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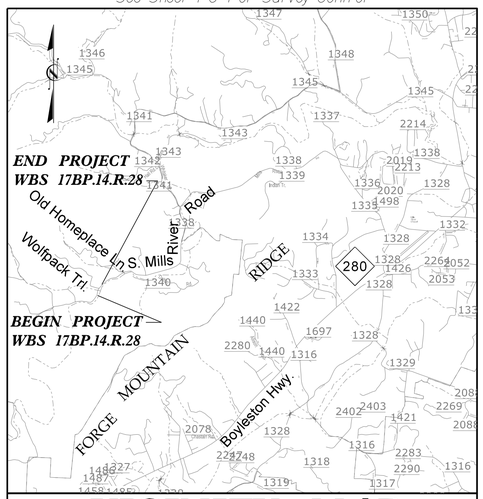
This file or an individual page shall not be considered a certified document.

4/20/12

PROJECT: 17BP.14.R.28

CONTRACT: DN00161

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HENDERSON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.14.R.28	1	

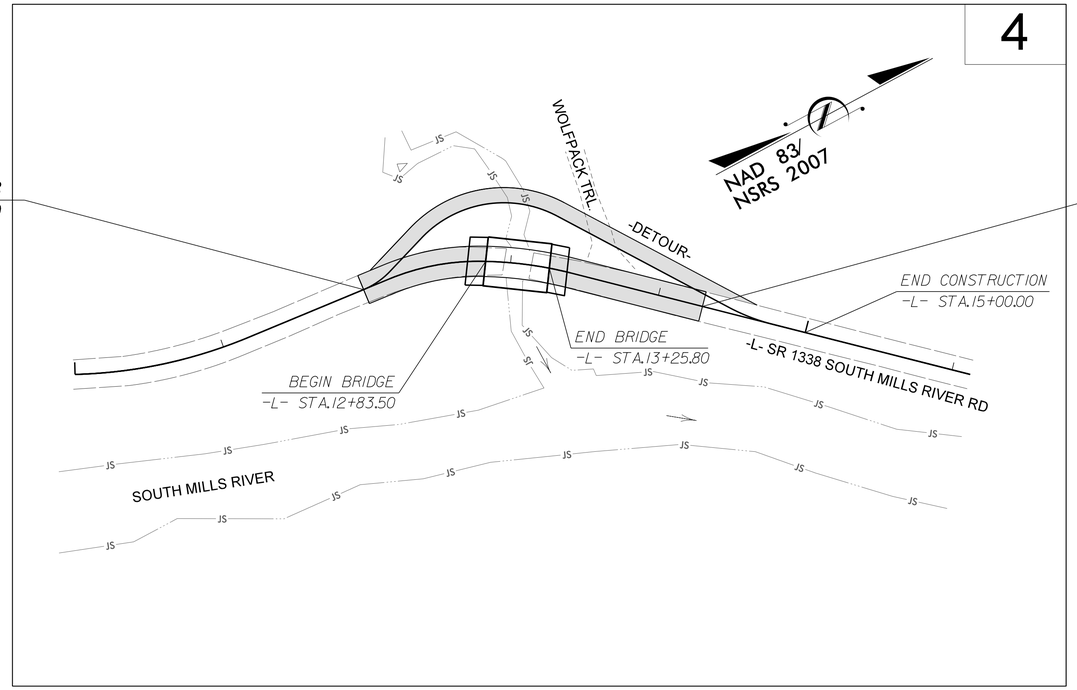
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.14.R.28		P.E., ROW, UTIL
17BP.14.R.28		CONST.

LOCATION: BRIDGE NO. 164 ON SR 1338 (SOUTH MILLS RIVER ROAD) OVER QUEEN CREEK
0.9 MILES WEST OF JUNCTION OF SR 1340
TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND STRUCTURE

4

BEGIN PROJECT WBS 17BP.14.R.28
–L– STA. 12+00.00

END PROJECT WBS 17BP.14.R.28
–L– STA. 14+30.00



THERE IS NO CONTROL OF ACCESS ON THIS PROJECT

GRAPHIC SCALES

PLANS: 50 25 0 50 100
PROFILE (HORIZONTAL): 50 25 0 50 100
PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2003 = 100
ADT 2025 = 200
K = N/A %
D = N/A %
T = 6 % *
V = 35 MPH
* (TTST 6% + DUAL 0%)
FUNC CLASS = RURAL LOCAL
SUB–REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT WBS 17BP.14.R.28 = 0.036 MILES
LENGTH STRUCTURE PROJECT WBS 17BP.14.R.28 = 0.008 MILES
TOTAL LENGTH PROJECT WBS 17BP.14.R.28 = 0.044 MILES

NCDOT Contact:
JOSHUA B. DEYTON, P.E.

Prepared in the Office of
DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NORTH CAROLINA 28210
(704) 332-2289 NC LICENSE NO. C-2213

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:

LETTING DATE:

JAMES E. BECK, P.E.
PROJECT ENGINEER

MICHAEL D. HAGE, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026971 ENGINEER JOSHUA G. DALTON

Joshua G Dalton P.E.

SIGNATURE:

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026815 ENGINEER JAMES E. BECK

James E. Beck P.E.

SIGNATURE:

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

11/13/2015
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mhage

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.28	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026815 ENGINEER JAMES E. BECK

James E. Beck

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
1C-1	SURVEY CONTROL SHEET
2A-1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2B-1	DETAIL OF REINFORCED SANDBAG HEADWALL
3B-1 THRU 3B-2	ROADWAY SUMMARIES
3D-1	DRAINAGE SUMMARIES
4 THRU 5	PLAN AND PROFILE SHEET
TMP-1 THRU TMP-3	TRAFFIC MANAGEMENT PLANS
PMP-1	PAVEMENT MARKING PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
RF-1	REFORESTATION PLANS
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS
X-1A	CROSS-SECTION SUMMARY SHEET
X-1 THRU X-3	CROSS-SECTIONS
S-0 THRU S-14	STRUCTURE PLANS

GENERAL NOTES: 2012 SPECIFICATIONS
EFFECTIVE: 01-17-12
REVISED: 07/30/12

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED 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.

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

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.

SUBSURFACE PLANS:

SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT.

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

AT&T - 1408 PATTON AVE., ASHEVILLE, NC 28806

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY CONTRACT IN ACCORDANCE WITH SECTION 801 OF THE 2012 NORTH CAROLINA STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

2012 ROADWAY ENGLISH STANDARD DRAWINGS

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:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.11	Reinforced Bridge Approach Fills - Sub Regional Tier
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.37	Steel Grate and Frame
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units

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12/05/11

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.28	1B

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- 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 — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite R/W Marker — RW
- Proposed Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent 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 — Vineyard

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

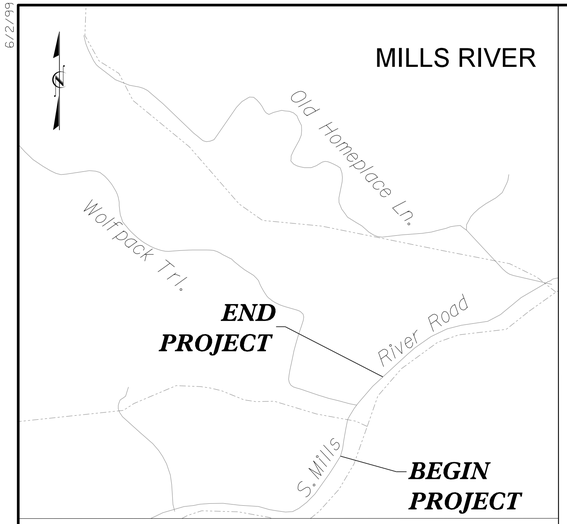
MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- 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.

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.28	IC-1
LOCATION AND SURVEYS	

SURVEY CONTROL SHEET BRIDGE NO. 164



PROJECT VICINITY MAP

CONTROL DATA

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	BL1	609852.1142	918276.0958	2192.48	10+18.93	15.47 RT
2	BL2	610120.5290	918303.9620	2191.78	12+82.06	13.61 LT
3	BL3	610357.5485	918550.0610	2190.06	OUTSIDE PROJECT LIMITS	

-FINAL- ROW MARKER IRON PIN AND CAP-E

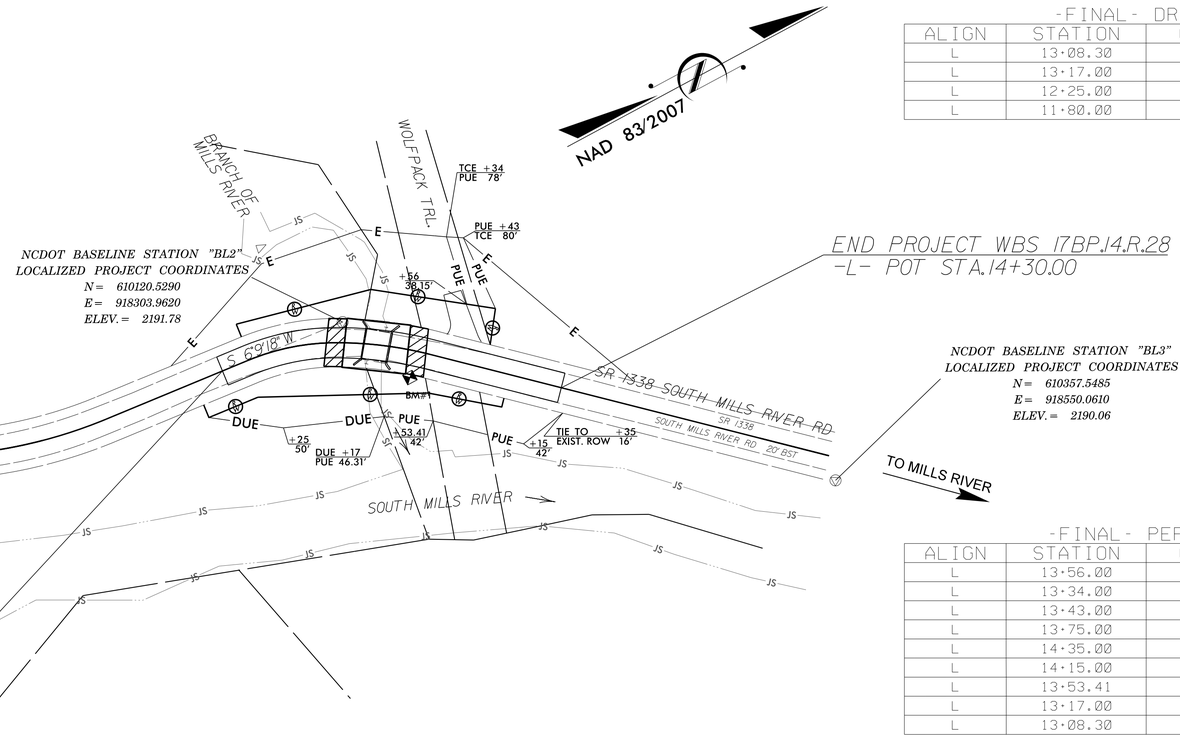
ALIGN	STATION	OFFSET	NORTH	EAST
L	12+20.00	-16.00	610057.0418	918280.8954
L	12+20.00	-25.00	610058.0368	918271.9506
L	12+98.04	-36.00	610147.1059	918293.8299
L	13+75.00	-40.00	610213.6028	918343.8507
L	13+77.48	-16.00	610199.2072	918363.2132
L	13+95.00	16.00	610190.4907	918398.6397
L	13+95.00	22.00	610186.4352	918403.0615
L	13+45.66	25.00	610148.0460	918371.9233
L	12+15.00	25.00	610047.7861	918321.1604
L	11+80.00	25.00	610012.9633	918317.6421
L	11+80.00	16.00	610013.8681	918308.6877

-FINAL- DRAINAGE UTILITY EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
L	13+08.30	32.51	610117.3567	918356.3849
L	13+17.00	46.31	610115.1237	918371.8523
L	12+25.00	50.00	610053.0771	918346.9169
L	11+80.00	25.00	610012.9633	918317.6421

FINAL -L-

TYPE	STATION	NORTH	EAST
PC	10+00.00	609841.0999	918253.8765
PT	11+16.82	609952.6151	918286.4175
PC	12+18.46	610053.7454	918296.6352
PCC	12+78.58	610110.8378	918314.1707
PT	13+40.35	610161.0304	918349.9095
POT	16+12.30	610361.4487	918533.7248



-FINAL- PERMANENT UTILITY EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
L	13+56.00	-38.15	610198.3469	918332.3748
L	13+34.00	-78.00	610207.5419	918286.8732
L	13+43.00	-80.00	610217.0565	918292.7423
L	13+75.00	-40.00	610213.6028	918343.8507
L	14+35.00	16.00	610219.9697	918425.6765
L	14+15.00	42.00	610187.6562	918431.3194
L	13+53.41	42.00	610142.2664	918389.6898
L	13+17.00	46.31	610115.1237	918371.8523
L	13+08.30	32.51	610117.3567	918356.3849

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "440164 BL-2" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 610120.5290(ft) EASTING: 918303.9620(ft) ELEVATION: 2191.78(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99977461
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "440164 BL-2" TO -L- STATION IS S 6°9'18" W 85.65'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

BENCHMARK DATA

BM1 ELEVATION = 2193.97
N 610142 E 918357
L STATION 13+31.00 18 RIGHT
RR SPIKE IN 36" BEECH TREE

STRUCTURE: 440164
COUNTY: HENDERSON

NOTE: DRAWING NOT TO SCALE

NOTES:

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

   THE FILES TO BE FOUND ARE AS FOLLOWS: 44-0164_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.

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REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.28	2A-1
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026815 ENGINEER JAMES E. BECK

James E. Beck

HYDRAULICS ENGINEER

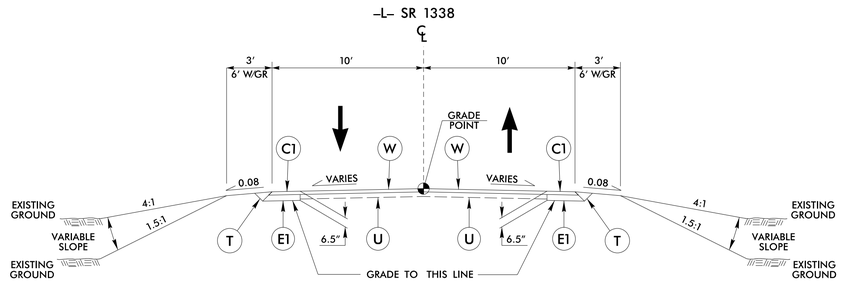
NORTH CAROLINA PROFESSIONAL SEAL 026971 ENGINEER JOSHUA G. DALTON

Joshua G Dalton

PAVEMENT SCHEDULE

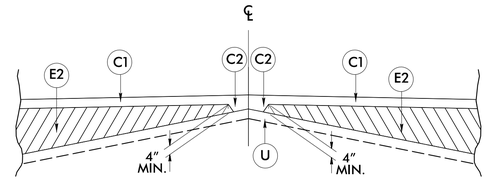
C1	PROP. APPROX. 2.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½″ IN 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 4″ IN DEPTH OR GREATER THAN 5½″ IN DEPTH.
J	PROP. 6″ AGGREGATE BASE COURSE.
R	SHOULDER BERM GUTTER.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET NO. 2).

