STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	5C.032072	1	25

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
5C.032072		P.E.
5C.032072		CONST.

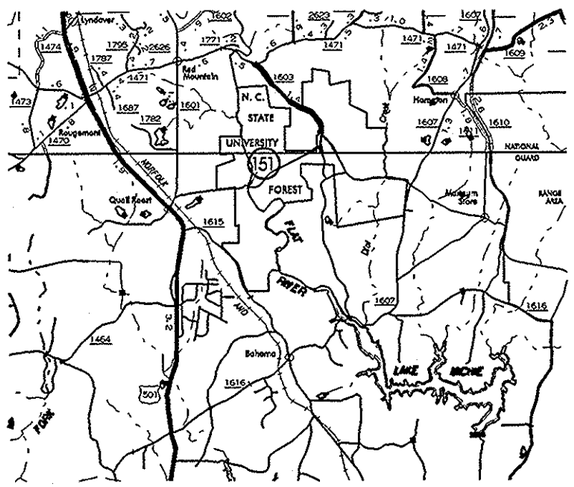
STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS

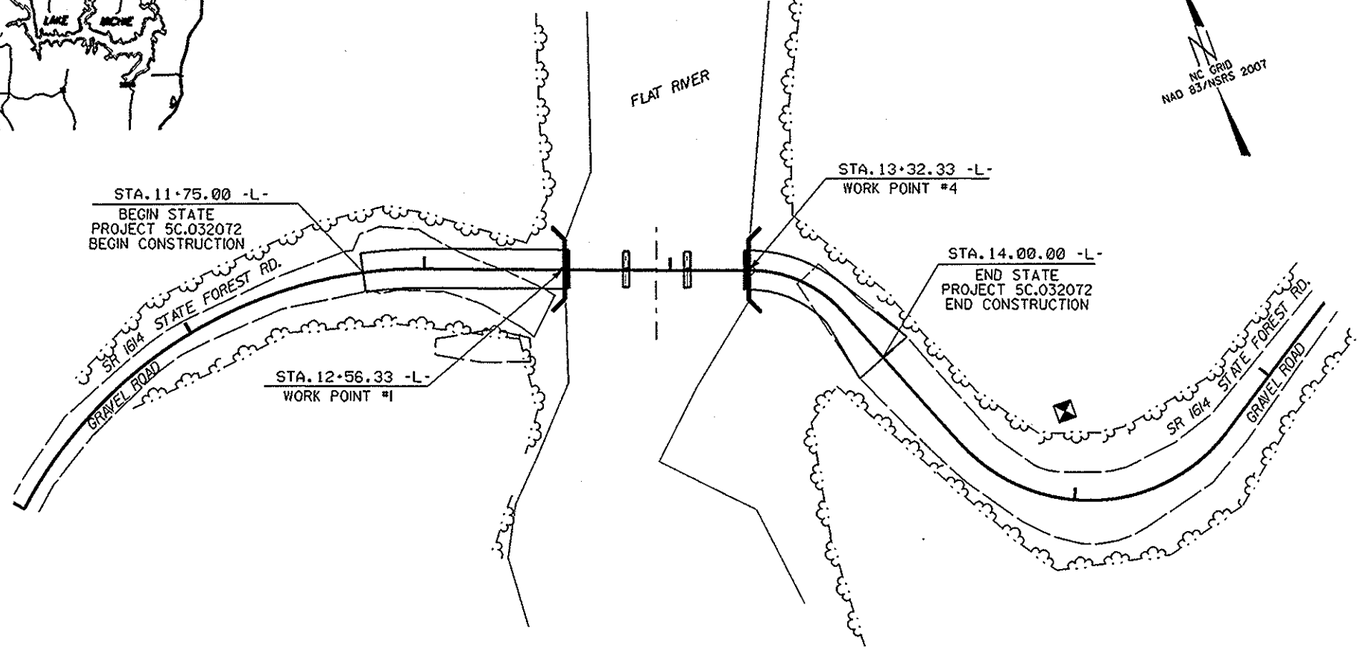
DURHAM COUNTY

LOCATION: BRIDGE 151 ON SR 1614 OVER FLAT RIVER

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



VICINITY MAP



DESIGN DATA

ADT 2008 = 50

PROJECT LENGTH

LENGTH OF BRIDGE PROJECT = 0.0428 MILES

2012 STANDARD SPECIFICATIONS

LETTING DATE:

MAY 23, 2012

Prepared in the Office of:

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STRUCTURES MANAGEMENT UNIT – PRESERVATION & REPAIR GROUP
1000 BIRCH RIDGE DR. RALEIGH, N.C. 27610

RICK NELSON, P.E.
PROJECT ENGINEER

ENGINEER

FARZIN ASEFNIA, P.E.
PROJECT DESIGN ENGINEER

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	5C.032072	IA	25

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
5C.032072		P.E.
5C.032072		CONST.

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS

DURHAM COUNTY

LOCATION: BRIDGE 151 ON SR 1614 OVER FLAT RIVER

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

INDEX OF SHEETS

1	*TITLE SHEET*
1A	*INDEX OF SHEETS*
S1–S10	*STRUCTURES*
R1–R3	*ROADWAY*
X1–X6	*CROSS SECTIONS*
EC1–EC4	*EROSION CONTROL*

DESIGN DATA

ADT 2008 = 50

PROJECT LENGTH

LENGTH OF BRIDGE PROJECT = 0.0428 MILES

2012 STANDARD SPECIFICATIONS

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RICK NELSON, P.E.
PROJECT ENGINEER

ENGINEER

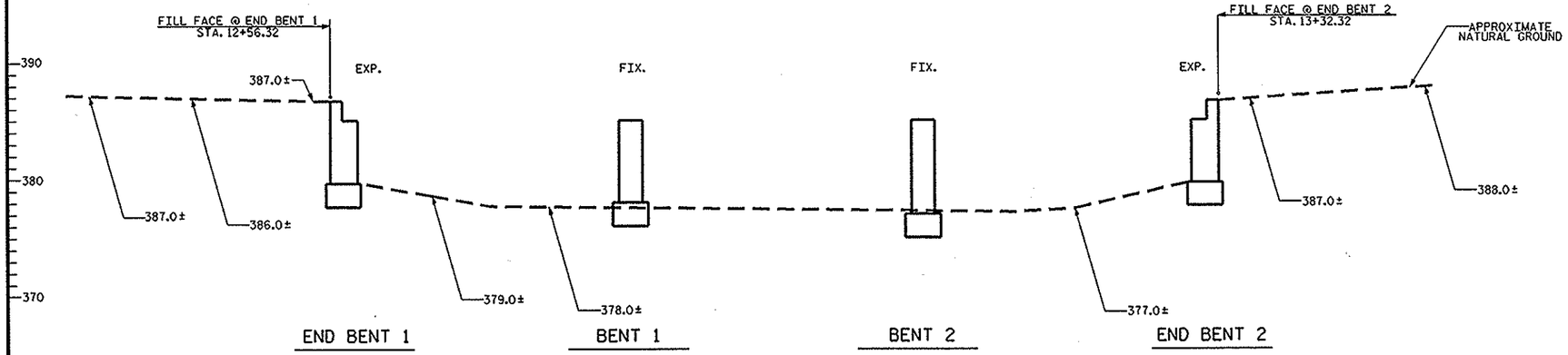
FARZIN ASEFNIA, P.E.
PROJECT DESIGN ENGINEER

12+50 | 13+00 | 13+50

-2.07% +8.38%

GRADE DATA

SPAN A | SPAN B | SPAN C



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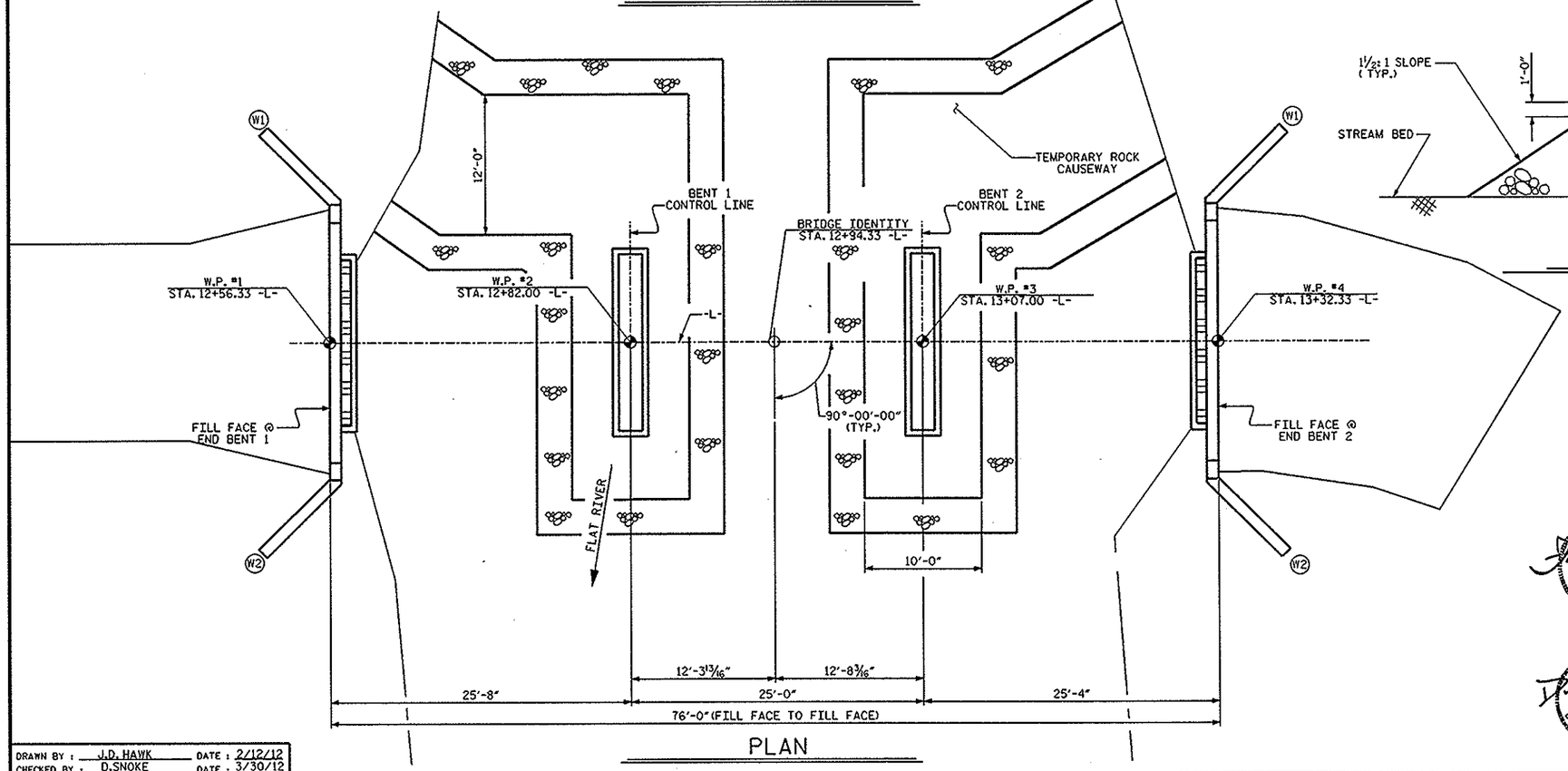
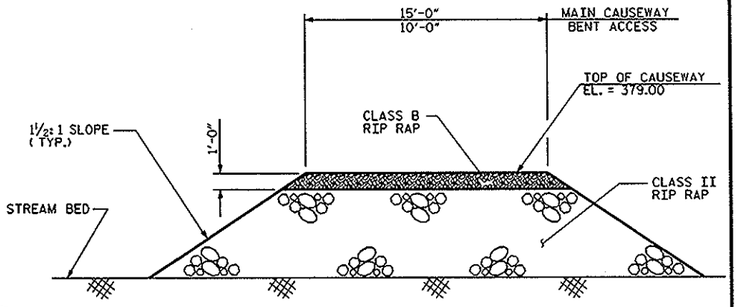


PLAN



DETAIL OF CAUSEWAY

DRAWN BY : J.D. HAWK DATE : 2/12/12
CHECKED BY : D.SNOKE DATE : 3/30/12

03-APR-2012 08:46
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PROJECT NO. 5C.032072
DURHAM COUNTY
STATION: 12+94.32 -L-
SHEET 1 OF 2 REPLACES BRIDGE #151

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20103 ENGINEERING INFRASTRUCTURE 4/9/2012

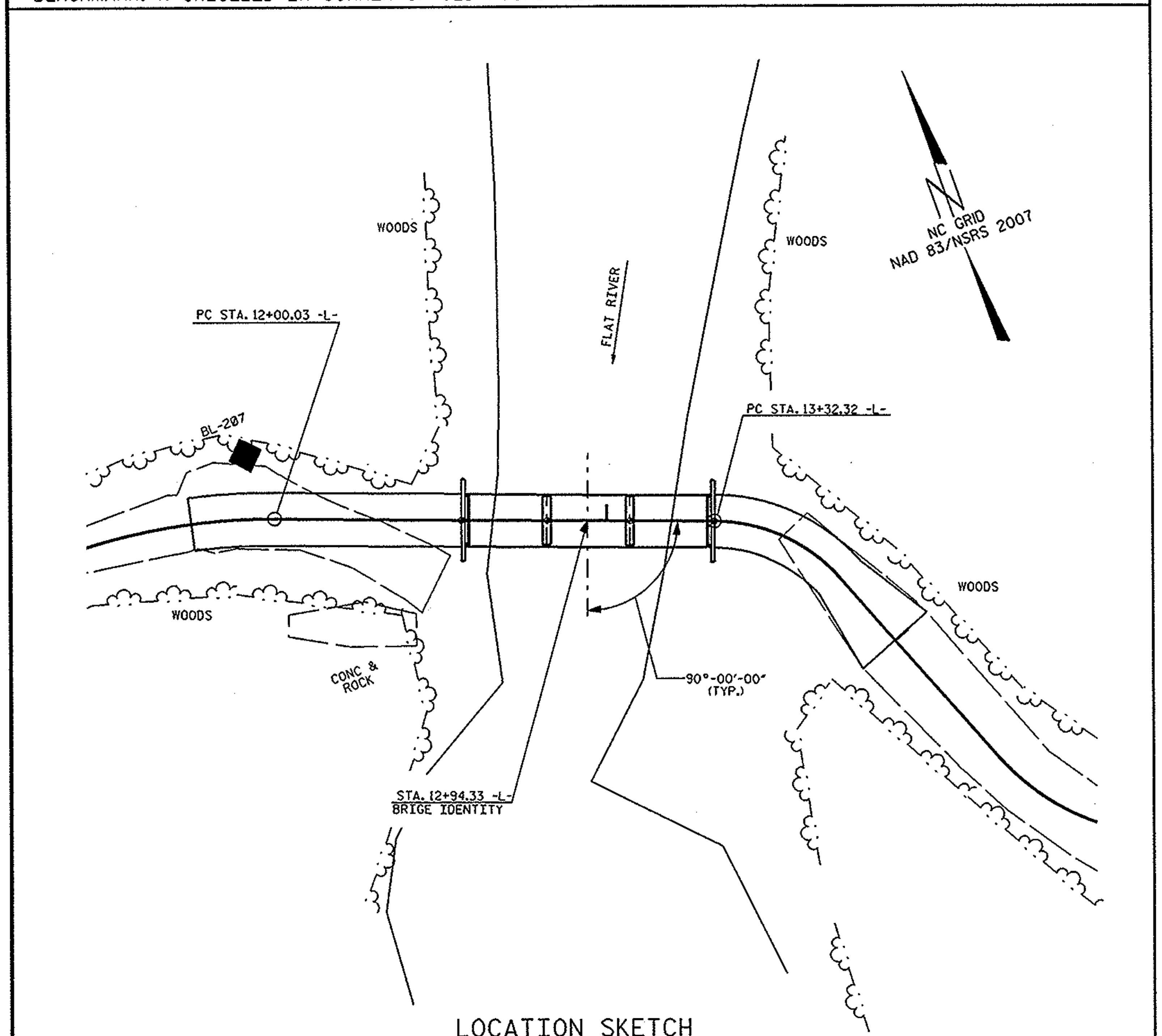
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 035635 ENGINEER DAVID N. SNOKE 4/9/2012

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER
FLAT RIVER
ON SR 1614

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			25

BENCHMARK: "X" CHISELED IN CORNER OF OLD FOUNDATION 35' LT. OF STA. 14+87.00 -L- EL. 385.77



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HS-20 OR ALTERNATE LOADING.

