STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BK-5117	1	27
AVERY COUNTY #16			

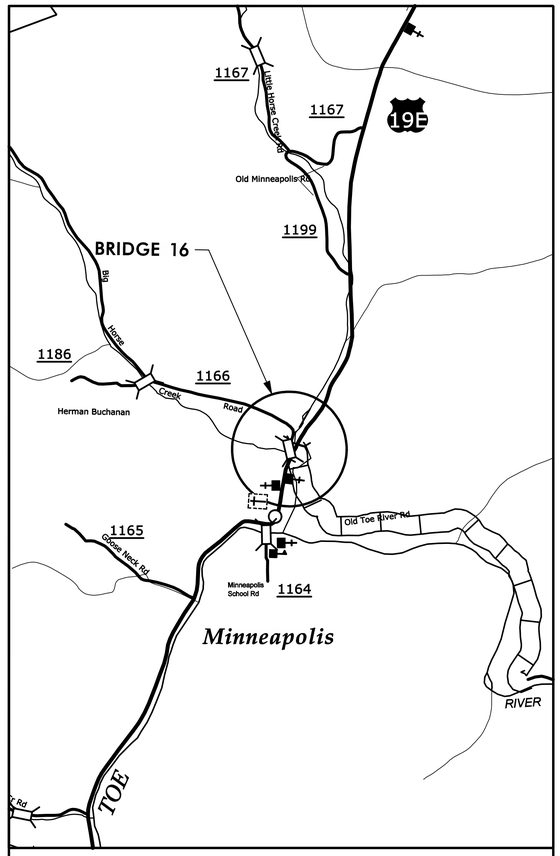
WBS PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
42568.1.1		P.E.
42568.3.1		CONST

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

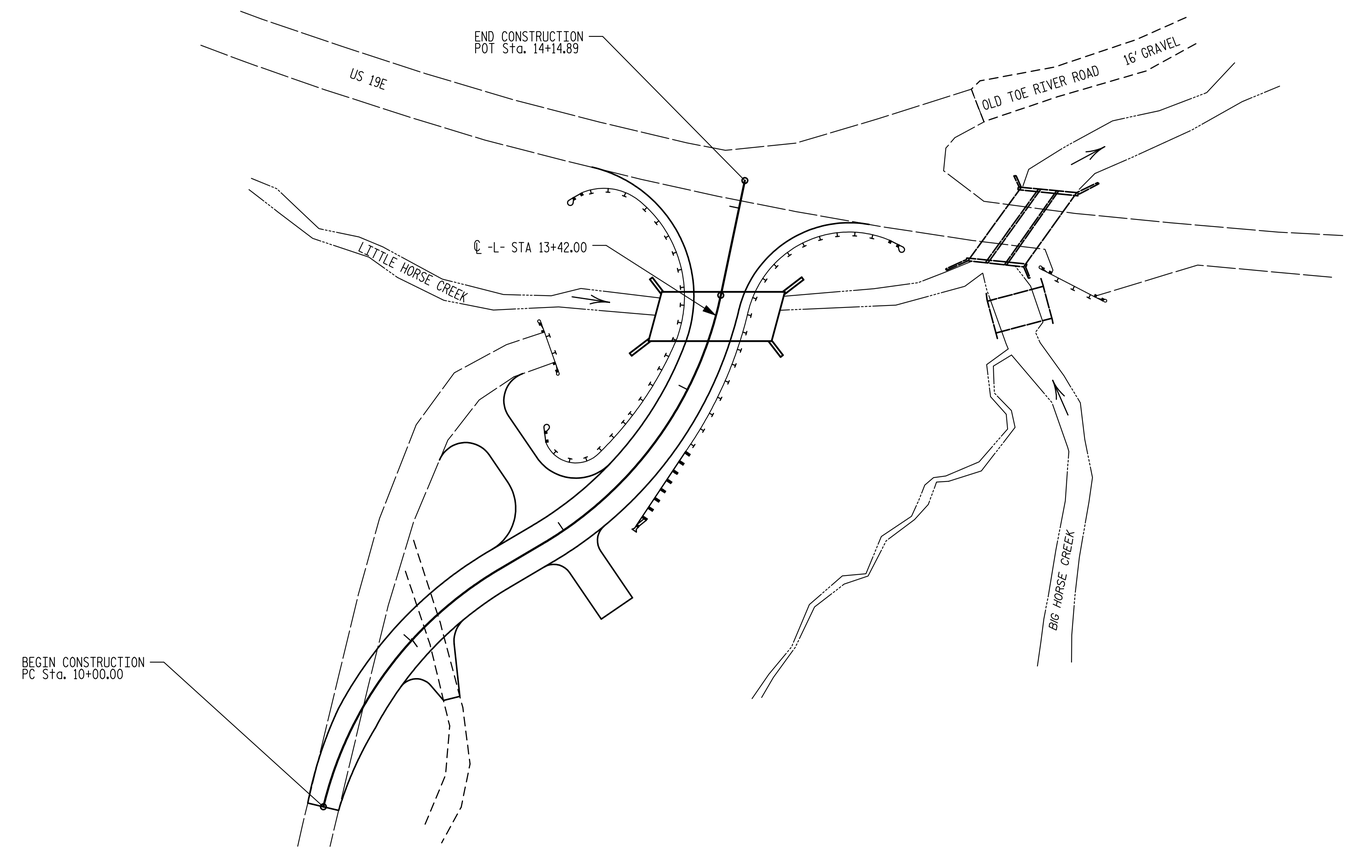
AVERY COUNTY

LOCATION: BRIDGE NO. 16 ON SR 1166 OVER LITTLE HORSE CREEK

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURE, GUARDRAIL, STRUCTURE, TRAFFIC CONTROL AND EROSION CONTROL



VICINITY MAP



PROJECT LENGTH

LENGTH ROADWAY STATE PROJECT BK-5117	=	0.067 MILES
LENGTH STRUCTURES STATE PROJECT BK-5117	=	0.012 MILES
TOTAL LENGTH STATE PROJECT BK-5117	=	0.079 MILES

Prepared In the Office of:
Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC1 License No: P-0258
for the
NCDOT STRUCTURES MANAGEMENT UNIT

2012 STANDARD SPECIFICATIONS

LETTING DATE:
AUGUST 23, 2012

RICK NELSON, P.E.
PROJECT ENGINEER

ZAKI WAFA, P.E.
PROJECT MANAGEMENT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 20332 ENGINEER JAMES E. MONDOLFI
5-23-12

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

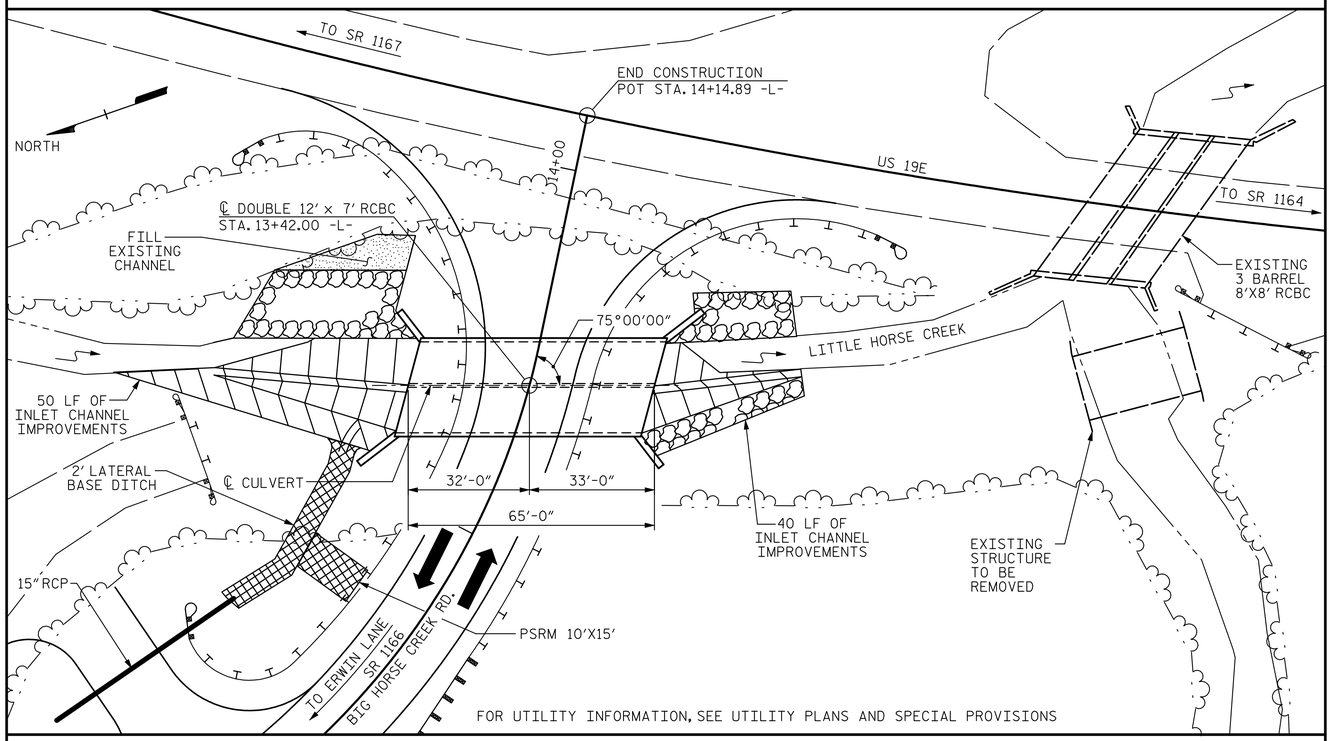
TIP PROJECT: BK-5117

CONTRACT: DO00154

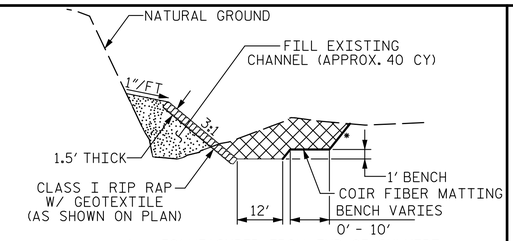
09/08/99

5/24/2012
P:\structures\BKProjects\BK-5117_Avery_16\BK5117\Structures\bk_5117_sd_TS.dgn
Florence & Hutcheson - An ICA Company

TBM BL-4-REBAR & CAP LOCATED AT STA. 11+46.86 -L-; 77.85' LT, EL. 3219.13

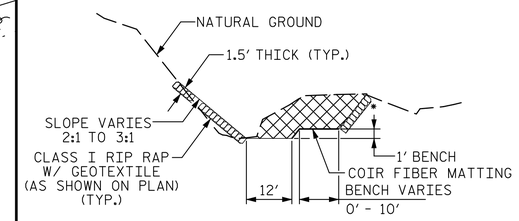


LOCATION SKETCH



L = 50' MEASURED FROM END OF CULVERT
EST. EXCAVATION = 43 CY
EST. CLASS I RIP RAP = 65 TONS
EST. GEOTEXTILE = 100 SY
EST. COIR FIBER MATTING = 77 SY

INLET CHANNEL IMPROVEMENT



L = 40' MEASURED FROM END OF CULVERT
EST. EXCAVATION = 26 CY
EST. CLASS I RIP RAP = 73 TONS
EST. GEOTEXTILE = 120 SY
EST. COIR FIBER MATTING = 70 SY

OUTLET CHANNEL IMPROVEMENT

CHANNEL EXCAVATION

* SIDE SLOPES VARY FROM 2:1 TO EXISTING

NOTES

ASSUMED LIVE LOAD = HS-25 OR ALTERNATE LOADING.

DESIGN FILL = 6.5'

FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.

3" Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:

1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
2. THE REMAINING PORTIONS OF THE WALLS, SILLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.

THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.

STEEL IN THE BOTTOM SLAB MAY BE SPLICED AT THE PERMITTED CONSTRUCTION JOINT AT THE CONTRACTOR'S OPTION.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL AND BOTH FACES OF INTERIOR WALLS ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS.

A 3 FOOT STRIP OF GEOTEXTILE SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

FOR CULVERT DIVERSION DETAILS, SEE EROSION CONTROL PLANS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE		
BARREL @ 2.374 CY/FT	154.3	C.Y.
WINGS, SILLS, ETC.	41.4	C.Y.
TOTAL	195.7	C.Y.
REINFORCING STEEL		
BARREL	32,193	LBS.
WINGS, ETC.	1,753	LBS.
TOTAL	33,946	LBS.
FOUNDATION CONDITIONING MATERIAL	139	TONS
CULVERT EXCAVATION	LUMP SUM	

HYDRAULIC DATA

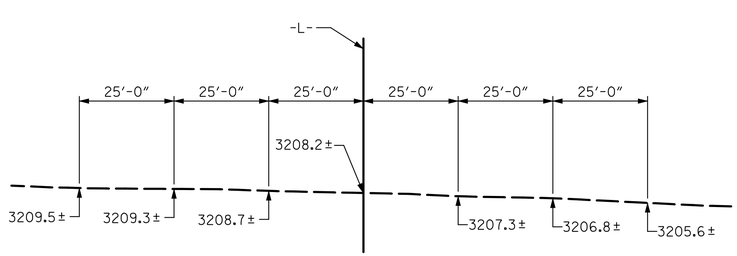
DESIGN DISCHARGE	= 700 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YR.
DESIGN HIGH WATER ELEVATION	= 3214.5
DRAINAGE AREA	= 1.75SQ MI
BASIC DISCHARGE (Q 100)	= 1100CFS
BASIC HIGH WATER ELEVATION	= 3215.8

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 2200 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 500 YR.(+)
OVERTOPPING FLOOD ELEVATION	= 3220.8

GRADE DATA

GRADE POINT ELEV. @ STATION 13+42.00	= 3221.444
BED ELEV. @ STATION 13+42.00	= 3207.130
ROADWAY SLOPES 2:1	



PROFILE ALONG ℄ CULVERT

PROJECT NO. 42568

AVERY COUNTY

STATION: 13+42.00 -L-

SHEET 1 OF 5 REPLACES BRIDGE NO. 16

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE BARREL
12FT X 7FT RCBC
75° SKEW
LITTLE HORSE CREEK

Florence & Hutcheson
CONSULTING ENGINEERS
3121 Kingdom Way, Suite 100 Raleigh, NC 27603
NC License No: F-0258

NORTH CAROLINA PROFESSIONAL SEAL ENGINEER JAMES E. MONDOLFI
5-23-12

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			C-1
1			3					TOTAL SHEETS
2			4					5

DRAWN BY : G. M. GILLAND DATE : FEB 2012
CHECKED BY : J. E. MONDOLFI DATE : FEB 2012

5/23/2012
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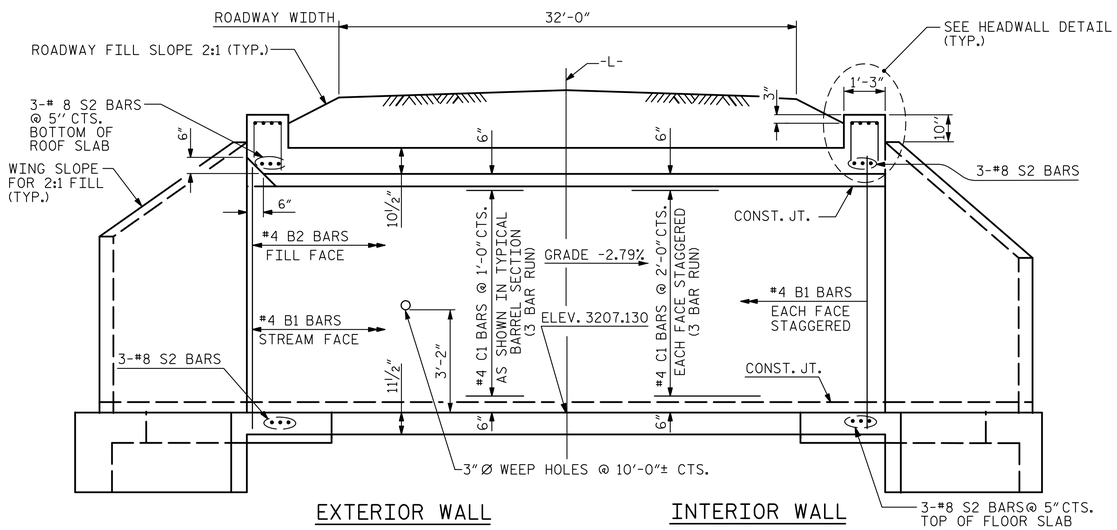
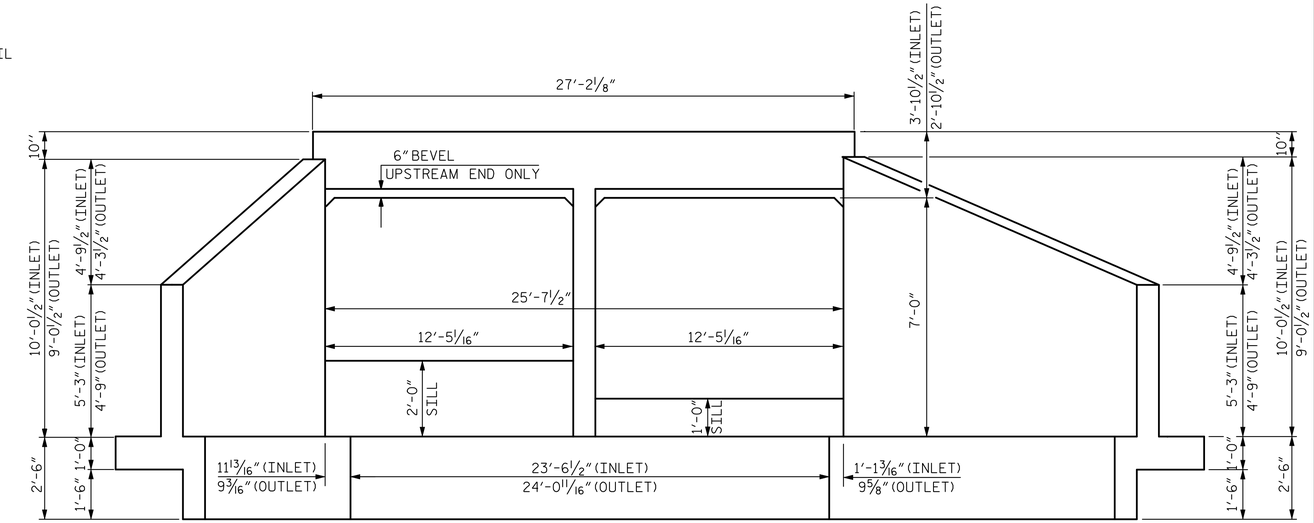
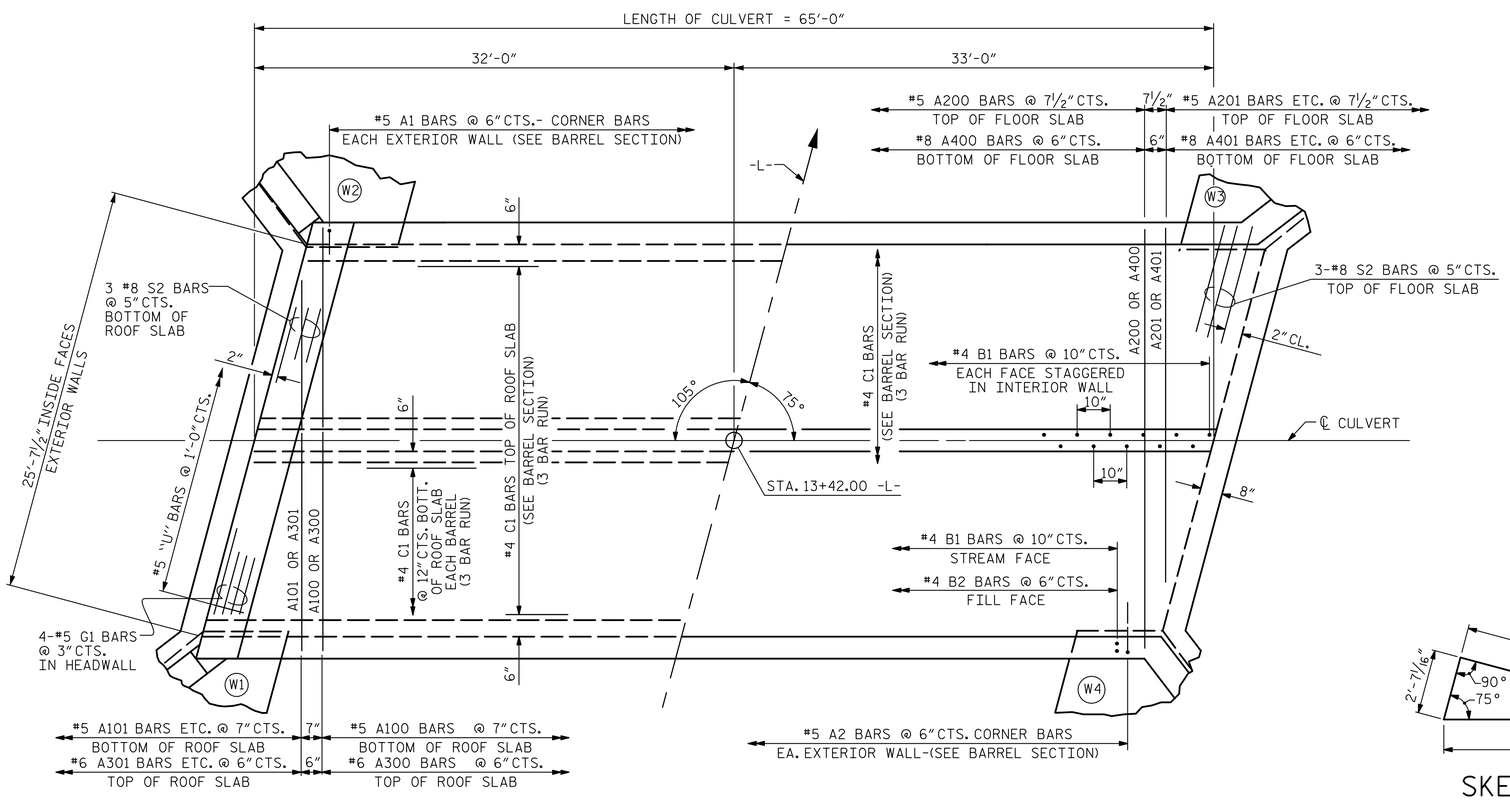
Florence & Hutcheson - An ICA Company



