

STATE OF NORTH CAROLINA

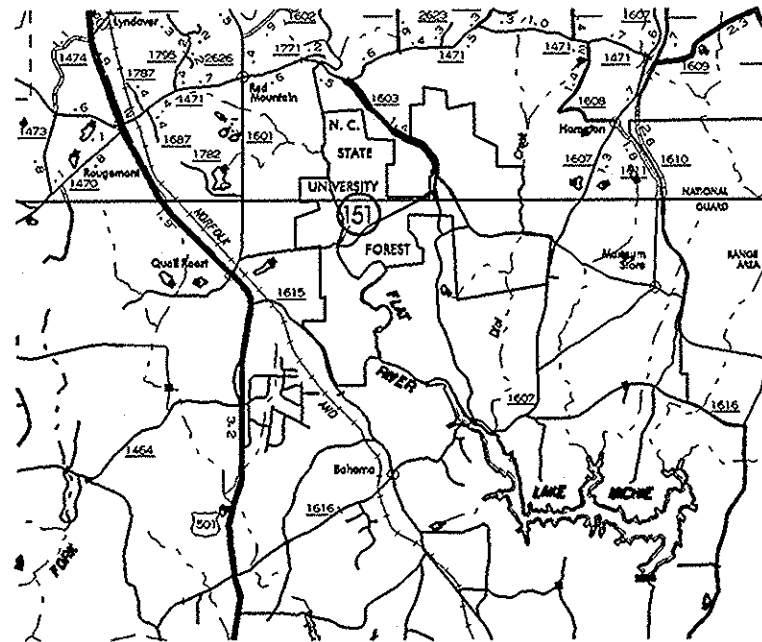
DIVISION OF HIGHWAYS

DURHAM COUNTY

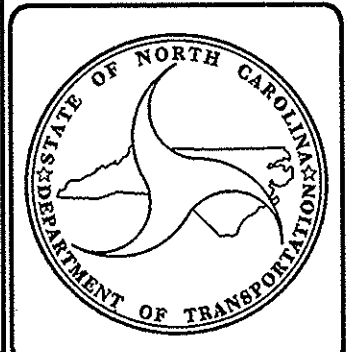
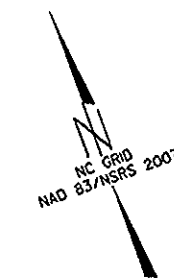
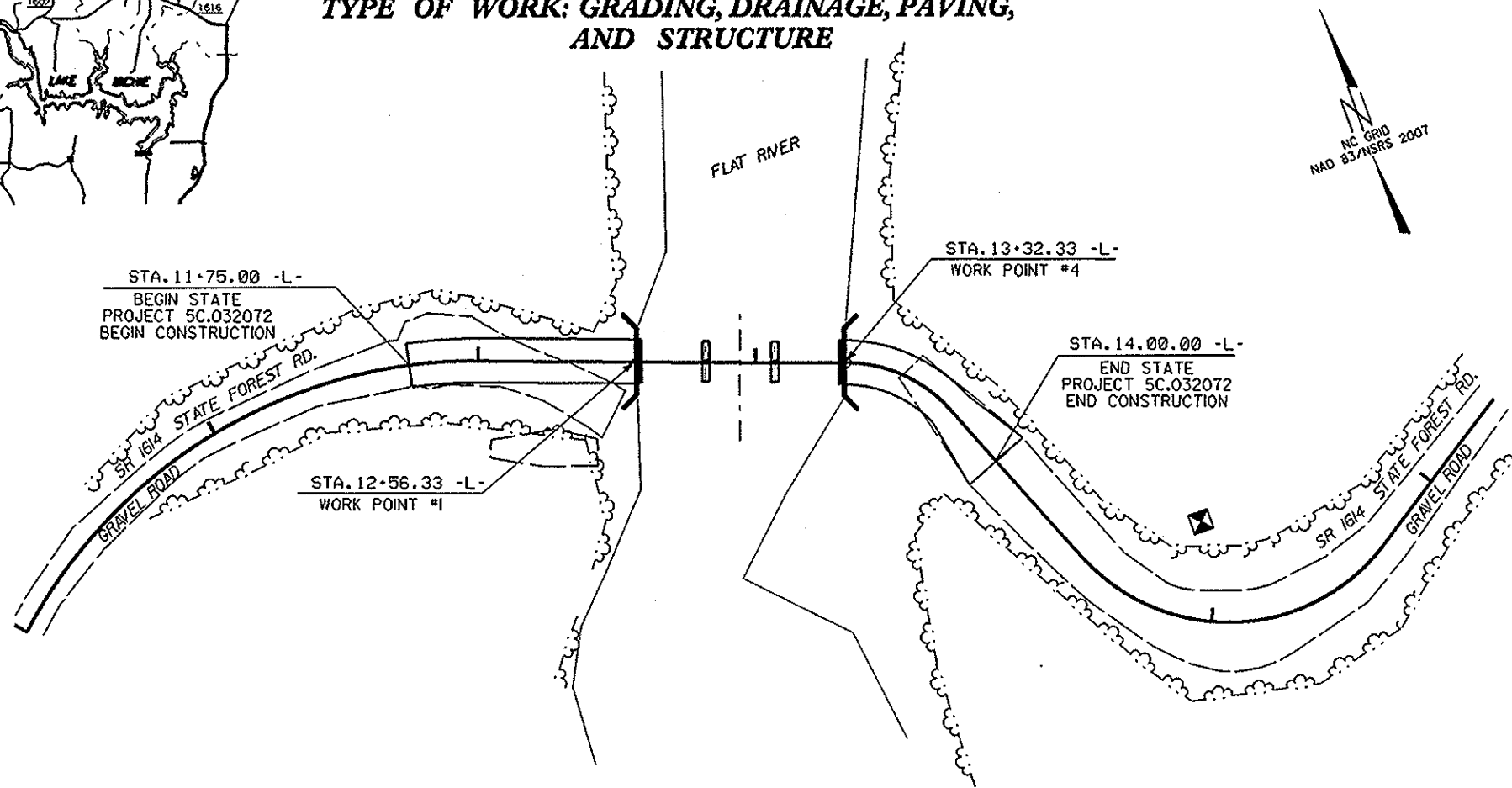
LOCATION: BRIDGE 151 ON SR 1614 OVER
FLAT RIVER

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

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.	



VICINITY MAP



DESIGN DATA
ADT 2008 = 60

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 OF NORTH CAROLINA

DIVISION OF HIGHWAYS

DURHAM COUNTY

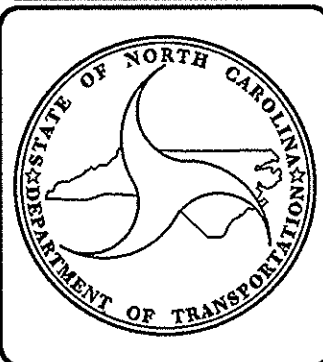
LOCATION: BRIDGE 151 ON SR 1614 OVER
FLAT RIVER

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

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.	

INDEX OF SHEETS

1	TITLE SHEET
IA	INDEX OF SHEETS
SI-S10	STRUCTURES
RI-R3	ROADWAY
XI-X6	CROSS SECTIONS
EC1-EC4	EROSION CONTROL



DESIGN DATA
ADT 2008 = 60

PROJECT LENGTH
LENGTH OF BRIDGE PROJECT = 0.0428 MILES

2012 STANDARD SPECIFICATIONS

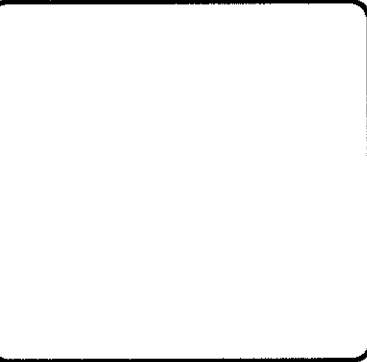
LETTING DATE:
MAY 23, 2012

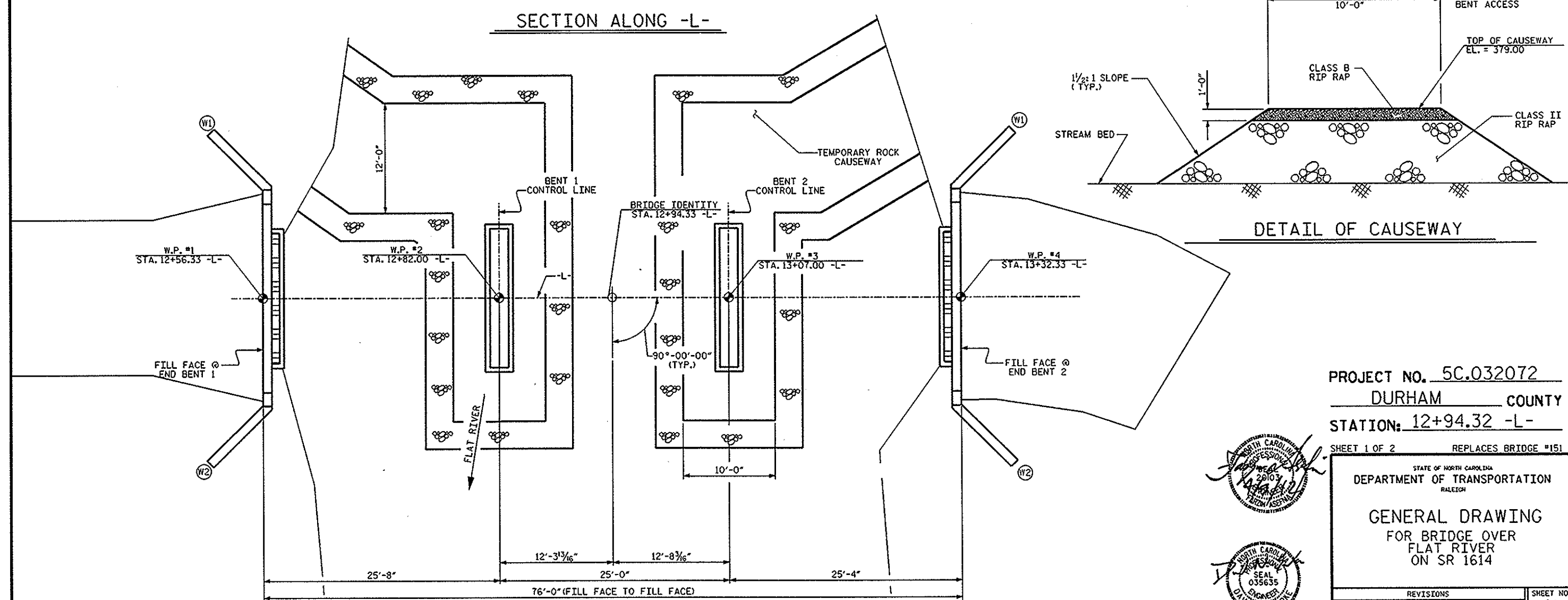
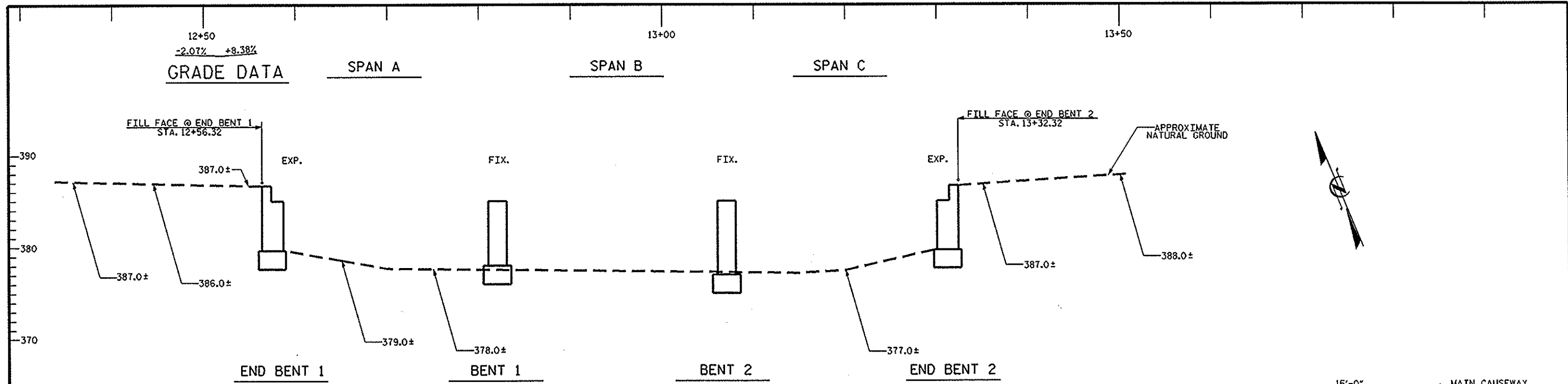
Prepared in the Office of:
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ENGINEER

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PROJECT DESIGN ENGINEER





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

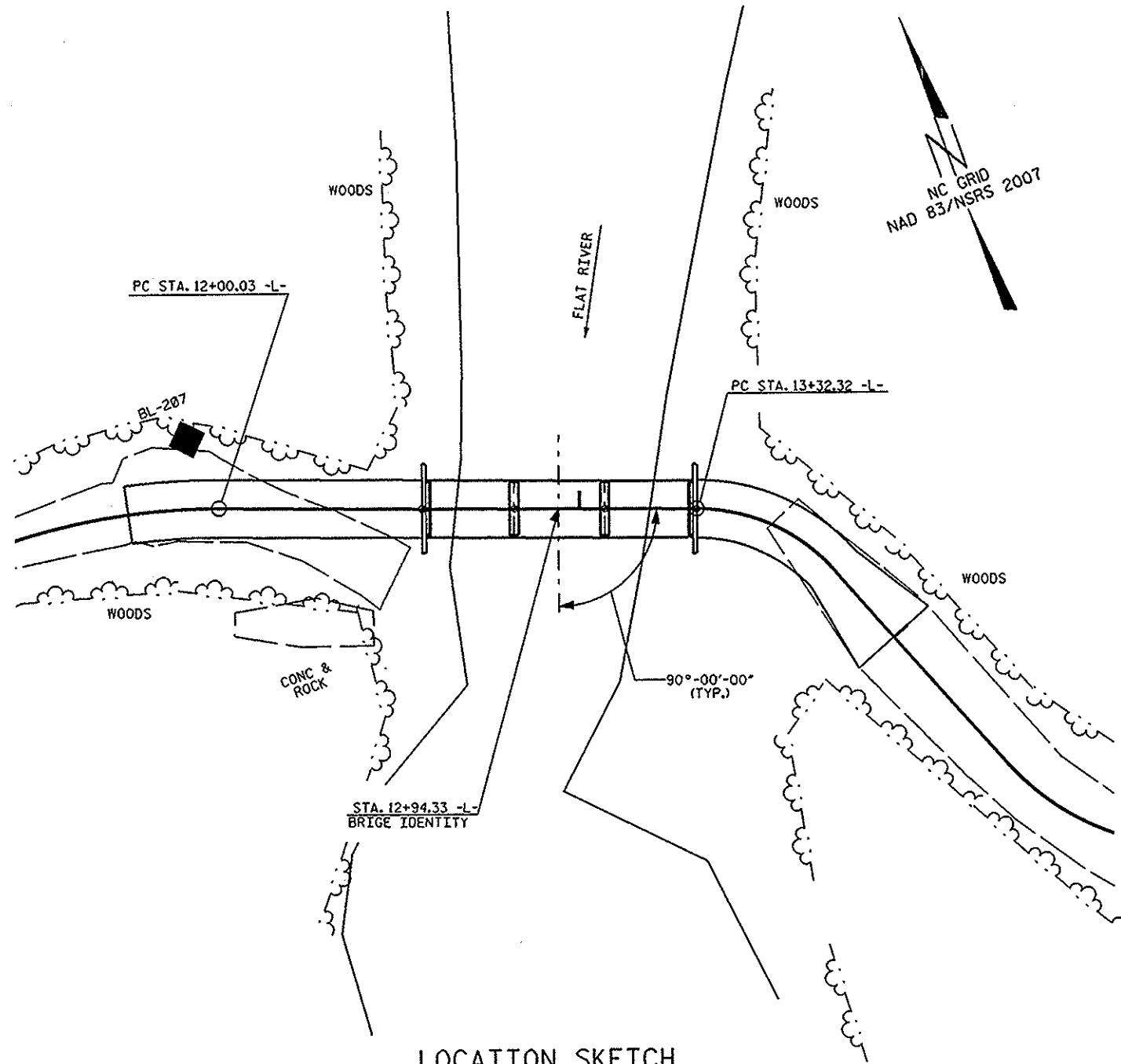


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
GENERAL DRAWING FOR BRIDGE OVER FLAT RIVER ON SR 1614					
REVISIONS					SHEET NO.
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		
					S-1
					TOTAL SHEETS 25

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

03-APR-2012 08:46
 S:\PRG\POC\Squad C\Brdge_Replacements\Durham\151\HAWK\Durham\151\151_S0_G0.dgn
 dsnoke

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.