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

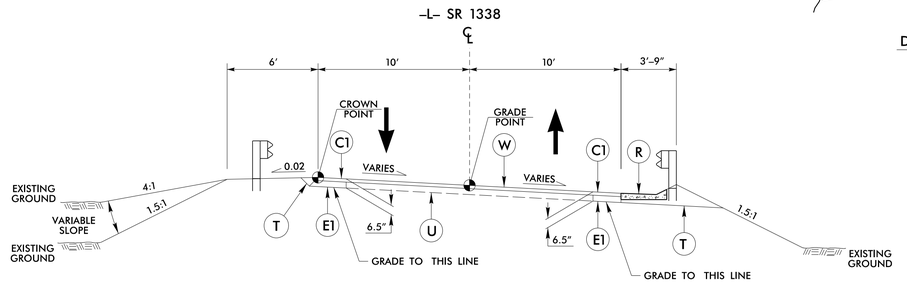


TYPICAL SECTION NO. 1

–L– STA 12+00.00 TO –L– STA 12+30.00
(END BRIDGE) –L– STA 13+37.21 TO –L– STA 14+30.00

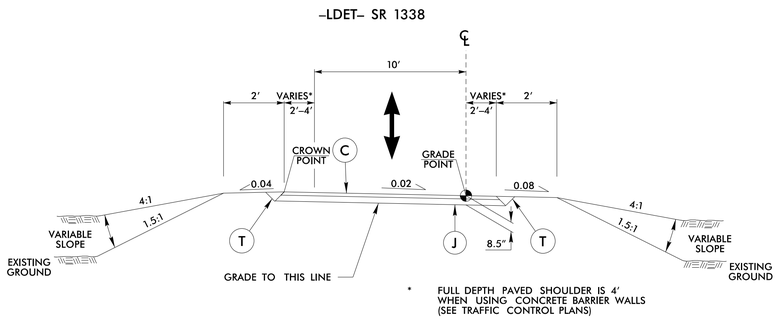


DETAIL SHOWING METHOD OF WEDGING (W)



TYPICAL SECTION NO. 2

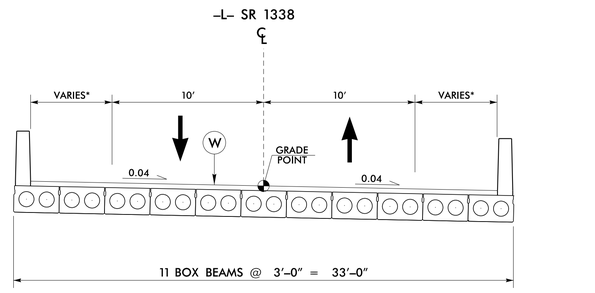
–L– STA 12+30.00 TO –L– STA 12+72.78 (BEGIN BRIDGE)



* FULL DEPTH PAVED SHOULDER IS 4′ WHEN USING CONCRETE BARRIER WALLS (SEE TRAFFIC CONTROL PLANS)

TYPICAL SECTION NO. 4

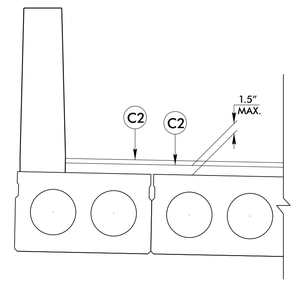
–LDET– STA 12+00.00 TO –LDET– STA 15+07.96



*SHOULDER VARIES FROM 4′–6″ TO 6′–4″ ON CURVE

TYPICAL SECTION NO. 3

–L– STA 12+72.78 TO –L– STA 13+37.21



DETAIL SHOWING METHOD OF WEDGING (ON BRIDGE)

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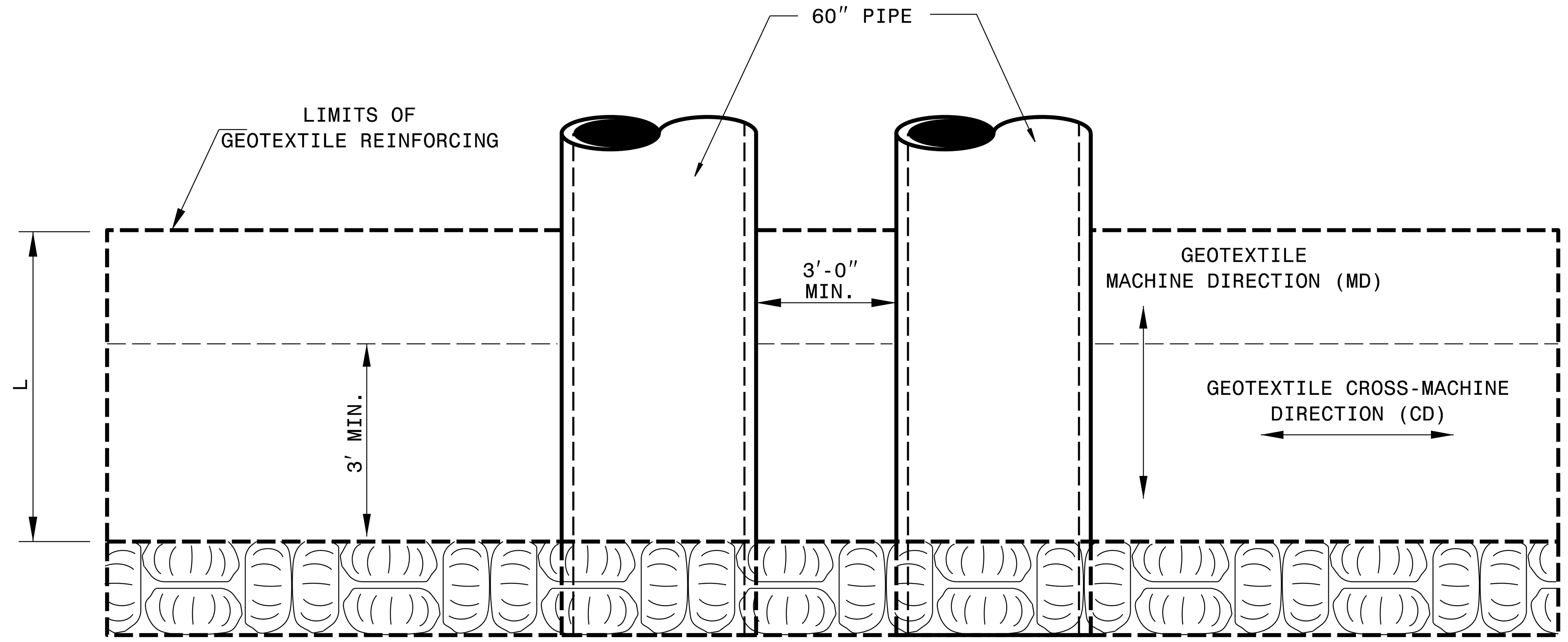
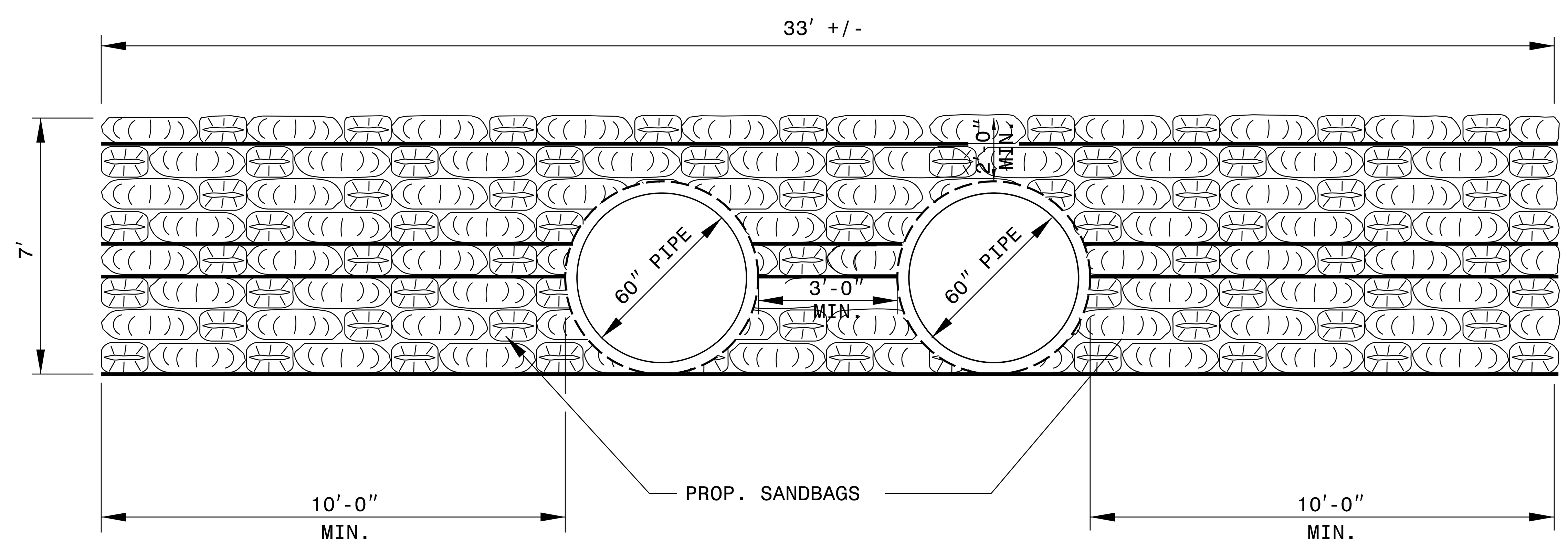
PROJECT REFERENCE NO.	SHEET NO.
17BPJ4.R.28	2B-1
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026815 JAMES E. BECK — James E. Beck

CONTRACT STANDARDS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 JOEL S. HOWERTON — Joel S. Howerton



PLAN



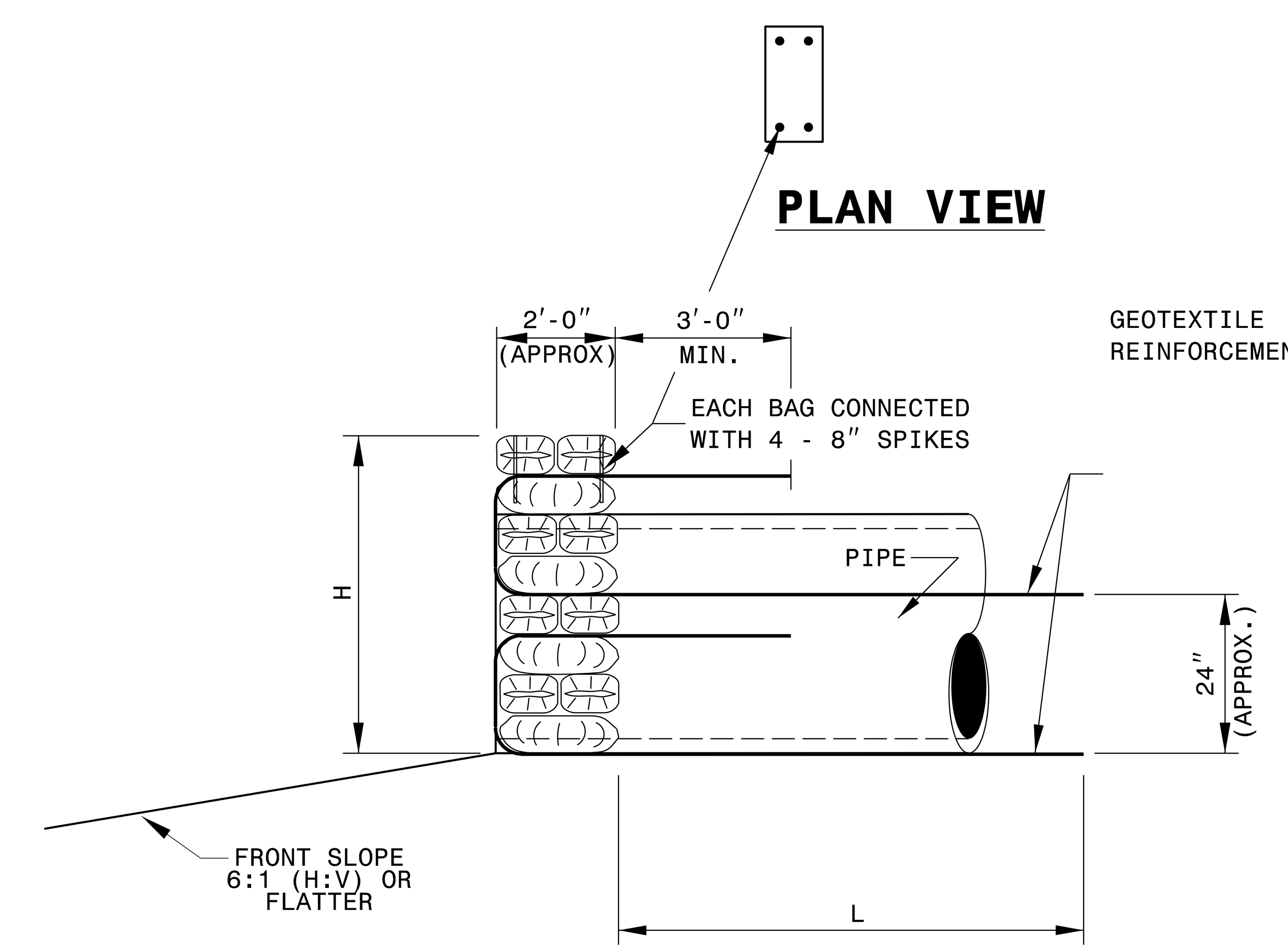
FRONT ELEVATION

GENERAL NOTES:

1. FOR REINFORCED SANDBAG HEADWALLS, SEE SANDBAG HEADWALLS PROVISION.
2. REINFORCED SANDBAG HEADWALLS ARE BASED ON A TRAFFIC SURCHARGE OF 250 LB/SF OR LESS AND A BACK SLOPE OF 2:1(H:V) OR FLATTER.
3. REINFORCED SANDBAG HEADWALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:

   UNIT WEIGHT, = 120 LB/CF
   FRICTION ANGLE, = 30 DEGREES
   COHESION, c = 0 LB/SF

4. DO NOT USE REINFORCED SANDBAG HEADWALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE REINFORCED SANDBAG HEADWALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW SANDBAGS OR PIPES.
6. DO NOT PLACE GEOTEXTILE REINFORCEMENT OR SANDBAGS UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
7. 24" LONG #4 REINFORCING STEEL BARS MAY BE SUBSTITUTED FOR 8" LONG STEEL SPIKES. DRIVE #4 BAR THROUGH NO MORE THAN 5 SANDBAGS.
8. DO NOT SPLICE OR OVERLAP GEOTEXTILE REINFORCEMENT SO SEAMS ARE PARALLEL TO THE HEADWALL FACE.
9. HEADWALL DIMENSIONS MAY BE ADJUSTED FOR ONE OR MORE PIPES AS SHOWN IN THE PLANS.



SIDE ELEVATION

GEOTEXTILE REINFORCEMENT (TYPE 5 GEOTEXTILE)

WALL HEIGHT H (ft)	REINF. LENGTH L (ft)	WIDE WIDTH TENSILE STRENGTH @ ULTIMATE (MD) (lb/ft)
< 4	6	2400
4 TO 6	6	3400
6 TO 8	= H	4300
8 TO 10	= H	5200
10 TO 12	= H	6200

TOTAL AREA SANDBAG HEADWALLS = 192 S.F.

CONTRACT STANDARDS & DEVELOPMENT UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-707-6950 FAX 919-250-4119

DETAIL OF REINFORCED SANDBAG HEADWALL

ORIGINAL BY: ______ DATE: ______
MODIFIED BY: mhage DATE: 10-29-15
CHECKED BY: ______ DATE: ______
FILE SPEC.: s:details/howerton/sandbagheadwall.dgn

12/06/07

COMPUTED BY: MDH DATE: 10/27/14
CHECKED BY: JEB DATE: 10/28/14

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.28	3B-1

"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 BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

GUARDRAIL SUMMARY

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 GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	III	GRAU 350	M-350	XIII	CAT-1	VI MOD	BIC	AT-1	EA	G	NG				
-L-	12+31.67	13+47.00	LT	68.75	12.50		BRIDGE	BRIDGE	VARIES	VARIES	25	6.25	1	1		2	1						1							
-L-	11+93.15	13+86.88	RT	100.00	37.50		BRIDGE	BRIDGE	VARIES	VARIES	25	25	1	1		2	2						0							
			SUBTOTAL	168.75	50	0.00																								

ANCHOR UNIT DEDUCTIONS

GRAU 350	3 X 25	=	-75		
TYPE III	4 X 18.75	=	-75		
AT-1		=	-6.25		
		TOTAL	12.5	50.00	0.00
(5 ADDITIONAL GUARDRAIL POSTS)		SAY	12.5	50	0.00

PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD^2
DETOUR	DETOUR	DETOUR	CL	431.10
			TOTAL:	431.10
			SAY:	440

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH
-L-(RT)	12+30	12+70.51	40.5
		TOTAL:	40.5
		SAY:	41

RIGHT OF WAY AREA DATA

PARCEL NO.	PROPERTY OWNERS NAMES	TOTAL ACREAGE	AREA TAKEN	AREA REMAINING RT.	AREA REMAINING LT.	CONST. EASE.	DRAIN./ UTIL. EASE.	PERM. UTIL. EASE.
1	WILLIAM FRANKLIN GILLESPIE, MARIA GILLESPIE	0.189	0.057	0.040	0.091	0.091	0.040	0.000
2	WILLIAM GILLESPIE, MARIA GILLESPIE	0.059	0.026	0.013	0.020	0.020	0.000	0.013
3	DENNIS MCCRAW, DEANNA MCCCRAW	0.084	0.029	0.015	0.040	0.032	0.000	0.023
4	MOUNTAIN BEAN GROWERS, INC.	0.099	0.005	0.022	0.071	0.064	0.000	0.029

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mpage

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.28	3B-2

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

IN CUBIC YARDS

STATION	STATION	UNCL. EXCAV.	EMBANK. +15%	BORROW	WASTE
PHASE I (DETOUR CONSTRUCTION)					
–DETOUR– 12+50	–DETOUR– 14+25	22	315	293	
SUBTOTALS:		22	315	293	
PHASE II					
–L– 12+00	–L– 12+75	30	8	8	30
–L– 13+25	–L– 14+25	84	47	47	84
SUBTOTALS:		114	55	55	114
PHASE III (DETOUR REMOVAL)					
–DETOUR– 12+50	–DETOUR– 14+25	315			315
SUBTOTAL:		315			315
SUMMARIES SUBTOTAL:		451	370	348	429
WASTE IN LIEU OF BORROW					
PROJECT TOTALS:		451	370	348	429
EST. 5% TO REPLACE TOPSOIL				17	
ON BORROW PIT					
GRAND TOTALS:		451	370	365	429
SAY:		460	380	370	430

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.

Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing & Grubbing, and Removal & Breakup of existing pavement will be paid at the lump sum price for "Grading".

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COMPUTED BY: MDH	DATE: 10/27/14
CHECKED BY: JEB	DATE: 10/28/14

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.28	3D-1

12/06/07

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

NOTE: INVERT ELEVATIONS INDICATED ARE FOR BID PURPOSES ONLY AND SHALL NOT BE USED FOR PROJECT CONSTRUCTION STAKEOUT. SEE "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES, SECTION 300–5".

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE
12+45 –L–	RT	401		2191.6															
		401	402		2188.6	2187			20										
12+31.67	LT	403							36										
12+31.67	LT	404						52											
PROJECT TOTAL								52	56										

STATION	C.S. PIPE 12" .064	15" .064	18" .064	24" .064	36" .079	42" .109	48" .109	R.C. PIPE (CLASS III) 15"	18"	24"	30"	36"	42"	48"	R.C. PIPE (CLASS IV) 12"	15"	18"	24"	30"	36"	42"	48"
12+45 –L–																						
12+31.67																						
12+31.67																						
PROJECT TOTAL																						

STATION	**" R. C. PIPE (CLASS V)	**" R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	**" R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	LIN. *FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G		CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET	G.D.I. TYPE "B" STD. 840.18 OR 840.27 OR 840.45	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	T.B.D.I. STD. 840.35 OR 840.46	T.B.I. FRAME WITH TWO GRATES STD. 840.29	M.H. FRAME & COVER STD. 840.54	T.B.J.B. STD. 840.34	DRAINAGE PIPE ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN.FT.	REMARKS
12+45 –L–								1												1	1							
12+31.67																											26	REMOVE 26 LF EXISTING 12" PIPE
12+31.67																											52	REMOVE 52 LF TEMPORARY 12" PIPE
PROJECT TOTAL								1												1	1						78	

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

ABBREVIATIONS

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

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

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 54"	60"	66"	72"	78"	84"		
13+14 –LDET–	CL	501			2186.6	2185.8									
13+20 –LDET–	CL	502			2186.6	2185.8									

STATION	C.S. PIPE 54" .109	54" .138	54" .168	54" SHOP ELON–GATED .138	54" SHOP ELON–GATED .168	60" .138	60" .168	66" .138	66" .168	72" .138	72" .168	
13+14 –LDET–						28						
13+20 –LDET–						28						

STATION	STRUCTURAL PLATE PIPE 60" 12	60" 10		66" 12	66" 10		72" 12	72" 10				
13+14 –LDET–												
13+20 –LDET–												

STATION	REINFORCED ENDWALLS WITH R.C. – C.Y.	WITH C.S. – C.Y.	MASONARY DRAINAGE STRUCTURES CUBIC YARDS	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G		CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET							REINF. CONC. FLARED END SECTIONS NO. & SIZE	CORR. STEEL FLARED END SECTIONS NO. & SIZE	REINF. CONC. ELBOWS NO. & SIZE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD 840.72	PIPE REMOVAL LIN.FT.	REMARKS
13+14 –LDET–																						28	REMOVE TEMP. 60" CSP
13+20 –LDET–																						28	REMOVE TEMP. 60" CSP

ABBREVIATIONS

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

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PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.28	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER: SEAL 026815, JAMES E. BECK — James E. Beck	HYDRAULICS ENGINEER: SEAL 026971, JOSHUA G. DALTON — Joshua G Dalton

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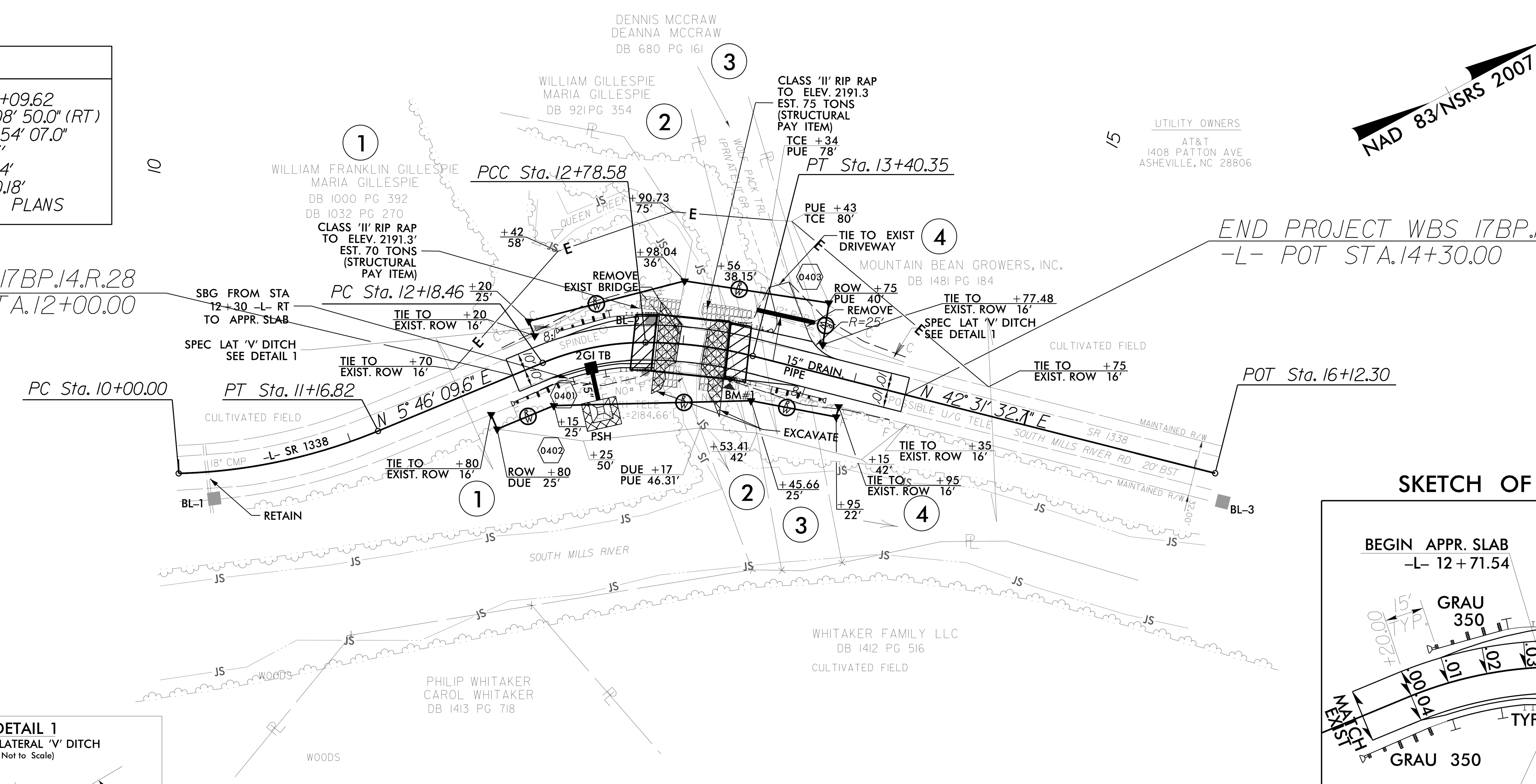
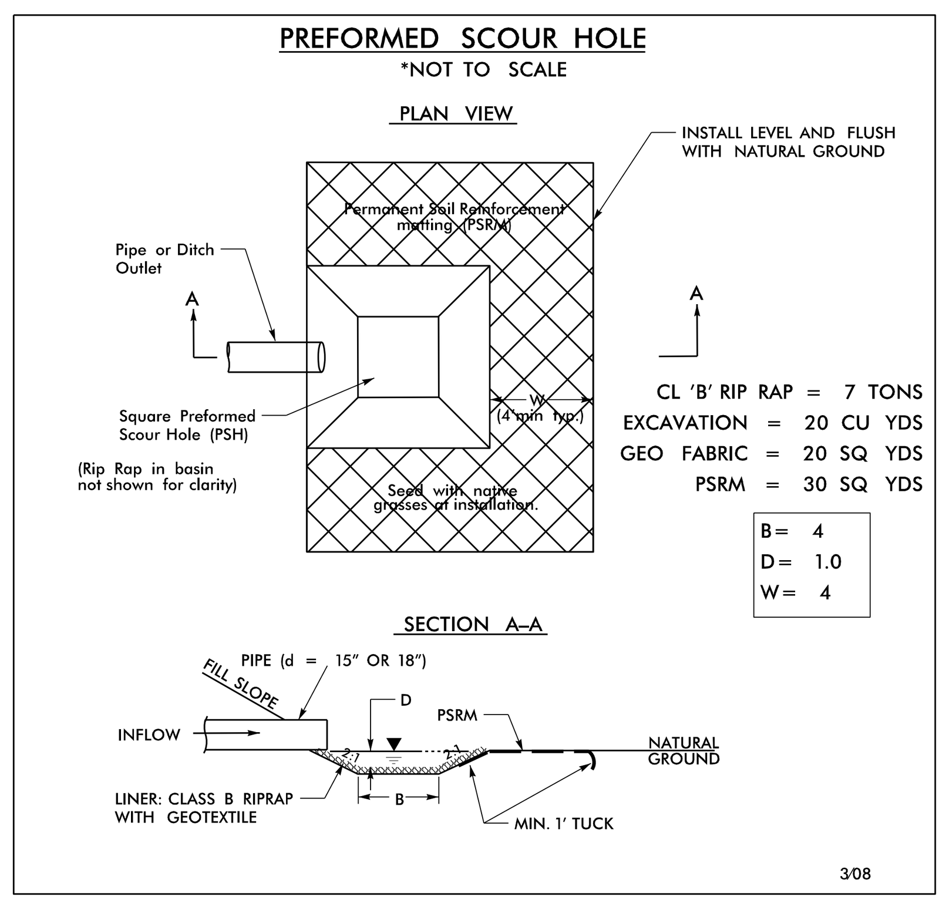
SUNGATE DESIGN GROUP, P.A.

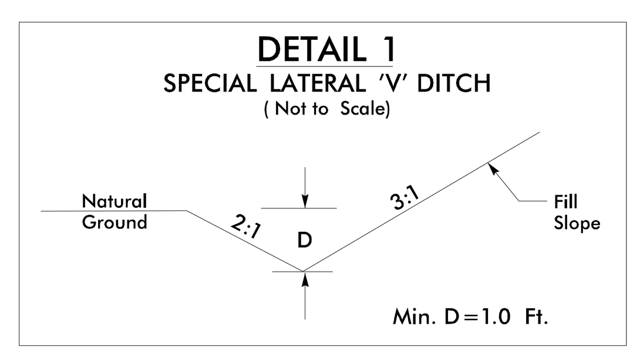
-L- CURVE DATA

PI Sta 10+59.07	PI Sta 12+48.92	PI Sta 13+09.62
Δ = 20° 59' 47.9" (LT)	Δ = 22° 36' 33.1" (RT)	Δ = 14° 08' 50.0" (RT)
D = 17° 58' 25.4"	D = 37° 36' 37.9"	D = 22° 54' 07.0"
L = 116.82'	L = 60.11'	L = 61.77'
T = 59.07'	T = 30.45'	T = 31.04'
R = 318.78'	R = 152.34'	R = 250.18'
e = N/A	e = SEE PLANS	e = SEE PLANS





