TIP PROJECT: B-2500A

CONTRACT: C203171

STRUCTURES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-2500A		

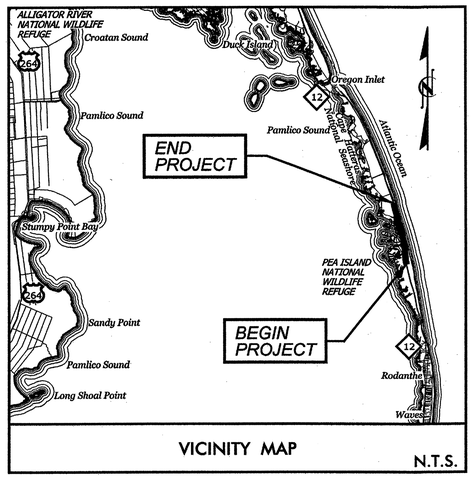
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
32635.1.6	BRNHF-0012(55)	P.E.
32635.3.FR6	BRNHF-0012(55)	CONSTRUCTION

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

DARE COUNTY

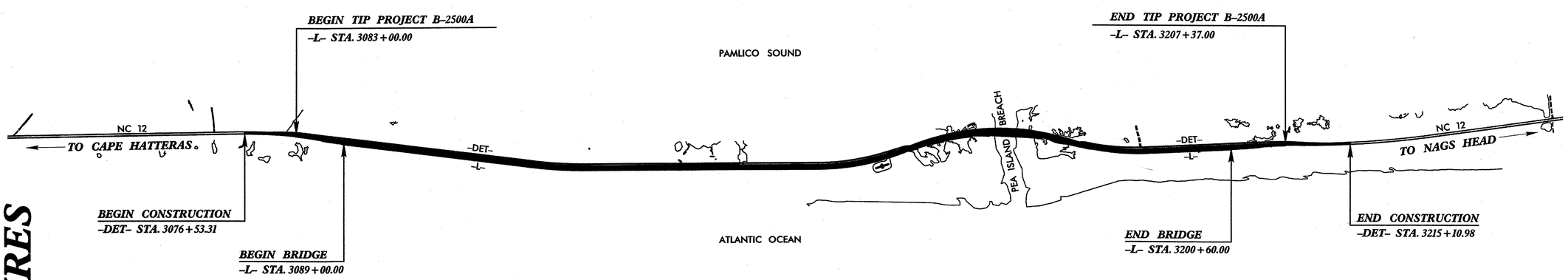
LOCATION: PEA ISLAND ON NC 12 – LONG TERM IMPROVEMENTS (PHASE II)

TYPE OF WORK: GRADING, PAVING, DRAINAGE & STRUCTURE



VICINITY MAP N.T.S.

NAD 83 NSRS 2007



STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

ADT 2012 = 7,300
ADT 2032 = 10,900
DHV = N/A
D = N/A
T = 6%
V = 60 MPH
FUNC. CLASSIFICATION: COLLECTOR
T = 1% TTST+5% DUALS
REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT = 0.241 MILES

LENGTH OF STRUCTURE TIP PROJECT = 2.114 MILES

TOTAL LENGTH OF TIP PROJECT = 2.355 MILES

PREPARED FOR:
STRUCTURES MANAGEMENT UNIT
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2012 STANDARD SPECIFICATIONS

LETTING DATE:
NOVEMBER 19, 2013

MARK F. ROBBINS, PE
PROJECT ENGINEER

KEVIN G. BAILEY, PE
PROJECT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18165 ENGINEER MARK F. ROBBINS 10-4-12

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

10/3/2012
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NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

INDEX OF DRAWINGS

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

DRAWN BY : TRL DATE : 4-12
CHECKED BY : CLG DATE : 4-12

STV/ Ralph Whitehead Associates, Inc.
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Charlotte, NC 28208
NC License No. F-0991

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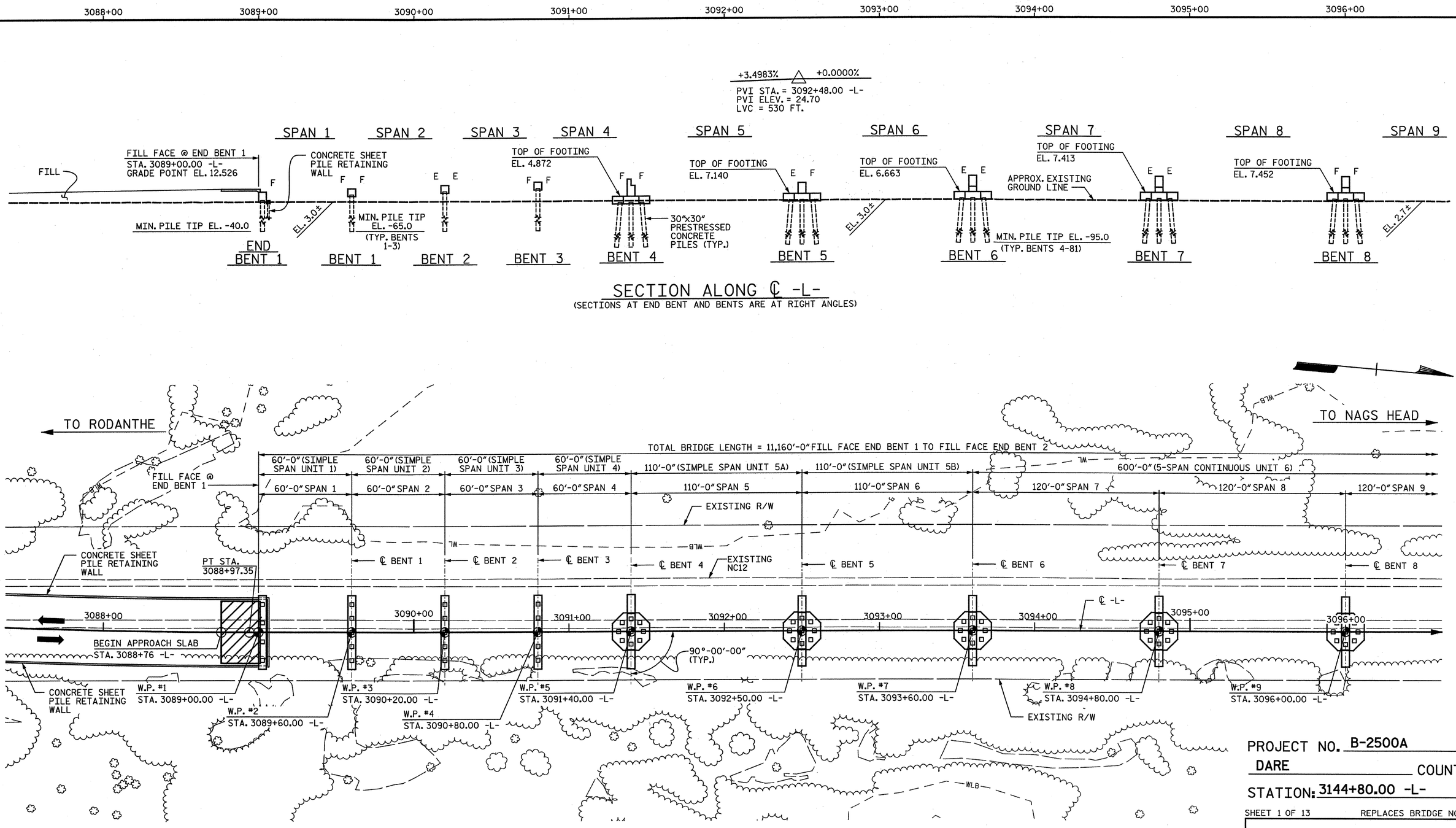

SECTION ALONG ℄ -L-

(SECTIONS AT END BENT AND BENTS ARE AT RIGHT ANGLES)

PLAN

(SPAN LENGTHS MEASURED ALONG -L- LINE)

HORIZONTAL CURVE DATA -L-

PI = 3087+67.38
Δ = 3°-43'-29.5" (LT.)
D = 1°-25'-56.6"
L = 260.04'
T = 130.07'
R = 4,000.00'

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.
2. CONTRACTOR HAS THE OPTION TO USE 36"X 36" PRESTRESSED CONCRETE PILES FOR END BENT 1, BENT 1, BENT 2 AND BENT 3. SEE BENT SHEETS FOR ADDITIONAL INFORMATION.
3. FOR RETAINING WALL DETAILS, SEE CONCRETE SHEET PILE RETAINING WALL SHEETS.

