

**This electronic collection of documents is provided
for the convenience of the user
and is Not a Certified Document –**

**The documents contained herein were originally issued
and sealed by the individuals whose names and license
numbers appear on each page, on the dates appearing
with their signature on that page.**

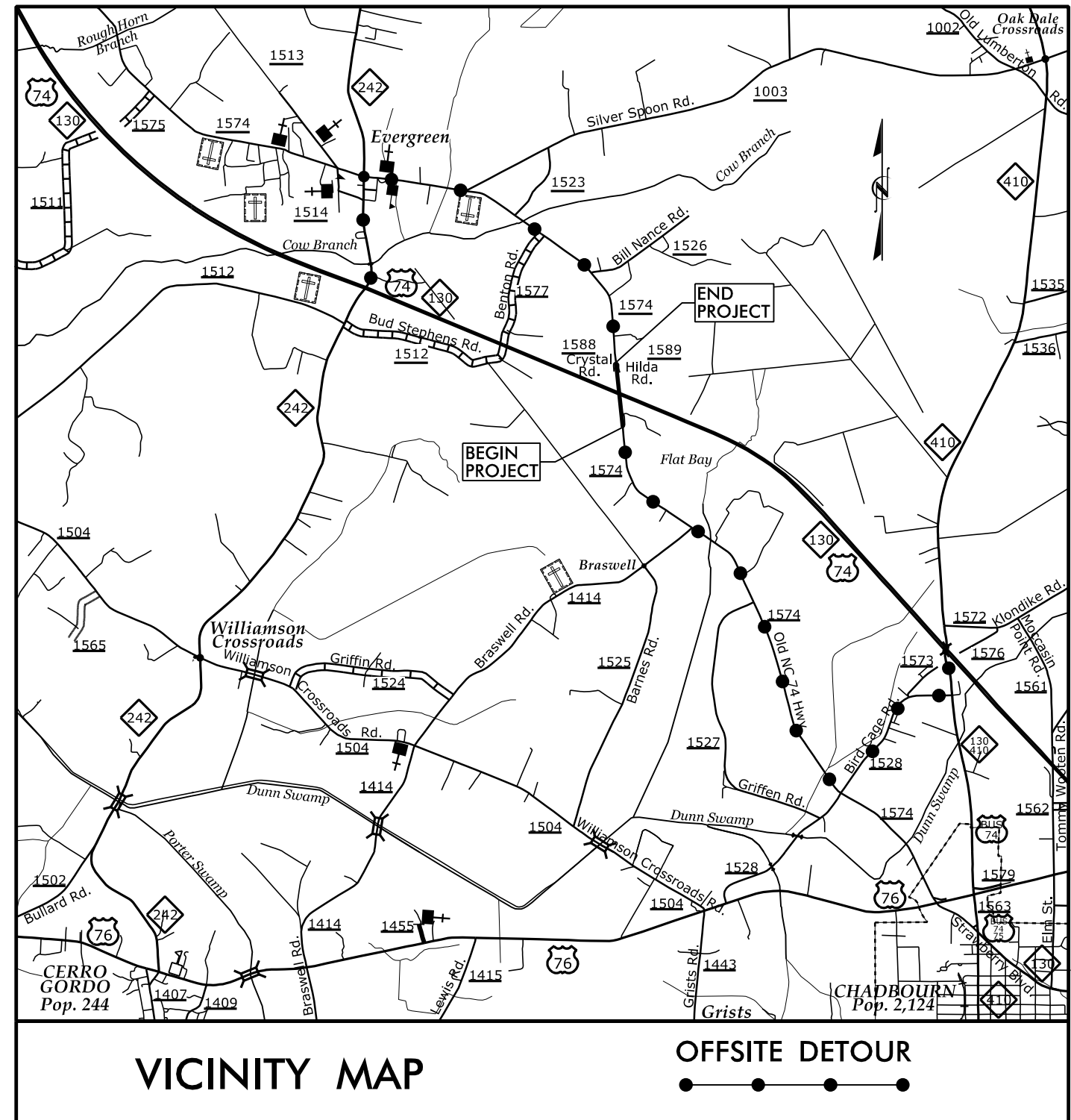
**This file or an individual page
shall not be considered a certified document.**

09_08/2015

TIP PROJECT: W-5518

CONTRACT: C203781

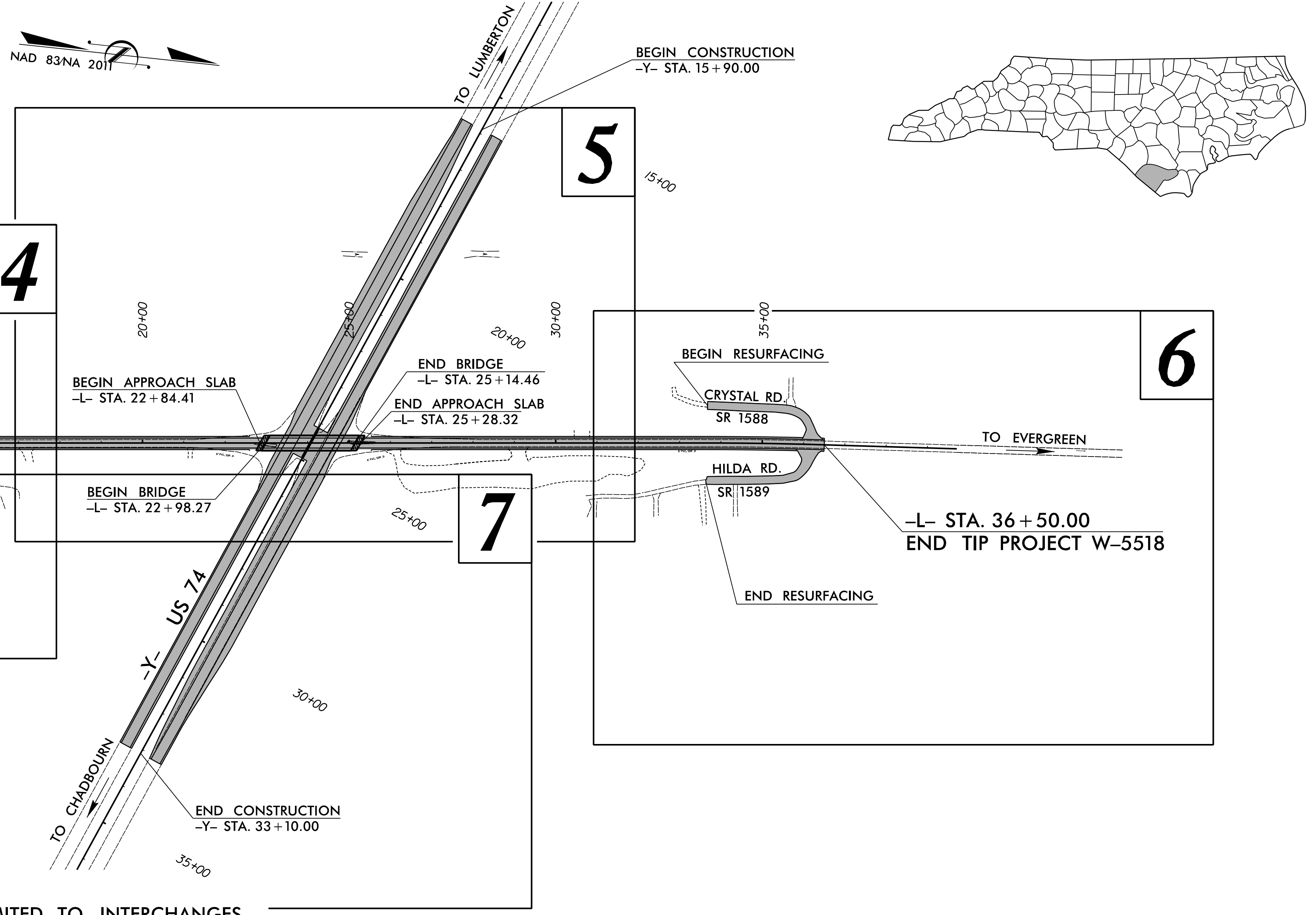
See Sheet 1-A For Index of Sheets



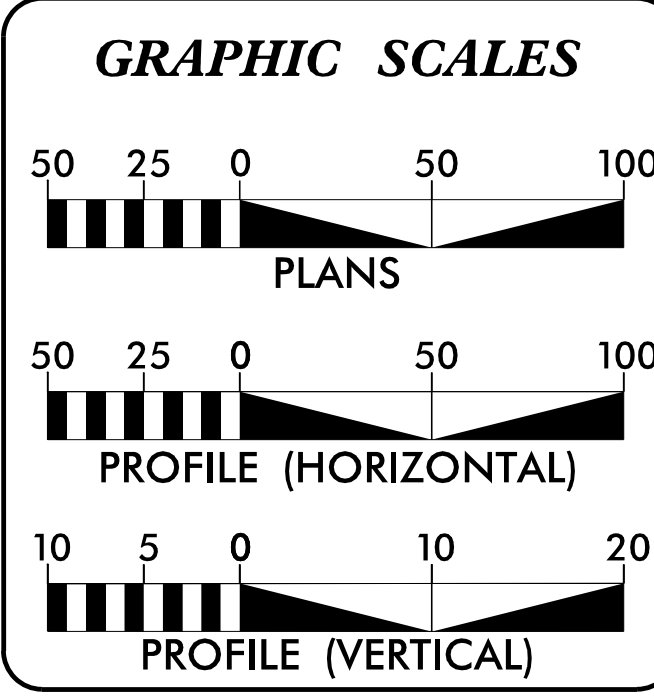
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
COLUMBUS COUNTY

LOCATION: CONSTRUCT OVERPASS OF SR 1574 (OLD US 74) OVER US 74
TYPE OF WORK: GRADING, DRAINAGE, PAVING & STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	W-5518	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
43741.1.FS1	HSIP-0074(155)	PE	
43741.2.FS1	HSIP-0074(155)	RW, UTIL.	
43741.3.FS1	HSIP-0074(155)	CONST.	



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



DESIGN DATA

ADT 2014 =	1,100
ADT 2035 =	2,100
K =	%
D =	%
T =	6 %*
V =	60 MPH
*TTST =	3% DUAL = 3%
FUNC CLASS =	
MAJOR COLLECTOR	
STATEWIDE TIER	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT W-5518 =	0.419 MILES
LENGTH STRUCTURE TIP PROJECT W-5518 =	0.041 MILES
TOTAL LENGTH TIP PROJECT W-5518 =	0.460 MILES

Prepared for:
HIGHWAY DIVISION 6
558 Gillespie St.
Fayetteville, NC 28301
2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 27, 2015

LETTING DATE:
FEBRUARY 16, 2016

Prepared by:
MULKEY ENGINEERS & CONSULTANTS
PO BOX 33127
RALEIGH, N.C. 27636
(919) 851-1912 FAX
WWW.MULKEYINC.COM
NC License No. C107

JOHNNY BANKS
PROJECT MANAGER

STEPHEN C. BROWDE, PE
ROADWAY PROJECT DESIGN ENGINEER

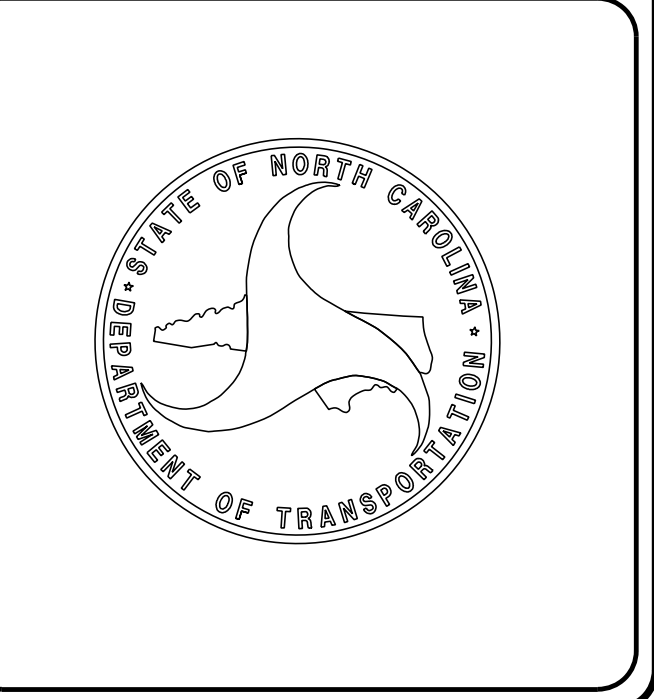
SEAN MATUSZEWSKI
NCDOT CONTACT

HYDRAULICS ENGINEER

DocuSigned by:
David Becker
12/18/2015 12:18:20 PM
P.E.