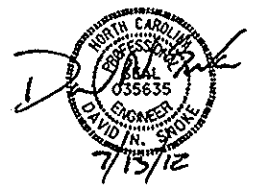
PROJECT NO. 5C.032072
 DURHAM COUNTY
 STATION: 12+94.32 -L-

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	SO. YDS.	LUMP SUM	LUMP SUM	LUMP SUM	CU. YDS.	LBS.	LBS.	TONS	SO. YDS.	LUMP SUM	LF	LF	LF	LBS
ROADWAY		33	441							231	175					
SUPERSTRUCTURE									18974			LUMP SUM	1216	456	152	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	456	152	1634

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

18-AL-2012 12:56
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 dsnoke

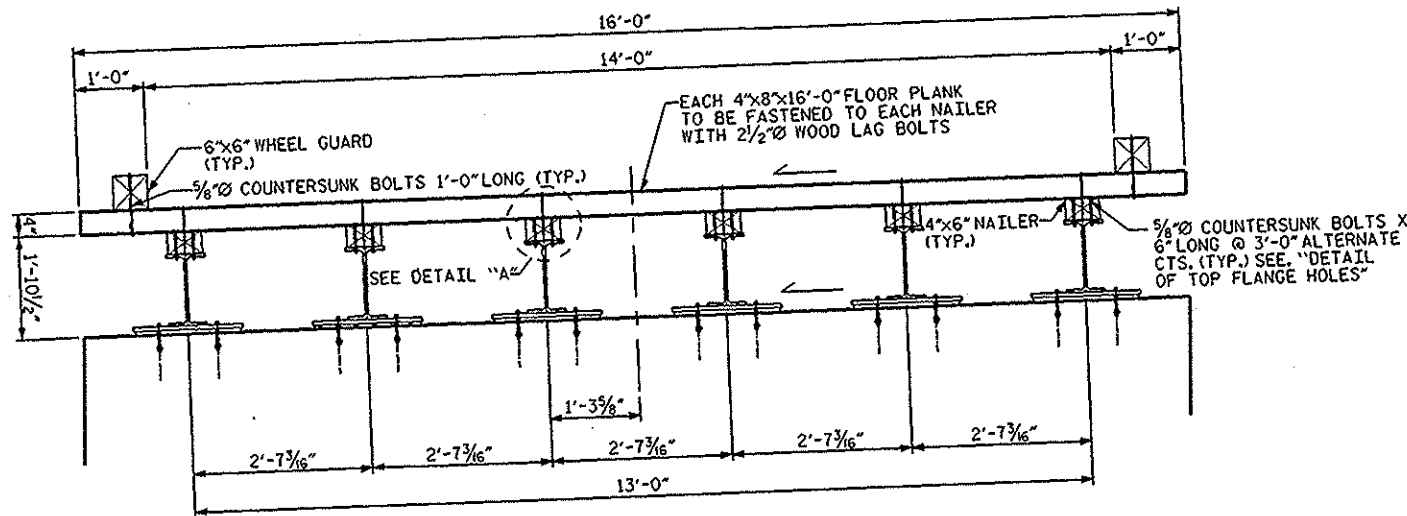


SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

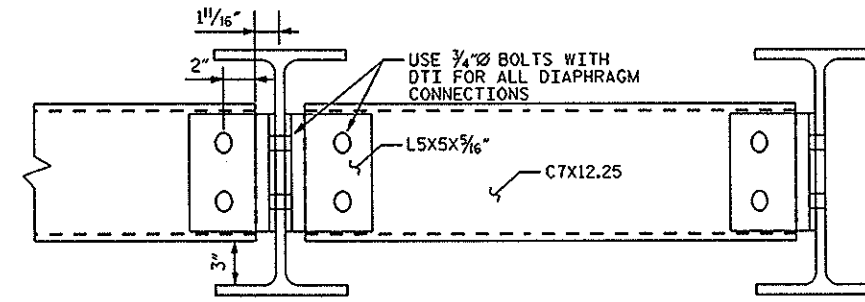
GENERAL DRAWING
 FOR BRIDGE OVER
 FLAT RIVER
 ON SR 1614

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

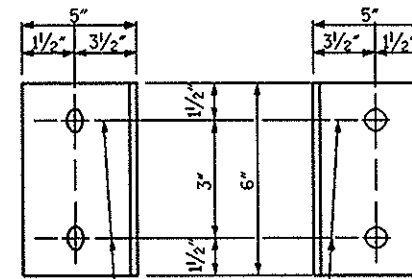


TYPICAL SECTION

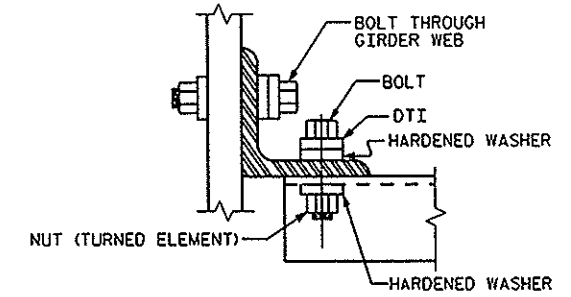
GIRDERS SHALL BE PERPENDICULAR TO TOP OF CAP AND DECK SHALL BE PARALLEL TO TOP OF CAP.



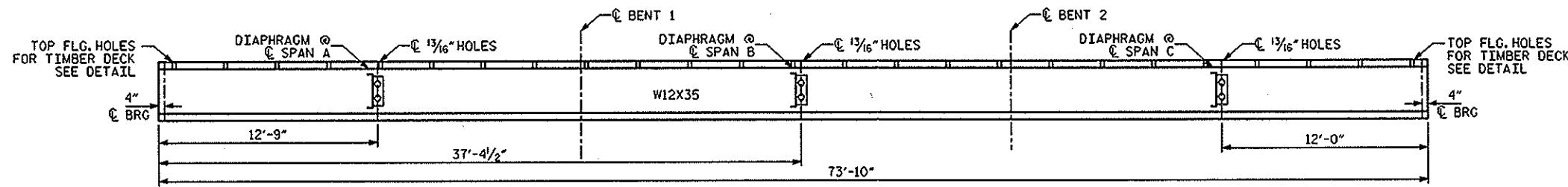
PART SECTION AT INTERMEDIATE DIAPHRAGM



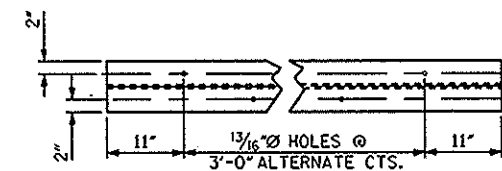
CONNECTOR ANGLE DETAILS



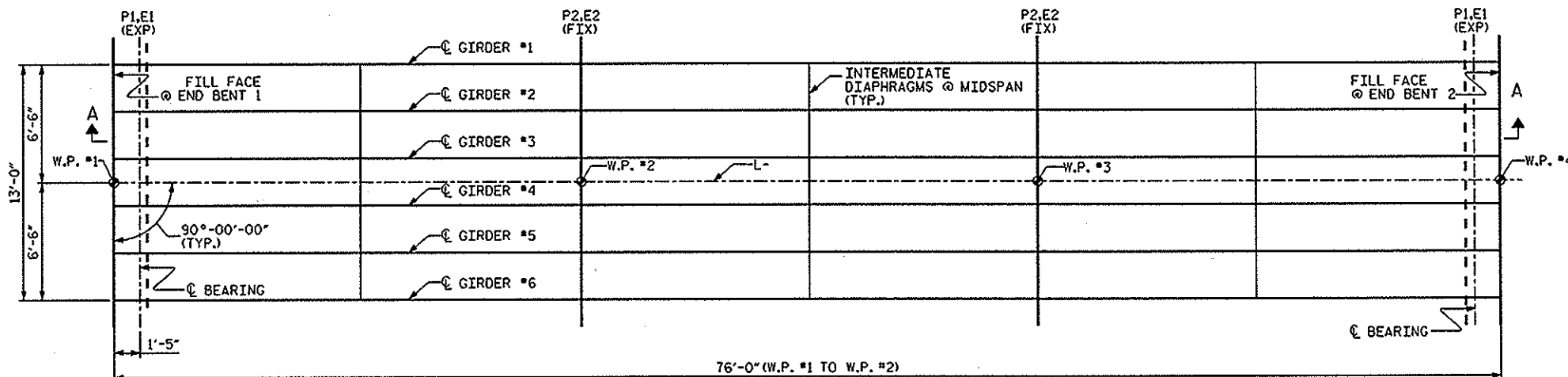
BOLT WITH DTI ASSEMBLY DETAIL



GIRDER ELEVATION



DETAIL OF TOP FLANGE HOLES

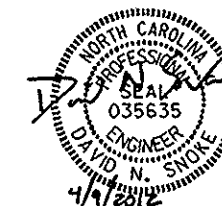


FRAMING PLAN

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

SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH				SUPERSTRUCTURE DETAILS	
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		
SHEET NO.					S-3
TOTAL SHEETS					25



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

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" 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 2 1/4" PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.

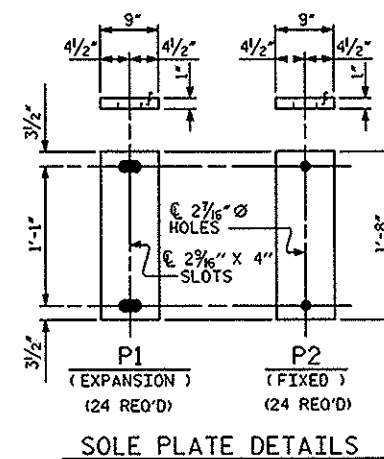
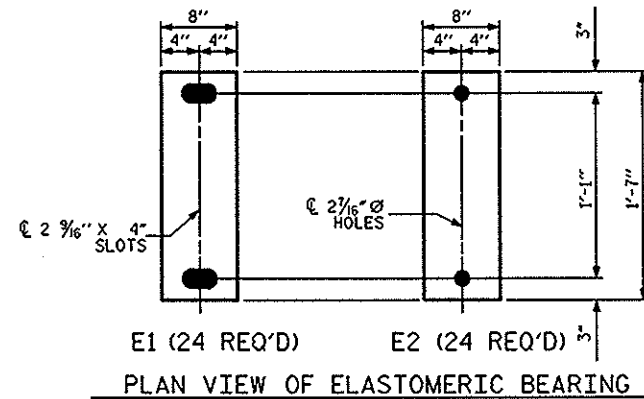
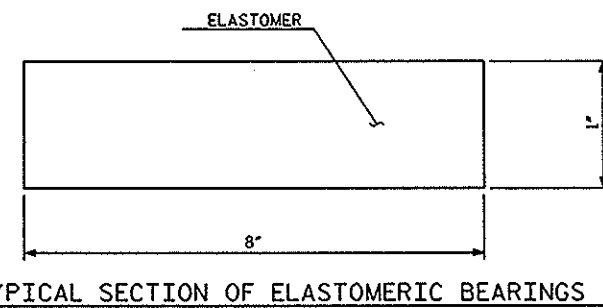
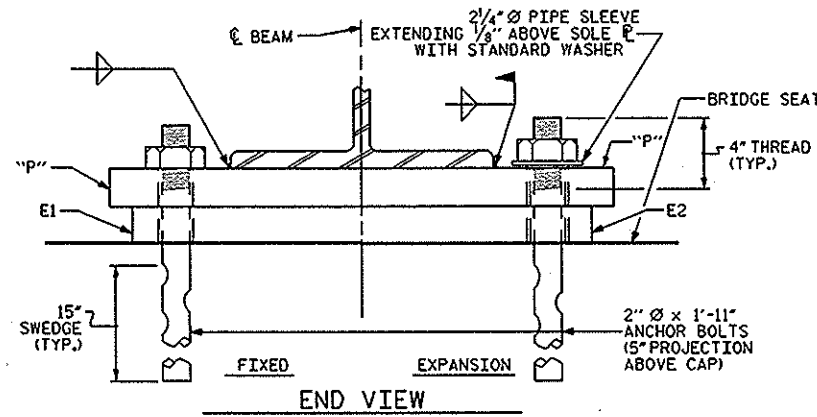
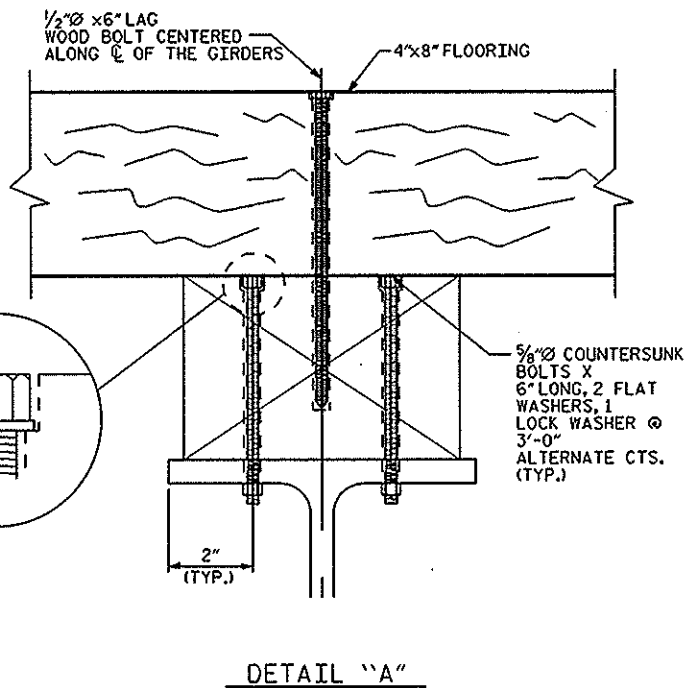
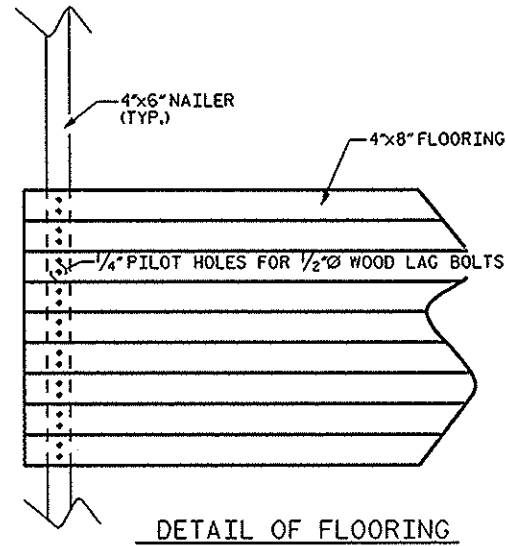
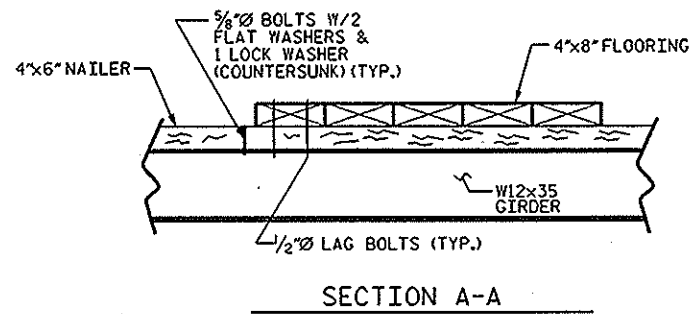
THE PAYMENT FOR THE PIPE SLEEVES SHALL BE INCLUDED IN THE SEVERAL PAY ITEMS.

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.

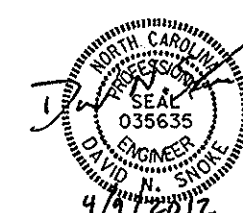
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT. ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.



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

SHEET 2 OF 2

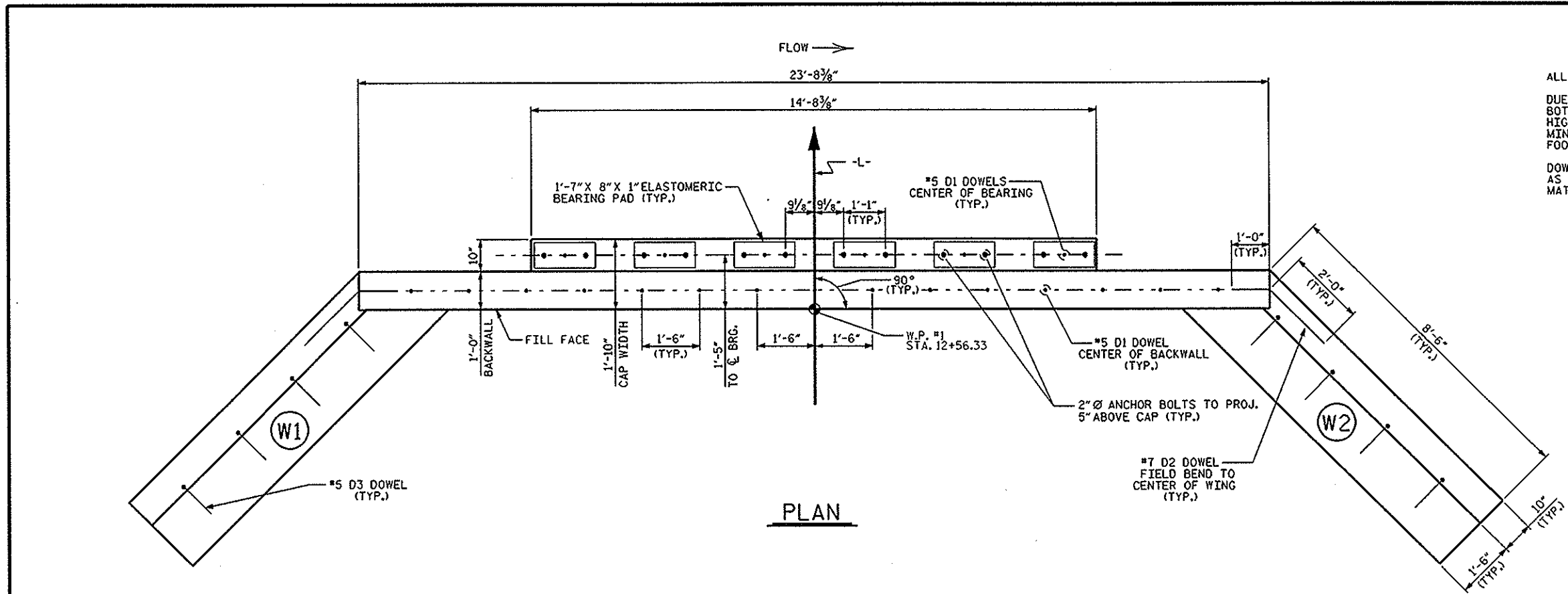
REVISIONS					SHEET NO.
NO.	BY	DATE	NO.	DATE	S-4
1			3		1074
2			4		26



SUPERSTRUCTURE
 DETAILS

STD. NO. EB1

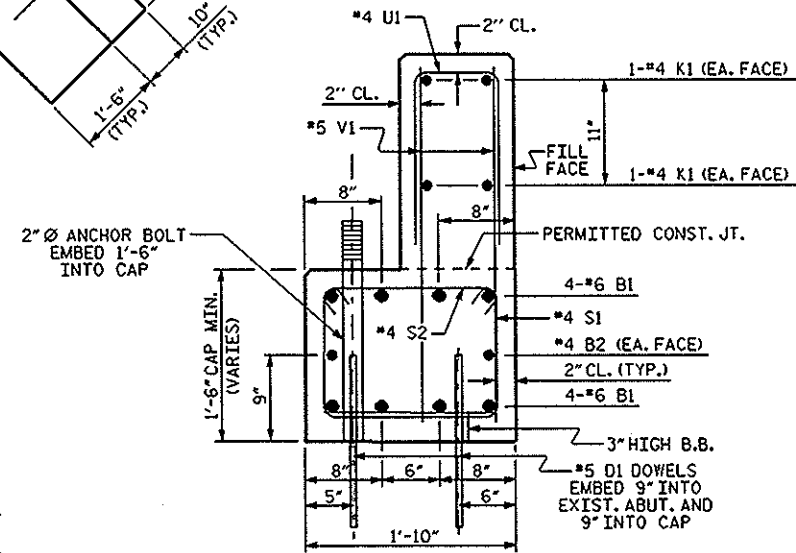
ASSEMBLED BY: J.D. HAWK DATE: 2/12/12
 CHECKED BY: D.N. SNOKE DATE: 3/30/12
 DRAWN BY: JMB 11/87 REV. 10/17/00 RWW/LES
 CHECKED BY: ARB 11/87 REV. 5/1/05 TLA/GM
 REV. 10/1/8 NAA/GM



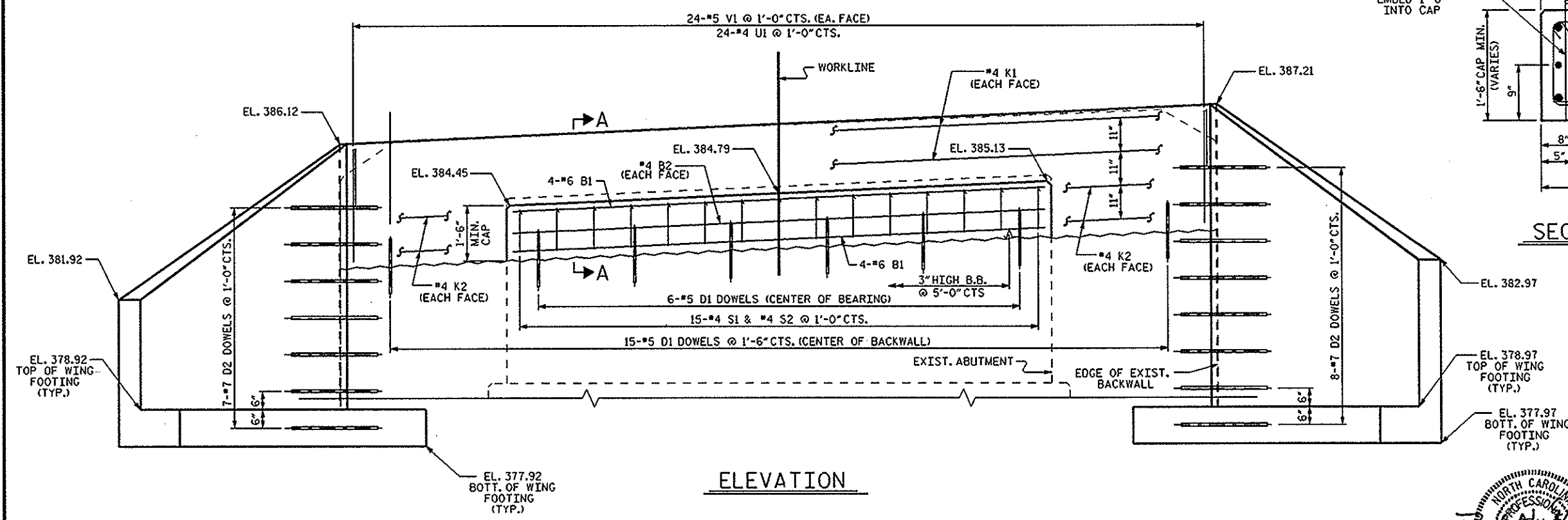
NOTES

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.

