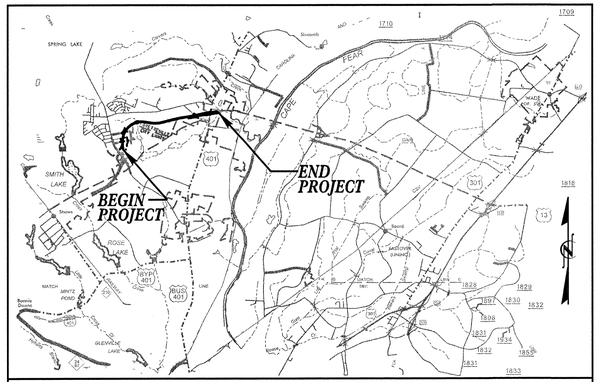
TIP PROJECT: X-0002CB

CONTRACT: C202618

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

LOCATION: FAYETTEVILLE OUTER LOOP
FROM EAST OF SR1600 (MCARTHUR RD.)
TO WEST OF US401(RAMSEY ST.)

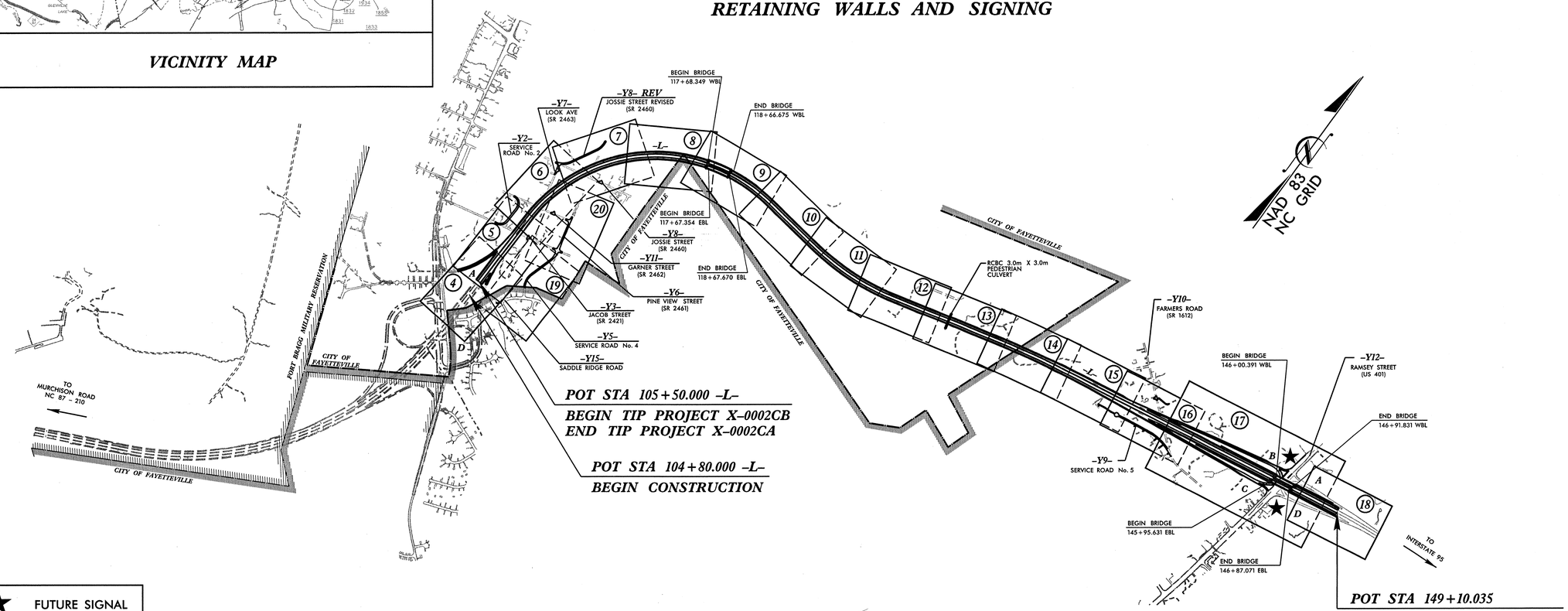
TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, RETAINING WALLS AND SIGNING

METRIC

ALL DIMENSIONS IN THESE PLANS ARE IN METERS UNLESS OTHERWISE SHOWN

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	X-0002CB	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
35196.1.2	NHF-DPR-0100(002)	P.E.
35196.2.4		ROW & UTIL
35196.3.20	NHF-0100(20)	CONST.



★ FUTURE SIGNAL

THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS LIMITED TO INTERCHANGES

GRAPHIC SCALES

5 0 10 PLANS

5 0 10 PROFILE (HORIZONTAL)

1 0 2 PROFILE (VERTICAL)

DESIGN DATA

ADT 2011	=	38,100
ADT 2036	=	66,390
DHV	=	9 %
D	=	55 %
T	=	10 % *
V	=	110 km/h

* (TTST 4 % DUAL 6 %)
FUNC. CLASS = INTERSTATE

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT X-0002CB	=	4.170 km
LENGTH STRUCTURES TIP PROJECT X-0002CB	=	0.190 km
TOTAL LENGTH OF TIP PROJECT X-0002CB	=	4.360 km

Prepared In the Office of:
MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX
NC License Number F-0105
FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2006 METRIC STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MAY 31, 2006

LETTING DATE: FEBRUARY 15, 2011

T.R. REID, P.E.
PROJECT ENGINEER

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

HYDRAULICS ENGINEER
SDG
Sungate Design Group, P.A.
Engineering - Landscape Architecture - Environmental
915-A Jones Franklin Rd.
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NC License Number C-0890
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS, JR.
SIGNATURE: P.E. 11/24/10

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SIGNATURE: P.E. 11/24/10

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

9/09/99

11/24/2010
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thrifmann

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	1-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

10-19-10

MOFFATT & NICHOL ENGINEERS
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INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C THRU 1-E	SURVEY CONTROL SHEETS
1-F THRU 1-G	CENTERLINE COORDINATE SHEETS
2 THRU 2-E	PAVEMENT SCHEDULE, TYPICAL SECTIONS, WEDGING DETAILS
2-F THRU 2-G	BRIDGE SKETCH DETAILS
2-H THRU 2-K	INTERSECTION DETAILS
2-L	DITCH DETAILS
2-M	PREFORMED SCOUR HOLE AND ENERGY DISSIPATOR DETAILS
2-N	SHEARPOINT DIAGRAM
2-O	REINFORCED SLOPE - STA. 118+17.50
2-P	TRANSITION FROM 750MM CURB & GUTTER TO VALLEY GUTTER
2-Q	DETAILS OF GROUND IMPROVEMENT WITH PRELOADING AND WICK DRAINS
2-R	EMBANKMENT MONITORING DETAIL
2-S	INSTRUMENTATION DETAILS
2-T THRU 2-U	PIPE INSTALLATION DETAILS
2-V	JUNCTION BOX WITH SLAB LID
3 (2 SHEETS)	SUMMARY OF QUANTITIES
3-A THRU 3-I	DRAINAGE SUMMARY
3-J	GUARDRAIL SUMMARY
3-K	FUTURE GUARDRAIL SUMMARY
3-L	ASPHALT PAVEMENT REMOVAL SUMMARY, 750mm CURB & GUTTER SUMMARY, VALLEY GUTTER SUMMARY, WOVEN WIRE FENCE SUMMARY
3-M	EARTHWORK SUMMARY
3-N	PARCEL INDEX SHEETS
4 THRU 20	PLAN SHEETS
21 THRU 35	PROFILE SHEETS
TCP-1 THRU TCP-28	TRAFFIC CONTROL PLANS
PM-1 THRU PM-3	PAVEMENT MARKING PLANS
EC-1 THRU EC-37	EROSION CONTROL PLANS
RF-1	REFORESTATION PLANS
SIGN-1 THRU SIGN-5	SIGNING PLANS
UC-1 THRU UC-6	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-10	UTILITIES BY OTHERS
X	INDEX OF CROSS SECTIONS
X-A THRU X-B	CROSS SECTION SUMMARY SHEETS
X-1 THRU X-113	CROSS SECTIONS
C-1 THRU C-	CULVERT PLANS
S-1 THRU S-	STRUCTURE PLANS
W-1 THRU W-	WALL PLANS

GENERAL NOTES:

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

GRADE LINE:
GRADING AND SURFACING:

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

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.

GRADING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01 & 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. 848.02 USING 900 MM RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

STREET TURNOUT:

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

GUARDRAIL:

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

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

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:

Fayetteville PWC - Power (Distribution),
Fayetteville PWC - Power (Transmission)
Progress Energy - Power (Distribution)
Time Warner Cable
Century Link
Piedmont Natural Gas
Fayetteville PWC - Water / Sewer

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.

EFF. 08-01-08
REV. 07-16-06

2006 ROADWAY METRIC STANDARD DRAWINGS

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.01	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
225.09	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	
610.03	Guide for Paving Shoulders Under Bridges - Method III
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
815.03	Pipe Underdrain and Blind Drain
838.01	Concrete Endwall for Single and Double Pipe Culverts - 375mm thru 1200mm Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 375mm thru 1200mm Pipe 90 Skew
838.21	Reinforced Concrete Endwall - for Single 1350mm/1400mm Pipe 90 Skew
838.27	Reinforced Concrete Endwall - for Single 1500mm Pipe 90 Skew
838.45	Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40
838.51	Reinforced Brick Endwall - for Single 1350mm/1400mm Pipe 90 Skew
838.57	Reinforced Brick Endwall - for Single 1500mm Pipe 90 Skew
838.75	Notes for Reinforced Brick Endwall - Std. Dwg 838.51 thru 838.70
838.80	Precast Endwalls - 300mm thru 1800mm Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 300mm thru 1350mm Pipe
840.02	Concrete Catch Basin - 300mm thru 1350mm Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.17	Concrete Grated Drop Inlet Type 'A' - 300mm thru 1800mm Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 300mm thru 900mm Pipe
840.19	Concrete Grated Drop Inlet Type 'D' - 300mm thru 900mm Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.24	Frames and Narrow Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete
840.26	Brick Grated Drop Inlet Type 'A' - 300mm thru 1800mm Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 300mm thru 900mm Pipe
840.28	Brick Grated Drop Inlet Type 'D' - 300mm thru 900mm Pipe
840.29	Frames and Narrow Slot Flat Grates
840.31	Concrete Junction Box - 300mm thru 1650mm Pipe
840.32	Brick Junction Box - 300mm thru 1650mm Pipe
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
848.02	Driveway Turnout - Radius Type
848.04	Street Turnout
850.01	Concrete Paved Ditches
850.10	Guide for Berm Drainage Outlet - 375mm and 450mm Pipe
850.11	Guide for Berm Drainage Outlet - 600mm and 750mm Pipe
862.01	Guardrail Placement
862.02	Guardrail Installation
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

8/17/09

10/15/2010
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ShortFlash

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

MOFFATT & NICHOL ENGINEERS
1616 EAST MILLBROOK ROAD, SUITE 160
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METRIC

PROJ. REFERENCE NO.	SHEET NO.
X-0002CB	1-B

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

3/15/06
9/24/2010
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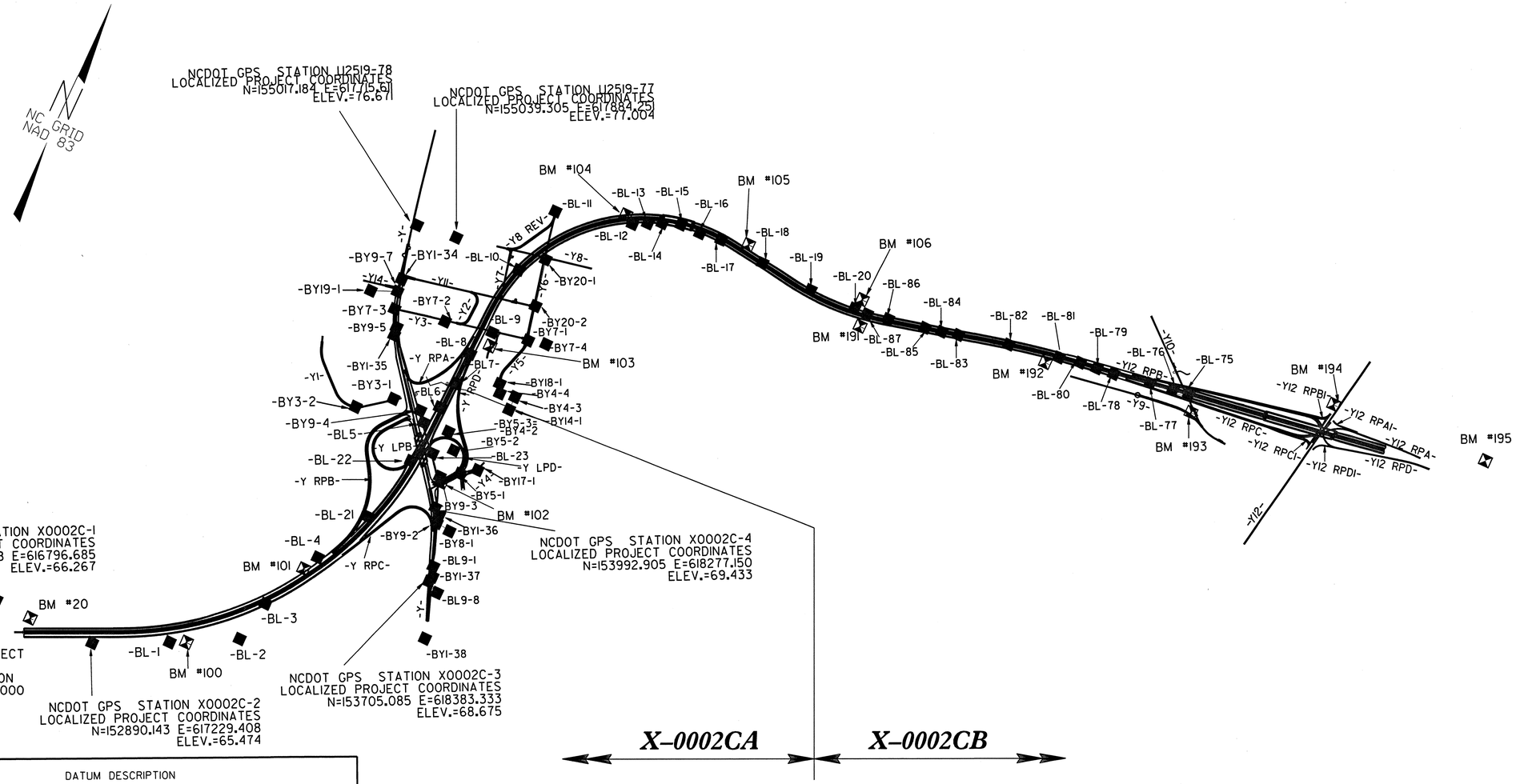
CSHELTON

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	1-C
LOCATION AND SURVEYS	

SURVEY CONTROL SHEET X-0002-C



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "X2D8"

WITH NAD 83 STATE PLANE GRID COORDINATES OF

NORTHING: 154807.5364(m) EASTING: 625333.9514(m)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: .999874791

THE N.C. LAMBERT GRID BEARING

LOCALIZED HORIZONTAL GROUND DISTANCE FROM

"X2D8" TO -L- STATION 83+40.000 IS

8,612.975M S76°35'17.10"W

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES

VERTICAL DATUM USED IS NAD83/NGVD 29

NOTES:

1. 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:
X0002C_LS_CONTROL_080409.TXT
SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

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

NOTE: DRAWING NOT TO SCALE

6/2/99

9/24/2010
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SURVEY CONTROL SHEET X-0002C

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
221	X-0002C BL-1	153027.9550	617518.1380	68.519	89+34.799	54.651 RT
222	X-0002C BL-2	153162.0960	617774.1650	69.664	92+83.327	109.502 RT
223	X-0002C BL-3	153338.6530	617809.7330	67.282	93+50.311	15.087 RT
224	X-0002C BL-4	153601.3180	617925.1530	69.576	96+35.218	36.965 LT
225	X-0002C BL-21	153941.1010	618042.9810	69.926	99+87.945	20.763 LT
226	X-0002C BL-22	154125.4670	618104.1850	70.771	102+03.121	15.360 LT
227	X-0002C BL-23	154191.3950	618172.5270	69.420	102+72.469	48.686 RT
228	X-0002C BL-5	154291.8750	618084.0280	66.726	103+69.965	42.604 LT
229	X-0002C BL-6	154376.7820	618117.6800	65.322	104+55.713	11.156 LT
230	X-0002C BL-7	154494.6380	618135.8430	61.666	105+73.999	3.956 RT
231	X-0002C BL-8	154627.8050	618140.1530	68.852	107+07.233	4.824 RT
232	X-0002C BL-9	154746.0840	618184.6640	70.548	108+26.622	46.265 RT
233	X-0002C BL-10	155026.0440	618174.5150	72.715	111+08.424	3.432 LT
234	X-0002C BL-11	155388.8490	618209.6430	75.444	113+54.312	110.904 LT
235	X-0002C BL-12	155397.0900	618520.0950	70.914	116+33.890	21.721 RT
236	X-0002C BL-13	155426.1360	618576.0920	68.426	116+98.879	19.627 RT
237	X-0002C BL-14	155451.8620	618629.9950	62.003	117+59.860	14.257 RT
238	X-0002C BL-15	155479.1990	618701.8460	56.191	118+37.457	6.020 RT
239	X-0002C BL-16	155479.9970	618788.2120	67.248	119+24.604	17.192 RT
240	X-0002C BL-17	155492.8000	618874.0720	68.841	120+17.145	5.304 RT
241	X-0002C BL-18	155476.3760	619074.9750	74.984	122+13.941	3.026 LT
242	X-0002C BL-19	155459.1860	619302.1520	72.637	124+42.477	14.638 LT
243	X-0002C BL-20	155466.5160	619497.9190	77.302	126+41.535	16.498 LT
244	X-0002C BL-87	155467.7230	619554.7350	75.170	126+98.608	9.368 LT
245	X-0002C BL-86	155486.0830	619642.5920	70.633	127+88.998	8.738 LT
246	X-0002C BL-85	155517.8760	619795.7000	62.572	129+45.271	2.670 LT
247	X-0002C BL-84	155532.6340	619865.4490	56.791	130+16.521	0.167 LT
248	X-0002C BL-83	155549.4980	619933.5830	66.305	130+86.711	0.098 LT
249	X-0002C BL-82	155620.3560	620138.8360	67.147	132+98.168	0.280 LT
250	X0002C BL-81	155639.8880	620348.7000	63.067	135+11.810	2.702 RT
251	X-0002C BL-80	155657.4360	620437.8480	47.967	136+02.641	0.256 LT
252	X-0002C BL-79	155665.4590	620509.5360	45.768	136+74.694	3.193 RT
253	X-0002C BL-78	155673.9290	620582.3550	50.128	137+47.935	6.379 RT
254	X-0002C BL-77	155703.4810	620734.5430	55.796	139+02.883	1.338 RT
255	X-0002C BL-76	155720.3250	620831.2760	54.614	140+01.063	0.049 RT
256	X-0002C BL-75	155731.3940	620898.3520	54.969	140+69.046	0.241 LT

BY3

POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
81	X-0002C -BY3-2	154230.8270	617802.8230	70.155	11+93.698	0.336 RT
80	X-0002C -BY3-1	154326.3570	617931.0370	69.378	10+33.197	4.378 RT

BY4

POINT	DESC.	NORTH	EAST	ELEVATION	Y_RPD STATION	OFFSET
61	X0002C BY4-2 BY	154301.0570	618193.9770	66.425	3+15.867	46.490 RT
62	X0002C BY4-1	154462.8870	618273.7900	60.125	2+05.962	103.989 LT
63	X-0002C BY4-4	154531.9422	618319.6203	65.572	1+24.033	167.134 LT
64	X-0002C BY4-3	154543.5956	618381.7302	67.462	1+21.988	230.320 LT

BY5

POINT	DESC.	NORTH	EAST	ELEVATION	Y_RPD STATION	OFFSET
60	X-0002C BL-6	154376.7820	618117.6800	65.322	2+25.121	73.389 RT
61	X0002C BY4-2 BY	154301.0570	618193.9770	66.425	3+15.867	46.490 RT
65	X0002C BY5-2	154240.6380	618246.1390	68.806	3+92.968	46.123 RT
66	X0002C BY5-1	154164.3770	618310.1720	68.516	5+07.186	3.967 LT

BY7

POINT	DESC.	NORTH	EAST	ELEVATION	Y3 STATION	OFFSET
83	X0002C BY7-3	154663.7945	617778.0739	72.716	OUTSIDE PROJECT LIMITS	
84	X0002C BY7-2	154705.0330	617988.9540	73.650	12+06.783	4.530 RT
86	X0002C BY7-1	154778.3289	618333.2704	69.976	15+58.814	3.868 RT
87	X0002C BY7-4	154795.9380	618405.9584	69.318	OUTSIDE PROJECT LIMITS	

BY9

POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
260	X0002C BY9-7	154734.1257	617758.5159	74.783	11+75.961	6.234 RT
261	X0002C BY7-3	154663.7945	617778.0739	72.716	12+48.900	5.485 RT
262	X0002C BY9-5	154599.8530	617817.4720	68.648	13+23.874	5.481 LT
263	NOT SET	154382.1311	618005.8933	UNKNOWN	16+12.555	6.882 LT
264	X0002C BY9-4	154329.9860	618051.0830	66.670	16+81.555	6.335 LT
265	X0002C BL-5	154291.8750	618084.0280	66.726	17+31.929	5.673 LT
266	X0002C BL-23	154191.3950	618172.5270	69.420	18+65.801	5.900 LT
267	X0002C BY9-3	154117.4600	618239.6290	69.605	19+63.990	11.921 LT
268	X0002C BY9-2	153937.4540	618310.6720	69.174	21+55.652	6.321 LT
269	X0002C BY9-1	153769.2440	618373.3240	69.284	23+35.150	6.458 LT
270	X0002C BY9-8	153689.5952	618402.9063	68.403	24+20.115	6.444 LT

BY14

POINT	DESC.	NORTH	EAST	ELEVATION	Y_RPD STATION	OFFSET
90	X0002C BY4-3	154543.5956	618381.7302	67.462	1+21.988	230.320 LT
91	X0002C BY14-1	154488.2170	618382.4710	64.548	2+41.231	213.646 LT

BY8

POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
88	X0002C BY9-2	153937.4540	618310.6720	69.174	21+55.652	6.321 LT
89	X0002C BY8-1	153932.0414	618372.1412	69.223	21+82.136	62.055 LT

BY17

POINT	DESC.	NORTH	EAST	ELEVATION	Y4 STATION	OFFSET
92	X0002C BY5-1	154164.3770	618310.1720	68.516	10+49.381	22.743 LT
93	X0002C BY17-1	154208.2126	618369.7152	65.764	11+10.162	5.186 RT

BY18

POINT	DESC.	NORTH	EAST	ELEVATION	Y5 STATION	OFFSET
94	X0002C BY18-1	154568.3770	618302.0450	66.384	10+50.767	1.669 LT
95	X0002C BY4-4	154531.9422	618319.6203	65.572	10+10.640	6.174 LT

BY19

POINT	DESC.	NORTH	EAST	ELEVATION	Y14 STATION	OFFSET
96	X0002C BY9-7	154734.1257	617758.5159	74.783	10+05.657	12.603 LT
97	X0002C BY19-1	154698.8794	617657.3666	74.758	11+13.621	33.704 LT

BY20

POINT	DESC.	NORTH	EAST	ELEVATION	Y6 STATION	OFFSET
280	X0002C BL-11	155388.8490	618209.6430	75.444	OUTSIDE PROJECT LIMITS	
281	X0002C BY20-1	155111.6092	618257.3029	72.564	13+37.864	5.911 RT
282	X0002C BY20-2	154919.7181	618300.9054	71.313	11+41.081	5.739 RT

NEWBY1

POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
BY134	BY1-34	154764.5650	617751.0250	75.339	11+44.644	5.776 RT
BY135	BY1-35	154564.9790	617822.3020	67.127	13+54.584	11.127 RT
229	X-0002C BL-6	154376.7820	618117.6800	65.322	16+90.447	87.242 LT
BY136	BY1-36	153968.8710	618305.8770	69.383	21+24.532	12.770 LT
BY137	BY1-37	153729.2330	618388.1250	68.942	23+77.811	6.395 LT
BY138	BY1-38	153486.7710	618464.8900	68.597	26+30.510	9.902 RT

DATUM DESCRIPTION
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT
IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY
NCDOT FOR MONUMENT "X208"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 154807.5364(m) EASTING: 625333.9514(m)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT
(GROUND TO GRID) IS: .999987479
THE N.C. LAMBERT GRID BEARING
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"X208" TO -L- STATION 83+40.000 IS
8,612.975M S76°35'17.10"W
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAD83/NGVD 29

BM20 ELEVATION - 60.576
N 152874 E 616955
L STATION 83+66 59 LEFT
NAIL IN BASE OF 10 INCH PINE

BM100 ELEVATION - 70.518
N 153057 E 617581
L STATION 90+00 66 RIGHT
R/R SPIKE IN BASE OF 450MM PINE TREE

BM101 ELEVATION - 68.906
N 153533 E 617892
L STATION 95+58 31 LEFT
R/R SPIKE IN BASE OF 450MM PINE TREE

BM102 ELEVATION - 69.784
N 154100 E 618257
L STATION 101+92 139 RIGHT
R/R SPIKE IN BASE OF 375MM PINE TREE

BM103 ELEVATION - 70.457
N 154692 E 618200
L STATION 107+73 63 RIGHT
R/R SPIKE IN BASE OF 250MM CHERRY TREE

BM104 ELEVATION - 67.299
N 155419 E 618479
L STATION 116+09 17 LEFT
R/R SPIKE IN BASE OF 200MM PINE TREE

BM105 ELEVATION - 74.413
N 155522 E 618990
L STATION 121+24 36 LEFT
R/R SPIKE IN BASE OF 450MM PINE TREE

BM106 ELEVATION - 77.036
N 155513 E 619512
L STATION 126+62 61 LEFT
R/R SPIKE IN BASE OF 450MM PINE TREE

BM191 ELEVATION - 75.618
N 155410 E 619550
L STATION 126+85 47 RIGHT
3 NAILS IN BASE OF 430MM PINE TREE

BM192 ELEVATION - 64.147
N 155598 E 620307
L STATION 134+63 37 RIGHT
3 NAILS IN BASE OF 320MM PINE TREE

BM193 ELEVATION - 47.780
N 155666 E 620938
L STATION 140+98 71 RIGHT
3 NAILS IN BASE OF 500MM PINE TREE

BM194 ELEVATION - 35.131
N 155945 E 621458
L STATION 146+55 122 LEFT
3 NAILS IN BASE OF 600MM PINE TREE

BM195 ELEVATION - 34.466
N 155892 E 622909
L STATION 159+03
N 64° 46' 10.6" E DIST 217.925
3 NAILS IN BASE OF 250MM PINE TREE

NOTES:

1. 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:
X0002C_LS_CONTROL_080409.TXT
SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

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

NOTE: DRAWING NOT TO SCALE

6/2/99
9/24/2010
R:\Roadway\proj\x0002c_ls_1D.dgn

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	1-E
LOCATION AND SURVEYS	

SURVEY CONTROL SHEET X-0002C

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
221	X-0002C BL-1	153027.9550	617518.1380	68.519	89+34.799	54.651 RT
222	X-0002C BL-2	153162.0960	617774.1650	69.664	92+03.327	109.502 RT
223	X-0002C BL-3	153338.6530	617809.7330	67.282	93+50.311	15.087 RT
224	X-0002C BL-4	153601.3180	617925.1530	69.576	96+35.218	36.965 LT
225	X-0002C BL-21	153841.1010	618042.9810	69.926	99+07.945	20.763 LT
226	X-0002C BL-22	154125.4670	618104.1850	70.771	102+03.121	15.360 LT
227	X-0002C BL-23	154191.3950	618172.5270	69.420	102+72.469	48.686 RT
228	X-0002C BL-5	154291.8750	618084.0280	66.726	103+69.965	42.604 LT
229	X-0002C BL-6	154376.7820	618117.6800	65.322	104+55.713	11.156 LT
230	X-0002C BL-7	154494.6380	618135.8430	61.666	105+73.999	3.956 RT
231	X-0002C BL-8	154627.8050	618140.1530	68.852	107+07.233	4.824 RT
232	X-0002C BL-9	154746.0840	618184.6640	70.548	108+26.622	46.265 RT
233	X-0002C BL-10	155026.0440	618174.5150	72.715	111+08.424	3.432 LT
234	X-0002C BL-11	155308.8490	618209.6430	75.444	113+54.312	110.904 LT
235	X-0002C BL-12	155397.0900	618520.0950	70.914	116+33.890	21.721 RT
236	X-0002C BL-13	155426.1360	618576.0920	68.426	116+98.879	19.627 RT
237	X-0002C BL-14	155451.8620	618629.9950	62.003	117+59.860	14.257 RT
238	X-0002C BL-15	155479.1990	618701.8460	56.191	118+37.457	6.020 RT
239	X-0002C BL-16	155479.9970	618788.2120	67.248	119+24.604	17.192 RT
240	X-0002C BL-17	155492.8000	618879.0720	68.841	120+17.145	5.304 RT
241	X-0002C BL-18	155476.3760	619074.9750	74.984	122+13.941	3.026 LT
242	X-0002C BL-19	155459.1860	619302.1520	72.637	124+42.477	14.638 LT
243	X-0002C BL-20	155466.5160	619497.9190	77.302	126+41.535	16.498 LT
244	X-0002C BL-87	155467.7290	619554.7350	75.170	126+98.608	9.368 LT
245	X-0002C BL-86	155486.0830	619642.5920	70.633	127+88.998	8.738 LT
246	X-0002C BL-85	155517.8760	619795.7000	62.572	129+45.271	2.670 LT
247	X-0002C BL-84	155532.6340	619865.4490	56.791	130+16.521	0.167 LT
248	X-0002C BL-83	155549.4980	619933.5830	66.305	130+86.711	0.098 LT
249	X-0002C BL-82	155600.3560	620138.8360	67.147	132+98.168	0.280 LT
250	X0002C BL-81	155639.8880	620348.7000	63.067	135+11.810	2.702 RT
251	X-0002C BL-80	155657.4360	620437.8480	47.967	136+02.641	0.256 LT
252	X-0002C BL-79	155665.4590	620509.5360	45.768	136+74.694	3.193 RT
253	X-0002C BL-78	155673.9290	620582.3550	50.128	137+47.935	6.379 RT
254	X-0002C BL-77	155703.4810	620734.5430	55.796	139+02.883	1.338 RT
255	X-0002C BL-76	155720.3250	620831.2760	54.614	140+01.063	0.049 RT
256	X-0002C BL-75	155731.3940	620898.3520	54.969	140+69.046	0.241 LT

X2BY2

POINT	DESC.	NORTH	EAST	ELEVATION	Y2B STATION	OFFSET
BY24	X0002C -BY24	154940.9320	616747.2380	78.291	0+47.359	5.250 LT
BY25	X0002C-BY25	154787.5460	616912.2800	77.538	1+19.703	5.564 LT
BY26	X0002C-BY26	154578.4850	617100.6990	77.795	1+18.134	10.732 LT
BY27	X0002C-BY27	154285.8410	617221.1840	73.751	4+34.007	3.790 RT
BY28	X0002C-BY28	154037.0570	617342.9910	70.410	2+03.158	5.639 LT
BY29	X0002C-BY29	153757.9800	617451.6800	67.878	5+02.313	7.199 LT
BY30	X0002C-BY30	153537.1430	617332.8630	71.291	2+61.435	116.098 RT
BY31	X0002C-BY31	153415.3620	617103.9150	69.573	6+91.923	145.206 RT
BY32	X0002C-BY32	153256.3160	616926.4380	68.733	0+71.087	39.413 LT
BY33	X0002C-BY33	153155.6750	616759.9180	66.367	2+85.326	10.006 RT

BY3

POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
81	X-0002C -BY3-2	154230.8270	617802.8230	70.155	11+93.698	0.336 RT
80	X-0002C -BY3-1	154326.3570	617931.0370	69.378	10+33.197	4.378 RT

BY4

POINT	DESC.	NORTH	EAST	ELEVATION	Y_RPD STATION	OFFSET
61	X0002C BY4-2 BY	154301.0570	618193.9770	66.425	3+15.867	46.490 RT
62	X0002C BY4-1	154462.8870	618273.7900	60.125	2+05.962	103.989 LT
63	X-0002C BY4-4	154531.9422	618319.6203	65.572	1+24.033	167.134 LT
64	X-0002C BY4-3	154543.5956	618381.7302	67.462	1+21.988	230.320 LT

BY5

POINT	DESC.	NORTH	EAST	ELEVATION	Y_RPD STATION	OFFSET
60	X-0002C BL-6	154376.7820	618117.6800	65.322	2+25.121	73.389 RT
61	X0002C BY4-2 BY	154301.0570	618193.9770	66.425	3+15.867	46.490 RT
65	X0002C BY5-2	154240.6380	618246.1390	68.806	3+92.968	46.123 RT
66	X0002C BY5-1	154164.3770	618310.1720	68.516	5+07.186	3.967 LT

BY7

POINT	DESC.	NORTH	EAST	ELEVATION	Y3 STATION	OFFSET
83	X0002C BY7-3	154663.7945	617778.0739	72.716	OUTSIDE PROJECT LIMITS	
84	X0002C BY7-2	154705.0330	617988.9540	73.650	12+06.783	4.530 RT
86	X0002C BY7-1	154778.3289	618333.2704	69.976	15+58.814	3.868 RT
87	X0002C BY7-4	154795.9380	618405.9584	69.318	OUTSIDE PROJECT LIMITS	

BY9

POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
260	X0002C BY9-7	154734.1257	617758.5159	74.783	11+75.961	6.234 RT
261	X0002C BY7-3	154663.7945	617778.0739	72.716	12+48.900	5.485 RT
262	X0002C BY9-5	154599.5530	617817.4720	68.648	13+23.874	5.481 LT
263	NOT SET	154382.1311	618005.8933	UNKNOWN	16+12.555	6.882 LT
264	X0002C BY9-4	154329.9860	618051.0830	66.670	16+81.555	6.335 LT
265	X0002C BL-5	154291.8750	618084.0280	66.726	17+31.929	5.873 LT
266	X0002C BL-23	154191.3950	618172.5270	69.420	18+65.801	5.900 LT
267	X0002C BY9-3	154117.4600	618239.6290	69.605	19+63.990	11.921 LT
268	X0002C BY9-2	153937.4540	618310.6720	69.174	21+55.652	6.321 LT
269	X0002C BY9-1	153769.2440	618373.3240	69.284	23+35.150	6.458 LT
270	X0002C BY9-8	153689.5952	618402.9063	68.403	24+20.115	6.444 LT

BY14

POINT	DESC.	NORTH	EAST	ELEVATION	Y_RPD STATION	OFFSET
90	X0002C BY4-3	154543.5956	618381.7302	67.462	1+21.988	230.320 LT
91	X0002C BY14-1	154488.2170	618382.4710	64.548	2+41.231	213.646 LT

BY8

POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
88	X0002C BY9-2	153937.4540	618310.6720	69.174	21+55.652	6.321 LT
89	X0002C BY8-1	153932.0414	618372.1412	69.223	21+82.136	62.055 LT

BY17

POINT	DESC.	NORTH	EAST	ELEVATION	Y4 STATION	OFFSET
92	X0002C BY5-1	154164.3770	618310.1720	68.516	10+49.381	22.743 LT
93	X0002C BY17-1	154208.2126	618369.7152	65.764	11+10.162	5.186 RT

BY18

POINT	DESC.	NORTH	EAST	ELEVATION	Y5 STATION	OFFSET
94	X0002C BY18-1	154568.3770	618302.0450	66.384	10+50.767	1.669 LT
95	X0002C BY4-4	154531.9422	618319.6203	65.572	10+10.640	6.174 LT

BY19

POINT	DESC.	NORTH	EAST	ELEVATION	Y14 STATION	OFFSET
96	X0002C BY9-7	154734.1257	617758.5159	74.783	10+05.657	12.603 LT
97	X0002C BY19-1	154690.8794	617657.3666	74.758	11+13.621	33.704 LT

BY20

POINT	DESC.	NORTH	EAST	ELEVATION	Y6 STATION	OFFSET
280	X0002C BL-11	155308.8490	618209.6430	75.444	OUTSIDE PROJECT LIMITS	
281	X0002C BY20-1	155111.6092	618257.3029	72.564	13+37.864	5.911 RT
282	X0002C BY20-2	154919.7181	618300.9054	71.313	11+41.081	5.739 RT

NEWBY1

POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
BY134	BY1-34	154764.5650	617751.0250	75.339	11+44.644	5.776 RT
BY135	BY1-35	154564.9790	617822.3020	67.127	13+54.584	11.127 RT
229	X-0002C BL-6	154376.7820	618117.6800	65.322	16+90.447	87.242 LT
BY136	BY1-36	153968.8710	618305.8770	69.383	21+24.532	12.770 LT
BY137	BY1-37	153729.2330	618388.1250	68.942	23+77.811	6.395 LT
BY138	BY1-38	153486.7710	618464.8900	68.597	26+30.510	9.902 RT

BM20 ELEVATION = 60.576
N 152874 E 616955
L STATION 83+66 59 LEFT
NAIL IN BASE OF 10 INCH PINE

BM100 ELEVATION = 70.518
N 153057 E 617581
L STATION 90+00 66 RIGHT
R/R SPIKE IN BASE OF 450MM PINE TREE

BM101 ELEVATION = 68.906
N 153533 E 617892
L STATION 95+58 31 LEFT
R/R SPIKE IN BASE OF 450MM PINE TREE

BM102 ELEVATION = 69.784
N 154100 E 618257
L STATION 101+92 139 RIGHT
R/R SPIKE IN BASE OF 375MM PINE TREE

BM103 ELEVATION = 70.457
N 154692 E 618200
L STATION 107+73 63 RIGHT
R/R SPIKE IN BASE OF 250MM CHERRY TREE

BM104 ELEVATION = 67.299
N 155419 E 618479
L STATION 116+09 17 LEFT
R/R SPIKE IN BASE OF 200MM PINE TREE

BM105 ELEVATION = 74.413
N 155522 E 618990
L STATION 121+24 36 LEFT
R/R SPIKE IN BASE OF 450MM PINE TREE

BM106 ELEVATION = 77.036
N 155513 E 619512
L STATION 126+62 61 LEFT
R/R SPIKE IN BASE OF 450MM PINE TREE

BM191 ELEVATION = 75.618
N 155410 E 619550
L STATION 126+85 47 RIGHT
3 NAILS IN BASE OF 430MM PINE TREE

BM192 ELEVATION = 64.147
N 155598 E 620307
L STATION 134+63 37 RIGHT
3 NAILS IN BASE OF 320MM PINE TREE

DATUM DESCRIPTION
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "X2D8"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 154807.5364(m) EASTING: 625333.9514(m)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: .99987479I
THE N.C. LAMBERT GRID BEARING
LOCALIZED HORIZONTAL GROUND DISTANCE FROM "X2D8" TO -L- STATION 83+40.000 IS
8,612.975M S76°35'17.10"W
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAD83/NGVD 29

BM193 ELEVATION = 47.780
N 155666 E 620938
L STATION 140+98 71 RIGHT
3 NAILS IN BASE OF 500MM PINE TREE

BM194 ELEVATION = 35.131
N 155945 E 621458
L STATION 146+55 122 LEFT
3 NAILS IN BASE OF 600MM PINE TREE

BM195 ELEVATION = 34.466
N 155892 E 622909
L STATION 159+03
N 64° 46' 10.6" E DIST . 217.925
3 NAILS IN BASE OF 250MM PINE TREE

NOTES:

1. 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:
X0002C_LS_CONTROL_060129.TXT
SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
◎ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

9/24/2010
r:\roadway\proj\x0002c_ls_1E.dgn
cnowell

PROJ. REFERENCE NO.	SHEET NO.
X-0002CB	1-F

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CENTERLINE COORDINATE LIST

Point #	Chain	Station	Northing (Y)	Easting (X)
1	L	104+00.000	154320.7994	618127.3935
2	L	104+40.000	154360.7860	618128.4268
3	L	104+80.000	154400.7727	618129.4602
4	L	105+20.000	154440.7593	618130.4935
5	L	105+60.000	154480.7460	618131.5269
6	L	106+00.000	154520.7326	618132.5602
7	L	106+40.000	154560.7193	618133.5936
8	L	106+80.000	154600.7059	618134.6269
9	L	107+20.000	154640.6926	618135.6603
10	L	107+60.000	154680.6792	618136.6937
11	L	108+00.000	154720.6659	618137.7270
12	L	108+40.000	154760.6525	618138.7604
13	L	108+80.000	154800.6382	618139.8297
14	L	109+20.000	154840.5985	618141.5749
15	L	109+60.000	154880.4383	618145.0933
16	L	110+00.000	154920.0136	618150.8688
17	L	110+40.000	154959.1945	618158.8950
18	L	110+80.000	154997.8531	618169.1458
19	L	111+20.000	155035.8631	618181.5878
20	L	111+60.000	155073.1005	618196.1802
21	L	112+00.000	155109.4438	618212.8756
22	L	112+40.000	155144.7742	618231.6193
23	L	112+80.000	155178.9764	618252.3502
24	L	113+20.000	155211.9389	618275.0006
25	L	113+60.000	155243.5539	618299.4966
26	L	114+00.000	155273.7184	618325.7582
27	L	114+40.000	155302.3337	618353.6997
28	L	114+80.000	155329.3066	618383.2298
29	L	115+20.000	155354.5489	618414.2522
30	L	115+60.000	155377.9783	618446.6657
31	L	116+00.000	155399.5182	618480.3643
32	L	116+40.000	155419.0984	618515.2380
33	L	116+80.000	155436.6549	618551.1732
34	L	117+20.000	155452.1305	618588.0523
35	L	117+60.000	155465.4746	618625.7551
36	L	118+00.000	155476.6436	618664.1584
37	L	118+40.000	155485.6011	618703.1370
38	L	118+80.000	155492.3178	618742.5635
39	L	119+20.000	155496.7719	618782.3093
40	L	119+60.000	155498.9488	618822.2446
41	L	120+00.000	155498.8413	618862.2390
42	L	120+40.000	155496.4499	618902.1620
43	L	120+80.000	155492.0185	618941.9130
44	L	121+20.000	155486.5506	618981.5372
45	L	121+60.000	155480.9424	619021.1421
46	L	122+00.000	155475.3342	619060.7470
47	L	122+40.000	155469.7260	619100.3519
48	L	122+80.000	155464.1178	619139.9568
49	L	123+20.000	155458.5097	619179.5617
50	L	123+60.000	155452.9726	619219.1766
51	L	124+00.000	155448.1575	619258.8842
52	L	124+40.000	155444.7411	619298.7357
53	L	124+80.000	155442.8095	619338.6867
54	L	125+20.000	155442.3654	619378.6819
55	L	125+60.000	155443.4095	619418.6660
56	L	126+00.000	155445.9403	619458.5836
57	L	126+40.000	155449.9543	619498.3793
58	L	126+80.000	155455.4460	619537.9982
59	L	127+20.000	155462.4077	619577.3854
60	L	127+60.000	155470.8166	619616.4894
61	L	128+00.000	155480.2431	619655.3624
62	L	128+40.000	155489.8915	619694.1813
63	L	128+80.000	155499.5402	619733.0001
64	L	129+20.000	155509.1889	619771.8190
65	L	129+60.000	155518.8377	619810.6378
66	L	130+00.000	155528.4864	619849.4566
67	L	130+40.000	155538.1352	619888.2755
68	L	130+80.000	155547.7839	619927.0943
69	L	131+20.000	155557.4327	619965.9131
70	L	131+60.000	155567.0814	620004.7320
71	L	132+00.000	155576.7301	620043.5508
72	L	132+40.000	155586.3748	620082.3706
73	L	132+80.000	155595.8835	620121.2239
74	L	133+20.000	155605.0096	620160.1687
75	L	133+60.000	155613.6894	620199.2154
76	L	134+00.000	155621.9217	620238.3589
77	L	134+40.000	155629.7055	620277.5940
78	L	134+80.000	155637.0398	620316.9156
79	L	135+20.000	155643.9236	620356.3186
80	L	135+60.000	155650.4159	620395.7882
81	L	136+00.000	155656.7647	620435.2811
82	L	136+40.000	155663.1087	620474.7748
83	L	136+80.000	155669.4527	620514.2685
84	L	137+20.000	155675.7967	620553.7622
85	L	137+60.000	155682.1408	620593.2560
86	L	138+00.000	155688.4848	620632.7497
87	L	138+40.000	155694.8288	620672.2434
88	L	138+80.000	155701.1728	620711.7371
89	L	139+20.000	155707.5168	620751.2308
90	L	139+60.000	155713.8608	620790.7245
91	L	140+00.000	155720.2048	620830.2182
92	L	140+40.000	155726.5489	620869.7120
93	L	140+80.000	155732.8929	620909.2057
94	L	141+20.000	155739.2369	620948.6994
95	L	141+60.000	155745.5809	620988.1931
96	L	142+00.000	155751.9249	621027.6868
97	L	142+40.000	155758.2689	621067.1805
98	L	142+80.000	155764.6130	621106.6742
99	L	143+20.000	155770.9570	621146.1680
100	L	143+60.000	155777.3010	621185.6617
101	L	144+00.000	155783.6450	621225.1554
102	L	144+40.000	155789.9890	621264.6491
103	L	144+80.000	155796.3330	621304.1428
104	L	145+20.000	155802.6770	621343.6365
105	L	145+60.000	155809.0211	621383.1302
106	L	146+00.000	155815.3651	621422.6240
107	L	146+40.000	155821.7091	621462.1177
108	L	146+80.000	155828.0531	621501.6114
109	L	147+20.000	155834.3971	621541.1051
110	L	147+60.000	155840.7411	621580.5988
111	L	148+00.000	155847.0851	621620.0925
112	L	148+40.000	155853.4292	621659.5862
113	L	148+80.000	155859.7388	621699.0854
114	L	149+20.000	155865.7042	621738.6378
115	L	149+60.000	155871.0213	621778.2823
116	L	150+00.000	155875.6570	621818.0123
117	L	150+40.000	155879.6100	621857.8160
118	L	150+80.000	155882.8791	621897.6817
119	L	151+20.000	155885.4634	621937.5976
120	L	151+60.000	155887.3620	621977.5520
121	L	152+00.000	155888.5746	622017.5332
122	L	152+40.000	155889.1006	622057.5292
123	L	152+80.000	155888.9399	622097.5284
124	L	153+20.000	155888.0926	622137.5189
125	L	153+60.000	155886.5590	622177.4890
126	L	154+00.000	155884.3394	622217.4269
127	L	154+40.000	155881.4345	622257.3208
128	L	154+80.000	155877.8453	622297.1590
129	L	155+20.000	155873.5726	622336.9296
130	L	155+60.000	155868.6179	622376.6211
131	L	156+00.000	155862.9826	622416.2216
132	L	156+40.000	155856.6683	622455.7196
133	L	156+80.000	155849.6768	622495.1034
134	L	157+20.000	155842.0103	622534.3613
135	L	157+60.000	155833.6710	622573.4818
136	L	158+00.000	155824.6614	622612.4535
137	L	158+40.000	155814.9841	622651.2647
138	L	158+80.000	155804.7040	622689.9208
139	L	159+03.018	155798.6469	622712.1280
140	Y_RPA	0+00.000	154701.0394	618123.0151
141	Y_RPA	0+20.000	154681.1388	618121.0235
142	Y_RPA	0+40.000	154661.2646	618118.7864
143	Y_RPA	0+60.000	154641.4522	618116.0595
144	Y_RPA	0+80.000	154621.7551	618112.6009
145	Y_RPA	1+00.000	154602.2525	618108.1794
146	Y_RPA	1+20.000	154583.0242	618102.6868
147	Y_RPA	1+40.000	154564.1305	618096.1350
148	Y_RPA	1+60.000	154545.6298	618088.5441
149	Y_RPA	1+80.000	154527.5791	618079.9377
150	Y_RPA	2+00.000	154510.0342	618070.3423
151	Y_RPA	2+20.000	154493.0491	618059.7875
152	Y_RPA	2+40.000	154476.6763	618048.3058
153	Y_RPA	2+60.000	154460.9663	618035.9327
154	Y_RPA	2+80.000	154446.0473	618022.6207
155	Y_RPA	3+00.000	154433.0501	618007.4595
156	Y_RPA	3+20.000	154424.1880	617989.6168
157	Y_RPA	3+40.000	154422.1195	617969.8557
158	Y_RPA	3+60.000	154427.8965	617950.8472
159	Y_RPA	3+80.000	154440.1758	617935.1594
160	Y_RPA	4+00.000	154455.4419	617922.2536
161	Y_RPA	4+00.488	154455.8259	617921.9518
162	Y_RPD	0+00.000	154627.0607	618149.5127
163	Y_RPD	0+20.000	154607.0665	618149.0331
164	Y_RPD	0+40.000	154587.0684	618148.7756
165	Y_RPD	0+60.000	154567.0699	618148.9626
166	Y_RPD	0+80.000	154547.0893	618149.8159
167	Y_RPD	1+00.000	154527.1668	618151.5514
168	Y_RPD	1+20.000	154507.3553	618154.2759
169	Y_RPD	1+40.000	154487.7048	618157.9872
170	Y_RPD	1+60.000	154468.2643	618162.6759
171	Y_RPD	1+80.000	154449.0825	618168.3303
172	Y_RPD	2+00.000	154430.2072	618174.9364
173	Y_RPD	2+20.000	154411.6857	618182.4777
174	Y_RPD	2+40.000	154393.5642	618190.9352
175	Y_RPD	2+60.000	154375.8881	618200.2878
176	Y_RPD	2+80.000	154358.7015	618210.5121
177	Y_RPD	3+00.000	154342.0474	618221.5827
178	Y_RPD	3+20.000	154325.9673	618233.4717
179	Y_RPD	3+40.000	154310.4537	618246.0921
180	Y_RPD	3+60.000	154295.3457	618259.1966
181	Y_RPD	3+80.000	154280.4344	618272.5253
182	Y_RPD	4+00.000	154265.3300	618285.6320
183	Y_RPD	4+20.000	154249.2086	618297.4482
184	Y_RPD	4+40.000	154231.4589	618306.5967
185	Y_RPD	4+60.000	154212.1793	618311.7580
186	Y_RPD	4+80.000	154192.2355	618312.5235
187	Y_RPD	5+00.000	154172.6170	618308.8551
188	Y_RPD	5+20.000	154154.2657	618300.9954
189	Y_RPD	5+40.000	154137.4686	618290.1633
190	Y_RPD	5+60.000	154121.5927	618278.0018
191	Y_RPD	5+80.000	154105.8553	618265.6593
192	Y_RPD	6+00.000	154090.1180	618253.3168
193	Y_RPD	6+20.000	154074.3807	618240.9743
194	Y_RPD	6+40.000	154058.6434	618228.6318
195	Y_RPD	6+45.631	154054.2123	618225.1566
196	Y2	13+00.000	154742.8580	618070.8558
197	Y2	13+20.000	154762.5331	618073.6551
198	Y2	13+40.000	154782.5168	618074.4605
199	Y2	13+60.000	154802.5006	618075.2659
200	Y2	13+80.000	154822.4844	618076.0713
201	Y2	14+00.000	154841.8215	618072.1131
202	Y2	14+20.000	154855.9636	618058.3568
203	Y2	14+40.000	154860.4190	618039.1375
204	Y2	14+49.806	154858.7802	618029.4813
205	Y5	10+00.000	154526.2361	618330.5184
206	Y5	10+20.000	154543.1527	618319.8494
207	Y5	10+40.000	154560.0694	618309.1804
208	Y5	10+60.000	154577.4585	618299.3545
209	Y5	10+80.000	154596.6176	618293.8000
210	Y5	11+00.000	154616.5552	618293.1583
211	Y5	11+20.000	154636.0435	618297.4342
212	Y5	11+40.000	154655.0751	618303.5821
213	Y5	11+60.000	154674.1067	618309.7301
214	Y5	11+80.000	154693.1384	618315.8780
215	Y5	12+00.000	154712.1700	618322.0260
216	Y5	12+20.000	154731.2206	618328.1123
217	Y5	12+40.000	154750.9526	618331.0400
218	Y5	12+60.000	154770.7955	618328.9954
219	Y5	12+70.359	154780.8947	618326.6913
220	Y6	10+00.000	154780.8947	618326.6913
221	Y6	10+20.000	154800.3936	618322.2427
222	Y6	10+40.000	154819.8926	618317.7941
223	Y6	10+60.000	154839.3916	618313.3455
224	Y6	10+80.000	154858.8906	618308.8968
225	Y6	11+00.000	154878.3895	618304.4482
226	Y6	11+20.000	154897.8885	618299.9996
227	Y6	11+40.000	154917.3875	618295.5510
228	Y6	11+60.000	154936.8864	618291.1024
229	Y6	11+80.000	154956.3854	618286.6537
230	Y6	12+00.000	154975.8844	618282.2051
231	Y6	12+20.000	154995.3833	618277.7565
232	Y6	12+40.000	155014.8823	618273.3079
233	Y6	12+60.000	155034.3813	618268.8592
234	Y6	12+80.000	155053.8802	618264.4106
235	Y6	13+00.000	155073.3792	618259.9620
236	Y6	13+20.000	155092.8782	618255.5134
237	Y6	13+40.000	155112.3771	618251.0647
238	Y6	13+60.000	155131.9517	618246.9681
239	Y6	13+80.000	155151.5582	618243.0202
240	Y6	14+00.000	155171.1646	618239.0722
241	Y6	14+20.000	155190.7711	618235.1243
242	Y6	14+40.000	155210.3776	618231.1764
243	Y6	14+60.000	155229.9841	618227.2285
244	Y6	14+80.000	155249.5905	618223.2805
245	Y6	15+00.000	155269.1970	618219.3326
246	Y6	15+20.000	155288.8035	618215.3847
247	Y6	15+25.483	155294.1784	618214.3024
248	Y7	10+00.000	154885.9983	618158.0485
249	Y7	10+20.000	154905.4889	618153.5633
250	Y7	10+40.000	154924.9795	618149.0781
251	Y7	10+60.000	154944.4701	618144.5929
252	Y7	10+80.000	154963.9607	618140.1077
253	Y7	11+00.000	154983.4513	618135.6225
254	Y7	11+20.000	155002.9418	618131.1373
255	Y7	11+40.000	155022.4324	618126.6521
256	Y7	11+60.000	155041.9230	618122.1669
257	Y7	11+80.000	155061.4136	618117.6817
258	Y7	12+00.000	155080.9042	618113.1965
259	Y7	12+10.702	155091.3333	618110.7965
260	Y8	10+00.000	155076.3926	618049.8172
261	Y8	10+20.000	155080.4834	618069.3944
262	Y8	10+40.000	155084.5742	618088.9715
263	Y8	10+60.000	155088.6651	618108.5487
264	Y8	10+80.000	155092.7559	618128.1258
265	Y8	11+00.000	155096.8467	618147.7030
266	Y8	11+20.000	155100.9375	618167.2802
267	Y8	11+40.000	155105.0283	618186.8573
268	Y8	11+60.000	155109.1191	618206.4345
269	Y8	11+80.000	155113.2100	618226.0116
270	Y8	12+00.000	155117.3008	618245.5888
271	Y8	12+20.000	155121.2576	618265.1934
272	Y8	12+40.000	155125.1783	618284.8053
273	Y8	12+60.000	155129.0990	618304.4172
274	Y8	12+80.000	155133.0197	618324.0292
275	Y8	13+00.000	155136.9404	618343.6411
276	Y8	13+20.000	155140.8610	618363.2531
277	Y8	13+40.000	155144.7817	618382.8650
278	Y8	13+60.000	155148.7024	618402.4769
279	Y8	13+80.000	155152.6231	618422.0889
280	Y8	14+00.000	155156.5438	618441.7008
281	Y8	14+05.111	155157.5458	618446.7128
282	Y8_REV	11+00.000	155114.1657	618139.6005
283	Y8_REV	11+20.000	155131.0699	618150.2393
284	Y8_REV	11+40.000	155148.4894	618160.0659
285	Y8_REV	11+60.000	155165.9089	618169.8925
286	Y8_REV	11+80.000	155183.3284	618179.7190
287	Y8_REV	12+00.000	155200.7479	618189.5456
288	Y8_REV	12+20.000	155218.1674	618199.3722
289	Y8_REV	12+40.000	155235.6446	618209.0917
290	Y8_REV	12+60.000	155254.4937	618215.6213
291	Y8_REV	12+80.000	155274.3722	618217.2846
292	Y8_REV	12+92.574	155286.8430	618215.7794
293	Y9	10+00.000	155603.9951	620511.2100
294	Y9	10+20.000	155607.1671	620530.9568
295	Y9	10+40.000	155610.3391	620550.7037
296	Y9	10+60.000	155613.5111	620570.4505
297	Y9	10+80.000	155616.6832	620590.1974
298	Y9	11+00.000	155619.8552	620609.9442
299	Y9	11+20.000	155623.0272	620629.6911
300	Y9	11+40.000	155626.1992	620649.4380
301	Y9	11+60.000	155629.3712	620669.1848
302	Y9	11+80.000	155632.5432	620688.9317
303	Y9	12+00.000	155635.7152	620708.6785
304	Y9	12+20.000	155638.8771	620728.4270
305	Y9	12+40.000	155641.9446	620748.1903
306	Y9	12+60.000	155644.8990	620767.9709
307	Y9	12+80.000	155647.7402	620787.7680
308	Y9	13+00.000	155650.4680	620807.5811
309	Y9	13+20.000	155653.0824	620827.4095
310	Y9	13+40.000	155655.5833	620847.2525
311	Y9	13+60.000	155657.9886	620867.1073
312	Y9	13+80.000	155659.5293	620887.0415
313	Y9	14+00.000	155659.3330	620907.0343
314	Y9	14+20.000	155657.4012	620926.9344
315	Y9	14+40.000	155653.7483	620946.5916
316	Y9	14+60.000	155648.4021	620965.8573
317	Y9	14+80.000	155641.4030	620984.5859
318	Y9	15+00.000	155632.8038	621002.6358
319	Y9	15+03.789	155630.9995	621005.9676
320	Y10	10+00.000	155956.1435	620621.4520
321	Y10	10+20.000	155943.0687	620636.5864
322	Y10	10+40.000	155929.9939	620651.7208
323	Y10	10+60.000	155916.9191	620666.8552
324	Y10	10+80.000	155903.8443	620681.9896
325	Y10	11+00.000	155890.7695	620697.1240
326	Y10	11+20.000	155877.6947	620712.2583
327	Y10	11+40.000	155864.6200	620727.3927
328	Y10	11+60.000	155851.5452	620742.5271
329	Y10	11+80.000	155838.4704	620757.6615
330	Y10	12+00.000	155825.3956	620772.7959
331	Y10	12+20.000	155812.3208	620787.9303
332	Y10	12+40.000	155799.2460	620803.0647
333	Y10	12+60.000	155786.1712	620818.1991
334	Y10	12+80.000	155773.0964	620833.3335
335	Y10	13+00.000	155760.0216	620848.4679
336	Y10	13+20.000	155746.9557	620863.6099
337	Y10	13+40.000	155733.9303	620878.7868
338	Y10	13+60.000	155720.9483	620894.0009
339	Y10	13+80.000	155708.0098	620909.2520
340	Y10	14+00.000	155695.1150	620924.5400
341	Y10	14+20.000	155682.2638	620939.8647
342	Y10	14+40.000	155669.4470	620955.2182
343	Y10	14+60.000	155656.6327	620970.5738
344	Y10	14+80.000	155643.9584	620986.0425
345	Y10	15+00.000	155632.8692	621002.6720
346	Y10	15+20.000	155623.8721	621020.5203
347	Y10	15+40.000	155617.0991	621039.3256
348	Y10	15+60.000	155612.6498	621058.8118
349	Y10	15+80.000	155610.5481	621078.6907
350	Y10	16+00.000	155609.2491	621098.6485
351	Y10	16+20.000	155607.9501	621118.6062
352	Y10	16+23.032	155607.7531	621121.6323
353	Y12	10+00.000	155264.9543	621366.5559
354	Y12	10+20.000	155284.6712	621369.9089
355	Y12	10+40.000	155304.3882	621373.2618
356	Y12	10+60.000	155324.1051	621376.6148
357	Y12	10+80.000	155343.8220	621379.9678
358	Y12	11+00.000	155363.5390	621383.3207
359	Y12	11+20.000	155383.2559	621386.6737
360	Y12	11+40.000	155402.9729	621390.0267
361	Y12	11+60.000	155422.6898	621393.3796
362	Y12	11+80.000	155442.4067	621396.7326
363	Y12	12+00.000	155462.1237	621400.0856
364	Y12	12+20.000	155481.8406	621403.4385
365	Y12	12+40.000	155501.5575	621406.7915
366	Y12	12+60.000	155521.2745	621410.1445
367	Y12	12+80.000	155540.9914	621413.4974
368	Y12	13+00.000	155560.7084	621416.8504
369	Y12	13+20.000	155580.4253	621420.2034
370	Y12	13+40.000	155600.1422	621423.5563
371	Y12	13+60.000	155619.8592	621426.9093
372	Y12	13+80.000	155639.5761	621430.2623
373	Y12	14+00.000	155659.2930	621433.6153
374	Y12	14+20.000	155679.0100	621436.9682
375	Y12	14+40.000	155698.7269	621440.3212
376	Y12	14+60.000	155718.4439	621443.6742
377	Y12	14+80.000	155738.1608	621447.0271
378	Y12	15+00.000	155757.8777	621450.3801
379	Y12	15+20.000	155777.5947	621453.7331
380	Y12	15+40.000	155797.3116	621457.0860
381	Y12	15+60.000	155817.0285	621460.4390
382	Y12	15+80.000	155836.7455	621463.7920
383	Y12	16+00.000	155856.4624	621467.1449
384	Y12	16+20.000	155876.1794	621470.4979
385	Y12	16+40.000	155895.8963	621473.8509
386	Y12	16+60.000	155915.6132	621477.2038
387	Y12	16+80.000	155935.3302	621480.5568
388	Y12	17+00.000	155955.0471	621483.9098
389	Y12	17+20.000	155974.7640	621487.2627
390	Y12	17+40.000	155994.4810	621490.6157
391	Y12	17+60.000	156014.1979	621493.9687
392	Y12	17+80.000	156033.9148	621497.3216
393	Y12	18+00.000	156053.6318	621500.6746
394	Y12	18+20.000	156073.3487	621504.0276
395	Y12	18+40.000	156093.0657	621507.3805
396	Y12	18+60.000	156112.7826	621510.7335
397	Y12	18+80.000	156132.4995	621514.0865
398	Y12	19+00.000	156152.2165	621517.4394
399	Y12	19+15.578	156167.5736	621520.0510