ROADWAY DESIGN ENGINEER

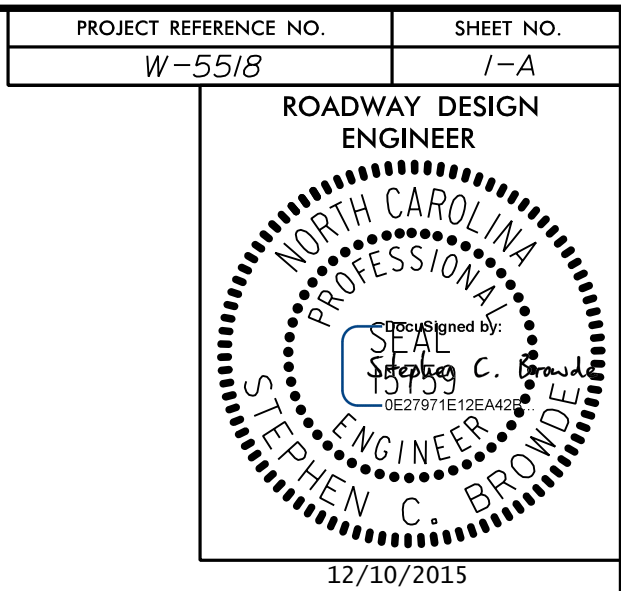
DocuSigned by:
Stephen C. Browde
12/18/2015 12:18:20 PM
P.E.



12/17/2015
R:\Roadway\Proj\W5518_rdy_tsh.dgn
Keys

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARDS



<p>SHEET #</p> <p>1</p> <p>1-A</p> <p>1-B</p> <p>1-C-1</p> <p>2A-1 THRU 2A-2</p> <p>2B-1</p> <p>2B-2</p> <p>2C-1</p> <p>2G-1</p> <p>3B-1</p> <p>3B-2</p> <p>3D-1</p> <p>3G-1</p> <p>4 THRU 7</p> <p>8 THRU 9</p> <p>TMP-1 THRU TMP-7</p> <p>PMP-1 THRU PMP-5</p> <p>EC-1 THRU EC-11</p> <p>SIGN-1 THRU SIGN-9</p> <p>UC-1 THRU UC-8</p> <p>UO-1 THRU UO-5</p> <p>X-INDEX</p> <p>X-1A</p> <p>X-1 THRU X-44</p> <p>S-1 THRU S-33</p>	<p>DESCRIPTION</p> <p>TITLE SHEET</p> <p>INDEX OF SHEETS, GENERAL NOTES, & LIST OF STANDARD DRAWINGS</p> <p>CONVENTIONAL SYMBOLS</p> <p>SURVEY CONTROL SHEET</p> <p>PAVEMENT SCHEDULE & TYPICAL SECTIONS</p> <p>GUIDE FOR PAVING SHOULDERS UNDER BRIDGES METHOD III</p> <p>STRUCTURE ANCHOR UNITS - TYPE III</p> <p>COAL COMBUSTION PRODUCT PLACEMENT DETAIL</p> <p>STANDARD EMBANKMENT MONITORING DETAIL</p> <p>SUMMARY OF EARTHWORK, ASPHALT PAVEMENT REMOVAL & BREAKING, SHOULDER BERM GUTTER, WOVEN WIRE FENCE, AND CABLE GUIDERAIL</p> <p>SUMMARY OF GUARDRAIL</p> <p>SUMMARY OF DRAINAGE</p> <p>GEOTECHNICAL SUMMARY TABLES</p> <p>PLAN</p> <p>PROFILE</p> <p>TRANSPORTATION MANAGEMENT PLANS</p> <p>PAVEMENT MARKING PLANS</p> <p>EROSION CONTROL PLANS</p> <p>SIGNING PLANS</p> <p>UTILITY CONSTRUCTION PLANS</p> <p>UTILITIES BY OTHERS PLANS</p> <p>CROSS-SECTION SHEET INDEX</p> <p>CROSS-SECTION SUMMARY</p> <p>CROSS-SECTIONS</p> <p>STRUCTURE PLANS</p>	<p>GENERAL NOTES:</p> <p>2012 SPECIFICATIONS EFFECTIVE: 01-17-2012 REVISED: 10-31-2014</p> <p>2012 ROADWAY ENGLISH STANDARD DRAWINGS</p> <p>EFF. 01-17-2012 REV. 10-30-2012</p> <p>The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation Raleigh, N. C., Dated January, 2012 are applicable to this project and by reference hereby are considered a part of these plans:</p> <table border="0"> <thead> <tr> <th>STD.NO.</th> <th>TITLE</th> </tr> </thead> <tbody> <tr> <td colspan="2">DIVISION 2 - EARTHWORK</td> </tr> <tr> <td>200.03</td> <td>Method of Clearing - Method III</td> </tr> <tr> <td>225.02</td> <td>Guide for Grading Subgrade - Secondary and Local</td> </tr> <tr> <td>225.04</td> <td>Method of Obtaining Superelevation - Two Lane Pavement</td> </tr> <tr> <td>225.09</td> <td>Guide for Shoulder and Ditch Transition at Grade Separations</td> </tr> <tr> <td colspan="2">DIVISION 3 - PIPE CULVERTS</td> </tr> <tr> <td>300.01</td> <td>Method of Pipe Installation</td> </tr> <tr> <td>310.10</td> <td>Driveway Pipe Construction</td> </tr> <tr> <td colspan="2">DIVISION 4 - MAJOR STRUCTURES</td> </tr> <tr> <td>422.10</td> <td>Reinforced Bridge Approach Fills</td> </tr> <tr> <td colspan="2">DIVISION 5 - SUBGRADE, BASES AND SHOULDERS</td> </tr> <tr> <td>560.01</td> <td>Method of Shoulder Construction - High Side of Super-elevated Curve - Method I</td> </tr> <tr> <td colspan="2">DIVISION 6 - ASPHALT BASES AND PAVEMENTS</td> </tr> <tr> <td>654.01</td> <td>Pavement Repairs</td> </tr> <tr> <td>665.01</td> <td>Asphalt Shoulders - Milled Rumble Strips</td> </tr> <tr> <td colspan="2">DIVISION 8 - INCIDENTALS</td> </tr> <tr> <td>815.02</td> <td>Subsurface Drain</td> </tr> <tr> <td>840.00</td> <td>Concrete Base Pad for Drainage Structures</td> </tr> <tr> <td>840.25</td> <td>Anchorage for Frames - Brick or Concrete or Precast</td> </tr> <tr> <td>840.29</td> <td>Frames and Narrow Slot Flat Grates</td> </tr> <tr> <td>840.35</td> <td>Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates</td> </tr> <tr> <td>840.46</td> <td>Traffic Bearing Precast Drainage Structure</td> </tr> <tr> <td>846.01</td> <td>Concrete Curb, Gutter and Curb & Gutter</td> </tr> <tr> <td>846.04</td> <td>Drop Inlet Installation in Shoulder Berm Gutter</td> </tr> <tr> <td>854.04</td> <td>Concrete Median Barrier - Precast Permanent</td> </tr> <tr> <td>862.01</td> <td>Guardrail Placement</td> </tr> <tr> <td>862.02</td> <td>Guardrail Installation</td> </tr> <tr> <td>862.03</td> <td>Structure Anchor Units (See Also Sheet 2B-2)</td> </tr> <tr> <td>865.01</td> <td>Cable Guiderail</td> </tr> <tr> <td>866.02</td> <td>Woven Wire Fence - with Wood Post</td> </tr> <tr> <td>876.01</td> <td>Rip Rap in Channels</td> </tr> <tr> <td>876.02</td> <td>Guide for Rip Rap at Pipe Outlets</td> </tr> </tbody> </table>	STD.NO.	TITLE	DIVISION 2 - EARTHWORK		200.03	Method of Clearing - Method III	225.02	Guide for Grading Subgrade - Secondary and Local	225.04	Method of Obtaining Superelevation - Two Lane Pavement	225.09	Guide for Shoulder and Ditch Transition at Grade Separations	DIVISION 3 - PIPE CULVERTS		300.01	Method of Pipe Installation	310.10	Driveway Pipe Construction	DIVISION 4 - MAJOR STRUCTURES		422.10	Reinforced Bridge Approach Fills	DIVISION 5 - SUBGRADE, BASES AND SHOULDERS		560.01	Method of Shoulder Construction - High Side of Super-elevated Curve - Method I	DIVISION 6 - ASPHALT BASES AND PAVEMENTS		654.01	Pavement Repairs	665.01	Asphalt Shoulders - Milled Rumble Strips	DIVISION 8 - INCIDENTALS		815.02	Subsurface Drain	840.00	Concrete Base Pad for Drainage Structures	840.25	Anchorage for Frames - Brick or Concrete or Precast	840.29	Frames and Narrow Slot Flat Grates	840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates	840.46	Traffic Bearing Precast Drainage Structure	846.01	Concrete Curb, Gutter and Curb & Gutter	846.04	Drop Inlet Installation in Shoulder Berm Gutter	854.04	Concrete Median Barrier - Precast Permanent	862.01	Guardrail Placement	862.02	Guardrail Installation	862.03	Structure Anchor Units (See Also Sheet 2B-2)	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	<p>GRADE LINE: GRADING AND SURFACING:</p> <p>THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.</p> <p>CLEARING:</p> <p>CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.</p> <p>SUPERELEVATION:</p> <p>ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 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.</p> <p>SHOULDER CONSTRUCTION:</p> <p>ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01</p> <p>SIDE ROADS:</p> <p>THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.</p> <p>SUBSURFACE DRAINS:</p> <p>SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.</p> <p>GUARDRAIL:</p> <p>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.</p> <p>TEMPORARY SHORING:</p> <p>SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.</p> <p>END BENTS:</p> <p>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.</p> <p>UTILITIES:</p> <p>UTILITY OWNERS ON THIS PROJECT ARE: DUKE POWER, COLUMBUS CITY WATER, MSNC, & CENTURYLINK</p> <p>ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.</p>
STD.NO.	TITLE																																																																				
DIVISION 2 - EARTHWORK																																																																					
200.03	Method of Clearing - Method III																																																																				
225.02	Guide for Grading Subgrade - Secondary and Local																																																																				
225.04	Method of Obtaining Superelevation - Two Lane Pavement																																																																				
225.09	Guide for Shoulder and Ditch Transition at Grade Separations																																																																				
DIVISION 3 - PIPE CULVERTS																																																																					
300.01	Method of Pipe Installation																																																																				
310.10	Driveway Pipe Construction																																																																				
DIVISION 4 - MAJOR STRUCTURES																																																																					
422.10	Reinforced Bridge Approach Fills																																																																				
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS																																																																					
560.01	Method of Shoulder Construction - High Side of Super-elevated Curve - Method I																																																																				
DIVISION 6 - ASPHALT BASES AND PAVEMENTS																																																																					
654.01	Pavement Repairs																																																																				
665.01	Asphalt Shoulders - Milled Rumble Strips																																																																				
DIVISION 8 - INCIDENTALS																																																																					
815.02	Subsurface Drain																																																																				
840.00	Concrete Base Pad for Drainage Structures																																																																				
840.25	Anchorage for Frames - Brick or Concrete or Precast																																																																				
840.29	Frames and Narrow Slot Flat Grates																																																																				
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates																																																																				
840.46	Traffic Bearing Precast Drainage Structure																																																																				
846.01	Concrete Curb, Gutter and Curb & Gutter																																																																				
846.04	Drop Inlet Installation in Shoulder Berm Gutter																																																																				
854.04	Concrete Median Barrier - Precast Permanent																																																																				
862.01	Guardrail Placement																																																																				
862.02	Guardrail Installation																																																																				
862.03	Structure Anchor Units (See Also Sheet 2B-2)																																																																				
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																																																																				

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

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

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	⊙ EIP
Property Corner	-----
Property Monument	⊠ ECM
Parcel/Sequence Number	Ⓜ 123
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	⊠
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	--- WLB ---
Proposed Wetland Boundary	--- WLB ---
Existing Endangered Animal Boundary	--- EAB ---
Existing Endangered Plant Boundary	--- EPB ---
Known Soil Contamination: Area or Site	☠ ☠
Potential Soil Contamination: Area or Site	☠ ?