CULVERT SECTION NORMAL TO ROADWAY

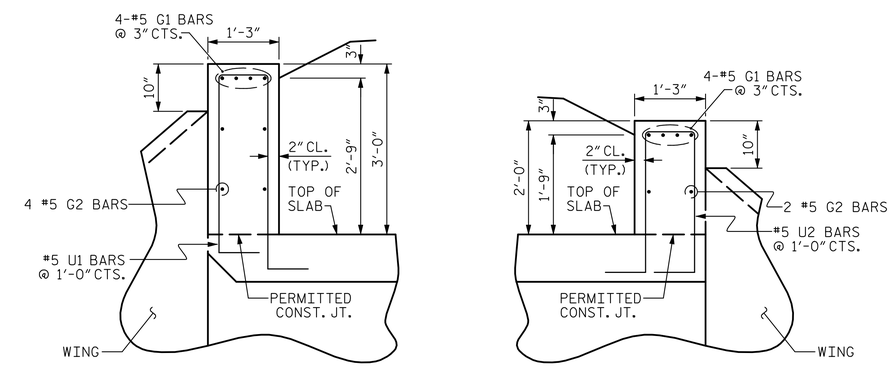


END ELEVATION NORMAL TO SKEW



PART PLAN - ROOF SLAB

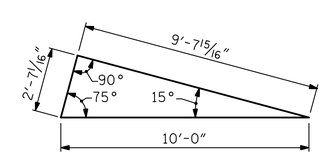
PART PLAN - FLOOR SLAB



INLET END

OUTLET END

HEADWALL DETAILS



SKEW TRIANGLE

PROJECT NO. 42568

AVERY COUNTY

STATION: 13+42.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE BARREL 12FT X 7FT RCBC 75° SKEW LITTLE HORSE CREEK

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

NORTH CAROLINA PROFESSIONAL SEAL ENGINEER JAMES E. MONDOLFI
5-23-12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-2
1			3			TOTAL SHEETS
2			4			5

DRAWN BY : G. M. GILLAND DATE : FEB 2012
CHECKED BY : J. E. MONDOLFI DATE : FEB 2012

5/23/2012
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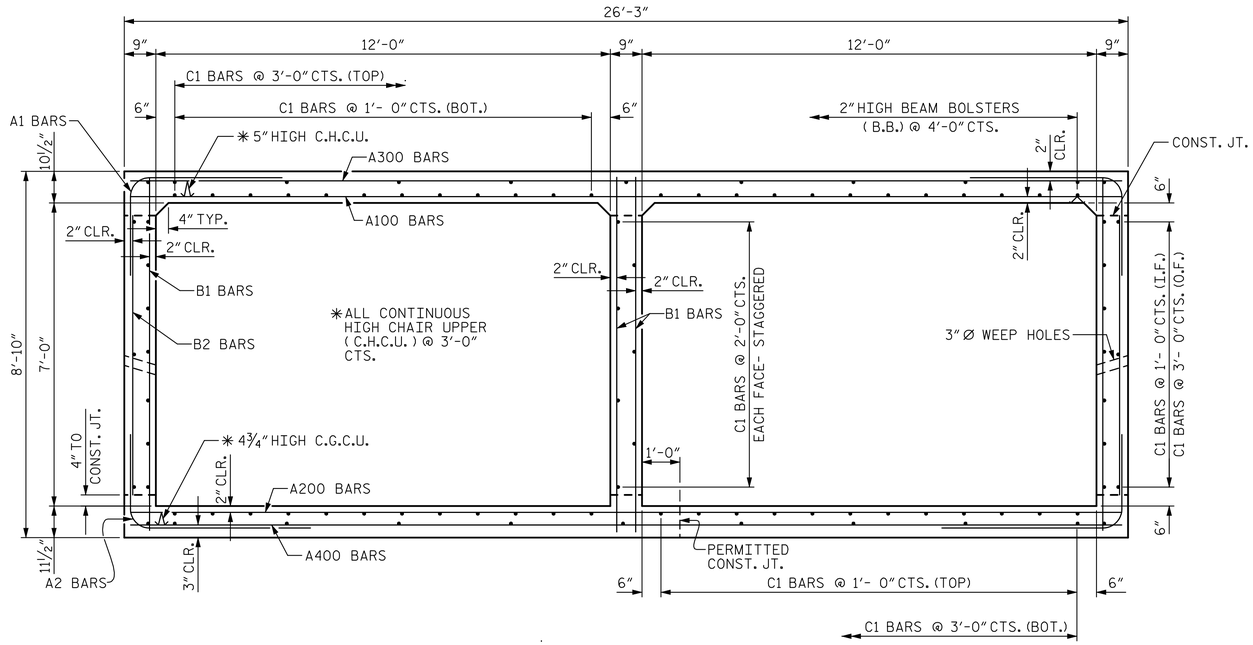
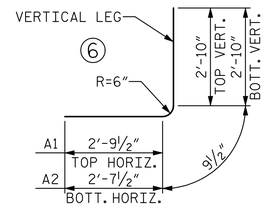
Florence & Hutcheson - An ICA Company

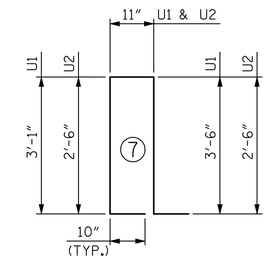


RIGHT ANGLE SECTION OF BARREL

THERE ARE 97 "C" BARS IN SECTION OF BARREL

BAR TYPES





SPLICE LENGTH CHART

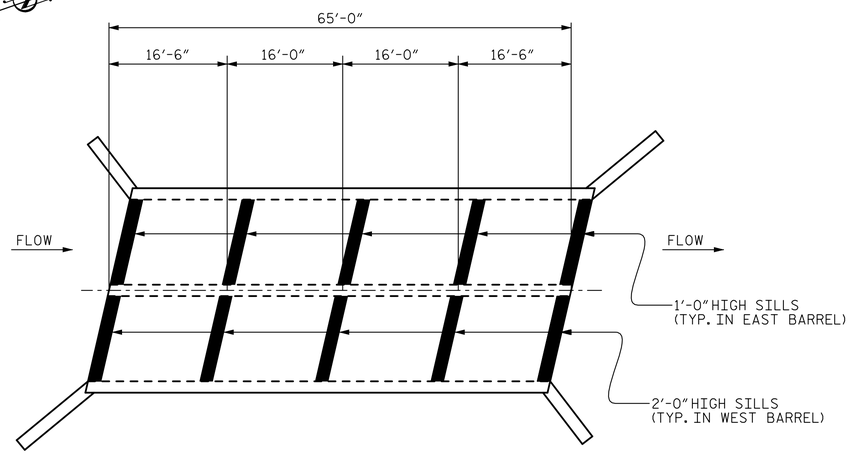
BAR	SIZE	SPLICE LENGTH
A200	#5	1'-9"
A400	#6	2'-10"
B1	#4	1'-9"
B3	#4	1'-9"
A1	#5	1'-8"
C1	#4	1'-11"

BILL OF MATERIAL

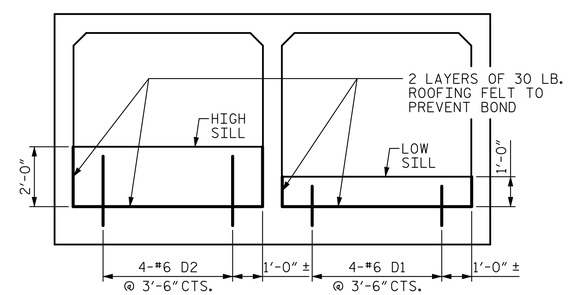
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A100	99	#5	STR	25'-11"	2676	A400	116	#8	STR	25'-11"	8027
A101	2	#5	STR	24'-9"	52	A401	2	#8	STR	24'-5"	130
A102	2	#5	STR	22'-6"	47	A402	2	#8	STR	22'-6"	120
A103	2	#5	STR	20'-4"	42	A403	2	#8	STR	20'-8"	110
A104	2	#5	STR	18'-2"	38	A404	2	#8	STR	18'-10"	101
A105	2	#5	STR	16'-0"	33	A405	2	#8	STR	16'-11"	90
A106	2	#5	STR	13'-10"	29	A406	2	#8	STR	15'-1"	81
A107	2	#5	STR	11'-8"	24	A407	2	#8	STR	13'-2"	70
A108	2	#5	STR	9'-6"	20	A408	2	#8	STR	11'-4"	61
A109	2	#5	STR	7'-4"	15	A409	2	#8	STR	9'-6"	51
A110	2	#5	STR	5'-1"	11	A410	2	#8	STR	7'-7"	40
A111	2	#5	STR	2'-11"	9	A411	2	#8	STR	5'-9"	31
						A412	2	#8	STR	3'-11"	21
A200	93	#5	STR	25'-11"	2514	A413	2	#8	STR	2'-0"	11
A201	2	#5	STR	23'-11"	50						
A202	2	#5	STR	21'-7"	45	A1	258	#5	6	6'-4"	1704
A203	2	#5	STR	19'-3"	40	A2	258	#5	6	6'-2"	1659
A204	2	#5	STR	16'-11"	35						
A205	2	#5	STR	14'-7"	31	B1	312	#4	STR	8'-5"	1754
A206	2	#5	STR	12'-3"	26	B2	260	#4	STR	6'-3"	1086
A207	2	#5	STR	9'-11"	21						
A208	2	#5	STR	7'-7"	16	C1	291	#4	STR	22'-10"	4439
A209	2	#5	STR	5'-3"	11						
A210	2	#5	STR	2'-11"	6	D1	20	#6	STR	1'-6"	45
						D2	20	#6	STR	2'-6"	75
A300	116	#6	STR	25'-11"	4516						
A301	2	#6	STR	24'-5"	73	G1	8	#5	STR	26'-10"	224
A302	2	#6	STR	22'-6"	68	G2	6	#4	STR	26'-10"	108
A303	2	#6	STR	20'-8"	62						
A304	2	#6	STR	18'-10"	57	S2	12	#8	STR	26'-10"	860
A305	2	#6	STR	16'-11"	51						
A306	2	#6	STR	15'-1"	45	U1	27	#5	STR	9'-2"	258
A307	2	#6	STR	13'-2"	40	U2	27	#5	STR	7'-7"	214
A308	2	#6	STR	11'-4"	34						
A309	2	#6	STR	9'-6"	29						
A310	2	#6	STR	7'-7"	23						
A311	2	#6	STR	5'-9"	17						
A312	2	#6	STR	3'-11"	12						
A313	2	#6	STR	2'-0"	6						

REINFORCING STEEL 32,193 LBS

CLASS A CONCRETE
CULVERT 154.3 CY
SILLS 6.9 CY
TOTAL = 161.2 CY

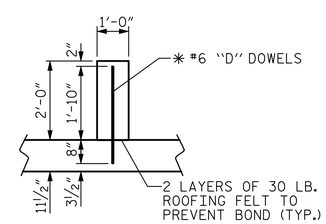


CULVERT SILL LAYOUT



HARVEST AND STOCKPILE EXISTING BED MATERIAL. BACKFILL PROPOSED CULVERT WITH AVAILABLE BED MATERIAL AND NATURAL STONE WITH A SIMILAR GRADATION TO THAT OF CLASS B RIPRAP. STONES LARGER THAN 12" SHALL NOT BE PLACED WITHIN THE LOW FLOW CHANNEL.

END ELEVATION
(LOOKING UPSTREAM)



✱DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINISHED.

SECTION THROUGH HIGH SILL
(LOW SILL SIMILAR)

CULVERT SILL DETAILS

PROJECT NO. 42568

AVERY COUNTY

STATION: 13+42.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE BARREL
12FT X 7FT RCBC
75° SKEW
LITTLE HORSE CREEK

Florence & Hutcheson
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NORTH CAROLINA PROFESSIONAL SEAL 20032 ENGINEER JAMES E. MONDOLFI
5-23-12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-3
1			3			TOTAL SHEETS
2			4			5

DRAWN BY : G. M. GILLAND DATE : FEB 2012
CHECKED BY : J. E. MONDOLFI DATE : FEB 2012

5/23/2012
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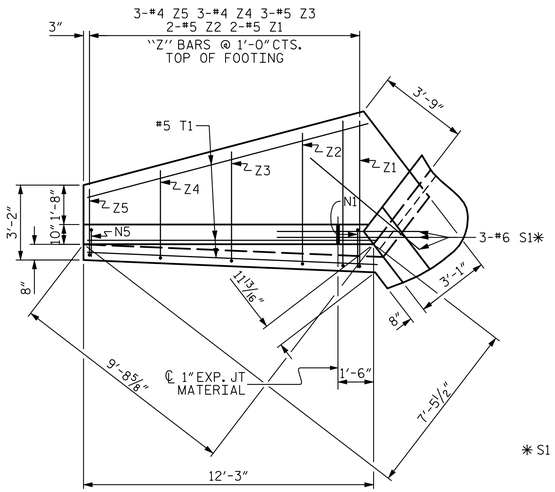
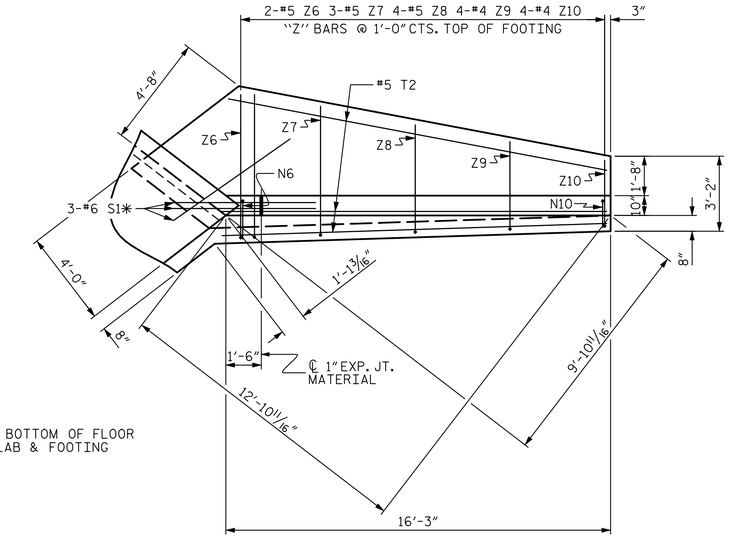
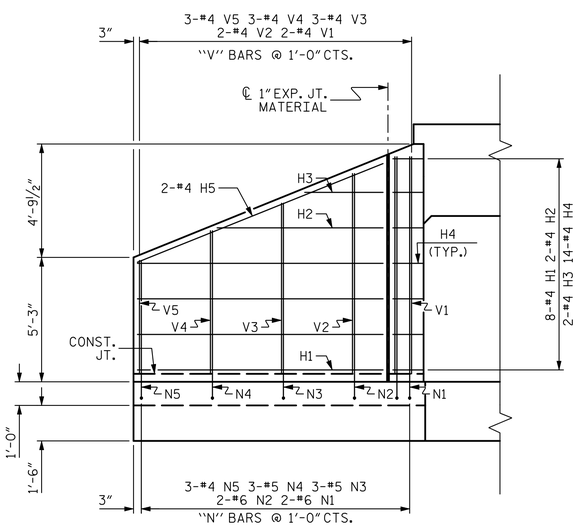