ALL ITEMS BASED UPON BEST AVAILABLE INFORMATION.

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS ROADWAY SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 12+94.32 -L-

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

REMOVAL OF THE SPECIFIED PORTION OF EXISTING END BENTS SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

BILL OF MATERIAL

	GRADING	AGGREGATE BASE COURSE	GENERIC PAVING ITEM	CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMPORARY ACCESS	PARTIAL REMOVAL OF EXISTING STRUCTURE	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	REINFORCING STEEL	APPROXIMATE LBS. STRUCTURAL STEEL	RIP RAP CLASS II	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARING	4"X8"X16' TREATED LUMBER	4"X6" TREATED LUMBER	6"X6" TREATED LUMBER	STRUCTURE HARDWARE
	LUMP SUM	TONS	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM	CU. YDS.	LBS.	LBS.	TONS	SQ. YDS.	LUMP SUM	LF	LF	LF	LBS
ROADWAY		33	441							231	175					
SUPERSTRUCTURE									18974			LUMP SUM	1216	152	456	1634
END BENT 1							8.1	1198								
BENT 1							10.8	1883								
BENT 2							12.6	2041								
END BENT 2							8.1	1198								
TOTAL	LUMP SUM	33	441	LUMP SUM	LUMP SUM	LUMP SUM	39.6	6320	18974	231	175	LUMP SUM	1216	152	456	1634

DRAWN BY : J.D. HAWK DATE : 2/12/12
CHECKED BY : D.SNOKE DATE : 3/30/12

01-MAY-2012 11:47
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dsnoke

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 035635 DAVID N. SNOKE
4/9/2012

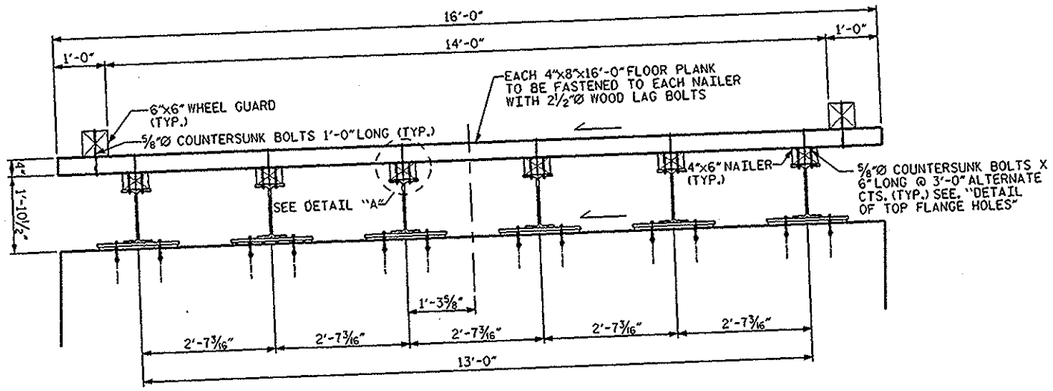
PROJECT NO. 5C.032072
DURHAM COUNTY
STATION: 12+94.32 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

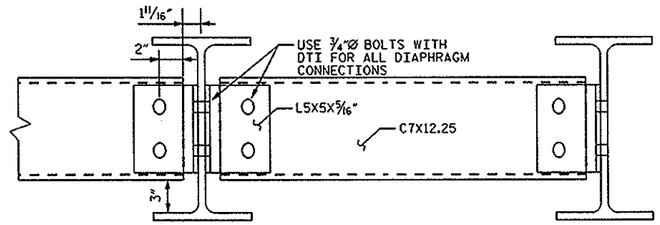
GENERAL DRAWING
FOR BRIDGE OVER
FLAT RIVER
ON SR 1614

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			S-2
1			3					TOTAL SHEETS
2			4					25

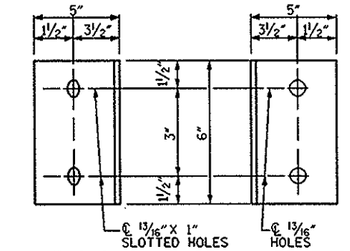


TYPICAL SECTION

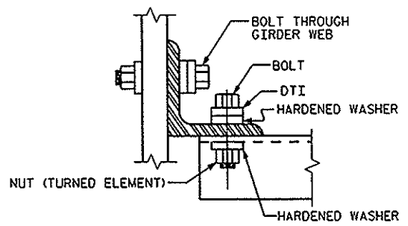
GIRDERS SHALL BE PERPENDICULAR TO TOP OF CAP AND DECK SHALL BE PARALLEL TO TOP OF CAP.



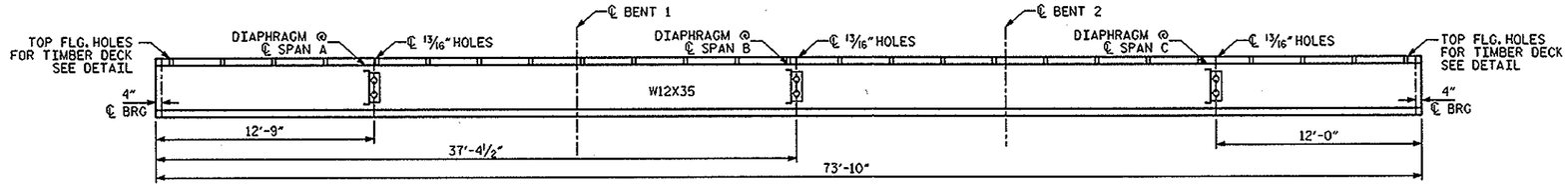
PART SECTION AT INTERMEDIATE DIAPHRAGM



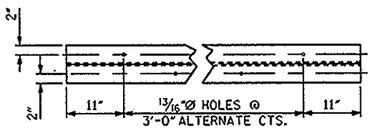
CONNECTOR ANGLE DETAILS



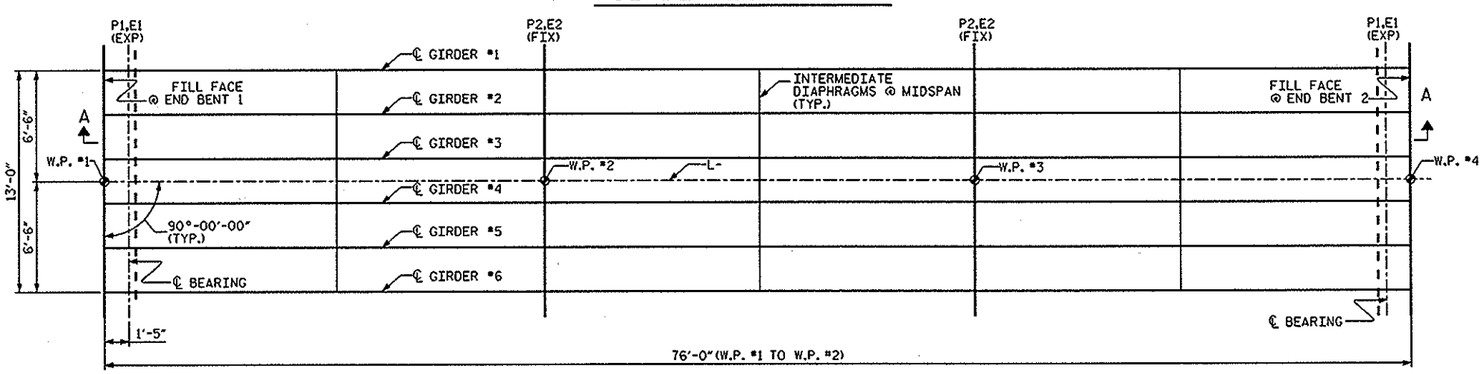
BOLT WITH DTI ASSEMBLY DETAIL



GIRDER ELEVATION



DETAIL OF TOP FLANGE HOLES



FRAMING PLAN

PROJECT NO. 5C.032072

DURHAM COUNTY

STATION: 12+94.32 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTUCTURE DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			25

NORTH CAROLINA PROFESSIONAL SEAL 035635 ENGINEER DAVID N. SNOKE 4/9/2012

DRAWN BY : J.D. HAWK DATE : 2/2/12
CHECKED BY : D.SNOKE DATE : 3/30/12

09-APR-2012 08:55
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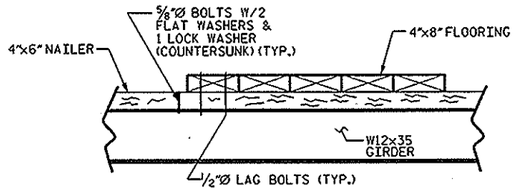
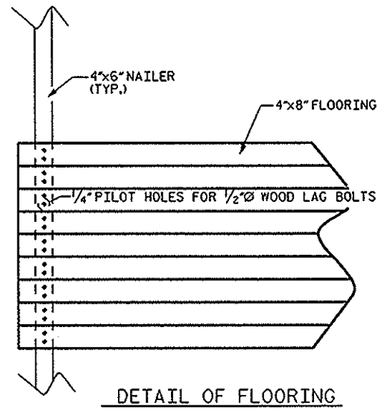
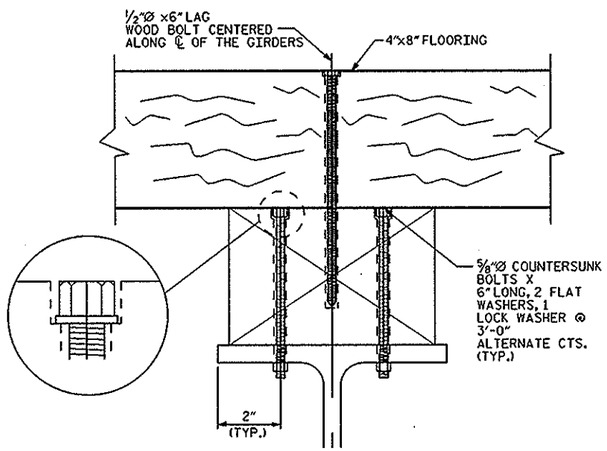


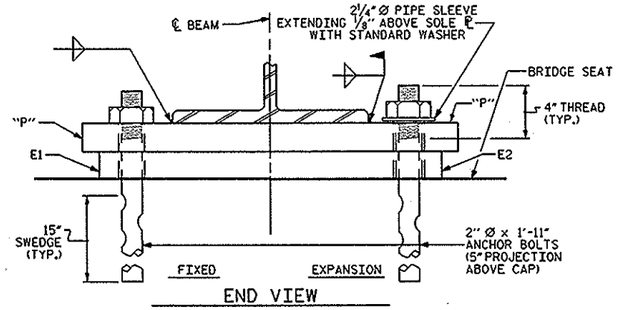
SECTION A-A



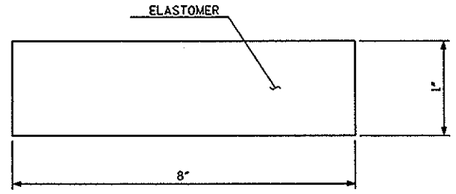
DETAIL OF FLOORING



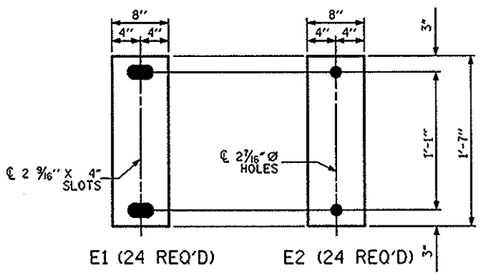
DETAIL "A"



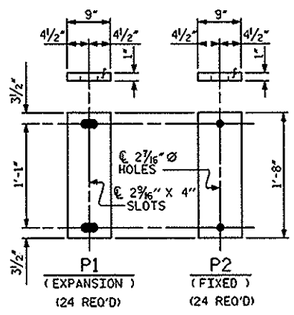
END VIEW



TYPICAL SECTION OF ELASTOMERIC BEARINGS



PLAN VIEW OF ELASTOMERIC BEARING



SOLE PLATE DETAILS

NOTES

ALL STRUCTURAL STEEL, INCLUDING DIAPHRAGMS, AND CONNECTOR ANGLES SHALL BE AASHTO M270 GRADE 50 OR APPROVED EQUAL.

ALL STRUCTURAL STEEL, INCLUDING DIAPHRAGMS, AND CONNECTOR ANGLES SHALL BE PAINTED IN ACCORDANCE WITH NCDOT STANDARD SPECIFICATIONS.

ALL HARDWARE FOR TIMBER STRUCTURE SHALL BE IN ACCORDANCE WITH NCDOT STANDARD SPECIFICATIONS, SECTION 1074-4.