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	Ⓢ
Well	⊙ W
Small Mine	⊗
Foundation	⊠
Area Outline	⊠
Cemetery	⊠
Building	⊠
School	⊠
Church	⊠
Dam	⊠

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	--- C ---
Proposed Slope Stakes Fill	--- F ---
Proposed Curb Ramp	Ⓜ CR
Existing Metal Guardrail	⊠
Proposed Guardrail	⊠
Existing Cable Guiderail	⊠
Proposed Cable Guiderail	⊠
Equality Symbol	⊠
Pavement Removal	⊠

VEGETATION:

Single Tree	⊠
Single Shrub	⊠
Hedge	⊠
Woods Line	⊠

Orchard	⊠
Vineyard	⊠

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	⊠ CONC
Bridge Wing Wall, Head Wall and End Wall	⊠ CONC WW
MINOR:	
Head and End Wall	⊠ CONC HW
Pipe Culvert	⊠
Footbridge	⊠
Drainage Box: Catch Basin, DI or JB	⊠ CB
Paved Ditch Gutter	⊠
Storm Sewer Manhole	⊠
Storm Sewer	⊠

UTILITIES:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

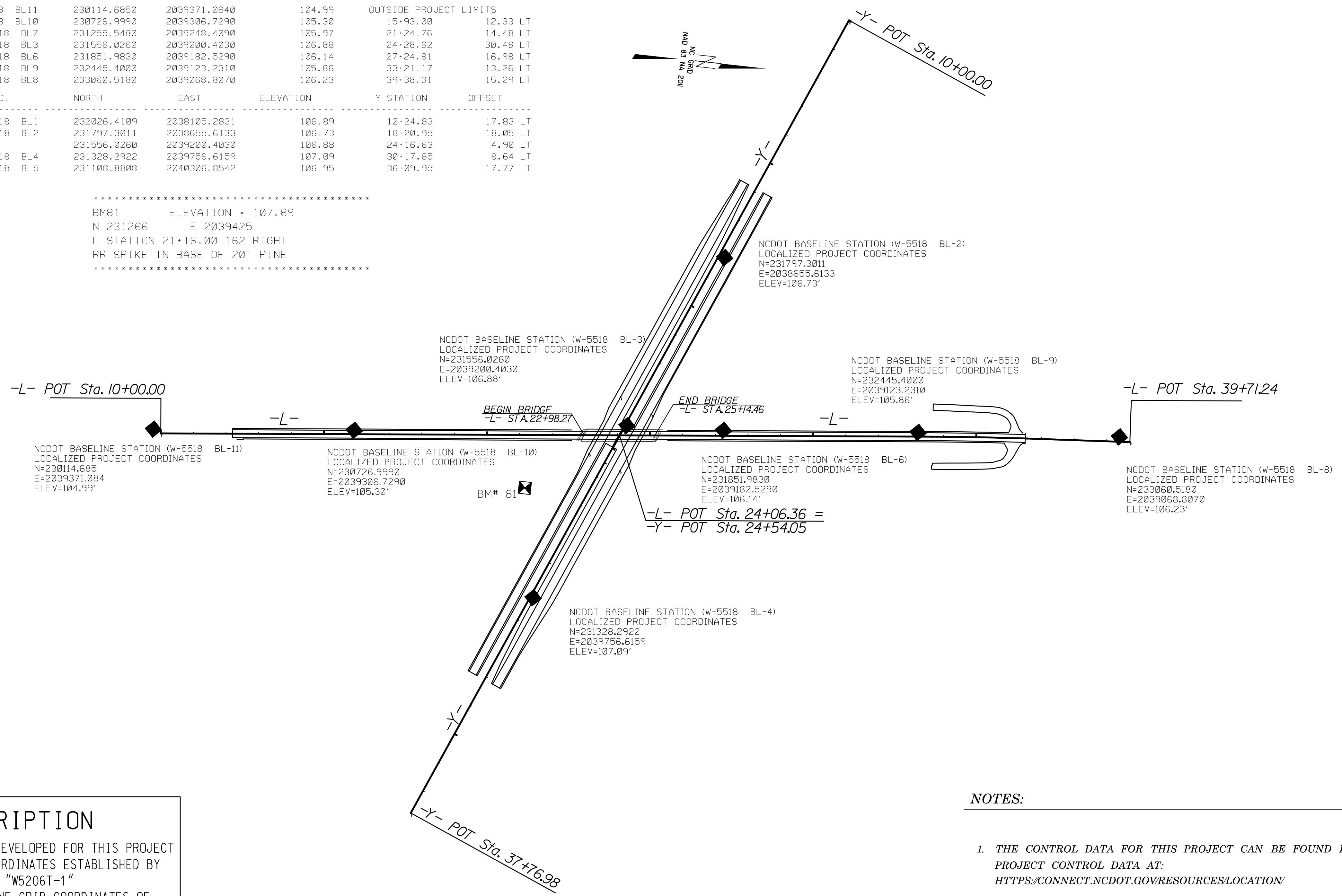
Utility Pole	⊠
Utility Pole with Base	⊠
Utility Located Object	⊠
Utility Traffic Signal Box	⊠
Utility Unknown U/G Line	--- 7UTL ---
U/G Tank; Water, Gas, Oil	⊠
Underground Storage Tank, Approx. Loc.	⊠
A/G Tank; Water, Gas, Oil	⊠
Geoenvironmental Boring	⊠
U/G Test Hole (S.U.E.*)	⊠
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

SURVEY CONTROL SHEET W-5518

BL	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
11	W5518	BL11	230114.6850	2039371.0840	104.99	OUTSIDE PROJECT LIMITS	
10	W5518	BL10	230726.9990	2039306.7290	105.30	15+93.00	12.33 LT
7	W5518	BL7	231255.5480	2039248.4090	105.97	21+24.76	14.48 LT
3	W5518	BL3	231556.0260	2039200.4030	106.88	24+28.62	30.48 LT
6	W5518	BL6	231851.9830	2039182.5290	106.14	27+24.81	16.98 LT
9	W5518	BL9	232445.4000	2039123.2310	105.86	33+21.17	13.26 LT
8	W5518	BL8	233060.5180	2039068.8070	106.23	39+38.31	15.29 LT

BY	POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
1	W5518	BL1	232026.4109	2038105.2831	106.89	12+24.83	17.83 LT
2	W5518	BL2	231797.3011	2038655.6133	106.73	18+20.95	18.05 LT
30			231556.0260	2039200.4030	106.88	24+16.63	4.90 LT
4	W5518	BL4	231328.2922	2039756.6159	107.09	30+17.65	8.64 LT
5	W5518	BL5	231108.8808	2040306.8542	106.95	36+09.95	17.77 LT

 BM81 ELEVATION = 107.89
 N 231266 E 2039425
 L STATION 21+16.00 162 RIGHT
 RR SPIKE IN BASE OF 20' PINE



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "W5206T-1"

WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 232252.2080(±) EASTING: 2037563.4410(±) ELEVATION: 106.7200(±)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.00000000

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "W5206T-1" TO -L- STATION 10+00 IS S40°42'12.40"E 2788.0301

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
 VERTICAL DATUM USED IS NAVD 88

- NOTES:**
- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/](https://connect.ncdot.gov/resources/location/)
 THE FILES TO BE FOUND ARE AS FOLLOWS:
 W-5518_LS_CONTROL.TXT
 - SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
 - Ⓢ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
 PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
 NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION
 SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

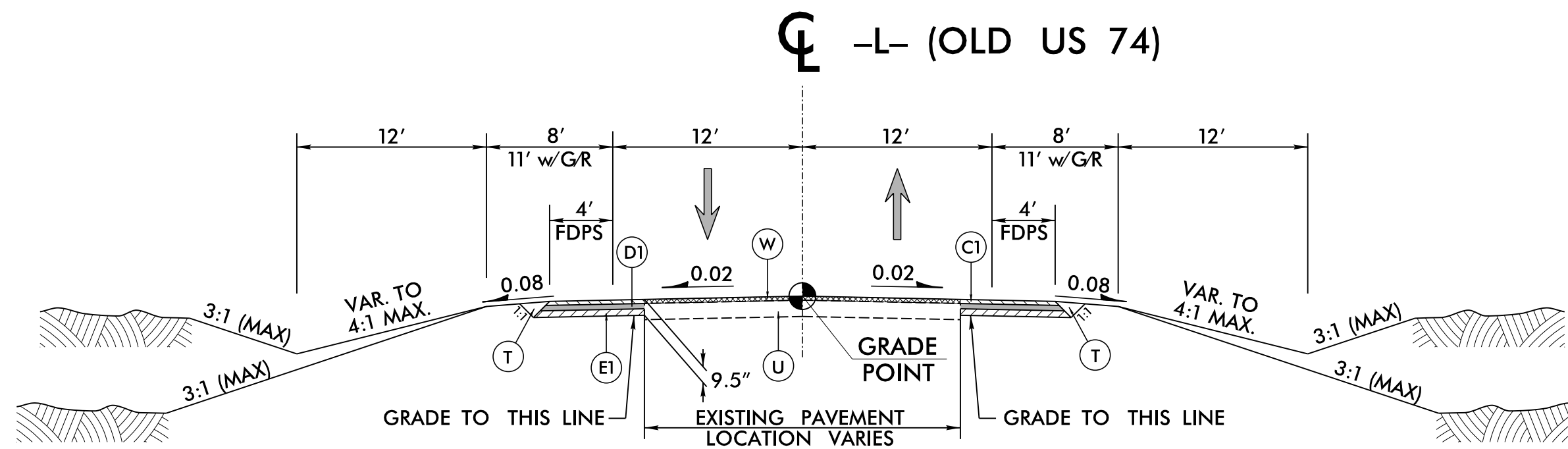
NOTE: DRAWING NOT TO SCALE

6/2/99
 11/23/2015
 R:\Roadway\Proj\W5518_ControlSheet_1C.dgn

PROJECT REFERENCE NO. <i>W-5518</i>	SHEET NO. <i>2A-1</i>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER <i>JOHN C. BOYD</i>	PAVEMENT DESIGN ENGINEER <i>ANDREW G. MITCHELL</i>
SEAL 12/18/2015	SEAL 12/18/2015

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
C4	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5C, AT AN AVERAGE RATE OF 224 LBS. PER SQ. YD.
D1	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2 1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.
J	8" AGGREGATE BASE COURSE.
T	EARTH MATERIAL.
T1	SHOULDER CONSTRUCTION WITH AGGREGATE SHOULDER BORROW
U	EXISTING PAVEMENT.
V	MILL EXISTING PAVEMENT 2".
W	WEDGING EXISTING PAVEMENT (SEE WEDGING DETAIL).
Y	RUMBLE STRIPS

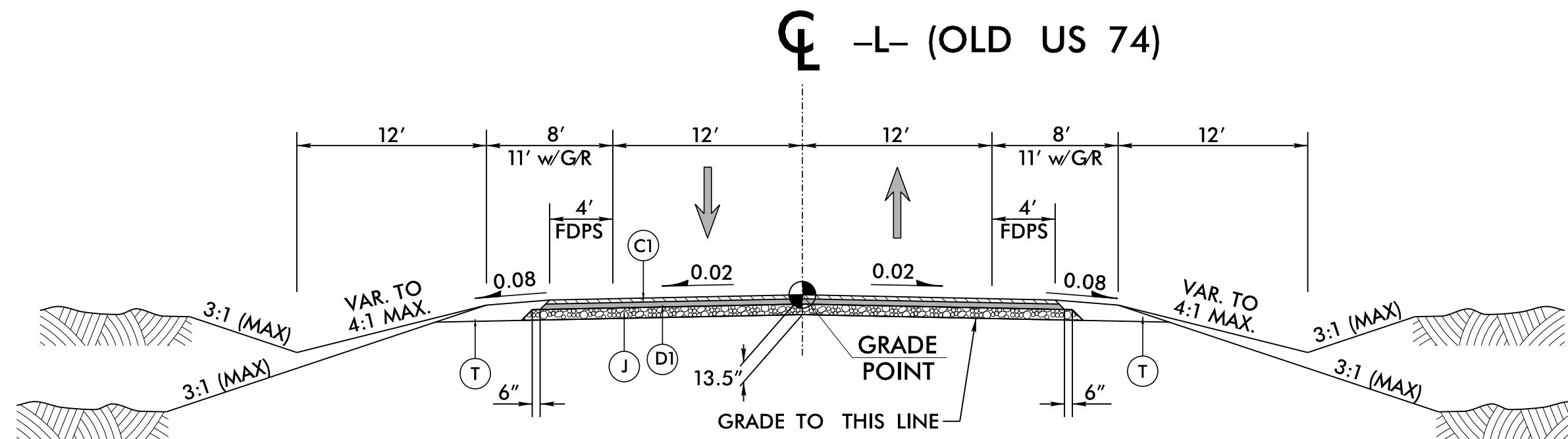
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1 AS FOLLOWS:

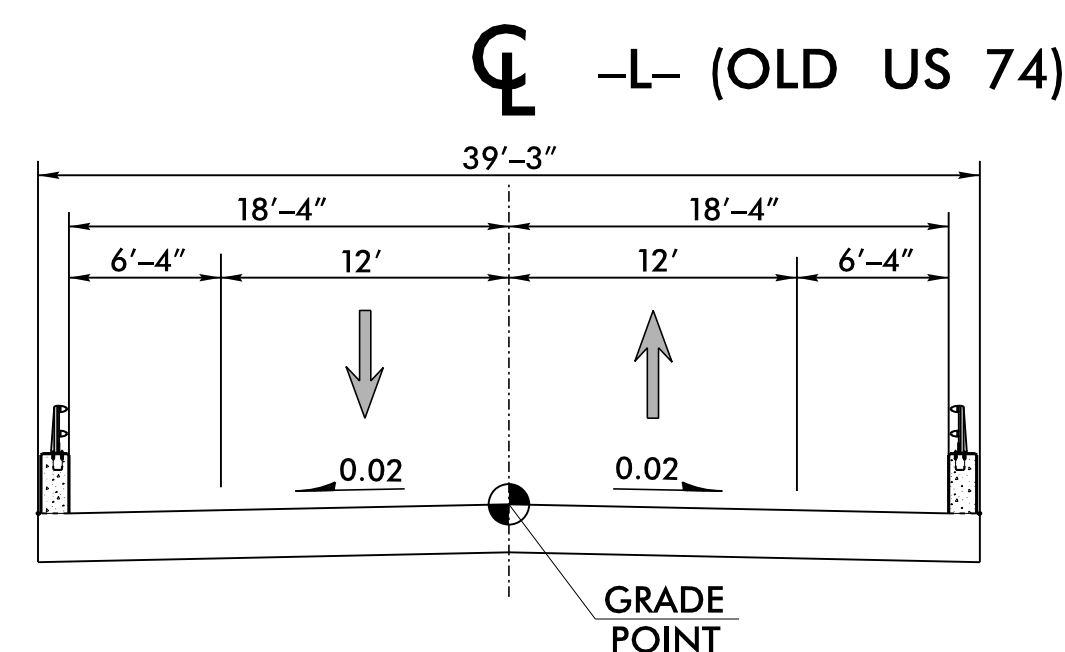
- L- STA. 12+20.00 TO 13+50.00
- L- STA. 35+50.00 TO 36+50.00