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

DRAWN BY : CLG DATE : 12-11
CHECKED BY : TRL DATE : 3-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St. Ste. 200
Charlotte, NC 28208
NC License No. F-0991

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-

SHEET 1 OF 13 REPLACES BRIDGE NO. 69

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING BRIDGE ON NC 12 OVER PEA ISLAND BREACH

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			219

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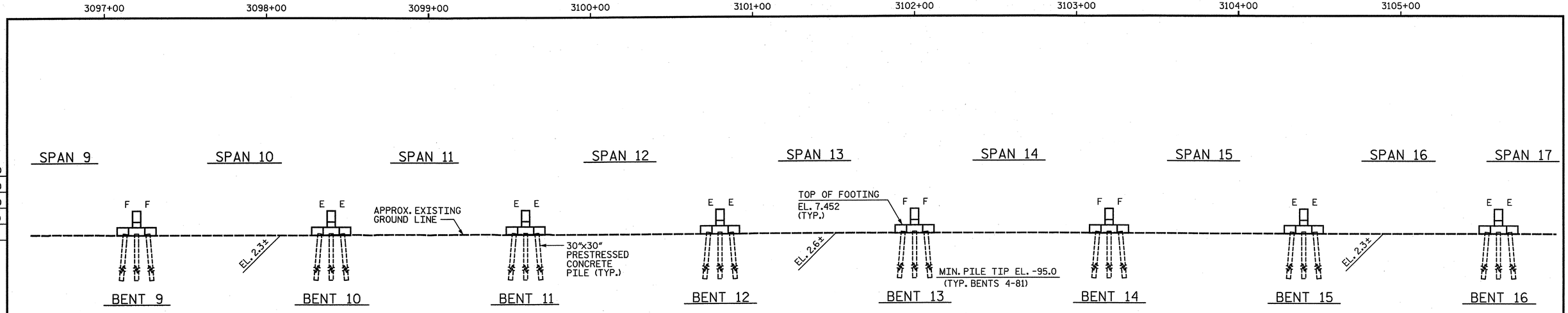

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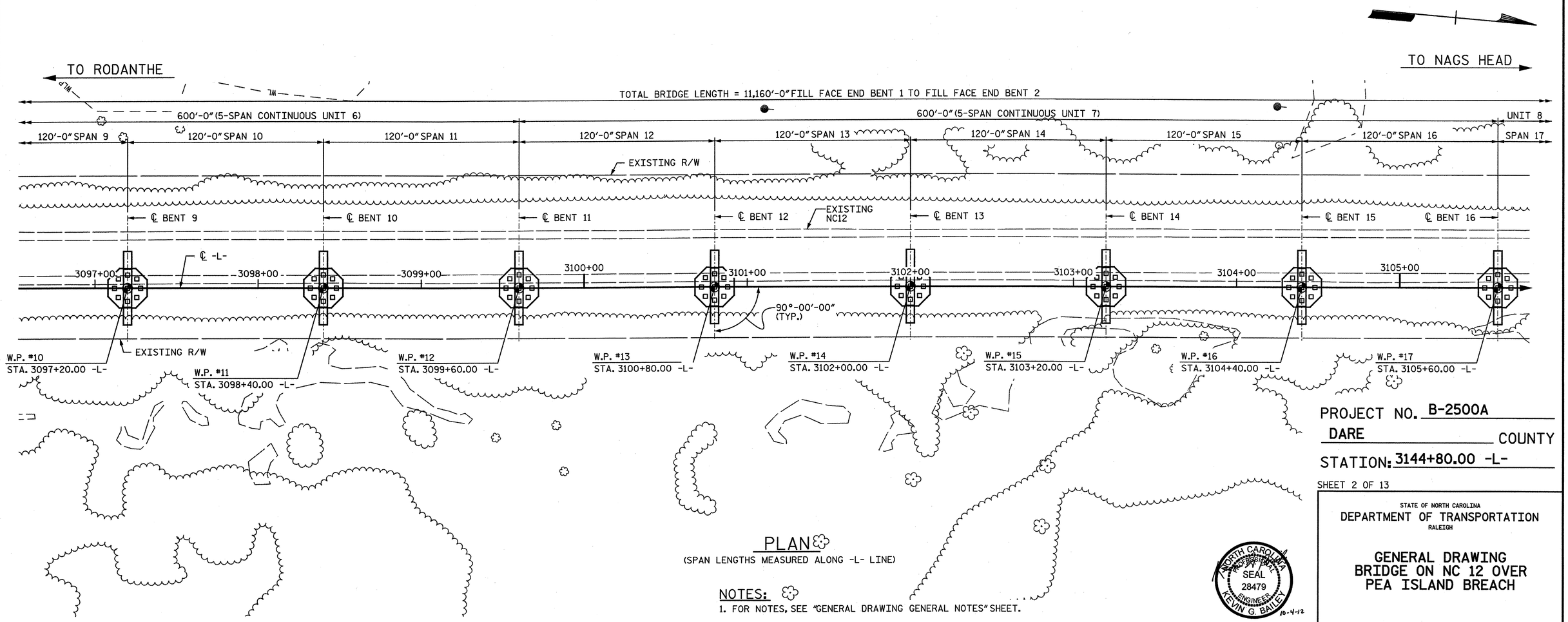
(SECTIONS AT BENTS ARE AT RIGHT ANGLES)



PLAN

(SPAN LENGTHS MEASURED ALONG -L- LINE)

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING BRIDGE ON NC 12 OVER PEA ISLAND BREACH