PLAN



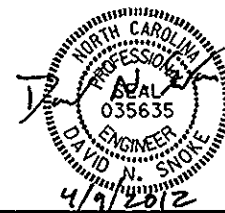
SECTION A-A



ELEVATION

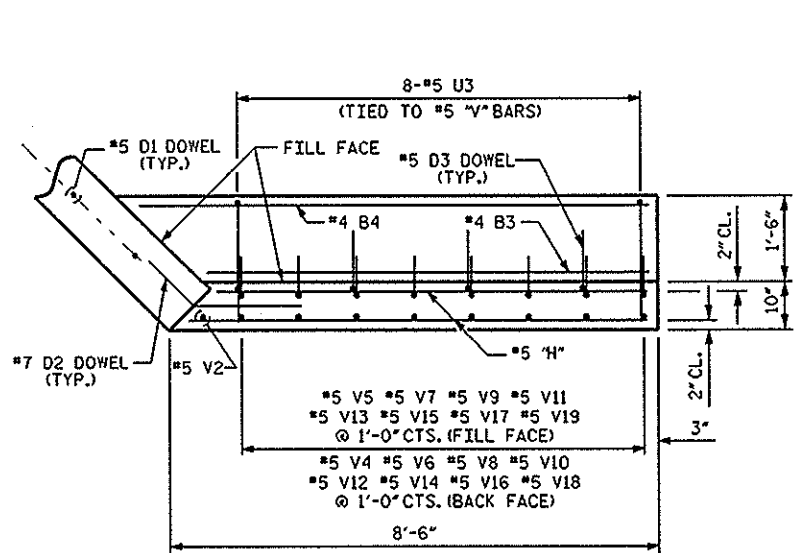
PROJECT NO. 5C.032072
DURHAM COUNTY
 STATION: 12+94.32 -L-

SHEET 1 OF 2
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT #1

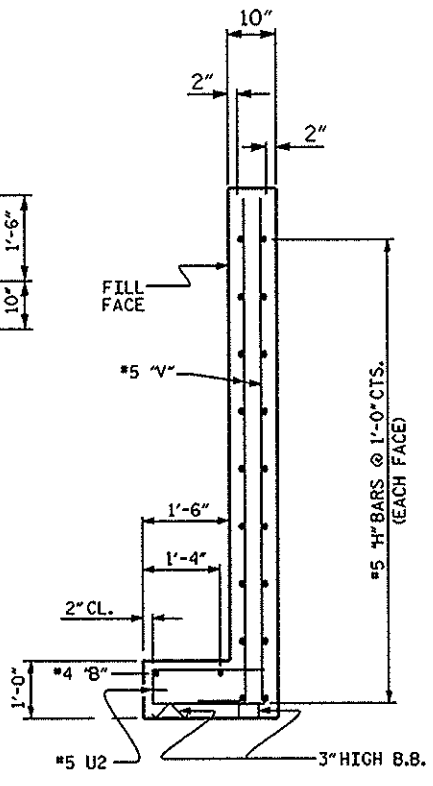


REVISIONS					SHEET NO.
NO.	BY	DATE	NO.	DATE	S-5
1			3		TOTAL SHEETS
2			4		25

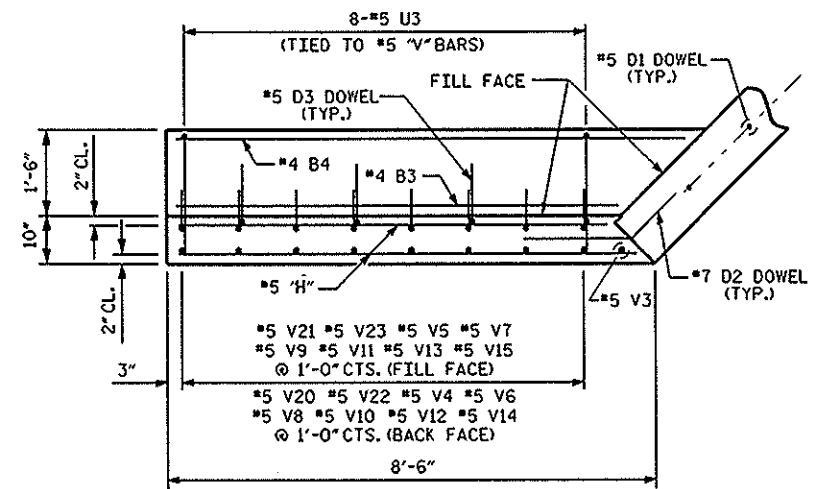
DRAWN BY: D.V. JOYNER DATE: 2-23-2012
 CHECKED BY: D.J. SMOKE DATE: 3-30-2012



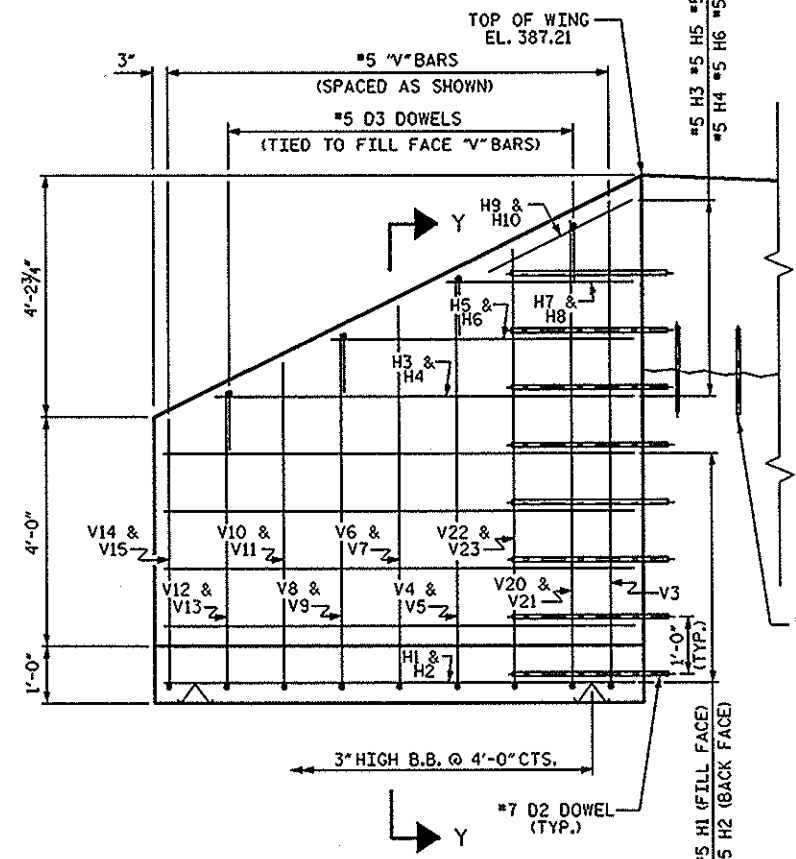
PLAN OF WING (W1)



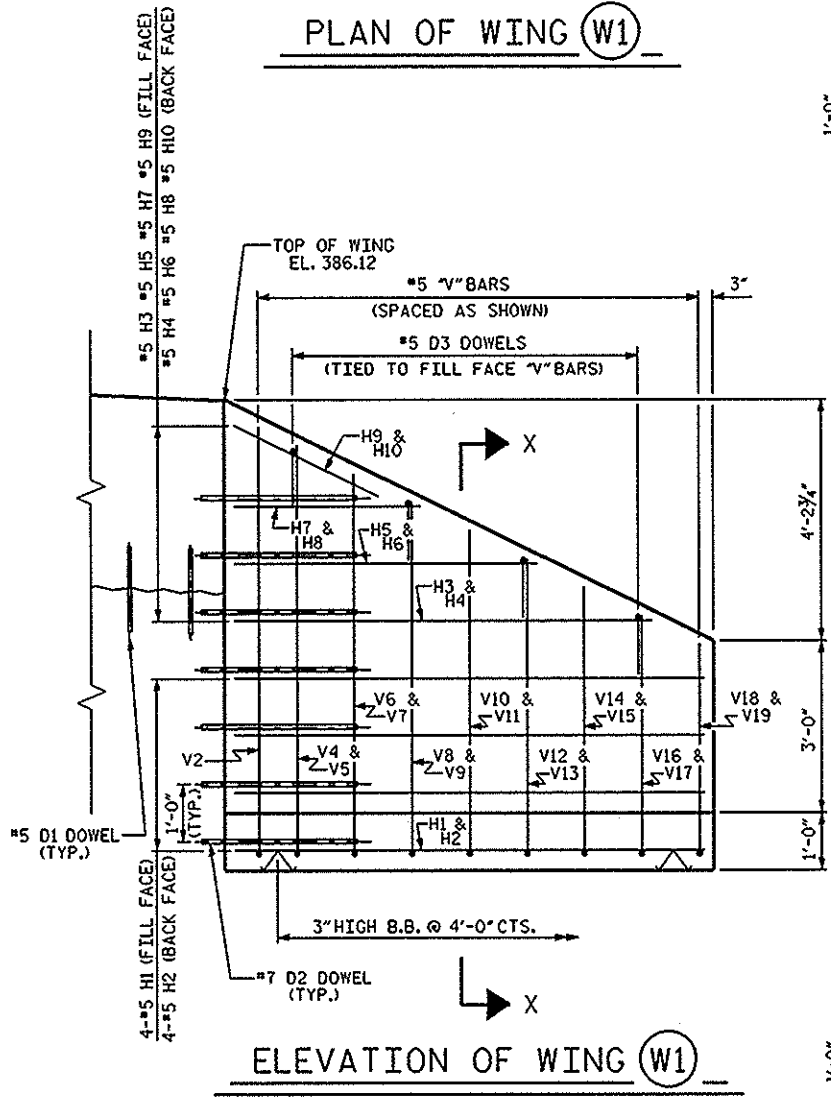
SECTION Y-Y



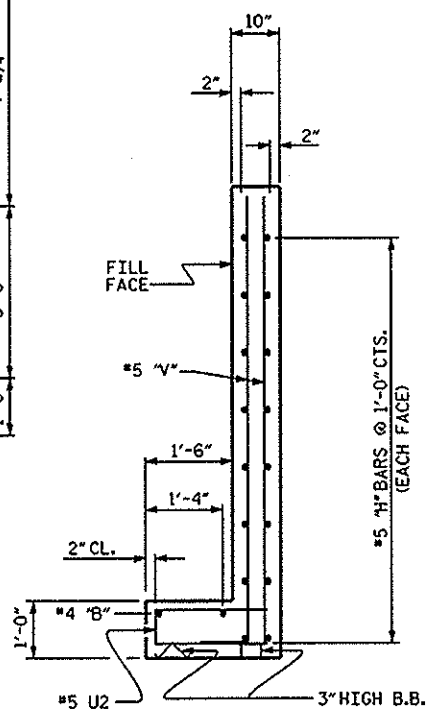
PLAN OF WING (W2)



ELEVATION OF WING (W2)

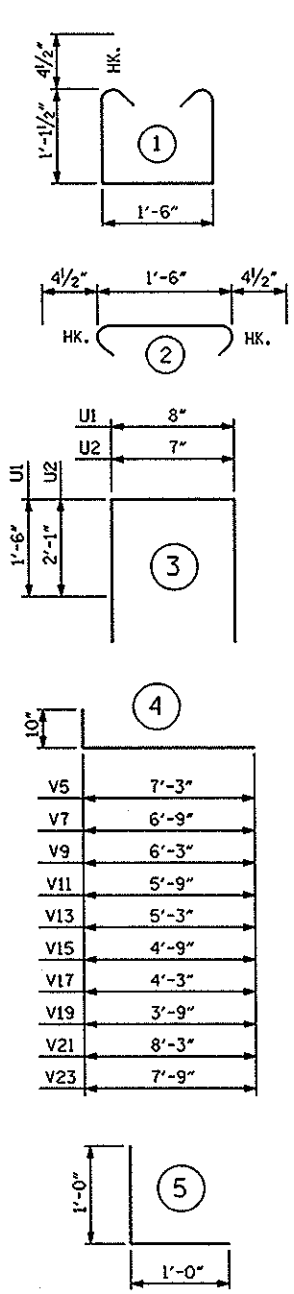


ELEVATION OF WING (W1)



SECTION X-X

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

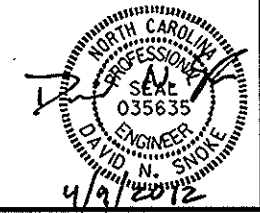
BILL OF MATERIAL

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"	6
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

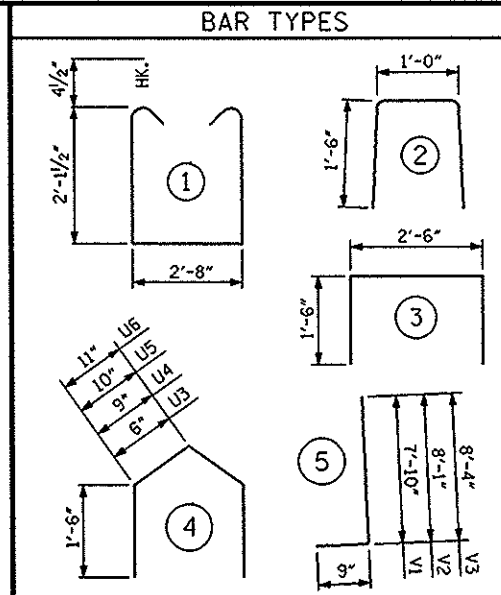
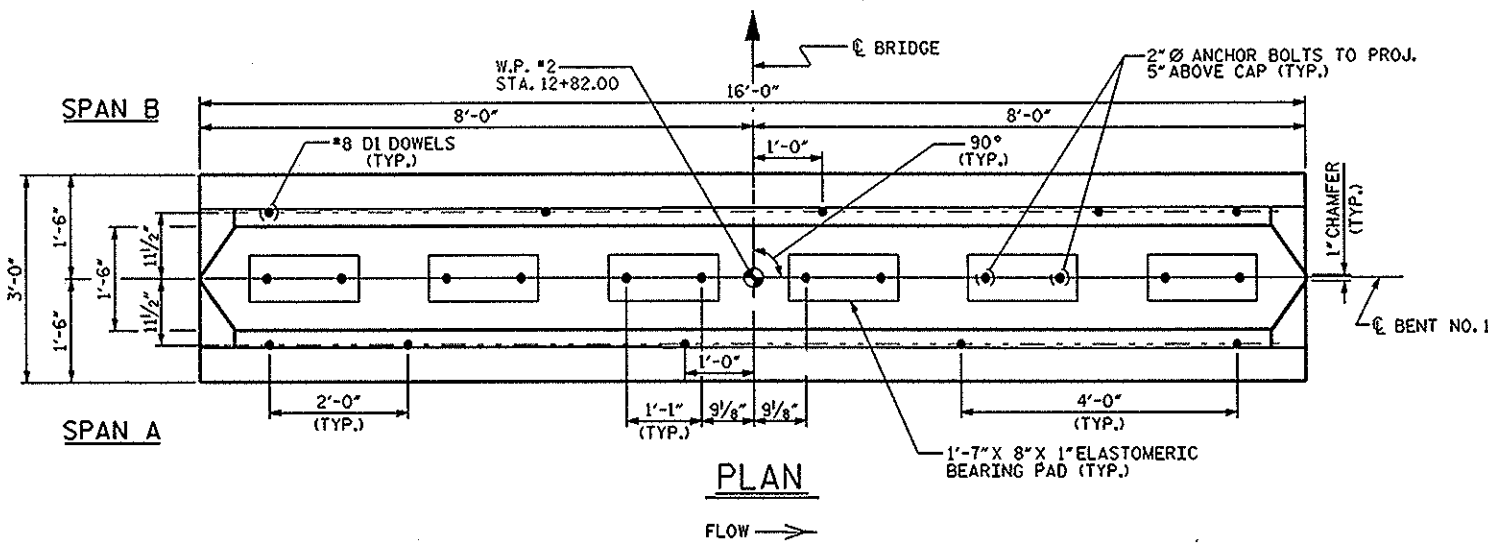
PROJECT NO. 5C.032072
 DURHAM COUNTY
 STATION: 12+94.32 -L-
 SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT #1
 WING DETAILS