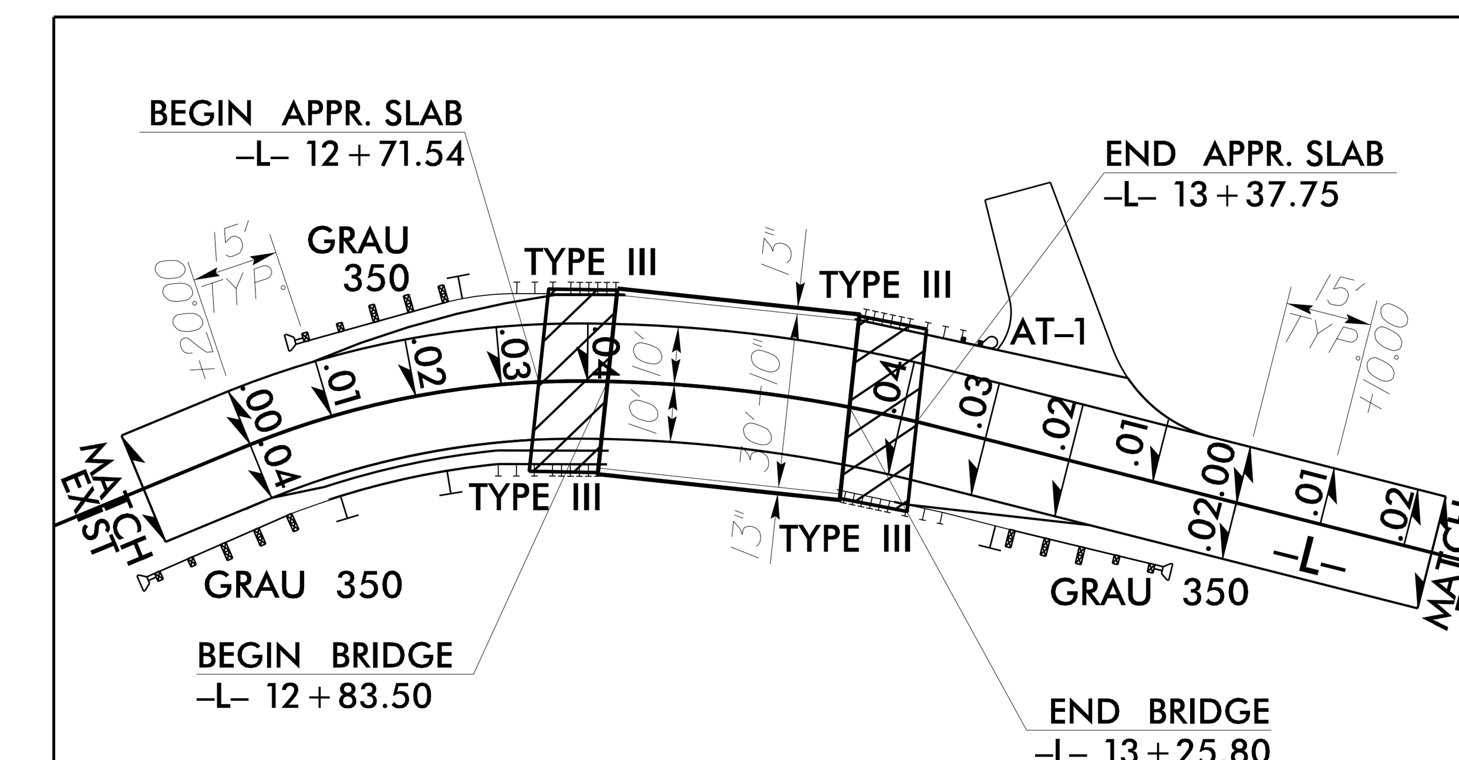
FROM STA. 12+45 -L- RT



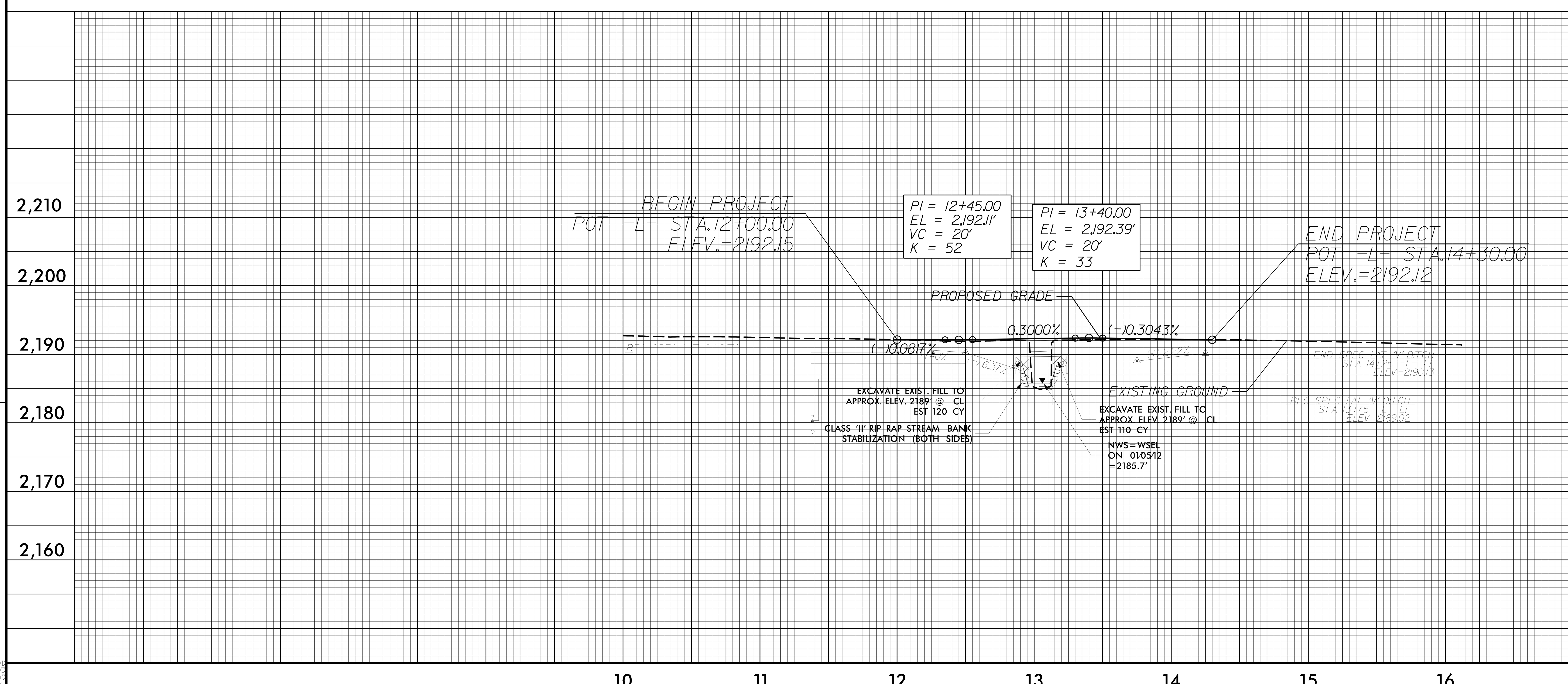
FROM STA. 12+00 TO STA. 12+85 -L- LT
FROM STA. 13+75 TO STA. 14+25 -L- LT

FOR STRUCTURE PLANS, SEE SHEET S-1 THRU S-14

SKETCH OF PAVEMENT/BRIDGE RELATIONSHIP



NOT TO SCALE



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 650 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 2191.2 FT
BASE DISCHARGE	= 950 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 2192.2 FT
OVERTOPPING DISCHARGE	= 950 CFS
OVERTOPPING FREQUENCY	= 100 YRS
OVERTOPPING ELEVATION	= 2192.1 FT
DATE OF SURVEY	= 01/05/12
W.S.ELEVATION AT DATE OF SURVEY	= 2185.7 FT

REVISIONS

8/17/99

11/13/2015
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PROJECT REFERENCE NO.	SHEET NO.
17BPJ4.R.28	5

RW SHEET NO.

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026815 JAMES E. BECK — James E. Beck

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026971 JOSHUA G. DALTON — Joshua G Dalton

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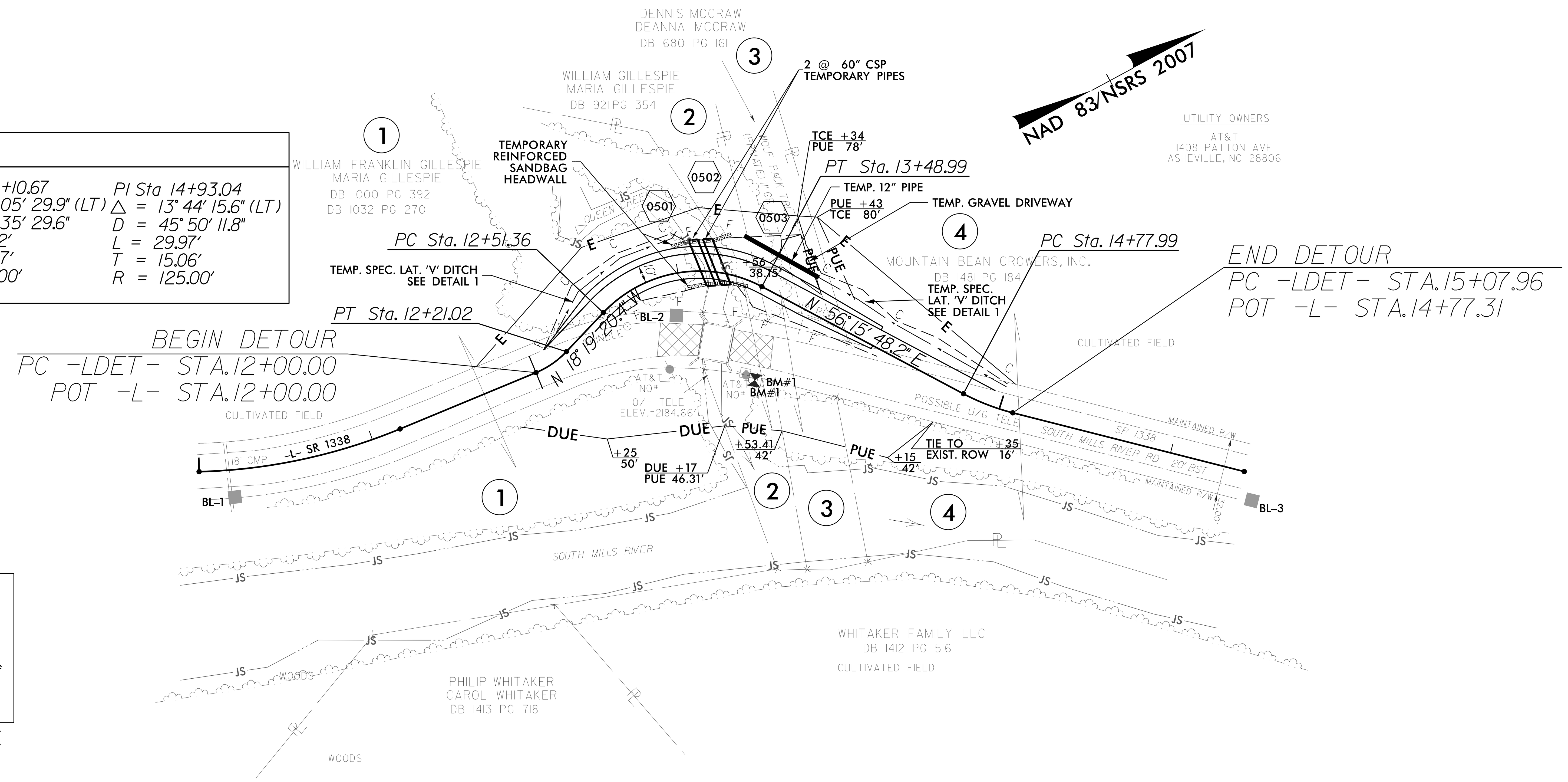
SUNGATE DESIGN GROUP, P.A.

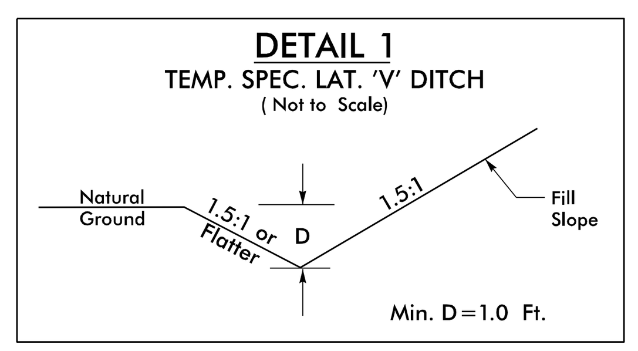
8/17/99

REVISIONS

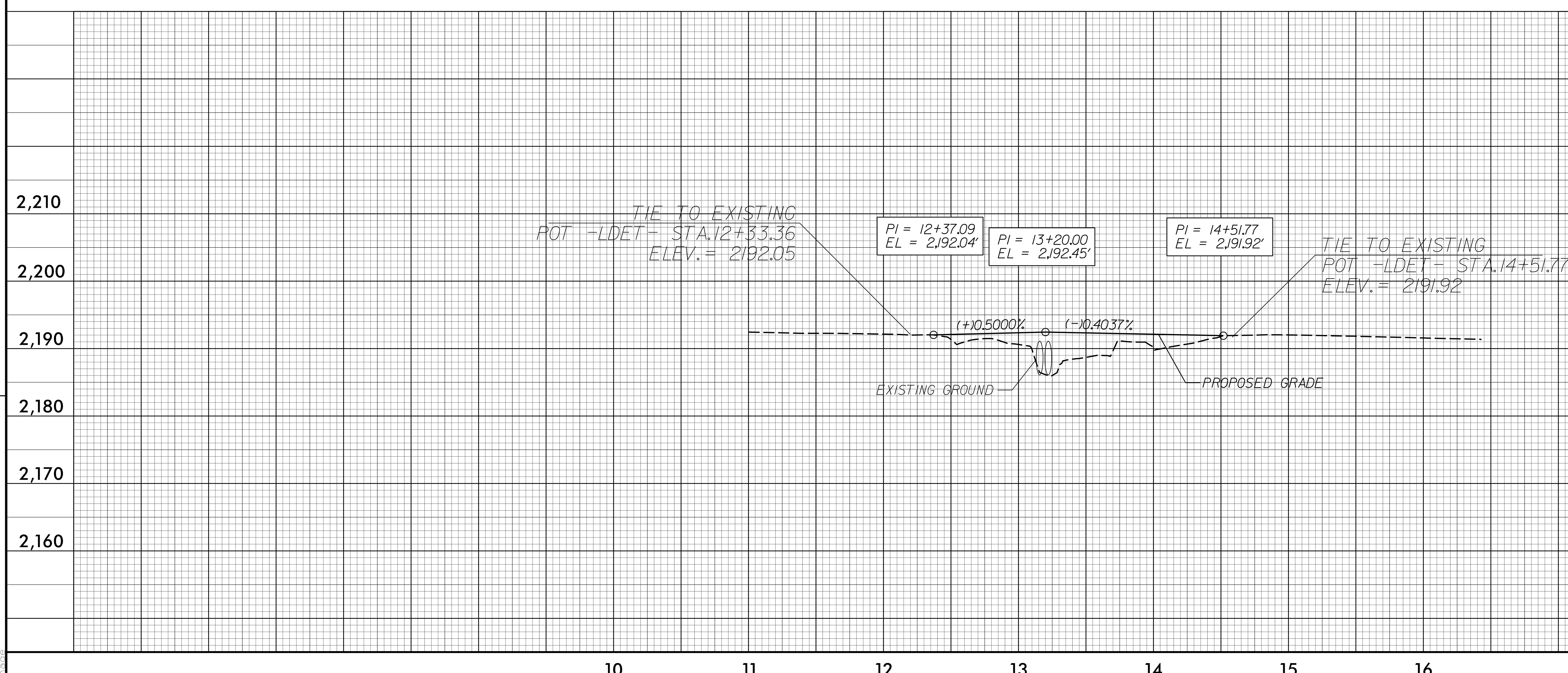
-LDET- CURVE DATA

PI Sta 10+59.07	PI Sta 13+08.48	PI Sta 12+10.67	PI Sta 14+93.04
Δ = 20° 59′ 47.9″ (LT)	Δ = 74° 35′ 08.6″ (RT)	Δ = 24° 05′ 29.9″ (LT)	Δ = 13° 44′ 15.6″ (LT)
D = 17° 58′ 25.4″	D = 76° 23′ 39.7″	D = 114° 35′ 29.6″	D = 45° 50′ 11.8″
L = 116.82′	L = 97.63′	L = 21.02′	L = 29.97′
T = 59.07′	T = 57.12′	T = 10.67′	T = 15.06′
R = 318.78′	R = 75.00′	R = 50.00′	R = 125.00′





FROM STA. 12+25 TO STA. 13+00 -LDET- LT
FROM STA. 13+75 TO STA. 15+00 -LDET- LT



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	350	CFS
DESIGN FREQUENCY	=	5	YRS
DESIGN HW ELEVATION	=	2192.0	FT
BASE DISCHARGE	=	950	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	2192.16	FT
OVERTOPPING DISCHARGE			CFS
OVERTOPPING FREQUENCY			YRS
OVERTOPPING ELEVATION			FT
DATE OF SURVEY	=	01/05/12	
W.S.ELEVATION AT DATE OF SURVEY	=	2187.0	FT

11/13/2015
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PROJECT: WBS 17BP.14.R.28

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STATE PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.28	TMP-01

PLAN FOR PROPOSED TRAFFIC CONTROL

HENDERSON COUNTY

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ENGLISH ROADWAY STANDARD DRAWINGS"-ROADWAY DESIGN UNIT-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:

STD. NO.	TITLE
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1165.01	TRUCK MOUNTED IMPACT ATTENUATOR
1180.01	SKINNY DRUM

INDEX OF SHEETS

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- NORTH ARROW
- PROPOSED PVMT. -------- EXIST. PVMT.
- WORK AREA
- ONGOING CONSTRUCTION
- REMOVAL OF EXISTING PAVEMENT
- GRADING ONLY

TRAFFIC CONTROL DEVICES

- TYPE I BARRICADE
- TYPE II BARRICADE
- TYPE III BARRICADE
- CONE
- DRUM
- FLASHING ARROW PANEL (TYPE C)
- TYPE 'B' WARNING LIGHT
- STATIONARY SIGN
- PORTABLE SIGN
- STATIONARY OR PORTABLE SIGN
- WARNING FLAGS
- CRASH CUSHION
- CHANGEABLE MESSAGE SIGN
- TRUCK MOUNTED IMPACT ATTENUATOR (TMIA)
- POLICE
- FLAGGER

PAVEMENT MARKINGS

- CRYSTAL/CRYSTAL PAVEMENT MARKER
- YELLOW/YELLOW PAVEMENT MARKER
- CRYSTAL/RED PAVEMENT MARKER
- PAVEMENT MARKING SYMBOLS

PLAN PREPARED IN THE OFFICE OF
PROGRESSIVE DESIGN GROUP, INC.
ENGINEERS • CONSULTANTS
CHARLOTTE, NC 704.573.3003

APPROVED: _____
DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 025465 ENGINEER TIM AREY

PLAN PREPARED BY: PROGRESSIVE DESIGN GROUP, INC.

TIM AREY, P.E.	TRAFFIC CONTROL ENGINEER
DONALD SPENCE, P.E.	TRAFFIC CONTROL PROJECT ENGINEER
_____	TRAFFIC CONTROL PROJECT DESIGN ENGINEER
L.D. ASHLEY	TRAFFIC CONTROL DESIGN ENGINEER / TECHNICIAN

GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

LANE AND SHOULDER CLOSURE REQUIREMENTS

A) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.

B) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.

C) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

D) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.

E) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.

PAVEMENT EDGE DROP OFF REQUIREMENTS

F) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED TRAVEL LANE THAT HAS AN EDGE OF PAVEMENT DROP-OFF AS FOLLOWS:

BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.

BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.

G) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) 100 ft IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

H) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

PROJECT NOTES & PHASING

PROJ. REFERENCE NO.	SHEET NO.
17BP.14.R.28	TMP-02

SIGNING

I) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

J) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

K) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 100 ft IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC CONTROL DEVICES

L) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH) EXCEPT, 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.

M) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

PHASING

STEP 1: INSTALL WORK ZONE ADVANCE WARNING SIGNS AS SHOWN ON ROADWAY STANDARD DRAWING NO. 1101.01

STEP 2: INSTALL 2 TEMPORARY 60" DRAINAGE PIPES IN BRANCH OF MILLS CREEK AND CONSTRUCT THE TEMPORARY RUN AROUND DETOUR AS SHOWN ON SHEET TMP-03, DETAIL-1.

STEP 3: INSTALL A PORTABLE TRAFFIC SIGNAL SYSTEM FOR THE TEMPORARY SINGLE LANE RUN AROUND SHOWN ON SHEET TMP-03, DETAIL-2. INSTALL ADVANCE WARNING SIGNS AND SHIFT SOUTH MILLS RIVER ROAD TRAFFIC ONTO THE TEMPORARY ONE LANE RUN AROUND DETOUR AS SHOWN ON SHEET TMP-03, DETAIL-2.

STEP 4: CONSTRUCT THE PROPOSED CULVERT AND ROADWAY APPROACHES FOR SOUTH MILLS RIVER ROAD AS SHOWN ON SHEET TMP-03, DETAIL-2. PLACE TRAFFIC IN THE FINAL PATTERN, REMOVE TEMPORARY ALIGNMENT, AND ALL TRAFFIC CONTROL DEVICES.

PLAN PREPARED IN THE OFFICE OF:
PROGRESSIVE DESIGN GROUP, INC.
ENGINEERS • CONSULTANTS

APPROVED:_____ DATE:_____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 025465 ENGINEER TIM AREY

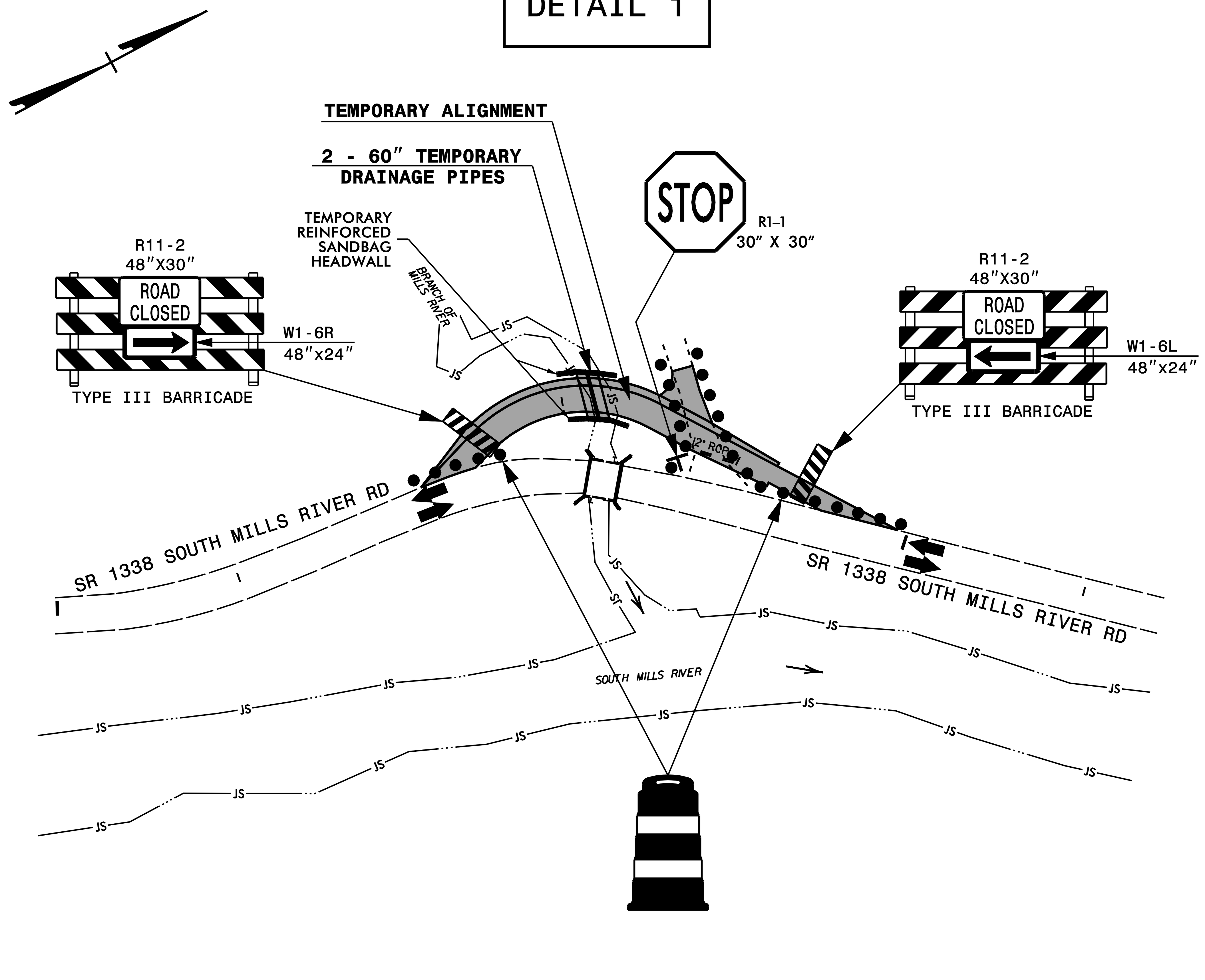
DIVISION OF HIGHWAYS • STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION • WORK ZONE TRAFFIC CONTROL

TRANSPORTATION MANAGEMENT PLAN

PROJECT NOTES & PHASING

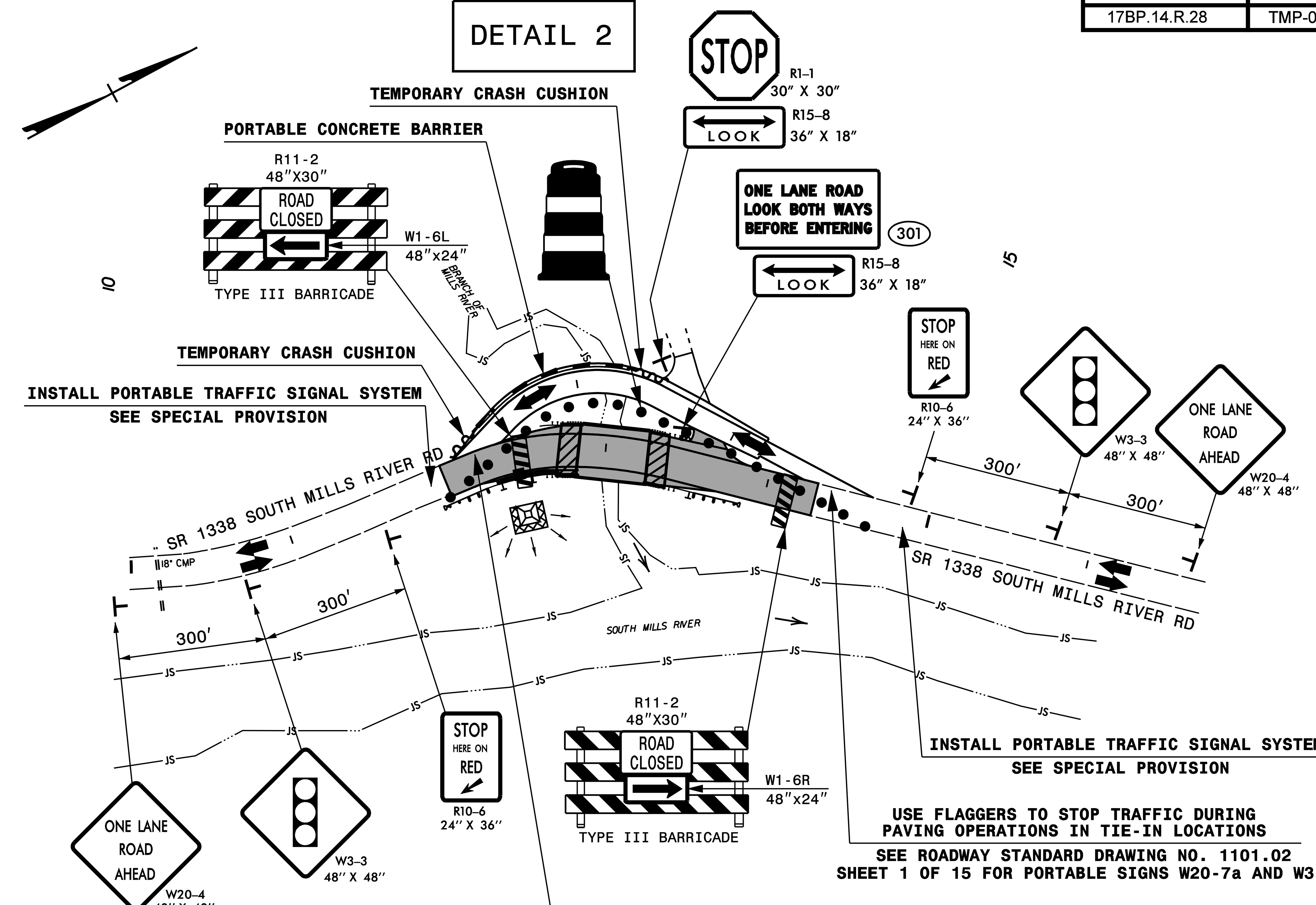
PROJ. REFERENCE NO.	SHEET NO.
17BP.14.R.28	TMP-03

DETAIL 1



INSTALL WORK ZONE ADVANCE WARNING SIGNS AS SHOWN ON ROADWAY STANDARD DRAWING NO. 1101.01, SHEET 3 OF 3 AND GENERAL NOTE I.

DETAIL 2



USE FLAGGERS TO STOP TRAFFIC DURING PAVING OPERATIONS IN TIE-IN LOCATIONS

SEE ROADWAY STANDARD DRAWING NO. 1101.02 SHEET 1 OF 15 FOR PORTABLE SIGNS W20-7a AND W3-4

INSTALL WORK ZONE ADVANCE WARNING SIGNS AS SHOWN ON ROADWAY STANDARD DRAWING NO. 1101.01, SHEET 3 OF 3 AND GENERAL NOTE I.

SIGN NUMBER: 301
TYPE: D BACKG COLOR: White
QUANTITY: 1 COPY COLOR: Black

SIGN WIDTH: 3′-6″ MAJ. COPY SERIES: Ground
HEIGHT: 2′-0″
TOTAL AREA: 7.0 Sq.Ft.

BORDER TYPE: RECESSED
RECESS: 0.38″
WIDTH: 0.63″
RADII: 1.13″

NO. Z BARS: NONE
LENGTH: NA MAT'L: 1.6 mm ALUMINUM

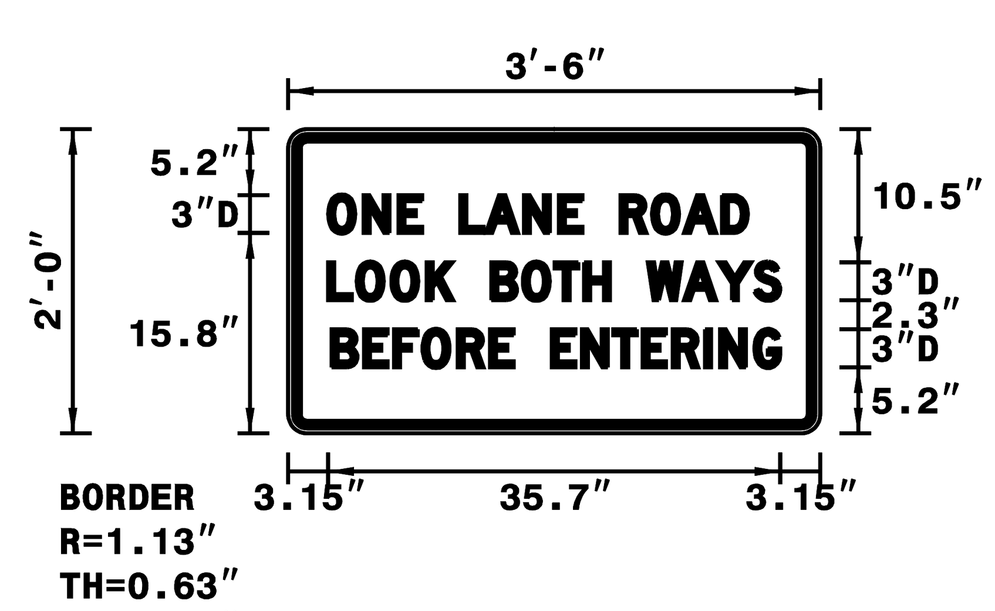
LETTER POSITIONS

```
O    N    E       L    A    N    E       R    O    A    D
2.12 1.9          1.9  2.5  2    1.9     2    2.1  2.5  2       33.1
L    O    O    K       B    O    T    H       W    A    Y    S
1.9  2.1  2.1  2.1     2    2.1  1.9  2       2.7  2.5  2.6  2  35.7
B  E    F    O    R    E       E    N    T    E    R    I    N    G
2  1.9  1.9  2.1  2    1.9     1.9  2    1.9  1.9  2    0.5  2    2  35.4
```

Letter positions are to the lower left corners

USE NOTES:
1. Legend and border shall be direct applied black non reflective sheeting.
2. Background shall be Type III reflective sheeting.

DESIGN BY: PDG CHECKED BY: TMA STD #:
PROJECT ID: 440163 DIV: 12 DATE: Feb 02, 2013



NORTH CAROLINA D.O.T. SIGN DETAIL

PLAN PREPARED IN THE OFFICE OF:
PROGRESSIVE DESIGN GROUP, INC.
ENGINEERS • CONSULTANTS

APPROVED: ______ DATE: ______

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025465 ENGINEER TIM AREY

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

TRANSPORTATION MANAGEMENT PLAN DETAIL SHEET

5/14/99

PROJECT: WBS 17BP.14.R.28

CONTRACT: DN00161

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HENDERSON COUNTY

LOCATION: BRIDGE NO. 164 ON SR 1338 (SOUTH MILLS RIVER ROAD) OVER QUEEN CREEK 0.9 MILES WEST OF JUNCTION OF SR 1640

TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND STRUCTURE

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.28	PMP-1

APPROVED: _____ DATE: _____

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026815 ENGINEER JAMES E. BECK

James E. Beck

DRMP
ENGINEERS • PLANNERS • SCIENTISTS
DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NORTH CAROLINA 28210
(704) 332-2289
NC LICENSE NO. C-223

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - 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:

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO LANE AND MULTILANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

PAVEMENT MARKINGS AND MARKERS

A) STATE FORCES WILL INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE.

