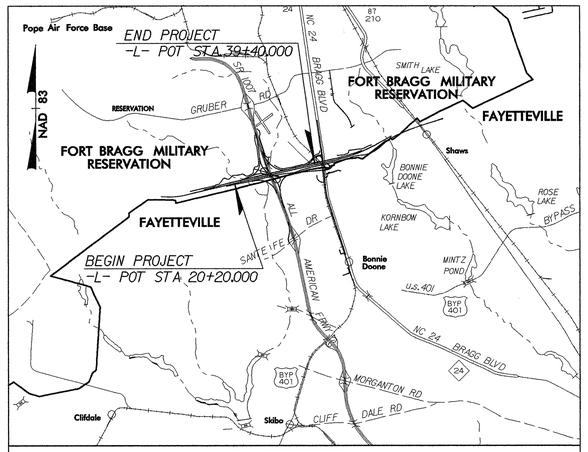
TIP PROJECT: U-2519DA

CONTRACT: C202028

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




VICINITY MAP

# STATE OF NORTH CAROLINA
# DIVISION OF HIGHWAYS

# CUMBERLAND COUNTY

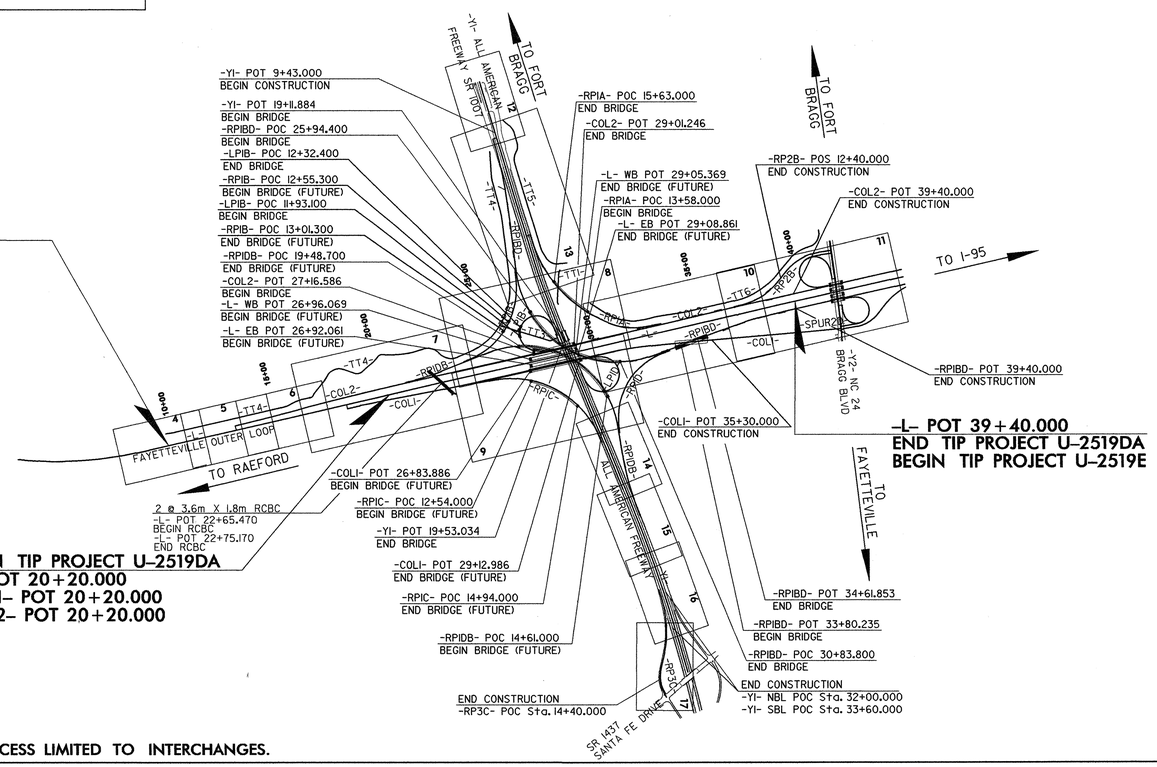
***LOCATION: FAYETTEVILLE OUTER LOOP FROM EAST OF SR 1415 TO WEST OF NC 24 (BRAGG BOULEVARD)***

***TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, CULVERTS, SIGNING, WIDENING, RETAINING WALL***

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

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| N.C. | U-2519DA | 1 | |

| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION |
|---|---|---|
| 34817.1.2 | NHF-DPR-0100(001) | PE |
| 34817.2.4 | NHF-100(9) | R/W and UTIL |
| 34817.3.12 | NHF-0100(21) | CONST |




THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS LIMITED TO INTERCHANGES.

***GRAPHIC SCALE***

5 0 10
PLANS

5 0 10
PROFILE (HORIZONTAL)

1 0 2
PROFILE (VERTICAL)

***DESIGN DATA***

ADT 2007 = 27300
ADT 2030 = 66200
DHV = 9 %
D = 55 %
T = 12 %
(DUALS 8 %, TTST 4 %)
V = 110 km/h
FUNCT CLASS = INTERSTATE

***PROJECT LENGTH***

| | | |
|---|---|---|
| LENGTH ROADWAY TIP PROJECT U-2519DA | 1.693 | KM. |
| LENGTH STRUCTURES TIP PROJECT U-2519DA | 0.227 | KM. |
| TOTAL LENGTH TIP PROJECT U-2519DA | 1.920 | KM. |

NOTE: EB LANE BRIDGE STATIONING USED TO DETERMINE LENGTH OF STRUCTURES

PLANS PREPARED BY:
*FLORENCE & HUTCHESON, INC.*
*CONSULTING ENGINEERS*
*4020 WESTCHASE BLVD., SUITE 475*
*RALEIGH, NC 27607*
*PREPARED FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION*

***2006 STANDARD SPECIFICATIONS***

***RIGHT OF WAY DATE:***
MAY 19, 2006

***LETTING DATE:***
SEPTEMBER 20, 2011

***NCDOT CONTACT:***

DENNIS J. MORY, P.E.
*PROJECT ENGINEER*

HENRY W. BARE
*PROJECT DESIGN ENGINEER*

K. ZAK HAMIDI, P.E.
*ROADWAY DESIGN - PROJECT ENGINEER*

***HYDRAULICS ENGINEER***
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS JR.
SIGNATURE: 8/19/11 P.E.

***ROADWAY DESIGN***
NORTH CAROLINA PROFESSIONAL SEAL 19661 ENGINEER DENNIS JAMES MORY
8-19-11 P.E.
SIGNATURE:

***DIVISION OF HIGHWAYS***
***STATE OF NORTH CAROLINA***

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

Art McMillan P.E.
*STATE HIGHWAY DESIGN ENGINEER*

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| PROJ. REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | I-A |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORT

8-19-11

C202028

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 STANDARD DRAWINGS |
| 1-B | CONVENTIONAL SYMBOLS |
| 1-C THRU 1-D | SURVEY CONTROL DATA |
| 1-E | CENTERLINE COORDINATE LIST |
| 2 THRU 2-F | PAVEMENT SCHEDULE, TYPICAL SECTIONS AND TYPICAL DETAILS |
| 2-G THRU 2-H | DRAINAGE DITCH DETAILS |
| 2-I | BRIDGE SKETCHES |
| 2-J THRU 2-Q | SHEAR POINT DIAGRAM |
| 2-R THRU 2-Y | FENCE LAYOUT |
| 2-Z | TEMPORARY BRIDGE APPROACH FILL |
| 2-AA THRU 2-AB | CHAIN LINK SECURITY FENCE with BARBED WIRE DETAILS |
| 2-AC | 750mm CURB & GUTTER TRANSITION TO 150X200 APPROACH SLAB CURB |
| 2-AD | CHIPPED TIRE MATERIAL DETAIL |
| 2-AE | MODIFIED CONCRETE FLUME DETAIL |
| 2-AF | SPECIAL JUNCTION BOX DETAIL |
| 2-AG | SPECIAL JUNCTION BOX DETAIL |
| 2-AH THRU 2-AI | DETAIL FOR GEOGRID REINFORCED SOIL SLOPE |
| 2-AJ | DETAIL FOR HIGH STRENGTH FABRIC FOR EMBANKMENT STABILIZATION |
| 2-AK | DETAIL FOR ROCK PLATING |
| 2-AL THRU 2-AO | DETAIL FOR TEMPORARY MEDIAN CROSSOVERS |
| 2-AP THRU 2-AQ | DETAILS FOR METHOD OF PIPE INSTALLATION |
| 2-AR | DETAIL TO CONVERT EXISTING DROP INLET OR CATCH BASIN TO JUNCTION BOX |
| 2-AS | DETAIL FOR STANDARD TEMPORARY SHORING |
| 3 | SUMMARY OF QUANTITIES (2 SHEETS) |
| 3-A THRU 3-H | DRAINAGE SUMMARY |
| 3-I | GUARDRAIL SUMMARY |
| 3-J | CABLE GUIDERAIL AND FENCE SUMMARIES<br>SUMMARY OF PAVEMENT REMOVAL |
| 3-K | EARTHWORK SUMMARY |
| 3-L | PARCEL INDEX SHEET |
| 3-M | FUTURE GUARDRAIL SUMMARY |
| 4 THRU 17 | PLAN SHEETS |
| 18 THRU 67 | PROFILE SHEETS |
| TCP-1 THRU TCP-43 | TRAFFIC CONTROL PLANS |
| PM-1 THRU PM-10 | PAVEMENT MARKING PLANS |
| EC-1 THRU EC-25 | EROSION CONTROL PLANS |
| RF-1 | REFORESTATION PLAN |
| SIGN-1 THRU SIGN-8 | SIGNING PLANS |
| UC-1 THRU UC-2 | UTILITY CONSTRUCTION PLANS |
| UO-1 THRU UO-5 | UTILITY BY OTHERS (CONFLICT) PLANS |
| X-1, X-1A THRU X-1F | CROSS-SECTION INDEX OF SHEETS AND SUMMARY |
| X-2 THRU X-258 | CROSS-SECTIONS |
| S-1 THRU S-411 | STRUCTURE PLANS |
| SS-1 THRU S-17 | SUPERSTRUCTURE PLANS |
| C-1 THRU C-8 | CULVERT PLANS |
| W-1 THRU W-3 | RETAINING WALL PLANS |

## GENERAL NOTES:

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

### GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED OR FUTURE 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 (Tank Trails and Perimeter Rds Along Ft Bragg) AND METHOD III (Along Remainder of Project).

### SUPERELEVATION:

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

### SHOULDER CONSTRUCTION:

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

### 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.

### GUARDRAIL:

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

### TEMPORARY SHORING:

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

### END BENTS:

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

### UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE TIME WARNER CABLE, PIEDMONT NATURAL GAS,

PROGRESS ENERGY DISTRIBUTION, AND PROGRESS ENERGY TRANSMISSION

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

### RIGHT-OF-WAY MARKERS:

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

## 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 |
| 200.03 | Method of Clearing - Method III |
| 225.01 | Guide for Grading Subgrade - Interstate and Freeway |
| 225.02 | Guide for Grading Subgrade - Secondary and Local |
| 225.03 | Deceleration and Acceleration Lanes |
| 225.04 | Method of Obtaining Superelevation - Two Lane Pavement |
| 225.05 | Method of Obtaining Superelevation - Divided Highways |
| 225.09 | Guide for Shoulder and Ditch Transition at Grade Separations |
| 240.01 | Guide for Berm Ditch Construction |
| DIVISION 4 - MAJOR STRUCTURES | |
| 422.10 | Reinforced Bridge Approach Fills |
| DIVISION 5 - SUBGRADE, BASES AND SHOULDERS | |
| 560.02 | Method of Shoulder Construction - High Side of Superelevated Curve - Method II |
| DIVISION 6 - ASPHALT BASES AND PAVEMENTS | |
| 610.02 | Guide for Paving Shoulders Under Bridges - Method II |
| 610.03 | Guide for Paving Shoulders Under Bridges - Method III |
| 654.01 | Pavement Repairs |
| 665.01 | Milled Rumble Strips - Asphalt Pavements |
| DIVISION 8 - INCIDENTALS | |
| 815.03 | Pipe Underdrain and Blind Drain |
| 838.01 | Concrete Endwall for Single and Double Pipe Culverts - 375mm thru 1200mm Pipe 90 Skew |
| 838.11 | Brick Endwall for Single and Double Pipe Culverts - 375mm thru 1200mm Pipe 90 Skew |
| 838.39 | Reinforced Concrete Endwall - for Single 1800mm Pipe 90 Skew |
| 838.45 | Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40 |
| 838.69 | 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 |
| 840.17 | Concrete Grated Drop Inlet Type 'A' - 300mm thru 1800mm Pipe |
| 840.18 | Concrete Grated Drop Inlet Type 'B' - 300mm thru 900mm Pipe |
| 840.19 | Concrete Grated Drop Inlet Type 'D' - 300mm thru 900mm Pipe |
| 840.20 | Frames and Wide Slot Flat Grates |
| 840.22 | Frames and Wide Slot Sag Grates |
| 840.25 | Anchorage for Frames - Brick or Concrete |
| 840.26 | Brick Grated Drop Inlet Type 'A' - 300mm thru 1800mm Pipe |
| 840.27 | Brick Grated Drop Inlet Type 'B' - 300mm thru 900mm Pipe |
| 840.28 | Brick Grated Drop Inlet Type 'D' - 300mm thru 900mm Pipe |
| 840.31 | Concrete Junction Box - 300mm thru 1650mm Pipe |
| 840.32 | Brick Junction Box - 300mm thru 1650mm Pipe |
| 840.45 | Precast Drainage Structure |
| 840.54 | Manhole Frame and Cover |
| 840.66 | Drainage Structure Steps |
| 840.71 | Concrete and Brick Pipe Plug |
| 840.72 | Pipe Collar |
| 846.01 | Concrete Curb, Gutter and Curb & Gutter |
| 846.04 | Drop Inlet Installation in Shoulder Berm Gutter |
| 850.01 | Concrete Paved Ditches |
| 850.11 | Guide for Berm Drainage Outlet - 600mm and 750mm Pipe |
| 852.01 | 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 |
| 865.01 | Cable Guiderail |
| 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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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

| PROJ. REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 1-B |

*S.U.E = SUBSURFACE UTILITY ENGINEER

# CONVENTIONAL SYMBOLS

## ROADS & RELATED ITEMS

Edge of Pavement
Curb
Prop. Slope Stakes Cut — C
Prop. Slope Stakes Fill — F
Prop. Woven Wire Fence
Prop. Chain Link Fence
Prop. Barbed Wire Fence
Prop. Wheelchair Ramp — WCR
Exist. Guardrail
Prop. Guardrail
Equality Symbol
Pavement Removal

## RIGHT OF WAY

Baseline Control Point
Existing Right of Way Marker
Exist. Right of Way Line w/Marker
Prop. Right of Way Line with Proposed R/W marker (Iron Pin & Cap)
Prop. Right of Way Line with Proposed (Concrete or Granite) R/W Marker
Exist. Control of Access Line — CA
Prop. Control of Access Line — CA
Exist. Easement Line — E
Prop. Temp. Construction Easement Line — E
Prop. Temp. Drainage Easement Line — TDE
Prop. Perm. Drainage Easement Line — PDE

## HYDROLOGY

Stream or Body of Water
Flow Arrow
Disappearing Stream
Spring
Swamp Marsh
Shoreline
Falls, Rapids
Prop Lateral, Tail, Head Ditches — FLOW

## STRUCTURES

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

MINOR
Head & End Wall — CONC HW
Pipe Culvert
Footbridge
Drainage Boxes — CB
Paved Ditch Gutter

## UTILITIES

Exist. Pole
Exist. Power Pole
Prop. Power Pole
Exist. Telephone Pole
Prop. Telephone Pole
Exist. Joint Use Pole
Prop. Joint Use Pole
Telephone Pedestal — T
Cable TV Pedestal — C
Hydrant
Satellite Dish
Exist. Water Valve
Sewer Clean Out
Power Manhole — P
Telephone Booth
Water Manhole — W
Light Pole
H-Frame Pole
Power Line Tower
Pole with Base
Gas Valve
Gas Meter
Telephone Manhole — T
Power Transformer
Sanitary Sewer Manhole
Storm Sewer Manhole — S
Tank; Water, Gas, Oil
Water Tank With Legs
Traffic Signal Junction Box — S
Fiber Optic Splice Box — F
Television or Radio Tower
Utility Power Line Connects to Traffic Signal Lines Cut Into the Pavement — TS

Recorded Water Line — W
Designated Water Line (S.U.E.*) — W
Sanitary Sewer — SS
Recorded Sanitary Sewer Force Main — FSS
Designated Sanitary Sewer Force Main(S.U.E.*) — FSS
Recorded Gas Line — G
Designated Gas Line (S.U.E.*) — G
Storm Sewer — S
Recorded Power Line — P
Designated Power Line (S.U.E.*) — P
Recorded Telephone Cable — T
Designated Telephone Cable (S.U.E.*) — T
Recorded U/G Telephone Conduit — TC
Designated U/G Telephone Conduit (S.U.E.*) — TC
Unknown Utility (S.U.E.*) — ?UTL
Recorded Television Cable — TV
Designated Television Cable (S.U.E.*) — TV
Recorded Fiber Optics Cable — FO
Designated Fiber Optics Cable (S.U.E.*) — FO
Exist. Water Meter
U/G Test Hole (S.U.E.*)
Abandoned According to U/G Record — ATTUR
End of Information — E.O.I.

## BOUNDARIES & PROPERTIES

State Line
County Line
Township Line
City Line
Reservation Line
Property Line
Property Line Symbol — PL
Exist. Iron Pin — EIP
Property Corner
Property Monument — ECM
Property Number — 123
Parcel Number — 6
Fence Line — WW & ISBW
Existing Wetland Boundaries — WLB
Proposed Wetland Boundaries — WLB
Existing Endangered Animal Boundaries — EAB
Existing Endangered Plant Boundaries — EPB

## BUILDINGS & OTHER CULTURE

Buildings
Foundations
Area Outline
Gate
Gas Pump Vent or U/G Tank Cap
Church
School
Park
Cemetery
Dam
Sign — S
Well — W
Small Mine
Swimming Pool

## TOPOGRAPHY

Loose Surface
Hard Surface
Change in Road Surface
Curb
Right of Way Symbol — R/W
Guard Post — GP
Paved Walk
Bridge
Box Culvert or Tunnel
Ferry
Culvert
Footbridge
Trail, Footpath
Light House

## VEGETATION

Single Tree
Single Shrub
Hedge
Woods Line
Orchard
Vineyard — VINEYARD

## RAILROADS

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

revised 2/25/97

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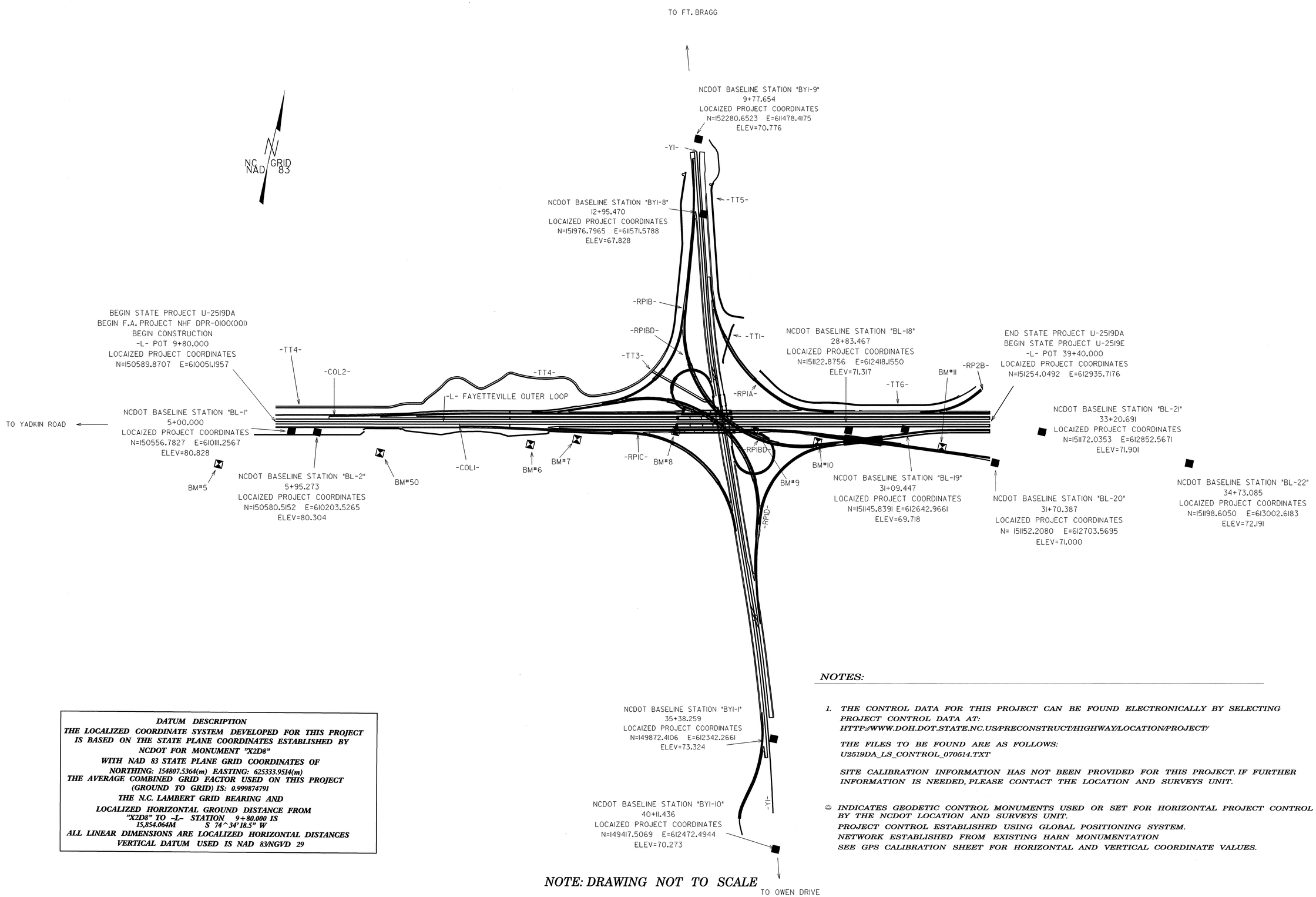
# SURVEY CONTROL SHEET U-2519DA

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519-DA | 1-C |
| Location and Surveys | |




***DATUM DESCRIPTION***

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

***WITH NAD 83 STATE PLANE GRID COORDINATES OF***

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

***THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999874791***

***THE N.C. LAMBERT GRID BEARING AND***

***LOCALIZED HORIZONTAL GROUND DISTANCE FROM "X2D8" TO -L- STATION 9+80.000 IS 15,854.064M S 74^34'18.5" W***

***ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES***

***VERTICAL DATUM USED IS NAD 83/NGVD 29***

***NOTES:***

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

   ***THE FILES TO BE FOUND ARE AS FOLLOWS:***
   ***U2519DA_LS_CONTROL_070514.TXT***

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

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

***NOTE: DRAWING NOT TO SCALE***

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519-DA | 1-D |
| Location and Surveys | |

# SURVEY CONTROL SHEET U-2519DA

NC GRID NAD 83

BL

| POINT | DESC. | NORTH | EAST | ELEVATION | L STATION | OFFSET |
|---|---|---|---|---|---|---|
| BL1 | BL-1 | 150556.7827 | 610111.2567 | 80.828 | 10+31.105 | 45.721 RT |
| BL2 | BL-2 | 150580.5152 | 610203.5265 | 80.304 | 11+26.347 | 43.298 RT |
| BL3 | BL-3 | 150597.9932 | 610261.9192 | 79.444 | 11+87.173 | 39.368 RT |
| BL4 | BL-4 | 150618.4916 | 610328.9976 | 78.670 | 12+57.140 | 34.443 RT |
| BL5 | BL-5 | 150686.3602 | 610550.9958 | 71.760 | 14+88.706 | 18.118 RT |
| BL6 | BL-6 | 150776.7290 | 610846.6320 | 74.095 | 17+97.081 | 3.610 LT |
| BL7 | BL-7 | 150841.0068 | 611057.1843 | 65.837 | 20+16.688 | 19.004 LT |
| BL8 | BL-8 | 150905.9518 | 611269.6317 | 59.231 | 22+38.290 | 34.623 LT |
| BL9 | BL-9 | 150946.8950 | 611403.5420 | 63.976 | 23+77.973 | 44.475 LT |
| BL10 | BL-10 | 150964.7170 | 611461.8334 | 65.430 | 24+38.777 | 48.763 LT |
| BL11 | BL-11 | 151024.7271 | 611658.1113 | 67.646 | 26+43.515 | 63.201 LT |
| BL12 | BL-12 | 151044.0070 | 611733.2151 | 59.506 | 27+21.030 | 65.137 LT |
| BL13 | BL-13 | 151056.3116 | 611853.6777 | 65.008 | 28+41.182 | 50.098 LT |
| BL14 | BL-14 | 151063.8781 | 611898.7490 | 64.782 | 28+86.802 | 47.358 LT |
| BL15 | BL-15 | 151077.2371 | 611989.1758 | 60.040 | 29+77.920 | 40.086 LT |
| BL16 | BL-16 | 151086.9980 | 612068.5774 | 57.625 | 30+57.488 | 31.781 LT |
| BL17 | BL-17 | 151089.3482 | 612127.7465 | 57.977 | 31+15.675 | 20.795 LT |
| BL18 | BL-18 | 151122.8756 | 612418.1550 | 71.317 | 34+06.202 | 11.696 RT |
| BL19 | BL-19 | 151145.8391 | 612642.9661 | 69.718 | 36+30.433 | 39.762 RT |
| BL20 | BL-20 | 151152.2080 | 612703.5695 | 71.000 | 36+90.920 | 47.154 RT |
| BL21 | BL-21 | 151172.0353 | 612852.5671 | 71.901 | 38+40.567 | 61.265 RT |
| BL22 | BL-22 | 151198.6050 | 613002.6183 | 72.191 | 39+92.754 | 69.042 RT |

BY1

| POINT | DESC. | NORTH | EAST | ELEVATION | Y1 STATION | OFFSET |
|---|---|---|---|---|---|---|
| BY11 | BY1-11 | 152737.5422 | 611339.1172 | 73.058 | OUTSIDE PROJECT LIMITS | |
| BY9 | BY1-9 | 152280.6523 | 611478.4175 | 70.776 | OUTSIDE PROJECT LIMITS | |
| BY8 | BY1-8 | 151976.7965 | 611571.5788 | 67.828 | 10+00.000 | 0.184 LT |
| BY7 | BY1-7 | 151680.1740 | 611662.3638 | 64.896 | 13+10.205 | 0.311 LT |
| BY6 | BY1-6 | 151381.1069 | 611753.9156 | 62.298 | 16+22.969 | 0.389 RT |
| BY5 | BY1-5 | 151110.2320 | 611854.2370 | 64.338 | 19+11.827 | 1.717 RT |
| BY4 | BY1-4 | 150792.1590 | 611987.2130 | 67.103 | 22+56.573 | 0.034 RT |
| BY3 | BY1-3 | 150530.2017 | 612095.5678 | 70.239 | 25+40.056 | 0.280 LT |
| BY2 | BY1-2 | 150214.5633 | 612222.8468 | 72.785 | 28+80.397 | 0.267 LT |
| BY1 | BY1-1 | 149872.4106 | 612342.2661 | 73.324 | 32+42.835 | 0.413 RT |
| BY10 | BY1-10 | 149417.5069 | 612472.4944 | 70.273 | OUTSIDE PROJECT LIMITS | |

**********
BM5 ELEVATION = 66.803
N 150440 E 609933
L STATION 8+33 120 RIGHT
NAIL IN BASE OF 15" PINE
**********

**********
BM6 ELEVATION = 68.510
N 150768 E 611182
L STATION 21+22 80 RIGHT
NAIL IN BASE OF 12" PINE
**********

**********
BM7 ELEVATION = 68.753
N 150849 E 611428
L STATION 23+80 57 RIGHT
NAIL IN BASE OF 18" PINE
**********

**********
BM8 ELEVATION = 59.098
N 150940 E 611727
L STATION 26+92 34 RIGHT
NAIL IN BASE OF 6" OAK
**********

**********
BM10 ELEVATION = 63.429
N 151030 E 612323
L STATION 32+92 81 RIGHT
NAIL IN BASE OF 24" PINE
**********

**********
BM11 ELEVATION = 72.098
N 151088 E 612684
L STATION 36+58 105 RIGHT
NAIL IN BASE OF 10" PINE
**********

**********
BM9 ELEVATION = 64.401
N 151012 E 612019
L STATION 29+92 30 RIGHT
NAIL IN BASE OF 15" PINE
**********

**********
BM50 ELEVATION = 72.936
N 150553 E 610476
L STATION 13+86 131 RIGHT
NAIL IN BASE OF 12" PINE
**********

***DATUM DESCRIPTION***

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

***WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 154807.5364(m) EASTING: 625333.9514(m)***

***THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999874791***

***THE N.C. LAMBERT GRID BEARING AND***

***LOCALIZED HORIZONTAL GROUND DISTANCE FROM "X2D8" TO -L- STATION 9+80.000 IS 15,854.064M S 74^34'18.5" W***

***ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES***

***VERTICAL DATUM USED IS NAD 83/NGVD 29***

*NOTES:*

*THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:*
*HTTP:\WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT*
*HTTP:\WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT*
*U2519DA_LS_CONTROL_070514.TXT*

*IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.*

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

*PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.*

*NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING USER SERVICE (OPUS)*

*NOTE: DRAWING NOT TO SCALE*

*NOTE: DRAWING NOT TO SCALE*

6/2/99

DATE=6/2/99 TIME=8:00 AM

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

R/W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 1-E |
| R /W SHEET NO. | |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030051 ENGINEER DENNIS JAMES MOSS
8-28-2008

HYDRAULICS ENGINEER

# CENTERLINE COORDINATE LIST

| Point # | Chain | Station | Northing(Y) | Easting(X) |
|---|---|---|---|---|
| 1 | L | 3+00.0000 | 150524.6575 | 609377.8768 |
| 2 | L | 3+40.0001 | 150521.9140 | 609417.7825 |
| 3 | L | 3+80.0001 | 150519.6351 | 609457.7171 |
| 4 | L | 4+20.0001 | 150518.2294 | 609497.6915 |
| 5 | L | 4+60.0001 | 150517.7396 | 609537.6876 |
| 6 | L | 5+00.0001 | 150518.1660 | 609577.6845 |
| 7 | L | 5+40.0001 | 150519.5082 | 609617.6611 |
| 8 | L | 5+80.0001 | 150521.7657 | 609657.5964 |
| 9 | L | 6+20.0001 | 150524.9372 | 609697.4696 |
| 10 | L | 6+60.0001 | 150529.0211 | 609737.2597 |
| 11 | L | 7+00.0001 | 150534.0151 | 609776.9459 |
| 12 | L | 7+40.0001 | 150539.9168 | 609816.5072 |
| 13 | L | 7+80.0001 | 150546.7230 | 609855.9230 |
| 14 | L | 8+20.0001 | 150554.4302 | 609895.1726 |
| 15 | L | 8+60.0001 | 150562.9749 | 609934.2488 |
| 16 | L | 9+00.0001 | 150571.9199 | 609973.2357 |
| 17 | L | 9+40.0001 | 150580.8953 | 610012.2158 |
| 18 | L | 9+80.0001 | 150589.8707 | 610051.1958 |
| 19 | L | 10+20.0001 | 150598.8461 | 610090.1758 |
| 20 | L | 10+60.0001 | 150607.8215 | 610129.1558 |
| 21 | L | 11+00.0001 | 150616.7968 | 610168.1359 |
| 22 | L | 11+40.0001 | 150625.7722 | 610207.1159 |
| 23 | L | 11+80.0001 | 150634.7476 | 610246.0959 |
| 24 | L | 12+20.0001 | 150643.7230 | 610285.0759 |
| 25 | L | 12+60.0001 | 150652.6984 | 610324.0560 |
| 26 | L | 13+00.0001 | 150661.6738 | 610363.0360 |
| 27 | L | 13+40.0001 | 150670.6492 | 610402.0160 |
| 28 | L | 13+80.0001 | 150679.6245 | 610440.9960 |
| 29 | L | 14+20.0001 | 150688.5999 | 610479.9761 |
| 30 | L | 14+60.0001 | 150697.5753 | 610518.9561 |
| 31 | L | 15+00.0001 | 150706.5507 | 610557.9361 |
| 32 | L | 15+40.0001 | 150715.5261 | 610596.9162 |
| 33 | L | 15+80.0001 | 150724.5015 | 610635.8962 |
| 34 | L | 16+20.0001 | 150733.4769 | 610674.8762 |
| 35 | L | 16+60.0001 | 150742.4522 | 610713.8562 |
| 36 | L | 17+00.0001 | 150751.4276 | 610752.8363 |
| 37 | L | 17+40.0001 | 150760.4030 | 610791.8163 |
| 38 | L | 17+80.0001 | 150769.3784 | 610830.7963 |
| 39 | L | 18+20.0001 | 150778.3538 | 610869.7763 |
| 40 | L | 18+60.0001 | 150787.3292 | 610908.7564 |
| 41 | L | 19+00.0001 | 150796.3046 | 610947.7364 |
| 42 | L | 19+40.0001 | 150805.2799 | 610986.7164 |
| 43 | L | 19+80.0001 | 150814.2553 | 611025.6964 |
| 44 | L | 20+20.0001 | 150823.2307 | 611064.6765 |
| 45 | L | 20+60.0001 | 150832.2061 | 611103.6565 |
| 46 | L | 21+00.0001 | 150841.1815 | 611142.6365 |
| 47 | L | 21+40.0001 | 150850.1569 | 611181.6165 |
| 48 | L | 21+80.0001 | 150859.1323 | 611220.5966 |
| 49 | L | 22+20.0001 | 150868.1076 | 611259.5766 |
| 50 | L | 22+60.0001 | 150877.0830 | 611298.5566 |
| 51 | L | 23+00.0001 | 150886.0584 | 611337.5367 |
| 52 | L | 23+40.0001 | 150895.0338 | 611376.5167 |
| 53 | L | 23+80.0001 | 150904.0092 | 611415.4967 |
| 54 | L | 24+20.0001 | 150912.9846 | 611454.4767 |
| 55 | L | 24+60.0001 | 150921.9600 | 611493.4568 |
| 56 | L | 25+00.0001 | 150930.9353 | 611532.4368 |
| 57 | L | 25+40.0001 | 150939.9107 | 611571.4168 |
| 58 | L | 25+80.0001 | 150948.8861 | 611610.3968 |
| 59 | L | 26+20.0001 | 150957.8615 | 611649.3769 |
| 60 | L | 26+60.0001 | 150966.8369 | 611688.3569 |
| 61 | L | 27+00.0001 | 150975.8123 | 611727.3369 |
| 62 | L | 27+40.0001 | 150984.7877 | 611766.3169 |
| 63 | L | 27+80.0001 | 150993.7630 | 611805.2970 |
| 64 | L | 28+20.0001 | 151002.7384 | 611844.2770 |
| 65 | L | 28+60.0001 | 151011.7138 | 611883.2570 |
| 66 | L | 29+00.0001 | 151020.6892 | 611922.2371 |
| 67 | L | 29+40.0001 | 151029.6646 | 611961.2171 |
| 68 | L | 29+80.0001 | 151038.6400 | 612000.1971 |
| 69 | L | 30+20.0001 | 151047.6154 | 612039.1771 |
| 70 | L | 30+60.0001 | 151056.5907 | 612078.1572 |
| 71 | L | 31+00.0001 | 151065.5661 | 612117.1372 |
| 72 | L | 31+40.0001 | 151074.5415 | 612156.1172 |
| 73 | L | 31+80.0001 | 151083.5169 | 612195.0972 |
| 74 | L | 32+20.0001 | 151092.4923 | 612234.0773 |
| 75 | L | 32+60.0001 | 151101.4677 | 612273.0573 |
| 76 | L | 33+00.0001 | 151110.4431 | 612312.0373 |
| 77 | L | 33+40.0001 | 151119.4184 | 612351.0173 |
| 78 | L | 33+80.0001 | 151128.3938 | 612389.9974 |
| 79 | L | 34+20.0001 | 151137.3692 | 612428.9774 |
| 80 | L | 34+60.0001 | 151146.3446 | 612467.9574 |
| 81 | L | 35+00.0001 | 151155.3200 | 612506.9374 |
| 82 | L | 35+40.0001 | 151164.2954 | 612545.9175 |
| 83 | L | 35+80.0001 | 151173.2708 | 612584.8975 |
| 84 | L | 36+20.0001 | 151182.2461 | 612623.8775 |
| 85 | L | 36+60.0001 | 151191.2215 | 612662.8576 |
| 86 | L | 37+00.0001 | 151200.1969 | 612701.8376 |
| 87 | L | 37+40.0001 | 151209.1723 | 612740.8176 |
| 88 | L | 37+80.0001 | 151218.1477 | 612779.7976 |
| 89 | L | 38+20.0001 | 151227.1231 | 612818.7777 |
| 90 | L | 38+60.0001 | 151236.0985 | 612857.7577 |
| 91 | L | 39+00.0001 | 151245.0738 | 612896.7377 |
| 92 | L | 39+40.0001 | 151254.0492 | 612935.7177 |
| 93 | L | 39+80.0001 | 151263.0246 | 612974.6978 |
| 94 | L | 40+20.0001 | 151272.0000 | 613013.6778 |
| 95 | L | 40+60.0001 | 151280.9754 | 613052.6578 |
| 96 | L | 41+00.0001 | 151289.9508 | 613091.6378 |
| 97 | L | 41+40.0001 | 151298.9262 | 613130.6179 |
| 98 | L | 41+80.0001 | 151307.9015 | 613169.5979 |
| 99 | L | 42+20.0001 | 151316.8769 | 613208.5779 |
| 100 | L | 42+60.0001 | 151325.8523 | 613247.5579 |
| 101 | L | 43+00.0001 | 151334.8277 | 613286.5380 |
| 102 | L | 43+40.0001 | 151343.8031 | 613325.5180 |
| 103 | L | 43+80.0001 | 151352.7785 | 613364.4980 |
| 104 | L | 44+80.0000 | 151358.9126 | 613391.1385 |
| 105 | L | 45+20.0000 | 151367.9283 | 613430.1092 |
| 106 | L | 45+59.9999 | 151377.1526 | 613469.0309 |
| 107 | L | 45+99.9999 | 151386.7635 | 613507.8589 |
| 108 | L | 46+39.9999 | 151396.8179 | 613546.5744 |
| 109 | L | 46+79.9999 | 151407.3146 | 613585.1724 |
| 110 | L | 47+19.9999 | 151418.2524 | 613623.6476 |
| 111 | L | 47+59.9999 | 151429.6298 | 613661.9952 |
| 112 | L | 47+99.9999 | 151441.4453 | 613700.2101 |
| 113 | L | 48+39.9999 | 151453.6974 | 613738.2872 |
| 114 | L | 48+79.9999 | 151466.3845 | 613776.2216 |
| 115 | L | 49+19.9999 | 151479.5049 | 613814.0084 |
| 116 | L | 49+59.9999 | 151493.0570 | 613851.6425 |
| 117 | L | 49+99.9999 | 151507.0388 | 613889.1190 |
| 118 | L | 50+39.9999 | 151521.4486 | 613926.4331 |
| 119 | L | 50+79.9999 | 151536.2845 | 613963.5798 |
| 120 | L | 51+19.9999 | 151551.5446 | 614000.5543 |
| 121 | L | 51+59.9999 | 151567.2269 | 614037.3517 |
| 122 | L | 51+99.9999 | 151583.3292 | 614073.9672 |
| 123 | L | 52+39.9999 | 151599.8496 | 614110.3960 |
| 124 | L | 52+79.9999 | 151616.7858 | 614146.6334 |
| 125 | L | 53+19.9999 | 151634.1356 | 614182.6746 |
| 126 | L | 53+59.9999 | 151651.8967 | 614218.5149 |
| 127 | L | 53+99.9999 | 151670.0669 | 614254.1495 |
| 128 | L | 54+40.0000 | 151688.6436 | 614289.5739 |
| 129 | L | 54+79.9999 | 151707.5792 | 614324.8080 |
| 130 | L | 55+19.9999 | 151726.7144 | 614359.9340 |
| 131 | L | 55+59.9999 | 151745.8927 | 614395.0365 |
| 132 | L | 55+99.9999 | 151765.0711 | 614430.1391 |
| 133 | L | 56+39.9999 | 151784.2495 | 614465.2417 |
| 134 | L | 56+79.9999 | 151803.4278 | 614500.3442 |
| 135 | L | 57+19.9999 | 151822.6062 | 614535.4468 |
| 136 | L | 57+59.9999 | 151841.7846 | 614570.5493 |
| 137 | L | 57+99.9999 | 151860.9629 | 614605.6519 |
| 138 | L | 58+39.9999 | 151880.1413 | 614640.7545 |
| 139 | L | 58+79.9999 | 151899.3197 | 614675.8570 |
| 140 | L | 59+19.9999 | 151918.4981 | 614710.9596 |
| 141 | L | 59+21.6184 | 151919.2741 | 614712.3800 |
| 142 | L | 59+21.6184 | 151919.2741 | 614712.3800 |

Disclaimer: This coordinate list is provided for the convenience of interested contractors and is intended for use during the project bidding process only. Coordinates are localized to this particular project and any conversion to state grid coordinates or other formats will be the responsibility of the recipient. While every effort has been made to provide up-to-date, accurateinformation, NCDOT makes no express guarantee as to the validity or potential for revision of this information prior to project letting.

FILE: R:\U-2519DA\Roadway\Proj\U2519DA_RDY_COORD.dgn
DATE: 08/05/2008 02:36:15 PM
PLOT DRIVER: M:\RAHCAD\PLOTDRV\Metric_plan_full\plotter_metric.pltr
REV TABLE: M:\RAHCAD\REVCADS_DATA\REV_TA.XTBL

## PAVEMENT SCHEDULE

| ITEM | DESCRIPTION |
|---|---|
| C | Prop. Approx. 50mm Asphalt Concrete Surface Course, Type S9.5C, at an Average Rate of 120 kg. Per SQ. Meter. |
| C1 | Prop. Approx. 80mm Asphalt Concrete Surface Course, Type S9.5C, at an Average Rate of 96 kg. Per SQ. Meter in each of two layers. |
| C2 | Prop. Approx. 40mm Asphalt Concrete Surface Course, Type S9.5C, at an Average Rate of 96 kg. Per SQ. Meter. |
| C3 | Prop. Approx. 80mm Asphalt Concrete Surface Course, Type S9.5B, at an Average Rate of 96 kg. Per SQ. Meter in each of two layers. |
| C5 | Prop. Var. Depth Asphalt Concrete Surface Course, Type S9.5, at an Average Rate of 2.40 kg. Per SQ. Meter Per 1mm Depth, to be placed in layers not to exceed 50mm in depth. |
| D3 | Prop. Approx. 110mm Asphalt Concrete Intermediate Course, Type I19.0C, at an Average Rate of 269.5 kg. Per SQ. Meter. |
| D4 | Prop. Approx. 65mm Asphalt Concrete Intermediate Course, Type I19.0B, at an Average Rate of 159.25 kg. Per SQ. Meter. |
| D5 | Prop. Var. Depth Asphalt Concrete Intermediate Course, Type I19.0, at an Average Rate of 2.45 kg. Per SQ. Meter Per 1mm Depth, to be placed in layers not less than 65mm or greater than 110mm in depth. |
| E | Prop. Approx. 100mm Asphalt Concrete Base Course, Type B25.0B, at an Average Rate of 245 kg. Per SQ. Meter. |
| E3 | Prop. Var. Depth Asphalt Concrete Base Course, Type B25.0, at an Average Rate of 2.45 kg. Per SQ. Meter Per 1mm Depth, to be placed in layers not less than 75mm or greater than 140mm in depth. |
| J1 | Prop. 250mm Aggregate Base Course |
| J2 | Prop. 150mm Aggregate Base Course |
| J3 | Prop. Var. Depth Aggregate Base Course |
| | |
| R | Shoulder Berm Gutter |
| T | Earth Material |
| U | Existing Pavement |
| V | Var. Depth Milling Bituminous Pavement |
| W1 | Var. Depth Asphalt Pavement (See Standard Wedging Detail on This Sheet) |
| W2 | Var. Depth Asphalt Pavement (See Standard Wedging Detail on This Sheet) |


PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

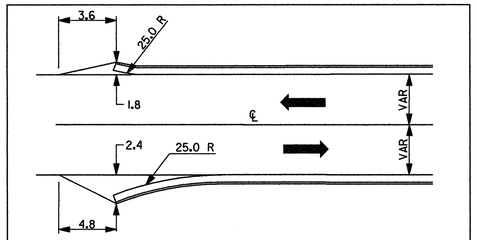

METRIC

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2 |
| R /W SHEET NO. | |

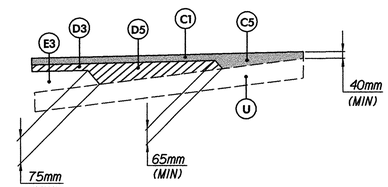
NOTES:
1. ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.
2. SHOULDER ROLLOVER NOT TO EXCEED 0.06 (TYP).
3. USE 4:1 MAX SLOPES ON INSIDE OF INTERCHANGE.
4. SEE PLANS FOR LOCATION OF ACCELERATION AND DECELERATION LANES.
5. SEE PLANS FOR LOCATION OF TURN LANES AND INTERSECTION TURNOUTS.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 22031 ENGINEER DENNIS JAMES MORK
8/19/11

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER DONG CHI CHEN
8/19/11

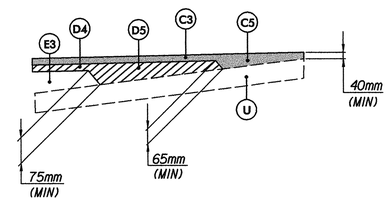



DETAIL OF CURB & GUTTER END TREATMENT




W1 – WEDGING DETAIL FOR RESURFACING

USE IN CONJUNCTION WITH TYPICAL SECTION NO.5

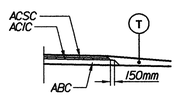



W2 – WEDGING DETAIL FOR RESURFACING

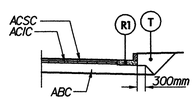
USE IN CONJUNCTION WITH TYPICAL SECTION NO.14

## PAVEMENT EDGE CONSTRUCTION DETAILS

SEE TYPICAL SECTIONS FOR PAVEMENT DESIGN




USE IN CONJUNCTION WITH TYPICAL SECTION NO. 5

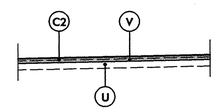



USE IN CONJUNCTION WITH TYPICAL SECTION NO. 5A

## MILLING DETAIL

VARIABLE DEPTH: MAINTAIN 40mm S9.5C MIN

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 5 FOR NBL & SBL

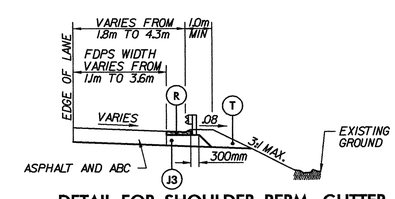



**NORTHBOUND LANES**

-Y1- 18+60.000 TO -Y1- 19+11.960 (BRIDGE)
-Y1- 19+53.110 (BRIDGE) TO -Y1- 20+50.000

**SOUTHBOUND LANES**

-Y1- 18+50.000 TO -Y1- 19+11.960 (BRIDGE)
-Y1- 19+53.110 (BRIDGE) TO -Y1- 20+10.000




## DETAIL FOR SHOULDER BERM GUTTER

-Y1- 18+00.000 TO -Y1- 19+08.524 (NBL BRIDGE)

## PAVEMENT SCHEDULE

| ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|---|---|---|---|---|---|---|---|
| C | 50mm S9.5C | D3 | 110mm I19.0C | J1 | 250mm ABC | T | EARTH MATERIAL |
| C1 | 80mm S9.5C | D4 | 65mm I19.0B | J2 | 150mm ABC | U | EXISTING PAVEMENT |
| C2 | 40mm S9.5C | D5 | VAR. DEPTH I19.0 | J3 | VAR. DEPTH ABC | V | VAR. DEPTH MILLING |
| C3 | 80mm S9.5B | E | 100mm B25.0B | | | W1 | VAR. DEPTH ASPHALT PAVM'T |
| C5 | VAR. DEPTH S9.5 | E3 | VAR. DEPTH B25.0 | R | SHOULDER BERM GUTTER | W2 | VAR. DEPTH ASPHALT PAVM'T |


PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607


METRIC

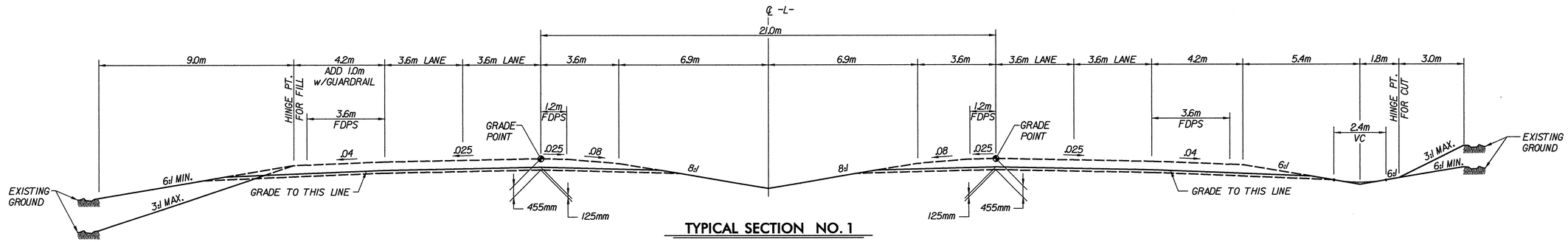
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-A |
| R /W SHEET NO. | |

NOTES:
1. ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.
2. SHOULDER ROLLOVER NOT TO EXCEED 0.06 (TYP).
3. USE 4:1 MAX SLOPES ON INSIDE OF INTERCHANGE.
4. SEE PLANS FOR LOCATION OF ACCELERATION AND DECELERATION LANES.
5. SEE PLANS FOR LOCATION OF TURN LANES AND INTERSECTION TURNOUTS.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORY
8-19-11

PAVEMENT DESIGN ENGINEER



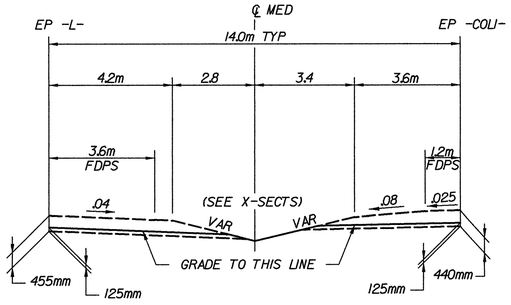

## TYPICAL SECTION NO. 1

**WESTBOUND LANES**

-L- 20+20.000 TO -L- 26+96.069 (BRIDGE)
-L- 29+05.369 (BRIDGE) TO -L- 39+40.000

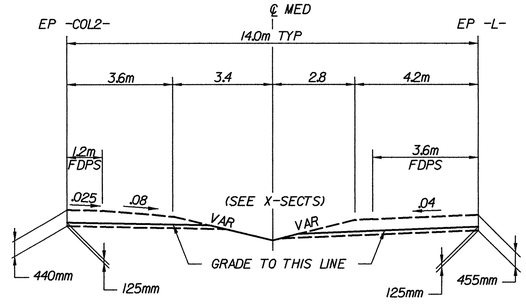
**EASTBOUND LANES**

-L- 20+20.000 TO -L- 26+92.061 (BRIDGE)
-L- 29+08.861 (BRIDGE) TO -L- 39+40.000



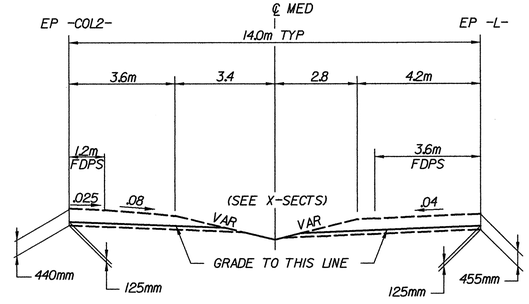

## PARTIAL TYPICAL SECTION NO. 1A

USE IN CONJUNCTION WITH TYPICAL SECTION NOS. 1 & 2



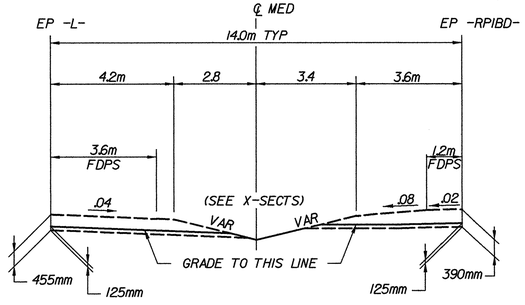

## PARTIAL TYPICAL SECTION NO. 1B

USE IN CONJUNCTION WITH TYPICAL SECTION NOS. 1 & 3



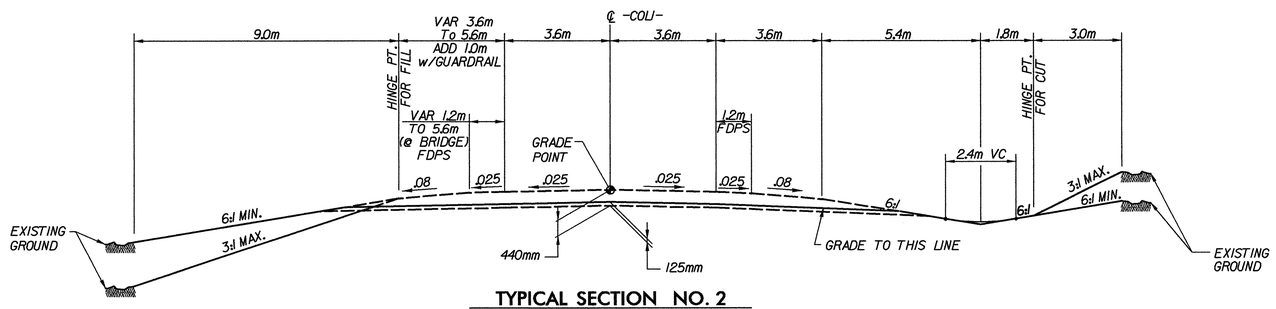

## PARTIAL TYPICAL SECTION NO. 1C

USE IN CONJUNCTION WITH TYPICAL SECTION NOS. 1 & 4



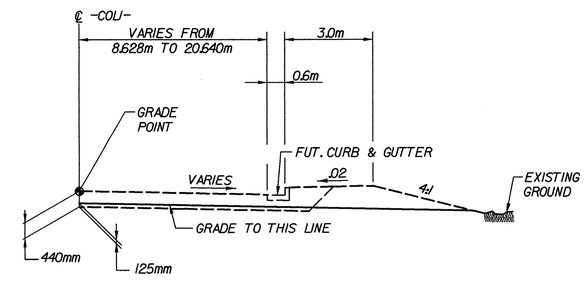

## PARTIAL TYPICAL SECTION NO. 1D

USE IN CONJUNCTION WITH TYPICAL SECTION NOS. 1 & 9




## TYPICAL SECTION NO. 2

-COLI- 22+18.576 TO -COLI- 26+83.886 (BRIDGE)
-COLI- 29+12.986 (BRIDGE) TO 35+30.000




## PARTIAL TYPICAL SECTION NO. 2A

-COLI- 29+12.986 (BRIDGE) TO -COLI- 30+27.694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## PAVEMENT SCHEDULE

| ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|---|---|---|---|---|---|---|---|
| C | 50mm S9.5C | D3 | 110mm I19.0C | J1 | 250mm ABC | T | EARTH MATERIAL |
| C1 | 80mm S9.5C | D4 | 65mm I19.0B | J2 | 150mm ABC | U | EXISTING PAVEMENT |
| C2 | 40mm S9.5C | D5 | VAR. DEPTH I19.0 | J3 | VAR. DEPTH ABC | V | VAR. DEPTH MILLING |
| C3 | 80mm S9.5B | E | 100mm B25.0B | | | W1 | VAR. DEPTH ASPHALT PAVM'T |
| C5 | VAR. DEPTH S9.5 | E3 | VAR. DEPTH B25.0 | R | SHOULDER BERM GUTTER | W2 | VAR. DEPTH ASPHALT PAVM'T |


PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

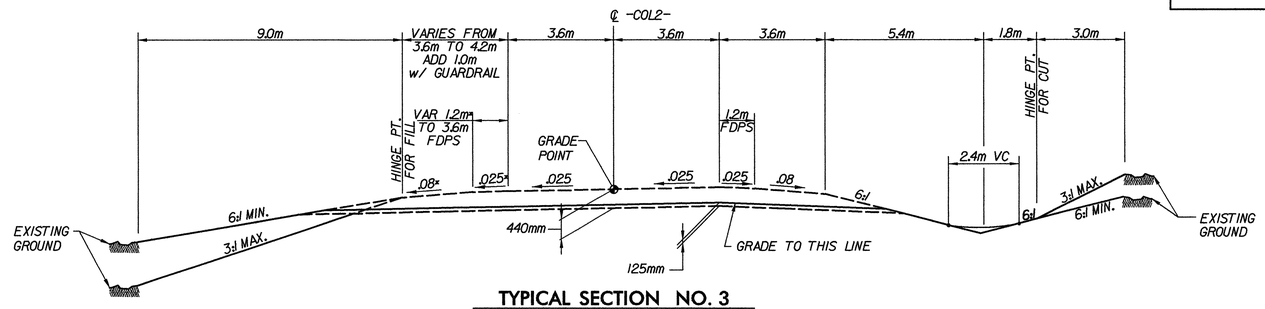

METRIC

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-B |
| R /W SHEET NO. | |

NOTES:
1. ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.
2. SHOULDER ROLLOVER NOT TO EXCEED 0.06 (TYP).
3. USE 4:1 MAX SLOPES ON INSIDE OF INTERCHANGE.
4. SEE PLANS FOR LOCATION OF ACCELERATION AND DECELERATION LANES.
5. SEE PLANS FOR LOCATION OF TURN LANES AND INTERSECTION TURNOUTS.

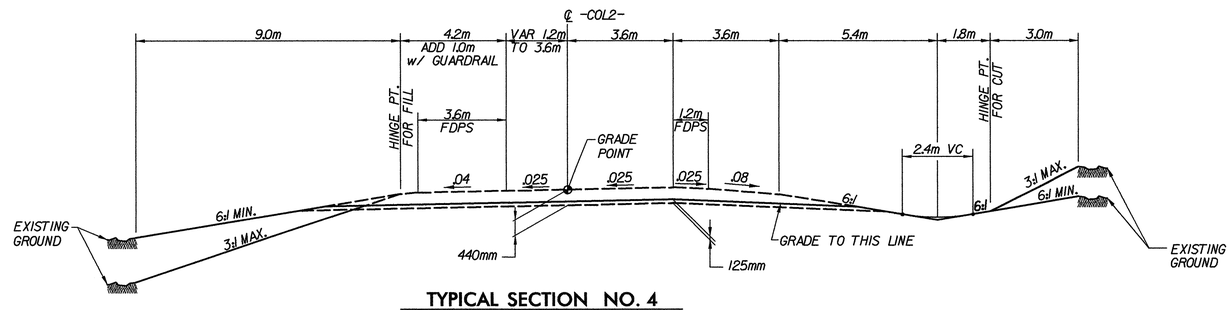
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES GORA
8-19-11

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER DONGCHI CHEN
8/19/11



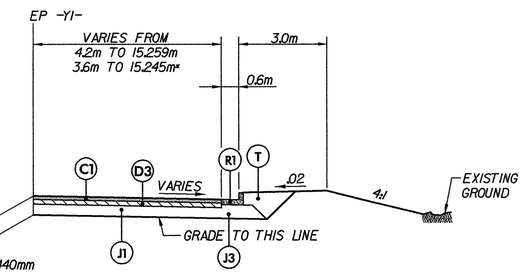

### TYPICAL SECTION NO. 3

-COL2- 20+20.000 TO -COL2- 22+56.317
-COL2- 29+01.246 (BRIDGE) TO -COL2- 39+40.000
NOTE: SEE STD 665.01 FOR GORE & RAMP TREATMENT



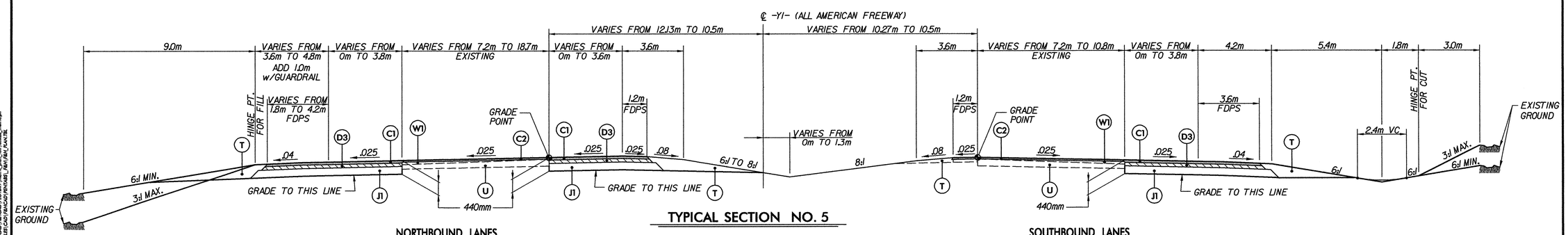

### TYPICAL SECTION NO. 4

-COL2- 22+56.317 TO -COL2- 27+16.586 (BRIDGE)




### PARTIAL TYPICAL SECTION NO. 5A

-Y1- 18+38.838 TO -Y1- 19+11.884 (BRIDGE) SB
*-Y1- 21+04.401 TO -Y1- 21+93.962 NB




### TYPICAL SECTION NO. 5

**NORTHBOUND LANES**

-Y1- 9+43.000 TO -Y1- 11+37.175 (RESURFACING & WIDENING ONLY)
-Y1- 11+37.175 TO -Y1- 19+11.884 (BRIDGE)
-Y1- 19+53.034 (BRIDGE) TO -Y1- 30+80.000
-Y1- 30+80.000 TO -Y1- 32+00.000 (RESURFACING ONLY)
NOTE: BEGIN NEW 4.2m FDPS 11+08.247

**SOUTHBOUND LANES**

-Y1- 9+43.000 TO -Y1- 9+67.474 (RESURFACING ONLY)
-Y1- 9+67.474 TO -Y1- 19+11.884 (BRIDGE)
-Y1- 19+53.034 (BRIDGE) TO -Y1- 33+60.000

USE (E2) IN LIEU OF (J1)
FOR NARROW WIDENING (LESS THAN 2m)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## PAVEMENT SCHEDULE

| ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|---|---|---|---|---|---|---|---|
| C | 50mm S9.5C | D3 | 110mm I19.0C | J1 | 250mm ABC | T | EARTH MATERIAL |
| C1 | 80mm S9.5C | D4 | 65mm I19.0B | J2 | 150mm ABC | U | EXISTING PAVEMENT |
| C2 | 40mm S9.5C | D5 | VAR. DEPTH I19.0 | J3 | VAR. DEPTH ABC | V | VAR. DEPTH MILLING |
| C3 | 80mm S9.5B | E | 100mm B25.0B | | | W1 | VAR. DEPTH ASPHALT PAVM'T |
| C5 | VAR. DEPTH S9.5 | E3 | VAR. DEPTH B25.0 | R | SHOULDER BERM GUTTER | W2 | VAR. DEPTH ASPHALT PAVM'T |


PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607


METRIC

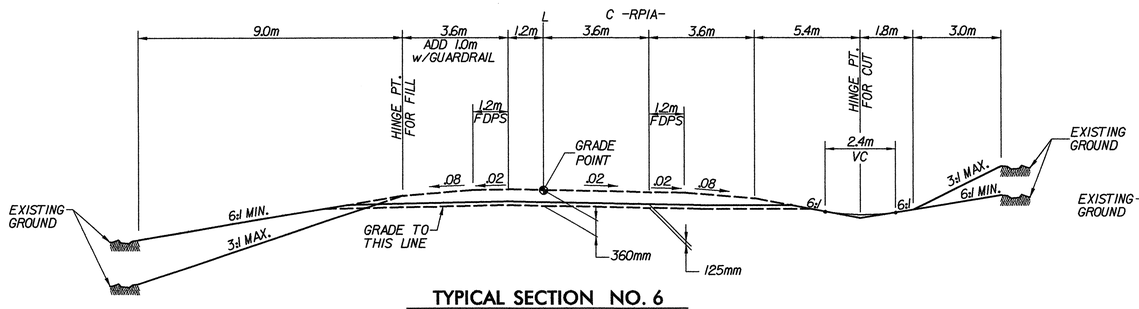
NOTES:
1. ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.
2. SHOULDER ROLLOVER NOT TO EXCEED 0.06 (TYP).
3. USE 4:1 MAX SLOPES ON INSIDE OF INTERCHANGE.
4. SEE PLANS FOR LOCATION OF ACCELERATION AND DECELERATION LANES.
5. SEE PLANS FOR LOCATION OF TURN LANES AND INTERSECTION TURNOUTS.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-C |
| R /W SHEET NO. | |

ROADWAY DESIGN ENGINEER

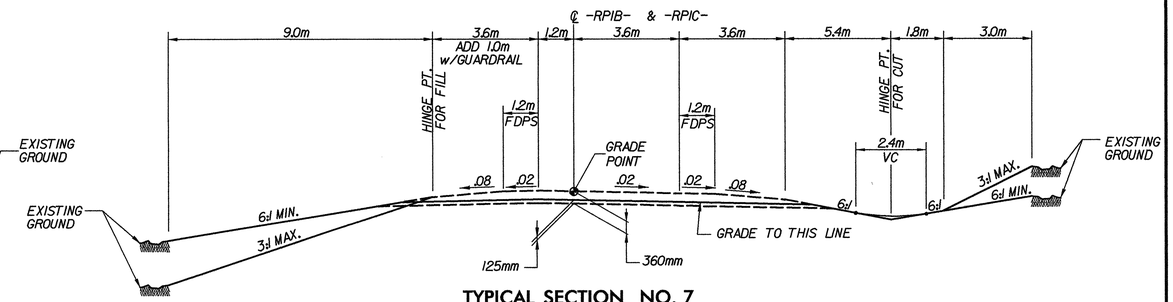
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORY

PAVEMENT DESIGN ENGINEER



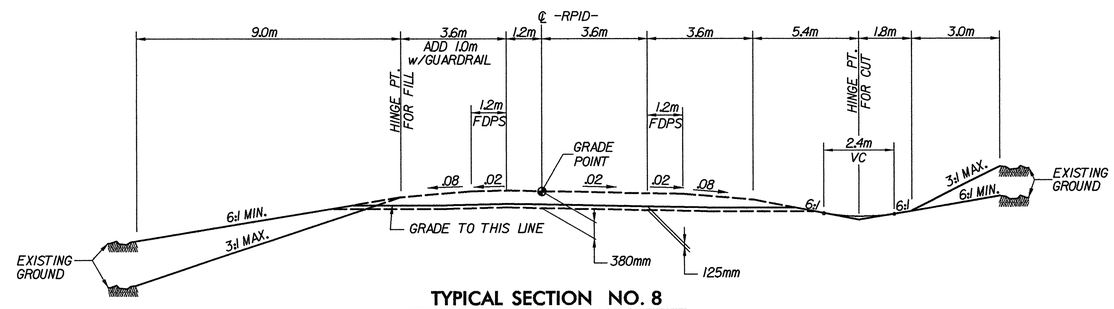

## TYPICAL SECTION NO. 6

-RPIA- 11+40.989 TO -RPIA- 13+58.000 (BRIDGE)
-RPIA- 15+63.000 (BRIDGE) TO -RPIA- 16+78.026



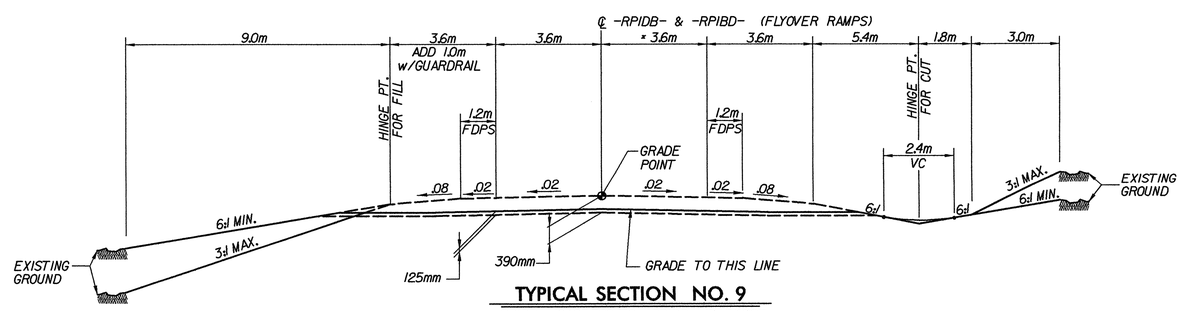

## TYPICAL SECTION NO. 7

-RPIB- 10+88.762 TO -RPIB- 12+55.300 (BRIDGE)
-RPIB- 13+01.300 (BRIDGE) TO -RPIB- 14+44.437
-RPIC- 11+49.820 TO -RPIC- 12+54.000 (BRIDGE)
-RPIC- 14+94.000 (BRIDGE) TO -RPIC- 15+88.064




## TYPICAL SECTION NO. 8

-RPID- 10+74.553 TO -RPID- 13+95.592




## TYPICAL SECTION NO. 9

-RPIDB- 10+85.386 TO -RPIDB- 13+53.823
-RPIBD- 20+11.935 TO -RPIBD- 25+94.400 (BRIDGE)
-RPIBD- 30+83.800 (BRIDGE) TO -RPIBD- 33+80.235 (BRIDGE)
-RPIBD- 34+61.853 (BRIDGE) TO -RPIBD- 39+40.000

* -RPIBD- 3 LANES 33+21.938 TO -RPIBD- 39+40.000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## PAVEMENT SCHEDULE

| ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|---|---|---|---|---|---|---|---|
| C | 50mm S9.5C | D3 | 110mm I19.0C | J1 | 250mm ABC | T | EARTH MATERIAL |
| C1 | 80mm S9.5C | D4 | 65mm I19.0B | J2 | 150mm ABC | U | EXISTING PAVEMENT |
| C2 | 40mm S9.5C | D5 | VAR. DEPTH I19.0 | J3 | VAR. DEPTH ABC | V | VAR. DEPTH MILLING |
| C3 | 80mm S9.5B | E | 100mm B25.0B | | | W1 | VAR. DEPTH ASPHALT PAVM'T |
| C5 | VAR. DEPTH S9.5 | E3 | VAR. DEPTH B25.0 | R | SHOULDER BERM GUTTER | W2 | VAR. DEPTH ASPHALT PAVM'T |


PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607


METRIC

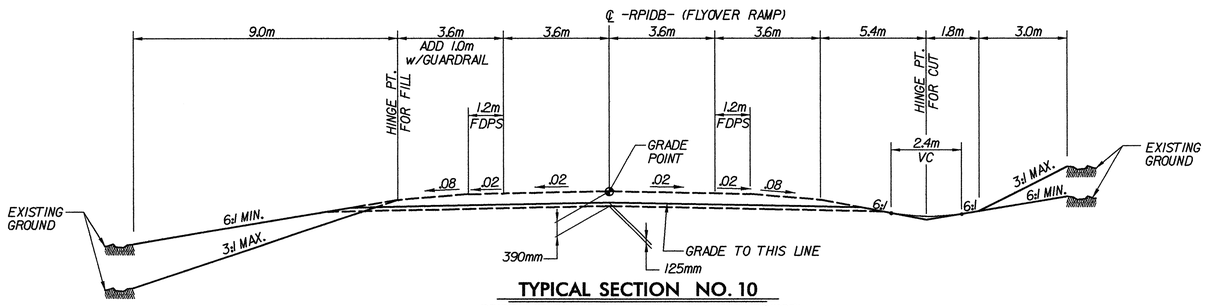
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-D |
| R /W SHEET NO. | |

ROADWAY DESIGN ENGINEER

PAVEMENT DESIGN ENGINEER

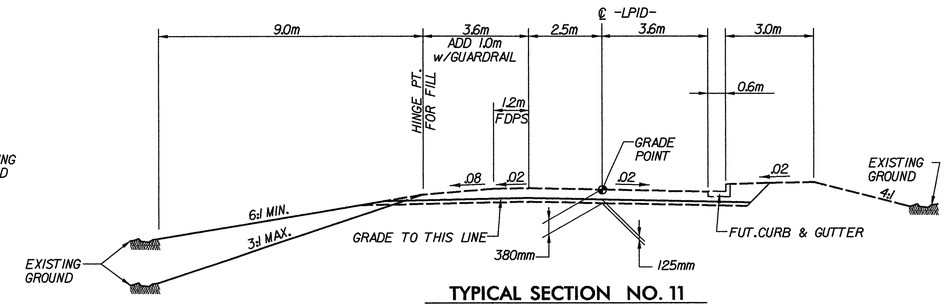
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORT
8.19.11

NOTES:
1. ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.
2. SHOULDER ROLLOVER NOT TO EXCEED 0.06 (TYP).
3. USE 4:1 MAX SLOPES ON INSIDE OF INTERCHANGE.
4. SEE PLANS FOR LOCATION OF ACCELERATION AND DECELERATION LANES.
5. SEE PLANS FOR LOCATION OF TURN LANES AND INTERSECTION TURNOUTS.



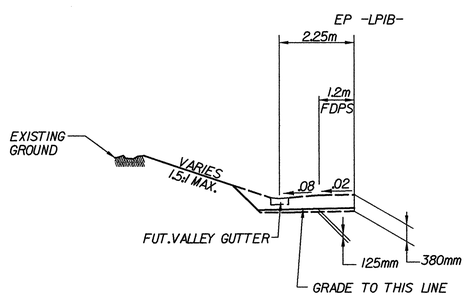

## TYPICAL SECTION NO. 10

-RPIDB- 13+53.823 TO -RPIDB- 14+61.000 (BRIDGE)
-RPIDB- 19+48.700 (BRIDGE) TO -RPIDB- 23+54.661



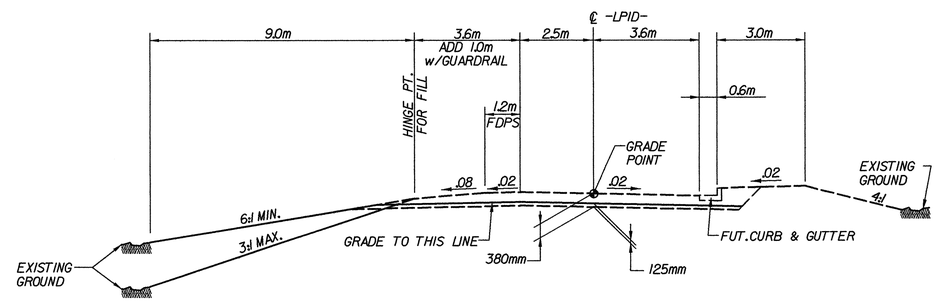

## TYPICAL SECTION NO. 11

-LPIB- 10+87.980 (BRIDGE) TO -LPIB- 11+93.100 (BRIDGE)
-LPIB- 12+32.400 (BRIDGE) TO -LPIB- 13+86.299



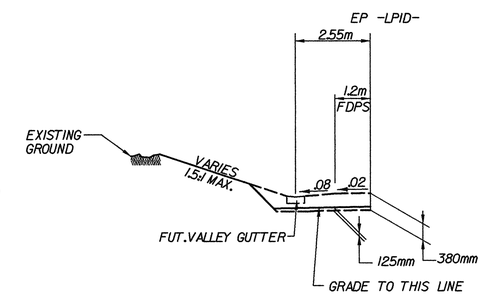

## PARTIAL TYPICAL SECTION NO. 11A

-LPIB- 11+30.000 TO -LPIB- 11+80.000



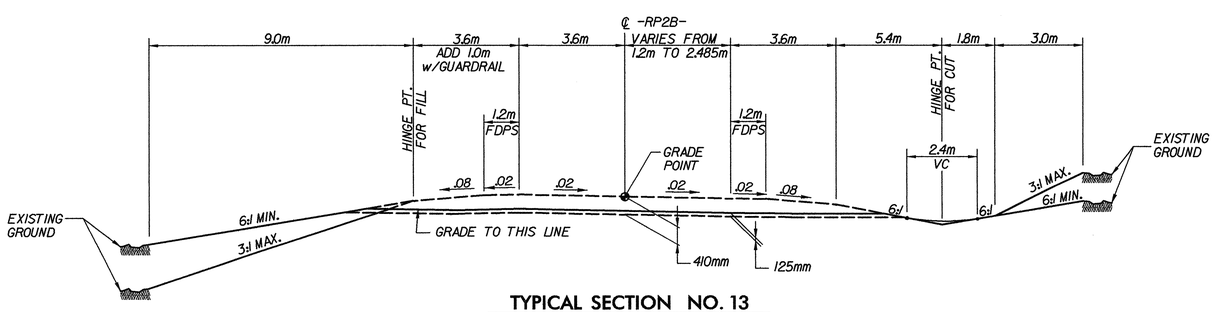

## TYPICAL SECTION NO. 12

-LPID- 10+89.227 TO -LPID- 13+78.808



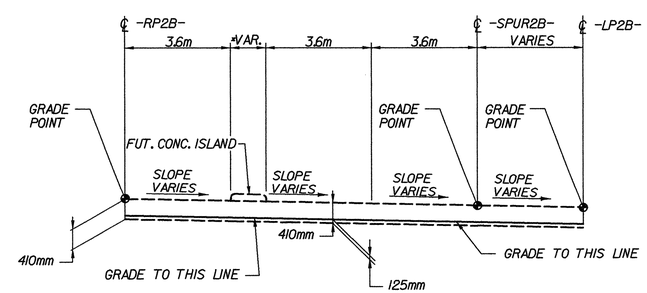

## PARTIAL TYPICAL SECTION NO. 12A

-LPID- 11+25.000 TO -LPID- 11+73.000




## TYPICAL SECTION NO. 13

-RP2B- 11+03.783 TO -RP2B- 12+40.000
-RP2B- 12+40.000 TO -RP2B- 14+60.000




## PARTIAL TYPICAL SECTION NO. 13A

USE IN CONJUNCTION WITH TYPICAL SECTION NO.13 -RP2B-

-RP2B- 14+00.833 TO -RP2B- 14+60.000

*WIDTH VARIES FROM 4.8m TO 1.3m FOR MONOLITHIC CONCRETE ISLAND

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## PAVEMENT SCHEDULE

| ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|---|---|---|---|---|---|---|---|
| C | 50mm S9.5C | D3 | 110mm I19.0C | J1 | 250mm ABC | T | EARTH MATERIAL |
| C1 | 80mm S9.5C | D4 | 65mm I19.0B | J2 | 150mm ABC | U | EXISTING PAVEMENT |
| C2 | 40mm S9.5C | D5 | VAR. DEPTH I19.0 | J3 | VAR. DEPTH ABC | V | VAR. DEPTH MILLING |
| C3 | 80mm S9.5B | E | 100mm B25.0B | | | W1 | VAR. DEPTH ASPHALT PAVM'T |
| C5 | VAR. DEPTH S9.5 | E3 | VAR. DEPTH B25.0 | R | SHOULDER BERM GUTTER | W2 | VAR. DEPTH ASPHALT PAVM'T |


PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

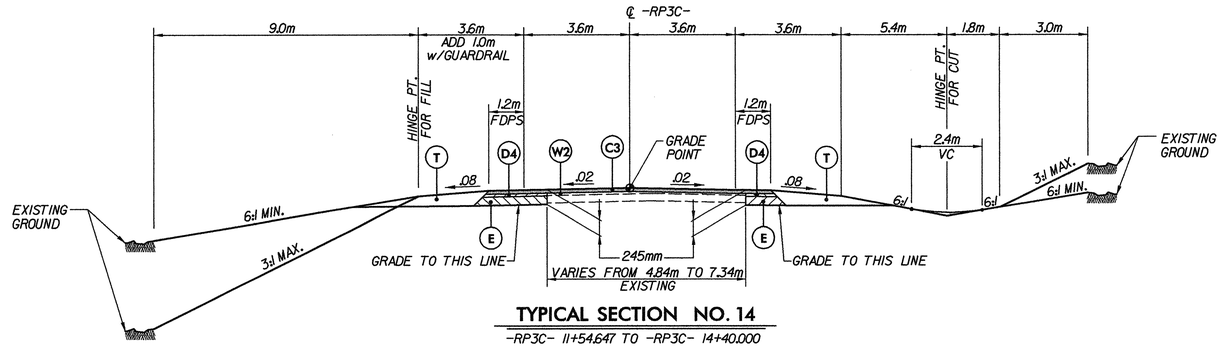

METRIC

NOTES:
1. ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.
2. SHOULDER ROLLOVER NOT TO EXCEED 0.06 (TYP).
3. USE 4:1 MAX SLOPES ON INSIDE OF INTERCHANGE.
4. SEE PLANS FOR LOCATION OF ACCELERATION AND DECELERATION LANES.
5. SEE PLANS FOR LOCATION OF TURN LANES AND INTERSECTION TURNOUTS.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-E |
| R /W SHEET NO. | |

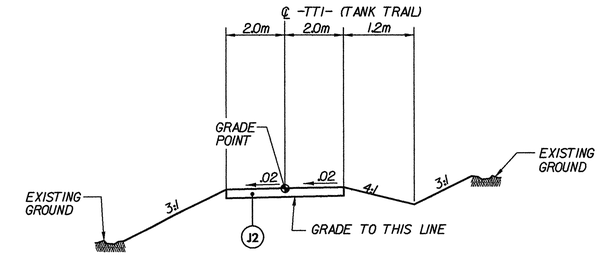
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20051 ENGINEER DENNIS JAMES MORY
8-19-11

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER DONG-CHI CHEN
8/19/11



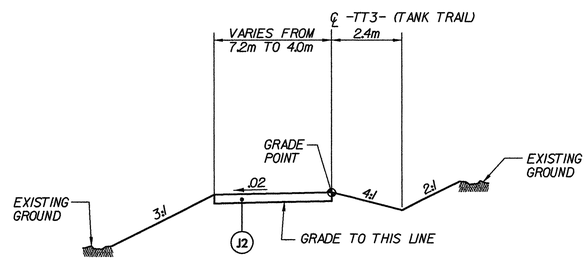

**TYPICAL SECTION NO. 14**

-RP3C- 11+54.647 TO -RP3C- 14+40.000



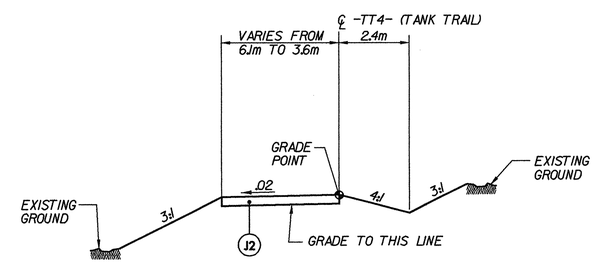

**TYPICAL SECTION NO. 15**

-TT1- 10+00.000 TO -TT1- 11+61.707




**TYPICAL SECTION NO. 16**

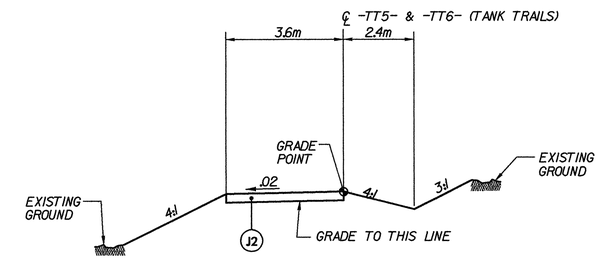
-TT3- 10+62.339 TO -TT3- 13+25.057




**TYPICAL SECTION NO. 17**

-TT4- 17+06.175 TO -TT4- 29+08.104 LB
-TT4- 29+29.758 LA TO -TT4- 35+68.068

NOTE: TRANSITION 6.1m TO 3.6m FROM 28+00.000 TO 28+40.000




**TYPICAL SECTION NO. 18**

-TT5- 10+90.000 TO -TT5- 17+88.776
-TT6- 10+00.000 TO -TT6- 18+48.673

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USER: Dennis Mory Bentley Systems, Inc. Plans CAD (FBHCAD) (FACTORY) (worst_plan_full) (Adobe_mail).pdf
PRV TABLE: V:\XAL_FLOW\ST_DRIVE_FILES\CAD\RENTABS_REV\RH_FLAT.TBL

## PAVEMENT SCHEDULE

| ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|---|---|---|---|---|---|---|---|
| C | 50mm S9.5C | D3 | 110mm I19.0C | J1 | 250mm ABC | T | EARTH MATERIAL |
| C1 | 80mm S9.5C | D4 | 65mm I19.0B | J2 | 150mm ABC | U | EXISTING PAVEMENT |
| C2 | 40mm S9.5C | D5 | VAR. DEPTH I19.0 | J3 | VAR. DEPTH ABC | V | VAR. DEPTH MILLING |
| C3 | 80mm S9.5B | E | 100mm B25.0B | | | W1 | VAR. DEPTH ASPHALT PAVM'T |
| C5 | VAR. DEPTH S9.5 | E3 | VAR. DEPTH B25.0 | R | SHOULDER BERM GUTTER | W2 | VAR. DEPTH ASPHALT PAVM'T |


PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607


METRIC

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-F |
| R /W SHEET NO. | |

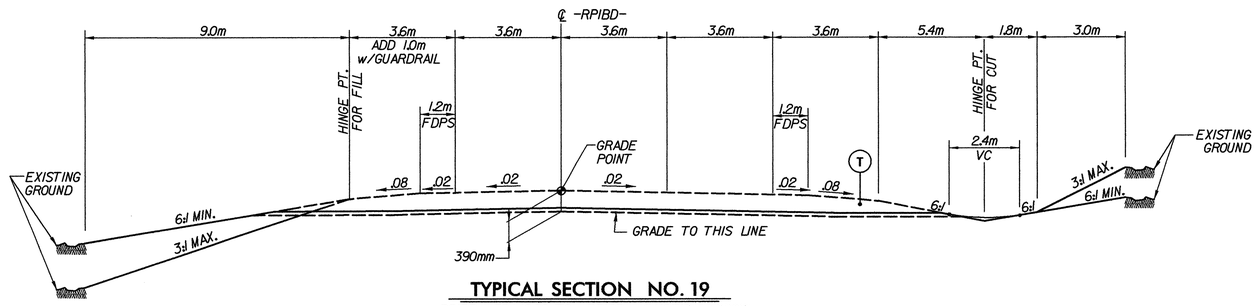
NOTES:
1. ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.
2. SHOULDER ROLLOVER NOT TO EXCEED 0.06 (TYP).
3. USE 4:1 MAX SLOPES ON INSIDE OF INTERCHANGE.
4. SEE PLANS FOR LOCATION OF ACCELERATION AND DECELERATION LANES.
5. SEE PLANS FOR LOCATION OF TURN LANES AND INTERSECTION TURNOUTS.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 22031 ENGINEER DENNIS JAMES MORAY

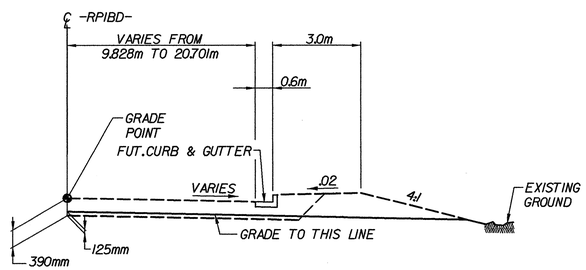
8-19-11

PAVEMENT DESIGN ENGINEER



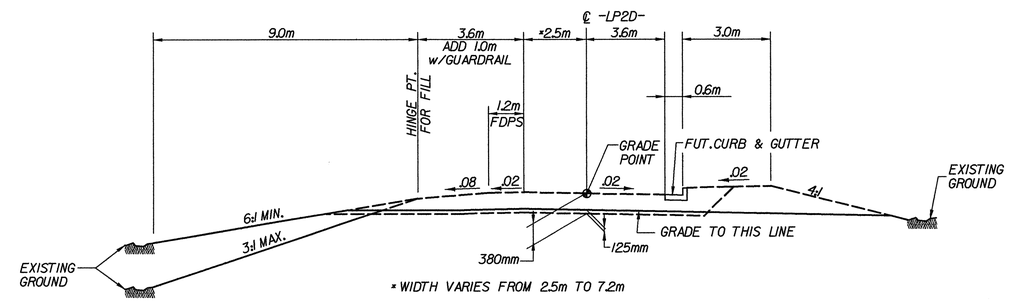

## TYPICAL SECTION NO. 19

-RPIBD- 39+40.00 TO -RPIBD- 41+10.713 (BRIDGE)
-RPIBD- 41+57.213 (BRIDGE) TO -RPIBD- 42+80.000
(PAVING ONLY)




## PARTIAL TYPICAL SECTION NO. 19A

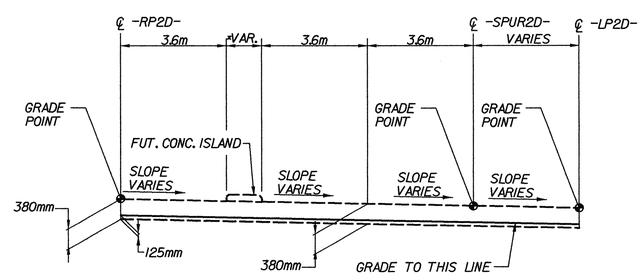
-RPIBD- 41+57.213 (BRIDGE) TO -RPIBD- 42+36.607
USE IN CONJUNCTION WITH TYPICAL SECTION NO.19 -RPIBD-




* WIDTH VARIES FROM 2.5m TO 7.2m

## TYPICAL SECTION NO. 20

-LP2D- 10+66.993 TO -LP2D- 12+47.166
(PAVING ONLY)




## PARTIAL TYPICAL SECTION NO. 20A

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 20 -LP2D-

-LP2D- 12+05.397 TO -LP2D- 12+47.166
-SPUR2D- 10+00.000 TO -SPUR2D- 10+41.224

* WIDTH VARIES FROM 4.0m TO 1.7m FOR MONOLITHIC CONCRETE ISLAND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DATE: 8/19/2011 TIME: 12:45 PM
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PW TABLE: V:\BSL_FLORIDC_SERVER_FILES\CAD\WINCADPRV\MS_MRTN\PW_MRTN\PW_SA-NTE

# DRAINAGE DITCH DETAILS

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-G |
| R /W SHEET NO. | |

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 28034 ENGINEER DENNIS JAMES MORY — 8-29-08

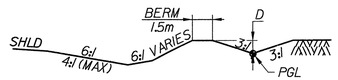
HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR. — 8/29/08

CONST.REV.

R/W REV.

NOTE:
1) SEE PROFILES FOR SPECIAL DITCH GRADES.

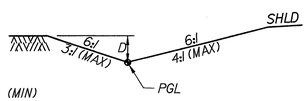
## DETAIL 1
### SPECIAL BERM DITCH




D = 1.0m (MIN)

| STATION TO STATION | EST DDE CM |
|---|---|
| -Y1- 26+40 TO -Y1- 26+70 LT | 28 |
| -Y1- 27+00 TO -Y1- 27+20 LT | 42 |
| | |

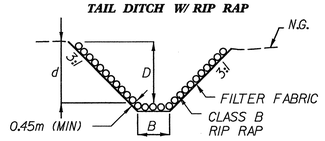
## DETAIL 2
### SPECIAL V-DITCH




D = 0.3m (MIN)

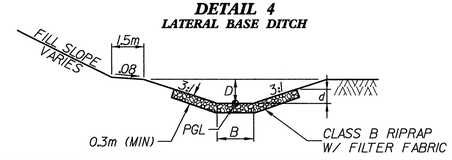
| STATION TO STATION |
|---|
| -L- 33+80 TO -L- 34+00 RT |
| -COLI- 33+80 TO -COLI- 34+00 LT |
| -COL2- 38+40 TO -COL2- 38+80 LT |
| -RPIA- 16+28 TO -RPIA- 17+55 RT |
| -RPIB- 14+60 TO -RPIB- 15+39 RT |
| -RPIBD- 20+65 TO -RPIBD- 22+25 RT |
| -RPIBD- 21+58 TO -RPIBD- 22+45 LT |
| -RP3C- 12+00 TO -RP3C- 12+96 LT |
| |

## DETAIL 3
### TAIL DITCH W/ RIP RAP



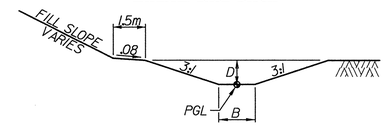

| STATION TO STATION | B | D (MIN) | d (MIN) | CLASS B RIPRAP M TONS | CLASS II RIPRAP M TONS | FILTER FABRIC SM | EST DDE CM |
|---|---|---|---|---|---|---|---|
| -RPIBD- 21+58 LT | 0.9 | 0.9 | 0.9 | 40 | - | 50 | 70 |
| -RPIBD- 21+50 RT | 0.9 | 0.9 | 0.9 | - | 130 | 150 | 90 |
| -TT4- 32+55 LT | 0.9 | 0.9 | 0.9 | - | 90 | 100 | 50 |
| | | | | | | | |

## DETAIL 4
### LATERAL BASE DITCH



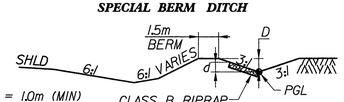

| STATION TO STATION | B M | D (MIN) M | d (MAX) M | CLASS B RIPRAP TONS | FILTER FABRIC SM | EST DDE CM |
|---|---|---|---|---|---|---|
| -RPIDB- 22+60 TO -RPIDB- 23+10 RT | 0.9 | 0.9 | 0.9 | 212 | 498 | 72 |
| -LPIB- 13+55 TO 14+00 -LPIB- RT | 0.9 | 0.9 | 0.9 | 164 | 386 | 190 |
| | | | | | | |

## DETAIL 5
### LATERAL BASE DITCH




| STATION TO STATION | B M | D (MIN) M | EST DDE CM |
|---|---|---|---|
| -RPIBD- 36+40 TO -RPIBD- 37+30 RT | 0.9 | 0.9 | 300 |
| -LPIB- 14+00 TO -LPIB- 14+60 RT | 0.9 | 0.9 | 233 |
| | | | |

## DETAIL 6
### SPECIAL BERM DITCH

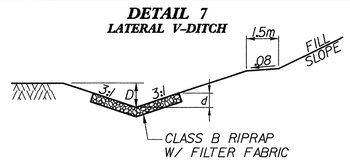



D = 1.0m (MIN)
d = 0.6m (MIN)

CLASS B RIPRAP
W/ FILTER FABRIC
0.300m (MIN THICKNESS)

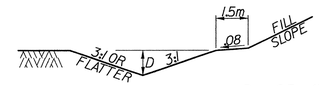
| STATION TO STATION | CLASS B RIPRAP TONS | FILTER FABRIC SM | EST DDE CM |
|---|---|---|---|
| -Y1- 26+70 TO -Y1- 27+00 LT | 35 | 58 | 30 |
| | | | |

## DETAIL 7
### LATERAL V-DITCH




| STATION TO STATION | D (MIN) M | d (MAX) M | CLASS B RIPRAP TONS | FILTER FABRIC SM | EST DDE CM |
|---|---|---|---|---|---|
| -RPIB- 13+20 TO -RPIB- 14+14 RT | 0.3 | 0.3 | 131 | 366 | 172 |
| -COLI- 22+00 TO -COLI- 22+20 RT | 0.3 | 0.3 | 46 | 78 | 9 |
| | | | | | |

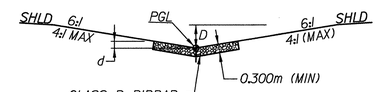
## DETAIL 8
### LATERAL V-DITCH




D = 0.3m (MIN)

| STATION TO STATION | EST DDE CM |
|---|---|
| -RPIDB- 12+70 TO 13+31 -RPIDB- RT | 211 |
| -RPIA- 12+20 TO 13+87 -RPIA- RT | 1098 |
| -RPIB- 14+14 TO -RPIB- 14+60 RT | 54 |
| -RPID- 10+60 TO -RPID- 11+63.5 RT | 565 |
| | |

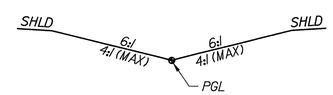
## DETAIL 9
### SPECIAL V-DITCH




D = 0.3m (MIN)
d = 0.3m (MIN)

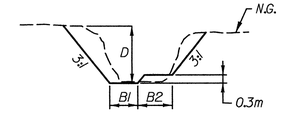
| STATION TO STATION | CLASS B RIPRAP TONS | FILTER FABRIC SM |
|---|---|---|
| -COLI- 26+00 TO -COLI- 26+90 LT | 237 | 506 |
| -RPIBD- 31+15 TO -RPIBD- 31+55 RT | 106 | 225 |
| -RPIB- 11+86 TO -RPIB- 12+09 LT | 61 | 129 |

## DETAIL 11
### SPECIAL V-DITCH




| STATION TO STATION |
|---|
| -L- 23+27 TO -L- 23+80 RT |
| -L- 33+60 TO -L- 33+80 RT |
| -RPIB- 11+20 TO -RPIB- 11+86 LT |
| -RPIB- 13+50 TO -RPIB- 14+15 LT |
| -LPID- 12+09 TO -LPID- 12+24 LT |
| -Y1- 25+00 TO -Y1- 25+40 LT |

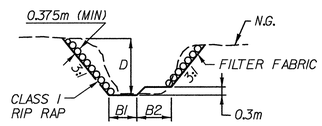
## DETAIL 13
### INLET DITCH




D = 0.6m (TYP)
B1 VARIES FROM 2.0m TO 3.6m
B2 VARIES FROM 0.0m TO 3.6m

| STATION TO STATION | EST DDE CM |
|---|---|
| -L- 22+30 LT | 60 |

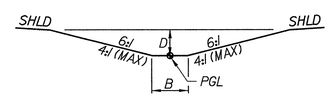
## DETAIL 14
### OUTLET TAIL DITCH




D = 0.6m (TYP)
B1 VARIES FROM 3.6m TO 1.4m
B2 VARIES FROM 3.6m TO 0.0m

| STATION TO STATION | CLASS I RIPRAP TONS | FILTER FABRIC SM | EST DDE CM |
|---|---|---|---|
| -L- 23+13 RT | 40 | 45 | 150 |

## DETAIL 15
### SPECIAL BASE DITCH




| STATION TO STATION | B M | D (MIN) M |
|---|---|---|
| -L- 32+60 TO -L- 33+60 RT | 1.2 | 0.6 |
| -Y1- 24+40 TO -Y1- 25+00 LT | 1.2 | 0.6 |

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DATE: 08/29/2008 11:53:33 AM
PLOT DRIVER: M:\PWCAD\PLOTDRV\Metric_plan_full\kfline_metric.plt
PEN TABLE: M:\PWCAD\PENTABS_RNY\RAL_RAY.TBL

# DRAINAGE DITCH DETAILS

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

CONST.REV.
R/W REV.