REVISIONS				SHEET NO.
NO.	BY	DATE	NO.	DATE
1			25	
2			25	

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

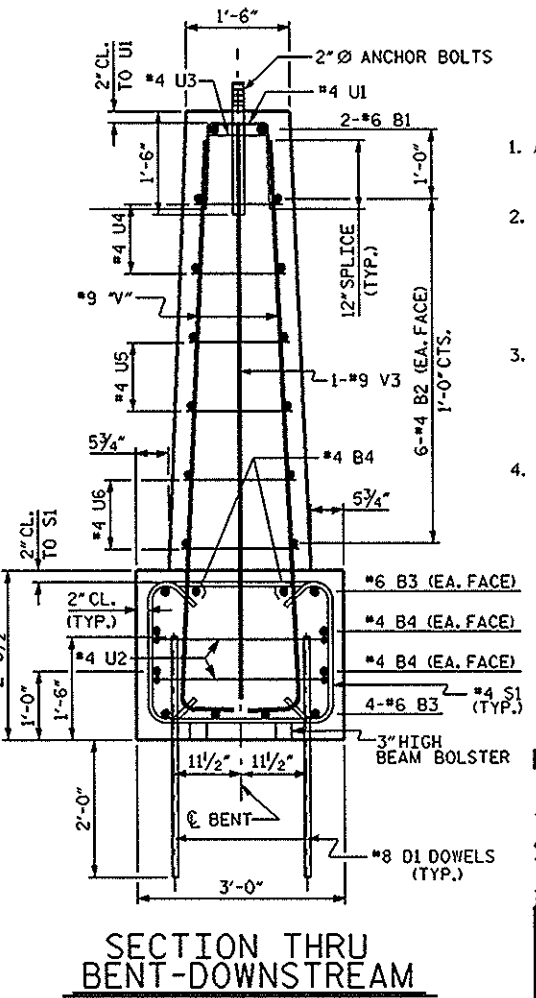
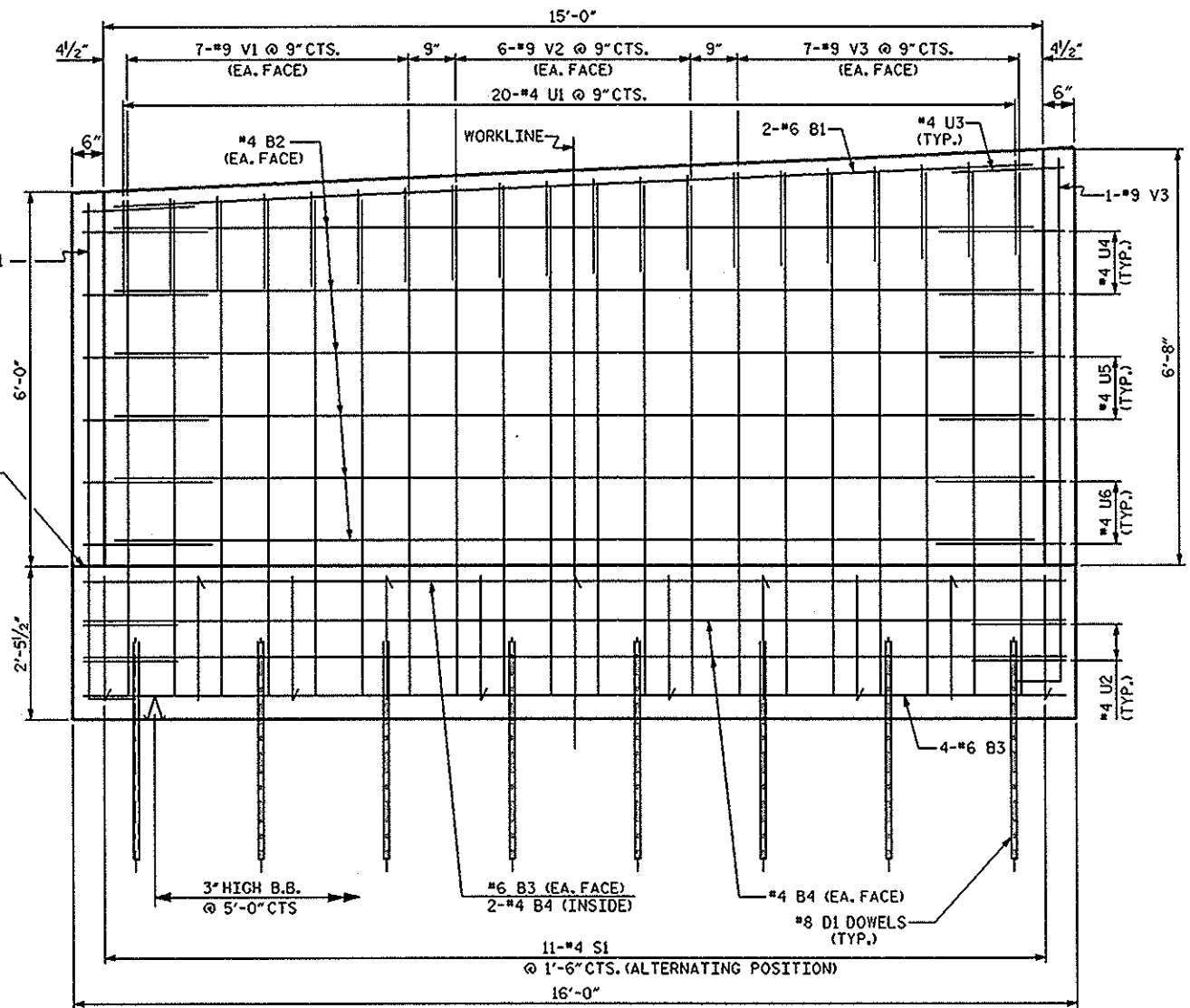
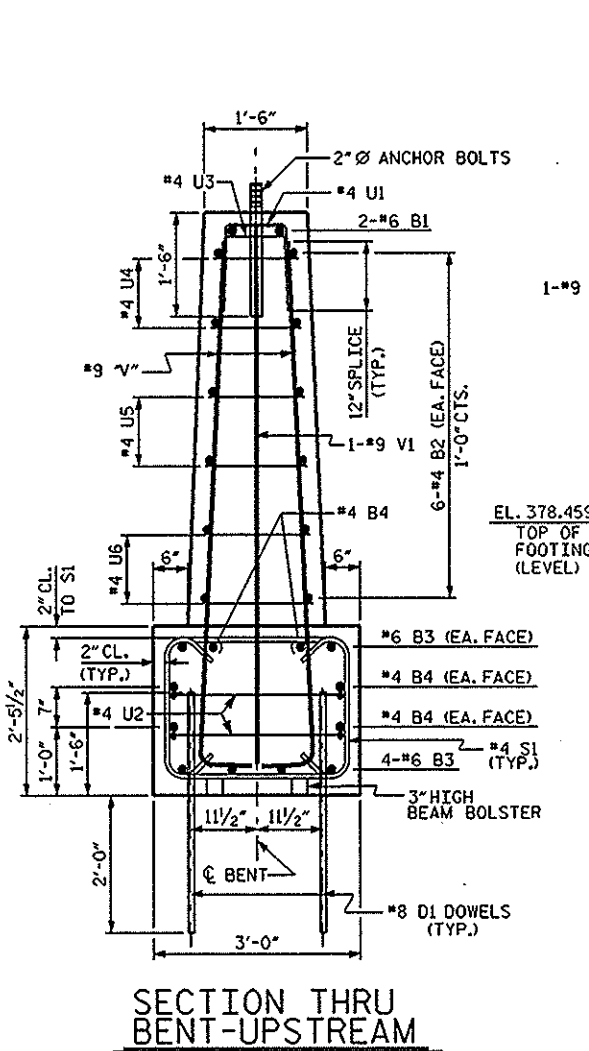


BILL OF MATERIAL					
BENT 1					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	2	#6	STR	14'-8"	44
B2	12	#4	STR	14'-8"	118
B3	6	#6	STR	15'-8"	141
B4	6	#4	STR	15'-8"	63
D1	10	#8	STR	3'-6"	93
S1	11	#4	L	7'-8"	56
U1	20	#4	2	4'-0"	53
U2	4	#4	3	4'-6"	12
U3	2	#4	4	4'-0"	5
U4	4	#4	4	4'-6"	12
U5	4	#4	4	4'-8"	12
U6	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

NOTES

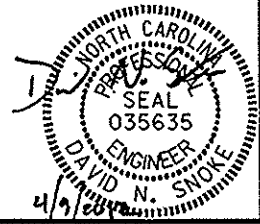
1. ALL ELEVATIONS BASED ON BEST AVAILABLE INFORMATION
2. THE SPREAD FOOTING AT BENT NO.1 AND BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 10 TSF. CHECK FIELD CONDITIONS FOR THE REQUIRED RESISTANCE OF 15 TSF JUST BEFORE PLACING CONCRETE.
3. KEY IN SPREAD FOOTINGS AT BENT NO.1 AND BENT NO.2 AT LEAST 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 LIFE OF THE STRUCTURE.



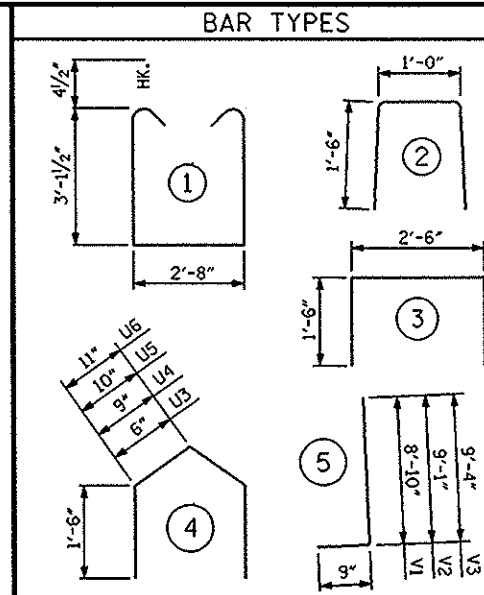
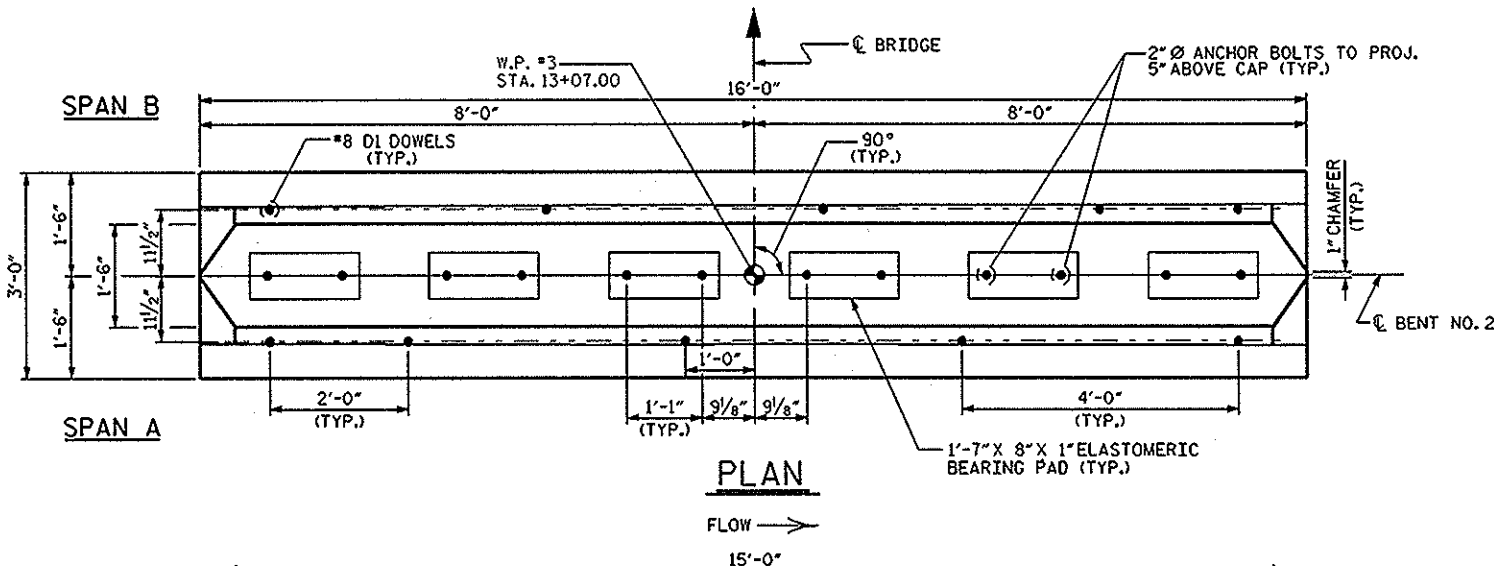
PROJECT NO. 5C.032072
 DURHAM COUNTY
 STATION: 12+94.32 -L-
 SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT #1

REVISIONS				SHEET NO.
NO.	BY	DATE	DESCRIPTION	
1				5-7
2				TOTAL SHEETS 25



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

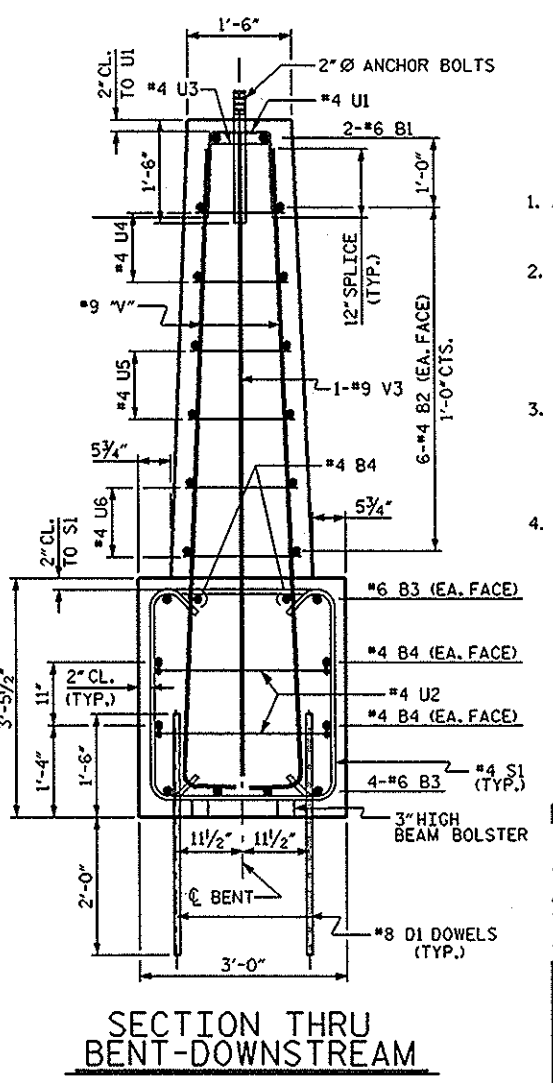
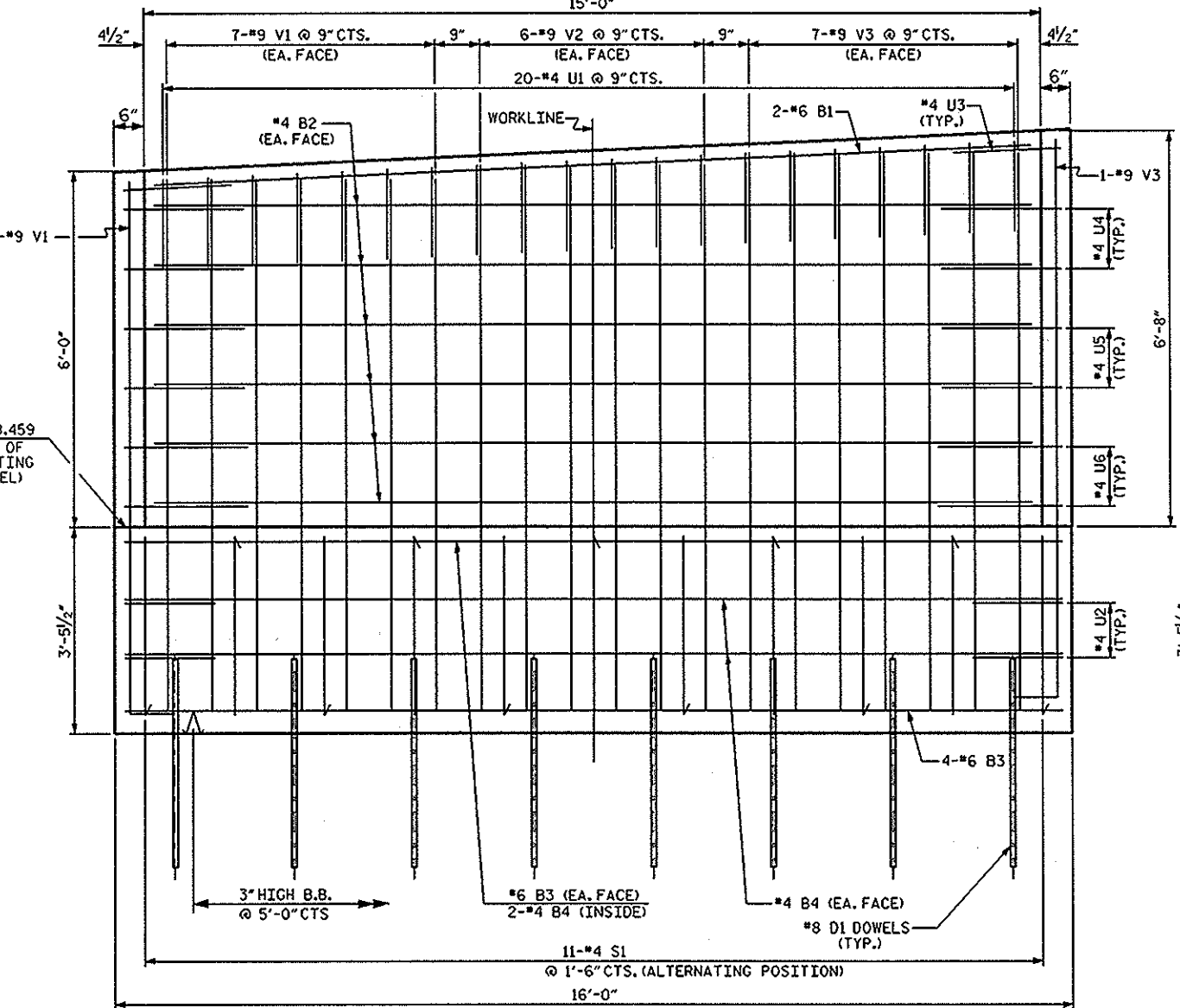
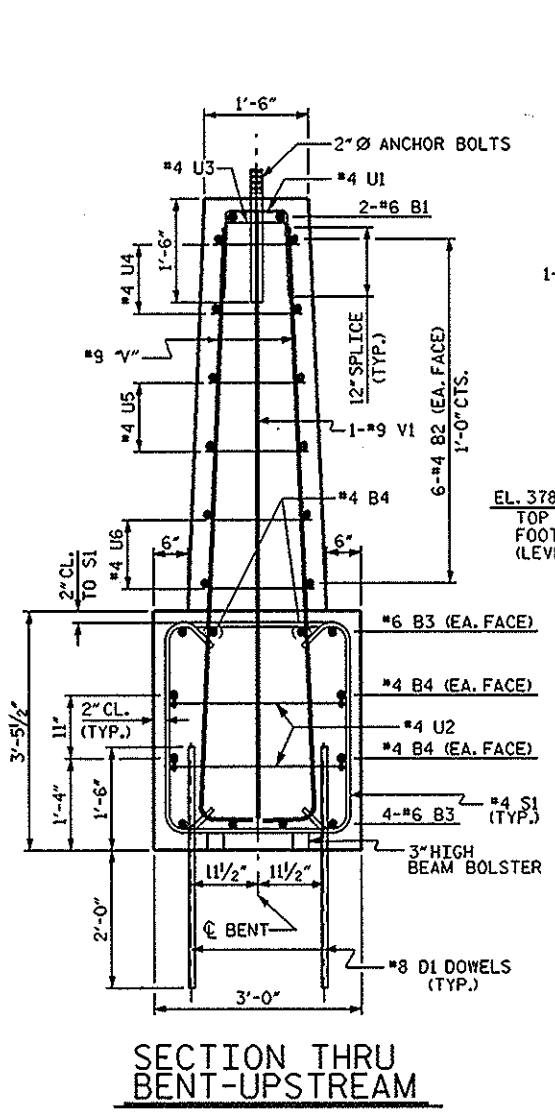


BILL OF MATERIAL				
BENT 2				
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	#6	STR	14'-8"	44
B2	#4	STR	14'-8"	118
B3	#6	STR	15'-8"	141
B4	#4	STR	15'-8"	63
D1	#8	STR	3'-6"	93
S1	#4	I	9'-8"	71
U1	#4	2	4'-0"	53
U2	#4	3	4'-6"	12
U3	#4	4	4'-0"	5
U4	#4	4	4'-6"	12
U5	#4	4	4'-8"	12
U6	#4	4	4'-10"	13
V1	#9	5	9'-7"	489
V2	#9	5	9'-10"	401
V3	#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 LIFE OF THE STRUCTURE.