PROJ. REFERENCE NO.	SHEET NO.
X-0002CB	1-G

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CENTERLINE COORDINATE LIST

Point #	Chain	Station	Northing (Y)	Easting (X)
400	Y12_RPA	0+00.000	155895.4826	621876.5815
401	Y12_RPA	0+20.000	155895.1974	621856.5836
402	Y12_RPA	0+40.000	155894.7405	621836.5889
403	Y12_RPA	0+60.000	155894.1120	621816.5988
404	Y12_RPA	0+80.000	155893.3119	621796.6149
405	Y12_RPA	1+00.000	155892.3404	621776.6386
406	Y12_RPA	1+20.000	155891.1975	621756.6713
407	Y12_RPA	1+40.000	155889.8952	621736.7138
408	Y12_RPA	1+60.000	155888.4690	621716.7647
409	Y12_RPA	1+80.000	155886.9570	621696.8220
410	Y12_RPA	2+00.000	155885.3971	621676.8829
411	Y12_RPA	2+20.000	155883.8249	621656.9448
412	Y12_RPA	2+40.000	155882.2525	621637.0067
413	Y12_RPA	2+60.000	155880.6802	621617.0686
414	Y12_RPA	2+80.000	155879.1079	621597.1305
415	Y12_RPA	3+00.000	155877.4047	621577.2036
416	Y12_RPA	3+20.000	155874.7913	621557.3793
417	Y12_RPA	3+40.000	155870.3074	621537.9007
418	Y12_RPA	3+60.000	155863.1887	621519.2300
419	Y12_RPA	3+80.000	155853.3922	621501.8146
420	Y12_RPA	4+00.000	155841.1324	621486.0360
421	Y12_RPA	4+20.000	155826.6778	621472.2398
422	Y12_RPA	4+40.000	155810.3451	621460.7284
423	Y12_RPA	4+60.000	155792.4922	621451.7538
424	Y12_RPA	4+80.000	155773.5102	621445.5128
425	Y12_RPA	4+90.143	155763.5839	621443.4385
426	Y12_RPA1	3+00.000	155881.1244	621576.9094
427	Y12_RPA1	3+20.000	155879.5521	621556.9713
428	Y12_RPA1	3+40.000	155877.9797	621537.0332
429	Y12_RPA1	3+60.000	155876.4074	621517.0951
430	Y12_RPA1	3+80.000	155878.0379	621497.3087
431	Y12_RPA1	3+95.363	155884.6964	621483.5099
432	Y12_RPB	0+00.000	155705.6770	620650.2444
433	Y12_RPB	0+20.000	155708.8616	620669.9892
434	Y12_RPB	0+40.000	155712.1213	620689.7218
435	Y12_RPB	0+60.000	155715.5313	620709.4289
436	Y12_RPB	0+80.000	155719.1538	620729.0980
437	Y12_RPB	1+00.000	155723.0002	620748.7245
438	Y12_RPB	1+20.000	155727.0410	620768.3120
439	Y12_RPB	1+40.000	155731.2044	620787.8738
440	Y12_RPB	1+60.000	155735.4164	620807.4252
441	Y12_RPB	1+80.000	155739.6318	620826.9760
442	Y12_RPB	2+00.000	155743.8472	620846.5267
443	Y12_RPB	2+20.000	155748.0626	620866.0774
444	Y12_RPB	2+40.000	155752.2780	620885.6281
445	Y12_RPB	2+60.000	155756.4934	620905.1788
446	Y12_RPB	2+80.000	155760.7088	620924.7295
447	Y12_RPB	3+00.000	155764.9242	620944.2803
448	Y12_RPB	3+20.000	155769.1396	620963.8310
449	Y12_RPB	3+40.000	155773.3550	620983.3817
450	Y12_RPB	3+60.000	155777.5704	621002.9324
451	Y12_RPB	3+80.000	155781.7858	621022.4831
452	Y12_RPB	4+00.000	155786.0012	621042.0338
453	Y12_RPB	4+20.000	155790.2166	621061.5845
454	Y12_RPB	4+40.000	155794.4320	621081.1353
455	Y12_RPB	4+60.000	155798.6474	621100.6860
456	Y12_RPB	4+80.000	155802.8628	621120.2367
457	Y12_RPB	5+00.000	155807.0782	621139.7874
458	Y12_RPB	5+20.000	155811.2935	621159.3381
459	Y12_RPB	5+40.000	155815.5089	621178.8888
460	Y12_RPB	5+60.000	155819.7243	621198.4395
461	Y12_RPB	5+80.000	155823.9397	621217.9903
462	Y12_RPB	6+00.000	155828.1551	621237.5410
463	Y12_RPB	6+20.000	155832.3705	621257.0917
464	Y12_RPB	6+40.000	155836.5859	621276.6424
465	Y12_RPB	6+60.000	155840.8013	621296.1931
466	Y12_RPB	6+80.000	155845.0167	621315.7438
467	Y12_RPB	7+00.000	155849.2321	621335.2945
468	Y12_RPB	7+20.000	155853.4475	621354.8453
469	Y12_RPB	7+40.000	155857.5617	621374.4170
470	Y12_RPB	7+60.000	155860.1382	621394.2343
471	Y12_RPB	7+80.000	155858.7661	621414.1311
472	Y12_RPB	8+00.000	155851.3312	621432.5823
473	Y12_RPB	8+20.000	155837.8361	621447.1937
474	Y12_RPB	8+40.000	155820.0265	621456.0498
475	Y12_RPB	8+60.000	155800.2316	621457.9923
476	Y12_RPB	8+64.645	155795.6254	621457.4078
477	Y12_RPB1	8+00.000	155870.4841	621433.0053

Point #	Chain	Station	Northing (Y)	Easting (X)
478	Y12_RPB1	8+20.000	155880.4107	621450.1786
479	Y12_RPB1	8+40.000	155896.7566	621461.4156
480	Y12_RPB1	8+49.521	155905.9051	621463.9892
481	Y12_RPC	0+00.000	155674.4645	620635.0018
482	Y12_RPC	0+20.000	155676.8588	620654.8580
483	Y12_RPC	0+40.000	155679.2531	620674.7141
484	Y12_RPC	0+60.000	155681.6474	620694.5703
485	Y12_RPC	0+80.000	155684.0417	620714.4265
486	Y12_RPC	1+00.000	155686.4360	620734.2826
487	Y12_RPC	1+20.000	155688.8303	620754.1388
488	Y12_RPC	1+40.000	155691.2246	620773.9950
489	Y12_RPC	1+60.000	155693.6189	620793.8511
490	Y12_RPC	1+80.000	155696.0132	620813.7073
491	Y12_RPC	2+00.000	155698.4075	620833.5635
492	Y12_RPC	2+20.000	155700.8018	620853.4196
493	Y12_RPC	2+40.000	155703.1961	620873.2758
494	Y12_RPC	2+60.000	155705.5905	620893.1320
495	Y12_RPC	2+80.000	155707.9848	620912.9881
496	Y12_RPC	3+00.000	155710.3791	620932.8443
497	Y12_RPC	3+20.000	155712.7734	620952.7004
498	Y12_RPC	3+40.000	155715.1677	620972.5566
499	Y12_RPC	3+60.000	155717.5620	620992.4128
500	Y12_RPC	3+80.000	155719.9563	621012.2689
501	Y12_RPC	4+00.000	155722.3506	621032.1251
502	Y12_RPC	4+20.000	155724.7449	621051.9813
503	Y12_RPC	4+40.000	155727.1392	621071.8374
504	Y12_RPC	4+60.000	155729.5335	621091.6936
505	Y12_RPC	4+80.000	155731.9278	621111.5498
506	Y12_RPC	5+00.000	155734.3221	621131.4059
507	Y12_RPC	5+20.000	155736.7164	621151.2621
508	Y12_RPC	5+40.000	155739.1107	621171.1183
509	Y12_RPC	5+60.000	155741.5050	621190.9744
510	Y12_RPC	5+80.000	155743.8993	621210.8306
511	Y12_RPC	6+00.000	155746.2936	621230.6868
512	Y12_RPC	6+20.000	155748.6879	621250.5429
513	Y12_RPC	6+40.000	155751.0822	621270.3991
514	Y12_RPC	6+60.000	155753.4765	621290.2553
515	Y12_RPC	6+80.000	155755.8708	621310.1114
516	Y12_RPC	7+00.000	155758.2651	621329.9676
517	Y12_RPC	7+20.000	155760.7857	621349.8077
518	Y12_RPC	7+40.000	155764.2018	621369.5096
519	Y12_RPC	7+60.000	155769.4637	621388.7927
520	Y12_RPC	7+80.000	155777.3205	621407.1650
521	Y12_RPC	8+00.000	155787.8031	621424.1763
522	Y12_RPC	8+20.000	155800.6818	621439.4539
523	Y12_RPC	8+40.000	155815.6746	621452.6633
524	Y12_RPC	8+60.000	155832.4529	621463.5149
525	Y12_RPC	8+80.000	155850.6492	621471.7710
526	Y12_RPC	9+00.000	155869.8648	621477.2508
527	Y12_RPC	9+04.763	155874.5455	621478.1320
528	Y12_RPC1	8+00.000	155760.8606	621429.3901
529	Y12_RPC1	8+10.214	155756.3684	621438.5598
530	Y12_RPD	0+00.000	155870.6473	621927.4808
531	Y12_RPD	0+20.000	155869.3050	621907.5261
532	Y12_RPD	0+40.000	155867.5436	621887.6044
533	Y12_RPD	0+60.000	155865.1183	621867.7533
534	Y12_RPD	0+80.000	155861.8293	621848.0274
535	Y12_RPD	1+00.000	155857.7453	621828.4498
536	Y12_RPD	1+20.000	155853.1517	621808.9847
537	Y12_RPD	1+40.000	155848.3461	621789.5707
538	Y12_RPD	1+60.000	155843.5228	621770.1610
539	Y12_RPD	1+80.000	155838.6995	621750.7513
540	Y12_RPD	2+00.000	155833.8761	621731.3416
541	Y12_RPD	2+20.000	155829.0528	621711.9320
542	Y12_RPD	2+40.000	155824.2295	621692.5223
543	Y12_RPD	2+60.000	155819.4062	621673.1126
544	Y12_RPD	2+80.000	155814.5829	621653.7029
545	Y12_RPD	3+00.000	155809.7595	621634.2933
546	Y12_RPD	3+20.000	155804.9362	621614.8836
547	Y12_RPD	3+40.000	155800.1129	621595.4739
548	Y12_RPD	3+60.000	155795.2896	621576.0642
549	Y12_RPD	3+80.000	155790.4764	621556.6521
550	Y12_RPD	4+00.000	155786.5016	621537.0591
551	Y12_RPD	4+20.000	155785.6413	621517.1173
552	Y12_RPD	4+40.000	155790.2687	621497.7569
553	Y12_RPD	4+60.000	155801.3546	621481.2428
554	Y12_RPD	4+80.000	155817.5893	621469.7516
555	Y12_RPD	5+00.000	155836.8495	621464.7861
556	Y12_RPD	5+13.142	155849.9444	621465.4279

Point #	Chain	Station	Northing (Y)	Easting (X)
557	Y12_RPD1	4+00.000	155785.6427	621537.2449
558	Y12_RPD1	4+20.000	155780.8193	621517.8353
559	Y12_RPD1	4+40.000	155775.9960	621498.4256
560	Y12_RPD1	4+60.000	155769.2684	621479.6972
561	Y12_RPD1	4+80.000	155755.5174	621465.4014
562	Y12_RPD1	4+98.637	155738.3028	621458.6149

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

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

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	2

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

10/27/10

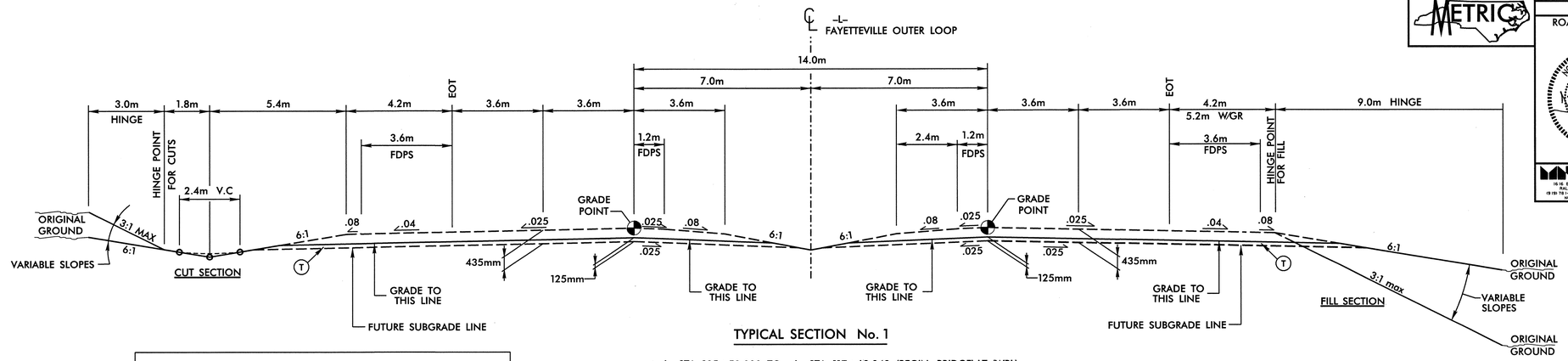
PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER JOHN CHI CHEN

11/2/10

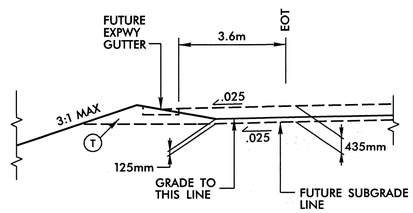
MOFFATT & NICHOL

1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4669 FAX
NC LICENSE NUMBER F-0105



TYPICAL SECTION No. 1

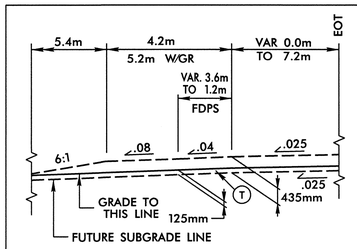
-L- STA 105+50.000 TO -L- STA 117+68.349 (BEGIN BRIDGE) LT (WBL)
-L- STA 105+50.000 TO -L- STA 117+67.354 (BEGIN BRIDGE) RT (EBL)
-L- STA 118+66.675 (END BRIDGE) TO -L- STA 143+00.000 LT (WBL)
-L- STA 118+67.670 (END BRIDGE) TO -L- STA 142+30.000 RT (EBL)



INSET DETAIL No. 1

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

-L- STA 129+80.000 TO -L- STA 130+40.000 LT (WBL)
-L- STA 135+80.000 TO -L- STA 138+00.000 LT (WBL)
-L- STA 143+00.000 TO -L- STA 143+30.000 LT (WBL)
-L- STA 117+20.000 TO -L- STA 117+67.354 (BEGIN BRIDGE) RT (EBL)
-L- STA 118+67.670 (END BRIDGE) TO -L- STA 121+20.000 RT (EBL)
-L- STA 129+20.000 TO -L- STA 130+40.000 RT (EBL)
-L- STA 135+60.000 TO -L- STA 138+00.000 -L- RT (EBL)
* -L- STA 141+60.000 TO -L- STA 142+30.000 (BEGIN BRIDGE) RT (EBL)



INSET DETAIL No. 2

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

-L- STA 134+80.000 TO -L- STA 138+20.000 LT
-L- STA 107+06.371 TO -L- STA 109+40.000 RT

PAVEMENT SCHEDULE

CODE	DESCRIPTION
C1	PROP. APPROX. 80mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 96 kg PER SQ. METER IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 2.4 kg PER SQ. METER PER 1mm DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 40mm OR GREATER THAN 50mm IN DEPTH.
C3	PROP. APPROX. 60mm ASPHALT CONC. SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 70.5 kg PER SQ. METER IN EACH OF TWO LAYERS.
C4	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 2.35 kg PER SQ. METER PER 1mm DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 25mm OR GREATER THAN 40mm IN DEPTH.
D1	PROP. APPROX. 100mm ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 245 kg PER SQ. METER.
D2	PROP. VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 2.45 kg PER SQ. METER PER 1mm DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 65mm OR GREATER THAN 110mm IN DEPTH.
E1	PROP. APPROX. 100mm ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 245 kg PER SQ. METER.
E2	PROP. APPROX. 120mm ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 294 kg PER SQ. METER.
E3	PROP. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 2.45 kg PER SQ. METER PER 1mm DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 75mm OR GREATER THAN 140mm IN DEPTH.
J1	PROP. 150mm AGGREGATE BASE COURSE
J2	PROP. 200mm AGGREGATE BASE COURSE
P	PRIME COAT AT THE RATE OF 1.6 L PER SQ. METER.

CODE	DESCRIPTION
R1	750mm CONC. CURB & GUTTER
R2	600mm CONCRETE VALLEY GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VARIABLE DEPTH BITUMINOUS PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET NO. 2-G)

NOTE: ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.

6/16/99
10/27/2010
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PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	2-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

10-19-10

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER CHI CHEN

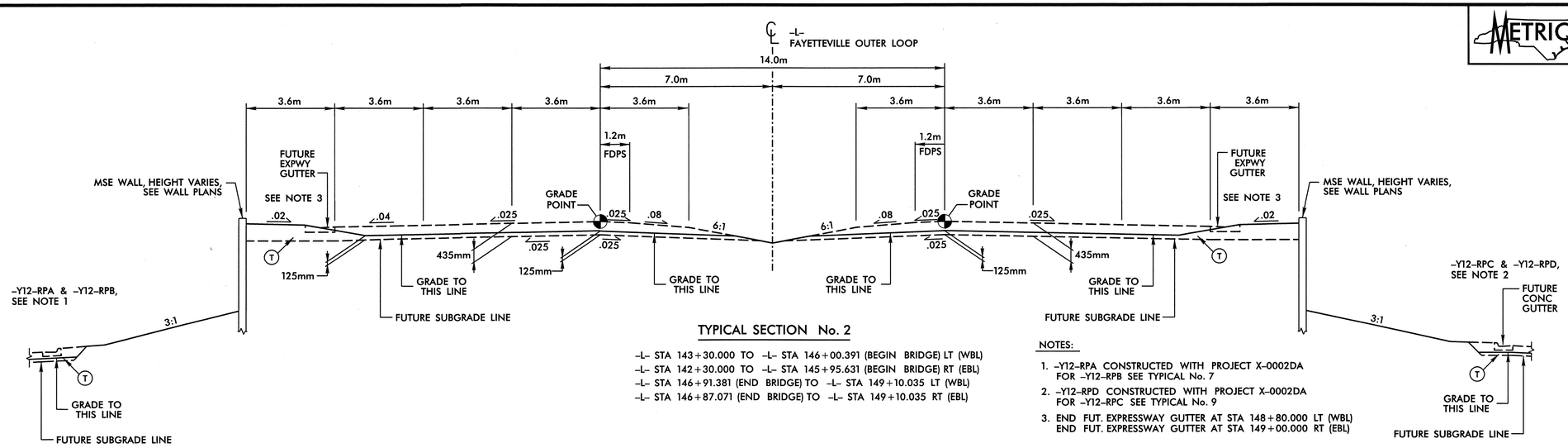
10/22/10

MOFFATT & NICHOL
16 W. EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-1441 (919) 781-1308 FAX
NC LICENSE NUMBER F-0109

PAVEMENT SCHEDULE

CODE	DESCRIPTION
T	EARTH MATERIAL

NOTE: ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.

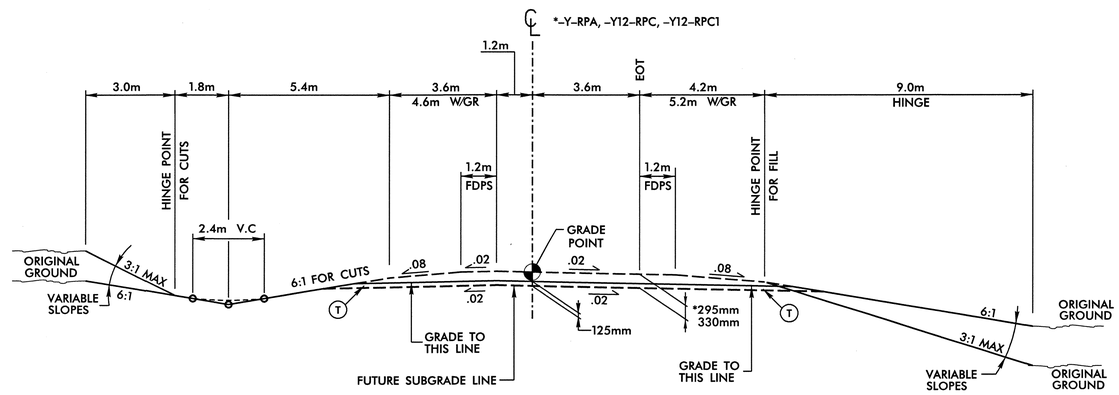


TYPICAL SECTION No. 2

-L- STA 143+30.000 TO -L- STA 146+00.391 (BEGIN BRIDGE) LT (WBL)
-L- STA 142+30.000 TO -L- STA 145+95.631 (BEGIN BRIDGE) RT (EBL)
-L- STA 146+91.381 (END BRIDGE) TO -L- STA 149+10.035 LT (WBL)
-L- STA 146+87.071 (END BRIDGE) TO -L- STA 149+10.035 RT (EBL)

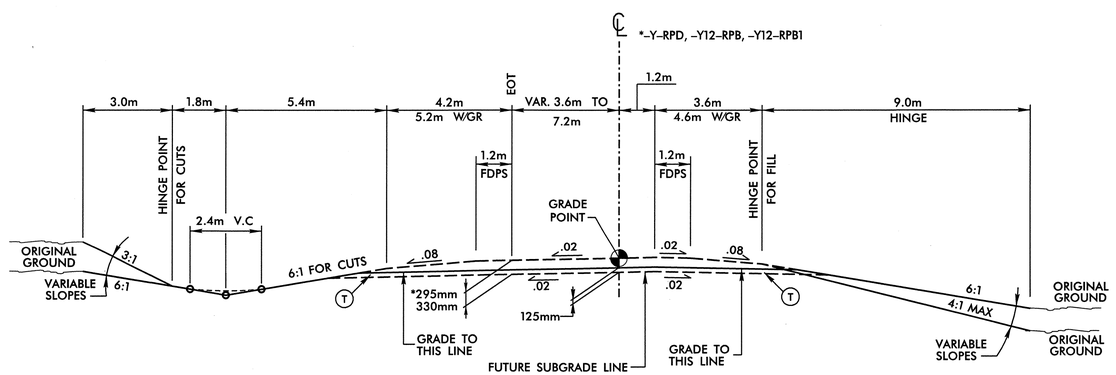
NOTES:

1. -Y12-RPA CONSTRUCTED WITH PROJECT X-0002DA FOR -Y12-RPB SEE TYPICAL No. 7
2. -Y12-RPD CONSTRUCTED WITH PROJECT X-0002DA FOR -Y12-RPC SEE TYPICAL No. 9
3. END FUT. EXPRESSWAY GUTTER AT STA 148+80.000 LT (WBL)
   END FUT. EXPRESSWAY GUTTER AT STA 149+00.000 RT (EBL)



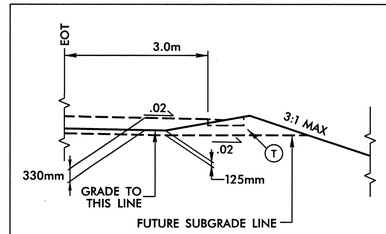
TYPICAL SECTION No. 3

* -Y-RPA STA 0+00.000 TO -Y-RPA STA 2+70.000
-Y12-RPC STA 0+00.000 TO -Y12-RPC STA 3+20.000
-Y12-RPC1 STA 7+01.646 TO -Y12-RPC1 STA 7+72.982



TYPICAL SECTION No. 4

* -Y-RPD STA 0+00.000 TO -Y-RPD STA 1+50.000
-Y12-RPB STA 0+00.000 TO -Y12-RPB STA 3+20.000
-Y12-RPB1 STA 7+71.347 TO -Y12-RPB1 STA 7+89.391



INSET DETAIL No. 3

TO BE USED IN CONJUNCTION WITH TYPICAL SECTION No. 3 AS FOLLOWS:

-Y12-RPC STA 0+00.000 TO STA -Y12-RPC 0+60.000 RT
-Y12-RPC STA 1+60.000 TO STA -Y12-RPC 2+40.000 RT

10/15/2010
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bartman

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	2-B

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID
9-29-2010

PAVEMENT DESIGN ENGINEER

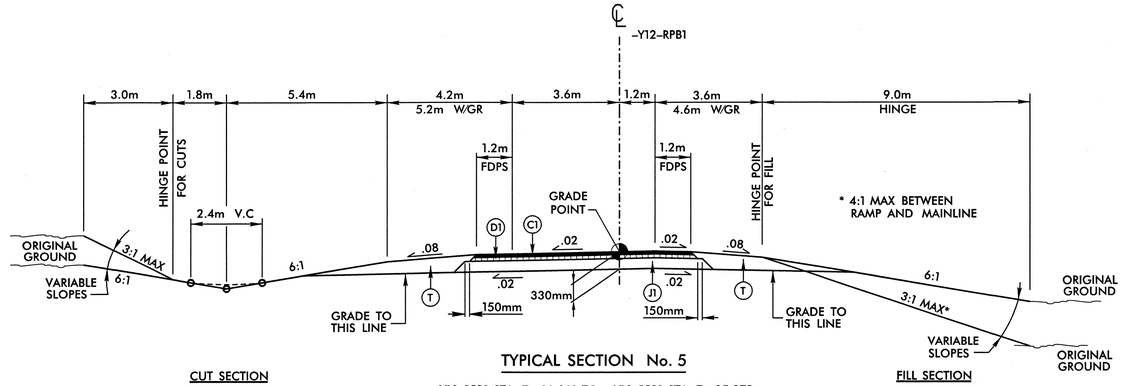
NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER DONG CHI CHEN
10/14/10

MOFFATT & NICHOL
16 W. EAST MELBROOK ROAD, SUITE 160
WAKE FOREST, NORTH CAROLINA 27587
(919) 781-4626 VOICE (919) 781-4628 FAX
NC LICENSE NUMBER F-0105

PAVEMENT SCHEDULE

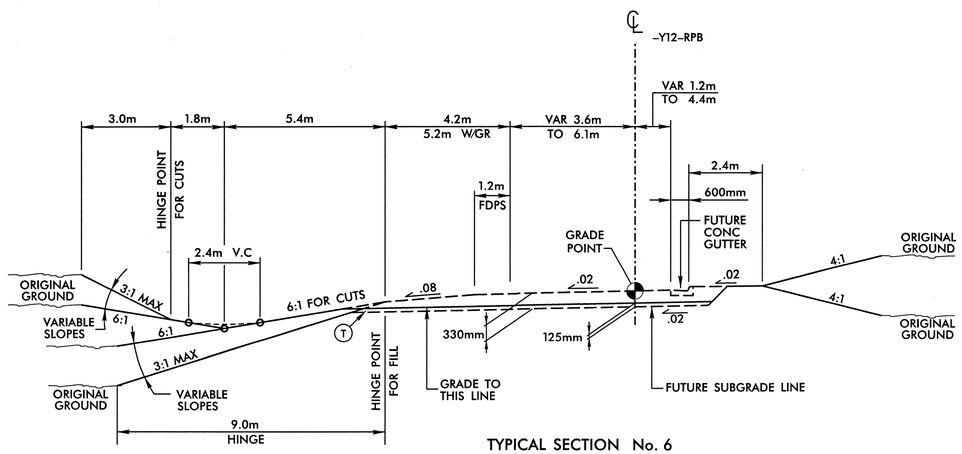
CODE	DESCRIPTION
C1	80mm S9.5B
D1	100 mm I19.0B
J1	150 mm ABC
R1	750mm CURB & GUTTER
T	EARTH MATERIAL

NOTE: ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.



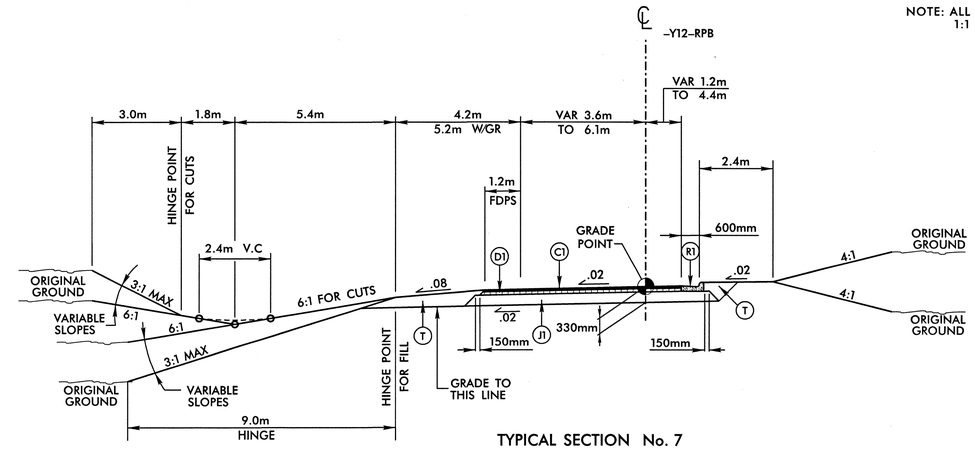
TYPICAL SECTION No. 5

-Y12-RPB1 STA 7+89.391 TO -Y12-RPB1 STA 7+95.972



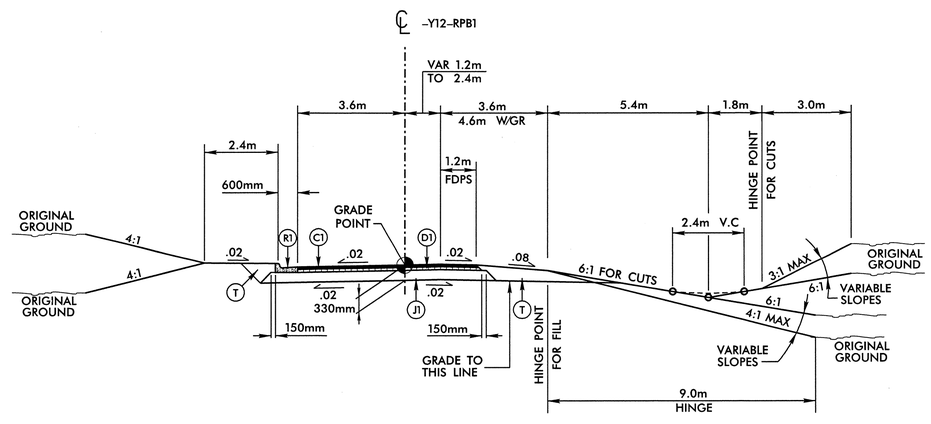
TYPICAL SECTION No. 6

-Y12-RPB STA 3+20.000 TO -Y12-RPB STA 7+87.346



TYPICAL SECTION No. 7

-Y12-RPB STA 7+87.346 TO -Y12-RPB STA 8+27.617



TYPICAL SECTION No. 8

-Y12-RPB1 STA 7+95.972 TO -Y12-RPB1 STA 8+31.616

6/16/99

9/24/2010
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cpowell

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	2-C

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

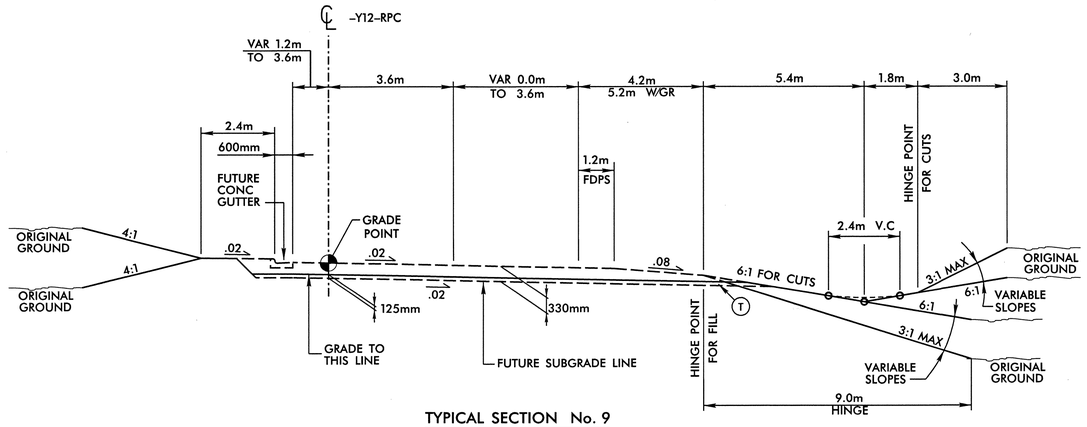
9-29-2010

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER CHI CHEN

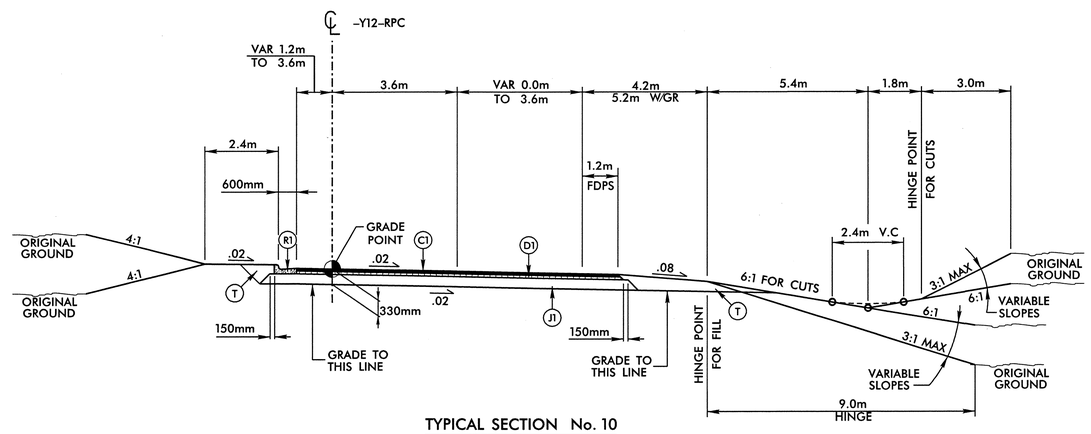
10/14/10

MOFFATT & NICHOL
10 W. EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-1022 (919) 781-1083 FAX
NC LICENSE NUMBER F-0108



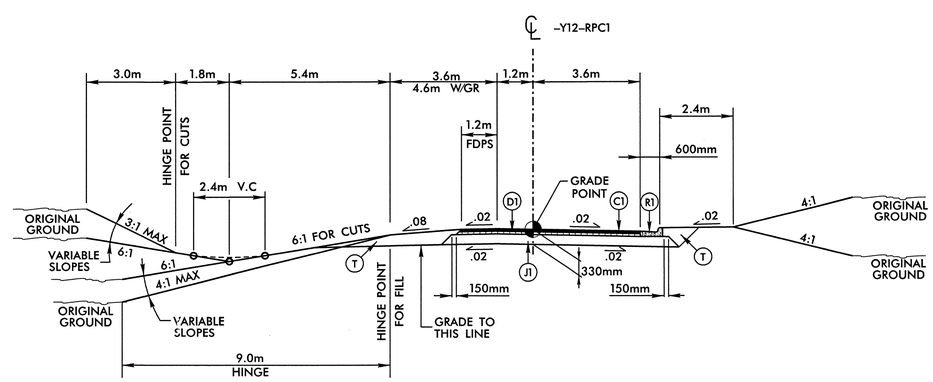
TYPICAL SECTION No. 9

-Y12-RPC STA 3+20.000 TO -Y12-RPC STA 7+71.643



TYPICAL SECTION No. 10

-Y12-RPC STA 7+71.643 TO -Y12-RPC STA 8+31.881



TYPICAL SECTION No. 11

-Y12-RPC1 STA 7+72.946 TO -Y12-RPC1 STA 8+10.214

PAVEMENT SCHEDULE

CODE	DESCRIPTION
C1	80mm S9.5B
D1	100 mm I19.0B
J1	150 mm ABC
R1	750mm CURB & GUTTER
T	EARTH MATERIAL

NOTE: ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.

6/16/99

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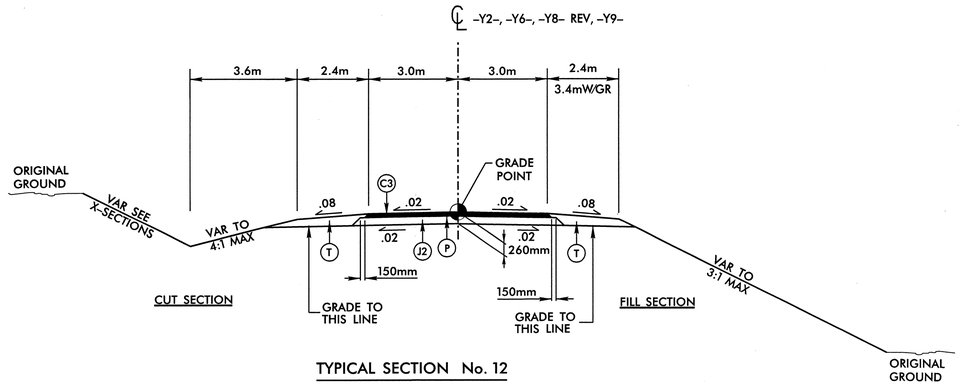
PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	2-D
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID 10/29/10

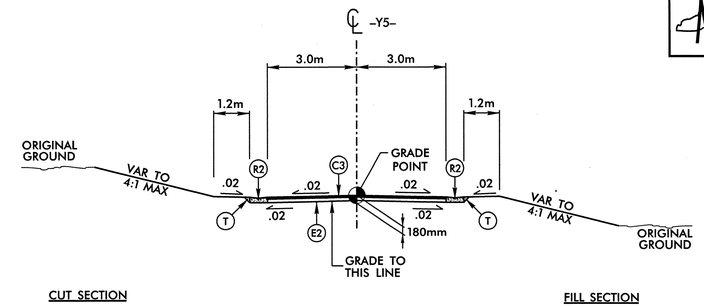
NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER CHI CHEN 11/2/10

MOFFATT & NICHOL
16 W. EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-1940 (919) 781-1941 FAX
NC LICENSE NUMBER F-0105



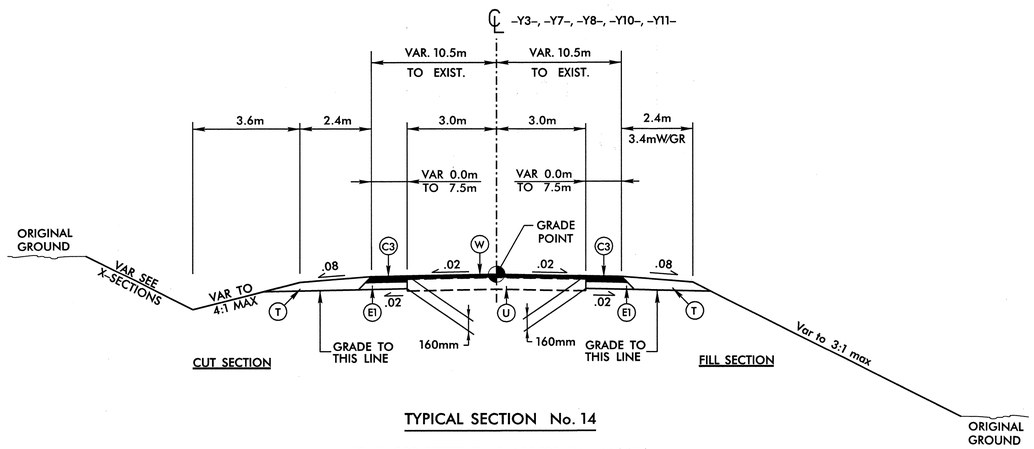
TYPICAL SECTION No. 12

–Y2– (SERVICE ROAD No. 2) {Connects Jacob w/Garner} STA 12+55.000 TO STA 14+45.275
–Y6– (PINEVIEW STREET) STA 10+03.175 TO STA 11+60.000
–Y8– REV (JOSSIE STREET REVISED) STA 10+44.315 TO STA 12+92.574
–Y9– (SERVICE ROAD No. 5) {Connects to Farmer} STA 11+90.000 TO STA 15+03.789



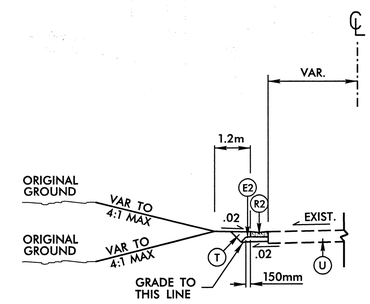
TYPICAL SECTION No. 13

–Y5– (SERVICE ROAD No. 4) {Connects Saddle Ridge w/Jacob} STA 10+49.918 TO STA 12+67.220



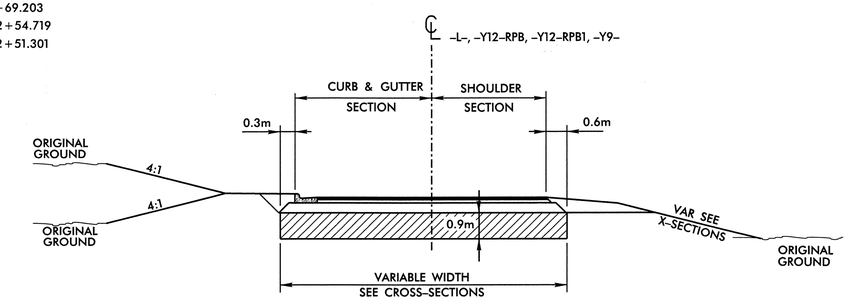
TYPICAL SECTION No. 14

–Y3– (JACOB STREET) STA 14+08.803 TO 14+24.964
–Y7– (LOOK AVE) STA 11+59.686 TO STA 12+07.443
–Y8– (JOSSIE STREET) STA 12+49.333 TO 12+69.203
–Y10– (FARMERS ROAD)STA 12+34.754 TO 12+54.719
–Y11– (GARNER STREET) STA 12+30.173 TO 12+51.301



TYPICAL SECTION No. 15

–Y15– (SADDLE RIDGE ROAD) STA 10+39.868 TO STA 10+59.28



UNDERCUT DETAIL

–L– STA 125+30 TO –L– STA 125+50 (WBL)
–L– STA 125+30 TO –L– STA 125+70 (EBL)
–L– STA 127+70 TO –L– STA 128+85 (WBL & EBL)
–L– STA 132+90 TO –L– STA 135+37 (WBL & EBL)
–L– STA 139+55 TO –L– STA 141+19 (WBL)
–L– STA 140+35 TO –L– STA 140+55 (EBL)
–Y12–RPB STA 1+34 TO –Y12–RPB STA 2+99
–Y12–RPB1 STA 7+71 TO –Y12–RPB1 STA 8+45
–Y9– STA 11+90 TO –Y9– STA 12+45
–Y9– STA 13+47 TO –Y9– STA 14+97

PAVEMENT SCHEDULE

CODE	DESCRIPTION
C3	60mm SF9.5A
E1	100 mm B25.0B
E2	120 mm B25.0B
J2	200 mm ABC
P	PRIME COAT
R2	600mm VALLEY GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VARIABLE WEDGING

NOTE: ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.

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bwatson

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	2-E

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

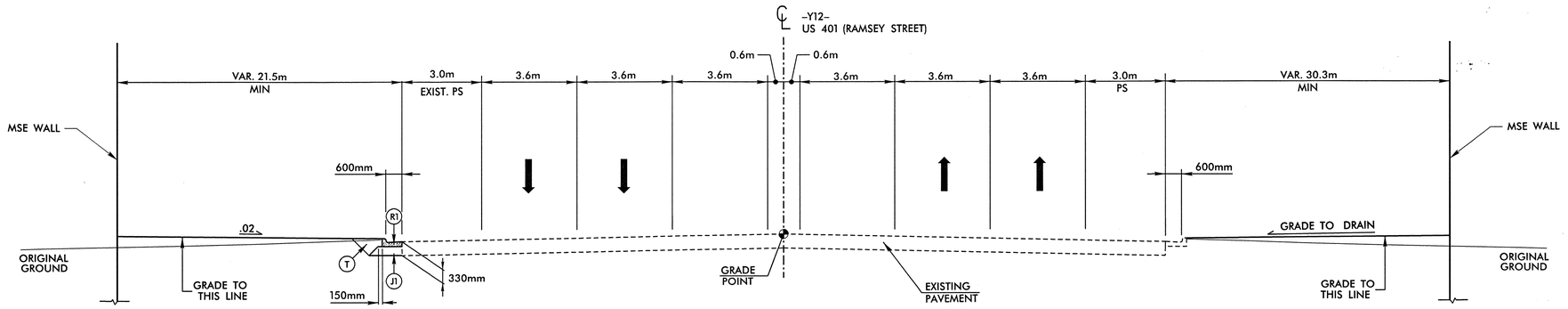
9-29-2010

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER DONG-CHI CHEN

10/14/10

MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX
NC LICENSE NUMBER F-0105

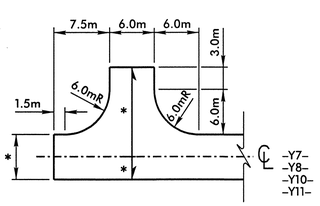


TYPICAL SECTION No. 16

–Y12– (US 401 /RAMSEY ST) STA 15+52.274 TO STA 15+69.381

PAVEMENT SCHEDULE	
CODE	DESCRIPTION
C1	80mm S9.5B
C2	VARIABLE DEPTH S9.5B
C3	60mm SF9.5A
C4	VARIABLE DEPTH SF9.5A
D1	100mm I19.0B
D2	VARIABLE DEPTH I19.0B
E3	VARIABLE DEPTH B25.0B
J1	150 mm ABC
R1	750mm CURB & GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT

NOTE: ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.

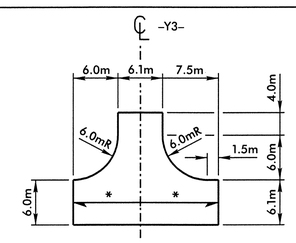


TURNAROUND DETAIL

TO BE USED IN CONJUNCTION WITH TYPICAL SECTION No. 13 AND 15 AS FOLLOWS:

(–Y7–) STA 11+70.317 TO 11+88.420
(–Y8–) STA 12+49.333 TO 12+69.203
(–Y10–) STA 12+34.754 TO 12+54.719
(–Y11–) STA 12+30.173 TO 12+51.301

* VARIES SEE PLAN

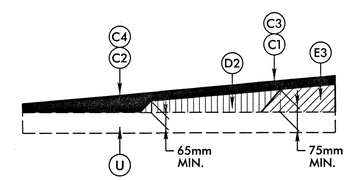


TURNAROUND DETAIL

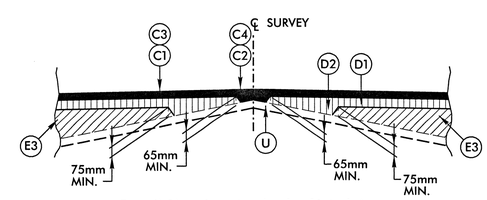
TO BE USED IN CONJUNCTION WITH TYPICAL SECTION No. 13 AS FOLLOWS:

(–Y3–) STA 14+08.803 TO 14+24.964

* VARIES SEE PLAN



Wedging Detail For Resurfacing



Detail Showing Method of Wedging

INCIDENTAL MILLING

INCIDENTAL MILLING SHALL BE UTILIZIED AT THE FOLLOWING LOCATIONS TO TIE INTO EXISTING PAVEMENT.

–Y2–	STA. 12+55.000
–Y2–	STA. 14+45.275
–Y3–	STA. 14+24.944
–Y3–	STA. 15+29.740
–Y3–	STA. 15+75.184
–Y5–	STA. 10+47.560
–Y8–	STA. 12+69.203
–Y8–REV	STA. 10+44.315
–Y8–REV	STA. 12+92.574
–Y9–	STA. 15+03.789
–Y10–	STA. 12+34.754
–Y11–	STA. 12+51.301
–Y11–	STA. 13+01.250
–Y12–RPB	STA. 8+00.419
–Y12–RPB1	STA. 8+02.709
–Y12–RPC	STA. 8+28.079
–Y12–RPC1	STA. 8+08.193

6/16/08
9/28/2010
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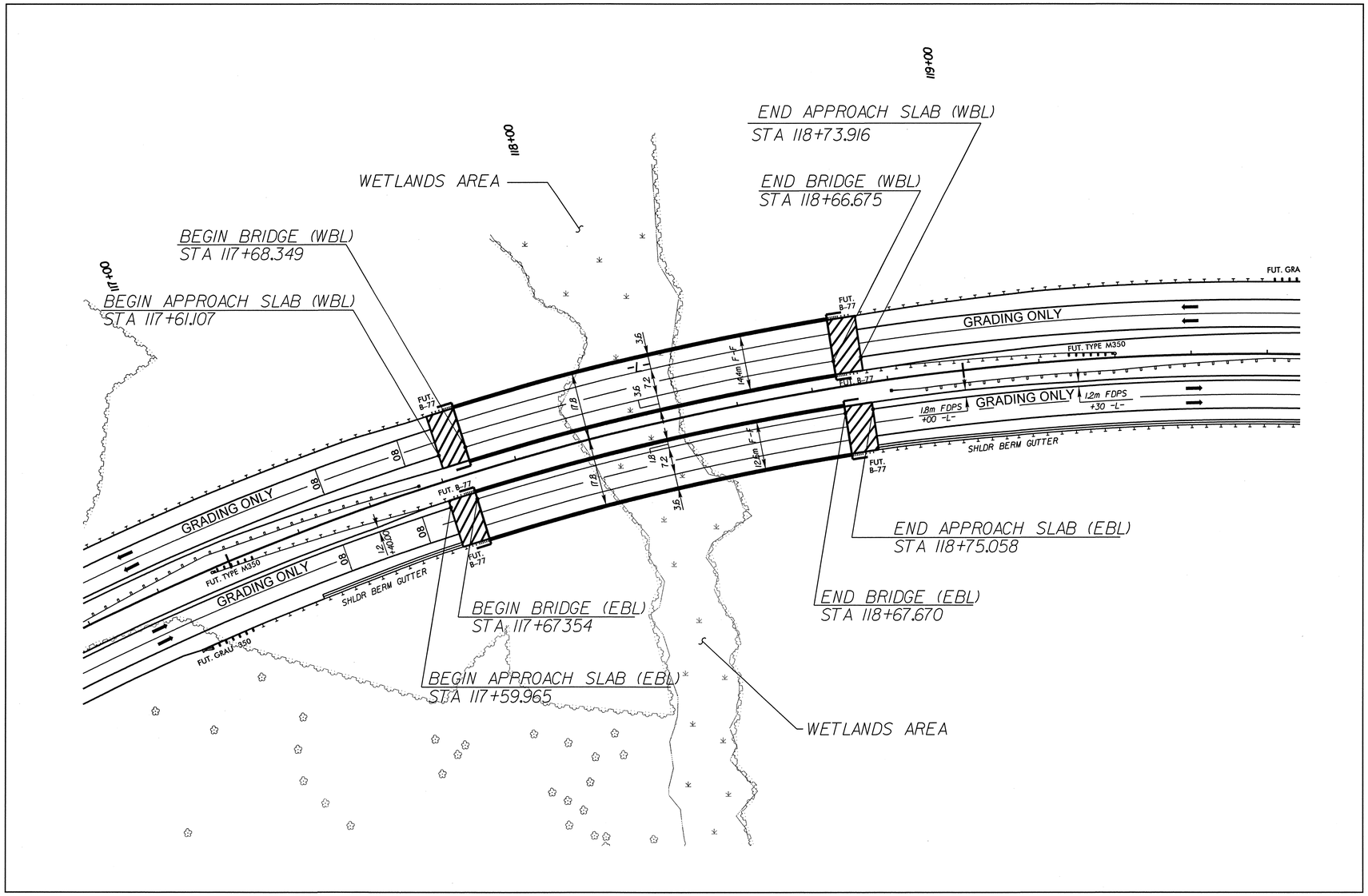
jeaves

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	2-F
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID
9-24-2010

MOFFATT & NICHOL
16 W. EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-1940 TEL (919) 781-1965 FAX
NC LICENSE NUMBER F-0109

SKETCH SHOWING BRIDGES IN RELATIONSHIP TO PAVEMENT



BRIDGE SKETCH No. 1

DETAIL SHOWING PAVEMENT-BRIDGE RELATIONSHIP FOR -L- OVER WETLAND AREA

BRIDGE APPROACH SLAB

9/24/2010
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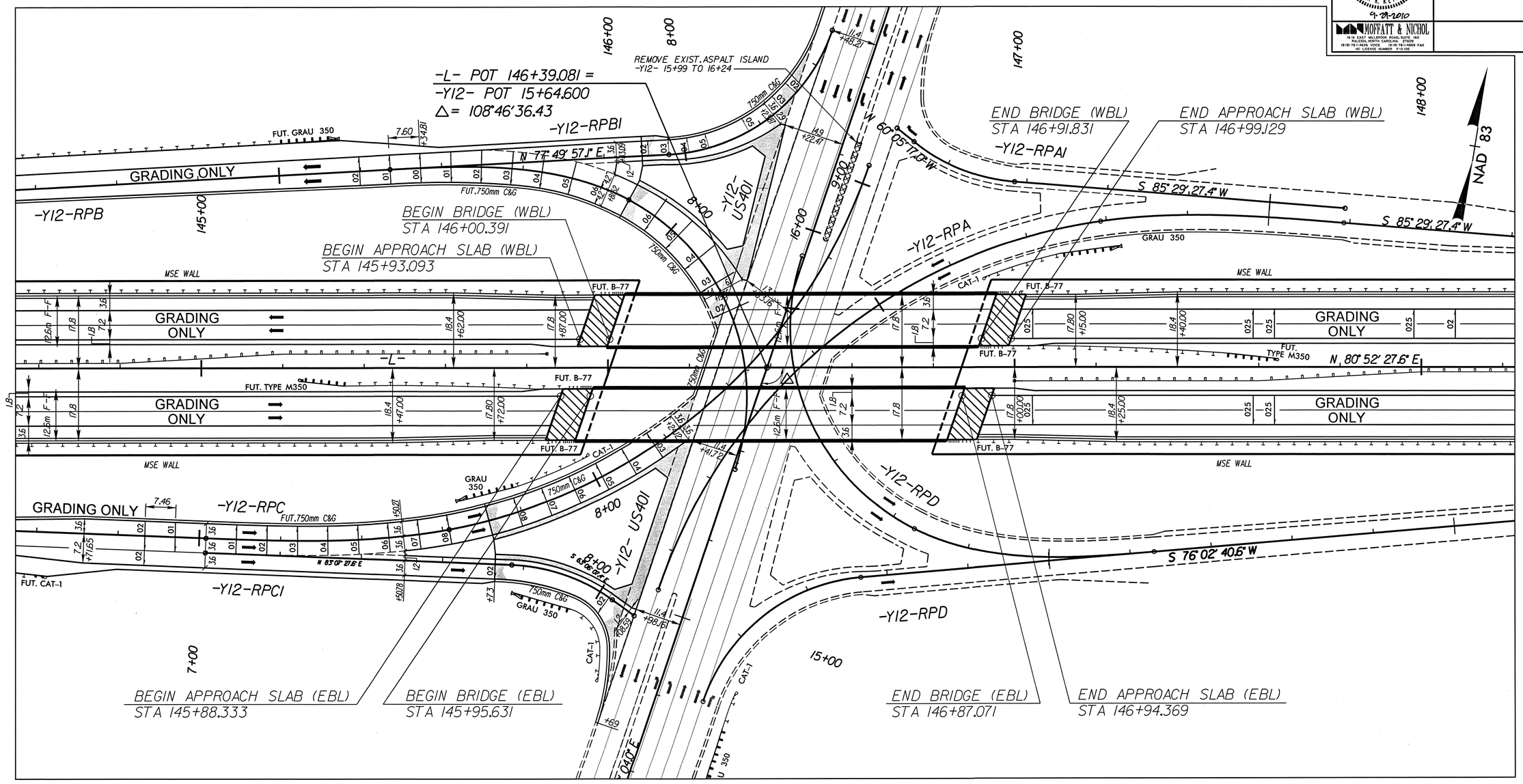
PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	2-G
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

METRIC

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID 9-28-2010

MOFFATT & NICHOL
16 W. EXPY. WILLIBROOK ROAD, SUITE 140
WILMINGTON, NORTH CAROLINA 28405
(910) 791-4626 VOICE (910) 791-4669 FAX
NC LICENSE NUMBER F-0105

SKETCH SHOWING BRIDGES IN RELATIONSHIP TO PAVEMENT



BRIDGE SKETCH No. 2

DETAIL SHOWING PAVEMENT-BRIDGE RELATIONSHIP FOR -L- (FAYETTEVILLE OUTER LOOP) OVER -Y12- (US 401 RAMSEY STREET)

BRIDGE APPROACH SLAB

9/24/2010
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cpowell

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	2-H
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

METRIC

2.5 0 5

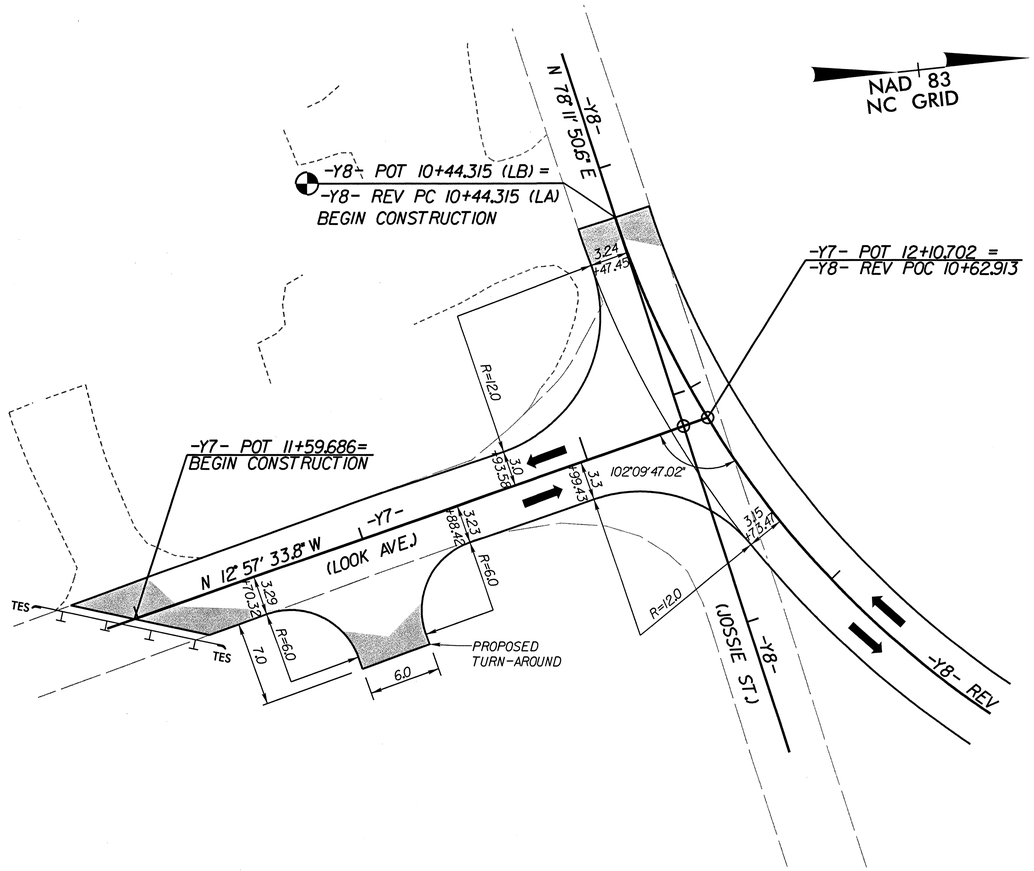
CONST.REV.