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2 AS FOLLOWS:

- L- STA. 13+50.00 TO 22+98.27 (BEGIN BRIDGE)
- L- STA. 25+14.46 (END BRIDGE) TO 35+50.00



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3 AS FOLLOWS:

- L- STA. 22+98.27 (BEGIN BRIDGE) TO 25+14.46 (END BRIDGE)

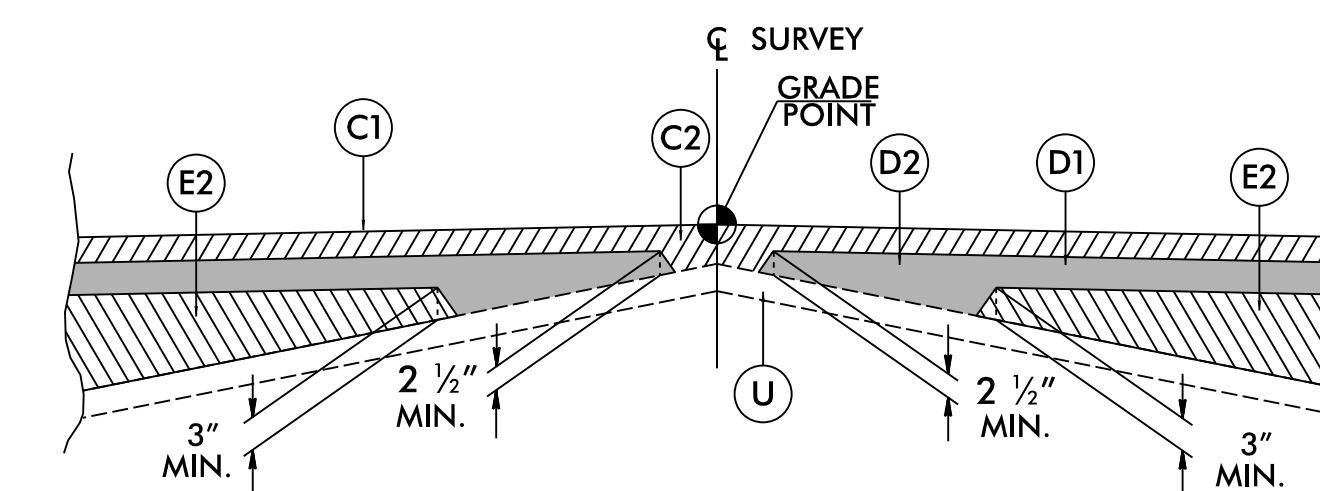
MILLING DETAIL

NOTES TO CONTRACTOR:

For surface mixes over 1" in thickness, mill the existing pavement in accordance with the above sketch as directed by the Engineer.

Locations shall include ties into existing concrete pavement at bridge approaches where the bridge will not be resurfaced, and at the beginning and ending point of each surfacing map.

Perform the work in accordance with Section 607 of the January 2012 North Carolina Department of Transportation Standard Specifications for Roads and Structures. Resurfacing will be accomplished at the same time as the milling operation.



Detail Showing Method of Wedging

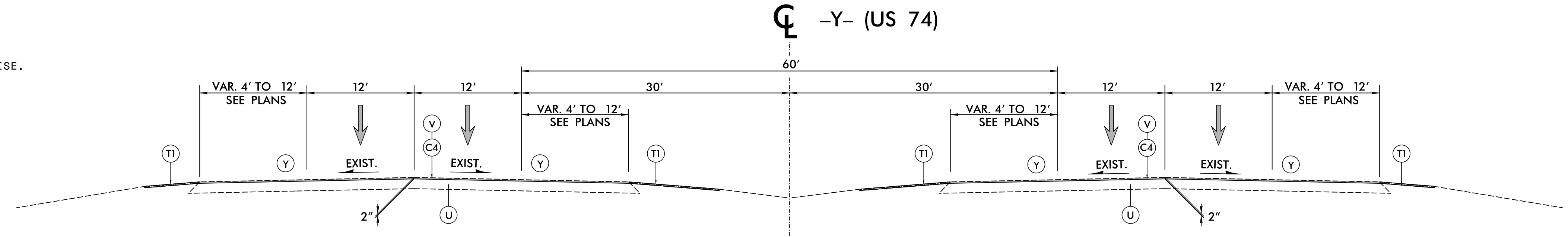
5/14/99



PROJECT REFERENCE NO. W-5518		SHEET NO. 2A-2	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER 		PAVEMENT DESIGN ENGINEER 	

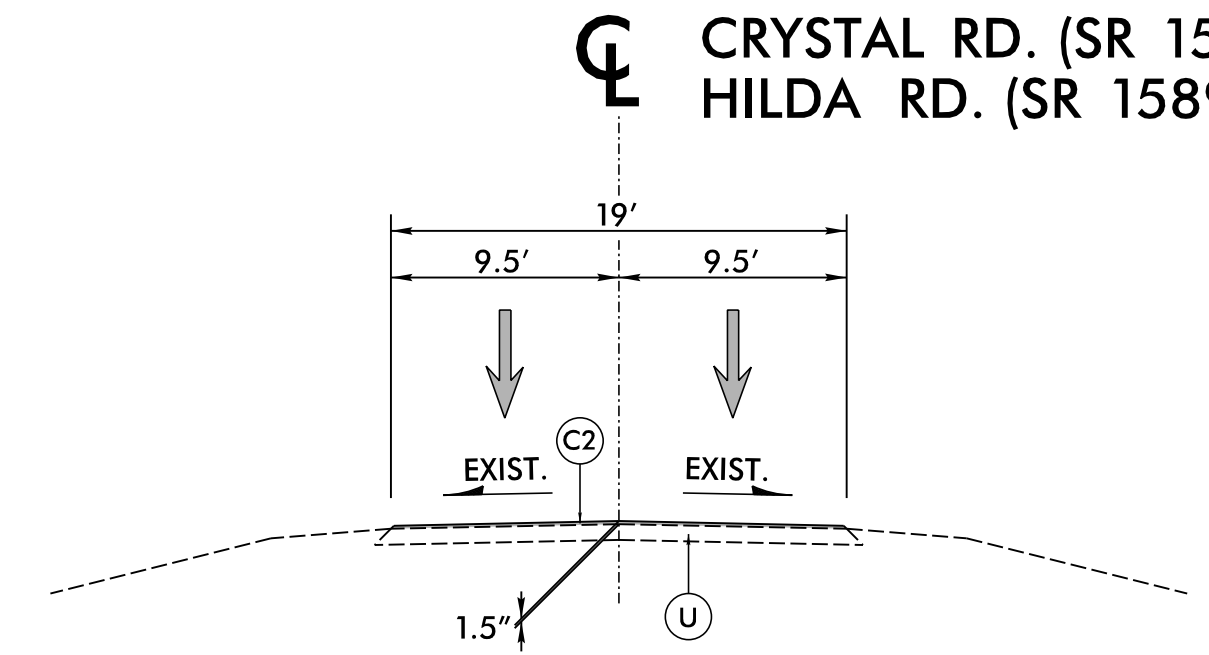
PAVEMENT SCHEDULE	
C2	1.5" S9.5B.
C4	2" S9.5C.
T1	SHOULDER CONSTRUCTION W/ ASB
U	EXISTING PAVEMENT.
V	MILL EXISTING PAVEMENT 2".
Y	RUMBLE STRIPS.

- NOTES:
 1) SEE SHEET 2 FOR DETAILED PAVEMENT SCHEDULE.
 2) PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4 AS FOLLOWS:
 -Y- STA. 15+90.00 TO 33+10.00

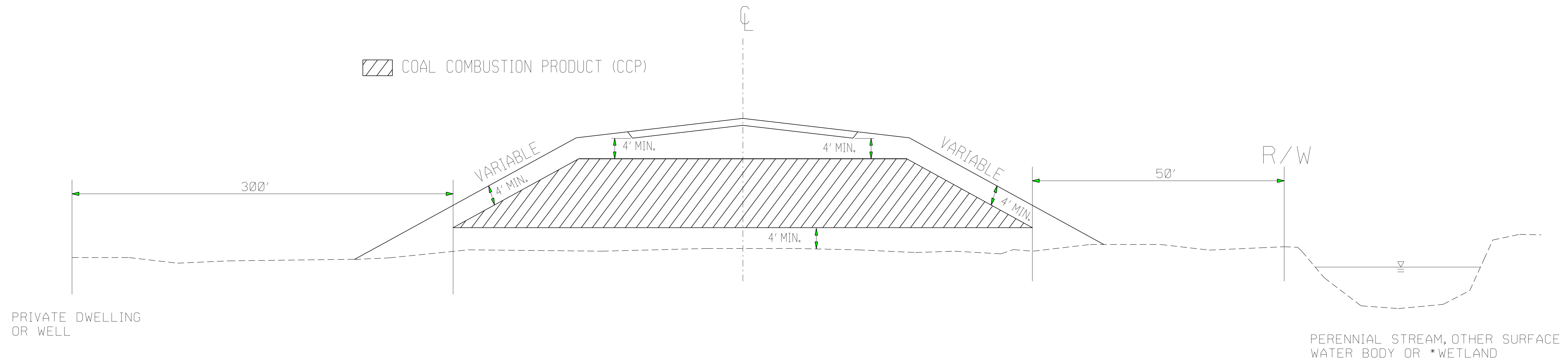


TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5 AS FOLLOWS:
 (-L- STATIONING)
 CRYSTAL RD. STA. 33+67+/- LT TO 36+47+/- LT
 HILDA RD. STA. 33+63+/- RT TO 36+45+/- RT

R:\12/18/2015\Projects\121815\121815_P\01\W5518_rdy_typ.dgn

COAL COMBUSTION PRODUCT PLACEMENT



PLACE CCP IN HATCHED AREA IN ACCORDANCE WITH THE PROJECT SPECIAL PROVISIONS

PLACE CCP A MINIMUM OF 5' ABOVE SEASONAL HIGH GROUND WATER

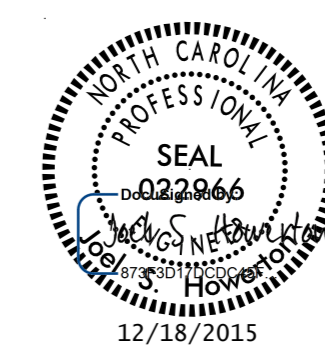
PLACE AT LOCATIONS AS APPROVED BY THE ENGINEER

PLACE SOIL BORROW MATERIAL ON THE OUTSIDE OF CCP AS EACH LIFT OF CCP IS PLACED

*(OBTAIN PERMISSION FROM ARMY CORPS OF ENGINEERS)

69
68
67
66
65
64
63
62
61
60
59
58
57
56
55
54
53
52
51
50
49
48
47
46
45
44
43
42
41
40
39
38
37
36
35
34
33
32
31
30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

