067.959SFT	NORTHING 667556.015SFT
LONGITUDE 80°54'23.55302"W	ELEVATION 850.881SFT	EASTING 1433067.958SFT
HEIGHT 747.787SFT	HORZ ERROR 0.001SFT	ELEVATION 850.875SFT
	VERT ERROR 0.006SFT	UTILIZED HORZ AND VERT
	3D ERROR 0.007SFT	QUALITY SURVEY QUALITY
POINT R3833-5_WGS84	NORTHING 674049.749SFT	POINT R3833-5_LOCAL
LATITUDE 35°35'15.38167"N	EASTING 1442759.016SFT	NORTHING 674049.750SFT
LONGITUDE 80°52'27.75769"W	ELEVATION 863.645SFT	EASTING 1442759.015SFT
HEIGHT 760.506SFT	HORZ ERROR 0.001SFT	ELEVATION 863.627SFT
	VERT ERROR 0.018SFT	UTILIZED HORZ AND VERT
	3D ERROR 0.018SFT	QUALITY SURVEY QUALITY
POINT R3833-6_WGS84	NORTHING 672775.265SFT	POINT R3833-6_LOCAL
LATITUDE 35°35'02.80060"N	EASTING 1442869.015SFT	NORTHING 672775.265SFT
LONGITUDE 80°52'26.13495"W	ELEVATION 860.186SFT	EASTING 1442869.014SFT
HEIGHT 757.085SFT	HORZ ERROR 0.001SFT	ELEVATION 860.176SFT
	VERT ERROR 0.010SFT	UTILIZED HORZ AND VERT
	3D ERROR 0.010SFT	QUALITY SURVEY QUALITY
POINT R3833-7_WGS84	NORTHING 671617.614SFT	POINT R3833-7_LOCAL
LATITUDE 35°34'52.30361"N	EASTING 1447978.791SFT	NORTHING 671617.615SFT
LONGITUDE 80°51'24.02377"W	ELEVATION 807.532SFT	EASTING 1447978.793SFT
HEIGHT 704.525SFT	HORZ ERROR 0.002SFT	ELEVATION 807.532SFT
	VERT ERROR 0.000SFT	UTILIZED HORZ AND VERT
	3D ERROR 0.002SFT	QUALITY SURVEY QUALITY
POINT R3833-8_WGS84	NORTHING 670468.775SFT	POINT R3833-8_LOCAL
LATITUDE 35°34'40.98571"N	EASTING 1448202.894SFT	NORTHING 670468.775SFT
LONGITUDE 80°51'21.05133"W	ELEVATION 817.818SFT	EASTING 1448202.894SFT
HEIGHT 714.847SFT	HORZ ERROR 0.000SFT	ELEVATION 817.824SFT
	VERT ERROR 0.006SFT	UTILIZED HORZ AND VERT
	3D ERROR 0.006SFT	QUALITY SURVEY QUALITY
POINT R3833-9_WGS84	NORTHING 670705.209SFT	POINT R3833-9_LOCAL
LATITUDE 35°34'44.16643"N	EASTING 1452781.487SFT	NORTHING 670705.207SFT
LONGITUDE 80°50'25.68877"W	ELEVATION 847.000SFT	EASTING 1452781.485SFT
HEIGHT 744.077SFT	HORZ ERROR 0.003SFT	ELEVATION 847.010SFT
	VERT ERROR 0.010SFT	UTILIZED HORZ AND VERT
	3D ERROR 0.010SFT	QUALITY SURVEY QUALITY
POINT R3833-10_WGS84	NORTHING 669877.153SFT	POINT R3833-10_LOCAL
LATITUDE 35°34'35.90939"N	EASTING 1452402.709SFT	NORTHING 669877.153SFT
LONGITUDE 80°50'30.08729"W	ELEVATION 839.437SFT	EASTING 1452402.709SFT
HEIGHT 736.534SFT	HORZ ERROR 0.000SFT	ELEVATION 839.451SFT
	VERT ERROR 0.014SFT	UTILIZED HORZ AND VERT
	3D ERROR 0.014SFT	QUALITY SURVEY QUALITY
POINT EXIT33-3_WGS84	NORTHING 662759.145SFT	POINT EXIT33-3_LOCAL
LATITUDE 35°33'24.60094"N	EASTING 1447369.024SFT	NORTHING 662759.144SFT
LONGITUDE 80°51'29.39697"W	ELEVATION 816.771SFT	EASTING 1447369.025SFT
HEIGHT 714.023SFT	HORZ ERROR 0.001SFT	ELEVATION 816.803SFT
	VERT ERROR 0.032SFT	UTILIZED HORZ AND VERT
	3D ERROR 0.032SFT	QUALITY SURVEY QUALITY
POINT EXIT33-4_WGS84	NORTHING 664031.208SFT	POINT EXIT33-4_LOCAL
LATITUDE 35°33'37.16007"N	EASTING 1447268.147SFT	NORTHING 664031.207SFT
LONGITUDE 80°51'30.90579"W	ELEVATION 798.285SFT	EASTING 1447268.147SFT
HEIGHT 695.494SFT	HORZ ERROR 0.001SFT	ELEVATION 798.313SFT
	VERT ERROR 0.028SFT	UTILIZED HORZ AND VERT
	3D ERROR 0.028SFT	QUALITY SURVEY QUALITY
POINT 5 JS 21_WGS84	NORTHING 660646.707SFT	POINT 5 JS 21_LOCAL
LATITUDE 35°33'03.80154"N	EASTING 1447843.701SFT	NORTHING 660646.708SFT
LONGITUDE 80°51'23.17533"W	ELEVATION 867.640SFT	EASTING 1447843.701SFT
HEIGHT 764.965SFT	HORZ ERROR 0.001SFT	ELEVATION 867.571SFT
	VERT ERROR 0.069SFT	UTILIZED HORZ AND VERT
	3D ERROR 0.069SFT	QUALITY SURVEY QUALITY

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "SCHOOL"
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF
NORTHING: 672252.7040(ft) EASTING: 1442140.3605(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999851370
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "SCHOOL" TO -L- STATION 229+50.00 IS
N 69°32'08" E 1852.10'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTES:

1. *THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 8395 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.*

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

THE FILES TO BE FOUND ARE AS FOLLOWS:
R3833B_LS_GPSCALIB_080924.HTML
R3833B_LS_WGS84_080924.TXT
R3833B_LS_LOCAL_080924.TXT
R3833B_LS_CONTROL_080924.TXT

THE WGS84 AND LOCAL FILES ARE COMMA DELIMITED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

▲ *INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.*
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	1 E
Location and Surveys	

SURVEY CONTROL SHEET R-3833B

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
6	GPS-6	672775.2650	1442869.0140	860.17	OUTSIDE PROJECT LIMITS	
34	BL-34	672934.7790	1443780.2760	861.66	228+59.26	45.18 LT
35	BL-35	672895.8610	1444643.5940	848.78	237+11.32	50.46 LT
36	BL-36	672508.2460	1445332.6470	841.51	244+92.61	46.64 LT
37	BL-37	672127.1890	1445842.6270	818.81	251+20.35	42.88 LT
38	BL-38	671523.5360	1446271.5830	802.25	258+55.42	29.51 RT
39	BL-39	671170.4790	1446855.4840	770.57	265+41.84	12.67 LT
40	BL-40	671101.8330	1447641.9000	824.45	273+38.59	7.59 LT
41	BL-41	671139.6880	1448229.9970	837.93	279+26.32	50.86 LT
42	BL-42	671010.8800	1449001.8250	846.58	287+02.16	28.22 LT
43	BL-43	670732.6860	1449642.8780	825.41	293+99.24	20.93 LT
44	BL-44	670547.0750	1450153.1170	800.17	299+40.25	22.49 LT

BY20

POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
73	BY20-73	671669.7790	1446624.5730	773.35	10+80.97	17.51 RT
72	BY20-73	671422.5620	1446526.7430	779.92	13+43.81	22.55 LT
138	BL-38	671523.5360	1446271.5830	802.25	13+85.16	248.73 RT

BY21

POINT	DESC.	NORTH	EAST	ELEVATION	Y10 STATION	OFFSET
74	BY21-74	671447.5300	1446986.6750	772.87	14+02.90	19.82 RT
111	BY20-73	671669.7790	1446624.5730	773.35	OUTSIDE PROJECT LIMITS	

BY22

POINT	DESC.	NORTH	EAST	ELEVATION	Y3 STATION	OFFSET
140	BL-40	671101.8330	1447641.9000	824.45	OUTSIDE PROJECT LIMITS	
75	BY22-75	670787.6120	1448031.8420	832.57	15+05.56	93.59 LT
76	BY22-76	670018.5070	1448075.7200	828.03	22+66.83	21.43 LT
77	BY22-77	668967.4200	1447757.7890	827.69	OUTSIDE PROJECT LIMITS	

BY23

POINT	DESC.	NORTH	EAST	ELEVATION	Y6 STATION	OFFSET
89	BY23-89	674628.9980	1447385.9350	819.36	19+99.41	8.63 RT
78	BY23-78	673465.9120	1447615.3380	802.30	31+84.90	8.43 RT
79	BY23-79	672624.5090	1447725.7100	795.54	40+31.77	62.81 RT
107	GPS-7	671617.6150	1447978.7930	807.53	50+68.60	9.18 RT
99	NOT SET	671129.6454	1448073.9799	UNKNOWN	55+65.76	10.13 RT
108	GPS-8	670468.7750	1448202.8940	817.87	62+38.78	10.80 LT
80	BY23-80	669289.3050	1448207.0380	798.76	74+18.21	9.97 LT
81	BY23-81	668558.1410	1448084.8750	783.58	81+58.84	8.32 LT
90	BY23-90	667590.5100	1447828.1450	772.35	91+59.68	9.83 RT
91	BY23-91	666580.6180	1447585.7730	772.36	101+98.23	3.06 RT

BY24

POINT	DESC.	NORTH	EAST	ELEVATION	Y8 STATION	OFFSET
82	BY24-82	671428.7190	1449151.6550	850.64	10+99.99	19.16 RT
141	BL-42	671010.8800	1449001.8250	846.58	15+43.56	36.07 RT

BY25

POINT	DESC.	NORTH	EAST	ELEVATION	Y7 STATION	OFFSET
142	BL-42	671010.8800	1449001.8250	846.58	OUTSIDE PROJECT LIMITS	
83	BY25-83	670319.3010	1449093.5130	839.64	16+62.99	15.22 LT

BY26

POINT	DESC.	NORTH	EAST	ELEVATION	Y9 STATION	OFFSET
85	BY26-85	671191.4300	1449502.5830	823.01	12+07.26	23.12 LT
84	BY26-84	670887.9120	1449393.1800	836.56	15+29.20	9.08 LT
143	BL-43	671010.8800	1449001.8250	846.58	15+30.58	401.14 RT

BY30

POINT	DESC.	NORTH	EAST	ELEVATION	Y4 STATION	OFFSET
150	BY20-72	671422.5620	1446526.7430	779.92	OUTSIDE PROJECT LIMITS	
151	BY30-97	671187.9011	1446371.4778	776.02	12+04.74	6.68 LT
152	BY30-98	670870.0801	1446209.7355	792.43	15+64.63	8.46 LT
153	BY30-99	670608.7336	1446246.3763	777.56	18+42.99	49.49 LT
154	BY30-100	670374.5968	1446361.8430	759.81	21+29.49	37.73 LT
155	BY30-101	670188.3143	1446569.5150	760.77	24+15.21	0.01 RT
156	BY30-102	669965.4481	1446803.0340	767.45	27+49.11	47.67 RT
157	BY30-103	669707.5051	1446968.1803	786.03	30+64.44	36.64 RT
158	BY30-104	669423.9591	1447123.7293	791.81	33+87.85	37.50 RT
159	BY30-105	669237.6173	1447248.8740	800.09	36+11.46	18.00 RT

****
BM*11 ELEVATION - 830.64'
N 672467 E 1444681
L STATION 239+39 329' RIGHT
RAILROAD SPIKE IN THE ROOT OF A 72"
OAK TREE.
****

****
BM*12 ELEVATION - 785.67'
N 671496 E 1447311
L STATION 270+04 399' LEFT
RAILROAD SPIKE IN THE BASE OF A 48"
TWIN BEECH TREE (328' EAST OF BY21-74).
****

****
BM*13 ELEVATION - 830.71'
N 671391 E 1449557
L STATION 290+99 572' LEFT
RAILROAD SPIKE SET IN THE EDGE OF
PAVEMENT AND GUTTER AT ENTRANCE OF
CUL-DE-SAC, 36' SE OF A MANHOLE.
****

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NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

PROJ. REFERENCE NO.	SHEET NO.
R-3833B	1-F

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CENTERLINE COORDINATE LIST

Point #	Chain	Station	Northing (Y)	Easting (X)
1	Y4	10+00.00	671368.1113	1446468.8723
2	Y4	10+50.00	671324.9223	1446443.6787
3	Y4	11+00.00	671281.7334	1446418.4851
4	Y4	11+50.00	671238.5444	1446393.2916
5	Y4	12+00.00	671195.3555	1446368.0980
6	Y4	12+50.00	671152.1666	1446342.9044
7	Y4	13+00.00	671108.9776	1446317.7109
8	Y4	13+50.00	671065.7887	1446292.5173
9	Y4	14+00.00	671022.5997	1446267.3238
10	Y4	14+50.00	670979.0079	1446242.8508
11	Y4	15+00.00	670933.5301	1446222.1133
12	Y4	15+50.00	670886.3574	1446205.5900
13	Y4	16+00.00	670837.8795	1446193.4175
14	Y4	16+50.00	670788.4967	1446185.6963
15	Y4	17+00.00	670738.6168	1446182.4901
16	Y4	17+50.00	670688.6519	1446183.8254
17	Y4	18+00.00	670639.0145	1446189.6913
18	Y4	18+50.00	670590.1146	1446200.0392
19	Y4	19+00.00	670542.3561	1446214.7837
20	Y4	19+50.00	670496.1333	1446233.8030
21	Y4	20+00.00	670451.8280	1446256.9401
22	Y4	20+50.00	670409.8062	1446284.0038
23	Y4	21+00.00	670370.4149	1446314.7707
24	Y4	21+50.00	670333.9793	1446348.9866
25	Y4	22+00.00	670300.8005	1446386.3690
26	Y4	22+50.00	670271.1524	1446426.6092
27	Y4	23+00.00	670245.2042	1446469.3323
28	Y4	23+50.00	670220.5172	1446512.8128
29	Y4	24+00.00	670195.8302	1446556.2933
30	Y4	24+50.00	670171.1432	1446599.7738
31	Y4	25+00.00	670146.4563	1446643.2543
32	Y4	25+50.00	670121.7693	1446686.7348
33	Y4	26+00.00	670095.6695	1446729.3634
34	Y4	26+50.00	670065.7416	1446769.3944
35	Y4	27+00.00	670032.1955	1446806.4461
36	Y4	27+50.00	669995.3262	1446840.1925
37	Y4	28+00.00	669955.4580	1446870.3370
38	Y4	28+50.00	669912.9413	1446896.6145
39	Y4	29+00.00	669869.1690	1446920.7802
40	Y4	29+50.00	669825.3962	1446944.9452
41	Y4	30+00.00	669781.6234	1446969.1101
42	Y4	30+50.00	669737.8507	1446993.2750
43	Y4	31+00.00	669694.0779	1447017.4399
44	Y4	31+50.00	669650.3051	1447041.6048
45	Y4	32+00.00	669606.5323	1447065.7697
46	Y4	32+50.00	669562.7595	1447089.9346
47	Y4	33+00.00	669518.9867	1447114.0995
48	Y4	33+50.00	669475.2139	1447138.2644
49	Y4	34+00.00	669431.4411	1447162.4293
50	Y4	34+50.00	669387.6683	1447186.5942
51	Y4	35+00.00	669343.8955	1447210.7592
52	Y4	35+50.00	669300.1227	1447234.9241
53	Y4	36+00.00	669256.3500	1447259.0890
54	Y4	36+50.00	669212.5772	1447283.2539
55	Y4	37+00.00	669168.8044	1447307.4188
56	Y4	37+50.00	669125.0316	1447331.5837
57	Y4	38+00.00	669082.2826	1447357.4472
58	Y4	38+50.00	669044.0977	1447389.6391
59	Y4	39+00.00	669011.6785	1447427.6312
60	Y4	39+50.00	668985.8943	1447470.4048
61	Y4	40+00.00	668967.4364	1447516.8129
62	Y4	40+50.00	668956.6726	1447565.5914
63	Y4	41+00.00	668941.5904	1447613.1191
64	Y4	41+50.00	668915.2572	1447655.5021
65	Y4	42+00.00	668885.8263	1447695.9227
66	Y4	42+27.35	668869.7281	1447718.0323
67	Y13	10+00.00	669006.1364	1447435.5851
68	Y13	10+50.00	668964.7897	1447407.4717
69	Y13	11+00.00	668926.7409	1447375.1219
70	Y13	11+50.00	668894.5861	1447336.9082
71	Y13	12+00.00	668869.2138	1447293.8909
72	Y13	12+50.00	668847.2953	1447248.9512
73	Y13	12+68.60	668839.1417	1447232.2340
74	RPA		672727.8867	1447816.2433
75	RPA	50	672678.8369	1447825.9443
76	RPA	1+00.00	672629.8279	1447835.8495
77	RPA	1+50.00	672580.9018	1447846.1555
78	RPA	2+00.00	672532.0806	1447856.9480
79	RPA	2+50.00	672483.3699	1447868.2281
80	RPA	3+00.00	672434.7744	1447879.9948

Point #	Chain	Station	Northing (Y)	Easting (X)
81	RPA	3+50.00	672386.2990	1447892.2469
82	RPA	4+00.00	672337.9465	1447904.9758
83	RPA	4+50.00	672289.6901	1447918.0645
84	RPA	5+00.00	672241.4776	1447931.3139
85	RPA	5+50.00	672193.2697	1447944.5803
86	RPA	6+00.00	672145.0618	1447957.8468
87	RPA	6+50.00	672096.8539	1447971.1132
88	RPA	7+00.00	672048.6460	1447984.3797
89	RPA	7+50.00	672000.4381	1447997.6461
90	RPA	8+00.00	671952.2302	1448010.9125
91	RPA	8+50.00	671904.0223	1448024.1790
92	RPA	9+00.00	671855.8144	1448037.4454
93	RPA	9+50.00	671807.6065	1448050.7118
94	RPA	10+00.00	671759.3986	1448063.9783
95	RPA	10+50.00	671711.1907	1448077.2447
96	RPA	11+00.00	671662.9828	1448090.5112
97	RPA	11+50.00	671614.7749	1448103.7776
98	RPA	12+00.00	671566.5670	1448117.0440
99	RPA	12+50.00	671518.3591	1448130.3105
100	RPA	13+00.00	671470.1512	1448143.5769
101	RPA	13+50.00	671421.9433	1448156.8434
102	RPA	14+00.00	671373.5808	1448169.5207
103	RPA	14+50.00	671324.3422	1448177.9994
104	RPA	15+00.00	671274.4442	1448177.6419
105	RPA	15+50.00	671225.9483	1448165.9415
106	RPA	16+00.00	671181.4545	1448143.3792
107	RPA	16+50.00	671143.3584	1448111.1700
108	RPA	17+00.00	671113.7109	1448071.0479
109	RPA	17+50.00	671094.1084	1448025.1731
110	RPA	18+00.00	671085.6063	1447976.0156
111	RPA	18+13.80	671085.2905	1447962.2181
112	RPA1	14+00.00	671373.7325	1448170.1106
113	RPA1	14+50.00	671325.5246	1448183.3770
114	RPA1	15+00.00	671277.3167	1448196.6435
115	RPA1	15+50.00	671229.1786	1448210.1460
116	RPA1	16+00.00	671185.3250	1448233.6789
117	RPA1	16+50.00	671151.5850	1448270.2651
118	RPA1	17+00.00	671131.6730	1448315.8770
119	RPA1	17+35.36	671127.2018	1448350.8699
120	RPB		672953.2687	1447678.0613
121	RPB	50	672903.7837	1447685.2187
122	RPB	1+00.00	672854.2986	1447692.3761
123	RPB	1+50.00	672804.8135	1447699.5335
124	RPB	2+00.00	672755.3285	1447706.6910
125	RPB	2+50.00	672705.8434	1447713.8484
126	RPB	3+00.00	672656.3584	1447721.0058
127	RPB	3+50.00	672606.8733	1447728.1632
128	RPB	4+00.00	672557.3882	1447735.3207
129	RPB	4+50.00	672507.9032	1447742.4781
130	RPB	5+00.00	672458.4181	1447749.6355
131	RPB	5+50.00	672408.9331	1447756.7929
132	RPB	6+00.00	672359.4480	1447763.9504
133	RPB	6+50.00	672309.9629	1447771.1078
134	RPB	7+00.00	672260.4779	1447778.2652
135	RPB	7+50.00	672210.9928	1447785.4226
136	RPB	8+00.00	672161.5078	1447792.5801
137	RPB	8+50.00	672112.0227	1447799.7375
138	RPB	9+00.00	672062.5376	1447806.8949
139	RPB	9+50.00	672013.0526	1447814.0523
140	RPB	10+00.00	671963.5675	1447821.2098
141	RPB	10+50.00	671914.0824	1447828.3672
142	RPB	11+00.00	671864.5974	1447835.5246
143	RPB	11+50.00	671815.1123	1447842.6820
144	RPB	12+00.00	671765.6273	1447849.8395
145	RPB	12+50.00	671716.1422	1447856.9969
146	RPB	13+00.00	671666.6571	1447864.1543
147	RPB	13+50.00	671617.1721	1447871.3117
148	RPB	14+00.00	671567.6870	1447878.4692
149	RPB	14+50.00	671518.2020	1447885.6266
150	RPB	15+00.00	671468.7170	1447892.7846
151	RPB	15+50.00	671419.3058	1447900.4256
152	RPB	16+00.00	671370.3134	1447910.3649
153	RPB	16+50.00	671322.4042	1447924.5855
154	RPB	17+00.00	671276.5548	1447944.4495
155	RPB	17+50.00	671233.5397	1447969.8748
156	RPB	18+00.00	671194.0301	1448000.4646
157	RPB	18+50.00	671158.6425	1448035.7417
158	RPB	19+00.00	671127.9292	1448075.1554
159	RPB	19+50.00	671102.3695	1448118.0907
160	RPB	20+00.00	671082.3621	1448163.8777

Point #	Chain	Station	Northing (Y)	Easting (X)
161	RPB	20+50.00	671068.2193	1448211.8019
162	RPB	21+00.00	671060.1617	1448261.1154
163	RPB	21+36.10	671058.2018	1448297.1475
164	RPB1	15+00.00	671468.7139	1447892.7844
165	RPB1	15+50.00	671419.2289	1447899.9419
166	RPB1	16+00.00	671369.7438	1447907.0993
167	RPB1	16+50.00	671320.2587	1447914.2567
168	RPB1	17+00.00	671270.7737	1447921.4141
169	RPB1	17+50.00	671220.9191	1447922.6696
170	RPB1	18+00.00	671172.3032	1447911.5562
171	RPB1	18+50.00	671127.9483	1447888.7605
172	RPB1	18+50.58	671127.4725	1447888.4341
173	RPC		669191.1660	1448140.1128
174	RPC	50	669240.8501	1448145.7230
175	RPC	1+00.00	669290.5879	1448150.8346
176	RPC	1+50.00	669340.3801	1448155.3855
177	RPC	2+00.00	669390.2244	1448159.3239
178	RPC	2+50.00	669440.1140	1448162.6390
179	RPC	3+00.00	669490.0412	1448165.3302
180	RPC	3+50.00	669539.9982	1448167.3972
181	RPC	4+00.00	669589.9770	1448168.8395
182	RPC	4+50.00	669639.9700	1448169.6570
183	RPC	5+00.00	669689.9693	1448169.8495
184	RPC	5+50.00	669739.9671	1448169.4171
185	RPC	6+00.00	669789.9556	1448168.3597
186	RPC	6+50.00	669839.9270	1448166.6776
187	RPC	7+00.00	669889.8734	1448164.3710
188	RPC	7+50.00	669939.7871	1448161.4402
189	RPC	8+00.00	669989.6603	1448157.8858
190	RPC	8+50.00	670039.4852	1448153.7082
191	RPC	9+00.00	670089.2539	1448148.9082
192	RPC	9+50.00	670138.9588	1448143.4865
193	RPC	10+00.00	670188.5920	1448137.4439
194	RPC	10+50.00	670238.1457	1448130.7813
195	RPC	11+00.00	670287.6124	1448123.4999
196	RPC	11+50.00	670336.9841	1448115.6007
197	RPC	12+00.00	670386.2533	1448107.0850
198	RPC	12+50.00	670435.4122	1448097.9542
199	RPC	13+00.00	670484.4531	1448088.2095
200	RPC	13+50.00	670533.3683	1448077.8527
201	RPC	14+00.00	670582.1503	1448066.8852
202	RPC	14+50.00	670630.7946	1448055.3220
203	RPC	15+00.00	670679.3558	1448043.4138
204	RPC	15+50.00	670727.8743	1448031.3327
205	RPC	16+00.00	670776.3748	1448019.1794
206	RPC	16+50.00	670824.9554	1448007.3577
207	RPC	17+00.00	670874.2587	1447999.2430
208	RPC	17+50.00	670924.1468	1447999.9082
209	RPC	18+00.00	670972.2503	1448013.0100
210	RPC	18+50.00	671015.2896	1448038.1740
211	RPC	19+00.00	671050.3013	1448073.6675
212	RPC	19+50.00	671074.8747	1448117.0467
213	RPC	20+00.00	671087.3178	1448165.3248
214	RPC	20+24.68	671088.6913	1448189.9479
215	RPC1	17+00.00	670873.3752	1447994.8602
216	RPC1	17+50.00	670921.8742	1447982.7009
217	RPC1	18+00.00	670968.7608	1447965.8555
218	RPC1	18+50.00	671007.7829	1447934.9652
219	RPC1	19+00.00	671034.5499	1447893.0073
220	RPC1	19+50.00	671046.1153	1447844.6009
221	RPC1	19+58.80	671046.4541	1447835.8127
222	RPD		669304.0207	1448244.6697
223	RPD	50	669353.5773	1448251.3132
224	RPD	1+00.00	669403.1543	1448257.8035
225	RPD	1+50.00	669452.7360	1448264.2574
226	RPD	2+00.00	669502.3252	1448270.6532
227	RPD	2+50.00	669551.9606	1448276.6784
228	RPD	3+00.00	669601.6655	1448282.0994
229	RPD	3+50.00	669651.4344	1448286.8986
230	RPD	4+00.00	669701.2593	1448291.0754
231	RPD	4+50.00	669751.1325	1448294.6290
232	RPD	5+00.00	669801.0463	1448297.5589
233	RPD	5+50.00	669850.9927	1448299.8648
234	RPD	6+00.00	669900.9641	1448301.5461
235	RPD	6+50.00	669950.9526	1448302.6026
236	RPD	7+00.00	670000.9505	1448303.0343
237	RPD	7+50.00	670050.9498	1448302.8409
238	RPD	8+00.00	670100.9427	1448302.0226

Point #	Chain	Station	Northing (Y)	Easting (X)
239	RPD	8+50.00	670150.9223	1448300.6015
240	RPD	9+00.00	670200.8908	1448298.8292
241	RPD	9+50.00	670250.8577	1448297.0088
242	RPD	10+00.00	670300.8245	1448295.1885
243	RPD	10+50.00	670350.7914	1448293.3682
244	RPD	11+00.00	670400.7583	1448291.5479
245	RPD	11+50.00	670450.7251	1448289.7275
246	RPD	12+00.00	670500.6920	1448287.9072
247	RPD	12+50.00	670550.6588	1448286.0869
248	RPD	13+00.00	670600.6257	1448284.2665
249	RPD	13+50.00	670650.5925	1448282.4462
250	RPD	14+00.00	670700.5594	1448280.6259
251	RPD	14+50.00	670750.5101	1448278.4346
252	RPD	15+00.00	670800.2763	1448273.7362
253	RPD	15+50.00	670849.2707	1448263.9331
254	RPD	16+00.00	670896.4725	1448247.5633
255	RPD	16+50.00	670940.9535	1448224.8164
256	RPD	17+00.00	670981.8571	1448196.1304
257	RPD	17+50.00	671018.3954	1448162.0579
258	RPD	18+00.00	671049.8647	1448123.2550
259	RPD	18+50.00	671075.6590	1448080.4690
260	RPD	19+00.00	671095.2816	1448034.5241
261	RPD	19+50.00	671108.3544	1447986.3049
262	RPD	20+00.00	671114.6257	1447936.7403
263	RPD	20+16.99	671115.1832	1447919.7602
264	RPD1	13+00.00	670601.0672	1448296.2584
265	RPD1	13+50.00	670651.0341	1448294.4381
266	RPD1	14+00.00	670701.0009	1448292.6178
267	RPD1	14+50.00	670750.9678	1448290.7974
268	RPD1	15+00.00	670800.9346	1448288.9771
269	RPD1	15+50.00	670850.9015	1448287.1568
270	RPD1	16+00.00	670900.8683	1448285.3365
271	RPD1	16+50.00	670950.8355	1448283.5240
272	RPD1	17+00.00	671000.4686	1448288.3774
273	RPD1	17+48.62	671046.1313	1448304.7377

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

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	2

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER R. REID

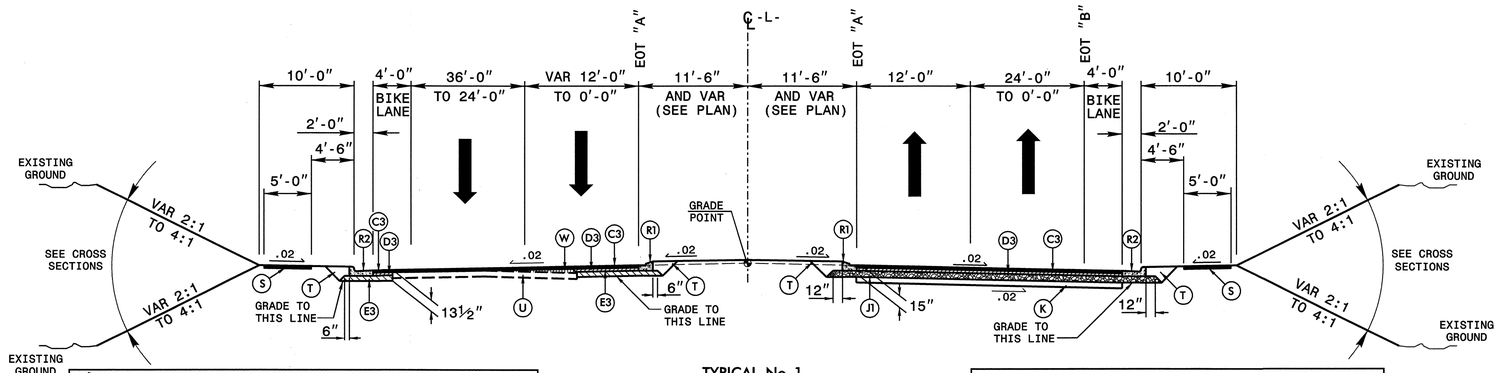
11/25/08

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER CHI CHEN

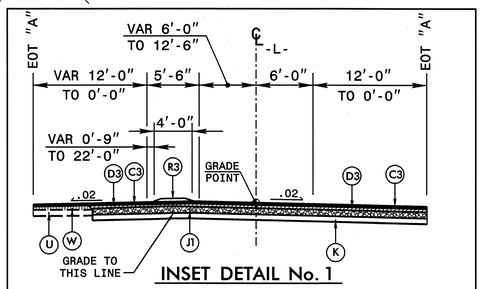
12/5/08

MOFFATT & NICHOL
16-16 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4669 FAX



TYPICAL No. 1

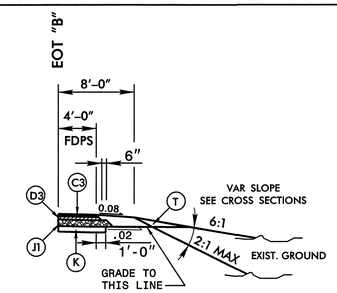
(–L–) STA 229+50.00 TO (BEGIN BRIDGE)
(–L–) (END BRIDGE) TO (–L–) STA 288+00.00



INSET DETAIL No. 1

TO BE USED IN CONJUNCTION WITH TYPICAL SECTION No. 1 AS FOLLOWS:

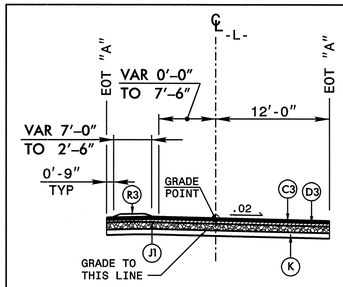
(–L–) STA 273+65.00 TO STA 276+15.00
(–L–) STA 276+15.00 TO (BEGIN BRIDGE)
(–L–) (END BRIDGE) TO STA 279+95.00
* (–L–) STA 279+95.00 TO STA 281+95.00
* REVERSE INSET AT THIS LOCATION



INSET DETAIL No. 2

TO BE USED IN CONJUNCTION WITH TYPICAL SECTION No. 1 AS FOLLOWS:

(–L–) STA 287+35.80 TO STA 288+00.00



INSET DETAIL No. 3

TO BE USED IN CONJUNCTION WITH TYPICAL SECTION No. 1 AS FOLLOWS:

(–L–) STA 260+00.00 TO STA 260+50.00
* (–L–) STA 260+50.00 TO STA 261+60.00
**(–L–) STA 261+60.00 TO STA 262+10.00
(–L–) STA 286+40.60 TO STA 286+90.60
* (–L–) STA 286+90.60 TO STA 287+80.23
**(–L–) STA 287+80.23 TO STA 288+00.00
* NO CURB AT THIS LOCATION (SEE PLANS)
** REVERSE INSET AT THIS LOCATION

PAVEMENT SCHEDULE

C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E2	PROP. APPROX. 3" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	R1	1'-6" CONCRETE CURB AND GUTTER.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E3	PROP. APPROX. 6½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 370.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS	R2	2'-6" CONCRETE CURB AND GUTTER.
C3	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E4	PROP. APPROX. 10" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD. IN EACH OF TWO LAYERS	R3	5" MONOLITHIC CONCRETE ISLAND
C4	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	E5	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.	R4	SHOULDER BERM GUTTER
C5	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	E6	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.	S	4" SIDEWALK
D1	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	E7	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	T	EARTH MATERIAL
D2	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	E8	PROP. APPROX. 4½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.	U	EXISTING PAVEMENT
D3	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	J1	PROP. 8" AGGREGATE BASE COURSE.	V	RUMBLE STRIPS
D4	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	J2	PROP. VAR. DEPTH AGGREGATE BASE COURSE.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET 2-D)
D5	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	K	BASE TO BE TREATED WITH LIME TO A DEPTH OF 8", AT A RATE OF 20 LBS. PER SQ. YD. AS DIRECTED BY THE ENGINEER OR BASE TO BE TREATED WITH CEMENT TO A DEPTH OF 7", AT A RATE OF 55 LBS. PER SQ. YD. AS DIRECTED BY THE ENGINEER	Z	MILLING (SEE MILLING DETAIL, SHEET 2-D)
D6	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.				
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	P	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YD.		

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

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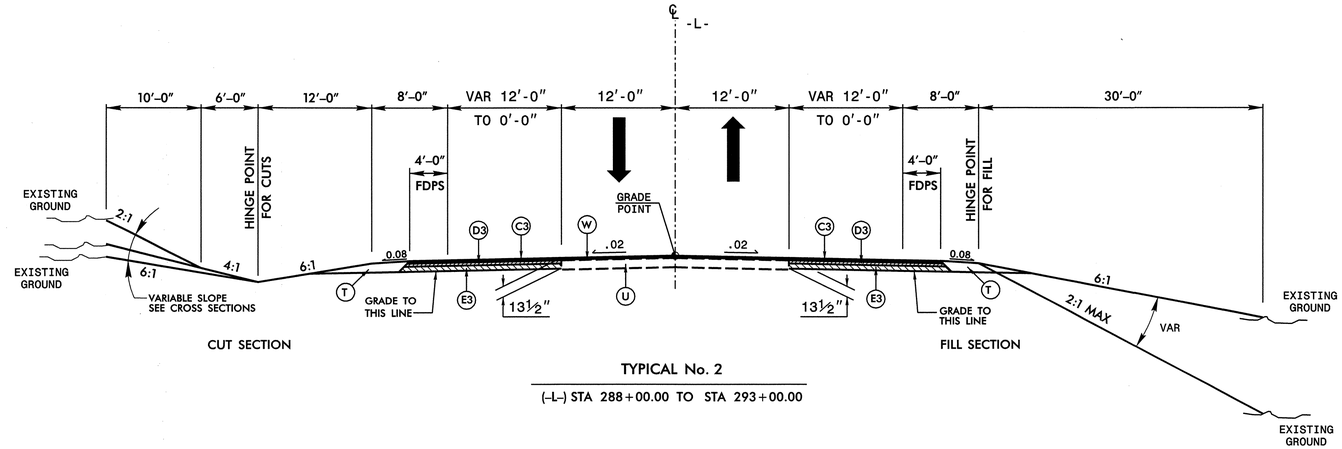
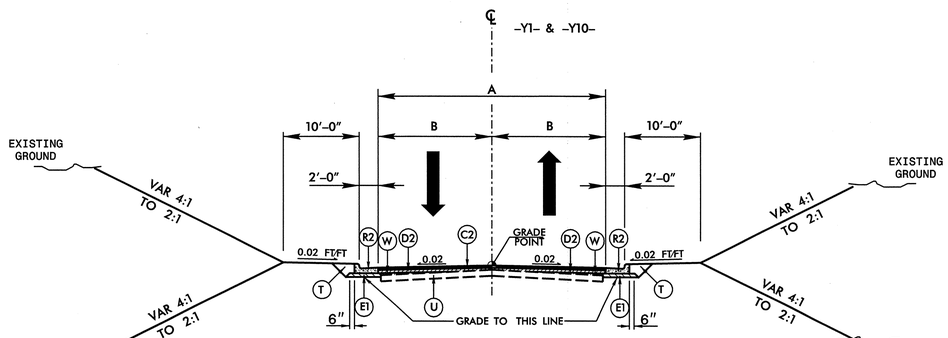
rrowell



TYPICAL No. 2

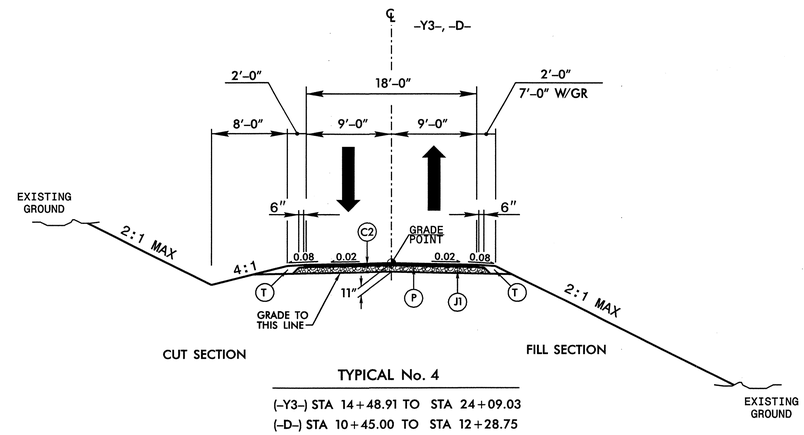
(-L-) STA 288+00.00 TO STA 293+00.00



	A	B
-Y1-	24'-0"	12'-0"
-Y10-	27'-0"	13'-6"

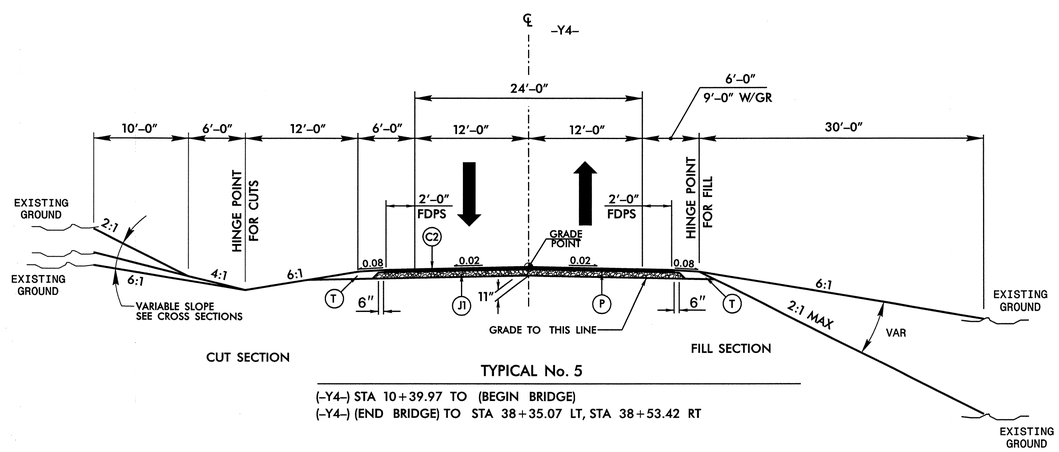
TYPICAL No. 3

(-Y1-) STA 10+00.00 TO STA 13+84.05
(-Y10-) STA 10+16.06 TO STA 12+25.00



TYPICAL No. 4

(-Y3-) STA 14+48.91 TO STA 24+09.03
(-D-) STA 10+45.00 TO STA 12+28.75



TYPICAL No. 5

(-Y4-) STA 10+39.97 TO (BEGIN BRIDGE)
(-Y4-) (END BRIDGE) TO STA 38+35.07 LT, STA 38+53.42 RT

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	2-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

11/25/08

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19668 ENGINEER JIAN-CHI CHEN

12/5/08

MOFFATT & NICHOL
16 W. EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX

PAVEMENT SCHEDULE

CODE	DESCRIPTION
C2	3" S9.5B
C3	3" S9.5C
D2	4" I19.0B
D3	4" I19.0C
E1	4" B25.0B
E3	6½" B25.0C
J1	8" ABC
P	PRIME COAT
R2	2'-6" CURB & GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING (SEE SHEET 2-D)

PAV'T EDGE SLOPES 1:1 UNLESS SHOWN OTHERWISE

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	2-B

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

11/28/08

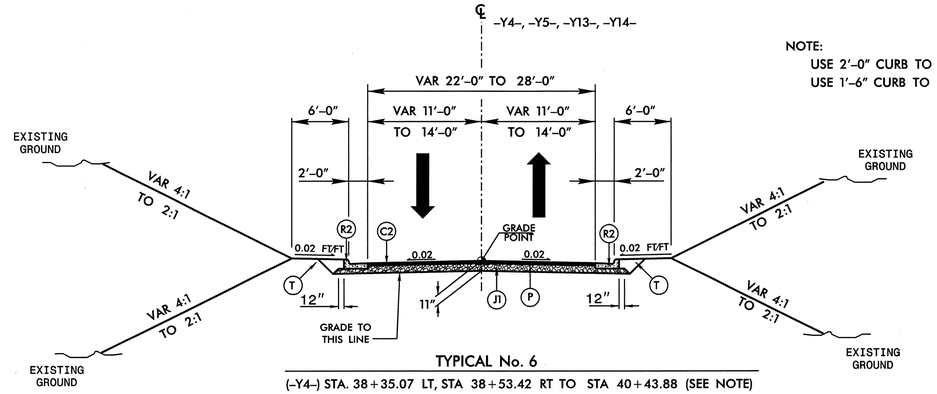
PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12368 ENGINEER DON-CHI CHEN

12/5/08

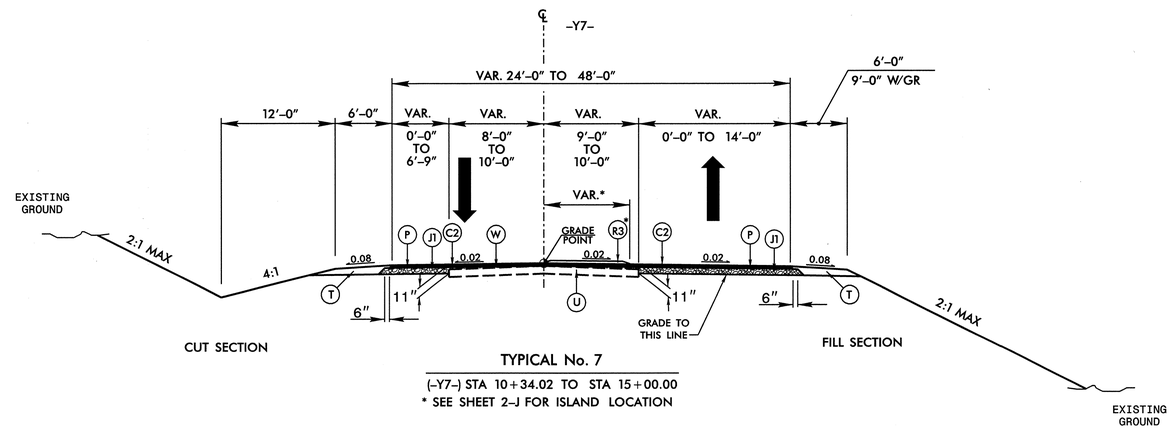
MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX

NOTE:
USE 2'-0" CURB TO MATCH EXIST ON -Y4- & -Y13-
USE 1'-6" CURB TO MATCH EXIST ON -Y5-



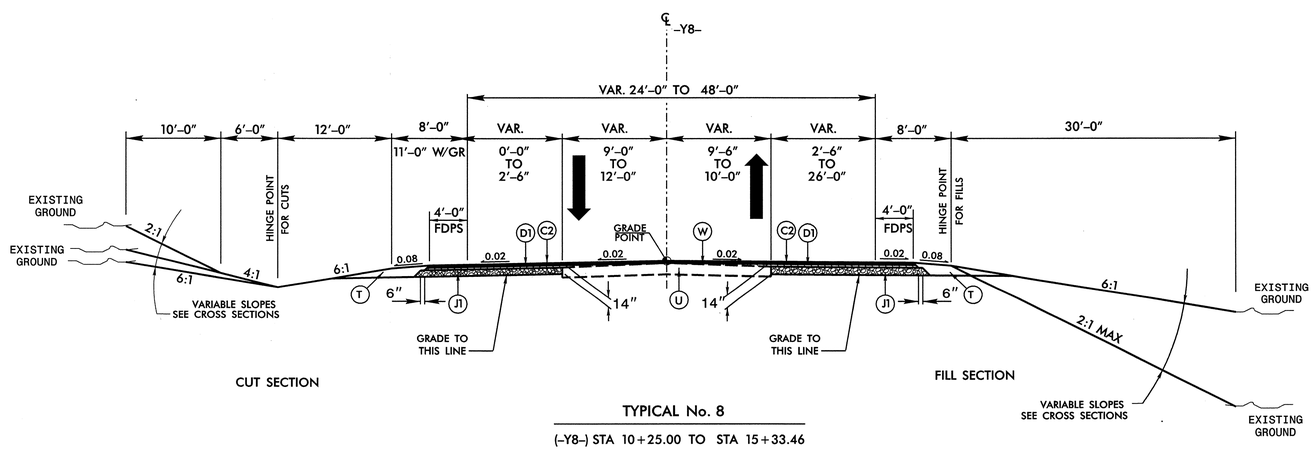
TYPICAL No. 6

(-Y4-) STA. 38+35.07 LT, STA 38+53.42 RT TO STA 40+43.88 (SEE NOTE)
(-Y5-) STA. 13+00.00 LT, STA 13+99.00 (SEE NOTE)
(-Y13-) STA. 10+12.00 TO STA 12+68.60 (SEE NOTE)
(-Y14-) STA. 10+35.00 TO STA 11+37.69



TYPICAL No. 7

(-Y7-) STA 10+34.02 TO STA 15+00.00
* SEE SHEET 2-J FOR ISLAND LOCATION

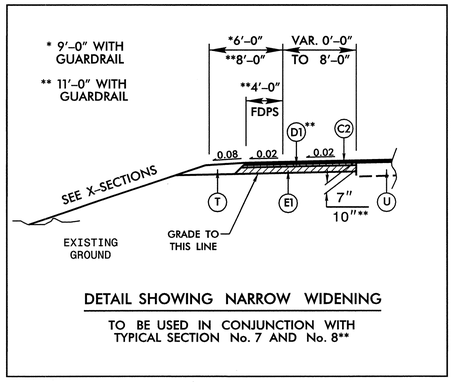


TYPICAL No. 8

(-Y8-) STA 10+25.00 TO STA 15+33.46

PAVEMENT SCHEDULE	
CODE	DESCRIPTION
C2	3" S9.5B
D1	3" I19.0B
E1	4" B25.0B
J1	8" ABC
P	PRIME COAT
R2	2'-6" CURB & GUTTER
R3	5" MONOLITHIC ISLAND
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING (SEE SHEET 2-D)

PAV'T EDGE SLOPES 1:1 UNLESS SHOWN OTHERWISE



DETAIL SHOWING NARROW WIDENING

TO BE USED IN CONJUNCTION WITH TYPICAL SECTION No. 7 AND No. 8**

11/24/2008
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cpowell

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	2-C

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER R. REID

12/16/08

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER DON-CHI CHEN

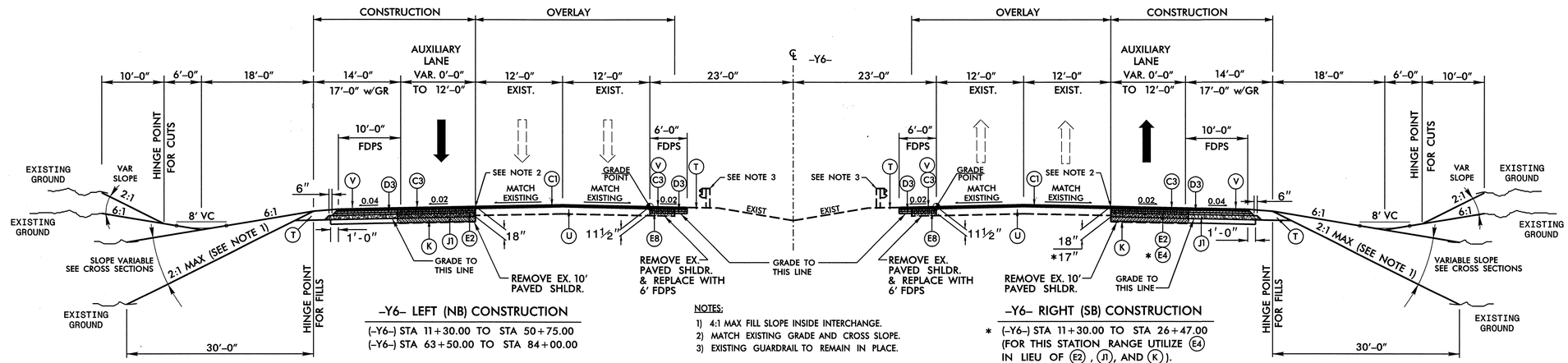
12/17/08

MOFFATT & NICHOL
16 16 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX

PAVEMENT SCHEDULE

CODE	DESCRIPTION
C1	1½" S9.5C
C2	3" S9.5B
C3	3" S9.5C
D1	3" I19.0B
D3	4" I19.0C
E2	3" B25.0C
E4	10" B25.0C
E8	4½" B25.0C
J1	8" ABC
K	8" LIME SUBBASE OR 7" CEMENT SUBBASE
T	EARTH MATERIAL
V	RUMBLE STRIPS
U	EXISTING PAVEMENT

PAV'T EDGE SLOPES 1:1 UNLESS SHOWN OTHERWISE



-Y6- LEFT (NB) CONSTRUCTION

(-Y6-) STA 11+30.00 TO STA 50+75.00
(-Y6-) STA 63+50.00 TO STA 84+00.00

-Y6- LEFT (NB) OVERLAY

(-Y6-) STA 11+30.00 TO STA 84+00.00

NOTES:

1) 4:1 MAX FILL SLOPE INSIDE INTERCHANGE.
2) MATCH EXISTING GRADE AND CROSS SLOPE.
3) EXISTING GUARDRAIL TO REMAIN IN PLACE.

-Y6- RIGHT (SB) CONSTRUCTION

* (-Y6-) STA 11+30.00 TO STA 26+47.00 (FOR THIS STATION RANGE UTILIZE (E4) IN LIEU OF (E2), (J1), AND (K)).

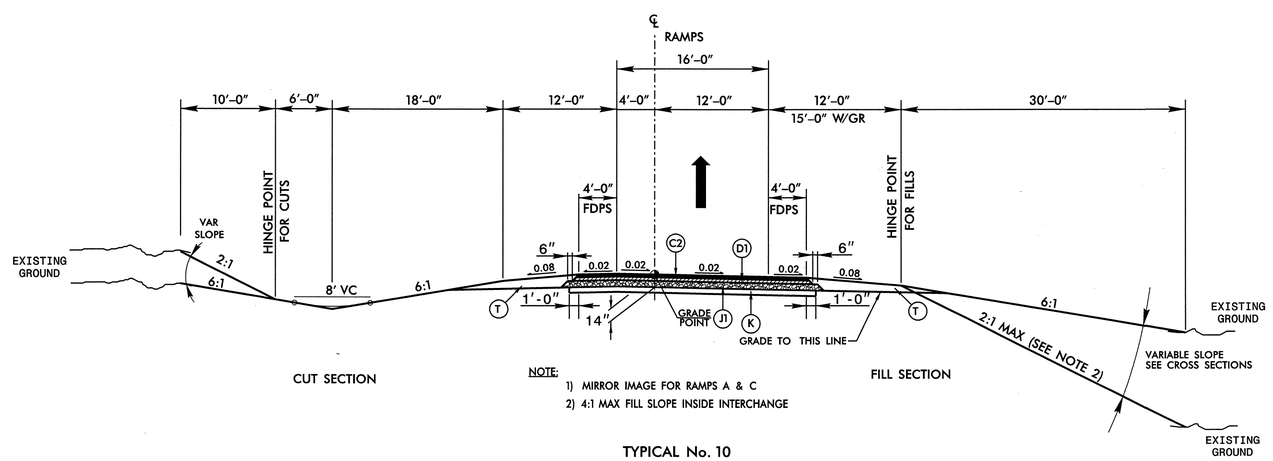
(-Y6-) STA 26+47.00 TO STA 48+25.00
(-Y6-) STA 59+75.00 TO STA 84+00.00

-Y6- RIGHT (SB) OVERLAY

(-Y6-) STA 11+30.00 TO STA 84+00.00

TYPICAL No. 9

(-Y6-) STA 11+30.00 TO STA 84+00.00 (AS NOTED)

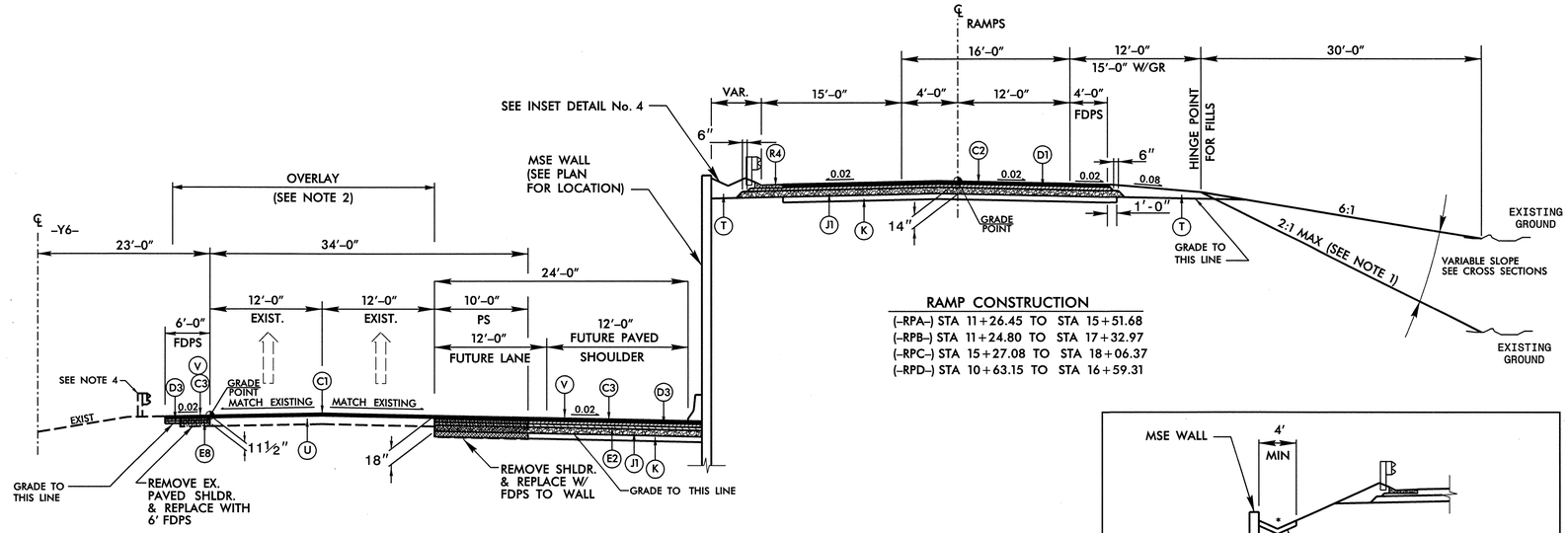


NOTE:

1) MIRROR IMAGE FOR RAMPS A & C
2) 4:1 MAX FILL SLOPE INSIDE INTERCHANGE

TYPICAL No. 10

(-RPA-) STA 0+00.00 TO STA 11+26.45
(-RPB-) STA 0+00.00 TO STA 11+24.80
(-RPC-) STA 0+00.00 TO STA 15+27.08
(-RPD-) STA 0+00.00 TO STA 10+63.15
(-RPA1-) STA 13+53.86 TO STA 17+35.36
(-RPB1-) STA 14+93.92 TO STA 18+50.58
(-RPC1-) STA 16+12.80 TO STA 19+58.80
(-RPD1-) STA 12+70.00 TO STA 17+48.62



RAMP CONSTRUCTION

(-RPA-) STA 11+26.45 TO STA 15+51.68
(-RPB-) STA 11+24.80 TO STA 17+32.97
(-RPC-) STA 15+27.08 TO STA 18+06.37
(-RPD-) STA 10+63.15 TO STA 16+59.31

SHOULDER CONSTRUCTION

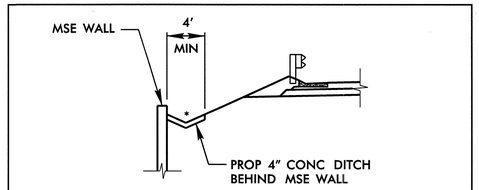
-Y6- STA 50+75.00 TO STA 63+50.00 (LT)
-Y6- STA 48+25.00 TO STA 59+75.00 (RT)

TYPICAL No. 11

RAMPS (SEE PLANS)

NOTES:

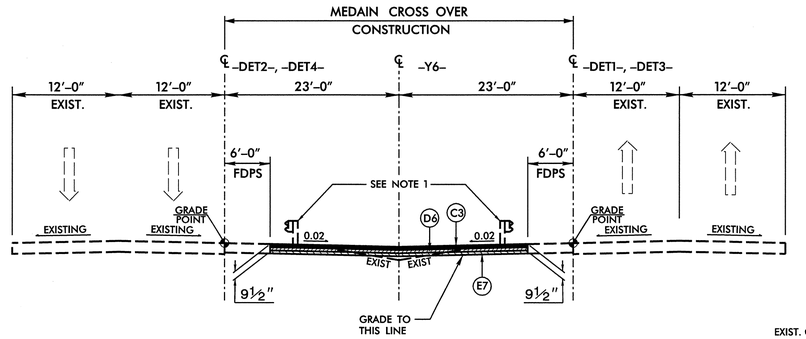
1) MIRROR IMAGE FOR RAMPS A & C
2) SEE TYPICAL No. 9 FOR -Y6- OVERLAY DETAILS.
3) SEE INSET No. 4 FOR CONCRETE DITCH BEHIND MSE WALL ALONG RAMPS.
4) EXISTING GUARDRAIL TO REMAIN IN PLACE.



* PROVIDE A MINIMUM DITCH DEPTH OF 1'-0"

INSET DETAIL No. 4

TO BE USED IN CONJUNCTION WITH TYPICAL SECTION No. 11, SEE SHEET 8

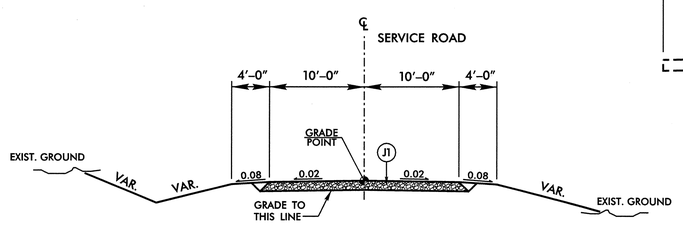


NOTE:

1) REMOVE EXISTING GUARDRAIL AS REQUIRED TO INSTALL MEDIAN CROSS OVER. REPLACE GUARDRAIL TO ORIGINAL LOCATION AFTER MEDIAN CROSS OVER HAS BEEN REMOVED.