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : CLG DATE : 12-11
CHECKED BY : TRL DATE : 3-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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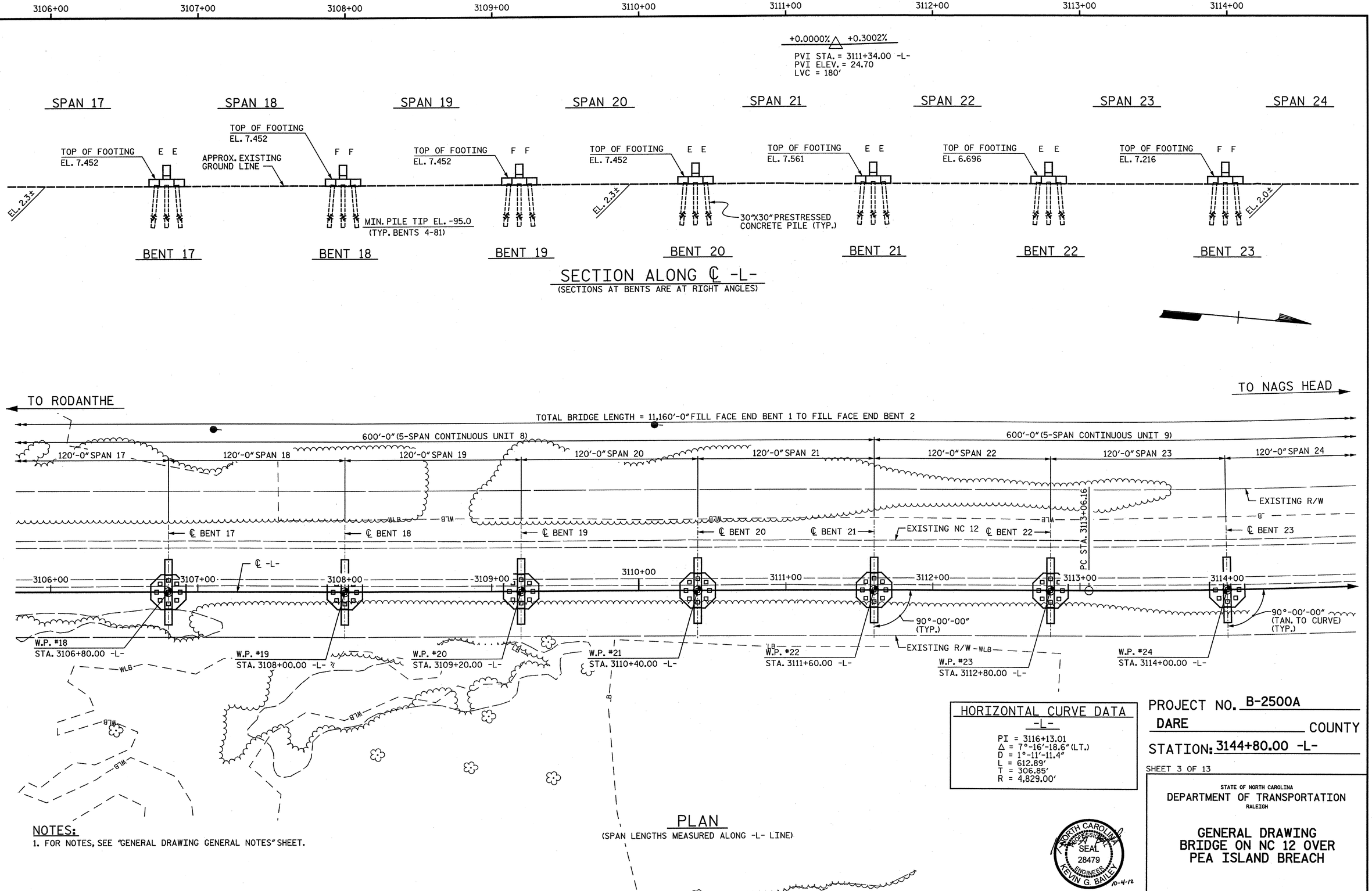

SECTION ALONG ℄ -L-

(SECTIONS AT BENTS ARE AT RIGHT ANGLES)

PLAN

(SPAN LENGTHS MEASURED ALONG -L- LINE)

HORIZONTAL CURVE DATA -L-

PI = 3116+13.01
Δ = 7°-16'-18.6" (LT.)
D = 1°-11'-11.4"
L = 612.89'
T = 306.85'
R = 4,829.00'

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 3 OF 13

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING BRIDGE ON NC 12 OVER PEA ISLAND BREACH

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

DRAWN BY : JDE DATE : 1-12
CHECKED BY : TRL DATE : 3-12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			219

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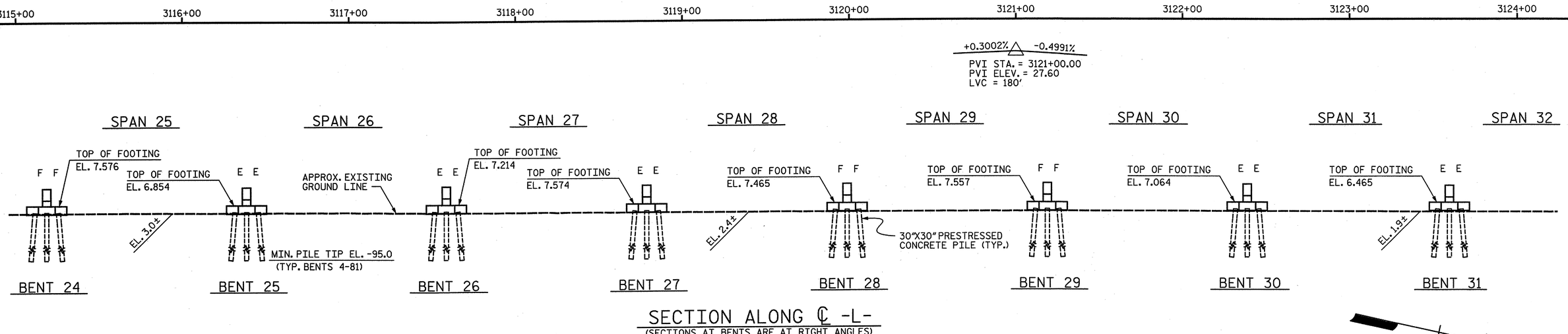
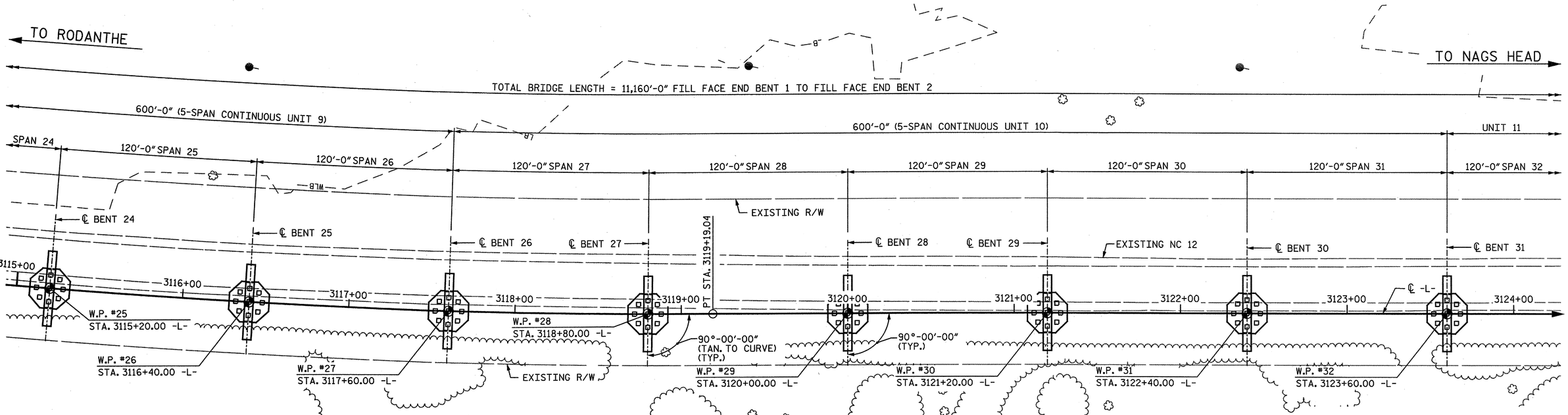


SECTION ALONG ℄ -L-

(SECTIONS AT BENTS ARE AT RIGHT ANGLES)



PLAN

(SPAN LENGTHS MEASURED ALONG -L- LINE)

HORIZONTAL CURVE DATA
-L-

PI = 3116+13.01
Δ = 7°-16'-18.6" (LT.)
D = 1°-11'-11.4"
L = 612.89'
T = 306.85'
R = 4,829.00'

NOTES:
1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 4 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE ON NC 12 OVER
PEA ISLAND BREACH