ALL BOLTS, NUTS, WASHERS, SCREWS, NAILS, AND ASSOCIATED STEEL HARDWARE SHALL BE GALVANIZED, AFTER FABRICATION, IN ACCORDANCE WITH NCDOT STANDARD SPECIFICATIONS FOR THERMALLY SPRAYED COATINGS, SECTION 1076.

TREATED TIMBER AND LUMBER SHALL BE IN ACCORDANCE WITH NCDOT STANDARD SPECIFICATIONS, SECTION 1082.

WOOD MEMBERS SHALL BE PREDRILLED TO EASE INSERTION AND PREVENT SPLITTING DURING CONSTRUCTION.

CONTINUOUS FLOOR PLANKS SHALL BE ATTACHED TO EACH NAILER WITH 2-1/2"Ø x 6" LAG BOLTS CENTERED WITH THE GIRDER CENTERS.

THE 4"x8" FLOOR PLANKS SHALL BE ONE PIECE SECTIONS, SPLICING OF THE PLANKS WILL NOT BE PERMITTED.

ALL DECK BOLTS, NUTS, AND SCREWS SHALL BE COUNTERSUNK OR RECESSED SO THAT THE TOP OF A BOLT, NUT OR SCREW IS FLUSH OR SLIGHTLY BELOW WITH THE SURROUNDING SURFACE OF THE TIMBER MEMBER.

TENSION ON THE ASTM A325 BOLTS THROUGH THE CHANNEL MEMBER AND WEB SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR STEEL GIRDERS.

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1#2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

THE 21#4"Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.

THE PAYMENT FOR THE PIPE SLEEVES SHALL BE INCLUDED IN THE SEVERAL PAY ITEMS.

SOLE PLATES, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

WHEN FIELD WELDING THE SOLE PLATE TO THE GIRDER FLANGE, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

PROJECT NO. 5C.032072

DURHAM COUNTY

STATION: 12+94.32 -L-

SHEET 2 OF 2

SUPERSTUCTURE DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			25

NORTH CAROLINA PROFESSIONAL SEAL 035635 ENGINEER DAVID N. SNOKE 4/9/2012

STD. NO. EB1

ASSEMBLED BY : J.D. HAWK		DATE : 2/12/12	
CHECKED BY : D.N. SNOKE		DATE : 3/30/12	
DRAWN BY : JMB 11/87	REV. 10/17/00	RWW/LES	
CHECKED BY : ARB 11/87	REV. 5/1/06	TLA/GM	
	REV. 10/1/8	MAA/GM	

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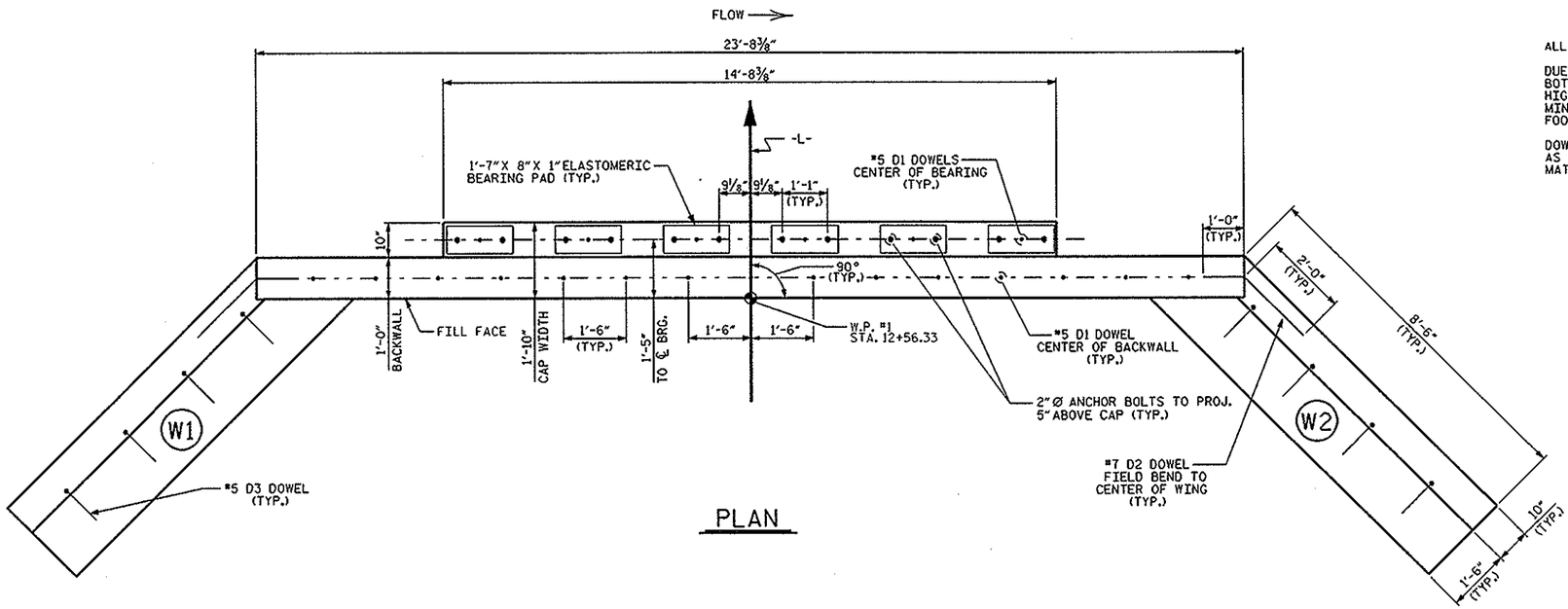
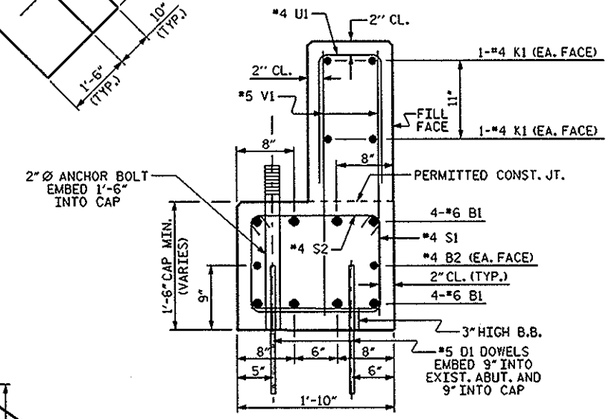
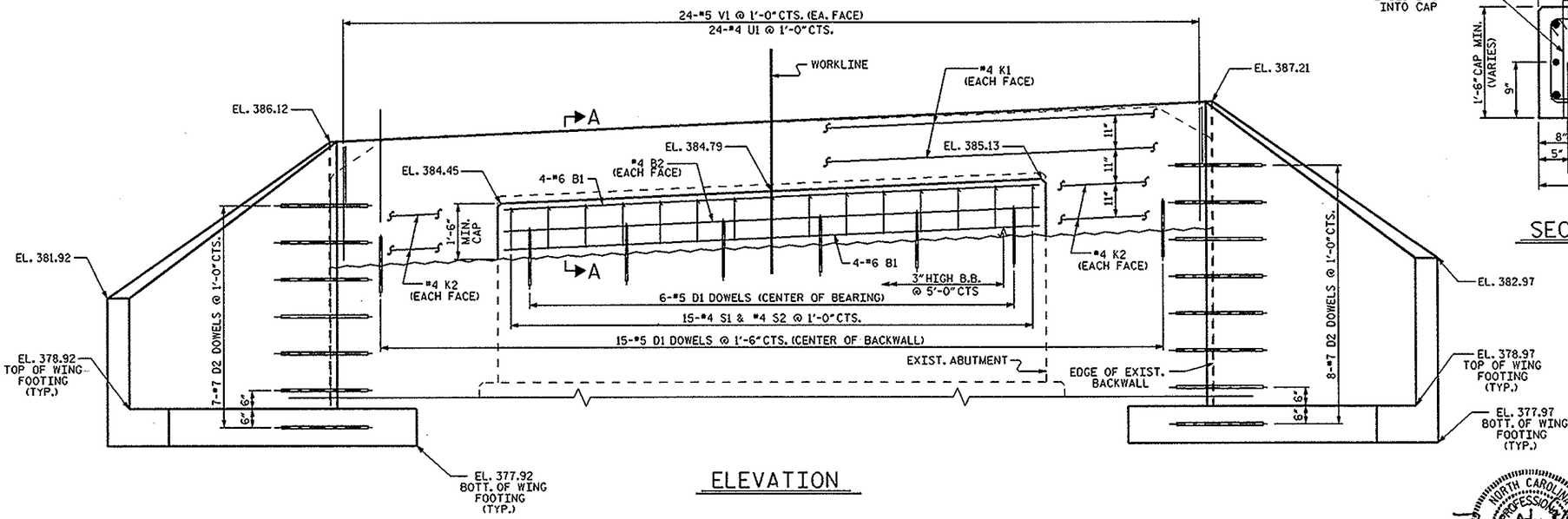
dsnoke



PLAN



SECTION A-A



ELEVATION

NOTES

ALL ELEVATIONS BASED ON BEST AVAILABLE INFORMATION.

DUE TO ESTIMATED ROCK LINE ELEVATION AT END BENTS, BOTTOM OF WING FOOTING ELEVATIONS MAY BEGIN AT A HIGHER ELEVATION THAN SHOWN, IF ABLE TO SATISFY THE MINIMUM 1'-0" KEYED INTO ROCK AND MUST MAINTAIN FOOTING THICKNESS OF 1'-0", WITH ENGINEERS APPROVAL.

DOWELS SHALL MAINTAIN EMBEDMENT AND PROJECTION LENGTHS AS SHOWN ON PLANS. THE DOWELS MAY BE FIELD BENT TO MATCH THE CENTERLINE OF THE WING OR ROADWAY.

PROJECT NO. 5C.032072

DURHAM COUNTY

STATION: 12+94.32 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #1

NORTH CAROLINA PROFESSIONAL SEAL 035635 ENGINEER DAVID N. SNOKE
4/9/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			25

DRAWN BY : D.V. JOYNER DATE : 2-23-2012
CHECKED BY : D.N. SNOKE DATE : 3-30-2012

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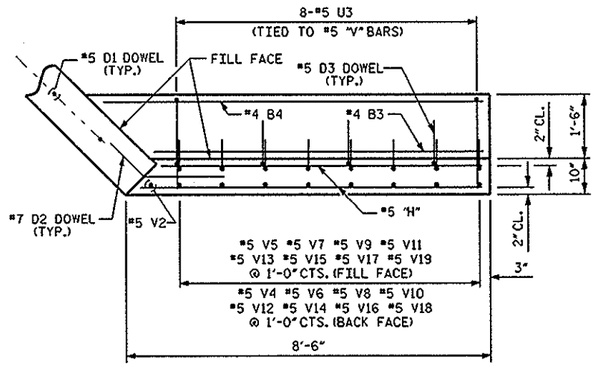
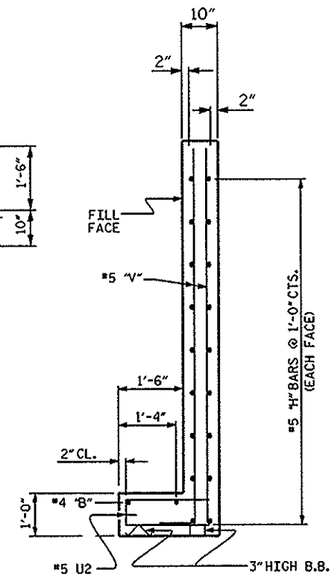
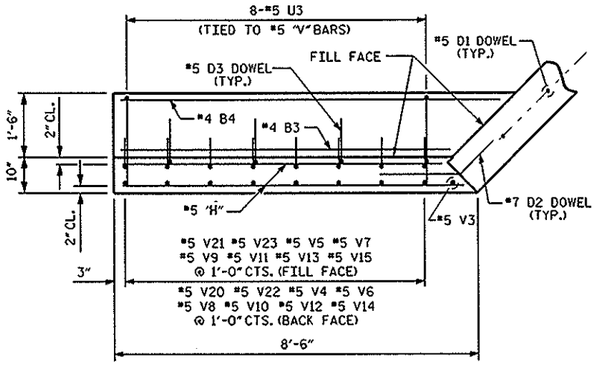


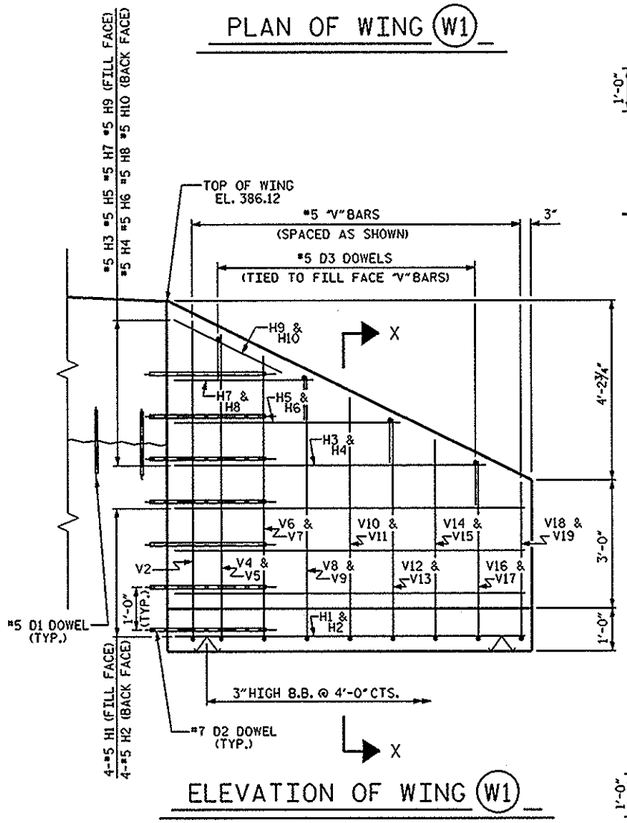
PLAN OF WING (W1)