R/W REV.

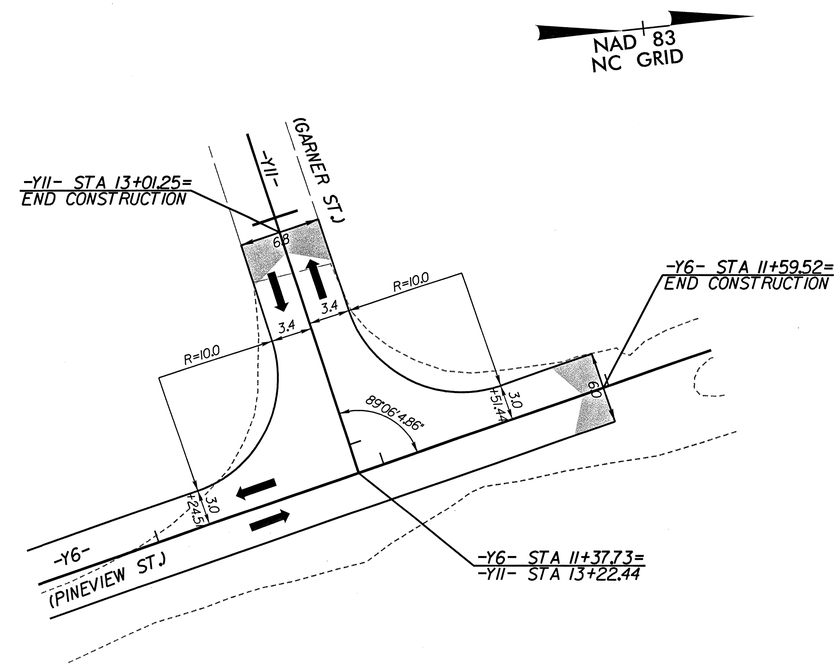
NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

9-29-2010

MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609-7860
(919) 781-4626 VOICE (919) 781-4869 FAX
NC LICENSE NUMBER F-0105



INTERSECTION DETAIL OF -Y7- AND -Y8- REV



INTERSECTION DETAIL OF -Y6- AND -Y11-

6/16/99

3/24/2010
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cpope

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	2-1
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

METRIC

2.5 0 5

CONST.REV.

R /W REV.

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID 9-29-2010

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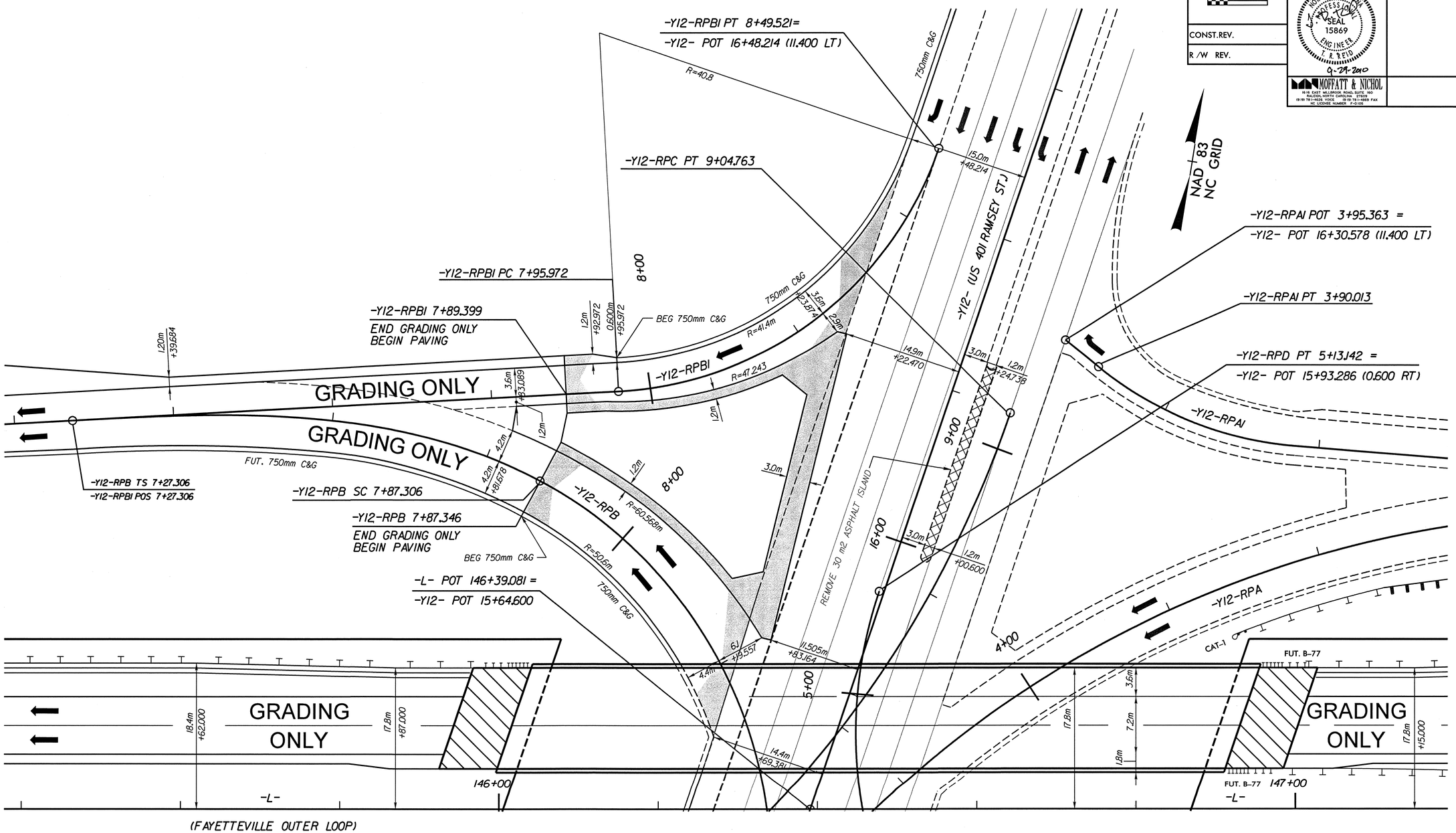
NC LICENSE NUMBER F-0105



(FAYETTEVILLE OUTER LOOP)

INTERSECTION DETAIL OF -Y12- AND -Y12-RPB /-Y12- AND -Y12-RPBI

9/24/2010
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cpope

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	2-J
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

METRIC

2.5 0 5

CONST.REV.

R /W REV.

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER A. R. REID 9-24-2010

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16 W. EAST MILLBROOK ROAD, SUITE 100
RALEIGH, NORTH CAROLINA 27609
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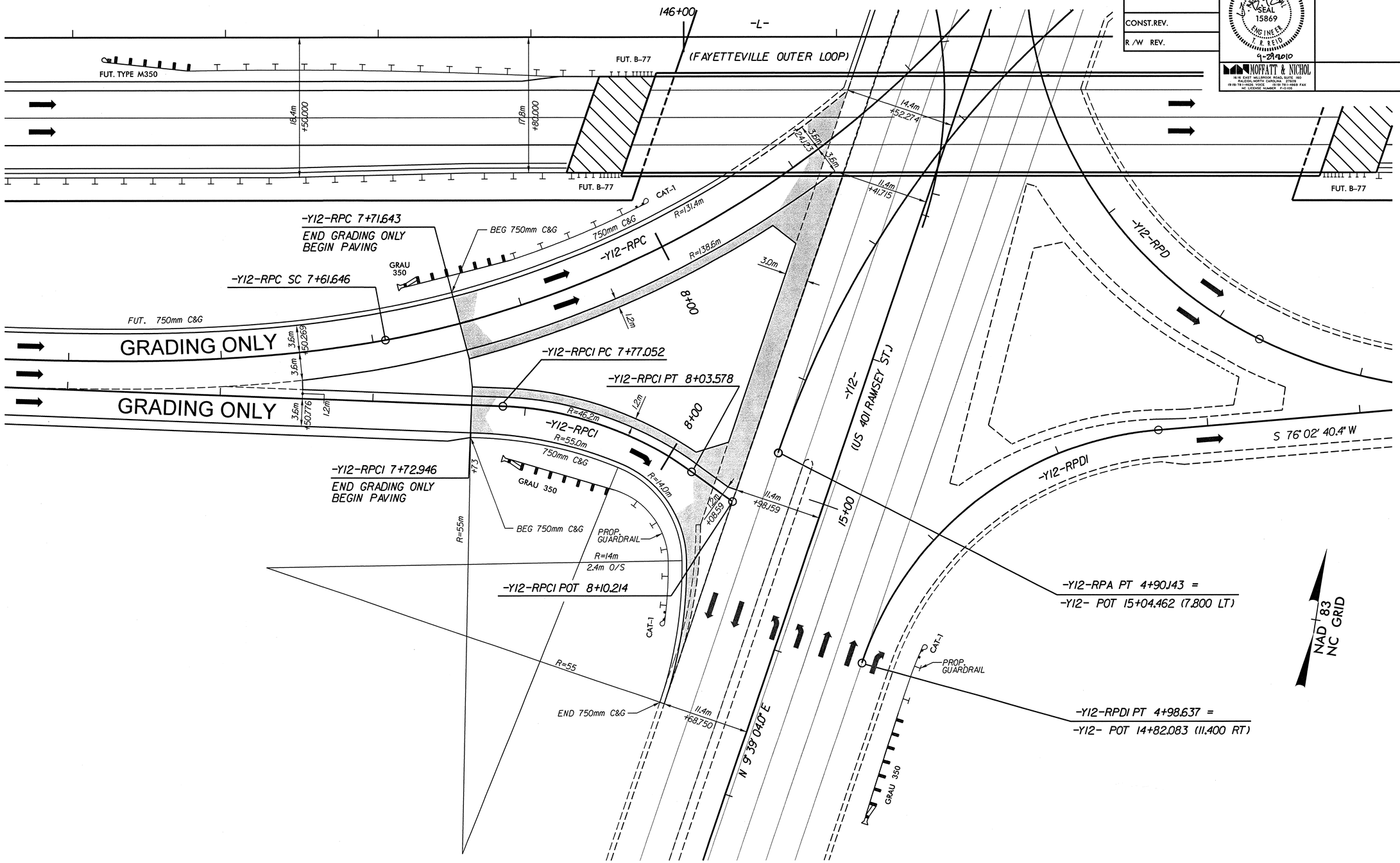
NC LICENSE NUMBER F-0105



INTERSECTION OF -Y12- AND -Y12- RAMP C /-Y12- AND -Y12- RAMP CI

9/24/2010
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cpowell

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	2-K
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

METRIC

2.5 0 5

CONST. REV.

R/W REV.

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER J. R. REID

9-29-2010

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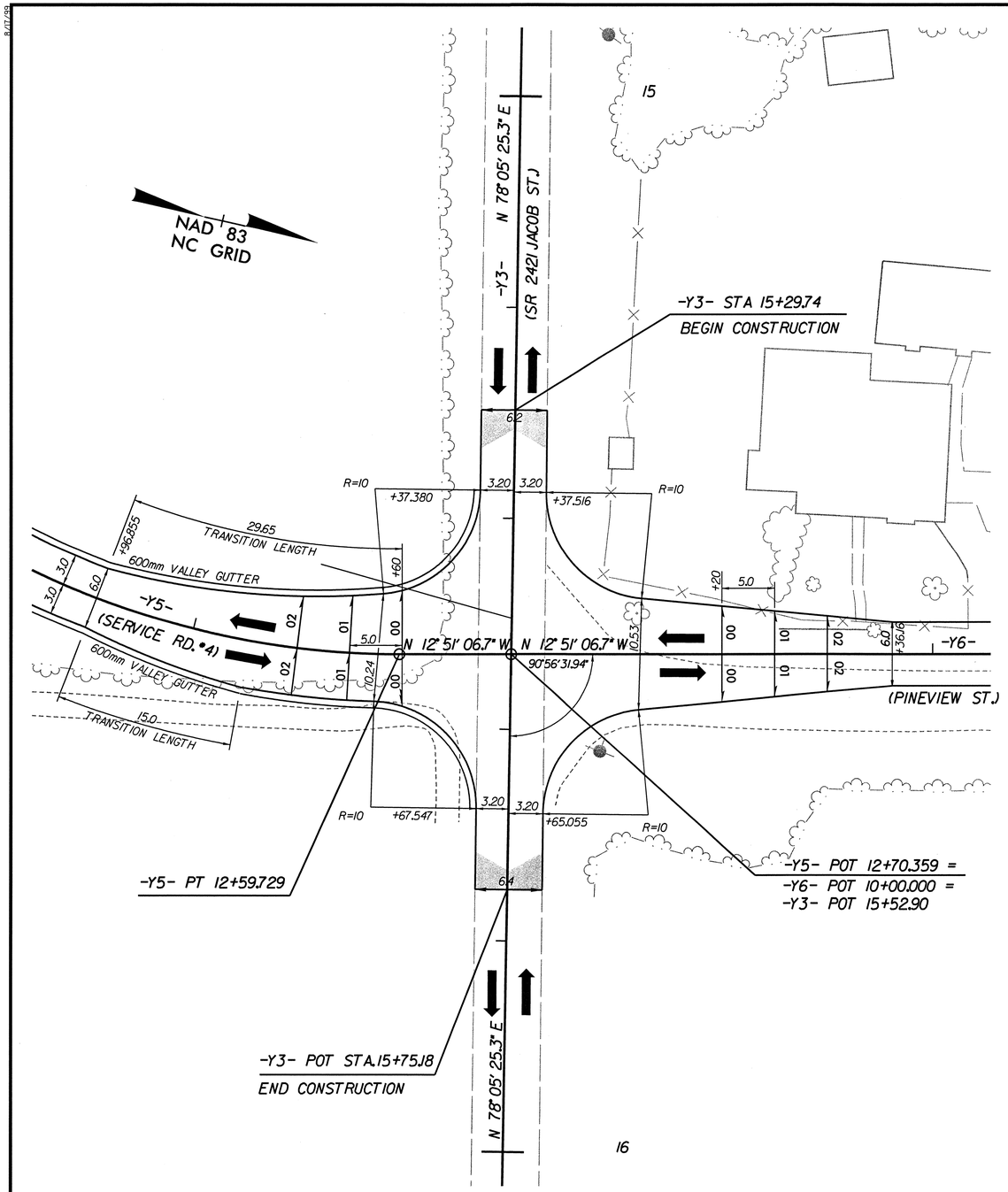
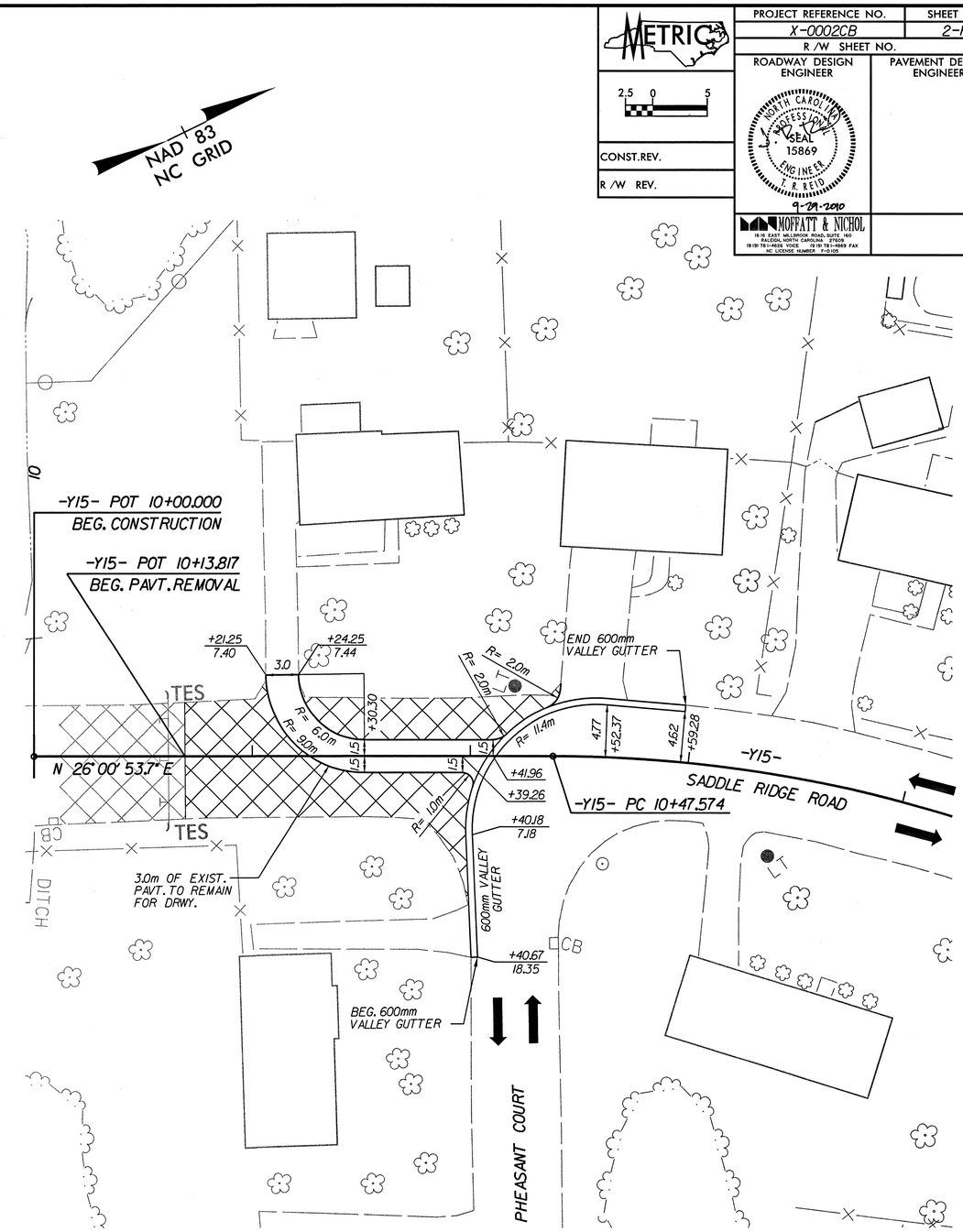
NC LICENSE NUMBER F-0105



INTERSECTION DETAIL OF -Y5- /-Y6- AND -Y3-



INTERSECTION DETAIL OF -Y15- (SADDLE RIDGE ROAD) & PHEASANT COURT

9/24/2010
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cpoole

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	2-L
R /W SHEET NO.	

METRIC

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER J. R. REID

9-29-2010

HYDRAULICS ENGINEER

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

10/21/10

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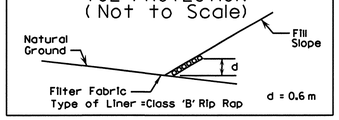
NC LICENSE NUMBER F-0105

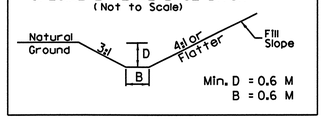
SDG Sungate Design Group, P.A.
Engineers · Planners · Architects · Surveyors
3916-A Jones Franklin Rd.
Raleigh, N.C. 27606

DETAIL 1
TOE PROTECTION
(Not to Scale)



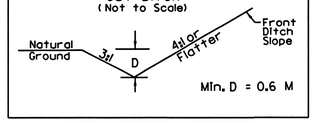
STA 117+45 TO STA 117+68 -L- RT
STA 118+67 TO STA 120+34 -L- LT
STA 121+35 TO STA 121+70 -L- RT
STA 130+10 TO STA 130+30 -L- RT

DETAIL 2
SPECIAL LATERAL BASE DITCH
(Not to Scale)



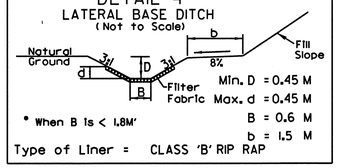
STA 120+35 TO STA 120+80 -L- LT

DETAIL 3
CUT DITCH
(Not to Scale)



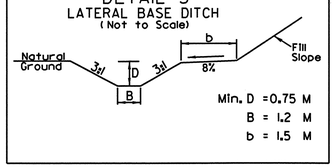
STA 108+90 TO STA 109+40 -L- LT
STA 124+18 TO STA 124+60 -L- LT
STA 124+18 TO STA 124+80 -L- RT
STA 12+00 TO STA 13+00 -Y9- LT
STA 145+40 TO STA 145+70 -L- RT

DETAIL 4
LATERAL BASE DITCH
(Not to Scale)



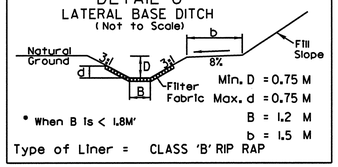
STA 0+84 TO STA 1+50 -Y-RPA RT
STA 136+71 TO STA 138+20 -L- LT
STA 142+95 TO STA 143+69 -L- LT

DETAIL 5
LATERAL BASE DITCH
(Not to Scale)



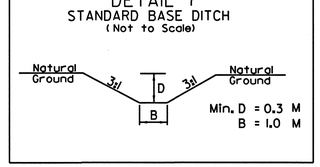
STA 114+30 TO STA 116+60 -L- LT
STA 143+69 TO STA 144+73 -L- LT

DETAIL 6
LATERAL BASE DITCH
(Not to Scale)



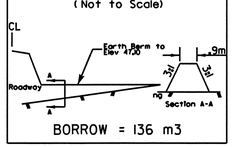
STA 116+60 TO STA 117+68 -L- LT

DETAIL 7
STANDARD BASE DITCH
(Not to Scale)



STA 129+91 TO STA 129+92 -L- RT
(TAIL DITCH) STA 136+53 -L- RT
(HEAD DITCH) STA 136+56 -L- LT

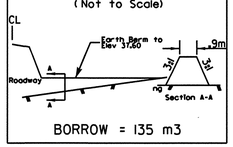
DETAIL 8
EARTH BERM
(Not to Scale)



BORROW = 136 m3

STA 141+87 -L- LT

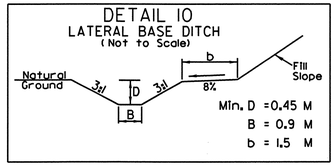
DETAIL 9
EARTH BERM
(Not to Scale)



BORROW = 135 m3

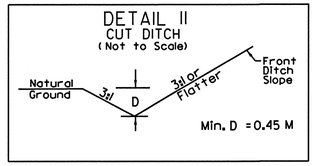
STA 144+16 TO STA 144+55 -L- RT

DETAIL 10
LATERAL BASE DITCH
(Not to Scale)



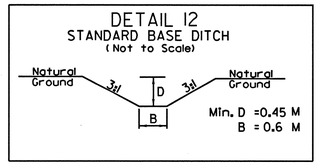
STA 143+96 TO STA 144+43 -L- RT

DETAIL 11
CUT DITCH
(Not to Scale)



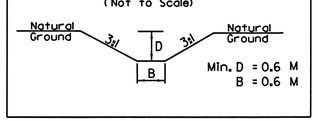
STA 12+60 TO STA 12+85 -Y2- LT
STA 12+60 TO STA 13+20 -Y2- RT
STA 11+00 TO STA 11+89 -Y8-REV LT
STA 11+00 TO STA 11+89 -Y8-REV RT

DETAIL 12
STANDARD BASE DITCH
(Not to Scale)



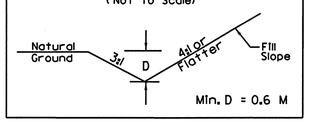
STA 107+47 TO STA 108+03 -L- LT

DETAIL 13
STANDARD BASE DITCH
(Not to Scale)



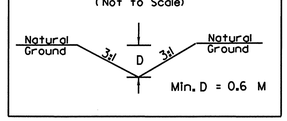
(TAIL DITCH) STA 112+14 -L- LT

DETAIL 14
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



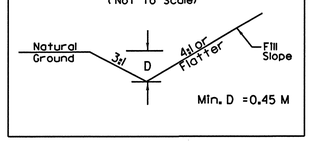
STA 13+00 TO STA 13+43 -Y9- LT
STA 145+70 TO STA 145+89 -L- RT

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



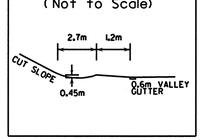
(TAIL DITCH) STA 140+09 -L- RT

DETAIL 16
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



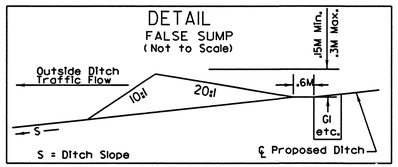
STA 12+20 TO STA 12+50 -Y5- RT

DETAIL 17
PARABOLIC SWALE
(Not to Scale)

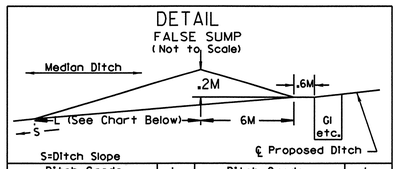


STA 10+51 TO STA 12+20 -Y5- RT

DETAIL
FALSE SUMP
(Not to Scale)

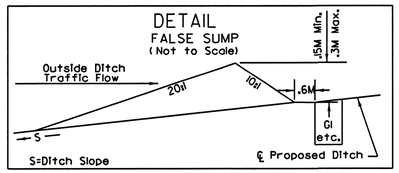


DETAIL
FALSE SUMP
(Not to Scale)



Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	6M	Over 4.0% To 6.0%	12M
Over 2.0% To 4.0%	9M	Over 6.0%	15M

DETAIL
FALSE SUMP
(Not to Scale)



8/17/99

9/24/2010
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cposkell

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	2-M
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID — 9-29-2010

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR. — 10/2/10

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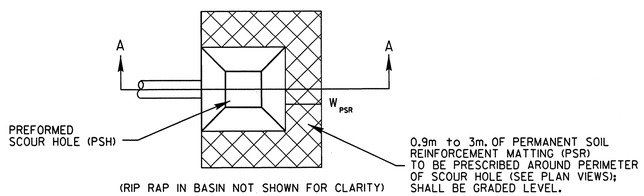
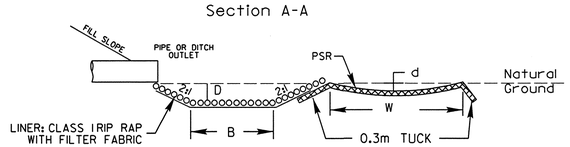
NC LICENSE NUMBER F-0105

SDG Sungate Design Group, P.A.
Transportation Consultants
510-A Jones Franklin Rd.
Raleigh, N.C. 27606



Section A-A



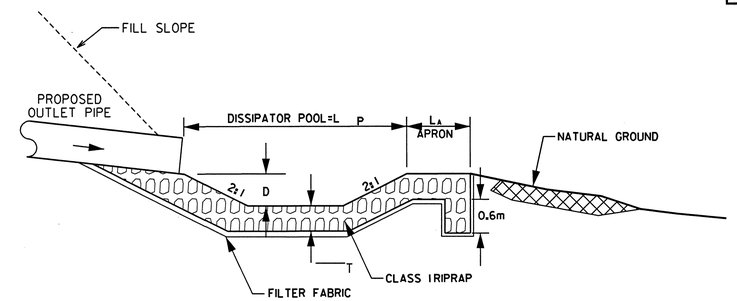
NOTES:

1. "B" DENOTES SIZE OF BASIN; FOR EXAMPLE: 1.5m x 1.5m PSH, B= 1.5
2. THE PERMANENT SOIL REINFORCEMENT MATTING (PSR) SHALL BE SEEDED AT INSTALLATION IN ACCORDANCE WITH THE SEEDING SPECIAL PROVISION.

STATION	B M	D M	W_{PSR} M	d M	CLASS I RIP RAP MTONS	DDE M3	FILTER FABRIC M2
119+10 -L- RT	1.2	0.4	1.3	0.15	4.0	2.8	7.8

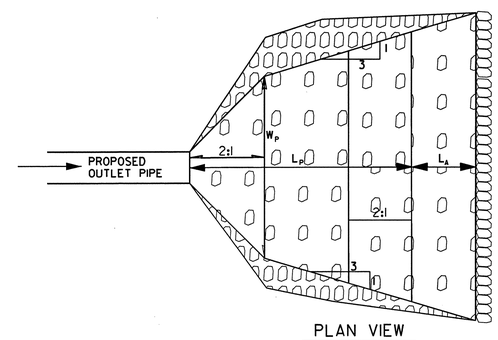
PREFORMED SCOUR HOLE WITH LEVEL SPREADER APRON

(Not to scale)



PROFILE

NOT TO SCALE



PLAN VIEW

NOT TO SCALE

STATION	L_P M	W_P M	L_A M	T M	D M	CLASS I RIP RAP MTONS	DDE M3	FILTER FABRIC M2
117+75 -L- LT	9.0	6.0	1.5	0.60	1.10	165	150	160
136+80 -L- LT	7.5	5.0	1.5	0.60	0.90	130	105	125
136+90 -L- RT	9.5	6.0	3.5	0.75	1.10	235	200	185

ENERGY DISSIPATOR

NOT TO SCALE

8/17/99

9/24/2010
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cpoole

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	2-N
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

10 0 20

CONST.REV.

R/W REV.

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

9-29-2010

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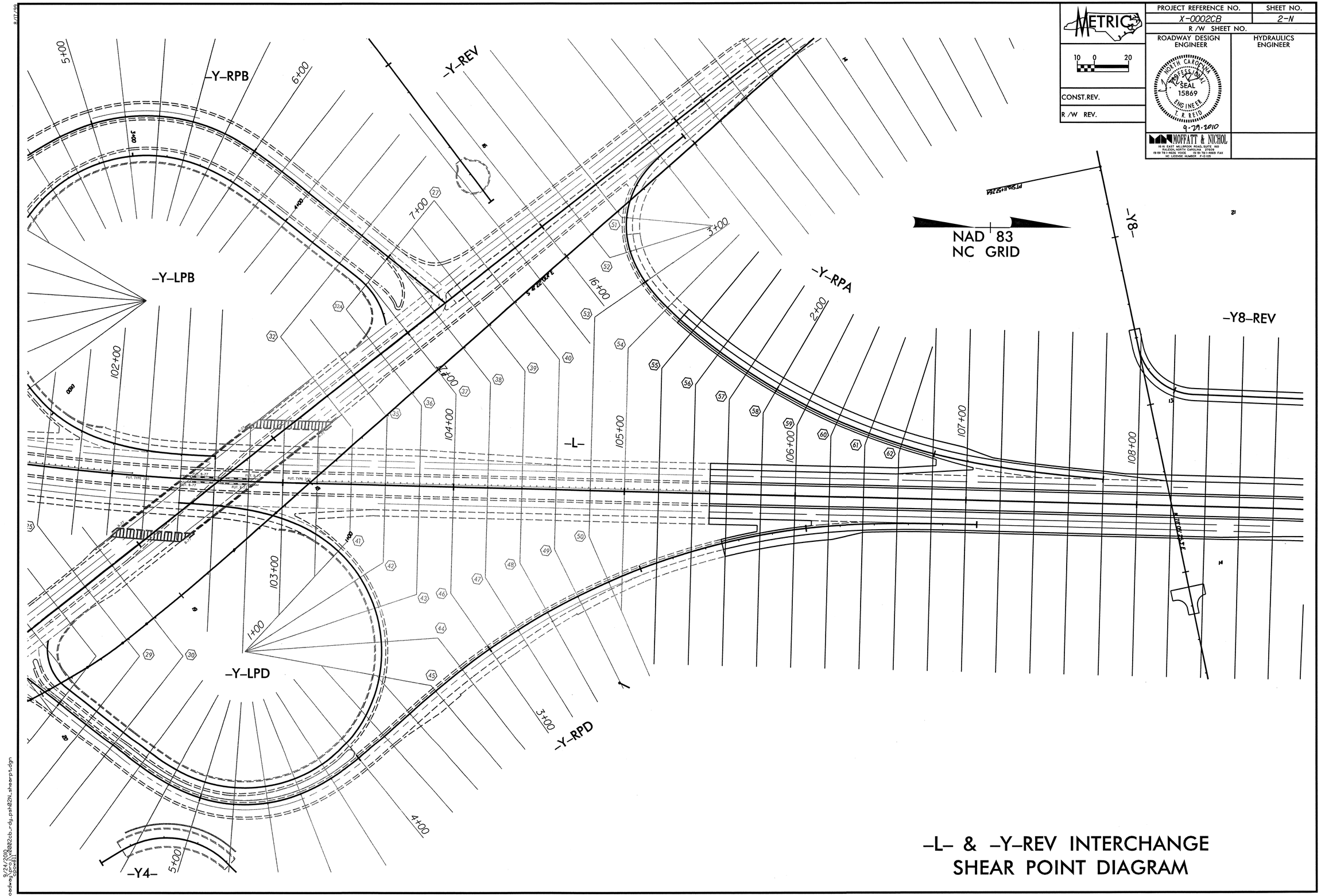
NC LICENSE NUMBER F-0105



-L- & -Y-REV INTERCHANGE SHEAR POINT DIAGRAM

8/17/99

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9/24/2010
10:09:41

PROJECT REFERENCE NO.	SHEET
35196.3.2 (X-0002CB)	2-0

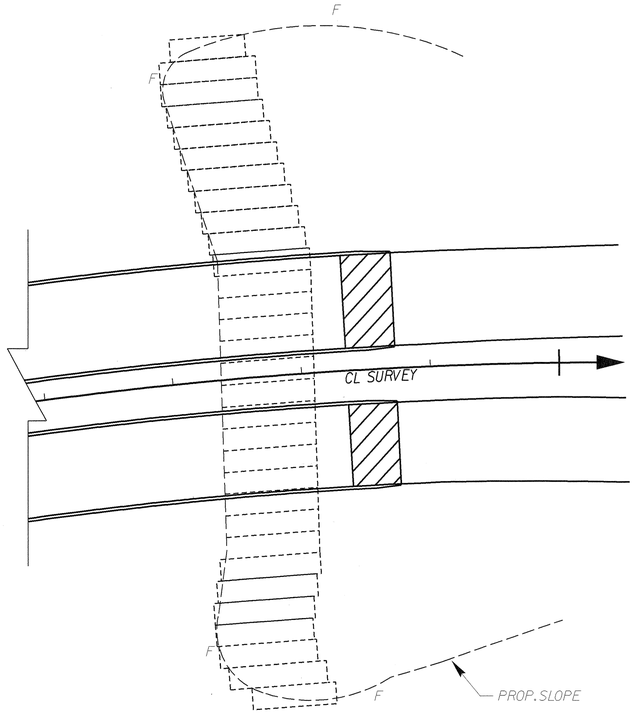
METRIC

ALL DIMENSIONS IN THESE PLANS ARE IN METERS

GEOTECHNICAL ENGINEER

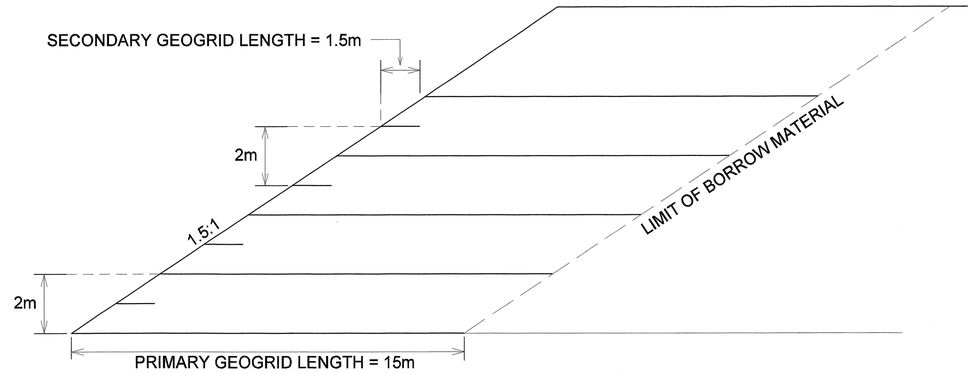
NORTH CAROLINA PROFESSIONAL SEAL 20175 ENGINEER ELIZABETH C. HOWEY 10/17/07

Elizabeth C. Howey
SIGNATURE DATE



PLAN VIEW OF END SLOPE
SHOWING LOWEST GEOGRID LAYER

N.T.S.



TYPICAL SECTION AT END SLOPE

N.T.S.

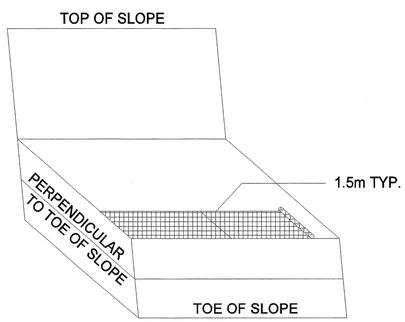
NOTES:

1. GEOGRID REINFORCED SLOPES SHALL BE CONSTRUCTED AT BOTH END BENTS. TO AVOID DEFORMATION OF THE TOP LAYER OF PRIMARY GEOGRID, HOLES SHOULD BE CUT AT THE ANTICIPATED PILE LOCATIONS PRIOR TO DRIVING PILES.
2. LAYERS OF REINFORCEMENT MAY NEED TO BE ADDED OR SUBTRACTED AS THE EMBANKMENT HEIGHT VARIES.
3. THE TOP LAYER OF PRIMARY GEOGRID REINFORCEMENT MAY BE LOWERED SLIGHTLY IF NECESSARY TO AVOID INTERFERENCE WITH THE END BENT CAPS.
4. THE PRIMARY GEOGRID REINFORCEMENT SHALL BE PLACED IN CONTINUOUS STRIPS IN THE DIRECTION PERPENDICULAR TO THE TOE OF SLOPE (SEE DETAIL).
5. ADJACENT STRIPS/ROLLS OF GEOGRID SHOULD BE BUTTED UP AGAINST EACH OTHER.
6. THE FIRST LAYER OF GEOGRID SHALL BE PLACED ON LEVEL GROUND, NOT STEEPER THAN 5% GRADE.
7. THE GEOGRID REINFORCED PORTION OF THE END SLOPES SHALL BE CONSTRUCTED OF GRANULAR SOIL MEETING THE CRITERIA OF COASTAL PLAIN BORROW OUTLINED IN SECTION 1018 OF THE NCDOT STANDARD SPECIFICATIONS, WITH THE ADDITIONAL CRITERIA OF A MAXIMUM P.I. OF 10 AND A MAXIMUM OF 35% PASSING THE NO.200 SIEVE.
8. TO PREVENT ACCUMULATION OF SURFACE RUNOFF IN THE TOE OF THE REINFORCED SOIL SLOPE REGION, THE CONTRACTOR SHOULD PROVIDE A DRAINAGE SYSTEM TO DIRECT SURFACE RUNOFF AWAY FROM THE TOE OF SLOPE.
9. SEE THE "SPECIAL PROVISION FOR GEOGRID REINFORCED SLOPES" FOR DETAILED REQUIREMENTS OF MATERIALS AND CONSTRUCTION.
10. THE ENTIRE EMBANKMENT SHALL BE CONSTRUCTED SIMULTANEOUSLY WITH THE REINFORCED SLOPES.

ESTIMATED QUANTITIES

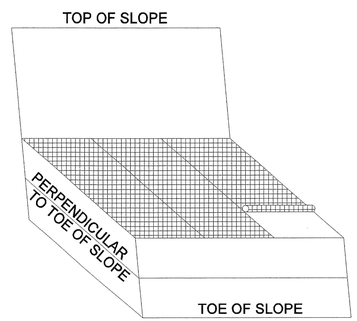
PRIMARY GEOGRID REINFORCEMENT	17,000 m^2
SECONDARY GEOGRID REINFORCEMENT	1,450 m^2
BORROW MATERIAL FOR GEOGRID REINFORCEMENT	34,000 m^3

ESTIMATED QUANTITIES DO NOT INCLUDE GEOGRID WASTE.



DETAIL OF ORIENTATION OF SECONDARY GEOGRID

N.T.S.



DETAIL OF ORIENTATION OF PRIMARY GEOGRID

N.T.S.

PREPARED BY: D. RACEY	DATE: 10/07		
REVIEWED BY: E.C. HOWEY	DATE: 10/07		

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- ■ CONTRACT OFFICE

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

REINFORCED SLOPE AT -L- STA. 118+17.50

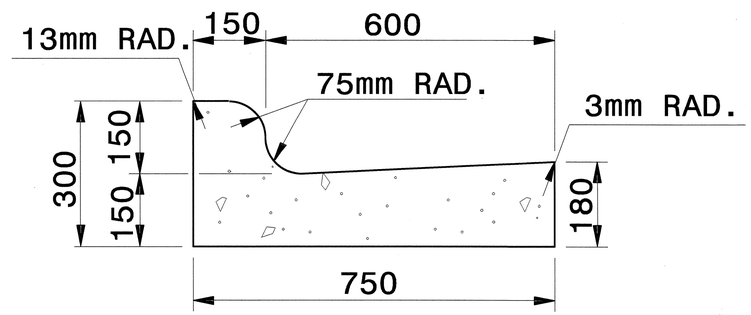
REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

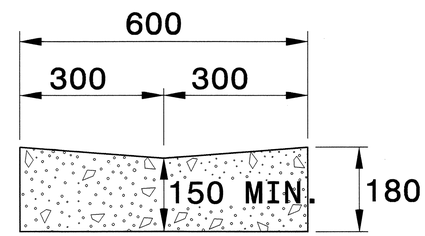
PROJECT REFERENCE NO.	SHEET NO.
X-0002 CB	2-P

METRIC

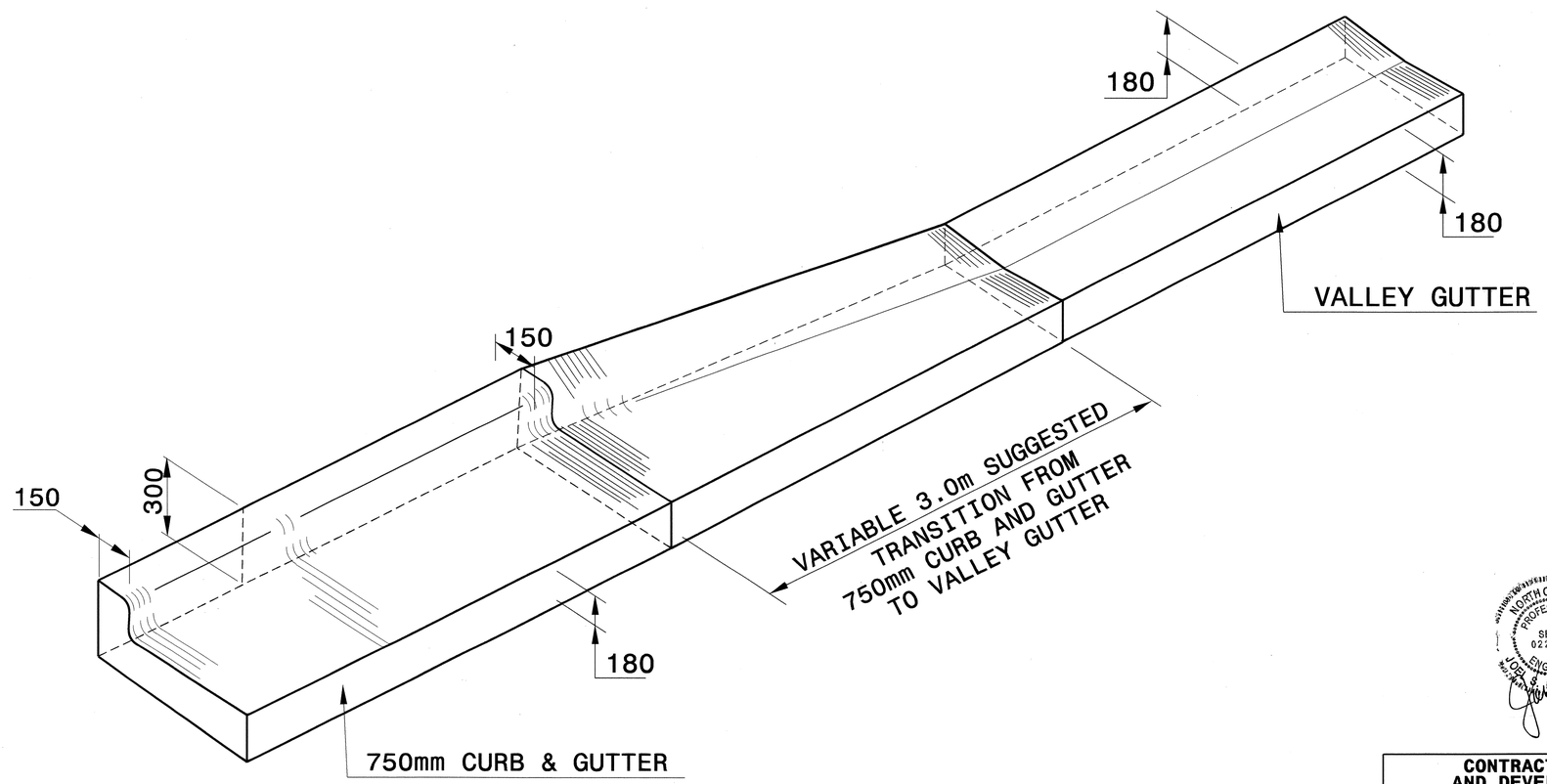
*NOTE: SEE STD. DWG. 846.01
FOR GENERAL NOTES



750mm CURB AND GUTTER



VALLEY GUTTER



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

ISOMETRIC VIEW OF TRANSITION

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWARD
10/21/10

CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-250-4128 FAX 919-250-4119

TRANSITION FROM 750mm CURB AND GUTTER TO VALLEY GUTTER

ORIGINAL BY: T.S.SPELL DATE: FEB.4,2009
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: w:usr/details/stand/cgtransit.dgn

04-SEP-2010 10:21
$$$$USERNAME$$$$
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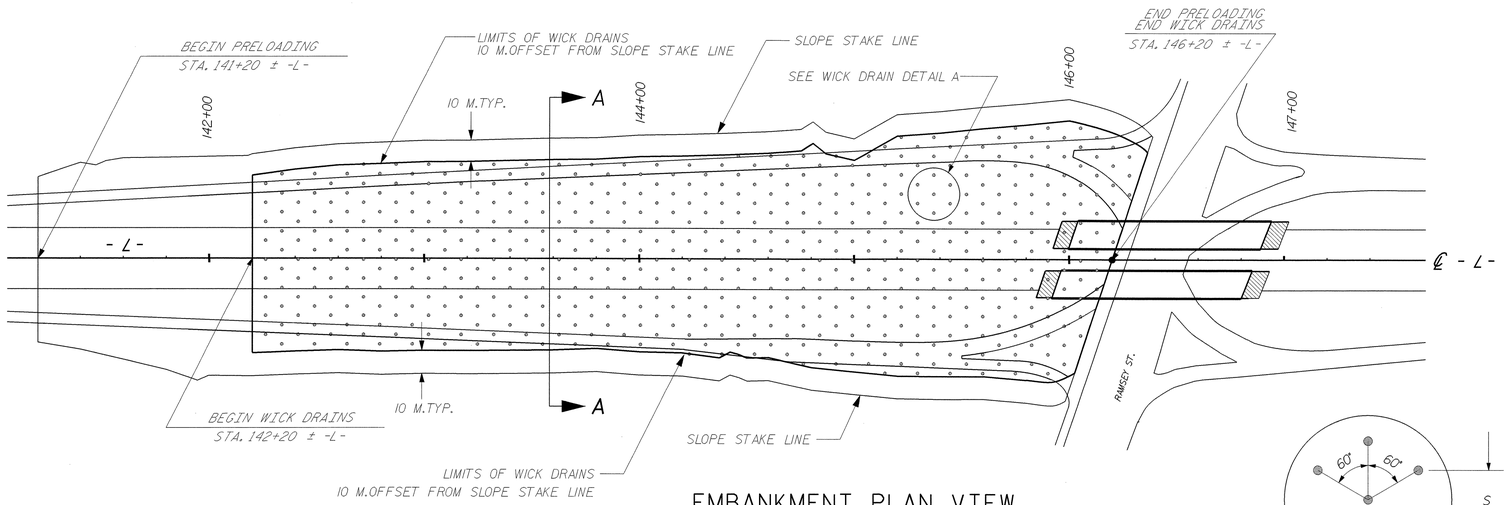
PROJECT REFERENCE NO.	SHEET
35196.1.2 (X-0002CB)	2-Q

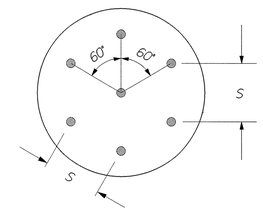
GEOTECHNICAL ENGINEER — SIGNATURE — DATE

ENGINEER — SIGNATURE — DATE



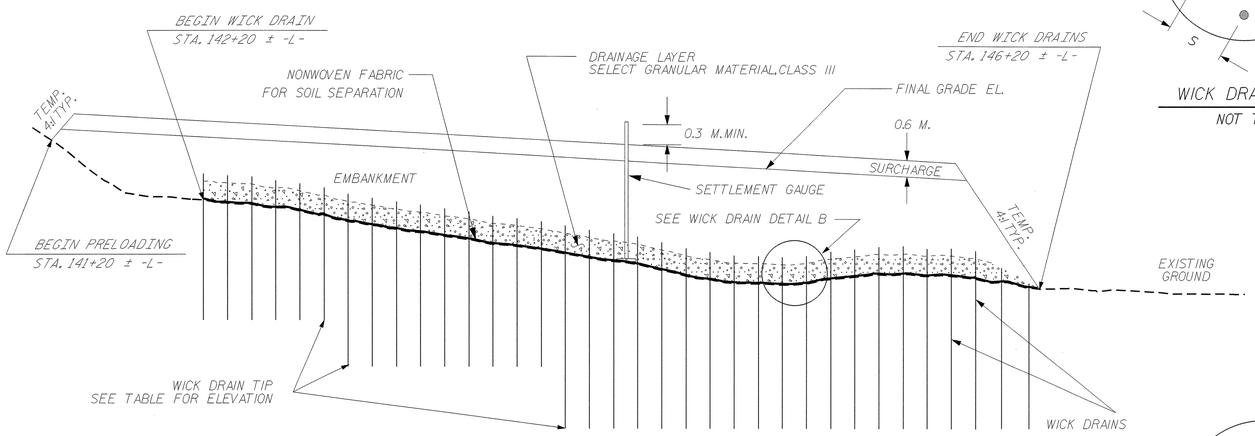
EMBANKMENT PLAN VIEW

NOT TO SCALE



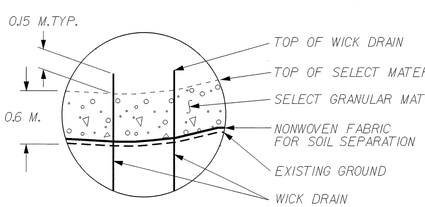
WICK DRAIN DETAIL A

NOT TO SCALE



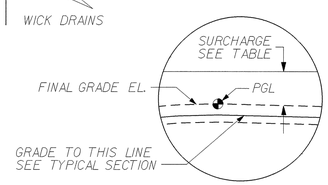
SECTION ALONG ℄ -L-

NOT TO SCALE



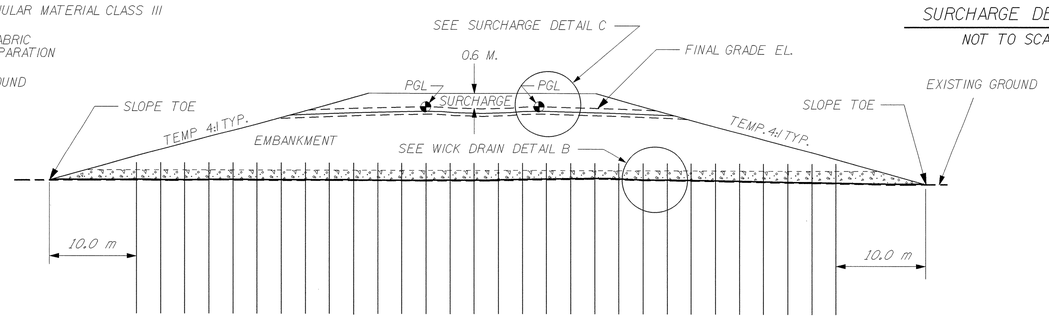
WICK DRAIN DETAIL B

NOT TO SCALE



SURCHARGE DETAIL C

NOT TO SCALE



A-A CROSS SECTION

NOT TO SCALE

PRELOADING AND WICK DRAIN CONFIGURATION					
STATIONS (-L- LINE)		WICK DRAIN SPACING, S	WICK DRAIN TIP ELEVATION	MINIMUM SURCHARGE	ESTIMATED WAITING PERIOD
FROM	TO				
141 + 20	142 + 20	-	-	0.6 M.	11 MONTH
142 + 20	143 + 00	1.5 M.	35.0 M.	0.6 M.	11 MONTH
143 + 00	144 + 00	1.5 M.	31.0 M.	0.6 M.	11 MONTH
144 + 00	146 + 20	1.5 M.	27.0 M.	0.6 M.	11 MONTH

NOTES

1. FOR WICK DRAINS, SEE INSTALLATION OF VERTICAL WICK DRAINS AND DRAINAGE LAYER SPECIAL PROVISION.
2. NONWOVEN FABRIC FOR SOIL SEPARATION SHALL BE PLACED ON EXISTING GROUND AS SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER. SEE NONWOVEN FABRIC FOR SOIL SEPARATION SPECIAL PROVISION.
3. THE DRAINAGE LAYER OF SELECT MATERIAL CLASS III SHALL BE INSTALLED AS SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER.
4. INSTALL WICK DRAINS AS DIRECTED BY PROVISIONS, PLANS, AND/OR ENGINEER AFTER THE SELECT GRANULAR MATERIAL CLASS III HAS BEEN PLACED AND COMPACTED. WICK DRAINS SHALL PENETRATE THE SELECT GRANULAR MATERIAL CLASS III AND SHALL BE INSTALLED TO THE LENGTH SHOWN ON THE PLANS AND/OR DIRECTED BY THE ENGINEER.
5. PRE-AUGERING MAY BE REQUIRED TO INSTALL THE WICK DRAINS. IF PRE-AUGERING IS NECESSARY, THE COST OF PRE-AUGERING IS INCIDENTAL TO THE COST OF THE WICK DRAINS.
6. CONSTRUCT EMBANKMENT TO THE FINAL GRADE.
7. INSTALL SURCHARGE MATERIAL AS SHOWN ON THE PLANS. SEE SURCHARGE PLACEMENT, MAINTENANCE AND REMOVAL SPECIAL PROVISION.
8. MAINTAIN THE SURCHARGE ELEVATIONS THROUGHOUT THE WAITING PERIODS.
9. FOR SETTLEMENT GAUGE, SEE EMBANKMENT MONITORING SPECIAL PROVISION AND EMBANKMENT MONITORING DETAIL SHEET.
10. WAITING PERIOD BEGINS AFTER CONSTRUCTING THE EMBANKMENT TO 0.6 METERS ABOVE THE FINAL GRADE ELEVATION.