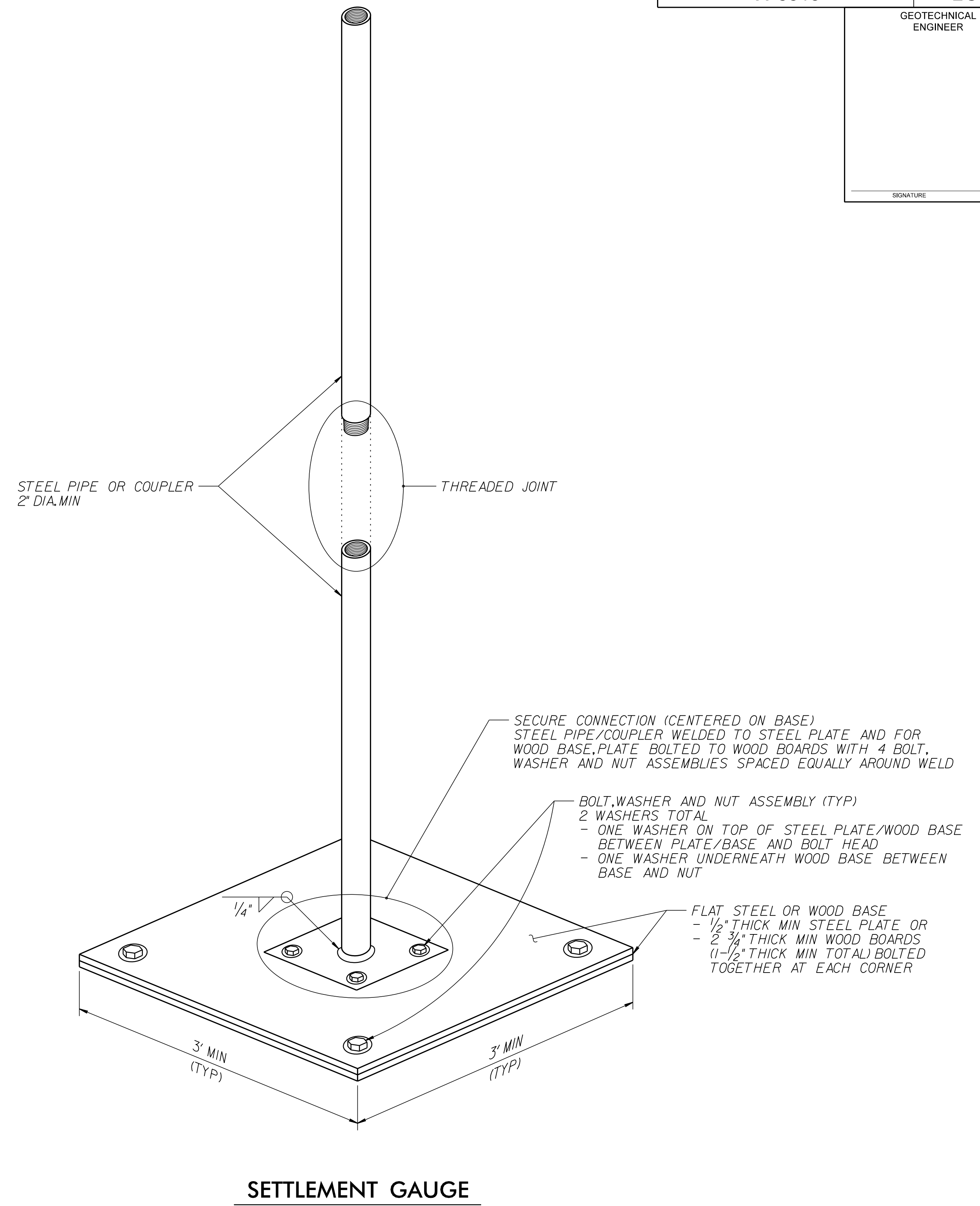
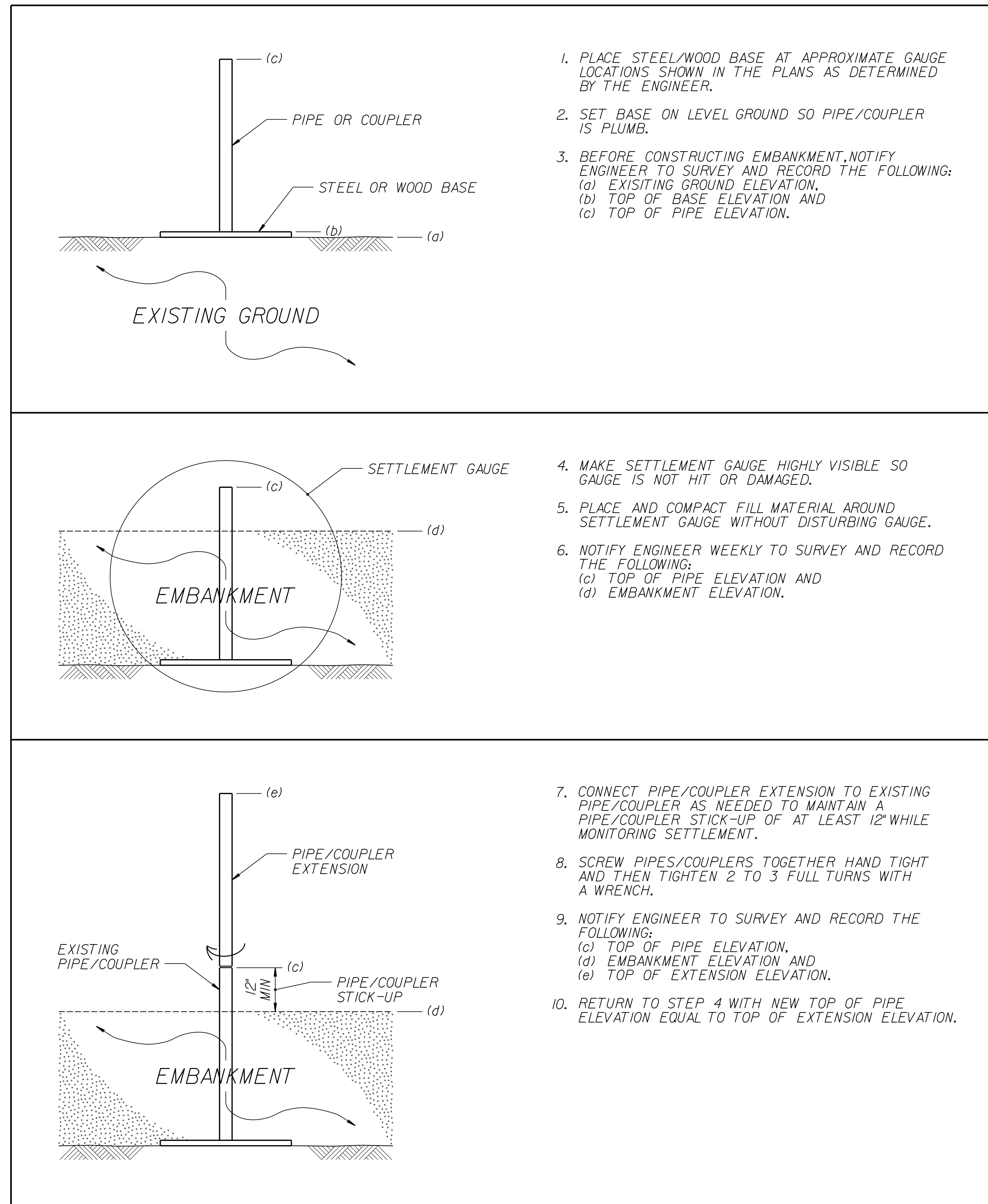


CONTRACT STANDARDS AND DEVELOPMENT UNIT	
Office 919-707-6950	FAX 919-250-4119
COAL COMBUSTION PRODUCT PLACEMENT DETAIL	
ORIGINAL BY: J.S.H.	DATE: 3/16/15
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.: joel/coal combustion material detail.dgn	

GEOTECHNICAL
ENGINEER

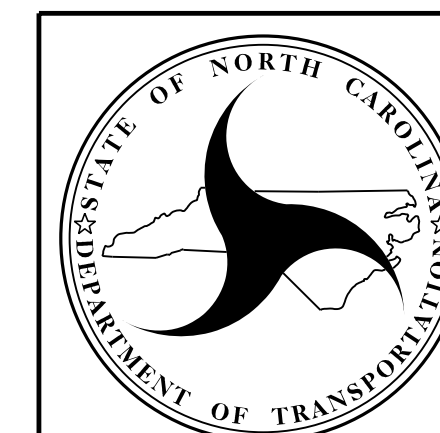
SIGNATURE _____ DATE _____

EMBANKMENT MONITORING SEQUENCE



NOTES:

1. SEE ROADWAY SUMMARY SHEETS FOR APPROXIMATE SETTLEMENT GAUGE LOCATIONS.
2. FOR STANDARD EMBANKMENT MONITORING, SEE EMBANKMENT SETTLEMENT GAUGES PROVISION.
3. INSTALL SETTLEMENT GAUGES AFTER CLEARING AND GRUBBING GAUGE LOCATIONS AND BEFORE CONSTRUCTING EMBANKMENTS WITH EMBANKMENT MONITORING.



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**GEOTECHNICAL
ENGINEERING UNIT**

STANDARD DETAIL NO. 1804.01

STANDARD
EMBANKMENT MONITORING

COMPUTED BY: W.C. Parker, PE DATE: 11-3-2015
 CHECKED BY: _____ DATE: _____

PROJECT NO. W-5518 SHEET NO. 3B-1

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

In Cubic Yards							
Line	Station	Station	Uncl. Excav.	Undercut Excav.	Embank. +%	Borrow	Waste
-L-	12+20.00	22+98.27	479	251	57,990	57,598	338
-BRIDGE-							
-L-	25+14.46	36+50.00	322	165	69,654	69,332	165
TOTALS:			801	416	127,644	126,930	503
Placement of Surcharge					563	563	
Removal of Surcharge			450				450
Shoulder Material					1,058	1,058	
Select Granular Material to Replace Borrow					-875	-875	
Additional Undercut - Contingency				3,600	4,500	4,500	3,600
PROJECT TOTALS:			1,251	4,016	132,890	132,176	4,553
Est. 5% to replace topsoil on Borrow Pits							6,609
GRAND TOTALS:			1,251			138,785	4,553
SAY:			1,400			145,800	4,553

Est. Undercut Contingency: 3,600 Yd³
 Est. Undercut by Stations: 416 Yd³
Total Undercut Excavation: 4,016 Yd³

Est. Shallow Undercut Contingency: 1,000 Yd³

Select Granular Material - Backfill Undercut: 700 Yd³
 Select Granular Material - Contingency: 1,000 Yd³
Total Select Granular Material: 1,700 Yd³

Class IV Subgrade Stabilization Mat'l: 1,900 Tons

DDE: 4,524 Yd³

Pavement Structure Volume: 149.63 Yd³

Note: Earthwork quantities are calculated by the NCDOT Division 6. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

ASPHALT PAVEMENT REMOVAL SUMMARY

LINE	BEGIN STA	END STA	LOC	AREA FT ²	AREA Yd ²
-Y-	23+26	24+12	MED RT	401.68	44.63
-Y-	23+50	24+12	MED LT	309.67	34.41
-Y-	24+96	25+82	MED	1,008.74	112.08
-L-	13+50	14+50	CL	1,818.51	202.06
-L-	22+98	23+33	CL	3,854.23	428.25
-L-	24+79	25+14	CL	3,242.74	360.30
-L-	34+50	35+50	CL	1,770.41	196.71
				TOTAL	1,378.44
				SAY	1,450

ASPHALT PAVEMENT BREAKING SUMMARY

LINE	BEGIN STA	END STA	LOC	AREA FT ²	AREA Yd ²
-L-	14+50+/-	23+00+/-	CL	18,630.45	2,070.05
-L-	25+14+/-	34+50+/-	CL	19,746.04	2,194.00
				TOTAL	4,264.05
				SAY	4,480

DOUBLE FACED CABLE GUIDERAIL SUMMARY

LINE	STATION	STATION	LOCATION	LENGTH LF	ANCHORS
-Y-	13+24.90	23+55.01	RT	1,030.11	2
-Y-	25+53.09	35+85.03	LT	1,031.94	2
Guardrail Totals:				2,062	4
Deductions for Anchor Units				4	100
GUARDRAIL TOTAL:				1,962	
				SAY	1,990

Additional Guardrail Posts = 11

WOVEN WIRE FENCE SUMMARY

LINE	STA	STA	LT. OR RT.	A	B	C	D	E	F	
				FABRIC L.F.	END BRACE	CORNER BRACE	LINE BRACE	4" POSTS	5" POSTS	
-L-	32+94	35+00	LT	207.98	1	1	0	12	5	
				TOTAL	207.98	1	1	0	12	5
				SAY	210			13	6	

Additional Barbed Wire = 50'

SHOULDER BERM GUTTER SUMMARY

LINE	LOC	BEG. STA.	END STA.	LENGTH	
-L-	LT	22+59	22+93	34.0	
-L-	RT	22+59	22+76	17.0	
-L-	LT	25+37	25+54	17.0	
-L-	RT	25+20	25+54	34.0	
				TOTAL	102.0
				SAY	105

COMPUTED BY: WC Parker, PE DATE: 7-14-2015
 CHECKED BY: _____ DATE: _____

PROJECT NO.
W-5518

SHEET NO.
3G-1

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				SD	2,000
				TOTAL LF:	2,000

*UD = Underdrain
 *BD = Blind Drain
 *SD = Subsurface Drain

SUMMARY OF SURCHARGES AND BRIDGE WAITING PERIODS

End Bent/ Bent No.	LINE	Station	Station	Surcharge Height FT ¹	MONTHS
EB1	-L-	22+00	23+00	2.0	3
EB2	- L -	25 + 15	NA	N/A	3

Notes:
¹Surcharge height is above finished grade and extends horizontally from hinge point to hinge point.

