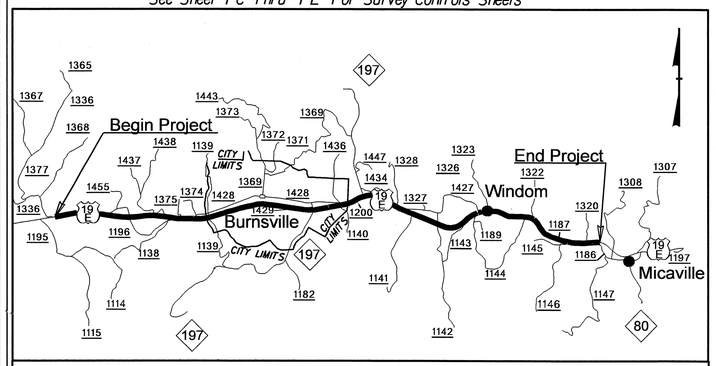
6/24/99

R-2519A

CONTRACT: C202332

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols
See Sheet 1-C Thru 1-E For Survey Controls Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

YANCEY COUNTY

LOCATION: US 19 E FROM EAST OF SR 1336 (JACKS CREEK ROAD) TO SR 1186 (OLD US 19)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNALS, CURB & GUTTER, CULVERTS, AND RETAINING WALLS

METRIC

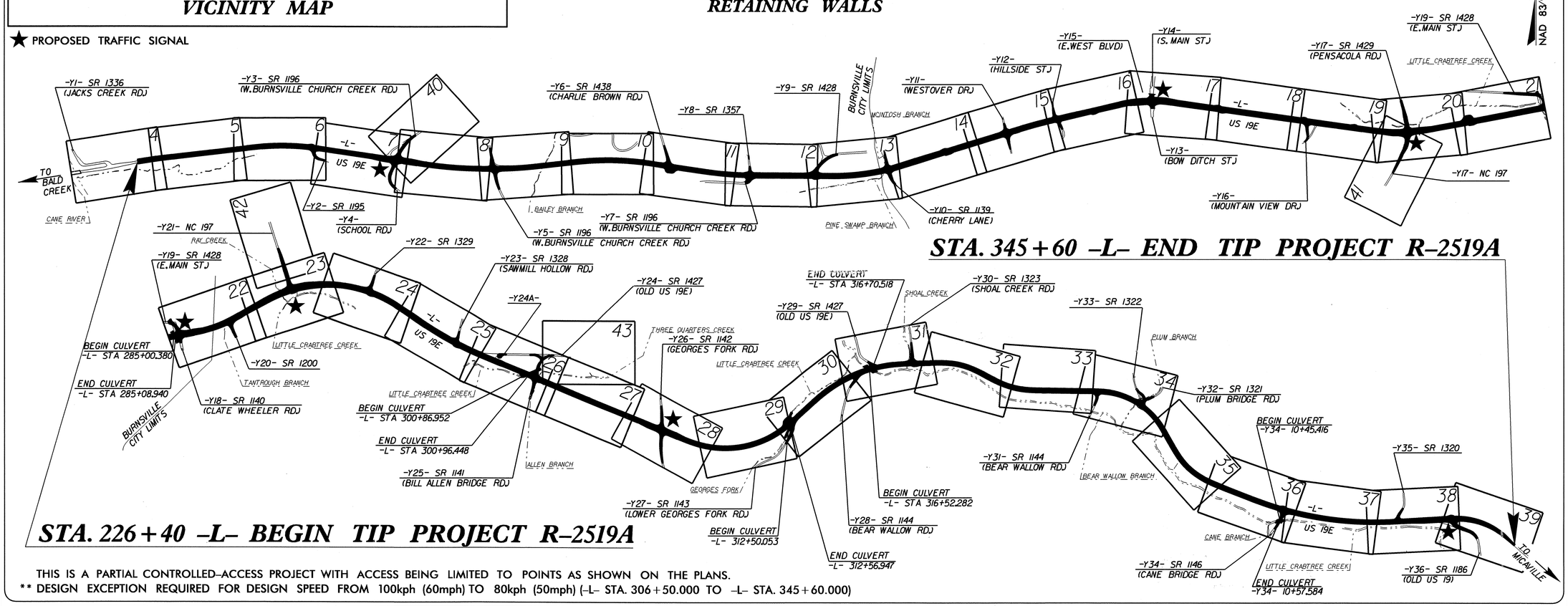
ALL DIMENSIONS IN THESE PLANS ARE IN METERS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2519A	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
35609.1.1		PE
35609.2.1		R/W, UTIL
35609.3.1		CONST

★ PROPOSED TRAFFIC SIGNAL

NAD 83/95



THIS IS A PARTIAL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS.
** DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED FROM 100kph (60mph) TO 80kph (50mph) (-L- STA. 306+50.000 TO -L- STA. 345+60.000)

GRAPHIC SCALES

5 0 10 — PLANS

5 0 10 — PROFILE (HORIZONTAL)

1 0 2 — PROFILE (VERTICAL)

DESIGN DATA

ADT 2011	=	28,450
ADT 2031	=	40,093
DHV	=	8 %
D	=	63 %
T	=	8 % *
(C&G sect.)V	=	80 km/h
(Shld. sect.)V	=	100 km/h**

* TTST 4 % DUAL 4 %
FUNC. CLASS. = ARTERIAL
STATEWIDE TIER

PROJECT LENGTH

LENGTH OF ROADWAY PROJECT R-2519A	=	11.877 Km
LENGTH OF STRUCTURE PROJECT R-2519A	=	0.043 Km
TOTAL LENGTH OF TIP PROJECT R-2519A	=	11.920 Km

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MARCH 31, 2005

LETTING DATE: MAY 17, 2011

BRENDA MOORE, PE
PROJECT ENGINEER

KATRINA N. WASHINGTON, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM
2/4/11
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE
2/4/11
SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY DESIGN ENGINEER

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6/24/99

R-2519A

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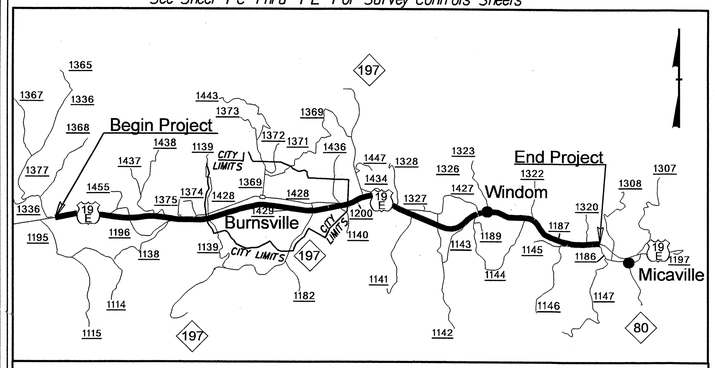

VICINITY MAP

★ PROPOSED TRAFFIC SIGNAL

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

YANCEY COUNTY

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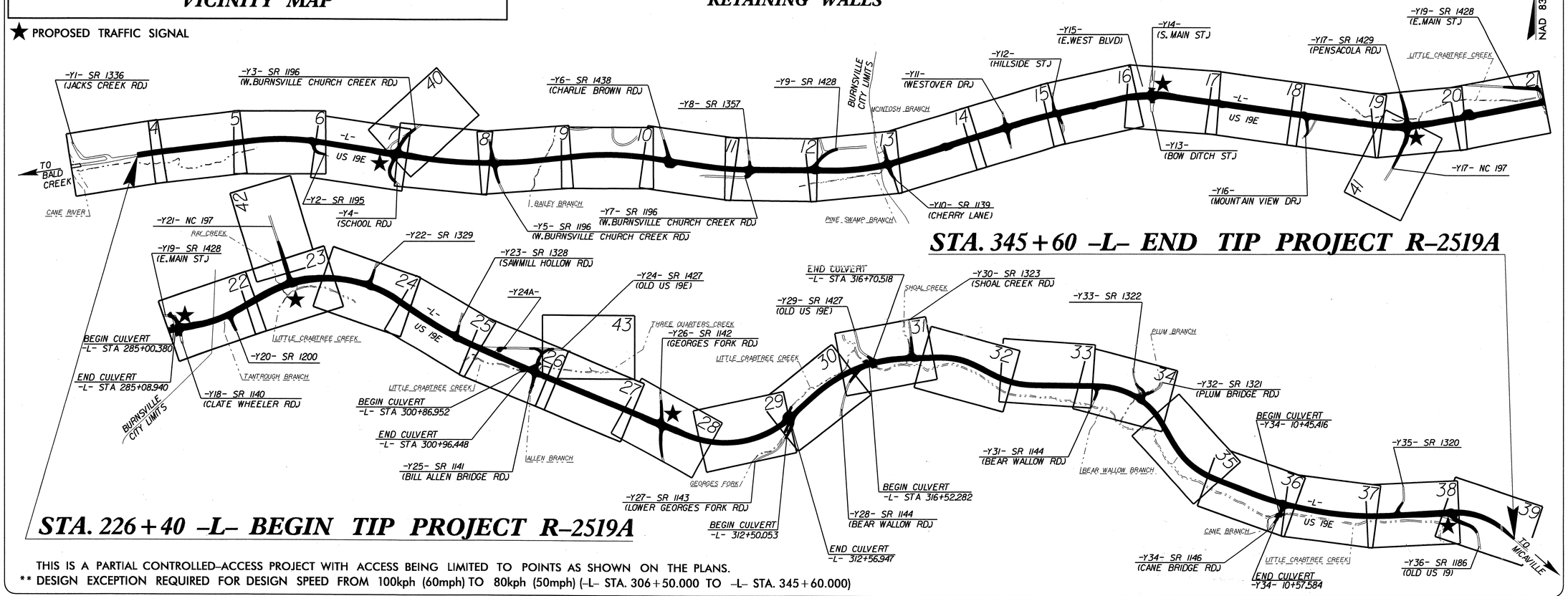
35609.2.1		R/W, UTIL
35609.3.1		CONST

Part 1 of 2

NAD 83/95



STA. 345+60 -L- END TIP PROJECT R-2519A

STA. 226+40 -L- BEGIN TIP PROJECT R-2519A

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DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER P.E.

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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	1-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE

5/3/11

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

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
2 THRU 2-G	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
2-H THRU 2-J	INTERSECTION DETAIL SHEETS
2-K THRU 2-S	DRAINAGE DETAIL SHEETS
2-T	DETAIL OF REINFORCED CONCRETE ENDWALL FOR 2.41m X 1.70m (PIPE ARCH) -90°
2-U	DETAIL OF 1950mm REINFORCED CONCRETE WINGWALL -90°
2-V	DETAIL OF REINFORCED CONCRETE ENDWALL FOR 2.23m X 1.60m (PIPE ARCH) -90°
2-W	METHOD OF PIPE INSTALLATION (ARCH PIPE)
2-X	DETAILS OF SPECIAL CATCH BASINS
2-Y	DETAIL OF SPECIAL JUNCTION BOX W/ MANHOLE
2-Z	DETAIL OF TRAFFIC BEARING JUNCTION BOX W/ MANHOLE CONNECTING 1950mm RCP TO EXISTING RC BOX CULVERT
2-AA THRU 2-AC	TRAFFIC BEARING JUNCTION BOX W/ MANHOLE
2-AD	DETAIL TO CONVERT EXISTING DROP INLET OR CATCH BASIN TO JUNCTION BOX (MANHOLE OPTIONAL)
2-AE THRU 2-AF	METHOD OF PIPE INSTALLATION
2-AG	PROPOSED PEDESTRIAN SAFETY RAIL
2-AH	STANDARD TEMPORARY SHORING
2-AI	STANDARD TEMPORARY MSE WALLS
2-AJ	STANDARD TEMPORARY MSE WALL REINFORCEMENT TABLES
2-AK	TEMPORARY FABRIC WALL
2-AL	HILFIKER TEMPORARY WALL
2-AM	SIERRASCAPE TEMPORARY WALL
2-AN THRU 2-AP	RETAINED EARTH TEMPORARY WALL
2-AQ THRU 2-AS	TERRATREL TEMPORARY WALL
2-AT	DETAIL OF PIPE LINER INSTALLATION
2-AU	DETAIL OF CONCRETE DROP INLET FOR 1200mm PIPE
2-AV	REINFORCED SOIL SLOPE (RSS) DETAIL
2-AW	5-STRAND BARBED WIRE FENCE DETAIL
3 (3 sheets)	SUMMARY OF QUANTITIES
3-A	SUMMARY OF WOVEN WIRE FENCE, SUMMARY OF SHOULDER BERM GUTTER, AND SUMMARY OF EXPRESSWAY GUTTER
3-B THRU 3-C	GUARDRAIL SUMMARY
3-D THRU 3-Y	LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 1200mm & UNDER)
3-Z	LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 1350mm & OVER)
3-AA THRU 3-AB	PARCEL INDEX SHEETS
3-AC	SUMMARY OF EARTHWORK, SUMMARY OF EXISTING ASPHALT PAVEMENT REMOVAL
4 THRU 43	PLAN SHEETS
44 THRU 78	PROFILE SHEETS
TCP-1 THRU TCP-86	TRAFFIC CONTROL PLANS
SD-1 THRU SD-3	SPECIAL SIGN DESIGN PLANS
PMP-1 THRU PMP-35	PAVEMENT MARKING PLANS
EC-1 THRU EC-109	EROSION CONTROL PLANS
RF-1 THRU RF-3	REFORESTATION PLANS
SIGN-1 THRU SIGN-28	SIGNING PLANS
SIG-1 THRU SIG-96	SIGNAL PLANS
UC-1 THRU UC-10	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-41	UTILITIES BY OTHER PLANS
X-1A THRU X-1F	CROSS-SECTIONS SUMMARY SHEETS
X-1 THRU X-368	CROSS-SECTIONS
C-1 THRU C-119	CULVERT PLANS
W-1 THRU W-15	RETAINING WALL PLANS

GENERAL NOTES:

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

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE the Town of Burnsville, French Broad EMC, Piedmont Natural Gas, Frontier Communications (Phone), and Charter Communications (CATV). ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:

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

WHEELCHAIR RAMPS:

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

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	
200.02	Method of Clearing - Method II
225.06	Method of Grading Sight Distance at Intersections
240.01	Guide for Berm Ditch Construction
DIVISION 3 - PIPE CULVERTS	
310.02	Parallel Pipe End Section - Precast Concrete Section for 375mm to 600mm Pipe
310.03	Cross Pipe End Section - Precast Concrete Section for 450mm to 750mm Pipe
310.04	Parallel Pipe End Section - Prefabricated Steel Section for 375mm to 600mm Pipe
310.10	Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
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
838.27	Reinforced Concrete Endwall - for Single 1500mm Pipe 90 Skew
838.39	Reinforced Concrete Endwall - for Single 1800mm Pipe 90 Skew
838.45	Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40
838.57	Reinforced Brick Endwall - for Single 1500mm Pipe 90 Skew
838.69	Reinforced Brick Endwall - for Single 1800mm 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
840.04	Concrete Open Throat Catch Basin - 300mm thru 1200mm Pipe
840.05	Brick Open Throat Catch Basin - 300mm thru 1200mm Pipe
840.14	Concrete Drop Inlet - 300mm thru 750mm Pipe
840.15	Brick Drop Inlet - 300mm thru 750mm Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.17	Concrete 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
840.22	Frames and Wide Slot Sag Grates
840.24	Frames and Narrow Slot Sag Grates
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
840.30	Driveway Drop Inlet
840.31	Concrete Junction Box - 300mm thru 1650mm Pipe
840.32	Brick Junction Box - 300mm thru 1650mm Pipe
840.34	Traffic Bearing Junction Box - for Use with Pipes 1050mm and Under
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.51	Brick Manhole - 300mm thru 900mm Pipe
840.53	Precast Manhole with Masonry Base - 300mm thru 1050mm Pipe
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
846.02	Drop Inlet Installation in Expressway Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
848.01	Concrete Sidewalk
848.02	Driveway Turnout - Radius Type
848.04	Street Turnout
848.05	Wheelchair Ramp - Curb Cut
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
852.01	Concrete Islands
852.05	Median Curb for Catch Basin - for Use with 450mm Curb and Gutter
852.06	Method for Placement of Drop Inlets in Concrete Islands
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
866.01	Chain Link Fence - 1200mm, 1500mm and 1800mm High Fence
866.02	Woven Wire Fence - with Wood Post
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

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Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJ. REFERENCE NO.	SHEET NO.
R-2519A	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.

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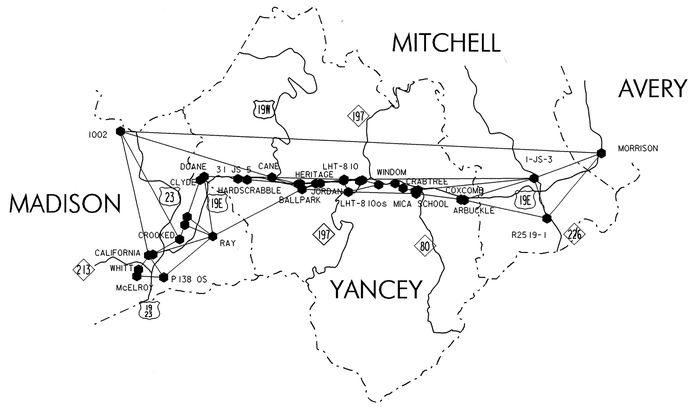
PROJECT REFERENCE NO.	SHEET NO.
R-2519A	1-C
LOCATION & SURVEYS	

SURVEY CONTROL SHEET



GPS CONTROL NETWORK
NOT TO SCALE

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "R2519A-1"
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 244860.731(m) EASTING: 307037.904(m)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999822000
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "R2519A-1" TO -L- STATION 224+30.000 IS
N 82°14'01" E 417.095m
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

NOTES:

THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO EXISTING NCGS AND NCDOT MONUMENTS USING USING A NAD 83/95 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.

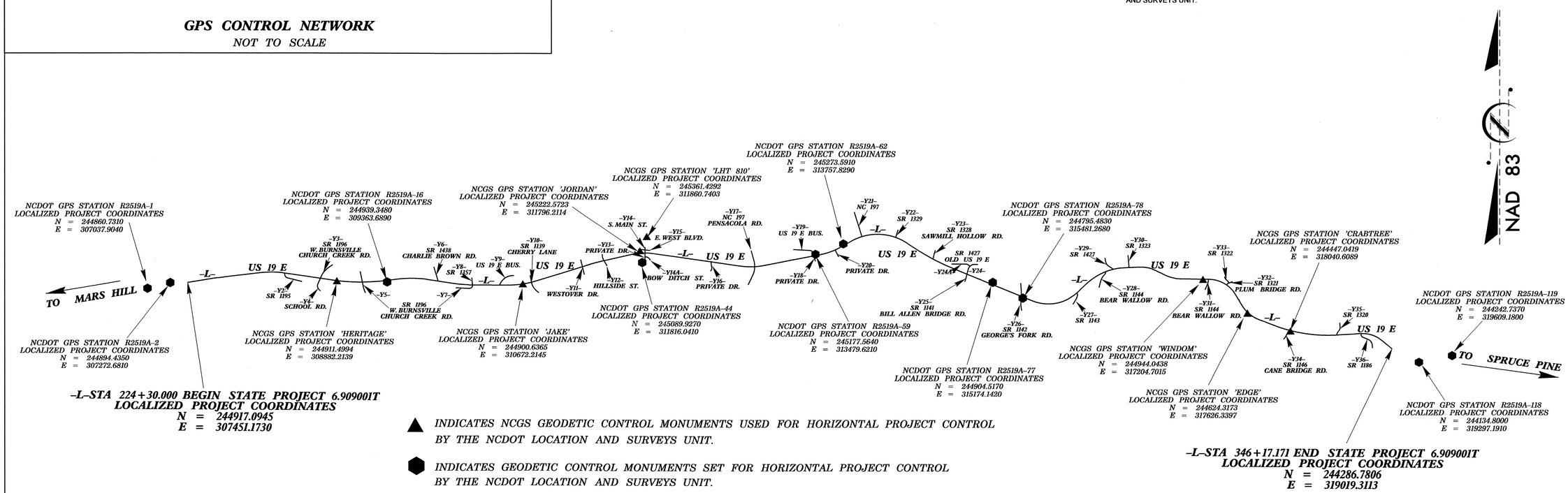
THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:

HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

THE FILES TO BE FOUND ARE AS FOLLOWS:

R2519A_LS_GPSCALIB_030710.HTML
R2519A_LS_WGS84_030710.TXT
R2519A_LS_LOCAL_030710.TXT
R2519A_LS_CONTROL_030710.TXT

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



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

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

PROJECT CONTROL ESTABLISHED UTILIZING GLOBAL POSITIONING SYSTEM.

NETWORK ESTABLISHED FROM EXISTING NCGS AND NCDOT MONUMENTATION.

SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES

NOTE: DRAWING NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	1-D
LOCATION & SURVEYS	

SURVEY CONTROL SHEET

GPS CALIBRATION REPORT

PROJECT : 6.909001T

TIP NUMBER	R-2519A		
USER NAME	J.GORDON	DATE & TIME	9:50:38 AM 7/10/03
COORDINATE SYSTEM	US STATE PLANE 1983(AT GROUND)	ZONE	NORTH CAROLINA 3200
HORIZONTAL DATUM	NAD 1983 (CONUS)		
VERTICAL DATUM		GEOID MODEL	GEOID99 (CONUS)
COORDINATE UNITS	METERS		
DISTANCE UNITS	METERS		
HEIGHT UNITS	METERS		

LOCAL SITE INFORMATION

LOCALIZED AROUND

LATITUDE	35°54'40.40569"N
LONGITUDE	82°21'10.08524"W
SITE SCALE FACTOR	1.0001780300

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

DATUM TRANSFORMATION PARAMETERS

DATUM TRANSFORMATION COMPUTATION NOT REQUESTED

UPDATED DEFAULT PROJECTION (TRANSVERSE MERCATOR) DEFINITION

UPDATED DEFAULT PROJECTION NOT REQUESTED

HORIZONTAL ADJUSTMENT PARAMETERS

NORTHING COORDINATE OF ROTATION CENTER	242970.986M
EASTING COORDINATE OF ROTATION CENTER	307548.408M
ROTATION ABOUT THE CENTER POINT	0°00'01"
TRANSLATION NORTH	0.182M
TRANSLATION EAST	0.134M
SCALE FACTOR	0.99999376

VERTICAL ADJUSTMENT PARAMETERS

NORTHING COORDINATE OF ORIGIN POINT	250378.278M
EASTING COORDINATE OF ORIGIN POINT	288404.211M
VERTICAL SEPARATION AT ORIGIN	-0.164M
SLOPE NORTH	-6.147PPM
SLOPE EAST	2.750PPM

GEOID MODEL DEFINITION

GEOID99 (CONUS)

RESIDUAL DIFFERENCES BETWEEN GPS (WGS84) AND LOCAL COORDINATES

SUMMARY

	MAXIMUM ERROR	ROOT MEAN SQUARE ERROR	POINT
HORIZONTAL	0.051M	0.022	MCELROY_WGS84
VERTICAL	0.058M	0.019	R2519-1_WGS84
THREE-DIMENSIONAL	0.070M	0.030	R2519-1_WGS84

POINT RESIDUALS

WGS84 COORDINATES	CALCULATED POINT FOR DISPLAY ONLY	LOCAL COORDINATES
POINT 1002_WGS84 LATITUDE 35°57'18.23692"N LONGITUDE 82°33'40.58624"W HEIGHT 1138.290M	NORTHING 250378.278M EASTING 288404.211M ELEVATION 1168.476M HORZ ERROR 0.005M VERT ERROR 0.029M 3D ERROR 0.029M	POINT 1002_LOCAL NORTHING 250378.282M EASTING 288404.209M ELEVATION 1168.505M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT MORRISON_WGS84 LATITUDE 35°57'01.20615"N LONGITUDE 82°00'06.61923"W HEIGHT 785.629M	NORTHING 248185.080M EASTING 338836.069M ELEVATION 816.593M HORZ ERROR 0.045M VERT ERROR 0.038M 3D ERROR 0.059M	POINT MORRISON_LOCAL NORTHING 248185.061M EASTING 338836.118M ELEVATION 816.631M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT P1380S_WGS84 LATITUDE 35°49'07.57718"N LONGITUDE 82°30'18.43879"W HEIGHT 609.483M	NORTHING 235083.000M EASTING 292933.378M ELEVATION 639.625M HORZ ERROR 0.044M VERT ERROR 0.024M 3D ERROR 0.050M	POINT P1380S_LOCAL NORTHING 235082.994M EASTING 292933.422M ELEVATION 639.601M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT MCELROY_WGS84 LATITUDE 35°49'08.34324"N LONGITUDE 82°32'10.84083"W HEIGHT 623.054M	NORTHING 235206.669M EASTING 290114.142M ELEVATION 653.216M HORZ ERROR 0.051M VERT ERROR 0.018M 3D ERROR 0.054M	POINT MCELROY_LOCAL NORTHING 235206.667M EASTING 290114.193M ELEVATION 653.234M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT A29_WGS84 LATITUDE 35°49'12.60019"N LONGITUDE 82°32'09.91589"W HEIGHT 624.831M	NORTHING 235336.974M EASTING 290142.022M ELEVATION 654.993M HORZ ERROR 0.021M VERT ERROR 0.003M 3D ERROR 0.021M	POINT A29_LOCAL NORTHING 235336.956M EASTING 290142.011M ELEVATION 654.996M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT WHIT_WGS84 LATITUDE 35°49'30.74194"N LONGITUDE 82°32'04.47281"W HEIGHT 646.937M	NORTHING 235890.954M EASTING 290298.490M ELEVATION 677.090M HORZ ERROR 0.019M VERT ERROR 0.009M 3D ERROR 0.021M	POINT WHIT_LOCAL NORTHING 235898.937M EASTING 290298.480M ELEVATION 677.107M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT R2518A-1_WGS84 LATITUDE 35°50'20.53533"N LONGITUDE 82°31'25.07228"W HEIGHT 669.985M	NORTHING 237389.661M EASTING 291341.410M ELEVATION 700.142M HORZ ERROR 0.031M VERT ERROR 0.013M 3D ERROR 0.034M	POINT R2518A-1_LOCAL NORTHING 237389.656M EASTING 291341.441M ELEVATION 700.155M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT CALIFORNIA_WGS84 LATITUDE 35°50'21.60963"N LONGITUDE 82°31'14.73202"W HEIGHT 651.305M	NORTHING 237420.463M EASTING 291476.622M ELEVATION 681.461M HORZ ERROR 0.018M VERT ERROR 0.010M 3D ERROR 0.020M	POINT CALIFORNIA_LOCAL NORTHING 237420.447M EASTING 291476.613M ELEVATION 681.471M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT R2518A-2_WGS84 LATITUDE 35°50'23.87123"N LONGITUDE 82°31'06.40928"W HEIGHT 651.704M	NORTHING 237475.809M EASTING 291813.177M ELEVATION 681.859M HORZ ERROR 0.023M VERT ERROR 0.020M 3D ERROR 0.024M	POINT R2518A-2_LOCAL NORTHING 237475.804M EASTING 291813.199M ELEVATION 681.867M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT CROOKED_WGS84 LATITUDE 35°51'18.87216"N LONGITUDE 82°24'17.64808"W HEIGHT 652.295M	NORTHING 239073.796M EASTING 294600.777M ELEVATION 682.436M HORZ ERROR 0.015M VERT ERROR 0.009M 3D ERROR 0.018M	POINT CROOKED_LOCAL NORTHING 239073.799M EASTING 294600.792M ELEVATION 682.427M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT BUCKNER_WGS84 LATITUDE 35°52'08.98706"N LONGITUDE 82°28'58.05598"W HEIGHT 674.185M	NORTHING 240600.343M EASTING 295146.303M ELEVATION 704.322M HORZ ERROR 0.013M VERT ERROR 0.001M 3D ERROR 0.013M	POINT BUCKNER_LOCAL NORTHING 240600.347M EASTING 295146.315M ELEVATION 704.323M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT WILJOR_WGS84 LATITUDE 35°52'35.84055"N LONGITUDE 82°28'49.33304"W HEIGHT 680.686M	NORTHING 241419.904M EASTING 295394.039M ELEVATION 710.821M HORZ ERROR 0.005M VERT ERROR 0.006M 3D ERROR 0.008M	POINT WILJOR_LOCAL NORTHING 241419.908M EASTING 295394.042M ELEVATION 710.827M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT RAY_WGS84 LATITUDE 35°51'33.46645"N LONGITUDE 82°26'59.21916"W HEIGHT 687.007M	NORTHING 239402.005M EASTING 298087.976M ELEVATION 717.120M HORZ ERROR 0.013M VERT ERROR 0.022M 3D ERROR 0.026M	POINT RAY_LOCAL NORTHING 239402.005M EASTING 298087.989M ELEVATION 717.096M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT CLYDE_WGS84 LATITUDE 35°54'41.56352"N LONGITUDE 82°28'00.48532"W HEIGHT 839.678M	NORTHING 245250.038M EASTING 296754.060M ELEVATION 869.810M HORZ ERROR 0.012M VERT ERROR 0.023M 3D ERROR 0.026M	POINT CLYDE_LOCAL NORTHING 245250.044M EASTING 296754.070M ELEVATION 869.833M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT DOANE_WGS84 LATITUDE 35°54'54.30626"N LONGITUDE 82°27'43.68444"W HEIGHT 825.867M	NORTHING 245627.891M EASTING 297188.804M ELEVATION 856.001M HORZ ERROR 0.008M VERT ERROR 0.028M 3D ERROR 0.029M	POINT DOANE_LOCAL NORTHING 245627.896M EASTING 297188.809M ELEVATION 856.029M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT 31-JS-5_WGS84 LATITUDE 35°54'50.87911"N LONGITUDE 82°25'22.76679"W HEIGHT 755.917M	NORTHING 245399.784M EASTING 300716.558M ELEVATION 786.076M HORZ ERROR 0.015M VERT ERROR 0.023M 3D ERROR 0.027M	POINT 31-JS-5_LOCAL NORTHING 245399.793M EASTING 300716.546M ELEVATION 786.099M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT HARDSCRABBLE_WGS84 LATITUDE 35°54'49.93389"N LONGITUDE 82°24'43.83053"W HEIGHT 747.653M	NORTHING 245306.248M EASTING 301690.259M ELEVATION 777.820M HORZ ERROR 0.014M VERT ERROR 0.022M 3D ERROR 0.026M	POINT HARDSCRABBLE_LOCAL NORTHING 245306.258M EASTING 301690.250M ELEVATION 777.842M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT CANE_WGS84 LATITUDE 35°55'00.14153"N LONGITUDE 82°23'00.86249"W HEIGHT 725.587M	NORTHING 245563.151M EASTING 304282.501M ELEVATION 755.785M HORZ ERROR 0.010M VERT ERROR 0.008M 3D ERROR 0.013M	POINT CANE_LOCAL NORTHING 245563.159M EASTING 304282.495M ELEVATION 755.793M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT R2519A-1_WGS84 LATITUDE 35°54'40.39980"N LONGITUDE 82°21'10.09045"W HEIGHT 750.582M	NORTHING 244860.726M EASTING 307037.912M ELEVATION 780.787M HORZ ERROR 0.009M VERT ERROR 0.005M 3D ERROR 0.011M	POINT R2519A-1_LOCAL NORTHING 244860.731M EASTING 307037.904M ELEVATION 780.782M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT R2519A-2_WGS84 LATITUDE 35°54'41.74954"N LONGITUDE 82°21'00.77825"W HEIGHT 744.760M	NORTHING 244894.425M EASTING 307272.698M ELEVATION 774.967M HORZ ERROR 0.020M VERT ERROR 0.015M 3D ERROR 0.025M	POINT R2519A-2_LOCAL NORTHING 244894.435M EASTING 307272.681M ELEVATION 774.952M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT BALLPARK_WGS84 LATITUDE 35°54'23.14085"N LONGITUDE 82°20'53.15029"W HEIGHT 770.452M	NORTHING 244314.688M EASTING 307444.525M ELEVATION 800.648M HORZ ERROR 0.012M VERT ERROR 0.007M 3D ERROR 0.014M	POINT BALLPARK_LOCAL NORTHING 244314.694M EASTING 307444.514M ELEVATION 800.641M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT HERITAGE_WGS84 LATITUDE 35°54'44.06027"N LONGITUDE 82°19'56.65147"W HEIGHT 806.938M	NORTHING 244911.491M EASTING 308882.232M ELEVATION 837.158M HORZ ERROR 0.023M VERT ERROR 0.020M 3D ERROR 0.030M	POINT HERITAGE_LOCAL NORTHING 244911.502M EASTING 308882.212M ELEVATION 837.138M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT R2519A-16_WGS84 LATITUDE 35°54'45.48704"N LONGITUDE 82°19'37.49878"W HEIGHT 793.841M	NORTHING 244939.338M EASTING 309363.708M ELEVATION 824.066M HORZ ERROR 0.021M VERT ERROR 0.024M 3D ERROR 0.032M	POINT R2519A-16_LOCAL NORTHING 244939.348M EASTING 309363.689M ELEVATION 824.042M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT LHT-8220S_WGS84 LATITUDE 35°54'18.88995"N LONGITUDE 82°17'39.37039"W HEIGHT 807.636M	NORTHING 244021.155M EASTING 312297.024M ELEVATION 837.877M HORZ ERROR 0.016M VERT ERROR 0.026M 3D ERROR 0.031M	POINT LHT-8220S_LOCAL NORTHING 244021.161M EASTING 312297.009M ELEVATION 837.851M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT R2519A-44_WGS84 LATITUDE 35°54'53.82476"N LONGITUDE 82°17'59.95512"W HEIGHT 827.195M	NORTHING 245089.920M EASTING 311816.058M ELEVATION 857.448M HORZ ERROR 0.018M VERT ERROR 0.013M 3D ERROR 0.022M	POINT R2519A-44_LOCAL NORTHING 245089.927M EASTING 311816.041M ELEVATION 857.435M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT JORDAN_WGS84 LATITUDE 35°54'57.30482"N LONGITUDE 82°18'00.92167"W HEIGHT 824.227M	NORTHING 245222.561M EASTING 311796.220M ELEVATION 854.482M HORZ ERROR 0.042M VERT ERROR 0.024M 3D ERROR 0.048M	POINT JORDAN_LOCAL NORTHING 245222.582M EASTING 311796.183M ELEVATION 854.458M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT LHT-810_WGS84 LATITUDE 35°55'01.87607"N LONGITUDE 82°17'58.53327"W HEIGHT 827.717M	NORTHING 245361.425M EASTING 311860.768M ELEVATION 857.975M HORZ ERROR 0.020M VERT ERROR 0.015M 3D ERROR 0.025M	POINT LHT-810_LOCAL NORTHING 245361.432M EASTING 311860.741M ELEVATION 857.982M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT R2519A-59_WGS84 LATITUDE 35°54'57.65827"N LONGITUDE 82°16'53.76324"W HEIGHT 771.098M	NORTHING 245177.659M EASTING 313475.638M ELEVATION 801.378M HORZ ERROR 0.018M VERT ERROR 0.022M 3D ERROR 0.027M	POINT R2519A-59_LOCAL NORTHING 245177.565M EASTING 313479.621M ELEVATION 801.358M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT R2519A-62_WGS84 LATITUDE 35°55'01.06695"N LONGITUDE 82°16'42.80063"W HEIGHT 768.420M	NORTHING 245273.584M EASTING 313757.846M ELEVATION 798.707M HORZ ERROR 0.018M VERT ERROR 0.025M 3D ERROR 0.030M	POINT R2519A-62_LOCAL NORTHING 245273.592M EASTING 313757.830M ELEVATION 798.682M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT R2519A-77_WGS84 LATITUDE 35°54'50.61398"N LONGITUDE 82°15'45.86324"W HEIGHT 756.968M	NORTHING 244904.511M EASTING 315174.159M ELEVATION 787.276M HORZ ERROR 0.016M VERT ERROR 0.022M 3D ERROR 0.027M	POINT R2519A-77_LOCAL NORTHING 244904.517M EASTING 315174.143M ELEVATION 787.254M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT R2519A-78_WGS84 LATITUDE 35°54'47.40597"N LONGITUDE 82°15'33.47982"W HEIGHT 759.246M	NORTHING 244795.477M EASTING 315481.283M ELEVATION 789.561M HORZ ERROR 0.016M VERT ERROR 0.014M 3D ERROR 0.022M	POINT R2519A-78_LOCAL NORTHING 244795.484M EASTING 315481.268M ELEVATION 789.547M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT WINDOM_WGS84 LATITUDE 35°54'54.05602"N LONGITUDE 82°14'24.97990"W HEIGHT 736.954M	NORTHING 244944.128M EASTING 317204.715M ELEVATION 767.316M HORZ ERROR 0.016M VERT ERROR 0.011M 3D ERROR 0.020M	POINT WINDOM_LOCAL NORTHING 244944.136M EASTING 317204.701M ELEVATION 767.305M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT CRABTREE_WGS84 LATITUDE 35°54'38.82413"N LONGITUDE 82°13'51.01720"W HEIGHT 728.854M	NORTHING 244447.099M EASTING 318040.600M ELEVATION 759.236M HORZ ERROR 0.016M VERT ERROR 0.012M 3D ERROR 0.020M	POINT CRABTREE_LOCAL NORTHING 244447.108M EASTING 318040.587M ELEVATION 759.224M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT R2519A-118_WGS84 LATITUDE 35°54'30.02196"N LONGITUDE 82°13'00.52932"W HEIGHT 725.077M	NORTHING 244134.802M EASTING 319297.196M ELEVATION 755.499M HORZ ERROR 0.004M VERT ERROR 0.010M 3D ERROR 0.011M	POINT R2519A-118_LOCAL NORTHING 244134.800M EASTING 319297.192M ELEVATION 755.489M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT R2519A-119_WGS84 LATITUDE 35°54'33.84966"N LONGITUDE 82°12'48.23409"W HEIGHT 719.739M	NORTHING 244242.743M EASTING 319609.183M ELEVATION 748.172M HORZ ERROR 0.007M VERT ERROR 0.001M 3D ERROR 0.007M	POINT R2519A-119_LOCAL NORTHING 244242.737M EASTING 319609.180M ELEVATION 748.171M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT MICA_SCHOOL_WGS8 LATITUDE 35°54'21.33548"N LONGITUDE 82°12'55.79738"W HEIGHT 720.561M	NORTHING 243863.339M EASTING 319407.125M ELEVATION 750.985M HORZ ERROR 0.009M VERT ERROR 0.003M 3D ERROR 0.009M	POINT MICA_SCHOOL_LOCAL NORTHING 243863.330M EASTING 319407.124M ELEVATION 750.982M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT COXCOMB_WGS84 LATITUDE 35°54'07.61367"N LONGITUDE 82°09'47.14351"W HEIGHT 824.762M	NORTHING 243288.591M EASTING 324122.253M ELEVATION 835.346M HORZ ERROR 0.014M VERT ERROR 0.008M 3D ERROR 0.016M	POINT COXCOMB_LOCAL NORTHING 243288.579M EASTING 324122.259M ELEVATION 835.354M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT ARBUCKLE_WGS84 LATITUDE 35°54'06.69143"N LONGITUDE 82°09'33.55389"W HEIGHT 803.741M	NORTHING 243249.325M EASTING 324461.991M ELEVATION 834.337M HORZ ERROR 0.015M VERT ERROR 0.003M 3D ERROR 0.015M	POINT ARBUCKLE_LOCAL NORTHING 243249.312M EASTING 324461.998M ELEVATION 834.340M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT 1-JS-3_WGS84 LATITUDE 35°55'28.51772"N LONGITUDE 82°04'44.51009"W HEIGHT 741.764M	NORTHING 245542.637M EASTING 331785.627M ELEVATION 772.570M HORZ ERROR 0.037M VERT ERROR 0.014M 3D ERROR 0.040M	POINT 1-JS-3_LOCAL NORTHING 245542.613M EASTING 331785.655M ELEVATION 772.584M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY
POINT R2519-1_WGS84 LATITUDE 35°53'14.14677"N LONGITUDE 82°03'45.84036"W HEIGHT 758.812M	NORTHING 241357.144M EASTING 333128.111M ELEVATION 789.778M HORZ ERROR 0.039M VERT ERROR 0.058M 3D ERROR 0.070M	POINT R-2519-1_LOCAL NORTHING 241357.118M EASTING 333128.148M ELEVATION 789.836M UTILIZED HORZ AND VERT QUALITY SURVEY QUALITY

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "R2519A-1"
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 244860.731m) EASTING: 307037.904m)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999822000
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "R2519A-1" TO -L- STATION 224+30.000 IS
N 82°14'01" E 417.095m
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

NOTES:

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R2519A_LS_GPSCALIB_030710.HTML
R2519A_LS_WGS84_030710.TXT
R2519A_LS_LOCAL_030710.TXT
R2519A_LS_CONTROL_030710.TXT

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

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	1-E
LOCATION & SURVEYS	

SURVEY CONTROL SHEET

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	BL-1	244860.7310	307037.9040	780.732	OUTSIDE PROJECT LIMITS	
2	BL-2	244894.4350	307272.6810	774.922	OUTSIDE PROJECT LIMITS	
4	BL-4	244933.9100	307528.2420	773.304	225+08.750	4.558 LT
6	BL-6	244986.6490	307831.3020	783.495	228+15.882	13.200 LT
8	BL-8	245019.7220	308098.3200	792.987	230+84.938	14.521 LT
9	BL-9	245023.3460	308374.4330	803.085	233+58.476	13.924 LT
11	BL-11	244974.4490	308717.3020	819.447	237+04.480	14.809 LT
15	BL-15	244911.4990	308882.2130	837.124	238+76.202	24.176 RT
17	BL-17	244936.2470	309104.4490	823.539	240+96.052	14.052 LT
16	BL-16	244939.3480	309363.6890	824.026	243+55.991	0.831 RT
18	BL-18	244971.7460	309608.8190	828.389	246+02.122	12.061 LT
21	BL-21	244925.7910	309858.7090	823.830	248+54.932	8.973 RT
23	BL-23	244885.5050	310169.1160	817.976	251+66.585	13.821 RT
30	BL-30	244909.3780	310421.2690	817.369	254+18.360	12.267 LT
32	BL-32	244900.6360	310672.2140	821.559	256+68.989	6.276 RT
33	BL-33	244981.8810	310983.9780	826.537	259+90.383	11.266 RT
37	BL-37	245061.4900	311236.8090	830.776	262+55.449	10.163 RT
40	BL-40	245125.9970	311467.1690	837.716	264+95.484	9.351 RT
43	BL-43	245222.5720	311796.2110	854.420	268+35.502	17.682 LT
46	BL-46	245161.4230	312092.3950	845.031	271+34.483	16.135 RT
51	BL-51	245152.6030	312343.5850	834.808	273+84.501	9.665 LT
52	BL-52	245053.6270	312632.0520	823.804	276+78.337	9.091 RT
54	BL-54	245068.5820	312909.5120	810.768	279+55.349	11.220 RT
58	BL-58	245138.9770	313162.4430	804.220	282+15.859	15.612 LT
59	BL-59	245177.5640	313479.6210	801.341	285+34.648	5.947 RT
62	BL-62	245273.5910	313757.8290	798.665	288+28.361	10.496 RT
64	BL-64	245376.4942	313988.8090	795.760	290+08.519	13.575 LT
67	BL-67	245394.3930	314158.5080	796.691	292+55.757	9.285 LT
68	BL-68	245297.6680	314393.4860	795.972	295+08.102	9.930 LT
71	BL-71	245147.6288	314598.5730	792.052	297+61.338	8.472 RT
73	BL-73	245018.2660	314934.4610	786.783	301+20.591	7.497 LT
77	BL-77	244904.5170	315174.1420	787.224	303+85.515	6.685 RT
78	BL-78	244795.4830	315481.2680	789.493	307+11.038	9.112 LT
81	BL-81	244689.9760	315716.8680	799.870	309+61.204	31.012 RT
82	BL-82	244787.5980	315947.7410	790.152	312+03.822	3.813 RT
84	BL-84	244947.6610	316128.1350	775.152	314+44.866	2.061 RT
88	BL-88	245066.8960	316311.6550	770.987	316+60.131	21.501 LT
91	BL-91	245057.9080	316491.6340	769.079	318+35.908	12.610 RT
95	BL-95	245065.3940	316688.1430	768.844	320+33.400	0.509 LT
96	BL-96	244961.7660	316898.0190	768.196	322+65.868	13.099 RT
97	BL-97	244944.0430	317204.7010	767.259	325+70.387	14.254 RT
99	BL-99	244918.2730	317430.9760	765.675	327+99.049	12.688 LT
103	BL-103	244741.2120	317543.1300	766.907	330+07.994	13.077 RT
104	BL-104	244624.3170	317626.3390	764.668	331+47.606	15.121 RT
124	BL-124	244541.3340	317787.2380	760.677	333+24.702	12.015 RT
105	BL-105	244447.0410	318040.6080	759.171	335+93.366	17.523 RT
107	BL-107	244413.9790	318251.4380	757.648	338+04.664	12.244 RT
108	BL-108	244408.8770	318485.3920	755.706	340+36.992	12.169 RT
110	BL-110	244420.6420	318711.9040	763.935	342+64.104	13.365 RT
112	BL-112	244395.5650	318903.0620	771.071	344+59.343	9.939 LT
113	BL-113	244270.0380	319029.1380	768.686	OUTSIDE PROJECT LIMITS	
115	BL-115	244176.5190	319144.1390	762.674	OUTSIDE PROJECT LIMITS	
118	BL-118	244134.8000	319297.1910	755.477	OUTSIDE PROJECT LIMITS	
119	BL-119	244242.7370	319609.1800	748.171	OUTSIDE PROJECT LIMITS	
122	BL-122	244218.1250	319872.3150	758.066	OUTSIDE PROJECT LIMITS	

BY

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
Y2	BL-2	244894.4350	307272.6810	774.922	OUTSIDE PROJECT LIMITS	
3	BY-3	244819.8130	307370.9140	776.160	OUTSIDE PROJECT LIMITS	

BY1

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
7	BY1-7	245025.5310	307371.7940	771.921	OUTSIDE PROJECT LIMITS	
5	BY1-5	244934.4010	307417.8160	771.752	OUTSIDE PROJECT LIMITS	
Y4	BL-4	244933.9105	307528.2430	773.311	225+08.751	4.559 LT

BY2

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
Y9	BL-9	245023.3468	308374.4330	803.080	233+58.476	13.925 LT
10	BY2-10	244963.5740	308393.6940	802.419	233+85.622	42.804 RT
12	BY2-12	244920.2570	308571.8740	807.770	235+68.442	59.888 RT

BY3

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
14	BY3-14	245087.4090	308851.2780	824.186	238+20.878	145.986 LT
Y11	BL-11	244974.4500	308717.3020	819.433	237+04.480	14.810 LT

BY4

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
Y111	BL-11	244974.4500	308717.3020	819.433	237+04.480	14.810 LT
13	BY4-13	244870.7540	308693.4610	821.932	236+95.920	91.246 RT

BY5

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
19	BY5-19	245100.1060	309085.4220	831.819	240+75.829	177.810 LT
Y17	BL-17	244936.2472	309104.4498	823.538	240+96.052	14.052 LT
20	BY5-20	244866.7690	309148.8010	820.024	241+39.037	55.977 RT

BY6

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
28	BY6-28	245104.8015	309387.8810	819.031	243+98.992	160.759 LT
27	BY6-27	245059.5690	309492.0480	824.428	244+94.173	104.587 LT
26	BY6-26	245091.1740	309602.7580	832.670	245+96.133	131.474 LT
25	BY6-25	244988.5380	309638.9270	838.320	246+31.433	29.366 LT
24	BY6-24	245032.8690	309724.3660	840.152	247+10.401	78.951 LT
22	BY6-22	245092.8330	309809.9120	834.380	247+82.403	148.997 LT
Y21	BL-21	244925.7918	309858.7090	823.828	248+54.932	8.973 RT

BY7

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
29	BY7-29	244856.8130	309886.4460	814.527	248+92.606	73.067 RT
Y231	BL-23	244885.5055	310169.1163	817.981	251+66.585	13.820 RT

BY8

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
123	BY8-123	244981.5410	310181.9580	824.471	251+77.877	82.431 LT
Y23	BL-23	244885.5055	310169.1163	817.981	251+66.585	13.820 RT

BY9

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
31	BY9-31	244986.9330	310523.9000	821.491	255+20.366	90.641 LT
Y30	BL-30	244909.3785	310421.2697	817.371	254+18.360	12.267 LT

BY10

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
35	BY10-35	244989.0400	310735.7150	823.520	257+51.606	67.867 LT
34	BY10-34	244908.7900	310763.9810	823.091	257+59.382	16.880 RT
36	BY10-36	244837.6740	310814.3940	827.426	257+87.248	98.863 RT

BY11

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
39	BY11-39	245148.8780	311228.8670	831.739	262+73.762	75.653 LT
Y37	BL-37	245061.4900	311236.8100	830.791	262+55.449	10.163 RT
38	BY11-38	245004.4410	311256.2410	835.698	262+57.100	70.408 RT

BY12

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
41	BY12-41	245201.5460	311444.1720	836.917	264+90.030	69.432 LT
Y40	BL-40	245125.9970	311467.1692	837.739	264+95.484	9.351 RT
42	BY12-42	245061.3090	311474.8760	843.946	264+87.695	73.938 RT

BY13

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
Y43	BL-43	245222.5723	311796.2115	854.443	268+35.502	17.682 LT
44	BY13-44	245089.9270	311816.0410	857.398	268+47.426	115.998 RT

BY14

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
45	BY14-45	245361.4290	311860.7400	857.904	268+95.008	154.956 LT
Y44	BY13-44	245089.9270	311816.0410	857.428	268+47.426	115.998 RT

BY15

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
48	BY15-48	245255.6720	311763.7020	855.128	268+08.122	53.875 LT
47	BY15-47	245232.1730	311854.8820	852.605	268+92.361	25.603 LT
49	BY15-49	245226.8540	311960.5970	844.168	269+94.941	30.554 LT
50	BY15-50	245235.1310	312078.7110	833.571	271+10.795	54.992 LT

BY16

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
53	BY16-53	245126.0070	312529.7500	828.237	275+72.554	8.917 LT
55	BY16-55	245044.0170	312483.6110	840.086	275+38.126	78.638 RT

BY17

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
56	BY17-56	245166.7290	312877.9360	809.871	279+27.155	88.394 LT
Y54	BL-54	245068.5830	312909.5127	810.774	279+55.349	11.219 RT
57	BY17-57	244908.7550	312838.9130	818.253	278+89.433	169.541 RT

BY18

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
Y59	BL-59	245177.5640	313479.6210	801.341	285+34.648	5.947 RT
60	BY18-60	245097.9850	313485.6820	801.061	285+25.682	85.252 RT

BY19

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
61	BY19-61	245239.2060	313420.3120	801.411	284+87.946	65.721 LT
63	BY19-63	245219.9800	313669.5850	800.705	287+26.684	16.427 RT

BY20

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
Y63	BY19-63	245219.9800	313669.5855	800.709	287+26.685	16.427 RT
65	BY20-65	245143.0080	313714.0950	799.467	287+34.670	104.989 RT

BY21

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
66	BY21-66	245479.6360	313889.3310	800.745	290+20.578	117.663 LT
Y64	BL-64	245376.4940	313988.8088	795.764	290+08.519	13.575 LT

BY22

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
70	BY22-70	245432.4100	314270.9120	799.757	293+48.479	73.376 LT
69	BY22-69	245355.4500	314253.2270	795.235	293+56.917	5.078 RT
Y67	BL-67	245355.4083	314253.2178	796.701	293+56.923	5.121 RT

BY23

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
72	BY23-72	245275.6300	314645.2890	797.569	297+40.127	126.259 LT
Y71	BL-71	245147.6288	314598.5735	792.064	297+61.339	8.471 RT

BY24

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
Y711	BL-71	245147.6288	314598.5735	792.064	297+61.339	8.471 RT
74	BY24-74	245100.6350	314743.2830	789.240	299+12.425	11.070 LT
75	BY24-75	245098.7450	314919.4310	788.277	300+76.118	76.235 LT

BY25

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
Y73	BL-73	245018.2670	314934.4610	786.797	301+20.591	7.498 LT
76	BY25-76	244914.8760	314913.0770	788.493	301+40.082	96.266 RT

BY26

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
79	BY26-79	244914.5955	315446.2218	780.123	306+33.374	105.985 LT
Y78	BL-78	244795.4830	315481.2680	789.493	307+11.038	9.112 LT
80	BY26-80	244686.8720	315454.4950	794.058	307+27.527	101.528 RT

BY27

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
87	BY27-87	244641.4778	315936.9970	786.805	310+59.822	93.597 RT
86	BY27-86	244700.5470	315936.1260	783.754	311+54.021	72.785 RT
85	BY27-85	244783.4760	315998.9680	786.468	312+40.544	37.920 RT
83	BY27-83	244847.7290	315996.6730	785.075	312+80.201	11.981 LT

BY28

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
Y88	BL-88	245066.8970	316311.6555	770.999	316+60.132	21.502 LT
90	BY28-90	244962.1830	316224.5790	779.057	315+37.306	42.597 RT
93	BY28-93	244860.2260	316206.6750	788.757	314+55.986	119.175 RT

BY29

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
92	BY29-92	245203.5240	316249.7820	774.129	316+43.787	170.285 LT
89	BY29-89	245102.9170	316267.4190	772.692	316+31.203	69.275 LT
Y881	BL-88	245066.8970	316311.6555	770.999	316+60.132	21.502 LT

BY30

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
94	BY30-94	245212.3140	316485.3040	776.547	318+34.626	141.928 LT
Y91	BL-91	245057.9020	316491.6345	769.091	318+35.909	12.610 RT

BY31

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
Y97	BL-97	244944.0438	317204.7015	767.266	325+70.388	14.253 RT
98	BY31-98	244932.2410	317260.7880	766.341	326+27.465	24.758 RT
100	BY31-100	244836.4790	317211.8110	763.547	325+79.123	121.698 RT

BY32

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
102	BY32-102	244969.8490	317519.8970	767.166	328+33.274	107.092 LT
Y991	BL-99	244918.2740	317430.9767	765.684	327+99.049	12.689 LT

BY33

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
101	BY33-101	245001.6150	317410.4530	768.894	327+48.867	76.564 LT
Y99	BL-99	244918.2740	317430.9767	765.684	327+99.049	12.689 LT

BY34

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
Y105	BL-105	244447.0420	318040.6090	759.177	335+93.367	17.522 RT
106	BY34-106	244369.0280	317975.1900	758.517	335+52.977	110.173 RT

BY35

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
109	BY35-109	244500.9370	318523.5070	757.924	340+80.395	77.531 LT
Y108	BL-108	244408.8775	318485.3930	755.697	340+36.993	12.169 RT

BY36

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
Y110	BL-110	244420.6428	318711.9050	763.935	342+64.105	13.364 RT
111	BY36-111	244284.9060	318828.7350	754.652	344+53.849	123.296 RT

BY37

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
116	BY37-116	244361.1020	319065.3870	763.543	346+02.859	86.266 LT
114	BY37-114	244237.6610	319053.4430	757.404	OUTSIDE PROJECT LIMITS	
117	BY37-117	244140.8700	319027.4920	752.590	OUTSIDE PROJECT LIMITS	

BY38

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
120	BY38-120	244378.4850	319687.9990	744.615	OUTSIDE PROJECT LIMITS	
Y119	BL-119	244242.7370	319609.1800	748.171	OUTSIDE PROJECT LIMITS	

BY39

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
Y1191	BL-119	244242.7370	319609.1800	748.171	OUTSIDE PROJECT LIMITS	
121	BY39-121	244116.5330	319544.8080	750.722	OUTSIDE PROJECT LIMITS	

BM1 ELEVATION = 774.815
N 244742 E 307455
L STATION 224+38
S 1° 14' 24.5" E DIST 175.429
SPIKE IN BASE OF 36" OAK

BM2 ELEVATION = 822.428
N 244840 E 308712
L STATION 237+19 119 RIGHT
SPIKE IN BASE OF 12" MAPLE

BM3 ELEVATION = 837.089
N 245092 E 309815
L STATION 247+87 148 LEFT
SPIKE IN BASE OF 14" LOCUST

BM4 ELEVATION = 825.544
N 245068 E 310810
L STATION 258+49 122 LEFT
SPIKE IN BASE OF 14" POPLAR

BM5 ELEVATION = 851.192
N 245232 E 311723
L STATION 267+68 36 LEFT
SPIKE IN BASE OF 24" FORKED LOCUST

BM6 ELEVATION = 816.802
N 244941 E 312842
L STATION 278+91 138 RIGHT
SPIKE IN BASE OF 15" DOUBLE LOCUST

BM7 ELEVATION = 803.589
N 245270 E 313437
L STATION 285+10 93 LEFT
SPIKE IN BASE OF 10" MAPLE

BM8 ELEVATION = 794.759
N 245196 E 314649
L STATION 297+83 58 LEFT
SPIKE IN BASE OF 10" OAK

BM9 ELEVATION = 796.952
N 244672 E 315466
L STATION 307+44 111 RIGHT
SPIKE IN BASE OF 20" WALNUT

BM10 ELEVATION = 781.044
N 245166 E 316291
L STATION 316+67 123 LEFT
SPIKE IN BASE OF 16" OAK

BM11 ELEVATION = 765.845
N 244805 E 317197
L STATION 325+64 154 RIGHT
SPIKE IN BASE OF 30" WAHOO

BM12 ELEVATION = 758.772
N 244335 E 317962
L STATION 335+51 147 RIGHT
SPIKE IN BASE OF 35" SYCAMORE

BM13 ELEVATION = 758.116
N 244152 E 319014
L STATION 346+17
S 2° 20' 47.1" W DIST 134.552
SPIKE IN BASE OF 9" POPLAR

BM14 ELEVATION = 744.678
N 244370 E 319695
L STATION 346+17
N 82° 59' 15.0" E DIST 680.630
SPIKE IN BASE OF 24" POPLAR

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "R2519A1"
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 244860.731(m) EASTING: 307037.904(m)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999822000
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "R2519A1" TO -L- STATION 224+30.000 IS
N 82°14'01" E 417.095m
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

NOTES:

THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO EXISTING NCGS AND NCDOT MONUMENTS USING USING A NAD 83/95 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.

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:

R2519A_LS_GPSCALIB_030710.HTML
R2519A_LS_WGS84_030710.TXT
R2519A_LS_LOCAL_030710.TXT
R2519A_LS_CONTROL_030710.TXT

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

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2

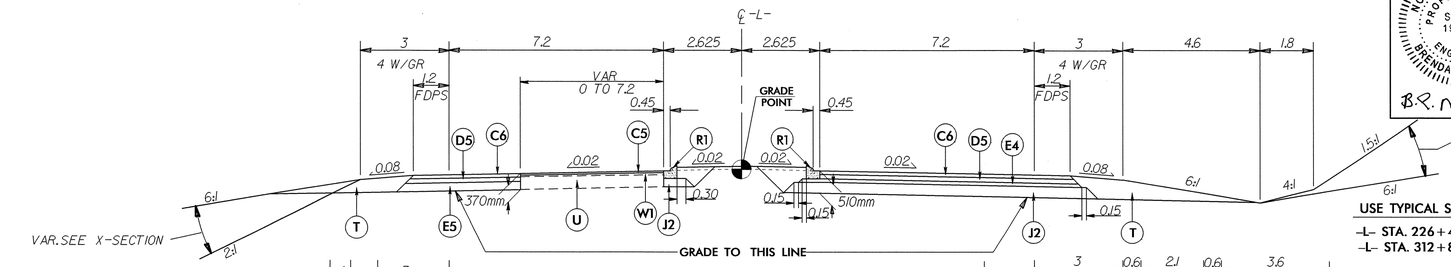
ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE — 3/4/11

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER DUN-CHI CHEN — 2/2/11

FINAL PAVEMENT SCHEDULE

C1	PROP. APPROX. 60 mm ASPHALT CONC. SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 70.5 kg PER SQ. METER IN EACH OF TWO LAYERS.
C2	PROP. APPROX. 40 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 96 kg PER SQ. METER.
C3	PROP. APPROX. 80 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 96 kg PER SQ. METER IN EACH OF TWO LAYERS.
C4	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 2.4 kg PER SQ. METER PER 1 mm DEPTH,TO BE PLACED IN LAYERS NOT TO EXCEED 50 mm IN DEPTH.
C5	PROP. APPROX. 40 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 96 kg PER SQ. METER.
C6	PROP. APPROX. 80 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 96 kg PER SQ. METER IN EACH OF TWO LAYERS.
C7	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 2.4 kg PER SQ. METER PER 1 mm DEPTH,TO BE PLACED IN LAYERS NOT TO EXCEED 50 mm IN DEPTH.
D1	PROP. APPROX. 65 mm ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 159.25 kg PER SQ. METER.
D2	PROP. APPROX. 80 mm ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 196 kg PER SQ. METER.
D3	PROP. VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 2.45 kg PER SQ. METER PER 1 mm DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 65 mm OR GREATER THAN 110 mm IN DEPTH.
D4	PROP. APPROX. 65 mm ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 159.25 kg PER SQ. METER.
D5	PROP. APPROX. 100 mm ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 245 kg PER SQ. METER.
D6	PROP. VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 2.45 kg PER SQ. METER PER 1 mm DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 65 mm OR GREATER THAN 110 mm IN DEPTH.
E1	PROP. APPROX. 100 mm ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 245 kg PER SQ. METER.
E2	PROP. APPROX. 120 mm 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 1 mm DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 75 mm IN DEPTH OR GREATER THAN 140 mm IN DEPTH.
E4	PROP. APPROX. 80 mm ASPHALT CONC. BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 196 kg PER SQ. METER.
E5	PROP. APPROX. 190 mm ASPHALT CONC. BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 232.75 kg PER SQ. METER IN EACH OF TWO LAYERS.
E6	PROP. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 2.45 kg PER SQ. METER PER 1 mm DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 75 mm IN DEPTH OR GREATER THAN 140 mm IN DEPTH.
J1	PROP. 200 mm AGGREGATE BASE COURSE.
J2	PROP. 250 mm AGGREGATE BASE COURSE.
R1	450 mm CONCRETE CURB AND GUTTER.
R2	750 mm CONCRETE CURB AND GUTTER.
R3	CONCRETE EXPRESSWAY GUTTER.
R4	SHOULDER BERM GUTTER.
S	100 mm CONCRETE SIDEWALK.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	INCIDENTAL STONE
W1	VARIABLE DEPTH ASPHALT PAVEMENT. (SEE WEDGING DETAIL 1)
W2	VARIABLE DEPTH ASPHALT PAVEMENT. (SEE WEDGING DETAIL 2)
W3	VARIABLE DEPTH ASPHALT PAVEMENT. (SEE WEDGING DETAIL 3)

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



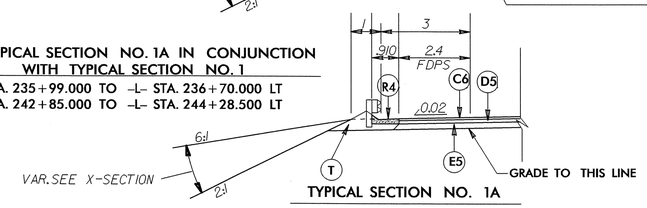
USE TYPICAL SECTION NO. 1

-L- STA. 226+40.000 TO -L- STA. 245+20.000
-L- STA. 312+80.000 TO -L- STA. 314+20.000

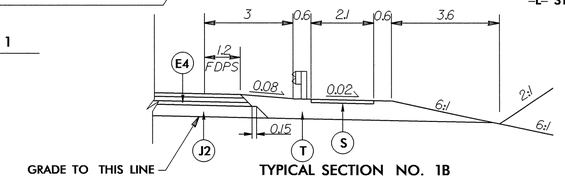
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1A IN CONJUNCTION WITH TYPICAL SECTION NO. 1

-L- STA. 235+99.000 TO -L- STA. 236+70.000 LT
-L- STA. 242+85.000 TO -L- STA. 244+28.500 LT



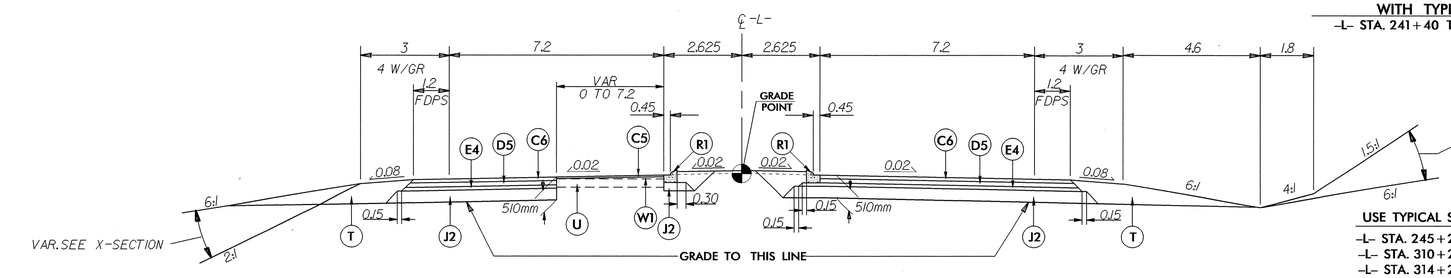
TYPICAL SECTION NO. 1A



TYPICAL SECTION NO. 1B

USE TYPICAL SECTION NO. 1B IN CONJUNCTION WITH TYPICAL SECTION NO. 1

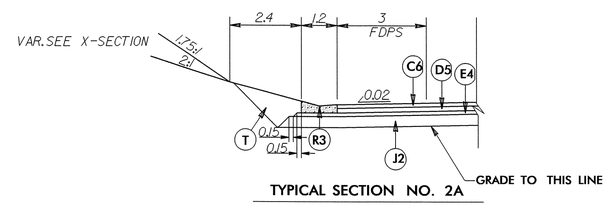
-L- STA. 241+40 TO -L- STA. 244+80 RT



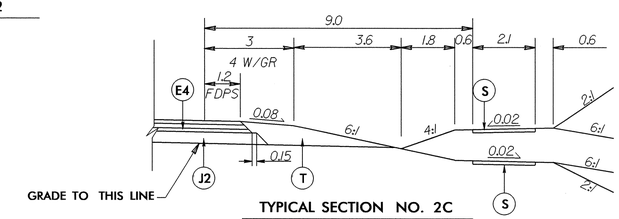
USE TYPICAL SECTION NO. 2

-L- STA. 245+20.000 TO -L- STA. 247+60.000
-L- STA. 310+20.000 TO -L- STA. 312+80.000
-L- STA. 314+20.000 TO -L- STA. 315+60.000

TYPICAL SECTION NO. 2



TYPICAL SECTION NO. 2A



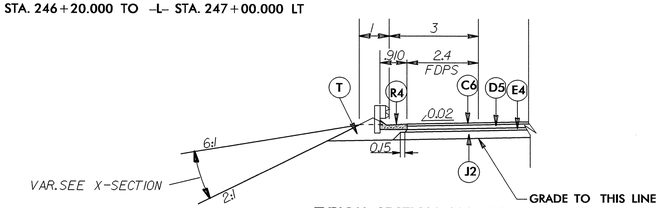
TYPICAL SECTION NO. 2C

USE TYPICAL SECTION NO. 2A IN CONJUNCTION WITH TYPICAL SECTION NO. 2

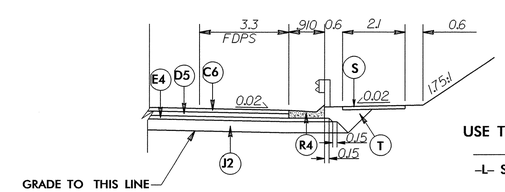
-L- STA. 246+20.000 TO -L- STA. 247+00.000 LT

USE TYPICAL SECTION NO. 2C IN CONJUNCTION WITH TYPICAL SECTION NO. 1, 2 AND 3

-L- STA. 237+25 TO -L- STA. 241+40 RT
-L- STA. 246+80 TO -L- STA. 251+65 RT



TYPICAL SECTION NO. 2B



TYPICAL SECTION NO. 2D

USE TYPICAL SECTION NO. 2D IN CONJUNCTION WITH TYPICAL SECTION NO. 1 AND 2

-L- STA. 244+80.000 TO -L- STA. 246+80.000 RT

USE TYPICAL SECTION NO. 2B IN CONJUNCTION WITH TYPICAL SECTION NO. 1, 2, 6

-L- STA. 226+40.000 TO -L- STA. 226+83.000 RT
-L- STA. 227+52.000 TO -L- STA. 230+45.000 RT
-L- STA. 230+73.000 TO -L- STA. 232+12.000 RT
-L- STA. 232+98.000 TO -L- STA. 233+50.000 RT
-L- STA. 234+99.000 TO -L- STA. 236+30.000 RT
-L- STA. 305+29.000 RT TO -Y26- STA. 10+50.000 LT
-L- STA. 312+66.000 TO -L- STA. 313+45.000 LT
-L- STA. 313+36.000 TO -L- STA. 314+13.000 RT
-L- STA. 327+80.000 TO -L- STA. 328+72.000 RT
-L- STA. 340+79.000 TO -Y36- STA. 10+84.000 RT

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FINAL PAVEMENT SCHEDULE	
C5	40mm, TYPE S9.5C
C6	80mm, TYPE S9.5C
D5	100mm, TYPE I19.0C
E4	80mm, TYPE B25.0C
E5	190mm, TYPE B25.0C
J2	250mm, ABC
R1	450mm, C & G
R2	750mm, C & G
R3	CONC. EXPWY GUTTER
S	100mm, SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W1	WEDGING DETAIL 1

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-A

ROADWAY DESIGN ENGINEER

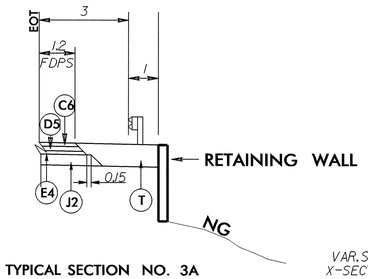
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE

B.R. Moore 9/4/11

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER DAVID CHI CHEN

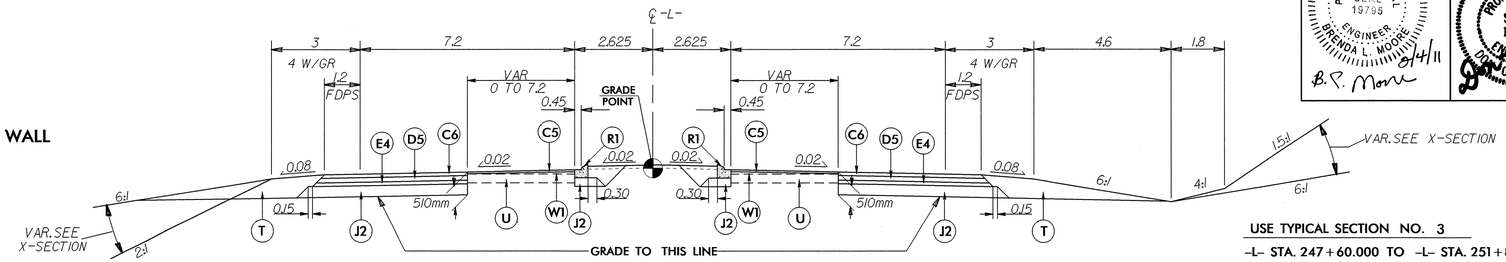
2/2/11



TYPICAL SECTION NO. 3A

USE TYPICAL SECTION NO. 3A IN CONJUNCTION WITH TYPICAL SECTION NO. 3

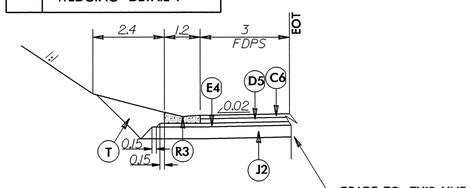
-L- STA. 299+60.000 RT TO -L- STA. 300+60.000 RT



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

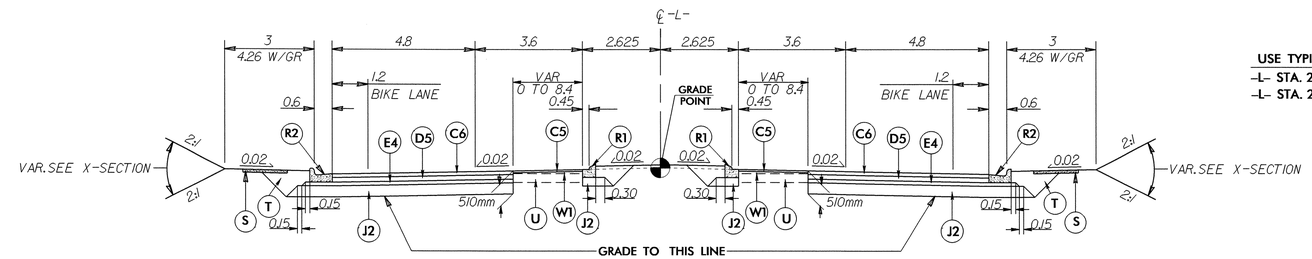
-L- STA. 247+60.000 TO -L- STA. 251+83.430
-L- STA. 299+76.000 TO -L- STA. 310+20.000
-L- STA. 315+60.000 TO -L- STA. 316+20.000



TYPICAL SECTION NO. 3B

USE TYPICAL SECTION NO. 3B IN CONJUNCTION WITH TYPICAL SECTION NO. 3

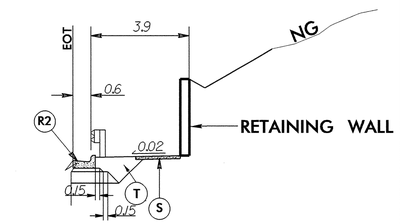
-L- STA. 309+40.000 TO -L- STA. 309+85.000 LT



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4

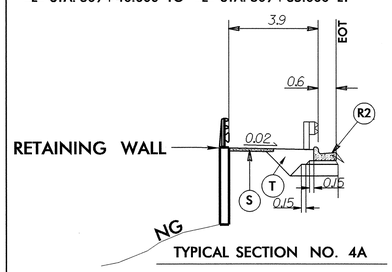
-L- STA. 251+83.430 TO -L- STA. 280+00.000
-L- STA. 286+20.000 TO -L- STA. 299+76.000



TYPICAL SECTION NO. 4B

USE TYPICAL SECTION NO. 4B IN CONJUNCTION WITH TYPICAL SECTION NO. 4

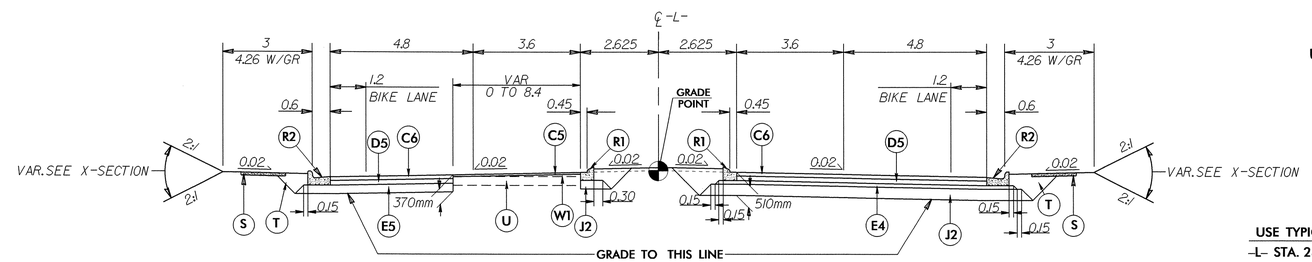
-L- STA. 266+80.000 TO -L- STA. 268+14.000 RT



TYPICAL SECTION NO. 4A

USE TYPICAL SECTION NO. 4A IN CONJUNCTION WITH TYPICAL SECTION NO. 4

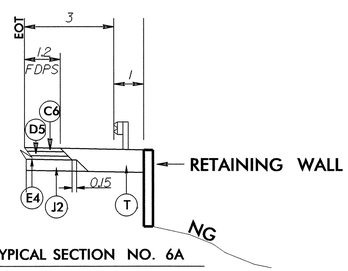
-L- STA. 256+27.000 TO -L- STA. 257+20.000 RT
-L- STA. 269+40.000 TO -L- STA. 271+20.000 LT
-L- STA. 277+48.000 TO -L- STA. 279+20.000 LT
-L- STA. 290+10.000 TO -L- STA. 291+65.000 RT



TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5

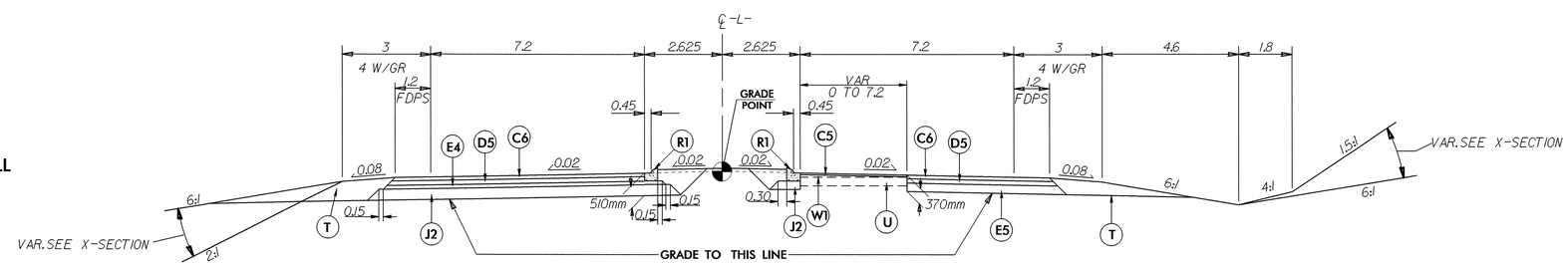
-L- STA. 280+00.000 TO -L- STA. 286+20.000



TYPICAL SECTION NO. 6A

USE TYPICAL SECTION NO. 6A IN CONJUNCTION WITH TYPICAL SECTION NO. 6

-L- STA. 318+30.000 RT TO -L- STA. 318+50.000 RT
-L- STA. 341+22.000 RT TO -L- STA. 341+80.000 RT



TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 6

-L- STA. 316+20.000 TO -L- STA. 344+00.000

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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-B

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE

3/4/11

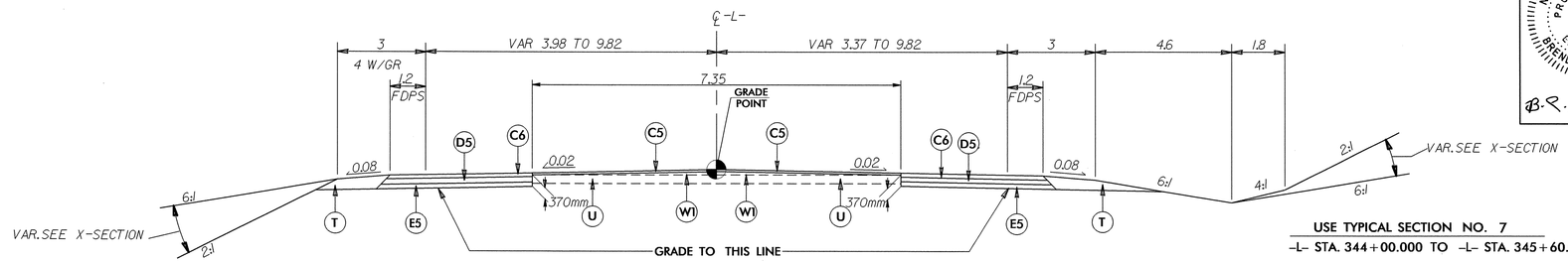
B.R. Moore

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER DUNG-CHI CHEN

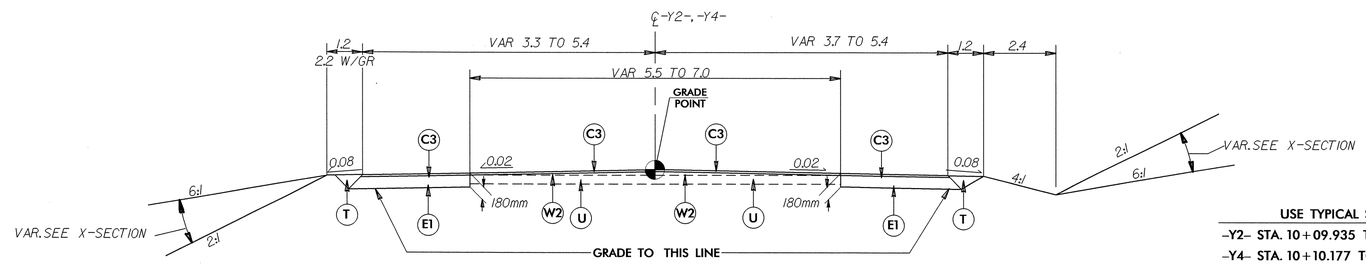
2/12/11

FINAL PAVEMENT SCHEDULE	
C3	80mm, TYPE S9.5B
C5	40mm, TYPE S9.5C
C6	80mm, TYPE S9.5C
D5	100mm, TYPE I19.0C
E1	100mm, TYPE B25.0B
E5	190mm, TYPE B25.0C
R3	CONC. EXPWY GUTTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W1	WEDGING DETAIL 1
W2	WEDGING DETAIL 2



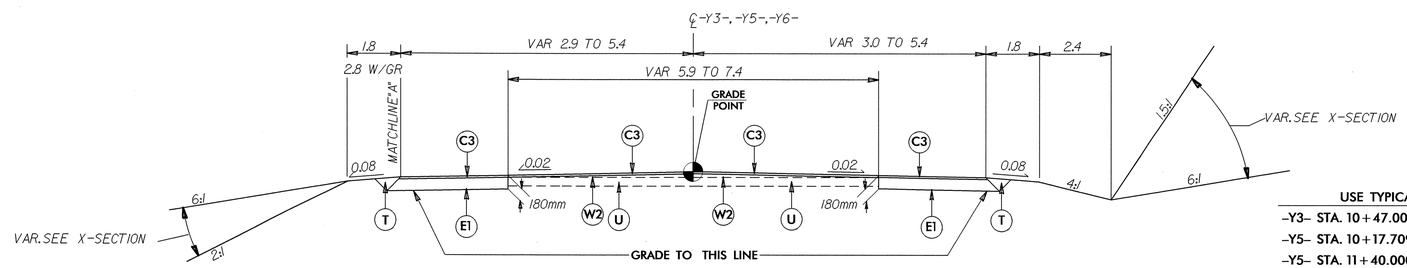
TYPICAL SECTION NO. 7

USE TYPICAL SECTION NO. 7
-L- STA. 344+00.000 TO -L- STA. 345+60.000



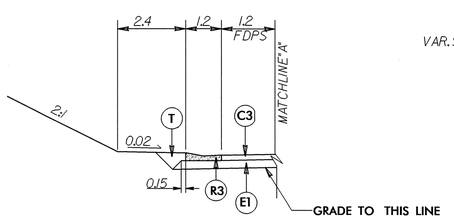
TYPICAL SECTION NO. 8

USE TYPICAL SECTION NO. 8
-Y2- STA. 10+09.935 TO -Y2- STA. 10+83.900
-Y4- STA. 10+10.177 TO -Y4- STA. 11+34.000



TYPICAL SECTION NO. 9

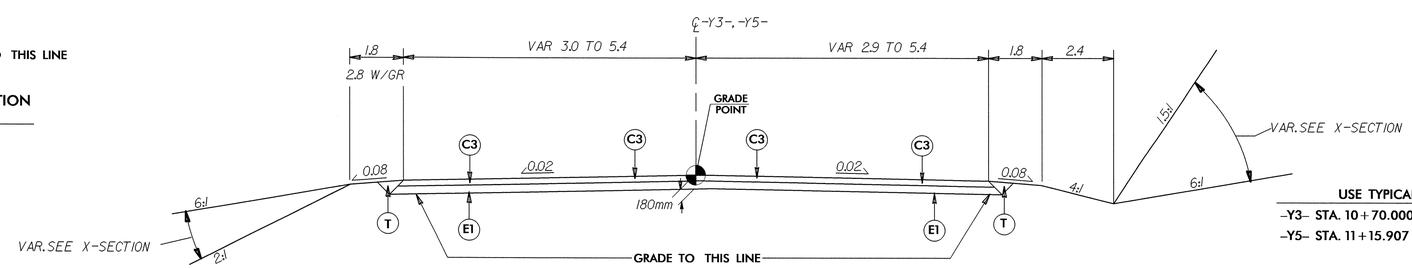
USE TYPICAL SECTION NO. 9
-Y3- STA. 10+47.000 TO -Y3- STA. 10+70.000
-Y5- STA. 10+17.709 TO -Y5- STA. 10+95.923
-Y5- STA. 11+40.000 TO -Y5- STA. 11+93.760
-Y6- STA. 10+50.340 TO -Y6- STA. 11+30.114



TYPICAL SECTION NO. 9A

USE TYPICAL SECTION NO. 9A IN CONJUNCTION WITH TYPICAL SECTION NO. 9

-Y3- STA. 10+66.200 TO -L- STA. 11+50.000 LT



TYPICAL SECTION NO. 10

USE TYPICAL SECTION NO. 10
-Y3- STA. 10+70.000 TO -Y3- STA. 11+70.994
-Y5- STA. 11+15.907 TO -Y5- STA. 11+40.000

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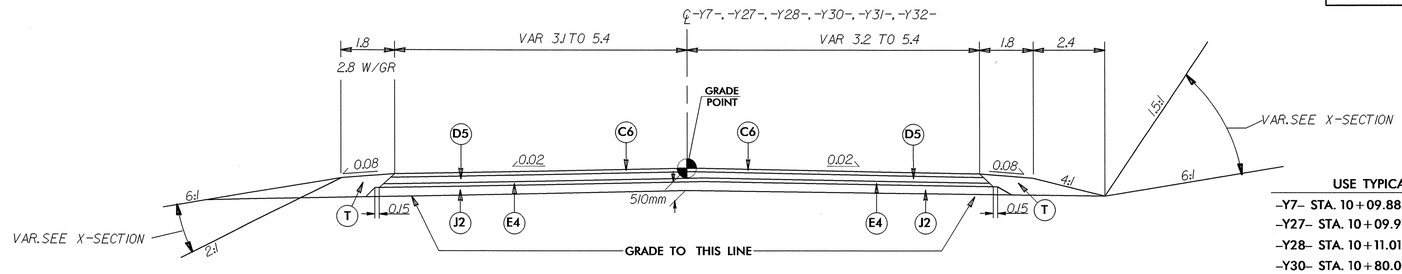
PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-C
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE 3/4/11

NORTH CAROLINA PROFESSIONAL SEAL 13396 ENGINEER DONCHI CHEN 2/2/11

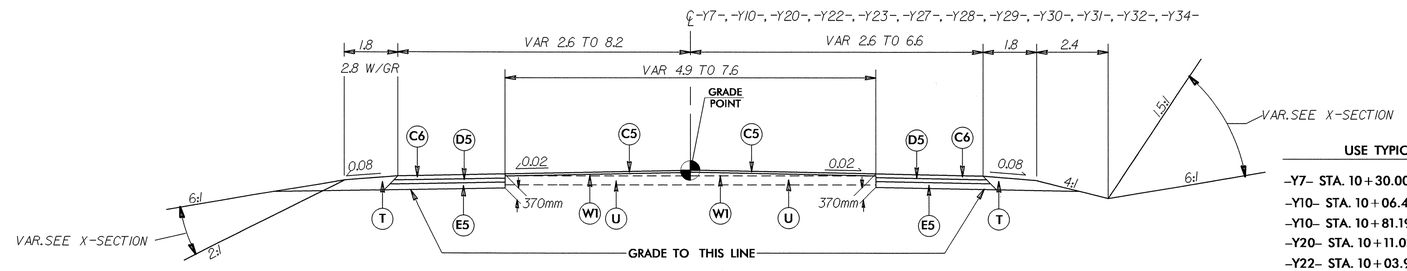
FINAL PAVEMENT SCHEDULE	
C3	80mm, TYPE S9.5B
C5	40mm, TYPE S9.5C
C6	80mm, TYPE S9.5C
D1	65mm, TYPE I19.0B
D5	100mm, TYPE I19.0C
E1	100mm, TYPE B25.0B
E4	80mm, TYPE B25.0C
E5	190mm, TYPE B25.0C
J2	250mm, ABC
R2	750mm, C & G
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W1	WEDGING DETAIL 1
W3	WEDGING DETAIL 3



TYPICAL SECTION NO. 11

USE TYPICAL SECTION NO. 11

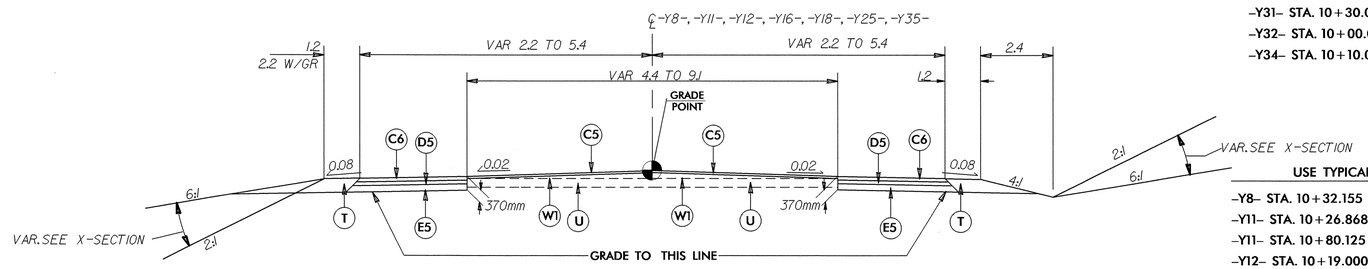
-Y7- STA. 10+09.883 TO -Y7- STA. 10+30.000
-Y27- STA. 10+09.917 TO -Y27- STA. 10+80.000
-Y28- STA. 10+11.019 TO -Y28- STA. 10+60.000
-Y30- STA. 10+80.000 TO -Y30- STA. 11+07.189
-Y31- STA. 10+09.841 TO -Y31- STA. 10+30.000
-Y32- STA. 10+10.000 TO -Y32- STA. 10+59.314



TYPICAL SECTION NO. 12

USE TYPICAL SECTION NO. 12

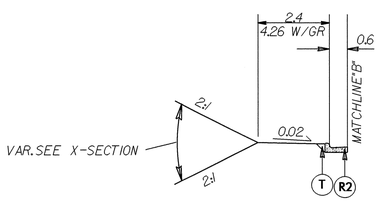
-Y7- STA. 10+30.000 TO -Y7- STA. 10+40.720
-Y10- STA. 10+06.458 TO -Y10- STA. 10+59.121
-Y10- STA. 10+81.191 TO -Y10- STA. 11+40.912
-Y20- STA. 10+11.029 TO -Y20- STA. 10+72.980
-Y22- STA. 10+03.955 TO -Y22- STA. 10+66.203
-Y23- STA. 10+37.000 TO -Y23- STA. 10+77.414
-Y27- STA. 10+80.000 TO -Y27- STA. 10+95.550
-Y28- STA. 10+60.000 TO -Y28- STA. 10+67.662
-Y29- STA. 11+00.000 TO -Y29- STA. 11+31.399
-Y30- STA. 10+28.278 TO -Y30- STA. 10+80.000
-Y31- STA. 10+30.000 TO -Y31- STA. 10+58.994
-Y32- STA. 10+00.000 TO -Y32- STA. 10+10.000
-Y34- STA. 10+10.082 TO -Y34- STA. 10+89.563



TYPICAL SECTION NO. 13

USE TYPICAL SECTION NO. 13

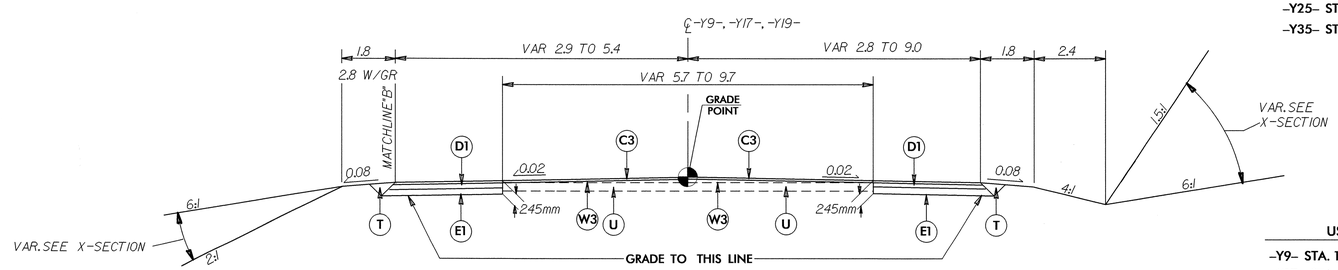
-Y8- STA. 10+32.155 TO -Y8- STA. 10+60.264
-Y11- STA. 10+26.868 TO -Y11- STA. 10+58.037
-Y11- STA. 10+80.125 TO -Y11- STA. 11+38.355
-Y12- STA. 10+19.000 TO -Y12- STA. 10+30.000
-Y12- STA. 10+90.000 TO -Y12- STA. 11+15.000
-Y16- STA. 10+70.000 TO -Y16- STA. 10+90.198
-Y18- STA. 10+25.000 TO -Y18- STA. 10+31.000
-Y25- STA. 10+09.869 TO -Y25- STA. 10+69.019
-Y35- STA. 10+64.255 TO -Y35- STA. 10+90.000



TYPICAL SECTION NO. 14A.

USE TYPICAL SECTION NO. 14A IN CONJUNCTION WITH TYPICAL SECTION NO. 14

-Y17- STA. 10+80.000 TO -Y17- STA. 11+47.744 LT
-Y17- STA. 11+69.832 TO -Y17- STA. 12+94.160 RT



TYPICAL SECTION NO. 14

USE TYPICAL SECTION NO. 14

-Y9- STA. 11+24.000 TO -Y9- STA. 11+68.066
-Y17- STA. 10+25.000 TO -Y17- STA. 11+47.744
-Y17- STA. 11+69.832 TO -Y17- STA. 13+40.000
-Y19- STA. 10+25.000 TO -Y19- STA. 12+19.754

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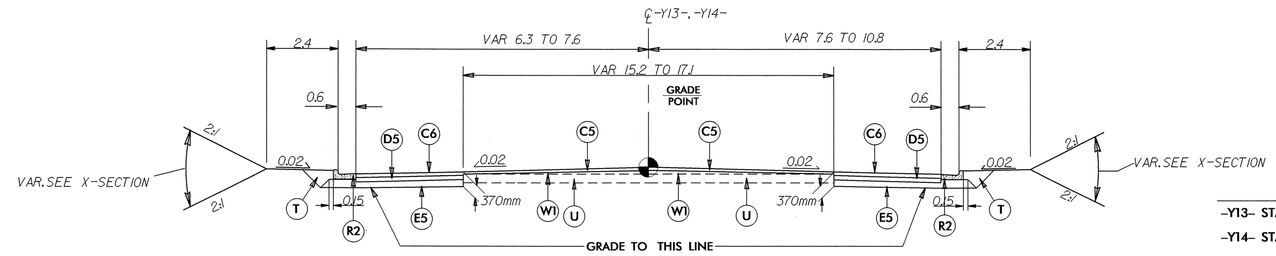
PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-D
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

METRIC

NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE 2/4/11

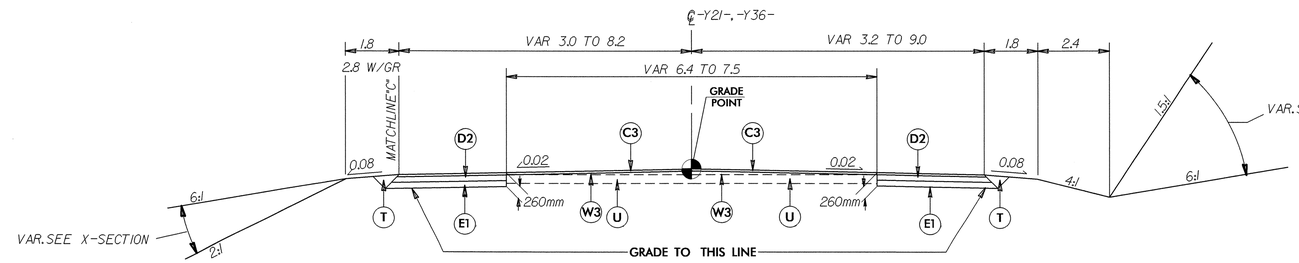
NORTH CAROLINA PROFESSIONAL SEAL 12758 ENGINEER DAN-CHI CHEN 2/2/11

FINAL PAVEMENT SCHEDULE	
C3	80mm, TYPE S9.5B
C5	40mm, TYPE S9.5C
C6	80mm, TYPE S9.5C
D2	80mm, TYPE I19.0B
D5	100mm, TYPE I19.0C
E1	100mm, TYPE B25.0B
E2	120mm, TYPE B25.0B
E5	190mm, TYPE B25.0C
R2	750mm, C & G
R4	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W1	WEDGING DETAIL 1
W2	WEDGING DETAIL 2
W3	WEDGING DETAIL 3



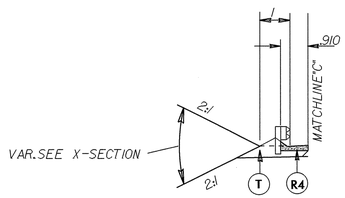
TYPICAL SECTION NO. 15

USE TYPICAL SECTION NO. 15
-Y13- STA. 10+11.026 TO -Y13- STA. 10+30.377
-Y14- STA. 10+31.355 TO -Y14- STA. 10+48.791

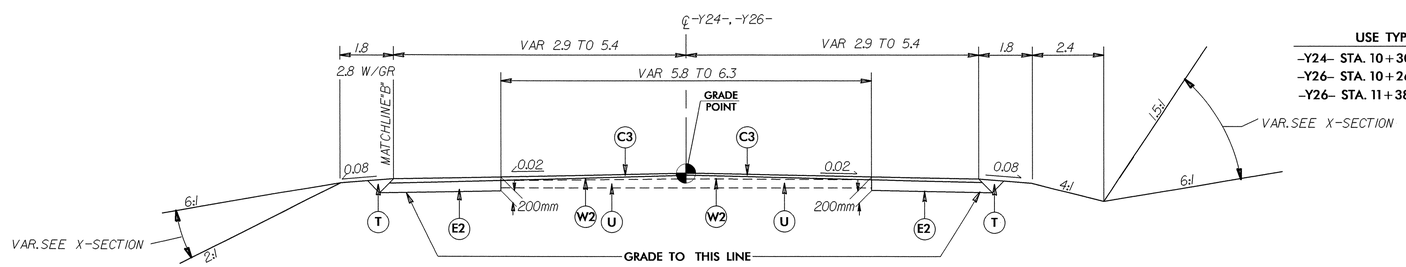


TYPICAL SECTION NO. 16

USE TYPICAL SECTION NO. 16
-Y21- STA. 10+67.500 TO -Y21- STA. 12+33.932
-Y36- STA. 10+09.826 TO -Y36- STA. 11+39.000

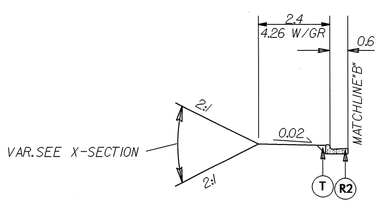


TYPICAL SECTION NO. 16A.
USE TYPICAL SECTION NO. 16A IN CONJUNCTION WITH TYPICAL SECTION NO. 16
-Y36- STA. 10+09.826 TO -Y36- STA. 10+84.015 RT

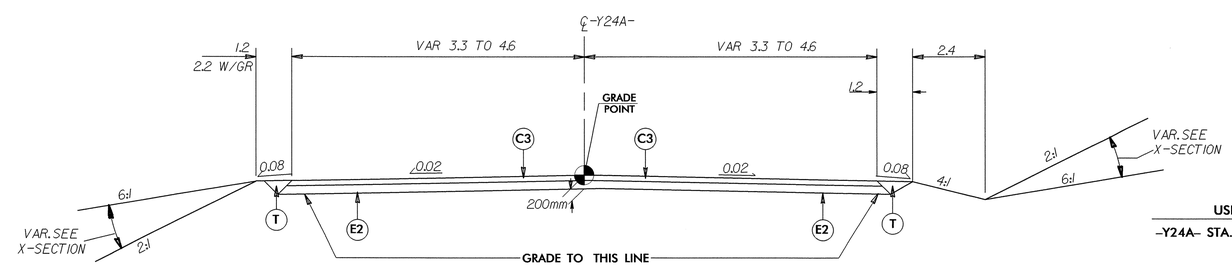


TYPICAL SECTION NO. 17

USE TYPICAL SECTION NO. 17
-Y24- STA. 10+30.144 TO -Y24- STA. 10+59.000
-Y26- STA. 10+26.848 TO -Y26- STA. 11+17.687
-Y26- STA. 11+38.531 TO -Y26- STA. 12+63.374



TYPICAL SECTION NO. 17A.
USE TYPICAL SECTION NO. 14A IN CONJUNCTION WITH TYPICAL SECTION NO. 17
-Y26- STA. 10+59.000 TO -Y26- STA. 12+63.374 LT



TYPICAL SECTION NO. 18

USE TYPICAL SECTION NO. 18
-Y24A- STA. 10+03.600 TO -Y24A- STA. 10+19.000

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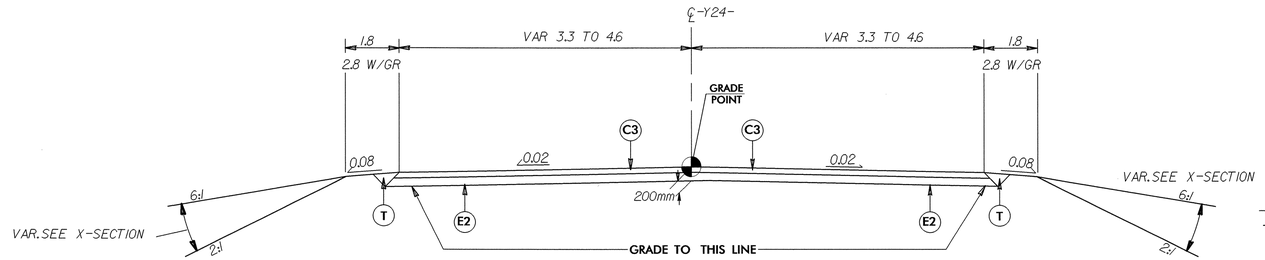
PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-E

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE — 2/4/11

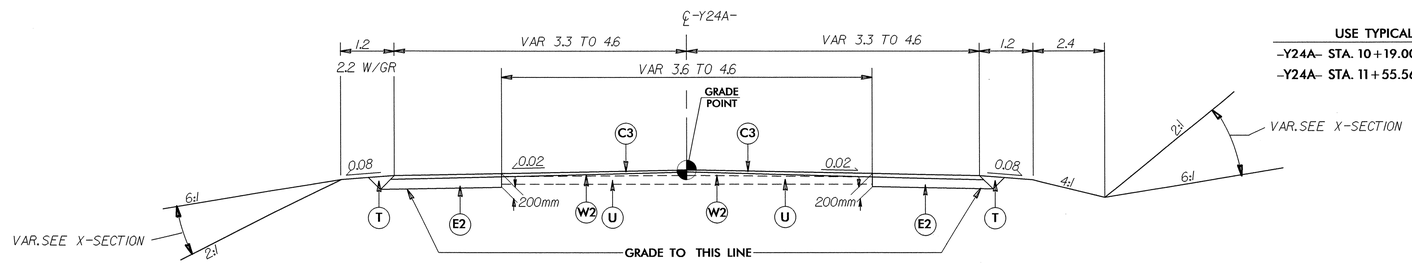
PAVEMENT DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER CHI CHEN — 2/2/11

FINAL PAVEMENT SCHEDULE	
C3	80mm, TYPE S9.5B
C4	VAR. TYPE S9.5B
C5	40mm, TYPE S9.5C
C6	80mm, TYPE S9.5C
C7	VAR. TYPE S9.5C
D1	65mm, TYPE I19.0B
D2	80mm, TYPE I19.0B
D3	VAR. TYPE I19.0B
D5	100mm, TYPE I19.0C
D6	VAR. TYPE I19.0C
E2	120mm, TYPE B25.0B
E3	VAR. TYPE B25.0B
E4	80mm, TYPE B25.0C
E6	VAR. TYPE B25.0C
J2	250mm, ABC
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W2	WEDGING DETAIL 2



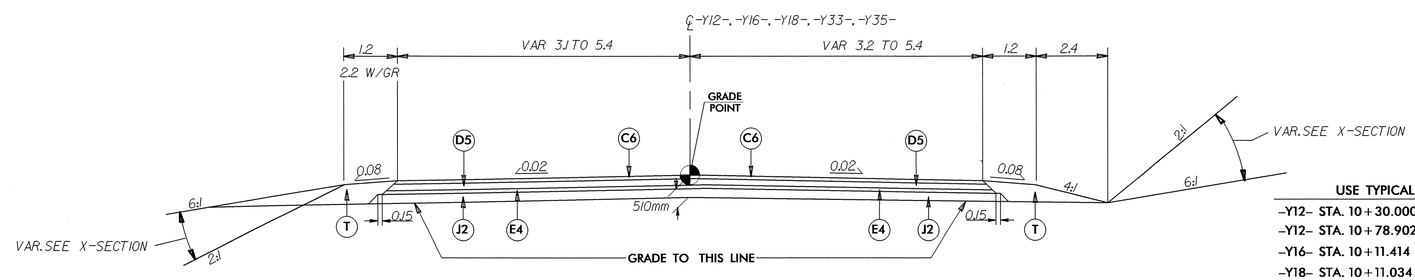
TYPICAL SECTION NO. 19

USE TYPICAL SECTION NO. 19
-Y24- STA. 10+59.000 TO -Y24- STA. 11+52.962



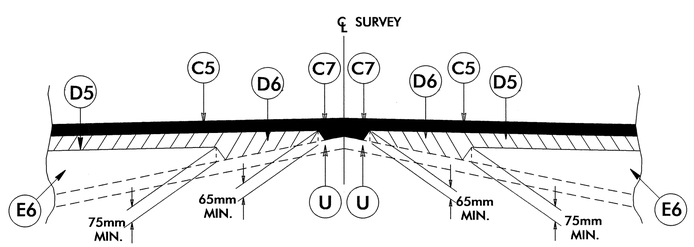
TYPICAL SECTION NO. 20

USE TYPICAL SECTION NO. 20
-Y24A- STA. 10+19.000 TO -Y24A- STA. 10+59.600
-Y24A- STA. 11+55.566 TO -Y24A- STA. 11+83.566

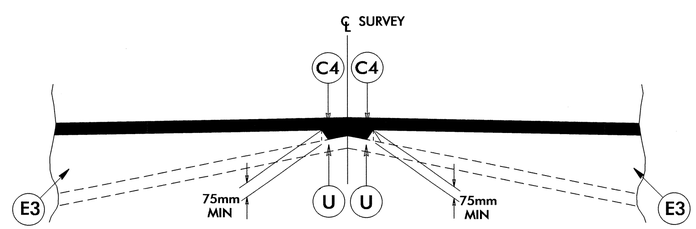


TYPICAL SECTION NO. 21

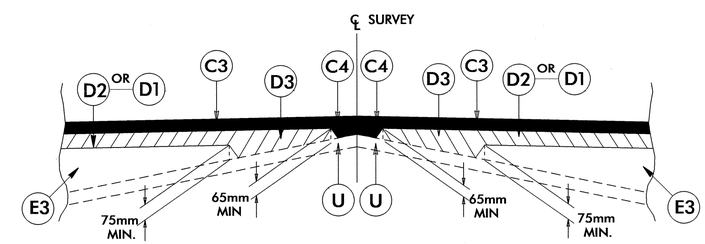
USE TYPICAL SECTION NO. 21
-Y12- STA. 10+30.000 TO -Y12- STA. 10+55.694
-Y12- STA. 10+78.902 TO -Y12- STA. 10+90.000
-Y16- STA. 10+11.414 TO -Y16- STA. 10+70.000
-Y18- STA. 10+11.034 TO -Y18- STA. 10+25.000
-Y33- STA. 10+15.000 TO -Y33- STA. 10+70.000
-Y35- STA. 10+90.000 TO -Y35- STA. 11+15.981



Wedging Detail 1



Wedging Detail 2



Wedging Detail 3

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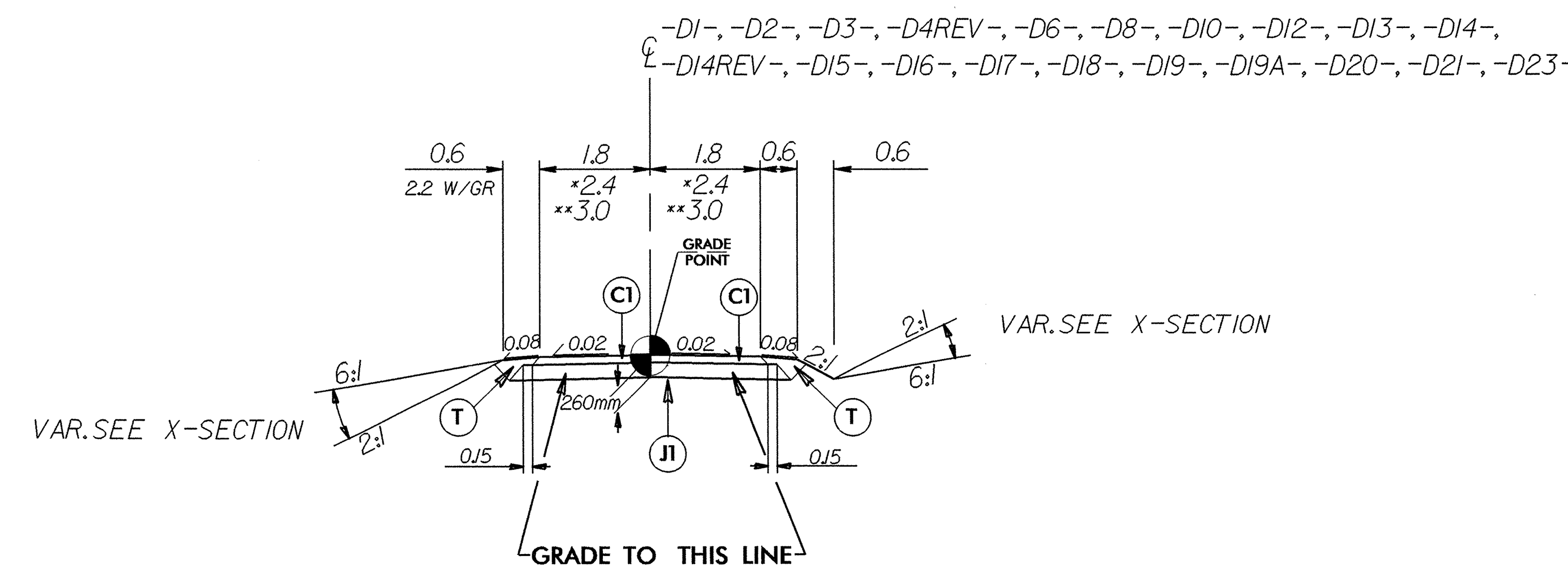
PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-F

METRIC

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE, B.P. Moore 2/4/11

PAVEMENT DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER DON CHI CHEN, 2/2/11

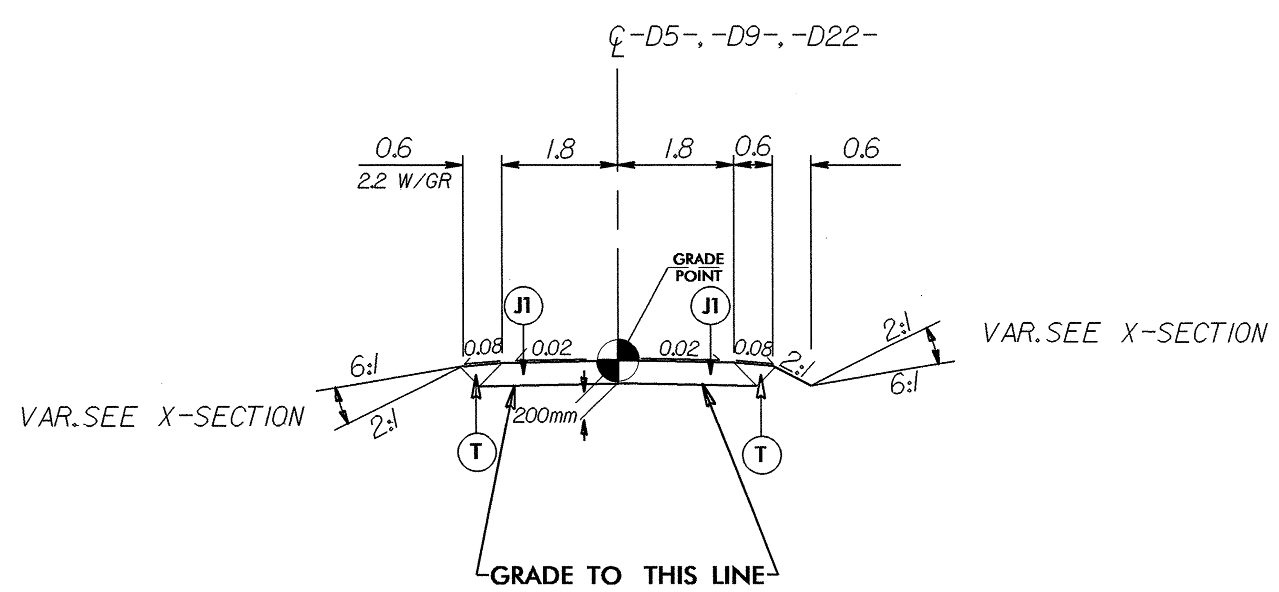
FINAL PAVEMENT SCHEDULE	
C1	60mm, TYPE SF9.5A
J1	200mm, ABC
T	EARTH MATERIAL
V	INCIDENTAL STONE



TYPICAL SECTION NO. 22

USE TYPICAL SECTION NO. 22

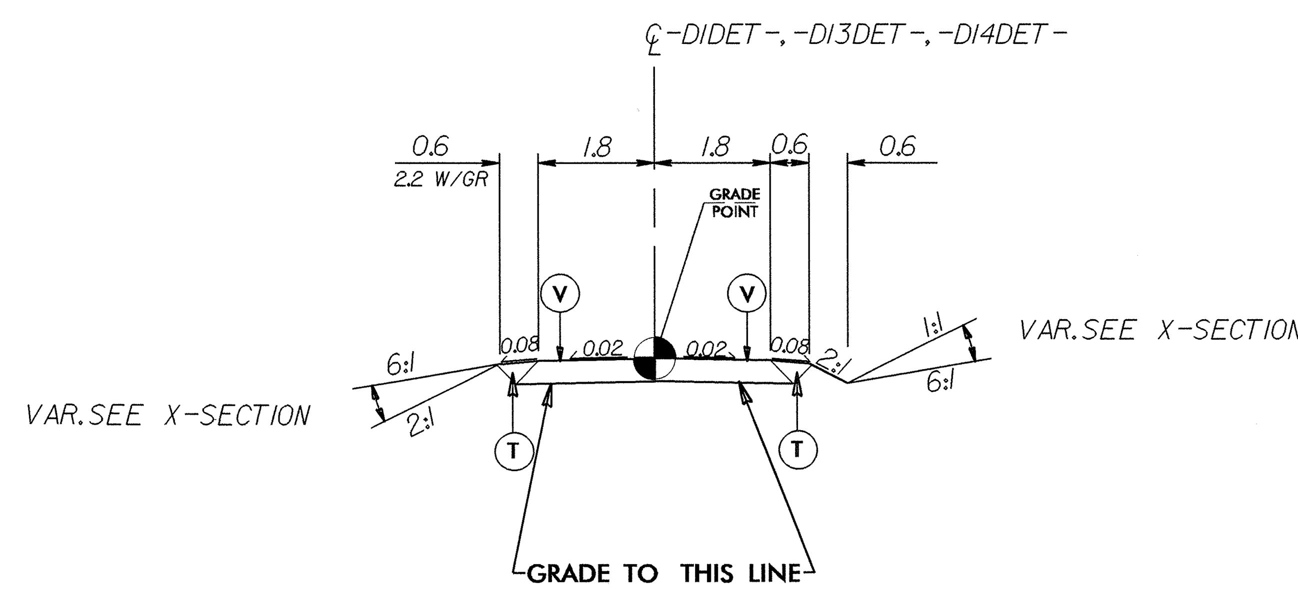
-D1- STA. 10+11.165 TO -D1- STA. 10+56.000
-D2- STA. 10+10.000 TO -D2- STA. 11+56.187
-D3- STA. 10+11.630 TO -D3- STA. 10+42.000
*-D4REV- STA. 10+13.350 TO -D4REV- STA. 10+35.000
-D6- STA. 10+11.025 TO -D6- STA. 10+42.000
**-D8- STA. 10+11.025 TO -D8- STA. 10+58.000
*-D10- STA. 10+10.000 TO -D10- STA. 10+42.519
-D12- STA. 10+06.303 TO -D12- STA. 10+60.024
-D13REV- STA. 10+21.207 TO -D13REV- STA. 11+80.916
-D14REV- STA. 10+28.000 TO -D14- STA. 12+05.834
-D15REV- STA. 10+02.000 TO -D15REV- STA. 10+97.490
-D16- STA. 10+09.825 TO -D16- STA. 10+45.000
**-D17- STA. 10+05.400 TO -D17- STA. 11+95.000
**-D18- STA. 10+10.130 TO -D18- STA. 10+24.140
-D19- STA. 10+09.825 TO -D19- STA. 19+33.830
-D19A- STA. 10+02.178 TO -D19A- STA. 10+38.185
-D20- STA. 10+11.065 TO -D20- STA. 10+60.420
-D21- STA. 10+04.430 TO -D21- STA. 10+60.400
-D23- STA. 10+11.025 TO -D23- STA. 10+54.950



TYPICAL SECTION NO. 23

USE TYPICAL SECTION NO. 23

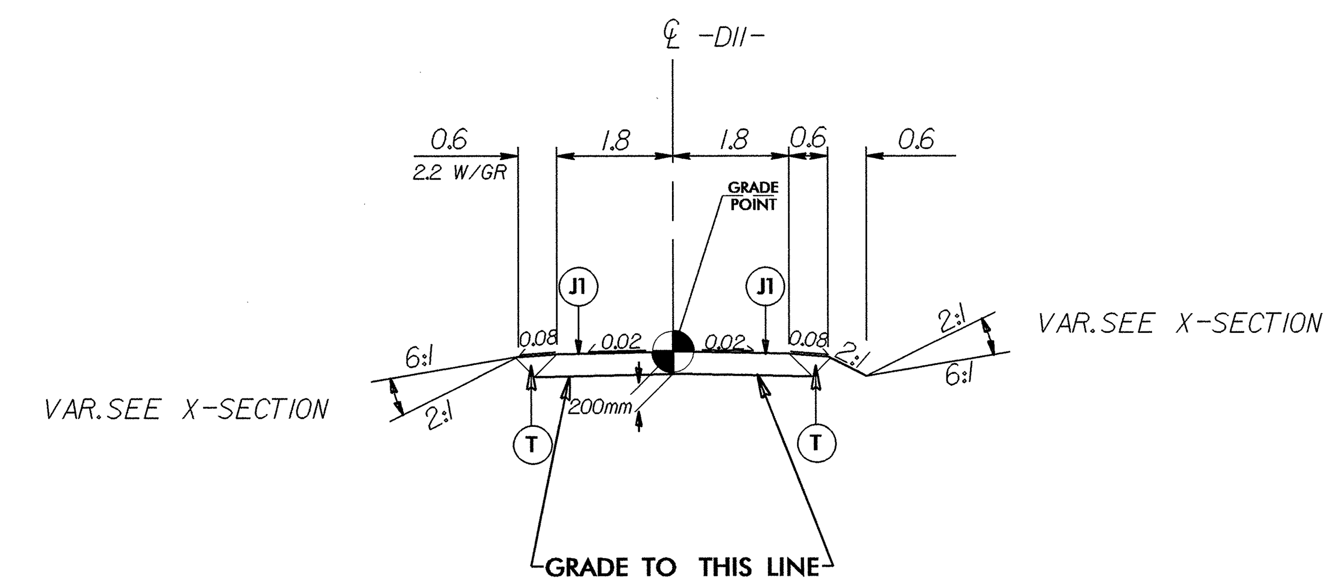
-D5- STA. 10+11.625 TO -D5- STA. 10+57.281
-D9- STA. 10+11.025 TO -D9- STA. 10+45.000
-D22- STA. 10+04.420 TO -D22- STA. 10+71.140



TYPICAL SECTION NO. 24

USE TYPICAL SECTION NO. 24

-D1DET- STA. 10+06.618 TO -D1DET- STA. 10+42.851
-D13DET- STA. 10+06.911 TO -D13DET- STA. 10+97.418
-D14DET- STA. 10+00.000 TO -D14DET- STA. 11+03.384



TYPICAL SECTION NO. 25

USE TYPICAL SECTION NO. 25

-D11- STA. 10+15.000 TO -D11- STA. 10+73.072

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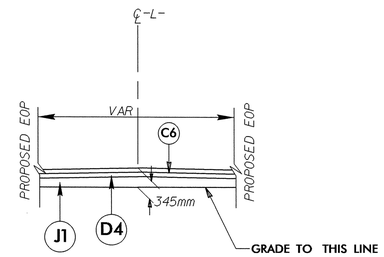
PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-G
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE 3/4/11

NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER DEW-CHI CHEN 2/2/11

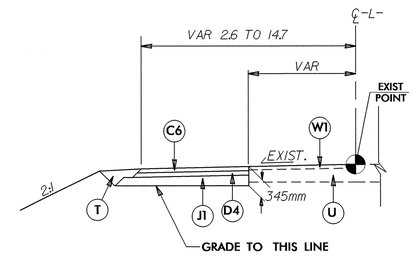
FINAL PAVEMENT SCHEDULE	
C2	40mm, TYPE S9.5B
C6	80mm, TYPE S9.5C
D4	65mm, TYPE I19.0C
E1	100mm, TYPE B25.0B
J1	200mm, ABC
T	EARTH MATERIAL
W1	WEDGING DETAIL 1



DETAIL SHOWING TEMPORARY PAVEMENT IN MEDIAN

-L- STA. 236+00 TO -L- STA. 238+48
-L- STA. 282+60 TO -L- STA. 284+10
-L- STA. 314+20 TO -L- STA. 321+30

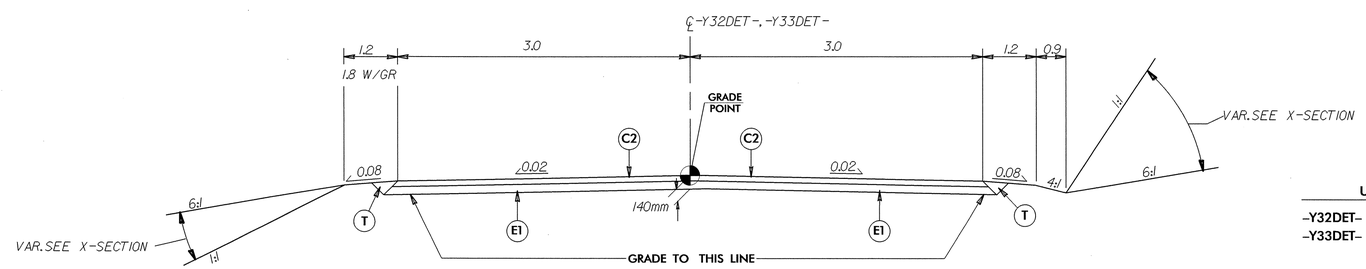
SEE TRAFFIC CONTROL PLANS



DETAIL SHOWING TEMPORARY PAVEMENT

-L- STA. 284+16.000 TO -L- STA. 285+82.000

SEE TRAFFIC CONTROL PLANS



TYPICAL SECTION NO. 26

USE TYPICAL SECTION NO. 26

-Y32DET- STA. 10+12.493 TO -Y32DET- STA. 10+63.842
-Y33DET- STA. 10+00.000 TO -Y33DET- STA. 10+62.999

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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-H
R /W SHEET NO.	

METRIC

5 0 10

CONST.REV.

R /W REV.