ESTIMATED QUANTITIES		
WICK DRAINS	179,500	METER
SELECT GRANULAR MATERIAL, CLASS III	26,100	CUBIC METER
NONWOVEN FABRIC FOR SOIL SEPARATION	43,500	SQUARE METER

PREPARED BY: J. PARK	DATE: 08/2010	
REVIEWED BY: J. BATTS	DATE: 08/2010	

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STATE OF NORTH CAROLINA
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RALEIGH

Ground Improvement with Preloading and Wick Drains

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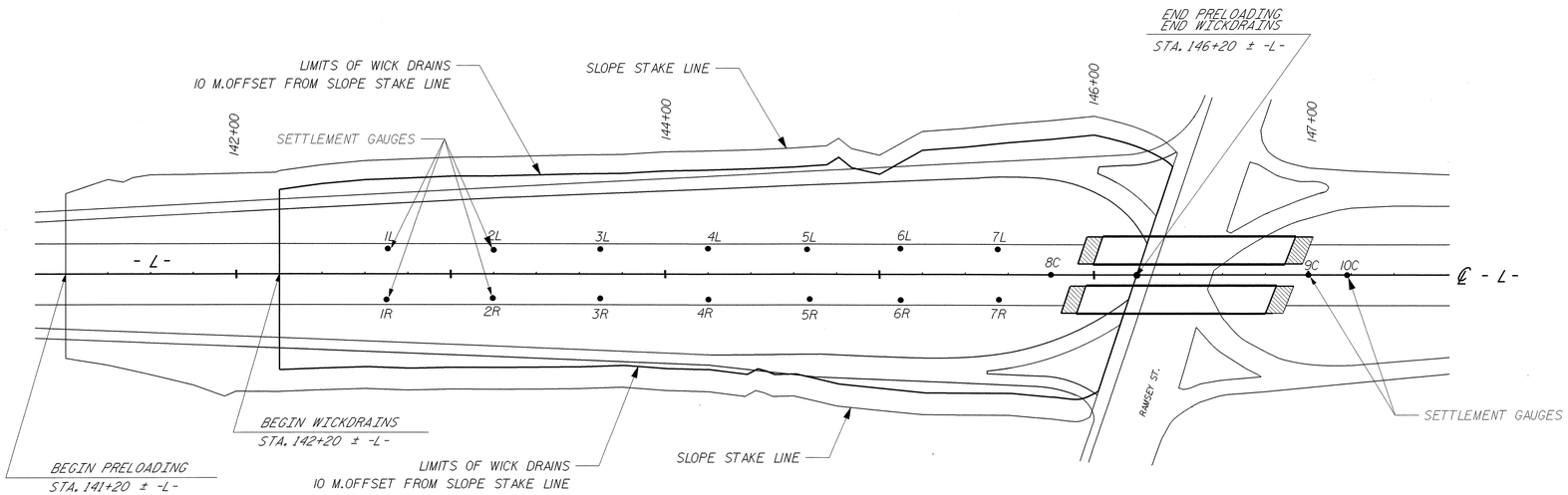
PROJECT REFERENCE NO.	SHEET
35196.1.2 (X-0002CB)	2-R

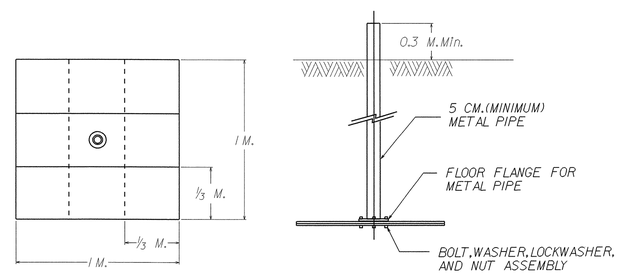
GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 32171 ENGINEER JINYOUNG PARK 12-1-10	
SIGNATURE DATE	SIGNATURE DATE



SETTLEMENT GAUGE LOCATIONS

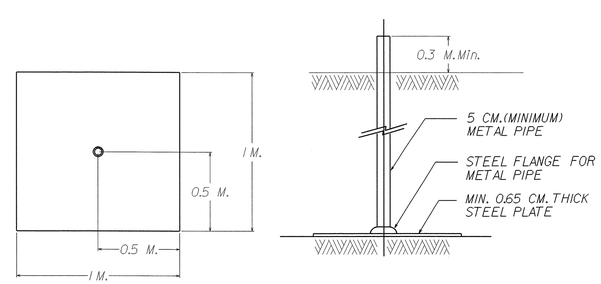
NOT TO SCALE

SETTLEMENT GAUGE LOCATIONS		
GAUGE NO.	STATION -L-	OFFSET FROM -L-
1L	142 + 70 ±	10 M. ±, LT
1R	142 + 70 ±	10 M. ±, RT
2L	143 + 20 ±	10 M. ±, LT
2R	143 + 20 ±	10 M. ±, RT
3L	143 + 70 ±	10 M. ±, LT
3R	143 + 70 ±	10 M. ±, RT
4L	144 + 20 ±	10 M. ±, LT
4R	144 + 20 ±	10 M. ±, RT
5L	144 + 65 ±	10 M. ±, LT
5R	144 + 65 ±	10 M. ±, RT
6L	145 + 10 ±	10 M. ±, LT
6R	145 + 10 ±	10 M. ±, RT
7L	145 + 55 ±	10 M. ±, LT
7R	145 + 55 ±	10 M. ±, RT
8C	145 + 80 ±	0 M. ±
9C	147 + 00 ±	0 M. ±
10C	147 + 18.40 ±	0 M. ±



DETAIL OF WOOD BASE

SIX - 2.5 CM. X 1/3 M. X 1 M PLANKS OF LUMBER OR TWO PIECES 2.5 CM. X 1 M.X 1 M.EXTERIOR GRADE PLYWOOD, SECURELY FASTENED AND THEN COATED WITH WOOD PRESERVATIVE



DETAIL OF STEEL BASE

NOTES

1. THE USE OF EITHER THE WOOD BASE OR THE STEEL BASE SETTLEMENT GAUGE SHALL BE THE CONTRACTOR'S OPTION.
2. SETTLEMENT GAUGES SHALL BE INSTALLED BEFORE ANY FILL IS PLACED.
3. SETTLEMENT GAUGE ELEVATIONS ARE TO BE DETERMINED AND RECORDED WEEKLY BY THE RESIDENT ENGINEER.
4. THE INITIAL ELEVATION OF THE SETTLEMENT GAUGE PLATE (AT TOP OF PLATE) SHALL BE DETERMINED AT THE TIME OF INSTALLATION ALONG WITH THE EMBANKMENT ELEVATION. WHEN NEW SECTIONS OF THE PIPE ARE ADDED, ELEVATIONS SHALL BE RECORDED AT THE TOP OF EXISTING PIPE AND AT THE TOP OF THE NEW PIPE. THIS IS TO TAKE INTO ACCOUNT INTERIM SETTLEMENT, VARIABLE PIPE LENGTHS, AND THREAD LENGTHS IN COUPLING.
5. RESULTS OF SETTLEMENT GAUGE READINGS SHALL BE FORWARDED TO MR. K.J. KIM, EASTERN REGIONAL GEOTECHNICAL MANAGER, WITHIN THREE DAYS.

SETTLEMENT GUAGE QUANTITIES	
EMBANKMENT SETTLEMENT GAUGES	17 EACH

PREPARED BY: J. PARK	DATE: 09/2010
REVIEWED BY: K. J. KIM	DATE: 09/2010

GEOTECHNICAL ENGINEERING UNIT

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STATE OF NORTH CAROLINA
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RALEIGH

Embankment Monitoring Detail

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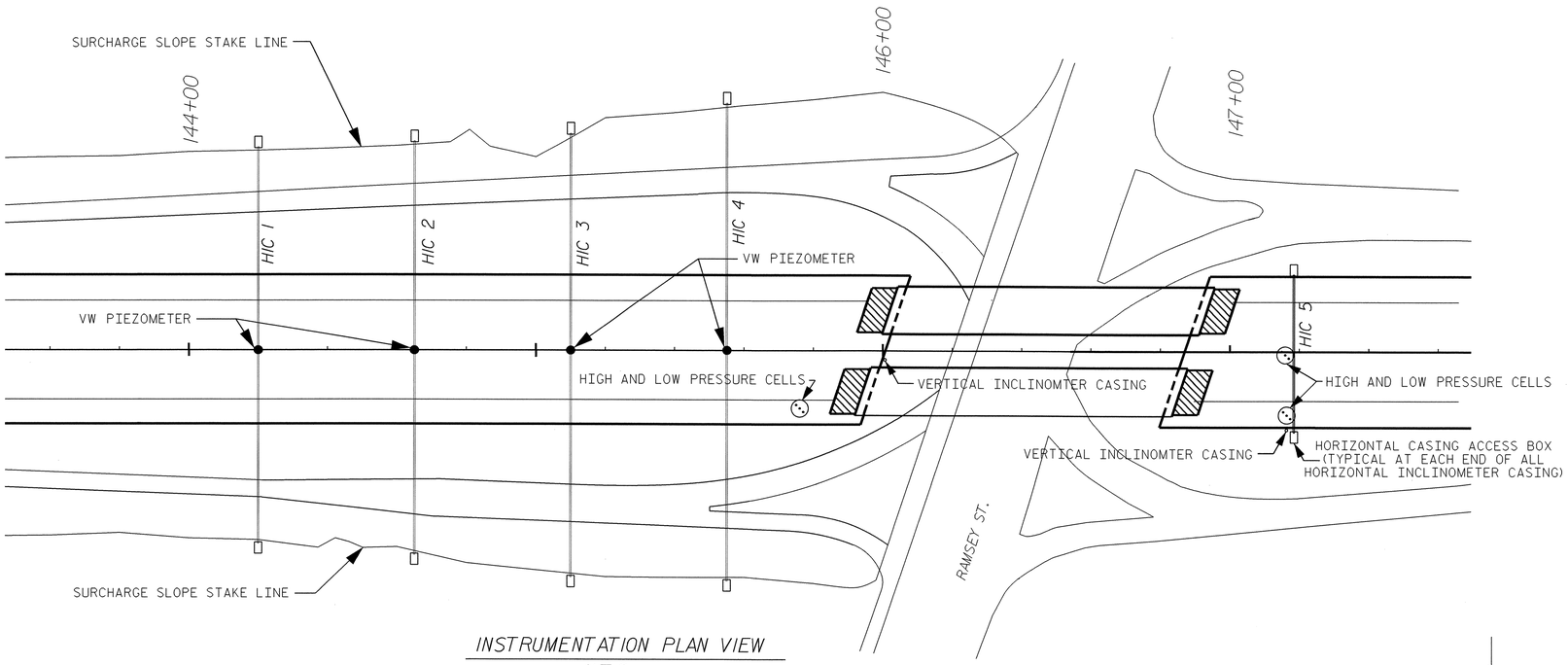
PROJECT REFERENCE NO.	SHEET
X-0002CB	2-S

GEOTECHNICAL ENGINEER | ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032672 ENGINEER MICHAEL D. VALIQUETTE 09/10/09

SIGNATURE DATE | SIGNATURE DATE



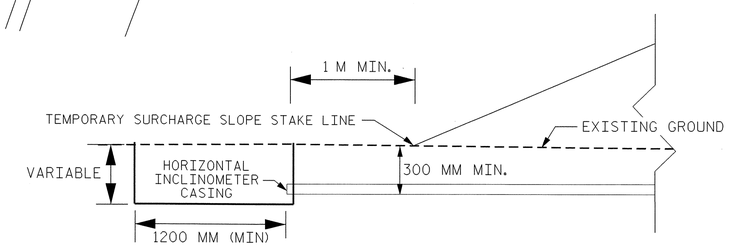
INSTRUMENTATION PLAN VIEW
N.T.S.

NOTES

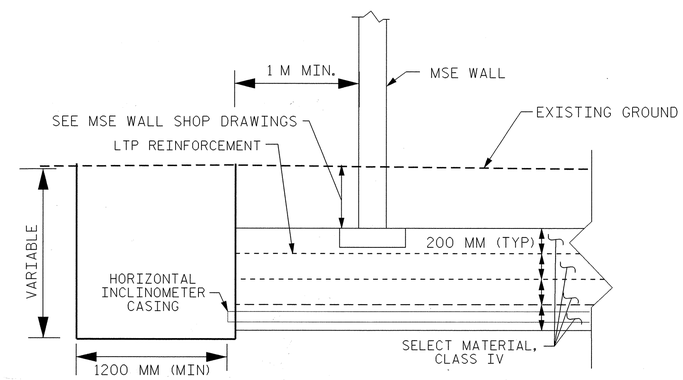
1. FOR PIEZOMETERS, HIGH AND LOW PRESSURE CELLS, HORIZONTAL INCLINOMETER CASING WITH PULL CABLE, COMPLETE HORIZONTAL INCLINOMETER PROBE SYSTEM, HORIZONTAL CASING ACCESS BOXES, AND VERTICAL INCLINOMETER CASING, SEE EMBANKMENT AND MSE WALL INSTRUMENTATION SPECIAL PROVISION.
2. FOR MSE WALL, SEE MSE WALL PLAN SHEETS
3. FOR LTP REINFORCEMENT, SEE PILE SUPPORTED EMBANKMENT AND MSE WALL PLAN SHEETS.
4. LOCATIONS OF ALL INSTRUMENTS SHOWN ON THIS PLAN SHEET ARE APPROXIMATE. THE ENGINEER WILL DETERMINE THE EXACT LOCATIONS AT THE TIME OF INSTALLATION.

QUANTITIES

VW PIEZOMETER	8 EACH
HIGH PRESSURE CELL	6 EACH
LOW PRESSURE CELL	3 EACH
HORIZONTAL INCLINOMETER CASING WITH PULL CABLE	500 LINEAR METERS
COMPLETE HORIZONTAL INCLINOMETER PROBE SYSTEM	1 EACH
HORIZONTAL CASING ACCESS BOX	10 EACH
VERTICAL INCLINOMETER CASING	40 LINEAR METERS



HORIZONTAL CASING ACCESS BOX
TYPICAL SECTION AT EMBANKMENTS
N.T.S.



HORIZONTAL CASING ACCESS BOX
TYPICAL SECTION AT MSE WALLS
N.T.S.

HORIZONTAL INCLINOMETER CASING

	STATION	BEGIN	END
HIC 1	144+20	59m LT +/-	56m RT +/-
HIC 2	144+65	61m LT +/-	59m RT +/-
HIC 3	145+10	63m LT +/-	65m RT +/-
HIC 4	145+55	71m LT +/-	67m RT +/-
HIC 5	147+18.4	22.5m LT +/-	22.5m RT +/-

VW PIEZOMETERS

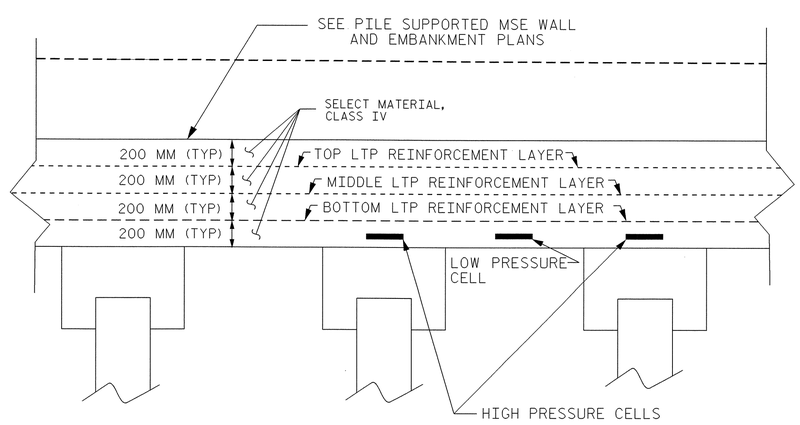
	STATION	OFFSET
1	144+20	0m
2	144+65	0m
3	145+10	0m
4	145+55	0m

VERTICAL INCLINOMETER CASING

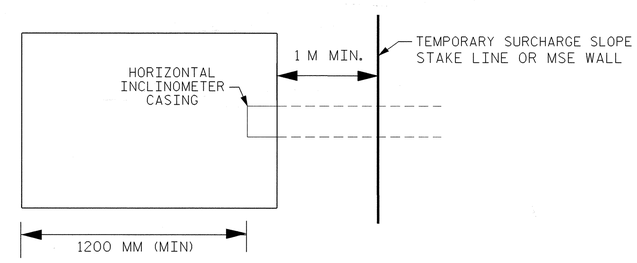
	STATION	OFFSET
1	146+01	2m RT +/-
2	147+16.4	22.5m RT +/-

PRESSURE CELLS

	STATION	OFFSET
1	145+78.301	13.575m RT
2	145+79.301	14.545m RT
3	145+80.301	15.514m RT
4	147+15.400	0m
5	147+16.400	0.969m RT
6	147+17.400	1.939m RT
7	147+15.400	15.509m RT
8	147+16.400	16.478m RT
9	147+17.400	17.447m RT



PRESSURE CELL LOCATION DETAIL
N.T.S.



HORIZONTAL CASING ACCESS
BOX TYPICAL PLAN VIEW
N.T.S.

PREPARED BY: M.D. VALIQUETTE	DATE: 09/2010
REVIEWED BY: K.J. KIM	DATE: 09/2010

GEOTECHNICAL ENGINEERING UNIT
[X] EASTERN REGIONAL OFFICE
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

EMBANKMENT AND MSE WALL INSTRUMENTATION

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
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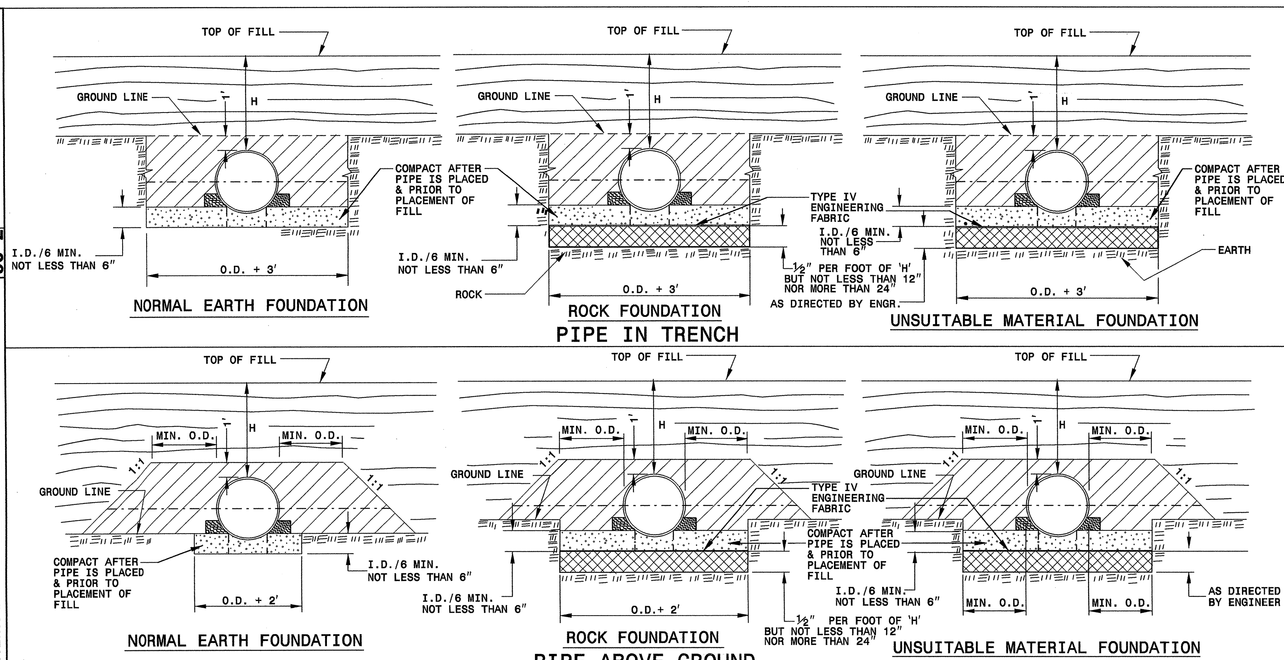
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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.

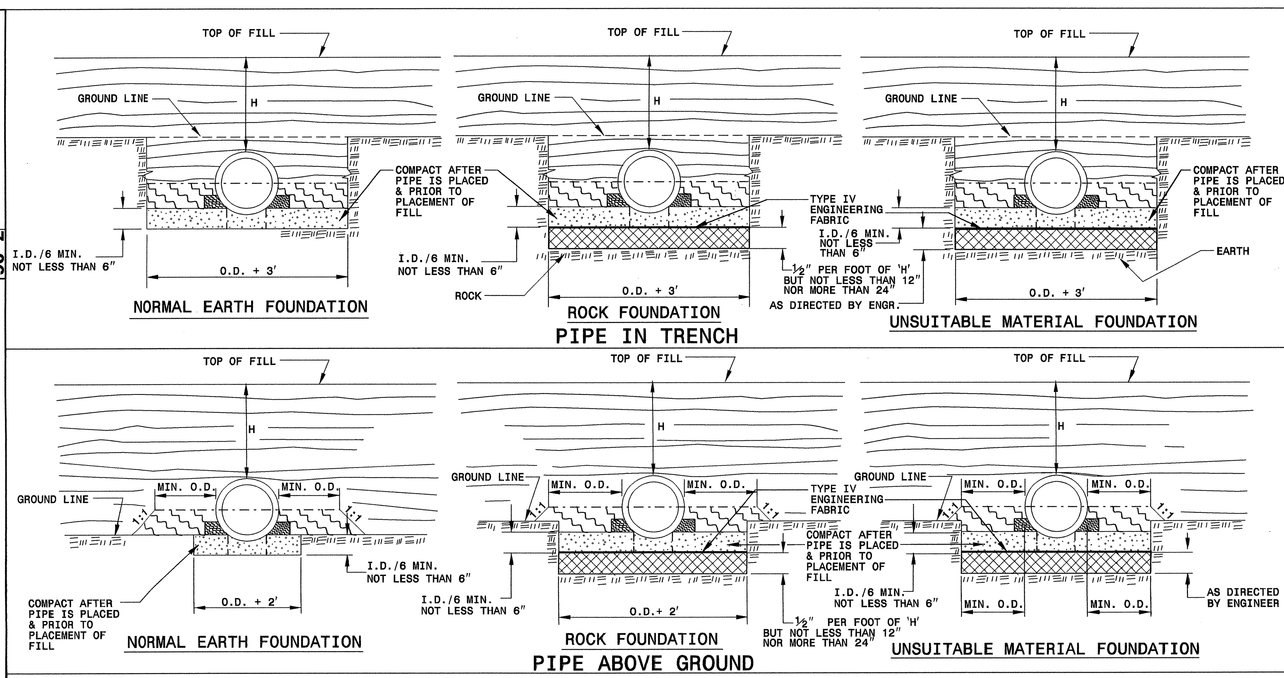
SHEET 1 OF 3
300D01

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



GENERAL NOTES:

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

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

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

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

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

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

SPRINGLINE OF PIPE

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

APPROVED SUITABLE LOCAL MATERIAL ABOVE SPRINGLINE.

UNDISTURBED EARTH MATERIAL

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

SHEET 2 OF 3
300D01

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

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022656 JOSEPH S. HARTZOG

SEE PLATE FOR TITLE

ORIGINAL BY: KKempf DATE: 5-15-09
MODIFIED BY: DATE:
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PROJECT REFERENCE NO. X-0022CB
SHEET NO. 2-T

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

SEE PLATE FOR TITLE

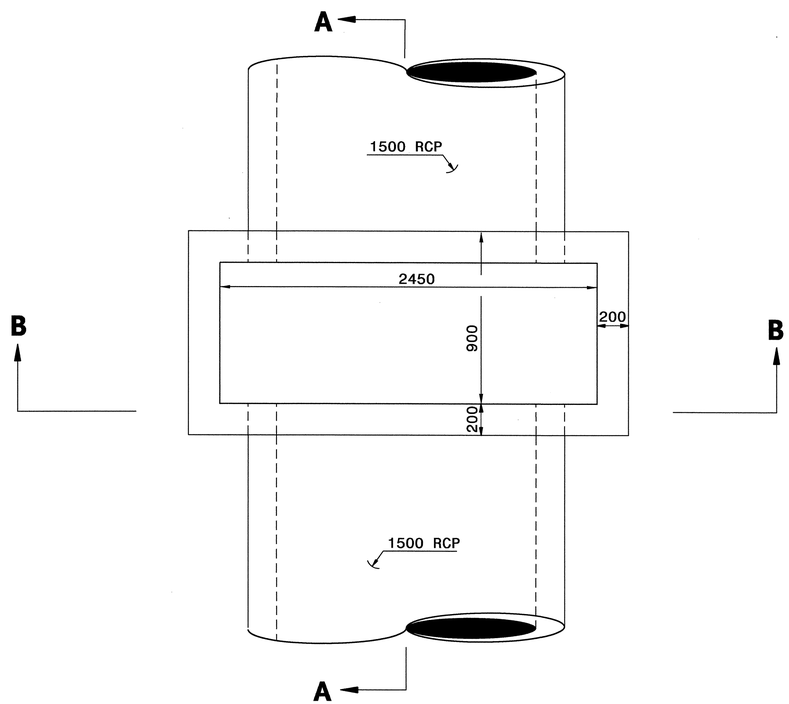
ORIGINAL BY: KKempf DATE: 5-15-09
MODIFIED BY: DATE:
CHECKED BY: DATE: 7/30/09
FILE SPEC/ericward/stds/stdetodetails/30001/0300d01.dgn

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966

PROJECT REFERENCE NO. X-0002CB
SHEET NO. 2-U

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	2-V

METRIC



PLAN

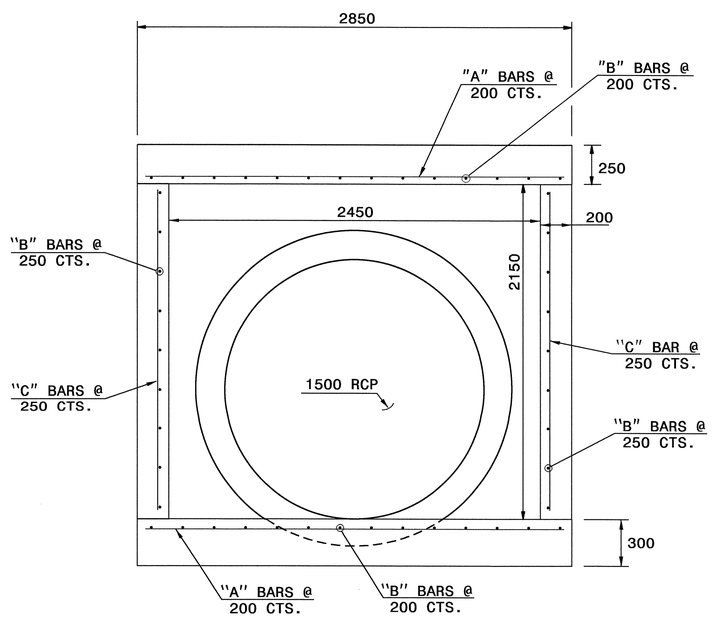
GENERAL NOTES:

1. USE CLASS "B" CONCRETE THROUGHOUT.
2. CONSTRUCT CONCRETE BOX IN ACCORDANCE WITH SECTION 825 OF THE STANDARD SPECIFICATIONS.
3. USE FORMS TO CONSTRUCT THE BOTTOM SLAB.
4. ADJUST LENGTH OF STEEL BARS AS NEEDED TO COMPENSATE FOR PIPES AND FRAME AND GRATE OPENINGS.
5. USE ASTM A 615, GRADE 400 REINFORCING STEEL.
6. CUT OR BEND STEEL BARS AS NEEDED TO PROVIDE 50mm CLEARANCE.
7. HEIGHT OF JUNCTION BOX MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.

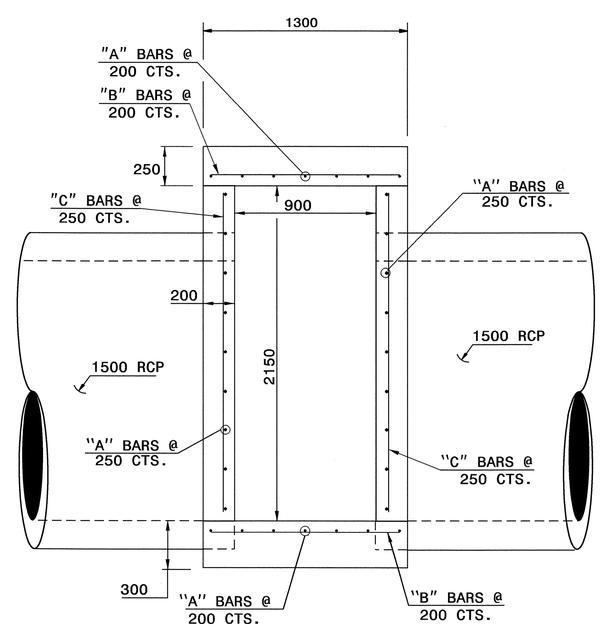
BILL OF MATERIALS

BAR	QTY	SIZE	LENGTH	WEIGHT
A	32	#15	2750 mm	136.6 kg
B	46	#15	1200 mm	85.7 kg
C	32	#15	2050 mm	101.8 kg
TOTAL REINF. STEEL				324.1 kg
TOTAL CONC.				5.4 cu. m
DEDUCTIONS FOR ONE PIPE				
60" RCP				0.7 cu. m

NO DEDUCTIONS HAVE BEEN MADE TO ACCOMMODATE PIPES.



SECTION B-B



SECTION A-A

NORTH CAROLINA PROFESSIONAL SEAL 022566 ENGINEER JOEL S. TOWERY
10/14/10

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

DETAIL OF SPECIAL JUNCTION BOX

ORIGINAL BY: K.A. Kempf DATE: October 6, 2010
MODIFIED BY: DATE:
CHECKED BY: DATE: 10/14/10
FILE SPEC.: /details/kkempf/metric/jb1800_x0002.dgn

14-OCT-2010 11:23
S:\Contracts\Contracts\Special Details\kkempf\metric\jb1800_x0002.dgn
$$$$USERNAME$$$$

6/10/99

COMPUTED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____

6/15/99

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	3(1 of 2)

METRIC

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202618

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING
0001000000-M	200	Lump Sum		CLEARING & GRUBBING .. HECTARE(S)
0008000000-M	200	1.6	HA	SUPPLEMENTARY CLEARING & GRUBBING
0015000000-N	205	8	EA	SEALING ABANDONED WELLS
0022000000-M	225	561,900	M3	UNCLASSIFIED EXCAVATION
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ********** (118+17.512 -L-EBL)
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ********** (118+17.512 -L-WBL)
0036000000-M	225	19,700	M3	UNDERCUT EXCAVATION
0038000000-M	SP	400	M3	SHALLOW UNDERCUT
0080000000-M	SP	900	MTN	CLASS IV SUBGRADE STABILIZATION
0084000000-M	SP	179,500	M	WICK DRAINS
0106000000-M	230	624,100	M3	BORROW EXCAVATION
0127000000-N	SP	17	EA	EMBANKMENT SETTLEMENT GAUGES
0134000000-M	240	11,400	M3	DRAINAGE DITCH EXCAVATION
0141000000-M	240	730	M	BERM DITCH CONSTRUCTION
0156000000-M	250	2,510	M2	REMOVAL OF EXISTING ASPHALT PAVEMENT
0192000000-N	260	10	HR	PROOF ROLLING
0194000000-M	SP	26,100	M3	SELECT GRANULAR MATERIAL, CLASS III
0195000000-M	SP	15,655	M3	SELECT GRANULAR MATERIAL
0196000000-M	270	18,200	M2	FABRIC FOR SOIL STABILIZATION
0234000000-M	SP	34,000	M3	GENERIC GRADING ITEM BORROW MATERIAL FOR GEOGRID REINFORCEMENT
0241000000-M	SP	43,500	M2	GENERIC GRADING ITEM NONWOVEN FABRIC FOR SOIL SEPARATION
0241000000-M	SP	17,000	M2	GENERIC GRADING ITEM PRIMARY GEOGRID REINFORCEMENT
0241000000-M	SP	1,450	M2	GENERIC GRADING ITEM SECONDARY GEOGRID REINFORCEMENT
0257000000-M	SP	500	M	GENERIC GRADING ITEM HORIZONTAL INCLINOMETER CASING WITH PULL CABLE
0257000000-M	SP	40	M	GENERIC GRADING ITEM VERTICAL INCLINOMETER CASING
0262000000-N	SP	1	EA	GENERIC GRADING ITEM COMPLETE HORIZONTAL INCLINOMETER PROBE SYSTEM
0262000000-N	SP	6	EA	GENERIC GRADING ITEM HIGH PRESSURE CELL
0262000000-N	SP	10	EA	GENERIC GRADING ITEM HORIZONTAL CASING ACCESS BOX
0262000000-N	SP	3	EA	GENERIC GRADING ITEM LOW PRESSURE CELL
0262000000-N	SP	8	EA	GENERIC GRADING ITEM VW PIEZOMETER
0318000000-M	SP	1,826	MTN	FOUNDATION CONDITIONING MATERIAL, MINOR STRS
0320000000-M	SP	5,460	M2	FOUNDATION CONDITIONING FABRIC
0350000000-M	SP	114	M	****MM RC PIPE CULVERTS, CONTRACTOR DESIGN (1500MM)
0926000000-M	320	142.8	M	****MM CS STRUCTURAL PLATE PIPE, ****MM THICK (1800MM, 3.51MM)
0973100000-M	SP	123.6	M	***MM WELDED STEEL PIPE, ****MM THICK, GRADE ** IN SOIL (1200MM, 16MM, B)
0987000000-M	310	39.6	M	GENERIC PIPE ITEM 1000MM CS PIPE CULVERTS, 2.01MM THICK
0987000000-M	310	49.2	M	GENERIC PIPE ITEM 1050MM RC PIPE CULVERTS, CLASS III
0987000000-M	310	3.6	M	GENERIC PIPE ITEM 1350MM RC PIPE CULVERTS, CLASS III
0987000000-M	310	86.4	M	GENERIC PIPE ITEM 1350MM RC PIPE CULVERTS, CLASS IV
0987000000-M	310	6	M	GENERIC PIPE ITEM 1500MM RC PIPE CULVERTS, CLASS III
0987000000-M	310	38.4	M	GENERIC PIPE ITEM 375MM SIDE DRAIN PIPE
0987000000-M	310	99.6	M	GENERIC PIPE ITEM 400MM CS PIPE CULVERTS, 1.63MM THICK
0987000000-M	310	28.8	M	GENERIC PIPE ITEM 450MM CS PIPE CULVERTS, 1.63MM THICK
0987000000-M	310	10.8	M	GENERIC PIPE ITEM 450MM SIDE DRAIN PIPE
0987000000-M	310	42	M	GENERIC PIPE ITEM 600MM CS PIPE CULVERTS, 1.63MM THICK
0987000000-M	310	26.4	M	GENERIC PIPE ITEM 600MM RC PIPE CULVERTS, CLASS IV
0987000000-M	310	22.8	M	GENERIC PIPE ITEM 800MM CS PIPE CULVERTS, 2.01MM THICK
0987000000-M	310	24	M	GENERIC PIPE ITEM 900MM CS PIPE CULVERTS, 2.01MM THICK
0987000000-M	310	110.4	M	GENERIC PIPE ITEM 900MM RC PIPE CULVERTS, CLASS IV
0988000000-M	310	2	EA	GENERIC PIPE ITEM 1000MM CS PIPE ELBOWS, 2.01MM THICK
0988000000-M	310	5	EA	GENERIC PIPE ITEM 400MM CS PIPE ELBOWS, 1.63MM THICK
0988000000-M	310	1	EA	GENERIC PIPE ITEM 450MM CS PIPE ELBOWS, 1.63MM THICK
0988000000-M	310	4	EA	GENERIC PIPE ITEM 600MM CS PIPE ELBOWS, 1.63MM THICK
0988000000-M	310	4	EA	GENERIC PIPE ITEM 800MM CS PIPE ELBOWS, 2.01MM THICK
0988000000-M	310	2	EA	GENERIC PIPE ITEM 900MM CS PIPE ELBOWS, 2.01MM THICK
0995000000-M	340	254.6	M	PIPE REMOVAL
1011000000-N	500	Lump Sum		FINE GRADING
1077000000-M	SP	30	MTN	#57 STONE
1110000000-M	510	5,800	MTN	STABILIZER AGGREGATE
1121000000-M	520	3,910	MTN	AGGREGATE BASE COURSE
1220000000-M	545	325	MTN	INCIDENTAL STONE BASE
1275000000-M	600	9,410	L	PRIME COAT
1330000000-M	607	220	M2	INCIDENTAL MILLING
1489000000-M	610	640	MTN	ASPHALT CONC BASE COURSE, TYPE B25.0B
1498000000-M	610	370	MTN	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
1519000000-M	610	290	MTN	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
1525000000-M	610	1,160	MTN	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A
1560000000-M	620	140	MTN	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
1693000000-M	654	160	MTN	ASPHALT PLANT MIX, PAVEMENT REPAIR
2022000000-M	SP	662	M3	SUBDRAIN EXCAVATION
2033000000-M	SP	331	M3	SUBDRAIN FINE AGGREGATE
2044000000-M	SP	800	M	150MM PERFORATED SUBDRAIN PIPE
2070000000-N	SP	6	EA	SUBDRAIN PIPE OUTLETS
2077000000-M	SP	12	M	150MM OUTLET PIPE (SUBDRAINS)
2209000000-M	838	7.2	M3	ENDWALLS
2220000000-M	838	8.1	M3	REINFORCED ENDWALLS
2275000000-M	SP	200	M3	FLOWABLE FILL
2286000000-N	840	128	EA	MASONRY DRAINAGE STRUCTURES
2297000000-M	840	13.8	M3	MASONRY DRAINAGE STRUCTURES
2308000000-M	840	39.62	M	MASONRY DRAINAGE STRUCTURES
2364200000-N	840	28	EA	FRAME WITH TWO GRATES, STD 840.20
2365000000-N	840	74	EA	FRAME WITH TWO GRATES, STD 840.22
2366000000-N	840	1	EA	FRAME WITH TWO GRATES, STD 840.24
2367000000-N	840	4	EA	FRAME WITH TWO GRATES, STD 840.29
2374000000-N	840	4	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)
2374000000-N	840	6	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)
2374000000-N	840	7	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)
2396000000-N	840	5	EA	FRAME WITH COVER, STD 840.54
2440000000-N	852	5	EA	CONCRETE TRANSITIONAL SECTION FOR CATCH BASIN
2549000000-M	846	275	M	750MM CONCRETE CURB & GUTTER
2580000000-M	846	480	M	CONCRETE VALLEY GUTTER
2612000000-M	848	20	M2	150MM CONCRETE DRIVEWAY
2619000000-M	850	120	M2	100MM CONCRETE PAVED DITCH
2800000000-N	858	1	EA	ADJUSTMENT OF CATCH BASINS
2815000000-N	858	1	EA	ADJUSTMENT OF DROP INLETS
3030000000-M	862	83.82	M	STEEL BM GUARDRAIL
3045000000-M	862	19.05	M	STEEL BM GUARDRAIL, SHOP CURVED
3105000000-N	862	10	EA	STEEL BM GUARDRAIL TERMINAL SECTIONS
3150000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS
3210000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE CAT-1
3270000000-N	SP	4	EA	GUARDRAIL ANCHOR UNITS, TYPE 350

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STATE OF NORTH CAROLINA
SUMMARY OF QUANTITIES

PROJECT REFERENCE No.	SHEET No.
X-0002 CB	3 (2 of 2)

ItemNumber	Sec #	Quantity	Unit	Description
3503000000-M	866	8,290	M	WOVEN WIRE FENCE, 1200MM FABRIC
3509000000-M	866	1,770	EA	100MM TIMBER FENCE POSTS, 2.30M LONG
3515000000-M	866	320	EA	125MM TIMBER FENCE POSTS, 2.50M LONG
3565000000-M	866	2	EA	DOUBLE GATES, ****MM HIGH, ****MM WIDE, ****MM OPENING (1200MM, 3050MM, 6100MM)
3628000000-M	876	1,000	MTN	RIP RAP, CLASS I
3649000000-M	876	825	MTN	RIP RAP, CLASS B
3656000000-M	876	7,465	M2	FILTER FABRIC FOR DRAINAGE
3659000000-N	SP	1	EA	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON
3691000000-N	SP	3	EA	GENERIC EROSION CONTROL ITEM ENERGY DISSIPATOR BASIN
4072000000-M	903	58	M	SUPPORTS, 4.5-KG STEEL U-CHANNEL
4078000000-M	903	15	EA	SUPPORTS, 3-KG STEEL U-CHANNEL
4102000000-N	904	37	EA	SIGN ERECTION, TYPE E
4155000000-N	907	6	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4400000000-M	1110	101	M2	WORK ZONE SIGNS (STATIONARY)
4405000000-M	1110	33	M2	WORK ZONE SIGNS (PORTABLE)
4410000000-M	1110	30	M2	WORK ZONE SIGNS (BARRICADE MOUNTED)
4415000000-N	1115	1	EA	FLASHING ARROW PANELS, TYPE C
4420000000-N	1120	2	EA	CHANGEABLE MESSAGE SIGN
4422000000-N	1120	100	DAY	CHANGEABLE MESSAGE SIGN (SHORT TERM)
4430000000-N	1130	130	EA	DRUMS
4435000000-N	1135	60	EA	CONES
4445000000-M	1145	110	M	BARRICADES (TYPE III)
4455000000-N	1150	400	MD	FLAGGER
4465000000-N	1160	1	EA	TEMPORARY CRASH CUSHIONS
4485000000-M	1170	56	M	PORTABLE CONCRETE BARRIER
4490000000-M	1170	73	M	PORTABLE CONCRETE BARRIER (ANCHORED)
4510000000-N	SP	420	HR	LAW ENFORCEMENT
4516000000-N	1180	25	EA	SKINNY DRUM
4650000000-N	1251	65	EA	TEMPORARY RAISED PAVEMENT MARKERS
4685000000-M	1205	640	M	THERMOPLASTIC PAVEMENT MARKING LINES (100MM, 2.3MM)
4686000000-M	1205	841	M	THERMOPLASTIC PAVEMENT MARKING LINES (100MM, 3.1MM)
4695000000-M	1205	297	M	THERMOPLASTIC PAVEMENT MARKING LINES (200MM, 2.3MM)
4710000000-M	1205	15	M	THERMOPLASTIC PAVEMENT MARKING LINES (600MM, 3.1MM)
4721000000-M	1205	8	EA	THERMOPLASTIC PAVEMENT MARKING CHARACTER (3.1MM)
4725000000-M	1205	11	EA	THERMOPLASTIC PAVEMENT MARKING SYMBOL (2.3MM)
4810000000-M	1205	12,372	M	PAINT PAVEMENT MARKING LINES (100MM)
4835000000-M	1205	36	M	PAINT PAVEMENT MARKING LINES (600MM)
4840000000-N	1205	8	EA	PAINT PAVEMENT MARKING CHARACTER
4845000000-N	1205	14	EA	PAINT PAVEMENT MARKING SYMBOL
4850000000-M	1205	703	M	REMOVAL OF PAVEMENT MARKING LINES (100MM)
4875000000-N	1205	12	EA	REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS
4900000000-N	1251	67	EA	PERMANENT RAISED PAVEMENT MARKERS
5325600000-M	1510	8	M	150MM WATER LINE
5325800000-M	1510	30	M	200MM WATER LINE
5546000000-M	1515	2	EA	200MM VALVE
5648000000-N	1515	1	EA	RELOCATE WATER METER
5649000000-N	1515	3	EA	RECONNECT WATER METER
5672000000-N	1515	2	EA	RELOCATE FIRE HYDRANT
5691300000-M	1520	116	M	200MM SANITARY GRAVITY SEWER

ItemNumber	Sec #	Quantity	Unit	Description
5775000000-M	1525	3	EA	1200MM DIA UTILITY MANHOLE
5781000000-M	1525	2.21	M	UTILITY MANHOLE WALL, 1200MM DIA
5801000000-M	1530	348	M	ABANDON 200MM UTILITY PIPE
5816000000-N	1530	2	EA	ABANDON UTILITY MANHOLE
6000000000-M	1605	9,500	M	TEMPORARY SILT FENCE
6006000000-M	1610	7,025	MTN	STONE FOR EROSION CONTROL, CLASS A
6009000000-M	1610	6,410	MTN	STONE FOR EROSION CONTROL, CLASS B
6012000000-M	1610	5,170	MTN	SEDIMENT CONTROL STONE
6015000000-M	1615	100	HA	TEMPORARY MULCHING
6018000000-M	1620	2,375	KG	SEED FOR TEMPORARY SEEDING
6021000000-M	1620	17.25	MTN	FERTILIZER FOR TEMPORARY SEEDING
6024000000-M	1622	4,000	M	TEMPORARY SLOPE DRAINS
6027000000-N	1622	60	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
6029000000-M	SP	7,500	M	SAFETY FENCE
6030000000-M	1630	32,285	M3	SILT EXCAVATION
6036000000-M	1631	122,500	M2	MATTING FOR EROSION CONTROL
6037000000-M	SP	1,300	M2	COIR FIBER MAT
6038000000-M	SP	4,750	M2	PERMANENT SOIL REINFORCEMENT MAT
6042000000-M	1632	1,750	M	6.4MM HARDWARE CLOTH
6046000000-M	SP	30	M	TEMPORARY PIPE FOR STREAM CROSSING
6071010000-M	SP	3,310	M	WATTLE
6071020000-M	SP	3,030	KG	POLYACRYLAMIDE (PAM)
6071030000-M	SP	5,000	M	COIR FIBER BAFFLES
6071050000-M	SP	21	EA	***MM SKIMMER (38MM)
6071050000-M	SP	11	EA	***MM SKIMMER (51MM)
6071050000-M	SP	2	EA	***MM SKIMMER (64MM)
6071050000-M	SP	1	EA	***MM SKIMMER (76MM)
6084000000-M	1660	75	HA	SEEDING & MULCHING
6087000000-M	1660	75	HA	MOWING
6090000000-M	1661	2,075	KG	SEED FOR REPAIR SEEDING
6093000000-M	1661	7	MTN	FERTILIZER FOR REPAIR SEEDING
6096000000-M	1662	1,725	KG	SEED FOR SUPPLEMENTAL SEEDING
6108000000-M	1665	102	MTN	FERTILIZER TOPDRESSING
6114500000-N	SP	100	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	75	EA	RESPONSE FOR EROSION CONTROL
6123000000-M	1670	2	HA	REFORESTATION
6138000000-M	SP	30,000	M3	GENERIC EROSION CONTROL ITEM BORROW PIT DEWATERING BASIN
******* BEGIN SCHEDULE AA ******* ******* (3 ALTERNATES) *******				
0987000000-M AA1	310	1,464	M	GENERIC PIPE ITEM 375MM RC PIPE CULVERTS, CLASS III
0987000000-M AA1	310	564	M	GENERIC PIPE ITEM 450MM RC PIPE CULVERTS, CLASS III
0987000000-M AA1	310	1,300.8	M	GENERIC PIPE ITEM 600MM RC PIPE CULVERTS, CLASS III
0987000000-M AA1	310	1,152	M	GENERIC PIPE ITEM 750MM RC PIPE CULVERTS, CLASS III
0987000000-M AA1	310	643.2	M	GENERIC PIPE ITEM 900MM RC PIPE CULVERTS, CLASS III
*** OR ***				
0540000000-M AA2	SP	559.2	M	****MM ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, ****MM THICK (400MM, 1.63MM)
0540000000-M AA2	SP	288	M	****MM ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, ****MM THICK (450MM, 1.63MM)

ItemNumber	Sec #	Quantity	Unit	Description
0540000000-M AA2	SP	909.6	M	****MM ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, ****MM THICK (600MM, 1.63MM)
0540000000-M AA2	SP	960	M	****MM ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, ****MM THICK (800MM, 2.01MM)
0540000000-M AA2	SP	591.6	M	****MM ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, ****MM THICK (900MM, 2.01MM)
0987000000-M AA2	310	904.8	M	GENERIC PIPE ITEM 375MM RC PIPE CULVERTS, CLASS III
0987000000-M AA2	310	276	M	GENERIC PIPE ITEM 450MM RC PIPE CULVERTS, CLASS III
0987000000-M AA2	310	391.2	M	GENERIC PIPE ITEM 600MM RC PIPE CULVERTS, CLASS III
0987000000-M AA2	310	192	M	GENERIC PIPE ITEM 750MM RC PIPE CULVERTS, CLASS III
0987000000-M AA2	310	51.6	M	GENERIC PIPE ITEM 900MM RC PIPE CULVERTS, CLASS III
*** OR ***				
0536000000-M AA3	SP	559.2	M	****MM HDPE PIPE CULVERTS (375MM)
0536000000-M AA3	SP	288	M	****MM HDPE PIPE CULVERTS (450MM)
0536000000-M AA3	SP	909.6	M	****MM HDPE PIPE CULVERTS (600MM)
0536000000-M AA3	SP	960	M	****MM HDPE PIPE CULVERTS (750MM)
0536000000-M AA3	SP	591.6	M	****MM HDPE PIPE CULVERTS (900MM)
0987000000-M AA3	310	904.8	M	GENERIC PIPE ITEM 375MM RC PIPE CULVERTS, CLASS III
0987000000-M AA3	310	276	M	GENERIC PIPE ITEM 450MM RC PIPE CULVERTS, CLASS III
0987000000-M AA3	310	391.2	M	GENERIC PIPE ITEM 600MM RC PIPE CULVERTS, CLASS III
0987000000-M AA3	310	192	M	GENERIC PIPE ITEM 750MM RC PIPE CULVERTS, CLASS III
0987000000-M AA3	310	51.6	M	GENERIC PIPE ITEM 900MM RC PIPE CULVERTS, CLASS III
******* END SCHEDULE AA *******				

RA-0239

COMPUTED BY: Chris Powell DATE: 7/21/2010

CHECKED BY: Trent Huffman DATE: 7/23/2010

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

METRIC

PROJECT NO.	SHEET NO.
X-0002CB	3-A

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

CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE)

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	300	375	450	600	600 CLASS IV	750	900	900 CLASS IV	1050	1050	1200
-L-																		
Structure Numbers 1-49 Not Used																		
106+60	CL	50		68.11	66.10													
106+60	CL	50	48		66.10	65.56												
106+60	RT	51		67.41	66.57													
106+60	RT	51	50		66.57	66.48			26.4									
107+76	LT	52		68.05	67.21													
107+76	LT	52	53		67.21	67.08			26.4									
107+76	CL	53		68.69	66.70													
107+76	CL	53	50		66.70	66.10												
107+76	RT	54		68.16	67.32													
107+76	RT	54	53		67.32	67.08			26.4									
108+90	LT	55			70.50													
108+90	LT	55	56		70.50	68.04												
108+90	LT	56		69.26	68.04													
108+90	LT	56	57		68.04	67.05							22.8					
108+90	CL	57		69.30	67.05													
108+90	CL	57	53		67.05	66.70												
108+90	RT	58		68.34	67.50													
108+90	RT	58	57		67.50	67.42			26.4									
110+05	LT	59			71.20													
110+05	LT	59	60		71.20	69.05												
110+05	LT	60		70.27	69.05													
110+05	LT	60	61		69.05	67.94							24.0					
110+05	CL	61		69.90	67.54													
110+05	CL	61	65		67.54	66.91												
110+05	RT	62		68.82	67.98													
110+05	RT	62	61		67.98	67.91			22.8									
112+05	LT	63			71.85													
112+05	LT	63	64		71.85	69.05												
112+05	LT	64		70.27	69.05													
112+05	LT	64	65		69.05	66.91							22.8					
112+05	CL	65		69.90	66.76													
112+05	CL	65	68		66.76	66.34												
112+05	RT	66		68.82	67.98													
112+05	RT	66	65		67.98	67.29			22.8									
113+55	LT	67		69.57	68.73													
113+55	LT	67	68		68.73	66.87			22.8									
113+55	CL	68		69.20	66.34													
113+55	CL	68	70		66.34	66.11												
113+55	RT	69		68.12	67.28													
113+55	RT	69	68		67.28	66.87			22.8									
114+30	CL	70		68.92	66.11													
114+30	CL	70	OUT		66.11	65.80									34.8			
114+30	RT	71		67.84	66.93													
114+30	RT	71	70		66.93	66.56				24.0								
SHEET TOTALS									196.8	24.0			69.6	34.8				

C.S. PIPE (UNLESS NOTED OTHERWISE); CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D; SIDE DRAIN PIPE; ENDWALLS (STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)) CU. METERS

STATION	FROM	TO	C.S. 300 (1.63)	C.S. 400 (1.63)	C.S. 450 (1.63)	C.S. 600 (1.63)	C.S. 800 (2.01)	C.S. 900 (2.01)	C.S. 1000 (2.01)	C.S. 1200 (2.01)	300	375	450	600	750	900	1050	1200	375mm SIDE DRAIN PIPE	450mm SIDE DRAIN PIPE	600mm SIDE DRAIN PIPE	R.C.P.	C.S.P.
106+60	50																						
106+60	50	48													178.8								
106+60	51																						
106+60	51	50																					
107+76	52																						
107+76	52	53																					
107+76	53																						
107+76	53	50													115.2								
107+76	54																						
107+76	54	53																					
108+90	55																						
108+90	55	56					4.8																
108+90	56																						
108+90	56	57																					
108+90	57																						
108+90	57	53													112.8								
108+90	58																						
108+90	58	57																					
110+05	59																						
110+05	59	60					3.6																
110+05	60																						
110+05	60	61																					
110+05	61																						
110+05	61	65													208.8								
110+05	62																						
110+05	62	61																					
112+05	63																						
112+05	63	64					8.4																
112+05	64																						
112+05	64	65																					
112+05	65																						
112+05	65	68														138.0							
112+05	66																						
112+05	66	65																					
113+55	67																						
113+55	67	68																					
113+55	68																						
113+55	68	70														74.4							
113+55	69																						
113+55	69	68																					
114+30	70																						
114+30	70	OUT																					
114+30	71																						
114+30	71	70																					
SHEET TOTALS							16.8								615.6	212.4							

QUANITIES FOR DRAINAGE STRUCTURES; *TOTAL METERS FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B'); FRAME, GRATES, AND HOOD STANDARD 840.03 (TYPE OF GRATE); CONCRETE TRANSITIONAL SECTION

STATION	FROM	TO	PER EACH (0 THRU 1.50)	METERS A: 1.5 THRU 3.00	METERS B: 3.00 AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	E	F	G	DROP INLET	CATCH BASIN	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22
106+60	50		1	0.51								1				1
106+60	50	48														
106+60	51		1										1			1
106+60	51	50														
107+76	52		1										1			1
107+76	52	53														
107+76	53		1	0.49								1				1
107+76	53	50														
107+76	54		1										1			1
107+76	54	53														
108+90	55															
108+90	55	56														
108+90	56		1										1			1
108+90	56	57														
108+90	57		1	0.75								1				1
108+90	57	53														
108+90	58		1										1			1
108+90	58	57														
110+05	59															
110+05	59	60														
110+05	60		1										1			1
110+05	60	61														
110+05	61		1	0.86								1				1
110+05	61	65														
110+05	62		1										1			1
110+05	62	61														
112+05	63															
112+05	63	64														
112+05	64		1										1			1
112+05	64	65														
112+05	65		1	1.50	0.14							1				1
112+05	65	68														
112+05	66		1										1			1
112+05	66	65														
113+55	67		1										1			1
113+55	67	68														
113+55	68		1	1.36								1				1
113+55	68	70														
113+55	69		1										1			1
113+55	69	68														
114+30	70		1	1.31								1				1
114+30	70	OUT														
114+30	71		1										1			1
114+30	71	70														
SHEET TOTALS			19	6.78	0.14							7	12			19
				6.96												

C.S. ELBOWS NO. & SIZE

STATION	FROM	TO	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	M.H. FRAME AND COVER STD. 840.54	ADJUST CATCH BASIN	ADJUST DROP INLET	PAVED DITCH m2 STD. 850.10 or 850.11	1200mm WELDED STEEL PIPE W/TRENCHLESS INSTALLATION	400	450	600	800	900	1000	CONC. COLLARS CL. "B" M^3 STD. 840.72	CONC. & BRICK PIPE PLUG, M^3 STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
106+60	50																			
106+60	50	48																		
106+60	51																			
106+60	51	50																		
107+76	52																			
107+76	52	53																		
107+76	53																		7.2	PIPE REMOVAL IS AT CHURCH DRIVEWAY
107+76	53	50																		
107+76	54																		7.2	PIPE REMOVAL IS AT CHURCH DRIVEWAY
107+76	54	53																		
108+90	55								23.7											BERM DITCH OUTLET (Std. 850.11)
108+90	55	56												1						
108+90	56																			
108+90	56	57																		
108+90	57																			
108+90	57	53																		
108+90	58																			
108+90	58	57																		
110+05	59								23.7											BERM DITCH OUTLET (Std. 850.11)
110+05	59	60												1						
110+05	60																			
110+05	60	61																		
110+05	61																			
110+05	61	65																		
110+05	62																			
110+05	62	61																		
112+05	63								23.7											BERM DITCH OUTLET (Std. 850.11)
112+05	63	64												1						
112+05	64																			
112+05	64	65																		
112+05	65																		7.2	
112+05	65	68																		
112+05	66																		15.6	
112+05	66	65																		
113+55	67																			
113+55	67	68																		
113+55	68																			
113+55	68	70																		
113+55	69																			
113+55	69	68																		
114+30	70																			
114+30	70	OUT																		
114+30	71																			
114+30	71	70																		
SHEET TOTALS									71.1					3					37.2	

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

RA-0239,11/8/2010,R:\Drainage\x0002cb_Drainage_summaries.xls

COMPUTED BY: Chris Powell DATE: 7/21/2010

CHECKED BY: Trent Huffman DATE: 7/23/2010

RA-0239

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

METRIC

PROJECT NO.	SHEET NO.
X-0002CB	3-B

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

Column headings: STATION; SIZE; THICKNESS OR GAUGE; LOCATION (LT, RT, OR CL)'; STRUCTURE NO. (FROM, TO); TOP ELEVATION; INVERT ELEVATION; INVERT ELEVATION; SLOPE CRITICAL; CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE): 300, 375, 450, 600 (CLASS IV), 750, 900, 900 (CLASS IV), 1050, 1050, 1200; C.S. PIPE (UNLESS NOTED OTHERWISE): 300 (1.63), 400 (1.63), 450 (1.63), 600 (1.63), 800 (2.01), 900 (2.01), 1000 (2.01), 1200 (2.01); CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D: 300, 375, 450, 600, 750, 900, 1050, 1200; 375mm SIDE DRAIN PIPE; 450mm SIDE DRAIN PIPE; 600mm SIDE DRAIN PIPE; ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. METERS: R.C.P., C.S.P.; QUANITIES FOR DRAINAGE STRUCTURES: PER EACH (0 THRU 1.50); *TOTAL METERS FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS: A 1.5 THRU 3.00, B 3.00 AND ABOVE; C.B. STD. 840.01 OR STD. 840.02; FRAME, GRATES, AND HOOD STANDARD 840.03, TYPE OF GRATE: E, F, G; CONCRETE TRANSITIONAL SECTION: DROP INLET, CATCH BASIN; G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26; G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27; G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28; G.D.I. FRAME WITH TWO GRATES STD. 840.20; G.D.I. FRAME WITH TWO GRATES STD. 840.22; G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24; G.D.I. (N.S.) FRAME WITH GRATE STD. 840.29; J.B. STD. 840.31 OR STD. 840.32; M.H. FRAME AND COVER STD. 840.54; ADJUST CATCH BASIN; ADJUST DROP INLET; PAVED DITCH m2 STD. 850.10 or 850.11; 1200mm WELDED STEEL PIPE W/TRENCHLESS INSTALLATION; C.S. ELBOWS NO. & SIZE: 400, 450, 600, 800, 900, 1000; CONC. COLLARS CL. "B" M^3 STD. 840.72; CONC. & BRICK PIPE PLUG, M^3 STD. 840.71; PIPE REMOVAL (METERS); REMARKS.