PROJECT NO. 5C.032072
 DURHAM COUNTY
 STATION: 12+94.32 -L-
 SHEET 1 OF 1

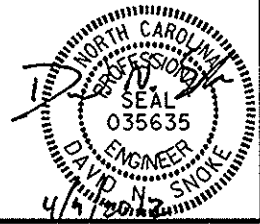
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

BENT #2

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

TOTAL SHEETS: 25

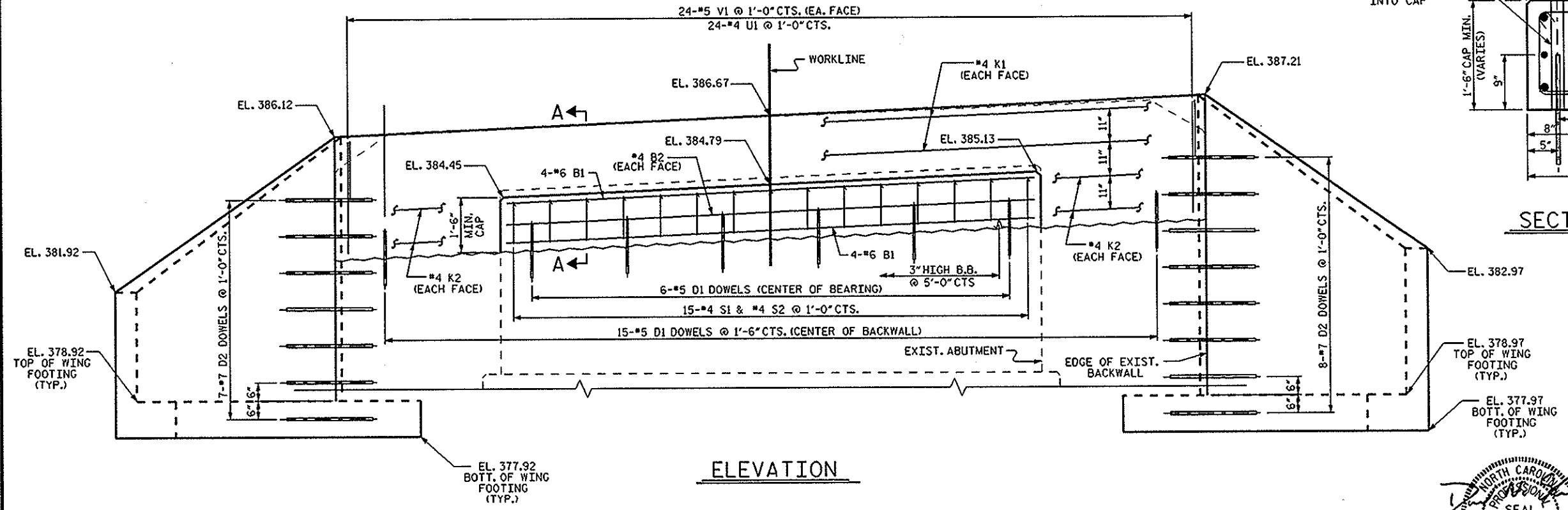
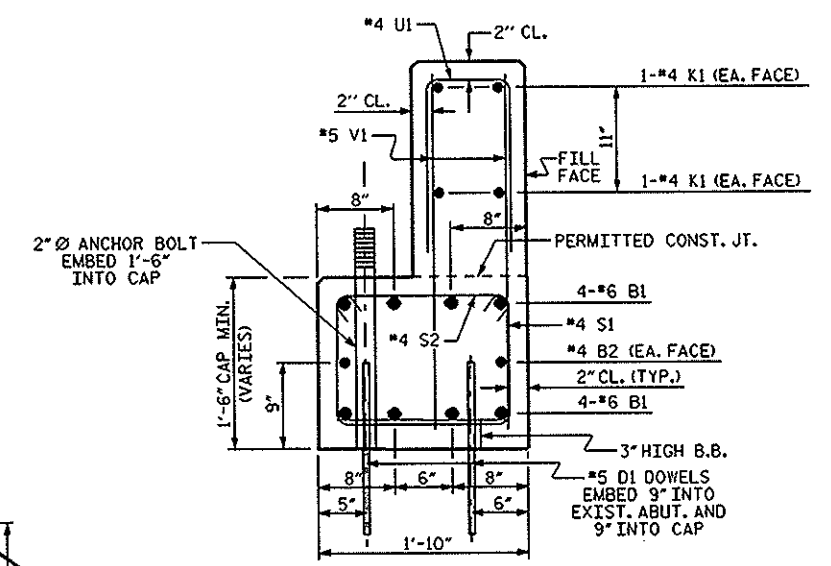
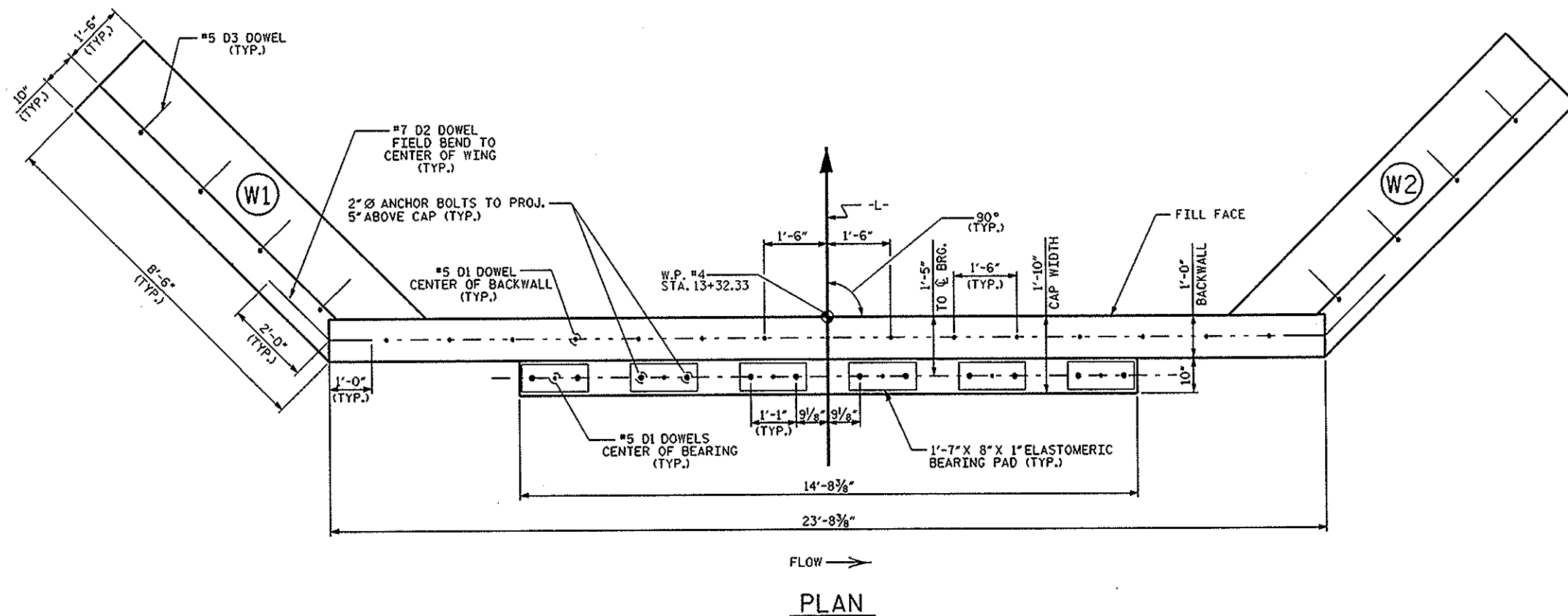


DRAWN BY: D.V. JOYNER DATE: 2-8-12
 CHECKED BY: D.N. SNOKE DATE: 3-30-12

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.

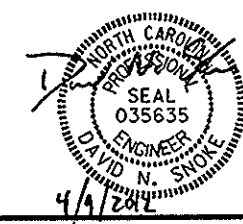


PROJECT NO. 5C.032072
DURHAM COUNTY
 STATION: 13+32.32 -L-
 SHEET 1 OF 2

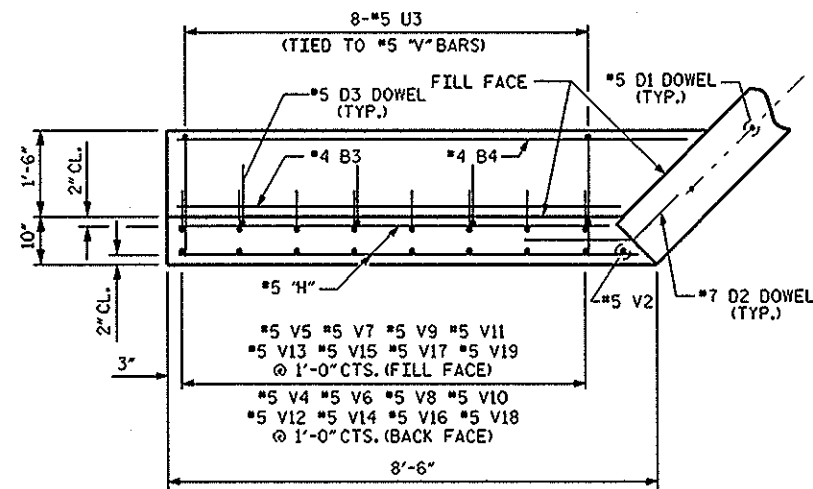
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 END BENT #2**

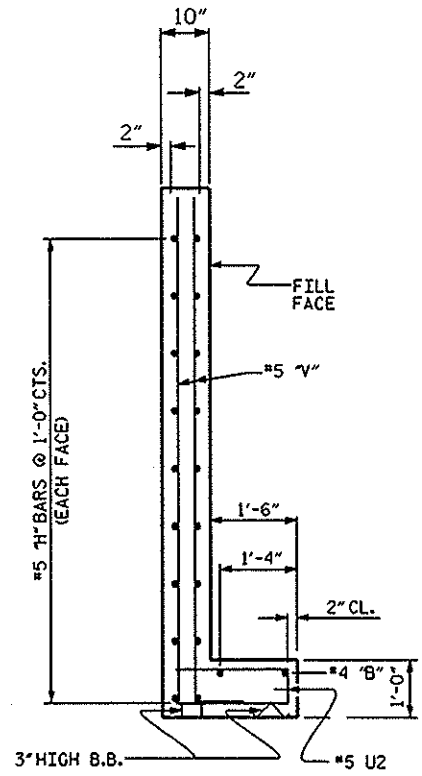
REVISIONS						SHEET NO. S-9
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 25
2			4			



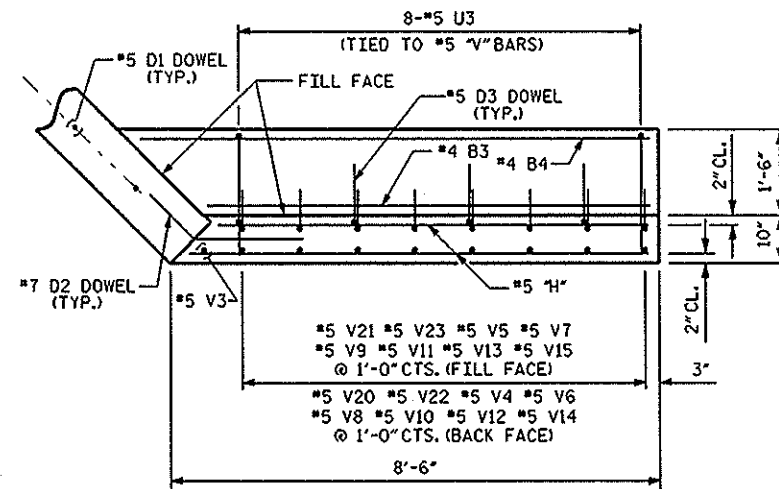
DRAWN BY : D.V. JOYNER DATE : 2-23-2012
 CHECKED BY : D.J. SMOKE DATE : 3-30-2012



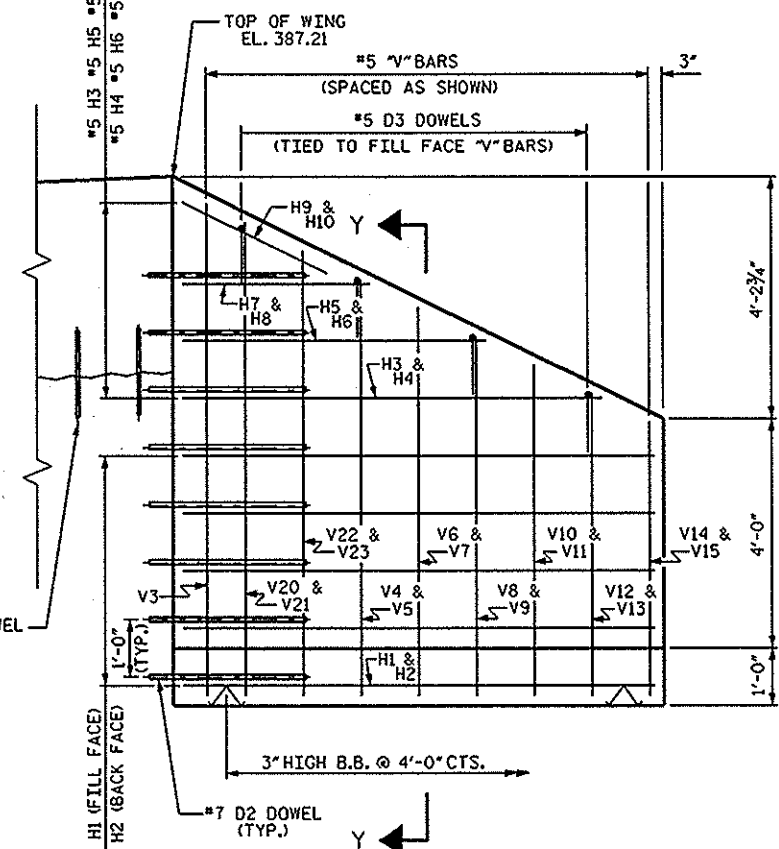
PLAN OF WING (W1)



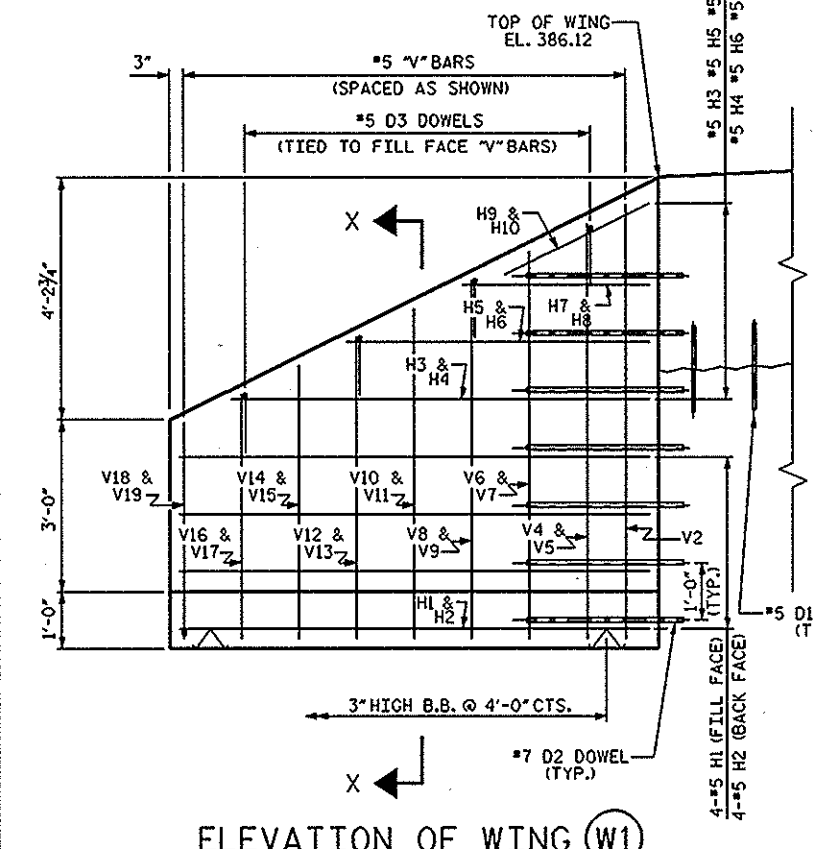
SECTION Y-Y



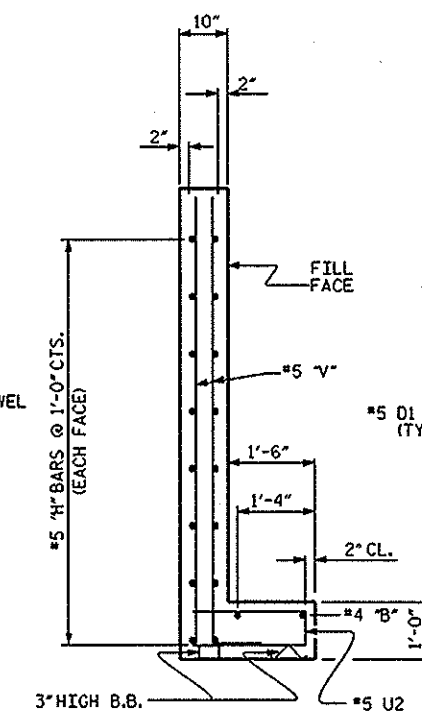
PLAN OF WING (W2)



ELEVATION OF WING (W2)

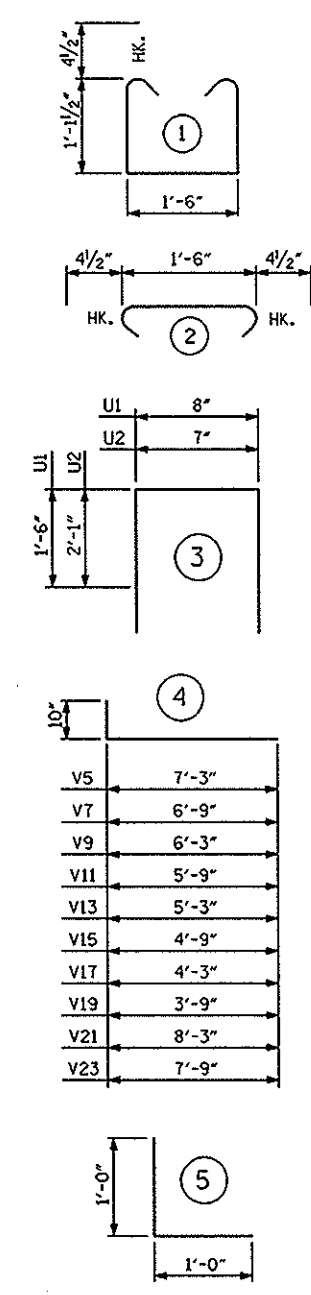


ELEVATION OF WING (W1)