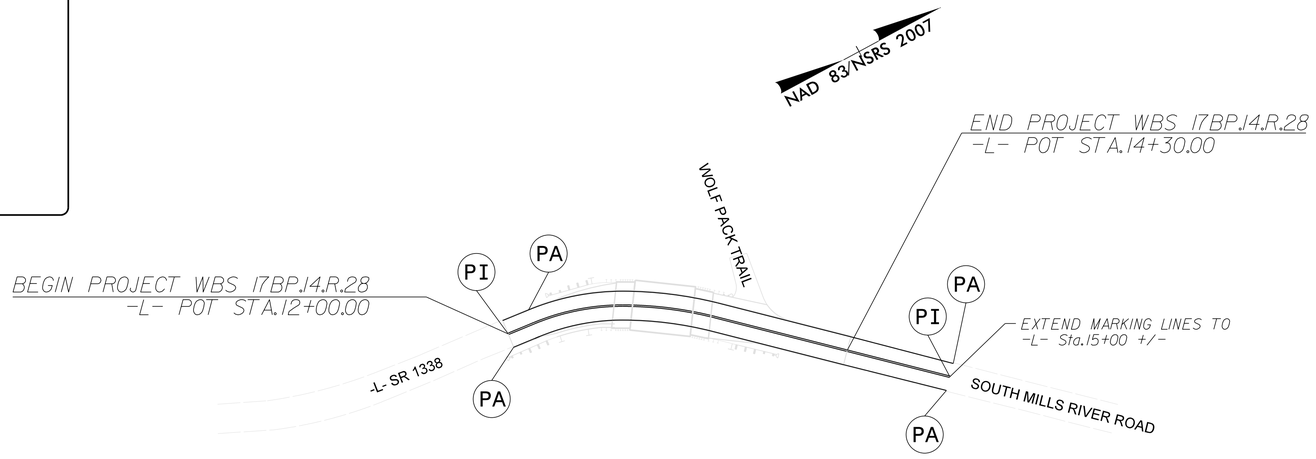
B) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

PAVEMENT MARKING SCHEDULE

FINAL PAVEMENT MARKINGS

PAVEMENT MARKING LINES

PA	WHITE EDGELINE (4")	PAINT
PI	YELLOW DOUBLE CENTER LINE (4")	PAINT



SYMBOL & MARKING LEGEND

(PA)	PAINT	-	WHITE EDGELINE (4")
(PI)	PAINT	-	YELLOW DOUBLE CENTER LINE (4")

11/13/2015
F:\Roadway\Proj\44-0164_Rdy_pln_pmp.dgn
mmoss

CONTRACT: DN00161

PROJECT: 17BP.14.R.28

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.14.R.28	EC-1	

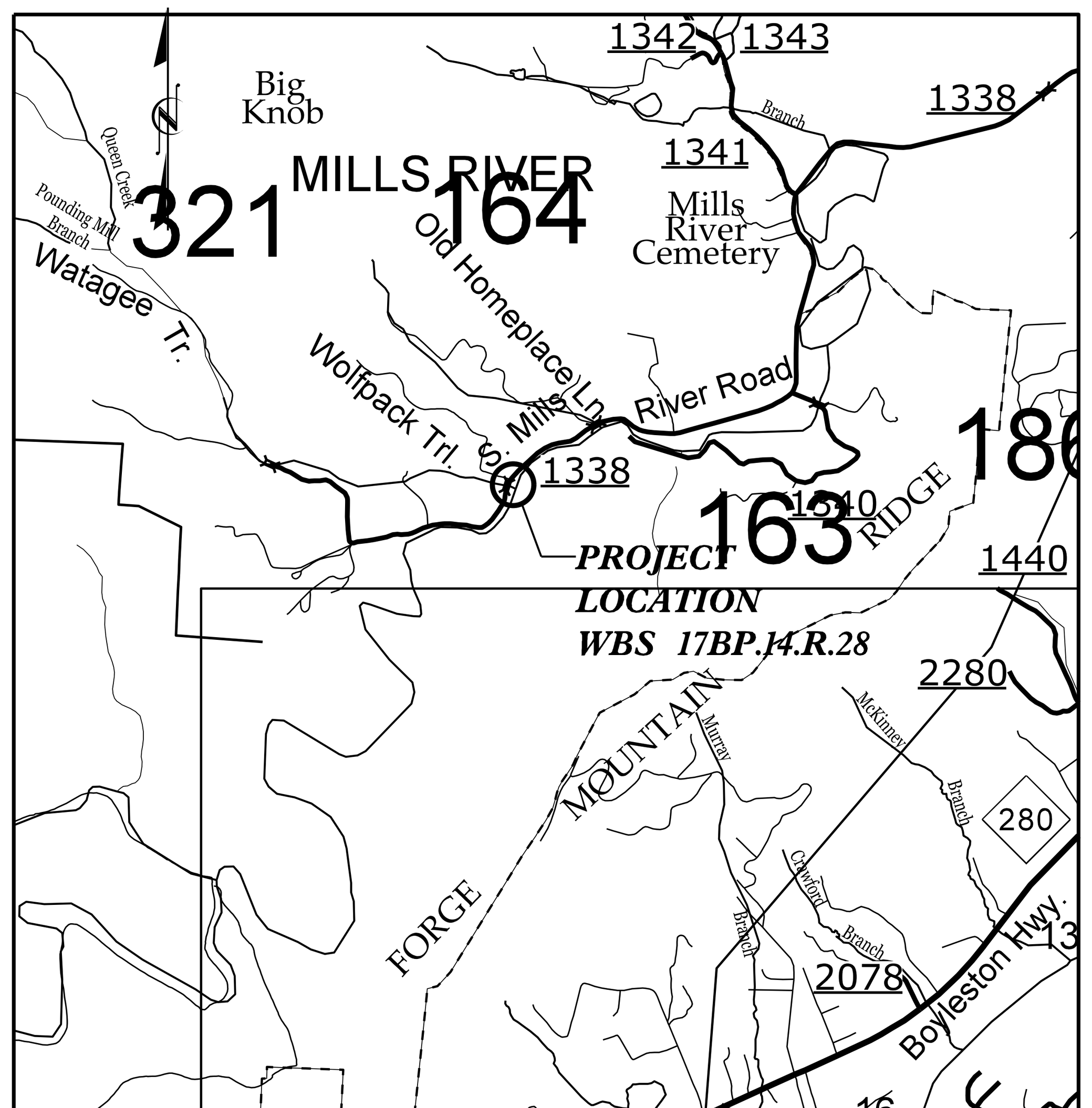
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
17BP.14.R.28		P.E., ROW, UTIL

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

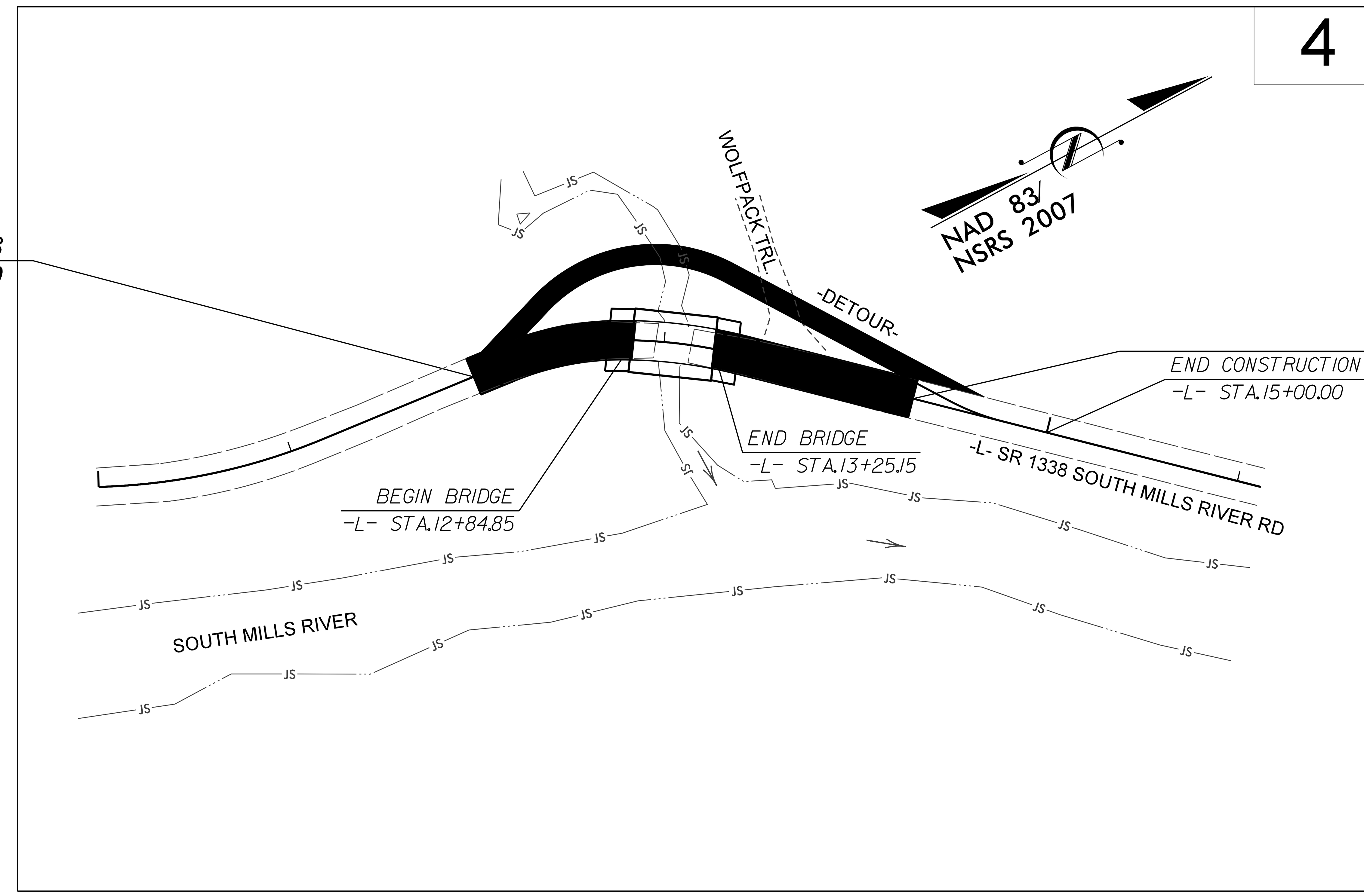
PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

LOCATION: BRIDGE NO. 164 ON SR 1338 (SOUTH MILLS RIVER ROAD) OVER QUEEN CREEK 0.9 MILES WEST OF JUNCTION OF SR 1340

TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND STRUCTURE



VICINITY MAP



THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES

THERE IS NO CONTROL OF ACCESS ON THIS PROJECT

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

EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TSD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	
1633.02	Temporary Rock Silt Check Type-B	
	Wattle/Coir Fiber Wattle	EW / CFW
	Wattle/Coir Fiber Wattle with Polyacrylamide (PAM)	
1634.01	Temporary Rock Sediment Dam Type-A	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	
1635.02	Rock Pipe Inlet Sediment Trap Type-B	
1630.04	Stilling Basin	
1630.06	Special Stilling Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	
	Tiered Skimmer Basin	
	Infiltration Basin	

THIS PROJECT CONTAINS EROSION CONTROL PLANS FOR CLEARING AND GRUBBING PHASE OF CONSTRUCTION.

Joshua G. Dalton, PE, CPESC
LEVEL III NAME

3552
LEVEL III CERTIFICATION NO.

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

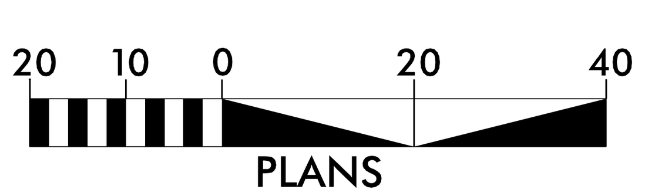
ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

Refer To E. C. Special Provisions for Special Considerations.

HIGH QUALITY WATER(S) EXIST ON THIS PROJECT

High Quality Water Zone(s) Exist
From Sta. 12+00 -L-
to Sta. 14+30 -L-
Refer To E. C. Special Provisions for Special Considerations.

GRAPHIC SCALE



THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 3, 2011 ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER QUALITY.

Prepared in the Office of:

SUNGATE DESIGN GROUP, P.A.
915 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
NC COA No. C-0890

2012 STANDARD SPECIFICATIONS

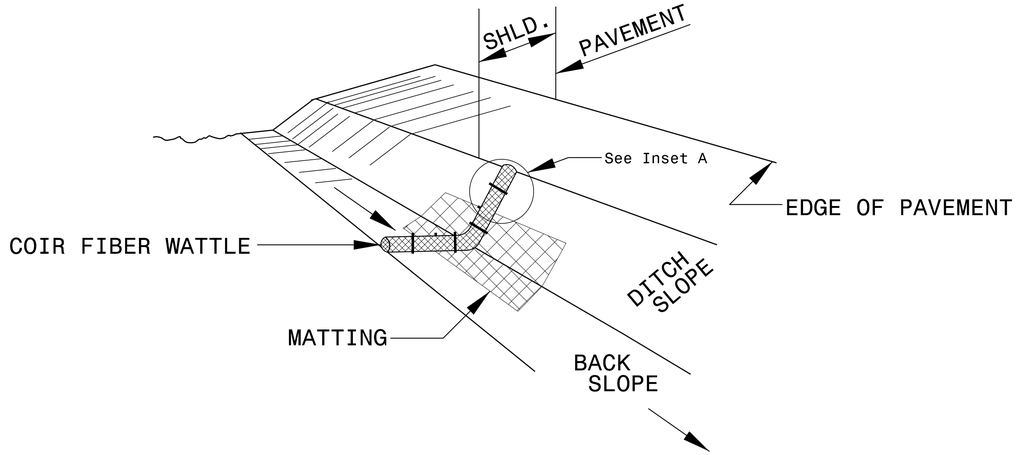
Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2012 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

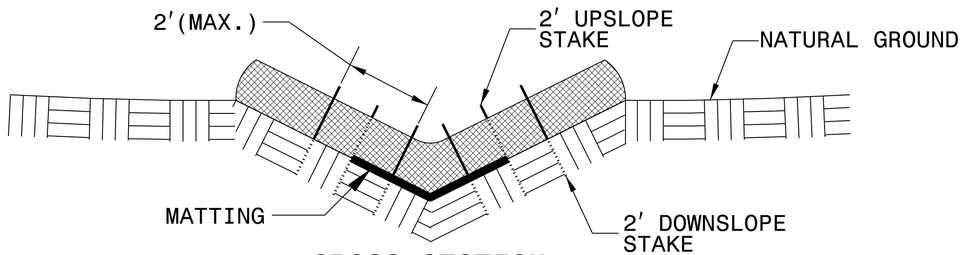
1604.01	Railroad Erosion Control Detail
1605.01	Temporary Silt Fence
1606.01	Special Sediment Control Fence
1607.01	Gravel Construction Entrance
1622.01	Temporary Berms and Slope Drains
1630.01	Riser Basin
1630.02	Silt Basin Type B
1630.03	Temporary Silt Ditch
1630.04	Stilling Basin
1630.05	Temporary Diversion
1630.06	Special Stilling Basin
1631.01	Matting Installation
1632.01	Rock Inlet Sediment Trap Type A
1632.02	Rock Inlet Sediment Trap Type B
1632.03	Rock Inlet Sediment Trap Type C
1633.01	Temporary Rock Silt Check Type A
1633.02	Temporary Rock Silt Check Type B
1634.01	Temporary Rock Sediment Dam Type A
1634.02	Temporary Rock Sediment Dam Type B
1635.01	Rock Pipe Inlet Sediment Trap Type A
1635.02	Rock Pipe Inlet Sediment Trap Type B
1640.01	Coir Fiber Baffle
1645.01	Temporary Stream Crossing

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.28	EC-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

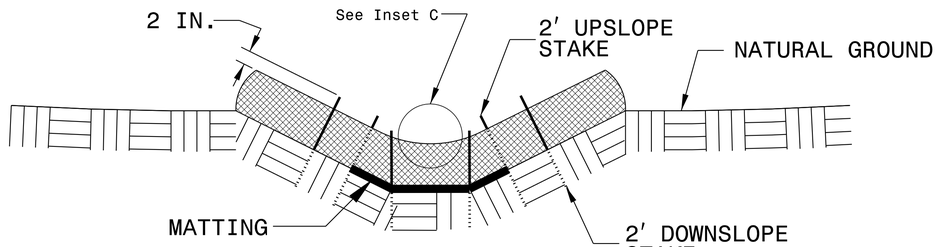
COIR FIBER WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

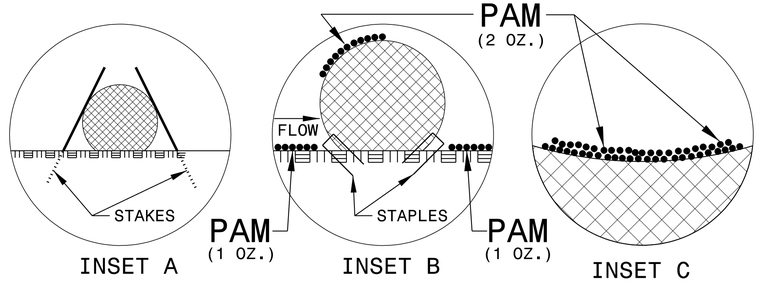
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

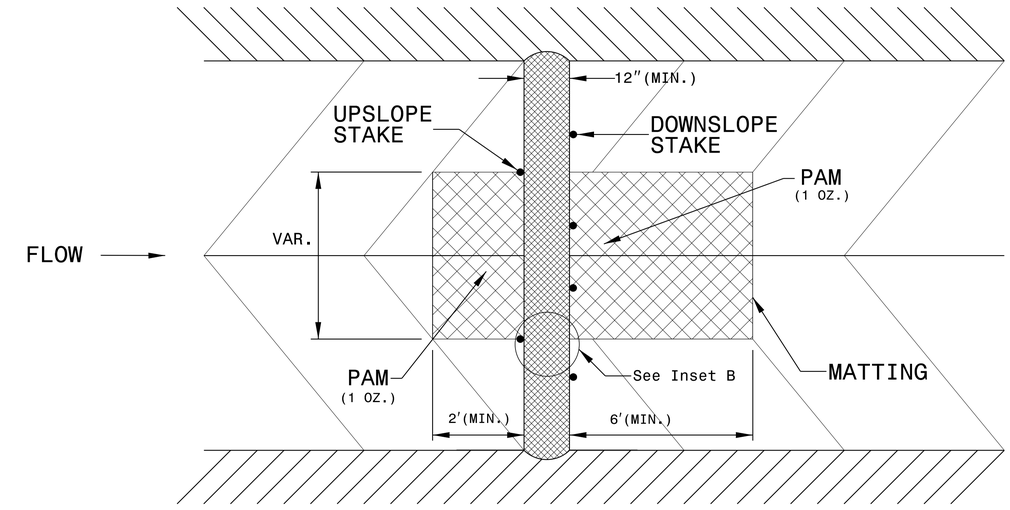
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH WATTLE.