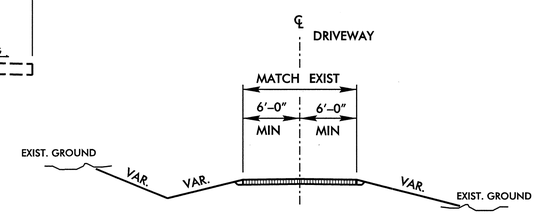
TYPICAL No. 11

(-DET1-) STA 41+00.00 TO STA 48+34.37
(-DET2-) STA 41+00.00 TO STA 48+35.73
(-DET3-) STA 61+00.00 TO STA 67+98.30
(-DET4-) STA 61+00.00 TO STA 68+01.96



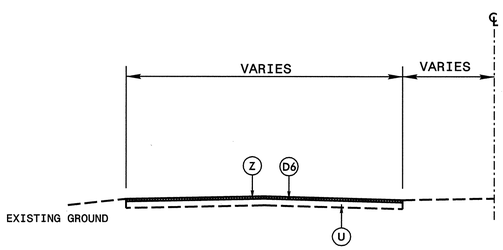
PROPOSED SERVICE ROAD TYPICAL

(-Y15-) STA 10+90.16 TO STA 13+06.14



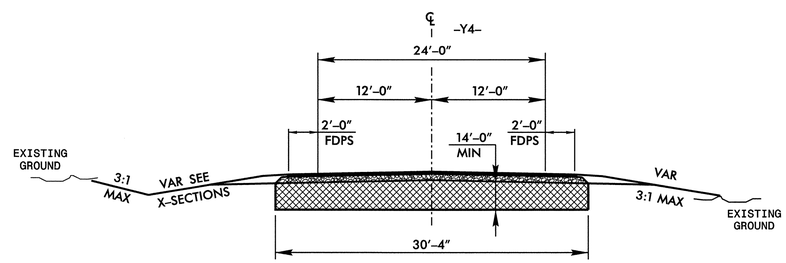
6" CONCRETE DRIVEWAY

ACCESS TO PARCEL'S 163 & 295
(-Y7- RIGHT SIDE)



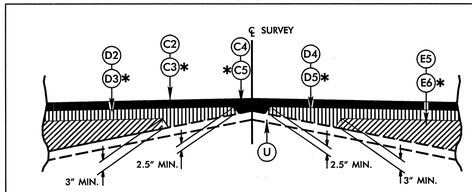
DETAIL FOR MILLING EXISTING PAVEMENT

MILL EXISTING PAVEMENT 2.5" AND REPLACE WITH I19.0C AT THE FOLLOWING LOCATIONS:
-L- STA 229+50.00 TO STA 293+00.00 LT (EXISTING)



UNDERCUT DETAIL

(-Y4-) STA 35+60.00 TO 36+50.00



Detail Showing Method of Wedging For -L-*, -Y1- and -Y10-

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	2-D

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER R. REID 12/11/08

PAVEMENT DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER DONG-CHI CHEN 12/12/08

MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4969 FAX

PAVEMENT SCHEDULE

CODE	DESCRIPTION
C1	1½" S9.5C
C2	3" S9.5B
C3	3" S9.5C
C4	VAR. S9.5B
C5	VAR. S9.5C
D1	3" I19.0B
D2	4" I19.0B
D3	4" I19.0C
D4	VAR. I19.0B
D5	VAR. I19.0C
D6	2½" I19.0C
E2	3" B25.0C
E5	VAR. B25.0B
E6	VAR. B25.0C
E7	4" B25.0C
E8	4½" B25.0C
J1	8" ABC
K	8" LIME SUBBASE OR 7" CEMENT SUBBASE
R4	SHLDR BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	RUMBLE STRIPS
W	WEDGING (THIS SHEET)
Z	MILLING (THIS SHEET)

PAV'T EDGE SLOPES 1:1 UNLESS SHOWN OTHERWISE

R/W/2008
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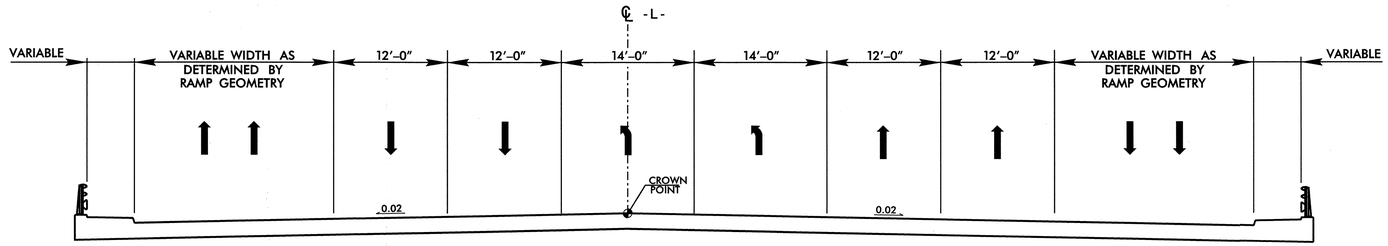
PROJECT REFERENCE NO.	SHEET NO.
R-3833B	2-E
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

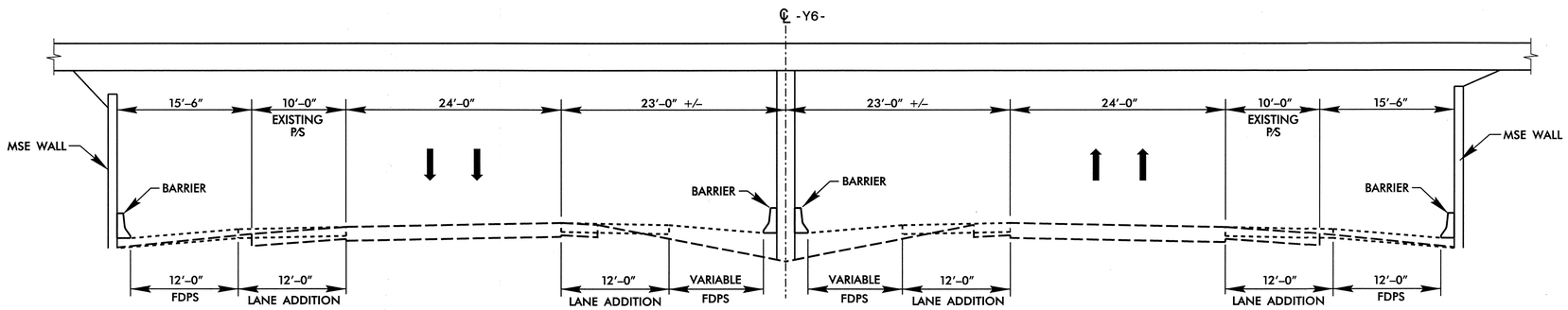
NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID
11/25/08

MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX



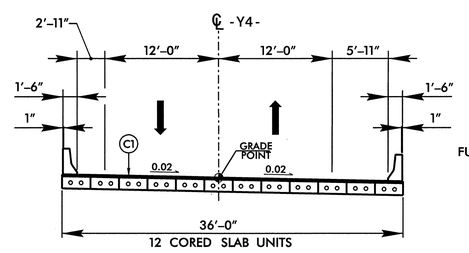
TYPICAL SECTION ON STRUCTURE

FUNCTIONAL CLASSIFICATION: COLLECTOR



FUNCTIONAL CLASSIFICATION = INTERSTATE

TYPICAL SECTION ON ROADWAY UNDER STRUCTURE



FUNCTIONAL CLASSIFICATION = RURAL LOCAL

NOTE: BRIDGE TO BE CORED SLAB

TYPICAL SECTION ON STRUCTURE

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11/24/2008
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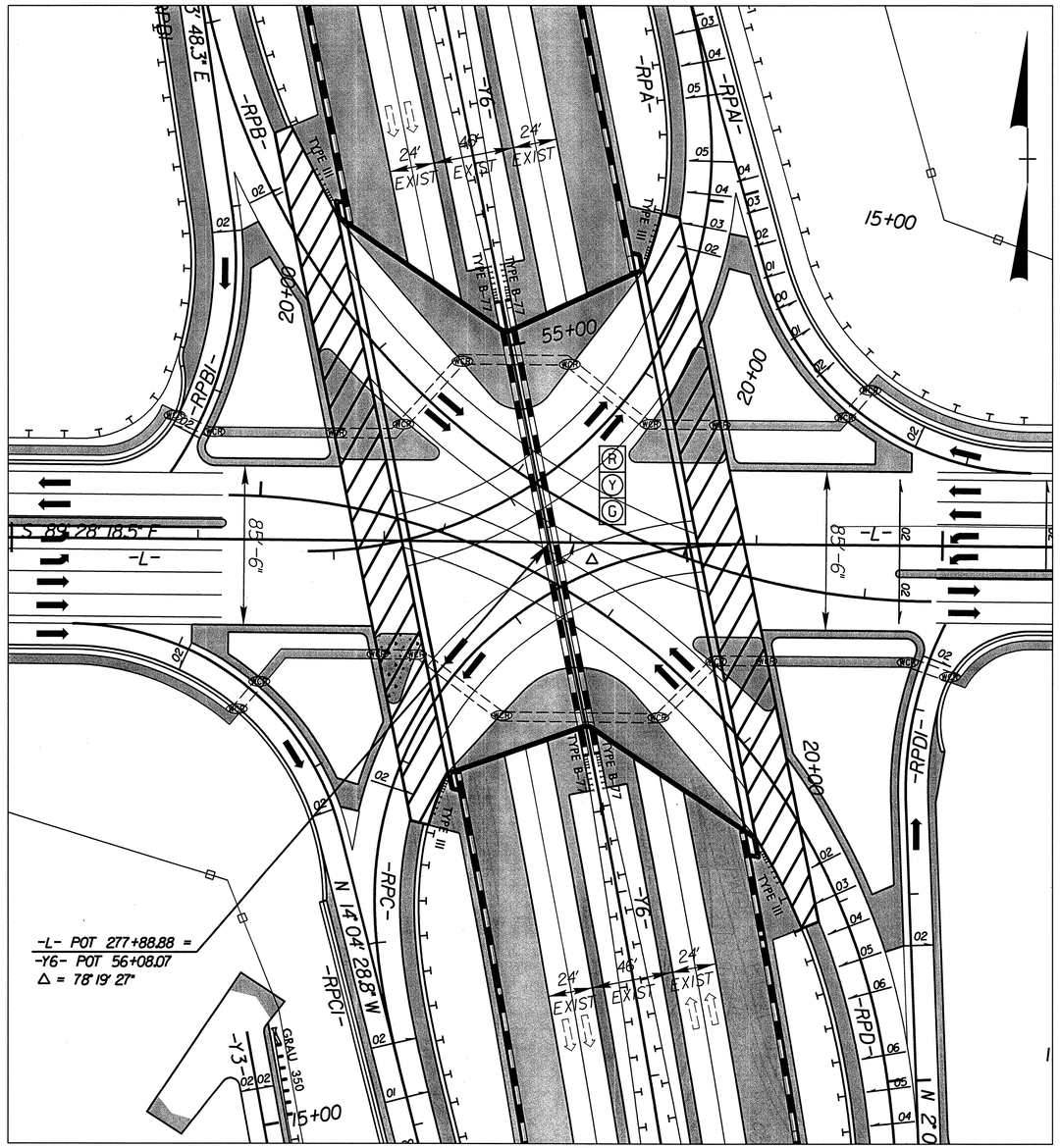
PROJECT REFERENCE NO.	SHEET NO.
R-3833B	2-F
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

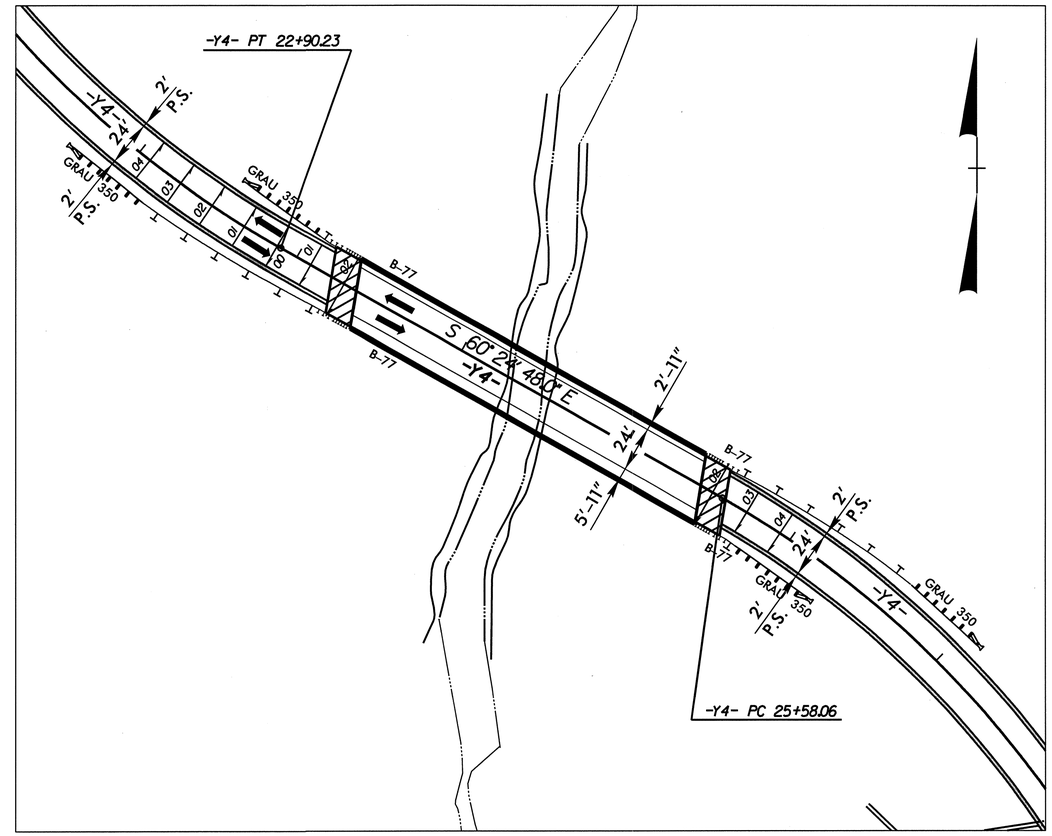
NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID
11/25/08

MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX



DETAIL SHOWING PAVEMENT-BRIDGE RELATIONSHIP FOR -L- OVER -Y6-

NOTE: SEE SHEETS 2-H & 2-I FOR LAYOUT OF CONCRETE ISLANDS



DETAIL SHOWING PAVEMENT-BRIDGE RELATIONSHIP FOR -Y4- OVER STREAM

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11/25/2008
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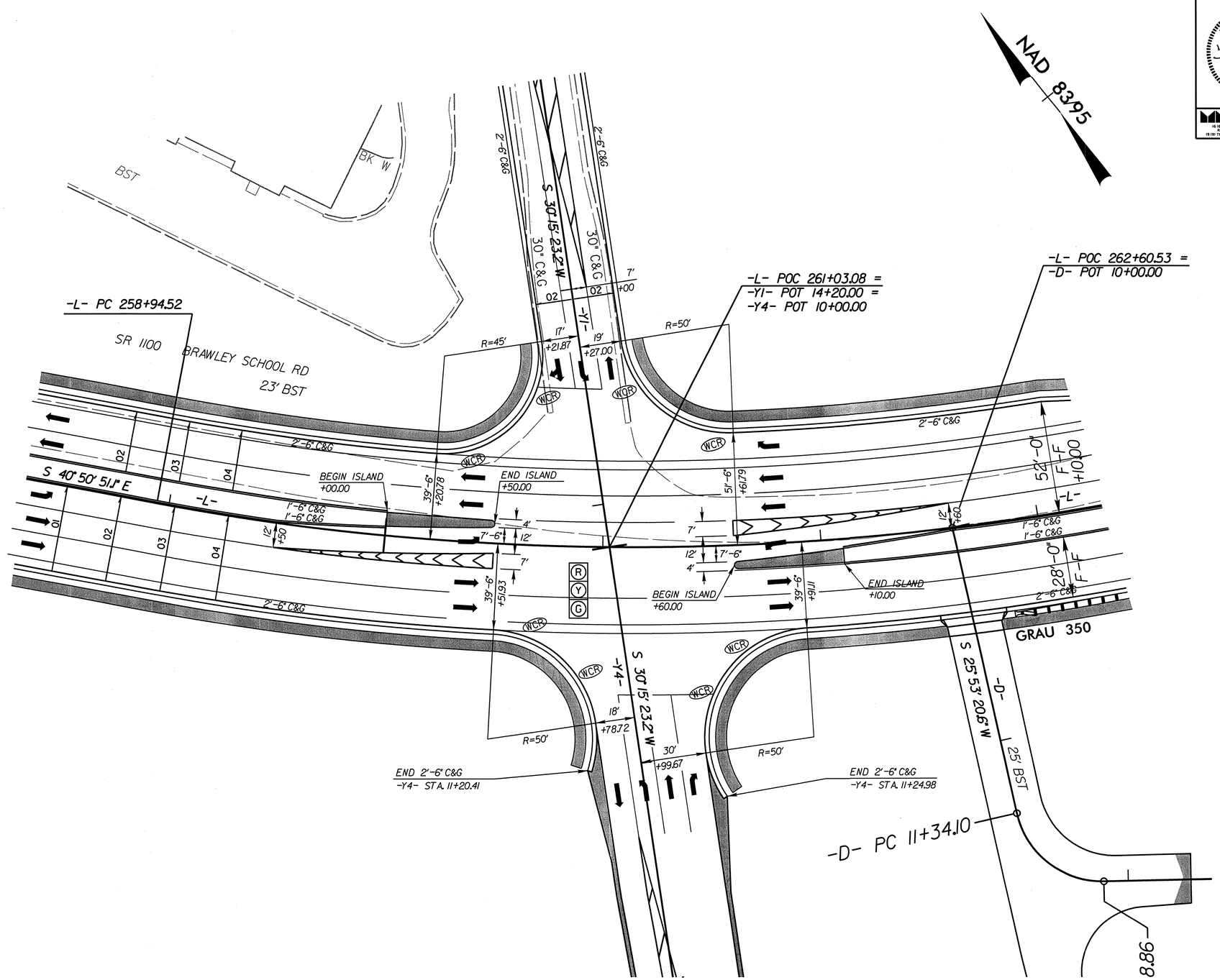
PROJECT REFERENCE NO.	SHEET NO.
R-3833B	2-G
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER L. R. REID

11/25/08

MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4865 FAX



INTERSECTION DETAIL OF -L- AND -Y1- / -Y4-

GRAPHIC SCALE
25 12.5 0 25 50
PLANS

8/17/99

11/25/2008
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cpowell

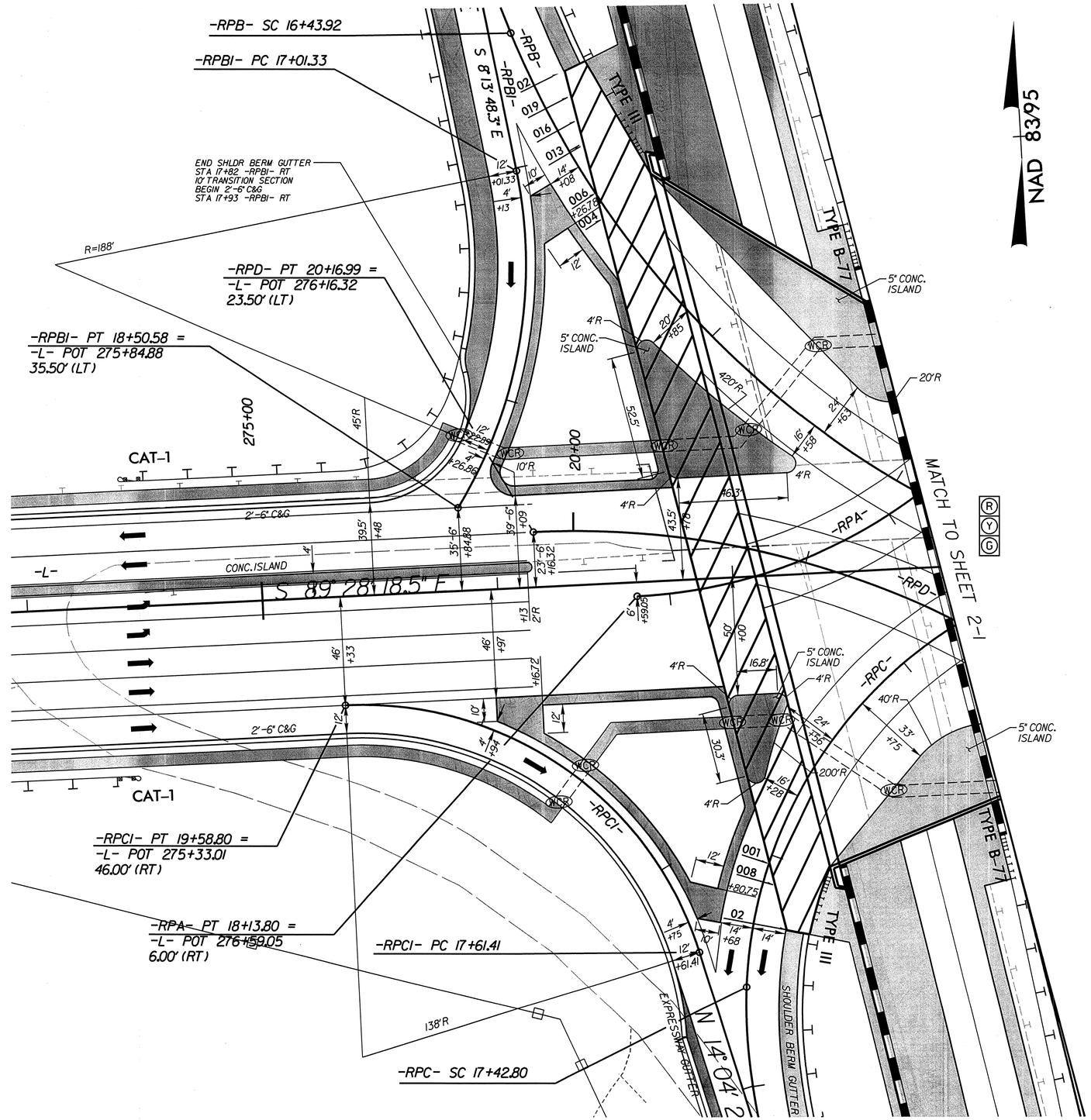
PROJECT REFERENCE NO.	SHEET NO.
R-3833B	2-H
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER R. R. REID

11/25/08

MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4669 FAX



INTERSECTION DETAIL OF -L- AND -RPB- / -RPC-

GRAPHIC SCALE
25 12.5 0 25 50
PLANS

8/17/99

11/24/2008
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8/17/99

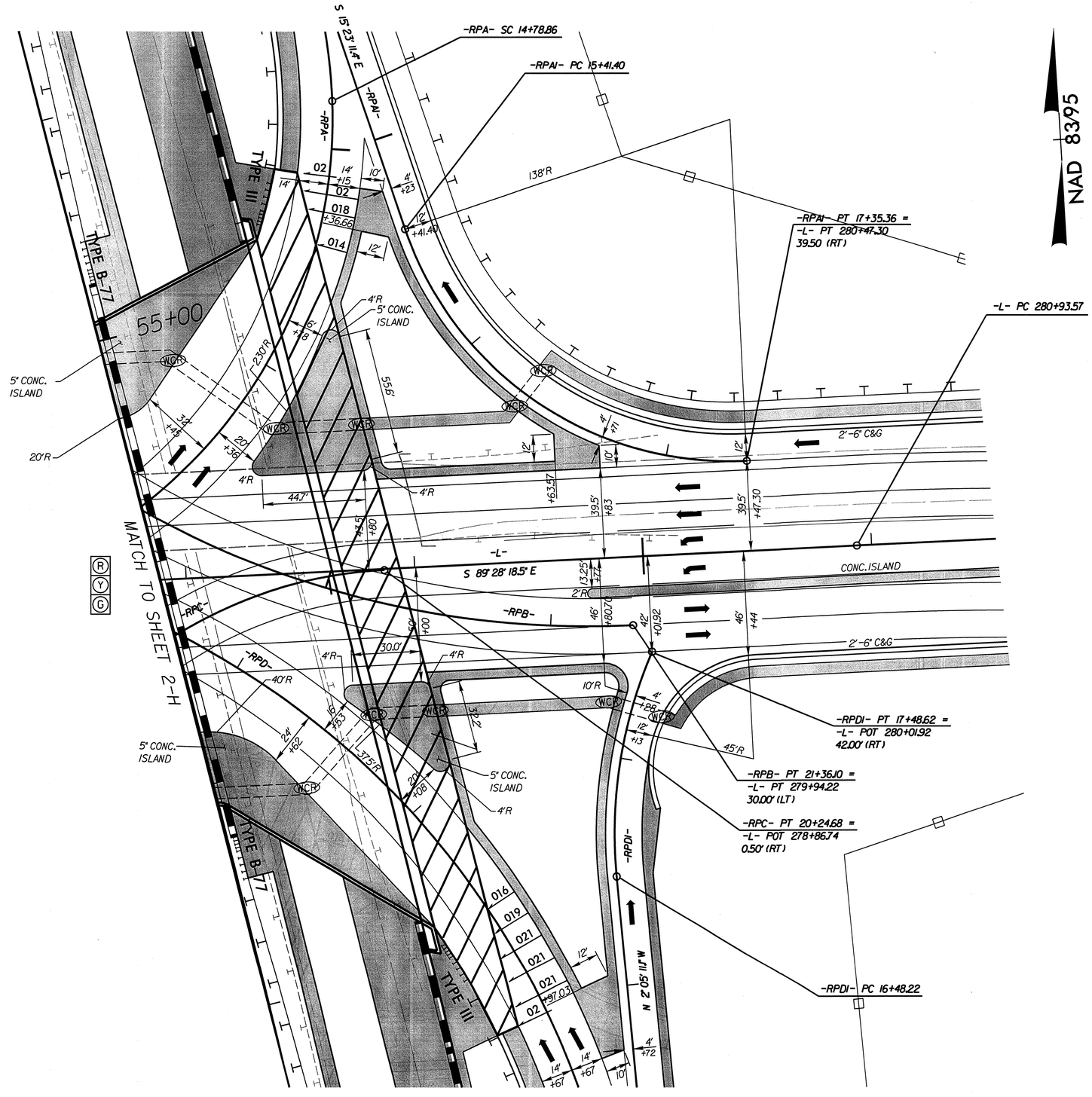
PROJECT REFERENCE NO.	SHEET NO.
R-3833B	2-1
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER J. R. REID

11/25/08

MOFFATT & NICHOL
1616 EAST MILBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4669 FAX



INTERSECTION DETAIL OF -L- AND -RPA- / -RPD-

GRAPHIC SCALE
25 12.5 0 25 50
PLANS

11/24/2008
R:\Roadway\Proj\r-3833b_rdy_det_2i.dgn

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	2-J
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

11/25/08

MOFFATT & NICHOL
1616 EAST MILBROOK ROAD, SUITE 160
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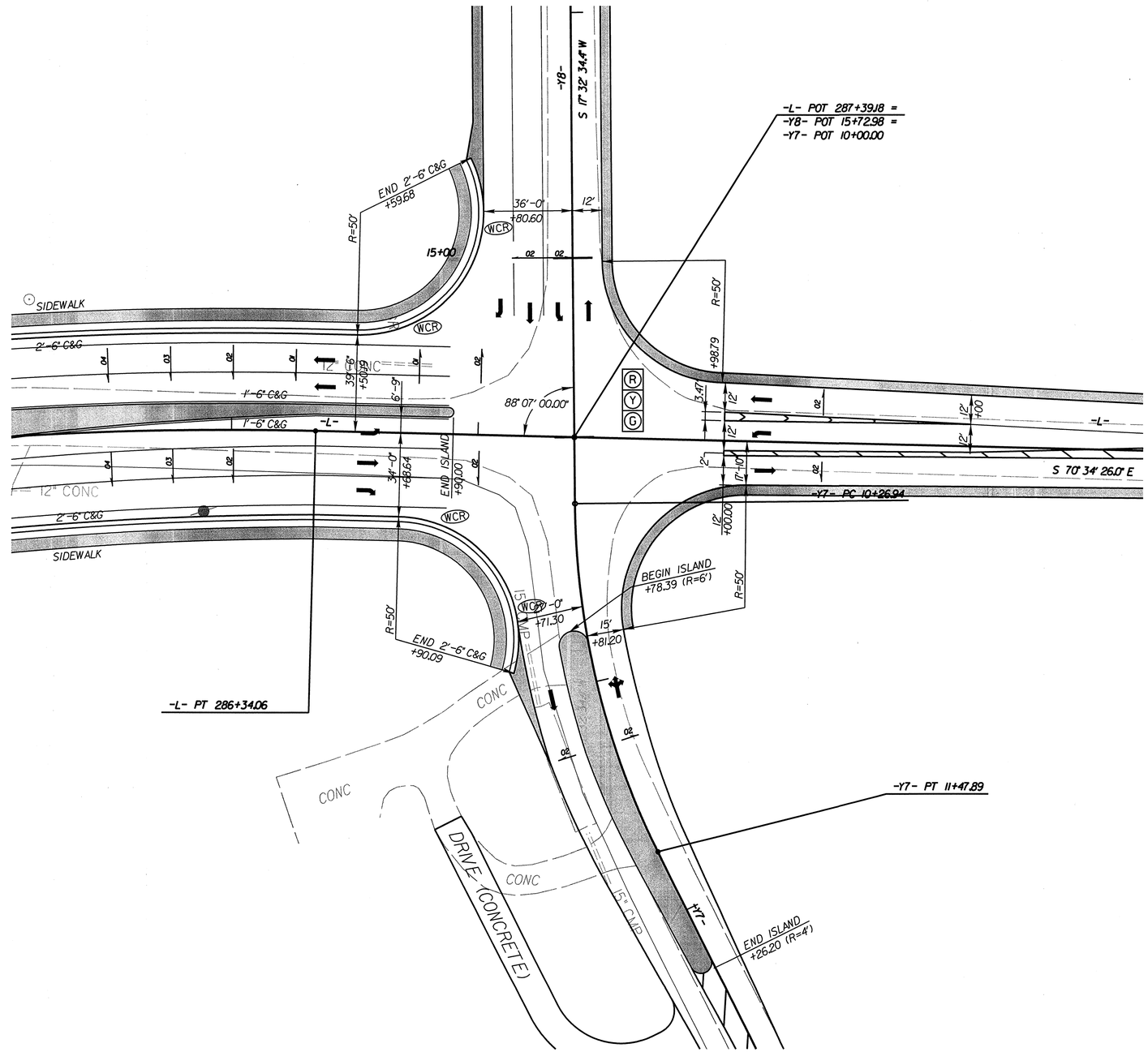
(919) 781-4626 VOICE (919) 781-6669 FAX

NAD 83/95



INTERSECTION DETAIL OF -L- AND -Y7- / -Y8-

GRAPHIC SCALE
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PLANS

11/24/2008
R:\Roadway\Proj\r-3833b_rdy_det_2j.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	2-K
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

11/25/08

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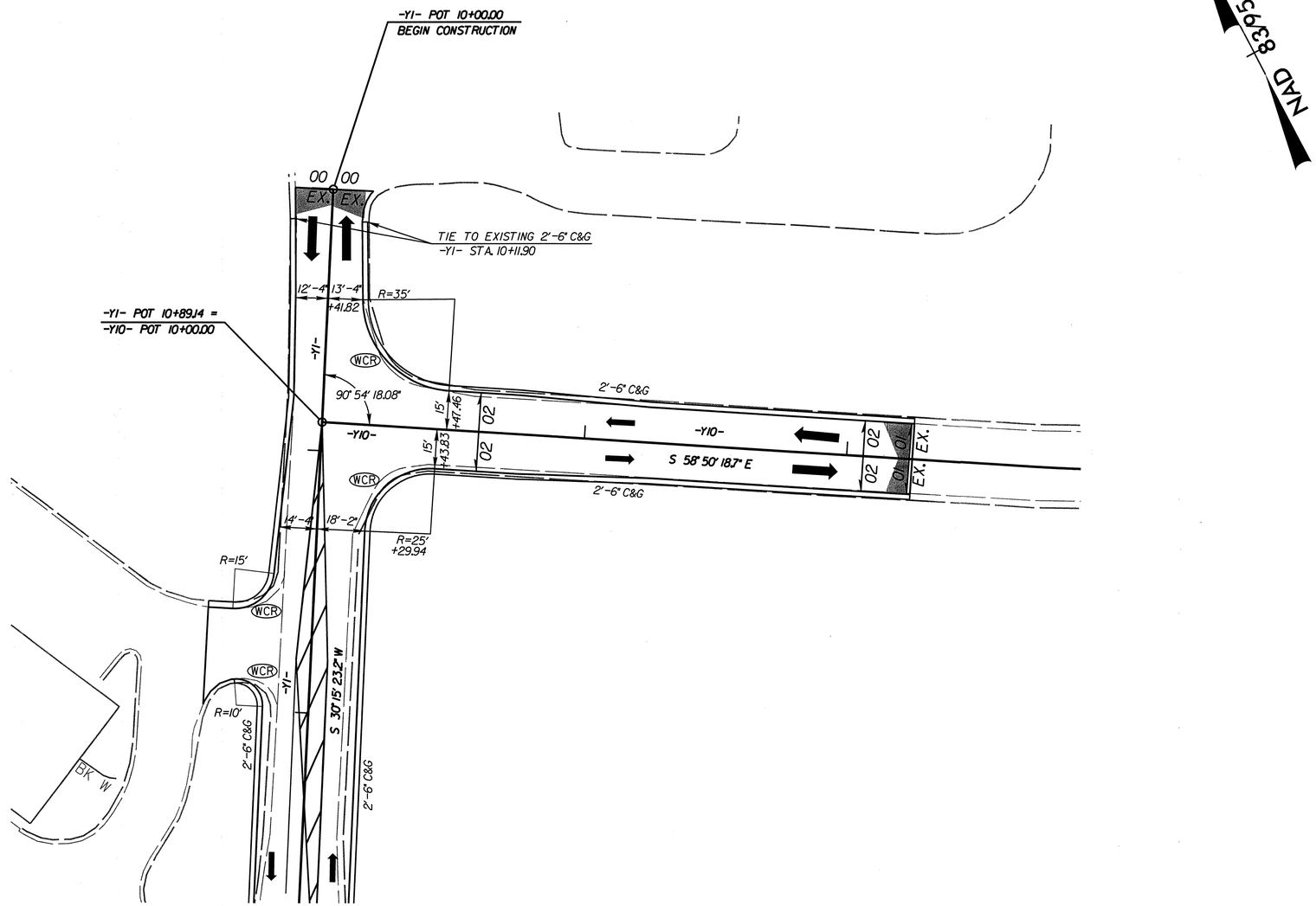
(919) 781-4626 VOICE (919) 781-4869 FAX

NAD 83/95



INTERSECTION DETAIL OF -Y1- & -Y10-

GRAPHIC SCALE
25 12.5 0 25 50
PLANS

11/25/2008
R:\Roadway\Proj\r-3833b_rdy_det_2k.dgn
cpowell
8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	2-L
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

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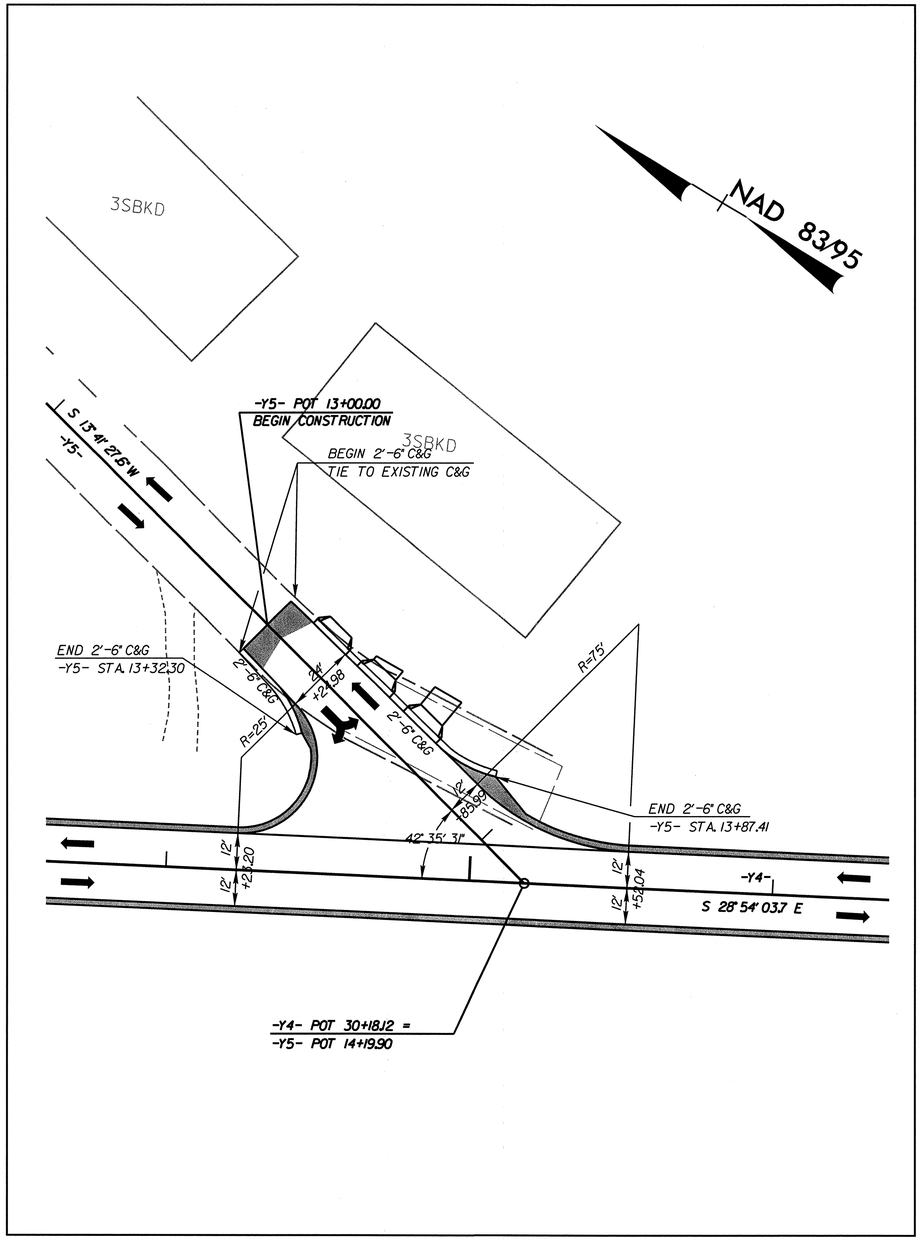
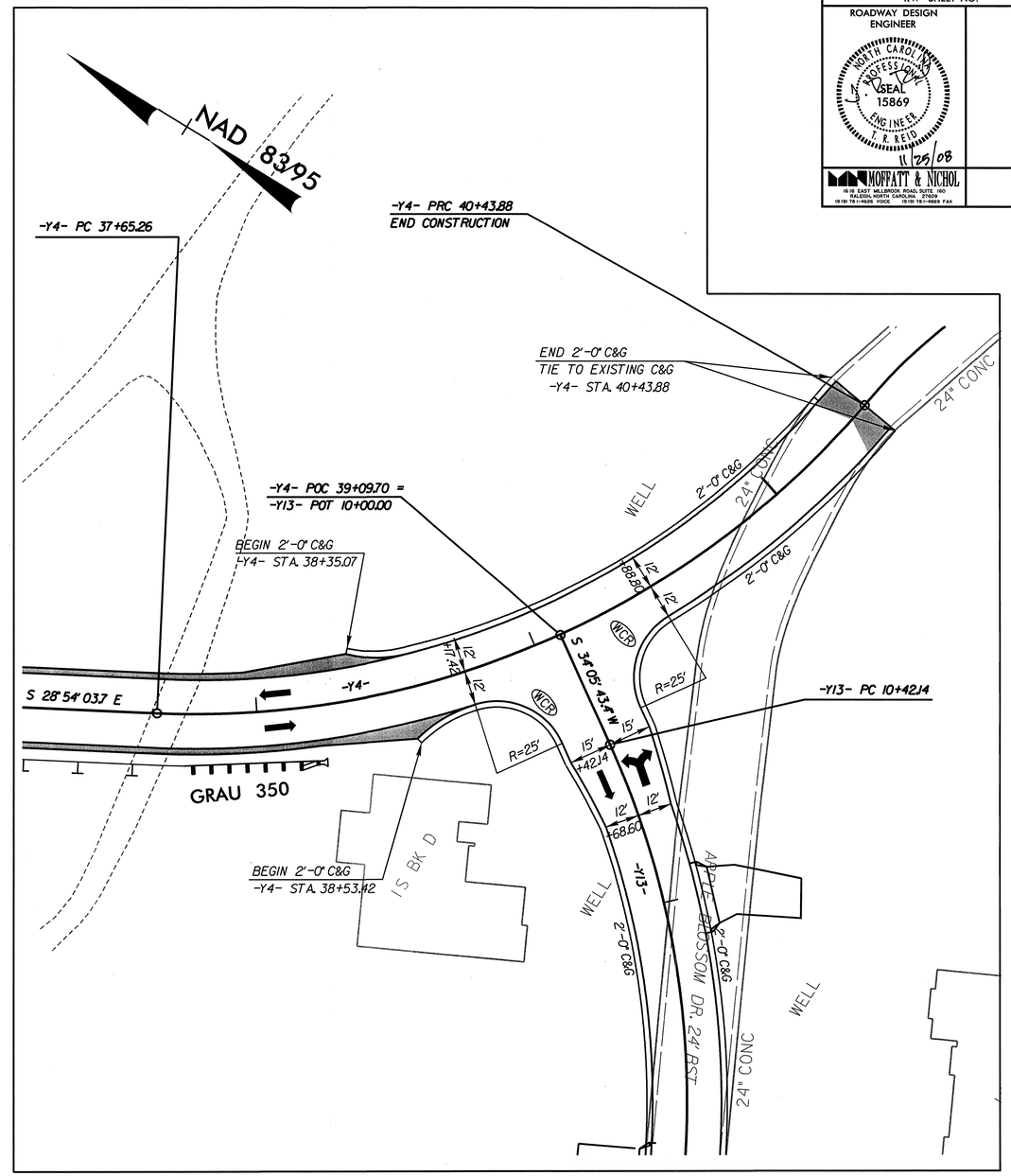


INTERSECTION DETAIL OF -Y4- & -Y5-



INTERSECTION DETAIL OF -Y4- & -Y13-

GRAPHIC SCALE
25 12.5 0 25 50
PLANS

8/17/99

11/25/2008
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cpowell

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	2-M
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

8/12/09

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS III

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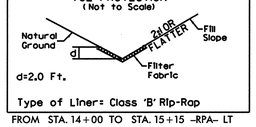
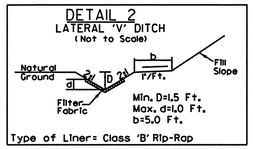
SDG Sungate Design Group, P.A.
Roadway • Landscape Architecture • Environmental
910-A Jones Franklin Rd.
Raleigh, N.C. 27606

DETAIL 1
TOE PROTECTION
(Not to Scale)



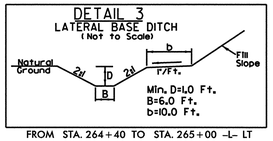
FROM STA. 14+00 TO STA. 15+15 -RPA- LT
STA. 15+50 TO STA. 16+50 -Y6- RT
STA. 44+00 TO STA. 45+10 -Y6- LT
STA. 67+00 TO STA. 68+50 -Y6- LT

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



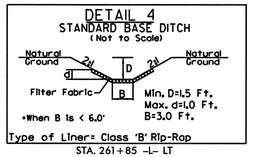
FROM STA. 14+00 TO STA. 15+00 -Y6- LT
STA. 35+25 TO STA. 38+00 -Y4- LT

DETAIL 3
LATERAL BASE DITCH
(Not to Scale)



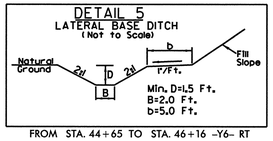
FROM STA. 264+40 TO STA. 265+00 -L- LT

DETAIL 4
STANDARD BASE DITCH
(Not to Scale)



STA. 261+85 -L- LT

DETAIL 5
LATERAL BASE DITCH
(Not to Scale)

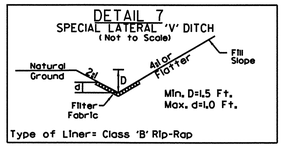


FROM STA. 44+65 TO STA. 46+16 -Y6- RT

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

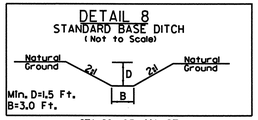
FROM STA. 19+37 TO STA. 19+50 -RPC1- LT

DETAIL 7
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



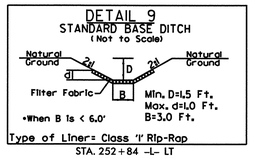
FROM STA. 11+00 TO STA. 13+50 -Y4- RT

DETAIL 8
STANDARD BASE DITCH
(Not to Scale)



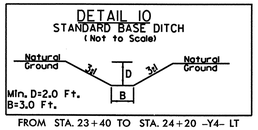
STA. 10+95 -Y4- RT

DETAIL 9
STANDARD BASE DITCH
(Not to Scale)



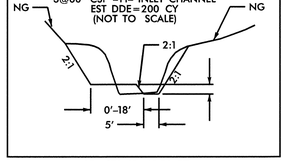
STA. 252+84 -L- LT
STA. 28+40 -Y4- LT

DETAIL 10
STANDARD BASE DITCH
(Not to Scale)



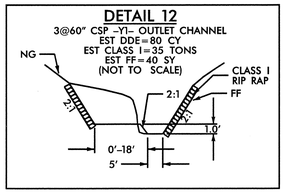
FROM STA. 23+40 TO STA. 24+20 -Y4- LT

DETAIL 11
3@60" CSP -Y1- INLET CHANNEL
EST DDE=200 CY
(NOT TO SCALE)



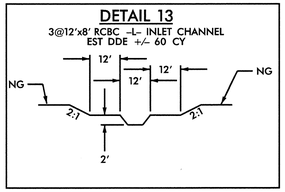
-Y1- STA. 11+21.58 RT

DETAIL 12
3@60" CSP -Y1- OUTLET CHANNEL
EST DDE=80 CY
EST CLASS I=35 TONS
EST FF=40 SY
(NOT TO SCALE)



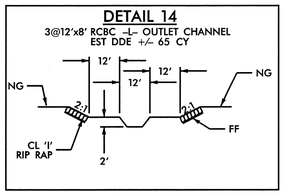
-Y1- STA. 11+62.43 LT

DETAIL 13
3@12'x8' RCBC -L- INLET CHANNEL
EST DDE +/- 60 CY



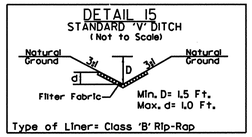
-L- STA. 265+07.49 LT

DETAIL 14
3@12'x8' RCBC -L- OUTLET CHANNEL
EST DDE +/- 65 CY



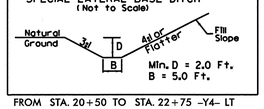
-L- STA. 265+10.23 RT

DETAIL 15
STANDARD 'V' DITCH
(Not to Scale)



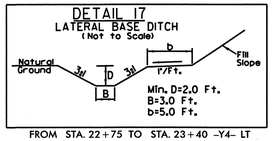
STA. 12+68 -Y1- LT

DETAIL 16
SPECIAL LATERAL BASE DITCH
(Not to Scale)



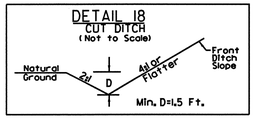
FROM STA. 20+50 TO STA. 22+75 -Y4- LT

DETAIL 17
LATERAL BASE DITCH
(Not to Scale)



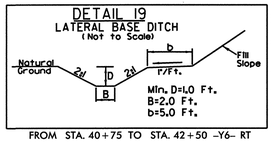
FROM STA. 22+75 TO STA. 23+40 -Y4- LT

DETAIL 18
CUT DITCH
(Not to Scale)



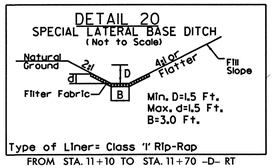
FROM STA. 34+50 TO STA. 35+25 -Y4- LT

DETAIL 19
LATERAL BASE DITCH
(Not to Scale)



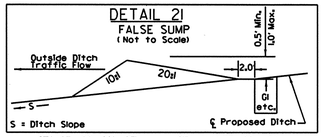
FROM STA. 40+75 TO STA. 42+50 -Y6- RT

DETAIL 20
SPECIAL LATERAL BASE DITCH
(Not to Scale)



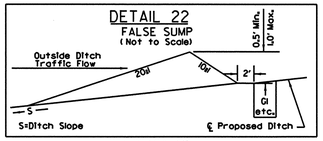
FROM STA. 11+10 TO STA. 11+70 -D- RT

DETAIL 21
FALSE SUMP
(Not to Scale)



STA. 15+39 -Y6- RT
STA. 27+90 -Y6- RT
STA. 30+24 -Y6- RT
STA. 4+50 -RPA- LT
STA. 5+88 -RPA- LT
STA. 7+33 -RPA- LT
STA. 77+22 -Y6- RT
STA. 14+88 -Y4- RT
STA. 18+00 -Y4- RT
STA. 21+67 -Y4- RT
STA. 28+35 -Y4- RT

DETAIL 22
FALSE SUMP
(Not to Scale)



STA. 38+24 -Y6- LT
STA. 7+40 -RPD- RT
STA. 0+32 -RPD- RT
STA. 18+06 -Y4- LT
STA. 19+67 -Y4- LT

8/11/2009
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mwilliams

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	2-N

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

8/12/09

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR.

8/12/09

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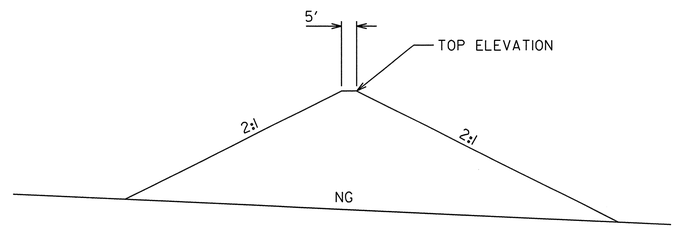
Raleigh, N.C. 27606



	STATION	TOP ELEV	VOL REQ'D (CF)
BASIN #1	263+00 -L- LT	771.1'	22,500
BASIN #2	266+00 -L- RT	768.0'	6,900
BASIN #3	253+00 -L- LT	802.0'	5,500

HAZARDOUS SPILL BASIN DETAILS

(Not to scale)

6/2/99

8/12/2009
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thurfmann

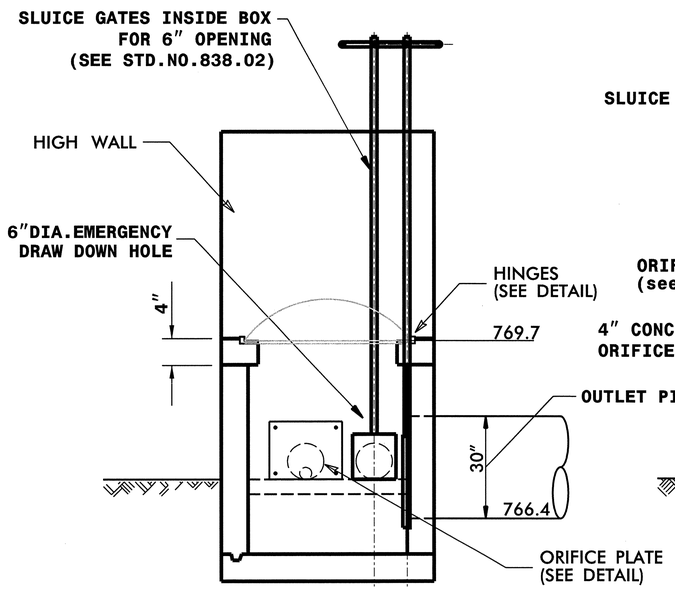
PROJECT REFERENCE NO.	SHEET NO.
R-3833B	2-O

HYDRAULICS ENGINEER

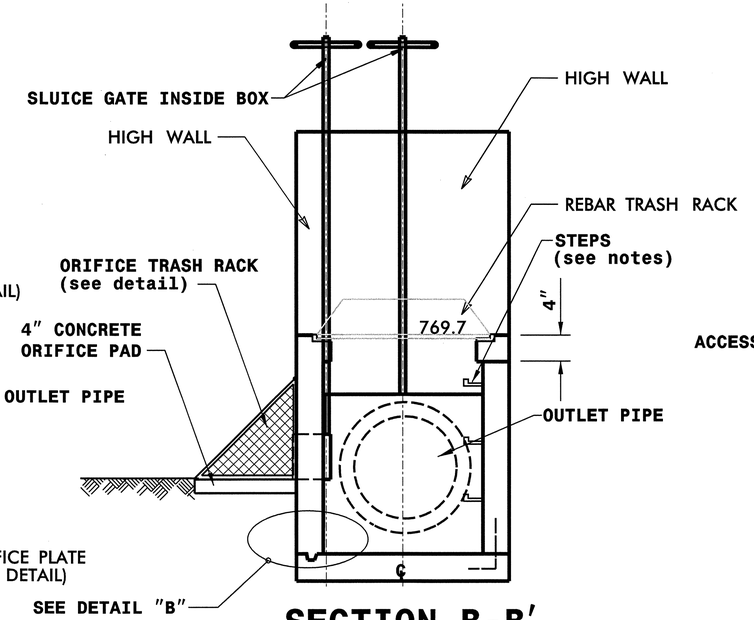
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS, JR.

12/09/08

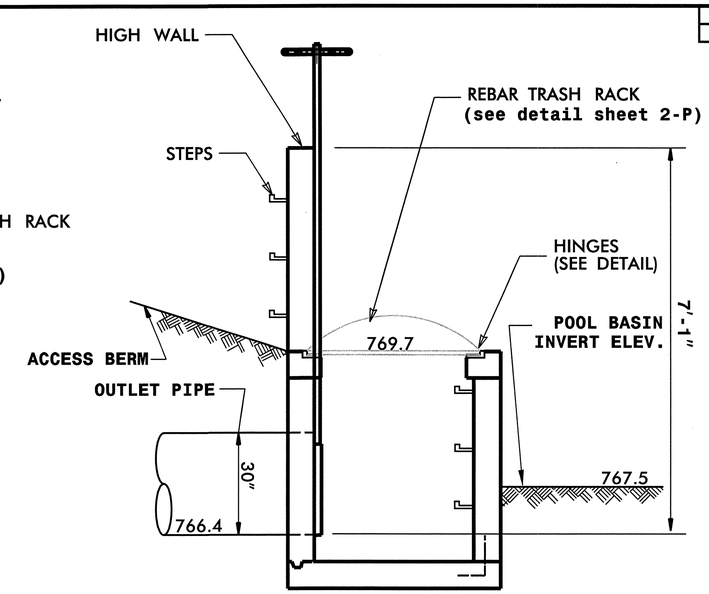
SDG Sungate Design Group, P.A. Planning • Landscape Architecture • Engineering 3904 N. Juniper St. Raleigh, N.C. 27609



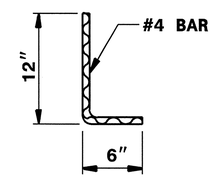
SECTION A-A'



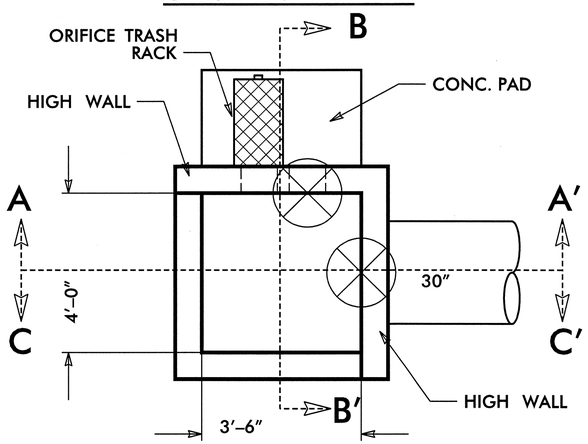
SECTION B-B'



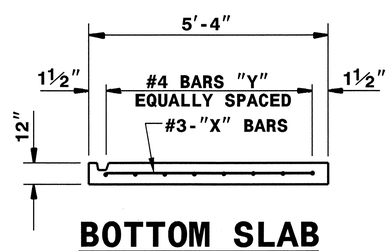
SECTION C-C'



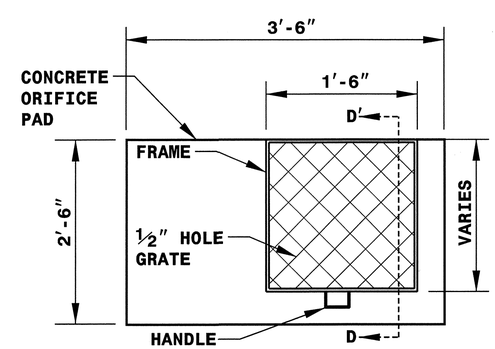
DOWEL



PLAN



BOTTOM SLAB



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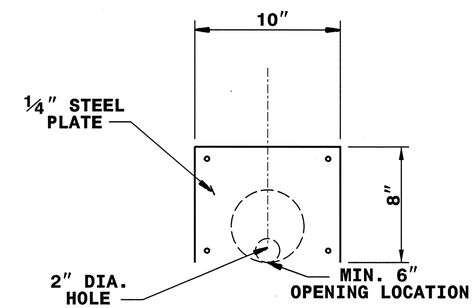


ORIFICE PLATE

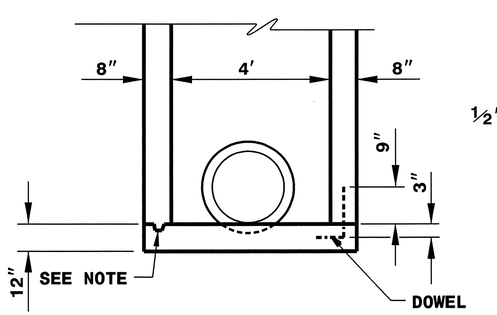
ORIFICE TRASH RACK NOTES:

1. ALL JOINTS SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF ¼" BEAD.
2. IF BOLTS ARE CHEMICALLY ANCHORED, FOLLOW STD. DWG. 862.04 FOR ANCHORING PROCEDURE.
3. REMOVABLE ORIFICE TRASH RACK SHALL BE ATTACHED TO CONCRETE BOX BY HINGE OR SLIDE RAIL SYSTEM.
4. RACK AND HARDWARE SHALL BE ALUMINUM OR GALVANIZED IN ACCORDANCE WITH ASTM 153.

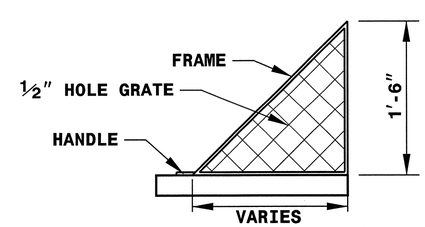
NOT TO SCALE

GENERAL NOTES:

* CHANGES IN ELEVATIONS MUST BE APPROVED BY THE ENGINEER.
* CLASS 'B' CONCRETE TO BE USED THROUGHOUT. PRECAST CONCRETE STRUCTURES TO BE SUBMITTED FOR APPROVAL.
* OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2 INCH KEYWAY, OR #4 BAR DOWELS AT 12 INCH CENTERS, AS DIRECTED BY THE ENGINEER.
* FORMS ARE TO BE USED FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
* IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OF BOX, ADD TO BASE AS SHOWN ON STANDARD 840.00.
* ALL DRAWDOWN STRUCTURES OVER 3 FEET IN DEPTH TO BE PROVIDED WITH STEPS 12 INCH ON CENTERS. STEPS SHALL BE INSTALLED IN ACCORDANCE WITH STANDARD 840.66.
* FOR 8'-0" IN HEIGHT OR LESS USE 8 INCH WALLS AND BOTTOM SLAB. OVER 8'-0" IN HEIGHT USE 12" WALLS TO 6'-0" FROM TOP OF WALL AND USE 8 INCH THICK WALLS FOR THE REMAINING 6'-0". ADJUST QUANTITIES ACCORDINGLY
* RETICULINE FRAME AND GRATE TO BE APPROVED BY THE ENGINEER..



DETAIL 'B'



SECTION D-D'

REMOVABLE ORIFICE TRASH RACK

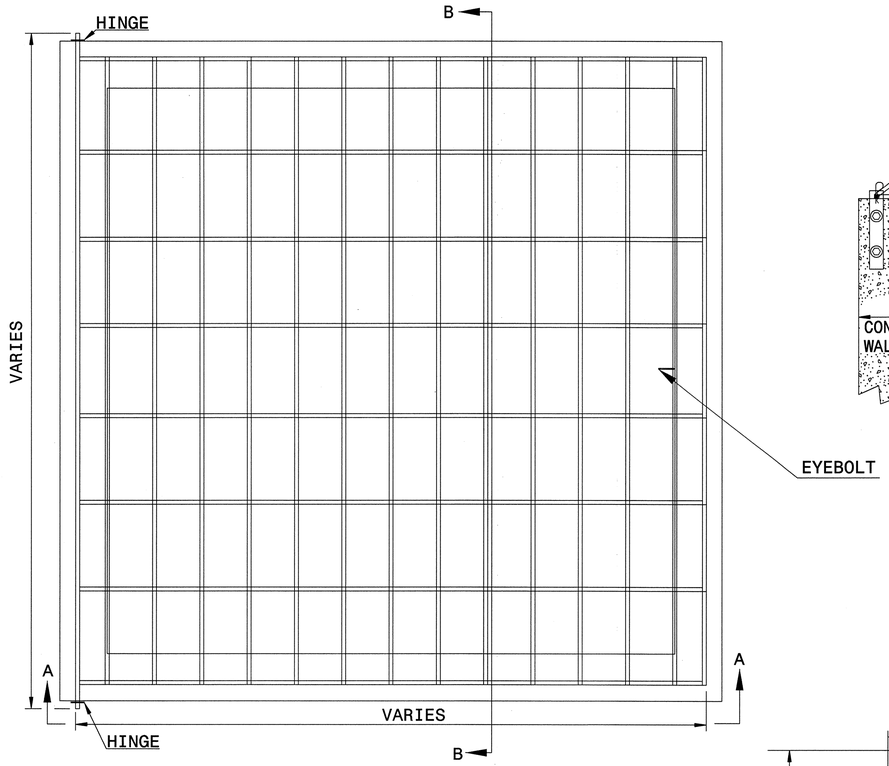
STRUCTURE NO. 41
(-L- 263+18 LT.)

DETAIL OF OUTLET CONTROL STRUCTURE

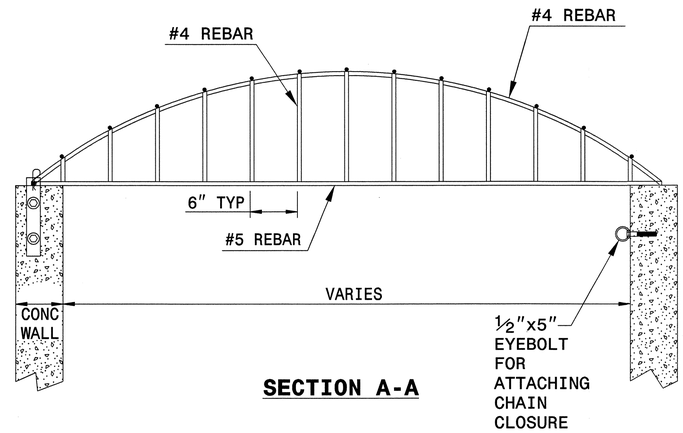
ORIGINAL BY: _____ DATE: _____
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

12/9/2008
R-3833B
thuffman
R-3833B\Drainage\r3833b_rdy_det_2o.dgn

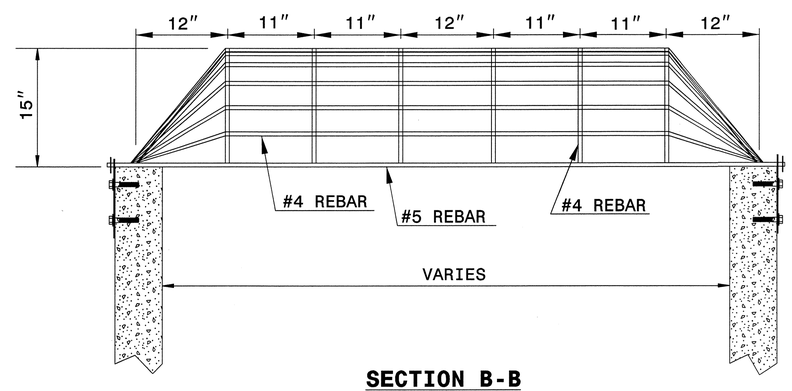
PROJECT REFERENCE NO.	SHEET NO.
R-3833B	2-P



PLAN



SECTION A-A



SECTION B-B

RISER TRASH RACK NOTES:

1. ALL JOINTS SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A ¼" BEAD.
2. IF BOLTS ARE CHEMICALLY ANCHORED, FOLLOW STD. DWG. 862.04 FOR ANCHORING PROCEDURE.
3. EYEBOLT FOR CHAIN CLOSURE SHALL BE INSTALLED BY THE SAME METHOD AS THE HINGE PLATE BOLTS.
4. RACK AND HARDWARE SHALL BE REBAR AND GALVANIZED IN ACCORDANCE WITH ASTMA 153.