SECTION X-X

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

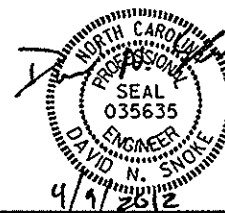
BILL OF MATERIAL

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
O1	21	5	STR	1'-6"	33
O2	15	7	STR	3'-0"	92
O3	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

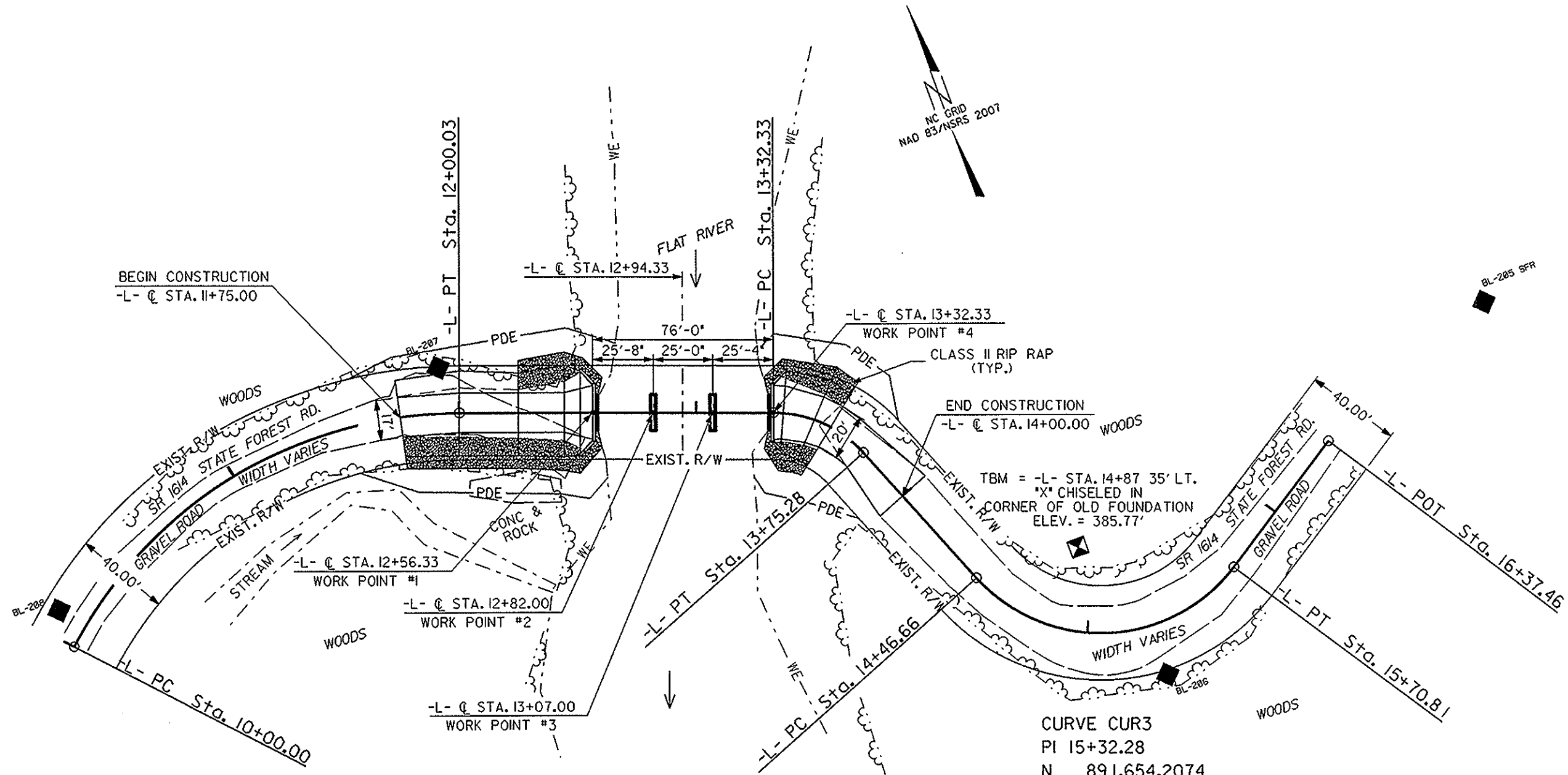
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT #2
 WING DETAILS



REVISIONS					SHEET NO.
NO.	BY	DATE	NO.	DATE	S-10
1			3		
2			4		

DRAWN BY: D.V. JOYNER DATE: 2-23-2012
 CHECKED BY: D.J. SMOKE DATE: 3-30-2012

09-APR-2012 09:04
 S:\PRG\POC\Squad C\Brdge_Replacements\Durham IS\Substructure\SR1614.S0.E.dgn
 danoko



PLAN
SCALE: 1"=50'

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

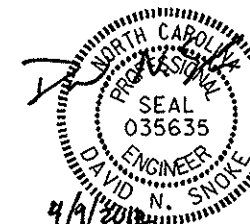
CURVE CUR2
 PI 13+55.16
 N 891,820.9466
 E 2,033,605.5045
 Δ 48° 13' 40" (RT)
 D 112° 16' 35"
 R 51.03
 Lc 42.95
 T 22.84

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

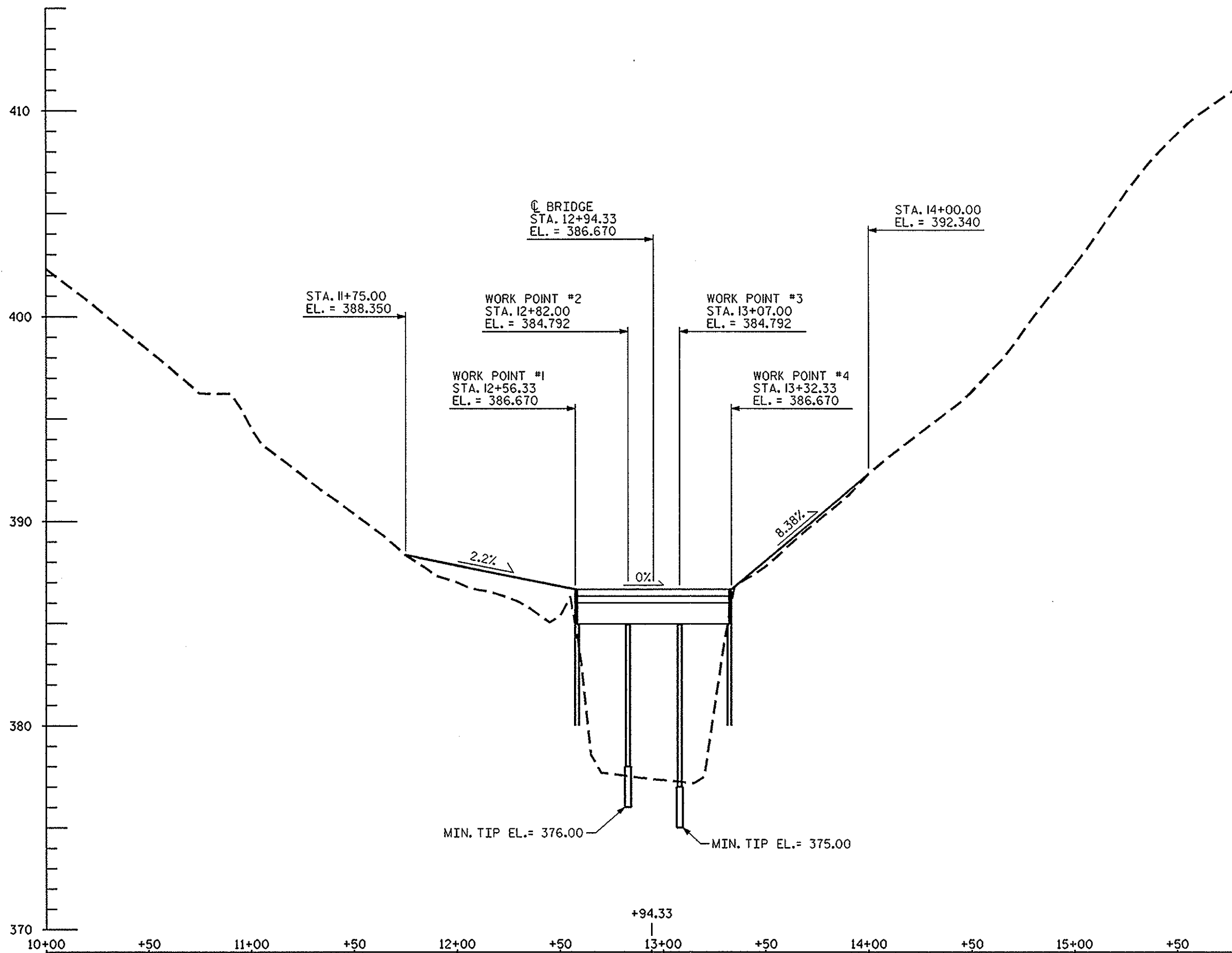
PROJECT NO. 5C.032072
DURHAM COUNTY
 BRIDGE NO. 151

SHEET 1 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
PLAN VIEW ALONG C SURVEY OF BRIDGE #151 ON SR-1614 OVER FLAT CREEK					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		
					SHEET NO. R-1 TOTAL SHEETS 25



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



MIN. TIP EL.= 376.00 MIN. TIP EL.= 375.00

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

16+00 +50 17+00

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

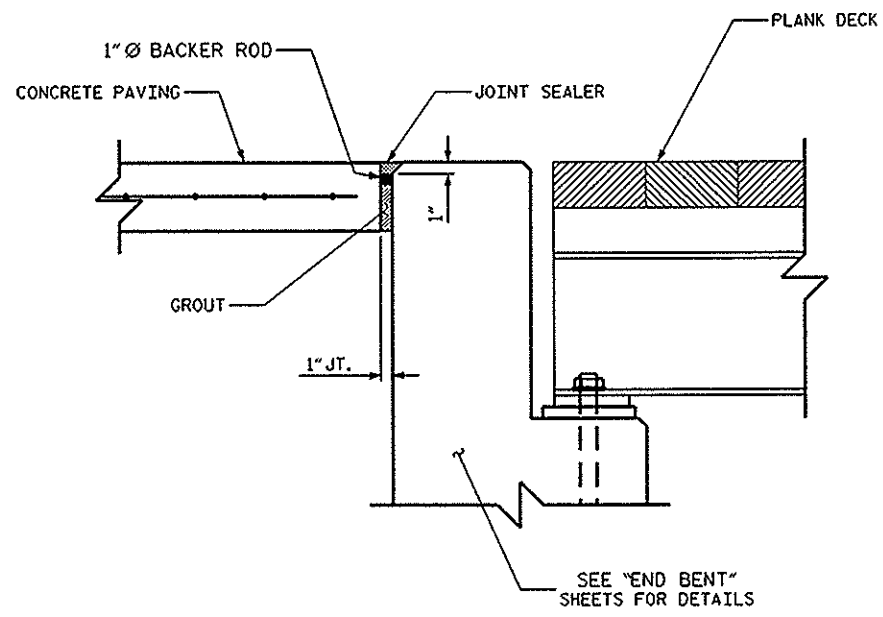
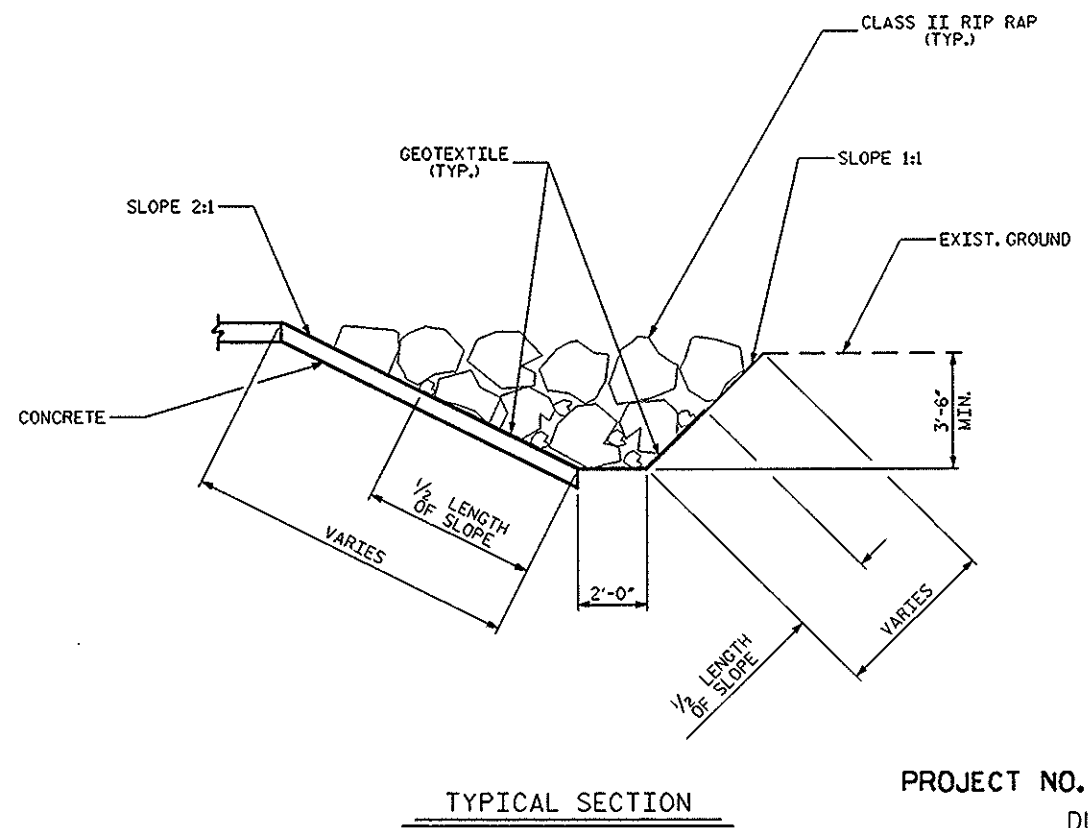
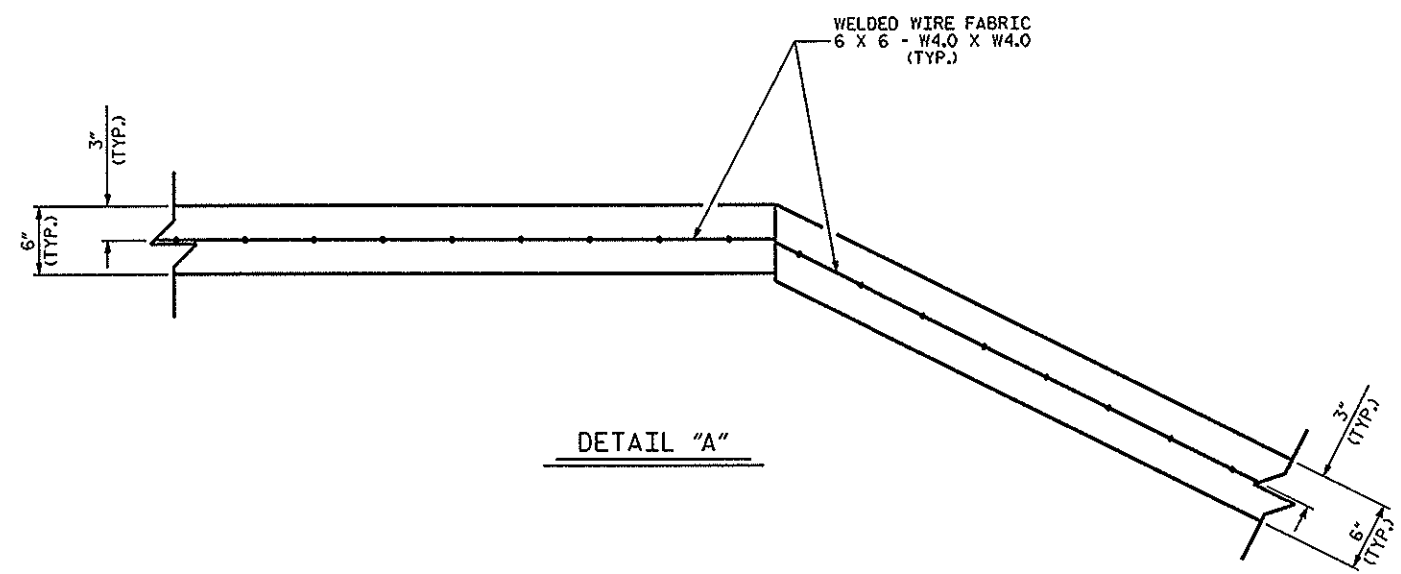
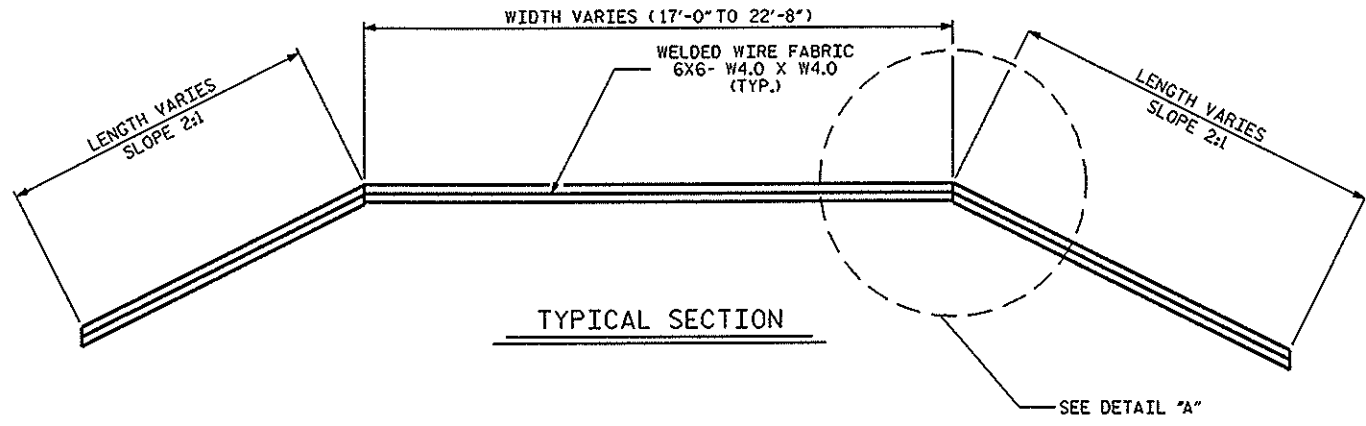
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	R-2
1			3			TOTAL SHEETS
2			6			25

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

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

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 REMOVAL 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.