INITIALLY APPLY 2 OUNCES OF ANIONIC OR NEUTRALLY CHARGED PAM OVER WATTLE WHERE WATER WILL FLOW AND 1 OUNCE OF PAM ON MATTING ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.





TOP VIEW

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.28	EC-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

EROSION CONTROL PLAN

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 04

PROJECT REFERENCE NO.	SHEET NO.
17BPJ4.R.28	EC-04/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

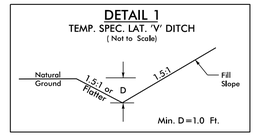
INSTALL PIPE(S) IN JURISDICTIONAL AREAS WITHOUT IMPACTING STREAM UNTIL AREA STABILIZED AND ACCORDING TO NCDOT BEST MANAGEMENT PRACTICES FOR CONSTRUCTION AND MAINTENANCE ACTIVITIES MANUAL.

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

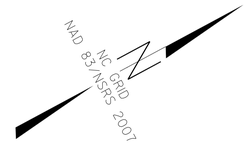
NOTE:
PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE.

Place Matting for Erosion Control in Temporary Ditches and Diversions.

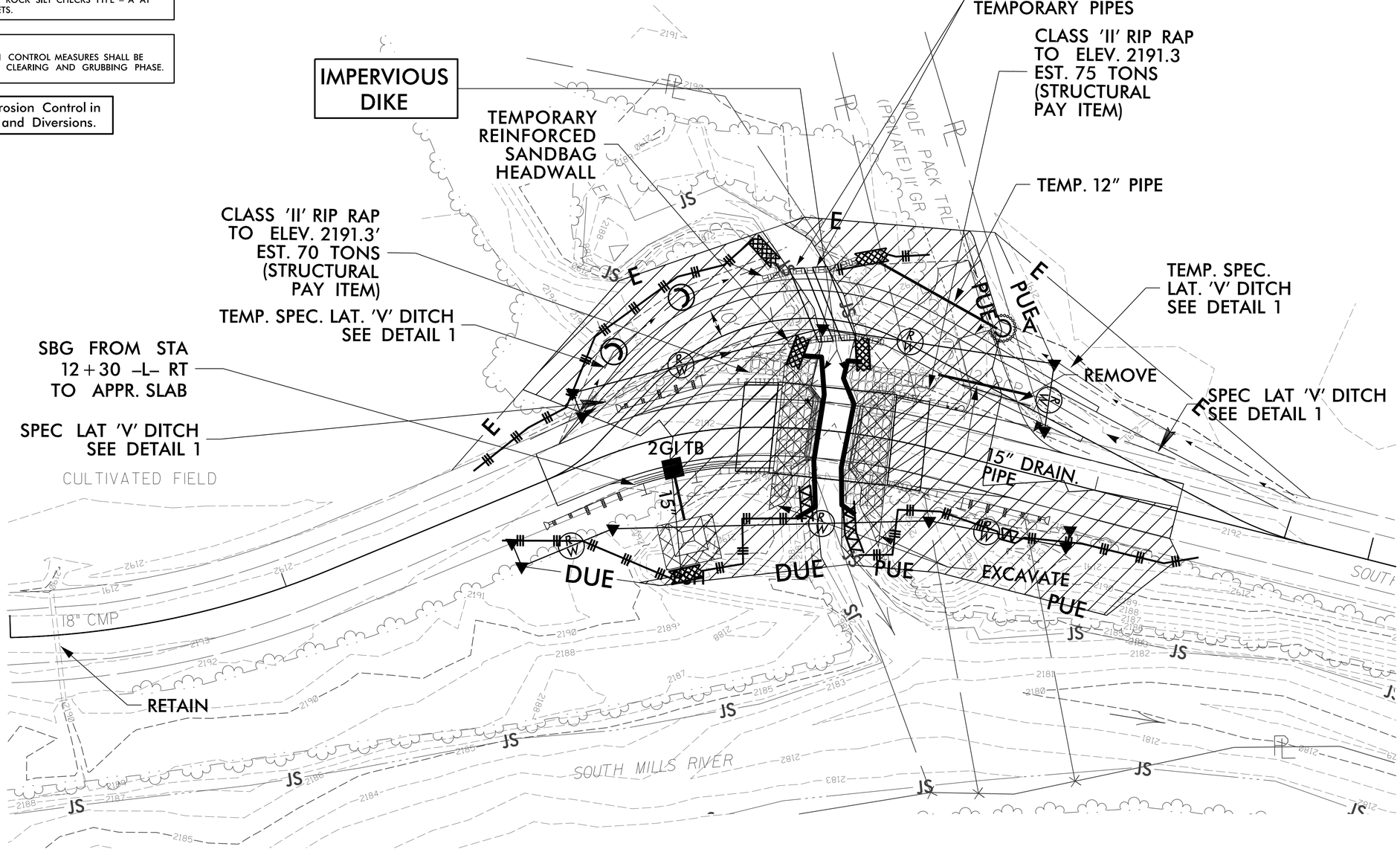
DETAIL 1
TEMP. SPEC. LAT. 'V' DITCH
(Not to Scale)



FROM STA. 12+25 TO STA. 13+00 –LDET– LT
FROM STA. 13+75 TO STA. 15+00 –LDET– LT



20 10 0 20 40
PLANS

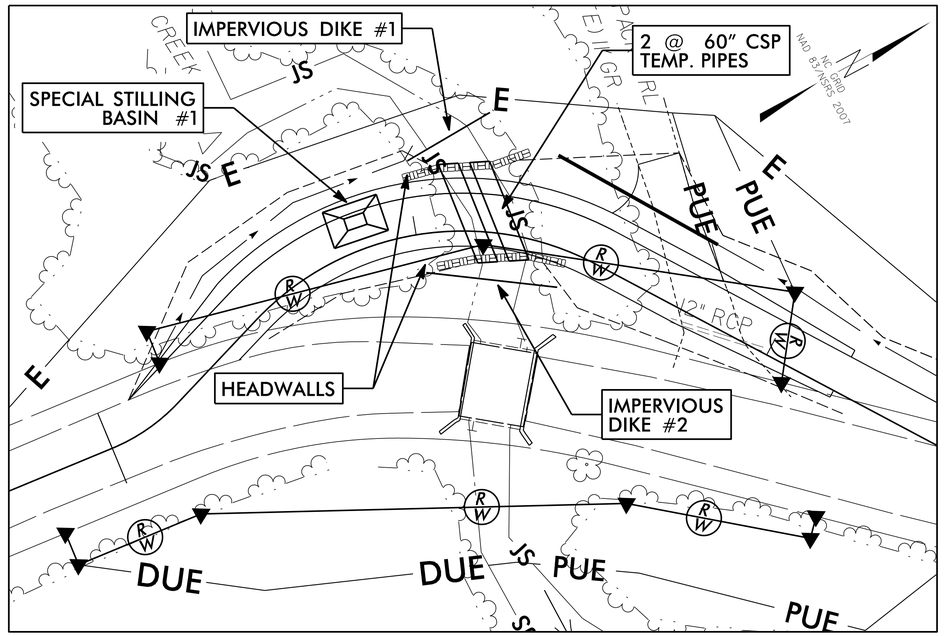


PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.28	EC-05/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

BRIDGE 164
HENDERSON COUNTY

CONSTRUCTION SEQUENCE FOR 2@60" CSP TEMPORARY PIPES AND 1@40' – 21" CORED SLAB ON QUEENS CREEK

PHASE 1

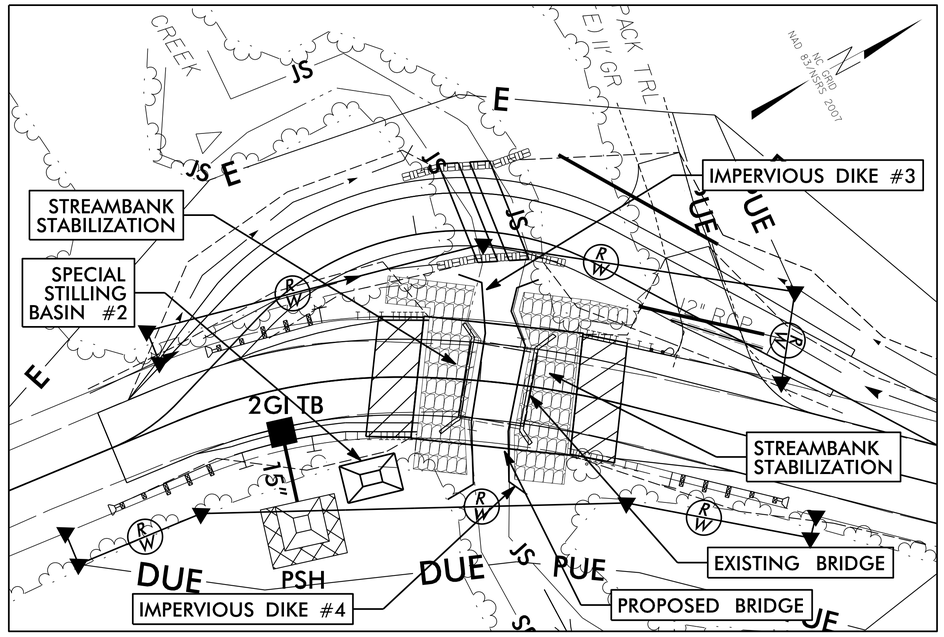


20 10 0 20 40
SCALE: 1" = 20'

PHASE 1

1. CONSTRUCT SPECIAL STILLING BASIN #1.
2. CONSTRUCT IMPERVIOUS DIKE #1, DIVERT FLOW USING PUMP AROUND OPERATION OR TEMPORARY PIPE.
3. CONSTRUCT IMPERVIOUS DIKE #2.
4. DEWATER CONSTRUCTION AREA.
5. INSTALL 2 @ 60" CSP AND HEADWALLS.
6. REMOVE IMPERVIOUS DIKE #2.
7. REMOVE IMPERVIOUS DIKE #1.
8. REMOVE SPECIAL STILLING BASIN #1.
9. COMPLETE DETOUR ROADWAY CONSTRUCTION.

PHASE 2



PHASE 2

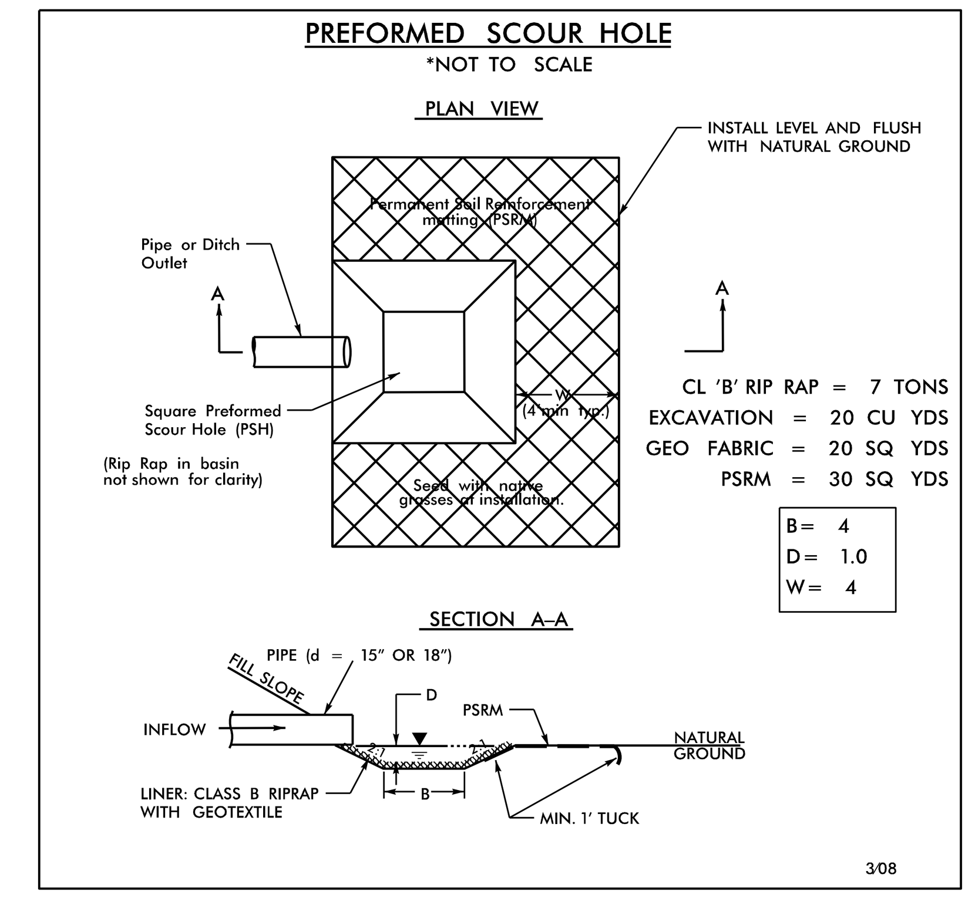
1. CONSTRUCT SPRECIAL STILLING BASIN #2.
2. REMOVE EXISTING BRIDGE DECK.
3. CONSTRUCT IMPERVIOUS DIKE #3 AND #4.
4. DEWATER CONSTRUCTION AREA.
5. REMOVE EXISTING BRIDGE ABUTMENTS AND WINGWALLS.
6. CONSTRUCT PROPOSED END BENTS, CAPS, WINGWALLS AND SLOPING ABUTMENTS.
7. INSTALL CLASS 'II' RIPRAP STREAMBANK STABILIZATION.
8. REMOVE IMPERVIOUS DIKE #3 AND #4.
9. REMOVE SPECIAL STILLING BASIN #2.
10. COMPLETE BRIDGE AND ROADWAY CONSTRUCTION.

PROJECT REFERENCE NO.	SHEET NO.
17BPJ4.R.28	EC-06/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

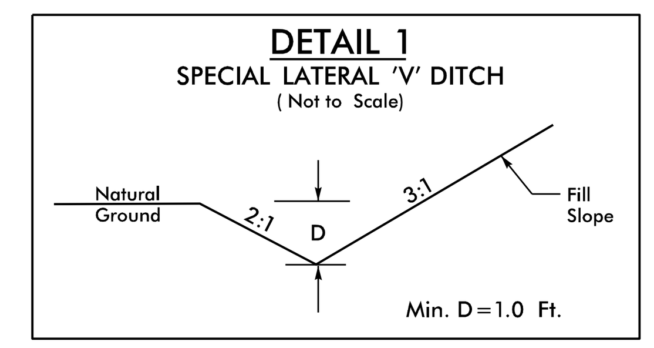
EROSION CONTROL PLAN

NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.