STATION	LOC.	FROM	TO	TOP ELEV.	INVERT ELEV.	INVERT ELEV.	R.C. 375	R.C. 450	R.C. 750	R.C. 1050	C.S. 400 (1.63)	HDPE 375	HDPE 900	PER EACH	A 1.5 THRU 3.00	B 3.00 AND ABOVE	G.D.I. TYPE "A"	G.D.I. TYPE "B"	G.D.I. FRAME STD. 840.20	G.D.I. FRAME STD. 840.22	PAVED DITCH	ELBOWS 400	REMARKS
-L-																							
114+90	CL	72		69.12	67.13									1	0.49			1		1			
114+90	CL	72	OUT		67.13	66.40	36.0																
114+90	RT	73		68.04	67.20									1				1		1			
114+90	RT	73	72		67.20	67.13	22.8																
115+90	CL	74		69.62	67.56									1	0.56			1		1			
115+90	CL	74	OUT		67.56	65.92		36.0															
115+90	RT	75		68.54	67.63									1				1		1			
115+90	RT	75	74		67.63	67.56		22.8															
115+90	RT	76			68.24																8.4		BERM DITCH OUTLET (Std. 850.10)
115+90	RT	76	75		68.24	67.70					3.6											1	
117+20	CL	77		70.27	69.20									1				1		1			
117+20	CL	77	OUT		69.20	60.79					51.6												
117+20	RT	78		70.10	69.26									1				1	1				
117+20	RT	78	77		69.26	69.20	15.6																
117+58	RT	79		70.29	69.45									1				1	1				
117+58	RT	79	78		69.45	69.26						36.0											
118+77	RT	80		70.94	70.10							31.2		1				1	1				
118+77	RT	80	82		70.10	70.04																	
119+10	CL	81		71.22	70.38									1			1			1			
119+10	CL	81	82		70.38	70.04	15.6																
119+10	RT	82		71.05	70.04									1				1	1				
119+10	RT	82	OUT		70.04	65.00					24.0											1	ROD AND LUG CONN. W/ SLEEVE GASKET
Structure Number 83 Not Used																							
119+60	CL	84		71.47	70.63									1			1			1			
119+60	CL	84	81		70.63	70.38						49.2											
120+35	LT	IN	85		70.80	67.28			30.0														
120+35	CL	85		71.85	67.28									1	1.50	1.57	1			1			PIPE INLET EL = 70.80
120+35	CL	85	86		67.28	67.22				15.6													
120+35	RT	86		71.67	67.22									1	1.50	1.45	1		1				
120+35	RT	86	OUT		67.22	66.40				16.8													
121+10	LT	87		71.79	70.95									1				1		1			
121+10	LT	87	88		70.95	68.50	24.0																
121+10	CL	88		72.16	67.66									1	1.50	1.50	1			1			
121+10	CL	88	85		67.66	67.43							74.4										
123+20	LT	89		71.57	70.73									1				1		1			
123+20	LT	89	90		70.73	68.82	22.8																
123+20	CL	90		72.01	68.29									1	1.50	0.72	1			1			
123+20	CL	90	88		68.29	67.66							208.8										
123+20	RT	91		71.69	70.85									1				1		1			
123+20	RT	91	90		70.85	68.82	24.0																
System Continues on Next Sheet																							
SHEET TOTALS							160.8	58.8	30.0	32.4	79.2	116.4	283.2	18	7.05	5.24	6	12	5	13	8.4	2	
															13.86								

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

RA-0239

COMPUTED BY: Chris Powell DATE: 7/21/2010

CHECKED BY: Trent Huffman DATE: 7/23/2010

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

METRIC

PROJECT NO.: X-0002CB SHEET NO.: 3-C

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 300	375	450	600	600 CLASS IV	750	900	900 CLASS IV	1050	1050	1200	C.S. PIPE (UNLESS NOTED OTHERWISE) 300	400 (1.63)	450 (1.63)	600 (1.63)	800 (2.01)	900 (2.01)	1000 (2.01)	1200 (2.01)
-L-																										
System Continues on Previous Sheet																										
124+18	LT	92			71.60																					
124+18	LT	92	93		71.60	68.82																	6.0			
124+18	LT	93		70.04	68.82																					
124+18	LT	93	94		68.82	68.74							24.0													
124+18	CL	94		71.06	68.59																					
124+18	CL	94	90		68.59	68.29																				
124+18	RT	95		70.86	70.02																					
124+18	RT	95	94		70.02	69.11			24.0																	
124+18	RT	96			72.05																					
124+18	RT	96	95		72.05	70.02														6.0						
126+10	LT	97		68.37	67.46																					
126+10	LT	97	98		67.46	67.39				22.8																
126+10	CL	98		69.14	67.39																					
126+10	CL	98	101		67.39	66.09																				
126+10	RT	99		69.31	68.47																					
126+10	RT	99	98		68.47	67.47			22.8																	
127+40	LT	100		67.07	66.16																					
127+40	LT	100	101		66.16	66.09				22.8																
127+40	CL	101		67.84	65.94																					
127+40	CL	101	105		65.94	64.94																				
127+40	RT	102		68.01	67.17																					
127+40	RT	102	101		67.17	66.17			22.8																	
128+60	RT	103		66.17	65.33																					
128+60	RT	103	105		65.33	65.16			25.2																	
128+70	LT	104		66.07	65.23																					
128+70	LT	104	105		65.23	65.16			22.8																	
128+70	CL	105		66.51	64.79																					
128+70	CL	105	109		64.79	63.56																				
130+50	LT	108		65.63	63.35																					
130+50	LT	108	OUT		63.35	58.00																		24.0		
130+05	CL	109		65.16	63.41																					
130+05	CL	109	108		63.41	63.35								16.8												
130+05	RT	110		65.63	64.52																					
130+05	RT	110	109		64.52	93.94			15.6																	
130+40	LT	111		65.28	64.44																					
130+40	LT	111	108		64.44	63.88																				
130+40	RT	112		65.47	64.63																					
130+40	RT	112	110		64.63	64.52																				
System Continues on Next Sheet																										
SHEET TOTALS									133.2	45.6			24.0	16.8						6.0			6.0	24.0		

STATION	FROM	TO	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 300	375	450	600	750	900	1050	1200	375mm SIDE DRAIN PIPE	450mm SIDE DRAIN PIPE	600mm SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. METERS R.C.P.	C.S.P.
124+18	94	90						96.0							
126+10	98	101		128.4											
127+40	101	105				128.4									
128+70	105	109					134.4								
130+40	111	108		33.6											
130+40	112	110		33.6											
SHEET TOTALS				195.6		128.4	134.4	96.0							

STATION	FROM	TO	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0 THRU 1.50)	*TOTAL METERS FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5 THRU 3.00	B 3.00 AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22
124+18	93		1										1			1
124+18	94		1	0.97								1				1
124+18	95		1										1			1
126+10	97		1										1			1
126+10	98		1	0.25								1				1
126+10	99		1										1			1
127+40	100		1										1			1
127+40	101		1	0.40								1				1
127+40	102		1										1			1
128+60	103		1										1			1
128+70	104		1										1			1
128+70	105		1	0.22								1				1
130+50	108		1	0.78									1		1	
130+05	109		1	0.25									1			1
130+05	110		1										1		1	
130+40	111		1										1		1	
130+40	112		1										1		1	
SHEET TOTALS			17	2.87								4	13		4	13
				2.87												

STATION	FROM	TO	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	M.H. FRAME AND COVER STD. 840.54	ADJUST CATCH BASIN	ADJUST DROP INLET	PAVED DITCH m2 STD. 850.10 or 850.11	1200mm WELDED STEEL PIPE W/TRENCHLESS INSTALLATION	C.S. ELBOWS NO. & SIZE 400	450	600	800	900	1000	CONC. COLLARS CL. "B" M^3 STD. 840.72	CONC. & BRICK PIPE PLUG, M^3 STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
124+18	92								23.7											BERM DITCH OUTLET (Std. 850.11)
124+18	92	93												1						
124+18	96								8.4											BERM DITCH OUTLET (Std. 850.10)
124+18	96	95									1									
130+50	108	OUT													2					
SHEET TOTALS									32.1		1			1	2					

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: Chris Powell DATE: 7/21/2010

CHECKED BY: Trent Huffman DATE: 7/23/2010

RA-0239

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

METRIC

PROJECT NO.: X-0002CB SHEET NO.: 3-D

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

STATION (SIZE / THICKNESS OR GAUGE)	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 300	375	450	600	600 CLASS IV	750	900	900 CLASS IV	1050	1050	1200
-L-																		
132+40	LT	113		62.62	61.78													
132+40	LT	113	114		61.78	61.47			22.8									
132+40	CL	114		62.81	61.24													
132+40	CL	114	117		61.24	59.84												
132+40	RT	115		62.37	61.46													
132+40	RT	115	114		61.46	61.39				22.8								
133+80	LT	116		61.33	60.49													
133+80	LT	116	117		60.49	60.07			22.8									
133+80	CL	117		61.41	59.84													
133+80	CL	117	121		59.84	58.38												
133+80	RT	118		60.97	60.06													
133+80	RT	118	117		60.06	59.99				22.8								
135+10	RT	119		59.52	58.68													
135+10	RT	119	121		58.68	58.60			22.8									
135+20	LT	120		59.71	58.87													
135+20	LT	120	121		58.87	58.60			22.8									
135+20	CL	121		59.83	58.23													
135+20	CL	121	124		58.23	55.17												
136+90	LT	123		57.13	56.29													
136+90	LT	123	124		56.29	55.52			21.6									
136+90	CL	124		56.74	54.83													
136+90	CL	124	125		54.83	54.77										16.8		
136+90	RT	125		57.21	54.77													
136+90	RT	125	OUT		54.77	45.70												
138+00	LT	126		55.26	52.97													
138+00	LT	126	OUT		52.97	52.70												
138+00	CL	127		54.87	53.04													
138+00	CL	127	126		53.04	52.97				20.4								
138+00	RT	128		55.26	53.18													
138+00	RT	128	127		53.18	53.11			20.4									
138+60	RT	129		54.21	53.37													
138+60	RT	129	128		53.37	53.18												
139+96	LT	130			59.00													
139+96	LT	130	131		59.00	49.95												
139+96	LT	131		50.87	49.80													
139+96	LT	131	132		49.80	49.70					33.6							
139+96	CL	132		51.61	49.70													
139+96	CL	132	136		49.70	48.14												
140+10	RT	133		51.62	50.30													
140+10	RT	133	OUT		50.30	48.80												
140+40	RT	134		51.23	50.39													
140+40	RT	134	133		50.39	50.30												
141+00	LT	135		49.31	48.40													
141+00	LT	135	136		48.40	48.29				38.4								
System Continues On Next Sheet																		
SHEET TOTALS									133.2	104.4	33.6					16.8		

STATION	FROM	TO	C.S. PIPE (UNLESS NOTED OTHERWISE) 300 (1.63)	400 (1.63)	450 (1.63)	600 (1.63)	800 (2.01)	900 (2.01)	1000 (2.01)	1200 (2.01)	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 300	375	450	600	750	900	1050	1200	375mm SIDE DRAIN PIPE	450mm SIDE DRAIN PIPE	600mm SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. METERS R.C.P.	C.S.P.
132+40	113																						
132+40	113	114																					
132+40	114																						
132+40	114	117												139.2									
132+40	115																						
132+40	115	114																					
133+80	116																						
133+80	116	117																					
133+80	117																						
133+80	117	121												139.2									
133+80	118																						
133+80	118	117																					
135+10	119																						
135+10	119	121																					
135+20	120																						
135+20	120	121																					
135+20	121																						
135+20	121	124													169.2								
136+90	123																						
136+90	123	124																					
136+90	124																						
136+90	124	125																					
136+90	125																						
136+90	125	OUT							39.6														
138+00	126																						
138+00	126	OUT											6.0										
138+00	127																						
138+00	127	126																					
138+00	128																						
138+00	128	127																					
138+60	129																						
138+60	129	128										58.8											
139+96	130																						
139+96	130	131			28.8																		
139+96	131																						
139+96	131	132																					
139+96	132																						
139+96	132	136												104.4									
140+10	133																						
140+10	133	OUT		14.4																			
140+40	134																						
140+40	134	133										30.0											
141+00	135																						
141+00	135	136																					
SHEET TOTALS				14.4	28.8				39.6			88.8	6.0	382.8	169.2								

STATION	FROM	TO	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0 THRU 1.50)	*TOTAL METERS FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5 THRU 3.00	B 3.00 AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	M.H. FRAME AND COVER STD. 840.54	ADJUST CATCH BASIN	ADJUST DROP INLET	PAVED DITCH m2 STD. 850.10 or 850.11	1200mm WELDED STEEL PIPE W/TRENCHLESS INSTALLATION	C.S. ELBOWS NO. & SIZE 400	450	600	800	900	1000	CONC. COLLARS CL. "B" M^3 STD. 840.72	CONC. & BRICK PIPE PLUG, M^3 STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
132+40	113		1										1			1																		
132+40	113	114																																
132+40	114		1	0.07								1				1																		
132+40	114	117																																
132+40	115		1										1			1																		
132+40	115	114																																
133+80	116		1										1			1																		
133+80	116	117																																
133+80	117		1	0.07								1				1																		
133+80	117	121																																
133+80	118		1										1			1																		
133+80	118	117																																
135+10	119		1										1			1																		
135+10	119	121																																
135+20	120		1										1			1																		
135+20	120	121																																
135+20	121		1	0.10								1				1																		
135+20	121	124																																
136+90	123		1										1		1																			
136+90	123	124																																
136+90	124		1	0.41								1				1																		
136+90	124	125																																
136+90	125		1	0.94								1			1																			
136+90	125	OUT																													2				
138+00	126		1	0.79									1		1																			
138+00	126	OUT																																
138+00	127		1	0.33									1			1																		
138+00	127	126																																
138+00	128		1	0.58									1		1																			
138+00	128	127																																
138+60	129		1										1		1																			
138+60	129	128																																
139+96	130																						8.4											BERM DITCH OUTLET (Std. 850.10)
139+96	130	131																								1								
139+96	131		1										1			1																		
139+96	131	132																																
139+96	132		1	0.41								1				1																		
139+96	132	136																																
140+10	133		1										1		1																			
140+10	133	OUT																							2									
140+40	134		1										1		1																			
140+40	134	133																																
141+00	135		1										1			1																		
141+00	135	136																																
SHEET TOTALS			21	3.70								6	15		7	14							8.4		2	1				2				

3.70

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

RA-0239

COMPUTED BY: Chris Powell DATE: 7/21/2010

CHECKED BY: Trent Huffman DATE: 7/23/2010

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

METRIC

PROJECT NO.	SHEET NO.
X-0002CB	3-E

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) SIZE 300	375	450	600	750	900	900	1050	1050	1200
THICKNESS OR GAUGE											CLASS IV			CLASS IV			
-L-																	
System Continues On Previous Sheet																	
141+00	CL	136		50.38	48.14												
141+00	CL	136	141		48.14	46.79											
142+40	LT	139		47.05	46.21												
142+40	LT	139	140		46.21	44.17											
142+95	LT	140		45.01	43.94												
142+95	LT	140	OUT		43.94	41.00											
142+95	CL	141		48.24	46.79												
142+95	CL	141	140		46.79	43.94					31.2						
142+95	LT	140		45.01	43.94												
142+95	LT	140	OUT		43.94	41.00											
142+95	CL	141		48.24	46.79												
142+95	CL	141	140		46.79	43.94					31.2						
Structure Numbers 142-145 Not Used																	
141+40	RT	137		49.39	48.55												
141+40	RT	137	OUT		48.55	47.17			21.6								
141+50	LT	138			45.92	42.22								110.4			
143+69	LT	248		42.40	39.50												
143+69	LT	248	OUT		39.50	37.64					26.4						
143+69	LT	249		47.89	43.52												
143+69	LT	249	248		43.52	39.50											
143+69	CL	250		47.43	43.57												
143+69	CL	250	249		43.57	43.52					18.0						
143+69	RT	250A		47.89	46.98												
143+69	RT	250A	250		46.98	45.28			18.0								
144+89	LT	251		46.58	45.74												
144+89	LT	251	252		45.74	44.01			18.0								
144+89	CL	252		46.11	43.93												
144+89	CL	252	250		43.93	43.57											
144+89	RT	253		46.58	45.74												
144+89	RT	253	252		45.74	44.01			18.0								
145+94	LT	254		45.45	44.61												
145+94	LT	254	255		44.61	44.28			22.8								
145+80	CL	255		45.11	44.20												
145+80	CL	255	252		44.20	43.93											
145+80	RT	256		45.61	44.77												
145+80	RT	256	255		44.77	44.28			16.8								
147+45		146	EX.	36.58	34.43	33.66											
147+45		147		43.62	42.78												
147+45		147	148		42.78	42.50			16.8								
147+45		148		43.14	42.22												
147+45		148	150		42.22	39.28											
System Continues On Next Sheet																	
SHEET TOTALS									132.0		49.2	26.4			110.4		

STATION	C.S. PIPE (UNLESS NOTED OTHERWISE) SIZE 300	400	450	600	800	900	1000	1200	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D SIZE 300	375	450	600	750	900	1050	1200	375mm SIDE DRAIN PIPE	450mm SIDE DRAIN PIPE	600mm SIDE DRAIN PIPE
THICKNESS OR GAUGE		1.63	1.63	1.63	2.01	2.01	2.01	2.01											
-L-																			
System Continues On Previous Sheet																			
141+00																			
141+00												195.6							
142+40											55.2								
142+95																			
142+95				24.0															
142+95																			
142+95																			
142+95				24.0															
142+95																			
142+95																			
Structure Numbers 142-145 Not Used																			
141+40																			
141+40																			
141+50																			
143+69																			
143+69																			
143+69																			
143+69				18.0															
143+69																			
143+69																			
143+69																			
143+69																			
143+69																			
144+89																			
144+89																			
144+89																			
144+89																			
144+89																			
144+89																			
144+89																			
144+89																			
145+94																			
145+94																			
145+80																			
145+80																			
145+80																			
145+80																			
147+45																			
147+45																			
147+45																			
147+45																			
147+45																			
System Continues On Next Sheet																			
SHEET TOTALS				42.0						55.2	195.6	315.6							

STATION	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. METERS R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0 THRU 1.50)	1.5 THRU 3.00	*TOTAL METERS FOR PAY QUANTITY SHALL BE COL. "A" + (1.3 X COL. "B") METERS A	3.00 AND ABOVE	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 DROP INLET	CATCH BASIN	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	M.H. FRAME AND COVER STD. 840.54	ADJUST CATCH BASIN	ADJUST DROP INLET	PAVED DITCH m2 STD. 850.10 or 850.11	1200mm WELDED STEEL PIPE W/TRENCHLESS INSTALLATION	C.S. ELBOWS NO. & SIZE 400	450	600	800	900	1000	CONC. COLLARS CL - "B" M³ STD. 840.72	CONC. & BRICK PIPE PLUG, M³ STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
-L-																																						
System Continues On Previous Sheet																																						
141+00			1	0.74										1			1																					
141+00																																						
142+40			1												1		1																					
142+40																																						
142+95			1												1		1																					
142+95																													2									
142+95			1											1			1																					
142+95																																						
142+95			1												1		1																					
142+95																													2									
142+95			1											1			1																					
142+95																																						
Structure Numbers 142-145 Not Used																																						
141+40			1												1		1																					
141+40																																						
141+50	2.6																																					
143+69			1	1.41																1			1															
143+69																																						
143+69			1	1.50	1.37										1		1																					
143+69																													2									
143+69			1	1.50	0.86									1			1																					
143+69																																						
143+69			1												1		1																					
143+69																																						
144+89			1												1		1																					
144+89																																						
144+89			1	0.68										1			1																					
144+89																																						
144+89			1												1		1																					
144+89																																						
145+94			1												1		1																					
145+94																																						
145+80			1												1		1																					
145+80																																						
145+80			1												1		1																					
145+80																																						
147+45			1	0.65											1		1																				4.8	REMOVE EXISTING 2GI
147+45			1												1		1																					
147+45																																						
147+45			1											1			1																					
147+45																																						OUTLET PIPE TO ADJUSTED DI
System Continues On Next Sheet																																						
SHEET TOTALS	2.6		18	6.48	2.23									5	12		8	9				1			1												4.8	
				9.38																																		

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

RA-0239

COMPUTED BY: Chris Powell DATE: 7/21/2010

CHECKED BY: Trent Huffman DATE: 7/23/2010

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

METRIC

PROJECT NO.	SHEET NO.
X-0002CB	3-F

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

STATION	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 300	375	450	600	600 CLASS IV	750	900	900 CLASS IV	1050	1050	1200
-L-																		
System Continues On Previous Sheet																		
147+45		149		43.62	42.78													
147+45		149	148		42.78	42.50			16.8									
148+50		150		40.79	39.28													
148+50		150	153		39.28	38.59												
Structure Number 151 Not Used																		
148+80		152		40.80	39.96													
148+80		152	153		39.96	38.67			16.8									
148+80		153		40.09	38.59													
148+80		153	EX.		38.59	37.18												
148+80		154		40.51	39.12													
148+80		154	153		39.12	38.67			15.6									
148+98		155		40.02	39.18													
148+98		155	154		39.18	39.12												
0+61, -Y-RPA	RT	156		67.31	66.47													
0+61, -Y-RPA	RT	156	OUT		66.47	66.00												
1+48, -Y-RPA	RT	IN	157		65.80	63.71							45.6					
1+77, -Y-RPA	LT	157		65.31	63.71													
1+77, -Y-RPA	LT	157	OUT		63.71	62.60												
Structure Numbers 158-172 Not Used																		
10+05, -Y15-	LT	173		57.70	56.89													
10+05, -Y15-	LT	173	OUT		56.89	56.80												
10+40, -Y15-	LT	174		59.20	57.70													
10+40, -Y15-	LT	174	173		57.70	56.89												
10+46, -Y15-	LT	175		59.70	58.71													
10+46, -Y15-	LT	175	174		58.71	57.70				8.4								
10+48, -Y15-	LT	176		59.81	57.85													
10+48, -Y15-	LT	176	174		57.85	57.70					7.2							
10+88, -Y15-	LT	177		62.38	60.93													
10+88, -Y15-	LT	177	176		60.93	57.85					37.2							
11+27, -Y15-	LT	178		64.57	63.39													
11+27, -Y15-	LT	178	177		63.39	60.93					38.4							
10+05, -Y5-	LT	179		64.60	63.46													
10+05, -Y5-	LT	179	178		63.46	63.39					9.6							
10+15, -Y5-	RT	231		65.73	64.54													
10+15, -Y5-	RT	231	179		64.54	63.82					21.6							
System Continues On Next Sheet																		
SHEET TOTALS									49.2	8.4	114.0		45.6					

SIZE / THICKNESS OR GAUGE: C.S. PIPE 300, 400, 450, 600: 1.63; 800, 900, 1000, 1200: 2.01

STATION	FROM	TO	C.S. PIPE (UNLESS NOTED OTHERWISE) 300	400	450	600	800	900	1000	1200	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 300	375	450	600	750	900	1050	1200	375mm SIDE DRAIN PIPE	450mm SIDE DRAIN PIPE	600mm SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. METERS R.C.P.	C.S.P.
148+98	155	154										18.0											
0+61, -Y-RPA	156	OUT										20.4											
1+77, -Y-RPA	157	OUT													40.8								
10+05, -Y15-	173	OUT												4.8									
10+40, -Y15-	174	173												33.6									
SHEET TOTALS												38.4		38.4	40.8								

STATION	FROM	TO	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0 THRU 1.50)	*TOTAL METERS FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5 THRU 3.00	B 3.00 AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	M.H. FRAME AND COVER STD. 840.54	ADJUST CATCH BASIN	ADJUST DROP INLET	PAVED DITCH m2 STD. 850.10 or 850.11	1200mm WELDED STEEL PIPE W/TRENCHLESS INSTALLATION	C.S. ELBOWS NO. & SIZE 400	450	600	800	900	1000	CONC. COLLARS CL. "B" M^3 STD. 840.72	CONC. & BRICK PIPE PLUG, M^3 STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
147+45	149		1										1		1																			
148+50	150																					1												
148+50	150	153																																RETAIN EXISTING PIPE FROM 150 TO 153
148+80	152		1										1		1																			
148+80	153		1										1			1																		INLET FROM 150 IS RETAINED EXISTING PIPE
148+80	153	EX.																																OUTLET TO EXISTING PIPE
148+80	154		1										1		1																			
148+98	155		1										1		1																			
0+61, -Y-RPA	156		1										1			1																		
1+77, -Y-RPA	157		1	0.10									1			1																		
																																	24	REM. IS FOR 600 CS NEAR STRUC #173
10+05, -Y15-	173		1											1			1																55.2	
10+40, -Y15-	174		1			1			1		1																							
10+46, -Y15-	175		1			1		1			1																							
10+48, -Y15-	176		1	0.46															1	1														RETAIN EX. PIPE ON SOUTHEAST SIDE
10+88, -Y15-	177		1																1	1														
11+27, -Y15-	178		1			1			1																									FIELD VERIFY GRATE TYPE, SEE STD. 840.03
11+27, -Y15-	178	177																															38.4	
10+05, -Y5-	179		1			1		1																										FIELD VERIFY GRATE TYPE, SEE STD. 840.03
10+05, -Y5-	179	178																															9.6	
10+15, -Y5-	231		1			1			1																									
SHEET TOTALS			15	0.56		5		2	3		2		7	1	4	3	1		2	2		1											127.2	

0.56

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: Chris Powell DATE: 7/21/2010
CHECKED BY: Trent Huffman DATE: 7/23/2010

RA-0239

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

METRIC

PROJECT NO.	SHEET NO.
X-0002CB	3-G

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	CLASS III R.C. PIPE 375	CLASS III R.C. PIPE 450	CLASS III R.C. PIPE 600	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 375	450	600	ENDWALLS R.C.P. (CU. METERS)	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0 THRU 1.50)	METERS A 1.5 THRU 3.00	C.B. STD. 840.01 OR STD. 840.02	TYPE OF GRATE E	F	G	CATCH BASIN	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	M.H. FRAME AND COVER STD. 840.54	ADJUST CATCH BASIN	1200mm WELDED STEEL PIPE W/TRENCHLESS INSTALLATION	REMARKS
System Continues On Previous Sheet																												
10+51, -Y5-	LT	232		66.30	65.39									1		1		1		1								
10+51, -Y5-	LT	232	233		65.39	65.26	12.0																					
10+51, -Y5-	RT	233		66.53	65.04									1							1		1					
10+51, -Y5-	RT	233	231		65.04	64.54			34.8																			
10+68, -Y5-	RT	234		66.58	65.10									1		1			1	1								
10+68, -Y5-	RT	234	233		65.10	65.04						14.4																
10+90, -Y5-	RT	235		66.63	65.18									1							1		1					
10+90, -Y5-	RT	235	234		65.18	65.10						19.2																
11+21, -Y5-	LT	236		67.79	66.88									1		1		1		1								
11+21, -Y5-	LT	236	237		66.88	66.71	9.6																					
11+21, -Y5-	RT	237		67.55	66.64									1							1		1					
11+21, -Y5-	RT	237	235		66.64	65.33					48.0																	
12+00, -Y5-	RT	238		68.61	67.77									1							1		1					
12+00, -Y5-	RT	238	237		67.77	66.71				57.6																		
Structure Numbers 180-191 Not Used																												
7+84,-Y12-RPB	RT	192		35.10	34.19									1		1	1											
7+84,-Y12-RPB	RT	192	193		34.19	34.15	6.0																					
7+92, -Y12-RPB	RT	193		35.11	34.15									1		1			1									
7+92, -Y12-RPB	RT	193	194		34.15	33.41	18.0																					
7+99, -Y12-RPB	LT	194		34.25	33.34									1							1	1						
7+99, -Y12-RPB	LT	194	195		33.34	33.30		18.0																				
8+04, -Y12-RPB1	LT	195		35.17	33.27						22.8			1	0.40	1		1										
8+04, -Y12-RPB1	LT	195	196		33.27	33.21			18.0																			
8+24, -Y12-RPB1	LT	196		34.89	33.21									1	0.18	1	1											
8+24, -Y12-RPB1	LT	196	197		33.21	33.14			22.8																			
16+50, -Y12-	LT	197		35.18	33.14									1	0.54	1		1										FIELD VERIFY GRATE TYPE
16+50, -Y12-	LT	197	EX.		33.14	32.05			74.4																			OUTLETS INTO EXISTING CB
6+46, -Y12-RPC	RT	198			35.86	35.16							4.6														123.6	TRENCHLESS INSTALLATION
7+61, -Y12-RPC	LT	199		35.45	34.54									1		1			1									
7+61, -Y12-RPC	LT	199	200		34.54	34.21	19.2																					
7+83, -Y12-RPC	LT	200		35.32	34.41									1		1			1									
7+83, -Y12-RPC	LT	200	201		34.41	34.22	19.2																					
8+03, -Y12-RPC	LT	201		35.24	34.22									1		1	1											
8+03, -Y12-RPC	LT	201	202		34.22	32.90	15.6																					
8+03, -Y12-RPC	RT	202		35.15	32.48									1	1.17									1	1			OUTLET JB INTO RETAINED 600 PIPE
8+03, -Y12-RPC	RT	202	EX.		32.48	32.41																						
7+96, -Y12-RPC	RT	203		34.50	33.66									1							1	1						
7+96, -Y12-RPC	RT	203	202		33.66	32.90				7.2																		
8+03, -Y12-RPC1	RT	204		35.73	34.59							10.8		1		1	1											ADJUST PIPE INLET EL AS NEEDED TO DRAIN
8+03, -Y12-RPC1	RT	204	203		34.59	32.48			21.6																			FIELD VERIFY GRATE TYPE ON CB
14+77, -Y12-	LT	205																								1		
SHEET TOTALS							99.6	18.0	171.6	64.8	70.8	44.4	4.6	19	2.29	12	4	4	4	3	6	2	4	1	1	1	123.6	

Total in box below the 1.5 THRU 3.00 and 3.00 AND ABOVE columns: 2.29

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

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

RA-0239

COMPUTED BY: Chris Powell DATE: 7/21/2010

CHECKED BY: Trent Huffman DATE: 7/23/2010

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

METRIC

PROJECT NO.	SHEET NO.
X-0002CB	3-H

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) SIZE 300	375	450	600	750	900	900	1050	1050	1200
THICKNESS OR GAUGE											CLASS IV			CLASS IV			
Structure Numbers 206-227 Not Used																	
12+90, -Y2-	LT	IN	228		70.00	68.90				16.8							
12+90, -Y2-	RT	228		68.82	68.75												
12+90, -Y2-	RT	228	OUT		68.75	68.70											
Structure Numbers 229-230 Not Used																	
11+80, -Y7-	RT	239			73.99	73.94											
11+45, -Y8- REV	CL	240			72.15	71.95						22.8					
13+45, -Y9-	CL	241			47.10	47.00					22.8						
14+88, -Y9-	RT	242			43.50	43.30											
12+45, -Y10-	RT	243			61.14	60.24											
Structure Number 244 Not Used																	
12+92, -Y9-	RT	245															
14+02 -Y9-	RT	246															
14+43, -Y9-	RT	247															
SHEET TOTALS										16.8	22.8	22.8					
TOTAL SHEET 3-A								196.8	24.0			69.6	34.8				
TOTAL SHEET 3-B								160.8	58.8			30.0			32.4		
TOTAL SHEET 3-C								133.2	45.6			24.0	16.8				
TOTAL SHEET 3-D								133.2	104.4	33.6					16.8		
TOTAL SHEET 3-E								132.0		49.2	26.4			110.4			
TOTAL SHEET 3-F								49.2	8.4	114.0		45.6					
TOTAL SHEET 3-G								99.6	18.0	171.6							
TOTAL SHEET 3-H									16.8	22.8		22.8					
TOTAL SHEET 3-I																	
PROJECT TOTALS								904.8	276.0	391.2	26.4	192.0	51.6	110.4	49.2		

STATION	C.S. PIPE (UNLESS NOTED OTHERWISE) SIZE 300	400	450	600	800	900	1000	1200	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D SIZE 300	375	450	600	750	900	1050	1200
THICKNESS OR GAUGE		1.63	1.63	1.63	1.63	2.01	2.01	2.01	2.01							
Structure Numbers 206-227 Not Used																
12+90, -Y2-																
12+90, -Y2-																
12+90, -Y2-												15.6				
Structure Numbers 229-230 Not Used																
11+80, -Y7-																
11+45, -Y8- REV																
13+45, -Y9-																
14+88, -Y9-																
12+45, -Y10-																
Structure Number 244 Not Used																
12+92, -Y9-																
14+02 -Y9-																
14+43, -Y9-																
SHEET TOTALS												15.6				
TOTAL SHEET 3-A					16.8								615.6	212.4		
TOTAL SHEET 3-B	79.2									116.4				283.2		
TOTAL SHEET 3-C	6.0				6.0		24.0			195.6		128.4	134.4	96.0		
TOTAL SHEET 3-D	14.4	28.8						39.6		88.8	6.0	382.8	169.2			
TOTAL SHEET 3-E			42.0							55.2	195.6	315.6				
TOTAL SHEET 3-F										38.4		38.4	40.8			
TOTAL SHEET 3-G										64.8	70.8	44.4				
TOTAL SHEET 3-H											15.6					
TOTAL SHEET 3-I																
PROJECT TOTALS	99.6	28.8	42.0		22.8		24.0		39.6	559.2	288.0	909.6	960.0	591.6		

STATION	375mm SIDE DRAIN PIPE	450mm SIDE DRAIN PIPE	600mm SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. METERS R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0 THRU 1.50)	METERS 1.5 THRU 3.00 A	3.00 AND ABOVE B	*TOTAL METERS 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 DROP INLET	CATCH BASIN	G.D.I. TYPE 'A' STD. 840.17 OR STD. 840.26	G.D.I. TYPE 'B' STD. 840.18 OR STD. 840.27	G.D.I. TYPE 'D' STD. 840.19 OR STD. 840.28	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	M.H. FRAME AND COVER STD. 840.54	ADJUST CATCH BASIN	ADJUST DROP INLET	PAVED DITCH m2 STD. 850.10 or 850.11	1200mm WELDED STEEL PIPE W/TRENCHLESS INSTALLATION	C.S. ELBOWS NO. & SIZE 400	450	600	800	900	1000	CONC. COLLARS CL. "B" M^3 STD. 840.72	CONC. & BRICK PIPE PLUG, M^3 STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
Structure Numbers 206-227 Not Used																																							
12+90, -Y2-																																							
12+90, -Y2-						1										1			1																				
12+90, -Y2-																																							
Structure Numbers 229-230 Not Used																																							
11+80, -Y7-	10.8																																						
11+45, -Y8- REV																																							
13+45, -Y9-																																							
14+88, -Y9-																																						12.0	
14+88, -Y9-	6.0																																					8.4	
12+45, -Y10-		10.8																																					
Structure Number 244 Not Used																																							
12+92, -Y9-	7.2																																						
14+02 -Y9-	7.2																																						
14+43, -Y9-	7.2																																						
SHEET TOTALS	38.4	10.8				1													1		1																	20.4	
TOTAL SHEET 3-A						19	6.78	0.14								7	12			19								71.1									3			37.2	
TOTAL SHEET 3-B						18	7.05	5.24								6	12		5	13								8.4					2								
TOTAL SHEET 3-C						17	2.87									4	13		4	13								32.1					1			1	2				
TOTAL SHEET 3-D						21	3.70									6	15		7	14								8.4					2	1			2				
TOTAL SHEET 3-E				2.6		18	6.48	2.23								5	12		8	9				1		1										4				4.8	
TOTAL SHEET 3-F						15	0.56		5		2	3		2		7	1	4	3		1		2			2		1												127.2	
TOTAL SHEET 3-G				4.6		19	2.29		12	4	4	4		3		6			2			4	1			1	1			123.6											
TOTAL SHEET 3-H	38.4	10.8				1										1			1																					20.4	
TOTAL SHEET 3-I																							1			1														65	1350 & OVER - JB & MH FRAME AND COVER TOTALS FROM SHEET 3-I
PROJECT TOTALS	38.4	10.8		7.2		128	29.73	7.61	17	4	6	7		5	28	78	1	28	74		1	4	5			5		1	1	120	123.6					5	1	4	4	2	2				254.6	
							39.62																																				

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

RA-0239

COMPUTED BY: Chris Powell DATE: 7/21/2010

CHECKED BY: Trent Huffman DATE: 7/23/2010

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

METRIC

PROJECT NO.	SHEET NO.
X-0002CB	3-I

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 1350mm & 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 1350	1350 CLASS IV	1500 CONTRACTOR DESIGN	1650	1800	1950	2100	C.S. PIPE (UNLESS NOTED OTHERWISE) SIZE 1400 THICKNESS OR GAUGE 2.77	1400 3.51	1400 4.27	1500 2.77	1500 3.51	1650 2.77	1650 3.51	1800 2.77	1800 3.51	SHOP ELONGATED	STRUCTURAL PLATE PIPE SIZE 1500 THICKNESS OR GAUGE 2.77	1500 3.51	1500 4.27	1650 2.77	1650 3.51	1650 4.27	1800 2.77	1800 3.51	1800 4.27	REINFORCED ENDWALLS CLASS 'A' CONC. WITH R.C. - M^3	WITH C.S. - M^3	MASONRY DRAINAGE STRUCTURES CUBIC METERS	C.B. STD. 840.01 OR 840.02	FRAMES, GRATES & HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	J.B. STD. 840.31 OR 840.32	M.H. FRAME AND COVER STD. 840.54	J.B. WITH SLAB LID - SEE SHEET 2-V	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. - "B" M^2 STD. 840.72	PIPE REMOVAL (METERS)	REMARKS
-L-																																																	
129+92	LT	106			57.33																											3.8																	
129+92	LT	106	107		57.33	57.31		3.6																																									
129+92	LT	107		61.40	55.02																													8.4							1	1						SEE SHEET 3-H FOR PROJECT TOTAL
129+92	LT	107	OUT		55.02	54.73			86.4																																								
136+56	CL	122	122A		44.90	42.72					114.0																					4.3																	
136+56	RT	122A		47.60	42.72																													5.4									1				
136+56	RT	122A	OUT		42.72	42.70				6.0																																							
144+61	CL	198A	OUT		36.50	35.20																									142.8																	65	FILL REMAINING PORTION OF TEMPORARY PIPE W/ FLOWABLE FILL ROD AND LUG CONN. W/ SLEEVE GASKET
SHEET TOTALS								3.6	86.4	6.0	114.0																				142.8			8.1		13.8						1	1	1				65	

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

RA-0239

COMPUTED BY:	C. POWELL	DATE:	7/22/2010
CHECKED BY:	T. HUFFMAN	DATE:	7/23/2010

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

METRIC

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	3-J

"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

GUARDRAIL SUMMARY

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

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350		SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GRAU-350	M-350	CAT-1	AT-1	TYPE-III	B-77	B-83	TES	G	NG				
-Y3-	14+08	-	CL	11.43																		2						ROAD CLOSURE (2 TERMINAL END SECTIONS)
-Y7-	11+60	-	CL	15.24																		2						ROAD CLOSURE (2 TERMINAL END SECTIONS)
-Y8-	12+48	-	CL	7.62																		2						ROAD CLOSURE (2 TERMINAL END SECTIONS)
-Y10-	12+56	-	CL	7.62																		2						ROAD CLOSURE (2 TERMINAL END SECTIONS)
-Y11-	12+30	-	CL	11.43																		2						ROAD CLOSURE (2 TERMINAL END SECTIONS)
-Y12-	14+62	14+87	RT	26.67			14+82	14+82	2.4	3.4					1		1											OVERHEAD SIGN FOUNDATION
-Y12-RPA	3+36	3+74	LT	36.20			3+72	3+72	2.4	3.4					1		1											OBSTACLE / MSE WALL
-Y12-RPC	7+63	8+01	RT	36.20			7+99	7+99	2.4	3.4					1		1											OBSTACLE / MSE WALL
-Y12-RPC1	7+78	8+10	RT		19.05		7+00	7+00	4.2	5.2					1		1											OVERHEAD SIGN FOUNDATION
TOTAL				152.41	19.05										4		4					10						
LESS ANCHOR DEDUCTIONS																												
		GRAU-350	4 @ 15.24	-60.96																								
		CAT-1	4 @ 1.91	-7.64																								
		TES	10																									
SUB-TOTAL				83.81	19.05																							
SAY TOTAL				83.82	19.05																							
ADDITIONAL GUARDRAIL POSTS			5																									

RA-0239

COMPUTED BY:	C. POWELL	DATE:	7/22/2010
CHECKED BY:	T. HUFFMAN	DATE:	7/23/2010

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

FUTURE GUARDRAIL SUMMARY

METRIC

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	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	M-350	CAT-1	AT-1	TYPE-III	B-77	B-83	TES		G	NG				
-L-	107+50	108+03	MED RT	53.34			108+00		4.2	5.2					1		1												OVERHEAD SIGN FOUNDATION
-L-	107+97	108+50	MED LT	53.34			108+00		4.2	5.2					1		1												OVERHEAD SIGN FOUNDATION
-L-	107+97	108+50	LT	53.34			108+00		1.8	3.6					1		1												OVERHEAD SIGN FOUNDATION
-L-	115+37	117+68	LT	232.41			117+68	115+40	4.2	5.2		30.0		0.6			1			1									FILL WARRANT / BRIDGE
-L-	116+84	117+67	RT	83.82			117+20	117+67	4.2	5.2	50.0		1.0		1					1									BRIDGE
-L-	116+95	117+67	MED RT	72.39				117+67	1.8	3.6	47.6		3.2			1				1									BRIDGE
-L-	118+68	121+43	RT	274.32			118+67	121+40	4.2	5.2	30.0		0.6				1			1									BRIDGE / FILL WARRANT
-L-	118+67	119+40	MED LT	72.39				118+67	3.6	3.6	47.6		3.2			1				1									BRIDGE
-L-	118+67	119+95	LT	129.54			119+80	118+67	4.2	5.2		50.0		1.0	1					1									BRIDGE
-L-	128+85	130+63	RT	179.07			129+00	130+60	4.2	5.2					1		1												FILL WARRANT / CULVERT
-L-	129+37	130+55	LT	118.11			130+40	129+40	4.2	5.2					1		1												FILL WARRANT / CULVERT
-L-	135+25	138+00	RT	274.32			135+40		4.2	5.2					1														FILL WARRANT / GR CONTINUES ALONG -Y12-RPC
-L-	135+57	138+55	LT	297.18			138+40	135+60	4.2	5.2					1		1												FILL WARRANT
-L-	141+45	145+92	RT	449.58			141+60	145+92	1.8	3.6	30.0		0.6		1					1									HIGH MAST LIGHTS / BRIDGE
-L-	145+24	145+96	MED RT	72.39			145+96		1.8	3.6		47.6		3.2		1				1									HIGH MAST LIGHTS / BRIDGE
-L-	142+97	146+04	LT	308.61			146+04	143+00	4.2	5.2		30.0		0.6			1			1									BRIDGE
-L-	146+83	149+03	RT	220.98			146+83	149+00	4.2	5.2	30.0		0.6				1			1									FILL WARRANT / BRIDGE
-L-	146+91	147+65	MED LT	76.20				146+71	1.8	3.6	30.0		3.2			1				1									MEDIAN OBSTACLE / BRIDGE
-L-	146+96	148+95	LT	198.12			148+80	146+96	4.2	5.2		30.0		0.6	1					1									FILL WARRANT / BRIDGE
-Y12-RPB	2+97	7+15	LT	419.10			6+21	3+31	4.2	5.2					1		1												FILL WARRANT
-Y12-RPC	0+00	6+63	RT	662.94				6+20	4.2	5.2							1												FILL WARRANT / CONTINUES FROM -L- 138+00 RT
TOTAL				4,301.49											12	4	12			12									
LESS ANCHOR DEDUCTIONS																													
		GRAU-350	12 @ 15.24	-182.88																									
		M-350	4 @ 11.43	-45.72																									
		CAT-1	12 @ 1.91	-22.92																									
		B-77	12 @ 5.72	-68.64																									
SUB-TOTAL				3,981.33											12	4	12			12									
FUTURE SAY TOTAL				4,061.46											12	4	12			12									
ADDITIONAL FUTURE GUARDRAIL POSTS				10																									

COMPUTED BY: T. HUFFMAN DATE: 6/23/2010
CHECKED BY: T. R. REID DATE: 6/25/2010

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

METRIC

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	3-L

ASPHALT PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	AREA (m2)
-Y3-	12+88	13+28	LT & RT	221
-Y3-	13+95	14+08	LT & RT	81
-Y6-	14+36	14+80	LT & RT	200
-Y7-	11+07	11+60	LT & RT	322
-Y8-	10+75	11+25	LT & RT	521
-Y8-	12+11	12+49	LT & RT	222
-Y10-	12+56	12+68	LT & RT	77
-Y10-	13+99	14+62	LT & RT	326
-Y11-	10+74	11+38	LT & RT	353
-Y11-	12+02	12+31	LT & RT	164
			TOTAL	2,487
			SAY	2,510

-Y12- 15+99 TO 16+24 REMOVE EX. ASPHALT ISLAND: 25m

VALLEY GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	LENGTH (m)
-Y5-	10+50	12+67	RT	217
-Y5-	10+50	12+67	LT	217
-Y15-	10+41	10+59	LT/RT	39
			TOTAL	474
			SAY	480

750mm CURB & GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	LENGTH (m)
-Y12-RPB	7+87	8+27	RT	40
-Y12-RPB1	7+96	8+32	LT	36
-Y12-RPC	7+72	8+32	LT	60
-Y12-RPC1	7+73	8+10	RT	37
-Y12-	15+52	15+69	LT	17
-Y12-	16+47	17+24	LT	77
			TOTAL	267
			SAY	275

WOVEN WIRE FENCE SUMMARY

STATION TO STATION	LOCATION LT/RT	FABRIC L.M.	100mm POSTS	125mm POSTS
-Y-RPD 1+50 TO -L- 117+60	RT	1,155	247	43
-L- 118+75 TO -L- 130+26	RT	1,186	255	43
-L- 130+00 TO -L- 130+55	RT	55	12	
-L- 130+34 TO -Y12-RPC1 16+51	RT	1,658	352	68
-L- 136+37 TO -L- 136+43 DOUBLE GATE - 2 @ 3.05	RT	6.1		4
-Y-RPA 2+70 TO -L- 117+61	LT	1,327	287	43
-L- 118+74 TO -L- 130+26	LT	1,180	251	46
-L- 130+07 TO -L- 130+55	LT	40	10	
-L- 130+34 TO -Y12-RPB1 7+41	LT	1,658	352	68
-L- 136+22 TO -L- 136+27 DOUBLE GATE - 2 @ 3.05	LT	6.1		4
	TOTAL	8,281	1,766	319
	SAY	8,290	1,770	320

COMPUTED BY: C. POWELL DATE: 10 /20 /2010
CHECKED BY: T. HUFFMAN DATE: 10 /20 /2010

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	3-M

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

IN CUBIC METERS

X-0002CB

LOCATION				UNCL. EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
L	105+00.000	TO	111+00.000	41,058	0	34,740	0	6,318
INCLUDES RAMP D @ YREV								
YRPA	0+00.000	TO	2+70.000	428	0	7,620	7,192	0
Y2	12+55.000	TO	14+45.275	2,000	0	0	0	2,000
Y5	10+49.918	TO	12+67.220	1,946	0	26	0	1,920
Y6	10+03.175	TO	11+60.000	530	0	0	0	530
125mm EXTRA MAT'L FROM GRADING ONLY						3,713	3,713	0
SUMMARY SUBTOTAL No. 1				45,962	0	46,099	10,905	10,768
L	111+00.000	TO	117+68.349	75,306	0	60,696	0	14,610
			(BEG BRDG WBL)					
Y7	11+59.686	TO	12+07.443	175	0	0	0	175
Y8REV	10+44.315	TO	12+92.574	3,460	0	925	0	2,535
125mm EXTRA MAT'L FROM GRADING ONLY						4,511	4,511	0
SUMMARY SUBTOTAL No. 2				78,941	0	66,132	4,511	17,320
L	118+66.675	TO	128+60.000	177,195	2,852	60,723	11,868	131,192
(END BRDG WBL)								
125mm EXTRA MAT'L FROM GRADING ONLY						6,705	6,705	0
SUMMARY SUBTOTAL No. 3				177,195	2,852	67,428	18,573	131,192
L	128+60.000	TO	138+60.000	123,634	6,172	261,071	207,358	76,093
125mm EXTRA MAT'L FROM GRADING ONLY						6,750	6,750	0
SUMMARY SUBTOTAL No. 4				123,634	6,172	267,821	214,108	76,093
L	138+60.000	TO	146+40.000	83,568	4,246	298,604	281,310	70,520
INCLUDES RAMPS @ Y12								
Beg Brdg 146+00.391, ramp extends to 146+40								
Y9	11+90.000	TO	15+03.789	6,920	1,735	2,834	1,648	7,469
125mm EXTRA MAT'L FROM GRADING ONLY						4,998	4,998	0
SUMMARY SUBTOTAL No. 5				90,488	5,981	306,436	287,956	77,989
L	146+91.681	TO	149+10.035	503	0	25,314	24,811	0
(END BRDG WBL)								
125mm EXTRA MAT'L FROM GRADING ONLY						1,474	1,474	0
SUMMARY SUBTOTAL No. 6				503	0	26,788	26,285	0

X-0002CB

LOCATION	UNCL. EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
SUBTOTAL SUMMARIES 1 THRU 6	516,723	15,005	780,704	562,338	313,362
ADDITIONAL UNDERCUT		4,650	5,813	5,813	4,650
SHOULDER MATERIAL			5,575	5,575	
WASTE IN LIEU OF BORROW				-28,088	-28,088
LOSS DUE TO CLEARING AND GRUBBING	-15,000			15,000	
MATERIAL FOR EARTH BERMS			339	339	
SELECT MAT'L CLASS II OR III IN LIEU OF BORROW			-15,655	-15,655	
SELECT MAT'L CLASS III IN LIEU OF BORROW			-26,100	-26,100	
ADD'L MATERIAL FOR PRELOADING			75,138	75,138	
REMOVAL OF PRELOADING MATERIAL	60,110				60,110
PROJECT TOTALS	561,833	19,655	825,814	594,360	350,034
EST 5% TO REPLACE TOP SOIL ON BORROW PIT				29,718	
X-0002CB GRAND TOTALS:	561,833	19,655	825,814	624,078	350,034
X-0002CB SAY TOTALS:	**561,900**	**19,700**		**624,100**	

ESTIMATED DDE	11,400 M3	
PAVEMENT STRUCTURE VOLUME (-Y8-REV & -Y9-)	2,500 M3	
SHALLOW UNDERCUT (CONTINGENCY)	400 M3	
GRADE POINT UNDERCUT	4,000 M3	
SUBGRADE UNDERCUT (CONTINGENCY)	650 M3	
SELECT GRANULAR MAT'L, (CLASS II OR III)	15,655 M3	(BACKFILL FOR SUBGRADE UNDERCUT AREAS)
SELECT GRANULAR MAT'L, CLASS III	26,100 M3	(DRAINAGE BLANKET FOR PRELOADING)
SUBGRADE STAB - STABILIZER AGGREGATE	5,800 MTNS	
CLASS IV SUBGRADE STABILIZATION	900 MTNS	

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

Note: "Quantities are approximate only. The Resident Engineer will re-cross-section the work accurately when the project is staked out. These cross-section notes will be used in computing the final quantities for which the contractor will be paid."

6/15/93

10/27/2010
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PROJ. REFERENCE NO.	SHEET NO.
X-0002CB	3-N

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1-7		**NOT USED**
8	4, 5 - 19, 20	PAUL THOMPSON DEVELOPMENT, CORP.
9-53A		**NOT USED**
53B	4, 5	NELLIE E. EVANS McKINNIE
55	5, 6	SARAH H. BLUE
55A	5	JAMES EDWARD WILLIAMS AND WIFE GRALDINE J. WILLIAMS
56	5, 6	JONAS A. McALLISTER, JR. AND WIFE LOUISE S. McALLISTER
57	5, 6	MARCELLA WALTON
913	5	EUREKA CHAPEL BAPTIST CHURCH
59	5	BENJAMIN J. EVANS HEIRS
62	5, 6	FEDERAL HOME LOAN MORTGAGE CORP.
63	5, 6	MARILYN M. AND JOSEPH KIRK
64	6	JAMES ALBERT McLAUGHLIN
65	6	EDWARD N. AND MARY AGNESS McKOY ELLIOT
66	6	CHRISTOPHER NORVEL McKOY
67	6	WILLIE AND ROSA L. RILES
68	6	COSMAS D. AND MARYROSE V. EAGLIN
69	6, 7	CHERYL EVANS
69A	7	CHERYL V. WALKER
70	6, 7	MAXWELL AND JOSEPH GRIFFEN
71	6	VANESSA SAMUEL AND BEVERLY LUCAS
72	6	DELORES S. AND DENNIS R. McNAIR
73	6	CAROLYN DOBBINS
74	6	HARRIET EVANS KING
74A	6	EDDIE W. COUNCIL
75	6	WILLIE SIMMONS
76	7	J.D. AND SUE ELLIOT
77	7, 8	NORMAN ANTONIO WHITTED
77A	7	LaSALLE BANK NATIONAL ASSOCIATION
78	7, 8	JULIUS D. AND SUE C. ELLIOT
78A	8	JACQUELINE C. ANDREWS
79	7	CHARILIE C. AND GLORIA V. MIMS
80	7	E.R. AND RUTH B. McKEITHAN
81	7	HUGH M AND THELMA T. MACKEY
82	7	BETTY LOU ARMSTRONG
83	7	MASCO McLEAN AND ELIZA JANE McCLEAN
84	7	JOHN THORN
85		**NOT USED**
86		**NOT USED**
87	7, 8	EDITH EVANS MELVIN
88		**NOT USED**
89	8 - 14	ANDREWS ROAD CO.
89A	8	QUARTERMAIN CONSTRUCTION, LLC
90	12 - 14	CUMBERLAND COUNTY BOARD OF EDUCATION
91	14	CEDAR FALLS BAPTIST CHURCH
910	14 - 15	NCDOT (FORMERLY DORIS ELIZABETH H. WOLBERT, et al)
93	15 - 16	EDWIN G. OSTENDORF
94	15 - 16	MARVIN N. HADOCK
95	15 - 16	JAMES B. OSTENDORF
96		**NOT USED**
97	16	EDWIN G. OSTENDORF
98	16	ROY J. HADDOCK
99		**NOT USED**
100	16 - 17	EDWIN G. OSTENDORF
101	16	CLAYTON L. FARMER
102	16	DEWAYNE L. FARMER
102Z	16	NCDOT (FOMERLY DEWAYNE L. FARMER)
103	16	MARIE S. FARMER
104	16	ADA J. ELLIOT
105	16	CHRISTINE F. BROWN

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
106	16	EDWIN G. OSTENDORF
107	16 - 17	JOHN HAGGARD
108	16 - 17	CHARLESENA E WALKER
109	17	BRENDA R. LYONS
110	17	LYNWOOD F. ROSSER
111		**NOT USED**
112	17	LILLIAN A. WILLIAMS
113	17	KELLY
114	17	LOUISE ROSSER
115 - 129A		**NOT USED**
130	19, 20	JESSIE E. AND ROCHESTER AVERY
131	20	MACEO JAMES
132		**NOT USED**
133	20	**UNKNOWN**
134	20	JOHN A. McGREGOR

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	4
R /W SHEET NO. 10&11 (X-0002C)	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID — 9-29-2010

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR. — 10/21/10

MOFFATT & NICHOL — 1616 EAST MILLBROOK ROAD, SUITE 160, RALEIGH, NORTH CAROLINA 27609 (919) 781-9626 VOICE (919) 781-9693 FAX

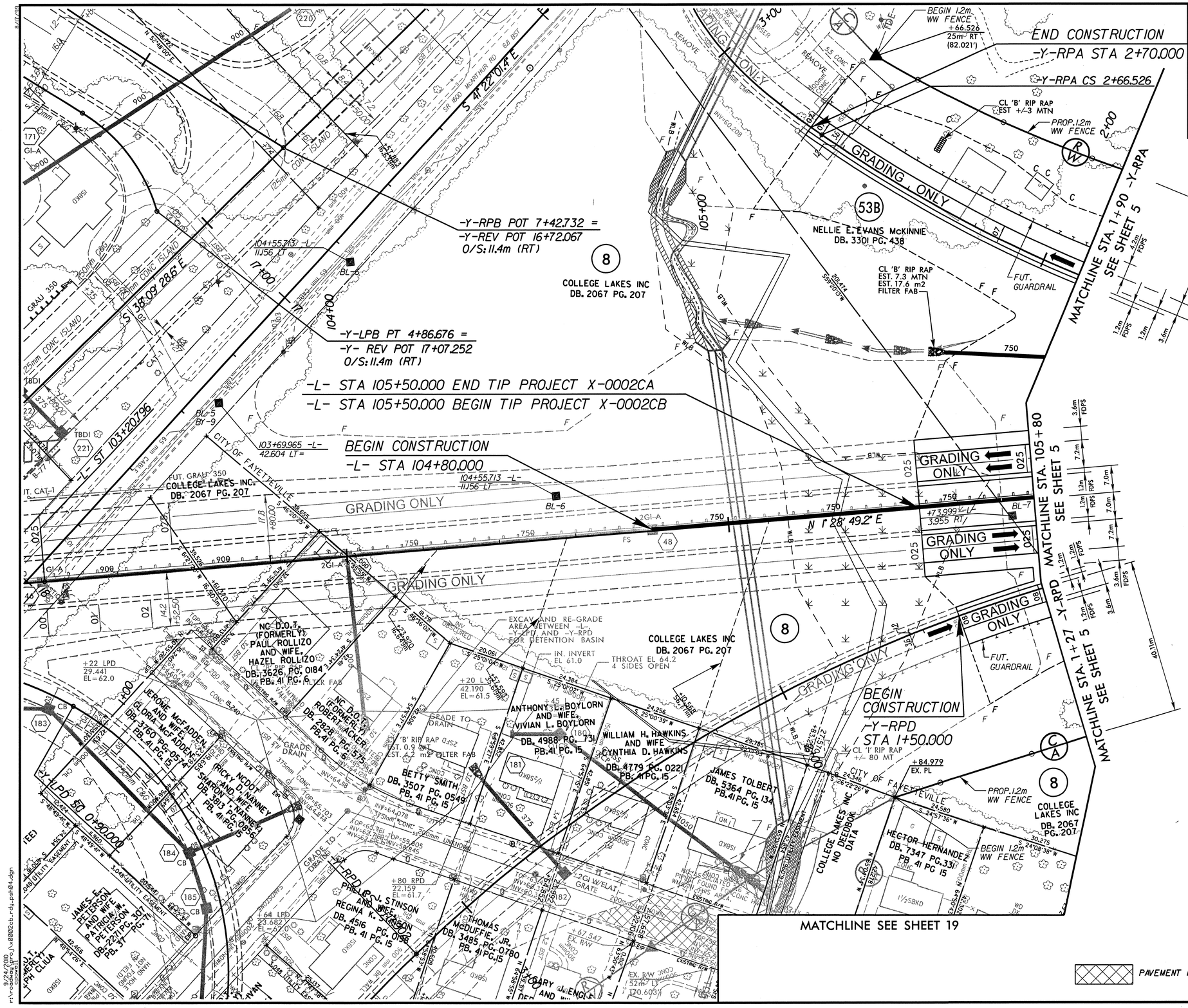
SDG Sungate Design Group, P.A. Engineering & Planning Consultants 5516-A James Phillips Rd. Raleigh, N.C. 27606

METRIC 5 0 10

CONST.REV.

R /W REV.

NAD 83 NC GRID



-Y-RPA

PIs Sta 0+60.049	PI Sta 1+80.075
Θs = 7° 09' 43.1"	Δ = 28° 05' 42.2" (RT)
Ls = 90.000	L = 176.526
LT = 60.049	T = 90.075
ST = 30.045	R = 360.000
	SE = 0.07
	RO = 90.000
	DS = 80 kph

-Y-RPD

PIs Sta 0+60.040	PI Sta 2+07.137
Θs = 6° 26' 44.8"	Δ = 32° 38' 40.5" (LT)
Ls = 90.000	L = 227.902
LT = 60.040	T = 117.137
ST = 30.036	R = 400.000
	SE = 0.08
	DS = 80 kph

PAVEMENT REMOVAL

FOR DITCH DETAILS SEE SHEET 2-L
FOR -L- PROFILE SEE SHEET 21
FOR -Y-RPA PROFILE SEE SHEET 29
FOR -Y-RPD PROFILE SEE SHEET 29

8/17/99

9/24/2010 r:\roadway\proj\x0002cb_rdy_psh04.dgn

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	5
R /W SHEET NO.	12 (X-0002C)

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER J. R. REID — 9-29-2010

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR. — 10/26/10

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

SDG Sungate Design Group, P.A. Transportation Consultants 510-J James Kerr Blvd. Greensboro, NC 27410 Raleigh, N.C. 27606

CONST.REV.