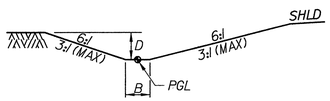
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-H |
| R /W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 29031 ENGINEER DENNIS JAMES MOREY
8/24/09

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR.
8/24/09

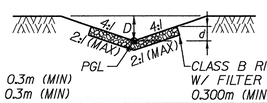
NOTE:
1) SEE PROFILES FOR SPECIAL DITCH GRADES.

## DETAIL 16
### SPECIAL CUT GRASSED SWALE




| STATION TO STATION | B M | D (MIN) M |
|---|---|---|
| -COLI- 31+20 TO -COLI- 32+42 RT | 1.2 | 0.6 |
| -COLI- 34+58 TO -COLI- 35+27 RT | 0.6 | 0.6 |
| -COLI- 35+27 TO -COLI- 35+47 RT | 0.9 | 0.9 |
| -COL2- 38+80 TO -COL2- 39+68 LT | 0.6 | 0.6 |
| -RPIDB- 12+70 TO -RPIDB- 13+31 RT | 0.6 | 0.6 |
| -Y1- 23+63 TO -Y1- 25+00 LT | 1.2 | 0.9 |
| | | |

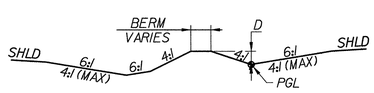
## DETAIL 18
### TAIL DITCH




D = 0.3m (MIN)
d = 0.3m (MIN)

| STATION TO STATION | CLASS B RIPRAP TONS | FILTER FABRIC SM | EST DDE CM |
|---|---|---|---|
| -Y1- 26+90 TO -Y1- 27+20 RT | 68 | 151 | 36 |

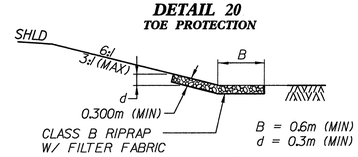
## DETAIL 19
### SPECIAL BERM DITCH




D = 0.6m (MIN)

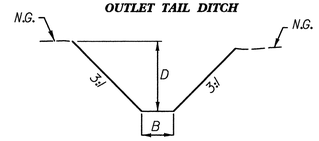
| STATION TO STATION |
|---|
| -RPIB- 12+09 TO -RPIB- 12+45 LT |
| -RPIB- 13+00 TO -RPIB- 13+50 LT |
| -RPIDB- 19+62 TO -RPIDB- 20+26 RT |

## DETAIL 20
### TOE PROTECTION




| STATION TO STATION | CLASS B RIPRAP TONS | FILTER FABRIC SM |
|---|---|---|
| -RPID- 12+40 TO -RPID- 14+00 RT | 240 | 475 |

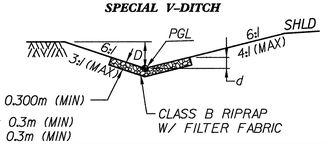
## DETAIL 22
### OUTLET TAIL DITCH




B VARIES FROM 0.0m TO 0.9m

| STATION | B M | D (MIN) M | EST DDE CM |
|---|---|---|---|
| -TT3- 12+90 RT | 0.9 | 0.9 | 35 |
| -RPIDB- 13+50 LT | 0.9 | 0.9 | 100 |
| -RPIDB- 13+80 LT | 0.0 | 0.3 | 7 |
| -RPIDB- 14+55 LT | 0.0 | 0.3 | 6 |
| -Y1- 22+60 LT | 0.0 | 0.3 | 3 |
| -Y1- 23+50 LT | 0.9 | 0.9 | 19 |
| -Y1- 26+89 RT | 0.9 | 0.9 | 27 |
| | | | |

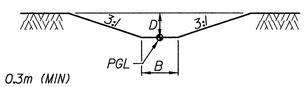
## DETAIL 23
### SPECIAL V-DITCH




D = 0.3m (MIN)
d = 0.3m (MIN)

| STATION TO STATION | CLASS B RIPRAP TONS | FILTER FABRIC SM |
|---|---|---|
| -L- 33+60 TO -L- 33+80 RT | 53 | 112 |
| -COLI- 33+58 TO -COLI- 33+80 LT | 58 | 124 |
| -Y1- 27+20 TO -Y1- 27+40 RT | 53 | 112 |
| | | |

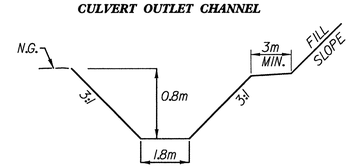
## DETAIL 25
### INLET HEAD DITCH




D = 0.3m (MIN)

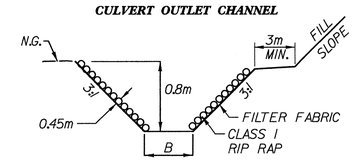
| STATION TO STATION | B M | D (MIN) M | EST DDE CM |
|---|---|---|---|
| -L- 20+66 TO -L- 21+76 LT | 2.7 | 0.9 | 595 |
| | | | |

## DETAIL 26
### CULVERT OUTLET CHANNEL




| STATION TO STATION | EST DDE CM |
|---|---|
| -L- 29+50 LT TO -L- 30+00 LT | 240 |

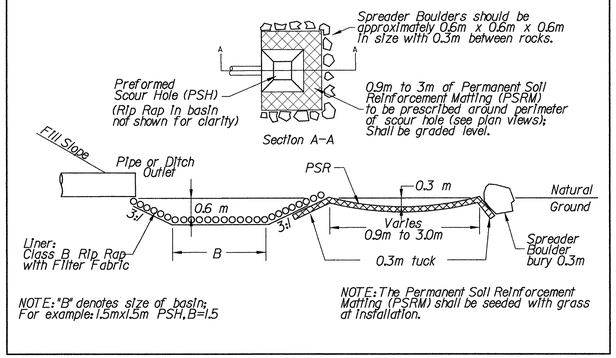
## DETAIL 27
### CULVERT OUTLET CHANNEL




B VARIES FROM 2.1m TO 1.8m

| STATION TO STATION | CLASS I RIPRAP TONS | FILTER FABRIC SM | EST DDE CM |
|---|---|---|---|
| -L- 30+00 LT TO -L- 30+13.5 LT | 130 | 150 | 160 |

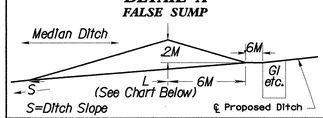
## DETAIL 28
### PREFORMED SCOUR HOLE WITH LEVEL SPREADER APRON




NOTE: "B" denotes size of basin; For example: 1.5mx1.5m PSH, B=1.5

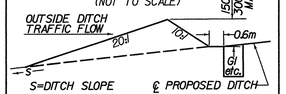
NOTE: The Permanent Soil Reinforcement Matting (PSRM) shall be seeded with grass at installation.

## DETAIL A
### FALSE SUMP



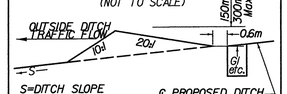

| Ditch Grade | L | Ditch Grade | L |
|---|---|---|---|
| 0.0% To 2.0% | 6m | Over 4.0% To 6.0% | 12m |
| Over 2.0% To 4.0% | 9m | Over 6.0% | 15m |

## DETAIL B
### FALSE SUMP
(NOT TO SCALE)




LEGEND FS-B

## DETAIL C
### FALSE SUMP
(NOT TO SCALE)




LEGEND FS-C

FILE: E:\U-2519DA\Roadway\Proj\U2519DA_RDY_DET_DRN_30-2H.dgn
DATE: 08/29/2008 11:32:08 AM
PLOT DRIVER: M:\BENCAD\PLOTTERS\Metric_Color_full\dflate_metric.plt
PLOT SCALE: 1:1 USER: M:\BENCAD\PROJECTS\U2519DA_CHRIS_SAUNDERS

# BRIDGE SKETCHES

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

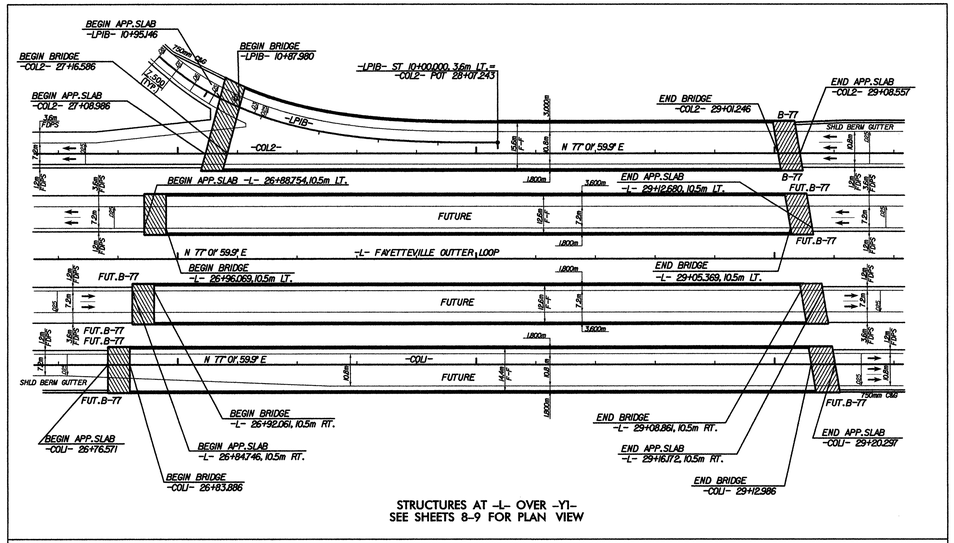
METRIC
5m 0 10m

CONST.REV.

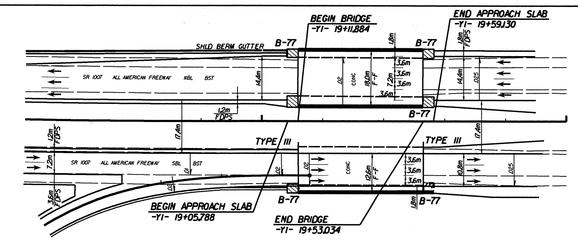
R/W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-I |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

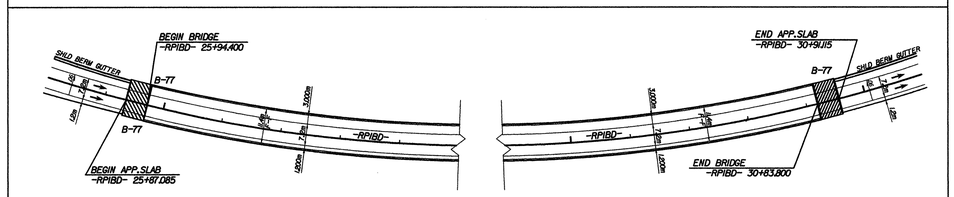
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20031 DENNIS JAMES MORY
10-6-08



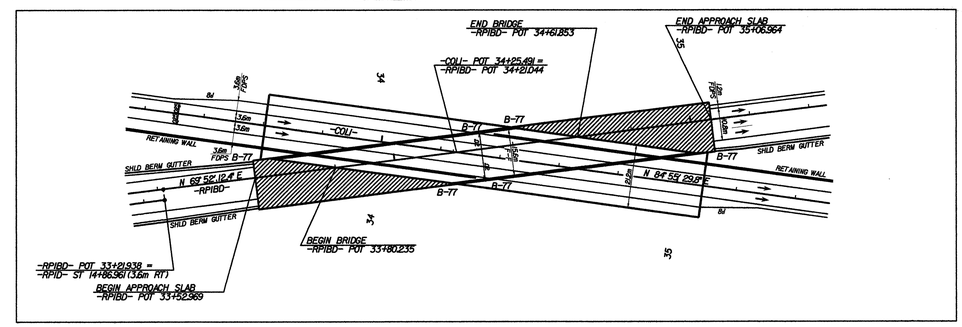

STRUCTURES AT -L- OVER -Y1-
SEE SHEETS 8-9 FOR PLAN VIEW

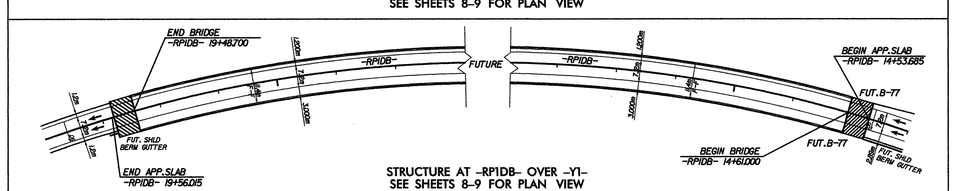



STRUCTURE AT -Y1- OVER BEAVER CREEK
SEE SHEET 8 FOR PLAN VIEW

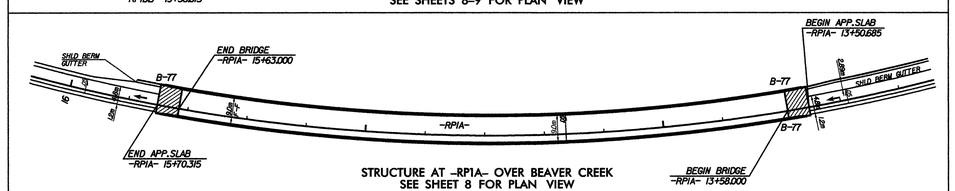



STRUCTURE AT -RP1BD- OVER -Y1-
SEE SHEETS 8-9 FOR PLAN VIEW

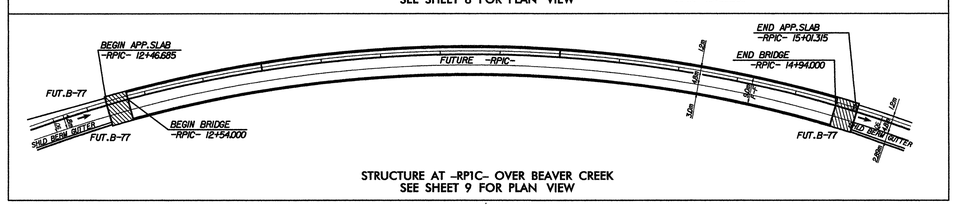


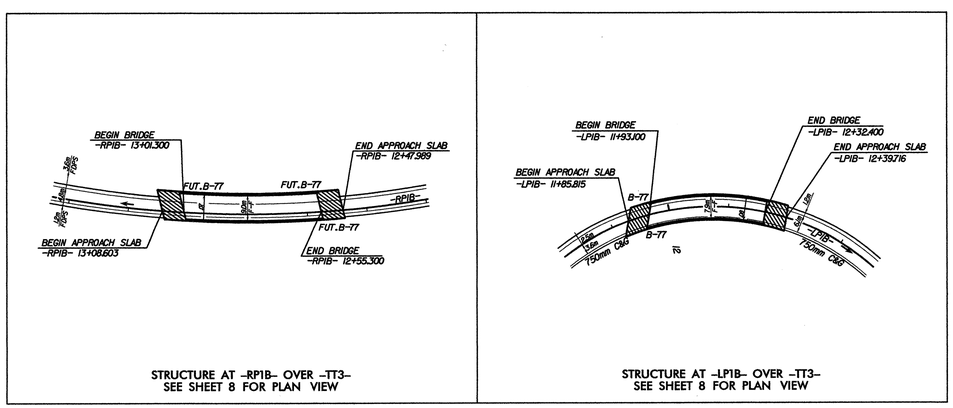

STRUCTURE AT -RP1DB- OVER -Y1-
SEE SHEETS 8-9 FOR PLAN VIEW




STRUCTURE AT -RP1A- OVER BEAVER CREEK
SEE SHEET 8 FOR PLAN VIEW




STRUCTURE AT -RP1C- OVER BEAVER CREEK
SEE SHEET 9 FOR PLAN VIEW




STRUCTURE AT -RP1B- OVER -TT3-
SEE SHEET 8 FOR PLAN VIEW

STRUCTURE AT -LP1B- OVER -TT3-
SEE SHEET 8 FOR PLAN VIEW

FILE: n:\U-2519DA\Roadway\Proj\U2519DA_RDY_DFT_21_BRGSKTCH.dgn
DATE: 10/06/2008 09:51:27 AM
OUT FORMS: H:\MicroStation\Forms\metric_plan_6x8\6x8plan_metric.pltcfg
PRV TABLE: M:\FRAMCAD\PRVTABS_RAFI\FRH_PLAN.TBL

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC

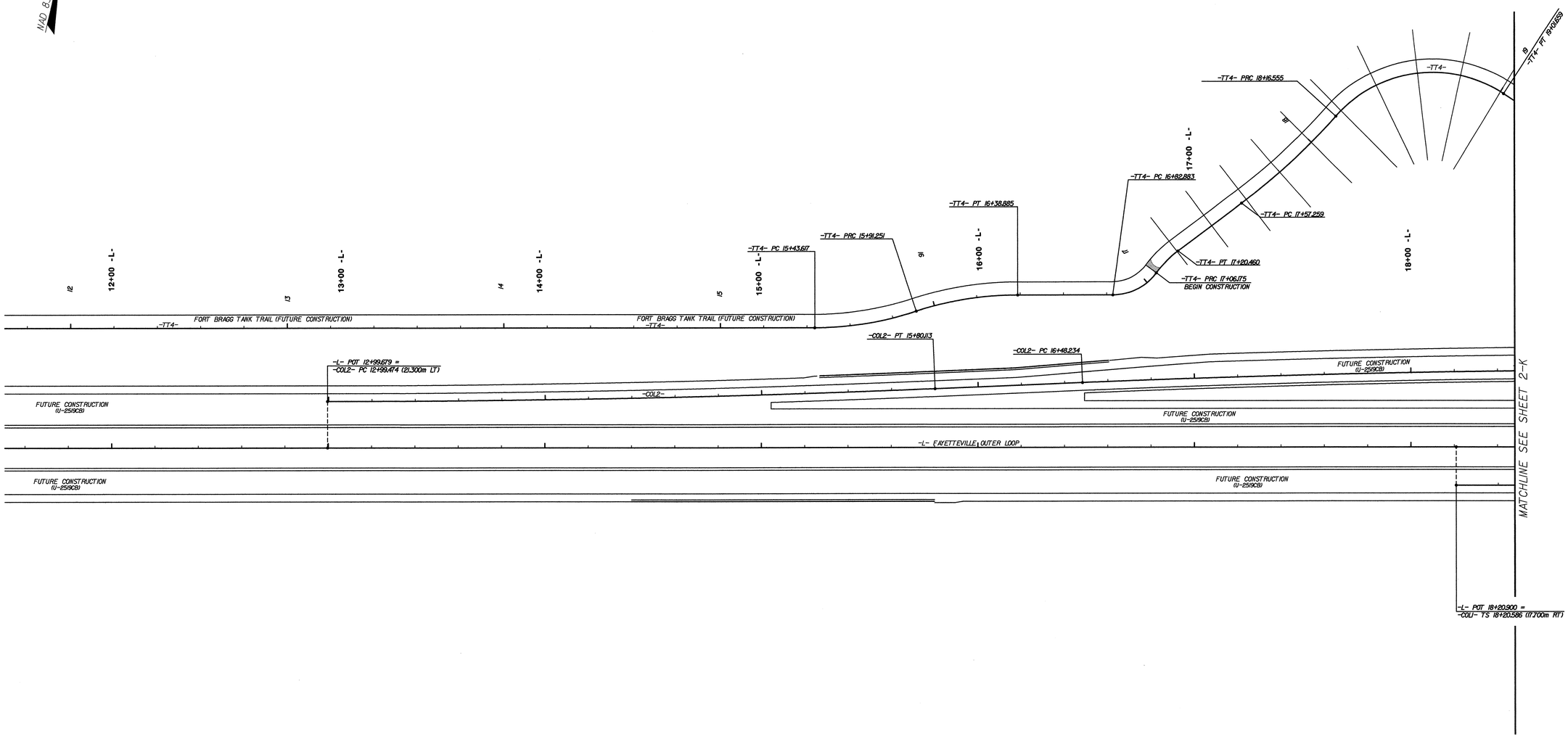
5m 0 10m

CONST.REV.

R/W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-J |
| R /W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORY
8-27-08




# SHEAR POINT DIAGRAM

FILE: R:\U-2519DA\Roadway\Proj\U2519DA_RDY_DFT_21_SPT.dgn
DATE: 08/08/2008 03:34:23 PM
PLOT SCALE: 40.0000 ' / in. PLOT DRIVER: Metric.pltcfg; Full; full; plotter_metric.plt
PEN TABLE: M:\MICRO\PENTABS_RDY\RDY_PLAN.TBL

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

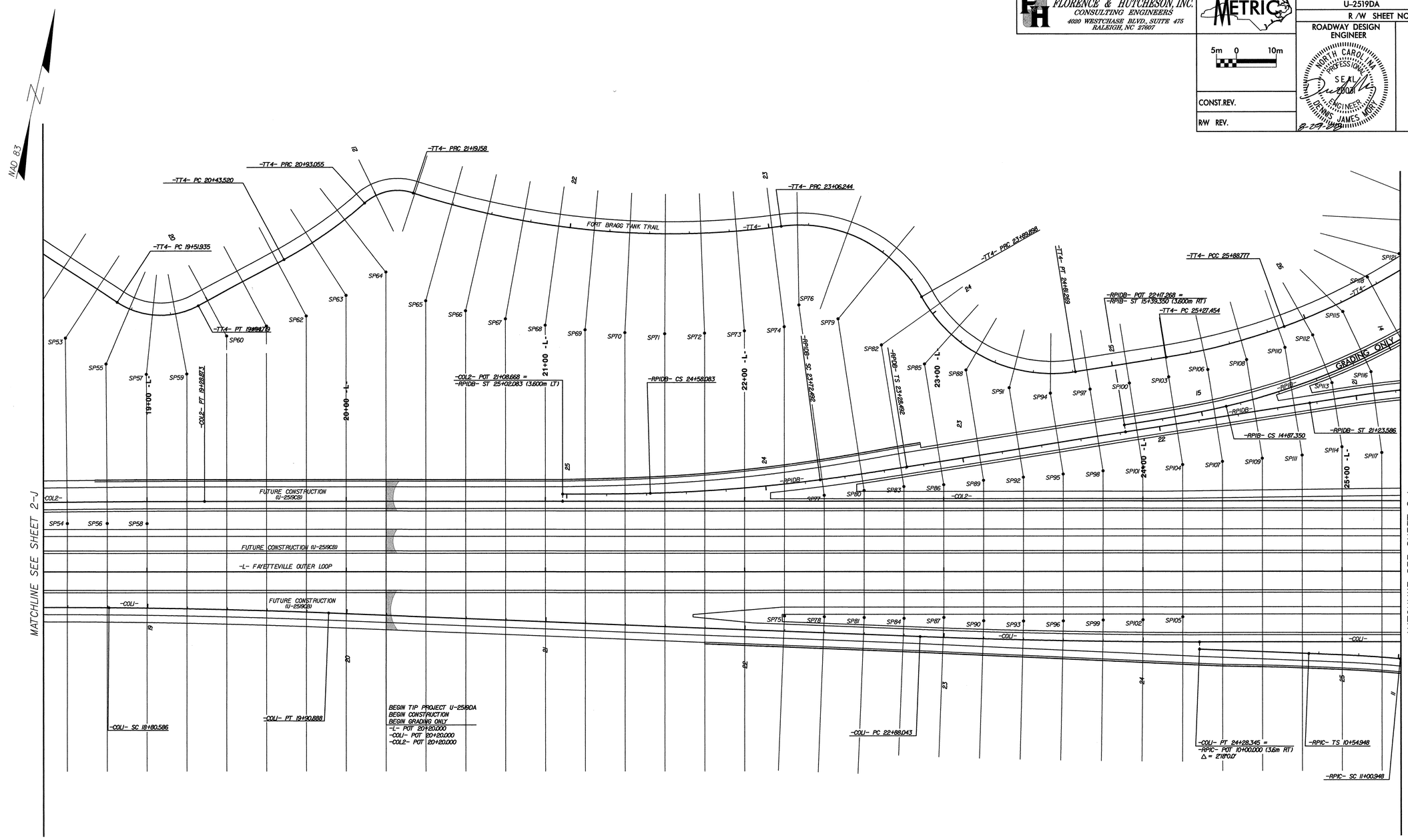
R/W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-K |
| R /W SHEET NO. | |

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 29021 ENGINEER DENNIS JAMES MOREY 8-29-2008




# SHEAR POINT DIAGRAM

FILE: R:\U-2519DA\Roadway Proj\U2519DA_RDY_DET_2K_SP2.dgn
DATE: 08/08/2008 03:44:01 PM
PLOT DRIVER: M:\RMCAD\PLOTTERS\Metric_Color_full\dflaw_metric.plt
PLOT NAME: M:\PWCADTEMP\RS_DRYMC_LAKE.TBL

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

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

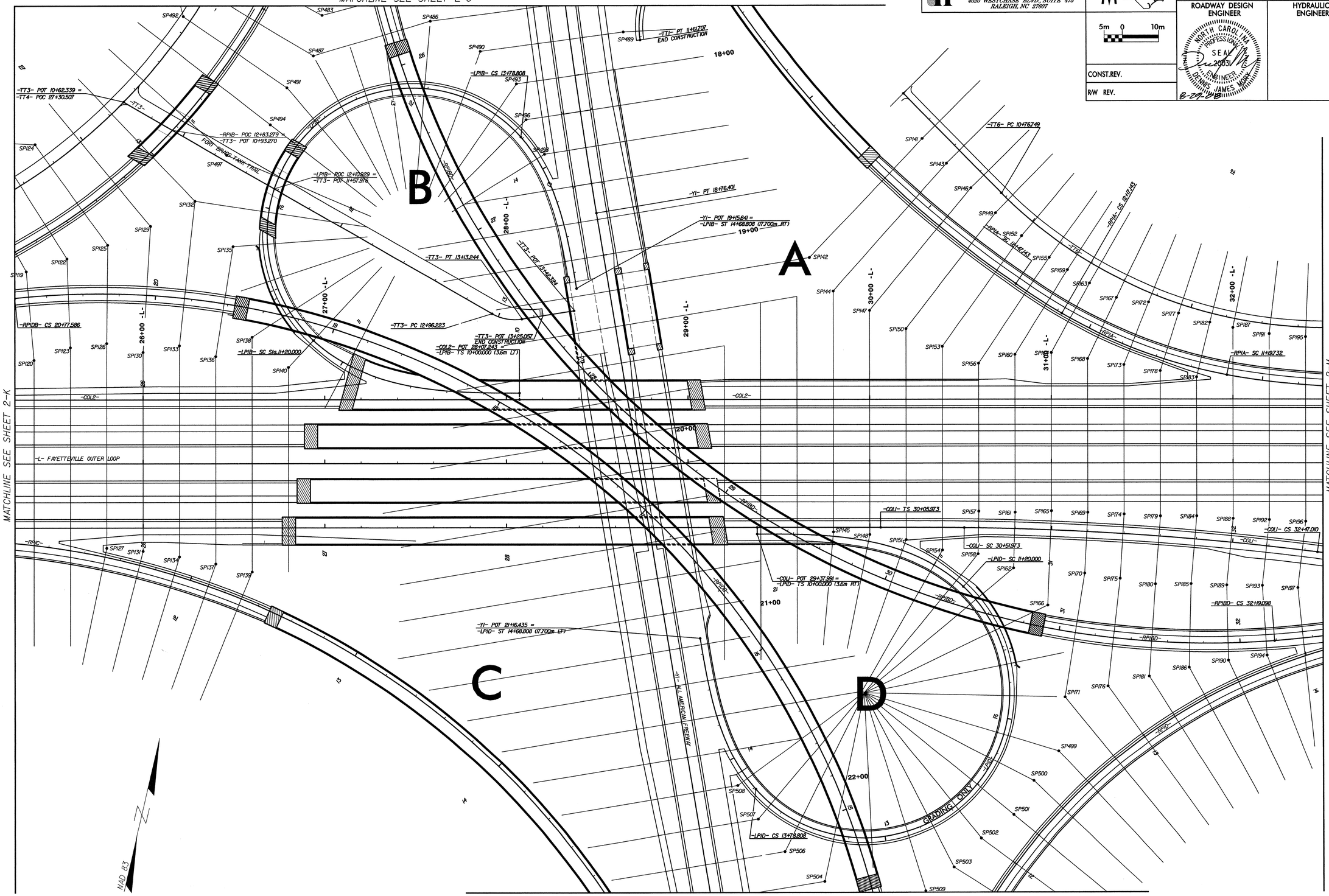
5m 0 10m

CONST.REV.

R/W REV.

NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORY

8-29-08




## SHEAR POINT DIAGRAM

FILE: R:\U-2519DA\Roadway\Proj\U2519DA_RDY_DET_2L_SP3.dgn
DATE: 08/08/2008 03:44:30 PM
PLOT DRIVER: M:\F&HCAD\PLOTDRV\Metric_plan_full\fullsize_metric.plt
PEN TABLE: M:\F&HCAD\PENTABS_F&H\F&H_PLAN.TBL

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

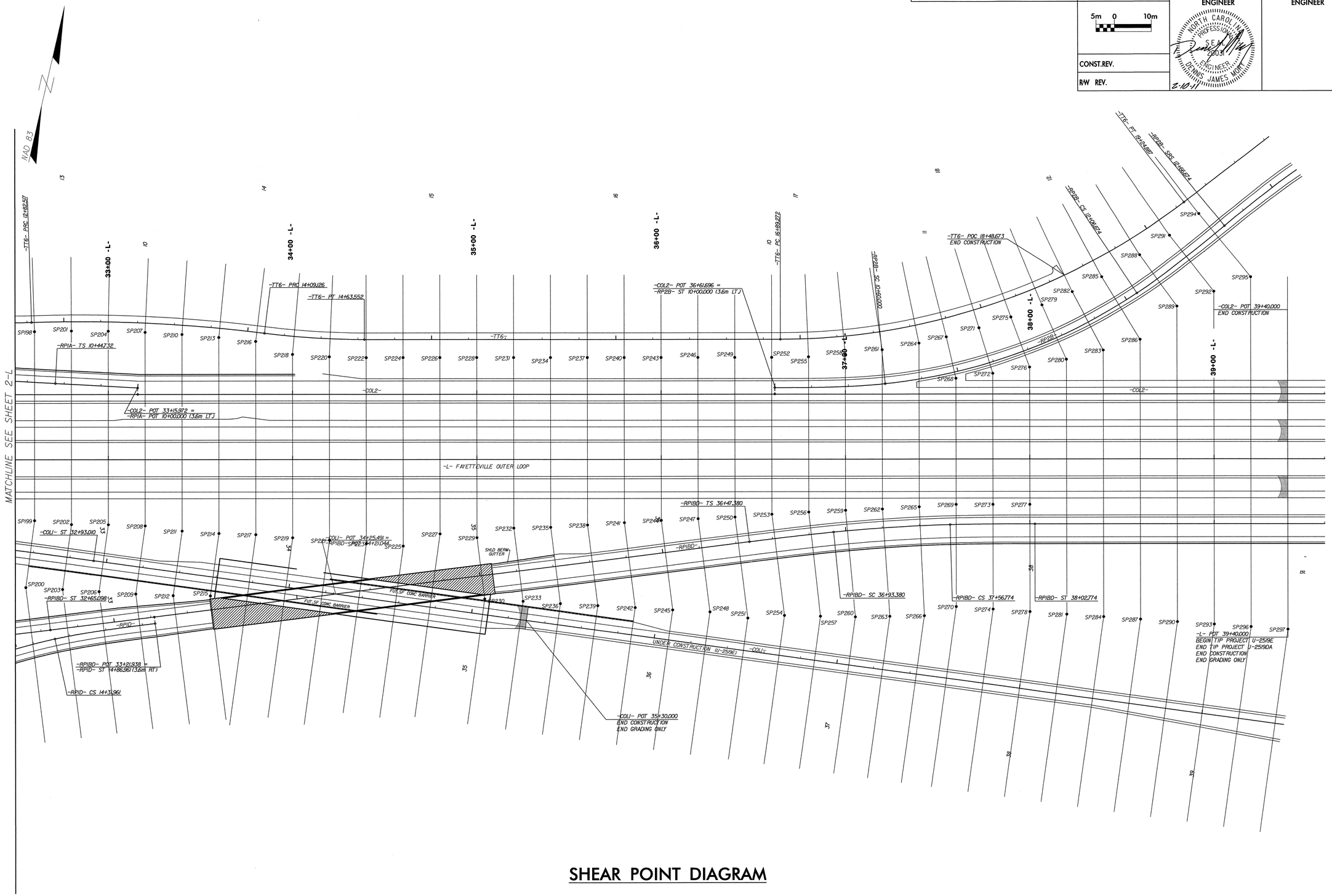
5m 0 10m

CONST.REV.

R/W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-M |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

NORTH CAROLINA PROFESSIONAL SEAL 030351 ENGINEER DENNIS JAMES MORT
2-10-11




# SHEAR POINT DIAGRAM

FILE: R:\Roadway\Proj\U2519DA_RDY_DET_2W_SP4.dgn
DATE: 2/10/2011 9:58:40 AM
PLOT DRIVER: V:\Bsl\Bsl_Driver_Files\CAD\RAHCAD\PLOTDRV\Metric_plan full\wsfloe_Interchange_Metric.pltr
PEN TABLE: V:\BAL_FLOHUT_SERVER_FILES\CAD\RAHCAD\PENTABS_PEN\RAH_PLAN.TBL

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

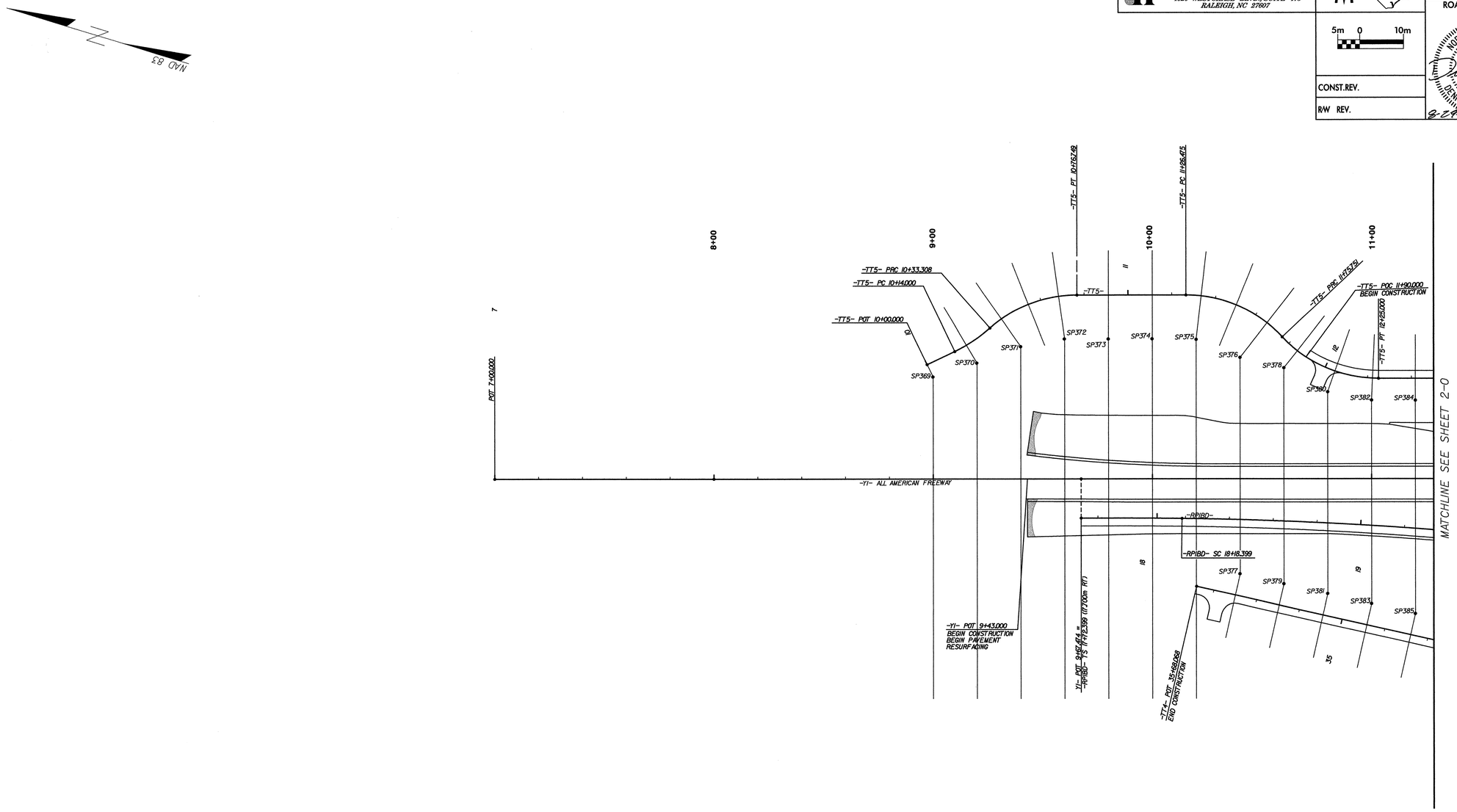
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-N |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

5m 0 10m

CONST.REV.

R/W REV.

NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORY
8-24-08




## SHEAR POINT DIAGRAM

FILE: R:\U-2519DA\Roadway\Proj\U2519DA_RDY_DET_2N_SPS.dgn
DATE: 08/08/2008 03:45:10 PM
PLOT DRIVER: M:\FRMCAD\PLOTDRV\Metric_plan_full\fullsize_metric.plt
PEN TABLE: M:\FRMCAD\PENTABS_FRM\FRM_PLAN.TBL

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

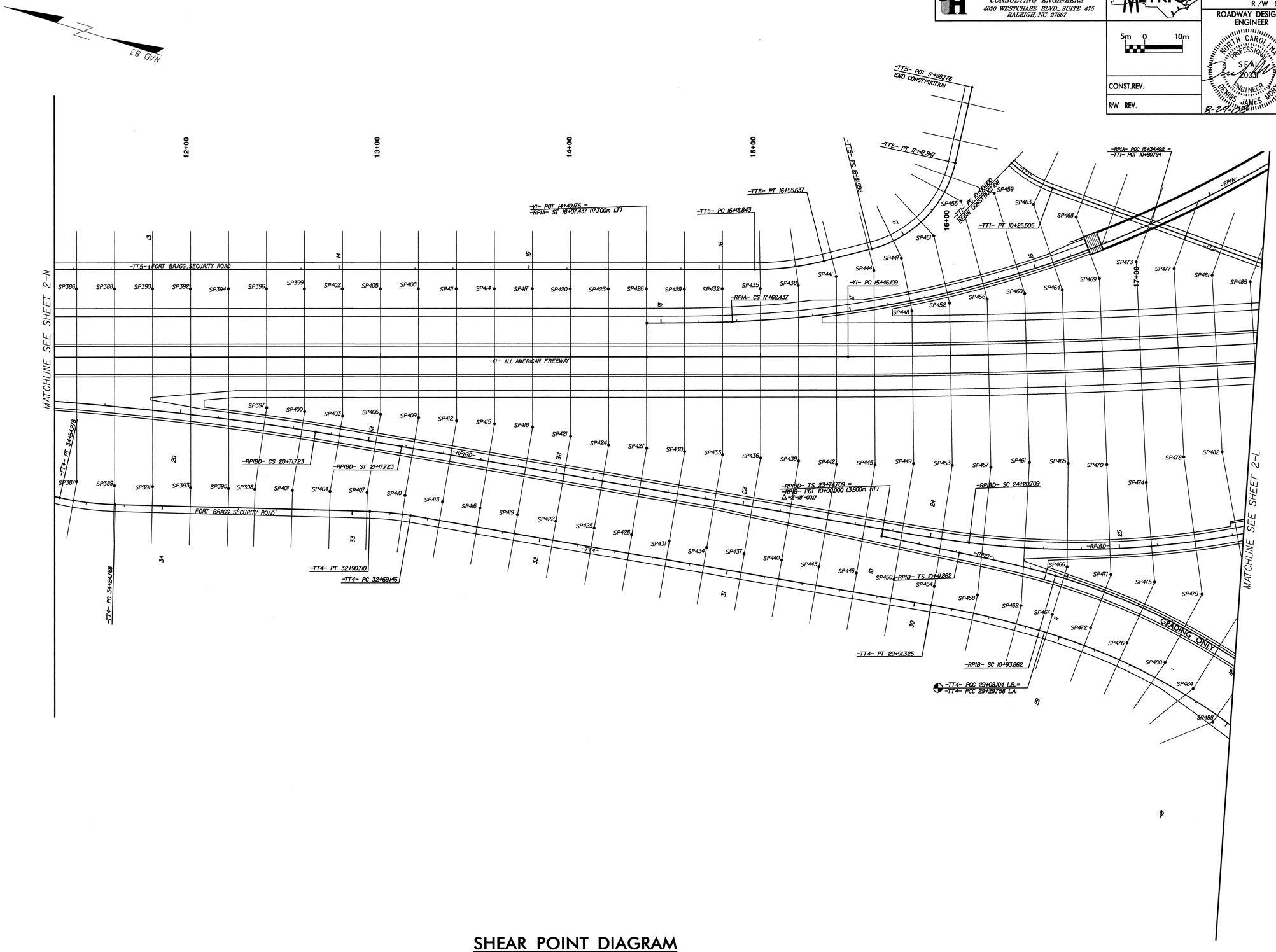
5m 0 10m

CONST.REV.

R/W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-O |
| R /W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORY
8-24-09




## SHEAR POINT DIAGRAM

FILE: R:\U-2519DA\Roadway Proj\U2519DA_RDY_DET_2-O_SP4.dgn
DATE: 08/06/2009 03:42:28 PM
PLOT DRIVER: hp designjet 1055cm HPGL2 v5.6 for Windows - 8.0.1 (Letter_metric.pltcfg)
PLOT NAME: rw (PHICAD)(PROTUBE)_DETAIL PLAN.TBL

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

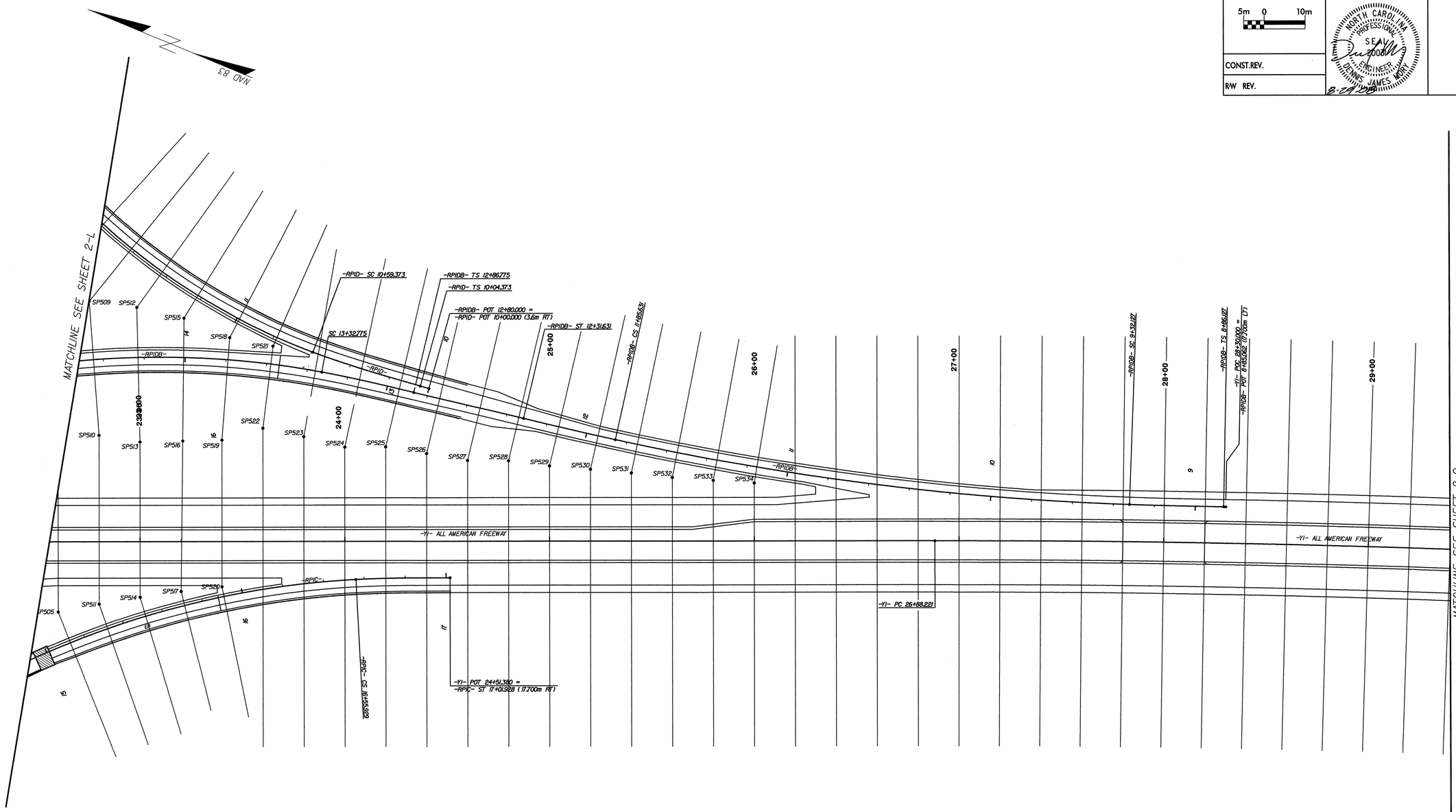
5m 0 10m

CONST.REV.

R/W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-P |
| R /W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

NORTH CAROLINA PROFESSIONAL SEAL 20008 ENGINEER DENNIS JAMES MORY
8-29-08




# SHEAR POINT DIAGRAM

FILE: R:\U-2519DA\Roadway\Proj\U2519DA_RDY_DET_2P_SP7.dgn
DATE: 08/08/2008 03:45:42 PM
PLOT SCALE: 1:1440.0 (Portrait) Metric plan full\bilbao_metric.pltcfg
PRN TABLE: M:\(RHCAD)\PRN\FCAD3_FH-H1\Std_PLAN.TBL

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-Q |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

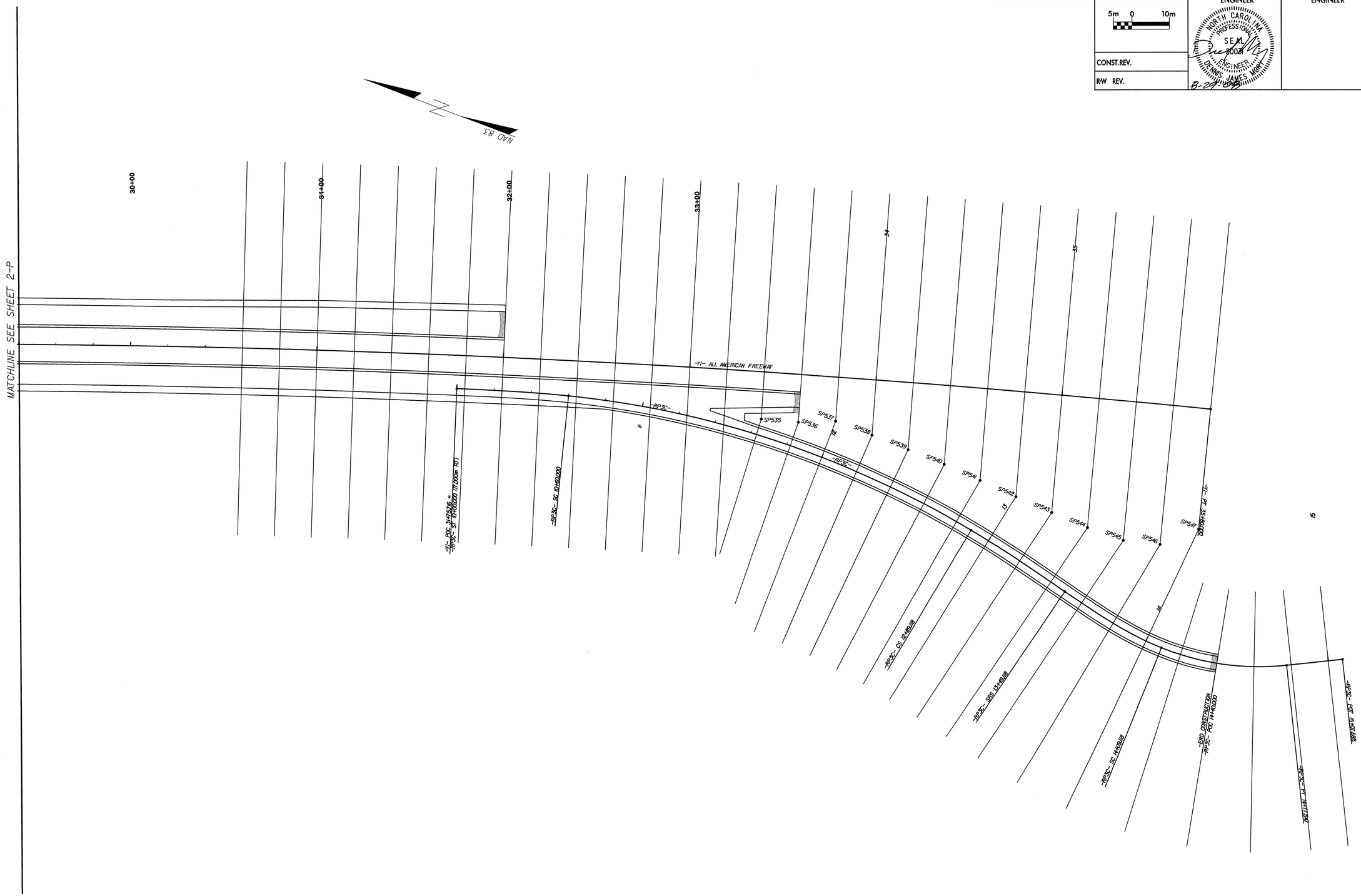
5m 0 10m

CONST.REV.

R/W REV.

NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORY

8-29-08




## SHEAR POINT DIAGRAM

FILE: R:\U-2519DA\Roadway\Proj\U2519DA_RDY_DET_2Q_SP8.dgn
DATE: 08/08/2008 03:45:59 PM
PLOT DRIVER: M:\F&HCAD\PLOTDRV\Metric_plan_full\fullsize_metric.pll
PEN TABLE: M:\F&HCAD\PENTABS_F&H\F&H_PLAN.TBL

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

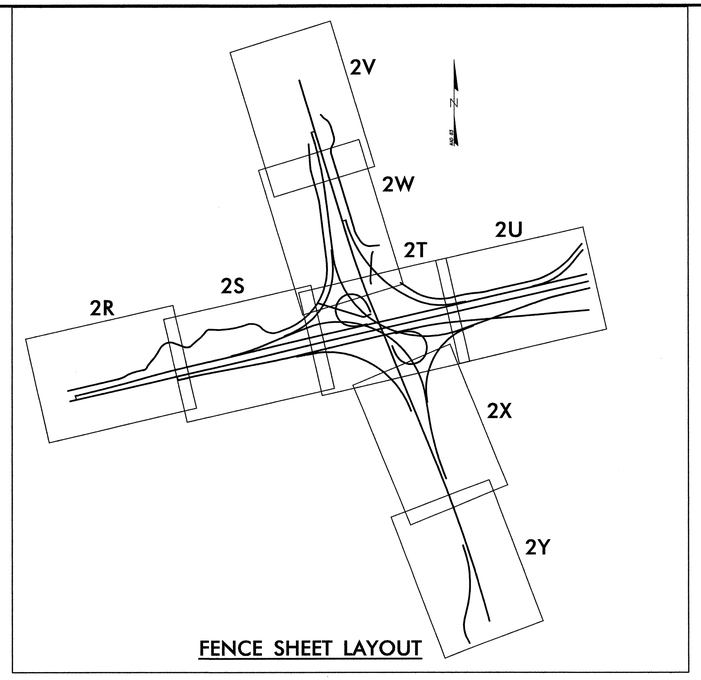
CONST.REV.

R/W REV.

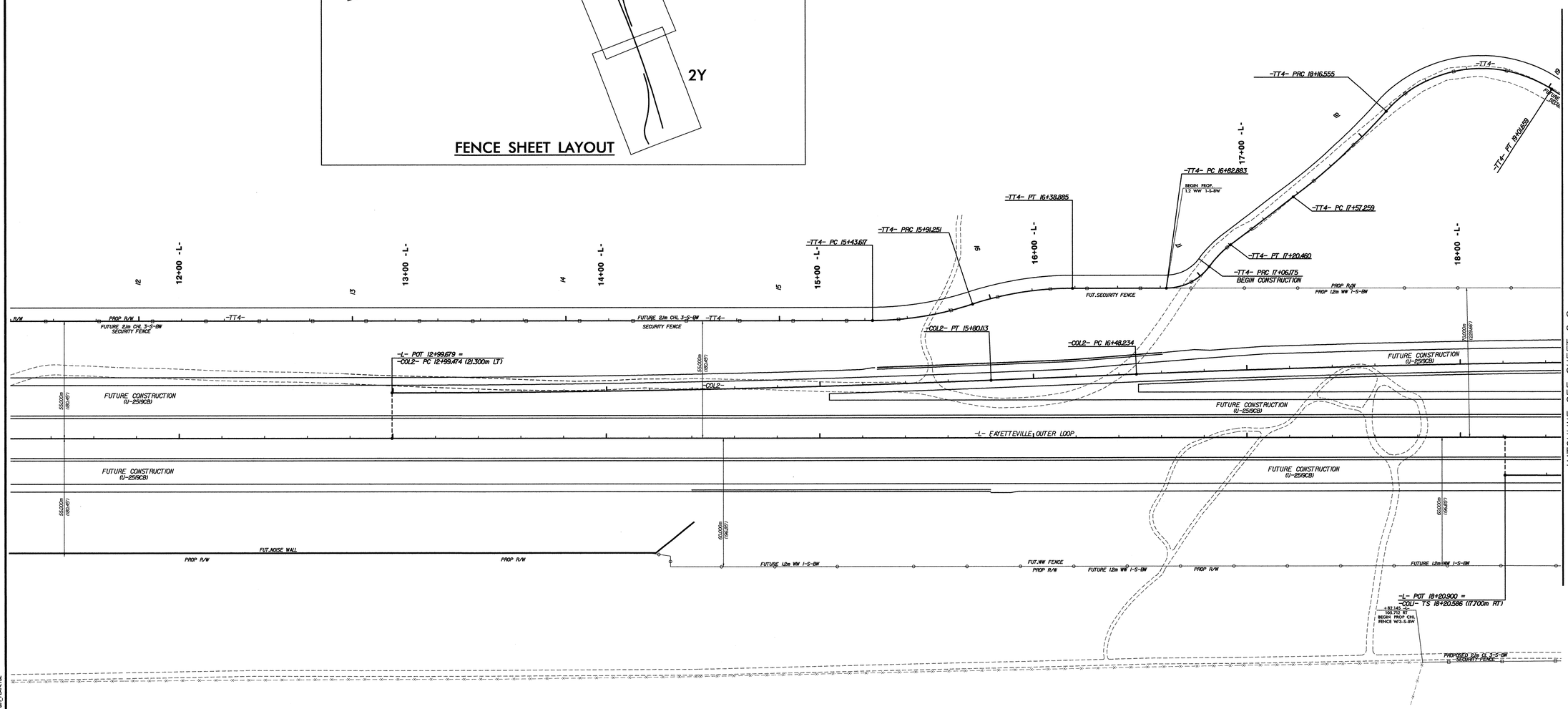
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-R |
| R /W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

NORTH CAROLINA PROFESSIONAL SEAL 20021 ENGINEER DENNIS JAMES MORAY

NAD 83




FENCE SHEET LAYOUT




FENCE LAYOUT

FILE: R:\U-2519DA\Roadway\Proj\U2519DA_RDY_DFT_28_F1.dgn
DATE: 09/08/2009 03:46:33 PM
SCT TYPE: M:\FRA\CAD\TRDWY\Metric_Sans_8.0\T_Editing_metric.pll
PCT TABLE: M:\FRA\CAD\PROTLIBS_RDY\FRA_PLAN.TBL

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

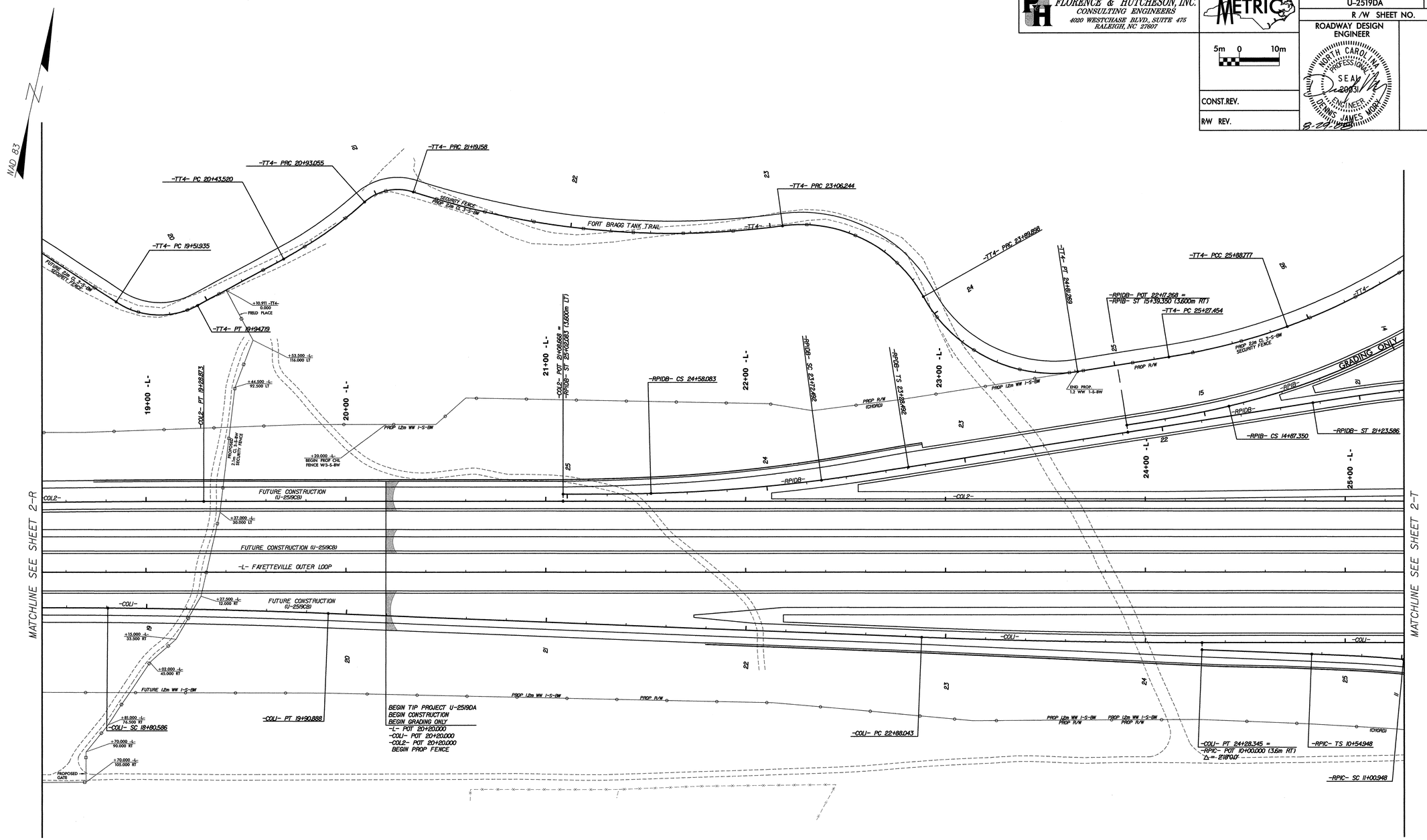
5m 0 10m

CONST.REV.

R/W REV.

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

NORTH CAROLINA PROFESSIONAL SEAL 28031 ENGINEER DENNIS JAMES MOORE 8-27-2008




# FENCE LAYOUT

FILE: R:\U-2519DA\Roadway\Proj\U2519DA_RDY_DFT_2S_F12.dgn
DATE: 08/08/2008 03:47:06 PM
PLOT SCALE: 1:1 (Metric) PLOT DEPTH: Metric.dgns full full.dgns metric.pdf
PEN TABLE: M:\RDWCAD\PENTABS_RDY\RDY_PLAN.TBL

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

CONST.REV.

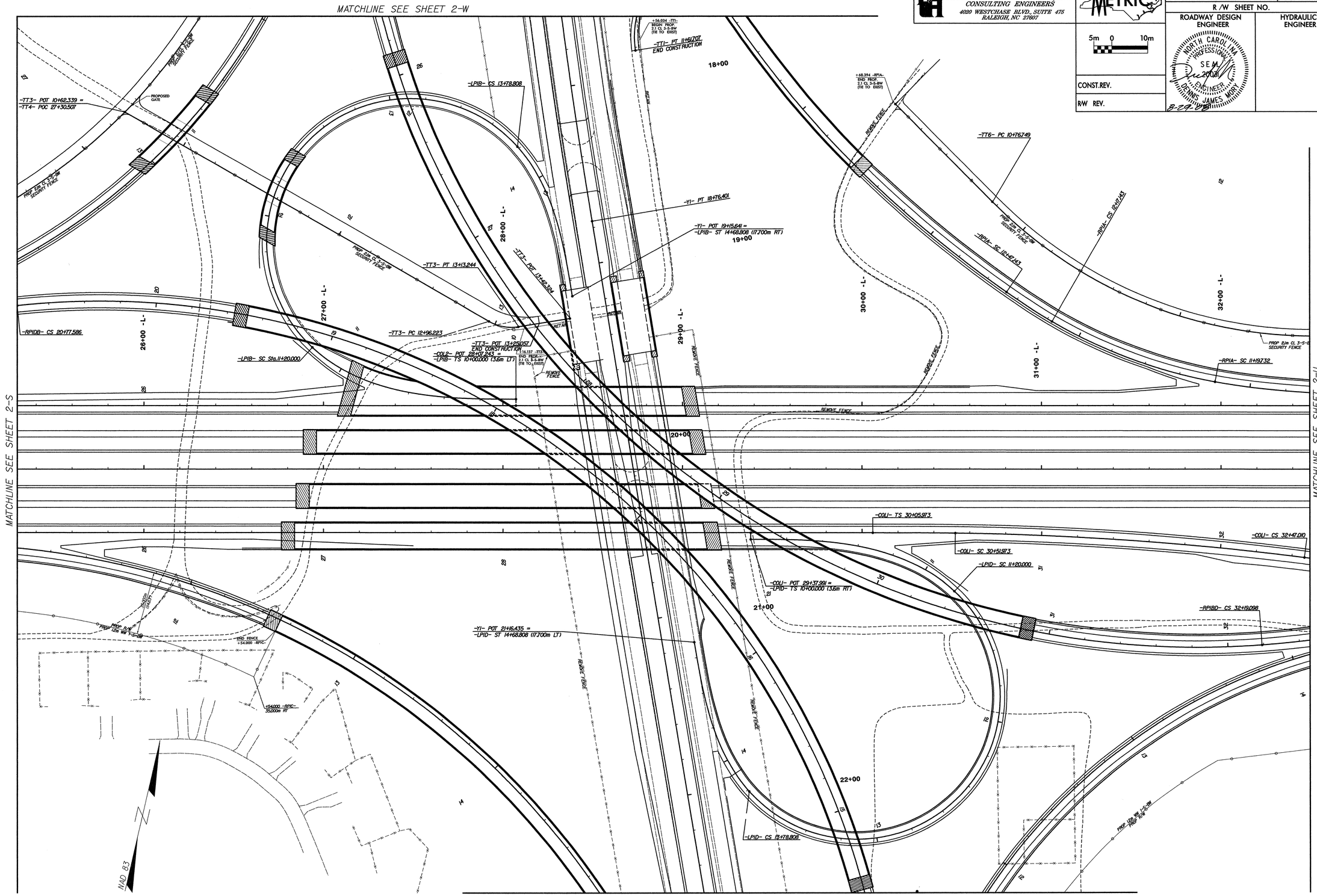
R/W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-T |
| R /W SHEET NO. | |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 20021 ENGINEER DENNIS JAMES MORY
8-29-08

HYDRAULICS ENGINEER




# FENCE LAYOUT

FILE: c:\U-2519DA Roadway\Proj\U2519DA_RDY_DEF_2T_R3.dgn
DATE: 08/27/2008 12:50:49 PM
PLOT DRIVER: M:\FMCAD\PLOTDRV\Metric_Plan_Full\Mass_metric.plt
PLOT SCALE: M:\FMCAD\PROJECTS\U2519DA_CAD\FMCAD_SHEETS

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

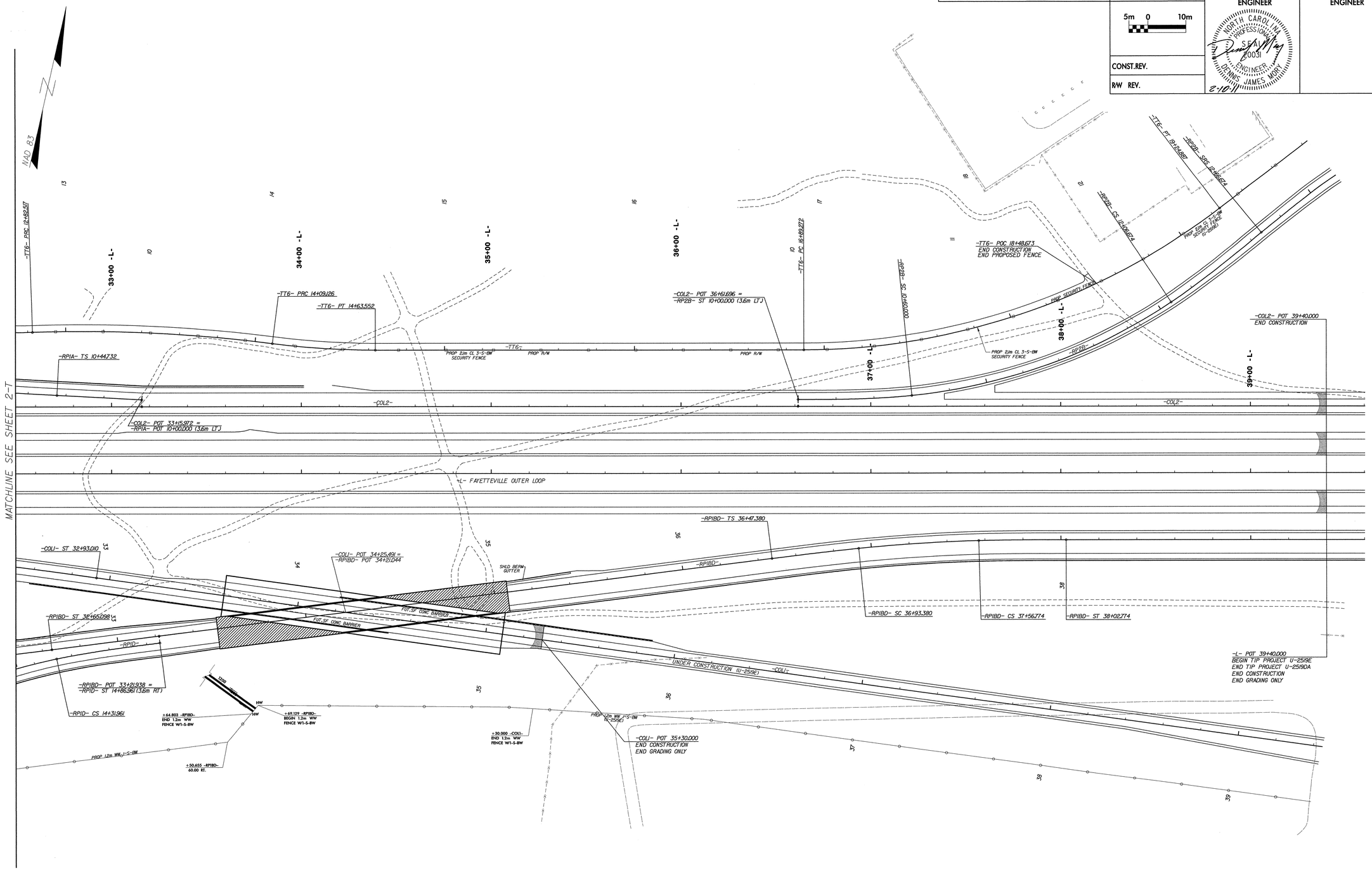
5m 0 10m

CONST.REV.

R/W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-U |
| R /W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORT
2-10-11




# FENCE LAYOUT

FILE: B:\Roadway\Proj\U2519DA_RDY_DET_2U_F4.4.dgn
DATE: 2/10/2011 10:00:33 AM
PLOT DRIVER: V:\Bu_Rwhs_Server_Files\CADD\RDCADD\ROTDRV\Metric_plan_full\halfsize_Interchange_Metric.pltr
PRINT TABLE: V:\RDCADD\CONFIG\SETTINGS\CONFIGRDCADD\PRINTSET_DMJM\TBL\A4.TBL

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-V |
| R /W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

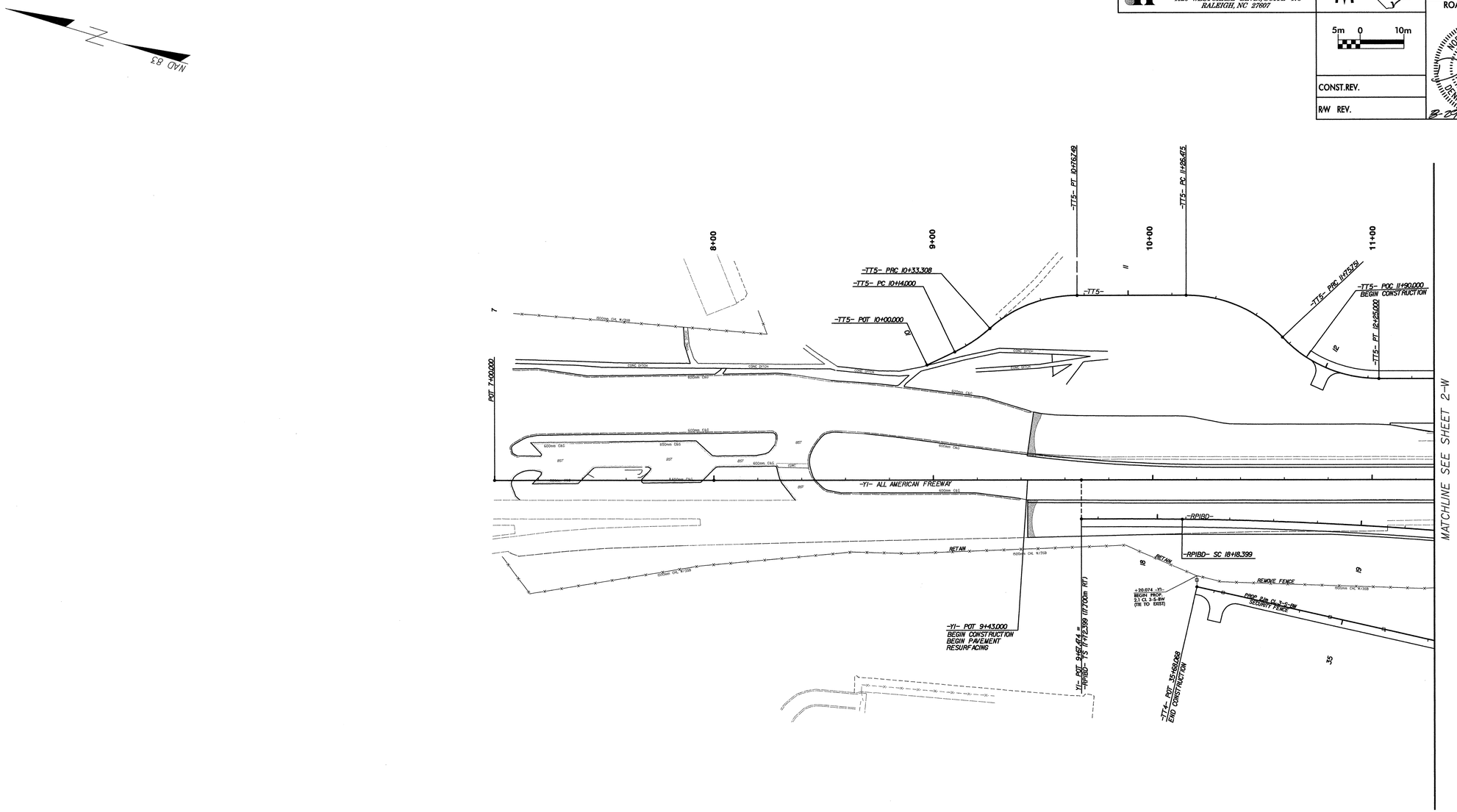
5m 0 10m

CONST.REV.

R/W REV.

NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORT

8-29-08




# FENCE LAYOUT

FILE: R:\U-2519DA\Roadway\Proj\U2519DA_RDY_DET_2V_FL5.dgn
DATE: 08/08/2008 03:48:09 PM
PLOT DRIVER: /Metric_plan_full\fullsize_metric.plt
PEN TABLE: /R&H\CAD\PENTABS_R&H\R&H_PLAN.TBL

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

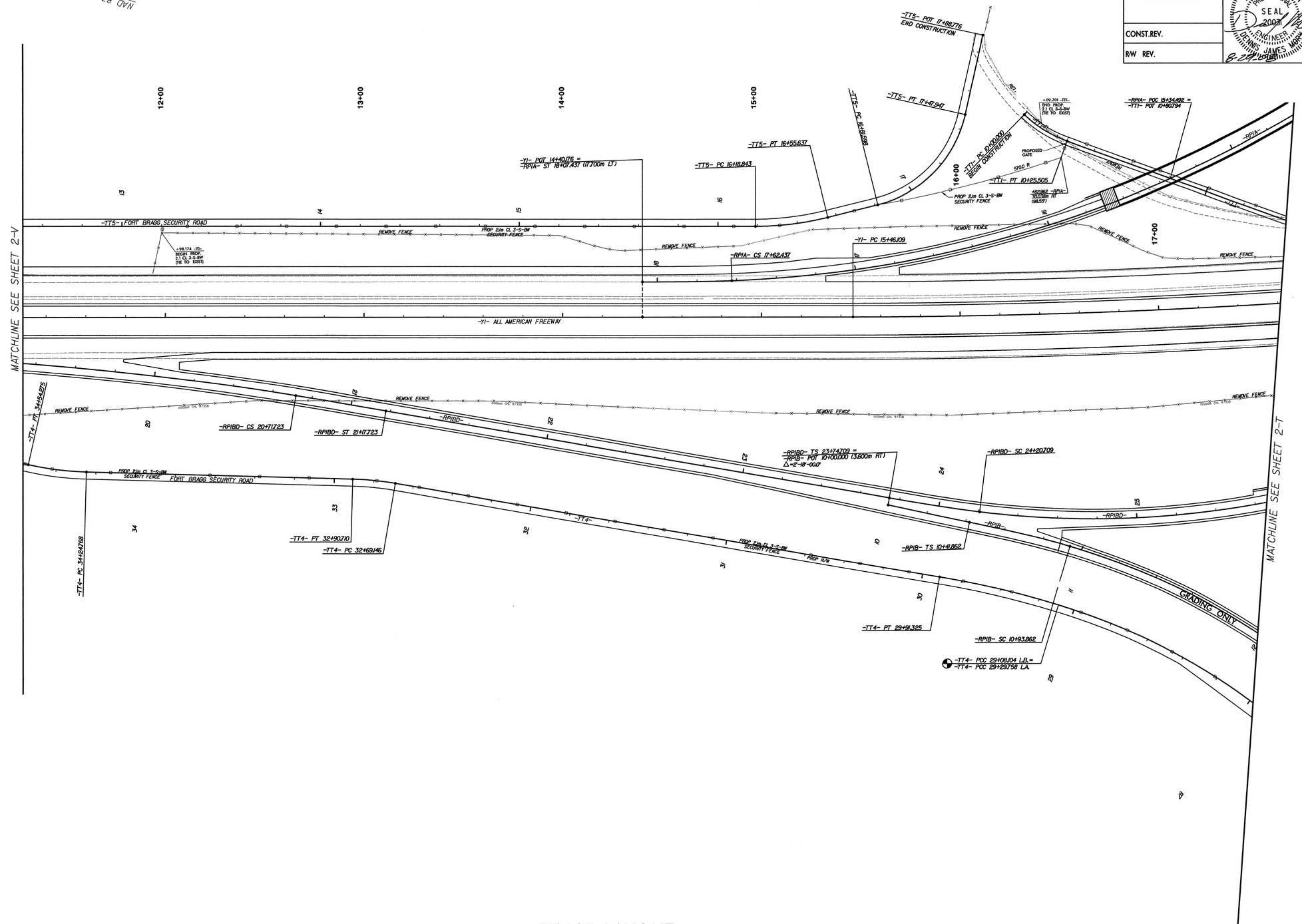
5m 0 10m

CONST.REV.

R/W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-W |
| R /W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORAN 8-28-2008




# FENCE LAYOUT

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PEN TABLE: M:\FRM\CAD\PENTABS_FRM\FRM_PLAN.TBL

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

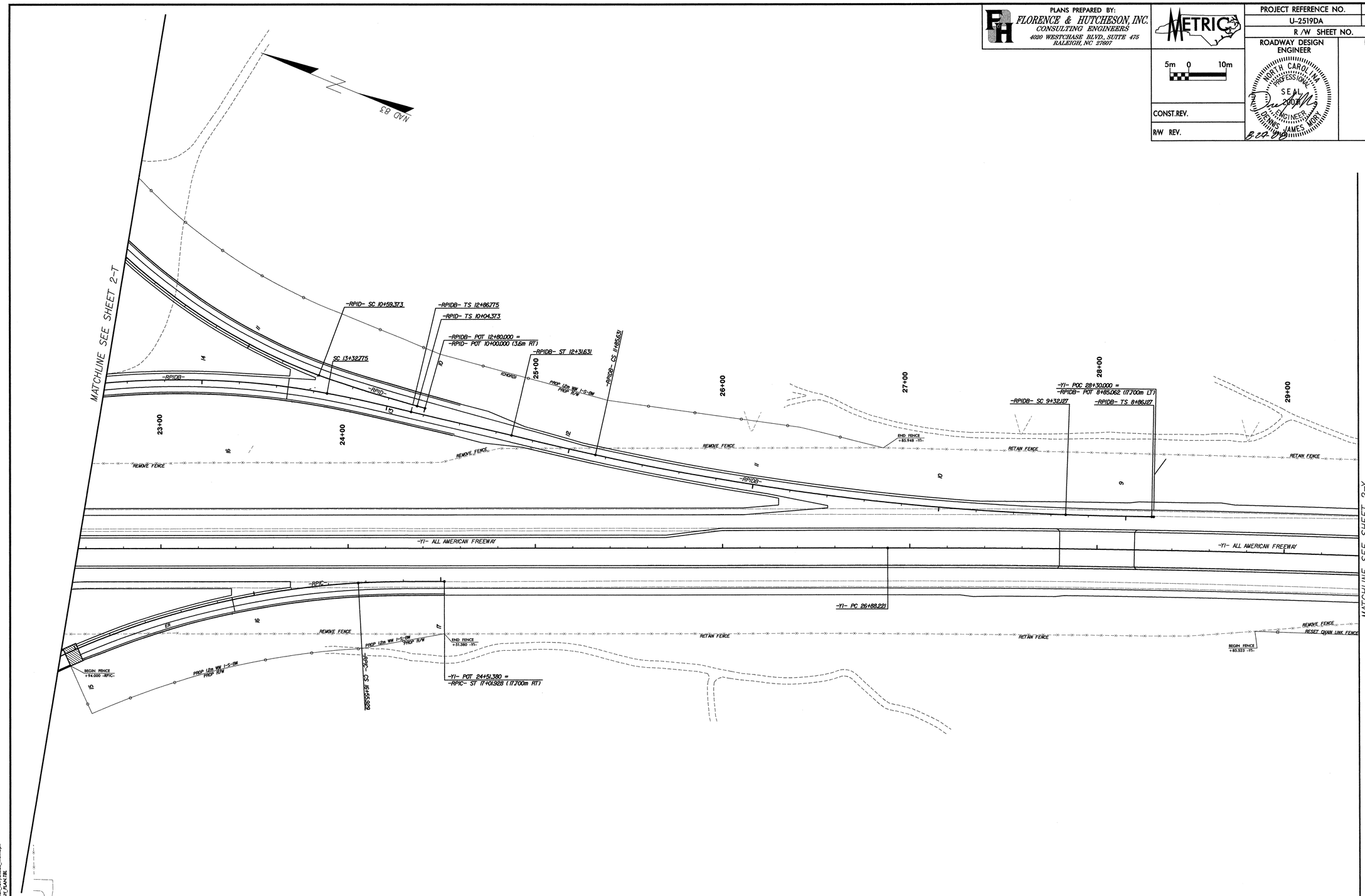
CONST.REV.

R/W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-X |
| R /W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

NORTH CAROLINA PROFESSIONAL SEAL 20038 ENGINEER DENNIS JAMES MORY

8-27-09

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PEN TABLE: M:\PENCAD\REVISED_RDY\TMX\2-5A-X.TBL

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

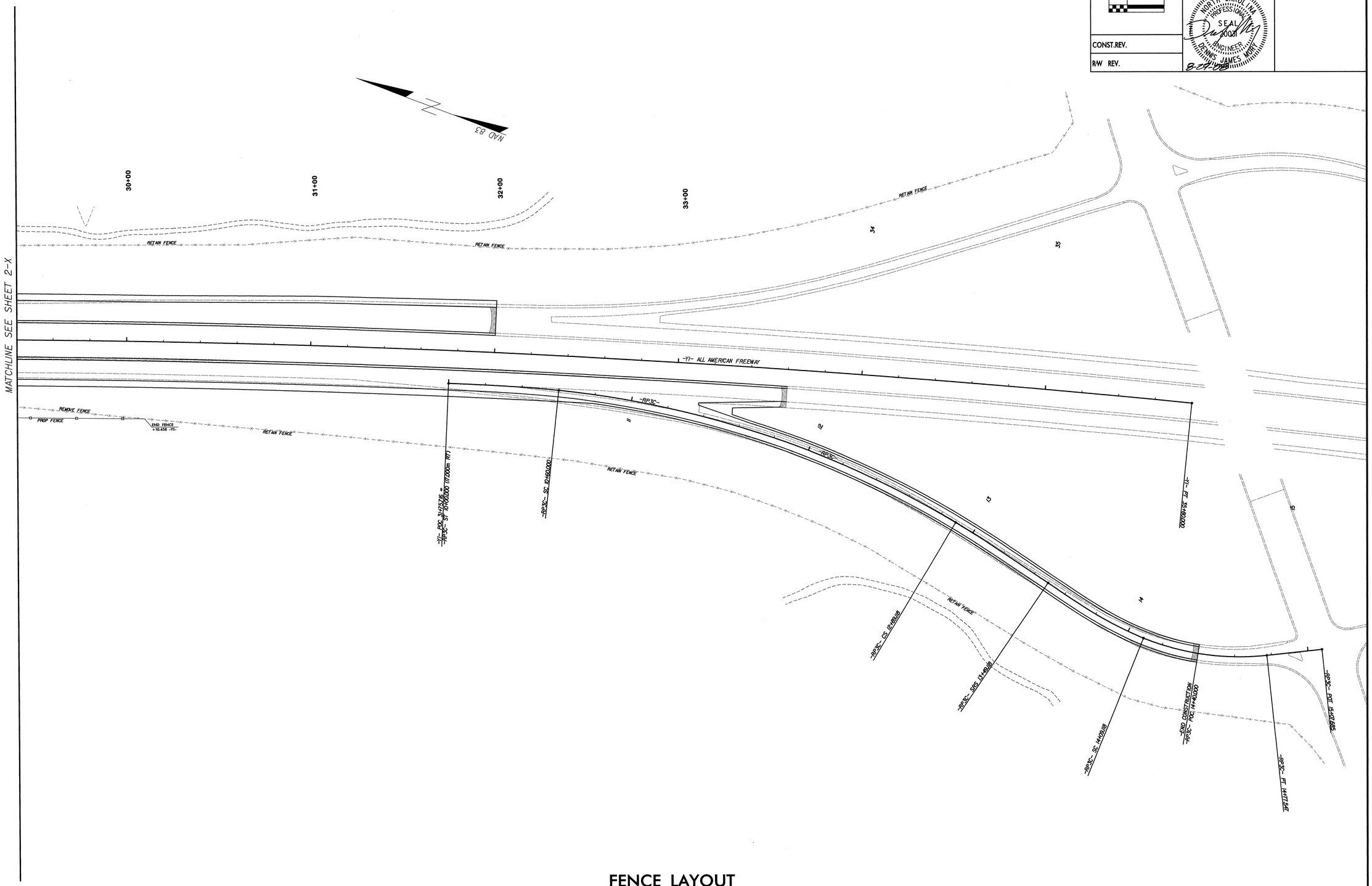
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-Y |
| R /W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

5m 0 10m

CONST.REV.

R/W REV.

NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORY 8-24-08




FENCE LAYOUT

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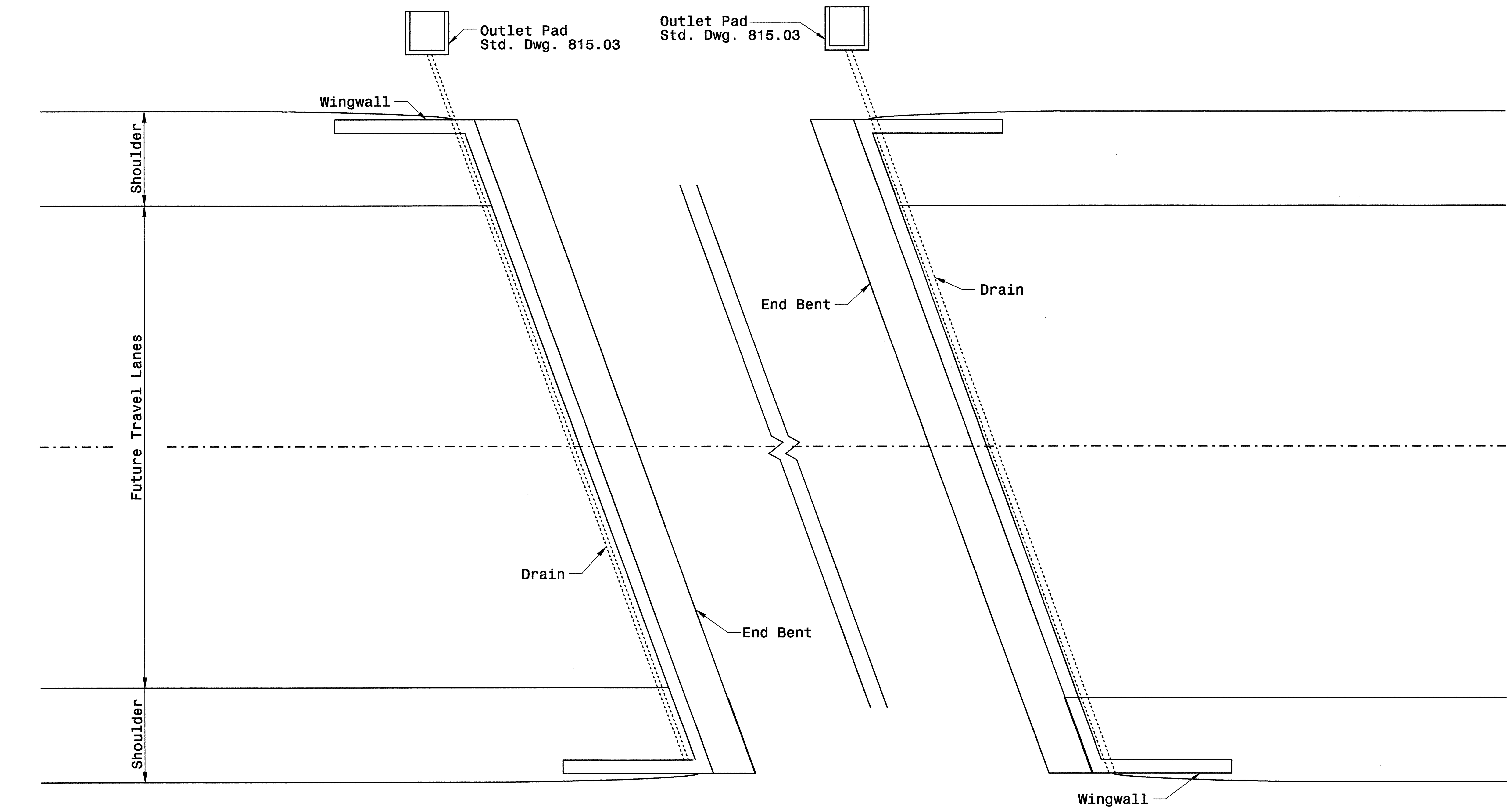
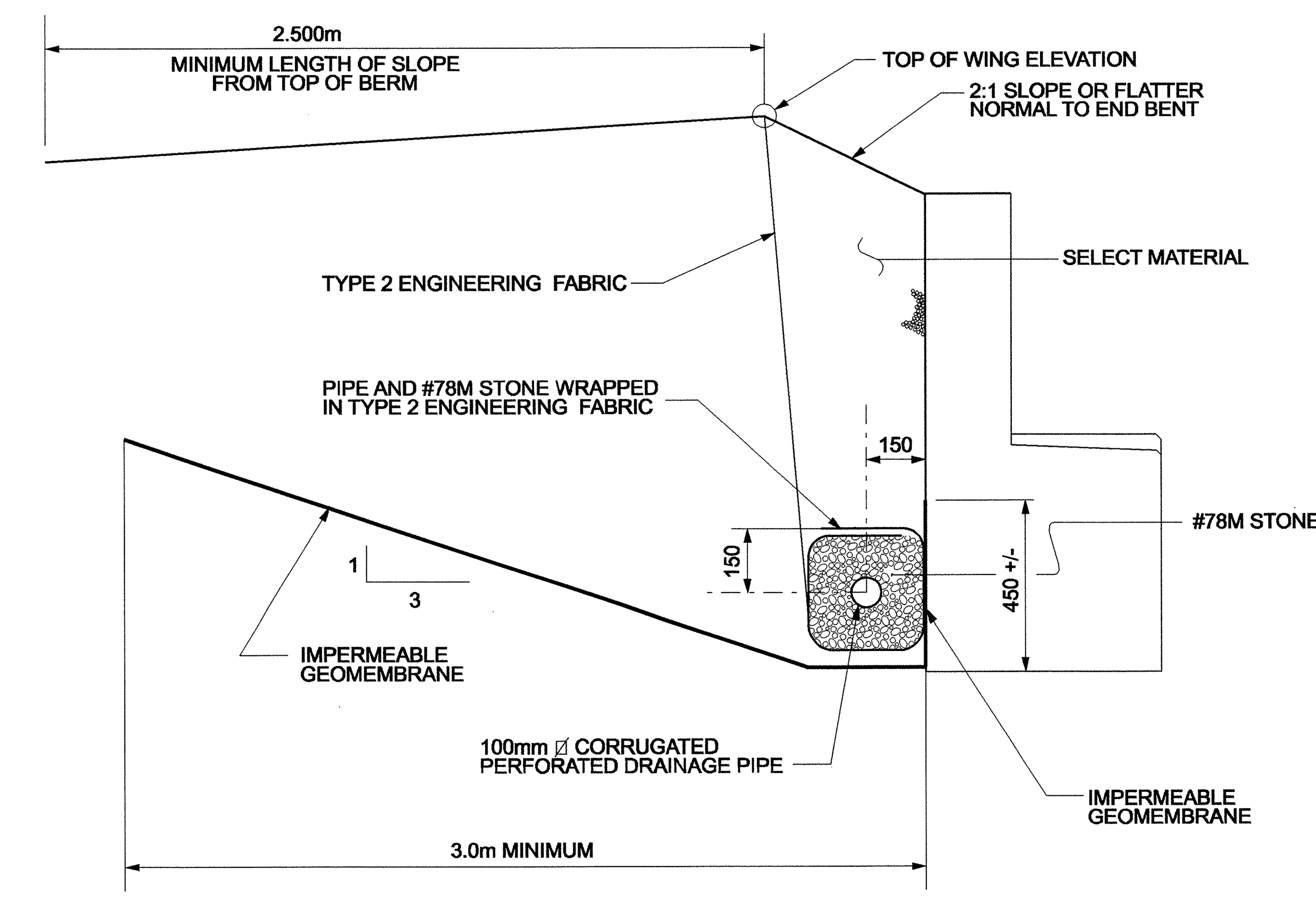
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-2 |

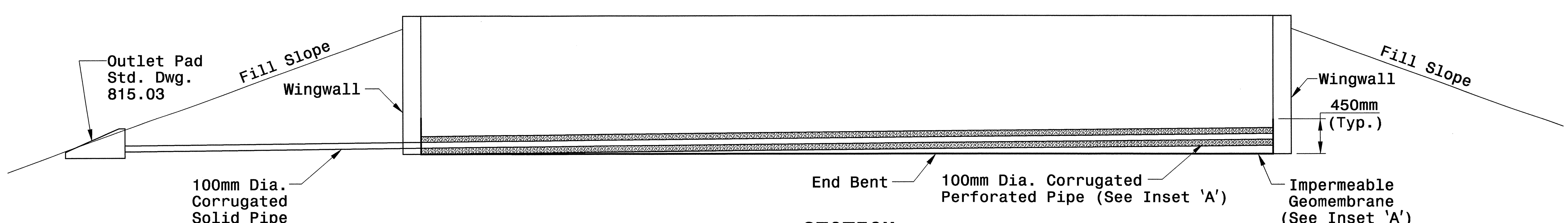
METRIC




**PLAN VIEW**




**TEMPORARY FILL/DRAINAGE - INSET 'A'**




**SECTION**

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON
3/17/11

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

**TEMPORARY BRIDGE APPROACH FILL**

ORIGINAL BY: ______ DATE: ______
MODIFIED BY: nbritt DATE: 07/31/08
CHECKED BY: Joel S. Howerton DATE: 8/20/08
FILE SPEC.: detail/nbritt/english/misc/temporary fill drainage.dgn

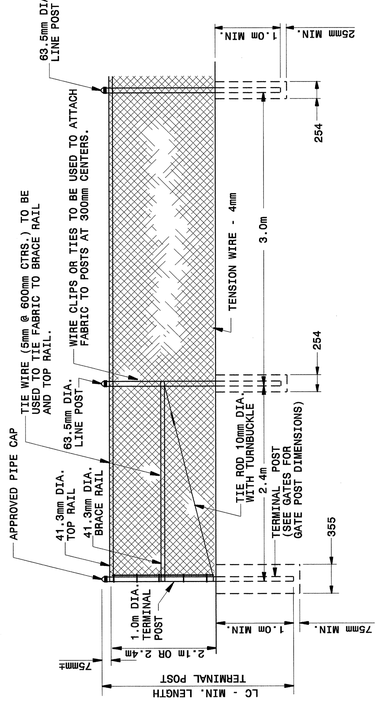
5/14/99
$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$$

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-AA |

METRIC

NOTES:

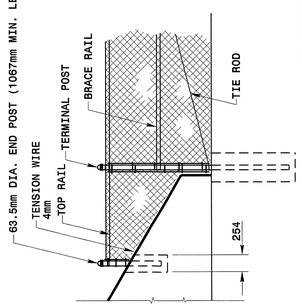
1. CAPS ARE REQUIRED ON POSTS.
2. CAPS MAY BE OMITTED WHEN BARBED WIRE SUPPORT ARMS ARE USED.
3. FENCE FABRIC SHALL BE INSTALLED ON THE SIDE FARTHEST FROM THE HIGHWAY EXCEPT THAT ON HORIZONTAL CURVES GREATER THAN THREE DEGREES THE FENCE SHALL BE INSTALLED SO AS TO PULL AGAINST POSTS.
4. ALL CHANGES IN DIRECTION OF FENCE LINE OF 30° OR MORE SHALL BE CONSIDERED AS CORNERS.
5. 4.9mm X 9.5mm FLAT STRETCHER BAR TO BE USED FOR 25mm MESH ONLY, OTHERWISE USE 4.9mm X 19mm FLAT STRETCHER BAR.
6. FOR DITCH CROSSING, MAXIMUM WIRE SPACING TO BE 150mm AND MAXIMUM CLEARANCE BETWEEN LOWEST STRAND AND GROUND TO BE 150mm.
7. TERMINAL POSTS, BRACED IN BOTH DIRECTIONS WHERE POSSIBLE, SHALL BE INSTALLED AT INTERVALS NOT TO EXCEED 200.1m (106.7m ON SHORT RADIUS CURVES), AS SHOWN IN THE DETAILS, AND AS DIRECTED BY THE ENGINEER.
8. WHEN PAY ITEM REQUIRES BARBED WIRE ATTACHMENT, BARBED WIRE IS TO BE ATTACHED TO THE TOP OF THE CHAIN LINK FENCE FOR ITS ENTIRE LENGTH INCLUDING GATES.