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : JDE DATE : 1-12
CHECKED BY : CLG DATE : 3-12

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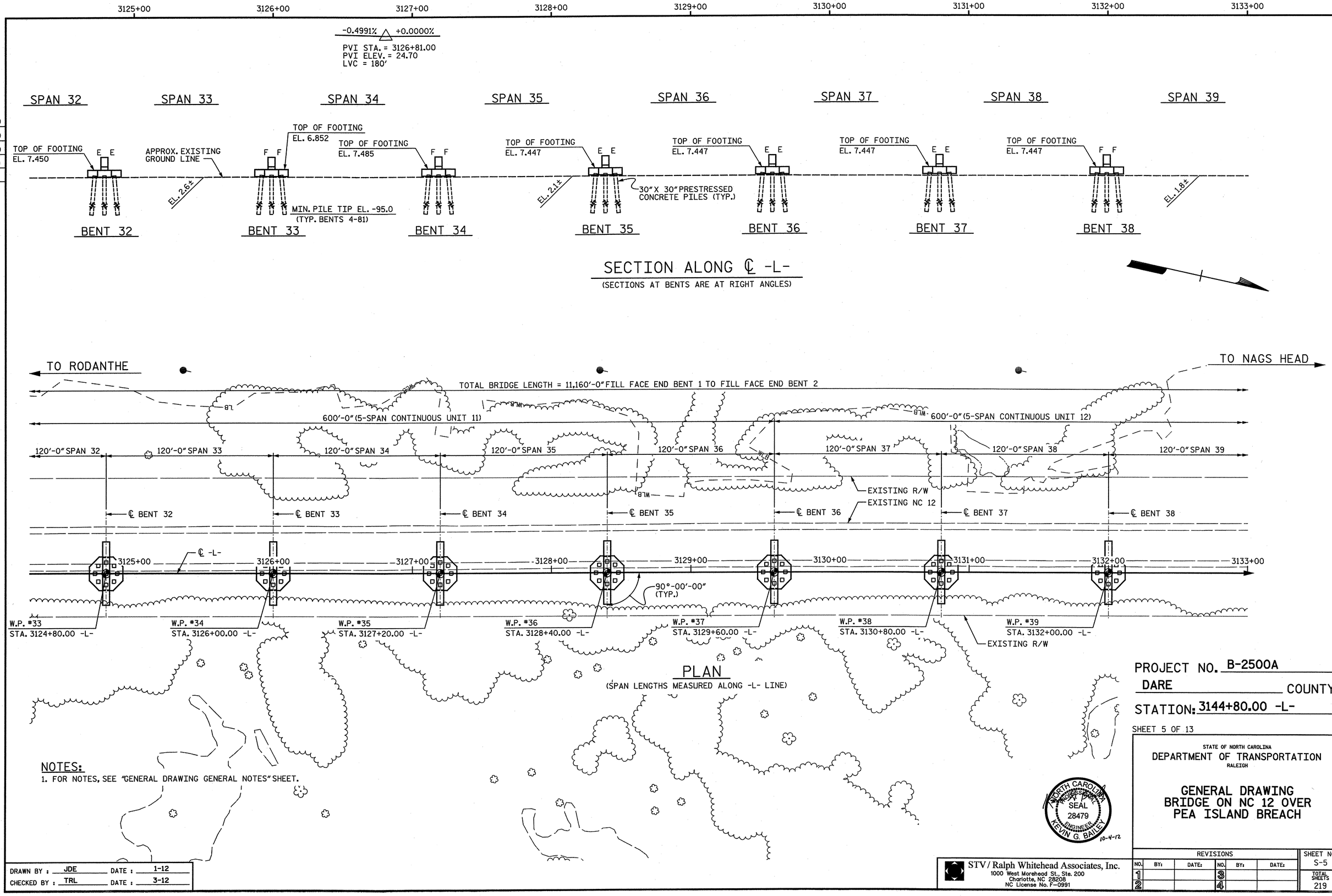

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 5 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE ON NC 12 OVER
PEA ISLAND BREACH

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : JDE DATE : 1-12
CHECKED BY : TRL DATE : 3-12

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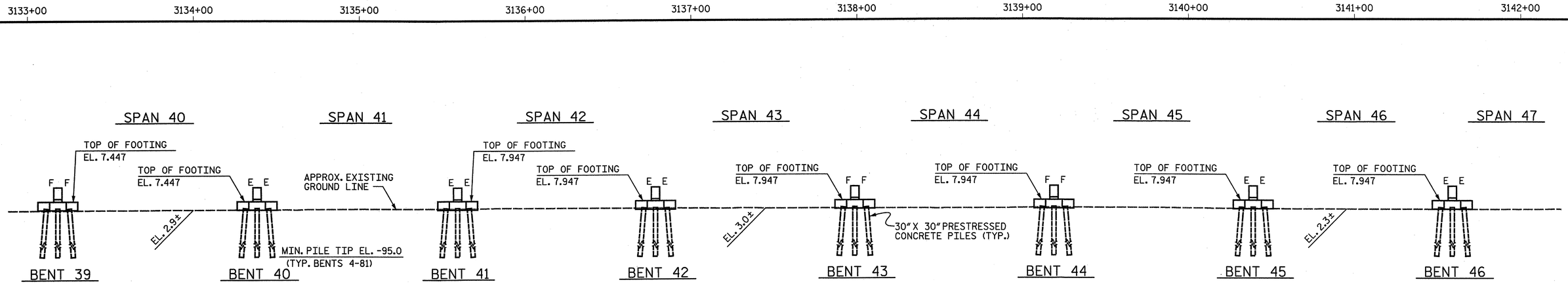

SECTION ALONG ℄ -L-

(SECTIONS AT BENTS ARE AT RIGHT ANGLES)

TO RODANTHE

TO NAGS HEAD

TOTAL BRIDGE LENGTH = 11,160'-0" FILL FACE END BENT 1 TO FILL FACE END BENT 2

600'-0" (5-SPAN CONTINUOUS UNIT 12)

600'-0" (5-SPAN CONTINUOUS UNIT 13)

(UNIT 14)

120'-0" SPAN 39 | 120'-0" SPAN 40 | 120'-0" SPAN 41 | 120'-0" SPAN 42 | 120'-0" SPAN 43 | 120'-0" SPAN 44 | 120'-0" SPAN 45 | 120'-0" SPAN 46 | 120'-0" SPAN 47

87°

M.L.B.

℄ BENT 41

EXISTING 24" CMP
24" CMP

EXISTING R/W

EXISTING NC 12

℄ BENT 39 | ℄ BENT 40 | ℄ BENT 42 | ℄ BENT 43 | ℄ BENT 44 | ℄ BENT 45 | ℄ BENT 46

3133+00 | 3134+00 | 3135+00 | 3136+00 | 3137+00 | 3138+00 | 3139+00 | 3140+00 | 3141+00 | ℄ -L- | 3142+00

90°-00'-00" (TYP.)