SUMMARY OF SETTLEMENT GAUGES

Gauge No.	LINE	Approx. Station	Approx. Offset
1	-L-	22+78	20' RT
2	-L-	23+00	20' LT
3	-L-	25+22	20' RT
4	-L-	25+36	20' LT
TOTAL GAUGES (EACH):			4

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type ASU/AST	Aggregate Thickness INCHES	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU		1,000	1,900	3,000		
TOTAL CY/TONS/SY:					1,000	1,900	3000*	0	0

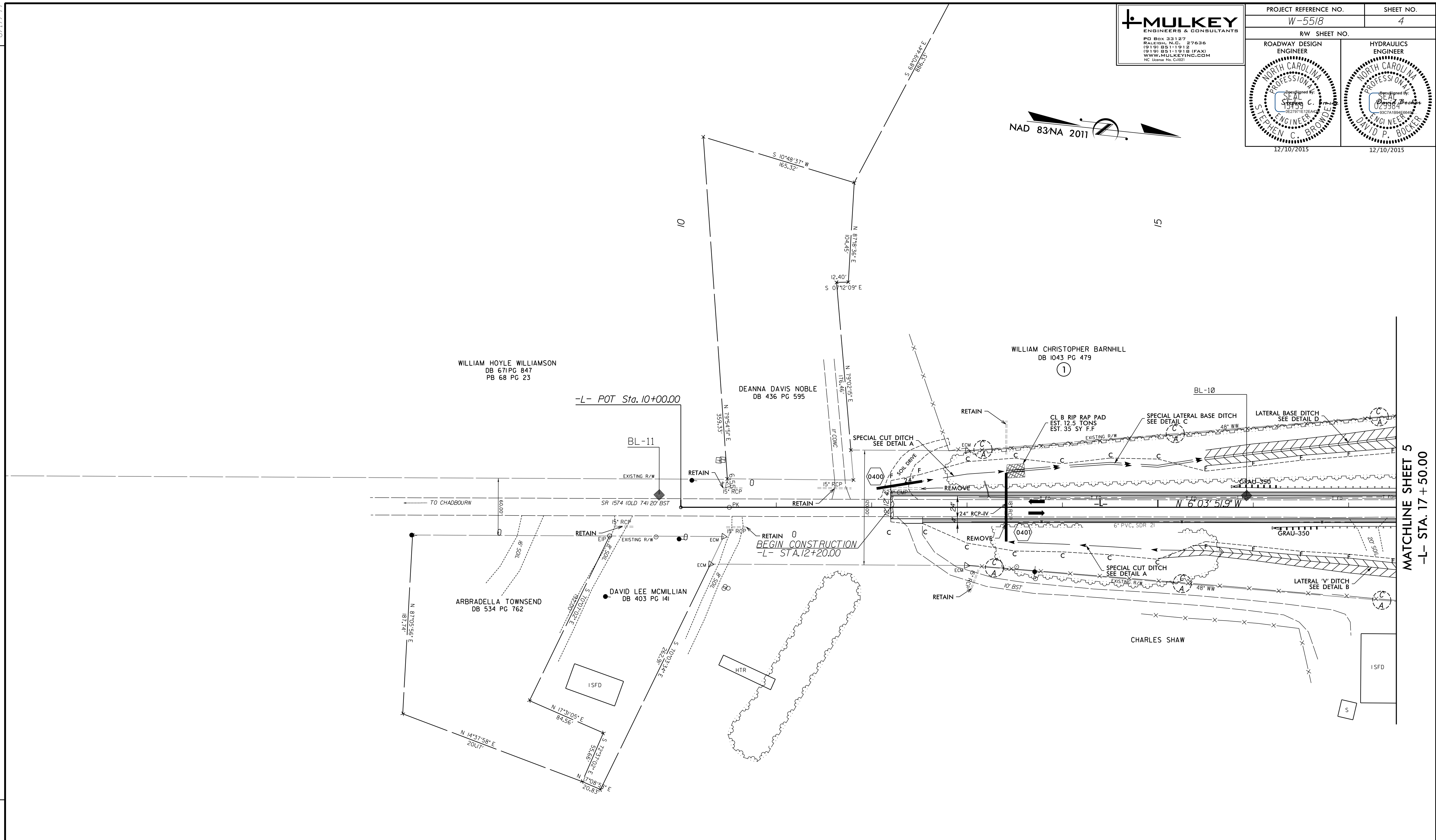
ASU = Aggregate Subgrade, AST = Aggregate Stabilization

*Total square yards of Geotextile for Soil Stabilization is only the estimated quantity for ASU/AST and may only represent a portion of the geotextile quantity shown in the Item Sheets of the Proposal.

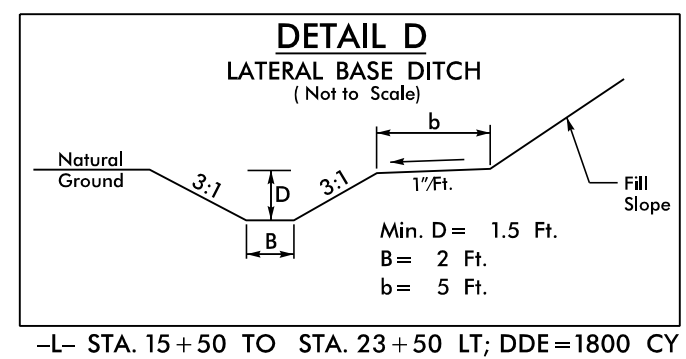
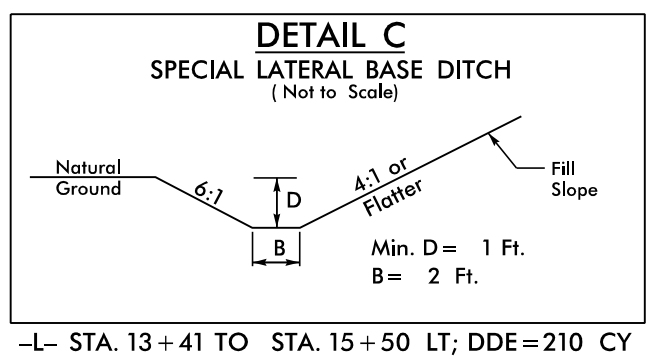
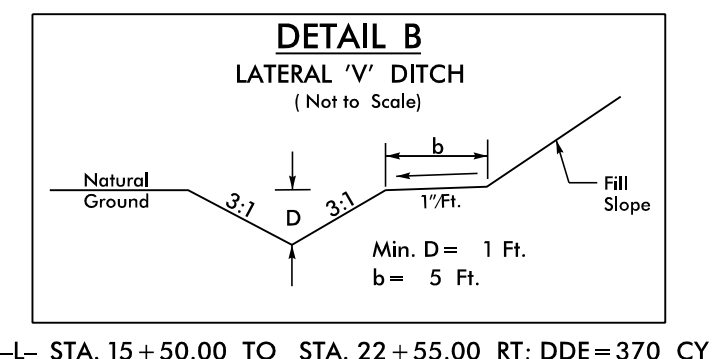
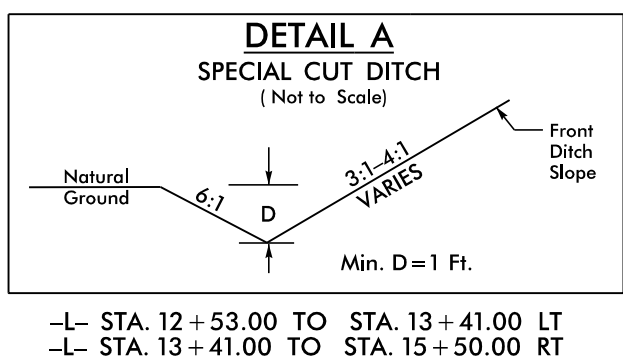
PROJECT REFERENCE NO. <i>W-5518</i>		SHEET NO. 4
RW SHEET NO.		HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER
STEPHEN C. BROWNE		DAVID P. BOCKER
12/10/2015		12/10/2015



REVISIONS



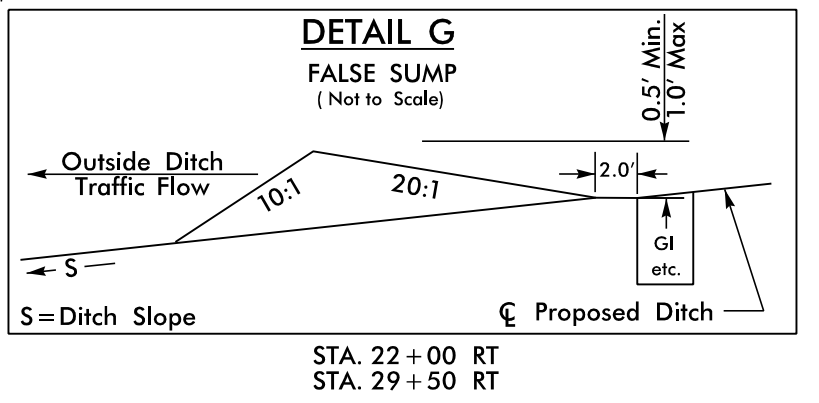
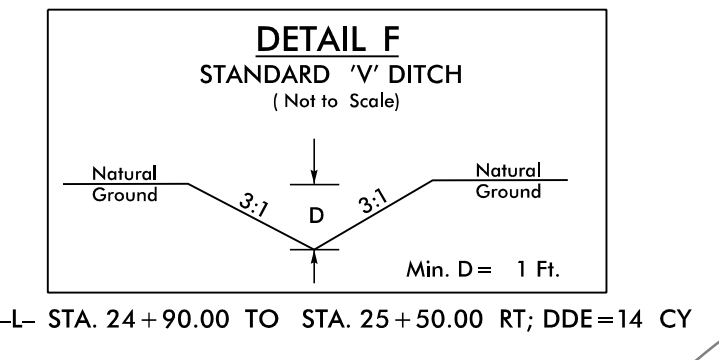
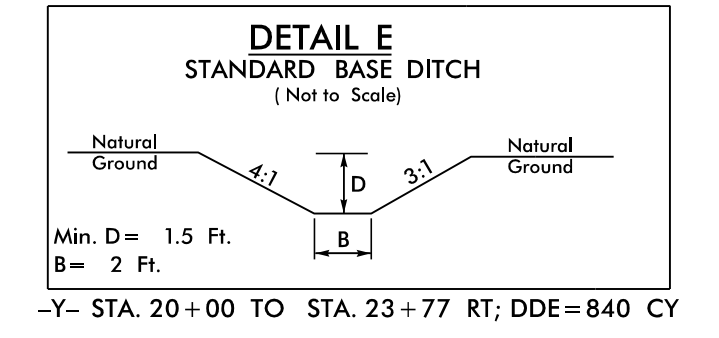
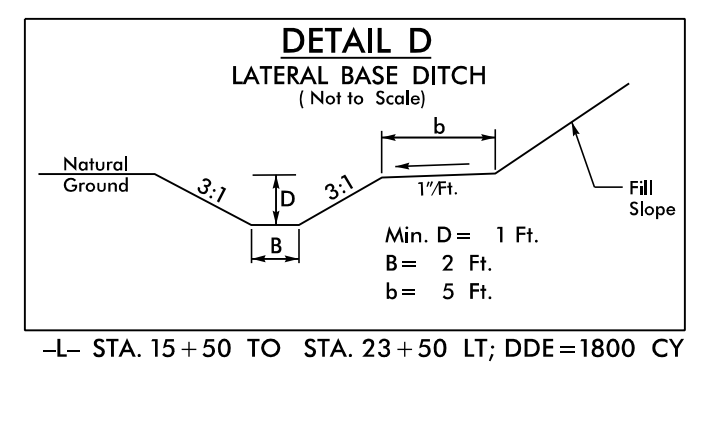
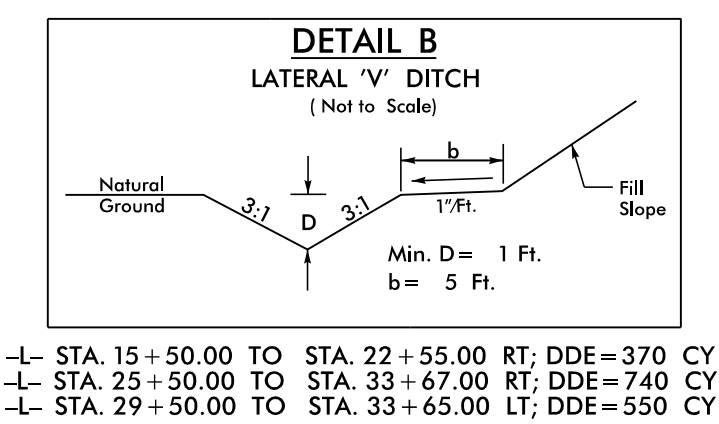
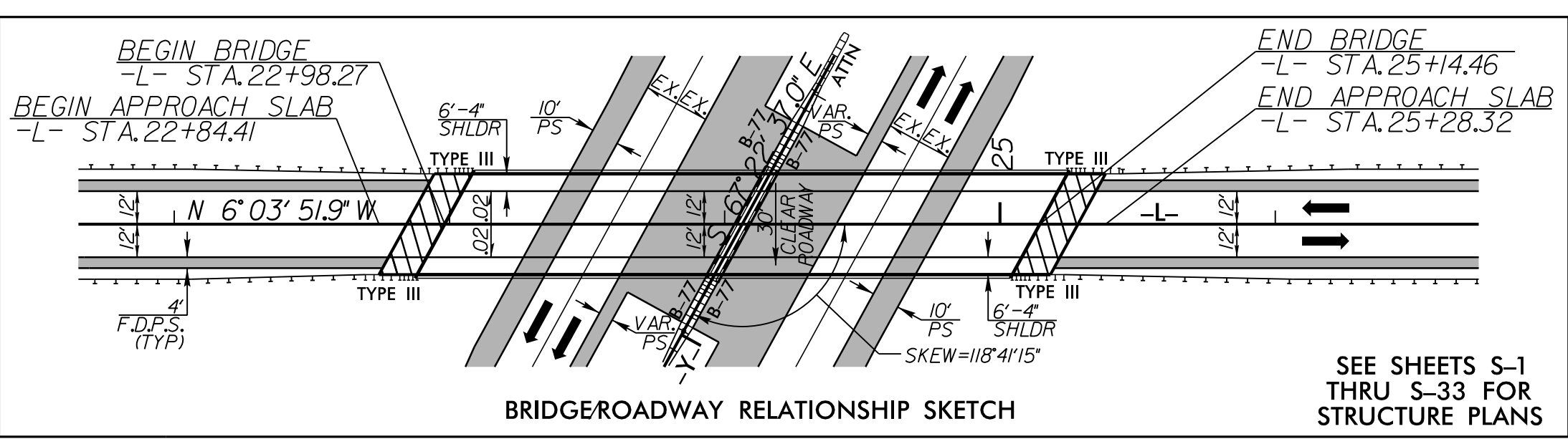
MATCHLINE SHEET 5
-L- STA. 17 + 50.00