PLAN W2

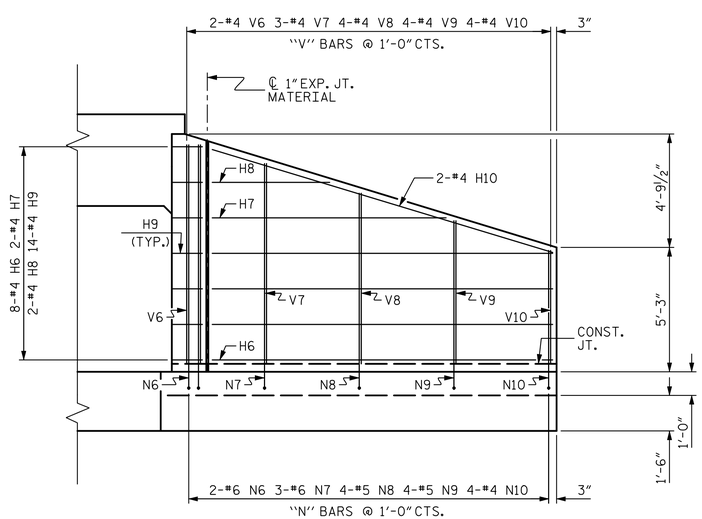


PLAN W1

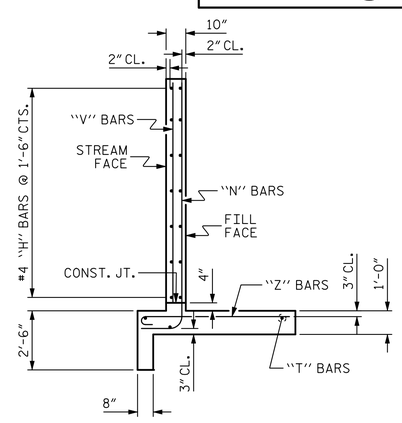
* S1 @ BOTTOM OF FLOOR SLAB & FOOTING



ELEVATION W2



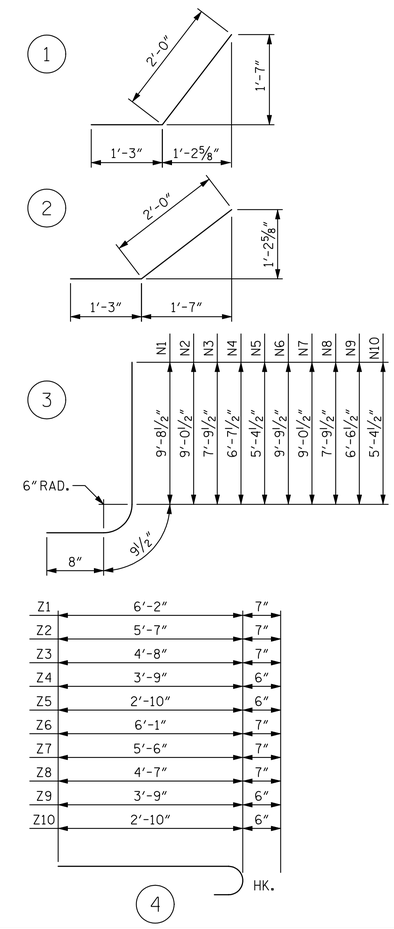
ELEVATION W1



TYPICAL WING SECTION

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	8	#4	STR	10'-4"	55
H2	2	#4	STR	7'-0"	9
H3	2	#4	STR	3'-3"	4
H4	14	#4	1	3'-3"	30
H5	2	#4	STR	11'-2"	15
H6	8	#4	STR	14'-4"	77
H7	2	#4	STR	9'-10"	13
H8	2	#4	STR	4'-11"	7
H9	14	#4	2	3'-3"	30
H10	2	#4	STR	15'-0"	20
N1	2	#6	3	11'-2"	34
N2	2	#6	3	10'-6"	32
N3	3	#5	3	9'-3"	29
N4	3	#5	3	8'-1"	25
N5	3	#4	3	6'-10"	14
N6	2	#6	3	11'-3"	34
N7	3	#6	3	10'-6"	47
N8	4	#5	3	9'-3"	39
N9	4	#5	3	8'-0"	33
N10	4	#4	3	6'-10"	18
S1	6	#6	STR	6'-0"	54
T1	3	#5	STR	12'-3"	38
T2	3	#5	STR	16'-3"	51
V1	2	#4	STR	9'-2"	12
V2	2	#4	STR	8'-5"	11
V3	3	#4	STR	7'-3"	15
V4	3	#4	STR	6'-0"	12
V5	3	#4	STR	4'-10"	10
V6	2	#4	STR	9'-3"	12
V7	3	#4	STR	8'-5"	17
V8	4	#4	STR	7'-2"	19
V9	4	#4	STR	6'-0"	16
V10	4	#4	STR	4'-9"	13
Z1	2	#5	4	6'-9"	14
Z2	2	#5	4	6'-2"	13
Z3	3	#5	4	5'-3"	16
Z4	3	#4	4	4'-3"	9
Z5	3	#4	4	3'-4"	7
Z6	2	#5	4	6'-8"	14
Z7	3	#5	4	6'-1"	19
Z8	4	#5	4	5'-2"	22
Z9	4	#4	4	4'-3"	11
Z10	4	#4	4	3'-4"	9

REINFORCING STEEL FOR 2 WINGS 979 LBS

CLASS A CONCRETE
- 2 WINGS 13.9 CY
- 1 HEADWALLS 3.8 CY
- 1 END CURTAIN WALLS 1.5 CY
- TOTAL 19.2 CY

PROJECT NO. 42568

AVERY COUNTY

STATION: 13+42.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

WINGS AT INLET END OF CONCRETE BOX CULVERT

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

NORTH CAROLINA PROFESSIONAL SEAL 20332 ENGINEER JAMES E. MONDOLFI
5-23-12

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		C-4
1			3				TOTAL SHEETS
2			4				5

DRAWN BY : G. M. GILLAND DATE : FEB 2012
CHECKED BY : J. E. MONDOLFI DATE : FEB 2012

5/23/2012
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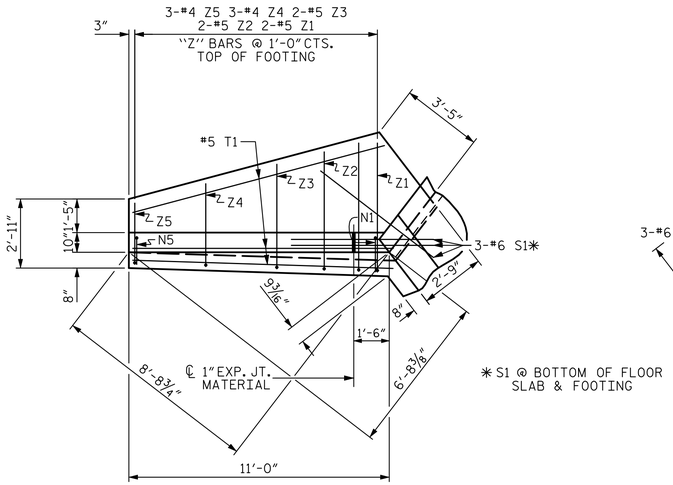
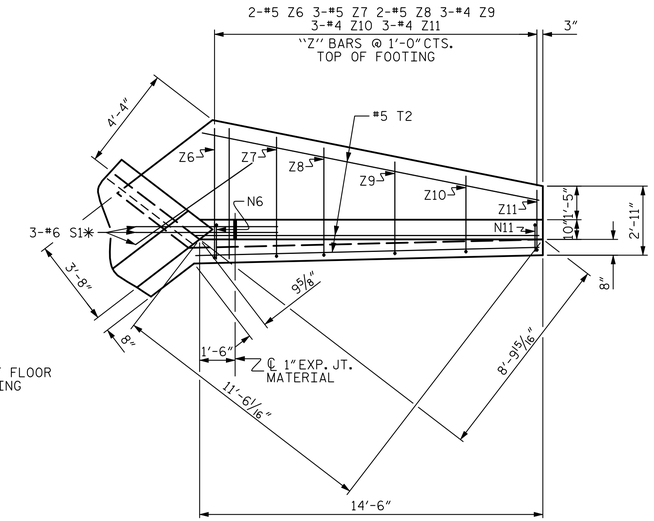
Florence & Hutcheson - An ICA Company

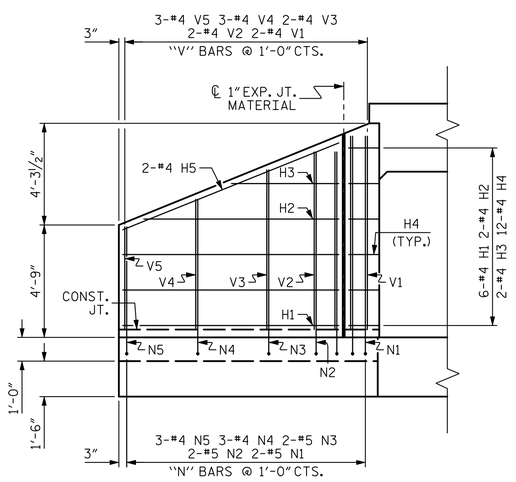


* S1 @ BOTTOM OF FLOOR SLAB & FOOTING

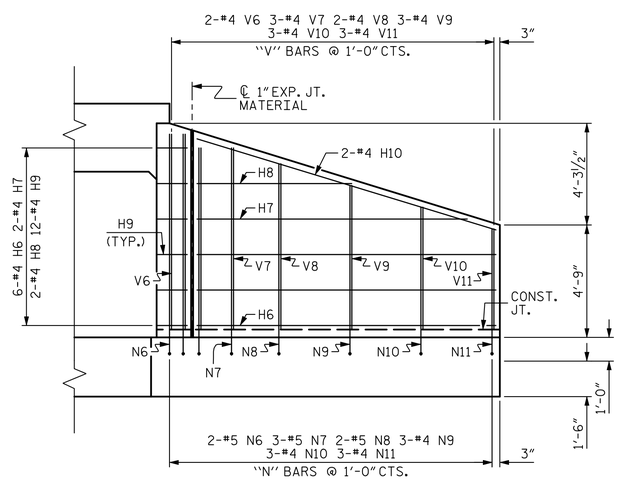
PLAN W4



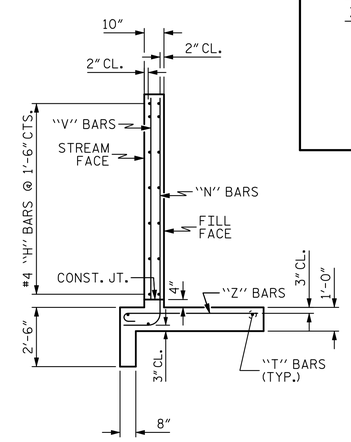
PLAN W3



ELEVATION W4



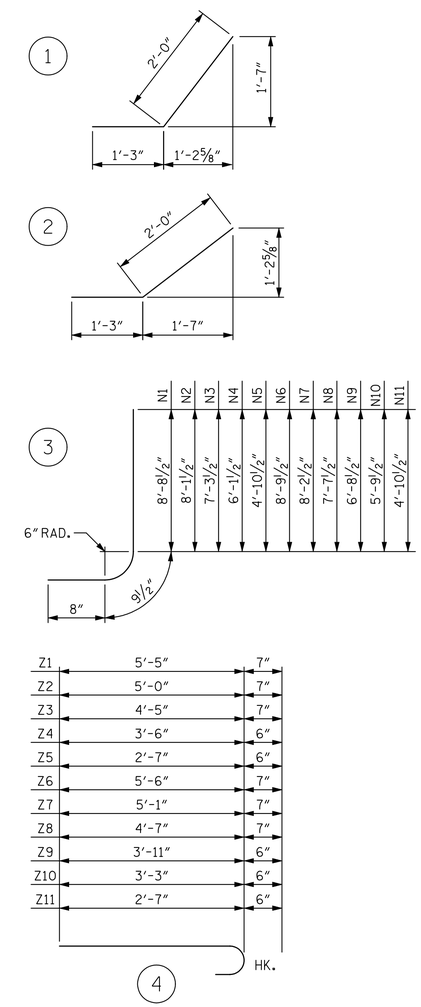
ELEVATION W3



TYPICAL WING SECTION

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	6	#4	STR	9'-1"	36
H2	2	#4	STR	8'-2"	11
H3	2	#4	STR	4'-6"	6
H4	12	#4	1	3'-3"	26
H5	2	#4	STR	9'-10"	13
H6	6	#4	STR	12'-7"	50
H7	2	#4	STR	11'-4"	15
H8	2	#4	STR	6'-6"	9
H9	12	#4	2	3'-3"	26
H10	2	#4	STR	13'-2"	18
N1	2	#5	3	10'-2"	21
N2	2	#5	3	9'-7"	20
N3	2	#5	3	8'-9"	18
N4	3	#4	3	7'-7"	15
N5	3	#4	3	6'-4"	13
N6	2	#5	3	10'-3"	21
N7	3	#5	3	9'-8"	30
N8	2	#5	3	9'-1"	19
N9	3	#4	3	8'-2"	16
N10	3	#4	3	7'-3"	15
N11	3	#4	3	6'-4"	13
S1	6	#6	STR	6'-0"	54
T1	3	#5	STR	11'-0"	34
T2	3	#5	STR	14'-6"	45
V1	2	#4	STR	8'-2"	11
V2	2	#4	STR	7'-6"	10
V3	2	#4	STR	6'-9"	9
V4	3	#4	STR	5'-6"	11
V5	3	#4	STR	4'-4"	9
V6	2	#4	STR	8'-3"	11
V7	3	#4	STR	7'-8"	15
V8	2	#4	STR	7'-0"	9
V9	3	#4	STR	6'-1"	12
V10	3	#4	STR	5'-2"	10
V11	3	#4	STR	4'-3"	9
Z1	2	#5	4	6'-0"	13
Z2	2	#5	4	5'-7"	12
Z3	2	#5	4	5'-0"	10
Z4	3	#4	4	4'-0"	8
Z5	3	#4	4	3'-1"	6
Z6	2	#5	4	6'-1"	13
Z7	3	#5	4	5'-8"	18
Z8	2	#5	4	5'-2"	11
Z9	3	#4	4	4'-5"	9
Z10	3	#4	4	3'-9"	8
Z11	3	#4	4	3'-1"	6

REINFORCING STEEL FOR 2 WINGS	774	LBS
CLASS A CONCRETE		
2 WINGS	11.3	CY
1 HEADWALLS	2.5	CY
1 END CURTAIN WALLS	1.5	CY
TOTAL	15.3	CY

PROJECT NO. 42568

AVERY COUNTY

STATION: 13+42.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

WINGS AT OUTLET END OF CONCRETE BOX CULVERT

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NORTH CAROLINA PROFESSIONAL SEAL 20038 ENGINEER JAMES E. MONDOLFI
5-23-12

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CHECKED BY : J. E. MONDOLFI DATE : FEB 2012

5/23/2012
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STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF	
STRUCTURAL STEEL - AASHTO M270 GRADE 36	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION	
GRADE 60	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR	
UNTREATED - EXTREME FIBER STRESS	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

ENGLISH

JANUARY, 1990

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "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	DRUM
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGERS
1180.01	SKINNY-DRUM
1205.01	PAVEMENT MARKINGS - LINE TYPES & OFFSETS
1205.02	PAVEMENT MARKINGS - 2 LANE & MULTILANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	PAVEMENT MARKING SPACING
1251.01	RAISED PAVEMENT MARKERS PERMANENT AND TEMPORARY
1261.01	GUARDRAIL & BARRIER DELINEATOR SPACING
1261.02	GUARDRAIL & BARRIER DELINEATOR TYPES
1262.01	GUARDRAIL END DELINEATION
1264.01	OBJECT MARKERS
1264.02	PLACEMENT OF OBJECT MARKERS

INDEX OF SHEETS

SHEET NO.	TITLE
TCP-1	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, LEGEND, PAV'T MARKING SCHEDULE AND INDEX OF SHEETS
TCP-2	GENERAL NOTES
TCP-3	PHASE I PHASING AND OVERVIEW
TCP-4	PHASE II PHASING AND OVERVIEW
TCP-5	PHASE III PHASING AND OVERVIEW

PAV'T MARKING SCHEDULE

DESCRIPTION	PAY ITEM
WHITE EDGELINE 2X	PAINT (4")
YELLOW DOUBLE CENTER LINE 2X	PAINT (4")
WHITE STOP BAR 2X	PAINT (24")
YELLOW AND YELLOW	TEMPORARY RAISED MARKERS

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- NORTH ARROW
- PROPOSED PVMT.
- EXIST. PVMT.
- PROPOSED CONSTRUCTION
- REMOVAL OF EXIST. PAVEMENT

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
- WARNING FLAGS
- CRASH CUSHION
- CHANGEABLE MESSAGE SIGN
- TRUCK MOUNTED IMPACT ATTENUATOR (TMIA)
- POLICE
- FLAGGER
- DRUM (PROFILE)

PAVEMENT MARKINGS

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

NORTH CAROLINA PROFESSIONAL SEAL 15876 ENGINEER MICHAEL T. RZEPKA
5-23-12

PROJECT NO. 42568
COUNTY: AVERY
STATION: 13+42.00

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CULVERT ON SR 1166
OVER LITTLE HORSE CREEK

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

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DRAWN BY: G.E. PARKER DATE: FEBRUARY 2012
CHECKED BY: M.T. RZEPKA DATE: FEBRUARY 2012

5/23/2012
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PROJECT NOTES

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 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.

C) 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.

PAVEMENT EDGE DROP OFF REQUIREMENTS

D) 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 2 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.

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.

E) 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) 500 FT. IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

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

SIGNING

G) 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.

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

I) 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

J) 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 WHEN LANE CLOSURES ARE NOT IN EFFECT. WHEN SKINNY DRUMS ARE ALLOWED REFER TO SECTION 1180 OF STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES OR AS SHOWN IN THE PLANS.

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

PAVEMENT MARKINGS AND MARKERS

L) INSTALL TEMPORARY PAVEMENT MARKINGS AND TEMPORARY PAVEMENT MARKERS ON INTERIM LAYERS OF PAVEMENT AS FOLLOWS:

ROAD NAME	MARKING	MARKER
SR 1166 (BIG HORSE CREEK RD.)	PAINT	TEMPORARY RAISED

M) THE DIVISION WILL INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE.

N) PLACE ONE APPLICATION OF PAINT FOR TEMPORARY TRAFFIC PATTERNS. PLACE A SECOND APPLICATION OF PAINT SIX (6) MONTHS AFTER THE INITIAL APPLICATION AND EVERY SIX MONTHS AS DIRECTED BY THE ENGINEER.

O) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

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

LOCAL NOTES

1) CONTRACTOR TO MAINTAIN ACCESS TO ALL DRIVEWAYS, WITHIN THE PROJECT LIMITS, AT ALL TIMES.

NORTH CAROLINA PROFESSIONAL SEAL 15876 ENGINEER MICHAEL T. RZEPKA
5-23-12

PROJECT NO. 42568
COUNTY: AVERY
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CULVERT ON SR 1166
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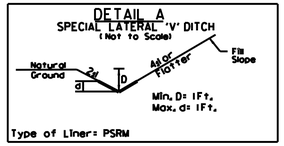
PROJECT REFERENCE NO.	SHEET NO.
BK5117	R-1
R/W SHEET NO.	

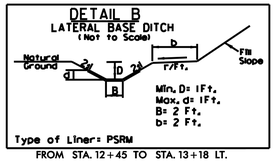
ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 022982 ENGINEER MICHAEL A. YOUNG — 5-23-12

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 021162 ENGINEER HERBERT TURNER, JR. — 5-23-12

GRAPHIC SCALE: 50 0 50 100

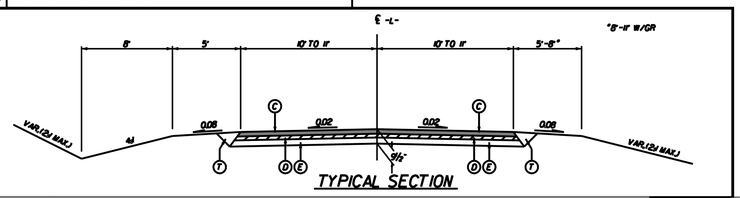


FROM STA. 11+00 TO STA. 11+75 LT.