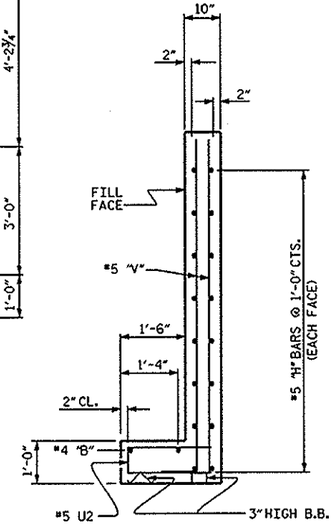
SECTION Y-Y



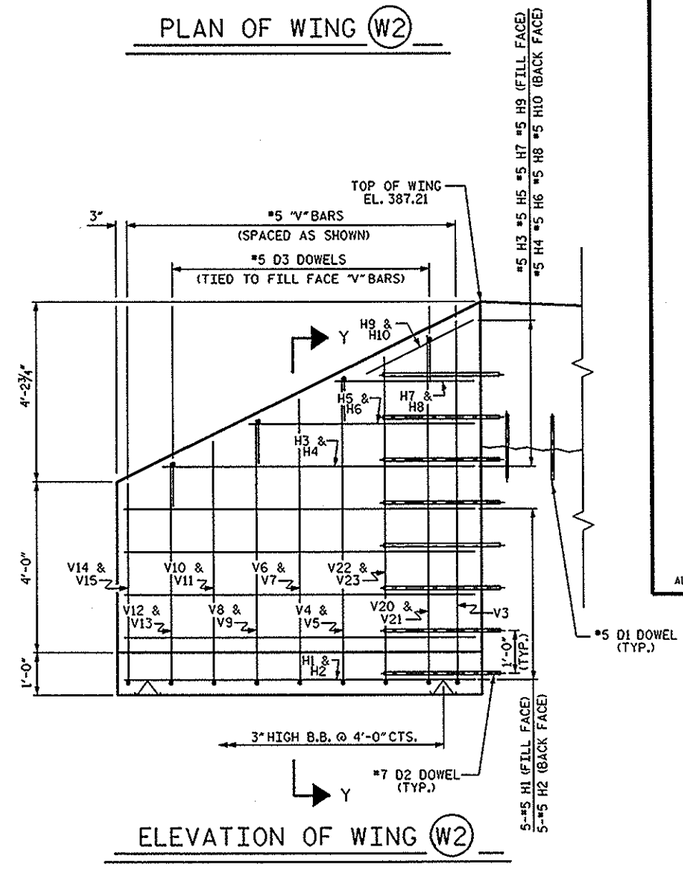
PLAN OF WING (W2)



ELEVATION OF WING (W1)

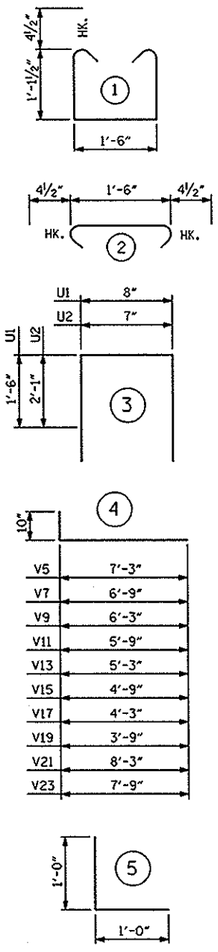


SECTION X-X



ELEVATION OF WING (W2)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	6	STR	14'-4"	172
B2	2	4	STR	14'-4"	19
B3	2	4	STR	7'-8"	10
B4	2	4	STR	8'-10"	12
D1	21	5	STR	1'-6"	33
D2	15	7	STR	3'-0"	92
D3	16	5	5	2'-0"	33
H1	9	5	STR	7'-5"	70
H2	9	5	STR	7'-11"	74
H3	2	5	STR	6'-7"	14
H4	2	5	STR	7'-1"	15
H5	2	5	STR	4'-7"	10
H6	2	5	STR	5'-1"	11
H7	2	5	STR	2'-7"	5
H8	2	5	STR	3'-1"	6
H9	2	5	STR	2'-0"	4
H10	2	5	STR	2'-9"	6
K1	4	4	STR	23'-4"	62
K2	8	4	STR	4'-2"	22
S1	15	4	1	4'-6"	45
S2	15	4	2	2'-3"	23
U1	24	4	3	3'-8"	59
U2	16	5	3	4'-9"	79
V1	24	5	STR	3'-0"	75
V2	1	5	STR	7'-7"	8
V3	1	5	STR	8'-7"	9
V4	2	5	STR	7'-3"	15
V5	2	5	4	8'-1"	17
V6	2	5	STR	6'-9"	14
V7	2	5	4	7'-7"	16
V8	2	5	STR	6'-3"	13
V9	2	5	4	7'-1"	15
V10	2	5	STR	5'-9"	12
V11	2	5	4	6'-7"	14
V12	2	5	STR	5'-3"	11
V13	2	5	4	6'-1"	13
V14	2	5	STR	4'-9"	10
V15	2	5	4	5'-7"	12
V16	1	5	STR	4'-3"	4
V17	1	5	4	5'-1"	5
V18	1	5	STR	3'-9"	4
V19	1	5	4	4'-7"	5
V20	1	5	STR	8'-3"	9
V21	1	5	4	9'-1"	9
V22	1	5	STR	7'-9"	8
V23	1	5	4	8'-7"	9
REINFORCING STEEL					LBS. 1183

CLASS A CONCRETE BREAKDOWN		
CAP & BACKWALL	C.Y.	3.7
WINGS	C.Y.	4.4
TOTAL	C.Y.	8.1

PROJECT NO. 5C.032072

DURHAM COUNTY

STATION: 12+94.32 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #1

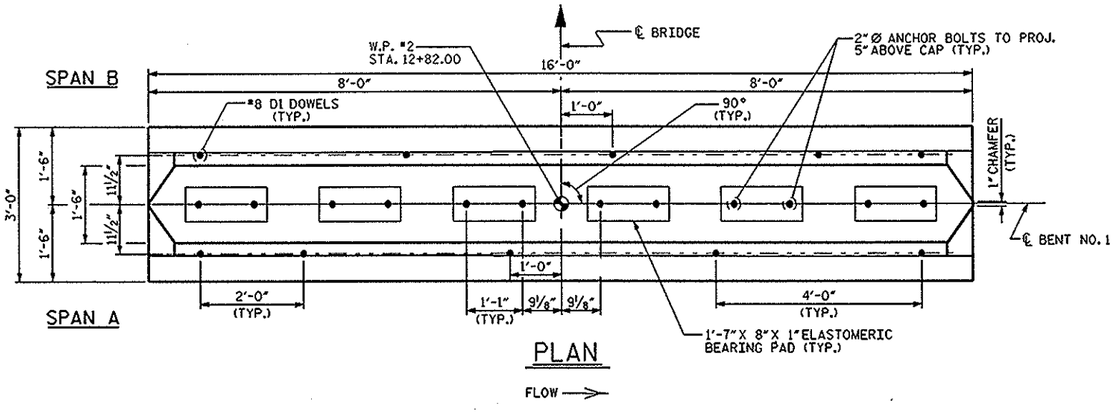
WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			25

NORTH CAROLINA PROFESSIONAL SEAL 035635 ENGINEER DAVID N. SNOKE
4/9/2012

DRAWN BY : D.V. JOYNER DATE : 2-23-2012
CHECKED BY : D.N. SNOKE DATE : 3-30-2012

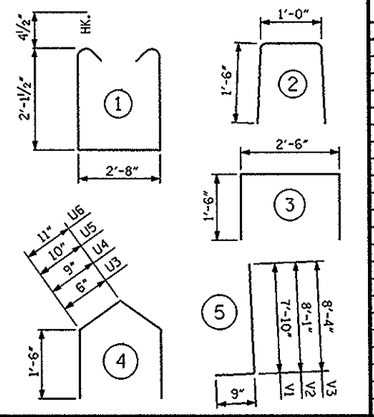
09-APR-2012 09:02
S:\PRS\P0C\Squad C\Bridge_Replacements\Durham 151\Substructure\SR1614_SD_E*.dgn
danoko



PLAN

FLOW →

BAR TYPES



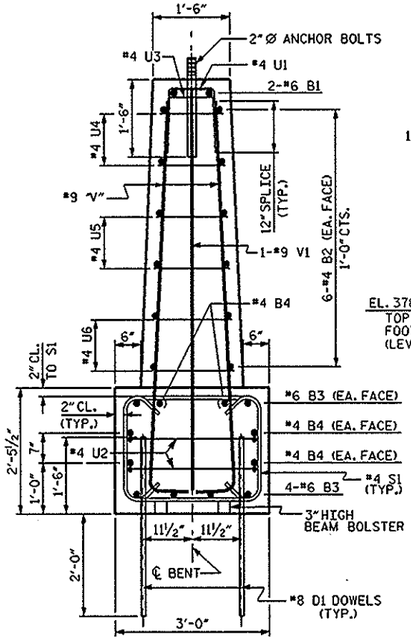
BILL OF MATERIAL

BENT 1

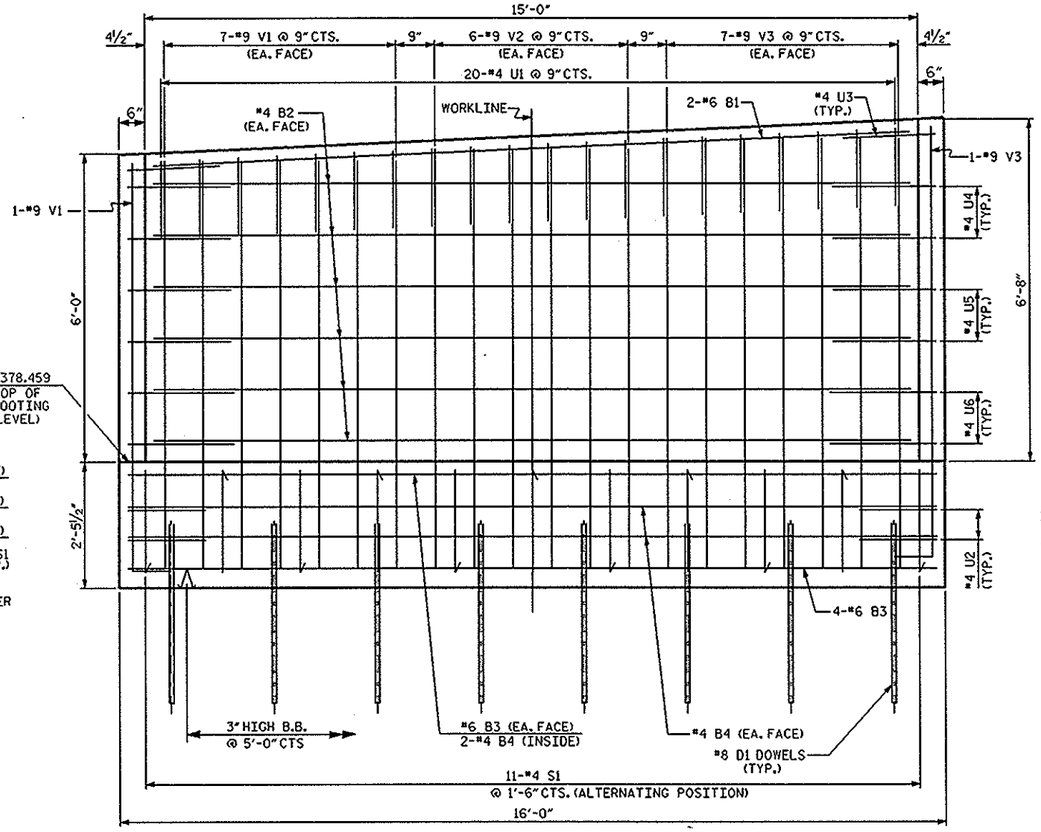
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	2	#6	STR	14'-8"	44
B2	12	#4	STR	14'-8"	118
B3	6	#6	STR	15'-8"	141
B4	6	#4	STR	15'-8"	63
D1	10	#8	STR	3'-6"	93
S1	11	#4	1	7'-8"	56
U1	20	#4	2	4'-0"	53
U2	4	#4	3	4'-6"	12
U3	2	#4	4	4'-0"	5
U4	4	#4	4	4'-6"	12
U5	4	#4	4	4'-8"	12
U6	4	#4	4	4'-10"	13
V1	15	#9	5	8'-7"	438
V2	12	#9	5	8'-10"	360
V3	15	#9	5	9'-1"	463
REINFORCING STEEL				LBS.	1883

CLASS A CONCRETE BREAKDOWN

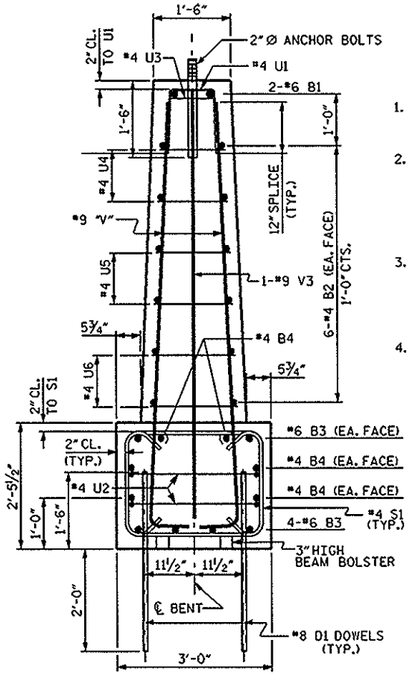
POUR 1 (BENT FOOTING)	C.Y.	4.4
POUR 2 (BENT WALL)	C.Y.	6.4
TOTAL	C.Y.	10.8



SECTION THRU
BENT-UPSTREAM



ELEVATION



SECTION THRU
BENT-DOWNSTREAM

NOTES

1. ALL ELEVATIONS BASED ON BEST AVAILABLE INFORMATION
2. THE SPREAD FOOTING AT BENT NO. 1 AND BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 10 TSF. CHECK FIELD CONDITIONS FOR THE REQUIRED RESISTANCE OF 15 TSF JUST BEFORE PLACING CONCRETE.
3. KEY IN SPREAD FOOTINGS AT BENT NO. 1 AND BENT NO. 2 AT LEAST 12" INTO ROCK WITH MINIMUM THICKNESS AS SHOWN ON THE PLANS.
4. THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 AND BENT NO. 2 IS THE BOTTOM OF FOOTING ELEVATION. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFEOF THE STRUCTURE.