12/10/2015
K:\Roadway\Proj\W5518_rdw_psh4.dgn

8/17/09

PROJECT REFERENCE NO. W-5518	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
12/10/2015	12/10/2015



NOTE:
BEGIN DOUBLE FACED CABLE GUIDERAIL
-Y- STA.13+24.90
END DOUBLE FACED CABLE GUIDERAIL
-Y- STA.35+85.03



MATCHLINE SHEET 4
-L- STA. 17 + 50.00

MATCHLINE SHEET 6
-L- STA. 31 + 50.00

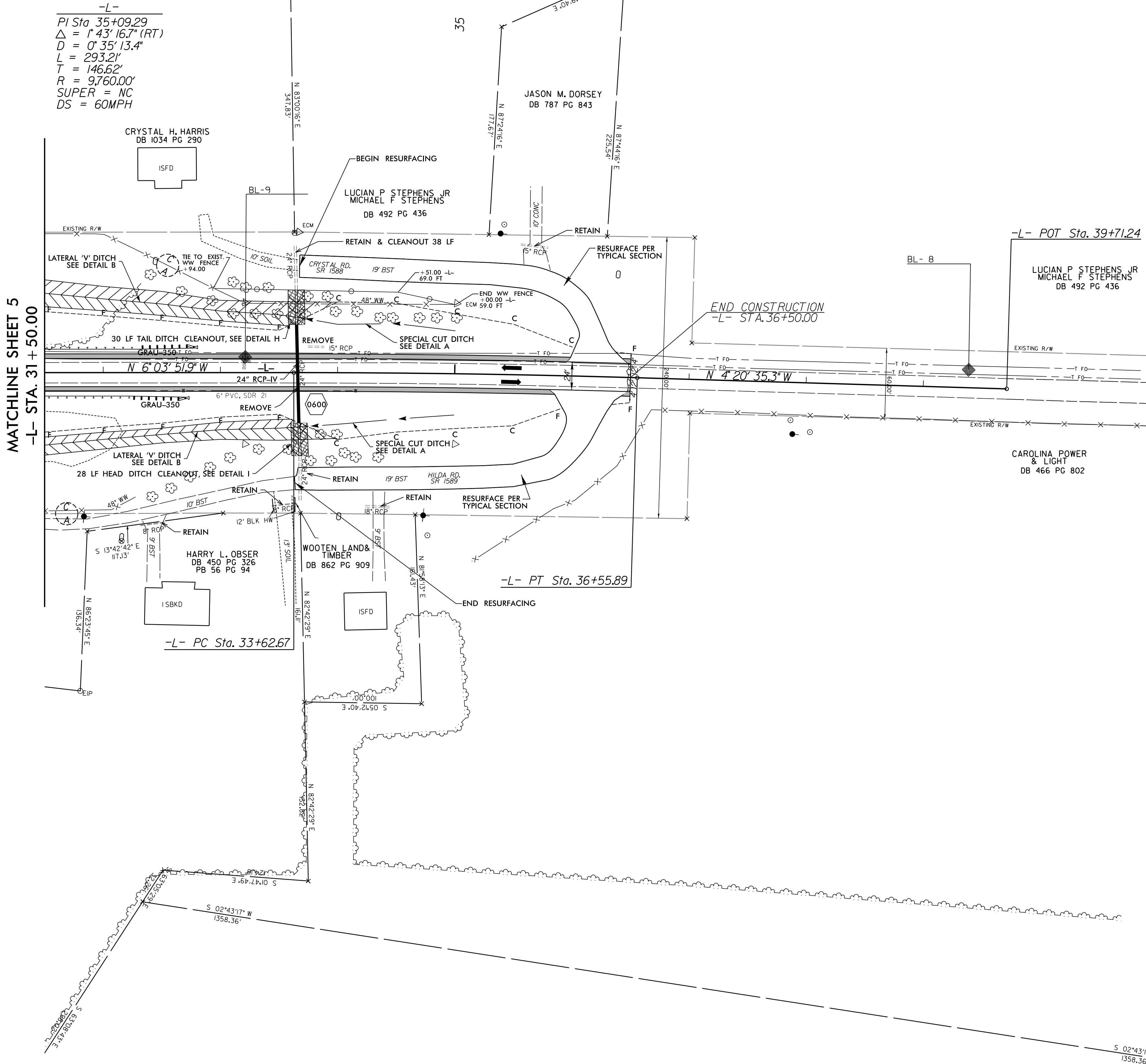
12/10/2015
K:\Roadway\Proj\W5518_rdu_pah5.dgn
E:\Users\rdm

MATCHLINE SHEET 7
-Y- STA. 26 + 50.00

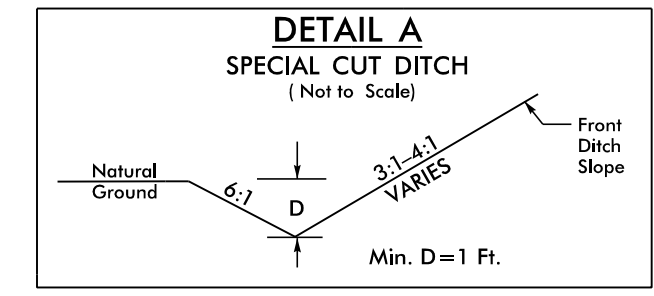
ALIECE H. JOHNSON
DB 832 PG 93
DB 451PG 285

SEE SHEET 8 FOR -L- PROFILE

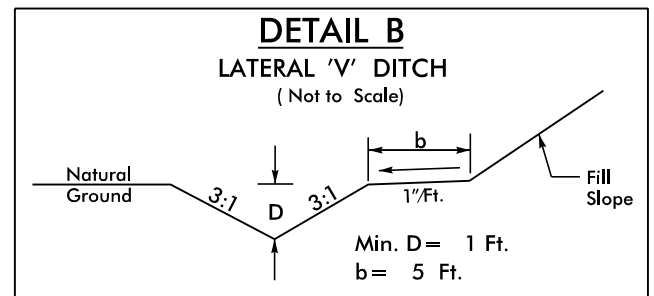




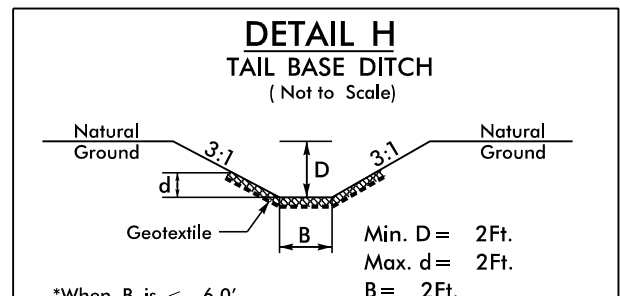
REVISIONS



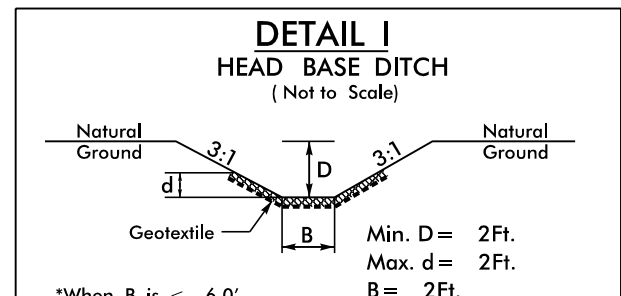
-L- STA. 33+65.00 TO STA. 35+00.00 LT
-L- STA. 33+67.00 TO STA. 35+00.00 RT



-L- STA. 25+50.00 TO STA. 33+67.00 RT; DDE=740 CY
-L- STA. 26+05.00 TO STA. 28+00.00 LT; DDE=150 CY
-L- STA. 29+50.00 TO STA. 33+65.00 LT; DDE=550 CY

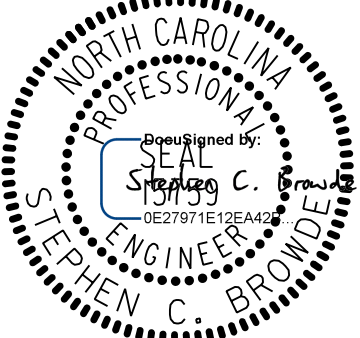
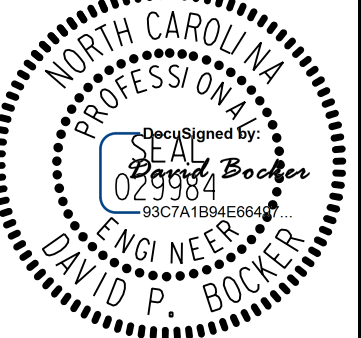


*When B is < 6.0'
DDE=14 CY
Type of Liner=19 TON CLASS B Rip-Rap
Geotextile=53 SY
-L- STA. 33+65 LT



*When B is < 6.0'
DDE=13 CY
Type of Liner=17.5 TON CLASS B Rip-Rap
Geotextile=49 SY
-L- STA. 33+67 RT

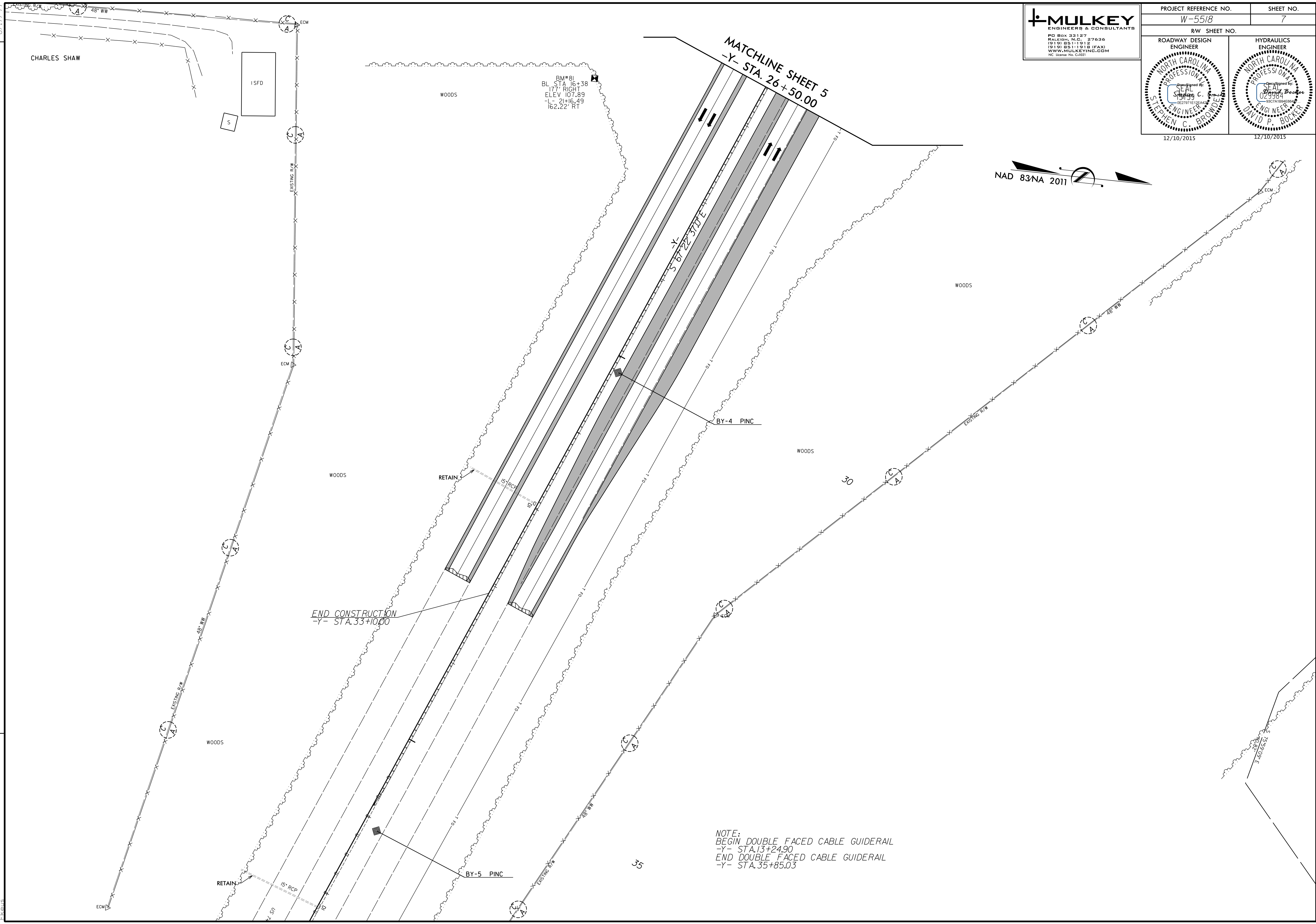
MULKEY
 ENGINEERS & CONSULTANTS
 PD BOX 33127
 RALEIGH, N.C. 27636
 (919) 851-1912
 (919) 851-1918 (FAX)
 WWW.MULKEYINC.COM
 NC License No. C62021