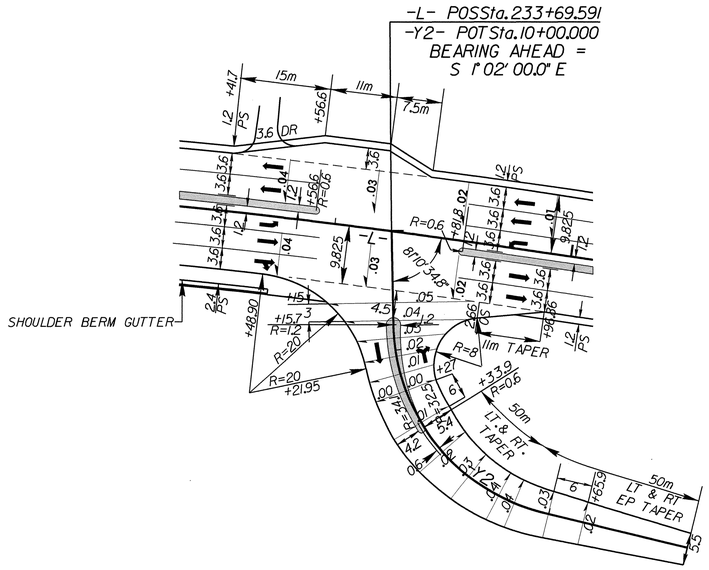
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE

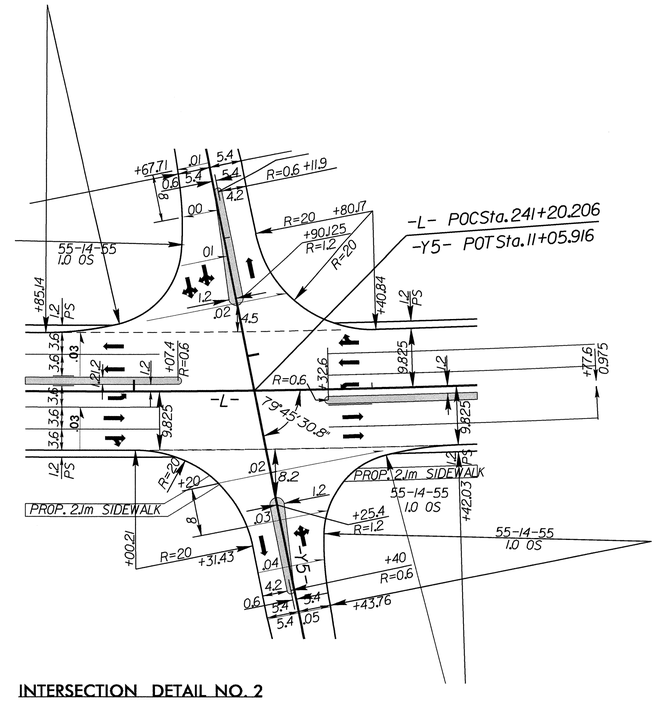
2/4/11

125mm MONOLITHIC SURFACE MOUNTED ISLAND

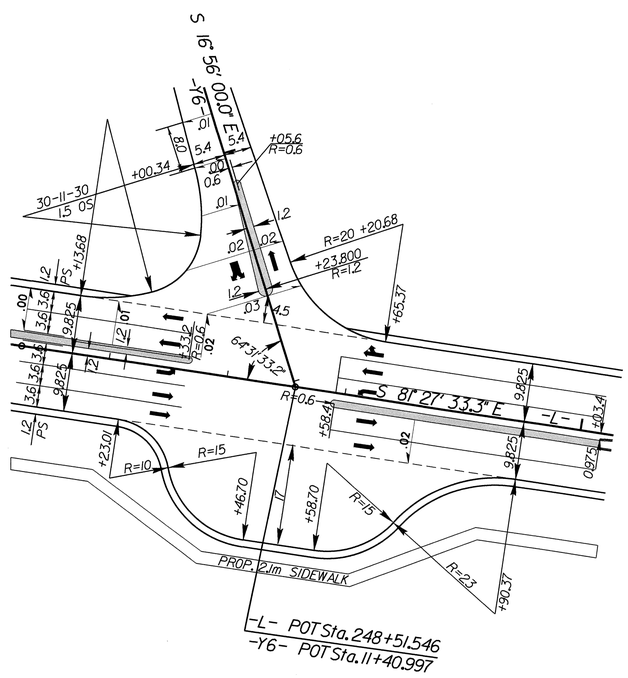
WCR WHEEL CHAIR RAMP



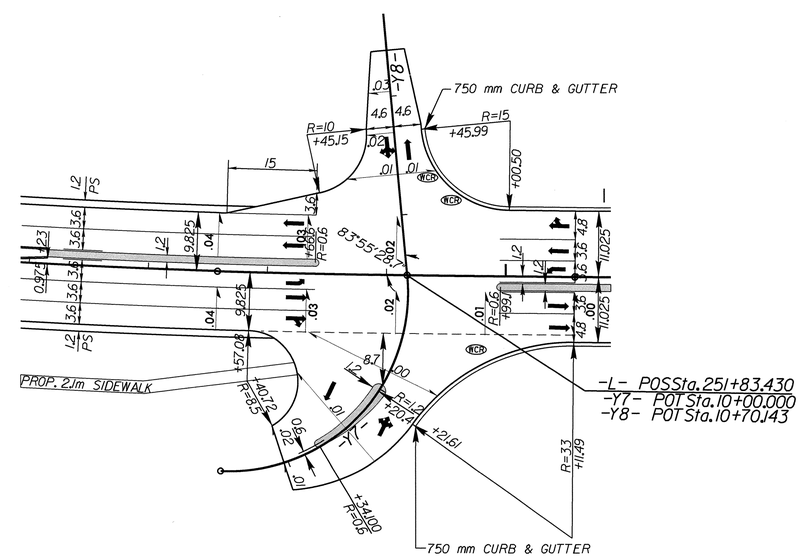
INTERSECTION DETAIL NO. 1
-Y2-



INTERSECTION DETAIL NO. 2
-Y5-



INTERSECTION DETAIL NO. 3
-Y6-



INTERSECTION DETAIL NO. 4
-Y7-/-Y8-

FOR WCR STATIONING SEE PAVEMENT MARKING PLANS

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METRIC	PROJECT REFERENCE NO.	SHEET NO.
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CONST.REV.	R /W SHEET NO.	
R /W REV.	ROADWAY DESIGN ENGINEER	

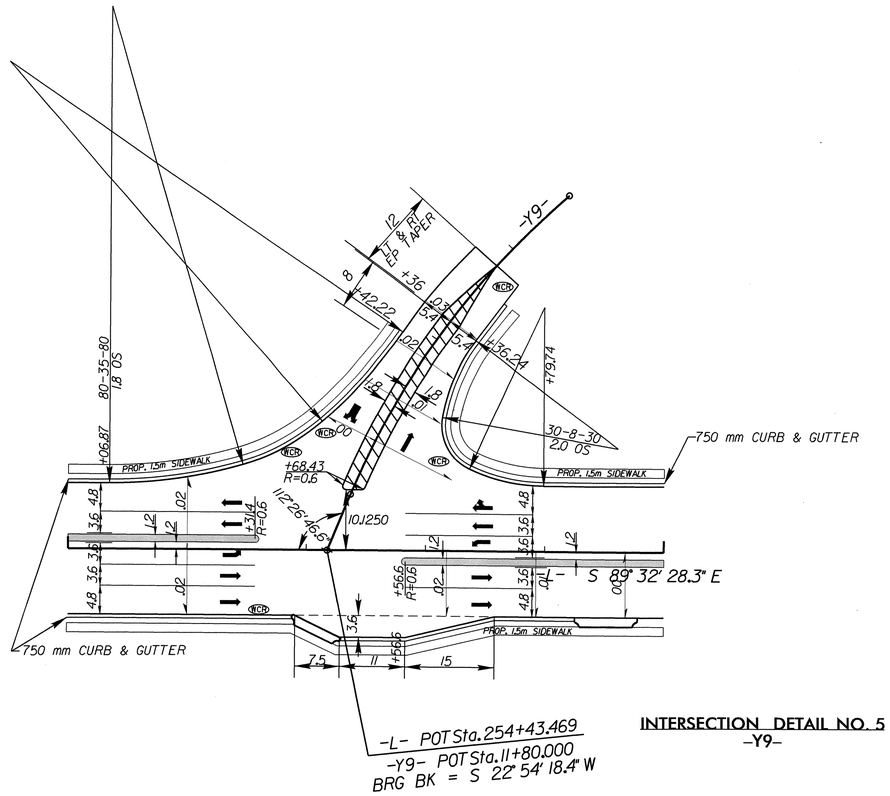
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE

B.L. Moore 2/4/11

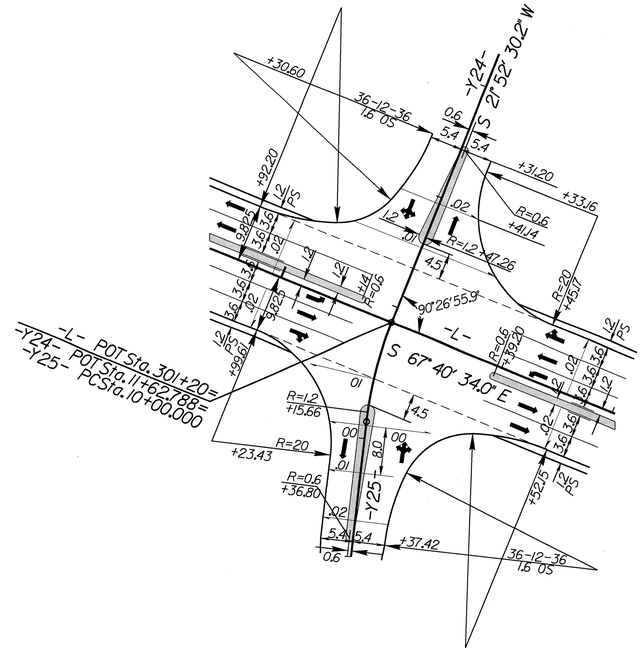
125mm MONOLITHIC SURFACE MOUNTED ISLAND

WHEEL CHAIR RAMP

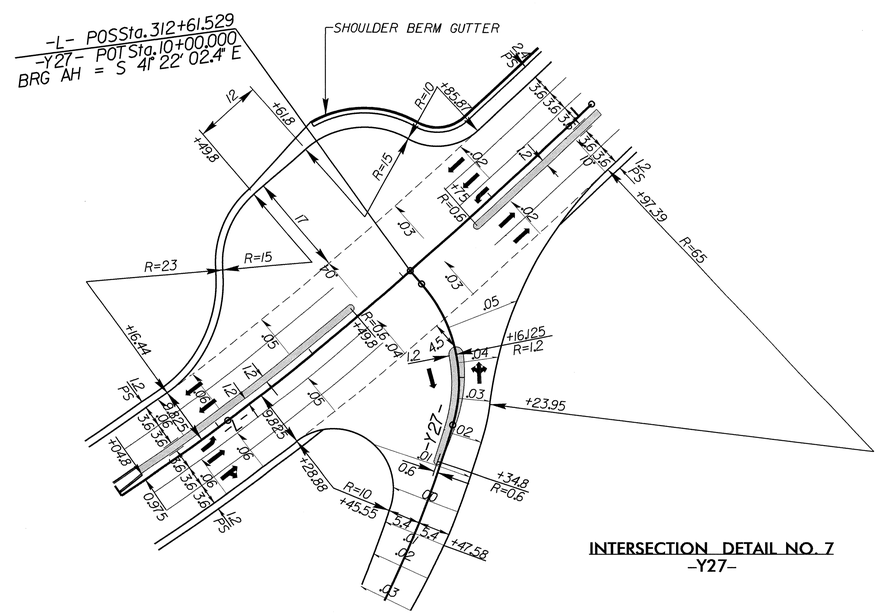
PAINT STRIPE ISLAND



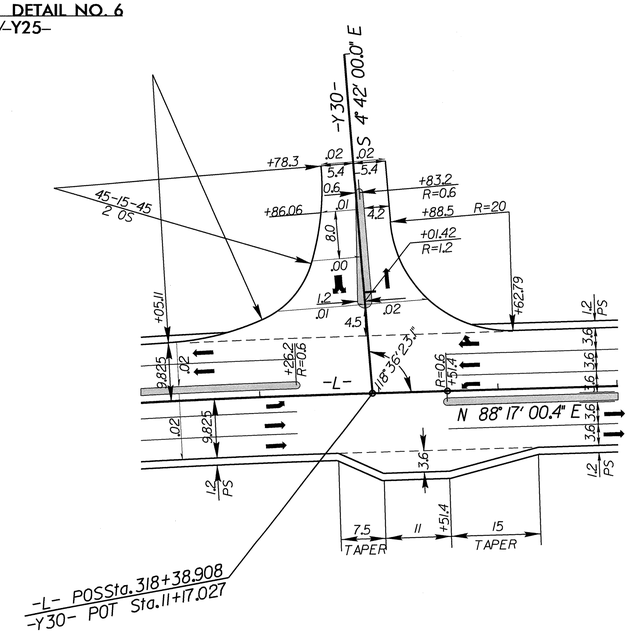
INTERSECTION DETAIL NO. 5
-Y9-



INTERSECTION DETAIL NO. 6
-Y24-/-Y25-



INTERSECTION DETAIL NO. 7
-Y27-



INTERSECTION DETAIL NO. 8
-Y30-

FOR WCR STATIONING SEE PAVEMENT MARKING PLANS

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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-J
R /W SHEET NO.	

METRIC

5 0 10

CONST.REV.

R /W REV.

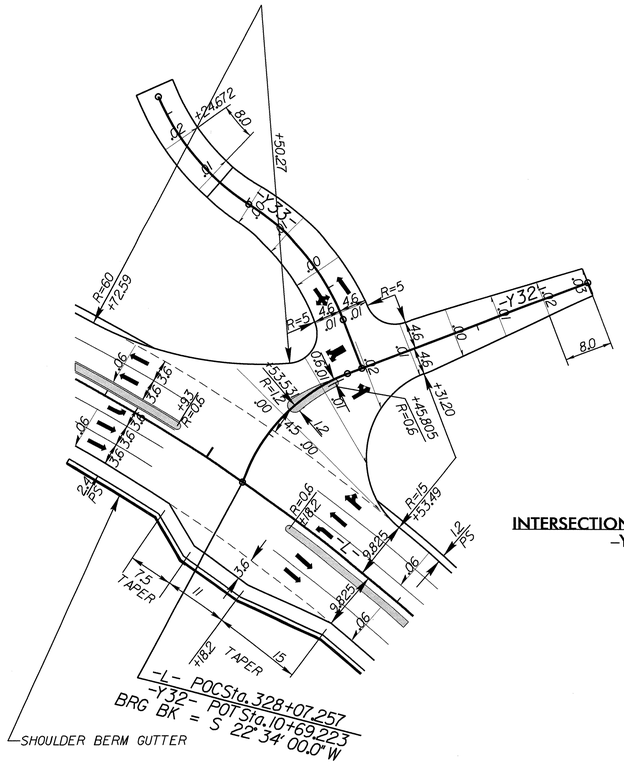
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19715 ENGINEER BRENDA L. MOORE

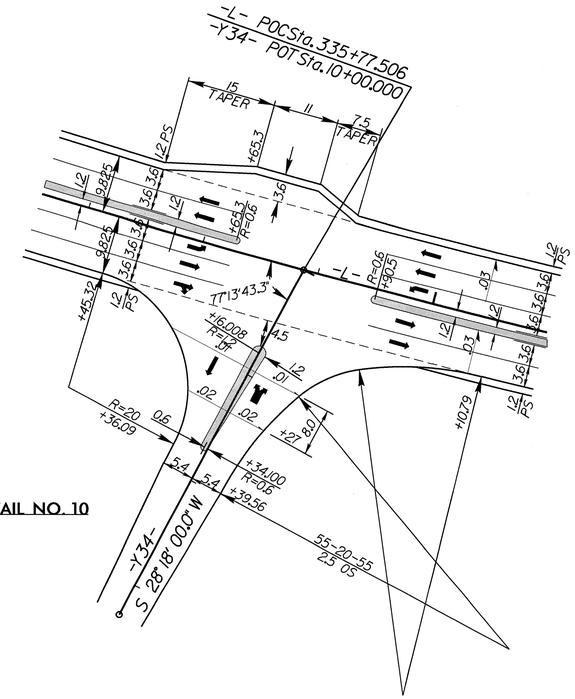
B. L. Moore 2/4/11

125mm MONOLITHIC SURFACE MOUNTED ISLAND

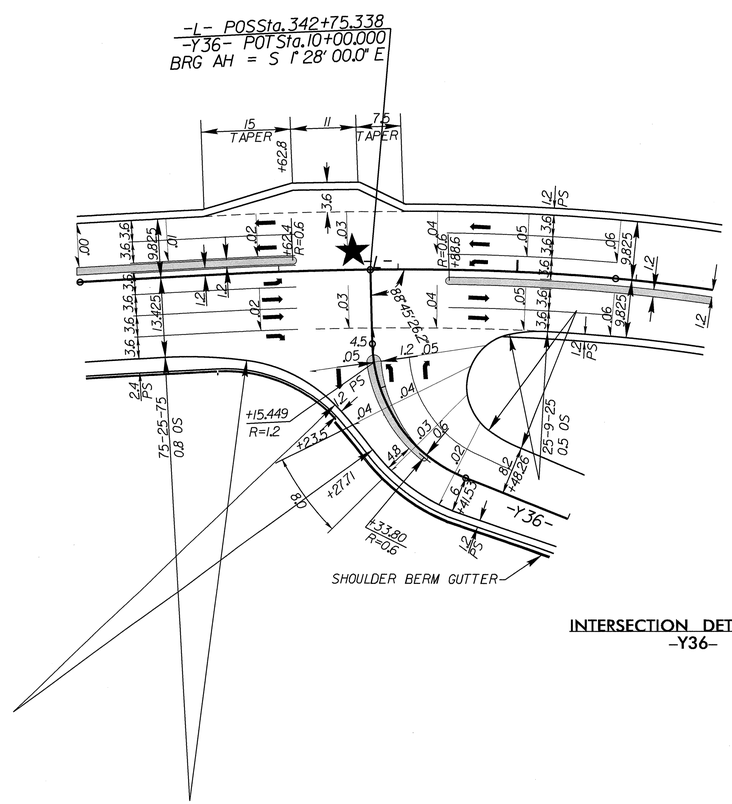
TRAFFIC SIGNAL



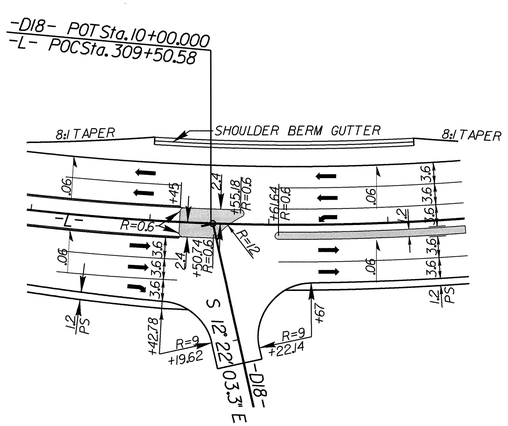
INTERSECTION DETAIL NO. 9
-Y32-



INTERSECTION DETAIL NO. 10
-Y34-



INTERSECTION DETAIL NO. 11
-Y36-



INTERSECTION DETAIL NO. 12
-D18-

02-FEB-2011 16:06
R:\Roadway\Proj\25119a_rdy_intersections.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-K
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5m 0 10m

CONST.REV.

R /W REV.

NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.F. NOTTINGHAM 2/4/11

DRAINAGE DITCH DETAILS

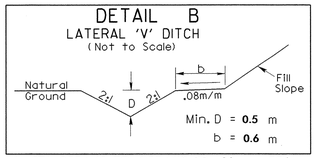
DETAIL A
TOE PROTECTION
(Not to Scale)

d= 0.5m

Type of Liner= PSRM

FROM –L– STA 255+40 TO STA 256+00 LT

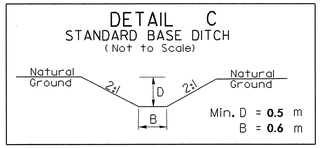
DETAIL B
LATERAL 'V' DITCH
(Not to Scale)



Min. D = 0.5 m
b = 0.6 m

–L– STA 255+40 TO 255+80 RT dde = 236 cm

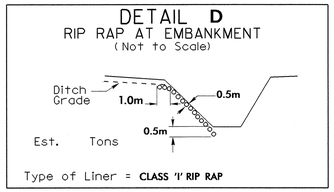
DETAIL C
STANDARD BASE DITCH
(Not to Scale)



Min. D = 0.5 m
B = 0.6 m

–D3– STA. 10+37 TO 10+70 RT
–L– STA. 255+40 RT
–L– STA. 317+35 RT

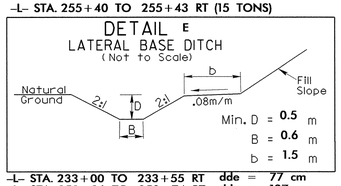
DETAIL D
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner = CLASS 'I' RIP RAP

–L– STA. 233+00 TO 233+03 RT (5 TONS)
–L– STA. 255+40 TO 255+43 RT (15 TONS)

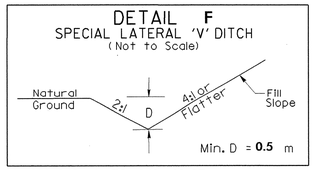
DETAIL E
LATERAL BASE DITCH
(Not to Scale)



Min. D = 0.5 m
B = 0.6 m
b = 1.5 m

–L– STA. 233+00 TO 233+55 RT dde = 77 cm
–L– STA 252+96 TO 253+74 RT dde = 137 cm
–L– STA 313+30 TO 314+20 RT dde = 129 cm
–Y2– STA 10+22 TO 10+32 RT dde = 6 cm

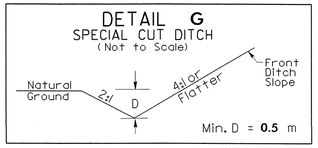
DETAIL F
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D = 0.5 m

–L– STA. 242+40 TO 242+68 RT
–L– STA 254+00 TO 254+20 LT

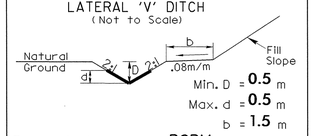
DETAIL G
SPECIAL CUT DITCH
(Not to Scale)



Min. D = 0.5 m

–Y2– STA. 10+40 TO 10+69 LT
–L– STA. 236+40 TO 236+80 RT
–L– STA. 237+40 TO 237+60 LT
–L– STA. 240+80 TO 241+11 RT
–L– STA. 242+00 TO 242+40 RT
–L– STA. 242+00 TO 242+50 LT
–Y5– STA. 10+64 TO 10+73 RT
–Y5– STA. 11+35 TO 11+60 RT
–L– STA. 250+20 TO 250+40 LT
–Y10– STA. 11+20 TO 11+40 RT
–L– STA. 299+80 TO 300+20 LT
–L– STA 301+03 TO 301+12 RT
–Y24A– STA. 10+12 TO 10+40 LT
–Y24– STA. 10+40 TO 10+70 RT
–Y25– STA 10+20 TO 10+40 RT
–L– STA. 310+06 TO 310+36 LT
–L– STA. 311+40 TO 311+80 RT
–L– STA. 320+20 TO 321+00 LT
–L– STA. 328+80 TO 329+30 LT

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

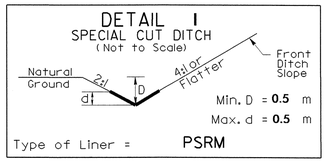


Min. D = 0.5 m
Max. d = 0.5 m
b = 1.5 m

Type of Liner = PSRM

–L– STA. 249+76 TO 250+20 LT dde = 24 cm

DETAIL I
SPECIAL CUT DITCH
(Not to Scale)

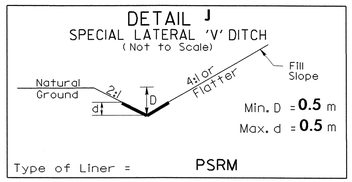


Min. D = 0.5 m
Max. d = 0.5 m

Type of Liner = PSRM

–L– STA 327+40 TO 327+80 LT

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

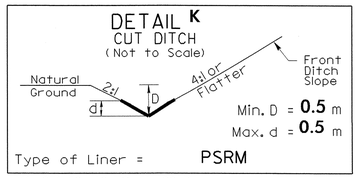


Min. D = 0.5 m
Max. d = 0.5 m

Type of Liner = PSRM

–L– STA. 248+10 TO 248+25 LT
–L– STA. 300+80 TO 301+02 LT

DETAIL K
CUT DITCH
(Not to Scale)

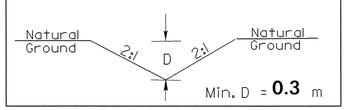


Min. D = 0.5 m
Max. d = 0.5 m

Type of Liner = PSRM

–Y6– STA. 10+60 TO 11+00 RT
–Y17– STA. 13+07 TO 13+40 RT

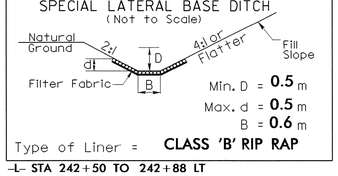
DETAIL L
STANDARD 'V' DITCH
(Not to Scale)



Min. D = 0.3 m

–L– STA. 245+07 TO 245+61 RT

DETAIL M
SPECIAL LATERAL BASE DITCH
(Not to Scale)

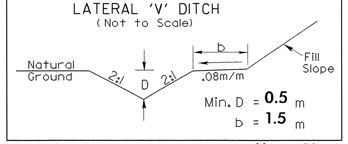


Min. D = 0.5 m
Max. d = 0.5 m
B = 0.6 m

Type of Liner = CLASS 'B' RIP RAP

–L– STA 242+50 TO 242+88 LT

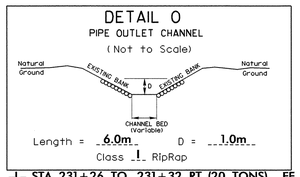
DETAIL N
LATERAL 'V' DITCH
(Not to Scale)



Min. D = 0.5 m
b = 1.5 m

–Y5– STA. 10+20 TO 10+50 RT dde = 36 cm
–Y10– STA 11+02 TO 11+20 RT dde = 26 cm

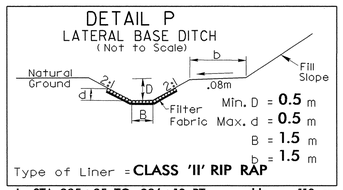
DETAIL O
PIPE OUTLET CHANNEL
(Not to Scale)



Length = 6.0m D = 1.0m
Class I RipRap

–L– STA. 231+26 TO 231+32 RT (20 TONS) FF = 39.3 SM
–L– STA. 235+90 TO 235+95 RT (20 TONS) FF = 44.7 SM
–L– STA. 270+63 TO 270+69 LT (20 TONS) FF = 44.7 SM
–L– STA. 297+69 TO 297+72 RT (20 TONS) FF = 41.7 SM

DETAIL P
LATERAL BASE DITCH
(Not to Scale)

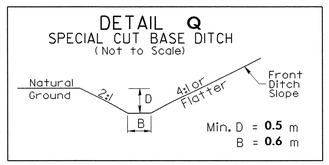


Min. D = 0.5 m
Max. d = 0.5 m
B = 1.5 m
b = 1.5 m

Type of Liner = CLASS 'II' RIP RAP

–L– STA. 235+95 TO 236+10 RT. dde = 110 cm

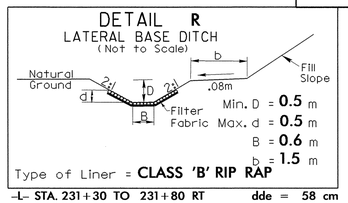
DETAIL Q
SPECIAL CUT BASE DITCH
(Not to Scale)



Min. D = 0.5 m
B = 0.6 m

–L– STA 324+55 TO 325+00 LT

DETAIL R
LATERAL BASE DITCH
(Not to Scale)

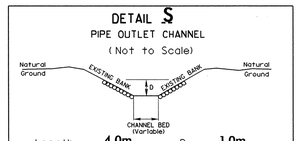


Min. D = 0.5 m
Max. d = 0.5 m
B = 0.6 m
b = 1.5 m

Type of Liner = CLASS 'B' RIP RAP

–L– STA. 231+30 TO 231+80 RT dde = 58 cm

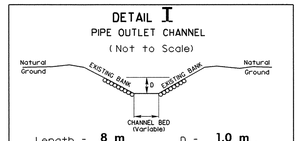
DETAIL S
PIPE OUTLET CHANNEL
(Not to Scale)



Length = 4.0m D = 1.0m
Est = 15 Tons of Class I RipRap

–L– STA. 228+10 RT FF = 28.6 SM
–L– STA. 230+91 RT FF = 31.0 SM

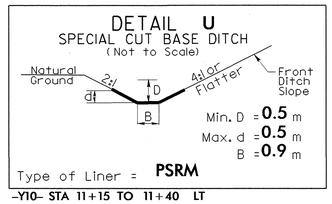
DETAIL T
PIPE OUTLET CHANNEL
(Not to Scale)



Length = 8 m D = 1.0 m
Est = 30 Tons of Class I RipRap

–L– STA. 230+37 TO 230+45 RT (25 TONS)
EST. DDE 30 C.M. FF = 57.2 SM

DETAIL U
SPECIAL CUT BASE DITCH
(Not to Scale)

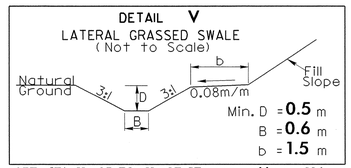


Min. D = 0.5 m
Max. d = 0.5 m
B = 0.9 m

Type of Liner = PSRM

–Y10– STA 11+15 TO 11+40 LT

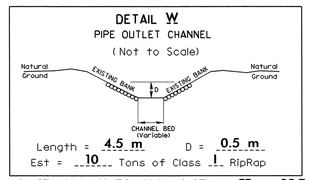
DETAIL V
LATERAL GRASSED SWALE
(Not to Scale)



Min. D = 0.5 m
B = 0.6 m
b = 1.5 m

–Y17– STA 11+05 TO 11+27 RT dde = 126 cm

DETAIL W
PIPE OUTLET CHANNEL
(Not to Scale)



Length = 4.5 m D = 0.5 m
Est = 10 Tons of Class I RipRap

–L– STA. 314+40 TO 314+42 LT FF = 25.7 SM
–L– STA. 324+43 TO 324+47 RT FF = 21.2 SM

8/17/99

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s:\ea\BERRAMAE\2519a_ditch.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-L
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC 5m 0 10m

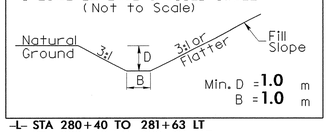
CONST.REV.

R /W REV.

NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER R. NOTTINGHAM 2/4/11

DRAINAGE DITCH DETAILS

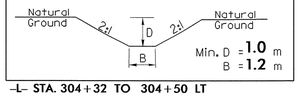
DETAIL X
SPECIAL LATERAL GRASSED SWALE
(Not to Scale)



Min. D = 1.0 m
B = 1.0 m

-L- STA 280+40 TO 281+63 LT
-L- STA 282+68 TO 283+95 -LT

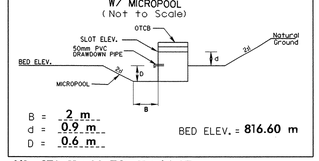
DETAIL AD
STANDARD BASE DITCH
(Not to Scale)



Min. D = 1.0 m
B = 1.2 m

-L- STA. 304+32 TO 304+50 LT

DETAIL AK
STORMWATER RETENTION BASIN
W/ MICROPOOL
(Not to Scale)

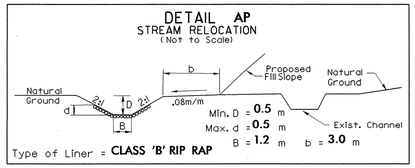


B = 2 m
d = 0.9 m
D = 0.6 m

BED ELEV. = 816.60 m

-Y3- STA. 11+38 TO 11+64 LT

DETAIL AP
STREAM RELOCATION
(Not to Scale)

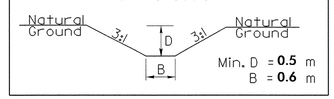


Min. D = 0.5 m
Max. d = 0.5 m
B = 1.2 m
b = 3.0 m

Type of Liner = CLASS 'B' RIP RAP

-L- STA 333+17 TO 333+60 LT dde = 81 cm

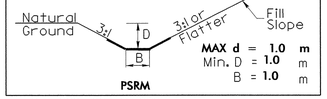
DETAIL Z
STANDARD GRASSED SWALE
(Not to Scale)



Min. D = 0.5 m
B = 0.6 m

-L- STA. 285+35 TO 285+45 LT

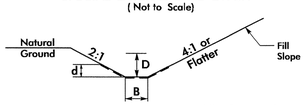
DETAIL Y
SPECIAL LATERAL GRASSED SWALE
(Not to Scale)



MAX d = 1.0 m
Min. D = 1.0 m
B = 1.0 m
PSRM

-L- STA 282+22 TO 282+68 LT

DETAIL AE
SPECIAL LATERAL BASE DITCH
(Not to Scale)

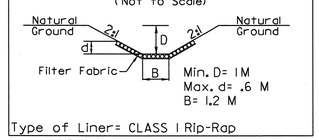


Min. D = 0.5m
Max. d = 0.5m
B = 0.6m

Type of Liner = PSRM

-L- 307+20 TO 307+80 LT

DETAIL AL
STANDARD BASE DITCH
(Not to Scale)

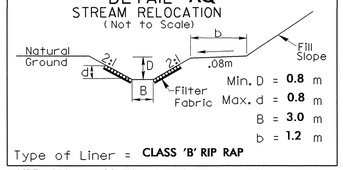


Min. D= 1M
Max. d= .6 M
B= 1.2 M

Type of Liner= CLASS I Rip-Rap

-Y26- STA. 9+35 TO STA. 9+72 LT
FF = 226 SM

DETAIL AQ
STREAM RELOCATION
(Not to Scale)

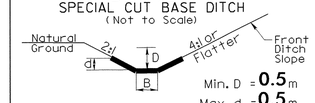


Min. D = 0.8 m
Max. d = 0.8 m
B = 3.0 m
b = 1.2 m

Type of Liner = CLASS 'B' RIP RAP

-Y35- STA. 10+66 TO 10+94 LT dde = 120 cm

DETAIL AG
SPECIAL CUT BASE DITCH
(Not to Scale)

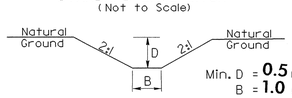


Min. D = 0.5 m
Max. d = 0.5 m
B = 0.6 m

Type of Liner = PSRM

-Y30- STA 10+40 TO 11+00 LT

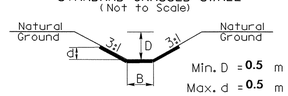
DETAIL AF
STANDARD BASE DITCH
(Not to Scale)



Min. D = 0.5 m
B = 1.0 m

-D16- STA. 10+19 TO 10+24 LT

DETAIL AM
STANDARD GRASSED SWALE
(Not to Scale)

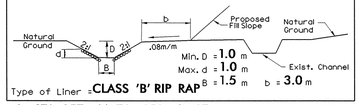


Min. D = 0.5 m
Max. d = 0.5 m
B = 1.5 m

Type of Liner = PSRM

-L- STA. 276+50 TO 276+83 LT

DETAIL AW
STREAM RELOCATION
(Not to Scale)

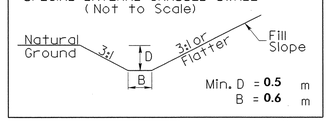


Min. D = 1.0 m
Max. d = 1.0 m
B = 1.5 m
b = 3.0 m

Type of Liner = CLASS 'B' RIP RAP

-L- STA 257+66 TO 258+60 LT dde = 605 cm

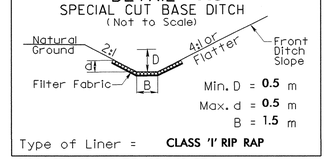
DETAIL AA
SPECIAL LATERAL GRASSED SWALE
(Not to Scale)



Min. D = 0.5 m
B = 0.6 m

-L- STA 292+84 TO 293+12 LT
-L- STA 332+60 TO 333+00 LT

DETAIL AO
SPECIAL CUT BASE DITCH
(Not to Scale)

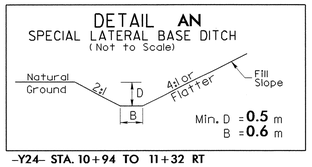


Min. D = 0.5 m
Max. d = 0.5 m
B = 1.5 m

Type of Liner = CLASS 'I' RIP RAP

-Y26- STA 11+60 TO 12+40 RT
FF = 476.9 SM

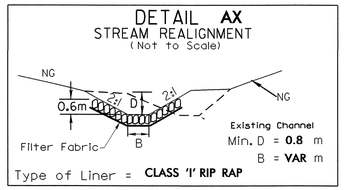
DETAIL AN
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D = 0.5 m
B = 0.6 m

-Y24- STA. 10+94 TO 11+32 RT

DETAIL AX
STREAM REALIGNMENT
(Not to Scale)

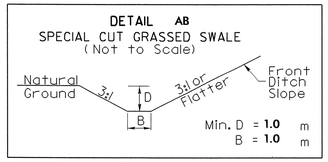


Min. D = 0.8 m
B = VAR m

Type of Liner = CLASS 'I' RIP RAP

-L- STA. 233+00 RT FF = 6.7 SM

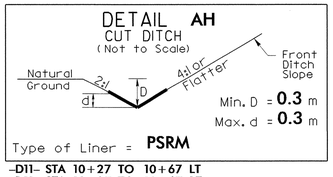
DETAIL AB
SPECIAL CUT GRASSED SWALE
(Not to Scale)



Min. D = 1.0 m
B = 1.0 m

-Y22- STA 10+09 TO 10+23 RT

DETAIL AH
CUT DITCH
(Not to Scale)

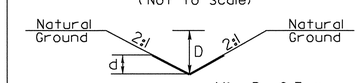


Min. D = 0.3 m
Max. d = 0.3 m

Type of Liner = PSRM

-D11- STA 10+27 TO 10+67 LT
-D11- STA 10+27 TO 10+67 RT
-D13REV- STA 10+21 TO 11+63 LT
-D13REV- STA 10+21 TO 11+64 RT
-D14- STA 10+28 TO 12+00 RT

DETAIL D-2
STANDARD 'V' DITCH
(Not to Scale)

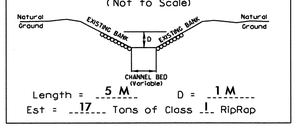


Min. D= 0.3 m
Max. d= 0.3 m

Type of Liner= PSRM

-Y33DET- STA. 10+30 LT
-L- STA. 248+60 - 249+00 RT

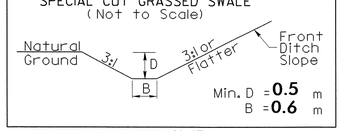
DETAIL AZ
PIPE OUTLET CHANNEL
(Not to Scale)



Length = 5 M D = 1 M
Est = 17 Tons of Class I RipRap

-L- STA. 256+10 TO 256+15 RT FF = 39.8 SM
-L- STA. 279+92 TO 279+98 LT FF = 39.8 SM

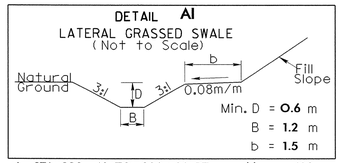
DETAIL AC
SPECIAL CUT GRASSED SWALE
(Not to Scale)



Min. D = 0.5 m
B = 0.6 m

-L- STA 301+43 TO 302+60 LT

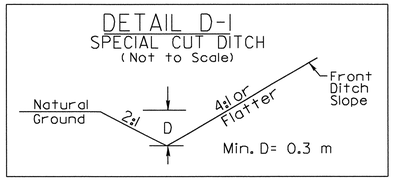
DETAIL AI
LATERAL GRASSED SWALE
(Not to Scale)



Min. D = 0.6 m
B = 1.2 m
b = 1.5 m

-L- STA 228+40 TO 230+00 RT dde = 430 cm

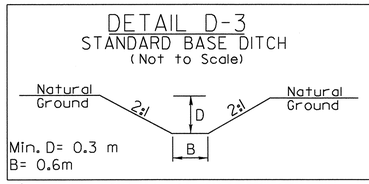
DETAIL D-1
SPECIAL CUT DITCH
(Not to Scale)



Min. D= 0.3 m

FROM STA. AT SAG TO STA. AT INLET OF PIPE
-Y33DET- RT

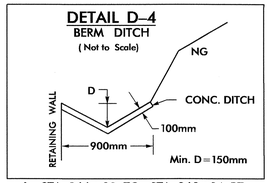
DETAIL D-3
STANDARD BASE DITCH
(Not to Scale)



Min. D= 0.3 m
B= 0.6m

STA. 10+21 -Y33DET- LT

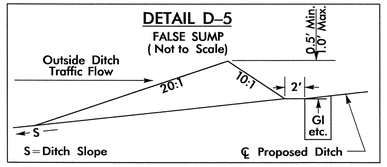
DETAIL D-4
BERM DITCH
(Not to Scale)



Min. D=150mm

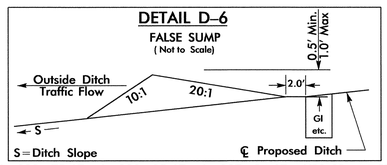
-L- 266+80 TO STA. 268+14 RT.

DETAIL D-5
FALSE SUMP
(Not to Scale)



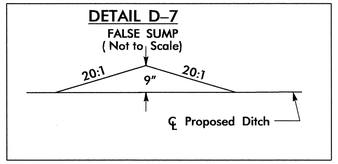
-Y21- 11+10 RT.; -D11- 10+32 LT.; -L- 247+84 LT.; -L- 322+42 LT.; -L- 322+83 LT.; -L- 324+39 LT.; -L- 304+44 RT.; -L- 312+55 LT.; -L- 306+02 RT.; -L- 312+24 RT.; -L- 311+84 RT.; -L- 331+00 LT.; -L- 335+68 LT.; -L- 337+03 LT.; -L- 338+54 LT. -Y36- 11+18 LT.

DETAIL D-6
FALSE SUMP
(Not to Scale)



-L- 229+75 LT.; -L- 230+35 LT.; -L- 237+36 LT.; -Y30 10+64 RT.; -L- 236+26 RT.; -D11- 10+31 RT.; -Y5- 10+78 LT.; -Y4- 10+20 LT.; -D12- 10+21 RT.; -D12- 10+46 RT; -L- 311+84 RT.; -L- 310+22 RT.; -L- 331+01 LT.; -L- 332+01 LT.; -L- 335+24 LT.; -L- 342+85 LT.; -L- 342+35 LT.; -L- 331+44 LT.; -L-343+35 LT.

DETAIL D-7
FALSE SUMP
(Not to Scale)



-L- 306+61 RT.

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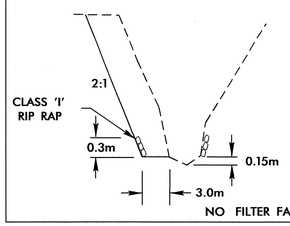
DRAINAGE DETAILS

METRIC	PROJECT REFERENCE NO.	SHEET NO.
5m 0 10m	R-2519A	2-M
	R /W SHEET NO.	
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R /W REV.		NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER R. T. NOTTINGHAM 2/4/11

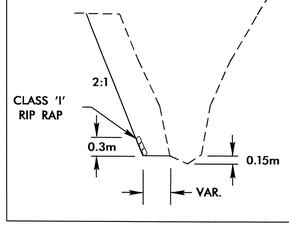
DETAIL C-12
LOW FLOW BENCH AT CULVERT
ENTRANCE AND OUTLET
(NOT TO SCALE)



NO FILTER FABRIC

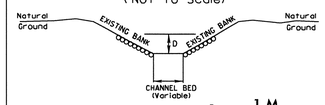
-L- 257+22 RT.
-L- 279+05 TO 279+22 LT.
-L- 279+60 TO 279+72 LT.

DETAIL C-18
LOW FLOW BENCH AT CULVERT
ENTRANCE AND OUTLET
(NOT TO SCALE)



-L- 289+90 RT.

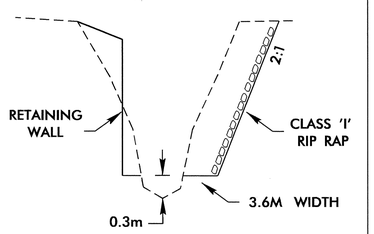
DETAIL C-35
CULVERT OUTLET BANK PROTECTION
(Not to Scale)



D = 1 M
Est = 45 Tons of Class I RipRap
NOTE: ARMOR ONLY TO LIMITS SHOWN ON PLANS

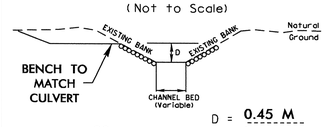
-Y34- STA. 10+51 LT. AND RT.
NO FILTER FABRIC

DETAIL C-15
LOW FLOW BENCH
AT CULVERT OUTLET
(NOT TO SCALE)



-Y18- 10+25 TO 10+41 RT.

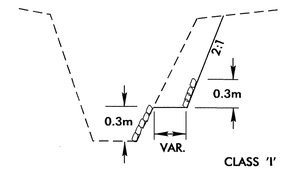
DETAIL C-23
CULVERT OUTLET BANK PROTECTION
(Not to Scale)



D = 0.45 M
Est = 33 Tons of Class I RipRap
NOTE: ARMOR ONLY TO LIMITS SHOWN ON PLANS
NO FILTER FABRIC

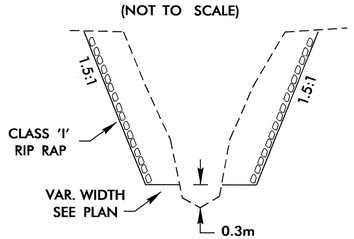
-L- STA. 301+39 LT
AND -Y24- 11+24 RT.

DETAIL C-45
LOW FLOW BENCH AT CULVERT
ENTRANCE AND OUTLET
(NOT TO SCALE)



-L- 301+39 RT.

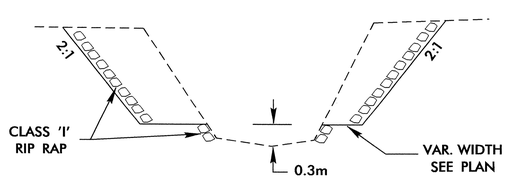
DETAIL C-16
LOW FLOW BENCH CONSTRUCTION
AND BANK STABILIZATION
(NOT TO SCALE)



NOTE: ARMOR RIGHT SIDE OF CHANNEL ONLY
FROM 283+95 TO 284+46
(SEE PLANS)

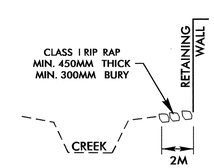
-L- STA 283+95 TO 285+00 LT.

DETAIL C-28
LOW FLOW BENCH CONSTRUCTION
AND BANK STABILIZATION
(NOT TO SCALE)



-L- STA. 316+39 LT.
-L- STA 316+82 RT.

DETAIL W-1
ARMORING DETAIL FOR
TOE OF RETAINING WALL
(NOT TO SCALE)



NO FILTER FABRIC

-L- 278+60 TO 279+21 LT.

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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-N
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5m 0 10m

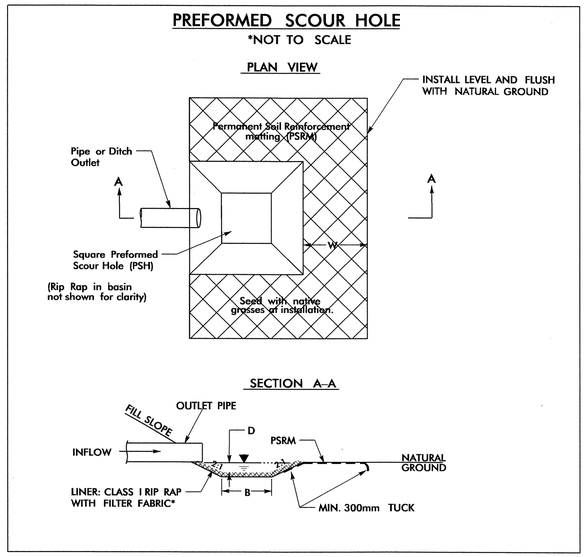
CONST.REV.

R /W REV.

NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM

2/4/11

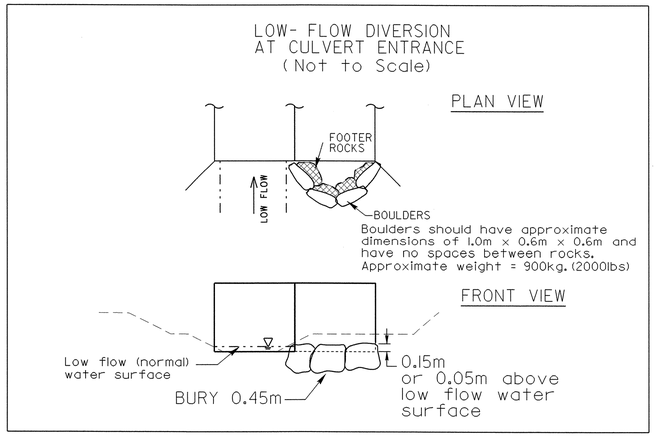
PREFORMED SCOUR HOLE



SHEET #	STATION	PIPE SIZE	B	D	W
5	L 227+52 RT	400	1.2m	0.6m	1.2m
7	L 235+00 RT	400	1.2m	0.6m	1.2m
10	L 245+12 LT	375	1.2m	0.6m	1.2m
12	L 251+99 RT	750	2.2m	0.6m	1.2m
17	L 271+02 LT	400	1.2m	0.6m	1.2m
20*	L 278+26 LT	1050	3.0m	0.6m	1.2m
22	L 287+88 RT	750	2.2m	0.6m	1.2m
23	L 288+50 RT	450	1.4m	0.6m	1.2m
23	L 289+70 RT	450	1.4m	0.6m	1.2m
23	L 290+02 RT	600	1.8m	0.8m	1.2m
24	L 292+88 RT	600	1.8m	0.6m	1.2m
26	L 299+06 RT	450	1.4m	0.6m	1.2m
33	L 323+17 RT	600	1.8m	0.6m	1.2m
33	L 323+93 RT	375	1.2m	0.6m	1.2m
34	L 328+11 RT	400	1.2m	0.6m	1.2m
35	L 331+12 RT	400	1.2m	0.6m	1.2m
36	L 333+06 RT	400	1.2m	0.6m	1.2m
37	L 338+49 RT	450	1.4m	0.6m	1.2m
38	L 342+30 RT	800	2.0m	0.6m	0
39	Y36 10+84 RT	400	1.2m	0.6m	1.2m

* USE CLASS II RIP RAP LINER

LOW- FLOW DIVERSION



SHEET #	STATION	BOULDERS TONS	FOOTER ROCKS TONS
21	-L- 284+17 LT	2.5	2.5
21	-L- 284+45 LT	2.5	2.5
21	-L- 285+06 LT	2.5	2.5
26	-L- 300+70 RT	2.5	2.5
31	-L- 316+39 LT	2.5	2.5
31	-L- 316+49 LT	2.5	2.5
31	-L- 318+15 LT	2.5	2.5
36	-Y34- 10+60 RT	2.5	2.5

FOOTER ROCKS TO BE PAID FOR AS "BOULDERS" PER MTN

8/17/99

10-JAN-2011 08:32
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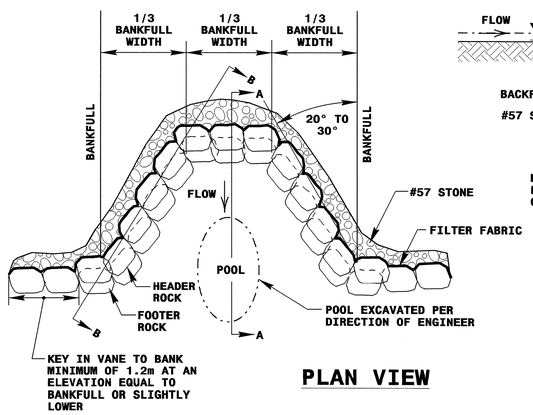
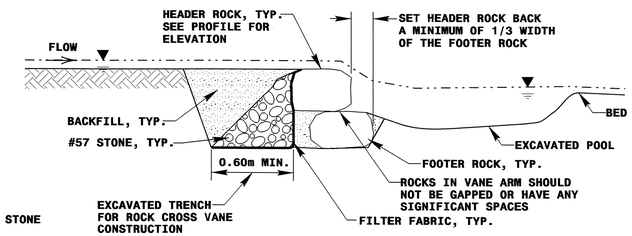
METRIC	PROJECT REFERENCE NO.	SHEET NO.
5m 0 10m	R-2519A	2-0
	R /W SHEET NO.	
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R /W REV.		NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER M.T. NOTTINGHAM 2/4/11

ROCK CROSS VANE (RCV) DETAIL

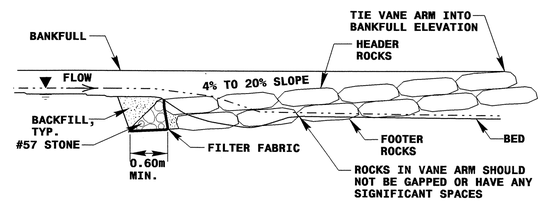
NOT TO SCALE



PLAN VIEW



SECTION A-A



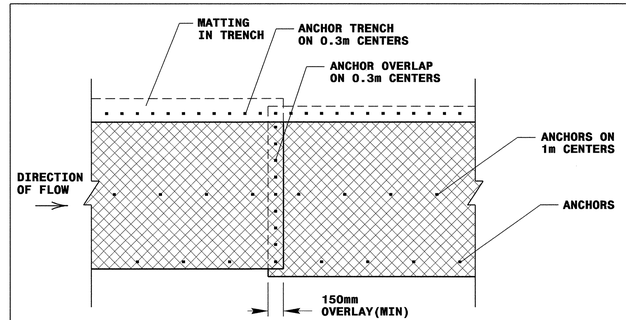
SECTION B-B

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

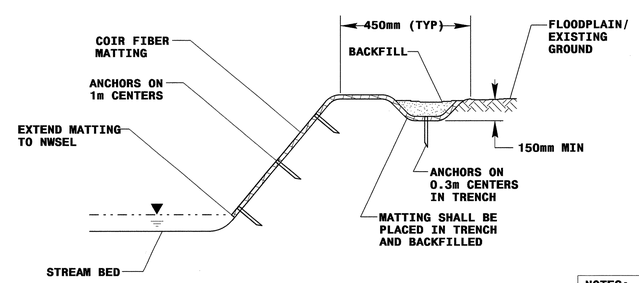
RCV LOCATION	BOULDER DIMENSIONS	1/3 BANKFULL WIDTH (m)	BOULDER QUANTITIES		#57 STONE, m. tons	FILTER FABRIC, sq. meters
STATION	Ht. x Ln. x Wd. (m)		#, approx.	WEIGHT, m. tons		
-L- 235+90 RT	0.6 x 1.2 x 0.9	1.2	25	33	11.1	34
-L- 314+04 LT	0.6 x 1.2 x 0.9	2.1	23	31	10.3	31
-L- 314+40 LT	0.6 x 1.2 x 0.9	2.1	23	31	10.3	31
-L- 314+42 LT	0.6 x 1.2 x 0.9	2.1	23	31	10.3	31
-L- 314+64 LT	0.6 x 1.2 x 0.9	2.1	23	31	10.3	31
-L- 315+00 LT	0.6 x 1.2 x 0.9	2.1	23	31	10.3	31
-L- 315+20 LT	0.6 x 1.2 x 0.9	2.1	23	31	10.3	31
-L- 315+50 LT	0.6 x 1.2 x 0.9	2.1	23	31	10.3	31
-Y30- 10+29 RT	0.6 x 1.2 x 0.9	2.0	23	31	10.3	31
-Y30- 10+50 RT	0.6 x 1.2 x 0.9	2.0	23	31	10.3	31
-Y30- 10+68 RT	0.6 x 1.2 x 0.9	2.0	23	31	10.3	31
-Y30- 10+88 RT	0.6 x 1.2 x 0.9	2.0	23	31	10.3	31
-Y32- 9+85 RT	0.6 x 1.2 x 0.9	1.33	18	25	8.2	25
-Y32- 10+03 RT	0.6 x 1.2 x 0.9	1.33	18	25	8.2	25
-Y32- 10+20 RT	0.6 x 1.2 x 0.9	1.33	18	25	8.2	25
-Y33- 9+88 RT	0.5 x 0.9 x 0.6	0.6	9	11	3.7	11.3
-Y33- 10+01 RT	0.5 x 0.9 x 0.6	0.6	9	11	3.7	11.3
-Y33- 10+14 RT	0.5 x 0.9 x 0.6	0.6	9	11	3.7	11.3
-Y33- 10+28 RT	0.5 x 0.9 x 0.6	0.6	9	11	3.7	11.3
-L- 327+95 RT	0.6 x 1.2 x 0.9	1.33	18	25	8.2	25
-L- 327+95 RT	0.6 x 1.2 x 0.9	1.33	18	25	8.2	25
TOTALS				543 m. tons	180 m. tons	543 sq. m.

COIR FIBER MATTING DETAIL

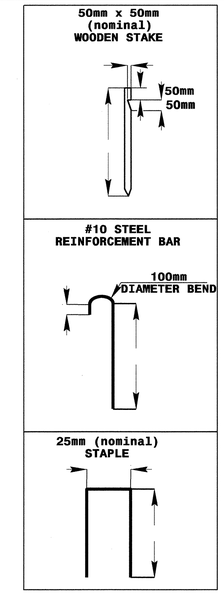
NOT TO SCALE



PLAN VIEW



TYPICAL CROSS SECTION



ANCHOR OPTIONS

NOTES:
1. IN AREAS TO BE MATTED, ALL SEEDING, SOIL AMENDMENTS, AND SOIL PREPARATION MUST BE COMPLETED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS PRIOR TO PLACEMENT OF COIR FIBER MATTING.
2. REBAR OR STAPLES MAY BE USED IN PLACE OF WOODEN STAKES AS DIRECTED BY THE ENGINEER.

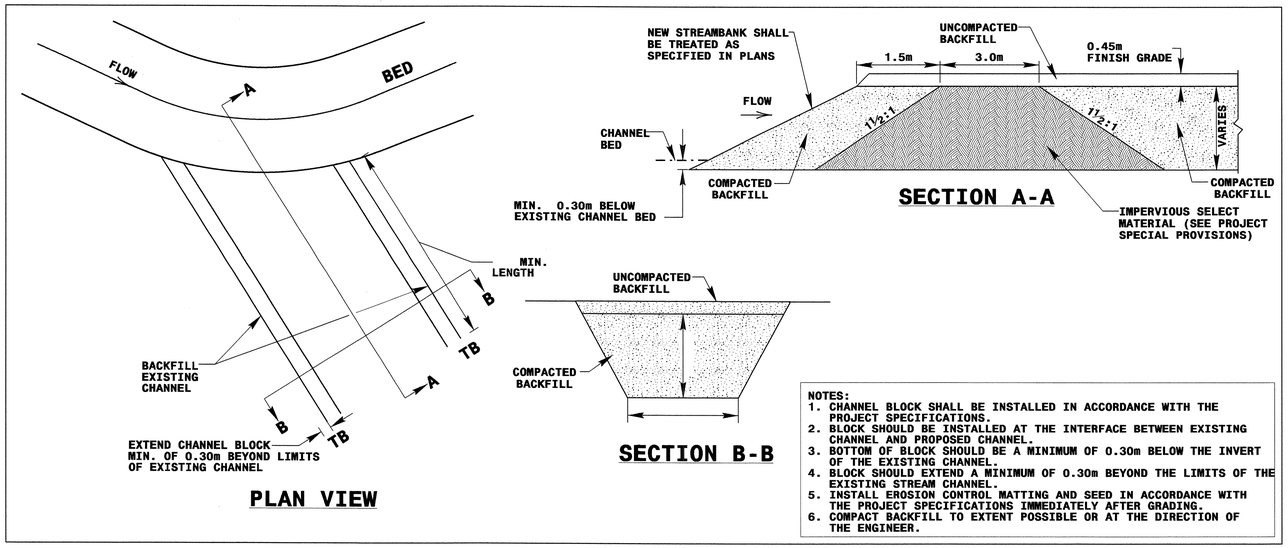
10-JAN-2011 08:32
s:\hydraulics\r2519a_ditch.dgn
$$$$USERNAME$$$$

METRIC	PROJECT REFERENCE NO.	SHEET NO.
	R-2519A	2-P
	R/W SHEET NO.	
5m 0 10m	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CONST.REV.		
R/W REV.		

NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM 2/4/11

STREAM PLUG

NOT TO SCALE

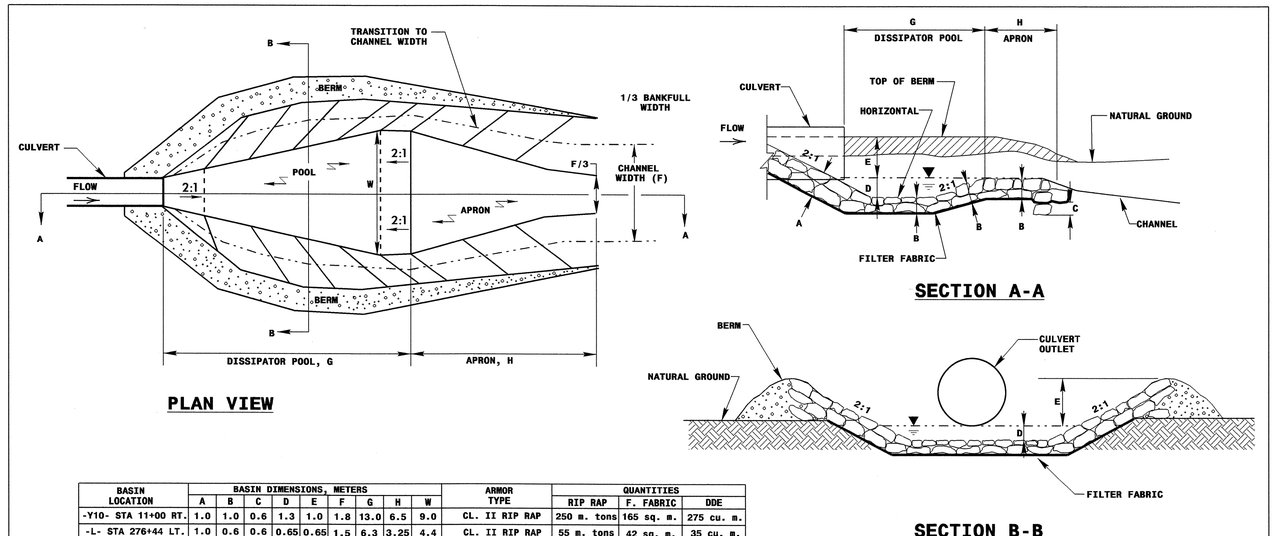


NOTES:
1. CHANNEL BLOCK SHALL BE INSTALLED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
2. BLOCK SHOULD BE INSTALLED AT THE INTERFACE BETWEEN EXISTING CHANNEL AND PROPOSED CHANNEL.
3. BOTTOM OF BLOCK SHOULD BE A MINIMUM OF 0.30m BELOW THE INVERT OF THE EXISTING CHANNEL.
4. BLOCK SHOULD EXTEND A MINIMUM OF 0.30m BEYOND THE LIMITS OF THE EXISTING STREAM CHANNEL.
5. INSTALL EROSION CONTROL MATTING AND SEED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS IMMEDIATELY AFTER GRADING.
6. COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.

STREAM PLUG LOCATION AND QUANTITIES	
STATION	IMPERVIOUS SELECT MATERIAL
-L- 314+10 RT.	13.5 cu. m.
-Y30- 10+30 RT.	16.9 cu. m.
-Y32- 9+95 RT.	11.7 cu. m.

ROCK ENERGY DISSIPATOR BASIN DETAIL

NOT TO SCALE



BASIN LOCATION	BASIN DIMENSIONS, METERS									ARMOR TYPE	QUANTITIES		
	A	B	C	D	E	F	G	H	W		RIP RAP	F. FABRIC	DDE
-Y10- STA 11+00 RT.	1.0	1.0	0.6	1.3	1.0	1.8	13.0	6.5	9.0	CL. II RIP RAP	250 m. tons	165 sq. m.	275 cu. m.
-L- STA 276+44 LT.	1.0	0.6	0.6	0.65	0.65	1.5	6.3	3.25	4.4	CL. II RIP RAP	55 m. tons	42 sq. m.	35 cu. m.

ALL DIMENSIONS ARE APPROXIMATE

10-JAN-2011 08:31
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-0
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5m 0 10m

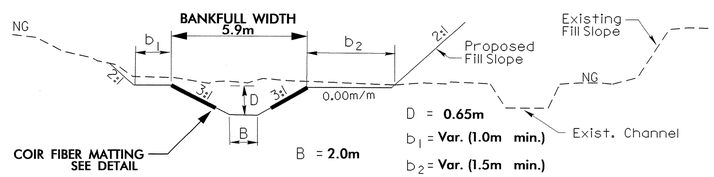
CONST.REV.

R /W REV.

NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A. T. NOTTINGHAM 2/4/11

GEORGES FORK STREAM RELOCATION

TYPICAL RIFFLE SECTION



D = 0.65m

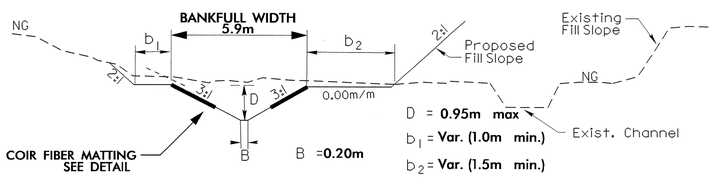
b_1 = Var. (1.0m min.)

b_2 = Var. (1.5m min.)

B = 2.0m

NOTE: SEE -L- CROSS SECTIONS FOR b_1 AND b_2 DIMENSIONS

TYPICAL POOL SECTION



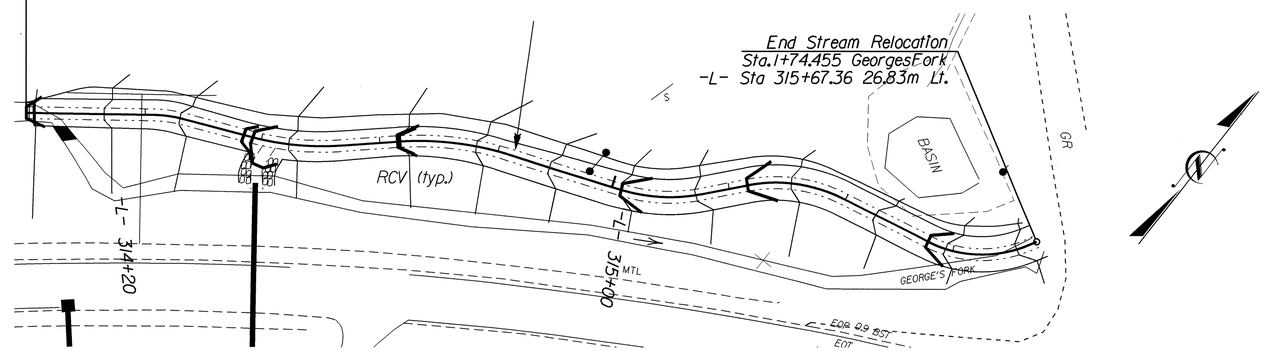
D = 0.95m max

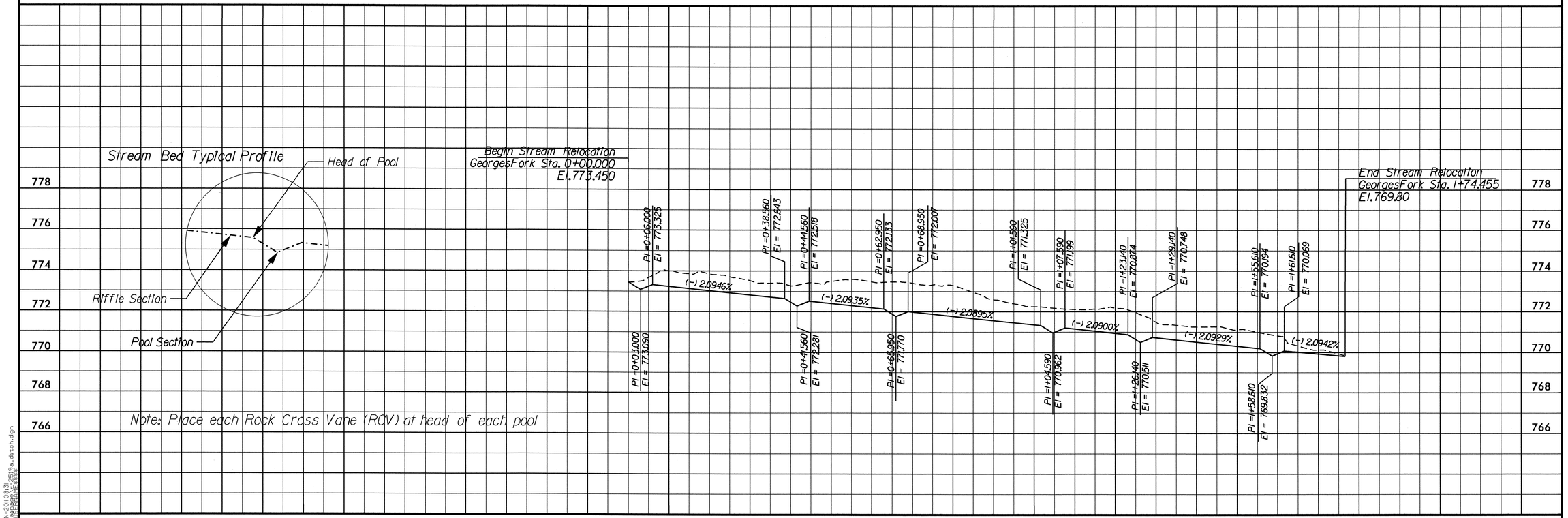
b_1 = Var. (1.0m min.)

b_2 = Var. (1.5m min.)

B = 0.20m

NOTE: SEE -L- CROSS SECTIONS FOR b_1 AND b_2 DIMENSIONS





Note: Place each Rock Cross Vane (RCV) at head of each pool

C:\JAN-2010\R-2519a_ditch.dgn

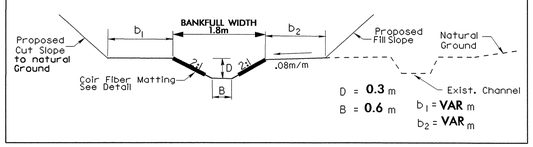
METRIC	PROJECT REFERENCE NO.	SHEET NO.
	R-2519A	2-R
	R/W SHEET NO.	
5m 0 10m	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CONST.REV.		
R/W REV.		

NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM
2/4/11

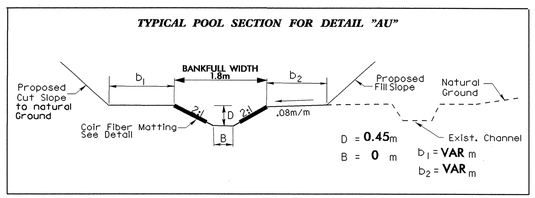
PLUM BRANCH AND PLUM BRANCH TRIBUTARY STREAM RELOCATION

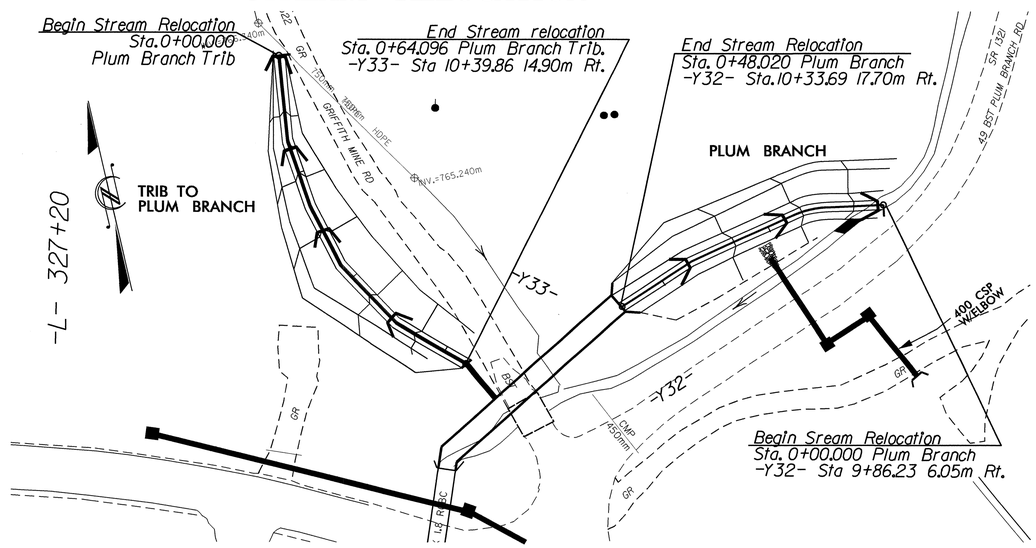
PLUM BRANCH STREAM RELOCATION TRIBUTARY DETAILS

TYPICAL RIFFLE SECTION FOR DETAIL "AU"



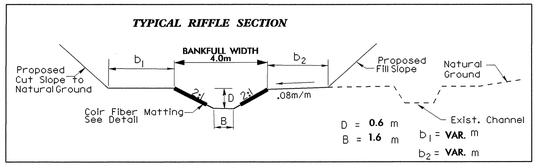
TYPICAL POOL SECTION FOR DETAIL "AU"



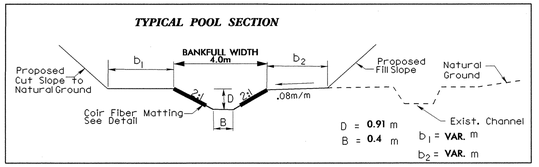


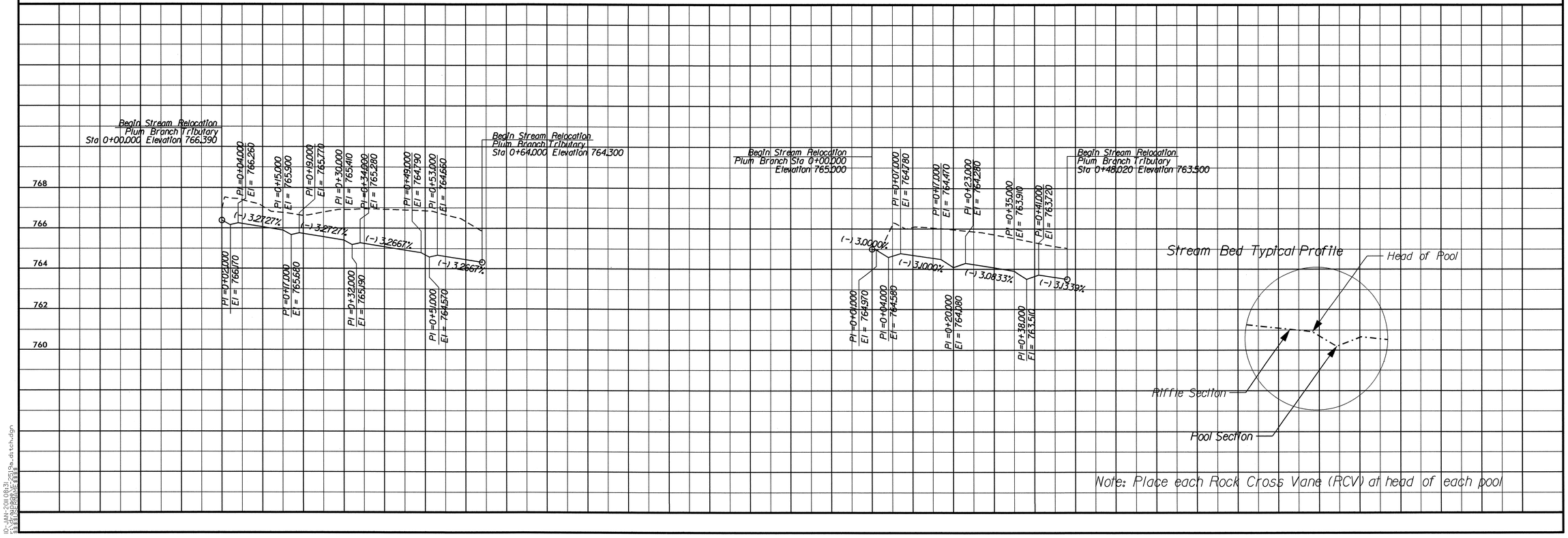
PLUM BRANCH STREAM RELOCATION DETAILS

TYPICAL RIFFLE SECTION



TYPICAL POOL SECTION





Note: Place each Rock Cross Vane (RCV) at head of each pool

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-S
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5m 0 10m

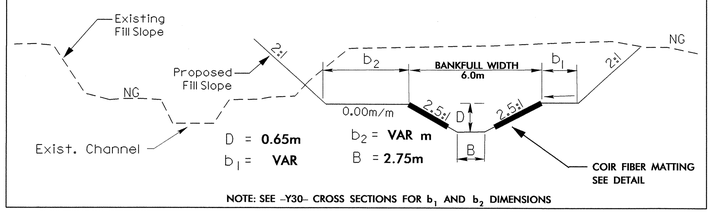
CONST.REV.

R /W REV.

NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER R. T. NOTTINGHAM 2/4/11

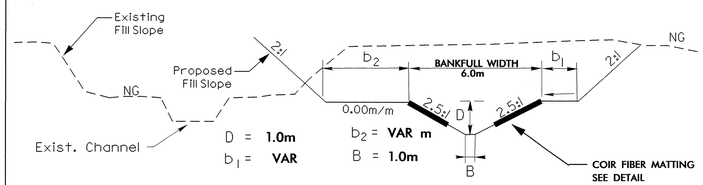
SHOAL CREEK STREAM RELOCATION

TYPICAL RIFFLE SECTION

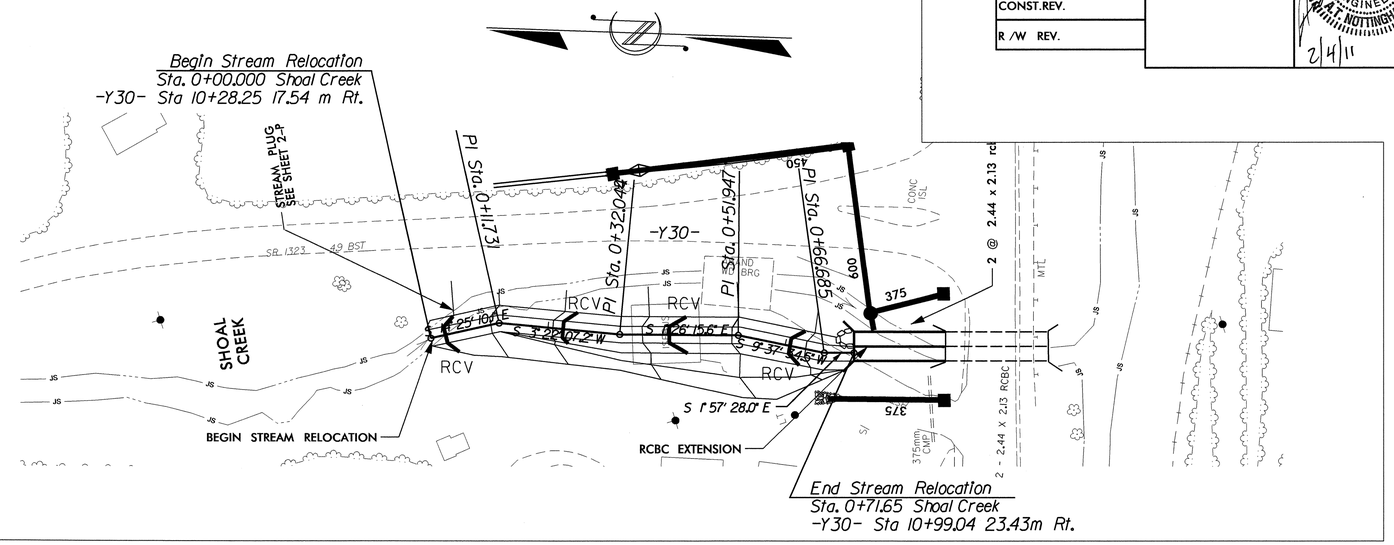


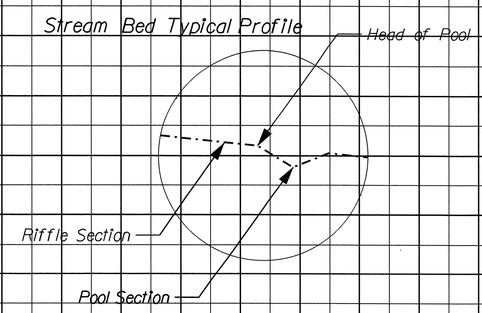
NOTE: SEE -Y30- CROSS SECTIONS FOR b_1 AND b_2 DIMENSIONS

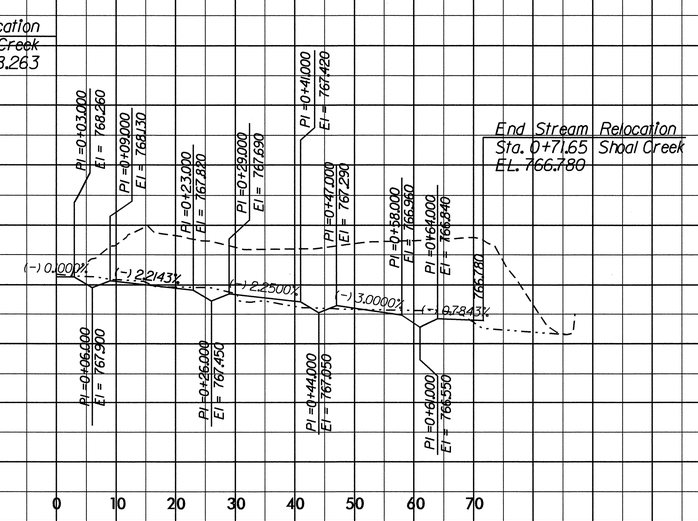
TYPICAL POOL SECTION



NOTE: SEE -Y30- CROSS SECTIONS FOR b_1 AND b_2 DIMENSIONS

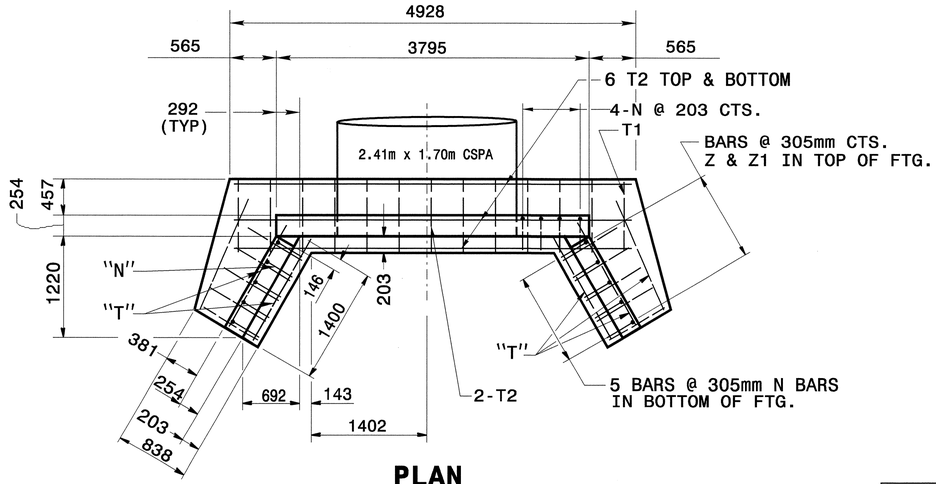




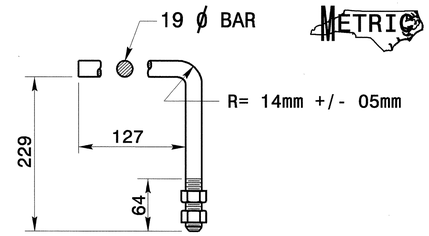


Note: Place each Rock Cross Vane (RCV) at head of each pool

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-T



PLAN



HOOK BOLT

NOTE: CONSTRUCT HOOK BOLTS (ANCHORS) AT 610mm CTS. ALONG THE CIRCUMFERENCE OF THE 2.41m X 1.70m CMPA. EMBED THE HOOK BOLTS 152mm IN DEPTH. THE GALVANIZED 19mm DIA. HOOK BOLTS MUST MEET ASTM A-307 OR ASTM A-836. BOTH BOLTS AND NUTS MUST BE IN ACCORDANCE WITH ASTM A-153 FOR GALVANIZING.

NOTES:

ALL CONCRETE TO BE CLASS "A".

ALL REINFORCING STEEL SHALL BE ASTMA615-GRADE 60.

ALL REINFORCING STEEL SHALL BE DEFORMED BARS. WHERE SPLICING OF REINFORCMENT IS NECESSARY, BARS ARE TO BE LAPPED 45 DIAMETERS. ALL DIMENSIONS RELATIVE TO REINFORCEMENT ARE TO CENTERS OF BARS.

THE FOOTING, CURTAIN WALL AND 102mm OF WALL ARE TO BE POURED IN ONE OPERATION ALLOWING NO TIME FOR INITIAL SET TO TAKE PLACE BETWEEN THEM. THE REMAINING WALL SHALL THEN BE POURED IN ONE OPERATION.

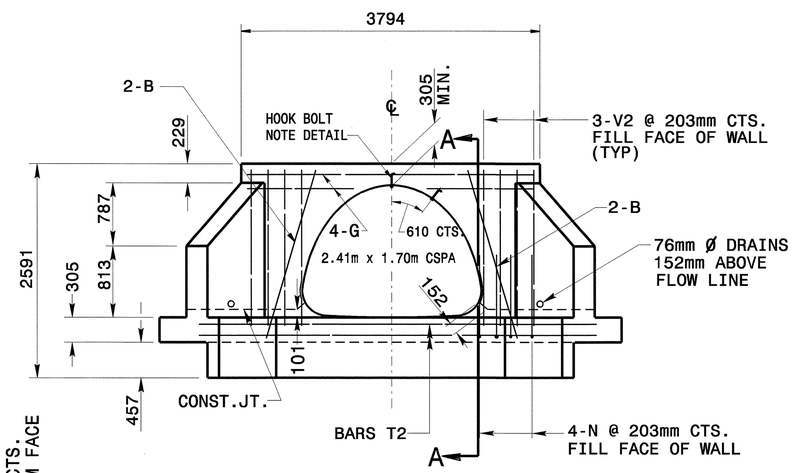
ALL EXPOSED CORNERS ARE TO BE CHAMFERED 25mm.

76mm DIAMETER DRAINS SHALL BE PLACED IN WALL AS SHOWN AND BE 152mm ABOVE NORMAL FLOW LINE.

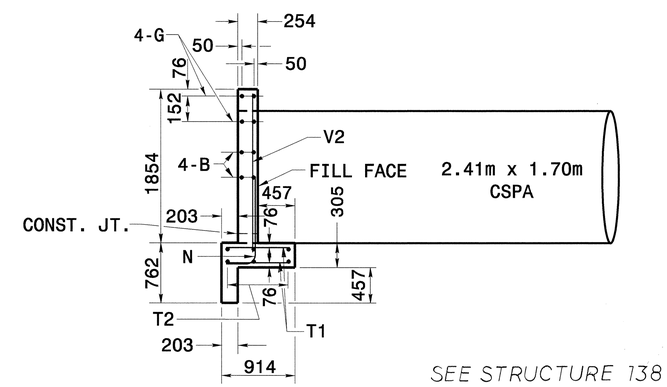
ALL MATERIAL AND WORKMANSHIP AS PER N.C.DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.

THE EXTRA BARS ARE PROVIDED FOR HOLDING REINFORCING STEEL IN CORRECT POSITION IN WING.

ALL DIMENSIONS IN MILLIMETERS UNLESS OTHER WISE NOTED

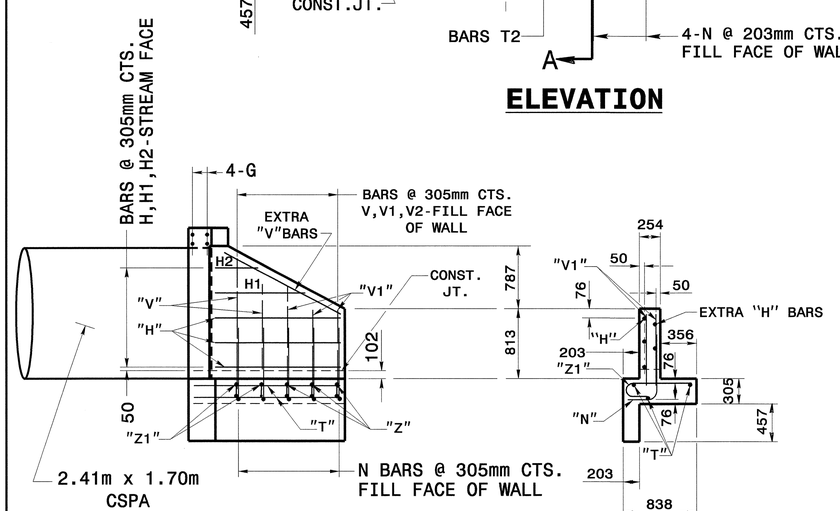


ELEVATION



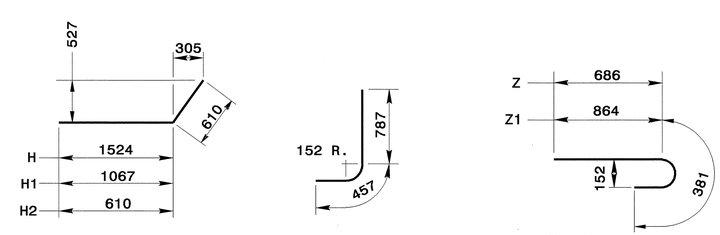
SEE STRUCTURE 138

SECTION - AA



WING ELEVATION

END OF WING



"H" BARS

"N" BARS

"Z" BARS

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

DESIGN DATA

Specifications	A.A.S.H.T.O. (1977)
Steel in tension	14,062,000 kgs. PER SQ.METER
Concrete in compression	843,720 kgs. PER SQ. METER
Shear Class "A" Concrete	SEE A.A.S.H.T.O.
Equiv. fluid pressure of earth	481 kgs. PER CU. METER

BILL OF MATERIAL FOR ENDWALL

REINF. STEEL			1 PIPES	
BAR	SIZE	LENGTH	NO.	WEIGHT
B	#13	2134	4	8
G	#13	3692	4	15
H	#13	2134	10	21
H1	#13	1676	2	4
H2	#13	1219	4	5
N	#13	1245	18	23
T	#13	1524	8	12
T1	#13	838	13	10
T2	#13	4826	6	29
V	#13	1600	8	13
V1	#13	1245	8	10
V2	#13	1880	6	15
Z	#13	1167	5	5
Z1	#13	1245	5	6

REINF. STEEL kgs.	178
TOTAL CON./R.C. CU. METER	5.2
2.41m x 1.70m CSAP DEDUCTION CU. METERS	-0.7
CON./R.C. CU. METERS	4.5

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL B. NOWAKOWSKI 2/22/11

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

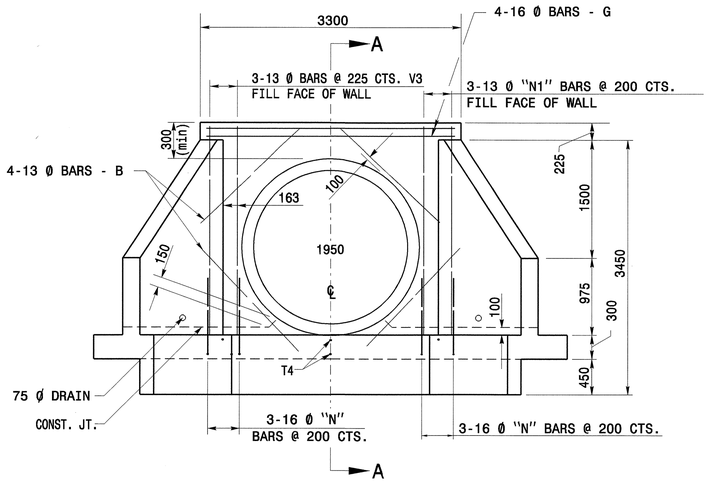
DETAIL OF REINFORCED CONCRETE ENDWALL FOR 2.41m X 1.70m (Pipe Arch)-90°

ORIGINAL BY:		DATE:	
MODIFIED BY:	rnbritt	DATE:	3/31/09
CHECKED BY:		DATE:	5/7/09
FILE SPEC.:	details/nbritt/metric/mhydro/2.41m x 1.70m CSPA sk90.dgn		

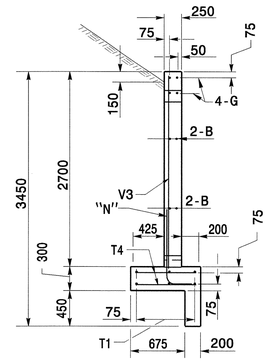
$$$$$$$SYSTIME$$$$$
$$$$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-U

METRIC



END ELEVATION



SECTION A-A FOR ALL ENDWALLS

ALL DIMENSIONS IN MILLIMETERS UNLESS OTHER WISE NOTED

NOTES:

ALL CONCRETE TO BE CLASS "A".

ALL REINFORCING STEEL SHALL BE ASTM A615-GRADE 60.

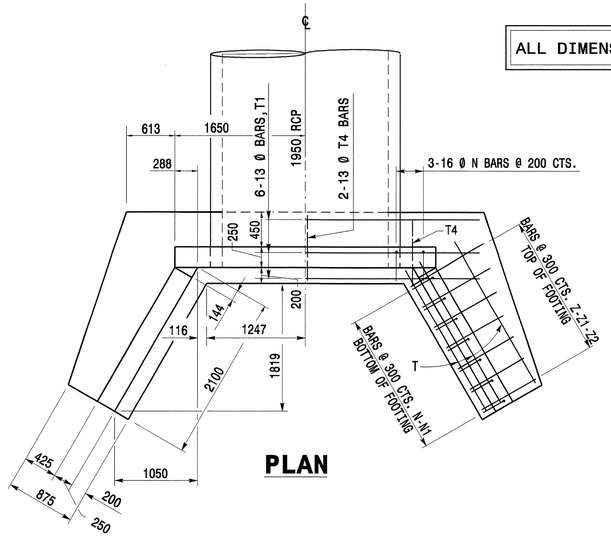
ALL REINFORCING STEEL SHALL BE DEFORMED BARS. WHERE SPLICING OF REINFORCMENT IS NECESSARY, BARS ARE TO BE LAPPED 45 DIAMETERS. ALL DIMENSIONS RELATIVE TO REINFORCEMENT ARE TO CENTERS OF BARS.

THE FOOTING, CURTAIN WALL AND 100mm OF WALL ARE TO BE POURED IN ONE OPERATION ALLOWING NO TIME FOR INITIAL SET TO TAKE PLACE BETWEEN THEM. THE REMAINING WALL SHALL THEN BE POURED IN ONE OPERATION.

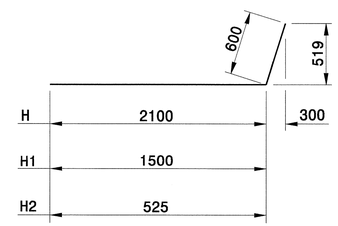
ALL EXPOSED CORNERS ARE TO BE CHAMFERED 25mm.

75mm DIAMETER DRAINS SHALL BE PLACED IN WALL AS SHOWN AND BE 150mm ABOVE NORMAL FLOW LINE.

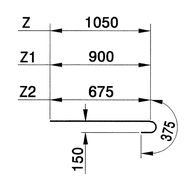
ALL MATERIAL AND WORKMANSHIP AS PER N.C.DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.



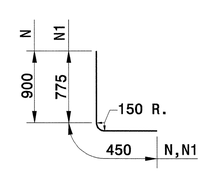
PLAN



BARS H-H1-H2



BARS Z-Z1-Z2

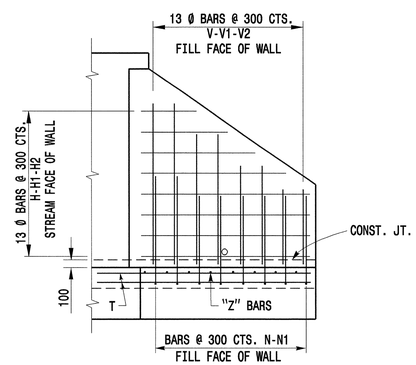


BARS N-N1

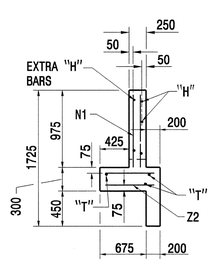
BILL OF MATERIAL FOR ONE ENDWALL

REINFORCING STEEL			1 PIPE	
BAR	SIZE	LENGTH	NO.	WEIGHT
B	#13	1800	8	15
G	#16	3225	4	20
H	#13	2700	10	27
H1	#13	2100	6	13
H2	#13	1125	4	5
N	#16	1350	10	21
N1	#13	1225	10	12
T	#13	1950	6	12
T1	#13	4500	6	27
T4	#13	825	4	3
V	#13	1725	6	10
V1	#13	1350	6	8
V2	#13	825	8	7
V3	#13	2550	6	14
Z	#16	1425	4	9
Z1	#13	1275	4	5
Z2	#13	1050	6	6
TOTAL REINF. STEEL (kg)				214
CLASS "A" CONC. (cu. m.)				6.1

* NO DEDUCTIONS HAVE BEEN MADE FOR PIPES
DEDUCTION FOR 1950 mm RC PIPE = 1.0 CU. M.



ELEVATION OF WING



END OF WING

SEE STRUCTURE 324

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOELSI HOWESTON 2/22/11

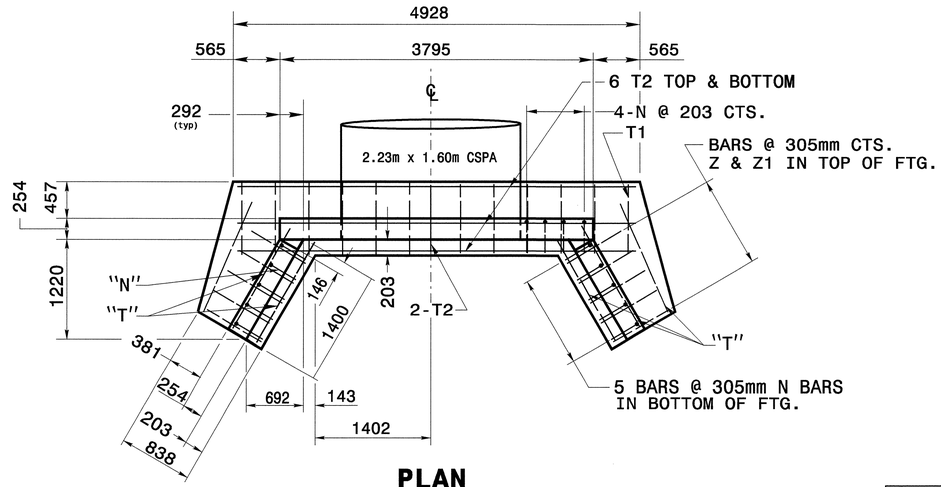
PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

DETAIL OF 1950mm REINFORCED CONCRETE WINGWALL -90° SKEW

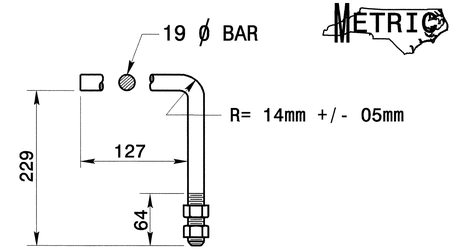
ORIGINAL BY: DATE:
MODIFIED BY: nbritt DATE: 3-31-09
CHECKED BY: DATE: 5/7/09
FILE SPEC.: details/nbritt/mhydro/1950wingwall 90sk.dgn

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

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-V



PLAN



HOOK BOLT

NOTE: CONSTRUCT HOOK BOLTS (ANCHORS) AT 610mm CTS. ALONG THE CIRCUMFERENCE OF THE 2.23m X 1.60m CMPA. EMBED THE HOOK BOLTS 152mm IN DEPTH. THE GALVANIZED 19mm DIA. HOOK BOLTS MUST MEET ASTM A-307 OR ASTM A-836. BOTH BOLTS AND NUTS MUST BE IN ACCORDANCE WITH ASTM A-153 FOR GALVANIZING.

NOTES:

ALL CONCRETE TO BE CLASS "A".

ALL REINFORCING STEEL SHALL BE ASTMA615-GRADE 60.

ALL REINFORCING STEEL SHALL BE DEFORMED BARS. WHERE SPLICING OF REINFORCMENT IS NECESSARY, BARS ARE TO BE LAPPED 45 DIAMETERS. ALL DIMENSIONS RELATIVE TO REINFORCEMENT ARE TO CENTERS OF BARS.

THE FOOTING, CURTAIN WALL AND 102mm OF WALL ARE TO BE POURED IN ONE OPERATION ALLOWING NO TIME FOR INITIAL SET TO TAKE PLACE BETWEEN THEM. THE REMAINING WALL SHALL THEN BE POURED IN ONE OPERATION.

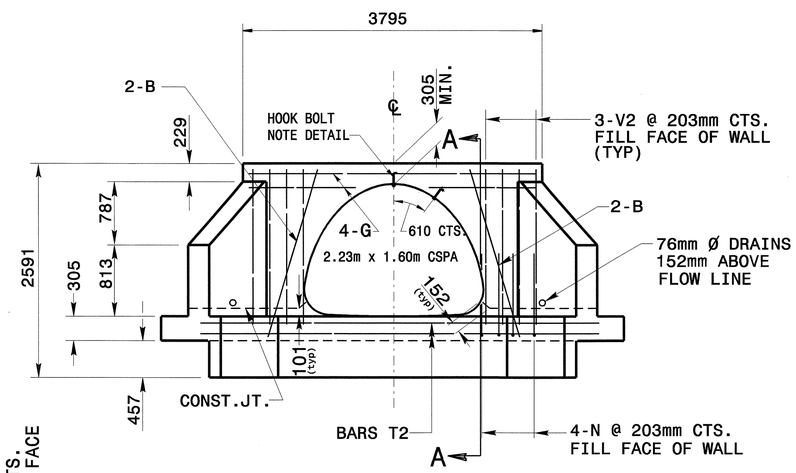
ALL EXPOSED CORNERS ARE TO BE CHAMFERED 25mm.

76mm DIAMETER DRAINS SHALL BE PLACED IN WALL AS SHOWN AND BE 152mm ABOVE NORMAL FLOW LINE.

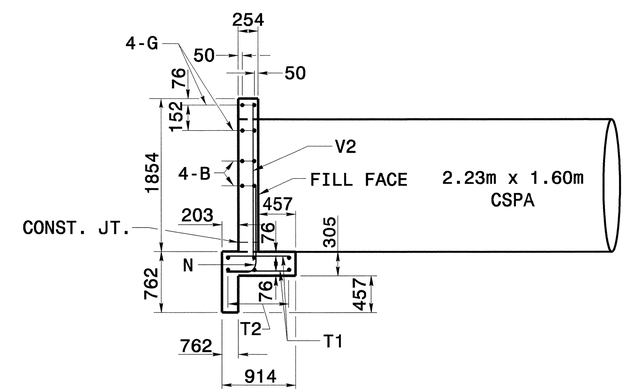
ALL MATERIAL AND WORKMANSHIP AS PER N.C.DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.

THE EXTRA BARS ARE PROVIDED FOR HOLDING REINFORCING STEEL IN CORRECT POSITION IN WING.

ALL DIMENSIONS IN MILLIMETERS UNLESS OTHER WISE NOTED

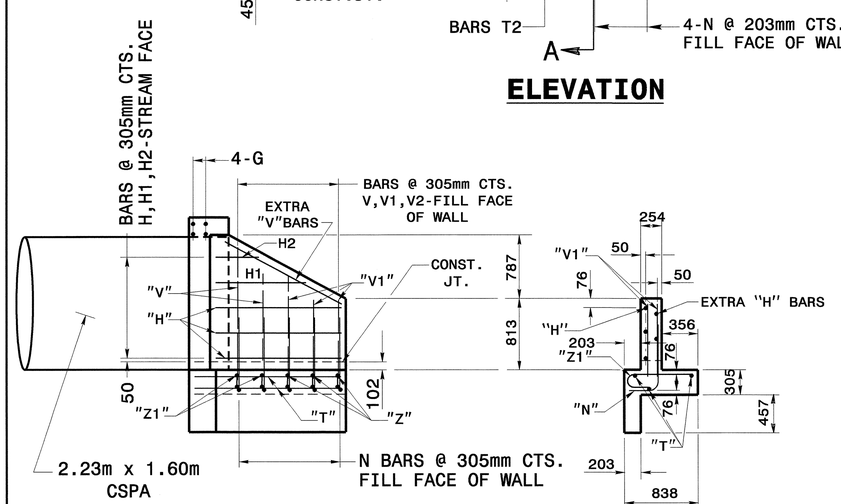


ELEVATION



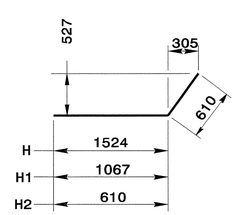
SECTION - AA

SEE STRUCTURE 22

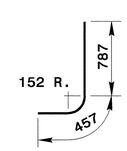


WING ELEVATION

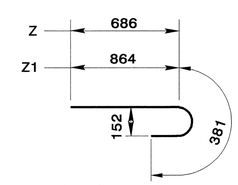
END OF WING



"H" BARS



"N" BARS



"Z" BARS

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

DESIGN DATA

Specifications	A.A.S.H.T.O.
Steel in tension	14,062,000 kgs. PER SQ.METER
Concrete in compression	843,720 kgs. PER SQ. METER
Shear Class "A" Concrete	SEE A.A.S.H.T.O.
Equiv. fluid pressure of earth	481 kgs. PER CU. METER

BILL OF MATERIAL FOR ENDWALL

REINF. STEEL			1 PIPES	
BAR	SIZE	LENGTH	NO.	WEIGHT
B	#13	2134	4	8
G	#13	3692	4	15
H	#13	2134	10	21
H1	#13	1676	2	4
H2	#13	1219	4	5
N	#13	1245	18	23
T	#13	1524	8	12
T1	#13	838	12	10
T2	#13	4826	6	29
V	#13	1600	8	13
V1	#13	1245	8	10
V2	#13	1880	6	15
Z	#13	1167	5	5
Z1	#13	1245	5	6

REINF. STEEL kgs.	178
TOTAL CON./R.C. CU. METER	5.2
2.23m x 1.60m CSAP DEDUCTION CU. METERS	0.7
CON./R.C. CU. METERS	4.5

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL B. HOCUTT 2/23/11

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

DETAIL OF REINFORCED CONCRETE ENDWALL FOR 2.23m X 1.60m (Pipe Arch)-90°

ORIGINAL BY: DATE:
MODIFIED BY: rnbritt DATE: 3-31-09
CHECKED BY: DATE: 5/7/09
FILE SPEC.: pwtails/nbritt/metric/mhydro/2.23m x 1.60m CSPA sk90.dgn

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

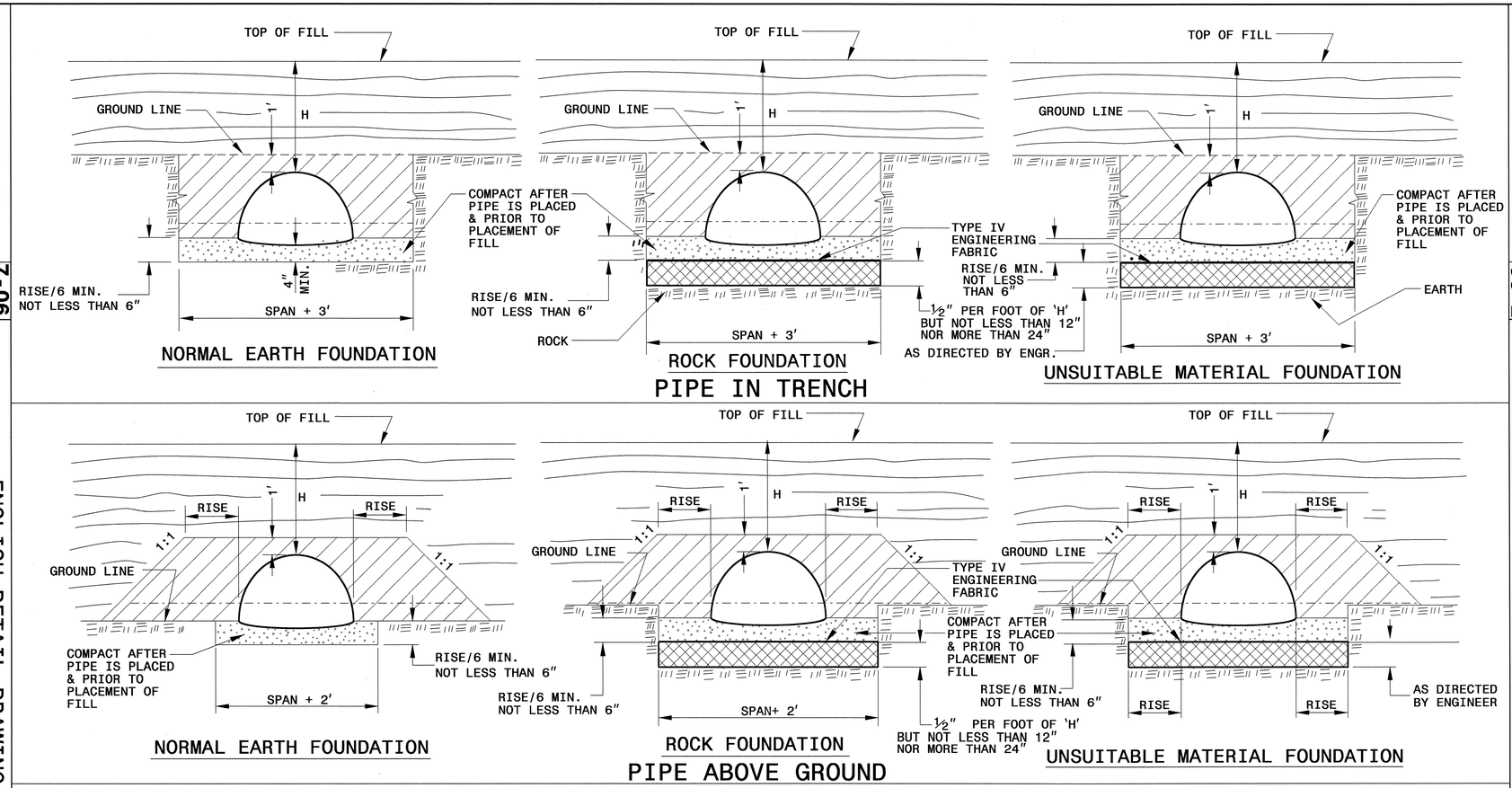
PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-W

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

7-06

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION

ARCH PIPE



NORMAL EARTH FOUNDATION

ROCK FOUNDATION

UNSUITABLE MATERIAL FOUNDATION

PIPE IN TRENCH

NORMAL EARTH FOUNDATION

ROCK FOUNDATION

UNSUITABLE MATERIAL FOUNDATION

PIPE ABOVE GROUND

GENERAL NOTES:

SPAN = HORIZONTL DIMENSION OF PIPE ARCH.

RISE = VERTICAL DIMENSION OF PIPE ARCH.

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.

NOTE: TAKE CARE TO SEAT ARCH PIPE SO THAT THE ENTIRE BOTTOM OF ARCH IS TOUCHING THE BEDDING MATERIAL.

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

ARCH PIPE

SHEET 1 OF 3

300D01

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON 2/22/11

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

SEE PLATE FOR TITLE

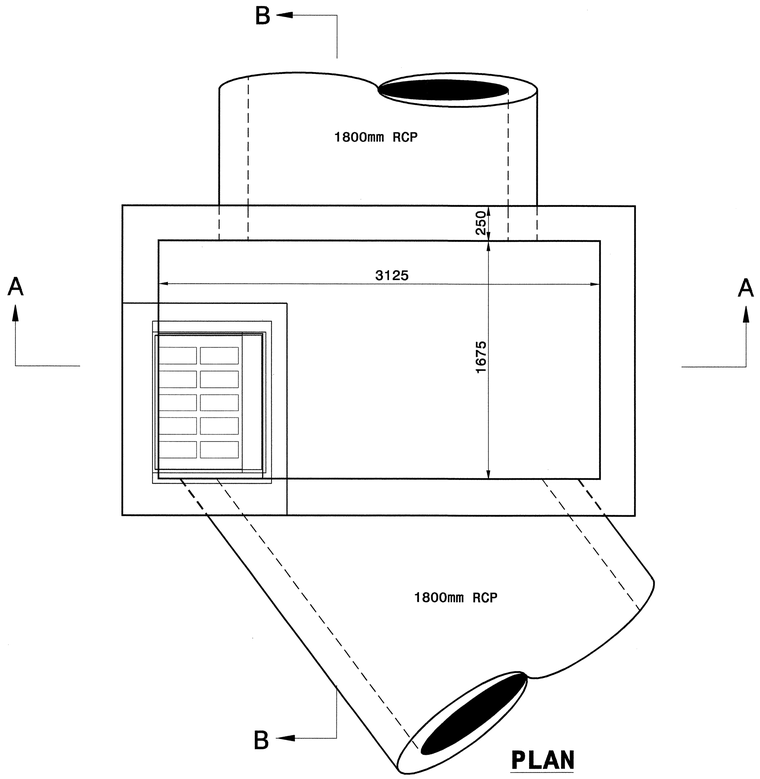
ORIGINAL BY: DATE:
MODIFIED BY: rnbritt DATE: 12-14-10
CHECKED BY: DATE: 2/8/11
FILE SPEC.: details/nbritt/english/hydro/arch0300d01.dgn

5/14/99

$$$$$SYSTIME$$$$
$$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-X

METRIC



PLAN

NOTES:

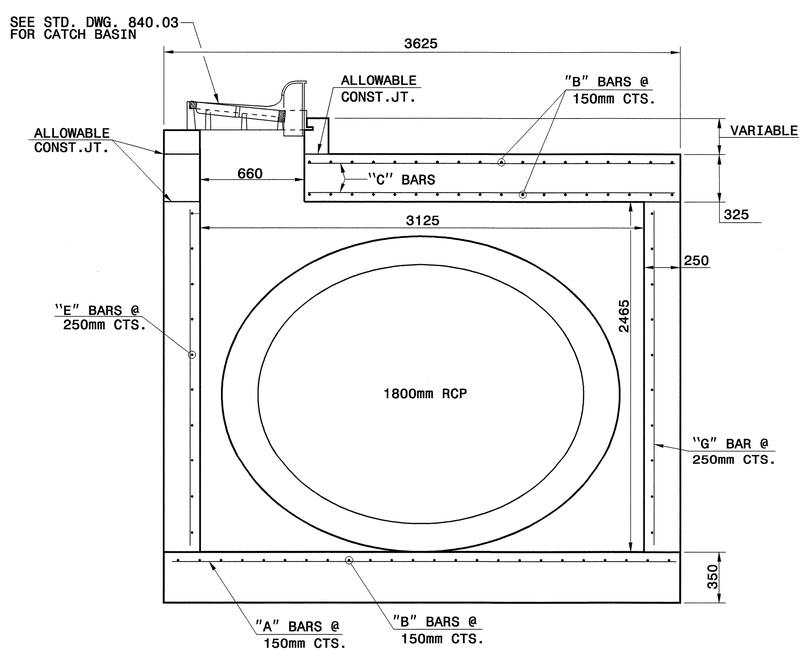
1. USE CLASS "B" CONCRETE THROUGHOUT.
2. CONSTRUCT CONCRETE BOX IN ACCORDANCE WITH SECTION 825 OF THE STANDARD SPECIFICATIONS.
3. USE FORMS FOR CONSTRUCTION OF THE BOTTOM SLAB.
4. ADJUST LENGTH OF STEEL BARS AS NEEDED TO COMPENSATE FOR PIPES AND FRAME AND GRATE OPENINGS.
5. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 400.
6. CUT OR BEND STEEL BARS AS NEEDED TO PROVIDE 50mm CLEARANCE.
7. LOCATE FRAME AND GRATE AS FIELD CONDITIONS DICTATE AND AS DIRECTED BY THE ENGINEER.
8. PLACE STEPS 300mm ON CENTERS IN ACCORDANCE WITH STD. NO.840.66.

BILL OF MATERIALS

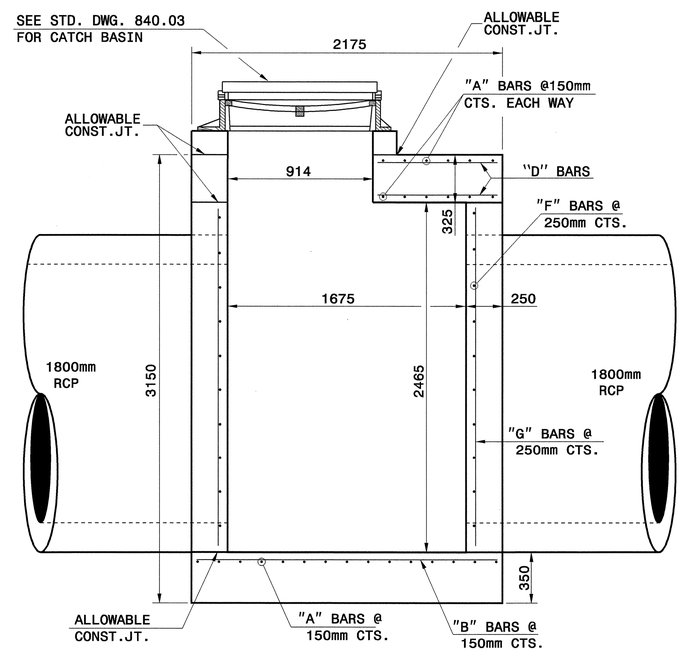
BAR	QTY	SIZE	LENGTH	WEIGHT
A	26	#16	3525	142
B	60	#16	2075	193
C	7	#16	2365	26
D	8	#16	910	11
E	22	#16	1575	54
F	22	#16	3025	103
G	40	#16	2365	147
H	24	#16	925	34
TOTAL REINF. STEEL (lbs.)				710
TOTAL CONCRETE (CU. YDS.)				11.9
DEDUCTIONS FOR ONE PIPE				
1800mm RCP (m^3) SKEWED				13.3
1800mm RCP (m^3)				1.0

NO DEDUCTIONS HAVE BEEN MADE TO ACCOMMODATE PIPES OR CATCH BASIN OPENING.

* #16 "H" BARS AROUND EACH PIPE.



SECTION A-A



SECTION B-B

SEE STRUCTURE
154 156 156A 159 162 320
164 170 180 297

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOHN S. HOWERTON
2/2/11

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

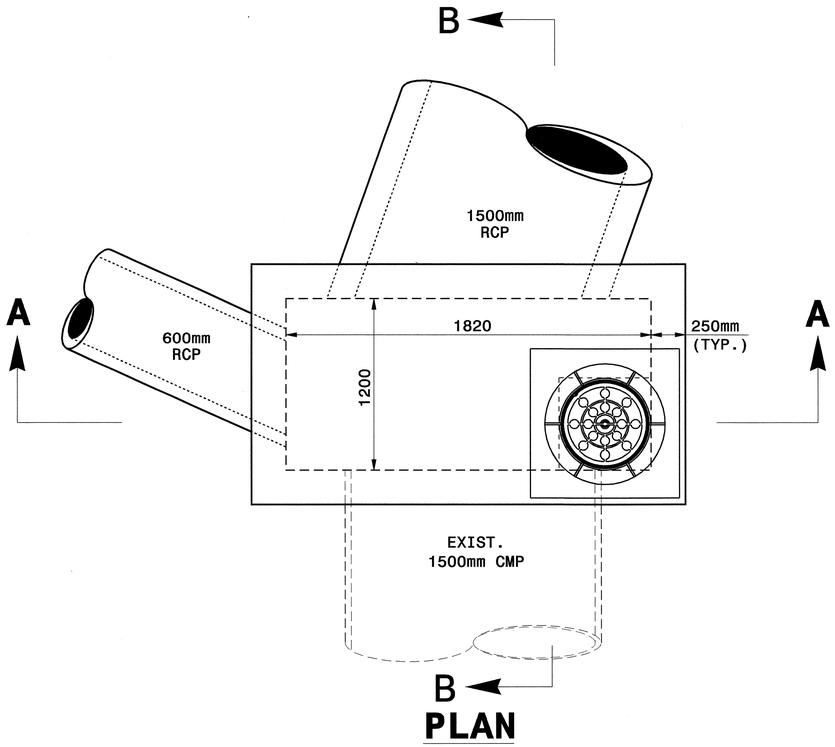
DETAIL OF SPECIAL CATCH BASIN

ORIGINAL BY: T.Stephenson DATE: Aug.1996
MODIFIED BY: T.Scott DATE: Mar.2009
CHECKED BY: DATE: 3/7/09
FILE SPEC.: /s:\sr/details/stand/tbjbacb_r2519a.dgn

$$$$$$$$CSTIME$$$$ DGN $$$$$$$$
$$$$$$$$DLENAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-Y

METRIC



PLAN

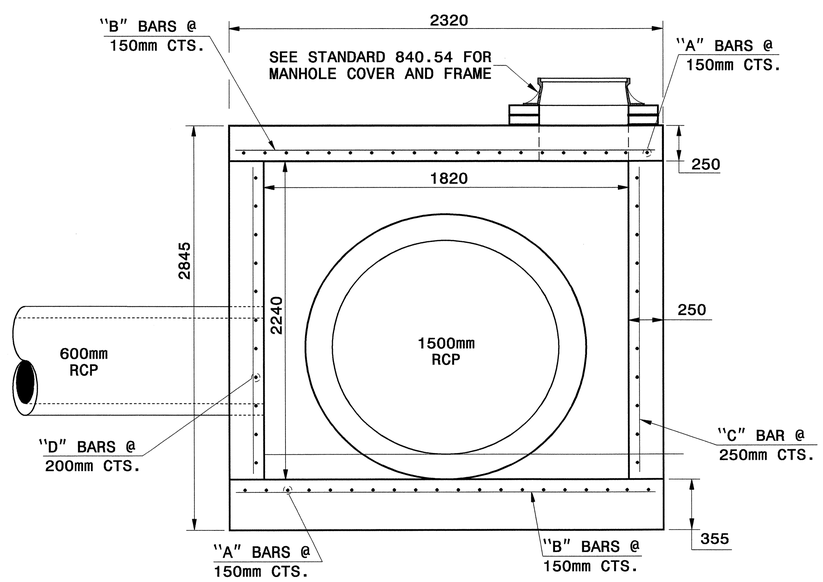
NOTES:

1. USE CLASS "B" CONCRETE THROUGHOUT.
2. CONSTRUCT CONCRETE BOX IN ACCORDANCE WITH SECTION 825 OF THE STANDARD SPECIFICATIONS AND MAY BE ADJUSTED TO FIT PIPE CONDITION.
3. USE FORMS FOR CONSTRUCTION OF THE BOTTOM SLAB.
4. ADJUST LENGTH OF STEEL BARS AS NEEDED TO COMPENSATE FOR PIPES.
5. CONFORM REINFORCING STEEL TO ASTM A615, GRADE 400.
6. CUT OR BEND STEEL BARS AS NEEDED TO PROVIDE 50mm CLEARANCE AROUND PIPES OR AS DIRECTED BY THE ENGINEER.
7. REFER TO STANDARD 840.54 FOR MANHOLE.
8. JUNCTION BOXES OVER 1.0M IN DEPTH WITH MANHOLES SHALL REQUIRE STEPS TO BE PLACED ON 355mm CTRS. REFERENCE STD.NO.840.66
9. ADJUST THE STEEL CONCRETE AND BRICK MASONARY QUANTITIES TO INCLUDE THE ADDITION OF THE MANHOLE (I.E. DIAGONAL BARS SHORTENED AROUND OPENING IN TOP SLAB AND VARIABLE HEIGHT BRICK MASONARY, REDUCE CONCRETE IN OPENING IN TOP SLAB.
10. DIMENSIONS MAY BE ADJUSTED TO SUIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.

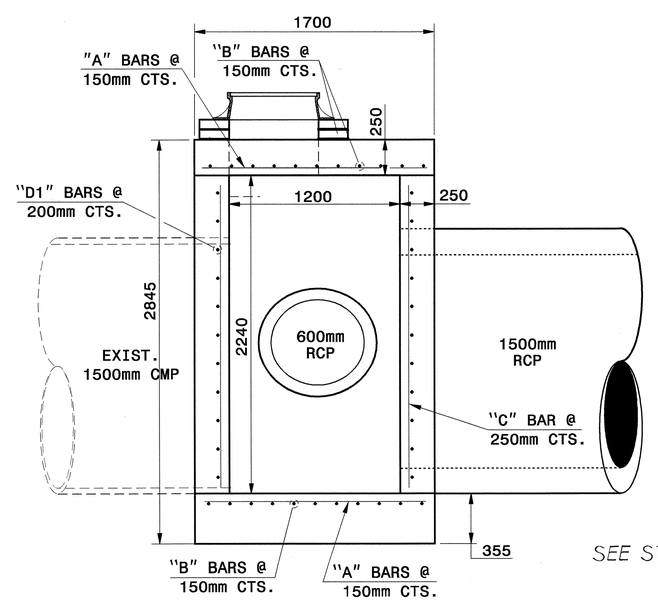
BILL OF MATERIALS

BAR	QTY	SIZE	LENGTH	WEIGHT
A	32	#16	1600	79
B	24	#16	2220	83
C	34	#16	2825	113
D	22	#19	1600	79
D1	22	#19	2220	109
TOTAL REINF. STEEL (kg)				463
TOTAL CLASS 'B' CONC. (m^3)				6.1
DEDUCTIONS FOR ONE PIPE				
600mm RCP (m^3)				0.11
1500mm RCP (m^3)				0.68

NO DEDUCTIONS HAVE BEEN MADE TO ACCOMMODATE PIPES OR MANHOLE OPENING. OPENING.



SECTION A-A



SECTION B-B

SEE STRUCTURE 686

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL R. JONSON 2/22/11

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

DETAIL OF SPECIAL JUNCTION BOX W/MANHOLE

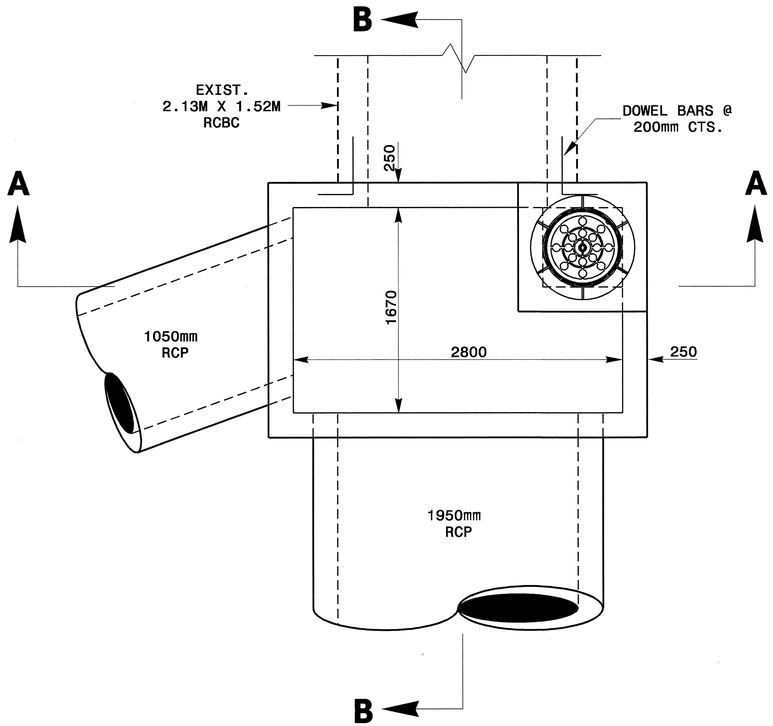
ORIGINAL BY: T.S.Spell DATE: 3-25-09
MODIFIED BY: DATE:
CHECKED BY: DATE: 5/7/09
FILE SPEC.: w:tspell/metric/tbjb&cb_r2519a.dgn

6/10/99

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

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-Z

METRIC



PLAN

NOTES:

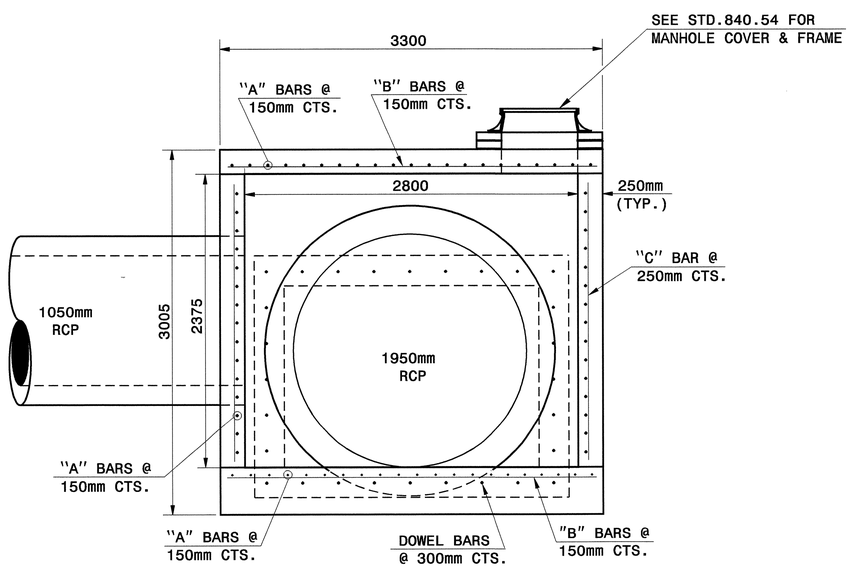
1. USE CLASS "B" CONCRETE THROUGHOUT.
2. CONSTRUCT CONCRETE BOX IN ACCORDANCE WITH SECTION 825 OF THE STANDARD SPECIFICATIONS AND MAY BE ADJUSTED TO FIT PIPE CONDITION.
3. USE FORMS FOR CONSTRUCTION OF THE BOTTOM SLAB.
4. ADJUST LENGTH OF STEEL BARS AS NEEDED TO COMPENSATE FOR PIPES.
5. CONFORM REINFORCING STEEL TO ASTM A615, GRADE 400.
6. CUT OR BEND STEEL BARS AS NEEDED TO PROVIDE 50mm CLEARANCE AROUND PIPES OR AS DIRECTED BY THE ENGINEER.
7. REFER TO STANDARD 840.54 FOR MANHOLE.
8. JUNCTION BOXES OVER 1.0M IN DEPTH WITH MANHOLES SHALL REQUIRE STEPS TO BE PLACED ON 355mm CTRS. REFERENCE STD.NO.840.66
9. ADJUST THE STEEL CONCRETE AND BRICK MASONARY QUANTITIES TO INCLUDE THE ADDITION OF THE MANHOLE (I.E. DIAGONAL BARS SHORTENED AROUND OPENING IN TOP SLAB AND VARIABLE HEIGHT BRICK MASONARY, REDUCE CONCRETE IN OPENING IN TOP SLAB.
10. DIMENSIONS MAY BE ADJUSTED TO SUIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.

BILL OF MATERIALS

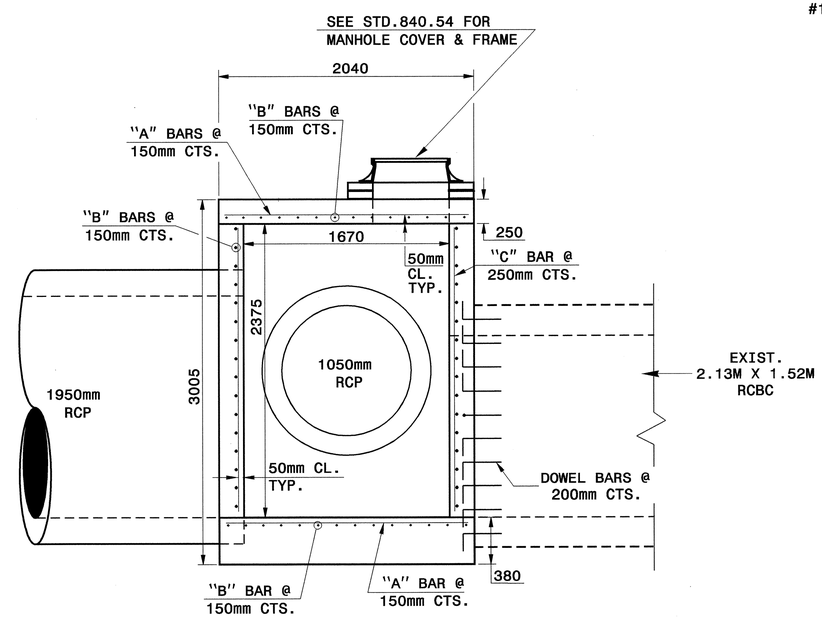
BAR	NO.	SIZE	LENGTH	WEIGHT
A	76	#16	1840	217
B	58	#16	3100	279
C	42	#16	2275	148
D	36	#19	500	40
TOTAL REINF. STEEL (kg)				684
TOTAL CONC. (cu. m.)				9.1

DEDUCTIONS FOR EACH PIPE	
1050mm RCP	0.29
1950mm RCP	1.28
2.13X1.52 RCBC	0.65

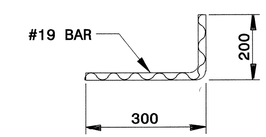
NO DEDUCTIONS HAVE BEEN MADE TO ACCOMMODATE PIPES OR MANHOLE OPENING.



SECTION A-A



SECTION B-B



DOWEL

SEE STRUCTURE 323

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

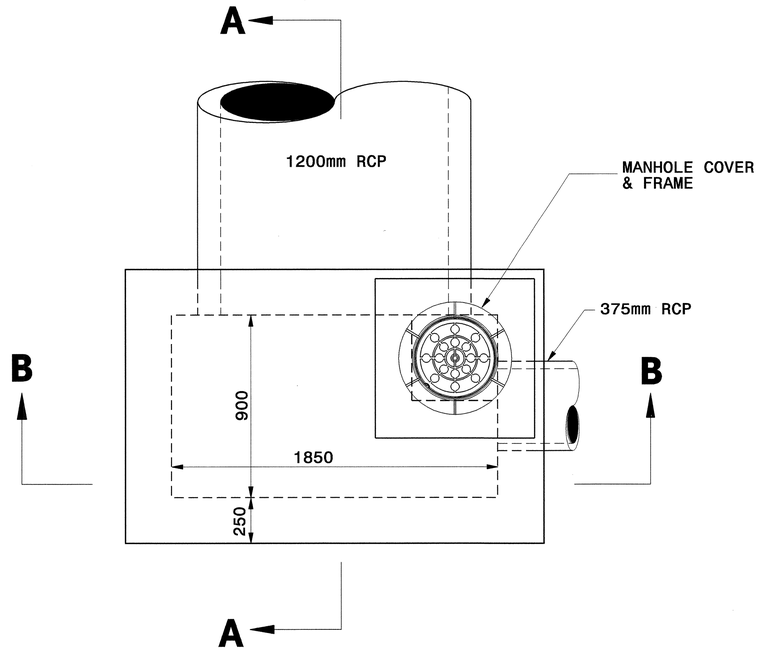
DETAIL OF TRAFFIC BEARING JUNCTION BOX W/MANHOLE CONNECTING 1950mm RCP TO EXISTING RC BOX CULVERT

ORIGINAL BY: TSpell DATE: 4-30-09
MODIFIED BY: DATE:
CHECKED BY: DATE: 5/7/09
FILE SPEC.: wtspell/metric/stand/tbjb&cb r2519a.dgn

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

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-AA

METRIC



PLAN

NOTES:

1. USE CLASS "B" CONCRETE THROUGHOUT.
2. CONSTRUCT CONCRETE BOX IN ACCORDANCE WITH SECTION 825 OF THE STANDARD SPECIFICATIONS AND MAY BE ADJUSTED TO FIT PIPE CONDITION.
3. USE FORMS FOR CONSTRUCTION OF THE BOTTOM SLAB.
4. ADJUST LENGTH OF STEEL BARS AS NEEDED TO COMPENSATE FOR PIPES.
5. CONFORM REINFORCING STEEL TO ASTM A615, GRADE 400.
6. CUT OR BEND STEEL BARS AS NEEDED TO PROVIDE 50mm CLEARANCE AROUND PIPES OR AS DIRECTED BY THE ENGINEER.
7. REFER TO STANDARD 840.54 FOR MANHOLE.
8. JUNCTION BOXES OVER 1.0M IN DEPTH WITH MANHOLES SHALL REQUIRE STEPS TO BE PLACED ON 355mm CTRS. REFERENCE STD.NO.840.66
9. ADJUST THE STEEL CONCRETE AND BRICK MASONARY QUANTITIES TO INCLUDE THE ADDITION OF THE MANHOLE (I.E. DIAGONAL BARS SHORTENED AROUND OPENING IN TOP SLAB AND VARIABLE HEIGHT BRICK MASONARY, REDUCE CONCRETE IN OPENING IN TOP SLAB.
10. DIMENSIONS MAY BE ADJUSTED TO SUIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.