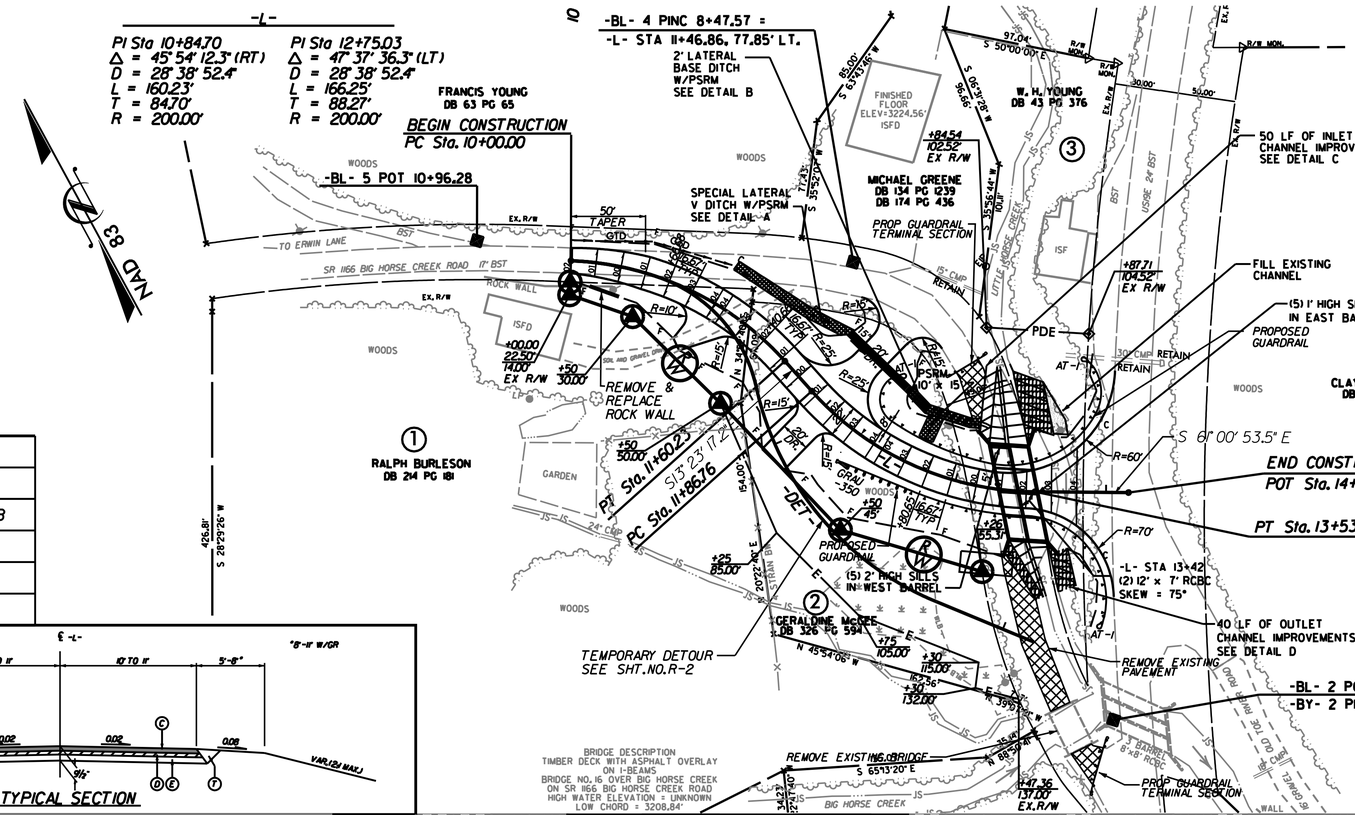


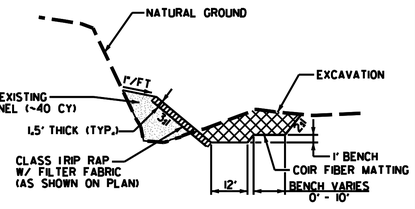
FROM STA. 12+45 TO STA. 13+18 LT.

PAVEMENT SCHEDULE	
(C)	3" SURFACE COURSE, TYPE S9.5B
(D)	2½" INTERMEDIATE COURSE, TYPE I19.0B
(E)	4" BASE COURSE, TYPE B25.0B
(T)	EARTH MATERIAL
(U)	EXISTING PAVEMENT



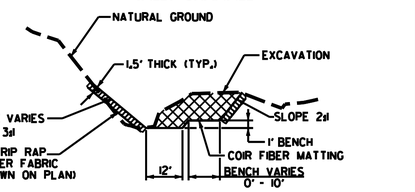
TYPICAL SECTION





EST. DDE = 43 CY
EST. CLASS I RIP RAP = 65 TONS
EST. FILTER FABRIC = 100 SY
EST. COIR FIBER MATTING = 77 SY

DETAIL C
INLET CHANNEL



EST. DDE = 26 CY
EST. CLASS I RIP RAP = 73 TONS
EST. FILTER FABRIC = 120 SY
EST. COIR FIBER MATTING = 70 SY

DETAIL D
OUTLET CHANNEL

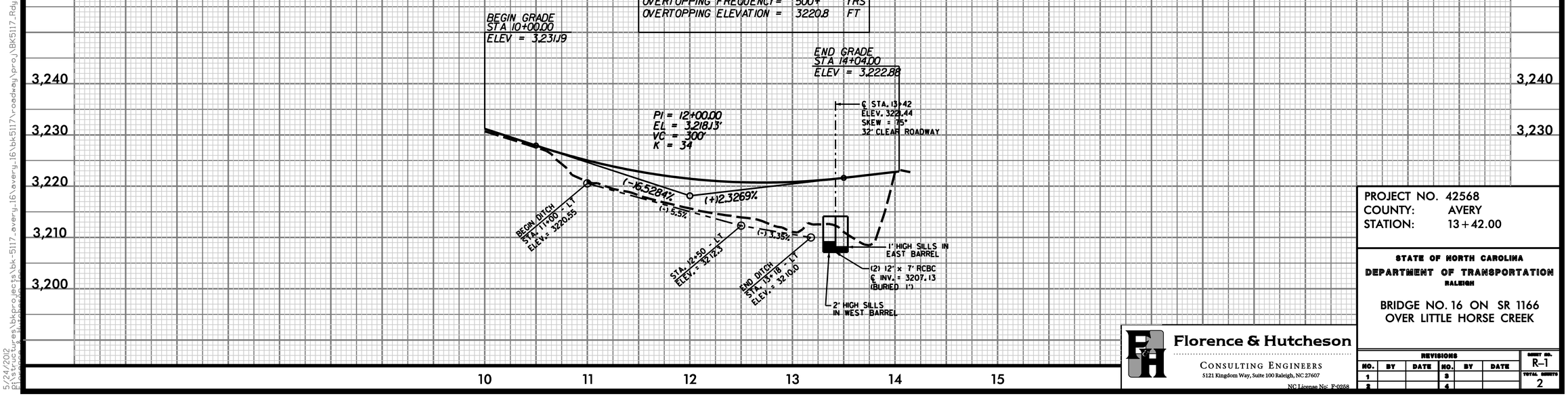
BM # 1
-L- STA. 15+84.225' RT
-BL- 2' 18" REBAR AND CAP
EL. 3213.45

RIGHT OF WAY AREA DATA

PARCEL NO.	PROPERTY OWNERS NAME	TOTAL ACREAGE	AREA TAKEN	AREA REMAINING RIGHT	AREA REMAINING LEFT	CONSTR. EASEMENT	PERMANENT DRAINAGE EASEMENT	TEMPORARY DRAINAGE EASEMENT
1	RALPH BURLESON		4,891.08 sf			197.75 sf		
2	GERALDINE McGEE		18,159.72 sf			8,610.02 sf		
3	W.H. YOUNG						6993.92 sf	

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	=	700	CFS
DESIGN FREQUENCY	=	25	YRS
DESIGN HW ELEVATION	=	3214.5	FT
BASE DISCHARGE	=	1100	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	3215.8	FT
OVERTOPPING DISCHARGE	=	2200	CFS
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING ELEVATION	=	3220.8	FT



PROJECT NO. 42568
COUNTY: AVERY
STATION: 13+42.00

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE NO. 16 ON SR 1166
OVER LITTLE HORSE CREEK

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0268

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	R-1
1			3			TOTAL SHEETS
2			4			2

8/17/99

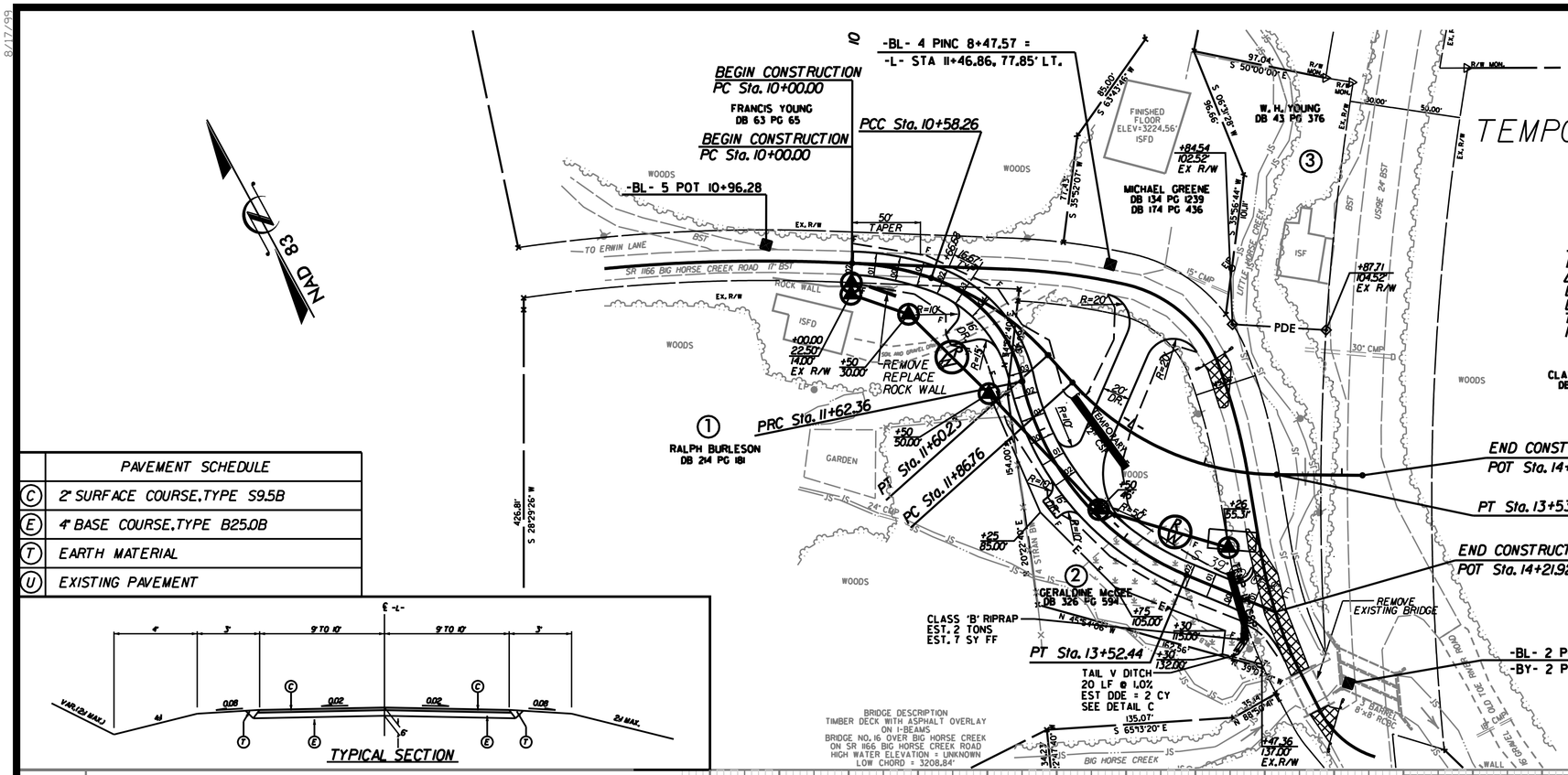
5/24/2012
ELiscombe
s:\structures\bkprojects\bk-5117_avery_16\avery_16\bk5117\roadway\proj\BK5117_Rdy_psh.dgn

PROJECT REFERENCE NO.	SHEET NO.
BK5117	R-2
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 022982 ENGINEER MICHAEL A. YOUNG — 5-23-12

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 021162 ENGINEER HERBERT TURNER, JR. — 5-23-12

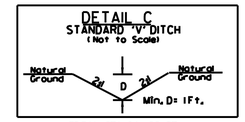
GRAPHIC SCALE: 50 0 50 100



-DET-

PI Sta 10+29.34	PI Sta 11+15.58	PI Sta 12+65.27
Δ = 16° 41' 21.3" (RT)	Δ = 59° 38' 45.5" (RT)	Δ = 54° 27' 20.4" (LT)
D = 28° 38' 52.4"	D = 57° 17' 44.8"	D = 28° 38' 52.4"
L = 58.26'	L = 104.10'	L = 190.09'
T = 29.34'	T = 57.32'	T = 102.91'
R = 200.00'	R = 100.00'	R = 200.00'

DETAIL C
STANDARD "V" DITCH
(Not To Scale)



FROM STA. 14+00 RT

	PAVEMENT SCHEDULE
C	2" SURFACE COURSE, TYPE S9.5B
E	4" BASE COURSE, TYPE B25.0B
T	EARTH MATERIAL
U	EXISTING PAVEMENT

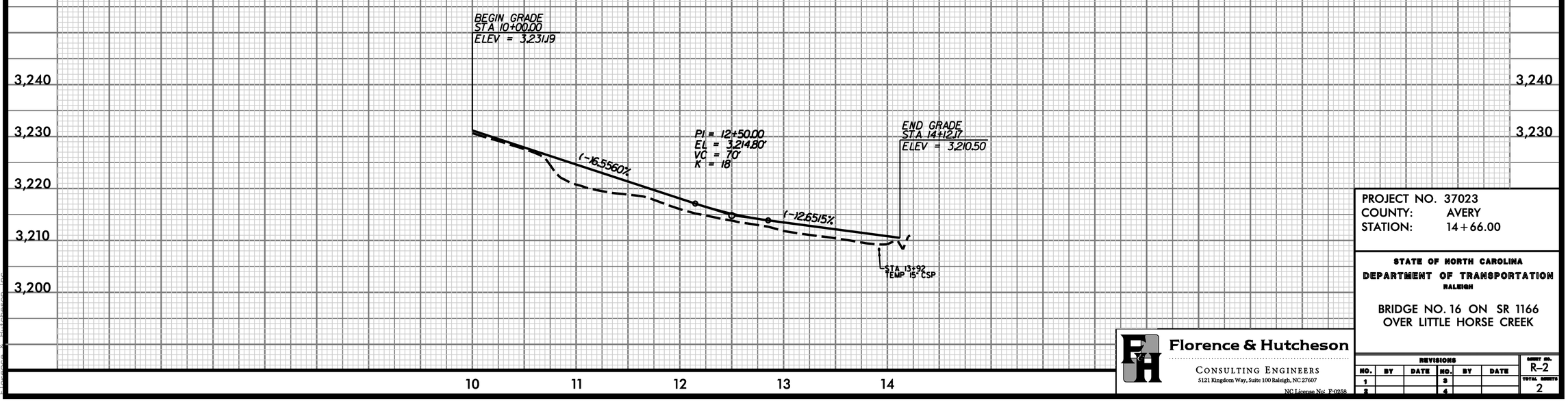
TYPICAL SECTION

BRIDGE DESCRIPTION
TIMBER DECK WITH ASPHALT OVERLAY
ON I-BEAMS
BRIDGE NO. 16 OVER BIG HORSE CREEK
ON SR 1166 BIG HORSE CREEK ROAD
HIGH WATER ELEVATION = UNKNOWN
LOW CHORD = 3208.84'

BM # 1
-L- STA. 15+84.225' RT
-BL- 2 .18" REBAR AND CAP
EL. 3213.45

RIGHT OF WAY AREA DATA

PARCEL NO.	PROPERTY OWNERS NAME	TOTAL ACREAGE	AREA TAKEN	AREA REMAINING RIGHT	AREA REMAINING LEFT	CONSTR. EASEMENT	PERMANENT DRAINAGE EASEMENT	TEMPORARY DRAINAGE EASEMENT
1	RALPH BURLESON		4,891.08 sf			197.75 sf		
2	GERALDINE McGEE		18,159.72 sf			8,610.02 sf		
3	W.H. YOUNG						6993.92 sf	



PROJECT NO. 37023
COUNTY: AVERY
STATION: 14+66.00

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE NO. 16 ON SR 1166
OVER LITTLE HORSE CREEK

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	R-2
1			3			TOTAL SHEETS
2			4			2

8/17/99

5/24/2012
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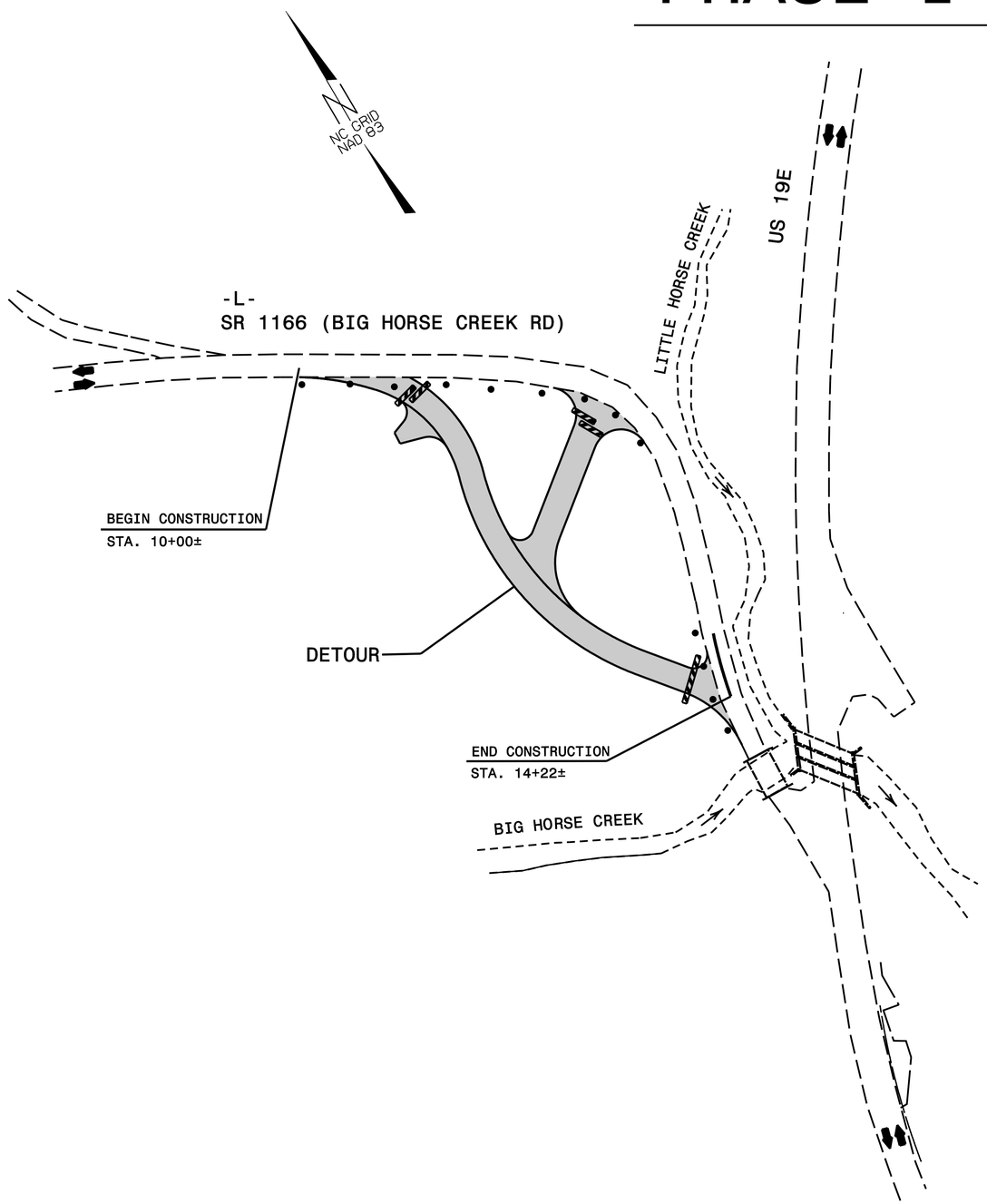
PHASE I OVERVIEW