REBAR TRASH RACK

*** NOT TO SCALE**

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

DETAIL OF REBAR TRASH RACK

ORIGINAL BY: L. Robinson DATE: 1995
MODIFIED BY: E.E. Ward & T.S.S. DATE: 3-3-98
CHECKED BY: DATE:
FILE SPEC.: DS113:/usr/details/stand/flashboard2.dgn

11/24/2008
R:\Hydraulics\Bridge\r-3833b_hyd_det_psh2p.dgn
thuffman

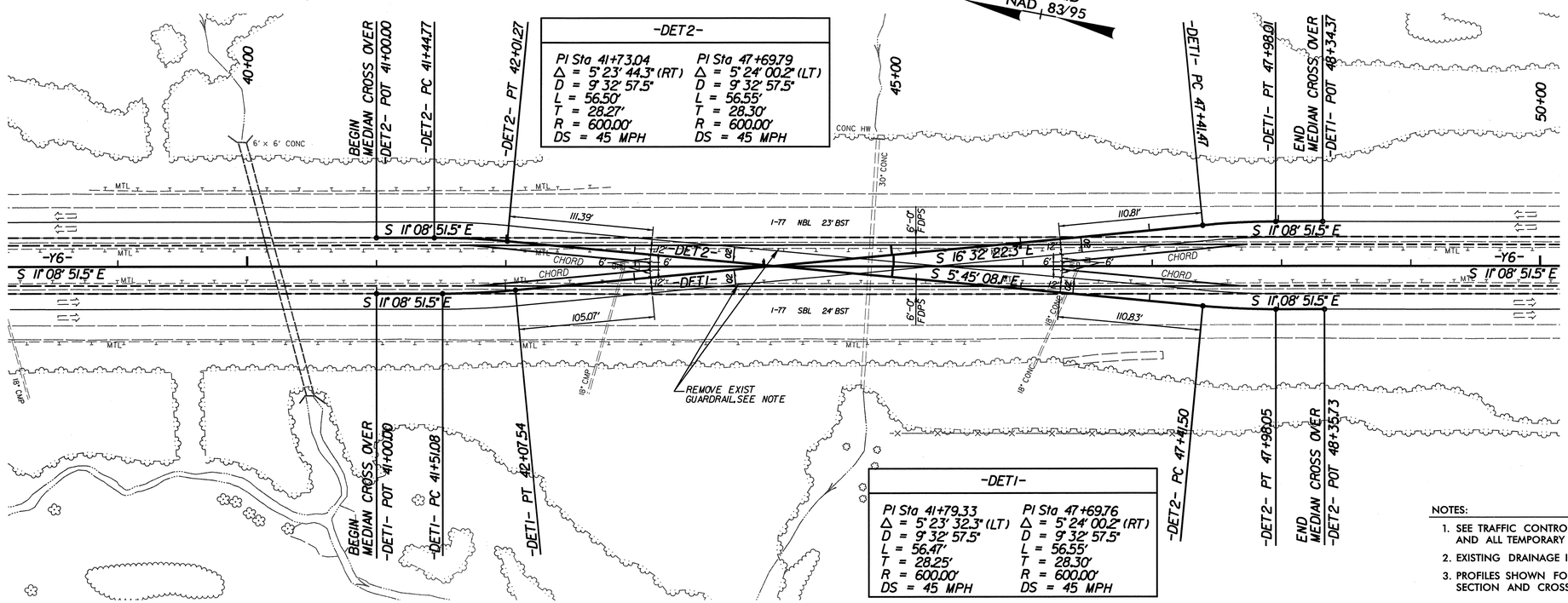
PROJECT REFERENCE NO.	SHEET NO.
R-3833B	2-Q
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID 11/25/08

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR. 11/26/08

MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX

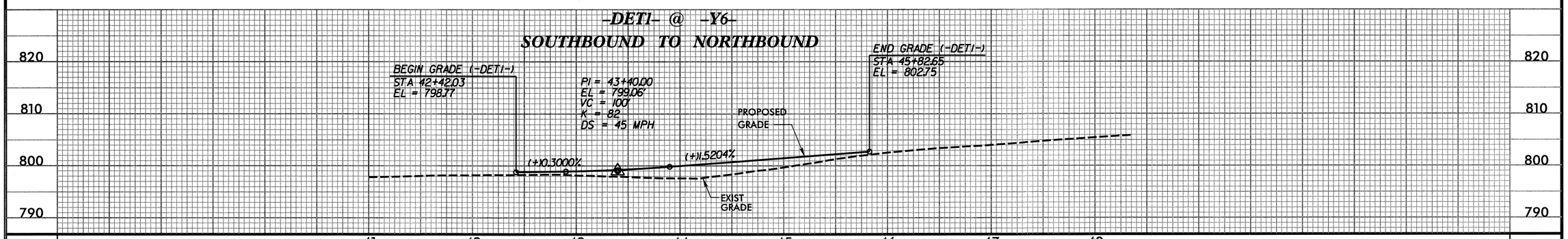
SDG Sungate Design Group, P.A.
Planning • Engineering • Surveying
910-A Jones Franklin Rd.
Raleigh, N.C. 27606

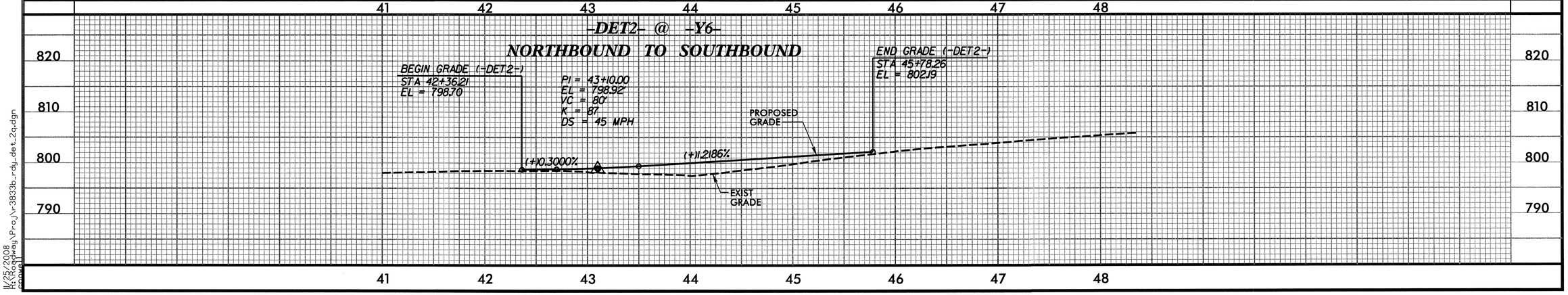


NOTES:

1. SEE TRAFFIC CONTROL PLANS FOR LIMITS OF MEDIAN GUARDRAIL REMOVAL AND ALL TEMPORARY TRAFFIC CONTROL DEVICES.
2. EXISTING DRAINAGE INLETS TO REMAIN IN OPERATION WITH CROSS OVER.
3. PROFILES SHOWN FOR REFERENCE ONLY, SEE CROSS OVER TYPICAL SECTION AND CROSS SECTIONS FOR PAVEMENT RELATIONSHIP TIE-IN.

FOR TRAFFIC CONTROL PLANS SEE TCP-1 THRU TCP-27





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PROJECT REFERENCE NO.	SHEET NO.
R-3833B	2-R
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID 12/2/08

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLIN JR. 12/02/08

MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
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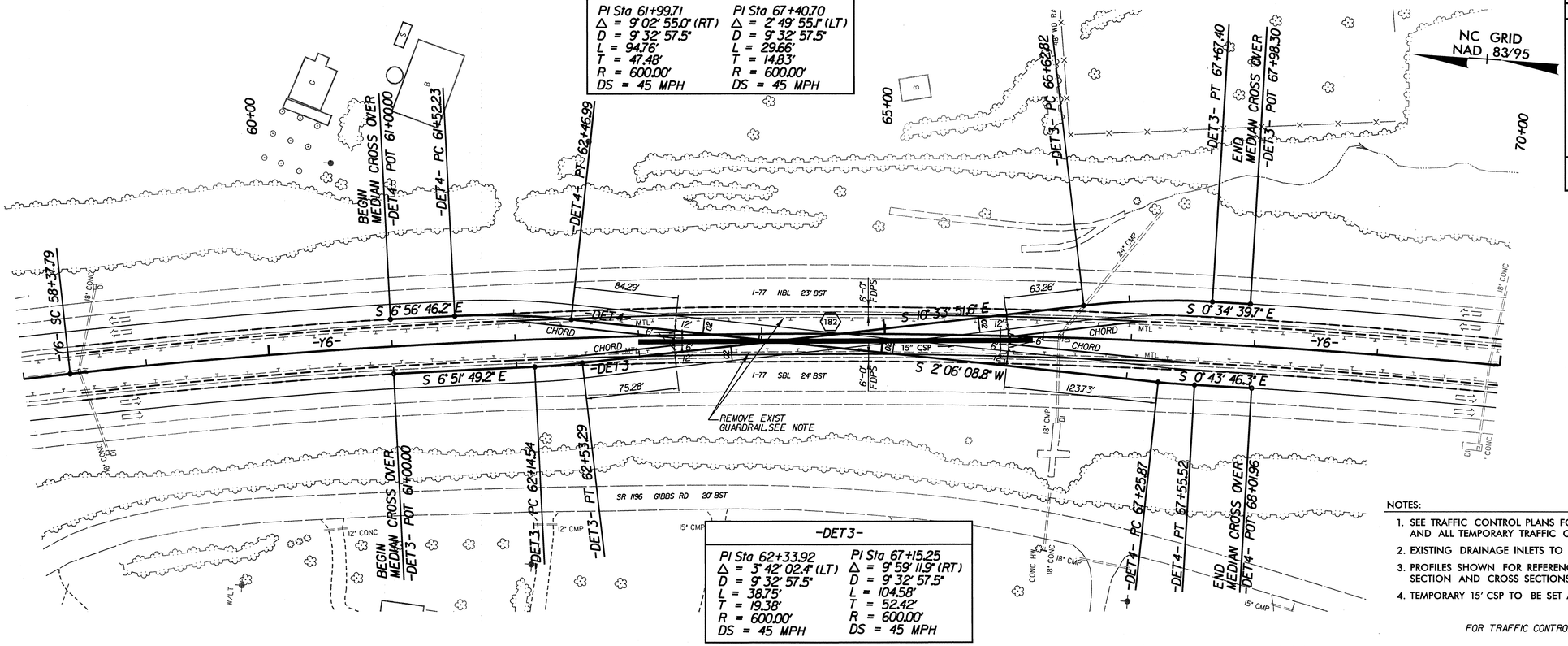
SDG Sungate Design Group, P.A.
Transportation Consultants
910-A Jones Franklin Rd.
Raleigh, N.C. 27606

-DET4-

PI Sta 61+99.71	PI Sta 67+40.70
Δ = 9° 02' 55.0" (RT)	Δ = 2° 49' 55.1" (LT)
D = 9° 32' 57.5"	D = 9° 32' 57.5"
L = 94.76'	L = 29.66'
T = 47.48'	T = 14.83'
R = 600.00'	R = 600.00'
DS = 45 MPH	DS = 45 MPH



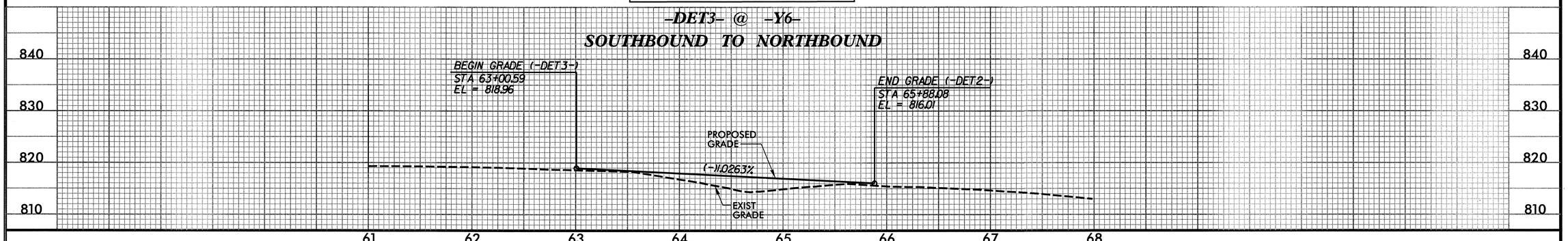
-DET3-

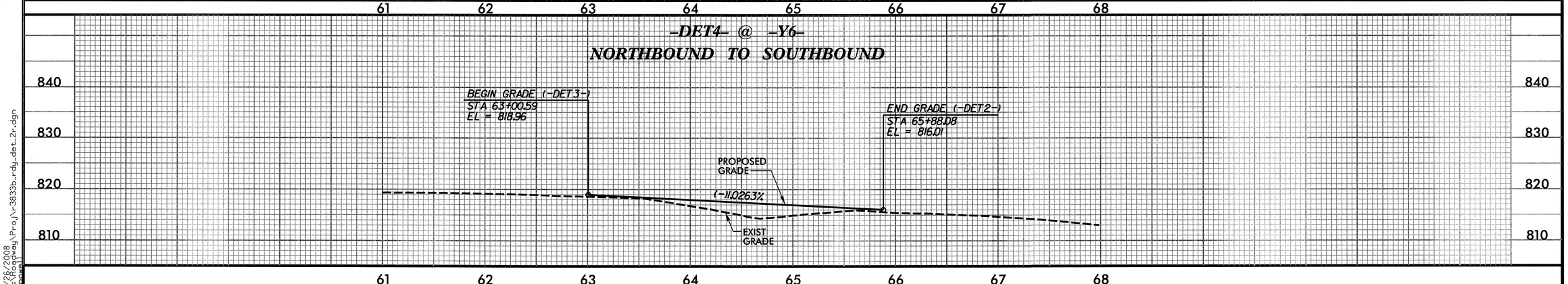
PI Sta 62+33.92	PI Sta 67+15.25
Δ = 3° 42' 02.4" (LT)	Δ = 9° 59' 11.9" (RT)
D = 9° 32' 57.5"	D = 9° 32' 57.5"
L = 38.75'	L = 104.58'
T = 19.38'	T = 52.42'
R = 600.00'	R = 600.00'
DS = 45 MPH	DS = 45 MPH

NOTES:

1. SEE TRAFFIC CONTROL PLANS FOR LIMITS OF MEDIAN GUARDRAIL REMOVAL AND ALL TEMPORARY TRAFFIC CONTROL DEVICES.
2. EXISTING DRAINAGE INLETS TO REMAIN IN OPERATION WITH CROSS OVER.
3. PROFILES SHOWN FOR REFERENCE ONLY, SEE CROSS OVER TYPICAL SECTION AND CROSS SECTIONS FOR PAVEMENT RELATIONSHIP TIE-IN.
4. TEMPORARY 15' CSP TO BE SET AS DIRECTED BY THE RESIDENT ENGINEER.

FOR TRAFFIC CONTROL PLANS SEE TCP-1 THRU TCP-27





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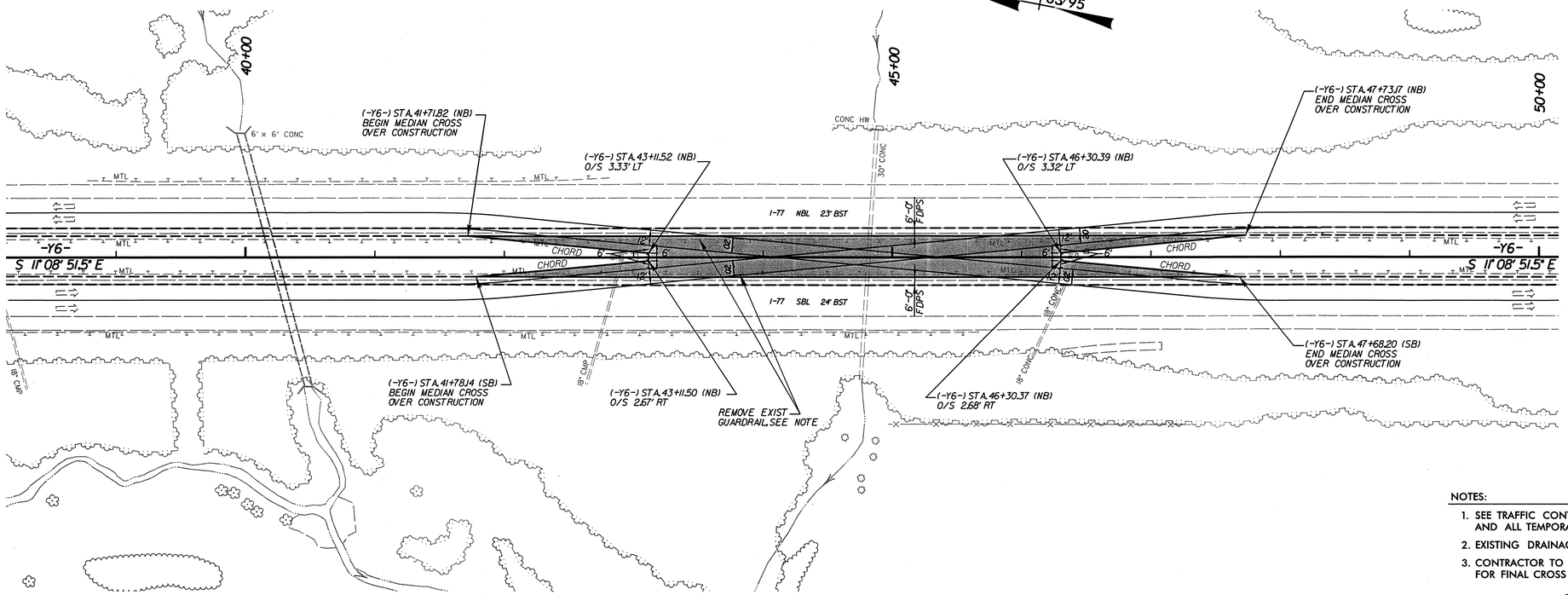
PROJECT REFERENCE NO.	SHEET NO.
R-3833B	2-S
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

11/25/08

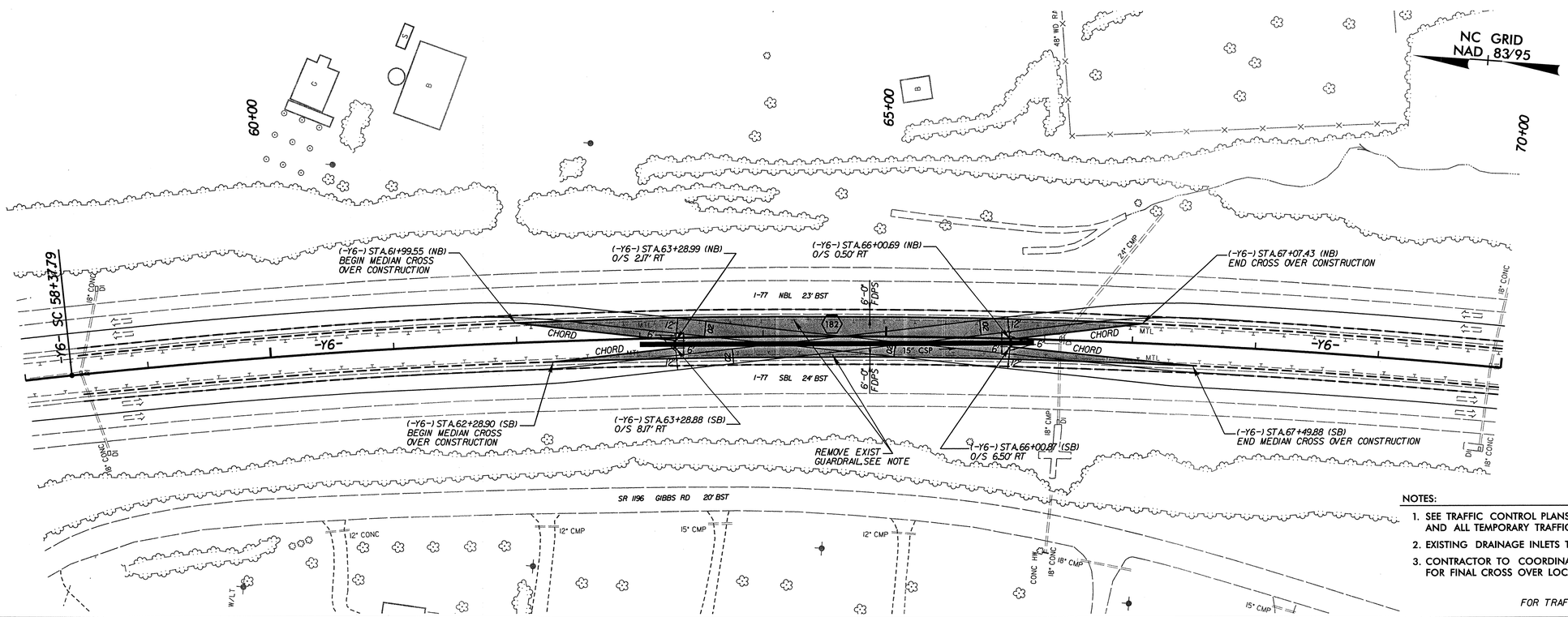
MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX



NOTES:

1. SEE TRAFFIC CONTROL PLANS FOR LIMITS OF MEDIAN GUARDRAIL REMOVAL AND ALL TEMPORARY TRAFFIC CONTROL DEVICES.
2. EXISTING DRAINAGE INLETS TO REMAIN IN OPERATION WITH CROSS OVER.
3. CONTRACTOR TO COORDINATE WITH RESIDENT ENGINEER FOR FINAL CROSS OVER LOCATION BEFORE CONSTRUCTION.

FOR TRAFFIC CONTROL PLANS SEE TCP-1 THRU TCP-27



NOTES:

1. SEE TRAFFIC CONTROL PLANS FOR LIMITS OF MEDIAN GUARDRAIL REMOVAL AND ALL TEMPORARY TRAFFIC CONTROL DEVICES.
2. EXISTING DRAINAGE INLETS TO REMAIN IN OPERATION WITH CROSS OVER.
3. CONTRACTOR TO COORDINATE WITH RESIDENT ENGINEER FOR FINAL CROSS OVER LOCATION BEFORE CONSTRUCTION.

FOR TRAFFIC CONTROL PLANS SEE TCP-1 THRU TCP-27

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11/26/2008
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pcowell

PROJECT REFERENCE NO.	SHEET
R-3833B	2-T

GEOTECHNICAL ENGINEER

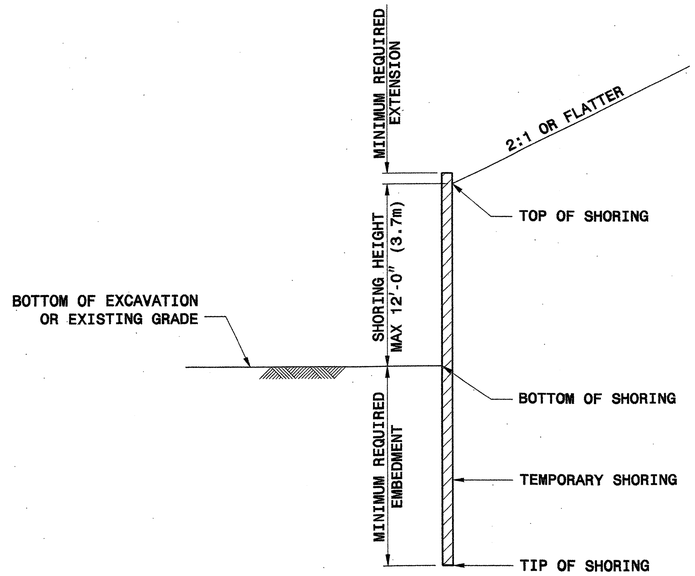
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

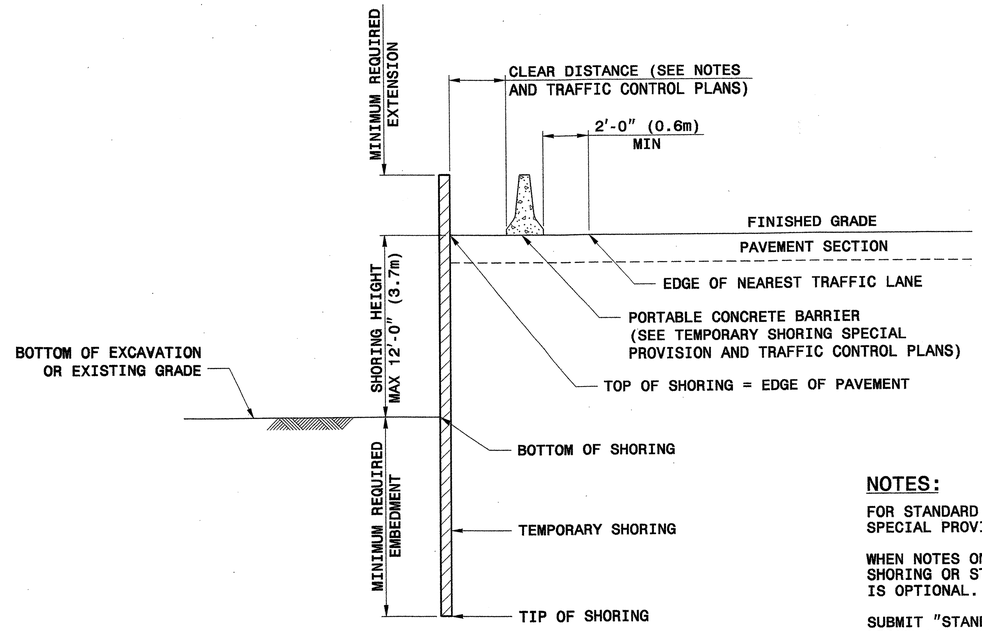
SIGNATURE DATE

ENGINEER

SIGNATURE DATE



SLOPE CASE



SURCHARGE CASE

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

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

NOTES:

FOR STANDARD TEMPORARY SHORING, SEE TEMPORARY SHORING SPECIAL PROVISION.

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

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

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

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

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

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

VERIFY GROUNDWATER ELEVATION BEFORE BEGINNING SHORING CONSTRUCTION.

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

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

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

CONTACT THE ENGINEER IF MINIMUM REQUIRED EMBEDMENT IS NOT ACHIEVED.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.01

STANDARD TEMPORARY SHORING

DATE: 2-20-07

PROJECT REFERENCE NO.	SHEET
R-3833B	2-U

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

STANDARD TEMPORARY MSE WALL OPTIONS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

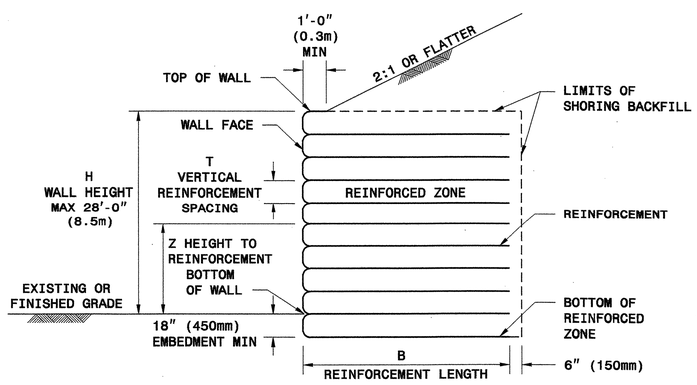
PLACE SHORING BACKFILL IN 8" TO 10" (200mm to 250mm) THICK LIFTS AND COMPACT IN ACCORDANCE WITH SUBARTICLE 235-4(C) OF THE STANDARD SPECIFICATIONS. USE ONLY HAND OPERATED COMPACTION EQUIPMENT WITHIN 3'-0" (1m) OF THE WALL FACE.

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

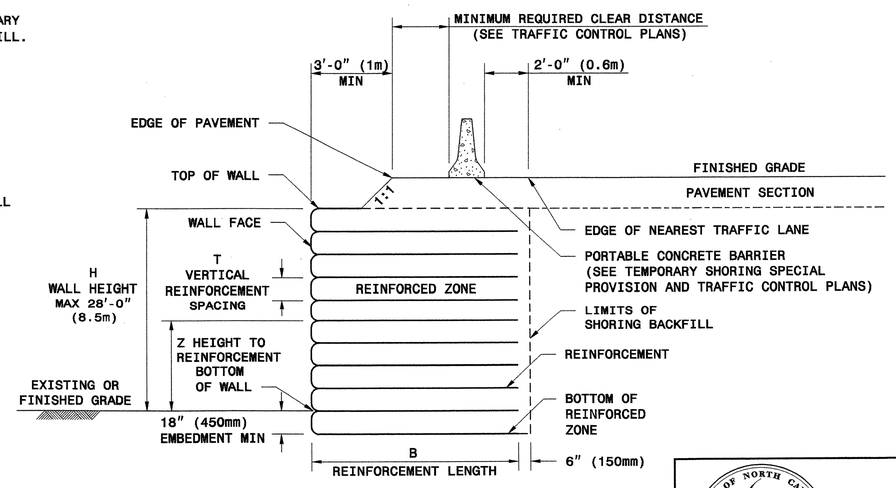
COVER REINFORCING AND RETENTION FABRIC WITH AT LEAST 3" (75mm) OF SHORING BACKFILL. PLACE TOP REINFORCEMENT LAYER BETWEEN 4" AND 24" (100mm and 600mm) BELOW TOP OF WALL DEPENDING ON WALL OPTION.

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

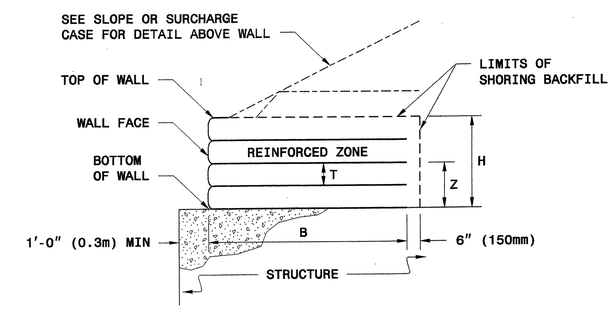
IF THE TOP OF WALL IS WITHIN 5'-0" (1.5m) OF FINISHED GRADE, REMOVE TOP FORM OR FACING AND INCORPORATE THE TOP REINFORCEMENT LAYER INTO THE FILL WHEN PLACING FILL IN FRONT OF THE WALL. STANDARD TEMPORARY MSE WALLS REMAIN IN PLACE PERMANENTLY UNLESS REQUIRED OTHERWISE.



SLOPE CASE



SURCHARGE CASE



TEMPORARY MSE WALL ON STRUCTURE

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY MECHANICALLY STABILIZED EARTH (MSE) WALLS

SHEET 1 OF 11 DATE: 2-20-07

PROJECT REFERENCE NO.	SHEET
R-3833B	2-V

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

HOW TO USE THIS SHEET:

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

MINIMUM REQUIRED REINFORCEMENT LENGTH B (FT)

(FOR ALL WALL OPTIONS)

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

TERRATREL TEMPORARY WALL (STRIPS PER LEVEL PER PANEL)

H (FT)

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

SLOPE AND SURCHARGE CASES

SIERRASCAPE TEMPORARY WALL (GEOGRID TYPE)

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

H (FT)

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

SLOPE CASE

H (FT)

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

SURCHARGE CASE

H (FT)

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

SURCHARGE CASE

HILFIKER TEMPORARY WALL (WELDED WIRE MAT TYPE)

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

H (FT)

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

SLOPE CASE

H (FT)

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

SURCHARGE CASE

RETAINED EARTH TEMPORARY WALL (WELDED WIRE MESH TYPE)

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

H (FT)

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

SLOPE AND SURCHARGE CASES

NOTES FOR HILFIKER TEMPORARY WALL

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

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY MSE WALL REINFORCEMENT TABLES - ENGLISH UNITS

SHEET 2 OF 11 DATE: 2-20-07

PROJECT REFERENCE NO.	SHEET
R-3833B	2-W

GEOTECHNICAL ENGINEER

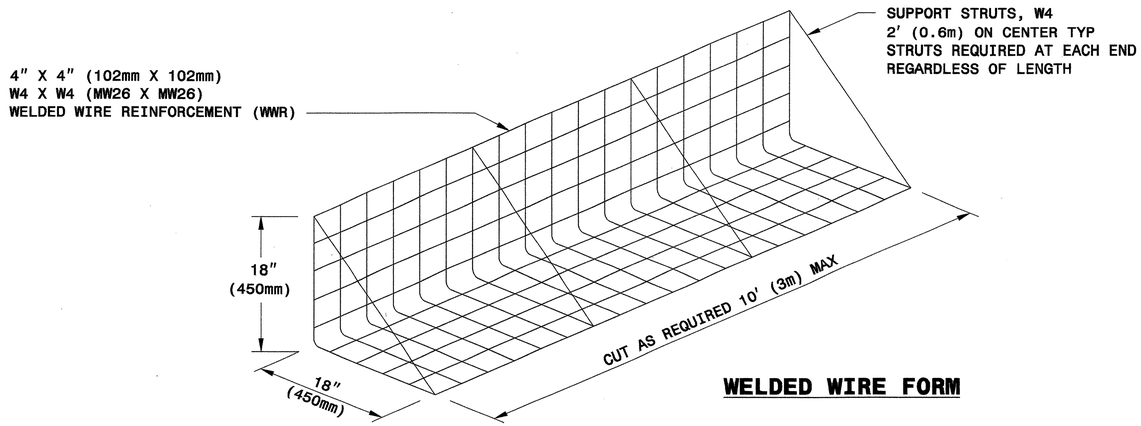
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

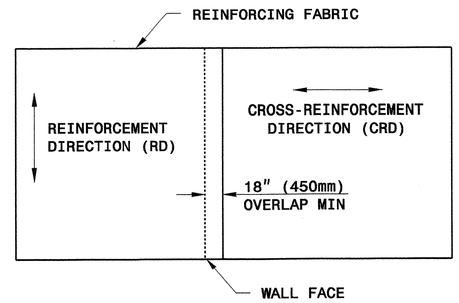
SIGNATURE DATE

ENGINEER

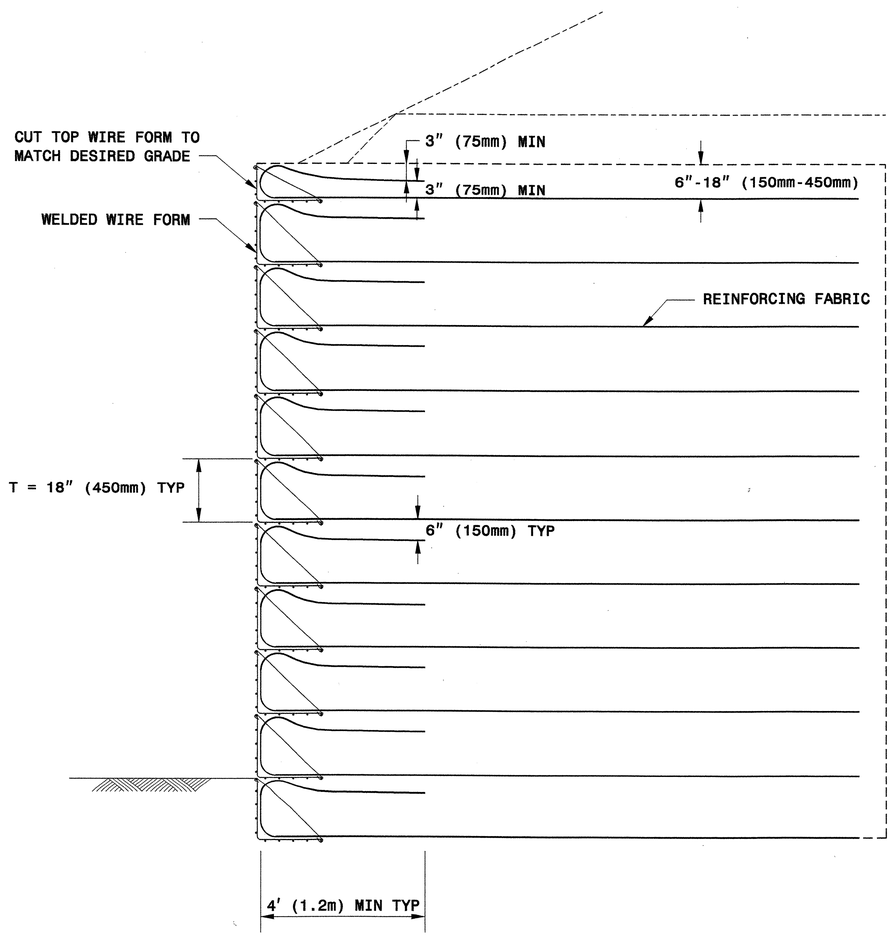
SIGNATURE DATE



WELDED WIRE FORM



PLAN VIEW OF FABRIC OVERLAP



TYPICAL SECTION

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

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

*RD = REINFORCEMENT DIRECTION

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

TEMPORARY FABRIC WALL

SHEET 3 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
R-3833B	2-X

GEOTECHNICAL ENGINEER

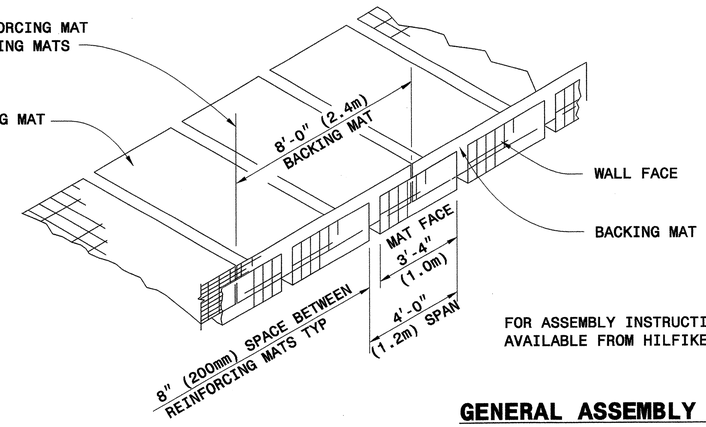
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

SIGNATURE DATE

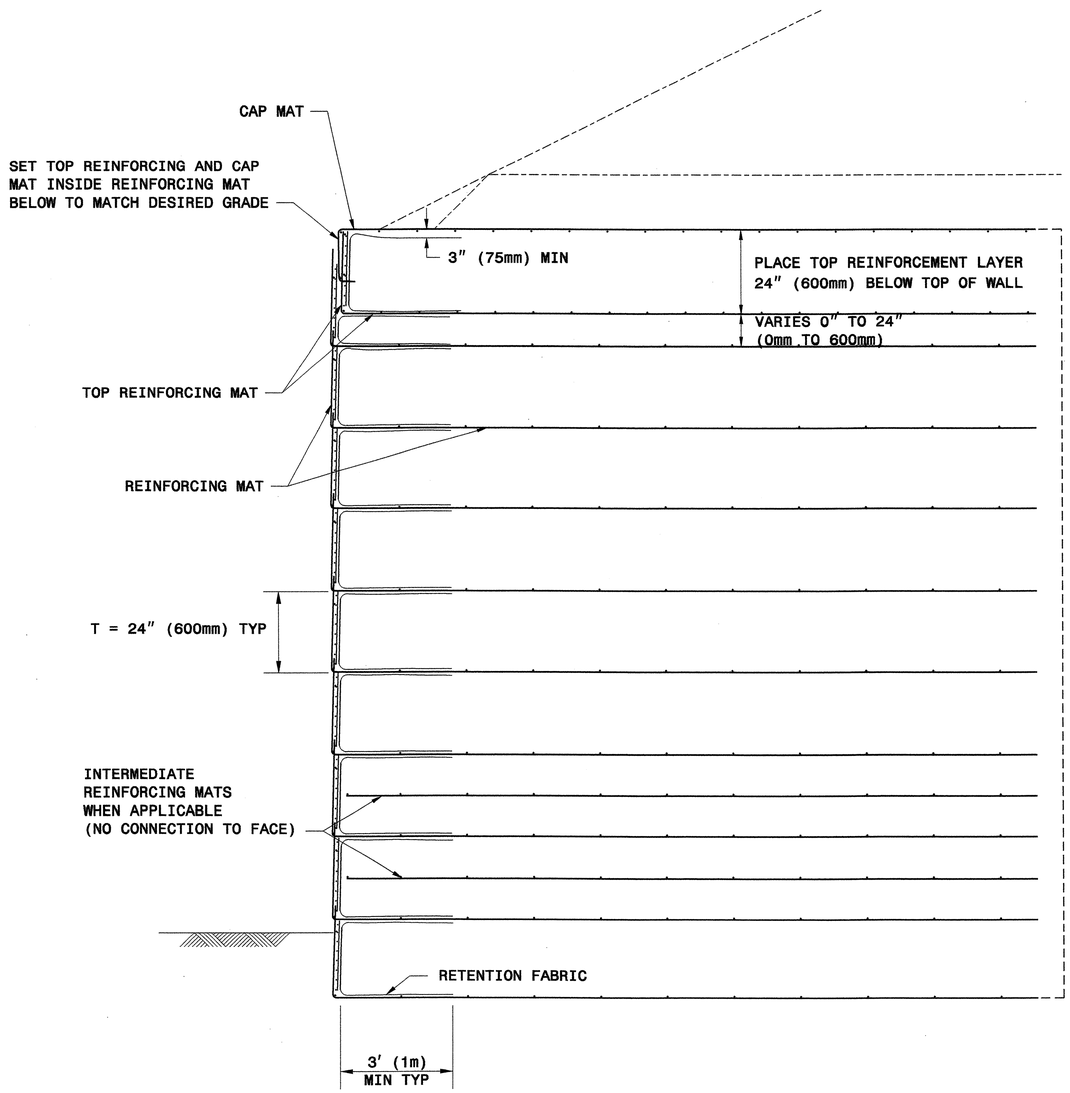
ENGINEER

SIGNATURE DATE

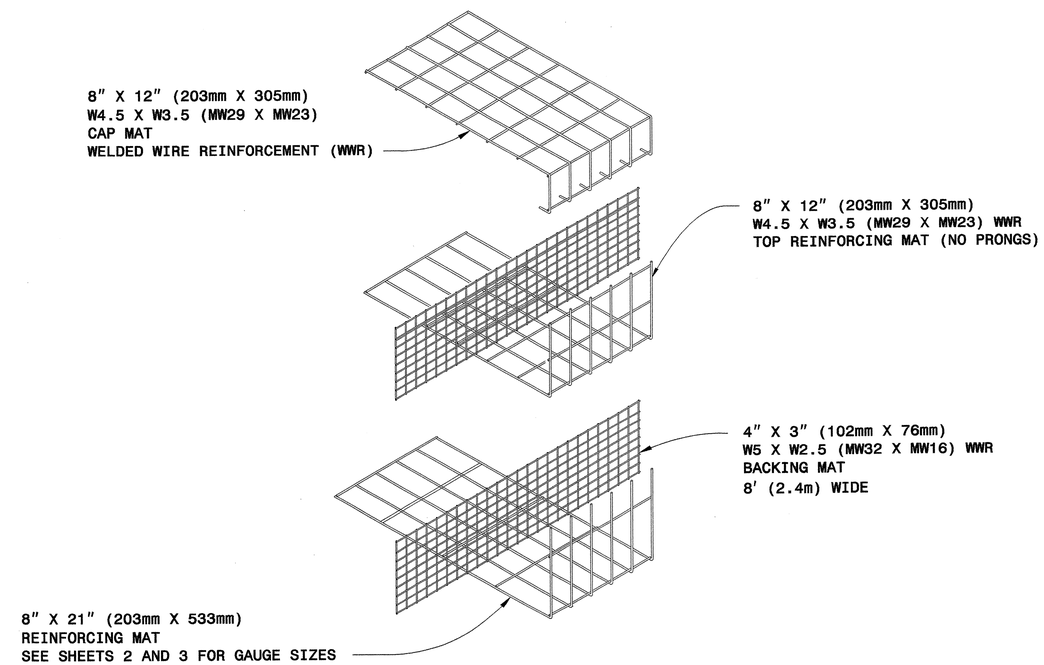


FOR ASSEMBLY INSTRUCTIONS, SEE WELDED WIRE WALL CONSTRUCTION GUIDE AVAILABLE FROM HILFIKER WEBSITE AT WWW.HILFIKER.COM/WWW

GENERAL ASSEMBLY DETAIL



TYPICAL SECTION



WALL COMPONENTS

HILFIKER RETAINING WALLS

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

HILFIKER TEMPORARY WALL

SHEET 4 OF 11

DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
R-3833B	2-Y

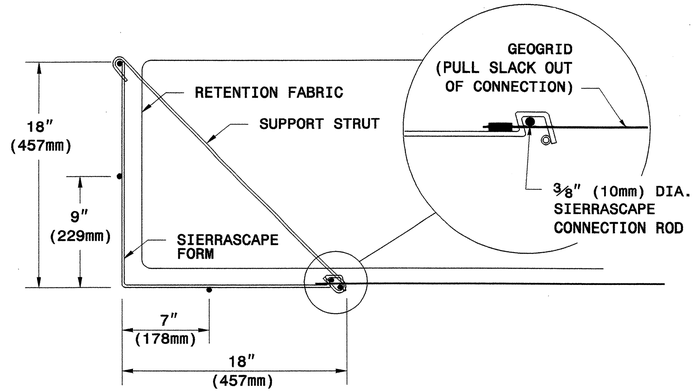
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

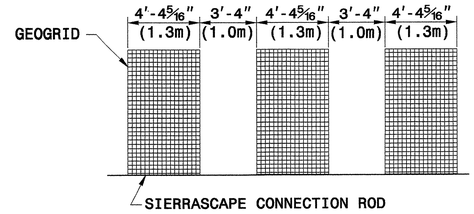
Scott A. Hidden 3/29/07
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

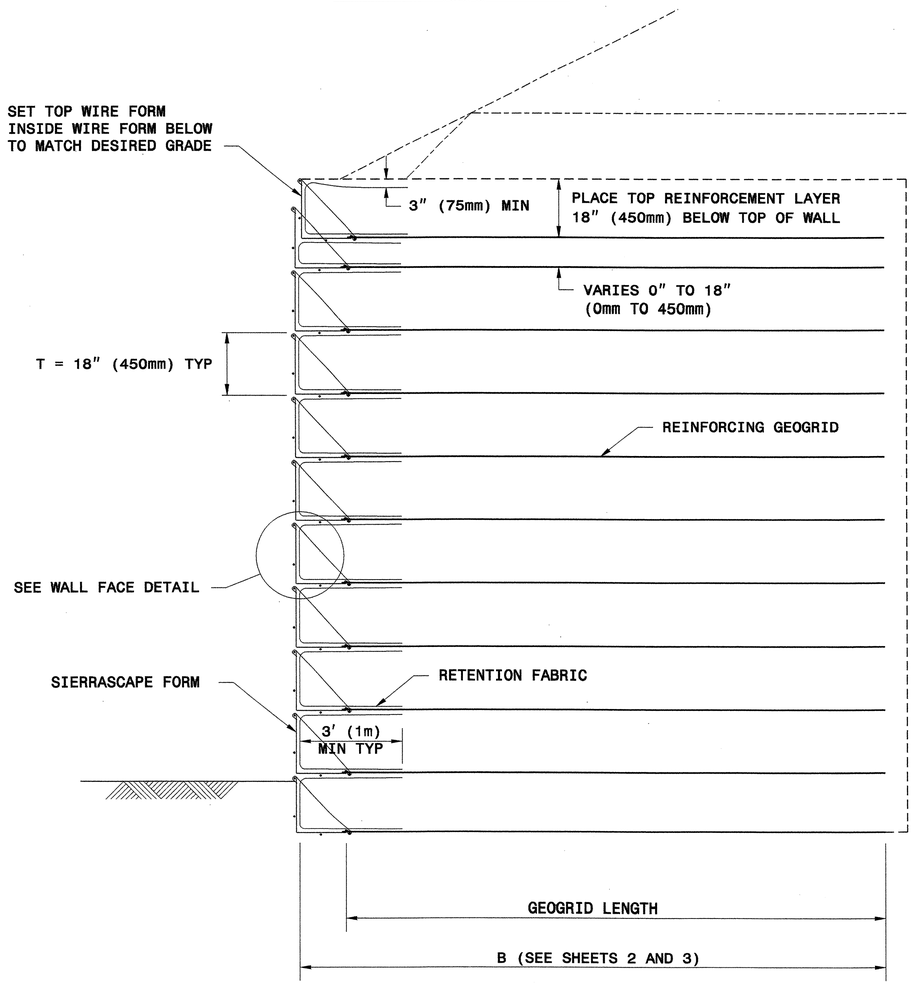


WALL FACE DETAIL

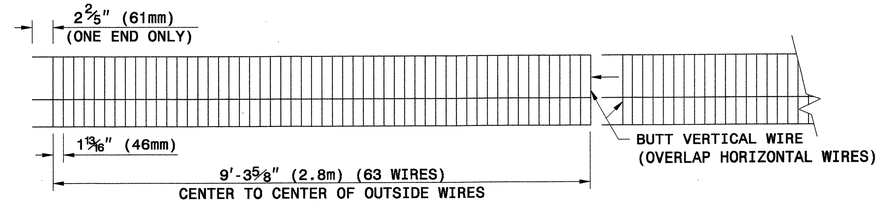


PLACE ALTERNATE LAYERS OF GEOGRID IN STAGGERED PATTERN SUCH THAT THE LAYER ABOVE IS CENTERED OVER SPACE BELOW

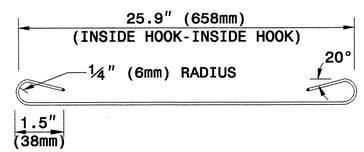
TYPICAL GEOGRID COVERAGE



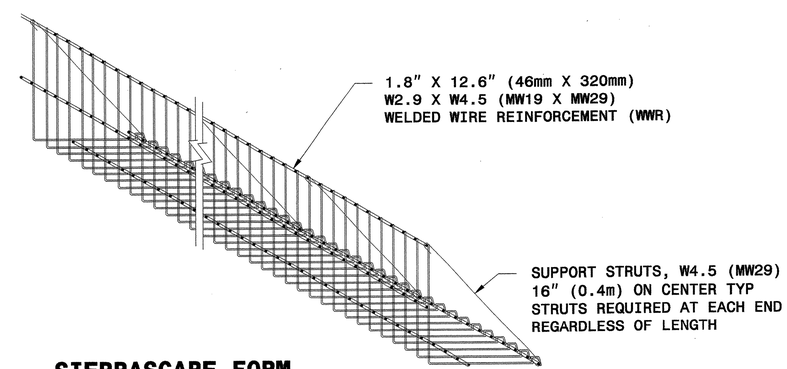
TYPICAL SECTION



ELEVATION VIEW



SUPPORT STRUT



SIERRASCAPE FORM

WALL COMPONENTS

TENSAR®
TENSAR EARTH TECHNOLOGIES, INC.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

SIERRASCAPE
TEMPORARY WALL

SHEET 5 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
R-3833B	2-Z

GEOTECHNICAL ENGINEER

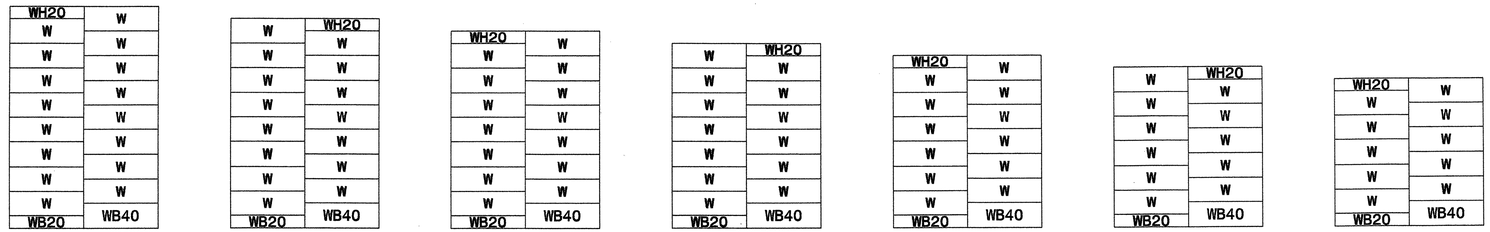
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07
SIGNATURE DATE

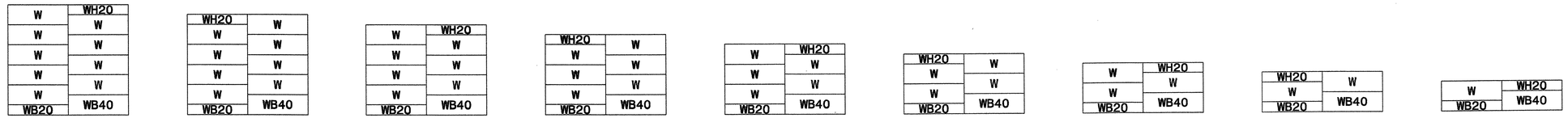
ENGINEER

SIGNATURE DATE

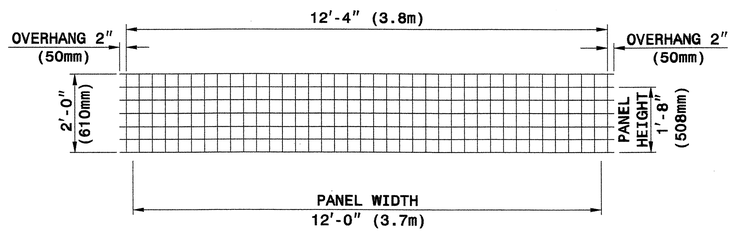
PANEL LAYOUTS



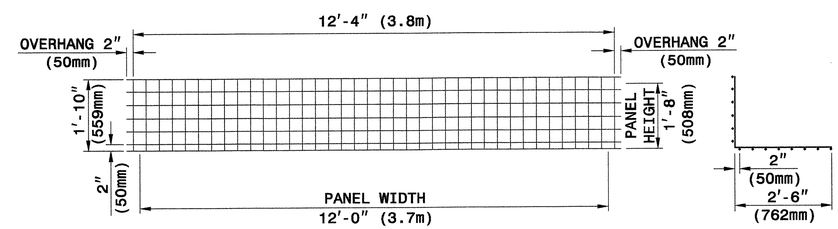
H - WALL HEIGHT							
(FEET-INCHES)	< 28 - 0	< 27 - 0	< 25 - 4	< 23 - 8	< 22 - 0	< 20 - 4	< 18 - 8
(METER)	< 8.5	< 8.2	< 7.7	< 7.2	< 6.7	< 6.2	< 5.7



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

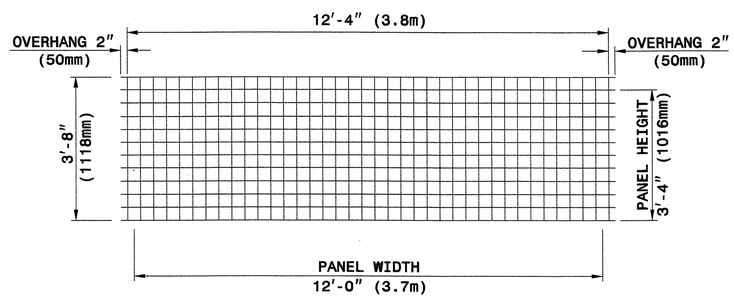


TYPE WH20

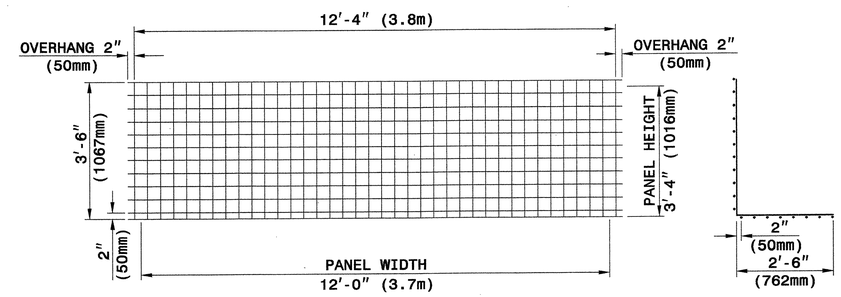


TYPE WB20

SECTION



TYPE W



TYPE WB40

SECTION

WELDED WIRE FACINGS

WELDED WIRE FORMS

PANEL TYPES (WELDED WIRE FACINGS AND FORMS)

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

The Reinforced Earth Company

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

RETAINED EARTH TEMPORARY WALL

SHEET 6 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
R-3833B	2-AA

GEOTECHNICAL ENGINEER

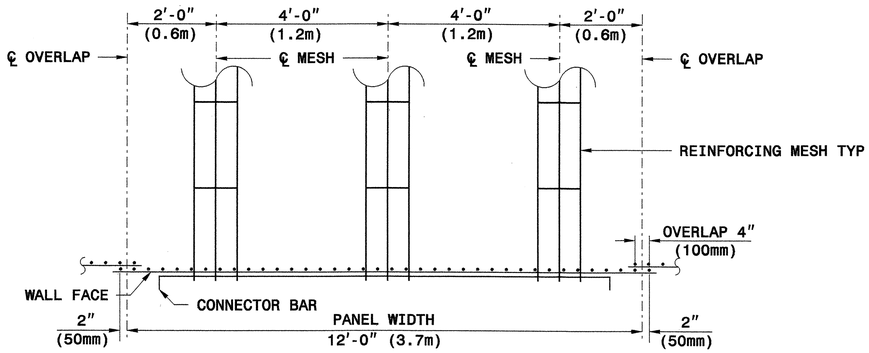
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

SIGNATURE DATE

ENGINEER

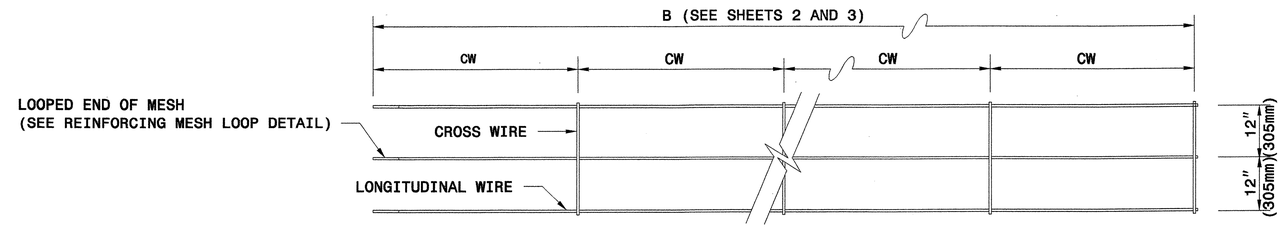
SIGNATURE DATE



REINFORCING MESH PLACEMENT DETAIL
(PLAN VIEW)

½" (13mm) DIA. BAR

CONNECTOR BAR



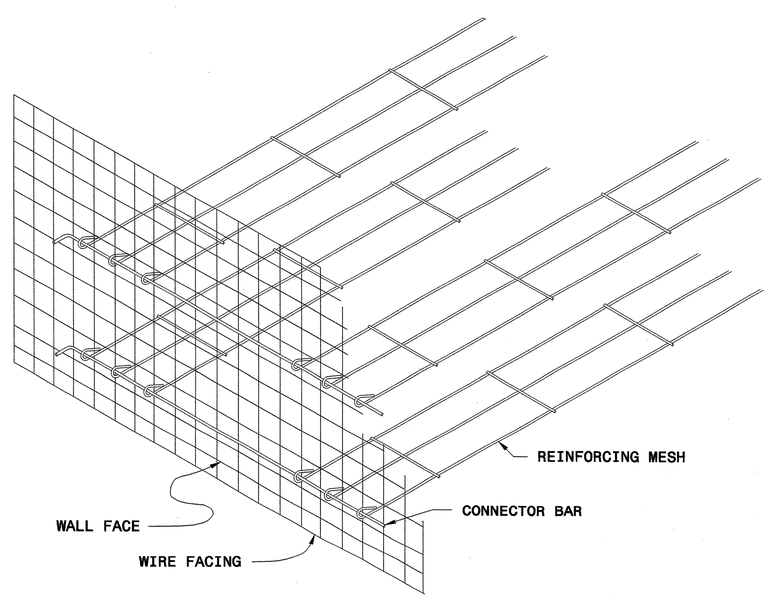
IF REINFORCEMENT LENGTH IS NOT AN INCREMENT OF 2'-0" (610mm) MAKE CW EQUAL TO 12" (305mm) AT THE END OF THE REINFORCING MESH OPPOSITE THE LOOPED END

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

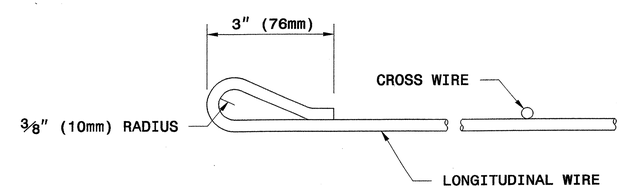
NO. OF LONGITUDINAL WIRES
GAUGE OF LONGITUDINAL WIRES
GAUGE OF CROSS WIRES
SPACING OF CROSS WIRES IN FT (mm), CW

REINFORCING MESH DESIGNATION

REINFORCING MESH



GENERAL ASSEMBLY DETAIL



REINFORCING MESH LOOP DETAIL

The Reinforced Earth Company

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

RETAINED EARTH TEMPORARY WALL

SHEET 7 OF 11

DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
R-3833B	2-AB

GEOTECHNICAL ENGINEER

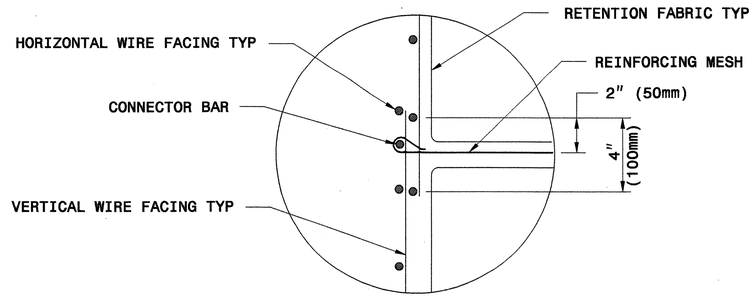
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

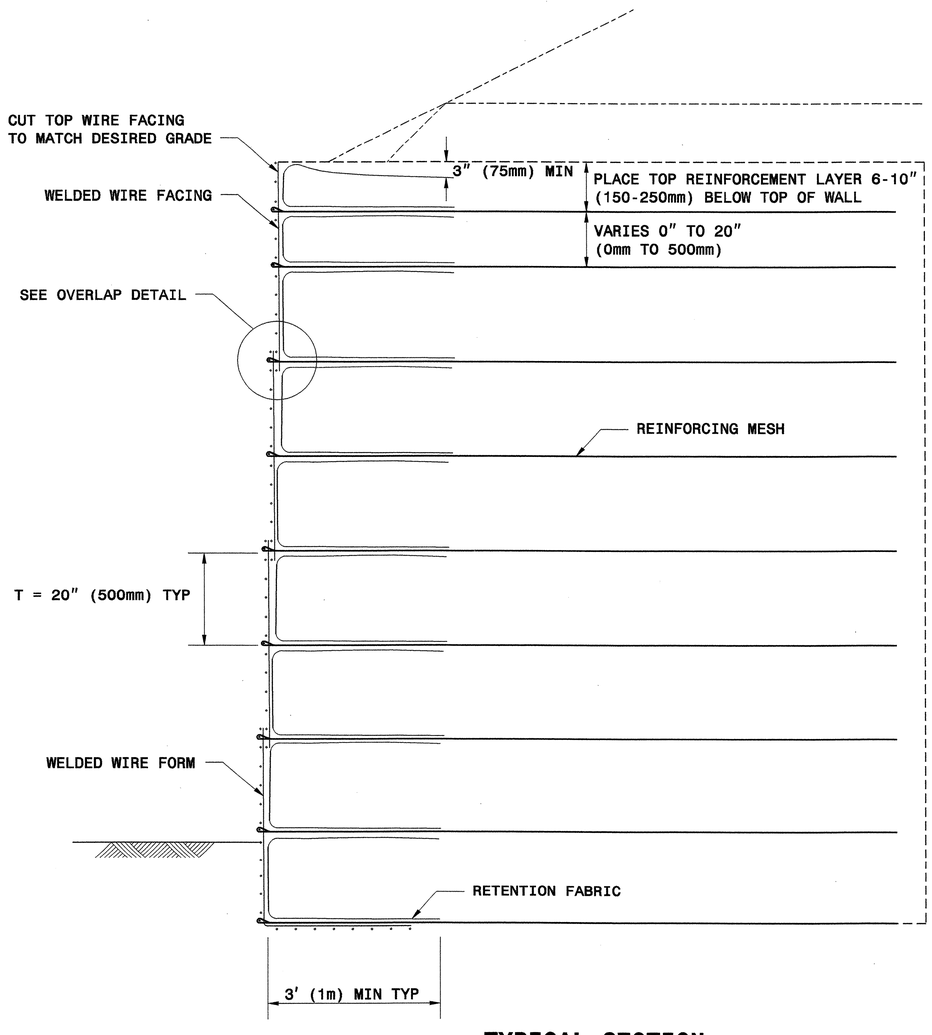
SIGNATURE DATE

ENGINEER

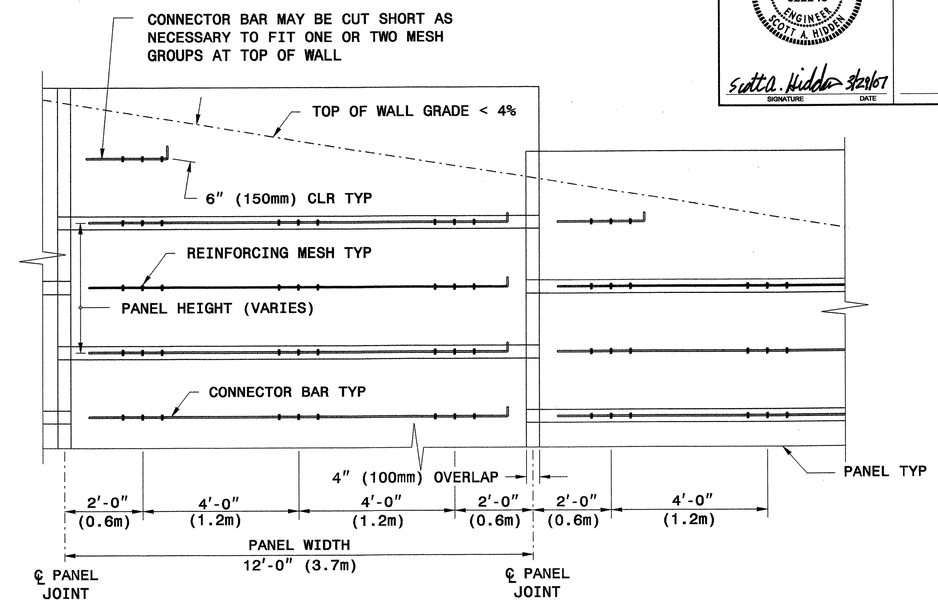
SIGNATURE DATE



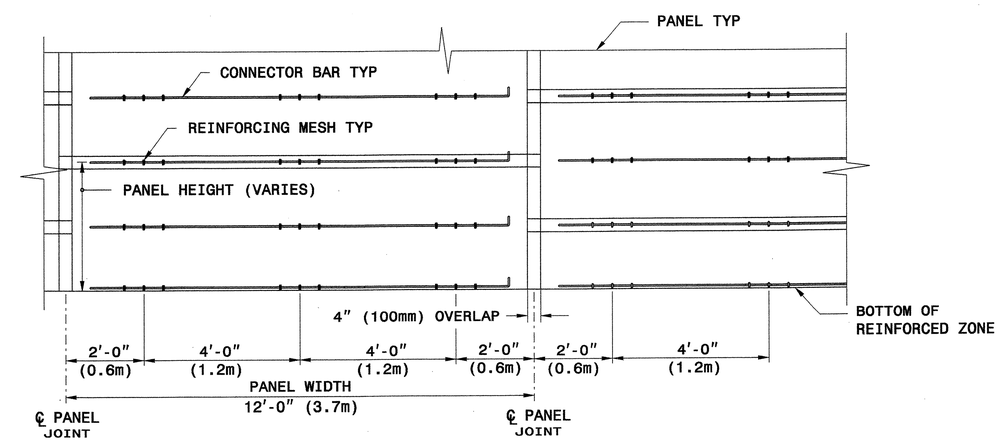
OVERLAP DETAIL



TYPICAL SECTION



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



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

The Reinforced Earth Company

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

RETAINED EARTH
TEMPORARY WALL

SHEET 8 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
R-3833B	2-AC

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

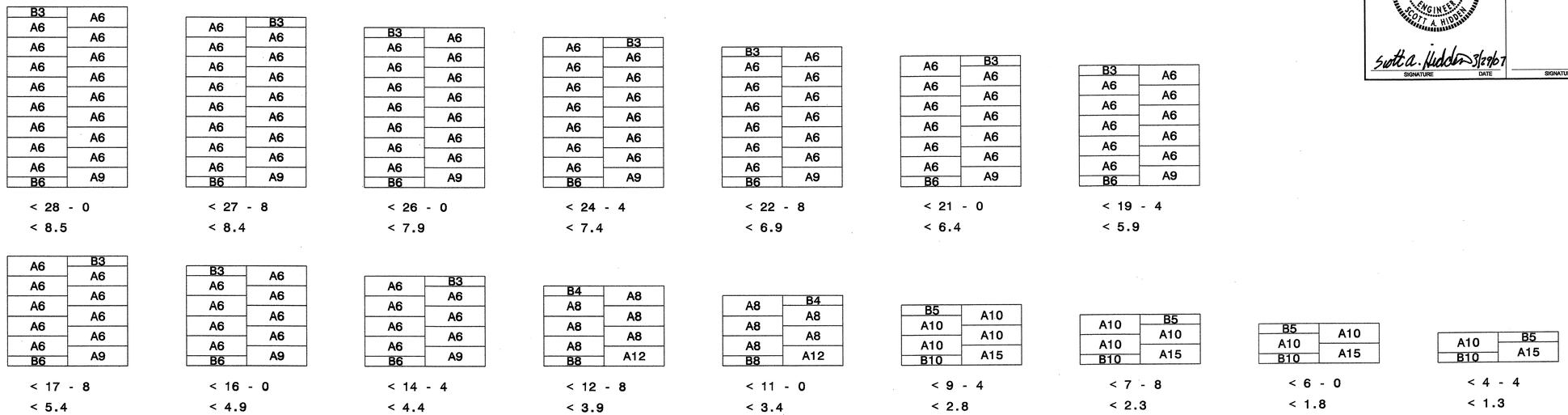
Scott A. Hidden 3/28/07

SIGNATURE DATE

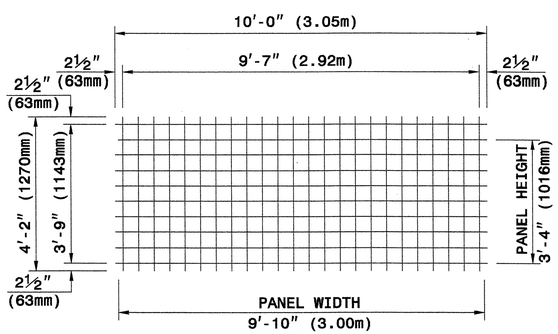
ENGINEER

SIGNATURE DATE

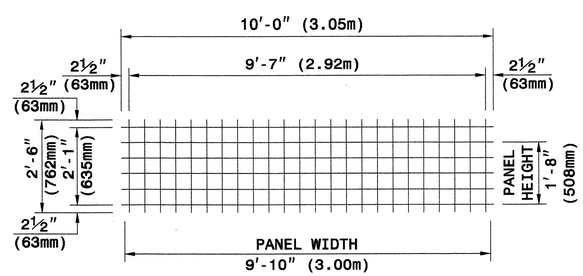
PANEL LAYOUTS



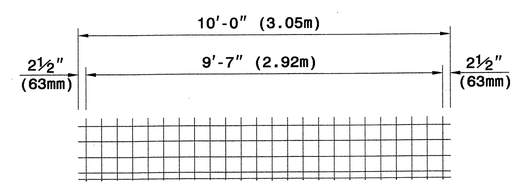
H - WALL HEIGHT									
(FEET-INCHES)	< 28 - 0	< 27 - 8	< 26 - 0	< 24 - 4	< 22 - 8	< 21 - 0	< 19 - 4		
(METER)	< 8.5	< 8.4	< 7.9	< 7.4	< 6.9	< 6.4	< 5.9		
(FEET-INCHES)	< 17 - 8	< 16 - 0	< 14 - 4	< 12 - 8	< 11 - 0	< 9 - 4	< 7 - 8	< 6 - 0	< 4 - 4
(METER)	< 5.4	< 4.9	< 4.4	< 3.9	< 3.4	< 2.8	< 2.3	< 1.8	< 1.3