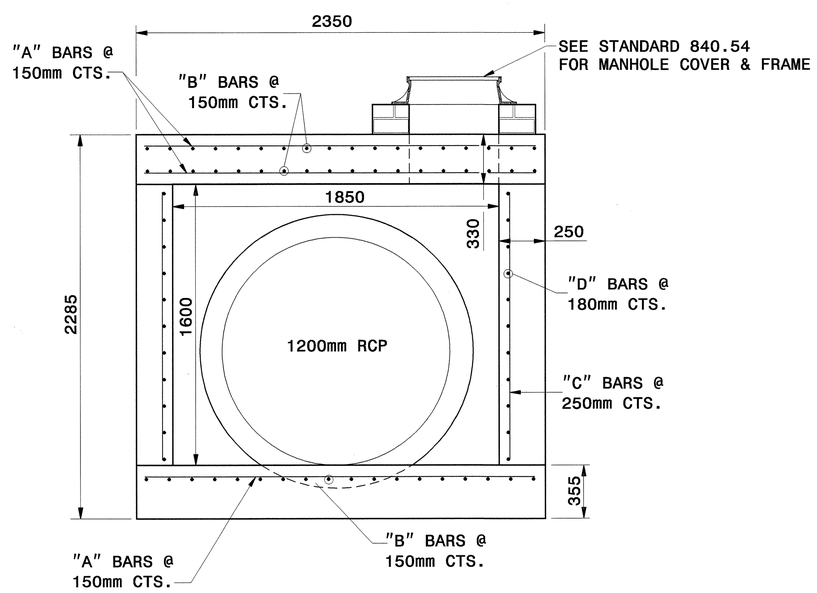
BILL OF MATERIALS

BAR	QTY	SIZE	LENGTH	WEIGHT
A	27	#16	2250	94
B	45	#16	1300	97
C	28	#16	1450	72
D	24	#19	2250	90
D1	24	#19	1300	51
TOTAL REINF. STEEL (kg)				404
TOTAL CONC. (m^3)				5.0
DEDUCTIONS FOR ONE PIPE				
375mm RCP (m^3)				0.03
1200mm RCP (m^3)				0.28

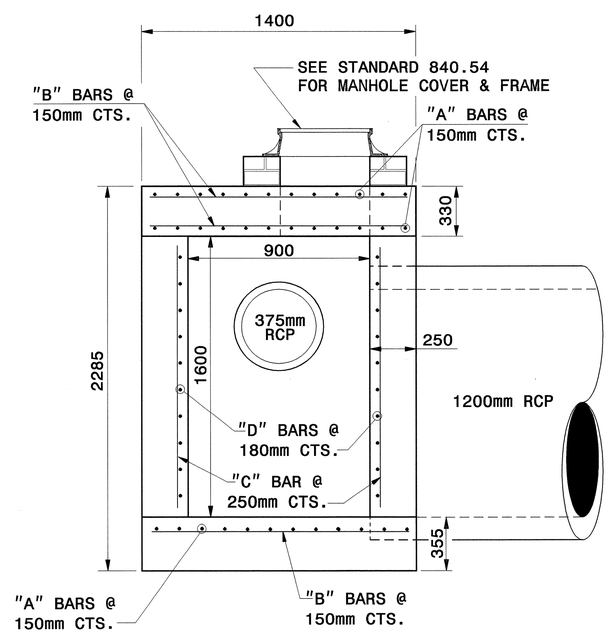
NO DEDUCTIONS HAVE BEEN MADE TO ACCOMMODATE PIPES.

SEE STRUCTURE 443

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER LOEL G. HOWERTON
2/22/11



SECTION B-B



SECTION A-A

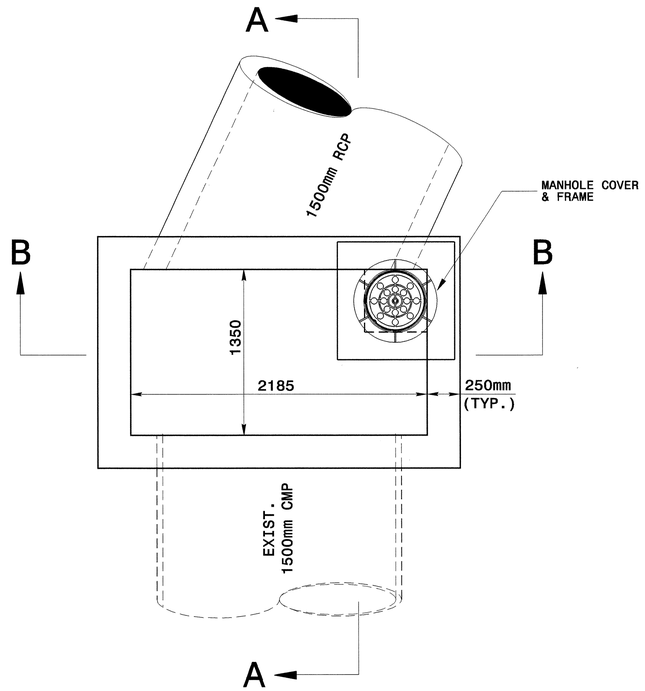
PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

TRAFFIC BEARING JUNCTION BOX W/MANHOLE

ORIGINAL BY:	rnbritt	DATE:	10-11-04
MODIFIED BY:	tspell	DATE:	04-15-09
CHECKED BY:	[signature]	DATE:	5/7/09
FILE SPEC.:	details/nbritt/metric/hydro/tbjb1200_375.dgn		

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-AB

METRIC



PLAN

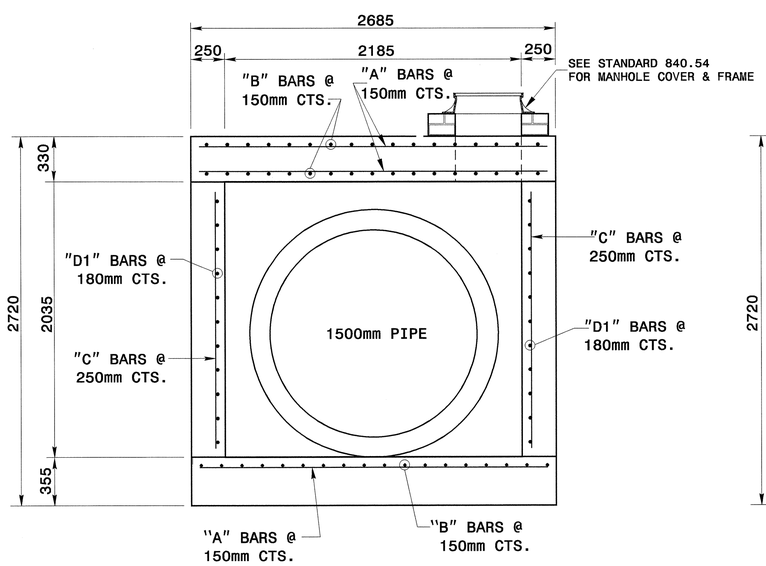
NOTES:

1. USE CLASS "B" CONCRETE THROUGHOUT.
2. CONSTRUCT CONCRETE BOX IN ACCORDANCE WITH SECTION 825 OF THE STANDARD SPECIFICATIONS AND MAY BE ADJUSTED TO FIT PIPE CONDITION.
3. USE FORMS FOR CONSTRUCTION OF THE BOTTOM SLAB.
4. ADJUST LENGTH OF STEEL BARS AS NEEDED TO COMPENSATE FOR PIPES.
5. CONFORM REINFORCING STEEL TO ASTM A615, GRADE 400.
6. CUT OR BEND STEEL BARS AS NEEDED TO PROVIDE 50mm CLEARANCE AROUND PIPES OR AS DIRECTED BY THE ENGINEER.
7. REFER TO STANDARD 840.54 FOR MANHOLE.
8. JUNCTION BOXES OVER 1.0M IN DEPTH WITH MANHOLES SHALL REQUIRE STEPS TO BE PLACED ON 355mm CTRS. REFERENCE STD.NO.840.66
9. ADJUST THE STEEL CONCRETE AND BRICK MASONARY QUANTITIES TO INCLUDE THE ADDITION OF THE MANHOLE (I.E. DIAGONAL BARS SHORTENED AROUND OPENING IN TOP SLAB AND VARIABLE HEIGHT BRICK MASONARY, REDUCE CONCRETE IN OPENING IN TOP SLAB.
10. DIMENSIONS MAY BE ADJUSTED TO SUIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.

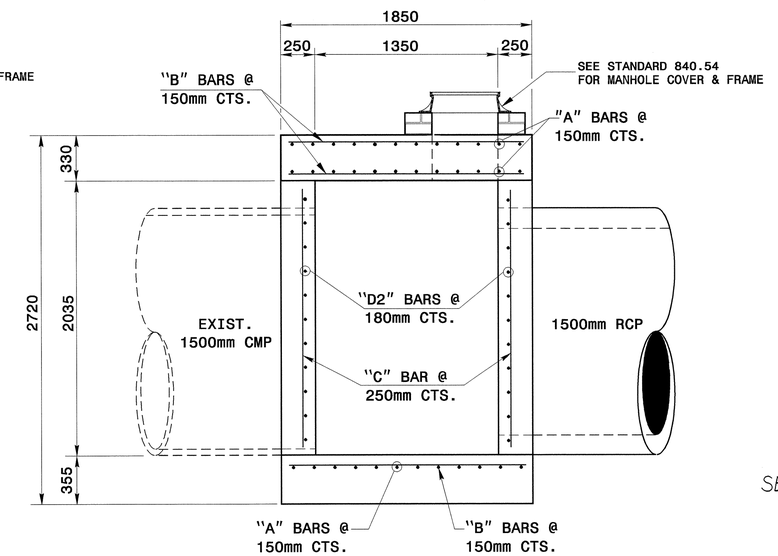
BILL OF MATERIALS

BAR	NO.	SIZE	LENGTH	WEIGHT
A	36	#16	2560	132
B	54	#16	1720	139
C	38	#16	2620	114
D1	30	#19	1720	102
D2	30	#19	2560	150
TOTAL REINF. STEEL (kg)				637
TOTAL CONC. (cu. m.)				7.5
DEDUCTIONS FOR ONE PIPE				
1500mm RCP (m^3)				0.44

NO DEDUCTIONS HAVE BEEN MADE TO ACCOMODATE PIPE OPENINGS.



SECTION B-B



SECTION A-A

SEE STRUCTURE 625

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON 2/22/11

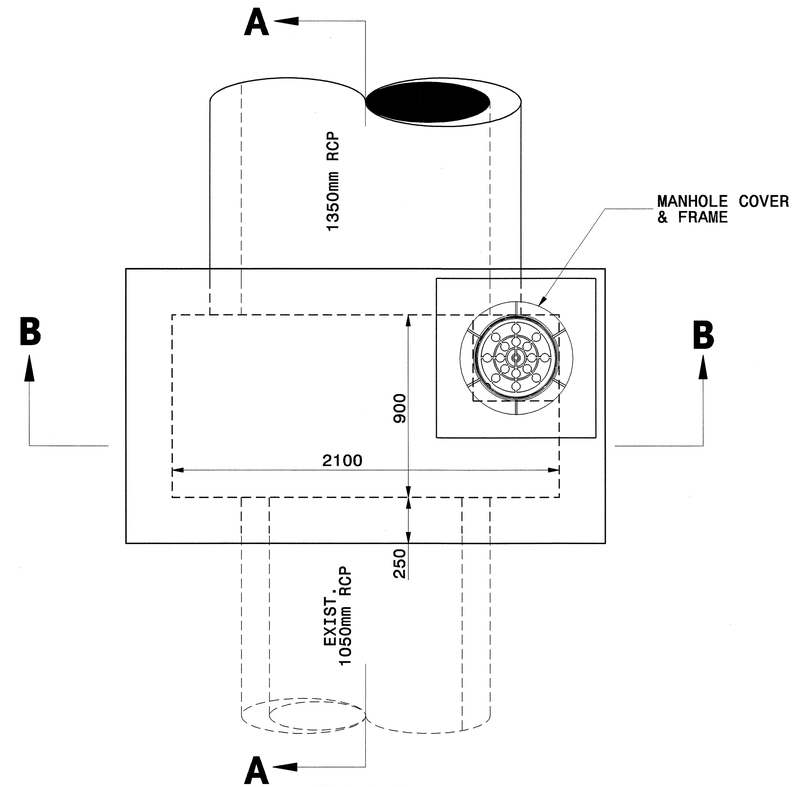
PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

TRAFFIC BEARING
JUNCTION BOX W/MANHOLE

ORIGINAL BY: nbritt DATE: 09-16-04
MODIFIED BY: tspell DATE: 04-16-09
CHECKED BY: [signature] DATE: 5/7/09
FILE SPEC.: details/nbritt/metric/hydro/tbjb&cb r2519a.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-AC

METRIC



PLAN

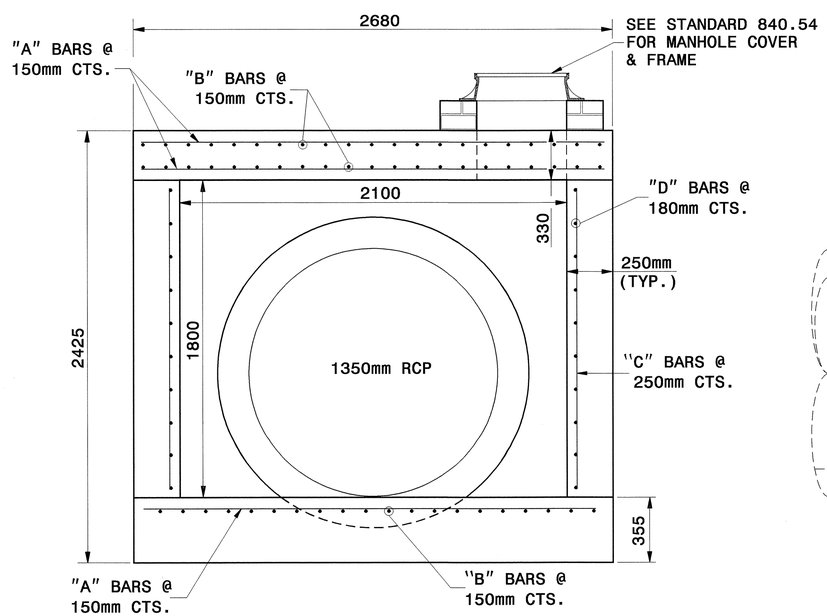
NOTES:

1. USE CLASS "B" CONCRETE THROUGHOUT.
2. CONSTRUCT CONCRETE BOX IN ACCORDANCE WITH SECTION 825 OF THE STANDARD SPECIFICATIONS AND MAY BE ADJUSTED TO FIT PIPE CONDITION.
3. USE FORMS FOR CONSTRUCTION OF THE BOTTOM SLAB.
4. ADJUST LENGTH OF STEEL BARS AS NEEDED TO COMPENSATE FOR PIPES.
5. CONFORM REINFORCING STEEL TO ASTM A615, GRADE 400.
6. CUT OR BEND STEEL BARS AS NEEDED TO PROVIDE 50mm CLEARANCE AROUND PIPES OR AS DIRECTED BY THE ENGINEER.
7. REFER TO STANDARD 840.54 FOR MANHOLE.
8. JUNCTION BOXES OVER 1.0M IN DEPTH WITH MANHOLES SHALL REQUIRE STEPS TO BE PLACED ON 355mm CTRS. REFERENCE STD.NO.840.66
9. ADJUST THE STEEL CONCRETE AND BRICK MASONARY QUANTITIES TO INCLUDE THE ADDITION OF THE MANHOLE (I.E. DIAGONAL BARS SHORTENED AROUND OPENING IN TOP SLAB AND VARIABLE HEIGHT BRICK MASONARY, REDUCE CONCRETE IN OPENING IN TOP SLAB.
10. DIMENSIONS MAY BE ADJUSTED TO SUIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.

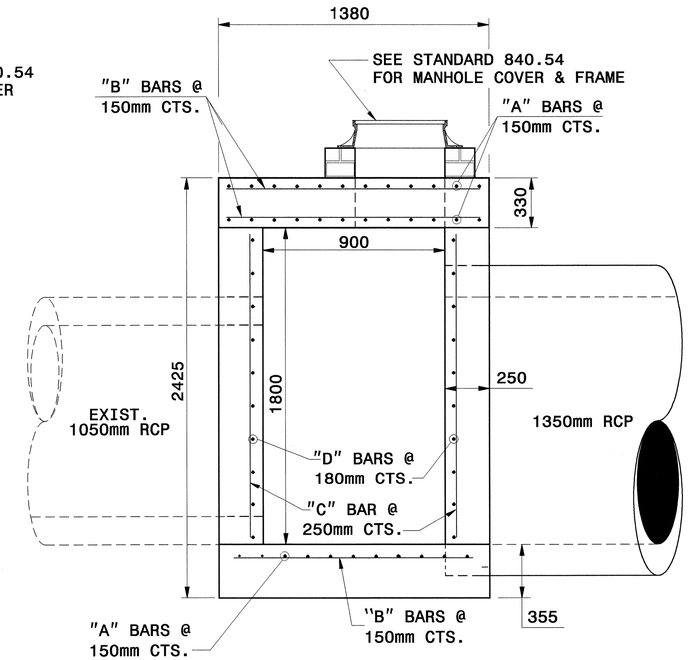
BILL OF MATERIALS

BAR	QTY	SIZE	LENGTH	WEIGHT
A	27	#16	2580	108
B	54	#16	1280	107
C	34	#16	1500	86
D	19	#19	2580	110
D1	19	#19	1280	54
TOTAL REINF. STEEL (kg)				465
TOTAL CONC. (m^3)				6.0
DEDUCTIONS FOR ONE PIPE				
1050mm RCP (m^3)				0.22
1350mm RCP (m^3)				0.36

NO DEDUCTIONS HAVE BEEN MADE TO ACCOMMODATE PIPES.



SECTION A-A



SECTION B-B

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON 2/22/11

SEE STRUCTURE 674 660

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

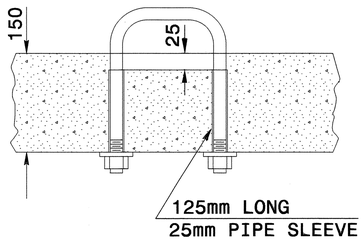
TRAFFIC BEARING JUNCTION BOX W/MANHOLE

ORIGINAL BY: rnbritt DATE: 10-11-04
MODIFIED BY: tspell DATE: 04-15-09
CHECKED BY: [signature] DATE: 5/7/09
FILE SPEC.: details/nbritt/metric/hydro/tbjb&cb_r2519a.dgn

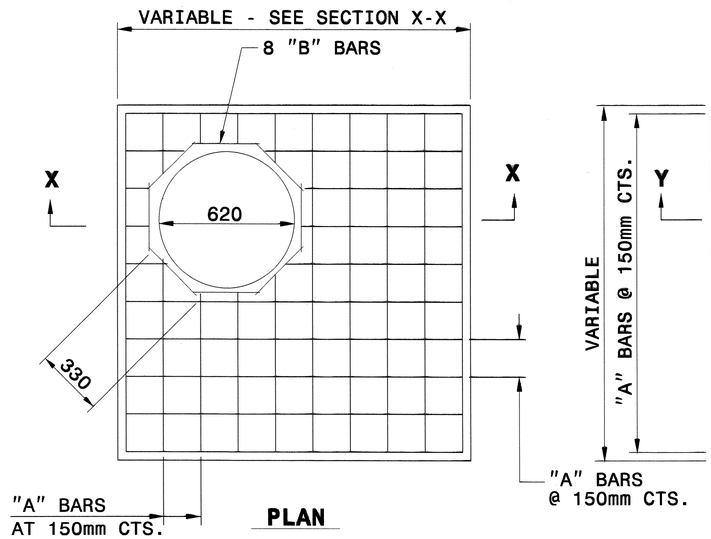
Note:
This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-AD

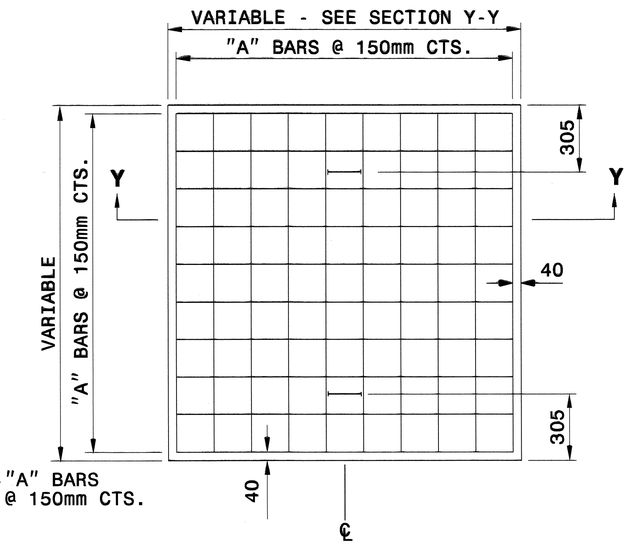
METRIC



PARTIAL SECTION



PLAN



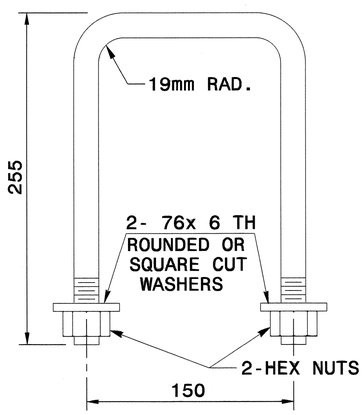
PLAN

GENERAL NOTES:

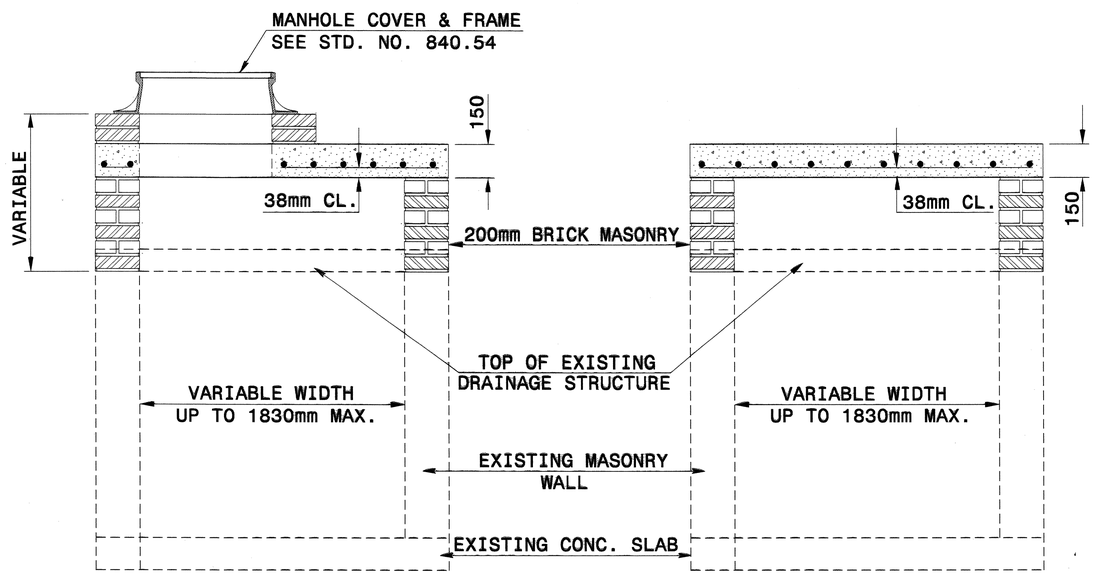
CONSTRUCT IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.

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

DETAIL INTENDED FOR NON-TRAFFIC BEARING DRAINAGE STRUCTURES.



DETAIL OF HANDLE



SECTION X-X **SECTION Y-Y**

BILL OF MATERIALS

REINFORCING STEEL

CODE	SIZE	QTY.	LENGTH	REINF. STEEL kgs.
A	#16	20	1370	45.52
B	#16	8	330	4.10
			TOTAL	49.62 *

MASONRY	m^3
TOP SLAB CONCRETE CLASS "B"	.3305 *
BRICK MASONRY PER m HT (MIN)	1.7651

* NOTE:
QUANTITIES BASED ON 1070mm X 1070mm DRAINAGE STRUCTURE. ADJUST QUANTITIES FOR LARGER STRUCTURES AND MANHOLE CONSTRUCTION.

SEE STRUCTURE
181 175 173 168 453 185

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON 2/22/11

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

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

ORIGINAL BY: T.S.S. DATE: NOV 1997
MODIFIED BY: T.S.S. DATE: FEB 2000
CHECKED BY: [signature] DATE: 1/11/11
FILE SPEC.: ds174:/usr/details/metric/stand/boxtojb.dgn

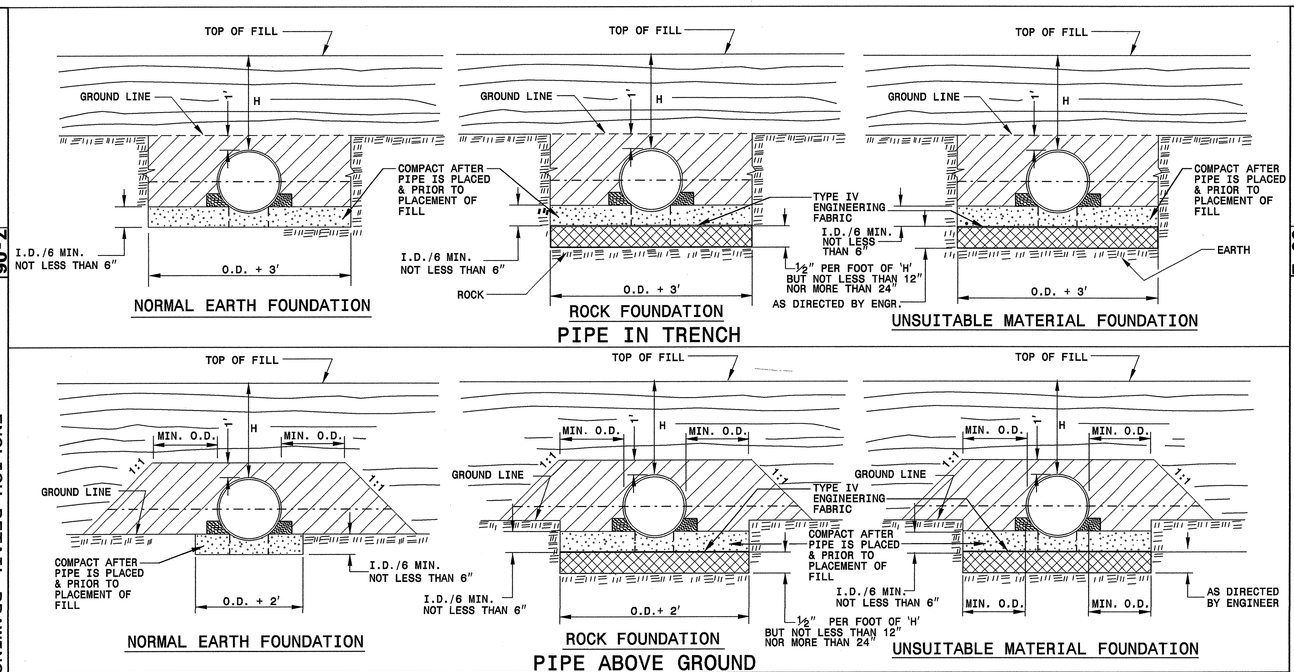
30-JUL-2009 08:48
s:\contracts\contracts\special details\erickward\stds\06' stds to special details\30001\0300d01.dgn
jhowerton AT PS23750I

5/14/99

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

7-06

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
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

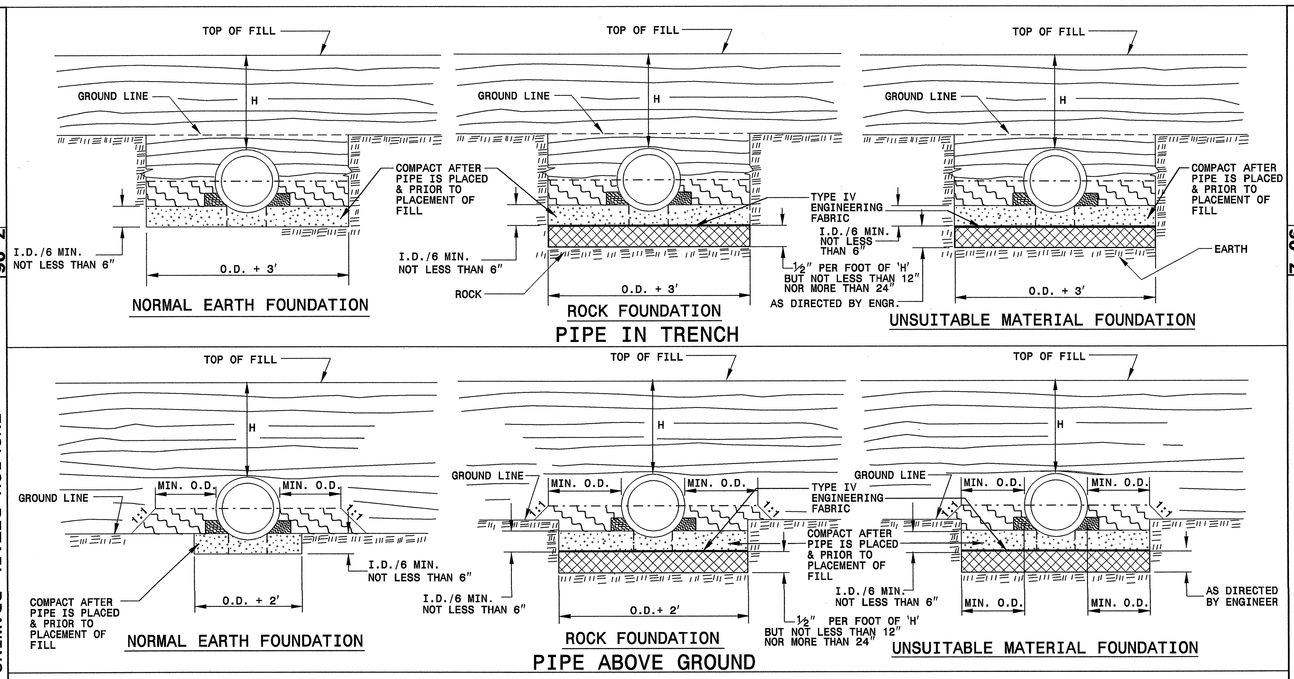
SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.

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

ORIGINAL BY: KKempf DATE: 5-15-09
MODIFIED BY: DATE:
CHECKED BY: DATE: 7/30/09
FILE SPEC/erickward/stds/06 details/30001/0300d01.dgn

SEE PLATE FOR TITLE

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOSEPH SHAMMAS

PROJECT REFERENCE NO. R-2519A
SHEET NO. 2-AE

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

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

SHEET 3 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
FILL HEIGHT TABLES

SHEET 3 OF 3
300D01

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

NORTH CAROLINA PROFESSIONAL SEAL 022166 ENGINEER

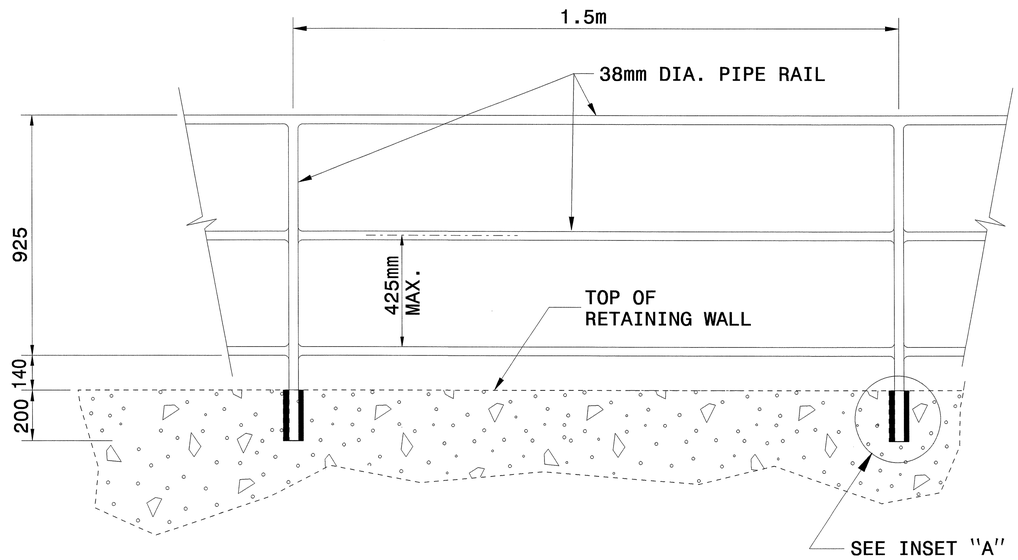
SEE PLATE FOR TITLE

ORIGINAL BY: KKempf DATE: 5-15-09
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC: /projects/ericward/stds/details/300d01/0300d01.dgn

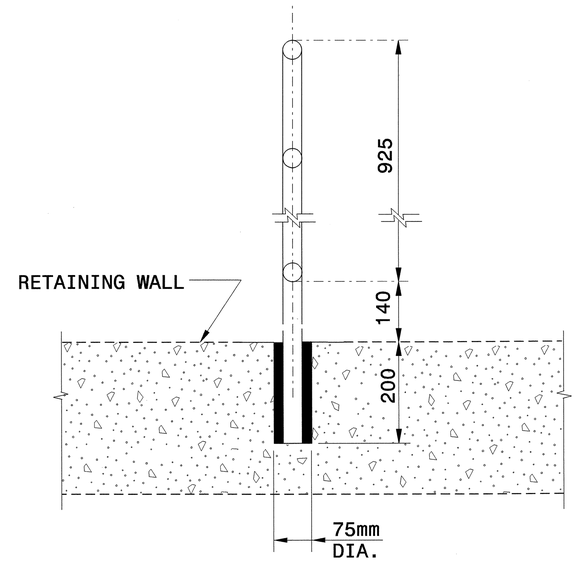
PROJECT REFERENCE NO. R-2519A
SHEET NO. 2-AF

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-AG

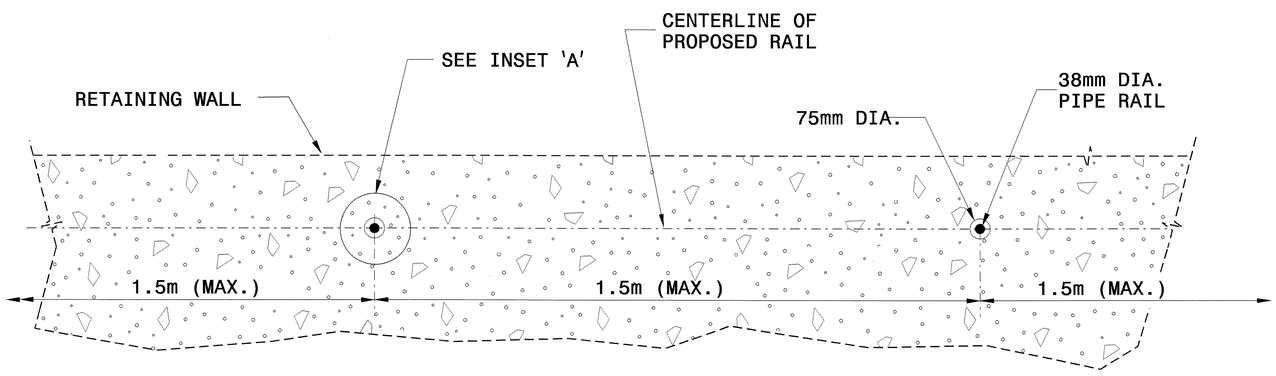
METRIC



ELEVATION OF PROPOSED PEDESTRIAN HANDRAIL



INSET 'A'



PLAN VIEW

NOTES:

CONSTRUCT PROPOSED STEEL PIPE RAIL OF 38mm DIAMETER SCHEDULE 40 PLAIN END GALVANIZED STEEL PIPE MEETING THE REQUIREMENTS OF ASTM A53.

REPAIR GALVANIZING IN ACCORDANCE WITH SECTION 1076 OF THE NCDOT STANDARD SPECIFICATIONS.

PAINT, IF REQUIRED BY THE ENGINEER, IN ACCORDANCE WITH SECTION 1080 OF THE STANDARD SPECIFICATIONS.

WELD IN ACCORDANCE WITH ARTICLE 1072-20 OF THE STANDARD SPECIFICATIONS.

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON

2/22/11

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

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

PROPOSED PEDESTRIAN SAFETY RAIL

ORIGINAL BY:	E.E.WARD	DATE:	12-99
MODIFIED BY:	T.S.Spell	DATE:	1-4-05
CHECKED BY:	[signature]	DATE:	2/22/11
FILE SPEC.:	w:jhowerton/retain wall handrails.dgn		

$$$$SYSTEME$$$$
$$$$TIME$$$$
$$$$DGN$$$$

PROJECT REFERENCE NO.	SHEET
R-2519A	2-AH

GEOTECHNICAL ENGINEER

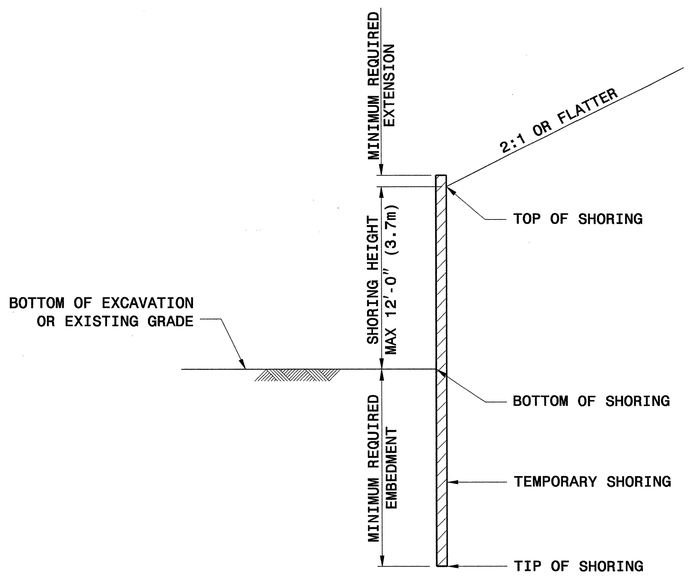
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

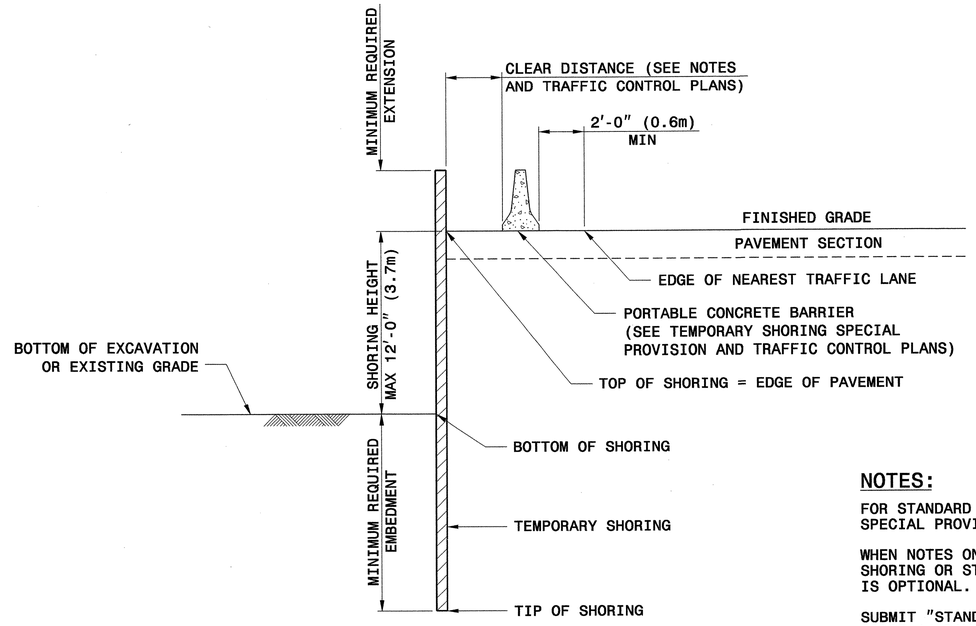
SIGNATURE DATE

ENGINEER

SIGNATURE DATE



SLOPE CASE



SURCHARGE CASE

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

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

NOTES:

FOR STANDARD TEMPORARY SHORING, SEE TEMPORARY SHORING SPECIAL PROVISION.

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

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

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

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

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

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

VERIFY GROUNDWATER ELEVATION BEFORE BEGINNING SHORING CONSTRUCTION.

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

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

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

CONTACT THE ENGINEER IF MINIMUM REQUIRED EMBEDMENT IS NOT ACHIEVED.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.01

STANDARD TEMPORARY SHORING

DATE: 2-20-07

PROJECT REFERENCE NO.	SHEET
R-2519A	2-A1

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

STANDARD TEMPORARY MSE WALL OPTIONS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

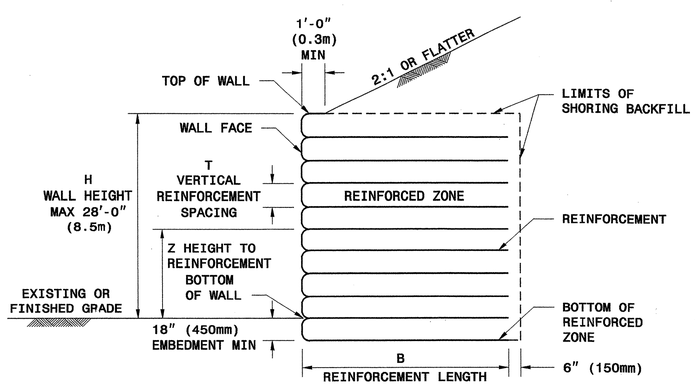
PLACE SHORING BACKFILL IN 8" TO 10" (200mm to 250mm) THICK LIFTS AND COMPACT IN ACCORDANCE WITH SUBARTICLE 235-4(C) OF THE STANDARD SPECIFICATIONS. USE ONLY HAND OPERATED COMPACTION EQUIPMENT WITHIN 3'-0" (1m) OF THE WALL FACE.

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

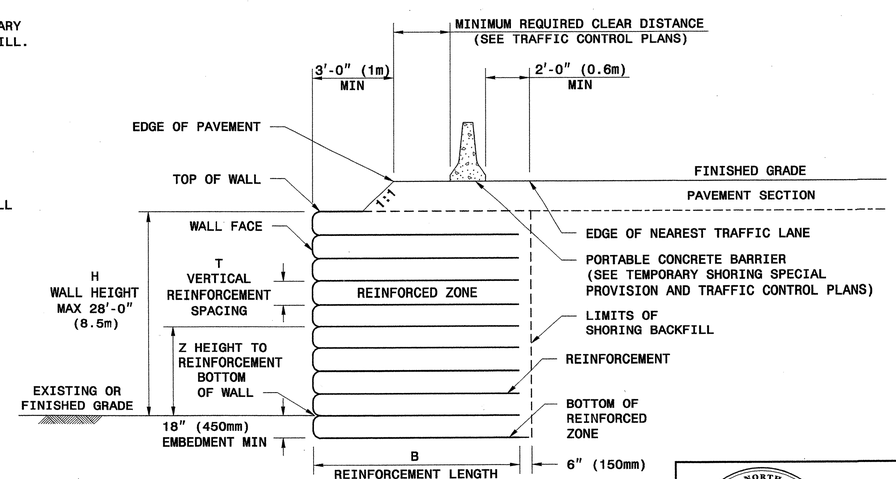
COVER REINFORCING AND RETENTION FABRIC WITH AT LEAST 3" (75mm) OF SHORING BACKFILL. PLACE TOP REINFORCEMENT LAYER BETWEEN 4" AND 24" (100mm and 600mm) BELOW TOP OF WALL DEPENDING ON WALL OPTION.

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

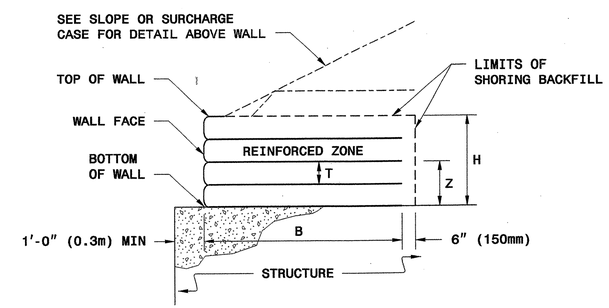
IF THE TOP OF WALL IS WITHIN 5'-0" (1.5m) OF FINISHED GRADE, REMOVE TOP FORM OR FACING AND INCORPORATE THE TOP REINFORCEMENT LAYER INTO THE FILL WHEN PLACING FILL IN FRONT OF THE WALL. STANDARD TEMPORARY MSE WALLS REMAIN IN PLACE PERMANENTLY UNLESS REQUIRED OTHERWISE.



SLOPE CASE



SURCHARGE CASE



TEMPORARY MSE WALL ON STRUCTURE

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY MECHANICALLY STABILIZED EARTH (MSE) WALLS

SHEET 1 OF 11 DATE: 2-20-07

PROJECT REFERENCE NO.	SHEET
R-2519A	2-AJ

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

scott a. hidden 3/29/07

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

HOW TO USE THIS SHEET:

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

MINIMUM REQUIRED REINFORCEMENT LENGTH B (FT)

(FOR ALL WALL OPTIONS)

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

TERRATREL TEMPORARY WALL (STRIPS PER LEVEL PER PANEL)

H (FT)

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

SLOPE AND SURCHARGE CASES

SIERRASCAPE TEMPORARY WALL (GEOGRID TYPE)

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

H (FT)

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

SLOPE CASE

H (FT)

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

SURCHARGE CASE

HILFIKER TEMPORARY WALL (WELDED WIRE MAT TYPE)

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

H (FT)

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

SLOPE CASE

H (FT)

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

SURCHARGE CASE

RETAINED EARTH TEMPORARY WALL (WELDED WIRE MESH TYPE)

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

H (FT)

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

SLOPE AND SURCHARGE CASES

NOTES FOR HILFIKER TEMPORARY WALL

1) CAP MAT AT TOP OF WALL IS NOT INCLUDED IN TABLES.

2) REINFORCEMENT IS NOT REQUIRED AT 1′ LEVEL FOR SLOPE CASE UNTIL WALL HEIGHT (H) IS GREATER THAN 24′.

3) REINFORCEMENT IS NOT REQUIRED AT 3′ LEVEL FOR SLOPE CASE UNTIL WALL HEIGHT (H) IS GREATER THAN 26′.

4) REINFORCEMENT IS NOT REQUIRED AT 1′ LEVEL FOR SURCHARGE CASE UNTIL WALL HEIGHT (H) IS GREATER THAN 26′.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY MSE WALL REINFORCEMENT TABLES - ENGLISH UNITS

SHEET 2 OF 11

DATE: 2-20-07

PROJECT REFERENCE NO.	SHEET
R-2519A	2-AK

GEOTECHNICAL ENGINEER

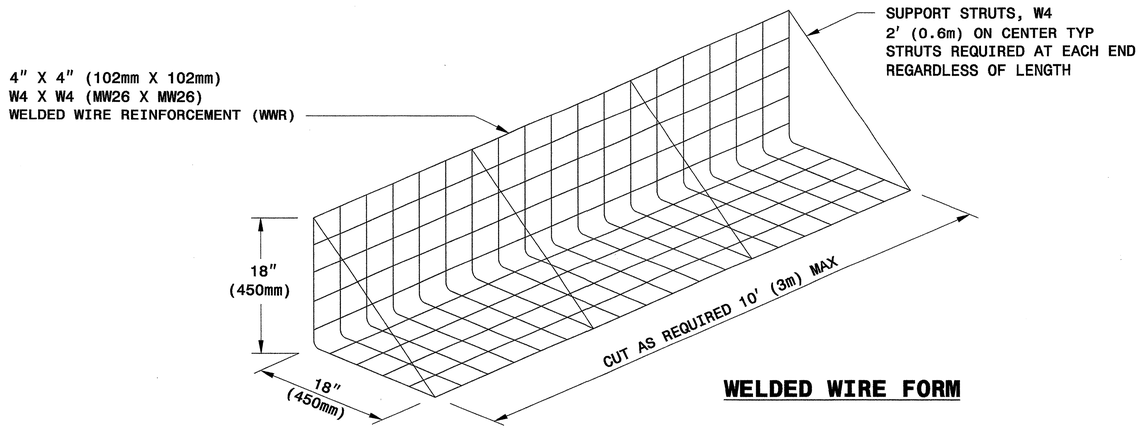
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

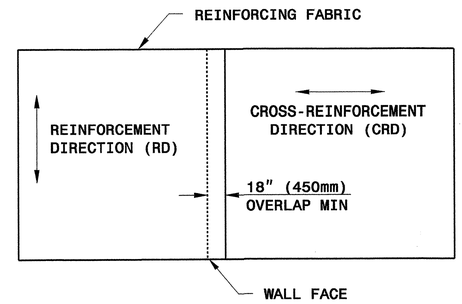
SIGNATURE DATE

ENGINEER

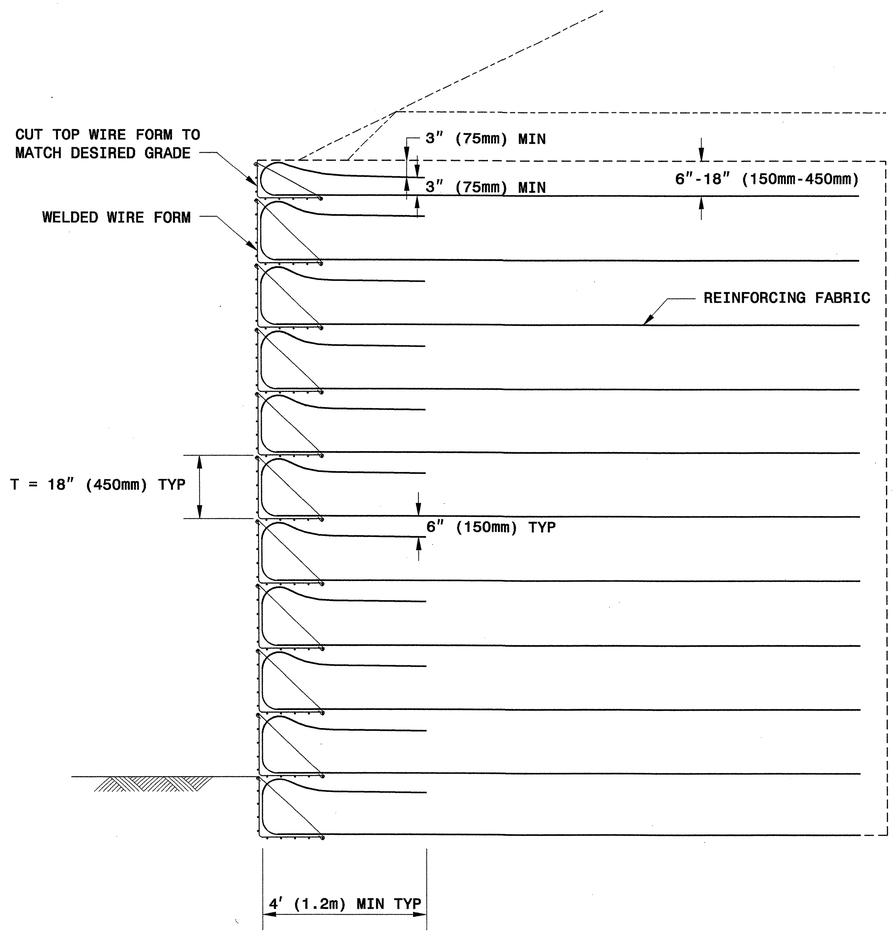
SIGNATURE DATE



WELDED WIRE FORM



PLAN VIEW OF FABRIC OVERLAP



TYPICAL SECTION

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

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

*RD = REINFORCEMENT DIRECTION

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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

TEMPORARY FABRIC WALL

SHEET 3 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
R-2519A	2-AL

GEOTECHNICAL ENGINEER

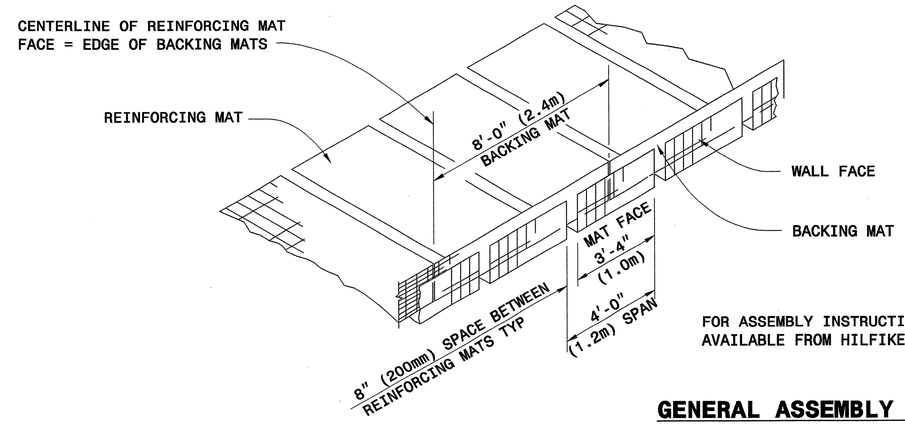
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

SIGNATURE DATE

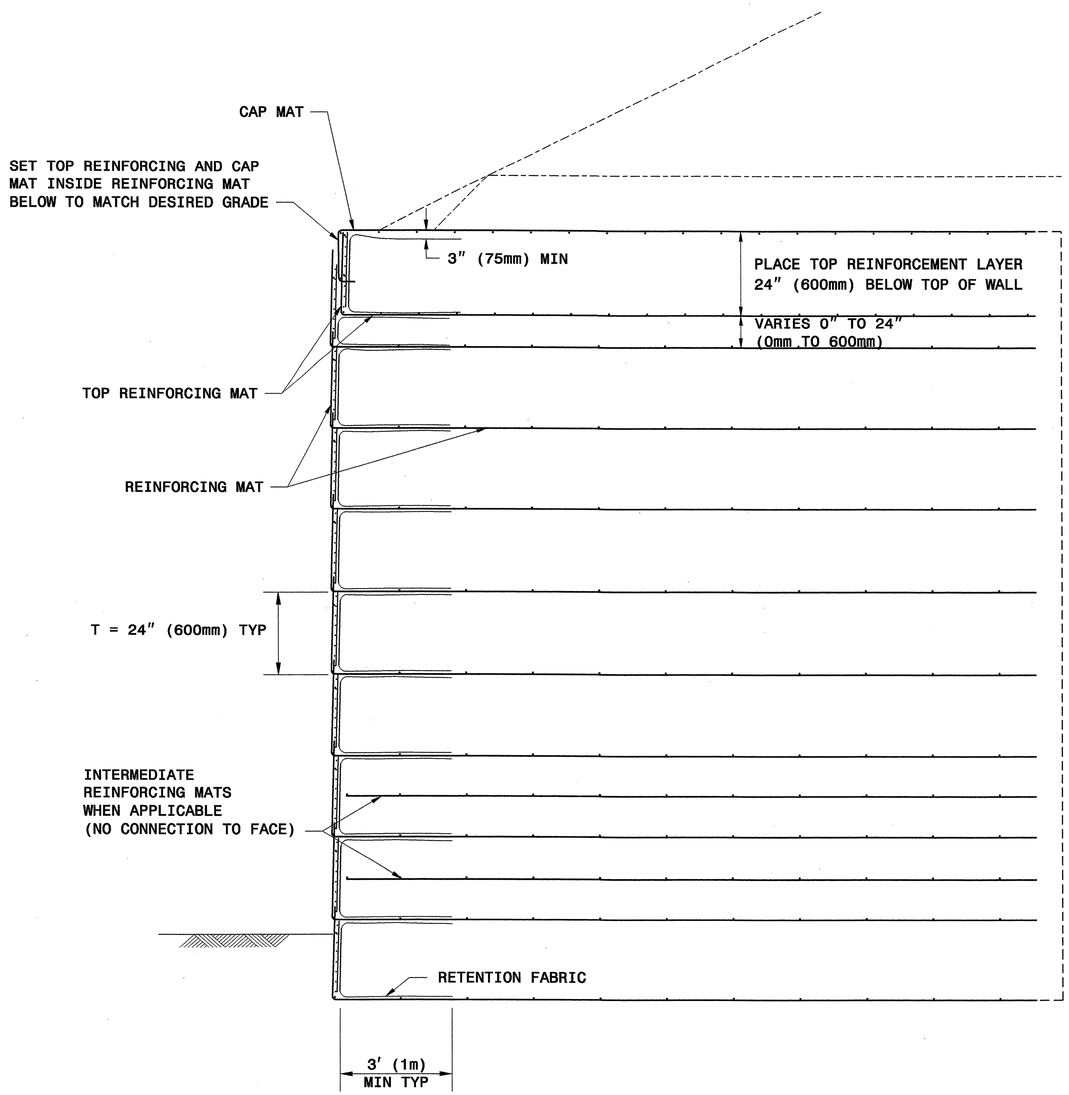
ENGINEER

SIGNATURE DATE

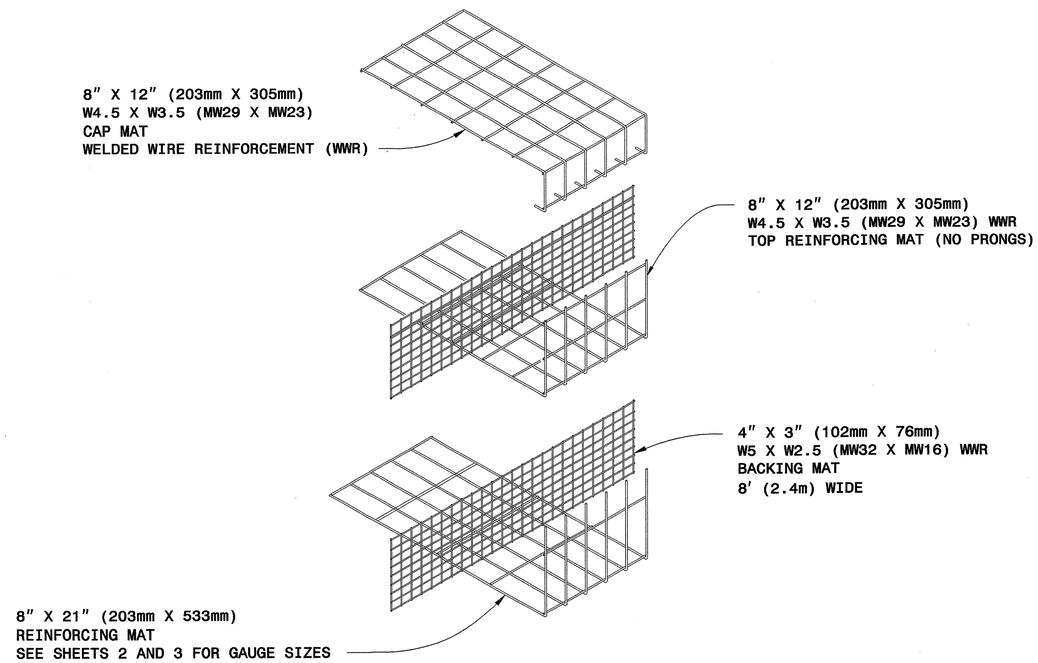


FOR ASSEMBLY INSTRUCTIONS, SEE WELDED WIRE WALL CONSTRUCTION GUIDE AVAILABLE FROM HILFIKER WEBSITE AT WWW.HILFIKER.COM/WWW

GENERAL ASSEMBLY DETAIL



TYPICAL SECTION



WALL COMPONENTS

HILFIKER RETAINING WALLS

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

HILFIKER
TEMPORARY WALL

SHEET 4 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
R-2519A	2-AM

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07
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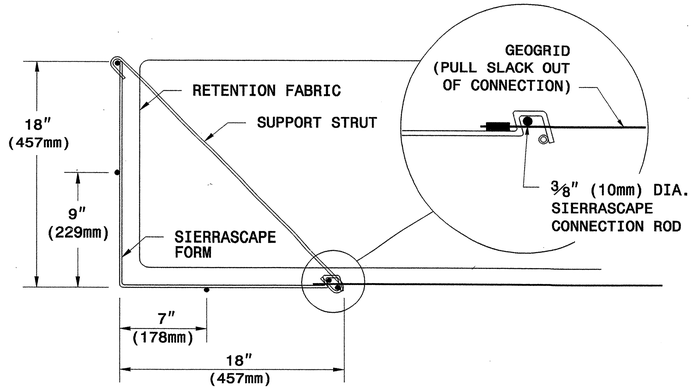
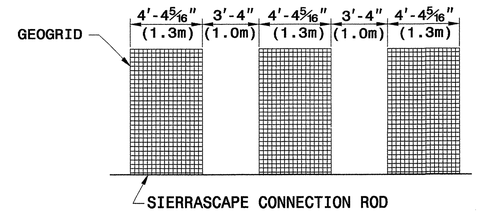
ENGINEER

SIGNATURE DATE

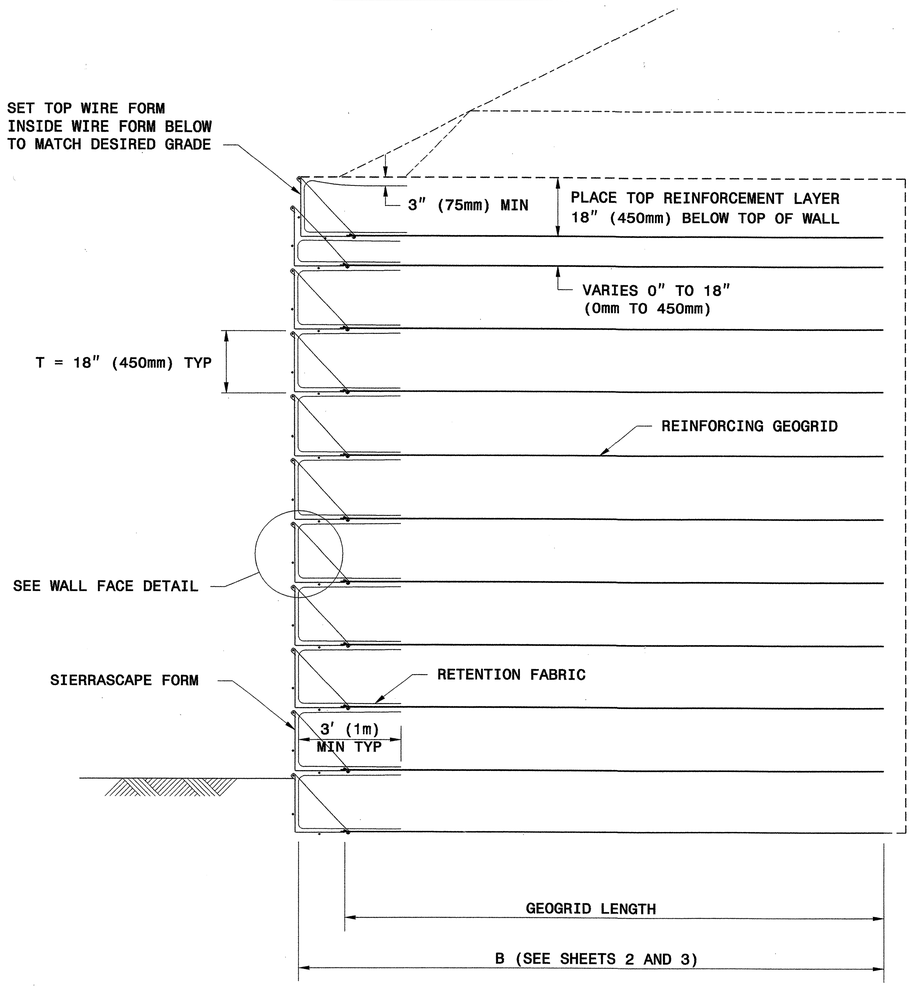


WALL FACE DETAIL

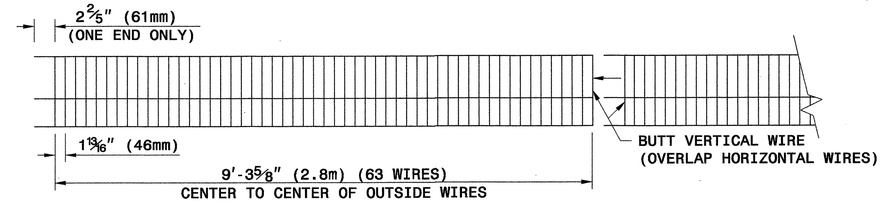


PLACE ALTERNATE LAYERS OF GEOGRID IN STAGGERED PATTERN SUCH THAT THE LAYER ABOVE IS CENTERED OVER SPACE BELOW

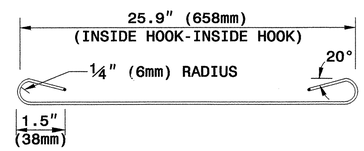
TYPICAL GEOGRID COVERAGE



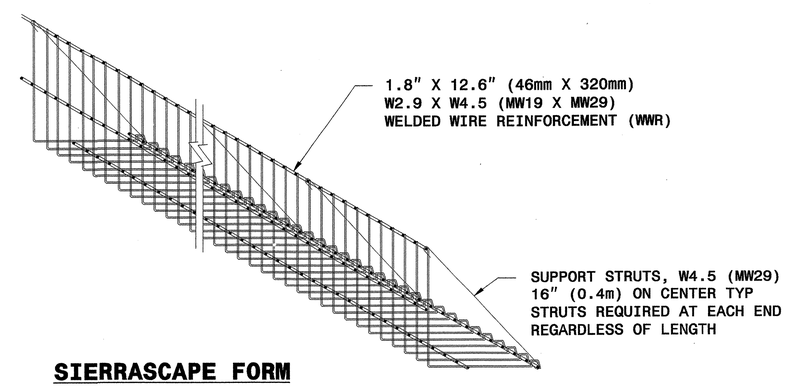
TYPICAL SECTION



ELEVATION VIEW



SUPPORT STRUT



SIERRASCAPE FORM

WALL COMPONENTS

TENSAR®
TENSAR EARTH TECHNOLOGIES, INC.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

SIERRASCAPE TEMPORARY WALL

SHEET 5 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
R-2519A	2-AN

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

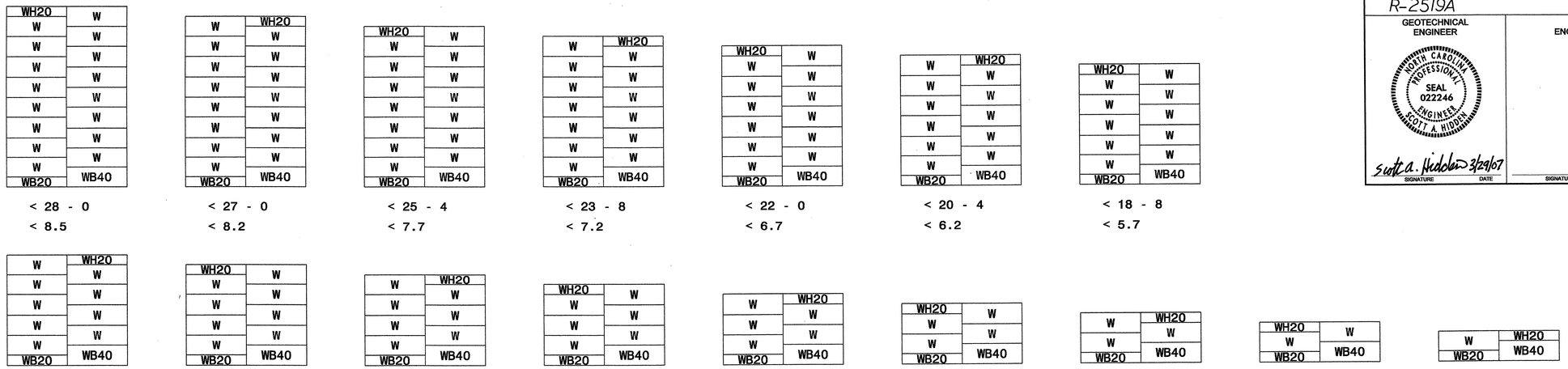
Scott A. Hidden 3/29/07

SIGNATURE DATE

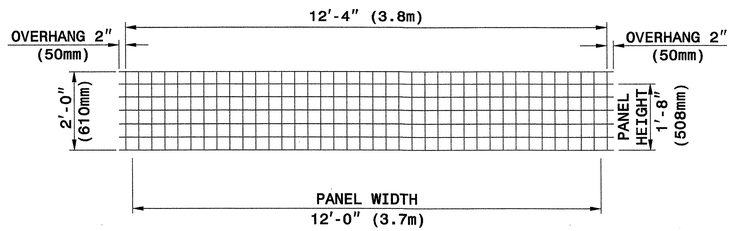
ENGINEER

SIGNATURE DATE

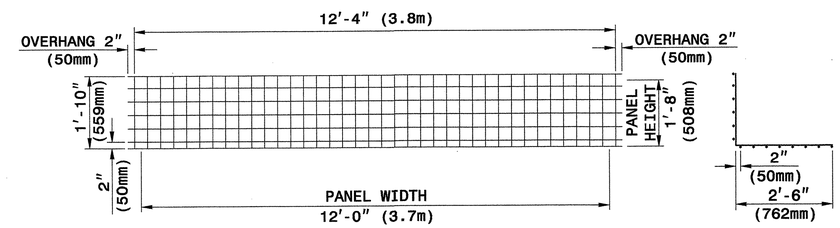
PANEL LAYOUTS



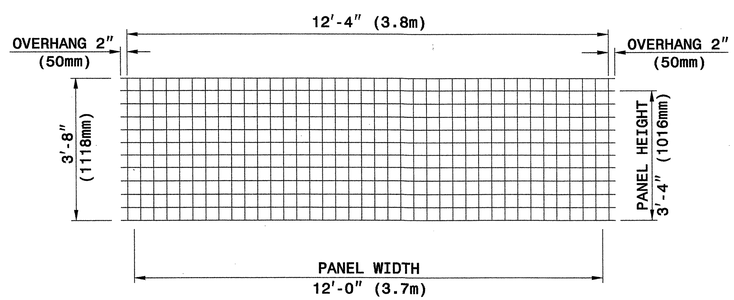
H - WALL HEIGHT									
(FEET-INCHES)	< 28 - 0	< 27 - 0	< 25 - 4	< 23 - 8	< 22 - 0	< 20 - 4	< 18 - 8		
(METER)	< 8.5	< 8.2	< 7.7	< 7.2	< 6.7	< 6.2	< 5.7		
(FEET-INCHES)	< 17 - 0	< 15 - 4	< 13 - 8	< 12 - 0	< 10 - 4	< 8 - 8	< 7 - 0	< 5 - 4	< 3 - 8
(METER)	< 5.2	< 4.7	< 4.2	< 3.7	< 3.2	< 2.6	< 2.1	< 1.6	< 1.1



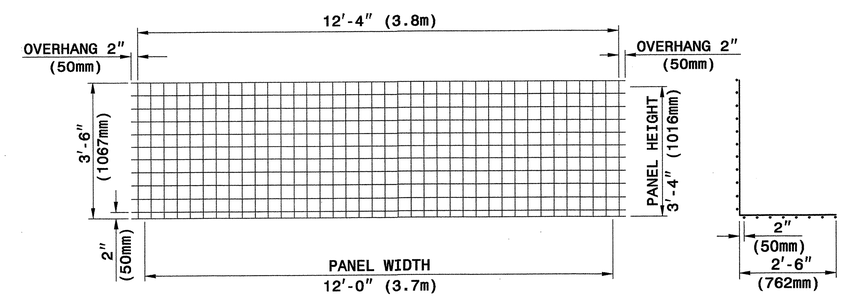
TYPE WH20



TYPE WB20 **SECTION**



TYPE W



TYPE WB40 **SECTION**

WELDED WIRE FACINGS **WELDED WIRE FORMS**

PANEL TYPES (WELDED WIRE FACINGS AND FORMS)

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

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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

RETAINED EARTH TEMPORARY WALL

SHEET 6 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
R-2519A	2-AO

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07
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ENGINEER

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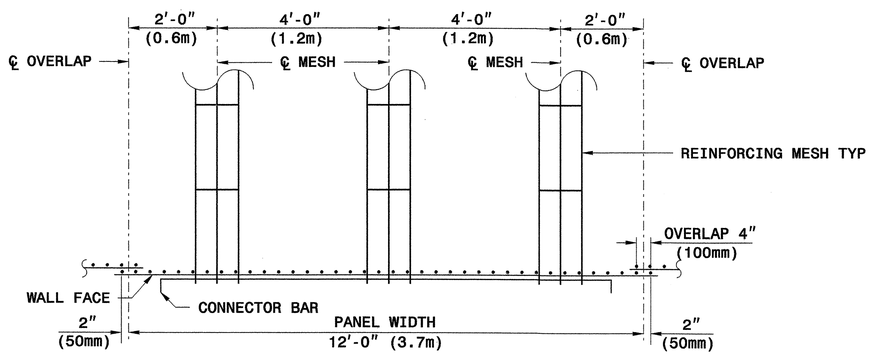
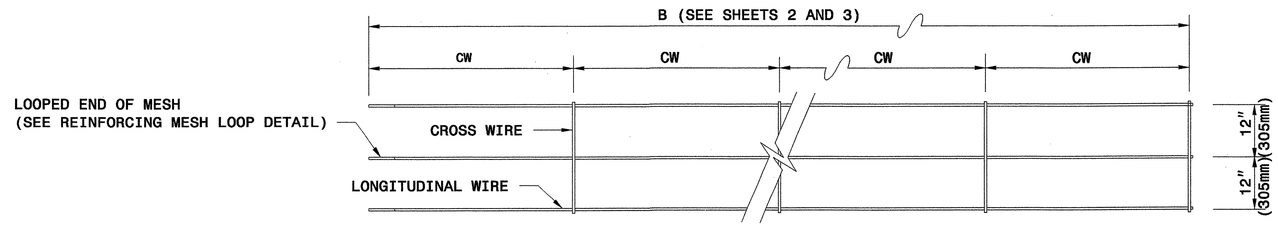


REINFORCING MESH PLACEMENT DETAIL
(PLAN VIEW)

½" (13mm) DIA. BAR

CONNECTOR BAR



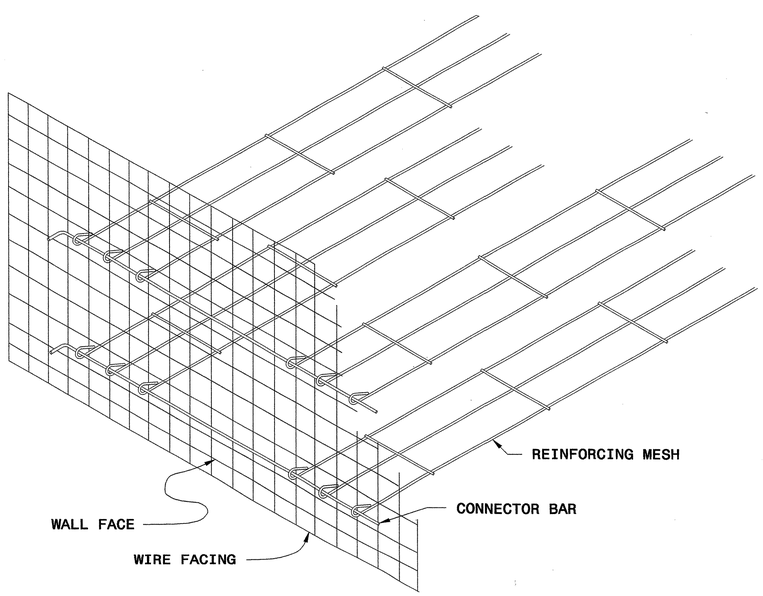
IF REINFORCEMENT LENGTH IS NOT AN INCREMENT OF 2'-0" (610mm) MAKE CW EQUAL TO 12" (305mm) AT THE END OF THE REINFORCING MESH OPPOSITE THE LOOPED END

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

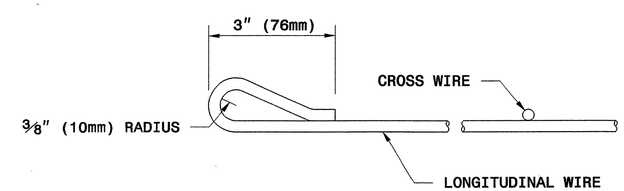
NO. OF LONGITUDINAL WIRES
GAUGE OF LONGITUDINAL WIRES
GAUGE OF CROSS WIRES
SPACING OF CROSS WIRES IN FT (mm), CW

REINFORCING MESH DESIGNATION

REINFORCING MESH



GENERAL ASSEMBLY DETAIL



REINFORCING MESH LOOP DETAIL

The Reinforced Earth Company

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

RETAINED EARTH TEMPORARY WALL

SHEET 7 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
R-2519A	2-AP

GEOTECHNICAL ENGINEER

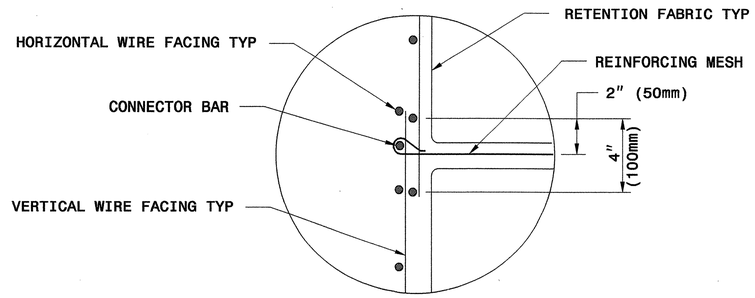
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

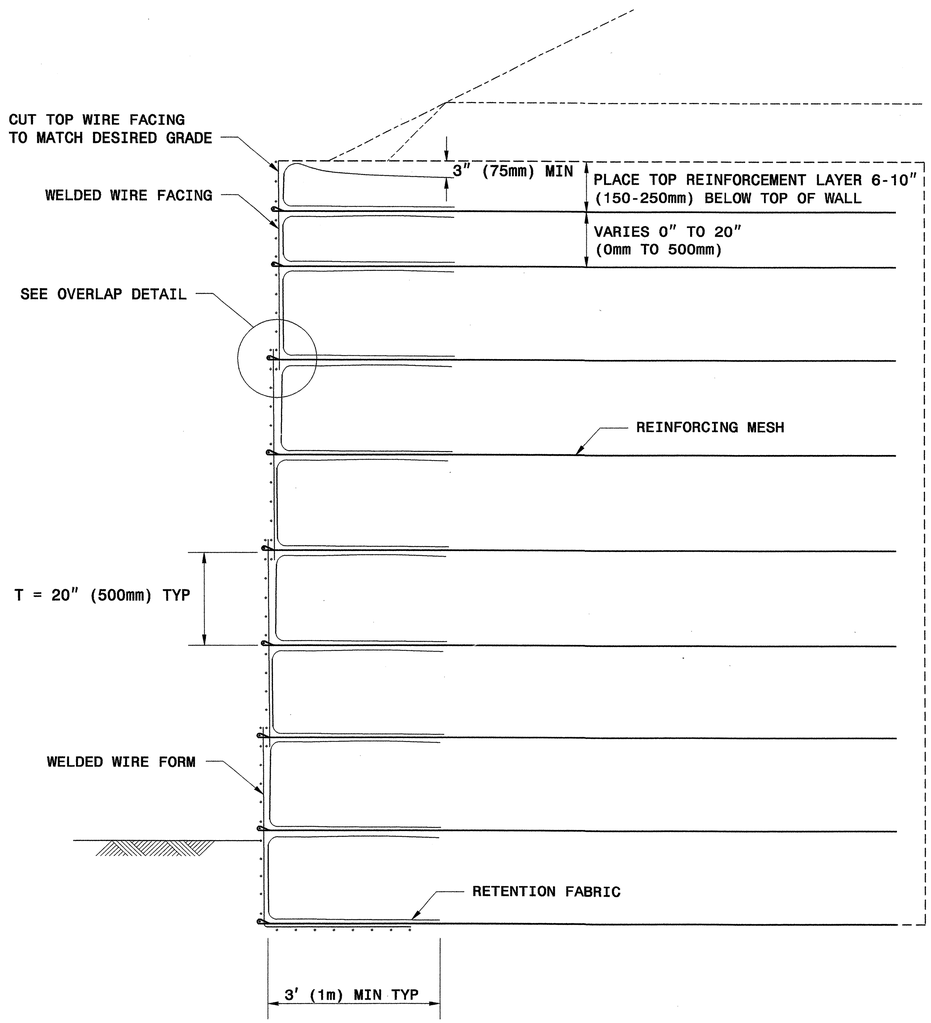
SIGNATURE DATE

ENGINEER

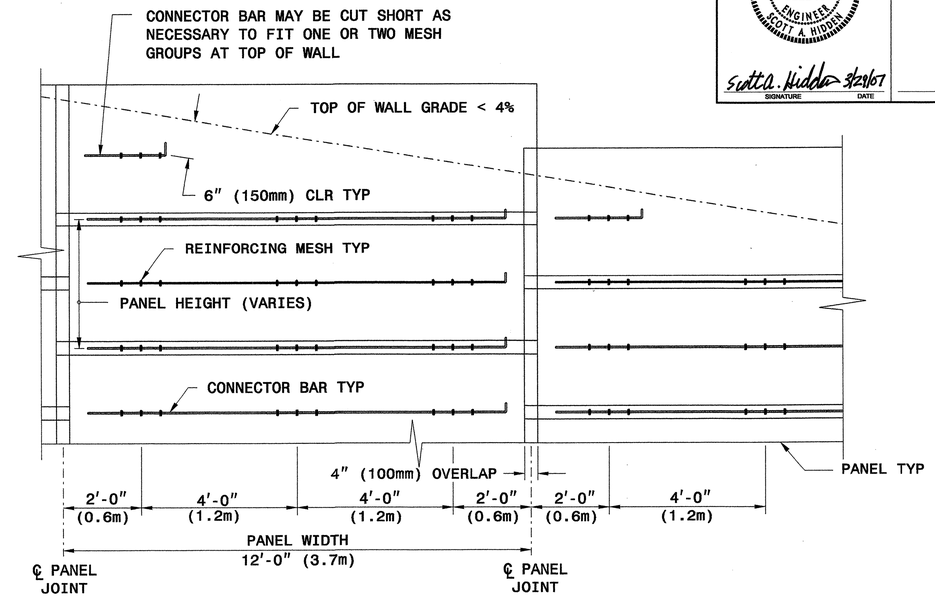
SIGNATURE DATE



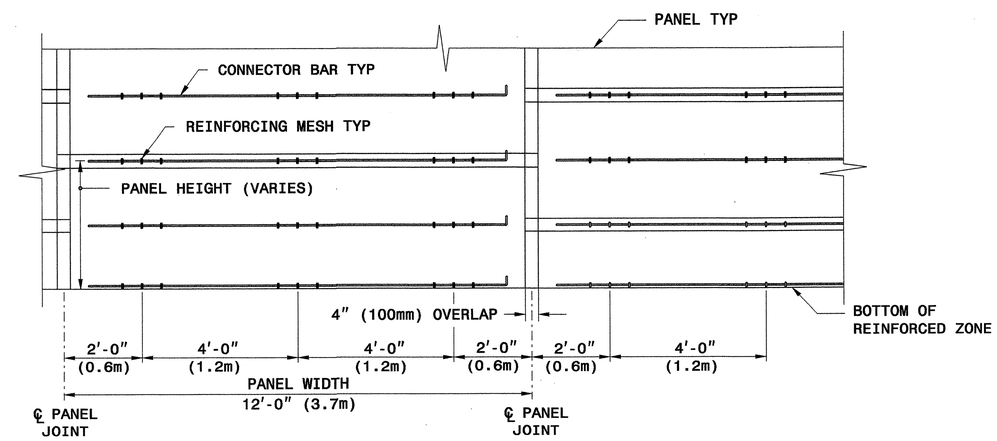
OVERLAP DETAIL



TYPICAL SECTION



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



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

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GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

RETAINED EARTH TEMPORARY WALL

SHEET 8 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
R-2519A	2-AQ

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

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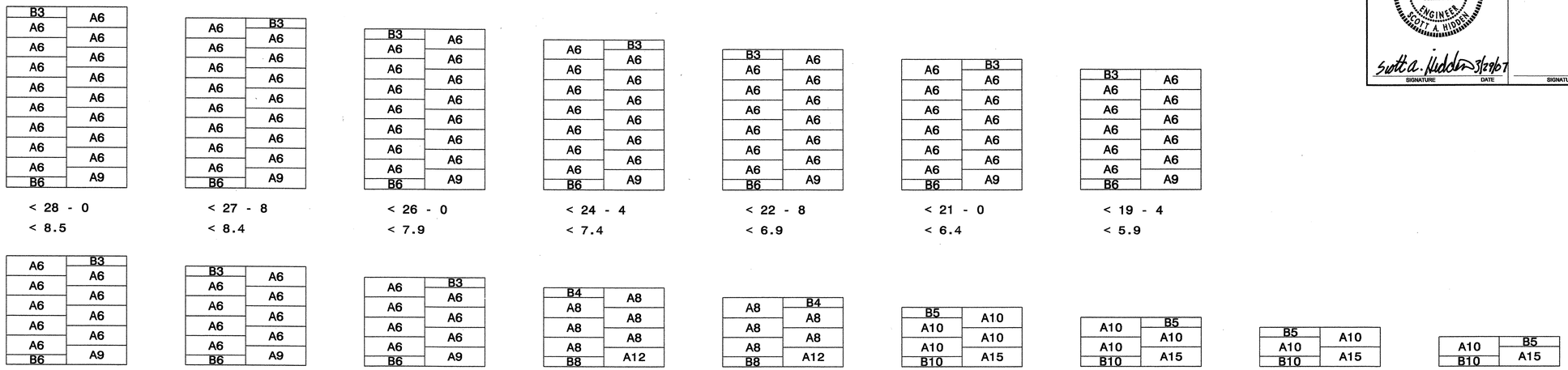
SIGNATURE DATE

ENGINEER

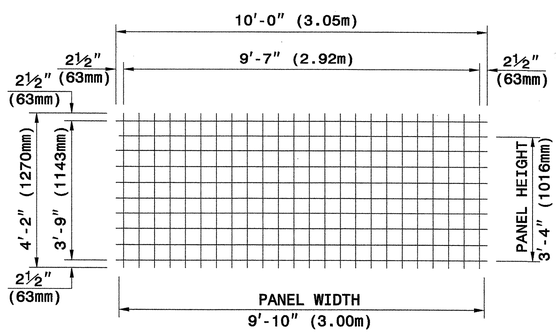
SIGNATURE DATE

PANEL LAYOUTS

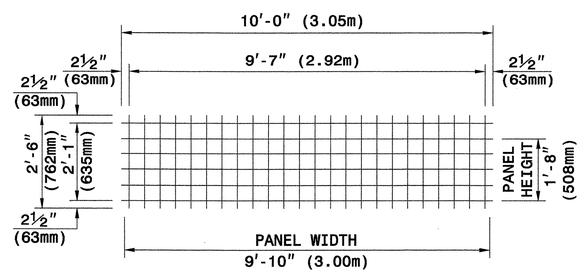


H - WALL HEIGHT							
(FEET-INCHES)	< 28 - 0	< 27 - 8	< 26 - 0	< 24 - 4	< 22 - 8	< 21 - 0	< 19 - 4
(METER)	< 8.5	< 8.4	< 7.9	< 7.4	< 6.9	< 6.4	< 5.9

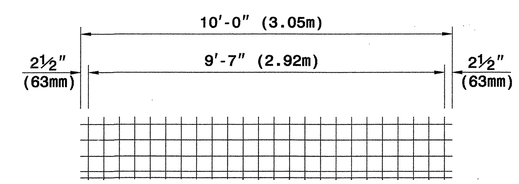
(FEET-INCHES)	< 17 - 8	< 16 - 0	< 14 - 4	< 12 - 8	< 11 - 0	< 9 - 4	< 7 - 8	< 6 - 0	< 4 - 4
(METER)	< 5.4	< 4.9	< 4.4	< 3.9	< 3.4	< 2.8	< 2.3	< 1.8	< 1.3



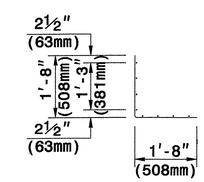
TYPE A



TYPE B



WELDED WIRE FORM



SECTION

WELDED WIRE FACINGS

PANEL TYPES (WELDED WIRE FACINGS AND FORM

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

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

TERRATREL
TEMPORARY WALL

SHEET 9 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
R-2519A	2-AR

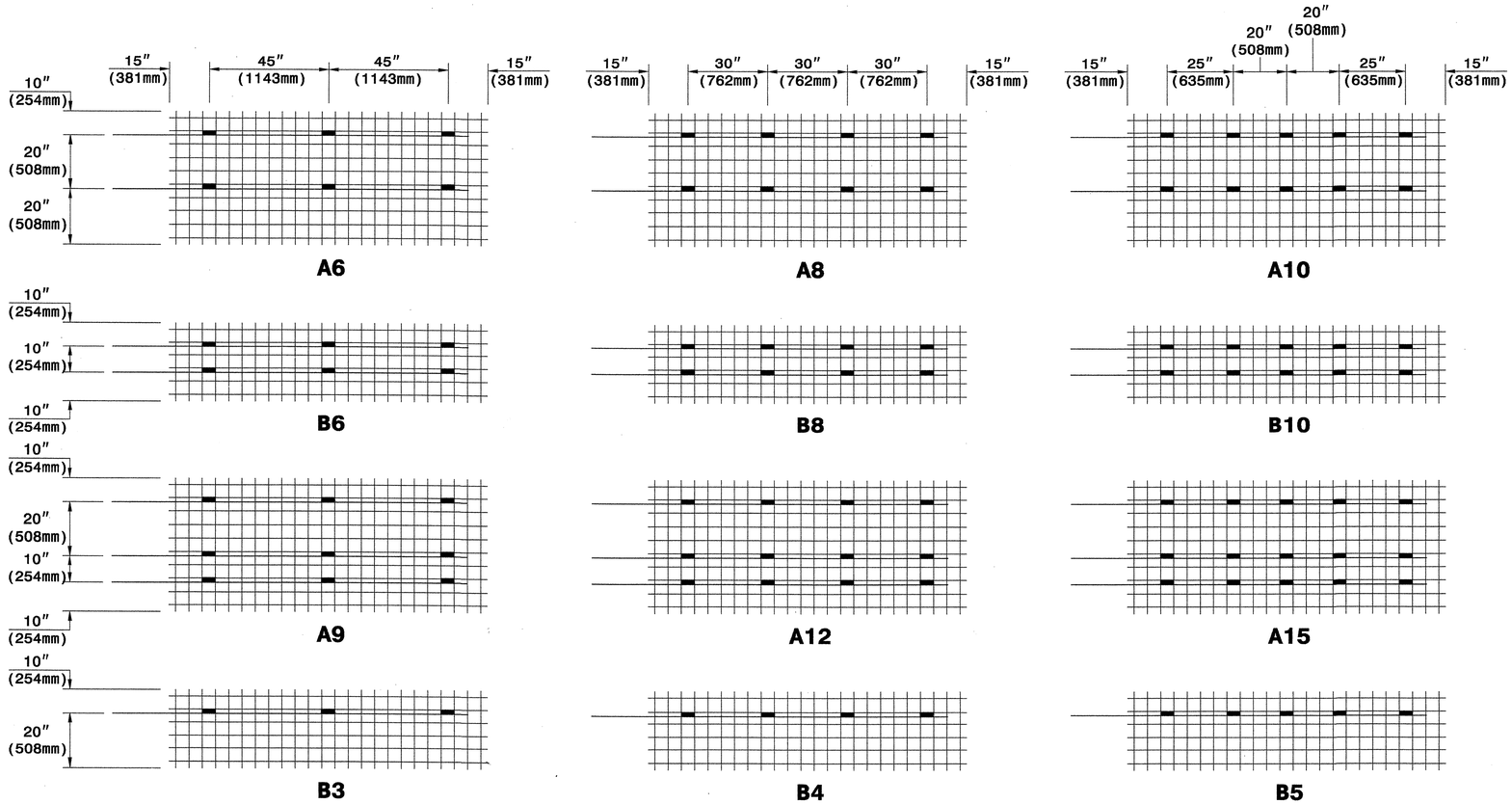
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

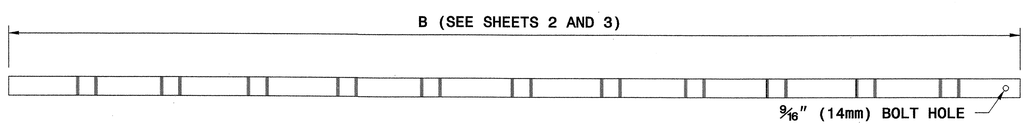


KEY: A8

NUMBER OF REINFORCING STRIPS

PANEL TYPE

CONNECTOR ROD AND REINFORCING STRIP PLACEMENT DIAGRAMS



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

½" (13mm) DIA. ROD

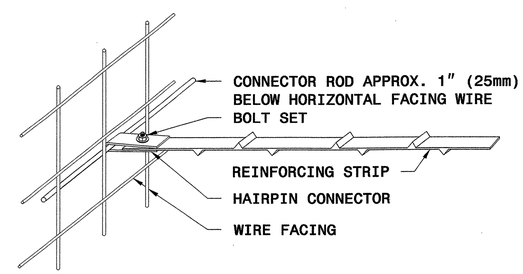
CONNECTOR ROD

½" (13mm) BOLT WITH NUT AND WASHER

BOLT SET

HAIRPIN CONNECTOR

WALL COMPONENTS



STRIP TO FACING CONNECTION

The Reinforced Earth Company

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

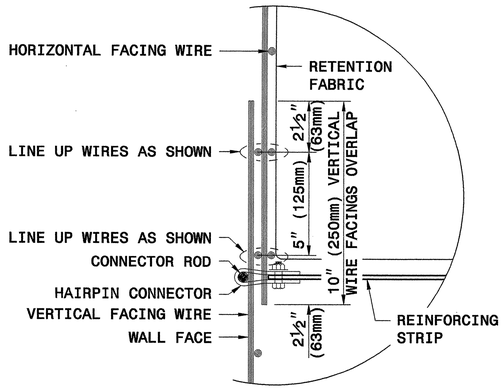
TERRATREL
TEMPORARY WALL

SHEET 10 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
R-2519A	2-AS

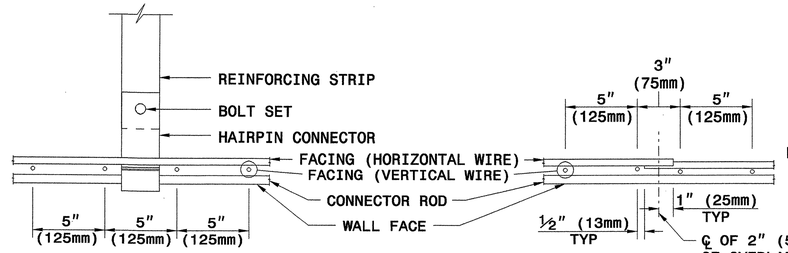
GEOTECHNICAL ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN — Scott A. Hidden 3/29/07 — SIGNATURE DATE

ENGINEER — SIGNATURE DATE



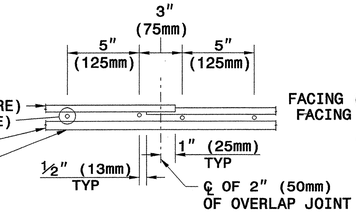
OVERLAP FACINGS VERTICALLY ONE FULL 5" (125mm) WIRE SQUARE DISREGARDING HALF SQUARES AT EDGES

VERTICAL OVERLAP DETAIL



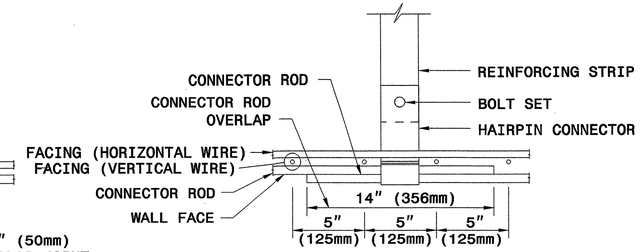
PLAN DETAIL 'A'

STRIP CONNECTION



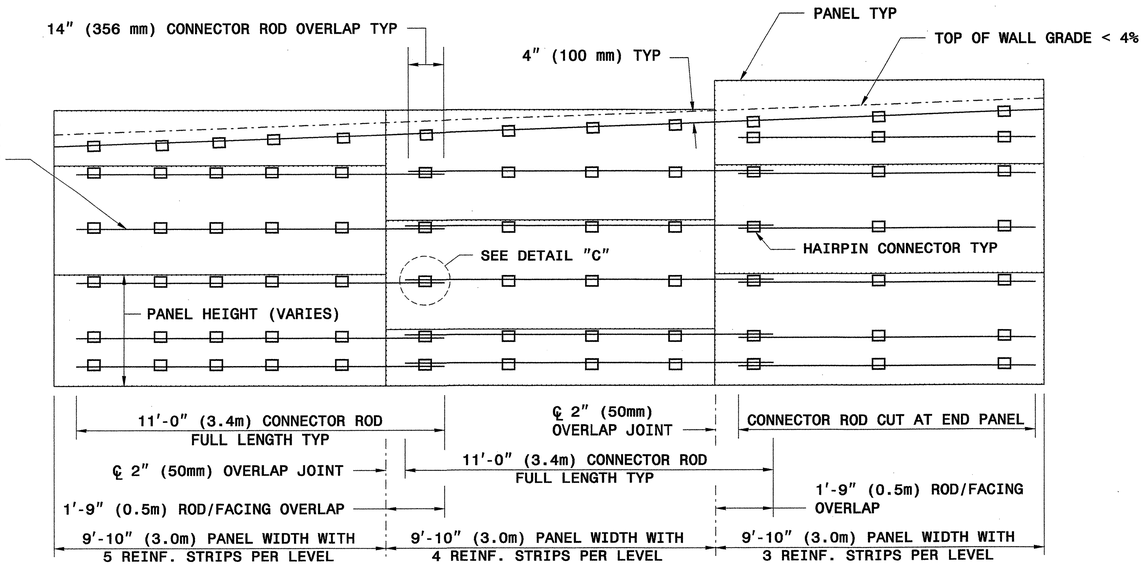
PLAN DETAIL 'B'

HORIZONTAL OVERLAP DETAIL



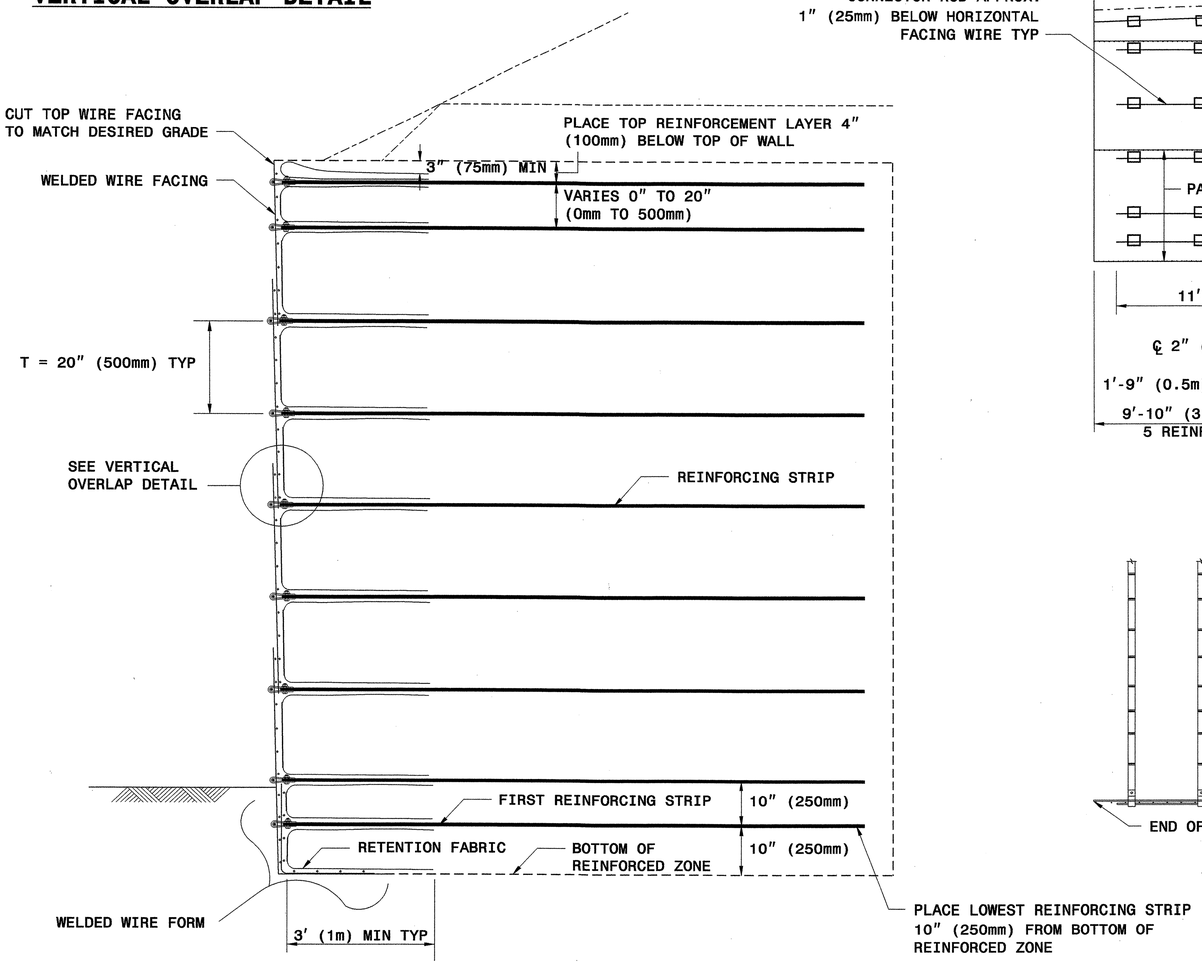
PLAN DETAIL 'C'

STRIP CONNECTION WITH HORIZONTAL OVERLAP DETAIL

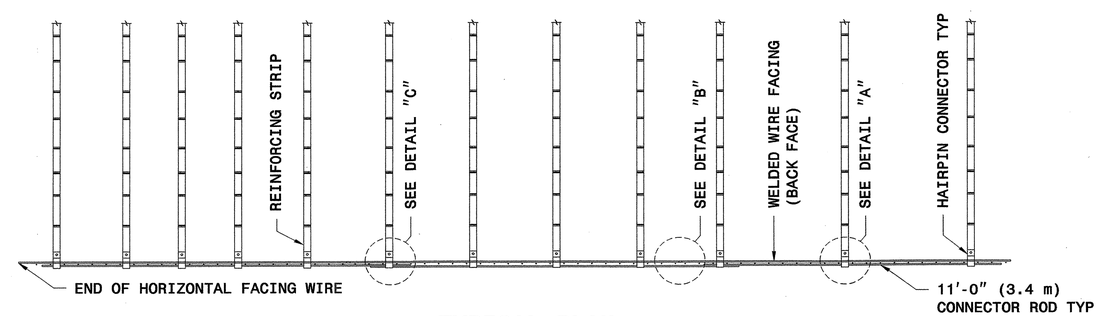


TYPICAL ELEVATION

(WIRES NOT SHOWN FOR CLARITY)



TYPICAL SECTION



TYPICAL PLAN

The Reinforced Earth Company

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

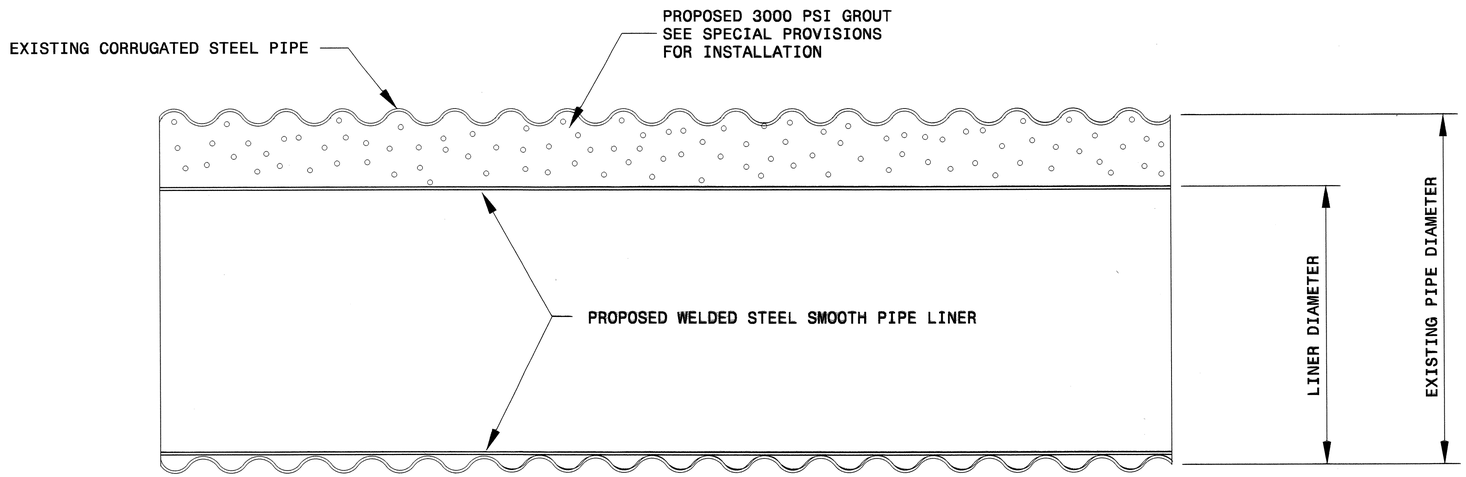
STANDARD DRAWING NO. 1801.02

TERRATREL TEMPORARY WALL

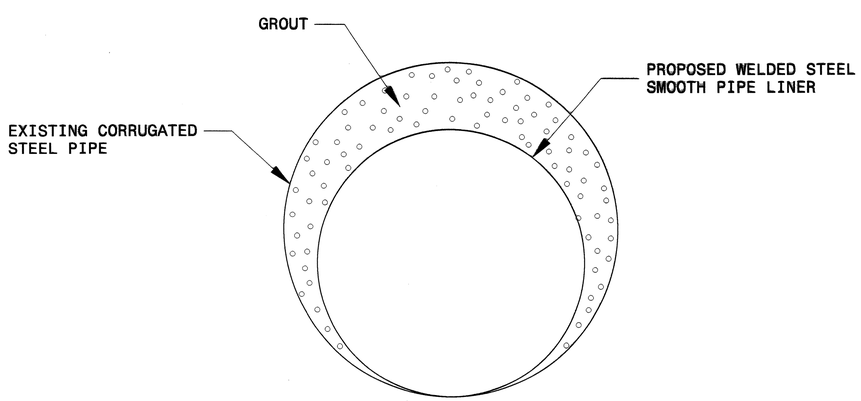
SHEET 11 OF 11 — DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-AT

METRIC



ELEVATION



END ELEVATION

GROUT QUANTITIES PER FOOT

EXISTING CSP SIZE (mm)	WELDED STEEL LINER SIZE (mm)	GROUT (M^3/M)
900	750	0.19
1200	1000	0.27
1500	1350	0.34
1650	1500	0.37
1800	1650	0.41
1950	1800	0.44

NOTE: SEE PLANS FOR PIPE LENGTHS AND LOCATIONS.

SEE STRUCTURE 24A-24, 27A

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON 2/22/11

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

SMOOTH WELDED STEEL PIPE LINER INSIDE A CORRUGATED STEEL PIPE

ORIGINAL BY: T.Spell DATE: June 23,1998
MODIFIED BY: K. Kempf DATE: Jan. 6, 2011
CHECKED BY: [signature] DATE: 1/7/11
FILE SPEC.: details/tspell/metric/liner_culvert.dgn

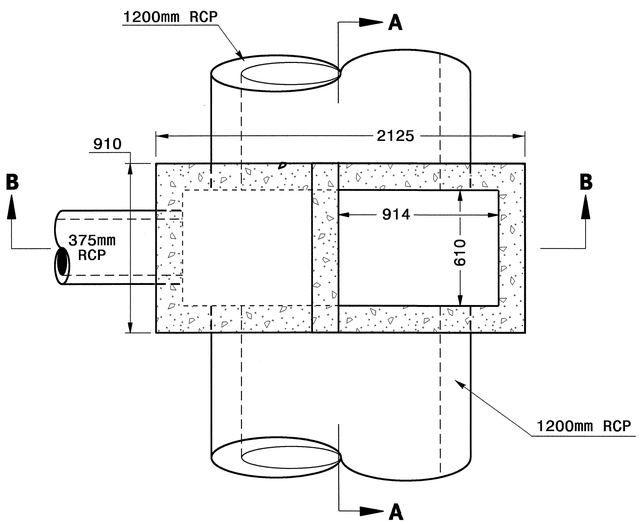
07-JAN-2011 10:04
S:\Contracts\Contracts\Special Details\tspell\metric\liner_culvert.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	2-AU

METRIC

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

ENGLISH DETAIL DRAWING FOR
CONCRETE DROP INLET
FOR 1200mm PIPE



PLAN

GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

PROVIDE ALL DROP INLETS OVER 1.0m IN DEPTH WITH STEPS 300mm ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.

OPTIONAL CONSTRUCTION - MONOLITHIC POUR 50mm KEYWAY OR #13 BAR DOWELS AT 300mm CENTERS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.

CONSTRUCT WITH PIPE CROWNS MATCHING.

MAX. DEPTH OF THIS STRUCTURE FROM TOP OF BOTTOM SLAB TO TOP ELEV. IS 3.6 METERS.

INSTALL 50mm WEEPHOLES AS DIRECTED BY THE ENGINEER.

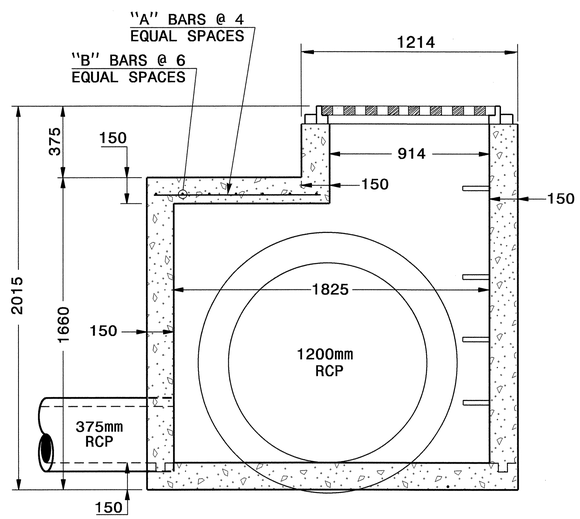
INSTALL STONE DRAINS, OF A MINIMUM OF 0.028 CUBIC METER OF NO. 78M STONE IN A POROUS FABRIC BAG OR WRAP, AT EACH WEEP HOLE OR AS DIRECTED BY THE ENGINEER.

CHAMFER ALL EXPOSED CORNERS 25mm.

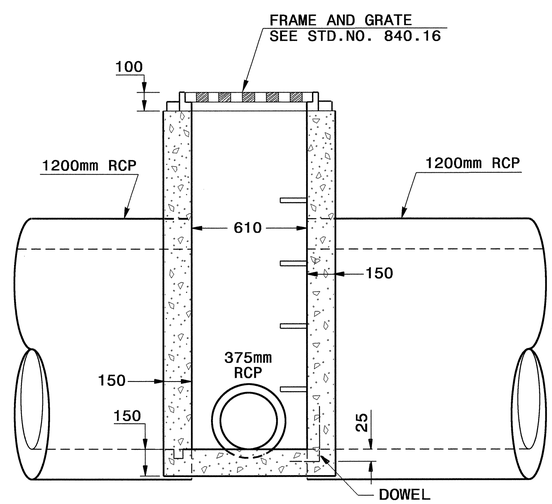
DRAWING NOT TO SCALE.

BILL OF MATERIAL

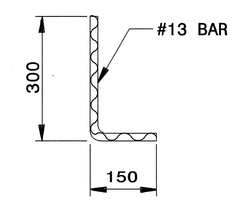
BAR	NO.	SIZE	LENGTH	WEIGHT
A	5	#13	950	4.7
B	7	#13	500	3.5
D	18	#13	450	8.1
TOTAL REINF. STEEL (kg.)				16.3
CLASS "B" CONC. (m^3)				2.0



SECTION B-B



SECTION A-A



DOWEL

SEE STRUCTURE 445

SHEET 1 OF 1
840D14

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

ENGLISH DETAIL DRAWING FOR
CONCRETE DROP INLET
FOR 1200mm PIPE

SHEET 1 OF 1
840D14

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON 2/2/11

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

SEE PLATE FOR TITLE

ORIGINAL BY: T.S.Spell DATE: 2-2-11
MODIFIED BY: DATE:
CHECKED BY: DATE: 2/2/11
FILE SPEC.: $:details/metric/840d14m_r2248bb.dgn

02-FEB-2011 10:12
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET
R-2519A (WBS 35609.1.1)	2-AV

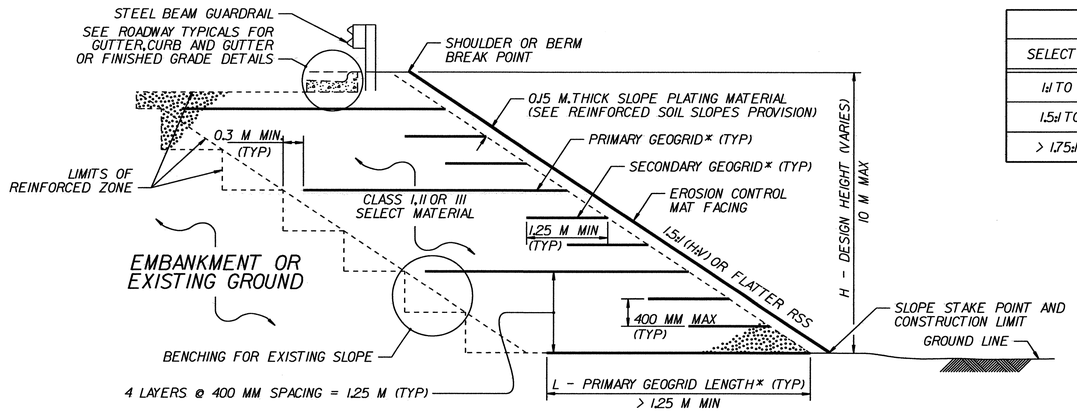
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 29869 ENGINEER SHANE C CLARK

SIGNATURE — DATE 2/24/11

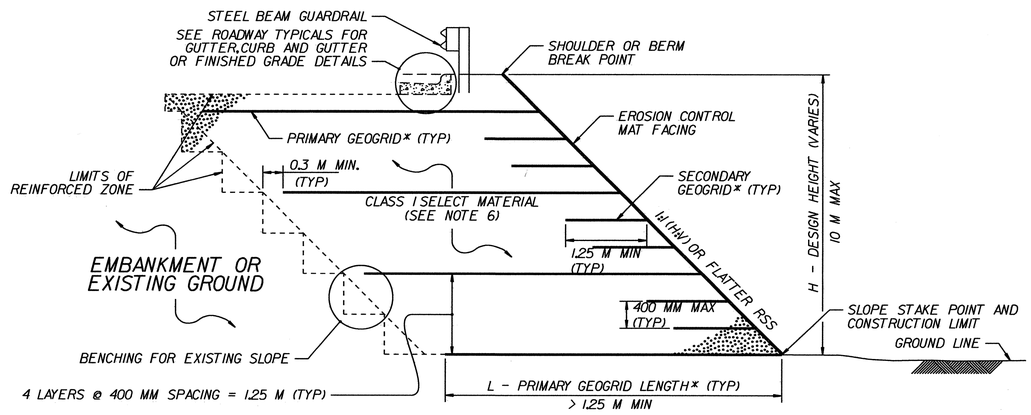
ENGINEER

SIGNATURE — DATE



RSS WITH SELECT MATERIAL THAT DOES NOT MEET ARTICLE 560-2 OF THE STANDARD SPECIFICATIONS – TYPICAL SECTION

***SEE TABLES AND GEOGRID LAYOUT DETAILS.**



RSS WITH SELECT MATERIAL THAT MEETS ARTICLE 560-2 OF THE STANDARD SPECIFICATIONS – TYPICAL SECTION

***SEE TABLES AND GEOGRID LAYOUT DETAILS.**

H (M)	0 - < 3		3 - 6		> 6 - 10	
SELECT MATERIAL CLASS	I	II OR III	I	II OR III	I	II OR III
1:1 TO < 1.5:1 (H:V) RSS	1.20	SEE NOTE 6	1.10	SEE NOTE 6	1.00	SEE NOTE 6
1.5:1 TO 1.75:1 (H:V) RSS	1.15	1.00	1.05	0.95	0.95	0.90
> 1.75:1 TO 2:1 (H:V) RSS	1.10	0.75	1.00	0.70	0.90	0.65

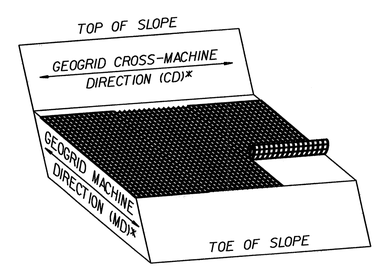
L /H RATIO (L > 1.25 M MIN)

IF L ≤ 4', USE SECONDARY GEOGRID INSTEAD OF PRIMARY GEOGRID.

	H (M)	0 - < 3		3 - 6		> 6 - 10	
	SELECT MATERIAL CLASS	I	II OR III	I	II OR III	I	II OR III
PRIMARY GEOGRID (NOT REQUIRED FOR > 2:1 (H:V) RSS)	1:1 TO < 1.5:1 (H:V) RSS	2XT	SEE NOTE 6	3XT	SEE NOTE 6	5XT	SEE NOTE 6
		SG150		SG200		SG350	
		SF20		SF35		SF55	
		UX1100HS		UX1400HS		UX1500HS	
	1.5:1 TO 1.75:1 (H:V) RSS	2XT	2XT	3XT	2XT	3XT	2XT
		SG150	SG150	SG200	SG150	SG200	SG150
		SF20	SF20	SF35	SF20	SF35	SF20
		UX1100HS	UX1100HS	UX1400HS	UX1100HS	UX1400HS	UX1100HS
	> 1.75:1 TO 2:1 (H:V) RSS	2XT	2XT	2XT	2XT	2XT	2XT
		SG150	SG150	SG150	SG150	SG150	SG150
		SF20	SF20	SF20	SF20	SF20	SF20
		UX1100HS	UX1100HS	UX1100HS	UX1100HS	UX1100HS	UX1100HS
SECONDARY GEOGRID	1:1 (H:V) OR FLATTER RSS	2XT					
		SG150					
		SF11					
		BX1100					

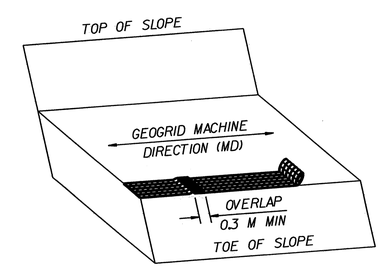
PRIMARY AND SECONDARY GEOGRIDS

#XT REFERS TO MIRAFI SERIES GEOGRID.
SG### REFERS TO STRATAGRID SERIES GEOGRID.
SF## REFERS TO SYNTEEN SERIES GEOGRID.
UX####HS AND BX#### REFER TO TENSAR SERIES GEOGRID.



PRIMARY GEOGRID LAYOUT

***SEE NOTES 7 AND 8.**



SECONDARY GEOGRID LAYOUT

GEOGRID LAYOUT DETAILS

NOTES:

1. SEE ROADWAY PLANS FOR REINFORCED SOIL SLOPE (RSS) LOCATIONS.
2. FOR STANDARD REINFORCED SOIL SLOPES, SEE REINFORCED SOIL SLOPES PROVISION. FOR EROSION CONTROL MAT FACING, SEE PERMANENT SOIL REINFORCEMENT MAT PROVISION.
3. STANDARD RSS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
   UNIT WEIGHT, γ = 18.8 kN/M3
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 kPa
4. DO NOT USE STANDARD RSS IF THE ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE OR GROUNDWATER IS ABOVE EXISTING GROUND OR TOE OF SLOPE.
5. DO NOT USE STANDARD RSS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW RSS.
6. FOR 1:1 TO < 1.5:1 (H:V) RSS, USE CLASS I SELECT MATERIAL IN THE REINFORCED ZONE THAT MEETS ARTICLE 560-2 OF THE STANDARD SPECIFICATIONS EXCEPT FOR SELECT MATERIAL THAT MEETS AASHTO M 145 FOR SOIL CLASSIFICATIONS A-4 AND A-5. DO NOT USE A-4 OR A-5 SOIL OR CLASS II OR III SELECT MATERIAL FOR 1:1 TO < 1.5:1 (H:V) RSS.
7. EXCEPT FOR TENSAR UX GEOGRIDS, DO NOT SPLICE OR OVERLAP PRIMARY GEOGRIDS IN THE MACHINE DIRECTION (MD) SO THAT SPLICES OR OVERLAPS ARE PARALLEL TO THE TOE OF SLOPE. TENSAR UX GEOGRIDS MAY BE SPLICED ONCE PER PRIMARY GEOGRID LENGTH IN ACCORDANCE WITH TENSAR'S RECOMMENDED CONNECTION DETAIL. A LENGTH OF AT LEAST 1.25 M IS REQUIRED FOR EACH TENSAR UX GEOGRID PIECE.
8. EXCEPT FOR TENSAR UX GEOGRIDS, PLACE PRIMARY GEOGRIDS SO THAT GEOGRIDS ARE ADJACENT TO EACH OTHER IN THE CROSS-MACHINE DIRECTION (CD). TENSAR UX GEOGRIDS MAY BE PLACED WITH A MAXIMUM SPACING BETWEEN GEOGRIDS OF 0.5 M IN THE CD. STAGGER TENSAR UX GEOGRIDS SO THAT GEOGRIDS ARE CENTERED OVER GAPS IN THE PRIMARY GEOGRID LAYER BELOW.
9. OBTAIN APPROVAL OF THE EXCAVATION DIMENSIONS AND IN-SITU MATERIAL BEFORE PLACING THE FIRST PRIMARY GEOGRID LAYER.

PREPARED BY: T WILLIAMS	DATE: 2/2011
REVIEWED BY: S CLARK	DATE: 2/2011

GEOTECHNICAL ENGINEERING UNIT

☐ EASTERN REGIONAL OFFICE
☒ WESTERN REGIONAL OFFICE
☐ CONTRACT OFFICE

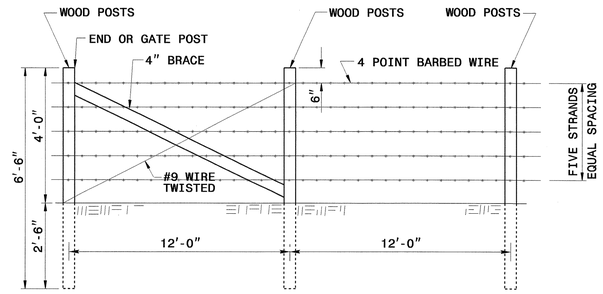
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

REINFORCED SOIL SLOPE (RSS) DETAILS

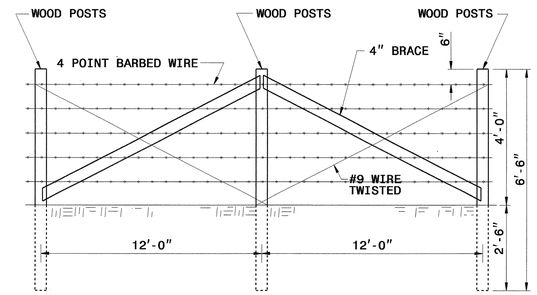
REVISIONS

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

PROJ. REFERENCE NO.	SHEET NO.
R-2519A	2-AW



FIVE STRAND BARBED WIRE FENCE END OR GATE LOCATION



LINE BRACES

NOTES :

BARBED WIRE, GATES, LATCH DEVICES, HINGES, AND INSULATORS SHALL BE OF A TYPE AND INSTALLED AS APPROVED BY THE ENGINEER.

CLASS B CONCRETE ANCHOR TO BE USED AT GATE POSTS OR WHERE REQUIRED BY SOIL CONDITIONS. CONCRETE ANCHOR MAY ALSO BE USED IN LIEU OF SETTING POSTS TO THEIR REQUIRED DEPTH.

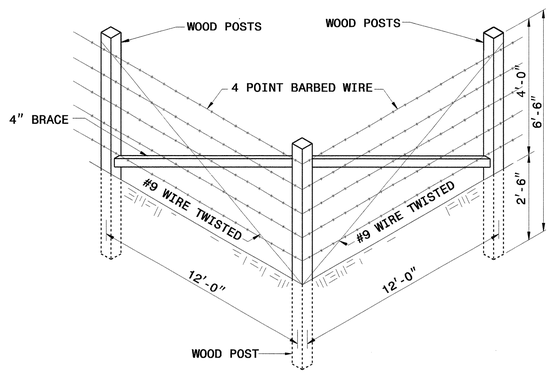
THE FENCE SHALL BE INSTALLED FACING THE PROPERTY OWNER EXCEPT ON HORIZONTAL CURVES GREATER THAN 3 DEGREES WHERE THE FENCE SHALL BE INSTALLED AS TO PULL AGAINST ALL POSTS.

MAXIMUM SPACING OF LINE BRACES IS 500'.

ALL POSTS AND BRACES MAY BE EITHER ROUND OR SQUARE AT THE OPTION OF THE CONTRACTOR, PROVIDED THAT THE SAME TYPE IS USED THROUGHOUT THE PROJECT FOR BOTH POSTS AND BRACES. DIMENSIONS SHOW THE DIAMETER OF ROUND POSTS OR EDGE DIMENSIONS OF SQUARE POSTS.

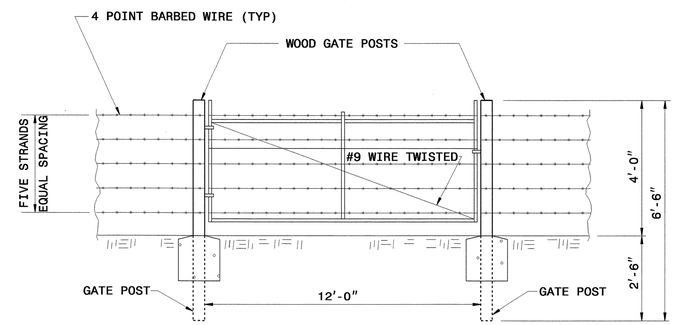
THE BRACE WIRE IS TO BE PLACED AROUND POSTS WITH ONE WIRE ON EACH SIDE OF THE BRACE. ALL BRACE WIRES TO BE TIGHTENED BY TWISTING BETWEEN BRACE AND EACH POST.

POSTS TO BE NOTCHED 1" FOR BRACES AND ATTACHED TO BRACES USING TWO GALVANIZED 12D NAILS AT EACH END OR AS DIRECTED BY THE ENGINEER.