R /W REV.

METRIC 5 0 10

-Y-RPA

PIs Sta 0+60.049
Θs = 7° 09' 43.1"
Ls = 90.000
LT = 60.049
ST = 30.045

PI Sta 1+80.075
Δ = 28° 05' 42.2" (RT)
L = 176.526
T = 90.075
R = 360.000
SE = 0.07
RO = 90.000
DS = 80 kph

-Y2-

PI Sta 12+92.849
Δ = 75° 46' 56.7" (LT)
L = 46.293
T = 27.238
R = 35.000
SE = 0.02
RO = 6.5m
DS = 30 kph

-Y3- POT 12+50.000 =
-Y2- POT 12+50.00

-Y2- STA 12+55.00
BEGIN CONSTRUCTION
N 78° 05' 25.3" E

NAD 83
NC GRID

JAMES EDWARD WILLIAMS AND WIFE, GERALDINE J. WILLIAMS (55A) DB. 2631, PG. 558 PB. 20 PG. 49

LAT 0.6m BASE DITCH
STA 0+84 TO STA 1+50
-Y-RPA RT
EST. DDE 137 m3
EST. 110 MTN CL 'B' RIP RAP
EST. 238 m2 FILTER FAB
SEE DETAIL #4

(53B) NELLIE E. EVANS McKINNIE DB. 3301 PG. 438

TAIL DITCH
EST DDE+/- 45 m
SEE DETAIL #12

SPECIAL DITCH GRADE
STA 12+60 TO STA 12+85
-Y2- LT SEE DETAIL #11

SPECIAL DITCH GRADE
STA 12+60 TO STA 13+20
-Y2- RT SEE DETAIL #11

-Y2- PC 12+65.611

CL 'B' RIP RAP
EST. 2.7 MTN
EST. 8.4 m2 FILTER FAB

PROP. 1.2m WW FENCE

CL 'B' RIP RAP
EST. 1.8 MTN
EST. 5.9 m2 FILTER FAB

-Y-RPA TS 0+00.000 =
-L- POT 107+80.000 (14.200m LT)

MATCHLINE STA. 1+90 -Y-RPA SEE SHEET 4

MATCHLINE STA. 13+40 -Y2- SEE SHEET 6

MATCHLINE STA. 105+80 SEE SHEET 4

MATCHLINE STA. 108+60 SEE SHEET 6

MATCHLINE STA. 1+27 -Y-RPD

MATCHLINE STA. 108+57.147 -L- TS

(55) SARAH W. McINTYRE DB. 5337, PG. 439 PB. 20 PG. 49

(56) YVETTE McALLISTER DB. 5337, PG. 439 PB. 20 PG. 49

(57) MARCELLA WALTON DB. 2497, PG. 648 PB. 20 PG. 49

(62) COROLLYN DOBBINS DB. 5373, PG. 368

(63) MARILYN MELVIN KIRK AND HUSBAND, JOSEPH KIRK DB. 4771, PG. 0390 PB. 20 PG. 49

SHIRLEY A. BLUE DB. 7035, PG. 889 PB. 20 PG. 49

COROLYN DOBBINS DB. 6324, PG. 515 PB. 20 PG. 49

(913) NC D.O.T. (FORMERLY) EUREKA CHAPEL BAPTIST CHURCH TRACT 2 DB. 2312 PG. 518 PB. 36 PG. 74

(59) BENJAMIN J. EVANS HEIRS DB. PG.2101, PG. 18 PB. 36 PG. 74

(913) NC D.O.T. (FORMERLY) EUREKA CHAPEL BAPTIST CHURCH TRACT 1 DB. PG.2312, PG. 517 PB. 36 PG. 74

(913) NC D.O.T. (FORMERLY) EUREKA CHAPEL BAPTIST CHURCH TRACT 3 DB. PG.2312, PG. 518 PB. 36 PG. 74

(8) COLLEGE LAKES INC DB. 2067 PG. 207

(8) COLLEGE LAKES INC DB. 2067 PG. 207

-Y-RPD SC 0+90.000

-Y-RPD ST 0+00.000 =
-L- POT 107+06.731 (14.200m RT)

END CONSTRUCTION
-Y3- STA 14+24.944

FAYETTEVILLE OUTER LOOP

GRADING ONLY

-Y-RPD

PIs Sta 0+60.040
Θs = 6° 26' 44.8"
Ls = 90.000
LT = 60.040
ST = 30.036

PI Sta 2+07.137
Δ = 32° 38' 40.5" (LT)
L = 227.902
T = 117.137
R = 400.000
SE = 0.08
RO = 90.000
DS = 80 kph

-L-

PIs Sta 109+09.823
Θs = 3° 13' 59.2"
Ls = 79.000
LT = 52.675
ST = 26.341

PAVEMENT REMOVAL

MATCHLINE SEE SHEET 19

MATCHLINE STA. 14+70 -Y3- SEE SHEET 20

FOR DITCH DETAILS SEE SHEET 2-L
FOR -L- PROFILE SEE SHEET 21
FOR -Y-RPA PROFILE SEE SHEET 29
FOR -Y-RPD PROFILE SEE SHEET 29
FOR -Y2- PROFILE SEE SHEET 30

8/17/99

9/28/2010
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PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	6
R/W SHEET NO.	13 (X-0002C)

METRIC

5 0 10

CONST. REV.

R/W REV.

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER R. REID — 9-29-2010

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR. — 10/21/10

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

SDG Sungate Design Group, P.A. — Engineers · Planners · Surveyors · Architects, 915-A Jones Franklin Rd., Raleigh, N.C. 27606

NAD 83 NC GRID

-Y2-
PI Sta 14+26.594
Δ = 104° 15' 40.1" (LT)
L = 63.690
T = 45.009
R = 35.000
SE = 0.04
RO = 6.5m
DS = 30 kph

-Y8- REV
PI Sta 10+80.579
Δ = 48° 46' 10.0" (LT)
L = 68.095
T = 36.264
R = 80.000
SE = 0.04
RO = 20.0m
DS = 30 kph

-Y8- POT 10+44.315 (LB) =
-Y8- REV PC 10+44.315 (LA)
BEGIN CONSTRUCTION

-Y2- POT 14+49.806 =
-Y11- POT 10+50.000

-Y2- PT 14+45.275
END CONSTRUCTION

-Y7- POT 12+10.702 =
-Y8- REV POC 10+62.913

-Y11- STA 12+51.301
END CONSTRUCTION

MATCHLINE STA. 13+40 -Y2- SEE SHEET 5

MATCHLINE STA. 108+60 SEE SHEET 5

MATCHLINE STA. 10+90 -Y8- REV SEE SHEET 7

MATCHLINE STA. 111+60 SEE SHEET 7

MATCHLINE STA. 12+80 -Y11- SEE SHEET 20

55 SARAH W. McINTYRE DB. 5337, PG. 439 PB. 20 PG. 49
WILLIAM C. CURRIE DB. 775 PG. 192

64 LILLIAN McLAUCHLIN DB. 4379, PG. 0034 PB. 20 PG. 49

56 YVETTE MCALISTER DB. 6857, PG. 231 PB. 20 PG. 49

57 MARCELLA WALTON DB. 2497, PG. 648 PB. 20 PG. 49

62 COROLLYN DOBBINS DB. 5373, PG. 368

63 MARILYN MELVIN KIRK AND HUSBAND, JOSEPH KIRK DB. 4771, PG. 0390 PB. 20 PG. 49

65 MINH COURTNEY DB. 6719, PG. 263 PB. 20 PG. 49

66 MARY M. ELLIOT DB. 7635, PG. 171 PB. 20 PG. 49
CHRISTOPHER N. McKOY DB. 6812, PG. 187 PB. 20 PG. 49

71 VANESSA SAMUEL AND BEVERLY LUCAS DB. 4631, PG. 0795 PB. 20 PG. 49

72 JOEL JENKINS DB. 6357, PG. 0750 PB. 20 PG. 49

73 CAROLYN DOBBINS DB. 4874, PG. 0474 PB. 20 PG. 49

SHIRLEY A. BLUE DB. 7035, PG. 889 PB. 20 PG. 49

COROLYN DOBBINS DB. 6324, PG. 515 PB. 20 PG. 49

CAROLYN DOBBINS DB. 4874, PG. 0474 PB. 20 PG. 49

67 WILLIE RILES AND WIFE, ROSA L. RILES DB. 2160, PG. 185 PB. 15, PG. 8

JOE DYSON JONES AND WIFE BEULEAH JANE JONES DB. 4387, PG. 0681 PB. 15, PG. 8

68 COSMAS D. EAGLIN AND WIFE, MARYROSE VERA EAGLIN DB. 3004 PG. 205

WILLIE RILES AND WIFE, ROSA L. RILES DB. 2160, PG. 185 PB. 15, PG. 8

70 MAXWELL AND JOSEPH GRIFFEN DB. 780 PG. 407

69 CHERYL EVANS DB. 4346 PG. 0342 PB. 36 PG. 71

74A ADDIE W. COUNCIL (HEIRS) DB. 5099, PG. 274 PB. 36, PG. 71

74 HARRIET EVANS KING DB. 4822, PG. 660 PB. 36, PG. 71

75 WILLIE SIMMONS, UNMARRIED DB. 4838, PG. 0381 PB. 36, PG. 71

DO NOT DISTURB EXISTING WELL

BERM DITCH STA 108+90 TO STA 109+90 -L- LT

BERM DITCH STA 110+05 TO STA 111+10 -L- LT

PROP. 1.2m WW FENCE

SEAL ABANDONED WELL

FUT. CABLE GUIDERAIL

SPECIAL DITCH GRADE STA 108+90 TO STA 109+40 -L- RT SEE DETAIL #3

GRADING ONLY

FAYETTEVILLE OUTER LOOP

GRADING ONLY

PAVEMENT REMOVAL

-L-

PIs Sta 109+09.823
Θs = 3° 13' 59.2"
Ls = 79.000
LT = 52.675
ST = 26.341

PI Sta 116+37.531
Δ = 90° 06' 47.2" (RT)
L = 1,100.939
T = 701.383
R = 700.000
SE = 0.08
RO = 79.000
DS = 110 kph

FOR INTERSECTION DETAILS SEE SHEET 2-H
FOR DITCH DETAILS SEE SHEET 2-L
FOR -L- PROFILE SEE SHEET 22
FOR -Y2- PROFILE SEE SHEET 30
FOR -Y7- PROFILE SEE SHEET 31
FOR -Y8- REV PROFILE SEE SHEET 31

9/28/2010
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PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	7
R/W SHEET NO.	14 (X-0002C)

METRIC

5 0 10

CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER L. R. REID — 09-29-2010

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. KENNY WELLS, JR. — 10/21/10

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

SDG Sungate Design Group, P.A., Raleigh, N.C. 27606

-Y8- REV

PI Sta 10+80.579
Δ = 48° 46' 10.0" (LT)
L = 68.095
T = 36.264
R = 80.000
SE = 0.04
DO = 20.000
DS = 50 kph

PI Sta 12+65.351
Δ = 40° 48' 45.6" (LT)
L = 56.985
T = 29.762
R = 80.000
SE = 0.04
DO = 20.000
DS = 50 kph

-Y8- REV PT 12+92.574 =
-Y6- POT STA 15+18.000
END CONSTRUCTION

-Y6- REV POT 15+25.483

NAD 83
NC GRID

MATCHLINE STA. 10+90 -Y8- REV
SEE SHEET 6

MATCHLINE STA. 111+60 SEE SHEET 6

MATCHLINE STA. 114+60 SEE SHEET 8

-Y8- REV PT 11+12.410

-Y8- REV PC 12+35.589

N 29° 25' 40.5" E
-Y8- REV

N 17° 23' 05.5" W

S 18° 41' 41.3" E
-Y8-

-Y6-

GRADING ONLY

FUT. CABLE GUIDERAIL

FAYETTEVILLE OUTER LOOP

GRADING ONLY

FUT. CABLE GUIDERAIL

REMOVE

REMOVE

+90.000 R/W

+12.410 10m LT (32.808')

+36.000 17m LT (55.774')

+35.589 10m LT (32.808')

+92.574 EX. R/W

EX. R/W 10m LT (32.808')

+54.312 -L- 110.903' LT

+83.000 EX. R/W

+40.000 R/W

EX. R/W 55m LT (180.447')

EX. R/W 55m RT (180.446')

EX. R/W 55m RT (180.446')

EX. R/W 55m RT (180.446')

EX. R/W 55m RT (180.446')

EX. R/W 55m RT (180.446')

70 MAXWELL AND JOSEPH GRIFFEN DB. 780 PG. 407

69 CHERYL EVANS DB. 4346 PG. 0342 PB. 36 PG. 71

SPECIAL DITCH GRADE STA 11+00 TO STA 11+89 -Y8-REV LT SEE DETAIL #11

76 LED FORD AND WIFE, MARY LEARY FORD DB. 6453 PG. 302

77 NORMAN ANTONIO WHITTED DB. 4613 PG. 448

78 JULIUS D. ELLIOT AND WIFE, SUE C. ELLIOT DB. 3036 PG. 383

LAT 1.2m BASE DITCH STA 114+30 TO STA 116+60 -L- LT EST. DDE 6.992 m3 SEE DETAIL #5

PROP. 1.2m WW FENCE

CL 'B' RIP RAP EST. 7.3 MTN EST. 17.6m2 FILTER FAB

SPECIAL DITCH GRADE STA 11+00 TO STA 11+89 -Y8-REV RT SEE DETAIL #11

69A CHERYL WALKER DB. 3865 PG. 187 PB. 36 PG. 71

TAIL DITCH EST DDE +/-160 m³ SEE DETAIL #13

77A ZOOK ACKERS DB 7572 PG 332 PB 98 PG 198

CL 'I' RIP RAP EST. 13.6 MTN EST. 25.1 m2 FILTER FAB

CL 'B' RIP RAP EST +/-3 MTN

81 HUGH M. MACKEY AND WIFE, THELMA T. MACKEY DB. 2260 PG. 429

83 MASCO McLEAN AND WIFE, ELIZA JANE McCLEAN DB. 4021 PG. 0337

800 CSP W/ELBOW

69 CHERYL EVANS DB. 4346 PG. 0342 PB. 36 PG. 71

80 ARMSTRONG LIVING TRUST DB. 5797 PG. 276

SEAL ABANDONED WELL

SEAL ABANDONED WELL

82 ARMSTRONG LIVING TRUST DB. 5797 PG. 276

83 MASCO McLEAN DB. 2017 PG. 523

84 JOHN THORN DB. 2089 PG. 33

83 MASCO McLEAN DB. 2006 PG. 365

87 EDITH EVANS MELVIN DB. 4613 PG. 446

79 CHARLIE C. MIMS AND WIFE GLORIA V. MIMS DB. 2862 PG. 151 PB. 32 PG. 39

NELLIE THOMAS NICHOLS WASHINGTON DB. 2197 PG. 249 PB. 32 PG. 39

-Y8- POT 12+04.244 =
-Y6- POT 13+45.941

-Y8- STA 12+69.203
END CONSTRUCTION

-L-

PI Sta 116+37.531
Δ = 90° 06' 47.2" (RT)
L = 1,100.939
T = 701.383
R = 700.000
SE = 0.08
RO = 79.000
DS = 110 kph

PAVEMENT REMOVAL

FOR DITCH DETAILS SEE SHEET 2-L
FOR -L- PROFILE SEE SHEET 22
FOR -Y8- REV PROFILE SEE SHEET 31 & 32

8/17/99

9/28/2010
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PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	8
R/W SHEET NO. 15 (X-0002C)	

METRIC

5 0 10

CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

9-22-2010

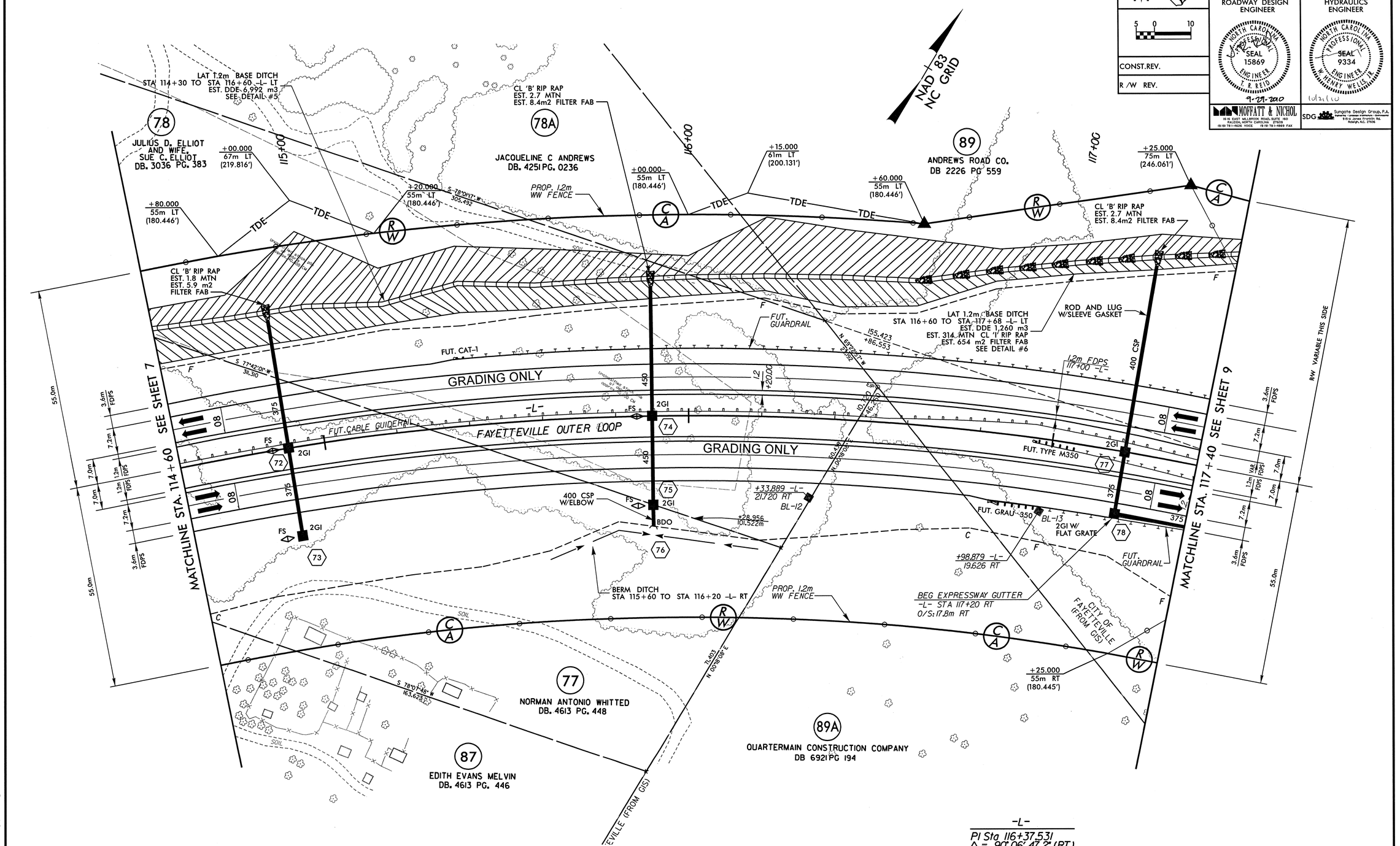
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WILLIAMS, JR.

10/21/10

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

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



-L-

PI Sta 116+37.531
Δ = 90°06'47.2" (RT)
L = 1,100.939
T = 701.383
R = 700.000
SE = 0.08
RO = 79.000
DS = 110 kph

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

8/17/99

9/24/2010
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PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	9
R /W SHEET NO.	16 (X-0002C)

METRIC

5 0 10

CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER JAMES R. REID — 9-29-2010

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER WHITNEY WELLS — 10/21/10

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

SDG Sungate Design Group, P.A. — 810-A James Faircloth Blvd, Raleigh, N.C. 27606

-L-

PI Sta 116+37.531
Δ = 90° 06' 47.2" (RT)
L = 1,100.939
T = 701.383
R = 700.000
SE = 0.08
RO = 79.000
DS = 110 kph

PIs Sta 120+63.428
Θs = 3° 13' 59.2"
Ls = 79.000
LT = 52.675
ST = 26.341

ENERGY DISSIPATOR								
STATION	L_P (M)	W_P (M)	L_A (M)	T (M)	D (M)	CLASS I RIP RAP (M)	DDE (M^3)	FILTER FABRIC (M^2)
117+75 -L- LT	9.0	6.0	1.5	0.60	1.10	165	150	160

LAT 1.2m BASE DITCH
STA 116+60 TO
STA 117+68 -L- LT
EST. DDE 1,260 m3
EST. 314 MTN CL 'I' RIP RAP
EST. 654 m2 FILTER FAB
SEE DETAIL #6

+75.000 82m LT (269.028')

+60.000 R/W LT

+90.000 R/W LT

+50.000 75m LT (246.061')

+90.000 55m LT (180.446')

+37.087 55m LT (180.446')

+90.000 55m RT (180.448')

+37.087 55m RT (180.445')

89 ANDREWS ROAD CO. DB 2226 PG 559

NAD 83 NC GRID

119+00

120+00

118+00

PROP. 1.2m WW FENCE

CHORD

TOE PROTECTION
END BRIDGE TO
STA 120+34 -L- RT
EST. 153 MTN CL 'B' RIP RAP
EST. 317 m2 FILTER FAB
SEE DETAIL #1

LAT 0.6m BASE DITCH
STA 120+35 TO STA 120+80 -L- LT
SEE DETAIL #2

ENERGY DISSIPATOR
SEE SPECIAL DETAIL
EST. DDE 150 m3
SHEET 2-M

SLOPE REINFORCEMENT
SEE DETAIL SHEET 2-O

BEGIN WW FENCE AT BRIDGE

END WW FENCE AT BRIDGE

FUT. GUARDRAIL

FUT. B-77

FUT. GRAU 350

GRADING ONLY

FUT. TYPE M350

FUT. CABLE GUIDERAIL

FAYETTEVILLE OUTER LOOP

3.6m FDPS +13.576 -L-

1.2m FDPS +00 -L-

1.8m FDPS +00 -L-

1.2m FDPS +30 -L-

2GI -A

2GI W/ FLAT GRATE

BEG. FUT. EXPRESSWAY GUTTER +75

+24.604 -L- 17.191 RT

+17.145 -L- 5.303 RT

-L- CS 120+37.087

400 CSP W/ELBOW
ROD AND LUG CONNECTORS
W/SLEEVE GASKET

PFSH
SEE SPECIAL DETAIL
SHEET 2-M

CL 'I' RIP RAP
EST. 11.8 MTN
EST. 25.1m2 FILTER FAB

BEG. WW FENCE AT BRIDGE

CL 'II' RIP RAP
EST +/- 2,800 MTN
(STRUCTURE PAY ITEM)

+59.860 -L- 14.256 RT

+37.457 -L- 6.020 RT

BL-14

BL-15

BL-16

BL-17

R/W VARIABLE THIS SIDE

MATCHLINE STA. 117+40 SEE SHEET 8

MATCHLINE STA. 120+60 SEE SHEET 10

TOE PROTECTION
STA 117+45 TO
BEGIN BRIDGE -L- RT
EST. 36 MTN CL 'B' RIP RAP
EST. 74 m2 FILTER FAB
SEE DETAIL #1

END FUT. EXPRESSWAY GUTTER +60

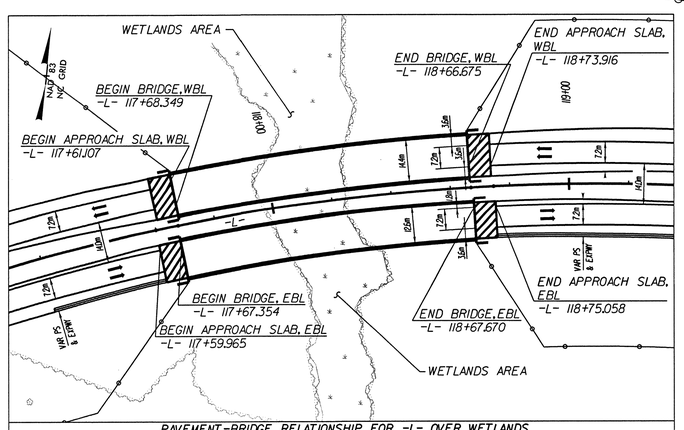
S 63°20'50" E 308.138

CITY OF FAYETTEVILLE (FROM GIS)

200mm PVC

375mm M/TL

PREFORMED SCOUR HOLE (PFSH)							
STATION	B (M)	D (M)	W_{PSR} (M)	d (M)	CLASS I RIP RAP (MTONS)	DDE (M^3)	FILTER FABRIC (M^2)
119+10 -L- RT	1.2	0.4	1.3	0.15	4.0	2.8	7.8



PAVEMENT-BRIDGE RELATIONSHIP FOR -L- OVER WETLANDS
(SEE SHEET 2-K FOR A LARGER DETAIL VIEW)

FOR DITCH DETAILS SEE SHEET 2-L
FOR ENERGY DISSIPATOR DETAILS AND LEVEL SPREADER DETAILS SEE SHEET 2-M
FOR -L- PROFILE SEE SHEET 23
SEE S-1 THRU S- FOR STRUCTURE PLANS

9/28/2010
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PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	10
R /W SHEET NO.	17 (X-0002C)

METRIC

5 0 10

CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER R. T. REID

9-29-2010

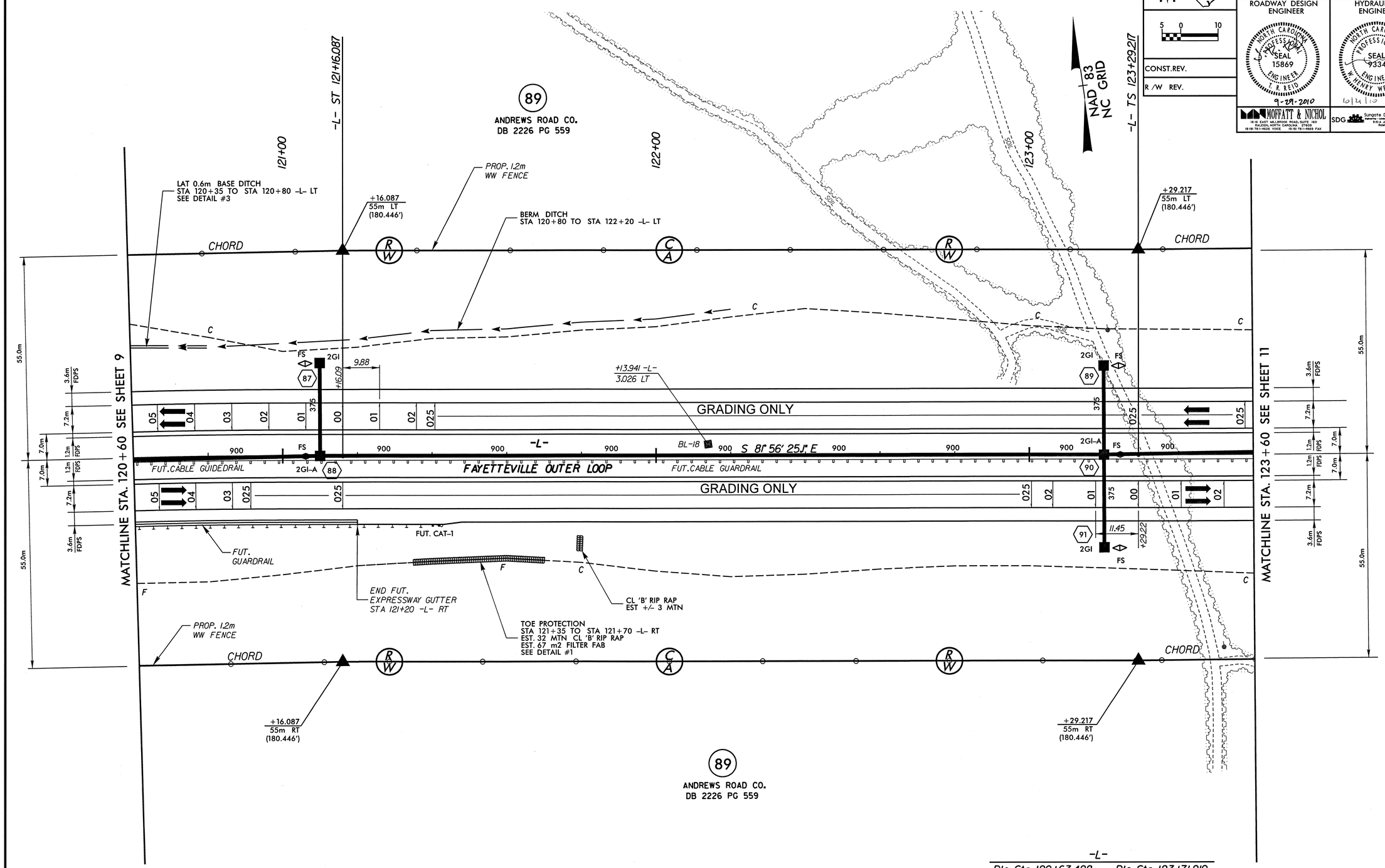
HYDRAULICS ENGINEER

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

10/4/10

MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4629 FAX

SDG Sungate Design Group, P.A.
Transportation Consultants
5101-A Jonathan Drive, Brookside Park
Raleigh, N.C. 27606



-L-

Pls Sta 120+63.428	Pls Sta 123+71.219
θs = 3° 13' 59.2"	θs = 1° 40' 44.0"
Ls = 79.000	Ls = 63.000
LT = 52.675	LT = 42.002
ST = 26.341	ST = 21.002

FOR DITCH DETAILS SEE SHEET 2-L
FOR -L- PROFILE SEE SHEET 24

8/17/99

9/24/2010
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PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	11
R/W SHEET NO. 18 (X-0002C)	

METRIC

5 0 10

CONST. REV.

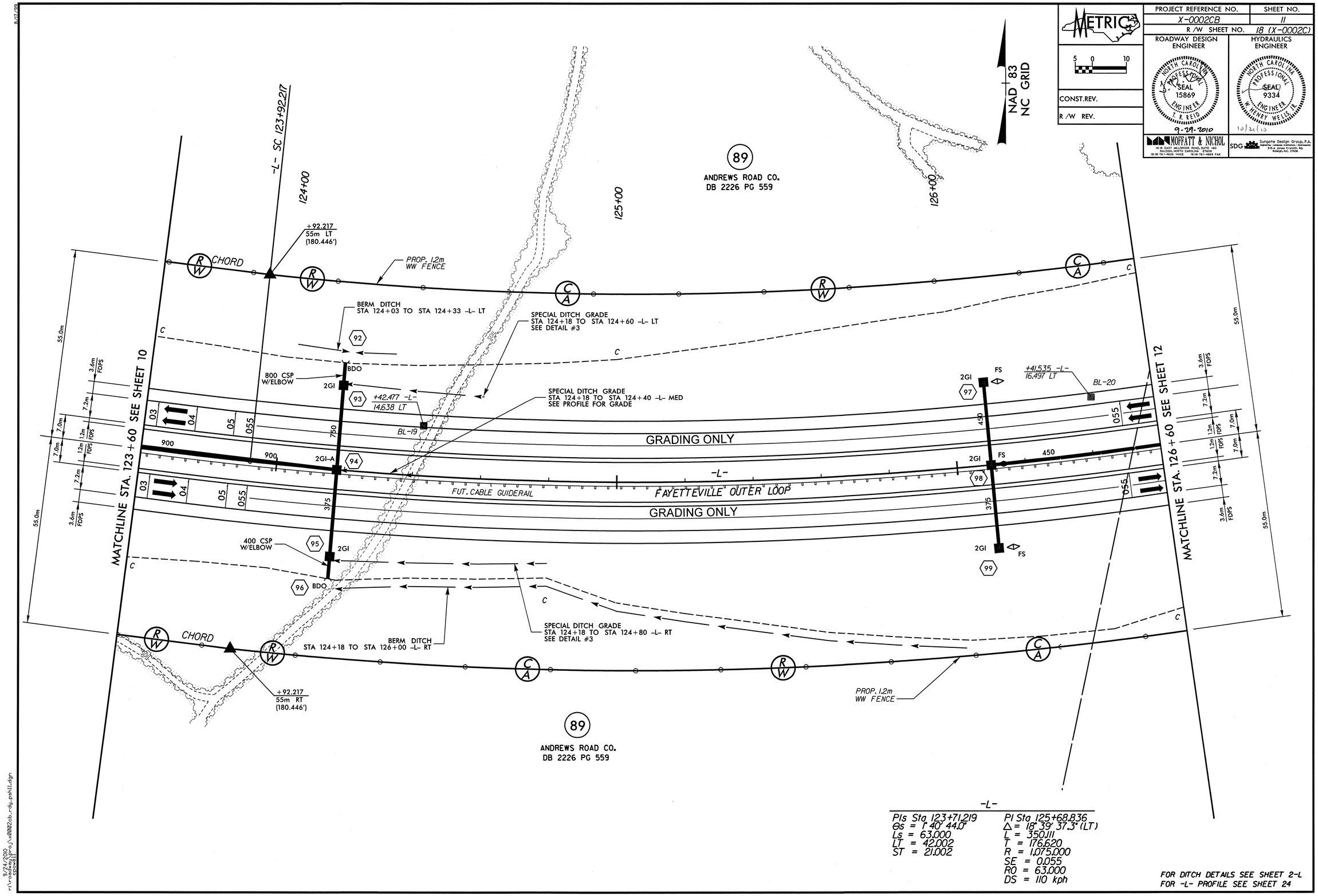
R/W REV.

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER R. REID — 9-29-2010

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR. — 10/24/10

MOFFATT & NICHOL
10 N. EAST MALLORY ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-6669 FAX

SDG Sungate Design Group, P.A.
Planning · Licensed Architecture · Engineering
916-A Jones Franklin Rd.
Raleigh, N.C. 27606



-L-

PIs Sta 123+71.219	PI Sta 125+68.836
Θs = 1° 40' 44.0"	Δ = 18° 39' 37.3" (LT)
Ls = 63.000	L = 350.111
LT = 42.002	T = 176.620
ST = 21.002	R = 1,075.000
	SE = 0.055
	RO = 63.000
	DS = 110 kph

FOR DITCH DETAILS SEE SHEET 2-L
FOR -L- PROFILE SEE SHEET 24

9/24/2010
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cbowen

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	12
R/W SHEET NO.	19 (X-0002C)

METRIC

5 0 10

CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER J. R. REID

9-29-2010

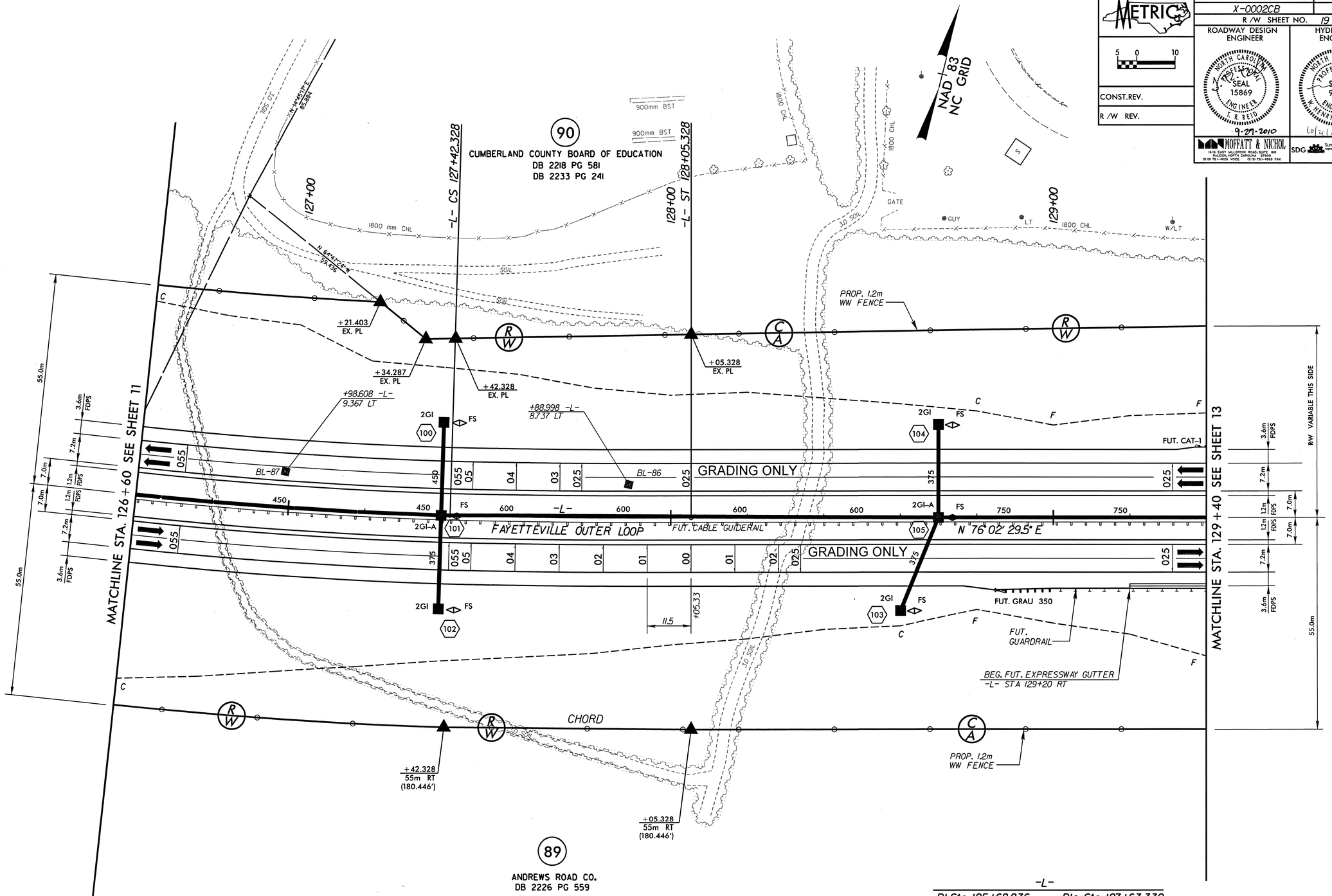
MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-6915 FAX

HYDRAULICS ENGINEER

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

10/21/10

SDG Sungate Design Group, P.A.
Engineers • Planners • Surveyors
919-A Jones Franklin Rd.
Raleigh, N.C. 27606



-L-

PI Sta 125+68.836	PIs Sta 127+63.330
Δ = 18° 39' 37.3" (LT)	θs = 1° 40' 44.0"
L = 350.111	Ls = 63.000
T = 176.620	LT = 42.002
R = 1,075.000	ST = 21.002
SE = 0.055	
RO = 63.000	
DS = 110 kph	

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

8/17/99

9/24/2010
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PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	13
R /W SHEET NO.	20 (X-0002C)

METRIC

5 0 10

CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER J. R. REID

9-29-2010

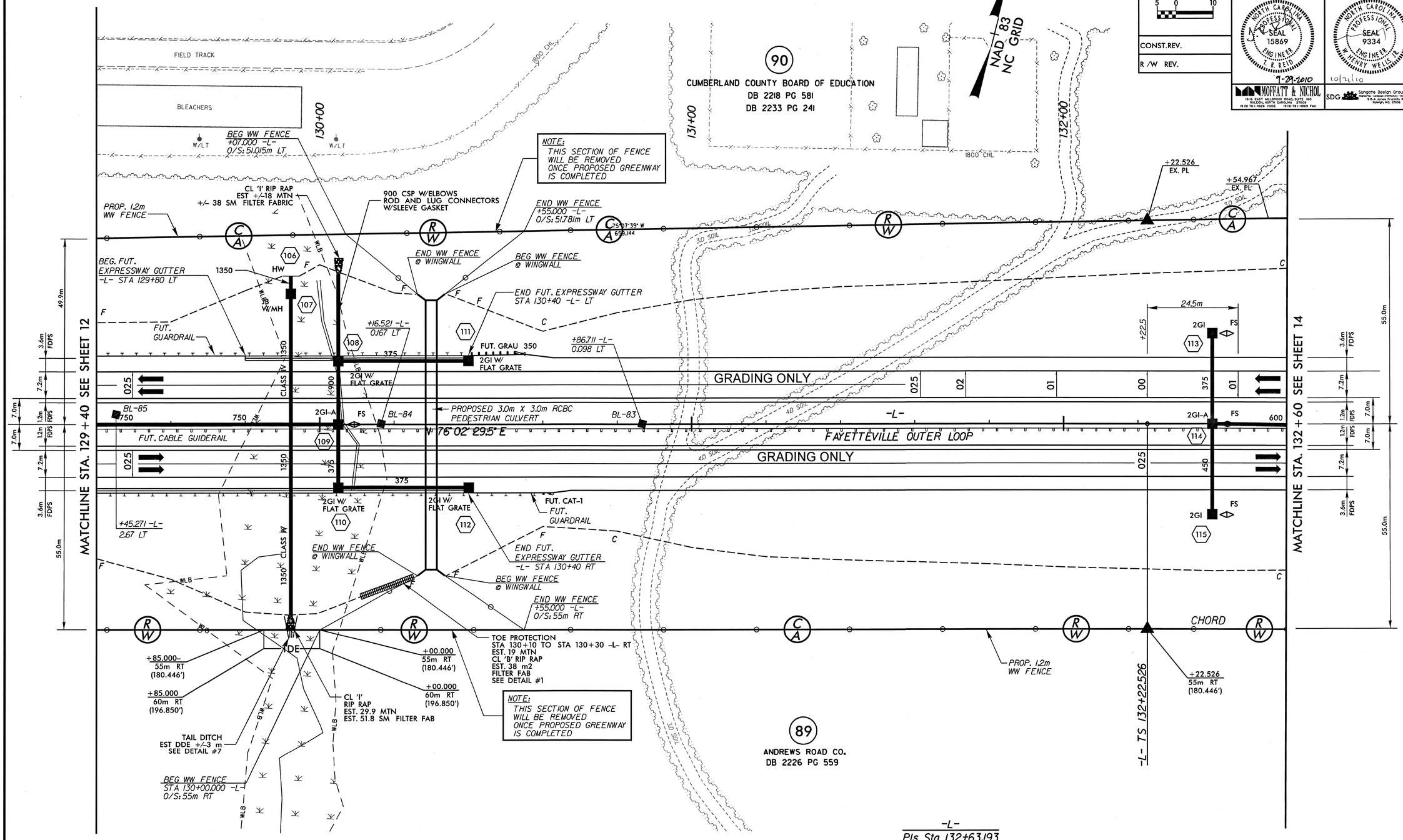
HYDRAULICS ENGINEER

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

10/21/10

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

SDG Sungate Design Group, P.A.
Northern Office: 3101 Poplarwood Court
510-A James Sprunt Drive
Raleigh, N.C. 27609



-L-
PIs Sta 132+63.193
Θs = 0° 30' 00.0"
Ls = 61.000
LT = 40.667
ST = 20.333

FOR DITCH DETAILS SEE SHEET 2-L
FOR -L- PROFILE SEE SHEET 25
SEE C-1 THRU C- FOR CULVERT PLANS

8/17/99

9/24/2010
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PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	14
R/W SHEET NO.	21 (X-0002C)

METRIC

5 0 10

CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

9-29-2010

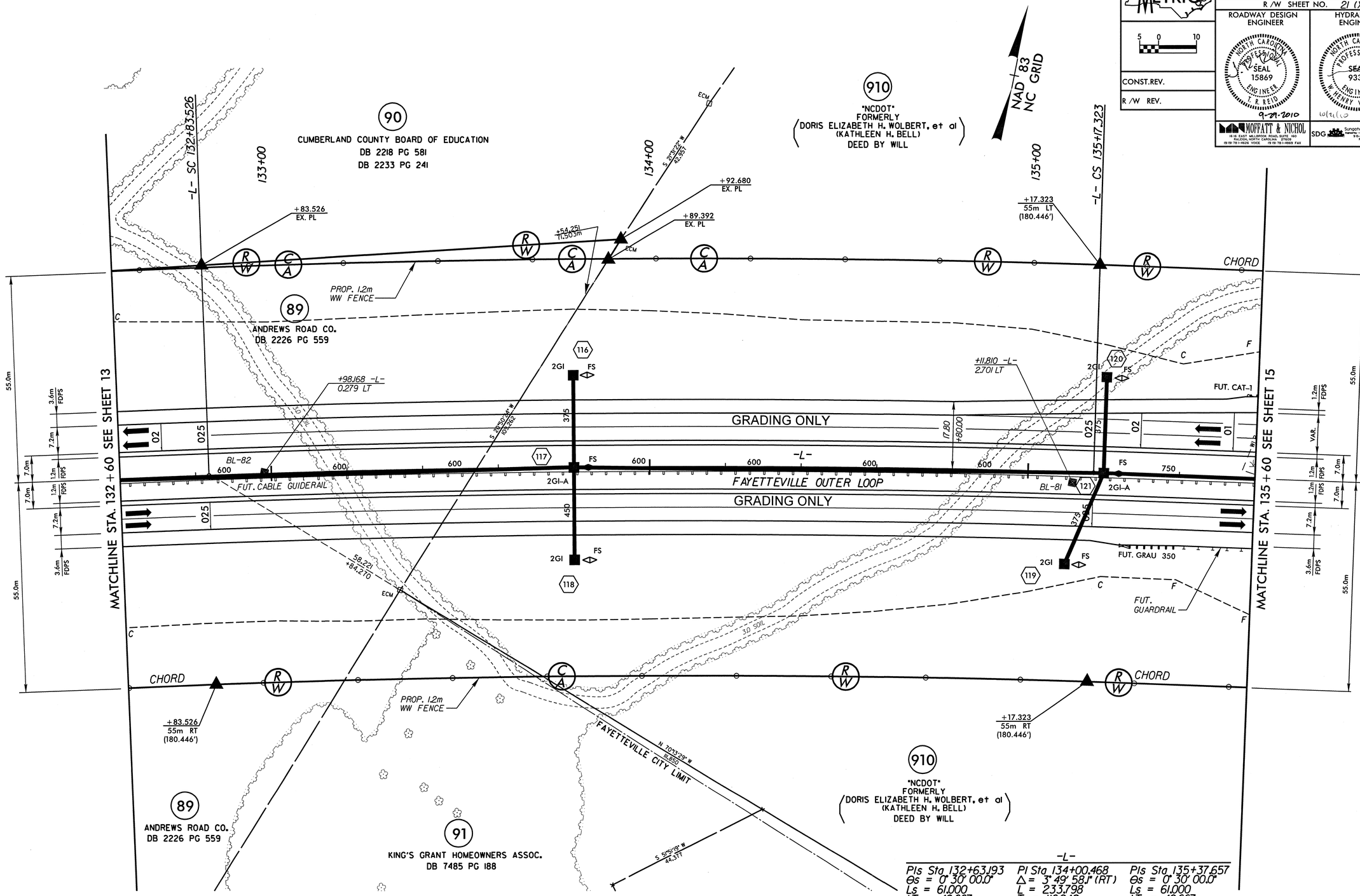
HYDRAULICS ENGINEER

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

10/21/10

MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-9626 VOICE (919) 781-9693 FAX

SDG Sungate Design Group, P.A.
Raleigh, North Carolina 27601
Kim James Proctor, Inc.
Raleigh, N.C. 27606



-L-

PIs Sta 132+63.193	PI Sta 134+00.468	PIs Sta 135+37.657
Θs = 0° 30' 00.0"	Δ = 3° 49' 58.1" (RT)	Θs = 0° 30' 00.0"
Ls = 61.000	L = 233.798	Ls = 61.000
LT = 40.667	T = 116.942	LT = 40.667
ST = 20.333	R = 3,495.000	ST = 20.333
	SE = 0.025	
	RO = 61.000	
	DS = 110 kph	

FOR DITCH DETAILS SEE SHEET 2-L
FOR -L- PROFILE SEE SHEET 26

8/17/99

9/24/2010
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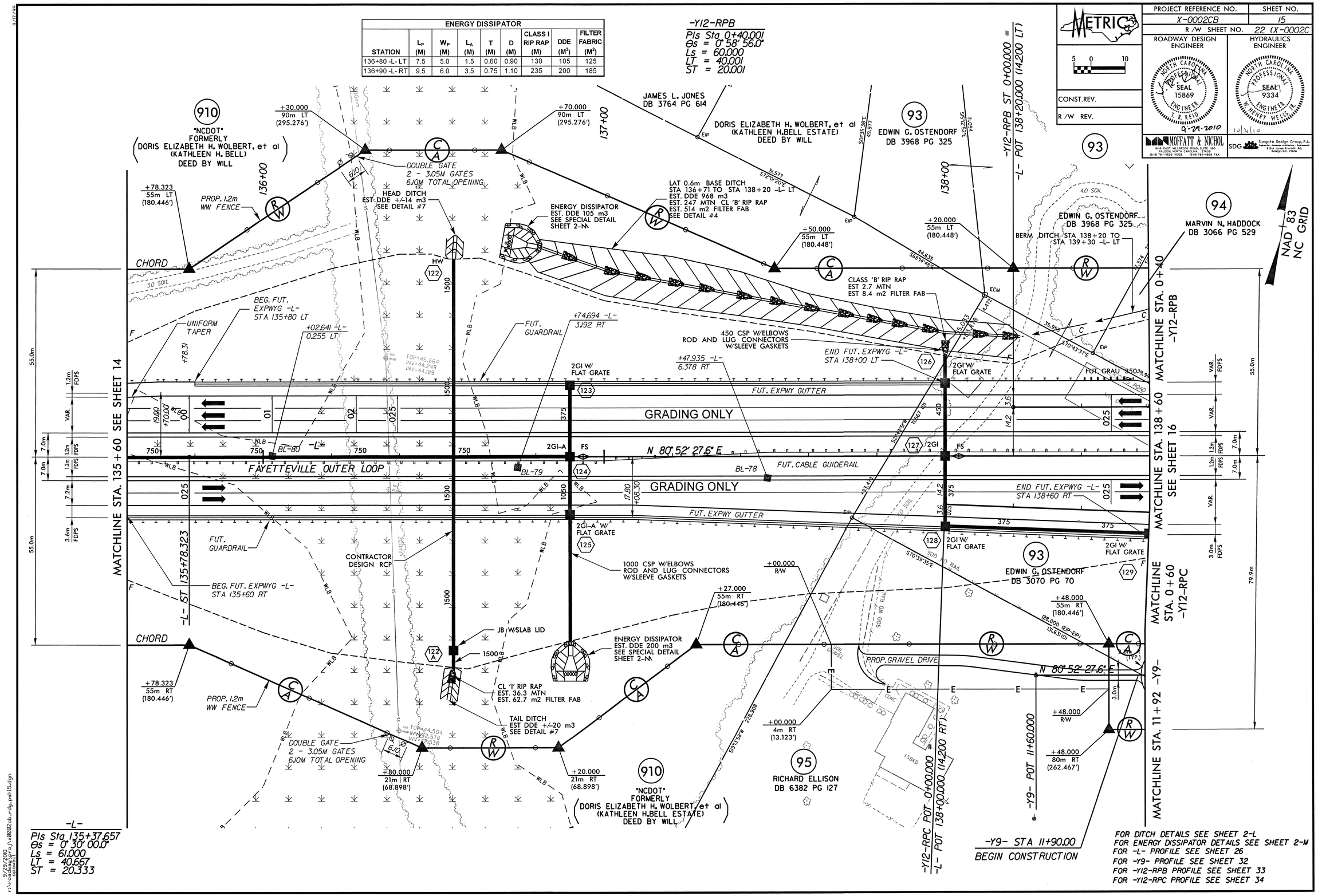
ENERGY DISSIPATOR								
STATION	L_P (M)	W_P (M)	L_A (M)	T (M)	D (M)	CLASS I RIP RAP (M)	DDE (M^3)	FILTER FABRIC (M^2)
136+80 -L- LT	7.5	5.0	1.5	0.60	0.90	130	105	125
136+90 -L- RT	9.5	6.0	3.5	0.75	1.10	235	200	185



PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	16
R /W SHEET NO.	23 (X-0002C)

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID 9-29-2010

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR. 10/26/10

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

SDG Sungate Design Group, P.A. Transportation Consultants 510-A Jones Franklin Rd. Raleigh, N.C. 27606

METRIC 5 0 10

CONST.REV.

R /W REV.

-Y9-

PI Sta 12+80.154
Δ = 2° 15' 00.0" (RT)
L = 137.248
T = 68.633
R = 3,495.000
SE = 0.02
RO = 35.000
DS = 100 kph

PI Sta 14+34.395
Δ = 35° 47' 03.8" (RT)
L = 143.648
T = 74.253
R = 230.000
SE = 0.05
RO = 35.000
DS = 60 kph

-Y12-RPB

PIs Sta 0+40.001
Es = 0' 58' 56.0"
Ls = 60.000
LT = 40.001
ST = 20.001

PI Sta 0+76.454
Δ = 1° 04' 38.5" (LT)
L = 32.906
T = 16.454
R = 1,750.000
SE = 0.03
RO = 60.000
DS = 110 kph

PIs Sta 1+12.907
Es = 0' 58' 56.0"
Ls = 60.000
LT = 40.001
ST = 20.001

-Y10- STA 12+34.754
BEGIN CONSTRUCTION

EDWIN G. OSTENDORF
DB 1174 PG 598

ROBERT OSTENDORF
DB 3440 PG 18

NAD 83
NC GRID

EX. R/W
81.298 m LT
(266.727')

EX. R/W
35m LT
(114.829')

EX. R/W
57 m LT
(187.007')

EX. R/W
55m RT
(180.446')

EX. PL
80m RT
(262.467')

+79.305
55m LT
(180.446')

-Y12-RPB SC 0+66.000

-Y12-RPB CS 0+92.906

-Y12-RAB ST 1+52.906

S 49° 10' 33" E

93 EDWIN G. OSTENDORF DB 3968 PG 325

94 MARVIN N. HADDOCK DB 3066 PG 529

98 ROY J. HADDOCK DB 3066 PG 535

97 EDWIN G. OSTENDORF

100 EDWIN G. OSTENDORF DB 4186 PG 171

106 EDWIN G. OSTENDORF DB 3968 PG 326

106 EDWIN G. OSTENDORF DB 4198 PG 36

108 CHARLESENA E WALKER DB 5434 PG 830

107 BARBARA ARTIS DB 3020 PG 61

105 CHRISTINE F. BROWN DB 3763 PG 177

104 DELCINE TOWNES DB 6767 PG 267

101 CLAYTON L. FARMER DB 846 PG 440

102 DEWAYNE L. FARMER DB 3099 PG 77

103 MARIE S. FARMER DB 3654 PG 329

95 -Y9- PC 12+11.52

-Y9- PT 13+48.770

-Y9- PC 13+60.141

-Y10- PC 13+07.194

-Y10- PT 14+26.810

MATCHLINE STA. 0+40 -Y12-RPB

MATCHLINE STA. 138+60 -Y12-RPB SEE SHEET 15

MATCHLINE STA. 0+60 -Y12-RPC

MATCHLINE 11+92 -Y9-

MATCHLINE STA. 3+40 -Y12-RPB

MATCHLINE STA. 141+60 -Y12-RPB SEE SHEET 17

MATCHLINE STA. 3+60 -Y12-RPC

MATCHLINE STA. 14+60 -Y10-

MATCHLINE STA. 14+60 -Y9-

GRADING ONLY

N 77° 49' 57.1" E

N 80° 52' 27.6" E

N 83° 07' 27.6" E

S 50° 09' 17.1" E

FAYETTEVILLE OUTER LOOP

-Y12-RPB

-L-

-Y12-RPC

-Y9-

-Y10-

BEG. FUT. EXPWYG -L- STA 139+60 RT

BEG. FUT. EXPWYG -L- STA 141+60 RT

END FUT. EXPWYG -L- STA 140+40 RT

FUT. GUARDRAIL

FUT. CABLE GUIDERAIL

FUT. CAT-1

CLASS/IV RCP

FUT. 750mm C&G

FUT. GRAU 350

2GI W/ FLAT GRATE

400 CSP W/ELBOWS ROD AND LUG CONNECTORS W/SLEEVE GASKETS

CL 'B' RIP RAP EST +/-3 MTN

CL 'B' RIP RAP EST. 2.7 MTN EST. 8.4 m2 FILTER FAB

CL 'B' RIP RAP EST. 0.9 MTN EST. 4.2 m2 FILTER FAB

CL 'B' RIP RAP EST. 2.7 MTN EST. 9.2 m2 FILTER FAB

SPECIAL DITCH GRADE STA 12+00 TO STA 13+00 -Y9- LT SEE DETAIL #3

TAIL DITCH EST DDE +/-16 m3 SEE DETAIL #15

SPECIAL LAT 'V' DITCH STA 13+00 TO STA 13+43 -Y9- LT SEE DETAIL #14

BERM DITCH STA 138+20 TO STA 139+30 -L- LT

REMOVE

PROP. GR DRIVE

PROP. 1.2m WW FENCE

450 CSP W/ELBOW

SEAL ABANDONED WELLS

SEAL ABANDONED WELL

DO NOT DISTURB EXISTING WELL

PRELOADING AREA

-L- STA 141+20 TO 146+20 IS TO BE PRELOADED SEE DETAIL SHEETS 2-Q & 2-R

PAVEMENT REMOVAL

FOR DITCH DETAILS SEE SHEET 2-L
FOR -L- PROFILE SEE SHEET 27
FOR -Y9- PROFILE SEE SHEET 32
FOR -Y12-RPB PROFILE SEE SHEET 33 & 34
FOR -Y12-RPC PROFILE SEE SHEET 34 & 35

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9/28/2010

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	17
R/W SHEET NO.	24 (X-0002C)
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 15869	SEAL 9334
12/8/10	12/13/10

CONST. REV.

R/W REV.