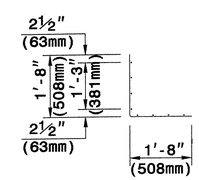
TYPE A



TYPE B



WELDED WIRE FORM



SECTION

WELDED WIRE FACINGS

PANEL TYPES (WELDED WIRE FACINGS AND FORM

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

The Reinforced Earth Company

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

TERRATREL TEMPORARY WALL

SHEET 9 OF 11

DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
R-3833B	2-AD

GEOTECHNICAL ENGINEER

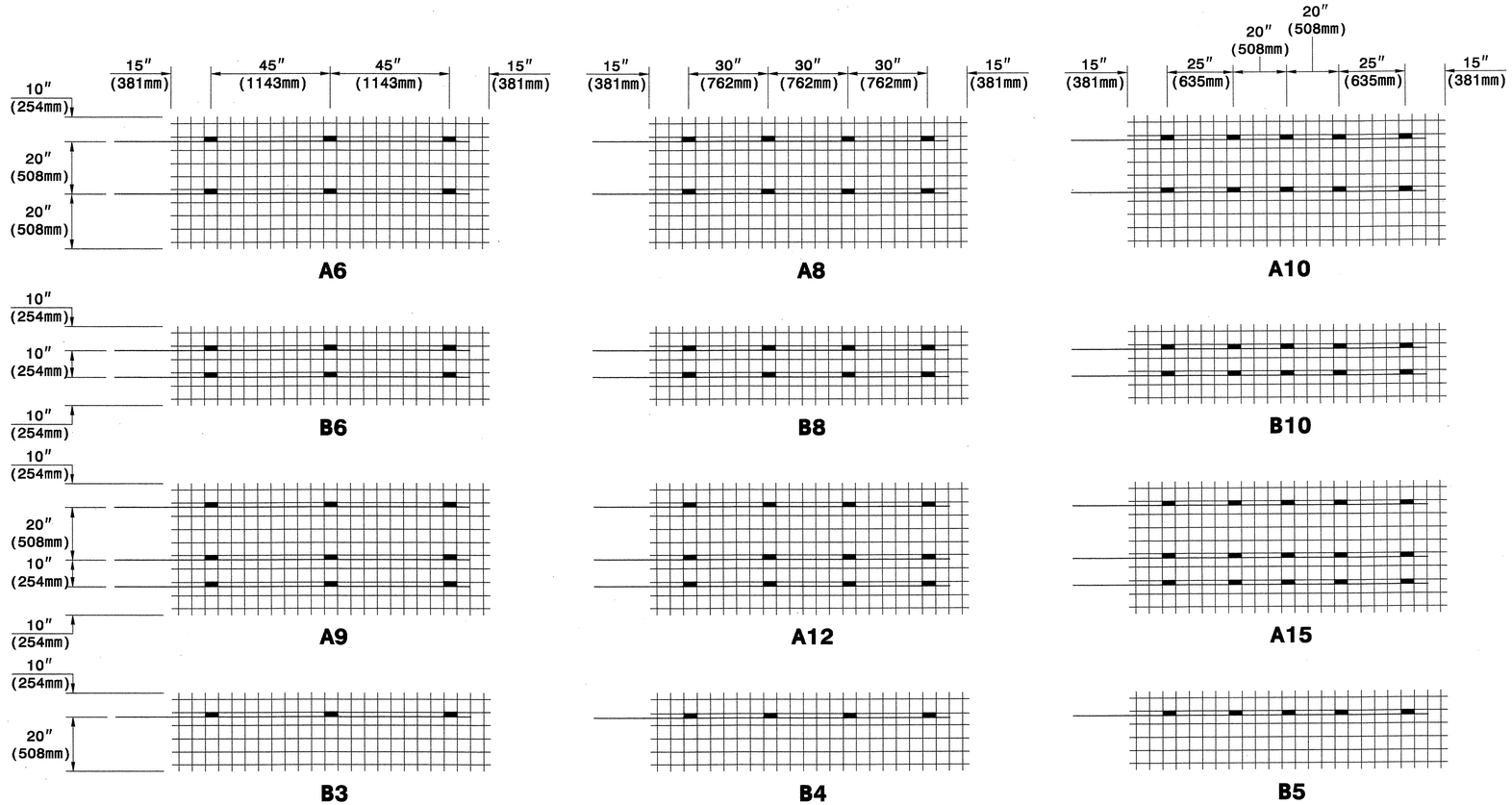
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

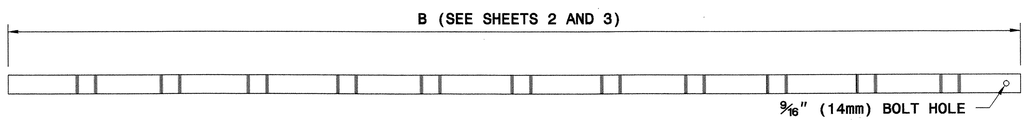


KEY: A8

NUMBER OF REINFORCING STRIPS

PANEL TYPE

CONNECTOR ROD AND REINFORCING STRIP PLACEMENT DIAGRAMS



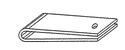
REINFORCING STRIP - 2" X 5/32" (50mm X 4mm)

½" (13mm) DIA. ROD

CONNECTOR ROD

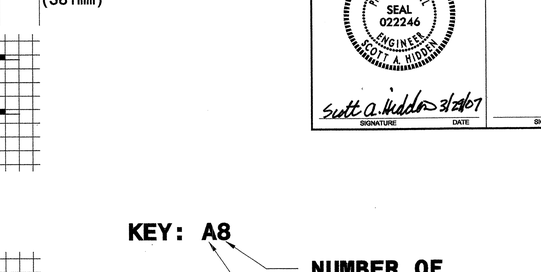
½" (13mm) BOLT WITH NUT AND WASHER

BOLT SET



HAIRPIN CONNECTOR

WALL COMPONENTS



STRIP TO FACING CONNECTION

The Reinforced Earth Company

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

TERRATREL TEMPORARY WALL

SHEET 10 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
R-3833B	2-AE

GEOTECHNICAL ENGINEER

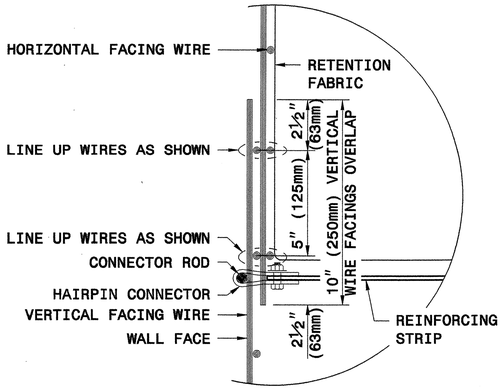
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/27/07

SIGNATURE DATE

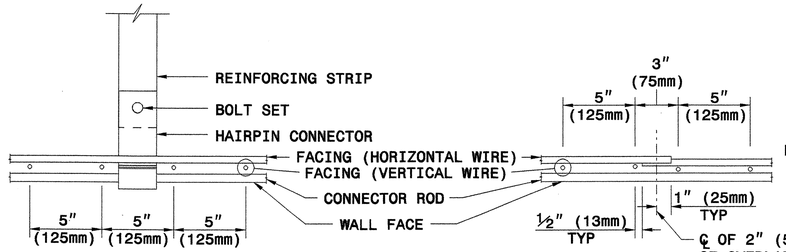
ENGINEER

SIGNATURE DATE



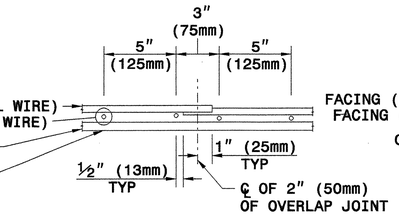
OVERLAP FACINGS VERTICALLY ONE FULL 5" (125mm)
WIRE SQUARE DISREGARDING HALF SQUARES AT EDGES

VERTICAL OVERLAP DETAIL



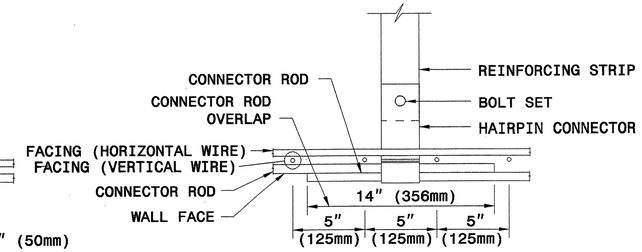
PLAN DETAIL 'A'

STRIP CONNECTION



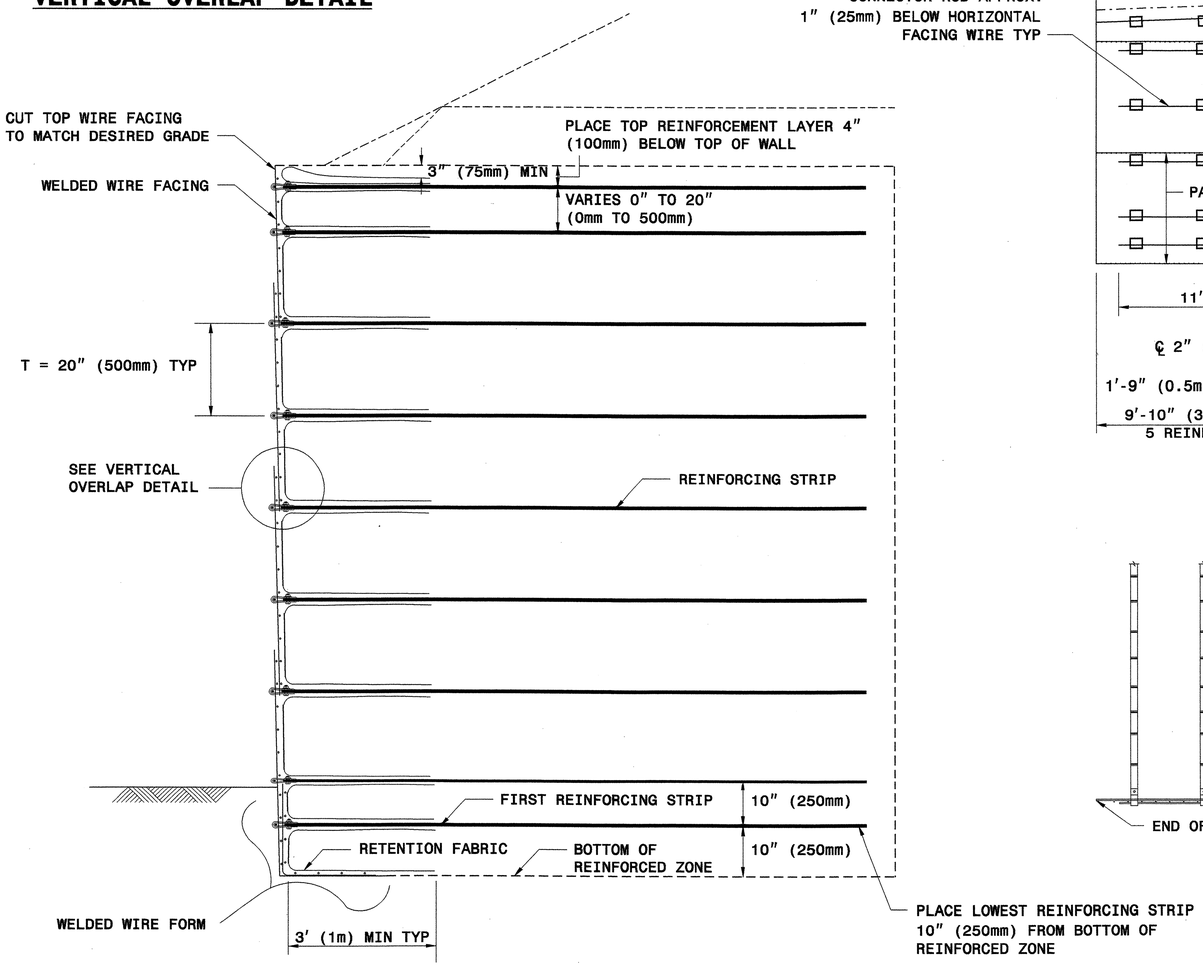
PLAN DETAIL 'B'

HORIZONTAL OVERLAP DETAIL

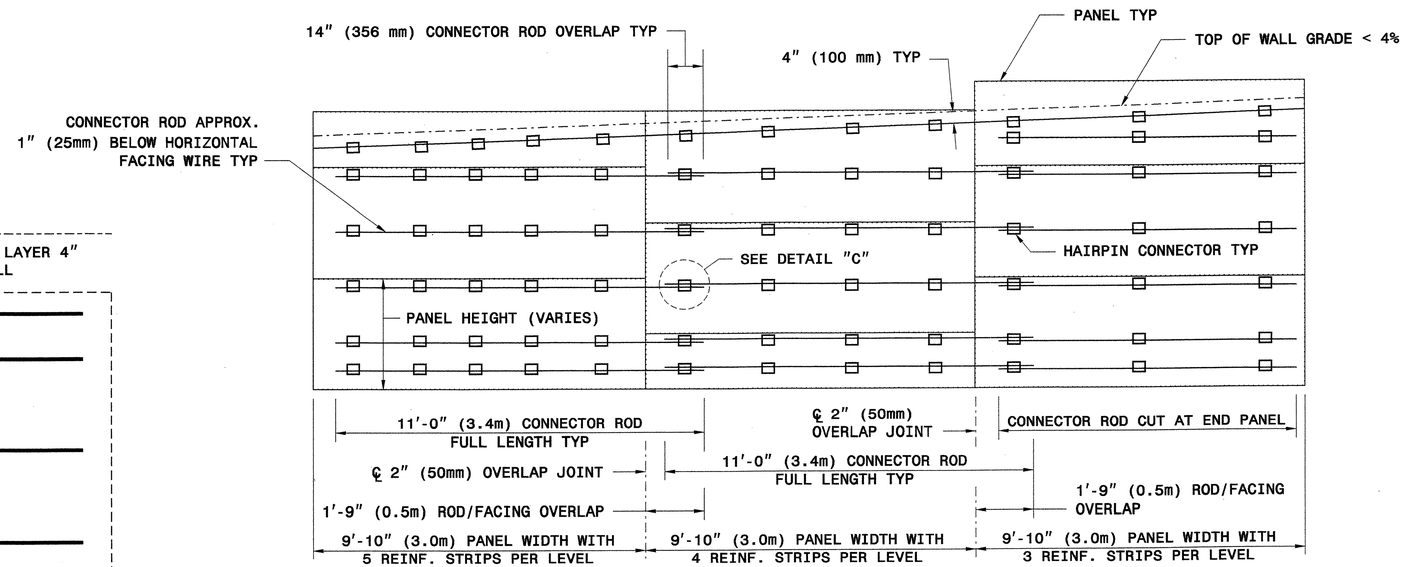


PLAN DETAIL 'C'

STRIP CONNECTION WITH HORIZONTAL OVERLAP DETAIL

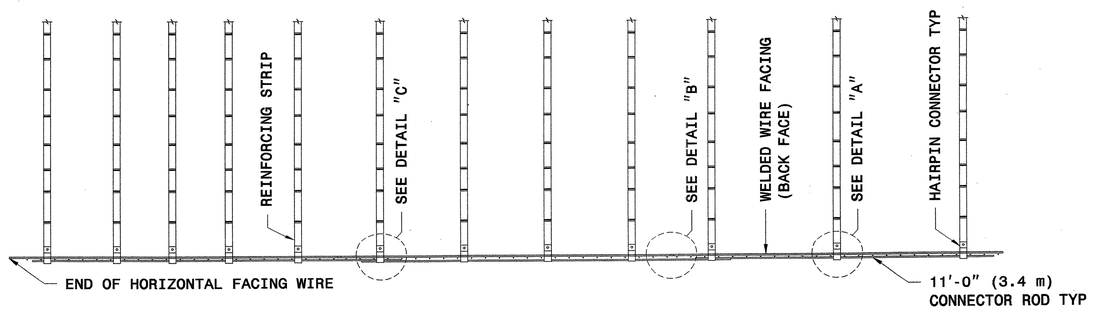


TYPICAL SECTION



TYPICAL ELEVATION

(WIRES NOT SHOWN FOR CLARITY)



TYPICAL PLAN

The Reinforced Earth Company

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

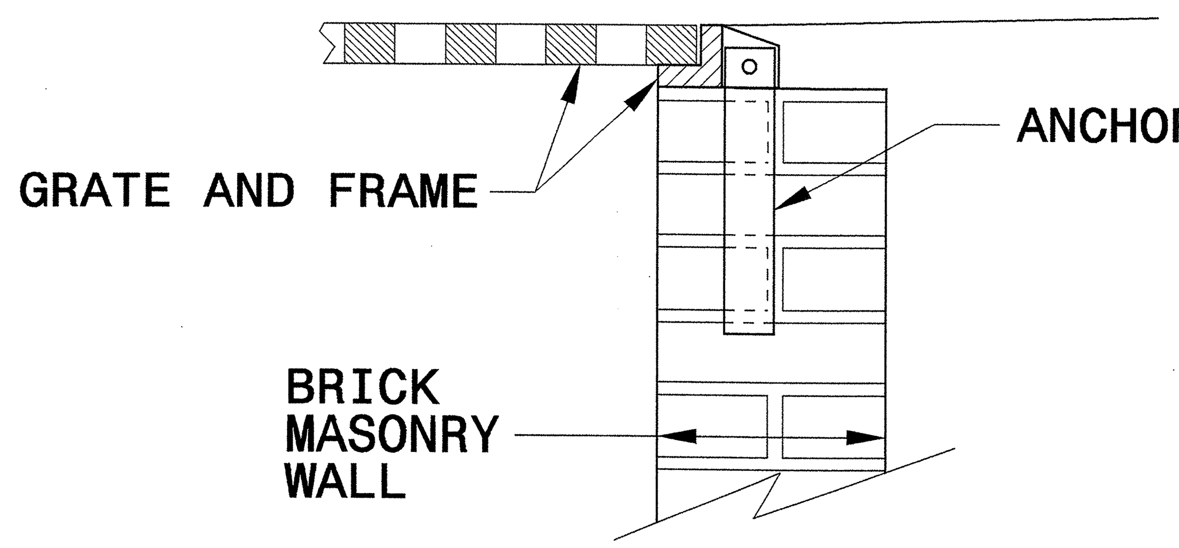
TERRATREL TEMPORARY WALL

SHEET 11 OF 11 DATE: 12-19-06

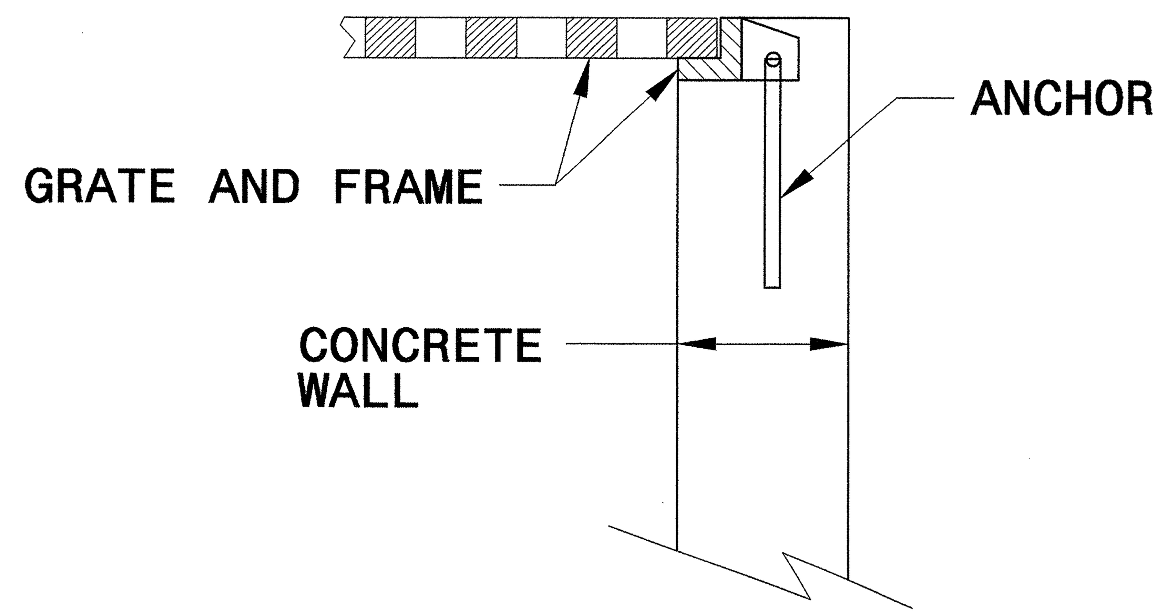
PROJECT REFERENCE NO.	SHEET NO.
R-3833B	2-AF

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

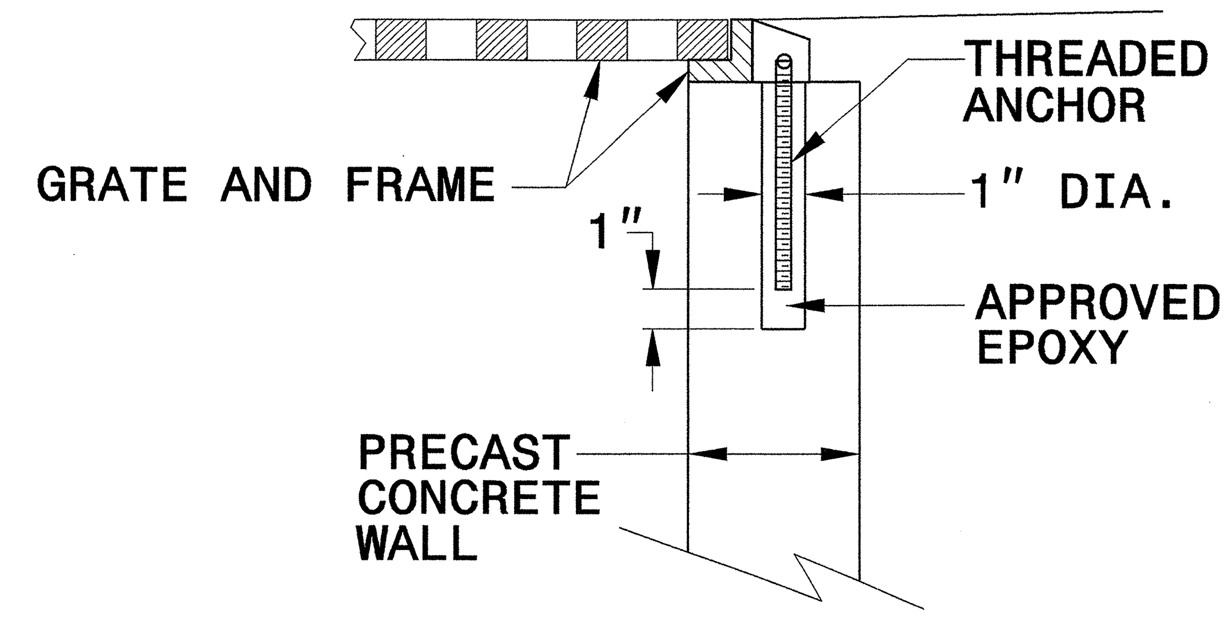
ENGLISH DETAIL DRAWING FOR
ANCHORAGE FOR FRAMES
BRICK/CONCRETE/PRECAST CONCRETE



BRICK MASONRY CONSTRUCTION



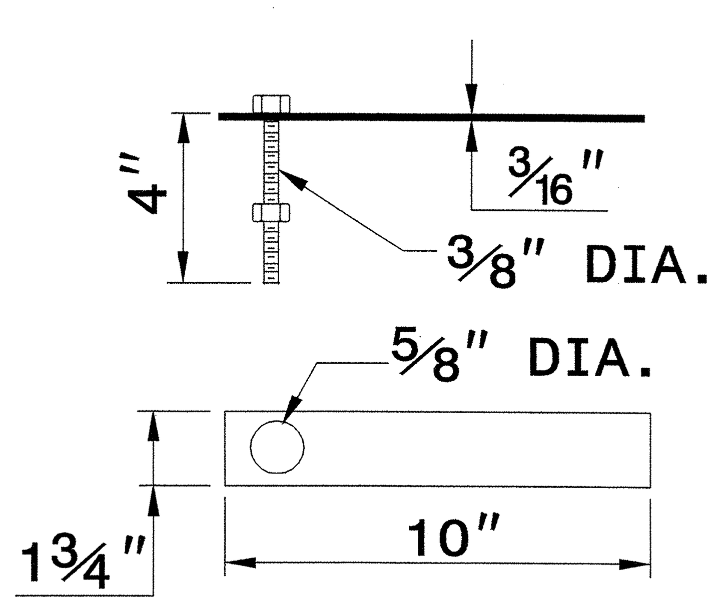
CONCRETE CONSTRUCTION



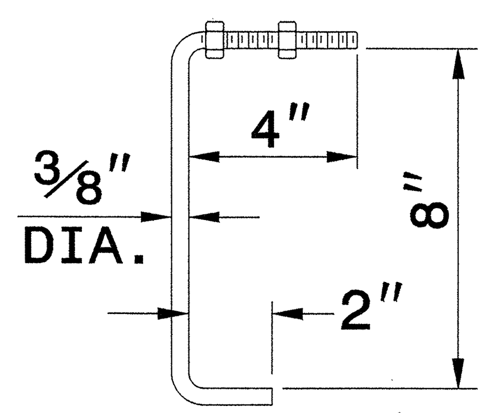
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

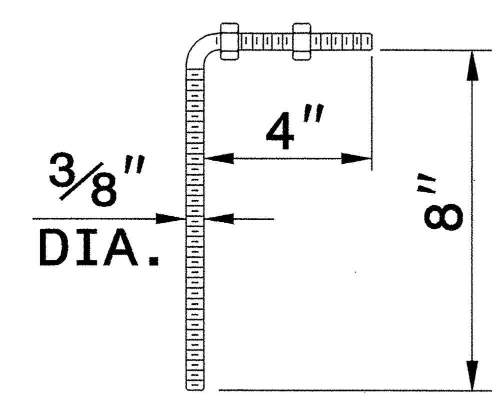
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



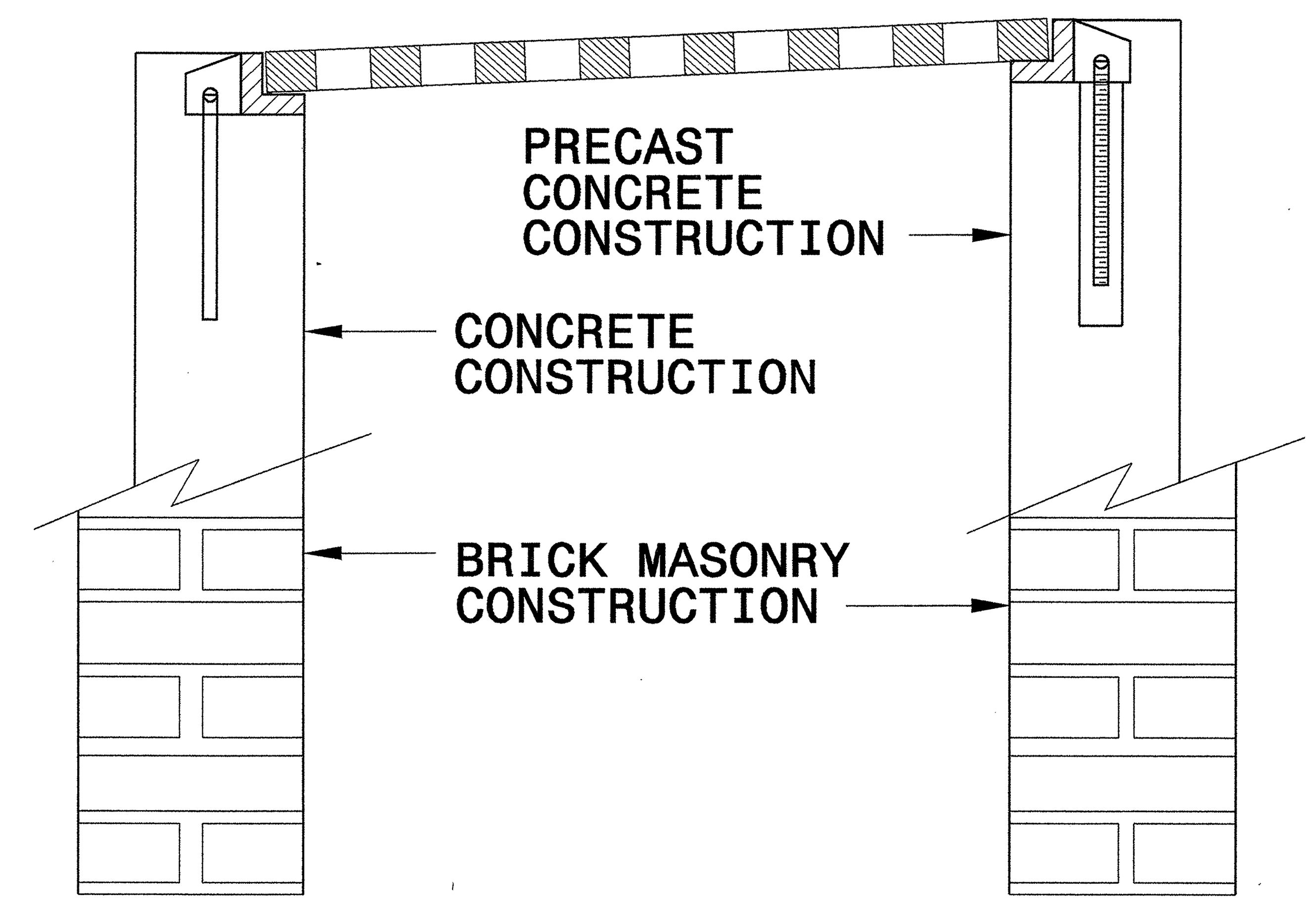
MASONRY ANCHOR
3/8" DIA. BOLT WITH PLATE



CONCRETE ANCHOR
3/8" DIA. BENT BAR



PRECAST CONCRETE ANCHOR
3/8" DIA. BENT BAR



FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS

SHEET 1 OF 1
840D25

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

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

SHEET 1 OF 1
840D25

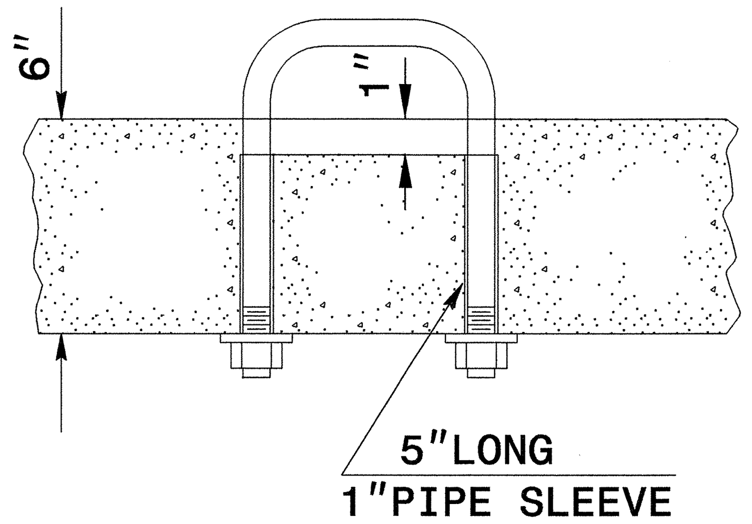
NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON
12/3/08

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

SEE PLATE FOR TITLE

ORIGINAL BY: 2006 STD 840.25 DATE: 07/18/06
MODIFIED BY: E.E. WARD DATE: 9/25/06
CHECKED BY: [signature] DATE: 11/13/08
FILE SPEC.:

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



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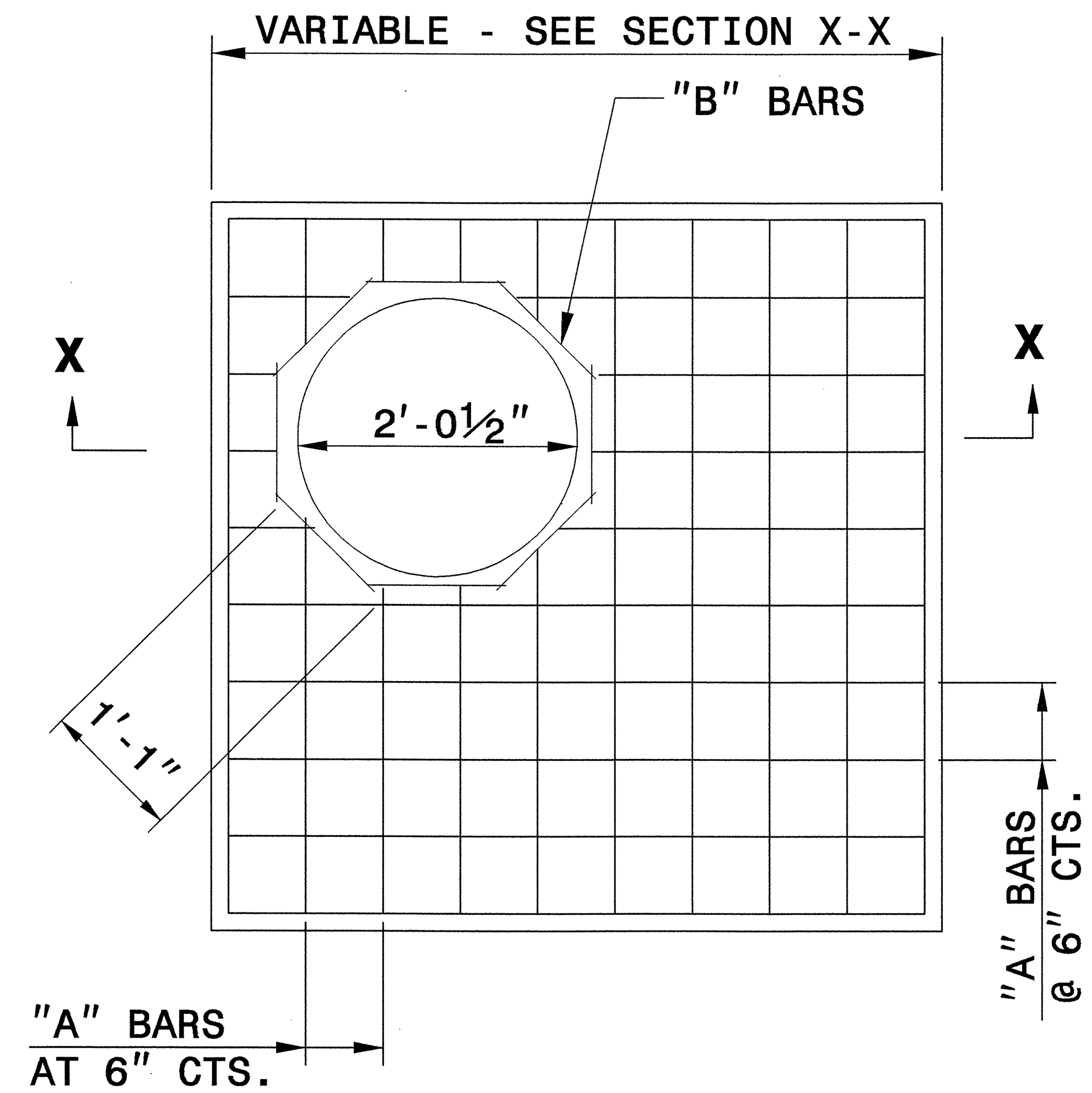

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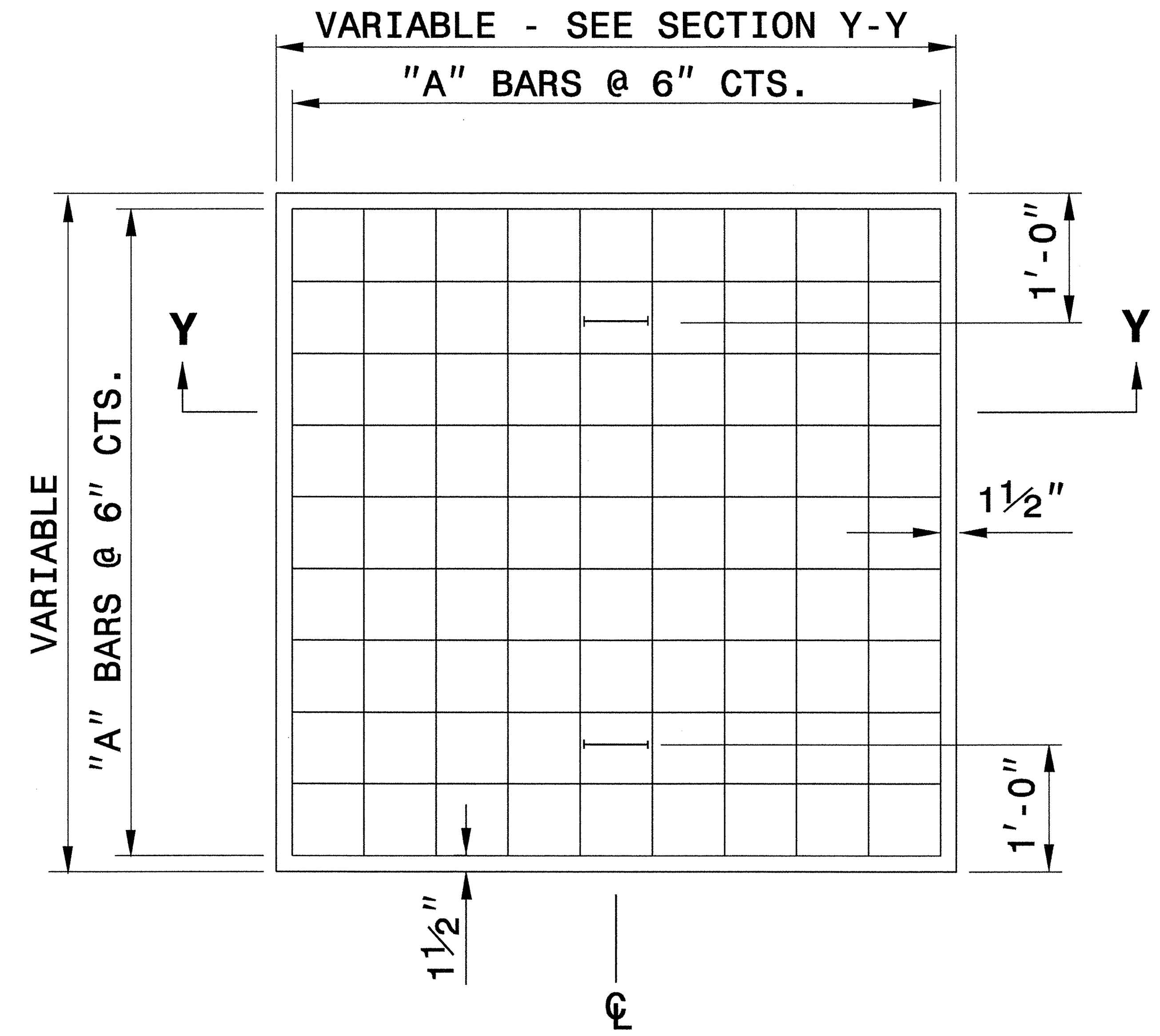


PLAN

GENERAL NOTES:

CONSTRUCT IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.

THE DIMENSIONS FOR THE EXISTING BOXES ARE APPROXIMATE AND MAY VARY SLIGHTLY.

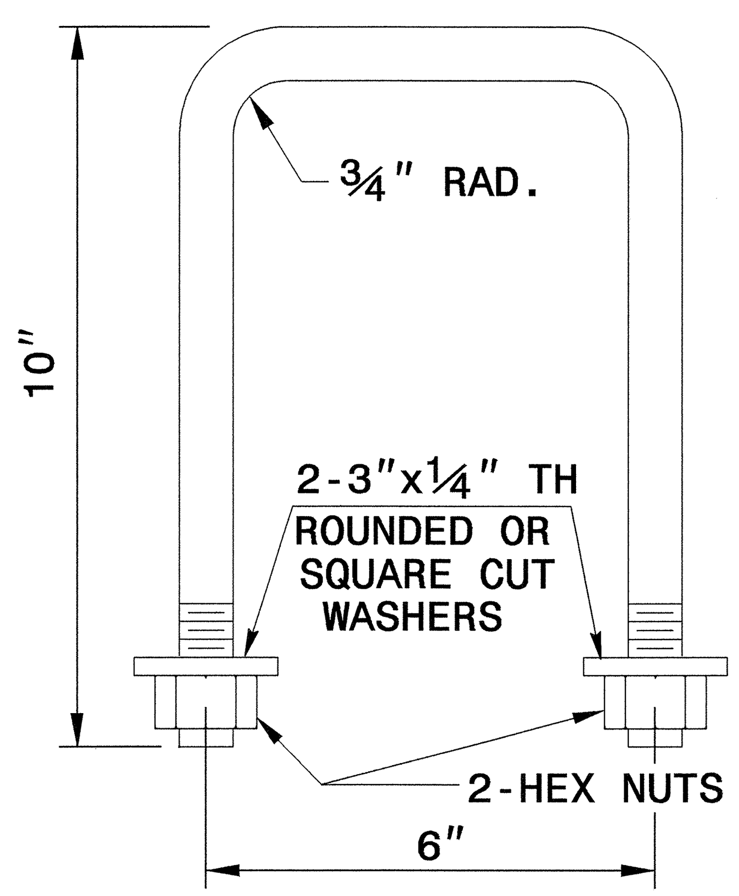
DETAIL INTENDED FOR NON-TRAFFIC BEARING DRAINAGE STRUCTURES.

BILL OF MATERIALS

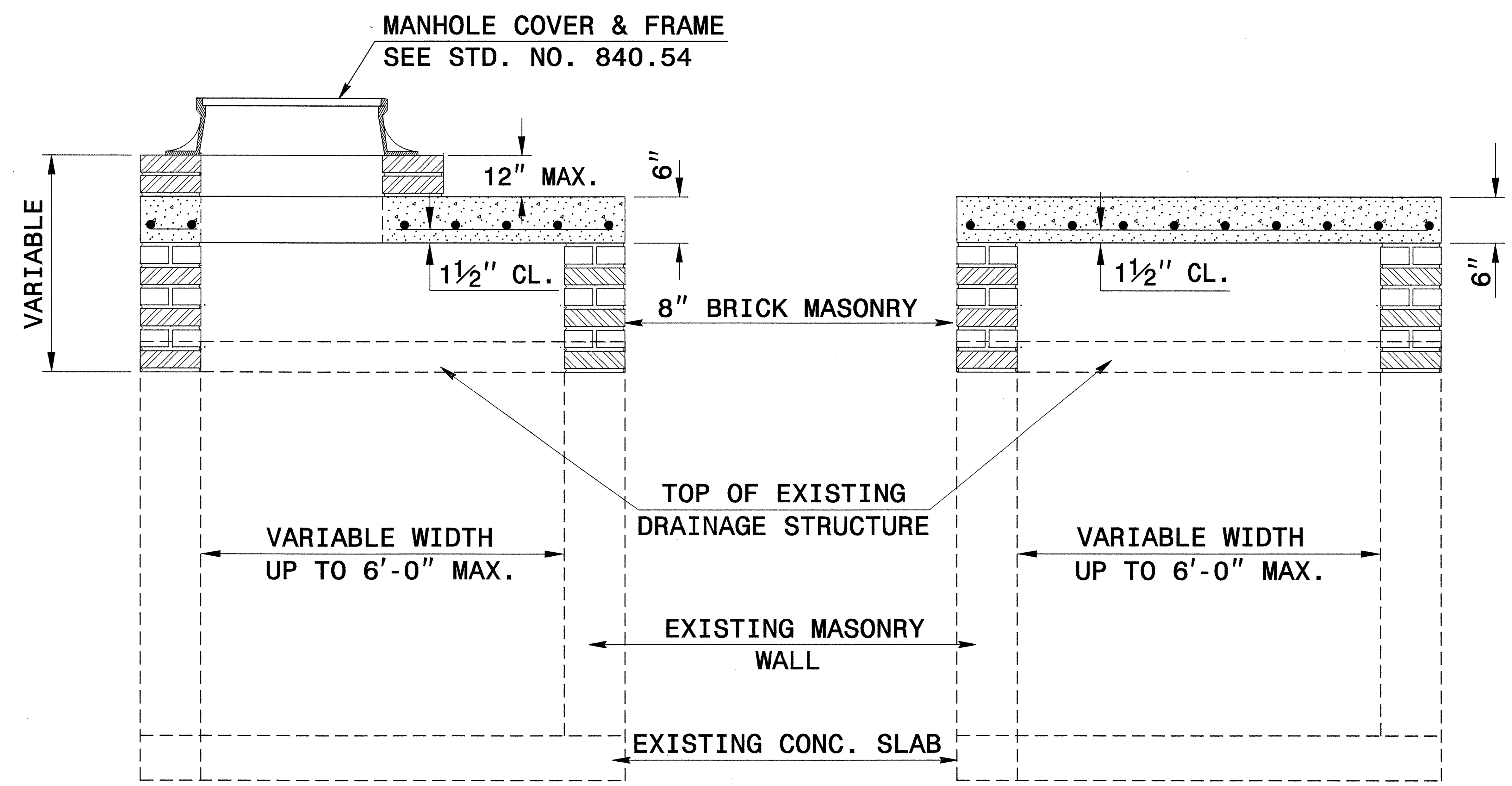
REINFORCING STEEL				
CODE	SIZE	QTY.	LENGTH	REINF. STEEL LBS.
A	#4	20	4'-6"	60.12
B	#4	8	1'-1"	5.79
TOTAL				65.91 *

MASONRY	CU YDS
TOP SLAB CONCRETE CLASS "B"	.4326 *
BRICK MASONRY PER FT HT (MIN)	.4111

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

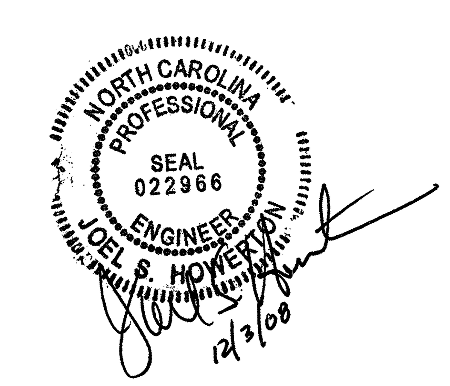


DETAIL OF HANDLE



SECTION X-X

SECTION Y-Y



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

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

ORIGINAL BY: T.S.S. DATE: NOV.1997
MODIFIED BY: T.S.S. DATE: FEB.2000
CHECKED BY: [signature] DATE: 12/2/08
FILE SPEC.: ds174:/usr/details/stand/boxtojbe.dgn

5/14/99
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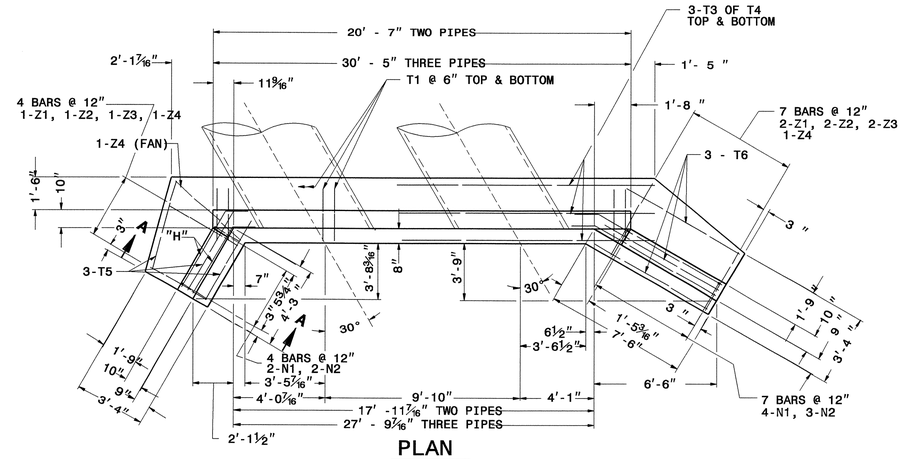
PROJECT REFERENCE NO.	SHEET NO.
R-3833B	2-AH

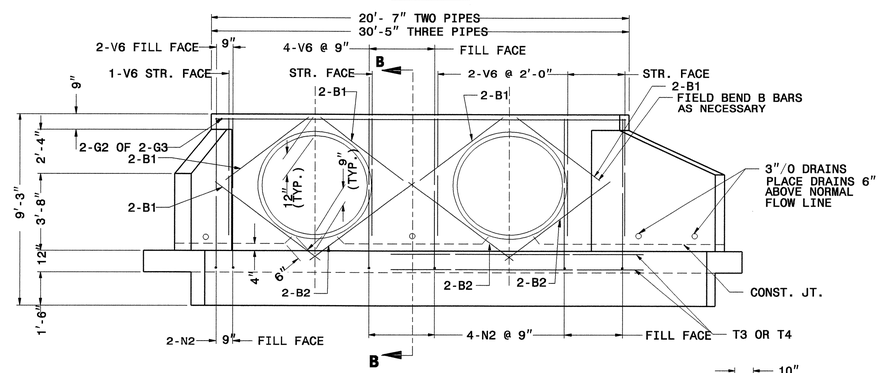
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
REINFORCED CONCRETE ENDWALL
FOR DOUBLE & TRIPLE 60" PIPE 60° OR 120° SKEW

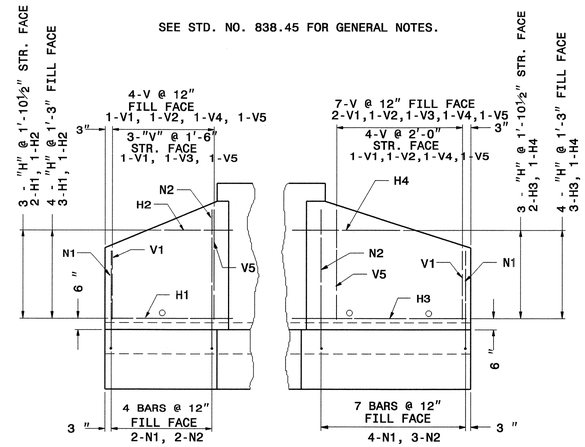
SHEET 1 OF 1
838D30



PLAN



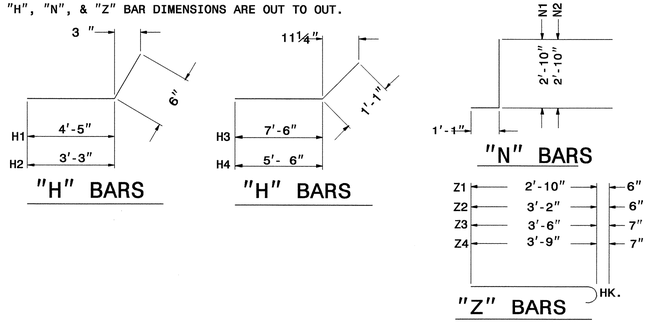
ELEVATION

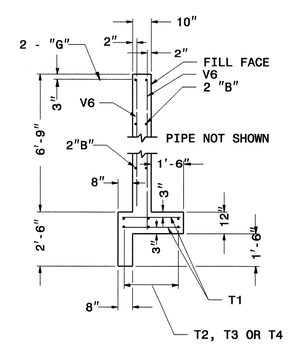


WING ELEVATION

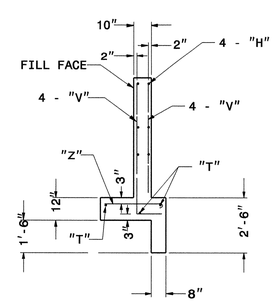
BILL OF MATERIAL FOR ENDWALLS						
REINF. STEEL			2 - PIPES		3 - PIPES	
BAR	SIZE	LENGTH	NO.	WEIGHT	NO.	WEIGHT
Z1	#4	3'-4"	3	7	3	7
Z2	#4	3'-7"	3	7	3	7
Z3	#5	4'-1"	2	9	2	9
Z4	#5	4'-4"	4	18	4	18
N1	#4	3'-5"	6	14	6	14
N2	#4	3'-11"	15	61	19	78
V1	#4	3'-3"	5	11	5	11
V2	#4	3'-11"	3	8	3	8
V3	#4	4'-3"	2	6	2	6
V4	#4	4'-6"	3	9	3	9
V5	#4	5'-1"	5	17	5	17
V6	#4	6'-3"	15	63	21	88
H1	#4	4'-11"	5	16	5	16
H2	#4	3'-9"	2	5	2	5
H3	#4	8'-7"	5	29	5	29
H4	#4	6'-7"	2	9	2	9
G2	#7	20'-3"	2	83	-	-
G3	#7	30'-1"	-	-	2	123
T1	#4	2'-6"	82	137	122	204
T3	#4	23'-9"	6	95	-	-
T4	#4	17'-5"	-	-	12	140
T5	#4	4'-6"	3	9	3	9
T6	#4	7'-0"	3	14	3	14
B1	#4	5'-0"	10	33	14	47
B2	#4	6'-6"	6	26	10	43
REINF. STEEL LBS.				686		911
CONC/C.M. CU. YDS.			9.5		12.3	
CONC/R.C. CU. YDS.			8.9		11.4	

"H", "N", & "Z" BAR DIMENSIONS ARE OUT TO OUT.





SECTION - BB



SECTION - AA

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

ENGLISH DETAIL DRAWING FOR
REINFORCED CONCRETE ENDWALL
FOR DOUBLE & TRIPLE 60" PIPE 60° OR 120° SKEW

SHEET 1 OF 1
838D30

-Y1- 11+20 RT.

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON
12/2/08

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

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MODIFIED BY: DATE:
CHECKED BY: DATE: 12/2/08
FILE SPEC.:

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jhowerton AT PS237501

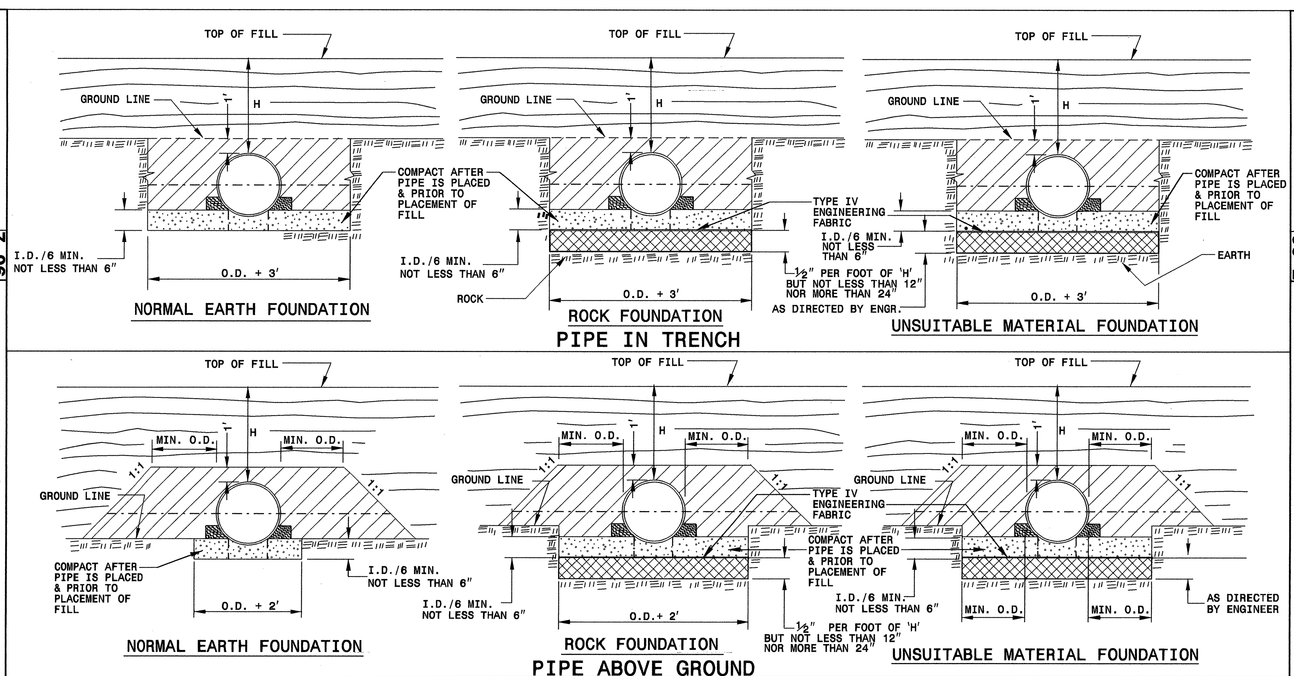
5/14/99

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

7-06

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION

FLEXIBLE PIPE



GENERAL NOTES:

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

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

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

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

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

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

SPRINGLINE OF PIPE

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

APPROVED SUITABLE LOCAL MATERIAL.

UNDISTURBED EARTH MATERIAL

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

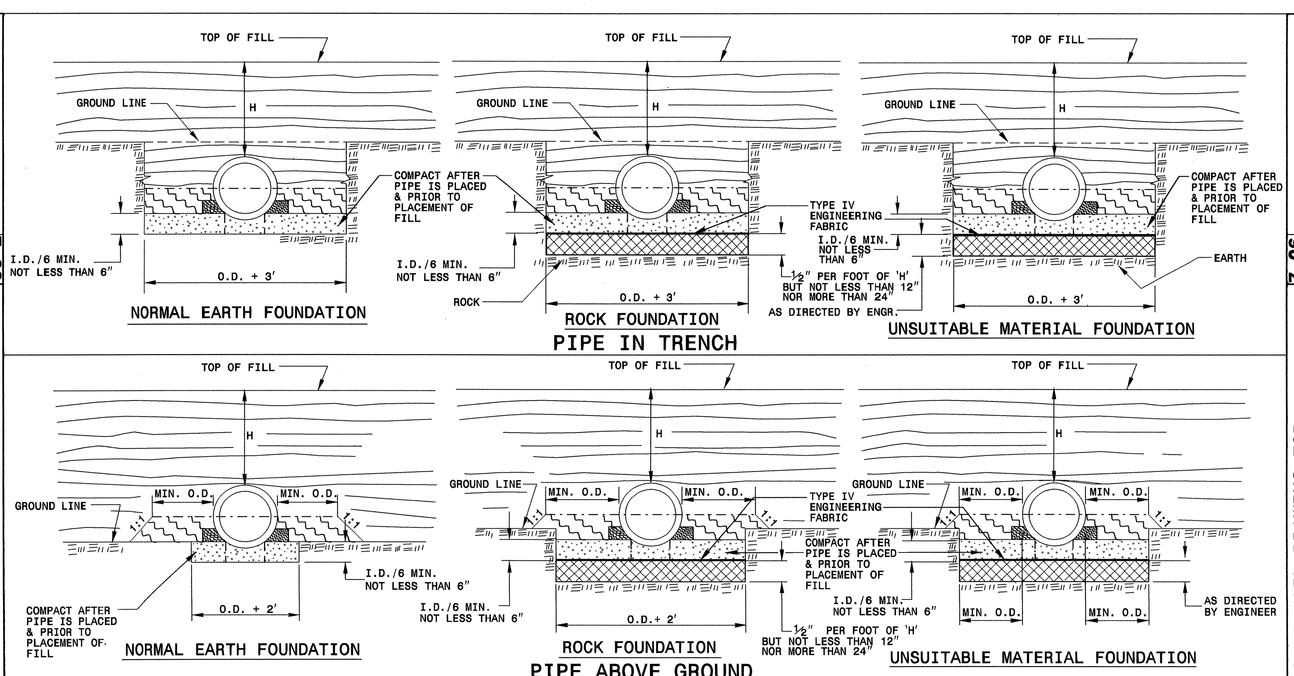
SHEET 1 OF 3
300D01

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

7-06

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION

RIGID PIPE



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TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

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

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

SPRINGLINE OF PIPE

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

APPROVED SUITABLE LOCAL MATERIAL ABOVE SPRINGLINE.