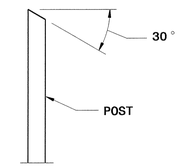


FENCE CORNER

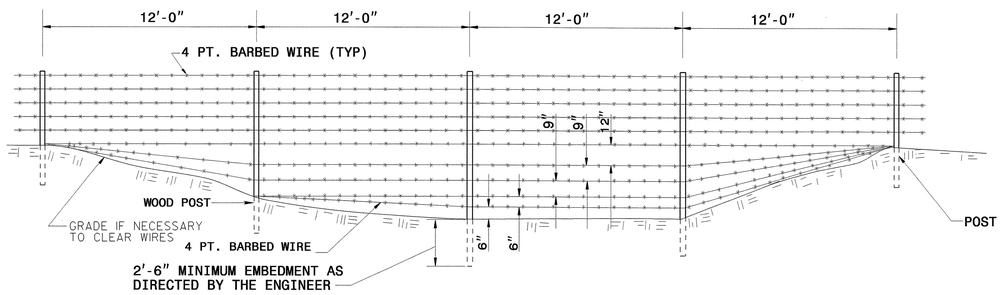
TO BE USED WHEN CORNER ANGLE IS 15° OR GREATER



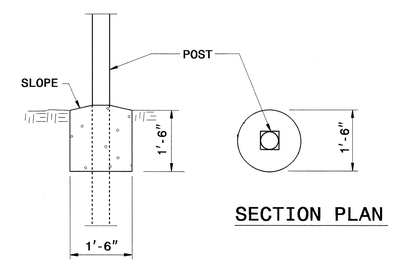
GATE



DETAIL SHOWING METHOD OF CUTTING POST TOPS



DETAIL OF DITCH CROSSING



SECTION PLAN

DETAIL OF POST ANCHOR

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWARD
5/5/11

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

FIVE STRAND BARBED WIRE FENCE

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: rmbritt DATE: 12-03-04
CHECKED BY: [signature] DATE: 5/5/11
FILE SPEC.: details/nbritt/english/misc/barbedwire.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	3 (1 of 3)

6/15/99

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202332

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING
00067	SP	LumpSum		Field Office
0001000000-M	200	Lump Sum		CLEARING & GRUBBING .. HECTARE(S)
0008000000-M	200	1.2	HA	SUPPLEMENTARY CLEARING & GRUB-BING
0022000000-M	225	1,176,000	M3	UNCLASSIFIED EXCAVATION
0036	225	5,000	M3	UNDERCUT EXCAVATION
0038000000-M	SP	2,000	M3	SHALLOW UNDERCUT
0080000000-M	SP	4,300	MTN	CLASS IV SUBGRADE STABILIZA-TION
0134000000-M	240	5,100	M3	DRAINAGE DITCH EXCAVATION
0141000000-M	240	2,690	M	BERM DITCH CONSTRUCTION
0156000000-M	250	34,500	M2	REMOVAL OF EXISTING ASPHALT PAVEMENT
0192000000-N	260	33	HR	PROOF ROLLING
0195000000-M	SP	500	M3	SELECT GRANULAR MATERIAL
0196000000-M	270	4,750	M2	FABRIC FOR SOIL STABILIZATION
0199000000-M	SP	706	M2	TEMPORARY SHORING
0241000000-M	SP	135	M2	GENERIC GRADING ITEM REINFORCED SOIL SLOPES
0255000000-M	SP	1,000	MTN	GENERIC GRADING ITEM EXCAVATION, HAULING, AND DISPOSAL OF CONTAMINATED SOIL
0318000000-M	SP	4,973	MTN	FOUNDATION CONDITIONING MATE-RIAL, MINOR STRS
0320000000-M	SP	15,794	M2	FOUNDATION CONDITIONING FABRIC
0986000000-M	SP	56.4	M	GENERIC PIPE ITEM 1650MM WELDED STEEL PIPE LINER
0986000000-M	SP	45.6	M	GENERIC PIPE ITEM 750MM WELDED STEEL PIPE LINER
0987000000-M	310	34.8	M	GENERIC PIPE ITEM 1000MM BIT COAT CS PIPE CUL-VERTS, TYPE B 2.01MM THICK
0987000000-M	310	528.8	M	GENERIC PIPE ITEM 1050MM RC PIPE CULVERTS, CLASS IV
0987000000-M	310	46.8	M	GENERIC PIPE ITEM 1200MM BIT COAT CS PIPE CUL-VERTS, TYPE B 2.01MM THICK
0987000000-M	310	132	M	GENERIC PIPE ITEM 1200MM RC PIPE CULVERTS, CLASS IV
0987000000-M	310	103.2	M	GENERIC PIPE ITEM 1350MM RC PIPE CULVERTS, CLASS III
0987000000-M	310	20.4	M	GENERIC PIPE ITEM 1400MM BIT COAT CS PIPE CUL-VERTS, TYPE B 2.77MM THICK
0987000000-M	310	21.6	M	GENERIC PIPE ITEM 1500MM BIT COAT CS PIPE CUL-VERTS, TYPE B 2.77MM THICK
0987000000-M	310	180	M	GENERIC PIPE ITEM 1500MM RC PIPE CULVERTS, CLASS III
0987000000-M	310	7.2	M	GENERIC PIPE ITEM 1800MM BIT COAT CS PIPE CUL-VERTS, TYPE B 3.50MM THICK
0987000000-M	310	307.2	M	GENERIC PIPE ITEM 1800MM RC PIPE CULVERTS, CLASS III
0987000000-M	310	27.6	M	GENERIC PIPE ITEM 1950MM RC PIPE CULVERTS, CLASS III
0987000000-M	310	21.6	M	GENERIC PIPE ITEM 2230MM X 1600MM BIT COAT CS PIPE ARCH CULVERTS, TYPE B 2.77MM THK
0987000000-M	310	13.2	M	GENERIC PIPE ITEM 2410MM X 1700MM BIT COAT CS PIPE ARCH CULVERTS, TYPE B 2.77MM THK
0987000000-M	310	13.2	M	GENERIC PIPE ITEM 300MM BIT COAT CS PIPE CUL-VERTS, TYPE B 1.63MM THICK
0987000000-M	310	4,966.8	M	GENERIC PIPE ITEM 375MM RC PIPE CULVERTS, CLASS IV
0987000000-M	310	285.6	M	GENERIC PIPE ITEM 375MM SIDE DRAIN PIPE
0987000000-M	310	963.6	M	GENERIC PIPE ITEM 400MM BIT COAT CS PIPE CUL-VERTS, TYPE B 1.63MM THICK
0987000000-M	310	265.2	M	GENERIC PIPE ITEM 450MM BIT COAT CS PIPE CUL-VERTS, TYPE B 1.63MM THICK
0987000000-M	310	1,200	M	GENERIC PIPE ITEM 450MM RC PIPE CULVERTS, CLASS IV
0987000000-M	310	121.2	M	GENERIC PIPE ITEM 450MM SIDE DRAIN PIPE
0987000000-M	310	345.6	M	GENERIC PIPE ITEM 600MM BIT COAT CS PIPE CUL-VERTS, TYPE B 1.63MM THICK
0987000000-M	310	1,586.4	M	GENERIC PIPE ITEM 600MM RC PIPE CULVERTS, CLASS IV
0987000000-M	310	34.8	M	GENERIC PIPE ITEM 600MM SIDE DRAIN PIPE
0987000000-M	310	838.6	M	GENERIC PIPE ITEM 750MM RC PIPE CULVERTS, CLASS IV
0987000000-M	310	56.4	M	GENERIC PIPE ITEM 800MM BIT COAT CS PIPE CUL-VERTS, TYPE B 1.63MM THICK
0987000000-M	310	26.4	M	GENERIC PIPE ITEM 900MM BIT COAT CS PIPE CUL-VERTS, TYPE B 2.01MM THICK
0987000000-M	310	511.2	M	GENERIC PIPE ITEM 900MM RC PIPE CULVERTS, CLASS IV
0988000000-M	310	4	EA	GENERIC PIPE ITEM 1000MM BIT COAT CS PIPE ELBOW, TYPE B 2.01MM THICK
0988000000-M	310	4	EA	GENERIC PIPE ITEM 1200MM BIT COAT CS PIPE ELBOW, TYPE B 2.01MM THICK
0988000000-M	310	18	EA	GENERIC PIPE ITEM 375MM PIPE END SECTION
0988000000-M	310	110	EA	GENERIC PIPE ITEM 400MM BIT COAT CS PIPE ELBOW, TYPE B 1.63MM THICK
0988000000-M	310	3	EA	GENERIC PIPE ITEM 400MM PIPE END SECTION
0988000000-M	310	16	EA	GENERIC PIPE ITEM 450MM BIT COAT CS PIPE ELBOW, TYPE B 1.63MM THICK
0988000000-M	310	4	EA	GENERIC PIPE ITEM 450MM PIPE END SECTION
0988000000-M	310	27	EA	GENERIC PIPE ITEM 600MM BIT COAT CS PIPE ELBOW, TYPE B 1.63MM THICK
0988000000-M	310	3	EA	GENERIC PIPE ITEM 600MM PIPE END SECTION
0988000000-M	310	7	EA	GENERIC PIPE ITEM 800MM BIT COAT CS PIPE ELBOW, TYPE B 1.63MM THICK
0988000000-M	310	2	EA	GENERIC PIPE ITEM 900MM BIT COAT CS PIPE ELBOW, TYPE B 2.01MM THICK
0995000000-M	340	3,302.8	M	PIPE REMOVAL
1011000000-N	500	Lump Sum		FINE GRADING
1077000000-M	SP	180	MTN	#57 STONE
1110000000-M	510	3,000	MTN	STABILIZER AGGREGATE
1121000000-M	520	120,450	MTN	AGGREGATE BASE COURSE
1220000000-M	545	12,000	MTN	INCIDENTAL STONE BASE
1231000000-M	560	27,090	M3	SHOULDER BORROW
1330	607	12,000	M2	INCIDENTAL MILLING
1489000000-M	610	2,740	MTN	ASPHALT CONC BASE COURSE, TYPE B25.0B
1491000000-M	610	37,100	MTN	ASPHALT CONC BASE COURSE, TYPE B25.0C
1498000000-M	610	700	MTN	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
1503000000-M	610	44,700	MTN	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C
1519000000-M	610	4,200	MTN	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
1523000000-M	610	44,300	MTN	ASPHALT CONC SURFACE COURSE, TYPE S9.5C
1525000000-M	610	880	MTN	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A
1560000000-M	620	4,170	MTN	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
1565000000-M	620	2,660	MTN	ASPHALT BINDER FOR PLANT MIX, GRADE PG 70-22
1693000000-M	654	~~1,902~~ 6,000	MTN	ASPHALT PLANT MIX, PAVEMENT REPAIR
2000000000-N	806	625	EA	RIGHT OF WAY MARKERS
2022000000-M	SP	414	M3	SUBDRAIN EXCAVATION
2033000000-M	SP	310.5	M3	SUBDRAIN FINE AGGREGATE
2044000000-M	SP	750	M	150MM PERFORATED SUBDRAIN PIPE
2070000000-N	SP	5	EA	SUBDRAIN PIPE OUTLETS
2077000000-M	SP	10	M	150MM OUTLET PIPE (SUBDRAINS)
2209000000-M	838	19.2	M3	ENDWALLS
2220000000-M	838	48.8	M3	REINFORCED ENDWALLS
2253000000-M	840	~~12~~ 36	M3	PIPE COLLARS
2264000000-M	840	~~2.01~~ 10	M3	PIPE PLUGS
2275000000-M	SP	~~55~~ 100	M3	FLOWABLE FILL
2286000000-N	840	522	EA	MASONRY DRAINAGE STRUCTURES
2297000000-M	840	111.89	M3	MASONRY DRAINAGE STRUCTURES
2308000000-M	840	87.7	M	MASONRY DRAINAGE STRUCTURES
2364000000-N	840	130	EA	FRAME WITH TWO GRATES, STD 840.16
2365000000-N	840	3	EA	FRAME WITH TWO GRATES, STD 840.22
2366000000-N	840	94	EA	FRAME WITH TWO GRATES, STD 840.24
2367000000-N	840	28	EA	FRAME WITH TWO GRATES, STD 840.29
2374000000-N	840	11	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)
2374000000-N	840	100	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)
2374000000-N	840	129	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)
2396000000-N	840	32	EA	FRAME WITH COVER, STD 840.54
2418000000-M	SP	10.8	M	FRAME WITH GRATES, DRIVEWAY DROP INLET
2440000000-N	852	71	EA	CONCRETE TRANSITIONAL SECTION FOR CATCH BASIN
2451000000-N	852	59	EA	CONCRETE TRANSITIONAL SECTION FOR DROP INLETS
2535000000-M	846	2,420	M	*** X ***MM CONCRETE CURB (200MM X 450MM)
2542000000-M	846	15,500	M	450MM CONCRETE CURB & GUTTER
2549000000-M	846	9,500	M	750MM CONCRETE CURB & GUTTER
2556000000-M	846	1,790	M	SHOULDER BERM GUTTER
2577000000-M	846	210	M	CONCRETE EXPRESSWAY GUTTER
2591000000-M	848	17,500	M2	100MM CONCRETE SIDEWALK
2605000000-N	848	90	EA	CONCRETE WHEELCHAIR RAMPS
2612000000-M	848	1,450	M2	150MM CONCRETE DRIVEWAY
2619000000-M	850	440	M2	100MM CONCRETE PAVED DITCH
2647000000-M	852	4,180	M2	125MM MONOLITHIC CONCRETE IS-LANDS (SURFACE MOUNTED)
2860000000-N	859	1	EA	CONVERT EXISTING CATCH BASIN TO JUNCTION BOX
2938000000-N	SP	3	EA	CONVERT EXISTING DROP INLET TO JUNCTION BOX WITH MANHOLE COVER
3030000000-M	862	7,246.62	M	STEEL BM GUARDRAIL
3045000000-M	862	826.77	M	STEEL BM GUARDRAIL, SHOP CURVED
3105000000-N	862	6	EA	STEEL BM GUARDRAIL TERMINAL SECTIONS
3150000000-N	862	20	EA	ADDITIONAL GUARDRAIL POSTS
3195000000-N	862	3	EA	GUARDRAIL ANCHOR UNITS, TYPE AT-1
3210000000-N	862	45	EA	GUARDRAIL ANCHOR UNITS, TYPE CAT-1
3270000000-N	SP	68	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3285000000-N	SP	2	EA	GUARDRAIL ANCHOR UNITS, TYPE M-350
3317000000-N	862	1	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77
3360000000-M	863	4,890	M	REMOVE EXISTING GUARDRAIL
3380000000-M	862	15.24	M	TEMPORARY STEEL BM GUARDRAIL
3389100000-N	SP	3	EA	GUARDRAIL ANCHOR UNITS, TYPE 350 TEMPORARY
3503000000-M	866	11,720	M	WOVEN WIRE FENCE, 1200MM FAB-RIC

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STATE OF NORTH CAROLINA
SUMMARY OF QUANTITIES

PROJECT REFERENCE No.	SHEET No.
R-2519A	3 (2 of 3)

ItemNumber	Sec #	Quantity	Unit	Description
3509000000-M	866	2,360	EA	100MM TIMBER FENCE POSTS, 2.30M LONG
3515000000-M	866	845	EA	125MM TIMBER FENCE POSTS, 2.50M LONG
3536000000-M	866	70	M	CHAIN LINK FENCE, 1200MM FABRIC
3542000000-M	866	20	EA	METAL LINE POSTS FOR 1200MM CHAIN LINK FENCE
3548000000-M	866	7	EA	METAL TERMINAL POSTS FOR 1200MM CHAIN LINK FENCE
3554000000-M	866	2	EA	METAL GATE POSTS FOR ****MM CHAIN LINK FENCE, DOUBLE GATE (1200MM)
3565000000-M	866	1	EA	DOUBLE GATES, ****MM HIGH, ****MM WIDE, ****MM OPENING (1200MM, 1800MM, 3600MM)
3575000000-M	SP	800	M	GENERIC FENCING ITEM STEEL PIPE HANDRAIL
3557	866	100	M	ADDITIONAL BARBED WIRE
3628000000-M	876	1,845	MTN	RIP RAP, CLASS I
3559	866	300	M	5 STRAND BARBED WIRE FENCE W/ POSTS
3635000000-M	876	385	MTN	RIP RAP, CLASS II
3649000000-M	876	760	MTN	RIP RAP, CLASS B
3651000000-M	SP	590	MTN	BOULDERS
3656000000-M	876	22,810	M2	FILTER FABRIC FOR DRAINAGE
3659000000-N	SP	20	EA	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON
4072000000-M	903	2,749	M	SUPPORTS, 4.5-KG STEEL U-CHANNEL
4096000000-N	904	28	EA	SIGN ERECTION, TYPE D
4102000000-N	904	325	EA	SIGN ERECTION, TYPE E
4108000000-N	904	25	EA	SIGN ERECTION, TYPE F
4116100000-N	904	15	EA	SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (D)
4116100000-N	904	23	EA	SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (E)
4155000000-N	907	216	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4360000000-N	SP	3	EA	GENERIC SIGNING ITEM DISPOSAL OF FLASHERS SYSTEM
4400000000-M	1110	344	M2	WORK ZONE SIGNS (STATIONARY)
4405000000-M	1110	105	M2	WORK ZONE SIGNS (PORTABLE)
4410000000-M	1110	39	M2	WORK ZONE SIGNS (BARRICADE MOUNTED)
4415000000-N	1115	2	EA	FLASHING ARROW PANELS, TYPE C
4420000000-N	1120	4	EA	CHANGEABLE MESSAGE SIGN
4430000000-N	1130	1,230	EA	DRUMS
4445000000-M	1145	379	M	BARRICADES (TYPE III)
4465000000-N	1160	11	EA	TEMPORARY CRASH CUSHIONS
4470000000-N	1160	4	EA	RESET TEMPORARY CRASH CUSHIONS
4480000000-N	1165	2	EA	TMIA
4485000000-M	1170	206	M	PORTABLE CONCRETE BARRIER
4490000000-M	1170	144	M	PORTABLE CONCRETE BARRIER (ANCHORED)
4495000000-M	1170	195	M	PORTABLE CONCRETE BARRIER (DRAINAGE)
4500000000-M	1170	115	M	RESET PORTABLE CONCRETE BARRIER
4505000000-M	1170	127	M	RESET PORTABLE CONCRETE BARRIER (ANCHORED)
4510000000-N	SP	80	HR	LAW ENFORCEMENT
4516000000-N	1180	100	EA	SKINNY DRUM
4589000000-N	SP	Lump Sum		GENERIC TRAFFIC CONTROL ITEM FLAGGERS
4650000000-N	1251	1,933	EA	TEMPORARY RAISED PAVEMENT MARKERS
4695000000-M	1205	209	M	THERMOPLASTIC PAVEMENT MARKING LINES (200MM, 2.3MM)
4697000000-M	1205	1,258	M	THERMOPLASTIC PAVEMENT MARKING LINES (200MM, 3.1MM)
4710000000-M	1205	764	M	THERMOPLASTIC PAVEMENT MARKING LINES (600MM, 3.1MM)
4715000000-M	1205	216	M	THERMOPLASTIC RUMBLE STRIP (100MM, 6.2MM)
4725000000-M	1205	392	EA	THERMOPLASTIC PAVEMENT MARKING SYMBOL (2.3MM)

ItemNumber	Sec #	Quantity	Unit	Description
4810000000-M	1205	293,086	M	PAINT PAVEMENT MARKING LINES (100MM)
4820000000-M	1205	164	M	PAINT PAVEMENT MARKING LINES (200MM)
4835000000-M	1205	2,073	M	PAINT PAVEMENT MARKING LINES (600MM)
4845000000-N	1205	576	EA	PAINT PAVEMENT MARKING SYMBOL
4847000000-M	1205	38,531	M	POLYUREA PAVEMENT MARKING LINES (100MM, **********) (HIGHLY REFLECTIVE ELEMENTS)
4847110000-M	1205	70	M	POLYUREA PAVEMENT MARKING LINES (200MM, **********) (HIGHLY REFLECTIVE ELEMENTS)
4847220000-N	1205	98	EA	POLYUREA PAVEMENT MARKING SYMBOL (**********) (HIGHLY REFLECTIVE ELEMENTS)
4860000000-M	1205	192	M	REMOVAL OF PAVEMENT MARKING LINES (200MM)
4905000000-N	1253	1,795	EA	SNOWPLOWABLE PAVEMENT MARKERS
5325800000-M	1510	32	M	200MM WATER LINE
5326200000-M	1510	575	M	300MM WATER LINE
5546000000-M	1515	3	EA	200MM VALVE
5558000000-M	1515	3	EA	300MM VALVE
5643100000-M	1515	4	EA	20MM WATER METER
5643200000-M	1515	2	EA	50MM WATER METER
5648000000-N	1515	10	EA	RELOCATE WATER METER
5649000000-N	1515	2	EA	RECONNECT WATER METER
5666000000-M	1515	2	EA	FIRE HYDRANT
5672000000-N	1515	2	EA	RELOCATE FIRE HYDRANT
5691300000-M	1520	548	M	200MM SANITARY GRAVITY SEWER
5709400000-M	1520	728	M	200MM FORCE MAIN SEWER
5768000000-N	1520	4	EA	SANITARY SEWER CLEAN-OUT
5775000000-M	1525	8	EA	1200MM DIA UTILITY MANHOLE
5781000000-M	1525	6	M	UTILITY MANHOLE WALL, 1200MM DIA
5801000000-M	1530	1,853	M	ABANDON 200MM UTILITY PIPE
5815500000-N	1530	1	EA	REMOVE FIRE HYDRANT
5871500000-M	1550	13	M	TRENCHLESS INSTALLATION OF 200MM IN SOIL
5871510000-M	1550	13	M	TRENCHLESS INSTALLATION OF 200MM NOT IN SOIL
6000000000-M	1605	35,000	M	TEMPORARY SILT FENCE
6006000000-M	1610	29,000	MTN	STONE FOR EROSION CONTROL, CLASS A
6009000000-M	1610	27,500	MTN	STONE FOR EROSION CONTROL, CLASS B
6012000000-M	1610	22,250	MTN	SEDIMENT CONTROL STONE
6015000000-M	1615	150	HA	TEMPORARY MULCHING
6018000000-M	1620	2,850	KG	SEED FOR TEMPORARY SEEDING
6021000000-M	1620	22	MTN	FERTILIZER FOR TEMPORARY SEEDING
6024000000-M	1622	~~2,000~~ 4,000	M	TEMPORARY SLOPE DRAINS
6027000000-N	1622	~~100~~ 300	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
6029000000-M	SP	14,000	M	SAFETY FENCE
6030000000-M	1630	88,200	M3	SILT EXCAVATION
6036000000-M	1631	223,000	M2	MATTING FOR EROSION CONTROL
6037000000-M	SP	800	M2	COIR FIBER MAT
6038000000-M	SP	12,500	M2	PERMANENT SOIL REINFORCEMENT MAT
6042000000-M	1632	8,000	M	6.4MM HARDWARE CLOTH
6045000000-M	SP	100	M	***MM TEMPORARY PIPE (450MM)
6045000000-M	SP	30	M	***MM TEMPORARY PIPE (900MM)
6069000000-M	1638	290	M3	STILLING BASINS
6070000000-N	SP	75	EA	SPECIAL STILLING BASINS
6071020000-M	SP	1,500	KG	POLYACRYLAMIDE (PAM)
6071030000-M	SP	35,000	M	COIR FIBER BAFFLES

ItemNumber	Sec #	Quantity	Unit	Description
6071050000-M	SP	61	EA	***MM SKIMMER (38MM)
6071050000-M	SP	1	EA	***MM SKIMMER (51MM)
6084000000-M	1660	170	HA	SEEDING & MULCHING
6087000000-M	1660	100	HA	MOWING
6090000000-M	1661	6,000	KG	SEED FOR REPAIR SEEDING
6093000000-M	1661	22.25	MTN	FERTILIZER FOR REPAIR SEEDING
6096000000-M	1662	4,000	KG	SEED FOR SUPPLEMENTAL SEEDING
6108000000-M	1665	225	MTN	FERTILIZER TOPDRESSING
6111000000-M	SP	1,150	M	IMPERVIOUS DIKE
6114500000-N	SP	200	MHR	SPECIALIZED HAND MOWING
6120000000-M	SP	1,550	M3	CULVERT DIVERSION CHANNEL
6123000000-M	1670	12	HA	REFORESTATION
6126000000-M	SP	0.86	HA	STREAMBANK REFORESTATION
6133000000-N	SP	Lump Sum		GENERIC EROSION CONTROL ITEM DIVERSION PUMPING FOR MITIGATION
6138000000-M	SP	45	M3	GENERIC EROSION CONTROL ITEM IMPERVIOUS SELECT MATERIAL
6150000000-M	SP	50	MTN	GENERIC EROSION CONTROL ITEM AERIAL FERTILIZER TOPDRESSING
7000000000-M	1705	28	EA	PEDESTRIAN SIGNAL HEAD (***MM, ** SECTION) (400MM, 1 SECTION WITH COUNTDOWN)
7060000000-M	1705	5,230	M	SIGNAL CABLE
7120000000-M	1705	84	EA	VEHICLE SIGNAL HEAD (300MM, 3 SECTION)
7132000000-M	1705	18	EA	VEHICLE SIGNAL HEAD (300MM, 4 SECTION)
7144000000-M	1705	12	EA	VEHICLE SIGNAL HEAD (300MM, 5 SECTION)
7264000000-M	1710	1,140	M	MESSENGER CABLE (9.52MM)
7288000000-M	1715	100	M	PAVED TRENCHING (**********) (1 CONDUIT, 50MM)
7300000000-M	1715	3,020	M	UNPAVED TRENCHING (**********) (1 CONDUIT, 50MM)
7301000000-M	1715	480	M	DIRECTIONAL DRILL (**********) (2 CONDUIT, 50MM)
7324000000-N	1716	54	EA	JUNCTION BOX (STANDARD SIZE)
7348000000-N	1716	22	EA	JUNCTION BOX (OVER-SIZED, HEAVY DUTY)
7360000000-N	1720	30	EA	WOOD POLE
7372000000-N	1721	60	EA	GUY ASSEMBLY
7408000000-M	1722	7	EA	25MM RISER WITH WEATHERHEAD
7420000000-M	1722	32	EA	50MM RISER WITH WEATHERHEAD
7444000000-M	1725	6,000	M	INDUCTIVE LOOP SAWCUT
7456000000-M	1726	14,620	M	LEAD-IN CABLE (**********) (14-2)
7575142000-N	SP	4	EA	900MHZ WIRELESS RADIO SYSTEM
7588000000-N	SP	13	EA	METAL POLE WITH SINGLE MAST ARM
7590000000-N	SP	1	EA	METAL POLE WITH DUAL MAST ARM
7613000000-N	SP	14	EA	SOIL TEST
7614100000-M	SP	56	M3	DRILLED PIER FOUNDATION
7624000000-N	1743	3	EA	SIGNAL PEDESTAL WITH FOUNDATION
7631000000-N	SP	14	EA	MAST ARM WITH METAL POLE DESIGN
7636000000-N	1745	13	EA	SIGN FOR SIGNALS
7684000000-N	1750	7	EA	SIGNAL CABINET FOUNDATION
7756000000-N	1751	7	EA	CONTROLLER WITH CABINET (TYPE 2070L, BASE MOUNTED)
7780000000-N	1751	87	EA	DETECTOR CARD (TYPE 2070L)
7980000000-N	SP	1	EA	GENERIC SIGNAL ITEM FURNISH WIRELESS LIGHTNING ARRESTOR
7980000000-N	SP	1	EA	GENERIC SIGNAL ITEM FURNISH WIRELESS RADIO MODEM

STATE OF NORTH CAROLINA
SUMMARY OF QUANTITIES

PROJECT REFERENCE No.	SHEET No.
R-2519 A	3

(3 of 3)

ItemNumber	Sec #	Quantity	Unit	Description
******* BEGIN SCHEDULE AA ******* ******* (3 ALTERNATES) *******				
0987000000-M AA1	310	31.2	M	GENERIC PIPE ITEM 1050MM RC PIPE CULVERT, CLASS III
0987000000-M AA1	310	866.4	M	GENERIC PIPE ITEM 375MM RC PIPE CULVERT, CLASS III
0987000000-M AA1	310	496.8	M	GENERIC PIPE ITEM 450MM RC PIPE CULVERT, CLASS III
0987000000-M AA1	310	613.2	M	GENERIC PIPE ITEM 600MM RC PIPE CULVERT, CLASS III
0987000000-M AA1	310	69.6	M	GENERIC PIPE ITEM 750MM RC PIPE CULVERT, CLASS III
0987000000-M AA1	310	12	M	GENERIC PIPE ITEM 900MM RC PIPE CULVERT, CLASS III
*** OR ***				
0986000000-M AA2	SP	31.2	M	GENERIC PIPE ITEM 1050MM ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, 2.01MM
0986000000-M AA2	SP	866.4	M	GENERIC PIPE ITEM 375MM ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, 1.63MM
0986000000-M AA2	SP	496.8	M	GENERIC PIPE ITEM 450MM ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, 1.63MM
0986000000-M AA2	SP	613.2	M	GENERIC PIPE ITEM 600MM ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, 1.63MM
0986000000-M AA2	SP	69.6	M	GENERIC PIPE ITEM 750MM ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, 1.63MM
0986000000-M AA2	SP	12	M	GENERIC PIPE ITEM 900MM ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, 2.01MM
*** OR ***				
0986000000-M AA3	SP	31.2	M	GENERIC PIPE ITEM 1050MM HDPE PIPE CULVERTS
*** OR ***				
0986000000-M AA3	SP	31.2	M	GENERIC PIPE ITEM 1050MM HDPE PIPE CULVERTS
0986000000-M AA3	SP	866.4	M	GENERIC PIPE ITEM 375MM HDPE PIPE CULVERTS
0986000000-M AA3	SP	496.8	M	GENERIC PIPE ITEM 450MM HDPE PIPE CULVERTS
0986000000-M AA3	SP	613.2	M	GENERIC PIPE ITEM 600MM HDPE PIPE CULVERTS
0986000000-M AA3	SP	69.6	M	GENERIC PIPE ITEM 750MM HDPE PIPE CULVERTS
0986000000-M AA3	SP	12	M	GENERIC PIPE ITEM 900MM HDPE PIPE CULVERTS
******* END SCHEDULE AA *******				

COMPUTED BY: DJS	DATE: 02/20/09
CHECKED BY: KNW	DATE: 12/2010

PROJECT NO.	SHEET NO.
R-2519A	3-A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF WOVEN WIRE FENCE

Station to Station	Location LT/RT	Length m	100 mm POST	125mm POST
-L- 226+28.275 TO -L- 226+58.000	LT	29.725	5	4
-L- 227+20.000 TO -L- 228+24.000	LT	104.195	22	4
-L- 228+79.030 TO -L- 230+60.000	LT	198.943	38	19
-L- 231+18.000 TO -L- 231+81.000	LT	68.960	12	10
-L- 232+53.179 TO -L- 233+36.000	LT	86.012	18	4
-L- 233+54.000 TO -L- 234+20.000	LT	67.916	11	10
-L- 234+38.000 TO -L- 234+67.000	LT	29.000	5	4
-L- 234+85.000 TO -L- 235+30.000	LT	45.000	8	4
-L- 235+48.000 TO -Y3- 11+44.568	LT	139.406	30	4
-Y3- 10+50.000 TO -L- 240+25.000	LT	366.420	77	19
-L- 241+32.000 TO -L- 243+43.160	LT	219.049	44	16
-L- 243+49.710 TO -L- 245+20.000	LT	173.154	36	10
-L- 245+38.000 TO -Y6- 10+00.000	LT	314.213	62	28
-L- 248+56.320 TO -L- 249+20.000	LT	63.956	13	4
-L- 249+70.000 TO -L- 251+72.430	LT	200.703	41	13
-L- 226+40.000 TO -L- 226+86.000	RT	45.865	9	4
-L- 227+40.000 TO -L- 230+48.000	RT	314.474	66	16
-L- 230+66.000 TO -L- 231+68.000	RT	102.635	19	10
-L- 232+19.300 TO -L- 232+57.000	RT	36.843	4	10
-L- 232+74.000 TO -Y2- 10+59.100	RT	128.105	27	7
-L- 234+80.000 TO -Y4- 11+38.561	RT	327.587	66	25
-Y4- 11+38.561 TO -L- 239+90.000	RT	354.480	75	19
-L- 240+08.000 TO -L- 240+60.000	RT	53.563	10	4
-L- 240+80.000 TO -Y5- 11+80.000	RT	72.068	13	7
-Y5- 11+79.794 TO -L- 243+95.000	RT	290.300	61	16
-L- 244+13.000 TO -L- 245+50.000	RT	136.300	27	10
-L- 245+99.000 TO -L- 246+52.000	RT	50.607	10	4
-L- 246+90.000 TO -L- 247+90.000	RT	97.786	17	13
-L- 248+08.000 TO -L- 248+94.000	RT	87.244	18	4
-L- 249+09.000 TO -L- 251+05.000	RT	205.056	43	10
-Y7- 11+01.157 TO -L- 252+86.000	RT	83.173	17	4
-L- 299+16.727 TO -L- 300+00.000	LT	95.000	17	13
-L- 300+12.000 TO -L- 300+55.000	LT	43.000	8	4
-L- 300+67.000 TO -Y24A- 10+25.000	LT	71.216	13	7
-Y24- 10+30.144 TO -Y24- 11+20.000	LT	75.529	14	7
-L- 301+42.000 TO -L- 302+16.000	LT	76.663	13	10
-L- 302+34.000 TO -L- 302+93.000	LT	59.368	12	4
-L- 303+53.000 TO -L- 303+80.799	LT	27.800	4	4
-L- 304+17.000 TO -L- 304+82.000	LT	68.163	11	10
-L- 305+00.000 TO -Y26- 10+80.000	LT	168.268	35	10
-Y26- 10+80.000 TO -L- 308+00.000	LT	125.447	24	13
-L- 308+21.000 TO -L- 309+74.959	LT	145.360	31	7
-L- 310+10.959 TO -L- 315+60.000	LT	546.655	118	22
-L- 317+00.000 TO -L- 317+63.000	LT	66.097	13	4
-L- 317+81.000 TO -Y30- 10+25.000	LT	84.408	16	7
-Y30- 10+40.000 TO -L- 320+03.000	LT	240.970	49	16
-L- 320+21.000 TO -L- 322+17.000	LT	227.545	48	10
-L- 322+35.000 TO -L- 324+10.000	LT	178.009	32	22
-L- 324+28.000 TO -L- 324+60.000	LT	44.664	7	7
-L- 324+78.000 TO -L- 326+36.000	LT	182.235	38	10
-L- 326+54.000 TO -L- 327+44.000	LT	188.243	38	13
-L- 327+50.000 TO -L- 328+30.000	LT	107.256	19	13
-L- 328+40.000 TO -L- 329+30.000	LT	108.683	22	7
-L- 329+48.000 TO -L- 329+99.396	LT	52.547	10	4
-L- 330+35.396 TO -L- 333+00.000	LT	248.208	52	13
-L- 333+18.000 TO -L- 337+13.000	LT	405.914	87	19
-L- 337+31.000 TO -Y35- 10+60.000	LT	370.936	73	34
-L- 340+97.640 TO -L- 344+12.000	LT	441.600	91	28
-L- 344+30.000 TO -L- 345+29.793	LT	115.444	21	13
-Y25- 10+40.000 TO -L- 302+47.000	RT	114.388	23	7
-L- 302+65.000 TO -L- 303+92.000	RT	127.622	25	10
-L- 304+10.000 TO -L- 306+72.000	RT	269.286	56	16
-L- 307+25.058 TO -L- 307+47.000	RT	21.942	3	4
-L- 308+04.000 TO -L- 309+47.000	RT	153.378	31	10
-L- 309+65.000 TO -L- 309+79.000	RT	18.345	1	7
-L- 309+97.000 TO -L- 310+93.000	RT	110.122	19	16
-L- 311+11.000 TO -L- 312+05.000	RT	101.597	20	7
-Y27- 11+00.000 TO -L- 312+77.000	RT	104.270	20	10
-L- 313+20.000 TO -L- 314+13.889	RT	108.307	22	7
-L- 314+31.889 TO -L- 315+60.500	RT	135.642	27	10
-Y28- 10+42.874 TO -L- 316+29.000	RT	50.263	8	7
SUBTOTAL		10373.128	2080.216	758.000

Station to Station	Location LT/RT	Length m	100 mm POST	125mm POST
-L- 321+85.000 TO -L- 322+24.000	RT	40.970	7	4
-L- 322+42.000 TO -L- 324+66.000	RT	233.790	50	10
-L- 324+84.000 TO -L- 325+27.000	RT	43.000	8	4
-L- 325+45.000 TO -Y31- 10+46.983	RT	66.262	12	7
-Y31- 10+38.158 TO -L- 326+97.809	RT	73.871	14	7
-L- 328+94.663 TO -L- 334+81.000	RT	603.072	132	19
-L- 335+05.000 TO -L- 335+50.000	RT	45.926	9	4
-L- 342+00.000 TO -Y36- 10+95.473	RT	151.687	30	13
-Y36- 11+40.000 TO -L- 344+71.051	RT	80.292	13	13
SUBTOTAL		1338.870	275	81
PROJECT TOTAL		11711.998	2355	839
SAY		**11720 M**	**2360** *EA*	**845** *EA*

SUMMARY OF SHOULDER BERM GUTTER

Station to Station	Location LT/RT	Length m
-L- 226+40.00 TO 226+82.00	RT	42
-L- 227+52.00 TO 230+45.00	RT	293
-L- 230+73.00 TO 232+12.00	RT	139
-L- 232+98.00 TO 233+50.00	RT	52
-L- 234+99.00 TO 236+30.00	RT	131
-L- 235+99.00 TO 236+70.00	LT	71
-L- 242+85.00 TO 244+28.50	LT	144
-L- 305+29.00 RT TO -Y26- 10+50.00 LT		199
-L- 312+66.00 TO 313+45.00	LT	86
-L- 313+36.00 TO 314+13.00	RT	77
-L- 327+80.00 TO 328+72.00	RT	92
-L- 340+79.00 TO -Y36- 10+84	RT	260
-L- 244+80.00 TO 246+80.00	RT	200
PROJECT TOTAL		1786
SAY		**1790 M**

SUMMARY OF EXPRESSWAY GUTTER

Station to Station	Location LT/RT	Length m
-L- 246+20.000 TO 247+00.000	LT	81
-L- 309+40.000 TO 309+85.000	LT	45
-Y3- 10+66.200 TO 11+50.000	LT	82
PROJECT TOTAL		208
SAY		**210 M**

COMPUTED BY: K.N. WASHINGTON DATE: 4/2010
CHECKED BY: CAL DATE: 12/2010

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
GUARDRAIL SUMMARY

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R - 2519A	3-B

RD253058

"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		ADDITIONAL GR POSTS	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	AT - 1	B-77	CAT-1	GRAU 350	TERMINAL END	M-350	G	NG				
-L-	226+40.000	226+85.815	RT	45.720			226+40.000	226+85.815	3	4							1									TIE TO EXIST. GUARDRAIL
-L-	227+36.698	230+47.326	RT	312.420			227+52.000	230+45.000	3	4	15.24		0.305				1	1								
-L-	228+37.813	228+63.350	LT																					25.739		
-L-	228+86.045	232+05.567	RT																					321.654		
-L-	230+57.233	232+16.556	RT	160.020			230+73.000	232+12.000	3	4	15.24		0.305				1	1								
-L-	230+87.786	231+14.105	LT																					27.212		
-L-	231+27.961	233+42.730	LT																					218.844		
-L-	231+29.365	233+40.006	LT	213.360			233+40.006	231+29.365	3	4	15.24		0.305				1	1								
	-L- 232+28.801	-Y2- 10+67.874	RT	137.160	57.150		232+28.801	-Y2- 10+60.000	3/1.2	4/2.2	15.24	15.24	0.305	0.305				2								
-L-	232+57.756	233+65.356	RT																					110.734		
-L-	233+49.808	234+25.580	LT																					77.37		
-L-	233+53.231	234+24.384	LT	68.580	7.620		233+80.000	233+53.231	3	4	15.24		0.305				1	1								
-L-	234+32.230	234+74.384	LT																					42.705		
-L-	234+33.711	234+73.724	LT	41.910			234+60.000	234+33.711	3	4	15.24		0.305				1	1								
-L-	234+81.677	235+24.194	LT																					43.399		
	-L- 234+83.761	-Y4- 11+18.400	RT	220.980	99.060		234+99.000	-Y4- 11+18.400	3/1.2	4/2.2	15.24	15.24	0.305	0.305				2								
-L-	235+47.518	236+22.719	RT																					75.409		
	-L- 235+97.099	-Y3- 11+40.532	LT	106.680	30.480		-Y3- 11+40.532	235+99.000	3/1.8	4/2.8	15.24		0.305				1	1								
-L-	235+78.937	237+00.071	LT																					140.991		
-L-	236+89.337	237+63.950	LT																					78.462		
	-L- 240+41.79	-Y5- 10+63.602	LT																					80.795		
-L-	241+39.854	244+41.616	RT	304.800			241+55.132	244+41.616	3	4	15.24		0.305				1	1								
-L-	242+73.473	245+02.267	LT																					229.063		
-L-	242+81.630	245+17.385	LT	236.220			245+02.000	242+85.000	3	4	15.24		0.305				1	1								
-L-	244+59.802	246+83.310	RT	220.980			244+30.000	246+80.000	3	4	15.24		0.305				1	1								
-L-	244+74.793	246+66.759	RT	186.690			244+75.000	246+60.000	3	4									2							
-L-	246+15.527	246+96.449	LT	91.440			246+20.000	246+80.000	3	4	15.24	15.24	0.305	0.305				2								
-L-	249+42.518	249+62.579	LT																					20.066		
-L-	249+74.446	250+56.948	LT	83.820			250+00.000	250+56.948	3	4	15.24		0.305				1	1								
-L-	249+79.436	250+33.439	LT																					53.924		
-L-	-Y7- 10+30.905	-L- 253+78.763	RT	182.880	26.670		-Y7- 10+20.000	253+75.000	3.6	4.26	15.24		0.305				1	1								
-L-	-L- 256+25.559	257+32.963	RT	91.440			256+27.000	257+32.963	3.6	4.26	15.24		0.305				1	1								
-L-	-L- 257+15.351	-Y10- 11+22.068	RT	41.910	26.670		257+21.218	-Y10- 11+00.000	3.6/1.8	4.26/2.8	15.24	15.24	0.305	0.305				2								
-L-	256+26.409	257+40.287	RT																					114.773		
-L-	-L- 257+13.065	-Y10- 10+06.935	LT	34.290	38.100		-Y10- 10+06.935	257+12.435	3.6/1.8	4.26/2.8	15.24		0.305				1	1								
-L-	-Y10- 10+26.360	-L- 258+86.636	LT	129.540	19.050		258+60.000	-Y10- 10+45.000	3.6/1.8	4.26/2.8	15.24	15.24	0.305	0.305				2								
-L-	257+29.059	257+41.177	LT																					12.477		
-L-	268+90.948	272+76.771	LT																					388.729		
-L-	268+97.470	271+35.294	LT	240.030			272+60.000	268+97.470	0.6	3.6	15.24		0.305				1	1								
-L-	271+35.294	273+09.318	LT	167.640	7.620		272+60	271+35.294	3.6	4.26	15.24		0.305				1	1								
-L-	266+67.261	268+15.859	RT	148.590	3.810		266+80.000	266+67.261	0.6	3.6	15.24		0.305				1	1								
-L-	275+62.525	276+93.977	LT	133.350			276+94.274	275+70.000	3.6	4.26	15.24		0.305				1	1								
-L-	275+73.650	276+91.954	LT																					118.305		
-L-	277+36.096	279+25.119	LT	186.690			279+19.352	277+36.096	0.6	3.6	1		1.22		1		1									
-L-	279+19.348	-Y17- 11+01.378	LT	34.290	11.430		-Y17- 11+20.000	279+19.348	3.6	4.26	15.24		0.305				1	1								
-L-	277+40.891	279+31.619	LT																					190.864		
-L-	279+76.527	279+98.322																						22.589		
	-Y17- 11+11.01	-L- 280+27.729	LT	80.010	19.050		280+10.000	-Y17- 11+20.000	3.6	4.26	15.24	15.24	0.305	0.305				2								
	-L- 284+64.112	-Y19- 11+55.910	LT	60.960	41.910		-Y19- 11+18.000	284+64.112	3.6	4.26	15.24		0.305				1	1								
	-L- 284+75.821	-Y18- 10+44.656	RT	60.960	7.620		285+05.000	-Y18- 10+44.656	3.6	4.26	15.24		0.305			1		1								TIE TO EXIST. BRIDGE RAIL
	-Y20- 10+61.917	-L- 288+16.757	RT	102.870	11.430		-Y20- 10+40.000	288+16.757	3.6	4.26	15.24		0.305				1	1								
-L-	287+50.270	288+11.639	LT	60.960			287+90	287+50.270	0.6	3.6	15.24		0.305				1	1								
-L-	289+34.468	289+91.603	RT	38.100			289+80.000	289+91.603	3.6	4.26	15.24		0.305				1	1								
-L-	287+49.934	288+11.639	LT	60.960			287+80.000	288+10.738	3.6	4.26	15.24		0.305				1	1								
-L-	289+76.936	289+89.083	RT																					12.409		
-L-	289+99.543	290+37.760	RT	19.050	7.620		290+10.000	290+37.760	0.6	3.6	15.24		0.305				1	1								
	290+53.198	291+67.000	RT	110.490			290+53.198	291+67.000	0.6	3.6	15.24		0.305				1	1								
-L-	291+64.960	292+99.120	RT	129.540			291+64.960	292+99.120	3.6	4.26	15.24		0.305				1	1								
-L-	298+30.915	300+86.910	RT	259.080			298+60.000	300+86.910	3.6/3	4.26/4	15.24		0.305				1	1								USE 2.44 M POST SPACING ADJ TO RETAINING WALL
-L-	291+08.360	291+42.722	LT																					35.457		
	-L- 300+89.905	-Y24- 11+08.958	LT	26.670	30.480		-Y24- 11+40.000	300+89.905	3/1.8	4/2.8	15.24		0.305				1	1								
	-Y24- 10+88.095	-L- 301+95.898	LT	91.440	30.480		301+80.000	-Y24- 11+20.000	3/1.8	4/2.8	15.24	15.24	0.305	0.305				1		1						
	-L- 305+26.991	-Y26- 10+34.477	LT	186.690	26.670		-Y26- 10+40.000	305+26.991	3/1.8	4/2.8	15.24		0.305				1	1								
	-Y26- 10+34.477	-L- 307+23.598	LT	80.010	30.480		-Y26- 10+40.000	307+07.820	3/1.8	4/2.8	15.24	15.24	0.305	0.305				2								
-L-	305+33.040	306+77.879	LT																					145.622		
-L-	309+97.482	310+89.786	RT	95.250			310+30.000	310+89.786	3	4	15.24		0.305				1	1								
-L-	310+05.052	310+76.190	RT																					72.058		
	-L- 311+70.000	-Y27- 10+86.727	RT	102.870	19.050		311+90.000	-Y27- 10+80.000	3	4	15.24	15.24	0.305	0.305				2								
-L-	312+03.906	312+49.842	RT																					46.146		
-L-	312+43.467	315+28.154	LT																					286.644		
-L-	312+62.142	315+80.589	LT	300.990	30.480		315+60.000	312+61.406	3	4	15.24		0.305				1	1								
-L-	313+11.741	314+49.799	RT																					138.069		
-L-	313+19.981	314+15.894	RT	95.250			313+30.000	314+15.894	3	4	15.24		0.305				1	1								
-L-	-L- 316+27.183	-Y29- 11+00.000	LT	30.480	19.050				3	4	1		1.22		1		1									
-L-	316+44.409	318+65.692	RT	213.360	7.620		316+70.000	318+65.692	3	4	15.24		0.305				1	1								
-L-	-L- 318+04.935	-Y30- 10+37.033	LT	45.720	41.910		-Y30- 10+40.000	318+04.935	3	4	15.24		0.305				1	1								
-L-	318+05.014	318+51.959	RT																					46.7912		USE 2.44 M POST SPACING ADJ TO RETAINING WALL
-L-	319+47.585	322+23.233	RT	270.510			319+90.000	322+23.233	3	4	15.24		0.305				1	1								
-L-	321+26.630	322+21.365	RT																					95.825		
-L-	322+38.870	324+22.472	RT	190.500			322+38.870	324+22.472	3	4	15.24		0.305				1	1								
-L-	322+48.824	324+50.713	RT																					206.237		
-L-	325+41.394	326+03.212	RT																					61.740		
-L-	324+61.388	325+23.076	RT																					61.689		
-L-	327+61.496	328+75.918	RT	102.870	11.430		307+80.000	328+75.918	3	4	15.24		0.305				1	1								
-L-	328+89.331	334+58.006	RT	560.070			330+25.000	334+58.006	3	4	15.24		0.305				1	1								
-L-	330+59.729	334+66.423	RT																					415.626		
	-Y34- 10+65.565	-L- 338+67.082	RT	316.230	19.050		-Y34- 10+60.000	338+67.082	3/1.8	4/2.8	15.24		0.305				1	1								
-L-	335+92.959	338+64.833	RT																					274.414		
	SHEET TOTAL:			**7513.320**	**681.990**										**2**	**1**	**42**	**57**	**2**	**1**				**4292.831**		

CSD23745

COMPUTED BY:	K.N. WASHINGTON	DATE:	4/2010
CHECKED BY:	CAL	DATE:	12/2010

"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

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
GUARDRAIL SUMMARY

PROJECT REFERENCE NO.	SHEET NO.
R - 2519A	3-C

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		ADDITIONAL GR POSTS	REMOVE EXISTING GUARDRAIL	TEMPORARY GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	AT - 1	B-77	CAT-1	GRAU 350	Terminal End Section	Temp. GRAU 350	M-350	G	NG				
-L-	338+96.534	340+55.301	RT	160.020			339+35.000	340+55.301	3	4	15.24		0.305				1	1							160.331		
	-L- 340+63.761	-Y36- 11+00.468	RT	243.840	49.530		340+63.761	-Y36- 10+90.000	3	4	15.24	15.24	0.305	0.305				2							274.461		USE 2.44 M POST SPACING ADJ TO RETAINING WALL
-L-	341+28.107	342+49.980	LT																						121.917		
-L-	343+63.813	344+76.195	RT	110.490			344+10.000	346+76.376	3	4	15.24	15.24	0.305	0.305				2							34.982		
-Y3-	10+60.139	11+32.701	RT	72.390							15.24	15.24	0.305	0.305				2									
-Y28-	10+42.874	10+67.662	RT	22.860			10+42.800	10+67.662	1.8	2.8	15.24		0.305				1	1									
	-Y32- 10+00.00	-Y33- 10+49.215	LT	45.720	7.620		-Y32- 10+30.000	-Y33- 10+60.000	1.8/1.2	2.8/2.2	15.24	15.24	0.305	0.305				2									
-Y34-	10+44.134	10+78.807	RT	34.290	3.810		10+50.000	10+78.807	1.8	2.8		15.24	1.22	0.305	1						1						
-D14REV-	10+39.301	11+95.170	LT	137.160	19.050				1.2	2.2									2								PLACE TERMINAL SECTIONS ON BOTH ENDS
-D23-	10+21.799	10+54.950	LT	7.620	30.480		10+54.950	10+21.799	1.2	2.2		15.24		0.305					2								PLACE TERMINAL SECTIONS ON BOTH ENDS
	-Y25- 10+21.638	-L- 301+53.750	LT	19.050	30.480		-Y25-10+45.000	-L- 301+53.750	1.2/3	2.2/4	15.24		0.305				1	1									
-L-	226+40.000	226+55.240	RT																	1						15.24	TEMPORARY GUARDRAIL TO BE REMOVED
-L-	230+50.000		RT																	2							TEMPORARY GUARDRAIL TO BE REMOVED
SHEET SUBTOTAL:				853.440	140.970										1		3	11	4	3	1			20	591.691	15.24	
PROJECT TOTAL:				8,366.760	822.960										3	1	45	68	6	3	2			20	4,884.522	15.24	

LESS ANCHOR DEDUCTIONS:				
GRAU M-350	2	@ 15.24 =	-30.48	
GRAU -350	68	@ 15.24 =	-1036.320	
CAT - 1	45	@ 1.905 =	-85.725	
B-77	1	@ 5.7150 =	-5.715	
AT - 1	3	@ 1.905 =		-5.715
ANCHOR TOTALS:			-1158.24	-5.715
GRAND TOTAL:			7,208.520	817.245
SAY			7246.620	826.770 M

	AT - 1	B-77	CAT-1	GRAU 350	Terminal End Section	Temp. GRAU 350	M-350	G	NG	ADDITIONAL GR POSTS	REMOVE EXISTING GUARDRAIL	TEMPORARY GUARDRAIL
GRAND TOTAL:	3	1	45	68	6	3	2			20	4884.522	15.24
SAY	3 EA	1 EA	45 EA	68 EA	6 EA	3 EA	2 EA			20 EA	4890 M	15.24 M

RD253058

COMPUTED BY: TMW DATE: 3/7/2007

CHECKED BY: KNW DATE: 1/1/2011

METRIC

PROJECT NO.	SHEET NO.
R-2519A	3-D

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS IV R.C. PIPE (UNLESS NOTED OTHERWISE) 300	375	450	600	750	900	1050	1200	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300	400	450	600	600	800	800	900	900	1000	1000	1200	1200
THICKNESS OR GAUGE																	1.630	1.630	1.630		1.630		2.010		2.010		2.010	
-L- 226+57	LT	3																										
-L- 226+98	LT	4																										
-L- 227+17	LT	5																										
-L- 227+38	LT																											
-L- 227+59	RT	6		781.38	780.54																							
-L- 227+59	RT	6	7		780.54	780.32																						
-L- 227+53	RT	7		781.16	780.32																							
-L- 227+53	RT	7	8		780.32	776.5											12											
-L- 228+42	LT	9	10		780.93	780.9																			4.8			
-L- 228+18	RT	11		779.22	776.4																							
-L- 228+18	LT	11	11A		776.4	776.6						26.2																
-L- 228+18	RT	11	12		776.4	775.42									12													
-L- 228+61	LT																											
-L- 228+80	LT	13		785.04	784.12																							
-L- 228+80	CL	13	14		784.12	784				28.8																		
-L- 228+79	LT	14		785.8	784																							
-L- 228+79	LT	14	15		784	778.4												18										
-L- 229+80	LT	16	17		797.5	787.69											21.6											
-L- 229+80	LT	17		788.53	787.69																							
-L- 229+80	CL	17	18		787.69	787.52				30																		
-L- 229+80	RT	18		789.29	787.52																							
-L- 229+80	RT	18	19		787.52	780.1												22.8										
-L- 230+39	LT	20	21		803	789.78											27.6											
-L- 230+39	LT	21		790.62	789.78																							
-L- 230+39	LT	21	17		789.78	787.69																						
-L- 230+75	RT	23	18		791.73	788.45																						
-L- 230+75	RT	23		792.57	791.73																							
-L- 230+94	RT	24			783.1																		10.8					
-L- 230+91	CL	24A	24		787.3	783.1																						
-L- 231+25	LT	25		794.44	793.52																							
-L- 231+25	CL	25	26		793.52	793.3			15.6																			
-L- 231+26	RT	26		794.14	793.3																							
-L- 231+26	RT	26	23		793.3	791.73																						
-L- 232+29	LT	28		797..95	797.03																							
-L- 232+29	CL	28	29		797.03	795.7			20.4																			
-L- 232+29	RT	29		796.5	795.7																							
-L- 232+29	RT	29	30		795.7	789.8											49.2											
-L-233+00	RT	32		799.94	799.1																							
-L- 233+00	RT	32	33		799.1	798.95																						
-L- 233+46	RT	33		802.03	798.95																							
-L- 233+46	RT	33	34		798.95	797.9											12.0											
-L- 233+83	RT	35B		805	804.2																							
-Y2- 10+34.33	CL	35			798.7	801				27.6																		
-L- 235+00	RT	36		810.19	809.35																							
-L- 235+00	RT	36	37		809.37	806.25											15.6											
-L- 236+00	LT	38		815	814.14																							
-L- 233+83	RT	35B	35A		804.2	804			22.8																			
-L- 236+00	LT	38	39		814.14	812											10.8											
-D2- 10+16	CL	41															13.2											
-L- 236+30	RT	43	42		819.18	808.5													22.8									
-L- 236+30	RT	43		815.63	819.18																							
-L- 236+57	RT	44	43		815	814.18																						
-L- 236+60	LT	44A		818.19	817.19																							
-L- 236+60	LT	44A	44		817.19	814.18			26.4																			
SHEET TOTALS									85.2	86.4		26.2			12		162	40.8	22.8				11		4.8			

STATION	CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR HDPE, TYPE S OR D 300	375	450	600	750	900	1050	1200	375 SIDE DRAIN PIPE	450 SIDE DRAIN PIPE	600 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 1.5m)	*TOTAL L.M. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5m THRU 3.0m	B 3.0m AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G
-L- 226+57									10.8											
-L- 226+98									10.8											
-L- 227+17									9.6											
-L- 227+38																				
-L- 227+59														1						
-L- 227+59		6																		
-L- 227+53														1						
-L- 227+53																				
-L- 228+42													2.9							
-L- 228+18														1	1.32					
-L- 228+18																				
-L- 228+18																				
-L- 228+61																				
-L- 228+80														1						
-L- 228+80																				
-L- 228+79														1	0.3					
-L- 228+79																				
-L- 229+80																				
-L- 229+80														1						
-L- 229+80																				
-L- 229+80														1	0.27					
-L- 229+80																				
-L- 230+39																				
-L- 230+39														1						
-L- 230+39		60																		
-L- 230+75		94.8																		
-L- 230+75														1						
-L- 230+94																				
-L- 230+91																				
-L- 231+25														1			1			1
-L- 231+25																				
-L- 231+26														1						
-L- 231+26		51.6																		
-L- 232+29														1			1			1
-L- 232+29																				
-L- 232+29														1						
-L- 232+29																				
-L-233+00														1						
-L- 233+00		45.6																		
-L- 233+46														1	1.5	0.08				
-L- 233+46																				
-L- 233+83														1						
-Y2- 10+34.33																				
-L- 235+00														1						
-L- 235+00																				
-L- 236+00														1						
-L- 233+83																				
-L- 236+00																				
-D2- 10+16																				
-L- 236+30																				
-L- 236+30														1	1.5	0.55				
-L- 236+57			27.6																	
-L- 236+60														1						
-L- 236+60																				
SHEET TOTALS		258	27.6						31				2.9	20	4.89	0.63	2			2

STATION	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	O.T.C.B. STD. 840.04 OR 840.05	J.B. STD. 840.31 OR 840.32		MANHOLE STD. 840.53	MANHOLE STD. 840.51 OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54			DRIVEWAY D.I. STD. 840.30		T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	750mm WELDED STEEL PIPE LINER (MIN. 13mm THICK) GRADE B (SEE SHEET 2-AT)	CONC TRANSITIONAL SECTION FOR C.B.	CONC TRANSITIONAL SECTION FOR D.I.	BERM DRAINAGE OUTLET STD. 850.10 OR 850.11	CONVERT EXISTING C.B. TO J.B. (SEE SHEET 2-AD)	CONVERT EXISTING D.I. TO J.B. W/MH COVER (SEE SHEET 2-AD)	PARALLEL PIPE END SECTION STD. 310.02	CROSS PIPE END SECTION STD. 310.03	PARALLEL PIPE END SECTION STD. 310.04	PREFORMED SCOUR HOLE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.M. STD. 840.72	CONC. & BRICK PIPE PLUG, C.M. STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
-L- 226+57																													1								375mm Pipe End Section
-L- 226+98																													1							7.0	remove 200mm CMP/ 375mm Pipe End Section
-L- 227+17																													1								375mm Pipe End Section
-L- 227+38																																				10.5	remove 200mm CMP
-L- 227+59				1						1																											
-L- 227+59																																					
-L- 227+53				1						1																											
-L- 227+53																																1	2X400				
-L- 228+42																																		0.65			remove existing HW
-L- 228+18												1																									
-L- 228+18																																					
-L- 228+18																																					
-L- 228+61																																				26.6	remove 450mm CMP
-L- 228+80				1					1																												
-L- 228+80																																					
-L- 228+79				1						1																											
-L- 228+79																																	2X450				
-L- 229+80																										1							1X400				
-L- 229+80				1					1																												
-L- 229+80																																					
-L- 229+80				1						1																											
-L- 229+80																																	2X450				
-L- 230+39																										1							1X400				
-L- 230+39				1					1																												
-L- 230+39																																					
-L- 230+75																																					
-L- 230+75				1						1																											
-L- 230+94																																		0.56			
-L- 230+91																							45.6														
-L- 231+25																								1													
-L- 231+25																																					
-L- 231+26				1						1																											
-L- 231+26																																					
-L- 232+29																								1													
-L- 232+29																																					
-L- 232+29				1					1																												
-L- 232+29																																	2x400				
-L-233+00				1						1																											
-L- 233+00																																					
-L- 233+46				1						1																											
-L- 233+46																																	2x400				
-L- 233+83	1	1																							1												
-Y2- 10+34.33																																				17.3	remove 600mm CMP
-L- 235+00				1						1																											
-L- 235+00																																1	2x400				
-L- 236+00				1						1																											
-L- 233+83																																					
-L- 236+00																																	2x400				
-D2- 10+16																																					
-L- 236+30																																	2x600				
-L- 236+30			1						1																												
-L- 236+57																																				94.3	remove 450mm CMP & 375mm HDPE
-L- 236+60	1	1																							1								4x450				
-L- 236+60																																	2x600				
SHEET TOTALS	2	2	1	14					5	10		1											45.6	2	2	2			3			2	12x400	1.21		155.67	

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

RD253058,2/11/2011,R:\Roadway\estimate\Final\SUMMARY\R2519a_ Drainage_summary.xls

RD253058

COMPUTED BY: TMW DATE: 3/7/2007

CHECKED BY: KNW DATE: 1/1/2011

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

METRIC

PROJECT NO.	SHEET NO.
R-2519A	3-E

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS IV R.C. PIPE (UNLESS NOTED OTHERWISE) 300	375	450	600	750	900	1050	1200	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300 (1.630)	400 (1.630)	450 (1.630)	600 (1.630)	800 (1.630)	900 (2.010)	1000 (2.010)	1200 (2.010)
-L- 236+57	RT	44		816.45	815																		
-Y3- 11+46	RT	45		817.75	816																		
-Y3- 11+46	RT	45	46		816	811.5													15.6				
-Y3- 10+81	LT	47	48		820.5	818																	
-Y3- 11+07	LT	48		819	818																		
-Y3- 11+07	LT	48	50		818	817.41				32.4													
-Y3- 11+51	LT	49		819.8	818.86																		
-Y3- 11+51	LT	49	50		818.86	817.41											15.6						
-Y3- 11+41	LT	50		818.25	817.18																		
-Y3- 11+41	CL	50	51		817.18	816.6					24												
-Y3- 11+67	RT																						
-L- 237+19	RT	52	44		818.4	815					62.4												
-L- 237+19	RT	52		820	818.4																		
-L- 237+30	RT	53	52		818.5	818.4																	
-L- 237+30	RT	53		820.12	818.5																		
-L- 237+81	RT	58A	53		820.9	818.5				51.6													
-L- 238+49	LT	54		823.1	822.1																		
-L- 237+29	RT	53A		821.45	818.6																		
-L- 237+29	RT	53A	53		818.6	818.5			14.4														
-L- 238+49	LT	54	55		822.1	822											2.4						
-L- 238+39	RT	56		824.05	823.13																		
-L- 238+39	RT	56	57		823.13	823			6.0														
-L- 238+45	RT	57		824.17	821.8																		
-L- 238+45	RT	57	58		821.8	821.6			15.6														
-L- 238+45	RT	58		823.64	821.6																		
-L- 239+79	RT	59		824.8	823.96																		
-L- 239+79	RT	59	59A		823.96	823.74			60														
-L- 239+79	RT	59	59B		823.96	824.16			7.2														
-L- 239+79	RT	59B		825	824.16																		
-L- 240+31	RT/LT																						
-L- 237+81	RT	58A		821.81	820.9																		
-L- 238+45	RT	58	58A		821.6	820.9				64.8													
-L- 240+49	CL	60		824.66	823.74																		
-L- 240+49	LT	60	61		823.74	823.5			16.8														
-L- 240+61	RT	62		824.39	823.55																		
-L- 241+04	RT	62A		823.4	822.56																		
-L- 241+04	RT	62	62A		823.55	822.56			44.4														
-L- 241+04	RT	62B	62A		822.3	822.56			15.6														
-L- 241+02	LT	63		823.83	822.91																		
-L- 239+20	RT	59A		824.58	823.74																		
-L- 239+20	RT	59A	58		823.74	821.6			75.6														
-L- 241+02	LT	63	64		822.91	822.26			18.0														
-Y5- 10+57	RT	65																					
-Y5- 10+73	CL	66			822.3	821.9				26.4													
-L- 242+19	RT	67		822.55	821.67																		
-L- 242+19	RT	67	68		821.67	821.63			4.8														
-L- 242+14	RT	68		822.55	821.63																		
-L- 242+14	RT	68	69		821.63	821.9			38.4														
-L- 242+69	RT	70		828.82	821.13																		
-L- 241+76	RT	69		822.68	821.9																		
-L- 242+69	RT	70	71		821.13	819											19.2						
-L- 242+86	LT	72		822.61	821.77																		
-L- 242+86	LT	72	73		821.77	821.73																	
-L- 242+92	LT	73		822.81	821.73																		
-L- 242+68	RT	70	67		821.13	821.67			50.4														
-L- 242+92	LT	73	74		821.73	817.3											12						
-L- 244+51	LT	75		826.5	825.58																		
-L- 244+51	CL	75	76		825.58	825.3			24														
-L- 244+54	RT	77																					
-L- 244+81	RT	78		826.51	825.92																		
-L- 244+81	RT	78	79		825.92	825.59																	
-L- 245+20	LT	80		827.61	826.69																		
-L- 245+20	LT	80	81		826.69	826.23			15.6														
-L- 245+20	LT	81		827.07	826.23																		
-L- 245+20	LT	81	82		826.23	826																	
-L- 240+80	RT	63A		823.95	814.91																		
-L- 240+80	CL	63A	63B		821.82	821.97						48											
-L- 240+80	LT	63B		823.47	821.97																		
-L- 240+80	LT	63C			822					24													
SHEET TOTALS									406.8	199.2	86	48					49		16				

STATION	CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR HDPE, TYPE S OR D 300	375	450	600	750	900	1050	1200	375 SIDE DRAIN PIPE	450 SIDE DRAIN PIPE	600 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 1.5m)	*TOTAL L.M. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5m THRU 3.0m	B 3.0m AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G
-L- 236+57														1						
-Y3- 11+46														1	0.25					
-Y3- 11+46																				
-Y3- 10+81			49.2																	
-Y3- 11+07														1						
-Y3- 11+07																				
-Y3- 11+51														1						
-Y3- 11+51																				
-Y3- 11+41														1						
-Y3- 11+41																				
-Y3- 11+67																				
-L- 237+19																				
-L- 237+19														1	0.12					
-L- 237+30				14.4																
-L- 237+30														1						
-L- 237+81																				
-L- 238+49														1						
-L- 237+29														1	1.35					
-L- 237+29																				
-L- 238+49																				
-L- 238+39														1			1		1	
-L- 238+39																				
-L- 238+45														1	0.87		1		1	
-L- 238+45																				
-L- 238+45														1	0.37					
-L- 239+79														1						
-L- 239+79																				
-L- 239+79																				
-L- 239+79														1						
-L- 240+31																				
-L- 237+81														1						
-L- 238+45																				
-L- 240+49														1			1			1
-L- 240+49																				
-L- 240+61														1						
-L- 241+04														1						
-L- 241+04																				
-L- 241+04																				
-L- 241+02														1						
-L- 239+20														1						
-L- 239+20																				
-L- 241+02																				
-Y5- 10+57									14.4											
-Y5- 10+73																				
-L- 242+19														1			1	1		
-L- 242+19																				
-L- 242+14														1			1			1
-L- 242+14																				
-L- 242+69														1			1		1	
-L- 241+76														1						
-L- 242+69																				
-L- 242+86														1						
-L- 242+86		6																		
-L- 242+92														1						
-L- 242+68																				
-L- 242+92																				
-L- 244+51														1			1			1
-L- 244+51																				
-L- 244+54										13.2										
-L- 244+81														1						
-L- 244+81		10.8																		
-L- 245+20														1			1			1
-L- 245+20																				
-L- 245+20														1						
-L- 245+20		9.6																		
-L- 240+80														1	1.5	6.04				
-L- 240+80																				
-L- 240+80														1						
-L- 240+80																				
SHEET TOTALS		26.4	49.2	14					14	13				32	4.46	6.04	8	1	3	4

STATION	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	O.T.C.B. STD. 840.04 OR 840.05	J.B. STD. 840.31 OR 840.32	MANHOLE STD. 840.53	MANHOLE STD. 840.51 OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	DRIVEWAY D.I. STD. 840.30	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35
-L- 236+57			1						1									
-Y3- 11+46											1							
-Y3- 11+46																		
-Y3- 10+81																		
-Y3- 11+07										1								1
-Y3- 11+07																		
-Y3- 11+51				1					1									
-Y3- 11+51																		
-Y3- 11+41										1								1
-Y3- 11+41																		
-Y3- 11+67																		
-L- 237+19																		
-L- 237+19			1						1									
-L- 237+30																		
-L- 237+30			1						1									
-L- 237+81																		
-L- 238+49				1					1									
-L- 237+29	1	1																
-L- 237+29																		
-L- 238+49																		
-L- 238+39																		
-L- 238+39																		
-L- 238+45																		
-L- 238+45																		
-L- 238+45				1					1									
-L- 239+79				1					1									
-L- 239+79																		
-L- 239+79																		
-L- 239+79				1					1									
-L- 240+31																		
-L- 237+81				1					1									
-L- 238+45																		
-L- 240+49																		
-L- 240+49																		
-L- 240+61				1					1									
-L- 241+04				1					1									
-L- 241+04																		
-L- 241+04																		
-L- 241+02	1	1																
-L- 239+20				1					1									
-L- 239+20																		
-L- 241+02																		
-Y5- 10+57																		
-Y5- 10+73																		
-L- 242+19																		
-L- 242+19																		
-L- 242+14																		
-L- 242+14																		
-L- 242+69																		
-L- 241+76	1	1																
-L- 242+69																		
-L- 242+86				1						1								
-L- 242+86																		
-L- 242+92				1						1								
-L- 242+68																		
-L- 242+92																		
-L- 244+51																		
-L- 244+51																		
-L- 244+54																		
-L- 244+81					1					1								
-L- 244+81																		
-L- 245+20																		
-L- 245+20																		
-L- 245+20				1					1									
-L- 245+20																		
-L- 240+80	1	1																
-L- 240+80																		
-L- 240+80	1	1																
-L- 240+80																		
SHEET TOTALS	5	5	3	12	1				13	5	1							2

STATION	CONC TRANSITIONAL SECTION FOR C.B.	CONC TRANSITIONAL SECTION FOR D.I.	BERM DRAINAGE OUTLET STD. 850.10 OR 850.11	CONVERT EXISTING C.B. TO J.B. (SEE SHEET 2-AD)	CONVERT EXIST D.I. TO J.B. W/MH COVER (SEE SHEET 2-AD)	PARALLEL PIPE END SECTION STD. 310.02	CROSS PIPE END SECTION STD. 310.03	PARALLEL PIPE END SECTION STD. 310.04	PREFORMED SCOUR HOLE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.M. STD. 840.72	CONC. & BRICK PIPE PLUG, C.M. STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
-L- 236+57														
-Y3- 11+46														
-Y3- 11+46										2x600		0.1		plug and fill 450mm CMP
-Y3- 10+81														
-Y3- 11+07														
-Y3- 11+07														
-Y3- 11+51														
-Y3- 11+51										2x400				
-Y3- 11+41														
-Y3- 11+41														
-Y3- 11+67													21.9	remove 450mm CMP
-L- 237+19													25.9	remove 450mm CMP
-L- 237+19														
-L- 237+30														
-L- 237+30														
-L- 237+81													149.9	remove 450mm CMP, remove D.I .
-L- 238+49														remove D.I.
-L- 237+29		1												
-L- 237+29														
-L- 238+49											0.29			
-L- 238+39	1													
-L- 238+39														
-L- 238+45	1													remove D.I.
-L- 238+45														
-L- 238+45														
-L- 239+79														
-L- 239+79														
-L- 239+79														
-L- 239+79														
-L- 240+31													32.6	remove 375mm CMP
-L- 237+81														
-L- 238+45														
-L- 240+49	1													
-L- 240+49							1							375mm Pipe End Section
-L- 240+61													19.6	remove 375mm CMP
-L- 241+04														
-L- 241+04														
-L- 241+04														
-L- 241+02		1												
-L- 239+20														
-L- 239+20														
-L- 241+02							1							375mm Pipe End Section
-Y5- 10+57													23.6	remove 350mm CMP
-Y5- 10+73														remove D.I.
-L- 242+19	1													
-L- 242+19														
-L- 242+14	1													
-L- 242+14														
-L- 242+69	1													
-L- 241+76		1												
-L- 242+69										2x400				
-L- 242+86														
-L- 242+86														
-L- 242+92														
-L- 242+68														
-L- 242+92										2x400				
-L- 244+51	1													
-L- 244+51							1							375mm Pipe End Section
-L- 244+54						1							6.5	remove 450mm CMP/450mm Pipe End Section
-L- 244+81														
-L- 244+81						1								375mm Pipe End Section
-L- 245+20	1													
-L- 245+20														
-L- 245+20														
-L- 245+20									1					
-L- 240+80														
-L- 240+80													48	remove 750 cmp
-L- 240+80														remove & replace DI
-L- 240+80													23.6	remove 450 cmp
										2x600				
SHEET TOTALS	8	3				2	3		1	6x400	0.29	0.10	351.53	

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

RD253058,2/11/2011,R:\Roadway\estimate\Final\SUMMARY\R2519a_ Drainage_summary.xls

RD253058

COMPUTED BY: TMW DATE: 3/7/2007

CHECKED BY: KNW DATE: 1/1/2011

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

METRIC

PROJECT NO.	SHEET NO.
R-2519A	3-F

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 1200 & 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 IV R.C. PIPE (UNLESS NOTED OTHERWISE) 300	375	450	600	750	900	1050	1200	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300 (1.630)	400 (1.630)	450 (1.630)	600 (1.630)	800 (1.630)	900 (2.010)	1000 (2.010)	1200 (2.010)	CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR HDPE, TYPE S OR D 300	375	450	600	750	900	1050	1200	375 SIDE DRAIN PIPE	450 SIDE DRAIN PIPE	600 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 1.5m)	*TOTAL L.M. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5m THRU 3.0m	B 3.0m AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	O.T.C.B. STD. 840.04 OR 840.05	J.B. STD. 840.31 OR 840.32	MANHOLE STD. 840.53	MANHOLE STD. 840.51 OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	DRIVEWAY D.I. STD. 840.30	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	CONC TRANSITIONAL SECTION FOR C.B.	CONC TRANSITIONAL SECTION FOR D.I.	BERM DRAINAGE OUTLET STD. 850.10 OR 850.11	CONVERT EXISTING C.B. TO J.B. (SEE SHEET 2-AD)	CONVERT EXIST D.I. TO J.B. W/MH COVER (SEE SHEET 2-AD)	PARALLEL PIPE END SECTION STD. 310.02	CROSS PIPE END SECTION STD. 310.03	PARALLEL PIPE END SECTION STD. 310.04	PREFORMED SCOUR HOLE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.M. STD. 840.72	CONC. & BRICK PIPE PLUG, C.M. STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
-L- 246+79	RT	83		827.44	826.6																															1											1					1																						
-L- 246+79	RT	83	84		826.6	826.52																			113																																															
-L- 246+99	LT	85		827.75	826.83																															1			1		1																						1												
-L- 246+99	LT	85	86		826.83	826.79			10.8																																																																		
-L- 247+94	RT	84		825.09	824.25																															1											1					1																							
-L- 246+99	LT	86		827.23	826.79																															1											1						1																						
-L- 247+01	LT	87	86		838.13	827.24												25.2																																																							2x400				
-L- 247+01	LT	87		838.8	838.13																															1							1	1																														
-L- 247+80	LT	88		826.34	825.42																															1			1		1																						1												
-L- 247+80	LT	88	89		825.42	824.77			15.6																																																																		
-L- 247+80	LT	89		825.61	824.77																															1											1					1																							
-L- 246+99	LT	86	89		826.79	824.77																			81.6																																																	
-L- 247+80	LT	89	91		824.77	822.98																			32.4																																																	
-L- 248+11	LT	91		825.25	822.59																															1	1.16																				1	1															remove headwall
-L- 248+11	LT	90	91		823	822.59																						7.2																																															
-Y6- 10+75	RT	90A																																	6.0																																										
-Y6- 10+85	LT																																																																													22.1	remove 375mm RCP
-L- 247+94	RT	84	93		824.25	823.54																			26																																																	
-Y6- 11+05	RT																																																																													16.1	remove 450mm CMP
-L- 248+01	RT	92																															11																																								1							7.1	remove 450mm CMP/ 375mm Pipe End Section
-L- 248+20	LT	93A		825.32	824.32																															1							1	1																					1											
-L- 248+20	CL	93A	93		824.32	823.54			18																																																																		
-L- 248+20	RT	93		824.38	823.54																															1											1					1																							
-L- 248+20	RT	93	94		823.54	821.7												14.4																																																							2x400				
-L- 249+02	RT	94A		820.6	819.1																															1							1	1																														
-L- 249+11	RT	94A	94B		819.1	814												26.4																																																							2x400				
-L- 249+08	RT	94C		821.71	820.71																															1											1					1																							
-L- 249+02	RT	95		822.65	821.65																															1							1	1																					1											
-L- 249+08	RT	94C	94A		820.71	819.1																			17																																																	
-L- 249+02	RT	95	94C		821.65	820.71			16.8																																																													2x400				
-L- 248+82	LT	97		824.9	821.5																															1	1.5	0.4																	1			1															
-L- 248+82	LT	97	97A		824	820.7													10.8																																																									19.5	remove 450mm RCP
-L- 248+82	LT	97A		822.2	820.7																															1									1						1																							
-L- 248+82	LT	97B			823.7														1.2																																																								0.33			
-L- 248+82	LT	97A	98		820.7	819.5																					32.4																																															
-L- 249+14	LT	98		821	819.5																															1									1						1																							
-L- 249+14	LT	98	98A		819.5	813.5														40.8																																																					2x600			24.4	remove 600mm CMP
-L- 249+68	LT	100																														16.8																																													17.5	remove 450mm RCP
-L- 251+30	CL	101A		818.69	817.69																															1							1	1																					1											
-L- 251+59	LT	101		818.5	816.9																															1	0.1						1	1																					1												7.6	remove 450mm CMP
-Y8- 10+40	CL	102	104		818.93	818.85			14.4																																																															9.7	remove D.I. and 375mm CMP
-Y8- 10+33	LT	103	104		819.01	818.85			14.4																																																																		
-Y8- 10+47	LT	104		819.98	818.85																															1			1			1																																					
-L- 251+66	LT	101A	101		817.69	816.9			36.0																																																																		
-L- 251+66	LT	101B		818.55	818.55																															1							1	1																					1											
-L- 251+66	LT	101B	101		818.55	816.9			7.2																																																																		
-Y8- 10+47	LT	104	105		818.85	817.43			16.8																																																																		
-L- 251+97	LT	105		818.35	817.05																															1			1		1																																						
-L- 251+97	LT	105	107		817.05	816.44						13.2																																																																
-L- 252+00	RT	107		818.71	816.44																															1	0.77						1	1																					1											
-L- 252+00	RT	107	108		816.44	815.3						26.4																																																																
-L- 251+98	RT	108			815.3																																																																			1			2.0	remove 750mm CMP
-L- 252+14	LT	109	105		817.3	817.21					15.6																																																																	
-L- 252+14	LT	109		818.5	817.3																															1							1	1																														
-L- 252+27	LT	110	109		817.81	817.75			12.0																																																																		
-L- 252+27	LT	110		818.5	817.81																															1							1	1																														
-L- 252+44	LT	111		818.7	818.01																															1							1	1																														
-L- 252+44	LT	111	112		818.01	817.52			4.8																																																																		
-L- 252+48	LT	112		818.44	817.52																															1			1		1																																						
-L- 252+48	LT	112	114	818.44	817.52				46.8																																																																		
-L- 252+96	LT	113		819.2	818.51																															1							1	1																														
-L- 252+96	LT	113	114		818.51	817.32												7.2																																																							2x400				
-L- 252+96	LT	114		818.24	817.25																															1			1			1																																					
																																																																								2+600				
SHEET TOTALS										214		16	40					73	12	41						270		32	7.2				28	6				28	3.53	0.4	6		4	2	12	12	2	5	1				6	2		1		1	2				2	6				1			1	10x400	0.33		125.92	

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: TMW DATE: 3/7/2007

CHECKED BY: KNW DATE: 1/1/2011

RD253058

METRIC

PROJECT NO.	SHEET NO.
R-2519A	3-G

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION / SIZE	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS IV R.C. PIPE (UNLESS NOTED OTHERWISE) 300	375	450	600	750	900	1050	1200	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300	400	450	600	600	800	800	900	900	1000	1000	1200	1200
THICKNESS OR GAUGE																1.630	1.630	1.630	1.630		1.630		2.010		2.010		2.010	
-L- 252+96	CL	114	115		817.25	817				21.6																		
-L- 252+96	RT	115		818.24	817																							
-L- 252+96	RT	115	116		817	814											12.0											
-L- 253+40	RT	117		817.9	816.98																							
-L- 253+40	RT	117	118		816.98	813.5											13.2											
-L- 253+40	LT	119		817.9	816.98																							
-L- 253+40	LT	119	124		816.98	816.82			50.4																			
-L- 254+01	LT	122	123		816.5	816.3																						
-L- 253+91	LT	124A		818.04	816.14																							
-L- 253+96	LT	123		817.75	816.3																							
-L- 253+96	LT	123	124		816.3	816.25					2.4																	
-L- 253+92	LT	124		817.74	816.25																							
-L- 253+92	CL	124	124A		816.25	816					10.2																	
-L- 253+92	CL	124A		818.04	816.14																							
-L- 253+92	CL	125	124A		816	816.14					13.2																	
-L- 253+91	RT	125		817.74	816																							
-L- 253+91	RT	125	120		816	815.9						15.6																
-L- 253+74	RT	120		817.76	815.9																							
-L- 253+74	RT	120	121		815.9	813.2															14.4							
-L- 254+45	RT	126		817.6	816.91																							
-L- 254+45	RT	126	127		816.91	816.8																						
-L- 254+47	RT	127		817.87	816.8																							
-L- 254+47	RT	127	125		816.8	816.5			54.0																			
-L- 254+91	LT	128		819.2	818.51																							
-L- 254+91	LT	128	129		818.51	817.26																						
-L- 254+74	LT	129		818.18	817.26																							
-L- 254+74	LT	129	123		817.26	816.83			75.6																			
-L- 255+13	RT	130		818.87	817.95																							
-L- 255+13	RT	130	133		817.95	817.85			25.2																			
-L- 255+40	RT	133		819.4	817.75																							
-L- 255+40	LT	131	132		818	817.85																						
-L- 255+40	LT	132		819	817.85																							
-L- 255+40	LT	132	133		817.85	817.75					12.0																	
-L- 255+40	LT	133	134		817.75	817.5					19.2																	
-L- 255+80	LT	135		819.74	818.75																							
-L- 255+80	LT	135	136		818.75	818.65				13.2																		
-L- 255+80	RT	136		820.14	818.65																							
-L- 255+80	RT	136	137		818.65	818.5				18.0																		
-L- 256+67	RT	139		821.64	820.72																							
-L- 256+67	RT	139	140		820.72	820.35			12.0																			
-L- 256+67	LT	140		821.27	820.35																							
-L- 256+68	LT	141		822.8	822.11																							
-L- 256+68	LT	141	140		822.11	820.35											8.4											
-L- 256+67	LT	140	135		820.35	818.82			85.2																			
-Y10- 10+47	RT	142		822.56	821.64																							
-Y10- 10+47	RT	142	143		821.64	821.6			12.0																			
-Y10- 10+46	LT	143		822.7	821.6																							
-Y10- 10+24	LT	144																										
-L- 257+81	LT	145		823.24	822.32																							
-L- 257+81	LT	145	146		822.32	822.21			6.0																			
-L- 257+74	LT	146		823.13	822.21																							
SHEET TOTALS									320	53	57	16					34				14							

STATION	CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR HDPE, TYPE S OR D 300	375	450	600	750	900	1050	1200	375 SIDE DRAIN PIPE	450 SIDE DRAIN PIPE	600 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 1.5m)	*TOTAL L.M. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5m THRU 3.0m	B 3.0m AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G
-L- 252+96																				
-L- 252+96														1			1		1	
-L- 252+96																				
-L- 253+40														1			1		1	
-L- 253+40																				
-L- 253+40														1			1			1
-L- 253+40																				
-L- 254+01				9.6																
-L- 253+91														1	0.4					
-L- 253+96														1			1		1	
-L- 253+96																				
-L- 253+92														1			1			1
-L- 253+92																				
-L- 253+92														1						
-L- 253+92																				
-L- 253+91														1	0.24		1		1	
-L- 253+91																				
-L- 253+74														1	0.36		1		1	
-L- 253+74																				
-L- 254+45														1						
-L- 254+45		7.2																		
-L- 254+47														1			1	1		
-L- 254+47																				
-L- 254+91														1						
-L- 254+91		19.2																		
-L- 254+74														1			1		1	
-L- 254+74																				
-L- 255+13														1			1		1	
-L- 255+13																				
-L- 255+40														1	0.15		1		1	
-L- 255+40				6																
-L- 255+40														1			1		1	
-L- 255+40																				
-L- 255+40																				
-L- 255+80														1			1		1	
-L- 255+80																				
-L- 255+80														1			1		1	
-L- 255+80																				
-L- 256+67														1			1		1	
-L- 256+67																				
-L- 256+67														1			1		1	
-L- 256+68														1						
-L- 256+68																				
-L- 256+67																				
-Y10- 10+47														1			1			1
-Y10- 10+47																				
-Y10- 10+46														1			1		1	
-Y10- 10+24									9.6											
-L- 257+81														1			1		1	
-L- 257+81																				
-L- 257+74														1			1		1	
SHEET TOTALS		26		16					9.6					25	1.15		20	1	16	3

STATION	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	O.T.C.B. STD. 840.04 OR 840.05	J.B. STD. 840.31 OR 840.32		MANHOLE STD. 840.53	MANHOLE STD. 840.51 OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54			DRIVEWAY D.I. STD. 840.30		T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35		CONC TRANSITIONAL SECTION FOR C.B.	CONC TRANSITIONAL SECTION FOR D.I.	BERM DRAINAGE OUTLET STD. 850.10 OR 850.11	CONVERT EXISTING C.B. TO J.B. (SEE SHEET 2-AD)	CONVERT EXISTING D.I. TO J.B. W/MH COVER (SEE SHEET 2-AD)	PARALLEL PIPE END SECTION STD. 310.02	CROSS PIPE END SECTION STD. 310.03	PARALLEL PIPE END SECTION STD. 310.04	PREFORMED SCOUR HOLE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.M. STD. 840.72	CONC. & BRICK PIPE PLUG, C.M. STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
-L- 252+96																																					
-L- 252+96																																					
-L- 252+96																																	2x400				
-L- 253+40																																					
-L- 253+40																																	2x400				
-L- 253+40																																					
-L- 253+40																																					
-L- 254+01																																					
-L- 253+91	1	1																							1												
-L- 253+96																																					
-L- 253+96																																					
-L- 253+92																																				26.383	remove 450mm CMP
-L- 253+92																																					
-L- 253+92	1	1																							1												
-L- 253+92																																					
-L- 253+91																																					
-L- 253+91																																					
-L- 253+74																																					
-L- 253+74																																	2x800				
-L- 254+45	1	1																																			remove D.I.
-L- 254+45																																					
-L- 254+47																																					
-L- 254+47																																					
-L- 254+91	1	1																																			
-L- 254+91																																					
-L- 254+74																																					
-L- 254+74																																					
-L- 255+13																								1													
-L- 255+13																																					
-L- 255+40																								1													
-L- 255+40																														1							600mm Pipe End Section
-L- 255+40																																					
-L- 255+40																																					
-L- 255+40																																					
-L- 255+80																																					
-L- 255+80																																					
-L- 255+80																								1													
-L- 255+80																																					
-L- 256+67																								1												24.0319	remove 450 CMP and HW
-L- 256+67																																					
-L- 256+67																																					
-L- 256+68	1	1																																			
-L- 256+68																																	2x400				
-L- 256+67																																					
-Y10- 10+47																																					
-Y10- 10+47																																				30.91	remove 2x1200mm CMP
-Y10- 10+46																																					
-Y10- 10+24																																					
-L- 257+81																																					
-L- 257+81																																					
-L- 257+74																																					
																																	6x400				
SHEET TOTALS	5	5																						4	2					1			2x800			81.3249	

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

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COMPUTED BY: TMW DATE: 3/7/2007

CHECKED BY: KNW DATE: 1/1/2011

RD248619

METRIC

PROJECT NO.	SHEET NO.
R-2519A	3-H

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS IV R.C. PIPE (UNLESS NOTED OTHERWISE) 300	CLASS IV 375	CLASS IV 450	CLASS IV 600	CLASS IV 750	CLASS IV 900	CLASS IV 1050	CLASS IV 1200	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300 (1.630)	BIT. 400 (1.630)	BIT. 450 (1.630)	BIT. 600 (1.630)	BIT. 800 (1.630)	BIT. 900 (2.010)	BIT. 1000 (2.010)	BIT. 1200 (2.010)	CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR HDPE, TYPE S OR D 300	CLASS III 375	CLASS III 450	CLASS III 600	CLASS III 750	CLASS III 900	CLASS III 1050	CLASS III 1200	375 SIDE DRAIN PIPE	450 SIDE DRAIN PIPE	600 SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. METERS R.C.P.	ENDWALLS C.S.P.
-L- 257+74	CL	146	147		822.21	822.15			13.2																											
-L- 257+67	RT	147		823.47	822.15																															
-L- 257+67	RT	147	148		822.15	822.05			18.0																											
-L- 257+81	RT	153		823.72	822.75																															
-L- 257+81	RT	153	147		822.75	822.5			13.2																											
-Y10- 11+14	LT	150	151		822	821.69							12.0																						2.6	
-Y10- 11+02	LT	151		823.14	821.69																															
-Y10- 11+02	LT	151	152		821.69	818.7															15.6															
-L- 258+32	RT	155		826.8	826.11																															
-L- 258+32	RT	155	156		826.11	823.62											14.4																			
-L- 259+15	RT	160		828.2	827.51																															
-L- 259+15	RT	160	159		827.51	824.83											13.2																			
-L- 259+79	LT	157		826.62	825.7																															
-L- 259+79	LT	157	158		825.7	824.83			56.4																											
-L- 259+21	LT	158		825.75	824.83																															
-L- 259+21	LT	158	158A		824.83	825			12.0																											
-L- 259+21	CL	158A		826.13	825																															
-L- 259+21	CL	158B	158A		825.49	825			28.8																											
-L- 259+51	LT	158B		826.49	825.49																															
-L- 259+96	RT	161		829.3	828.61																															
-L- 259+96	RT	161	162		828.61	825.95											12.0																			
-L- 260+58	RT	162B	162		825.44	825.95									21.6																					
-L- 260+20	RT	162B		827.25	825.44																															
-L- 260+20	RT	162A		827.55	826																															
-L- 260+58	LT	163		827.85	826.93																															
-L- 260+20	RT	162A	162B		826	825.44			12.0																											
-L- 260+58	CL	163	164		826.93	826.84			21.6																											
-L- 260+58	RT	164		827.85	826.1																															
-L- 260+58	RT	165		827.8	827.04																															
-L- 260+58	RT	165	164		827.04	826.81				4.8																										
-L- 260+20	RT	164	162B												38.4																					
-L- 260+97	RT	166																															9.6			
-L- 261+48	LT	167		827.9	826.4																															
-L- 261+48	LT	167	168		826.4	825.77			4.8																											
-L- 261+49	LT	168		829	825.77																															
-L- 261+73	RT	170	164		828.01	826.25								112.8																						
-L- 261+73	LT	169		829.61	828.69																															
-L- 261+73	LT	169	170		828.69	828.6			21.6																											
-L- 261+73	RT	170		829.61	828.01																															
-L- 261+73	RT	171		831.1	830.41																															
-L- 261+73	RT	171	170		830.41	828.64											14.4																			
-L- 261+99	LT	172		828.4	827.7																															
-L- 261+99	LT	172	173		827.7	827.5			6.0																											
-L- 262+06	LT	173A		830.39	829.39																															
-L- 262+01	LT	173		830.25	826.59																															
-Y11- 10+42	RT	174		830.57	829.87																															
-Y11- 10+42	RT	174	175		829.87	829.8			3.6																											
-Y11- 10+45	RT	175		830.8	827.37																															
-L- 262+01	LT	173	173A		826.59	829.39			14.4																											
-Y11- 11+02	RT	176	179		831.5	830.74											7.2																			
-Y11- 10+95	RT	179		831.66	830.74																															
-Y11- 11+13	LT	177	178		832.86	832.01											6.0																			
-Y11 11+08	LT	178		832.93	832.01																															
-Y11 11+08	LT	178	179		832.01	830.74			15.6																											
-Y11- 10+95	RT	179	180		830.74	829.77			20.4																											
-L- 262+44	RT	180		830.69	829.09																															
-L- 262+44	RT	180	170		829.09	828.01								69.6																						
-Y11- 10+43	LT	181		830.7	827.62																															
-L- 262+85	LT	182		831.43	830.51																															
-L- 262+90	RT	182A		831.69	830.46																															
-L- 262+90	LT	182	182A		830.51	830.46			13.2																											
SHEET TOTALS									274.8	4.8			12	182.4	60		67				16												9.6		2.6	

STATION	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0 THRU 1.5m)	*TOTAL L.M. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5m THRU 3.0m	METERS B 3.0m AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	O.T.C.B. STD. 840.04 OR 840.05	J.B. STD. 840.31 OR 840.32	MANHOLE STD. 840.53	MANHOLE STD. 840.51 OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	C.B. (SEE SPECIAL DETAIL SHEET 2-X)	DRIVEWAY D.I. STD. 840.30	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	CONC TRANSITIONAL SECTION FOR C.B.	CONC TRANSITIONAL SECTION FOR D.I.	BERM DRAINAGE OUTLET STD. 850.10 OR 850.11	CONVERT EXISTING C.B. TO J.B. (SEE SHEET 2-AD)	CONVERT EXISTING D.I. TO J.B. W/MH COVER (SEE SHEET 2-AD)	PARALLEL PIPE END SECTION STD. 310.02	CROSS PIPE END SECTION STD. 310.03	PARALLEL PIPE END SECTION STD. 310.04	PREFORMED SCOUR HOLE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.M. STD. 840.72	CONC. & BRICK PIPE PLUG, C.M. STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
-L- 257+74																																								
-L- 257+67	1							1	1																			1											30.9	remove 2x1200mm CMP
-L- 257+67																																								
-L- 257+81	1							1	1																			1												
-L- 257+81																																								
-Y10- 11+14																																								
-Y10- 11+02	1			1	1																																			
-Y10- 11+02																																				2x900				
-L- 258+32	1							1	1																															
-L- 258+32																																				2x400				
-L- 259+15	1							1	1																															
-L- 259+15																																				2x400			14.6	remove 250mm CMP
-L- 259+79	1			1		1																																		
-L- 259+79																																								
-L- 259+21	1			1		1																																		
-L- 259+21																																							28.8	remove 600mm CMP
-L- 259+21	1																		1			1																		
-L- 259+21																																								
-L- 259+51	1							1	1																			1												
-L- 259+96	1							1	1																															
-L- 259+96																																				2x400				
-L- 260+58																																						0.34	15.5	plug 1200mm CMP & remove 450mm CMP
-L- 260+20	1	0.31		1			1																																	
-L- 260+20	1	0.05						1	1																			1												
-L- 260+58	1			1		1																																		
-L- 260+20																																								
-L- 260+58																																							21.0	remove 450mm CMP
-L- 260+58	1	0.25					1																1																	
-L- 260+58	1							1	1																															
-L- 260+58																																								
-L- 260+20																																								
-L- 260+97																																1							11.9	remove 450mm CMP/450mm Pipe End Section
-L- 261+48	1							1	1																															
-L- 261+48																																								
-L- 261+49																						1									1									1.2m new structure
-L- 261+73																																								remove 450mm CMP
-L- 261+73	1			1		1																																		
-L- 261+73																																								
-L- 261+73	1	0.1					1																1																	
-L- 261+73	1							1	1																															
-L- 261+73																																				2x400				
-L- 261+99	1							1	1																															
-L- 261+99																																								
-L- 262+06	1							1	1																			1												
-L- 262+01	1	1.5	0.66																1			1																		remove existing DI
-Y11- 10+42	1	1.07						1	1																															
-Y11- 10+42																																								
-Y11- 10+45																						1									1									0.2m of new structure
-L- 262+01																																								
-Y11- 11+02																																				2x400				
-Y11- 10+95	1			1			1																																	
-Y11- 11+13																																				2x400				
-Y11 11+08	1			1		1																																		
-Y11 11+08																																								
-Y11- 10+95																																								
-L- 262+44	1	0.1					1																1																	
-L- 262+44																																							27.9304	remove 600mm CMP
-Y11- 10+43																						1									1									0.3m new structure
-L- 262+85	1			1		1																																		
-L- 262+90	1							1	1																			1												
-L- 262+90																																								
																																				2x900				
SHEET TOTALS	28	3.38	0.66	9	1	6	5	14	14										2			5	3					6			3	1				12x400		0.34	150.59	

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

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RD253058

COMPUTED BY: TMW DATE: 3/7/2007

CHECKED BY: KNW DATE: 1/1/2011

METRIC

PROJECT NO.	SHEET NO.
R-2519A	3-I

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

Station	Location (LT, RT, or CL)	Structure No. From	Structure No. To	Top Elevation	Invert Elevation	Invert Elevation	Slope Critical	Class IV R.C. Pipe (Unless Noted Otherwise) 300	375	450	600	750	900	1050	1200	Bituminous Coated C.S. Pipe Type B (Unless Noted Otherwise) 300	400	450	600	800	900	1000	1200
THICKNESS OR GAUGE																1.630	1.630	1.630	1.630	1.630	2.010	2.010	2.010
-L- 262+85	CL	182A	183		830.51	830.42			10.8														
-L- 262+95	RT	183		831.45	830																		
-L- 262+95	RT	183	180		830	829.24							50.4										
-L- 263+47	LT	184		832.8	832.1																		
-L- 263+47	LT	184	185		832.1	831.5			21.6														
-L- 263+24	LT	185		832.2	830.02																		
-L- 263+30	RT	186		832.31	831.39																		
-L- 263+30	RT	186	187		831.39	831.35			10.8														
-L- 263+40	RT	187		832.52	831.35																		
-L- 263+40	RT	187	188		831.35	831.25			9.6														
-L- 263+39	RT	188		832.3	830.85																		
-L- 263+39	RT	188	183		830.85	830							43.2										
-L- 263+40	RT	189		832	831.31																		
-L- 263+40	RT	189	188		831.31	831.25																	
-L- 263+57	RT	190		832.4	831.71																		
-L- 263+57	RT	190	191		831.71	831.65																	
-L- 263+57	RT	191		832.71	831.26																		
-L- 263+57	RT	191	188		831.26	830.85							16.8										
-L- 264+00	LT	192		834.23	833.31																		
-L- 264+00	LT	192	193		833.31	833.03			12.0														
-L- 264+00	RT	193		833.95	832.5																		
-L- 264+00	RT	193	191		832.5	831.26							42.0										
-L- 264+00	RT	194	193		835.6	833.03											8.4						
-L- 264+68	RT	195	193		835.25	832.65						66.0											
-L- 264+68	RT	195		836.55	835.25																		
-Y12- 10+93	RT	196	197		837.8	836.6											6.0						
-Y12- 10+87	RT	197		837.52	836.6																		
-Y12- 10+87	RT	197	198		836.6	835.84			9.6														
-L- 264+81	RT	198		837.1	835.45																		
-L- 264+81	RT	198	195		835.45	835.25						14.4											
-Y12- 11+19	LT	199	200		840.5	837.41													25.2				
-Y12- 10+96	LT	200		838.61	837.41																		
-Y12- 10+96	LT	200	201		837.41	837.05																	
-Y12- 10+47	LT																						
-L- 264+85	LT																						
-L- 265+04	RT	201		838.2	836.9																		
-L- 265+04	RT	201	198		836.9	835.45						22.8											
-L- 264+97	LT																						
-L- 265+22	LT	202		838.96	838.04																		
-L- 265+37	LT																						
-L- 265+22	LT	202	203		838.04	837.95			21.6														
-L- 265+21	RT	203		838.96	837.81																		
-L- 265+25	RT	204		839	838.31																		
-L- 265+25	RT	204	203		838.31	837.81																	
-L- 265+21	RT	203	201		837.81	836.9					15.6												
-L- 265+44	RT	205																					
-L- 265+79	RT	206		841.56	840.42																		
-L- 265+48	RT	206	203		840.42	837.81					57.6												
-L- 265+79	RT	206A		843.9	843.6																		
-L- 265+79	RT	206A	206		843.6	840.42																	
-L- 266+24	RT	207	207A		843.9	842.81																	
-L- 266+23	RT	207A		843.5	842.81																		
-L- 266+23	RT	207A	208		842.81	842.58																	
-L- 266+23	RT	208		843.5	842.35																		
-L- 266+23	RT	208	206		842.35	840.42					44.4												
-L- 265+79	LT	206B		841.84	840.9																		
-L- 265+79	RT	206B	206		840.9	840.42			12.0														
SHEET TOTALS									108		117.6	103	152				14		25				

Station	From	To	Class III R.C. Pipe or C.S.Pipe, Type IR Aluminized or HDPE, Type S or D 300	375	450	600	750	900	1050	1200	375 Side Drain Pipe	450 Side Drain Pipe	600 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 1.5m)	*Total L.M. for Pay Quantity shall be Col. 'A' + (1.3 x Col.'B') Meters A 1.5m thru 3.0m	B 3.0m and above	C.B. Std. 840.01 or Std. 840.02	Frame, Grates, and Hood Standard 840.03 Type of Grate E	F	G
-L- 262+85	182A	183																				
-L- 262+95	183															1			1			1
-L- 262+95	183	180																				
-L- 263+47	184															1						
-L- 263+47	184	185																				
-L- 263+24	185																					
-L- 263+30	186															1			1			1
-L- 263+30	186	187																				
-L- 263+40	187															1			1			1
-L- 263+40	187	188																				
-L- 263+39	188															1			1			1
-L- 263+39	188	183																				
-L- 263+40	189															1						
-L- 263+40	189	188		4.8																		
-L- 263+57	190															1						
-L- 263+57	190	191		10.8																		
-L- 263+57	191															1			1			1
-L- 263+57	191	188																				
-L- 264+00	192															1			1			1
-L- 264+00	192	193																				
-L- 264+00	193															1			1			1
-L- 264+00	193	191																				
-L- 264+00	194	193																				
-L- 264+68	195	193																				
-L- 264+68	195															1			1			1
-Y12- 10+93	196	197																				
-Y12- 10+87	197															1			1			1
-Y12- 10+87	197	198																				
-L- 264+81	198															1						
-L- 264+81	198	195																				
-Y12- 11+19	199	200																				
-Y12- 10+96	200															1						
-Y12- 10+96	200	201				12																
-Y12- 10+47																						
-L- 264+85																						
-L- 265+04	201															1			1			1
-L- 265+04	201	198																				
-L- 264+97																						
-L- 265+22	202															1			1		1	
-L- 265+37																						
-L- 265+22	202	203																				
-L- 265+21	203															1			1			1
-L- 265+25	204															1						
-L- 265+25	204	203		13.2																		
-L- 265+21	203	201																				
-L- 265+44	205										9.6											
-L- 265+79	206															1			1			1
-L- 265+48	206	203																				
-L- 265+79	206A															1						
-L- 265+79	206A	206		13.2																		
-L- 266+24	207	207A		8.4																		
-L- 266+23	207A															1						
-L- 266+23	207A	208		4.8																		
-L- 266+23	208															1			1			1
-L- 266+23	208	206																				
-L- 265+79	206B															1						
-L- 265+79	206B	206																				
SHEET TOTALS				55		12					9.6					23			14		1	13

Station	From	To	D.I. Std. 840.14 or Std. 840.15	D.I. Frame and Grate Std. 840.16	G.D.I. Type "A" Std. 840.17 or 840.26	G.D.I. Type "B" Std. 840.18 or 840.27	G.D.I. Type "D" Std. 840.19 or 840.28	G.D.I. Frame with Two Grates Std. 840.20	G.D.I. Frame with Two Grates Std. 840.22	G.D.I. (N.S.) Frame with Grate Std. 840.24	G.D.I. (N.S.) Frame with Two Grates Std. 840.24	G.D.I. (N.S.) Frame with Two Grates Std. 840.29	O.T.C.B. Std. 840.04 or 840.05	J.B. Std. 840.31 or 840.32	Manhole Std. 840.53	Manhole Std. 840.51 or Std. 840.53	M.H. Frame and Cover Std. 840.54	Driveway D.I. Std. 840.30	T.B.J.B. Std. 840.34	T.B.D.I. Std. 840.35	Conc Transitional Section for C.B.	Conc Transitional Section for D.I.	Berm Drainage Outlet Std. 850.10 or 850.11	Convert Existing C.B. to J.B. (See Sheet 2-AD)	Convert Existing D.I. to J.B. W/MH Cover (See Sheet 2-AD)	Parallel Pipe End Section Std. 310.02	Cross Pipe End Section Std. 310.03	Parallel Pipe End Section Std. 310.04	Preformed Scour Hole
-L- 262+85	182A	183																											
-L- 262+95	183																												
-L- 262+95	183	180																											
-L- 263+47	184		1	1																									
-L- 263+47	184	185																											
-L- 263+24	185																								1				
-L- 263+30	186																					1							
-L- 263+30	186	187																											
-L- 263+40	187																					1							
-L- 263+40	187	188																											
-L- 263+39	188																												
-L- 263+39	188	183																											
-L- 263+40	189		1	1																									
-L- 263+40	189	188																											
-L- 263+57	190		1	1																									
-L- 263+57	190	191																											
-L- 263+57	191																												
-L- 263+57	191	188																											
-L- 264+00	192																					1							
-L- 264+00	192	193																											
-L- 264+00	193																												
-L- 264+00	193	191																											
-L- 264+00	194	193																						1					
-L- 264+68	195	193																											
-L- 264+68	195																												
-Y12- 10+93	196	197																											
-Y12- 10+87	197																												
-Y12- 10+87	197	198																											
-L- 264+81	198															1	1												
-L- 264+81	198	195																											
-Y12- 11+19	199	200																											
-Y12- 10+96	200		1	1																									
-Y12- 10+96	200	201																											
-Y12- 10+47																													
-L- 264+85																													
-L- 265+04	201																												
-L- 265+04	201	198																											
-L- 264+97																													
-L- 265+22	202																												
-L- 265+37																													
-L- 265+22	202	203																											
-L- 265+21	203																												
-L- 265+25	204		1	1																									
-L- 265+25	204	203																											
-L- 265+21	203	201																											
-L- 265+44	205																												
-L- 265+79	206																												
-L- 265+48	206	203																											
-L- 265+79	206A		1	1																									
-L- 265+79	206A	206																											
-L- 266+24	207	207A																											
-L- 266+23	207A		1	1																									
-L- 266+23	207A	208																											
-L- 266+23	208																												
-L- 266+23	208	206																											
-L- 265+79	206B		1	1																			1						
-L- 265+79	206B	206																											
SHEET TOTALS			8	8												1	1					3	1	1	1				

Station	From	To	Corr. Steel Elbows No. & Size	Conc. Collars Cl. "B" C.M. Std. 840.72	Conc. & Brick Pipe Plug, C.M. Std. 840.71	Pipe Removal (Meters)	Remarks
-L- 262+85	182A	183					
-L- 262+95	183						
-L- 262+95	183	180				12.3	remove 450mm CMP
-L- 263+47	184						
-L- 263+47	184	185					
-L- 263+24	185						0.5m of new structure
-L- 263+30	186						
-L- 263+30	186	187					
-L- 263+40	187						
-L- 263+40	187	188					
-L- 263+39	188						
-L- 263+39	188	183				31.394	remove 600mm CMP& remove 300mm CMP
-L- 263+40	189						
-L- 263+40	189	188					
-L- 263+57	190						
-L- 263+57	190	191					
-L- 263+57	191						
-L- 263+57	191	188				6.4	remove 375mm CMP
-L- 264+00	192						
-L- 264+00	192	193					
-L- 264+00	193						
-L- 264+00	193	191				12.9	remove 375mm & 450mm CMP
-L- 264+00	194	193	1x400				
-L- 264+68	195	193					
-L- 264+68	195						
-Y12- 10+93	196	197	2x400				
-Y12- 10+87	197						
-Y12- 10+87	197	198					
-L- 264+81	198						
-L- 264+81	198	195					
-Y12- 11+19	199	200	2x600			24.6	remove 375mm CMP
-Y12- 10+96	200						
-Y12- 10+96	200	201					
-Y12- 10+47						22.3	remove 600mm CMP
-L- 264+85						24.6	remove drainage structure & 600mm CMP
-L- 265+04	201						
-L- 265+04	201	198					
-L- 264+97						12.6	remove 450mm CMP
-L- 265+22	202						
-L- 265+37						24.7	remove 450mm CMP
-L- 265+22	202	203					
-L- 265+21	203						
-L- 265+25	204						
-L- 265+25	204	203					
-L- 265+21	203	201					remove 300mm CMP
-L- 265+44	205						
-L- 265+79	206						
-L- 265+48	206	203				12.7	remove 450mm CMP
-L- 265+79	206A						
-L- 265+79	206A	206					
-L- 266+24	207	207A					
-L- 266+23	207A						
-L- 266+23	207A	208					
-L- 266+23	208						
-L- 266+23	208	206				20.7	remove 450mm CMP
-L- 265+79	206B						
-L- 265+79	206B	206					
			3x400				
SHEET TOTALS			2x600			205.21	

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

RD253058,2/11/2011,R:\Roadway\estimate\Final\SUMMARY\R2519a_ Drainage_summary.xls

RD253058

COMPUTED BY: TMW DATE: 3/7/2007

CHECKED BY: KNW DATE: 1/1/2011

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

METRIC

PROJECT NO.	SHEET NO.
R-2519A	3-J

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

STATION	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS IV R.C. PIPE (UNLESS NOTED OTHERWISE)								BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE)								CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR HDPE, TYPE S OR D							
SIZE								300	375	450	600	750	900	1050	1200	300	400	450	600	800	900	1000	1200	300	375	450	600	750	900	1050	1200
THICKNESS OR GAUGE																1.630	1.630	1.630	1.630	1.630	2.010	2.010	2.010								
-L- 265+79	LT																														
-L- 267+11	LT	209		847.67	846.75																										
-L- 267+11	LT	209	210		846.75	844.57			42.0																						
-L- 266+68	LT	210		845.49	844.57																										
-L- 266+47	RT	211A		844.98	844																										
-L- 266+68	LT	210	211		845.49	844.57			20.4																						
-L- 266+48	LT	211		844.55	843.63																										
-L- 266+48	LT	211	212		843.63	842.53			22.8																						
-L- 266+23	LT	212		843.45	842.53																										
-L- 266+47	LT	211	211A						12																						
-L- 266+23	LT	212	208		842.53	842.43			26.4																						
-L- 266+81	RT	213	208		845.04	842.51				56.4																					
-L- 266+81	RT	213		846.03	845.04																										
-L- 267+62	LT	214		850	849.03																										
-L- 266+81	RT	213A		846.2																											
-L- 267+62	LT	214	215		849.03	848.72			13.2																						
-L- 267+57	LT	215		849.64	848.72																										
-L- 267+57	LT	215	216		848.72	848.48			6.0																						
-L- 267+50	LT	216		849.4	848.48																										
-L- 266+81	RT	213A	213																						3.6						
-L- 267+50	CL	216	217		848.48	848.18			12.0																						
-L- 267+50	RT	217		849.1	848.18																										
-L- 267+50	RT	217	213		848.18	845.11			68.4																						
-L- 267+80	RT	218	217		849.13	848.18			27.6																						
-L- 267+80	RT	218		850.05	849.13																										
-L- 268+58	RT	219	218A	850.2	850.2				38.4																						
-L- 268+00	RT	218A	218		849.93	849.13			34.8																						
-L- 268+14	RT	218B		851.40	850.13																										
-L- 268+17	RT	218A		850.84	849.93																										
-L- 268+58	RT	219		851.28	850.2																										
-Y13- 10+30	RT	220	219		850.26	850.2			20.4																						
-L- 268+14	RT	218A	218B		849.93	850.13																									
-Y13- 10+30	RT	220		851.17	850.26																										
-Y14- 10+21	RT	221		854.24	853.27																										
-Y14- 10+21	RT	221	222		853.27	853.08			10.8																						
-Y14- 10+30	RT	222		854	853.01																										
-Y14- 10+30	CL	222	224		853.01	851.71				24.0																					
-Y14- 10+24	LT	223	224		854.46	851.71												9.6													
-Y14- 10+35	LT	224		852.7	851.71																										
-Y14- 10+35	LT	224	225		851.71	845.09																				84.0					
-L- 270+46	LT	226		838.3	837																										
-L- 269+79	LT	225		846	844.93																										
-L- 269+79	LT	225	226		844.93	844																				67.2					
-L- 269+09	RT	227		850.3	849.61																										
-L- 269+09	RT	227	228		849.61	849.55																			10.8						
-L- 270+46	LT	226	238																							13.2					
-L- 269+18	RT	228		851.18	849.55																										
-L- 269+18	RT	228	231		849.55	849.25			42.0																						
-L- 269+53	CL	229		850.63	849.71																										
-L- 269+53	CL	229	230		849.71	849.57			7.2																						
-L- 269+62	CL	230		850.49	849.47																										
-L- 269+62	RT	230	231		849.47	849.34			10.8																						
-L- 269+62	RT	231		850.26	849.25																										
-L- 269+62	RT	231	233		849.25	848.8			15.6																						
-L- 269+79	RT	232		849.7	849.01																										
-L- 269+79	RT	232	233		849.01	848.9																			4.8						
-L- 269+79	RT	233		849.72	848.8																										
-L- 269+79	RT	233	234		848.8	848.1			26.4																						
-L- 270+06	RT	234		849.5	848																										
-L- 270+06	RT	234	235		848	847.15				16.8																					
SHEET TOTALS									457	97								9.6							19	164					

STATION	375 SIDE DRAIN PIPE	450 SIDE DRAIN PIPE	600 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 1.5m)	*TOTAL L.M. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5m THRU 3.0m	B 3.0m AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	O.T.C.B. STD. 840.04 OR 840.05	J.B. STD. 840.31 OR 840.32		MANHOLE STD. 840.53	MANHOLE STD. 840.51 OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54			DRIVEWAY D.I. STD. 840.30		T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	
-L- 265+79																																			
-L- 267+11						1			1		1																								
-L- 267+11																																			
-L- 266+68						1			1		1																								
-L- 266+47						1							1	1																					
-L- 266+68																																			
-L- 266+48						1			1		1																								
-L- 266+48																																			
-L- 266+23						1			1		1																								
-L- 266+47																																			
-L- 266+23																																			
-L- 266+81																																			
-L- 266+81						1			1			1																							
-L- 267+62						1							1	1																					
-L- 266+81						1										1					1														
-L- 267+62																																			
-L- 267+57						1			1			1																							
-L- 267+57																																			
-L- 267+50						1			1			1																							
-L- 266+81																																			
-L- 267+50																																			
-L- 267+50						1			1			1																							
-L- 267+50																																			
-L- 267+80																																			
-L- 267+80						1			1			1																							
-L- 268+58																																			
-L- 268+00																																			
-L- 268+14						1										1			1																
-L- 268+17																																			
-L- 268+58						1			1			1																							
-Y13- 10+30																																			
-L- 268+14																																			
-Y13- 10+30						1			1			1																							
-Y14- 10+21						1							1	1																					
-Y14- 10+21																																			
-Y14- 10+30						1			1		1																								
-Y14- 10+30																																			
-Y14- 10+24																																			
-Y14- 10+35						1			1			1																							
-Y14- 10+35																																			
-L- 270+46						1							1	1																					
-L- 269+79						1										1						1													
-L- 269+79																																			
-L- 269+09						1							1	1																					
-L- 269+09																																			
-L- 270+46																																			
-L- 269+18						1	0.13		1		1																								
-L- 269+18																																			
-L- 269+53						1			1		1																								
-L- 269+53																																			
-L- 269+62						1			1		1																								
-L- 269+62																																			
-L- 269+62						1			1		1																								
-L- 269+62																																			
-L- 269+79						1							1	1																					
-L- 269+79																																			
-L- 269+79						1			1		1																								
-L- 269+79																																			
-L- 270+06						1																						1	1						
-L- 270+06																																			
SHEET TOTALS						28	0.13		18		10	8	6	6		3			1		1	1						1	1						

STATION	CONC TRANSITIONAL SECTION FOR C.B.	CONC TRANSITIONAL SECTION FOR D.I.	BERM DRAINAGE OUTLET STD. 850.10 OR 850.11	CONVERT EXISTING C.B. TO J.B. (SEE SHEET 2-AD)	CONVERT EXISTING D.I. TO J.B. W/MH COVER (SEE SHEET 2-AD)	PARALLEL PIPE END SECTION STD. 310.02	CROSS PIPE END SECTION STD. 310.03	PARALLEL PIPE END SECTION STD. 310.05	PREFORMED SCOUR HOLE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.M. STD. 840.72	CONC. & BRICK PIPE PLUG, C.M. STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
-L- 265+79													29.2	remove 400mm STEEL
-L- 267+11													6.3	remove 450mm CMP
-L- 267+11													18.2	remove 600mm CONC
-L- 266+68														
-L- 266+47		1												
-L- 266+68													17.5	remove 600mm CONC
-L- 266+48														
-L- 266+48														
-L- 266+23														
-L- 266+47														
-L- 266+23													28.1	remove 450mm CMP
-L- 266+81														
-L- 266+81														
-L- 267+62														
-L- 266+81														
-L- 267+62														
-L- 267+57	1													
-L- 267+57														
-L- 267+50	1													
-L- 266+81														
-L- 267+50														
-L- 267+50														
-L- 267+50														
-L- 267+80														
-L- 267+80														
-L- 268+58														
-L- 268+00														
-L- 268+14														
-L- 268+17														
-L- 268+58														
-Y13- 10+30														
-L- 268+14														
-Y13- 10+30														
-Y14- 10+21														remove/ replace D.I.
-Y14- 10+21													18.7	remove 300mm CMP & conc. HW
-Y14- 10+30														
-Y14- 10+30													19.1	remove 450mm CMP
-Y14- 10+24										2x450				remove 450mm CMP
-Y14- 10+35														
-Y14- 10+35														
-L- 270+46														
-L- 269+79														
-L- 269+79														
-L- 269+09														
-L- 269+09														
-L- 270+46														
-L- 269+18														
-L- 269+18														
-L- 269+53	1													
-L- 269+53														
-L- 269+62	1													
-L- 269+62														
-L- 269+62														
-L- 269+62														
-L- 269+79														
-L- 269+79														
-L- 269+79														
-L- 269+79													12.4	remove 600mm CMP & HWs
-L- 270+06														
-L- 270+06													6.1	remove 600mm CMP & D.I.
SHEET TOTALS	4	1								2x450			155.49	

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

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RD253058

COMPUTED BY: TMW DATE: 3/7/2007

CHECKED BY: KNW DATE: 1/1/2011

METRIC

PROJECT NO.	SHEET NO.
R-2519A	3-K

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS IV R.C. PIPE (UNLESS NOTED OTHERWISE) 300	375	450	600	750	900	1050	1200	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300	400	450	600	800	900	1000	1200	CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR HDPE, TYPE S OR D 300	375	450	600	750	900	1050	1200	375 SIDE DRAIN PIPE	450 SIDE DRAIN PIPE	600 SIDE DRAIN PIPE
THICKNESS OR GAUGE																1.630	1.630	1.630	1.630	1.630	2.010	2.010	2.010											
-L- 270+23	RT	235		848.14	847.15																													
-L- 270+23	RT	235	236		847.15	846.24																				6.0								
-L- 270+24	RT	236		847	846.24																													
-L- 270+24	RT	236	237		846.24	846												6.0																
-L- 271+22	LT	240		845.3	844.38																													
-L- 271+04	LT	240	241		844.38	835											22.8																	
-L- 271+09	RT	242		845.47	844.5																													
-L- 271+09	RT	242	243		844.5	844.07																			10.8									
-L- 271+11	RT	243		844.99	844.07																													
-L- 271+11	RT	243	246		844.07	842.16			51.6																									
-L- 271+36	RT	244		845.6	844.63																													
-L- 271+36	RT	244	245		844.63	844.25				25.2																								
-L- 271+62	RT	245		845.22	843.3																													
-L- 271+62	RT	245	246		843.3	841.94													8.4															
-L- 271+63	RT	246		843.08	841.94																													
-L- 271+83	RT	247		844.7	843.73																													
-L- 271+50	LT	246A		843.84	842.5																													
-L- 271+83	RT	247	245		843.73	843.6			19.2																									
-L- 271+63	RT	246	248		841.94	838.94					85.2																							
-L- 272+52	RT	248		840.08	837.27																													
-L- 272+20	RT	248A		841.36	840.5																													
-L- 272+20	LT	248A	249		840.5	840.16			13.2																									
-L- 272+20	LT	249		841.08	840.16																													
-L- 271+50	RT	246A	246		842.5	841.94			14.4																									
-L- 272+20	LT	249	250		840.16	838.95			31.2																									
-L- 272+52	LT	250		839.87	838.95																													
-L- 272+52	LT	250	251		838.95	833.63													20.4															
-L- 272+48	LT	251		834.55	833.63																													
-L- 272+52	LT	248	250		837.27	838.95					22.8																							
-L- 272+59	RT	253	254		839.5	838.35														4.8														
-L- 272+59	RT	254		839.65	838.35																													
-L- 272+59	RT	254	255		838.35	835.84						70.8																						
-L- 273+30	RT	255		837.14	835.84																													
-L- 273+30	RT	255	256		835.84	833.68						60.0																						
-L- 273+91	RT	256		834.98	833.68																													
-L- 273+91	RT	256	259		833.68	831.63						60.0																						
-L- 274+51	RT	259		832.93	831.63																													
-L- 274+51	RT	259	263		831.63	829.63						51.6																						
-L- 274+18	LT	257		833.8	832.11																													
-L- 274+18	LT	257	258		832.11	833.02																			4.8									
-L- 273+60	LT	257A		836.06	835.06																													
L- 273+60	LT	257A	258		835.06	833.02			58.8																									
-L- 274+18	LT	258		833.94	833.02																													
-L- 274+18	LT	258	261		833.02	830.08			81.6																									
-L- 274+99	LT	260		831.3	830.63																													
-L- 274+99	LT	260	261		830.63	830.08																			8.4									
-L- 275+00	LT	261		831	830.08																													
-L- 275+00	LT	261	266		830.08	829.15			26.4																									
-L- 275+03	LT	262		831.2	830.23																													
-L- 275+03	CL	262	263		830.23	829.96			14.4																									
-L- 275+03	RT	263		830.93	829.63																													
-L- 274+93	RT	264	263		845.5	829.79													33.6															
-L- 275+03	RT	263	271		829.63	828.69						18.0																						
-L- 275+23	LT	265		830.1	829.43																													
-L- 275+23	LT	265	266		829.43	829.15																			13.2									
-L- 275+27	LT	266		830.07	829.15																													
-L- 275+27	LT	266	275		829.15	827.5			42.0																									
SHEET TOTALS									353	25	108	260					23	6	62	4.8					37	6								

STATION	STRUCTURE NO. FROM	STRUCTURE NO. TO	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 1.5m)	*TOTAL L.M. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5m THRU 3.0m	B 3.0m AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	O.T.C.B. STD. 840.04 OR 840.05	J.B. STD. 840.31 OR 840.32	MANHOLE STD. 840.53	MANHOLE STD. 840.51 OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	DRIVEWAY D.I. STD. 840.30	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	CONC TRANSITIONAL SECTION FOR C.B.	CONC TRANSITIONAL SECTION FOR D.I.	BERM DRAINAGE OUTLET STD. 850.10 OR 850.11	CONVERT EXISTING C.B. TO J.B. (SEE SHEET 2-AD)	CONVERT EXISTING D.I. TO J.B. W/MH COVER (SEE SHEET 2-AD)	PARALLEL PIPE END SECTION STD. 310.02	CROSS PIPE END SECTION STD. 310.03	PARALLEL PIPE END SECTION STD. 310.04	PREFORMED SCOUR HOLE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.M. STD. 840.72	CONC. & BRICK PIPE PLUG, C.M. STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
-L- 270+23	235				1			1		1																																	
-L- 270+23	235	236																																								13.3	remove 600mm CMP
-L- 270+24	236				1							1	1																														
-L- 270+24	236	237																																									tie to existing CB
-L- 271+22	240				1			1			1																																
-L- 271+04	240	241																																				1	2x400				
-L- 271+09	242				1							1	1																														
-L- 271+09	242	243																																									
-L- 271+11	243				1			1		1																																	
-L- 271+11	243	246																																									
-L- 271+36	244				1							1	1																														
-L- 271+36	244	245																																									
-L- 271+62	245				1	0.42						1	1																														
-L- 271+62	245	246																																					2x600				
-L- 271+63	246				1			1		1																																	
-L- 271+83	247				1							1	1																														
-L- 271+50	246A				1							1	1																	1													
-L- 271+83	247	245																																									
-L- 271+63	246	248																																								30.6	remove 450mm CMP
-L- 272+52	248				1	1.31		1		1																																	
-L- 272+20	248A				1							1	1																	1													
-L- 272+20	248A	249																																									
-L- 272+20	249				1			1			1																																
-L- 271+50	246A	246																																									
-L- 272+20	249	250																																									
-L- 272+52	250				1			1			1																																
-L- 272+52	250	251																																					2x600			12.1171	remove 600mm CMP and DI
-L- 272+48	251				1																	1																					
-L- 272+52	248	250																																							0.08	27.4971	plug 600 cmp and fill w/ flowable fill
-L- 272+59	253	254																													1								1x800				
-L- 272+59	254				1			1		1																																	
-L- 272+59	254	255																																									
-L- 273+30	255				1			1		1																																	
-L- 273+30	255	256																																									
-L- 273+91	256				1			1		1																																	
-L- 273+91	256	259																																									
-L- 274+51	259				1			1		1																																	
-L- 274+51	259	263																																									
-L- 274+18	257				1	0.19						1	1																														
-L- 274+18	257	258																																									
-L- 273+60	257A				1			1			1																																
L- 273+60	257A	258																																									
-L- 274+18	258				1			1			1																																
-L- 274+18	258	261																																								30.2	remove 2x300mm CMP
-L- 274+99	260				1							1	1																														
-L- 274+99	260	261																																									
-L- 275+00	261				1			1			1																																
-L- 275+00	261	266																																								9.1	remove 375mm CMP
-L- 275+03	262				1							1	1																	1													
-L- 275+03	262	263																																									
-L- 275+03	263				1			1		1																																	
-L- 274+93	264	263																													1								1x600				
-L- 275+03	263	271																																									
-L- 275+23	265				1							1	1																														
-L- 275+23	265	266																																									
-L- 275+27	266				1			1			1																																
-L- 275+27	266	275																																								9.0	remove 375mm CMP
																																							2x400				
																																							5x600				
SHEET TOTALS					28	1.92		16		9	7	11	11									1								3	2							1	1x800		0.08	131.89	

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

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RD253058

COMPUTED BY: TMW DATE: 3/7/2007

CHECKED BY: KNW DATE: 1/1/2011

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

METRIC

PROJECT NO.	SHEET NO.
R-2519A	3-L

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS IV R.C. PIPE (UNLESS NOTED OTHERWISE) 300	375	450	600	750	900	1050	1200	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300 (1.630)	400 (1.630)	450 (1.630)	600 (1.630)	800 (1.630)	900 (2.010)	1000 (2.010)	1200 (2.010)
-Y16- 10+80	LT	267		840.02	839.1																		
-Y16- 10+80	CL	267	268		839.1	838.97				13.2													
-Y16- 10+80	RT	268		839.89	838.97																		
-Y16- 10+80	RT	268	269		838.97	830.67												42.0					
-Y16- 10+31	RT	269		831.59	830.67																		
-Y16- 10+31	RT	269	270		830.67	830.32				6.0													
-Y16- 10+25	RT	270		831.31	830.32																		
-Y16- 10+25	RT	270	271		830.31	829				13.2													
-L- 275+21	RT	271		830.34	828.54																		
-L- 275+21	RT	271	277		828.54	826.78							54.0										
-Y16- 10+40	LT	272	273		833.13	830.86											9.6						
-Y16- 10+30	LT	273		831.78	830.86																		
-Y16- 10+30	LT	273	270		830.86	830.39			10.8														
-L- 275+70	LT	274		828.3	827.63																		
-L- 275+70	LT	274	275		827.63	827.5																	
-L- 275+71	LT	275		828.42	827.43																		
-L- 275+71	LT	275	282		827.43	824.66				66.0													
-L- 275+75	RT	276		828.5	827.53																		
-L- 275+75	RT	276	277		827.53	827.31			9.6														
-L- 275+75	RT	277		828.23	825.89																		
-L- 275+75	RT	278		827.2	826.51																		
-L- 275+75	RT	278	277		826.51	826.41																	
-L- 275+75	RT	277	280		825.89	825.69							24.0										
-L- 275+99	RT	279		827.4	826.43																		
-L- 275+99	RT	279	280		826.43	826.34																	
-L- 275+99	RT	280		827.26	825.69																		
-L- 275+99	RT	280	281		825.69	824.28							36.0										
-L- 276+35	RT	281		825.73	824.28																		
-L- 276+35	CL	281	282		824.28	824							24.0										
-L- 276+37	LT	282		825.65	824																		
-L- 276+37	LT	282	283		824	816.35																20.4	
-L- 276+40	LT	283		818.4	816.35																		
-L- 276+40	LT	283	284		816.35	816.2																	
-L- 277+16	LT	285		822.28	821.31																		
-L- 277+16	LT	285	286		821.31	821.04			12.0														
-L- 277+16	RT	286		821.96	821.04																		
-L- 277+17	RT	287		822.27	821.6																		
-L- 277+17	RT	287	286		821.6	821.04																	
-L- 277+16	RT	286	289		821.04	819.72			24.0														
-L- 277+41	RT	288		821.4	820.36																		
-L- 277+41	RT	288	289		820.36	819.65																	
-L- 277+42	RT	289		820.64	819.5																		
-L- 277+42	RT	289	291		819.5	818.34					28.2												
-L- 277+77	RT	290		819.2	817.9																		
-L- 277+69	RT	290	291		817.9	817.88																4.8	
-L- 277+77	RT	290A		821.0	819.6																		
-L- 277+77	RT	290A	290		819.6	817.9																4.8	
-L- 277+71	RT	291		819.48	817.88																		
-L- 277+71	RT	291	293		817.88	817.7								21.6									
-L- 277+10	LT	292		821.33	820.41																		
-L- 277+28	LT	292	285		820.41	817.7			12.0														
-L- 277+72	LT	293		819.3	817.7																		
-L- 277+72	LT	293	297		818.7	815.15								52.8									
SHEET TOTALS									68	98	28		138	74			9.6	42				30.0	