PHASE I

STEP 1: - INSTALL ADVANCE WARNING WORK ZONE SIGNS (SEE ROADWAY STANDARD DRAWING NO. 1101.01, SHEET 3 OF 3)

STEP 2: - USING ROADWAY STANDARD DRAWING NO. 1101.02, SHEET 1 OF 15, CONSTRUCT PROPOSED DETOUR UP TO EXISTING PAVEMENT ELEVATION FROM STA. 10+00± TO STA. 14+22±. (SEE LOCAL NOTE 1)

PROJECT NO. 42568
COUNTY: AVERY
STATE: 13 + 42.00

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CULVERT ON SR 1166
OVER LITTLE HORSE CREEK

NORTH CAROLINA PROFESSIONAL SEAL 15876 ENGINEER MICHAEL T. RZEPKA
5-23-12

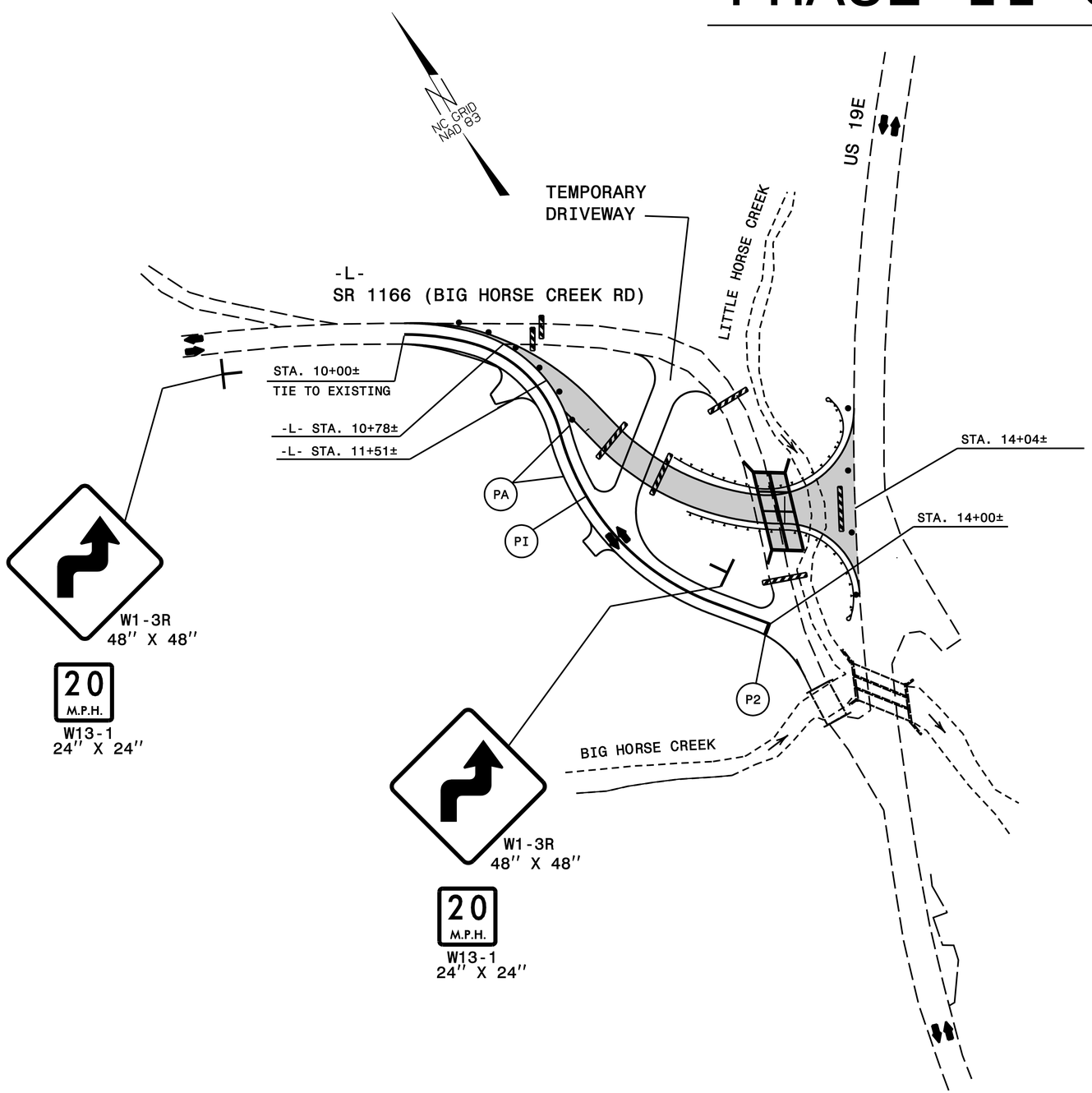
Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TCP-3
1			3			TOTAL SHEETS
2			4			5

DRAWN BY: G.E. PARKER DATE: FEBRUARY 2012
CHECKED BY: M.T. RZEPKA DATE: FEBRUARY 2012

5/23/2012
S:\Structures\bkprojects\bk-5117_avery_16\avery_16\mal1002b\trafficcontrol\tcp\phaseIovNEW.dgn
Florence & Hutcheson, Inc.

PHASE II OVERVIEW



PHASE II

WORKING IN A CONTINOUS MANNER, COMPLETE THE FOLLOWING WORK IN PHASE II, STEP 1, IN ONE DAY'S OPERATION.

STEP 1: - USING ROADWAY STANDARD DRAWING NO. 1101.02, SHEET 1 OF 15, PAVE/WEDGE AS NECESSARY TO SMOOTHLY TIE PROPOSED DETOUR WITH EXISTING SR 1166 (BIG HORSE CREEK RD.) FROM -L- STA. 10+00± TO -L- STA. 11+51±. PLACE TEMPORARY PAVEMENT MARKINGS AND MARKERS FROM STA. 10+00± TO STA. 14+00±. SWITCH SR 1166 (BIG HORSE CREEK RD.) TRAFFIC ONTO DETOUR ALIGNMENT, PLACE TRAFFIC CONTROL DEVICES, AND OPEN BOTH LANES OF DETOUR TO TRAFFIC.

STEP 2: - USING ROADWAY STANDARD DRAWING NO. 1101.02, SHEET 1 OF 15 (AS NECESSARY), CONSTRUCT PROPOSED -L-, SR 1166 (BIG HORSE CREEK RD.) FROM EDGE AND ELEVATION OF DETOUR PAVEMENT (STA. 10+78±) TO STA. 14+04± INCLUDING PROPOSED CULVERT. (SEE LOCAL NOTE 1)

PROJECT NO. 42568
COUNTY: AVERY
STATION: 13+42.00

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CULVERT ON SR 1166
OVER LITTLE HORSE CREEK

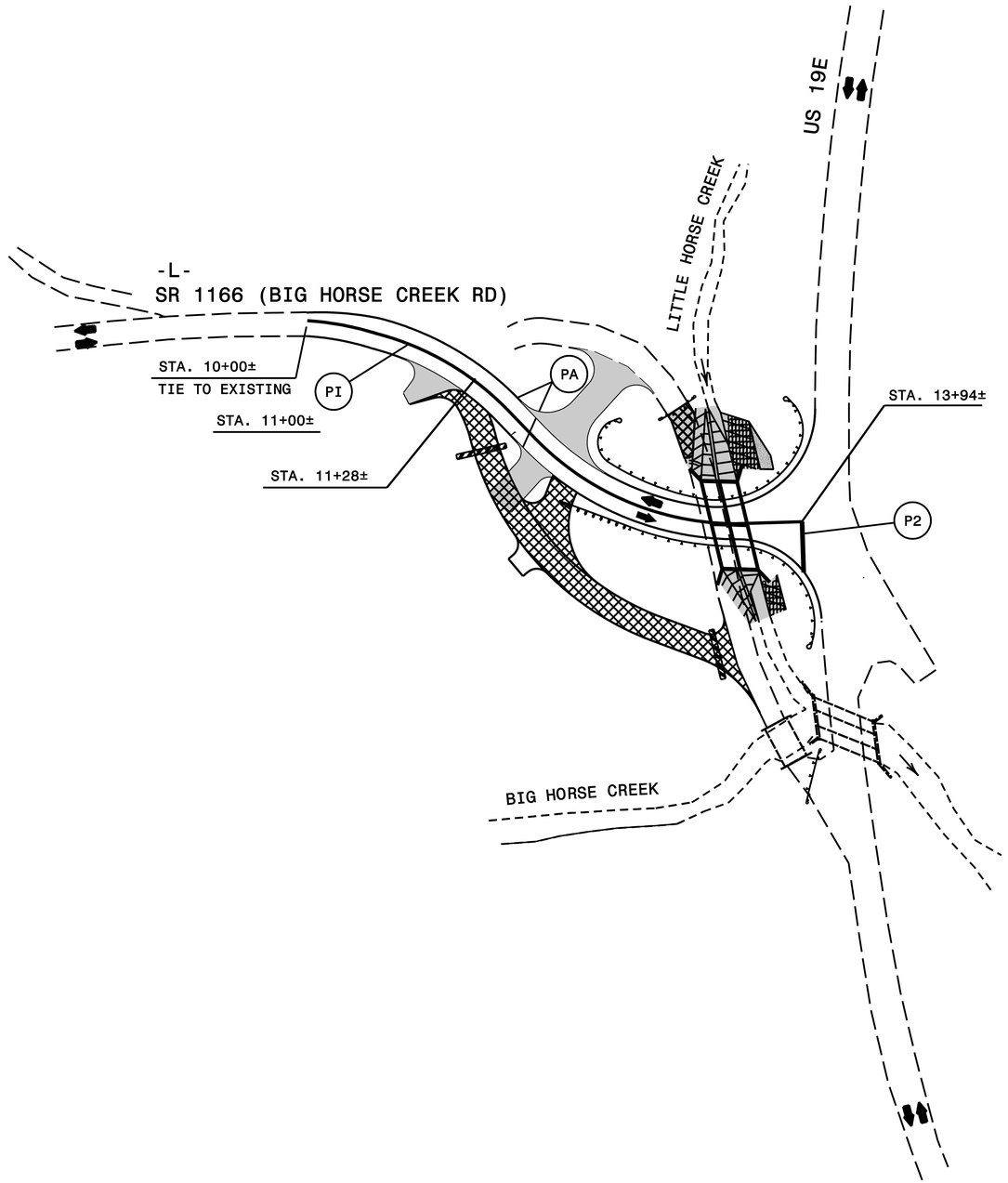
Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0288

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TCP-4
1			3			TOTAL SHEETS
2			4			5

DRAWN BY: G.E. PARKER DATE: FEBRUARY 2012
CHECKED BY: M.T. RZEPKA DATE: FEBRUARY 2012

5/23/2012
C:\Projects\bkprojects\bk-5117.avery.16\avery.16\mall002b\trafficcontrol\tcp\phaseIIov.dgn
Florence & Hutcheson, Inc.

PHASE III OVERVIEW



PHASE III

WORKING IN A CONTINOUS MANNER, COMPLETE THE FOLLOWING WORK IN PHASE III, STEP 1, IN ONE DAY'S OPERATION.

STEP 1: - USING ROADWAY STANDARD DRAWING NO. 1101.02, SHEET 1 OF 15, PAVE/WEDGE AS NECESSARY TO SMOOTHLY TIE PROPOSED -L- LINE WITH EXISTING SR 1166 (BIG HORSE CREEK RD.) FROM -L- STA. 10+00± TO -L- STA. 11+28±. PLACE TEMPORARY PAVEMENT MARKINGS AND MARKERS FROM STA. 10+00± TO STA. 13+94±. SWITCH SR 1166 (BIG HORSE CREEK RD.) TRAFFIC ONTO -L- LINE ALIGNMENT, PLACE TRAFFIC CONTROL DEVICES, AND OPEN BOTH LANES OF -L- LINE TO TRAFFIC.

STEP 2: - AWAY FROM TRAFFIC.

- COMPLETE PROPOSED CULVERT ENDWALLS AND CHANNEL MODIFICATIONS.

- REMOVE EXISTING BRIDGE, EXISTING SR 1166 (BIG HORSE CREEK RD) AND TEMPORARY DETOUR PAVEMENT AS SHOWN (SEE ROADWAY PLANS)

STEP 3: - USING ROADWAY STANDARD DRAWING NO. 1101.02, SHEET 1 OF 15, PLACE FINAL LAYER OF SURFACE COURSE ON -L-, SR 1166 (BIG HORSE CREEK RD) FROM -L- STA. 10+00± TO -L- STA. 14+15±.

- REMOVE ALL TRAFFIC CONTROL DEVICES.

PROJECT NO. 42568
COUNTY: AVERY
STATION: 13+42.00

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CULVERT ON SR 1166
OVER LITTLE HORSE CREEK

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TCP-5
1			3			TOTAL SHEETS
2			4			5

DRAWN BY: G.E. PARKER DATE: FEBRUARY 2012
CHECKED BY: M.T. RZEPKA DATE: FEBRUARY 2012

5/23/2012
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Florence & Hutcheson, Inc.

TIP PROJECT: BK-5117

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BK-5117	EC-1	

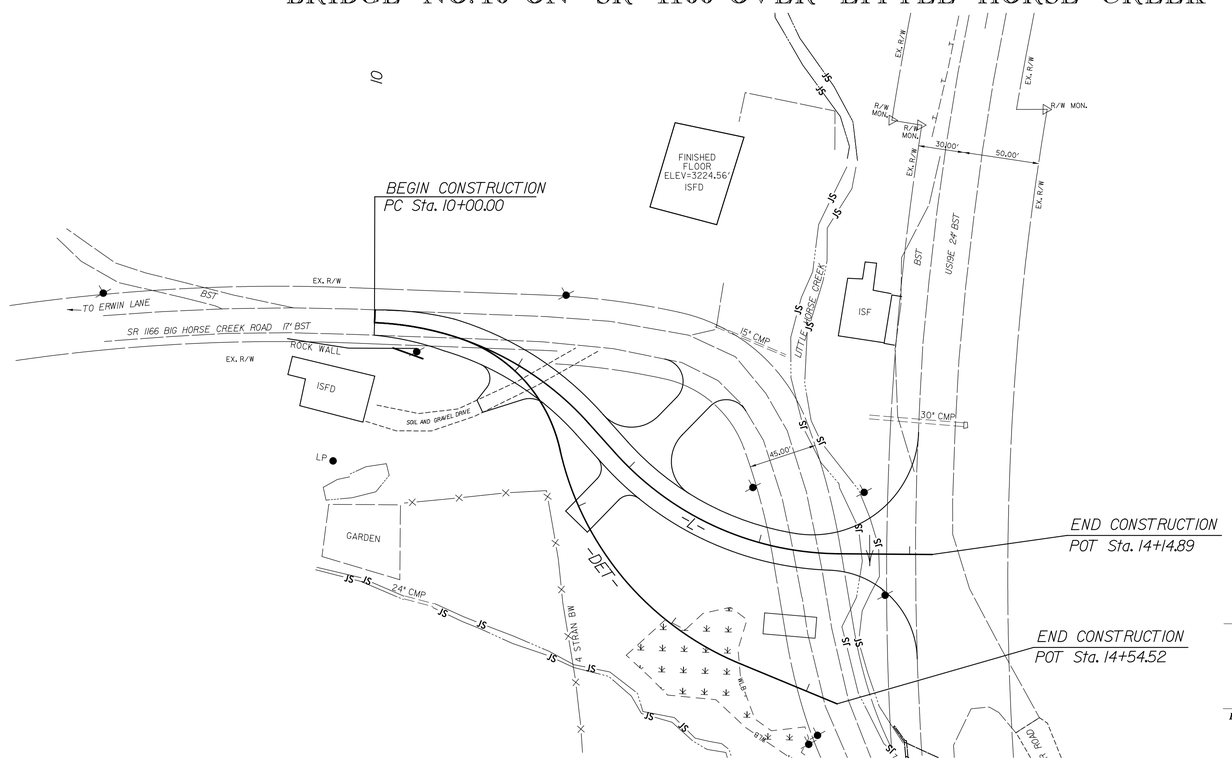
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

AVERY COUNTY

BRIDGE NO. 16 ON SR 1166 OVER LITTLE HORSE CREEK



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	
	Silt Basin Type B	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	
	Temporary Rock Silt Check Type-B	
	Wattle	
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	

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

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

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

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

W. HERBERT TURNER, JR, P.E.
ROADSIDE ENVIRONMENTAL ENGINEER
3150
LEVEL III CERTIFICATION NUMBER

STACEY H. BAILEY, P.E.
ROADSIDE ENVIRONMENTAL PROJECT ENGINEER
3074
LEVEL III CERTIFICATION NUMBER

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

GRAPHIC SCALE

25 0 50
PLANS

25 0 50
PROFILE (HORIZONTAL)

5 0 10
PROFILE (VERTICAL)

ROADSIDE ENVIRONMENTAL PROJECT ENGINEER

LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: FEBRUARY 23, 2012

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:

FLORENCE & HUTCHESON

5121 KINGDOM WAY, SUITE 100
RALEIGH NC 27607
NC License No: F-0258

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 July 18, 2006 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