UNDISTURBED EARTH MATERIAL

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

SHEET 2 OF 3
300D01

PROJECT SERVICES UNIT
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Office 919-250-4128 FAX 919-250-4119

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ORIGINAL BY: Kfeagrf DATE: 5-15-99
MODIFIED BY: DATE:
CHECKED BY: DATE: 7/9/09
FILE SPEC: e:\ericward\stds\stdstoderta18/30001/0300d01.dgn

NORTH CAROLINA PROFESSIONAL SEAL 025936 ENGINEER JOHN W. HOWERTON 8/20/09

PROJECT REFERENCE NO. R-3833B
SHEET NO. 2-A1

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jhowerton AT PS237501

5/14/99

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

7-06

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION

FILL HEIGHT TABLES

SHEET 3 OF 3
300D01

FLEXIBLE PIPE

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

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

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

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

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

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

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

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

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

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

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

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

RIGID PIPE

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

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

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

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

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

RCP - AASHTO M170

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

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

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

7-06

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION

FILL HEIGHT TABLES

SHEET 3 OF 3
300D01

PROJECT SERVICES UNIT
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ORIGINAL BY: KKempf DATE: 5-15-09
MODIFIED BY: DATE:
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FILE SPEC: /ericward/stds/stdstodetails/30001/0300d01.dgn

PROJECT REFERENCE NO. R-3833B
SHEET NO. 2-AJ

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	3 (1 of 3)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202068

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING
0001000000-E	200	Lump Sum		CLEARING & GRUBBING .. ACRE(S)
0008000000-E	200	2	ACR	SUPPLEMENTARY CLEARING & GRUB-BING
0015000000-N	205	1	EA	SEALING ABANDONED WELLS
0022000000-E	225	125,000	CY	UNCLASSIFIED EXCAVATION
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ********** (24+39 -Y4-)
~~0029000000-N~~	~~SP~~	~~Lump Sum~~		~~REINFORCED BRIDGE APPROACH FILL, STATION ********** (277+89 -L-)~~
0036000000-E	225	14,475	CY	UNDERCUT EXCAVATION
0080000000-E	SP	6,300	TON	CLASS IV SUBGRADE STABILIZA-TION
0106000000-E	230	127,000	CY	BORROW EXCAVATION
0134000000-E	240	1,200	CY	DRAINAGE DITCH EXCAVATION
0141000000-E	240	1,420	LF	BERM DITCH CONSTRUCTION
0156000000-E	250	26,480	SY	REMOVAL OF EXISTING ASPHALT PAVEMENT
0177000000-E	250	5,830	SY	BREAKING OF EXISTING ASPHALT PAVEMENT
0192000000-N	260	20	HR	PROOF ROLLING
0195000000-E	265	4,000	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	10,000	SY	FABRIC FOR SOIL STABILIZATION
0199000000-E	SP	11,134	SF	TEMPORARY SHORING
0241000000-E	SP	22,766	SY	GENERIC GRADING ITEM FOUNDATION CONDITIONING FABRIC
0248000000-N	SP	Lump Sum		GENERIC GRADING ITEM EARTHWORK FOR HAZARDOUS SPILL BASINS
0318000000-E	300	1,810	TON	FOUNDATION CONDITIONING MATE-RIAL, MINOR STRS
0343000000-E	310	48	LF	15" SIDE DRAIN PIPE
0344000000-E	310	80	LF	18" SIDE DRAIN PIPE
0354000000-E	310	332	LF	**** RC PIPE CULVERTS, CLASS ***** 36", CLASS V
0708000000-E	310	788	LF	15" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
0714000000-E	310	312	LF	18" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
0720000000-E	310	28	LF	24" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
0726000000-E	310	68	LF	30" BIT COAT CS PIPE CULVERTS, TYPE B 0.079" THICK
0750000000-E	310	44	LF	54" BIT COAT CS PIPE CULVERTS, TYPE B 0.109" THICK
0756000000-E	310	60	LF	60" BIT COAT CS PIPE CULVERTS, TYPE B 0.138" THICK
0806000000-E	310	22	EA	15" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK
0807000000-E	310	8	EA	18" BIT COAT CS PIPE ELBOWS, T YPE B 0.064" THICK
0808000000-E	310	4	EA	24" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK
0809000000-E	310	2	EA	30" BIT COAT CS PIPE ELBOWS, T YPE B 0.079" THICK
0986000000-E	SP	132	LF	GENERIC PIPE ITEM 18" RC PIPE CULVERTS (CONTRACTOR DESIGN)
0986000000-E	SP	136	LF	GENERIC PIPE ITEM 36" RC PIPE CULVERTS (CONTRACTOR DESIGN)
0995000000-E	340	2,314	LF	PIPE REMOVAL
1011000000-N	500	Lump Sum		FINE GRADING
1044000000-E	501	23,300	SY	LIME TREATED SOIL (SLURRY METHOD)
1066000000-E	501	240	TON	LIME FOR LIME TREATED SOIL
1110000000-E	510	750	TON	STABILIZER AGGREGATE
1121000000-E	520	38,300	TON	AGGREGATE BASE COURSE
1176000000-E	542	15,530	SY	SOIL CEMENT BASE
1187000000-E	542	428	TON	PORTLAND CEMENT FOR SOIL CE-MENT BASE
1209000000-E	543	5,830	GAL	ASPHALT CURING SEAL

ItemNumber	Sec #	Quantity	Unit	Description
1220000000-E	545	2,000	TON	INCIDENTAL STONE BASE
1275000000-E	600	2,146	GAL	PRIME COAT
1297000000-E	607	8,900	SY	MILLING ASPHALT PAVEMENT, ***" DEPTH (2-1/2")
1489000000-E	610	620	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1491000000-E	610	18,940	TON	ASPHALT CONC BASE COURSE, TYPE B25.0C
1498000000-E	610	3,690	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
1503000000-E	610	17,490	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C
1519000000-E	610	5,850	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
1523000000-E	610	22,110	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5C
1560000000-E	620	2,190	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
1565000000-E	620	1,327	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 70-22
1693000000-E	654	915	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
1840000000-E	665	29,200	LF	MILLED RUMBLE STRIPS (ASPHALT CEMENT CONCRETE)
2022000000-E	815	336	CY	SUBDRAIN EXCAVATION
2033000000-E	815	168	CY	SUBDRAIN FINE AGGREGATE
2044000000-E	815	1,000	LF	6" PERFORATED SUBDRAIN PIPE
2055000000-E	815	30	EA	6" SUBDRAIN PIPE WYES, TEES, & ELBOWS
2066000000-N	815	2	EA	CONCRETE PAD FOR SUBDRAIN PIPE OUTLET
2077000000-E	815	12	LF	6" OUTLET PIPE (SUBDRAINS)
2143000000-E	818	15	TON	BLOTTING SAND
2209000000-E	838	18	CY	ENDWALLS
2220000000-E	838	17.3	CY	REINFORCED ENDWALLS
2253000000-E	840	23.2	CY	PIPE COLLARS
2275000000-E	SP	140	CY	FLOWABLE FILL
2286000000-N	840	156	EA	MASONRY DRAINAGE STRUCTURES
2297000000-E	840	11.09	CY	MASONRY DRAINAGE STRUCTURES
2308000000-E	840	185.36	LF	MASONRY DRAINAGE STRUCTURES
2352000000-N	840	7	EA	FRAME WITH GRATE, STD 840.**** (840.16)
2352000000-N	840	1	EA	FRAME WITH GRATE, STD 840.**** (840.20)
2364200000-N	840	34	EA	FRAME WITH TWO GRATES, STD 840.20
2365000000-N	840	33	EA	FRAME WITH TWO GRATES, STD 840.22
2366000000-N	840	10	EA	FRAME WITH TWO GRATES, STD 840.24
2367000000-N	840	1	EA	FRAME WITH TWO GRATES, STD 840.29
2374000000-N	840	2	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)
2374000000-N	840	37	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)
2374000000-N	840	23	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)
2396000000-N	840	3	EA	FRAME WITH COVER, STD 840.54
2440000000-N	852	15	EA	CONCRETE TRANSITIONAL SECTION FOR CATCH BASIN
2451000000-N	852	2	EA	CONCRETE TRANSITIONAL SECTION FOR DROP INLETS
2462000000-E	SP	1	EA	**" SLUICE GATE (24")
2462000000-E	SP	2	EA	**" SLUICE GATE (30")
2462000000-E	SP	1	EA	**" SLUICE GATE (6")
2542000000-E	846	8,720	LF	1'-6" CONCRETE CURB & GUTTER
2549000000-E	846	13,190	LF	2'-6" CONCRETE CURB & GUTTER
2556000000-E	846	3,930	LF	SHOULDER BERM GUTTER

ItemNumber	Sec #	Quantity	Unit	Description
2577000000-E	846	2,530	LF	CONCRETE EXPRESSWAY GUTTER
2591000000-E	848	5,830	SY	4" CONCRETE SIDEWALK
2605000000-N	848	40	EA	CONCRETE WHEELCHAIR RAMPS
2612000000-E	848	710	SY	6" CONCRETE DRIVEWAY
2619000000-E	850	810	SY	4" CONCRETE PAVED DITCH
2647000000-E	852	2,120	SY	5" MONOLITHIC CONCRETE ISLANDS (SURFACE MOUNTED)
2655000000-E	852	280	SY	5" MONOLITHIC CONCRETE ISLANDS (KEYED IN)
2724000000-E	857	~~2,325~~ 2,705	LF	PRECAST REINFORCED CONCRETE BARRIER, SINGLE FACED
2830000000-N	858	15	EA	ADJUSTMENT OF MANHOLES
2845000000-N	858	20	EA	ADJUSTMENT OF METER BOXES OR VALVE BOXES
2905000000-N	859	5	EA	CONVERT EXISTING DROP INLET TO JUNCTION BOX
3030000000-E	862	14,087.5	LF	STEEL BM GUARDRAIL
3045000000-E	862	312.5	LF	STEEL BM GUARDRAIL, SHOP CURVED
3150000000-N	862	10	EA	ADDITIONAL GUARDRAIL POSTS
3210000000-N	862	13	EA	GUARDRAIL ANCHOR UNITS, TYPE CAT-1
3215000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE III
3270000000-N	SP	22	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3317000000-N	862	10	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77
3360000000-E	863	10,090	LF	REMOVE EXISTING GUARDRAIL
3503000000-E	866	340	LF	WOVEN WIRE FENCE, 47" FABRIC
3509000000-E	866	20	EA	4" TIMBER FENCE POSTS, 7'-6" LONG
3515000000-E	866	10	EA	5" TIMBER FENCE POSTS, 8'-0" LONG
3536000000-E	866	17,430	LF	CHAIN LINK FENCE, 48" FABRIC
3542000000-E	866	~~1,430~~ 1,476	EA	METAL LINE POSTS FOR 48" CHAIN LINK FENCE
3548000000-E	866	~~90~~ 92	EA	METAL TERMINAL POSTS FOR 48" CHAIN LINK FENCE
3557000000-E	866	1,600	LF	ADDITIONAL BARBED WIRE
3628000000-E	876	795	TON	RIP RAP, CLASS I
3649000000-E	876	480	TON	RIP RAP, CLASS B
3656000000-E	876	6,155	SY	FILTER FABRIC FOR DRAINAGE
4048000000-E	902	12	CY	REINFORCED CONCRETE SIGN FOUN-DATIONS
4057000000-E	SP	144	CY	OVERHEAD FOOTING
4060000000-E	903	7,280	LB	SUPPORTS, BREAKAWAY STEEL BEAM
4066000000-E	903	1,034	LB	SUPPORTS, SIMPLE STEEL BEAM
4072000000-E	903	1,420	LF	SUPPORTS, 3-LB STEEL U-CHANNEL
4078000000-E	903	2	EA	SUPPORTS, 2-LB STEEL U-CHANNEL
4082100000-N	SP	Lump Sum		SUPPORTS, OVERHEAD SIGN STRUC-TURE AT STA ****** (13+75)
4082100000-N	SP	Lump Sum		SUPPORTS, OVERHEAD SIGN STRUC-TURE AT STA ****** (14+22)
4082100000-N	SP	Lump Sum		SUPPORTS, OVERHEAD SIGN STRUC-TURE AT STA ****** (15+60)
4082100000-N	SP	Lump Sum		SUPPORTS, OVERHEAD SIGN STRUC-TURE AT STA ****** (16+50)
4082100000-N	SP	Lump Sum		SUPPORTS, OVERHEAD SIGN STRUC-TURE AT STA ****** (274+50)
4082100000-N	SP	Lump Sum		SUPPORTS, OVERHEAD SIGN STRUC-TURE AT STA ****** (281+00)
4082100000-N	SP	Lump Sum		SUPPORTS, OVERHEAD SIGN STRUC-TURE AT STA ****** (36+00)
4082100000-N	SP	Lump Sum		SUPPORTS, OVERHEAD SIGN STRUC-TURE AT STA ****** (37+50)
4096000000-N	904	2	EA	SIGN ERECTION, TYPE D
4102000000-N	904	78	EA	SIGN ERECTION, TYPE E

STATE OF NORTH CAROLINA
SUMMARY OF QUANTITIES

PROJECT REFERENCE No.	SHEET No.
R-3833B	3 (2 of 3)

ItemNumber	Sec #	Quantity	Unit	Description
4108000000-N	904	5	EA	SIGN ERECTION, TYPE F
4110000000-N	904	9	EA	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (A)
4110000000-N	904	5	EA	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (B)
4114000000-N	904	2	EA	SIGN ERECTION, MILEMARKERS
4116100000-N	904	5	EA	SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (A)
4116100000-N	904	2	EA	SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (D)
4116100000-N	904	1	EA	SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (E)
4138000000-N	907	10	EA	DISPOSAL OF SUPPORT, STEEL BEAM
4152000000-N	907	3	EA	DISPOSAL OF SIGN SYSTEM, STEEL BEAM
4155000000-N	907	24	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4158000000-N	907	1	EA	DISPOSAL OF SIGN SYSTEM, WOOD
4192000000-N	907	2	EA	DISPOSAL OF SUPPORT, U-CHANNEL
4400000000-E	1110	620	SF	WORK ZONE SIGNS (STATIONARY)
4405000000-E	1110	870	SF	WORK ZONE SIGNS (PORTABLE)
4410000000-E	1110	240	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4415000000-N	1115	2	EA	FLASHING ARROW PANELS, TYPE C
4420000000-N	1120	4	EA	CHANGEABLE MESSAGE SIGN
4422000000-N	1120	6	DAY	CHANGEABLE MESSAGE SIGN (SHORT TERM)
4430000000-N	1130	500	EA	DRUMS
4435000000-N	1135	40	EA	CONES
4445000000-E	1145	160	LF	BARRICADES (TYPE III)
4455000000-N	1150	200	MD	FLAGGER
4465000000-N	1160	6	EA	TEMPORARY CRASH CUSHIONS
4470000000-N	1160	2	EA	RESET TEMPORARY CRASH CUSHIONS
4480000000-N	1165	4	EA	TMIA
4485000000-E	1170	19,230	LF	PORTABLE CONCRETE BARRIER
4500000000-E	1170	33,380	LF	RESET PORTABLE CONCRETE BARRIER
4507000000-E	SP	715	LF	WATER FILLED BARRIER
4510000000-N	SP	200	HR	LAW ENFORCEMENT
4650000000-N	1251	3,300	EA	TEMPORARY RAISED PAVEMENT MARKERS
4688000000-E	1205	32,920	LF	THERMOPLASTIC PAVEMENT MARKING LINES (6", 90 MILS)
4690000000-E	1205	8,850	LF	THERMOPLASTIC PAVEMENT MARKING LINES (6", 120 MILS)
4695000000-E	1205	205	LF	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)
4697000000-E	1205	1,210	LF	THERMOPLASTIC PAVEMENT MARKING LINES (8", 120 MILS)
4700000000-E	1205	6,250	LF	THERMOPLASTIC PAVEMENT MARKING LINES (12", 90 MILS)
4710000000-E	1205	500	LF	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)
4721000000-E	1205	48	EA	THERMOPLASTIC PAVEMENT MARKING CHARACTER (120 MILS)
4725000000-E	1205	130	EA	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)
4770000000-E	1205	2,000	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (IV)
4810000000-E	1205	255,120	LF	PAINT PAVEMENT MARKING LINES (4")
4820000000-E	1205	24,855	LF	PAINT PAVEMENT MARKING LINES (8")
4835000000-E	1205	1,500	LF	PAINT PAVEMENT MARKING LINES (24")
4840000000-N	1205	144	EA	PAINT PAVEMENT MARKING CHARACTER
4845000000-N	1205	210	EA	PAINT PAVEMENT MARKING SYMBOL
4847000000-E	1205	43,270	LF	POLYUREA PAVEMENT MARKING LINES (4", **********) (HIGHLY REFLECTIVE GLASS BEADS)
4847110000-E	1205	620	LF	POLYUREA PAVEMENT MARKING LINES (8", **********) (HIGHLY REFLECTIVE GLASS BEADS)
4850000000-E	1205	32,540	LF	REMOVAL OF PAVEMENT MARKING LINES (4")
4855000000-E	1205	32,540	LF	REMOVAL OF PAVEMENT MARKING LINES (6")
4870000000-E	1205	240	LF	REMOVAL OF PAVEMENT MARKING LINES (24")
4905000000-N	1253	1,670	EA	SNOWPLOWABLE PAVEMENT MARKERS
5000000000-E	1401	4	EA	***" HIGH MOUNT STANDARD (60')
5005000000-E	1401	2	EA	80' HIGH MOUNT STANDARD
5020000000-N	1401	1	EA	PORTABLE DRIVE UNIT
5025000000-E	1402	24.2	CY	HIGH MOUNT FOUNDATIONS
5030000000-N	1403	28	EA	HIGH MOUNT LUMINAIRES ******** (400W HPS)
5120000000-N	1407	1	EA	ELECTRIC SERVICE POLE **** ******** (30' CLASS 4)
5125000000-E	1407	50	LF	ELECTRIC SERVICE LATERAL ********** (3 #1/0 USE)
5145000000-N	1408	1	EA	LIGHT CONTROL EQUIPMENT, TYPE RW ********** (480V, 150A)
5155000000-E	1409	160	LF	ELECTRICAL DUCT, TYPE BD, SIZE ***** (2")
5155000000-E	1409	110	LF	ELECTRICAL DUCT, TYPE BD, SIZE ***** (4")
5170000000-E	1410	350	LF	** #8 W/G FEEDER CIRCUIT (2)
5175000000-E	1410	175	LF	** #6 W/G FEEDER CIRCUIT (2)
5180000000-E	1410	175	LF	** #4 W/G FEEDER CIRCUIT (2)
5205000000-E	1410	2,545	LF	** #8 W/G FEEDER CIRCUIT IN *****" CONDUIT (2, 1-1/2")
5210000000-E	1410	1,230	LF	** #6 W/G FEEDER CIRCUIT IN *****" CONDUIT (2, 1-1/2")
5215000000-E	1410	1,240	LF	** #4 W/G FEEDER CIRCUIT IN *****" CONDUIT (2, 1-1/2")
5240000000-N	1411	7	EA	ELECTRICAL JUNCTION BOXES ********** (PC18)
5240000000-N	1411	3	EA	ELECTRICAL JUNCTION BOXES ********** (PC36)
5252000000-N	1412	8	EA	UNDERPASS LUMINARIES ********* (TYPE WM 150W HPS)
5253000000-N	1412	Lump Sum		UNDERPASS CIRCUITRY AT ******* (UPL-1)
5255000000-N	1413	Lump Sum		PORTABLE LIGHTING
5325600000-E	1510	10	LF	6" WATER LINE
5326200000-E	1510	2,675	LF	12" WATER LINE
5326600000-E	1510	160	LF	16" WATER LINE
5572600000-E	1515	8	EA	16" TAPPING VALVE
5589100000-E	1515	2	EA	1" AIR RELEASE VALVE
5589200000-E	1515	1	EA	2" AIR RELEASE VALVE
5648000000-N	1515	4	EA	RELOCATE WATER METER
5672000000-N	1515	8	EA	RELOCATE FIRE HYDRANT
5679600000-E	1515	8	EA	24" LINE STOP
5691300000-E	1520	1,917	LF	8" SANITARY GRAVITY SEWER
5709900000-E	1520	2,110	LF	24" FORCE MAIN SEWER
5775000000-E	1525	10	EA	4' DIA UTILITY MANHOLE
5776000000-E	1525	2	EA	5' DIA UTILITY MANHOLE
5801000000-E	1530	1,724	LF	ABANDON 8" UTILITY PIPE
5804000000-E	1530	2,335	LF	ABANDON 12" UTILITY PIPE
5813000000-E	1530	1,790	LF	ABANDON 24" UTILITY PIPE
5816000000-N	1530	6	EA	ABANDON UTILITY MANHOLE
5836200000-E	1540	806	LF	30" ENCASEMENT PIPE
5836400000-E	1540	403	LF	36" ENCASEMENT PIPE
5872300000-E	1550	403	LF	TRENCHLESS INSTALLATION OF 30" IN SOIL
5872310000-E	1550	403	LF	TRENCHLESS INSTALLATION OF 30" NOT IN SOIL
5872400000-E	1550	202	LF	TRENCHLESS INSTALLATION OF 36" IN SOIL
5872410000-E	1550	202	LF	TRENCHLESS INSTALLATION OF 36" NOT IN SOIL
5882000000-N	SP	2	EA	GENERIC UTILITY ITEM CUT IN 12" GATE VALVE & VALVE BOX
5882000000-N	SP	1	EA	GENERIC UTILITY ITEM RELOCATE FIRE HYDRANT WITH NEW 6" GATE VALVE
5882000000-N	SP	12	EA	GENERIC UTILITY ITEM RELOCATE SANITARY SEWER CLEAN-OUT
6000000000-E	1605	19,000	LF	TEMPORARY SILT FENCE
6006000000-E	1610	3,320	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	5,430	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	3,650	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	161.5	ACR	TEMPORARY MULCHING
6018000000-E	1620	3,300	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	14.5	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	4,200	LF	TEMPORARY SLOPE DRAINS
6027000000-N	1622	31	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
6029000000-E	SP	3,000	LF	SAFETY FENCE
6030000000-E	1630	26,580	CY	SILT EXCAVATION
6036000000-E	1631	67,000	SY	MATTING FOR EROSION CONTROL
6037000000-E	SP	500	SY	COIR FIBER MAT
6038000000-E	SP	1,950	SY	PERMANENT SOIL REINFORCEMENT MAT
6042000000-E	1632	2,000	LF	1/4" HARDWARE CLOTH
6045000000-E	SP	160	LF	**" TEMPORARY PIPE (24")
6069000000-E	1638	1,310	CY	STILLING BASINS
6070000000-N	SP	8	EA	SPECIAL STILLING BASINS
6071010000-E	SP	1,440	LF	WATTLE
6071020000-E	SP	720	LB	POLYACRYLAMIDE (PAM)
6071030000-E	SP	2,695	LF	COIR FIBER BAFFLES
6071050000-E	SP	40	EA	**" SKIMMER (1-1/2")
6071050000-E	SP	1	EA	**" SKIMMER (2-1/2")
6084000000-E	1660	95	ACR	SEEDING & MULCHING
6087000000-E	1660	75	ACR	MOWING
6090000000-E	1661	1,250	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	3.25	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	2,025	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	60.75	TON	FERTILIZER TOPDRESSING
6111000000-E	SP	810	LF	IMPERVIOUS DIKE
6114500000-N	SP	290	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	54	EA	RESPONSE FOR EROSION CONTROL
6123000000-E	1670	0.75	ACR	REFORESTATION
7000000000-E	1705	14	EA	PEDESTRIAN SIGNAL HEAD (**", ** SECTION) (16",1 SECTION WITH COUNTDOWN)
7060000000-E	1705	8,530	LF	SIGNAL CABLE
7120000000-E	1705	36	EA	VEHICLE SIGNAL HEAD (12", 3 SECTION)
7132000000-E	1705	3	EA	VEHICLE SIGNAL HEAD (12", 4 SECTION)
7144000000-E	1705	3	EA	VEHICLE SIGNAL HEAD (12", 5 SECTION)
7252000000-E	1710	8,170	LF	MESSENGER CABLE (1/4")
7264000000-E	1710	2,220	LF	MESSENGER CABLE (3/8")
7279000000-E	1715	15	LF	TRACER WIRE

STATE OF NORTH CAROLINA
SUMMARY OF QUANTITIES

PROJECT REFERENCE No.	SHEET No.
R-30338	3 (3 of 3)

ItemNumber	Sec #	Quantity	Unit	Description
7300000000-E	1715	2,040	LF	UNPAVED TRENCHING (**********) (1, 2")
7301000000-E	1715	350	LF	DIRECTIONAL DRILL (**********) (4, 2")
7324000000-N	1716	21	EA	JUNCTION BOX (STANDARD SIZE)
7348000000-N	1716	4	EA	JUNCTION BOX (OVER-SIZED, HEAVY DUTY)
7360000000-N	1720	4	EA	WOOD POLE
7372000000-N	1721	33	EA	GUY ASSEMBLY
7408000000-E	1722	1	EA	1" RISER WITH WEATHERHEAD
7420000000-E	1722	1	EA	2" RISER WITH WEATHERHEAD
7430000000-N	1722	1	EA	HEAT SHRINK TUBING RETROFIT KIT
7432000000-E	1722	3	EA	2" RISER WITH HEAT SHRINK TUBING
7444000000-E	1725	3,370	LF	INDUCTIVE LOOP SAWCUT
7456000000-E	1726	11,600	LF	LEAD-IN CABLE (**********) (14-2)
7481000000-N	SP	1	EA	SITE SURVEY
7481200000-N	SP	4	EA	LUMINAIRE ARM FOR VIDEO SYSTEM
7481240000-N	SP	4	EA	CAMERA WITHOUT INTERNAL LOOP EMULATOR PROCESSING UNIT
7481260000-N	SP	2	EA	EXTERNAL LOOP EMULATOR PROCESSING UNIT
7484000000-N	SP	2	EA	MICROWAVE VEHICLE DETECTOR
7516000000-E	1730	9,200	LF	COMMUNICATIONS CABLE (**FIBER) (12)
7552000000-N	1731	3	EA	INTERCONNECT CENTER
7564000000-N	1732	3	EA	FIBER-OPTIC TRANSCEIVER, DROP & REPEAT
7568000000-N	SP	1	EA	FURNISH FIBER-OPTIC RESTORATION KIT
7570000000-N	SP	1	EA	FURNISH FIBER-OPTIC POWER METER
7572000000-N	SP	1	EA	FURNISH OPTICAL LIGHT GENERATOR
7574000000-N	SP	1	EA	FURNISH FIBER-OPTIC TRANSCEIVER
7576000000-N	SP	12	EA	METAL STRAIN SIGNAL POLE
7613000000-N	SP	10	EA	SOIL TEST
7614100000-E	SP	60	CY	DRILLED PIER FOUNDATION
7624000000-N	1743	10	EA	SIGNAL PEDESTAL WITH FOUNDATION
7630000000-N	SP	2	EA	METAL STRAIN POLE DESIGN
7636000000-N	1745	6	EA	SIGN FOR SIGNALS
7684000000-N	1750	3	EA	SIGNAL CABINET FOUNDATION
7756000000-N	1751	3	EA	CONTROLLER WITH CABINET (TYPE 2070L, BASE MOUNTED)
7780000000-N	1751	17	EA	DETECTOR CARD (TYPE 2070L)
7901000000-N	1753	3	EA	CABINET BASE EXTENDER
******* BEGIN SCHEDULE AA ******* ******* (3 ALTERNATES) *******				
0366000000-E AA1	310	7,616	LF	15" RC PIPE CULVERTS, CLASS III
0372000000-E AA1	310	2,132	LF	18" RC PIPE CULVERTS, CLASS III
0378000000-E AA1	310	1,972	LF	24" RC PIPE CULVERTS, CLASS III
0384000000-E AA1	310	1,948	LF	30" RC PIPE CULVERTS, CLASS III
0390000000-E AA1	310	468	LF	36" RC PIPE CULVERTS, CLASS III
*** OR ***				
0366000000-E AA2	310	4,856	LF	15" RC PIPE CULVERTS, CLASS III
0372000000-E AA2	310	1,268	LF	18" RC PIPE CULVERTS, CLASS III
0378000000-E AA2	310	1,520	LF	24" RC PIPE CULVERTS, CLASS III
0384000000-E AA2	310	1,612	LF	30" RC PIPE CULVERTS, CLASS III
0390000000-E AA2	310	352	LF	36" RC PIPE CULVERTS, CLASS III
0536000000-E AA2	SP	2,760	LF	***" HDPE PIPE CULVERTS (15")
0536000000-E AA2	SP	864	LF	***" HDPE PIPE CULVERTS (18")
0536000000-E AA2	SP	452	LF	***" HDPE PIPE CULVERTS (24")
0536000000-E AA2	SP	336	LF	***" HDPE PIPE CULVERTS (30")
0536000000-E AA2	SP	116	LF	***" HDPE PIPE CULVERTS (36")
*** OR ***				
0366000000-E AA3	310	4,856	LF	15" RC PIPE CULVERTS, CLASS III
0372000000-E AA3	310	1,268	LF	18" RC PIPE CULVERTS, CLASS III
0378000000-E AA3	310	1,520	LF	24" RC PIPE CULVERTS, CLASS III
0384000000-E AA3	310	1,612	LF	30" RC PIPE CULVERTS, CLASS III
0390000000-E AA3	310	352	LF	36" RC PIPE CULVERTS, CLASS III
0540000000-E AA3	SP	2,760	LF	***" ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, ****" THICK (15", 0.064")
0540000000-E AA3	SP	864	LF	***" ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, ****" THICK (18", 0.064")
0540000000-E AA3	SP	452	LF	***" ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, ****" THICK (24", 0.064")
0540000000-E AA3	SP	336	LF	***" ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, ****" THICK (30", 0.079")
0540000000-E AA3	SP	116	LF	***" ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, ****" THICK (36", 0.079")
******* END SCHEDULE AA *******				

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RD238355

COMPUTED BY:	C. POWELL	DATE:	10/29/2008
CHECKED BY:	T. HUFFMAN	DATE:	11/7/2008

PROJECT NO.	SHEET NO.
R-3833B	3-A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 15"	18"	24"	30"
-L-											
229+64	LT	2		861.20	858.07						
		2	3		858.07	857.78	X	92			
229+64	RT	3		861.20	858.07						
		3	6		858.07	852.73		304			
230+22	LT	1		861.00	858.75						
		1	2		858.75	858.07		56			
232+80	LT	4		857.60	853.86						
		4	5		853.86	853.86		52			
232+80	LT	5		856.86	853.86						
		5	6		853.86	852.73		48			
232+80	RT	6		855.73	852.48						
		6	8		852.48	848.15			264		
235+60	LT	7		852.52	849.52						
		7	9		849.52	848.12		168			
235+60	RT	8		851.40	848.15						
		8	12		848.15	845.88			264		
237+35	LT	9		851.12	848.12						
		IN	9		849.60	848.12				56	
		9	11		848.12	847.12	X			96	
238+38	LT	10		849.55	847.30						
		10	11		847.30	847.12	X	52			
238+38	LT	11		850.81	846.85						
		11	12		846.85	845.87				44	
238+38	RT	12		850.28	845.37						
		12	15		845.37	844.41	X				180
239+67	LT	13		850.42	847.42						
		13	14		847.42	847.28		56			
240+31	LT	14		850.28	847.28						
		14	15		847.28	846.71		44			
240+31	RT	15		849.71	844.41						
		15	18		844.41	843.45	X				152
241+63	LT	16		847.50	845.25						
		16	17		845.25	845.19	X	16			
241+63	LT	17		849.07	845.19						
		17	20		845.19	842.62		224			
241+90	RT	18		848.83	843.45						
		18	21		843.45	841.37					196
243+90	LT	19		844.00	841.75						
		19	20		841.75	841.70	X	16			
243+90	LT	20		845.62	841.70						
		20	21		841.70	841.44	X	84			
243+90	RT	21		845.62	841.37						
		21	23		841.37	834.52					232
246+25	LT	22		838.92	835.92						
		22	23		835.92	835.66	X	84			
246+25	RT	23		838.77	834.52						
		23	25		834.52	821.38					316
SHEET TOTALS								1,296	528	196	1,076

STATION	LOCATION	FROM	TO	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	PIPE REMOVAL LIN. FT.	REMARKS
229+64	LT	2		1			1			1						
229+64	RT	3		1			1		1							
230+22	LT	1		1									1	1		
232+80	LT	4		1									1	1		
232+80	LT	5		1			1		1		1					
232+80	RT	6		1			1		1							
235+60	LT	7		1			1		1		1				20	Sta 234+37 LT, DRIVEWAY PIPE REMOVAL
235+60	RT	8		1			1		1							
237+35	LT	9		1			1		1		1				36	Sta 237+33 LT, CROSS PIPE REMOVAL
		IN	9													OPEN END PIPE
238+38	LT	10		1									1	1		
238+38	LT	11		1			1		1		1					
238+38	RT	12		1			1		1							
239+67	LT	13		1			1		1		1					
240+31	LT	14		1			1		1		1					
240+31	RT	15		1	0.30		1		1							
241+63	LT	16		1									1	1		
241+63	LT	17		1			1			1					28	Sta 242+12 LT, DRIVEWAY PIPE REMOVAL
241+90	RT	18		1	0.38		1		1							
243+90	LT	19		1									1	1		
243+90	LT	20		1			1			1					20	Sta 244+17 LT, DRIVEWAY PIPE REMOVAL
243+90	RT	21		1			1		1							
246+25	LT	22		1			1			1						
246+25	RT	23		1			1		1							
SHEET TOTALS				23	0.68		18		14	4	6		5	5	104	SHEET TOTALS

Other columns (no entries on this sheet):

CLASS III R.C. PIPE 12"	18" CONTRACTOR DESIGN	36"	36" CLASS V	36" CONTRACTOR DESIGN	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 12"	15"	18"	24"	30"	36"	42"	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	J.B. STD. 840.31 OR 840.32	T.B. J.B. STD. 840.34	M.H. STD. 840.51 OR 840.53	M.H. FRAME AND COVER STD. 840.54	PAVED DITCH YD² STD. 850.10 OR 850.11	OUTLET CONTROL STRUCTURE, SEE SHEET 2-0	CONVERT D.I. TO J.B.	SLUICE GATE	BITUMINOUS COATED C.S. ELBOWS NO. & SIZE 12"	15"	18"	24"	30"	CONC. COLLARS CL. "B" C.Y. STD 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	EXIST. DRAINAGE STR. REMOVAL EA.

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

EAS208672

COMPUTED BY:	C. POWELL	DATE:	10/29/2008
CHECKED BY:	T. HUFFMAN	DATE:	11/7/2008

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-3833B	3-B

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) SIZE 12"	15"	18"	18" CONTRACTOR DESIGN	24"	30"	36"	36" CLASS V	36" CONTRACTOR DESIGN	42"	48"
THICKNESS OR GAUGE																		
-L-																		
249+50	LT	24		826.61	823.61													
		24	25		823.61	822.63			48									
249+50	RT	25		825.63	821.38													
		25	29		821.38	814.53							260					
251+50	LT	26		820.57	817.56													
		26	28		817.56	816.35			68									
252+20	LT	27		819.03	813.49													
		27	OUT		813.49	798.30												
252+20	LT	28		819.35	814.01													
		28	27		814.01	813.49	X						32					
252+20	RT	29		818.78	814.53													
		29	28		814.53	814.04	X						48					
252+60	LT	30																
		30	OUT		794.00	785.00												
253+73	RT	31		816.77	813.77													
		31	33		813.77	807.73			244									
256+00	LT	32		811.48	808.48													
		32	34		808.48	799.39			188									
256+20	RT	33		810.73	807.73													
		33	35		807.73	799.54			168									
257+90	LT	34		802.39	798.62													
		34	36		798.62	783.89				204								
257+90	RT	35		802.54	799.29													
		35	34		799.29	798.62	X			84								
260+00	LT	36		787.14	783.39													
		36	39		783.39	773.61							156					
260+00	LT	37		788.20	785.20													
		37	36		785.20	784.14			32									
261+47	RT	38		783.06	781.08													
		38	39		781.08	773.61			132									
261+65	LT	39		777.36	773.61													
		39	OUT		773.61	773.50							24					
263+10	LT	40		772.03	767.73													
		40	OUT		767.73	767.50	X		32									
263+18	LT	41		769.70	766.40													
		41	OUT		766.40	766.00												
264+21	RT	42		772.89	769.89													
		42	43		769.89	768.29			48									
264+21	LT	43		771.29	768.29													
		43	40		768.29	767.73	X		104									
265+68	RT	44																
		44	OUT		766.00	765.50												
SHEET TOTALS								1,064	288			180	340					

STATION	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) SIZE 12"	15"	18"	24"	30"	36"	42"	48"	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 12"	15"	18"	24"	30"	36"	42"	48"
THICKNESS OR GAUGE		.064	.064	.064	.079	.079	.109	.109								
-L-																
249+50																
249+50																
251+50																
252+20																
					68											
252+20																
252+20																
252+60																
253+73																
256+00																
256+20																
257+90																
257+90																
260+00																
260+00																
261+47																
261+65																
263+10																
263+18																
264+21																
264+21																
265+68																
										20						
SHEET TOTALS					68					20	76					

STATION	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. "A" * (1.3 X COL. "B") LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSISTIONAL SECTION CATCH BASIN	DROP INLET	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	J.B. STD. 840.31 OR 840.32	T.B. J.B. STD. 840.34	M.H. STD. 840.51 OR 840.53	M.H. FRAME AND COVER STD. 840.54	PAVED DITCH YD³ STD. 850.10 OR 850.11	OUTLET CONTROL STRUCTURE, SEE SHEET 2-0	CONVERT D.I. TO J.B.	SLUICE GATE	BITUMINOUS COATED C.S. ELBOWS NO. & SIZE 12"	15"	18"	24"	30"	CONC. COLLARS CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.17	EXIST. DRAINAGE STR. REMOVAL EA.	PIPE REMOVAL LIN. FT.	REMARKS
-L-																																												
249+50						1			1			1	1																												3	209	Sta 249+13 LT, REMOVE PIPE
249+50						1			1		1																																	
251+50						1			1		1		1																															
252+20						1	0.54		1			1																																
					68																																		2					
252+20						1	0.34		1		1		1																															
252+20						1			1		1																																	
252+60				2.3																																	1							Std. 838.02
253+73						1			1		1																														1	140	Sta. 254+27 LT, REMOVE PIPE
256+00						1			1			1																																
256+20						1			1		1																																	
257+90						1			1			1																																
257+90						1			1		1																																	
260+00						1			1			1																																
260+00						1			1		1		1																															
261+47						1			1			1																																
261+65						1			1		1																																	
263+10						1			1			1																																
263+18				2.3		1																											1			2								SEE SHEET 2-0
264+21						1			1	1		1																																
264+21						1			1	1																																		
265+68				1.5																																	1							Std. 838.02
SHEET TOTALS				6.1		19	0.88		18	2	9	7	5																			1			4				2			4	349	SHEET TOTALS

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: C. POWELL DATE: 10/29/2008

CHECKED BY: T. HUFFMAN DATE: 11/7/2008

PROJECT NO.	SHEET NO.
R-3833B	3-C

RD238355

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	18" CONTRACTOR DESIGN	24"	30"	36"	36" CLASS V	36" CONTRACTOR DESIGN	42"	48"
-L-																		
265+90	LT	45		774.62	770.87													
		45	46		770.87	770.31	X					48						
265+90	RT	46		775.74	770.31													
		46	OUT		770.31	766.00						76						
268+80	RT	47		793.55	790.55													
		47	48		790.55	789.43			48									
268+80	LT	48		792.43	788.68													
		48	45		788.68	770.87						276						
270+18	LT	49		803.95	799.83													
		49	48		799.83	788.68						136						
270+18	RT	50		804.10	800.35													
		50	49		800.35	799.83						84						
270+75	RT	51		808.17	804.42													
		51	50		804.42	800.35						56						
270+75	RT	52		814.00	814.00													
		52	51		814.00	804.42						32						
273+50	RT	53		824.91	821.91													
		53	51		821.91	805.17			272									
274+85	LT	54		833.21	825.41													
		54	OUT		825.41	788.00												
275+48	LT	55		836.17	825.61													
		55	54		825.61	825.41				60								
275+48	RT	56		835.55	825.91													
		56	55		825.91	825.61	X			104								
		IN	56		826.00	825.91	X			28								
282+00	RT	60		845.75	842.58													
		60	59		842.58	842.41			52									
281+44	RT	59		845.58	842.41													
		59	58		842.41	841.00			28									
281+44	RT	58		844.00	841.00													
		58	57		841.00	840.76			80									
280+63	RT	57		844.72	840.76													
		57	135		840.76	836.40												
-RPD1-																		
17+14	RT	135		839.40	836.40													
		135	136		836.40	834.86												
15+69	LT	136		836.15	833.20													
		136	137		833.20	832.70				88								
15+57	RT	137		838.50	832.70													
		137	142		832.70	814.40												
15+51	RT	142		818.36	813.36													
-L-																		
283+67	LT	61		849.12	841.00													
		61	OUT		841.00	838.66			28									
SHEET TOTALS									508	280		708						

STATION	FROM	TO	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	24"	30" .079	30"	36" .079	36"	42" .109	42"	48" .109	48"	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 12"	15"	18"	24"	30"	36"	42"	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.
274+85	54	OUT			84																							
280+63	57	135															44											
17+14	135	136																128										
15+57	137	142																36										
SHEET TOTALS					84												44	164										

STATION	STRUCTURE NO.	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29
265+90 LT	45	1			1		1													
265+90 RT	46	1	0.43		1			1	1											
268+80 RT	47	1			1			1	1											
268+80 LT	48	1			1		1													
270+18 LT	49	1			1		1													
270+18 RT	50	1			1			1												
270+75 RT	51	1			1			1												
273+50 RT	53	1			1			1												
274+85 LT	54	1	2.80		1		1													
275+48 LT	55	1	10.00	0.56	1		1													
275+48 RT	56	1	4.64		1			1												
282+00 RT	60	1								1	1	1								
281+44 RT	59	1								1	1	1								
281+44 RT	58	1			1			1												
280+63 RT	57	1			1			1												
17+14 RT	135	1											1					2		
15+69 LT	136	1												1				1		
15+57 RT	137	1	0.80											1			1			
15+51 RT	142	1												1			1			
283+67 LT	61	1	3.12		1			1												
SHEET TOTALS		20	21.79	0.56	14		5	9	2	2	2	2	1	3			2	3		

STATION	STRUCTURE NO.	J.B. STD. 840.31 OR 840.32	T.B. J.B. STD. 840.34	M.H. STD. 840.51 OR 840.53	M.H. FRAME AND COVER STD. 840.54	PAVED DITCH YD² STD. 850.10 OR 850.11	OUTLET CONTROL STRUCTURE, SEE SHEET 2-0	CONVERT D.I. TO J.B.	SLUICE GATE	BITUMINOUS COATED C.S. ELBOWS NO. & SIZE 12"	15"	18"	24"	30"	CONC. COLLARS CL. "B" C.Y. STD 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD 840.71	EXIST. DRAINAGE STR. REMOVAL EA.	PIPE REMOVAL LIN. FT.	REMARKS
268+80 RT	47																4	276	Sta 268+10 RT & LT, PIPE REMOVAL
270+75 RT	52					31													BDO (STD. 850.11)
	54-OUT											2							
275+48 LT	55																	128	Sta 275+79 LT, PIPE REMOVAL / HW REMOVAL
275+48 RT	56																	58	Sta 275+45 RT, PIPE REMOVAL
282+00 RT	60																		T.B.D.I.
281+44 RT	59																		T.B.D.I.
17+14 RT	135																		4 G.I.
	137-142											2							
15+51 RT	142																1		REMOVE EXIST. D.I.
SHEET TOTALS						31						4					5	462	SHEET TOTALS

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:	C. POWELL	DATE:	10/29/2008
CHECKED BY:	T. HUFFMAN	DATE:	11/7/2008

RD238355

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-3833B	3-D

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & 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 CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	18" CONTRACATOR DESIGN	24"	30"	36"	36" CLASS V	36" CONTRACTOR DESIGN	42"	48"
-L-																		
283+65	LT	62		847.16	841.45													
		62	61		841.45	841.00			32									
		64	62		842.20	841.45	X		232									
283+62	RT	63		845.13	842.38													
		63	62		842.38	842.20			48									
286+00	LT	64		848.00	842.80													
		65	64		842.80	842.50	X		96									
286+86	LT	65		847.10	842.80													
		66	65		843.10	842.80			88									
286+77	LT	66		845.80	843.10													
289+00	LT	67		843.00	840.25													
		67	68		840.25	837.45												
290+37	LT	68		840.20	837.45													
		68	OUT		837.45	832.60												
-Y8-																		
12+80	RT	66A																
-Y1-																		
11+02	RT	69		773.79	770.79													
		69	70		770.79	770.65			44									
11+30	RT	70		773.75	770.65													
		70	OUT		770.65	766.00			52									
12+67	LT	72		776.35	773.35													
		72	73		773.35	773.21			40									
12+67	RT	73		776.35	773.21													
		73	OUT		773.21	773.00												
-Y6-																		
21+00	LT	76		818.77	816.02													
		76	77		816.02	809.35												
22+90	LT	77		816.05	809.35													
		77	EXIST		809.35	809.31												
22+95	RT	78		810.00	804.46													
27+66	RT	79		806.30	803.30													
		79	EXIST		803.30	803.22												
27+72	LT	80		809.27	804.00													
		80	EXIST		804.00	803.96												
30+00	RT	81		802.96	800.21													
		81	83		800.21	793.20												
30+80	RT	83		796.97	793.20													
		83	OUT		793.20	789.80												
SHEET TOTALS									632									

STATION	FROM	TO	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 12"	15"	18"	24"	30"	36"	42"	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.
-L-																							
283+65	62																						
	62	61																					
	64	62																					
283+62	63																						
	63	62																					
286+00	64																						
	65	64																					
286+86	65																						
	66	65																					
286+77	66																						
289+00	67																						
	67	68										124											
290+37	68																						
	68	OUT										128											
-Y8-																							
12+80	66A																			80			
-Y1-																							
11+02	69																						
	69	70																					
11+30	70																						
	70	OUT																					
12+67	72																						
	72	73																					
12+67	73																						
	73	OUT										28											
-Y6-																							
21+00	76																						
	76	77										188											
22+90	77																						
	77	EXIST													8								
22+95	78																						
27+66	79																						
	79	EXIST											24										
27+72	80																						
	80	EXIST											8										
30+00	81																						
	81	83										76											
30+80	83																						
	83	OUT												28									
SHEET TOTALS												544	32	28	8					80			

STATION	FROM	TO	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET
-L-											
283+65	62		1	0.71		1		1		1	
	62	61									
	64	62									
283+62	63		1			1			1		
	63	62									
286+00	64		1	0.2		1		1		1	
	65	64									
286+86	65		1			1		1			
	66	65									
286+77	66		1								
289+00	67		1								
	67	68									
290+37	68		1								
	68	OUT									
-Y8-											
12+80	66A										
-Y1-											
11+02	69		1			1		1			
	69	70									
11+30	70		1			1			1		
	70	OUT									
12+67	72		1			1			1		
	72	73									
12+67	73		1			1		1			
	73	OUT									
-Y6-											
21+00	76		1								
	76	77									
22+90	77		1	1.7							
	77	EXIST									
22+95	78										
27+66	79		1								
	79	EXIST									
27+72	80		1	0.3							
	80	EXIST									
30+00	81		1								
	81	83									
30+80	83		1								
	83	OUT									
SHEET TOTALS			17	2.88		8		5	3	2	

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 GRATE STD. 840.20	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 TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	J.B. STD. 840.31 OR 840.32	T.B. J.B. STD. 840.34	M.H. STD. 840.51 OR 840.53	M.H. FRAME AND COVER STD. 840.54	PAVED DITCH YD^2 850.10 OR 850.11	OUTLET CONTROL STRUCTURE, SEE SHEET 2-0	CONVERT D.I. TO J.B.	SLUICE GATE	BITUMINOUS COATED C.S. ELBOWS NO. & SIZE 12"	15"	18"	24"	30"	CONC. COLLARS CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	EXIST. DRAINAGE STR. REMOVAL EA.	PIPE REMOVAL LIN. FT.	REMARKS
-L-																														
283+65	62																											1	62	Sta. 283+65 LT, PIPE REMOVAL
	62	61																												
	64	62																												
283+62	63																													
	63	62																												
286+00	64																													
	65	64																												
286+86	65																													
	66	65																												
286+77	66					1				1																				
289+00	67					1					1																			
	67	68																												
290+37	68					1					1																		238	Sta. 291+07 RT & LT, PIPE REMOVAL
	68	OUT																												
-Y8-																														
12+80	66A																													
-Y1-																														
11+02	69																													
	69	70																												
11+30	70																											2	53	Sta 11+33 LT & RT, REMOVE PIPE
	70	OUT																												
12+67	72																													
	72	73																												
12+67	73																													
	73	OUT																												
-Y6-																														
21+00	76					1			1																					
	76	77																												
22+90	77					1			1																			1		
	77	EXIST																									0.7				
22+95	78																		1											
27+66	79					1				1																				
	79	EXIST																									0.5		1		
27+72	80					1			1																					
	80	EXIST																									0.5		1		
30+00	81					1			1																					
	81	83																												
30+80	83												1																	
	83	OUT																												
SHEET TOTALS						8			4	2	2		1						1								1.7		6	353	SHEET TOTALS

RD238355

COMPUTED BY: C. POWELL DATE: 10/29/2008

CHECKED BY: T. HUFFMAN DATE: 11/7/2008

PROJECT NO.	SHEET NO.
R-3833B	3-E

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	BITUMINOUS COATED C.S. PIPE TYPE B 15" (.064)	BITUMINOUS COATED C.S. PIPE TYPE B 18" (.064)	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 15"	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 18"	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 30"	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	LIN. FT. A 5.0' THRU 10.0'	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. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	J.B. STD. 840.31 OR 840.32	M.H. FRAME AND COVER STD. 840.54	BITUMINOUS COATED C.S. ELBOWS NO. & SIZE 15"	CONC. COLLARS CL. "B" C.Y. STD 840.72	EXIST. DRAINAGE STR. REMOVAL EA.	REMARKS
-Y6-																							
30+00	RT	82		806.00	800.80							1	0.20		1	1							
		82	EXIST		800.80	800.75				8											0.5	1	
31+47	LT	84		803.96	801.21							1			1	1							
		84	85		801.21	793.44			84														
32+30	LT	85		799.30	793.44							1	0.9	1			2						4 G.I.
		85	EXIST		793.44	793.44					8										0.7		REMOVE HEAD WALL
36+00	RT	86		798.32	795.57							1			1	1							
		86	87		795.57	794.93			96														
37+00	RT	87		797.68	794.93							1			1	1							
		87	90		794.93	794.07			148														
38+50	RT	90		796.61	794.07							1			1	1							
38+50	RT	90	OUT		794.07	779.00	44													2			ROD & LUG CONNC. W/ SLEEVE GASKETS
38+31	RT	89																			0.5		
		89	OUT		778.52	777.00		16															
38+00	LT	88		794.90	791.65							1			1		1						
		88	91		791.65	784.60			100														
39+00	LT	91		789.60	784.60							1						1	1				
		91	OUT		784.60	784.50				16													
39+00	LT	92		796.37	793.31							1			1		1						FLAT GRATES
		92	91		793.31	784.60	36													2			
39+48	LT	93		796.41	793.46							1			1		1						FLAT GRATES
		93	92		793.46	793.31			44														
40+48	LT	95		796.51	793.76							1			1		1						FLAT GRATES
		95	93		793.76	793.46			96														
39+72	RT	94		796.89	793.90							1			1		1						FLAT GRATES
		94	OUT		793.90	778.00	44													2			ROD & LUG CONN. W/ SLEEVE GASKETS
40+98	RT	96		797.05	794.30							1			1		1						FLAT GRATES
		96	94		794.30	793.90			124														
42+48	RT	97		797.30	794.55							1			1		1						FLAT GRATES
		97	OUT		794.55	779.00	48													2			ROD & LUG CONNC. W/ SLEEVE GASKETS
42+63	RT	98																					
		98	OUT		778.60	774.00		44													0.5		
43+50	RT	99		797.47	794.70							1			1		1						FLAT GRATES
		99	100		794.70	794.30			36														
43+50	RT	100		797.47	794.30							1			1		1						FLAT GRATES
		100	OUT		794.30	781.80	36													2			ROD & LUG CONNC. W/ SLEEVE GASKETS
SHEET TOTALS							208	60	728	24	8	16	1.06	1	14	5	11	1	1	10	2.2	1	SHEET TOTALS

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

*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B')

EAS208672

COMPUTED BY:	C. POWELL	DATE:	10/29/2008
CHECKED BY:	T. HUFFMAN	DATE:	11/7/2008

PROJECT NO.	SHEET NO.
R-3833B	3-F

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) SIZE 12"	15"	18"	18" CONTRACTOR DESIGN	24"	30"	36"	36" CLASS V	36" CONTRACTOR DESIGN	42"	48"
								THICKNESS OR GAUGE										
-Y6-																		
44+75	RT	101		799.19	783.47													
		101	OUT		783.47	794.20												
44+88	LT	102																
		102	EXIST		791.60	791.41												
45+50	LT	103		796.74	793.70													
		103	OUT		793.70	791.80												
47+00	LT	106		798.66	795.90													
		106	103		795.90	793.70												
47+00	LT	107		802.07	799.40													
		107	106		799.40	795.90												
50+00	LT	113		807.00	803.00													
		113	107		803.00	799.40												
51+00	LT	116		808.50	806.20													
		116	113		806.20	804.20												
49+98	LT	115		814.85	812.10													
		115	114		812.10	803.10												
50+00	LT	114		810.57	803.10													
		114	113		803.10	803.00												
46+11	RT	104		801.96	796.50													
		104	OUT		796.50	794.20												
46+13	RT	105		800.43	796.90													
		105	104		796.90	796.50												
48+00	RT	108		803.40	800.40													
		108	105		800.40	796.90												
48+85	RT	111		805.40	801.40													
		111	108		801.40	800.40												
50+00	RT	112		806.80	804.10													
		112	111		804.10	801.40												
51+50	RT	117		809.03	806.30													
		117	112		806.30	804.10												
48+45	RT	111A		808.33	801.50													
		111A	111		801.50	801.40			8									
52+21	RT	118		829.67	826.90													
		118	119		826.90	826.60												
52+19	RT	119		830.50	826.90													
		119	OUT		826.90	793.80												
53+28	LT	120		834.28	831.50													
		120	121		831.50	831.10												
53+44	LT	121		836.40	831.10													
		121	OUT		831.10	825.00												
55+29	LT	122		843.10	840.10													
		122	121		840.10	831.10												
54+67	LT	123		837.84	813.10													
		IN	123		813.10	804.97									140			
SHEET TOTALS									8						140			

STATION	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) SIZE 12"	15"	18"	24"	30"	36"	42"	48"	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D SIZE 12"	15"	18"	24"	30"	36"	42"	48"
	THICKNESS OR GAUGE .064	.064	.064	.064	.079	.079	.109	.109								
-Y6-																
44+75																
														60		
44+88																
														24		
45+50																
											52					
47+00																
											148					
47+00																
									60							
50+00																
									296							
51+00																
									96							
49+98																
	24															
50+00																
									12							
46+11																
												32				
46+13																
												44				
48+00																
											184					
48+85																
									84							
50+00																
									112							
51+50																
									148							
48+45																
52+21																
									32							
52+19																
	76															
53+28																
									36							
53+44																
	36															
55+29																
									184							
54+67																
SHEET TOTALS	136								1,060	384	76		84			

STATION	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS (STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE)) CU. YARDS R.C.P.	C.S.P.	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	LIN. FT. A 5.0' THRU 10.0'	LIN. FT. B 10.0' AND ABOVE	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. "A" + (1.3 X COL. "B")	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.34	M.H. STD. 840.51 OR 840.53	M.H. FRAME AND COVER STD. 840.54	PAVED DITCH YD³ 850.10 OR 850.11	OUTLET CONTROL STRUCTURE, SEE SHEET 2-9	CONVERT D.I. TO J.B.	SLUICE GATE	BITUMINOUS COATED C.S. ELBOWS NO. & SIZE 12"	15"	18"	24"	30"	CONC. COLLARS CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	EXIST. DRAINAGE STR. REMOVAL EA.	PIPE REMOVAL LIN. FT.	REMARKS
-Y6-																																													
44+75						1	10.0	5.7																			1																		
44+88				3.4																																									
																																												REMOVE HEAD WALL	
45+50						1															1				1																				
47+00						1															1				1																				
47+00						1															1				1																				
50+00						1															1					1																		FLAT GRATES	
51+00						1															1					1																			
49+98						1															1					1																			
																																							2						
50+00						1	2.5														1					1																			
46+11						1	0.5														1					1																		FLAT GRATES	
46+13						1															1					1																			
48+00						1															1					1																			
48+85						1															1					1																		FLAT GRATES	
50+00						1															1					1																		FLAT GRATES	
51+50						1															1					1																		FLAT GRATES	
48+45						1	1.8														1					1																			
52+21						1														1			1		1																			3 GI W/ FLAT GRATES	
52+19						1															1					1																		FLAT GRATES	
																																							2					ROD & LUG W/ SLEEVE GASKET	
53+28						1															1					1																			
53+44						1	0.3		1		1																												2						
55+29						1			1		1																																		
54+67						1	10.0	14.7																						1														
SHEET TOTALS				3.4		21	25.06	20.46	2		2									1	16		1	10	7			2											6						SHEET TOTALS

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

EAS208672

COMPUTED BY:	C. POWELL	DATE:	10/29/2008
CHECKED BY:	T. HUFFMAN	DATE:	11/7/2008

PROJECT NO.	SHEET NO.
R-3833B	3-G

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	18" CONTRACTOR DESIGN	24"	30"	36"	36" CLASS V	36" CONTRACTOR DESIGN	42"	48"
-Y6-																		
54+01	RT	124		802.37	797.94													
		124	OUT		797.94	788.70					132							
53+55		125																
		125	OUT		794.94	788.70										136		
54+72	RT	126		809.77	803.87													
		126	OUT		803.87	795.00									192			
55+93	RT	128		812.50	805.66													
		128	126		805.66	803.87								116				
56+03	RT	127		815.37	807.26													
		127	128		807.26	805.66						212						
58+17	RT	129		816.50	811.60													
		129	127		811.60	807.26						28						
		Exist	129		812.27	811.60												
58+61	RT	130		816.94	812.80													
58+56	RT	131		830.50	831.70													
		131	132		831.70	831.40			32									
58+53	RT	132		834.14	831.40													
		132	133		831.40	812.80												
58+61	RT	133		821.84	812.80													
		133	130		812.80	812.70			8									
59+70	RT	134		821.17	818.50													
		134	133		818.50	812.80			104									
-RPD-																		
14+30	LT	138		833.58	830.80													
		138	139		830.80	822.20			96									
13+28	LT	140		825.00	822.30													
		140	139		822.30	822.20			16									
13+28	LT	139		829.66	822.20													
		139	144		822.20	821.80			76									
12+52	LT	144		826.17	821.80													
		144	145		821.80	814.90			188									
10+63	LT	145		817.70	814.90													
		145	146		814.90	814.60	X		56									
10+66	RT	146		817.70	814.60													
		146	151		814.60	811.60												
7+60	RT	151		814.32	811.60													
		151	153		811.60	807.40			64									
7+10	LT	153		812.00	807.40													
		153	154		807.40	806.80						100						
6+07	LT	154		812.18	806.80													
		154	OUT		806.80	794.50						96						
SHEET TOTALS									640		132	436		116	192	136		

STATION	FROM	TO	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 12"	15"	18"	24"	30"	36"	42"	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET
-Y6-																																
54+01	124																							1								
	124	OUT																														
53+55	125																															
	125	OUT																														
54+72	126																							1	0.90							
	126	OUT																														
55+93	128																															
	128	126																														
56+03	127																							1	3.11							
	127	128																														
58+17	129																							1								
	129	127																														
	Exist	129																														
58+61	130																							1								
58+56	131																							1								
	131	132																														
58+53	132																							1								
	132	133		36																												
58+61	133																							1	4.04							
	133	130																														
59+70	134																							1								
	134	133																														
-RPD-																																
14+30	138																							1								
	138	139																														
13+28	140																							1								
	140	139																														
13+28	139																							1	2.46							
	139	144																														
12+52	144																							1								
	144	145																														
10+63	145																							1								
	145	146																														
10+66	146																							1								
	146	151										304																				
7+60	151																							1								
	151	153																														
7+10	153																							1								
	153	154																														
6+07	154																							1	0.38							
	154	OUT																														
SHEET TOTALS				36								304												18	10.89							

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 GRATE STD. 840.20	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 TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	J.B. STD. 840.31 OR 840.32	T.B. J.B. STD. 840.34	M.H. STD. 840.51 OR 840.53	M.H. FRAME AND COVER STD. 840.54	PAVED DITCH YD^2 850.10 OR 850.11	OUTLET CONTROL STRUCTURE, SEE SHEET 2-0	CONVERT D.I. TO J.B.	SLUICE GATE	BITUMINOUS COATED C.S. ELBOWS NO. & SIZE 12"	15"	18"	24"	30"	CONC. COLLARS CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	EXIST. DRAINAGE STR. REMOVAL EA.	PIPE REMOVAL LIN. FT.	REMARKS
-Y6-																														
54+01	124												1																	
	124	OUT																												
53+55	125																													
	125	OUT																								0.8				
54+72	126												1																	
	126	OUT																												
55+93	128																		1											
	128	126																											100	Sta 55+58 RT, REMOVE PIPE
56+03	127													1		1														
	127	128																												
58+17	129												1																	
	129	127																										3	365	Sta 56+98 LT & RT, PIPE AND D.I. REMOVAL
	Exist	129																												
58+61	130					1			1																			1		FLAT GRATES / REMOVE D.I.
58+56	131					1			1																					FLAT GRATES
	131	132																												
58+53	132					1			1																					FLAT GRATES
	132	133																				2								
58+61	133					1				1																				
	133	130																												
59+70	134					1			1																					FLAT GRATES
	134	133																											20	Sta 60+43 RT, REMOVE DRIVEWAY PIPE
-RPD-																														FLAT GRATES
14+30	138					1			1																					
	138	139																												
13+28	140						1		1																					
	140	139																												
13+28	139					1			1																					FLAT GRATES
	139	144																												
12+52	144					1			1																					FLAT GRATES
	144	145																												
10+63	145					1				1																				
	145	146																												
10+66	146					1				1																				
	146	151																												
7+60	151					1				1																				
	151	153																												
7+10	153												1																	
	153	154																											37	Sta 7+10 LT, REMOVE EXIST. PIPE
6+07	154				1					1																				
	154	OUT																												
SHEET TOTALS					1	11	1		8	5			4	1		1			1			2				0.8		4	522	SHEET TOTALS

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

RD238355

COMPUTED BY:	C. POWELL	DATE:	10/29/2008
CHECKED BY:	T. HUFFMAN	DATE:	11/7/2008

PROJECT NO.	SHEET NO.
R-3833B	3-H

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	18" CONTRACTOR DESIGN	24"	30"	36"	36" CLASS V	36" CONTRACTOR DESIGN	42"	48"
-RPC-																		
13+50	LT	141		820.90	818.20													
		141	142		818.20	817.90			32									
13+50	RT	142		821.84	814.00													
		142	143		814.00	812.30			24									
13+50	RT	143		816.71	814.00													
		143	147		814.00	812.30			256									
10+12	RT	147		815.07	812.30													
		147	148		812.30	812.00			28									
10+12	LT	148		814.72	812.00													
		148	150		812.00	809.50			136									
8+73	RT	149																
		150	149		809.50	809.23				16								
8+74	LT	150		812.47	809.50													
		IN	150		825.85	809.50												
-Y3-																		
22+74	RT	152																
-Y6-																		
68+66	RT	155		808.95	806.20													
		155	156		806.20	802.42			120									
69+89	RT	156		805.29	802.42													
70+06	LT	157																
		157	OUT		799.66	799.45												
73+15	RT	158		796.80	794.05													
		158	EXIST		794.05	793.94				24								
73+51	LT	159		798.00	792.20													
		159	160		792.20	791.90												
73+51	LT	160		798.10	791.90													
77+00	RT	161			813.00													
		161	162		813.00	786.88												
77+00	RT	162		789.88	786.88													
		162	163		786.88	784.25				76								
77+79	RT	163		789.40	784.25													
-Y4-																		
10+95	RT	164			774.00													
		164	OUT		774.00	770.00							140					
SHEET TOTALS									596	116			140					