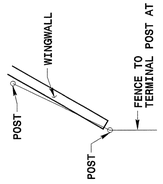


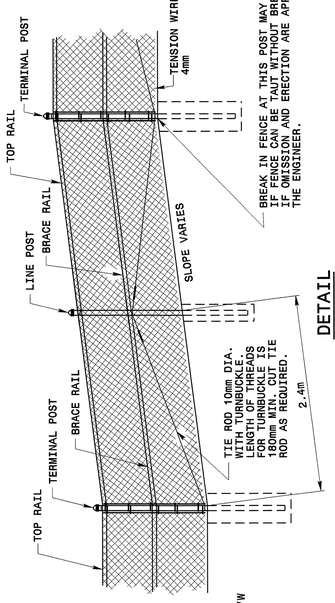

NOTE: LINE POST MAY BE DRIVEN TO A MINIMUM OF 1.0m IN LIEU OF CONCRETE ANCHOR, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

## ELEVATION

## METHOD OF TYING FENCE TO ENDWALL




## DETAIL

## METHOD OF CONSTRUCTING FENCE ON SHARP BREAK IN GRADE

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

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

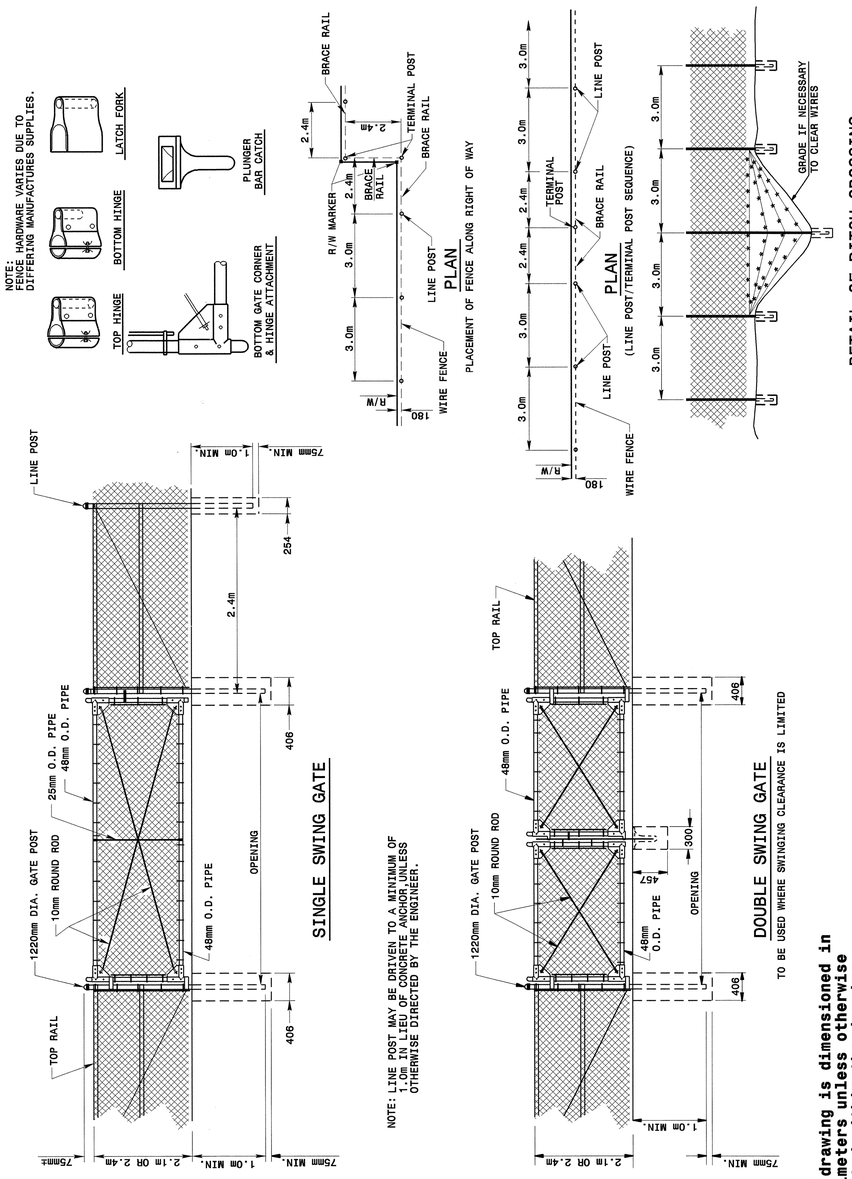
METRIC STANDARD DRAWING FOR
**CHAIN LINK FENCE**
FOR 2.1m OR 2.4m HEIGHT

SHEET 1 OF 3
**866D01**

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

METRIC STANDARD DRAWING FOR
**CHAIN LINK FENCE**
2.1m OR 2.4m HEIGHT

SHEET 2 OF 3
**866D01**




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

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

METRIC STANDARD DRAWING FOR
**CHAIN LINK FENCE**
2.1m OR 2.4m HEIGHT

SHEET 2 OF 3
**866D01**

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON
3/7/11

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

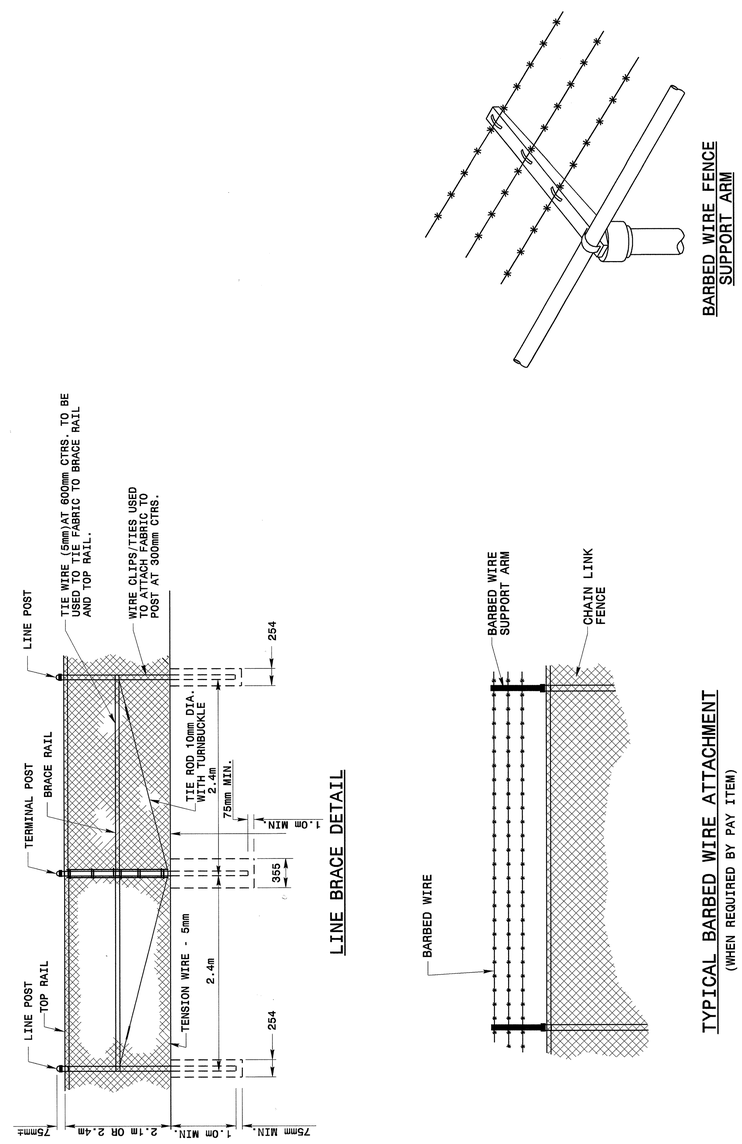
**SEE PLATE FOR TITLE**

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: rpbritt DATE: 12-13-04
CHECKED BY: _____ DATE: _____
FILE SPEC.: details/nbritt/metric/misc/chainlink.dgn

22-JUL-2008 11:53
$$$$USERNAME$$$$
.$$$$USERNAME$$$$

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-AB |

METRIC




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

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

METRIC STANDARD DRAWING FOR
**CHAIN LINK FENCE**
2.1m OR 2.4m HEIGHT

SHEET 3 OF 3
**866D01**

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

METRIC STANDARD DRAWING FOR
**CHAIN LINK FENCE**
2.1m OR 2.4m HEIGHT

SHEET 3 OF 3
**866D01**

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOHN L. SLOWESKI
3/17/11

**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: 12-13-04
CHECKED BY: _____ DATE: _____
FILE SPEC.: details/nbritt/metric/misc/chainlink.dgn

22-JUL-2008 11:53
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6/10/99

| PROJECT REFERENCE NO. | SHEET NO. |
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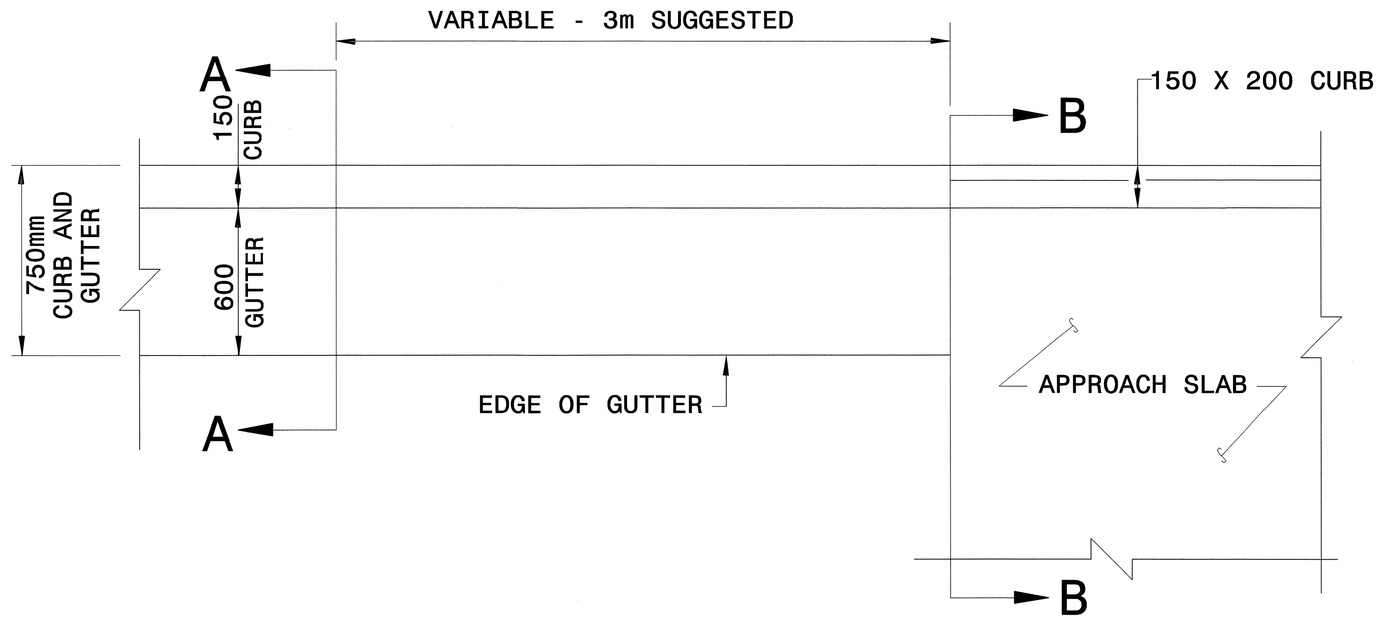
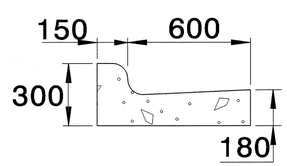
| U-2519DA | 2-AC |

METRIC

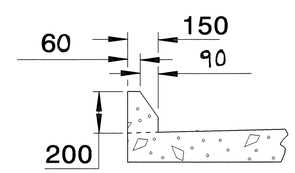



## PLAN VIEW OF TRANSITION

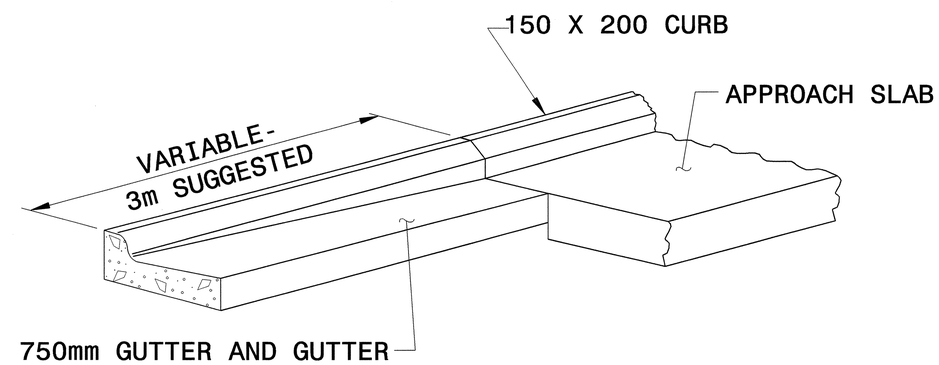
### SHOULDER BERM GUTTER TO APPROACH SLAB CURB



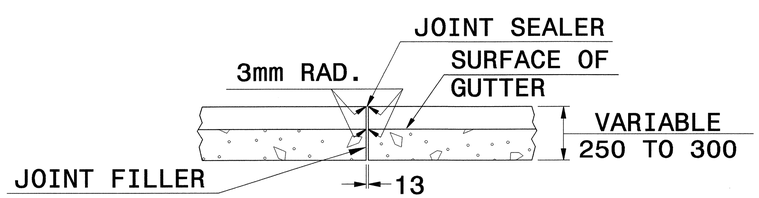

**SECTION A-A**
**750mm CURB & GUTTER**




**SECTION B-B**
**APPROACH SLAB CURB**




**ISOMETRIC VIEW**




**EXPANSION JOINT**

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

NOTES:
- PLACE EXPANSION JOINTS BETWEEN 750mm CURB & GUTTER AND TRANSITION AND APPROACH SLAB.
- FILL AND SEAL THE EXPANSION JOINTS WITH APPROVED JOINT SEALING COMPOUND.

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON
3/17/11

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

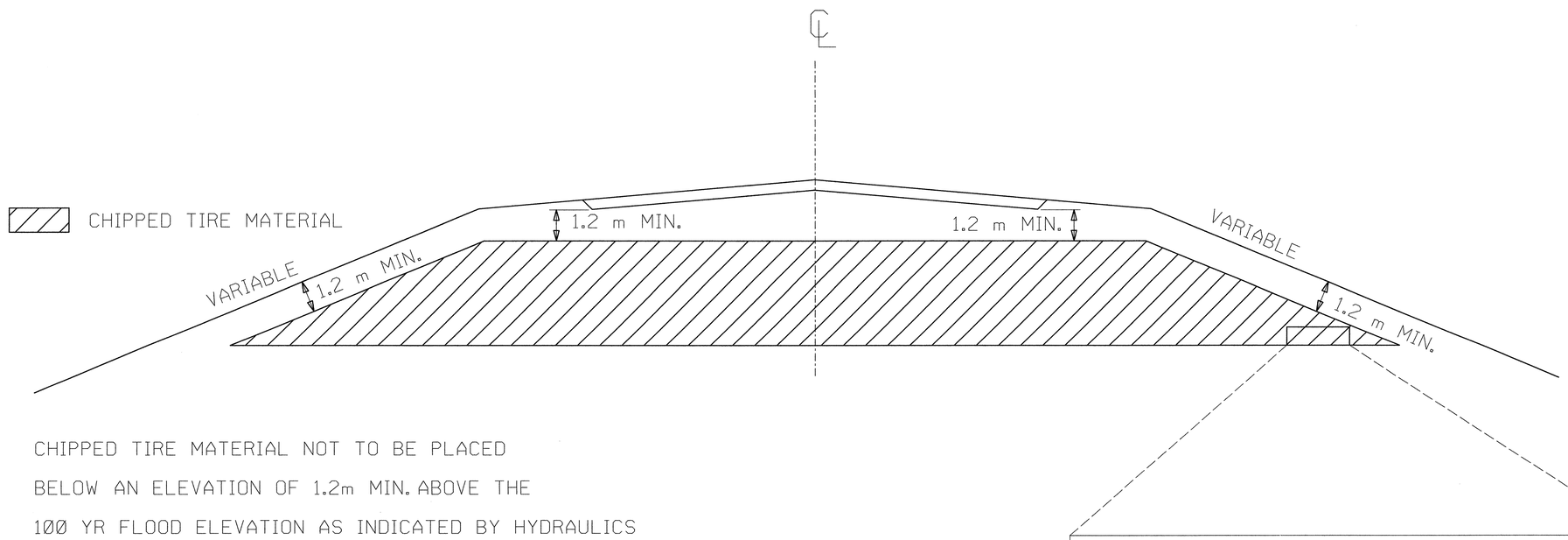
**TRANSITION FROM**
**750mm CURB AND GUTTER TO**
**150x200 APPROACH SLAB CURB**

ORIGINAL BY: T.S.Spell DATE: 11-01
MODIFIED BY: E.E. WARD DATE: 10-06
CHECKED BY: [signature] DATE: 7/16/08
FILE SPEC.: /ericward/usr/details/stand/cgtransit.dgn

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

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-AD |
| R/W SHEET NO. | |

# CHIPPED TIRE MATERIAL DETAIL




CHIPPED TIRE MATERIAL NOT TO BE PLACED
BELOW AN ELEVATION OF 1.2m MIN. ABOVE THE
100 YR FLOOD ELEVATION AS INDICATED BY HYDRAULICS

ESTIMATED CHIP TIRE MATERIAL = 18,130 $m^3$

| |
|---|
| 30-60% CHIPPED TIRE MATERIAL PER 305 mm LIFT |
| 100% EMBANKMENT SOIL PER 305 mm LIFT |
| 30-60% CHIPPED TIRE MATERIAL PER 305 mm LIFT |
| 100% EMBANKMENT SOIL PER 305 mm LIFT |

USE DETAIL AS FOLLOWS:

-L- 30+40 TO 33+20
-COL1- 30+40 TO 33+18
-COL2- 30+40 TO 33+20

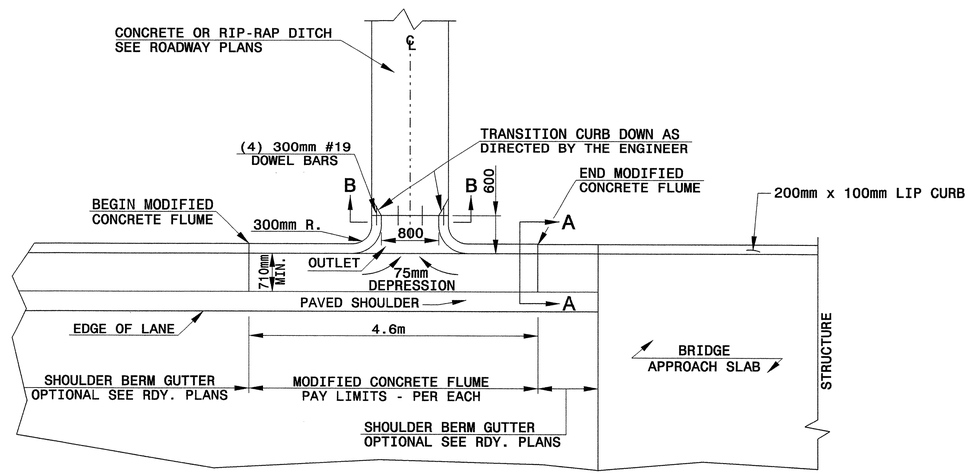
8/17/99

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-AE |

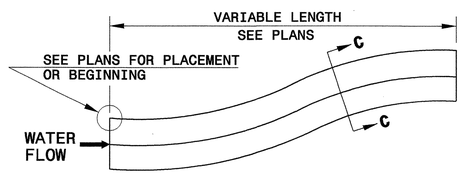
METRIC

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

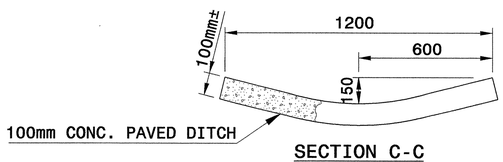
METRIC DETAIL DRAWING FOR
**MODIFIED CONCRETE FLUME**
WITH CONCRETE OR RIP-RAP DITCH



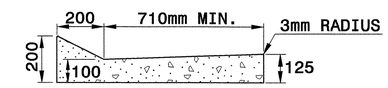

PLAN VIEW



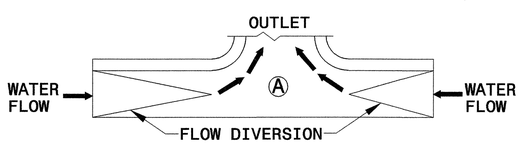

DOWNGRADE OR SAG



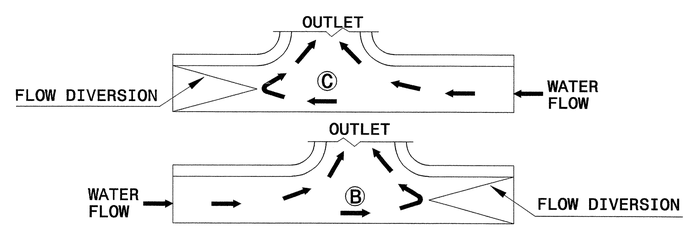

SECTION C-C



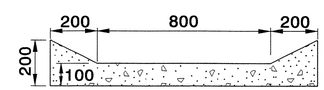

SECTION A-A



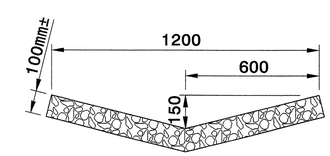

SAG




DOWN GRADE




SECTION B-B




RIP-RAP LINED DITCH

FLOW DIVERSION EXAMPLES

NOTES:

- CONSTRUCT MODIFIED CONCRETE FLUME AND SHOULDER BERM GUTTER IN ACCORDANCE WITH THIS DETAIL.
- CONSTRUCT CONCRETE DITCH IN ACCORDANCE WITH STD. DWG. NO. 850.01.
- CONSTRUCT RIP RAP LINED DITCH IN ACCORDANCE WITH THIS DETAIL, IF CALLED FOR IN PLANS.
- CONCRETE OR RIP RAP LINED DITCH SHALL BE THE TYPE AND LENGTH SPECIFIED BY THE ROADWAY PLANS. THE DITCH SHALL TERMINATE AS SHOWN ON THE PLANS. IF NO TERMINATION IS INDICATED PLACE RIP-RAP AT THE END OF THE DITCH AS INDICATED BY STD. DWG. 876.02 FOR AN 450mm PIPE. TRANSITIONS FROM THE DITCH TO TERMINATION SHALL BE AS DIRECTED BY THE ENGINEER.
- MODIFICATIONS SHALL BE AS DICTATED BY SITE CONDITIONS AND DIRECTED BY THE ENGINEER.

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

SHEET 1 OF 1
MODFLMDTCH


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

METRIC DETAIL DRAWING FOR
**MODIFIED CONCRETE FLUME**
WITH CONCRETE OR RIP-RAP DITCH

SHEET 1 OF 1
MODFLMDTCH


NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON
3/7/11

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

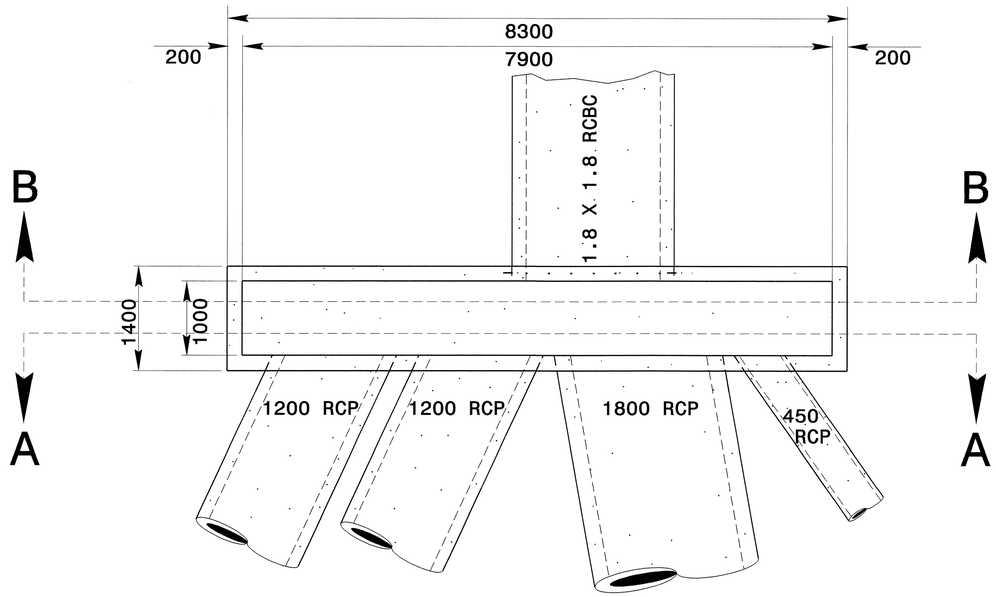
**SEE PLATE FOR TITLE**

| | | | |
|---|---|---|---|
| ORIGINAL BY: | E.E. Ward | DATE: | Apr. 2002 |
| MODIFIED BY: | E.E. Ward | DATE: | July 2004 |
| CHECKED BY: | | DATE: | |
| FILE SPEC.: | w:\details\stand\modifiedflume.dgn | | |

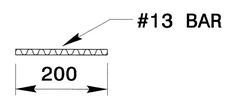
$$$$SYSTIME$$$$ $$$$DGN$$$$ $$$$USERNAME$$$$

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-AF |

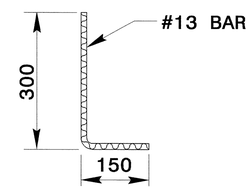
METRIC




## PLAN VIEW




## STRAIGHT DOWEL

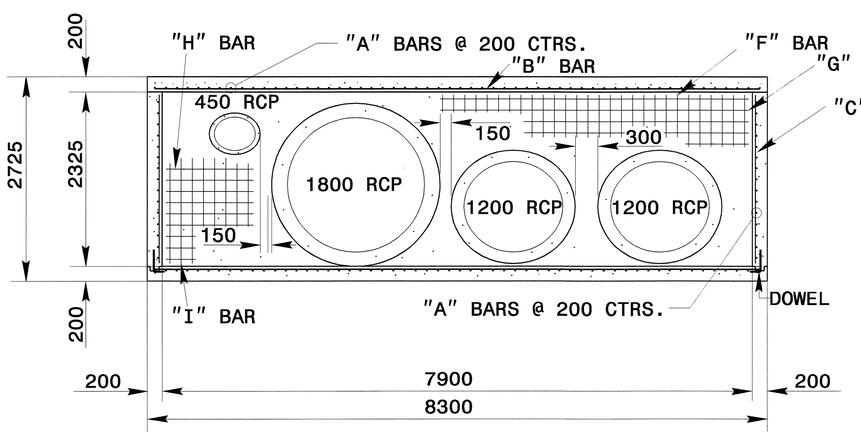



## DOWEL

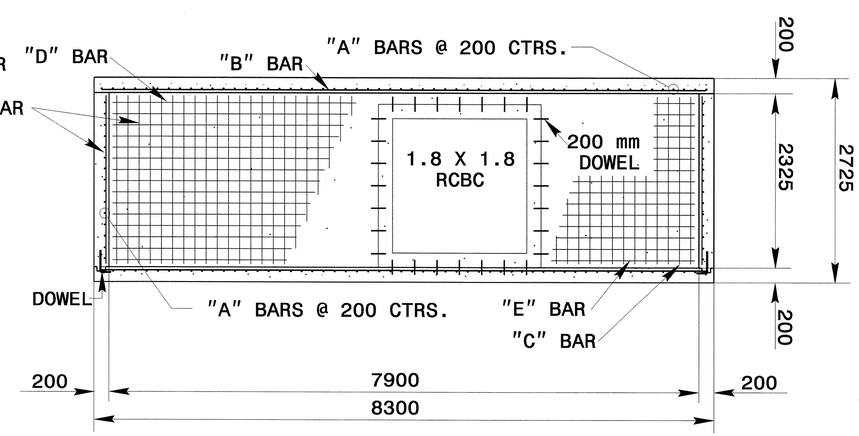
GENERAL NOTES:

* CHAMFER ALL EXPOSED CORNERS 25mm.
* USE CLASS "B" CONCRETE THROUGHOUT.
* OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 50mm KEYWAY, OR #13 BAR DOWELS AT 300mm CENTERS AS DIRECTED BY THE ENGINEER.
* USE FORMS TO CONSTRUCT THE BASE SLAB.
* IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OF BOX, ADD TO BASE AS SHOWN ON STD. DWG. 840.00.
* ALL DIMENSIONS ARE SHOWN IN MILLIMETERS UNLESS OTHERWISE NOTED.
* NO DEDUCTIONS HAVE BEEN MADE FOR PIPES.
* DIMENSION OF BOX & REINFORCING MAY BE FIELD ADJUSTED AS DIRECTED BY THE ENGINEER.

| BILL OF MATERIALS | | | | |
|---|---|---|---|---|
| BAR | QTY | SIZE | LENGTH | WEIGHT |
| A | 140 | #16 | 1300 mm | 282.5 kg |
| B | 18 | #16 | 8200 mm | 229.1 kg |
| C | 67 | #16 | 2225 mm | 231.4 kg |
| D | 15 | #16 | 3510 mm | 81.7 kg |
| E | 15 | #16 | 2010 mm | 46.8 kg |
| F | 25 | #16 | 690 mm | 26.8 kg |
| G | 5 | #16 | 4135 mm | 32.1 kg |
| H | 10 | #16 | 1365 mm | 15.2 kg |
| I | 5 | #16 | 1395 mm | 10.8 kg |
| DOWEL | 62 | #13 | 450 mm | 27.7 kg |
| STRAIGHT DOWEL | 28 | #13 | 200 mm | 5.6 kg |
| TOTAL REINF. STEEL | | | | 989.7 kg |
| TOTAL CONC. | | | | 13.3 cu. m |




## SECTION A-A




## SECTION B-B

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOMERTON 3/17/11

USE FOR STRUCTURE NO. 71

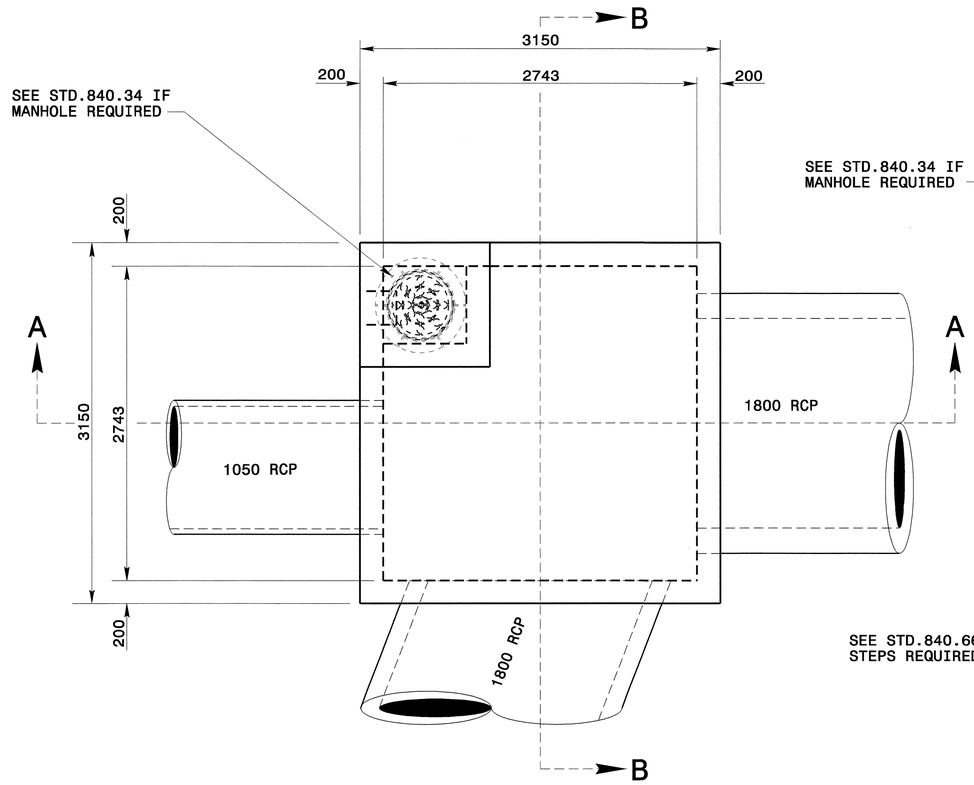
**PROJECT SERVICES UNIT**
**STANDARDS AND SPECIAL DESIGN**
Office 919-250-4128 FAX 919-250-4119

# JUNCTION BOX DETAIL

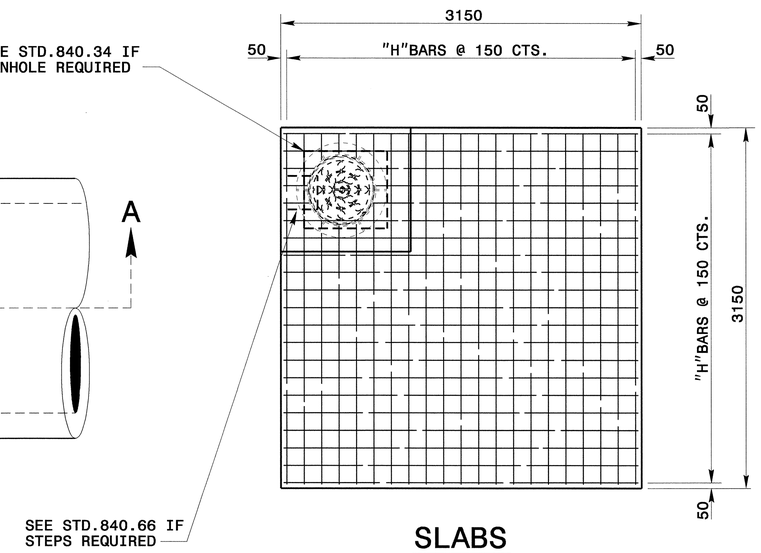
ORIGINAL BY: kakempf DATE: 09-19-05
MODIFIED BY: DATE:
CHECKED BY: DATE: 7/15/08
FILE SPEC.: details/kkempf/metric/u2519dajb.dgn

| PROJ. REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-AG |

METRIC




PLAN




SLABS

GENERAL NOTES:

-THE BASE SLAB SHALL BE CONSTRUCTED BY FORMING.

-SEE STD. DWG. 840.00 FOR CONSTRUCTION OF BASE SLAB

IF PIPE IS SET INTO BASE SLAB.
-CLASS 'B' CONCRETE SHALL BE USED THROUGHOUT.

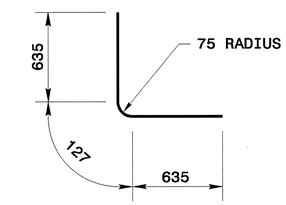
-CONSTRUCTION OPTIONS: MONOLITHIC POUR; CONSTRUCTION JOINTS AT UNION OF WALLS WITH FLOOR AND/OR TOP SLAB.

-REINFORCING STEEL SHALL BE CUT, BENT OR RELOCATED TO POSITION PIPE AS DIRECTED BY THE ENGINEER.

-ALL EXPOSED CORNERS SHALL BE CHAMFERED 25mm.

-SEE STD. DRAWING 840.34 FOR CONSTRUCTION OF RISER AND MANHOLE, IF REQURED.

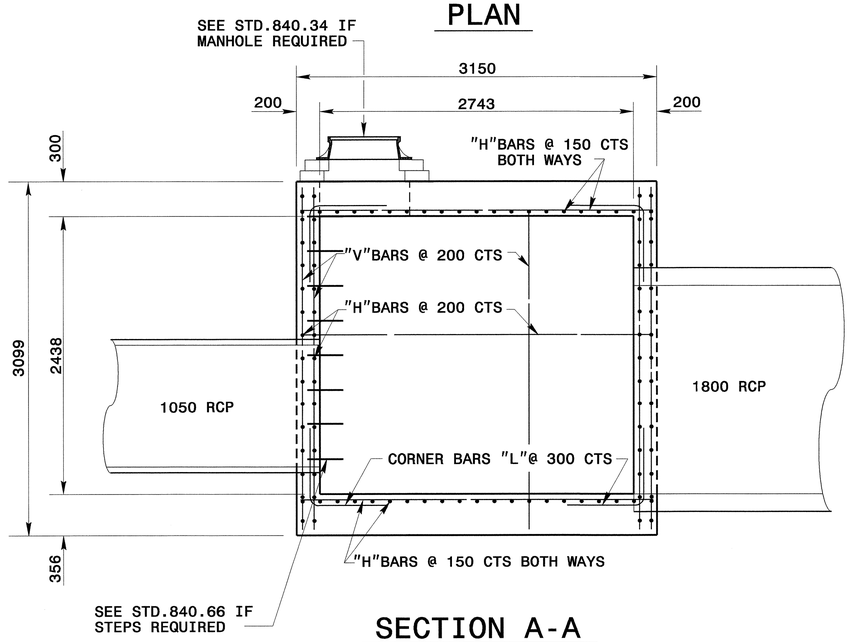
-JUNCTION BOXES OVER 1067mm IN DEPTH WITH MANHOLES SHALL REQUIRE STEPS TO BE PLACED ON 300mm CTRS. REFERENCE STD. NO. 840.66.



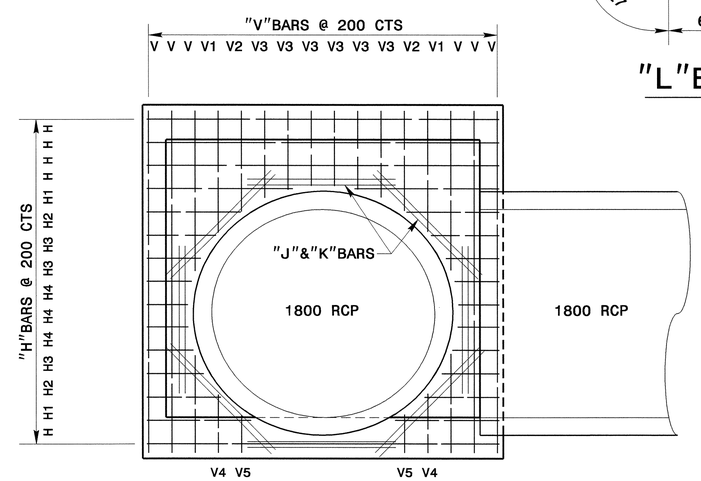

"L"BAR

## BILL OF MATERIAL

| CODE | BAR# | LENGTH | kg/m | QTY. | kg/Steel |
|---|---|---|---|---|---|
| | | | | | |
| H | 13 | 3048 | 0.994 | 164 | 497.1 |
| H1 | 13 | 762 | 0.994 | 16 | 12.1 |
| H2 | 13 | 610 | 0.994 | 16 | 9.7 |
| H3 | 13 | 457 | 0.994 | 24 | 10.9 |
| H4 | 13 | 356 | 0.994 | 24 | 8.5 |
| | | | | | |
| | | | | | |
| | | | | | |
| V | 13 | 2997 | 0.994 | 108 | 321.8 |
| V1 | 13 | 1067 | 0.994 | 8 | 8.5 |
| V2 | 13 | 838 | 0.994 | 8 | 6.7 |
| V3 | 13 | 660 | 0.994 | 24 | 15.7 |
| V4 | 13 | 457 | 0.994 | 8 | 3.6 |
| V5 | 13 | 356 | 0.994 | 8 | 2.8 |
| | | | | | |
| | | | | | |
| J | 13 | 1295 | 0.994 | 64 | 82.4 |
| K | 13 | 610 | 0.994 | 16 | 9.7 |
| L | 13 | 1397 | 0.994 | 80 | 111.1 |
| | | | | | |
| | TOTAL WEIGHT STEEL | | | | 1100.6 |
| | | | | | |
| | MASONARY QUANTITIES | | | | |
| CLASS "A" CONCRETE | | | | 12.4 CU.M. | |
| PIPE DEDUCTIONS | | | | | |
| 1-1050 RCP | | | | -0.3 CU.M. | |
| 2-1800 RCP | | | | -1.5 CU.M. | |
| | | | | | |
| TOTAL CLASS "A" CONCRETE | | | | 10.8 CU.M. | |




SECTION A-A




SECTION B-B

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER NOEL S. MOWBRAY
3/7/11

USE FOR STRUCTURE NO. 70


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


# DETAIL OF SPECIAL JUNCTION BOX

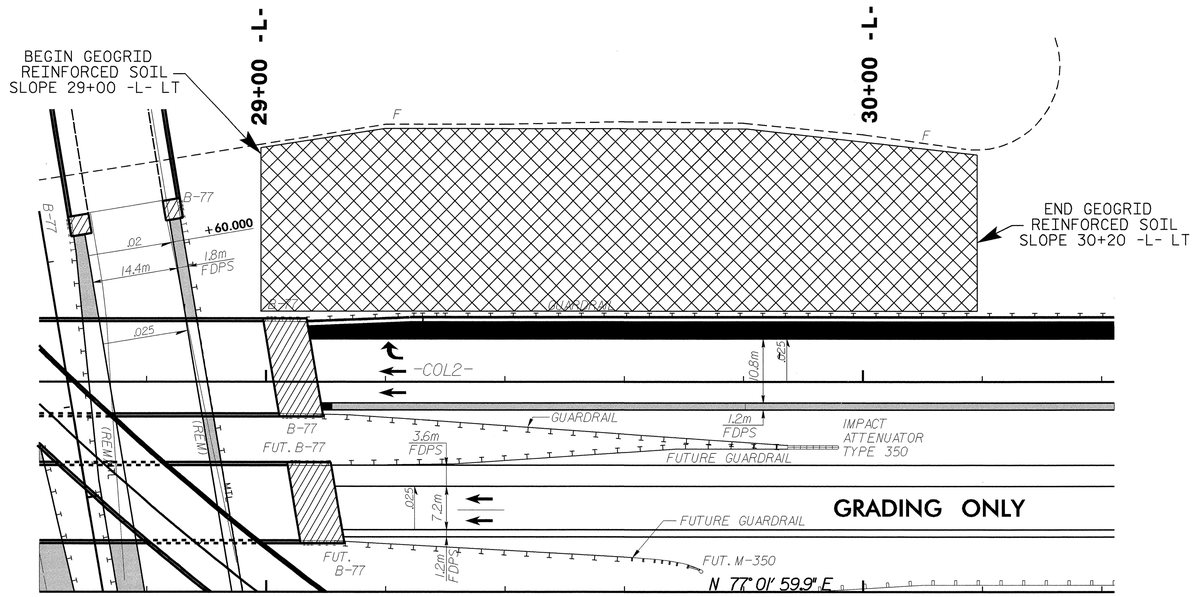
ORIGINAL BY: DATE:
MODIFIED BY: rnbritt DATE: 07-16-08
CHECKED BY: DATE: 7/21/08
FILE SPEC.: details/nbritt/metric/mhydro/jb1800-1050.dgn

| PROJECT REFERENCE NO. | SHEET |
|---|---|
| U-2519DA | 2-AH |

GEOTECHNICAL ENGINEER — SIGNATURE — DATE

ENGINEER — SIGNATURE — DATE

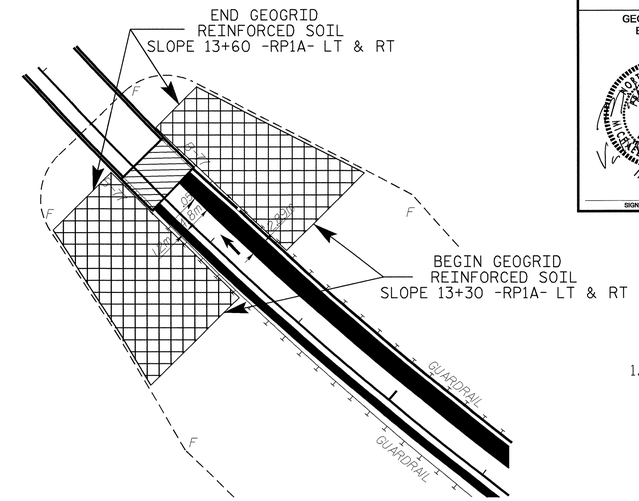
NORTH CAROLINA PROFESSIONAL SEAL 032672 ENGINEER MICHAEL D. VALIQUETTE




LOCATION SKETCH

29+00 TO 30+20 -L- LT

N.T.S.



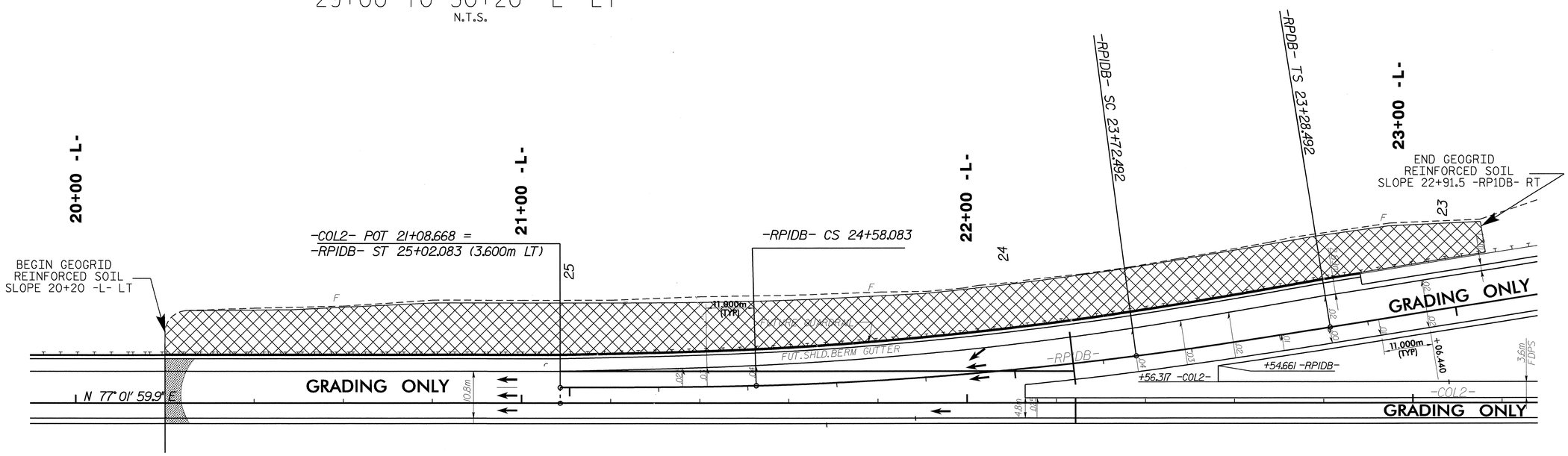

NOTES:

1. FOR TYPICAL SECTIONS, SEE GEOGRID REINFORCED SOIL SLOPE SHEET 2 OF 2

LOCATION SKETCH

13+30 TO 13+60 -RP1A- LT AND RT

N.T.S.




LOCATION SKETCH

20+20 TO 21+08.7 -L- LT

22+91.5 TO 25+02.1 -RP1DB- RT

N.T.S.

| | | | |
|---|---|---|---|
| PREPARED BY: | M. D. VALIQUETTE | DATE: 07/08 | |
| REVIEWED BY: | J. R. BATTS | DATE: 07/08 | |

**GEOTECHNICAL ENGINEERING UNIT**

☒ EASTERN REGIONAL OFFICE

☐ WESTERN REGIONAL OFFICE

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

# GEOGRID REINFORCED SOIL SLOPE 1 OF 2

REVISIONS

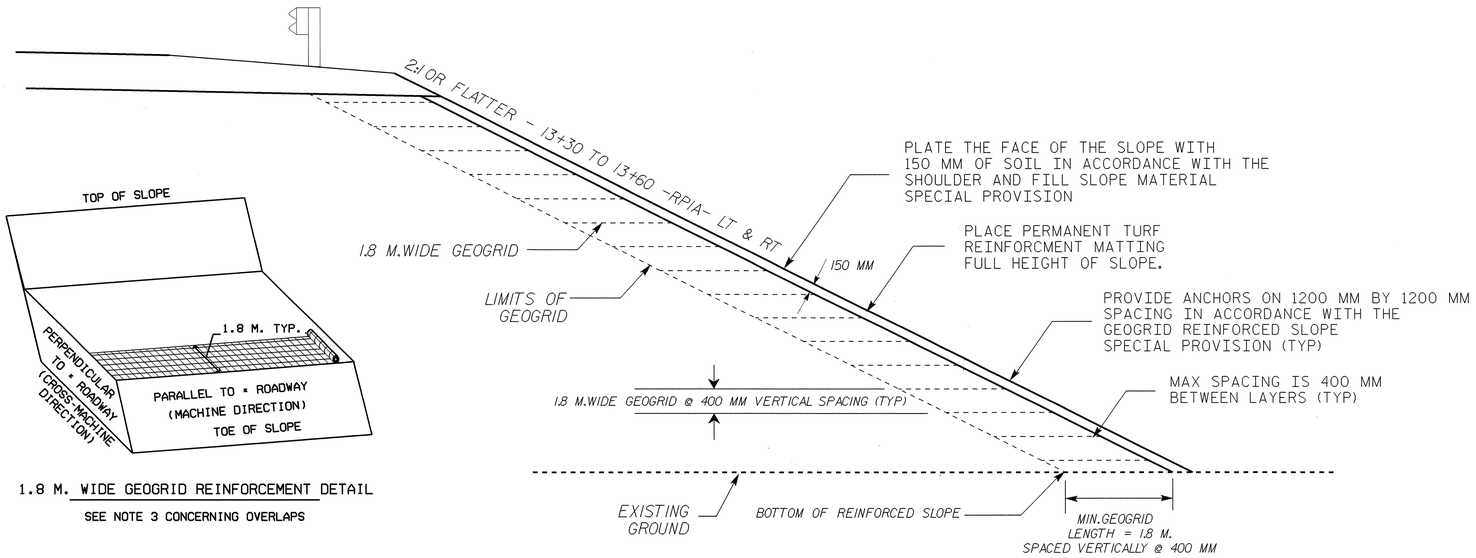
| NO. | BY | DATE | NO. | BY | DATE |
|---|---|---|---|---|---|
| 1 | - | - | 3 | - | - |
| 2 | - | - | 4 | - | - |

GEJ226167 7/29/2008 u2519da_geo_rdwy_rslope mvaliquette RD-Oce34

| PROJECT REFERENCE NO. | SHEET |
|---|---|
| U-2519DA | 2-A1 |

GEOTECHNICAL ENGINEER — SIGNATURE — DATE

ENGINEER — SIGNATURE — DATE







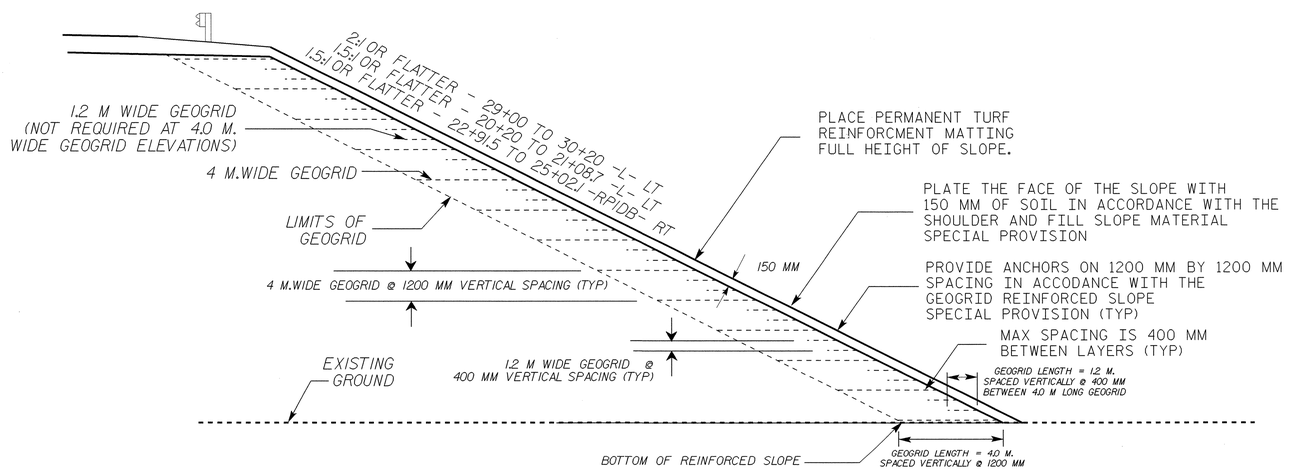
1.8 M. WIDE GEOGRID REINFORCEMENT DETAIL

SEE NOTE 3 CONCERNING OVERLAPS

## TYPICAL SECTION

## 13+30 TO 13+60 -RP1A- LT AND RT

N.T.S.




## TYPICAL SECTION

## 20+20 TO 21+08.7 -L- LT
## 22+91.5 TO 25+02.1 -RP1DB- RT
## 29+00 TO 30+20 -L- LT

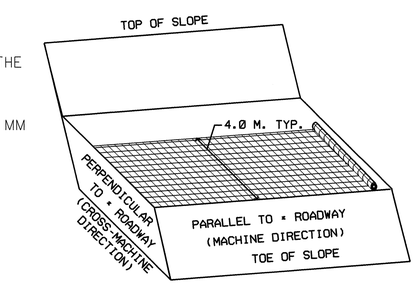
N.T.S.

NOTES:

1. GEOGRID REINFORCEED SOIL SLOPES SHALL BE PLACED AS SHOWN ON THE PLAN VIEWS
2. LAYERS OF REINFORCEMENT MAY NEED TO BE ADDED OR SUBTRACTED AT THE TOP OF SLOPE AS THE EMBANKMENT HEIGHT VARIES THROUGH THE STEEPENED SECTION.
3. ADJACENT ROWS OF GEOGRID SHALL BE JOINED BY EITHER A SECURE MECHANICAL CONNECTION OR A MINIMUM OF 300 MM OF OVERLAP.
4. PERMANENT TURF REINFORCEMENT MATTING SHALL BE PLACED ON THE GEOGRID REINFORCED SLOPE. SEE THE GEOGRID REINFORCED SOIL SLOPE SPECIAL PROVISION.
5. THE FIRST LAYER OF GEOGRID SHALL BE PLACED ON LEVEL GROUND, NOT STEEPER THAN 5% GRADE.
6. SEE THE SPECIAL PROVISION FOR GEOGRID REINFORCED SLOPE FOR DETAILED REQUIREMENTS OF MATERIALS AND CONSTRUCTION.
7. SEE ROADWAY CROSS SECTIONS FOR LIMITS OF SLOPE.
8. BACKFILL WITHIN THE REINFORCED VOLUME SHALL BE COMMON BORROW MATERIAL IN ACCORDANCE WITH SECTION 1018 OF THE STANDARD SPECIFICATIONS.
9. SEE HIGH STRENGTH FABRIC FOR EMBANKMENT STABILIZATION SHEET FOR LOCATIONS AND LIMITS OF SELECT GRANULAR MATERIAL, CLASS III.

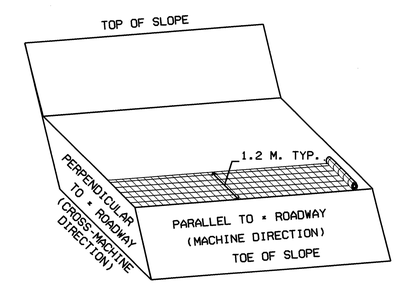
ESTIMATED QUANTITIES:

GEOGRID REINFORCEMENT:.....22,800 $M.^2$
PERMENANT TURF REINFORCEMENT MAT:.....9,200 $M.^2$




4 M. WIDE GEOGRID REINFORCEMENT DETAIL

SEE NOTE 3 CONCERNING OVERLAPS




1.2 M. WIDE GEOGRID REINFORCEMENT DETAIL

SEE NOTE 3 CONCERNING OVERLAPS

| | | | |
|---|---|---|---|
| PREPARED BY: | M. D. VALIQUETTE | DATE: 07/08 | |
| REVIEWED BY: | J. R. BATTS | DATE: 07/08 | |

**GEOTECHNICAL ENGINEERING UNIT**

☒ EASTERN REGIONAL OFFICE
☐ WESTERN REGIONAL OFFICE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# GEOGRID REINFORCED SOIL SLOPE 2 OF 2

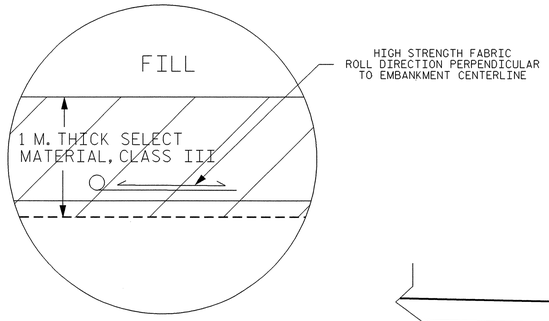
REVISIONS

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

| PROJECT REFERENCE NO. | SHEET |
|---|---|
| U-2519DA | 2-AJ |

GEOTECHNICAL ENGINEER — ENGINEER

SIGNATURE DATE — SIGNATURE DATE

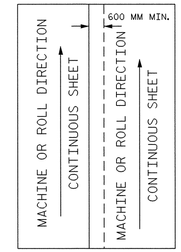



FABRIC DETAIL
NTS

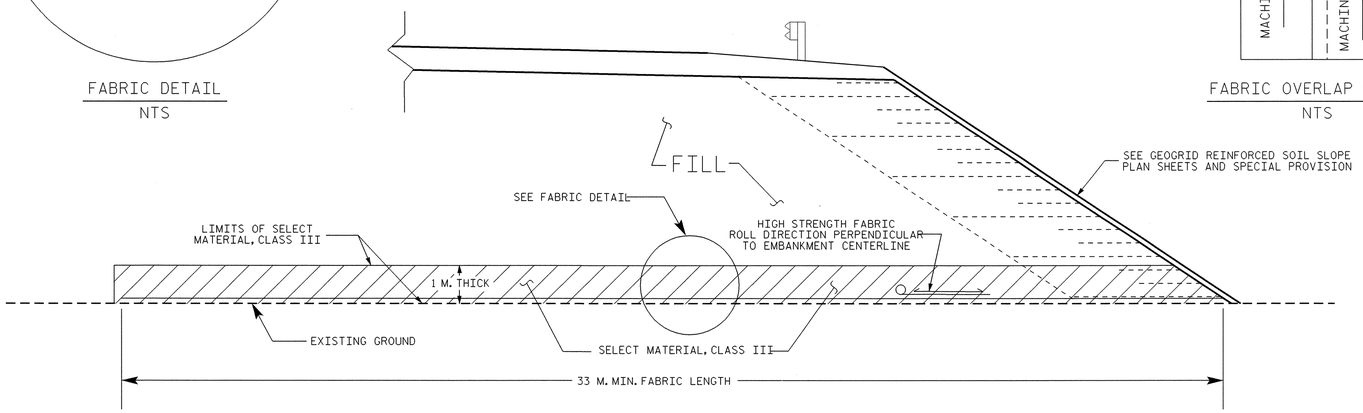
## QUANTITIES

FABRIC FOR EMBANKMENT STABILIZATION .....5500 $M^2$.*
SELECT MATERIAL, CLASS III.....5500 $M^3$.

*FABRIC FOR EMBANKMENT STABILIZATION ESTIMATED QUANTITY DOES NOT INCLUDE OVERLAPS OR WASTE.



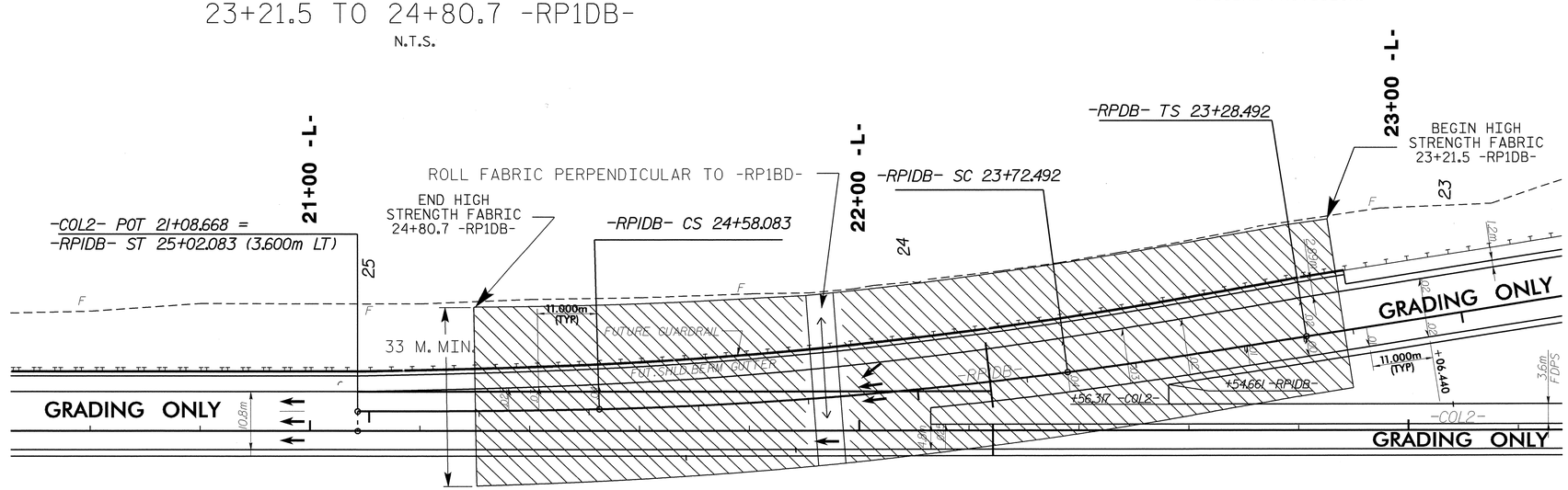

FABRIC OVERLAP DETAIL
NTS




TYPICAL SECTION
23+21.5 TO 24+80.7 -RP1DB-
N.T.S.

## NOTES

1. DO NOT GRUB, ONLY CLEAR THE AREA WITHIN THE LIMITS OF THE HIGH STRENGTH FABRIC FOR EMBANKMENT STABILIZATION.
2. PLACE HIGH STRENGTH FABRIC ON THE EXISTING GROUND AFTER CLEARING.
3. FABRIC MUST HAVE 1 M. OF SELECT MATERIAL, CLASS III ABOVE FABRIC.
4. PLACE THE FABRIC WITHOUT ANY WRINKLES OR CREASES.
5. NO SEAMS OR JOINTS ARE ALLOWED IN THE MACHINE DIRECTION.
6. EMBANKMENT STABILIZATION FABRIC SHEETS MUST HAVE A CONTINUOUS LENGTH OF 33 M. PERPENDICULAR TO THE EMBANKMENT CENTERLINE.
7. THE MINIMUM OVERLAP BETWEEN ADJACENT FABRIC PANELS IS 600 MM.
8. THE TERMS ROLL AND MACHINE DIRECTION ARE USED INTERCHANGEABLY.
9. FOR EMBANKMENT STABILIZATION FABRIC, SEE HIGH STRENGTH FABRIC FOR EMBANKMENT STABILIZATION SPECIAL PROVISION.




LOCATION SKETCH
23+21.5 TO 24+80.7 -RP1DB-
N.T.S.

| | | | |
|---|---|---|---|
| PREPARED BY: | M. D. VALIQUETTE | DATE: 07/08 |
| REVIEWED BY: | J. R. BATTS | DATE: 07/08 |

**GEOTECHNICAL ENGINEERING UNIT**
☒ EASTERN REGIONAL OFFICE
☐ WESTERN REGIONAL OFFICE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# HIGH STRENGTH FABRIC FOR EMBANKMENT STABILIZATION

REVISIONS

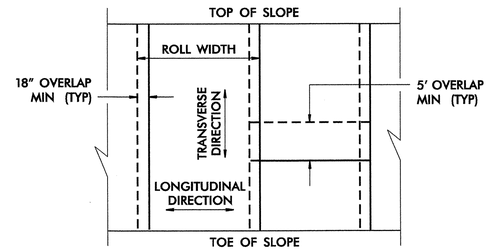
| NO. | BY | DATE | NO. | BY | DATE |
|---|---|---|---|---|---|
| 1 | | | 3 | | |
| 2 | | | 4 | | |

GEJ226167 7/29/2008 u2519da_geo_rdwy_hs_fabric mvaliquette RD-Oce34

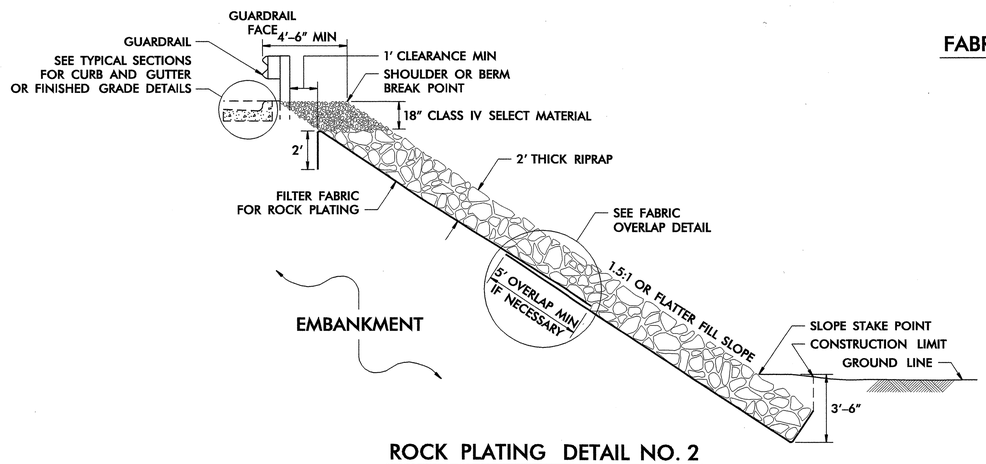
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-AK |

# ROCK PLATING DETAILS

FOR ROCK PLATING,
SEE ROCK PLATING SPECIAL PROVISION.




FABRIC OVERLAP DETAIL
(PLAN VIEW)

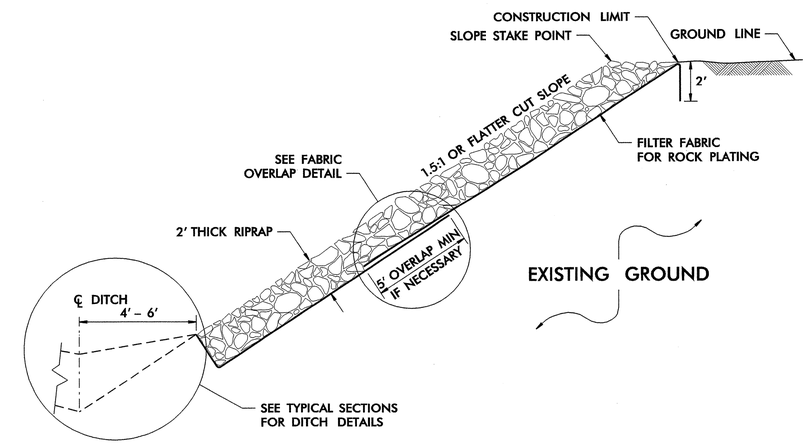



ROCK PLATING DETAIL NO. 2

USE ROCK PLATING DETAIL NO. 2
AT THE FOLLOWING LOCATIONS:

-Y1- STA 18+00 ± TO -Y1- STA 19+16 ± LT

EXTEND ROCK PLATING LIMITS TO 2.5:1 SLOPES.




ROCK PLATING DETAIL NO. 3

USE ROCK PLATING DETAIL NO. 3
AT THE FOLLOWING LOCATIONS:

-TT3- STA 10+96 ± TO -TT3- STA 11+53 ± LT & RT
-TT3- STA 11+64 ± TO -TT3- STA 12+30 ± LT & RT

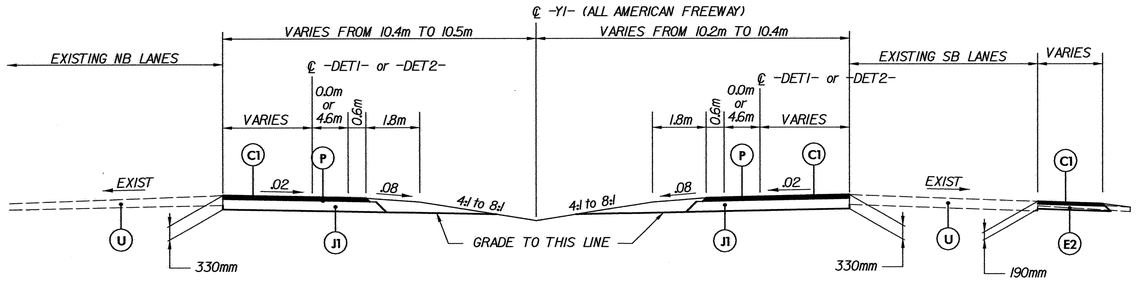
EXTEND ROCK PLATING LIMITS TO 2.5:1 SLOPES.

ROCK PLATING DETAIL(S) AND LOCATION(S) WERE PROVIDED THROUGH A SEALED DOCUMENT FROM THE GEOTECHNICAL ENGINEERING UNIT. THE DOCUMENT WAS SUBMITTED TO THE ROADWAY DESIGN UNIT ON JULY 22, 2008 AND SEALED BY A PROFESSIONAL ENGINEER, MICHAEL VALIQUETTE, PE, LICENSE # 032672.

ESTIMATED QUANTITIES:

ROCK PLATING ---------- 4,750 SQ. M

22-JUL-2008 12:23
r:\roadway\proj\2519da_rdy_rock plating detail.dgn
$$$$USERNAME$$$$




## TEMPORARY MEDIAN CROSS-OVER

-DET1- 10+00.000 TO -DET1- 23+02.718
-DET2- 10+00.000 TO -DET2- 23+00.529

NOTE: SEE TRAFFIC CONTROL PLANS FOR PHASING

## TEMPORARY MEDIAN CROSS-OVER QUANTITES

| ITEM - DESCRIPTION | QUANTITY | UNIT |
|---|---|---|
| UNCLASSIFIED EXCAVATION | 1,150 | M3 |
| REMOVAL OF EXISTING ASPHALT PAVEMENT | 6,110 | M2 |
| TEMPORARY PIPE (375mm) | 54 | M |
| FINE GRADING | 1 | LS |
| AGGREGATE BASE COURSE | 4,600 | MTN |
| PRIME COAT | 11,975 | L |
| ASPHALT CONCRETE BASE COURSE - TYPE B25.0C | 275 | MTN |
| ASPHALT CONCRETE SURFACE COURSE - TYPE S9.5C | 1625 | MTN |
| ASPHALT BINDER FOR PLANT MIX, GRADE PG64-22 | 12 | MTN |
| ASPHALT BINDER FOR PLANT MIX, GRADE PG70-22 | 98 | MTN |
| TEMPORARY DRAINAGE STRUCTURE AND GRATE | 2 | EA |
| TEMPORARY STEEL PLATE | 2 | EA |
| TEMPORARY STEEL BEAM GUARDRAIL | 160 | M |
| TEMPORARY ANCHOR UNIT GRAU-350 | 1 | EA |
| TEMPORARY STRUCTURE ANCHOR UNIT | 1 | EA |

METRIC

5 0 10

CONST.REV.

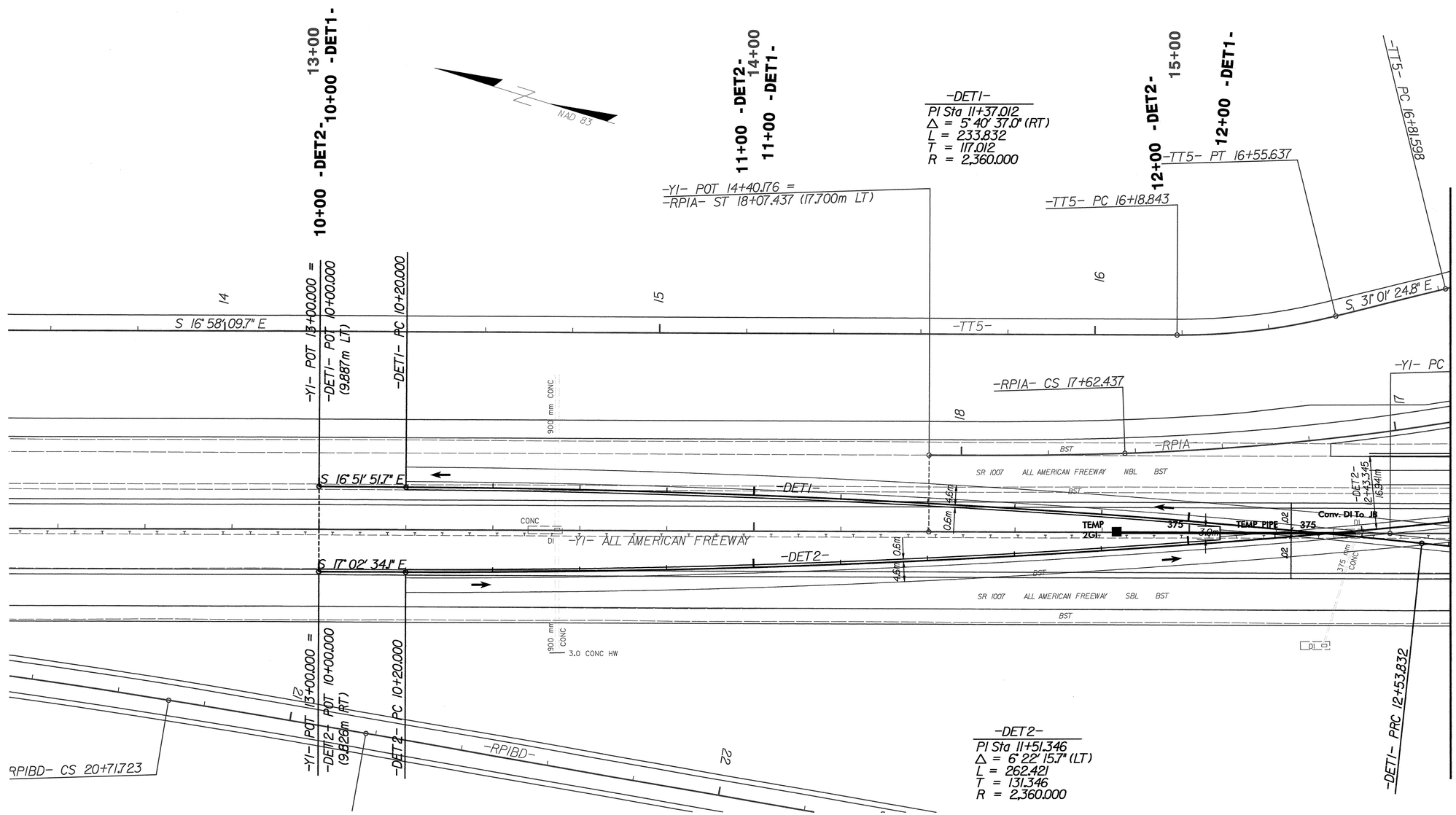
R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-AL |
| R /W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 16689 ENGINEER GRAHAM ALLEN WILLS
10-3-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 21162 ENGINEER HERBERT TURNER, JR.
10-3-08

KO & ASSOCIATES, P.C.
Consulting Engineers
5121 KINGDOM WAY, SUITE 100, RALEIGH, N.C. 27607
(919) 851-6066




10/3/2008
R:\Roadway\Proj\u2519da_rdy_psh_detour_1.dgn

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-AM |
| R /W SHEET NO. | |

METRIC

5 0 10

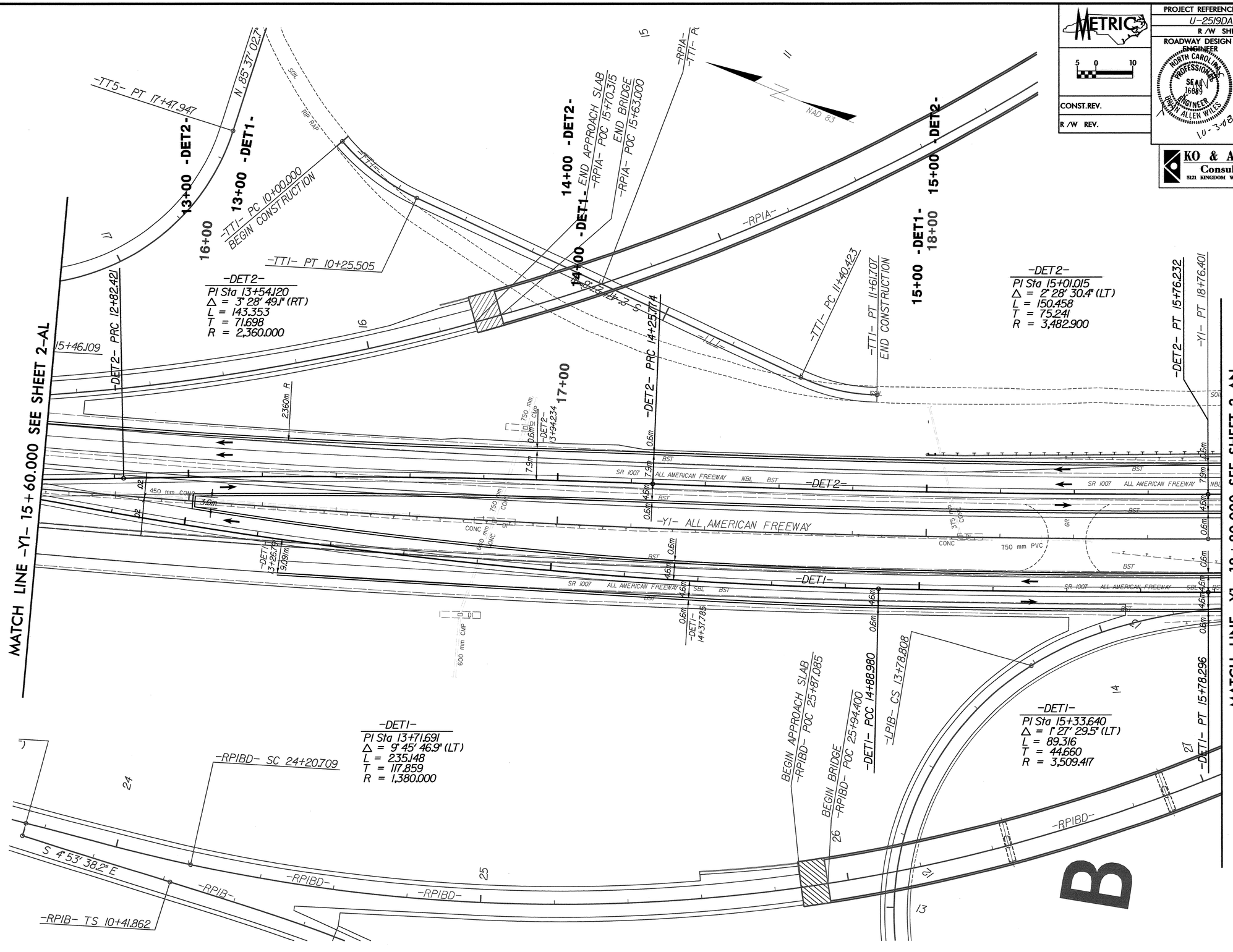
CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 16689 ENGINEER BRIAN ALLEN WILES
10-3-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 21162 ENGINEER HERBERT TURNER, JR.
10-3-08

**KO & ASSOCIATES, P.C.**
**Consulting Engineers**
5121 KINGDOM WAY, SUITE 100, RALEIGH, N.C. 27607
(919) 851-6066




10/3/2008
R:\Roadway\Proj\U2519da_rdy_psh_detour_2.dgn
KO & ASSOCIATES, P.C.

MATCH LINE -Y1- 18+80.000 SEE SHEET 2-AM

-TT3- PT 13+13.244

-TT3- POT 13+42.324

BEGIN APPROACH SLAB
-Y1- POT +

-Y1- POT 19+15.641 =
-LPIB- ST 14+68.808 (17.700m RT)

16+00 -DET1-
19+00
16+00 -DET2-

BEGIN BRIDGE
-Y1- POT +

A

N 67° 53' 59.8" E

-TT3- POT 13+25.057
END CONSTRUCTION
-COL2- POT 28+07.243 =
-LPIB- TS 10+00.000 (3.6m LT)

END BRIDGE
-Y1- POT +

END APPROACH SLAB
-Y1- POT +

29+00 -L-

400 mm CMP

S 22° 24' 31.2" E

S 22° 24' 31.2" E

-COL2-

17+00 -DET1- 17+00 -DET2-

N 77° 01' 59.9" E

20+00

FUTURE

GRADING

N 77° 01' 59.9" E

FUTURE

GRADING

FUTURE

750mm CMP

GRADING ONLY

PROP. TEMP. GUARDRAIL

-DET1-

-DET2-

-LPIB-

375 mm CMP

-Y1- POT 21+16.435 =
-LPID- ST 14+68.808 (17.700m LT)

-DET1- PC 18+06.894

-COL1- POT 29+37.991 =
-LPID- TS 10+00.000 (3.6m RT)

18+00 -DET1-
21+00
18+00 -DET2-

C

-DET2- PC 18+25.116

-Y1- ALL AMERICAN FREEWAY

-DET1-
18+46.857

SR 1007 ALL AMERICAN FREEWAY NBL

-DET1-
PI Sta 19+26.829
Δ = 5° 49' 06.6" (LT)
L = 239.662
T = 119.934
R = 2,360.000

-DET2-
PI Sta 19+38.622
Δ = 5° 30' 25.6" (RT)
L = 226.837
T = 113.506
R = 2,360.000

-DET2-
18+83.928

FUTURE

19+00 -DET1-
19+00 -DET2-
22+00

D

5000m R

-DET1-
19+39.409
7.243m

-LPID- CS 13+78.808

-LPID- POS 13+

450 mm CONC

MATCH LINE -Y1- 22+40.000 SEE SHEET 2-AO

NAD 83

METRIC

5 0 10

CONST. REV.

R/W REV.

KO & ASSOCIATES, P.C.
Consulting Engineers
5221 KINGSTON AVENUE, SUITE 100
WALTER B. JONES BUILDING
RALEIGH, N.C. 27607
(919) 851-1912

NORTH CAROLINA PROFESSIONAL SEAL ENGINEER 18869 ALLEN WILES
10-1-08

NORTH CAROLINA PROFESSIONAL SEAL ENGINEER 21162 HERBERT TURNER, JR.
10-1-08

ROADWAY DESIGN ENGINEER
R/W SHEET NO.
HYDRAULICS ENGINEER

PROJECT REFERENCE NO. U-2519DA
SHEET NO. 2-AN

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-A0 |
| R /W SHEET NO. | |

METRIC

5 0 10

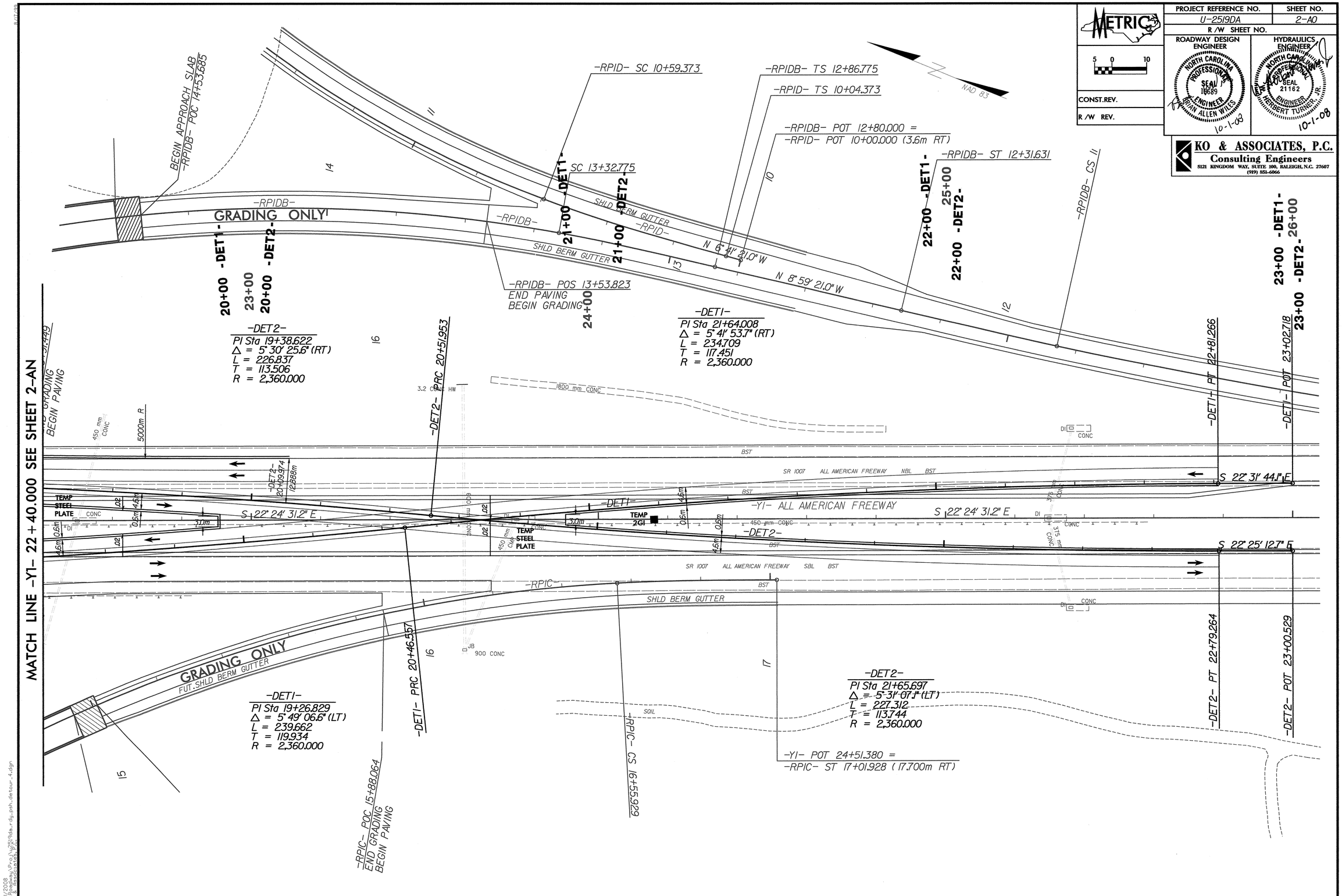
CONST.REV.

R /W REV.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19689 BRIAN ALLEN WILES
10-1-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21162 HERBERT TURNER, JR.
10-1-08

KO & ASSOCIATES, P.C.
Consulting Engineers
5121 KINGDOM WAY, SUITE 100, RALEIGH, N.C. 27607
(919) 851-6066



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s:\contracts\contracts\special details\ericward\stds\06' stds to special details\30001\0300d01.dgn
jhowerton AT PS237501

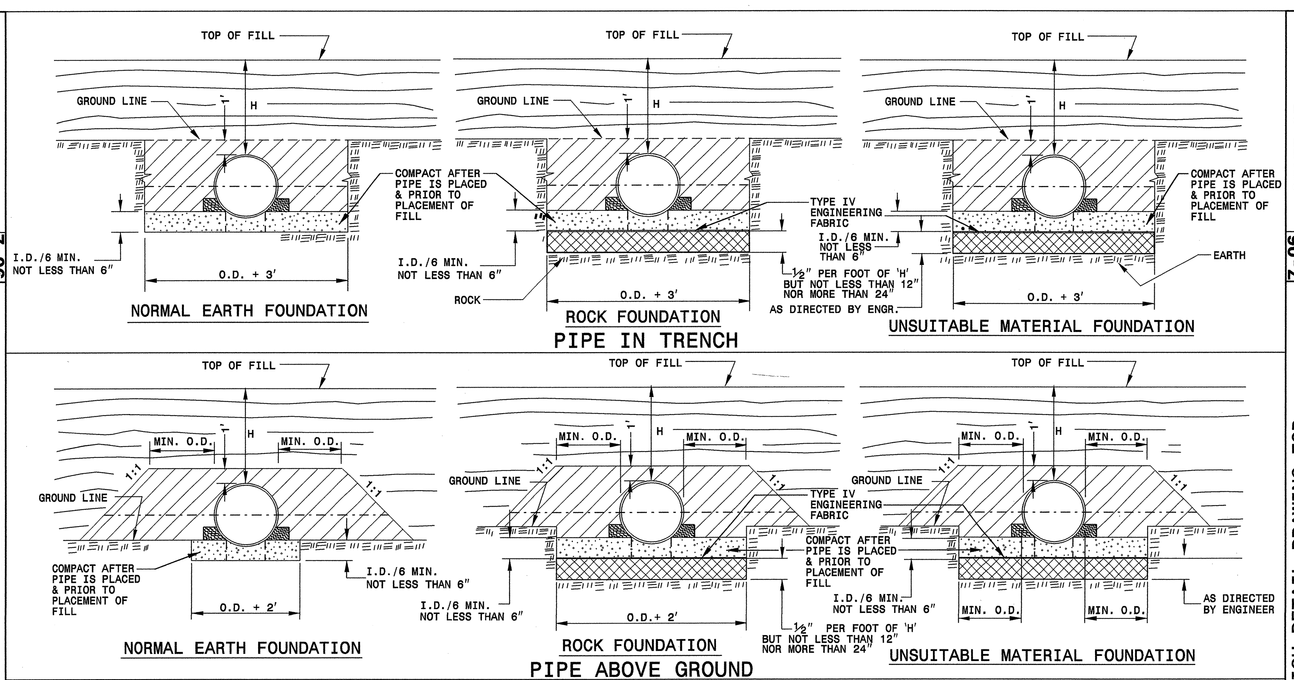
5/14/99

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

7-06

FLEXIBLE PIPE

ENGLISH DETAIL DRAWING FOR
**METHOD OF PIPE INSTALLATION**




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.

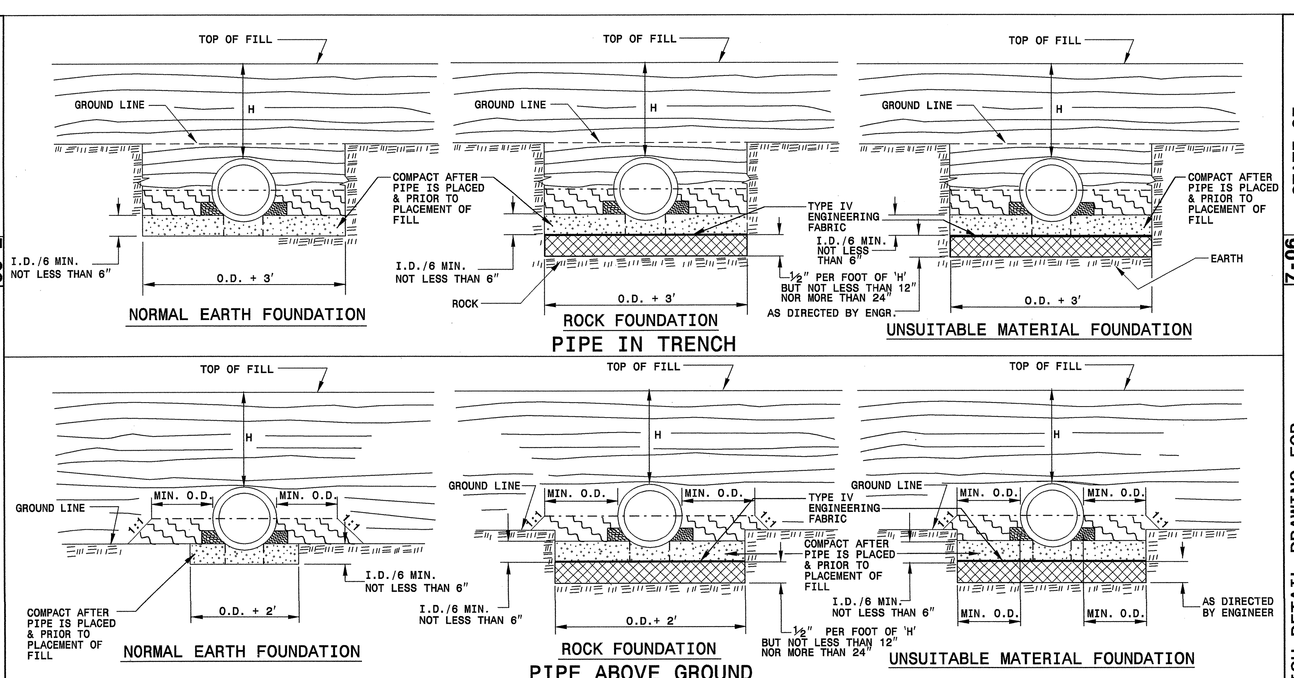
SHEET 1 OF 3
**300D01**

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

7-06

RIGID PIPE

ENGLISH DETAIL DRAWING FOR
**METHOD OF PIPE INSTALLATION**




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: e:\dgn\rd\stds\code\s13\30001\0300d01.dgn

**SEE PLATE FOR TITLE**

NORTH CAROLINA PROFESSIONAL SEAL 022866 ENGINEER

PROJECT REFERENCE NO. U-2519CA
SHEET NO. 2-1P

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

7-06

ENGLISH DETAIL DRAWING FOR
**METHOD OF PIPE INSTALLATION**
FILL HEIGHT TABLES

SHEET 3 OF 3
**300D01**

# FLEXIBLE PIPE

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

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

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

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

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

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

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

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

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

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

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

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

# RIGID PIPE

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

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

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

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

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

RCP - AASHTO M170

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

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

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

7-06

ENGLISH DETAIL DRAWING FOR
**METHOD OF PIPE INSTALLATION**
FILL HEIGHT TABLES

SHEET 3 OF 3
**300D01**

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

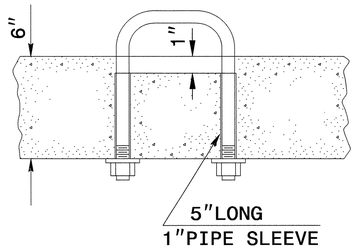
**SEE PLATE FOR TITLE**

ORIGINAL BY: Kkempf
MODIFIED BY: DATE: 5-15-09
CHECKED BY: DATE: 7/31/01
FILE SPEC: /projdir/stds/stdstodetails/30001/0300d01.dgn

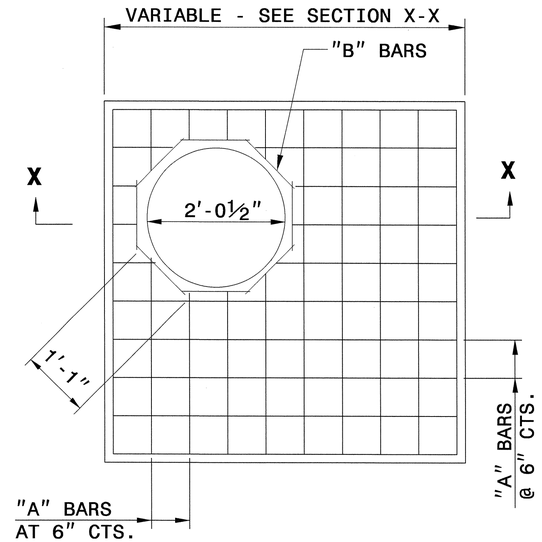
NORTH CAROLINA PROFESSIONAL SEAL 02986 ENGINEER JOSEPH S. HOWERTON 11/1/11

PROJECT REFERENCE NO. U-2519DA
SHEET NO. 2-A0

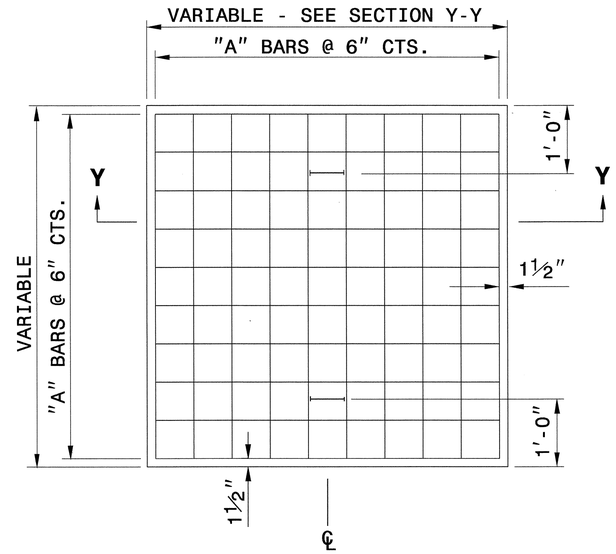
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 2-AR |




**PARTIAL SECTION**




**PLAN**



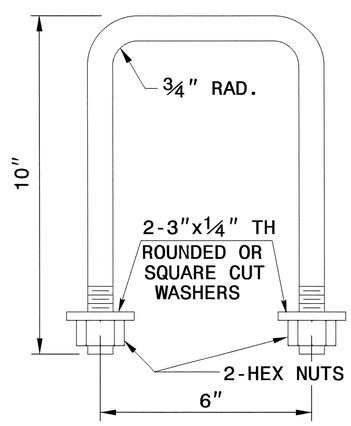

**PLAN**

GENERAL NOTES:

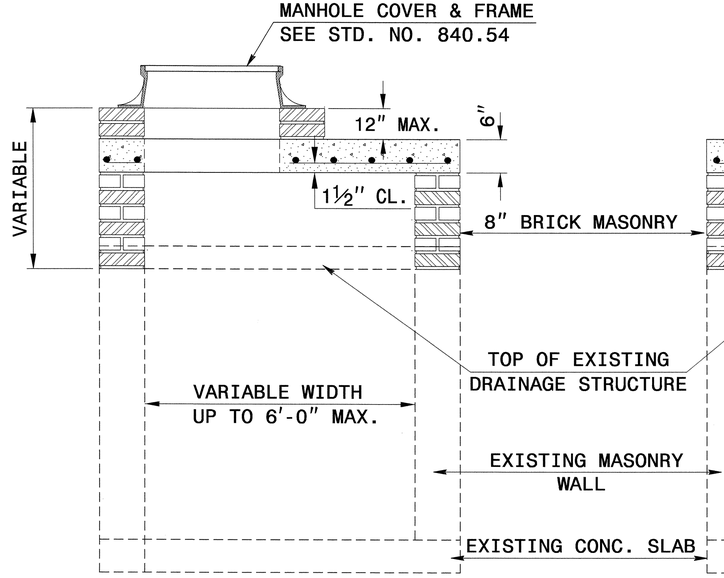
CONSTRUCT IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.