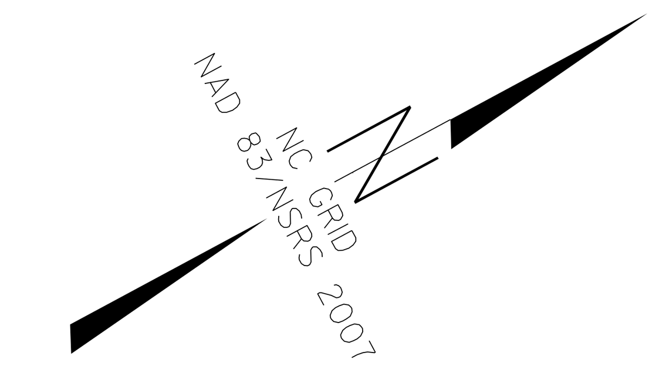
FROM STA. 12+45 -L- RT

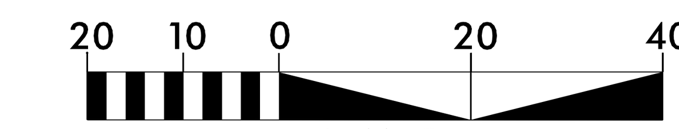


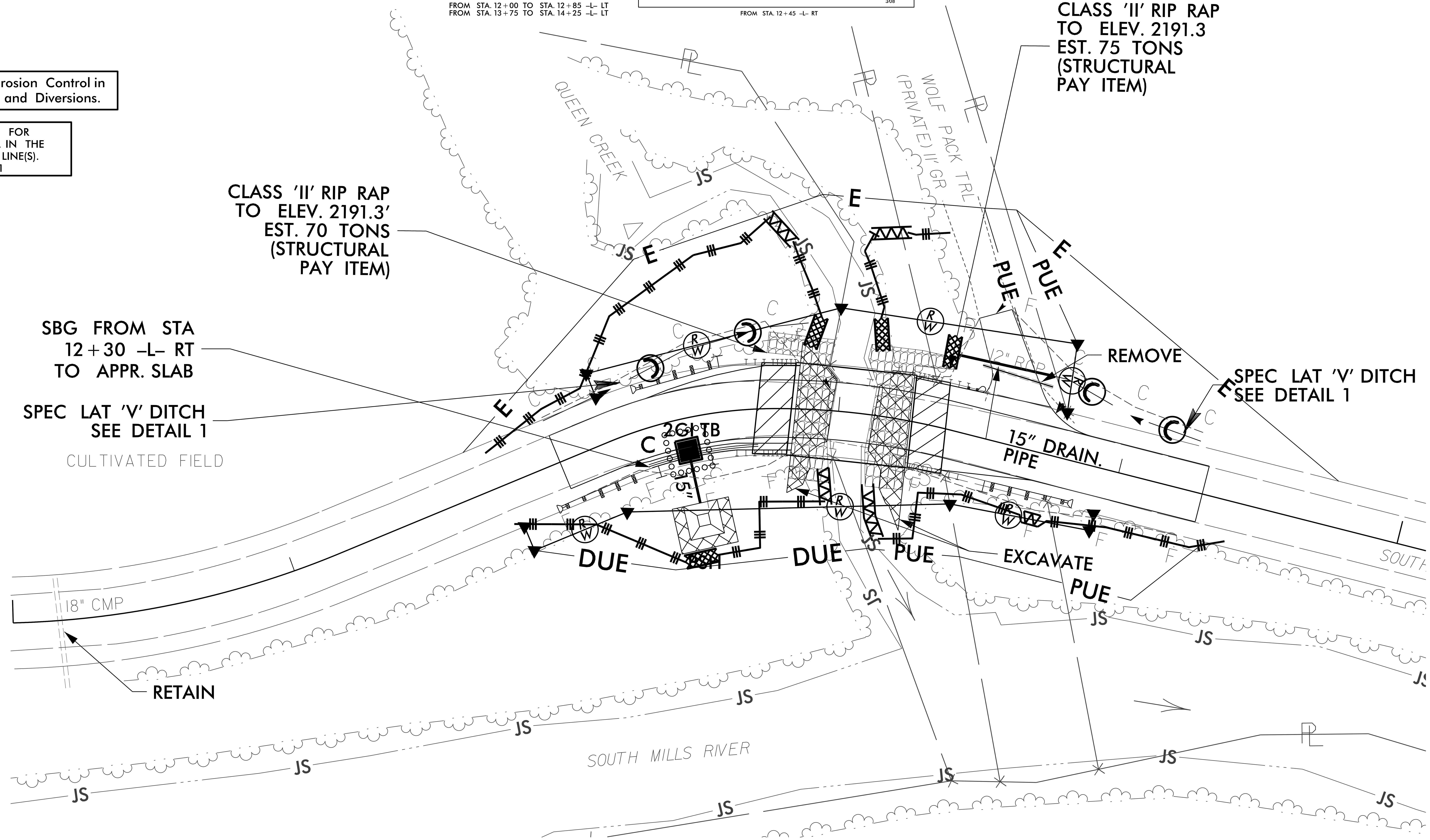
FROM STA. 12+00 TO STA. 12+85 -L- LT
FROM STA. 13+75 TO STA. 14+25 -L- LT

Place Matting for Erosion Control in Temporary Ditches and Diversions.

INSTALL MATTING FOR EROSION CONTROL IN THE PROPOSED DITCH LINE(S). SEE DETAIL 1







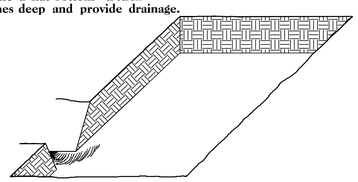
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.14.R.28	RF-1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

PLANTING DETAILS

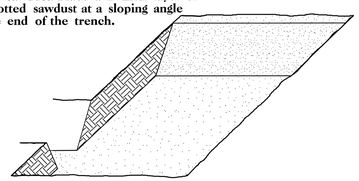
SEEDLING / LINER BAREROOT PLANTING DETAIL

HEALING IN

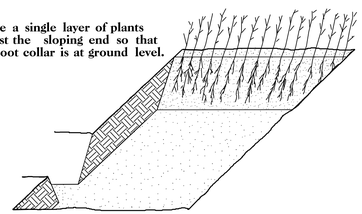
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



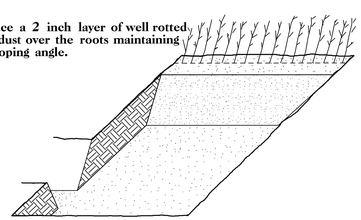
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



4. Place a single layer of plants against the sloping end so that the root collar is at ground level.

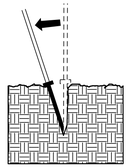


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

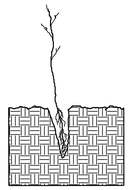


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

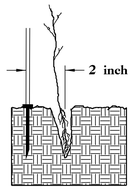
DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



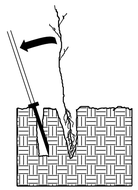
1. Insert planting bar as shown and pull handle toward planter.



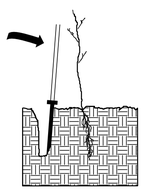
2. Remove planting bar and place seedling at correct depth.



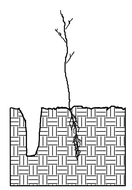
3. Insert planting bar 2 inches toward planter from seedling.



4. Pull handle of bar toward planter, firming soil at bottom.



5. Push handle forward firming soil at top.



6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

PLANTING BAG
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.

KBC PLANTING BAR
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.

ROOT PRUNING
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

REFORESTATION

☐ TREE REFORESTATION SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

REFORESTATION

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

25%	LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in – 18 in BR
25%	PLATANUS OCCIDENTALIS	SYCAMORE	12 in – 18 in BR
25%	FRAXINUS PENNSYLVANICA	GREEN ASH	12 in – 18 in BR
25%	BETULA NIGRA	RIVER BIRCH	12 in – 18 in BR

REFORESTATION DETAIL SHEET

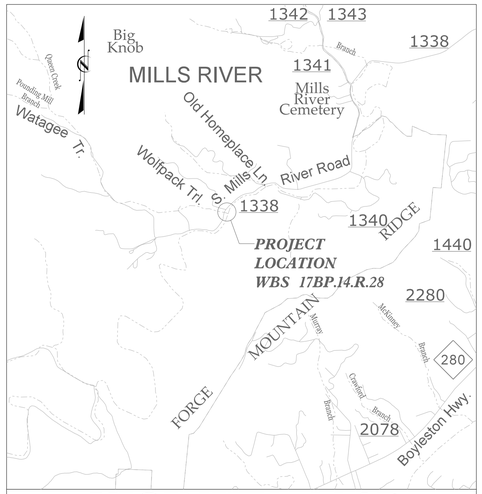
N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT

TIP PROJECT: 17BP.14.R.28

T.I.P. NO.	SHEET NO.
17BP.14.R.28	UO–1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

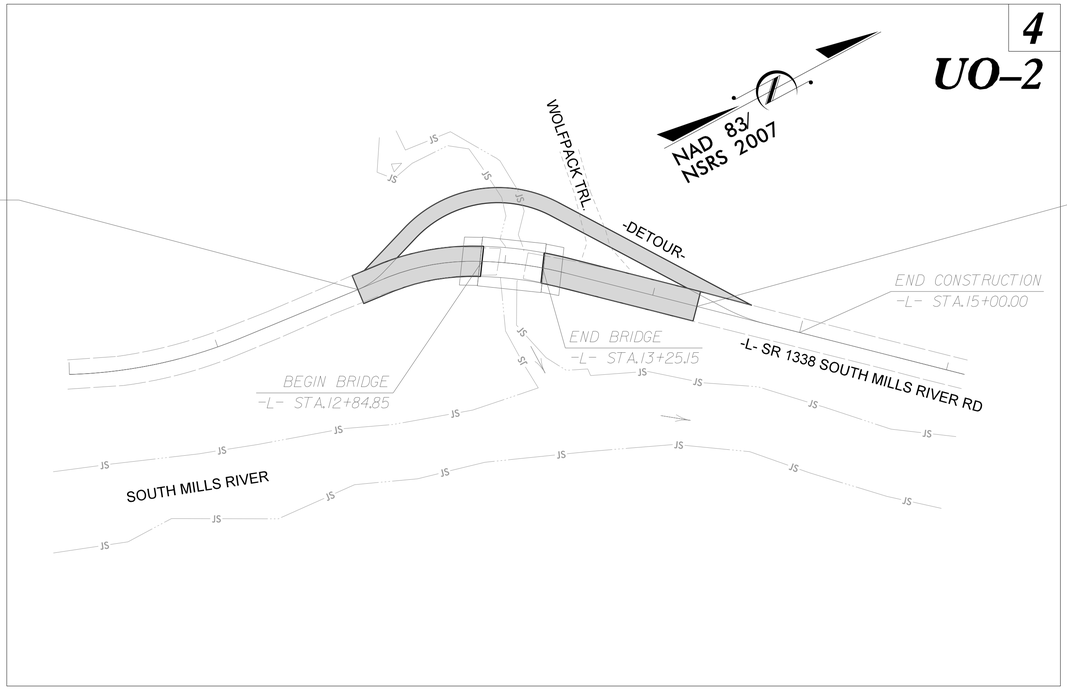
UTILITIES BY OTHERS PLANS
HENDERSON COUNTY



VICINITY MAP

LOCATION: BRIDGE NO. 164 ON SR 1338 (SOUTH MILLS RIVER ROAD) OVER QUEEN CREEK
0.9 MILES WEST OF JUNCTION OF SR 1340

TYPE OF WORK: UTILITIES

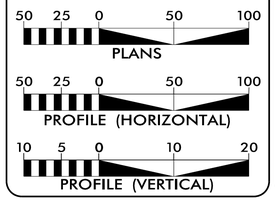


BEGIN PROJECT WBS 17BP.14.R.28
–L– STA. 12+00.00

END PROJECT WBS 17BP.14.R.28
–L– STA. 14+30.00

THERE IS NO CONTROL OF ACCESS ON THIS PROJECT

GRAPHIC SCALES



INDEX OF SHEETS

UTILITY OWNER ON PROJECT

(A) AT&T – TELECOMMUNICATIONS

PREPARED IN THE OFFICE OF:

HINDE ENGINEERING
License No. C-2639
7520 E. Independence Blvd., Suite 230 Charlotte, NC 28227

Todd E. Butner — UTILITY COORDINATION PROJECT MANAGER
Bill F. Black — PROJECT UTILITY COORDINATOR
James N. Arnold — PROJECT UTILITY DESIGNER

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

11/13/2015
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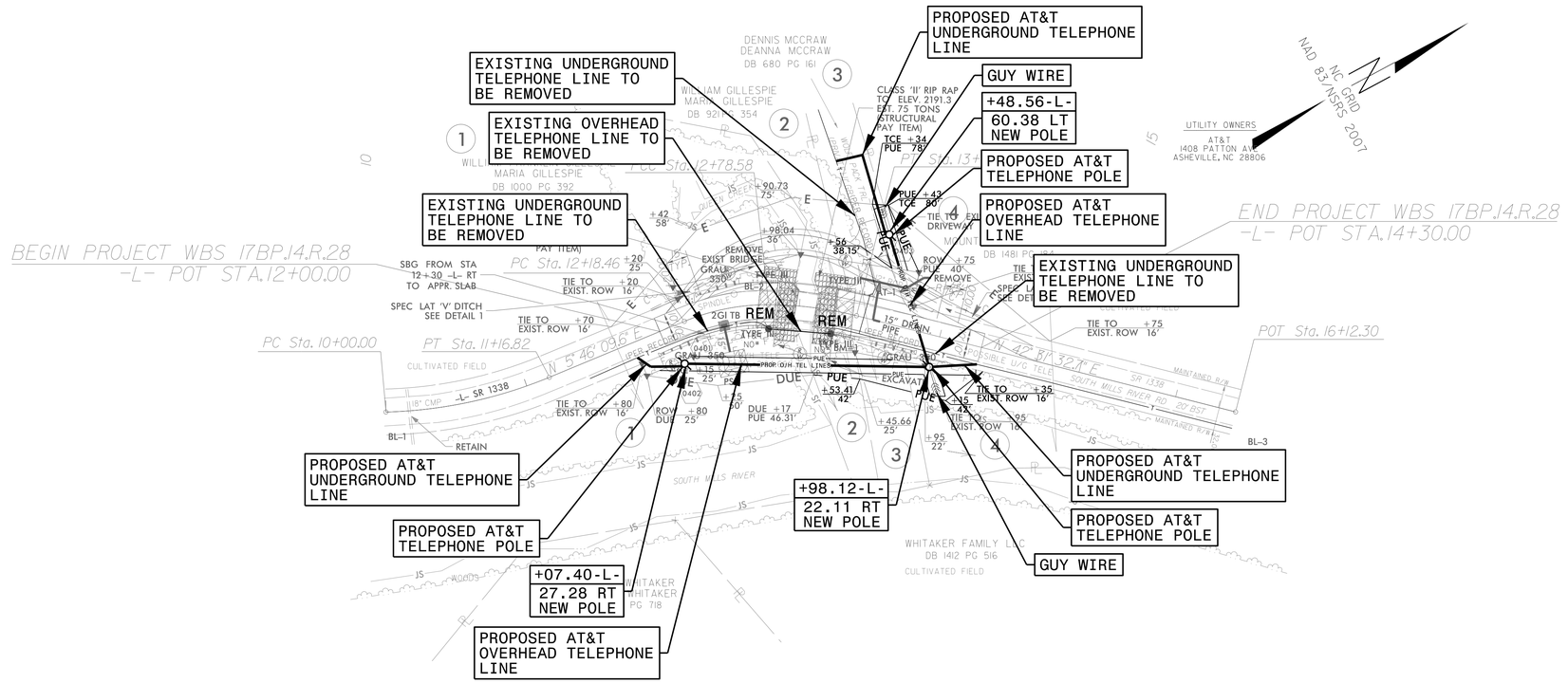
mhoge

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.28	U0-2

UTILITIES BY OTHERS

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.

SCALE:
0 50 100



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