W.P. #40
STA. 3133+20.00 -L-

W.P. #41
STA. 3134+40.00 -L-

W.P. #42
STA. 3135+60.00 -L-

W.P. #43
STA. 3136+80.00 -L-

W.P. #44
STA. 3138+00.00 -L-

W.P. #45
STA. 3139+20.00 -L-

EXISTING R/W

W.P. #46
STA. 3140+40.00 -L-

W.P. #47
STA. 3141+60.00 -L-

PLAN

(SPAN LENGTHS MEASURED ALONG -L- LINE)

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 6 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE ON NC 12 OVER
PEA ISLAND BREACH

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : JDE DATE : 1-12
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1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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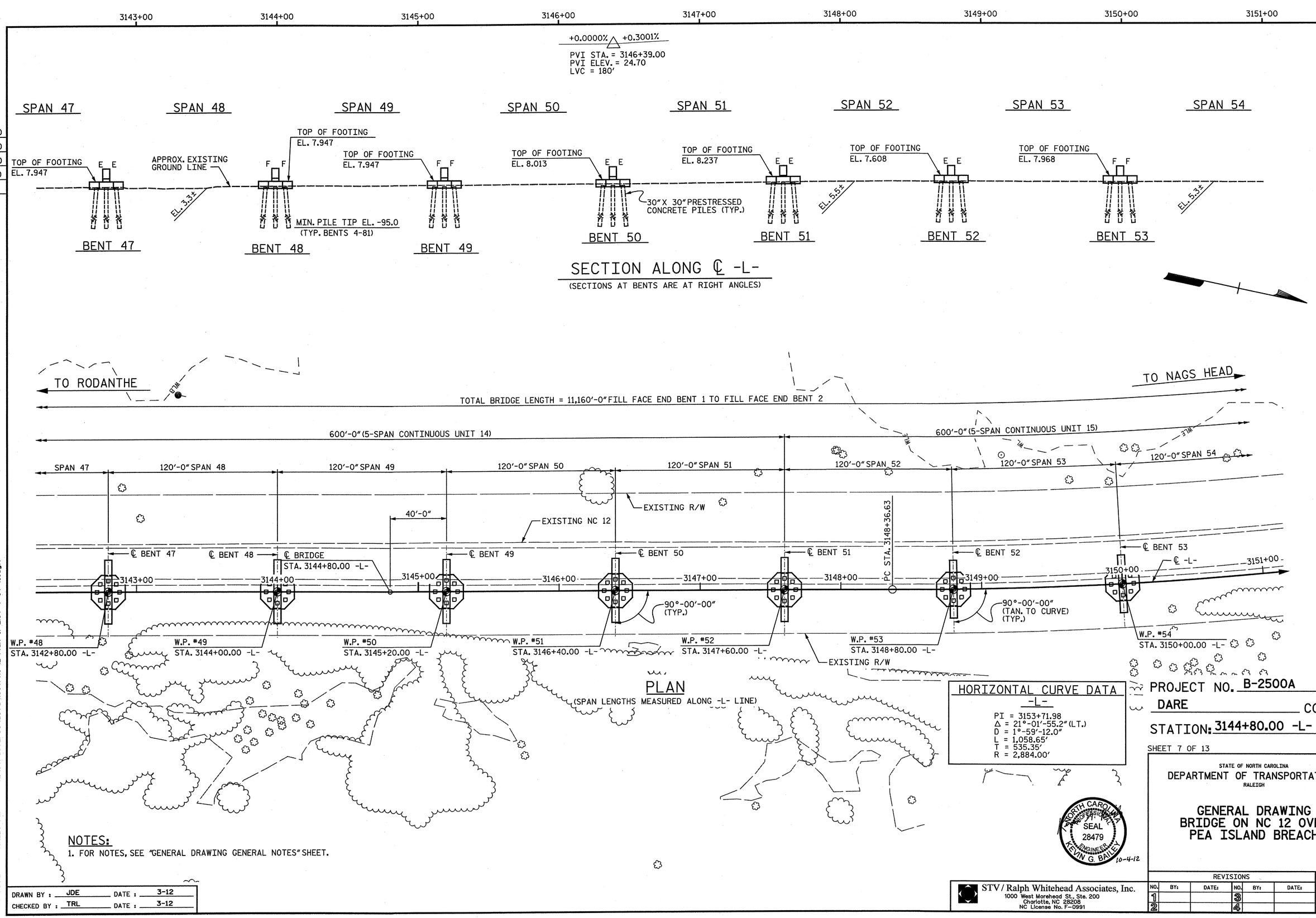

HORIZONTAL CURVE DATA

-L-

PI = 3153+71.98
Δ = 21°-01'-55.2" (LT.)
D = 1°-59'-12.0"
L = 1,058.65'
T = 535.35'
R = 2,884.00'

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

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CHECKED BY : TRL DATE : 3-12

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NC License No. F-0991

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 7 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING BRIDGE ON NC 12 OVER PEA ISLAND BREACH

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			219

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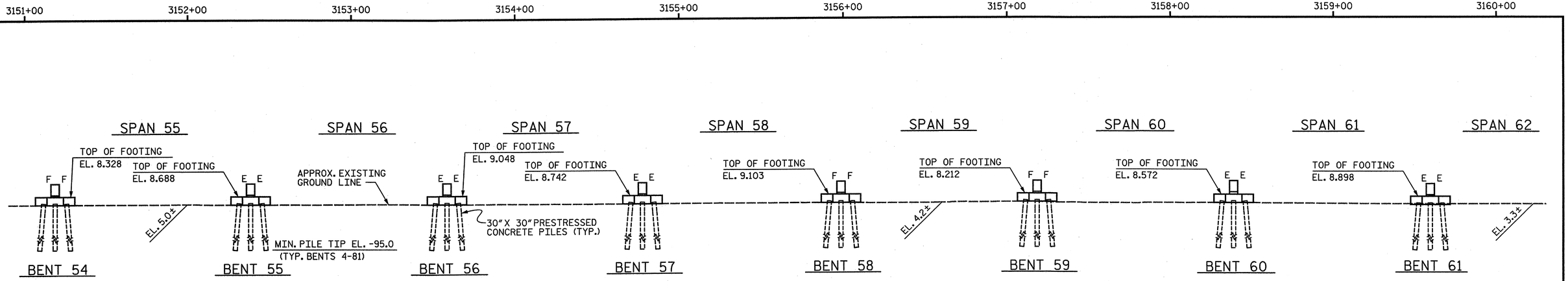
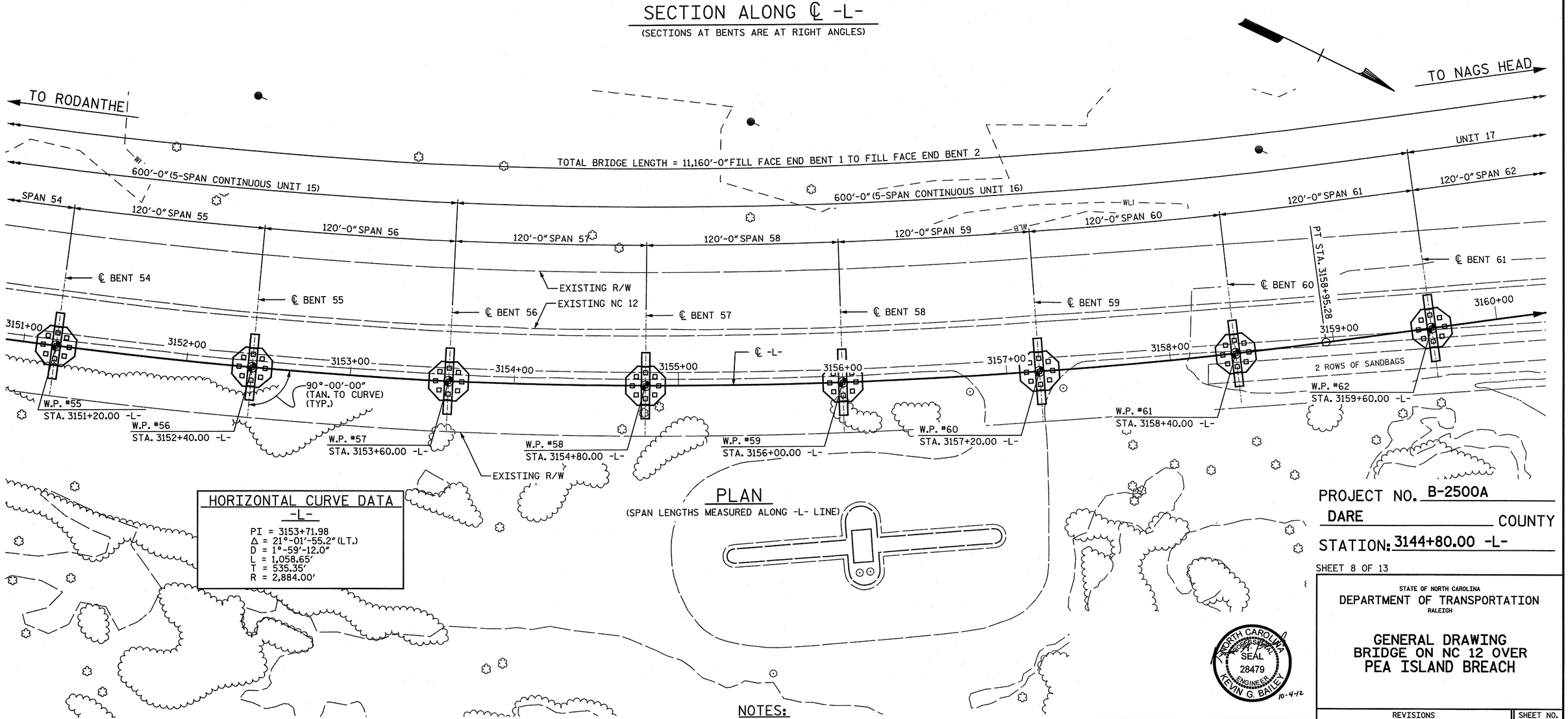