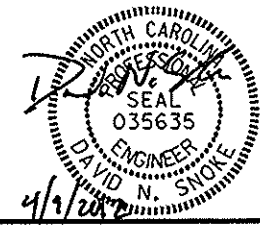


PROJECT NO. 5C.032072
DURHAM COUNTY
 STATION: 12+94.33
 SHEET 3 OF 3

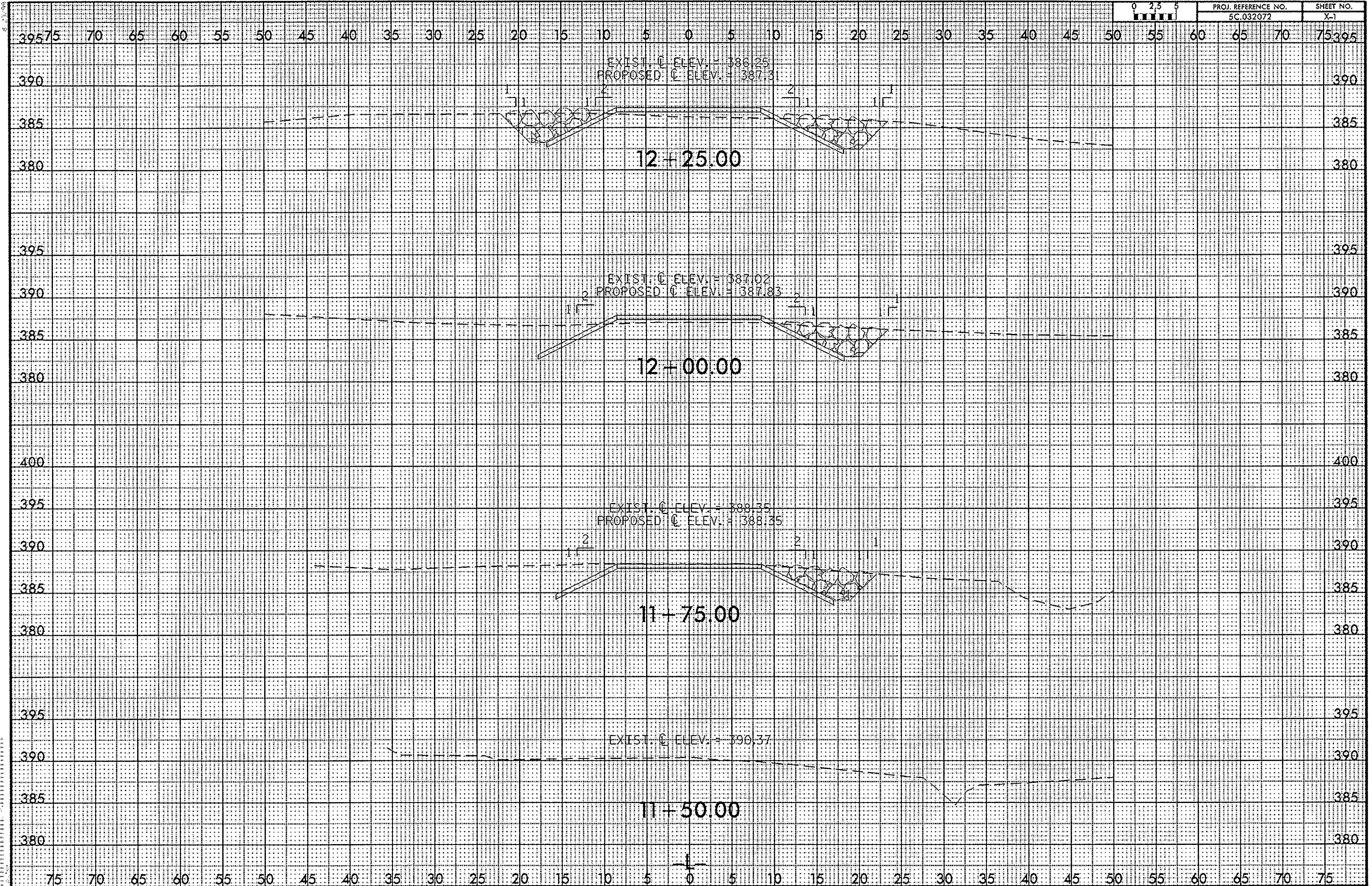
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

DETAILS

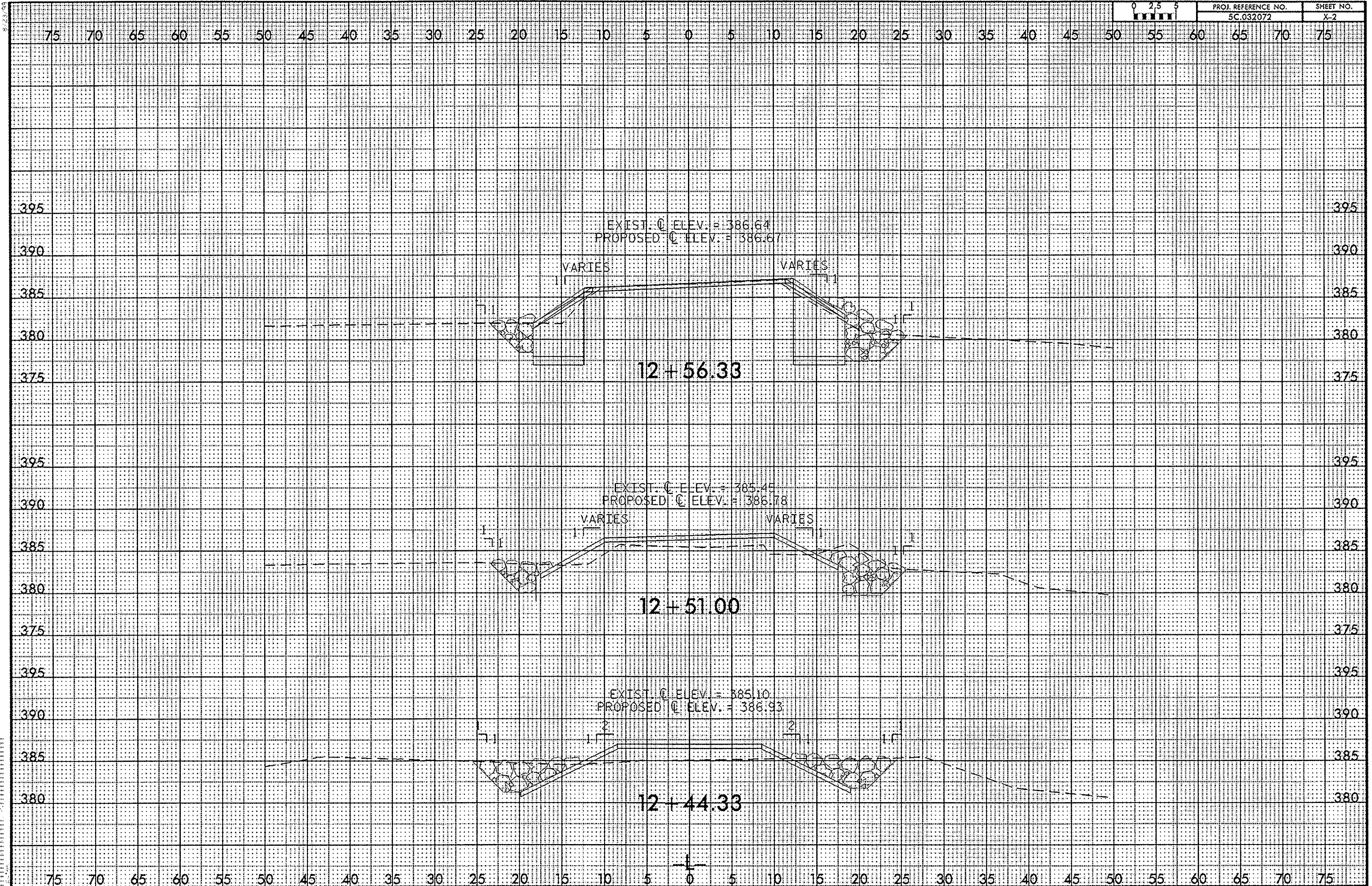
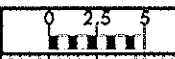
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	R-3
1			3			TOTAL SHEETS
2			4			25



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



VERTICAL CURVE



EXIST. C ELEV. = 386.64
PROPOSED C ELEV. = 386.67

VARIES

VARIES

12 + 56.33

EXIST. C ELEV. = 385.45
PROPOSED C ELEV. = 386.78

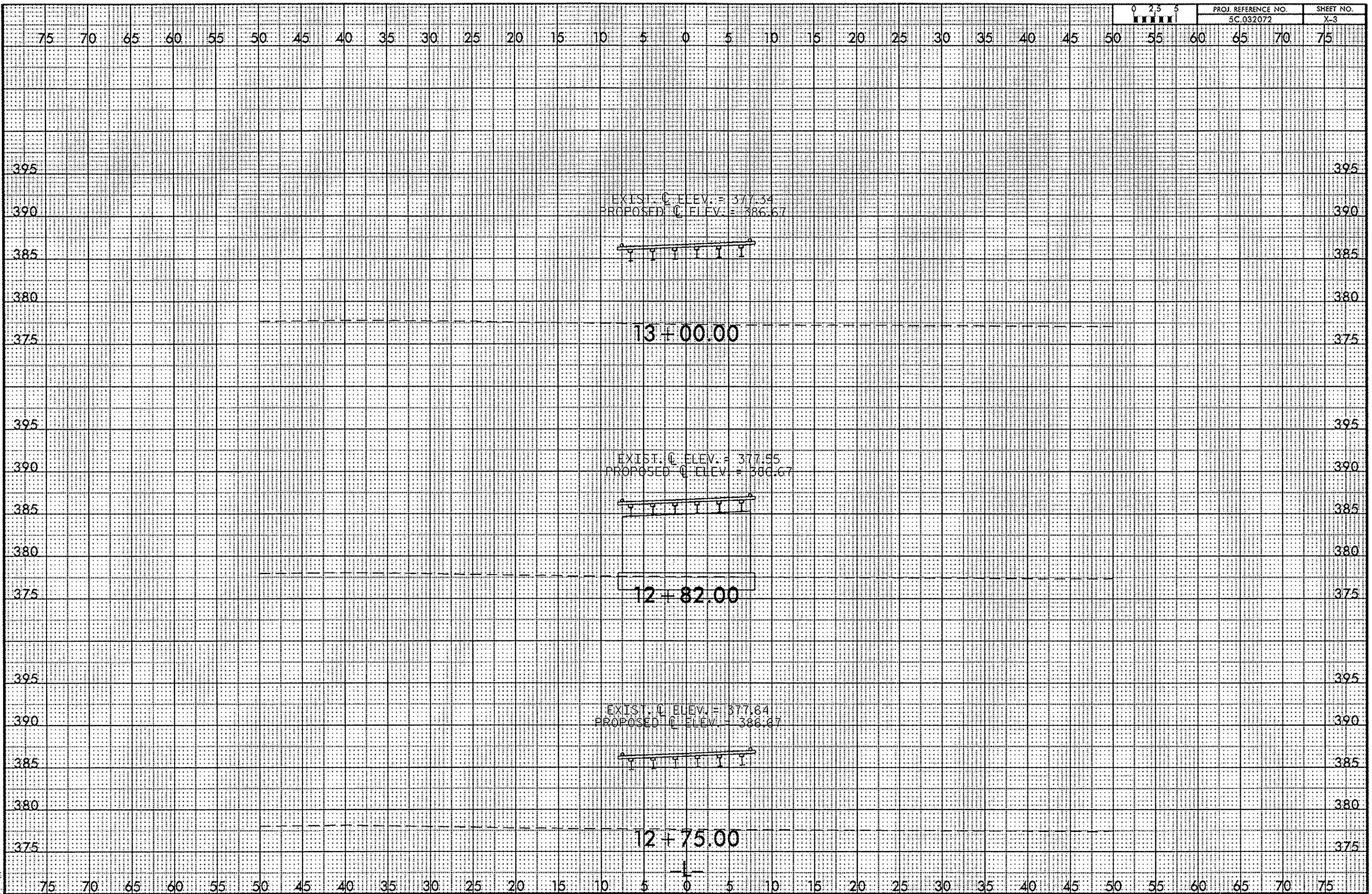
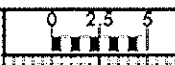
VARIES