PROJECT NO. 5C.032072

DURHAM COUNTY

STATION: 12+94.32 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT #1

NORTH CAROLINA PROFESSIONAL SEAL 035635 ENGINEER DAVID N. SNOKE
4/9/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			25

DRAWN BY : D.V. JOYNER DATE : 2-8-12
CHECKED BY : D.N. SNOKE DATE : 3-30-12

09-APR-2012 09:18
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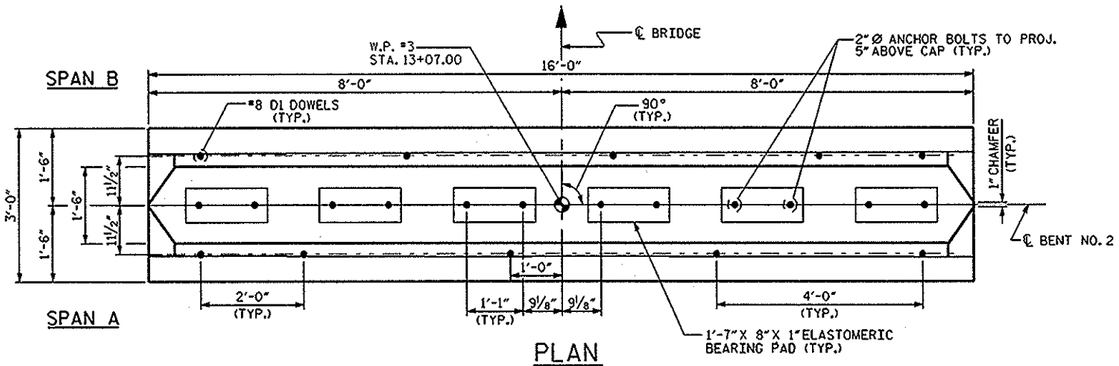
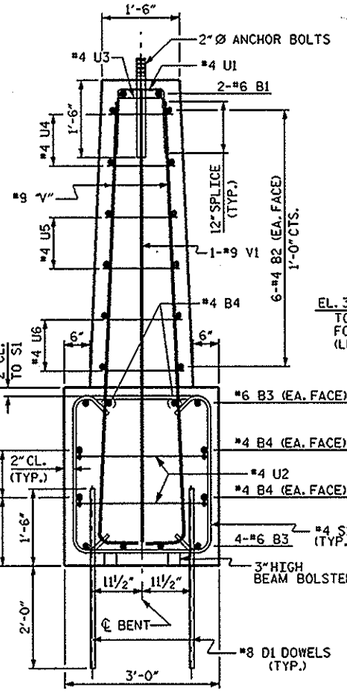
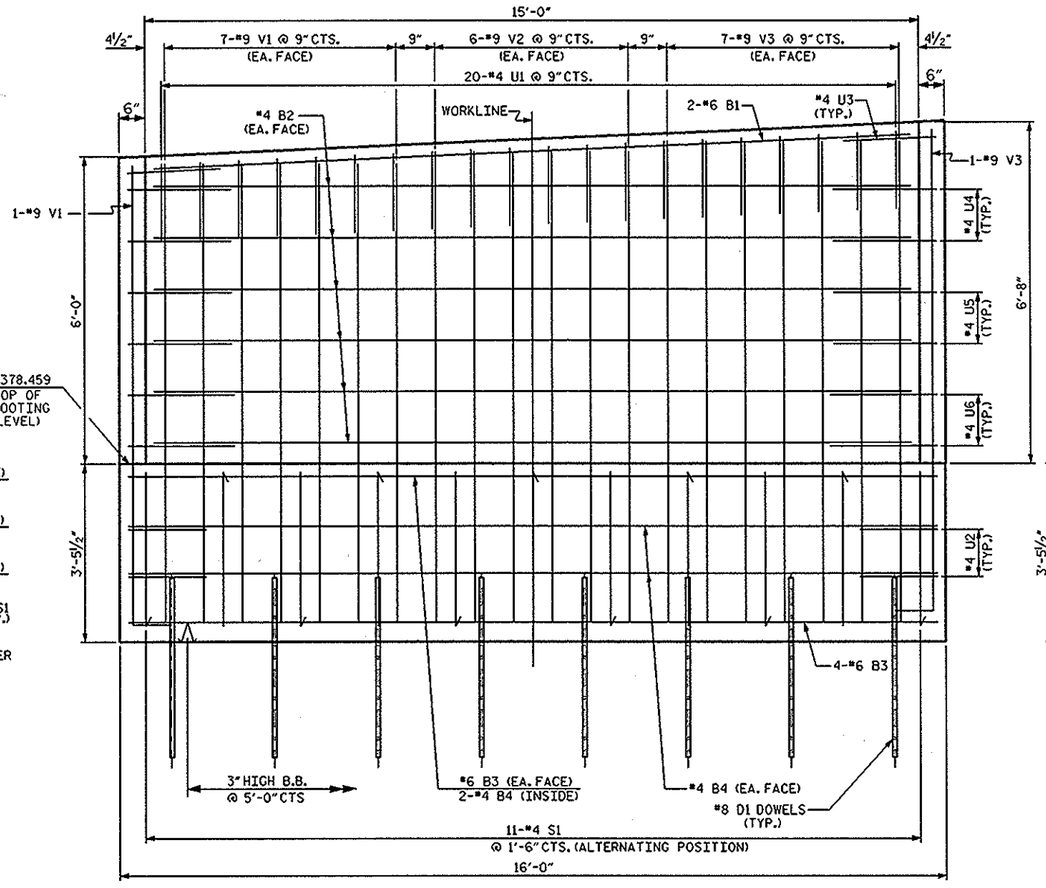


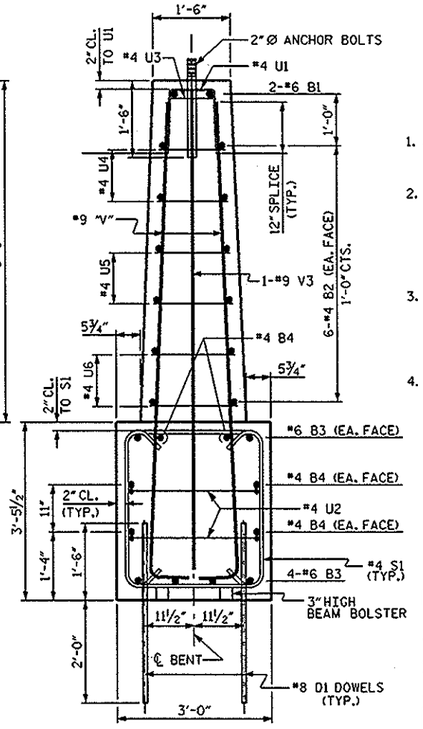
PLAN



SECTION THRU BENT-UPSTREAM

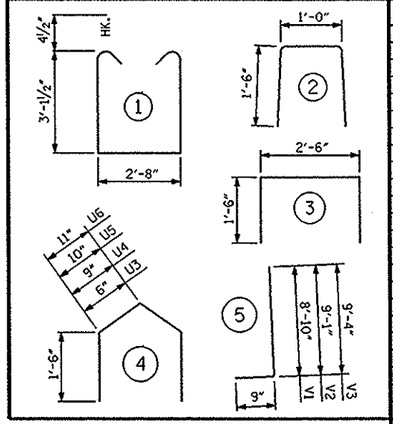


ELEVATION



SECTION THRU BENT-DOWNSTREAM

BAR TYPES



BILL OF MATERIAL

BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	2	#6	STR	14'-8"	44
B2	12	#4	STR	14'-8"	118
B3	6	#6	STR	15'-8"	141
B4	6	#4	STR	15'-8"	63
D1	10	#8	STR	3'-6"	93
S1	11	#4	1	9'-8"	71
U1	20	#4	2	4'-0"	53
U2	4	#4	3	4'-6"	12
U3	2	#4	4	4'-0"	5
U4	4	#4	4	4'-6"	12
U5	4	#4	4	4'-8"	12
U6	4	#4	4	4'-10"	13
V1	15	#9	5	9'-7"	489
V2	12	#9	5	9'-10"	401
V3	15	#9	5	10'-1"	514
REINFORCING STEEL				LBS.	2041

CLASS A CONCRETE BREAKDOWN

POUR 1 (BENT FOOTING)	C.Y.	6.2
POUR 2 (BENT WALL)	C.Y.	6.4
TOTAL	C.Y.	12.6

NOTES

1. ALL ELEVATIONS BASED ON BEST AVAILABLE INFORMATION
2. THE SPREAD FOOTING AT BENT NO. 1 AND BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 10 TSF. CHECK FIELD CONDITIONS FOR THE REQUIRED RESISTANCE OF 15 TSF JUST BEFORE PLACING CONCRETE.
3. KEY IN SPREAD FOOTINGS AT BENT NO. 1 AND BENT NO. 2 AT LEAST 12" INTO ROCK WITH MINIMUM THICKNESS AS SHOWN ON THE PLANS.
4. THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 AND BENT NO. 2 IS THE BOTTOM OF FOOTING ELEVATION. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFEOF THE STRUCTURE.

PROJECT NO. 5C.032072

DURHAM COUNTY

STATION: 12+94.32 -L-

SHEET 1 OF 1

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT #2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			25

NORTH CAROLINA PROFESSIONAL SEAL 035635 ENGINEER DAVID N. SNOKE
4/4/2012

DRAWN BY : D.V. JOYNER DATE : 2-8-12
CHECKED BY : D.N. SNOKE DATE : 3-30-12

09-APR-2012 09:18
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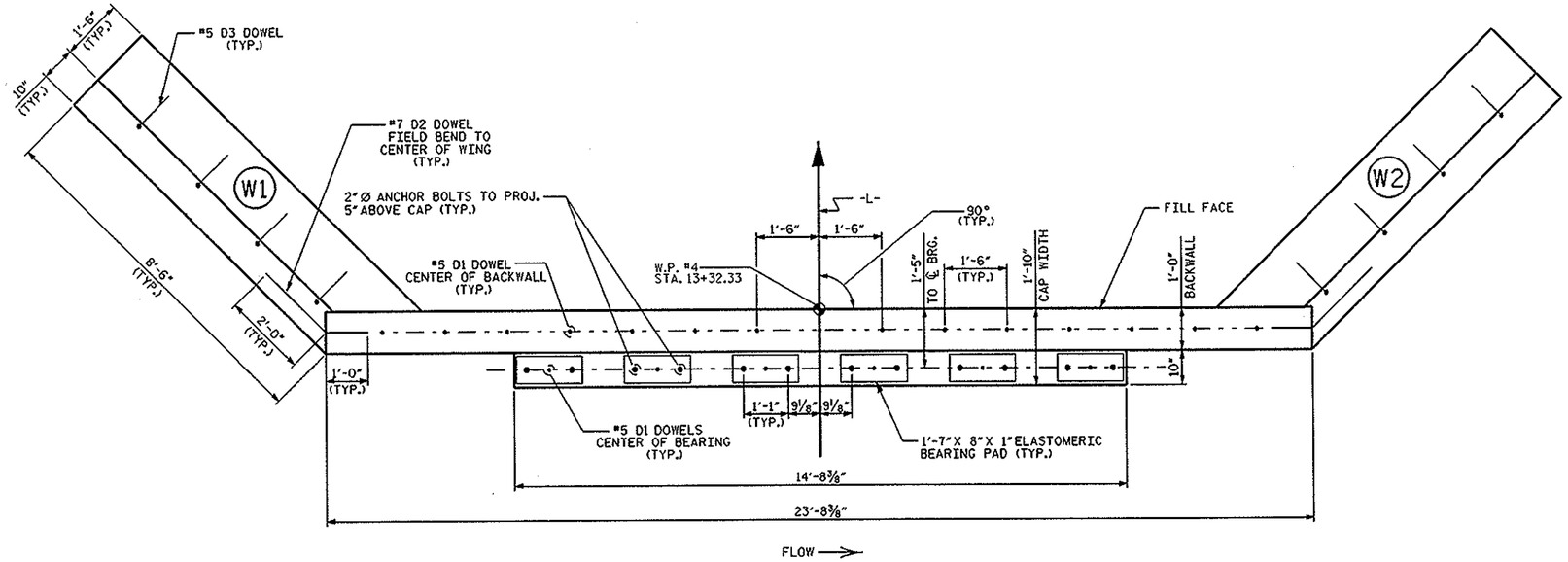
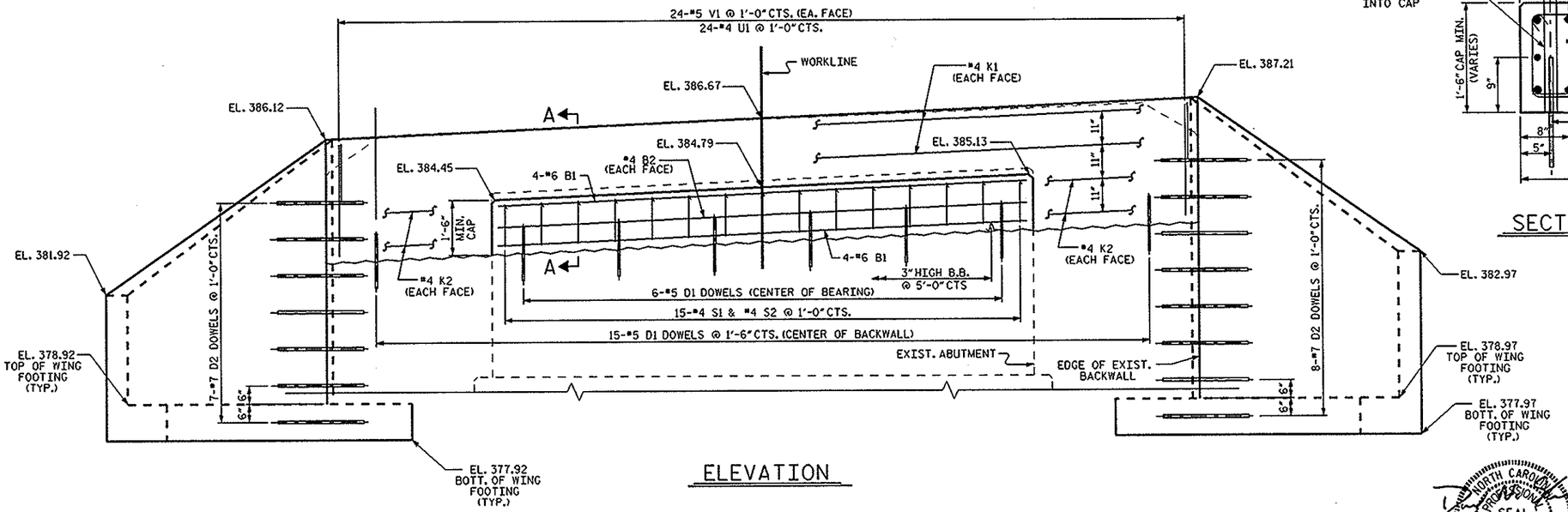
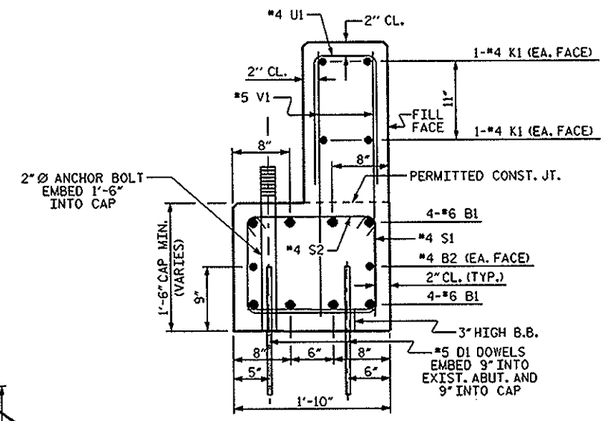


PLAN



ELEVATION



SECTION A-A

NOTES

ALL ELEVATIONS BASED ON BEST AVAILABLE INFORMATION.