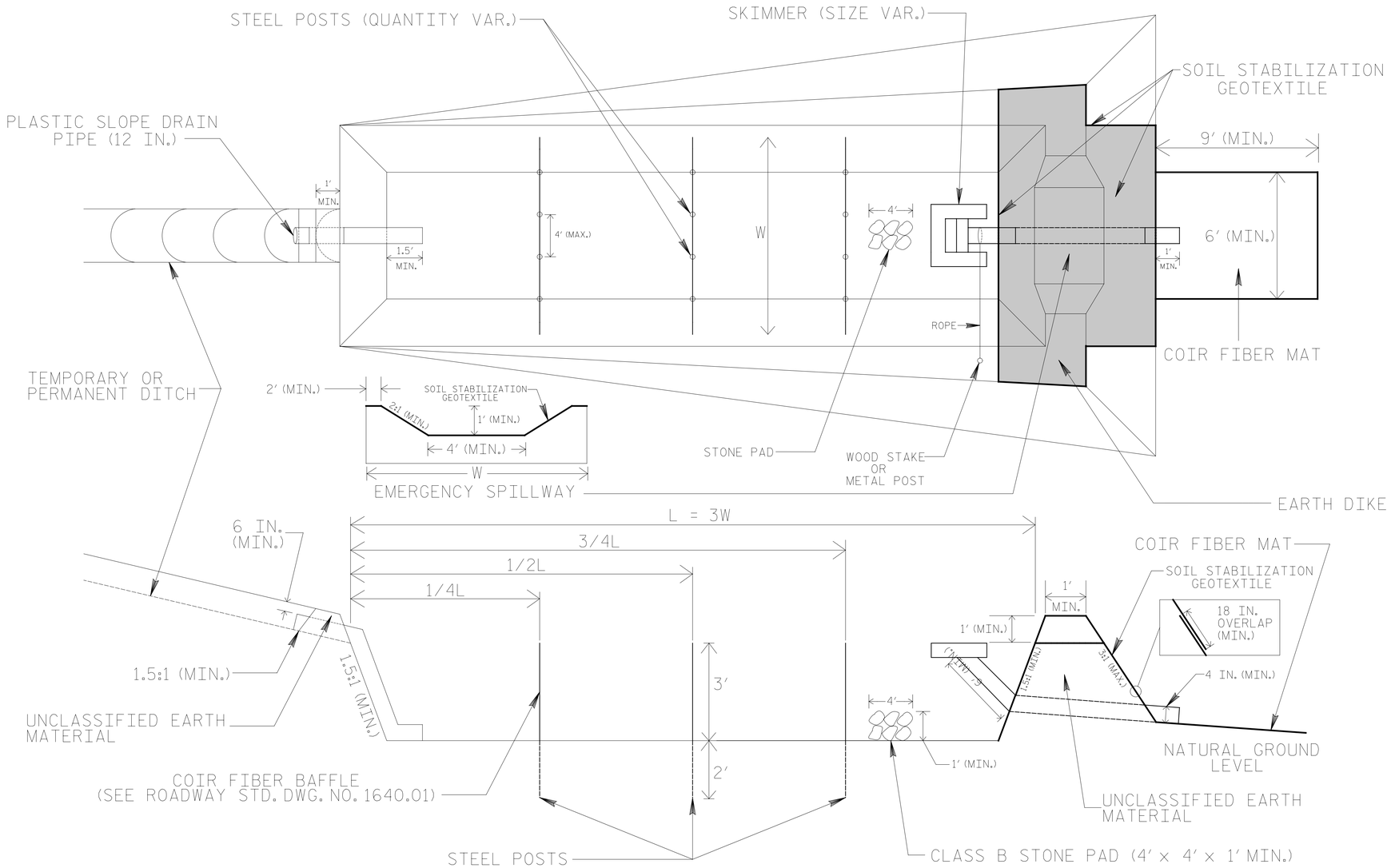
1604.01	Railroad Erosion Control Detail	1630.06	Special Stilling Basin
1605.01	Temporary Silt Fence	1632.01	Rock Inlet Sediment Trap Type A
1606.01	Special Sediment Control Fence	1632.02	Rock Inlet Sediment Trap Type B
1607.01	Gravel Construction Entrance	1632.03	Rock Inlet Sediment Trap Type C
1622.01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

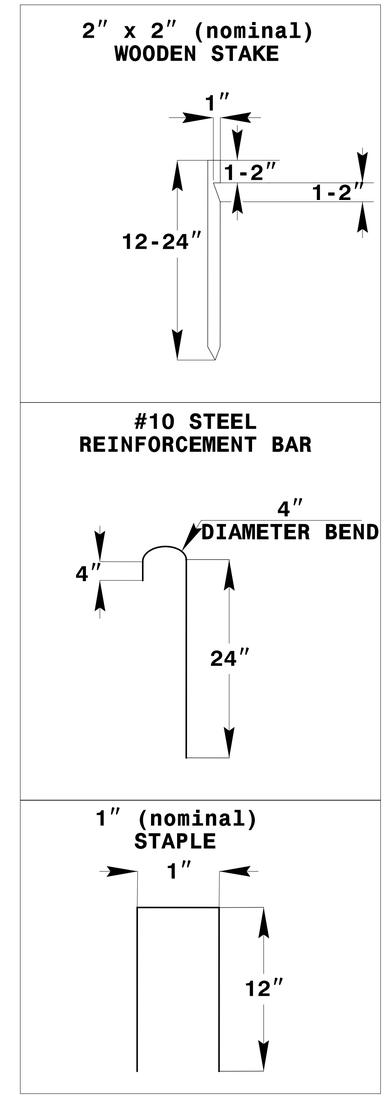
5/23/2012
R:\Hydraulics\erosion control\bk5117_hyd_tsh.dgn
Florence & Hutcheson, PBC

PROJECT REFERENCE NO.	SHEET NO.
BK-5117	EC-2
R/W SHEET NO.	
ROADSIDE ENVIRONMENTAL PROJECT ENGINEER	

LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: FEBRUARY 23, 2012

SKIMMER BASIN WITH BAFFLES DETAIL





COIR FIBER MAT ANCHOR OPTIONS

NOTES

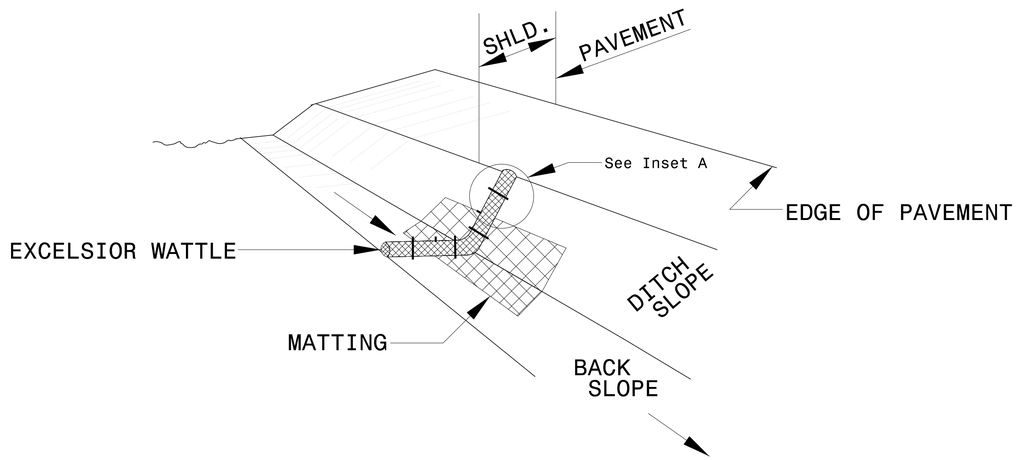
1. SEED AND PLACE MATTING FOR EROSION CONTROL ON INTERIOR AND EXTERIOR SIDESLOPES.
2. LIMIT EARTH DIKE HEIGHT TO 5 FT.
3. FOR BASIN DEPTH OF 3 FT., THE MINIMUM BASIN WIDTH SHALL BE 9 FT.
4. DETERMINE EMERGENCY SPILLWAY LENGTH (FT.) USING Q/0.8, WHERE Q IS FLOW RATE (CFS) INTO BASIN.
5. PLASTIC SLOPE DRAIN PIPE AT INLET OF BASIN MAY BE REPLACED BY FILTRATION GEOTEXTILE AS DIRECTED.
6. SOIL STABILIZATION GEOTEXTILE FOR EMERGENCY SPILLWAY SHALL BE ONE CONTINUOUS PIECE OF MATERIAL OR OVERLAPPED 18 IN. (MIN.).

NOT TO SCALE

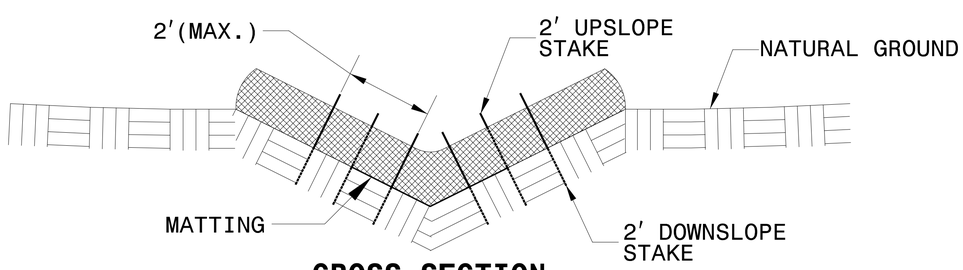
PROJECT REFERENCE NO.	SHEET NO.
BK-5117	EC-2A
R/W SHEET NO.	
ROADSIDE ENVIRONMENTAL PROJECT ENGINEER	

LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: FEBRUARY 23, 2012

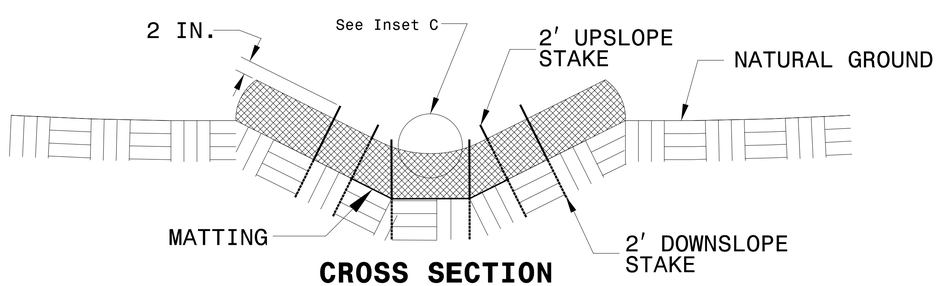
WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER EXCELSIOR 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.

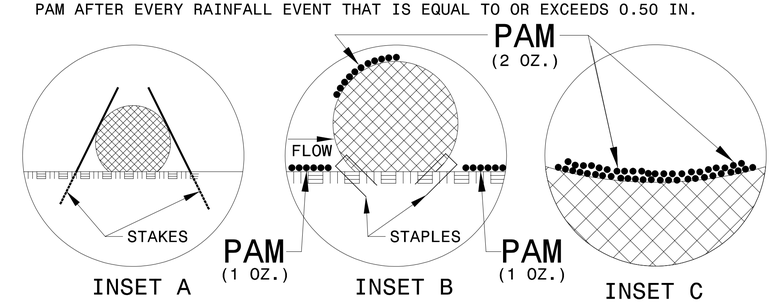
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

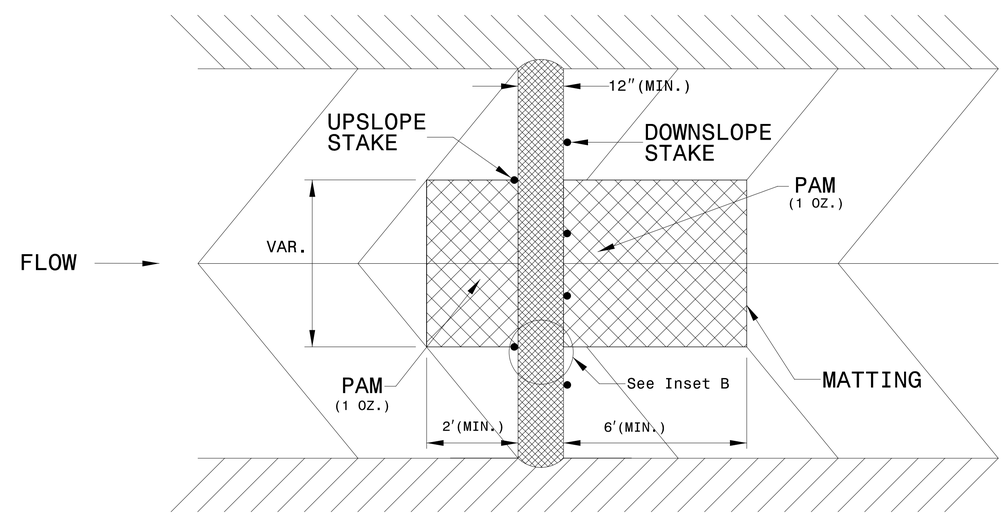
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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.
BK-5117	EC-2B

ROADSIDE ENVIRONMENTAL PROJECT ENGINEER

LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: FEBRUARY 23, 2012

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-DET-	12+90	13+60	RT	65
4	-L-	12+50	13+18	LT	50
				SUBTOTAL	115
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					7635
				TOTAL	7750
				SAY	7750

PERMANENT SOIL REINFORCEMENT MAT

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	11+00	12+50	LT	125
				SUBTOTAL	125
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					0
				TOTAL	125
				SAY	125

PROJECT REFERENCE NO.	SHEET NO.
BK-5117	EC-3

ROADSIDE ENVIRONMENTAL PROJECT ENGINEER

LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: FEBRUARY 23, 2012

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.

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

GRAPHIC SCALE
50 0 50 100

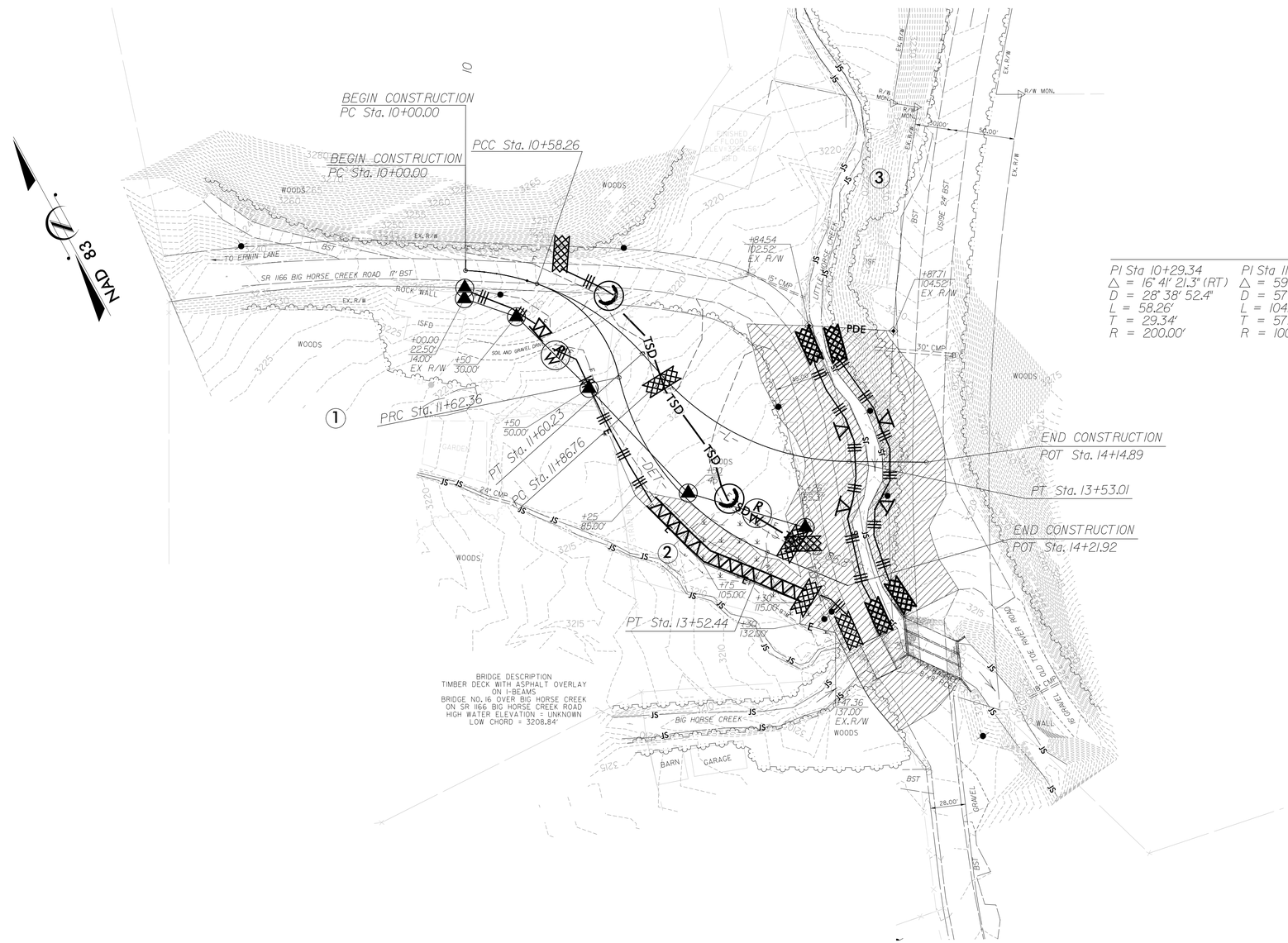
PROJECT REFERENCE NO.	SHEET NO.
BK5117	EC-4/CONST 4A
R/W SHEET NO.	
ROADSIDE ENVIRONMENTAL PROJECT ENGINEER	

LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: FEBRUARY 23, 2012

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4A

TEMPORARY DETOUR



-DET-

PI Sta 10+29.34	PI Sta 11+15.58	PI Sta 12+65.27
Δ = 16° 41' 21.3" (RT)	Δ = 59° 38' 45.5" (RT)	Δ = 54° 27' 20.4" (LT)
D = 28° 38' 52.4"	D = 57° 17' 44.8"	D = 28° 38' 52.4"
L = 58.26'	L = 104.10'	L = 190.09'
T = 29.34'	T = 57.32'	T = 102.91'
R = 200.00'	R = 100.00'	R = 200.00'

ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

PROJECT NO. 37023
COUNTY: AVERY
STATION: 14 + 66.00
REPLACES BRIDGE NO. 16

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE NO. 16 ON SR 1166
OVER LITTLE HORSE CREEK

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			
2			4			

8/17/99

2/23/2012
R:\Hydraulics\ergsgn control\BK5117_hyd_psh_det_c&g.dgn
Kevin Bassolsky, P.E.