STATION	LOCATION	FROM	TO	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	24"	30" .079	30"	36" .079	36"	42" .109	42"	48" .109	48"	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 12"	15"	18"	24"	30"	36"	42"	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.
		IN	150			96																							
22+74	RT	152																							48				
		157	OUT																12										
		161	162			56																							
10+95	RT	164																										2.3	
SHEET TOTALS						152													12						48			2.3	

STATION	LOCATION	FROM	TO	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29
13+50	LT	141		1												1			1			
13+50	RT	142		1	2.84											1			1			
13+50	RT	143		1												1				1		
10+12	RT	147		1												1				1		
10+12	LT	148		1												1			1			
8+74	LT	150		1												1			1			
68+66	RT	155		1												1			1			
73+15	RT	158		1												1				1		
73+51	LT	160		1	1.20											1				1		
77+00	RT	162		1												1				1		
SHEET TOTALS				10	4.04											10			5	5		

STATION	LOCATION	FROM	TO	J.B. STD. 840.31 OR 840.32	T.B. J.B. STD. 840.34		M.H. STD. 840.51 OR 840.53	M.H. FRAME AND COVER STD. 840.54		PAVED DITCH YD² 850.10 OR 850.11		OUTLET CONTROL STRUCTURE, SEE SHEET 2-0		CONVERT D.I. TO J.B.		SLUICE GATE	BITUMINOUS COATED C.S. ELBOWS NO. & SIZE 12"	15"	18"	24"	30"	CONC. COLLARS CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	EXIST. DRAINAGE STR. REMOVAL EA.	PIPE REMOVAL LIN. FT.	REMARKS
13+50	LT	141																								FLAT GRATES
		141	142																						40	Sta 11+54 &12+97 LT, REMOVE DRWY PIPE
13+50	RT	142																								FLAT GRATES
		148	150																						20	Sta 10+04, LT REMOVE DRWY PIPE
8+73	RT	149																				0.4		1		REMOVE D.I.
8+74	LT	150																								Sta 8+87 LT, REMOVE HEAD WALL
		IN	150																2						48	ROD & LUG CONNC. W/ SLEEVE GASKET
22+74	RT	152																							44	REMOVE DRWY PIPE
69+89	RT	156												1												
70+06	LT	157																				0.4				
73+15	RT	158																				0.4				
		158	EXIST																					1		REMOVE EXIST. D.I.
73+51	LT	159												1												
77+00	RT	161								11																BDO (STD. 850.10)
77+79	RT	163												1											52	REM HEAD WALL
10+95	RT	164																								HEAD WALL
SHEET TOTALS										11				3					2			1.2		2	204	SHEET TOTALS

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

EAS226265

COMPUTED BY: C. POWELL DATE: 10/29/2008

CHECKED BY: T. HUFFMAN DATE: 11/7/2008

PROJECT NO.	SHEET NO.
R-3833B	3-I

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) SIZE 12"	15"	18"	18"	24"	30"	36"	36"	36"	42"	48"
THICKNESS OR GAUGE											CONTRACTOR DESIGN				CLASS V	CONTRACTOR DESIGN		
-Y4-																		
14+73	RT	166			784.50													
		166	165		784.50	780.86												
14+73	RT	165		785.61	780.86													
		165	168		780.86	771.89												
17+87	RT	167			782.00													
		167	168		782.00	771.89												
17+87	RT	168		777.14	771.89													
		168	169		771.89	770.52								56				
17+87	LT	169		775.77	770.52													
		169	170		770.52	763.80												
19+50	LT	170		769.05	763.80													
		170	OUT		763.80	757.00												
21+50	RT	171		764.50	761.76													
		171	OUT		761.76	758.00												
23+18	RT	172		765.54	762.79													
		172	OUT		762.79	760.00												
27+93	RT	173		773.80	769.00													
		173	OUT		769.00	767.20												
28+20	LT	174			772.60													
		174	173		772.60	769.00									72			
28+50	RT	175		775.57	772.57													
		175	173		772.57	769.00												
30+50	RT	176		778.73	775.73													
		176	175		775.73	772.57												
30+50	LT	177		779.85	776.85													
		177	176		776.85	775.73				56								
30+50	LT	178			781.50													
		178	177		781.50	776.85												
35+65	LT	179																
		179	OUT		794.40	769.70									164			
38+50	LT	180		816.39	813.39													
		180	OUT		813.39	803.43												
39+71	LT	181		819.34	816.30													
		181	180		816.30	813.39			112									
-DET3-																		
62+00	CL	182		*	*													
		182	OUT		*	*												
SHEET TOTALS								112	56				56	236				
ADJUSTMENT OF UTILITY MANHOLES																		
PROJECT TOTALS								4,856	1,268	132	1,520	1,612	352	332	136			

STATION	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) SIZE 12"	15"	18"	24"		30"		36"		42"		48"
THICKNESS OR GAUGE				.064	.064	.064	.064	.079	.079	.109	.109	
-Y4-												
14+73												
						8						
14+73												
17+87												
						20						
17+87												
17+87												
19+50												
21+50												
23+18												
				24								
27+93												
28+20												
28+50												
30+50												
30+50												
30+50												
					16							
35+65												
38+50												
				64								
39+71												
-DET3-												
62+00												
				320								
SHEET TOTALS				408	16	28						
ADJUSTMENT OF UTILITY MANHOLES												
PROJECT TOTALS				788	312	28		68				

STATION	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D SIZE 12"	15"	18"	24"	30"	36"	42"	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.
-Y4-													
14+73													
14+73													
				328									
17+87													
17+87													
17+87													
					152								
19+50													
					92								
21+50													
	80												
23+18													
27+93													
					32								
28+20												3.4	
28+50													
			52										
30+50													
			196										
30+50													
30+50													
35+65												2.3	
38+50													
39+71													
-DET3-													
62+00													
SHEET TOTALS	80	248	328	244	32							5.7	
ADJUSTMENT OF UTILITY MANHOLES													
PROJECT TOTALS	2,760	864	452	336	116				48	80		18	

STATION	QUANTITES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	LIN. FT. A 5.0' THRU 10.0'	LIN. FT. B 10.0' AND ABOVE	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B')	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE m	F	G	CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITHTWO GRATES STD. 840.29	J.B. STD. 840.31 OR 840.32	T.B. J.B. STD. 840.34	M.H. STD. 840.51 OR 840.53	M.H. FRAME AND COVER STD. 840.54	PAVED DITCH YD³ 850.10 OR 850.11	OUTLET CONTROL STRUCTURE, SEE SHEET 2-0	CONVERT D.I. TO J.B.	SLUICE GATE
-Y4-																													
14+73																											31		
14+73	1													1					1										
17+87																											31		
17+87	1	0.3												1					1										
17+87	1	0.3												1					1										
19+50	1	0.3												1					1										
21+50	1													1					1										
23+18	1													1						1									
27+93	1																			1									
28+20																													
28+50	1													1					1										
30+50	1													1					1										
30+50	1													1					1										
30+50																											11		
35+65																													
38+50	1			1		1																							
39+71	1			1		1																							
-DET3-																													
62+00																													
SHEET TOTALS	12	0.75		2		2								9					8	1	1						73		
ADJUSTMENT OF UTILITY MANHOLES		90.0																											
PROJECT TOTALS	156	158.03	21.02	62	2	37	23	15	2	7	7	4	71	1	1	34	33	10	1	9	1			2		115		1	

STATION	BITUMINOUS COATED C.S. ELBOWS NO. & SIZE 12"	15"	18"	24"	30"	CONC. COLLARS CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	EXIST. DRAINAGE STR. REMOVAL EA.	PIPE REMOVAL LIN. FT.	REMARKS
-Y4-										
14+73										BDO (STD. 850.11)
				2						
14+73										
										SEE PLANS FOR PIPE LAYOUT
17+87										BDO (STD. 850.11)
				2						ROD & LUG CONNC. W/ SLEEVE GASKETS
17+87										
17+87										
19+50										
21+50										
23+18										FLAT GRATES
	2									ROD & LUG CONNC. W/ SLEEVE GASKETS
27+93										J.B. W/ SLAB LID
28+20										HEAD WALL
28+50										
30+50										
30+50										
				2						
35+65										HEAD WALL
38+50										
	2									ROD & LUG CONNC. W/ SLEEVE GASKETS
39+71										
-DET3-										
62+00										
									320	TEMP. PIPE (*- RESIDENT ENG. TO SET INV'S)
SHEET TOTALS	4	2	4						320	SHEET TOTALS
ADJUSTMENT OF UTILITY MANHOLES										ADJUSTMENT OF UTILITY MANHOLES
PROJECT TOTALS	22	8	4	2		5.9		22	2,314	PROJECT TOTALS

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

RA071

COMPUTED BY:	C. POWELL	DATE:	10/29/2008
CHECKED BY:	T. HUFFMAN	DATE:	11/7/2008

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-3833B	3-J

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) SIZE 54" THICKNESS OR GAUGE	CLASS III R.C. PIPE 60"	CLASS III R.C. PIPE 66"	CLASS III R.C. PIPE 72"	CLASS III R.C. PIPE 78"	CLASS III R.C. PIPE 84"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 54" .109	54" .138	54" .168	54" SHOP ELON-GATED .138	54" SHOP ELON-GATED .168	60" .138	60" .168	66" .138	66" .168	72" .159	72" .168	STRUCTURAL PLATE PIPE 60" 12	60" 10	66" 12	66" 10	72" 12	72" 10	REINFORCED ENDWALLS WITH R.C. - C.Y.	REINFORCED ENDWALLS WITH C.S. - C.Y.	MASONRY DRAINAGE STRUCTURES CUBIC YARDS	C.B. STD. 840.01 OR 840.02	FRAMES, GRATES & HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET	J.B. STD. 840.31 OR 840.32	M.H. FRAME AND COVER STD. 840.54	REINF. CONC. FLARED END SECTIONS NO. & SIZE	CORR. STEEL FLARED END SECTIONS NO. & Size	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
-Y1-																																																	
11+74	LT	71		769.60																												5.364								1								
		71	OUT		762.78	762.40													60														12.3													14.253		EXTEND EXIST 60" PIPES LT & RT
																																																	(INCL. 5 COLLARS, 3 INLET & 2 OUTLET)
-Y6-																																																	
13+87	LT	74																															5.0															
		74	EXIST		802.50	Exist								12																															3.0		REMOVE EXIST. HEAD WALL
16+14	RT	75		801.00																												5.726								1	1							
		75	OUT		792.00	792.00								32																																		54" SHOULD BE LAID FLAT
SHEET TOTALS														44					60														17.3	11.09							2	1						17.3		SHEET TOTALS
PROJECT TOTALS														44					60														17.3	11.09							2	1						17.3		PROJECT TOTALS

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: C.POWELL DATE: 10-30-08
CHECKED BY: T. HUFFMAN DATE: 10-30-08

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
GUARDRAIL SUMMARY

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	3-K

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL
W = TOTAL WIDTH OF FLARE FROM BEGIN

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

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GRAU 350	TYPE-III	CAT-1	Type B-77					No.	PERMITTED G	PERMITTED NG				
-L-	252+41	253+50	LT	112.5			252+50	252+00	13.2	16	50		1		1		1												FILL WARRANT
-L-	262+83	265+76	RT	300			263+50	265+50	2	12	50		1		1		1												FILL WARRANT
-L-	264+55	267+02	LT	250			266+50	264+50	2	12	50		1		1		1												FILL WARRANT
-L-	272+99	274+50	RT	150				274+50	14	16	50		1		1		1												OVERHEAD SIGN
-L-	274+50	276+74	RT																								224.0		EXIST BRIDGE APPROACH
-L-	274+05	276+67	LT																								262.0		EXIST BRIDGE TRAIL
-L-	274+42	275+37	LT	100				274+50	14	16	50		1				1												FILL WARRANT / OVERHEAD SIGN
-L-	278+97	280+09	LT																								112.0		EXIST BRIDGE APPROACH
-L-	279+03	280+16	RT																								113.0		EXIST BRIDGE TRAIL
-L-	280+47	283+53	LT	312.5			283+00		10.3	16	50		1		1														FILL WARRANT
-Y3-	14+50	23+75	LT	925			23+63	14+62	4	7	50		1		2														FILL WARRANT
-Y4-	21+68	23+43	RT	175			22+50		6	9	50		1		1			1											FILL WARRANT
-Y4-	22+54	23+30	LT	75			23+00		3	6		50		1	1			1											BRIDGE / FILL WARRANT
-Y4-	25+39	27+12	LT	175			26+00		3	6	156.25		3.125		1			1											BRIDGE / FILL WARRANT
-Y4-	25+52	26+29	RT	75				26+00	6	9		50		1	1			1											BRIDGE / FILL WARRANT
-Y4-	33+75	38+22	RT	450			34+50	37+75	6	9					2														BRIDGE / FILL WARRANT
-Y6-	11+64	17+00	LT	537.5			15+00	11+73	14	17	50		1		1		1												FILL WARRANT
-Y6-	11+70	17+58	LT																								588.0		EXIST GUARDRAIL ALONG -Y6-
-Y6-	12+78	16+56	RT	375			15+00	16+60	14	17	50		1		1		1												FILL WARRANT
-Y6-	13+04	16+77	RT																								373.0		EXIST GUARDRAIL ALONG -Y6-
-Y6-	29+00	31+85	RT	287.5			31+00		14	17					1			1											FILL WARRANT
-Y6-	29+39	45+67	RT																								1,628.0		EXIST GUARDRAIL ALONG -Y6-
-Y6-	31+85	37+15	RT																							530			RETAINING WALL PROTECTION
-Y6-	36+00	39+48	LT	350			39+48	36+00	12	15					1		1												FILL WARRANT / CULVERT / OVERHEAD SIGN
-Y6-	38+78	42+81	LT																								403.0		EXIST GUARDRAIL ALONG -Y6-
-Y6-	40+00	68+20	MED RT	2,825																							2,820.0		EXIST GUARDRAIL ALONG -Y6- MED SB
-Y6-	40+80	69+00	MED LT	2,825																							2,820.0		EXIST GUARDRAIL ALONG -Y6- MED NB
-Y6-	44+95	45+45	MED						8	11																	50.0		MEDIAN OBSTACLE PROTECTION
-Y6-	49+15	49+65	MED						8	11																	50.0		MEDIAN OBSTACLE PROTECTION
-Y6-	48+75	59+90	RT																							1,115			MSE WALL PROTECTION
-Y6-	50+00	60+90	LT																							1,090			MSE WALL PROTECTION
-Y6-	51+69	54+75	MED RT						8	11	287.5		9.25					1											MEDIAN OBSTACLE PROTECTION
-Y6-	51+69	54+75	MED LT						8	11		287.5		9.25				1											MEDIAN OBSTACLE PROTECTION
-Y6-	53+18	56+04	RT																								286.0		EXIST GUARDRAIL ALONG -Y6-
-Y6-	54+51	58+12	LT																								361.0		EXIST GUARDRAIL ALONG -Y6-
-Y6-	54+75	57+25	MED RT				54+75	57+25	18	22																250			MEDIAN OBSTACLE PROTECTION
-Y6-	54+75	57+25	MED LT				57+25	54+75	18	22																250			MEDIAN OBSTACLE PROTECTION
-Y6-	57+25	60+31	MED RT						8	11		287.5		9.25				1											MEDIAN OBSTACLE PROTECTION
-Y6-	57+25	60+31	MED LT						8	11	287.5		9.25					1											MEDIAN OBSTACLE PROTECTION
-Y6-	62+35	62+85	MED						8	11																			MEDIAN OBSTACLE PROTECTION
-Y6-	66+55	67+05	MED						8	11																			MEDIAN OBSTACLE PROTECTION
-RPA-	0+00	3+50	LT	350			2+50	0+00	14	17	50		1		1														FILL WARRANT
-RPA-	10+45	13+54	RT	312.5				10+50	10	10							1												FILL WARRANT
-RPA1-	13+54	15+20	RT	187.5				15+20	10	10						1													FILL WARRANT
-RPA1-	13+95	17+35	LT	187.5	162.5			14+50	12	15							1												FILL WARRANT
-RPB-	0+16	14+94	RT	1,475			0+50		12	15								1											FILL WARRANT / CULVERT
-RPB-	10+50	17+17	LT	675			11+00		10	10	50		1		1	1													FILL WARRANT
-RPB1-	14+94	18+50	RT	212.5	150				9	12																			FILL WARRANT
-RPC-	13+35	16+13	RT	275			14+50		10	10							1												FILL WARRANT
-RPC1-	16+13	17+72	RT	162.5			17+72		10	10						1													FILL WARRANT
-RPD-	2+55	7+68	RT	512.5			5+00	6+00	12	15	50		1		1		1												FILL WARRANT
-RPD-	12+00	16+44	LT	450			10+50		10	10	50		1		1	1													FILL WARRANT
-RPD1-	12+71	14+25	RT	162.5				14+22	12	15					1		1												OVERHEAD ASSEMBLY
SHEET TOTALS				15,263	312.5										22	4	13	10								3,235	10,090.0		
LESS ANCHOR DEDUCTIONS																													
	GRAU-350	22	@ 50.0	-1,100																									
	TYPE-III	4	@ 18.75	-75																									
	CAT-1	13	@ 6.25	-81.25																									
	TYPE B-77	10	@ 18.75	-187.5																									
GRAND TOTALS				13,818.8	312.5																								
SAY				14,087.5	312.5																								
ADDITIONAL GUARDRAIL POSTS = 10																													

COMPUTED BY: C.POWELL DATE: 10 /8 /08
CHECKED BY: T. HUFFMAN DATE: 10 /8 /08

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	3-L

REMOVAL OF EXISTING ASPHALT PAVEMENT SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD²
-L-	267+78	268+43	RT	174
-Y4-	39+36	39+99	RT	154
-Y6-	11+30	84+00	MED LT	3,231
-Y6-	11+30	84+00	MED RT	3,231
-Y6-	11+30	84+00	LT	8,078
-Y6-	11+30	84+00	RT	8,078
-Y6-	41+72	47+73	MED	1,550
-Y6-	62+00	67+50	MED	1,342
-Y7-	10+95	11+10	RT	15
-Y7-	11+41	11+67	RT	22
-RPC1-	17+26	19+59	LT	355
-L-	CONTINGENCY PER FINAL PAVEMENT DESIGN			450
			TOTAL:	26,473
			SAY:	26,480

BREAKING OF EXISTING ASPHALT PAVEMENT SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD²
-L-	233+50	238+50	LT	1,111
-L-	245+75	255+75	LT	2,333
-L-	265+75	267+25	LT	400
-L-	274+75	276+11	LT	348
-L-	279+00	283+50	LT	1,150
-Y13-	10+80	11+87	LT & RT	155
-D-	10+06	11+25	LT & RT	331
			TOTAL:	5,828
			SAY:	5,830

EXPRESSWAY GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	LENGTH (ft)
-Y6-	17+00	31+50	LT	1,450
-RPC-	6+50	16+13	LT	963
-RPC1-	16+13	17+28	LT	116
			TOTAL:	2,528
			SAY:	2,530

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	LENGTH (ft)
-Y6-	39+00	39+48	LT	48
-RPA-	0+00	3+00	RT	300
-RPA-	10+50	15+11	RT	461
-RPB-	11+00	16+69	LT	569
-RPB-	0+16	15+00	RT	1,478
-RPB1-	14+94	17+88	RT	294
-RPC-	13+40	17+70	RT	430
-RPD-	12+50	15+95	LT	344
			TOTAL:	3,924
			SAY:	3,930

12/06/07
12/2/2008
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COMPUTED BY: T. HUFFMAN DATE: 10/30/2008
CHECKED BY: C. POWELL DATE: 11/02/2008

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	3-M

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

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

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION		UNCL. EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
-L-	229+50.00 TO 259+50.00 (LT)	202	0	13,537	13,335	0
-Y14-	10+35.00 TO 11+50.00	137	0	43	0	94
SUB-TOTAL		339	0	13,580	13,335	94
-L-	259+50.00 TO 277+08.21 (LT) (BEG BRDG)	1,596	0	9,522	7,926	0
-Y1-	10+00.00 TO 13+00.00	96	0	1,231	1,135	0
-Y10-	10+50.00 TO 12+25.00	107	0	35	0	72
-RPB1-	17+50.00 TO 18+00.00	0	0	7,363	7,363	0
SUB-TOTAL		1,799	0	18,151	16,424	72
-L-	278+69.55 TO 293+00.000 (LT) (END BRIDGE)	353	0	9,632	9,279	0
-RPA1-	15+50.00 TO 16+00.00	0	0	4,969	4,969	0
-Y8-	10+25.00 TO 15+00.00	1,141	0	137	0	1,004
-Y15-	10+90.16 TO 13+00.00	725	0	0	0	725
SUB-TOTAL		2,219	0	14,738	14,248	1,729
-L-	229+50.00 TO 259+50.00 (RT)	9,713	0	14,317	4,604	0
SUB-TOTAL		9,713	0	14,317	4,604	0
-L-	259+50.000 TO 277+08.21 (RT)	8,492	0	18,637	10,145	0
-Y4-	11+00.00 TO 23+32.87 (BEG BRIDGE)	12,275	0	9,191	0	3,084
-Y4-	25+45.13 TO 40+43.88 (END BRIDGE)	4,461	2,775	23,651	19,190	2,775
-D-	10+50.00 TO 12+28.75	10	0	419	409	0
-Y3-	15+00.00 TO 24+00.00	1,369	0	24	0	1,345
-Y5-	13+00.00 TO 14+07.80	263	0	502	239	0
-Y13-	10+12.00 TO 12+68.60	45	0	1,487	1,442	0
-RPC1-	18+00.00 TO 18+50.00	0	0	1,922	1,922	0
SUB-TOTAL		26,915	2,775	55,833	33,347	7,204
-L-	278+69.55 TO 293+00.00 (RT) (END BRIDGE)	1,245	0	5,278	4,033	0
-RPD1-	16+50.00 TO 17+00.00	60	0	154	94	0
-Y7-	11+00.00 TO 15+00.00	1,850	0	0	0	1,850
SUB-TOTAL		3,155	0	5,432	4,127	1,850

LOCATION		UNCL. EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
-Y6-	11+30.00 TO 41+50.00 (LT)	10,475	0	1,932	0	8,543
SUB-TOTAL		10,475	0	1,932	0	8,543
-Y6-	11+30.00 TO 41+50.00 (MED)	1,278	0	0	0	1,278
SUB-TOTAL		1,278	0	0	0	1,278
-Y6-	11+30.00 TO 41+50.00 (RT)	6,700	0	8,866	2,166	0
SUB-TOTAL		6,700	0	8,866	2,166	0
-Y6-	41+50.00 TO 71+50.00 (LT)	53,995	0	23,611	0	30,384
SUB-TOTAL		53,995	0	23,611	0	30,384
-Y6-	41+50.00 TO 71+50.00 (MED)	1,278	0	0	0	1,278
SUB-TOTAL		1,278	0	0	0	1,278
-Y6-	41+50.00 TO 71+50.00 (RT)	24,358	0	66,041	41,683	0
SUB-TOTAL		24,358	0	66,041	41,683	0
-Y6-	71+50.00 TO 84+00.00 (LT)	1,545	0	168	0	1,377
SUB-TOTAL		1,545	0	168	0	1,377
-Y6-	71+50.00 TO 84+00.00 (MED)	532	0	0	0	532
SUB-TOTAL		532	0	0	0	532
-Y6-	71+50.00 TO 84+00.00 (RT)	17,311	0	37	0	17,274
SUB-TOTAL		17,311	0	37	0	17,274
PROJECT SUB-TOTAL		161,612	2,775	222,706	129,934	71,615
ADDITIONAL UNDERCUT			4,000	4,800	4,800	4,000
GRADE POINT UNDERCUT			4,350	5,220	5,220	4,350
SHALLOW UNDERCUT			3,350			3,350
SHOULDER MATERIAL				12,024	12,024	
WASTE TO REPLACE BORROW					-68,840	-68,840
LOSS DUE TO CLEARING & GRUBBING		-37,500			37,500	
PROJECT TOTAL		124,112	14,475	244,750	120,638	14,475
5% TO REPLACE TOPSOIL ON BORROW PITT					6,032	
GRAND TOTAL		124,112	14,475		126,669	
SAY		**125,000**	**14,475**		**127,000**	

ESTIMATED DDE = 1,200 CY
-L- & -Y6- PAVEMENT STRUCTURE VOLUME = 24,379 CY
HAZARDOUS SPILL BASIN CONSTRUCTION = 878 CY
Basin #1 = 533 CY
Basin #2 = 111 CY
Basin #3 = 234 CY

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PROJ. REFERENCE NO.	SHEET NO.
R-3833B	3-N

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
141	4	THERESA L. PASSANTINO
142	4	PINNACLE AT LAKE NORMAN, LLC
143	7,15,16	CASHION FARMS, LLC
143A	6,7,15	CLAUD W. CASHION
143B	5	CLAUD W. CASHION
143C	4,5	CLAUD W. CASHION
144	4,5	SHAKIL & MELISSA AHMED
145	5,6	ROE LTD
146	5	ROCKROSE SELF STORAGE, LLC
147	5	MARK A. GOODSON & ANN M. GOODSON
148	5	CHARLEEN LAWSON CASHION
149	5	MARVIN JOHN CASHION
150	5,6	HORACE P. CASHION
151	5,6	RODERICK STEVEN KISTLER
152	6,7	MICHAEL HORACE CASHION
153	7,15	TOWN OF MOORESVILLE
154	6,7,8,12	ROE LTD
155A	7,8,15,16,17	SUNRIDGE TOWNHOMES, LLC
155B	16,17	SUNRIDGE PLACE, LLC
156	7	THOMAS DOTOLI
157	7	BUDDY E. MURRY
158	8	JAMES C. SIDES
159	8	DOYLE A. TILLIS
160	8	WILLIAM L. PETTIT
161	8,12	JIMMY G. CALDWELL
162	8	DENNIS A. CALDWELL
163	8	ERIC JOHN KLINGEL
164	8	BOBBY P. BRAWLEY
165	8,9	DONALD LEE BLACKWELDER
166	8	PEGGY L. DRUM
167	8	JAMES L. ATKINSON
168	8,9	ROMAN CATHOLIC DIOCESE OF CHARLOTTE
170	8,9	GFS DEVELOPMENT INC
171	9	JASON SANCHEZ
172	9	ROBERT J. BERTUCCI
173	9	BRANDON KEITH MARTIN
174	9	KARL A. RIEMENSPERGER
175	9	DAVID & PATRICIA BOHRER
176	9	DARREN B. JOLLY
177	9	LAURA I. GRIFFIN
179	9	RUTH MARIE YOUNG
258	6,7	J&K'S EXCELLENT ADVENTURE, LLC
259	7	CLYDE H. BOOTH
260	8	THOMAS H. CAREY JR.
261	8	DONNA H. BRIGMAN
262	8,13	RANDALL M. HEBBERT
263	13	DWAYNE K. ROGERS
264	13,14	HUBERT M. JOHNSTON
265	13	PETER E. BRIZA
269	17	TED WAYNE RITCHIE
270	14	CESAR GALVEZ VAZQUEZ
272	14	CHRISTOPHER B. LEE
274	14	MARY JO CORCORAN
278	10	CGRWFS REAL PROPERTY, LLC
279	10,11,12	BUFFALO MOOREVILLE, LLC
281	10,11	AMSTAR ENTERTAINMENT, LLC
283	11,12	AMEX PROPERTIES, LLC
295	8	TERRY A. BOYLES
297	8,13	BOBBY RAY MOODY JR.
298	13	TERRY SCOTT WELCH
303	13	PETER M. SCIRE
341	17	JOHN ANTHONY JULIAN
350	17	SCOTT D. & KELLY M. LIPPARD
351	17	DOMINICK DEPALO
352	17	CURTIS C. LEWIS
353	17	JUDITH JOSEPH

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID — 11/25/08

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS JR. — 11/21/08

MOFFATT & NICHOL — 1616 E. MILLBROOK ROAD, SUITE 160, RALEIGH, NORTH CAROLINA 27609 (919) 781-4626 VOICE (919) 781-4865 FAX

SDG Sungate Design Group, P.A. Engineering · Planning · Surveying · Environmental 919-A Jones Franklin Rd. Raleigh, N.C. 27606

8/17/99

-L-
PI Sta 235+75.80
Δ = 38° 22' 09.6" (RT)
D = 4° 01' 14.7"
L = 954.28'
T = 495.81'
R = 1,425.00'
e = 0.04
RO = 100.00'
DS = 50mph

NAD 83/95 NC GRID

STA 229+50 END TIP PROJECT R-3833A
STA 229+50 BEGIN TIP PROJECT R-3833B
BEGIN CONSTRUCTION

-L- PC 230+79.99

MATCHLINE STA. 234+00 -L- SEE SHEET 5

PINNACLE AT LAKE NORMAN LLC DB 1614 PG 1146

NORTH POINT DEVELOPMENT CO. DB 1184 PG 103 CONDO BK 1 PG 98-100

TOP PROPERTIES, LLC DB 1130 PG 2148 PB 30 PG 100

FFC LIMITED PARTNERSHIP DB 1426 PG 1448 PB 143 PG 105

PINNACLE AT LAKE NORMAN, LLC DB 1614 PG 1146

(142) PINNACLE AT LAKE NORMAN LLC DB 1614 PG 1146

(144) SHAKIL & MELISSA AHMED DB 1728 PG 402

(143C) CLAUD W. CASHION DB 1594 PG 1069 DB 1885 PG 1130

(141) THERESA L. PASSANTINO DB 1017 PG 183

JOHN G. LEGGITT DB 1626 PG 337

GEORGE ERVIN DB 826 PG 269

WILLIAMSON'S CHAPEL UNITED METHODIST CHURCH DB 381 PG 837

WILLIAMSON'S CHAPEL UNITED METHODIST CHURCH DB 731 PG 840

WILLIAMSON'S CHAPEL UNITED METHODIST CHURCH DB 348 PG 12

SR 1100 BRAWLEY SCHOOL RD

N 83°26' 53.7" E

DO NOT DISTURB EXISTING WELL

FOR -L- PROFILE SEE SHEET 18

11/24/2008
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ppowell

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER R. REID — 11/25/08

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS III — 11/26/08

MOFFATT & NICHOL — 16-16 EAST MILLBROOK ROAD, SUITE 160, RALEIGH, NORTH CAROLINA 27609, (919) 781-4626 VOICE, (919) 781-4869 FAX

SDG Sungate Design Group, P.A. — Transport Design Services — 319-A James Pringle Rd., Raleigh, N.C. 27606

NAD 83/95 NC GRID

PINNACLE AT LAKE NORMAN, LLC
DB 1614 PG 1146

(144) SHAKIL & MELISSA AHMED
DB 1728 PG 402

(146) ROCKROSE SELF STORAGE, LLC
DB 1518 PG 1417
DB 1518 PG 1415

(147) MARK A. GOODSON & ANN M. GOODSON
DB 1531PG 1377

(148) CHARLEEN LAWSON CASHION
DB 416 PG 254
DB 416 PG 252
DB 220 PG 202
TAX MAP

(150) HORACE P. CASHION
DB 220 PG 291
TAX MAP

PRESSLEY L. CASHION
DB 718 PG 86
PB 28 PG 87

(143C) CLAUD W. CASHION
DB 1594 PG 1069
DB 1885 PG 1130

(149) MARVIN JOHN CASHION
DB 564 PG 116

(143B) CLAUD W. CASHION
DB 1594 PG 1069
DB 1885 PG 1130

(151) RODERICK STEVEN KISTLER
DB 1145 PG 1482

-Y14- POT 10+00.00

DO NOT DISTURB EXISTING LIGHT & SIGN AT INTERSECTION

-Y14- POT 10+35.00
BEGIN CONSTRUCTION

-L- PT 240+34.28

-L- POC 236+23.76 = -Y14- POT 11+77.25

BL-35 +11.32' -L- 50.46' LT

BL-36 244+92.61 -L- 46.64' (LT)

MATCHLINE STA. 234+00 -L- SEE SHEET 4

MATCHLINE STA. 246+00 -L- SEE SHEET 6

TRACT 2

REMOVE

5' CONC. SIDEWALK

60' EXISTING R/W

BMII
-BL- STATION 238+55
OFFSET 355.42' RIGHT
ELEV = 830.64'

-L-
PI Sta 235+75.80
Δ = 38° 22' 09.6" (RT)
D = 4° 01' 14.7"
L = 954.28'
T = 495.81'
R = 1,425.00'
e = 0.04
RO = 100'
DS = 50mph

FOR -L- PROFILE SEE SHEET 18
FOR -Y14- PROFILE SEE SHEET 29

8/17/99

11/25/2008
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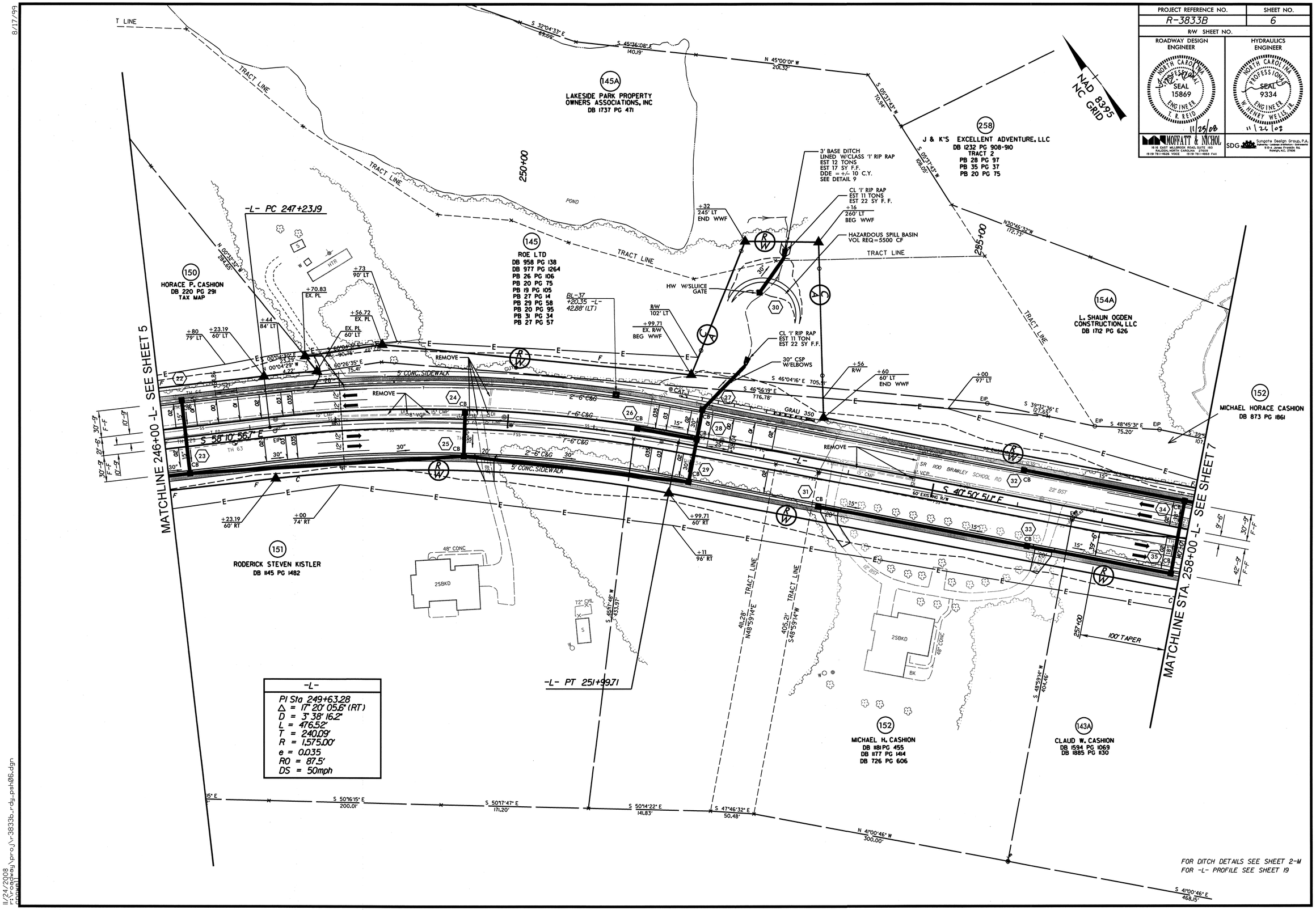
PROJECT REFERENCE NO.	SHEET NO.
R-3833B	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID 11/25/08

MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR. 11/26/08

SDG Sungate Design Group, P.A.
Transportation Planning & Engineering Consultants
919-A Jones Franklin Rd.
Raleigh, N.C. 27606



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11/24/2008
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ppowell

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	7
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER R. REID

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS III

MOFFATT & NICHOL, 16 W. EAST MILLBROOK ROAD, SUITE 160, RALEIGH, NORTH CAROLINA 27609, (919) 781-4626 VOICE (919) 781-4865 FAX

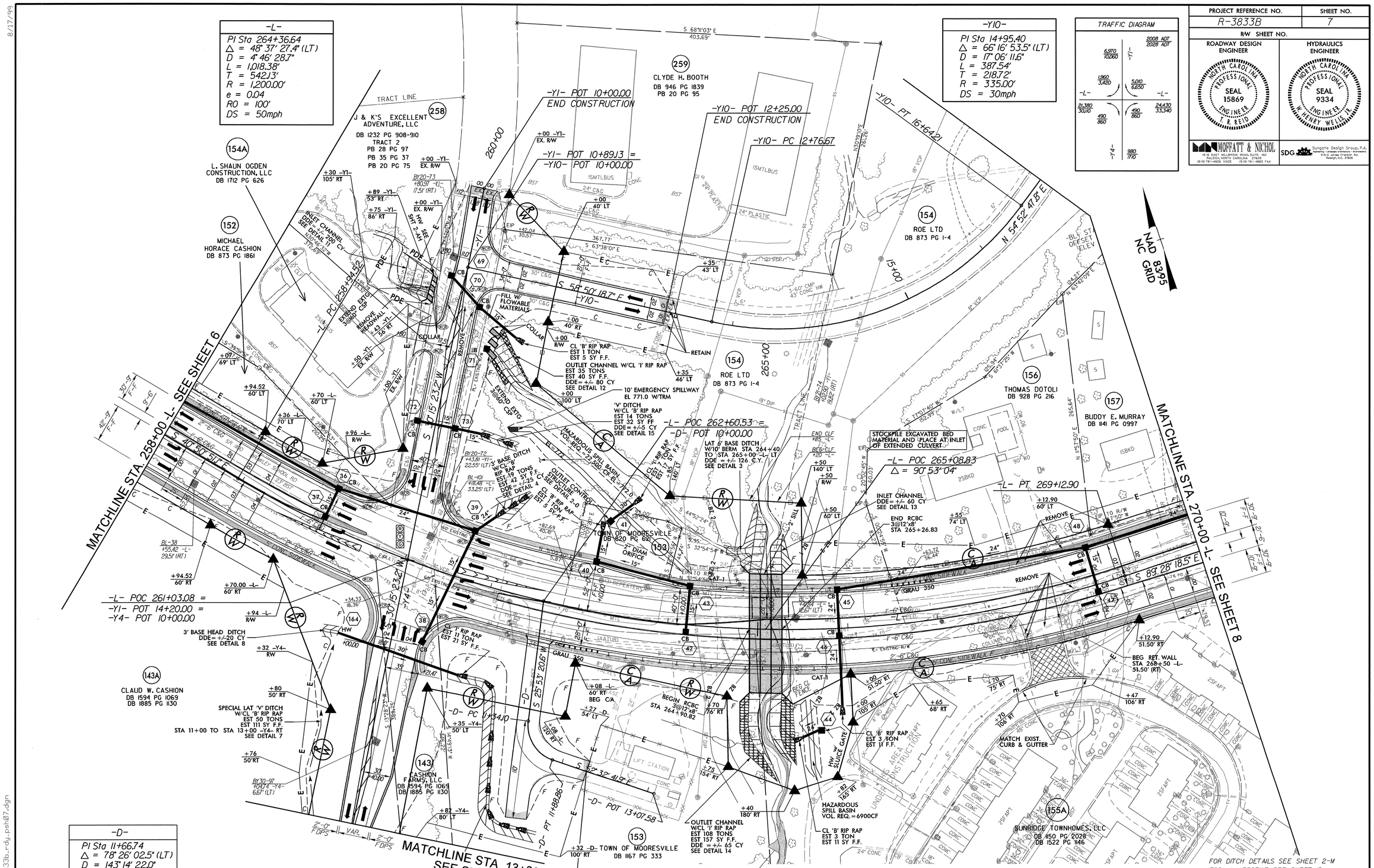
SDG Sungate Design Group, P.A. Highway Design • Traffic Engineering, 5 Sirius Jones Financial Rd. Raleigh, N.C. 27606

8/17/99

-L-
PI Sta 264+36.64
Δ = 48° 37' 27.4" (LT)
D = 4° 46' 28.7"
L = 1,018.38'
T = 542.13'
R = 1,200.00'
e = 0.04
RO = 100'
DS = 50mph

-Y10-
PI Sta 14+95.40
Δ = 66° 16' 53.5" (LT)
D = 17° 06' 11.6"
L = 387.54'
T = 218.72'
R = 335.00'
DS = 30mph

TRAFFIC DIAGRAM
2008 ADT / 2028 ADT
-Y1-: 6,970 / 10,060
-L-: 1,960 / 3,420
-L-: 5,010 / 6,650
-Y4-: 980 / 1710
-L-: 21,380 / 30,110
-L-: 490 / 860
-L-: 490 / 860
-L-: 24,430 / 33,340



-D-
PI Sta 11+66.74
Δ = 78° 26' 02.5" (LT)
D = 143° 14' 22.0"
L = 54.76'
T = 32.64'
R = 40.00'

FOR DITCH DETAILS SEE SHEET 2-M
FOR -L- PROFILE SEE SHEET 19
FOR -Y1- PROFILE SEE SHEET 25
FOR -Y4- PROFILE SEE SHEET 26 & 27
FOR -Y10- PROFILE SEE SHEET 28
FOR -D- PROFILE SEE SHEET 28
FOR INTERSECTION DETAILS SEE SHEET 2-G
FOR INTERSECTION DETAILS SEE SHEET 2-K
SEE C-1 THRU C-5 FOR CULVERT PLANS
SEE W-6 THRU W-7 FOR WALL PLANS

10/13/2009
R:\Roadway\Proj\r3833b_rdy_psh07.dgn
thuffman

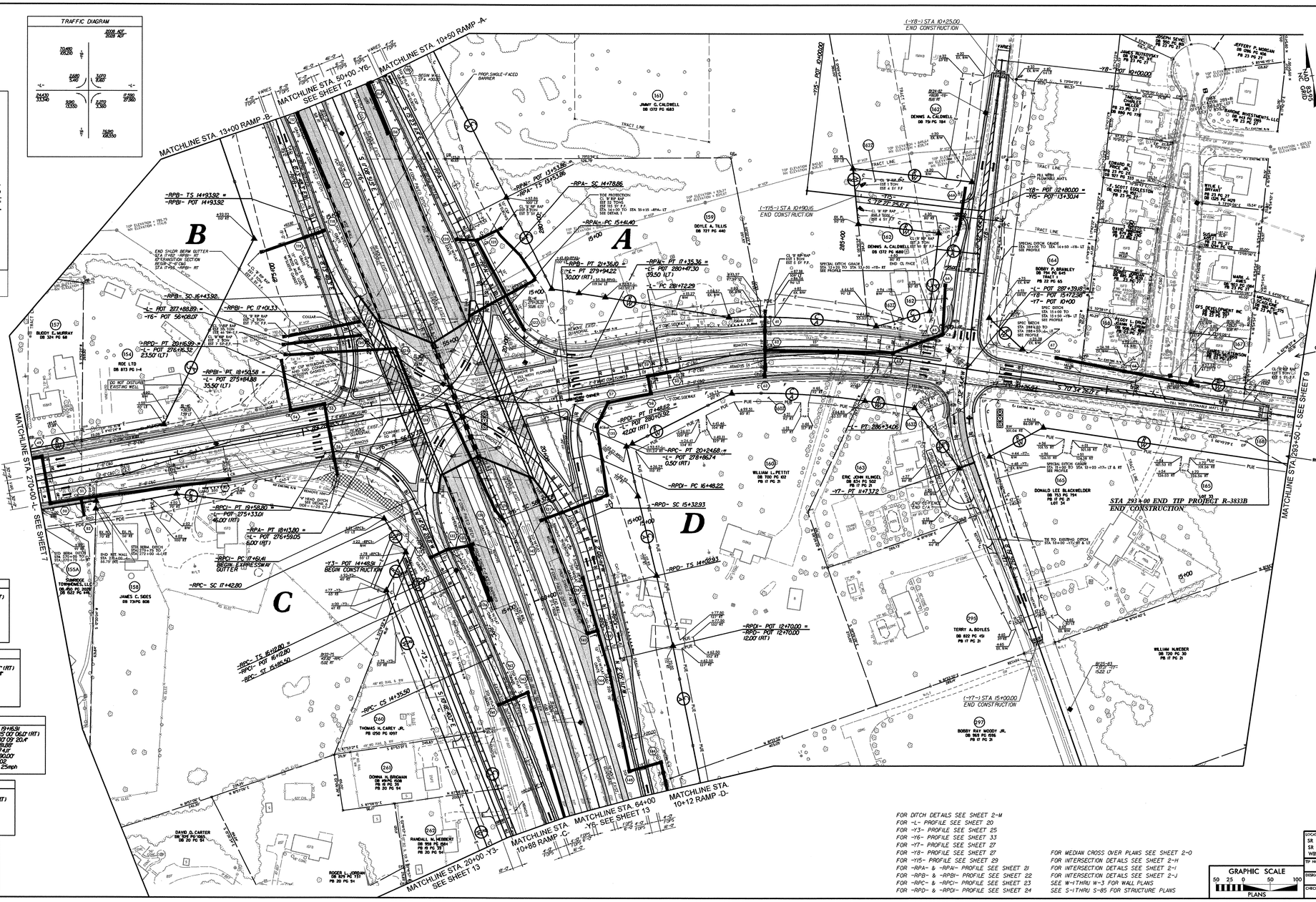
PROJECT REFERENCE NO.	SHEET NO.
R-3833B	8
R/W SHEET NO.	

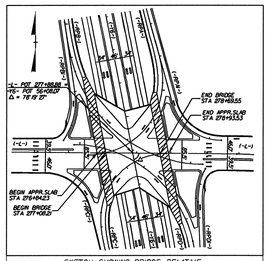
ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER — TRENT HUFFMAN

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER — MICHAEL W. LEE

HNTB NORTH CAROLINA, PC — 2109 WEST MOREHEAD STREET, CHARLOTTE, NORTH CAROLINA 28207

Kimley-Horn and Associates, P.A. — 4601 Charlotte Park, Suite 400, Charlotte, NC 28210





SKETCH SHOWING BRIDGE RELATIVE TO PROPOSED PAVEMENT
(SEE SHT 2-F,2-H & 2-I FOR MORE INFORMATION)

-L-	
PI Sta 284+05.29	
Δ = 18° 53' 52.5" (RT)	
D = 4°05' 33.2"	
L = 460.76'	
T = 233.00'	
R = 1,400.00'	
e = 0.04	
RO = 100'	
DS = 50mph	

-Y7-	
PI Sta 11+01.60	
Δ = 25° 52' 33.5" (LT)	
D = 17° 37' 46.1"	
L = 146.78'	
T = 74.66'	
R = 325.00'	
e = N/C	
DS = 30mph	

-Y9-	
PI Sta 12+92.36	
Δ = 1° 01' 01.7" (RT)	
D = 1°05' 45.3"	
L = 101.85'	
T = 50.93'	
R = 5,200.00'	
e = N/C	
DS = 30mph	

-RPCI-	
PI Sta 18+77.33	
Δ = 73° 23' 46.7" (LT)	
D = 38° 11' 49.1"	
L = 191.33'	
T = 110.03'	
R = 150.00'	
e = 0.02	
DS = 25mph	

-RPA-		
PI Sta 14+37.57	PI Sta 16+19.00	PI Sta 21+54.61
θs = 16° 39' 20.7"	Δ = 89° 15' 32.1" (RT)	Δ = 74° 05' 06.7" (LT)
Ls = 125.00'	D = 20° 39' 57.1"	D = 38° 11' 49.1"
LT = 63.71'	L = 334.94'	L = 193.95'
ST = 42.00'	T = 212.24'	T = 113.21'
	R = 275.00'	R = 150.00'
	e = 0.05	e = 0.02
	DS = 30mph	DS = 25mph

-RPAI-
PI Sta 17+79.62
Δ = 42° 45' 27.3" (RT)
D = 38° 59' 52.4"
L = 149.25'
T = 78.32'
R = 150.00'
e = 0.02
DS = 25mph

-RPB-		
PI Sta 15+94.11	PI Sta 19+26.51	
θs = 10° 44' 34.7"	Δ = 70° 29' 55.8" (LT)	
Ls = 150.00'	D = 14° 15' 26.2"	
LT = 100.18'	L = 492.17'	
ST = 50.17'	T = 282.69'	
	R = 400.00'	
	e = 0.05	
	DS = 35mph	

-RPBI-
PI Sta 17+70.52
Δ = 42° 09' 52.4"
D = 28° 39' 52.4"
L = 289.98'
T = 151.47'
R = 200.00'
e = 0.02
DS = 25mph

-RPC-			
PI Sta 7+98.34	PI Sta 14+85.50	PI Sta 17+00.01	PI Sta 19+16.51
Δ = 18° 24' 48.4" (LT)	θs = 0° 32' 13.7"	θs = 19° 36' 04.3"	Δ = 85° 07' 06.2" (RT)
D = 1° 29' 56.6"	Ls = 150.00'	Ls = 130.00'	D = 30° 09' 20.4"
L = 1,285.50'	LT = 100.00'	LT = 87.20'	L = 284.98'
T = 648.34'	ST = 50.00'	ST = 43.62'	T = 177.41'
R = 4,000.00'			R = 190.00'
e = 0.05			e = 0.02
DS = 70mph			DS = 25mph

-RPD-		
PI Sta 14+89.75	PI Sta 18+19.50	PI Sta 15+99.50
θs = 10° 20' 42.3"	Δ = 17° 02' 25.2" (LT)	Δ = 28° 45' 41.8" (RT)
Ls = 130.00'	D = 15° 54' 55.8"	D = 38° 39' 52.4"
LT = 86.92'	L = 484.00'	L = 100.40'
ST = 43.47'	T = 246.56'	T = 51.28'
	R = 360.00'	R = 300.00'
	e = 0.05	e = 0.02
	DS = 35mph	DS = 25mph

-Y6-		
PI Sta 57+11.13	PI Sta 70+04.47	PI Sta 82+06.35
θs = 0° 59' 59.2"	Δ = 23° 01' 01.9" (RT)	θs = 0° 59' 59.2"
Ls = 200.00'	D = 0° 59' 59.2"	Ls = 200.00'
LT = 133.34'	L = 2,301.69'	LT = 133.34'
ST = 66.67'	T = 1,166.68'	ST = 66.67'
	R = 5,730.00'	
	DS = 70mph	

FOR DITCH DETAILS SEE SHEET 2-M
FOR -L- PROFILE SEE SHEET 20
FOR -Y3- PROFILE SEE SHEET 25
FOR -Y6- PROFILE SEE SHEET 33
FOR -Y7- PROFILE SEE SHEET 27
FOR -Y8- PROFILE SEE SHEET 27
FOR -Y15- PROFILE SEE SHEET 29
FOR -RPA- & -RPAI- PROFILE SEE SHEET 21
FOR -RPB- & -RPBI- PROFILE SEE SHEET 22
FOR -RPC- & -RPCI- PROFILE SEE SHEET 23
FOR -RPD- & -RPDI- PROFILE SEE SHEET 24

FOR MEDIAN CROSS OVER PLANS SEE SHEET 2-O
FOR INTERSECTION DETAILS SEE SHEET 2-H
FOR INTERSECTION DETAILS SEE SHEET 2-I
FOR INTERSECTION DETAILS SEE SHEET 2-J
SEE W-1THRU W-3 FOR WALL PLANS
SEE S-1THRU S-85 FOR STRUCTURE PLANS

GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION: SR 1100 (BRAWLEY SCHOOL ROAD) FROM EAST OF SR 1109 (WILLIAMSON ROAD) TO EAST OF WINGHAVEN COURT

TIP NO.	COUNTY:
R-3833B	IREDELL

DESIGNED BY: TRENT HUFFMAN, P.E.
CHECKED BY: TIM REID, P.E. DATE: 081408

5/2/2012
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PROJECT REFERENCE NO.	SHEET NO.
R-3833B	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID 11/25/08

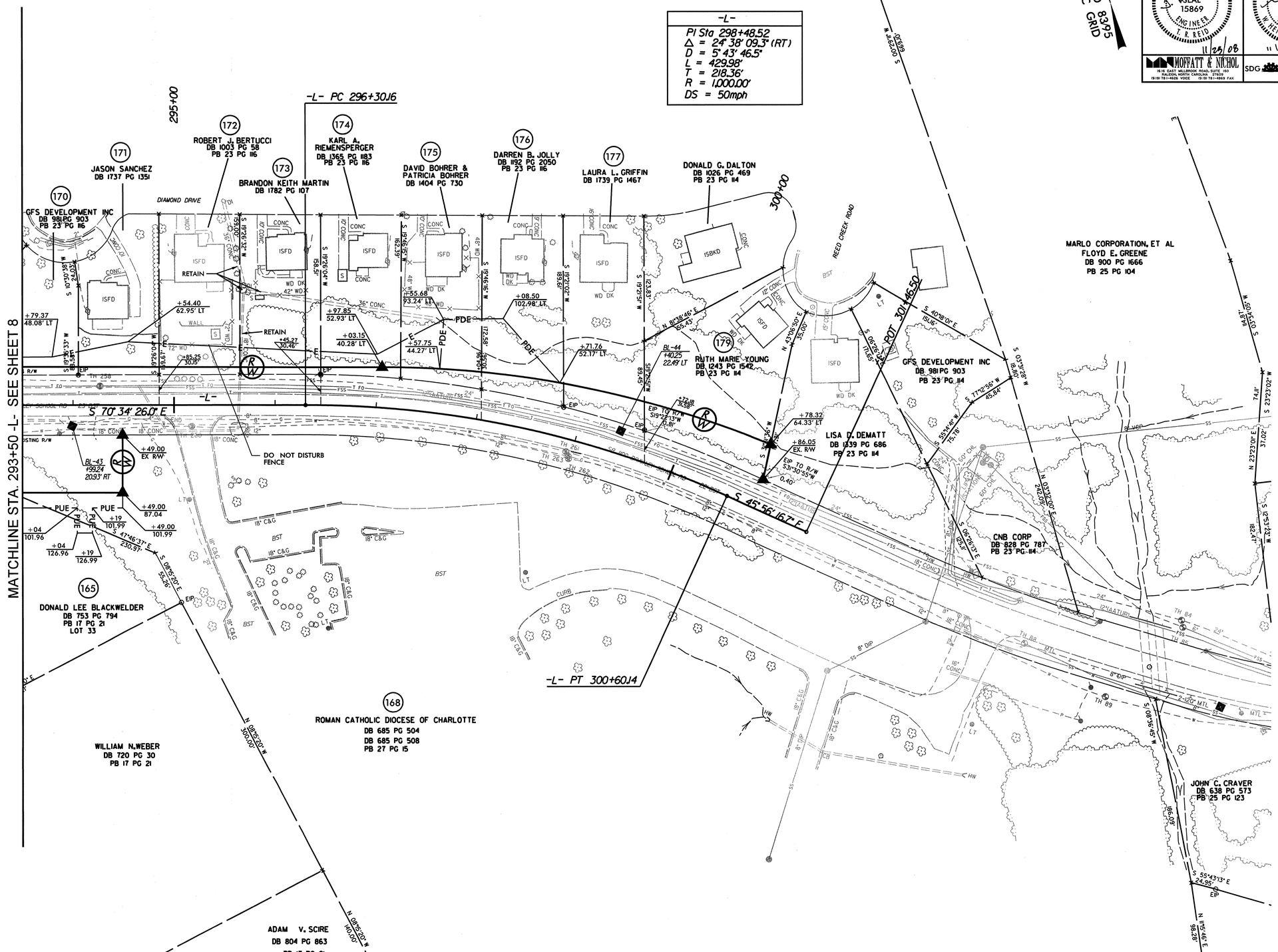
MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4969 FAX

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS IV 11/26/08

SDG Sungate Design Group, P.A.
PROFESSIONAL ENGINEERING FIRM P-0563
910-A James Kennedy Rd.
Raleigh, N.C. 27606

NAD 83/95 NC GRID

-L-
PI Sta 298+48.52
Δ = 24° 38' 09.3" (RT)
D = 5° 43' 46.5"
L = 429.98'
T = 218.36'
R = 1,000.00'
DS = 50mph



11/24/2008
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cpowell

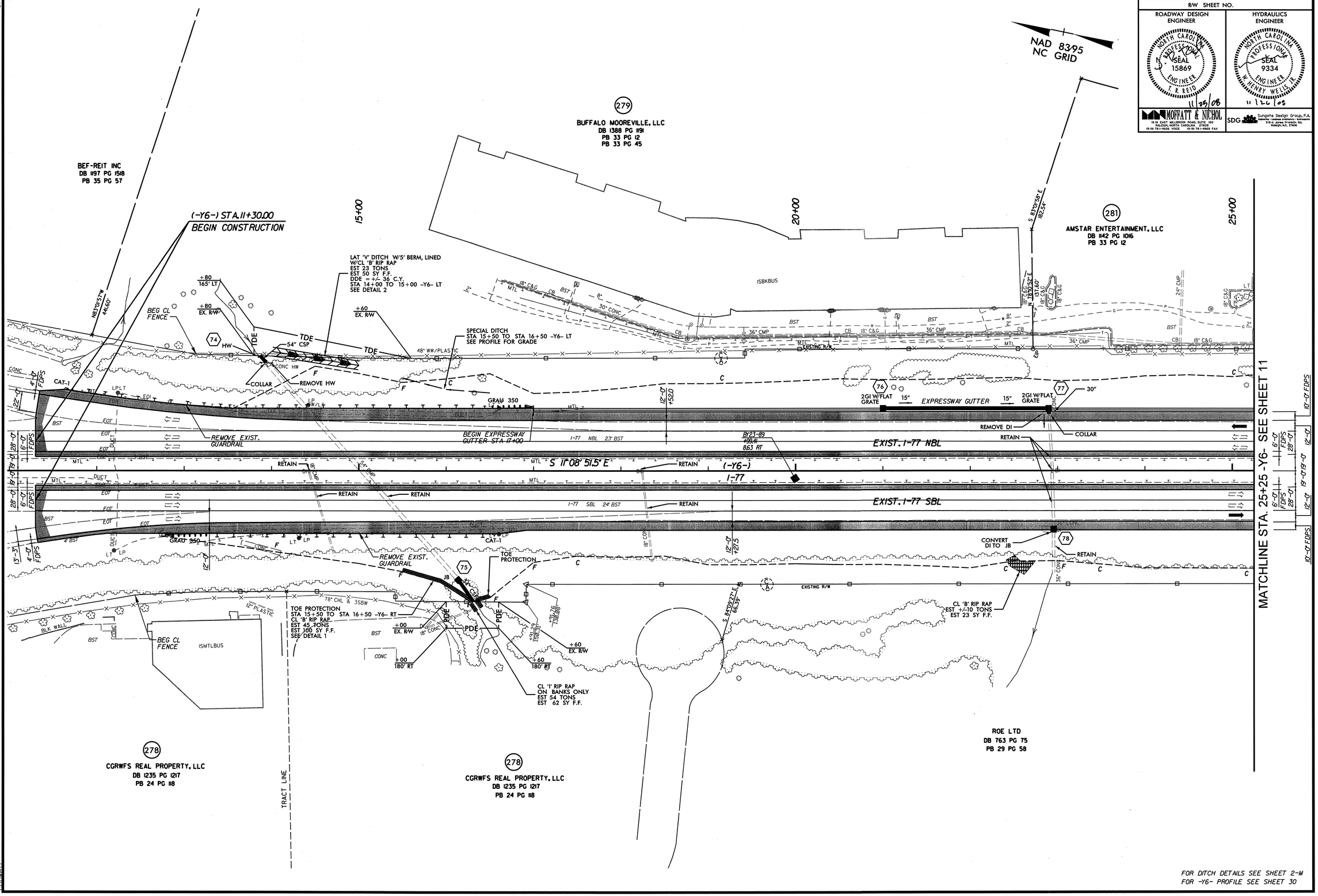
PROJECT REFERENCE NO.	SHEET NO.
R-3833B	10
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER R. REID
11/25/08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS III
11/26/08

MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX

SDG Sungate Design Group, P.A.
Transportation Planning / Traffic Engineering
110-A James Drive East
Raleigh, N.C. 27606



FOR DITCH DETAILS SEE SHEET 2-M
FOR -Y6- PROFILE SEE SHEET 30

8/17/99

11/25/2008
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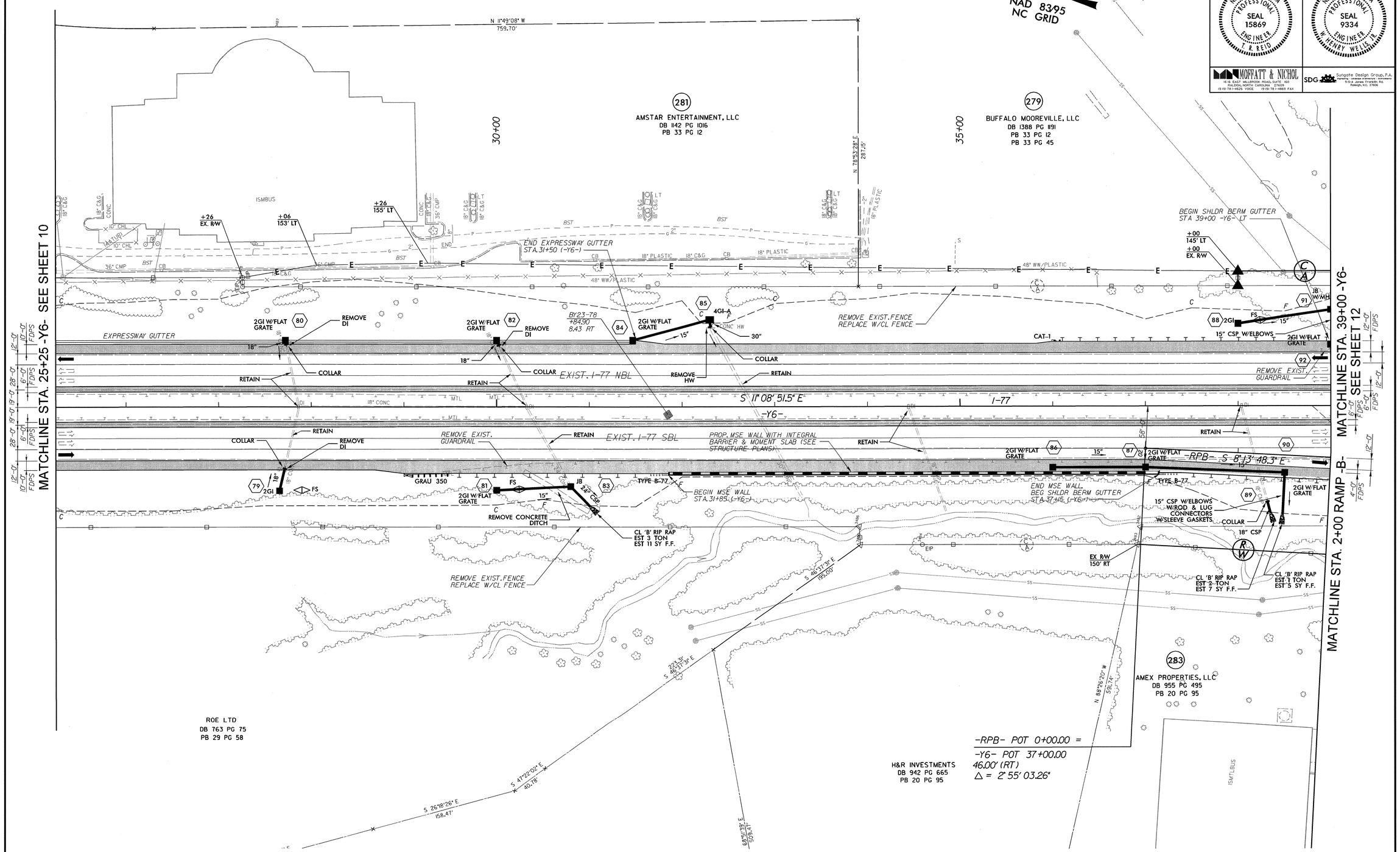
PROJECT REFERENCE NO.	SHEET NO.
R-3833B	11
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER R. REID

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR.