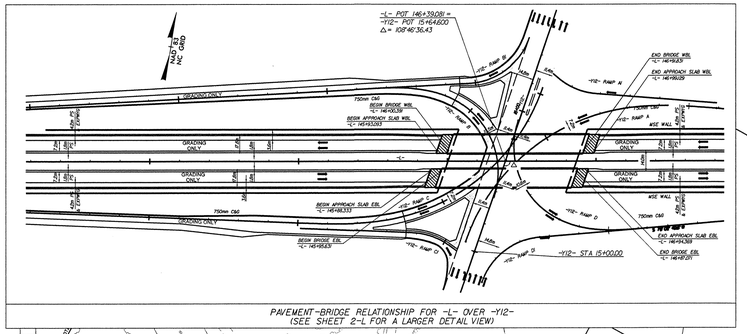
METRIC

-Y9-	-Y10-
PI Sta. 14+14.395	PI Sta. 15+26.099
Δ = 35° 47' 03.8" (RT)	Δ = 36° 01' 15.6" (LT)
L = 143.648	L = 104.091
T = 74.253	T = 53.904
R = 230.000	R = 165.000
SE = 0.06	
RO = 30.000	
DS = 60 kph	

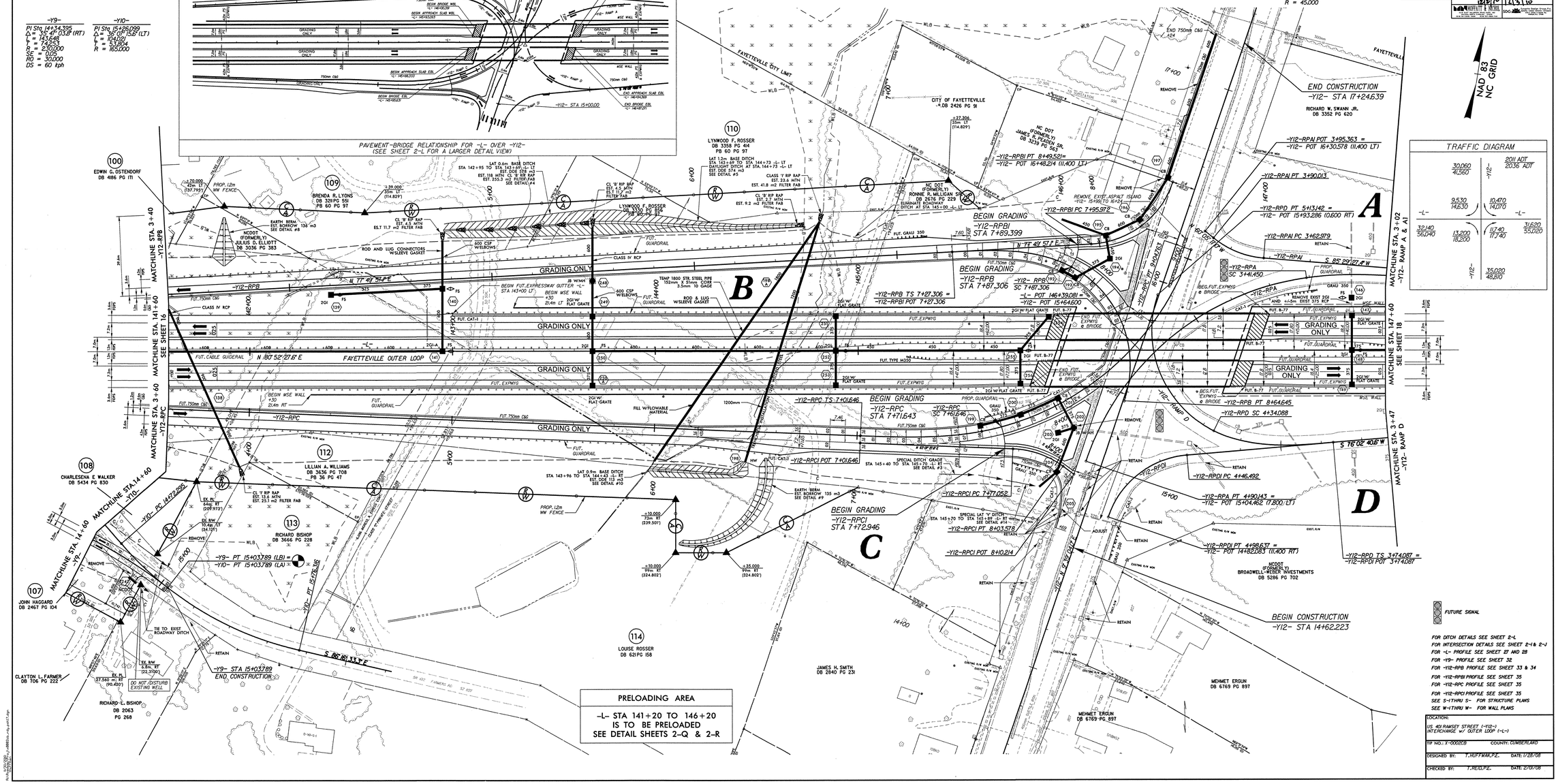
-Y12-RPA	-Y12-RPAI	-Y12-RPB	-Y12-RPBI	-Y12-RPC	-Y12-RPCI	-Y12-RPD	-Y12-RPDI
PIs Sta. 7+19.554	PI Sta. 4+24.352	PIs Sta. 7+67.948	PI Sta. 8+33.962	PIs Sta. 7+41.745	PI Sta. 11+90.713	PIs Sta. 4+14.729	PI Sta. 4+82.198
θB = 12° 43' 56.8"	Δ = 6.1° (B) 26.8° (LT)	θB = 31° 15' 08.7"	Δ = 80° 33' 58.8" (RT)	θB = 12° 43' 56.8"	Δ = 33° 46' 25.0" (RT)	θB = 37° 15' 18.7"	Δ = 92° 37' 53.3" (RT)
LS = 60.000	L = 148.693	LS = 60.000	L = 77.338	LS = 60.000	L = 59.526	LS = 60.000	L = 79.164
LT = 40.04	R = 82.920	LT = 40.042	T = 48.268	LT = 40.04	T = 13.267	LT = 40.04	T = 49.01
ST = 20.095	R = 135.000	ST = 20.585	R = 55.000	ST = 20.095	R = 45.000	ST = 20.585	R = 55.000
			SE = 0.08		SE = 0.08		
			RO = 60.000		RO = 24.000		
			DS = 40 kph		DS = 30 kph		

-Y12-RPC	-Y12-RPD
PI Sta. 8+40.756	PI Sta. 4+82.198
Δ = 50° 44' 26.9" (LT)	Δ = 92° 37' 53.3" (RT)
L = 143.117	L = 79.164
T = 79.10	T = 49.01
R = 135.000	R = 55.000
SE = 0.08	
RO = 60.000	
DS = 60 kph	

-Y12-RPDI
PI Sta. 4+75.935
Δ = 92° 37' 38.4" (LT)
L = 79.145
T = 49.443
R = 45.000



PAVEMENT-BRIDGE RELATIONSHIP FOR -L- OVER -Y12-
(SEE SHEET 2-L FOR A LARGER DETAIL VIEW)



TRAFFIC DIAGRAM		
	-Y12-	2011 ADT 2036 ADT
30,060 / 41,560		
9,530 / 14,630	-Y12-	10,470 / 14,070
-L-		-L-
32,140 / 36,040	13,200 / 18,200	117,40 / 117,40
	-Y12-	35,020 / 48,510
		31,620 / 55,020

FUTURE SIGNAL

FOR DITCH DETAILS SEE SHEET 2-L
FOR INTERSECTION DETAILS SEE SHEET 2-I & 2-J
FOR -L- PROFILE SEE SHEET 27 AND 28
FOR -Y9- PROFILE SEE SHEET 32
FOR -Y12-RPB PROFILE SEE SHEET 33 & 34
FOR -Y12-RPBI PROFILE SEE SHEET 35
FOR -Y12-RPC PROFILE SEE SHEET 35
FOR -Y12-RPCI PROFILE SEE SHEET 35
SEE S-1 THRU S- FOR STRUCTURE PLANS
SEE W-1 THRU W- FOR WALL PLANS

PRELOADING AREA
-L- STA 141+20 TO 146+20
IS TO BE PRELOADED
SEE DETAIL SHEETS 2-Q & 2-R

LOCATION:
US 401 RAMSEY STREET (-Y12-)
INTERCHANGE w/ OUTER LOOP (-L-)

TIP NO.: X-0002CB COUNTY: CUMBERLAND

DESIGNED BY: T. HUFFMAN, P.E. DATE: 1/28/08

CHECKED BY: T. REID, P.E. DATE: 2/08/08

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	18
R/W SHEET NO.	25 (X-0002C)

METRIC 5 0 10

CONST. REV.

R/W REV.

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID 9-29-2010

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, Jr. 10/4/10

MOFFATT & NICHOL — 1616 EAST MILBROOK ROAD, SUITE 160, RALEIGH, NORTH CAROLINA 27609, (919) 781-4626 VOICE, (919) 781-4691 FAX

SDG Sungate Design Group, P.A. — Highway · Urban Planning · Transport · Environment, 919-A Jones Franklin Rd., Raleigh, N.C. 27606

-Y12-RPA

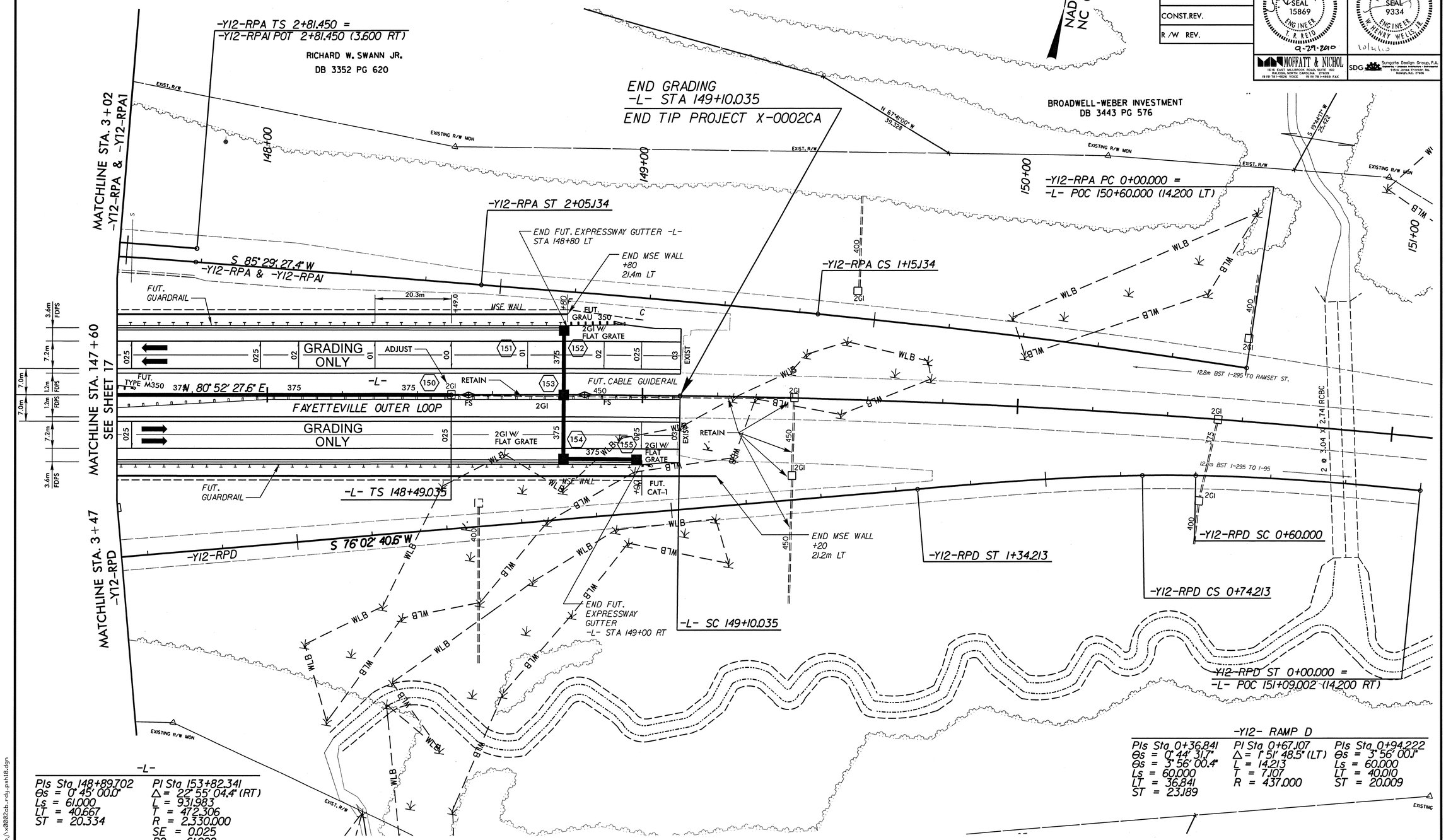
PIs Sta 3+21.554	PIs Sta 1+45.135	PI Sta 0+57.579
Θs = 12° 43' 56.6"	Θs = 1° 06' 23.7"	Δ = 2° 49' 52.3" (LT)
Ls = 60.000	Ls = 90.000	L = 115.134
LT = 40.104	LT = 60.001	T = 57.579
ST = 20.095	ST = 30.001	R = 2,330.000

-L-

PIs Sta 148+89.702	PI Sta 153+82.341
Θs = 0° 45' 00.0"	Δ = 22° 55' 04.4" (RT)
Ls = 61.000	L = 931.983
LT = 40.667	T = 472.306
ST = 20.334	R = 2,330.000
	SE = 0.025
	RO = 61.000
	DS = 110 kph

-Y12- RAMP D

PIs Sta 0+36.841	PI Sta 0+67.107	PIs Sta 0+94.222
Θs = 0° 44' 31.7"	Δ = 1° 51' 48.5" (LT)	Θs = 3° 56' 00.1"
Θs = 3° 56' 00.4"	L = 14.213	Ls = 60.000
Ls = 60.000	T = 7.107	LT = 40.010
LT = 36.841	R = 437.000	ST = 20.009
ST = 23.189		



FOR DITCH DETAILS SEE SHEET 2-L
FOR -L- PROFILE SEE SHEET 28
SEE W-1 THUR W- FOR WALL PLANS

9/24/2010
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PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	19
R/W SHEET NO. 30 (X-0002C)	

METRIC

5 0 10

CONST.REV.

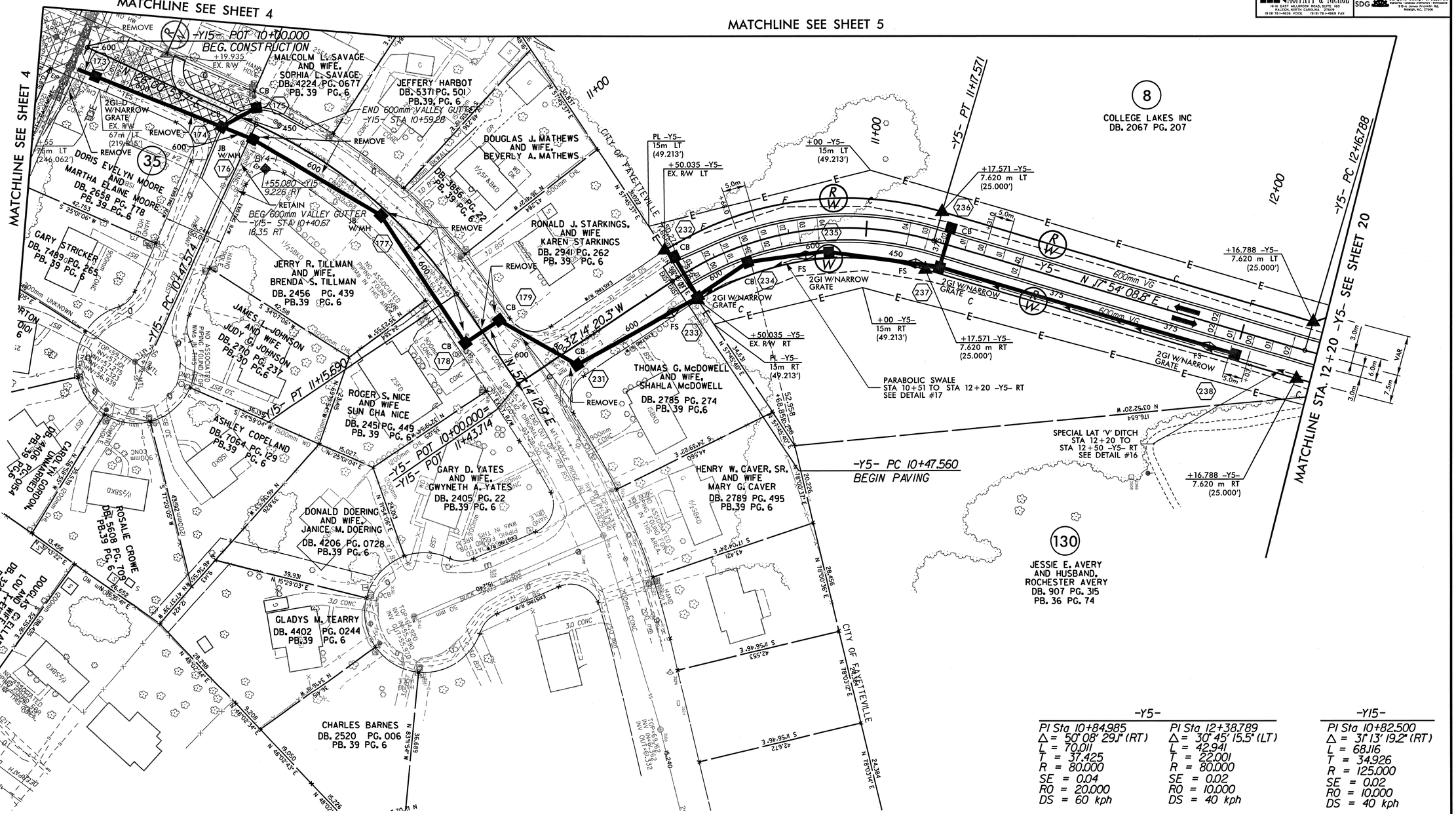
R/W REV.

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID 9-29-2010

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR. 10/2/10

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

SDG Sungate Design Group, P.A.
Transportation Consultants
8 W. Hargett Street, Suite 800
Raleigh, N.C. 27601



-Y5-		-Y15-
PI Sta 10+84.985	PI Sta 12+38.789	PI Sta 10+82.500
Δ = 50° 08' 29.1" (RT)	Δ = 30° 45' 15.5" (LT)	Δ = 31° 13' 19.2" (RT)
L = 70.011	L = 42.941	L = 68.116
T = 37.425	T = 22.001	T = 34.926
R = 80.000	R = 80.000	R = 125.000
SE = 0.04	SE = 0.02	SE = 0.02
RO = 20.000	RO = 10.000	RO = 10.000
DS = 60 kph	DS = 40 kph	DS = 40 kph

FOR DITCH DETAILS SEE SHEET 2-L
FOR INTERSECTION DETAIL SEE SHEET 2-K
FOR -Y5- PROFILE SEE SHEET 30

8/17/99

9/24/2010
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PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	20
R/W SHEET NO.	31 (X-0002C)

METRIC

5 0 10

CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER J. REID

9-29-2010

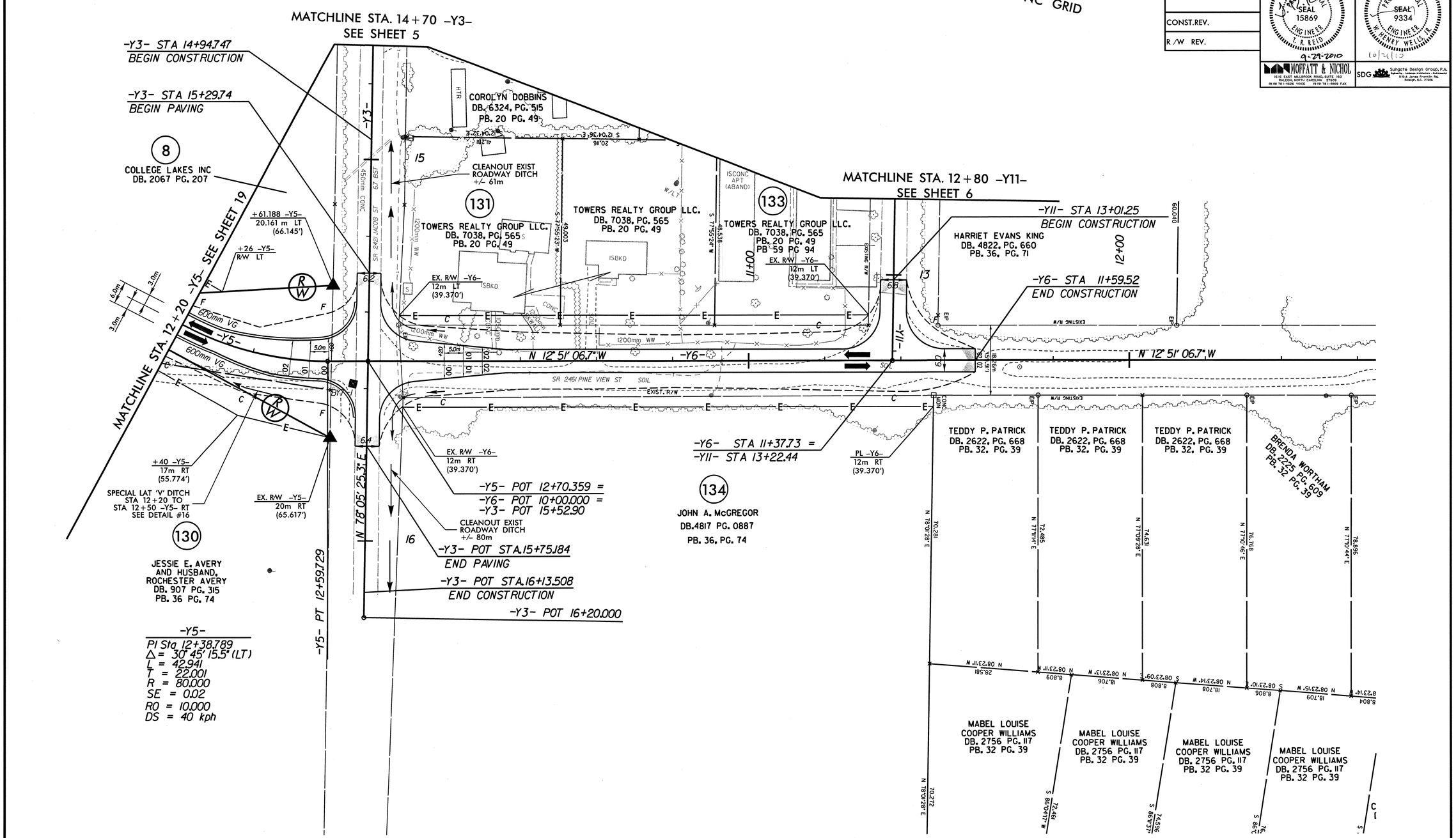
HYDRAULICS ENGINEER

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

10/21/10

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

SDG Sungate Design Group, P.A.
Transportation Consultants / Engineers
816 S. Jones Franklin Rd.
Raleigh, N.C. 27606



FOR -Y6- & -Y11- INTERSECTION DETAILS SEE SHEET 2-H
FOR -Y3-, -Y5- & -Y6- INTERSECTION DETAILS SEE SHEET 2-K
FOR DITCH DETAILS SEE SHEET 2-L
FOR -Y5- PROFILE SEE SHEET 30
FOR -Y6- PROFILE SEE SHEET 31

8/17/99

9/24/2010
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epowell

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	21

METRIC

HORIZONTAL 5 0 10

VERTICAL 1 0 2

CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

9-29-2010

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLING

10/2/10

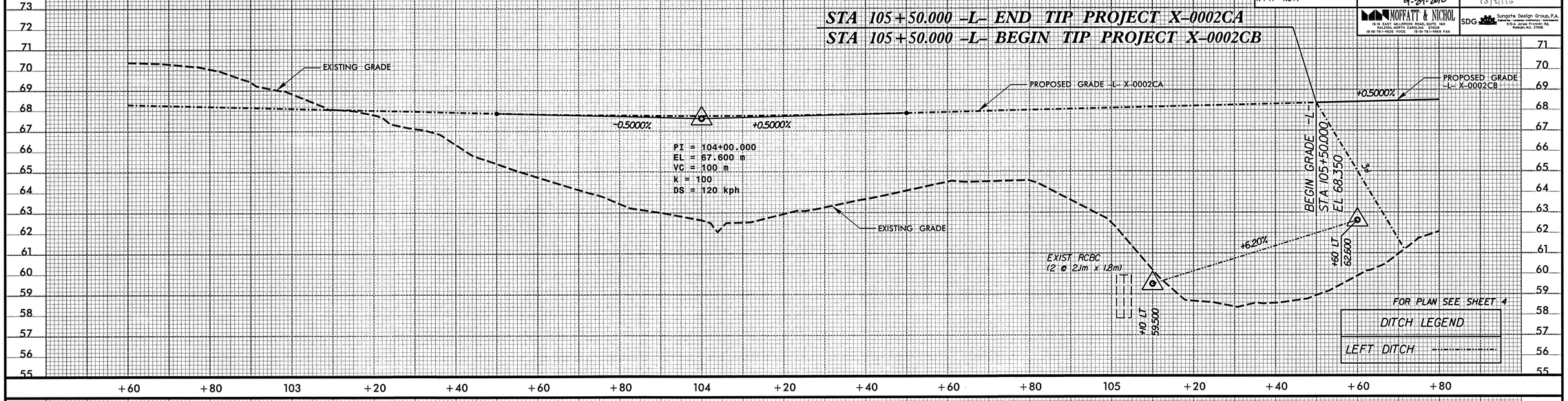
MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX

SDG Sungate Design Group, P.A.
Transportation Planning • Highway Design
Traffic Management • Transportation Management
5516-A Jones Franklin Rd.
Raleigh, NC 27606

-L- (FAYETTEVILLE OUTER LOOP)

STA 105+50.000 -L- END TIP PROJECT X-0002CA

STA 105+50.000 -L- BEGIN TIP PROJECT X-0002CB



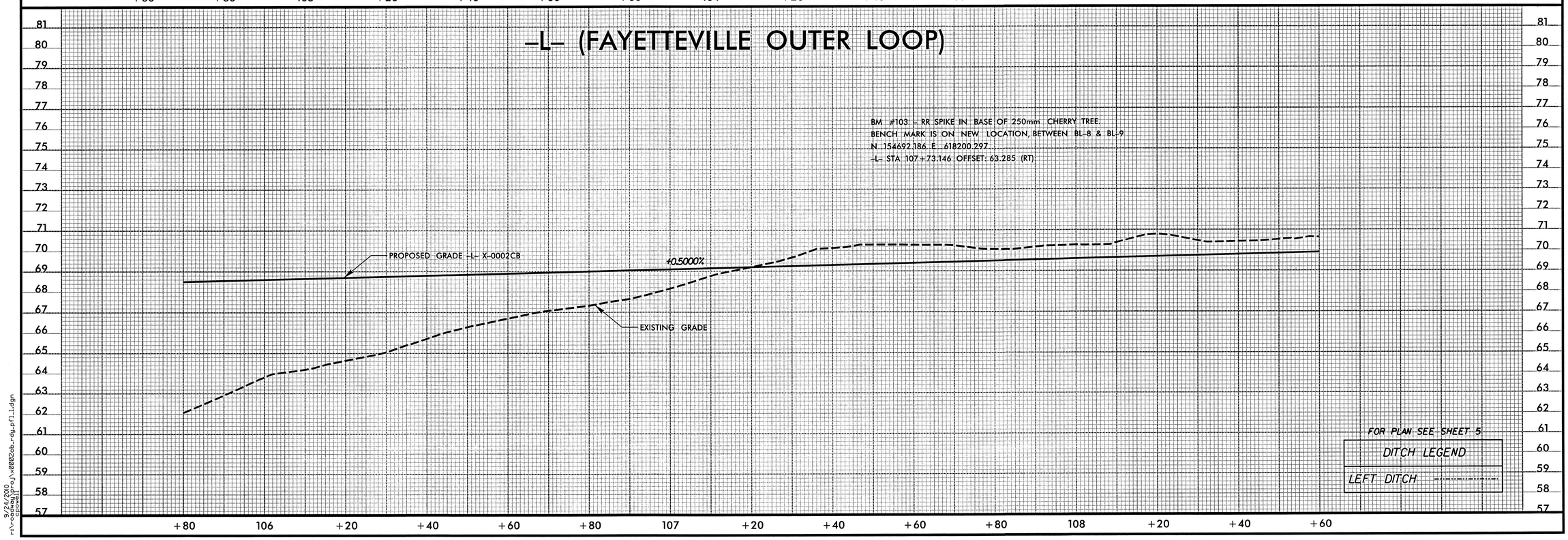
FOR PLAN SEE SHEET 4

DITCH LEGEND

LEFT DITCH

-L- (FAYETTEVILLE OUTER LOOP)

BM #103 - RR SPIKE IN BASE OF 250mm CHERRY TREE.
BENCH MARK IS ON NEW LOCATION, BETWEEN BL-8 & BL-9
N. 154692.186 E. 618200.297
-L- STA. 107+73.146 OFFSET: 63.285 (RT)



FOR PLAN SEE SHEET 5

DITCH LEGEND

LEFT DITCH

9/24/2010
r:\roadway\proj\x0002cb_rdy_pfl_1.dgn

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	22

METRIC

HORIZONTAL 5 0 10

VERTICAL 1 0 2

CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

9-24-2010

HYDRAULICS ENGINEER

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

10/26/10

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1616 EAST MILLBROOK ROAD, SUITE 160
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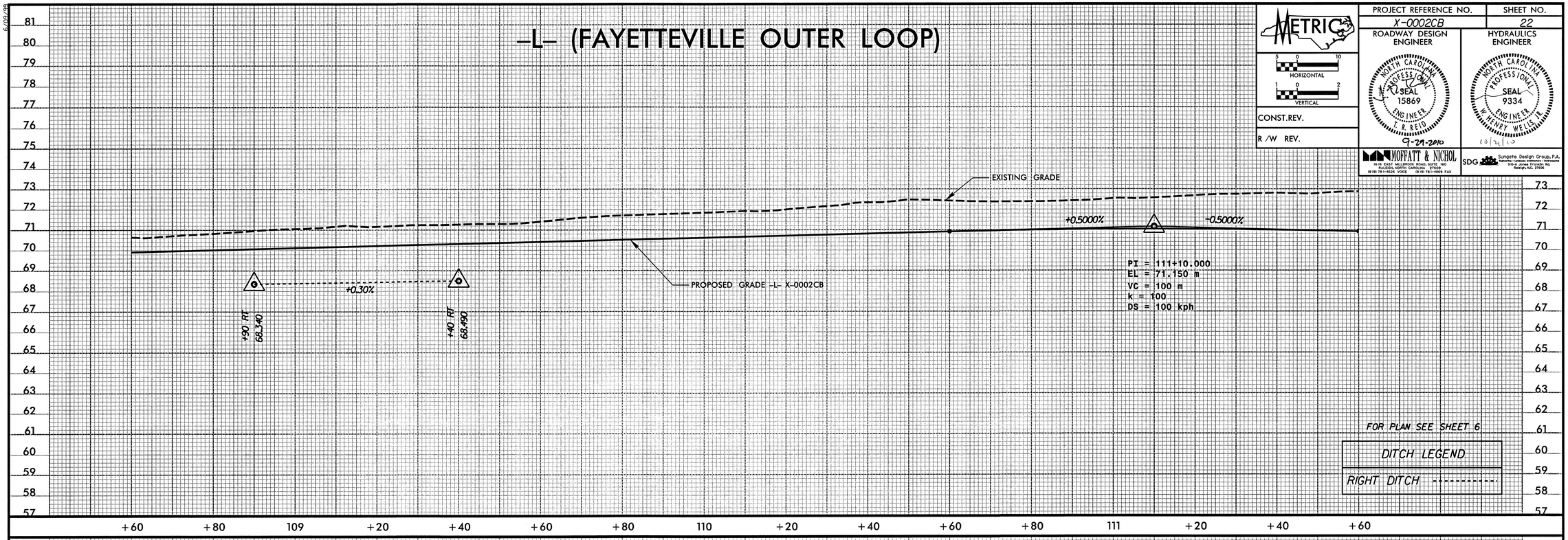
SDG Sungate Design Group, P.A.
Engineering • Planning • Surveying
5516 Jonathan Drive
Raleigh, N.C. 27606

-L- (FAYETTEVILLE OUTER LOOP)

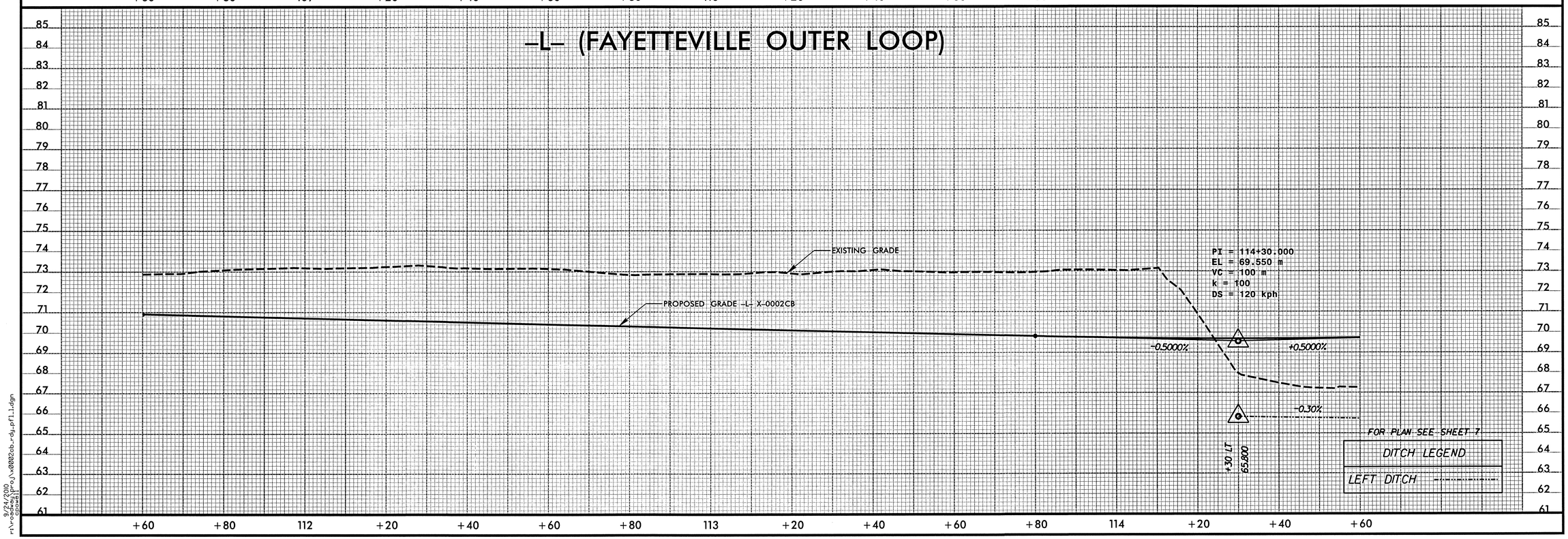


FOR PLAN SEE SHEET 6

DITCH LEGEND

RIGHT DITCH

-L- (FAYETTEVILLE OUTER LOOP)



FOR PLAN SEE SHEET 7

DITCH LEGEND

LEFT DITCH

6/09/99

9/24/2010
r:\roddesig\proj\x0002cb_rdg_pfl1.dgn

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	23

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

9-29-2010

HYDRAULICS ENGINEER

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

10/21/10

METRIC

HORIZONTAL 5 0 10

VERTICAL 1 0 2

CONST.REV.

R /W REV.

MOFFATT & NICHOL
16 W. EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-1460 VOICE (919) 781-1669 FAX

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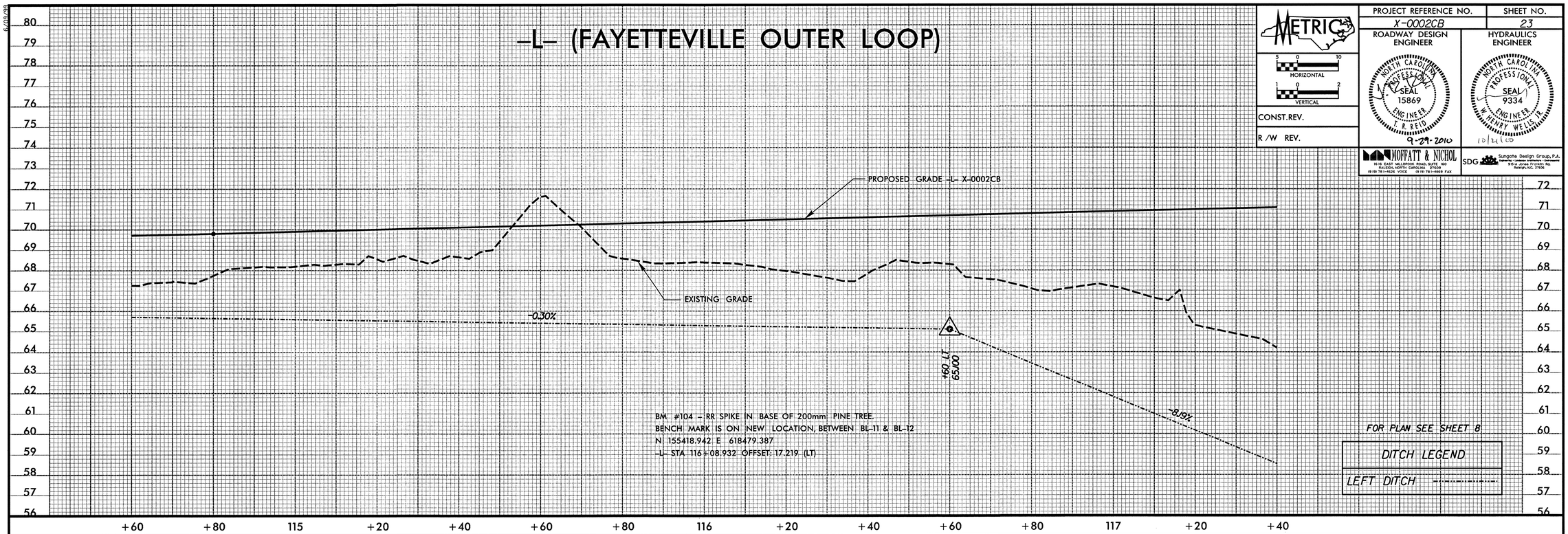
Engineers · Landscape Architects · Surveyors
510-A Jones Franklin Rd.
Raleigh, N.C. 27606

-L- (FAYETTEVILLE OUTER LOOP)

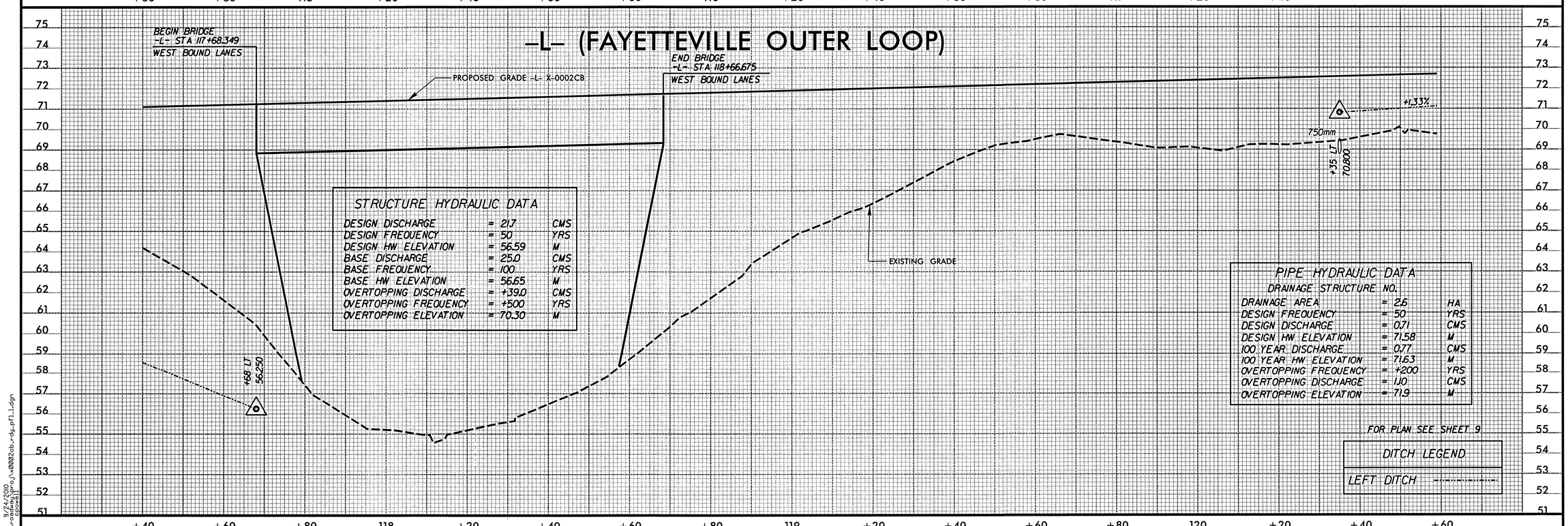


FOR PLAN SEE SHEET 8

DITCH LEGEND

LEFT DITCH

-L- (FAYETTEVILLE OUTER LOOP)



STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	=	21.7	CMS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	56.59	M
BASE DISCHARGE	=	25.0	CMS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	56.65	M
OVERTOPPING DISCHARGE	=	+39.0	CMS
OVERTOPPING FREQUENCY	=	+500	YRS
OVERTOPPING ELEVATION	=	70.30	M

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.

DRAINAGE AREA	=	2.6	HA
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	0.71	CMS
DESIGN HW ELEVATION	=	71.58	M
100 YEAR DISCHARGE	=	0.77	CMS
100 YEAR HW ELEVATION	=	71.63	M
OVERTOPPING FREQUENCY	=	+200	YRS
OVERTOPPING DISCHARGE	=	1.10	CMS
OVERTOPPING ELEVATION	=	71.9	M

FOR PLAN SEE SHEET 9

DITCH LEGEND

LEFT DITCH

6/09/98

9/24/2010
r:\roadway\proj\x0002cb_rdg_pt1_1.dgn

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	24

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

METRIC

HORIZONTAL 5 0 10

VERTICAL 1 0 2

CONST.REV.

R /W REV.

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER J. K. REID 9-30-2010

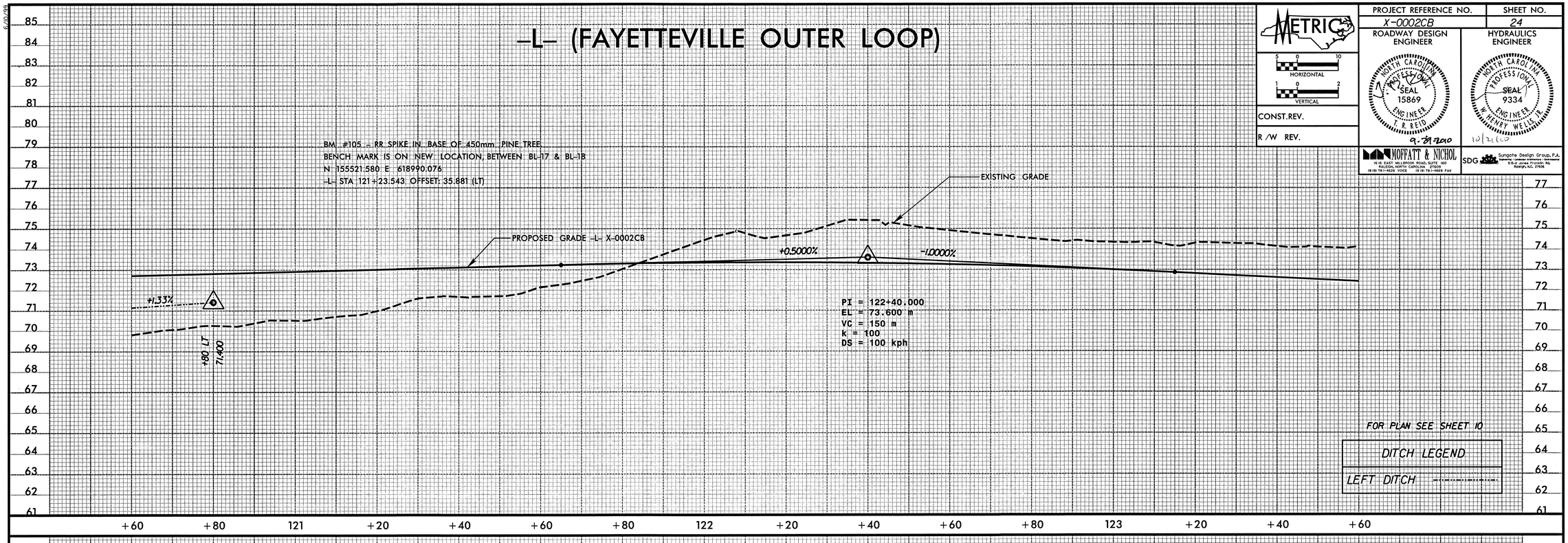
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS 10/21/2010

MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4628 FAX

SDG Sungate Design Group, P.A.
Engineering · Landscape Architecture · Environmental
510-A Jones Franklin Rd.
Raleigh, N.C. 27606

-L- (FAYETTEVILLE OUTER LOOP)

BM #105 - RR SPIKE IN BASE OF 450mm PINE TREE
BENCH MARK IS ON NEW LOCATION, BETWEEN BL-17 & BL-18
N 155521.580 E 618990.076
-L- STA 121+23.543 OFFSET: 35.881 (LT)

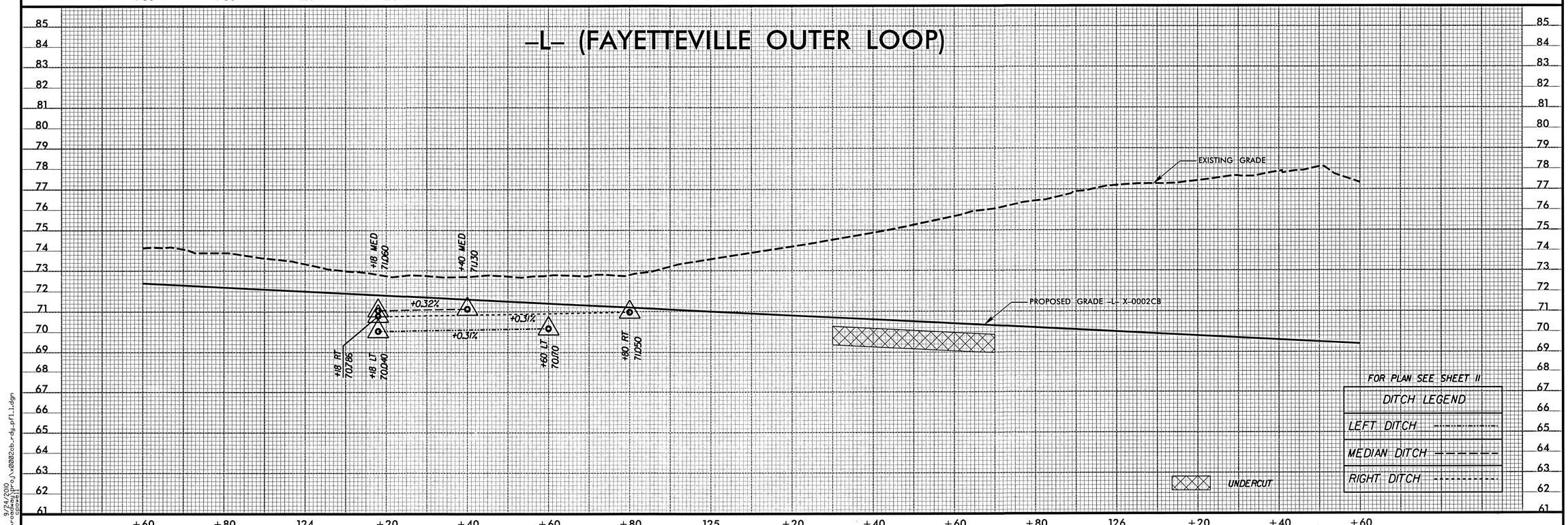


FOR PLAN SEE SHEET 10

DITCH LEGEND

LEFT DITCH

-L- (FAYETTEVILLE OUTER LOOP)



FOR PLAN SEE SHEET 11

DITCH LEGEND

LEFT DITCH

MEDIAN DITCH

RIGHT DITCH

UNDERCUT

6/10/99

9/24/2010
r:\roadway\proj\x0002cb_rdg_pf1_1.dgn

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	25

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

9-29-2010

HYDRAULICS ENGINEER

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

10/21/10

METRIC

5 0 10 HORIZONTAL

1 0 2 VERTICAL

CONST.REV.

R /W REV.

MOFFATT & NICHOL
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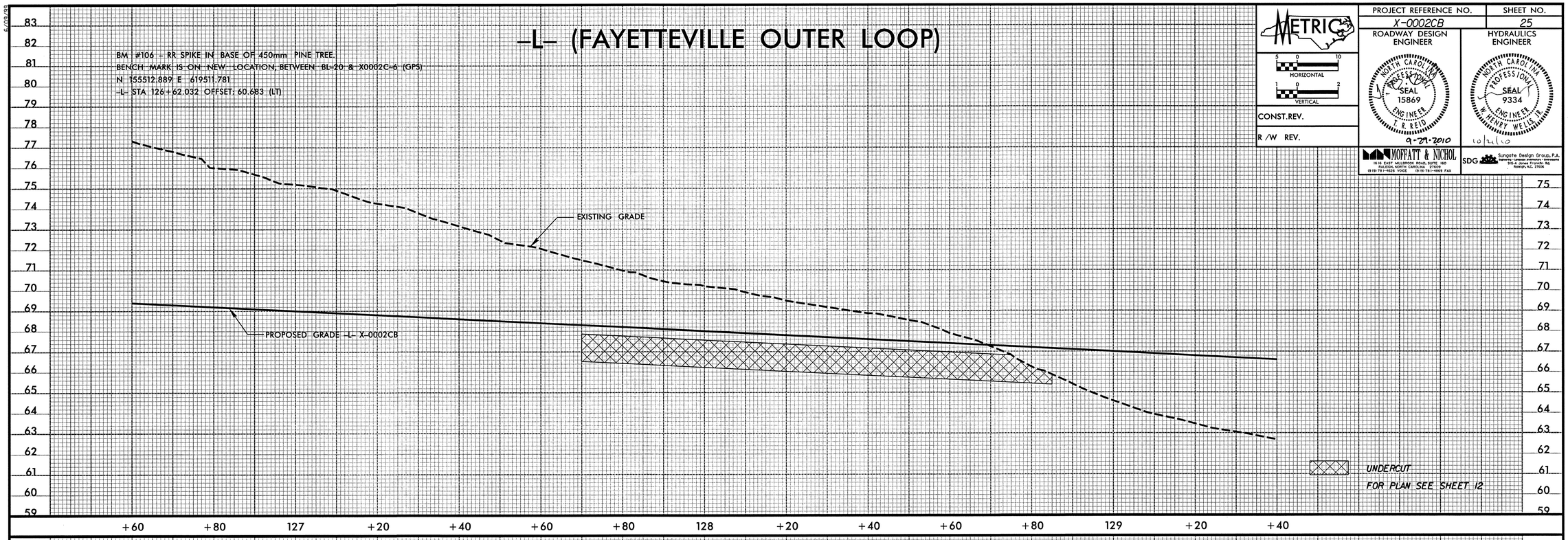
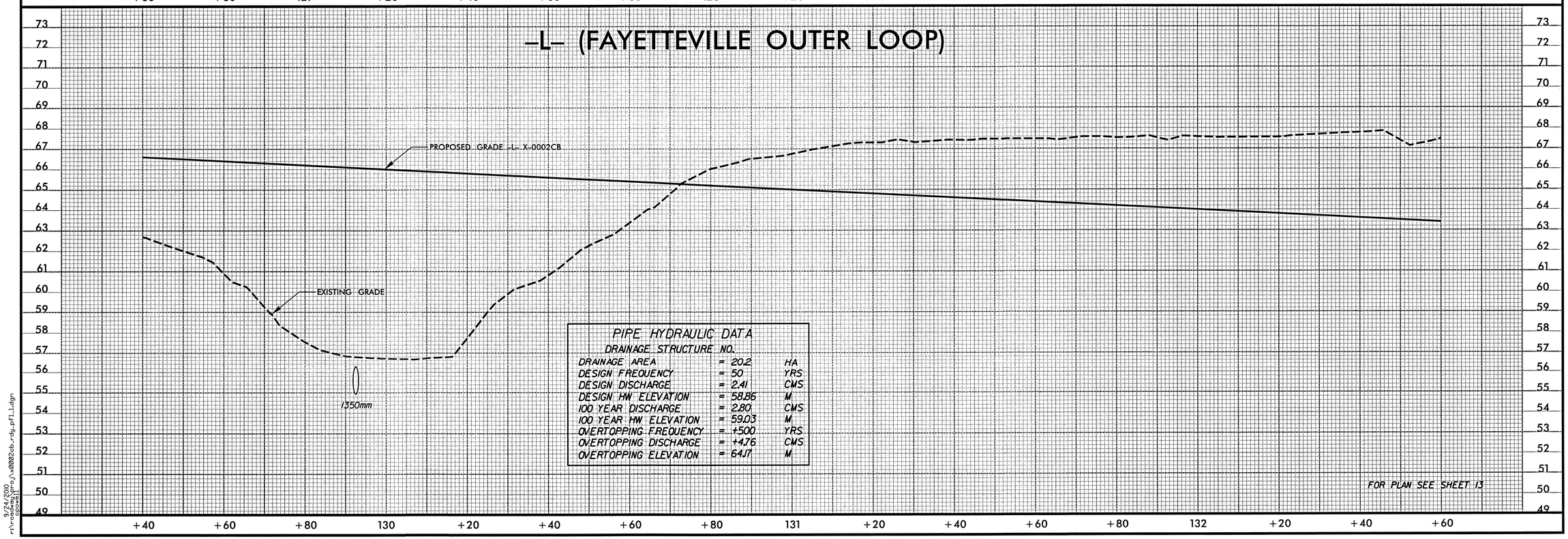
Engineering • Landscape Architecture • Environmental
510-A Jones Franklin Rd.
Raleigh, N.C. 27606

-L- (FAYETTEVILLE OUTER LOOP)

BM #106 – RR SPIKE IN BASE OF 450mm PINE TREE.
BENCH MARK IS ON NEW LOCATION, BETWEEN BL-20 & X0002C-6 (GPS)
N 155512.889 E 619511.781
-L- STA 126+62.032 OFFSET: 60.683 (LT)



-L- (FAYETTEVILLE OUTER LOOP)



PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	=	20.2	HA
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	2.41	CMS
DESIGN HW ELEVATION	=	58.86	M
100 YEAR DISCHARGE	=	2.80	CMS
100 YEAR HW ELEVATION	=	59.03	M
OVERTOPPING FREQUENCY	=	+500	YRS
OVERTOPPING DISCHARGE	=	+4.76	CMS
OVERTOPPING ELEVATION	=	64.17	M

6/09/99

9/24/2010
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PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	26

METRIC

HORIZONTAL 5 0 10

VERTICAL 1 0 2

CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

9-29-2010

HYDRAULICS ENGINEER

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

10/24/10

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16 W. EAST MILLBROOK ROAD, SUITE 160
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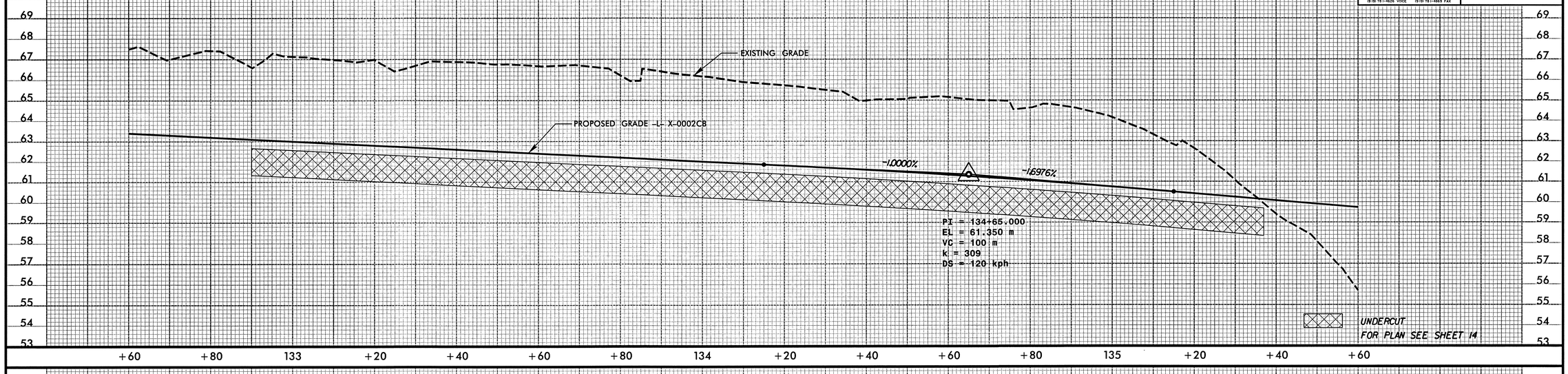
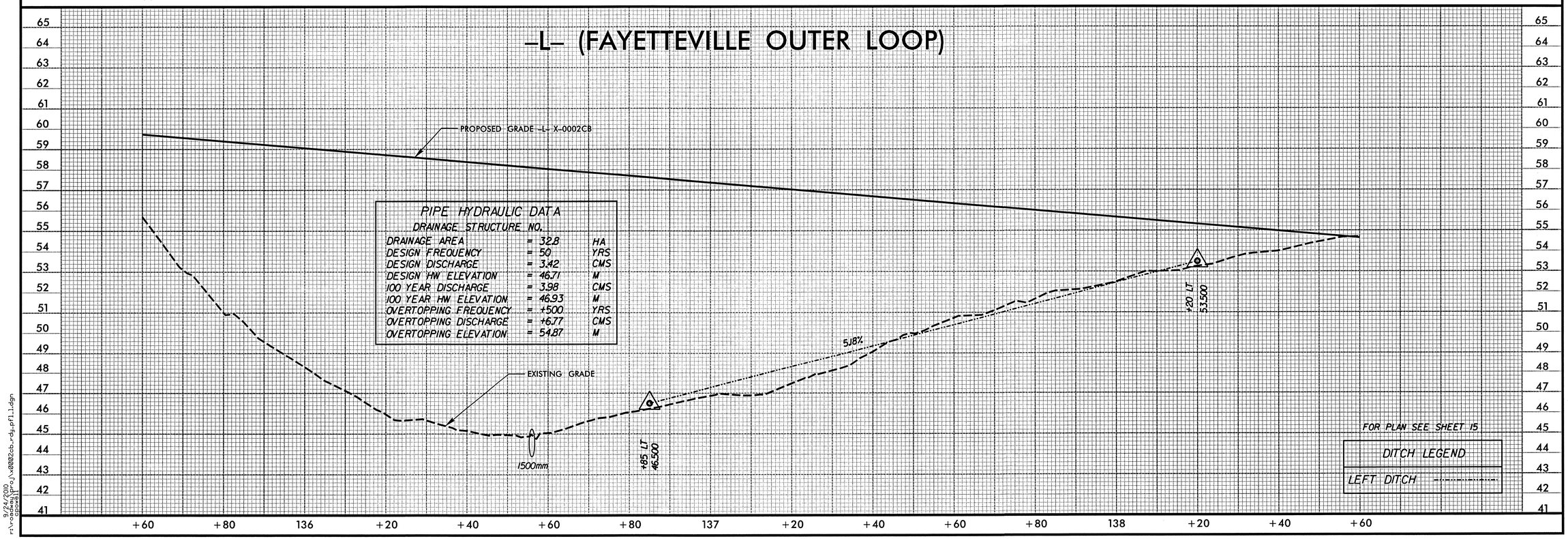
Engineers • Landscape Architects • Surveyors
510-A Jones Franklin Rd.
Raleigh, N.C. 27606

-L- (FAYETTEVILLE OUTER LOOP)



-L- (FAYETTEVILLE OUTER LOOP)



PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 32.8	HA
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 3.42	CMS
DESIGN HW ELEVATION	= 46.71	M
100 YEAR DISCHARGE	= 3.98	CMS
100 YEAR HW ELEVATION	= 46.93	M
OVERTOPPING FREQUENCY	= +500	YRS
OVERTOPPING DISCHARGE	= +6.77	CMS
OVERTOPPING ELEVATION	= 54.87	M