DUE TO ESTIMATED ROCK LINE ELEVATION AT END BENTS, BOTTOM OF WING FOOTING ELEVATIONS MAY BEGIN AT A HIGHER ELEVATION THAN SHOWN, IF ABLE TO SATISFY THE MINIMUM 1'-0" KEYED INTO ROCK AND MUST MAINTAIN FOOTING THICKNESS OF 1'-0", WITH ENGINEERS APPROVAL.

DOWELS SHALL MAINTAIN EMBEDMENT AND PROJECTION LENGTHS AS SHOWN ON PLANS. THE DOWELS MAY BE FIELD BENT TO MATCH THE CENTERLINE OF THE WING OR ROADWAY.

PROJECT NO. 5C.032072

DURHAM COUNTY

STATION: 13+32.32 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			25

NORTH CAROLINA PROFESSIONAL SEAL 035635 ENGINEER DAVID N. SNOKE
4/9/2012

DRAWN BY : D.V. JOYNER DATE : 2-23-2012
CHECKED BY : D.N. SNOKE DATE : 3-30-2012

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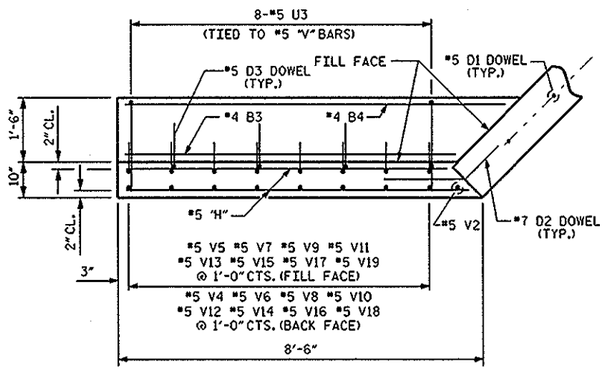
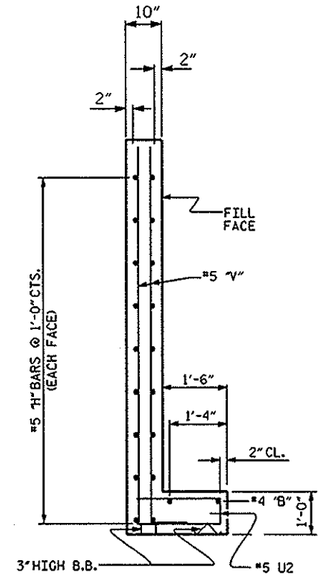
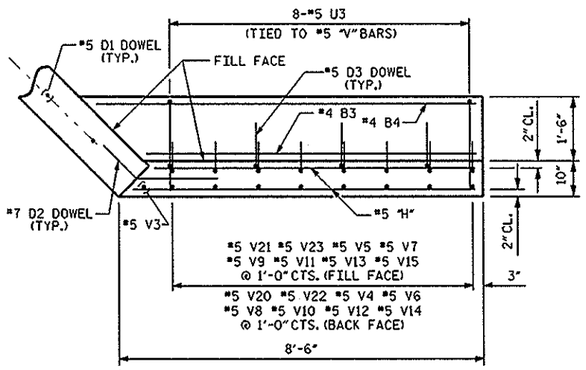


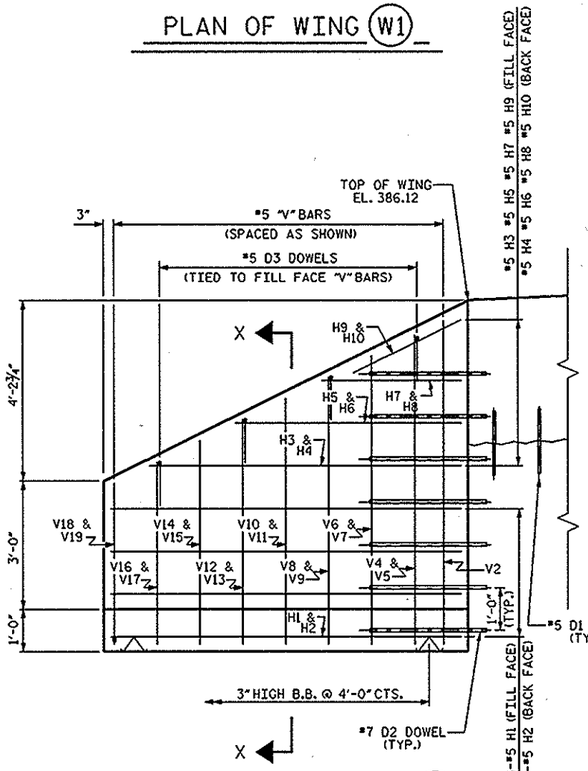
PLAN OF WING (W1)



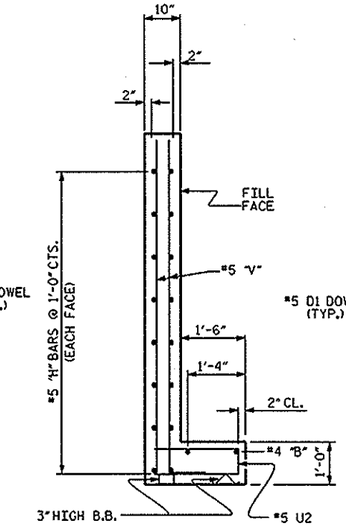
SECTION Y-Y



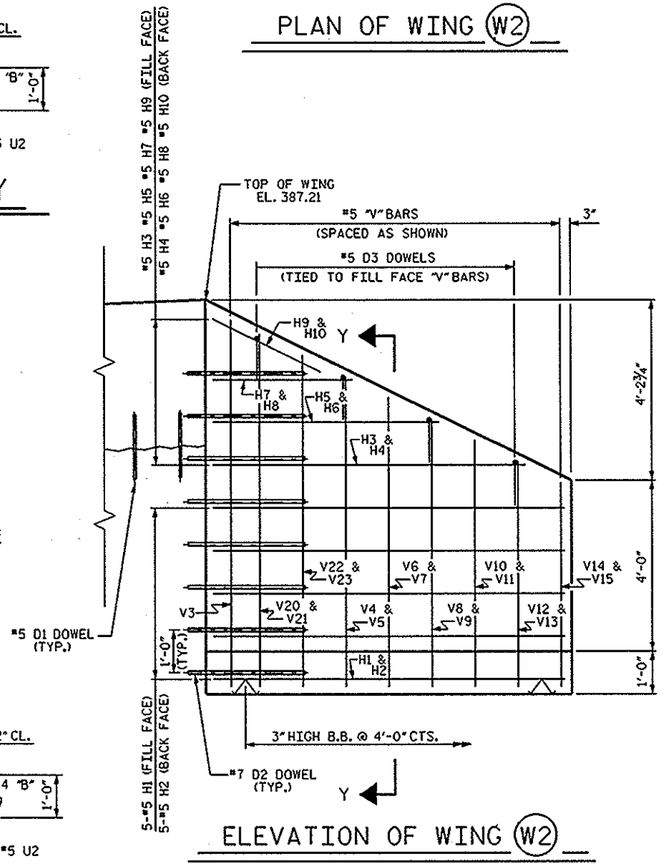
PLAN OF WING (W2)



ELEVATION OF WING (W1)

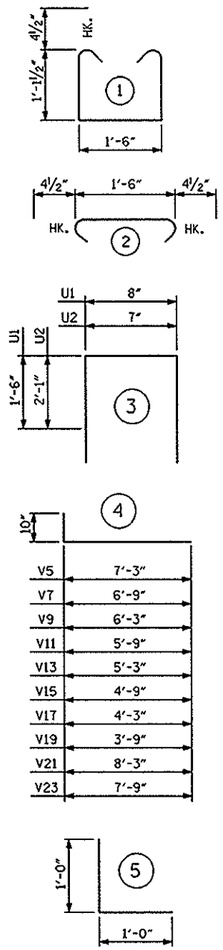


SECTION X-X



ELEVATION OF WING (W2)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	6	STR	14'-4"	172
B2	2	4	STR	14'-4"	19
B3	2	4	STR	7'-8"	10
B4	2	4	STR	8'-10"	12
D1	21	5	STR	1'-6"	33
D2	15	7	STR	3'-0"	92
D3	16	5	5	2'-0"	33
H1	9	5	STR	7'-5"	70
H2	9	5	STR	7'-11"	74
H3	2	5	STR	6'-7"	14
H4	2	5	STR	7'-1"	15
H5	2	5	STR	4'-7"	10
H6	2	5	STR	5'-1"	11
H7	2	5	STR	2'-7"	5
H8	2	5	STR	3'-1"	6
H9	2	5	STR	2'-0"	4
H10	2	5	STR	2'-9"	6
K1	4	4	STR	23'-4"	62
K2	8	4	STR	4'-2"	22
S1	15	4	1	4'-6"	45
S2	15	4	2	2'-3"	23
U1	24	4	3	3'-8"	59
U2	16	5	3	4'-9"	79
V1	24	5	STR	3'-0"	75
V2	1	5	STR	7'-7"	8
V3	1	5	STR	8'-7"	9
V4	2	5	STR	7'-3"	15
V5	2	5	4	8'-1"	17
V6	2	5	STR	6'-9"	14
V7	2	5	4	7'-7"	16
V8	2	5	STR	6'-3"	13
V9	2	5	4	7'-1"	15
V10	2	5	STR	5'-9"	12
V11	2	5	4	6'-7"	14
V12	2	5	STR	5'-3"	11
V13	2	5	4	6'-1"	13
V14	2	5	STR	4'-9"	10
V15	2	5	4	5'-7"	12
V16	1	5	STR	4'-3"	4
V17	1	5	4	5'-1"	5
V18	1	5	STR	3'-9"	4
V19	1	5	4	4'-7"	5
V20	1	5	STR	8'-3"	9
V21	1	5	4	9'-1"	9
V22	1	5	STR	7'-9"	8
V23	1	5	4	8'-7"	9
REINFORCING STEEL					LBS. 1183

CLASS A CONCRETE BREAKDOWN		
CAP & BACKWALL	C.Y.	4.5
WINGS	C.Y.	3.9
TOTAL	C.Y.	8.4

PROJECT NO. 5C.032072

DURHAM COUNTY

STATION: 13+32.32 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #2

WING DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 035635 ENGINEER DAVID N. SNOKE
4/9/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			25

DRAWN BY : D.V. JOYNER DATE : 2-23-2012
CHECKED BY : D.N. SNOKE DATE : 3-30-2012

09-APR-2012 09:04
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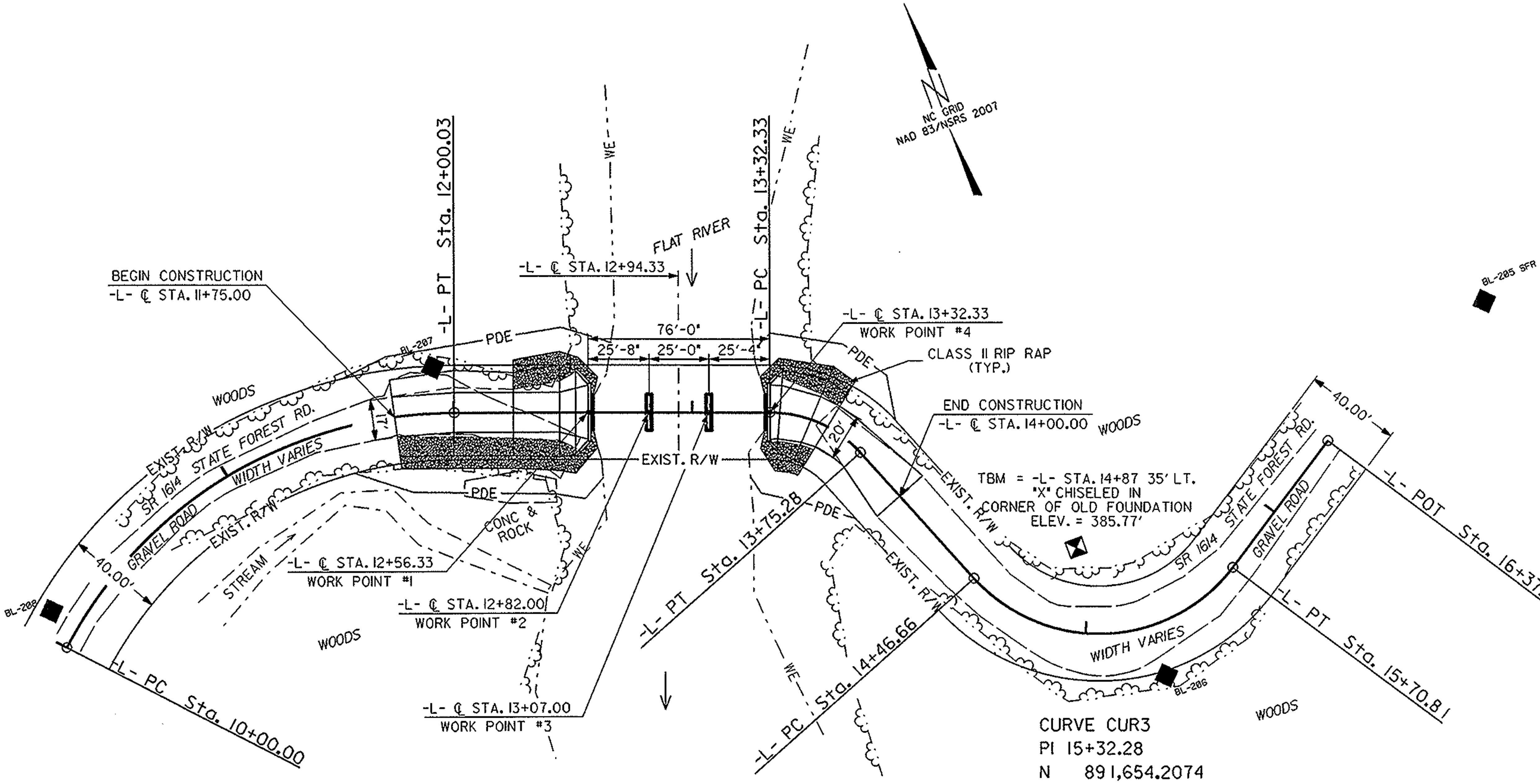
danoko