STATION	FROM	TO	CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR HDPE, TYPE S OR D 300	375	450	600	750	900	1050	1200	375 SIDE DRAIN PIPE	450 SIDE DRAIN PIPE	600 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 1.5m)	*TOTAL L.M. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5m THRU 3.0m	B 3.0m AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G
-Y16- 10+80	267															1						
-Y16- 10+80	267	268																				
-Y16- 10+80	268															1						
-Y16- 10+80	268	269																				
-Y16- 10+31	269															1						
-Y16- 10+31	269	270																				
-Y16- 10+25	270															1			1			1
-Y16- 10+25	270	271																				
-L- 275+21	271															1	0.3					
-L- 275+21	271	277																				
-Y16- 10+40	272	273																				
-Y16- 10+30	273															1			1		1	
-Y16- 10+30	273	270																				
-L- 275+70	274															1						
-L- 275+70	274	275		8.4																		
-L- 275+71	275															1			1			1
-L- 275+71	275	282																				
-L- 275+75	276															1						
-L- 275+75	276	277																				
-L- 275+75	277															1			1		1	
-L- 275+75	278															1						
-L- 275+75	278	277		6.0																		
-L- 275+75	277	280																				
-L- 275+99	279															1						
-L- 275+99	279	280		3.6																		
-L- 275+99	280															1	0.07		1		1	
-L- 275+99	280	281																				
-L- 276+35	281															1			1		1	
-L- 276+35	281	282																				
-L- 276+37	282															1	0.15		1			1
-L- 276+37	282	283																				
-L- 276+40	283															1	0.55					
-L- 276+40	283	284							7.2													
-L- 277+16	285															1						
-L- 277+16	285	286																				
-L- 277+16	286															1			1		1	
-L- 277+17	287															1						
-L- 277+17	287	286		12.0																		
-L- 277+16	286	289																				
-L- 277+41	288															1						
-L- 277+41	288	289			8.4																	
-L- 277+42	289															1			1		1	
-L- 277+42	289	291																				
-L- 277+77	290															1						
-L- 277+69	290	291																				
-L- 277+77	290A														1.4							
-L- 277+77	290A	290																				
-L- 277+71	291															1	0.1		1		1	
-L- 277+71	291	293																				
-L- 277+10	292															1			1			1
-L- 277+28	292	285																				
-L- 277+72	293															1	0.1		1			1
-L- 277+72	293	297																				
SHEET TOTALS				30	8.4				7.2						1.4	25	1.27		12		7	5

STATION	FROM	TO	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	O.T.C.B. STD. 840.04 OR 840.05	J.B. STD. 840.31 OR 840.32	MANHOLE STD. 840.53	MANHOLE STD. 840.51 OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	DRIVEWAY D.I. STD. 840.30	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	CONC TRANSITIONAL SECTION FOR C.B.	CONC TRANSITIONAL SECTION FOR D.I.	BERM DRAINAGE OUTLET STD. 850.10 OR 850.11	CONVERT EXISTING C.B. TO J.B. (SEE SHEET 2-AD)	CONVERT EXISTING D.I. TO J.B. W/MH COVER (SEE SHEET 2-AD)	PARALLEL PIPE END SECTION STD. 310.02	CROSS PIPE END SECTION STD. 310.03	PARALLEL PIPE END SECTION STD. 310.04	PREFORMED SCOUR HOLE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.M. STD. 840.72	CONC. & BRICK PIPE PLUG, C.M. STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
-Y16- 10+80	267												1																					
-Y16- 10+80	267	268																																
-Y16- 10+80	268					1					1																							
-Y16- 10+80	268	269																												2x450				
-Y16- 10+31	269					1					1																							
-Y16- 10+31	269	270																																
-Y16- 10+25	270																																	
-Y16- 10+25	270	271																																
-L- 275+21	271																1		1															
-L- 275+21	271	277																															16.7	remove 375mm CMP
-Y16- 10+40	272	273																												2x400				
-Y16- 10+30	273																																	
-Y16- 10+30	273	270																																
-L- 275+70	274		1	1																														
-L- 275+70	274	275																																
-L- 275+71	275																																	
-L- 275+71	275	282																																
-L- 275+75	276		1	1																		1												
-L- 275+75	276	277																																
-L- 275+75	277																																	
-L- 275+75	278		1	1																														
-L- 275+75	278	277																																
-L- 275+75	277	280																																remove 375mm CMP
-L- 275+99	279		1	1																														
-L- 275+99	279	280																																
-L- 275+99	280																																	
-L- 275+99	280	281																														0.16		remove D.I. and plug 600mm CMP w/ flowable fill
-L- 276+35	281																																	
-L- 276+35	281	282																																
-L- 276+37	282																																	
-L- 276+37	282	283																												2x1000				
-L- 276+40	283															1	1																	
-L- 276+40	283	284																																
-L- 277+16	285		1	1																		1												
-L- 277+16	285	286																																
-L- 277+16	286																																	
-L- 277+17	287		1	1																														
-L- 277+17	287	286																																
-L- 277+16	286	289																																remove 2 unknown drainage item
-L- 277+41	288		1	1																														
-L- 277+41	288	289																																
-L- 277+42	289																																	
-L- 277+42	289	291																																remove 2 unknown drainage item
-L- 277+77	290												1																					
-L- 277+69	290	291																													0.65		3.0	remove headwall & 3m of 450mm CMP
-L- 277+77	290A																																	
-L- 277+77	290A	290																																
-L- 277+71	291																																	
-L- 277+71	291	293																															27.2	remove 450mm CMP and conc hw
-L- 277+10	292																																	
-L- 277+28	292	285																																
-L- 277+72	293																																	
-L- 277+72	293	297																																
																														2x400				
																														2x450				
SHEET TOTALS			7	7		2					2		2			1	2		1			2								2x1000	0.65	0.16	46.87	

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

RD248619

COMPUTED BY: TMW DATE: 3/7/2007

CHECKED BY: KNW DATE: 1/1/2011

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

METRIC

PROJECT NO.	SHEET NO.
R-2519A	3-M

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS IV R.C. PIPE (UNLESS NOTED OTHERWISE) 300	375	450	600	750	900	1050	1200	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300 / 1.630	400 / 1.630	450 / 1.630	600 / 1.630	800 / 1.630	900 / 2.010	1000 / 2.010	1200 / 2.010	CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR HDPE, TYPE S OR D 300	375	450	600	750	900	1050	1200
-L- 277+90	RT	294		818.5	817.83																										
-L- 277+90	RT	294	295		817.83	817.73																			4.8						
-L- 277+89	RT	295		818.86	817.73																										
-L- 277+89	RT	295	301		817.73	816.15			44.4																						
-L- 278+26	CL	296		817.23	816.26																										
-L- 278+26	CL	296	297		816.26	815.83			12.0																						
-L- 278+26	LT	297		816.75	815.15																										
-L- 278+26	LT	297	299		815.15	810.5								14.4																	
-L- 278+34	RT	300		816.8	816.13																										
-L- 278+34	RT	300	301		816.13	816																			10.8						
-L- 278+34	RT	301		817.07	816																										
-L- 278+34	RT	301	303		816	814.03			45.6																						
-L- 278+78	RT	302		815.1	814.43																										
-L- 278+78	RT	302	303		814.43	814.03																			7.2						
-L- 278+79	RT	303		814.95	814.03																										
-L- 278+79	RT	303	305		814.03	811.49			42.0																						
-L- 279+24	RT	304		812.9	812.23																										
-L- 279+24	RT	304	305		812.23	811.49			15.6																						
-L- 279+10	LT	307A		812.3	809.3																										
-L- 279+19	RT	305		812.89	811.06																										
-L- 279+29	LT	306		811.98	811.06																										
-L- 279+29	LT	306	307		811.06	810.9			3.6																						
-L- 279+22	LT	307		812.32	809.26																										
-L- 279+10	LT	307A	307		809.3	809.26			8.4																						
-L- 279+24	LT	308		811.8	807.91																										
-L- 279+26	LT	309			806.8													4.8													
-Y17- 10+74	LT	310	311		809.1	808.35											7.2														
-Y17- 10+81	LT	311		809.27	808.35																										
-Y17- 10+81	LT	311	312		808.35	807.87			20.4																						
-Y17- 11+01	LT	312		808.29	807.87																										
-Y17- 11+01	CL	312	313		807.87	807.77			21.6																						
-Y17- 13+07	RT	314	316		815.12	811.29			48.0																						
-Y17- 12+60	RT	315	316			811.07													2.4												
-Y17- 12+59	RT	316		812.21	810.76																										
-Y17- 12+59	RT	316	318		810.76	809.82							33.6																		
-Y17- 12+26	RT	317		811.2	810.53																										
-Y17- 12+26	RT	317	318		810.53	810.35																			6.0						
-Y17- 12+26	RT	318		811.27	809.82																										
-Y17- 12+26	RT	318	319		809.82	809.5							33.6																		
-Y17- 11+91	RT	319		811.8	809.5																										
-Y17- 11+91	CL	319	320		809.5	809.4								18.0																	
-Y17- 11+91	LT	320		811.52	809.4																										
-Y17- 11+98	LT	321	320		810.95	810.6																			8.4						
-Y17- 11+91	LT	320	322		809.4	809.05								21.6																	
-L- 279+61	RT	322		811.1	809.05																										
-L- 279+61	RT	322	323		809.05	806.79								31.2																	
-L- 280+39	RT	325		807.6	806.68																										
-L- 280+39	RT	325	326		806.68	806.4			14.4																						
-L- 280+39	LT	326		807.32	806.4																										
-L- 280+39	LT	326	327		806.4	806.2			6.0																						
SHEET TOTALS									282				67	85			7.2	4.8	2.4						37						

STATION	STRUCTURE NO. FROM	TO	375 SIDE DRAIN PIPE	450 SIDE DRAIN PIPE	600 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 1.5m)	*TOTAL L.M. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5m THRU 3.0m	B 3.0m AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	O.T.C.B. STD. 840.04 OR 840.05	J.B. STD. 840.31 OR 840.32
-L- 277+90	294							1							1	1										
-L- 277+90	294	295																								
-L- 277+89	295							1			1		1													
-L- 277+89	295	301																								
-L- 278+26	296							1							1	1										
-L- 278+26	296	297																								
-L- 278+26	297							1	0.1					1												
-L- 278+26	297	299																								
-L- 278+34	300							1							1	1										
-L- 278+34	300	301																								
-L- 278+34	301							1			1		1													
-L- 278+34	301	303																								
-L- 278+78	302							1							1	1										
-L- 278+78	302	303																								
-L- 278+79	303							1			1		1													
-L- 278+79	303	305																								
-L- 279+24	304							1							1	1										
-L- 279+24	304	305																								
-L- 279+10	307A							1							1	1										
-L- 279+19	305							1	0.33																	
-L- 279+29	306							1																		
-L- 279+29	306	307																								
-L- 279+22	307							1	1.5	0.06					1	1										
-L- 279+10	307A	307																								
-L- 279+24	308							1	1.5	0.89	1			1												
-L- 279+26	309																									
-Y17- 10+74	310	311																								
-Y17- 10+81	311							1			1			1												
-Y17- 10+81	311	312																								
-Y17- 11+01	312							1			1	1														
-Y17- 11+01	312	313																								
-Y17- 13+07	314	316																								
-Y17- 12+60	315	316																								
-Y17- 12+59	316							1			1			1												
-Y17- 12+59	316	318																								
-Y17- 12+26	317							1							1	1										
-Y17- 12+26	317	318																								
-Y17- 12+26	318							1			1	1														
-Y17- 12+26	318	319																								
-Y17- 11+91	319							1	0.8		1		1													
-Y17- 11+91	319	320																								
-Y17- 11+91	320							1	0.62					1												
-Y17- 11+98	321	320																								
-Y17- 11+91	320	322																								
-L- 279+61	322							1	0.55																	
-L- 279+61	322	323																								
-L- 280+39	325							1			1			1												
-L- 280+39	325	326																								
-L- 280+39	326							1			1			1												
-L- 280+39	326	327																								
SHEET TOTALS								24	5.4	0.95	11	2	4	7	8	8										

STATION	STRUCTURE NO. FROM	TO	MANHOLE STD. 840.53	MANHOLE STD. 840.51 OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	C.B. (SEE SPECIAL DETAIL SHEET 2-X)	DRIVEWAY D.I. STD. 840.30	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	CONC TRANSITIONAL SECTION FOR C.B.	CONC TRANSITIONAL SECTION FOR D.I.	BERM DRAINAGE OUTLET STD. 850.10 OR 850.11	CONVERT EXISTING C.B. TO J.B. (SEE SHEET 2-AD)	CONVERT EXISTING D.I. TO J.B. W/MH COVER (SEE SHEET 2-AD)	PARALLEL PIPE END SECTION STD. 310.02	CROSS PIPE END SECTION STD. 310.03	PARALLEL PIPE END SECTION STD. 310.04	PREFORMED SCOUR HOLE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.M. STD. 840.72	CONC. & BRICK PIPE PLUG, C.M. STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
-L- 277+90	294																						
-L- 277+90	294	295																					
-L- 277+89	295																						
-L- 277+89	295	301																				7.8	remove 375mm CMP
-L- 278+26	296										1												
-L- 278+26	296	297																					
-L- 278+26	297					1																	
-L- 278+26	297	299																1	2x1000			1	
-L- 278+34	300																						
-L- 278+34	300	301																				9.9	remove 200mm CMP
-L- 278+34	301																						
-L- 278+34	301	303																				8.2	remove 375mm CMP
-L- 278+78	302																						
-L- 278+78	302	303																					
-L- 278+79	303																						
-L- 278+79	303	305																				42.1	remove 375mm CMP
-L- 279+24	304																						
-L- 279+24	304	305																					
-L- 279+10	307A										1												
-L- 279+19	305			1	1																		remove D.I.
-L- 279+29	306				1			1															
-L- 279+29	306	307																					
-L- 279+22	307										1												
-L- 279+10	307A	307																					
-L- 279+24	308																						
-L- 279+26	309																		1x450	0.33			outlet in the proposed culvert
-Y17- 10+74	310	311																	2x400				
-Y17- 10+81	311																						
-Y17- 10+81	311	312																					
-Y17- 11+01	312																						
-Y17- 11+01	312	313																					
-Y17- 13+07	314	316																				11.8	remove 300mm CMP
-Y17- 12+60	315	316																		0.4			
-Y17- 12+59	316																						
-Y17- 12+59	316	318																				9.5	remove 400mm CMP
-Y17- 12+26	317																						
-Y17- 12+26	317	318																					
-Y17- 12+26	318																				0.05		plug 450mm CMP
-Y17- 12+26	318	319																				9.5	remove 300mm CMP
-Y17- 11+91	319																						
-Y17- 11+91	319	320																					
-Y17- 11+91	320					1																	
-Y17- 11+98	321	320																					
-Y17- 11+91	320	322																					
-L- 279+61	322		1		1																		
-L- 279+61	322	323																					
-L- 280+39	325									1													
-L- 280+39	325	326																					
-L- 280+39	326																						
-L- 280+39	326	327																					
																			2x400				
																			1x450				
SHEET TOTALS			1	1	3	2		1		1	3							1	2x1000	0.73	0.05	99.81	

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

RD253058

COMPUTED BY: TMW DATE: 3/7/2007

CHECKED BY: KNW DATE: 1/1/2011

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

METRIC

PROJECT NO.	SHEET NO.
R-2519A	3-N

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS IV R.C. PIPE (UNLESS NOTED OTHERWISE) SIZE								BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) SIZE										CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR HDPE, TYPE S OR D SIZE							
THICKNESS OR GAUGE								300	375	450	600	750	900	1050	1200	1.630	1.630	1.630	1.630	1.630	2.010	2.010	2.010	300	375	450	600	750	900	1050	1200
-L- 280+70	LT	328																													
-L- 280+47	RT	329		807.6	806.63																										
-L- 280+47	RT	329	330		806.63	806.43			18.0																						
-L- 280+64	RT	330		807.4	806.43																										
-L- 280+64	RT	330	331		806.43	805.75			20.4																						
-L- 280+82	RT	331		806.67	805.75																										
-L- 280+83	RT	332	331		818	805.75										26.4															
-L- 280+82	RT	331	336		805.75	804.82			49.2																						
-L- 281+22	LT	333		805.93	805.01																										
-L- 281+22	LT	333	334		805.01	804.96			6.0																						
-L- 281+30	LT	335																													
-L- 281+31	RT	336		805.74	804.82																										
-L- 281+31	RT	336	342		804.82	804.04			51.6																						
-L- 281+61	LT	338		805.21	804.29																										
-L- 281+61	LT	338	339		804.29	804.2																			8.4						
-L- 281+87	LT	342A		805.24	803.9																										
-L- 281+92	LT	340									57.6																				
-L- 281+81	RT	341	342		808.6	804.04										10.8															
-L- 281+83	RT	342		804.96	803.97																										
-L- 281+83	RT	342	345		803.97	803.32				36.0																					
-L- 281+87	RT	342A	342		803.9	804.04			14.4																						
-L- 282+07	RT	343		808.6	807.91																										
-L- 282+07	RT	343	344		807.91	806.04										14.4															
-L- 282+21	RT	344		807	806.04																										
-L- 282+21	RT	344	345		806.04	803.39																			9.6						
-L- 282+18	RT	345		804.31	803.17																										
-L- 282+18	CL	345	346		803.17	803					30																				
-L- 282+29	LT	346		804.23	803																										
-L- 282+29	LT	346	347		803	802.8																					10.8				
-L- 282+63	RT	348		806	805.24																										
-L- 282+63	RT	348	349		805.24	802.69																				10.8					
-L- 282+63	RT	349		803.68	802.54																										
-L- 282+63	RT	349	350		802.54	802.2					10.8																				
-L- 282+63	LT	350	351		802.2	801.82					13.2																				
-L- 282+63	RT	350		803.95	802.2																										
-L- 282+63	LT	351		803.68	801.82																										
-L- 282+63	LT	351	352		801.82	801.7																					10.8				
-L- 282+79	LT	353											14.4																		
-L- 283+27	LT	354											14.4																		
-L- 283+39	LT	355		802.5	801.58																										
-L- 283+39	LT	355	356		801.58	801.33			8.4																						
-L- 283+67	LT	357											14.4																		
-L- 283+82	LT	358		802.19	801.27																										
-L- 283+82	LT	358	359		801.27	801.2			7.2																						
-L- 283+44	RT	360	361		805.5	801.31												13.2													
-L- 283+44	RT	361		802.45	801.31																										
-L- 283+44	RT	361	362		801.31	801.07					30.0																				
-L- 283+74	RT	362		802.21	801.07																										
-L- 283+74	RT	362	364		801.07	800.85					54.0																				
-L- 284+10	RT	363		801.8	801.11																										
-L- 284+10	RT	363	364		801.11	801																			7.2						
-L- 284+11	RT	364		802.1	800.85																										
SHEET TOTALS								175	36	196		43				52		13						25	11	22					

STATION	375 SIDE DRAIN PIPE	450 SIDE DRAIN PIPE	600 SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. METERS R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES *TOTAL L.M. FOR PAY QUANTITY SHALL BE COL. "A" + (1.3 X COL. "B") METERS A 1.5m THRU 3.0m	B 3.0m AND ABOVE	PER EACH (0 THRU 1.5m)	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	O.T.C.B. STD. 840.04 OR 840.05	J.B. STD. 840.31 OR 840.32	MANHOLE STD. 840.53	MANHOLE STD. 840.51 OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	DRIVEWAY D.I. STD. 840.30	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	CONC TRANSITIONAL SECTION FOR C.B.	CONC TRANSITIONAL SECTION FOR D.I.	BERM DRAINAGE OUTLET STD. 850.10 OR 850.11	CONVERT EXISTING C.B. TO J.B. (SEE SHEET 2-AD)	CONVERT EXISTING D.I. TO J.B. W/MH COVER (SEE SHEET 2-AD)	PARALLEL PIPE END SECTION STD. 310.02	CROSS PIPE END SECTION STD. 310.03	PARALLEL PIPE END SECTION STD. 310.04	PREFORMED SCOUR HOLE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.M. STD. 840.72	CONC. & BRICK PIPE PLUG, C.M. STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
-L- 280+70		19.2																																											
-L- 280+47								1					1	1																															
-L- 280+47																																													
-L- 280+64								1					1	1																															
-L- 280+64																																													
-L- 280+82								1			1			1																															
-L- 280+83																																	1							1x400					
-L- 280+82																																													
-L- 281+22								1			1			1																															
-L- 281+22																																													
-L- 281+30		34.8																																											
-L- 281+31								1			1			1																															
-L- 281+31																																											42.8	remove 375mm CMP, D.I., and 450mm CMP
-L- 281+61								1			1			1																															
-L- 281+61																																													
-L- 281+87								1					1	1																			1												
-L- 281+92																																										0.06		remove D.I., plug 375mm CMP
-L- 281+81																																	1							1x400					
-L- 281+83								1			1			1																															
-L- 281+83																																													
-L- 281+87																																													
-L- 282+07								1					1	1																															
-L- 282+07																																								2x400					
-L- 282+21								1					1	1																															
-L- 282+21																																													
-L- 282+18								1			1			1																															
-L- 282+18																																													
-L- 282+29								1			1			1																															
-L- 282+29																																													
-L- 282+63								1					1	1																															
-L- 282+63																																													
-L- 282+63								1			1			1																															
-L- 282+63																																												remove headwall	
-L- 282+63																																												remove 600 cmp	
-L- 282+63								1	0.25				1	1																			1												
-L- 282+63								1	0.36		1			1																															
-L- 282+63																																										0.08	31.4	remove 2x600mm CMP, D.I., & plug 600mm CMP	
-L- 282+79																																													
-L- 283+27																																											9.0	remove 375mm CMP	
-L- 283+39								1			1			1																															
-L- 283+39																																													
-L- 283+67																																											21.7	remove 2x250mm CMP	
-L- 283+82								1			1			1																															
-L- 283+82																																													
-L- 283+44																																	1							1x600					
-L- 283+44								1			1			1																													8.9	remove 450mm CMP	
-L- 283+44																																													
-L- 283+74								1			1			1																															
-L- 283+74																																											20.2	remove 450mm CMP	
-L- 284+10								1						1																															
-L- 284+10																																													
-L- 284+11								1			1			1																															
																																							4x400					
SHEET TOTALS		54						22	0.61		14		8	6	8	8																	2	3						1x600		0.14	134.02	

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

RD253058,2/11/2011,R:\Roadway\estimate\Final\SUMMARY\R2519a_ Drainage_summary.xls

RD253058

COMPUTED BY: TMW DATE: 3/7/2007

CHECKED BY: KNW DATE: 1/1/2011

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

METRIC

PROJECT NO. R-2519A SHEET NO. 3-O

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 1200 & 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 IV R.C. PIPE (UNLESS NOTED OTHERWISE) 300	375	450	600	750	900	1050	1200	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300 / 1.630	400 / 1.630	450 / 1.630	600 / 1.630	800 / 1.630	900 / 2.010	1000 / 2.010	1200 / 2.010	CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR HDPE, TYPE S OR D 300	375	450	600	750	900	1050	1200	375 SIDE DRAIN PIPE	450 SIDE DRAIN PIPE	600 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 1.5m)	*TOTAL L.M. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5m THRU 3.0m	B 3.0m AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	O.T.C.B. STD. 840.04 OR 840.05	J.B. STD. 840.31 OR 840.32		MANHOLE STD. 840.53	MANHOLE STD. 840.51 OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54			DRIVEWAY D.I. STD. 840.30		T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35		CONC TRANSITIONAL SECTION FOR C.B.	CONC TRANSITIONAL SECTION FOR D.I.	BERM DRAINAGE OUTLET STD. 850.10 OR 850.11	CONVERT EXISTING C.B. TO J.B. (SEE SHEET 2-AD)	CONVERT EXISTING D.I. TO J.B. W/MH COVER (SEE SHEET 2-AD)	PARALLEL PIPE END SECTION STD. 310.02	CROSS PIPE END SECTION STD. 310.03	PARALLEL PIPE END SECTION STD. 310.04	PREFORMED SCOUR HOLE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.M. STD. 840.72	CONC. & BRICK PIPE PLUG, C.M. STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
-L- 284+11	RT	364	366		800.85	800.7					18.0																																																																								20.2	remove 375mm CMP
-L- 284+27	RT	365		801.8	801.11																																1							1	1																																			
-L- 284+27	RT	365	366		801.11	801																			7.2																																																							
-L- 284+27	RT	366		802.05	800.07																																1	0.48		1		1																																						remove D.I.
-L- 284+27	RT	366	368		800.7	800.4					33.6																																																																								17.9	remove 375mm CMP
-L- 284+61	RT	367		802.1	801.4																																1							1	1																																			
-L- 284+61	RT	367	368		801.4	801.03																			6																																																							
-L- 284+61	RT	368		801.95	800.4																																1	0.05		1		1																																						remove D.I.
-L- 284+61	RT	368	369		800.4	800.05					42.0																																																																								43.9	remove 375mm CMP
-L- 285+02	RT	369		801.83	800.05																																1	0.28		1		1																																							
-L- 285+02	RT	369	370		800.05	800					3.6																																																																									tie to culvert
-L- 284+43	LT	371		802.05	798.85																																1	1.5	0.3	1			1																																					
-L- 284+95	LT	372	372A		798.75	801.11			9.6																																																																							
-L- 284+43	LT	371	372		798.85	798.75			49.2																																																																							
-L- 284+93	LT	372		801.9	798.75																																1	1.5	0.15	1			1																																					
-L- 284+93	LT	372	373		798.75	798.7					3.6																																																																									tie to culvert
-L- 285+08	LT	374		801.87	798.87																																1	1.5		1			1																																					
-L- 284+95	LT	372A		802.11	801.11																																1							1	1																							1												
-L- 285+08	LT	374	375		798.87	798.7			4.8																																																																							tie to culvert
-Y19- 11+55	LT	376		802	800.36																																1	0.14								1						1																												remove D.I.
-Y19- 11+55	LT	376	377		800.36	799.16								7.2																																																																	7.5	remove 300mm CONC
-Y19- 11+55	LT	377		801.06	799.16																																1	0.4								1						1																												remove D.I.
-Y19- 11+55	CL	377	378		799.16	799								28.8																																																																	17.6	remove 750mm RCP
-Y19- 11+63	LT	379	381		801	800.2					13.2																																																																					
-Y19- 11+73	LT	380		802.16	801																																1							1	1																																			
-Y19- 11+73	LT	380	381		801	800.34				10.8																																																																						
-Y19- 11+70	LT	381		801.1	800.2																																1							1	1																																			
-Y19- 11+70	LT	381	382		800.2	799.95													3.6																																																										0.4		11.8	remove D.I. And 450 RCP
-Y19- 11+70	RT	383		801.35	799.95																																1			1			1																																					
-Y19- 11+70	RT	383	384		799.95	799.5					8.4																																																																					
-D17- 10+40	CL	385							13.2																																																																					10.2	remove 450mm CMP
-L- 285+45	LT	386		801.74	800.82																																1			1		1																																							
-L- 285+45	LT	386	387		800.82	800.6																			8.4																																																							
-Y19- 11+93	CL	388			800.3						31.2																																																																								21.5	remove 600mm CMP
-L- 285+69	RT	389A		802.22	799.5																																1	1.22		1			1																																					
-L- 285+49	RT	389		802.07	799.07																																1			1			1																																					
-L- 285+49	RT	389	390		799.07	799.61																			22.8																																																						9.1	remove 300mm CMP
-Y18- 10+30	LT	390		800.53	799.61																																1			1			1																																					
-Y18- 10+30	LT	390	391		799.61	799.5			22.8																																																																							
-L- 285+69	RT	389A	389		799.5	799.07			26.4																																																																							
-L- 285+69	RT	389B		802.19	799.6																																1	1.09						1	1																							1												
-L- 285+69	RT	389B	389A		799.6	799.5			9.6																																																																							
-L- 286+23	LT	392A	394		800.4	800.24			60.0																																																																							
-L- 286+94	LT	393		800.8	800.3																																1																						1					1																remove drainage structure
-L- 286+94	LT	393	394		800.3	800.24			19.2																																																																						16.6	remove 2x375mm RCP
-L- 286+82	LT	394		801.16	800.24																																1			1			1																																					
-L- 286+21	LT	392A		801.72	800.2																																1			1			1																								1													
-L- 286+21	LT	392A	392		800.2	800.15			18.0																																																																							
-L- 286+82	LT	394	397		800.24	799.61			40.8																																																																							
-L- 287+23	RT	396		800.93	800.01																																1							1	1																							1												
-L- 286+60	LT	394A		801.76	800.35																																1							1	1																							1												
-L- 286+60	LT	394A	395		800.35	800.28			21.6																																																																							
-L- 287+23	CL	396	397		800.01	799.61			14																																																																							
-L- 287+23	LT	397		800.53	798.93																																1			1			1																																					
-L- 287+24	LT	398		800	799.03																																1							1	1																																			
-L- 287+24	LT	398	397		799.03	798.93			4.8																																																																							
-L- 286+81	LT	395	394		800.28	800.24			9.6																																																																							
-L- 286+81	LT	395		801.51	800.28																																1							1	1																							1												
-L- 287+23	LT	397	400		798.93	798.73					37.2																																																																					
-L- 287+61	LT	399		799.7	798.73																																1							1	1																																			
SHEET TOTALS									311	24	191			36					3.6						44.4												28	8.16	0.45	14		4	10	11	11	2						2							1					1			1	5									0.4		176.35	

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

RD253058

COMPUTED BY: TMW DATE: 3/7/2007

CHECKED BY: KNW DATE: 1/1/2011

METRIC

PROJECT NO.	SHEET NO.
R-2519A	3-P

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS IV R.C. PIPE (UNLESS NOTED OTHERWISE) 300	375	450	600	750	900	1050	1200
-L- 287+61	LT	399	400		798.73	798.7			4.8						
-L- 287+61	LT	400		799.88	798.7										
-L- 287+61	LT	400	401		798.7	798.37					26.4				
-L- 287+88	LT	401		799.51	798.21										
-L- 287+88	LT	401	402		798.21	798.17						13.2			
-L- 287+88	RT	402		799.87	798.17										
-L- 287+88	RT	402	403		798.17	798						20.4			
-Y20- 10+42	LT	404		799.92	799										
-Y20- 10+42	LT	404	405		799	796.3									
-Y20- 10+55	RT	405A							15.6						
-L- 288+44	LT	406		798.49	797.57										
-L- 288+44	LT	406	407		797.57	797.46			6.0						
-L- 288+50	LT	407		798.38	797.46										
-L- 288+50	CL	407	408		797.46	797.38			25.2						
-L- 288+50	RT	408		798.38	797.38										
-L- 288+50	RT	408	409		797.38	797.3									
-L- 289+45	LT	410		796.8	796.11										
-L- 289+45	LT	410	411		796.11	795.81			18.0						
-L- 289+49	LT	411		796.73	795.21										
-L- 289+51	RT	412		796.43	794.04										
-L- 289+51	RT	412	413		794.04	793.8									
-L- 290+11	LT	414		796.19	795.12										
-L- 290+11	LT	414	415		795.12	794.56			16.8						
-L- 290+10	RT	415		795.65	793.86										
-L- 290+10	RT	415	416		793.86	793.7					13.2				
-L- 290+10	RT	415	420		793.86	794.06					33.6				
-Y21- 11+86	LT	417	418		796	795.31			45.6						
-L- 290+45	LT	418		796.23	795.09										
-L- 290+45	LT	418	419		795.09	794.5					20.4				
-L- 290+43	RT	419		795.7	794.5										
-L- 290+43	RT	419	420		794.5	794.06					15.6				
-L- 290+37	RT	420		795.2	794.06										
-L- 290+94	LT	421		796.58	795.6										
-L- 290+94	LT	421	422		795.6	795.55					6.0				
-L- 290+89	LT	422		796.98	795.55										
-L- 290+89	LT	422	423		795.55	795.5					27.6				
-L- 290+62	LT	423		797	795.5										
-L- 290+62	LT	423	418		795.5	795.09					18.0				
-L- 290+91	RT	424		795.88	794.96										
-L- 290+91	RT	424	425		794.96	794.64			10.8						
-L- 290+91	RT	425		795.56	794.64										
-L- 290+91	RT	425	428		794.64	794.44			46.8						
-L- 291+38	LT	426		796.38	795.05										
-L- 291+38	RT	427	428		794.17	794.07									
-L- 291+38	RT	428		795.88	794.07										
-L- 291+38	RT	428	430		794.07	793.87				42.0					
-L- 291+81	LT	429		796.62	795.7										
SHEET TOTALS									190	42	161	34			

STATION	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300 (1.630)	400 (1.630)	450 (1.630)	600 (1.630)	800 (1.630)	900 (2.010)	1000 (2.010)	1200 (2.010)	CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR HDPE, TYPE S OR D 300	375	450	600	750	900	1050	1200	375 SIDE DRAIN PIPE	450 SIDE DRAIN PIPE	600 SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. METERS R.C.P.	C.S.P.
-L- 287+61																					
-L- 287+61																					
-L- 287+61																					
-L- 287+88																					
-L- 287+88																					
-L- 287+88																					
-L- 287+88																					
-Y20- 10+42																					
-Y20- 10+42		14.4																			
-Y20- 10+55																					
-L- 288+44																					
-L- 288+44																					
-L- 288+50																					
-L- 288+50																					
-L- 288+50																					
-L- 288+50											8.4										
-L- 289+45																					
-L- 289+45																					
-L- 289+49																					
-L- 289+51																					
-L- 289+51											22										
-L- 290+11																					
-L- 290+11																					
-L- 290+10																					
-L- 290+10																					
-L- 290+10																					
-Y21- 11+86																					
-L- 290+45																					
-L- 290+45																					
-L- 290+43																					
-L- 290+43																					
-L- 290+37																					
-L- 290+94																					
-L- 290+94																					
-L- 290+89																					
-L- 290+89																					
-L- 290+62																					
-L- 290+62																					
-L- 290+91																					
-L- 290+91																					
-L- 290+91																					
-L- 290+91																					
-L- 291+38																					
-L- 291+38			6.0																		
-L- 291+38																					
-L- 291+38																					
-L- 291+81																					
SHEET TOTALS		14	6								30										

STATION	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0 THRU 1.5m)	*TOTAL L.M. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5m THRU 3.0m	B 3.0m AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	O.T.C.B. STD. 840.04 OR 840.05	J.B. STD. 840.31 OR 840.32
-L- 287+61																			
-L- 287+61	1			1			1												
-L- 287+61																			
-L- 287+88	1			1			1												
-L- 287+88																			
-L- 287+88	1	0.2						1	1										
-L- 287+88																			
-Y20- 10+42	1			1			1												
-Y20- 10+42																			
-Y20- 10+55																			
-L- 288+44	1			1			1												
-L- 288+44																			
-L- 288+50	1			1			1												
-L- 288+50																			
-L- 288+50	1			1		1													
-L- 288+50																			
-L- 289+45	1							1	1										
-L- 289+45																			
-L- 289+49	1	0.02						1	1										
-L- 289+51	1	0.89		1		1													
-L- 289+51																			
-L- 290+11	1							1	1										
-L- 290+11																			
-L- 290+10	1	0.29		1		1													
-L- 290+10																			
-L- 290+10																			
-Y21- 11+86																			
-L- 290+45	1			1	1														
-L- 290+45																			
-L- 290+43	1							1	1										
-L- 290+43																			
-L- 290+37	1			1		1													
-L- 290+94	1							1	1										
-L- 290+94																			
-L- 290+89	1							1	1										
-L- 290+89																			
-L- 290+62	1							1	1										
-L- 290+62																			
-L- 290+91	1			1			1												
-L- 290+91																			
-L- 290+91	1			1			1												
-L- 290+91																			
-L- 291+38	1			1			1												
-L- 291+38																			
-L- 291+38	1	0.31		1			1												
-L- 291+38																			
-L- 291+81	1			1			1												
SHEET TOTALS	23	1.71		15	1	4	10	8	8										

STATION		MANHOLE STD. 840.53	MANHOLE STD. 840.51 OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54			DRIVEWAY D.I. STD. 840.30		T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35		CONC TRANSITIONAL SECTION FOR C.B.	CONC TRANSITIONAL SECTION FOR D.I.	BERM DRAINAGE OUTLET STD. 850.10 OR 850.11	CONVERT EXISTING C.B. TO J.B. (SEE SHEET 2-AD)	CONVERT EXISTING D.I. TO J.B. W/MH COVER (SEE SHEET 2-AD)	PARALLEL PIPE END SECTION STD. 310.02	CROSS PIPE END SECTION STD. 310.03	PARALLEL PIPE END SECTION STD. 310.04	PREFORMED SCOUR HOLE
-L- 287+61																				
-L- 287+61																				
-L- 287+61																				
-L- 287+88																				
-L- 287+88																				
-L- 287+88													1							
-L- 287+88																				1
-Y20- 10+42																				
-Y20- 10+42																				
-Y20- 10+55																				
-L- 288+44																				
-L- 288+44																				
-L- 288+50																				
-L- 288+50																				
-L- 288+50																				
-L- 288+50																				1
-L- 289+45																				
-L- 289+45																				
-L- 289+49													1							
-L- 289+51																				
-L- 289+51																				1
-L- 290+11													1							
-L- 290+11																				
-L- 290+10																				
-L- 290+10																				1
-L- 290+10																				
-Y21- 11+86																				
-L- 290+45																				
-L- 290+45																				
-L- 290+43													1							
-L- 290+43																				
-L- 290+37																				
-L- 290+94																				
-L- 290+94																				
-L- 290+89																				
-L- 290+89																				
-L- 290+62																				
-L- 290+62																				
-L- 290+91												1								
-L- 290+91																				
-L- 290+91																				
-L- 290+91																				
-L- 291+38												1								
-L- 291+38																				
-L- 291+38																				
-L- 291+38																				
-L- 291+81												1								
SHEET TOTALS												3	4							4

STATION	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.M. STD. 840.72	CONC. & BRICK PIPE PLUG, C.M. STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
-L- 287+61					
-L- 287+61					
-L- 287+61				23.9	remove 450mm CMP and brick hw
-L- 287+88					
-L- 287+88					
-L- 287+88				19.861	remove 450mm CMP and rock hw
-L- 287+88					
-Y20- 10+42					
-Y20- 10+42	2x400				
-Y20- 10+55					
-L- 288+44					
-L- 288+44					
-L- 288+50					
-L- 288+50					
-L- 288+50					
-L- 288+50					
-L- 289+45					
-L- 289+45				4.0	remove 450mm CMP
-L- 289+49					
-L- 289+51					
-L- 289+51					
-L- 290+11					
-L- 290+11					
-L- 290+10					
-L- 290+10					
-L- 290+10					
-Y21- 11+86					
-L- 290+45					
-L- 290+45				23.9	remove 450mm CMP
-L- 290+43					
-L- 290+43					
-L- 290+37					
-L- 290+94					
-L- 290+94					
-L- 290+89					
-L- 290+89					
-L- 290+62					
-L- 290+62					
-L- 290+91					
-L- 290+91					
-L- 290+91					
-L- 290+91					
-L- 291+38				3	remove 450mm CMP
-L- 291+38		0.33			
-L- 291+38					
-L- 291+38					
-L- 291+81					
SHEET TOTALS	2x400	0.33		74.66	

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

RD248619,3/9/2011,R:\Roadway\estimate\Final\SUMMARY\R2519a_ Drainage_summary.xls

RD248619

COMPUTED BY: TMW DATE: 3/7/2007

CHECKED BY: KNW DATE: 1/1/2011

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

METRIC

PROJECT NO.	SHEET NO.
R-2519A	3-Q

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

ABBREVIATIONS

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS IV R.C. PIPE (UNLESS NOTED OTHERWISE) 300	375	450	600	750	900	1050	1200
-L- 291+81	CL	429	430		795.7	795.22			16.8						
-L- 291+81	RT	430		796.14	793.87										
-L- 291+81	RT	430	431		793.87	793.66					70.8				
-L- 292+53	RT	431		796.26	792.6										
-L- 292+53	RT	431	432		792.6	792.4					33.6				
-L- 292+87	RT	432		796.15	792.4										
-L- 292+53	RT	432	433		792.4	791.5					14.4				
-L- 292+20	LT	434	435		796.7	796.05									
-L- 292+20	LT	435		796.97	796.05										
-L- 292+20	LT	435	436		796.05	795.9			36.0						
-L- 292+54	LT	436		796.95	795.64										
-L- 292+54	LT	436	438		795.64				22.8						
-L- 292+76	LT	437	438		797.8	795.97									
-L- 292+76	LT	438		796.89	795.97										
-L- 293+12	LT	439	440		796.26	795.63			14.4						
-L- 293+25	LT	440		796.6	795.63										
-L- 293+25	LT	440	441		795.63	795.53			9.6						
-L- 293+33	LT	441		796.2	795.53										
-L- 293+33	LT	441	443		795.53	795.38			9.6						
-Y22- 10+22	RT	442	443		796.68	794.84							40.8		
-L- 293+40	LT	443	445		795.38	795.35									13.2
-L- 293+41	LT	443		796.64	792.38										
-L- 293+32	LT	444		796.36	795.39										
-L- 293+32	LT	444	445		795.39	795.35			7.2						
-L- 293+38	LT	445		796.32	795.35										
-L- 293+38	CL	445	446		795.35	794.9									13
-L- 293+38	RT	446		795.82	794.9										
-L- 293+38	RT	446			794.9	792.5									14.4
-L- 293+64	RT	448		795.61	792										
-L- 293+64	RT	446	448		792	791.46			24.0						
-L- 294+00	RT	450		795.88	794.58										
-L- 294+00	CL	450	455		794.58	795				12.0					
-Y22- 10+39	LT	451	453		796.7	795.46					14.4				
-L- 294+00	RT	458	450		795.99					8.4					
-Y22- 10+46	LT	452		795.9	795.21										
-Y22- 10+46	LT	452	453		795.21	795.11			9.6						
-Y22- 10+53	LT	453		796.8	794.91										
-L- 294+15	LT	454		796.2	795.12										
-L- 294+00	RT	447		794.17	792.83										
-L- 294+00	RT	458	447		793.18	792.83				8.4					
-L- 294+09	LT	454	455		795.12	795									
-L- 293+98	LT	455		796.19	794.3										
-L- 294+15	RT	456		795.79	794.87										
-L- 294+15	RT	456	457		794.87	794.56			10.8						
-L- 294+16	RT	457		795.48	794.56										
-L- 294+16	RT	457	458		794.56	794.4			15.6						
-L- 294+00	RT	458		795.99	793.18										
-L- 295+07	LT	459	460		796.7	795.48									
-L- 294+99	LT	460		796.4	795.41										
-L- 294+99	LT	460	461		795.41	795.01				8.4					
-L- 294+97	LT	461		796	795.01										
-L- 294+97	LT	461	462		795.01	794.6				25.2					
-L- 295+23	LT	462		795.73	794.6										
-L- 295+23	CL	462	463		794.6	794.15				22.8					
SHEET TOTALS									176	85	133		41		41

STATION	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300	400	450	600	800	900	1000	1200	CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR HDPE, TYPE S OR D 300	375	450	600	750	900	1050	1200	375 SIDE DRAIN PIPE	450 SIDE DRAIN PIPE	600 SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. METERS R.C.P.	C.S.P.
THICKNESS OR GAUGE	1.630	1.630	1.630	1.630	1.630	2.010	2.010	2.010													
-L- 291+81																					
-L- 291+81																					
-L- 291+81																					
-L- 292+53																					
-L- 292+53																					
-L- 292+87																					
-L- 292+53																					
-L- 292+20		6.0																			
-L- 292+20																					
-L- 292+20																					
-L- 292+54																					
-L- 292+54																					
-L- 292+76		7.2																			
-L- 292+76																					
-L- 293+12																					
-L- 293+25																					
-L- 293+25																					
-L- 293+33																					
-L- 293+33																					
-Y22- 10+22																				2.6	
-L- 293+40																					
-L- 293+41																					
-L- 293+32																					
-L- 293+32																					
-L- 293+38																					
-L- 293+38																					
-L- 293+38																					
-L- 293+38																					
-L- 293+64																					
-L- 293+64																					
-L- 294+00																					
-L- 294+00																					
-Y22- 10+39																					
-L- 294+00																					
-Y22- 10+46																					
-Y22- 10+46																					
-Y22- 10+53																					
-L- 294+15																					
-L- 294+00																					
-L- 294+00																					
-L- 294+09	13.2																				
-L- 293+98																					
-L- 294+15																					
-L- 294+15																					
-L- 294+16																					
-L- 294+16																					
-L- 294+00																					
-L- 295+07		8.4																			
-L- 294+99																					
-L- 294+99																					
-L- 294+97																					
-L- 294+97																					
-L- 295+23																					
-L- 295+23																					
SHEET TOTALS	13	22																		2.6	

STATION	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0 THRU 1.5m)	*TOTAL L.M. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5m THRU 3.0m	B 3.0m AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	O.T.C.B. STD. 840.04 OR 840.05	J.B. STD. 840.31 OR 840.32
-L- 291+81																			
-L- 291+81	1	0.77		1			1												
-L- 291+81																			
-L- 292+53	1	1.5	0.66	1		1													
-L- 292+53																			
-L- 292+87	1	1.5	0.75	1		1													
-L- 292+53																			
-L- 292+20																			
-L- 292+20	1			1		1													
-L- 292+20																			
-L- 292+54	1			1			1												
-L- 292+54																			
-L- 292+76																			
-L- 292+76	1			1			1												
-L- 293+12																			
-L- 293+25	1							1	1										
-L- 293+25																			
-L- 293+33	1							1	1										
-L- 293+33																			
-Y22- 10+22																			
-L- 293+40																			
-L- 293+41	1	1.5	1.26																
-L- 293+32	1							1	1										
-L- 293+32																			
-L- 293+38	1								1										
-L- 293+38																			
-L- 293+38	1			1		1													
-L- 293+38																			
-L- 293+64	1	1.5	0.61	1		1													
-L- 293+64																			
-L- 294+00	1							1	1										
-L- 294+00																			
-Y22- 10+39																			
-L- 294+00																			
-Y22- 10+46	1							1	1										
-Y22- 10+46																			
-Y22- 10+53	1	0.39																	1
-L- 294+15	1																		
-L- 294+00	1																		1
-L- 294+00																			
-L- 294+09																			
-L- 293+98	1	0.39		1			1												
-L- 294+15	1			1	1														
-L- 294+15																			
-L- 294+16	1			1	1														
-L- 294+16																			
-L- 294+00	1	1.31		1		1													
-L- 295+07																			
-L- 294+99	1																	1	
-L- 294+99																			
-L- 294+97	1			1			1												
-L- 294+97																			
-L- 295+23	1			1			1												
-L- 295+23																			
SHEET TOTALS	25	8.86	3.28	14	2	6	6	5	6									1	2

STATION	FRAME WITH GRATES, DRIVEWAY DROP INLET	MANHOLE STD. 840.53	MANHOLE STD. 840.51 OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54		D.I. SEE SPECIAL DETAIL SHEET 2-AU	DRIVEWAY D.I. STD. 840.30	T.B.J.B. (SEE SPECIAL DETAIL 2-AA)	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35		CONC TRANSITIONAL SECTION FOR C.B.	CONC TRANSITIONAL SECTION FOR D.I.	BERM DRAINAGE OUTLET STD. 850.10 OR 850.11	CONVERT EXISTING C.B. TO J.B. (SEE SHEET 2-AD)	CONVERT EXISTING D.I. TO J.B. W/MH COVER (SEE SHEET 2-AD)	PARALLEL PIPE END SECTION STD. 310.02	CROSS PIPE END SECTION STD. 310.03	PARALLEL PIPE END SECTION STD. 310.04	PREFORMED SCOUR HOLE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.M. STD. 840.72	CONC. & BRICK PIPE PLUG, C.M. STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
-L- 291+81																									
-L- 291+81																									
-L- 291+81																									
-L- 292+53																									
-L- 292+53																									
-L- 292+87																									
-L- 292+53																				1					
-L- 292+20														1							1x400				
-L- 292+20																									
-L- 292+20																									
-L- 292+54																									remove headwall
-L- 292+54																									
-L- 292+76														1							1x400				
-L- 292+76																									
-L- 293+12																									
-L- 293+25																									
-L- 293+25																									
-L- 293+33																									
-L- 293+33																									
-Y22- 10+22																								52.8	remove 375mm CONC
-L- 293+40																								27.0	remove 1200 cmp
-L- 293+41				1				1																	remove C.B.
-L- 293+32													1												
-L- 293+32																									
-L- 293+38						1							1												
-L- 293+38																									
-L- 293+38																									
-L- 293+38																					2x400				
-L- 293+64																									
-L- 293+64																					2x400				
-L- 294+00																									
-L- 294+00																									
-Y22- 10+39																								38.3	remove 450mm CONC
-L- 294+00																								31.3	remove part of 450mm cmp
-Y22- 10+46																									
-Y22- 10+46																									
-Y22- 10+53																									remove existing CB
-L- 294+15	1						10.8																	24.7	remove 375mm CONC
-L- 294+00				1																					
-L- 294+00																									
-L- 294+09																									
-L- 293+98																									remove D.I.
-L- 294+15												1													
-L- 294+15																									
-L- 294+16																									
-L- 294+16																									
-L- 294+00																									
-L- 295+07														1							1x400				
-L- 294+99																									
-L- 294+99																									
-L- 294+97																									
-L- 294+97																								8.8	remove 450mm CMP
-L- 295+23																									
-L- 295+23																								32.1	remove 450mm cmp, DI, & part of 375 cmp
SHEET TOTALS	1			2		1	10.8	1				1	2	3						1	7x400			214.91	

RD253058,2/11/2011,R:\Roadway\estimate\Final\SUMMARY\R2519a_ Drainage_summary.xls

RD253058

COMPUTED BY: TMW DATE: 3/7/2007

CHECKED BY: KNW DATE: 1/1/2011

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

METRIC

PROJECT NO.	SHEET NO.
R-2519A	3-R

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS IV R.C. PIPE (UNLESS NOTED OTHERWISE) 300	375	450	600	750	900	1050	1200	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300 (1.630)	400 (1.630)	450 (1.630)	600 (1.630)	800 (1.630)	900 (2.010)	1000 (2.010)	1200 (2.010)	CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR HDPE, TYPE S OR D 300	375	450	600	750	900	1050	1200
-L- 295+22	RT	463		795.59	794.15																										
-L- 295+22	RT	463	464		794.15	793.29																				13.2					
-L- 295+76	RT	465		795.16	794.24																										
-L- 295+76	CL	465	466		794.24	794.15			22.8																						
-L- 295+76	LT	466		795.16	794.15																										
-L- 295+76	LT	466	468		794.15	793.48			60.0																						
-L- 296+36	RT	467		794.67	793.75																										
-L- 296+36	CL	467	468		793.75	793.48			14.4																						
-L- 296+36	LT	468		794.4	793.48																										
-L- 296+36	LT	468	470		793.48	792.77			50.4																						
-L- 296+86	CL	469		793.93	793.01																										
-L- 296+86	LT	469	470		793.01	792.77			12.0																						
-L- 296+86	LT	470		793.69	792.7																										
-L- 296+87	LT	471	470		794.7	792.77											12.0														
-L- 296+86	LT	470	474		792.7	791.4				56.4																					
-L- 297+24	RT																														
-L- 297+50	LT	472		796.61	791.64																										
-L- 297+50	LT	472	473		791.64	791.6			7.2																						
-L- 297+43	LT	473		792.77	791.6																										
-L- 297+43	LT	473	474		791.6	791.47			10.8																						
-L- 297+43	LT	474		792.39	791.4																										
-L- 297+46	LT	474	475		791.4	791				7.2																					
-Y23- 10+67	LT	477	478		792.1	790.92					13.2																				
-Y23- 10+68	LT	478		792.06	790.92																										
-Y23- 10+68	LT	478	480		790.92	789.79					30.0																				
-L- 298+00	LT	479		790.9	790.21																										
-L- 298+00	LT	479	480		790.21	790.01			6.0																						
-L- 298+00	LT	480		790.93	789.79																										
-L- 298+00	LT	480	481		789.79	789.29					20.4																				
-L- 298+19	LT	481		790.43	789.29																										
-L- 298+19	CL	481	482		789.29	789.15					13.2																				
-L- 298+20	RT	482		790.79	789.15																										
-L- 298+20	RT	482	483		789.15	788.8					19.2																				
-L- 298+72	CL																														
-L- 298+94	LT	484	485		788.5	787.76			9.6																						
-L- 299+03	LT	485		788.6	787.69																										
-L- 299+03	LT	485	486		787.69	787.59																				10.8					
-L- 299+06	LT	486		789.15	787.59																										
-L- 299+06	LT	486	488		787.59	787.45				14.4																					
-L- 299+00	RT	487		789.48	788.56																										
-L- 299+00	RT	487	488		788.56	788.5			6.0																						
-L- 299+06	RT	488		789.42	787.45																										
-L- 299+06	RT	488	489		787.45	786.5				21.6																					
-L- 299+75	RT	490		788.47	787.55																										
-L- 299+75	CL	490	491		787.55	787.45			25.2																						
-L- 299+75	CL	491		788.47	787.45																										
-L- 299+75	CL	491	492		787.45	787.35			10.8																						
-L- 300+06	LT	493																													
-L- 300+06	LT	494																													
SHEET TOTALS									235	100	96						12									24					

STATION	STRUCTURE NO. FROM	TO	375 SIDE DRAIN PIPE	450 SIDE DRAIN PIPE	600 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 1.5m)	*TOTAL L.M. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5m THRU 3.0m	B 3.0m AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G
-L- 295+22	463							1			1		1	
-L- 295+22	463	464												
-L- 295+76	465							1			1		1	
-L- 295+76	465	466												
-L- 295+76	466							1			1			1
-L- 295+76	466	468												
-L- 296+36	467							1			1			1
-L- 296+36	467	468												
-L- 296+36	468							1			1			1
-L- 296+36	468	470												
-L- 296+86	469							1			1			1
-L- 296+86	469	470												
-L- 296+86	470							1			1			1
-L- 296+87	471	470												
-L- 296+86	470	474												
-L- 297+24														
-L- 297+50	472							1	1.5	1.97				
-L- 297+50	472	473												
-L- 297+43	473							1						
-L- 297+43	473	474												
-L- 297+43	474							1			1			1
-L- 297+46	474	475												
-Y23- 10+67	477	478												
-Y23- 10+68	478							1			1			1
-Y23- 10+68	478	480												
-L- 298+00	479							1						
-L- 298+00	479	480												
-L- 298+00	480							1			1			1
-L- 298+00	480	481												
-L- 298+19	481							1			1			1
-L- 298+19	481	482												
-L- 298+20	482							1	0.14					
-L- 298+20	482	483												
-L- 298+72														
-L- 298+94	484	485												
-L- 299+03	485							1						
-L- 299+03	485	486												
-L- 299+06	486							1	0.06		1			1
-L- 299+06	486	488												
-L- 299+00	487							1			1			1
-L- 299+00	487	488												
-L- 299+06	488							1	0.47		1			1
-L- 299+06	488	489												
-L- 299+75	490							1			1		1	
-L- 299+75	490	491												
-L- 299+75	491							1			1			1
-L- 299+75	491	492												
-L- 300+06	493		15.6											
-L- 300+06	494		16.8											
SHEET TOTALS			32					21	2.17	1.97	16		3	13

STATION	STRUCTURE NO. FROM	TO	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	O.T.C.B. STD. 840.04 OR 840.05	J.B. STD. 840.31 OR 840.32		MANHOLE STD. 840.53	MANHOLE STD. 840.51 OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54			DRIVEWAY D.I. STD. 840.30		T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35		CONC TRANSITIONAL SECTION FOR C.B.	CONC TRANSITIONAL SECTION FOR D.I.	BERM DRAINAGE OUTLET STD. 850.10 OR 850.11	CONVERT EXISTING C.B. TO J.B. (SEE SHEET 2-AD)	CONVERT EXISTING D.I. TO J.B. W/MH COVER (SEE SHEET 2-AD)	PARALLEL PIPE END SECTION STD. 310.02	CROSS PIPE END SECTION STD. 310.03	PARALLEL PIPE END SECTION STD. 310.04	PREFORMED SCOUR HOLE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.M. STD. 840.72	CONC. & BRICK PIPE PLUG, C.M. STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
-L- 295+22	463																																						remove D.I.
-L- 295+22	463	464																																				14.5	remove 375mm CMP
-L- 295+76	465																																						
-L- 295+76	465	466																																					
-L- 295+76	466																																						
-L- 295+76	466	468																																					
-L- 296+36	467																									1													
-L- 296+36	467	468																																					
-L- 296+36	468																																						
-L- 296+36	468	470																																					
-L- 296+86	469																									1													
-L- 296+86	469	470																																					
-L- 296+86	470																																						
-L- 296+87	471	470																										1							1x400				
-L- 296+86	470	474																																				8.2	remove 375mm CMP
-L- 297+24																																						12.3	remove 375mm CMP
-L- 297+50	472		1	1																							1												
-L- 297+50	472	473																																					
-L- 297+43	473		1	1																							1												
-L- 297+43	473	474																																					
-L- 297+43	474																																						
-L- 297+46	474	475																																					
-Y23- 10+67	477	478																																				9.5	remove 300mm CMP
-Y23- 10+68	478																																						
-Y23- 10+68	478	480																																					
-L- 298+00	479		1	1																																			
-L- 298+00	479	480																																					
-L- 298+00	480																																						
-L- 298+00	480	481																																					
-L- 298+19	481																																						
-L- 298+19	481	482																																				21.6535	remove headwall and 600mm CMP
-L- 298+20	482		1	1																							1												
-L- 298+20	482	483																																					
-L- 298+72																																						26.7	remove headwall and 600mm CMP
-L- 298+94	484	485																																				6.1	remove 300mm CMP
-L- 299+03	485					1					1																												
-L- 299+03	485	486																																					
-L- 299+06	486																																						
-L- 299+06	486	488																																					
-L- 299+00	487																									1													
-L- 299+00	487	488																																					
-L- 299+06	488																									1													
-L- 299+06	488	489																																1					
-L- 299+75	490																																						
-L- 299+75	490	491																																					
-L- 299+75	491																																						
-L- 299+75	491	492																																					
-L- 300+06	493																														1								375mm Pipe End Section
-L- 300+06	494																														1								375mm Pipe End Section
SHEET TOTALS			4	4		1					1															4	3	1			2			1	1x400			98.89	

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: TMW DATE: 3/7/2007

CHECKED BY: KNW DATE: 1/1/2011

RD253058

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

METRIC

PROJECT NO.	SHEET NO.
R-2519A	3-S

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL
-Y24A- 10+61	RT	495	497		788.73	786.93	
-Y24A- 10+41	RT	496	497		790.7	786.93	
-Y24A- 10+40	RT	497		787.84	786.93		
-Y24A- 10+40	CL	497	498		786.93	786.6	
-Y24A- 10+10	CL	499			786		
-Y24- 10+57	LT						
-Y24- 10+67	LT						
-Y24- 10+88	LT						
-Y24- 11+03	LT						
-Y24- 11+39	RT	500			785.5		
-L- 301+03	RT	501		785.83	784.99		
-L- 301+03	RT	501	502		784.99	784.8	
-L- 301+13	LT	501A		787.48	786		
-Y25- 10+24	LT						
-Y25- 10+51	RT	503					
-L- 301+45	LT	505	504		783.45	783.4	
-L- 301+45	LT	505		785.12	783.45		
-L- 301+13	RT	501A	501		786	784.99	
-L- 302+72	LT	505A	505		783.57	783.45	
-L- 302+72	LT	506	505A		783.85	783.47	
-L- 302+72	LT	506		785.45	783.85		
-L- 302+73	CL	509	506		784.41	783.88	
-L- 302+52	RT	507		785.48	784.64		
-L- 301+83	LT	505A		785.23	783.57		
-L- 301+83	LT	505B	505A		785.5	783.57	
-L- 301+83	RT	505B		786.89	785.5		
-L- 302+52	RT	507	509		784.64	784.41	
-L- 302+73	RT	508	509		789	784.41	
-L- 302+73	RT	509		785.48	784.41		
-L- 303+20	LT	510					
-L- 303+00	LT	510A					
-L- 303+45	LT	511					
-L- 303+90	LT	512					
-L- 304+04	LT	513					
-L- 304+01	RT	514	516		789	784.7	
-L- 304+18	CL						
-L- 304+09	RT	515	516		789.7	785.08	
-L- 304+10	RT	516		786.3	784.7		
-L- 304+10	RT	516	517		784.7	784.5	
-L- 304+49	RT	517		786.56	784.5		
-L- 305+29	LT	518A		787.8	786.8		
-L- 305+29	LT	518		785.38	783.7		
-L- 305+29	LT	518A	518		786.8	783.7	
-L- 305+29	LT	518	518B		783.7	783.5	
-L- 304+49	RT	517	518		784.5	783.7	
-L- 306+41	RT	519	520		790.4	786.91	
-L- 306+40	RT	520		787.75	786.91		
-L- 306+40	RT	520	521		786.91	786.5	
-L- 306+40	LT	520A		788.19	787		
-L- 306+09	RT	521		787.49	786.5		
-L- 306+09	RT	521	522		786.5	786.2	
-L- 306+08	RT	523			783.6		
-Y26- 12+68	LT	524	525		797.8	795.62	
-L- 306+40	RT	520A	520		787	786.91	
-Y26- 12+62	LT	525		796.76	795.62		
-Y26- 12+62	LT	525	527		795.62	788.65	
-Y26- 12+35	RT						
-Y26- 11+89	LT	526		790	789.31		
-Y26- 11+89	LT	526	527		789.31	788.87	
-Y26- 11+87	LT	527		789.79	788.65		
-Y26- 11+87	LT	527	529		788.65	787.99	
-Y26- 11+60	CL	528	529		787.2	787	
-Y26- 11+60	LT	529		789.13	787		
-Y26- 11+60	LT	529	530		787	786.8	
SHEET TOTALS							

STATION (SIZE / THICKNESS OR GAUGE)	CLASS IV R.C. PIPE (UNLESS NOTED OTHERWISE) 300	375	450	600	750	900	1050	1200	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300 / 1.630	400 / 1.630	450 / 1.630	600 / 1.630	800 / 1.630	900 / 2.010	1000 / 2.010	1200 / 2.010
-Y24A- 10+61		21.6														
-Y24A- 10+41											7.2					
-Y24A- 10+40																
-Y24A- 10+40			18.0													
-Y24A- 10+10			28.8													
-Y24- 10+57																
-Y24- 10+67																
-Y24- 10+88																
-Y24- 11+03																
-Y24- 11+39					8.4											
-L- 301+03																
-L- 301+03		20.4														
-L- 301+13																
-Y25- 10+24																
-Y25- 10+51																
-L- 301+45					6.0											
-L- 301+45																
-L- 301+13		22.8														
-L- 302+72					38.4											
-L- 302+72					88.8											
-L- 302+72																
-L- 302+73				36.0												
-L- 302+52																
-L- 301+83																
-L- 301+83		20.4														
-L- 301+83																
-L- 302+52		21.6														
-L- 302+73										13.2						
-L- 302+73																
-L- 303+20																
-L- 303+00																
-L- 303+45																
-L- 303+90																
-L- 304+04																
-L- 304+01													13.2			
-L- 304+18																
-L- 304+09											9.6					
-L- 304+10																
-L- 304+10																
-L- 304+49																
-L- 305+29																
-L- 305+29																
-L- 305+29		81.6														
-L- 305+29					4.8											
-L- 304+49					39.6											
-L- 306+41										9.6						
-L- 306+40																
-L- 306+40																
-L- 306+40																
-L- 306+09																
-L- 306+09											10.8					
-L- 306+08											8.4					
-Y26- 12+68												9.6				
-L- 306+40		20.4														
-Y26- 12+62																
-Y26- 12+62				74.4												
-Y26- 12+35																
-Y26- 11+89																
-Y26- 11+89																
-Y26- 11+87																
-Y26- 11+87				26.4												
-Y26- 11+60						21.6										
-Y26- 11+60																
-Y26- 11+60																
SHEET TOTALS		209	46.8	137	186	21.6				22.8	36	9.6	13.2			

STATION	CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR HDPE, TYPE S OR D 300	375	450	600	750	900	1050	1200	375 SIDE DRAIN PIPE	450 SIDE DRAIN PIPE	600 SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. METERS R.C.P.	C.S.P.
-Y24A- 10+61													
-Y24A- 10+41													
-Y24A- 10+40													
-Y24A- 10+40													
-Y24A- 10+10													
-Y24- 10+57													
-Y24- 10+67													
-Y24- 10+88													
-Y24- 11+03													
-Y24- 11+39													
-L- 301+03													
-L- 301+03													
-L- 301+13													
-Y25- 10+24													
-Y25- 10+51									20.4				
-L- 301+45													
-L- 301+45													
-L- 301+13													
-L- 302+72													
-L- 302+72													
-L- 302+72													
-L- 302+73													
-L- 302+52													
-L- 301+83													
-L- 301+83													
-L- 301+83													
-L- 302+52													
-L- 302+73													
-L- 302+73													
-L- 303+20									16.8				
-L- 303+00									16.8				
-L- 303+45									10.8				
-L- 303+90									14.4				
-L- 304+04									7.2				
-L- 304+01													
-L- 304+18													
-L- 304+09													
-L- 304+10													
-L- 304+10					39.6								
-L- 304+49													
-L- 305+29													
-L- 305+29													
-L- 305+29													
-L- 305+29													
-L- 304+49													
-L- 306+41													
-L- 306+40													
-L- 306+40		32.4											
-L- 306+40													
-L- 306+09													
-L- 306+09													
-L- 306+08													
-Y26- 12+68													
-L- 306+40													
-Y26- 12+62													
-Y26- 12+62													
-Y26- 12+35													
-Y26- 11+89													
-Y26- 11+89		4.8											
-Y26- 11+87													
-Y26- 11+87													
-Y26- 11+60												2.6	
-Y26- 11+60													
-Y26- 11+60						12							
SHEET TOTALS		37.2			39.6	12			86.4			2.6	

STATION	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0 THRU 1.5m)	*TOTAL L.M. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5m THRU 3.0m	B 3.0m AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	O.T.C.B. STD. 840.04 OR 840.05	J.B. STD. 840.31 OR 840.32
-Y24A- 10+61																			
-Y24A- 10+41																			
-Y24A- 10+40	1										1					1			
-Y24A- 10+40																			
-Y24A- 10+10																			
-Y24- 10+57																			
-Y24- 10+67																			
-Y24- 10+88																			
-Y24- 11+03																			
-Y24- 11+39																			
-L- 301+03	1										1					1			
-L- 301+03																			
-L- 301+13	1							1	1										
-Y25- 10+24																			
-Y25- 10+51																			
-L- 301+45																			
-L- 301+45	1	0.17								1						1			
-L- 301+13																			
-L- 302+72																			
-L- 302+72																			
-L- 302+72	1	0.1								1						1			
-L- 302+73																			
-L- 302+52	1										1					1			
-L- 301+83	1	0.16								1						1			
-L- 301+83																			
-L- 301+83	1							1	1										
-L- 302+52																			
-L- 302+73																			
-L- 302+73	1										1					1			
-L- 303+20																			
-L- 303+00																			
-L- 303+45																			
-L- 303+90																			
-L- 304+04																			
-L- 304+01																			
-L- 304+18																			
-L- 304+09																			
-L- 304+10	1	0.1								1						1			
-L- 304+10																			
-L- 304+49	1	0.56								1						1			
-L- 305+29	1										1						1		
-L- 305+29	1	0.18																	1
-L- 305+29																			
-L- 305+29																			
-L- 304+49																			
-L- 306+41																			
-L- 306+40	1										1					1			
-L- 306+40																			
-L- 306+40	1							1	1										
-L- 306+09	1										1					1			
-L- 306+09																			
-L- 306+08																			
-Y26- 12+68																			
-L- 306+40																			
-Y26- 12+62	1			1		1													
-Y26- 12+62																			
-Y26- 12+35																			
-Y26- 11+89	1							1	1										
-Y26- 11+89																			
-Y26- 11+87	1			1		1													
-Y26- 11+87																			
-Y26- 11+60																			
-Y26- 11+60	1	0.63		1		1													
-Y26- 11+60																			
SHEET TOTALS	20	1.9		3		3		4	4	5	7					11	1		1

STATION	MANHOLE STD. 840.53	MANHOLE STD. 840.51 OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	DRIVEWAY D.I. STD. 840.30	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	CONC TRANSITIONAL SECTION FOR C.B.	CONC TRANSITIONAL SECTION FOR D.I.	BERM DRAINAGE OUTLET STD. 850.10 OR 850.11	CONVERT EXISTING C.B. TO J.B. (SEE SHEET 2-AD)	CONVERT EXISTING D.I. TO J.B. W/MH COVER (SEE SHEET 2-AD)	PARALLEL PIPE END SECTION STD. 310.02	CROSS PIPE END SECTION STD. 310.03	PARALLEL PIPE END SECTION STD. 310.04	PREFORMED SCOUR HOLE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.M. STD. 840.72	CONC. & BRICK PIPE PLUG, C.M. STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
-Y24A- 10+61																				
-Y24A- 10+41									1							1x450				
-Y24A- 10+40																				
-Y24A- 10+40																				
-Y24A- 10+10												1								450mm Pipe End Section
-Y24- 10+57																			8.0	remove 450mm CMP and 2 D.I.
-Y24- 10+67																			13.4	remove 450mm CMP and D.I.
-Y24- 10+88																			22.3	remove 450mm CMP and D.I.
-Y24- 11+03																			11.3	remove 450mm CMP and D.I., & plug 450mm CMP
-Y24- 11+39																				tie to culvert
-L- 301+03																				
-L- 301+03																				tie to culvert
-L- 301+13								1												
-Y25- 10+24																			12.4	remove 375mm CMP
-Y25- 10+51												1								375mm Pipe End Section
-L- 301+45																				tie to culvert
-L- 301+45																				
-L- 301+13																				
-L- 302+72																				
-L- 302+72																				
-L- 302+72																				
-L- 302+73																			9.7	remove 375mm CMP and headwall
-L- 302+52																				
-L- 301+83																				
-L- 301+83																				
-L- 301+83								1												
-L- 302+52																			28.3	remove 2x300mm CONC
-L- 302+73									1							2x400				
-L- 302+73																				
-L- 303+20												1								375mm Pipe End Section
-L- 303+00												1								375mm Pipe End Section
-L- 303+45												1								375mm Pipe End Section
-L- 303+90												1								375mm Pipe End Section
-L- 304+04												1								375mm Pipe End Section
-L- 304+01									1							1x800			13.2	remove 300mm CMP
-L- 304+18																		0.16	36.581	remove 600mm CMP & conc headwall, plug 600 cmp
-L- 304+09									1							1x450				
-L- 304+10																		0.16		plug 600mm CMP and remove headwall
-L- 304+10																				
-L- 304+49																				
-L- 305+29																				
-L- 305+29			1																	
-L- 305+29																				
-L- 305+29																				
-L- 304+49																				
-L- 306+41									1							1x400				
-L- 306+40																				
-L- 306+40																				
-L- 306+40								1												
-L- 306+09																				
-L- 306+09																	0.33			remove headwall
-L- 306+08																	0.33			
-Y26- 12+68														1		1x600				600mm of Pipe End Section
-L- 306+40																				
-Y26- 12+62																				
-Y26- 12+62																			20.2	remove 300mm RCP
-Y26- 12+35																			16.0	remove 200mm PVC
-Y26- 11+89																				
-Y26- 11+89																				
-Y26- 11+87																				
-Y26- 11+87																			42.2	remove headwall, 600mm CMP, & 375mm CMP
-Y26- 11+60																				
-Y26- 11+60																				
-Y26- 11+60																3x400				
																2x450				
																1x600				
SHEET TOTALS			1					3	5			7		1		1x800	0.66	0.32	233.71	

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

RD253058,2/11/2011,R:\Roadway\estimate\Final\SUMMARY\R2519a_ Drainage_summary.xls

COMPUTED BY: TMW DATE: 3/7/2007

CHECKED BY: KNW DATE: 1/1/2011

RD253058

PROJECT NO.: R-2519A SHEET NO.: 3-T

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS IV R.C. PIPE (UNLESS NOTED OTHERWISE) 300	375	450	600	750	900	1050	1200	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300 (1.630)	400 (1.630)	450 (1.630)	600 (1.630)	800 (1.630)	900 (2.010)	1000 (2.010)	1200 (2.010)
-Y26- 11+54	LT	530		789.09	786.8																		
-Y26- 11+54	CL	530	531A		786.8	786.5							18.0										
-L- 307+13	LT	531		789.89	786.5																		
-L- 307+20	LT	532	531		788.7	788.5																	
-L- 307+13	RT	531A		790	786.7																		
-L- 307+13	LT	531	533		786.5	786.3																	
-Y26- 11+08	LT	533		788.84	786.3																		
-Y26- 11+08	LT	533	534A		786.3	782.8								58.0									
-Y26- 10+10	LT	534		780.5	778.7																		
-L- 307+13	RT	531A	531		786.7	786.5							18.0										
-Y26- 10+16	LT	534	535		788.7	778.57								44.4									
-L- 307+55	RT	536																					
-L- 308+01	RT	537	538		793.8	791.88												6.0					
-L- 308+00	RT	538		792.79	791.88																		
-Y26- 10+50	LT	534A		784	782.8																		
-Y26- 10+50	LT	534B	534A		783	782.8			10.8														
-Y26- 10+50	RT	534B		784	783																		
-L- 308+00	RT	538	539		791.88	791.51				13.2													
-L- 307+90	RT	539		793.1	791.51																		
-L- 307+78	LT	540			790.1													12.0					
-L- 307+93	RT	541		793.13	792.21																		
-L- 308+60	RT	542A		795.8	794.8																		
-L- 307+93	RT	541	542		792.21	792.11			8.4														
-L- 308+00	RT	542		793.45	792.11																		
-L- 308+00	RT	542	543		792.11	791.46			20.4														
-L- 308+00	LT	543		792.3	791.39																		
-L- 308+60	RT	542A	542		794.8	792.1			60.0														
-L- 308+00	LT	543	544		791.39	790.1																	
-L- 308+11	LT	545																					
-D20- 10+23	LT	546																					
-D20- 10+34	LT	547																					
-L- 310+20	RT	548	550		796.2	795.9			16.8														
-L- 310+20	RT	548		797.1	796.2																		
-L- 310+36	LT	549			794													7.2					
-L- 310+20	RT	550		796.72	795.88																		
-L- 310+20	RT	550	551		795.88	791.9											21.6						
-Y26-10+50	LT	534A	534		782.8	788.7								40.0									
-L- 310+38	RT	551	552		791.82	788.6												16.8					
-L- 310+40	RT	551		792.82	791.82																		
-L- 311+80	RT	553		791.1	790.26																		
-L- 311+80	RT	553	554		790.26	790.16			20.4														
-L- 311+79	CL	554		791.75	790.16																		
-L- 311+79	CL	554	555		790.16	789.39			19.2														
-L- 311+80	LT	555		790.23	789.32																		
-L- 311+80	LT	555	556		789.32	787.05																	
-L- 312+20	LT	556		787.96	787.05																		
-L- 312+20	LT	556	558		787.05	784.32																	
-L- 312+48	LT	557		787.72	786.75																		
-L- 312+48	LT	557	558		786.75	784.4			33.6														
-L- 312+50	LT	558		785.62	784.17																		
-L- 312+50	LT	558	559		784.17	777.2													28.8				
-L- 312+99	RT	560	561		783.59	782.19											9.6						
-L- 313+08	RT	561		783.03	782.19																		
-L- 313+08	RT	561	562		782.19	781.16			12.0														
-L- 313+08	RT	562		782	781.16																		
-L- 313+08	RT	562	563		781.16	776.92											13.2						
-L- 313+42	LT	564		781.75	780.91																		
-L- 313+42	LT	564	565		780.91	780.73			22.8														
SHEET TOTALS									224	13			36	142			44	42	29				

STATION	CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR HDPE, TYPE S OR D 300	375	450	600	750	900	1050	1200	375 SIDE DRAIN PIPE	450 SIDE DRAIN PIPE	600 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 1.5m)	*TOTAL L.M. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5m THRU 3.0m	B 3.0m AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G
-Y26- 11+54														1	0.79					
-Y26- 11+54																				
-L- 307+13														1	1.5	0.39				
-L- 307+20					9.6															
-L- 307+13														1	1.5	0.3				
-L- 307+13							24													
-Y26- 11+08														1	1.04					
-Y26- 11+08																				
-Y26- 10+10														1						
-L- 307+13																				
-Y26- 10+16																				
-L- 307+55									15.6											
-L- 308+01																				
-L- 308+00														1						
-Y26- 10+50														1						
-Y26- 10+50																				
-Y26- 10+50														1						
-L- 308+00																				
-L- 307+90														1	0.09					
-L- 307+78																				
-L- 307+93														1			1		1	
-L- 308+60														1			1			1
-L- 307+93																				
-L- 308+00														1			1		1	
-L- 308+00																				
-L- 308+00														1						
-L- 308+60																				
-L- 308+00			20.4																	
-L- 308+11										13.2										
-D20- 10+23									8.4											
-D20- 10+34									7.2											
-L- 310+20																				
-L- 310+20														1			1		1	
-L- 310+36																				
-L- 310+20														1						
-L- 310+20																				
-Y26-10+50																				
-L- 310+38																				
-L- 310+40														1						
-L- 311+80														1						
-L- 311+80																				
-L- 311+79														1	0.09		1			1
-L- 311+79																				
-L- 311+80														1						
-L- 311+80			38.4																	
-L- 312+20														1						
-L- 312+20			33.6																	
-L- 312+48														1						
-L- 312+48																				
-L- 312+50														1						
-L- 312+50																				
-L- 312+99																				
-L- 313+08														1						
-L- 313+08																				
-L- 313+08														1						
-L- 313+08																				
-L- 313+42														1						
-L- 313+42																				
SHEET TOTALS			92		9.6		24		31	13				25	5.01	0.69	5		3	2

STATION	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	O.T.C.B. STD. 840.04 OR 840.05	J.B. STD. 840.31 OR 840.32		MANHOLE STD. 840.53	MANHOLE STD. 840.51 OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54
-Y26- 11+54			1						1							
-Y26- 11+54																
-L- 307+13														1		1
-L- 307+20																
-L- 307+13	1	1														
-L- 307+13																
-Y26- 11+08														1		1
-Y26- 11+08																
-Y26- 10+10												1				1
-L- 307+13																
-Y26- 10+16																
-L- 307+55																
-L- 308+01																
-L- 308+00				1					1							
-Y26- 10+50																1
-Y26- 10+50																
-Y26- 10+50				1						1						
-L- 308+00																
-L- 307+90																1
-L- 307+78																
-L- 307+93																
-L- 308+60																
-L- 307+93																
-L- 308+00																
-L- 308+00																
-L- 308+00				1					1							
-L- 308+60																
-L- 308+00																
-L- 308+11																
-D20- 10+23																
-D20- 10+34																
-L- 310+20																
-L- 310+20																
-L- 310+36																
-L- 310+20				1					1							
-L- 310+20																
-Y26-10+50																
-L- 310+38																
-L- 310+40												1				
-L- 311+80				1					1							
-L- 311+80																
-L- 311+79																
-L- 311+79																
-L- 311+80				1					1							
-L- 311+80																
-L- 312+20				1					1							
-L- 312+20																
-L- 312+48	1	1														
-L- 312+48																
-L- 312+50			1						1							
-L- 312+50																
-L- 312+99																
-L- 313+08				1					1							
-L- 313+08																
-L- 313+08				1					1							
-L- 313+08																
-L- 313+42				1						1						
-L- 313+42																
SHEET TOTALS	2	2	2	10					10	2		2		2		5

STATION			DRIVEWAY D.I. STD. 840.30		T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35		CONC TRANSITIONAL SECTION FOR C.B.	CONC TRANSITIONAL SECTION FOR D.I.	BERM DRAINAGE OUTLET STD. 850.10 OR 850.11	CONVERT EXISTING C.B. TO J.B. (SEE SHEET 2-AD)	CONVERT EXISTING D.I. TO J.B. W/MH COVER (SEE SHEET 2-AD)	PARALLEL PIPE END SECTION STD. 310.02	CROSS PIPE END SECTION STD. 310.03	PARALLEL PIPE END SECTION STD. 310.04	PREFORMED SCOUR HOLE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.M. STD. 840.72	CONC. & BRICK PIPE PLUG, C.M. STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
-Y26- 11+54																					
-Y26- 11+54																			0.16		remove headwall, plug 600mm CMP & fill w/ flowabl
-L- 307+13																					
-L- 307+20																					
-L- 307+13									1												
-L- 307+13																				13.4	remove 600mm CMP
-Y26- 11+08																					
-Y26- 11+08																				7.0	remove 375mm CMP
-Y26- 10+10																					
-L- 307+13																					
-Y26- 10+16																					
-L- 307+55																					
-L- 308+01										1							1x450				
-L- 308+00																					
-Y26- 10+50					1																
-Y26- 10+50																					
-Y26- 10+50																					
-L- 308+00																					
-L- 307+90					1																remove headwall
-L- 307+78																		0.29			
-L- 307+93								1													
-L- 308+60								1													
-L- 307+93																					
-L- 308+00								1													
-L- 308+00																					
-L- 308+00																					
-L- 308+60																					
-L- 308+00																					
-L- 308+11													1								450mm Pipe End Section
-D20- 10+23																					
-D20- 10+34																					
-L- 310+20																					
-L- 310+20								1												5.6	remove 375mm CMP
-L- 310+36																		0.33			remove headwall
-L- 310+20																					
-L- 310+20																	2x400				
-Y26-10+50																					
-L- 310+38																	2x450				
-L- 310+40																					
-L- 311+80																					
-L- 311+80																					
-L- 311+79								1													
-L- 311+79																					
-L- 311+80																					
-L- 311+80																					
-L- 312+20																					
-L- 312+20																					
-L- 312+48									1												
-L- 312+48																					
-L- 312+50																					
-L- 312+50																	2x600				tie to culvert
-L- 312+99															1		2x400			27.3	remove 150mm PVC/400mm Pipe End Section
-L- 313+08																					remove D.I.
-L- 313+08																				18.4	remove 250mm PVC
-L- 313+08																					
-L- 313+08																	2x400				
-L- 313+42																					
-L- 313+42																					
																	6x400				
																	3x450				
SHEET TOTALS					2			5	2	1			1		1		2x600	0.62	0.16	71.7	

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

RD253058

COMPUTED BY: TMW DATE: 3/7/2007

CHECKED BY: KNW DATE: 1/1/2011

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

METRIC

PROJECT NO.	SHEET NO.
R-2519A	3-U

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS IV R.C. PIPE (UNLESS NOTED OTHERWISE) 300	375	450	600	750	900	1050	1200	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300 (1.630)	400 (1.630)	450 (1.630)	600 (1.630)	800 (1.630)	900 (2.010)	1000 (2.010)	1200 (2.010)	CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR HDPE, TYPE S OR D 300	375	450	600	750	900	1050	1200
-L- 313+42	RT	565		781.6	780.76																										
-L- 313+42	RT	565	566		780.76	777											12.0														
-L- 314+10	LT	567		777.29	776.37																										
-L- 314+10	LT	567	568		776.37	775.82			14.4																						
-L- 314+10	RT	568		776.66	775.82																										
-L- 314+10	RT	568	569		775.82	774.3											10.8														
-L- 314+28	RT	570																													
-L- 314+79	CL																														
-Y28- 10+71	LT	572																													
-L- 315+66	LT	573		771.61	770.69																										
-L- 315+66	CL	573	574		770.69	769.16			19.2																						
-L- 315+68	RT	574		770	769.09																										
-L- 315+68	RT	574	575		769.09	768.76				62.4																					
-L- 316+32	RT	575		769.67	768.76																										
-L- 316+32	RT	575	576		768.76	768.45				28.8																					
-L- 316+60	RT	576		769.51	768.45																										
-L- 316+60	RT	576	577		768.45	768				8.4																					
-L- 316+46	LT	578		771.22	770.3																										
-L- 316+46	LT	578	575		770.3	768.59			20.4																						
-L- 317+35	CL	579			768.3																										
-L- 316+85	LT	579A		771.16	770.3																										
-L- 316+85	LT	579A	579		770.3	768.3			51.6																						
-L- 317+72	LT	580																													
-L- 317+76	LT	581		770.43	769.51																										
-L- 317+76	LT	581	582		769.51	769.4			15.6																						
-L- 318+07	LT	583		770.03	769.06																										
-L- 317+35	CL	579	579B							21.6																					
-L- 318+07	LT	583	584		769.06	768.95			20.4																						
-L- 318+45	LT	585		771.27	770.36																										
-Y30- 10+60	LT	585	586		770.36	767.76																				41					
-L- 318+50	LT	586		768.67	767.76																										
-L- 317+35	CL	579C	579							20.4																					
-L- 318+50	LT	586	588		767.76	767.6					28.8																				
-L- 318+25	LT	587		769.73	768.81																										
-L- 318+25	LT	587	588		768.81	768.5			13.2																						
-L- 318+21	LT	588		769.9	767.6																										
-L- 319+29	LT	591		767.9	767.2																										
-L- 319+40	LT	591A		767.9	767.3																										
-L- 319+40	LT	591A	591		767.3	767.2			10.8																						
-L- 318+21	LT	588	589		767.6	767.4					3.6																				
-L- 318+57	CL																														
-L- 318+89	RT	590		768.78	767.81																										
-L- 318+89	CL	590	592		767.81	767.64			40.8																						
-L- 318+85	RT	590A															13.2														
-L- 319+29	LT	591	592		767.86	769.57				15.6																					
-L- 319+29	LT	592		768.56	767.57																										
-L- 319+29	LT	592	593		767.57	767.33				30.0																					
-L- 319+59	LT	593		768.7	767.33																										
-L- 319+29	RT	590B															13.2														
-L- 319+65	RT	593	594		766.2					21.6																					
-D11- 10+20	RT	595	598		781	777.24																	8.4								
-D11- 10+29	LT	596	597		788.5	778.46											21.6														
-D11- 10+28	LT	597		779.3	778.46																										
-D11- 10+28	CL	597	598		788.46	778.1			7.2																						
-D11- 10+27	RT	598		779.3	777.24																										
-D11- 10+27	RT	598	599		777.24	766.84																	38.4								
-D11- 10+67	LT	600		768.46	767.62																										
-D11- 10+67	LT	600	599		767.62	767.5			13.2																						
-D11- 10+66	RT	599		768.9	766.84																										
SHEET TOTALS									227	209	32						71						47			41					

STATION	375 SIDE DRAIN PIPE	450 SIDE DRAIN PIPE	600 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 1.5m)	*TOTAL L.M. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5m THRU 3.0m	B 3.0m AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	O.T.C.B. STD. 840.04 OR 840.05	J.B. STD. 840.31 OR 840.32
-L- 313+42 (565)						1										1						1		
-L- 313+42 (565-566)																								
-L- 314+10 (567)						1			1		1													
-L- 314+10 (567-568)																								
-L- 314+10 (568)						1										1						1		
-L- 314+10 (568-569)																								
-L- 314+28 (570)			13.2																					
-L- 314+79																								
-Y28- 10+71 (572)	13.2																							
-L- 315+66 (573)						1			1		1													
-L- 315+66 (573-574)																								
-L- 315+68 (574)						1										1					1			
-L- 315+68 (574-575)																								
-L- 316+32 (575)						1										1					1			
-L- 316+32 (575-576)																								
-L- 316+60 (576)						1										1					1			
-L- 316+60 (576-577)																								
-L- 316+46 (578)						1			1		1													
-L- 316+46 (578-575)																								
-L- 317+35 (579)						1			1		1													
-L- 316+85 (579A)						1			1		1													
-L- 316+85 (579A-579)																								
-L- 317+72 (580)	12.0																							
-L- 317+76 (581)						1			1		1													
-L- 317+76 (581-582)																								
-L- 318+07 (583)						1							1	1										
-L- 317+35 (579-579B)																								
-L- 318+07 (583-584)																								
-L- 318+45 (585)						1										1					1			
-Y30- 10+60 (585-586)																								
-L- 318+50 (586)						1									1						1			
-L- 317+35 (579C-579)																								
-L- 318+50 (586-588)																								
-L- 318+25 (587)						1							1	1										
-L- 318+25 (587-588)																								
-L- 318+21 (588)						1	0.8																	
-L- 319+29 (591)						1											1		1					
-L- 319+40 (591A)						1											1		1					
-L- 319+40 (591A-591)																								
-L- 318+21 (588-589)																								
-L- 318+57																								
-L- 318+89 (590)						1							1	1										
-L- 318+89 (590-592)																								
-L- 318+85 (590A)																								
-L- 319+29 (591-592)																								
-L- 319+29 (592)						1			1	1														
-L- 319+29 (592-593)																								
-L- 319+59 (593)						1			1			1												
-L- 319+29 (590B)																								
-L- 319+65 (593-594)																								
-D11- 10+20 (595-598)					3.7																			
-D11- 10+29 (596-597)																								
-D11- 10+28 (597)						1										1					1			
-D11- 10+28 (597-598)																								
-D11- 10+27 (598)						1	0.56								1						1			
-D11- 10+27 (598-599)																								
-D11- 10+67 (600)						1										1					1			
-D11- 10+67 (600-599)																								
-D11- 10+66 (599)						1									1						1			
SHEET TOTALS	25		13		3.7	25	1.36		8	1	6	1	3	3	3	8	2		2		9	2		

STATION	MANHOLE STD. 840.53	MANHOLE STD. 840.51 OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	DRIVEWAY D.I. STD. 840.30	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	CONC TRANSITIONAL SECTION FOR C.B.	CONC TRANSITIONAL SECTION FOR D.I.	BERM DRAINAGE OUTLET STD. 850.10 OR 850.11	CONVERT EXISTING C.B. TO J.B. (SEE SHEET 2-AD)	CONVERT EXISTING D.I. TO J.B. W/MH COVER (SEE SHEET 2-AD)	PARALLEL PIPE END SECTION STD. 310.02	CROSS PIPE END SECTION STD. 310.03	PARALLEL PIPE END SECTION STD. 310.04	PREFORMED SCOUR HOLE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.M. STD. 840.72	CONC. & BRICK PIPE PLUG, C.M. STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
-L- 313+42 (565)																				
-L- 313+42 (565-566)																2x400				
-L- 314+10 (567)							1													
-L- 314+10 (567-568)																				
-L- 314+10 (568)																				
-L- 314+10 (568-569)																2x400				
-L- 314+28 (570)																				
-L- 314+79																		0.16		plug 600mm CMP and fill w/ flowable fill
-Y28- 10+71 (572)																			12.9	remove 375mm PLASTIC
-L- 315+66 (573)							1													
-L- 315+66 (573-574)																			6.0	remove pipe
-L- 315+68 (574)																				
-L- 315+68 (574-575)																				
-L- 316+32 (575)																				
-L- 316+32 (575-576)																			73.1	remove 375mm CMP
-L- 316+60 (576)																				
-L- 316+60 (576-577)																				tie to culvert
-L- 316+46 (578)							1													
-L- 316+46 (578-575)																				
-L- 317+35 (579)							1											0.06		plug 375mm RCP and fill w/ flowable fill
-L- 316+85 (579A)							1													
-L- 316+85 (579A-579)																				
-L- 317+72 (580)																				
-L- 317+76 (581)							1													
-L- 317+76 (581-582)													1						10.1	remove 375mm CONC/375mm Pipe End Section
-L- 318+07 (583)								1												
-L- 317+35 (579-579B)																				
-L- 318+07 (583-584)																			11.1	remove 375mm CMP
-L- 318+45 (585)																				
-Y30- 10+60 (585-586)																				
-L- 318+50 (586)																				
-L- 317+35 (579C-579)																				
-L- 318+50 (586-588)																				
-L- 318+25 (587)								1												
-L- 318+25 (587-588)																				
-L- 318+21 (588)			1		1															
-L- 319+29 (591)																				
-L- 319+40 (591A)																				
-L- 319+40 (591A-591)																				
-L- 318+21 (588-589)																				tie to culvert
-L- 318+57																			22.8	remove headwall and 450mm CMP
-L- 318+89 (590)								1												
-L- 318+89 (590-592)																				
-L- 318+85 (590A)												1								400mm Pipe End Section
-L- 319+29 (591-592)																				
-L- 319+29 (592)							1													
-L- 319+29 (592-593)																				
-L- 319+59 (593)							1													remove headwall
-L- 319+29 (590B)												1							15.7	remove 375mm CMP/ 400mm Pipe End Section
-L- 319+65 (593-594)																				remove 450 CMP and headwall
-D11- 10+20 (595-598)																2x1200				
-D11- 10+29 (596-597)									1							1x400				
-D11- 10+28 (597)																				
-D11- 10+28 (597-598)																				
-D11- 10+27 (598)																				
-D11- 10+27 (598-599)																2x1200				
-D11- 10+67 (600)																				
-D11- 10+67 (600-599)																				
-D11- 10+66 (599)																5x400				
SHEET TOTALS			1		1		8	3	1			2	1			4x1200		0.22	151.66	

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

RD253058,2/11/2011,R:\Roadway\estimate\Final\SUMMARY\R2519a_ Drainage_summary.xls

RD253058

COMPUTED BY: TMW DATE: 3/7/2007

CHECKED BY: KNW DATE: 1/1/2011

METRIC

PROJECT NO.	SHEET NO.
R-2519A	3-V

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 1200 & 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 IV R.C. PIPE (UNLESS NOTED OTHERWISE) 300	375	450	600	750	900	1050	1200	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300 (1.630)	400 (1.630)	450 (1.630)	600 (1.630)	800 (1.630)	900 (2.010)	1000 (2.010)	1200 (2.010)
-L- 320+06	LT	599	602		766.84	766.19									13.2								
-L- 320+21	LT	601		769.19	768.27																		
-L- 320+21	LT	601	602		768.27	768.12			15.6														
-L- 320+06	LT	602		769.2	766.16																		
-L- 321+30	LT	603		769.24	768.32																		
-L- 321+30	LT	603	604		768.32	768.28			7.2														
-L- 321+36	LT	604		769.25	768.28																		
-L- 321+36	LT	604	605		768.28	767.1			56.4														
-L- 321+93	LT	605		768.8	767.1																		
-L- 321+93	LT	605	610		767.1	767.04					16.8												
-D12- 10+02	RT	606	608		789.7	774.32											30.0						
-D12- 10+08	RT	607	608		778.5	774.09													8.4				
-D12- 10+16	RT	608		775.54	774.09																		
-D12- 10+16	RT	608	609		774.09	769.58													25.2				
-D12- 10+42	RT	609		771.03	769.58																		
-D12- 10+42	RT	609	610		769.58	767.04													14.4				
-L- 321+93	LT	610		768.49	767.04																		
-L- 321+93	CL	605	612		767.1	764.87					44.4												
-L- 322+38	LT	611		766.57	764.97																		
-L- 322+38	LT	611	612		764.97	764.87			20.4														
-L- 322+38	RT	612		768.3	764.87																		
-L- 322+38	RT	612	613		764.87	764.67						19.2											
-L- 322+80	LT	614	615		777.1	764.5													25.2				
-L- 322+80	LT	615		765.95	764.5																		
-L- 322+80	LT	615	616		764.5	764.23																	
-L- 323+00	LT	616		765.72	764.9																		
-L- 323+00	LT	616	617		764.9	764.66					15.6												
-L- 323+17	LT	617		765.66	764.66																		
-L- 323+17	CL	617	618		764.66	764					40.8												
-L- 323+20	RT	619		767.13	765.58																		
-L- 323+61	RT	620		766.83	765.91																		
-L- 323+61	RT	620	622		765.91	765.8			31.2														
-L- 323+93	LT	621		765.68	765.1																		
-L- 323+93	LT	621	622		765.1	765.02			20.4														
-L- 323+93	RT	622		766.78	765.02																		
-L- 323+93	RT	622	623		765.02	764			19.2														
-L- 324+70	LT	627																					
-L- 325+05	LT	628																					
-L- 326+13	RT																						
-L- 327+85	LT	629			764.3									8.4									
-Y33DET-	LT	629A																					
-Y33DET-	CL	629B																					
-Y33- 9+90	CL																						
-L- 327+37	LT	630		766.91	765.99																		
-L- 327+37	LT	630	631		765.99	765.5			55.2														
-L- 327+91	LT	631		766.47	765.5																		
-L- 327+91	CL	631	632		765.5	765.26			30.0														
-L- 328+20	RT	632		766.23	765.26																		
-L- 328+20	RT	632	633		765.26	764.42			18.0														
-L- 328+10	RT	633		765.26	764.42																		
-L- 328+10	RT	633	634		764.42	763											9.6						
SHEET TOTALS									274		118	19		8.4	13		40		73				

STATION	CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR HDPE, TYPE S OR D 300	375	450	600	750	900	1050	1200	375 SIDE DRAIN PIPE	450 SIDE DRAIN PIPE	600 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 1.5m)	*TOTAL L.M. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5m THRU 3.0m	B 3.0m AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G
-L- 320+06																				
-L- 320+21														1			1			1
-L- 320+21																				
-L- 320+06														1	1.5	0.19	1			1
-L- 321+30														1			1		1	
-L- 321+30																				
-L- 321+36														1			1		1	
-L- 321+36																				
-L- 321+93														1						
-L- 321+93																				
-D12- 10+02																				
-D12- 10+08																				
-D12- 10+16														1						
-D12- 10+16																				
-D12- 10+42														1						
-D12- 10+42																				
-L- 321+93														1						
-L- 321+93																				
-L- 322+38														1	0.1					
-L- 322+38																				
-L- 322+38														1	1.5	0.3	1			1
-L- 322+38																				
-L- 322+80																				
-L- 322+80														1						
-L- 322+80				19.2																
-L- 323+00														1						
-L- 323+00																				
-L- 323+17														1						
-L- 323+17																				
-L- 323+20														1	0.05		1			1
-L- 323+61														1			1			1
-L- 323+61																				
-L- 323+93														1						
-L- 323+93																				
-L- 323+93														1	0.26		1	1		
-L- 323+93																				
-L- 324+70											12.0									
-L- 325+05											9.6									
-L- 326+13																				
-L- 327+85												3.4								
-Y33DET-				22.8																
-Y33DET-			19.2																	
-Y33- 9+90																				
-L- 327+37														1			1		1	
-L- 327+37																				
-L- 327+91														1						
-L- 327+91																				
-L- 328+20														1						
-L- 328+20																				
-L- 328+10														1						
-L- 328+10																				
SHEET TOTALS			19	42							22	3.4		21	3.41	0.49	9	1	3	5

STATION	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	O.T.C.B. STD. 840.04 OR 840.05	J.B. STD. 840.31 OR 840.32	MANHOLE STD. 840.53	MANHOLE STD. 840.51 OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	DRIVEWAY D.I. STD. 840.30	T.B.J.B. (SEE SPECIAL DETAIL 2-AA)	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	CONC TRANSITIONAL SECTION FOR C.B.	CONC TRANSITIONAL SECTION FOR D.I.	BERM DRAINAGE OUTLET STD. 850.10 OR 850.11	CONVERT EXISTING C.B. TO J.B. (SEE SHEET 2-AD)	CONVERT EXISTING D.I. TO J.B. W/MH COVER (SEE SHEET 2-AD)	PARALLEL PIPE END SECTION STD. 310.02	CROSS PIPE END SECTION STD. 310.03	PARALLEL PIPE END SECTION STD. 310.04	PREFORMED SCOUR HOLE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.M. STD. 840.72	CONC. & BRICK PIPE PLUG, C.M. STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
-L- 320+06																																	
-L- 320+21																				1													
-L- 320+21																																	
-L- 320+06																				1												1.9	remove headwall and portion of 1200 CMP
-L- 321+30																				1													
-L- 321+30																																	
-L- 321+36																				1													
-L- 321+36																																	
-L- 321+93															1			1															
-L- 321+93																																	
-D12- 10+02																						1							1x400				
-D12- 10+08																													1x600				
-D12- 10+16			1						1																								
-D12- 10+16																													2x600				
-D12- 10+42			1						1																								
-D12- 10+42																													2x600				
-L- 321+93					1				1																								
-L- 321+93																																	
-L- 322+38					1				1																								
-L- 322+38																																	
-L- 322+38																				1													
-L- 322+38																																20.1584	remove headwall and 600mm CMP
-L- 322+80																						1							1x600				
-L- 322+80			1						1																								
-L- 322+80																																	
-L- 323+00			1						1																								
-L- 323+00																																	
-L- 323+17			1						1																								
-L- 323+17																												1					
-L- 323+20																				1													remove headwall
-L- 323+61																				1													
-L- 323+61																																	
-L- 323+93				1					1																								
-L- 323+93																																	
-L- 323+93																				1													
-L- 323+93																												1					
-L- 324+70																																10.0	Remove 375mm CMP
-L- 325+05																									1								600mm Pipe End Section
-L- 326+13																																23.0	remove headwall and 375mm CMP
-L- 327+85																																	tie to culvert
-Y33DET-																																22.8	temporary pipe for detour
-Y33DET-																																19.2	temporary pipe for detour
-Y33- 9+90																																9.5	remove 600mm CMP
-L- 327+37																				1													
-L- 327+37																																6.1	remove 375mm RCP
-L- 327+91	1	1																			1												
-L- 327+91																																	
-L- 328+20	1	1																			1												
-L- 328+20																																	
-L- 328+10				1						1																							
-L- 328+10																												1	2x400				
																													3x400				
SHEET TOTALS	2	2	5	2	2				8	1					1			1		9	2	2			1			3	6x600			112.68	

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

RD253058,2/11/2011 R:\Roadway\estimate\Final\SUMMARY\R2519a_ Drainage_summary.xls

RD253058

COMPUTED BY: TMW DATE: 3/7/2007

CHECKED BY: KNW DATE: 1/1/2011

METRIC

PROJECT NO. R-2519A SHEET NO. 3-W

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

*TOTAL L.M. 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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS IV R.C. PIPE (UNLESS NOTED OTHERWISE) 300	375	450	600	750	900	1050	1200	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300	400 (1.630)	450 (1.630)	600 (1.630)	800 (1.630)	900 (2.010)	1000 (2.010)	1200 (2.010)	CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR HDPE, TYPE S OR D 300	375	450	600	750	900	1050	1200	375 SIDE DRAIN PIPE	450 SIDE DRAIN PIPE	600 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 1.5m)	METERS A 1.5m THRU 3.0m	B 3.0m AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	O.T.C.B. STD. 840.04 OR 840.05	J.B. STD. 840.31 OR 840.32	MANHOLE STD. 840.53	MANHOLE STD. 840.51 OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	DRIVEWAY D.I. STD. 840.30	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	CONC TRANSITIONAL SECTION FOR C.B.	CONC TRANSITIONAL SECTION FOR D.I.	BERM DRAINAGE OUTLET STD. 850.10 OR 850.11	CONVERT EXISTING C.B. TO J.B. (SEE SHEET 2-AD)	CONVERT EXISTING D.I. TO J.B. W/MH COVER (SEE SHEET 2-AD)	PARALLEL PIPE END SECTION STD. 310.02	CROSS PIPE END SECTION STD. 310.03	PARALLEL PIPE END SECTION STD. 310.04	PREFORMED SCOUR HOLE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.M. STD. 840.72	CONC. & BRICK PIPE PLUG, C.M. STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
-Y32- 10+45	CL																																																																								12.5	remove 450mm CMP
-L- 328+71	CL	635		766.6	765.68																																1			1			1																			1													
-L- 328+71	CL	635	632		765.68	765.226			50.4																																																																		
-Y32- 10+00	LT	636	637		775	764.99											13.2																																															1							1x400				
-Y32- 10+00	LT	637		765.83	764.92																																1										1					1																									
-Y32- 10+00	LT	637	638		764.92	764.79																					9.6																																																
-Y32- 10+09	LT	638		765.7	764.63																																1										1					1																									
-Y32- 10+09	LT	638	639		764.63	764.5					18.0																																																																
-L- 329+29	LT	640	642		770.4	765.48											9.6																																															1							1x400				
-L- 329+39	LT	641	642		770.2	765.48											12.0																																																						1x400				
-L- 329+30	LT	642		766.4	765.48																																1										1					1																									
-L- 329+30	LT	642	643		765.48	764.94			19.2																																																																31.6	remove 375mm CMP
-L- 329+25	LT	643		767.4	764.9																																1	0.93		1			1																			1													
-L- 329+25	RT	643	643A		764.9	762.4												27.6																																																								28.8	remove 450 CMP
-L- 329+58	LT	644	646		766.7	765.36			16.8																																																																
-L- 329+72	LT	645	646		769.3	765.13													7.2																																													1							1x600				
-L- 329+74	LT	646		766.58	765.13																																1									1						1																									
-L- 329+74	LT	646	648		765.13	764.51																						39.6																																														
-L- 330+14	LT	647	648		769.4	764.74											9.6																																															1							1x400				
-L- 330+13	LT	648		765.96	764.51																																1									1						1																									
-L- 330+13	LT	648	650		764.51	762.66																						68.4																																											16.6	remove 375mm CMP
-L- 330+83	LT	649	650		767.5	762.51														7.2																																												1							1x800				
-L- 330+83	LT	650		764.11	762.51																																1	0.1								1						1																									
-L- 330+83	LT	650	651		762.51	762.16																							13.2																																													
-L- 330+97	LT	651		763.76	762.16																																1	0.1								1						1																									
-L- 330+97	LT	651	652		762.16	761						43.2																																																														21.2	remove 450mm CMP
-L- 331+13	RT	653		765.06	762.06																																1	1.5		1			1																			1													
-L- 331+13	RT	653	653A		762.06	758.85											21.6																																																						1	2x400				
-L- 331+96	LT	654		761.58	760.74																																1										1					1																									
-L- 331+96	CL	654	655		760.74	760.23			20.4																																																																
-L- 331+95	RT	655	655A		760.23													22.8																																																						29.5	remove 450mm CMP
-L- 331+95	RT	655		763.19	760.23																																1	1.46		1			1																			1												6.0	remove 450mm CSP
-L- 333+09	LT	656																																10.8																																									8.5	remove 375mm CMP
-L- 333+09	RT	657		761.35	760.43																																1			1			1																			1													
-L- 333+09	RT	657	658		760.43	757.5											19.2																																																						1	2x400				
-L- 333+50	LT	661A													6.0																																																												6.2	remove 1200mm CMP
-L- 333+81	RT	662		760.51	759.59																																1			1			1																			1													
-L- 333+81	RT	662	663		759.59	756.7											20.4																																																							2x400				
-L- 334+41	RT	664		760.06	759.14																																1			1			1																			1													
-L- 334+41	RT	664	665		759.14	756.5											20.4																																																							2x400				
-L- 335+20	LT	666	667		762.9	757.57											10.8																																															1							1x400				
-L- 335+18	RT	668		759.55	758.63																																1			1			1																			1													
-L- 335+18	RT	668	667		758.63	757.57			16.8																																																																
-L- 335+20	LT	667		758.41	757.5																																1										1					1																									
-L- 335+20	LT	667	670		757.5	756.8																					42.0																																														
-L- 335+64	LT	669		759.37	758.45																																1							1	1																		1												
-L- 335+64	LT	669	670		758.45	756.9			18.0																																																																
-L- 335+64	LT	670		758.1	756.65																																1									1						1																									
-L- 335+64	LT	670	672		756.65	755.87																						132																																												24.6	remove 450mm CMP and headwall
-L- 337+00	RT	671		758.54	757.62																																1			1			1																			1													
-L- 336+60	RT	671A		758.9	757.9																																1			1			1																			1													
-L- 337+00	CL	671	672		757.62	756.1			19.2																																																																
-L- 336+60	RT	671A	671		757.9	757.6			39.6																																																																
																																																																						13x400				
																																																																						1x600				
SHEET TOTALS									200		18	43.2			6		137	50	7.2	7.2						52	240	13					11				21	4.09		10			10	1	1	5	5					10										10	1	6						2	1x800			185.59	

RD253058,2/11/2011,R:\Roadway\estimate\Final\SUMMARY\R2519a_ Drainage_summary.xls

RD253058

COMPUTED BY: TMW DATE: 3/7/2007

CHECKED BY: KNW DATE: 1/1/2011

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

METRIC

PROJECT NO.	SHEET NO.
R-2519A	3-X

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS IV R.C. PIPE (UNLESS NOTED OTHERWISE) 300	375	450	600	750	900	1050	1200	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300 (1.630)	400 (1.630)	450 (1.630)	600 (1.630)	800 (1.630)	900 (2.010)	1000 (2.010)	1200 (2.010)	CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR HDPE, TYPE S OR D 300	375	450	600	750	900	1050	1200
-L- 336+99	LT	672		757.32	755.87																										
-L- 336+99	LT	672	674A		755.87	755.77						24.0																			
-L- 338+49	LT	675	676		774.3	754.96											39.6														
-L- 338+50	LT	676		755.88	754.97																										
-L- 337+80	RT	677A		757.8	756.8																										
-L- 338+50	LT	676	677		754.97	754.85				20.4																					
-L- 338+49	RT	677		757.09	754.85																										
-L- 338+49	RT	677	678		754.85	754.65				18.0																					
-L- 339+40	RT	679		756.2	755.28																										
-L- 337+80	RT	677A	677		756.8	754.9			68.4																						
-L- 339+40	RT	679	680		755.28	754.8			55.2																						
-L- 339+96	RT	680		755.72	753.3																										
-L- 339+96	RT	680	681		754.75	754.78			8.4																						
-L- 340+06	RT	681		755.7	754.78																										
-L- 339+96	RT	680	680A							15.6																					
-L- 340+07	LT	682	683		755.7	753.02													7.2												
-L- 340+06	LT	683		754.47	753.02																										
-L- 340+06	LT	683	684		753.02	752.8																					25.2				
-L- 340+33	LT	684		754.71	752.8																										
-L- 340+33	LT	684	686		752.8	752.2					27.6																				
-L- 340+87	RT	687		756.54	755.7																										
-L- 340+87	RT	687	688		755.7	755.56			6.0																						
-L- 340+80	RT	688		756.4	755.56																										
-L- 340+80	RT	688	689		755.56	753											7.2														
-L- 341+29	LT	690	691		753.5	752.97					16.8																				
-L- 341+32	LT	691		754.02	752.97																										
-L- 341+48	LT	692		757.8	756.96																										
-L- 341+31	RT	691	691A								25.2																				
-L- 341+48	LT	692	693		756.96	754.8											12.0														
-L- 342+40	LT	694	695		775.75	761.03													28.8												
-L- 342+40	LT	695		762.48	760.88																										
-L- 342+40	CL	695	695A		760.88	760.7						15.6																			
-L- 342+40	CL	695A		763.3	760.7																										
-L- 342+40	RT	696		762.2	760.6																										
-L- 342+40	RT	696	697		760.6	753														16.8											
-L- 342+40	LT	695	700		761.03	764.35																					50.4				
-L- 342+96	RT	698		766.24	765.27																										
-L- 342+40	RT	695A	696									24.0																			
-L- 342+96	RT	698	699		765.27	764.93			6.0																						
-L- 342+90	RT	699		765.9	764.93																										
-L- 342+90	CL	699	700		764.93	764.67			18.0																						
-L- 342+89	LT	700		765.8	764.35																										
-L- 342+89	LT	700	701		764.35	766.52																					51.6				
-L- 343+39	LT	701		767.97	766.52																										
-L- 343+39	LT	701	702		766.52	767.58																					37.2				
-L- 343+75	LT	702		769.77	767.58																										
-L- 343+75	LT	702	703		767.58	768.73					22.8																				
-L- 343+97	LT	703		769.81	768.73																										
-L- 343+97	LT	703	705		768.73	768.95																					43.2				
-L- 344+39	LT	704	705		771.5	768.96													4.8												
-L- 343+98	LT	703A		770.1	769.1																										
-L- 344+39	LT	705		770.4	768.95																										
-L- 343+81	RT	706		768.9	768.06																										
-L- 343+81	RT	706	707		768.06	767.1											6.0														
-L- 343+80	RT	707		767.94	767.1																										
-L- 343+98	LT	703A	703		769.1	768.7			14.4																						
-L- 343+80	RT	707	708		767.1	755.5											28.8														
SHEET TOTALS									176.4	54	92	64					94		41	17							208				

STATION	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0 THRU 1.5m)	*TOTAL L.M. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5m THRU 3.0m	B 3.0m AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	M.H. FRAME AND COVER STD. 840.54	T.B.J.B. STD. 840.34
-L- 336+99	1									1		1			
-L- 336+99															
-L- 338+49															
-L- 338+50	1										1	1			
-L- 337+80	1			1			1								
-L- 338+50															
-L- 338+49	1	0.74		1			1								
-L- 338+49															
-L- 339+40	1			1			1								
-L- 337+80															
-L- 339+40															
-L- 339+96	1	0.92		1			1								
-L- 339+96															
-L- 340+06	1			1	1										
-L- 339+96															
-L- 340+07															
-L- 340+06	1									1		1			
-L- 340+06															
-L- 340+33	1	0.41								1		1			
-L- 340+33															
-L- 340+87	1										1		1		
-L- 340+87															
-L- 340+80	1										1		1		
-L- 340+80															
-L- 341+29															
-L- 341+32	1													1	1
-L- 341+48	1										1	1			
-L- 341+31															
-L- 341+48															
-L- 342+40															
-L- 342+40	1	0.1								1		1			
-L- 342+40															
-L- 342+40	1	1.1						1	1						
-L- 342+40	1	0.1									1	1			
-L- 342+40															
-L- 342+40															
-L- 342+96	1							1	1						
-L- 342+40															
-L- 342+96															
-L- 342+90	1							1	1						
-L- 342+90															
-L- 342+89	1									1		1			
-L- 342+89															
-L- 343+39	1									1		1			
-L- 343+39															
-L- 343+75	1	0.69								1		1			
-L- 343+75															
-L- 343+97	1									1		1			
-L- 343+97															
-L- 344+39															
-L- 343+98	1			1			1								
-L- 344+39	1									1		1			
-L- 343+81	1										1		1		
-L- 343+81															
-L- 343+80	1										1	1			
-L- 343+98															
-L- 343+80															
SHEET TOTALS	26	4.06		6	1		5	3	3	9	7	13	3	1	1

STATION	CONC TRANSITIONAL SECTION FOR C.B.	CONC TRANSITIONAL SECTION FOR D.I.	BERM DRAINAGE OUTLET STD. 850.10 OR 850.11	PREFORMED SCOUR HOLE	CORR. STEEL ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.M. STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
-L- 336+99								
-L- 336+99							6.0	remove 450mm CMP
-L- 338+49			1		1x400			
-L- 338+50								
-L- 337+80	1							
-L- 338+50								
-L- 338+49	1							
-L- 338+49				1			21.3	remove headwall and 450mm CMP
-L- 339+40	1							
-L- 337+80								
-L- 339+40								
-L- 339+96	1							
-L- 339+96								
-L- 340+06	1							
-L- 339+96							19.7	remove 450mm CMP and hw
-L- 340+07			1		1x600			
-L- 340+06								
-L- 340+06								
-L- 340+33								
-L- 340+33							24.8	remove 600mm CMP
-L- 340+87								
-L- 340+87								
-L- 340+80								
-L- 340+80					2x400			
-L- 341+29								
-L- 341+32								
-L- 341+48								
-L- 341+31								remove 600mm CMP and headwall
-L- 341+48					2X400			
-L- 342+40			1		1x600			
-L- 342+40								
-L- 342+40						0.1		remove headwall, plug and fill 450mm CMP
-L- 342+40		1						
-L- 342+40								
-L- 342+40				1	2x800			
-L- 342+40								
-L- 342+96		1						
-L- 342+40								
-L- 342+96								
-L- 342+90		1						
-L- 342+90								
-L- 342+89								
-L- 342+89								
-L- 343+39								
-L- 343+39								
-L- 343+75								
-L- 343+75							9.3	remove 450mm CMP
-L- 343+97								
-L- 343+97								
-L- 344+39			1		1x600			
-L- 343+98	1							
-L- 344+39								
-L- 343+81								
-L- 343+81					2x400			
-L- 343+80								
-L- 343+98								
-L- 343+80					2x400			
					9x400			
					3x600			
SHEET TOTALS	6	3	4	2	2x800	0.1	80.92	

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

RD248619

COMPUTED BY: TMW DATE: 3/7/2007

CHECKED BY: KNW DATE: 1/1/2011

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

METRIC

PROJECT NO.	SHEET NO.
R-2519A	3-Y

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 1200 & 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 IV R.C. PIPE (UNLESS NOTED OTHERWISE) 300	375	450	600	750	900	1050	1200	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300 / 1.630	400 / 1.630	450 / 1.630	600 / 1.630	800 / 1.630	900 / 2.010	1000 / 2.010	1200 / 2.010
-Y36- 11+14	LT	708		756.2	755.5																		
-Y36- 11+14	LT	708	709		755.5													2.4					
-Y36- 10+84	RT	710		758.26	757.42																		
-Y36- 10+84	RT	710	711		757.42	753											16.8						
-Y36- 11+15	RT	712		756.31	754.86																		
-Y36- 11+15	RT	712	713		754.86	753												13.2					
-L- 345+50	LT	714																					
-Y21- 10+74	LT	715																					
-Y21- 11+05	LT	716		801.85	800.25																		
-Y21- 11+05	LT	716	717		800.25	798.82				26.4													
SHEET TOTALS										26.4							16.8	15.6					
SHEET 3-D TOTALS:									85.2	86.4		26.2			12.0		162.0	40.8	22.8		10.8	4.8	
SHEET 3-E TOTALS:									406.8	199.2	86.4	48.0					49.2		15.6				
SHEET 3-F TOTALS:									213.6		15.6	39.6					73.2	12.0	40.8				
SHEET 3-G TOTALS:									320.4	52.8	57.0	15.6					33.6			14.4			
SHEET 3-H TOTALS:									274.8	4.8			12.0	182.4	60.0		67.2				15.6		
SHEET 3-I TOTALS:									108.0		117.6	103.2	152.4				14.4		25.2				
SHEET 3-J TOTALS:									457.2	97.2								9.6					
SHEET 3-K TOTALS:									352.8	25.2	108.0	260.4					22.8	6.0	62.4	4.8			
SHEET 3-L TOTALS:									68.4	98.4	28.2		138.0	74.4			9.6	42.0				30.0	
SHEET 3-M TOTALS:									282.0				67.2	85.2			7.2	4.8	2.4				
SHEET 3-N TOTALS:									175.2	36.0	195.6		43.2				51.6		13.2				
SHEET 3-O TOTALS:									310.8	24.0	190.8			36.0					3.6				
SHEET 3-P TOTALS:									189.6	42.0	160.8	33.6					14.4	6.0					
SHEET 3-Q TOTALS:									176.4	85.2	133.2		40.8		40.8	13.2	21.6						
SHEET 3-R TOTALS:									235.2	99.6	96.0						12.0						
SHEET 3-S TOTALS:									208.8	46.8	136.8	186.0	21.6				22.8	36.0	9.6	13.2			
SHEET 3-T TOTALS:									224.4	13.2			36.0	142.4			44.4	42.0	28.8				
SHEET 3-U TOTALS:									226.8	208.8	32.4						70.8						46.8
SHEET 3-V TOTALS:									273.6		117.6	19.2		8.4	13.2		39.6		73.2				
SHEET 3-W TOTALS:									200.4		18.0	43.2			6.0		136.8	50.4	7.2	7.2			
SHEET 3-X TOTALS:									176.4	54.0	92.4	63.6					93.6		40.8	16.8			
SHEET 3-Y TOTALS:										26.4							16.8	15.6					
SHEET 3-Z TOTALS:																							
TOTAL FROM ALL SHEETS									4966.8	1200.0	1586.4	838.6	511.2	528.8	132.0	13.2	963.6	265.2	345.6	56.4	26.4	34.8	46.8
GRAND TOTALS									4966.8	1200.0	1586.4	838.6	511.2	528.8	132.0	13.2	963.6	265.2	345.6	56.4	26.4	34.8	46.8

STATION	CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR HDPE, TYPE S OR D 300	375	450	600	750	900	1050	1200	375 SIDE DRAIN PIPE	450 SIDE DRAIN PIPE	600 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 1.5m)	*TOTAL L.M. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5m THRU 3.0m	B 3.0m AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29
-Y36- 11+14 (708)														1										1					1	
-Y36- 11+14 (708-709)																														
-Y36- 10+84 (710)														1										1						1
-Y36- 10+84 (710-711)																														
-Y36- 11+15 (712)														1																
-Y36- 11+15 (712-713)																														
-L- 345+50 (714)									18																					
-Y21- 10+74 (715)										14.4																				
-Y21- 11+05 (716)														1										1					1	
-Y21- 11+05 (716-717)																														
SHEET TOTALS									18.0	14.4				4.0										3					2	1
SHEET 3-D TOTALS:		258.0		27.6					31.2				2.9	20.0	4.9	0.6	2			2	2	2	1	14					5	10
SHEET 3-E TOTALS:		26.4	49.2	14.4					14.4	13.2				32.0	4.5	6.0	8	1	3	4	5	5	3	12	1				13	5
SHEET 3-F TOTALS:		270.0		32.4	7.2				27.6	6.0				28.0	3.5	0.4	6		4	2	12	12	2	5	1				6	2
SHEET 3-G TOTALS:		26.4		15.6					9.6					25.0	1.2		20	1	16	3	5	5								
SHEET 3-H TOTALS:										9.6		2.6		28.0	3.4	0.7	9	1	6	5	14	14								
SHEET 3-I TOTALS:		55.2		12.0					9.6					23.0			14		1	13	8	8								
SHEET 3-J TOTALS:		19.2	164.4											28.0	0.1		18		10	8	6	6		3			1		1	1
SHEET 3-K TOTALS:		37.2	6.0											28.0	1.9		16		9	7	11	11								
SHEET 3-L TOTALS:		30.0	8.4				7.2						1.4	25.0	1.3		12		7	5	7	7		2					2	
SHEET 3-M TOTALS:		37.2												24.0	5.4	1.0	11	2	4	7	8	8								
SHEET 3-N TOTALS:		25.2	10.8	21.6						54.0				22.0	0.6		14		8	6	8	8								
SHEET 3-O TOTALS:		44.4												28.0	8.2	0.5	14		4	10	11	11	2						2	
SHEET 3-P TOTALS:			30.0											23.0	1.7		15	1	4	10	8	8								
SHEET 3-Q TOTALS:												2.6		25.0	8.9	3.3	14	2	6	6	5	6								
SHEET 3-R TOTALS:			24.0						32.4					21.0	2.2	2.0	16		3	13	4	4		1					1	
SHEET 3-S TOTALS:		37.2			39.6	12.0			86.4			2.6		20.0	1.9		3		3		4	4	5	7					11	1
SHEET 3-T TOTALS:			92.4		9.6		24.0		31.2	13.2				25.0	5.0	0.7	5		3	2	2	2	2	10					10	2
SHEET 3-U TOTALS:			40.8						25.2		13.2		3.7	25.0	1.4		8	1	6	1	3	3	3	8	2		2		9	2
SHEET 3-V TOTALS:			19.2	42.0							21.6	3.4		21.0	3.4	0.5	9	1	3	5	2	2	5	2	2				8	1
SHEET 3-W TOTALS:			51.6	240.0	13.2					10.8				21.0	4.1		10			10	1	1	5	5					10	
SHEET 3-X TOTALS:				207.6										26.0	4.1		6	1		5	3	3	9	7					13	3
SHEET 3-Y TOTALS:									18.0	14.4				4.0										3					2	1
SHEET 3-Z TOTALS:																				5			1						1	
TOTAL FROM ALL SHEETS		866.4	496.8	613.2	69.6	12.0	31.2		285.6	121.2	34.8	11.2	8.0	522.0	67.5	15.6	230	11	100	129	129	130	38	79	6		3		94	28
(row above GRAND TOTALS)															87.7															
GRAND TOTALS		866.4	496.8	613.2	69.6	12.0	31.2		285.6	121.2	34.8	11.2	8.0	522.0	67.5	15.6	230	11	100	129	129	130	38	79	6		3		94	28

STATION	O.T.C.B. STD. 840.04 OR 840.05	J.B. STD. 840.31 OR 840.32	FRAME WITH GRATES, DRIVEWAY DROP INLET	MANHOLE STD. 840.53	MANHOLE STD. 840.51 OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	C.B. (SEE SPECIAL DETAIL SHEET 2-X)	D.I. SEE SPECIAL DETAIL SHEET 2-AU	DRIVEWAY D.I. STD. 840.30	T.B.J.B. (SEE SPECIAL DETAIL 2-AA)	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	750mm WELDED STEEL PIPE LINER (MIN. 13mm THICK) GRADE B (SEE SHEET 2-AT)	CONC TRANSITIONAL SECTION FOR C.B.	CONC TRANSITIONAL SECTION FOR D.I.	BERM DRAINAGE OUTLET STD. 850.10 OR 850.11	CONVERT EXISTING C.B. TO J.B. (SEE SHEET 2-AD)	CONVERT EXISTING D.I. TO J.B. W/MH COVER (SEE SHEET 2-AD)	PARALLEL PIPE END SECTION STD. 310.02	CROSS PIPE END SECTION STD. 310.03	PARALLEL PIPE END SECTION STD. 310.04	PREFORMED SCOUR HOLE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.M. STD. 840.72	CONC. & BRICK PIPE PLUG, C.M. STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
-Y36- 11+14 (708)																											
-Y36- 11+14 (708-709)																								0.33			remove headwall
-Y36- 10+84 (710)																											
-Y36- 10+84 (710-711)																						1	2x400				
-Y36- 11+15 (712)					1	1																					
-Y36- 11+15 (712-713)																							2x450				
-L- 345+50 (714)																			1								375mm of Pipe End Section
-Y21- 10+74 (715)																										12.7	remove 375mm CMP
-Y21- 11+05 (716)																											remove D.I.
-Y21- 11+05 (716-717)																										21.4	remove 300mm PLASTIC & 450mm conc
																							2x400				
SHEET TOTALS					1	1													1			1	2x450	0.33		34.2	
SHEET 3-D TOTALS:		1											45.6	2	2	2			3			2		1.21		155.7	
SHEET 3-E TOTALS:	1											2		8	3				2	3		1		0.29	0.10	351.5	
SHEET 3-F TOTALS:		1			1	2								2	6				1			1		0.33		125.9	
SHEET 3-G TOTALS:														4	2					1						81.3	
SHEET 3-H TOTALS:		2				5	3								6			3	1						0.34	150.6	
SHEET 3-I TOTALS:					1	1								3	1	1	1									205.2	
SHEET 3-J TOTALS:					1	1								4	1											155.5	
SHEET 3-K TOTALS:	1														3	2						1			0.08	131.9	
SHEET 3-L TOTALS:	2				1	2					1				2									0.65	0.16	46.9	
SHEET 3-M TOTALS:				1	1	3	2				1			1	3							1		0.73	0.05	99.8	
SHEET 3-N TOTALS:															2	3									0.14	134.0	
SHEET 3-O TOTALS:						1					1			1	5									0.40		176.3	
SHEET 3-P TOTALS:														3	4							4		0.33		74.7	
SHEET 3-Q TOTALS:	1	2	1			2		1	10.8	1				1	2	3						1				214.9	
SHEET 3-R TOTALS:														4	3	1			2			1				98.9	
SHEET 3-S TOTALS:		1				1									3	5			7		1			0.66	0.32	233.7	
SHEET 3-T TOTALS:		2		2		5					2			5	2	1			1		1			0.62	0.16	71.7	
SHEET 3-U TOTALS:						1					1			8	3	1			2	1					0.22	151.7	
SHEET 3-V TOTALS:						1					1			9	2	2			1			3				112.7	
SHEET 3-W TOTALS:														10	1	6						2				185.6	
SHEET 3-X TOTALS:						1					1			6	3	4						2			0.10	80.9	
SHEET 3-Y TOTALS:					1	1													1			1		0.33		34.2	
SHEET 3-Z TOTALS:		5				5	5																	6.45	0.34	229.3	
TOTAL FROM ALL SHEETS	5	14	1	3	6	32	10	1	10.8	1	8	2	45.6	71	59	31	1	3	21	5	2	20		12.00	2.01	3302.8	
																								24.00			Contingency Item per Email from Divison 4/26/11
																									7.99		Contingency Item per Email from Divison 4/26/11
																							110x400				
																							16x450				
																							27x600				
																							7x800				18- 375mm Pipe End Sections
																							2x900				3 - 400mm Pipe End Sections
																							4x1000				4 - 450mm Pipe End Sections
GRAND TOTALS	5	14	1	3	6	32	10	1	10.8	1	8	2	45.6	71	59	31	1	3	21	5	2	20	4x1200	36.00	10.00	3302.8	3 - 600mm Pipe End Sections

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

RD253058,2/11/2011,R:\Roadway\estimate\Final\SUMMARY\R2519a_ Drainage_summary.xls