SECTION ALONG ℄ -L-

(SECTIONS AT BENTS ARE AT RIGHT ANGLES)



HORIZONTAL CURVE DATA -L-

PI = 3153+71.98
Δ = 21°-01'-55.2" (LT.)
D = 1°-59'-12.0"
L = 1,058.65'
T = 535.35'
R = 2,884.00'

PLAN

(SPAN LENGTHS MEASURED ALONG -L- LINE)

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			219

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 8 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING BRIDGE ON NC 12 OVER PEA ISLAND BREACH

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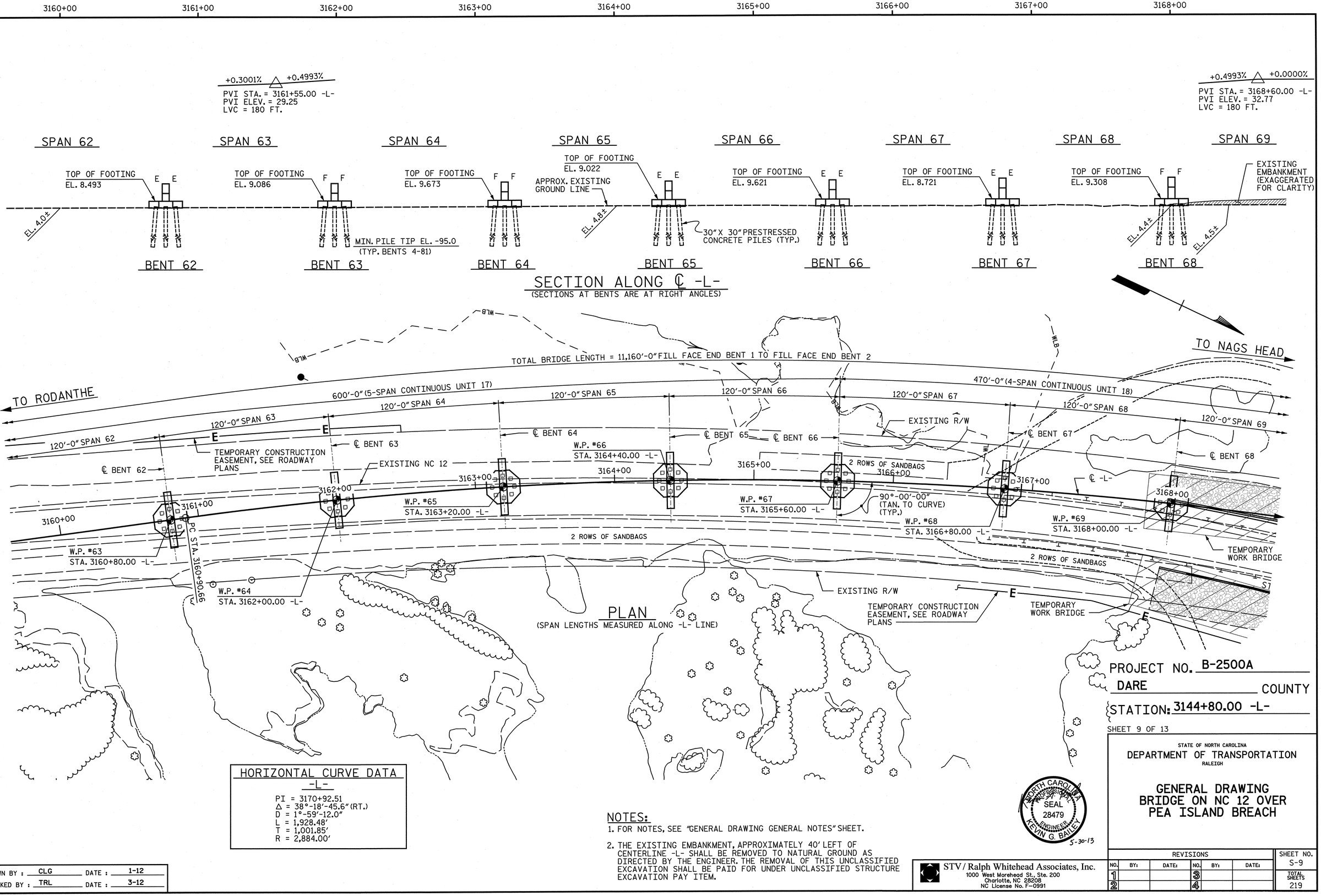

HORIZONTAL CURVE DATA -L-

PI = 3170+92.51
Δ = 38°-18'-45.6" (RT.)
D = 1°-59'-12.0"
L = 1,928.48'
T = 1,001.85'
R = 2,884.00'

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.
2. THE EXISTING EMBANKMENT, APPROXIMATELY 40' LEFT OF CENTERLINE -L- SHALL BE REMOVED TO NATURAL GROUND AS DIRECTED BY THE ENGINEER. THE REMOVAL OF THIS UNCLASSIFIED EXCAVATION SHALL BE PAID FOR UNDER UNCLASSIFIED STRUCTURE EXCAVATION PAY ITEM.