CURVE CUR3
PI 15+32.28
N 891,654.2074
E 2,033,672.9150
△ 101^ 15' 53" (LT)
D 81^ 33' 56"
R 70.25
Lc 124.15
T 85.62

PLAN
SCALE: 1"=50'

CURVE CUR1
PI 11+11.26
N 891,911.0128
E 2,033,354.8060
△ 62^ 27' 34" (RT)
D 31^ 13' 30"
R 183.49
Lc 200.03
T 111.26

CURVE CUR2
PI 13+55.16
N 891,820.9466
E 2,033,605.5045
△ 48^ 13' 40" (RT)
D 112^ 16' 35"
R 51.03
Lc 42.95
T 22.84

PROJECT NO. 5C.032072
DURHAM COUNTY
BRIDGE NO.: 151
SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN VIEW ALONG
℄ SURVEY OF BRIDGE #151
ON SR-1614 OVER
FLAT CREEK

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 035635 DAVID N. SNOKE
4/9/2012

REVISIONS								SHEET NO.
NO.	BY	DATE	NO.	BY	DATE			R-1
1			3					TOTAL SHEETS
2			4					25

DRAWN BY : R.PUTEK DATE : 01/12
CHECKED BY : D.SNOKE DATE : 03/12
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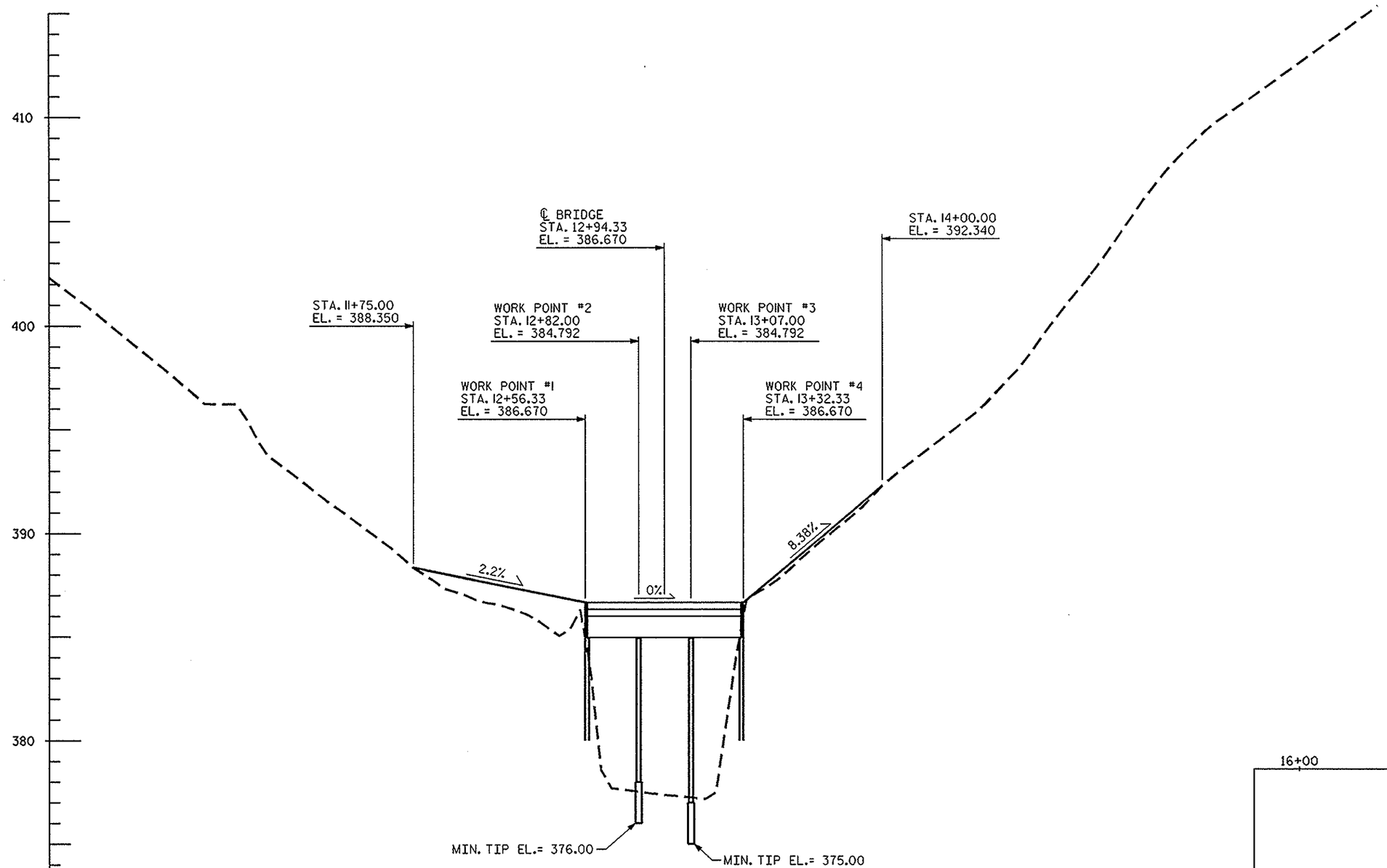

PROFILE

HORIZ. SCALE: 1" = 50'
VERT. SCALE: 1" = 5'

PROJECT NO. 5C.032072
DURHAM COUNTY
BRIDGE NO.: 151
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PROFILE ALONG ℄ SURVEY OF BRIDGE #151 ON SR 1614 OVER FLAT CREEK

NORTH CAROLINA PROFESSIONAL SEAL 035635 ENGINEER DAVID N. SNOKE
4/9/2012

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	R-2
1			3			TOTAL SHEETS
2			4			25

DRAWN BY : R.PUTEK DATE : 11/11
CHECKED BY : D.SNOKE DATE : 03/12

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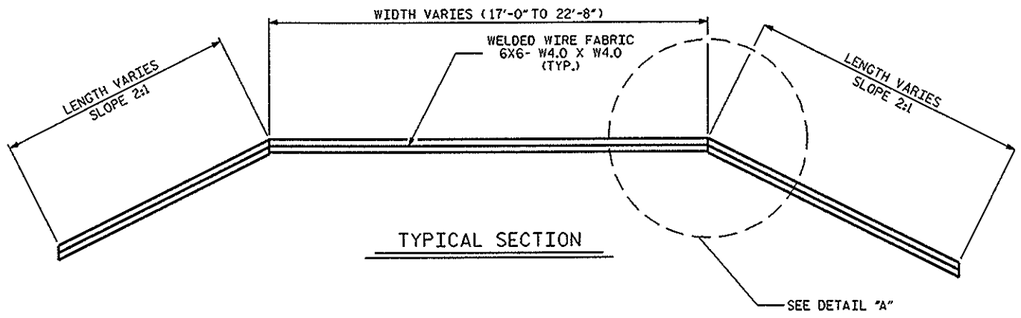
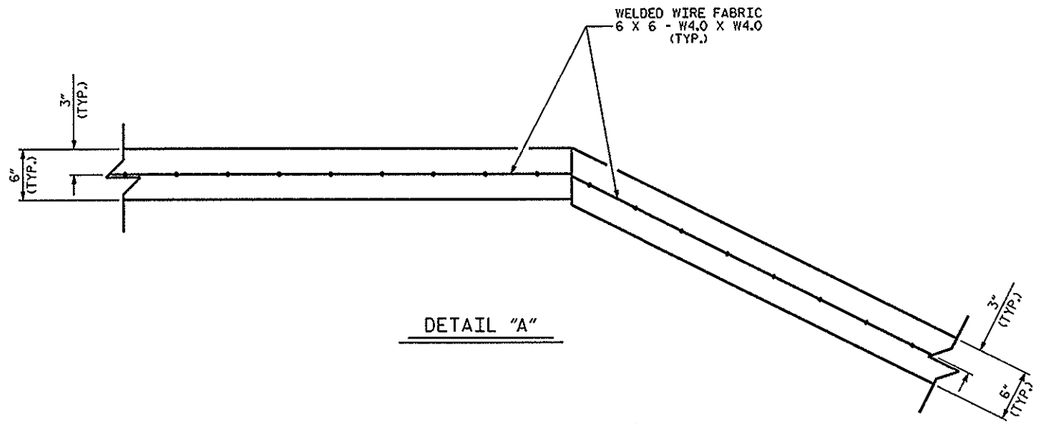
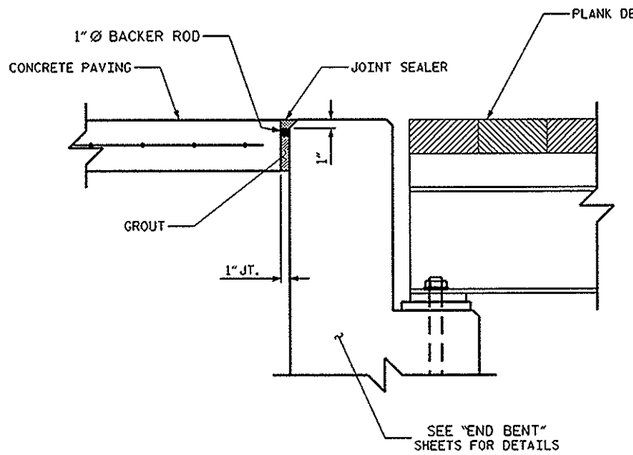


TYPICAL SECTION



DETAIL "A"



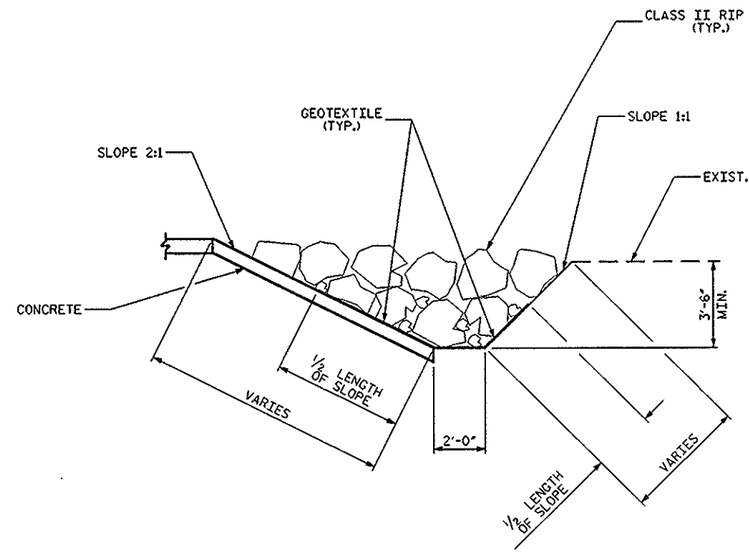
SECTION AT END BENT

NOTES:

ALL ELEVATIONS BASED UPON AVAILABLE INFORMATION.

CONTRACTOR MUST ACHIEVE PROPER ROADWAY DENSITY PRIOR TO PLACING CONCRETE ROADWAY IN ACCORDANCE WITH NCDOT STANDARD SPECIFICATIONS.

CLASS II RIP RAP SHALL BE USED. RIP RAP FROM THE CAUSEWAY AND REBAR FREE RUBBLE FROM END BENT PARTIAL REMOVEL MAY BE USED. THE TOP LAYER OF RIP RAP MUST CONSIST OF 18"DIAMETER OR GREATER TO MITIGATE THE WASHING AWAY OF RIP RAP DURING FLOOD EVENT.



TYPICAL SECTION

PROJECT NO. 5C.032072

DURHAM COUNTY

STATION: 12+94.33

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	R-3
1			3			TOTAL SHEETS
2			4			25

NORTH CAROLINA PROFESSIONAL SEAL 035635 ENGINEER DAVID N. SNOKE
4/1/2012

DRAWN BY : R.PUTEK DATE : 02/12
CHECKED BY : D.SNOKE DATE : 03/12

02-APR-2012 09:59
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rputek

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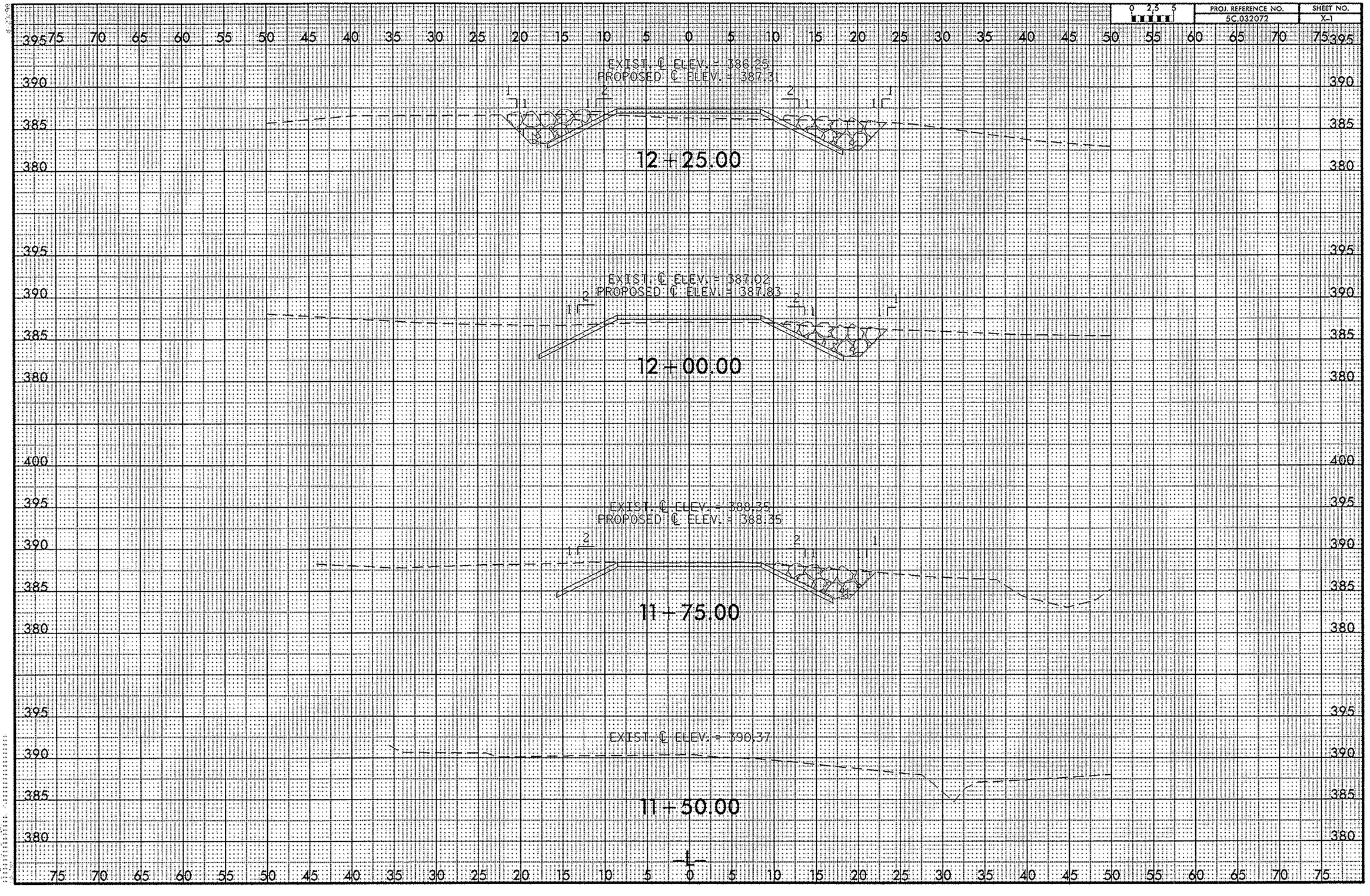
	5C.032072	X-1