GRAPHIC SCALE
50 0 50 100

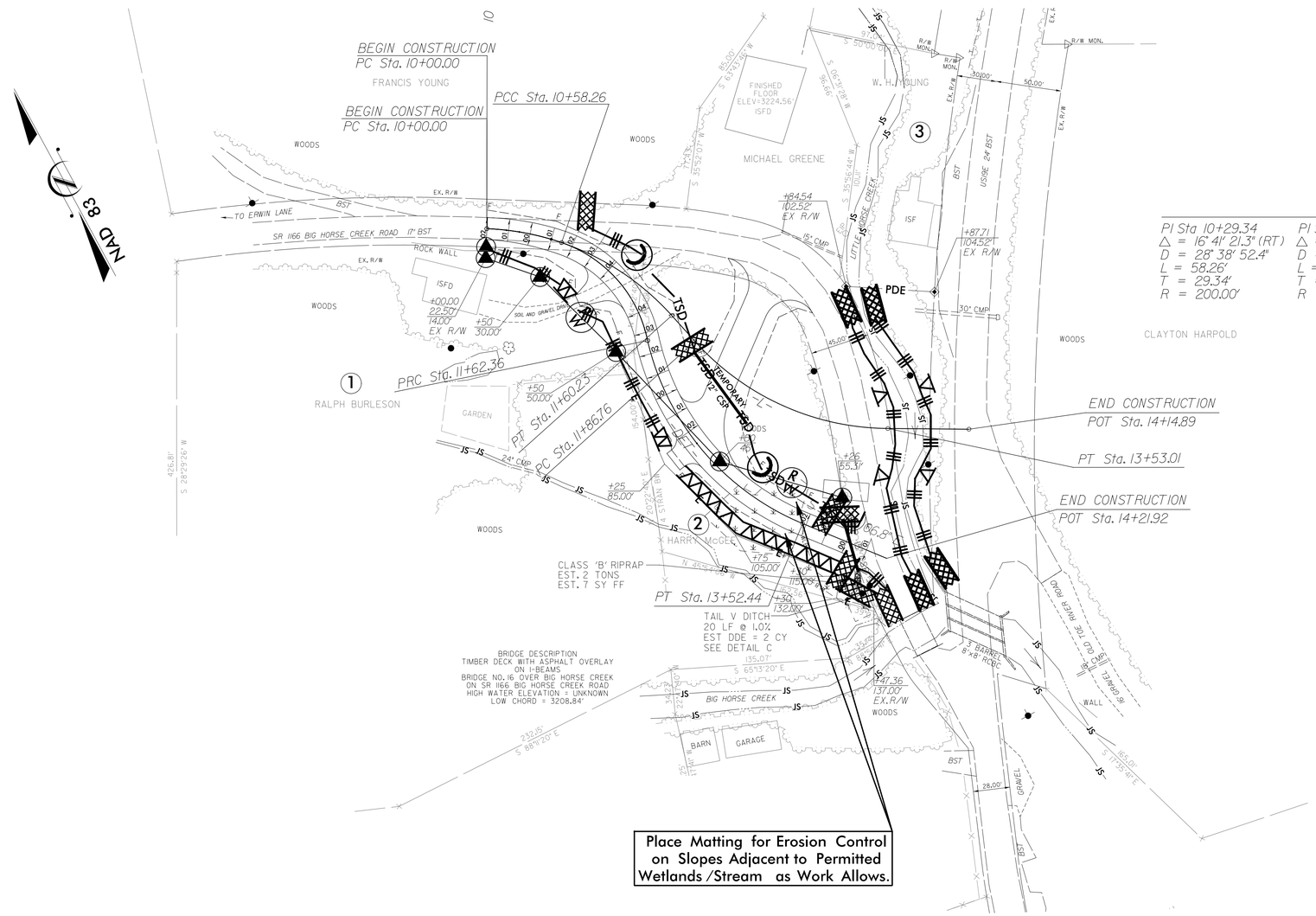
PROJECT REFERENCE NO.	SHEET NO.
BK-5117	EC-5/CONST 4A
R/W SHEET NO.	
ROADSIDE ENVIRONMENTAL PROJECT ENGINEER	

LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: FEBRUARY 23, 2012

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

FINAL GRADE EROSION CONTROL
FOR CONSTRUCTION SHEET 4A

TEMPORARY DETOUR

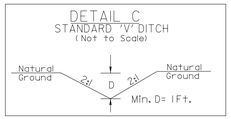


Place Matting for Erosion Control on Slopes Adjacent to Permitted Wetlands /Stream as Work Allows.

-DET-

PI Sta 10+29.34	PI Sta 11+15.58	PI Sta 12+65.27
Δ = 16° 41' 21.3" (RT)	Δ = 59° 38' 45.5" (RT)	Δ = 54° 27' 20.4" (LT)
D = 28° 38' 52.4"	D = 57° 17' 44.8"	D = 28° 38' 52.4"
L = 58.26'	L = 104.10'	L = 190.09'
T = 29.34'	T = 57.32'	T = 102.91'
R = 200.00'	R = 100.00'	R = 200.00'

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



FROM STA. 14+00 RT

PROJECT NO. 37023
COUNTY: AVERY
STATION: 14+66.00
REPLACES BRIDGE NO. 16

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE NO. 16 ON SR 1166
OVER LITTLE HORSE CREEK

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			
2			4			

8/17/99

2/23/2012
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K:\Projects\BK5117\Roadsides\EC

GRAPHIC SCALE
50 0 50 100

PROJECT REFERENCE NO.	SHEET NO.
BK5117	EC-6/CONST 4
R/W SHEET NO.	
ROADSIDE ENVIRONMENTAL PROJECT ENGINEER	

LEVEL III CERTIFIED BY:
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CERTIFICATION NUMBER: 3074
ISSUED: FEBRUARY 23, 2012

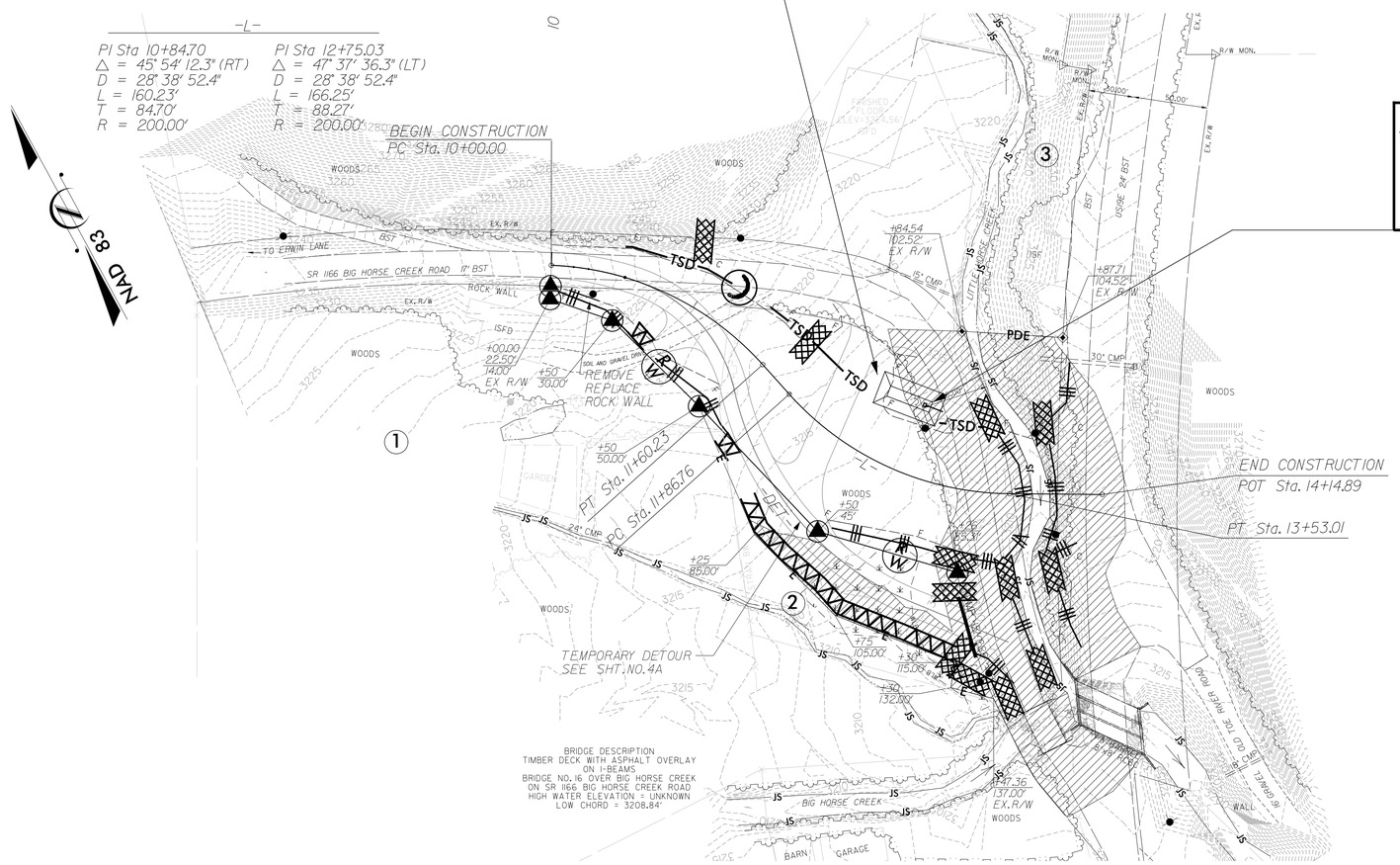
Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

CULVERT LOCATION: -L- STA 13+42
FOR CONSTRUCTION SEQUENCE, SEE
SHEET EC-8

Stabilize and reinforce
bank to allow for
installation of skimmer basin

44 x 22 x 3
1.5 inch Skimmer
with .875 inch
Orifice Diameter
14 ft. weir
ID 4.1



ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

PROJECT NO. 37023
COUNTY: AVERY
STATION: 14+66.00
REPLACES BRIDGE NO. 16

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE NO. 16 ON SR 1166
OVER LITTLE HORSE CREEK

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			
2			4			

8/17/99

2/23/2012
R:\Roadways\erosion control\BK5117_hyd_psh_c&g.dgn
Kci Associates, P.C.

GRAPHIC SCALE
50 0 50 100

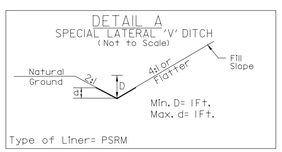
PROJECT REFERENCE NO.	SHEET NO.
BK5117	EC-7/CONST 4
R/W SHEET NO.	
ROADSIDE ENVIRONMENTAL PROJECT ENGINEER	

LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: FEBRUARY 23, 2012

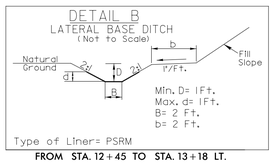
Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

8/17/99

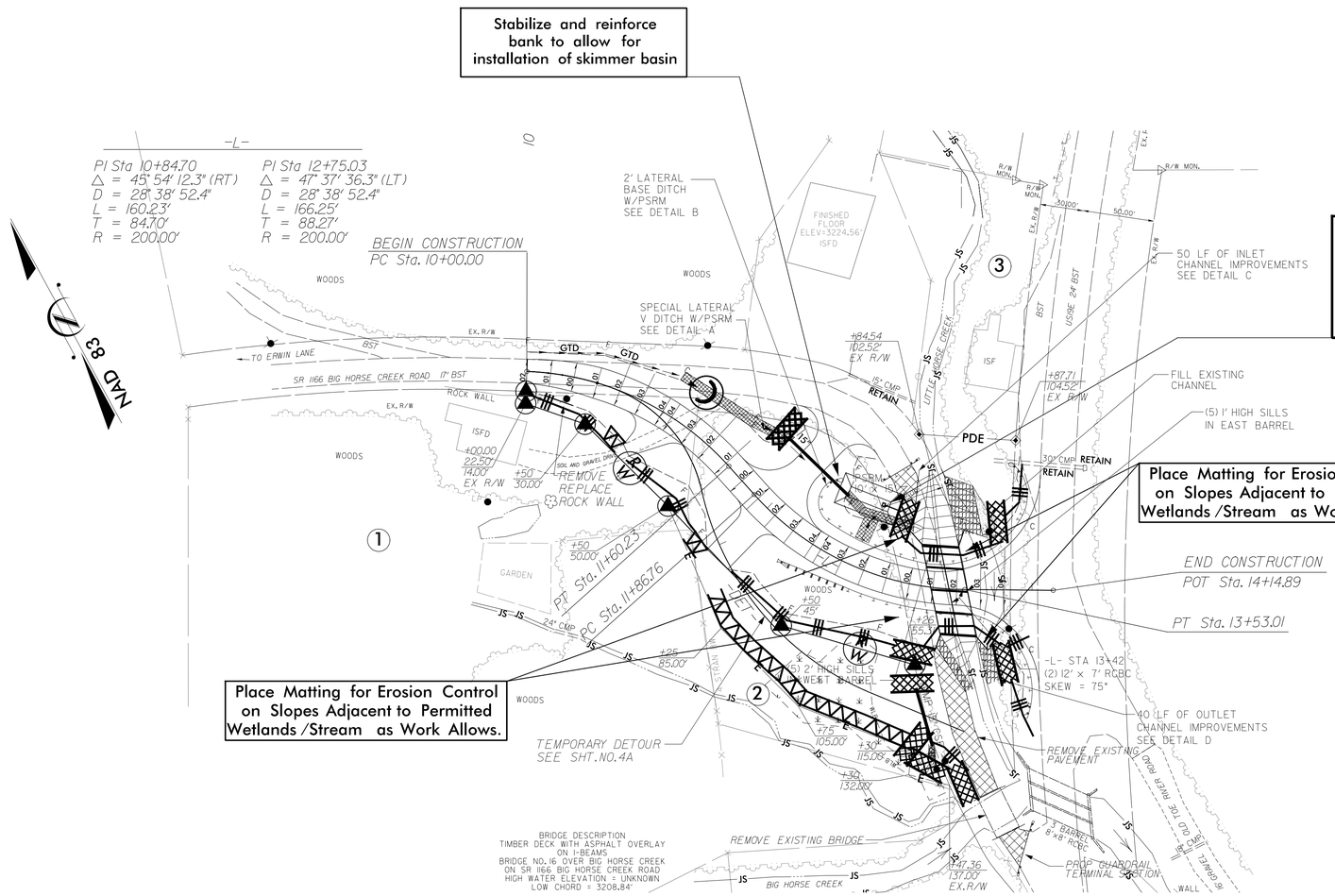
FINAL GRADE EROSION CONTROL FOR CONSTRUCTION SHEET 4

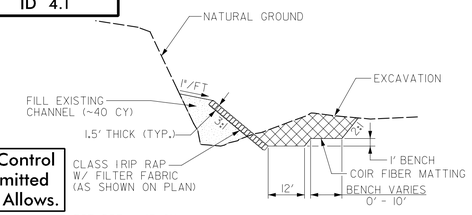


FROM STA. 11+00 TO STA. 11+75 LT.



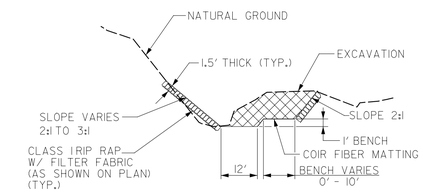
FROM STA. 12+45 TO STA. 13+18 LT.





EST. DDE = 43 CY
EST. CLASS IRIP RAP = 65 TONS
EST. FILTER FABRIC = 100 SY
EST. COIR FIBER MATTING = 77 SY

DETAIL C
INLET CHANNEL



EST. DDE = 26 CY
EST. CLASS IRIP RAP = 73 TONS
EST. FILTER FABRIC = 120 SY
EST. COIR FIBER MATTING = 70 SY

DETAIL D
OUTLET CHANNEL

PROJECT NO. 37023
COUNTY: AVERY
STATION: 14+66.00
REPLACES BRIDGE NO. 16

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE NO. 16 ON SR 1166
OVER LITTLE HORSE CREEK

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			
2			4			

2/23/2012
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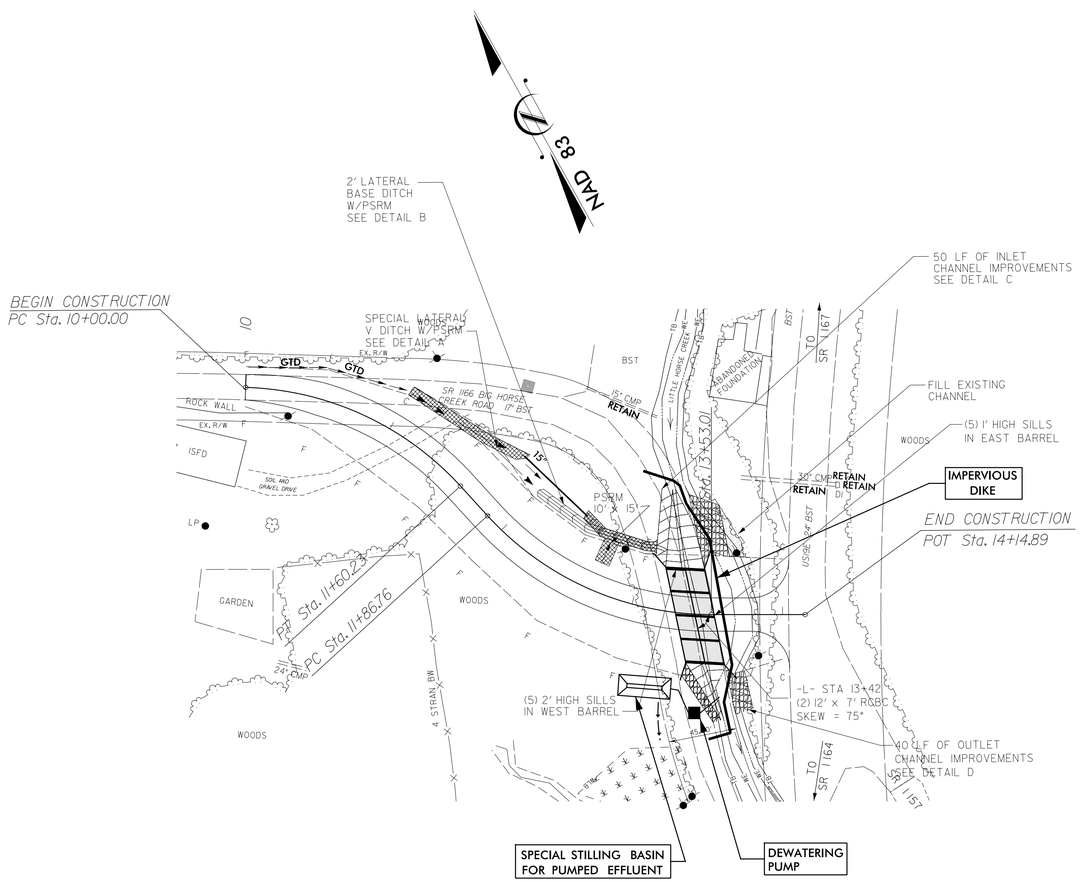
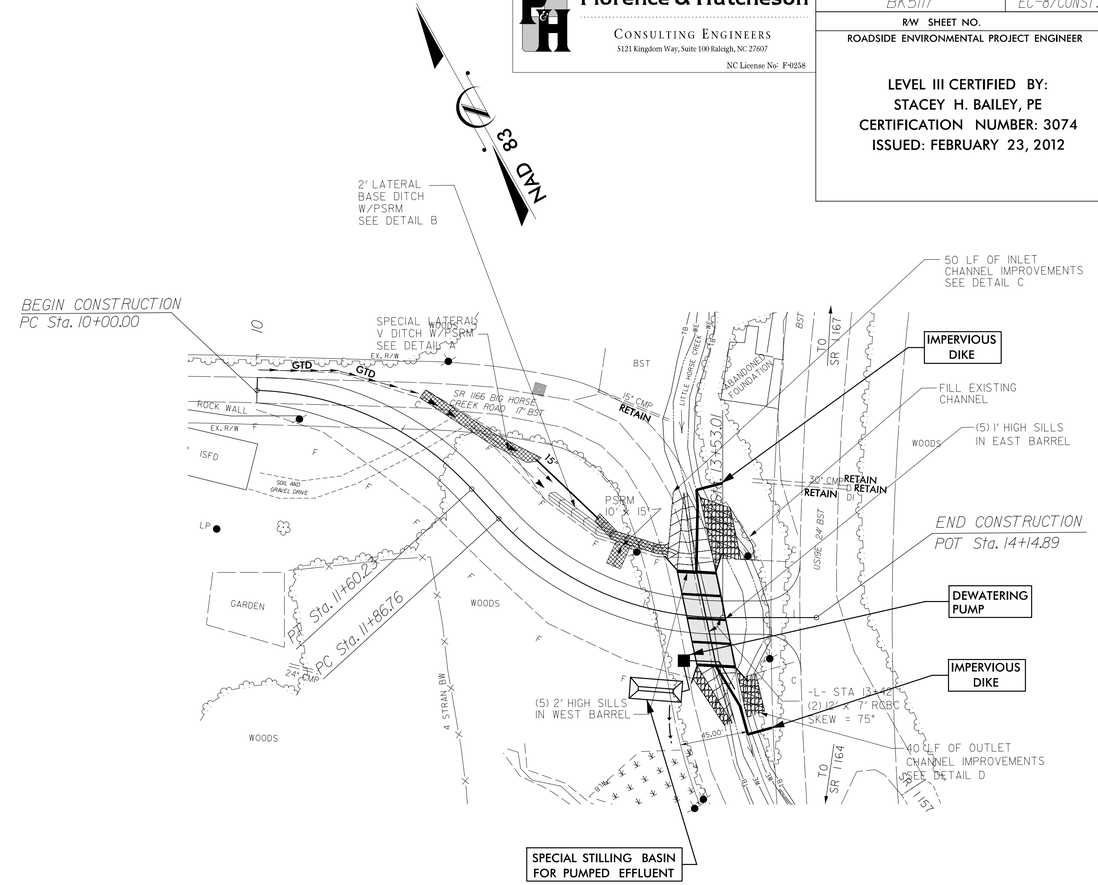
Kc Associates, P.C.