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

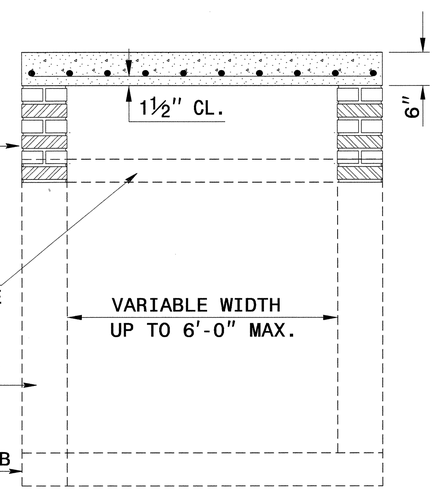
DETAIL INTENDED FOR NON-TRAFFIC BEARING DRAINAGE STRUCTURES.




**DETAIL OF HANDLE**




**SECTION X-X**




**SECTION Y-Y**

## BILL OF MATERIALS

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

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

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

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: 2/22/11
FILE SPEC.: ds174:/usr/details/stand/boxtojbe.dgn

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

| PROJECT REFERENCE NO. | SHEET |
|---|---|
| U-2519DA | 2-AS |

GEOTECHNICAL ENGINEER

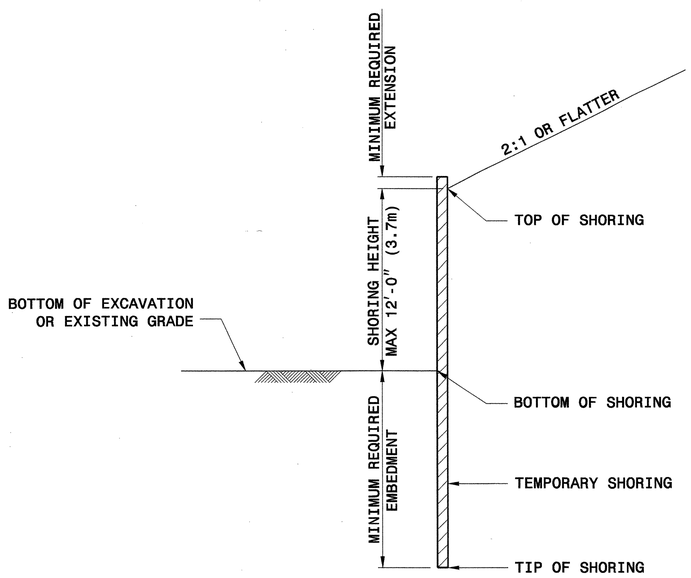
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

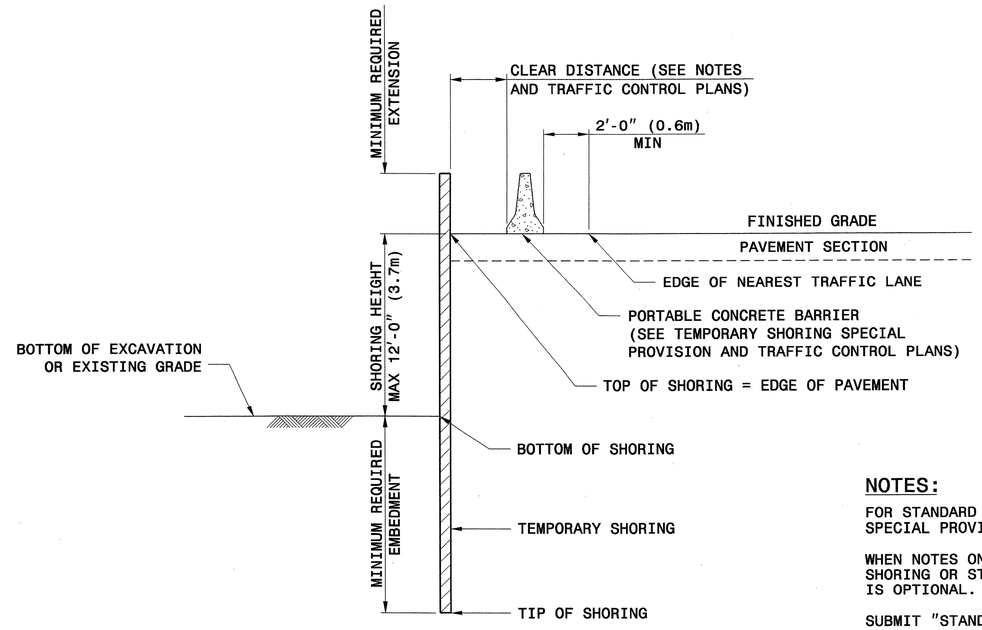
SIGNATURE DATE

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

# STATE OF NORTH CAROLINA
# SUMMARY OF QUANTITIES

| PROJECT REFERENCE No. | SHEET No. |
|---|---|
| U-2519DA | 3 |

Sheet 1 of 2

**STATE OF NORTH CAROLINA**
**DIVISION OF HIGHWAYS**
**ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202829**

| ItemNumber | Sec # | Quantity | Unit | Description |
|---|---|---|---|---|
| 0000100000-N | 800 | Lump Sum | | MOBILIZATION |
| 0000400000-N | 801 | Lump Sum | | CONSTRUCTION SURVEYING |
| 0000920000-M | SP | 18,130 | M3 | GENERIC MISCELLANEOUS ITEM CHIPPED TIRE MATERIAL |
| 0001000000-M | 200 | Lump Sum | | CLEARING & GRUBBING .. HECTARE(S) |
| 0008000000-M | 200 | 2 | HA | SUPPLEMENTARY CLEARING & GRUBBING |
| 0015000000-N | 205 | 4 | EA | SEALING ABANDONED WELLS |
| 0022000000-M | 225 | 339,500 | M3 | UNCLASSIFIED EXCAVATION |
| 0029000000-N | SP | Lump Sum | | REINFORCED BRIDGE APPROACH FILL, STATION ********** (12+10.929 -LP1B-) |
| 0029000000-N | SP | Lump Sum | | REINFORCED BRIDGE APPROACH FILL, STATION ********** (14+60.500 -RP1A-) |
| 0029000000-N | SP | Lump Sum | | REINFORCED BRIDGE APPROACH FILL, STATION ********** (28+08.916 -COL2-) |
| 0029000000-N | SP | Lump Sum | | REINFORCED BRIDGE APPROACH FILL, STATION ********** (28+39.100 -RP1BD-) |
| 0036000000-M | 225 | 28,000 | M3 | UNDERCUT EXCAVATION |
| 0038000000-M | SP | 600 | M3 | SHALLOW UNDERCUT |
| 0080000000-M | SP | 1,200 | MTN | CLASS IV SUBGRADE STABILIZATION |
| 0106000000-M | 230 | 1,649,300 | M3 | BORROW EXCAVATION |
| 0134000000-M | 240 | 4,660 | M3 | DRAINAGE DITCH EXCAVATION |
| 0141000000-M | 240 | 230 | M | BERM DITCH CONSTRUCTION |
| 0156000000-M | 250 | 19,600 | M2 | REMOVAL OF EXISTING ASPHALT PAVEMENT |
| 0192000000-N | 260 | 21 | HR | PROOF ROLLING |
| 0194000000-M | SP | 28,700 | M3 | SELECT GRANULAR MATERIAL, CLASS III |
| 0196000000-M | 270 | 38,450 | M2 | FABRIC FOR SOIL STABILIZATION |
| 0199000000-M | SP | 265.5 | M2 | TEMPORARY SHORING |
| 0223000000-M | SP | 4,750 | M2 | ROCK PLATING |
| 0234000000-M | SP | 5,500 | M3 | GENERIC GRADING ITEM SELECT MATERIAL, CLASS III |
| 0241000000-M | SP | 5,500 | M2 | GENERIC GRADING ITEM FABRIC FOR EMBANKMENT STABILIZATION |
| 0241000000-M | SP | 22,800 | M2 | GENERIC GRADING ITEM GEOGRID REINFORCEMENT |
| 0241000000-M | SP | 9,200 | M2 | GENERIC GRADING ITEM PERM TURF REINF MAT |
| 0248000000-N | SP | Lump Sum | | GENERIC GRADING ITEM TEMPORARY BRIDGE APPROACH FILL STA 29+05.369 -L-WBL |
| 0248000000-N | SP | Lump Sum | | GENERIC GRADING ITEM TEMPORARY BRIDGE APPROACH FILL STA 29+08.861 -L-EBL |
| 0248000000-N | SP | Lump Sum | | GENERIC GRADING ITEM TEMPORARY BRIDGE APPROACH FILL STA 29+12.986 -COL1- |
| 0318000000-M | SP | 1,940 | MTN | FOUNDATION CONDITIONING MATERIAL, MINOR STRS |
| 0320000000-M | SP | 5,830 | M2 | FOUNDATION CONDITIONING FABRIC |
| 0987000000-M | 310 | 171.6 | M | GENERIC PIPE ITEM 1050MM RC PIPE CULVERTS, CLASS III |
| 0987000000-M | 310 | 626.4 | M | GENERIC PIPE ITEM 1200MM RC PIPE CULVERTS, CLASS III |
| 0987000000-M | 310 | 588 | M | GENERIC PIPE ITEM 1200MM RC PIPE CULVERTS, CLASS IV |
| 0987000000-M | 310 | 12 | M | GENERIC PIPE ITEM 1800MM RC PIPE CULVERTS, CLASS III |
| 0987000000-M | 310 | 154.8 | M | GENERIC PIPE ITEM 1800MM RC PIPE CULVERTS, CLASS IV |
| 0987000000-M | 310 | 682.8 | M | GENERIC PIPE ITEM 400MM BIT COAT CS PIPE CULVERTS, TYPE B 1.63MM THICK |
| 0987000000-M | 310 | 50.4 | M | GENERIC PIPE ITEM 450MM BIT COAT CS PIPE CULVERTS, TYPE B 1.63MM THICK |
| 0987000000-M | 310 | 165.6 | M | GENERIC PIPE ITEM 750MM RC PIPE CULVERTS, CLASS IV |
| 0987000000-M | 310 | 40.8 | M | GENERIC PIPE ITEM 800MM BIT COAT CS PIPE CULVERTS, TYPE B 2.01MM THICK |
| 0987000000-M | 310 | 14.4 | M | GENERIC PIPE ITEM 900MM BIT COAT CS PIPE CULVERTS, TYPE B 2.01MM THICK |
| 0987000000-M | 310 | 91.2 | M | GENERIC PIPE ITEM 900MM RC PIPE CULVERTS, CLASS III |
| 0988000000-M | 310 | 58 | EA | GENERIC PIPE ITEM 400MM BIT COAT CS PIPE ELBOWS, TYPE B 1.63MM THICK |
| 0988000000-M | 310 | 2 | EA | GENERIC PIPE ITEM 450MM BIT COAT CS PIPE ELBOWS, TYPE B 1.63MM THICK |
| 0988000000-M | 310 | 4 | EA | GENERIC PIPE ITEM 800MM BIT COAT CS PIPE ELBOWS, TYPE B 2.01MM THICK |
| 0995000000-M | 340 | 65 | M | PIPE REMOVAL |
| 1000000000-M | 462 | 110 | M2 | 150MM SLOPE PROTECTION |
| 1011000000-N | 500 | Lump Sum | | FINE GRADING |
| 1077000000-M | SP | 25 | MTN | #57 STONE |
| 1110000000-M | 510 | 2,000 | MTN | STABILIZER AGGREGATE |
| 1121000000-M | 520 | 29,600 | MTN | AGGREGATE BASE COURSE |
| 1220000000-M | 545 | 1,000 | MTN | INCIDENTAL STONE BASE |
| 1308000000-M | 607 | 2,000 | M2 | MILLING ASPHALT PAVEMENT, *** TO ***MM DEPTH (0MM TO 40MM) |
| 1489000000-M | 610 | 585 | MTN | ASPHALT CONC BASE COURSE, TYPE B25.0B |
| 1491000000-M | 610 | 725 | MTN | ASPHALT CONC BASE COURSE, TYPE B25.0C |
| 1498000000-M | 610 | 395 | MTN | ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B |
| 1503000000-M | 610 | 11,585 | MTN | ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C |
| 1519000000-M | 610 | 570 | MTN | ASPHALT CONC SURFACE COURSE, TYPE S9.5B |
| 1523000000-M | 610 | 14,815 | MTN | ASPHALT CONC SURFACE COURSE, TYPE S9.5C |
| [redacted] | | | | |
| 1575000000-M | SP | 1,545 | MTN | ASPHALT BINDER FOR PLANT MIX |
| [redacted] | | | | |
| 1693000000-M | 654 | 50 | MTN | ASPHALT PLANT MIX, PAVEMENT REPAIR |
| 1880000000-M | SP | 15 | MTN | GENERIC PAVING ITEM LIME FOR LIME MODIFIED SOIL |
| 1891000000-M | SP | 1,500 | M2 | GENERIC PAVING ITEM LIME MODIFIED SOIL |
| 2022000000-M | SP | 538.2 | M3 | SUBDRAIN EXCAVATION |
| 2033000000-M | SP | 269.1 | M3 | SUBDRAIN FINE AGGREGATE |
| 2044000000-M | SP | 650 | 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 | 32.8 | M3 | ENDWALLS |
| 2220000000-M | 838 | 5.4 | M3 | REINFORCED ENDWALLS |
| 2253000000-M | 840 | 4.5 | M3 | PIPE COLLARS |
| 2264000000-M | 840 | 0.5 | M3 | PIPE PLUGS |
| 2286000000-N | 840 | 136 | EA | MASONRY DRAINAGE STRUCTURES |
| 2297000000-M | 840 | 24.1 | M3 | MASONRY DRAINAGE STRUCTURES |
| 2308000000-M | 840 | 7.5 | M | MASONRY DRAINAGE STRUCTURES |
| 2354000000-N | 840 | 1 | EA | FRAME WITH GRATE, STD 840.22 |
| 2364200000-N | 840 | 48 | EA | FRAME WITH TWO GRATES, STD 840.20 |
| 2365000000-N | 840 | 67 | EA | FRAME WITH TWO GRATES, STD 840.22 |
| 2374000000-N | 840 | 1 | EA | FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E) |
| 2374000000-N | 840 | 9 | EA | FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F) |
| 2396000000-N | 840 | 2 | EA | FRAME WITH COVER, STD 840.54 |
| 2549000000-M | 846 | 180 | M | 750MM CONCRETE CURB & GUTTER |
| 2556000000-M | 846 | 110 | M | SHOULDER BERM GUTTER |
| 2570000000-N | SP | 4 | EA | MODIFIED CONCRETE FLUME |
| 2619000000-M | 850 | 25 | M2 | 100MM CONCRETE PAVED DITCH |
| 2905000000-N | 859 | 3 | EA | CONVERT EXISTING DROP INLET TO JUNCTION BOX |
| 3000000000-N | SP | 1 | EA | IMPACT ATTENUATOR UNIT, TYPE 350 |
| 3030000000-M | 862 | 1,596.39 | M | STEEL BM GUARDRAIL |
| 3150000000-N | 862 | 10 | EA | ADDITIONAL GUARDRAIL POSTS |
| 3210000000-N | 862 | 8 | EA | GUARDRAIL ANCHOR UNITS, TYPE CAT-1 |
| 3215000000-N | 862 | 2 | EA | GUARDRAIL ANCHOR UNITS, TYPE III |
| 3270000000-N | SP | 8 | EA | GUARDRAIL ANCHOR UNITS, TYPE 350 |
| 3285000000-N | SP | 1 | EA | GUARDRAIL ANCHOR UNITS, TYPE M-350 |
| 3317000000-N | 862 | 5 | EA | GUARDRAIL ANCHOR UNITS, TYPE B-77 |
| 3360000000-M | 863 | 2,400 | M | REMOVE EXISTING GUARDRAIL |
| 3389400000-M | 865 | 2,100 | M | DOUBLE FACED CABLE GUIDERAIL |
| 3389500000-N | SP | 10 | EA | ADDITIONAL GUIDERAIL POSTS |
| 3389600000-N | 865 | 8 | EA | CABLE GUIDERAIL ANCHOR UNITS |
| 3503000000-M | 866 | 2,500 | M | WOVEN WIRE FENCE, 1200MM FABRIC |
| 3509000000-M | 866 | 532 | EA | 100MM TIMBER FENCE POSTS, 2.30M LONG |
| 3515000000-M | 866 | 112 | EA | 125MM TIMBER FENCE POSTS, 2.50M LONG |
| 3533000000-M | 866 | 3,650 | M | CHAIN LINK FENCE, ****MM FABRIC (2100MM) |
| 3539000000-M | 866 | 995 | EA | METAL LINE POSTS FOR ****MM CHAIN LINK FENCE (2100MM) |
| 3545000000-M | 866 | 45 | EA | METAL TERMINAL POSTS FOR ****MM CHAIN LINK FENCE (2100MM) |
| 3554000000-M | 866 | 6 | EA | METAL GATE POSTS FOR ****MM CHAIN LINK FENCE, DOUBLE GATE (2100MM) |
| 3557000000-M | 866 | 150 | M | ADDITIONAL BARBED WIRE |
| 3565000000-M | 866 | 1 | EA | DOUBLE GATES, ****MM HIGH, ****MM WIDE, ****MM OPENING (2100MM, 5350MM, 10700MM) |
| 3565000000-M | 866 | 2 | EA | DOUBLE GATES, ****MM HIGH, ****MM WIDE, ****MM OPENING (2100MM, 7500MM, 15000MM) |
| 3572000000-M | 867 | 140 | M | CHAIN LINK FENCE RESET |
| 3628000000-M | 876 | 245 | MTN | RIP RAP, CLASS I |
| 3635000000-M | 876 | 220 | MTN | RIP RAP, CLASS II |
| 3649000000-M | 876 | 1,610 | MTN | RIP RAP, CLASS B |
| 3656000000-M | 876 | 14,735 | M2 | FILTER FABRIC FOR DRAINAGE |
| 3659000000-N | SP | 5 | EA | PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON |
| 4048000000-M | 902 | 2 | M3 | REINFORCED CONCRETE SIGN FOUNDATIONS |
| 4057000000-M | SP | 81 | M3 | OVERHEAD FOOTING |
| 4060000000-M | 903 | 99 | KG | SUPPORTS, BREAKAWAY STEEL BEAM |
| 4066000000-M | 903 | 293 | KG | SUPPORTS, SIMPLE STEEL BEAM |
| 4072000000-M | 903 | 73 | M | SUPPORTS, 4.5-KG STEEL U-CHANNEL |
| 4082100000-N | SP | Lump Sum | | SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ****** (11+00 -Y1-) |
| 4082100000-N | SP | Lump Sum | | SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ****** (12+20 -Y1-) |
| 4082100000-N | SP | Lump Sum | | SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ****** (16+80 -Y1-) |
| 4082100000-N | SP | Lump Sum | | SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ****** (23+00 -Y1-) |
| 4082100000-N | SP | Lump Sum | | SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ****** (27+70 -Y1-) |

# STATE OF NORTH CAROLINA
# SUMMARY OF QUANTITIES

| PROJECT REFERENCE No. | SHEET No. |
|---|---|
| U-2519DA | 3 |

Sheet 2 of 2

| ItemNumber | Sec # | Quantity | Unit | Description |
|---|---|---|---|---|
| 4082100000-N | SP | Lump Sum | | SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ****** (28+30 -Y1-) |
| 4082100000-N | SP | Lump Sum | | SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ****** (31+75 -Y1-) |
| 4096000000-N | 904 | 2 | EA | SIGN ERECTION, TYPE D |
| 4102000000-N | 904 | 6 | EA | SIGN ERECTION, TYPE E |
| 4110000000-N | 904 | 3 | EA | SIGN ERECTION, TYPE *** (GROUND MOUNTED) (A) |
| 4116100000-N | 904 | 8 | EA | SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (E) |
| 4149000000-N | 907 | 4 | EA | DISPOSAL OF SIGN SYSTEM, OVERHEAD |
| 4152000000-N | 907 | 4 | EA | DISPOSAL OF SIGN SYSTEM, STEEL BEAM |
| 4155000000-N | 907 | 14 | EA | DISPOSAL OF SIGN SYSTEM, U-CHANNEL |
| 4158000000-N | 907 | 1 | EA | DISPOSAL OF SIGN SYSTEM, WOOD |
| 4192000000-N | 907 | 1 | EA | DISPOSAL OF SUPPORT, U-CHANNEL |
| 4238000000-N | 907 | 2 | EA | DISPOSAL OF SIGN, D, E OR F |
| 4400000000-M | 1110 | 35 | M2 | WORK ZONE SIGNS (STATIONARY) |
| 4405000000-M | 1110 | 43 | M2 | WORK ZONE SIGNS (PORTABLE) |
| 4410000000-M | 1110 | 16 | M2 | WORK ZONE SIGNS (BARRICADE MOUNTED) |
| 4415000000-N | 1115 | 2 | EA | FLASHING ARROW PANELS, TYPE C |
| 4420000000-N | 1120 | 2 | EA | CHANGEABLE MESSAGE SIGN |
| 4430000000-N | 1130 | 200 | EA | DRUMS |
| 4445000000-M | 1145 | 146 | M | BARRICADES (TYPE III) |
| 4465000000-N | 1160 | 2 | EA | TEMPORARY CRASH CUSHIONS |
| 4470000000-N | 1160 | 2 | EA | RESET TEMPORARY CRASH CUSHIONS |
| 4480000000-N | 1165 | 2 | EA | TMIA |
| 4485000000-M | 1170 | 3,322 | M | PORTABLE CONCRETE BARRIER |
| 4490000000-M | 1170 | 41 | M | PORTABLE CONCRETE BARRIER (ANCHORED) |
| 4495000000-M | 1170 | 1,200 | M | PORTABLE CONCRETE BARRIER (DRAINAGE) |
| 4500000000-M | 1170 | 4,102 | M | RESET PORTABLE CONCRETE BARRIER |
| 4510000000-N | SP | 500 | HR | LAW ENFORCEMENT |
| 4520000000-N | 1266 | 22 | EA | TUBULAR MARKERS (FIXED) |
| 4650000000-N | 1251 | 450 | EA | TEMPORARY RAISED PAVEMENT MARKERS |
| 4685000000-M | 1205 | 9,800 | M | THERMOPLASTIC PAVEMENT MARKING LINES (100MM, 2.3MM) |
| 4686000000-M | 1205 | 2,184 | M | THERMOPLASTIC PAVEMENT MARKING LINES (100MM, 3.1MM) |
| 4695000000-M | 1205 | 612 | M | THERMOPLASTIC PAVEMENT MARKING LINES (200MM, 2.3MM) |
| 4721000000-M | 1205 | 8 | EA | THERMOPLASTIC PAVEMENT MARKING CHARACTER (3.1MM) |
| 4725000000-M | 1205 | 10 | EA | THERMOPLASTIC PAVEMENT MARKING SYMBOL (2.3MM) |
| 4770000000-M | 1205 | 195 | M | COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (100MM) (IV) |
| 4810000000-M | 1205 | 41,532 | M | PAINT PAVEMENT MARKING LINES (100MM) |
| 4820000000-M | 1205 | 968 | M | PAINT PAVEMENT MARKING LINES (200MM) |
| 4845000000-N | 1205 | 15 | EA | PAINT PAVEMENT MARKING SYMBOL |
| 4847000000-M | 1205 | 195 | M | POLYUREA PAVEMENT MARKING LINES (100MM, **********) (HIGHLY REFLECTIVE ELEMENTS) |
| 4847110000-M | 1205 | 30 | M | POLYUREA PAVEMENT MARKING LINES (200MM, *********) (HIGHLY REFLECTIVE ELEMENTS) |
| 4850000000-M | 1205 | 5,408 | M | REMOVAL OF PAVEMENT MARKING LINES (100MM) |
| 4860000000-M | 1205 | 96 | M | REMOVAL OF PAVEMENT MARKING LINES (200MM) |
| 4905000000-N | 1253 | 113 | EA | SNOWPLOWABLE PAVEMENT MARKERS |
| 4935000000-N | 1267 | 13 | EA | FLEXIBLE DELINEATORS (CRYSTAL) |
| 4940000000-N | 1267 | 4 | EA | FLEXIBLE DELINEATORS (YELLOW) |
| 5255000000-N | 1413 | Lump Sum | | PORTABLE LIGHTING |

| ItemNumber | Sec # | Quantity | Unit | Description |
|---|---|---|---|---|
| 5801000000-M | 1530 | 122 | M | ABANDON 200MM UTILITY PIPE |
| 5816000000-N | 1530 | 1 | EA | ABANDON UTILITY MANHOLE |
| 6000000000-M | 1605 | 32,800 | M | TEMPORARY SILT FENCE |
| 6006000000-M | 1610 | 4,550 | MTN | STONE FOR EROSION CONTROL, CLASS A |
| 6009000000-M | 1610 | 20,700 | MTN | STONE FOR EROSION CONTROL, CLASS B |
| 6012000000-M | 1610 | 11,450 | MTN | SEDIMENT CONTROL STONE |
| 6015000000-M | 1615 | 100 | HA | TEMPORARY MULCHING |
| 6018000000-M | 1620 | 2,500 | KG | SEED FOR TEMPORARY SEEDING |
| 6021000000-M | 1620 | 18 | MTN | FERTILIZER FOR TEMPORARY SEEDING |
| 6024000000-M | 1622 | 10,000 | M | TEMPORARY SLOPE DRAINS |
| 6027000000-N | 1622 | 160 | EA | INLET PROTECTION AT TEMPORARY SLOPE DRAINS |
| 6029000000-M | SP | 4,550 | M | SAFETY FENCE |
| 6030000000-M | 1630 | 43,000 | M3 | SILT EXCAVATION |
| 6036000000-M | 1631 | 107,000 | M2 | MATTING FOR EROSION CONTROL |
| 6037000000-M | SP | 700 | M2 | COIR FIBER MAT |
| 6038000000-M | SP | 3,850 | M2 | PERMANENT SOIL REINFORCEMENT MAT |
| 6042000000-M | 1632 | 1,060 | M | 6.4MM HARDWARE CLOTH |
| 6046000000-M | SP | 30 | M | TEMPORARY PIPE FOR STREAM CROSSING |
| 6069000000-M | 1638 | 748 | M3 | STILLING BASINS |
| 6070000000-N | SP | 10 | EA | SPECIAL STILLING BASINS |
| 6071012000-M | SP | 3,000 | M | COIR FIBER WATTLE |
| 6071020000-M | SP | 3,000 | KG | POLYACRYLAMIDE (PAM) |
| 6071030000-M | SP | 5,000 | M | COIR FIBER BAFFLE |
| 6071050000-M | SP | 1 | EA | ***MM SKIMMER (102MM) |
| 6071050000-M | SP | 35 | EA | ***MM SKIMMER (38MM) |
| 6071050000-M | SP | 11 | EA | ***MM SKIMMER (51MM) |
| 6071050000-M | SP | 6 | EA | ***MM SKIMMER (64MM) |
| 6071050000-M | SP | 2 | EA | ***MM SKIMMER (76MM) |
| 6084000000-M | 1660 | 150 | HA | SEEDING & MULCHING |
| 6087000000-M | 1660 | 100 | HA | MOWING |
| 6090000000-M | 1661 | 4,050 | KG | SEED FOR REPAIR SEEDING |
| 6093000000-M | 1661 | 13.5 | MTN | FERTILIZER FOR REPAIR SEEDING |
| 6096000000-M | 1662 | 3,375 | KG | SEED FOR SUPPLEMENTAL SEEDING |
| 6108000000-M | 1665 | 200 | MTN | FERTILIZER TOPDRESSING |
| 6111000000-M | SP | 370 | M | IMPERVIOUS DIKE |
| 6114500000-N | SP | 250 | MHR | SPECIALIZED HAND MOWING |
| 6117000000-N | SP | 200 | EA | RESPONSE FOR EROSION CONTROL |
| 6120000000-M | SP | 850 | M3 | CULVERT DIVERSION CHANNEL |
| 6123000000-M | 1670 | 1.5 | HA | REFORESTATION |

******* BEGIN SCHEDULE AA *******
******* (3 ALTERNATES) *******

| ItemNumber | Sec # | Quantity | Unit | Description |
|---|---|---|---|---|
| 0987000000-M AA1 | 310 | 1,911.6 | M | GENERIC PIPE ITEM 375MM RC PIPE CULVERTS, CLASS III |
| 0987000000-M AA1 | 310 | 555.6 | M | GENERIC PIPE ITEM 450MM RC PIPE CULVERTS, CLASS III |
| 0987000000-M AA1 | 310 | 705.6 | M | GENERIC PIPE ITEM 600MM RC PIPE CULVERTS, CLASS III |
| 0987000000-M AA1 | 310 | 363.6 | M | GENERIC PIPE ITEM 750MM RC PIPE CULVERTS, CLASS III |

*** OR ***

| ItemNumber | Sec # | Quantity | Unit | Description |
|---|---|---|---|---|
| 0986000000-M AA2 | SP | 144 | M | GENERIC PIPE ITEM 375MM HDPE PIPE CULVERTS |
| 0986000000-M AA2 | SP | 190.8 | M | GENERIC PIPE ITEM 450MM HDPE PIPE CULVERTS |
| 0986000000-M AA2 | SP | 140.4 | M | GENERIC PIPE ITEM 600MM HDPE PIPE CULVERTS |
| 0986000000-M AA2 | SP | 112.8 | M | GENERIC PIPE ITEM 750MM HDPE PIPE CULVERTS |
| 0987000000-M AA2 | 310 | 1,767.6 | M | GENERIC PIPE ITEM 375MM RC PIPE CULVERTS, CLASS III |
| 0987000000-M AA2 | 310 | 364.8 | M | GENERIC PIPE ITEM 450MM RC PIPE CULVERTS, CLASS III |
| 0987000000-M AA2 | 310 | 565.2 | M | GENERIC PIPE ITEM 600MM RC PIPE CULVERTS, CLASS III |
| 0987000000-M AA2 | 310 | 250.8 | M | GENERIC PIPE ITEM 750MM RC PIPE CULVERTS, CLASS III |

*** OR ***

| ItemNumber | Sec # | Quantity | Unit | Description |
|---|---|---|---|---|
| 0986000000-M AA3 | SP | 144 | M | GENERIC PIPE ITEM 400MM ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, 1.63MM THICK |
| 0986000000-M AA3 | SP | 190.8 | M | GENERIC PIPE ITEM 450MM ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, 1.63MM THICK |
| 0986000000-M AA3 | SP | 140.4 | M | GENERIC PIPE ITEM 600MM ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, 1.63MM THICK |
| 0986000000-M AA3 | SP | 112.8 | M | GENERIC PIPE ITEM 800MM ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, 2.01MM THICK |
| 0987000000-M AA3 | 310 | 1,767.6 | M | GENERIC PIPE ITEM 375MM RC PIPE CULVERTS, CLASS III |
| 0987000000-M AA3 | 310 | 364.8 | M | GENERIC PIPE ITEM 450MM RC PIPE CULVERTS, CLASS III |
| 0987000000-M AA3 | 310 | 565.2 | M | GENERIC PIPE ITEM 600MM RC PIPE CULVERTS, CLASS III |
| 0987000000-M AA3 | 310 | 250.8 | M | GENERIC PIPE ITEM 750MM RC PIPE CULVERTS, CLASS III |

******* END SCHEDULE AA *******

| COMPUTED BY: | DJM | DATE: | 1/28/2008 |
|---|---|---|---|
| CHECKED BY: | CMKR, Sungate | DATE: | 8/28/2008 |

# STATE OF NORTH CAROLINA
# DIVISION OF HIGHWAYS

METRIC

| PROJECT NO. | SHEET NO. |
|---|---|
| U-2519DA | 3-A |

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

| LINE | STATION / SIZE / THICKNESS OR GAUGE | LOCATION (LT, RT, OR CL)' | STRUCTURE NO. FROM | STRUCTURE NO. TO | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | SLOPE CRITICAL | CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 300 | 375 | 450 | 600 | 750 | 900 | 1050 | 1200 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L | 21+20 | CL | 3 | | 65.927 | | | | | | | | | | | |
| L | 21+20 | CL | 3 | 2 | | 65.343 | 65.218 | | | 25.2 | | | | | | |
| L | 21+20 | RT | 2 | | 66.175 | | | | | | | | | | | |
| L | 21+20 | LT | 2 | 1 | | 65.218 | 65.113 | | | 21.6 | | | | | | |
| COL2 | 21+20 | LT | 1 | | 66.617 | | | | | | | | | | | |
| COL2 | 21+20 | LT | 1 | OUT | | 65.113 | 59.500 | | | | | | | | | |
| COL1 | 21+67 | RT | 4 | | 64.990 | | | | | | | | | | | |
| COL1 | 21+67 | RT | 4 | OUT | | 64.152 | 61.356 | | | | | | | | | |
| COL1 | 22+40 | RT | 5 | | 65.089 | | | | | | | | | | | |
| COL1 | 22+40 | RT | 5 | OUT | | 64.251 | 59.000 | | | | | | | | | |
| L | 22+24 | CL | 6 | | | 59.000 | 58.500 | | | | | | | | | 148.8 |
| L | 22+45 | CL | 7 | | | 59.000 | 58.500 | | | | | | | | | 151.2 |
| L | 22+95 | CL | 8 | | | 59.000 | 58.500 | | | | | | | | | 160.8 |
| L | 23+17 | CL | 9 | | | 59.000 | 58.500 | | | | | | | | | 165.6 |
| RP1DB | 23+82 | RT | 10 | | 65.186 | | | | | | | | | | | |
| RP1DB | 23+82 | RT | 10 | 11 | | 64.348 | 64.298 | | | 10.8 | | | | | | |
| RP1DB | 23+72 | RT | 11 | | 65.136 | | | | | | | | | | | |
| RP1DB | 23+72 | RT | 11 | 12 | | 64.298 | 64.245 | X | | 9.6 | | | | | | |
| RP1DB | 23+62 | RT | 12 | | 65.190 | | | | | | | | | | | |
| RP1DB | 23+62 | RT | 12 | 13 | | 64.245 | 64.040 | X | | 40.8 | | | | | | |
| RP1DB | 23+21 | RT | 13 | | 65.410 | | | | | | | | | | | |
| RP1DB | 23+21 | RT | 13 | OUT | | 64.040 | 59.000 | | | | | | | | | |
| COL1 | 23+00 | RT | 14 | | 64.538 | | | | | | | | | | | |
| COL1 | 23+00 | RT | 14 | 15 | | 63.700 | 63.261 | | | 26.4 | | | | | | |
| L | 23+27 | RT | 16 | | 64.187 | | | | | | | | | | | |
| L | 23+27 | RT | 16 | 15 | | 63.349 | 63.264 | X | | 16.8 | | | | | | |
| COL1 | 23+26.50 | RT | 15 | | 64.470 | | | | | | | | | | | |
| COL1 | 23+26.50 | RT | 15 | 17 | | 63.264 | 62.990 | X | | | 52.8 | | | | | |
| COL1 | 23+80 | RT | 17 | | 64.679 | | | | | | | | | | | |
| COL1 | 23+80 | RT | 17 | OUT | | 62.990 | 59.000 | | | | | | | | | |
| L | 23+29 | CL | 18 | | 63.956 | | | | | | | | | | | |
| L | 23+29 | CL | 18 | 19 | | 63.372 | 63.237 | X | | 26.4 | | | | | | |
| L | 23+40 | LT | 19 | | 64.097 | | | | | | | | | | | |
| L | 23+40 | LT | 19 | 20 | | 63.183 | 63.080 | | | | 20.4 | | | | | |
| COL2 | 23+40 | LT | 20 | | 64.478 | | | | | | | | | | | |
| COL2 | 23+40 | LT | 20 | OUT | | 62.780 | 61.895 | | | | | | 42.0 | | | |
| L | 24+40 | CL | 23 | | 64.710 | | | | | | | | | | | |
| L | 24+40 | CL | 23 | 22 | | 64.126 | 63.914 | | | 25.2 | | | | | | |
| L | 24+40 | LT | 22 | | 64.498 | | | | | | | | | | | |
| L | 24+40 | LT | 22 | 21 | | 63.838 | 63.662 | X | | | 21.6 | | | | | |
| COL2 | 24+40 | LT | 21 | | 64.576 | | | | | | | | | | | |
| COL2 | 24+40 | LT | 21 | 20 | | 62.976 | 62.780 | | | | | | | | | |
| SHEET TOTALS | | | | | | | | | | 202.8 | 94.8 | | 42.0 | | | 626.4 |

| LINE | STATION | FROM | TO | BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300 / 1.63 | 400 / 1.63 | 450 / 1.63 | 600 / 1.63 | 800 / 2.01 | 900 / 2.01 | 1000 / 2.01 | 1200 / 2.01 | CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR HDPE, TYPE S OR D 300 | 375 | 450 | 600 | 750 | 900 | ### | ### | 375mm SIDE DRAIN PIPE | 450mm SIDE DRAIN PIPE | 600mm SIDE DRAIN PIPE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COL2 | 21+20 | 1 | OUT | | 12.0 | | | | | | | | | | | | | | | | | |
| COL1 | 21+67 | 4 | OUT | | | | | | | | | | 36.0 | | | | | | | | | |
| COL1 | 22+40 | 5 | OUT | | 22.8 | | | | | | | | | | | | | | | | | |
| RP1DB | 23+21 | 13 | OUT | | 10.8 | | | | | | | | | | | | | | | | | |
| COL1 | 23+80 | 17 | OUT | | | 22.8 | | | | | | | | | | | | | | | | |
| COL2 | 24+40 | 21 | 20 | | | | | | | | | | | | | 99.6 | | | | | | |
| SHEET TOTALS | | | | | 45.6 | 22.8 | | | | | | | 36.0 | | | 99.6 | | | | | | |

| LINE | STATION | FROM | 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 1.50) | *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5 THRU 3.00 | B 3.00 AND ABOVE | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E | F | G | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATE STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR 840.26 | G.D.I. TYPE "B" STD. 840.18 OR 840.27 | G.D.I. TYPE "D" STD. 840.19 OR 840.28 | G.D.I. FRAME WITH TWO GRATES STD. 840.20 (FLAT) | G.D.I. FRAME WITH GRATE STD. 840.22 (SAG) | G.D.I. FRAME WITH TWO GRATES STD. 840.22 (SAG) | G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24 | G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24 | J.B. STD. 840.31 OR 840.32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L | 21+20 | 3 | | | | 1 | | | | | | | | | | | 1 | | | 1 | | |
| L | 21+20 | 2 | | | | 1 | | | | | | | | | | 1 | | | | 1 | | |
| COL2 | 21+20 | 1 | | | | 1 | 0.004 | | | | | | | | | 1 | | 1 | | | | |
| COL1 | 21+67 | 4 | | | | 1 | | | | | | | | | | 1 | | | | 1 | | |
| COL1 | 22+40 | 5 | | | | 1 | | | | | | | | | | 1 | | 1 | | | | |
| L | 22+24 | 6 | | 4.60 | | | | | | | | | | | | | | | | | | |
| L | 22+45 | 7 | | 4.60 | | | | | | | | | | | | | | | | | | |
| L | 22+95 | 8 | | 4.60 | | | | | | | | | | | | | | | | | | |
| L | 23+17 | 9 | | 4.60 | | | | | | | | | | | | | | | | | | |
| RP1DB | 23+82 | 10 | | | | 1 | | | | | | | | | | 1 | | 1 | | | | |
| RP1DB | 23+72 | 11 | | | | 1 | | | | | | | | | | 1 | | 1 | | | | |
| RP1DB | 23+62 | 12 | | | | 1 | | | | | | | | | | 1 | | 1 | | | | |
| RP1DB | 23+21 | 13 | | | | 1 | | | | | | | | | | 1 | | 1 | | | | |
| COL1 | 23+00 | 14 | | | | 1 | | | | | | | | | | 1 | | 1 | | | | |
| L | 23+27 | 16 | | | | 1 | | | | | | | | | | 1 | | | | 1 | | |
| COL1 | 23+26.50 | 15 | | | | 1 | | | | | | | | | | 1 | | 1 | | | | |
| COL1 | 23+80 | 17 | | | | 1 | 0.190 | | | | | | | | | 1 | | 1 | | | | |
| L | 23+29 | 18 | | | | 1 | | | | | | | | | | | 1 | | | 1 | | |
| L | 23+40 | 19 | | | | 1 | | | | | | | | | | 1 | | | | 1 | | |
| COL2 | 23+40 | 20 | | | | 1 | 0.198 | | | | | | | | 1 | | | | | 1 | | |
| L | 24+40 | 23 | | | | 1 | | | | | | | | | | | 1 | | | 1 | | |
| L | 24+40 | 22 | | | | 1 | | | | | | | | | | | 1 | | | 1 | | |
| COL2 | 24+40 | 21 | | | | 1 | 0.100 | | | | | | | | 1 | | | | | 1 | | |
| SHEET TOTALS | | | | 18.40 | | 19 | 0.492 | | | | | | | | 2 | 13 | 4 | 9 | | 10 | | |

| LINE | STATION | FROM | TO | MANHOLE STD. 840.51 | M.H. STD. 840.51 OR 840.53 | M.H. FRAME AND COVER STD. 840.54 | C.B. STD. 840.04 OR STD. 840.05 (OPEN THROAT) | MODIFIED CONCRETE FLUME | CONVERT DI TO JUNCTION BOX | PREFORMED SCOUR HOLE | BERM DITCH OUTLET STD. 850.10 | BERM DITCH OUTLET STD. 850.11 | CLASS IV R.C. PIPE 450 CLASS IV RCP | 750 CLASS IV RCP | 1200 CLASS IV RCP | CORR. STEEL ELBOWS NO. & SIZE 400 | 450 | 600 | 800 | CONC. COLLARS CL. "B" $M^3$ STD. 840.72 | CONC. & BRICK PIPE PLUG, $M^3$ STD. 840.71 | PIPE REMOVAL (METERS) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COL2 | 21+20 | 1 | OUT | | | | | | | | | | | | | 2 | | | | | | | |
| COL1 | 22+40 | 5 | OUT | | | | | | | | | | | | | 2 | | | | | | | |
| RP1DB | 23+21 | 13 | OUT | | | | | | | | | | | | | 2 | | | | | | | |
| COL1 | 23+80 | 17 | OUT | | | | | | | | | | | | | 2 | | | | | | | |
| SHEET TOTALS | | | | | | | | | | | | | | | | 8 | | | | | | | |

**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: DJM DATE: 1/28/2008

CHECKED BY: CMKR, Sungate DATE: 8/28/2008

# STATE OF NORTH CAROLINA
# DIVISION OF HIGHWAYS

METRIC

| PROJECT NO. | SHEET NO. |
|---|---|
| U-2519DA | 3-B |

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

| LINE | STATION (SIZE / THICKNESS OR GAUGE) | LOCATION (LT, RT, OR CL)' | STRUCTURE NO. FROM | STRUCTURE NO. TO | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | SLOPE CRITICAL | CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 300 | 375 | 450 | 600 | 750 | 900 | 1050 | 1200 | BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300 (1.63) | 400 (1.63) | 450 (1.63) | 600 (1.63) | 800 (2.01) | 900 (2.01) | 1000 (2.01) | 1200 (2.01) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RP1DB | 19+61 | LT | 26 | | 77.200 | | | | | | | | | | | | | | | | | | | |
| RP1DB | 19+61 | LT | 26 | 25 | | 76.362 | 67.449 | | | | | | | | | | | 34.8 | | | | | | |
| COL2 | 26+40 | LT | 25 | | 68.287 | | | | | | | | | | | | | | | | | | | |
| COL2 | 26+40 | LT | 25 | 24 | | 67.378 | 67.073 | | | | | | | | | | | | | | | | | |
| RP1DB | 20+27 | RT | 27 | | 70.200 | | | | | | | | | | | | | | | | | | | |
| RP1DB | 20+27 | RT | 27 | 24 | | 69.603 | 67.150 | | | 73.2 | | | | | | | | | | | | | | |
| COL2 | 25+80 | LT | 24 | | 68.229 | | | | | | | | | | | | | | | | | | | |
| COL2 | 25+80 | LT | 24 | 21 | | 66.781 | 63.509 | | | | | | | | | | | | | | | | | |
| RP1B | 14+53 | RT | 28 | | 67.450 | | | | | | | | | | | | | | | | | | | |
| RP1B | 14+53 | RT | 28 | 29 | | 66.536 | 65.785 | | | | | | | | | | | | | | | | | |
| RP1B | 15+40 | RT | 29 | | 67.080 | | | | | | | | | | | | | | | | | | | |
| RP1B | 15+40 | RT | 29 | OUT | | 65.785 | 62.700 | | | | | | | | | | | | | | | | | |
| LP1B | 11+20 | RT | 30 | | 70.431 | | | | | | | | | | | | | | | | | | | |
| LP1B | 11+20 | RT | 30 | 31 | | 69.516 | 68.887 | | | 37.2 | | | | | | | | | | | | | | |
| LP1B | 11+60 | RT | 31 | | 69.802 | | | | | | | | | | | | | | | | | | | |
| LP1B | 11+60 | RT | 31 | 32 | | 68.887 | 68.472 | | | 38.4 | | | | | | | | | | | | | | |
| LP1B | 11+80 | RT | 32 | | 69.387 | | | | | | | | | | | | | | | | | | | |
| LP1B | 11+80 | RT | 32 | OUT | | 68.472 | 65.590 | | | | | | | | | | | 20.4 | | | | | | |
| RPIBD | 25+60 | LT | 33 | | 74.520 | | | | | | | | | | | | | | | | | | | |
| RPIBD | 25+60 | LT | 33 | OUT | | 73.412 | 70.215 | | | 42.0 | | | | | | | | | | | | | | |
| RP1B | 12+08 | LT | 34 | | 69.570 | | | | | | | | | | | | | | | | | | | |
| RP1B | 12+08 | LT | 34 | 35 | | 68.935 | 65.462 | | | | | | | | | | | | | | | | | |
| LP1B | 12+75 | LT | 35 | | 66.192 | | | | | | | | | | | | | | | | | | | |
| LP1B | 12+75 | LT | 35 | 36 | | 65.354 | 64.678 | | | 22.8 | | | | | | | | | | | | | | |
| LP1B | 12+92 | RT | 36 | | 65.510 | | | | | | | | | | | | | | | | | | | |
| LP1B | 12+92 | RT | 36 | 37 | | 64.678 | 63.160 | | | 45.6 | | | | | | | | | | | | | | |
| LP1B | 13+40 | RT | 37 | | 63.998 | | | | | | | | | | | | | | | | | | | |
| LP1B | 13+40 | RT | 37 | OUT | | 63.160 | 62.000 | | | | 20.4 | | | | | | | | | | | | | |
| Y1 | 18+12 | RT | 38 | | 62.500 | | | | | | | | | | | | | | | | | | | |
| Y1 | 18+12 | RT | 38 | 39 | | 61.916 | 61.769 | X | | 20.4 | | | | | | | | | | | | | | |
| LP1B | 13+40 | RT | 39 | | 63.010 | | | | | | | | | | | | | | | | | | | |
| LP1B | 13+40 | RT | 39 | OUT | | 61.769 | 60.680 | | | 19.2 | | | | | | | | | | | | | | |
| TT4 | 12+91 | CL | 40 | | | | | | | | | | | | | | | | | | 15.6 | | | |
| L | 26+88 | LT | 41 | OUT | | | | | | | | | | | | | | | | | | | | |
| L | 29+12 | LT | 42 | OUT | | | | | | | | | | | | | | | | | | | | |
| L | 29+38 | CL | 43 | | | 63.000 | 57.110 | | | | | | | | | | | | | | | | | |
| COL2 | 29+80 | LT | 44 | | 71.950 | | | | | | | | | | | | | | | | | | | |
| COL2 | 29+80 | LT | 44 | 45 | | 71.112 | 69.092 | | | 79.2 | | | | | | | | | | | | | | |
| COL2 | 30+60 | LT | 45 | | 69.930 | | | | | | | | | | | | | | | | | | | |
| COL2 | 30+60 | LT | 45 | OUT | | 69.092 | 62.426 | | | | | | | | | | | 37.2 | | | | | | |
| COL2 | 30+34 | LT | | | | | | | | | | | | | | | | | | | | | | |
| SHEET TOTALS | | | | | | | | | | 378.0 | 20.4 | | | | | | | 92.4 | | | 15.6 | | | |

| LINE | 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 | ### | ### | 375mm SIDE DRAIN PIPE | 450mm SIDE DRAIN PIPE | 600mm SIDE DRAIN PIPE | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. METERS R.C.P. | C.S.P. | QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0 THRU 1.50) | *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5 THRU 3.00 | B 3.00 AND ABOVE | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E | F | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RP1DB | 19+61 | 26 | | | | | | | | | | | | | | | 1 | | | | | | |
| RP1DB | 19+61 | 26 | 25 | | | | | | | | | | | | | | | | | | | | |
| COL2 | 26+40 | 25 | | | | | | | | | | | | | | | 1 | | | | | | |
| COL2 | 26+40 | 25 | 24 | | | 60.0 | | | | | | | | | | | | | | | | | |
| RP1DB | 20+27 | 27 | | | | | | | | | | | | | | | 1 | | | | | | |
| RP1DB | 20+27 | 27 | 24 | | | | | | | | | | | | | | | | | | | | |
| COL2 | 25+80 | 24 | | | | | | | | | | | | | | | 1 | | | | | | |
| COL2 | 25+80 | 24 | 21 | | | | 140.4 | | | | | | | | | | | | | | | | |
| RP1B | 14+53 | 28 | | | | | | | | | | | | | | | 1 | | | | | | |
| RP1B | 14+53 | 28 | 29 | | | 86.4 | | | | | | | | | | | | | | | | | |
| RP1B | 15+40 | 29 | | | | | | | | | | | | | | | 1 | | | | | | |
| RP1B | 15+40 | 29 | OUT | | | 44.4 | | | | | | | | | | | | | | | | | |
| LP1B | 11+20 | 30 | | | | | | | | | | | | | | | 1 | | | 1 | | 1 | |
| LP1B | 11+20 | 30 | 31 | | | | | | | | | | | | | | | | | | | | |
| LP1B | 11+60 | 31 | | | | | | | | | | | | | | | 1 | | | 1 | | 1 | |
| LP1B | 11+60 | 31 | 32 | | | | | | | | | | | | | | | | | | | | |
| LP1B | 11+80 | 32 | | | | | | | | | | | | | | | 1 | | | 1 | | 1 | |
| LP1B | 11+80 | 32 | OUT | | | | | | | | | | | | | | | | | | | | |
| RPIBD | 25+60 | 33 | | | | | | | | | | | | | | | 1 | | | | | | |
| RPIBD | 25+60 | 33 | OUT | | | | | | | | | | | | | | | | | | | | |
| RP1B | 12+08 | 34 | | | | | | | | | | | | | | | 1 | | | | | | |
| RP1B | 12+08 | 34 | 35 | | 20.4 | | | | | | | | | | | | | | | | | | |
| LP1B | 12+75 | 35 | | | | | | | | | | | | | | | 1 | | | | | | |
| LP1B | 12+75 | 35 | 36 | | | | | | | | | | | | | | | | | | | | |
| LP1B | 12+92 | 36 | | | | | | | | | | | | | | | 1 | | | 1 | | 1 | |
| LP1B | 12+92 | 36 | 37 | | | | | | | | | | | | | | | | | | | | |
| LP1B | 13+40 | 37 | | | | | | | | | | | | | | | 1 | | | 1 | | 1 | |
| LP1B | 13+40 | 37 | OUT | | | | | | | | | | | | | | | | | | | | |
| Y1 | 18+12 | 38 | | | | | | | | | | | | | | | 1 | | | | | | |
| Y1 | 18+12 | 38 | 39 | | | | | | | | | | | | | | | | | | | | |
| LP1B | 13+40 | 39 | | | | | | | | | | | | | | | 1 | 0.438 | | 1 | 1 | | |
| LP1B | 13+40 | 39 | OUT | | | | | | | | | | | | | | | | | | | | |
| TT4 | 12+91 | 40 | | | | | | | | | | | | | | | | | | | | | |
| L | 26+88 | 41 | OUT | | | | | | | | | | | | | | | | | | | | |
| L | 29+12 | 42 | OUT | | | | | | | | | | | | | | | | | | | | |
| L | 29+38 | 43 | | | | | | | | | | | | | | | | | | | | | |
| COL2 | 29+80 | 44 | | | | | | | | | | | | | | | 1 | | | | | | |
| COL2 | 29+80 | 44 | 45 | | | | | | | | | | | | | | | | | | | | |
| COL2 | 30+60 | 45 | | | | | | | | | | | | | | | 1 | | | | | | |
| COL2 | 30+60 | 45 | OUT | | | | | | | | | | | | | | | | | | | | |
| COL2 | 30+34 | | | | | | | | | | | | | | | | | | | | | | |
| SHEET TOTALS | | | | | 20.4 | 190.8 | 140.4 | | | | | | | | | | 18 | 0.438 | | 6 | 1 | 5 | |

| LINE | 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 (FLAT) | G.D.I. FRAME WITH GRATE STD. 840.22 (SAG) | G.D.I. FRAME WITH TWO GRATES STD. 840.22 (SAG) | G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24 | G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24 | J.B. STD. 840.31 OR 840.32 | MANHOLE STD. 840.51 | M.H. STD. 840.51 OR 840.53 | M.H. FRAME AND COVER STD. 840.54 | C.B. STD. 840.04 OR STD. 840.05 (OPEN THROAT) | MODIFIED CONCRETE FLUME | CONVERT DI TO JUNCTION BOX | PREFORMED SCOUR HOLE | BERM DITCH OUTLET STD. 850.10 | BERM DITCH OUTLET STD. 850.11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RP1DB | 19+61 | 26 | | | | | 1 | | 1 | | | | | | | | | | | | | | |
| RP1DB | 19+61 | 26 | 25 | | | | | | | | | | | | | | | | | | | | |
| COL2 | 26+40 | 25 | | | | | 1 | | | | 1 | | | | | | | | | | | | |
| COL2 | 26+40 | 25 | 24 | | | | | | | | | | | | | | | | | | | | |
| RP1DB | 20+27 | 27 | | | | | | | | | | | | | | | | 1 | | | | | |
| RP1DB | 20+27 | 27 | 24 | | | | | | | | | | | | | | | | | | | | |
| COL2 | 25+80 | 24 | | | | 1 | | | | | 1 | | | | | | | | | | | | |
| COL2 | 25+80 | 24 | 21 | | | | | | | | | | | | | | | | | | | | |
| RP1B | 14+53 | 28 | | | | | 1 | | | | 1 | | | | | | | | | | | | |
| RP1B | 14+53 | 28 | 29 | | | | | | | | | | | | | | | | | | | | |
| RP1B | 15+40 | 29 | | | | | 1 | | | | 1 | | | | | | | | | | | | |
| RP1B | 15+40 | 29 | OUT | | | | | | | | | | | | | | | | | | | | |
| LP1B | 11+20 | 30 | | | | | | | | | | | | | | | | | | | | | |
| LP1B | 11+20 | 30 | 31 | | | | | | | | | | | | | | | | | | | | |
| LP1B | 11+60 | 31 | | | | | | | | | | | | | | | | | | | | | |
| LP1B | 11+60 | 31 | 32 | | | | | | | | | | | | | | | | | | | | |
| LP1B | 11+80 | 32 | | | | | | | | | | | | | | | | | | | | | |
| LP1B | 11+80 | 32 | OUT | | | | | | | | | | | | | | | | | | | | |
| RPIBD | 25+60 | 33 | | | | | 1 | | 1 | | | | | | | | | | | | | | |
| RPIBD | 25+60 | 33 | OUT | | | | | | | | | | | | | | | | | | | | |
| RP1B | 12+08 | 34 | | | | | | | | | | | | | | | | 1 | | | | | |
| RP1B | 12+08 | 34 | 35 | | | | | | | | | | | | | | | | | | | | |
| LP1B | 12+75 | 35 | | | | | 1 | | | | 1 | | | | | | | | | | | | |
| LP1B | 12+75 | 35 | 36 | | | | | | | | | | | | | | | | | | | | |
| LP1B | 12+92 | 36 | | | | | | | | | | | | | | | | | | | | | |
| LP1B | 12+92 | 36 | 37 | | | | | | | | | | | | | | | | | | | | |
| LP1B | 13+40 | 37 | | | | | | | | | | | | | | | | | | | | | |
| LP1B | 13+40 | 37 | OUT | | | | | | | | | | | | | | | | | | | | |
| Y1 | 18+12 | 38 | | | | | | 1 | | | 1 | | | | | | | | | | | | |
| Y1 | 18+12 | 38 | 39 | | | | | | | | | | | | | | | | | | | | |
| LP1B | 13+40 | 39 | | | | | | | | | | | | | | | | | | | | | |
| LP1B | 13+40 | 39 | OUT | | | | | | | | | | | | | | | | | | | | |
| TT4 | 12+91 | 40 | | | | | | | | | | | | | | | | | | | | | |
| L | 26+88 | 41 | OUT | | | | | | | | | | | | | | | | 1 | | | | |
| L | 29+12 | 42 | OUT | | | | | | | | | | | | | | | | 1 | | | | |
| L | 29+38 | 43 | | | | | | | | | | | | | | | | | | | | | |
| COL2 | 29+80 | 44 | | | | | 1 | | 1 | | | | | | | | | | | | | | |
| COL2 | 29+80 | 44 | 45 | | | | | | | | | | | | | | | | | | | | |
| COL2 | 30+60 | 45 | | | | | 1 | | 1 | | | | | | | | | | | | | | |
| COL2 | 30+60 | 45 | OUT | | | | | | | | | | | | | | | | | | | | |
| COL2 | 30+34 | | | | | | | | | | | | | | | | | | | | | | |
| SHEET TOTALS | | | | | | 1 | 8 | 1 | 4 | | 6 | | | | | | | 2 | 2 | | | | |

| LINE | STATION | FROM | TO | CLASS IV R.C. PIPE 450 CLASS IV RCP | 750 CLASS IV RCP | 1200 CLASS IV RCP | CORR. STEEL ELBOWS NO. & SIZE 400 | 450 | 600 | 800 | CONC. COLLARS CL. "B" $M^3$ STD. 840.72 | CONC. & BRICK PIPE PLUG, $M^3$ STD. 840.71 | PIPE REMOVAL (METERS) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RP1DB | 19+61 | 26 | | | | | | | | | | | | |
| RP1DB | 19+61 | 26 | 25 | | | | 2 | | | | | | | |
| COL2 | 26+40 | 25 | | | | | | | | | | | | |
| COL2 | 26+40 | 25 | 24 | | | | | | | | | | | |
| RP1DB | 20+27 | 27 | | | | | | | | | | | | |
| RP1DB | 20+27 | 27 | 24 | | | | | | | | | | | |
| COL2 | 25+80 | 24 | | | | | | | | | | | | |
| COL2 | 25+80 | 24 | 21 | | | | | | | | | | | |
| RP1B | 14+53 | 28 | | | | | | | | | | | | |
| RP1B | 14+53 | 28 | 29 | | | | | | | | | | | |
| RP1B | 15+40 | 29 | | | | | | | | | | | | |
| RP1B | 15+40 | 29 | OUT | | | | | | | | | | | |
| LP1B | 11+20 | 30 | | | | | | | | | | | | |
| LP1B | 11+20 | 30 | 31 | | | | | | | | | | | |
| LP1B | 11+60 | 31 | | | | | | | | | | | | |
| LP1B | 11+60 | 31 | 32 | | | | | | | | | | | |
| LP1B | 11+80 | 32 | | | | | | | | | | | | |
| LP1B | 11+80 | 32 | OUT | | | | 2 | | | | | | | |
| RPIBD | 25+60 | 33 | | | | | | | | | | | | |
| RPIBD | 25+60 | 33 | OUT | | | | | | | | | | | |
| RP1B | 12+08 | 34 | | | | | | | | | | | | |
| RP1B | 12+08 | 34 | 35 | | | | | | | | | | | |
| LP1B | 12+75 | 35 | | | | | | | | | | | | |
| LP1B | 12+75 | 35 | 36 | | | | | | | | | | | |
| LP1B | 12+92 | 36 | | | | | | | | | | | | |
| LP1B | 12+92 | 36 | 37 | | | | | | | | | | | |
| LP1B | 13+40 | 37 | | | | | | | | | | | | |
| LP1B | 13+40 | 37 | OUT | | | | | | | | | | | |
| Y1 | 18+12 | 38 | | | | | | | | | | | | |
| Y1 | 18+12 | 38 | 39 | | | | | | | | | | | |
| LP1B | 13+40 | 39 | | | | | | | | | | | | |
| LP1B | 13+40 | 39 | OUT | | | | | | | | | | | |
| TT4 | 12+91 | 40 | | | | | | | | | | | | |
| L | 26+88 | 41 | OUT | | | | | | | | | | | |
| L | 29+12 | 42 | OUT | | | | | | | | | | | |
| L | 29+38 | 43 | | | 165.6 | | | | | | | | | CLASS IV PIPE - |
| COL2 | 29+80 | 44 | | | | | | | | | | | | |
| COL2 | 29+80 | 44 | 45 | | | | | | | | | | | |
| COL2 | 30+60 | 45 | | | | | | | | | | | | |
| COL2 | 30+60 | 45 | OUT | | | | 2 | | | | | | | |
| COL2 | 30+34 | | | | | | | | | | | | 12.3 | REMOVE 750mm PIPE |
| SHEET TOTALS | | | | | 165.6 | | 6 | | | | | | 12.3 | |

**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: DJM DATE: 1/28/2008

CHECKED BY: CMKR, Sungate DATE: 8/28/2008

# STATE OF NORTH CAROLINA
# DIVISION OF HIGHWAYS

METRIC

| PROJECT NO. | SHEET NO. |
|---|---|
| U-2519DA | 3-C |

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

| LINE | STATION (SIZE / THICKNESS OR GAUGE) | LOCATION (LT, RT, OR CL)' | STRUCTURE NO. FROM | STRUCTURE NO. TO | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | SLOPE CRITICAL | CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 300 | 375 | 450 | 600 | 750 | 900 | 1050 | 1200 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L | 30+60 | LT | 46 | | 71.315 | | | | | | | | | | | |
| L | 30+60 | LT | 46 | 47 | | 70.477 | 70.255 | | | 25.2 | | | | | | |
| L | 30+60 | RT | 48 | | 71.297 | | | | | | | | | | | |
| L | 30+60 | RT | 48 | 47 | | 70.459 | 70.255 | | | 25.2 | | | | | | |
| L | 30+60 | CL | 47 | | 71.093 | | | | | | | | | | | |
| L | 30+60 | CL | 47 | 50 | | 70.255 | 68.251 | | | 120.0 | | | | | | |
| L | 31+80 | LT | 49 | | 69.311 | | | | | | | | | | | |
| L | 31+80 | LT | 49 | 50 | | 68.473 | 68.251 | | | 25.2 | | | | | | |
| L | 31+80 | RT | 51 | | 68.776 | | | | | | | | | | | |
| L | 31+80 | RT | 51 | 50 | | 68.192 | 68.105 | X | | 28.8 | | | | | | |
| L | 31+80 | CL | 50 | | 69.089 | | | | | | | | | | | |
| L | 31+80 | CL | 50 | 54 | | 67.641 | 67.053 | | | | | 105.6 | | | | |
| COL2 | 32+84.40 | LT | 52 | | 68.910 | | | | | | | | | | | |
| COL2 | 32+84.40 | LT | 52 | 53 | | 68.072 | 67.286 | | | 22.8 | | | | | | |
| L | 32+84.70 | LT | 53 | | 67.870 | | | | | | | | | | | |
| L | 32+84.70 | LT | 53 | 54 | | 67.210 | 67.060 | X | | | 25.2 | | | | | |
| L | 32+84.70 | CL | 54 | | 68.120 | | | | | | | | | | | |
| L | 32+84.70 | CL | 54 | 56 | | 66.520 | 66.150 | X | | | | | 74.4 | | | |
| L | 33+60 | RT | 55 | | 66.450 | | | | | | | | | | | |
| L | 33+60 | RT | 55 | 56 | | 65.587 | 65.387 | X | | | | 39.6 | | | | |
| L | 33+60 | CL | 56 | | 68.631 | | | | | | | | | | | |
| L | 33+60 | CL | 56 | 57 | | 65.387 | 61.500 | | | | | | | | 66.0 | |
| L | 33+60 | LT | 57 | | 63.300 | | | | | | | | | | | |
| L | 33+60 | LT | 57 | 70 | | 61.500 | 60.400 | | | | | | | | 105.6 | |
| RP1BD | 35+81.40 | RT | 67 | | 76.166 | | | | | | | | | | | |
| RP1BD | 35+81.40 | RT | 67 | 66 | | 75.582 | 75.377 | | | 40.8 | | | | | | |
| RP1BD | 35+40 | RT | 66 | | 76.590 | | | | | | | | | | | |
| RP1BD | 35+40 | RT | 66 | 65 | | 75.377 | 75.292 | | | 16.8 | | | | | | |
| RP1BD | 35+40 | LT | 65 | | 76.590 | | | | | | | | | | | |
| RP1BD | 35+40 | LT | 65 | 64 | | 75.292 | 70.779 | | | | | | | | | |
| L | 35+40 | RT | 64 | | 71.363 | | | | | | | | | | | |
| L | 35+40 | RT | 64 | 63 | | 70.703 | 70.032 | | | | 27.6 | | | | | |
| L | 35+40 | LT | 62 | | 71.561 | | | | | | | | | | | |
| L | 35+40 | LT | 62 | 63 | | 70.723 | 70.107 | | | 25.2 | | | | | | |
| L | 35+40 | CL | 63 | | 71.330 | | | | | | | | | | | |
| L | 35+40 | CL | 63 | 60 | | 69.882 | 68.457 | | | | | 120.0 | | | | |
| L | 34+20 | RT | 61 | | 69.355 | | | | | | | | | | | |
| L | 34+20 | RT | 61 | 60 | | 68.771 | 68.636 | X | | 26.4 | | | | | | |
| COL2 | 34+20 | LT | 58 | | 69.282 | | | | | | | | | | | |
| COL2 | 34+20 | LT | 58 | 59 | | 68.698 | 68.617 | X | | 26.4 | | | | | | |
| L | 34+20 | LT | 59 | | 69.740 | | | | | | | | | | | |
| L | 34+20 | LT | 59 | 60 | | 68.617 | 68.457 | | | | 25.2 | | | | | |
| L | 34+20 | CL | 60 | | 69.524 | | | | | | | | | | | |
| L | 34+20 | CL | 60 | 56 | | 68.305 | 66.524 | | | | | | 60.0 | | | |
| RP1BD | 36+40 | RT | 68 | | 75.800 | | | | | | | | | | | |
| RP1BD | 36+40 | RT | 68 | 69 | | 74.962 | 68.447 | | | | | | | | | |
| RP1BD | 36+40 | RT | 69 | | 69.361 | | | | | | | | | | | |
| RP1BD | 36+40 | RT | 69 | OUT | | 68.142 | 67.903 | | | | | | | | | |
| SHEET TOTALS | | | | | | | | | | 382.8 | 78.0 | 265.2 | 134.4 | | 171.6 | |

| STATION | FROM | TO | BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300 (1.63) | 400 (1.63) | 450 (1.63) | 600 (1.63) | 800 (2.01) | 900 (2.01) | 1000 (2.01) | 1200 (2.01) | CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR HDPE, TYPE S OR D 300 | 375 | 450 | 600 | 750 | 900 | ### | ### | 375mm SIDE DRAIN PIPE | 450mm SIDE DRAIN PIPE | 600mm SIDE DRAIN PIPE | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. METERS R.C.P. | C.S.P. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 35+40 | 65 | 64 | | 26.4 | | | | | | | | | | | | | | | | | | | |
| 36+40 | 68 | 69 | | 20.4 | | | | | | | | | | | | | | | | | | | |
| 36+40 | 69 | OUT | | | | | | | | | | | | | 13.2 | | | | | | | | |
| SHEET TOTALS | | | | 46.8 | | | | | | | | | | | 13.2 | | | | | | | | |

| STATION | FROM | QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0 THRU 1.50) | *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5 THRU 3.00 | B 3.00 AND ABOVE | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E | F | G | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATE STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR 840.26 | G.D.I. TYPE "B" STD. 840.18 OR 840.27 | G.D.I. TYPE "D" STD. 840.19 OR 840.28 | G.D.I. FRAME WITH TWO GRATES STD. 840.20 (FLAT) | G.D.I. FRAME WITH GRATE STD. 840.22 (SAG) | G.D.I. FRAME WITH TWO GRATES STD. 840.22 (SAG) | G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24 | G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24 | J.B. STD. 840.31 OR 840.32 | MANHOLE STD. 840.51 | M.H. STD. 840.51 OR 840.53 | M.H. FRAME AND COVER STD. 840.54 | C.B. STD. 840.04 OR STD. 840.05 (OPEN THROAT) | MODIFIED CONCRETE FLUME | CONVERT DI TO JUNCTION BOX | PREFORMED SCOUR HOLE | BERM DITCH OUTLET STD. 850.10 | BERM DITCH OUTLET STD. 850.11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30+60 | 46 | 1 | | | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | |
| 30+60 | 48 | 1 | | | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | |
| 30+60 | 47 | 1 | | | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | |
| 31+80 | 49 | 1 | | | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | |
| 31+80 | 51 | 1 | | | | | | | | | | | 1 | | | 1 | | | | | | | | | | | | | |
| 31+80 | 50 | 1 | | | | | | | | | 1 | | | | | 1 | | | | | | | | | | | | | |
| 32+84.40 | 52 | 1 | | | | | | | | | | 1 | | 1 | | | | | | | | | | | | | | | |
| 32+84.70 | 53 | 1 | | | | | | | | | | | 1 | | | 1 | | | | | | | | | | | | | |
| 32+84.70 | 54 | 1 | 0.100 | | | | | | | | 1 | | | | | 1 | | | | | | | | | | | | | |
| 33+60 | 55 | 1 | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | |
| 33+60 | 56 | 1 | 1.500 | 0.241 | | | | | | | 1 | | | | | 1 | | | | | | | | | | | | | |
| 33+60 | 57 | 1 | 0.300 | | | | | | | | | | | | | | | | 1 | | | 1 | | | | | | | |
| 35+81.40 | 67 | 1 | | | | | | | | | | | 1 | 1 | | | | | | | | | | | | | | | |
| 35+40 | 66 | 1 | | | | | | | | | | 1 | | 1 | | | | | | | | | | | | | | | |
| 35+40 | 65 | 1 | | | | | | | | | | 1 | | 1 | | | | | | | | | | | | | | | |
| 35+40 | 64 | 1 | | | | | | | | | | | 1 | | | 1 | | | | | | | | | | | | | |
| 35+40 | 62 | 1 | | | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | |
| 35+40 | 63 | 1 | | | | | | | | | 1 | | | | | 1 | | | | | | | | | | | | | |
| 34+20 | 61 | 1 | | | | | | | | | | | 1 | | | 1 | | | | | | | | | | | | | |
| 34+20 | 58 | 1 | | | | | | | | | | | 1 | | | 1 | | | | | | | | | | | | | |
| 34+20 | 59 | 1 | | | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | |
| 34+20 | 60 | 1 | | | | | | | | | 1 | | | | | 1 | | | | | | | | | | | | | |
| 36+40 | 68 | 1 | | | | | | | | | | 1 | | 1 | | | | | | | | | | | | | | | |
| 36+40 | 69 | 1 | | | | | | | | | 1 | | | | 1 | 1 | | | | | | | | | | | | | |
| SHEET TOTALS | | 24 | 1.900 | 0.241 | | | | | | | 6 | 10 | 6 | 5 | 1 | 17 | | | 1 | | | 1 | 1 | | | | | | |

| STATION | FROM | TO | CLASS IV R.C. PIPE 450 CLASS IV RCP | 750 CLASS IV RCP | 1200 CLASS IV RCP | CORR. STEEL ELBOWS NO. & SIZE 400 | 450 | 600 | 800 | CONC. COLLARS CL. "B" $M^3$ STD. 840.72 | CONC. & BRICK PIPE PLUG, $M^3$ STD. 840.71 | PIPE REMOVAL (METERS) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 35+40 | 65 | 64 | | | | 2 | | | | | | | |
| 36+40 | 68 | 69 | | | | 2 | | | | | | | |
| 36+40 | 69 | | | | | | | | | | | | 3GI - TYPE A |
| SHEET TOTALS | | | | | | 4 | | | | | | | |

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: DJM DATE: 1/28/2008

CHECKED BY: CMKR, Sungate DATE: 8/28/2008

# STATE OF NORTH CAROLINA
# DIVISION OF HIGHWAYS

METRIC

| PROJECT NO. | SHEET NO. |
|---|---|
| U-2519DA | 3-D |

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

| LINE | STATION (SIZE / THICKNESS OR GAUGE) | LOCATION (LT, RT, OR CL)' | STRUCTURE NO. FROM | STRUCTURE NO. TO | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | SLOPE CRITICAL | CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 300 | 375 | 450 | 600 | 750 | 900 | 1050 | 1200 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RP1A | 11+40 | RT | IN | 71 | | 63.300 | 63.130 | | | | 14.4 | | | | | |
| RP1A | 12+20 | RT | 72 | | 68.421 | | | | | | | | | | | |
| RP1A | 12+20 | RT | 72 | OUT | | 67.583 | 63.440 | | | | | | | | | |
| RP1A | 13+20 | RT | 73 | | 66.550 | | | | | | | | | | | |
| RP1A | 13+20 | RT | 73 | OUT | | 65.712 | 60.000 | | | | | | | | | |
| RP1A | 15+43 | RT | 74 | | 63.010 | | | | | | | | | | | |
| RP1A | 15+43 | RT | 74 | OUT | | 62.172 | 60.500 | | | | | | | | | |
| RP1BD | 37+03 | RT | 75 | | 74.613 | | | | | | | | | | | |
| RP1BD | 37+03 | RT | 75 | 76 | | 73.774 | 73.494 | X | | 26.4 | | | | | | |
| RP1BD | 37+30 | RT | 76 | | 74.669 | | | | | | | | | | | |
| RP1BD | 37+30 | RT | 76 | OUT | | 72.733 | 71.600 | | | | | | | | | |
| L | 37+40 | LT | 77 | | 74.570 | | | | | | | | | | | |
| L | 37+40 | LT | 77 | 78 | | 73.732 | 73.550 | | | 25.2 | | | | | | |
| L | 37+40 | CL | 78 | | 74.338 | | | | | | | | | | | |
| L | 37+40 | CL | 78 | 79 | | 73.550 | 73.350 | X | | 25.2 | | | | | | |
| L | 37+40 | RT | 79 | | 74.487 | | | | | | | | | | | |
| L | 37+40 | RT | 79 | 76 | | 73.275 | 73.083 | X | | | 24.0 | | | | | |
| L | 39+00 | LT | 80 | | 76.977 | | | | | | | | | | | |
| L | 39+00 | LT | 80 | 81 | | 76.139 | 75.907 | | | 25.2 | | | | | | |
| L | 39+00 | CL | 81 | | 76.745 | | | | | | | | | | | |
| L | 39+00 | CL | 81 | 82 | | 75.831 | 75.681 | X | | | 24.0 | | | | | |
| L | 39+00 | RT | 82 | | 76.833 | | | | | | | | | | | |
| L | 39+00 | RT | 82 | 84 | | 75.531 | 75.423 | | | | | 21.6 | | | | |
| RP1BD | 39+80 | RT | 83 | | 78.257 | | | | | | | | | | | |
| RP1BD | 39+80 | RT | 83 | 84 | | 77.419 | 75.548 | | | 80.4 | | | | | | |
| RP1BD | 39+00 | RT | 84 | | 77.055 | | | | | | | | | | | |
| RP1BD | 39+00 | RT | 84 | 85 | | 75.423 | 74.355 | | | | | 80.4 | | | | |
| RP1BD | 38+20 | RT | 85 | | 75.803 | | | | | | | | | | | |
| RP1BD | 38+20 | RT | 85 | 86 | | 74.355 | 73.389 | | | | | 63.6 | | | | |
| RP1BD | 37+56 | RT | 86 | | 74.837 | | | | | | | | | | | |
| RP1BD | 37+56 | RT | 86 | 76 | | 73.389 | 72.933 | | | | | 26.4 | | | | |
| COL1 | 24+40 | LT | 87 | | 65.149 | | | | | | | | | | | |
| COL1 | 24+40 | LT | 87 | 88 | | 64.565 | 64.457 | | | 21.6 | | | | | | |
| RP1C | 11+40 | RT | 89 | | 67.810 | | | | | | | | | | | |
| RP1C | 11+40 | RT | 89 | 88 | | 66.972 | 64.457 | | | 128.4 | | | | | | |
| COL1 | 24+40 | RT | 88 | | 65.450 | | | | | | | | | | | |
| COL1 | 24+40 | RT | 88 | OUT | | 64.457 | 59.700 | | | | | | | | | |
| RP1C | 15+22.84 | RT | 90 | | 67.750 | | | | | | | | | | | |
| RP1C | 15+22.84 | RT | 90 | OUT | | 66.912 | 60.500 | | | | | | | | | |
| RP1C | 16+30.50 | RT | 91 | | 68.960 | | | | | | | | | | | |
| RP1C | 16+30.50 | RT | 91 | OUT | | 68.122 | 62.300 | | | | | | | | | |
| COL1 | 26+88 | RT | | | | | | | | | | | | | | |
| COL1 | 26+55 | RT | 92 | | 70.430 | | | | | | | | | | | |
| COL1 | 26+55 | RT | 92 | OUT | | 69.592 | 65.732 | | | | | | | | | |
| SHEET TOTALS | | | | | | | | | | 332.4 | 62.4 | 192.0 | | | | |

| LINE | STATION | FROM | TO | BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300 / 1.63 | 400 / 1.63 | 450 / 1.63 | 600 / 1.63 | 600 | 800 / 2.01 | 800 | 900 / 2.01 | 900 | 1000 / 2.01 | 1000 | 1200 / 2.01 | 1200 | CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR HDPE, TYPE S OR D 300 | 375 | 450 | 600 | 750 | 900 | ### | ### | 375mm SIDE DRAIN PIPE | 450mm SIDE DRAIN PIPE | 600mm SIDE DRAIN PIPE | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. METERS R.C.P. | C.S.P. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RP1A | 12+20 | 72 | OUT | | 20.4 | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1A | 13+20 | 73 | OUT | | 21.6 | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1A | 15+43 | 74 | OUT | | 21.6 | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1BD | 37+30 | 76 | OUT | | | | | | 14.4 | | | | | | | | | | | | | | | | | | | | |
| COL1 | 24+40 | 88 | OUT | | 21.6 | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1C | 15+22.84 | 90 | OUT | | 22.8 | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1C | 16+30.50 | 91 | OUT | | 22.8 | | | | | | | | | | | | | | | | | | | | | | | | |
| COL1 | 26+55 | 92 | OUT | | 14.4 | | | | | | | | | | | | | | | | | | | | | | | | |
| SHEET TOTALS | | | | | 145.2 | | | | 14.4 | | | | | | | | | | | | | | | | | | | | |

| LINE | STATION | FROM | TO | QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0 THRU 1.50) | *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5 THRU 3.00 | B 3.00 AND ABOVE | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E | F | G | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATE STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR 840.26 | G.D.I. TYPE "B" STD. 840.18 OR 840.27 | G.D.I. TYPE "D" STD. 840.19 OR 840.28 | G.D.I. FRAME WITH TWO GRATES STD. 840.20 (FLAT) | G.D.I. FRAME WITH GRATE STD. 840.22 (SAG) | G.D.I. FRAME WITH TWO GRATES STD. 840.22 (SAG) | G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24 | G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24 | J.B. STD. 840.31 OR 840.32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RP1A | 12+20 | 72 | | 1 | | | | | | | | | | 1 | | 1 | | | | | |
| RP1A | 13+20 | 73 | | 1 | | | | | | | | | | 1 | | 1 | | | | | |
| RP1A | 15+43 | 74 | | 1 | | | | | | | | | | 1 | | 1 | | | | | |
| RP1BD | 37+03 | 75 | | 1 | | | | | | | | | | 1 | | 1 | | | | | |
| RP1BD | 37+30 | 76 | | 1 | 0.436 | | | | | | | | 1 | | | 1 | | | | | |
| L | 37+40 | 77 | | 1 | | | | | | | | | | 1 | | | | 1 | | | |
| L | 37+40 | 78 | | 1 | | | | | | | | | | 1 | | | | 1 | | | |
| L | 37+40 | 79 | | 1 | | | | | | | | | | 1 | | | | 1 | | | |
| L | 39+00 | 80 | | 1 | | | | | | | | | | 1 | | | | 1 | | | |
| L | 39+00 | 81 | | 1 | | | | | | | | | | 1 | | | | 1 | | | |
| L | 39+00 | 82 | | 1 | | | | | | | | | | 1 | | | | 1 | | | |
| RP1BD | 39+80 | 83 | | 1 | | | | | | | | | | 1 | | 1 | | | | | |
| RP1BD | 39+00 | 84 | | 1 | 0.132 | | | | | | | | 1 | | | 1 | | | | | |
| RP1BD | 38+20 | 85 | | 1 | | | | | | | | | 1 | | | 1 | | | | | |
| RP1BD | 37+56 | 86 | | 1 | | | | | | | | | 1 | | | 1 | | | | | |
| COL1 | 24+40 | 87 | | 1 | | | | | | | | | | | 1 | | | 1 | | | |
| RP1C | 11+40 | 89 | | 1 | | | | | | | | | | 1 | | 1 | | | | | |
| COL1 | 24+40 | 88 | | 1 | | | | | | | | | | 1 | | 1 | | | | | |
| RP1C | 15+22.84 | 90 | | 1 | | | | | | | | | | 1 | | 1 | | | | | |
| RP1C | 16+30.50 | 91 | | 1 | | | | | | | | | | 1 | | 1 | | | | | |
| COL1 | 26+55 | 92 | | 1 | | | | | | | | | | 1 | | 1 | | | | | |
| SHEET TOTALS | | | | 21 | 0.568 | | | | | | | | 4 | 16 | 1 | 14 | | 7 | | | |

| LINE | STATION | FROM | TO | | MANHOLE STD. 840.51 | M.H. STD. 840.51 OR 840.53 | M.H. FRAME AND COVER STD. 840.54 | | C.B. STD. 840.04 OR STD. 840.05 (OPEN THROAT) | | MODIFIED CONCRETE FLUME | | CONVERT DI TO JUNCTION BOX | PREFORMED SCOUR HOLE | BERM DITCH OUTLET STD. 850.10 | BERM DITCH OUTLET STD. 850.11 | | | | | CLASS IV R.C. PIPE 450 CLASS IV RCP | 750 CLASS IV RCP | 1200 CLASS IV RCP | CORR. STEEL ELBOWS NO. & SIZE 400 | 450 | 600 | 800 | CONC. COLLARS CL. "B" $M^3$ STD. 840.72 | CONC. & BRICK PIPE PLUG, $M^3$ STD. 840.71 | PIPE REMOVAL (METERS) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RP1A | 12+20 | 72 | OUT | | | | | | | | | | | | | | | | | | | | | 2 | | | | | | | |
| RP1A | 13+20 | 73 | OUT | | | | | | | | | | | | | | | | | | | | | 2 | | | | | | | |
| RP1A | 15+43 | 74 | OUT | | | | | | | | | | | | | | | | | | | | | 2 | | | | | | | |
| RP1BD | 37+30 | 76 | OUT | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | | |
| COL1 | 24+40 | 88 | OUT | | | | | | | | | | | | | | | | | | | | | 2 | | | | | | | |
| RP1C | 15+22.84 | 90 | OUT | | | | | | | | | | | | | | | | | | | | | 2 | | | | | | | |
| RP1C | 16+30.50 | 91 | OUT | | | | | | | | | | | | | | | | | | | | | 2 | | | | | | | |
| COL1 | 26+88 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 7.8 | REMOVE 600mm PIPE |
| COL1 | 26+55 | 92 | OUT | | | | | | | | | | | | | | | | | | | | | 2 | | | | | | | |
| SHEET TOTALS | | | | | | | | | | | | | | | | | | | | | | | | 14 | | | 2 | | | 7.8 | |

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: DJM DATE: 1/28/2008

CHECKED BY: CMKR, Sungate DATE: 8/28/2008

# STATE OF NORTH CAROLINA
# DIVISION OF HIGHWAYS

METRIC

PROJECT NO.: U-2519DA SHEET NO.: 3-E

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

| LINE | STATION | LOCATION (LT, RT, OR CL) | STRUCTURE NO. FROM | STRUCTURE NO. TO | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | SLOPE CRITICAL | CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 300 | 375 | 450 | 600 | 750 | 900 | 1050 | 1200 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L | 26+84 | RT | 93 | | | | | | | | | | | | | |
| L | 29+18 | RT | 94 | | | | | | | | | | | | | |
| COL1 | 30+80 | RT | 95 | | 68.527 | | | | | | | | | | | |
| COL1 | 30+80 | RT | 95 | OUT | | 67.892 | 63.440 | | | 60.0 | | | | | | |
| LP1D | 12+09 | LT | 96 | | 69.109 | | | | | | | | | | | |
| LP1D | 12+09 | LT | 96 | 97 | | 67.807 | 67.543 | X | | 32.4 | | | | | | |
| LP1D | 11+80 | RT | 97 | | 70.080 | | | | | | | | | | | |
| LP1D | 11+80 | RT | 97 | OUT | | 67.543 | 63.630 | | | | | | | | | |
| LP1D | 12+88 | LT | 98 | | 71.750 | | | | | | | | | | | |
| LP1D | 12+88 | LT | 98 | 99 | | 70.912 | 66.336 | | | | | | | | | |
| LP1D | 12+88 | LT | 99 | | 66.920 | | | | | | | | | | | |
| LP1D | 12+88 | LT | 99 | 100 | | 66.336 | 66.205 | | | 19.2 | | | | | | |
| LP1D | 13+00 | RT | 100 | | 67.120 | | | | | | | | | | | |
| LP1D | 13+00 | RT | 100 | OUT | | 66.205 | 63.680 | | | | | | | | | |
| LP1D | 13+59.60 | LT | 101 | | 66.102 | | | | | | | | | | | |
| LP1D | 13+59.60 | LT | 101 | 102 | | 65.518 | 65.316 | | | 15.6 | | | | | | |
| LP1D | 13+59.60 | RT | 102 | | 66.530 | | | | | | | | | | | |
| LP1D | 13+59.60 | RT | 102 | Out | | 65.316 | 63.450 | | | | | | | | | |
| LP1D | 14+68 | RT | 103 | | | | | | | | | | | | | |
| LP1D | 14+68 | RT | 103 | OUT | | | | | | | | | | | | |
| RP1DB | 14+52.50 | LT | 104 | | 77.660 | | | | | | | | | | | |
| RP1DB | 14+52.50 | LT | 104 | OUT | | 76.822 | 66.900 | | | | | | | | | |
| RP1DB | 13+80 | LT | 105 | | 75.840 | | | | | | | | | | | |
| RP1DB | 13+80 | LT | 105 | OUT | | 75.002 | 68.200 | | | | | | | | | |
| RP1D | 10+59 | CL | 106 | | | 69.200 | 66.400 | | | | | 73.2 | | | | |
| RP1DB | 11+74.50 | RT | 107 | | 70.194 | | | | | | | | | | | |
| RP1DB | 11+74.50 | RT | 107 | 108 | | 69.122 | 68.846 | X | | | | | | | | |
| RP1DB | 11+40.10 | RT | 108 | | 69.960 | | | | | | | | | | | |
| RP1DB | 11+40.10 | RT | 108 | OUT | | 68.846 | 68.600 | X | | | 51.6 | | | | | |
| RP1DB | 12+62 | RT | 109 | | 73.086 | | | | | | | | | | | |
| RP1DB | 12+62 | RT | 109 | 110 | | 72.248 | 72.163 | | | 16.8 | | | | | | |
| RP1DB | 12+62 | LT | 110 | | 73.150 | | | | | | | | | | | |
| RP1DB | 12+62 | LT | 110 | OUT | | 72.163 | 67.957 | | | | | | | | | |
| RP1D | 11+20 | RT | 111 | | 76.390 | | | | | | | | | | | |
| RP1D | 11+20 | RT | 111 | OUT | | 75.552 | 74.450 | | | 21.6 | | | | | | |
| RP1D | 13+20 | RT | 112 | | 77.030 | | | | | | | | | | | |
| RP1D | 13+20 | RT | 112 | OUT | | 76.192 | 73.705 | | | 28.8 | | | | | | |
| SHEET TOTALS | | | | | | | | | | 194.4 | 51.6 | 73.2 | | | | |

(SIZE / THICKNESS OR GAUGE)

| LINE | STATION | FROM | TO | BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300 (1.63) | 400 (1.63) | 450 (1.63) | 600 (1.63) | 800 (2.01) | 900 (2.01) | 1000 (2.01) | 1200 (2.01) | CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR HDPE, TYPE S OR D 300 | 375 | 450 | 600 | 750 | 900 | ### | ### | 375mm SIDE DRAIN PIPE | 450mm SIDE DRAIN PIPE | 600mm SIDE DRAIN PIPE | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. METERS R.C.P. | C.S.P. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L | 26+84 | 93 | | | | | | | | | | | | | | | | | | | | | | |
| L | 29+18 | 94 | | | | | | | | | | | | | | | | | | | | | | |
| COL1 | 30+80 | 95 | | | | | | | | | | | | | | | | | | | | | | |
| COL1 | 30+80 | 95 | OUT | | | | | | | | | | | | | | | | | | | | | |
| LP1D | 12+09 | 96 | | | | | | | | | | | | | | | | | | | | | | |
| LP1D | 12+09 | 96 | 97 | | | | | | | | | | | | | | | | | | | | | |
| LP1D | 11+80 | 97 | | | | | | | | | | | | | | | | | | | | | | |
| LP1D | 11+80 | 97 | OUT | | | 15.6 | | | | | | | | | | | | | | | | | | |
| LP1D | 12+88 | 98 | | | | | | | | | | | | | | | | | | | | | | |
| LP1D | 12+88 | 98 | 99 | | 27.6 | | | | | | | | | | | | | | | | | | | |
| LP1D | 12+88 | 99 | | | | | | | | | | | | | | | | | | | | | | |
| LP1D | 12+88 | 99 | 100 | | | | | | | | | | | | | | | | | | | | | |
| LP1D | 13+00 | 100 | | | | | | | | | | | | | | | | | | | | | | |
| LP1D | 13+00 | 100 | OUT | | 13.2 | | | | | | | | | | | | | | | | | | | |
| LP1D | 13+59.60 | 101 | | | | | | | | | | | | | | | | | | | | | | |
| LP1D | 13+59.60 | 101 | 102 | | | | | | | | | | | | | | | | | | | | | |
| LP1D | 13+59.60 | 102 | | | | | | | | | | | | | | | | | | | | | | |
| LP1D | 13+59.60 | 102 | Out | | 16.8 | | | | | | | | | | | | | | | | | | | |
| LP1D | 14+68 | 103 | | | | | | | | | | | | | | | | | | | | | | |
| LP1D | 14+68 | 103 | OUT | | 20.4 | | | | | | | | | | | | | | | | | | | |
| RP1DB | 14+52.50 | 104 | | | | | | | | | | | | | | | | | | | | | | |
| RP1DB | 14+52.50 | 104 | OUT | | 37.2 | | | | | | | | | | | | | | | | | | | |
| RP1DB | 13+80 | 105 | | | | | | | | | | | | | | | | | | | | | | |
| RP1DB | 13+80 | 105 | OUT | | 34.8 | | | | | | | | | | | | | | | | | | | |
| RP1D | 10+59 | 106 | | | | | | | | | | | | | | | | | | | | | | |
| RP1DB | 11+74.50 | 107 | | | | | | | | | | | | | | | | | | | | | | |
| RP1DB | 11+74.50 | 107 | 108 | | | | | | | | | | 34.8 | | | | | | | | | | | |
| RP1DB | 11+40.10 | 108 | | | | | | | | | | | | | | | | | | | | | | |
| RP1DB | 11+40.10 | 108 | OUT | | | | | | | | | | | | | | | | | | | | | |
| RP1DB | 12+62 | 109 | | | | | | | | | | | | | | | | | | | | | | |
| RP1DB | 12+62 | 109 | 110 | | | | | | | | | | | | | | | | | | | | | |
| RP1DB | 12+62 | 110 | | | | | | | | | | | | | | | | | | | | | | |
| RP1DB | 12+62 | 110 | OUT | | 25.2 | | | | | | | | | | | | | | | | | | | |
| RP1D | 11+20 | 111 | | | | | | | | | | | | | | | | | | | | | | |
| RP1D | 11+20 | 111 | OUT | | | | | | | | | | | | | | | | | | | | | |
| RP1D | 13+20 | 112 | | | | | | | | | | | | | | | | | | | | | | |
| RP1D | 13+20 | 112 | OUT | | | | | | | | | | | | | | | | | | | | | |
| SHEET TOTALS | | | | | 175.2 | 15.6 | | | | | | | 34.8 | | | | | | | | | | | |

| LINE | STATION | FROM | TO | QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0 THRU 1.50) | *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5 THRU 3.00 | B 3.00 AND ABOVE | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E | F | G | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATE STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR 840.26 | G.D.I. TYPE "B" STD. 840.18 OR 840.27 | G.D.I. TYPE "D" STD. 840.19 OR 840.28 | G.D.I. FRAME WITH TWO GRATES STD. 840.20 (FLAT) | G.D.I. FRAME WITH GRATE STD. 840.22 (SAG) | G.D.I. FRAME WITH TWO GRATES STD. 840.22 (SAG) | G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24 | G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24 | J.B. STD. 840.31 OR 840.32 | MANHOLE STD. 840.51 | M.H. STD. 840.51 OR 840.53 | M.H. FRAME AND COVER STD. 840.54 | C.B. STD. 840.04 OR STD. 840.05 (OPEN THROAT) | MODIFIED CONCRETE FLUME | CONVERT DI TO JUNCTION BOX | PREFORMED SCOUR HOLE | BERM DITCH OUTLET STD. 850.10 | BERM DITCH OUTLET STD. 850.11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L | 26+84 | 93 | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | |
| L | 29+18 | 94 | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | |
| COL1 | 30+80 | 95 | | 1 | | | | | | | | | | | | | | | | | | | | | 1 | | | | | |
| COL1 | 30+80 | 95 | OUT | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| LP1D | 12+09 | 96 | | 1 | | | | | | | | | | | | | | | | | | | | | 1 | | | | | |
| LP1D | 12+09 | 96 | 97 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LP1D | 11+80 | 97 | | 1 | 1.037 | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| LP1D | 11+80 | 97 | OUT | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| LP1D | 12+88 | 98 | | 1 | | | | | | | | | | | | | | | | | | | | | 1 | | | | | |
| LP1D | 12+88 | 98 | 99 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LP1D | 12+88 | 99 | | 1 | | | | | | | | | | | 1 | | | 1 | | | | | | | | | | | | |
| LP1D | 12+88 | 99 | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LP1D | 13+00 | 100 | | 1 | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| LP1D | 13+00 | 100 | OUT | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| LP1D | 13+59.60 | 101 | | 1 | | | | | | | | | | | 1 | | | 1 | | | | | | | | | | | | |
| LP1D | 13+59.60 | 101 | 102 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LP1D | 13+59.60 | 102 | | 1 | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| LP1D | 13+59.60 | 102 | Out | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| LP1D | 14+68 | 103 | | 1 | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| LP1D | 14+68 | 103 | OUT | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| RP1DB | 14+52.50 | 104 | | 1 | | | | | | | | | | 1 | | 1 | | | | | | | | | | | | | | |
| RP1DB | 14+52.50 | 104 | OUT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1DB | 13+80 | 105 | | 1 | | | | | | | | | | 1 | | 1 | | | | | | | | | | | | | | |
| RP1DB | 13+80 | 105 | OUT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1D | 10+59 | 106 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1DB | 11+74.50 | 107 | | 1 | | | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | |
| RP1DB | 11+74.50 | 107 | 108 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1DB | 11+40.10 | 108 | | 1 | | | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | |
| RP1DB | 11+40.10 | 108 | OUT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1DB | 12+62 | 109 | | 1 | | | | | | | | | | 1 | | 1 | | | | | | | | | | | | | | |
| RP1DB | 12+62 | 109 | 110 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1DB | 12+62 | 110 | | 1 | | | | | | | | | | 1 | | 1 | | | | | | | | | | | | | | |
| RP1DB | 12+62 | 110 | OUT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1D | 11+20 | 111 | | 1 | | | | | | | | | | 1 | | 1 | | | | | | | | | | | | | | |
| RP1D | 11+20 | 111 | OUT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1D | 13+20 | 112 | | 1 | | | | | | | | | | 1 | | 1 | | | | | | | | | | | | | | |
| RP1D | 13+20 | 112 | OUT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SHEET TOTALS | | | | 17 | 1.037 | | 4 | | 4 | | | | | 8 | 2 | 6 | | 4 | | | | | | | 3 | 2 | | 5 | | |

| LINE | STATION | FROM | TO | CLASS IV R.C. PIPE 450 CLASS IV RCP | 750 CLASS IV RCP | 1200 CLASS IV RCP | CORR. STEEL ELBOWS NO. & SIZE 400 | 450 | 600 | 800 | CONC. COLLARS CL. "B" $M^3$ STD. 840.72 | CONC. & BRICK PIPE PLUG, $M^3$ STD. 840.71 | PIPE REMOVAL (METERS) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LP1D | 11+80 | 97 | OUT | | | | | 2 | | | | | | |
| LP1D | 12+88 | 98 | 99 | | | | 2 | | | | | | | |
| LP1D | 13+00 | 100 | OUT | | | | 2 | | | | | | | |
| LP1D | 13+59.60 | 102 | Out | | | | 2 | | | | | | | |
| LP1D | 14+68 | 103 | OUT | | | | 2 | | | | | | | |
| RP1DB | 14+52.50 | 104 | OUT | | | | 2 | | | | | | | |
| RP1DB | 13+80 | 105 | OUT | | | | 2 | | | | | | | |
| RP1DB | 12+62 | 110 | OUT | | | | 2 | | | | | | | |
| SHEET TOTALS | | | | | | | 14 | 2 | | | | | | |

(All other rows are blank in these columns.)