0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	5C.032072	X-2

EXIST. ℄ ELEV. = 386.64
PROPOSED ℄ ELEV. = 386.67

VARIES 1:1 VARIES 1:1 1:1

12 + 56.33

EXIST. ℄ ELEV. = 385.45
PROPOSED ℄ ELEV. = 386.78

1:1 VARIES 1:1 VARIES 1:1 1:1

12 + 51.00

EXIST. ℄ ELEV. = 385.10
PROPOSED ℄ ELEV. = 386.93

1:1 2:1 2:1 1:1

12 + 44.33

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

395 390 385 380 375

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	5C.032072	X-3

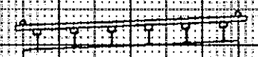
75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

395
390
385
380
375

EXIST. ℄ ELEV. = 377.34
PROPOSED ℄ ELEV. = 386.67

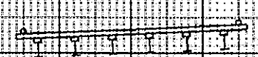
13+00.00

EXIST. ℄ ELEV. = 377.55
PROPOSED ℄ ELEV. = 386.67



12+82.00

EXIST. ℄ ELEV. = 377.64
PROPOSED ℄ ELEV. = 386.67



12+75.00

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

EXIST. ℄ ELEV. = 386.71
PROPOSED ℄ ELEV. = 386.67

13+32.33

EXIST. ℄ ELEV. = 380.77
PROPOSED ℄ ELEV. = 386.67

13+25.00

EXIST. ℄ ELEV. = 377.27
PROPOSED ℄ ELEV. = 386.67

13+07.00

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	5C.032072	X-5

EXIST. ℄ ELEV. = 388.46
PROPOSED ℄ ELEV. = 388.76

13+57.33

EXIST. ℄ ELEV. = 387.81
PROPOSED ℄ ELEV. = 388.15

13+50.00

EXIST. ℄ ELEV. = 386.94
PROPOSED ℄ ELEV. = 387.02
VARIES
VARIES

13+36.48

8-23-00

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
5C.032072	X-6

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

410 405 400 395 390 385

EXIST. ℄ ELEV. = 394.33

14 + 25.00

405 400 395 390 385 380

EXIST. ℄ ELEV. = 392.34
PROPOSED ℄ ELEV. = 392.34

2
1

14 + 00.00

400 395 390 385 380 375

EXIST. ℄ ELEV. = 390.05
PROPOSED ℄ ELEV. = 390.24

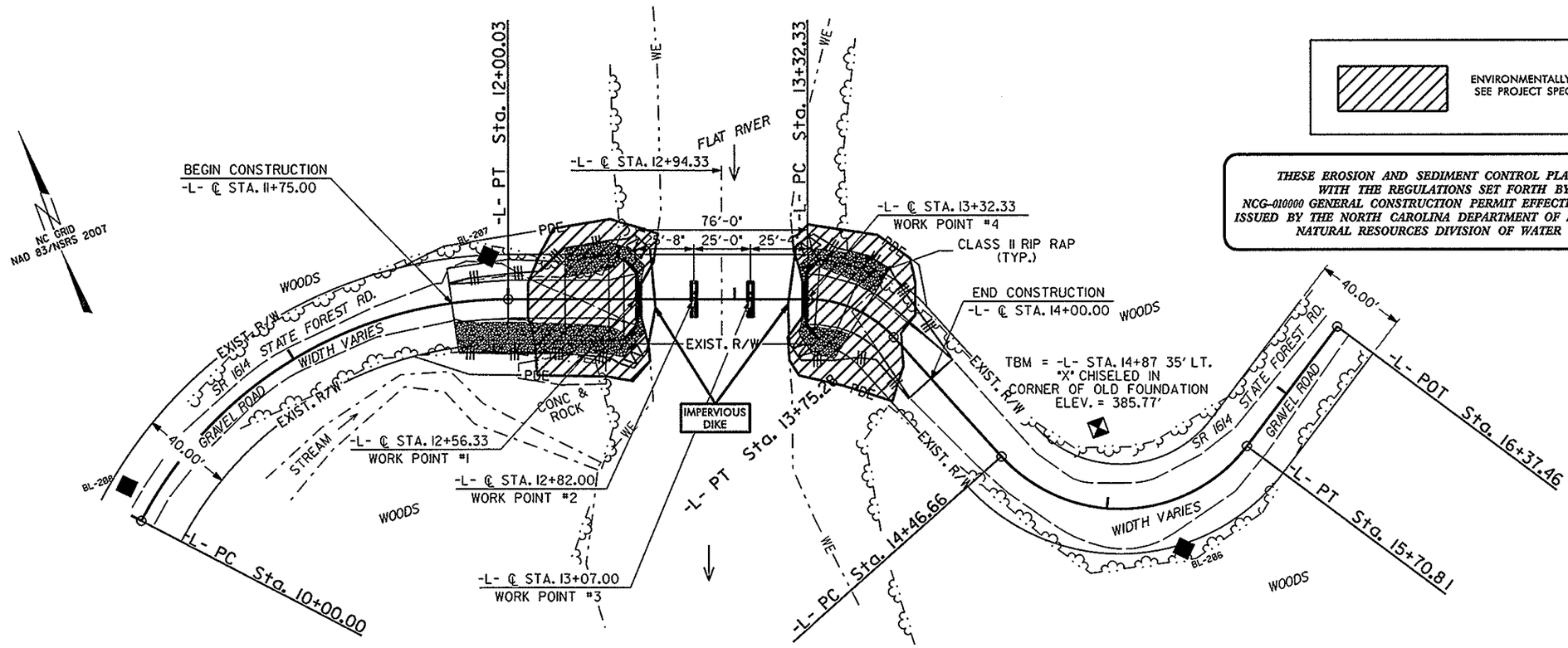
2
1

13 + 75.00

℄

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

EROSION CONTROL PLAN



ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

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.

Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	

2012 STANDARD DRAWINGS

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

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.

ROADSIDE ENVIRONMENTAL UNIT
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

2012 STANDARD SPECIFICATIONS

PROJECT NO. 5C.032072
DURHAM COUNTY
BRIDGE NO.: 151
SHEET OF

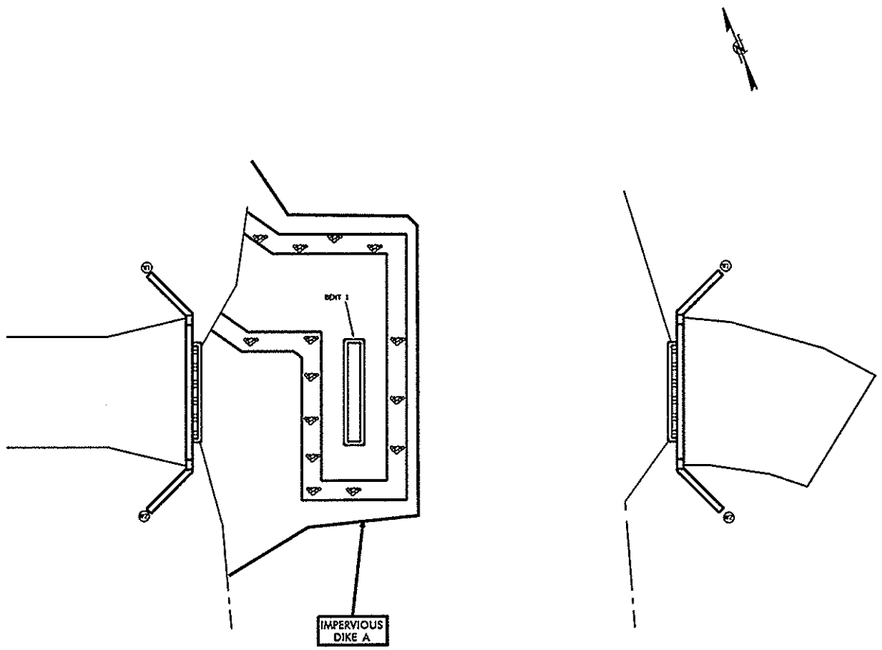
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

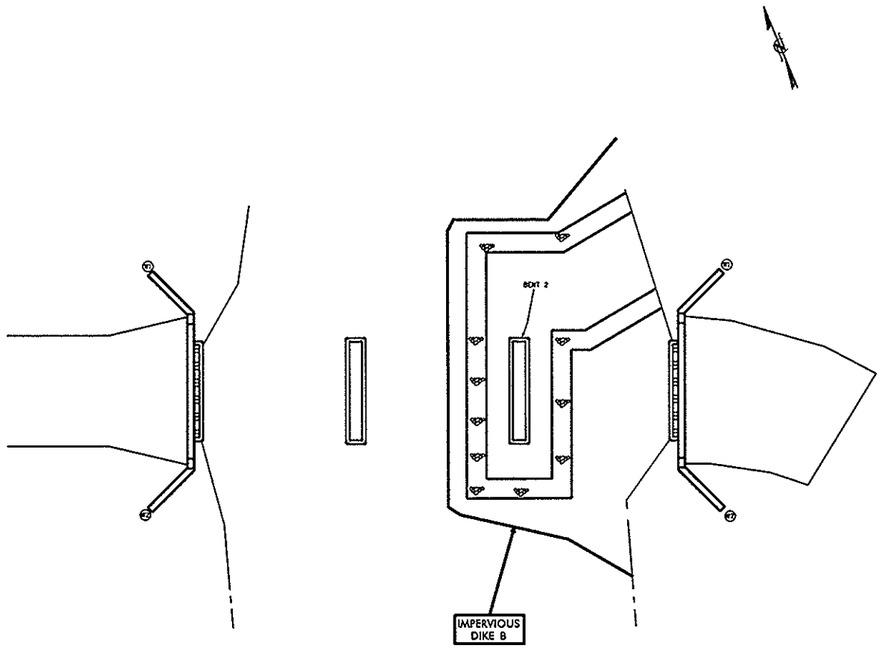
PLAN VIEW ALONG
℄ SURVEY OF BRIDGE #151
ON SR-1614 OVER
FLAT CREEK

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

FOOTING AND CAUSEWAY CONSTRUCTION SEQUENCE

PHASE I	PHASE II
1. INSTALL IMPERVIOUS DIKE A. 2. CONSTRUCT WESTERN CAUSEWAY AND BENT 1. 3. REMOVE WESTERN CAUSEWAY AND IMPERVIOUSE DIKE A.	1. INSTALL IMPERVIOUS DIKE B. 2. CONSTRUCT EASTERN CAUSEWAY AND BENT 2. 3. REMOVE EASTERN CAUSEWAY AND IMPERVIOUSE DIKE B.





ROADSIDE ENVIRONMENTAL UNIT
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
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2012 STANDARD SPECIFICATIONS

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PROJECT NO. 5C.032072
DURHAM COUNTY
BRIDGE NO.s 151
SHEET OF

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN VIEW ALONG
℄ SURVEY OF BRIDGE #151
ON SR-1614 OVER
FLAT CREEK

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1			3			TOTAL SHEETS
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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.

PROJECT NO. 5C.032072
DURHAM COUNTY
BRIDGE NO.: 151
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2012 STANDARD SPECIFICATIONS

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DEPARTMENT OF TRANSPORTATION
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PLAN VIEW ALONG
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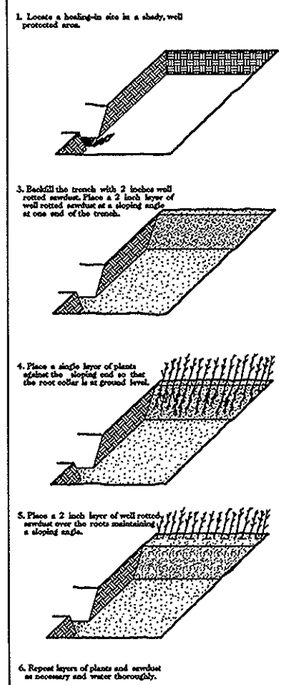
ROADSIDE ENVIRONMENTAL UNIT
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

2012 STANDARD SPECIFICATIONS

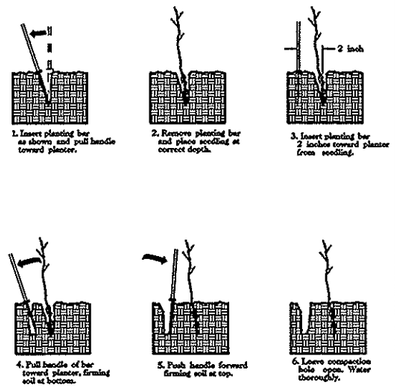
PLANTING DETAILS

SEEDLING / LINER BAREROOT PLANTING DETAIL

HEALING IN



DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



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:

35% PLATANUS OCCIDENTALIS	SYCAMORE	12 in - 18 in BR
35% FRAXINUS PENNSYLVANICA	GREEN ASH	12 in - 18 in BR
30% BETULA NIGRA	RIVER BIRCH	12 in - 18 in BR

PROJECT NO. 5C.032072
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PLAN VIEW ALONG
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FLAT CREEK

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