VARIES

12 + 51.00

EXIST. C ELEV. = 385.10
PROPOSED C ELEV. = 386.93

12 + 44.33

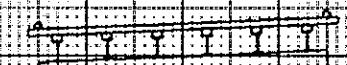


EXIST. C. ELEV. = 377.34
PROPOSED C. ELEV. = 386.67



13 + 00.00

EXIST. C. ELEV. = 377.55
PROPOSED C. ELEV. = 386.67



12 + 82.00

EXIST. C. ELEV. = 377.64
PROPOSED C. ELEV. = 386.67



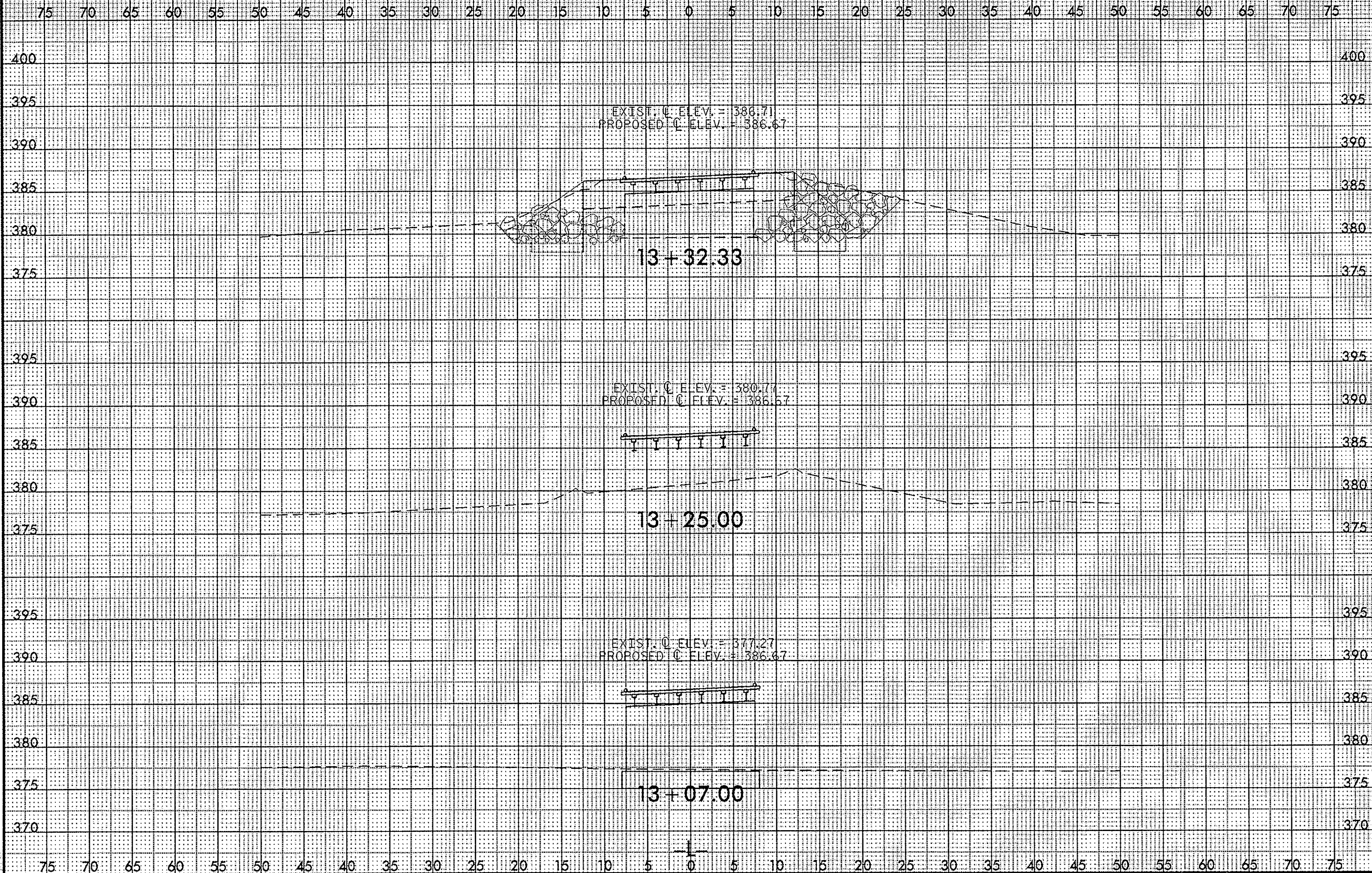
12 + 75.00



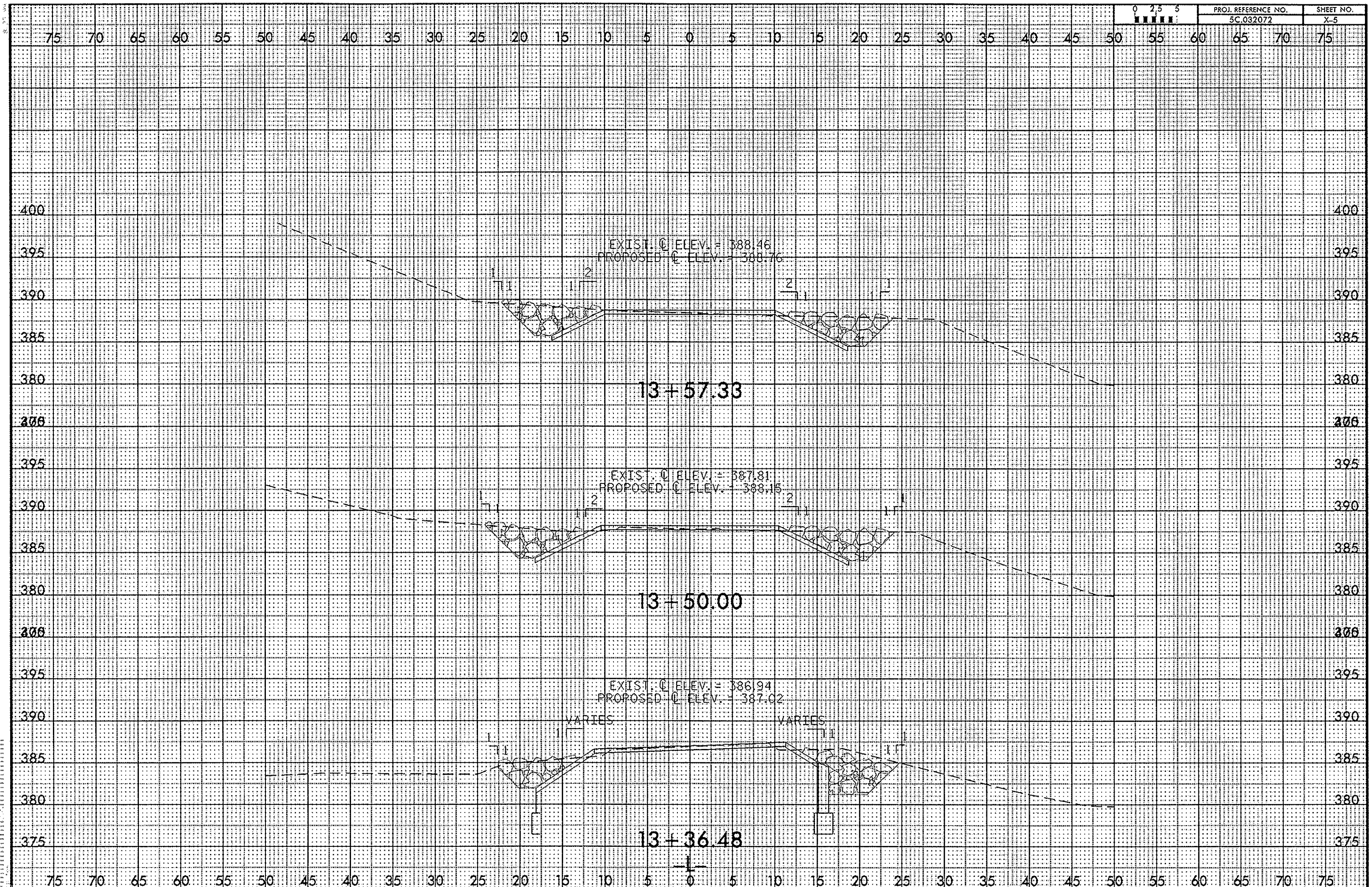
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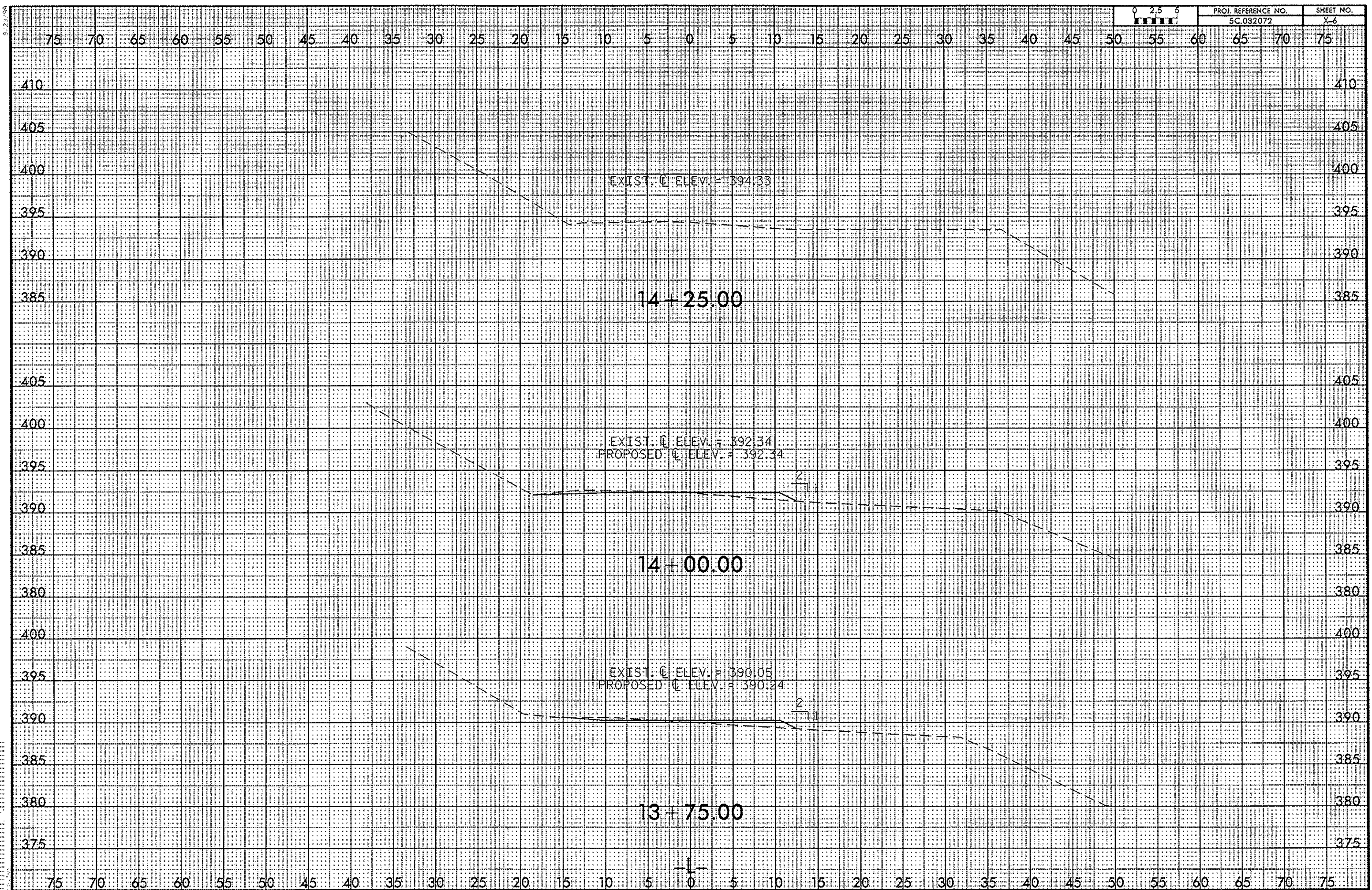
PROJ. REFERENCE NO. 5C.032072	SHEET NO. X-4
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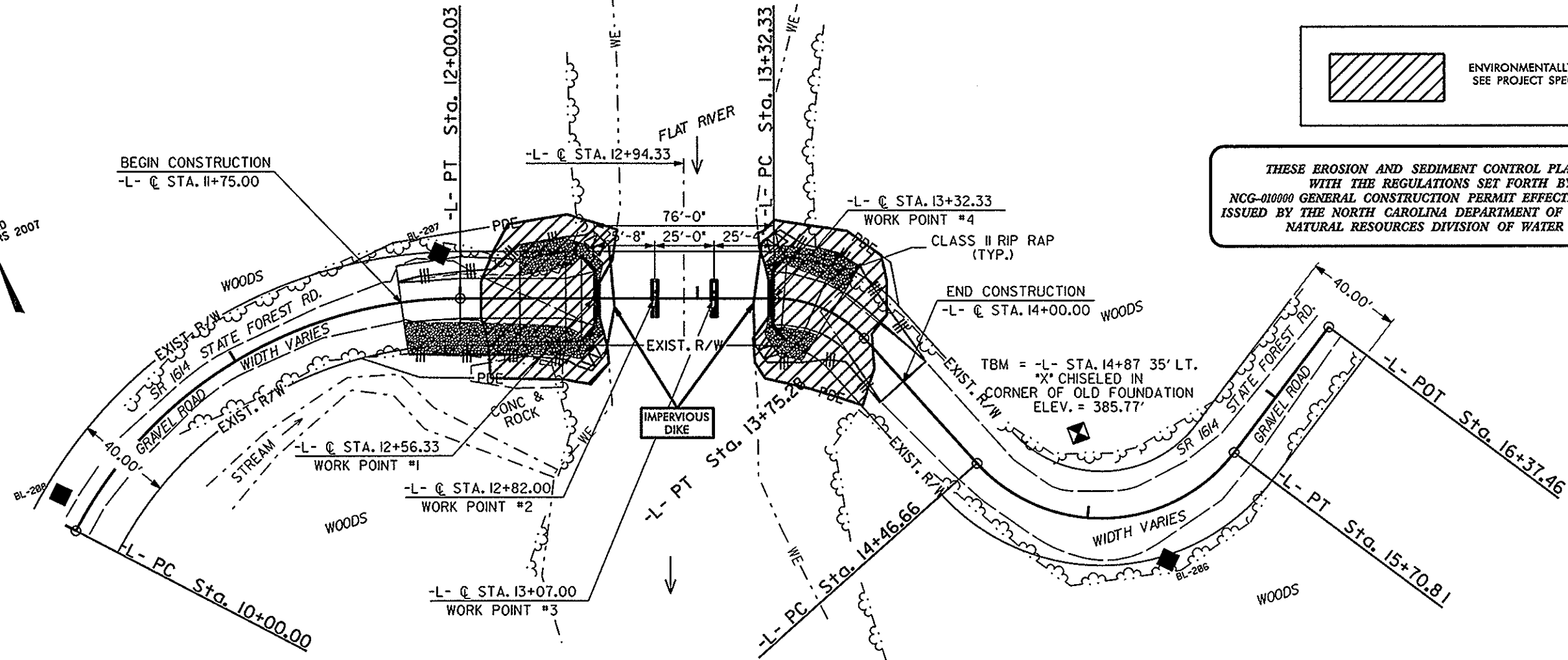
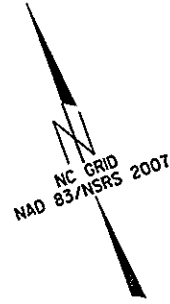
8-23-99



DATE: 11/11/11



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.

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.

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

2012 STANDARD DRAWINGS			
1604.01	Railroad Erosion Control Detail	1632.01	Rock Inlet Sediment Trap Type A
1605.01	Temporary Silt Fence	1632.02	Rock Inlet Sediment Trap Type B
1606.01	Special Sediment Control Fence	1632.03	Rock Inlet Sediment Trap Type C
1607.01	Gravel Construction Entrance	1633.01	Temporary Rock Silt Check Type A
1622.01	Temporary Berms and Slope Drains	1633.02	Temporary Rock Silt Check Type B
1630.01	Riser Basin	1634.01	Temporary Rock Sediment Dam Type A
1630.02	Silt Basin Type B	1634.02	Temporary Rock Sediment Dam Type B
1630.03	Temporary Silt Ditch	1635.01	Rock Pipe Inlet Sediment Trap Type A
1630.04	Stilling Basin	1635.02	Rock Pipe Inlet Sediment Trap Type B
1630.05	Temporary Diversion	1640.01	Coir Fiber Baffle
1630.06	Special Stilling Basin	1645.01	Temporary Stream Crossing
1631.01	Matting Installation		

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

2012 STANDARD SPECIFICATIONS

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

SHEET OF

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

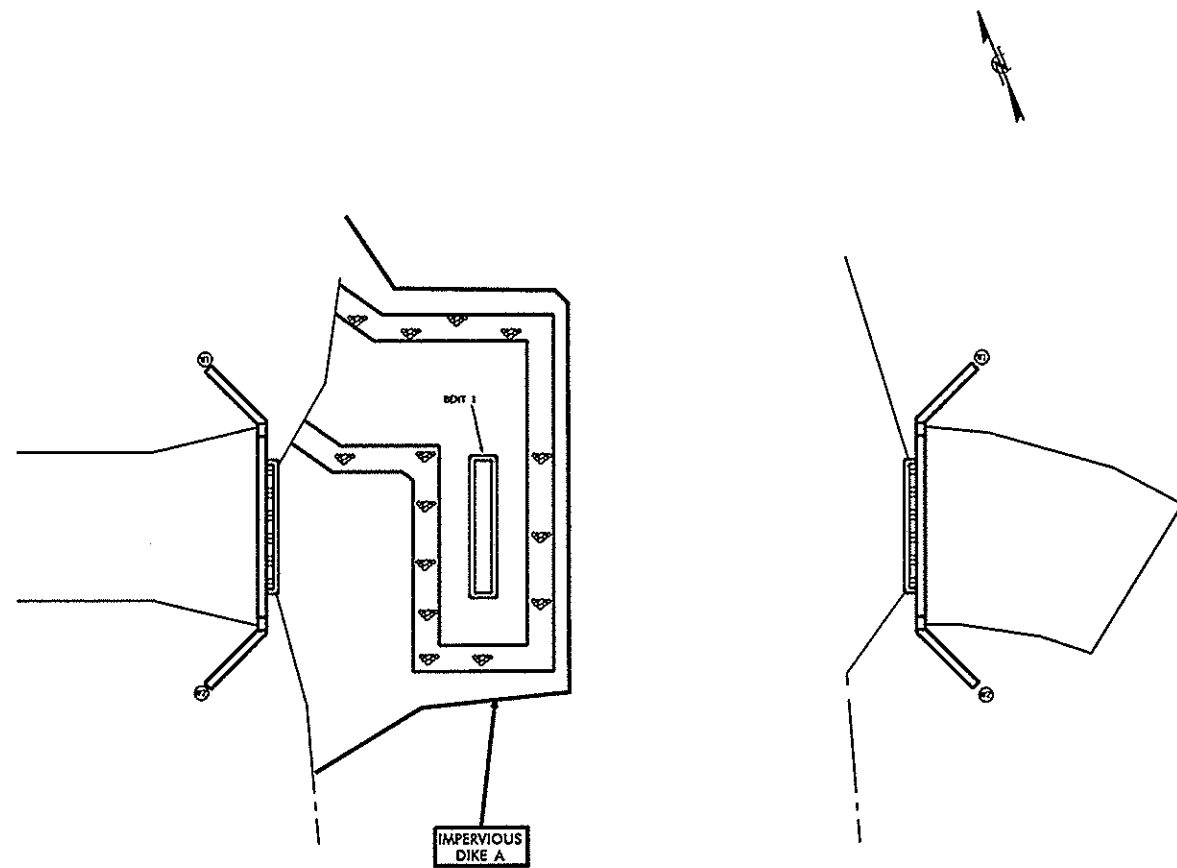
PLAN VIEW ALONG
@ SURVEY OF BRIDGE #151
ON SR-1614 OVER
FLAT CREEK

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

FOOTING AND CAUSEWAY CONSTRUCTION SEQUENCE

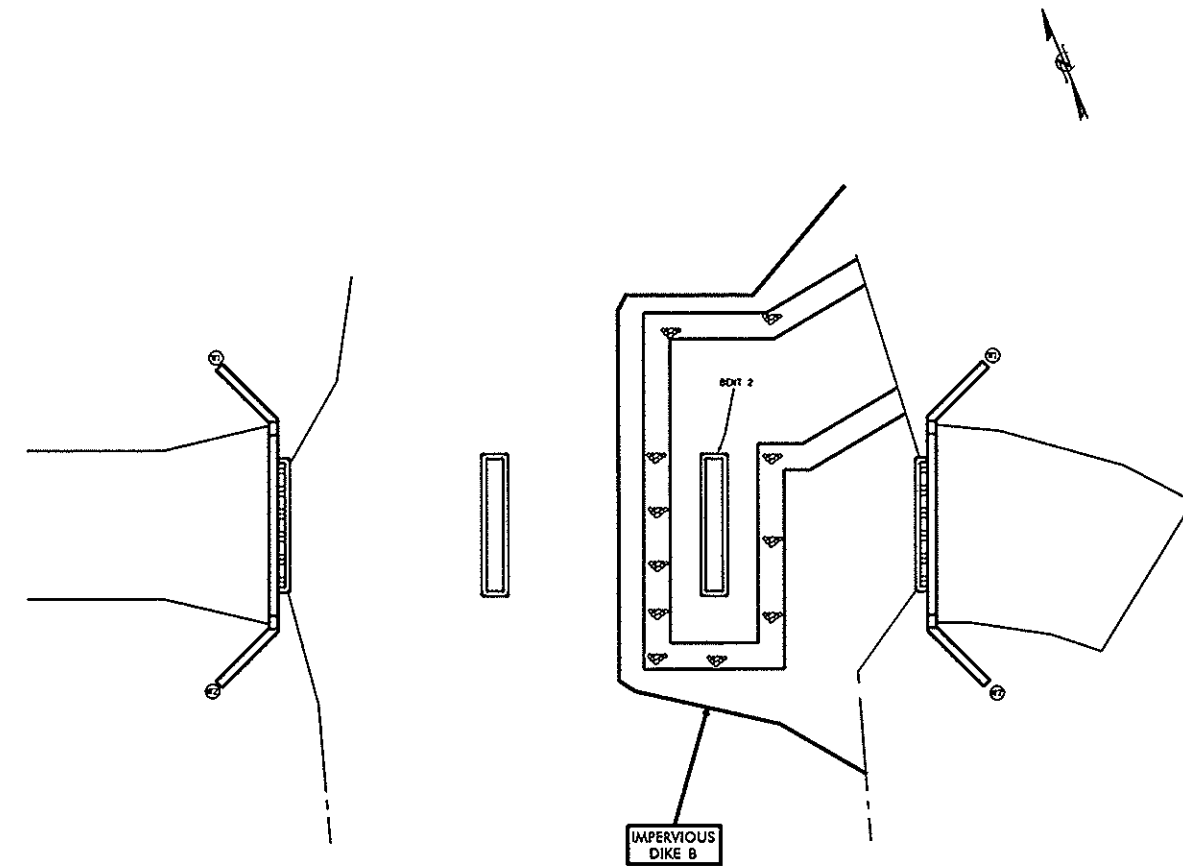
PHASE I

1. INSTALL IMPERVIOUS DIKE A.
2. CONSTRUCT WESTERN CAUSEWAY AND BENT 1.
3. REMOVE WESTERN CAUSEWAY AND IMPERVIOUS DIKE A.



PHASE II

1. INSTALL IMPERVIOUS DIKE B.
2. CONSTRUCT EASTERN CAUSEWAY AND BENT 2.
3. REMOVE EASTERN CAUSEWAY AND IMPERVIOUS DIKE B.



ROADSIDE ENVIRONMENTAL UNIT
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RALEIGH, N.C.
2012 STANDARD SPECIFICATIONS

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.

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

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

<i>SITE DESCRIPTION</i>	<i>STABILIZATION TIME</i>	<i>TIMEFRAME EXCEPTIONS</i>
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HOW) 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 HOW ZONES.

ROADSIDE ENVIRONMENTAL UNIT
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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-3
1			3			TOTAL SHEETS 4
2			4			

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.

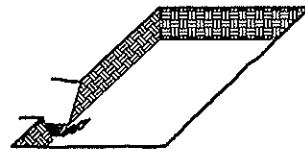
ROADSIDE ENVIRONMENTAL UNIT
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

2012 STANDARD SPECIFICATIONS

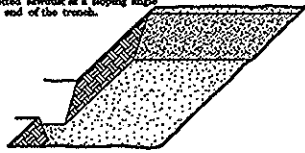
PLANTING DETAILS
SEEDLING / LINER BARERoot PLANTING DETAIL

HEALING IN

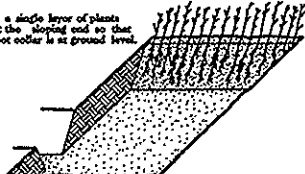
1. Locate a healing-in site in a shady, well protected area.



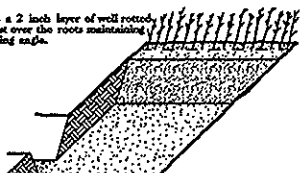
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



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

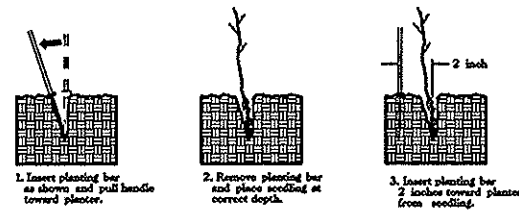


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.



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

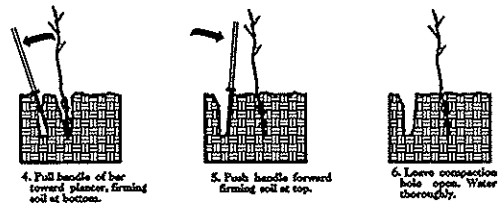
DIBBLE PLANTING METHOD USING THE KBC PLANTING BAR



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 connection 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:

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
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-4
1			3			TOTAL SHEETS
2			4			4