**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: DJM DATE: 1/28/2008

CHECKED BY: CMKR, Sungate DATE: 8/28/2008

# STATE OF NORTH CAROLINA
# DIVISION OF HIGHWAYS

METRIC

| PROJECT NO. | SHEET NO. |
|---|---|
| U-2519DA | 3-F |

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

| LINE | STATION / SIZE / THICKNESS OR GAUGE | LOCATION (L.T. RT. OR CL)' | STRUCTURE NO. FROM | STRUCTURE NO. TO | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | SLOPE CRITICAL | CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 300 | 375 | 450 | 600 | 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 | ### | ### |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | 1.63 | 1.63 | 1.63 | 1.63 | 2.01 | 2.01 | 2.01 | 2.01 | | | | | | | | |
| RP1BD | 31+30 | LT | 113 | | 78.300 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1BD | 31+30 | LT | 113 | OUT | | 77.462 | 68.299 | | | | | | | | | | | 32.4 | | | | | | | | | | | | | | |
| RP1D | 13+94 | RT | 114 | | 76.600 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1D | 13+94 | RT | 114 | 115 | | 76.016 | 75.856 | | | 32.4 | | | | | | | | | | | | | | | | | | | | | | |
| RP1BD | 32+11.50 | LT | 115 | | 76.870 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1BD | 32+11.50 | LT | 115 | Out | | 75.856 | 67.985 | | | | | | | | | | | 31.2 | | | | | | | | | | | | | | |
| RP1D | 14+40 | RT | 116 | | 76.980 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1D | 14+40 | RT | 116 | 117 | | 76.396 | 76.301 | | | 19.2 | | | | | | | | | | | | | | | | | | | | | | |
| RP1BD | 32+60 | LT | 117 | | 77.490 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1BD | 32+60 | LT | 117 | 118 | | 76.301 | 67.352 | | | | | | | | | | | 27.6 | | | | | | | | | | | | | | |
| COL1 | 32+60 | RT | 118 | | 68.600 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| COL1 | 32+60 | RT | 118 | 119 | | 67.352 | 66.997 | | | 16.8 | | | | | | | | | | | | | | | | | | | | | | |
| COL1 | 32+40 | RT | 119 | | 67.860 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| COL1 | 32+40 | RT | 119 | OUT | | 66.997 | 66.822 | X | | | | 34.8 | | | | | | | | | | | | | | | | | | | | |
| COL1 | 33+67.60 | RT | 120 | | 68.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| COL1 | 33+67.6 | RT | 120 | 121 | | 67.416 | 67.206 | | | 25.2 | | | | | | | | | | | | | | | | | | | | | | |
| COL1 | 32+42.50 | RT | 121 | | 68.044 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| COL1 | 32+42.50 | RT | 121 | OUT | | 67.206 | 66.490 | | | | | | | | | | | 18.0 | | | | | | | | | | | | | | |
| COL1 | 32+95 | RT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| COL1 | 35+01 | LT | 122 | | 69.735 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| COL1 | 35+01 | LT | 122 | OUT | | 68.897 | 65.980 | | | | | | | | | | | 28.8 | | | | | | | | | | | | | | |
| RP1BD | 33+19 | CL | 123 | | | 62.200 | 59.050 | | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1BD | 33+19 | CL | 124 | | | 62.200 | 59.050 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 11+72.50 | RT | 125 | | 65.908 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 11+72.50 | RT | 125 | 126 | | 65.248 | 65.132 | | | | 39.6 | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 11+72.50 | CL | 126 | | 66.507 | | | | | | 1.2 | | | | | | | | | | | | | | | | | | | | | |
| TT4 | 32+52 | CL | 127 | | | | | | | | | | | 16.8 | | | | | | | | | | | | | | | | | | |
| RP1BD | 21+58 | CL | 128 | | | 64.400 | 53.400 | | | | | | | 32.4 | | | | | | | | | | | | | | | | | | |
| Y1 | 13+55 | CL | 129 | | 64.790 | | | | | | | | | 1.2 | | | | | | | | | | | | | | | | | | |
| Y1 | 13+55 | LT | 130 | | | | | | | | | | | 2.4 | | | | | | | | | | | | | | | | | | |
| Y1 | 15+30 | RT | 131 | | 63.208 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 15+30 | RT | 131 | 132 | | 64.425 | 62.373 | | | 2.4 | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 15+30 | RT | 132 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 15+38 | CL | 133 | | 63.108 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 15+38 | CL | 133 | | | | | | | 1.2 | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 16+92 | CL | 135 | | 62.535 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 16+92 | CL | 135 | 134 | | 61.961 | 61.707 | | | 9.6 | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 16+83 | CL | 134 | | 62.545 | | | | | | | | 1.2 | | | | | | | | | | | | | | | | | | | |
| SHEET TOTALS | | | | | | | | | | 106.8 | 40.8 | 34.8 | 1.2 | 52.8 | | | | 138.0 | | | | | | | | | | | | | | |

| LINE | STATION | 375mm SIDE DRAIN PIPE | 450mm SIDE DRAIN PIPE | 600mm SIDE DRAIN PIPE | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. METERS R.C.P. | C.S.P. | QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0 THRU 1.50) | METERS A 1.5 THRU 3.00 | B 3.00 AND ABOVE | "TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B') | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E | F | G | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATE STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR 840.26 | G.D.I. TYPE "B" STD. 840.18 OR 840.27 | G.D.I. TYPE "D" STD. 840.19 OR 840.28 | G.D.I. FRAME WITH TWO GRATES STD. 840.20 (FLAT) | G.D.I. FRAME WITH GRATE STD. 840.22 (SAG) | G.D.I. FRAME WITH TWO GRATES STD. 840.22 (SAG) | G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24 | G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24 | J.B. STD. 840.31 OR 840.32 | MANHOLE STD. 840.51 | M.H. STD. 840.51 OR 840.53 | M.H. FRAME AND COVER STD. 840.54 | C.B. STD. 840.04 OR STD. 840.05 (OPEN THROAT) | MODIFIED CONCRETE FLUME | CONVERT DI TO JUNCTION BOX | PREFORMED SCOUR HOLE | BERM DITCH OUTLET STD. 850.10 | BERM DITCH OUTLET STD. 850.11 | CLASS IV R.C. PIPE 450 CLASS IV RCP | 750 CLASS IV RCP | 1200 CLASS IV RCP | CORR. STEEL ELBOWS NO. & SIZE 400 | 450 | 600 | 800 | CONC. COLLARS CL. "B" $M^3$ STD. 840.72 | CONC. & BRICK PIPE PLUG, $M^3$ STD. 840.71 | PIPE REMOVAL (METERS) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RP1BD | 31+30 | | | | | | 1 | | | | | | | | | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1BD | 31+30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | | | | | |
| RP1D | 13+94 | | | | | | 1 | | | | | | | | | | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1D | 13+94 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1BD | 32+11.50 | | | | | | 1 | | | | | | | | | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1BD | 32+11.50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | | | | | |
| RP1D | 14+40 | | | | | | 1 | | | | | | | | | | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1D | 14+40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1BD | 32+60 | | | | | | 1 | | | | | | | | | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1BD | 32+60 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | | | | | |
| COL1 | 32+60 | | | | | | 1 | | | | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| COL1 | 32+60 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| COL1 | 32+40 | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | |
| COL1 | 32+40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| COL1 | 33+67.60 | | | | | | 1 | | | | | | | | | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| COL1 | 33+67.6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| COL1 | 32+42.50 | | | | | | 1 | | | | | | | | | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| COL1 | 32+42.50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | | | | | |
| COL1 | 32+95 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 9.1 | REMOVE 900mm PIPE |
| COL1 | 35+01 | | | | | | 1 | | | | | | | | | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| COL1 | 35+01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | | | | | |
| RP1BD | 33+19 | | | | 4.60 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 294.0 | | | | | | | | | | CLASS IV PIPE - |
| RP1BD | 33+19 | | | | 4.60 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 294.0 | | | | | | | | | | CLASS IV PIPE - |
| Y1 | 11+72.50 | | | | | | 1 | | | | | | | | | | | | 1 | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 11+72.50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | REMOVE 375mm PIPE |
| Y1 | 11+72.50 | | | | | | 1 | | | | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | | | | 0.33 | | | COLLAR |
| TT4 | 32+52 | | | | 2.60 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RP1BD | 21+58 | | | | 2.60 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 13+55 | | | | | | 1 | 0.667 | | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | | | | 0.56 | | | COLLAR |
| Y1 | 13+55 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0.56 | | | COLLAR |
| Y1 | 15+30 | | | | | | 1 | | | | | | | | | | | | 1 | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 15+30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 15+30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0.29 | | | COLLAR |
| Y1 | 15+38 | | | | | | 1 | | | | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 15+38 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| Y1 | 16+92 | | | | | | 1 | | | | | | | | | | | | 1 | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 16+83 | | | | | | 1 | | | | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | | | | 0.48 | | | COLLAR |
| SHEET TOTALS | | | | | 14.40 | | 17 | 0.667 | | | | | | | | | 1 | 9 | 6 | 8 | | 8 | | | | | | | | | 1 | | 1 | | | | | | 588.0 | 10 | | | 2.22 | | 9.1 | |

| 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: DJM DATE: 1/28/2008

CHECKED BY: CMKR, Sungate DATE: 8/28/2008

# STATE OF NORTH CAROLINA
# DIVISION OF HIGHWAYS

METRIC

| PROJECT NO. | SHEET NO. |
|---|---|
| U-2519DA | 3-G |

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

| LINE | STATION | LOCATION (LT, RT, OR CL) | STRUCTURE NO. FROM | STRUCTURE NO. TO | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | SLOPE CRITICAL | CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 300 | 375 | 450 | 600 | 750 | 900 | 1050 | 1200 | BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300 | 400 (1.63) | 450 (1.63) | 600 (1.63) | 800 (2.01) | 900 (2.01) | 1000 (2.01) | 1200 (2.01) | CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR HDPE, TYPE S OR D 300 | 375 | 450 | 600 | 750 | 900 | ### | ### |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Y1 | 16+90 | LT | 136 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 16+90 | LT | 136 | 137 | | 60.483 | 59.431 | | | | | | 7.2 | | | | | | | | | | | | | | | | | | | |
| Y1 | 16+93 | LT | 137 | | 61.031 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 16+93 | LT | 137 | OUT | | 59.431 | 59.281 | | | | | | 28.8 | | | | | | | | | | | | | | | | | | | |
| Y1 | 19+02 | LT | 139 | | 64.042 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 19+02 | LT | 139 | 138 | | 63.204 | 62.447 | | | 102.0 | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 18+00 | LT | 138 | | 63.285 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 18+00 | LT | 138 | OUT | | 62.447 | 59.500 | | | | | | | | | | | 13.2 | | | | | | | | | | | | | | |
| Y1 | 18+10 | CL | 140 | | 62.848 | | | | | 1.2 | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 19+61 | CL | 141 | | 64.200 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 19+61 | RT | 142 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 19+61 | RT | 142 | OUT | | | | | | | | | | | | | | | 12.0 | | | | | | | | | | | | | |
| Y1 | 20+65 | CL | 143 | | 65.635 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 20+65 | CL | 143 | 144 | | 64.797 | 64.066 | | | 22.8 | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 20+88 | CL | 144 | | 65.979 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 20+88 | RT | 145 | | 65.285 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 20+88 | RT | 145 | OUT | | 57.575 | 57.500 | | | | | | | | | | | 14.4 | | | | | | | | | | | | | | |
| Y1 | 22+50 | CL | 146 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 22+50 | CL | 147 | | 67.393 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 22+50 | CL | 146 | 147 | | | | | | | 1.2 | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 22+40 | RT | 148 | | 63.612 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 22+40 | RT | 148 | OUT | | 64.425 | 62.000 | | | | 13.2 | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 23+62 | RT | 149 | | 63.677 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 23+62 | RT | 149 | OUT | | 62.032 | 59.600 | | | | | | | | | | | | | | | 14.4 | | | | | | | | | | |
| Y1 | 23+76 | CL | 151 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 23+76 | CL | 151 | 150 | | | | | | | 2.4 | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 23+76 | CL | 150 | | 68.738 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 25+30 | CL | 152 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 25+30 | CL | 152 | 153 | | | | | | 2.4 | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 25+30 | CL | 153 | | 70.384 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 25+38 | RT | 155 | | 70.038 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 25+38 | RT | 155 | 154 | | | | | | 6.0 | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 25+35 | RT | 154 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SHEET TOTALS | | | | | | | | | | 134.4 | 16.8 | | 36.0 | | | | | 27.6 | 12.0 | | | 14.4 | | | | | | | | | | |

| STATION | LOCATION | FROM | TO | 375mm SIDE DRAIN PIPE | 450mm SIDE DRAIN PIPE | 600mm SIDE DRAIN PIPE | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. METERS R.C.P. | C.S.P. | QUANTIES FOR DRAINAGE STRUCTURES PER EACH (0 THRU 1.50) | *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5 THRU 3.00 | B 3.00 AND ABOVE | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E | F | G | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATE STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR 840.26 | G.D.I. TYPE "B" STD. 840.18 OR 840.27 | G.D.I. TYPE "D" STD. 840.19 OR 840.28 | G.D.I. FRAME WITH TWO GRATES STD. 840.20 (FLAT) | G.D.I. FRAME WITH GRATE STD. 840.22 (SAG) | G.D.I. FRAME WITH TWO GRATES STD. 840.22 (SAG) | G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24 | G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24 | J.B. STD. 840.31 OR 840.32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16+93 | LT | 137 | | | | | | | 1 | 0.100 | | | | | | | | 1 | | | | | 1 | | | |
| 19+02 | LT | 139 | | | | | | | 1 | | | | | | | | | | 1 | | 1 | | | | | |
| 18+00 | LT | 138 | | | | | | | 1 | | | | | | | | | | 1 | | 1 | | | | | |
| 18+10 | CL | 140 | | | | | | | 1 | | | | | | | | | | 1 | | | | 1 | | | |
| 19+61 | CL | 141 | | | | | | | 1 | 0.179 | | | | | | | | | 1 | | | | 1 | | | |
| 20+65 | CL | 143 | | | | | | | 1 | | | | | | | | | | 1 | | | | 1 | | | |
| 20+88 | CL | 144 | | | | | | | 1 | 0.413 | | | | | | | | | 1 | | | | 1 | | | |
| 20+88 | RT | 145 | | | | | | | 1 | | | | | | | | | | | | | | | | | 1 |
| 22+50 | CL | 147 | | | | | | | 1 | 0.011 | | | | | | | | | 1 | | | | 1 | | | |
| 22+40 | RT | 148 | | | | | | | 1 | | | | | | | | | | | | | | | | | 1 |
| 23+62 | RT | 149 | | | | | | | 1 | 0.145 | | | | | | | | | | | | | | | | 1 |
| 23+76 | CL | 150 | | | | | | | 1 | | | | | | | | | | 1 | | | | 1 | | | |
| 25+30 | CL | 153 | | | | | | | 1 | | | | | | | | | | 1 | | | | 1 | | | |
| 25+38 | RT | 155 | | | | | | | 1 | | | | | | | | | | | 1 | | | 1 | | | |
| SHEET TOTALS | | | | | | | | | 14 | 0.848 | | | | | | | | 1 | 9 | 1 | 2 | | 9 | | | 3 |

| STATION | LOCATION | FROM | TO | MANHOLE STD. 840.51 | M.H. STD. 840.51 OR 840.53 | M.H. FRAME AND COVER STD. 840.54 | C.B. STD. 840.04 OR STD. 840.05 (OPEN THROAT) | MODIFIED CONCRETE FLUME | CONVERT DI TO JUNCTION BOX | PREFORMED SCOUR HOLE | BERM DITCH OUTLET STD. 850.10 | BERM DITCH OUTLET STD. 850.11 | CLASS IV R.C. PIPE 450 CLASS IV RCP | 750 CLASS IV RCP | 1200 CLASS IV RCP | CORR. STEEL ELBOWS NO. & SIZE 400 | 450 | 600 | 800 | CONC. COLLARS CL. "B" $M^3$ STD. 840.72 | CONC. & BRICK PIPE PLUG, $M^3$ STD. 840.71 | PIPE REMOVAL (METERS) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16+90 | LT | 136 | | | | | | | | | | | | | | | | | | 0.48 | | | COLLAR |
| 19+02 | LT | 139 | 138 | | | | | | | | | | | | | | | | | | | 13.7 | REMOVE 750mm PIPE IN MEDIAN |
| 18+00 | LT | 138 | OUT | | | | | | | | | | | | | 2 | | | | | | | |
| 18+10 | CL | 140 | | | | | | | | | | | | | | | | | | 0.29 | | | COLLAR |
| 19+61 | CL | 141 | | | | | | | | | | | | | | | | | | | | 1.6 | REMOVE PORTION OF 400mm PIPE |
| 19+61 | RT | 142 | | | | | | | | | | | | | | | | | | 0.33 | | | COLLAR |
| 20+88 | CL | 144 | | | | | | | | | | | | | | | | | | | | 1.7 | REMOVE PORTION OF 375mm PIPE |
| 22+50 | CL | 146 | | | | | | | | | | | | | | | | | | 0.33 | | | COLLAR |
| 23+76 | CL | 151 | | | | | | | 1 | | | | | | | | | | | | | | |
| 25+30 | CL | 152 | | | | | | | 1 | | | | | | | | | | | | 0.06 | | PLUG 375mm PIPE |
| 25+35 | RT | 154 | | | | | | | | | | | | | | | | | | 0.29 | | | COLLAR |
| SHEET TOTALS | | | | | | | | | 2 | | | | | | | 2 | | | | 1.72 | 0.06 | 17 | |

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: DJM DATE: 1/28/2008

CHECKED BY: CMKR, Sungate DATE: 8/28/2008

# STATE OF NORTH CAROLINA
# DIVISION OF HIGHWAYS

METRIC

| PROJECT NO. | SHEET NO. |
|---|---|
| U-2519DA | 3-H |

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

| LINE | STATION | LOCATION (LT, RT, OR CL)' | STRUCTURE NO. FROM | STRUCTURE NO. TO | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | SLOPE CRITICAL | CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 300 | 375 | 450 | 600 | 750 | 900 | 1050 | 1200 | BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 300 (1.63) | 400 (1.63) | 450 (1.63) | 600 (1.63) | 800 (2.01) | 900 (2.01) | 1000 (2.01) | 1200 (2.01) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Y1 | 26+89 | LT | 156 | | 71.990 | | | | | | | | | | | | | | | | | | | |
| Y1 | 26+89 | LT | 156 | 157 | | 71.990 | 69.482 | | | | | | | | | | | | | | 10.8 | | | |
| Y1 | 26+89 | LT | 157 | | 71.082 | | | | | | | | | | | | | | | | | | | |
| Y1 | 26+89 | LT | 157 | 158 | | 69.482 | 69.297 | | | | | | 37.2 | | | | | | | | | | | |
| Y1 | 26+89 | CL | 158 | | 71.658 | | | | | | | | | | | | | | | | | | | |
| Y1 | 26+89 | CL | 158 | OUT | | 69.147 | 68.700 | | | | | | | 38.4 | | | | | | | | | | |
| Y1 | 27+74 | RT | 159 | | 71.928 | | | | | | | | | | | | | | | | | | | |
| Y1 | 27+74 | RT | 159 | OUT | | 71.090 | 70.360 | | | | | | | | | | | | | | | | | |
| Y1 | 29+32 | LT | 160 | | 73.950 | | | | | | | | | | | | | | | | | | | |
| Y1 | 29+32 | LT | 160 | 161 | | 73.955 | 72.150 | | | | | | | | | | | 12.0 | | | | | | |
| Y1 | 29+32 | LT | 161 | | 72.854 | | | | | | | | | | | | | | | | | | | |
| Y1 | 29+32 | LT | 161 | 162 | | 72.150 | 72.078 | | | 3.6 | | | | | | | | | | | | | | |
| Y1 | 29+32 | LT | 162 | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 29+31 | RT | 163 | | 72.628 | | | | | | | | | | | | | | | | | | | |
| Y1 | 29+31 | RT | 163 | EX | | 71.701 | 71.396 | | | 32.4 | | | | | | | | | | | | | | |
| RP3C | 12+96 | LT | 164 | | 71.658 | | | | | | | | | | | | | | | | | | | |
| SHEET TOTALS | | | | | | | | | | 36.0 | | | 37.2 | 38.4 | | | | 12.0 | | | 10.8 | | | |
| SHEET TOTAL 3A | | | | | | | | | | 202.8 | 94.8 | | 42.0 | | | 626.4 | | 45.6 | 22.8 | | | | | |
| SHEET TOTAL 3B | | | | | | | | | | 378.0 | 20.4 | | | | | | | 92.4 | | | 15.6 | | | |
| SHEET TOTAL 3C | | | | | | | | | | 382.8 | 78.0 | 265.2 | 134.4 | | 171.6 | | | 46.8 | | | | | | |
| SHEET TOTAL 3D | | | | | | | | | | 332.4 | 62.4 | 192.0 | | | | | | 145.2 | | | 14.4 | | | |
| SHEET TOTAL 3E | | | | | | | | | | 194.4 | 51.6 | 73.2 | | | | | | 175.2 | 15.6 | | | | | |
| SHEET TOTAL 3F | | | | | | | | | | 106.8 | 40.8 | 34.8 | 1.2 | 52.8 | | | | 138.0 | | | | | | |
| SHEET TOTAL 3G | | | | | | | | | | 134.4 | 16.8 | | 36.0 | | | | | 27.6 | 12.0 | | | 14.4 | | |
| PROJECT TOTALS | | | | | | | | | | 1767.6 | 364.8 | 565.2 | 250.8 | 91.2 | 171.6 | 626.4 | | 682.8 | 50.4 | | 40.8 | 14.4 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| SAY | | | | | | | | | | | | | | | | | | | | | | | | |

| LINE | 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 | ### | ### | 375mm SIDE DRAIN PIPE | 450mm SIDE DRAIN PIPE | 600mm SIDE DRAIN PIPE | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. METERS R.C.P. | C.S.P. | QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0 THRU 1.50) | *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') METERS A 1.5 THRU 3.00 | B 3.00 AND ABOVE | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E | F | G | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATE STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR 840.26 | G.D.I. TYPE "B" STD. 840.18 OR 840.27 | G.D.I. TYPE "D" STD. 840.19 OR 840.28 | G.D.I. FRAME WITH TWO GRATES STD. 840.20 (FLAT) | G.D.I. FRAME WITH GRATE STD. 840.22 (SAG) | G.D.I. FRAME WITH TWO GRATES STD. 840.22 (SAG) | G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24 | G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24 | J.B. STD. 840.31 OR 840.32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Y1 | 26+89 | 156 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 26+89 | 156 | 157 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 26+89 | 157 | | | | | | | | | | | | | | | 1 | 0.100 | | | | | | | | 1 | | | | | 1 | | | |
| Y1 | 26+89 | 157 | 158 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 26+89 | 158 | | | | | | | | | | | | | | | 1 | 1.011 | | | | | | | | 1 | | | | | 1 | | | |
| Y1 | 26+89 | 158 | OUT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 27+74 | 159 | | | | | | | | | | | | | | | 1 | | | | | | | | | | 1 | | | | 1 | | | |
| Y1 | 27+74 | 159 | OUT | | 52.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 29+32 | 160 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 29+32 | 160 | 161 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 29+32 | 161 | | | | | | | | | | | | | | | 1 | | | | | | | | | | | 1 | | | 1 | | | |
| Y1 | 29+32 | 161 | 162 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 29+32 | 162 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 29+31 | 163 | | | | | | | | | | | | | | | 1 | | | | | | | | | | 1 | | | | 1 | | | |
| Y1 | 29+31 | 163 | EX | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RP3C | 12+96 | 164 | | | | | | | | | | | | | | | 1 | | | | | | | | | 1 | | | | | 1 | | | |
| SHEET TOTALS | | | | | 52.8 | | | | | | | | | | | | 6 | 1.111 | | | | | | | | 3 | 2 | 1 | | | 6 | | | |
| SHEET TOTAL 3A | | | | | 36.0 | | | 99.6 | | | | | | | 18.40 | | 19 | 0.492 | | | | | | | | 2 | 13 | 4 | 9 | | 10 | | | |
| SHEET TOTAL 3B | | | | | 20.4 | 190.8 | 140.4 | | | | | | | | | | 18 | 0.438 | | 6 | 1 | 5 | | | | 1 | 8 | 1 | 4 | | 6 | | | |
| SHEET TOTAL 3C | | | | | | | | 13.2 | | | | | | | | | 24 | 1.900 | 0.241 | | | | | | | 6 | 10 | 6 | 5 | 1 | 17 | | | 1 |
| SHEET TOTAL 3D | | | | | | | | | | | | | | | | | 21 | 0.568 | | | | | | | | 4 | 16 | 1 | 14 | | 7 | | | |
| SHEET TOTAL 3E | | | | | 34.8 | | | | | | | | | | | | 17 | 1.037 | | 4 | | 4 | | | | | 8 | 2 | 6 | | 4 | | | |
| SHEET TOTAL 3F | | | | | | | | | | | | | | | 14.40 | | 17 | 0.667 | | | | | | | | 1 | 9 | 6 | 8 | | 8 | | | |
| SHEET TOTAL 3G | | | | | | | | | | | | | | | | | 14 | 0.848 | | | | | | | | 1 | 9 | 1 | 2 | | 9 | | | 3 |
| PROJECT TOTALS | | | | | 144.0 | 190.8 | 140.4 | 112.8 | | | | | | | 32.80 | | 136 | 7.061 | 0.241 | 10 | 1 | 9 | | | | 18 | 75 | 22 | 48 | 1 | 67 | | | 4 |
| | | | | | | | | | | | | | | | | | | 7.374 | | | | | | | | | | | | | | | | |
| SAY | | | | | | | | | | | | | | | | | | 7.5 | | | | | | | | | | | | | | | | |

| LINE | STATION | FROM | TO | MANHOLE STD. 840.51 | M.H. STD. 840.51 OR 840.53 | M.H. FRAME AND COVER STD. 840.54 | C.B. STD. 840.04 OR STD. 840.05 (OPEN THROAT) | MODIFIED CONCRETE FLUME | CONVERT DI TO JUNCTION BOX | PREFORMED SCOUR HOLE | BERM DITCH OUTLET STD. 850.10 | BERM DITCH OUTLET STD. 850.11 | CLASS IV R.C. PIPE 450 CLASS IV RCP | 750 CLASS IV RCP | 1200 CLASS IV RCP | CORR. STEEL ELBOWS NO. & SIZE 400 | 450 | 600 | 800 | CONC. COLLARS CL. "B" $M^3$ STD. 840.72 | CONC. & BRICK PIPE PLUG, $M^3$ STD. 840.71 | PIPE REMOVAL (METERS) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Y1 | 26+89 | 156 | | | | | | | | | | 1 | | | | | | | | | | | CONC PAVED DITCH |
| Y1 | 26+89 | 156 | 157 | | | | | | | | | | | | | | | | 2 | | | | |
| Y1 | 26+89 | 157 | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 26+89 | 157 | 158 | | | | | | | | | | | | | | | | | | | 7.2 | REMOVE 750mm PIPE |
| Y1 | 26+89 | 158 | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 26+89 | 158 | OUT | | | | | | | | | | | | | | | | | | | | |
| Y1 | 27+74 | 159 | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 27+74 | 159 | OUT | | | | | | | | | | | | | | | | | | | | |
| Y1 | 29+32 | 160 | | | | | | | | | | | | | | | | | | | | | TIE TO EXIST CONC PAVED DITCH |
| Y1 | 29+32 | 160 | 161 | | | | | | | | | | | | | | | | | | | | |
| Y1 | 29+32 | 161 | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 29+32 | 161 | 162 | | | | | | | | | | | | | | | | | | | | |
| Y1 | 29+32 | 162 | | | | | | | | | | | | | | | | | | 0.29 | | | COLLAR |
| Y1 | 29+31 | 163 | | | | | | | | | | | | | | | | | | | | | |
| Y1 | 29+31 | 163 | EX | | | | | | | | | | | | | | | | | | | | OUTFALL TO EXISTING MEDIAN BOX |
| RP3C | 12+96 | 164 | | | | | | | | | | | | | | | | | | | | 7.5 | REMOVE PORTION OF 600mm PIPE |
| SHEET TOTALS | | | | | | | | | | | | 1 | | | | | | | 2 | 0.29 | | 14.7 | |
| SHEET TOTAL 3A | | | | | | | | | | | | | | | | 8 | | | | | | | |
| SHEET TOTAL 3B | | | | | | | 2 | 2 | | | | | | 165.6 | | 6 | | | | | | 12.3 | |
| SHEET TOTAL 3C | | | | | | 1 | 1 | | | | | | | | | 4 | | | | | | | |
| SHEET TOTAL 3D | | | | | | | | | | | | | | | | 14 | | | 2 | | | 7.8 | |
| SHEET TOTAL 3E | | | | | | | 3 | 2 | | 5 | | | | | | 14 | 2 | | | | | | |
| SHEET TOTAL 3F | | | | | | | 1 | | 1 | | | | | | 588.0 | 10 | | | | 2.22 | | 9.1 | |
| SHEET TOTAL 3G | | | | | | | | | 2 | | | | | | | 2 | | | | 1.72 | 0.06 | 17 | |
| PROJECT TOTALS | | | | | | 1 | 7 | 4 | 3 | 5 | | 1 | | 165.6 | 588.0 | 58 | 2 | | 4 | 4.23 | 0.06 | 60.9 | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| SAY | | | | | | | | | | | | | | | | | | | | 4.5 | 0.5 | 65 | |

**ABBREVIATIONS**

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

## *LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 1350mm & OVER)*

| LINE | 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 | 1800 CLASS IV | 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 | SHOP ELONGATED | STRUCTURAL PLATE PIPE 1500 2.77 | 1500 3.51 | 1500 4.27 | 1650 2.77 | 1650 3.51 | 1650 4.27 | 1800 2.77 | 1800 3.51 | 1800 4.27 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COL2 | 32+97 | LT | IN | 70 | | | | | | | | 12.0 | | | | | | | | | | | | | | | | | | |
| COL2 | 32+97 | LT | 70 | | 64.000 | | | | | | | | | | | | | | | | | | | | | | | | | |
| COL2 | 32+97 | LT | 70 | 71 | | | | | | | | | 154.8 | | | | | | | | | | | | | | | | | |
| COL2 | 31+40 | LT | 71 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PROJECT TOTALS | | | | | | | | | | | | 12.0 | 154.8 | | | | | | | | | | | | | | | | | |

| LINE | STATION | FROM | TO | REINFORCED ENDWALLS CLASS 'A' CONC. WITH R.C. - C.M. | WITH C.S. - C.M. | 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 | M.H. FRAME AND COVER STD. 840.54 | SPECIAL J.B. (SEE DETAIL ON SHEET 2-AF) | SPECIAL J.B. (SEE DETAIL ON SHEET 2-AG) | REINF. CONC. FLARED END SECTIONS NO. & SIZE | CoRR. STEEL FLARED END SECTIONS NO. & Size | CORR. STEEL ELBOWS NO. & SIZE | CONC. COLLARS CL. "B" $M^3$ STD. 840.72 | PIPE REMOVAL (METERS) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COL2 | 32+97 | IN | 70 | 5.4 | | | | | | | | | | | | | | | |
| COL2 | 32+97 | 70 | | | | 10.8 | | | | | 1 | | 1 | | | | | | |
| COL2 | 32+97 | 70 | 71 | | | | | | | | | | | | | | | | |
| COL2 | 31+40 | 71 | | | | 13.3 | | | | | | 1 | | | | | | | |
| PROJECT TOTALS | | | | 5.4 | | 24.1 | | | | | 1 | 1 | 1 | | | | | | |

**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: | HWB | DATE: | 8-28-2008 |
|---|---|---|---|
| CHECKED BY: | DJM | DATE: | 8-28-2008 |

# DIVISION OF HIGHWAYS
# STATE OF NORTH CAROLINA

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 3-I |

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

# GUARDRAIL SUMMARY

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

| SURVEY LINE | BEG. STA. | END STA. | LOCATION | LENGTH | | | WARRANT POINT | | "N" DIST. FROM E.O.L. | TOTAL SHOUL WIDTH | FLARE LENGTH | | W | | ANCHORS | | | | | | | | | IMPACT ATTENUATOR TYPE 350 | | SINGLE FACED CONCRETE BARRIER | REMOVE EXISTING GUARDRAIL | REMOVE & STOCKPILE EXISTING GUARDRAIL | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | STRAIGHT | SHOP CURVED | DOUBLE FACED | APPROACH END | TRAILING END | | | APPROACH END | TRAILING END | APPROACH END | TRAILING END | XI MOD | XI | GRAU 350 | M-350 | XIII | CAT-1 | VI MOD | B-77 | TYPE III | G | NG | | | | |
| -LP1B- | 13+88.821 | 14+65.021 | RT | 76.2 | | | BRIDGE | - | 3.0 | 4 | 70.50 | - | 2.2 | - | | | 1 | | | | | 1 | | | | | 46.9 | | |
| -Y1- | 11+08.247 | 14+40.176 | LT | 331.929 | | | 11+08.247 | - | 4.2 | 5.2 | - | 10.00 | - | 0.03 | | | | | | | | | | | | | 1076.8 | | |
| -RP1A- | 17+16.456 | 18+07.437 | RT | 90.981 | | | | | 3.6 | 4.6 | 15.24 | - | 0.3 | - | | | 1 | | | | | | | | | | | | |
| -Y1- | 16+71.960 | 17+15.775 | LT | 43.815 | | | 16+80.000 | 16+80.000 | 4.2 | 5.2 | 15.24 | - | 0.30 | - | | | 1 | | | 1 | | | | | | | | | |
| -Y1- | 18+01.403 | 19+11.893 | LT | 110.49 | | | BRIDGE | 18+01.403 | 4.2 | 5.2 | - | - | - | - | | | | | | 1 | | 1 | | | | | 76.7 | | |
| -Y1- | 18+56.732 | 19+11.977 | MED RT | 55.245 | | | BRIDGE | - | 4.2 | 5.2 | 43.82 | - | 4.40 | - | | | | 1 | | | | | 1 | | | | 61.6 | | |
| -Y1- | 19+53.041 | 23+07.371 | RT | 354.33 | | | BRIDGE | 22+54.031 | 3.0 | 3.6 | 17.50 | - | 1.2 | - | | | | | | 1 | | 1 | | | | | 463.3 | | |
| -Y1- | 19+53.041 | 20+92.106 | RT MED | 139.065 | | | BRIDGE | 20+92.106 | 3.0 | 3.6 | 92.20 | 28.50 | 5.9 | 1.9 | | | | | | | | | 1 | X | X | | 532.1 | | 1 IMPACT ATTENUATOR TYPE 350 |
| -Y1- | 19+53.041 | 20+92.106 | LT MED | 139.065 | | | BRIDGE | 20+92.106 | 3.0 | 3.6 | 28.5 | 39.00 | 1.9 | 2.6 | | | | | | | | 1 | | | | | 61.6 | | |
| -Y1- | 19+53.041 | 21+03.536 | LT | 150.495 | | | BRIDGE | - | 4.2 | 5.2 | 15.24 | - | 1.3 | - | | | 1 | | | | | 1 | | | | | 62.0 | | |
| -Y1- | 27+33.880 | 27+77.695 | RT | 43.815 | | | 27+70.000 | - | 4.2 | 5.2 | 15.24 | - | 0.3 | - | | | 1 | | | 1 | | | | | | | | | |
| -Y1- | 28+22.115 | 28+65.930 | LT | 43.815 | | | 28+30.000 | - | 4.2 | 5.2 | 15.24 | - | 0.3 | - | | | 1 | | | 1 | | | | | | | | | |
| -Y1- | 31+38.720 | 31+82.535 | RT | 43.815 | | | 31+70.000 | - | 4.2 | 5.2 | 15.24 | - | 0.3 | - | | | 1 | | | 1 | | | | | | | | | |
| -Y1- | 31+92.380 | 32+36.195 | LT | 43.815 | | | 32+00.000 | - | 4.2 | 5.2 | 15.24 | - | 0.3 | - | | | 1 | | | 1 | | | | | | | | | |
| -RP1C- | 15+88.064 | 17+01.928 | RT | 113.864 | | | - | 17+00.459 | 3.6 | 4.6 | - | - | - | - | | | | | | 1 | | | | | | | | | |
| SUBTOTAL GUARDRAIL | | | | 1780.739 | | | | | | | | | | | | | 8 | 1 | | 8 | | 5 | 2 | | | | 2381.0 | | |
| LESS ANCHOR UNIT DEDUCTIONS: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GRAU 350 | | 8 @ 15.24 | = | 121.92 | | | | | | | | | | | | | | | | | | | | | | | | | |
| M-350 | | 1 @ 11.43 | = | 11.43 | | | | | | | | | | | | | | | | | | | | | | | | | |
| CAT-1 | | 8 @ 1.905 | = | 15.24 | | | | | | | | | | | | | | | | | | | | | | | | | |
| B-77 | | 5 @ 5.715 | = | 28.575 | | | | | | | | | | | | | | | | | | | | | | | | | |
| TYPE III | | 2 @ 5.715 | = | 11.43 | | | | | | | | | | | | | | | | | | | | | | | | | |
| SUBTOTAL ANCHOR UNITS | | | | 188.595 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | TOTAL | 1592.144 | | | | | | | | | | | | | 8 | 1 | | 8 | | 5 | 2 | | | 0.0 | 2381.0 | | |
| | | | SAY | 1,596.39 | | | | | | | | | | | | | | | | | | | | | | 0 | 2400 | | |
| (10 ADDITIONAL GUARDRAIL POSTS) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| COMPUTED BY: | HWB | DATE: | 8-28-08 |
|---|---|---|---|
| CHECKED BY: | CMKR | DATE: | 8-28-08 |

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

METRIC

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 3-J |

# CABLE GUIDERAIL SUMMARY

| SURVEY LINE | BEG. STA. | END STA. | LOCATION | CABLE GUIDERAIL (M) | CABLE GUIDERAIL ANCHOR UNITS | | | | | RESET CABLE GUIDERAIL (M) | | RESET CABLE GUIDERAIL ANCHORS EACH | | | | | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | APPROACH TERMINAL | INTERMEDIATE | EACH | | | | | | | | | | | | |
| -Y1- | 9+43.000 | 19+05.776 | MED. | 962.776 | 2 | 2 | 4 | | | | | | | | | | | | G/R ANCHOR DEDUCTIONS FOR |
| -Y1- | 21+07.590 | 32+00.000 | MED. | 1092.410 | 2 | 2 | 4 | | | | | | | | | | | | ANCHORS |
| | | | | | | | | | | | | | | | | | | | 4 EACH @ 7.6m = 30.4m |
| | SUBTOTAL | | | 2055.186 | 4 | 4 | 8 | | | | | | | | | | | | |
| | ANCHOR DEDUCTIONS | | | 30.400 | | | | | | | | | | | | | | | |
| PROJECT TOTALS | | | | 2024.786 | | | 8 | | | | | | | | | | | | |
| SAY | | | | 2100.000 | | | | | | | | | | | | | | | |
| | (10 ADDITIONAL GUIDERAIL POSTS) | | | | | | | | | | | | | | | | | | |

## SUMMARY OF PAVEMENT REMOVAL

| IN SQUARE METERS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| LINE | STATION TO STATION | | | LOCATION | ASPHALT REMOVAL | ASPHALT BREAK-UP | CONC REMOVAL | CONC BREAK-UP |
| -Y1- SBL | 9+67.474 | TO | 19+08.524 | RT | 3,311.54 | | | |
| -Y1- SBL | 19+56.264 | TO | 32+00.000 | RT | 3,630.30 | | | |
| -Y1- SBL | 32+80.000 | TO | 33+60.000 | RT | 409.09 | | | |
| -Y1- SBL | 9+87.474 | TO | 19+08.524 | MED | 460.53 | | | |
| -Y1- SBL | 19+56.264 | TO | 20+64.280 | MED | 149.99 | | | |
| -Y1- SBL | 20+64.280 | TO | 33+60.000 | MED | 647.86 | | | |
| -RP3C- | 10+24.222 | TO | 11+04.214 | CL | 663.08 | | | |
| -RP3C- | 11+04.214 | TO | 14+40.000 | RT | 425.37 | | | |
| -RP3C- | 11+37.000 | TO | 14+40.000 | LT | 336.92 | | | |
| -Y1- NBL | 9+43.000 | TO | 19+08.524 | MED | 1,167.53 | | | |
| -Y1- NBL | 19+56.264 | TO | 26+00.000 | MED | 821.71 | | | |
| -Y1- NBL | 26+00.000 | TO | 32+00.000 | MED | 300.00 | | | |
| -Y1- NBL | 11+08.247 | TO | 19+08.524 | LT | 2,468.29 | | | |
| -Y1- NBL | 19+56.264 | TO | 32+00.000 | LT | 3,176.59 | | | |
| -Y1- | 18+20.000 | TO | 18+60.000 | MED XOVER | 699.79 | | | |
| -Y1- | 27+80.000 | TO | 28+20.000 | MED XOVER | 843.43 | | | |
| TOTAL | | | | | 19,512.02 | | | |
| SAY | | | | | 19,600 | | | |

## FENCE SUMMARIES

| 1.2m WOVEN WIRE FENCE | | | | | | |
|---|---|---|---|---|---|---|
| LINE | BEG STA | END | LOCATION | FABRIC | 100mm POST | 125mm POST |
| -COL1- | 20+20.000 | 24+28.345 | RT | 407.396 | 88 | 14 |
| -RP1C- | 10+00.000 | 12+54.000 | RT | 268.391 | 56 | 14 |
| -RP1C- | 14+94.000 | 17+01.928 | RT | 221.837 | 45 | 13 |
| -RP1DB- | 10+32.869 | 12+80.000 | RT | 242.394 | 53 | 8 |
| -RP1D- | 10+00.000 | 14+86.961 | RT | 437.744 | 93 | 18 |
| -RP1BD- | 33+21.938 | 33+64.803 | RT | 48.029 | 9 | 5 |
| -RP1BD- | 33+69.129 | 35+12.432 | RT | 144.697 | 31 | 7 |
| -COL2- | 16+63.866 | 21+08.668 | LT | 451.238 | 97 | 17 |
| -RP1DB- | 22+37.362 | 25+02.083 | RT | 259.241 | 55 | 11 |
| | | | TOTAL | 2480.967 | 527 | 107 |
| | | | SAY | 2500 | 532 | 112 |

| 2.1m CHAIN LINK SECURITY FENCE w/ 3-STRAND BW | | | | | | |
|---|---|---|---|---|---|---|
| LINE | BEG STA | END STA | LOCATION | FABRIC | LINE POST | TERM. POST |
| -L- | 17+82.145 | 18+70.000 | RT | 102.858 | 28 | 3 |
| -L- | 18+70.000 | 19+40.000 | CL | 257.082 | 71 | 4 |
| -L- | 18+70.000 | GATE | | | | |
| -TT3- | 10+62.339 | 13+16.137 | RT | 251.085 | 69 | 2 |
| -TT4- | 20+10.911 | 29+08.104 | RT | 897.193 | 247 | 11 |
| -TT4- | 29+29.758 | 35+68.068 | RT | 643.342 | 177 | 6 |
| -TT4- | 27+30.507 | GATE | | | | |
| -TT5- | 13+20.725 | 16+81.598 | RT | 364.305 | 100 | 4 |
| -RP1A- | 15+82.962 | 16+83.365 | RT | 106.065 | 29 | 4 |
| -TT1- | 10+09.701 | 10+56.034 | LT | 140.056 | 38 | 2 |
| -TT1- | 10+25.505 | GATE | | | | |
| -TT6- | <10+00.000 | 18+48.673 | RT | 850.715 | 234 | 9 |
| | | | TOTAL | 3612.701 | 993 | 45 |
| | | | SAY | 3650 | 995 | 45 |
| | | | 3 GATES with 6 GATE POSTS | | | |

| CHAIN LINK FENCE RESET | | | | |
|---|---|---|---|---|
| LINE | BEG STA | END STA | LOCATION | LENGTH |
| -Y1- | 28+72.702 | 30+10.458 | RT | 137.756 |
| | | | TOTAL | 137.756 |
| | | | SAY | 140 |

| COMPUTED BY: HWB | DATE: October-07 |
|---|---|
| CHECKED BY: CMKR | DATE: September-08 |

# STATE OF NORTH CAROLINA

# DIVISION OF HIGHWAYS

METRIC

| PROJECT NO. | SHEET NO. |
|---|---|
| U-2519DA | 3-K |

## *SUMMARY OF EARTHWORK*

***IN CUBIC METERS***

| LOCATION | UNCL. EXCAVATION | UNDERCUT | EMBT + % | BORROW | TOTAL WASTE |
|---|---|---|---|---|---|
| **SUMMARY #1** | | | | | |
| -L- 20+40.000 TO -L- 26+92.151 (BRIDGE) | 9,409 | 9,156 | 361,225 | 352,981 | 10,321 |
| -RP1DB- 19+48.700 (BRIDGE) TO -RP1DB- 23+90.574 | 581 | | 100,199 | 99,618 | |
| -RP1B- 13+02.124 TO -RP1B- 14+53.283 | 433 | | 14,550 | 14,117 | |
| -RP1C- 11+32.636 TO -RP1C- 12+54.000 | | | 18,350 | 18,350 | |
| -LP1B- 10+89.657 TO -LP1B- 11+93.100 (BRIDGE) | 110 | | 27,454 | 27,344 | |
| -LP1B- 12+32.400 (BRIDGE) TO -LP1B- 14+12.799 | 8,695 | | 6,686 | | 2,009 |
| -TT4- 17+06.175 TO -TT4- 27+20.000 | 224 | | 5,615 | 5,391 | |
| **SUBTOTAL: SUMMARY #1** | **19,452** | **9,156** | **534,079** | **517,801** | **12,330** |
| **SUMMARY #2** | | | | | |
| -L- 29+10.332 (BRIDGE) TO -L- 39+40.000 | 22,659 | 6,324 | 648,241 | 625,582 | 6,324 |
| -COL1- 30+40.000 TO -COL1- 35+30.000 | 2,976 | 436 | 96,559 | 93,583 | 436 |
| -RP1BD- 30+83.800 (BRIDGE) TO -RP1BD- 33+80.235 (BRIDGE) | | 2,932 | 199,570 | 199,570 | 2,932 |
| -RP1BD- 34+61.853 (BRIDGE) TO -RP1BD- 39+40.000 | | | 79,809 | 79,809 | |
| -RP1A- 11+16.392 TO -RP1A- 13+58.000 | | | 65,340 | 65,340 | |
| -TT6- 10+00.000 TO -TT6- 18+48.673 | 38 | | 2,198 | 2,160 | |
| -RP2B- 10+78.525 TO -RP2B- 12+40.000 | | | 10,664 | 10,664 | |
| **SUBTOTAL: SUMMARY #2** | **25,673** | **9,692** | **1,102,381** | **1,076,708** | **9,692** |
| **SUMMARY #3** | | | | | |
| -Y1- 9+43.000 TO -Y1- 19+11.810 LT. (BRIDGE) | 4,194 | | 6,676 | 2,482 | |
| -Y1- 9+67.474 TO -Y1- 19+11.810 RT. (BRIDGE) | 15,140 | | 5,716 | | 9,424 |
| -RP1BD- 20+25.588 TO -RP1BD- 25+94.000 (BRIDGE) | 27,029 | 587 | 15,963 | 290 | 11,943 |
| -RP1A- 15+63.000 (BRIDGE) TO -RP1A- 16+87.284 | 7,405 | 524 | 1,726 | | 6,203 |
| -RP1B- 10+76.394 TO -RP1B- 12+57.165 (BRIDGE) | 4,086 | | 2,479 | | 1,607 |
| -TT1- 10+00.000 TO -TT1- 11+61.707 | 266 | | 163 | | 103 |
| -TT3- 10+62.339 TO -TT3- 13+25.057 | 32,428 | | 68 | | 32,360 |
| -TT4- 27+20.000 TO -TT4- 35+68.068 | 315 | | 2,421 | 2,106 | |
| -TT5- 11+90.000 TO -TT5- 17+88.776 | 1,121 | | 1,621 | 500 | |
| **SUBTOTAL: SUMMARY #3** | **91,984** | **1,111** | **36,833** | **5,378** | **61,640** |
| **SUMMARY #4** | | | | | |
| -Y1- 19+56.000 (BRIDGE) TO -Y1- 30+00.000 LT. | 24,269 | | 10,280 | | 13,989 |
| -Y1- 19+56.000 (BRIDGE) TO -Y1- 30+00.000 RT. | 3,437 | | 26,121 | 22,684 | |
| -RP1DB- 10+96.266 TO -RP1DB- 14+61.000 (BRIDGE) | 16,488 | | 52,001 | 35,513 | |
| -RP1C- 14+94.000 (BRIDGE)TO -RP1C- 16+10.268 | | | 16,364 | 16,364 | |
| -RP1D- 10+56.603 TO -RP1D- 13+99.357 | 14 | | 90,953 | 90,939 | |
| -LP1D- 10+80.823 TO -LP1D- 14+04.723 | 161,959 | | 11,059 | | 150,900 |
| **SUBTOTAL: SUMMARY #4** | **206,167** | | **206,778** | **165,500** | **164,889** |
| **SUMMARY #5** | | | | | |
| -Y1- 30+00.000 TO -Y1- 32+00.000 LT. | 509 | | 24 | | 485 |
| -Y1- 30+00.000 TO -Y1- 33+60.000 RT. | 1,798 | | 600 | | 1,198 |
| -RP3C- 11+44.632 TO -RP3C- 14+40.000 | 382 | | 974 | 592 | |
| **SUBTOTAL: SUMMARY #5** | **2,689** | | **1,598** | **592** | **1,683** |

| LOCATION | UNCL. EXCAVATION | UNDERCUT | EMBT + % | BORROW | TOTAL WASTE |
|---|---|---|---|---|---|
| **TOTAL (SUMMARIES 1-5)** | **345,965** | **19,959** | **1,881,669** | **1,765,979** | **250,234** |
| SHOULDER MATERIAL | | | 19,375 | 19,375 | |
| LOSS DUE TO CLEARING & GRUBBING | -6,500 | | | 6,500 | |
| GRADE POINT UNDERCUT | | 1,000 | 1,250 | 1,250 | 1,000 |
| ADDITIONAL UNDERCUT EXCAVATION | | 7,000 | 8,750 | 8,750 | 7,000 |
| SHALLOW UNDERCUT | | | | | |
| WASTE TO BE USED IN LIEU OF BORROW | | | | -213,010 | -213,010 |
| CHIPPED TIRES TO BE USED IN LIEU OF BORROW | | | | -18,130 | |
| **PROJECT TOTAL** | **339,465** | **27,959** | **1,911,044** | **1,570,714** | **45,224** |
| ESTIMATE 5% TO REPLACE TOPSOIL IN BORROW PITS | | | | 78,536 | |
| **GRAND TOTAL** | **339,465** | **27,959** | **1,911,044** | **1,649,250** | **45,224** |
| **SAY** | **339,500** | **28,000** | | **1,649,300** | |
| CL IV SUBGRADE STABILIZATION = **1200 mtons** | | | | | |
| SHALLOW UNDERCUT = **600 $m^3$** | | | | | |
| DRAINAGE DITCH EXCAVATION = **4660 $m^3$** | | | | | |
| SELECT GRANULAR MATERIAL = **28,700 $m^3$** | | | | | |
| PAVEMENT STRUCTURE VOLUME = **9,900 $m^3$** | | | | | |

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

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

**Note: Embankment volumes shown include additional volume for 125mm over subgrade for Grading & Structure only plans**

| PROJ. REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 3-L |

# STATE OF NORTH CAROLINA
# DIVISION OF HIGHWAYS

## *PARCEL INDEX SHEET*

| PARCEL No. | SHEET No. | PROPERTY OWNER NAME |
|---|---|---|
| 1 | 4, 5, 6, 7, 8, 9 | FORT BRAGG MILITARY RESERVATION |
| 1 | 10, 11, 12, 13 | FORT BRAGG MILITARY RESERVATION |
| 2 | 9 | HAROLD POE |
| 3 | 9 | PAUL RUSSELL |
| 4 | 9 | JOHNNIE KING |
| 5 | 9 | VISTER LIVINGSTON |
| 6 | 9 | BROADWELL CONSTRUCTION CO. |
| 7 | 9, 14, 15, 16 | JOHN KOENIG |
| 9A | 9, 10, 14, 15, 16 | DOHN BROADWELL ET AL |
| 10 | 9, 10 | PROGRESS ENERGY |
| 12 | 11 | WACHOVIA BANK ET AL |
| | | |
| 911 | 10, 11 | NCDOT (JOSEPH E. O'CONNELL) |
| | | |
| 21 | 9 | NILS BOUMA |
| 22 | 9 | HERBERT WOODWORTH |
| 23 | 9 | ALBERT LAMPKINS |

| PARCEL No. | SHEET No. | PROPERTY OWNER NAME |
|---|---|---|

| COMPUTED BY: | HWB | DATE: | 8-16-2011 |
|---|---|---|---|
| CHECKED BY: | DJM | DATE: | 8-16-2011 |

# DIVISION OF HIGHWAYS
# STATE OF NORTH CAROLINA

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 3-M |

"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

# *FUTURE GUARDRAIL SUMMARY*

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

| SURVEY LINE | BEG. STA. | END STA. | LOCATION | LENGTH | | | WARRANT POINT | | "N" DIST. FROM E.O.L. | TOTAL SHOUL WIDTH | FLARE LENGTH | | W | | ANCHORS | | | | | | | | | IMPACT ATTENUATOR TYPE 350 | | SINGLE FACED CONCRETE BARRIER | REMOVE EXISTING GUARDRAIL | REMOVE & STOCKPILE EXISTING GUARDRAIL | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | STRAIGHT | SHOP CURVED | DOUBLE FACED | APPROACH END | TRAILING END | | | APPROACH END | TRAILING END | APPROACH END | TRAILING END | XI MOD | XI | GRAU 350 | M-350 | XIII | CAT-1 | VI MOD | B-77 | TYPE III | G | NG | | | | |
| -COL2- | 28+99.550 | 30+74.810 | LT | 175.260 | | | 30+40.000 | BRIDGE | 3.6 | 4.6 | 15.24 | - | 0.3 | - | | | 1 | | | | | 1 | | | | | | | |
| -COL2- | 29+02.140 | 29+53.575 | RT MED | 51.435 | | | BRIDGE | - | 3.6 | 3.6 | 11.43 | - | 1.2 | - | | | | 1 | | | | 1 | | | | | | | |
| -COL2- | 33+09.545 | 33+68.600 | RT MED | 59.055 | | | 33+16.000 | 33+16.000 | 3.6 | 3.6 | 11.43 | - | 1.2 | - | | | | 1 | | 1 | | | | | | | | | |
| -COL2- | 33+14.210 | 34+17.080 | LT | 102.87 | | | 33+80.000 | - | 3.6 | 4.6 | 15.24 | - | 0.3 | - | | | 1 | | | | | | | | | | | | |
| -RP1A- | 10+01.765 | 13+58.000 | RT | 356.235 | | | - | BRIDGE | 3.6 | 4.6 | - | - | - | - | | | | | | | | 1 | | | | | | | |
| -RP1A- | 12+30.365 | 13+58.000 | LT | 127.635 | | | 12+60.365 | BRIDGE | 3.6 | 4.6 | 106.70 | - | 1.5 | - | | | 1 | | | | | 1 | | | | | | | |
| -RP1A- | 15+63.000 | 15+78.240 | RT | 15.24 | | | BRIDGE | 15+78.240 | 3.6 | 4.6 | - | - | - | - | | | | | | 1 | | 1 | | | | | | | |
| -RP1BD- | 25+23.915 | 25+94.400 | LT | 70.485 | | | BRIDGE | - | 3.6 | 4.6 | 49.50 | | 0.6 | - | | | 1 | | | | | 1 | | | | | | | |
| -RP1BD- | 25+23.915 | 25+94.400 | RT | 70.485 | | | BRIDGE | - | 3.6 | 4.6 | 49.53 | - | 1.4 | - | | | 1 | | | | | 1 | | | | | | | |
| -RP1BD- | 30+83.800 | 33+60.158 | LT | 276.358 | | | BRIDGE | BRIDGE | 3.6 | 4.6 | 40.00 | 50.00 | 0.3 | 1.8 | | | | | | | | 2 | | | | | | | |
| -RP1BD- | 33+21.938 | 34+18.156 | RT | 96.218 | | | - | BRIDGE | 3.6 | 4.6 | 40.00 | - | 0.6 | - | | | | | | | | 1 | | | | | | | |
| -RP1BD- | 34+41.777 | 35+44.647 | LT | 102.87 | | | BRIDGE | 35+44.647 | 3.6 | 4.6 | - | 32.00 | - | 1.1 | | | | | | 1 | | 1 | | | | | | | |
| -RP1BD- | 34+99.775 | 39+40.000 | RT | 440.225 | | | 34+99.775 | - | 3.6 | 4.6 | 20.00 | - | 0.6 | - | | | | | | | | 1 | | | | | | | TIE TO U-2519E GUARDRAIL |
| -RP1DB- | 12+45.735 | 14+61.000 | LT | 215.265 | | | 12+80.000 | - | 3.6 | 4.6 | 15.24 | 7.20 | 0.3 | 0.6 | | | 1 | | | | | | | | | | | | |
| -RP1DB- | 13+84.800 | 14+61.000 | RT | 76.2 | | | 14+61.000 | - | 3.6 | 4.6 | 15.24 | - | 0.3 | - | | | 1 | | | | | 1 | | | | | | | |
| -RP1DB- | 12+45.710 | 12+80.000 | RT | 34.290 | | | 10+00.000 | - | 3.6 | 4.6 | - | 31.00 | - | 0.6 | | | | | | | | | | | | | | | |
| -RP1D- | 10+00.000 | 14+86.961 | RT | 486.961 | | | 10+00.000 | - | 3.6 | 4.6 | - | 31.00 | - | 0.6 | | | | | | | | | | | | | | | |
| -RP1D- | 11+12.451 | 12+78.186 | LT | 165.735 | | | 11+42.451 | 12+78.186 | 3.6 | 4.6 | 15.24 | - | 0.3 | - | | | 1 | | | 1 | | | | | | | | | |
| -LP1B- | 11+56.571 | 11+96.576 | LT | 40.005 | | | BRIDGE | - | 3.6 | 4.6 | - | 68.87 | - | 2.4 | | | 1 | | | | | 1 | | | | | | | |
| -LP1B- | 11+45.546 | 11+93.171 | RT | 47.625 | | | BRIDGE | - | 3.6 | 4.6 | 41.91 | - | 0.9 | - | | | 1 | | | | | 1 | | | | | | | |
| -COL2- | 20+20.000 | 21+08.668 | LT | 88.668 | | | - | - | 3.6 | 4.6 | - | - | - | - | | | | | | | | | | | | | | | |
| -RP1DB- | 22+17.268 | 25+02.083 | RT | 284.815 | | | - | - | 3.6 | 4.6 | - | - | - | - | | | | | | | | | | | | | | | |
| -RP1B- | 13+01.300 | 15+39.350 | RT | 238.05 | | | BRIDGE | - | 3.6 | 4.6 | - | - | - | - | | | | | | | | 1 | | | | | | | |
| -RP1B- | 12+11.485 | 12+55.300 | RT | 43.815 | | | BRIDGE | - | 3.6 | 4.6 | 15.24 | - | 0.3 | - | | | 1 | | | | | 1 | | | | | | | |
| -RP1B- | 12+11.485 | 12+55.300 | LT | 43.815 | | | BRIDGE | - | 3.6 | 4.6 | 15.24 | - | 0.3 | - | | | 1 | | | | | 1 | | | | | | | |
| -COL1- | 20+89.890 | 24+28.345 | RT | 338.455 | | | 21+19.890 | - | 3.6 | 4.6 | 15.24 | - | 0.3 | - | | | 1 | | | | | | | | | | | | |
| -RP1C- | 10+00.000 | 12+54.000 | RT | 254.000 | | | BRIDGE | - | 3.6 | 4.6 | - | - | - | - | | | | | | | | 1 | | | | | | | |
| -RP1C- | 11+53.035 | 12+54.000 | LT | 100.965 | | | BRIDGE | - | 3.6 | 4.6 | - | - | - | - | | | | | | | | 1 | | | | | | | |
| -COL1- | 25+82.835 | 26+83.800 | RT | 100.965 | | | BRIDGE | - | 3.6 | 4.6 | - | - | - | - | | | | | | | | 1 | | 1 | | | | | ATTENUATOR |
| -COL1- | 26+09.505 | 26+83.800 | LT MED | 74.295 | | | BRIDGE | - | 3.6 | 4.6 | - | - | - | - | | | | | | | | 1 | | 1 | | | | | ATTENUATOR |
| -L- | 26+10.145 | 26+92.060 | RT | 81.915 | | | BRIDGE | - | 3.6 | 4.6 | - | - | - | - | | | | | | | | 1 | | | | | | | |
| -L- | 26+21.500 | 26+92.060 | LT MED | 70.56 | | | BRIDGE | - | 3.6 | 4.6 | 11.43 | - | 1.2 | - | | | | 1 | | | | 1 | | | | | | | |
| -L- | 29+05.750 | 29+73.000 | LT MED | 67.25 | | | BRIDGE | - | 3.6 | 4.6 | 11.43 | - | 1.2 | - | | | | 1 | | | | 1 | | | | | | | |
| -COL1- | 29+13.800 | 29+37.991 | RT | 24.191 | | | - | - | 3.6 | 4.6 | - | - | - | - | | | | | | | | 1 | | | | | | | |
| | | | | | | | | | 3.6 | 4.6 | | | | | | | | | | | | | | | | | | | |
| -LP1D- | 10+00.000 | 10+93.919 | RT | 93.919 | | | - | 10+93.919 | 3.6 | 4.6 | - | - | - | - | | | | | | 1 | | | | | | | | | |
| -COL1- | 34+49.130 | 35+10.090 | RT | 60.960 | | | BRIDGE | - | 3.6 | 4.6 | - | - | - | - | | | | | | 1 | | 1 | | | | | | | |
| -L- | 29+03.490 | 29+96.835 | LT | 93.345 | | | BRIDGE | - | 3.6 | 4.6 | 15.24 | - | 0.3 | - | | | 1 | | | | | 1 | | | | | | | |
| -L- | 29+10.735 | 29+37.405 | RT | 26.670 | | | - | - | 3.6 | 4.6 | - | - | - | - | | | | | | 1 | | 1 | | | | | | | |
| -COL1- | 29+11.317 | 29+37.987 | RT | 26.670 | | | - | - | 3.6 | 4.6 | - | - | - | - | | | | | | 1 | | 1 | | | | | | | |
| -RP1C- | 14+94.000 | 15+87.345 | RT | 93.345 | | | - | 14+94.000 | 3.6 | 4.6 | - | - | - | - | | | | | | | | 1 | | | | | | | TIE TO GUARDRAIL PLACED UNDER U-2519DA |
| -L- | 33+08.000 | 33+70.865 | LT | 62.865 | | | 33+16.000 | 33+16.000 | 3.6 | 4.6 | 11.43 | - | 1.2 | - | | | | 1 | | 1 | | | | | | | | | |
| -COL1- | 32+06.965 | 32+58.400 | RT | 51.435 | | | 32+58.400 | 32+58.400 | 3.6 | 4.6 | 15.24 | - | 0.3 | - | | | 1 | | | | | 1 | | | | | | | |
| -COL1- | 33+50.995 | 34+21.480 | LT | 70.485 | | | 34+21.480 | 34+21.480 | 3.6 | 4.6 | - | 15.24 | - | 0.3 | | | 1 | | | | | 1 | | | | | | | |
| **SUBTOTAL GUARDRAIL** | | | | **5401.905** | | | | | | | | | | | | | **16** | **5** | | **9** | | **33** | | **2** | | | | | |
| LESS ANCHOR UNIT DEDUCTIONS: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GRAU 350 | | 16 @ 15.24 | = | 243.84 | | | | | | | | | | | | | | | | | | | | | | | | | |
| M-350 | | 5 @ 11.43 | = | 57.15 | | | | | | | | | | | | | | | | | | | | | | | | | |
| CAT-1 | | 9 @ 1.905 | = | 17.145 | | | | | | | | | | | | | | | | | | | | | | | | | |
| B-77 | | 33 @ 5.715 | = | 188.595 | | | | | | | | | | | | | | | | | | | | | | | | | |
| **SUBTOTAL ANCHOR UNITS** | | | | **506.730** | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | **TOTAL** | **4895.175** | | | | | | | | | | | | | **16** | **5** | | **9** | | **33** | | **2** | | | | | |
| | | | **SAY** | **4,895.85** | | | | | | | | | | | | | | | | | | | | | | | | | |
| **(10 ADDITIONAL GUARDRAIL POSTS)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 4 |
| R /W SHEET NO. | 4 |

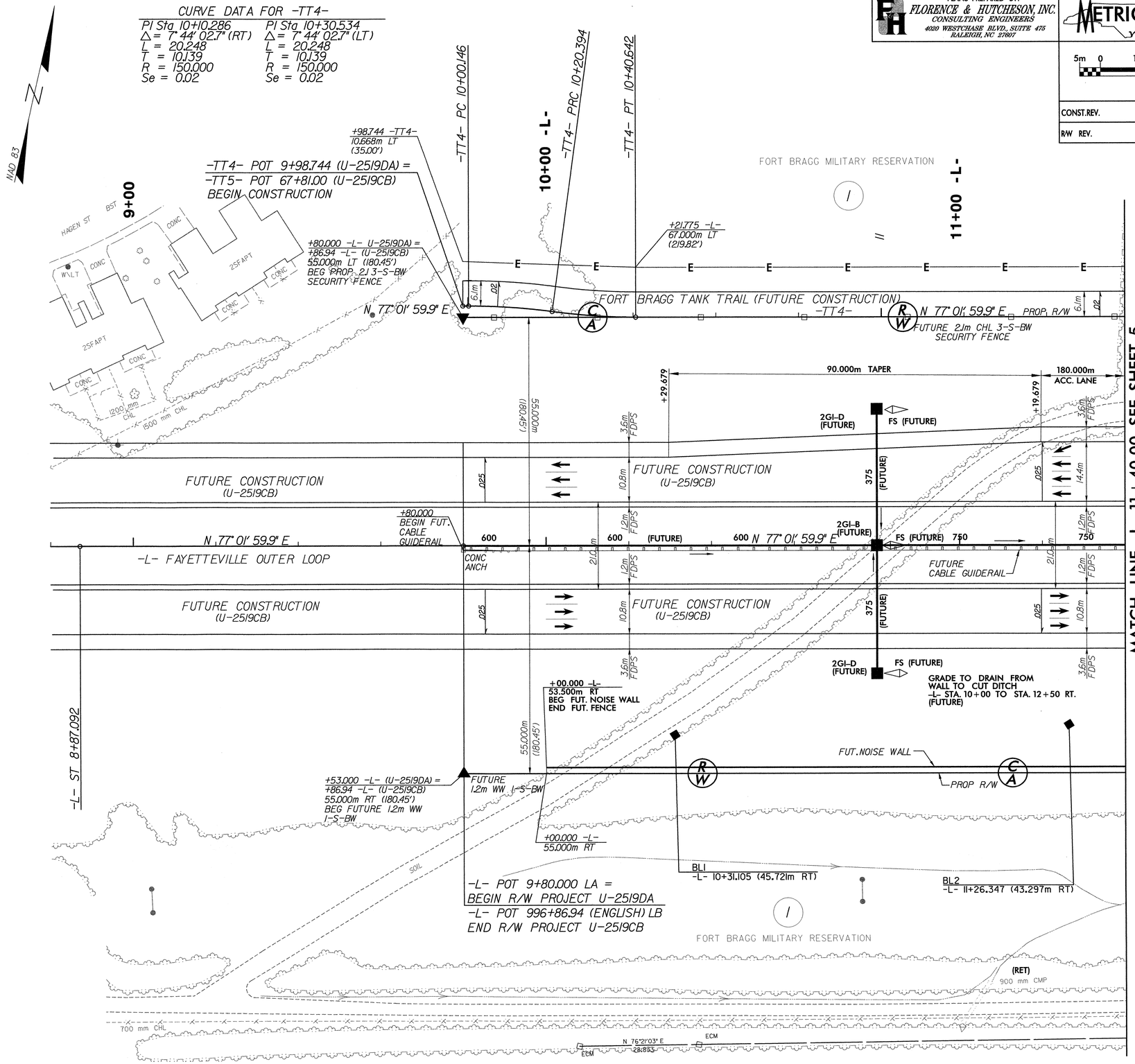
ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORY

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

5m 0 10m

CONST.REV.

R/W REV.




SEE SHEET 18 FOR -L- PROFILE
SEE SHEET 60 FOR -TT4- PROFILE

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DATE: 08/28/2008 02:16:53 PM
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PEN TABLE: M:\RdWCAD\PENTABS_F&H\F&H_Plan.tbl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

R/W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 5 |
| R/W SHEET NO. | 5 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MOORE
8-27-08

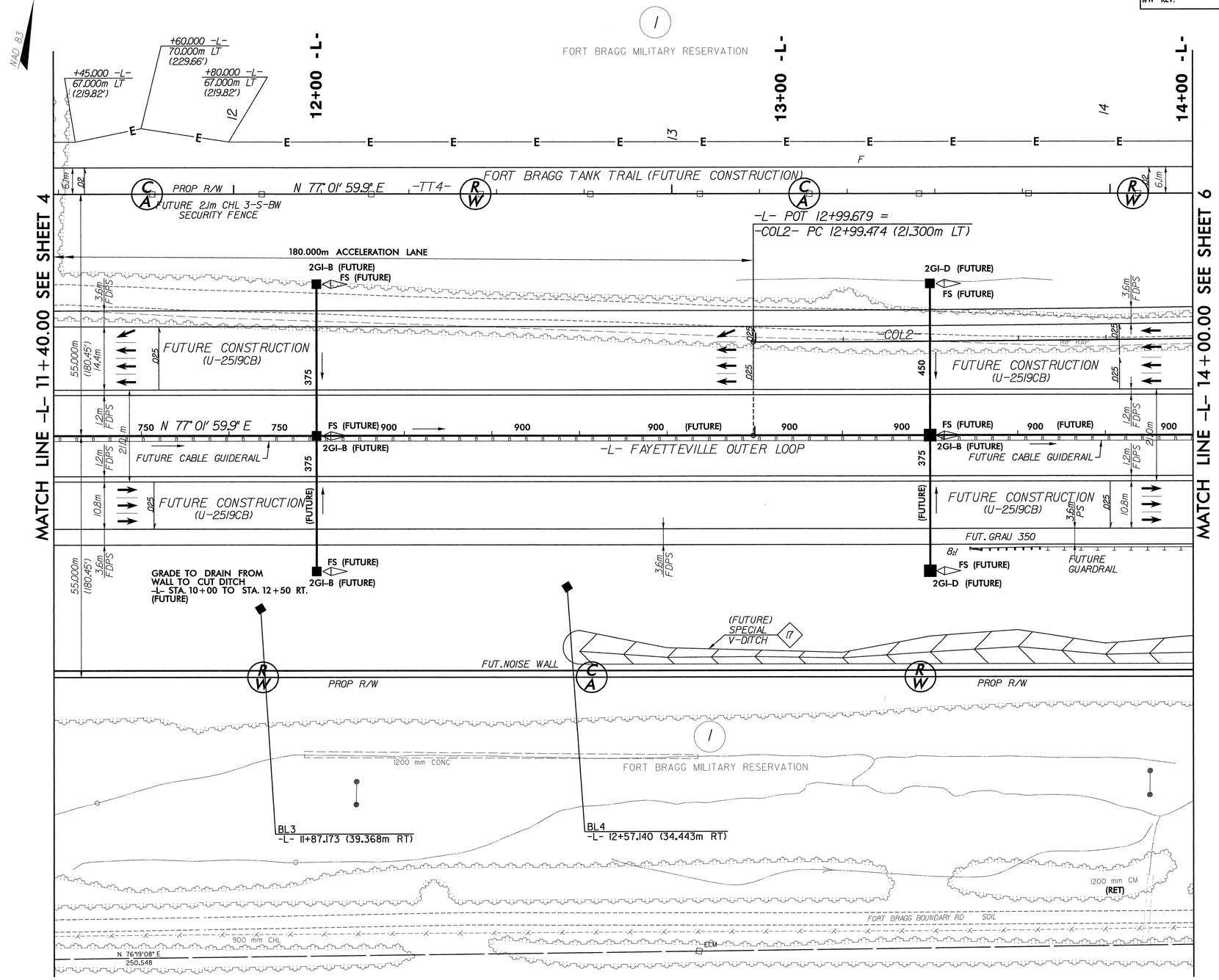
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS JR.
8/29/08

CURVE DATA FOR -COL2-

PI Sta 14+39.812
Δ = 2° 18' 01.2" (LT)
L = 280.639
T = 140.338
R = 6,990.000
Se = 0.025

PI Sta 17+88.573
Δ = 2° 18' 01.2" (RT)
L = 280.639
T = 140.338
R = 6,990.000
Se = 0.025

PIs Sta 44+65.302
θs = 0° 45' 28.8"
Ls = 91.542
LT = 61.029
ST = 30.515




SEE SHEETS 18-19 FOR -L- PROFILE
SEE SHEET 28 FOR -COL2- PROFILE
SEE SHEETS 60-61 FOR -TT4- PROFILE

FILE: r:\u-2519da\roadway\proj\U2519DA_RDY_PSH_05.dgn
DATE: 03/28/2008 02:17:18 PM
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PEN TABLE: M:\RdWCAD\PENTABS_RdWtbl\RdW_Pen.tbl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

CONST.REV.
R/W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 6 |
| R/W SHEET NO. | 6 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 2003 ENGINEER DENNIS JAMES MORAY
8-24-2006

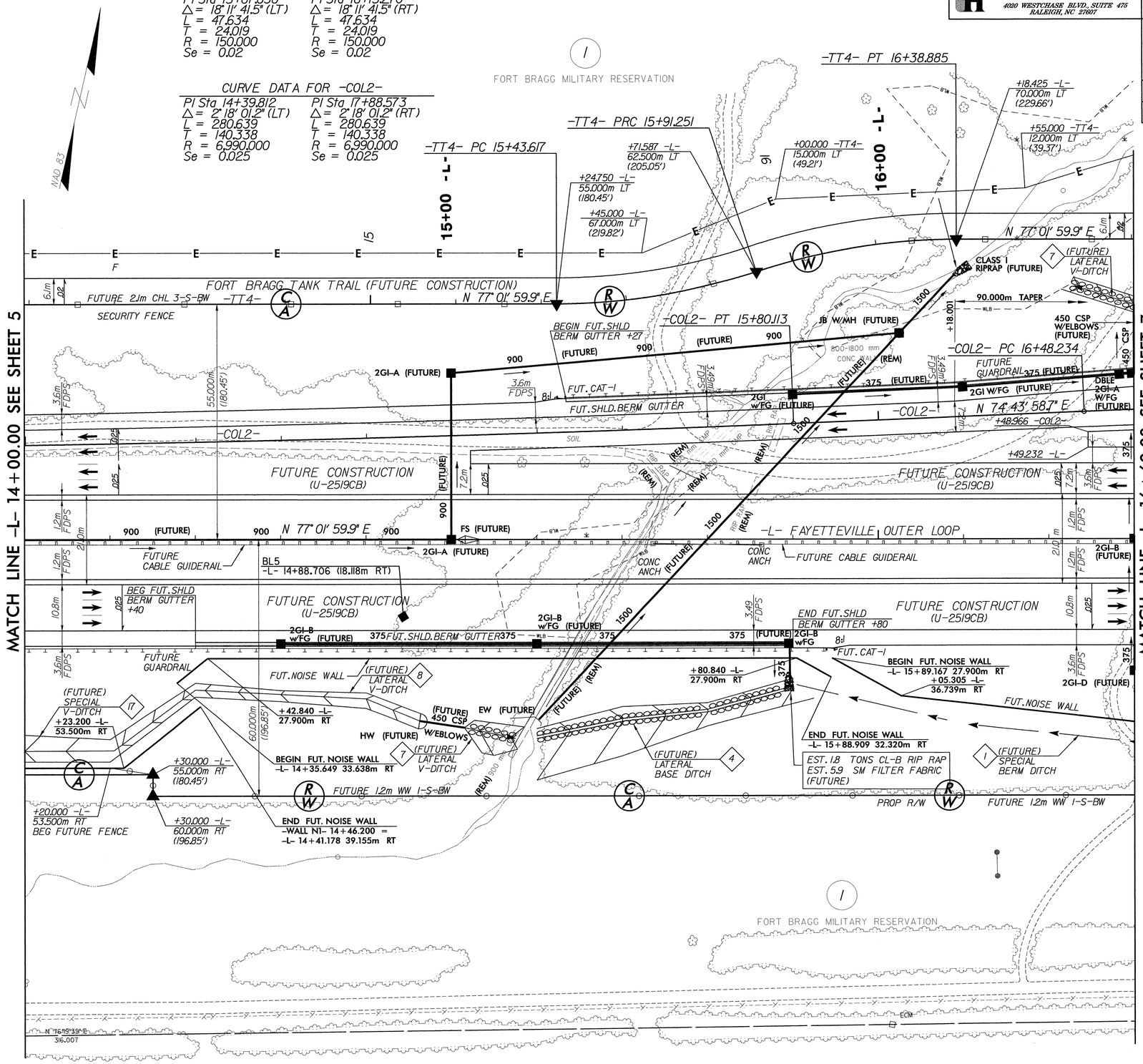
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS JR.
5/29/2008

CURVE DATA FOR -TT4-

| | |
|---|---|
| PI Sta 15+67.636 | PI Sta 16+15.270 |
| △= 18° 11' 41.5" (LT) | △= 18° 11' 41.5" (RT) |
| L = 47.634 | L = 47.634 |
| T = 24.019 | T = 24.019 |
| R = 150.000 | R = 150.000 |
| Se = 0.02 | Se = 0.02 |

CURVE DATA FOR -COL2-

| | |
|---|---|
| PI Sta 14+39.812 | PI Sta 17+88.573 |
| △= 2° 18' 01.2" (LT) | △= 2° 18' 01.2" (RT) |
| L = 280.639 | L = 280.639 |
| T = 140.338 | T = 140.338 |
| R = 6,990.000 | R = 6,990.000 |
| Se = 0.025 | Se = 0.025 |




SEE SHEET 19 FOR -L- PROFILE
SEE SHEET 28 FOR -COL2- PROFILE
SEE SHEET 61 FOR -TT4- PROFILE

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DATE: 06/26/2008 02:17:35 PM
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PWW FILE: H:\PWCAD\PROJECTS\U2519DA_D_RDY_PSH_01.dgn

PLANS PREPARED BY: FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS 848 CROSSHAIN CENTER SUITE 308 FAYETTEVILLE, NC 28305

METRIC

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 7 |
| R/W SHEET NO. | |
| 7 | |

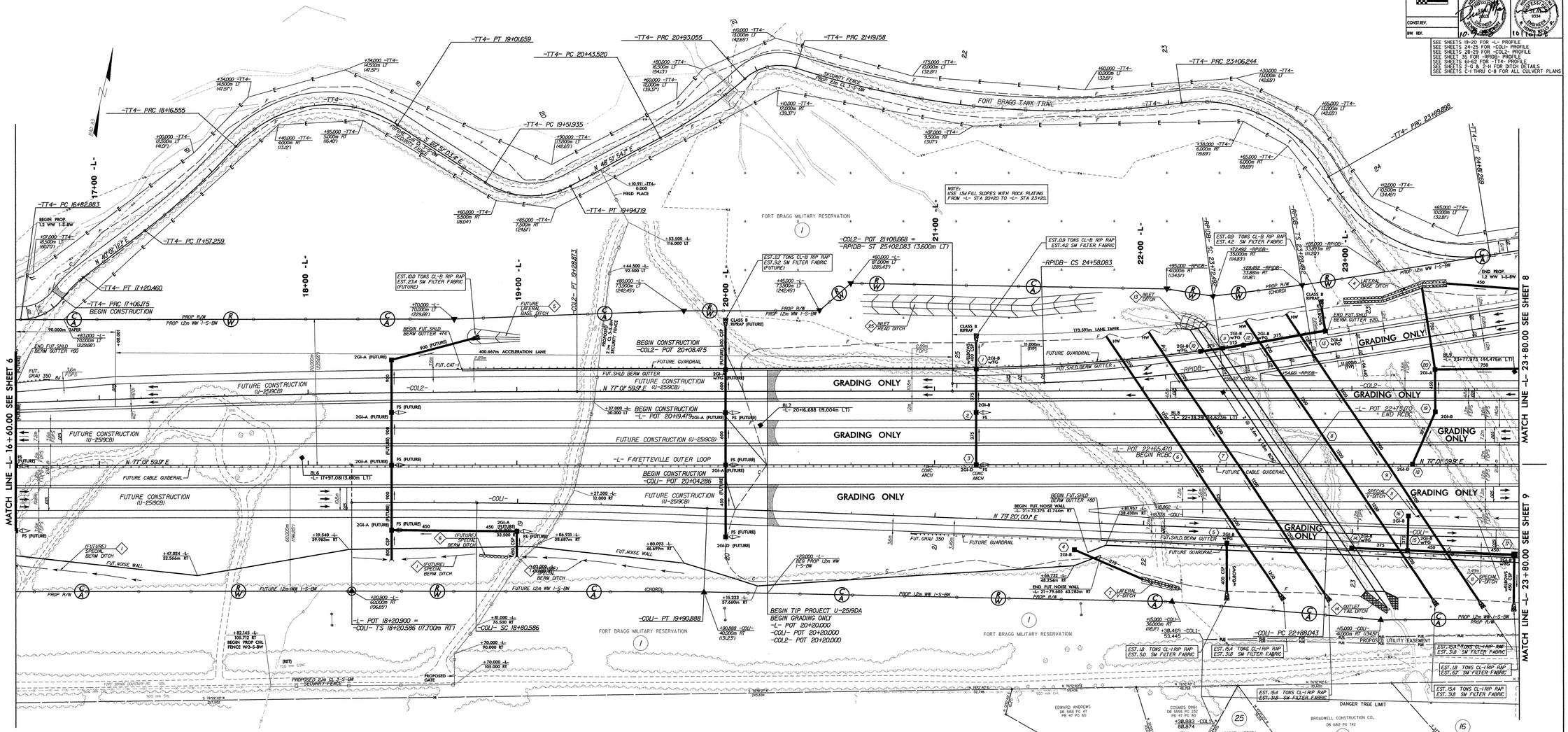
ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL ENGINEER 19314

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL ENGINEER 19314

CONST.REV.

RW REV.

SEE SHEETS 19-20 FOR -L- PROFILE
SEE SHEETS 24-25 FOR -COLI- PROFILE
SEE SHEETS 28-29 FOR -COL2- PROFILE
SEE SHEET 35 FOR -RPIDB- PROFILE
SEE SHEETS 61-62 FOR -TT4- PROFILE
SEE SHEETS 2-C & 2-H FOR DITCH DETAILS
SEE SHEETS C-1 THRU C-8 FOR ALL CULVERT PLANS




CURVE DATA FOR -COL2-

| | |
|---|---|
| PI Sta 14+39.812 | PI Sta 17+88.573 |
| Δ = 2° 18' 01.2" (LT) | Δ = 5° 18' 01.2" (RT) |
| L = 280.639 | L = 280.639 |
| T = 140.338 | T = 140.338 |
| R = 6,950.000 | R = 6,950.000 |
| Se = 0.025 | Se = 0.025 |

CURVE DATA FOR -COLI-

| | | |
|---|---|---|
| PIs Sta 18+60.586 | PI Sta 19+35.741 | PI Sta 23+58.204 |
| θs = 0° 29' 30.5" | Δ = 1° 48' 29.7" (RT) | Δ = 2° 18' 00.2" (LT) |
| Ls = 60.000 | L = 110.302 | L = 140.302 |
| LT = 40.000 | T = 55.155 | T = 70.150 |
| ST = 20.000 | R = 3,495.000 | R = 3,495.000 |
| | Se = 0.025 | Se = 0.025 |

| | |
|---|---|
| PIs Sta 30+36.640 | |
| θs = 0° 45' 10.5" | |
| Ls = 46.000 | |
| LT = 30.667 | |
| ST = 15.334 | |

CURVE DATA FOR -RPIDB-

| | | |
|---|---|---|
| PIs Sta 23+57.827 | PI Sta 24+15.326 | PIs Sta 24+17.275 |
| θs = 1° 57' 40.4" | Δ = 3° 52' 39.2" (RT) | θs = 1° 57' 40.4" |
| Ls = 44.000 | L = 85.598 | Ls = 44.000 |
| LT = 29.334 | T = 42.834 | LT = 29.334 |
| ST = 14.668 | R = 825.000 | ST = 14.668 |
| | Se = 0.04 | |

CURVE DATA FOR -TT4-

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PI Sta 10+10.286 | PI Sta 10+30.534 | PI Sta 15+67.636 | PI Sta 16+15.210 | PI Sta 16+95.45 | PI Sta 17+13.366 | PI Sta 17+38.000 | PI Sta 18+68.044 | PI Sta 19+75.630 | PI Sta 20+68.403 | PI Sta 21+07.437 | PI Sta 22+14.318 | PI Sta 23+53.880 | PI Sta 24+46.229 |
| Δ = 7° 44' 02.7" (RT) | Δ = 7° 44' 02.7" (LT) | Δ = 18° 11' 41.9" (LT) | Δ = 18° 11' 41.9" (RT) | Δ = 53° 22' 56.8" (LT) | Δ = 16° 22' 08.8" (RT) | Δ = 11° 08' 20.8" (LT) | Δ = 81° 16' 05.3" (RT) | Δ = 67° 11' 01.9" (LT) | Δ = 53° 32' 53.3" (LT) | Δ = 38° 48' 30.0" (RT) | Δ = 26° 49' 46.0" (LT) | Δ = 68° 28' 19.9" (RT) | Δ = 67° 48' 06.7" (LT) |
| L = 20.248 | L = 20.248 | L = 47.534 | L = 47.534 | L = 214.950 | L = 14.886 | L = 297.42 | L = 85.104 | L = 42.794 | L = 49.535 | L = 24.863 | L = 187.266 | L = 83.655 | L = 59.523 |
| T = 10.139 | T = 10.139 | T = 24.009 | T = 24.009 | T = 112.503 | T = 7.78 | T = 169.296 | T = 51.489 | T = 23.595 | T = 26.604 | T = 12.903 | T = 95.560 | T = 47.536 | T = 31.370 |
| R = 150.000 | R = 150.000 | R = 150.000 | R = 150.000 | R = 25.000 | R = 50.000 | R = 305.000 | R = 60.000 | R = 40.000 | R = 210.000 | R = 25.000 | R = 415.000 | R = 70.000 | R = 75.000 |
| Se = 0.02 | Se = 0.02 | Se = 0.02 | Se = 0.02 | Se = 0.02 | Se = 0.02 | Se = 0.02 | Se = 0.02 | Se = 0.02 | Se = 0.02 | Se = 0.02 | Se = 0.02 | Se = 0.02 | Se = 0.02 |

NOTE: HIGH STRENGTH FABRIC FOR EMBANKMENT STABILIZATION SHALL BE PLACED BETWEEN STA 23+15 AND STA 24+83 -RPIDB-. SEE SPECIAL PROVISION - HIGH STRENGTH FABRIC FOR EMBANKMENT STABILIZATION ON SHT 2-AI

NOTE: A GEOGRID REINFORCED SOIL SLOPE SHALL BE PLACED BETWEEN STA 20+20 TO 21+08 -L- (LEFT) AND STA 21+08 TO 22+91.5 -RPIDB- (RIGHT). SEE SPECIAL PROVISION - GEOGRID REINFORCED SLOPE ON SHTS 2-AH & 2-AJ

LOCATION: FAYETTEVILLE OUTER LOOP FROM EAST OF SR 1415 TO WEST OF NC 24 (BRAGG BLVD.)

TIP NO.: U-2519DA COUNTY: CUMBERLAND

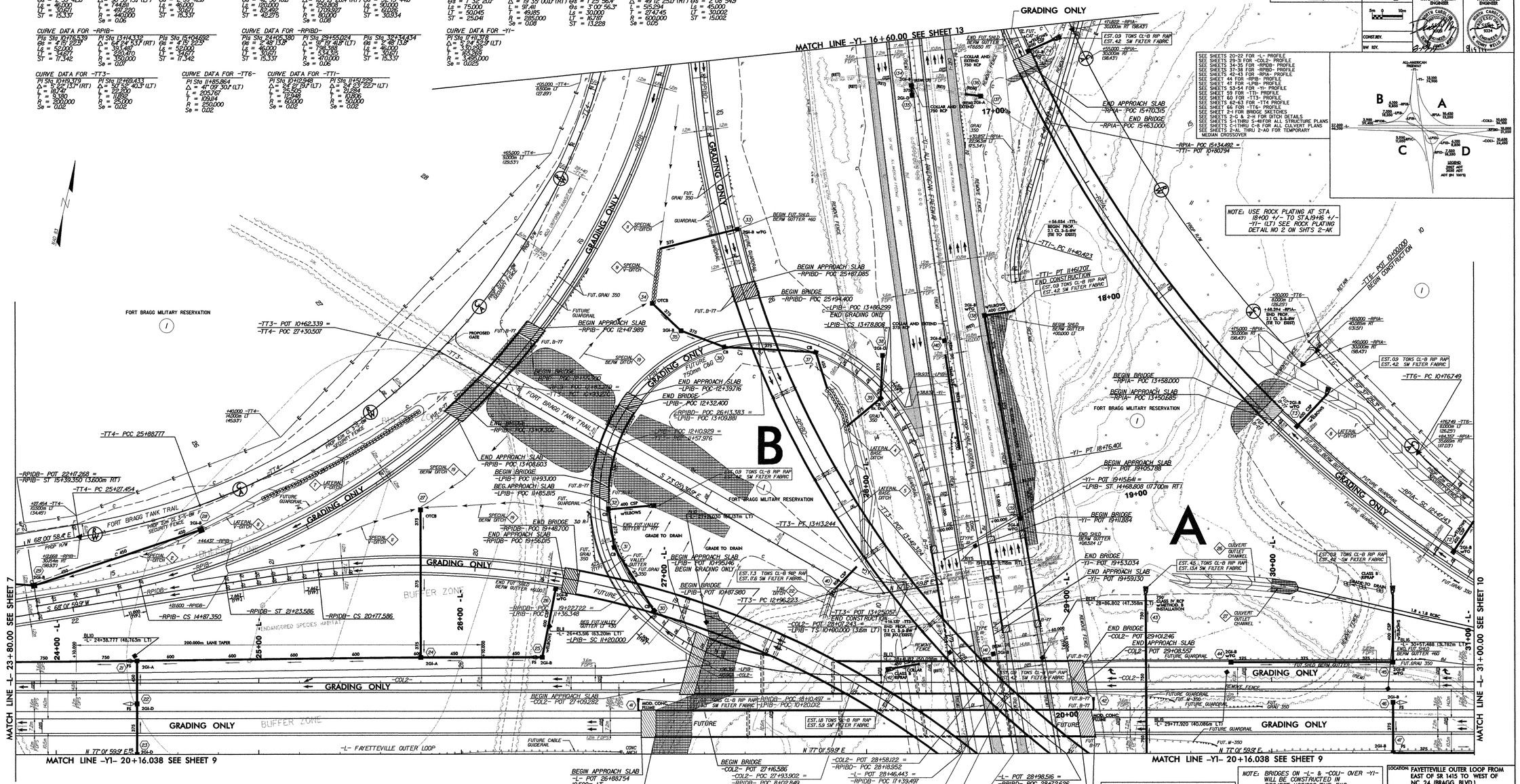
DESIGNED BY: DATE:

CHECKED BY: DATE:

FILE: U2519DA_R-7-SHEET7.DGN, R7_R7_SF.DGN
Created by: FHI, USERNAME: FHI, FHI, SF.DGN
Last Modified: 10/13/2020 2:00:00 PM
DGN SIZE: 34.0000 X 22.0000 IN
DGN SEED: M:\PROJECTS\PROJECT_FILES\SEED\SEED_MASTER.DGN

PLANS PREPARED BY: FLORENCE & HUTCHISON, INC. CONSULTING ENGINEERS 604 CROSSTOWN DR, SUITE 101 PEARL, MS 39208

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 8 |
| R/W SHEET NO. | 8 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
| CONST.REV. | |
| R/W REV. | |




LOCATION: FAYETTEVILLE OUTER LOOP FROM EAST OF SR 1415 TO WEST OF NC 24 (BRAGG BLVD.)