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 5-30-13

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 9 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING BRIDGE ON NC 12 OVER PEA ISLAND BREACH

DRAWN BY : CLG DATE : 1-12
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STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			219

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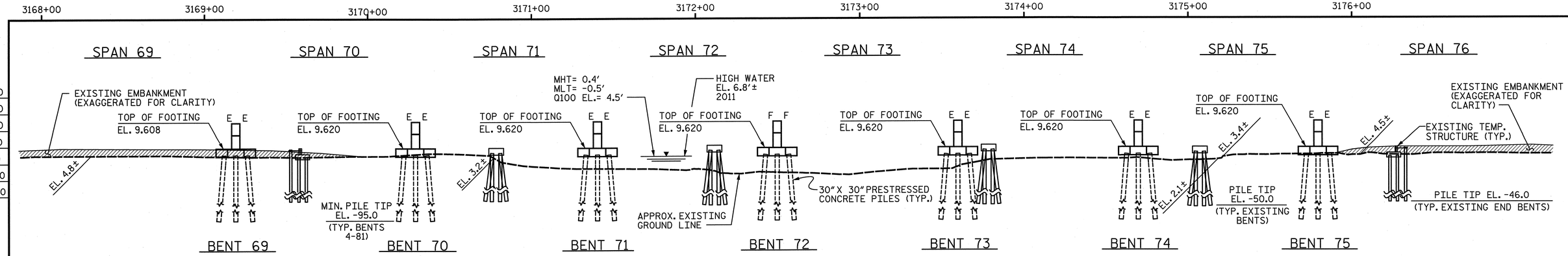
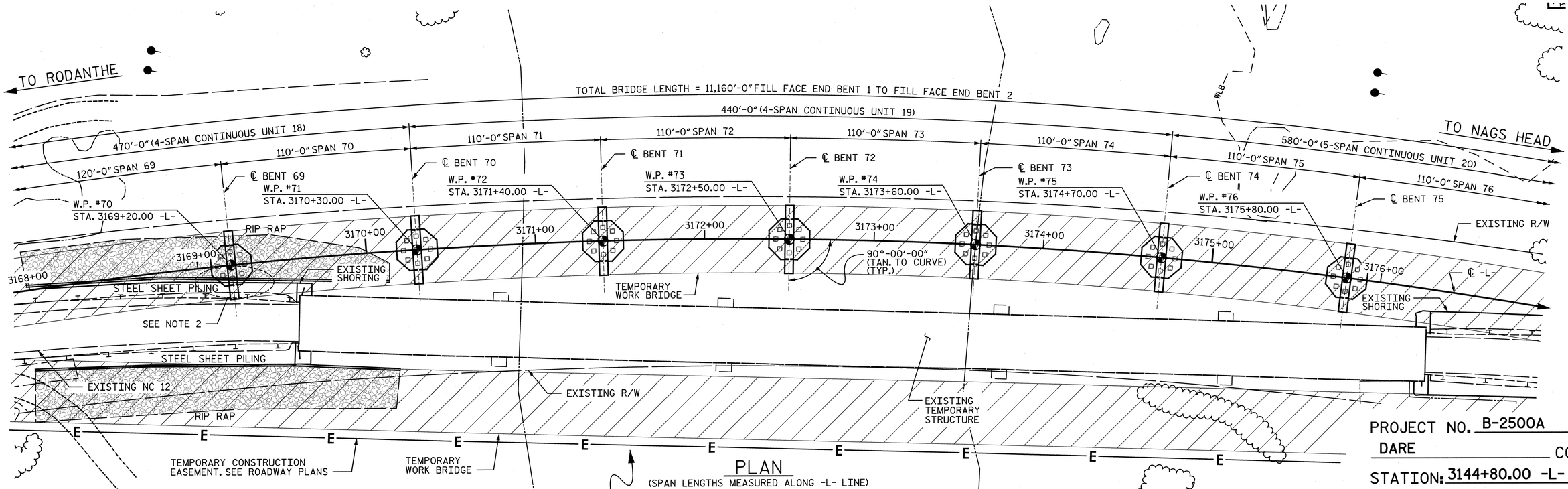


SECTION ALONG ℄ -L-
(SECTIONS AT BENTS ARE AT RIGHT ANGLES)



PLAN
(SPAN LENGTHS MEASURED ALONG -L- LINE)

HYDRAULIC DATA

DESIGN DISCHARGE	= 477,630 CFS
FREQUENCY OF DESIGN FLOOD	= 100 YR.
DESIGN HIGH WATER ELEVATION	= 4.5 FT. NAVD 88
DRAINAGE AREA	= TIDAL
BASIC DISCHARGE (Q100)	= 477,630 CFS
BASIC HIGH WATER ELEVATION	= 4.5'

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= N/A
FREQUENCY OF OVERTOPPING FLOOD	= 500+ YEARS
OVERTOPPING FLOOD ELEVATION	= N/A

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.
2. CONTRACTOR SHALL INSTALL NEW SHEETING IN THE AREA OF THE PROPOSED BENT 69 SUCH THAT THE FOOTING CAN BE CONSTRUCTED AND THE ROADWAY MAINTAINED FOR TRAFFIC. CONTRACTOR SHALL REMOVE PORTION OF EXISTING SHEETING THAT CONFLICTS WITH PROPOSED FOOTING CONSTRUCTION. NEW SHEETING AND INSTALLATION THEREOF FOR PROPOSED CONSTRUCTION AS DESCRIBED HEREIN SHALL BE CONSIDERED INCIDENTAL AND NO ADDITIONAL PAYMENT WILL BE MADE.
3. THE EXISTING EMBANKMENT, APPROXIMATELY 40' LEFT OF CENTERLINE -L- SHALL BE REMOVED TO NATURAL GROUND AS DIRECTED BY THE ENGINEER. THE REMOVAL OF THIS UNCLASSIFIED EXCAVATION SHALL BE PAID FOR UNDER UNCLASSIFIED STRUCTURE EXCAVATION PAY ITEM.

HORIZONTAL CURVE DATA
-L-

PI = 3170+92.51
Δ = 38°-18'-45.6" (RT.)
D = 1°-59'-12.0"
L = 1,928.48'
T = 1,001.85'
R = 2,884.00'

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY
5-30-13

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 10 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING BRIDGE ON NC 12 OVER PEA ISLAND BREACH

DRAWN BY : CLG DATE : 1-12
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Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			219

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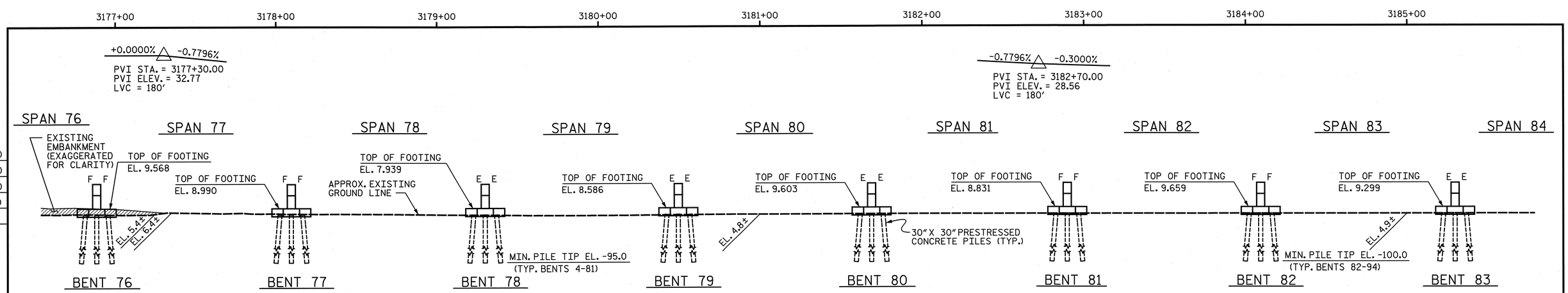
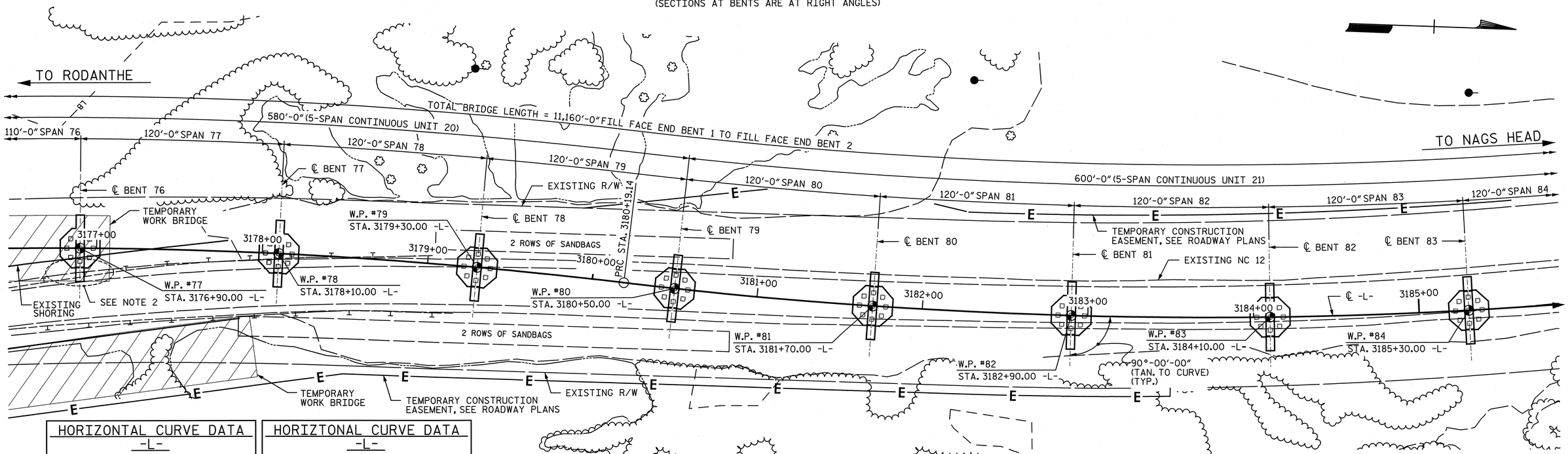