COMPUTED BY: TMW DATE: 3/7/2007

CHECKED BY: KNW DATE: 1/1/2011

RD253058

PROJECT NO.	SHEET NO.
R-2519A	3-Z

METRIC

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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) 1350	1500	1650	1800	1950	2100
-D1- 10+38	CL	22			780.7	780.2							
-L- 231+30	RT	27			784.0	784.2							
-L- 232+94	RT	31			794.51	795.5							
-L- 236+00	RT	40			807.23	806.1							
-L- 231+47	CL	27A			787.3	784.3							
-L- 249+52	LT	99	98A		813.55	813.45							
-L- 249+55	LT	98A		815.51	813.45								
-D4REV- 10+29	CL	138			816.3	815.7							
-L- 257+67	RT	148		823.1	819.5								
-L- 257+67	RT	148	149		819.5	818.7					30.0		
-L- 257+81	RT	154	148		821.38	819.5					16.8		
-L- 257+81	RT	154		823.93	821.38								
-L- 258+34	RT	156		824.54	821.99								
-L- 258+34	RT	156	154		821.99	821.38					51.6		
-L- 258+64	RT	156A	156		822.3	821.99					30.0		
-L- 258+64	RT	156A		824.85	822.3								
-L- 258+64	RT	159	156A		823.2	822.3					56.4		
-L- 258+64	RT	159		825.75	823.2								
-L- 259+99	RT	162		826.87	824.32								
-L- 259+99	RT	162	159		824.32	823.2					75.6		
-L- 270+62	LT	238	239		834.42	833.1							
-L- 270+62	LT	238		834.7	834.42								
-L- 279+85	RT	324	323		806.2	804.31						27.6	
-L- 279+91	RT	323		808.1	804.31								
-L- 297+58	CL	476			789.6	788.5					46.8		
-L- 314+41	CL	571			772.2	772.6			42.0				
-L- 324+53	LT	624	625		764.8	763.83			19.2				
-L- 324+48	LT	625		766.91	763.83				24.0				
-L- 324+48	RT	625	626		763.83	763.48			21.6				
-L- 324+46	RT	626			763.48				21.6				
-L- 333+17	LT	659	660		758	756.9		21.6					
-L- 333+17	CL	660		758.8	756.9								
-L- 333+17	RT	660	661		756.9	756.5		20.4					
-L- 337+25	LT	673	674A		755.8	755.77		4.8					
-L- 337+24	CL	674		758.4	755.77								
-L- 337+24	LT	674A		757.7	755.7								
-L- 337+24	RT	674	674B		755.77	755.1		19.2					
-L- 337+24	LT	674	674A		755.7	755.8		16.8					
-L- 340+64	LT	685	686		753.75	751.94		20.4					
-L- 340+54	LT	686		756.06	751.94								
-L- 340+54	RT	686	686A		751.94	751.9			18.0				
-L- 254+85	RT	129A		818.49	814.91								
-L- 254+85	CL	129A	129B		815	815.5			33.6				
-L- 254+85	LT	129B		818.62	815.5								
-L- 259+93	CL												
TOTALS								103.2	180.0		307.2	27.6	

SIZE / THICKNESS OR GAUGE:

STATION	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 1400 2.77	1400 3.51	1400 4.27	1500 2.77	1500 3.51	1650	1800 3.51	SHOP ELONGATED	BITUMINOUS COATED C.S. ARCH PIPE TYPE B (UNLESS NOTED OTHERWISE) 2230x1600 2.77	2230x1600 3.51	2230x1600 4.27	2410x1700 2.77	2410x1700 3.51	2410x1700 4.27	REINFORCED ENDWALLS CLASS 'A' CONC. WITH R.C. - C.M.	WITH C.S. - C.M.
-D1- 10+38									21.6							4.5
-L- 231+30							7.2									
-L- 232+94				15.6												4.4
-L- 236+00	15.6															
-L- 231+47																
-L- 249+52				6												4.4
-L- 249+55																
-D4REV- 10+29												13.2				4.5
-L- 257+67																
-L- 257+67																
-L- 257+81																
-L- 257+81																
-L- 258+34																
-L- 258+34																
-L- 258+64																
-L- 258+64																
-L- 258+64																
-L- 258+64																
-L- 259+99																
-L- 259+99																
-L- 270+62	4.8															
-L- 270+62																
-L- 279+85															5.1	
-L- 279+91																
-L- 297+58															5.4	
-L- 314+41															4.3	
-L- 324+53															4.3	
-L- 324+48																
-L- 324+48																
-L- 324+46																
-L- 333+17															3.8	
-L- 333+17																
-L- 333+17																
-L- 337+25															3.8	
-L- 337+24																
-L- 337+24																
-L- 337+24																
-L- 337+24																
-L- 340+64															4.3	
-L- 340+54																
-L- 340+54																
-L- 254+85																
-L- 254+85																
-L- 254+85																
-L- 259+93																
TOTALS	20.4			21.6			7.2		21.6			13.2			31	17.8

STATION	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	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	J.B. SEE SPECIAL DETAIL SHEET 2-Z	MANHOLE STD. 840.51	M.H. STD. 840.51 OR 840.53	M.H. FRAME AND COVER STD. 840.54	T.B.J.B. SEE SPECIAL DETAIL SHEET 2-Y	ENDWALL SEE SPECIAL DETAIL SHEET 2-V	T.B.J.B. SEE SPECIAL DETAIL SHEET 2-AC	C.B. SEE SPECIAL DETAIL SHEET 2-X	ENDWALL SEE SPECIAL DETAIL SHEET 2-T	WINGWALL SEE SPECIAL DETAIL SHEET 2-U	T.B.J.B. SEE SPECIAL DETAIL SHEET 2-AB	CONC. COLLARS CL. "B" M^3 STD. 840.72	CONC. & BRICK PIPE PLUG, C.M. STD. 840.71	1650MM WELDED STEEL PIPE LINER (MIN. 22MM THICK) GRADE B (SEE SHEET 2-AT)	PIPE REMOVAL (METERS)	REMARKS
-D1- 10+38																1										remove 1200mm CMP, headwall special detail
-L- 231+30																						2.49				
-L- 232+94																						2.08				
-L- 236+00																						1.88				
-L- 231+47																								56.4		see detail 2-AT
-L- 249+52																										
-L- 249+55	4.6									1																remove headwall
-D4REV- 10+29																			1							HW special detail, remove 1500mm & 900mm CMP
-L- 257+67	5.6					1			1																	tie spring box to 2GI
-L- 257+67																									16.14	remove 1500mm CMP and D.I.
-L- 257+81																										
-L- 257+81	11.9				1													1								
-L- 258+34	11.9				1													1								
-L- 258+34																										
-L- 258+64																										
-L- 258+64	11.9				1													1								
-L- 258+64																									15.66	remove 450mm CMP
-L- 258+64	11.9				1													1								
-L- 259+99	11.9				1													1								
-L- 259+99																										plug 1200mm CMP
-L- 270+62																										
-L- 270+62	3.8									1																
-L- 279+85																				1					25.05	remove 1500mm CMP
-L- 279+91	7.53										1															
-L- 297+58																									27.61	remove 375&1400mm CMP
-L- 314+41																										
-L- 324+53																									12.18	remove 1200mm CMP
-L- 324+48	6.62													1							1				13.71	remove 450mm CMP, headwall, & box
-L- 324+48																										
-L- 324+46																									20.88	remove 1500mm CMP & di
-L- 333+17																										
-L- 333+17	5.28																1									
-L- 333+17																									8.53	remove headwall, 375mm CMP, & culvert
-L- 337+25																									6.82	remove 450mm CMP
-L- 337+24	5.28																1								31.81	remove hw, wingwalls, 1350mm, 450mm
-L- 337+24	2.438									1				1												
-L- 337+24																										
-L- 337+24																										
-L- 340+64																										
-L- 340+54	4.63													1	1											remove headwall
-L- 340+54																									18.61	remove 1500mm CMP
-L- 254+85	3.307									1				1												
-L- 254+85																										
-L- 254+85	3.307									1				1												
-L- 259+93																							0.34		32.27	remove 1200 cmp
TOTALS	111.89				5	1			1	5	1			5	1	1	2	5	1	1	1	6.45	0.34	56.4	229.28	

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

PROJ. REFERENCE NO.	SHEET NO.
R-2519A	3-AA

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4,5	CHARLES EUGENE GARDNER
1A	4	GARY ADKINS & STROKES AUSTIN
1B	4	MATTHEW P. DICRISTINO
2	4,5	NORMAN J. RABEK
3	5	ESTEL HIGGINS
4	5	GARY ADKINS
5	5	JAMES B. GARDNER
6	5	KANE BALL
7	5,6	JAMES GARDNER
8	6	GRADY MCINTOSH
9	6	ROSE MARILYN ANGELL
10	6	WHEELER CEMETERY
11	6	DANNY RANDOLPH
12	6	ZULA WHEELER
13	6,7	JERRY JEROME MCINTOSH
14	6,7	RANDY MCINTOSH
15	7,40	VICKI BANKS TIPTON
16	6,7	VICKI BANKS TIPTON
17	7	THOMAS RICHARD FOX
17A	7	GARY ADKINS & STOKES AUSTIN
18	7,8	YANCEY COUNTY BOARD OF EDUCATION
19	7,8,40	CAROLINA CONFERENCE OF SEVENTH DAY ADVENTIST
20	8,9,40	FOUR JACKS, LLC
22	8,9	WILSON FAMILY PARTNERSHIP, LTD.
24	9	WILLIAM R. BANKS
25	9	CHARLES PHILLIP STYLES
26	9	DAVID IVAN PETERSON
27A	9,10	JERRY HOLCOMBE
27B	9,10	ROBERT W. HOLCOMBE
28	9,10	FREIDA B. BRYSON
29	10,11	CHARLES W. BANKS
30	10	DAVID BANKS
31	10,11	CHARLES AYERS
32	11	CHARLES AYERS
33	11	PREMIER MTN. PROPERTIES
34	11	BRYANT'S LAND AND DEVELOPMENT INDUSTRIES, INC.
34A	11	BETTY ANN YOUNG
34B	11	STATE EMPLOYEES' CREDIT UNION
35	11	PAMELA ZULLINGER
36	11,12	SIDNEY W. ZULLINGER
37	11,12	DYLAN WILSON
38	12	KENNETH DEAN MCCURRY, JR.
39	12	EARL TAYLOR
40	12,13	ANDREW E. BROWN
41	11,12	DAVID MCINTOSH
42	12,13	GEORGE DANIEL HENSLEY
43	13	FRANK MANEY
44	13	YANCEY COUNTY RESCUE SQUAD
45	13	BARBARA FORD
47	13	FRANK DEYTON
48	13	PREMIER MTN. PROPERTIES
49	13	YANCEY MOBILE HOME SALES
50	13	HIGH FIVE HOSPITALITY HOLDINGS, LLC
51	13	CHARLES NEILL ELLIS
52	13,14	PROPERTIES ON MAIN, LLC
53	13,14,15	ALAN A. CARDINALE
54	14	JADE ROBERTS
55	14	POLKWAY PROPERTIES, LLC
56	15	PHILLIP C. HARRIS
57	15	PHILLIP A. HARRIS

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
58	15	LINDA T. STEVENS
59	15	J. T. & BETTY FOX
59A	15	FRANK & BETTY FOX
60	15	MOUNTAINBANK
60A	15	MATTIE SUE LAWS ANGEL
61	15	CENTURA BANK
62	15	SHELBY SILVERS
64	15,16	BRENDA WILLIAMS MCFEE
65	15	KENNETH FRANK DEYTON
66	15,16	BOBBY & WANDA PROFFITT
67	16	WESTFORD, LLC
68	16	R. A. DICKSON
69	16	MARK E. HALL
70	16	STYLES BROTHERS
71	16	WILLIAM B. HUSKINS
72	16	FORREST S. MCCALL
73	16	WILLIAM B. HUSKINS
74	16	MCDONALD'S CORPORATION
75	16,17	M & M YANCEY, L.P.
76	16,17	ELOISE B. BRIGGS
77	17	WILLIAM R. COLLINS, JR.
78	17	BURNSVILLE NC BUSINESS TRUST
79	17	YANCEY COUNTY
80	17	EARL S. YOUNG
81	17,18	ALMA SULLIVAN
82	18	FOUR JACKS, LLC
82A	17,18	UNITED STATES GOVERNMENT/FOREST SERVICE
83	18	NORMAN HOPSON
84	18	JAMES H. JACKSON
85	18	JACK E. MCINTOSH
86	18	HOWARD PETERSON
87	18	ELOISE B. BRIGGS
88	18,19	BILL RIDDLE
89	18,19	PAUL D. BIGGERSTAFF
90	19	SONYA RIDDLE VESS
91	19	C.C. CANIPE AND WIFE ORA LEE CANIPE
93	19	BOBBY & WANDA PROFFITT
97	19	INGLES MARKETS INC.
99	19,20,41	CHARLES & KEVIN DELLINGER
99A	20,41	DELX, INC.
100	19,20	MOUNTAIN OPPORTUNITY CENTERS OF YANCEY COUNTY
101	20	CHARLES RANDOLPH
102	20	FRANK FOX
103	20	WALLACE B. EDGE
104	20,41	ELOISE B. BRIGGS
105	20	RUSSELL DAVID ROLAND
106	20	WALLACE B. EDGE
107	20,21,22	GREG & MADELINE BRYANT
108	20,21	BANKS PROPERTIES, LLC
109	20,21	LUTHER H. LAWHERN
110	21	THOMAS M. DONNELLY
112	21	LARRY D. EDWARDS
113	21	BILLY JOE YOUNG
114	21	ARLENE RAY, INC.
115	21	S.C.N. ENTERPRISES
116	21	FLORENCE F. YOUNG
117	21	SAMUEL S. STYLES
118	21,22	DAVID MCINTOSH
119	22	SAMUEL S. STYLES
120	22	ELOISE B. BRIGGS

PROJ. REFERENCE NO.	SHEET NO.
R-2519A	3-AB

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
121	22	GARY ATKINS
122	22,23,24	YANCEY COUNTY
123	22,23,42	GLEN RAVEN FILAMENT FABRICS, LLC
124	23,42	UNITED COMMUNITY BANK
126	23	GENE EARL WOODY
127	23	JAMES DAVID McCURRY
128	23,24	DONALD C. STYLES
129	23,24,26,28,31,32, 33,35,36,37,38	YANCEY COUNTY RAILROAD
130	24	RONALD EDWARDS
131	24	WILLIAM O. RIDDLE
132	24	LEE SLAGLE
133	24	GRADY P. MELTON
134	24	KEITH PRESNELL
135	24,25	CATALANO FAMILY LIMITED PARTNERSHIP
136	24	ELLIS T. MOODY
137	24,25	PHILLIP R. BANKS
138	25	KEITH PRESNELL
139	25	TINA MARIE SINK
140	25	KNARLD EDWARD CARROLL
141	25	ROBERT J. YOUNG
142	25	KENNETH ALDEN PRICE
143	25	JOE WILLIAMS
144	25	JAY (HANNAH) STYLES
145	25	CHARLES JUNIOR PETERSON
146	25	BANKS HOLDING COMPANY, L.P.
147	25	KEITH W. PRESNELL
148	25,26	ANN-MARGARET MASTROPAOLO & GERRARD L. PAGELS
149	25,26	BILLY J. LAWS
150	26	NAT LEE HOWELL
151	26	CLARENCE PRESNELL
152	26	WILLIAM IRA YOUNG
152A	26	QUALITY OIL, LLC
153	26	R & B DIESEL, INC.
154	26,43	PARALEE HENSLEY
155	26,43	YANCEY COUNTY
156	26,27	FARRELL HUGHES
156A	27	NORMAN RABEK
156B	26,27	FARRELL HUGHES
157	26	DOROTHY DEYTON
158	27	JAMES DOUGLAS BRYANT
159	27	FARRELL HUGHES
160	27	LAZARO S. RODRIGUEZ
161	27	CLARENCE & IRENE PRESNESLL
162	28	WILLIAM HAROLD PRESNELL
162A	27,28	WILLIAM HAROLD PRESNELL
163	27,28	GERALD & DONNA S. HONEYCUTT
164	27	FARRELL & ANNA LOU HUGHES
165	28	S. GAIL CRISP
166	28	RODNEY D. SHEPHERD
167	28	EDDS INDEPENDENT STATION
168	28	SAMUEL J. JONES
169	28	JOHNNY BENNETT
170	28,29	CLYDE BLALOCK
171	28,29	YANCEY COUNTY BOARD OF EDUCATION
172	28	THULA JEAN HUGHES
173	29	J. V. JONES CEMETERY
174	29	EUGENE STYLES
175	29	EUGENE STYLES
176	29	DEAN WILSON
177	29	JOHN DOUGLAS BENNETT
178	29,30,31	SHOAL CREEK BAPTIST CHURCH
179	29,30	NORMAN EVANS

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
180	29,30	ROY C. HARRIS
181	30	BARBARA FORD
182	30	JAMES G. MARSH, JR.
183	30	JETER BISS BUCHANAN
184	30	HERMAN HUGHES
185	30	NORMA P. EVANS
186	30	ROGER F. PENLAND
187	30	ELIZABETH YOUNG HUSKINS
188	30	DANNY HIGGINS
189	31	LEWIS J. MCENTYRE, JR.
190	31	YOUNGS CHAPEL FREEWILL BAPTIST CHURCH
191	31	CHARLES EDWARD DULANEY
192	31	MILTON WEISS
193	31	NORMAN ROBEK and JOY BOOTHE
194	31	WILLIAM IRA YOUNG
195	31,32	BETTY REVIS
196	31,32	ED GOUGE
197	32	LILLIAN ROBINSON
198	32,33	DEWEY PATE, JR.
199	32,33	PATSY B. MURPHY
199A	33	JOEL RALPH MURPHY JOEY RANDALL MURPHY
200	33	DAVID WAYNE GARLAND
201	33,34	BEULAH HUGHES
201A	33,34	DONNA GOUGE
202	33,34	SHERRILL McCOURRY
203	34	DANIEL KEITH HUGHES
204	34	BERDELLA PETERSON
205	34	FRED PETERSON
206	34	CARRIE BLEVINS
207	34	TROY G. BOONE
208	34,35	SADIE FORTNER
209	34,35	ARNOLD ZEB PHILLIPS
210	35	OLLIE EDITH STYLES ESTATE
211	35	JOHN GRIFFITH ,HEIRS
212	35	BRETT HUGHES
213	35	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
214	35,36,37	CHARLES R. DELLINGER
215	36	JAMES LUTHER THOMAS
216	36,37	CRABTREE BAPTIST CHURCH
217	37	DORIS F. PROFFITT
218	37	JENNINGS E. RAY
219	37	GERALD BURLESON
219A	37	DONNA MICHELLE BRIGGS FOX
220	37,38	JOHN MARK CHRISTIAN FREEMAN
221	38	JOHN ERIC GARLAND
222	38	RALPH R. TOMBERLIN
223	38,39	OVEL TOMBERLIN
224	39	GERALD T. BLALOCK
225	39	MICHAEL ANTHONY GILLEY
225A	39	RABON ROBINSON
226	39	MICAVILLE PRESBYTERIAN CHURCH
227	40	BOYD WHEELER
228	41	NORTHWESTERN REGIONAL HOUSING AUTHORITY
229	41	MYRTLE GOUGE
230	41	RALPH PETERSON
231	41	TAMMY LYNN WOODY
232	30,31	DEBORAH J. HUSKINS
233	31	NORMAN EVANS
234	43	JEANETTE HARRIS
235	39	HERMAN BEAVER
236	33	ALLEN D. BOONE
238	28	ZENUS ELKINS

RD2486

COMPUTED BY: CAL	DATE: 11/2010
CHECKED BY: KNW	DATE: 12/2010

PROJECT NO.	SHEET NO.
R-2519A	3-AC

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

(in cubic meters)

Location	Unclass. Excav.	EMB + %	Borrow	Waste
-L- 226+40.000 TO 235+40.000 LT	15086	323		14763
SUBTOTAL	15086	323	0	14763
-L- 235+40.000 TO 244+40.000 LT	22102	834		21268
-Y3- 10+47.000 TO 11+70.994	1400	795		605
-Y5- 10+17.709 TO 10+95.923	304	102		202
SUBTOTAL	23806	1731	0	22075
-L- 244+40.000 TO 253+40.000 LT	22433	1427		21006
-Y6- 10+50.340 TO 11+30.114	196	299	103	0
-Y8- 10+32.155 TO 10+60.264	174	0		174
SUBTOTAL	22803	1726	103	21180
-L- 253+40.000 TO 262+40.000 LT	764	6826	6062	
-Y9- 11+24.000 TO 11+68.066	1	160	159	
-Y10- 10+06.000 TO 10+59.121	11	388	377	
SUBTOTAL	776	7374	6598	0
-L- 262+40.000 TO 271+40.000 LT	2011	9604	7593	
-Y11- 10+26.868 TO 10+58.037	22	31	9	
-Y12- 10+19.000 TO 10+55.694	1	40	39	
-Y14- 10+31.355 TO 10+48.791	64	48		16
SUBTOTAL	2098	9723	7641	16
-L- 271+40.000 TO 280+40.000 LT	1436	21483	20047	
-Y17- 10+25.000 TO 11+47.744	261	894	633	
SUBTOTAL	1697	22377	20680	0
-L- 280+40.000 TO 289+40.000 LT	3153	2405		748
-Y19- 10+25.000 TO 12+19.754	787	284		503
SUBTOTAL	3940	2689	0	1251
-L- 289+40.000 TO 298+40.000 LT	29693	1670		28023
-Y21- 10+67.500 TO 12+33.932	402	398		4
-Y22- 10+03.955 TO 10+66.203	149	194	45	
-Y23- 10+37.000 TO 10+77.414	76	16		60
-Y24A- 11+55.566 TO 11+83.566	319	58		262
-Y24- 10+30.144 TO 11+52.962	195	2440	2245	
SUBTOTAL	30834	4776	2291	28349
-L- 298+40.000 TO 307+40.000 LT	4625	5733	1108	
-Y26- 10+26.848 TO 11+17.687	5	1599	1594	
SUBTOTAL	4630	7331	2701	0
-L- 307+40.000 TO 316+40.000 LT	28333	4886		23447
SUBTOTAL	28333	4886	0	23447
-L- 316+40.000 TO 324+80.000 LT	234619	1653		232966
-Y29- 11+00.000 TO 11+31.399	7	219	212	
-Y30- 10+28.278 TO 11+07.189	13024	656		12369
-D11- 10+15.00 TO 10+73.07	4895			4895
-D12- 10+06.30 TO 10+60.02	5913			5913
-D13REV- 10+21.21 TO 11+71.21	21327	2		21325
SUBTOTAL	279785	2530	212	277467
-L- 324+80.000 TO 333+80.000 LT	164575	2713		161863
-D14REV- 10+28.00 TO 12+05.83	44745	1		44744
-Y32- 10+00.000 TO 10+59.314	2318	711		1607
-Y33- 10+15.00 TO 10+70.08	118	779	661	
SUBTOTAL	211756	4203	661	208214
-L- 333+80.000 TO 342+80.000 LT	182266	3753		178513
-Y35- 10+64.255 TO 11+15.981	1313	73		1240
SUBTOTAL	183579	3826	0	179753
-L- 342+80.000 TO 345+60.000 LT	95656	97		95559
-D15REV- 10+02.00 TO 10+67.24	12098	58		12041
SUBTOTAL	107754	154	0	107600
TOTAL LEFT	**916877**	**73649**	**40885**	**884114**

Location	Unclass. Excav.	EMB + %	Borrow	Waste
-L- 226+40.000 TO 235+40.000 RT	4439	40801	36362	
-D1- 10+11.165 TO 10+56.000	7	2433	2426	
-Y2- 10+09.935 TO 10+83.900	478	358		120
-D22- 10+04.420 TO 10+71.14	23	8		15
SUBTOTAL	4947	43600	38788	135
-L- 235+40.000 TO 244+40.000 RT	46252	6903		39349
-D2- 10+10.00 TO 11+56.167	951	12		940
-Y4- 10+10.177 TO 11+34.000	952	1996	1044	
-Y5- 11+15.907 TO 11+93.760	399	265		135
SUBTOTAL	48554	9175	1044	40423
-L- 244+40.000 TO 253+40.000 RT	39653	3418		36235
-D23- 10+11.025 TO 10+54.95		1110	1110	
-Y7- 10+09.883 TO 10+40.720	35	289	254	
SUBTOTAL	39688	4817	1363	36235
-L- 253+40.000 TO 262+40.000 RT	1349	4755	3406	
-D3- 10+14.63 TO 10+42.00	53	120	67	
-D4REV- 10+13.350 TO 10+35.000	17	93	76	
-Y10- 10+81.191 TO 11+40.912	174	268	94	
SUBTOTAL	1593	5236	3643	0
-L- 262+40.000 TO 271+40.000 RT	3579	2259		1320
-Y11- 10+80.125 TO 11+38.355	155	14		141
-Y12- 10+78.902 TO 11+15.000	178	25		153
-Y13- 10+11.026 TO 10+30.377	2	47	45	
SUBTOTAL	3914	2345	45	1614
-L- 271+40.000 TO 280+40.000 RT	49818	525		49293
-Y16- 10+11.414 TO 10+90.198	8463	33		8430
-Y17- 11+69.832 TO 13+40.000	240	544	304	
SUBTOTAL	58521	1102	304	57723
-L- 280+40.000 TO 289+40.000 RT	22671	2730		19941
-Y18- 10+11.034 TO 10+31.000	45	151	106	
-Y20- 10+11.029 TO 10+72.980	55	636	581	
SUBTOTAL	22771	3517	687	19941
-L- 289+40.000 TO 298+40.000 RT	1655	13576	11921	
-D5- 10+14.63 TO 10+57.28	11	145	134	
SUBTOTAL	1666	13721	12055	0
-L- 298+40.000 TO 307+40.000 RT	54037	3924		50113
-Y25- 10+09.87 TO 10+69.02	136	25		111
-D6- 10+11.03 TO 10+42.00	232			232
-Y26- 11+38.531 TO 12+63.347	768	239		529
SUBTOTAL	55173	4188	0	50985
-L- 307+40.000 TO 316+40.000 RT	12989	16559	3570	
-D18- 10+10.13 TO 10+24.14	9			9
-Y27- 10+09.917 TO 10+95.550	1183	1415	232	
-D8- 10+48.83 TO 10+58.00	48			48
-D9- 10+11.03 TO 10+45.00	355	29		326
-D16- 10+09.83 TO 10+45.00		153	153	
-D10- 10+10.00 TO 10+42.52	220	1		219
SUBTOTAL	14804	18157	3955	602
-L- 316+40.000 TO 324+80.000 RT	1254	534		720
SUBTOTAL	1254	534	0	720
-L- 324+80.000 TO 333+80.000 RT	1940	1366		574
-Y31- 10+09.841 TO 10+58.994	5	199	194	
SUBTOTAL	1945	1565	194	574
-L- 333+80.000 TO 342+80.000 RT	1987	136		1851
-Y34- 10+10.082 TO 10+89.563	118	557	439	
-Y36- 10+09.829 TO 11+39.000	5062	1710		3352
SUBTOTAL	7167	2402	439	5203
-L- 342+80.000 TO 345+60.000 RT	7073	1458		5616
SUBTOTAL	7073	1458	0	5616
TOTAL RIGHT	**269070**	**111817**	**62517**	**219770**
PROJECT TOTAL	1185947	185465	103402	1103884
Loss Due to Clearing and Grubbing	-10000			-10000
Rock to Replace Borrow			-74929	-74929
Adjustment to Rock Borrow		-28473	-28473	
GRAND TOTAL	1175947	156992		1018955
SAY	**1176000 CM**			

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.

EST. SHALLOW UNDERCUT: 2000 CM
EST. FABRIC FOR SOIL STABILIZATION: 2000 SM
EST. CLASS IV SUBGRADE STABILIZATION: 4300 METRIC TONS
EST. SELECT GRANULAR MATERIAL: 500 CM
EST. -L- PAVEMENT STRUCTURE VOLUME: 52000 CM
SHOULDER BORROW: 27090CM
CONTINGENCY UNDERCUT EXCAVATION 5000CM

SUMMARY OF EXISTING ASPHALT PAVEMENT REMOVAL

Station to Station	Location LT/RT/CL	Area m2
-L- 226+40 TO 233+63	CL	1512
-L- 226+40 TO 236+80	LT	1348
-L- 233+81 TO 236+91	CL	463
-Y3- 10+62 TO 11+81	RT	723
-L- 236+80 TO 241+05	LT	640
-L- 237+37 TO 240+92	RT	581
-Y5- 11+18 TO 11+43	RT	29
-L- 241+20 TO 248+32	LT	1159
-L- 241+39 TO 251+63	CL	2021
-L- 248+63 TO 251+70	LT	350
-L- 251+94 TO 254+28	LT	305
-L- 252+02 TO 257+40	RT	651
-L- 254+66 TO 257+42	LT	435
-L- 257+65 TO 262+60	LT	623
-L- 257+65 TO 262+58	RT	563
-L- 262+88 TO 264+65	LT	303
-L- 262+72 TO 264+73	RT	185
-L- 264+88 TO 268+65	LT	452
-L- 264+97 TO 268+57	RT	420
-L- 269+01 TO 270+76	RT	164
-Y16- 10+15 TO 10+84	LT	367
-L- 275+74 TO 276+30	RT	27
-L- 275+53 TO 279+21	LT	359
-L- 277+90 TO 279+30	RT	125
-L- 279+49 TO 281+56	LT	215
-L- 279+60 TO 281+47	CL	456
-L- 282+77 TO 284+67	CL	415
-L- 284+08 TO 284+67	LT	32
-Y19- 11+70 TO 12+18	RT	225
-Y19- 11+66 TO 11+90	LT	87
-L- 285+54 TO 286+86	RT	100
-L- 287+97 TO 289+53	CL	903
-L- 290+49 TO 293+45	LT	448
-L- 290+64 TO 301+15	RT	2278
-L- 293+58 TO 297+54	LT	707
-L- 294+10 TO 297+08	CL	1404
-L- 297+82 TO 304+69	LT	1499
-Y24A- 11+58 TO 11+84	RT	44
-Y24A- 10+00 TO 10+26	RT	265
-L- 301+46 TO 306+83	RT	406
-L- 301+84 TO 306+32	CL	2188
-L- 305+18 TO 306+80	LT	94
-L- 306+99 TO 308+16	LT	59
-L- 307+62 TO 309+45	CL	880
-L- 309+43 TO 309+52	RT	23
-L- 309+64 TO 312+50	CL	818
-L- 310+38 TO 313+08	LT	158
-L- 313+42 TO 316+12	LT	181
-L- 313+60 TO 317+72	CL	1671
-Y29- 11+03 TO 11+42	LT	48
-L- 317+25 TO 327+91	RT	1296
-L- 326+34 TO 335+54	RT	820
-L- 328+68 TO 331+43	CL	126
-L- 332+13 TO 344+00	CL	1276
-L- 335+89 TO 341+34	RT	446
-L- 342+06 TO 342+82	RT	366
-L- 342+90 TO 345+59	RT	191
-L- 344+00 TO 345+51	LT	84
-L- 285+58 TO 285+95	LT	183
-L- 286+20 TO 286+82	LT	232
PROJECT TOTAL		**34429**
SAY		**34500 SM**

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	4
R/W SHEET NO.	

METRIC 5 0 10

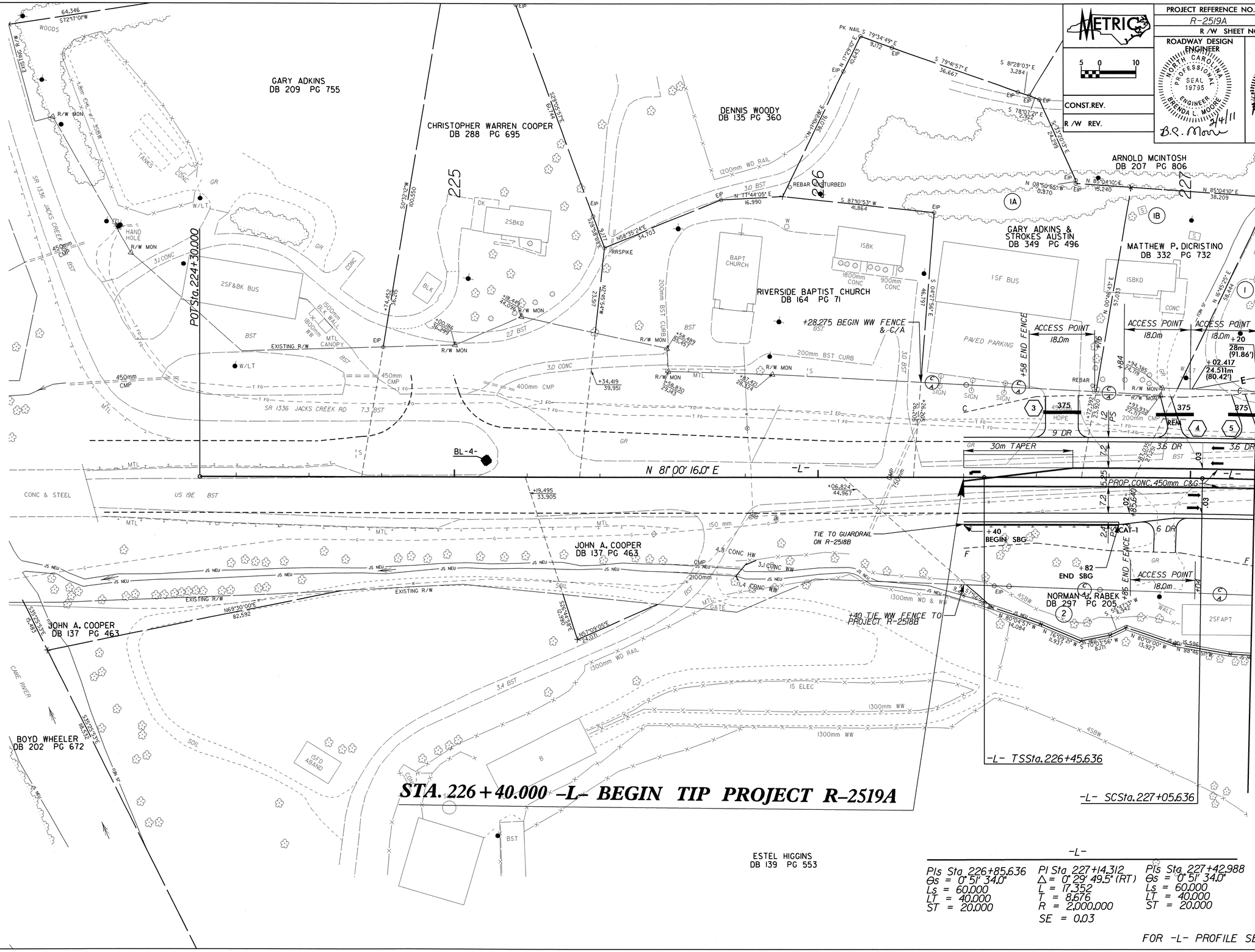
CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE
2/4/11
B.L. Moore

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER T. NOTTINGHAM
2/4/11

NAD 83/95



-L-

PIs Sta 226+85.636	PI Sta 227+14.312	PIs Sta 227+42.988
Θs = 0° 51' 34.0"	Δ = 0° 29' 49.5" (RT)	Θs = 0° 51' 34.0"
Ls = 60.000	L = 17.352	Ls = 60.000
LT = 40.000	T = 8.676	LT = 40.000
ST = 20.000	R = 2,000.000	ST = 20.000
	SE = 0.03	

FOR -L- PROFILE SEE SHEET 44

03-FEB-2011 10:06
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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	5
R /W SHEET NO.	

METRIC

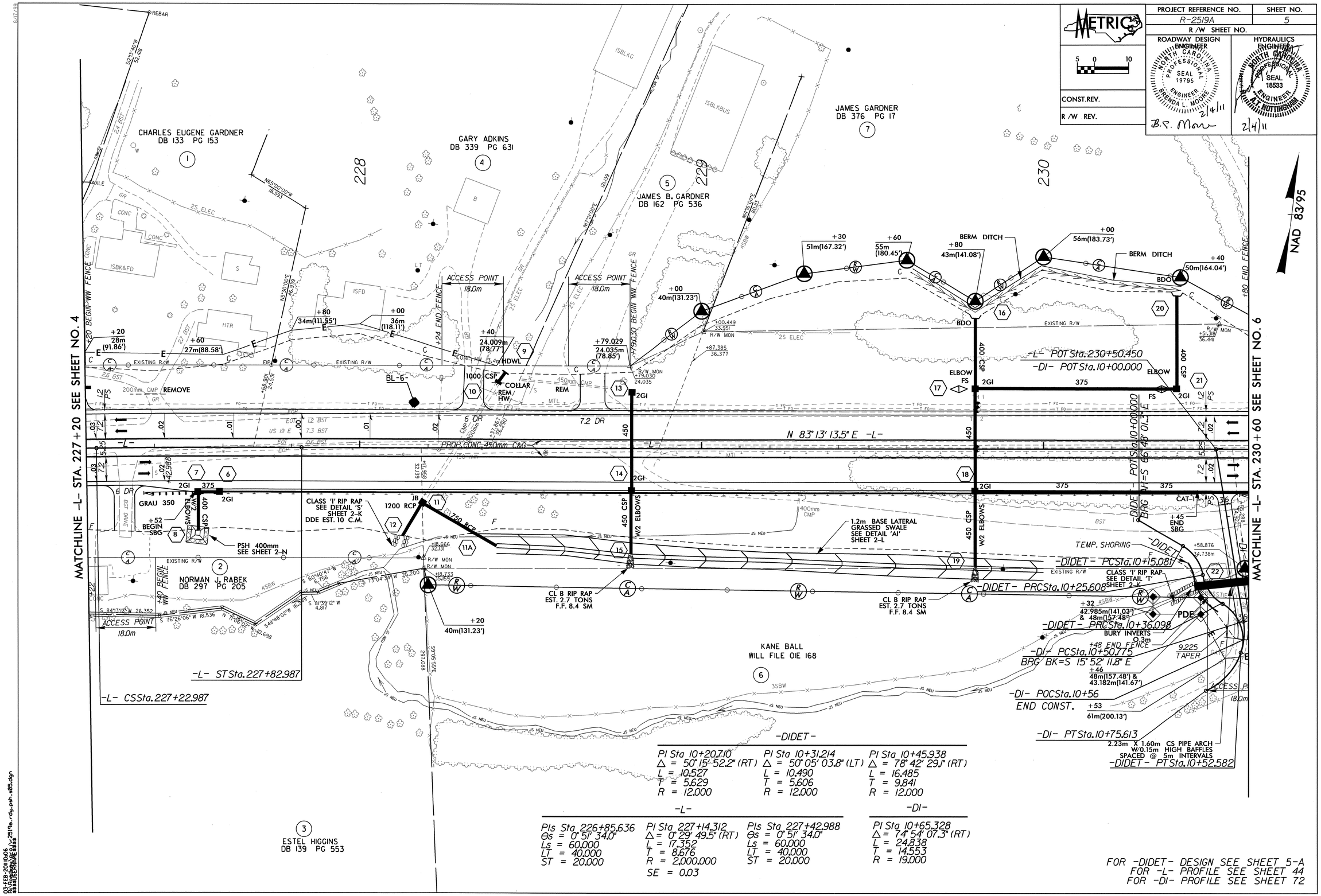
5 0 10

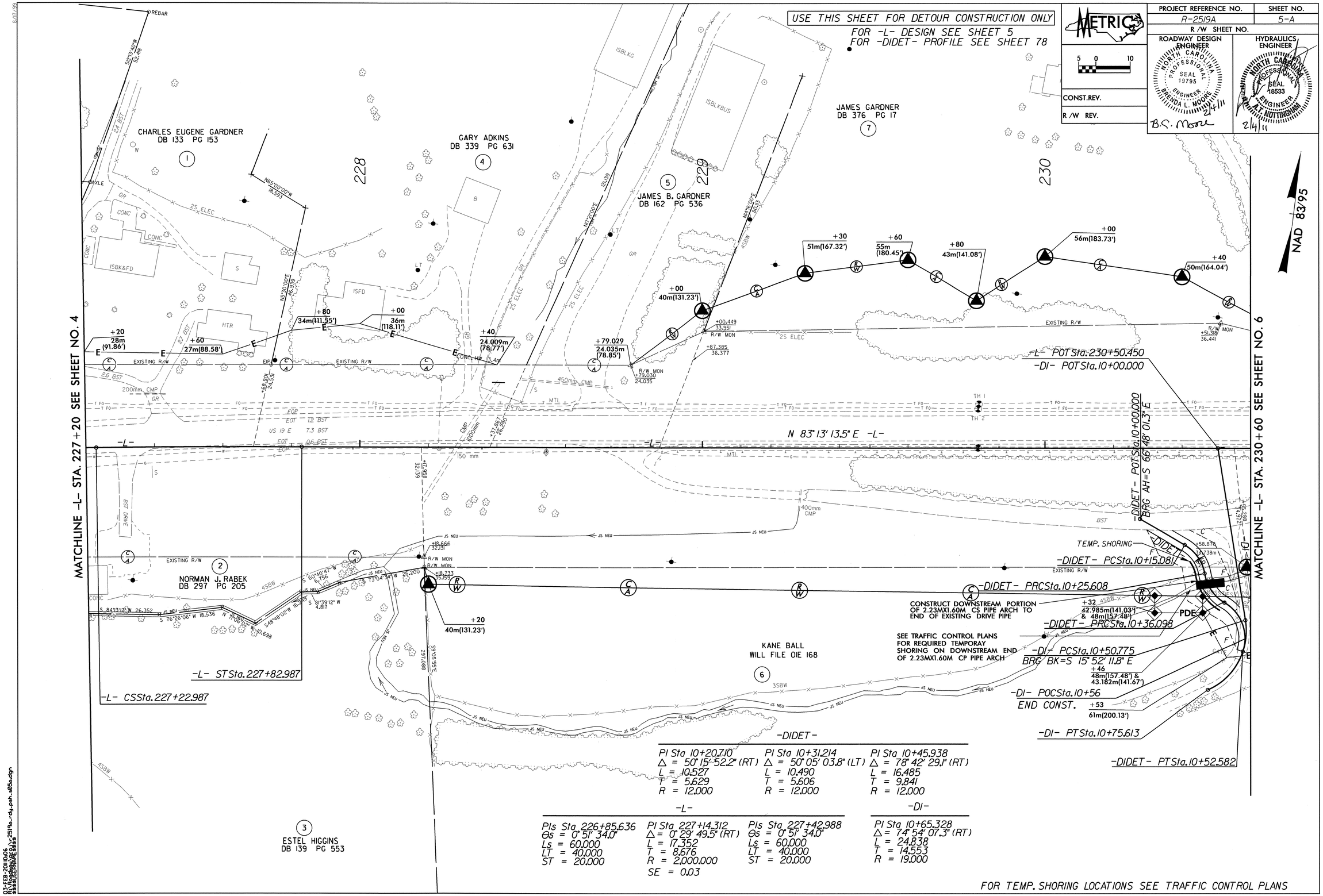
CONST.REV.

R /W REV.

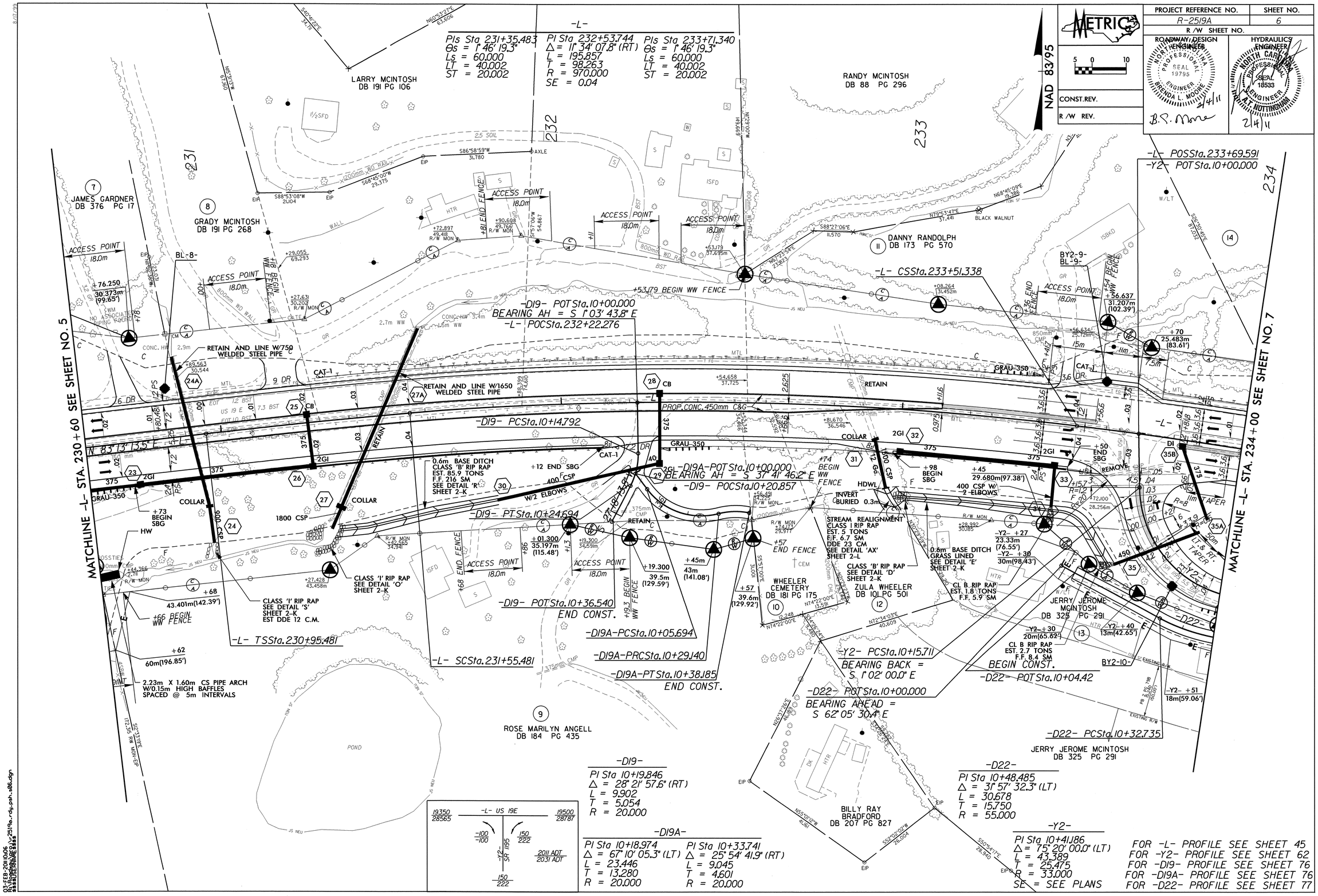
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE
2/4/11
B.L. Moore

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER R.T. NOTTINGHAM
2/4/11





USE THIS SHEET FOR DETOUR CONSTRUCTION ONLY
FOR -L- DESIGN SEE SHEET 5
FOR -DIDET- PROFILE SEE SHEET 78
METRIC
PROJECT REFERENCE NO.
R-2519A
SHEET NO.
5-A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R/W REV.
NAD 83/95
MATCHLINE -L- STA. 227+20 SEE SHEET NO. 4
MATCHLINE -L- STA. 230+60 SEE SHEET NO. 6
CHARLES EUGENE GARDNER
DB 133 PG 153
GARY ADKINS
DB 339 PG 631
JAMES B. GARDNER
DB 162 PG 536
JAMES GARDNER
DB 376 PG 17
NORMAN J. RABEK
DB 297 PG 205
KANE BALL
WILL FILE OIE 168
ESTEL HIGGINS
DB 139 PG 553
228
229
230
N 83° 13' 13.5" E -L-
-L- POT Sta. 230+50.450
-DI- POT Sta. 10+00.000
-DIDET- POT Sta. 10+00.000
BRG AH=S 66° 48' 01.3" E
TEMP. SHORING
-DIDET- PCSta. 10+15.081
-DIDET- PRCSta. 10+25.608
CONSTRUCT DOWNSTREAM PORTION OF 2.23MX1.60M CS PIPE ARCH TO END OF EXISTING DRIVE PIPE
-DIDET- PRCSta. 10+36.098
SEE TRAFFIC CONTROL PLANS FOR REQUIRED TEMPORAY SHORING ON DOWNSTREAM END OF 2.23MX1.60M CP PIPE ARCH
-DI- PCSta. 10+50.775
BRG BK=S 15° 52' 11.8" E
-DI- POCSta. 10+56
END CONST.
-DI- PTSta. 10+75.613
-DIDET- PTSta. 10+52.582
-L- ST Sta. 227+82.987
-L- CSSta. 227+22.987
-DIDET-
PI Sta 10+20.710
Δ = 50° 15' 52.2" (RT)
L = 10.527
T = 5.629
R = 12.000
PI Sta 10+31.214
Δ = 50° 05' 03.8" (LT)
L = 10.490
T = 5.606
R = 12.000
PI Sta 10+45.938
Δ = 78° 42' 29.1" (RT)
L = 16.485
T = 9.841
R = 12.000
-L-
PIs Sta 226+85.636
Θs = 0° 51' 34.0"
Ls = 60.000
LT = 40.000
ST = 20.000
PI Sta 227+14.312
Δ = 0° 29' 49.5" (RT)
L = 17.352
T = 8.676
R = 2,000.000
SE = 0.03
PIs Sta 227+42.988
Θs = 0° 51' 34.0"
Ls = 60.000
LT = 40.000
ST = 20.000
-DI-
PI Sta 10+65.328
Δ = 74° 54' 07.3" (RT)
L = 24.838
T = 14.553
R = 19.000
FOR TEMP. SHORING LOCATIONS SEE TRAFFIC CONTROL PLANS



METRIC
PROJECT REFERENCE NO.
R-2519A
SHEET NO.
6
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R/W REV.
NAD 83/95
-L-
PIs Sta 231+35.483
Θs = 1° 46' 19.3"
Ls = 60.000
LT = 40.002
ST = 20.002
PI Sta 232+53.744
Δ = 11° 34' 07.8" (RT)
L = 195.857
T = 98.263
R = 970.000
SE = 0.04
PIs Sta 233+71.340
Θs = 1° 46' 19.3"
Ls = 60.000
LT = 40.002
ST = 20.002
LARRY MCINTOSH
DB 191 PG 106
RANDY MCINTOSH
DB 88 PG 296
JAMES GARDNER
DB 376 PG 17
GRADY MCINTOSH
DB 191 PG 268
DANNY RANDOLPH
DB 173 PG 570
-L- POSSta.233+69.591
-Y2- POTSta.10+00.000
-L- CSSta.233+51.338
-D19- POTSta.10+00.000
BEARING AH = S 1° 03' 43.8" E
-L- POCSta.232+22.276
RETAIN AND LINE W/750 WELDED STEEL PIPE
RETAIN AND LINE W/1650 WELDED STEEL PIPE
-D19- PCSta.10+14.792
-D19A-POTSta.10+00.000
BEARING AH = S 37° 41' 46.2" E
-D19- POCSta.10+20.857
-D19- PTSta.10+24.694
-D19- POTSta.10+36.540
END CONST.
-D19A-PCSta.10+05.694
-D19A-PRCSta.10+29.140
-D19A-PTSta.10+38.185
END CONST.
-L- TSSta.230+95.481
-L- SCSta.231+55.481
-Y2- PCSta.10+15.711
BEARING BACK = S 1° 02' 00.0" E
-D22- POTSta.10+00.000
BEARING AHEAD = S 62° 05' 30.4" E
-D22- POTSta.10+04.42
-D22- PCSta.10+32.735
JERRY JEROME MCINTOSH
DB 325 PG 291
WHEELER CEMETERY
DB 181 PG 175
ZULA WHEELER
DB 101 PG 501
ROSE MARILYN ANGELL
DB 184 PG 435
BILLY RAY BRADFORD
DB 207 PG 827
MATCHLINE -L- STA. 230+60 SEE SHEET NO. 5
MATCHLINE -L- STA. 234+00 SEE SHEET NO. 7
-D19-
PI Sta 10+19.846
Δ = 28° 21' 57.6" (RT)
L = 9.902
T = 5.054
R = 20.000
-D19A-
PI Sta 10+18.974
Δ = 67° 10' 05.3" (LT)
L = 23.446
T = 13.280
R = 20.000
PI Sta 10+33.741
Δ = 25° 54' 41.9" (RT)
L = 9.045
T = 4.601
R = 20.000
-D22-
PI Sta 10+48.485
Δ = 31° 57' 32.3" (LT)
L = 30.678
T = 15.750
R = 55.000
-Y2-
PI Sta 10+41.186
Δ = 75° 20' 00.0" (LT)
L = 43.389
T = 25.475
R = 33.000
SE = SEE PLANS
FOR -L- PROFILE SEE SHEET 45
FOR -Y2- PROFILE SEE SHEET 62
FOR -D19- PROFILE SEE SHEET 76
FOR -D19A- PROFILE SEE SHEET 76
FOR -D22- PROFILE SEE SHEET 77

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	7
R /W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE — 2/4/11

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER W. A. NOTTINGHAM — 2/4/11

METRIC 5 0 10

CONST.REV.

R /W REV.

NAD 83/95

-L-

PIs Sta 231+35.483
Θs = 1° 46' 19.3"
Ls = 60.000
LT = 40.002
ST = 20.002

PI Sta 232+53.744
Δ = 11° 34' 07.8" (RT)
L = 195.857
T = 98.263
R = 970.000
SE = 0.04

PIs Sta 233+71.340
Θs = 1° 46' 19.3"
Ls = 60.000
LT = 40.002
ST = 20.002

-Y3-

PI Sta 11+05.865
Δ = 32° 48' 03.1" (LT)
L = 114.497
T = 58.865
R = 200.000
SE = SEE PLANS

-Y3- PT Sta.11+61.497
BEARING AH = S 23° 48' 26.9" W

FOR -L- PROFILE SEE SHEET 45
FOR -Y3- & -Y4- PROFILE SEE SHEET 62
FOR -D2- PROFILE SEE SHEET 72
FOR -D22- PROFILE SEE SHEET 77

★ PROPOSED TRAFFIC SIGNAL

MATCHLINE -Y3- STA. 11+40 SEE SHEET NO. 40

MATCHLINE -L- STA. 234+00 SEE SHEET NO. 6

MATCHLINE -L- 237+40 SEE SHEET NO. 8

RANDY MCINTOSH DB 88 PG 296

VICKI BANKS TIPTON, ET. AL. DB 289 PG 22

THOMAS RICHARD FOX DB 225 PG 402

JERRY JEROME MCINTOSH DB 325 PG 291

GARY ADKINS and STOKES AUSTIN DB 325 PG 167

-L- ST Sta.234+11.338

-L- S 81° 40' 00.1" E

-L- POT Sta.237+14.259

-Y3- POT Sta.11+81.89

-Y4- POT Sta.10+00.000

-Y2- S 76° 22' 00.0" E

-Y2- POT Sta.10+74.500

-D22- POT Sta.10+74.573

END CONST.
-Y2- POT Sta.10+85.000

-D22- PT Sta.10+67.200
BEARING AHEAD =
N 13° 37' 59.8" E

-D22- PCC Sta.10+63.413

-Y2- PT Sta.10+59.100

POT -D2- Sta.10+00.000
-L- POT Sta.253+98.996, 43.039 RT.

PCSta.10+06.257
BEARING BACK=N 65° 14' 00.0" E

POT -D2- Sta.10+10
BEGIN CONST.

POT Sta.12+02.780-Y2-

PCSta.10+58.167
BEARING BACK=S 23° 26' 58.4" W

PT Sta.10+94.500
BEARING AHEAD=S 2° 24' 47.3" E

PCSta.11+19.831

PT Sta.11+21.493
BEARING AH=S 49° 07' 00.9" E

PT Sta.11+36.307
BEARING AHEAD=S 33° 52' 44.3" E

PCSta.11+41.416

PT -D2- Sta.11+56.167
END CONST.
POC -Y4- Sta.11+12.391, 26.338 RT.

END CONST.
-Y4- POT Sta.11+34.000

-Y4-
POT Sta.11+38.561
END CONST.

-D22-

PI Sta 10+65.606
Δ = 72° 18' 57.2" (LT)
L = 3.786
T = 2.192
R = 3.000

-Y2-

PI Sta 10+41.86
Δ = 75° 20' 00.0" (LT)
L = 43.389
T = 25.475
R = 33.000
SE = SEE PLANS

-D2-

PI Sta 10+73.419	PI Sta 11+28.282	PI Sta 11+48.944
Δ = 112° 21' 12.7" (RT)	Δ = 31° 27' 57.0" (LT)	Δ = 28° 10' 20.0" (RT)
L = 88.242	L = 16.475	L = 14.751
T = 67.161	T = 8.451	T = 7.528
R = 45.000	R = 30.000	R = 30.000

-Y4-

PI Sta 10+94.873
Δ = 72° 33' 59.4" (LT)
L = 63.326
T = 36.706
R = 50.000
SE = SEE PLANS

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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	8
R/W SHEET NO.	

METRIC

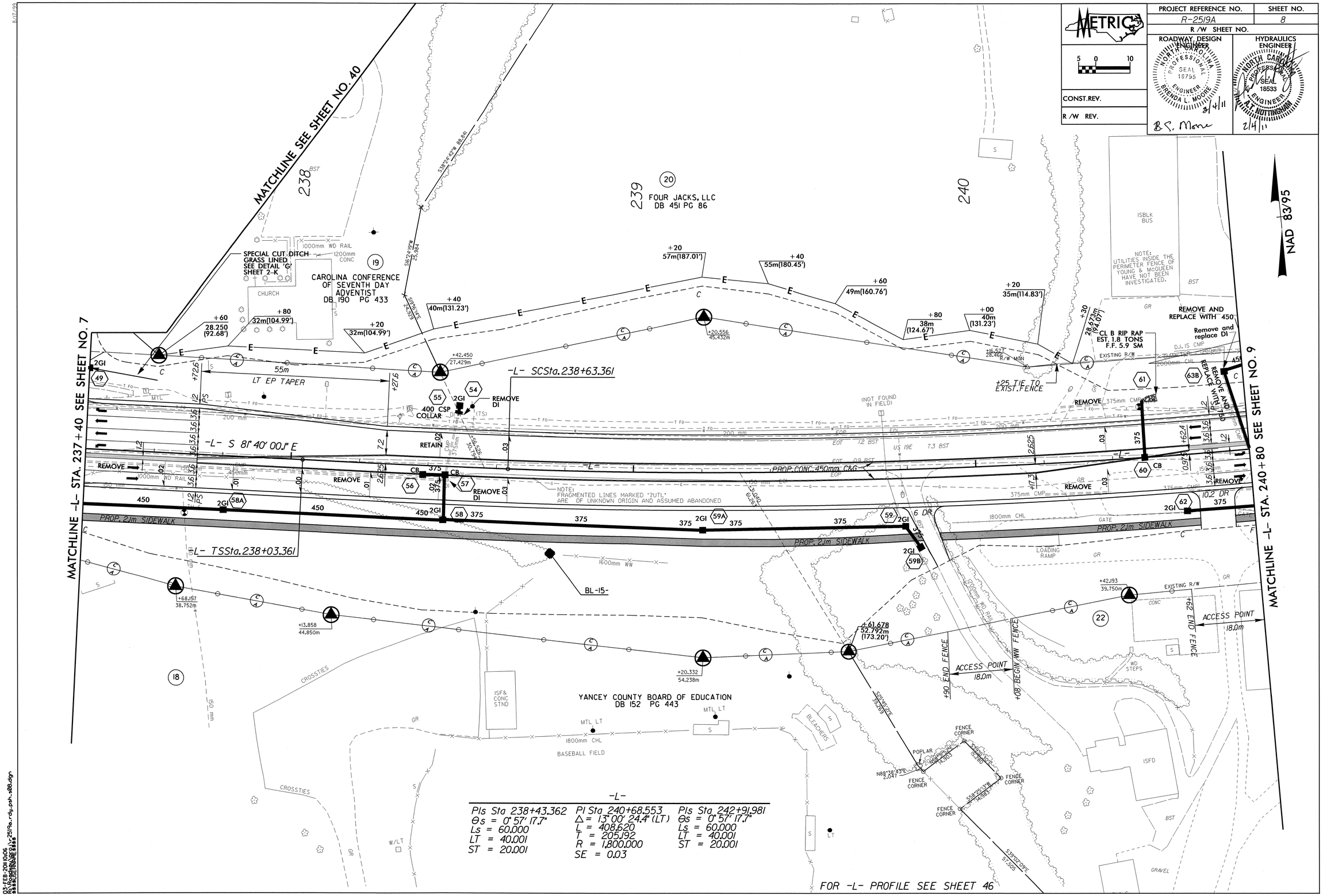
5 0 10

CONST. REV.

R/W REV.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE
2/4/11
B.S. Moore

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM
2/4/11



-L-

PIs Sta 238+43.362	PI Sta 240+68.553	PIs Sta 242+91.981
Θs = 0° 57' 17.7"	Δ = 13° 00' 24.4" (LT)	Θs = 0° 57' 17.7"
Ls = 60.000	L = 408.620	Ls = 60.000
LT = 40.001	T = 205.192	LT = 40.001
ST = 20.001	R = 1,800.000	ST = 20.001
	SE = 0.03	

03-FEB-2011 10:06
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	9
R/W SHEET NO.	

METRIC 5 0 10

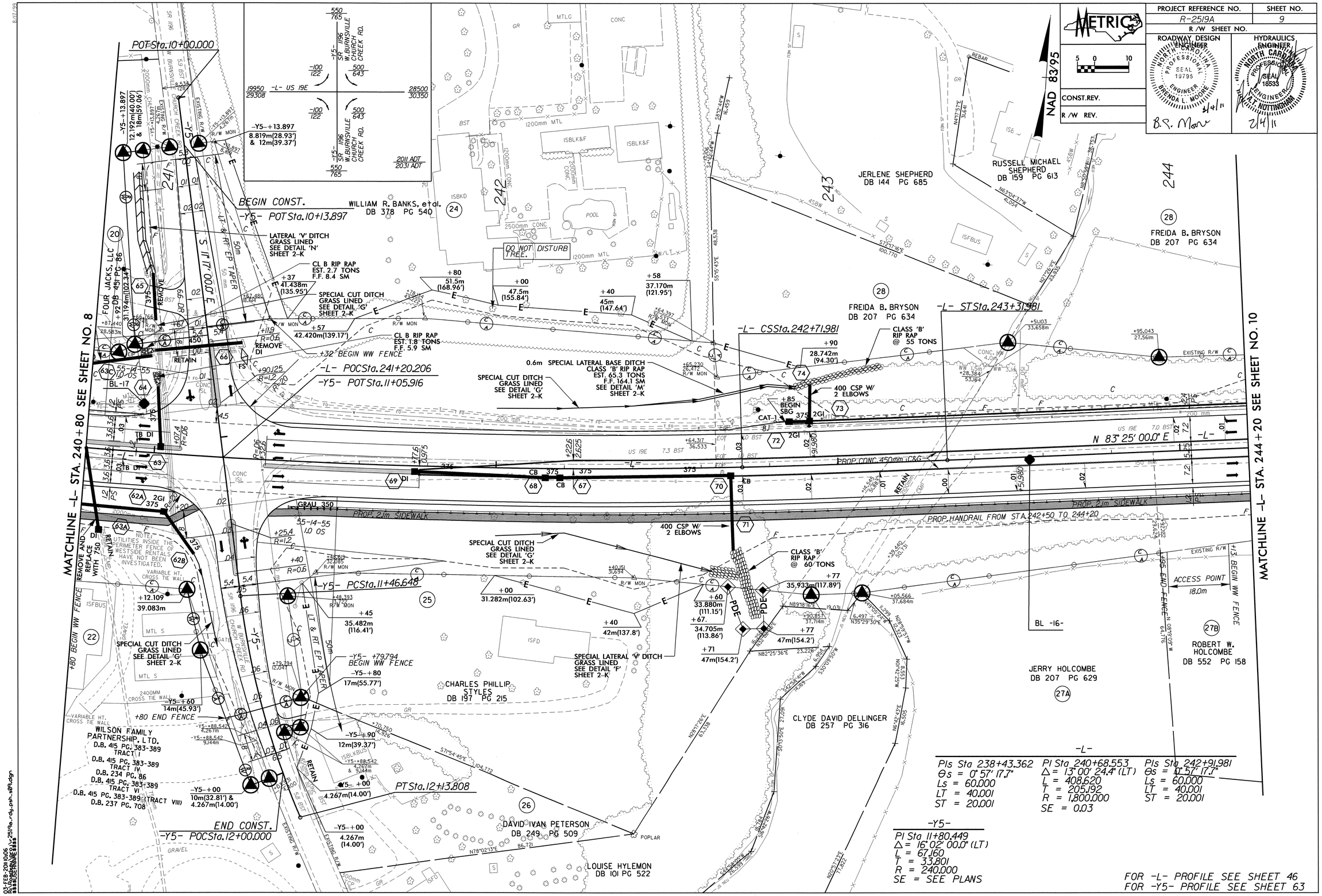
CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE 2/4/11 B.L. Moore

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER M. T. NOTTINGHAM 2/4/11

NAD 83/95



8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC 5 0 10

CONST.REV.

R/W REV.

NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE 2/14/11 B.R. Moore

NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER M. T. NOTTINGHAM 2/14/11

NAD 83/95

MATCHLINE -L- STA. 244+20 SEE SHEET NO. 9

MATCHLINE -L- STA. 247+60 SEE SHEET NO. 11

SR 1438 CHARLIE BROWN RD. 5.8 BST

EXISTING R/W

475mm CMP

18.288 (60')

245 246 247

28 FREIDA B. BRYSON DB 207 PG 634

ROBERT J. BROWN DB 94 PG 329

30 DAVID BANKS DB 359 PG 92

31 CHARLES AYERS et AL DB 234 PG 32

ACCESS POINT 18.0m

END FENCE

BEGIN WW FENCE

PSH 375mm SEE SHEET 2-N

+05 26.550m(87.11') & 33m(108.27')

+18 33m(108.27')

+18 26.342m(86.42')

+70 25.471m (83.57')

+82 42.234m (138.56')

+98 32.462m(106.50') & 40m(131.23')

+04 40m(131.23') & 31.121m(102.10')

+20 40m(131.23')

+98 39m(127.95')

GRAU-350

BL-18

8:1 TAPER

PROPOSED CONC EXPRESSWAY GUTTER -L- 246+20 TO 247+00

PROP. CONC 450mm C&G

PROP. 2.1m SIDEWALK

'V' DITCH GRASS LINED SEE DETAIL 'L' SHEET 2-K @ 20 CM EXC.

PROPOSED SBG -L- 244+80 TO 246+80

NOTE: FRAGMENTED LINES MARKED "?U" ARE OF UNKNOWN ORIGIN AND ASSUMED ABANDONED

TYPE D 2GI

REMOVE

CL B RIP RAP EST. 1.8 TONS F.F. 5.9 SM

TRANSITION CUT DITCH TO EXISTING DITCH

-L- CSSta.247+45.133

BERM DITCH

-L- SCSta.244+88.375

-L- TSSta.244+28.375

+50 END FENCE

+52 END FENCE

+99 BEGIN WW FENCE

+90 50.582m (165.95') BEGIN WW FENCE

+00 53m(173.88')

+35 44.349m (145.50')

ROBERT W. HOLCOMBE DB 552 PG 158

27B

JERRY HOLCOMBE DB 207 PG 629

27A

CEMETERY

29

CHARLES W. BANKS DB 209 PG 110

-L-

PIs Sta. 244+68.377	PI Sta. 246+17.246	PIs Sta. 247+65.134
Θs = 1° 25' 56.6"	Δ = 12° 15' 33.4" (RT)	Θs = 1° 25' 56.6"
Ls = 60.000	L = 256.758	Ls = 60.000
LT = 40.001	T = 128.871	LT = 40.001
ST = 20.001	R = 1,200.000	ST = 20.001
	SE = 0.04	

FOR -L- PROFILE SEE SHEET 47

03-FEB-2011 10:06
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	11
R/W SHEET NO.	

METRIC

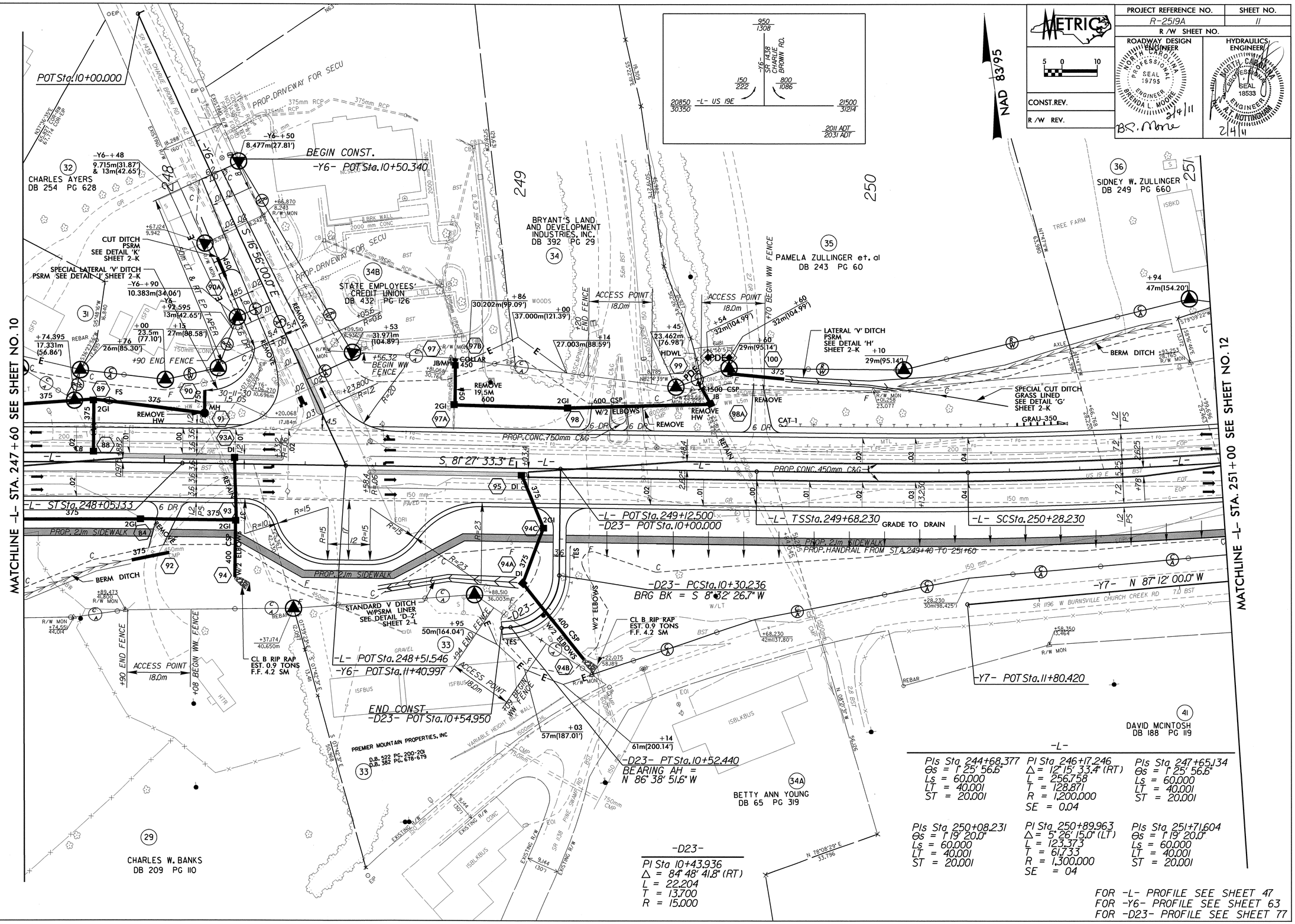
5 0 10

CONST. REV.

R/W REV.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE
2/4/11
B.L. Moore

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER R.T. NOTTINGHAM
2/4/11



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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	12
R/W SHEET NO.	

METRIC 5 0 10

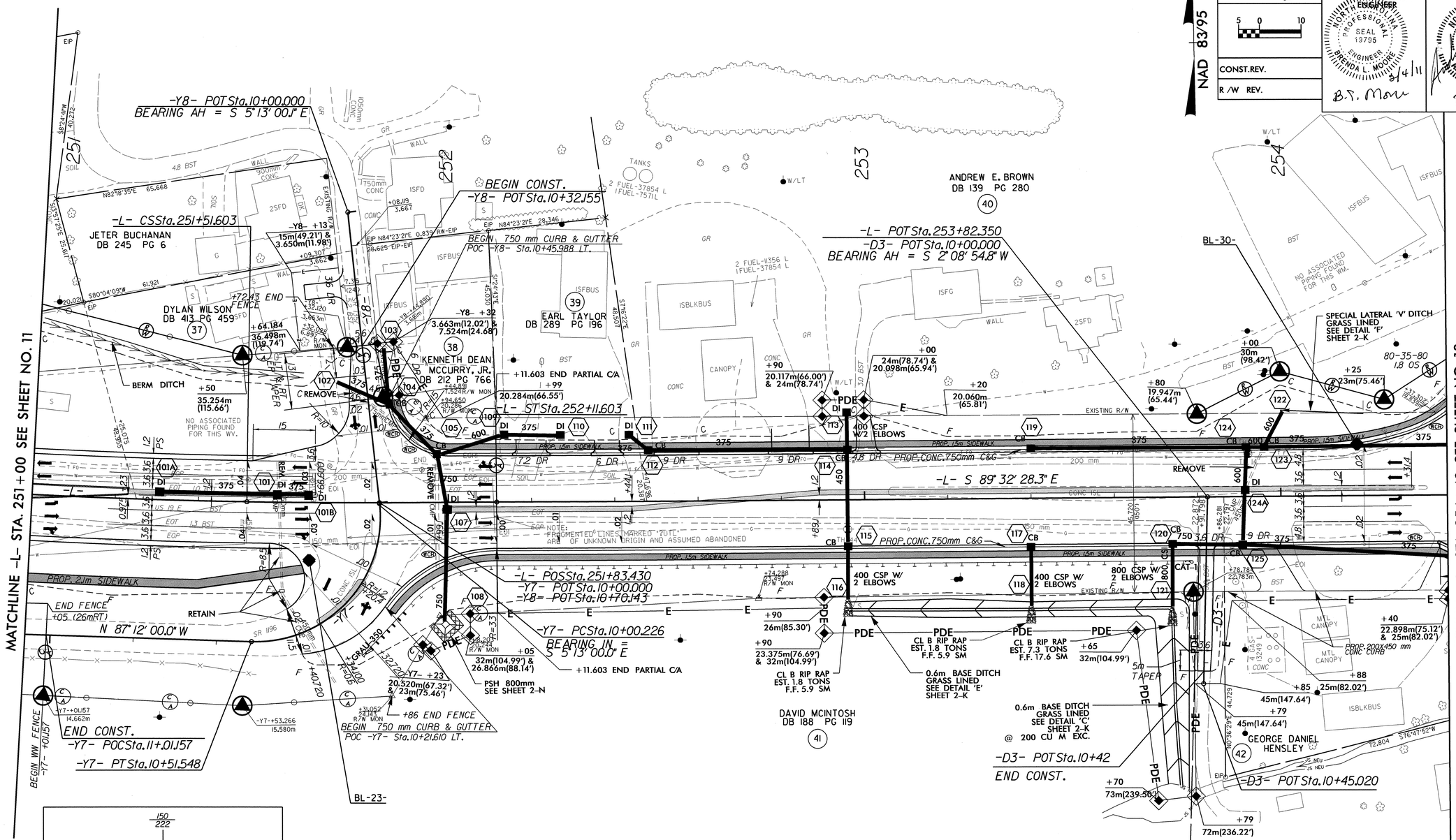
CONST.REV.

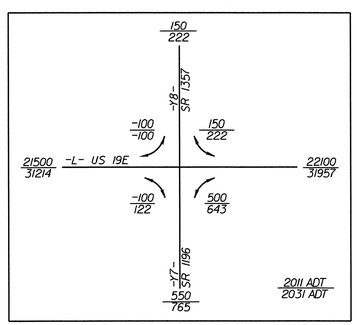
R/W REV.

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE — 3/4/11 — B.L. Moore

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 19533 ENGINEER A.T. NOTTINGHAM — 2/4/11

NAD 83/95





-Y7-

PI Sta 10+34.747
Δ = 98° 01' 00.0" (RT)
L = 51.321
T = 34.521
R = 30.000
SE = SEE PLANS

-L-

PIs Sta 250+08.231	PI Sta 250+89.963	PIs Sta 251+71.604
Θs = 1° 19' 20.0"	Δ = 5° 26' 15.0" (LT)	Θs = 1° 19' 20.0"
Ls = 60.000	L = 123.373	Ls = 60.000
LT = 40.001	T = 61.733	LT = 40.001
ST = 20.001	R = 1,300.000	ST = 20.001
	SE = 04	

FOR -L- PROFILE SEE SHEET 48
FOR -Y7- PROFILE SEE SHEET 63
FOR -Y8- PROFILE SEE SHEET 64
FOR -D3- PROFILE SEE SHEET 72
FOR WCR STATIONING SEE PAVEMENT MARKING PLANS

8/17/99

03-FEB-2011 10:06
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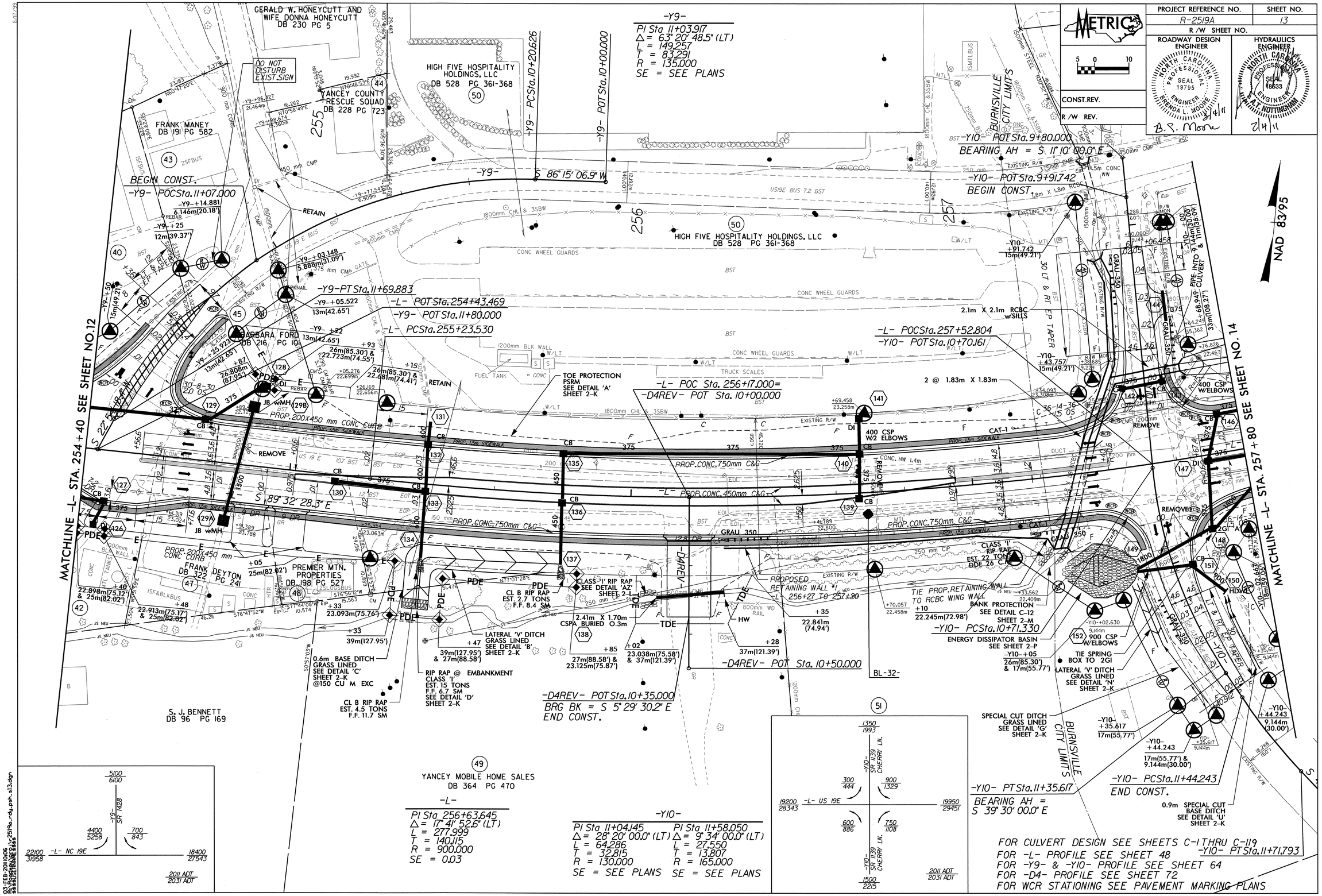
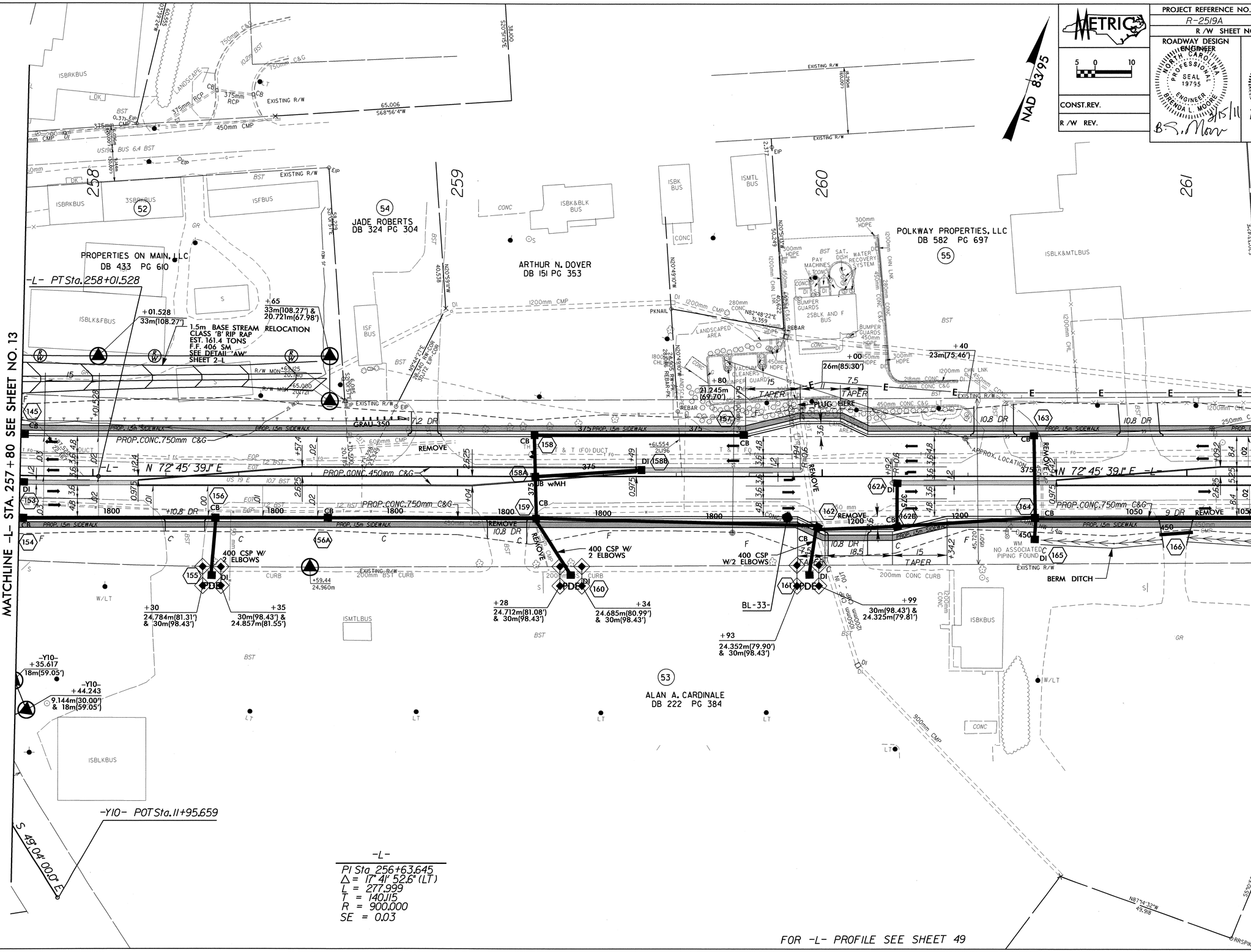


PROJECT REFERENCE NO.
R-2519A
SHEET NO.
13
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R/W REV.
METRIC
NAD 83/95
-Y9-
PI Sta 11+03.917
Δ = 63° 20' 48.5" (LT)
L = 149.257
T = 83.291
R = 135.000
SE = SEE PLANS
GERALD W. HONEYCUTT AND WIFE DONNA HONEYCUTT DB 230 PG 5
DO NOT DISTURB EXIST.SIGN
YANCEY COUNTY RESCUE SQUAD DB 228 PG 723
HIGH FIVE HOSPITALITY HOLDINGS, LLC DB 528 PG 361-368
FRANK MANEY DB 191 PG 582
BEGIN CONST.
-Y9- POCSta.11+07.000
-Y9- PTSta.11+69.883
-L- POTSta.254+43.469
-Y9- POTSta.11+80.000
-L- PCSta.255+23.530
BARBARA FORD DB 216 PG 101
-Y9- PCSta.10+20.626
-Y9- POTSta.10+00.000
-Y9- S 86° 15' 06.9" W
-Y10- POTSta.9+80.000
BEARING AH = S 11° 10' 00.0" E
-Y10- POTSta.9+91.742
BEGIN CONST.
-L- POCSta.257+52.804
-Y10- POTSta.10+70.161
-L- POC Sta. 256+17.000=
-D4REV- POT Sta. 10+00.000
TOE PROTECTION PSRM SEE DETAIL 'A' SHEET 2-K
PROP.200X450 mm CONC CURB
PROP.CONC.750mm C&G
PROP.CONC.450mm C&G
400 CSP W/2 ELBOWS
400 CSP W/ELBOWS
2.1m X 2.1m RCBC w/SILLS
2 @ 1.83m X 1.83m
S 89° 32' 28.3" E
MATCHLINE -L- STA. 254+40 SEE SHEET NO.12
MATCHLINE -L- STA. 257+80 SEE SHEET NO. 14
FRANK DEYTON DB 322 PG 241
PREMIER MTN. PROPERTIES DB 198 PG 527
CL B RIP RAP EST. 2.7 TONS F.F. 8.4 SM
CLASS 'I' RIP RAP SEE DETAIL 'AZ' SHEET 2-L
2.41m X 1.70m CSPA BURIED 0.3m
LATERAL 'V' DITCH GRASS LINED SEE DETAIL 'B' SHEET 2-K
0.6m BASE DITCH GRASS LINED SEE DETAIL 'C' SHEET 2-K @150 CU M EXC
RIP RAP @ EMBANKMENT CLASS 'I' EST. 15 TONS F.F. 6.7 SM SEE DETAIL 'D' SHEET 2-K
CL B RIP RAP EST. 4.5 TONS F.F. 11.7 SM
-D4REV- POT Sta. 10+50.000
-D4REV- POTSta.10+35.000
BRG BK = S 5° 29' 30.2" E
END CONST.
PROPOSED RETAINING WALL #1 -L- 256+27 TO 257+20
TIE PROP.RETAINING WALL TO RCBC WING WALL
BANK PROTECTION SEE DETAIL C-12 SHEET 2-M
-Y10- PCSta.10+71.330
ENERGY DISSIPATOR BASIN SEE SHEET 2-P
900 CSP W/ELBOWS
TIE SPRING BOX TO 2GI
LATERAL 'V' DITCH GRASS LINED SEE DETAIL 'N' SHEET 2-K
SPECIAL CUT DITCH GRASS LINED SEE DETAIL 'G' SHEET 2-K
-Y10- PTSta.11+35.617
BEARING AH = S 39° 30' 00.0" E
-Y10- PCSta.11+44.243
END CONST.
0.9m SPECIAL CUT BASE DITCH SEE DETAIL 'U' SHEET 2-K
-Y10- PTSta.11+71.793
BURNSVILLE CITY LIMITS
S. J. BENNETT DB 96 PG 169
YANCEY MOBILE HOME SALES DB 364 PG 470
-L-
PI Sta 256+63.645
Δ = 17° 41' 52.6" (LT)
L = 277.999
T = 140.115
R = 900.000
SE = 0.03
-Y10-
PI Sta 11+04.145
Δ = 28° 20' 00.0" (LT)
L = 64.286
T = 32.815
R = 130.000
SE = SEE PLANS
PI Sta 11+58.050
Δ = 9° 34' 00.0" (LT)
L = 27.550
T = 13.807
R = 165.000
SE = SEE PLANS
-L- US 19E
-L- NC 19E
-Y9- SR 1428
-Y10- SR 1139 CHERRY LN.
2011 ADT
2031 ADT
FOR CULVERT DESIGN SEE SHEETS C-1 THRU C-119
FOR -L- PROFILE SEE SHEET 48
FOR -Y9- & -Y10- PROFILE SEE SHEET 64
FOR -D4- PROFILE SEE SHEET 72
FOR WCR STATIONING SEE PAVEMENT MARKING PLANS

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE 3/15/11	NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER RAY NOTTINGHAM 2/15/11
CONST.REV.	
R/W REV.	

METRIC 5 0 10

NAD 83/95



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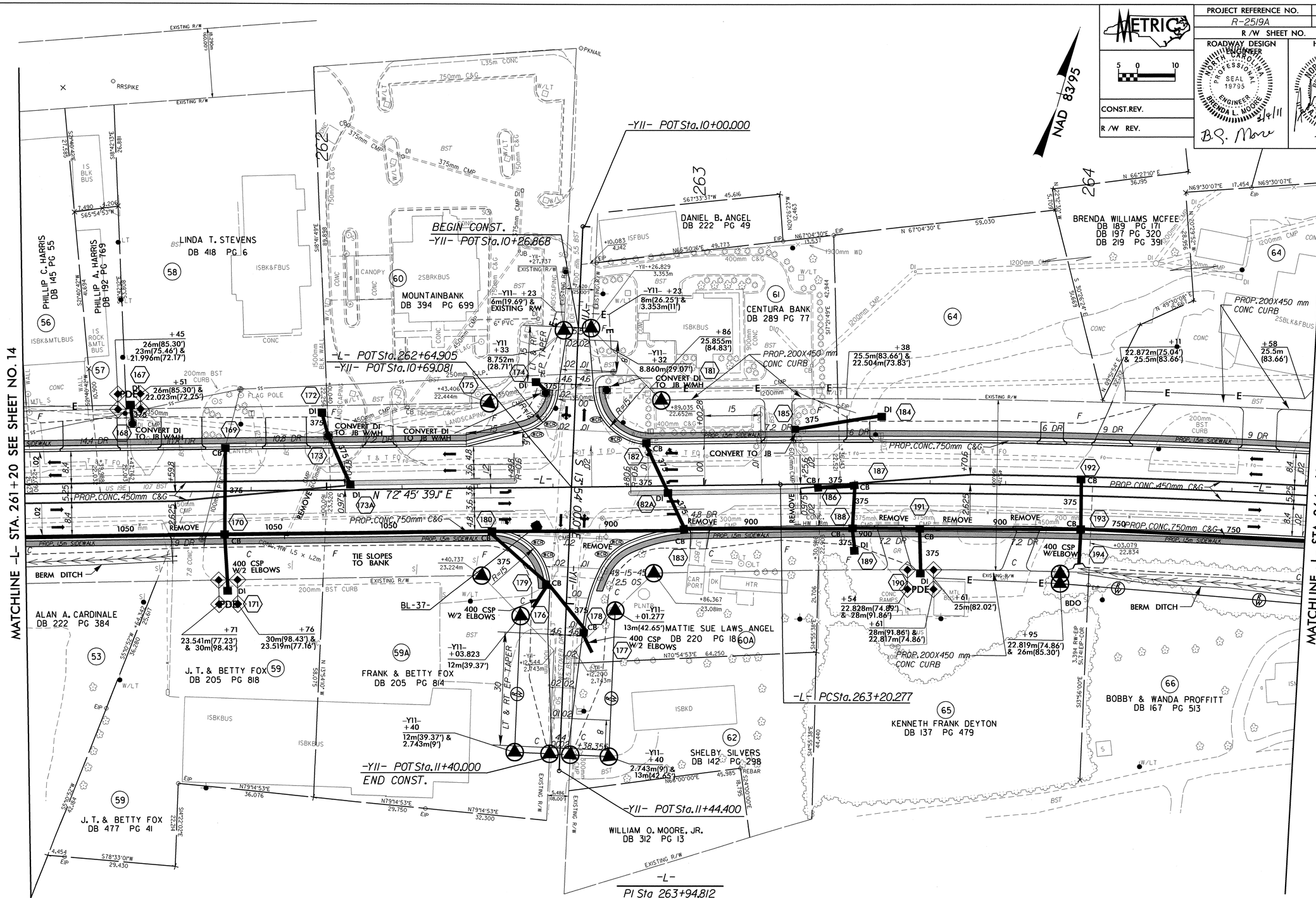
PROJECT REFERENCE NO.	SHEET NO.
R-2519A	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
BRENDA L. MOORE, PE, SEAL 19795, NORTH CAROLINA PROFESSIONAL ENGINEER, 5/4/11	A.T. NOTTINGHAM, PE, SEAL 18833, NORTH CAROLINA PROFESSIONAL ENGINEER, 2/4/11
CONST.REV.	
R/W REV.	

METRIC 5 0 10

NAD 83/95



FOR -L- PROFILE SEE SHEET 49
FOR -Y11- PROFILE SEE SHEET 65
FOR WCR STATIONING SEE PAVEMENT MARKING PLANS

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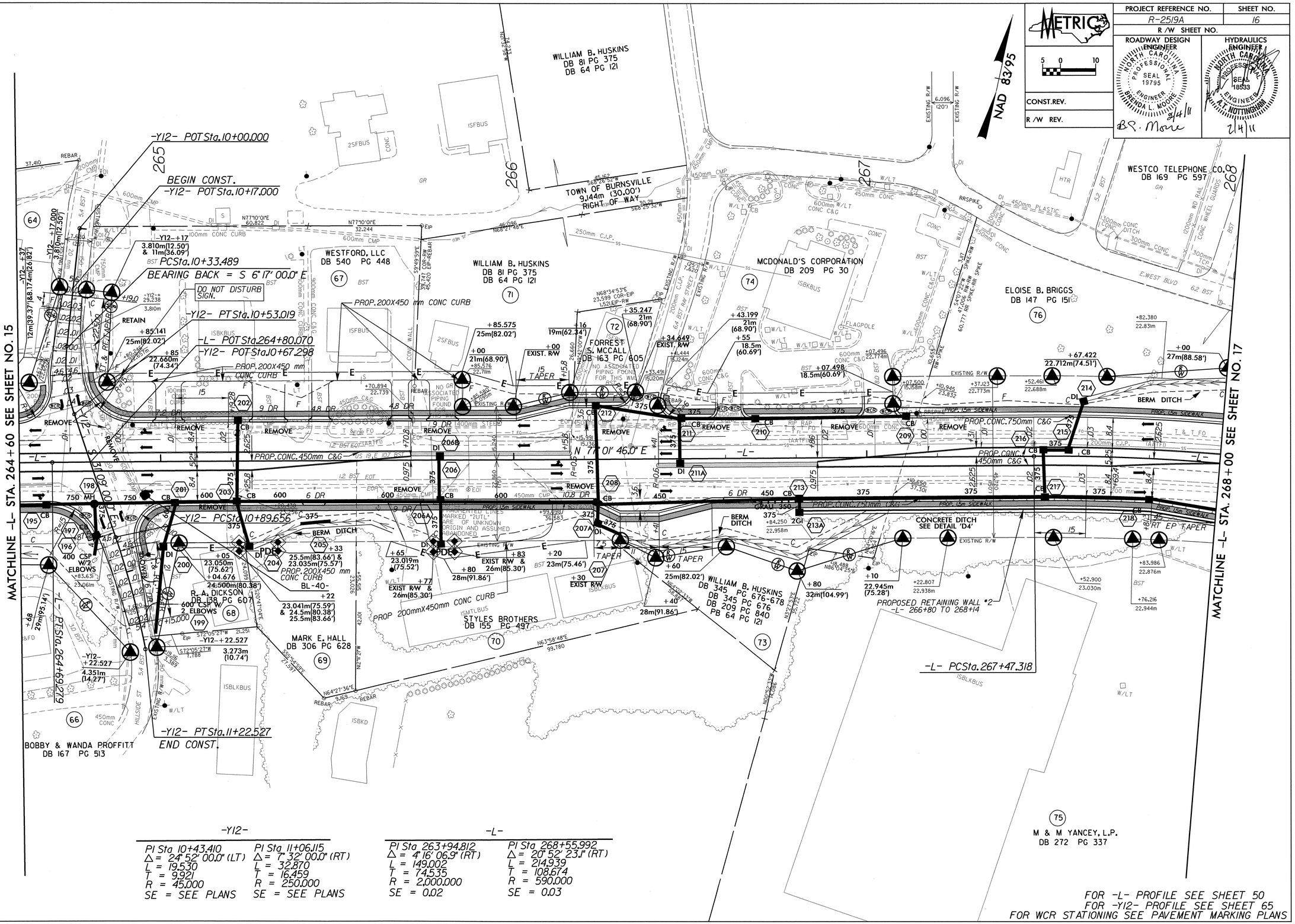
PROJECT REFERENCE NO.	SHEET NO.
R-2519A	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE 2/4/11	NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM 2/4/11
CONST.REV.	
R/W REV.	

METRIC

NAD 83/95



-Y12-

PI Sta 10+43.410	PI Sta 11+06.115
Δ = 24° 52' 00.0" (LT)	Δ = 7° 32' 00.0" (RT)
L = 19.530	L = 32.870
T = 9.921	T = 16.459
R = 45.000	R = 250.000
SE = SEE PLANS	SE = SEE PLANS

-L-

PI Sta 263+94.812	PI Sta 268+55.992
Δ = 4° 16' 06.9" (RT)	Δ = 20° 52' 23.1" (RT)
L = 149.002	L = 214.939
T = 74.535	T = 108.674
R = 2,000.000	R = 590.000
SE = 0.02	SE = 0.03

FOR -L- PROFILE SEE SHEET 50
FOR -Y12- PROFILE SEE SHEET 65
FOR WCR STATIONING SEE PAVEMENT MARKING PLANS

03-FEB-2011 10:06
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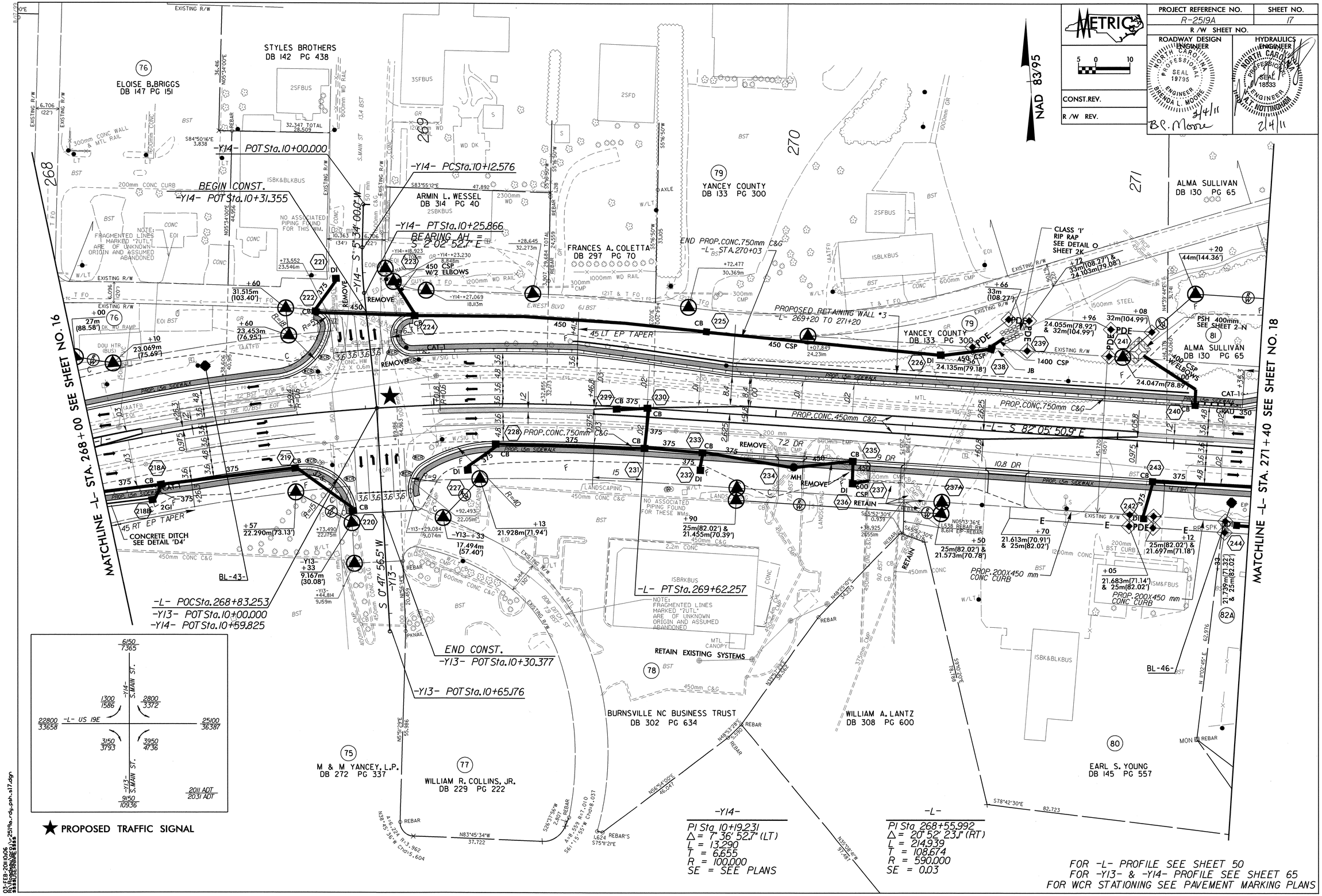


METRIC
PROJECT REFERENCE NO.
R-2519A
SHEET NO.
17
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R/W REV.
NAD 83/95
STYLES BROTHERS
DB 142 PG 438
ELOISE B.BRIGGS
DB 147 PG 151
ARMIN L. WESSEL
DB 314 PG 40
FRANCES A. COLETTA
DB 297 PG 70
YANCEY COUNTY
DB 133 PG 300
ALMA SULLIVAN
DB 130 PG 65
BURNSVILLE NC BUSINESS TRUST
DB 302 PG 634
WILLIAM A. LANTZ
DB 308 PG 600
EARL S. YOUNG
DB 145 PG 557
M & M YANCEY, L.P.
DB 272 PG 337
WILLIAM R. COLLINS, JR.
DB 229 PG 222
MATCHLINE -L- STA. 268+00 SEE SHEET NO. 16
MATCHLINE -L- STA. 271+40 SEE SHEET NO. 18
-Y14- POT Sta.10+00.000
BEGIN CONST.
-Y14- POT Sta.10+31.355
-Y14- PC Sta.10+12.576
-Y14- PT Sta.10+25.866
BEARING AH = S 2°02'52.7" E
-Y14- S 5°34'00.0" W
-Y13- S 0°47'56.5" W
-L- POC Sta.268+83.253
-Y13- POT Sta.10+00.000
-Y14- POT Sta.10+59.825
END CONST.
-Y13- POT Sta.10+30.377
-Y13- POT Sta.10+65.176
-L- PT Sta.269+62.257
-L- S 82°05'50.9" E
PROPOSED RETAINING WALL #3
-L- 269+20 TO 271+20
END PROP.CONC.750mm C&G
-L- STA.270+03
CLASS 'I' RIP RAP SEE DETAIL O SHEET 2K
PSH 400mm SEE SHEET 2-N
CONCRETE DITCH SEE DETAIL 'D4'
RETAIN EXISTING SYSTEMS
PROP.200X450 mm CONC CURB
PROP.CONC.750mm C&G
PROP.CONC.450mm C&G
PROP.15m SIDEWALK
45 LT EP TAPER
45 RT EP TAPER
NO ASSOCIATED PIPING FOUND FOR THIS WM.
NOTE: FRAGMENTED LINES MARKED "?UTL" ARE OF UNKNOWN ORIGIN AND ASSUMED ABANDONED
-Y14-
PI Sta 10+19.231
Δ = 7° 36' 52.7" (LT)
L = 13.290
T = 6.655
R = 100.000
SE = SEE PLANS
-L-
PI Sta 268+55.992
Δ = 20° 52' 23.1" (RT)
L = 214.939
T = 108.674
R = 590.000
SE = 0.03
FOR -L- PROFILE SEE SHEET 50
FOR -Y13- & -Y14- PROFILE SEE SHEET 65
FOR WCR STATIONING SEE PAVEMENT MARKING PLANS
PROPOSED TRAFFIC SIGNAL
-L- US 19E
-Y14- S.MAIN ST.
-Y13- S.MAIN ST.
2011 ADT
2031 ADT

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	18
R/W SHEET NO.	

METRIC

5 0 10

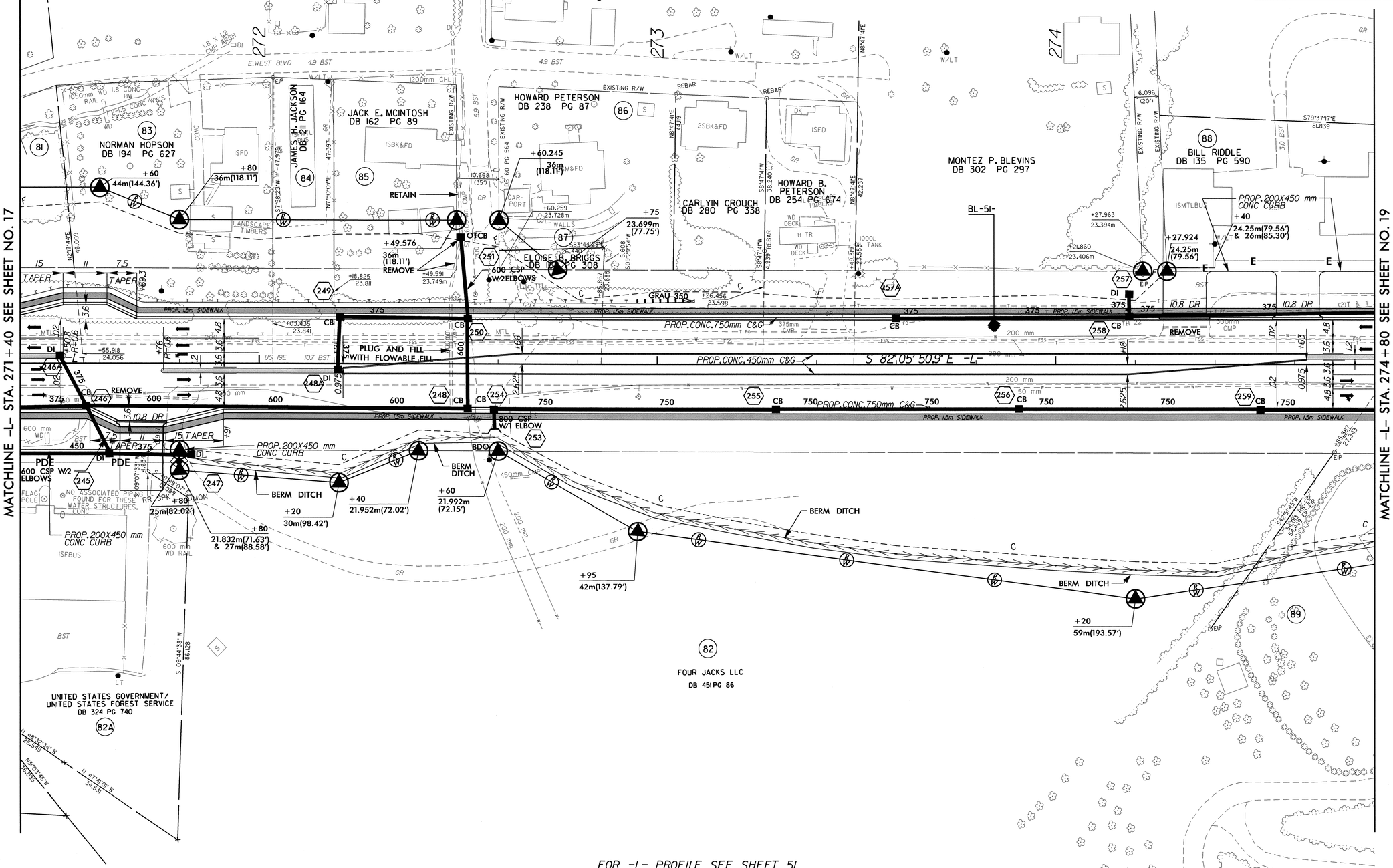
CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE
B.P. Moore 2/4/11

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18535 ENGINEER A.T. NOTTINGHAM
2/4/11

NAD 83/95



FOR -L- PROFILE SEE SHEET 51

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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	19
R/W SHEET NO.	

METRIC 5 0 10

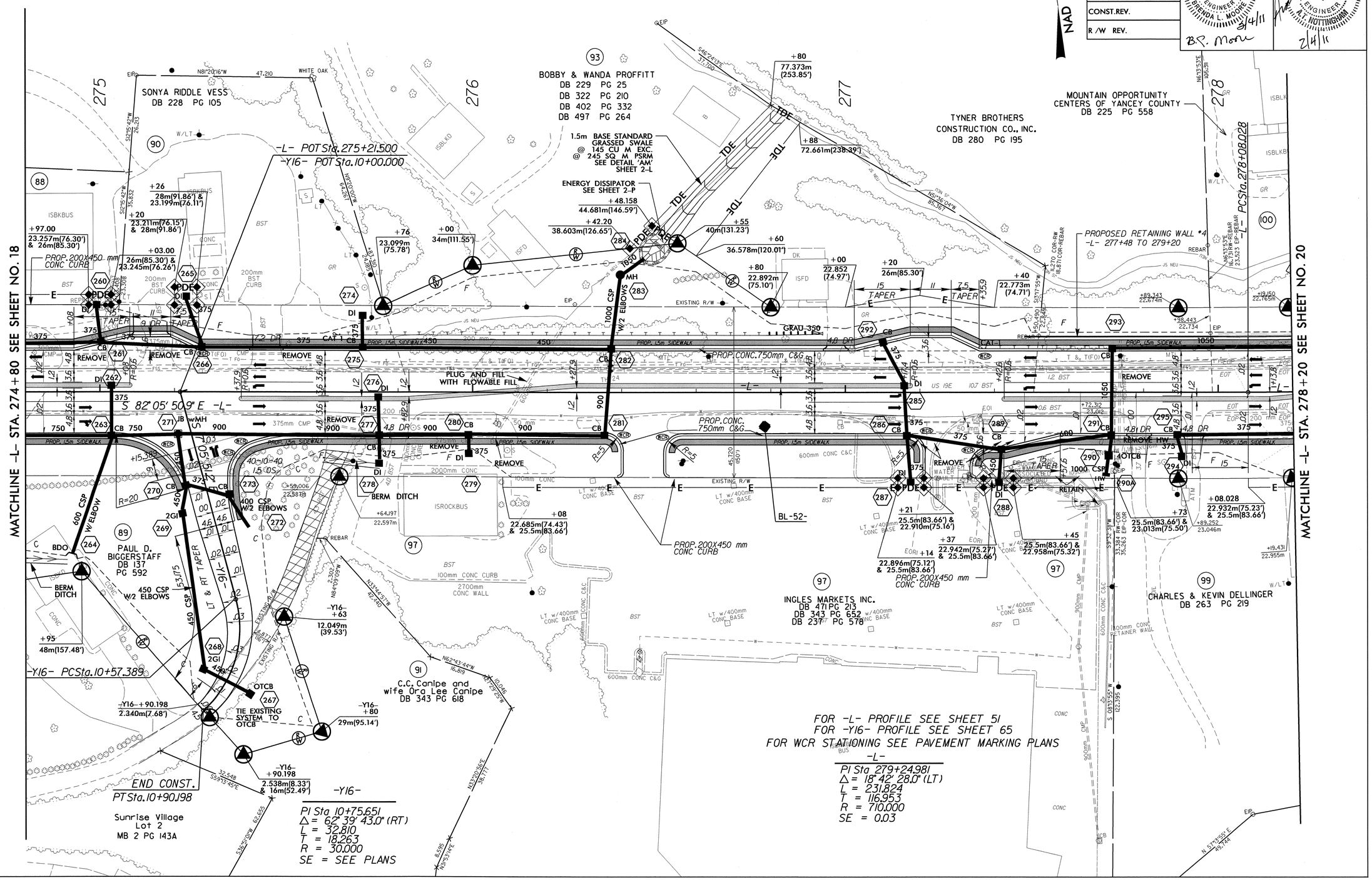
CONST. REV.

R/W REV.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE
3/4/11
B.R. Moore

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18033 ENGINEER T. NOTTINGHAM
3/4/11

NAD 83/95



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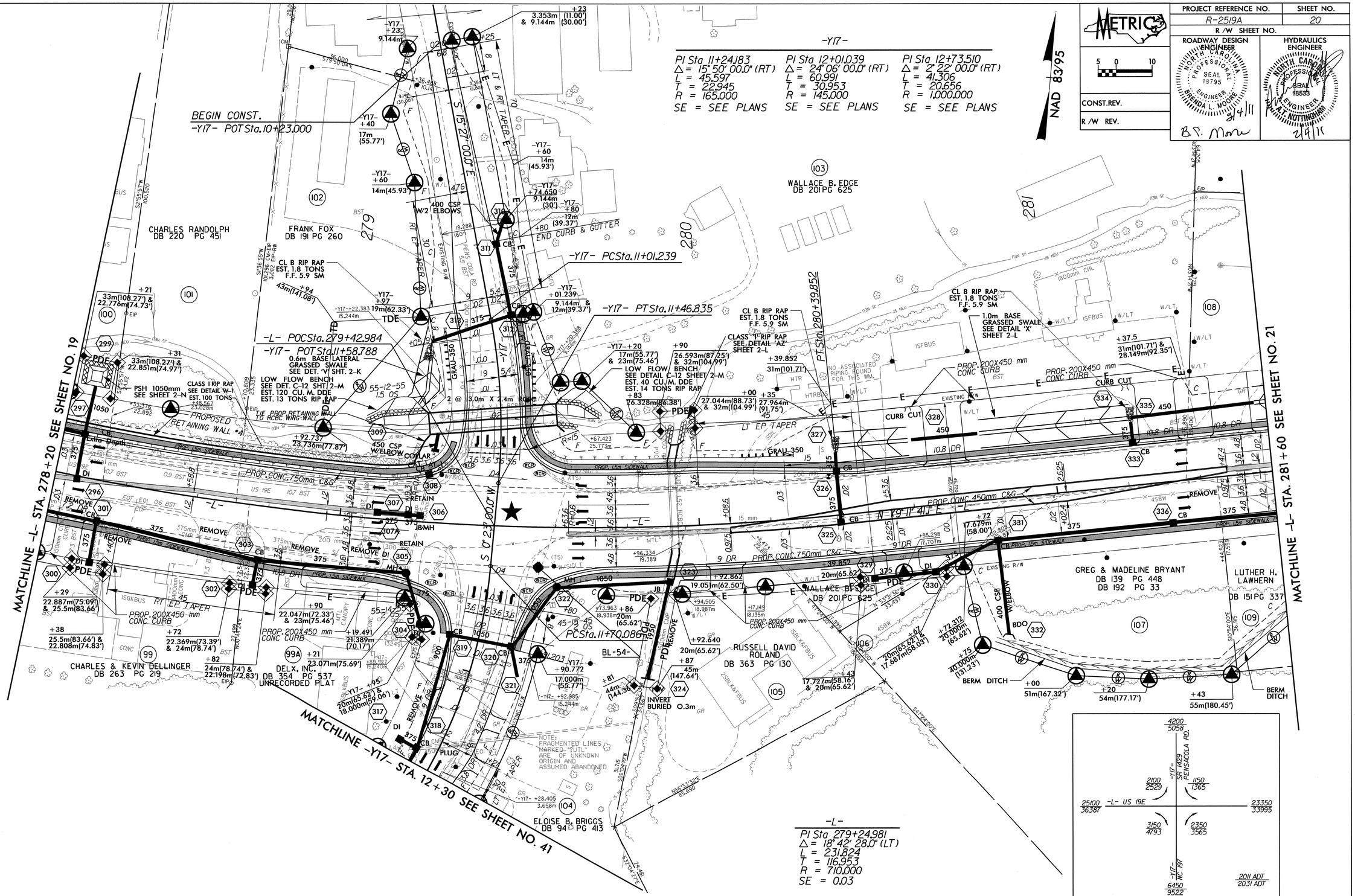
PROJECT REFERENCE NO.	SHEET NO.
R-2519A	20
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE 3/4/11	NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM 2/4/11
CONST.REV.	
R /W REV.	

METRIC 5 0 10

NAD 83/95

-Y17-

PI Sta 11+24.183	PI Sta 12+01.039	PI Sta 12+73.510
Δ = 15° 50' 00.0" (RT)	Δ = 24° 06' 00.0" (RT)	Δ = 2° 22' 00.0" (RT)
L = 45.597	L = 60.991	L = 41.306
T = 22.945	T = 30.953	T = 20.656
R = 165.000	R = 145.000	R = 1,000.000
SE = SEE PLANS	SE = SEE PLANS	SE = SEE PLANS



-L-

PI Sta 279+24.981
Δ = 18° 42' 28.0" (LT)
L = 231.824
T = 116.953
R = 710.000
SE = 0.03

FOR CULVERT DESIGN SEE SHEETS C-1 THRU C-119

★ PROPOSED TRAFFIC SIGNAL

FOR -L- PROFILE SEE SHEET 52
FOR -Y17- PROFILE SEE SHEET 66
FOR WCR STATIONING SEE PAVEMENT MARKING PLANS

03-FEB-2011 10:05
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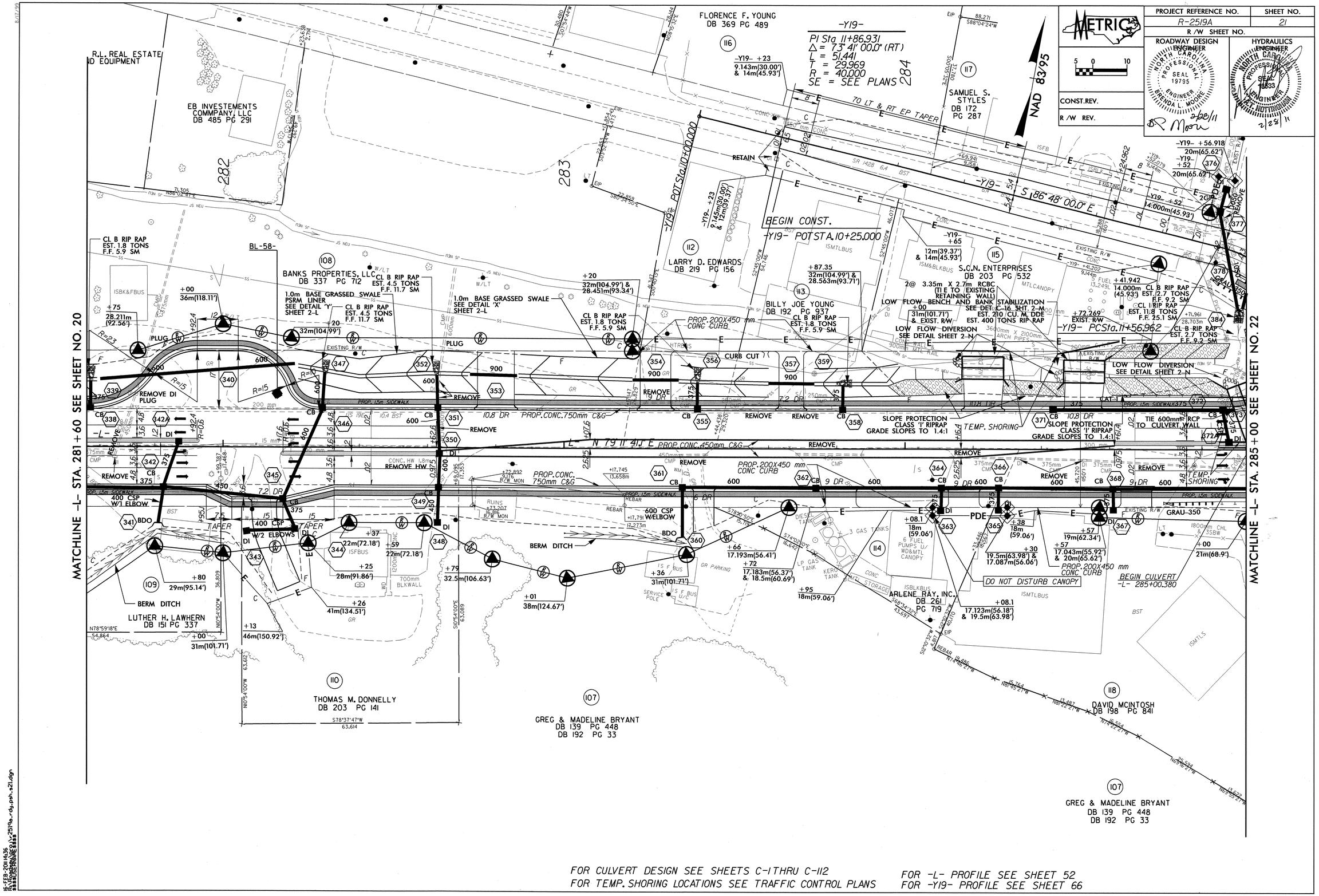

FOR CULVERT DESIGN SEE SHEETS C-1 THRU C-112
FOR TEMP. SHORING LOCATIONS SEE TRAFFIC CONTROL PLANS

FOR -L- PROFILE SEE SHEET 52
FOR -Y19- PROFILE SEE SHEET 66

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CONST.REV.	
R/W REV.	

METRIC 5 0 10

NAD 83/95

-DI7-

PI Sta 10+16.341
Δ = 46° 20' 49.6" (RT)
L = 103.11
T = 5.351
R = 12.500

PI Sta 11+04.181
Δ = 19° 05' 57.8" (LT)
L = 16.667
T = 8.412
R = 50.000

PI Sta 11+82.663
Δ = 107° 04' 51.7" (LT)
L = 23.361
T = 16.918
R = 12.500

-Y19-

PI Sta 11+86.931
Δ = 73° 41' 00.0" (RT)
L = 51.441
T = 29.969
R = 40.000
SE = SEE PLANS

-Y19- POCSta.11+88.660
-DI7- POTSta.10+00.000
BEARING AH =
N 48° 35' 51.2" E

-DI7- PCSta.10+10.990

-DI7- PTSta.10+21.102

-Y19- PTSta.12+08.402
BEARING AH =
S 13° 07' 00.0" E

-DI7- PCSta.11+65.745

-DI7- POTSta.11+99.737

-DI7- POTSta.11+95
END CONST.

-DI7- PTSta.11+89.107
BEARING AH = N 31° 14' 08.6" W

-L- POCSta.287+35.854
-Y20- POTSta.10+00.000

-L- PCSta.285+86.237

-DI7- PCSta.10+95.770

-DI7- PTSta.11+12.437

-L- PTSta.287+87.653

-L- POTSta.285+23.067
-Y18- POTSta.10+00.000
-Y19- POTSta.12+30.788

END CULVERT
-L- 285+08.940

END CONST.
-Y18- POTSta.10+50.000
BEARING BACK =
S 13° 07' 00.0" E

-Y18- POTSta.10+54.069

-Y20- POTSta.10+75.992
END CONST.

-L-
PI Sta 286+87.870
Δ = 18° 55' 06.6" (LT)
L = 201.416
T = 101.633
R = 610.000
SE = 0.03

-DI7- N 75° 50' 43.1" E

-DI7- S 85° 03' 19.2" E

-L- N 79° 11' 41.1" E

-L- N 60° 16' 34.5" E

MATCHLINE -L- STA. 285+00 SEE SHEET NO. 21

MATCHLINE -L- STA. 288+40 SEE SHEET NO. 23

GLEN RAVEN FILAMENT FABRICS, LLC
DB 349 PG 71

ELOISE B. BRIGGS
DB 147 PG 253

SAMUEL S. STYLES
DB 172 PG 287

DB 519 PG 296
GARY ATKINS

YANCEY COUNTY

DAVID MCINTOSH
DB 198 PG 841

GREG & MADELINE BRYANT
DB 139 PG 448
DB 192 PG 33

GREG & MADELINE BRYANT
DB 139 PG 448
DB 192 PG 33

CL B RIP RAP
EST. 1.8 TONS
F.F. 5.9 SM

CL B RIP RAP
EST. 0.9 TONS
F.F. 4.2 SM

CL B RIP RAP
EST. 0.9 TONS
F.F. 4.2 SM
400 CSP W/
2 ELBOWS

0.6m BASE
GRASSED SWALE
SEE DETAIL 'Z'
SHEET 2-L
@ 55 CM EXC

LOW FLOW BENCH
AND BANK STABILIZATION
SEE DETAIL C-15
EST. 70 CU. M. DDE
CLASS I RIP RAP
EST. 44 TONS

NOTE: PROPOSED RETAINING WALL *5
HAS BEEN ELIMINATED

NOTE:
FRAGMENTED LINES MARKED "?UTL"
ARE OF UNKNOWN ORIGIN AND
ASSUMED ABANDONED

NOTE:
UTILITIES INSIDE PREIMETER
FENCE OF GLEN RIVEN MILLS
WERE NOT INVESTIGATED.

NO ASSOCIATED
PIPING FOUND
FOR THIS WW

TEMP. SHORING

PROP. CONC. 750mm C&G

PROP. 200X450 mm
CONC CURB

PSH 750mm
SEE SHEET 2-N

BL-59-

BL-62-

90 TAPER

BURNSVILLE
CITY LIMITS

FOR CULVERT DESIGN SEE SHEETS C-1 THRU C-119
FOR TEMP. SHORING LOCATIONS SEE TRAFFIC CONTROL PLANS
FOR WCR STATIONING SEE PAVEMENT MARKING PLANS

FOR -L- PROFILE SEE SHEET 53
FOR -Y18- & -Y19- PROFILE SEE SHEET 66
FOR -Y20- PROFILE SEE SHEET 67
FOR -DI7- PROFILE SEE SHEET 76

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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	23
R /W SHEET NO.	