TIP NO.: U-2519DA COUNTY: CUMBERLAND

DESIGNED BY: DATE:

CHECKED BY: DATE:

PLANS PREPARED BY: FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS 840 CROSSPOINT DR., SUITE 100 RALEIGH, NC 27603

METRICS

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 9 |
| R/W SHEET NO. | 9 |

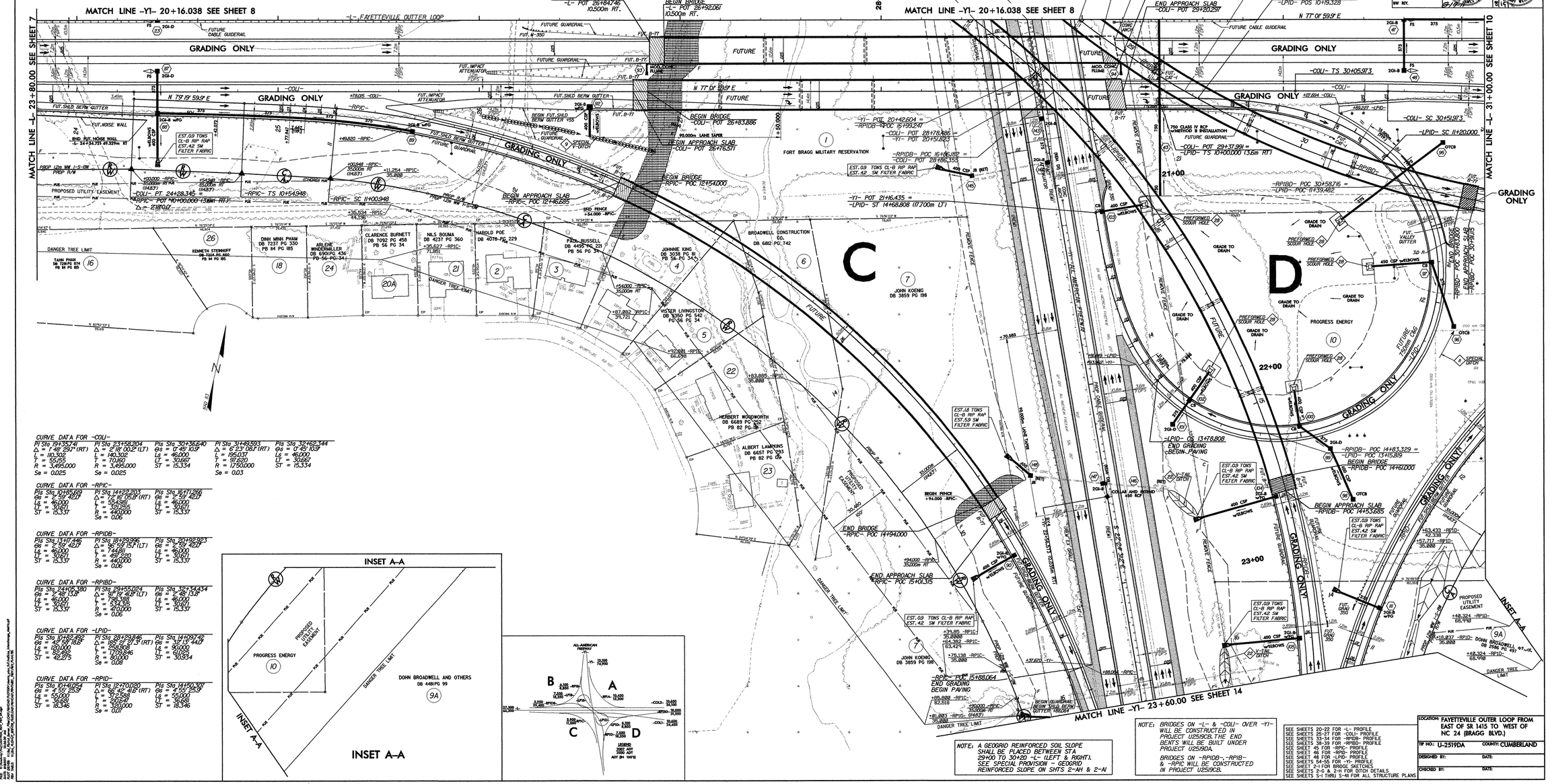
ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL ENGINEER 15374 JAMES W. WEBB 8/5/2010

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL ENGINEER 15374 JAMES W. WEBB 8/5/2010

5m 0 10m

CONST. REV.

NW REV.




CURVE DATA FOR -COU-

| PI Sta 19+35.74 | PI Sta 23+58.204 | PIs Sta 30+36.640 | PI Sta 31+49.593 | PIs Sta 32+62.544 |
|---|---|---|---|---|
| Δ = 1°48'29.7" (RT) | Δ = 2°18'00.2" (LT) | Θs = 0°45'10.5" | Δ = 6°23'08.1" (RT) | Θs = 0°45'10.5" |
| L = 101.502 | L = 140.302 | Ls = 46.000 | L = 195.037 | Ls = 46.000 |
| T = 55.155 | T = 70.160 | LT = 30.667 | T = 97.620 | LT = 30.667 |
| R = 3,495.000 | R = 3,495.000 | ST = 15.334 | R = 1,750.000 | ST = 15.334 |
| Se = 0.025 | Se = 0.025 | | Se = 0.03 | |

CURVE DATA FOR -RPIC-

| PIs Sta 10+95.669 | PI Sta 14+22.203 | PIs Sta 16+71.266 |
|---|---|---|
| Θs = 2°59'42.9" | Δ = 12°16'05.2" (RT) | Θs = 2°59'42.9" |
| Ls = 46.000 | L = 254.381 | Ls = 46.000 |
| LT = 30.671 | T = 127.326 | LT = 30.671 |
| ST = 15.337 | R = 1,190.000 | ST = 15.337 |
| | Se = 0.06 | |

CURVE DATA FOR -RPIDB-

| PIs Sta 13+17.446 | PI Sta 18+23.996 | PIs Sta 20+32.923 |
|---|---|---|
| Θs = 2°59'42.9" | Δ = 96°59'15.7" (LT) | Θs = 2°59'42.9" |
| Ls = 46.000 | L = 144.811 | Ls = 46.000 |
| LT = 30.671 | T = 97.220 | LT = 30.671 |
| ST = 15.337 | R = 140.000 | ST = 15.337 |
| | Se = 0.06 | |

CURVE DATA FOR -RPIBD-

| PIs Sta 24+15.380 | PI Sta 29+15.024 | PIs Sta 32+34.434 |
|---|---|---|
| Θs = 2°48'13.8" | Δ = 70°14'41.8" (LT) | Θs = 2°48'13.8" |
| Ls = 46.000 | L = 198.348 | Ls = 46.000 |
| LT = 30.671 | T = 57.326 | LT = 30.671 |
| ST = 15.337 | R = 161.000 | ST = 15.337 |
| | Se = 0.06 | |

CURVE DATA FOR -LPID-

| PIs Sta 10+12.892 | PI Sta 13+12.946 | PIs Sta 14+05.746 |
|---|---|---|
| Θs = 42°58'16.5" | Δ = 18°34'51.3" (RT) | Θs = 32°13'44.0" |
| Ls = 120.000 | L = 258.963 | Ls = 90.000 |
| LT = 82.455 | T = 131.946 | LT = 61.025 |
| ST = 42.275 | R = 80.000 | ST = 30.934 |
| | Se = 0.08 | |

CURVE DATA FOR -RPID-

| PIs Sta 10+41.054 | PI Sta 12+70.090 | PIs Sta 14+50.707 |
|---|---|---|
| Θs = 2°55'29.5" | Δ = 98°45'41.8" (RT) | Θs = 2°55'29.5" |
| Ls = 55.000 | L = 316.568 | Ls = 55.000 |
| LT = 36.681 | T = 209.48 | LT = 36.681 |
| ST = 18.346 | R = 300.000 | ST = 18.346 |
| | Se = 0.07 | |

NOTE: A GEOGRID REINFORCED SOIL SLOPE SHALL BE PLACED BETWEEN STA 29+00 TO 30+20 -L- (LEFT & RIGHT). SEE SPECIAL PROVISION - GEOGRID REINFORCED SLOPE ON SHTS 2-AH & 2-AI

NOTE: BRIDGES ON -L- & -COU- OVER -Y1- WILL BE CONSTRUCTED IN PROJECT U2519CB. THE END BENTS WILL BE BUILT UNDER PROJECT U2519DA.

BRIDGES ON -RPIDB-, -RPIB- & -RPIC WILL BE CONSTRUCTED IN PROJECT U2519CB.

SEE SHEETS 20-22 FOR -L- PROFILE
SEE SHEETS 25-27 FOR -COU- PROFILE
SEE SHEETS 33-34 FOR -RPIDB- PROFILE
SEE SHEETS 38-39 FOR -RPIBD- PROFILE
SEE SHEET 45 FOR -RPIC- PROFILE
SEE SHEET 46 FOR -RPID- PROFILE
SEE SHEET 48 FOR -LPID- PROFILE
SEE SHEETS 54-55 FOR -Y1- PROFILE
SEE SHEET 2-I FOR BRIDGE SKETCHES
SEE SHEETS 2-G & 2-H FOR DITCH DETAILS
SEE SHEETS 5-1 THRU 5-41 FOR ALL STRUCTURE PLANS

LOCATION: FAYETTEVILLE OUTER LOOP FROM EAST OF SR 1415 TO WEST OF NC 24 (BRAGG BLVD.)

TIP NO.: U-2519DA COUNTY: CUMBERLAND

DESIGNED BY: DATE:

CHECKED BY: DATE:

CURVE DATA FOR -RPIA-

| | | |
|---|---|---|
| PI Sta 10+94.77 | PI Sta 11+68.97 | PI Sta 12+30.371 |
| Θs = 1°32'20.1" | Δ = 19°39'00.0" (RT) | Θs = 1°29'56.4" |
| Ls = 75.000 | Ls = 97.411 | Ls = 30.000 |
| LT = 50.045 | T = 49.185 | LT = 16.787 |
| ST = 25.041 | R = 285.000 | ST = 13.228 |
| | Sθ = 0.016 | |

CURVE DATA FOR -COU-

| | | | |
|---|---|---|---|
| PI Sta 23+58.204 | PI Sta 30+36.640 | PI Sta 31+49.593 | PI Sta 32+62.344 |
| Δ = 2°18'00.2" (LT) | Θs = 0°45'10.9" | Θs = 0°45'10.9" | Θs = 0°45'10.9" |
| L = 140.302 | Ls = 46.000 | Ls = 46.000 | Ls = 46.000 |
| T = 70.160 | LT = 30.667 | T = 97.820 | LT = 30.667 |
| R = 3,495.000 | ST = 15.334 | R = 1,750.000 | ST = 15.334 |
| Sθ = 0.025 | | Sθ = 0.03 | |

CURVE DATA FOR -RPIBD-

| | | | | | | |
|---|---|---|---|---|---|---|
| PI Sta 24+06.380 | PI Sta 29+55.024 | PI Sta 32+34.434 | PI Sta 36+78.048 | PI Sta 37+25.091 | PI Sta 37+72.108 | |
| Θs = 2°48'13.8" | Θs = 9°34'41.8" (LT) | Θs = 2°48'13.8" | Θs = 46.000 | Θs = 0°33'59.1" (RT) | Θs = 1°31'01.8" | |
| Ls = 46.000 | L = 736.388 | Ls = 46.000 | Ls = 30.668 | L = 63.394 | Ls = 46.000 | |
| LT = 30.661 | T = 534.105 | LT = 30.661 | LT = 30.668 | T = 31.711 | LT = 30.668 | |
| ST = 15.331 | R = 470.000 | ST = 15.331 | ST = 15.334 | R = 107.000 | ST = 15.334 | |
| | Sθ = 0.06 | | | Sθ = 0.04 | | |

CURVE DATA FOR -RPID-

| | | |
|---|---|---|
| PI Sta 10+41.054 | PI Sta 12+70.020 | PI Sta 14+50.307 |
| Θs = 1°52'25.9" | Δ = 66°46'46.8" (RT) | Θs = 1°52'25.9" |
| Ls = 55.000 | L = 2,358.78 | Ls = 55.000 |
| LT = 36.681 | T = 1,267.87 | LT = 36.681 |
| ST = 18.346 | R = 1,200.000 | ST = 18.346 |
| | Sθ = 0.07 | |

CURVE DATA FOR -TT6-

| | | | |
|---|---|---|---|
| PI Sta 11+85.864 | PI Sta 13+45.954 | PI Sta 14+36.375 | PI Sta 18+41.473 |
| Δ = 46°05'30.1" (LT) | Δ = 9°04'03.2" (RT) | Δ = 7°15'07.3" (LT) | Δ = 37°29'51.4" (LT) |
| L = 205.767 | L = 126.609 | L = 54.426 | L = 235.615 |
| T = 109.114 | T = 63.437 | T = 27.249 | T = 122.201 |
| R = 250.000 | R = 800.000 | R = 430.000 | R = 360.000 |
| Sθ = 0.02 | Sθ = 0.02 | Sθ = 0.02 | Sθ = 0.02 |

PLANS PREPARED BY:
FLORENCE & HUTCHISON, INC.
CONSULTING ENGINEERS
848 CROTOMOTOR INN, SUITE 108
FAYETTEVILLE, NC 28305

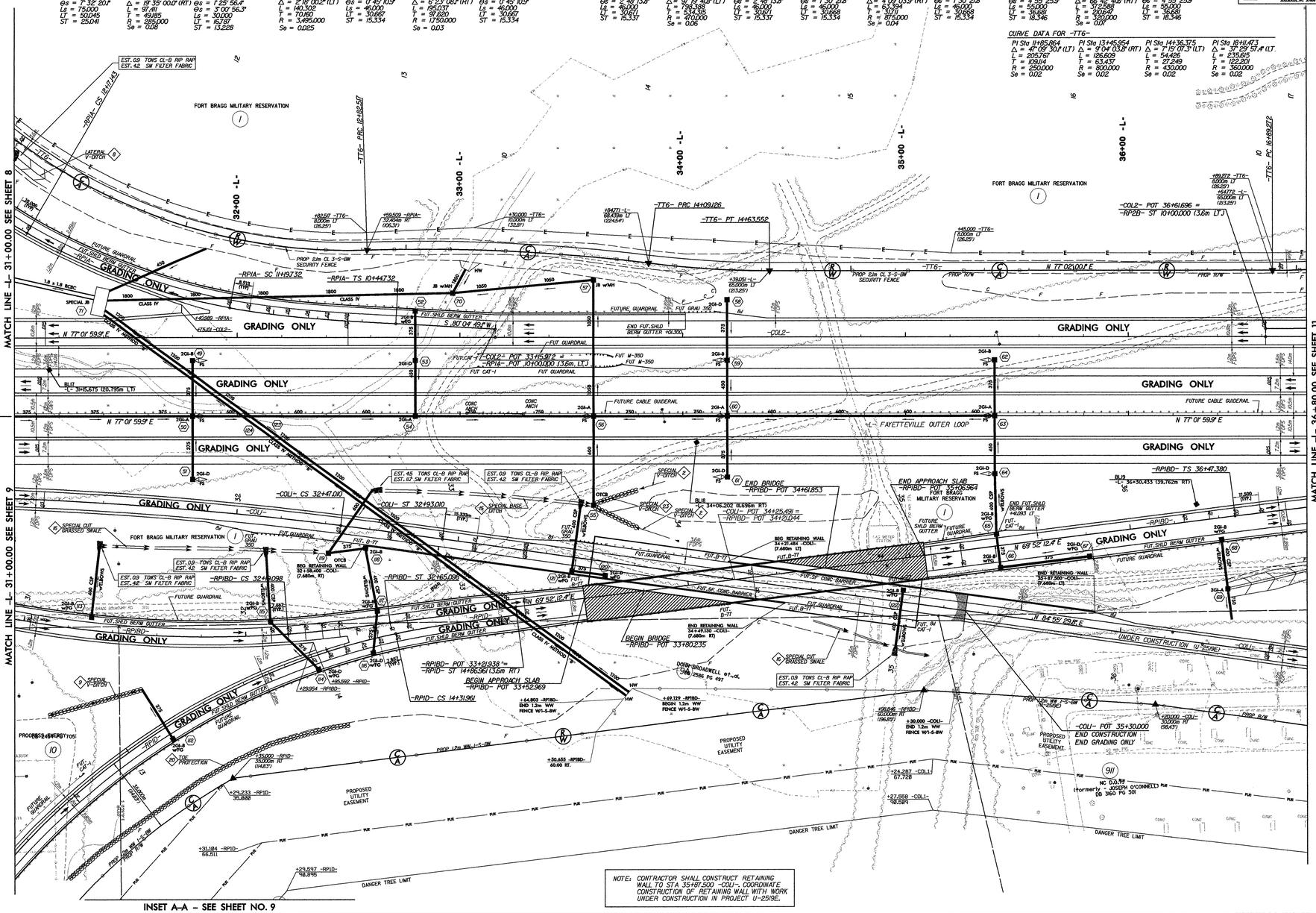
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 10 |
| R/W SHEET NO. | 10 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

METRIC
5m 0 10m

NORTH CAROLINA PROFESSIONAL SEAL 15397 ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 6334 ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETE
01/13/11

CONST.REV.
INV. REV.

SEE SHEET 22 FOR -L- PROFILE
SEE SHEET 27 FOR -COU- PROFILE
SEE SHEET 31 FOR -COL2- PROFILE
SEE SHEETS 33-41 FOR -RPIBD- PROFILE
SEE SHEET 42 FOR -RPIA- PROFILE
SEE SHEET 45 FOR -RPID- PROFILE
SEE SHEET 46 FOR -RP2B- PROFILE
SEE SHEETS 66-67 FOR -TT6- PROFILE
SEE SHEET 2-1 FOR BRIDGE SKETCHES
SEE SHEETS 2-2 & 2-3 FOR WALL DETAILS
SEE SHEETS 2-0 & 2-4 FOR DITCH DETAILS
SEE SHEETS S-1 THRU S-8 FOR ALL STRUCTURE PLANS
SEE SHEETS C-6 THRU C-9 FOR ALL CULVERT PLANS
SEE SHEETS W-1 THRU W-3 FOR RETAINING WALL PLANS




NOTE: CONTRACTOR SHALL CONSTRUCT RETAINING WALL TO STA. 35+87.500 -COU-. COORDINATE CONSTRUCTION OF RETAINING WALL WITH WORK UNDER CONSTRUCTION IN PROJECT U-2519E.

INSET A-A - SEE SHEET NO. 9

LOCATION: FAYETTEVILLE OUTER LOOP FROM EAST OF SR 1415 TO WEST OF NC 24 (BRAGG BLVD.)

TIP NO.: U-2519DA COUNTY: CUMBERLAND

DESIGNED BY: DATE:

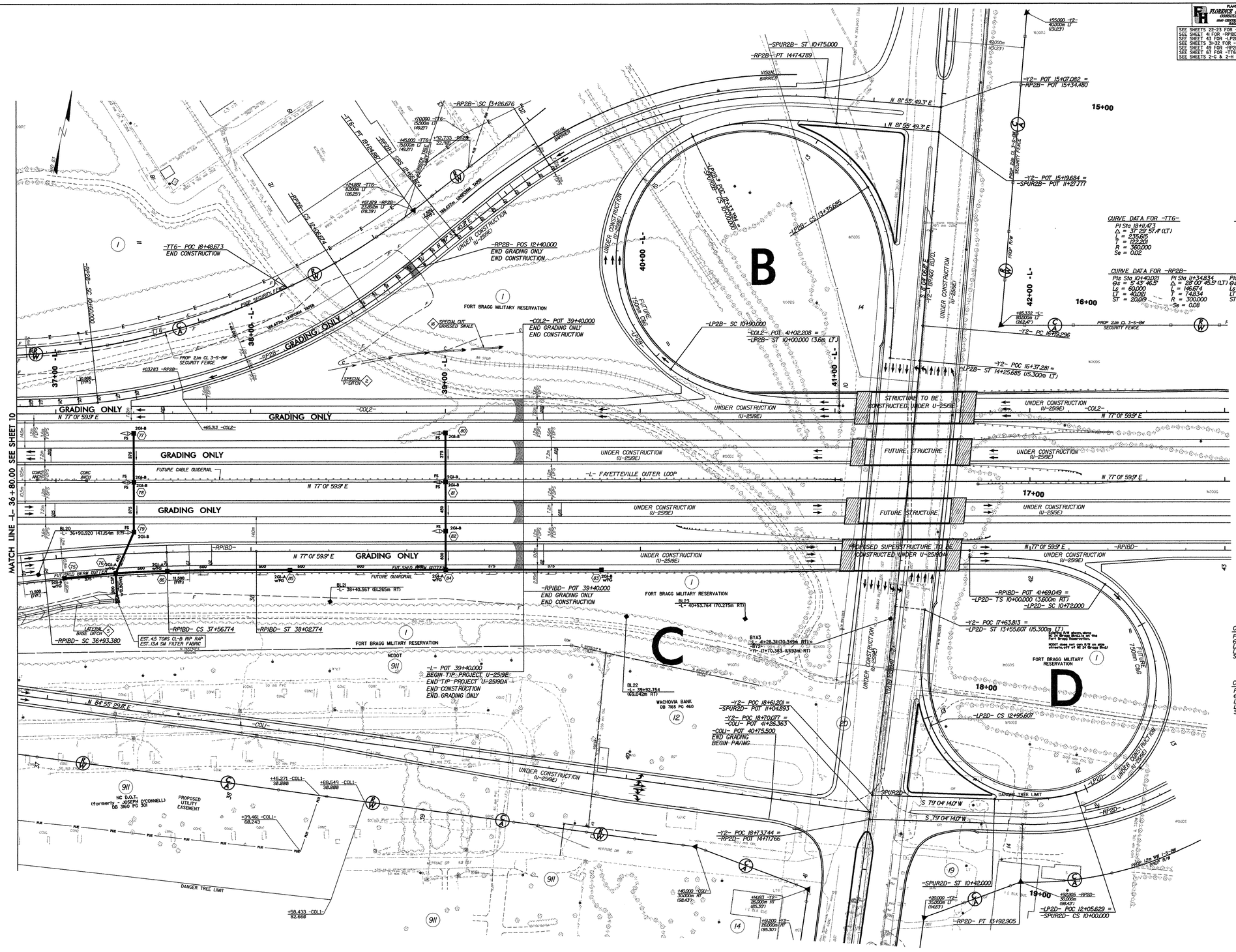
CHECKED BY: DATE:

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
8501 CHEVISKIE RD, SUITE 104
RALEIGH, N.C. 27613

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 11 |
| R/W SHEET NO. | |
| 11 & 12 | |

ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL ENGINEER 019
CONST. REV.
SW REV.

SEE SHEETS 22-23 FOR -L- PROFILE
SEE SHEET 41 FOR -RPBD- PROFILE
SEE SHEET 43 FOR -LP2D- PROFILE
SEE SHEETS 31-32 FOR -COL2- PROFILE
SEE SHEET 49 FOR -RP2B- PROFILE
SEE SHEET 67 FOR -TT6- PROFILE
SEE SHEETS 2-G & 2-H FOR DITCH DETAILS




CURVE DATA FOR -TT6-

| | |
|---|---|
| PI Sta 18+11.413 | |
| Δ = 37° 25' 57.4" (LT) | |
| L = 235.815 | |
| T = 122.201 | |
| R = 360.000 | |
| Se = 0.02 | |

CURVE DATA FOR -LP2B-

| | | |
|---|---|---|
| PI Sta 10+61.352 | PI Sta 14+65.929 | PI Sta 13+67.388 |
| Δs = 36° 49' 58.2" | Δ = 20° 05' 49.9" (RT) | Δs = 0° 25' 47.5" |
| Ls = 90.000 | Ls = 245.685 | Θs = 36° 51' 12.8" |
| LT = 61.352 | T = 375.929 | Ls = 90.000 |
| ST = 31.233 | R = 700.000 | LT = 60.996 |
| | Se = 0.08 | ST = 31.703 |

CURVE DATA FOR -RP2B-

| | | | | |
|---|---|---|---|---|
| PI Sta 10+40.021 | PI Sta 11+34.834 | PI Sta 12+26.693 | PI Sta 13+06.711 | PI Sta 14+03.403 |
| Θs = 5° 43' 46.5" | Δ = 28° 00' 49.5" (LT) | Θs = 5° 43' 46.5" | Θs = 1° 28' 24.1" | Δ = 36° 53' 49.5" (RT) |
| Ls = 60.000 | L = 146.674 | Ls = 60.000 | Ls = 60.000 | L = 148.114 |
| LT = 40.061 | T = 74.834 | LT = 40.061 | LT = 40.036 | T = 76.727 |
| ST = 20.019 | R = 300.000 | ST = 20.019 | ST = 20.032 | R = 230.000 |
| | Se = 0.08 | | | Se = 0.08 |

CURVE DATA FOR -Y2-

| |
|---|
| PI Sta 17+85.309 |
| Δ = 3° 48' 12.0" (RT) |
| L = 331.904 |
| T = 166.013 |
| R = 5,000.000 |
| Se = 0.025 |

CURVE DATA FOR -RPBD-

| | | |
|---|---|---|
| PI Sta 36+18.048 | PI Sta 37+25.091 | PI Sta 37+72.108 |
| Θs = 1° 30' 21.8" | Δ = 4° 09' 03.9" (RT) | Θs = 1° 30' 21.8" |
| Ls = 46.000 | L = 63.394 | Ls = 46.000 |
| LT = 30.668 | T = 31.711 | LT = 30.668 |
| ST = 15.334 | R = 875.000 | ST = 15.334 |
| | Se = 0.04 | |

CURVE DATA FOR -LP2D-

| | | |
|---|---|---|
| PI Sta 10+48.938 | PI Sta 12+71.177 | PI Sta 13+16.096 |
| Θs = 34° 22' 38.9" | Δ = 213° 31' 43.8" (RT) | Θs = 28° 38' 52.4" |
| Ls = 72.000 | L = 223.607 | Ls = 60.000 |
| LT = 48.938 | T = 199.177 | LT = 40.537 |
| ST = 24.855 | R = 60.000 | ST = 20.489 |
| | Se = 0.08 | |

LOCATION: FAYETTEVILLE OUTER LOOP FROM EAST OF SR 1415 TO WEST OF NC 24 (BRAGG BLVD.)

| | |
|---|---|
| TIP NO.: U-2519DA | COUNTY: CUMBERLAND |
| DESIGNED BY: | DATE: |
| CHECKED BY: | DATE: |

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

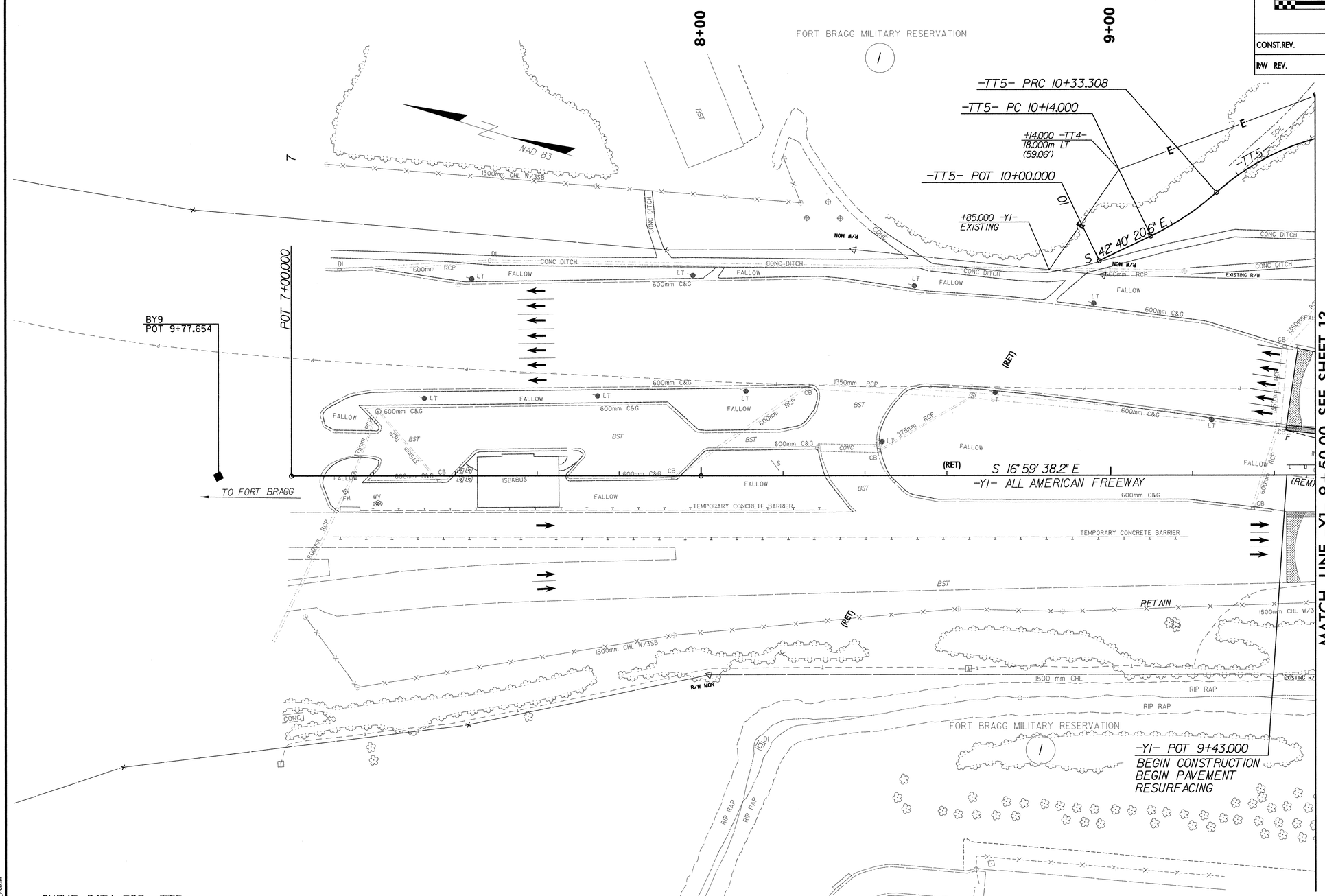
CONST.REV.

R/W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 12 |
| R /W SHEET NO. | 15 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 2005 ENGINEER DENNIS JAMES MORY
8-29-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR.
8/29/08




CURVE DATA FOR -TT5-

| | |
|---|---|
| PI Sta 10+23.716 | PI Sta 10+56.030 |
| Δ = 15° 48' 14.5" (LT) | Δ = 41° 28' 56.6" (RT) |
| L = 19.308 | L = 43.440 |
| T = 9.716 | T = 22.721 |
| R = 70.000 | R = 60.000 |
| Se = 0.02 | Se = 0.02 |

SEE SHEET 51 FOR -Y1- PROFILE

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PLOT SHEET: M:\SHACAD\BDY\BDS\U2519DA_BDY_RSH_12.dgn

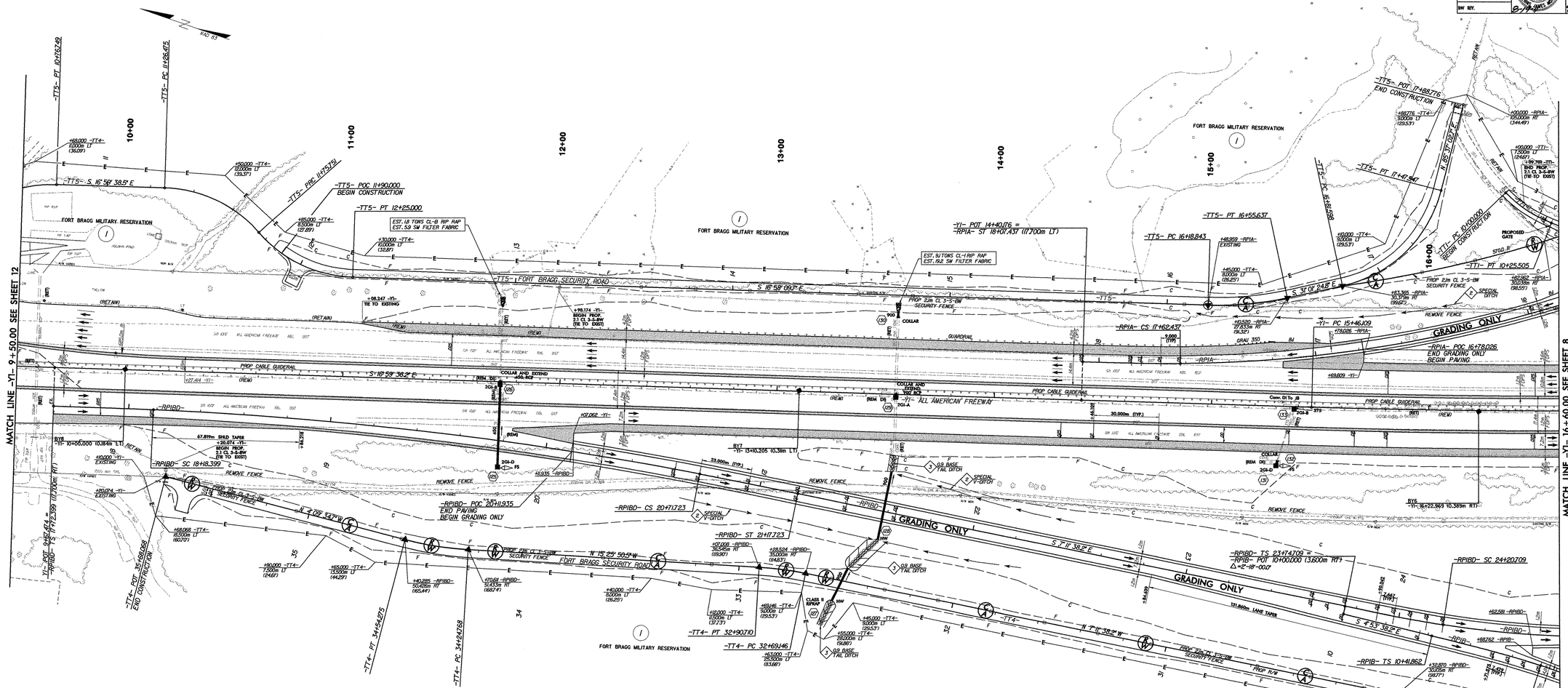
PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
848 CROTOMON DR., SUITE 3B
RALEIGH, NC 27609

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 13 |
| R/W SHEET NO. | 16 |

ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER

5m 0 10m

CONST.REV.
SW REV.




CURVE DATA FOR -RPIBD-

| | | | | | |
|---|---|---|---|---|---|
| PIs Sta 18+03.066 | PI Sta 19+48.283 | PIs Sta 20+48.057 | PIs Sta 24+15.380 | PI Sta 29+50.924 | PIs Sta 32+34.434 |
| Δ = 12°45'00.0" | Δ = 8°17'38.2" (RT) | Δ = 0°45'10.0" | Δ = 2°48'13.8" | Δ = 30°15'41.8" (LT) | Δ = 2°48'13.8" |
| Lc = 46.000 | L = 253.334 | Lc = 46.000 | Lc = 46.000 | L = 798.388 | Lc = 46.000 |
| Lt = 30.661 | Lc = 1282.884 | Lt = 30.662 | Lt = 30.661 | L = 534.305 | Lt = 30.661 |
| St = 15.334 | R = 17500.000 | St = 15.334 | St = 15.331 | R = 470.000 | St = 15.331 |
| | Se = 0.025 | | | Se = 0.06 | |

CURVE DATA FOR -Y1-

| |
|---|
| PI Sta 17+16.316 |
| Δ = 5°24'52.5" (LT) |
| L = 3.370.626 |
| Lc = 165.363 |
| R = 3,659.000 |
| Se = 0.025 |

CURVE DATA FOR -RPIA-

| | |
|---|---|
| PI Sta 15+21.889 | PIs Sta 17+77.439 |
| Δ = 48°12'25.0" (RT) | Δs = 2°08'54.9" |
| L = 515.294 | Lc = 45.000 |
| T = 271.745 | Lt = 30.002 |
| R = 600.000 | St = 15.002 |
| Se = 0.05 | |

CURVE DATA FOR -RPIB-

| | | | |
|---|---|---|---|
| PIs Sta 10+75.539 | PI Sta 13+14.332 | PIs Sta 15+04.692 | |
| Δs = 4°19'29.9" | Δ = 64°24'53.1" (RT) | Δs = 4°19'29.9" | |
| Lc = 52.000 | L = 393.462 | Lc = 52.000 | |
| Lt = 32.671 | T = 220.170 | Lt = 32.671 | |
| St = 17.342 | R = 350.000 | St = 17.342 | |
| | Se = 0.07 | | |

CURVE DATA FOR -TT1-

| |
|---|
| PI Sta 10+12.948 |
| Δ = 24°01'13.1" (LT) |
| L = 34.506 |
| T = 17.548 |
| R = 82.000 |
| Se = 0.02 |

CURVE DATA FOR -TT4-

| | | |
|---|---|---|
| PI Sta 29+60.590 | PI Sta 32+79.947 | PI Sta 34+39.569 |
| Δ = 7°03'18.4" (LT) | Δ = 8°14'12.3" (LT) | Δ = 11°16'15.8" (RT) |
| L = 61.562 | L = 291.564 | L = 281.518 |
| T = 30.823 | T = 145.800 | T = 142.602 |
| R = 500.000 | R = 1,920.000 | R = 1,500.000 |
| Se = 0.02 | Se = 0.02 | Se = 0.02 |

CURVE DATA FOR -TT5-

| | | | | | |
|---|---|---|---|---|---|
| PI Sta 10+23.716 | PI Sta 10+56.030 | PI Sta 11+52.598 | PI Sta 12+01.858 | PI Sta 16+37.333 | PI Sta 17+18.625 |
| Δ = 15°46'14.5" (LT) | Δ = 41°29'35.8" (RT) | Δ = 41°03'16.2" (RT) | Δ = 41°01'47.8" (LT) | Δ = 14°03'15.1" (LT) | Δ = 63°11'32.5" (LT) |
| L = 19.306 | L = 43.540 | L = 99.274 | L = 49.250 | L = 36.794 | L = 66.349 |
| T = 9.716 | T = 22.779 | T = 52.124 | T = 25.627 | T = 18.490 | T = 37.087 |
| R = 70.000 | R = 60.000 | R = 150.000 | R = 60.000 | R = 150.000 | R = 60.000 |
| Se = 0.02 | Se = 0.02 | Se = 0.02 | Se = 0.02 | Se = 0.02 | Se = 0.02 |

SEE SHEETS 36-37 FOR -RPIBD- PROFILE
SEE SHEET 43 FOR -RPIA- PROFILE
SEE SHEET 44 FOR -RPIB- PROFILE
SEE SHEETS 51-53 FOR -Y1- PROFILE
SEE SHEET 59 FOR -TT1- PROFILE
SEE SHEETS 63-64 FOR -TT4- PROFILE
SEE SHEETS 64-65 FOR -TT5- PROFILE
SEE SHEETS 2-G & 2-H FOR DITCH DETAILS

LOCATION: FAYETTEVILLE OUTER LOOP FROM EAST OF SR 1415 TO WEST OF NC 24 (BRAGG BLVD.)

TIP NO.: U-2519DA COUNTY: CUMBERLAND

DESIGNED BY: DATE:

CHECKED BY: DATE:

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 14 |
| R /W SHEET NO. | 17 |

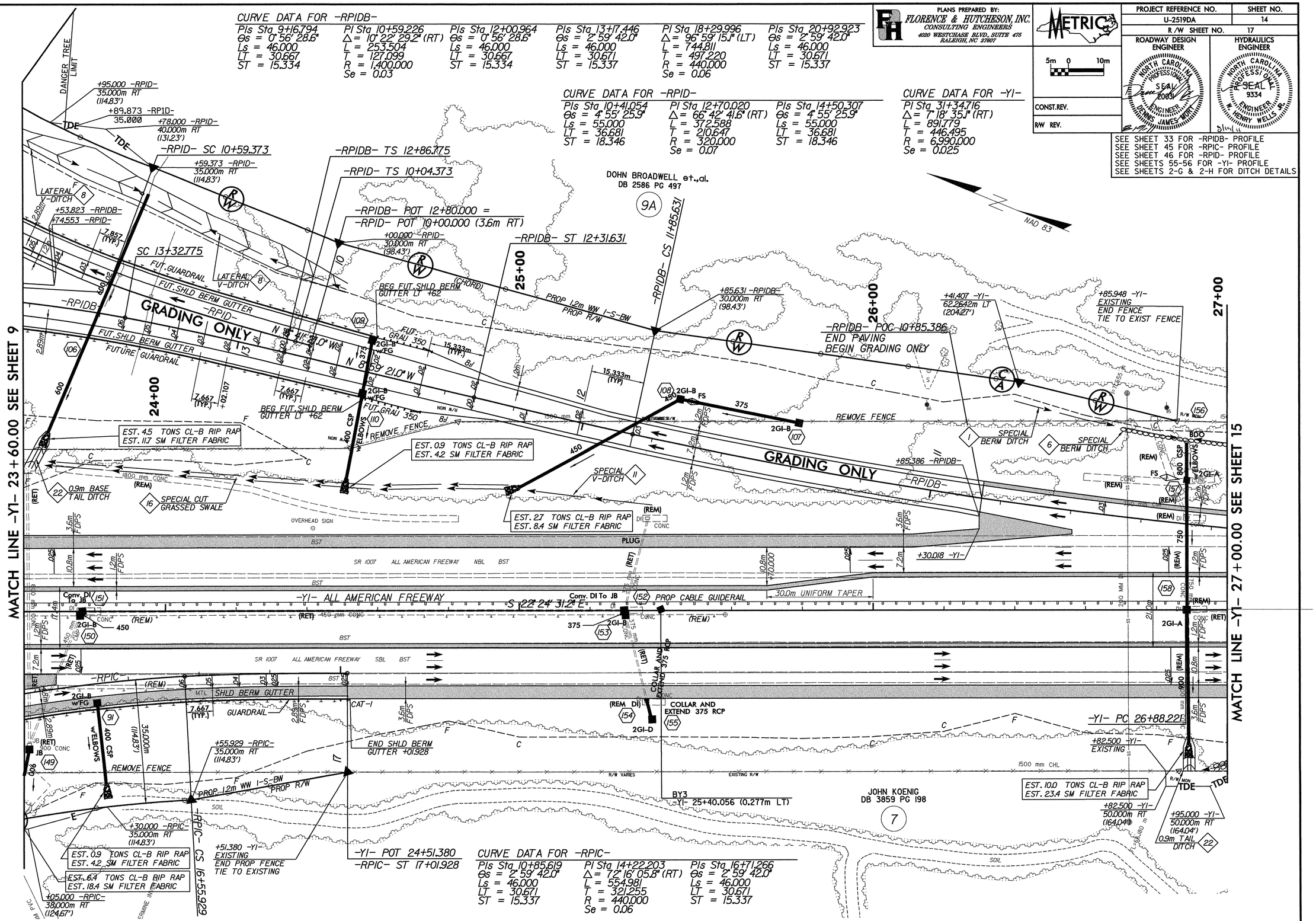
ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES HORT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR.

CONST.REV.

R/W REV.

SEE SHEET 33 FOR -RPIDB- PROFILE
SEE SHEET 45 FOR -RPIC- PROFILE
SEE SHEET 46 FOR -RPID- PROFILE
SEE SHEETS 55-56 FOR -Y1- PROFILE
SEE SHEETS 2-G & 2-H FOR DITCH DETAILS

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PEN TABLE: V:\BAL_FO&HU_SERVER_FILES\CAD\RdWAY\PENTABS_R17\R14_PLAN.TBL

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 15 |
| R /W SHEET NO. | 18 |

ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER

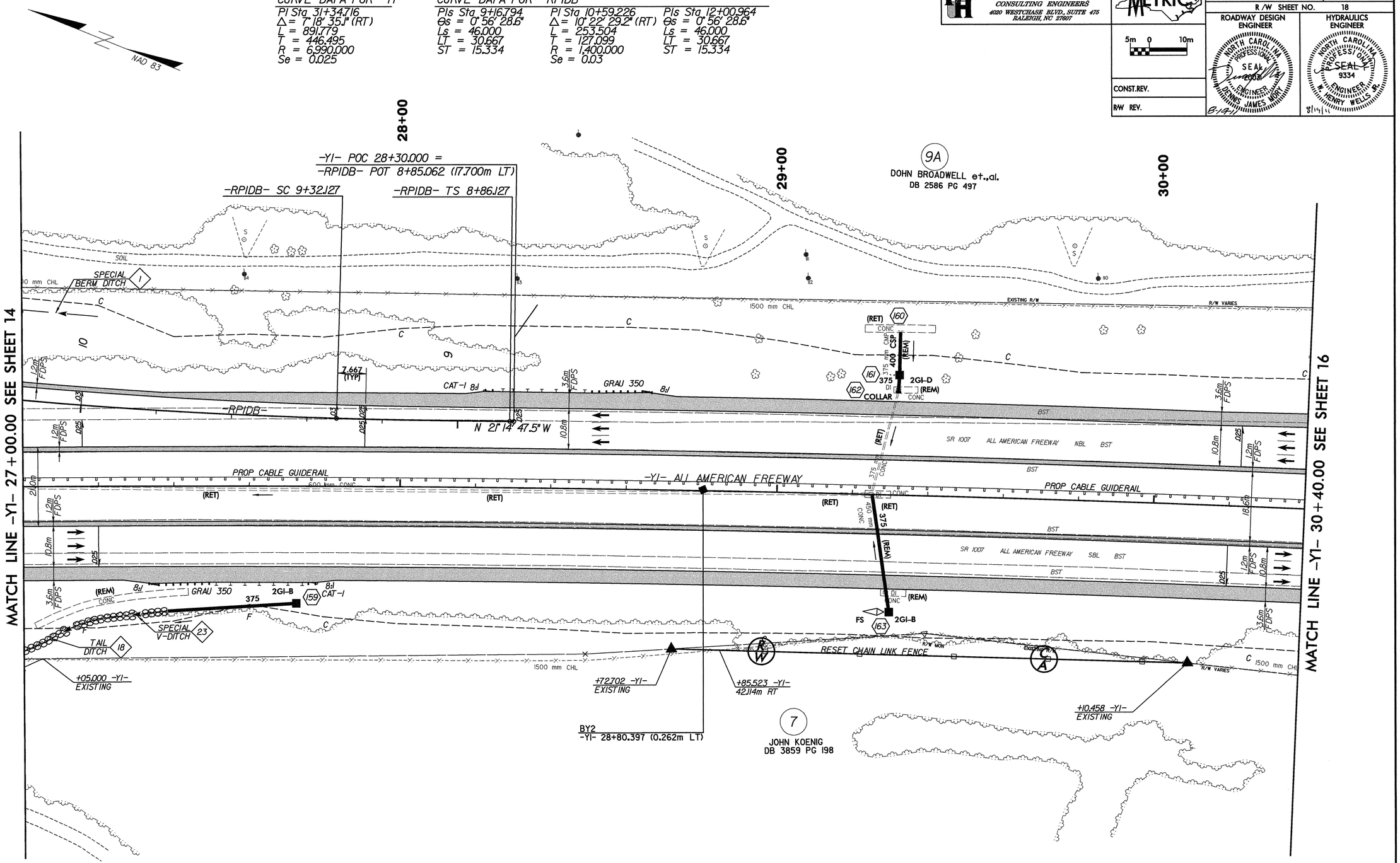
CONST.REV.
R/W REV.

CURVE DATA FOR -Y1-
PI Sta 31+34.716
Δ = 7° 18' 35.1" (RT)
L = 891.719
T = 446.495
R = 6,990.000
Se = 0.025

CURVE DATA FOR -RPIDB-
PI Sta 9+16.794
Θs = 0° 56' 28.6"
Ls = 46.000
LT = 30.667
ST = 15.334

PI Sta 10+59.226
Δ = 10° 22' 29.2" (RT)
L = 253.504
T = 127.099
R = 1,400.000
Se = 0.03

PI Sta 12+00.964
Θs = 0° 56' 28.6"
Ls = 46.000
LT = 30.667
ST = 15.334




SEE SHEET 33 FOR -RPIDB- PROFILE
SEE SHEETS 56-57 FOR -Y1- PROFILE
SEE SHEETS 2-G & 2-H FOR DITCH DETAILS

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 16 |
| R/W SHEET NO. | 19 |

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20081 ENGINEER DENNIS JAMES MORY
8/14/2008

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR.
5/29/08

CURVE DATA FOR -Y1-

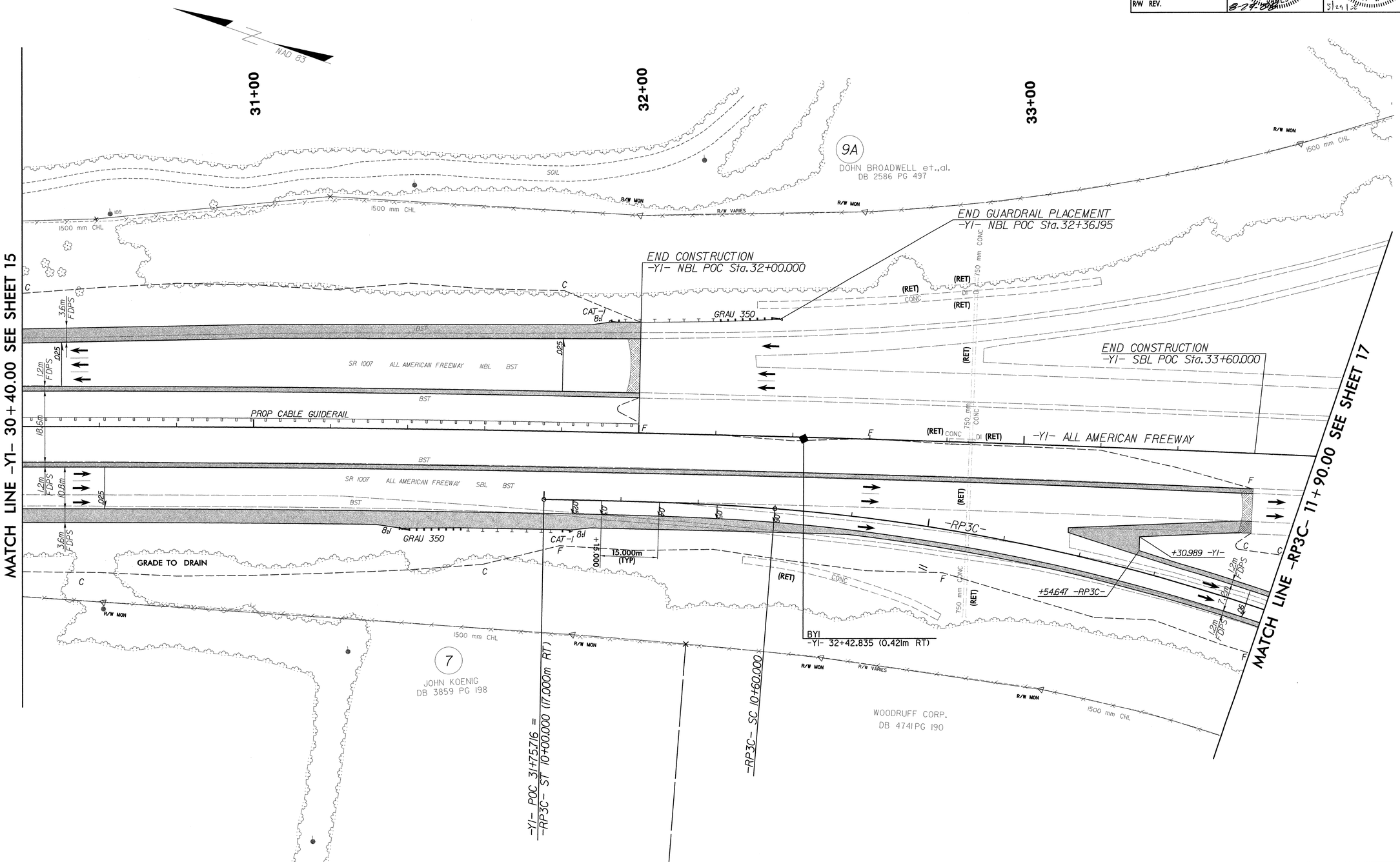
PI Sta 31+34.716
Δ = 7° 18' 35.1" (RT)
L = 891.779
T = 446.495
R = 6,990.000
Se = 0.025

CURVE DATA FOR -RP3C-

PIs Sta 10+38.608
θs = 0° 14' 47.1"
θs = 3° 16' 26.9"
Ls = 60.000
LT = 38.608
ST = 21.408

PI Sta 11+76.412
Δ = 25° 00' 16.9" (RT)
L = 229.118
T = 116.412
R = 525.000
Se = 0.06

PIs Sta 13+09.124
θs = 3° 16' 26.6"
Ls = 60.000
LT = 40.007
ST = 20.006




SEE SHEET 50 FOR -RP3C- PROFILE
SEE SHEETS 57-58 FOR -Y1- PROFILE

FILE: c:\u-2519da\roadway\proj\U2519DA_RDY_PSH_16.dgn
DATE: 08/28/2008 02:19:16 PM
PLOT DRIVER: M:\FBMCAD\PLOTDRV\Metric_Color_Full\fbfdot_metric.pltdrv
PLOT SCALE: M:\FBMCAD\PLOTSCALE\U2519DA_Plot.txt

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

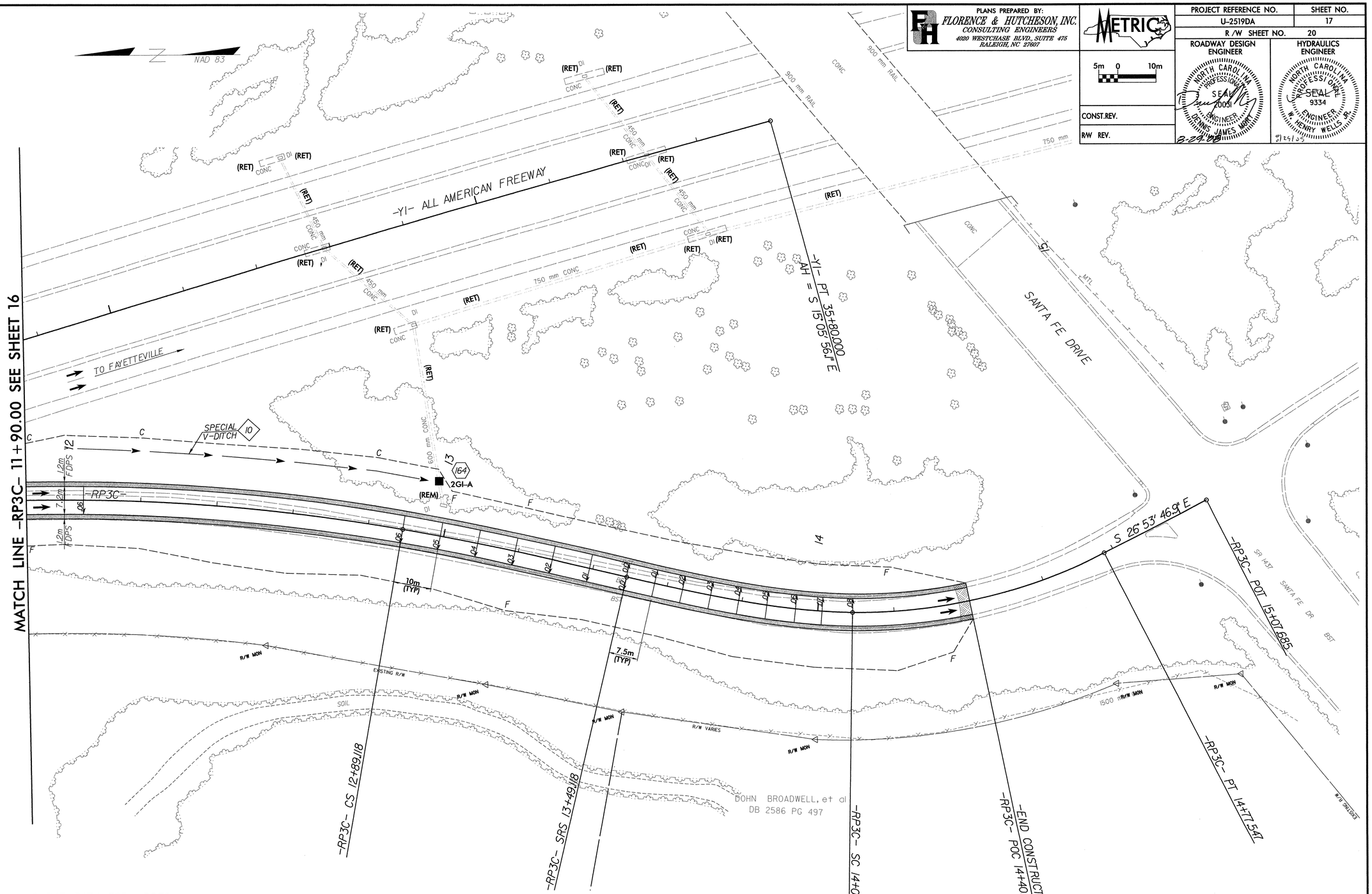
CONST.REV.

R/W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 17 |
| R /W SHEET NO. 20 | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20051 ENGINEER JENNING JAMES MOPT
3-29-05

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS JR.
3/29/05




CURVE DATA FOR -RP3C-

| | | | | |
|---|---|---|---|---|
| PIs Sta 10+38.608 | PI Sta 11+76.412 | PIs Sta 13+09.124 | PIs Sta 13+89.214 | PI Sta 14+44.030 |
| Θs = 0° 14' 47.1" | Δ = 25° 00' 16.9" (RT) | Θs = 3° 16' 26.6" | Θs = 12° 16' 39.6" | Δ = 28° 00' 19.0" (LT) |
| Θs = 3° 16' 26.9" | L = 229.118 | Ls = 60.000 | Ls = 60.000 | L = 68.430 |
| Ls = 60.000 | T = 116.412 | LT = 40.007 | LT = 40.097 | T = 34.913 |
| LT = 38.608 | R = 525.000 | ST = 20.006 | ST = 20.088 | R = 140.000 |
| ST = 21.408 | Se = 0.06 | | | Se = 0.08 |

SEE SHEET 50 FOR -RP3C- PROFILE
SEE SHEET 58 FOR -Y1- PROFILE
SEE SHEETS 2-G & 2-H FOR DITCH DETAILS

FILE: r:\u-2519da\roadway\proj\U2519DA_RDY_PS17.dgn
DATE: 03/28/2008 02:19:38 PM
PLOT SCALE: 1:50.000 USER: rhodges
PEN TABLE: M:\PENCAD\PENTABS\PENHT\Pen_Plot.tbl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

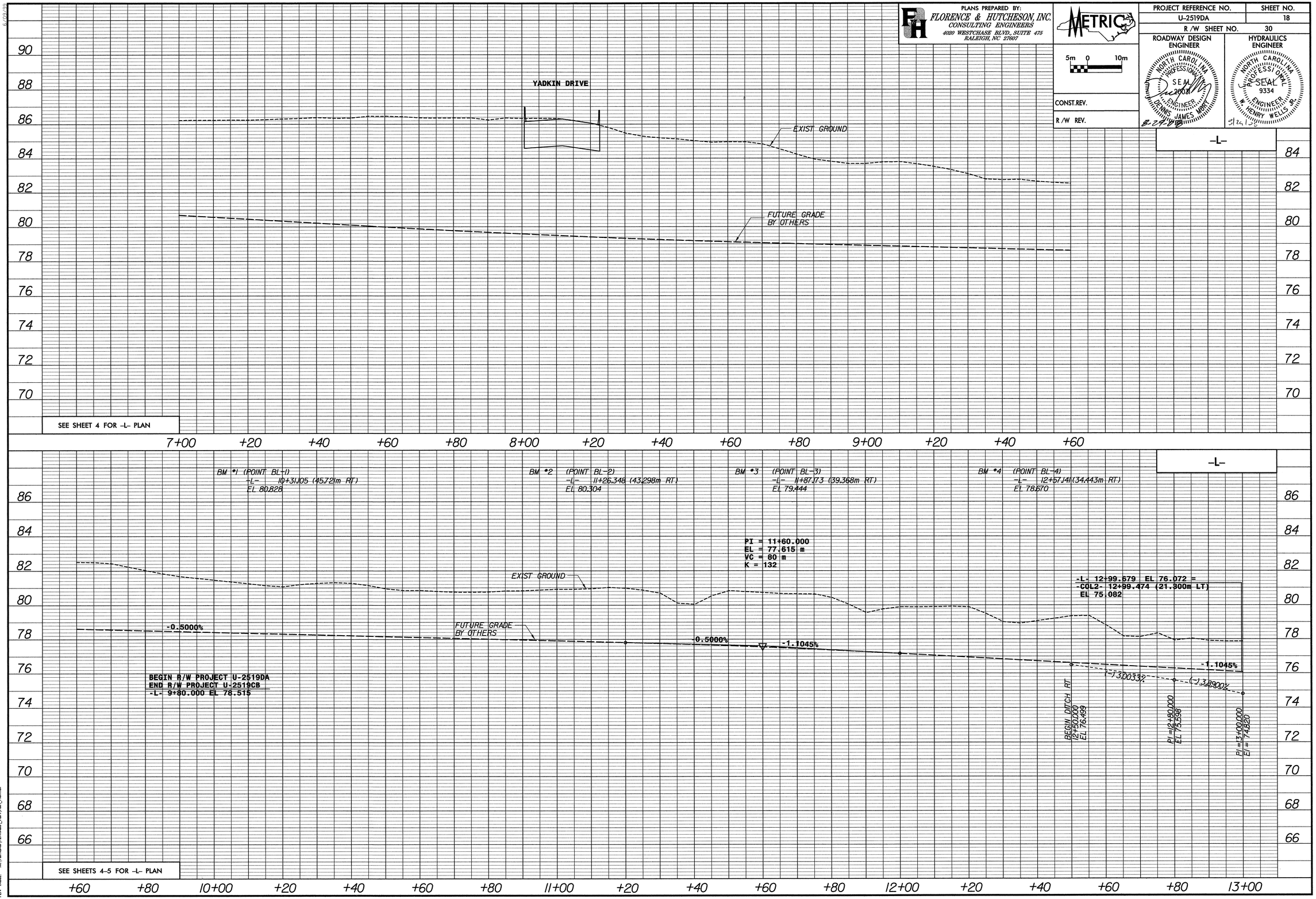
CONST.REV.

R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 18 |
| R /W SHEET NO. | 30 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26031 ENGINEER DENNIS JAMES MART
8-27-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR.
8/26/08




FILE: R:\U-2519DA\Roadway Proj\U2519DA_RDY_PSH_18_L.DGN
DATE: 08/06/2008 01:35:23 PM
MODEL: Model: PSH_PROFILE(RDY)
PEN TABLE: M:\PSHCAD\PENTABS_PSH\Plan.tbl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

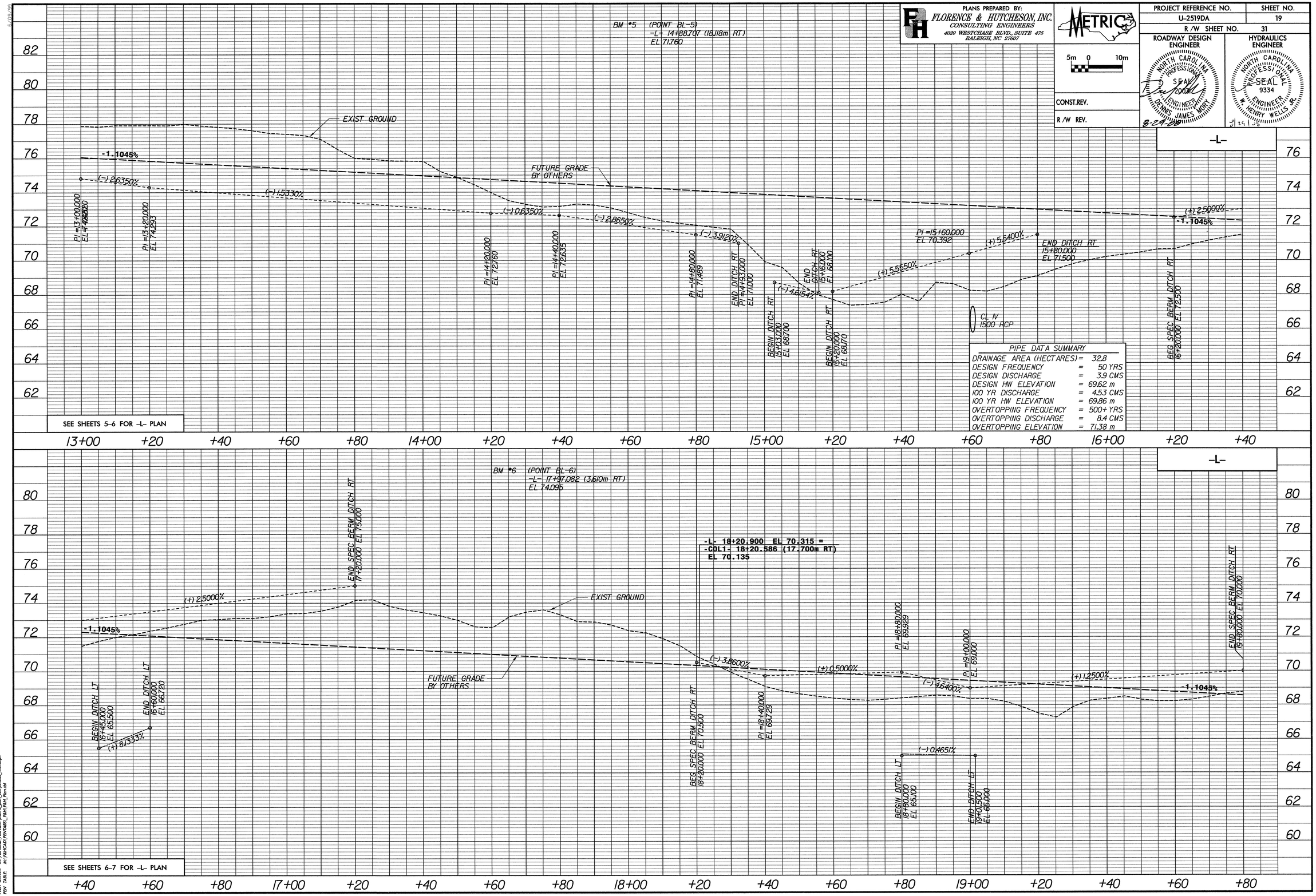
CONST.REV.

R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 19 |
| R /W SHEET NO. | |
| 31 | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORT
8-27-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY W. WELLS, JR.
8-29-08




PIPE DATA SUMMARY

| | | |
|---|---|---|
| DRAINAGE AREA (HECTARES) | = | 32.8 |
| DESIGN FREQUENCY | = | 50 YRS |
| DESIGN DISCHARGE | = | 3.9 CMS |
| DESIGN HW ELEVATION | = | 69.62 m |
| 100 YR DISCHARGE | = | 4.53 CMS |
| 100 YR HW ELEVATION | = | 69.86 m |
| OVERTOPPING FREQUENCY | = | 500+ YRS |
| OVERTOPPING DISCHARGE | = | 8.4 CMS |
| OVERTOPPING ELEVATION | = | 71.38 m |

FILE: n:\u-2519da\roadway\proj\U2519DA_RDY_PSH_19_LDGN
DATE: 08/29/2008 01:33:31 PM
MODEL: MicroStation V8 (Metric)
PEN TABLE: M:\FRAMCAD\PENTABS_fhinh\fhinh_metric.pdl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

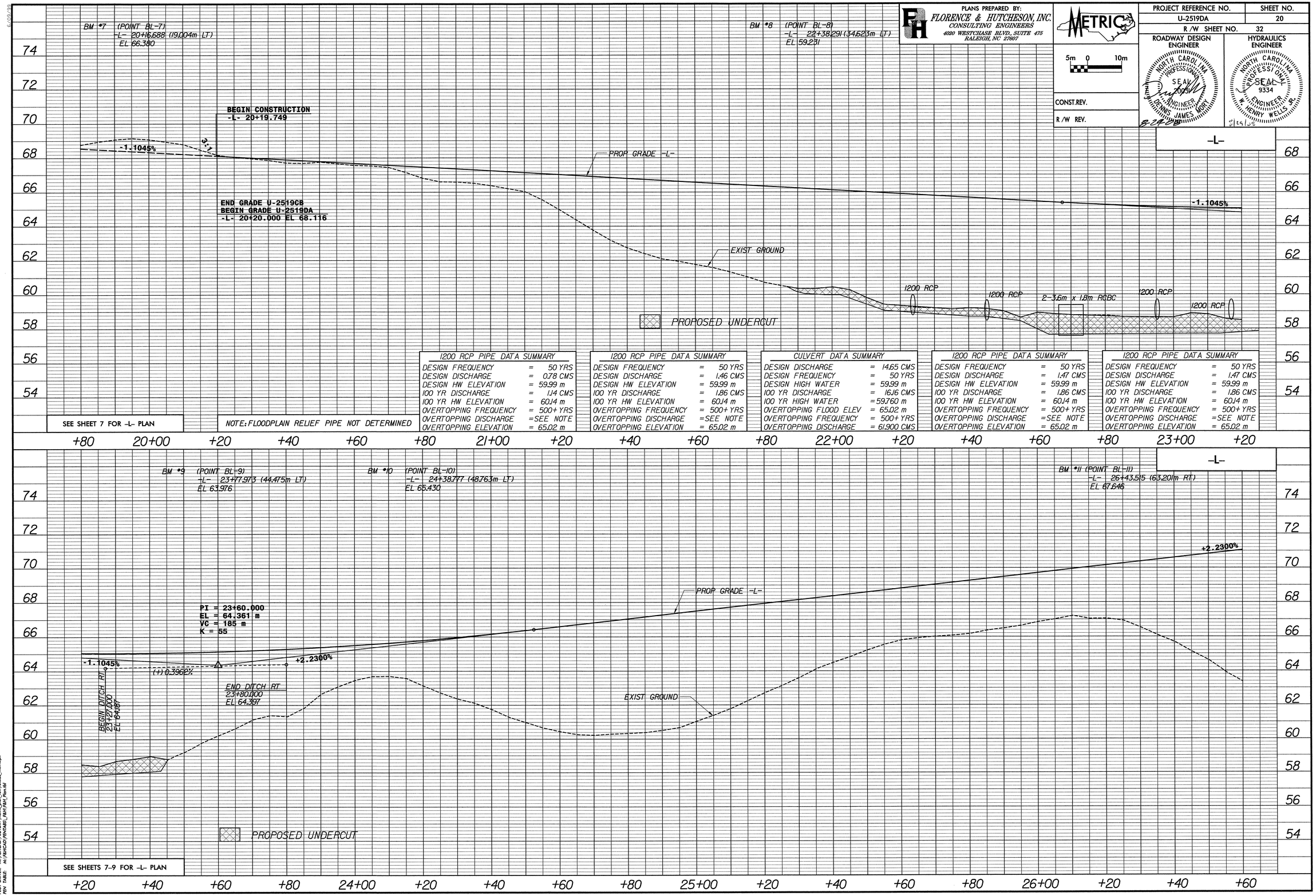
METRIC
5m 0 10m

CONST.REV.
R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 20 |
| R /W SHEET NO. 32 | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20034 ENGINEER DENNIS JAMES MONTAGUE

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS JR.
2/19/08




1200 RCP PIPE DATA SUMMARY

| | | |
|---|---|---|
| DESIGN FREQUENCY | = | 50 YRS |
| DESIGN DISCHARGE | = | 0.78 CMS |
| DESIGN HW ELEVATION | = | 59.99 m |
| 100 YR DISCHARGE | = | 1.14 CMS |
| 100 YR HW ELEVATION | = | 60.14 m |
| OVERTOPPING FREQUENCY | = | 500+ YRS |
| OVERTOPPING DISCHARGE | = | SEE NOTE |
| OVERTOPPING ELEVATION | = | 65.02 m |

1200 RCP PIPE DATA SUMMARY

| | | |
|---|---|---|
| DESIGN FREQUENCY | = | 50 YRS |
| DESIGN DISCHARGE | = | 1.46 CMS |
| DESIGN HW ELEVATION | = | 59.99 m |
| 100 YR DISCHARGE | = | 1.86 CMS |
| 100 YR HW ELEVATION | = | 60.14 m |
| OVERTOPPING FREQUENCY | = | 500+ YRS |
| OVERTOPPING DISCHARGE | = | SEE NOTE |
| OVERTOPPING ELEVATION | = | 65.02 m |

CULVERT DATA SUMMARY

| | | |
|---|---|---|
| DESIGN DISCHARGE | = | 14.65 CMS |
| DESIGN FREQUENCY | = | 50 YRS |
| DESIGN HIGH WATER | = | 59.99 m |
| 100 YR DISCHARGE | = | 16.16 CMS |
| 100 YR HIGH WATER | = | 59.760 m |
| OVERTOPPING FLOOD ELEV | = | 65.02 m |
| OVERTOPPING FREQUENCY | = | 500+ YRS |
| OVERTOPPING DISCHARGE | = | 61.900 CMS |

1200 RCP PIPE DATA SUMMARY

| | | |
|---|---|---|
| DESIGN FREQUENCY | = | 50 YRS |
| DESIGN DISCHARGE | = | 1.47 CMS |
| DESIGN HW ELEVATION | = | 59.99 m |
| 100 YR DISCHARGE | = | 1.86 CMS |
| 100 YR HW ELEVATION | = | 60.14 m |
| OVERTOPPING FREQUENCY | = | 500+ YRS |
| OVERTOPPING DISCHARGE | = | SEE NOTE |
| OVERTOPPING ELEVATION | = | 65.02 m |

1200 RCP PIPE DATA SUMMARY

| | | |
|---|---|---|
| DESIGN FREQUENCY | = | 50 YRS |
| DESIGN DISCHARGE | = | 1.47 CMS |
| DESIGN HW ELEVATION | = | 59.99 m |
| 100 YR DISCHARGE | = | 1.86 CMS |
| 100 YR HW ELEVATION | = | 60.14 m |
| OVERTOPPING FREQUENCY | = | 500+ YRS |
| OVERTOPPING DISCHARGE | = | SEE NOTE |
| OVERTOPPING ELEVATION | = | 65.02 m |

FILE: r:\u-2519da\roadway\proj\U2519DA_RDY_PSH_20_LDGN
DATE: 06/08/2006 01:35:40 PM
PLOTTED BY: M. FRANCO-PORTOCARRERO
PEN TABLE: M:\MICAD\PENTABS_F&H\F&H_Plan.tbl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
5540 CENTERVIEW DR., SUITE 316
RALEIGH, NC 27606

METRIC

5m 0 10m

CONST.REV.

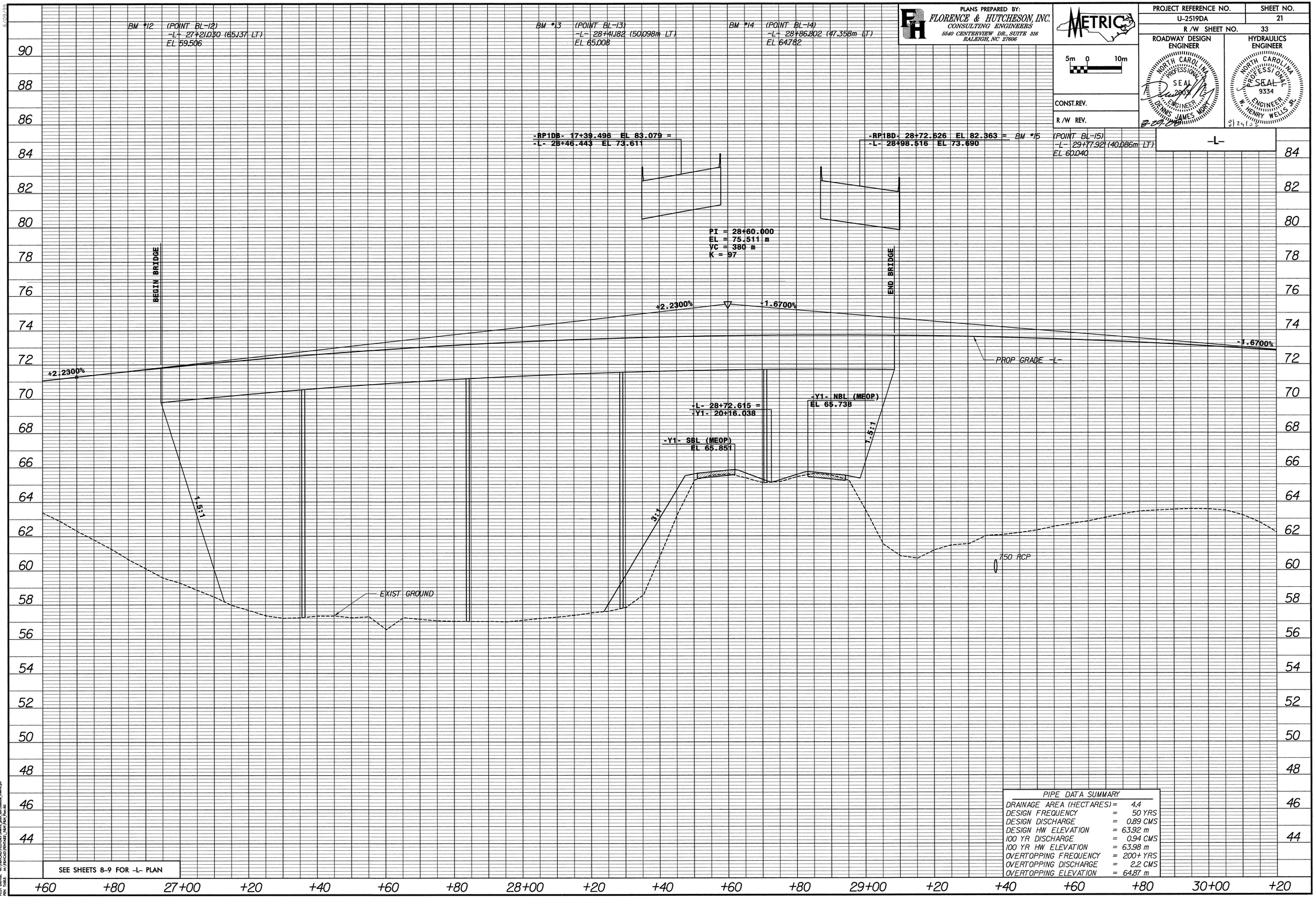
R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 21 |
| R /W SHEET NO. | 33 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 29031 ENGINEER DENNIS JAMES MORY

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

-L-




| PIPE DATA SUMMARY | | |
|---|---|---|
| DRAINAGE AREA (HECTARES) | = | 4.4 |
| DESIGN FREQUENCY | = | 50 YRS |
| DESIGN DISCHARGE | = | 0.89 CMS |
| DESIGN HW ELEVATION | = | 63.92 m |
| 100 YR DISCHARGE | = | 0.94 CMS |
| 100 YR HW ELEVATION | = | 63.98 m |
| OVERTOPPING FREQUENCY | = | 200+ YRS |
| OVERTOPPING DISCHARGE | = | 2.2 CMS |
| OVERTOPPING ELEVATION | = | 64.87 m |

SEE SHEETS 8-9 FOR -L- PLAN

FILE: r:\u-2519da\roadway\proj\U2519DA_RDY_PH-21_LDGN
DATE: 06/08/2018 3:53:48 PM
PLOT DRIVER: HP_PostScript_Level_2_Color_Gray_Adj.PS.plt
PEN TABLE: M:\PWCAD\PENTABS_FMH\FMH_Pen.tbl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

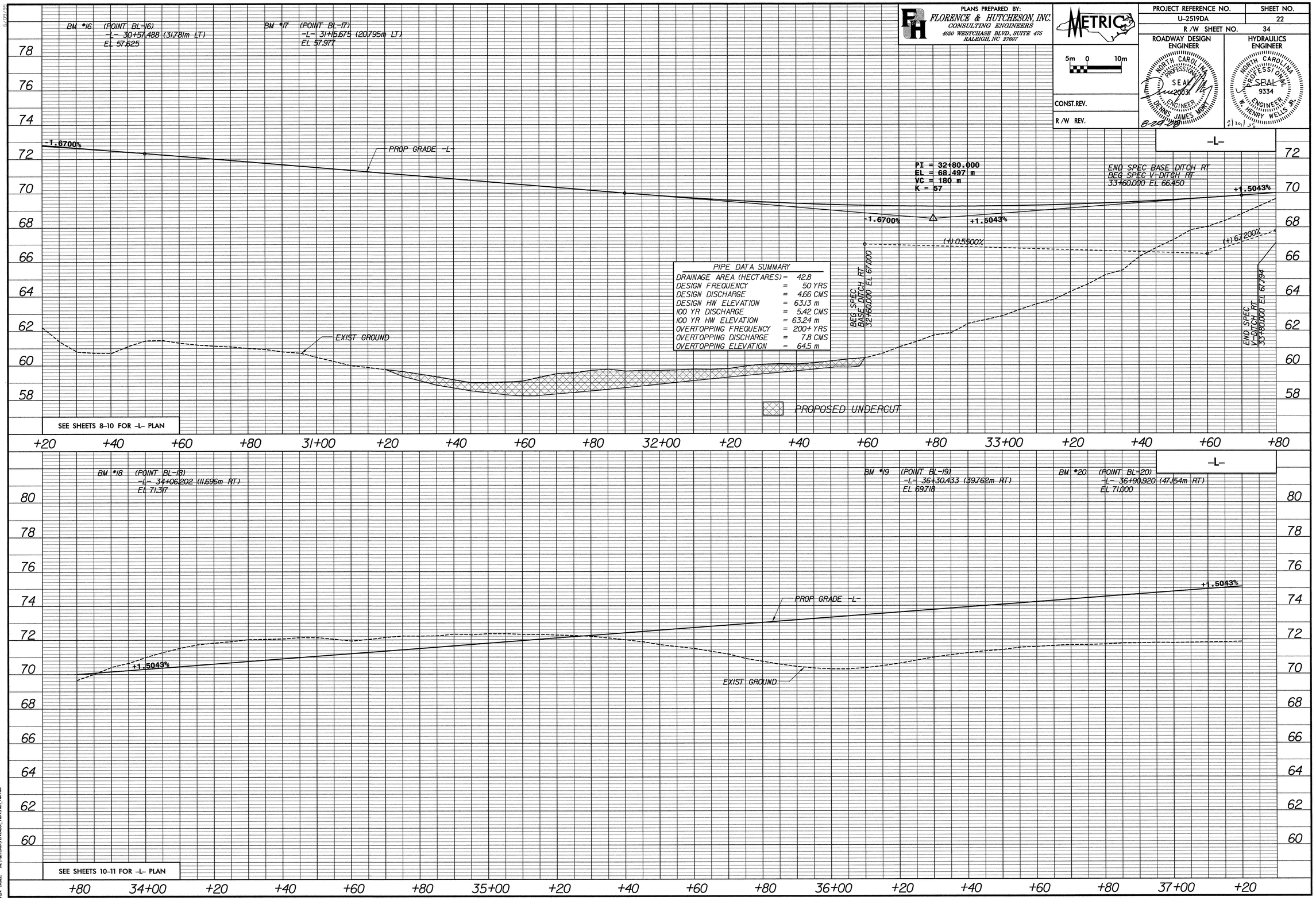
CONST.REV.

R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 22 |
| R /W SHEET NO. | 34 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORT
8-29-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR.
8/29/08




FILE: n:\u-2519da\roadway\proj\U2519DA_RDY_PSH_22_LOGH
DATE: 08/08/2008 01:33:57 PM
USER: mbrown MODEL: U2519DA\metric_plan full\fullplan_metric.pli
PSH TABLE: M:\FAH\CAD\PENTABLS_FAH\FAH_Plan.tbl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

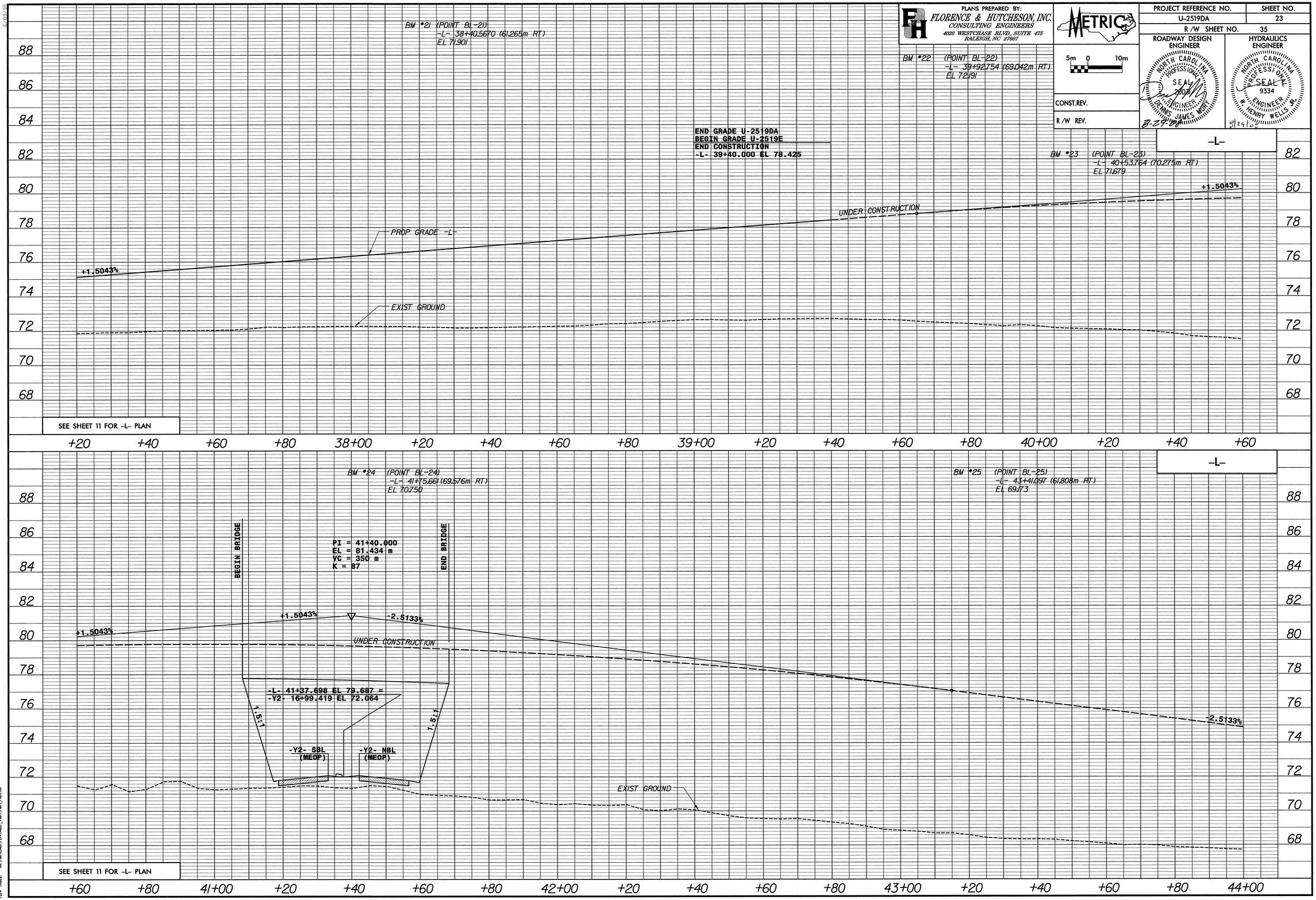
CONST.REV.

R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 23 |
| R /W SHEET NO. 35 | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20021 ENGINEER DENNIS JAMES MORT
8-27-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR.
8/29/08




FILE: r:\u-2519da\roadway\proj\U2519DA_RDY_FSH_23_L.DGN
DATE: 08/08/2008 01:34:05 PM
PLOT SCALE: 1:50 (H) 1:50 (V) MODEL: Metric_plan_full_fullline_metric.plt
PEN TABLE: M:\FHCAD\PENTABS_FH\FH_Plan.tbl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

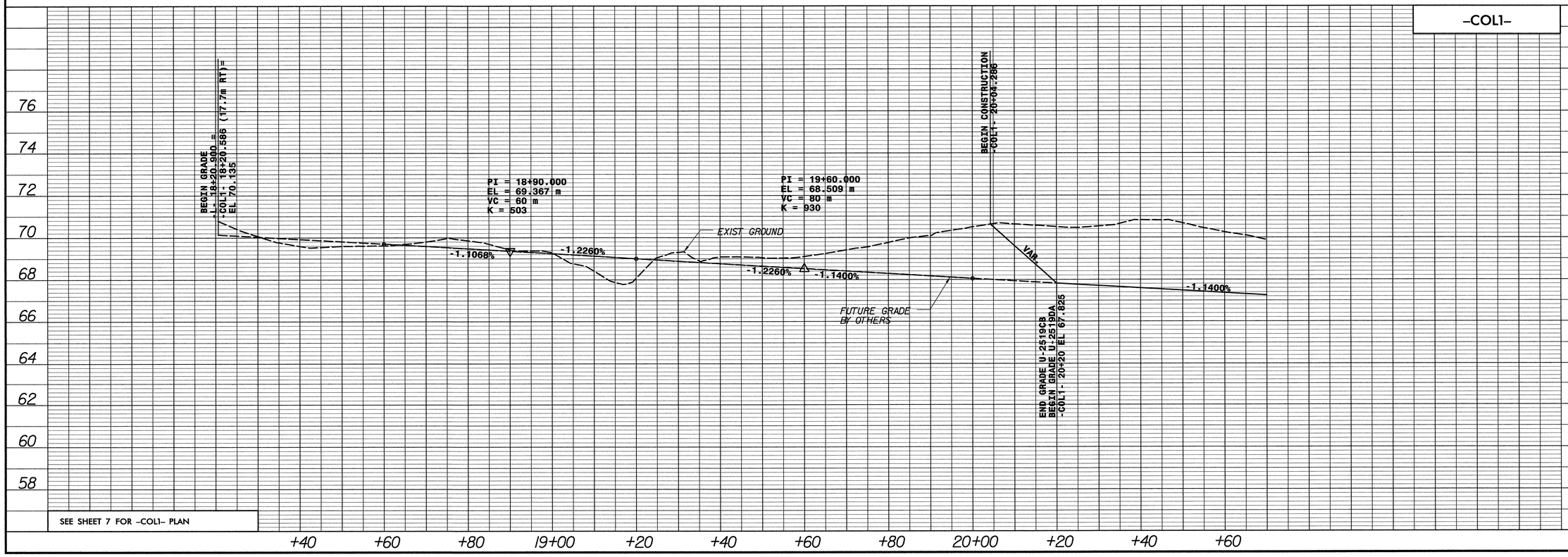
R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 24 |
| R /W SHEET NO. | 37 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORY
8-29-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS JR.
9/24/08

-COL1-




SEE SHEET 7 FOR -COL1- PLAN

FILE: R:\U-2519DA\Roadway\Proj\U2519DA_RDY_PSH_24_COL1.DGN
DATE: 08/29/2008 11:42:05 AM
PLOT DRIVER: M:\F&HCAD\PLOTDRV\Metric_plan_full\fullsize_metric.plt
PEN TABLE: M:\F&HCAD\PENTABS_F&H\F&H_PLAN.TBL

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

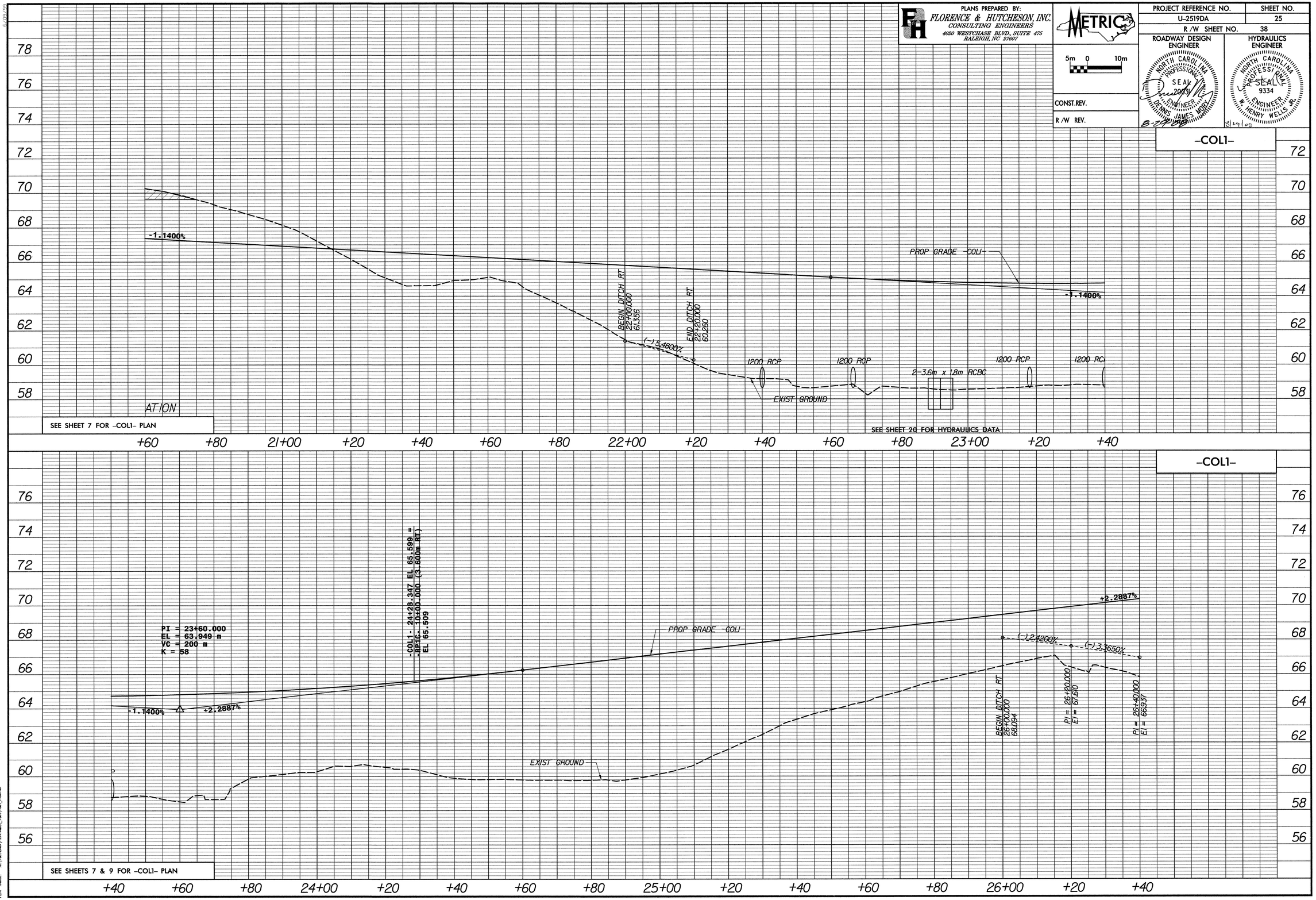
METRIC
5m 0 10m

CONST.REV.
R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 25 |
| R /W SHEET NO. 38 | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORLEY
8-27-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR.
8/29/08




FILE: r:\u-2519da\roadway\proj\U2519DA_RDY_PSH_25_COL1.DGN
DATE: 08/28/2008 01:34:23 PM
PLOT SCALE: 1:50 (22"x34") 1:100 (11"x17") /metric_plan_full/fullsize_metric.pltcfg
PSN TABLE: M:\BENCHCAD\PENTABS_RAH\RAH_Plan.tbl

| PIPE DATA SUMMARY | |
|---|---|
| DRAINAGE AREA (HECTARES) | = 3.05 |
| DESIGN FREQUENCY | = 50 YRS |
| DESIGN DISCHARGE | = 0.54 CMS |
| DESIGN HW ELEVATION | = 63.624 m |
| 100 YR DISCHARGE | = 0.57 CMS |
| 100 YR HW ELEVATION | = 63.663 m |
| OVERTOPPING FREQUENCY | = 500+YRS |
| OVERTOPPING DISCHARGE | = 2.66 CMS |
| OVERTOPPING ELEVATION | = 66.800 m |

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
5540 CENTERVIEW DR., SUITE 316
RALEIGH, NC 27606

METRIC

5m 0 10m

CONST.REV.