PROJECT REFERENCE NO. W-5518	SHEET NO. 7
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
 SEAL Stephen C. Browne 19499 STATE OF NORTH CAROLINA PROFESSIONAL ENGINEER	 SEAL David P. Bocker 19674 STATE OF NORTH CAROLINA PROFESSIONAL ENGINEER
12/10/2015	12/10/2015



REVISIONS

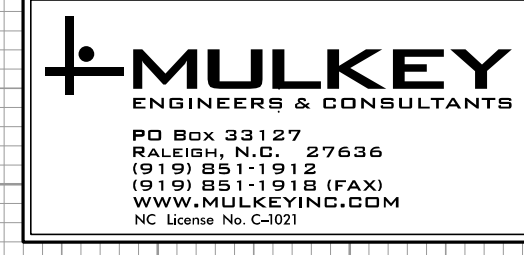
12/10/2015
 R. Rosado\Proj\W5518_rdu_psh7.dgn
 ELS



NOTE:
 BEGIN DOUBLE FACED CABLE GUIDERAIL
 -Y- STA.13+24.90
 END DOUBLE FACED CABLE GUIDERAIL
 -Y- STA.35+85.03

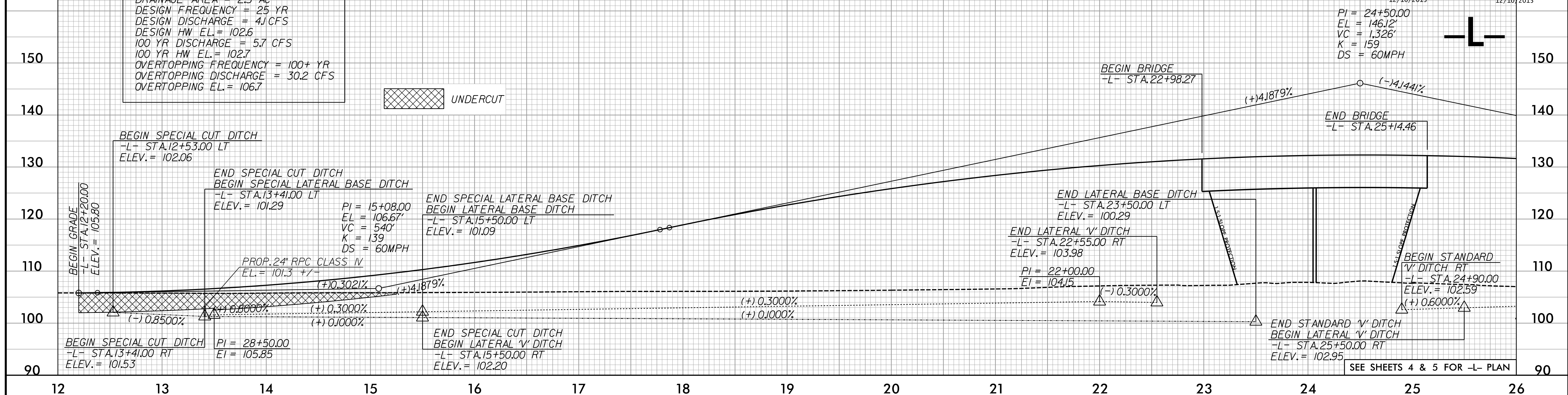
5/28/15

BM#81
BL STA 16+38 (177' RIGHT) =
-L- 21+16.49 (162.22' RT)
ELEV = 107.89

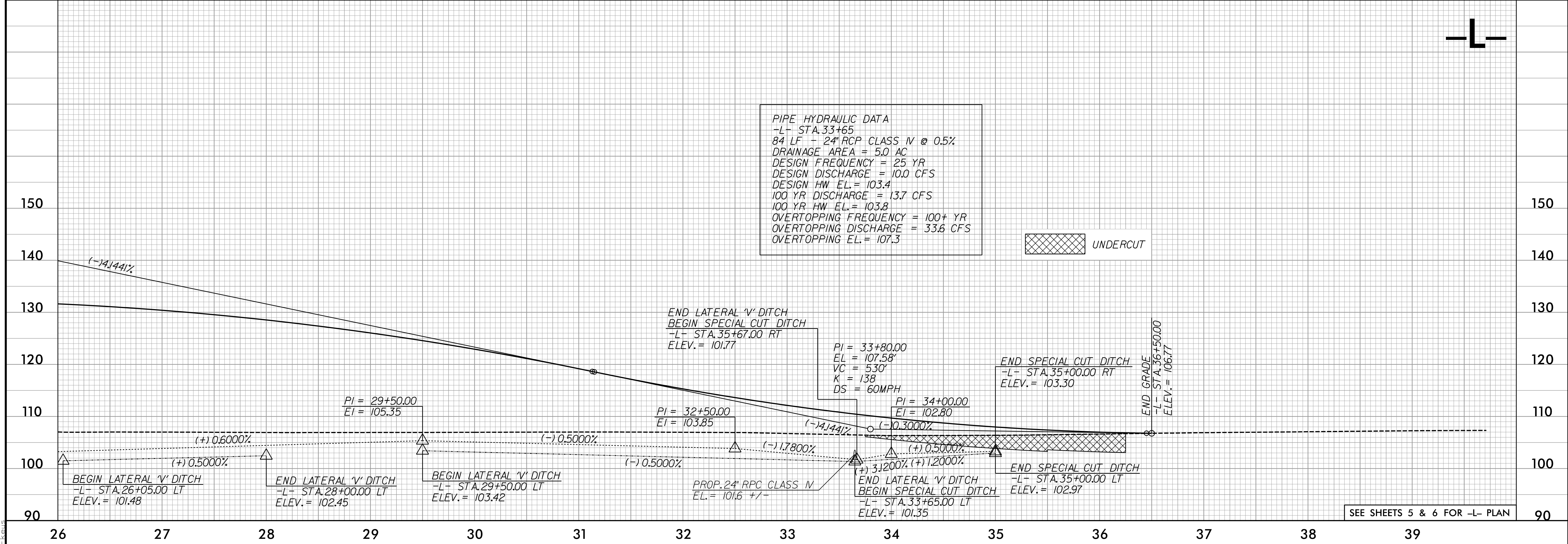


PROJECT REFERENCE NO. W-5518	SHEET NO. 8
ROADWAY DESIGN ENGINEER SEAL STEPHEN C. BROWN 12/17/2015	HYDRAULICS ENGINEER SEAL DAVID L. BOCKER 12/17/2015

PIPE HYDRAULIC DATA
-L- STA.13+41
72 LF - 24" RCP CLASS IV @ 0.5%
DRAINAGE AREA = 2.5 AC
DESIGN FREQUENCY = 25 YR
DESIGN DISCHARGE = 4.1 CFS
DESIGN HW EL. = 102.6
100 YR DISCHARGE = 5.7 CFS
100 YR HW EL. = 102.7
OVERTOPPING FREQUENCY = 100+ YR
OVERTOPPING DISCHARGE = 30.2 CFS
OVERTOPPING EL. = 106.7



PIPE HYDRAULIC DATA
-L- STA.33+65
84 LF - 24" RCP CLASS IV @ 0.5%
DRAINAGE AREA = 5.0 AC
DESIGN FREQUENCY = 25 YR
DESIGN DISCHARGE = 10.0 CFS
DESIGN HW EL. = 103.4
100 YR DISCHARGE = 13.7 CFS
100 YR HW EL. = 103.8
OVERTOPPING FREQUENCY = 100+ YR
OVERTOPPING DISCHARGE = 33.6 CFS
OVERTOPPING EL. = 107.3



12/10/2015 12:00:00 PM C:\Users\p1\OneDrive\Projects\W5518_rdy.pfl.dgn

SEE SHEETS 4 & 5 FOR -L- PLAN

SEE SHEETS 5 & 6 FOR -L- PLAN

5/28/15

BM#81
BL STA 16+38 (177' RIGHT) =
-Y- 27+35.51 (176.42' RT)
ELEV = 107.89

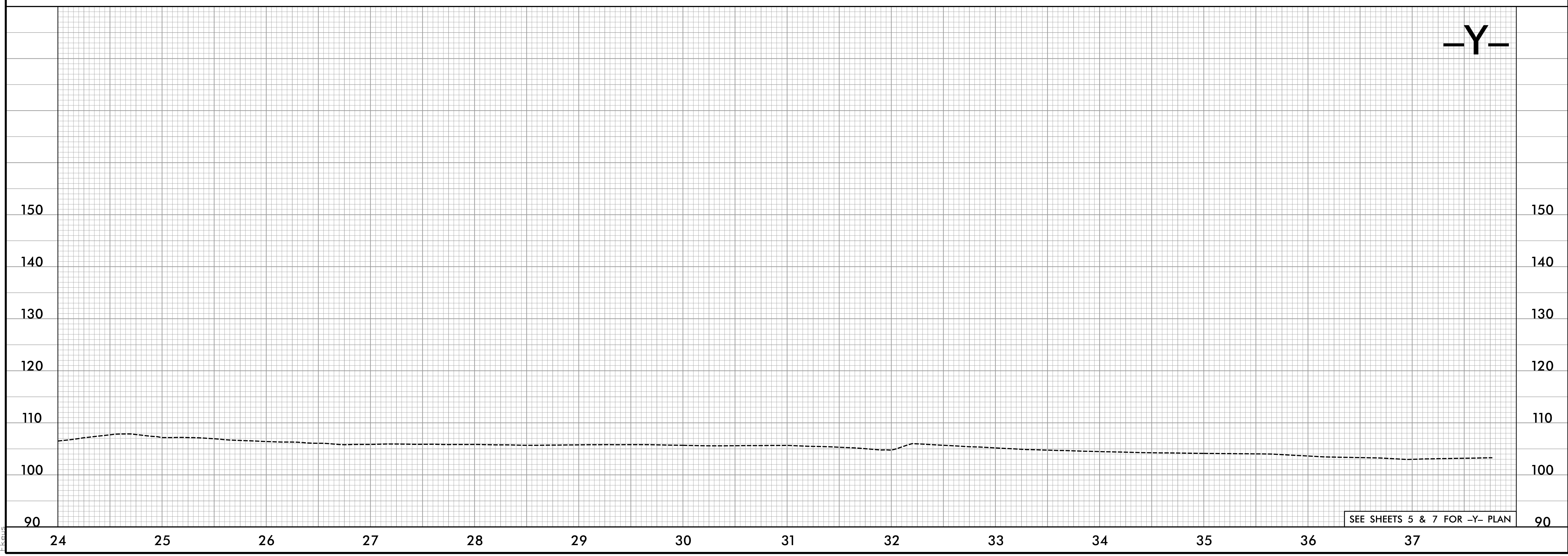
MULKEY
ENGINEERS & CONSULTANTS
PO BOX 33127
RALEIGH, N.C. 27636
(919) 851-1912
(919) 851-1918 (FAX)
WWW.MULKEYINC.COM
NC License No. C6202

PROJECT REFERENCE NO. W-5518	SHEET NO. 9
ROADWAY DESIGN ENGINEER DESIGNED BY: STEPHEN C. BRUNDT 12/10/2015	HYDRAULICS ENGINEER DESIGNED BY: DAVID P. BOCKER 12/10/2015



SEE SHEETS 5 & 7 FOR -Y- PLAN

12/10/2015
K:\Projects\W5518_rdy_pfl.dgn



SEE SHEETS 5 & 7 FOR -Y- PLAN