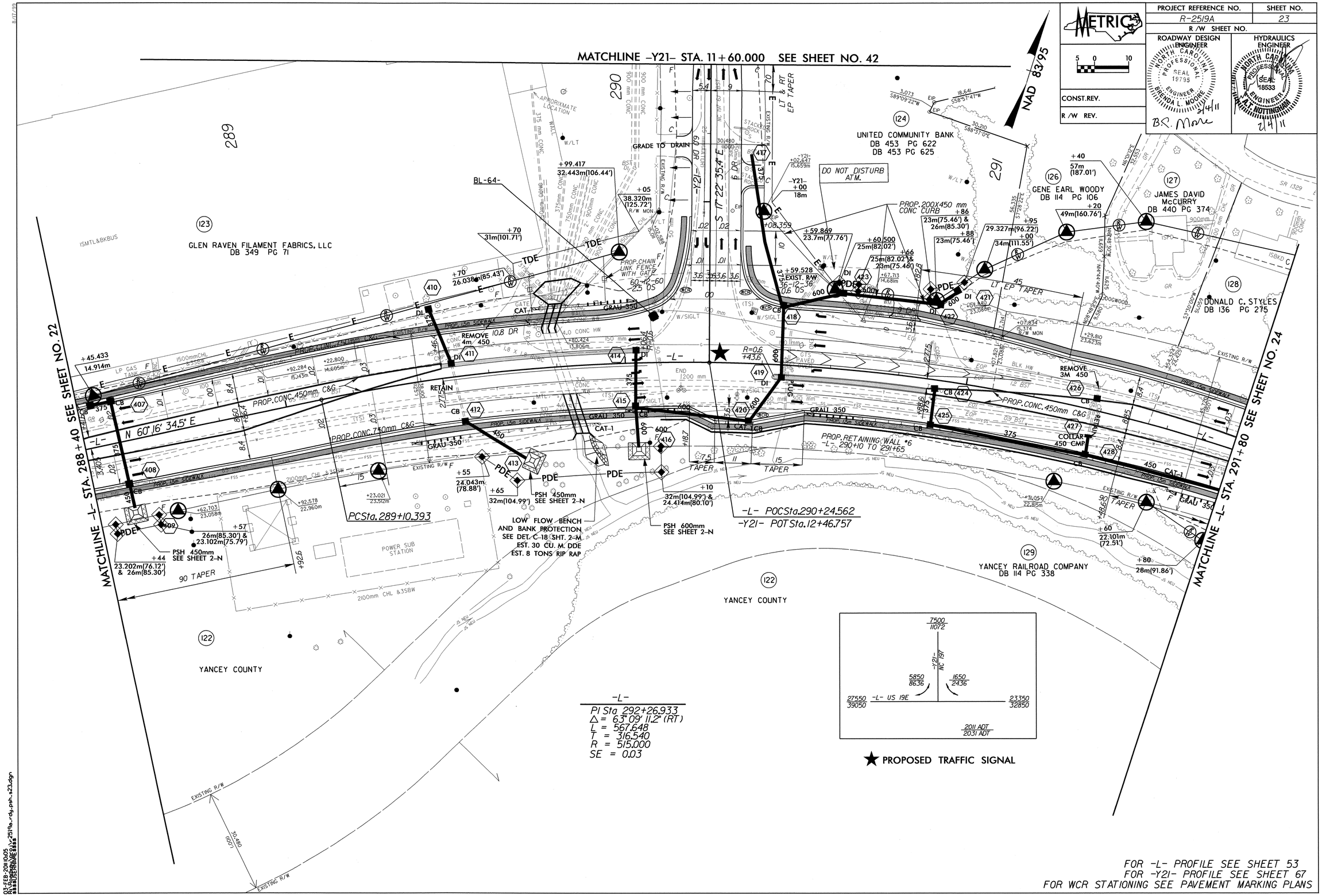
METRIC 5 0 10

CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE
2/4/11
B.L. Moore

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM
2/4/11



FOR -L- PROFILE SEE SHEET 53
FOR -Y21- PROFILE SEE SHEET 67
FOR WCR STATIONING SEE PAVEMENT MARKING PLANS

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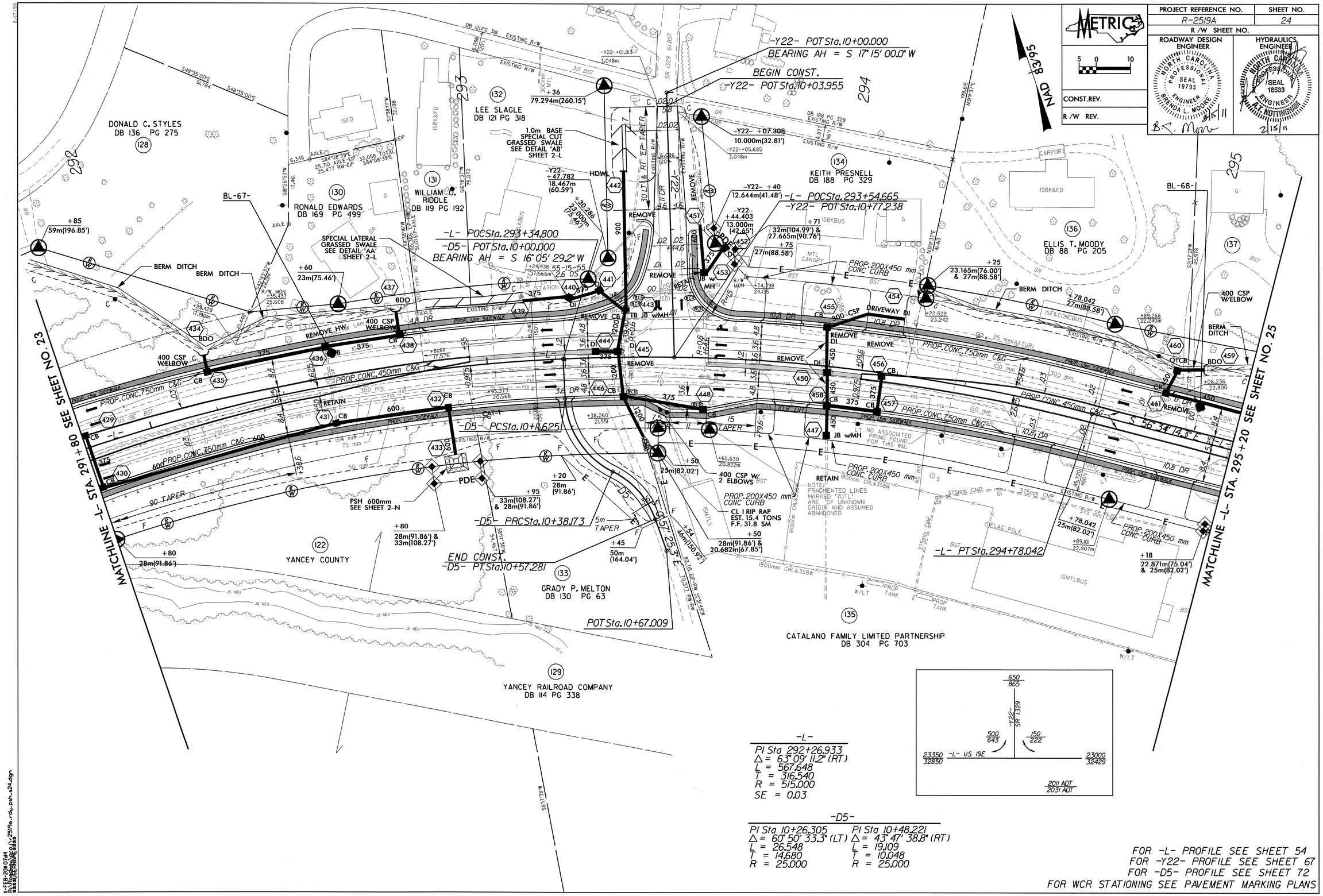


METRIC
PROJECT REFERENCE NO.
R-2519A
SHEET NO.
24
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R/W REV.
NAD 83/95
-Y22- POT Sta.10+00.000
BEARING AH = S 17° 15' 00.0" W
BEGIN CONST.
-Y22- POT Sta.10+03.955
-L- POC Sta.293+34.800
-D5- POT Sta.10+00.000
BEARING AH = S 16° 05' 29.2" W
-L- POC Sta.293+54.665
-Y22- POT Sta.10+77.238
-D5- PC Sta.10+11.625
-D5- PRC Sta.10+38.173
END CONST.
-D5- PT Sta.10+57.281
POT Sta.10+67.009
-L- PT Sta.294+78.042
DONALD C. STYLES
DB 136 PG 275
LEE SLAGLE
DB 121 PG 318
RONALD EDWARDS
DB 169 PG 499
WILLIAM O. RIDDLE
DB 119 PG 192
KEITH PRESNELL
DB 188 PG 329
ELLIS T. MOODY
DB 88 PG 205
YANCEY COUNTY
GRADY P. MELTON
DB 130 PG 63
CATALANO FAMILY LIMITED PARTNERSHIP
DB 304 PG 703
YANCEY RAILROAD COMPANY
DB 114 PG 338
MATCHLINE -L- STA. 291+80 SEE SHEET NO. 23
MATCHLINE -L- STA. 295+20 SEE SHEET NO. 25
1.0m BASE SPECIAL CUT GRASSED SWALE SEE DETAIL 'AB' SHEET 2-L
SPECIAL LATERAL GRASSED SWALE SEE DETAIL 'AA' SHEET 2-L
PSH 600mm SEE SHEET 2-N
NOTE: FRAGMENTED LINES MARKED "?UTL" ARE OF UNKNOWN ORIGIN AND ASSUMED ABANDONED
NO ASSOCIATED PIPING FOUND FOR THIS WM.
-L-
PI Sta 292+26.933
Δ = 63° 09' 11.2" (RT)
L = 567.648
T = 316.540
R = 515.000
SE = 0.03
-D5-
PI Sta 10+26.305
Δ = 60° 50' 33.3" (LT)
L = 26.548
T = 14.680
R = 25.000
PI Sta 10+48.221
Δ = 43° 47' 38.8" (RT)
L = 19.109
T = 10.048
R = 25.000
-L- US 19E
2011 ADT
2031 ADT
FOR -L- PROFILE SEE SHEET 54
FOR -Y22- PROFILE SEE SHEET 67
FOR -D5- PROFILE SEE SHEET 72
FOR WCR STATIONING SEE PAVEMENT MARKING PLANS

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	25
R /W SHEET NO.	

METRIC

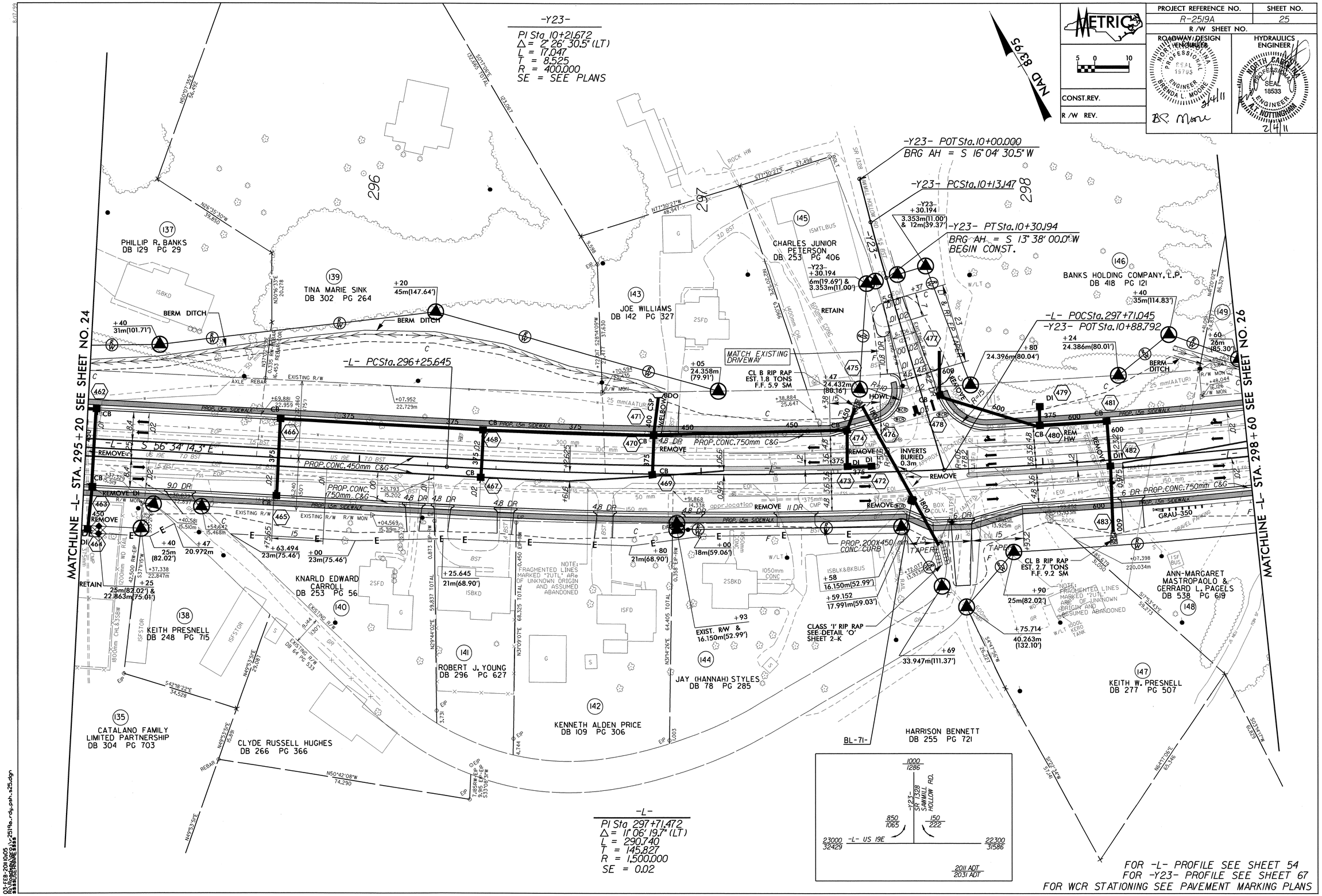
5 0 10

CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 19793 ENGINEER BRENDA L. MOORE 2/4/11 B.L. Moore

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER BRADLEY NOTTINGHAM 2/4/11



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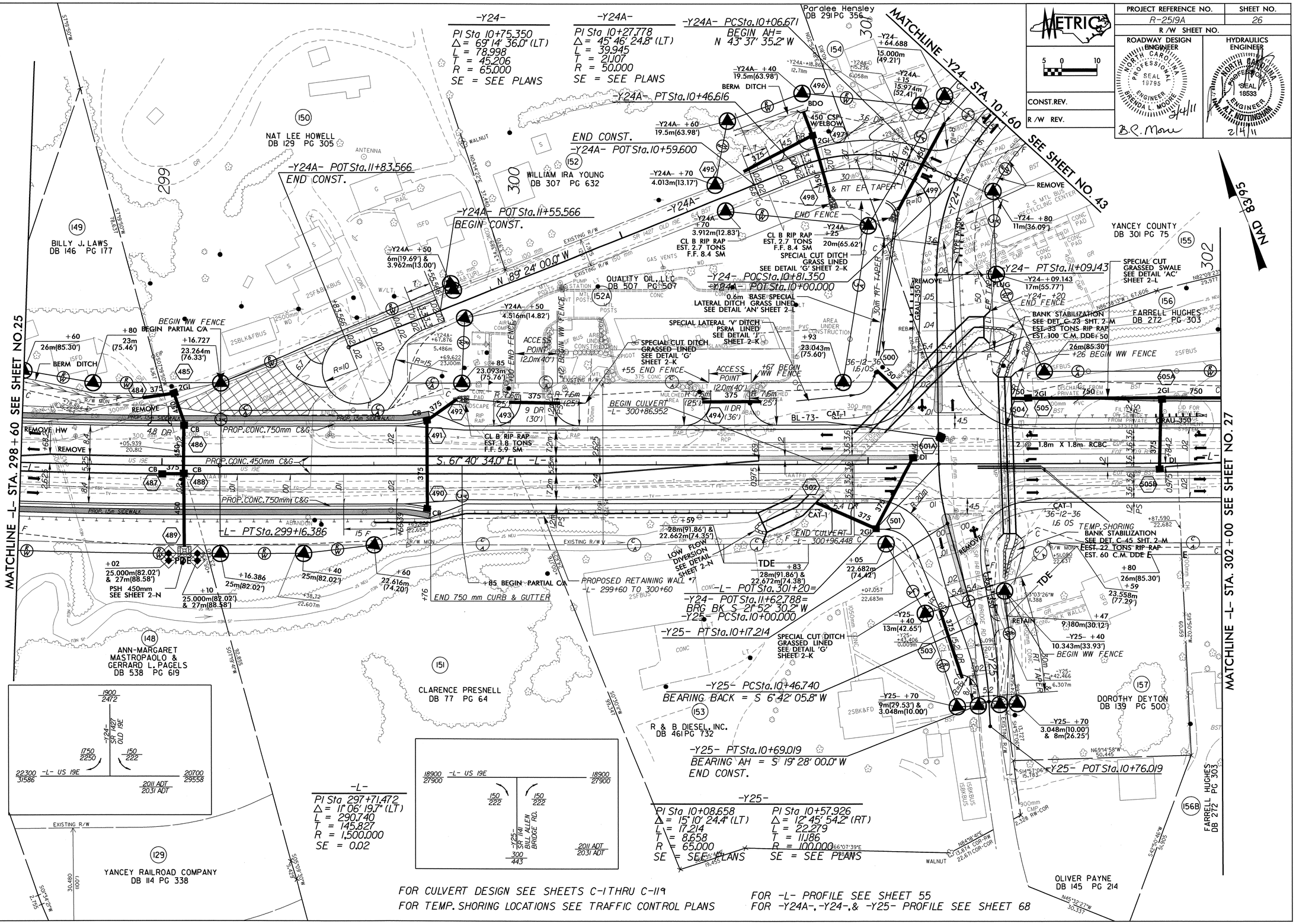
PROJECT REFERENCE NO.	SHEET NO.
R-2519A	26
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE 2/4/11	NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM 2/4/11
CONST.REV.	
R /W REV.	

METRIC 5 0 10



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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	27
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

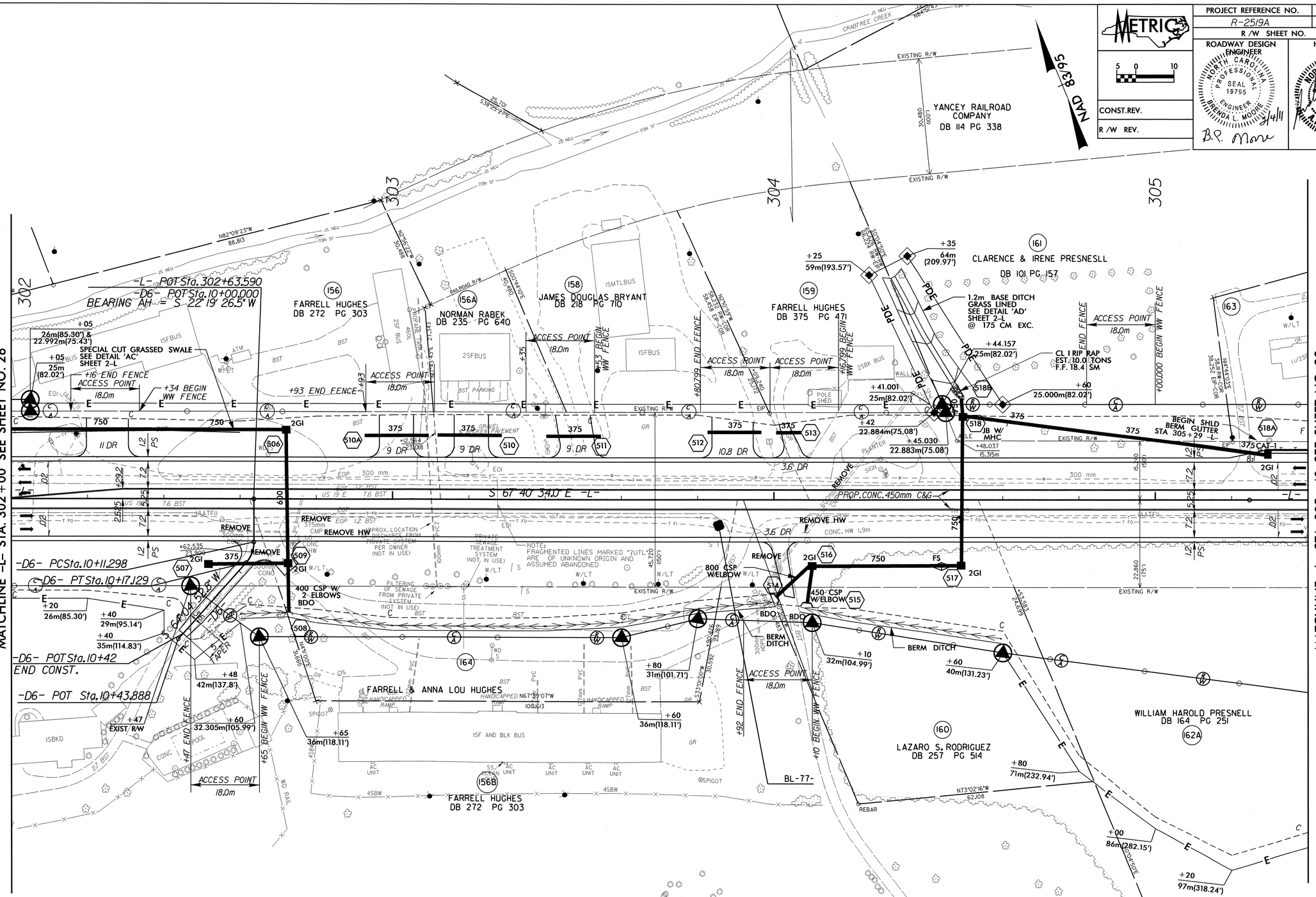
METRIC 5 0 10

CONST.REV.

R /W REV.

NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE 2/4/11 B.P. Moore

NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM 2/4/11



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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	28
R /W SHEET NO.	

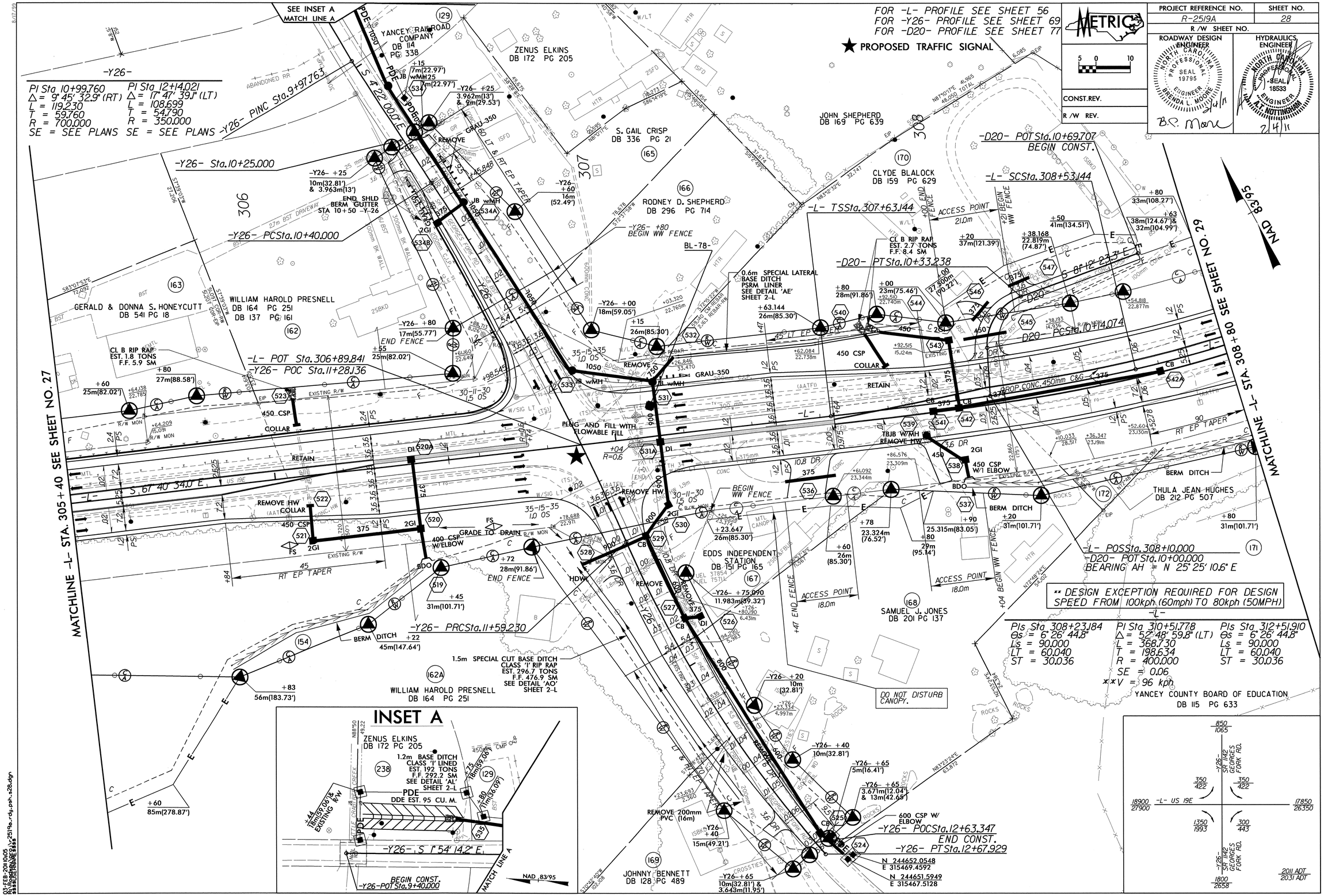
METRIC 5 0 10

CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE — B.P. Moore 2/4/11

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM — 2/4/11



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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	29
R/W SHEET NO.	

METRIC

5 0 10

CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE — 2/28/11 — B.R. Moore

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER A.T. NOTTINGHAM — 2/28/11

** DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED FROM 100 kph (60mph) TO 80 kph (50 mph)

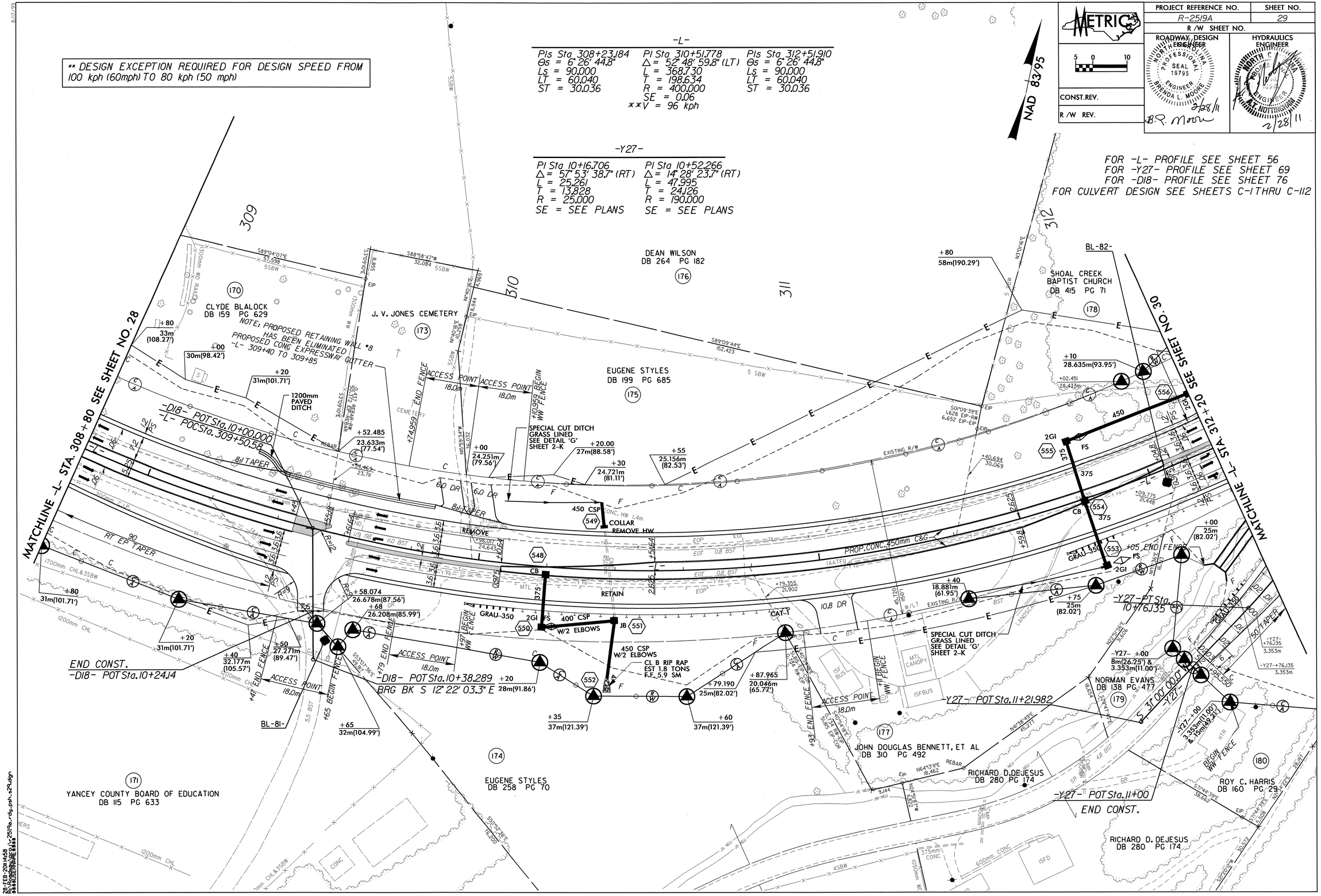
-L-

PIs Sta 308+23.184	PI Sta 310+51.778	PIs Sta 312+51.910
Θs = 6° 26' 44.8"	Δ = 52° 48' 59.8" (LT)	Θs = 6° 26' 44.8"
Ls = 90.000	L = 368.730	Ls = 90.000
LT = 60.040	T = 198.634	LT = 60.040
ST = 30.036	R = 400.000	ST = 30.036
	SE = 0.06	
	**V = 96 kph	

-Y27-

PI Sta 10+16.706	PI Sta 10+52.266
Δ = 57° 53' 38.7" (RT)	Δ = 14° 28' 23.7" (RT)
L = 25.261	L = 47.995
T = 13.828	T = 24.126
R = 25.000	R = 190.000
SE = SEE PLANS	SE = SEE PLANS

FOR -L- PROFILE SEE SHEET 56
FOR -Y27- PROFILE SEE SHEET 69
FOR -D18- PROFILE SEE SHEET 76
FOR CULVERT DESIGN SEE SHEETS C-1 THRU C-112



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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	30
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE — 2/4/11

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM — 2/4/11

METRIC 5 0 10

CONST.REV.

R/W REV.

NAD 83/95

-Y27-

PI Sta 10+16.706
Δ = 57° 53' 38.7" (RT)
L = 25.261
T = 13.828
R = 25.000
SE = SEE PLANS

PI Sta 10+52.266
Δ = 14° 28' 23.7" (RT)
L = 47.995
T = 24.126
R = 190.000
SE = SEE PLANS

** DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED FROM 100kph (60mph) TO 80kph (50mph)

FOR -L- PROFILE SEE SHEET 57
FOR -Y27- & -Y28- PROFILE SEE SHEET 69
FOR -D8-, -D9-, & -D10- PROFILE SEE SHEET 73
FOR -D16- PROFILE SEE SHEET 75
FOR CULVERT DESIGN SEE SHEETS C-1 THRU C-119

17850 / 26350 -L- US 19E 18100 / 26671
150 / 222 400 / 543
-Y27- SR 1143 LOWER GEORGES FORK RD.
550 / 765 2011 ADT / 2031 ADT

-L-

PIs Sta 308+23.184
θs = 6° 26' 44.8"
Ls = 90.000
LT = 60.040
ST = 30.036

PI Sta 310+51.778
Δ = 52° 48' 59.8" (LT)
L = 368.730
T = 198.634
R = 400.000
SE = 0.06
** V = 96 kph

PIs Sta 312+51.910
θs = 6° 26' 44.8"
Ls = 90.000
LT = 60.040
ST = 30.036

PIs Sta 314+01.908
θs = 4° 28' 06.5"
Ls = 90.000
LT = 60.019
ST = 30.017

PI Sta 316+01.330
Δ = 32° 43' 50.7" (LT)
L = 329.617
T = 169.442
R = 577.000
SE = 0.06

PIs Sta 317+91.523
θs = 4° 28' 06.5"
Ls = 90.000
LT = 60.019
ST = 30.017

-Y28-

PI Sta 10+12.569
Δ = 43° 00' 00.0" (RT)
L = 18.762
T = 9.848
R = 25.000
SE = SEE PLANS

PI Sta 10+69.835
Δ = 23° 26' 00.0" (LT)
L = 53.169
T = 26.961
R = 130.000
SE = SEE PLANS

PI Sta 11+36.930
Δ = 5° 42' 00.0" (LT)
L = 59.690
T = 29.870
R = 600.000

-D8-

PI Sta 10+26.115
Δ = 46° 33' 12.8" (RT)
L = 12.188
T = 6.453
R = 15.000

PI Sta 10+45.515
Δ = 49° 30' 17.7" (LT)
L = 12.960
T = 6.916
R = 15.000

-D9-

PI Sta 10+36.059
Δ = 10° 35' 38.7" (LT)
L = 9.245
T = 4.636
R = 50.000

-D10-

PI Sta 10+27.157
Δ = 41° 37' 50.3" (LT)
L = 21.798
T = 11.405
R = 30.000

-L- POT Sta. 313+12.000
-D9- POT Sta. 10+00.000
BEARING AH = S 43° 23' 03.4" E

-L- ST Sta. 313+11.874

-L- POS Sta. 312+61.529
-Y27- POT Sta. 10+00.000

-Y27- PC Sta. 10+02.879
BEARING BACK = S 41° 22' 02.4" E

-L- POS Sta. 313+02.930
-D8- POT Sta. 10+00.000
BEARING AH = S 43° 17' 55.4" E

-L- CS Sta. 312+21.874

SHOAL CREEK BAPTIST CHURCH DB 415 PG 71

-D16- POT Sta. 10+00
-L- POS Sta. 314+30
BRG AH = S 39° 06' 05.0" E

-L- TS Sta. 313+41.889

-L- SC Sta. 314+31.889

Begin Stream Relocation -GFS2- Sta. 0+00.000

GEORGES FORK STREAM RELOCATION SEE SHEET 2-Q

RCV SEE SHEET 2-O

STREAM PLUG SEE SHEET 2-P

CL I RIP RAP SEE DETAIL 'W' SHEET 2-K EST. DDE 15 C.M.

INLET AND OUTLET BURIED 0.3m

PLUG AND FILL WITH FLOWABLE FILL

PROP. CONC. 450mm C&G

-D16- PC Sta. 10+17.939

-D10- POT Sta. 10+00.000

-D16- PT Sta. 10+32.546

0.6m BASE DITCH GRASSED LINED SEE DETAIL 'E' SHEET 2-K

CL B RIP RAP EST 1.8 TONS F.F. 5.9 SM

1.0m BASE DITCH GRASS LINED SEE DETAIL 'AF' SHEET 2-L EST. 26 C.M. DDE

-D10- POT Sta. 10+10.000
BEGIN CONST.

-D10- PC Sta. 10+15.752

END CONST.
-D16- POT Sta. 10+45

-D16- PT Sta. 10+57.734

-D10- PT Sta. 10+37.549

-D10- POT Sta. 10+42.519
END CONST.

-D9- PC Sta. 10+31.423

-D9- PT Sta. 10+40.668
BEARING AH = S 53° 58' 42.1" E

-D9- POT Sta. 10+45
END CONST.

-D9- POT Sta. 10+52.722

-D8- PC Sta. 10+19.662

-D8- PT Sta. 10+31.850
BEARING AH = S 3° 15' 17.4" W

-D8- PT Sta. 10+51.559
BEARING AH = S 46° 15' 00.3" E

-D8- POT Sta. 10+58
END CONST.

-D8- POT Sta. 10+60.107

-Y27- PCC Sta. 10+28.140

-Y27- PC Sta. 10+38.599

-Y28- PC Sta. 11+66.751

-Y28- PT Sta. 11+07.061

-Y28- POC Sta. 11+27.106
-D10- POT Sta. 10+45.413

END CONST. -Y28-
POC Sta. 10+67.662
-Y28- PT Sta. 10+96.043

NOTE: PROPOSED RETAINING WALL #9 HAS BEEN ELIMINATED

MATCHLINE -L- STA. 312+20 SEE SHEET NO. 29

MATCHLINE -L- STA. 315+60 SEE SHEET NO. 31

BARBARA FORD DB 216 PG 36

ROY C. HARRIS DB 160 PG 29

NORMA P. EVANS DB 142 PG 568

ELIZABETH YOUNG HUSKINS DB 264 PG 231

DANNY HIGGINS DB 201 PG 179

ROGER F. PENLAND DB 254 PG 405

HERMAN HUGHES DB 158 PG 229

JAMES C. MARSH, JR. DB 297 PG 447

DANNY HUGHES DB 196 PG 820

JETER BISS BUCHANAN DB 156 PG 547

WINDOM METHODIST CHURCH DB 128 PG 24

-D16-
PI Sta 10+25.880
Δ = 55° 47' 36.8" (RT)
L = 14.607
T = 7.941
R = 15.000

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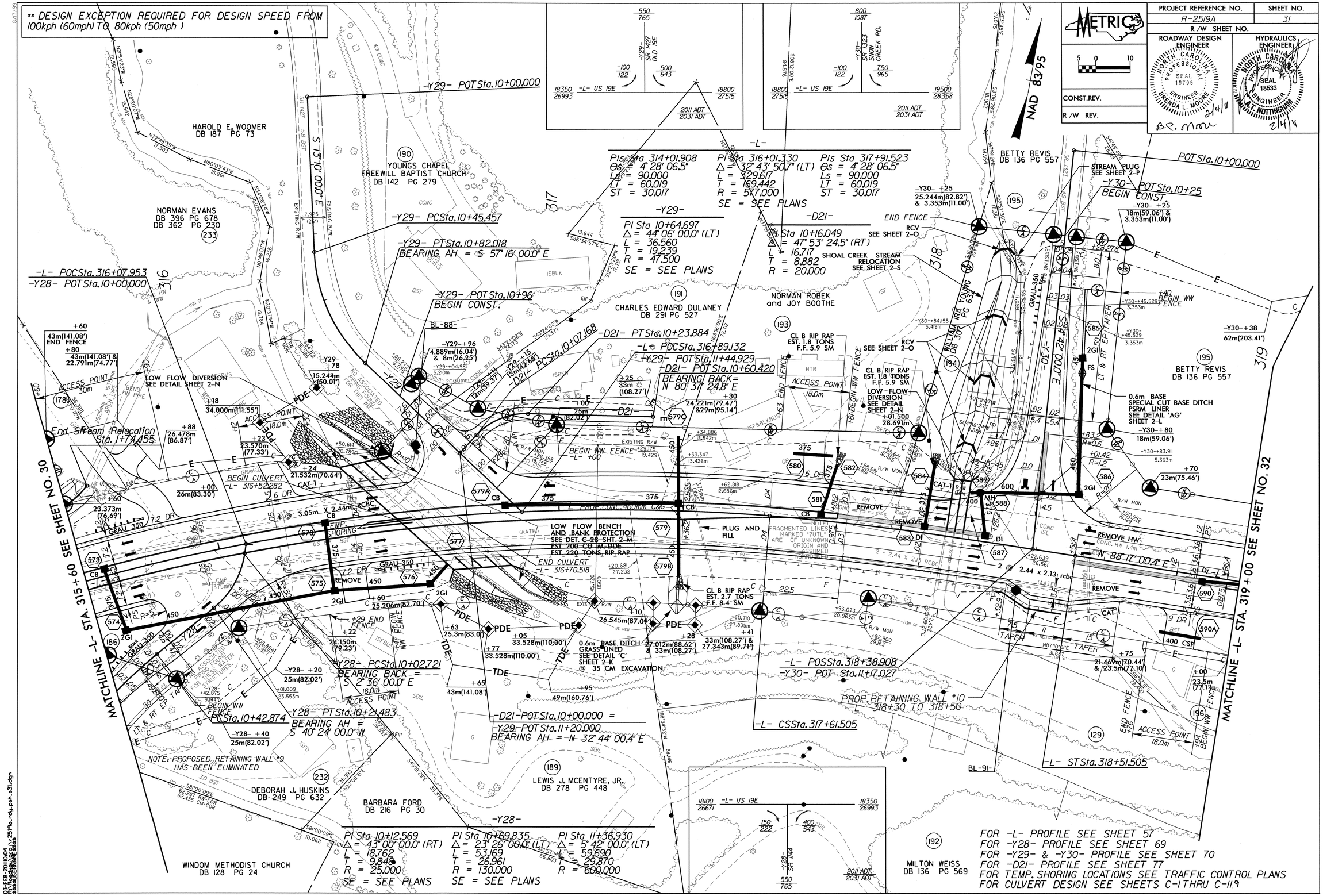


** DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED FROM 100kph (60mph) TO 80kph (50mph)
METRIC
PROJECT REFERENCE NO. R-2519A
SHEET NO. 31
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST. REV.
R/W REV.
NAD 83/95
HAROLD E. WOOMER DB 187 PG 73
YOUNGS CHAPEL FREEWILL BAPTIST CHURCH DB 142 PG 279
NORMAN EVANS DB 396 PG 678 DB 362 PG 230
CHARLES EDWARD DULANEY DB 291 PG 527
NORMAN ROBEK and JOY BOOTHE
BETTY REVIS DB 136 PG 557
WILLIAM IRA YOUNG DB 307 PG 632
DEBORAH J. HUSKINS DB 249 PG 632
BARBARA FORD DB 216 PG 30
LEWIS J. MCENTYRE, JR. DB 278 PG 448
WINDOM METHODIST CHURCH DB 128 PG 24
MILTON WEISS DB 136 PG 569
MATCHLINE -L- STA. 315+60 SEE SHEET NO. 30
MATCHLINE -L- STA. 319+00 SEE SHEET NO. 32
-Y29- POT Sta. 10+00.000
-Y29- PC Sta. 10+45.457
-Y29- PT Sta. 10+82.018 BEARING AH = S 57° 16' 00.0" E
-Y29- POT Sta. 10+96 BEGIN CONST.
-L- POC Sta. 316+07.953
-Y28- POT Sta. 10+00.000
-D21- PT Sta. 10+23.884
-L- POC Sta. 316+89.132
-Y29- POT Sta. 11+44.929
-D21- POT Sta. 10+60.420 BEARING BACK = N 80° 37' 24.8" E
-D21- PC Sta. 10+07.168
-Y28- PC Sta. 10+02.721 BEARING BACK = S 2° 36' 00.0" E
-Y28- PT Sta. 10+21.483 BEARING AH = S 40° 24' 00.0" W
-Y28- PC Sta. 10+42.874
-D21- POT Sta. 10+00.000 = -Y29- POT Sta. 11+20.000 BEARING AH = N 32° 44' 00.4" E
-L- POS Sta. 318+38.908
-Y30- POT Sta. 11+17.027
-L- CS Sta. 317+61.505
-L- ST Sta. 318+51.505
-Y30- POT Sta. 10+25 BEGIN CONST.
-Y30- POT Sta. 10+00.000
PI Sta 314+01.908 Θs = 4° 28' 06.5" Ls = 90.000 LT = 60.019 ST = 30.017
PI Sta 316+01.330 Δ = 32° 43' 50.7" (LT) L = 329.617 T = 169.442 R = 577.000 SE = SEE PLANS
PI Sta 317+91.523 Θs = 4° 28' 06.5" Ls = 90.000 LT = 60.019 ST = 30.017
PI Sta 10+64.697 Δ = 44° 06' 00.0" (LT) L = 36.560 T = 19.239 R = 47.500 SE = SEE PLANS
PI Sta 10+16.049 Δ = 47° 53' 24.5" (RT) L = 16.717 T = 8.882 R = 20.000
PI Sta 10+12.569 Δ = 43° 00' 00.0" (RT) L = 18.762 T = 9.848 R = 25.000 SE = SEE PLANS
PI Sta 10+69.835 Δ = 23° 26' 00.0" (LT) L = 53.169 T = 26.961 R = 130.000 SE = SEE PLANS
PI Sta 11+36.930 Δ = 5° 42' 00.0" (LT) L = 59.690 T = 29.870 R = 600.000
LOW FLOW DIVERSION SEE DETAIL SHEET 2-N
End Stream Relocation Sta. 1+74.455
BEGIN CULVERT -L- 316+52.282
END CULVERT -L- 316+70.518
LOW FLOW BENCH AND BANK PROTECTION SEE DET. C-28 SHT. 2-M EST. 200 CU. M. DDE EST. 220 TONS RIP RAP
PLUG AND FILL
CL B RIP RAP EST. 2.7 TONS F.F. 8.4 SM
CL B RIP RAP EST. 1.8 TONS F.F. 5.9 SM
0.6m BASE DITCH GRASS LINED SEE DETAIL 'C' SHEET 2-K @ 35 CM EXCAVATION
PROP. RETAINING WALL #10 -L- 318+30 TO 318+50
NOTE: PROPOSED RETAINING WALL #9 HAS BEEN ELIMINATED
SHOAL CREEK STREAM RELOCATION SEE SHEET 2-S
STREAM PLUG SEE SHEET 2-P
0.6m BASE SPECIAL CUT BASE DITCH PSRM LINER SEE DETAIL 'AG' SHEET 2-L
FOR -L- PROFILE SEE SHEET 57
FOR -Y28- PROFILE SEE SHEET 69
FOR -Y29- & -Y30- PROFILE SEE SHEET 70
FOR -D21- PROFILE SEE SHEET 77
FOR TEMP. SHORING LOCATIONS SEE TRAFFIC CONTROL PLANS
FOR CULVERT DESIGN SEE SHEETS C-1 THRU C-119

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	32
R /W SHEET NO.	

METRIC

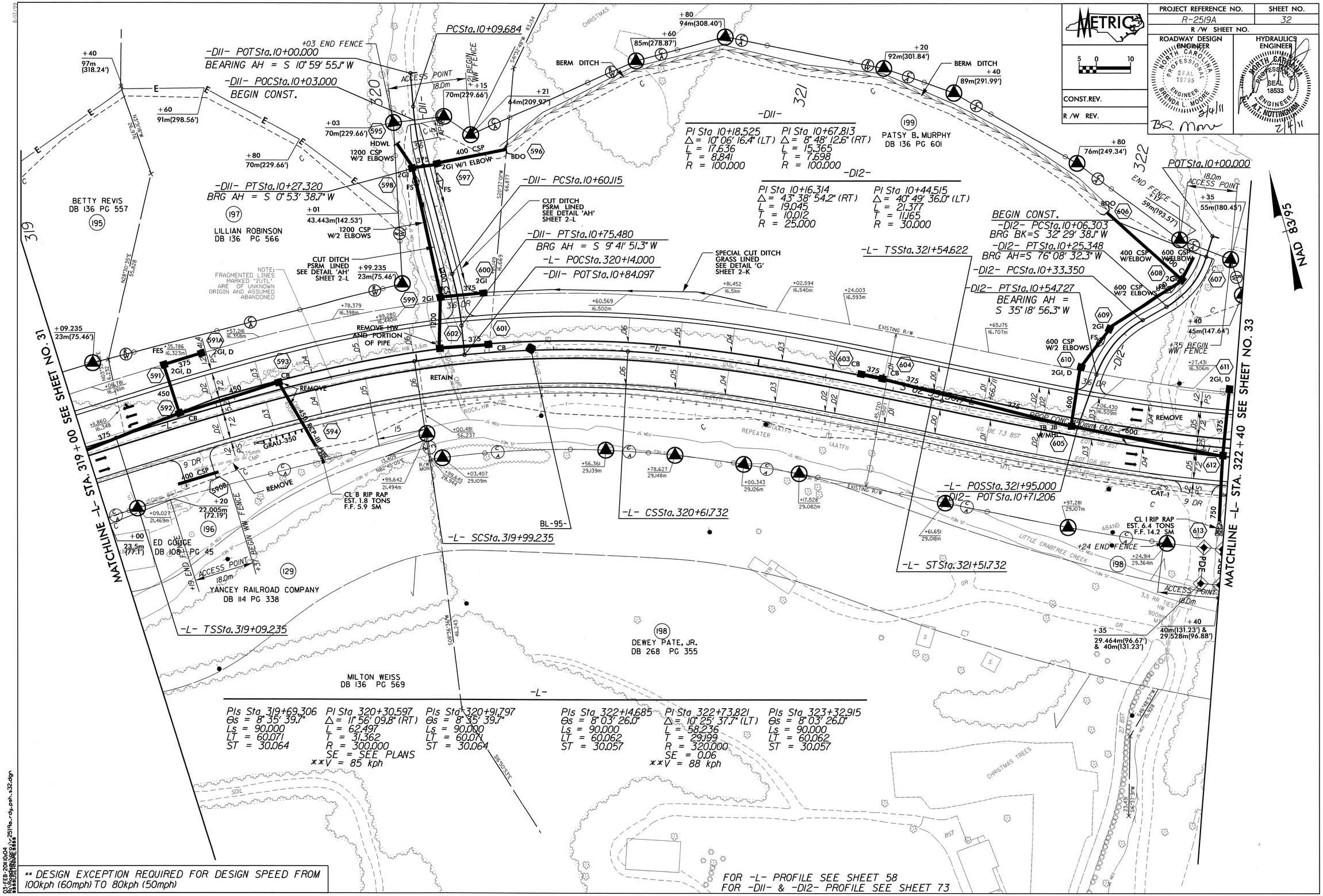
5 0 10

CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE
3/4/11
B.L. Moore

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER R. T. NOTTINGHAM
3/4/11



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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	33
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
2/4/11	2/4/11
CONST.REV.	
R /W REV.	

METRIC 5 0 10

NAD 83/95

** DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED FROM 100kph (60mph) TO 80kph (50mph)

-DI4REV-
PI Sta 11+00.718 △ = 20° 57' 01.9" (LT) L = 73.131 T = 36.979 R = 200.000
PI Sta 11+46.038 △ = 10° 28' 31.0" (RT) L = 18.283 T = 9.167 R = 100.000

-DI4-
PI Sta 11+91.285 △ = 52° 57' 00.5" (LT) L = 27.725 T = 14.941 R = 30.000

-L-
PIs Sta 322+14.685 Θs = 8° 03' 26.0" Ls = 90.000 LT = 60.062 ST = 30.057
PI Sta 322+73.821 △ = 10° 25' 37.7" (LT) L = 58.236 T = 29.199 R = 320.000 SE = SEE PLANS **V = 88 kph
PIs Sta 323+32.915 Θs = 8° 03' 26.0" Ls = 90.000 LT = 60.062 ST = 30.057

-DI3REV-
PI Sta 10+35.160 △ = 69° 48' 22.3" (RT) L = 24.367 T = 13.954 R = 20.000
PI Sta 10+69.802 △ = 7° 53' 33.3" (LT) L = 6.888 T = 3.449 R = 50.000
PI Sta 11+30.698 △ = 66° 31' 34.6" (LT) L = 23.222 T = 13.119 R = 20.000

~~-DI3-~~
~~PI Sta 10+39.779 △ = 49° 57' 38.4" (RT) L = 43.599 T = 23.294 R = 50.000~~
~~PI Sta 11+33.250 △ = 64° 12' 06.9" (LT) L = 22.411 T = 12.546 R = 20.000~~

FOR -DI3DET- DESIGN SEE SHEET 33-A
FOR -L- PROFILE SEE SHEET 58
FOR -DI3REV- PROFILE SEE SHEET 74
FOR -DI4REV- PROFILE SEE SHEET 75
FOR -DI4DET- DESIGN SEE SHEET 33-A

MATCHLINE -L- STA. 322+40 SEE SHEET NO. 32

MATCHLINE -L- STA. 325+80 SEE SHEET NO. 34

-L- SCSta.322+44.622
-L- CSSta.323+02.858
-L- POSSta.323+23.000
-DI3- POTSta.11+55.744
BEARING BK = S 5° 43' 14.8" W
-L- POSSta.323+04.95
-DI3REV- POTSta.11+80.916
-L- STSta.323+92.858
-L- POTSta.325+00.000
-DI4- POTSta.12+17.001
-DI3REV- PTSta.10+45.574
-DI3REV- PCSta.10+66.353
-DI3REV- PTSta.10+73.241
-DI3REV- PCSta.11+17.579
-DI3REV- S 8° 52' 31.9" W
-DI3REV- PTSta.11+40.801
-DI3- PCSta.11+20.703
-DI3- S 69° 55' 21.7" W
-DI3- PTSta.11+43.114
-DI3- POTSta.10+00.000 =
-DI3REV- POTSta.10+00.000
BEARING AH = S 19° 57' 42.9" W
-DI3- PCSta.10+16.484
-DI3REV- PCSta.10+21.207
BEGIN CONST.
-DI3- PTSta.10+60.083
-DI4REV- PTSta.11+55.153 BK =
-DI4- POTSta.11+54.543 AH
-DI4- PTSta.12+04.068
BEARING AH =
S 9° 59' 59.5" W
-DI4REV- PRCSta.11+36.871
-DI4- PCSta.11+76.344
S 62° 56' 59.9" W
S 62° 57' 00.0" W
S 89° 08' 00.1" E -L-
S 89° 46' 05.2" W
S 15° 20' 57.3" W
-DI3- S 43° 33' 34.3" W
APER
+10 END FENCE
+60 END FENCE
+28 BEGIN WW FENCE
+42 BEGIN WW FENCE
+84 BEGIN WW FENCE
+66 END FENCE
+21 END FENCE
+45 BEGIN WW FENCE
ACCESS POINT 18.0m
CUT DITCH PSRM LINED SEE DETAIL 'AH' SHEET 2-L
0.6m SPECIAL CUT BASE DITCH GRASSED LINED SEE DETAIL 'Q' SHEET 2-K
BERM DITCH
TERMINAL SECTION
EXISTING R/W
REMOVE
REMOVE HW
REMOVE HW AND STRUCTURE
PSH 375mm SEE SHEET 2-N
PSH 600 SEE SHEET 2-N
PIPE OUTLET CHANNEL SEE DETAIL 'W' SHEET 2-K EST. DDE 12 C.M.
INLET BURIED 0.3M
HDWL 600
TB JB W/MH
RETAIN
BL-96-
BL-97-
GRAU-350
LITTLE CRABTREE CREEK

201A DONNA GOUGE DB 399 PG 677
199 PATSY B. MURPHY DB 136 PG 601
201 BEULAH HUGHES DB 448 PG 92 DB 146 PG 329
199A JOEL RALPH MURPHY JOEY RANDALL MURPHY BY WILL DB 111 PG 200
200 DAVID WAYNE GARLAND DB 202 PG 591
198 DEWEY PATE, JR. DB 268 PG 355
202 SHERRILL McCOURRY DB 436 PG 607
236 ALLEN D. BOONE DB 217 PG 391
OLLIS REECE BOONE DB 173 PG 487
129 YANCEY RAILROAD COMPANY DB 114 PG 338

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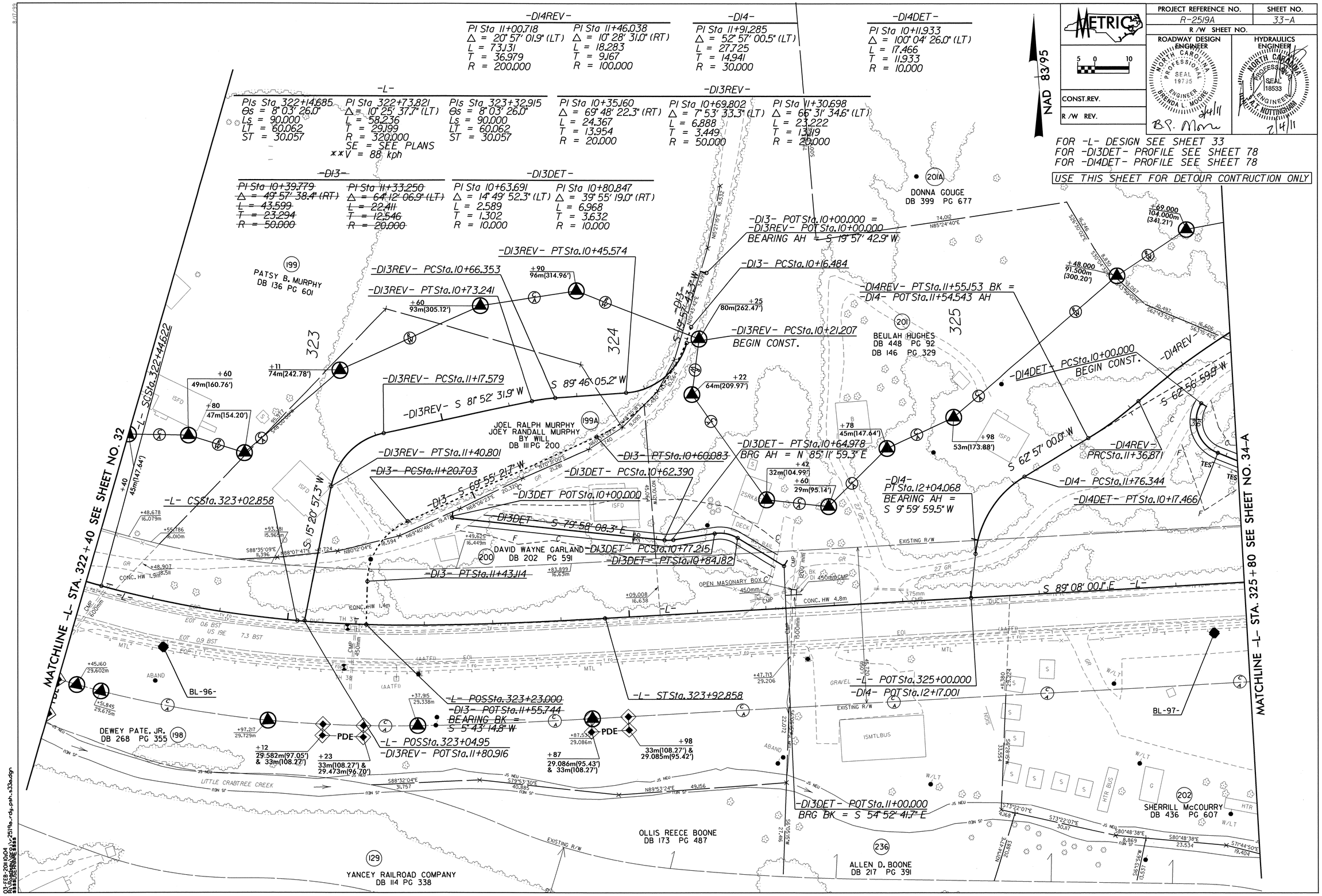


METRIC
PROJECT REFERENCE NO. R-2519A
SHEET NO. 33-A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R/W REV.
NAD 83/95
FOR -L- DESIGN SEE SHEET 33
FOR -DI3DET- PROFILE SEE SHEET 78
FOR -DI4DET- PROFILE SEE SHEET 78
USE THIS SHEET FOR DETOUR CONTRUCTION ONLY
-DI4REV-
PI Sta 11+00.718
Δ = 20° 57' 01.9" (LT)
L = 73.131
T = 36.979
R = 200.000
PI Sta 11+46.038
Δ = 10° 28' 31.0" (RT)
L = 18.283
T = 9.167
R = 100.000
-DI4-
PI Sta 11+91.285
Δ = 52° 57' 00.5" (LT)
L = 27.725
T = 14.941
R = 30.000
-DI4DET-
PI Sta 10+11.933
Δ = 100° 04' 26.0" (LT)
L = 17.466
T = 11.933
R = 10.000
-L-
PIs Sta 322+14.685
Θs = 8° 03' 26.0"
Ls = 90.000
LT = 60.062
ST = 30.057
PI Sta 322+73.821
Δ = 10° 25' 37.7" (LT)
L = 58.236
T = 29.199
R = 320.000
SE = SEE PLANS
**V = 88 kph
PIs Sta 323+32.915
Θs = 8° 03' 26.0"
Ls = 90.000
LT = 60.062
ST = 30.057
-DI3REV-
PI Sta 10+35.160
Δ = 69° 48' 22.3" (RT)
L = 24.367
T = 13.954
R = 20.000
PI Sta 10+69.802
Δ = 7° 53' 33.3" (LT)
L = 6.888
T = 3.449
R = 50.000
PI Sta 11+30.698
Δ = 66° 31' 34.6" (LT)
L = 23.222
T = 13.119
R = 20.000
-DI3-
PI Sta 10+39.779
Δ = 49° 57' 38.4" (RT)
L = 43.599
T = 23.294
R = 50.000
PI Sta 11+33.250
Δ = 64° 12' 06.9" (LT)
L = 22.411
T = 12.546
R = 20.000
-DI3DET-
PI Sta 10+63.691
Δ = 14° 49' 52.3" (LT)
L = 2.589
T = 1.302
R = 10.000
PI Sta 10+80.847
Δ = 39° 55' 19.0" (RT)
L = 6.968
T = 3.632
R = 10.000
-DI3- POTSta.10+00.000 =
-DI3REV- POTSta.10+00.000
BEARING AH = S 19° 57' 42.9" W
-DI3REV- PTSta.10+45.574
-DI3REV- PCSta.10+66.353
-DI3REV- PTSta.10+73.241
-DI3- PCSta.10+16.484
-DI3REV- PCSta.10+21.207
BEGIN CONST.
-DI4REV- PTSta.11+55.153 BK =
-DI4- POTSta.11+54.543 AH
-DI4DET- PCSta.10+00.000
BEGIN CONST.
-DI3REV- PCSta.11+17.579
-DI3REV- S 81° 52' 31.9" W
S 89° 46' 05.2" W
-DI3REV- PTSta.11+40.801
-DI3- PCSta.11+20.703
-DI3- S 69° 55' 21.7" W
-DI3- PTSta.10+60.083
-DI3DET- PCSta.10+62.390
-DI3DET POTSta.10+00.000
-DI3DET- S 79° 58' 08.3" E
-DI3DET- PCSta.10+77.215
-DI3DET- PTSta.10+84.182
-DI3- PTSta.11+43.114
-DI3DET- PTSta.10+64.978
BRG AH = N 85° 11' 59.3" E
-DI4- PTSta.12+04.068
BEARING AH =
S 9° 59' 59.5" W
-DI4REV- PRCSta.11+36.871
-DI4- PCSta.11+76.344
-DI4DET- PTSta.10+17.466
S 62° 57' 00.0" W
S 62° 56' 59.9" W
S 89° 08' 00.1" E
-L- CSSta.323+02.858
-L- SCSta.322+44.622
-L- POSSta.323+23.000
-DI3- POTSta.11+55.744
BEARING BK =
S 5° 43' 14.8" W
-L- POSSta.323+04.95
-DI3REV- POTSta.11+80.916
-L- STSta.323+92.858
-L- POTSta.325+00.000
-DI4- POTSta.12+17.001
-DI3DET- POTSta.11+00.000
BRG BK = S 54° 52' 41.7" E
MATCHLINE -L- STA. 322+40 SEE SHEET NO. 32
MATCHLINE -L- STA. 325+80 SEE SHEET NO. 34-A
DONNA GOUGE
DB 399 PG 677
PATSY B. MURPHY
DB 136 PG 601
BEULAH HUGHES
DB 448 PG 92
DB 146 PG 329
JOEL RALPH MURPHY
JOEY RANDALL MURPHY
BY WILL
DB 111 PG 200
DAVID WAYNE GARLAND
DB 202 PG 591
DEWEY PATE, JR.
DB 268 PG 355
SHERRILL McCOURRY
DB 436 PG 607
OLLIS REECE BOONE
DB 173 PG 487
ALLEN D. BOONE
DB 217 PG 391
YANCEY RAILROAD COMPANY
DB 114 PG 338
LITTLE CRABTREE CREEK
BL-96-
BL-97-

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	34
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
B.S. Moore 2/4/11	2/4/11
CONST.REV.	
R/W REV.	

** DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED FROM 100kph (60mph) TO 80kph (50mph)

-DI4- POT Sta. 10+00.000
BEARING AH = S 25° 00' 03.7" E
-DI4- PCSta. 10+11.224

-DI4- PT Sta. 10+35.784
BEARING AH = S 62° 56' 59.9" W

-DI4- POCSta. 10+28.000
BEGIN CONST.

-DI4-
PI Sta 10+26.662
Δ = 87° 57' 03.6" (RT)
L = 24.561
T = 15.438
R = 16.000

-DI4REV-
PI Sta 10+54.624
Δ = 10° 28' 31.0" (RT)
L = 18.283
T = 9.167
R = 100.000

PI Sta 11+91.285
Δ = 52° 57' 00.5" (LT)
L = 27.725
T = 14.941
R = 30.000

-DI4REV PCSta. 10+45.457 AH=
-DI4- POT Sta 10+45.457 BK

-DI4REV- PRCSta. 10+63.739

-Y33-
PI Sta 10+06.847
Δ = 7° 50' 00.0" (LT)
L = 13.672
T = 6.847
R = 100.000
SE = SEE PLANS

PI Sta 10+28.921
Δ = 34° 03' 11.1" (LT)
L = 23.774
T = 12.249
R = 40.000
SE = SEE PLANS

PI Sta 10+53.630
Δ = 36° 29' 11.1" (RT)
L = 25.472
T = 13.185
R = 40.000
SE = SEE PLANS

-Y33- PCSta. 10+00.000
-Y33- PT Sta. 10+13.672
BRG AH S 23° 20' 00.0" E

-Y33- POT Sta. 10+15.000
BEGIN CONST.

-Y33- PCSta. 10+16.672
-Y33- PRCSta. 10+40.445

-Y32- POT Sta. 10+40.600
-Y33- POT Sta. 10+74.680
-Y33- PT Sta. 10+65.918
BEARING AH=S 20° 54' 00.0" E

-Y32-
PI Sta 9+80.775
Δ = 38° 11' 49.9" (RT)
L = 40.000
T = 20.775
R = 60.000

PI Sta 10+56.071
Δ = 46° 32' 00.0" (LT)
L = 24.365
T = 12.899
R = 30.000
SE = SEE PLANS

FOR -Y32DET- DESIGN SEE SHEET 34-A
FOR -Y33DET- DESIGN SEE SHEET 34-A

-Y32- PCSta. 9+60.000
BRG BK = S 30° 54' 10.1" W

-Y32- POT Sta. 10+00.000
BEGIN CONST.

-Y32- PCSta. 10+43.171
-Y32- PT Sta. 10+67.536

-L- TSSta. 325+85.327

-L- POSSta. 326+22.085
-Y31- POT Sta. 10+00.000
BRG AH=S 5° 32' 00.0" W

-Y31- PCSta. 10+15.998
-Y31- +30
16.254m(53.33')

-Y31- PT Sta. 10+42.911

-Y31- +55
9.144m (30.00')
END CONST.
-Y31- POT Sta. 10+58.994

-Y31-
PI Sta 10+29.556
Δ = 17° 08' 00.0" (RT)
L = 26.913
T = 13.558
R = 90.000
SE = SEE PLANS

-Y31- POT Sta. 11+04.518

-L- SCSta. 326+75.327

-L- POCSta. 328+07.257
-Y32- POT Sta. 10+69.223
BRG BK = S 22° 34' 00.0" W

-L- CSSta. 328+97.741

PIs Sta 326+45.398
Θs = 8° 35' 39.7"
Ls = 90.000
LT = 60.071
ST = 30.064

PI Sta 327+91.925
Δ = 42° 28' 40.7" (RT)
L = 222.414
T = 116.597
R = 300.000
SE = 0.06
**V = 85 kph

PIs Sta 329+27.806
Θs = 8° 35' 39.7"
Ls = 90.000
LT = 60.071
ST = 30.064

FOR CULVERT DESIGN SEE SHEETS C-1 THRU C-119

FOR -L- PROFILE SEE SHEET 59
FOR -Y31- & -Y32- PROFILE SEE SHEET 70
FOR -Y33- PROFILE SEE SHEET 71
FOR -DI4- PROFILE SEE SHEET 74
FOR -DI4DET- DESIGN SEE SHEET 33-A

MATCHLINE -L- STA. 325+80 SEE SHEET NO. 33

MATCHLINE -L- STA. 329+20 SEE SHEET NO. 35

DANIEL KEITH HUGHES DB 285 PG 14 (203)
CARRIE BLEVINS DB 106 PG 189 (206)
DONNA GOUGE DB 399 PG 677 (201A)
BEULAH HUGHES DB 448 PG 92 DB 146 PG 329 (201)
SHERRILL McCOURRY DB 436 PG 607 (202)
BERDELLA PETERSON DB 98 PG 208 (204)
FRED PETERSON DB 185 PG 407 (205)
TROY G. BOONE DB 119 PG 605 (207)
ARNOLD ZEB PHILLIPS DB 206 PG 788 (209)
SADIE FORTNER DB 214 PG 299 (208)

CUT DITCH PSRM LINED SEE DETAIL 'AH' SHEET 2-L
SPECIAL CUT DITCH PSRM LINED SEE DETAIL 'I' SHEET 2-K
SPECIAL CUT DITCH GRASS LINED SEE DETAIL 'G' SHEET 2-K
PLUM BRANCH STREAM RELOCATION SEE SHEET 2-R
PLUM BRANCH TRIBUTARY STREAM RELOCATION SEE SHEET 2-R
ROCK CROSS VANE BACKFILLED w/ CLASS 'I' RIP RAP (45 TONS) SEE SHEET 2-O
PSH 400mm SEE SHEET 2-N
STREAM PLUG SEE SHEET 2-P
BERM DITCH
CL B RIP RAP EST. 45 TONS F.F. 11.7 SM
PROP. CONC. 450mm C&G
EXISTING R/W
ACCESS POINT 18.0m
END FENCE
BEGIN WW FENCE
TERMINAL SECTION
REMOVE
END CONST.

NAD 83/93

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	34-A
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE
2/4/11
B.L. Moore

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A. T. NOTTINGHAM
2/4/11

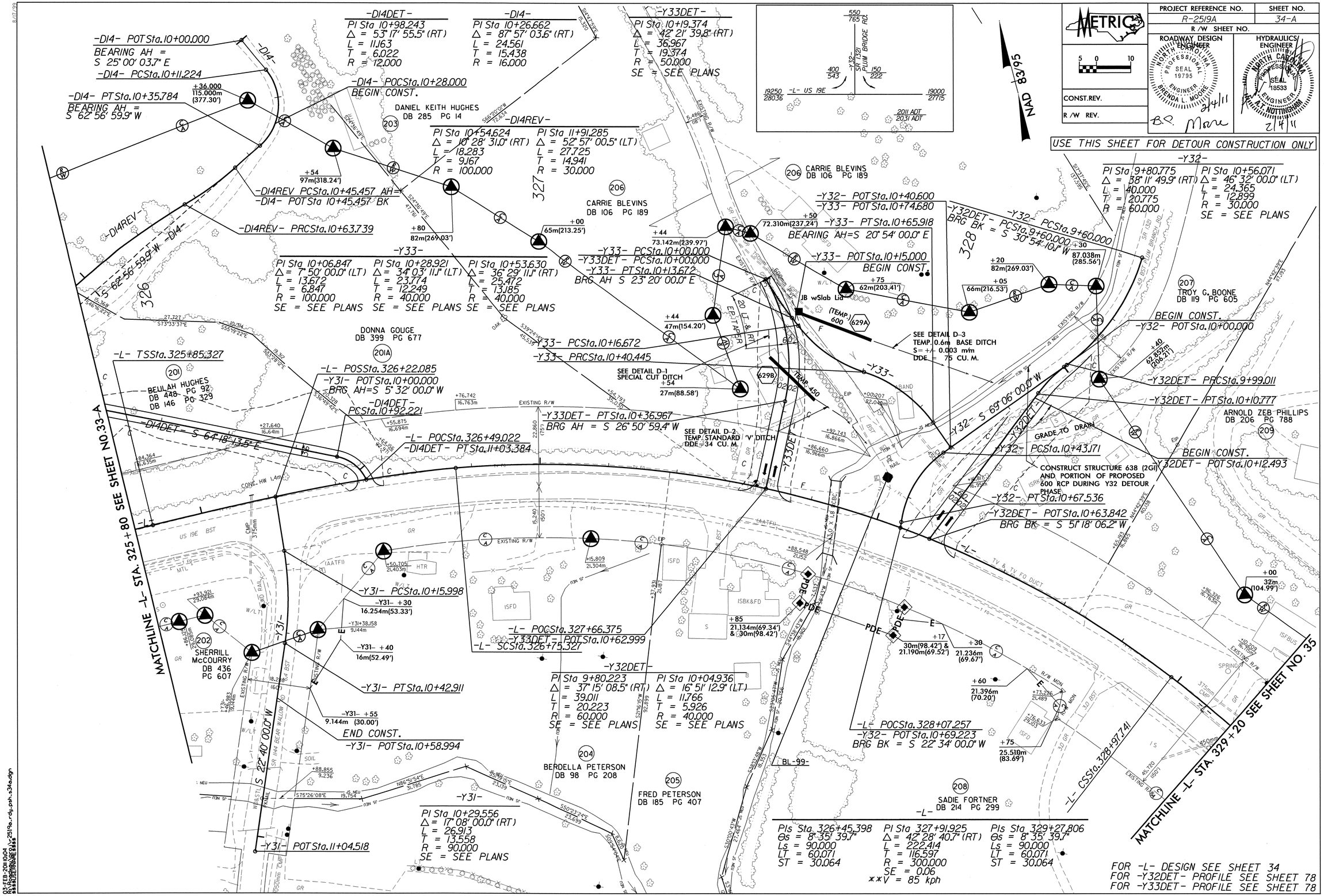
METRIC 5 0 10

CONST.REV.

R/W REV.

USE THIS SHEET FOR DETOUR CONSTRUCTION ONLY

NAD 83/95



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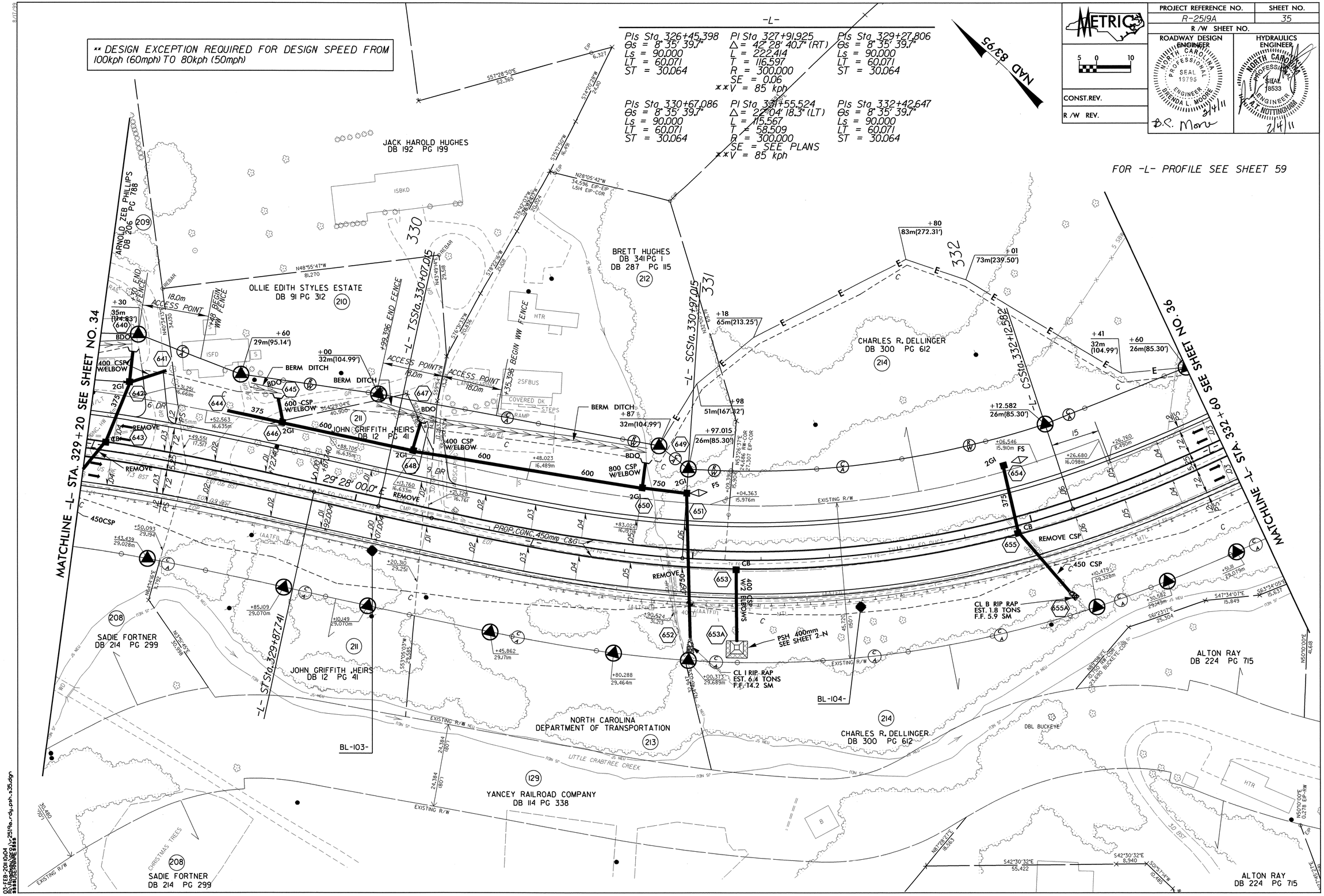

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	35
R/W SHEET NO.	

METRIC

CONST. REV.

R/W REV.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE 2/4/11

NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER H.A.T. NOTTINGHAM 2/4/11

B.C. Moore

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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	36
R/W SHEET NO.	

METRIC 5 0 10

CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE — 2/4/11

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER T. NOTTINGHAM — 2/4/11

NAD 83/95

** DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED FROM 100kph (60mph) TO 80kph (50mph)

-L-

PIs Sta 330+67.086
Θs = 8° 35' 39.7"
Ls = 90.000
LT = 60.071
ST = 30.064

PI Sta 331+55.524
Δ = 22° 04' 18.3" (LT)
L = 115.567
T = 58.509
R = 300.000
SE = SEE PLANS
**V = 85 kph

PIs Sta 332+42.647
Θs = 8° 35' 39.7"
Ls = 90.000
LT = 60.071
ST = 30.064

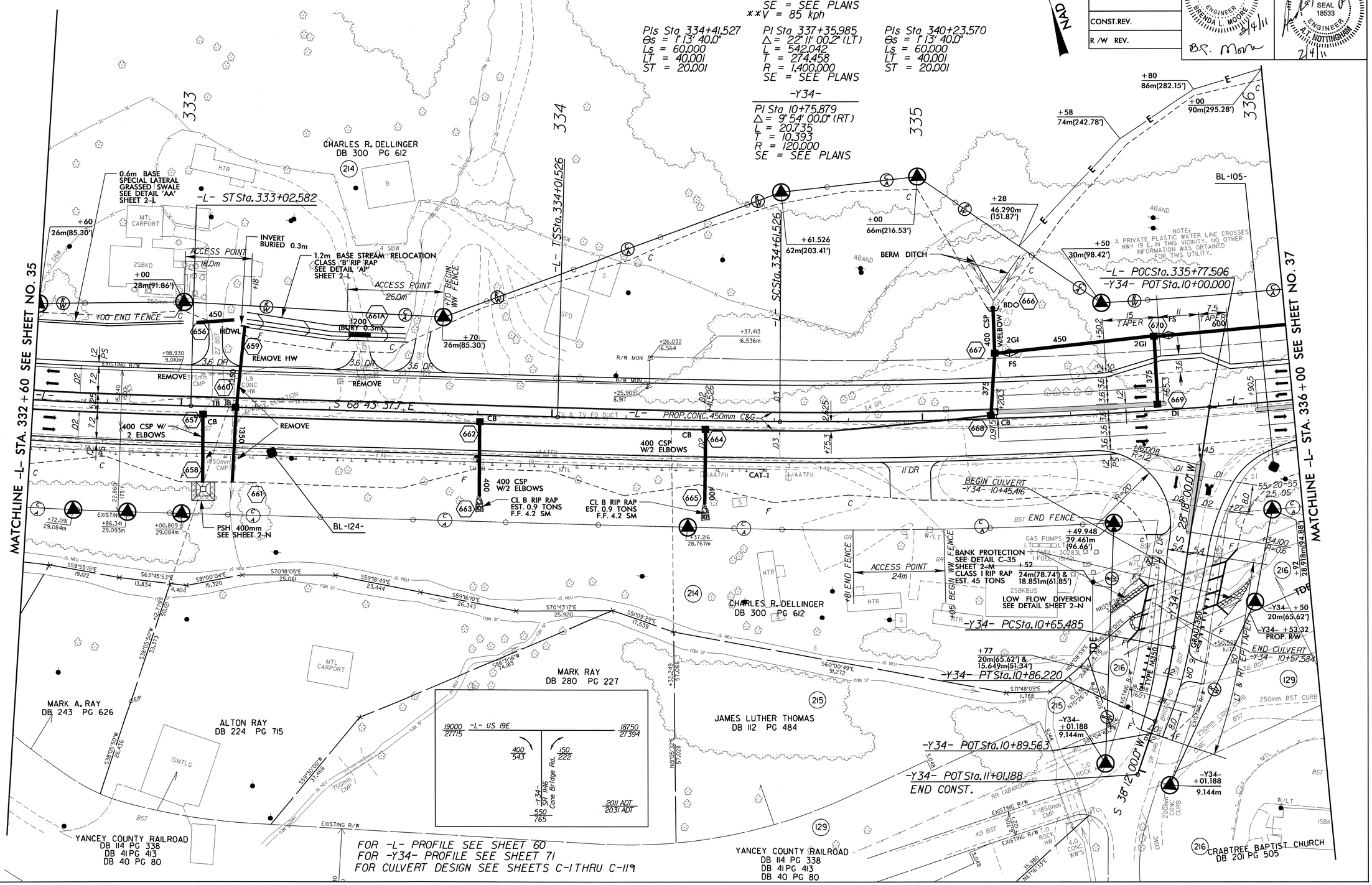
PIs Sta 334+41.527
Θs = 1° 13' 40.0"
Ls = 60.000
LT = 40.001
ST = 20.001

PI Sta 337+35.985
Δ = 22° 11' 00.2" (LT)
L = 542.042
T = 274.458
R = 1,400.000
SE = SEE PLANS

PIs Sta 340+23.570
Θs = 1° 13' 40.0"
Ls = 60.000
LT = 40.001
ST = 20.001

-Y34-

PI Sta 10+75.879
Δ = 9° 54' 00.0" (RT)
L = 20.735
T = 10.393
R = 120.000
SE = SEE PLANS



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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	37
R /W SHEET NO.	

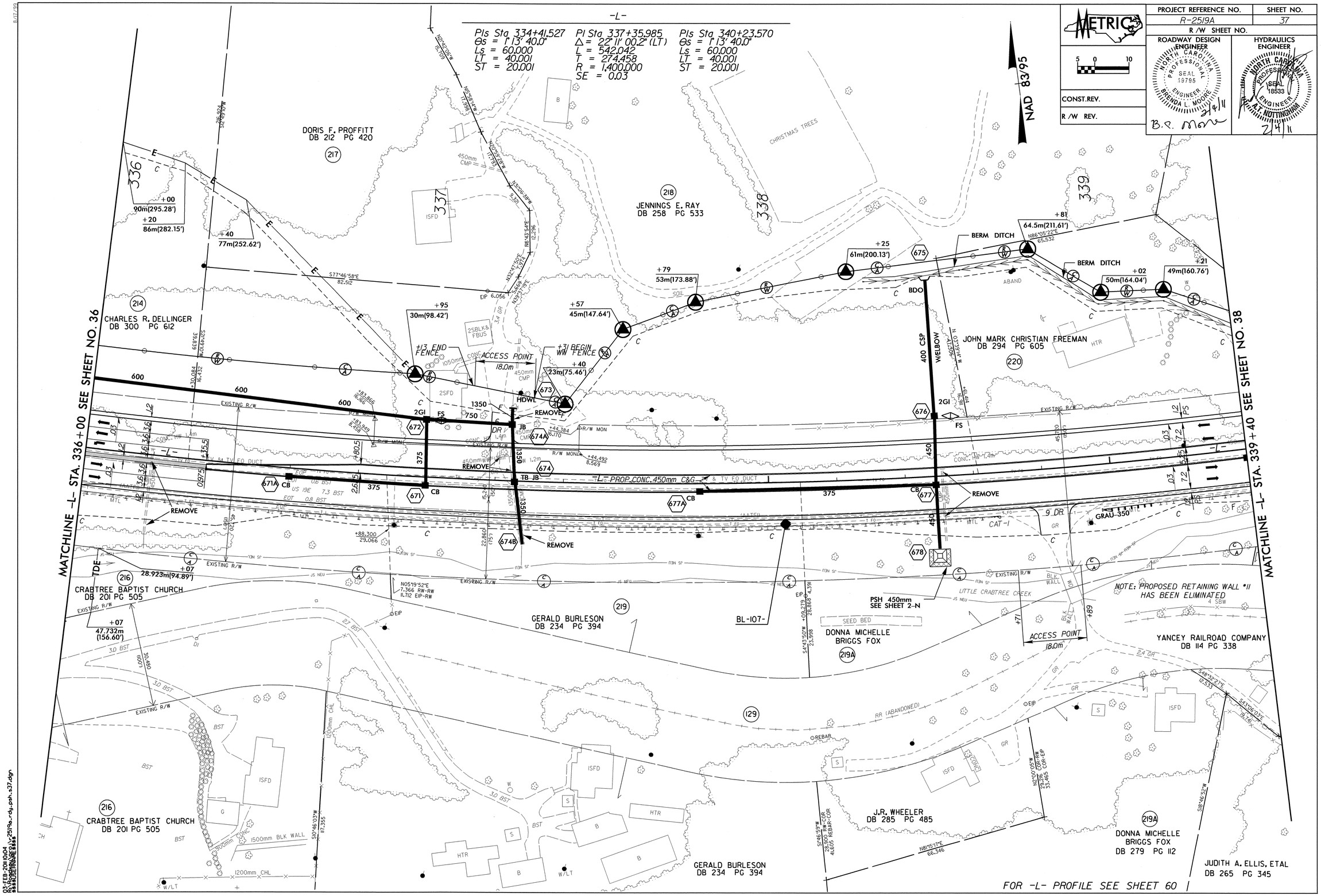
ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE 2/4/11 B.L. Moore

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM 2/4/11

METRIC 5 0 10

CONST.REV.

R /W REV.



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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	38
R /W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE — B.D. Moore 2/4/11

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER M.T. NOTTINGHAM — 2/4/11

METRIC 5 0 10

CONST.REV.

R /W REV.

NAD 83/95

** DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED FROM 100kph (60mph) TO 80kph (50mph)

-L-

PIs Sta 334+41.527
Θs = 1° 13' 40.0"
Ls = 60.000
LT = 40.001
ST = 20.001

PI Sta 337+35.985
Δ = 22° 11' 00.2" (LT)
L = 542.042
T = 274.458
R = 1,400.000
SE = 0.03

PIs Sta 340+23.570
Θs = 1° 13' 40.0"
Ls = 60.000
LT = 40.001
ST = 20.001

PIs Sta 342+86.635
Θs = 8° 35' 39.7"
Ls = 90.000
LT = 60.071
ST = 30.064

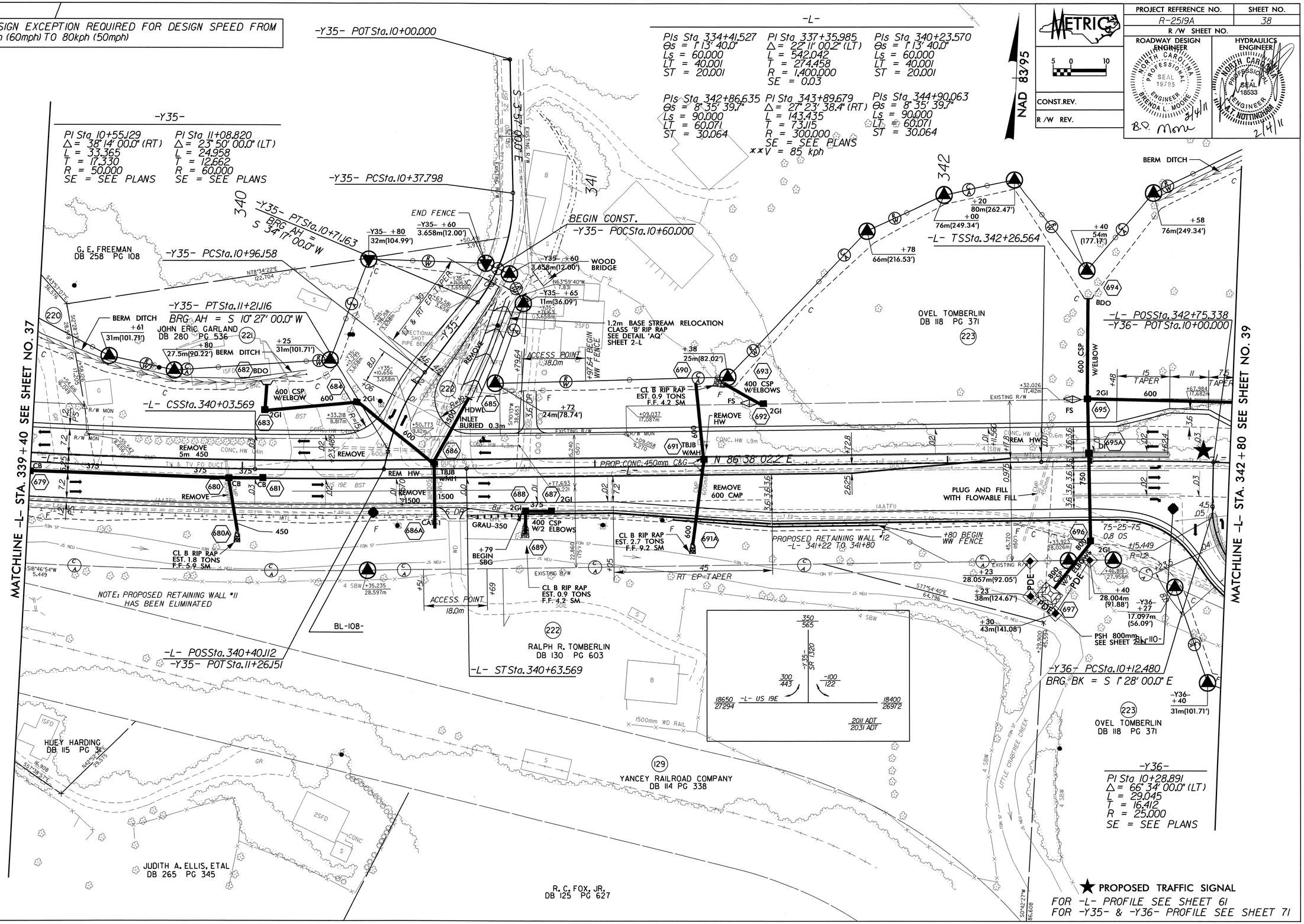
PI Sta 343+89.679
Δ = 27° 23' 38.4" (RT)
L = 143.435
T = 73.115
R = 300.000
SE = SEE PLANS
**V = 85 kph

PIs Sta 344+90.063
Θs = 8° 35' 39.7"
Ls = 90.000
LT = 60.071
ST = 30.064

-Y35-

PI Sta 10+55.129
Δ = 38° 14' 00.0" (RT)
L = 33.365
T = 17.330
R = 50.000
SE = SEE PLANS

PI Sta 11+08.820
Δ = 23° 50' 00.0" (LT)
L = 24.958
T = 12.662
R = 60.000
SE = SEE PLANS



-Y36-

PI Sta 10+28.891
Δ = 66° 34' 00.0" (LT)
L = 29.045
T = 16.412
R = 25.000
SE = SEE PLANS

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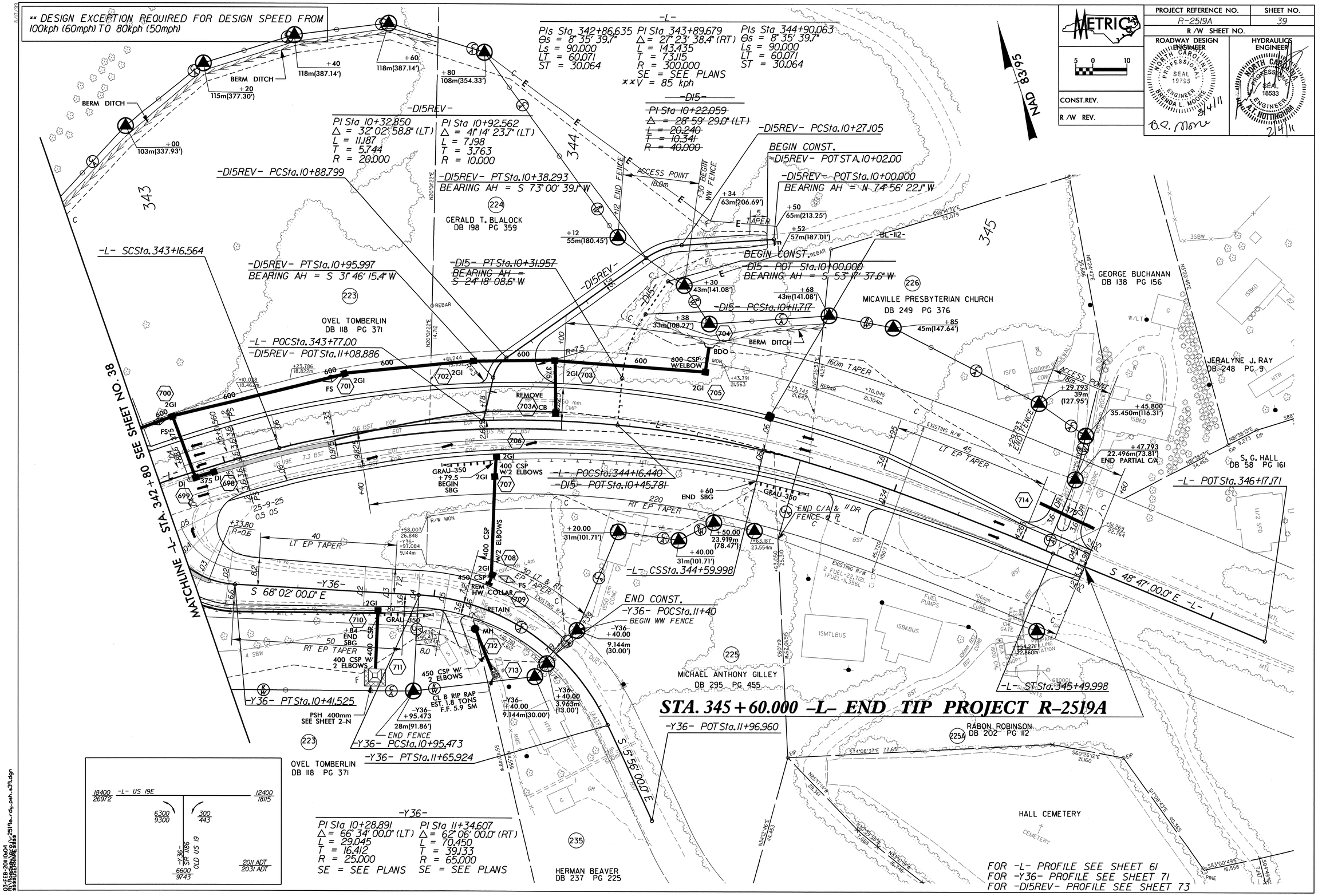


** DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED FROM 100kph (60mph) TO 80kph (50mph)
-L-
PIs Sta 342+86.635
Θs = 8° 35' 39.7"
Ls = 90.000
LT = 60.071
ST = 30.064
PI Sta 343+89.679
Δ = 27° 23' 38.4" (RT)
L = 143.435
T = 73.115
R = 300.000
SE = SEE PLANS
**V = 85 kph
PIs Sta 344+90.063
Θs = 8° 35' 39.7"
Ls = 90.000
LT = 60.071
ST = 30.064
-DI5-
PI Sta 10+22.059
Δ = 28° 59' 29.0" (LT)
L = 20.240
T = 10.341
R = 40.000
-DI5REV-
PI Sta 10+32.850
Δ = 32° 02' 58.8" (LT)
L = 11.187
T = 5.744
R = 20.000
PI Sta 10+92.562
Δ = 41° 14' 23.7" (LT)
L = 7.198
T = 3.763
R = 10.000
-DI5REV- PCSta.10+88.799
-DI5REV- PTSta.10+38.293
BEARING AH = S 73° 00' 39.1" W
-DI5REV- PCSta.10+27.105
BEGIN CONST.
-DI5REV- POTSTA.10+02.00
-DI5REV- POTSta.10+00.000
BEARING AH = N 74° 56' 22.1" W
-L- SCSta.343+16.564
-DI5REV- PTSta.10+95.997
BEARING AH = S 31° 46' 15.4" W
-DI5- PTSta.10+31.957
BEARING AH = S 24° 18' 08.6" W
-DI5- POT Sta.10+00.000
BEARING AH = S 53° 17' 37.6" W
-DI5- PCSta.10+11.717
-L- POCSta.343+77.00
-DI5REV- POTSta.11+08.886
-L- POCSta.344+16.440
-DI5- POTSta.10+45.781
-L- CSSta.344+59.998
END CONST.
-Y36- POCSta.11+40
BEGIN WW FENCE
-Y36- PTSta.10+41.525
-Y36- PCSta.10+95.473
-Y36- PTSta.11+65.924
-Y36- POTSta.11+96.960
-L- STSta.345+49.998
-L- POTSta.346+17.171
GERALD T. BLALOCK
DB 198 PG 359
OVEL TOMBERLIN
DB 118 PG 371
MICAVILLE PRESBYTERIAN CHURCH
DB 249 PG 376
GEORGE BUCHANAN
DB 138 PG 156
JERALYNE J. RAY
DB 248 PG 9
S. G. HALL
DB 58 PG 161
MICHAEL ANTHONY GILLEY
DB 295 PG 455
RABON ROBINSON
DB 202 PG 112
HALL CEMETERY
HERMAN BEAVER
DB 237 PG 225
MATCHLINE -L- STA. 342+80 SEE SHEET NO. 38
S 68° 02' 00.0" E
S 48° 47' 00.0" E
S 5° 56' 00.0" E
STA. 345+60.000 -L- END TIP PROJECT R-2519A
-Y36-
PI Sta 10+28.891
Δ = 66° 34' 00.0" (LT)
L = 29.045
T = 16.412
R = 25.000
SE = SEE PLANS
PI Sta 11+34.607
Δ = 62° 06' 00.0" (RT)
L = 70.450
T = 39.133
R = 65.000
SE = SEE PLANS
FOR -L- PROFILE SEE SHEET 61
FOR -Y36- PROFILE SEE SHEET 71
FOR -DI5REV- PROFILE SEE SHEET 73
NAD 83/95
METRIC
PROJECT REFERENCE NO.
R-2519A
SHEET NO.
39
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	40
R /W SHEET NO.	

METRIC

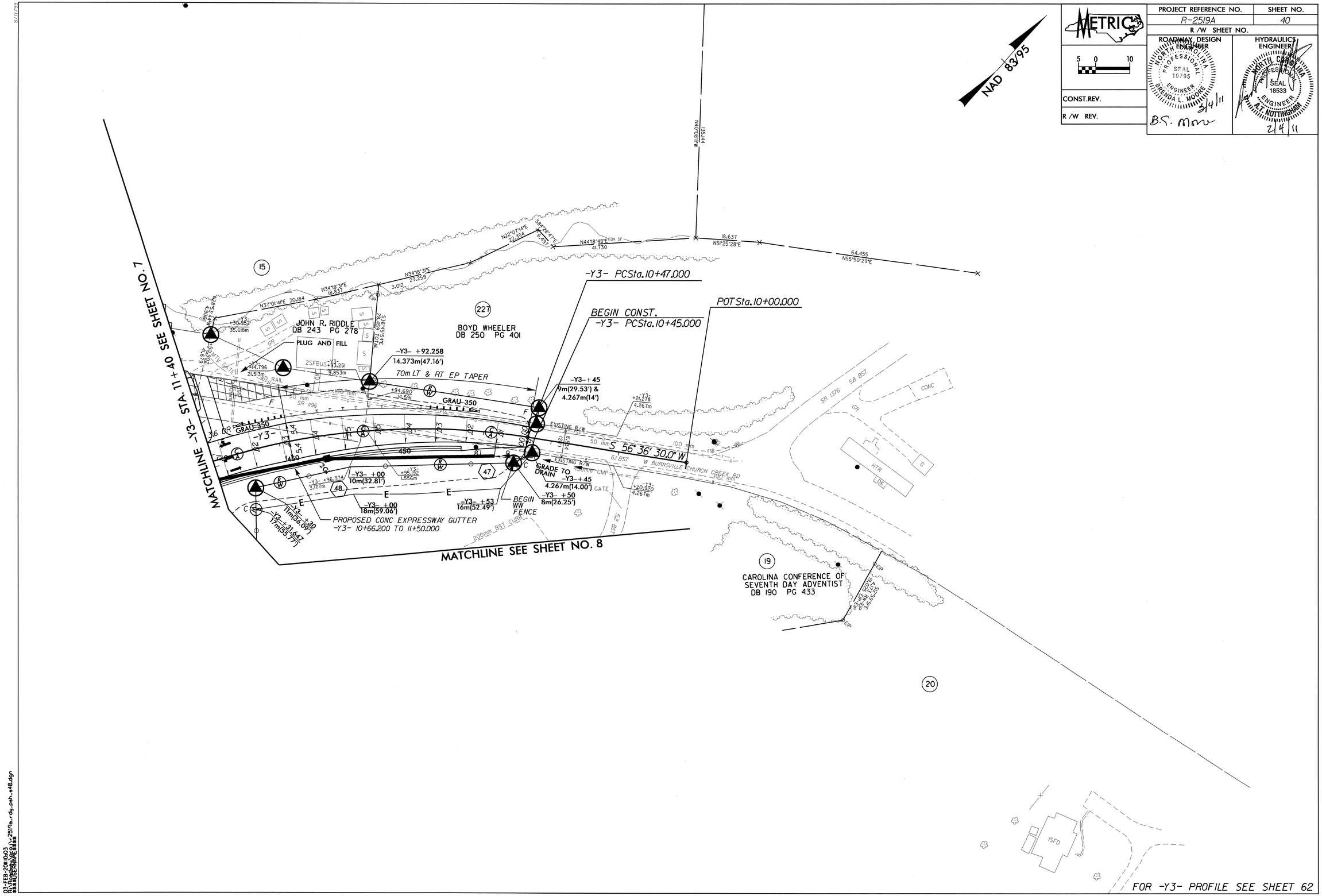
5 0 10

CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE
2/4/11
B.S. Moore

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A. NOTTINGHAM
2/4/11



8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	41
R /W SHEET NO.	

METRIC

5 0 10

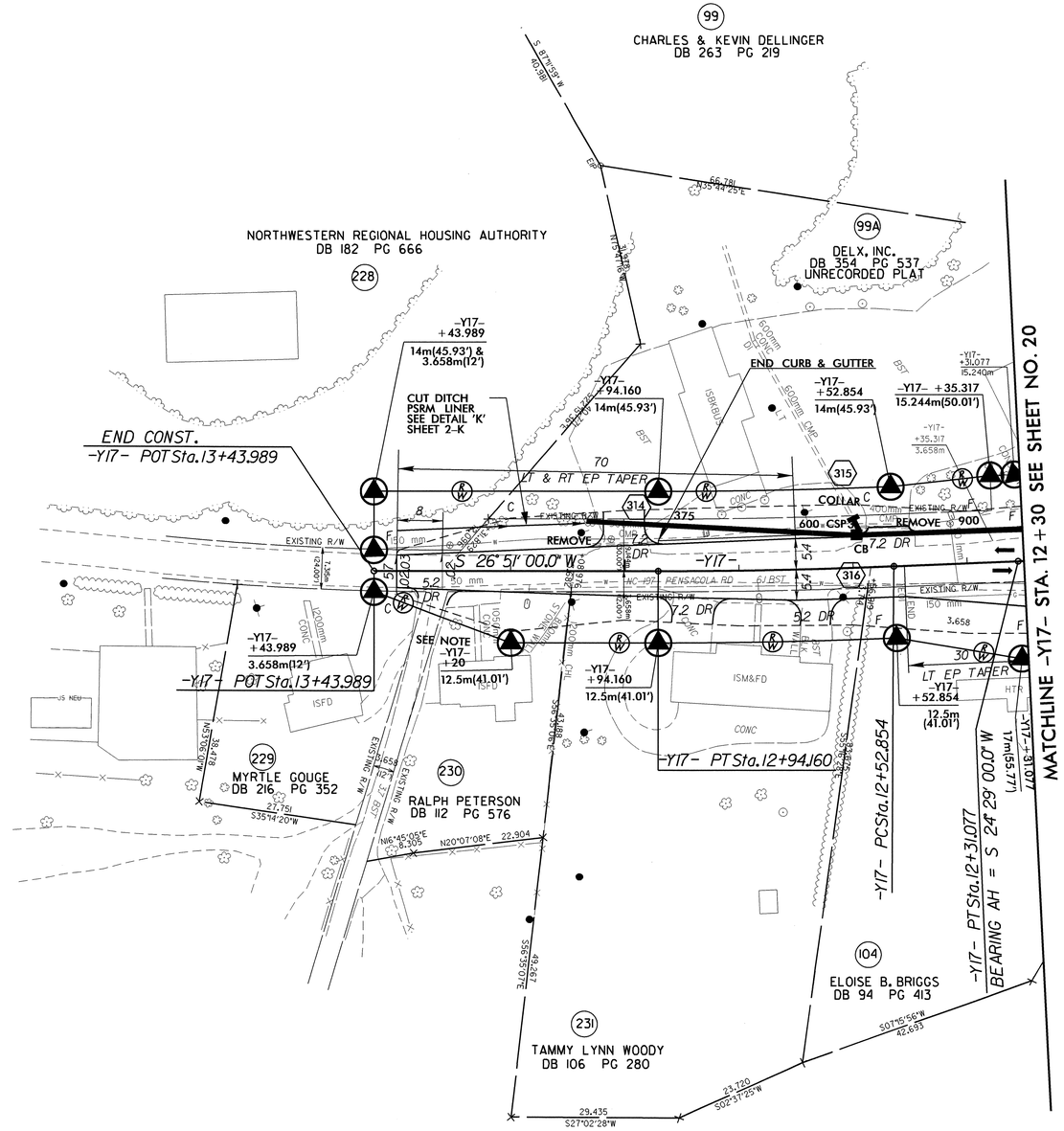
CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 13795 ENGINEER BRENDA L. MOORE
2/4/11
B.S. Moore

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM
2/4/11

NAD 83/95



FOR -Y17- PROFILE SEE SHEET 66

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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	42
R /W SHEET NO.	

METRIC

5 0 10

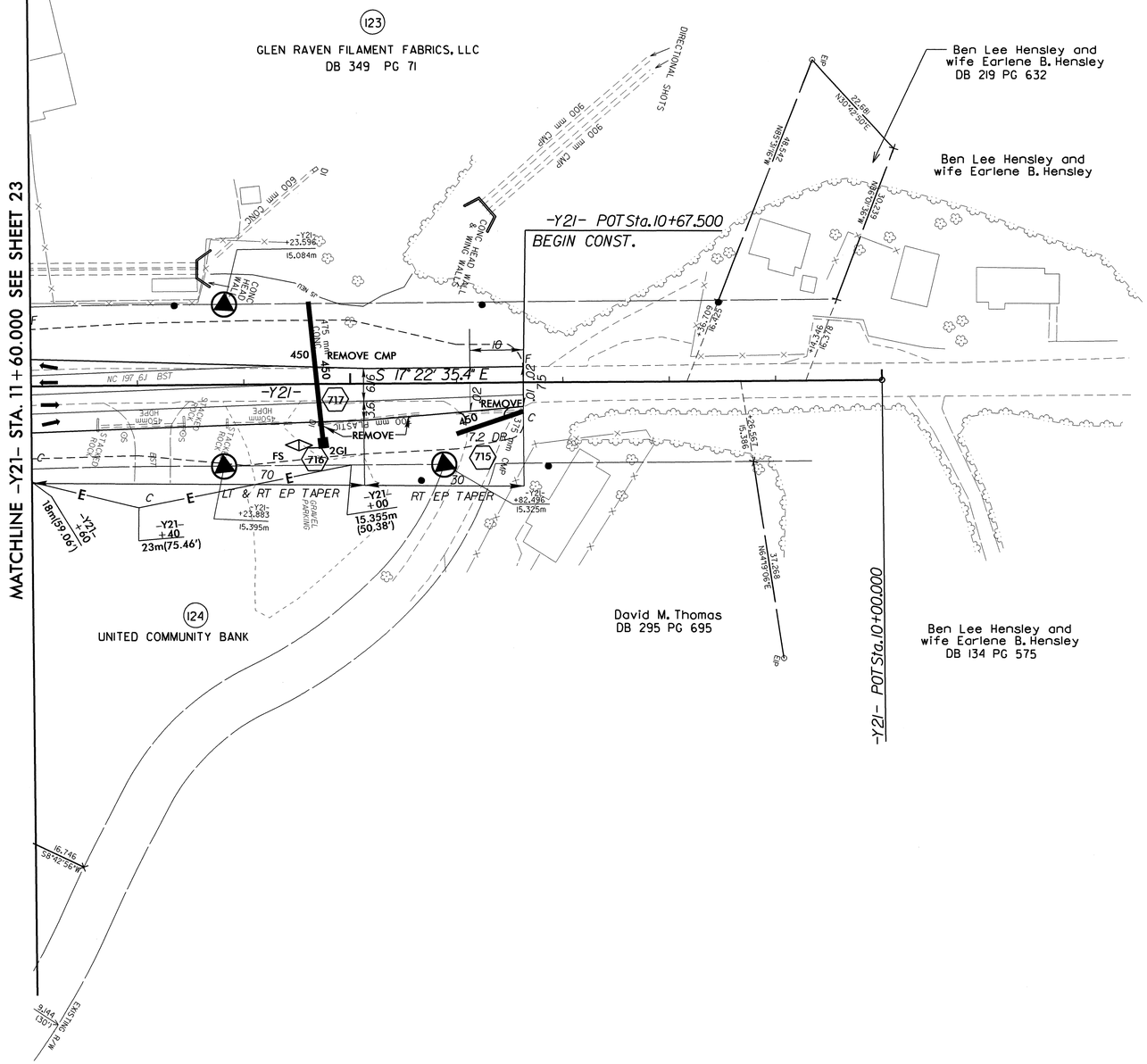
CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE
2/4/11
B.R. Moore

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A. NOTTINGHAM
2/4/11

NAD 83/95



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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	43
R/W SHEET NO.	

METRIC

5 0 10

CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE

2/4/11

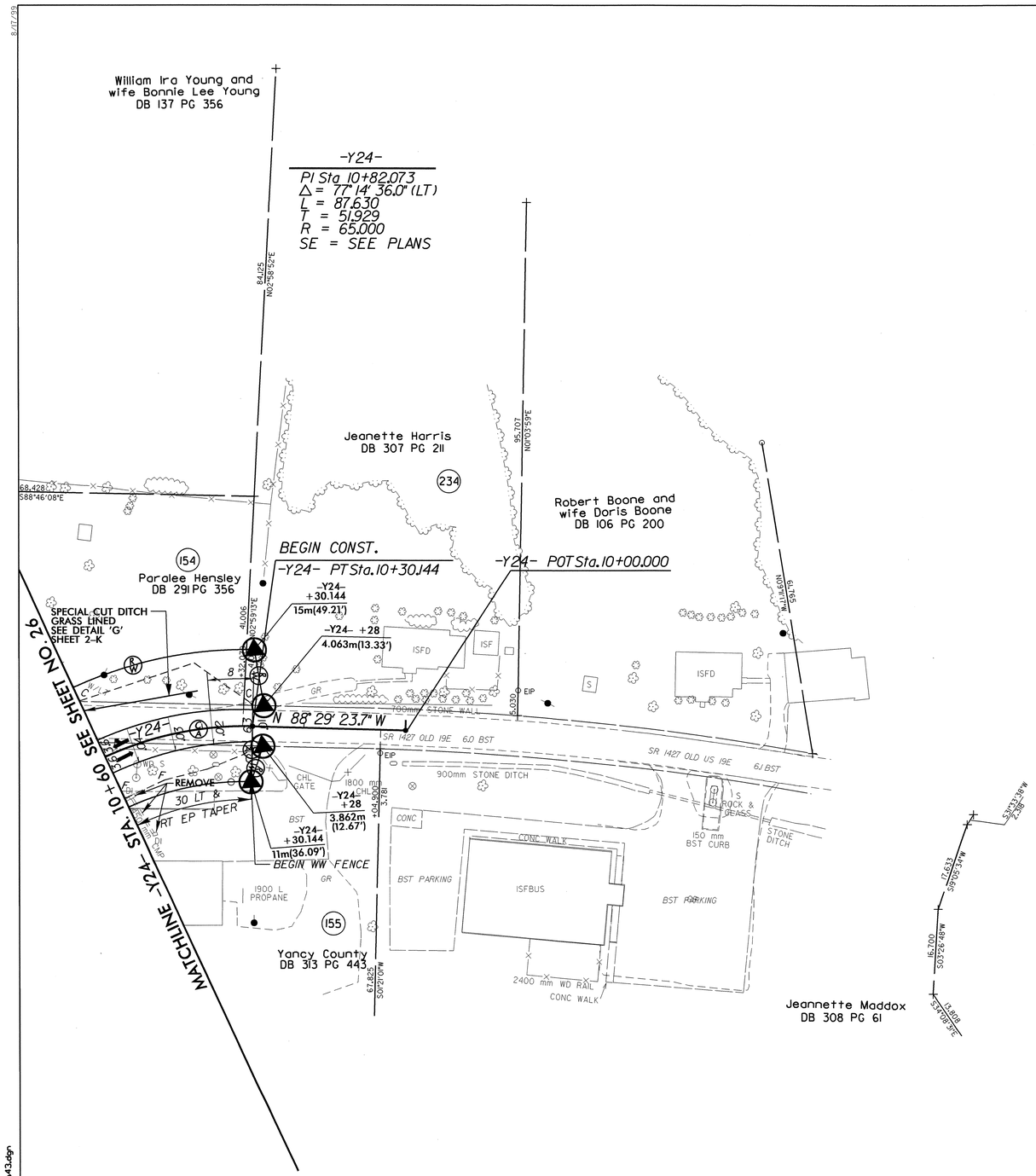
B. S. Moore

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM

2/4/11

NAD 83/95



FOR -Y24- PROFILE SEE SHEET 68

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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	44

METRIC

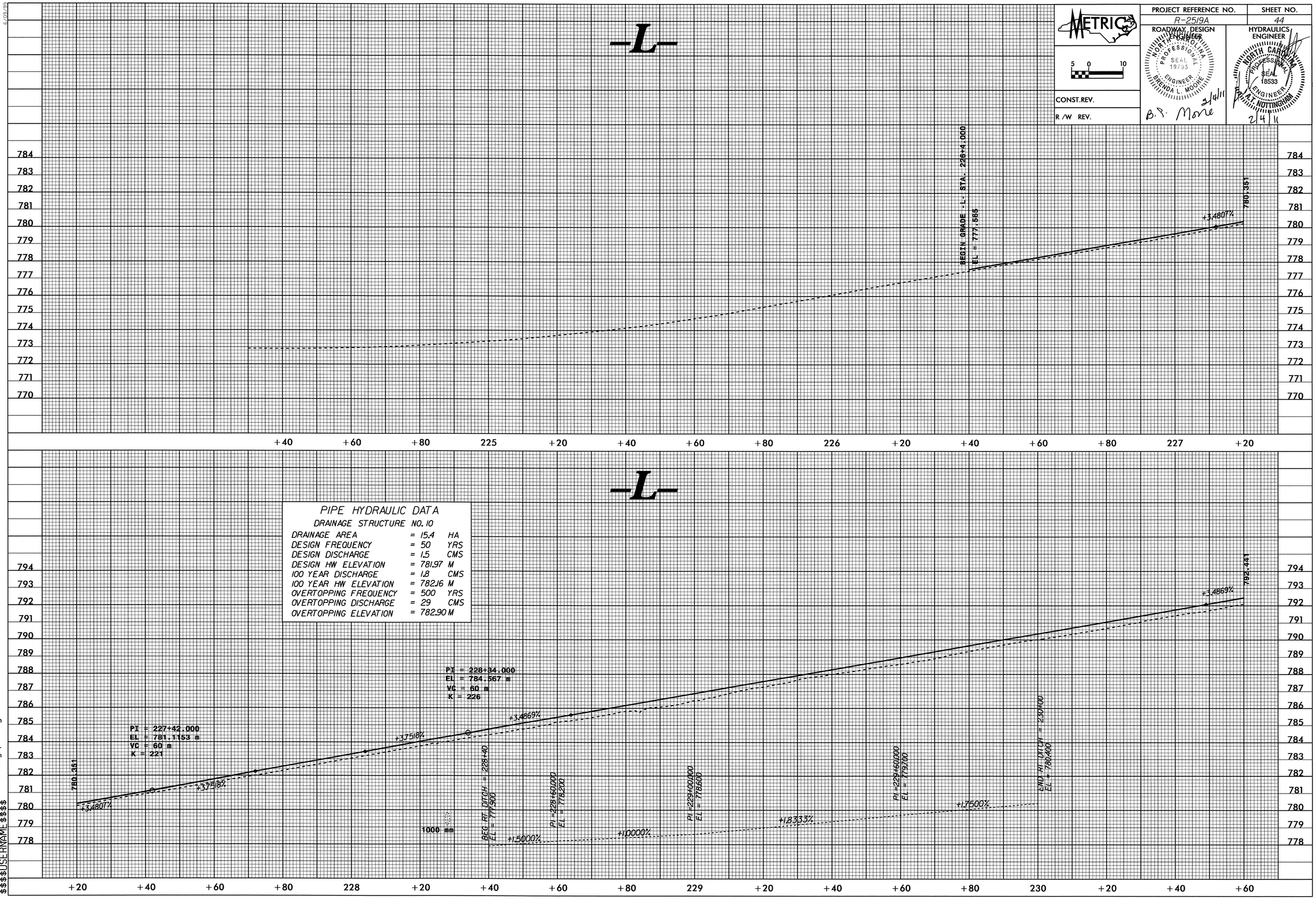
5 0 10

CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE
B.L. Moore 2/4/11

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER R.A. NOTTINGHAM
2/4/11



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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	45

METRIC

5 0 10

CONST.REV.

R/W REV.