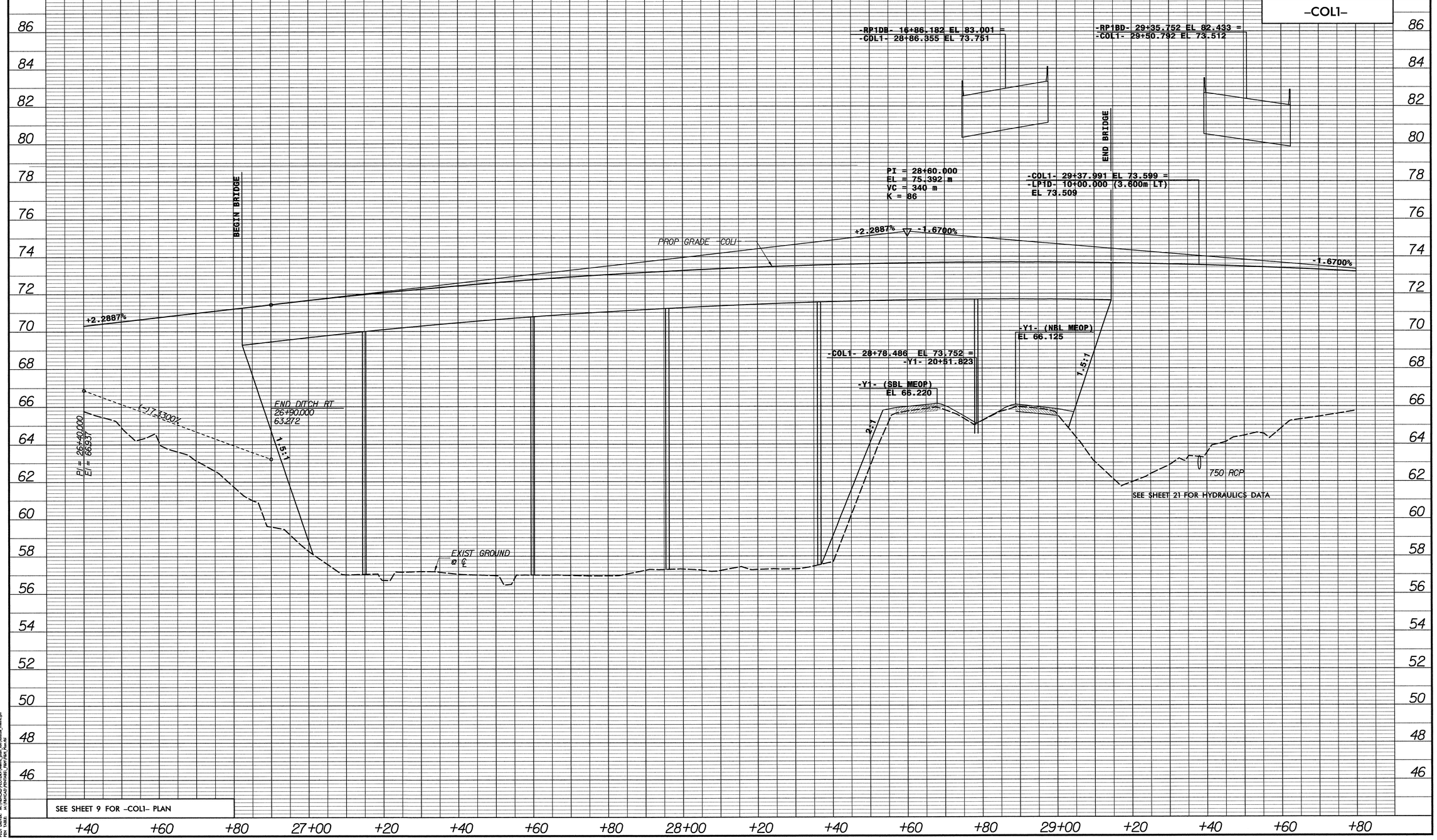
R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 26 |
| R /W SHEET NO. | 39 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MURPHY
8-20-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR.
3/21/08

-COL1-




SEE SHEET 9 FOR -COL1- PLAN

FILE: i:\u-2519da\roadway\plans\U2519DA_SDV_PR1_26_COL1.DGN
DATE: 8/20/2008 11:16:39 AM
PLOT DRIVER: M:\RBRCAD\PLOTDRV\Metric_plus_full_fullsize_metric.pltr
REV. TABLE: M:\RBRCAD\REVTABS_DEFAULT.Rev.tbl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

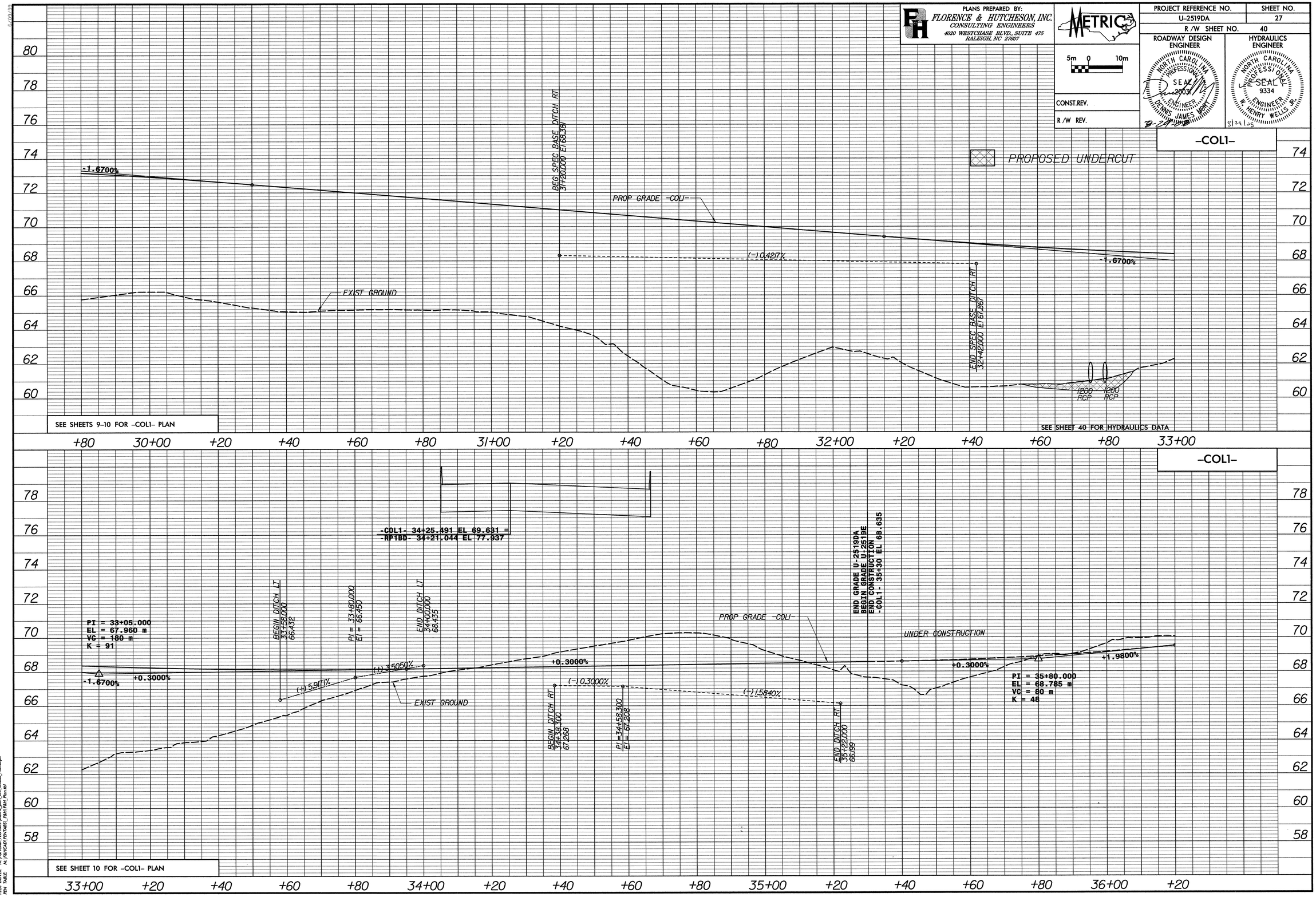
R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 27 |
| R /W SHEET NO. | 40 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 22003 ENGINEER DENNIS JAMES MORT

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

8/29/05




FILE: r:\u-2519da\roadway\proj\U2519DA_RDY_PS1_27_COL1.DGN
DATE: 08/29/2008 01:34:40 PM
RDY TEMPLATE: H:\SCO\TEMPLATES\RDY\Metric_pfm_full\fullline_metric.pl
PDF TABLE: M:\FEH\CAD\PENTABS_FEH\T&H_Plan.tbl
PEN TABLE:

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

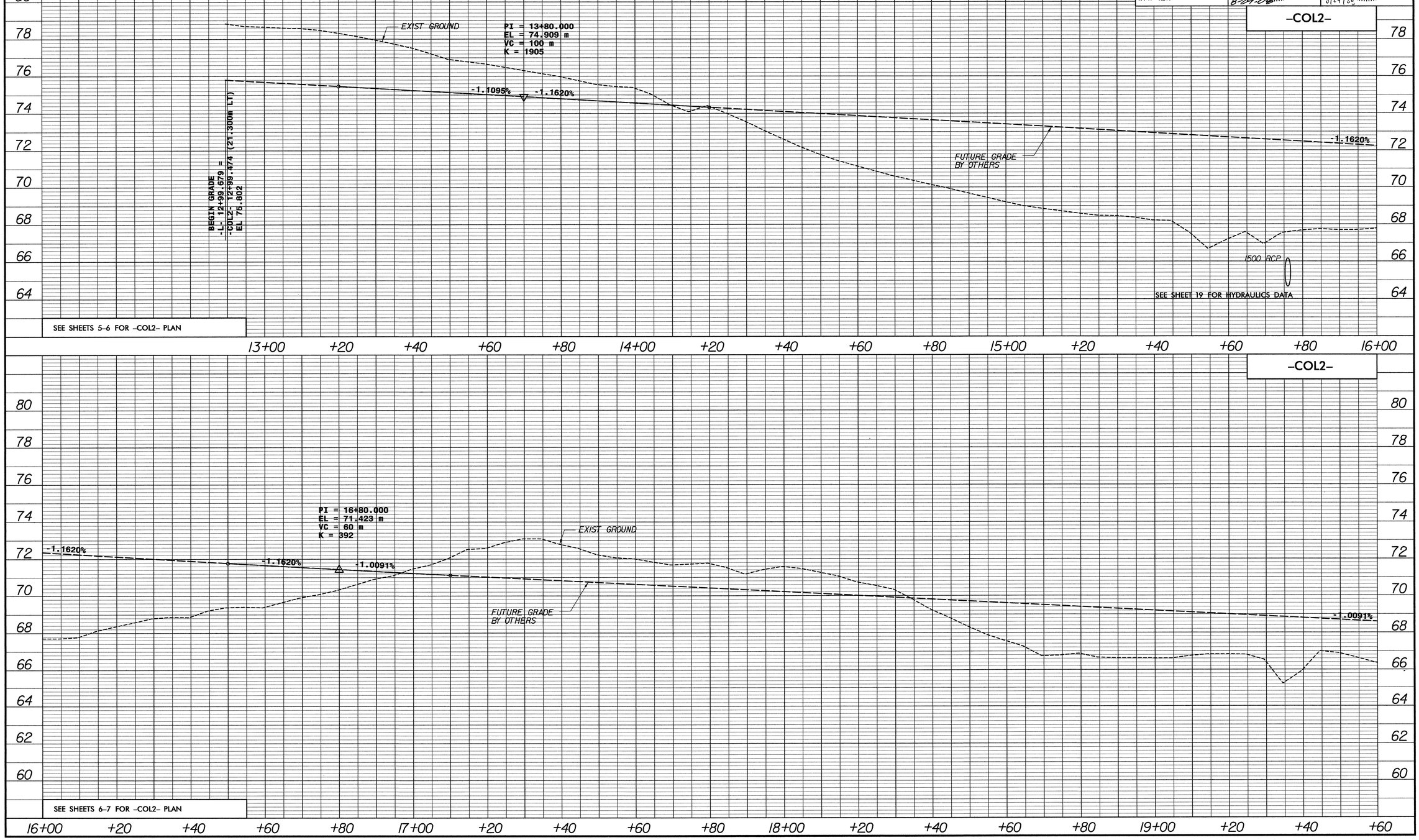
CONST.REV.

R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 28 |
| R /W SHEET NO. 42 | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 28031 ENGINEER DENNIS JAMES NORT
8-29-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR.
8/29/08




FILE: r:\u-2519da\roadway\proj\U2519DA_ROY_PSH_28_COL2.DGN
DATE: 08/29/2008 01:34:49 PM
PLOT TIMES: 15:42:40 (08/29) Metric_plan_full_fullsize_metric.plt
PEN TABLE: M:\FHCADD\PENTABS_FAH\F&H_Plan.tbl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

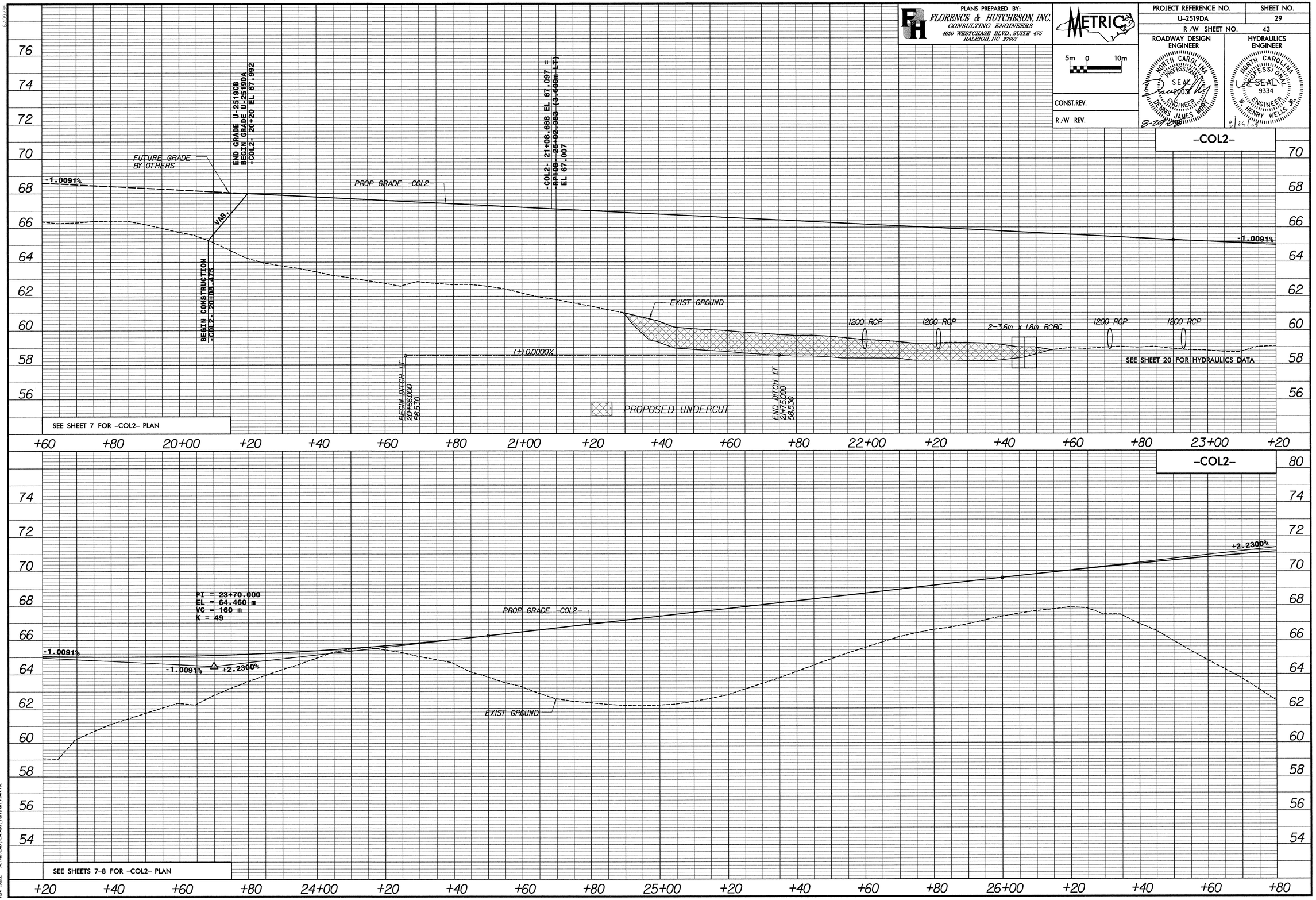
METRIC
5m 0 10m

CONST.REV.
R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 29 |
| R /W SHEET NO. | 43 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MART

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




FILE: R:\U-2519DA\Roadway\Proj\U2519DA_RDY_PSH_29_COL2.DGN
DATE: 08/29/2008 12:38:42 PM
USER: mmart MODEL: PSH_Plan_Metric_plan_full.fdot.dgn
PEN TABLE: M:\FDOT\CADD\PENTABS_FH\FDOT_PLAN.TBL

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
5540 CENTERVIEW DR., SUITE 316
RALEIGH, NC 27606

METRIC

5m 0 10m

CONST.REV.

R /W REV.

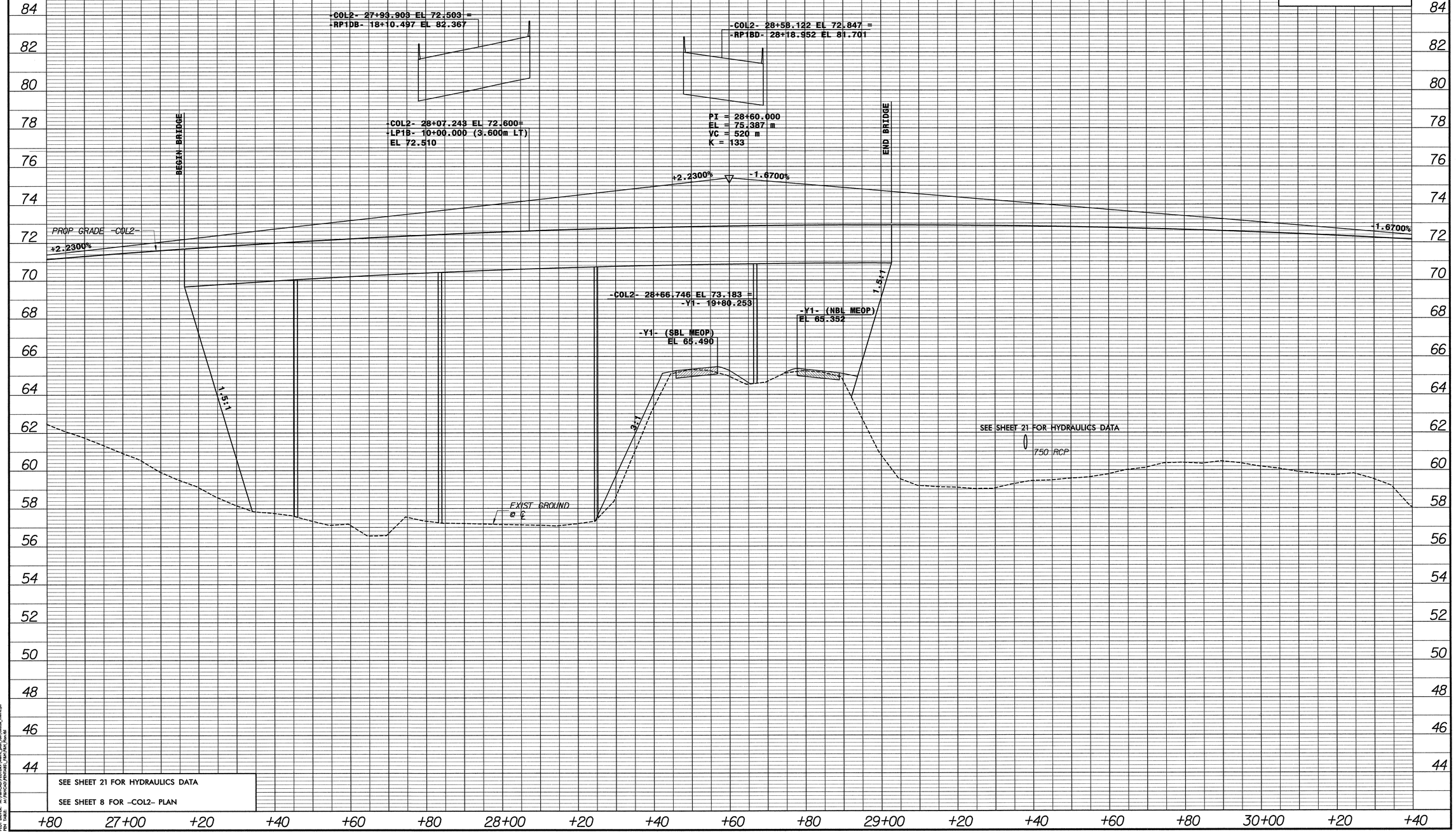
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 30 |
| R /W SHEET NO. | 44 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORT

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER WENDY WELLS JR.

5/29/09

## -COL2-




SEE SHEET 21 FOR HYDRAULICS DATA

SEE SHEET 8 FOR -COL2- PLAN

FILE: r:\u-2519da\roadway\proj\U2519DA_RDY_PH_30_COL2.DGN
DATE: 06/08/2006 10:35:08 PM
USER: wbhoward DGN: U2519DA_plans_full\full-size_metric.pl
PIN TABLE: ja:\MASCAD\PENTABS_PEM\PEM_Plan.tbl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

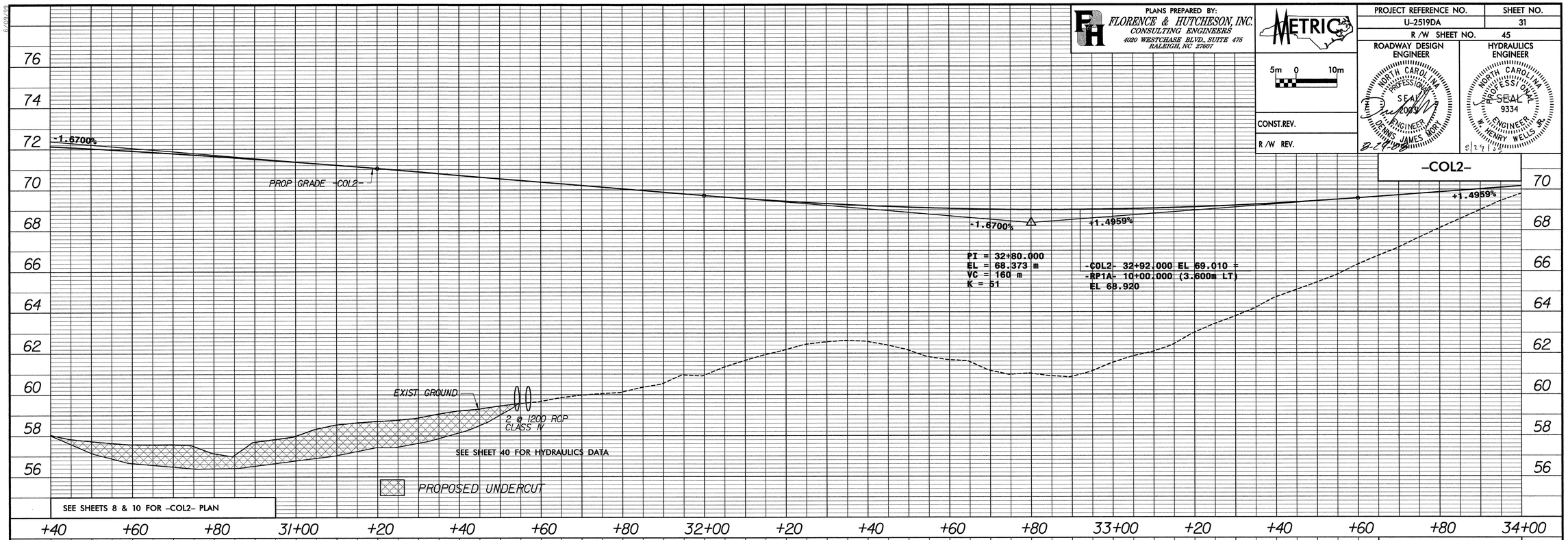
CONST.REV.

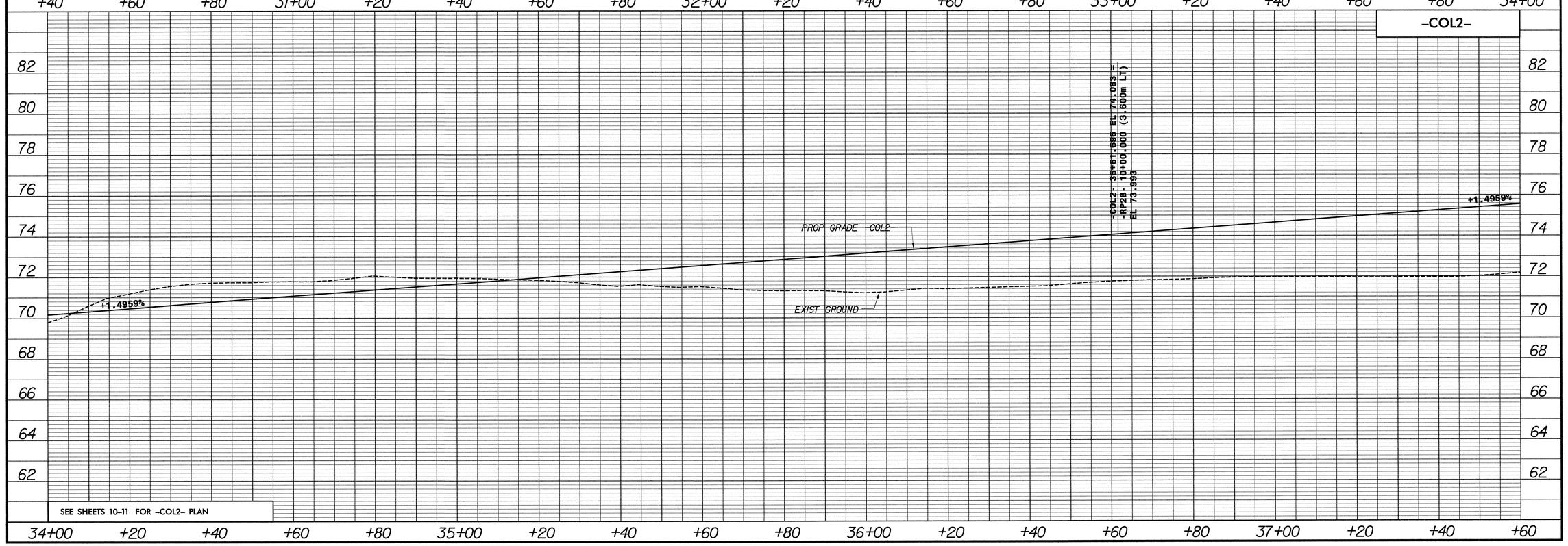
R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 31 |
| R /W SHEET NO. 45 | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORY
8-29-99

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR.
8/27/99

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DATE: 08/26/99 TIME: 09:57 AM
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PEN TABLE: M:\FBRCAD\PENTABS\FBH\FBH_Plan.tbl

6/09/99

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

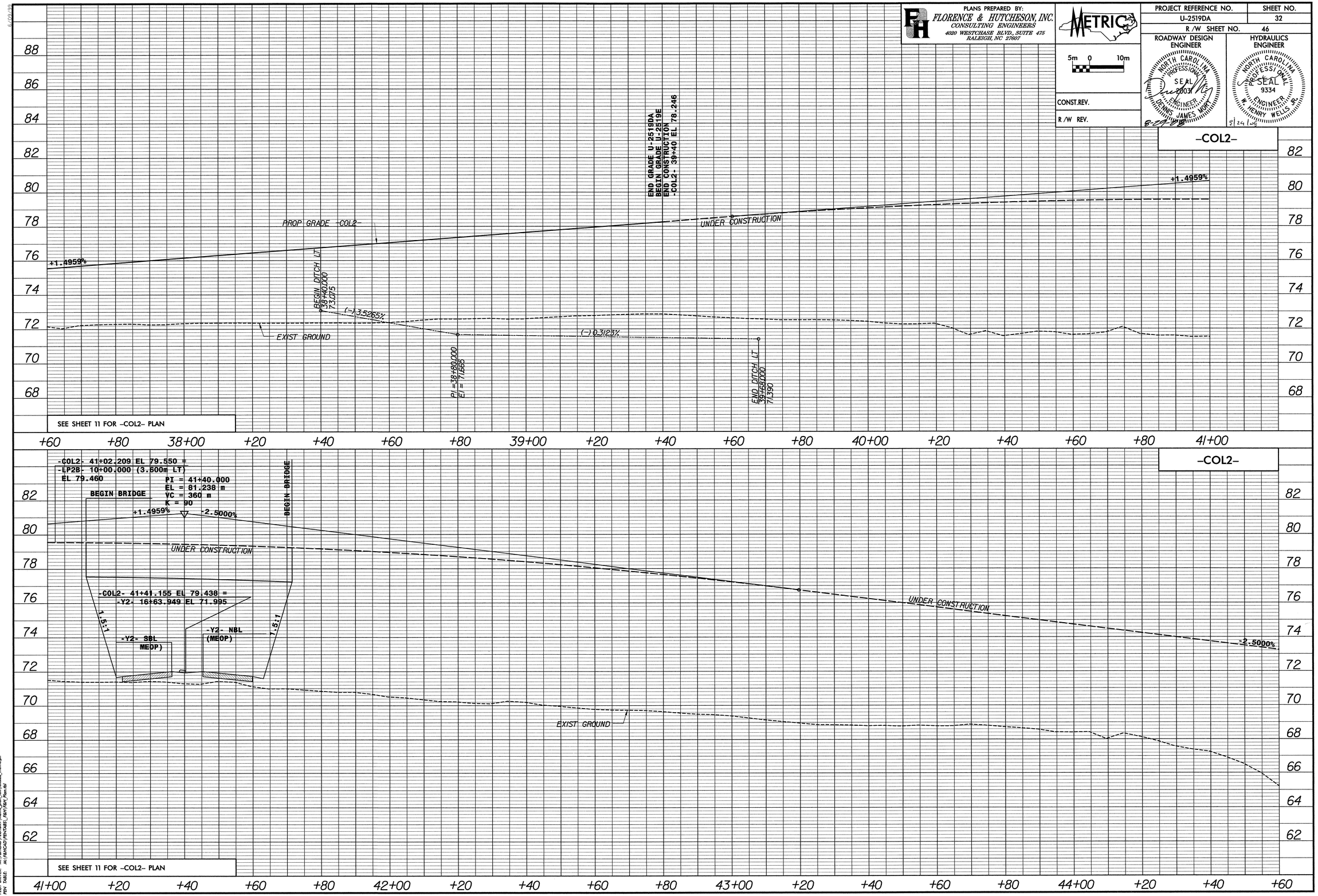
CONST.REV.

R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 32 |
| R /W SHEET NO. | |
| 46 | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 2003 ENGINEER DENNIS JAMES MUNT

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

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DATE: 08/08/2008 01:35:21 PM
PLOT SCALE: 1:50 PLOT DATE: 08/08/2008
PEN TABLE: M:\FSHCAD\PENTABS_FSH\FSH_Plan.tbl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

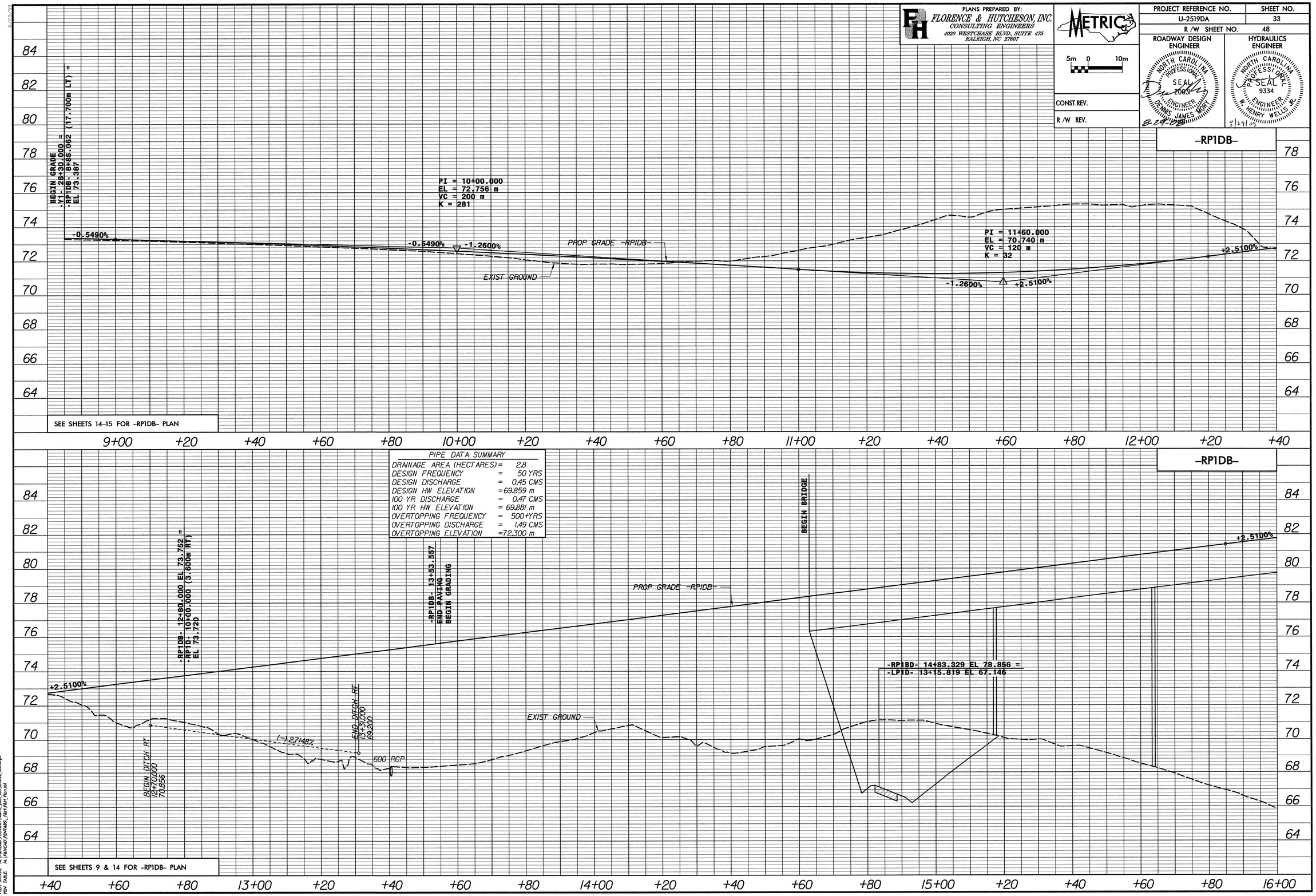
CONST.REV.

R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 33 |
| R /W SHEET NO. | 48 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MARY
8/29/08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS JR.
8/29/08




FILE: r:\u-2519da\roadway\proj\U2519DA_RDY_PSH_33_RP1DB.DGN
DATE: 08/28/2008 01:35:30 PM
PLOT SCALE: 1:40 (HORIZONTAL)\metric plan full\full size_metric.pll
PEN TABLE: M:\SHARED\PENTABS_F&H\F&H_Pen.tbl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
5540 CENTERVIEW DR., SUITE 316
RALEIGH, NC 27606

METRIC

5m 0 10m

CONST.REV.

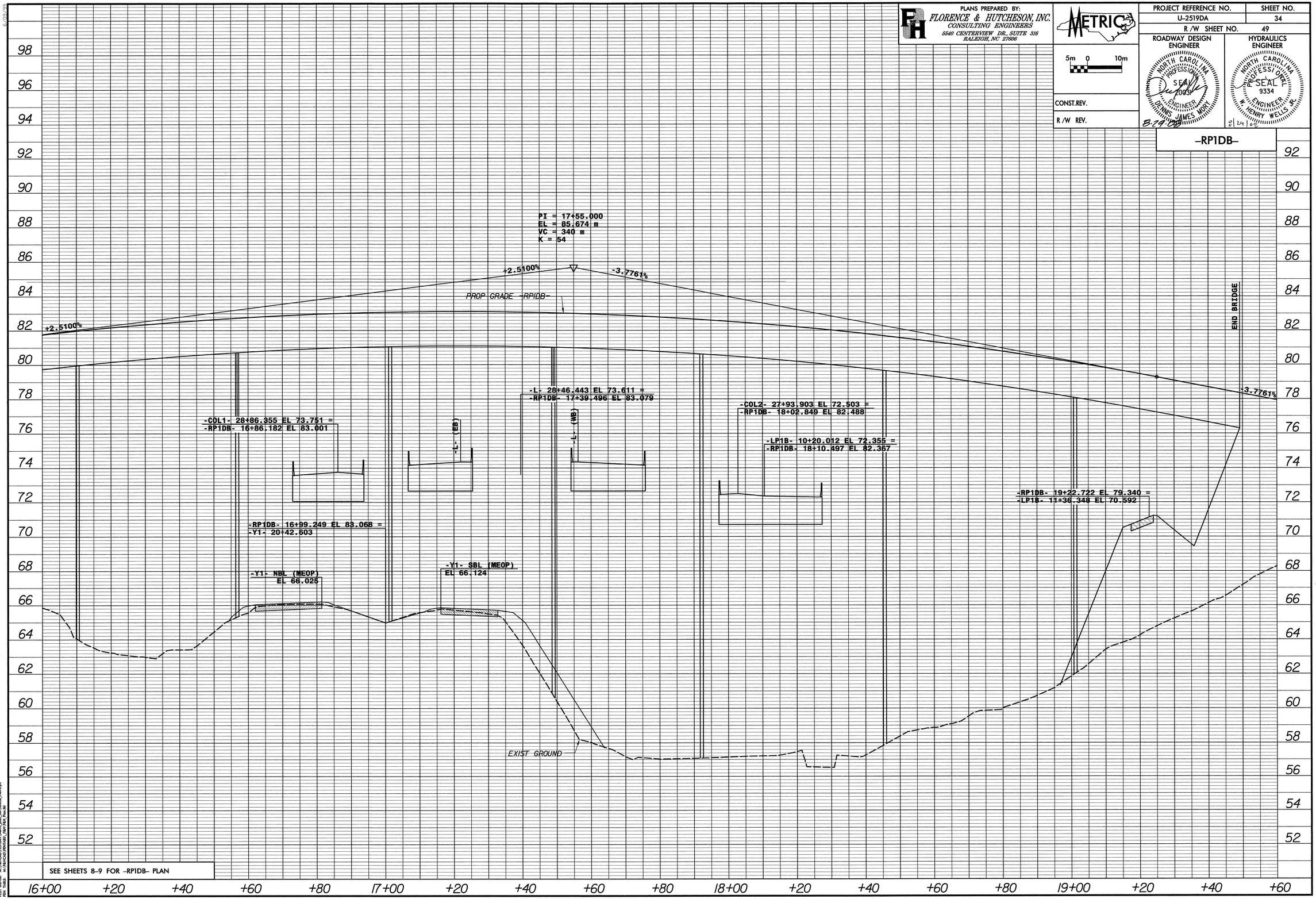
R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 34 |
| R /W SHEET NO. 49 | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 7003 ENGINEER DENNIS JAMES MIRT
8-29-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY W. WELLS, JR.
8/29/08

-RP1DB-




SEE SHEETS 8-9 FOR -RP1DB- PLAN

FILE: r:\u-2519da\roadway grds\U2519DA_RD7_RP1_34_RPDB_DGN
DATE: 8/29/2008 4:25:41 PM
PLOT DRIVER: WVRHCAD_PCSDB2 /metric_plan_full-full-plus_metric.pltr
PEN TABLE: W:\RdCAD\PENTABLE_Full\Full_Plus.tbl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

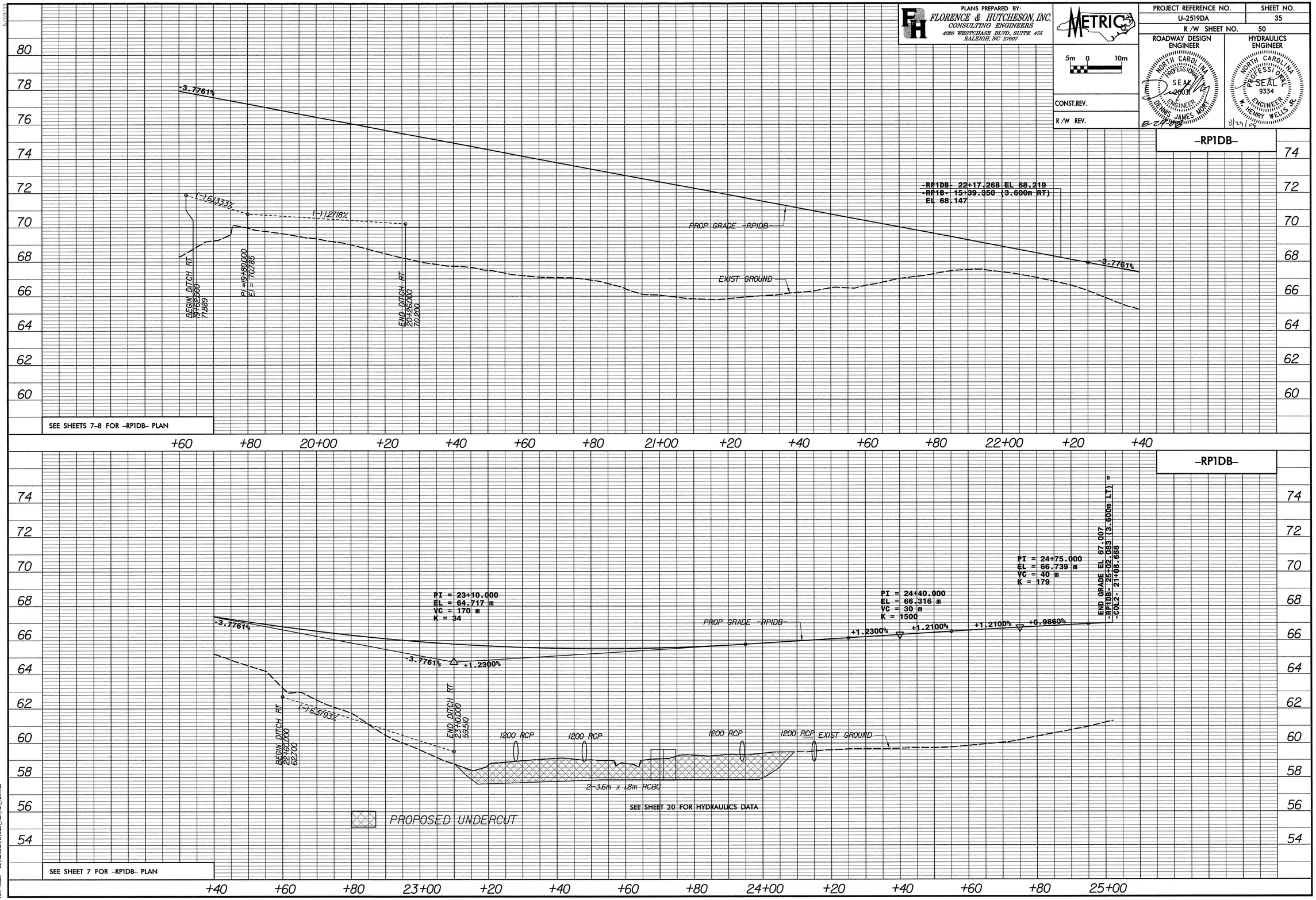
CONST.REV.

R/W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 35 |
| R/W SHEET NO. | 50 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORT
8-29-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS JR.
8/29/08



PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

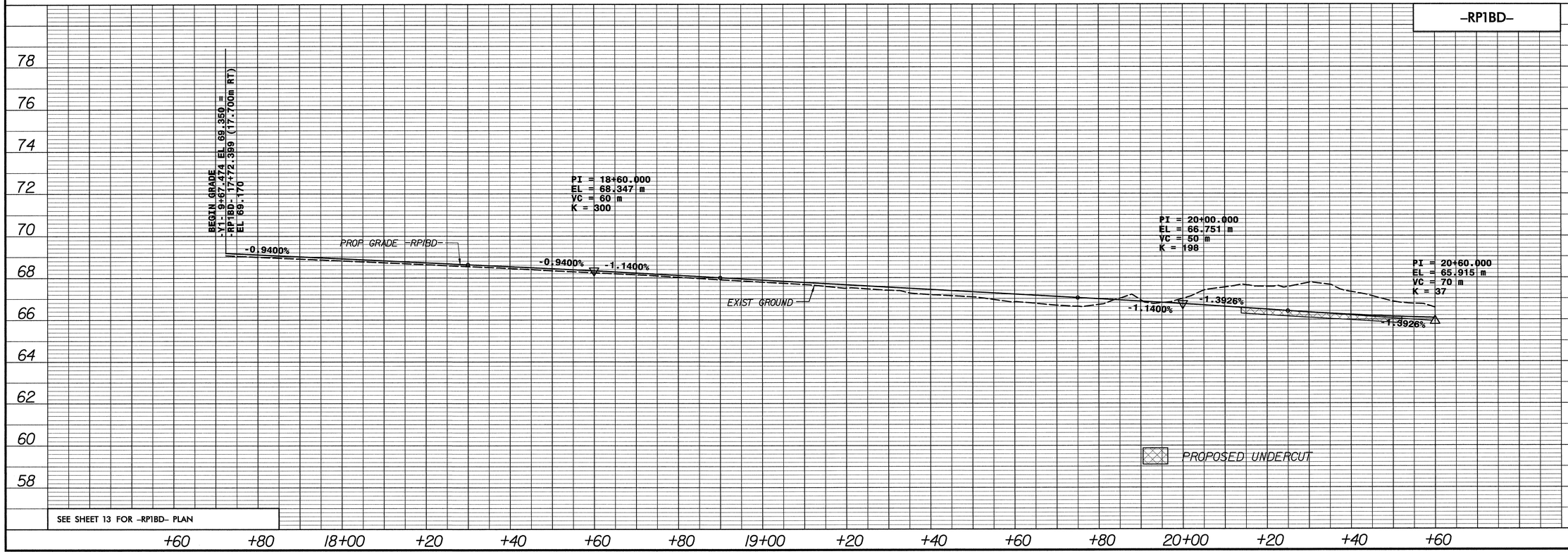
CONST.REV.

R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 36 |
| R /W SHEET NO. | 51 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORY
8-29-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS JR.
8/29/08




SEE SHEET 13 FOR -RP1BD- PLAN

FILE: r:\u-2519da\roadway\proj\U2519DA_RDY_PSH_36_RP1BD.DGN
DATE: 08/08/2008 01:35:55 PM
PLOT DRIVER: M:\F&HCAD\PLOTDRV\Metric_plan_full\fullsize_metric.plt
PEN TABLE: M:\F&HCAD\PENTABS_F&H\F&H_Plan.tbl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

R /W REV.

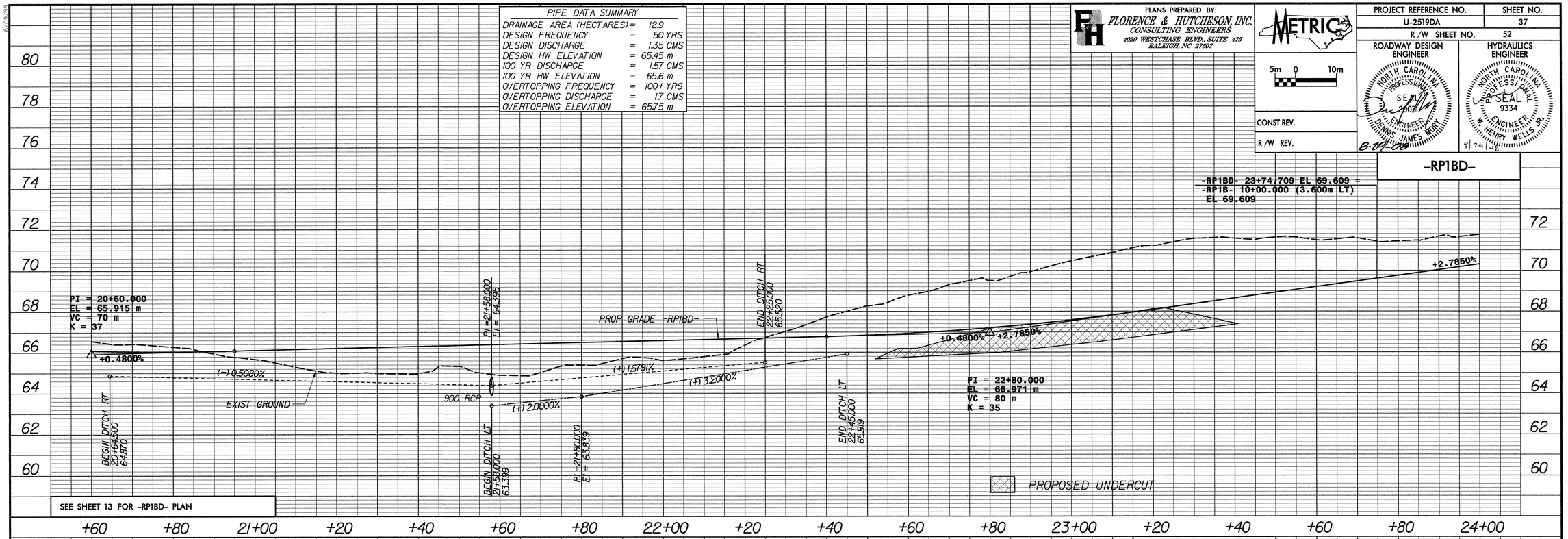
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 37 |
| R /W SHEET NO. | 52 |

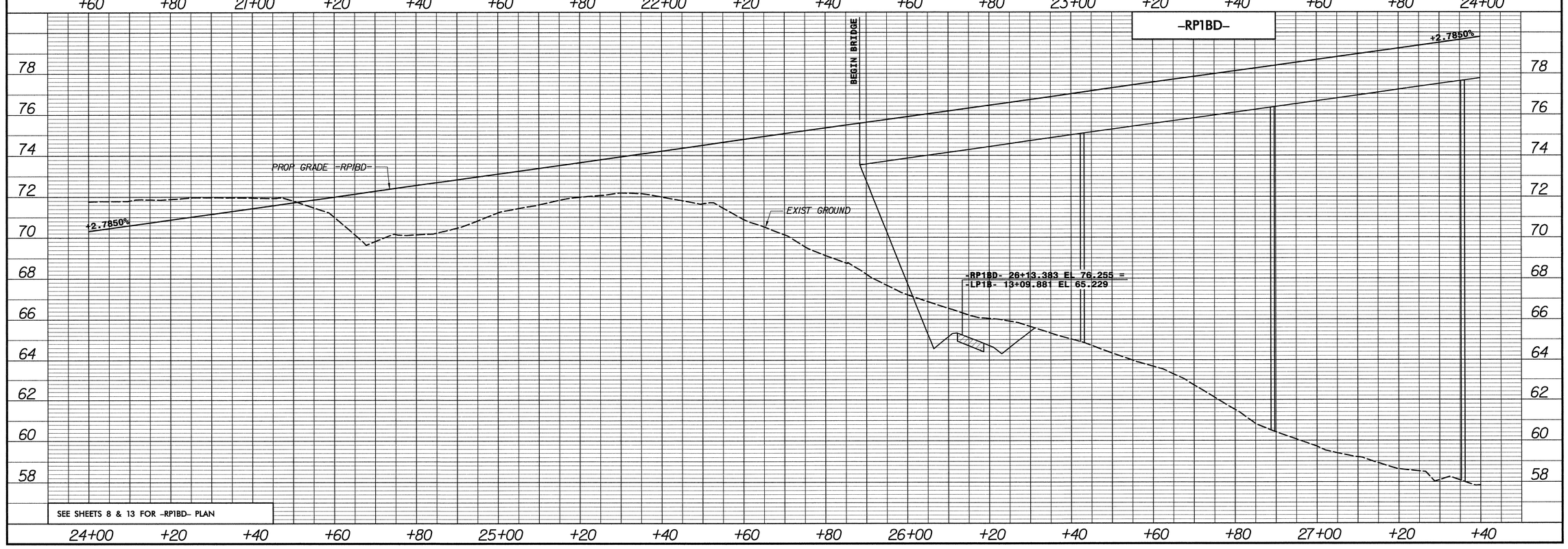
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20021 ENGINEER DENNIS JAMES MORT
8-27-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR.
5/29/08

PIPE DATA SUMMARY

| | | |
|---|---|---|
| DRAINAGE AREA (HECTARES) | = | 12.9 |
| DESIGN FREQUENCY | = | 50 YRS |
| DESIGN DISCHARGE | = | 1.35 CMS |
| DESIGN HW ELEVATION | = | 65.45 m |
| 100 YR DISCHARGE | = | 1.57 CMS |
| 100 YR HW ELEVATION | = | 65.6 m |
| OVERTOPPING FREQUENCY | = | 100+ YRS |
| OVERTOPPING DISCHARGE | = | 1.7 CMS |
| OVERTOPPING ELEVATION | = | 65.75 m |




FILE: R:\U-2519DA\Roadway\Proj\U2519DA_RDY_PRF_37_RP1BD.DGN
DATE: 08/29/2008 11:41:46 AM
CONFIGURATION: Metric\Roadway\Profile\metric_plan_full_fill.cfg
REV TABLE: M:\FRAMCAD FEATURES_REFERENCE\PLAN TBL

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
5540 CENTERVIEW DR., SUITE 316
RALEIGH, NC 27606

METRIC

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 38 |
| R/W SHEET NO. | 53 |

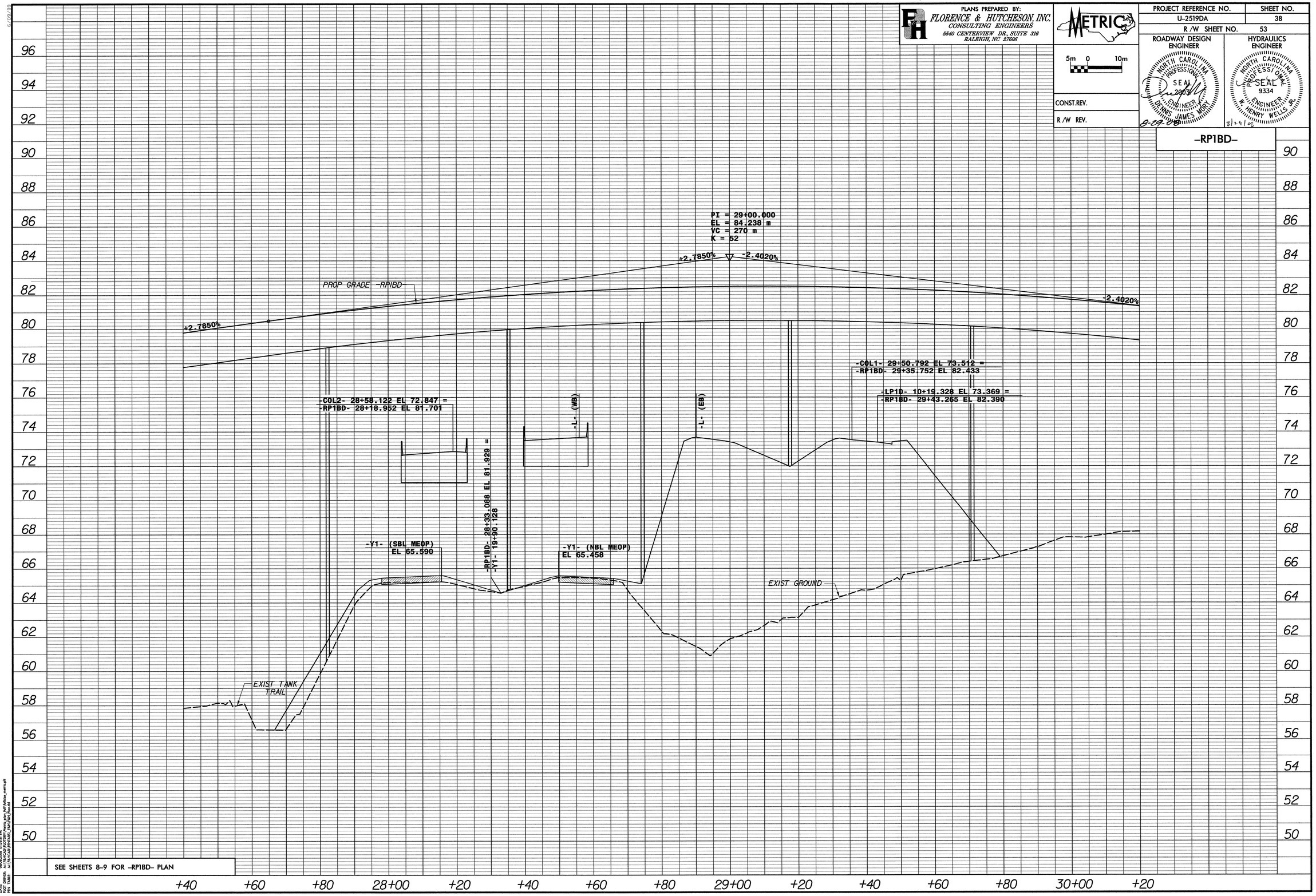
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 28031 ENGINEER DENNIS JAMES MORY
8-29-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS JR.
8/29/08

CONST.REV.

R/W REV.

-RP1BD-




SEE SHEETS 8-9 FOR -RP1BD- PLAN

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
5540 CENTERVIEW DR., SUITE 316
RALEIGH, NC 27606

METRIC

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 39 |
| R/W SHEET NO. | 54 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORY
8-29-08

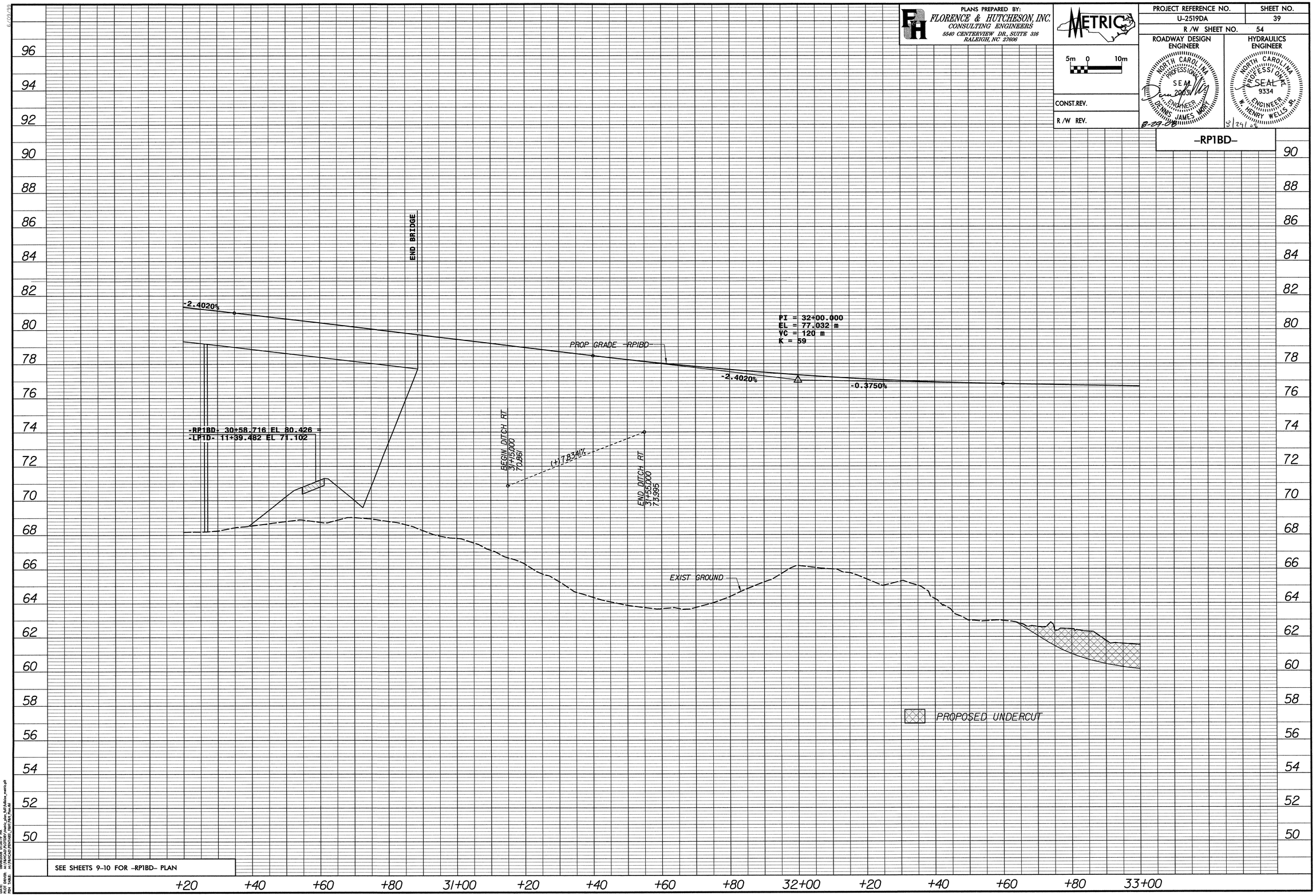
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS JR.
8/29/08

5m 0 10m

CONST.REV.

R/W REV.

-RP1BD-



PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
5540 CENTERVIEW DR., SUITE 316
RALEIGH, NC 27606

METRIC

5m 0 10m

CONST.REV.

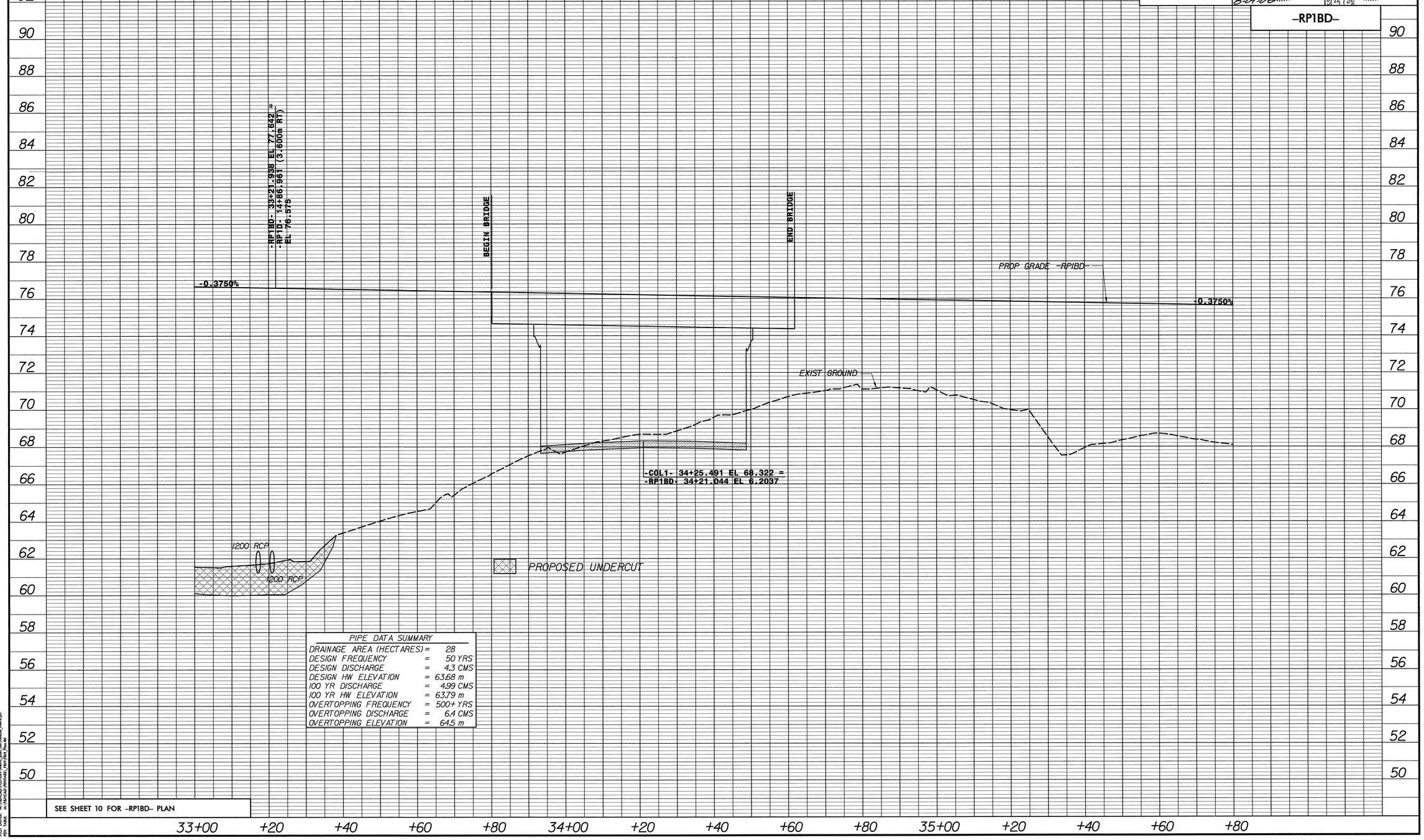
R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 40 |
| R /W SHEET NO. | 55 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MART
8-29-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR.
8/29/08

-RP1BD-




PIPE DATA SUMMARY

| | | |
|---|---|---|
| DRAINAGE AREA (HECTARES) | = | 28 |
| DESIGN FREQUENCY | = | 50 YRS |
| DESIGN DISCHARGE | = | 4.3 CMS |
| DESIGN HW ELEVATION | = | 63.68 m |
| 100 YR DISCHARGE | = | 4.99 CMS |
| 100 YR HW ELEVATION | = | 63.79 m |
| OVERTOPPING FREQUENCY | = | 500+ YRS |
| OVERTOPPING DISCHARGE | = | 6.4 CMS |
| OVERTOPPING ELEVATION | = | 64.5 m |

SEE SHEET 10 FOR -RP1BD- PLAN

FILE: n:\u2519da\roadway\proj\U2519DA_RDY_PSH_A0_RP1BD.DGN
DATE: 8/29/2008 11:16:17 am
PLOT DRIVER: M:\RBACAD\PLOTDRV\Metric_plus_full.tbl
PEN TABLE: M:\RBACAD\PENTABS\Metric\Full.tbl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

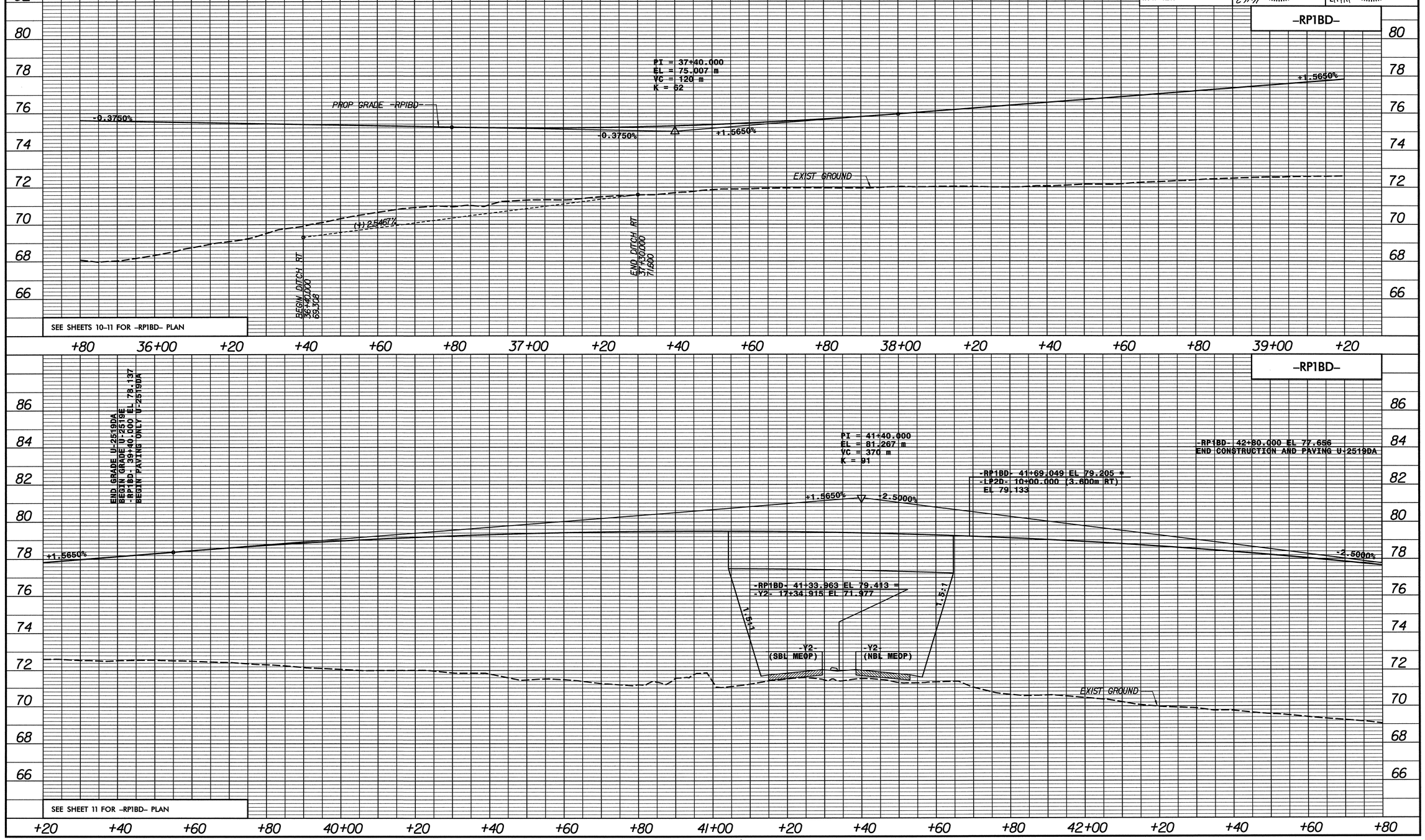
CONST.REV.

R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 41 |
| R /W SHEET NO. 56 | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26031 ENGINEER DENNIS JAMES MURPHY
2-11-11

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS JR.
2/14/11




FILE: 8_Roadway Proj U2519DA_RDY_PSH_41_RP1BD.DGN
PLOT SCALE: 1:500 Plot Date: 2/11/2011
PLOT DRIVER: V:\Bat_Files\Server_Files\CAD\RAHCAD\PLOTDRV\Metric_plan_full full size_metric.pltl
PEN TABLE: V:\MUL_PLOTHUT_SERVER_FILES\CAD\RAHCAD\PENTABS_RAH\RAH_PLAN.TBL

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

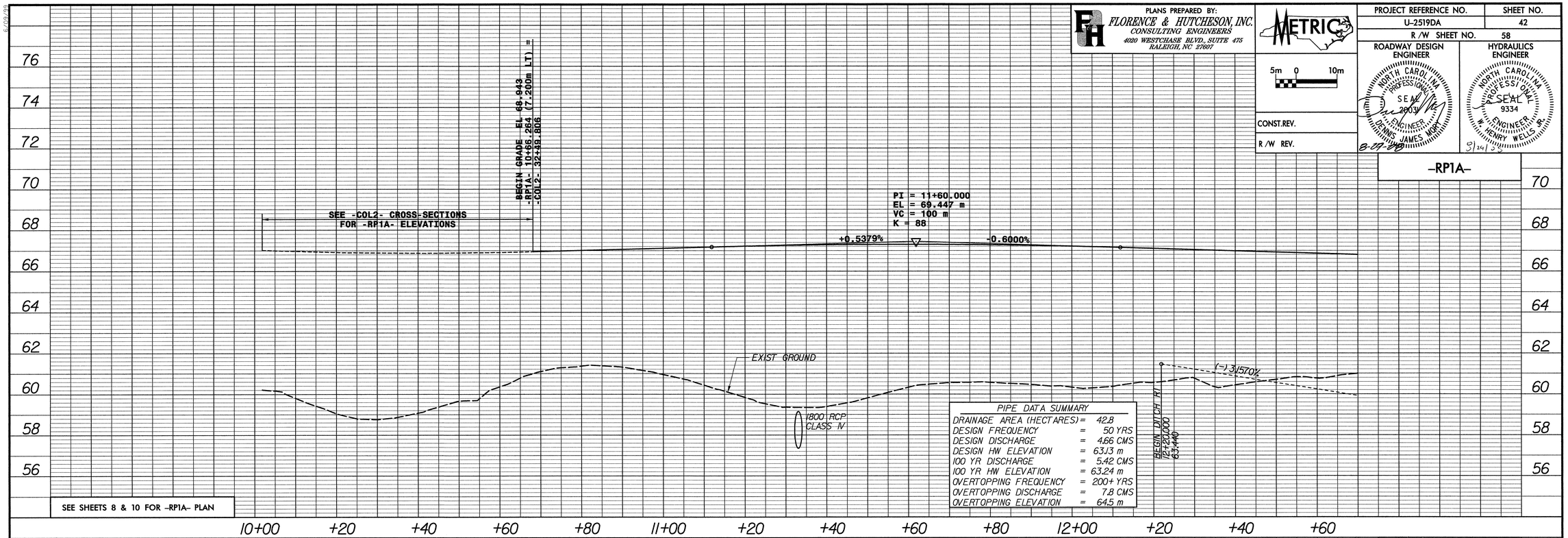
CONST.REV.

R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 42 |
| R /W SHEET NO. 58 | |

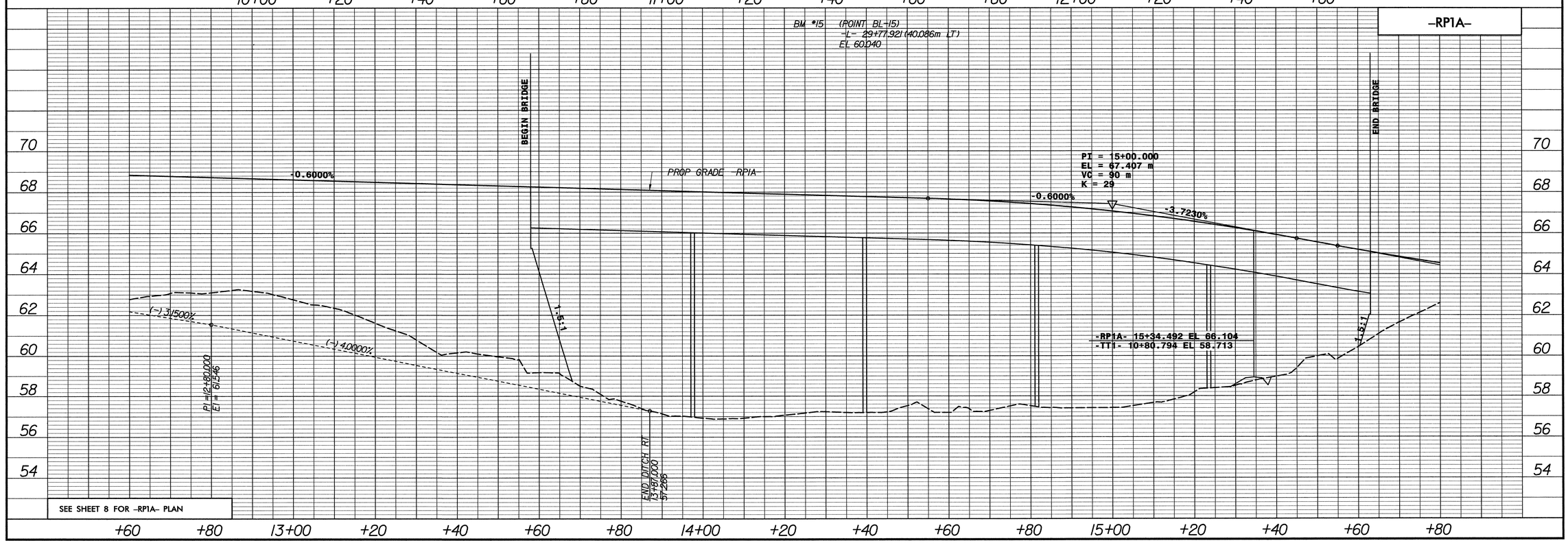
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORT
8-29-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR.
9/24/08




PIPE DATA SUMMARY

| | | |
|---|---|---|
| DRAINAGE AREA (HECTARES) | = | 42.8 |
| DESIGN FREQUENCY | = | 50 YRS |
| DESIGN DISCHARGE | = | 4.66 CMS |
| DESIGN HW ELEVATION | = | 63.13 m |
| 100 YR DISCHARGE | = | 5.42 CMS |
| 100 YR HW ELEVATION | = | 63.24 m |
| OVERTOPPING FREQUENCY | = | 200+ YRS |
| OVERTOPPING DISCHARGE | = | 7.8 CMS |
| OVERTOPPING ELEVATION | = | 64.5 m |




FILE: r:\u-2519da\roadway\proj\U2519DA_RDY_PSH_42_RP1A.DGN
DATE: 08/08/2008 01:36:44 PM
CONFIG: C:\Bentley\Workspace\Projects\Metric_plan_full\fahlice_metric.pll
PEN TABLE: M:\RDHCAD\PENTABS_F&H\F&H_Pen.tbl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

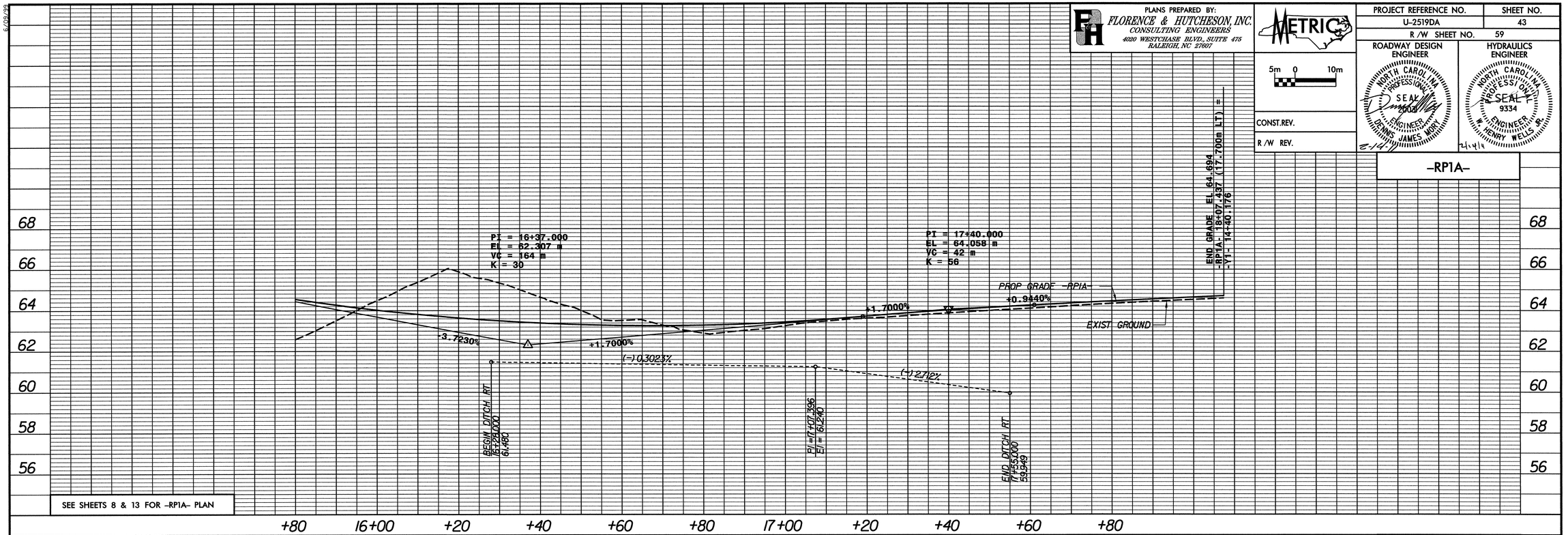
R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 43 |
| R /W SHEET NO. 59 | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20020 ENGINEER DENNIS JAMES MURT
2-11-14

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR.
2-11-14

## -RP1A-

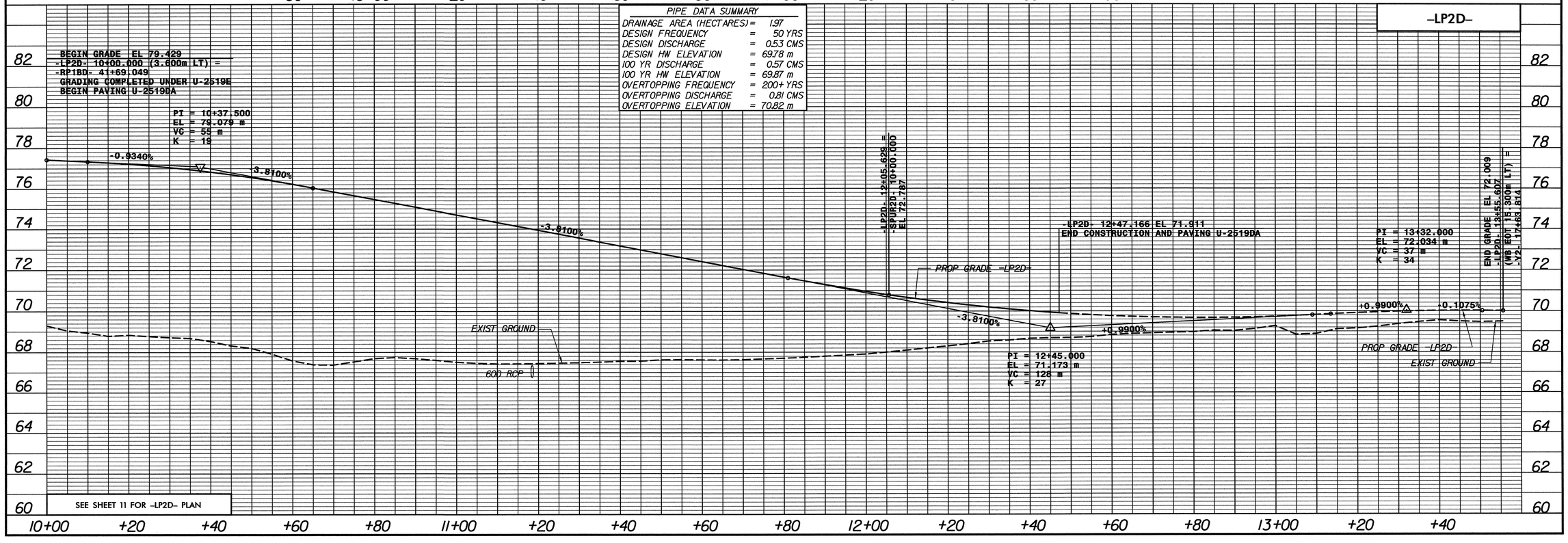



SEE SHEETS 8 & 13 FOR -RP1A- PLAN

## -LP2D-

PIPE DATA SUMMARY

| | | |
|---|---|---|
| DRAINAGE AREA (HECTARES) | = | 1.97 |
| DESIGN FREQUENCY | = | 50 YRS |
| DESIGN DISCHARGE | = | 0.53 CMS |
| DESIGN HW ELEVATION | = | 69.78 m |
| 100 YR DISCHARGE | = | 0.57 CMS |
| 100 YR HW ELEVATION | = | 69.87 m |
| OVERTOPPING FREQUENCY | = | 200+ YRS |
| OVERTOPPING DISCHARGE | = | 0.81 CMS |
| OVERTOPPING ELEVATION | = | 70.82 m |




SEE SHEET 11 FOR -LP2D- PLAN

FILE: 5.1 Roadway Plan U2519DA_RDY_PRN_43_RPA.DGN
DATE: 2/10/2014 10:22:11 AM
PLOT DRIVER: V:\Bat_Plot\Hut_Server_Files\CAD\RHCAD\PLOTDRV\Metric_Mem_full full size_metric.pltl
PEN TABLE: V:\BAL_PLOT\HUT_SERVER_FILES\CAD\RHCAD\PENTABS_RDY\RDY_PLAN.TBL

6/09/99

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

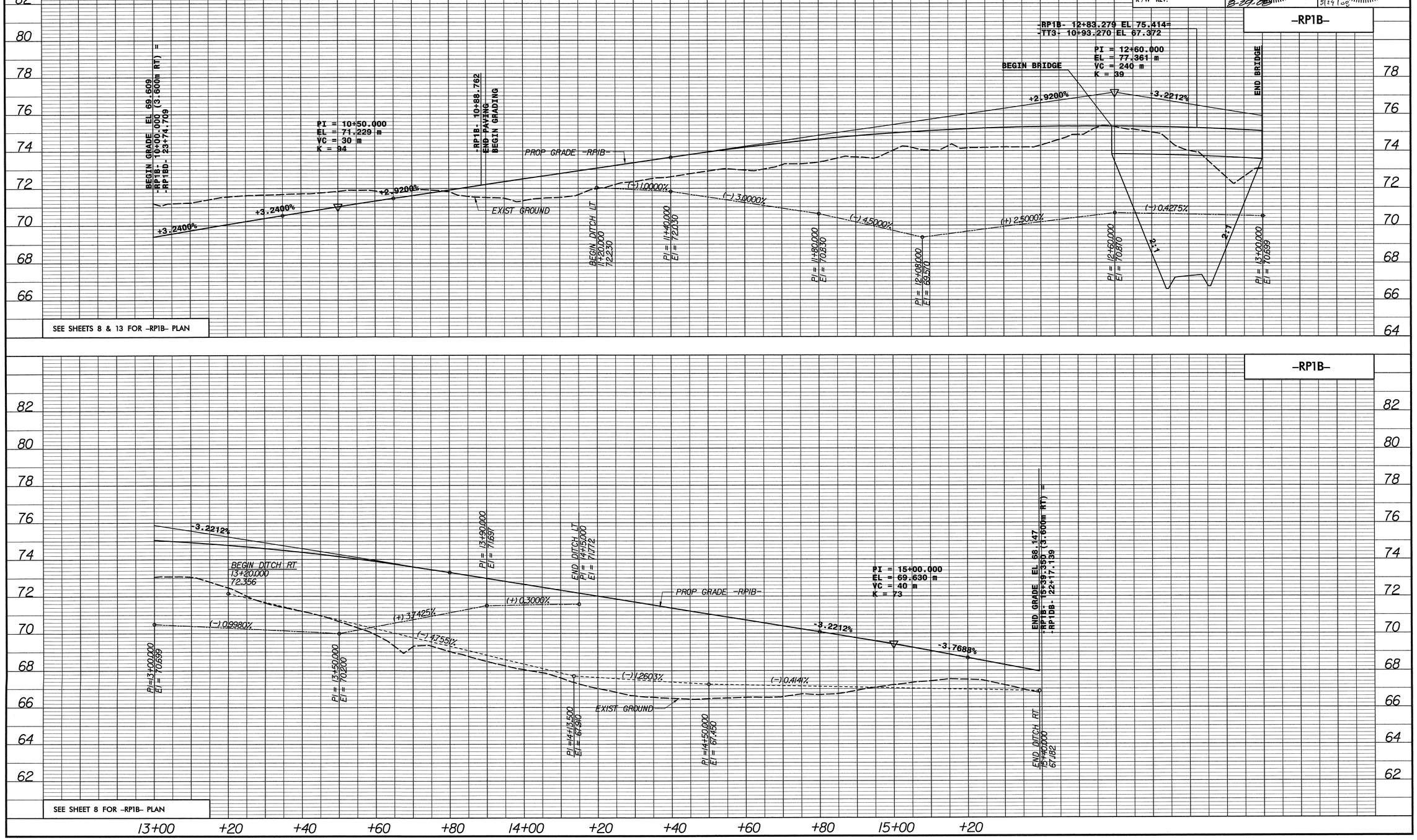
CONST.REV.

R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 44 |
| R /W SHEET NO. 60 | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORRY
8-29-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS JR.
8/29/08




SEE SHEETS 8 & 13 FOR -RP1B- PLAN

SEE SHEET 8 FOR -RP1B- PLAN

FILE: n:\u-2519da\roadway\proj\U2519DA_RDY_PSH_L4_RP1B.DGN
DATE: 8/29/2008 10:11:11 AM
PLOT: DRIVER: Microsoft PostScript Driver (Metric_plan_full).pltsize_metric.plt
PEN TABLE: M:\FRHCAD\PENTABS_FRH\FRH_Pen.tbl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

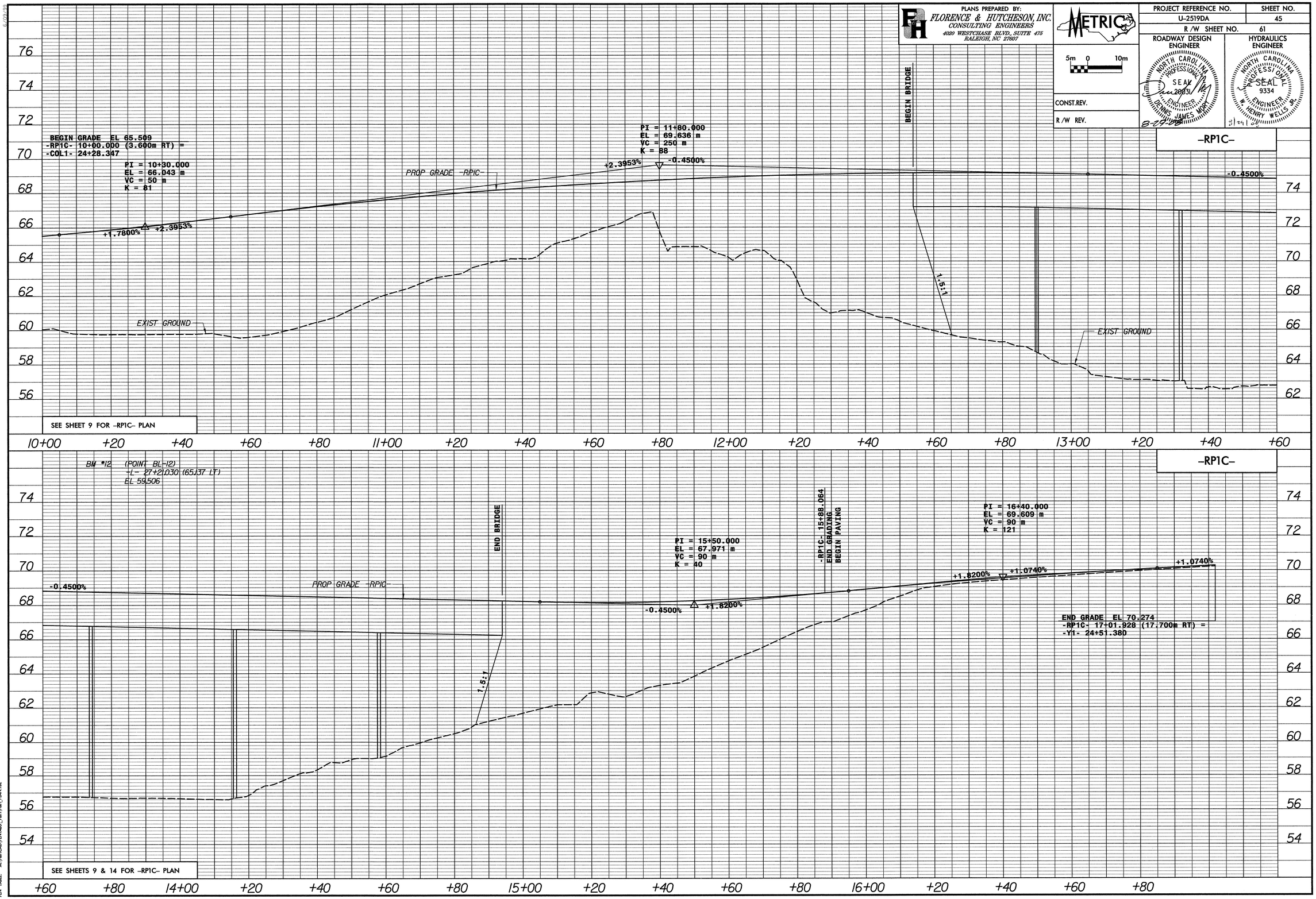
CONST.REV.

R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 45 |
| R /W SHEET NO. | 61 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MART
8-29-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR.
3/29/10




FILE: R:\U-2519DA\Roadway\Proj\U2519DA_RDY_PRL_45_RP1C.DGN
DATE: 08/29/2008 12:27:18 PM
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PEN TABLE: M:\FEHCAD\PENTABS_FEH\FEH_PLAN.TBL

| PIPE DATA SUMMARY | | |
|---|---|---|
| DRAINAGE AREA (HECTARES) | = | 2.8 |
| DESIGN FREQUENCY | = | 50 YRS |
| DESIGN DISCHARGE | = | 0.45 CMS |
| DESIGN HW ELEVATION | = | 69.65 m |
| 100 YR DISCHARGE | = | 0.474 CMS |
| 100 YR HW ELEVATION | = | 69.67 m |
| OVERTOPPING FREQUENCY | = | 500+ YRS |
| OVERTOPPING DISCHARGE | = | 1.48 CMS |
| OVERTOPPING ELEVATION | = | 72.26 m |

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 46 |
| R/W SHEET NO. | 62 |

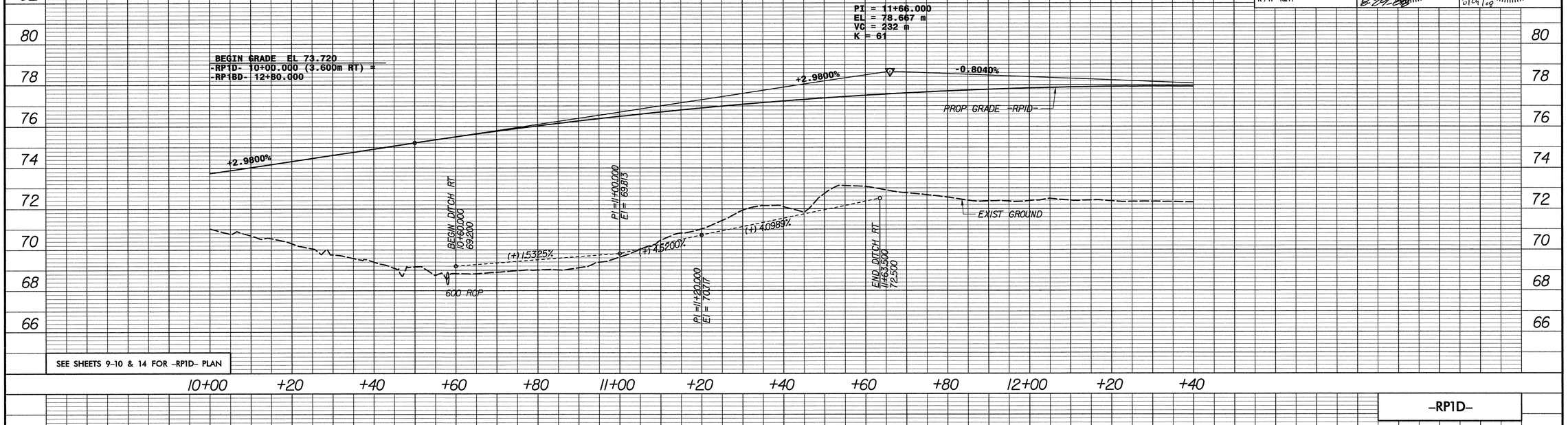
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20021 ENGINEER DENNIS JAMES MOORE

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR.
8/24/08

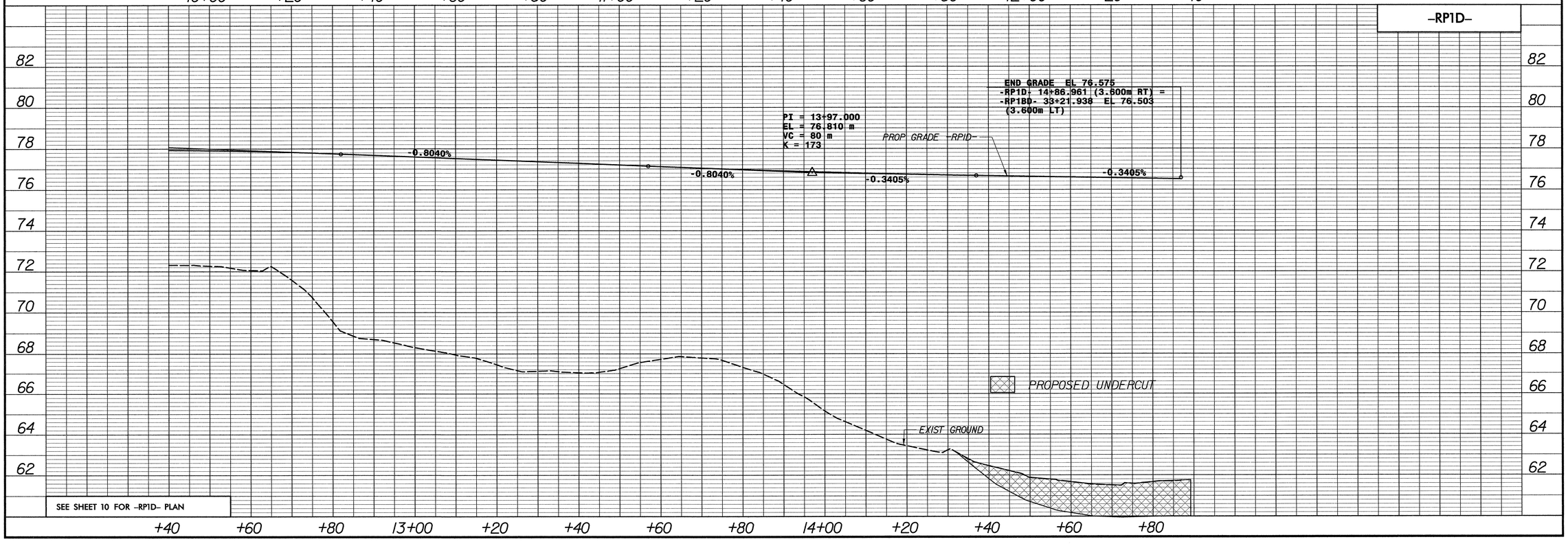
CONST.REV.