MOFFATT & NICHOL
16 W. EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX

SDG Sungate Design Group, P.A.
Transportation Planning • Design • Management
5-A N. Boylan Avenue Rd.
Raleigh, N.C. 27606



FOR DITCH DETAILS SEE SHEET 2-M
FOR -RPB- PROFILE SEE SHEET 22
FOR -Y6- PROFILE SEE SHEET 31
SEE W-4 THRU W-5 FOR WALL PLANS

8/17/99

10/13/2009
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rbuffman

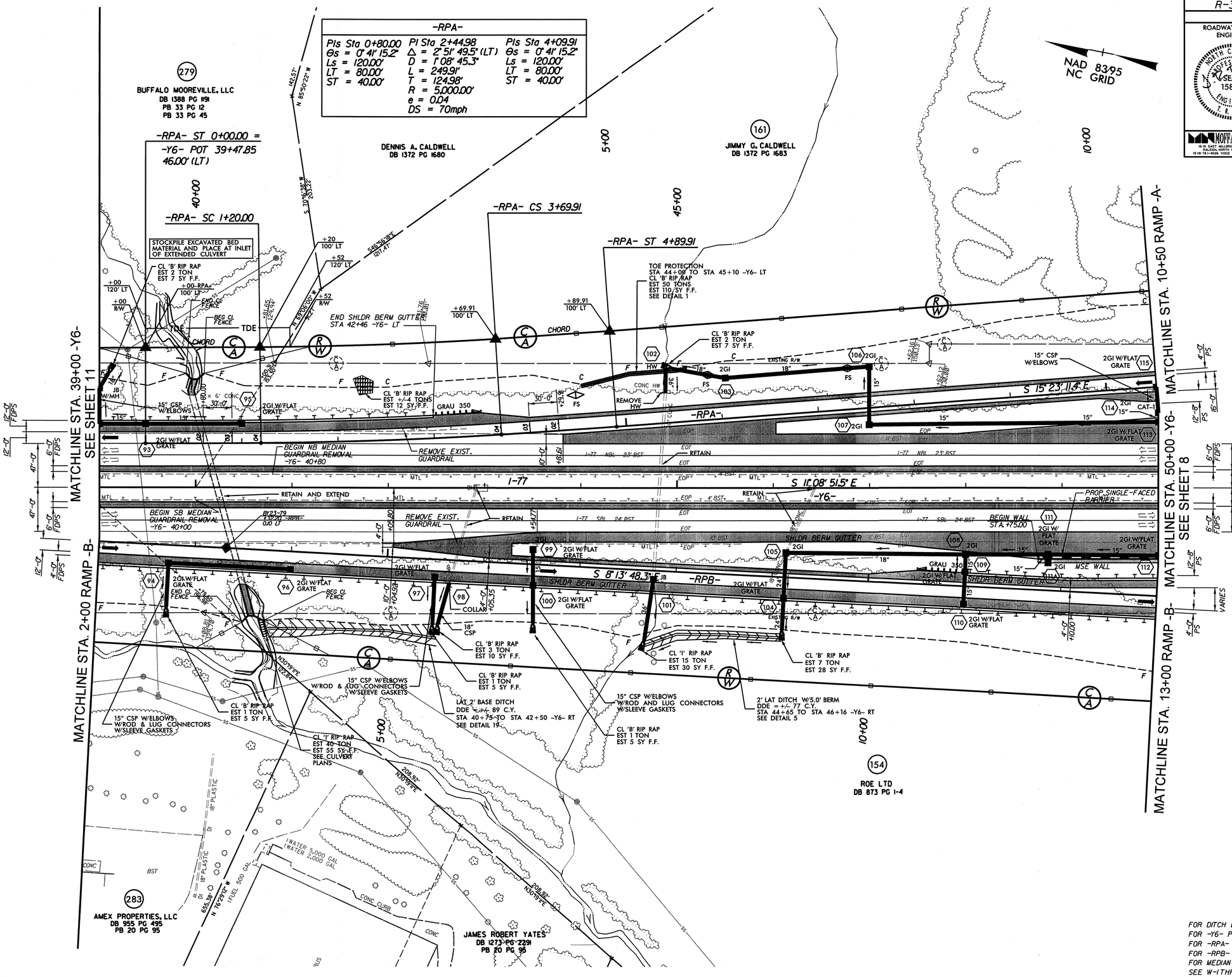
PROJECT REFERENCE NO.	SHEET NO.
R-3833B	12
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER R. R. REID 11/26/08

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLING 11/26/08

MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-6626 VOICE (919) 781-4869 FAX

SDG Sungate Design Group, P.A.
Transportation Planning / Engineering
719-A James Faircloth Blvd.
Raleigh, N.C. 27603



FOR DITCH DETAILS SEE SHEET 2-M
FOR -Y6- PROFILE SEE SHEET 32
FOR -RPA- PROFILE SEE SHEET 21
FOR -RPB- PROFILE SEE SHEET 22
FOR MEDIAN CROSS OVER PLANS SEE SHEET 2-O
SEE W-1 THRU W-3 FOR WALL PLANS
SEE C-6 THRU C-10 FOR CULVERT PLANS

8/17/99

11/25/2008
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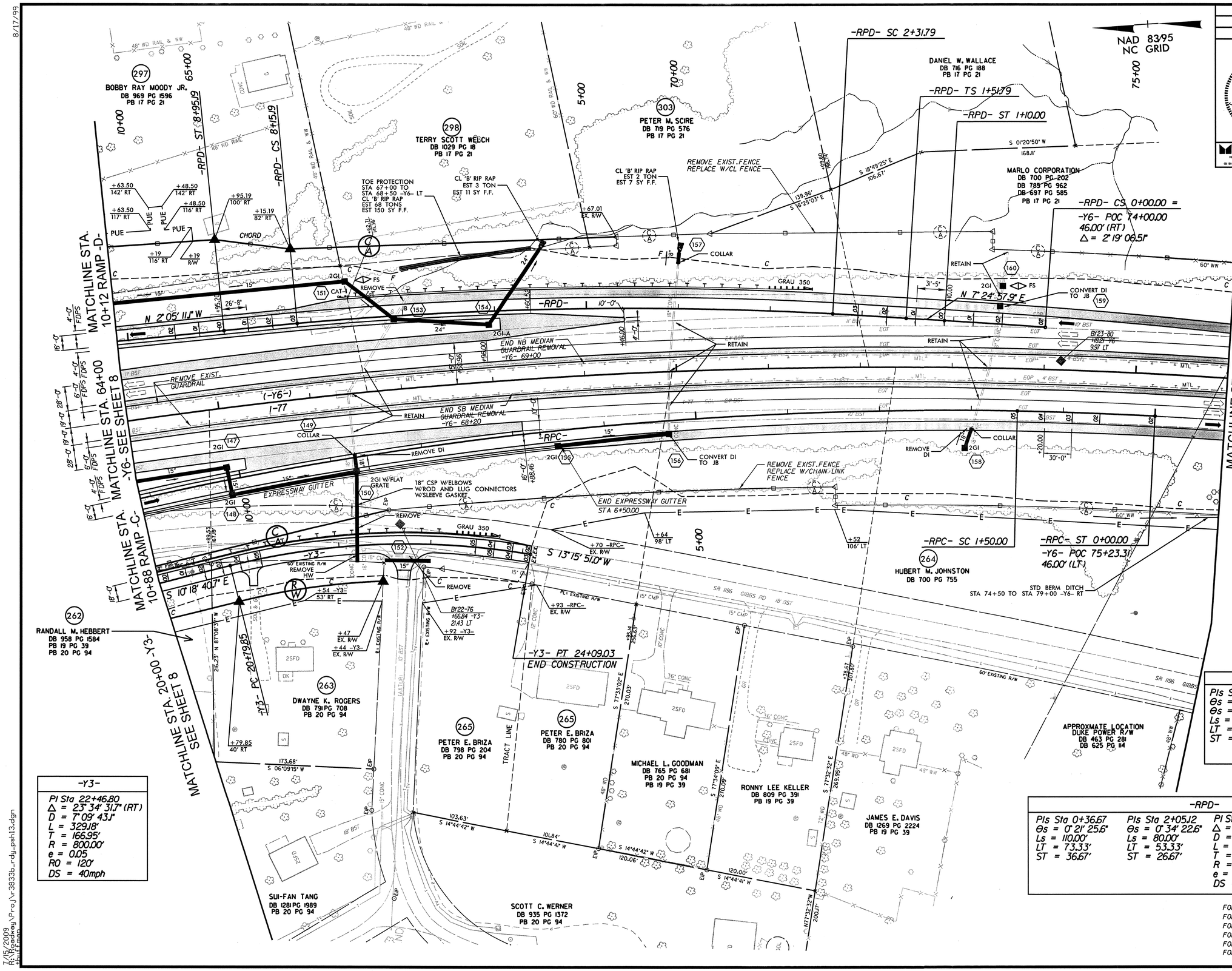
PROJECT REFERENCE NO.	SHEET NO.
R-3833B	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID 7/16/09

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR. 7/16/09

MOFFATT & NICHOL
16 16 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX

SDG Sungate Design Group, P.A.
Engineering - Surveying - Environmental Management
319-A Jones Franklin Rd.
Raleigh, N.C. 27606



-Y6-
PI Sta 70+04.47
Δ = 23° 01' 01.9" (RT)
D = 0° 59' 59.7"
L = 2,301.89'
T = 1,166.68'
R = 5,730.00'
DS = 70mph

-RPC-	
PIs Sta 0+79.35	PI Sta 7+98.34
θs = 0° 45' 21.6"	Δ = 18° 24' 48.4" (LT)
θs = 1° 04' 27.5"	D = 1° 25' 56.6"
Ls = 150.00'	L = 1,285.50'
LT = 79.35'	T = 648.34'
ST = 70.66'	R = 4,000.00'
	e = 0.05
	DS = 70mph

-Y3-
PI Sta 22+46.80
Δ = 23° 34' 31.7" (RT)
D = 1° 09' 43.1"
L = 329.18'
T = 166.95'
R = 800.00'
e = 0.05
RO = 120'
DS = 40mph

-RPD-			
PIs Sta 0+36.67	PIs Sta 2+05.12	PI Sta 5+24.01	PIs Sta 8+41.86
θs = 0° 21' 25.6"	θs = 0° 34' 22.6"	Δ = 8° 21' 23.7" (LT)	θs = 0° 34' 22.6"
Ls = 110.00'	Ls = 80.00'	D = 1° 25' 56.6"	Ls = 80.00'
LT = 73.33'	LT = 53.33'	L = 583.40'	LT = 53.33'
ST = 36.67'	ST = 26.67'	T = 292.22'	ST = 26.67'
		R = 4,000.00'	
		e = 0.03	
		DS = 70mph	

FOR DITCH DETAILS SEE SHEET 2-M
FOR -Y3- PROFILE SEE SHEET 25
FOR -Y6- PROFILE SEE SHEET 34
FOR -RPC- PROFILE SEE SHEET 23
FOR -RPD- PROFILE SEE SHEET 24
FOR MEDIAN CROSS OVER PLANS SEE SHEET 2-0

8/17/99

7/15/2009
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shirfman

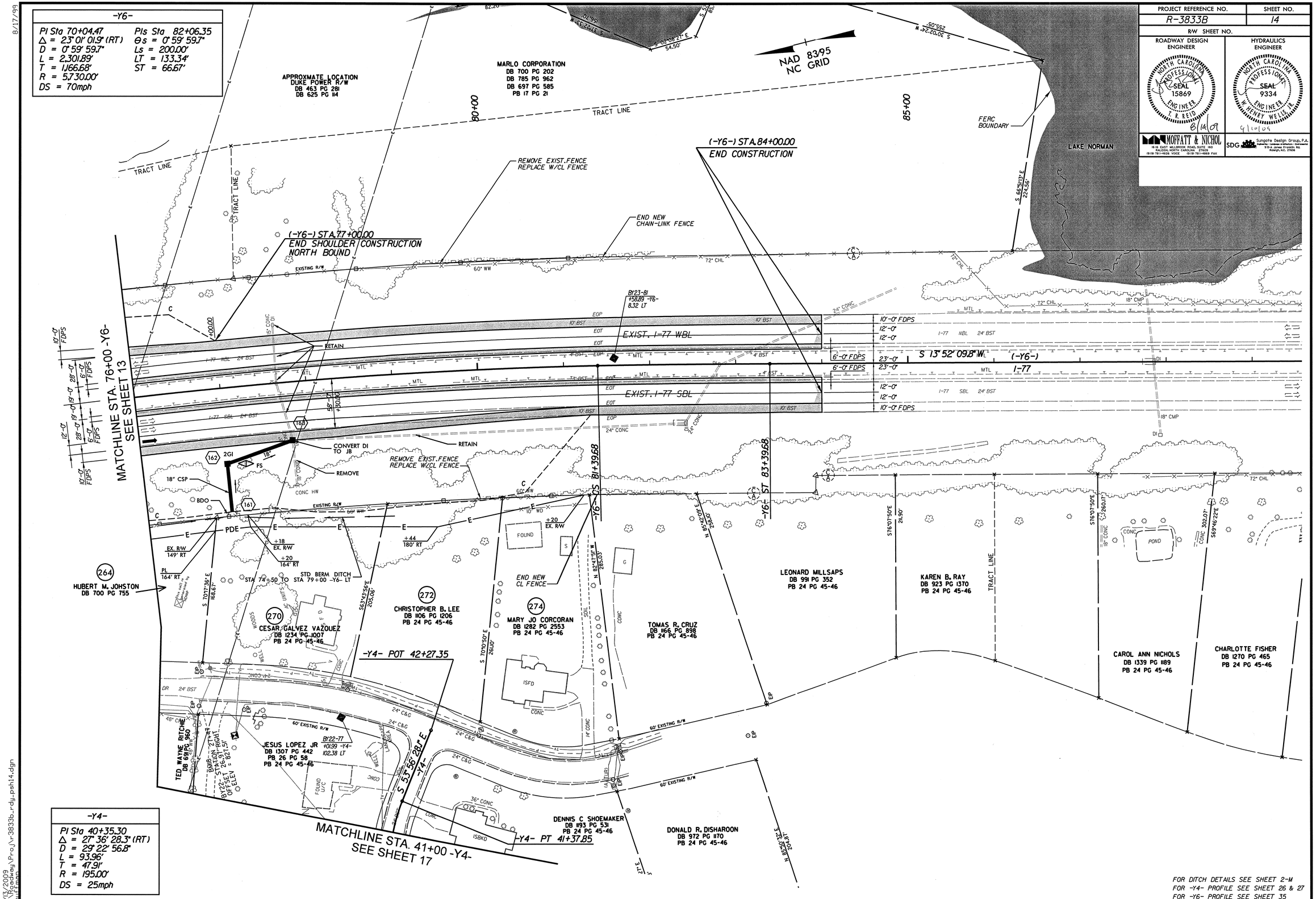
PROJECT REFERENCE NO.	SHEET NO.
R-3833B	14
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER R. REID 8/14/09

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS III 9/10/09

MOFFATT & NICHOL — 1616 EAST MILLBROOK ROAD, SUITE 160, RALEIGH, NORTH CAROLINA 27609, (919) 781-4626 VOICE, (919) 781-4669 FAX

SDG Sungate Design Group, P.A. — Engineering & Planning Consultants, 5104-A Jones Franklin Rd., Raleigh, N.C. 27606



FOR DITCH DETAILS SEE SHEET 2-M
FOR -Y4- PROFILE SEE SHEET 26 & 27
FOR -Y6- PROFILE SEE SHEET 35

8/17/99

8/13/2009
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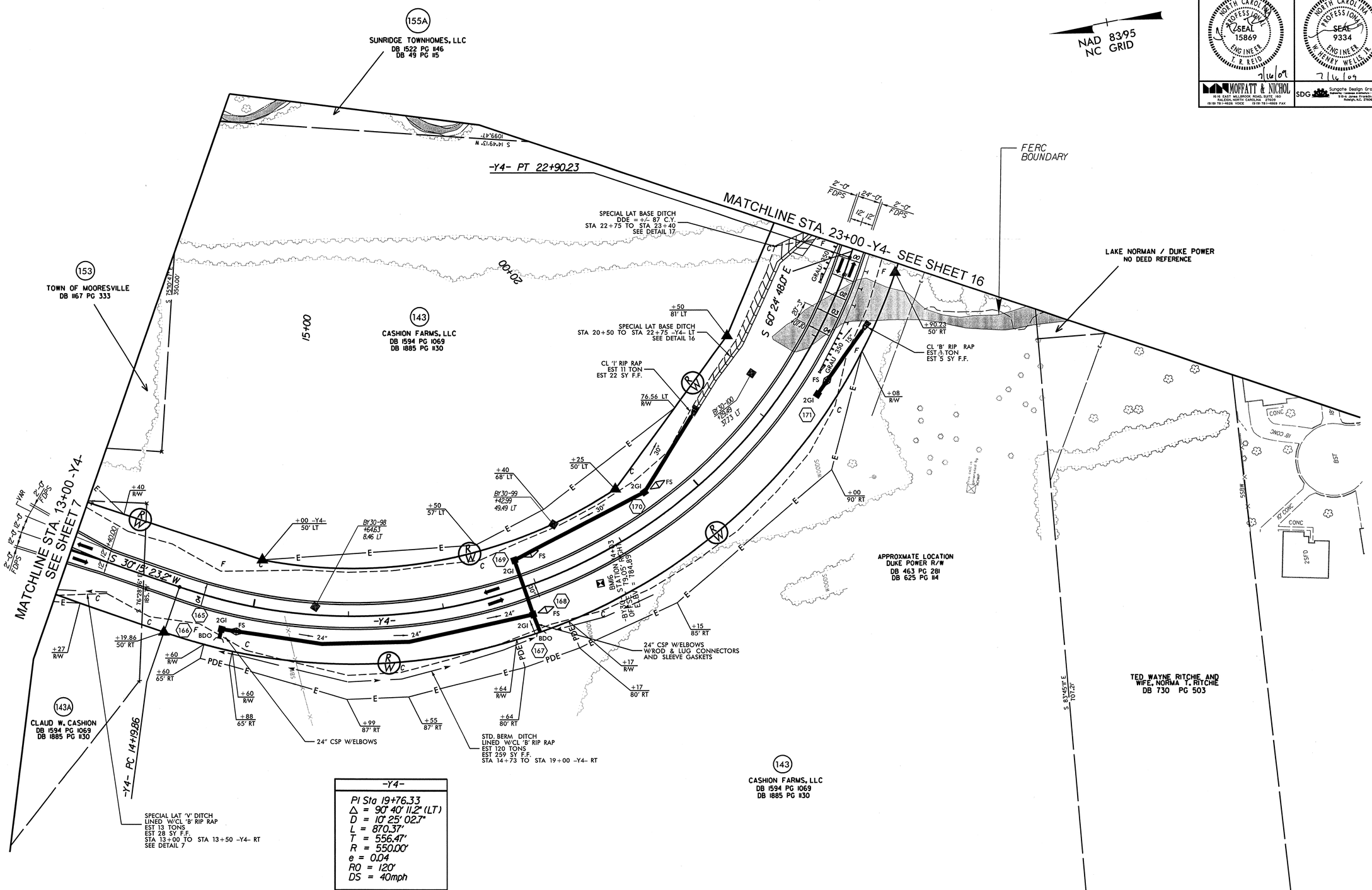
bwilliams

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID 7/16/09	NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR. 7/16/09
MOFFATT & NICHOL 1616 EAST MILLBROOK ROAD, SUITE 160 RALEIGH, NORTH CAROLINA 27609 (919) 781-4626 VOICE (919) 781-4869 FAX	SDG Sungate Design Group, P.A. Transport. Planning Engineering 919-A Jones Franklin Rd. Raleigh, N.C. 27606



FOR DITCH DETAILS SEE SHEET 2-M
FOR -Y4- PROFILE SEE SHEET 26 & 27

8/17/99

7/15/2009
R:\Roadway\Proj\r-3833b_rdy_psh15.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	16
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID — 7/6/09

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR. — 7/6/09

MOFFATT & NICHOL, 1616 E. MILLBROOK ROAD, SUITE 160, RALEIGH, NORTH CAROLINA 27609, (919) 781-4626 VOICE, (919) 781-4869 FAX

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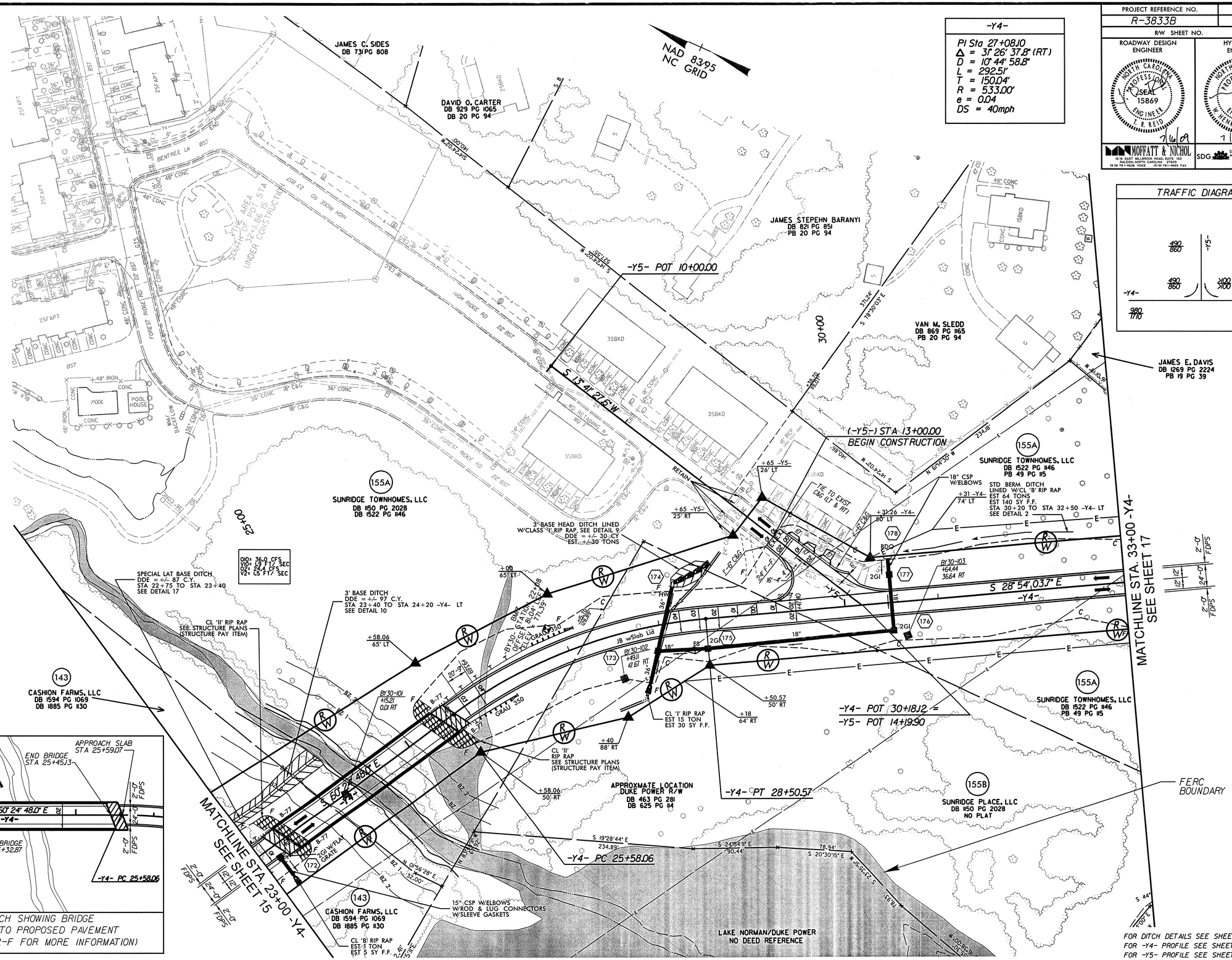
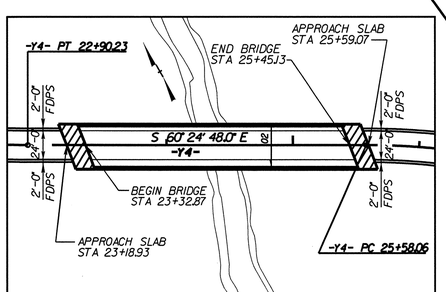
-Y4-
PI Sta 27+08.10
Δ = 31° 26' 37.8" (RT)
D = 10° 44' 58.8"
L = 292.51'
T = 150.04'
R = 533.00'
e = 0.04
DS = 40mph

TRAFFIC DIAGRAM

	-Y5-	-Y4-
2008 ADT / 2028 ADT		
430 / 860		
430 / 860	3100 / 5100	
980 / 1710		430 / 860





SKETCH SHOWING BRIDGE RELATIVE TO PROPOSED PAVEMENT (SEE SHEET 2-F FOR MORE INFORMATION)

FOR DITCH DETAILS SEE SHEET 2-M
FOR -Y4- PROFILE SEE SHEET 26 & 27
FOR -Y5- PROFILE SEE SHEET 27
FOR INTERSECTION DETAIL SEE SHEET 2-L
SEE S-86 THRU S-107 FOR STRUCTURE PLANS

8/17/99

7/15/2009
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shiffman

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID 7/6/09

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, IV 7/6/09

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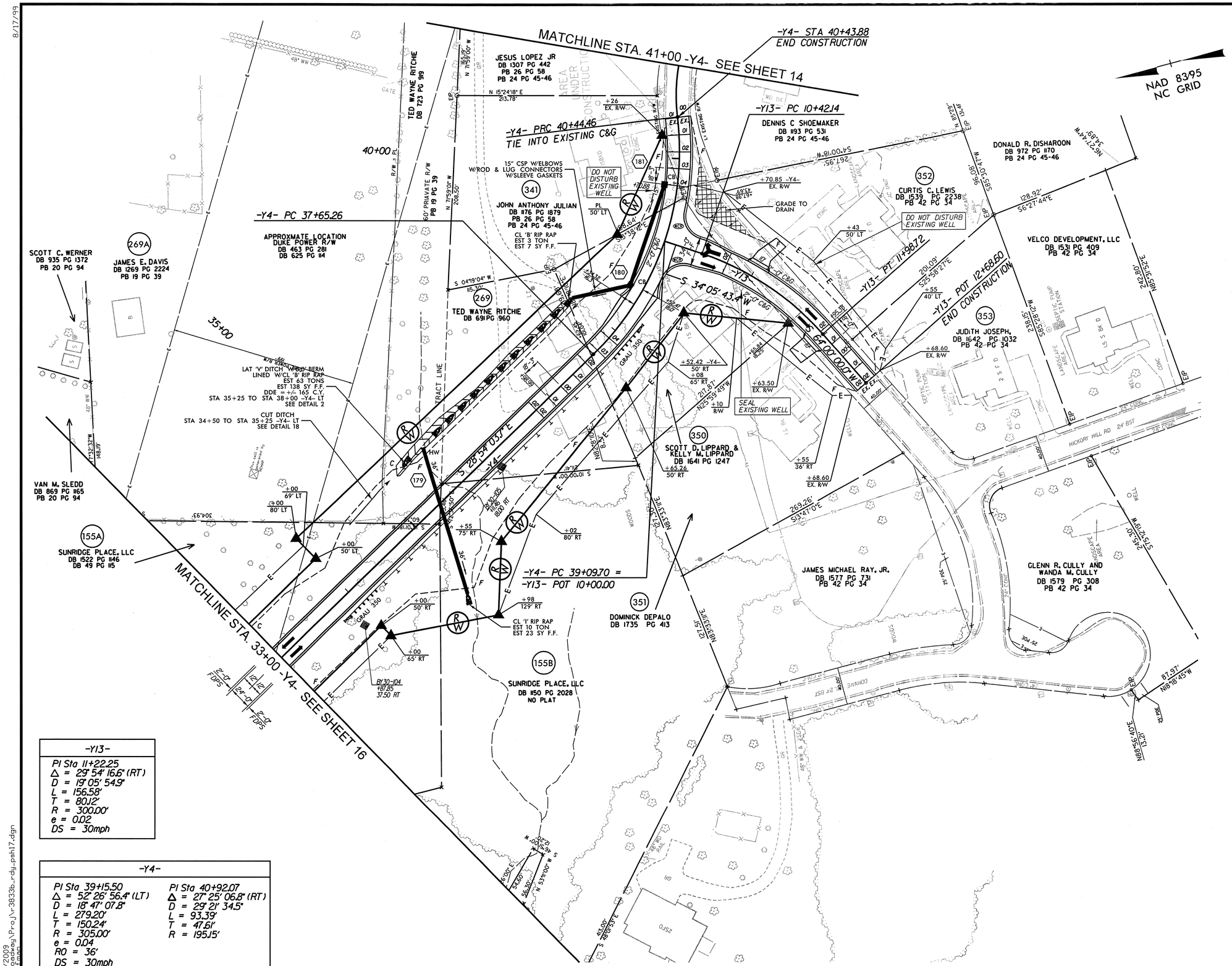
Raleigh, N.C. 27603



-Y13-
PI Sta 11+22.25
Δ = 29° 54' 16.6" (RT)
D = 19° 05' 54.9"
L = 156.58'
T = 80.12'
R = 300.00'
e = 0.02
DS = 30mph

-Y4-	
PI Sta 39+15.50	PI Sta 40+92.07
Δ = 52° 26' 56.4" (LT)	Δ = 27° 25' 06.8" (RT)
D = 18° 47' 07.8"	D = 29° 21' 34.5"
L = 279.20'	L = 93.39'
T = 150.24'	T = 47.61'
R = 305.00'	R = 195.15'
e = 0.04	
RO = 36'	
DS = 30mph	

TRAFFIC DIAGRAM

2008 ADT
2028 ADT

-Y4- 420/860 250/430 >100/>100 250/430 -Y4-

-Y13- 250/430

FOR DITCH DETAILS SEE SHEET 2-M
FOR -Y13- PROFILE SEE SHEET 29
FOR -Y4- PROFILE SEE SHEET 26 & 27
FOR INTERSECTION DETAIL SEE SHEET 2-L

8/17/99

7/15/2009
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shuffman

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	18

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER R. REID

11/25/08

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, III

11/26/08

MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
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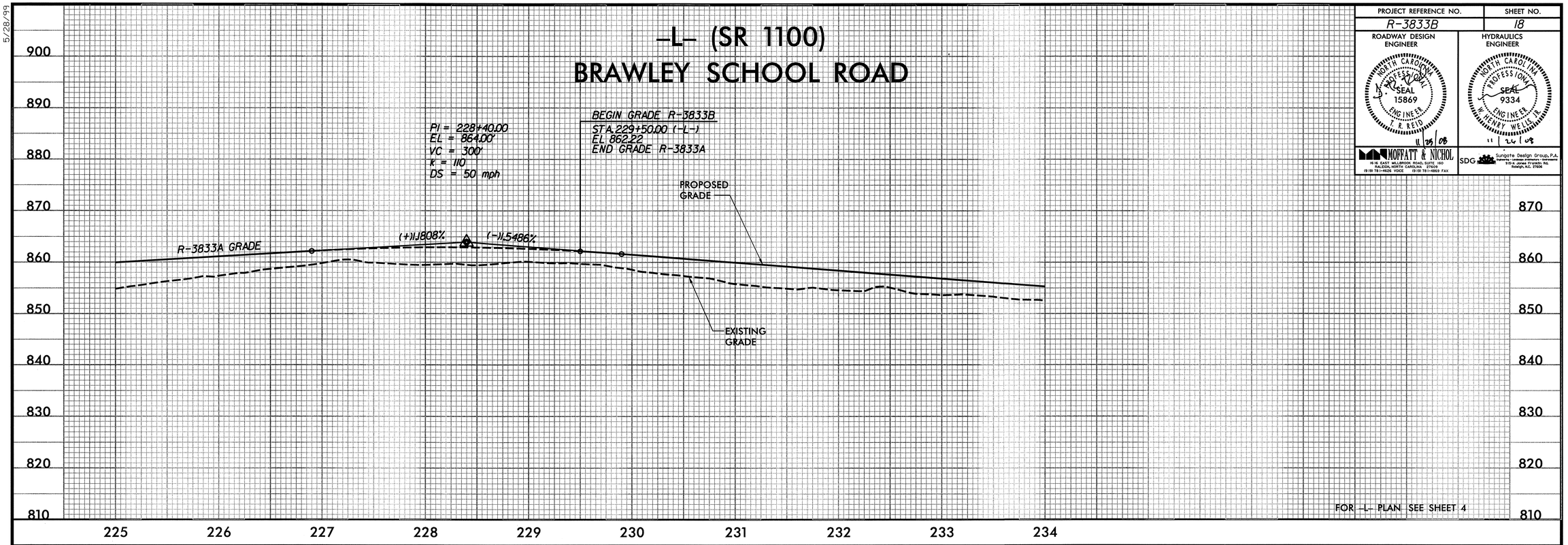
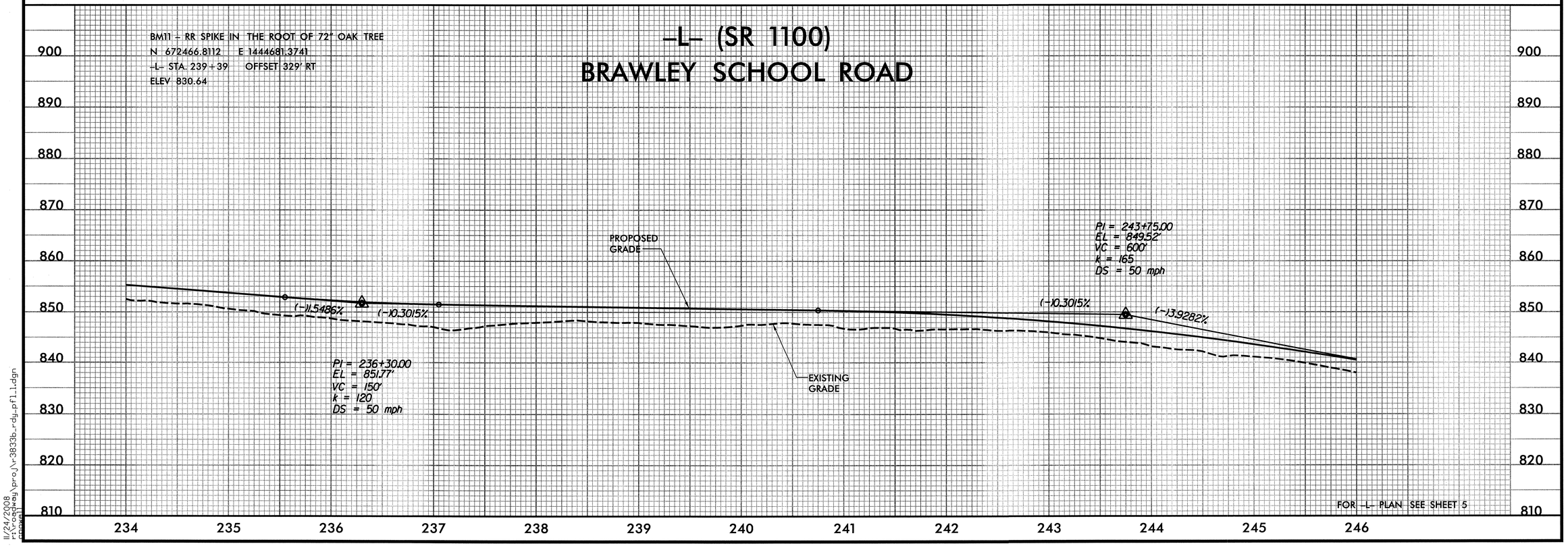
Raleigh, N.C. 27606

-L- (SR 1100)
BRAWLEY SCHOOL ROAD



FOR -L- PLAN SEE SHEET 4

-L- (SR 1100)
BRAWLEY SCHOOL ROAD



FOR -L- PLAN SEE SHEET 5

5/28/99
11/24/2008
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ppowell

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	19

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

11/24/08

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR.

4/26/08

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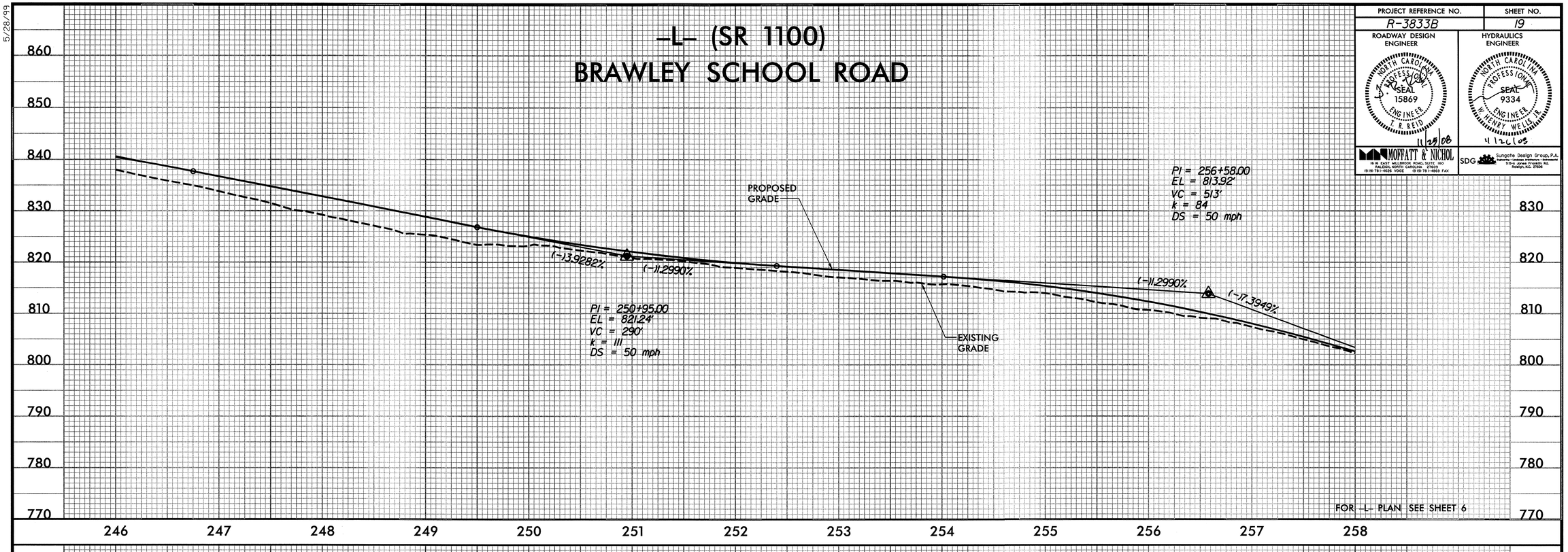
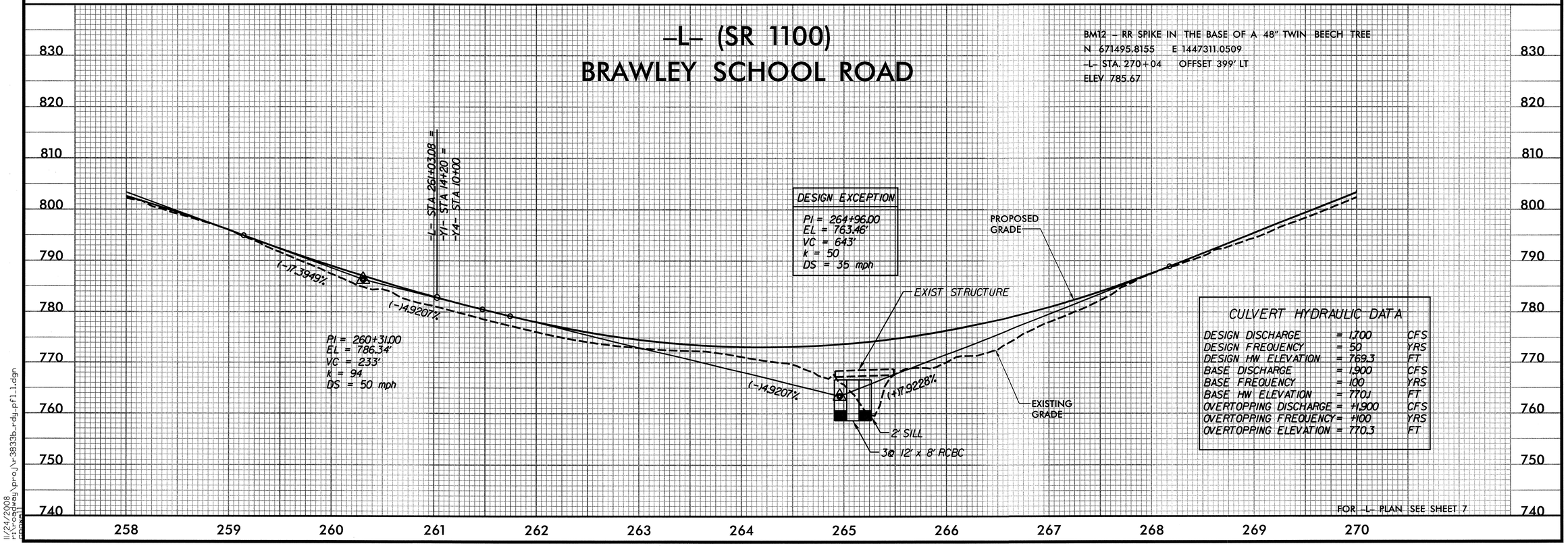
Raleigh, N.C. 27606

-L- (SR 1100)
BRAWLEY SCHOOL ROAD



FOR -L- PLAN SEE SHEET 6

-L- (SR 1100)
BRAWLEY SCHOOL ROAD



BM12 - RR SPIKE IN THE BASE OF A 48" TWIN BEECH TREE
N 671495.8155 E 1447311.0509
-L- STA. 270+04 OFFSET 399' LT
ELEV. 785.67

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 1,700	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 769.3	FT
BASE DISCHARGE	= 1,900	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 770.1	FT
OVERTOPPING DISCHARGE	= 11,900	CFS
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING ELEVATION	= 770.3	FT

FOR -L- PLAN SEE SHEET 7

5/28/99

11/24/2008
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ppowell

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	20

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER R. REID

11/24/08

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS JR.

11/24/08

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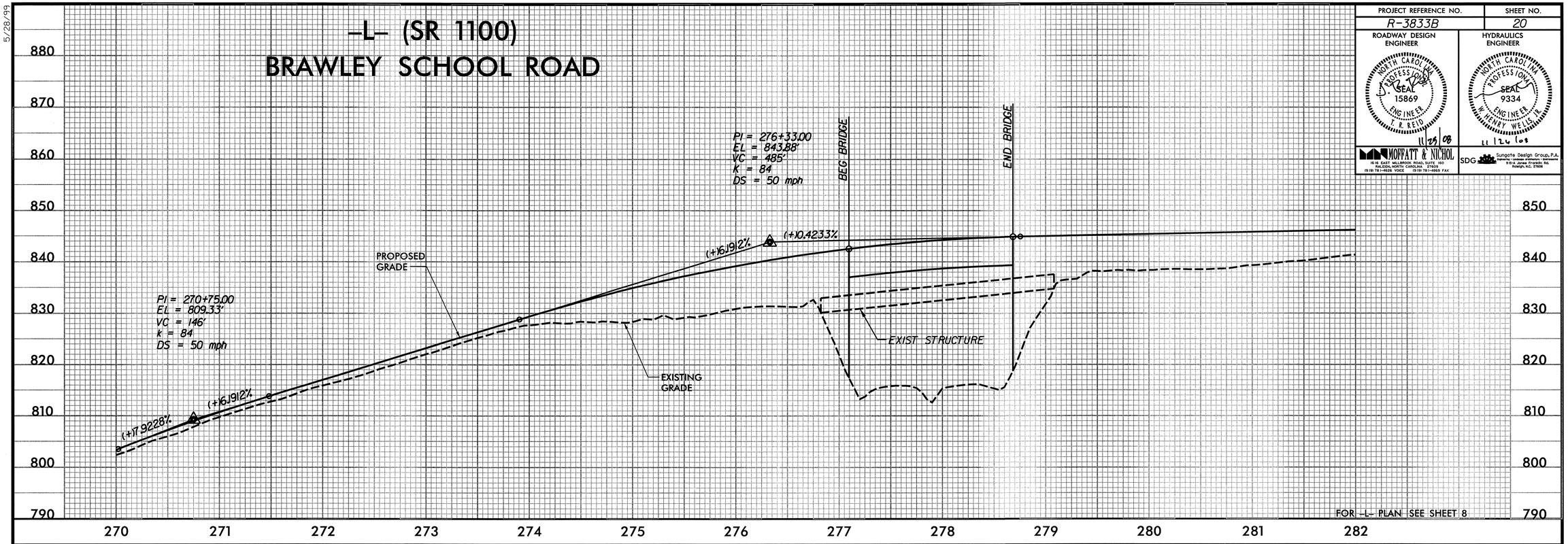
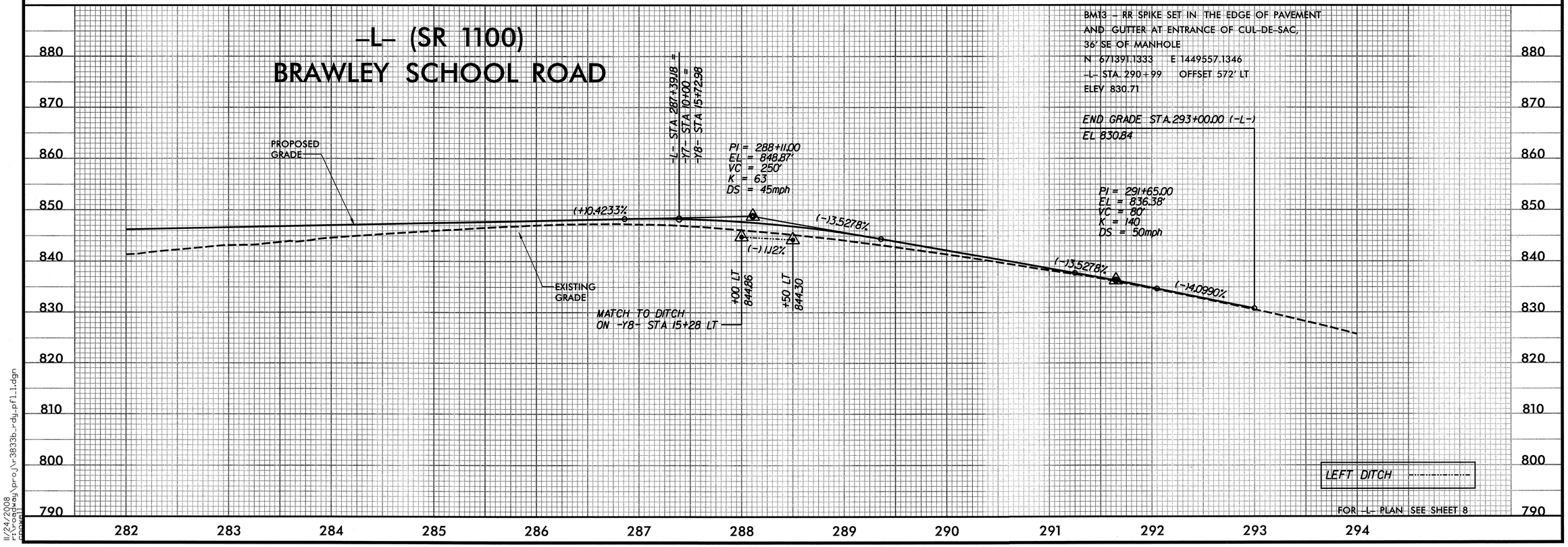
Raleigh, N.C. 27606

-L- (SR 1100)
BRAWLEY SCHOOL ROAD



FOR -L- PLAN SEE SHEET 8

-L- (SR 1100)
BRAWLEY SCHOOL ROAD



FOR -L- PLAN SEE SHEET 8

5/28/99

11/24/2008
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rpowell

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	21

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

11/25/08

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS JR.

11/26/08

MOFFATT & NICHOL
1616 E. EAST MILLBROOK ROAD, SUITE 160
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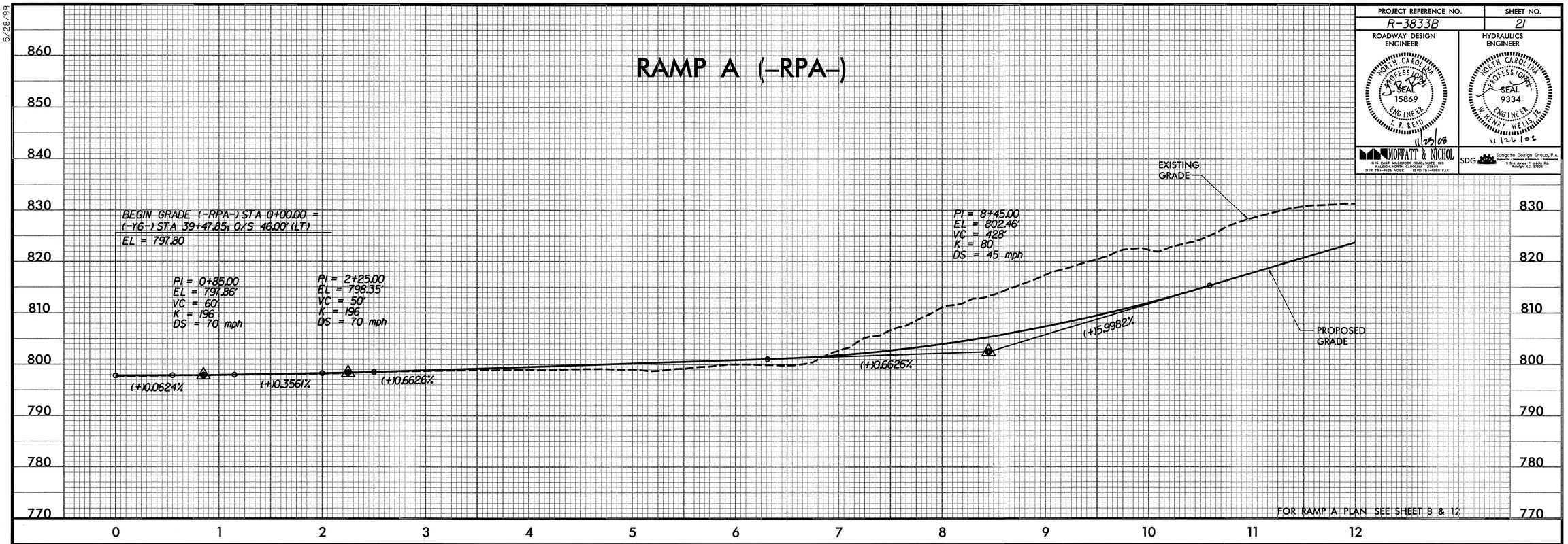
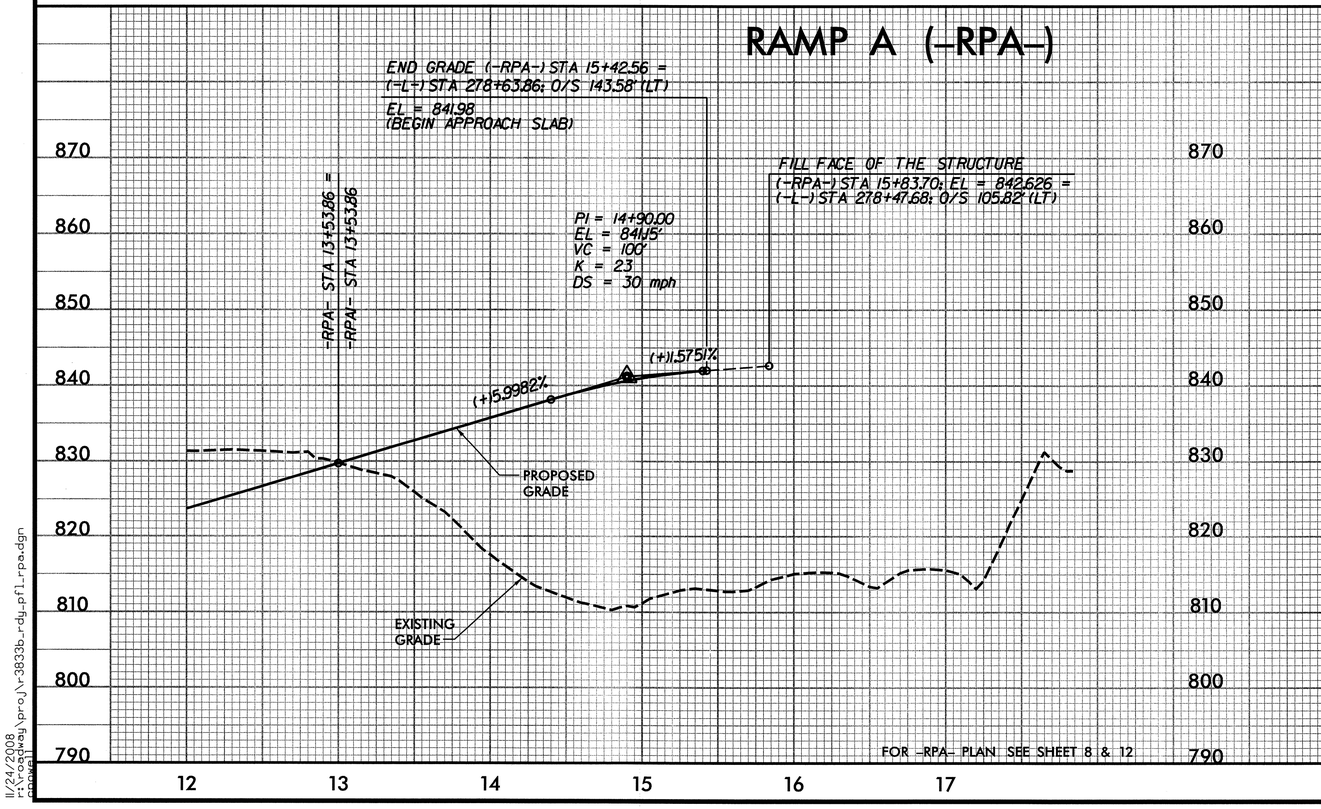
Raleigh, N.C. 27606

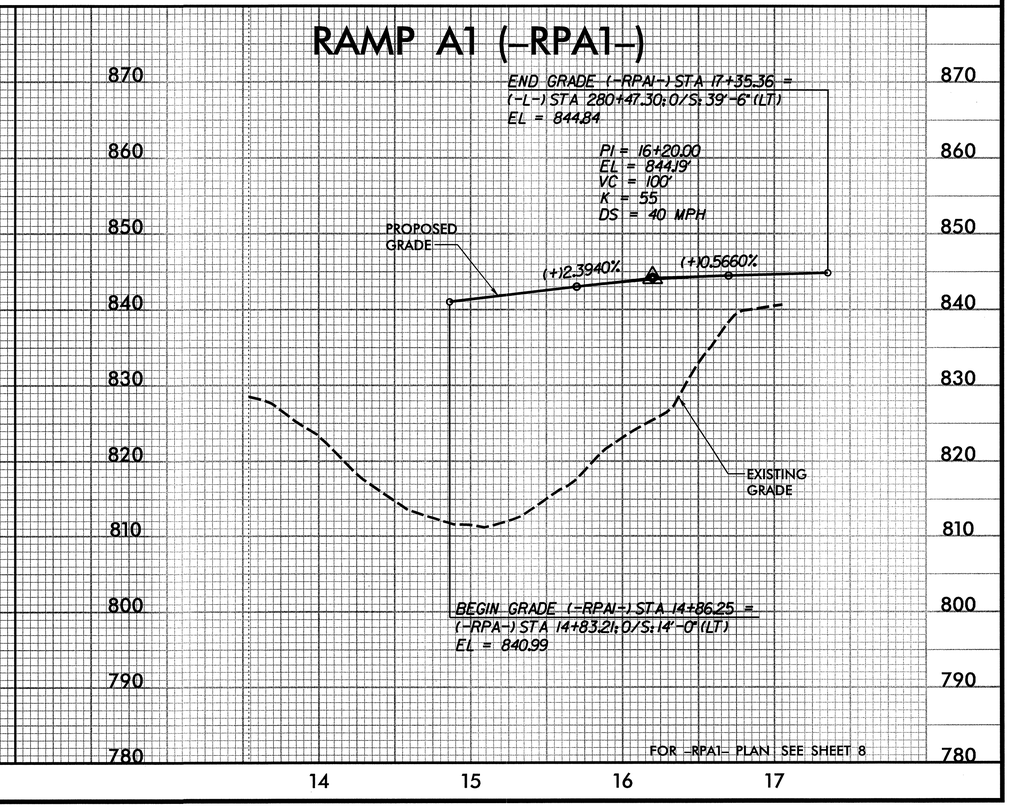
RAMP A (-RPA-)



RAMP A (-RPA-)



RAMP A1 (-RPA1-)



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ppowell

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	22

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER J. R. REID

11/25/08

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR.

11/25/08

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Raleigh, N.C. 27606

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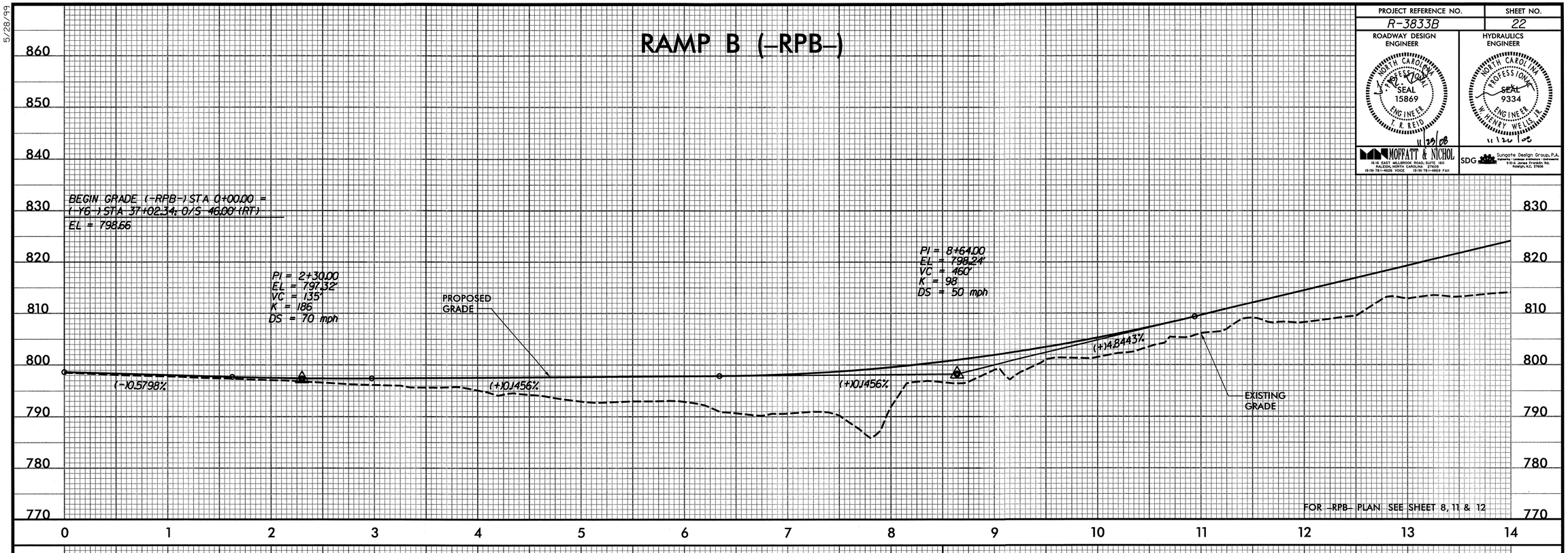
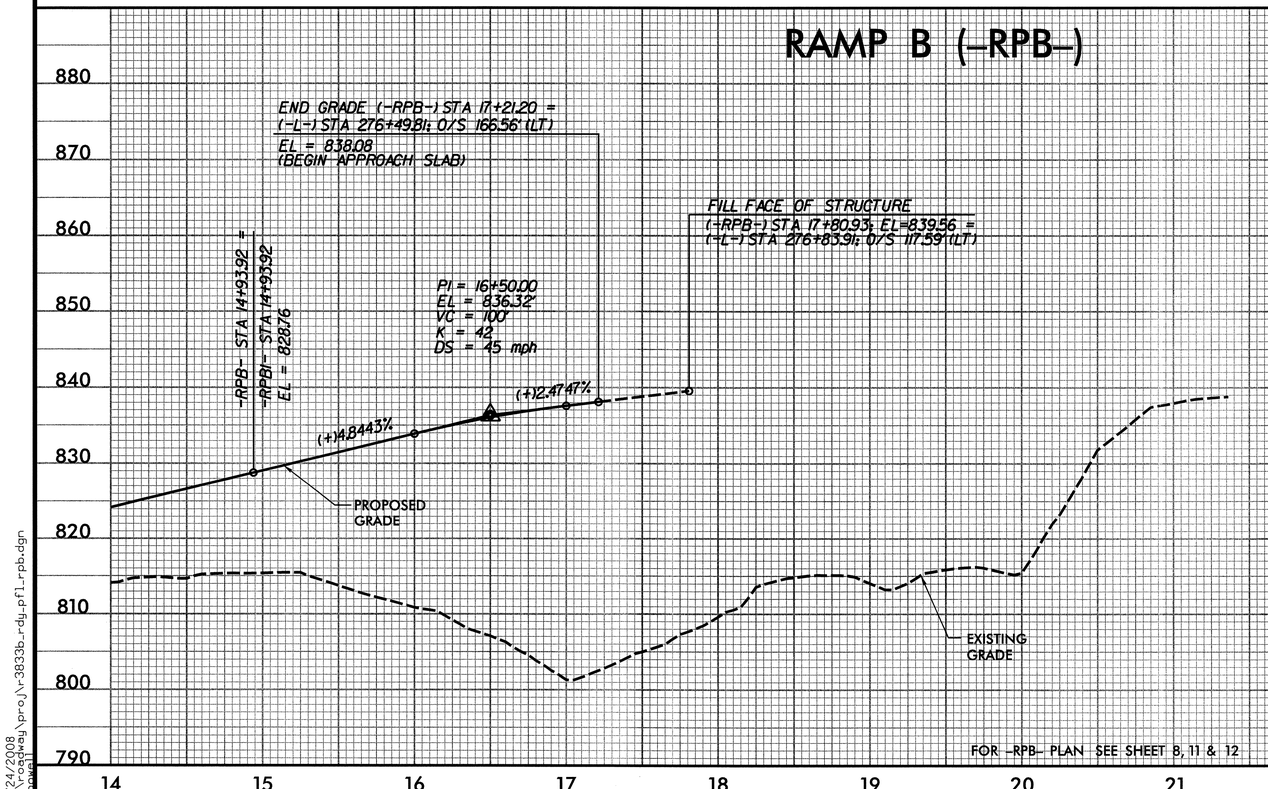
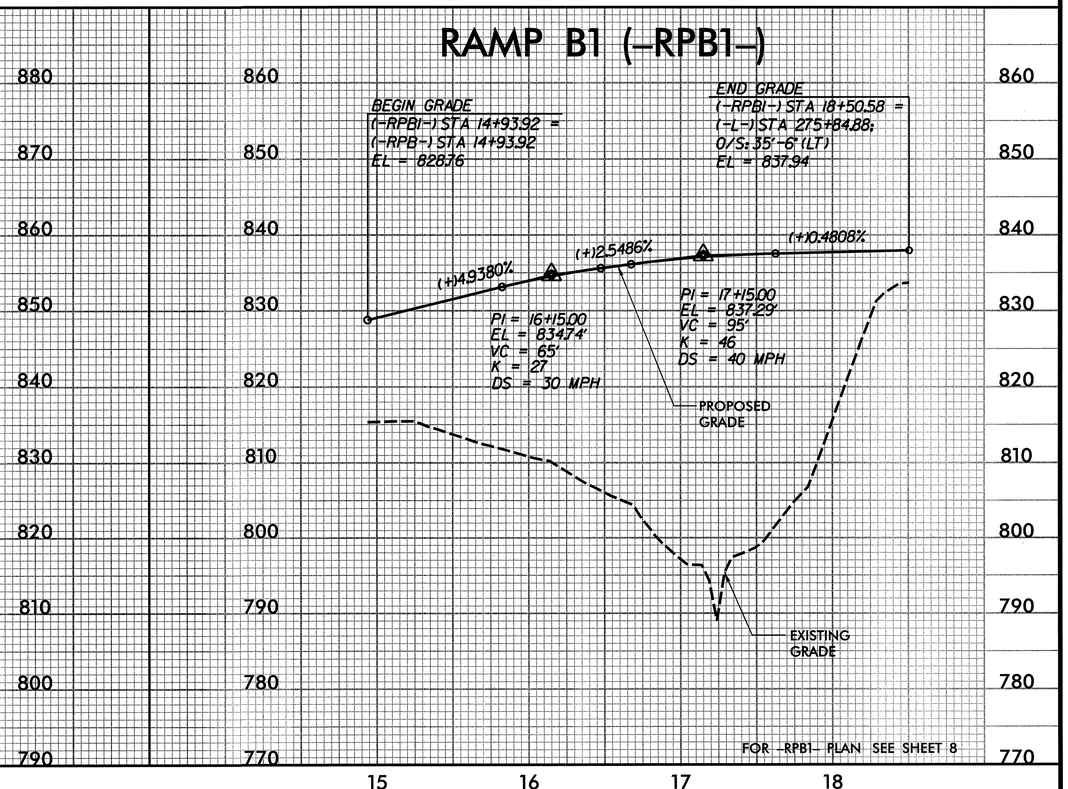
RAMP B (-RPB-)



RAMP B (-RPB-)



RAMP B1 (-RPB1-)



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rowell

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	23

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER J. R. REID 11/26/08

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR. 11/26/08

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Raleigh, N.C. 27606

5/28/99

RAMP C (-RPC-)

BEGIN GRADE (-RPC-) STA 0+00.00 =
(-Y6-) STA 75+23.31; O/S 46.00' (RT)
EL = 797.24

PI = 0+64.00
EL = 798.71'
VC = 96'
K = 248
DS = 70 mph

(+)2.2891%

(+)1.9022%

PI = 5+66.00
EL = 808.26'
VC = 50'
k = 284
DS = 70 mph

PROPOSED GRADE

(+)1.7264%

(+)0.4822%

PI = 9+85.00
EL = 815.49'
VC = 110'
K = 88
DS = 50 mph

EXISTING GRADE

PI = 12+50.00
EL = 816.77'
VC = 420'
K = 104
DS = 50 mph

FOR -RPC- PLAN SEE SHEET 8 & 13

RAMP C (-RPC-)

END GRADE (-RPC-) STA 17+96.17 =
(-L-) STA 277+09.47; O/S 122.12' (RT)
EL = 840.44
(BEGIN APPROACH SLAB)

FILL FACE OF STRUCTURE
(-RPC-) STA 18+33.98; EL = 841.19 =
(-L-) STA 277+26.49; O/S 88.43' (RT)

-RPC- STA 16+12.80 =
-RPC1- STA 16+12.80
EL = 833.19

PROPOSED GRADE

PI = 17+55.00
EL = 839.63'
VC = 80'
K = 31
DS = 45 mph

(+)1.9556%

(+)4.5267%

EXISTING GRADE

FOR -RPC- PLAN SEE SHEET 8 & 13

RAMP C1 (-RPC1-)

END GRADE
(-RPC1-) STA 19+58.80 =
(-L-) STA 275+33.01; O/S: 46'-0' (RT)
EL = 835.56

BEGIN GRADE
(-RPC1-) STA 16+12.80 =
(-RPC-) STA 16+12.80
EL = 833.19

PI = 17+96.00
EL = 842.06'
VC = 230'
K = 26
DS = 30 MPH

(+)4.8396%

(-)3.9919%

PROPOSED GRADE

EXISTING GRADE

FOR -RPC1- PLAN SEE SHEET 8

11/24/2008
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ppowell

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	24

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER K. REID

11/25/08

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR.