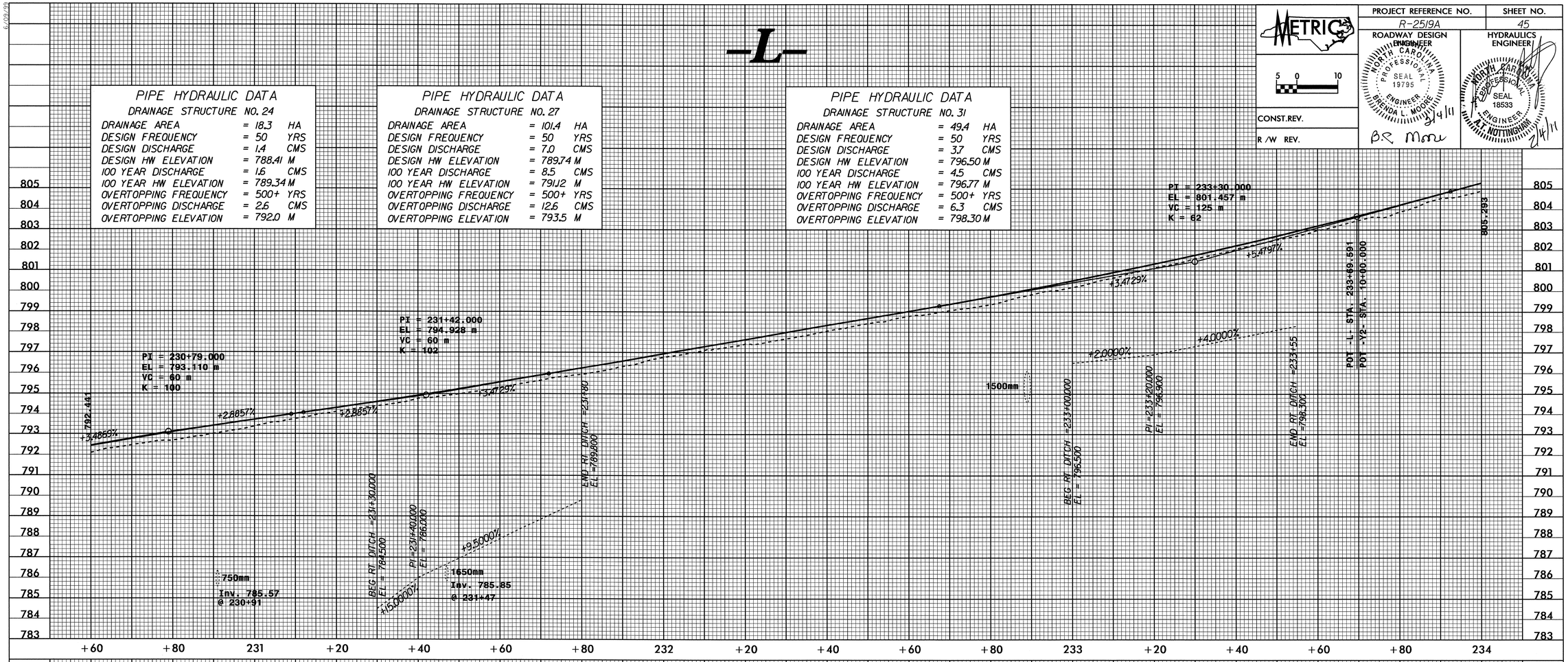
ROADWAY DESIGN ENGINEER

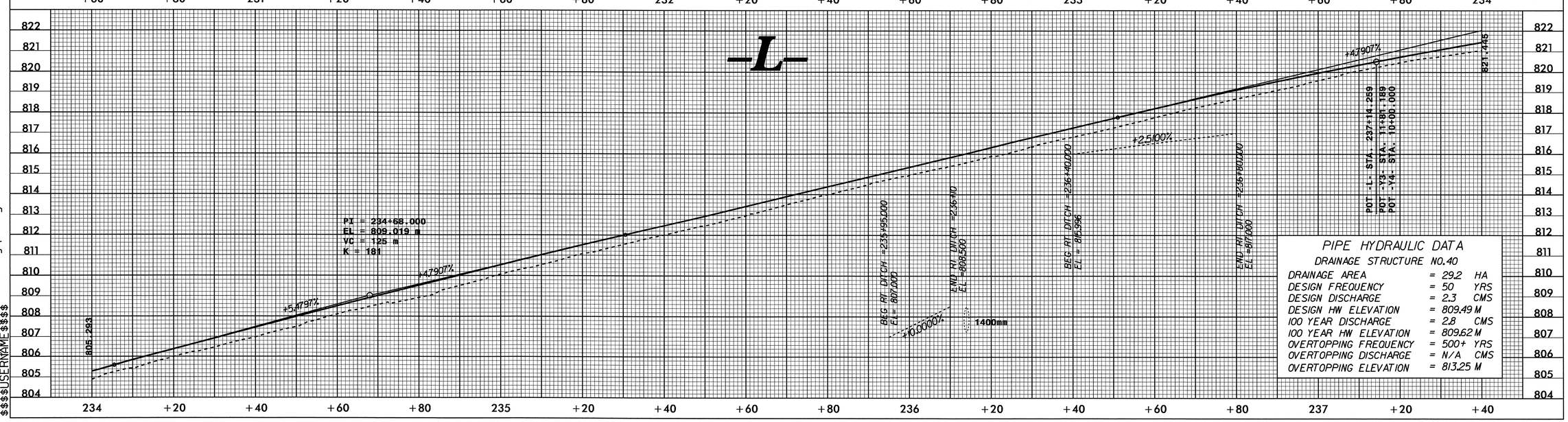
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE 2/4/11

B.R. Moore

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM 2/4/11





PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO. 24

DRAINAGE AREA	= 18.3	HA
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 1.4	CMS
DESIGN HW ELEVATION	= 788.41	M
100 YEAR DISCHARGE	= 1.6	CMS
100 YEAR HW ELEVATION	= 789.34	M
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 2.6	CMS
OVERTOPPING ELEVATION	= 792.0	M

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO. 27

DRAINAGE AREA	= 101.4	HA
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 7.0	CMS
DESIGN HW ELEVATION	= 789.74	M
100 YEAR DISCHARGE	= 8.5	CMS
100 YEAR HW ELEVATION	= 791.12	M
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 12.6	CMS
OVERTOPPING ELEVATION	= 793.5	M

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO. 31

DRAINAGE AREA	= 49.4	HA
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 3.7	CMS
DESIGN HW ELEVATION	= 796.50	M
100 YEAR DISCHARGE	= 4.5	CMS
100 YEAR HW ELEVATION	= 796.77	M
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 6.3	CMS
OVERTOPPING ELEVATION	= 798.30	M

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO. 40

DRAINAGE AREA	= 29.2	HA
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 2.3	CMS
DESIGN HW ELEVATION	= 809.49	M
100 YEAR DISCHARGE	= 2.8	CMS
100 YEAR HW ELEVATION	= 809.62	M
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= N/A	CMS
OVERTOPPING ELEVATION	= 813.25	M

03-FEB-2011 08:53
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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	46

METRIC

5 0 10

CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE

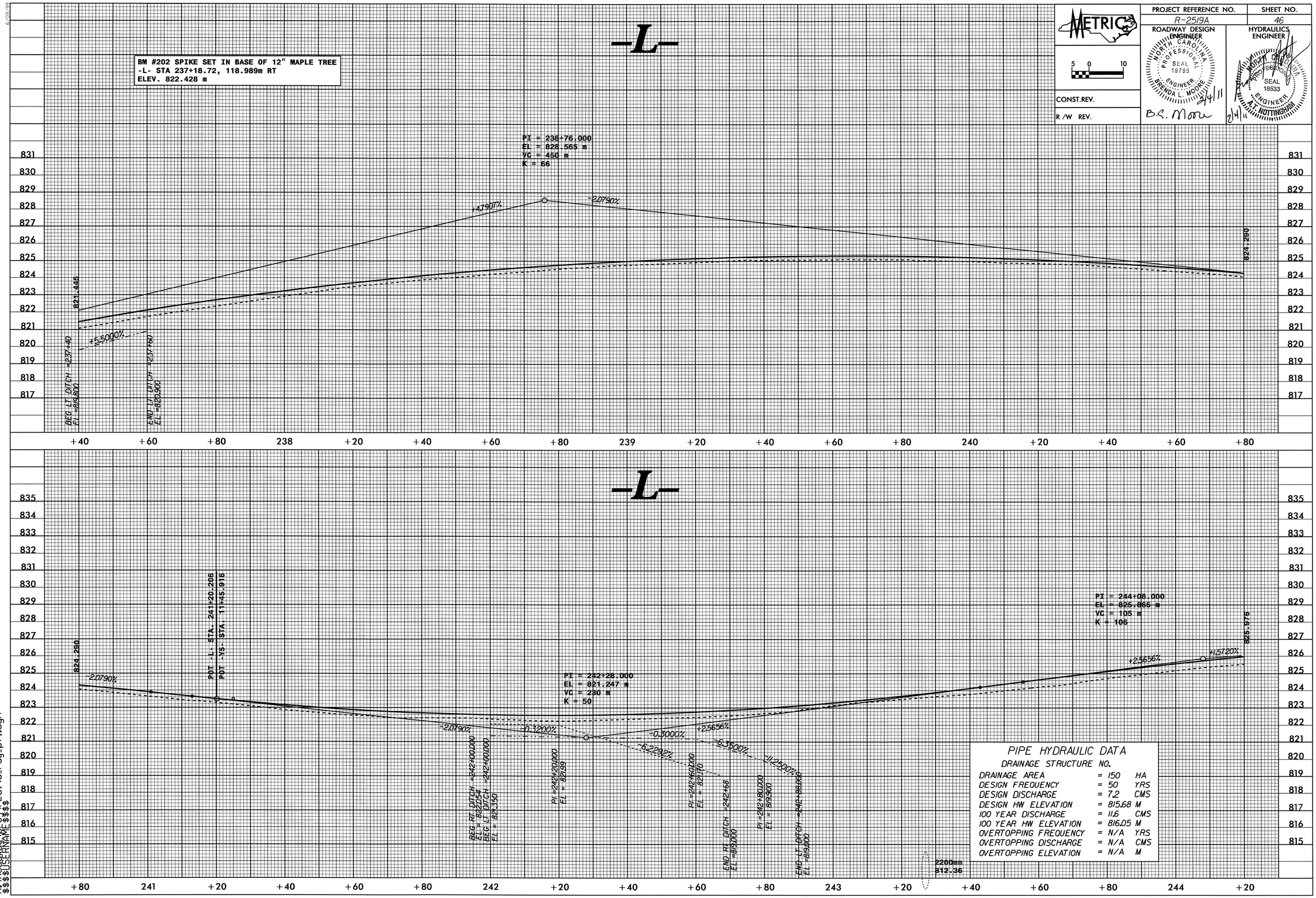
2/4/11

B.L. Moore

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A. T. NOTTINGHAM

2/4/11



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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	47

METRIC

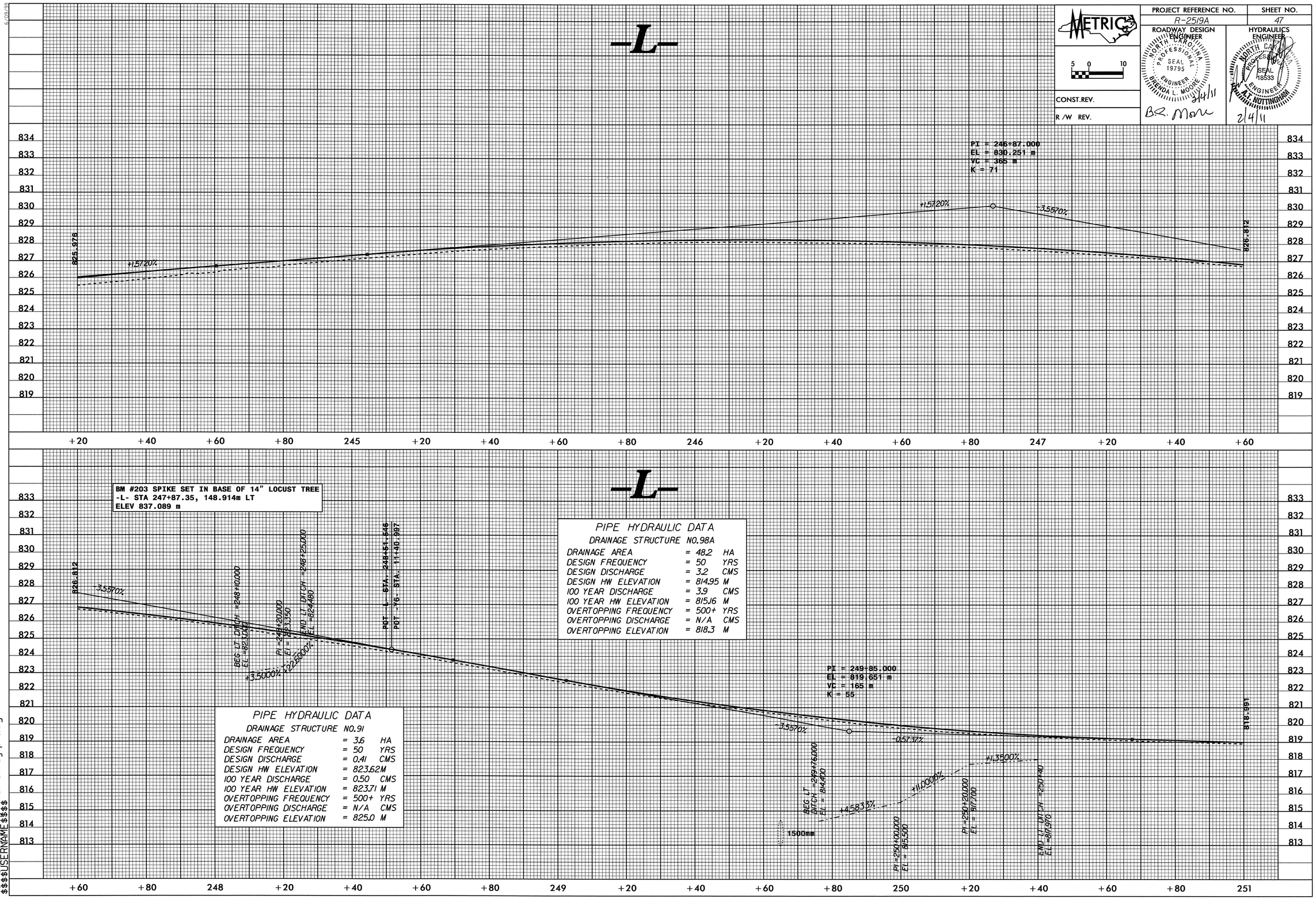
5 0 10

CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE
2/4/11
B.L. Moore

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM
2/4/11



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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	48

METRIC

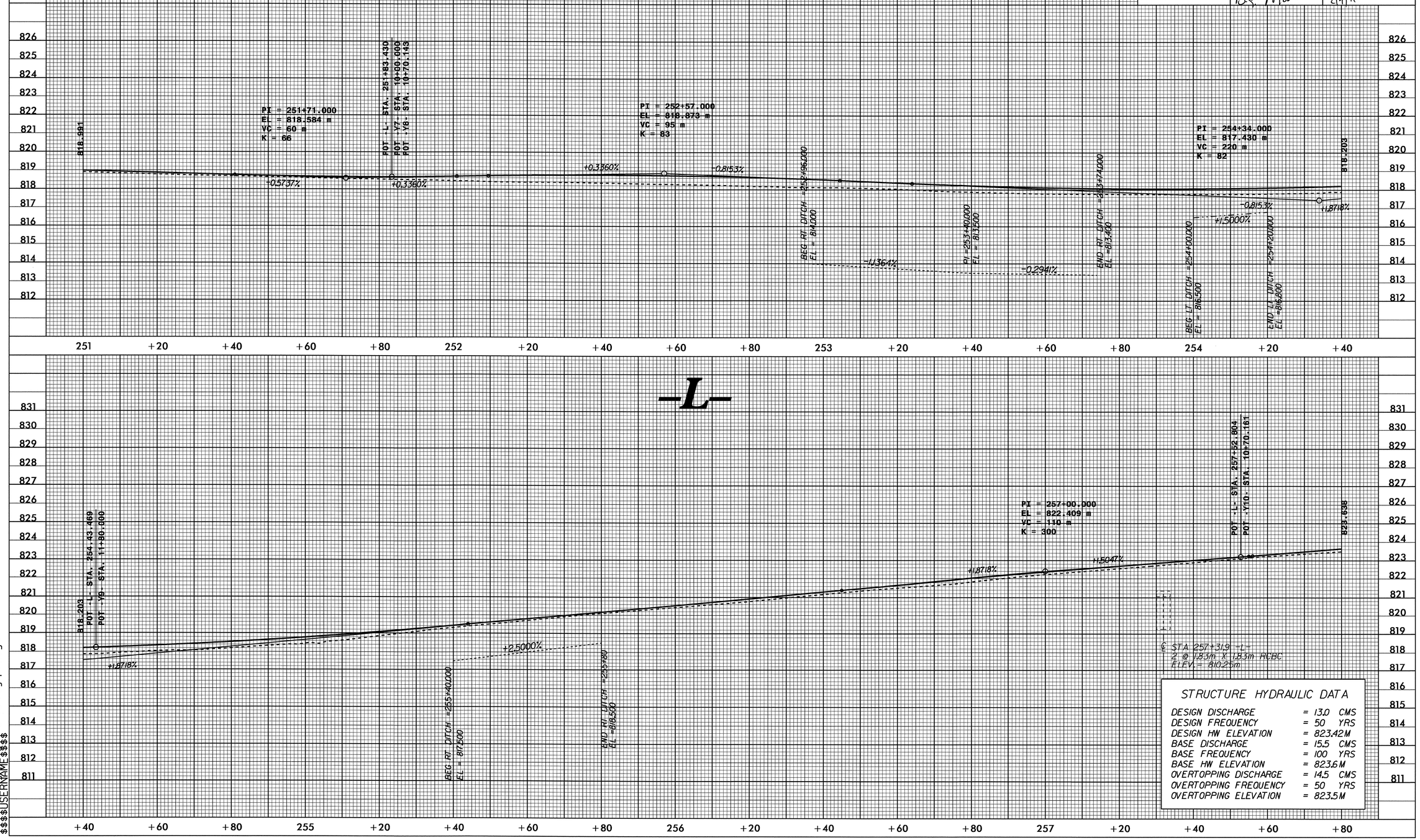
5 0 10

CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE
3/4/11
B.L. Moore

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM
2/4/11



STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 13.0	CMS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 823.42M	
BASE DISCHARGE	= 15.5	CMS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 823.6M	
OVERTOPPING DISCHARGE	= 14.5	CMS
OVERTOPPING FREQUENCY	= 50	YRS
OVERTOPPING ELEVATION	= 823.5M	

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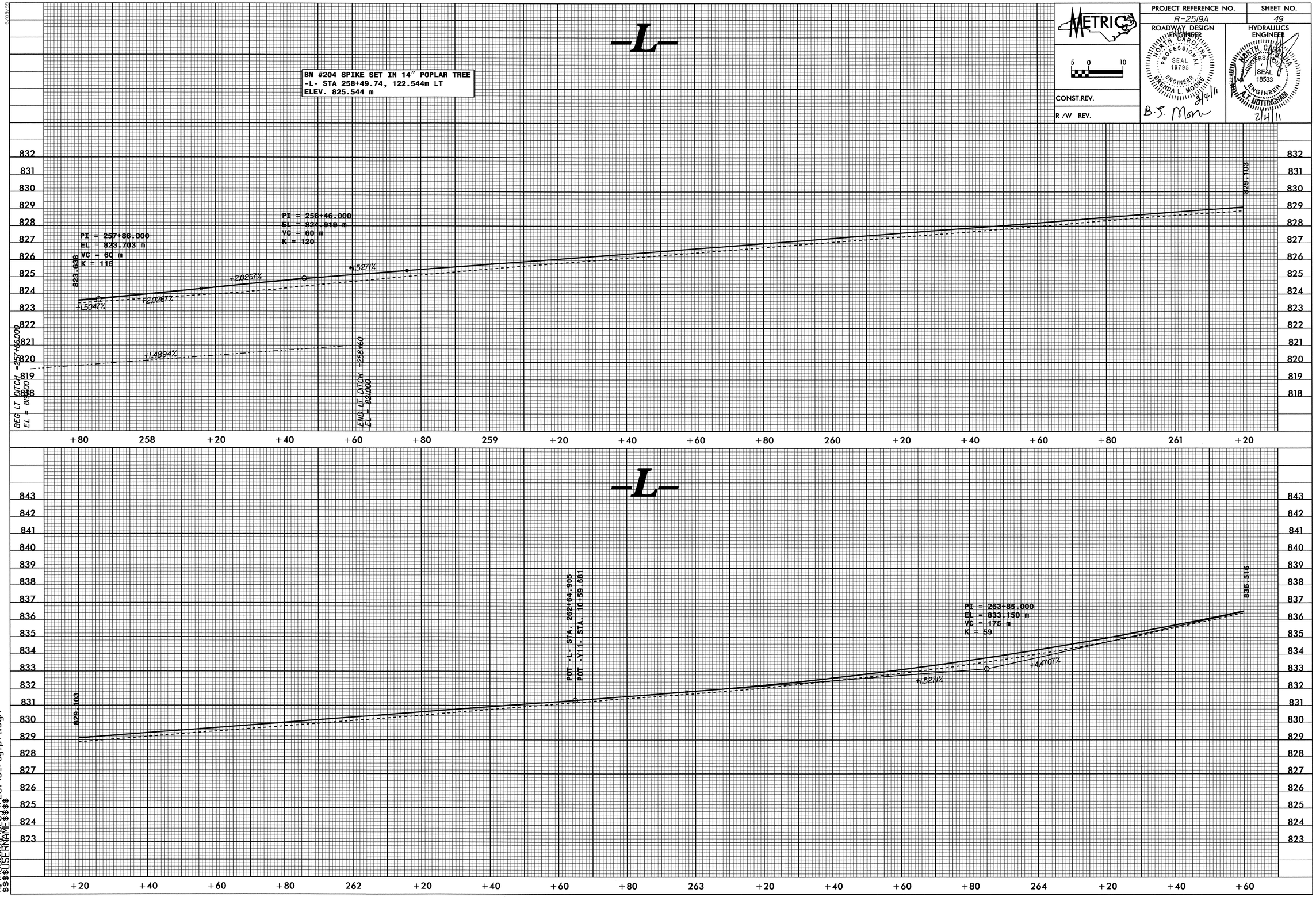
METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	R-2519A	49
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R/W REV.	NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE 2/4/11 B.L. Moore	NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER ROBERT L. NOTTINGHAM 2/4/11



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6/09/98

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	50

METRIC

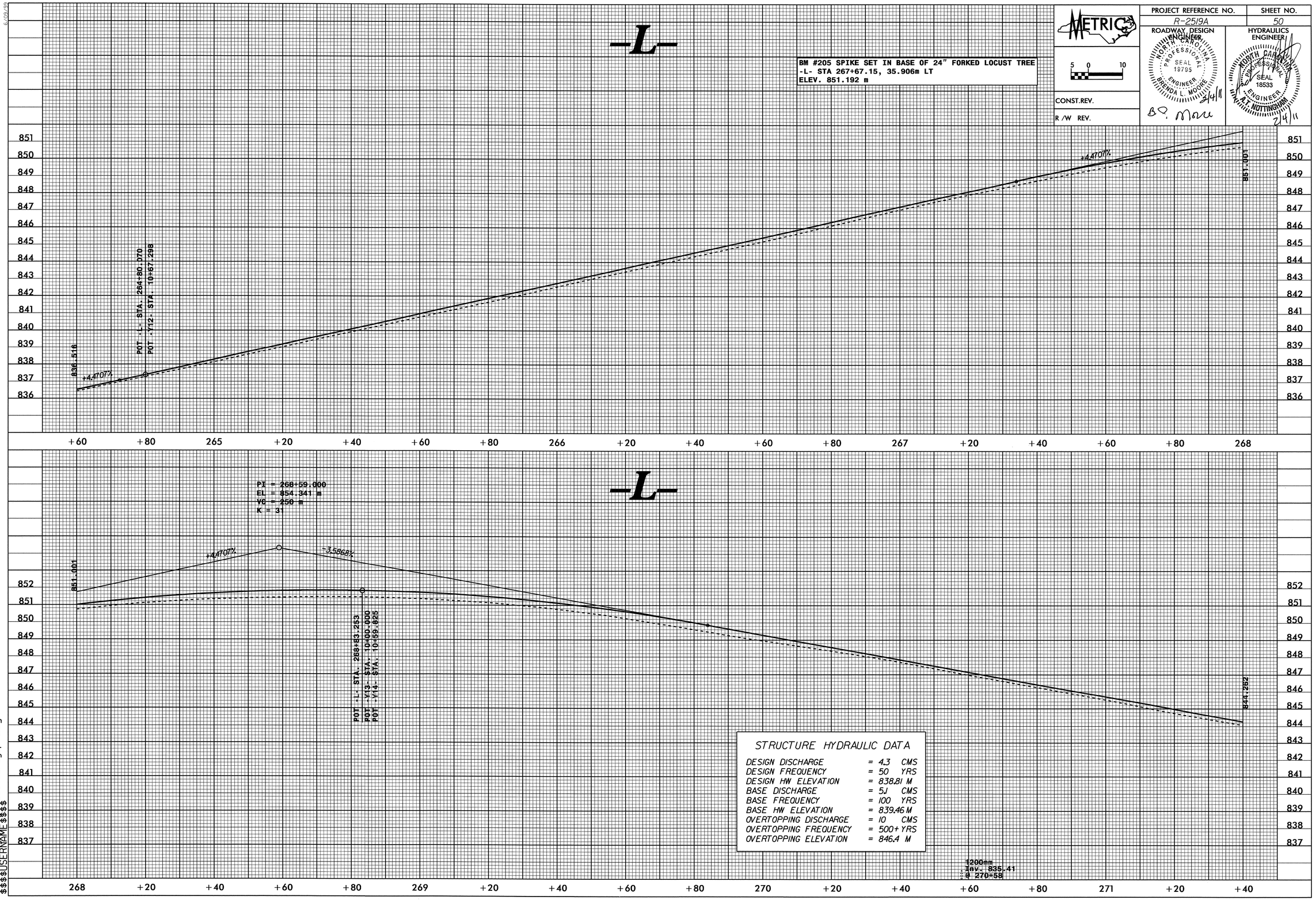
5 0 10

CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE
B.L. Moore 2/4/11

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM
2/4/11



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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	51

METRIC

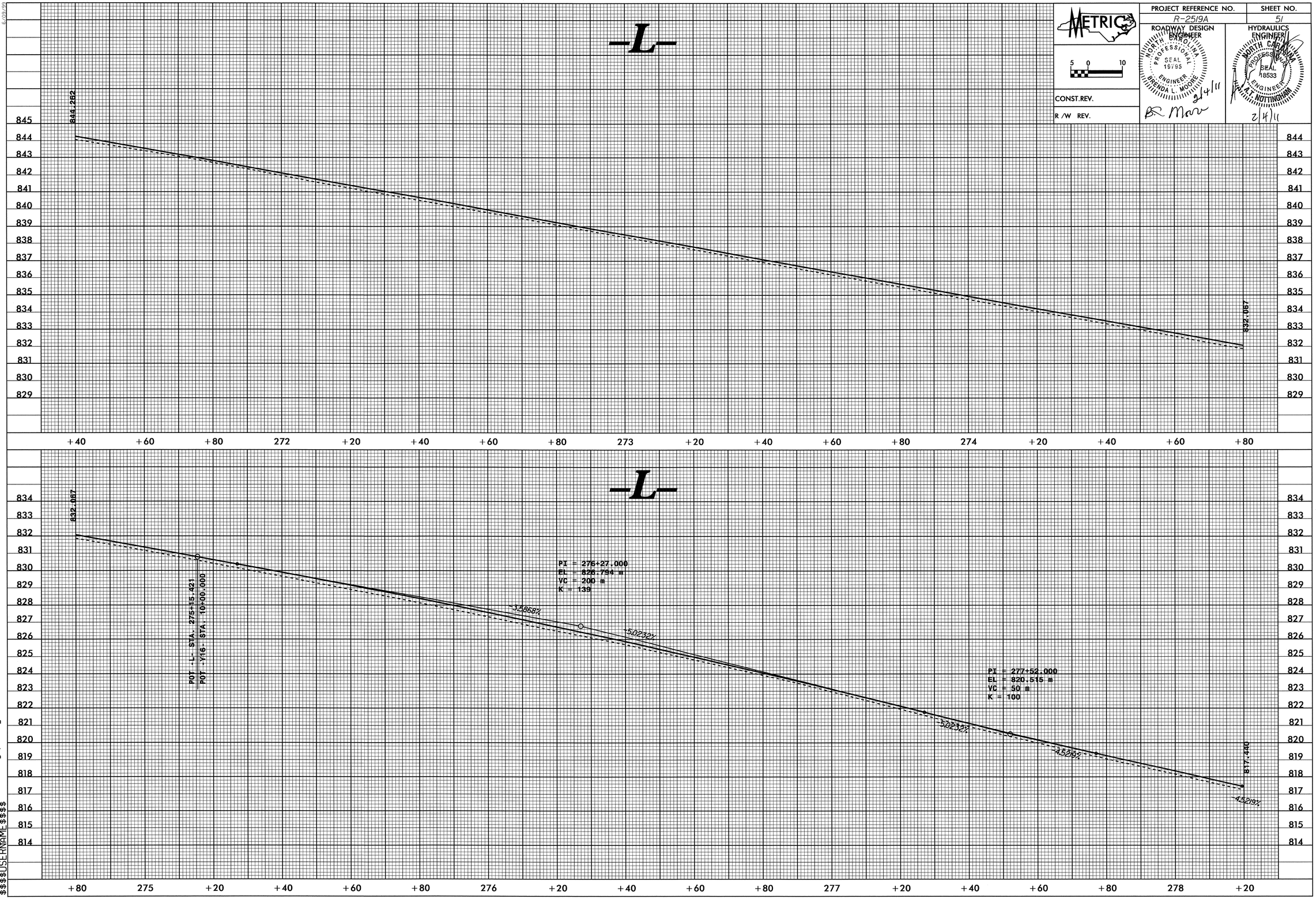
5 0 10

CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE
2/4/11

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER K.T. NOTTINGHAM
2/4/11



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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	52

METRIC

5 0 10

CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE

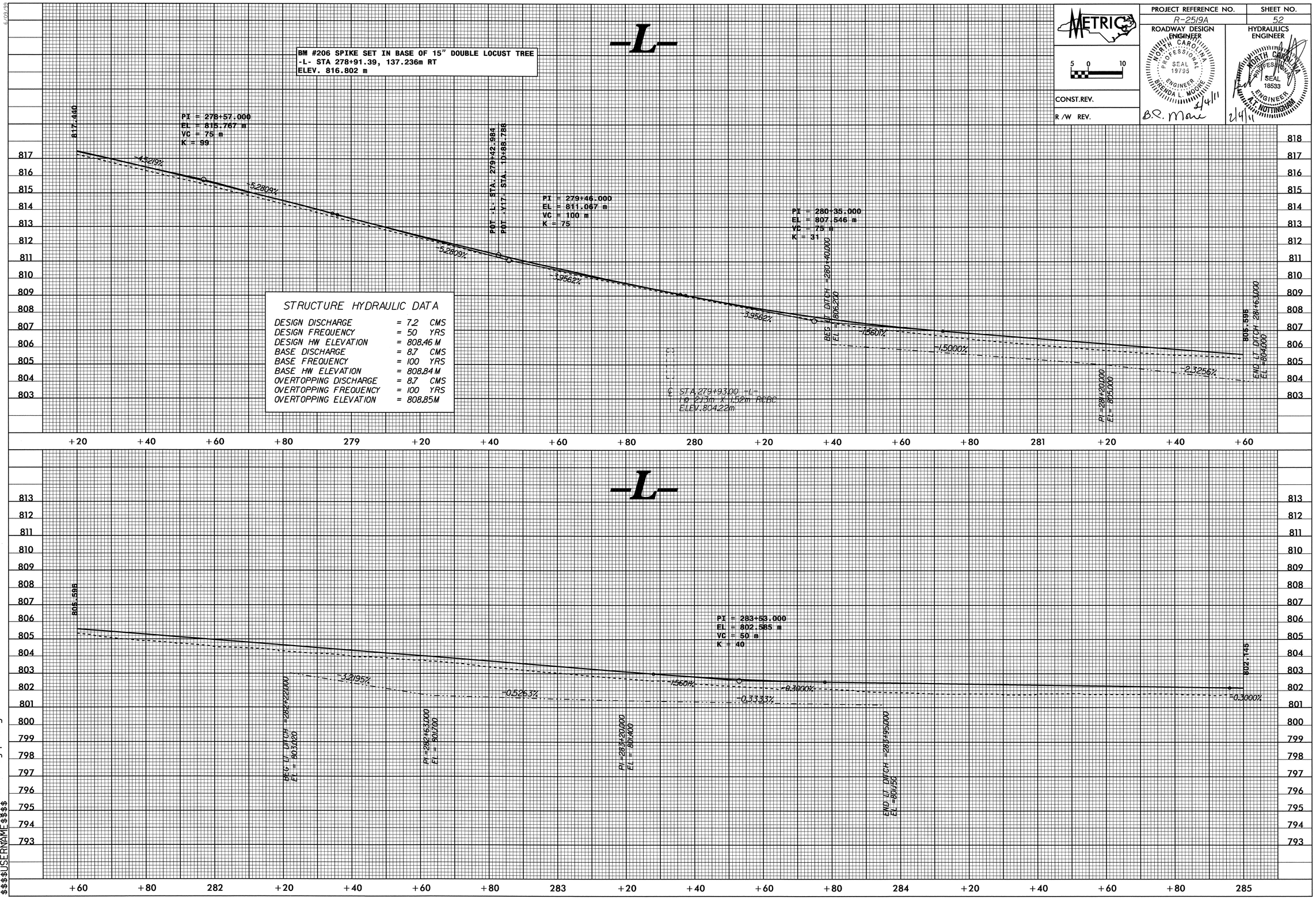
2/4/11

B.R. Moore

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER T. NOTTINGHAM

2/4/11



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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	53

METRIC

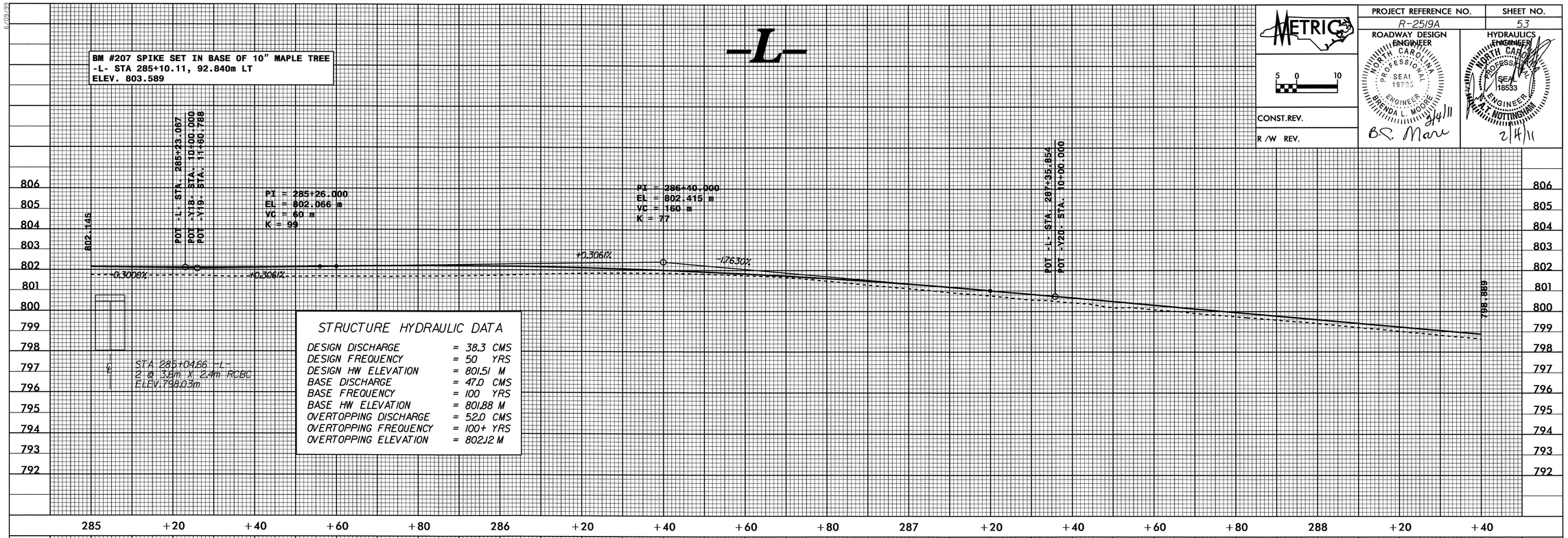
5 0 10

CONST.REV.

R/W REV.

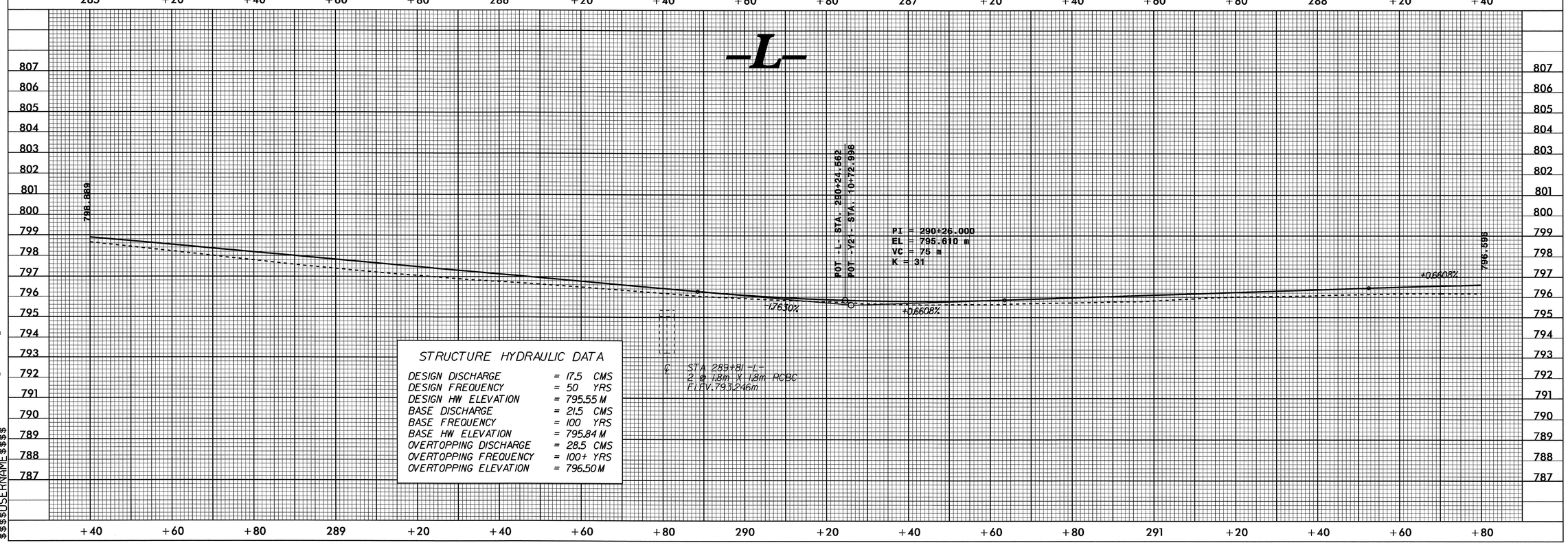
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE
2/4/11
B.C. Moore

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM
2/4/11



STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 38.3 CMS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 801.51 M
BASE DISCHARGE	= 47.0 CMS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 801.88 M
OVERTOPPING DISCHARGE	= 52.0 CMS
OVERTOPPING FREQUENCY	= 100+ YRS
OVERTOPPING ELEVATION	= 802.12 M



STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 17.5 CMS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 795.55 M
BASE DISCHARGE	= 21.5 CMS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 795.84 M
OVERTOPPING DISCHARGE	= 28.5 CMS
OVERTOPPING FREQUENCY	= 100+ YRS
OVERTOPPING ELEVATION	= 796.50 M

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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	54

METRIC

5 0 10

CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE

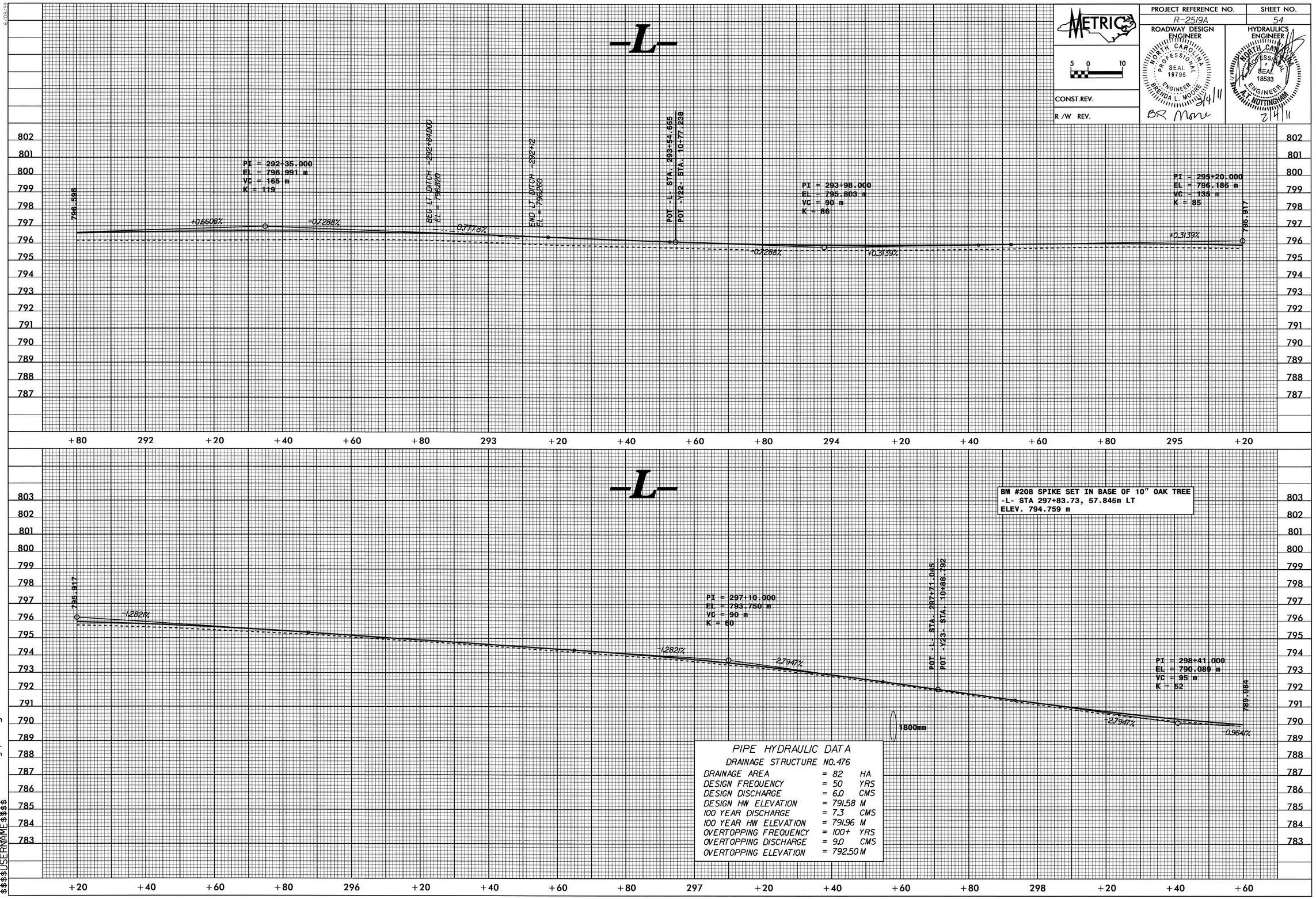
3/4/11

BR Moore

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER H. T. NOTTINGHAM

2/4/11



PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.476

DRAINAGE AREA	= 82	HA
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 6.0	CMS
DESIGN HW ELEVATION	= 791.58	M
100 YEAR DISCHARGE	= 7.3	CMS
100 YEAR HW ELEVATION	= 791.96	M
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING DISCHARGE	= 9.0	CMS
OVERTOPPING ELEVATION	= 792.50	M

02-FEB-2011 16:20
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	55
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

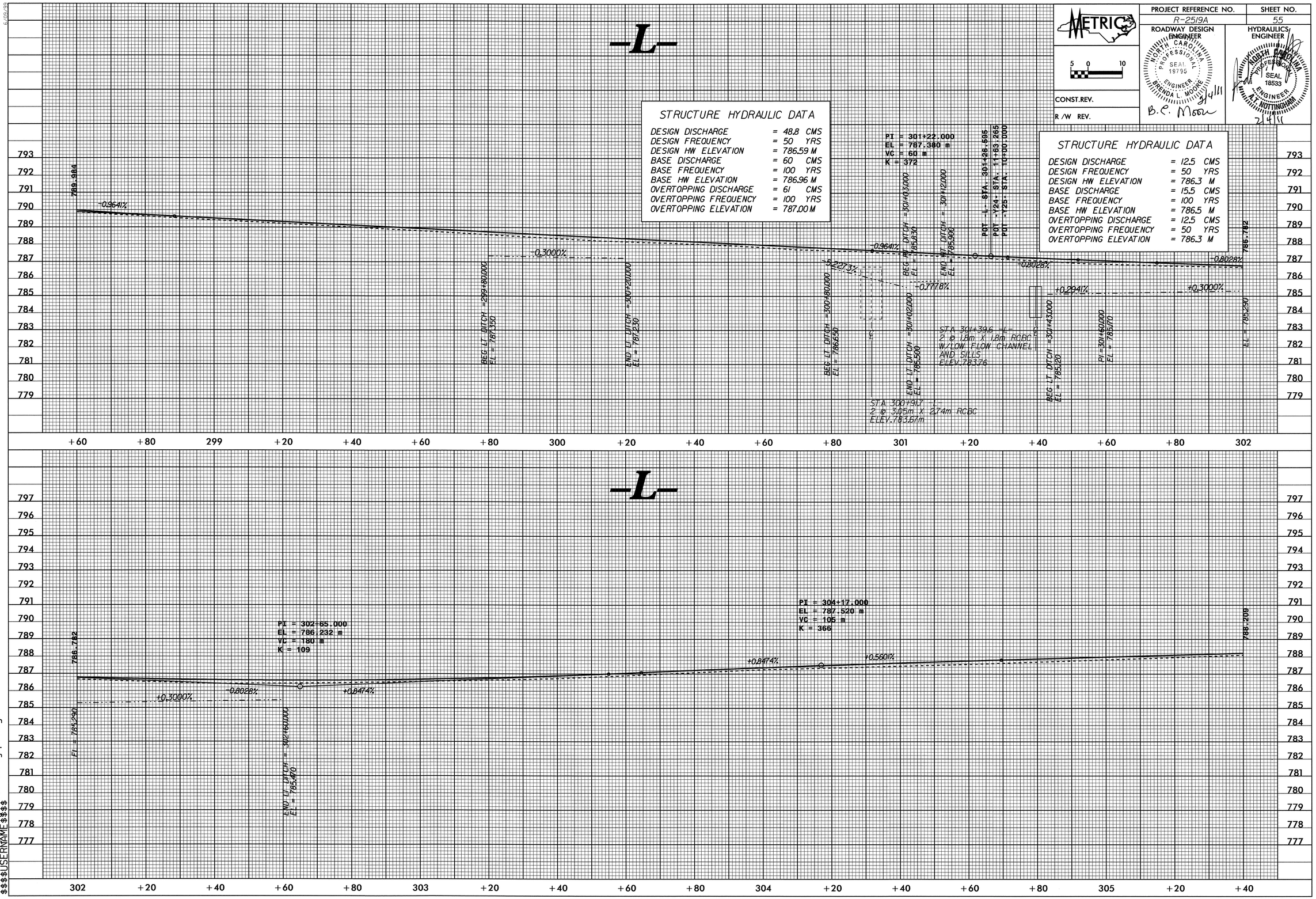
5 0 10

CONST.REV.

R/W REV.

NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE 2/4/11 B.C. Moore

NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM 2/4/11



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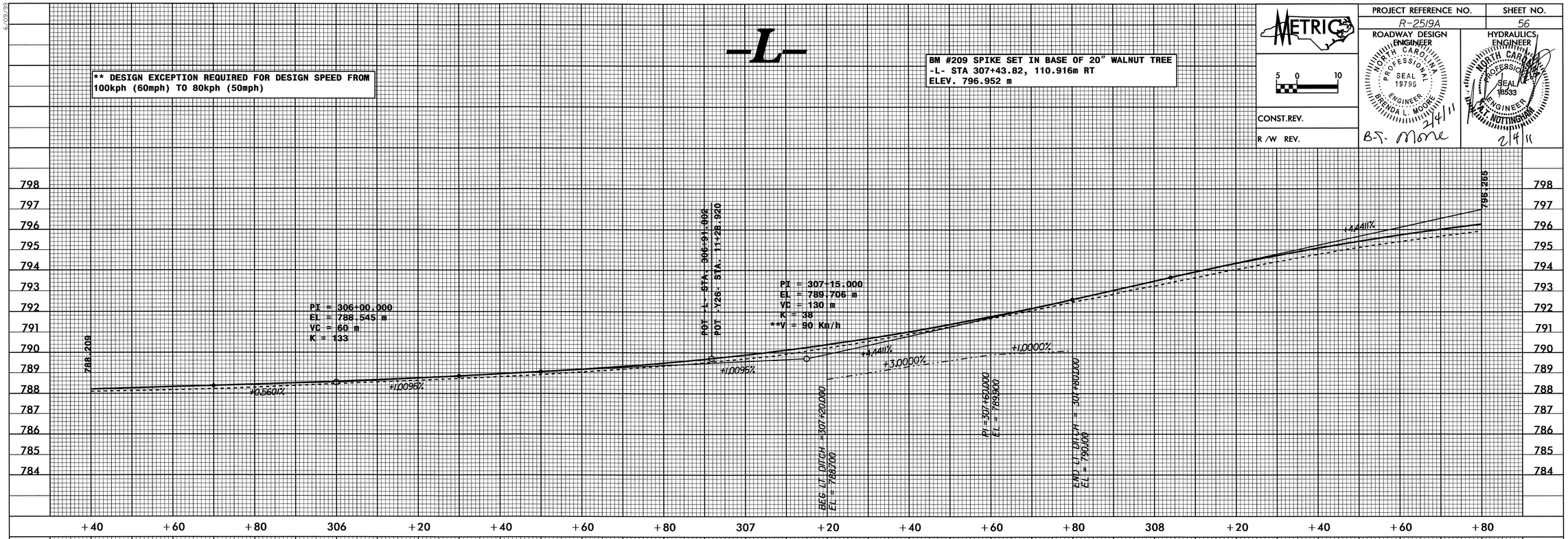
PROJECT REFERENCE NO.	SHEET NO.
R-2519A	56

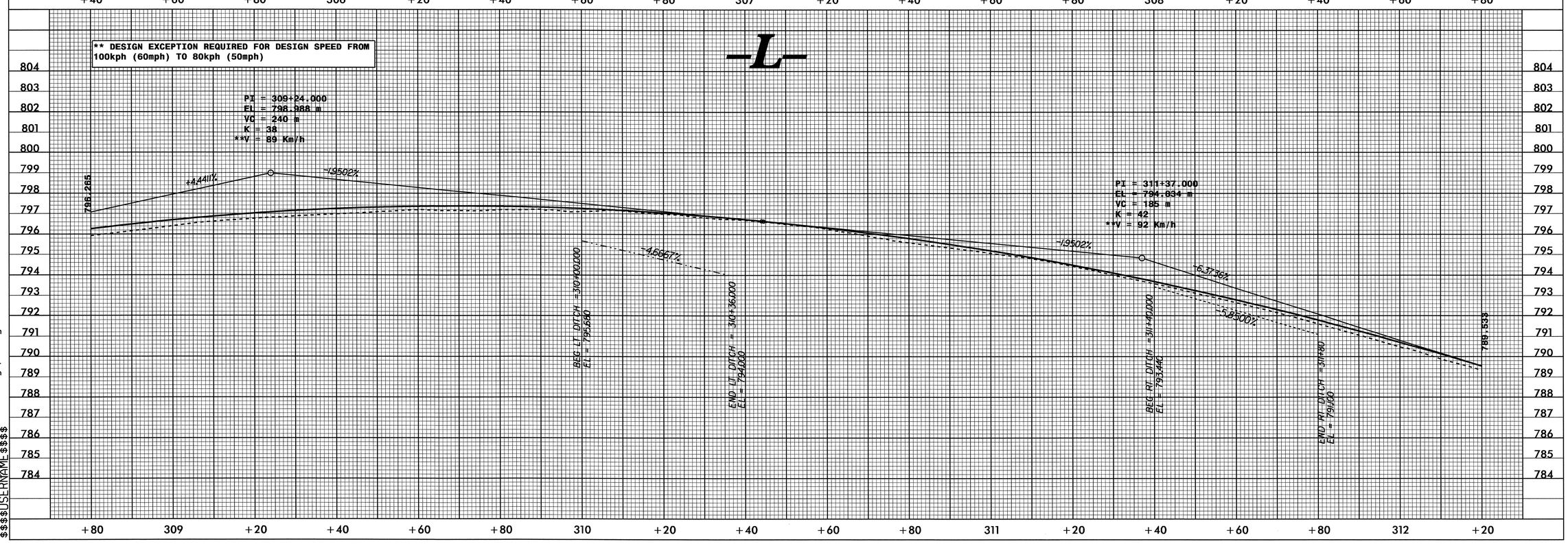
ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

CONST.REV.

R/W REV.





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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	57

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

METRIC

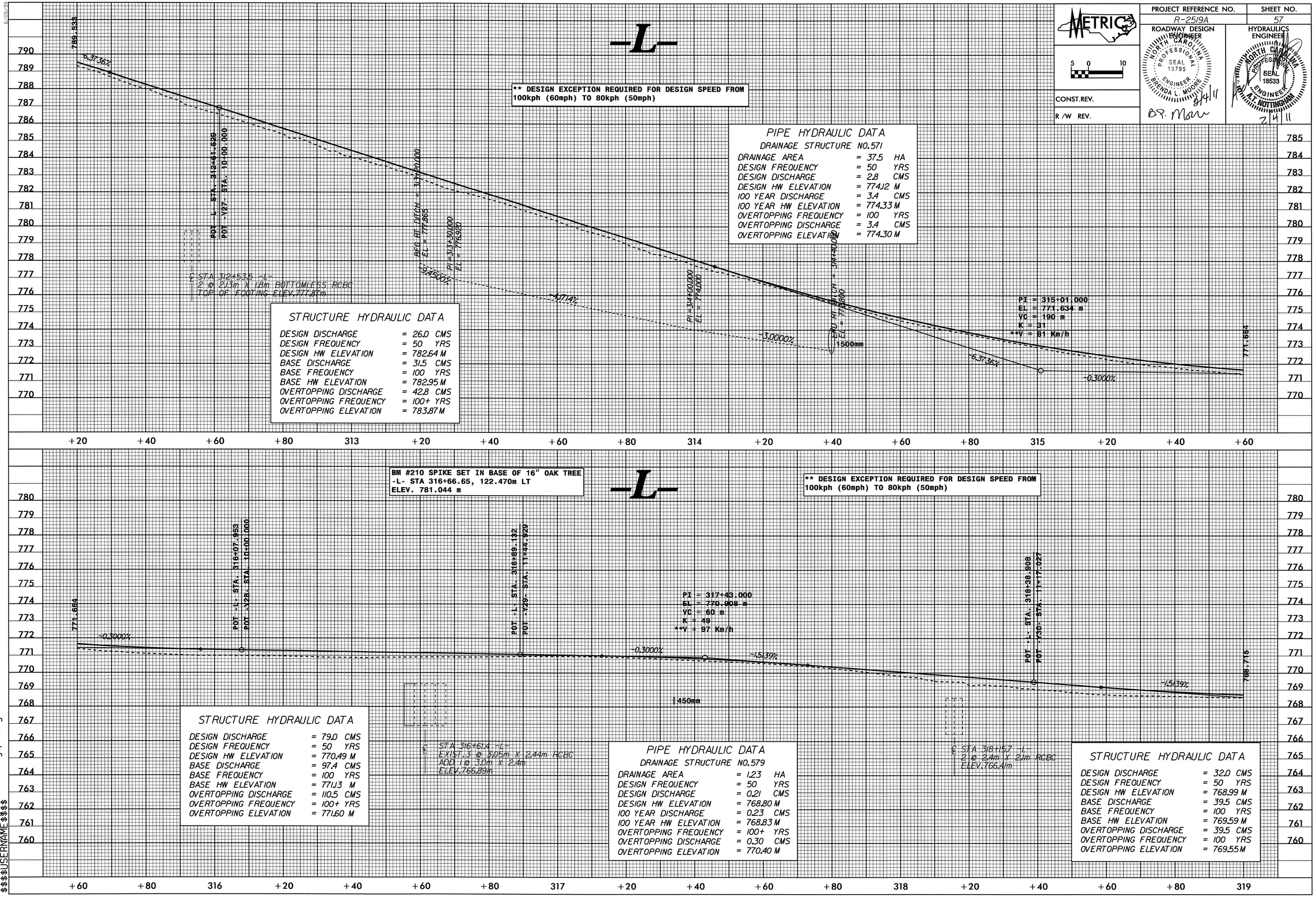
5 0 10

CONST.REV.

R/W REV.

NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE 2/4/11

NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER T.T. NOTTINGHAM 2/4/11



6/09/98

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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	58

METRIC

5 0 10

CONST.REV.

R /W REV.

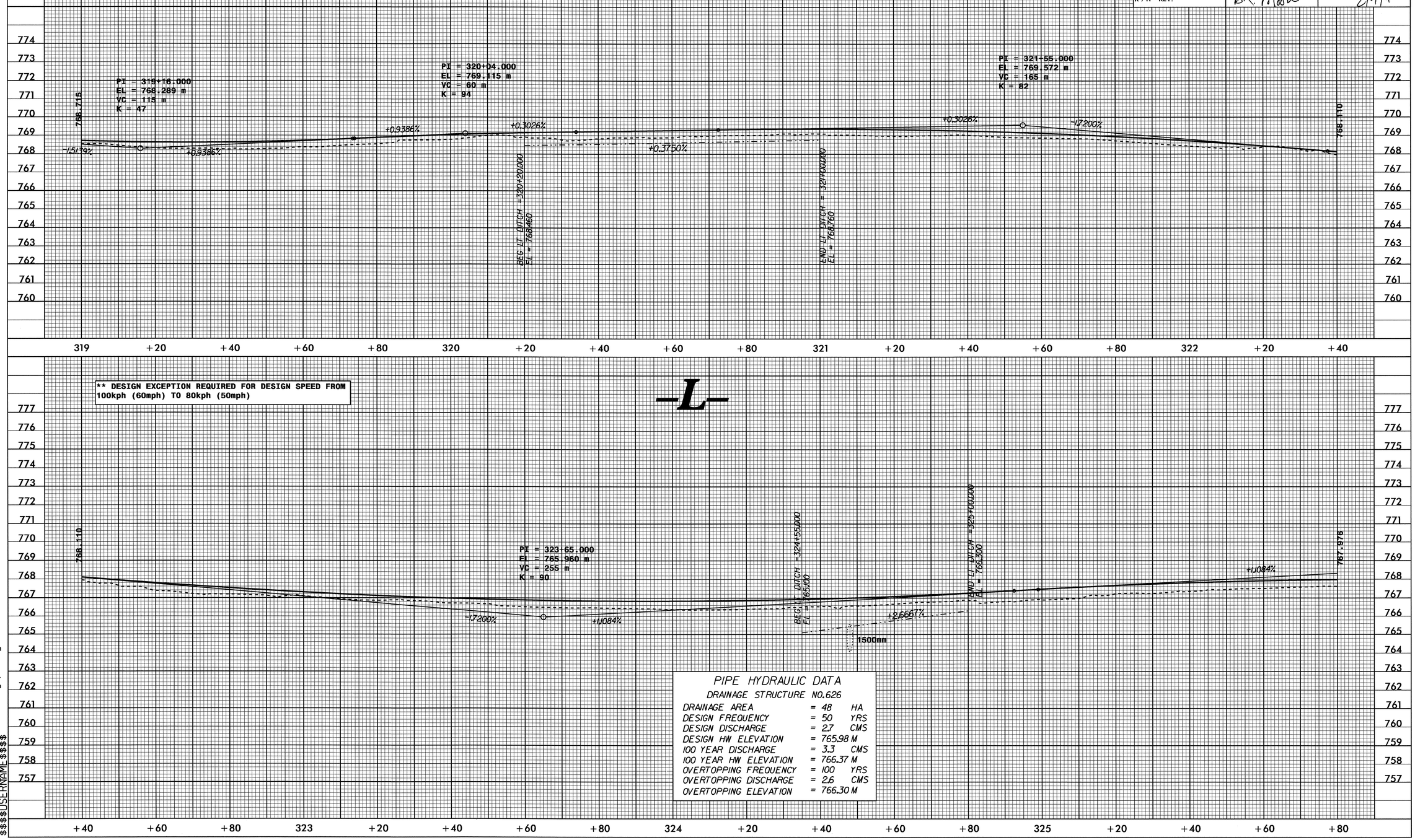
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE 2/4/11

B.L. Moore

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A. T. NOTTINGHAM 2/4/11



PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.626

DRAINAGE AREA	= 48	HA
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 2.7	CMS
DESIGN HW ELEVATION	= 765.98	M
100 YEAR DISCHARGE	= 3.3	CMS
100 YEAR HW ELEVATION	= 766.37	M
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING DISCHARGE	= 2.6	CMS
OVERTOPPING ELEVATION	= 766.30	M

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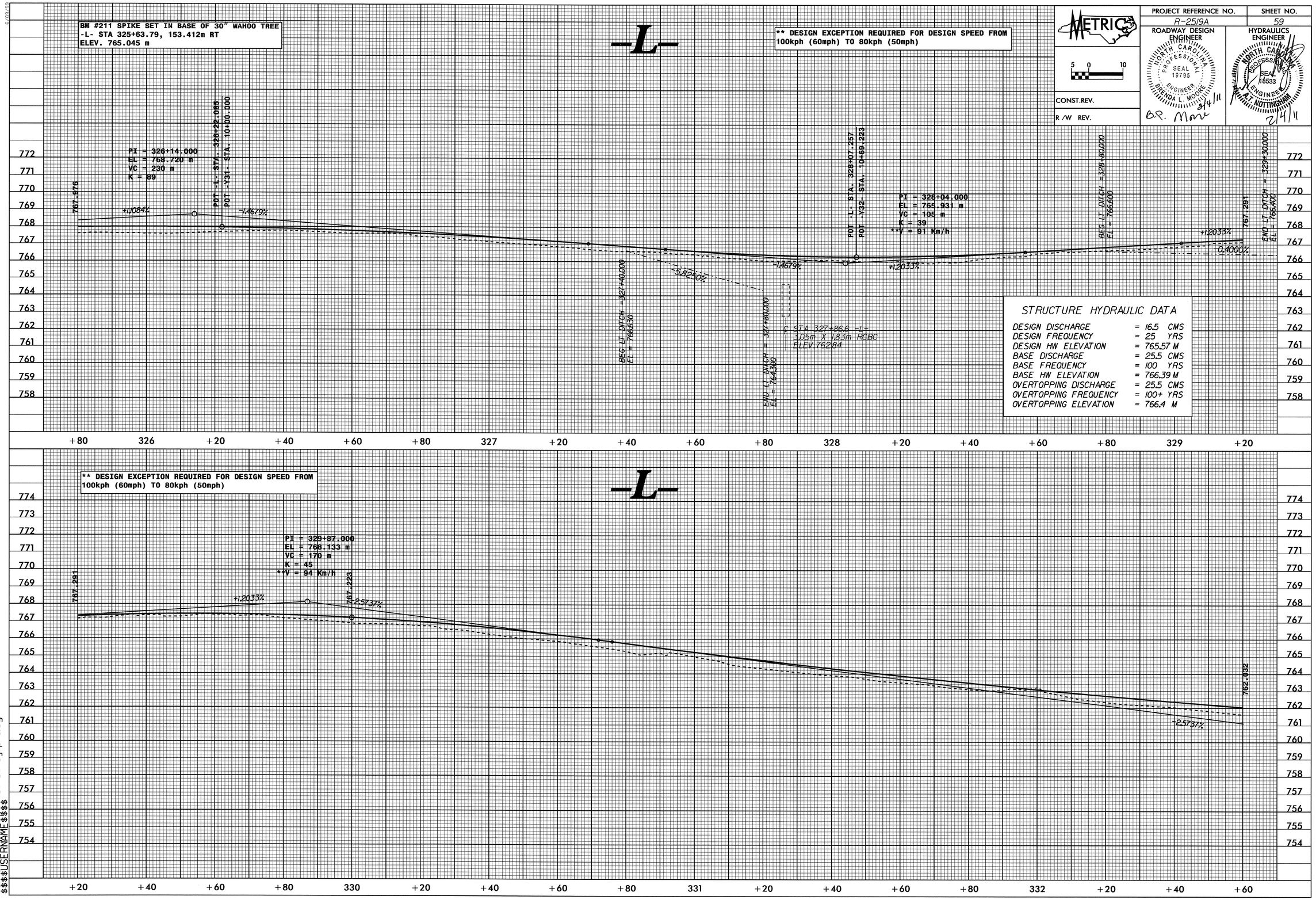
6/9/98

METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	R-2519A	59
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R/W REV.	NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE 3/4/11 BR. Moore	NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER ALT. NOTTINGHAM 3/4/11



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6/09/98

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	60

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

METRIC

5 0 10

CONST.REV.

R/W REV.

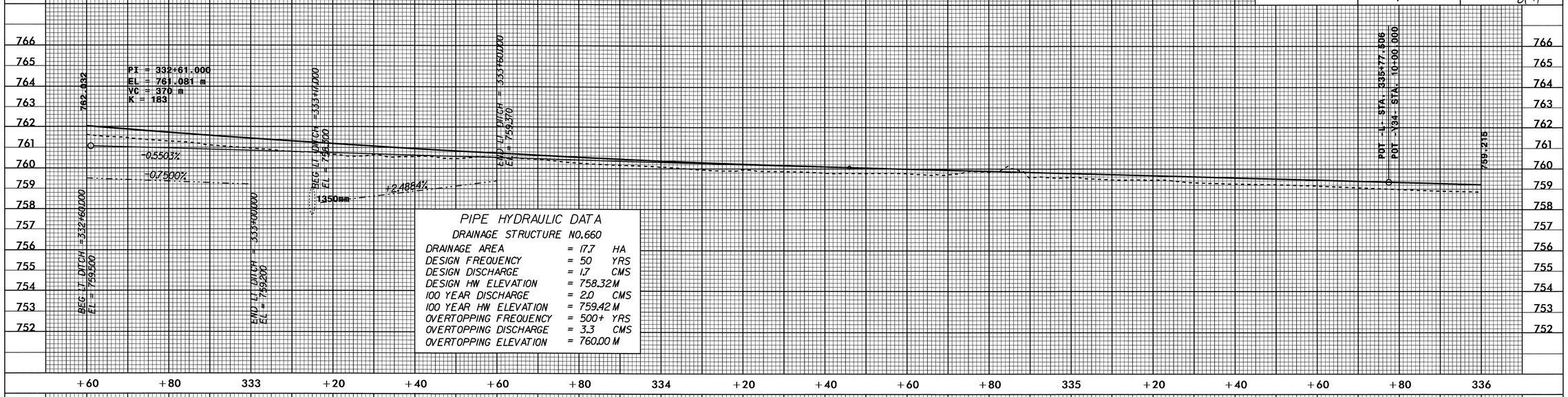
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE 2/4/11

B.L. Moore

NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A. NOTTINGHAM 2/4/11

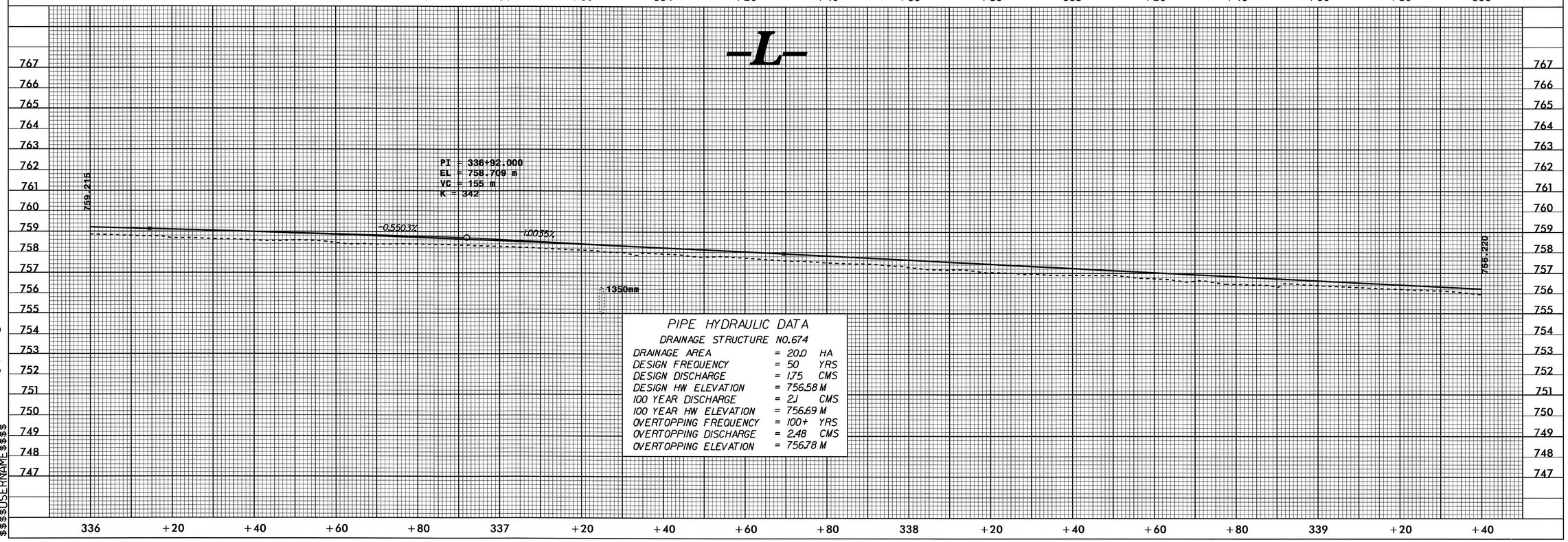
** DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED FROM 100kph (60mph) TO 80kph (50mph)

BM #212 SPIKE SET IN 35" SYCAMORE TREE
-L- STA 335+50.16, 146.538m RT
ELEV. 758.772 m



PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.660

DRAINAGE AREA	= 17.7	HA
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 1.7	CMS
DESIGN HW ELEVATION	= 758.32 M	
100 YEAR DISCHARGE	= 2.0	CMS
100 YEAR HW ELEVATION	= 759.42 M	
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 3.3	CMS
OVERTOPPING ELEVATION	= 760.00 M	



PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.674

DRAINAGE AREA	= 20.0	HA
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 1.75	CMS
DESIGN HW ELEVATION	= 756.58 M	
100 YEAR DISCHARGE	= 2.1	CMS
100 YEAR HW ELEVATION	= 756.69 M	
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING DISCHARGE	= 2.48	CMS
OVERTOPPING ELEVATION	= 756.78 M	

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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	61

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE 3/4/11

B.L. Moore

HYDRAULICS ENGINEER

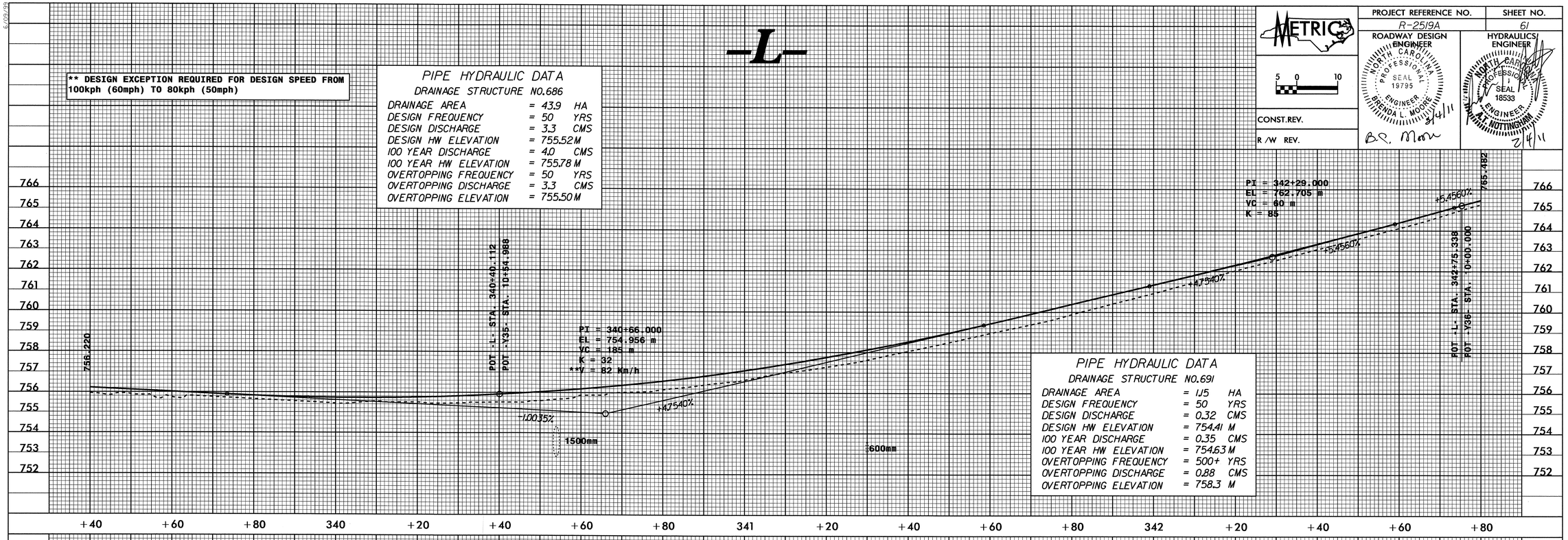
NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER T. NOTTINGHAM 3/4/11

METRIC

5 0 10

CONST.REV.

R/W REV.



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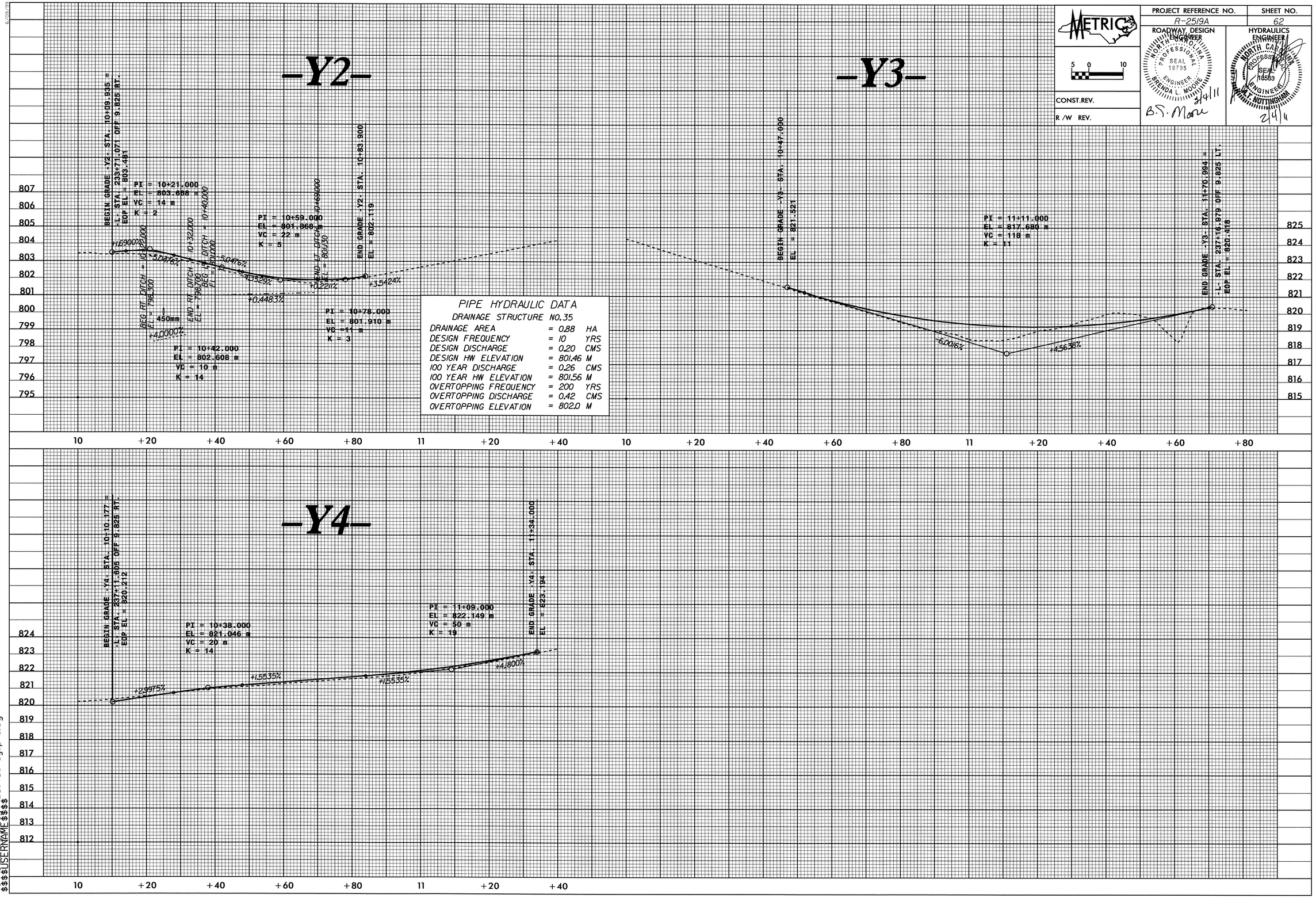
PROJECT REFERENCE NO.	SHEET NO.
R-2519A	62

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

CONST.REV.

R/W REV.



PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.35

DRAINAGE AREA	= 0.88	HA
DESIGN FREQUENCY	= 10	YRS
DESIGN DISCHARGE	= 0.20	CMS
DESIGN HW ELEVATION	= 801.46	M
100 YEAR DISCHARGE	= 0.26	CMS
100 YEAR HW ELEVATION	= 801.56	M
OVERTOPPING FREQUENCY	= 200	YRS
OVERTOPPING DISCHARGE	= 0.42	CMS
OVERTOPPING ELEVATION	= 802.0	M

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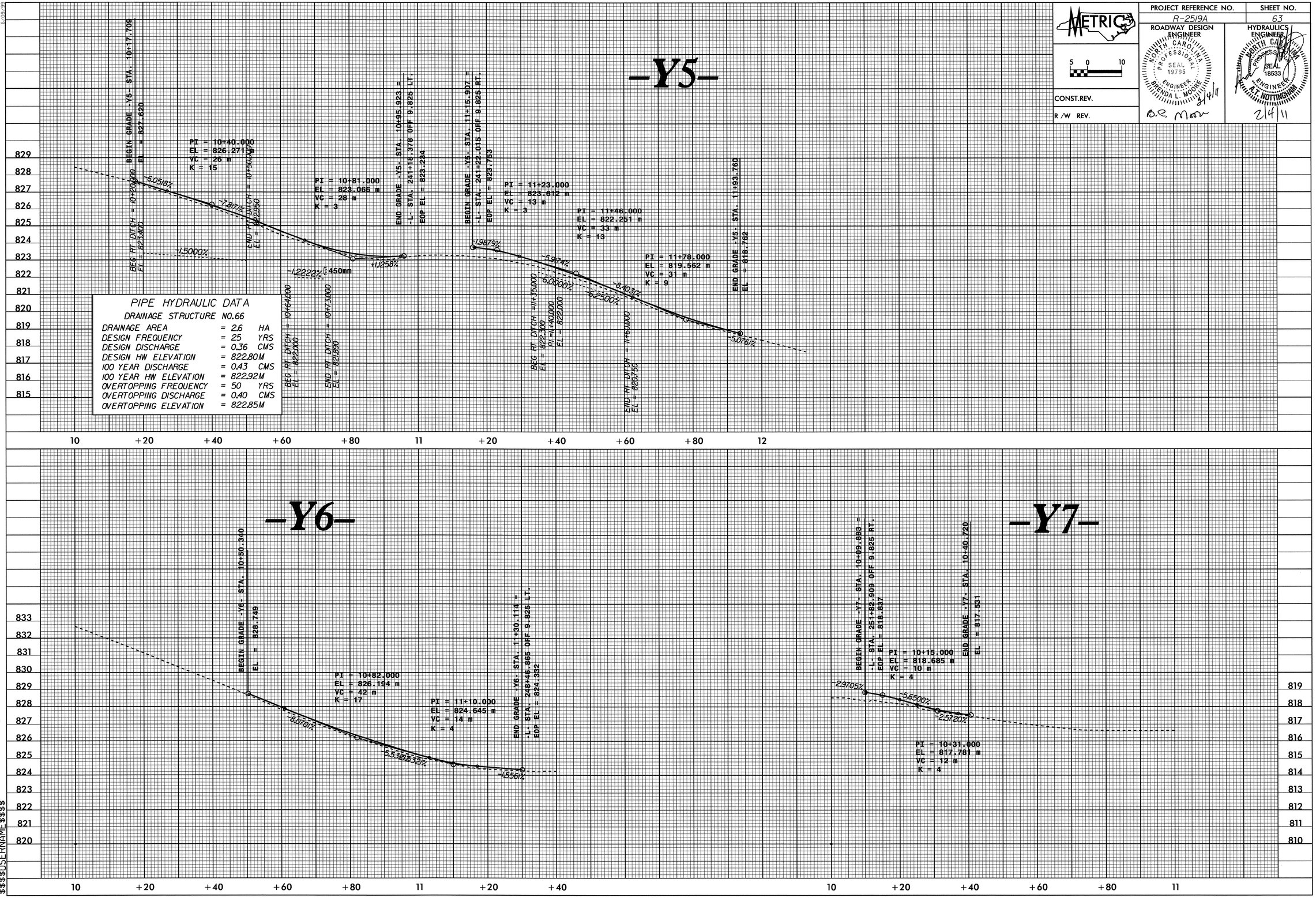
METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	R-2519A	63
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R/W REV.	NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE 2/4/11	NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM 2/4/11



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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	64

METRIC

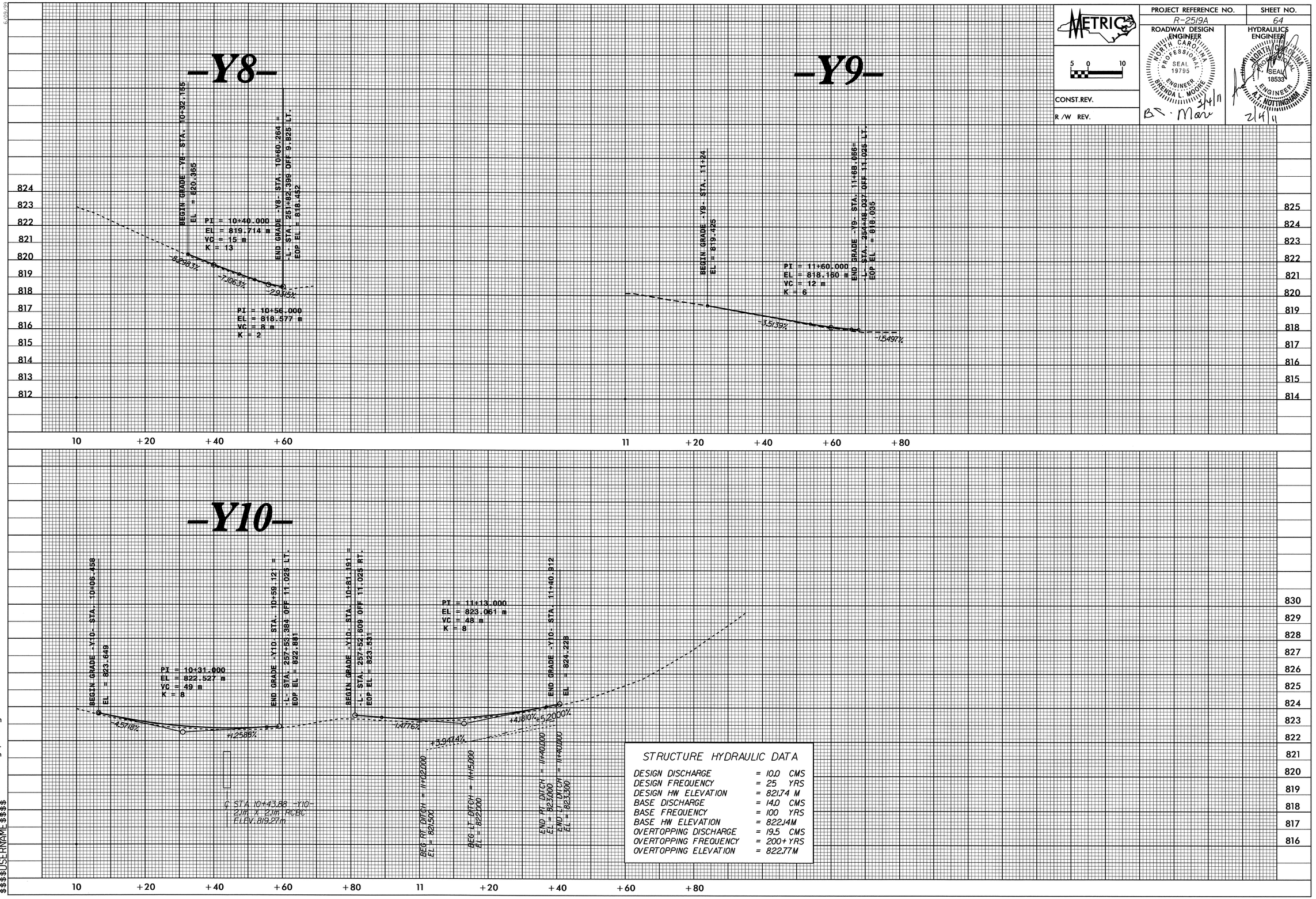
5 0 10

CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE
BP. Moore 2/4/11

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A. NOTTINGHAM
2/4/11



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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	65

METRIC

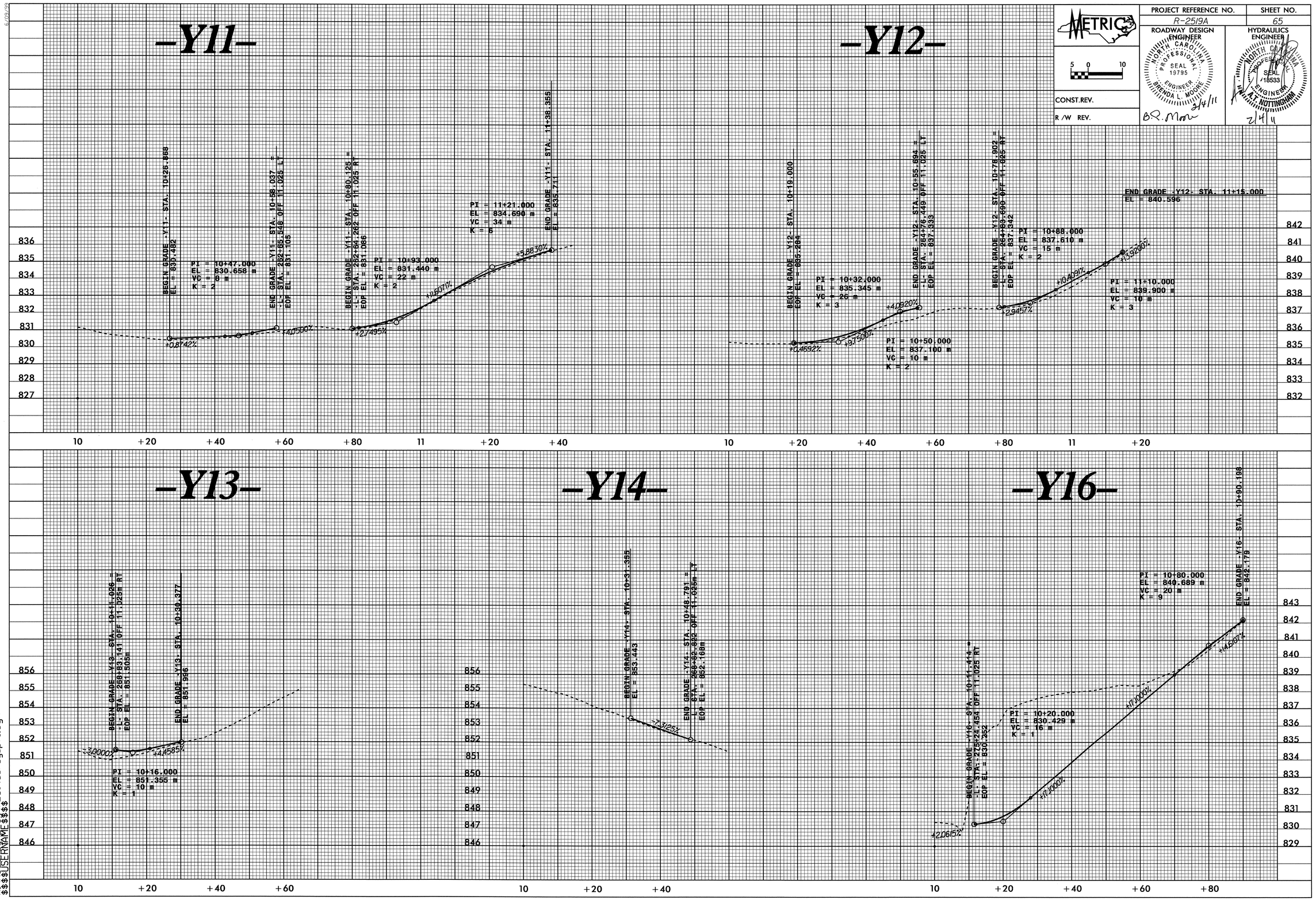
5 0 10

CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE
2/4/11
B.R. Moore

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER ANN T. NOTTINGHAM
2/4/11



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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	66

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 19793 ENGINEER BRENDA L. MOORE 2/4/11 B.L. Moore

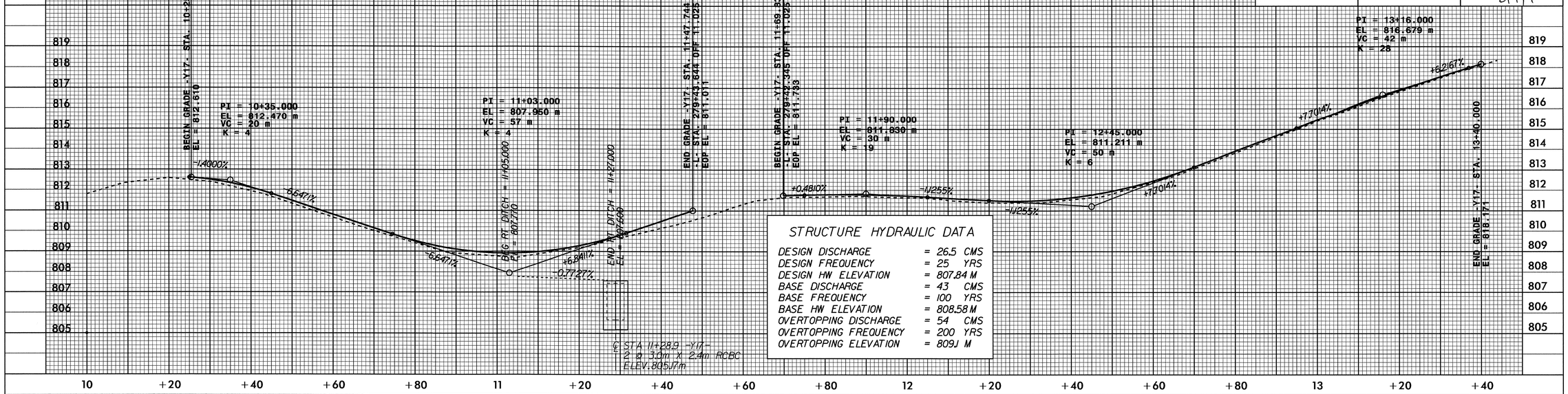
HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM 2/4/11

METRIC 5 0 10

CONST.REV.

R/W REV.

-Y17-

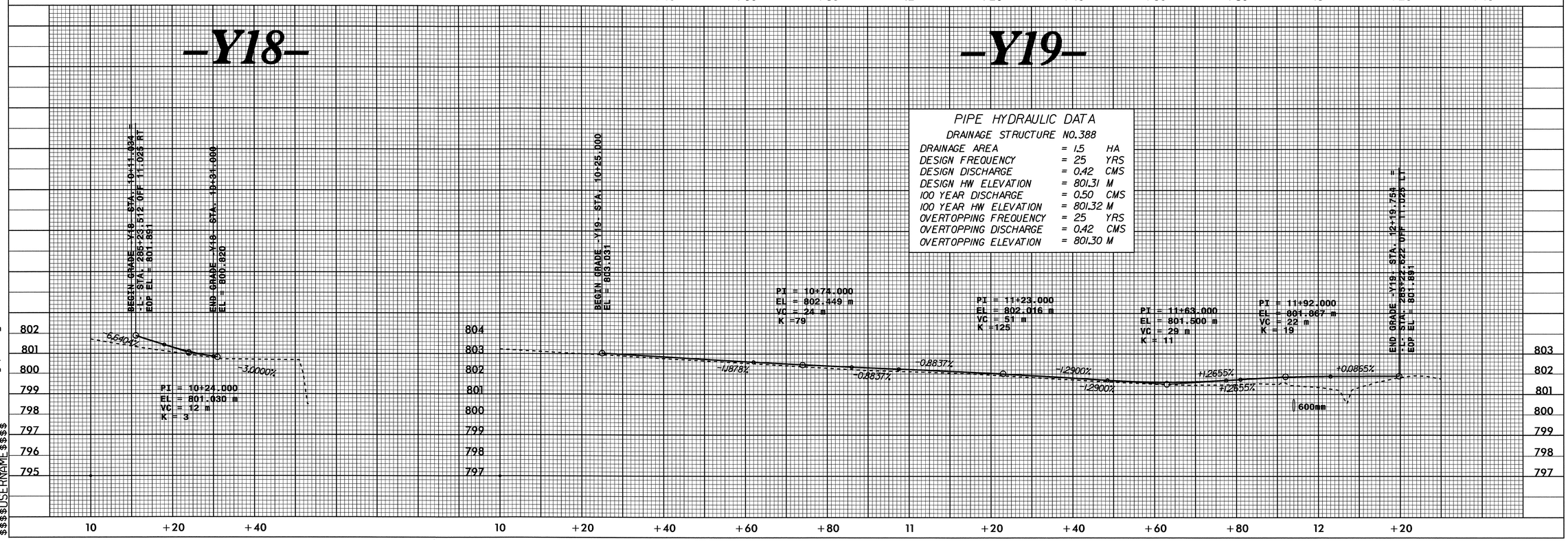


STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 26.5	CMS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 807.84	M
BASE DISCHARGE	= 43	CMS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 808.58	M
OVERTOPPING DISCHARGE	= 54	CMS
OVERTOPPING FREQUENCY	= 200	YRS
OVERTOPPING ELEVATION	= 809.1	M

-Y18-

-Y19-



PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.388

DRAINAGE AREA	= 1.5	HA
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 0.42	CMS
DESIGN HW ELEVATION	= 801.31	M
100 YEAR DISCHARGE	= 0.50	CMS
100 YEAR HW ELEVATION	= 801.32	M
OVERTOPPING FREQUENCY	= 25	YRS
OVERTOPPING DISCHARGE	= 0.42	CMS
OVERTOPPING ELEVATION	= 801.30	M

6/29/95

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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	67

METRIC

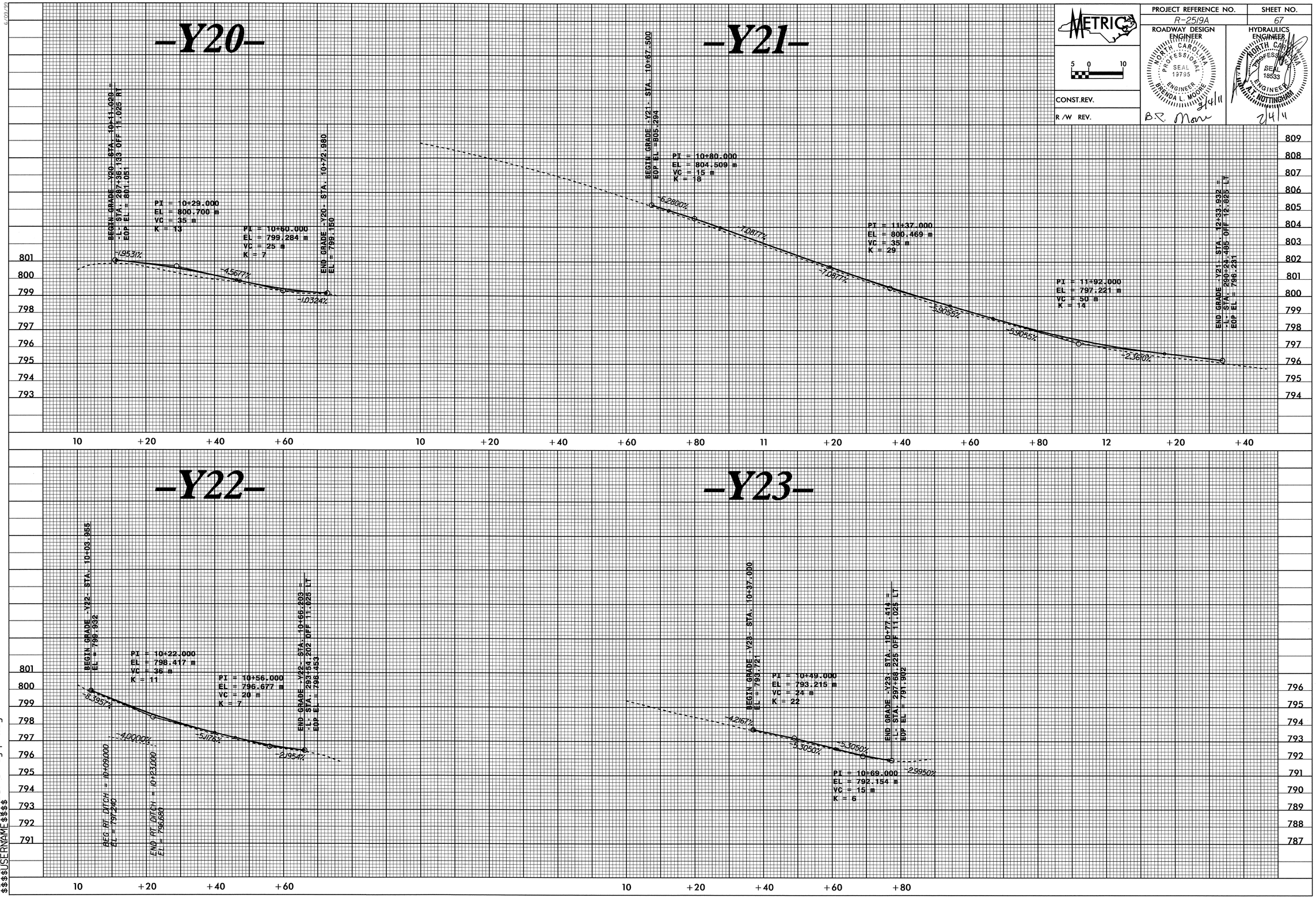
5 0 10

CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE
B.R. Moore 2/4/11

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A. NOTTINGHAM
2/4/11



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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	68

METRIC

5 0 10

CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE

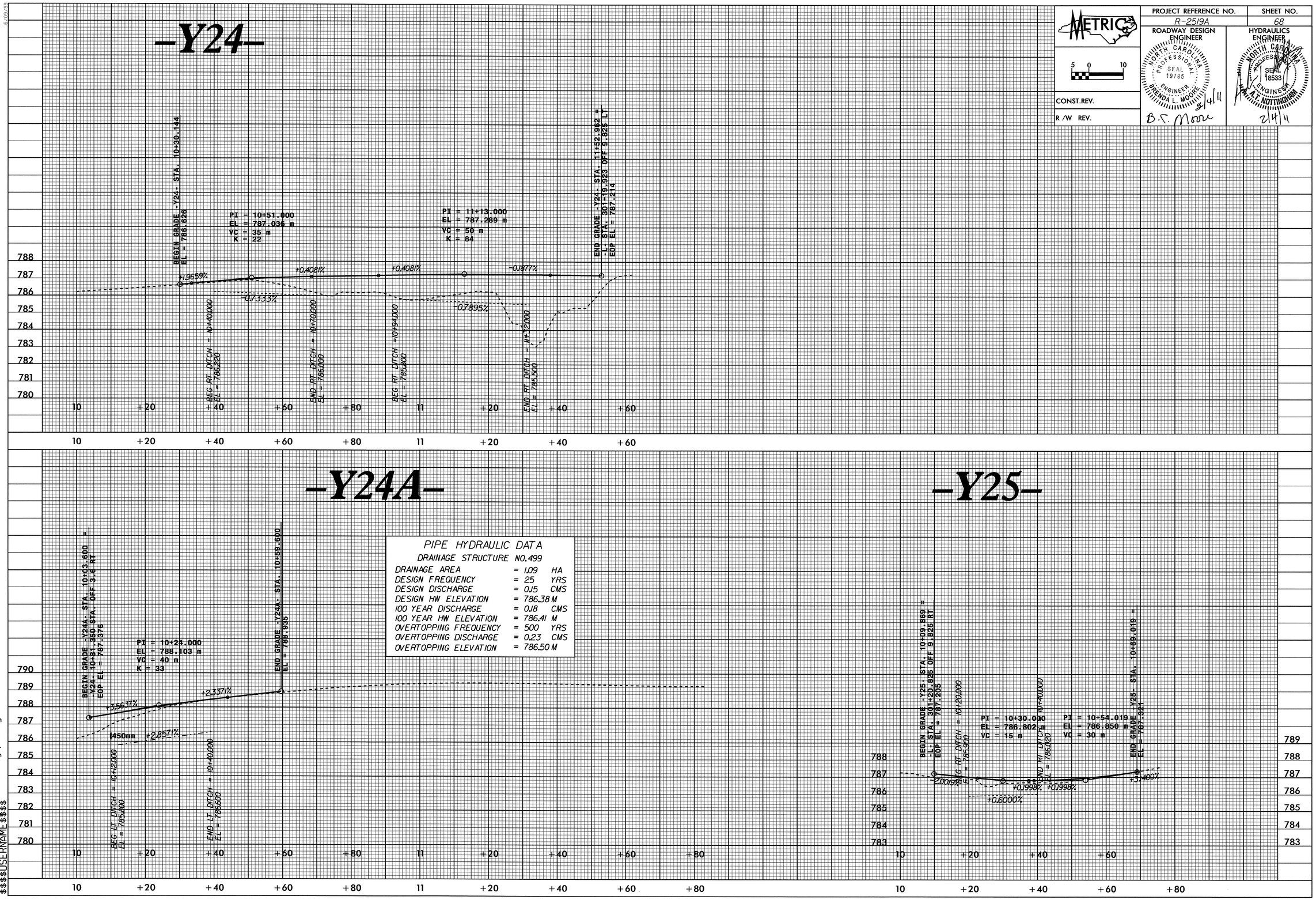
2/4/11

B.C. Moore

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM

2/4/11



PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.499

DRAINAGE AREA	= 1.09	HA
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 0.15	CMS
DESIGN HW ELEVATION	= 786.38	M
100 YEAR DISCHARGE	= 0.18	CMS
100 YEAR HW ELEVATION	= 786.41	M
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 0.23	CMS
OVERTOPPING ELEVATION	= 786.50	M

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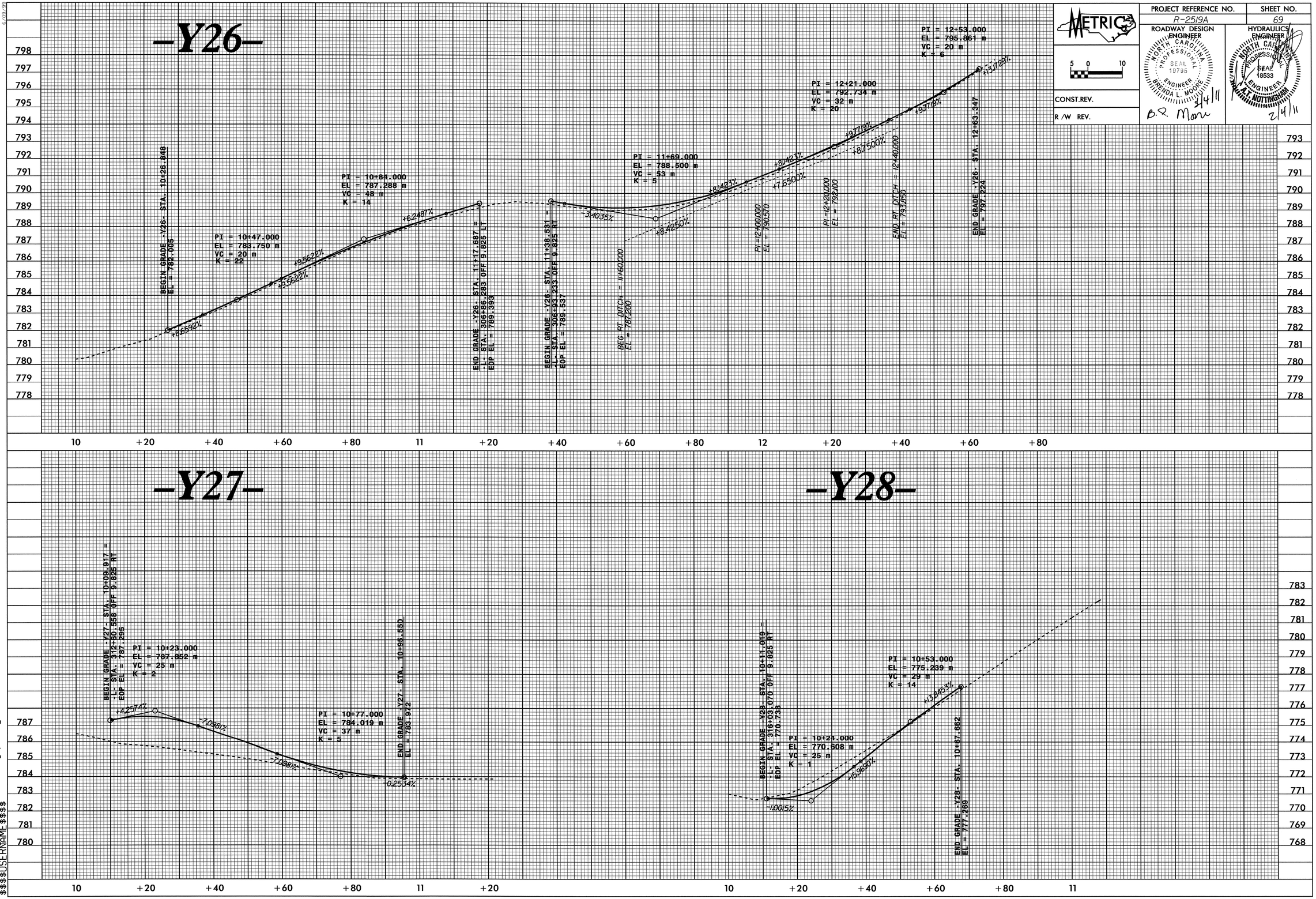
PROJECT REFERENCE NO.	SHEET NO.
R-2519A	69

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

CONST.REV.

R /W REV.



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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	70

METRIC

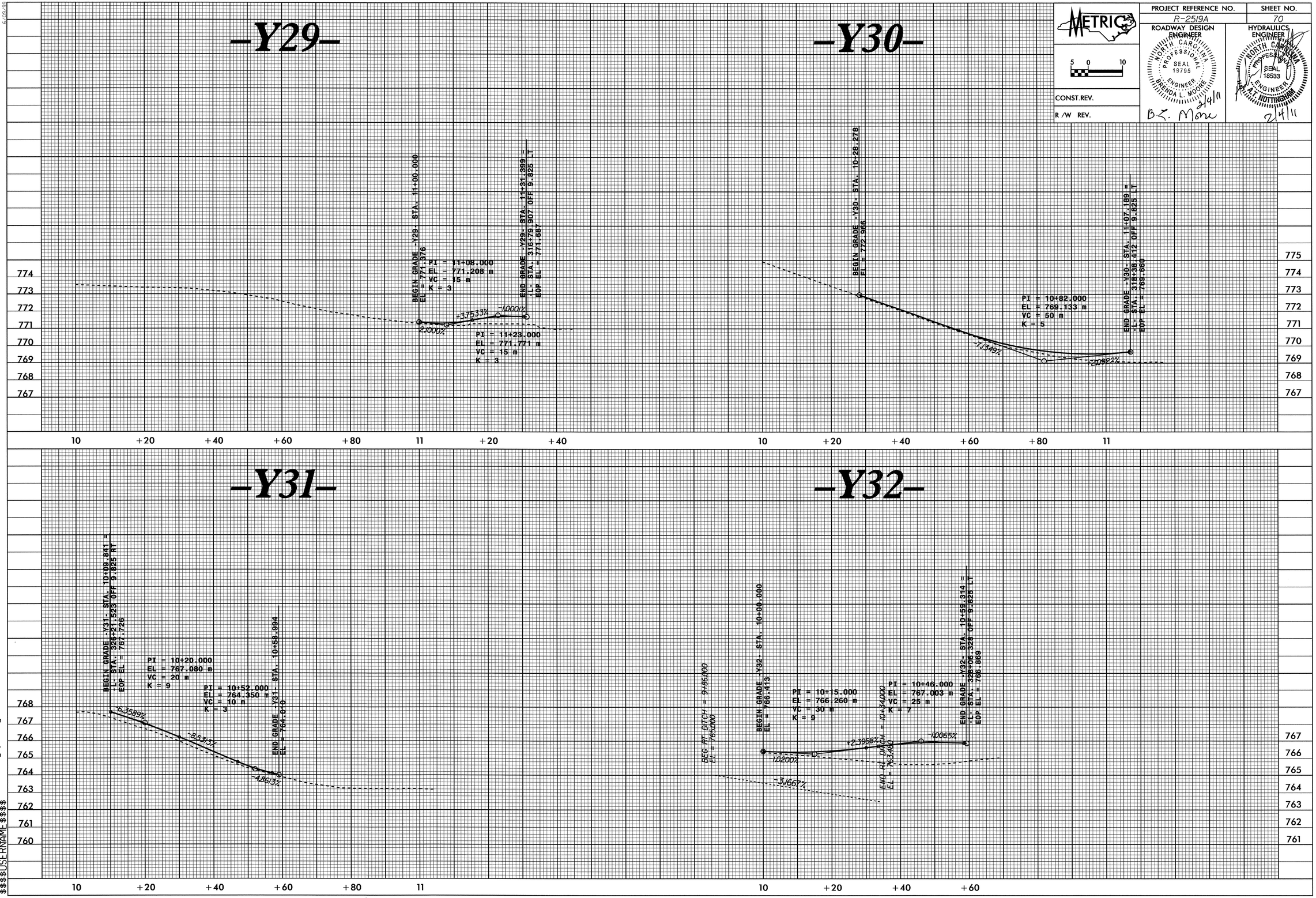
5 0 10

CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE
2/4/11
B.L. Moore

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A. NOTTINGHAM
2/4/11



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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	71

METRIC

5 0 10

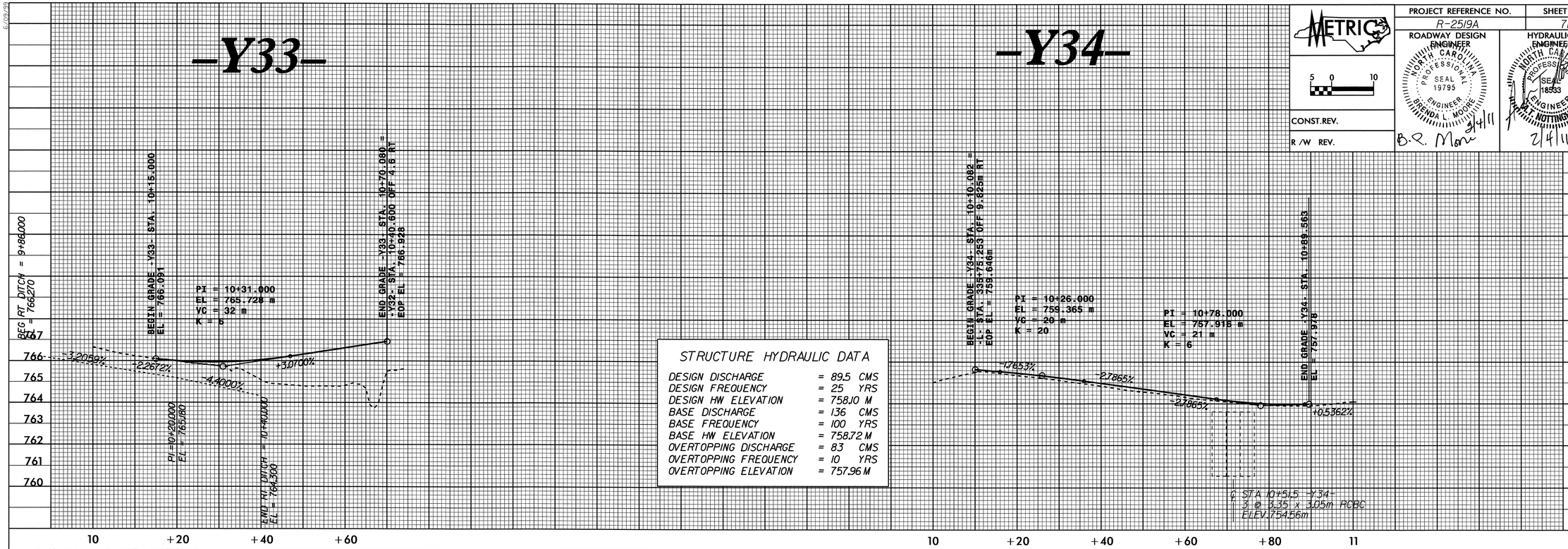
CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE
B.L. Moore 2/4/11

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18933 ENGINEER M.T. NOTTINGHAM
2/4/11

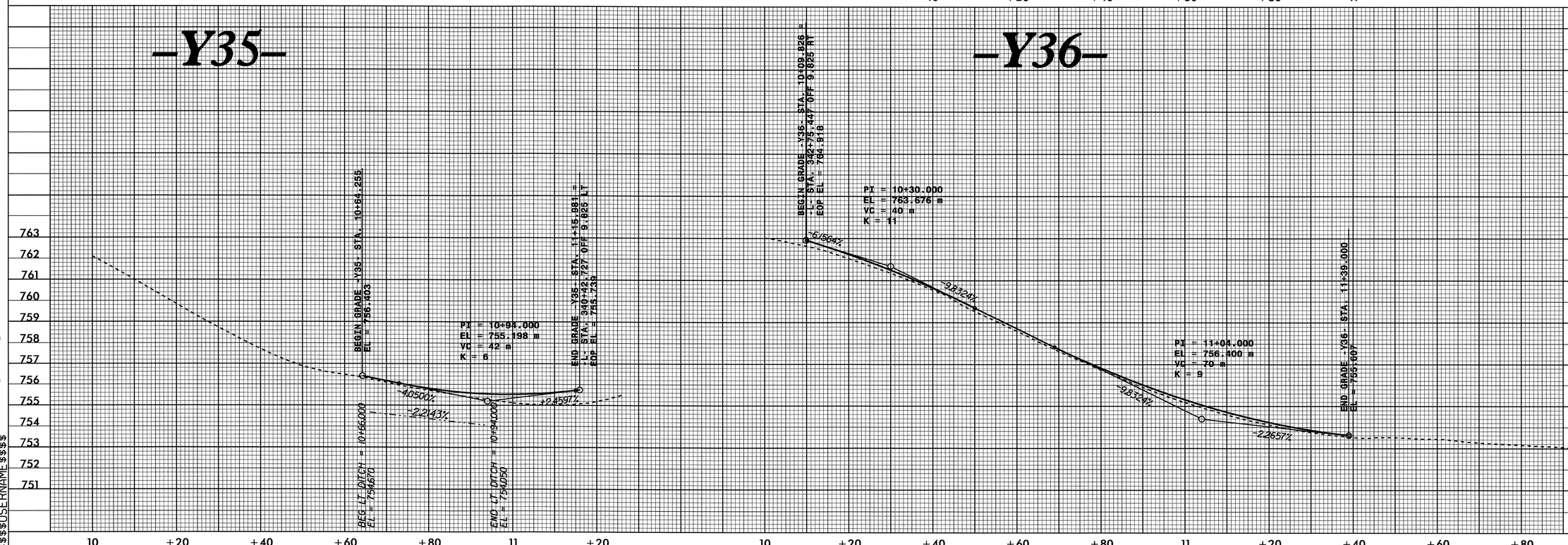
-Y33-



STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 89.5	CMS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 758.10	M
BASE DISCHARGE	= 136	CMS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 758.72	M
OVERTOPPING DISCHARGE	= 83	CMS
OVERTOPPING FREQUENCY	= 10	YRS
OVERTOPPING ELEVATION	= 757.96	M

-Y35-



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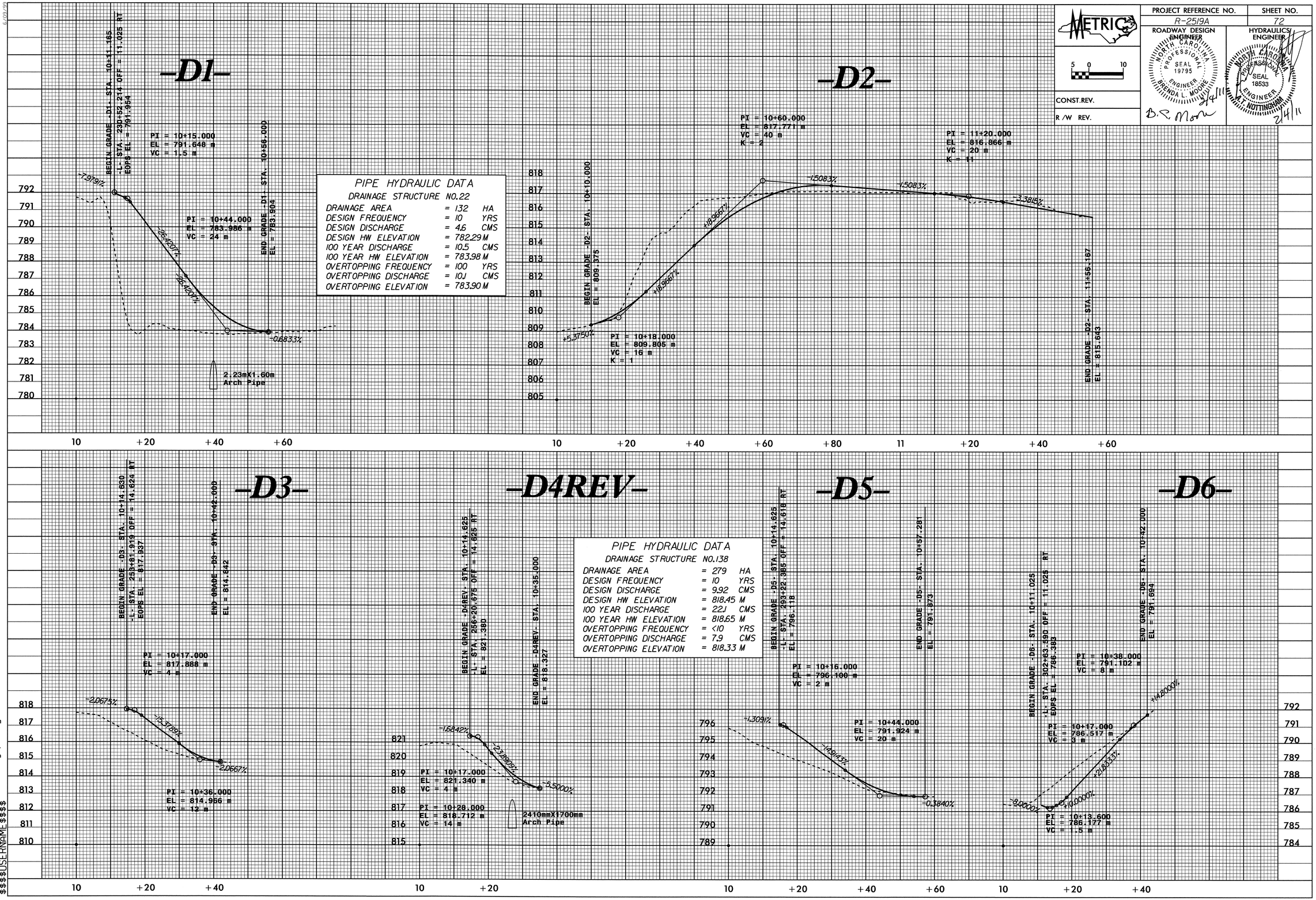
PROJECT REFERENCE NO.	SHEET NO.
R-2519A	72

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

CONST. REV.

R/W REV.



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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	73

METRIC

5 0 10

CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE

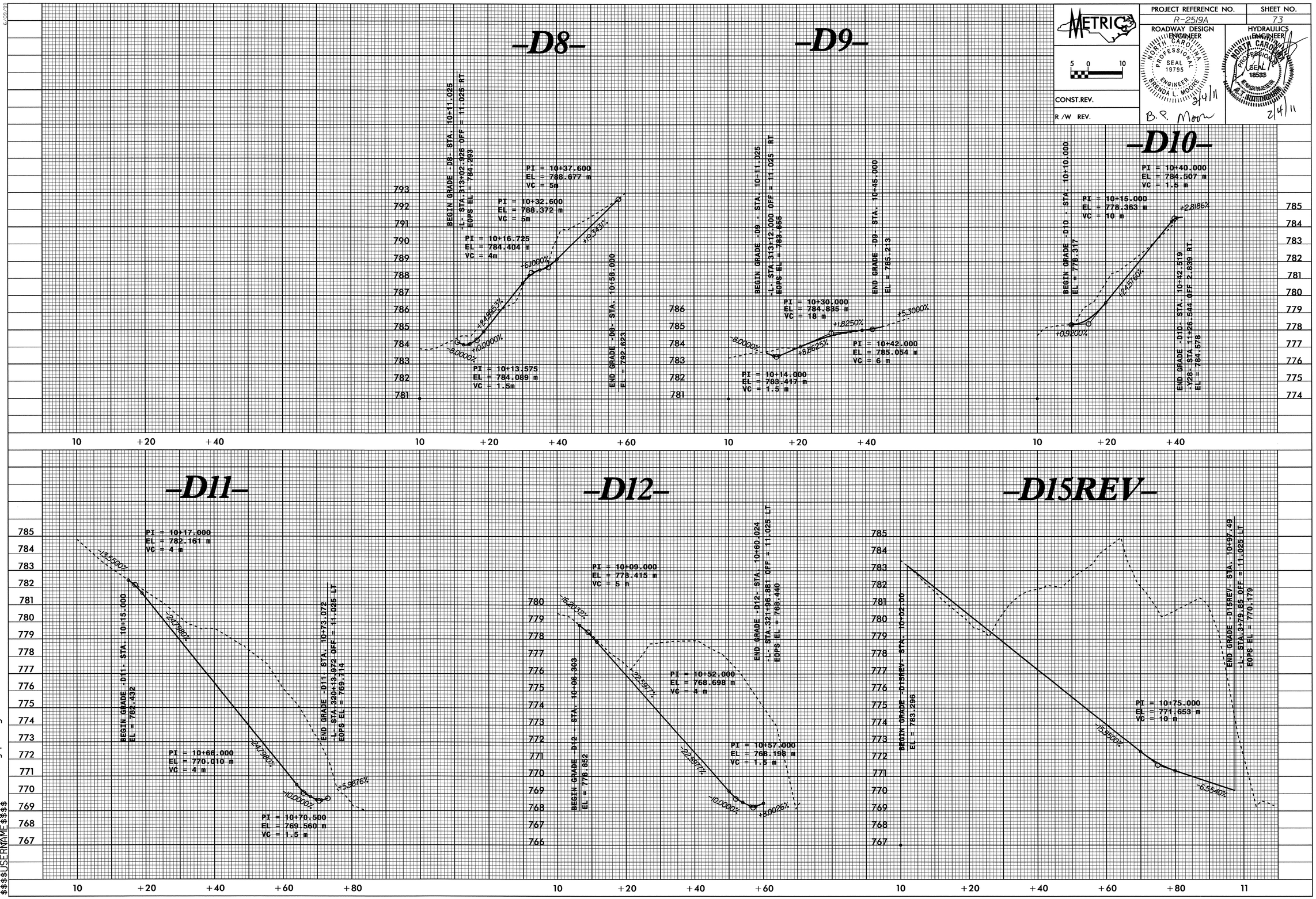
2/4/11

B.P. Moore

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NUTTINGHAM

2/4/11



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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	74

METRIC

5 0 10

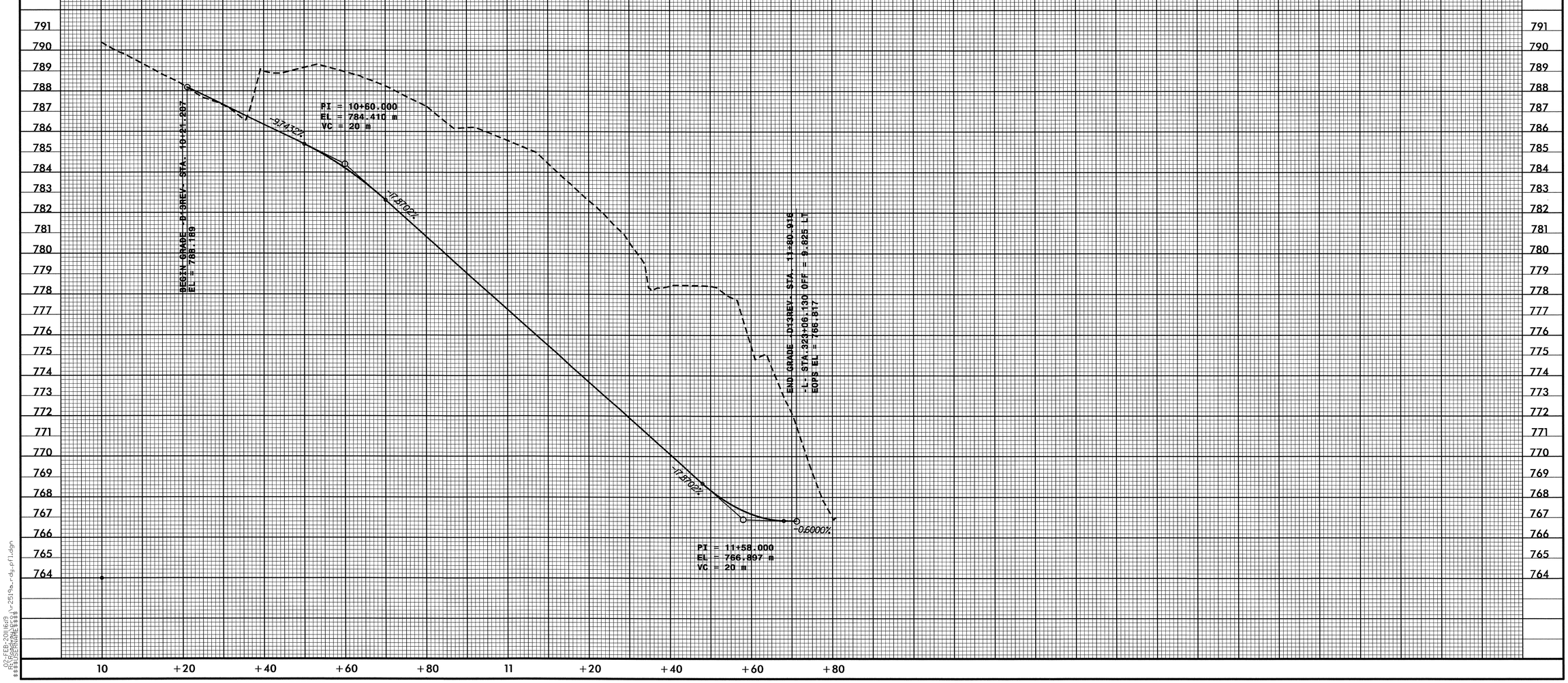
CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE
B.R. Moore 2/4/11

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM
2/4/11

-D13REV-



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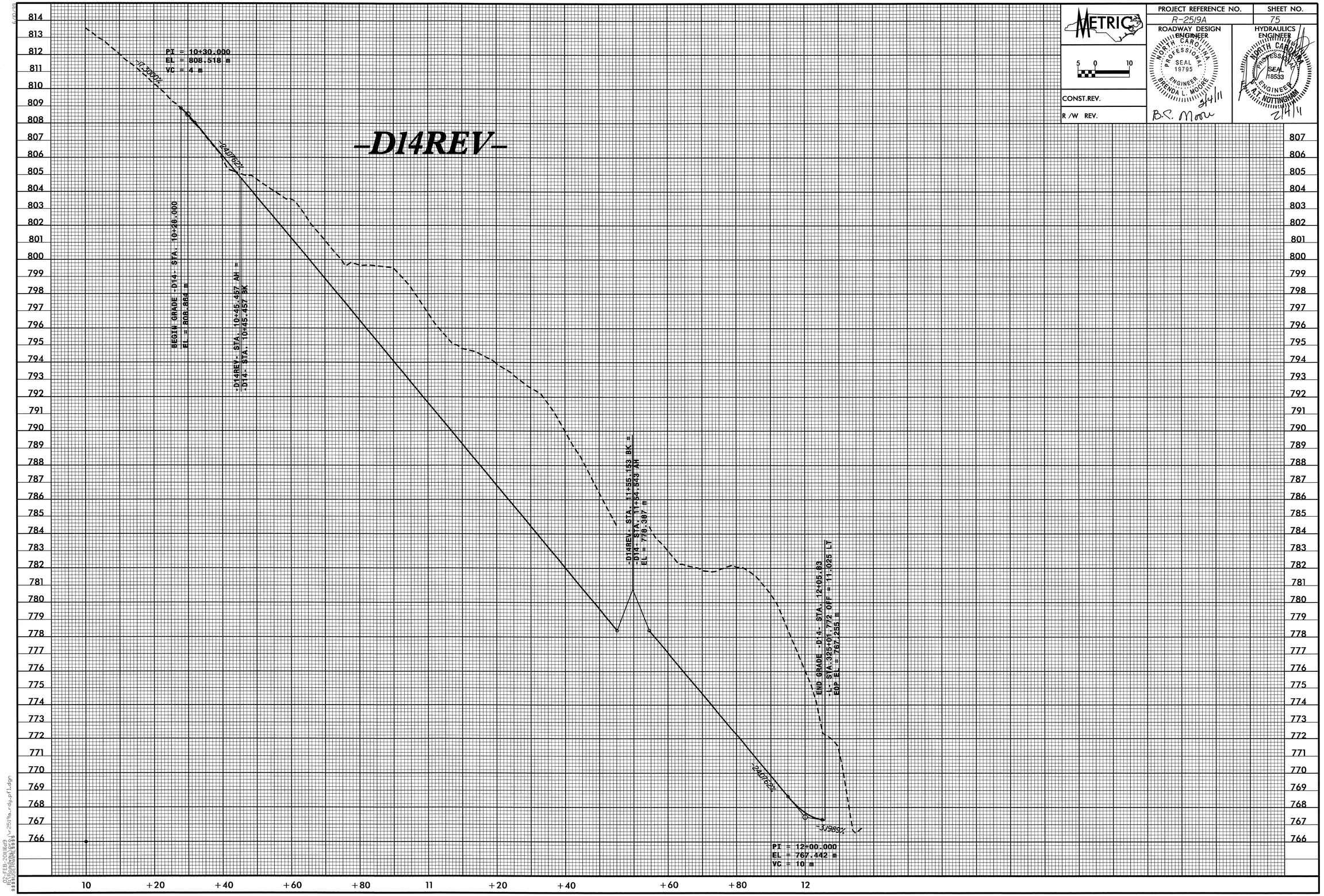

METRIC
PROJECT REFERENCE NO.
R-2519A
SHEET NO.
75
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R/W REV.
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE
NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM
2/4/11
B.C. Moore
-D14REV-
PI = 10+30.000
EL = 808.518 m
VC = 4 m
-17.3000%
-24.0762%
BEGIN GRADE -D14- STA. 10+28.000
EL = 808.864 m
-D14REV- STA. 10+45.457 AH =
-D14- STA. 10+45.457 BK
-D14REV- STA. 11+55.153 BK =
-D14- STA. 11+54.543 AH
EL = 778.387 m
END GRADE -D14- STA. 12+05.83
-L- STA. 325+01.772 OFF = 11.025 LT
EOP EL = 767.255 m
-24.0762%
-3.1989%
PI = 12+00.000
EL = 767.442 m
VC = 10 m
10
+20
+40
+60
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11
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+80
12

PROJECT REFERENCE NO.	SHEET NO.
R-2519A	76

METRIC

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CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER

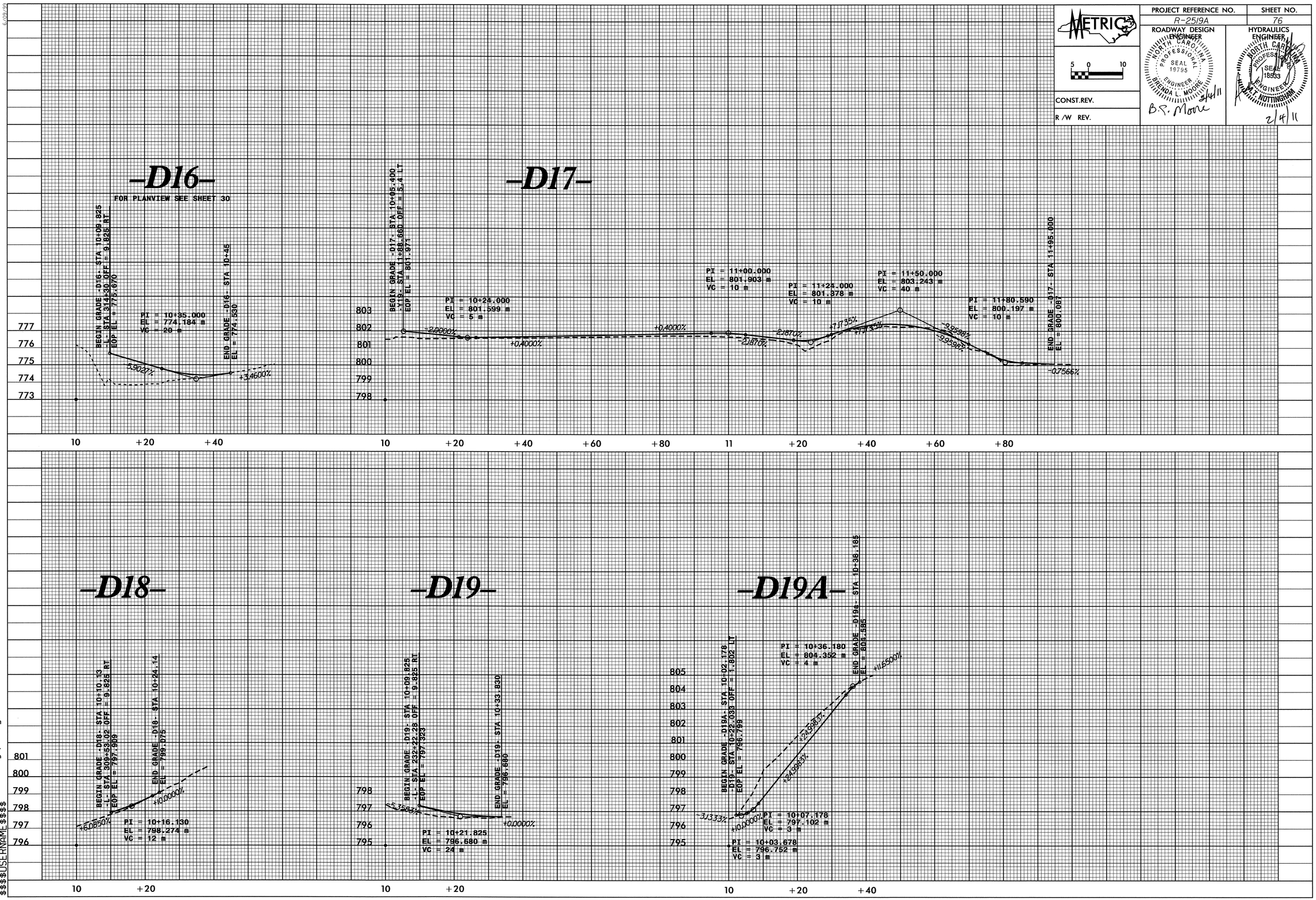
NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE

B.L. Moore 2/4/11

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER T. NOTTINGHAM

2/4/11



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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	77

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE

B.L. Moore 2/4/11

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.F. NOTTINGHAM

A.F. Nottingham 2/4/11

METRIC

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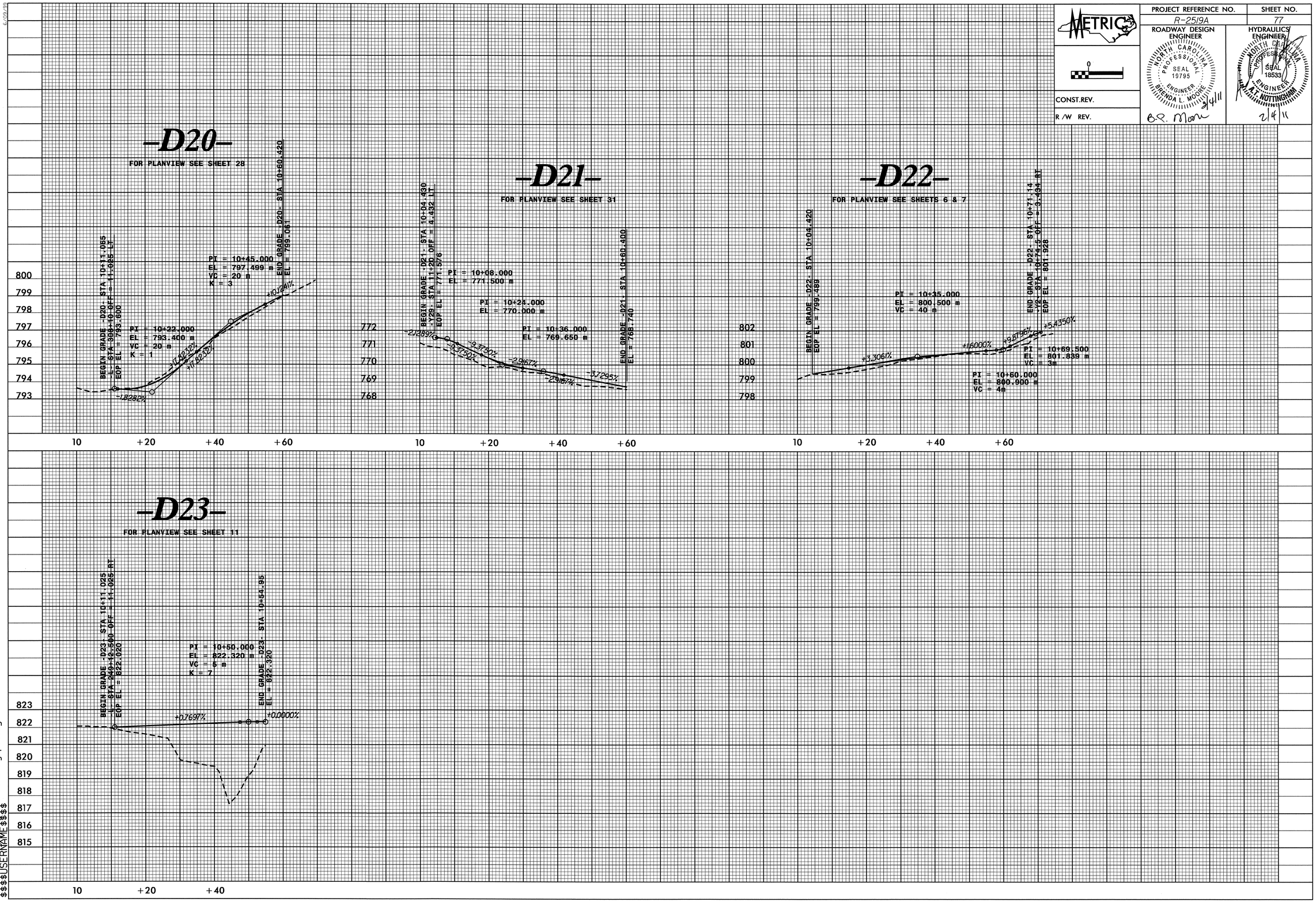
CONST.REV.

R/W REV.



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PROJECT REFERENCE NO.	SHEET NO.
R-2519A	78

METRIC

5 0 10

CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19795 ENGINEER BRENDA L. MOORE

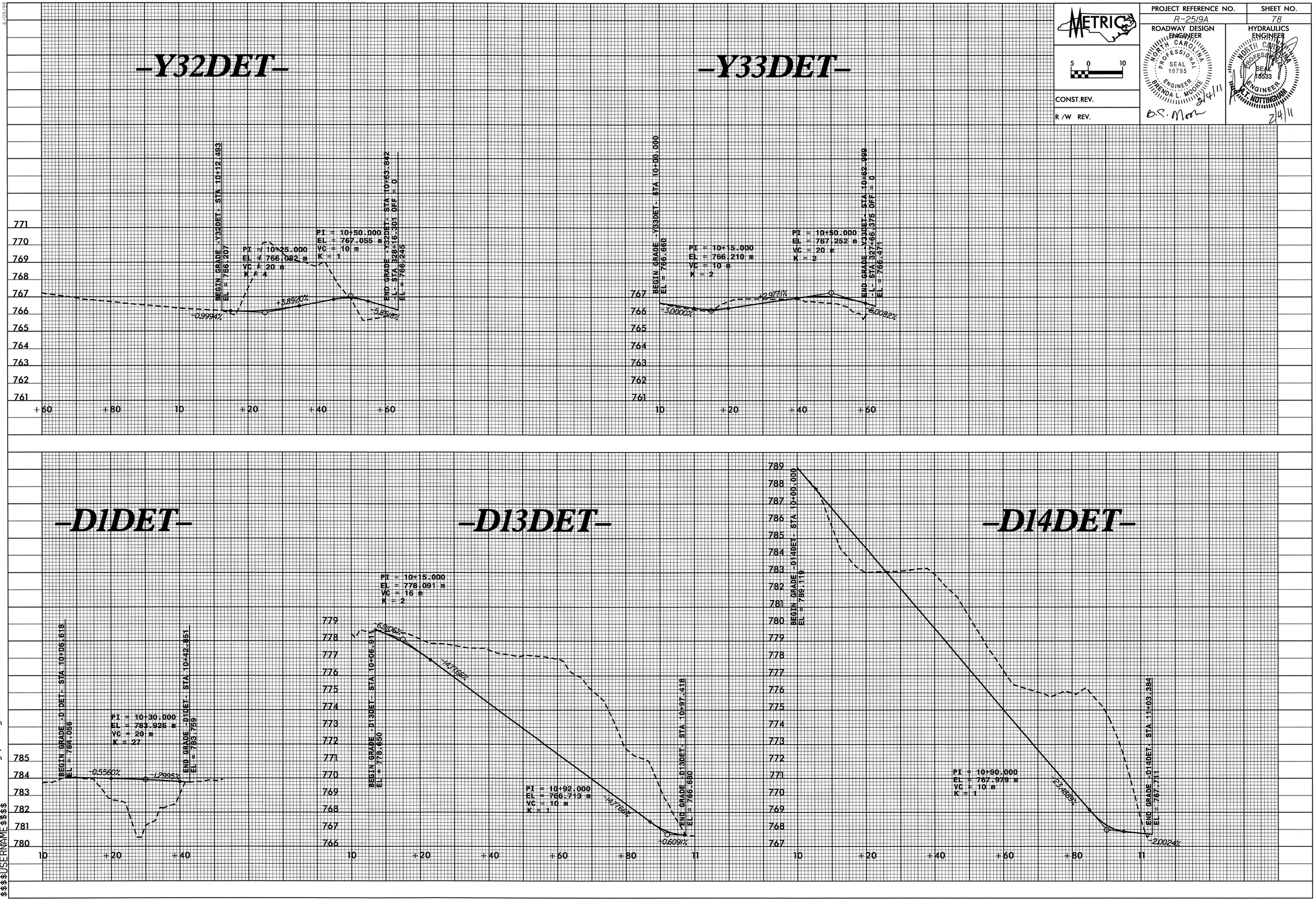
2/4/11

B.C. Moore

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A.T. NOTTINGHAM

2/4/11



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