R/W REV.

## -RP1D-




## -RP1D-




FILE: r:\U-2519DA\Roadway\Proj\U2519DA_RDY_PSH_46_RP1D.DGN
DATE: 08/26/2008 09:01:56 AM
MODEL: Metric_plan_full/fullsize_metric.plt
PEN TABLE: M:\RAHCAD\PENTABS_PSH\PSH_PLAN.TBL

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
5540 CENTERVIEW DR., SUITE 316
RALEIGH, NC 27606

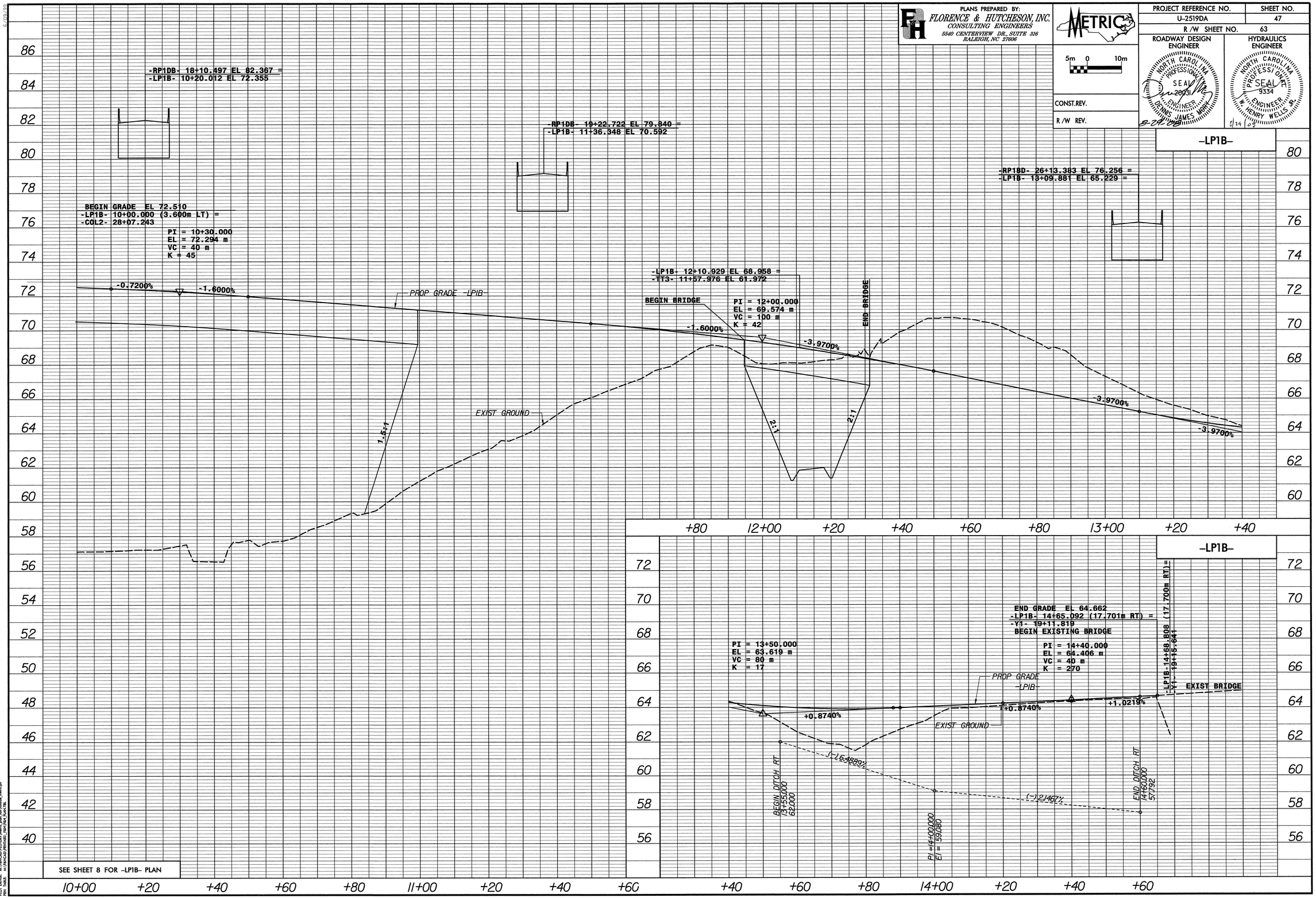
METRIC
5m 0 10m

CONST.REV.
R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 47 |
| R /W SHEET NO. 63 | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORT

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




FILE: R:\U-2519DA\Roadway\Proj\U2519DA_RDY_PH_47_LP1B.DGN
DATE: 5/29/2020 8:07:21 AM
PLOT DRIVER: XV:\WAFLAC\PLOTDRV\Metric_Color_Full\Bdlite_metric.pltr
BY: TIMER: X:\WAFLAC\PROJMAN_TIMER\PB_FLAT.TBL

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

CONST.REV.
R /W REV.

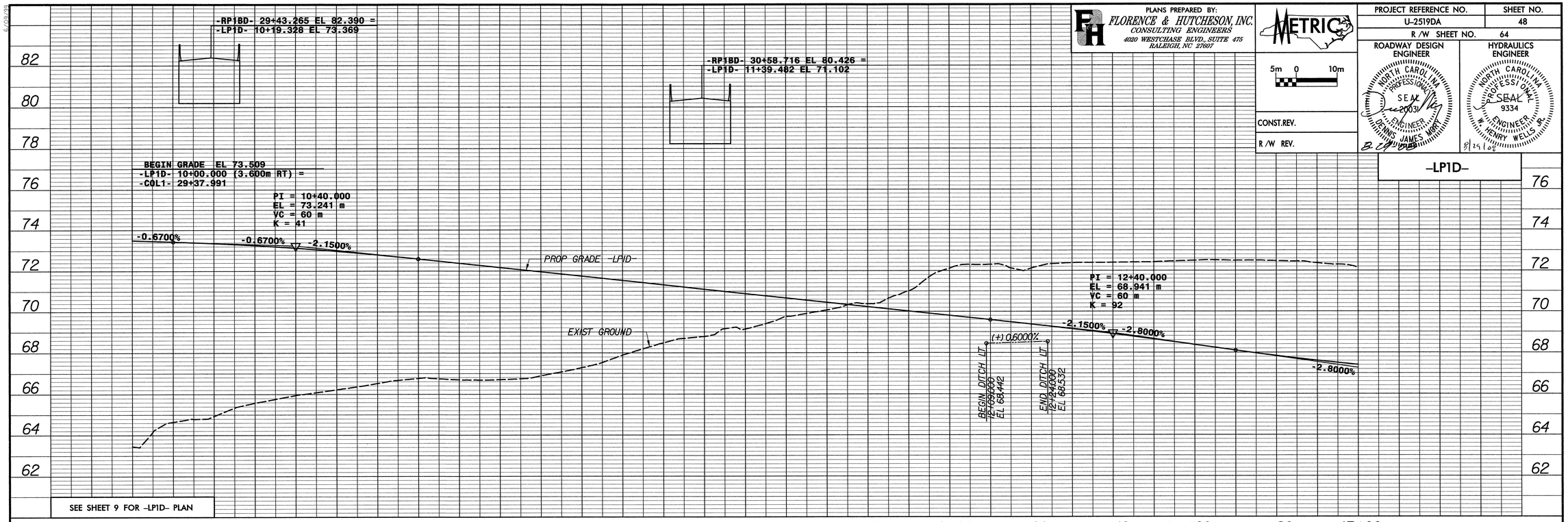
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 48 |
| R /W SHEET NO. | 64 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 2003 ENGINEER DENNIS JAMES MORT

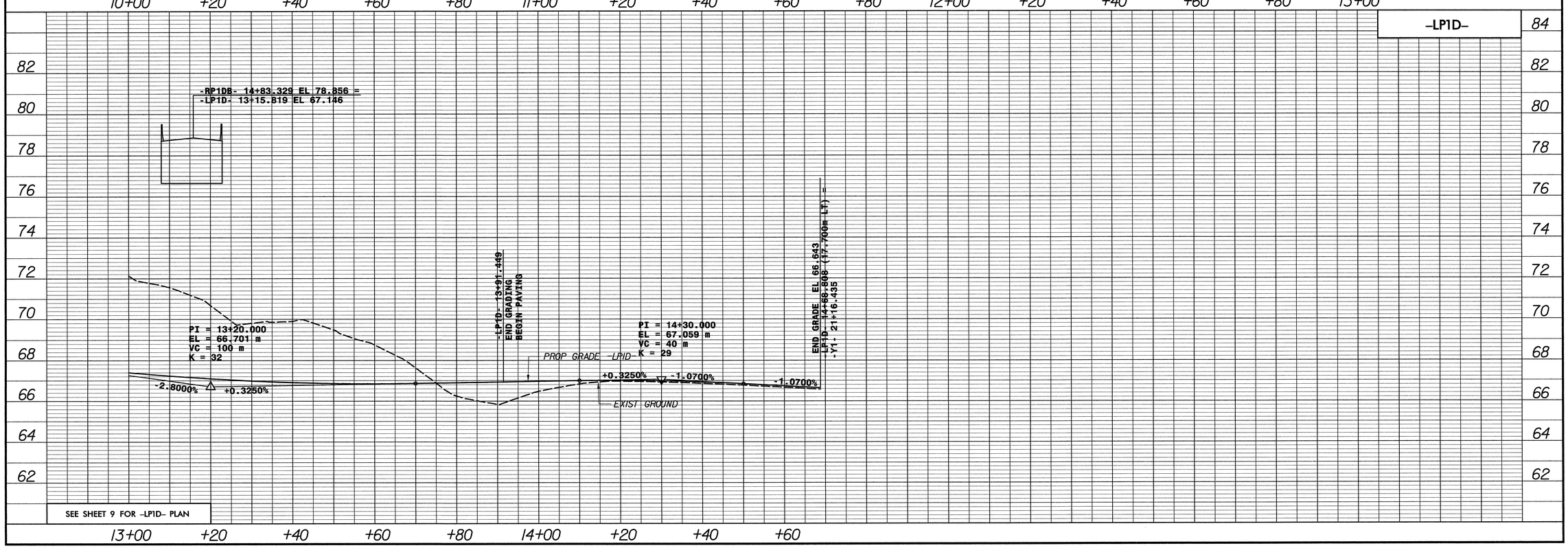
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR.

8/29/08

## -LP1D-




## -LP1D-




FILE: r:\u-2519da\roadway\proj\U2519DA_RDY_PSH_48_LP1D.DGN
DATE: 08/08/2008 01:37:21 PM
PLOT SCALE: 1:50(H)1:50(V) MODE: Metric plan, full\fullsize_metric.plt
PEN TABLE: M:\FBHCAD\PENTABS_FBH\FBH_Plan.tbl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

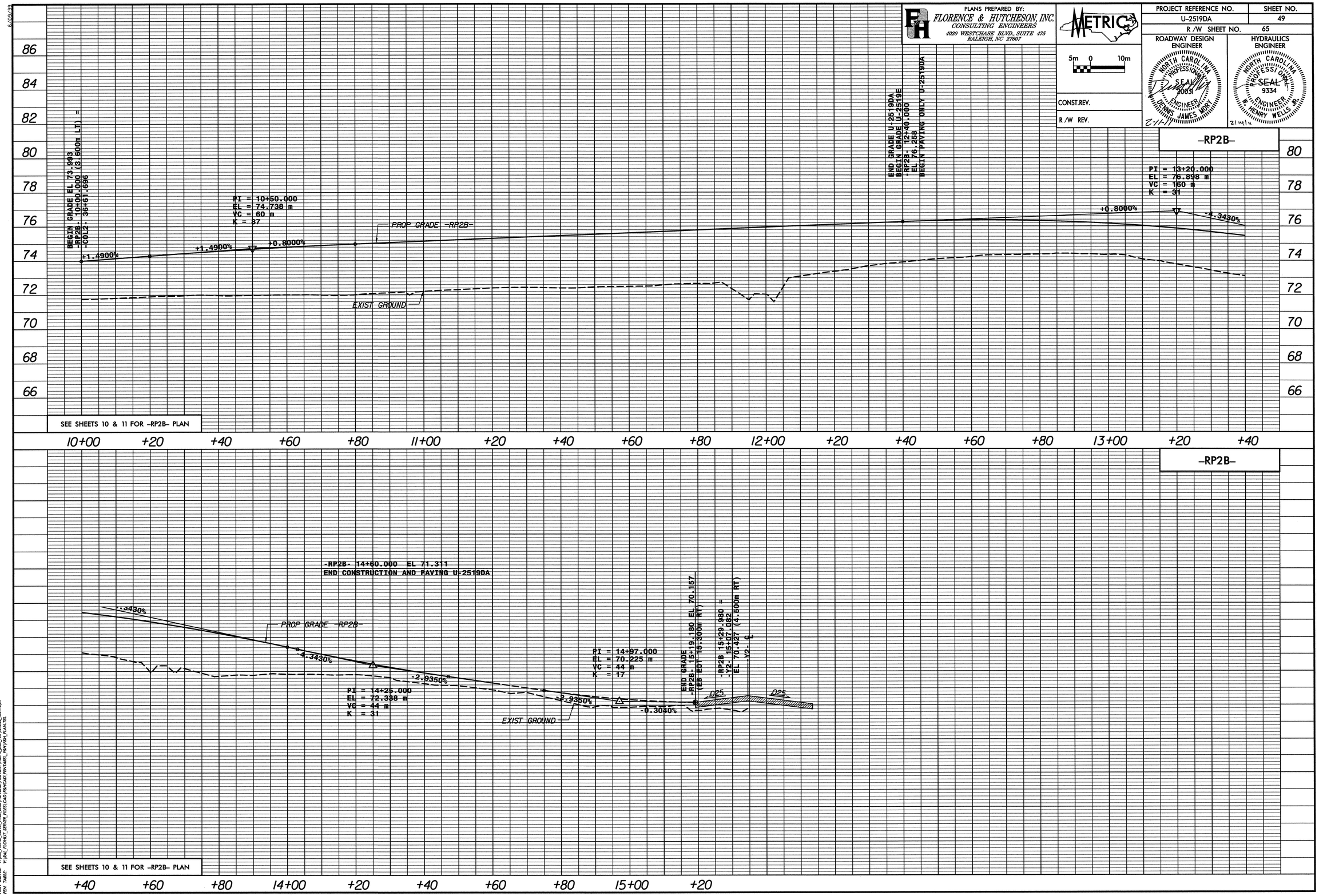
CONST.REV.

R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 49 |
| R /W SHEET NO. 65 | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20051 ENGINEER DENNIS JAMES MORY
2/14/11

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR.
2/14/11




FILE: R:\Roadway\Proj\U2519DA_RDY_PR_19_RP2B.DGN
DATE: 2/10/2011 USER: Hu_Hao
PLOT DRIVER: V:\Bal_Flo\Hu_Server_Files\CAD\RENCAD\PLOTDRV\Metric_plan_full\fullsize_metric.plt
PEN TABLE: V:\BAL_FLOHUT_SERVER_FILES\CAD\RENCAD\PRINTABS_RAH\PAH_PLAN.TBL

6/09/99

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

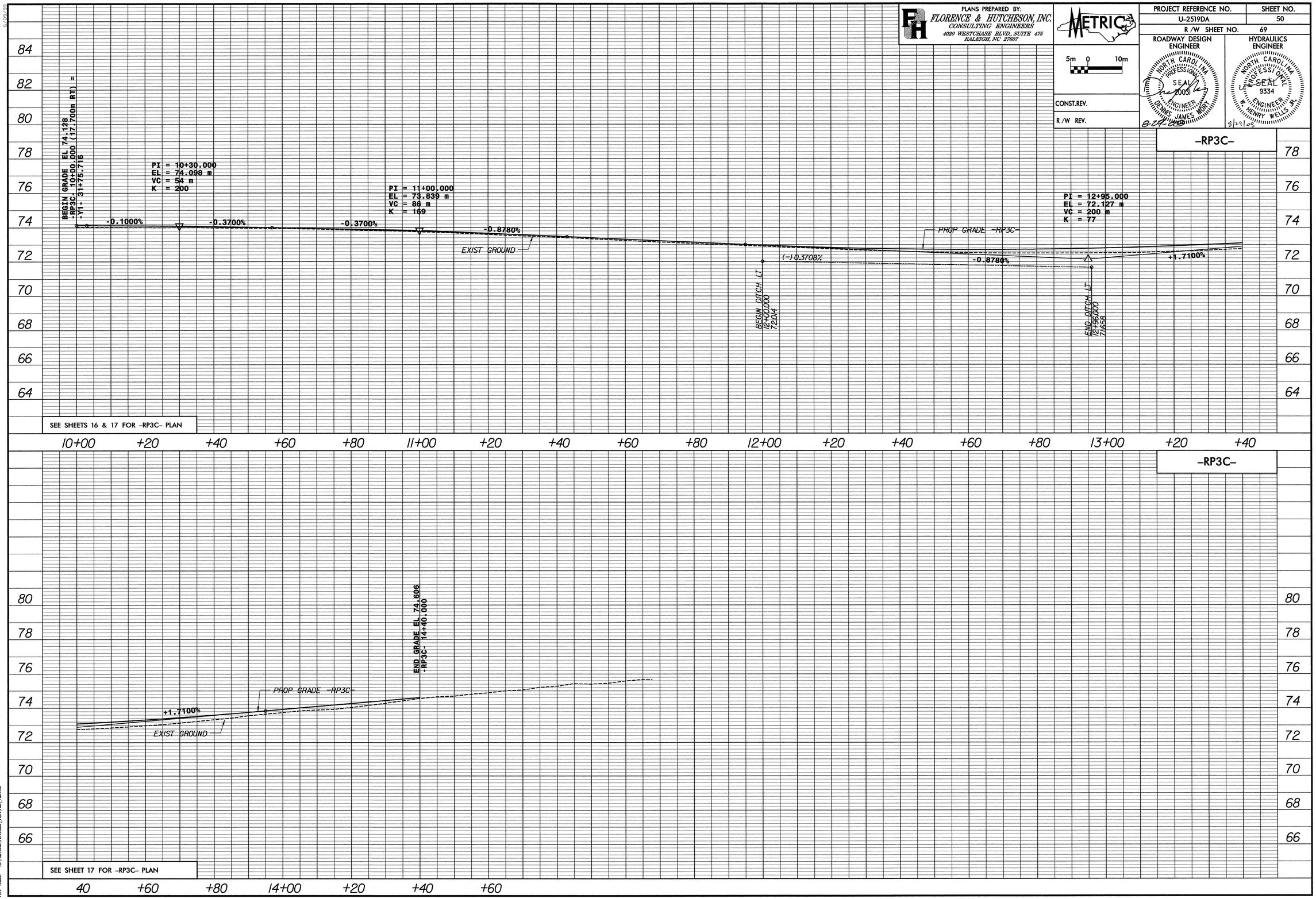
CONST.REV.

R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 50 |
| R /W SHEET NO. 69 | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MERRY
8-27-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS JR.
8/29/08




FILE: n:\u-2519da\roadway\proj\U2519DA_RDY_PSH_SO_RP3C.DGN
DATE: 08/06/2008 01:37:38 PM
PLOT DATE: 8/27/2008 By: merry Metric_plan_fill\fillsize_metric.plt
PEN TABLE: M:\RDHCAD\PENTABLE_F&H\F&H_Plan.tbl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

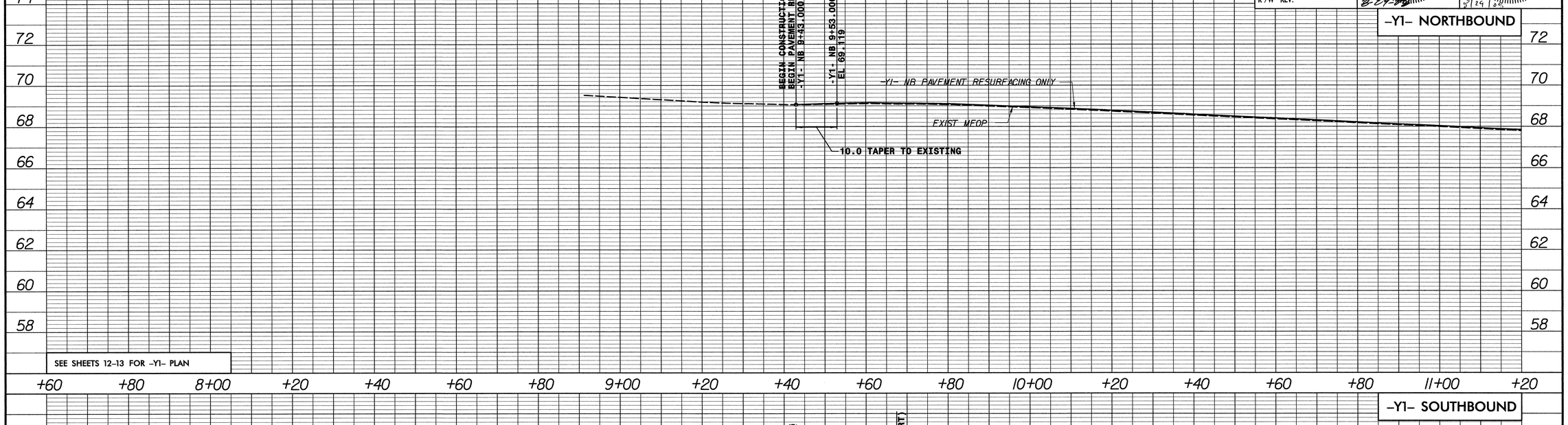
R/W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 51 |
| R/W SHEET NO. | 70 |

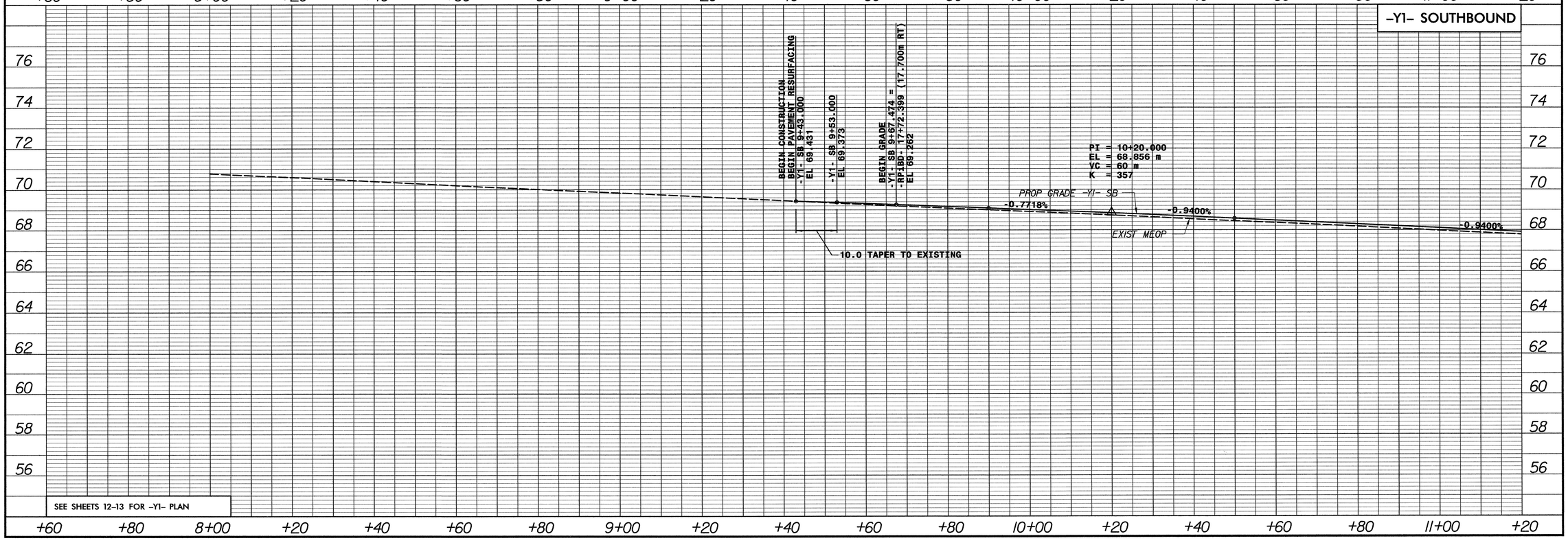
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20037 ENGINEER DENNIS JAMES MORT
8-27-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR.
8/29/08

## -Y1- NORTHBOUND




## -Y1- SOUTHBOUND




FILE: R:\U-2519DA\Roadway\Proj\U2519DA_RDY_PSH_51_Y1.DGN
DATE: 08/08/2008 08:37:34 AM
USER: dmorton PROJECT: U2519DA Metric plan full/fullsize metric.plt
PEN TABLE: M:\FEH\CAD\PENTABS_FEH\FEH_PLAN.TBL

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

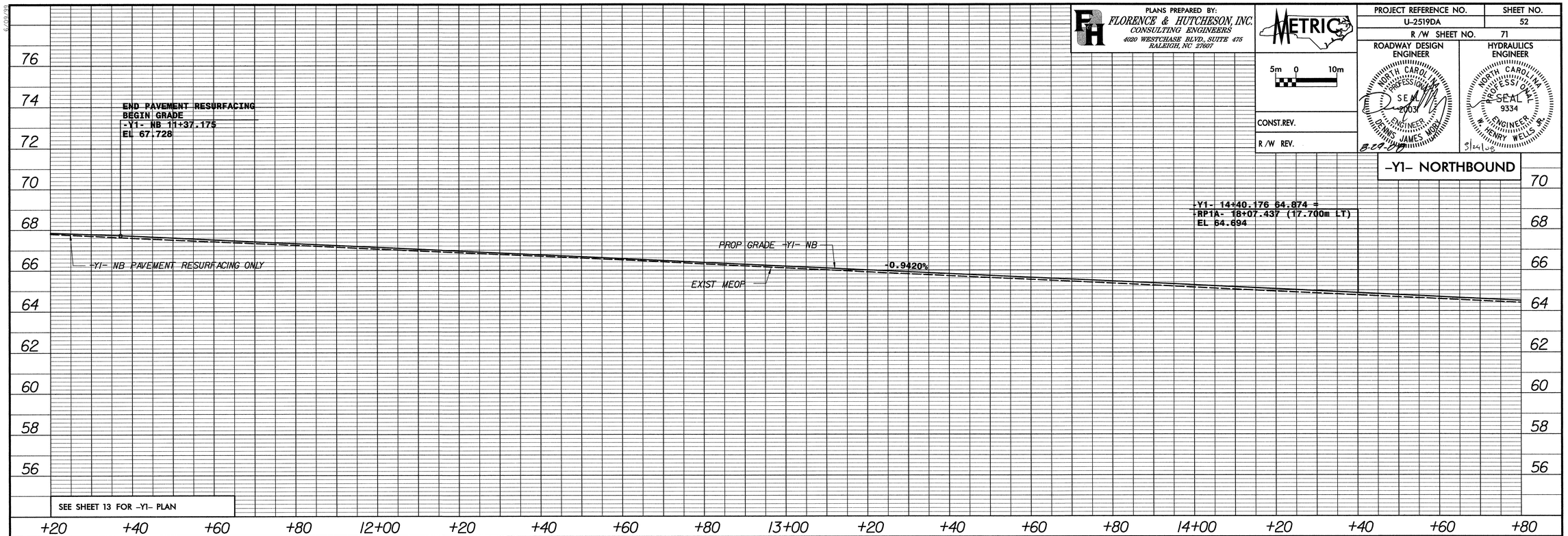
R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 52 |
| R /W SHEET NO. 71 | |

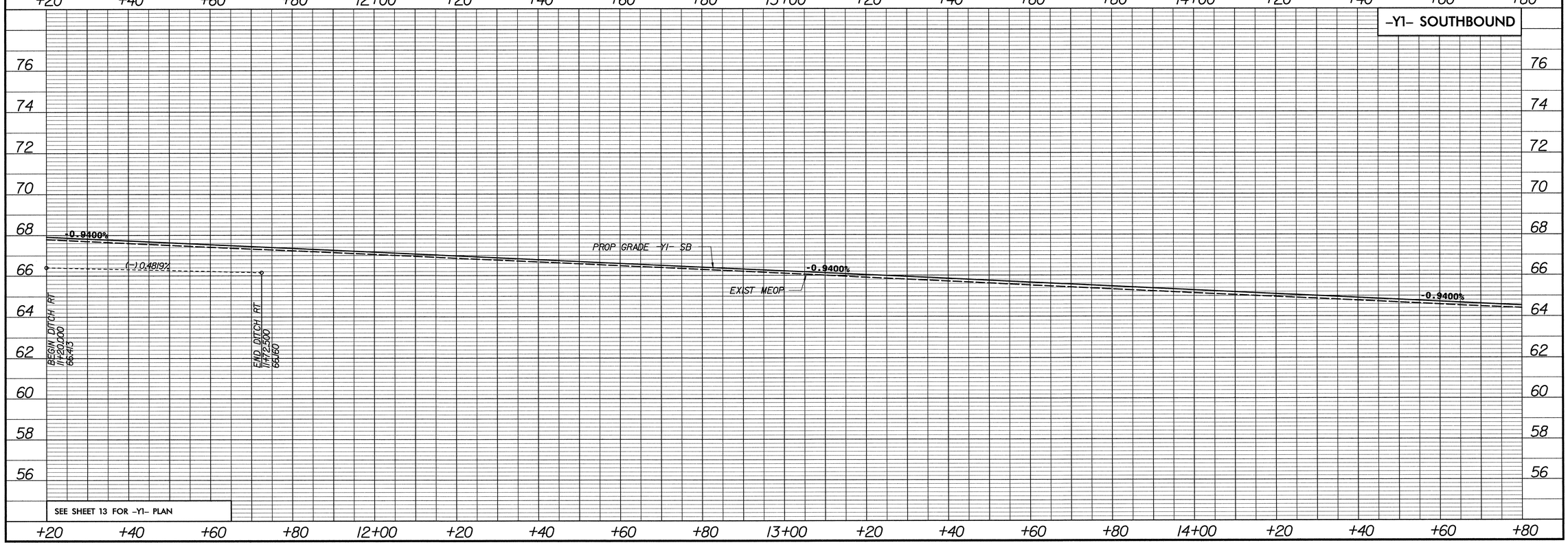
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 2003 ENGINEER DENNIS JAMES NORRIS
8-20-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR.
8/26/08

## -Y1- NORTHBOUND




## -Y1- SOUTHBOUND




FILE: R:\U-2519DA\Roadway\Proj\U2519DA_RDY_PRH_S2_Y1.DGN
DATE: 08/08/2008 08:37:54 AM
PLOT DRIVER: HL_FHWCAD.PLT (DTP) Hybrid
PLOT SCALE: H:1/50 (HCAD) (PRTCD80) (Left) (Left) (Left) EXT. Edition_metric.plt

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

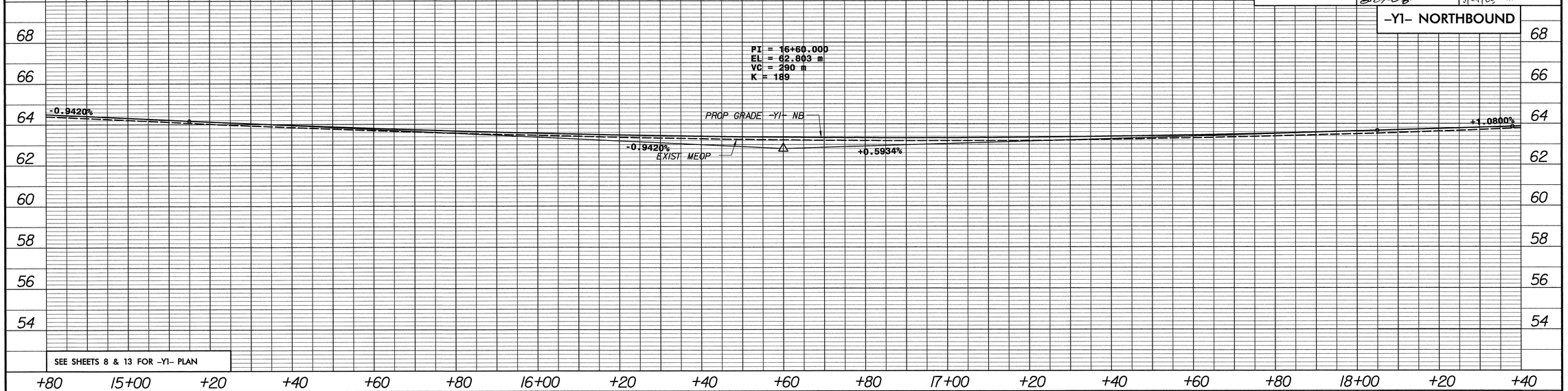
R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 53 |
| R /W SHEET NO. | 72 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORY
8/29/08

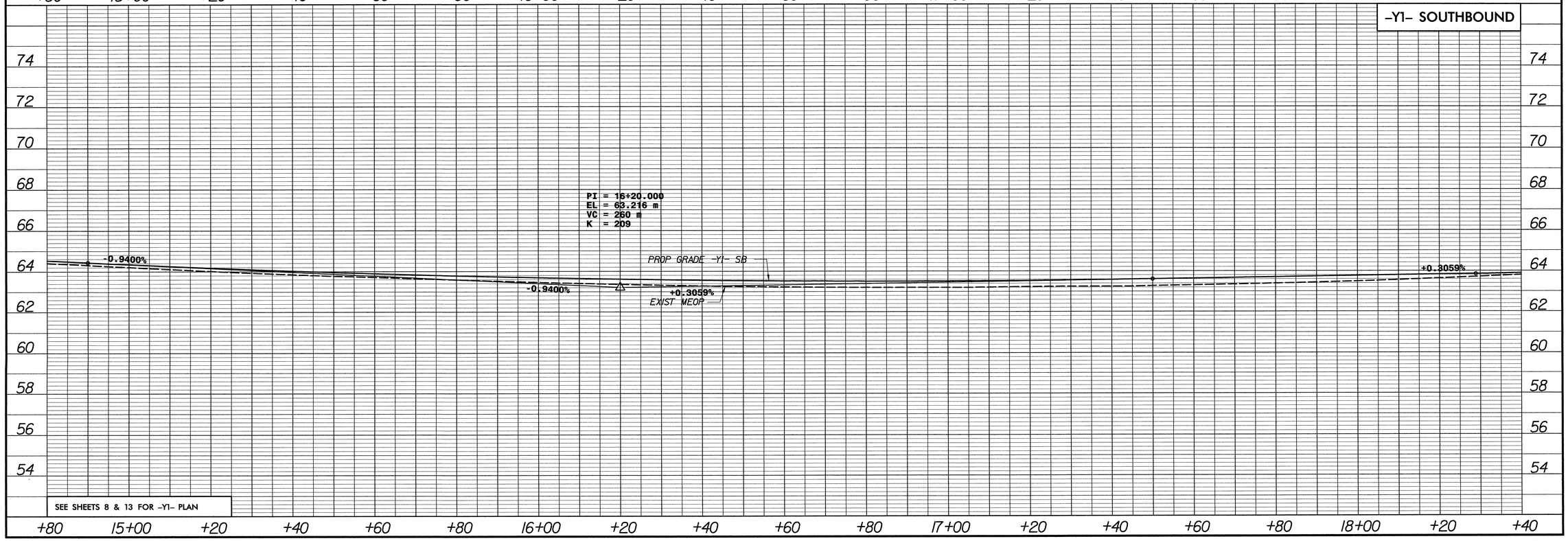
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS JR.
8/29/08

## -Y1- NORTHBOUND




SEE SHEETS 8 & 13 FOR -Y1- PLAN

## -Y1- SOUTHBOUND




SEE SHEETS 8 & 13 FOR -Y1- PLAN

FILE: R:\U-2519DA\Roadway Proj\U2519DA_RDY_PSH_S3_Y1.DGN
DATE: 08/29/2008 08:36:11 AM
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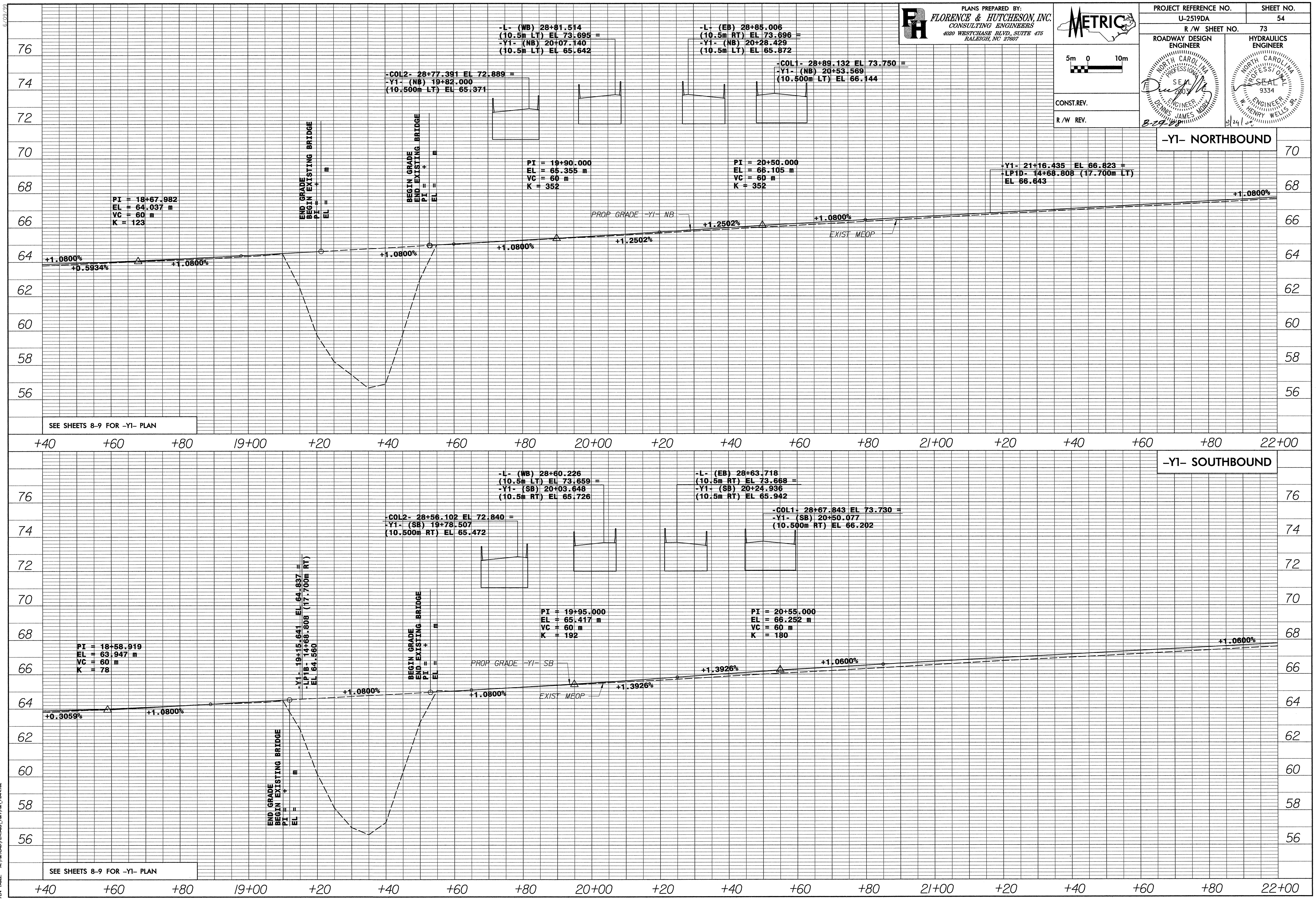



FILE: R:\U-2519DA\Roadway\Proj\U2519DA_RDY_PSH_54_Y1.DGN
DATE: 08/29/2008 12:59:02 PM
PLOT DRIVER: M:\F&HCAD\PLOTDRV\Metric_plan_full\halfsize_Interchange_Metric.plt
PEN TABLE: M:\F&HCAD\PENTABS_F&H\F&H_PLAN.TBL

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

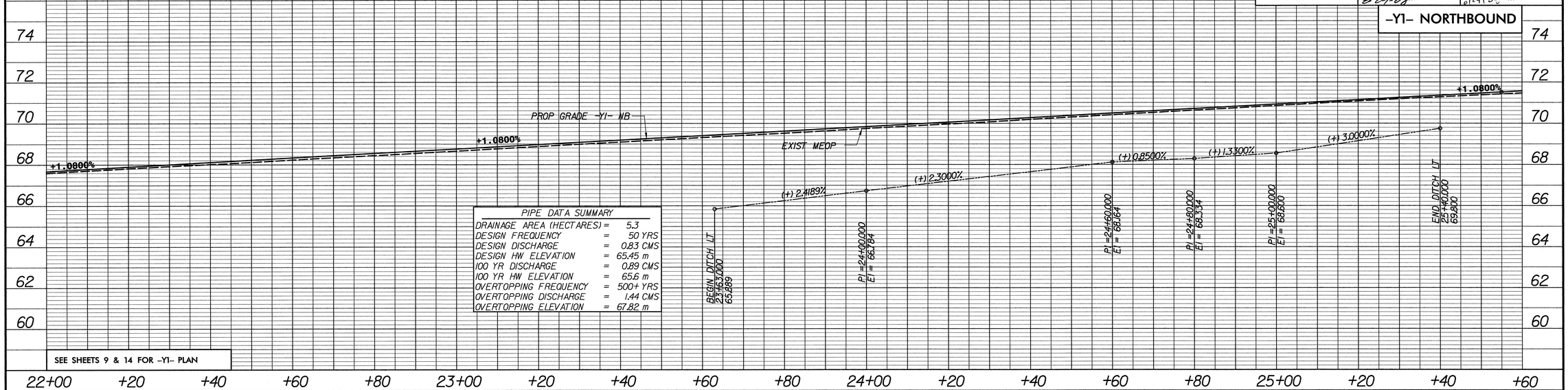
R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 55 |
| R /W SHEET NO. 74 | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 29031 ENGINEER DENNIS JAMES MART
8/27/08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR.
8/29/08

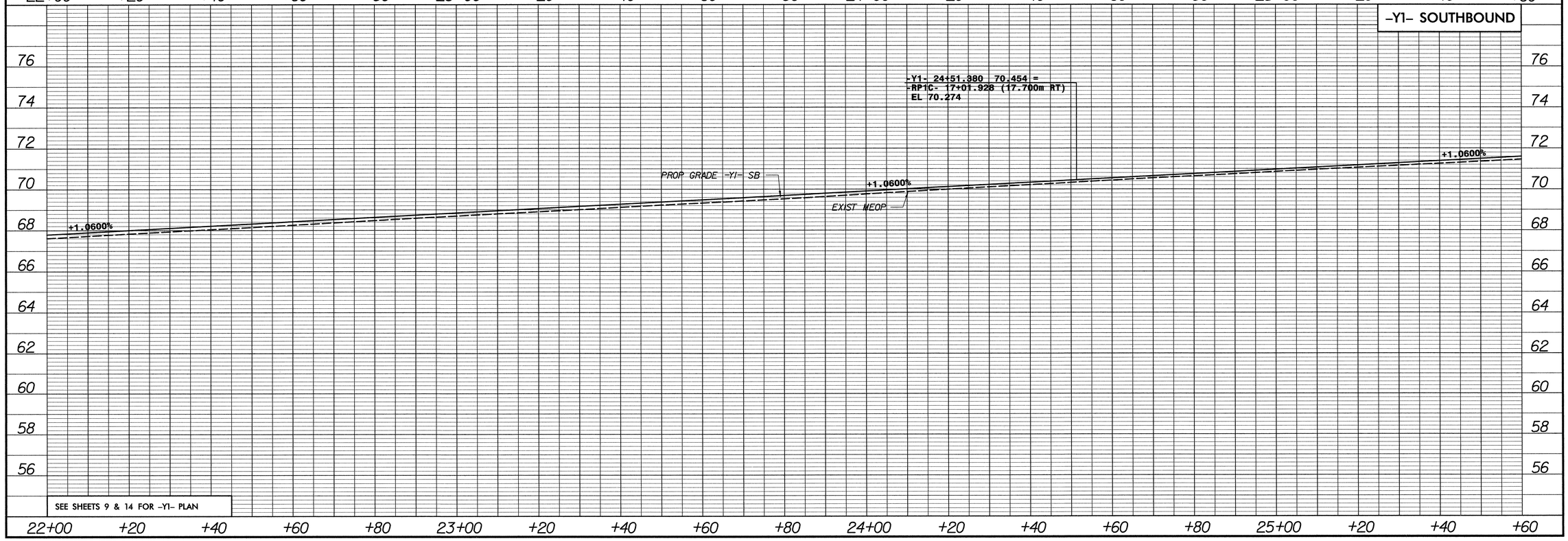
## -Y1- NORTHBOUND




PIPE DATA SUMMARY

| | | |
|---|---|---|
| DRAINAGE AREA (HECTARES) | = | 5.3 |
| DESIGN FREQUENCY | = | 50 YRS |
| DESIGN DISCHARGE | = | 0.83 CMS |
| DESIGN HW ELEVATION | = | 65.45 m |
| 100 YR DISCHARGE | = | 0.89 CMS |
| 100 YR HW ELEVATION | = | 65.6 m |
| OVERTOPPING FREQUENCY | = | 500+ YRS |
| OVERTOPPING DISCHARGE | = | 1.44 CMS |
| OVERTOPPING ELEVATION | = | 67.82 m |

## -Y1- SOUTHBOUND

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DATE: 08/08/2008 03:07:52 PM
PLOT SCALE: 1:50 (H) 1:50 (V) PLOT DRIVER: Metric_plan full\fdhice_metric.plt
PEN TABLE: M:\FRHCAD\PENTABS_FRHT\F&H_Plan.tbl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

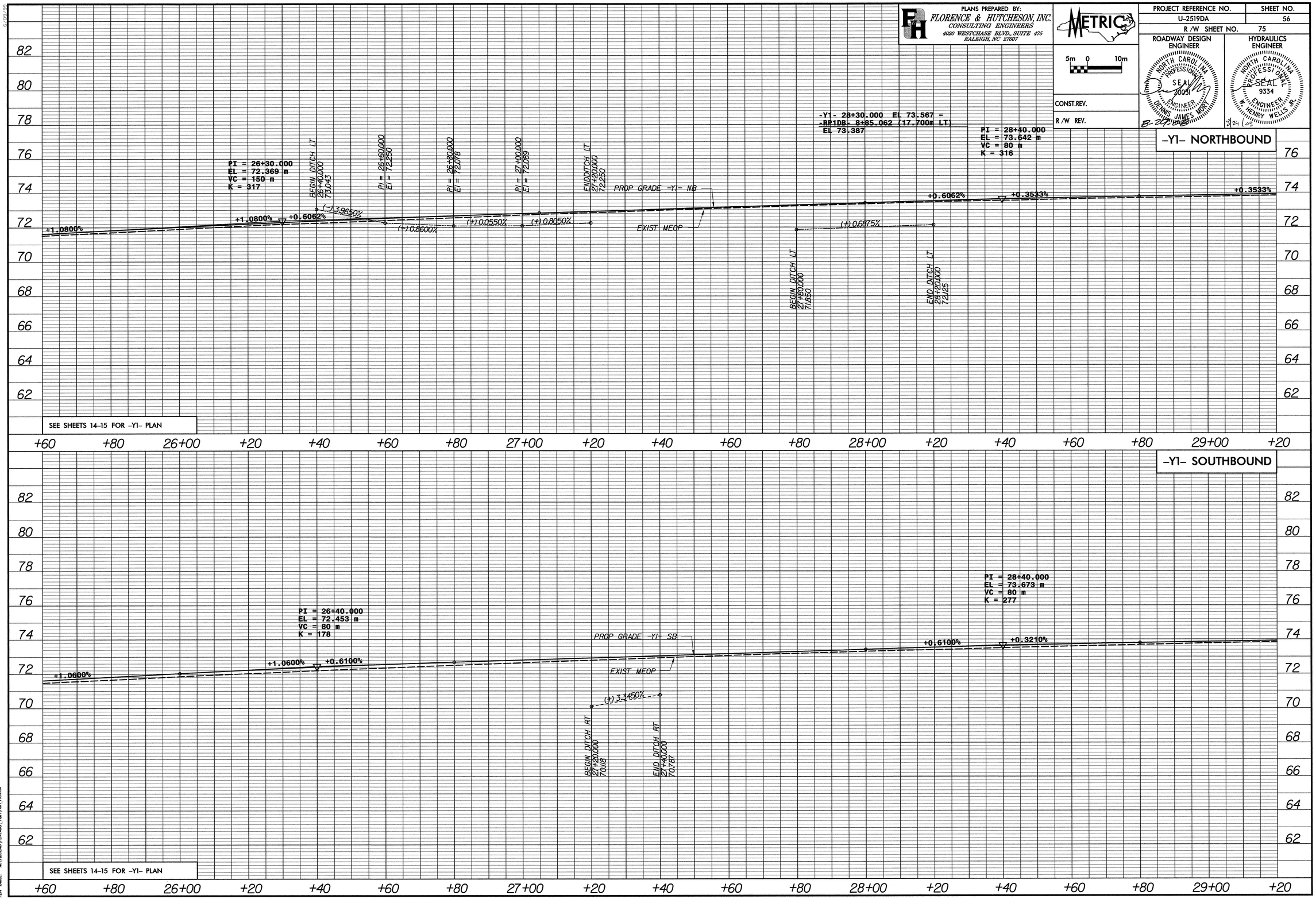
CONST.REV.

R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 56 |
| R /W SHEET NO. | 75 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 30051 ENGINEER DENNIS JAMES MORY

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

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DATE: 06/09/2008 03:06:00 PM
PLOT TABLE: M:\FHCAD\PRINTDRV\Mark_John_Full\Mark_metric.plt
PLOT TABLE: M:\FHCAD\PRINTDRV\S_R&H\R&H_Plan.tbl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

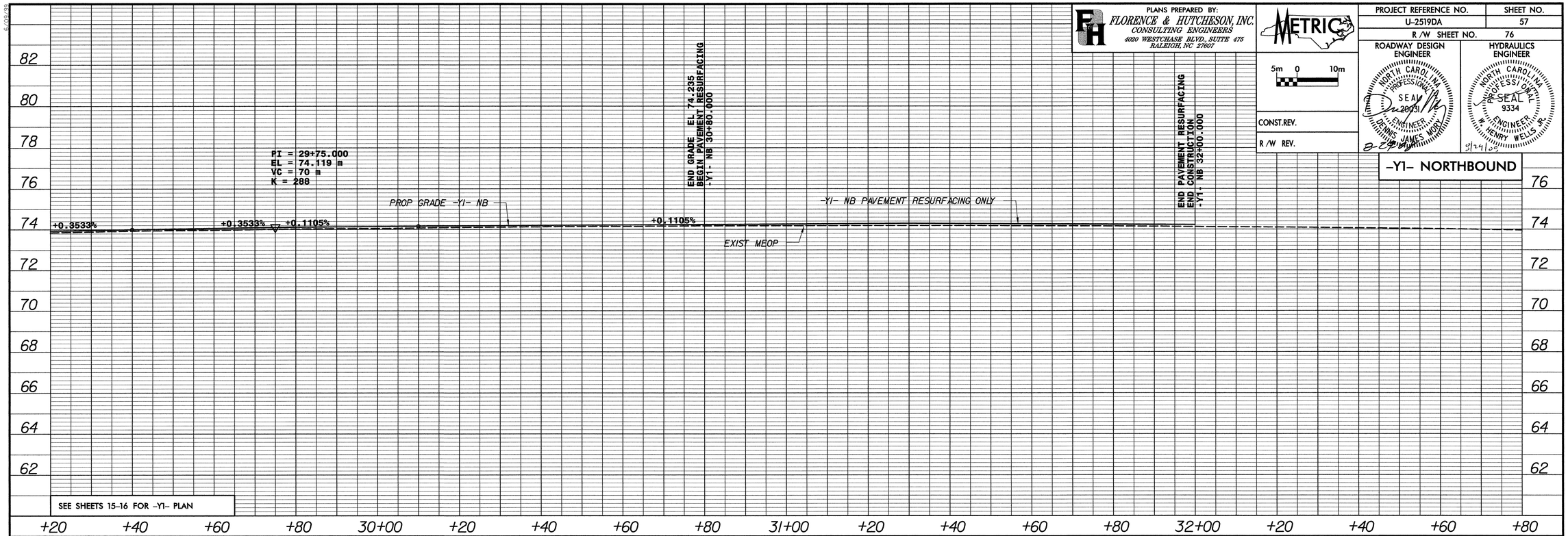
CONST.REV.

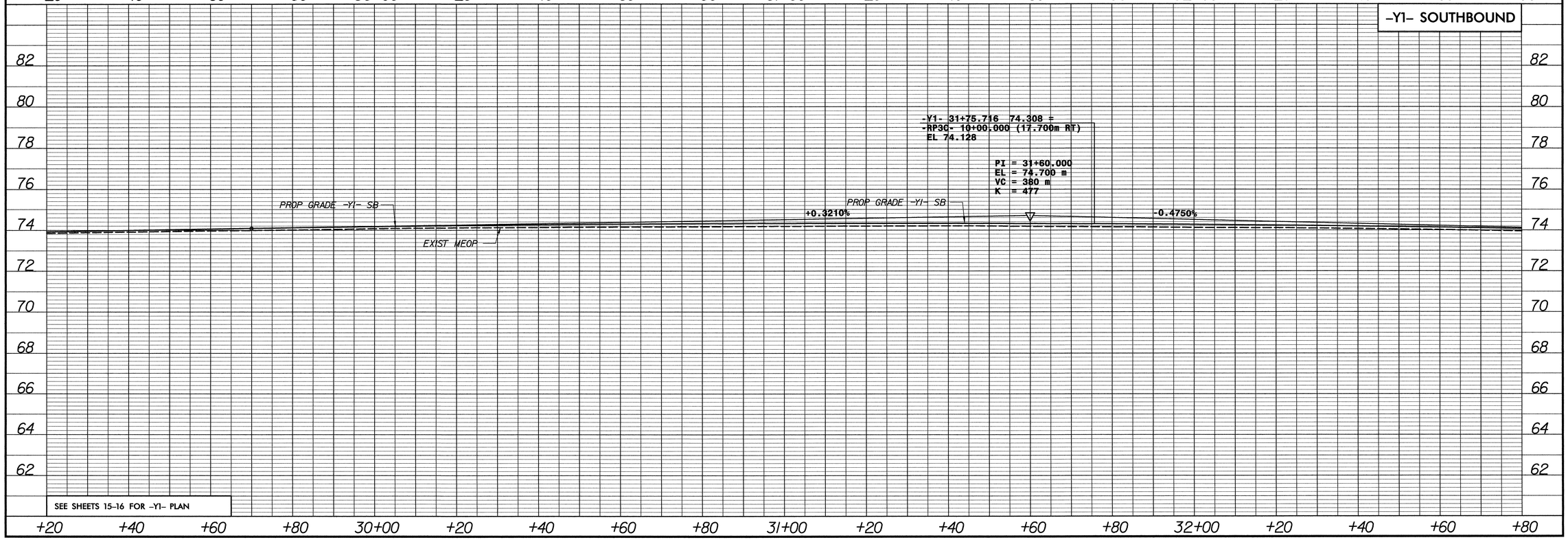
R/W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 57 |
| R/W SHEET NO. | 76 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORY
8-27-09

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS JR.
9/24/09




FILE: r:\u-2519da\roadway\proj\U2519DA_RDY_PSH_57_Y1.DGN
DATE: 08/08/2008 03:08:09 PM
PLOT DRIVER: M:\F&HCAD\PLOTDRV\Metric_plan_full\fullsize_metric.plt
PEN TABLE: M:\F&HCAD\PENTABS_F&H\F&H_Plan.tbl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

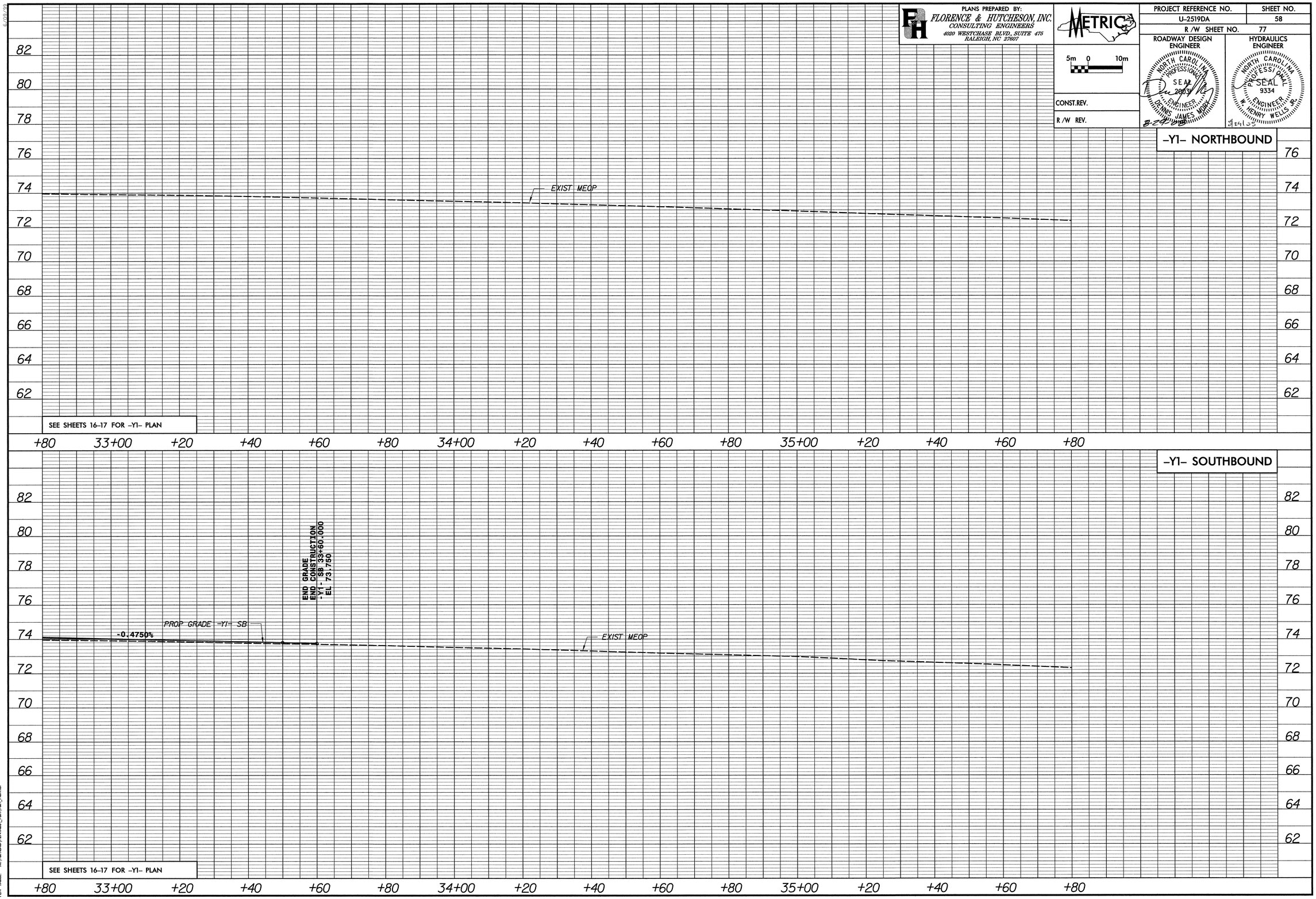
CONST.REV.

R/W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 58 |
| R/W SHEET NO. | 77 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORY
8-29-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS JR.
8/29/08




FILE: r:\u-2519da\roadway\proj\U2519DA_RDY_PSH_58_Y1.DGN
DATE: 08/08/2008 03:08:17 PM
PLOT DRIVER: M:\F&HCAD\PLOTDRV\Metric_plan_full\fullsize_metric.plt
PEN TABLE: M:\F&HCAD\PENTABS_F&H\F&H_Plan.tbl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

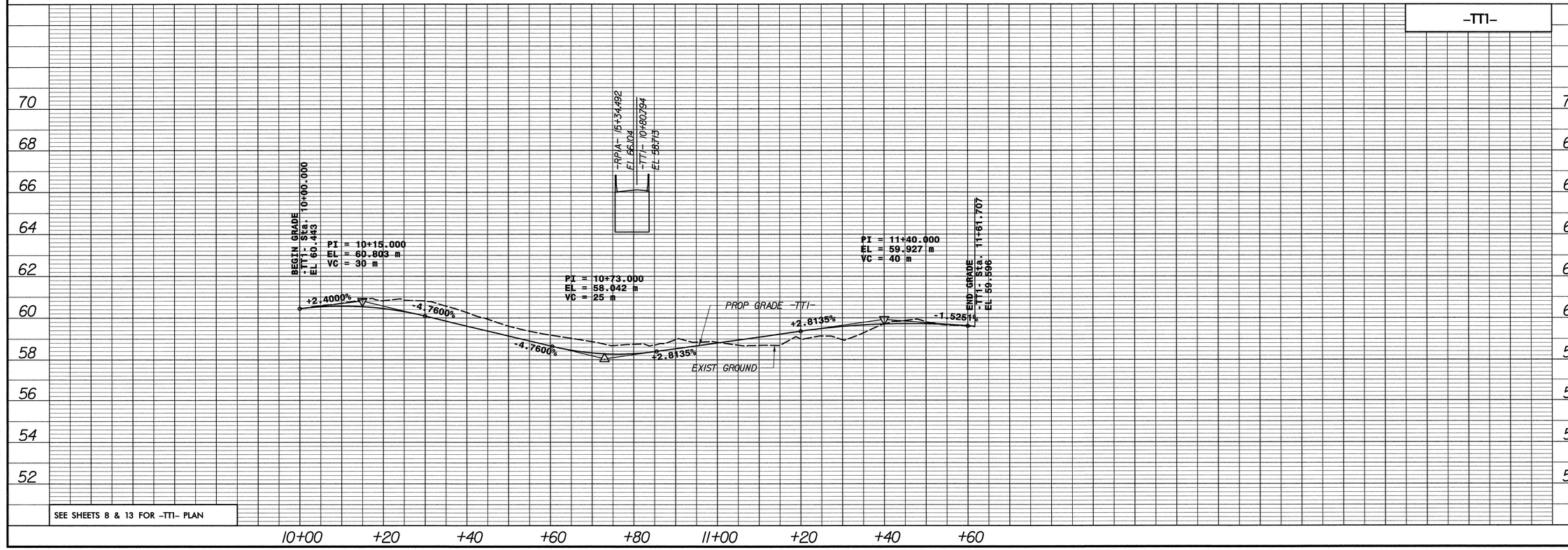
R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 59 |
| R /W SHEET NO. | 84 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MOBLY
8-29-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS JR.
9/29/08

-TT1-




SEE SHEETS 8 & 13 FOR -TT1- PLAN

FILE: r:\u-2519da\roadway\proj\U2519DA_RDY_PSH_59_TT1.DGN
DATE: 08/08/2008 01:37:45 PM
PLOT DRIVER: M:\F&HCAD\PLOTDRV\Metric_plan_full\fullsize_metric.plt
PEN TABLE: M:\F&HCAD\PENTABS_F&H\F&H_Plan.tbl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

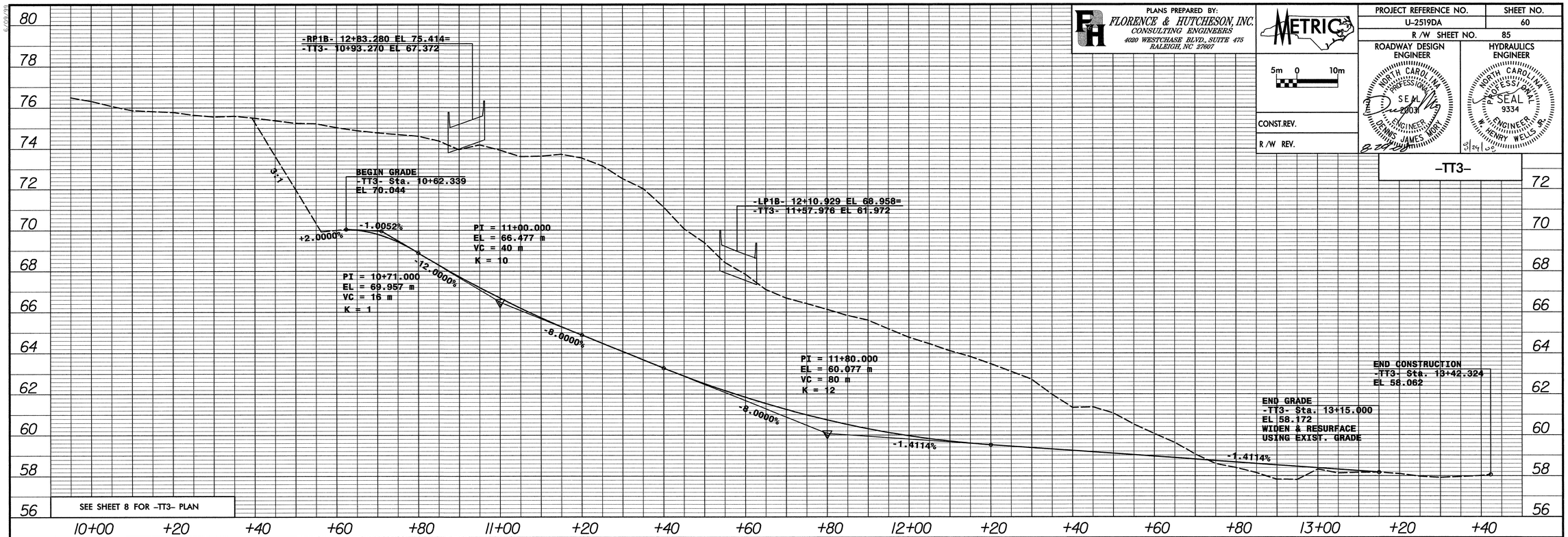
R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 60 |
| R /W SHEET NO. | 85 |

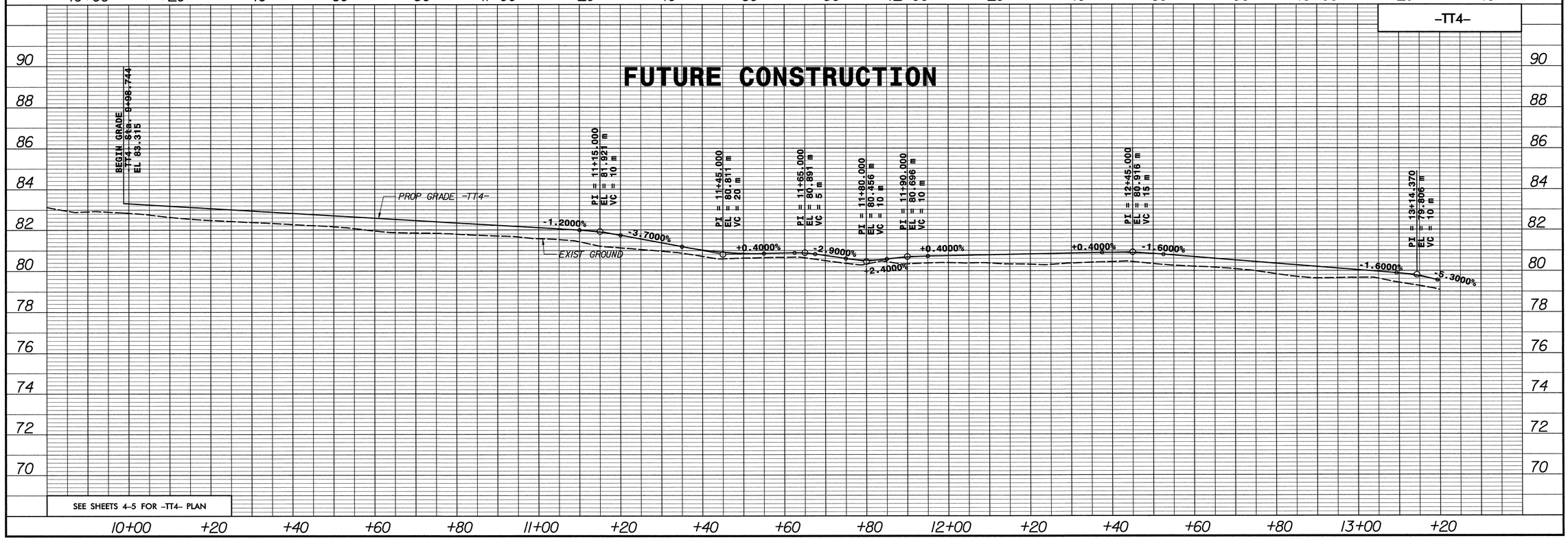
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 22031 ENGINEER DENNIS JAMES MURT
8/27/08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR.
8/26/08

## -TT3-




## -TT4-




FILE: R:\U-2519DA\Roadway\Proj\U2519DA_RDY_PRH_60_TT3_&_TT4.DGN
DATE: 08/07/2008 04:01:06 PM
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PEN TABLE: M:\RENCAD\PENTABS_RdH\RdH_Plan.tbl

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 61 |
| R /W SHEET NO. | |
| 86 | |

ROADWAY DESIGN ENGINEER

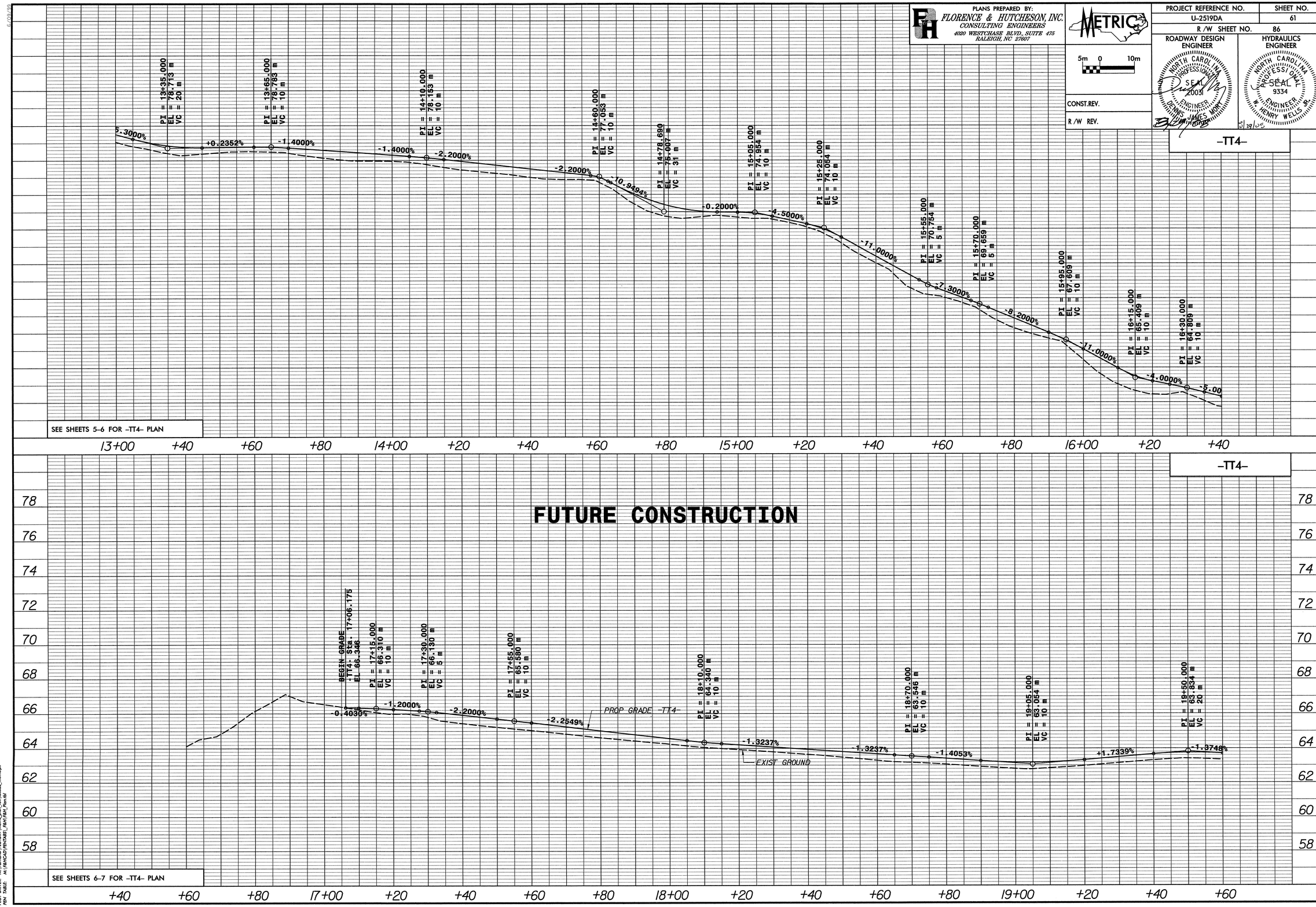
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MARK

HYDRAULICS ENGINEER

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

5/29/09

-TT4-

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PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

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CONST.REV.

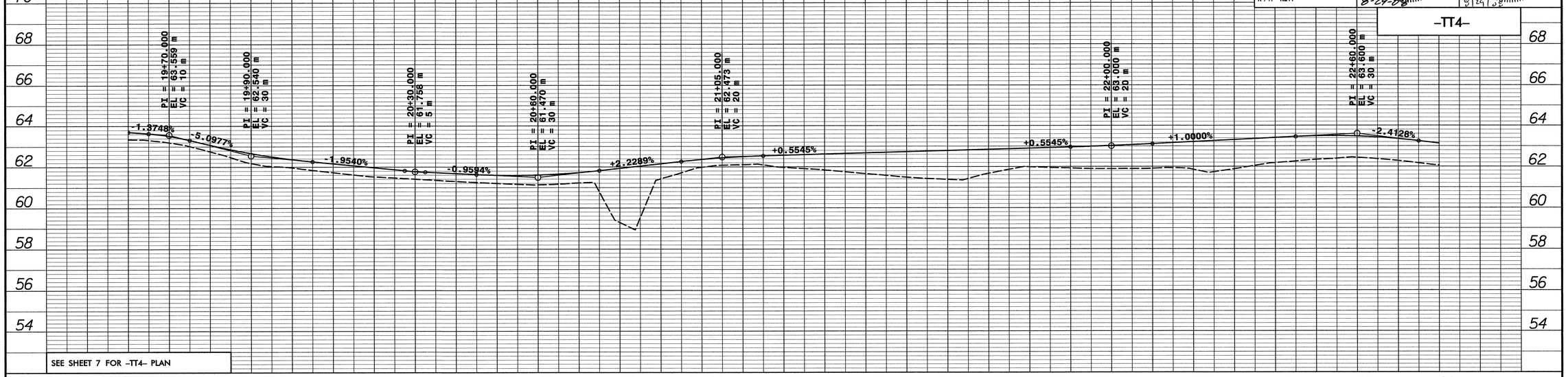
R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 62 |
| R /W SHEET NO. | 87 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 2003 ENGINEER DENNIS JAMES MARK
8-29-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR.
9/29/08

-TT4-




SEE SHEET 7 FOR -TT4- PLAN

-TT4-

SEE SHEETS 7-8 FOR -TT4- PLAN

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PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
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METRIC

5m 0 10m

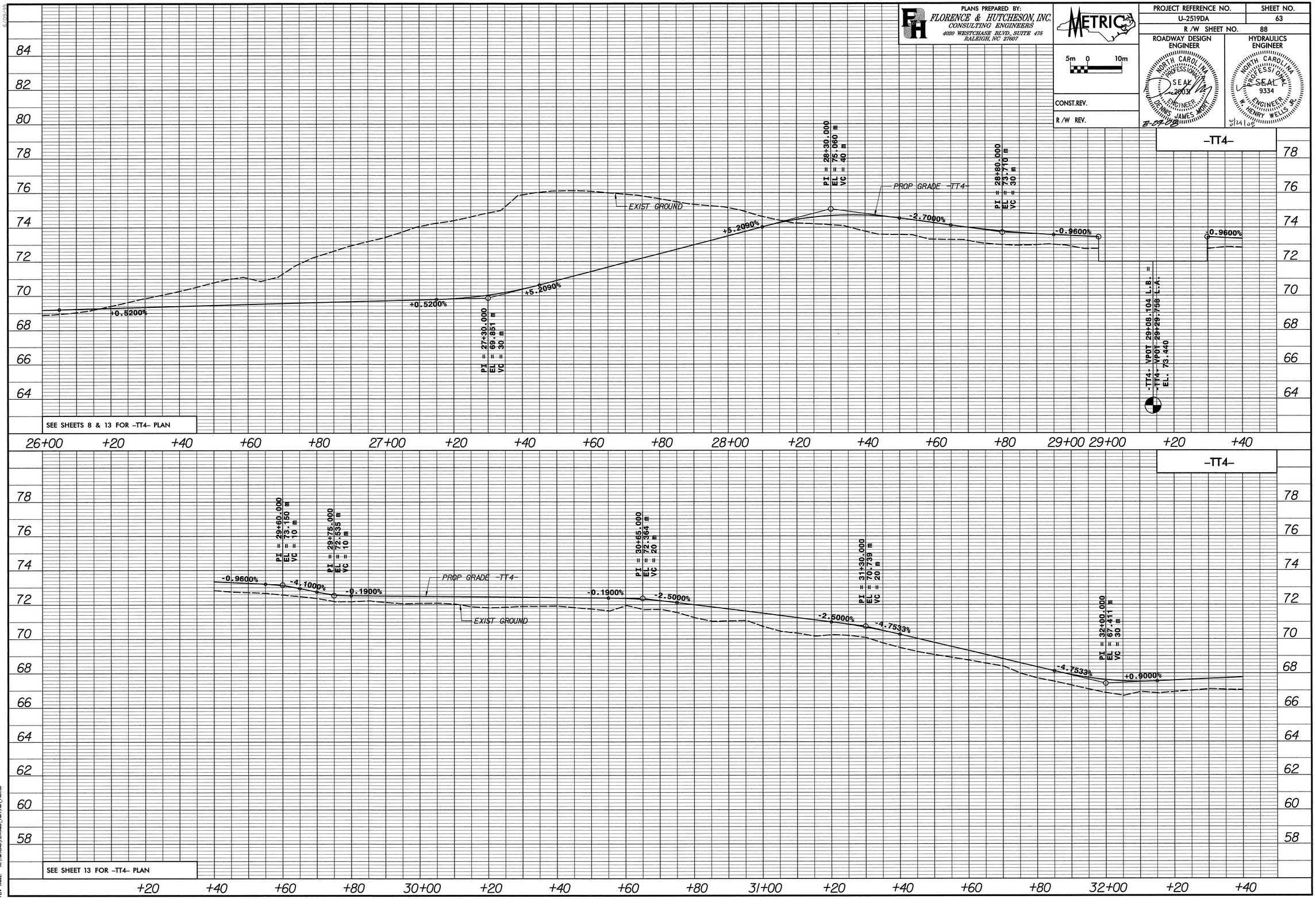
CONST.REV.

R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 63 |
| R /W SHEET NO. 88 | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORT
8-27-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR.
8/29/08

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PLANS PREPARED BY:
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RALEIGH, NC 27607

METRIC

5m 0 10m

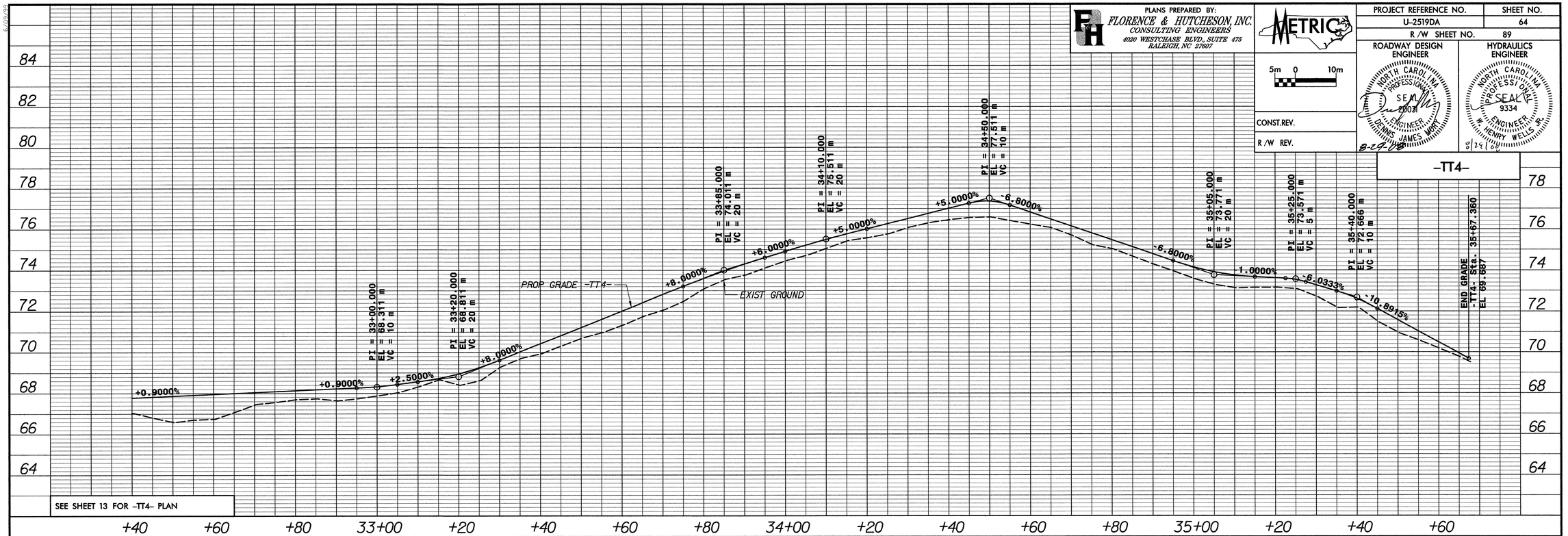
CONST.REV.

R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 64 |
| R /W SHEET NO. 89 | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MART
8-29-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS JR.
8/29/08

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PSH TABLE: M:\FEHCAD\PSH\CABS_F&H\F&H_Psm.tbl

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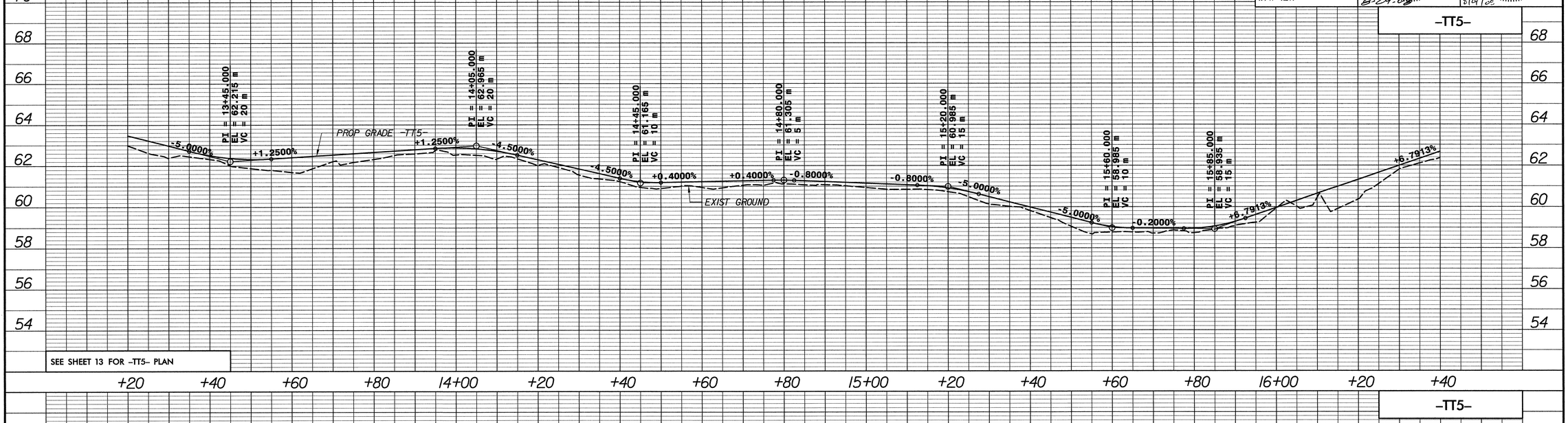
METRIC
5m 0 10m

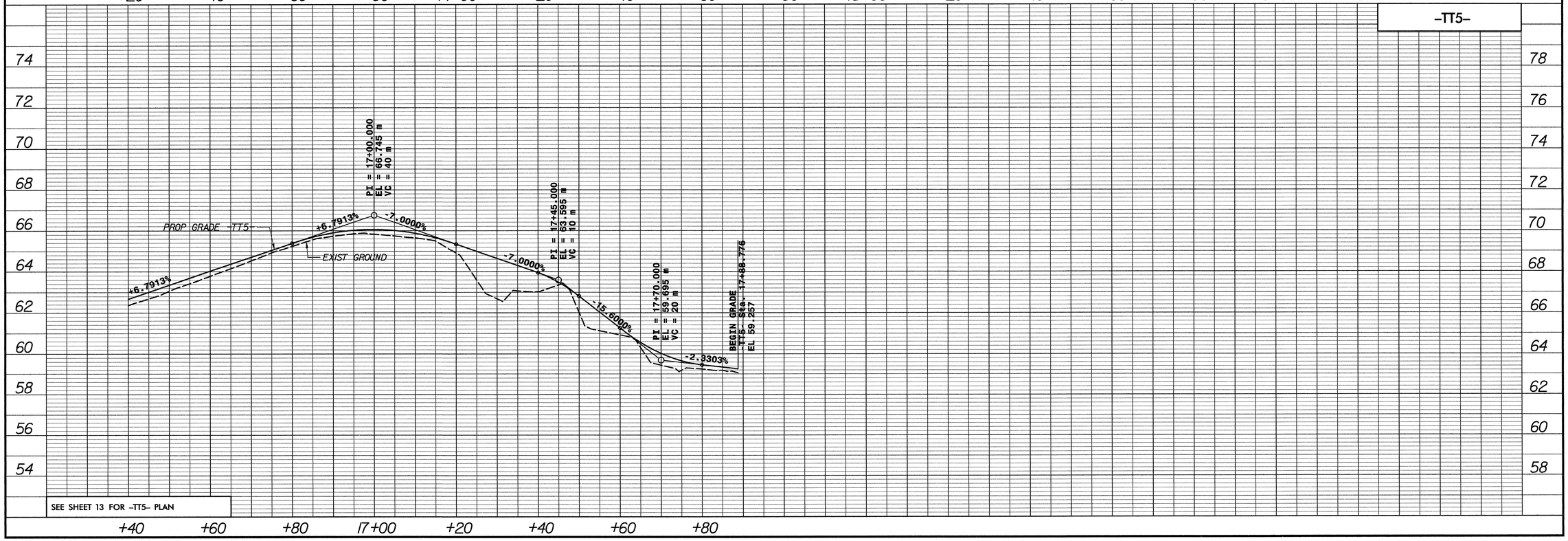
CONST.REV.
R /W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 65 |
| R /W SHEET NO. 90 | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 29081 ENGINEER DENNIS JAMES MORY
8-27-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS III
8/29/08

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FORMS: IRF(CAD)\PLOTDRV\Metric_plan_full\fullsize_metric.plt
PEN TABLE: M:\RdHCAD\PENTABS_F&H\F&H_Plan.tbl

PLANS PREPARED BY:
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CONSULTING ENGINEERS
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METRIC

5m 0 10m

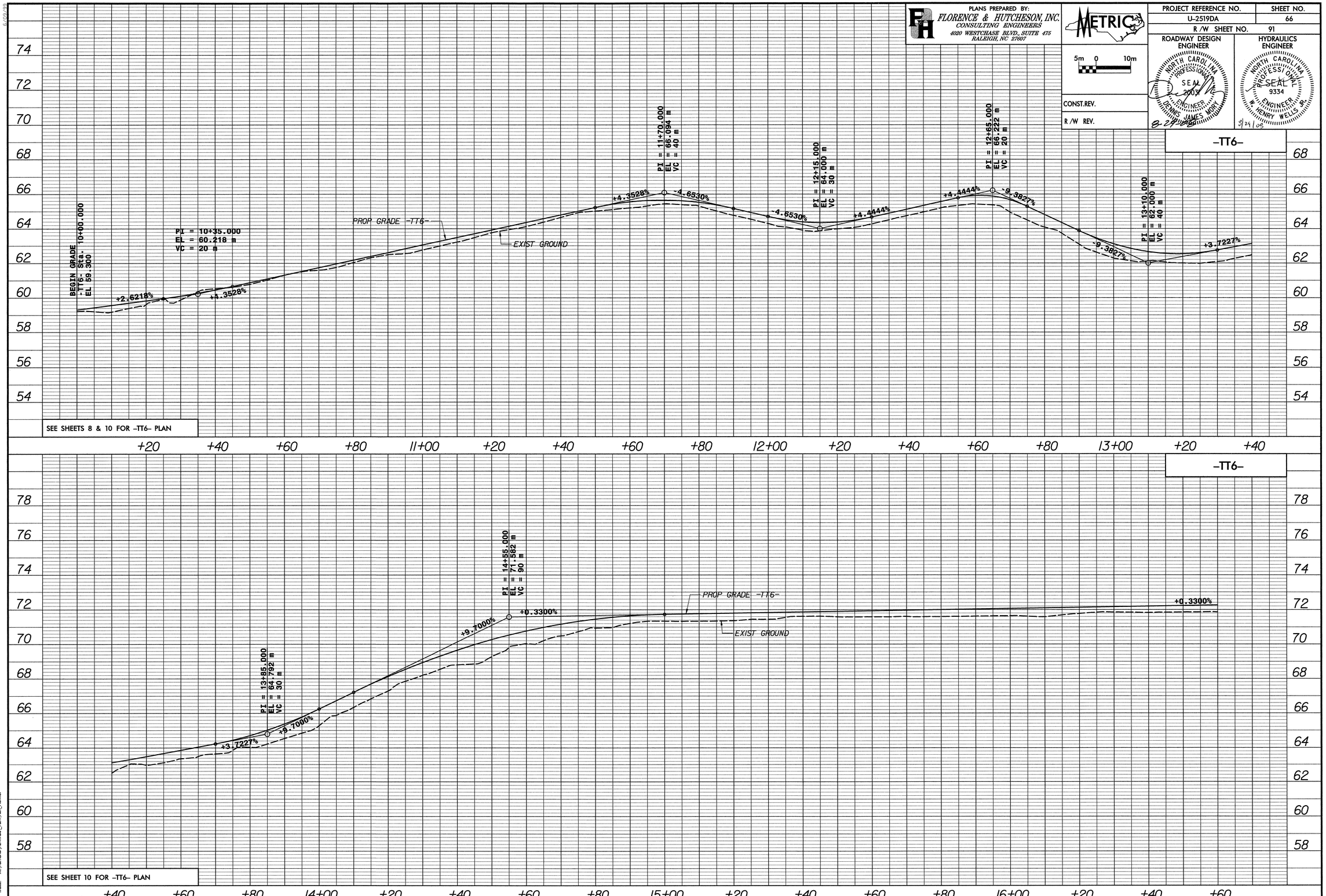
CONST.REV.

R/W REV.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 66 |
| R/W SHEET NO. | 91 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORY
8-29-08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS JR.
8/29/08

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RALEIGH, NC 27607

METRIC

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2519DA | 67 |
| R/W SHEET NO. | 92 |

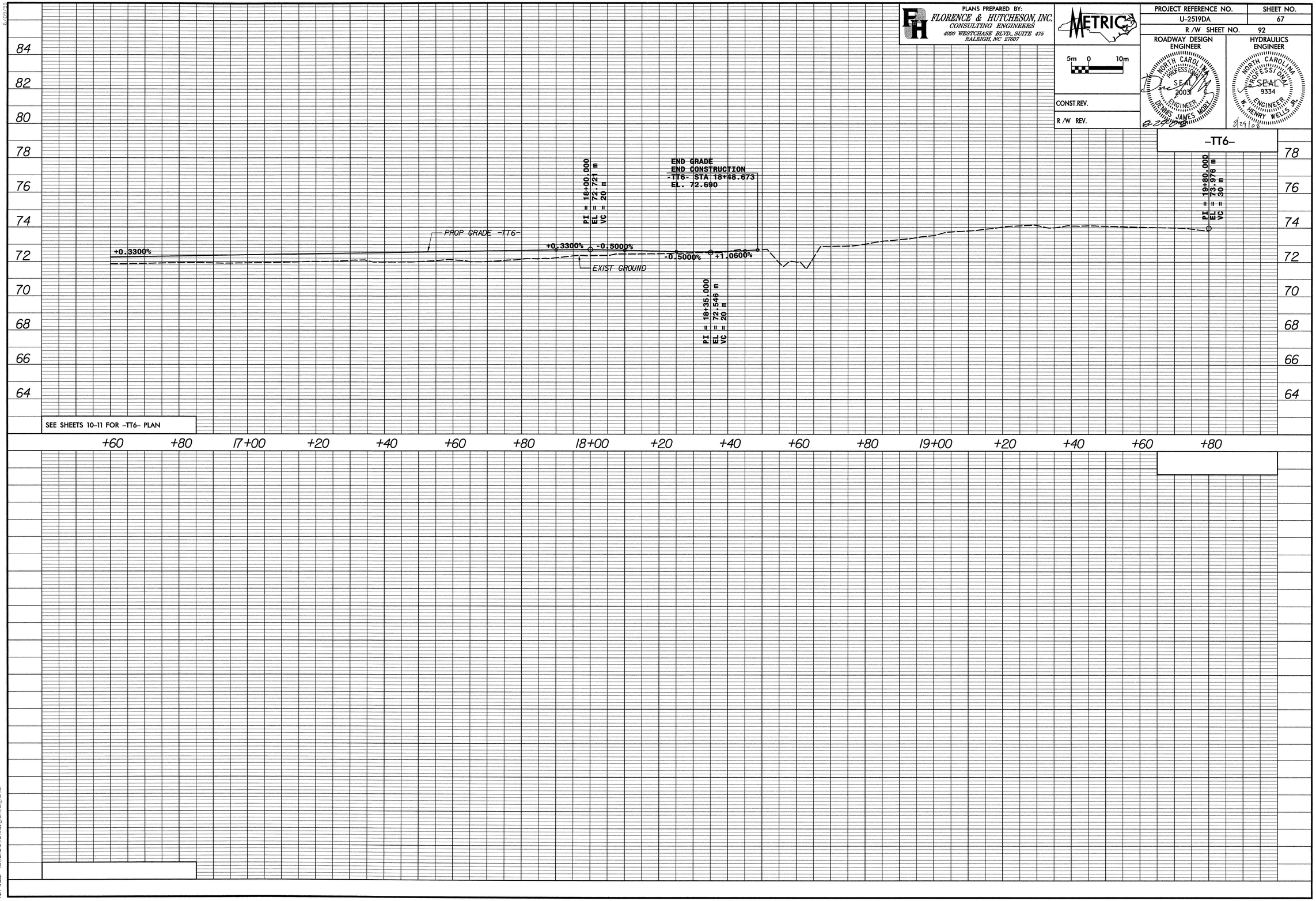
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20031 ENGINEER DENNIS JAMES MORY
8/29/08

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS JR.
8/29/08

5m 0 10m

CONST.REV.

R/W REV.

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