11/26/08

MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
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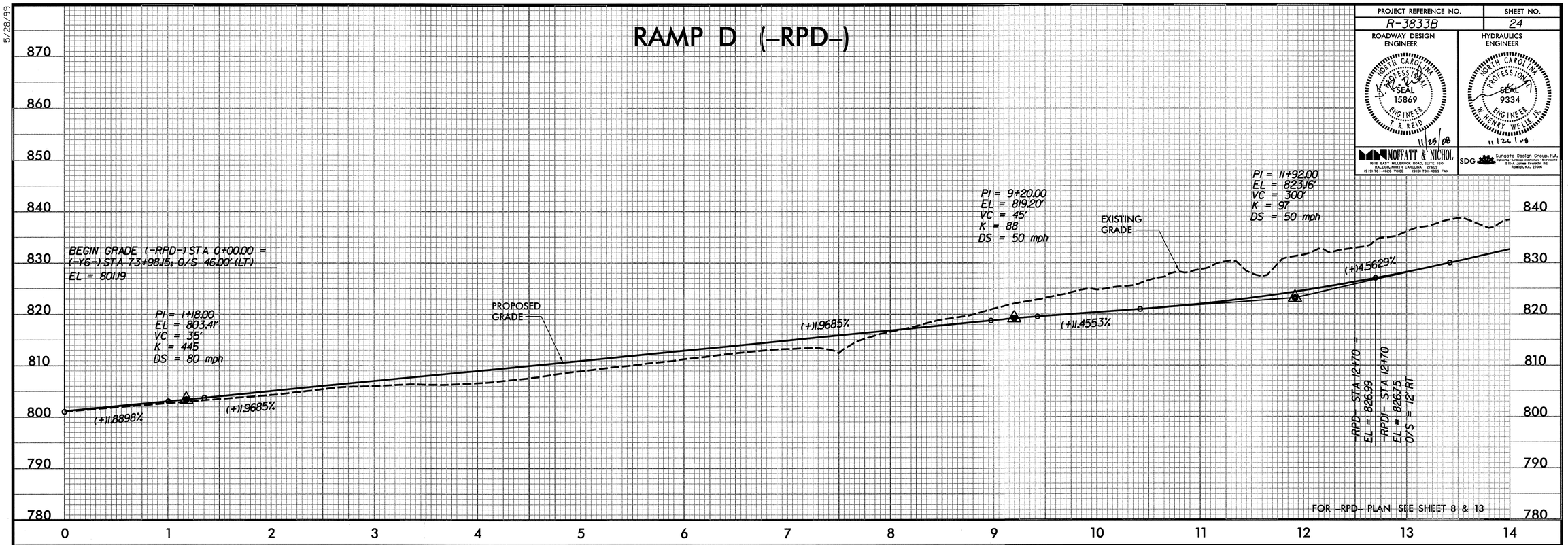
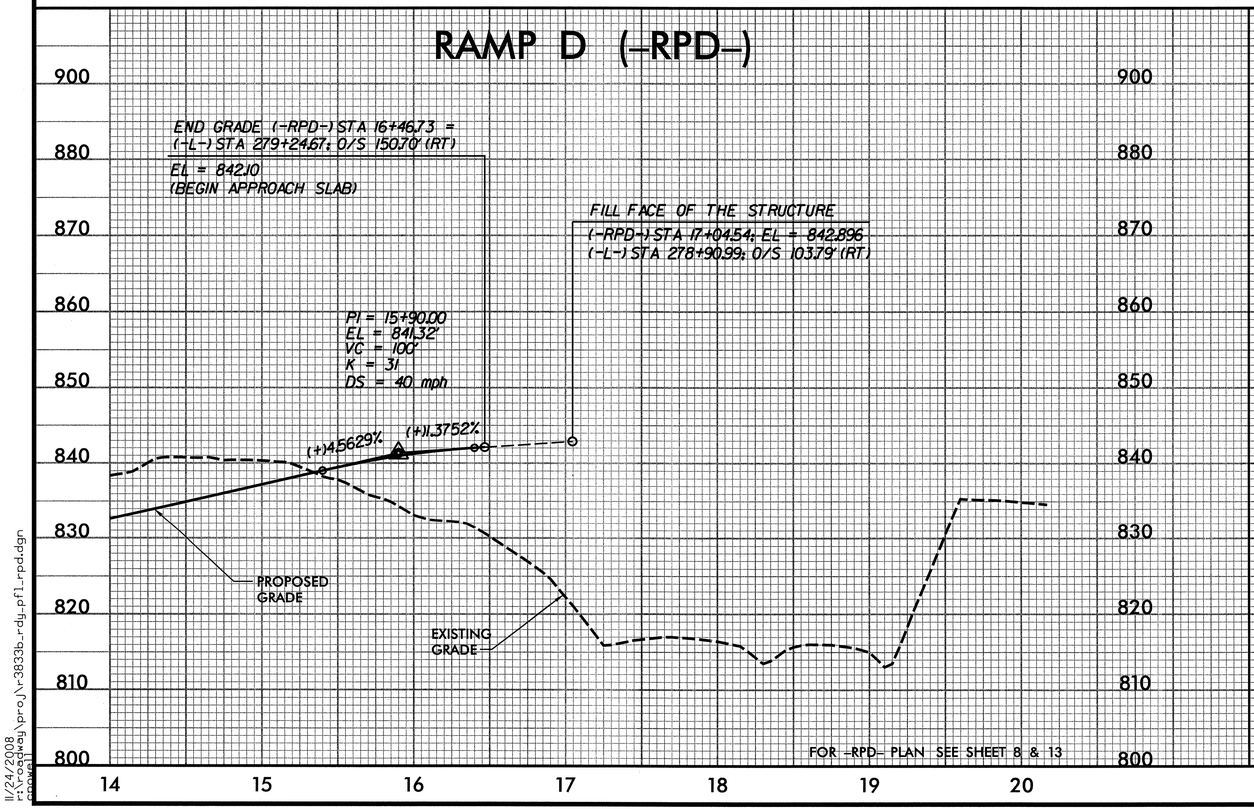
Raleigh, N.C. 27606

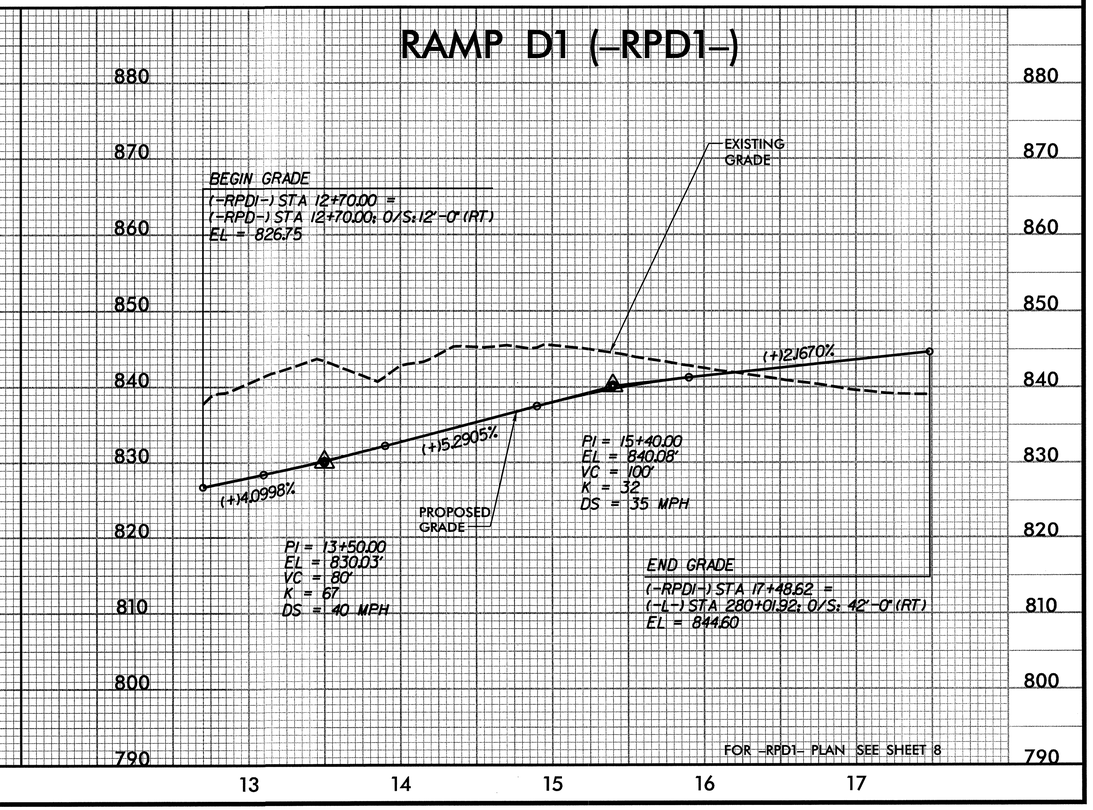
RAMP D (-RPD-)



RAMP D (-RPD-)



RAMP D1 (-RPD1-)



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11/24/2008
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ppowell

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	25

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

11/25/08

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR.

11/26/08

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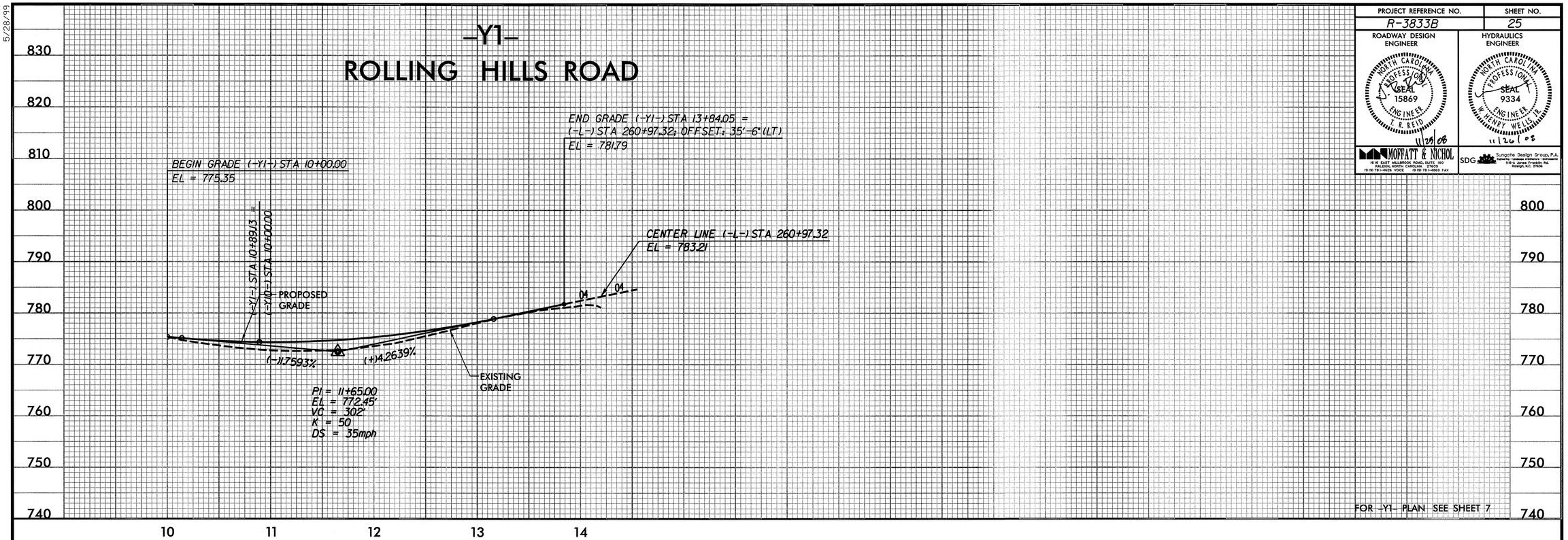
Raleigh, N.C. 27606

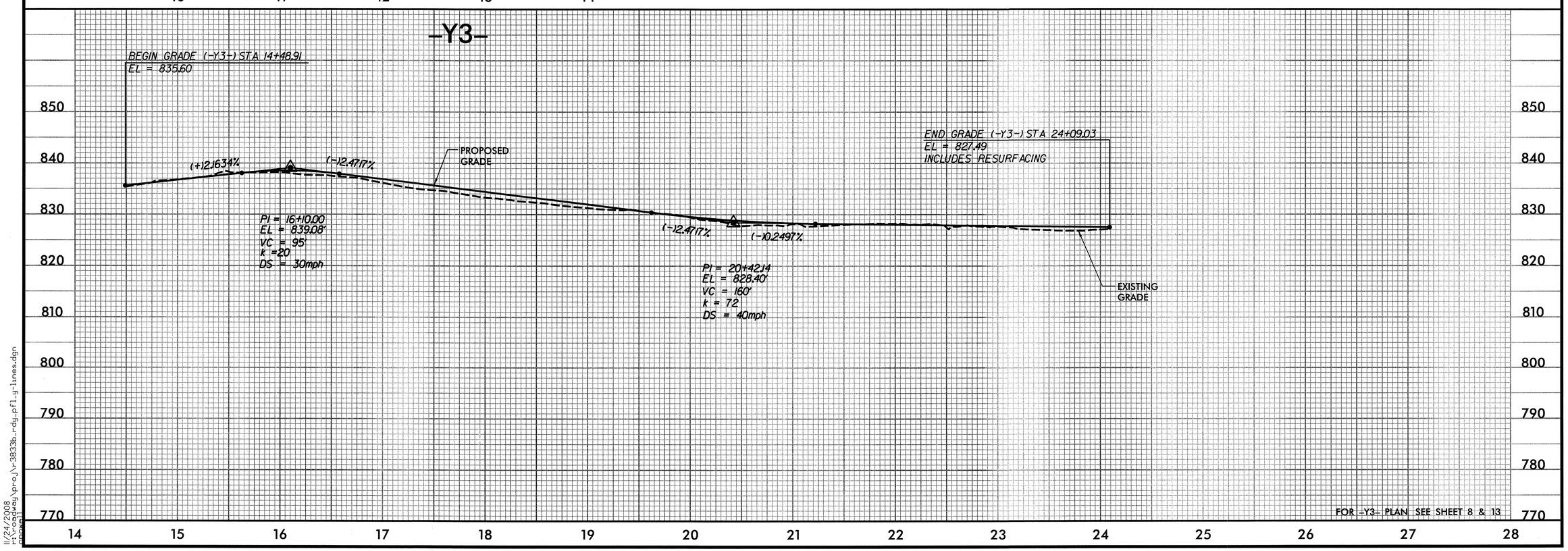
-Y1-

ROLLING HILLS ROAD



FOR -Y1- PLAN SEE SHEET 7

-Y3-



FOR -Y3- PLAN SEE SHEET 8 & 13

5/28/99

11/24/2008
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cpowell

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	26

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID 8/14/09

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR. 9/10/09

MOFFATT & NICHOL — 16 W. EAST MILLBROOK ROAD, SUITE 160, RALEIGH, NORTH CAROLINA 27609 (919) 781-4626 VOICE (919) 781-4869 FAX

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-Y4-

BEGIN GRADE (-Y4-) STA 10+39.97 =
(-L-) STA 261+09.09; OFFSET: 39'-6" (RT)
EL = 784.16

04

36" RCP

+00 RT 774.00

+00 RT 777.12

+00 RT 785.63

CENTER LINE OF (-L-)
STA 261+09.09
EL = 782.58

(+) 3.72%

(+) 5.27%

(+) 10.9823%

PI = 15+36.00
EL = 789.03'
VC = 410'
K = 80
DS = 40 mph

(-) 14.1308%

PROPOSED GRADE

EXISTING GRADE

PI = 21+54.00
EL = 763.50'
VC = 358'
K = 65
DS = 40 mph

(-) 14.1308%

(+) 11.3984%

(-) 0.30%

+00 LT 757.09

FOR -Y4- PLAN SEE SHEETS 7, 15, 16 & 17

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 5.3	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 25	CFS
DESIGN HW ELEVATION	= 777.06	FT
100 YEAR DISCHARGE	= 26.4	CFS
100 YEAR HW ELEVATION	= 777.24	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 46+	CFS
OVERTOPPING ELEVATION	= 782.40	FT

-Y4-

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 1600	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 763.3	FT
BASE DISCHARGE	= 2000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 763.8	FT
OVERTOPPING DISCHARGE	= 2400	CFS
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING ELEVATION	= 764.64	FT

BEG BRIDGE

END BRIDGE

PI = 26+50.00
EL = 770.44'
VC = 170'
K = 65
DS = 40 mph

PROPOSED GRADE

-Y4- STA 30+18.12 =
-Y5- STA 14+19.90

EXISTING GRADE

(+) 11.3984%

(+) 4.0068%

36" RCP

(-) 0.30%

+00 LT 756.19

(-) 1.20%

(-) 2.22%

+65 LT 794.40

(+) 5.38%

+50 LT 798.97

(+) 2.98%

+00 LT 800.46

+50 LT 796.44

+00 LT 795.84

36" CSP

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 15	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 39	CFS
DESIGN HW ELEVATION	= 775.75	FT
100 YEAR DISCHARGE	= 46	CFS
100 YEAR HW ELEVATION	= 776.20	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 81+	CFS
OVERTOPPING ELEVATION	= 778.00	FT

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 9.0	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 35	CFS
DESIGN HW ELEVATION	= 797.40	FT
100 YEAR DISCHARGE	= 38	CFS
100 YEAR HW ELEVATION	= 797.55	FT
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING DISCHARGE	= 38+	CFS
OVERTOPPING ELEVATION	= 798.00	FT

UNDERCUT EXCAVATION

RIGHT DITCH

LEFT DITCH

FOR -Y4- PLAN SEE SHEETS 7, 15, 16 & 17

8/14/2009
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PROJECT REFERENCE NO.	SHEET NO.
R-3833B	27

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

11/26/08

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR.

11/26/08

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16 W. EAST MILLBROOK ROAD, SUITE 160
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SDG Sungate Design Group, P.A.
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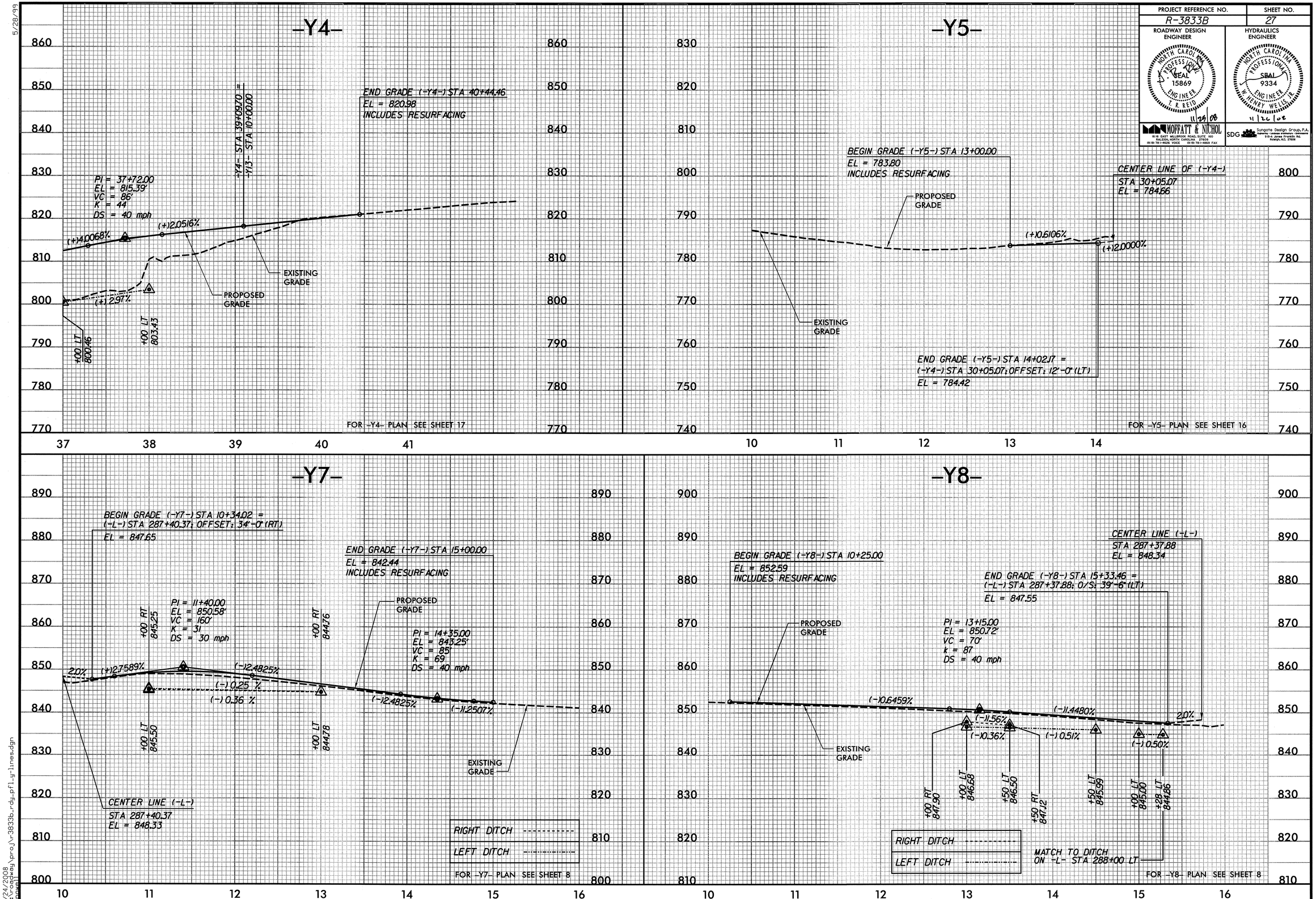
Raleigh, N.C. 27606



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gapwell

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	28

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

11/25/08

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WEST, JR.

11/26/08

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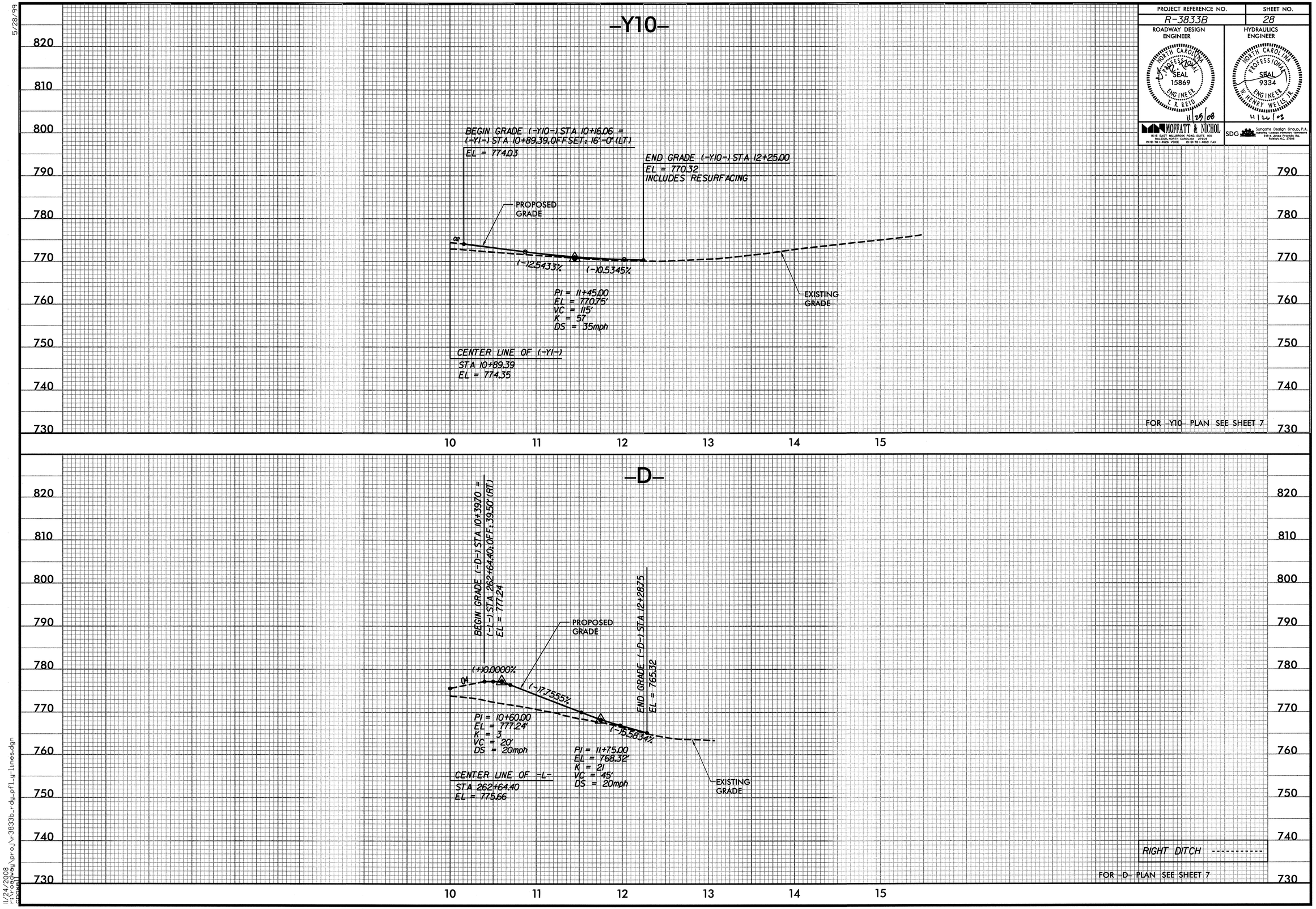

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PROJECT REFERENCE NO.	SHEET NO.
R-3833B	29

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER K. R. REID

11/20/08

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS, JR.

11/20/08

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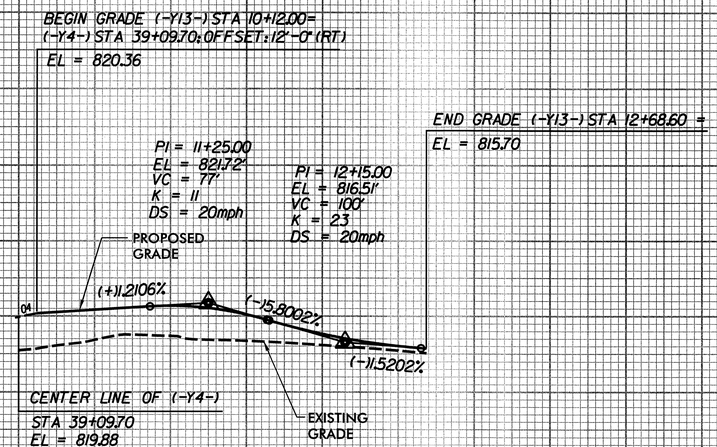
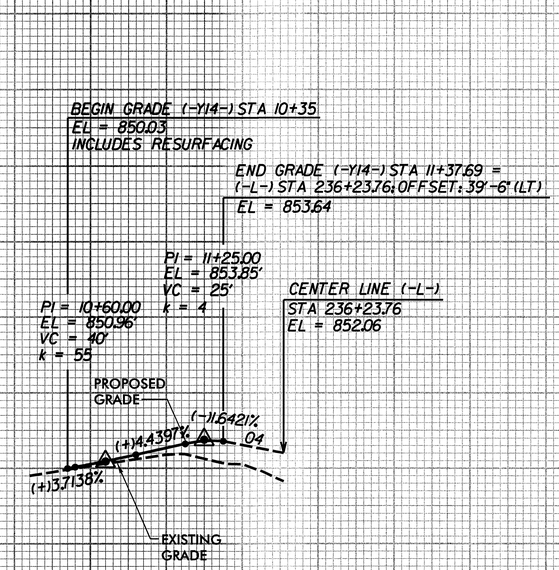
-Y13-



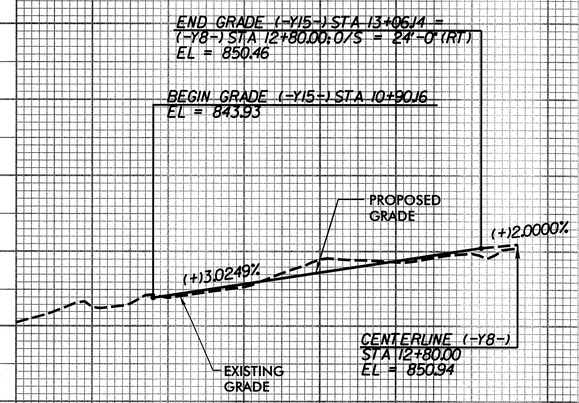
FOR -Y13- PLAN SEE SHEET 17

-Y14-



FOR -Y14- PLAN SEE SHEET 5

-Y15-



FOR -Y15- PLAN SEE SHEET 8

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PROJECT REFERENCE NO.	SHEET NO.
R-3833B	30

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

11/25/08

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WEAVER, JR.

11/26/08

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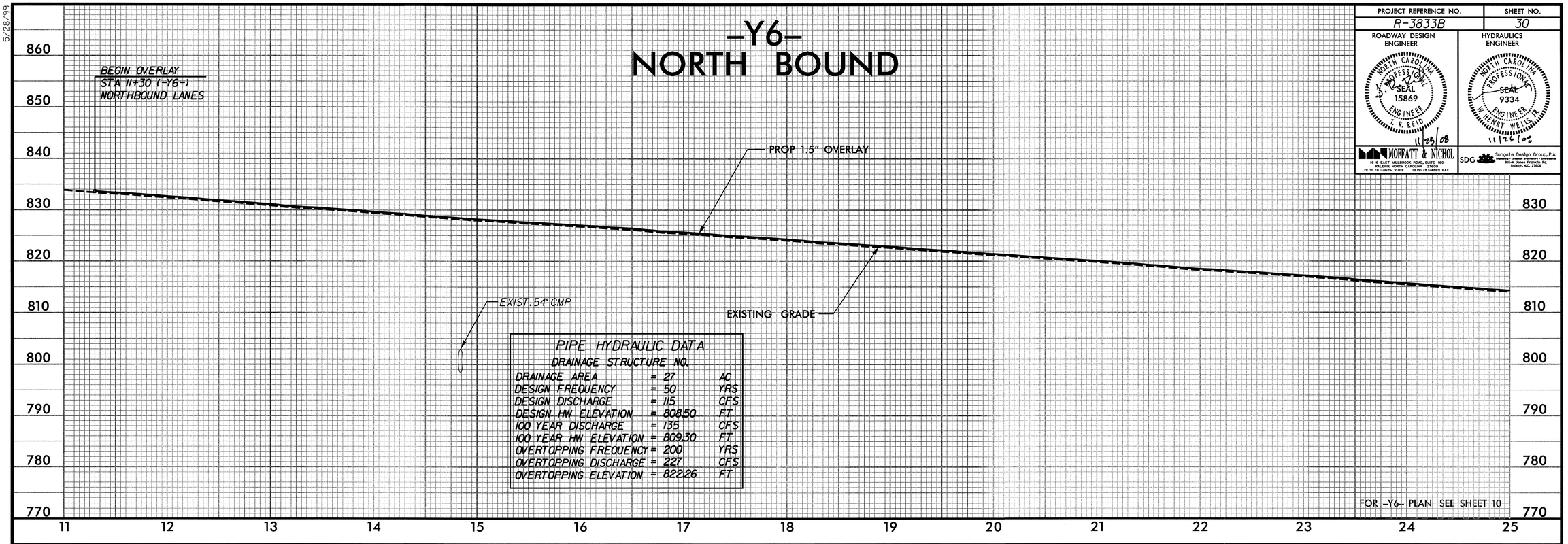
Raleigh, N.C. 27606

-Y6- NORTH BOUND

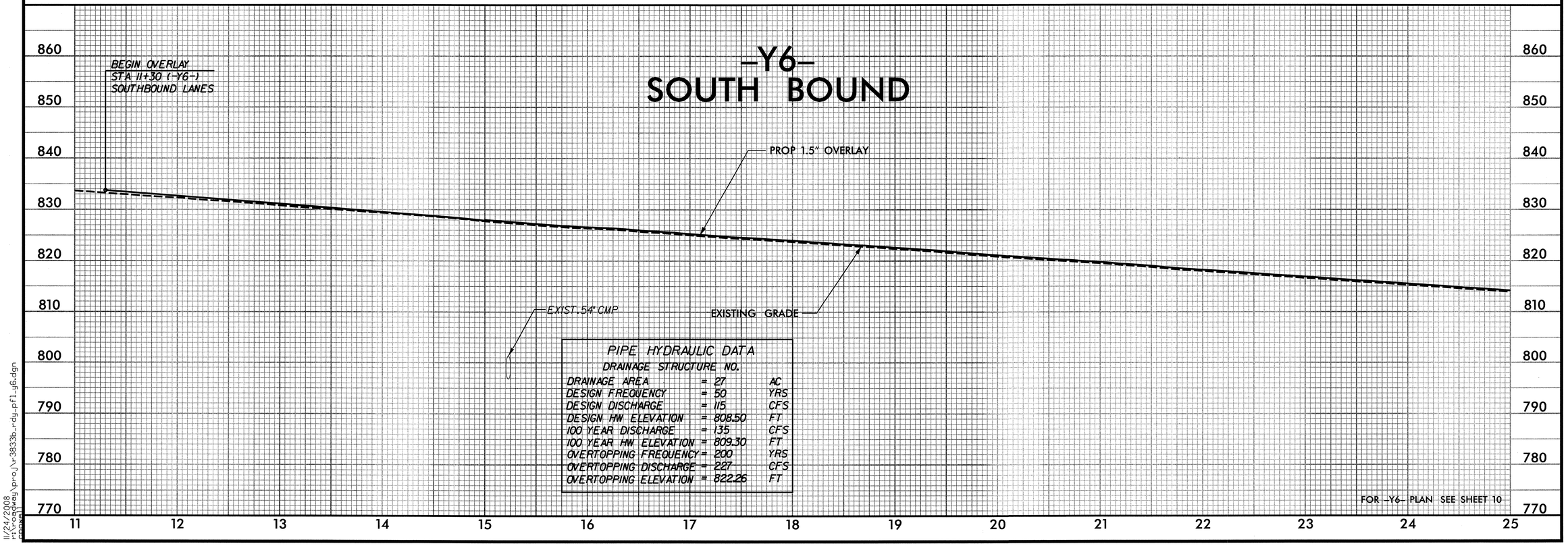


PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 27	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 115	CFS
DESIGN HW ELEVATION	= 808.50	FT
100 YEAR DISCHARGE	= 135	CFS
100 YEAR HW ELEVATION	= 809.30	FT
OVERTOPPING FREQUENCY	= 200	YRS
OVERTOPPING DISCHARGE	= 227	CFS
OVERTOPPING ELEVATION	= 822.26	FT

FOR -Y6- PLAN SEE SHEET 10

-Y6- SOUTH BOUND



PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 27	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 115	CFS
DESIGN HW ELEVATION	= 808.50	FT
100 YEAR DISCHARGE	= 135	CFS
100 YEAR HW ELEVATION	= 809.30	FT
OVERTOPPING FREQUENCY	= 200	YRS
OVERTOPPING DISCHARGE	= 227	CFS
OVERTOPPING ELEVATION	= 822.26	FT

FOR -Y6- PLAN SEE SHEET 10

11/24/2008
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PROJECT REFERENCE NO.	SHEET NO.
R-3833B	31

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

11/25/08

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WEISS, JR.

11/26/08

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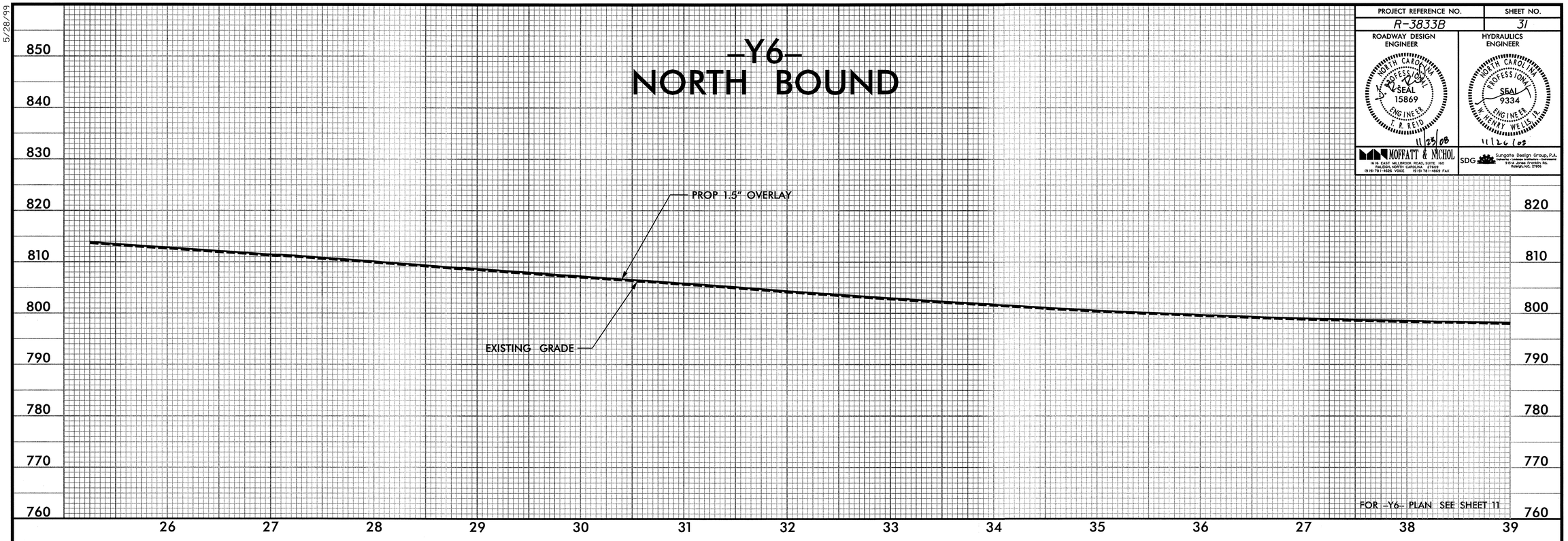
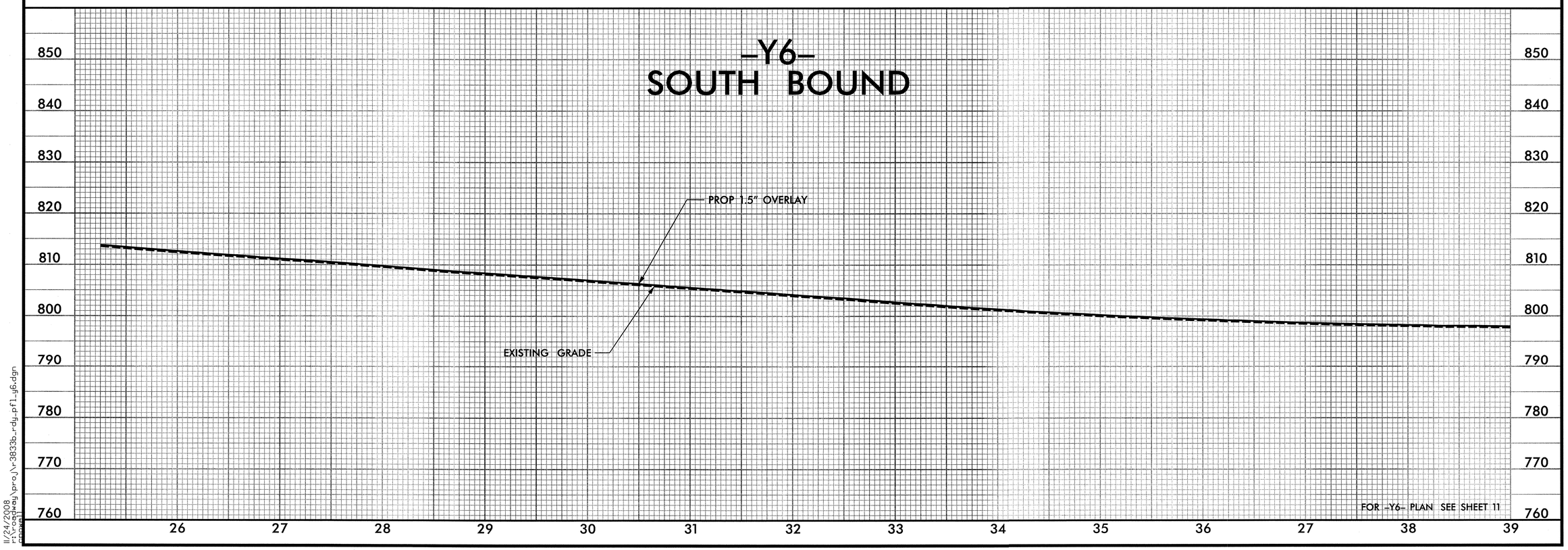
Raleigh, N.C. 27606

-Y6-
NORTH BOUND



FOR -Y6- PLAN SEE SHEET 11

-Y6-
SOUTH BOUND



FOR -Y6- PLAN SEE SHEET 11

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cpowell

PROJECT REFERENCE NO.	SHEET NO.
R-3833B	32

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER R. REID
11/25/08

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR.
11/26/08

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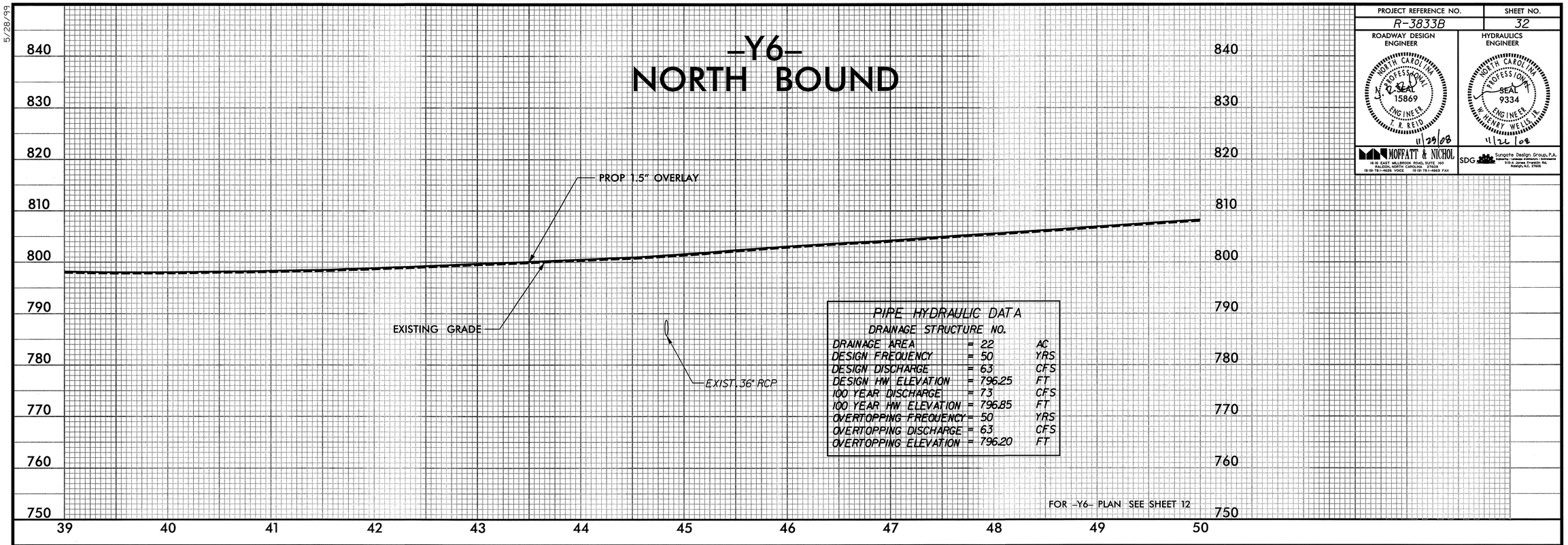
-Y6-
NORTH BOUND

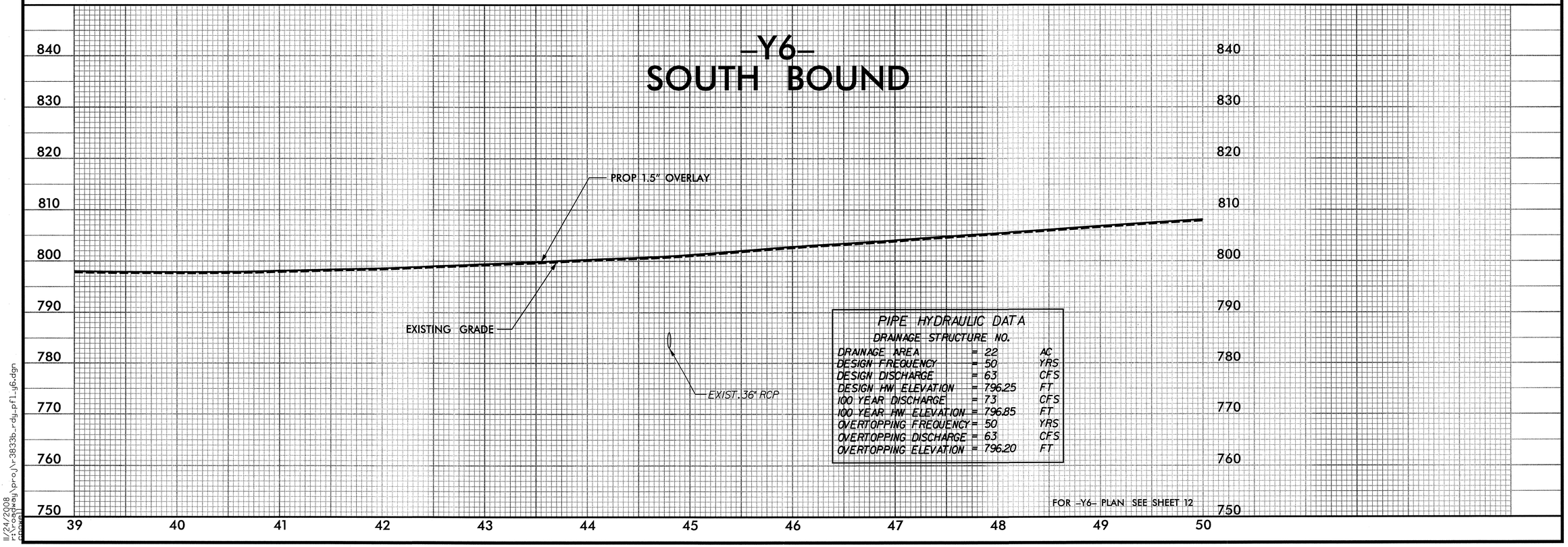


PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	=	22	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	63	CFS
DESIGN HW ELEVATION	=	796.25	FT
100 YEAR DISCHARGE	=	73	CFS
100 YEAR HW ELEVATION	=	796.85	FT
OVERTOPPING FREQUENCY	=	50	YRS
OVERTOPPING DISCHARGE	=	63	CFS
OVERTOPPING ELEVATION	=	796.20	FT

FOR -Y6- PLAN SEE SHEET 12

-Y6-
SOUTH BOUND



PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	=	22	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	63	CFS
DESIGN HW ELEVATION	=	796.25	FT
100 YEAR DISCHARGE	=	73	CFS
100 YEAR HW ELEVATION	=	796.85	FT
OVERTOPPING FREQUENCY	=	50	YRS
OVERTOPPING DISCHARGE	=	63	CFS
OVERTOPPING ELEVATION	=	796.20	FT

FOR -Y6- PLAN SEE SHEET 12

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PROJECT REFERENCE NO.	SHEET NO.
R-3833B	33

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER R. REID
11/25/08

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS, JR.
11/24/08

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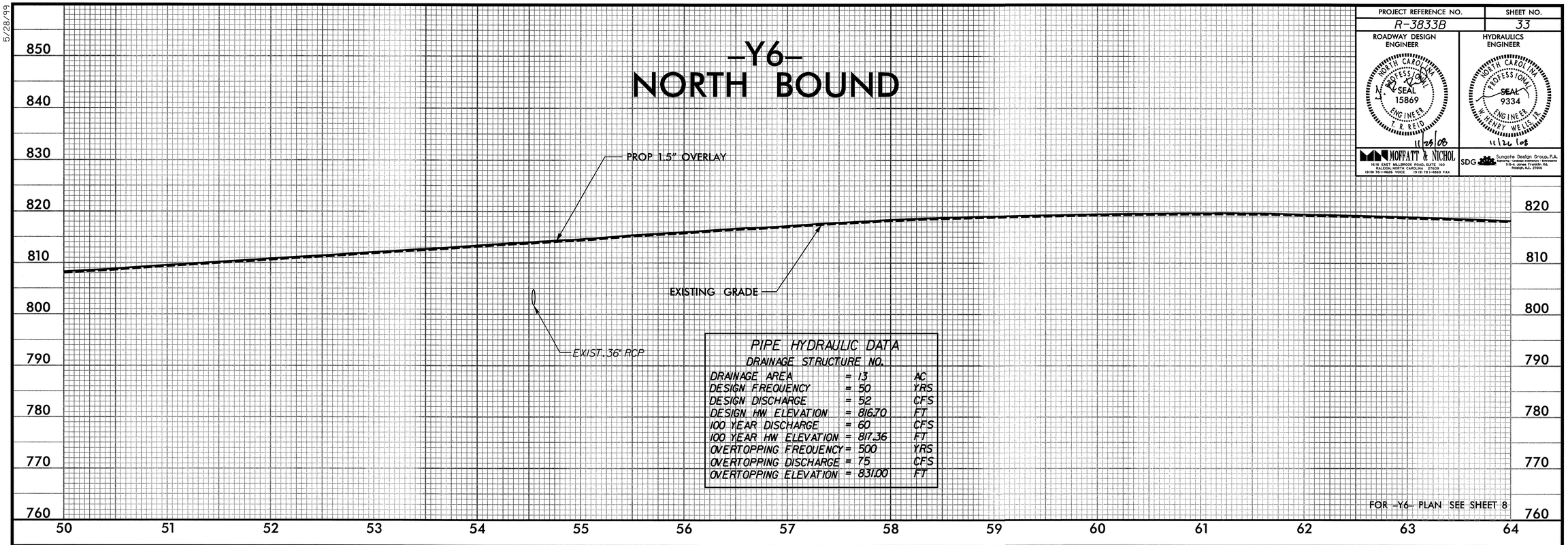
Raleigh, N.C. 27606

-Y6-
NORTH BOUND

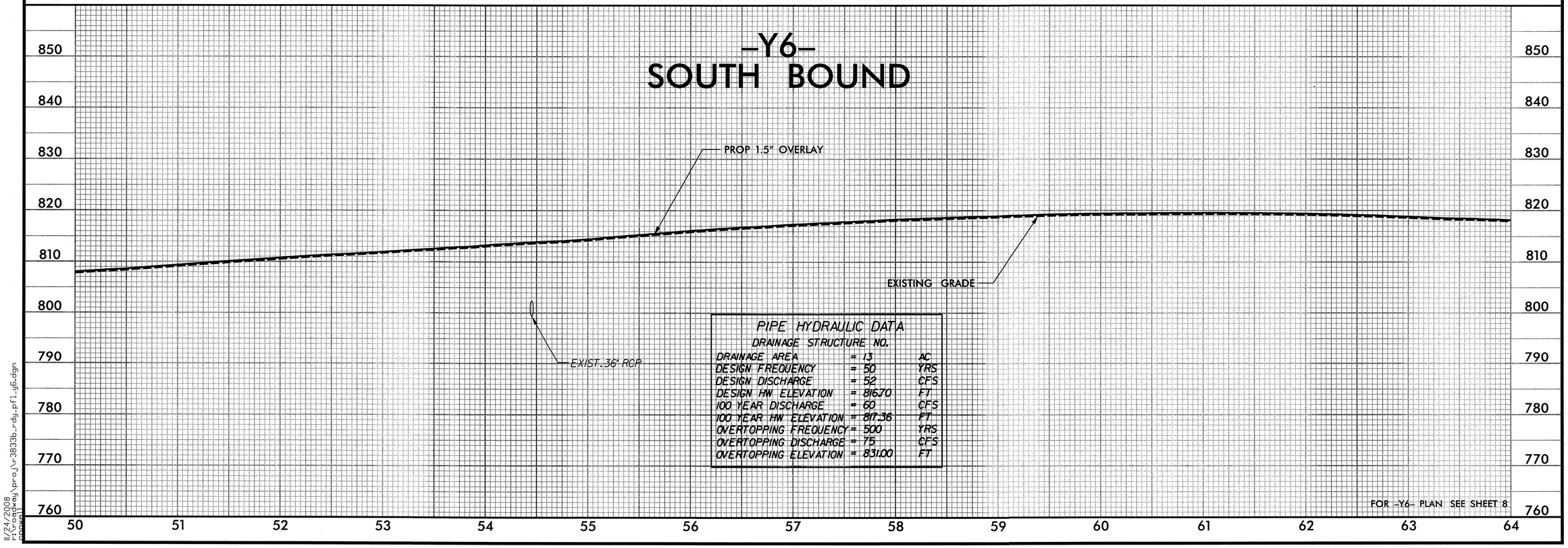


PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 13	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 52	CFS
DESIGN HW ELEVATION	= 816.70	FT
100 YEAR DISCHARGE	= 60	CFS
100 YEAR HW ELEVATION	= 817.36	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 75	CFS
OVERTOPPING ELEVATION	= 831.00	FT

FOR -Y6- PLAN SEE SHEET 8

-Y6-
SOUTH BOUND



PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 13	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 52	CFS
DESIGN HW ELEVATION	= 816.70	FT
100 YEAR DISCHARGE	= 60	CFS
100 YEAR HW ELEVATION	= 817.36	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 75	CFS
OVERTOPPING ELEVATION	= 831.00	FT

FOR -Y6- PLAN SEE SHEET 8

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PROJECT REFERENCE NO.	SHEET NO.
R-3833B	34

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

11/25/08

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR.

11/26/08

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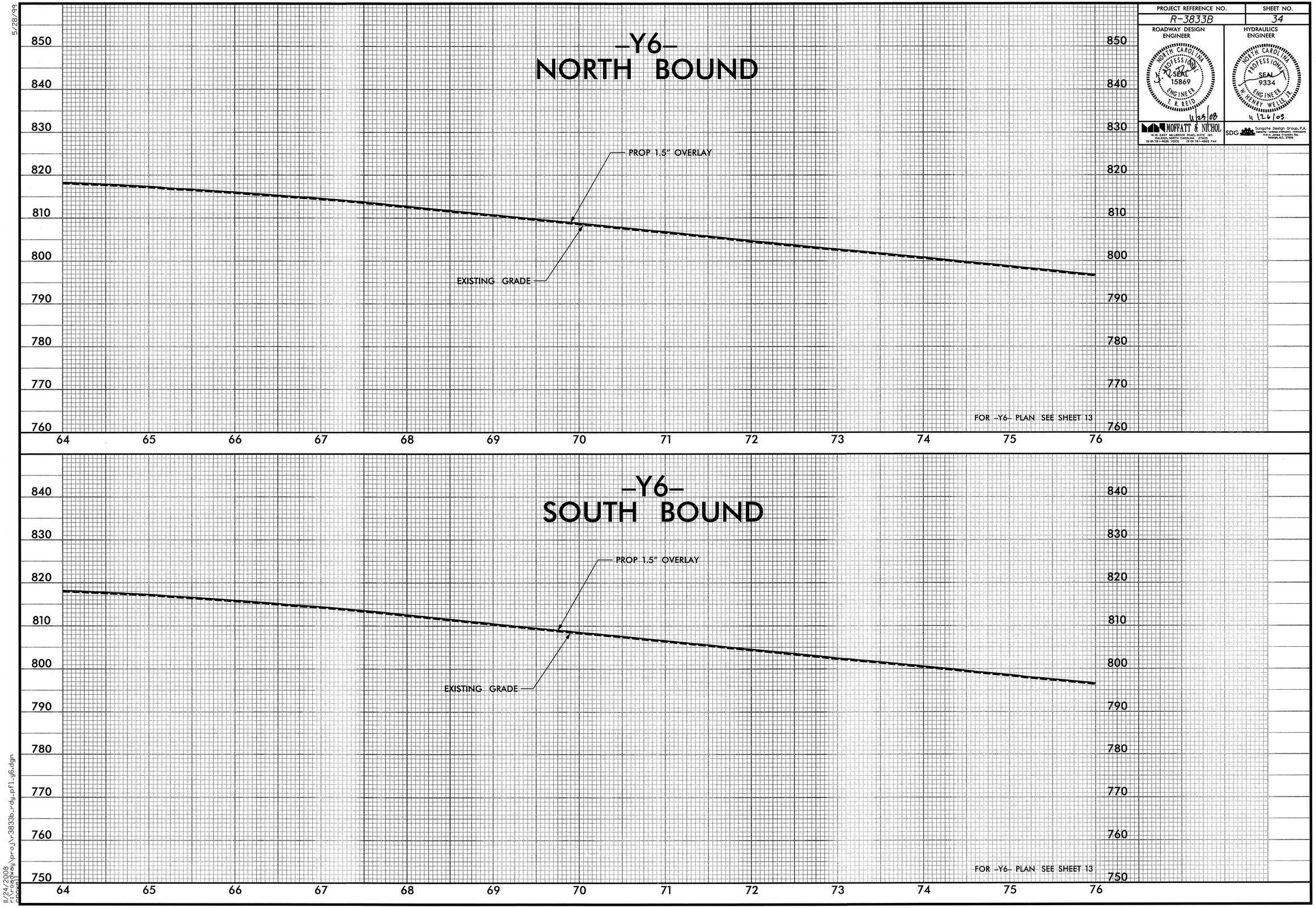

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PROJECT REFERENCE NO.	SHEET NO.
R-3833B	35

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

11/24/08

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR.

11/26/08

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SDG Sungate Design Group, P.A.
Transportation Consultants / Engineers
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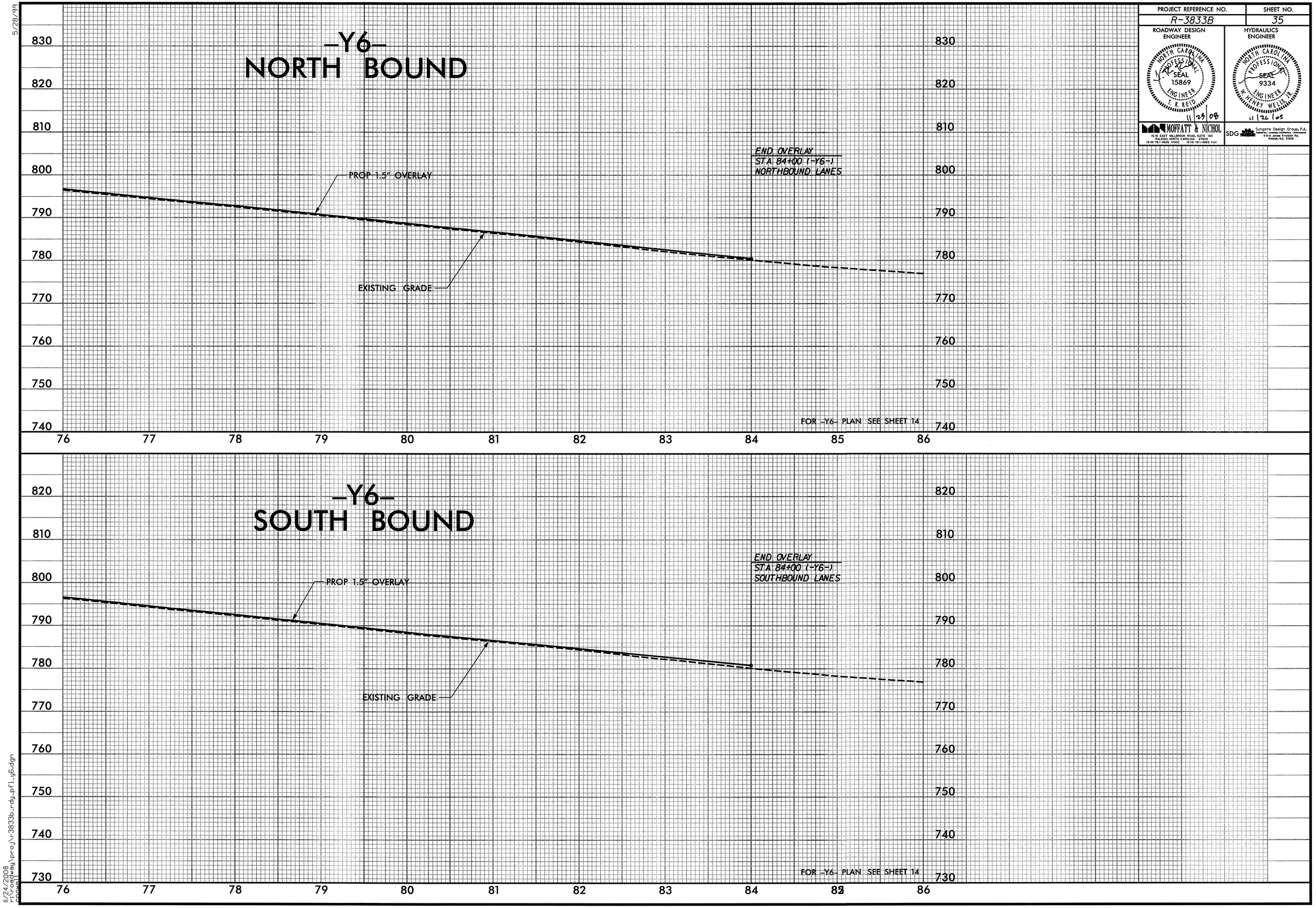

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