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
BK5117	EC-8/CONST.4
R/W SHEET NO.	
ROADSIDE ENVIRONMENTAL PROJECT ENGINEER	

LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: FEBRUARY 23, 2012





PHASE–1

CONSTRUCTION SEQUENCE (STA. 13 + 42 –L–)

(MAINTENANCE OF TRAFFIC VIA ON–SITE DETOUR.)

1. INSTALL SPECIAL STILLING BASIN.
2. PLACE PHASE–1 IMPERVIOUS DIKES.
3. MAINTAIN 4–FT MINIMUM BASE TO EXISTING CHANNEL.
4. PLACE PUMPING APPARATUS. DEWATER ENTRAPPED AREA.
5. CONSTRUCT BOX CULVERT, HEADWALLS, AND WEST SIDE WINGWALLS.
6. CONSTRUCT AND STABILIZE UPSTREAM AND DOWNSTREAM CHANNEL IMPROVEMENTS WITHIN THE PHASE–1 AREA (WEST SIDE). REFER TO ROADWAY PLANS FOR CHANNEL DETAIL.
7. REMOVE PHASE–1 IMPERVIOUS DIKES.

NOTES:

1. CULVERT CONSTRUCTION SHALL BE PERFORMED IN ONLY DRY OR ISOLATED SECTIONS OF CHANNEL.
2. IMPERVIOUS DIKES ARE TO BE USED TO ISOLATE WORK FROM STREAM FLOW AS NECESSARY.
3. ALL GRADED AREAS SHALL BE STABILIZED WITHIN 24 HOURS.
4. MAINTENANCE OF STREAM FLOW OPERATIONS SHALL BE INCIDENTAL TO THE WORK. THIS INCLUDES POLYETHYLENE SHEETING, DIVERSION PIPES, PUMPS AND HOSES.
5. PUMPS AND HOSES SHALL BE OF SUFFICIENT SIZE TO DEWATER THE WORK AREA.
6. THE CONTRACTOR SHALL NOT PUMP SEDIMENT–LADEN WATER DIRECTLY INTO STREAM. FOR DE–WATERING OF CULVERT SITES, THE CONTRACTOR SHALL FILTER SEDIMENT–LADEN WATER THROUGH SPECIAL STILLING BASIN.

PHASE–2

CONSTRUCTION SEQUENCE (STA. 13 + 42 –L–)

(ROAD CLOSURE – MAINTENANCE OF TRAFFIC VIA OFFSITE DETOUR.)

1. PLACE PHASE–2 UPSTREAM IMPERVIOUS DIKE.
2. DIVERT FLOW THROUGH HIGH FLOW BARREL (WEST).
3. PLACE PHASE–2 DOWNSTREAM IMPERVIOUS DIKE.
4. PLACE PUMPING APPARATUS. DEWATER ENTRAPPED AREA.
5. CONSTRUCT EAST SIDE WINGWALLS.
6. CONSTRUCT AND STABILIZE UPSTREAM AND DOWNSTREAM CHANNEL IMPROVEMENTS WITHIN THE PHASE–2 AREA (EAST SIDE). REFER TO ROADWAY PLANS FOR CHANNEL DETAIL.
7. REMOVE PHASE–2 IMPERVIOUS DIKES. DIVERT FLOW THROUGH LOW FLOW BARREL.
8. REMOVE SPECIAL STILLING BASIN. STABILIZE DISTURBED AREAS WITH SEED AND MULCH.
9. COMPLETE ROADWAY.

5/14/99
2/23/2012
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Florence & Hutcheson, Inc.

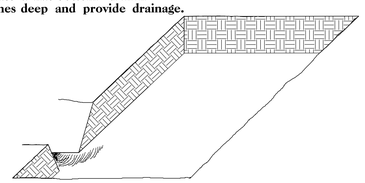
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BK-5117	RF-1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

PLANTING DETAILS

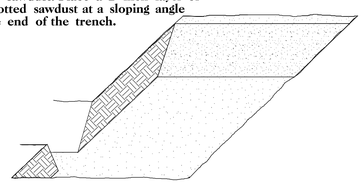
SEEDLING / LINER BAREROOT PLANTING DETAIL

HEALING IN

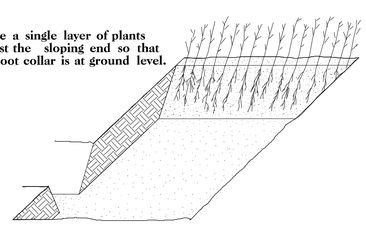
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



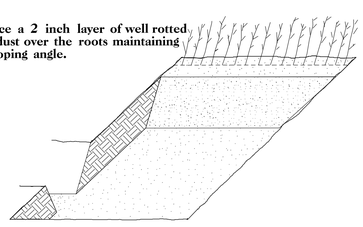
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



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

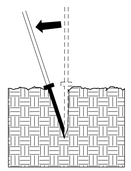


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

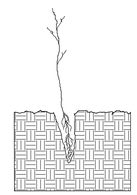


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

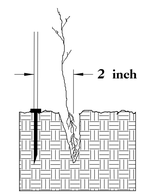
DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



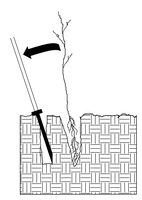
1. Insert planting bar as shown and pull handle toward planter.



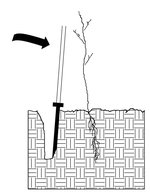
2. Remove planting bar and place seedling at correct depth.



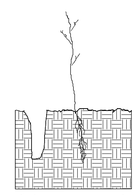
3. Insert planting bar 2 inches toward planter from seedling.



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

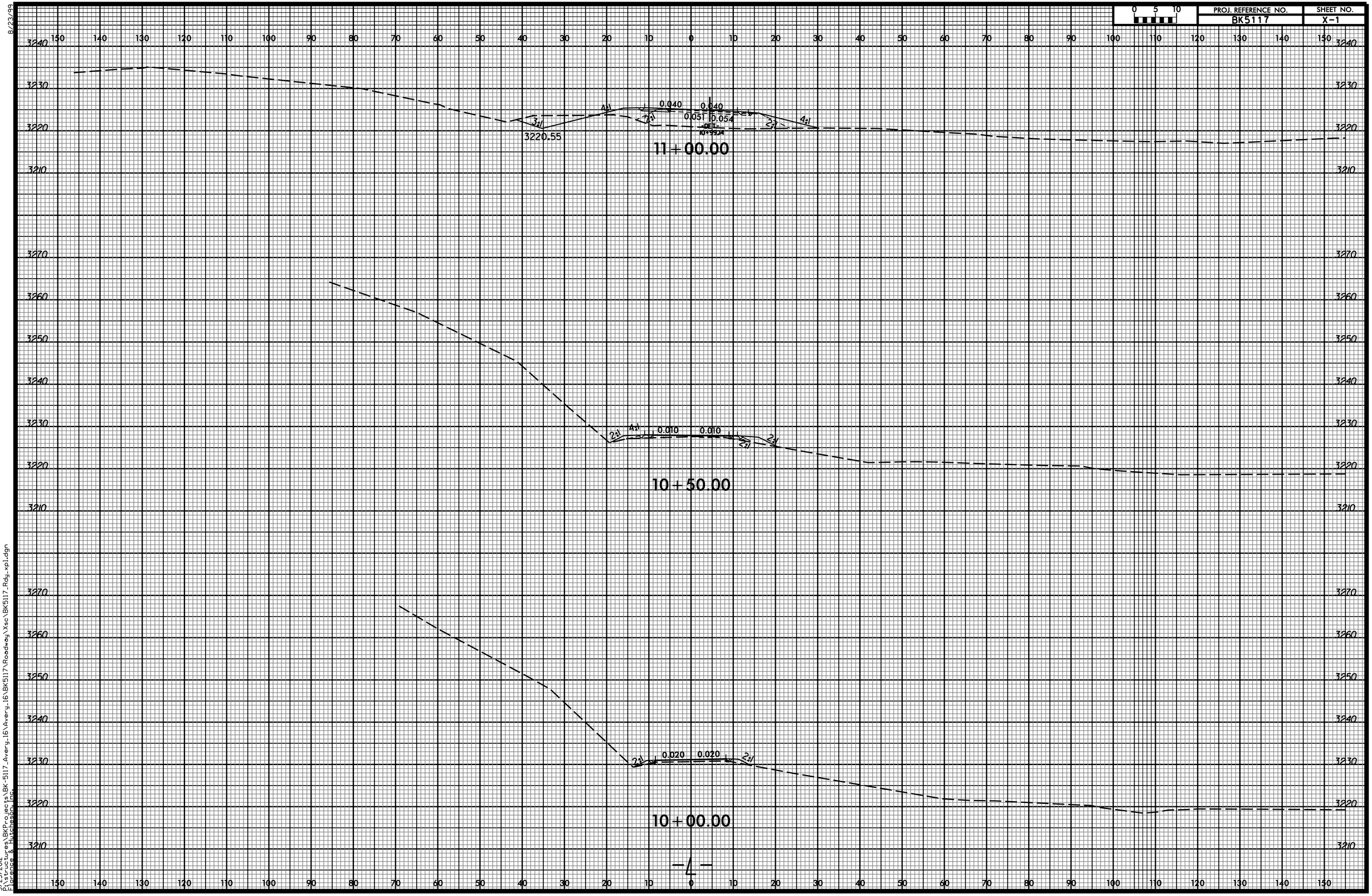
MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

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

PROJ. REFERENCE NO.	SHEET NO.
BK5117	X-1



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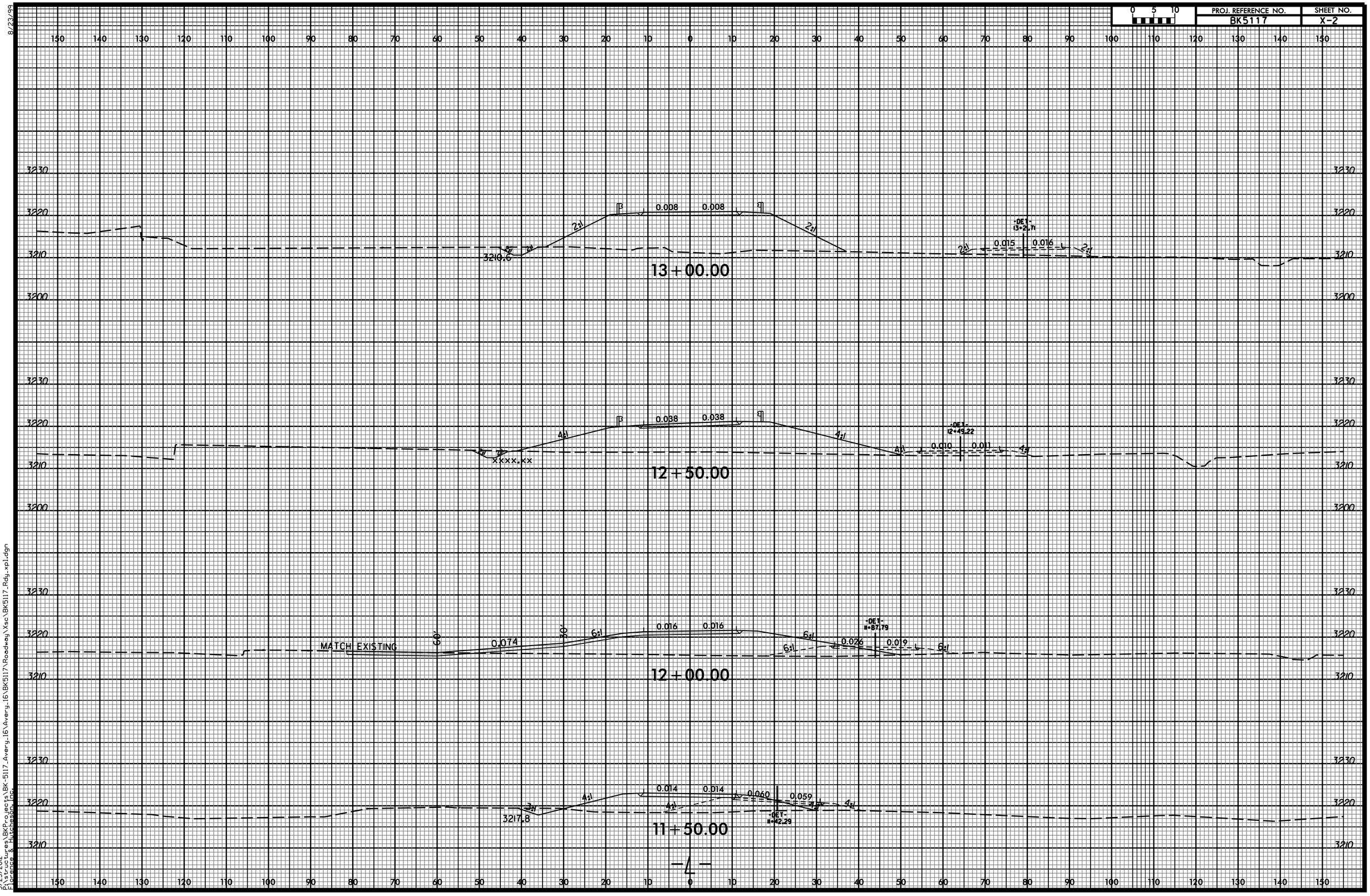
PROJ. REFERENCE NO.	SHEET NO.
BK5117	X-2



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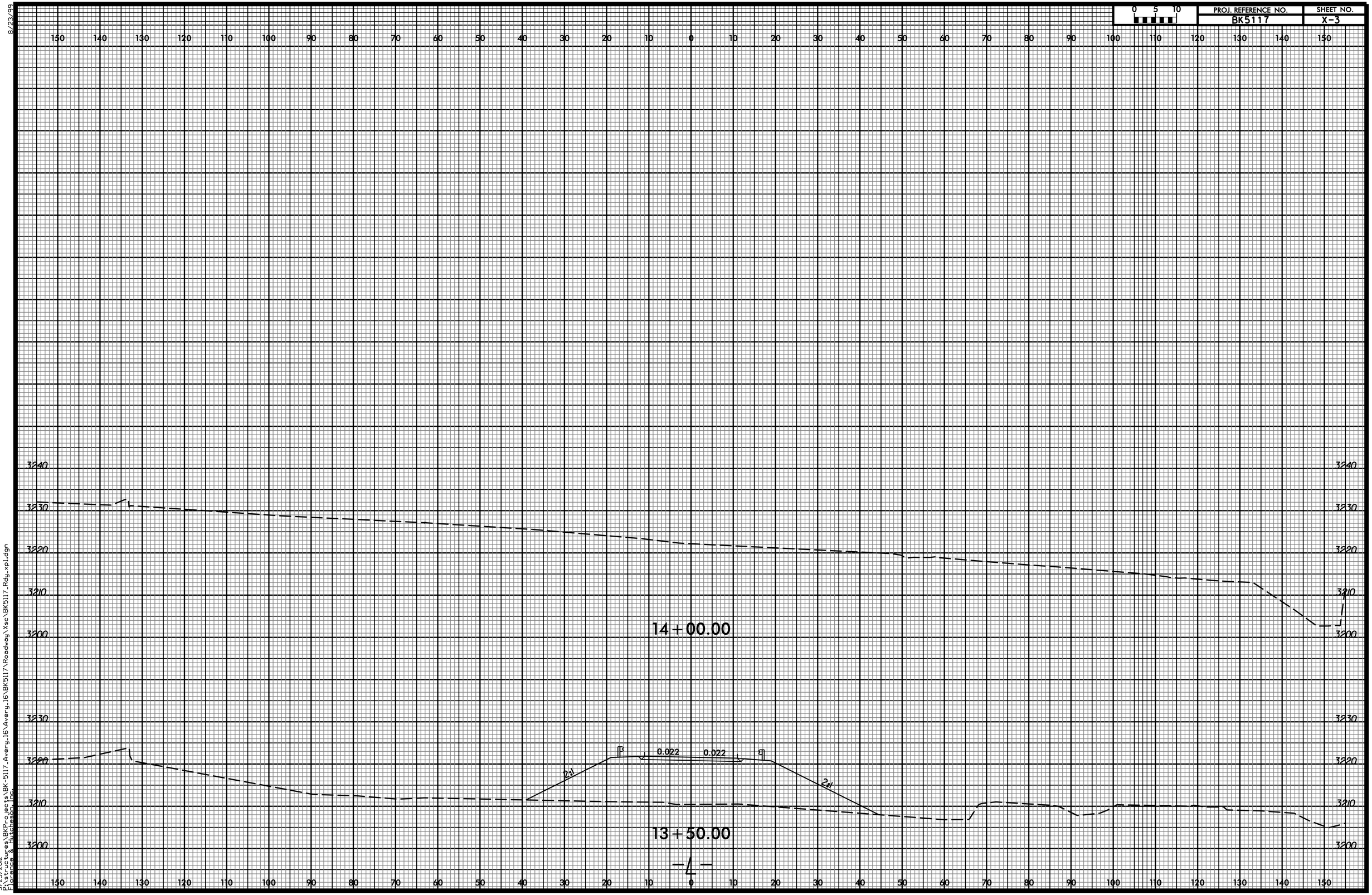
Florence & Hutcheson Inc.

PROJ. REFERENCE NO.	SHEET NO.
BK5117	X-3



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