6/09/99

9/24/2010
r:\roadway\proj\x0002cb_rdy_pfl_1.dgn

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	27

METRIC

HORIZONTAL 5 0 10

VERTICAL 1 0 2

CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. K. REID

9-29-2010

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS III

10/21/10

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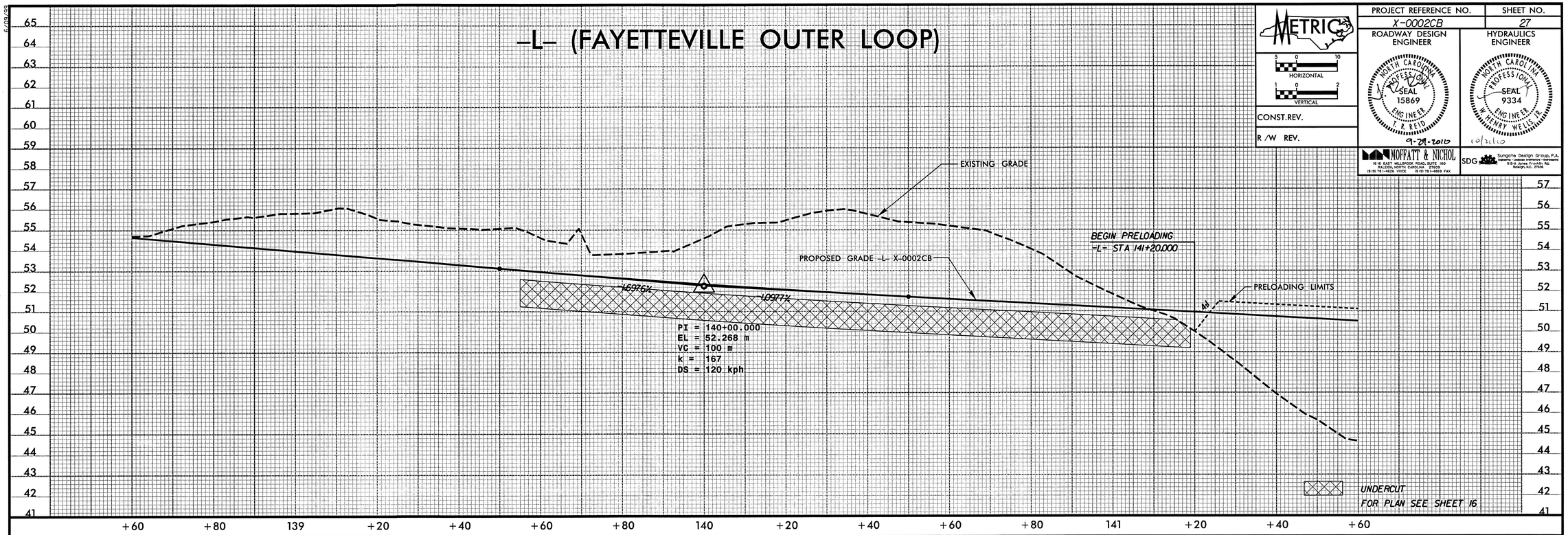
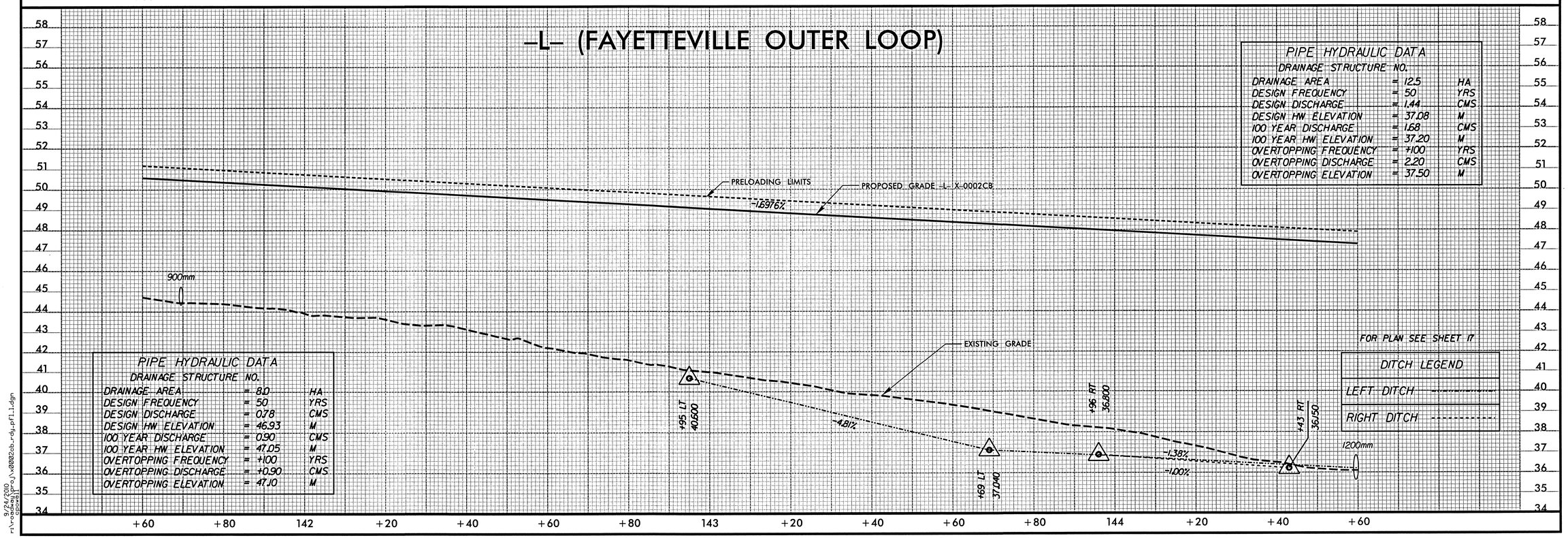
(919) 781-4626 VOICE (919) 781-4669 FAX

SDG Sungate Design Group, P.A.
Engineers • Planners • Surveyors
510 S. Lenoir St. Wake Forest, NC
Raleigh, N.C. 27604

-L- (FAYETTEVILLE OUTER LOOP)



-L- (FAYETTEVILLE OUTER LOOP)



PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 12.5	HA
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 1.44	CMS
DESIGN HW ELEVATION	= 37.08	M
100 YEAR DISCHARGE	= 1.68	CMS
100 YEAR HW ELEVATION	= 37.20	M
OVERTOPPING FREQUENCY	= +100	YRS
OVERTOPPING DISCHARGE	= 2.20	CMS
OVERTOPPING ELEVATION	= 37.50	M

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 8.0	HA
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 0.78	CMS
DESIGN HW ELEVATION	= 46.93	M
100 YEAR DISCHARGE	= 0.90	CMS
100 YEAR HW ELEVATION	= 47.05	M
OVERTOPPING FREQUENCY	= +100	YRS
OVERTOPPING DISCHARGE	= +0.90	CMS
OVERTOPPING ELEVATION	= 47.10	M

DITCH LEGEND

LEFT DITCH

RIGHT DITCH

6/09/99

9/24/2010
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PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	28

METRIC

HORIZONTAL 5 0 10

VERTICAL 1 0 2

CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. K. REID 9-29-2010

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS 10/21/10

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RALEIGH, NORTH CAROLINA 27609
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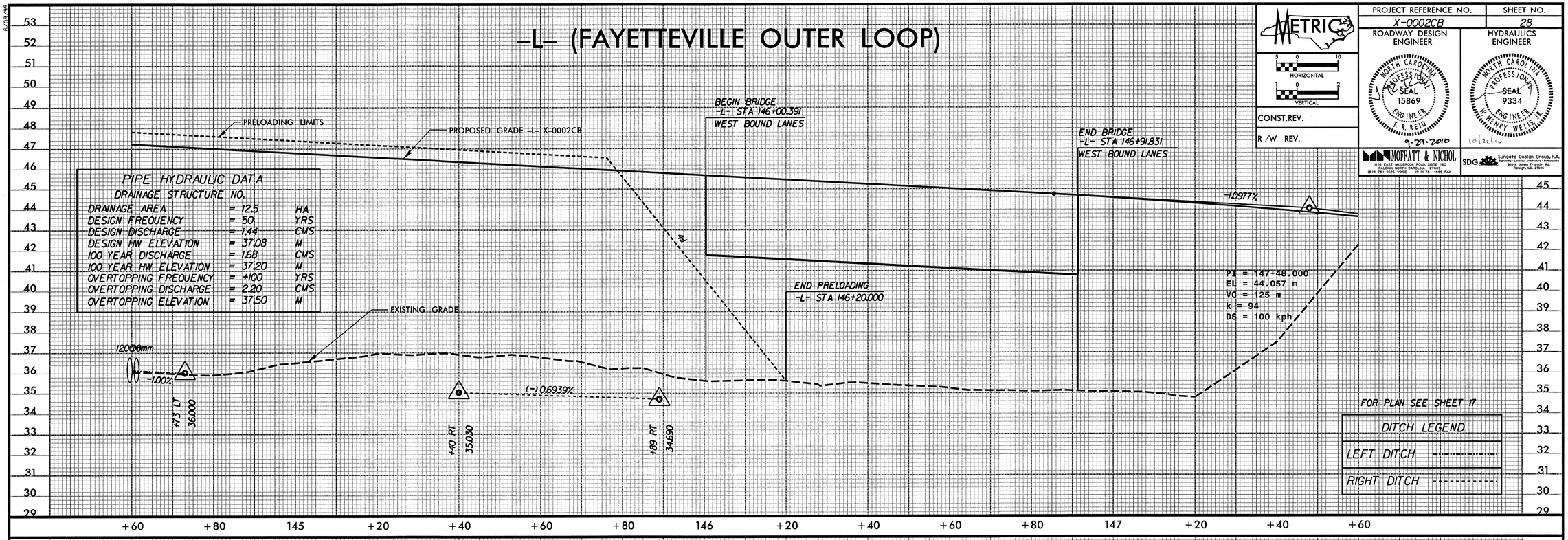
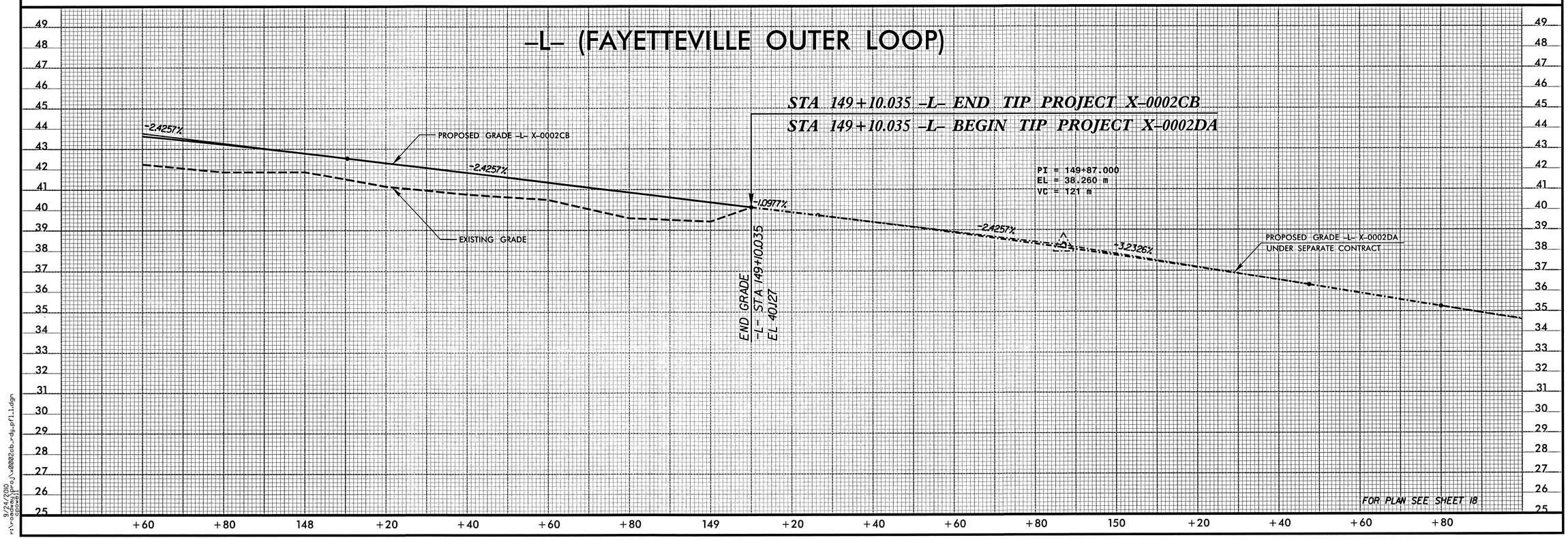
Transportation Consultants - Engineers
510-A Jones Franklin Rd.
Raleigh, N.C. 27606

6/09/99

-L- (FAYETTEVILLE OUTER LOOP)



-L- (FAYETTEVILLE OUTER LOOP)



9/24/2010
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PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	29

METRIC

HORIZONTAL 5 0 10

VERTICAL 1 0 2

CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

9-29-2010

HYDRAULICS ENGINEER

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

10/21/10

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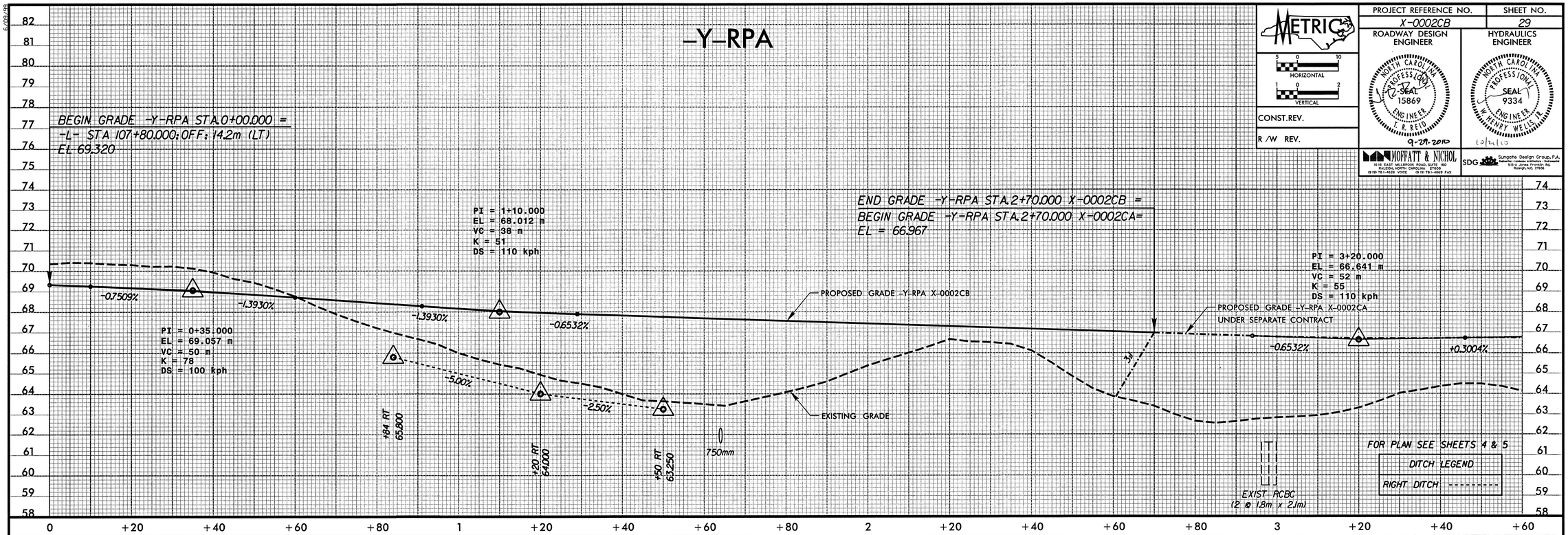
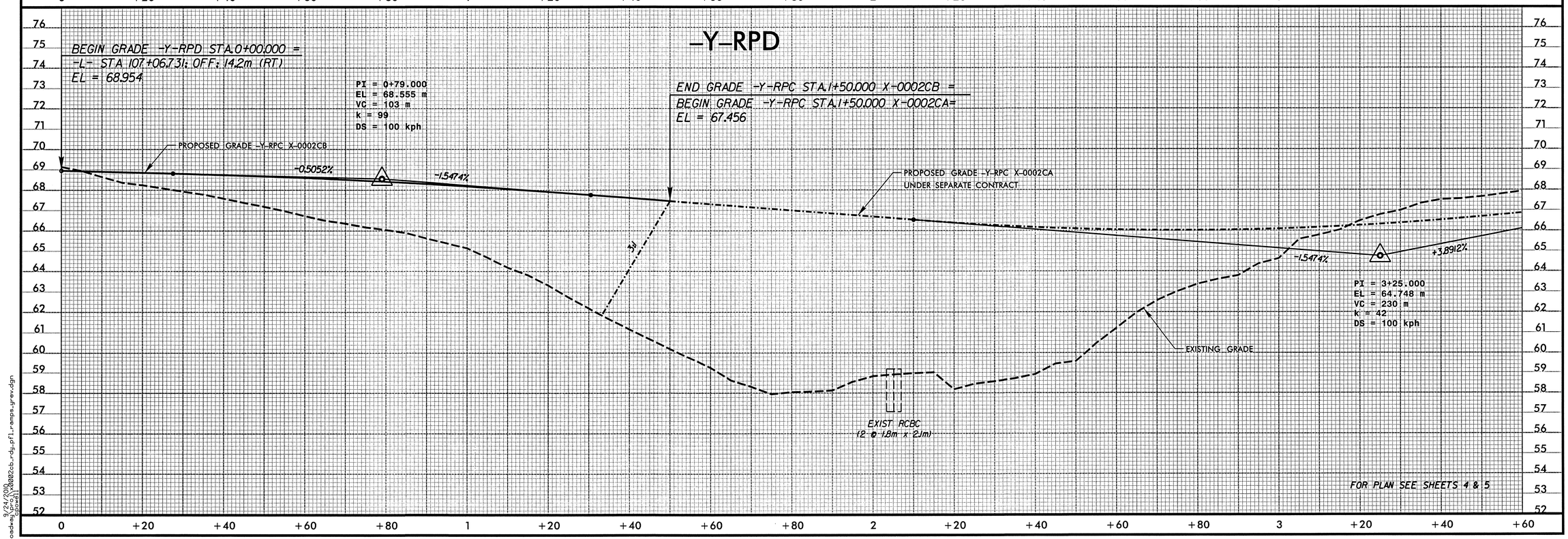
5516-J Jones Franklin Rd.
Raleigh, N.C. 27606

-Y-RPA



-Y-RPD



6/09/99

9/24/2010
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PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	30

METRIC

HORIZONTAL 5 0 10

VERTICAL 1 0 2

CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

9-29-2010

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS, JR.

10/4/10

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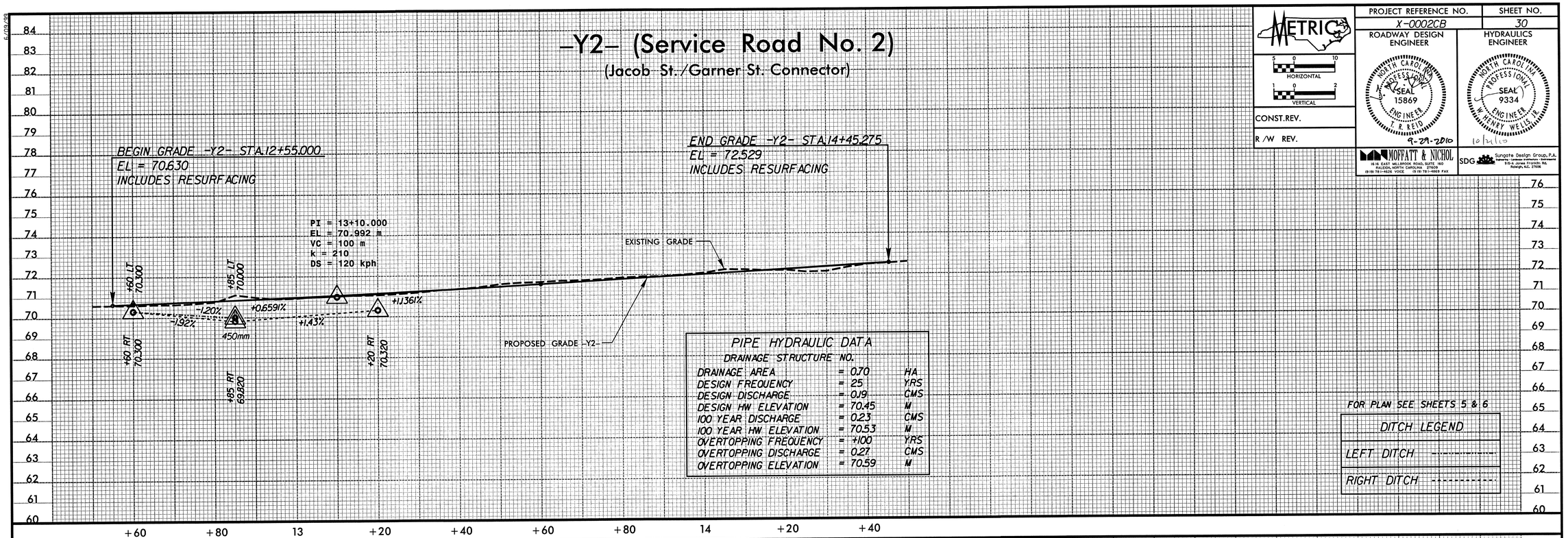
SDG Sungate Design Group, P.A.
Planners • Landscape Architects • Engineers
910-A James Drayton Rd.
Raleigh, N.C. 27606

-Y2- (Service Road No. 2)

(Jacob St./Garner St. Connector)



PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 0.70	HA
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 0.19	CMS
DESIGN HW ELEVATION	= 70.45	M
100 YEAR DISCHARGE	= 0.23	CMS
100 YEAR HW ELEVATION	= 70.53	M
OVERTOPPING FREQUENCY	= +100	YRS
OVERTOPPING DISCHARGE	= 0.27	CMS
OVERTOPPING ELEVATION	= 70.59	M

FOR PLAN SEE SHEETS 5 & 6

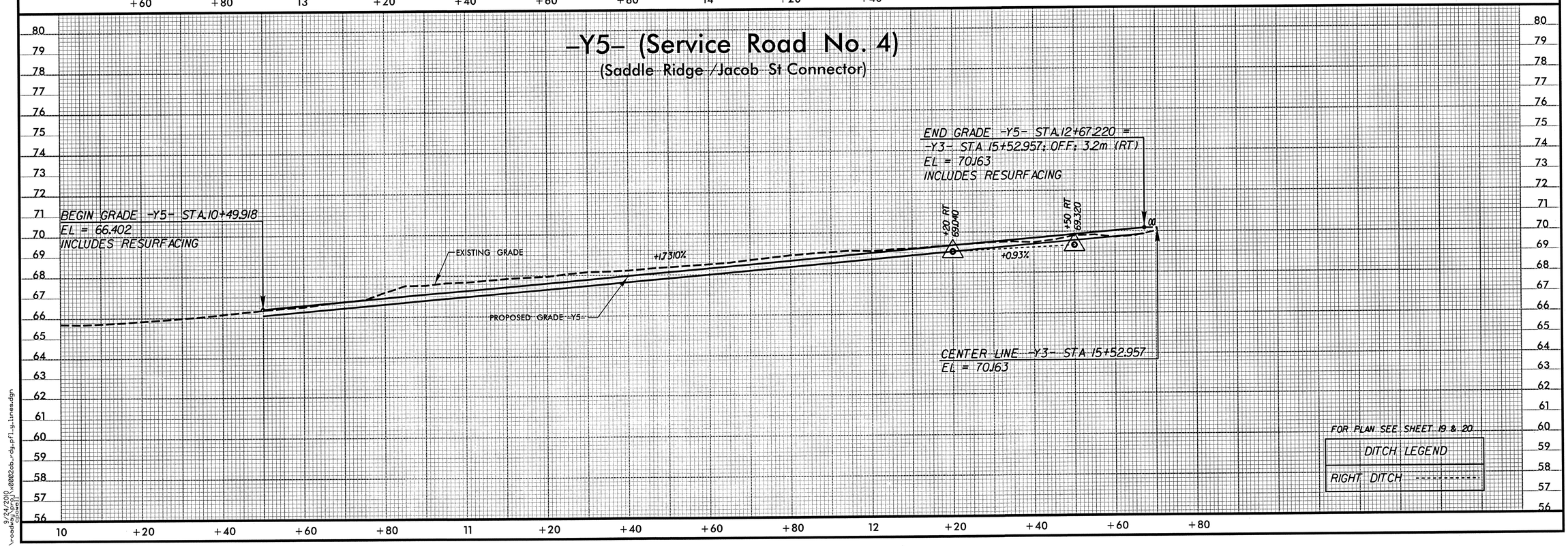
DITCH LEGEND

LEFT DITCH

RIGHT DITCH

-Y5- (Service Road No. 4)

(Saddle Ridge /Jacob St Connector)



FOR PLAN SEE SHEET 19 & 20

DITCH LEGEND

RIGHT DITCH

9/24/2010
r:\roadway\proj\x0002cb_rdy_prfl_g_lines.dgn

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	31

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

9-21-2010

HYDRAULICS ENGINEER

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

10/21/10

METRIC

HORIZONTAL 5 0 10

VERTICAL 1 0 2

CONST.REV.

R/W REV.

MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
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SDG Sungate Design Group, P.A.
Engineering · Landscape Architecture · Environmental
510-A Jones Franklin Rd.
Raleigh, N.C. 27606

6/09/99

-Y6- (Pineview Street)

BEGIN GRADE -Y6- STA.10+03.175 =
-Y3- STA 15+52.853; OFF: 3.2m (LT)
EL = 70.163
INCLUDES RESURFACING

PROPOSED GRADE -Y6-

+0.7179%

EXISTING GRADE

END GRADE -Y6- STA.11+60.000
EL = 71.289
INCLUDES RESURFACING

CENTER LINE -Y3- STA 15+52.853
EL = 70.163

FOR PLAN SEE SHEET 20

-Y7- (Look Ave)

BEGIN GRADE -Y7- STA.11+59.686
EL = 73.829
INCLUDES RESURFACING

PROPOSED GRADE -Y7-

1.3694%

EXISTING GRADE

END GRADE -Y7- STA.12+07.443 =
-Y8-REV STA 10+62.253; OFF: 3.2m (RT)
EL = 74.483

CENTER LINE -Y8-REV STA 10+62.253
EL = 74.420

FOR PLAN SEE SHEET 6

-Y8-REV (Jossie Street Revised)

BEGIN GRADE -Y8-REV STA.10+44.315
EL = 74.622
INCLUDES RESURFACING

+00 RT 73.500

+00 LT 73.000

EXISTING GRADE

PROPOSED GRADE -Y8-REV

-3.44%

-2.11%

+45 RT 71.950

+45 LT 72.150

750mm

+0.34%

+0.80%

-1.1279%

+89 RT 72.300

+89 LT 72.300

+2.2177%

PI = 12+00.000
EL = 72.866 m
VC = 67 m
K = 20
DS = 70 kph

FOR PLAN SEE SHEETS 6 & 7

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 2.4	HA
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 0.51	CMS
DESIGN HW ELEVATION	= 72.79	M
100 YEAR DISCHARGE	= 0.60	CMS
100 YEAR HW ELEVATION	= 72.85	M
OVERTOPPING FREQUENCY	= +500	YRS
OVERTOPPING DISCHARGE	= 0.95	CMS
OVERTOPPING ELEVATION	= 73.12	M

DITCH LEGEND

LEFT DITCH

RIGHT DITCH

9/24/2010
r:\roadway\proj\x0002cb_rdy_pfl_g_lines.dgn

PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	32

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID 9-29-2010

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS 10/26/10

METRIC — HORIZONTAL 5 0 10 — VERTICAL 1 0 2

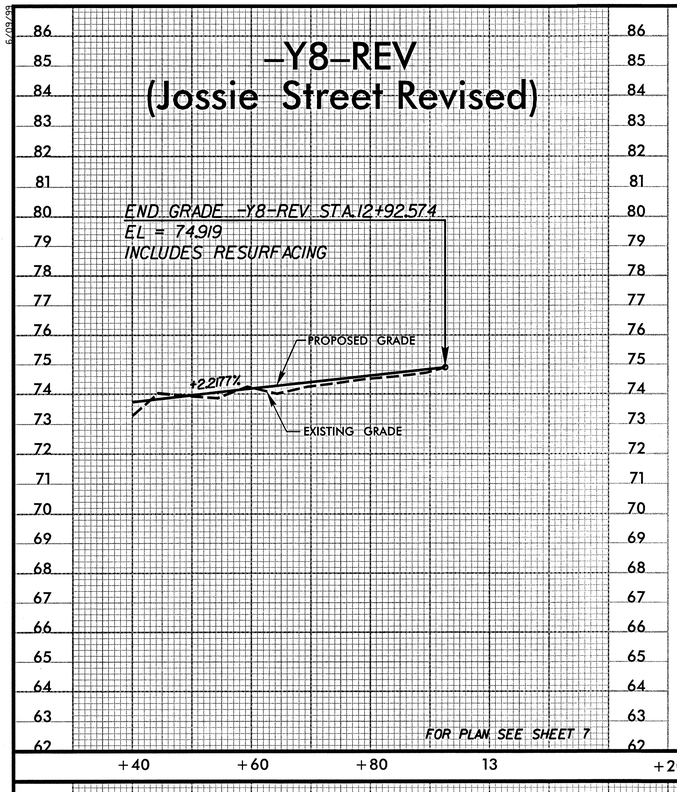
CONST.REV.

R /W REV.

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

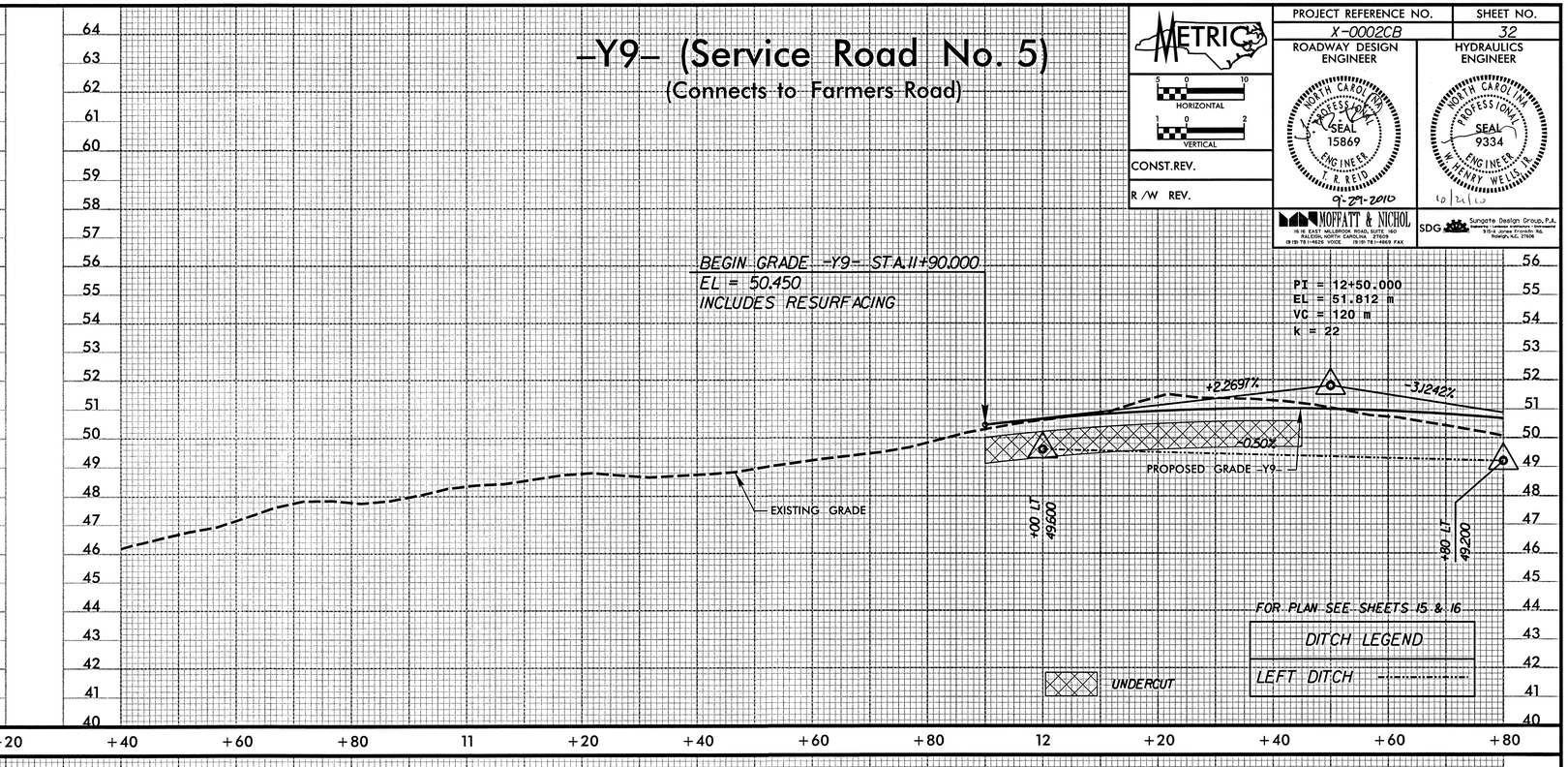
SDG Sungate Design Group, P.A. — Engineering Consultants — 510-A Jones Franklin Rd. Raleigh, N.C. 27606

-Y8-REV (Jossie Street Revised)



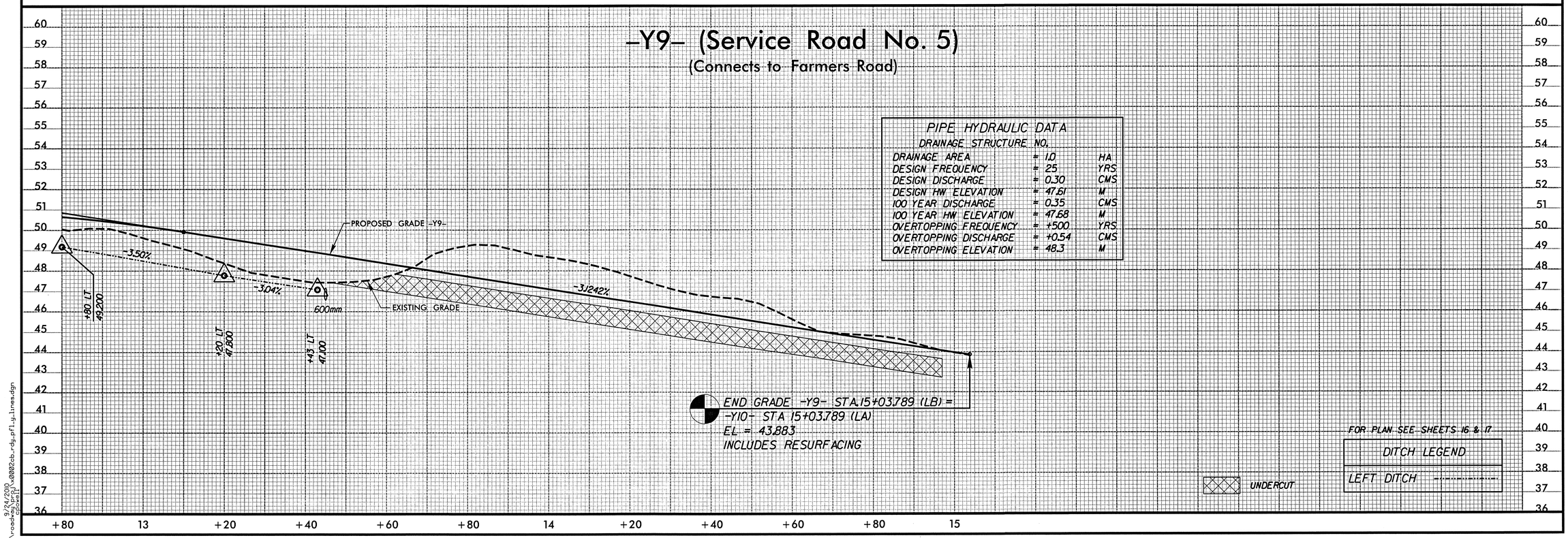
-Y9- (Service Road No. 5)

(Connects to Farmers Road)



-Y9- (Service Road No. 5)

(Connects to Farmers Road)



6/09/99

9/24/2010
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PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	33

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

METRIC

HORIZONTAL 5 0 10

VERTICAL 1 0 2

CONST.REV.

R /W REV.

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. K. REID 9-29-2010

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS 10/21/10

MOFFATT & NICHOL
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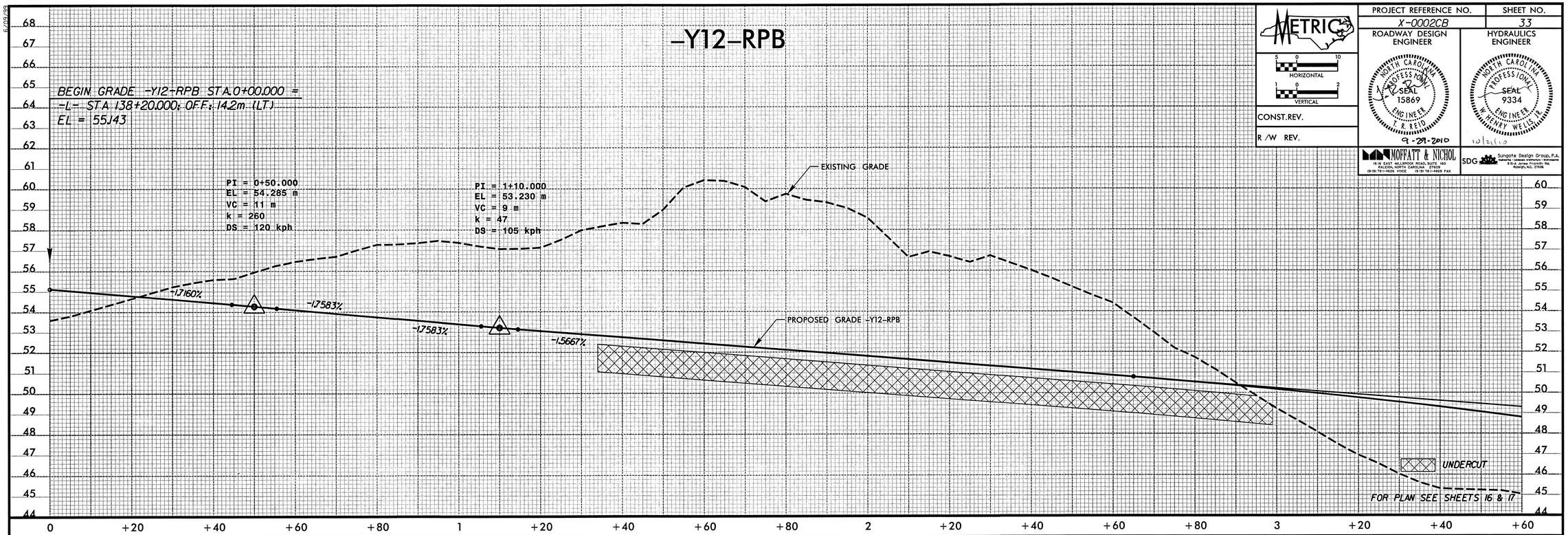
SDG Sungate Design Group, P.A.
Engineers · Landscape Architects · Surveyors
510-A Jones Franklin Rd.
Raleigh, N.C. 27606

-Y12-RPB



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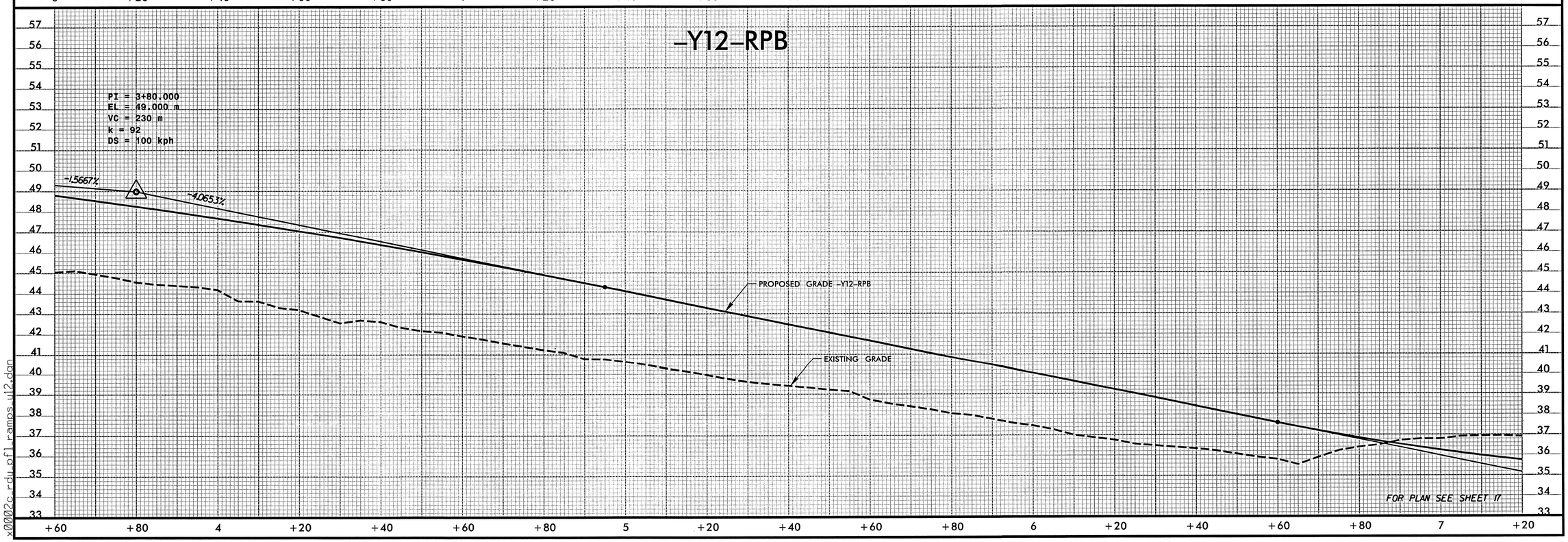

6/09/99

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PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	34

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

METRIC

HORIZONTAL 5 0 10

VERTICAL 1 0 2

CONST.REV.

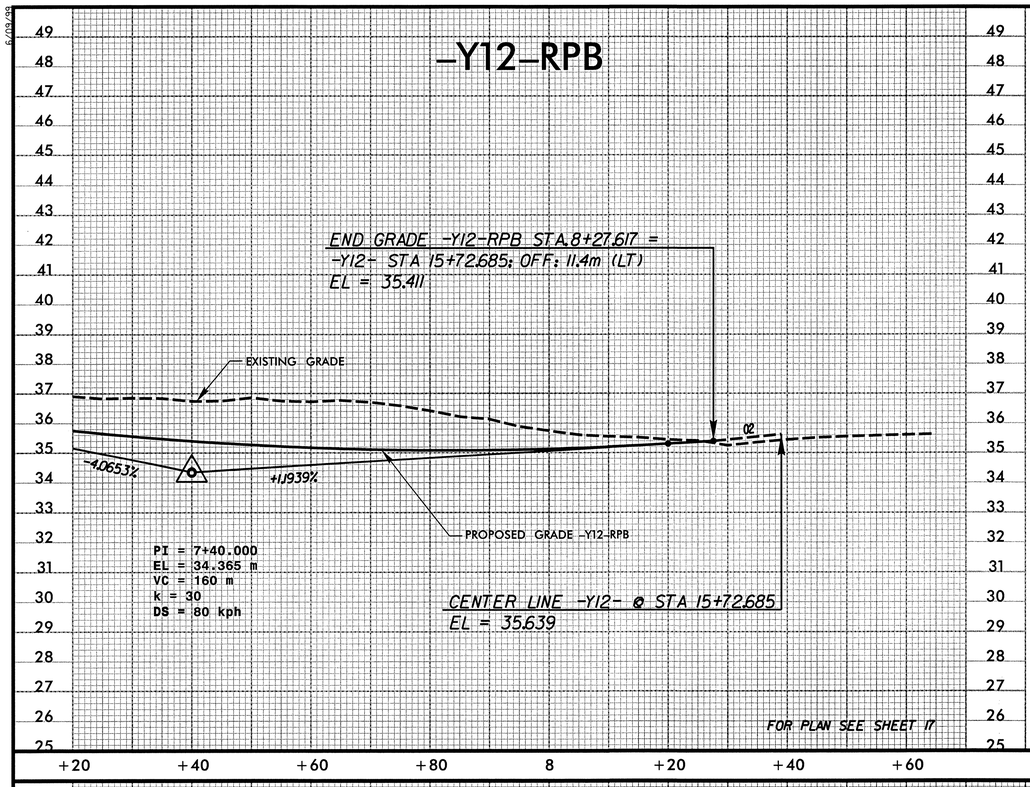
R /W REV.

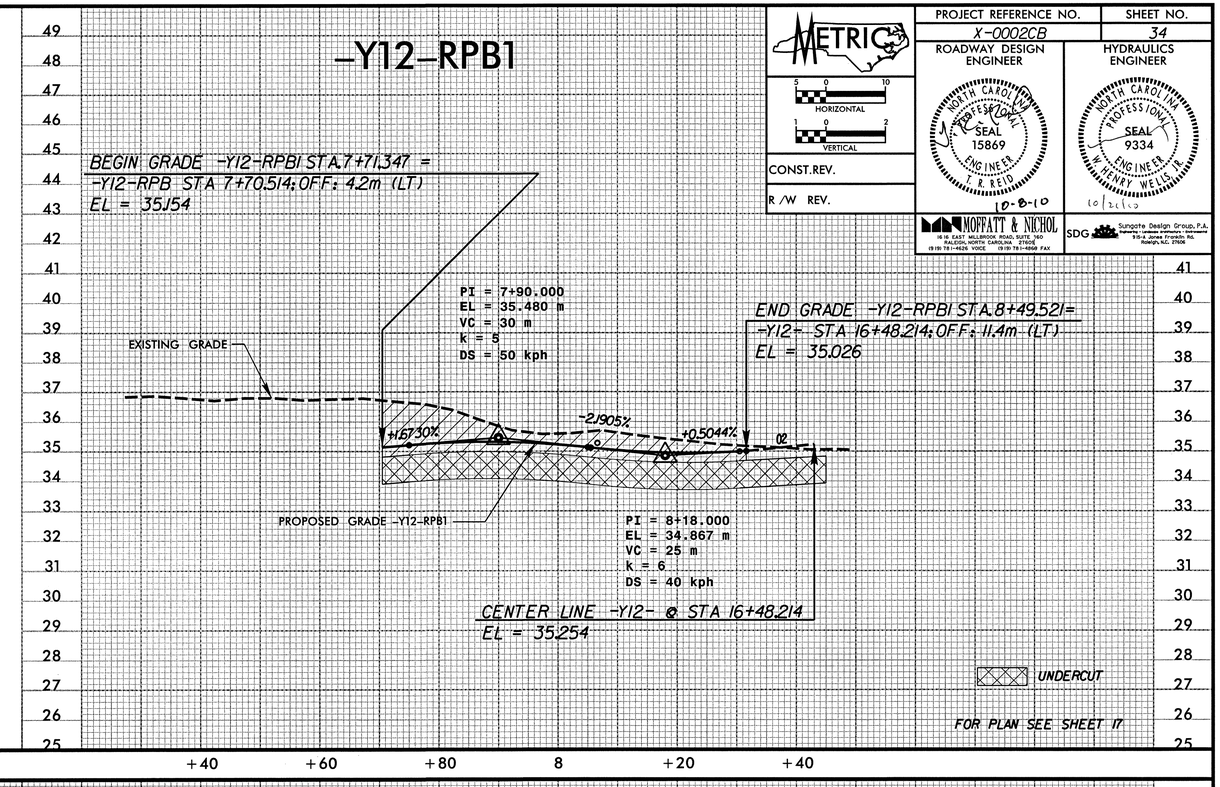
NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID 10-8-10

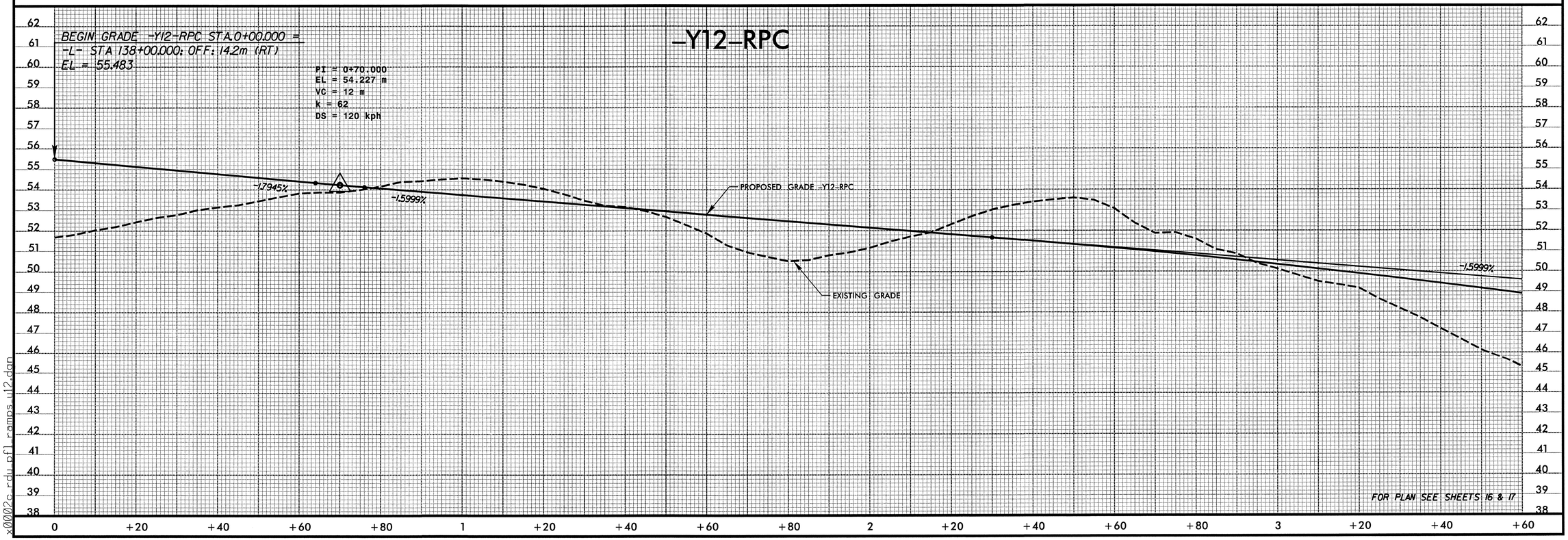
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS, JR. 10/21/10

MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4896 FAX

SDG Sungate Design Group, P.A.
Roberts & Stone & Associates Inc.
9101 A Glenwood Avenue Rd.
Raleigh, N.C. 27606







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PROJECT REFERENCE NO.	SHEET NO.
X-0002CB	35

METRIC

HORIZONTAL 5 0 10

VERTICAL 1 0 2

CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

9-29-2010

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR.

10/21/10

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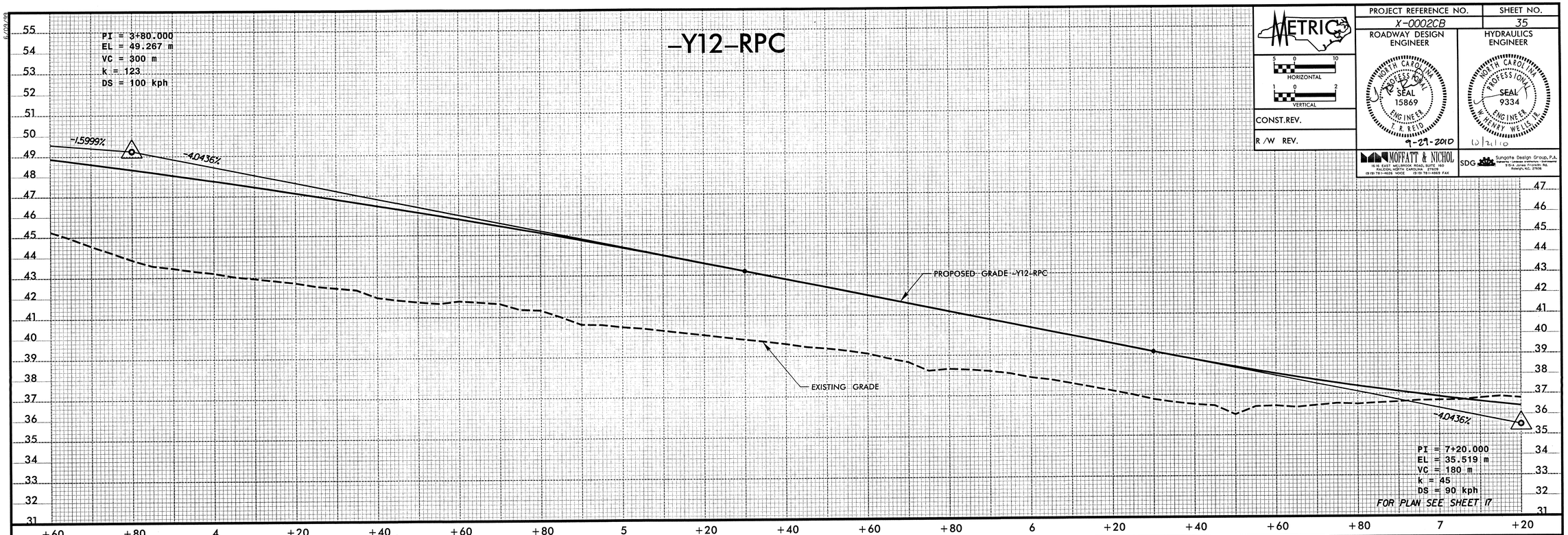
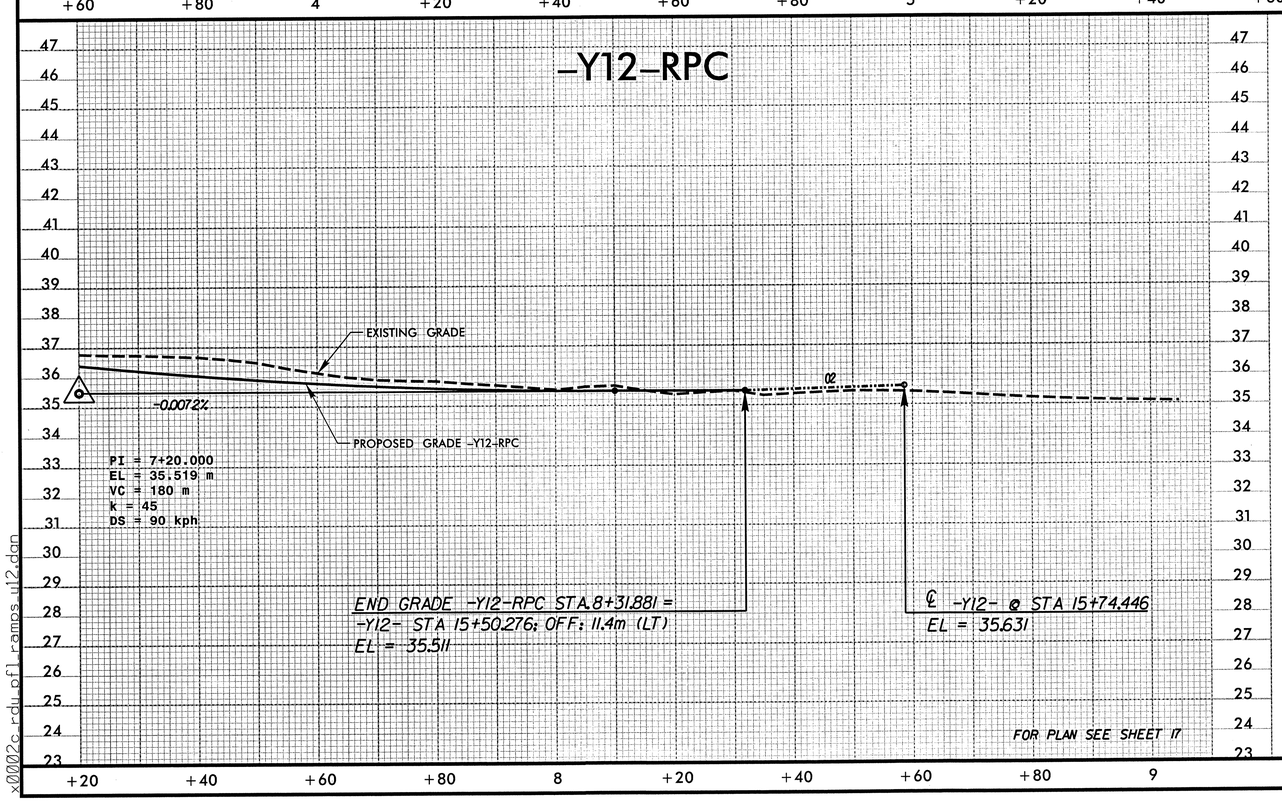
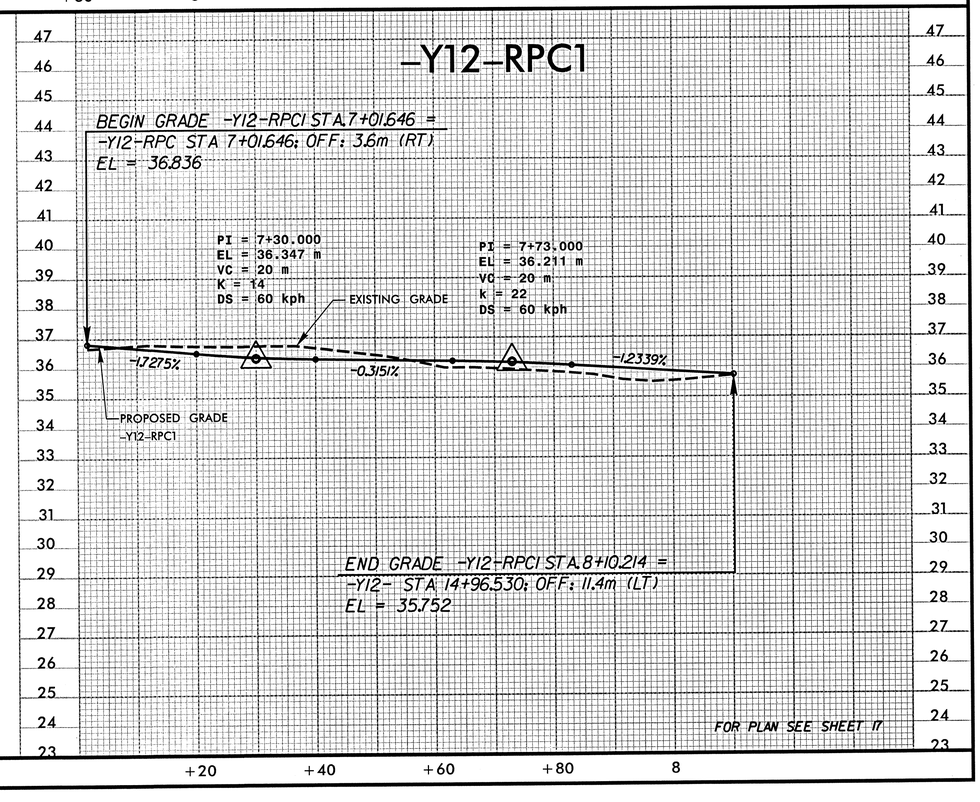
SDG Sungate Design Group, P.A.
Transportation Engineers & Consultants
915-A Jones Franklin Rd.
Raleigh, N.C. 27606







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