SECTION ALONG ℄ -L-

(SECTIONS AT BENTS ARE AT RIGHT ANGLES)



PLAN

(SPAN LENGTHS MEASURED ALONG -L- LINE)

HORIZONTAL CURVE DATA -L-	HORIZTONAL CURVE DATA -L-
PI = 3170+92.51	PI = 3185+28.08
Δ = 38°-18'-45.6" (RT.)	Δ = 20°-00'-57.9" (LT.)
D = 1°-59'-12.0"	D = 1°-59'-12"
L = 1,928.48'	L = 1,007.52'
T = 1,001.85'	T = 508.94'
R = 2,884.00'	R = 2,884.00'

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.
2. CONTRACTOR SHALL INSTALL NEW SHEETING IN THE AREA OF THE PROPOSED BENT 76 SUCH THAT THE FOOTING CAN BE CONSTRUCTED AND THE ROADWAY MAINTAINED FOR TRAFFIC. CONTRACTOR SHALL REMOVE PORTION OF EXISTING SHEETING THAT CONFLICTS WITH PROPOSED FOOTING CONSTRUCTION. NEW SHEETING AND INSTALLATION THEREOF FOR PROPOSED CONSTRUCTION AS DESCRIBED HEREIN SHALL BE CONSIDERED INCIDENTAL AND NO ADDITIONAL PAYMENT WILL BE MADE.
3. THE EXISTING EMBANKMENT, APPROXIMATELY 40' LEFT OF CENTERLINE -L- SHALL BE REMOVED TO NATURAL GROUND AS DIRECTED BY THE ENGINEER. THE REMOVAL OF THIS UNCLASSIFIED EXCAVATION SHALL BE PAID FOR UNDER UNCLASSIFIED STRUCTURE EXCAVATION PAY ITEM.

DRAWN BY : CLG DATE : 1-12
CHECKED BY : TRL DATE : 3-12

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-

SHEET 11 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING BRIDGE ON NC 12 OVER PEA ISLAND BREACH

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 5-30-13

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			219

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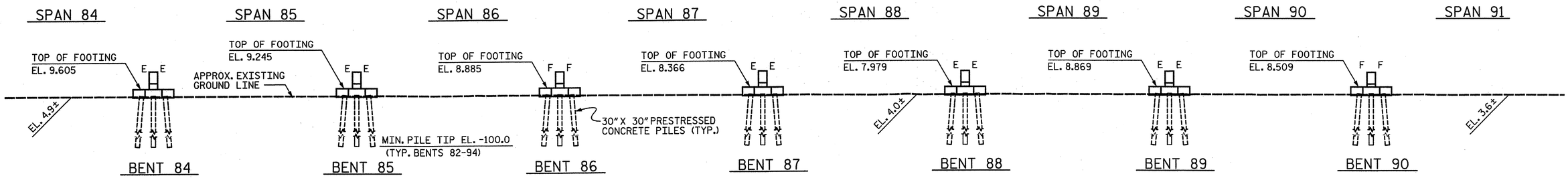
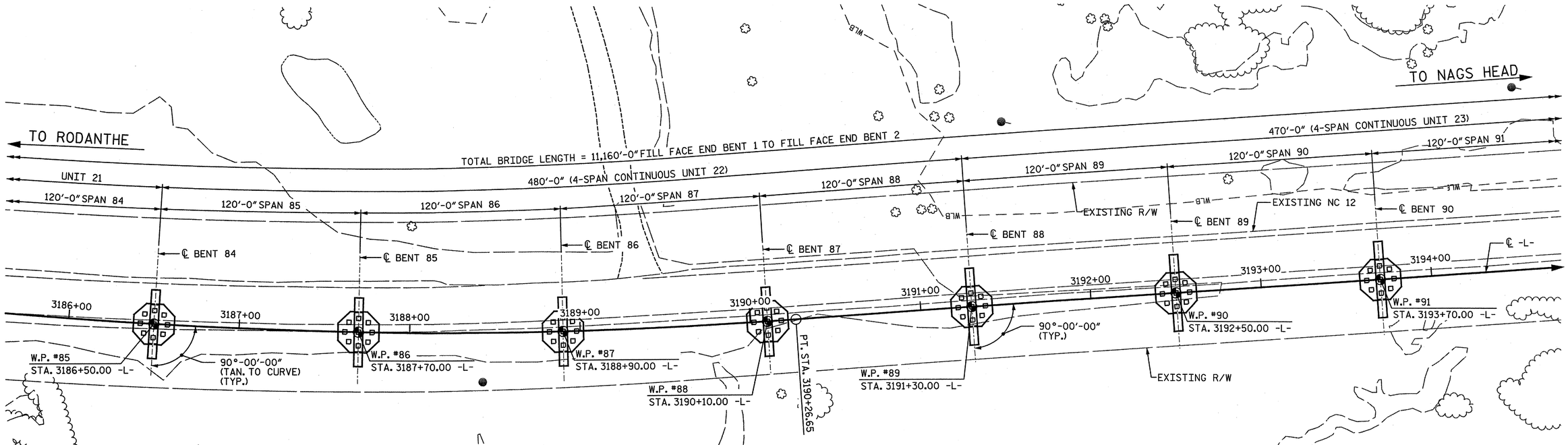


SECTION ALONG ℄ -L-

(SECTIONS AT BENTS ARE AT RIGHT ANGLES)



PLAN

(SPAN LENGTHS MEASURED ALONG -L- LINE)

HORIZTONAL CURVE DATA -L-

PI = 3185+28.08
Δ = 20°-00'-57.9" (LT.)
D = 1°-59'-12"
L = 1,007.52'
T = 508.94'
R = 2,884.00'

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 12 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING BRIDGE ON NC 12 OVER PEA ISLAND BREACH

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

DRAWN BY : JDE DATE : 1-12
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Charlotte, NC 28208
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			219

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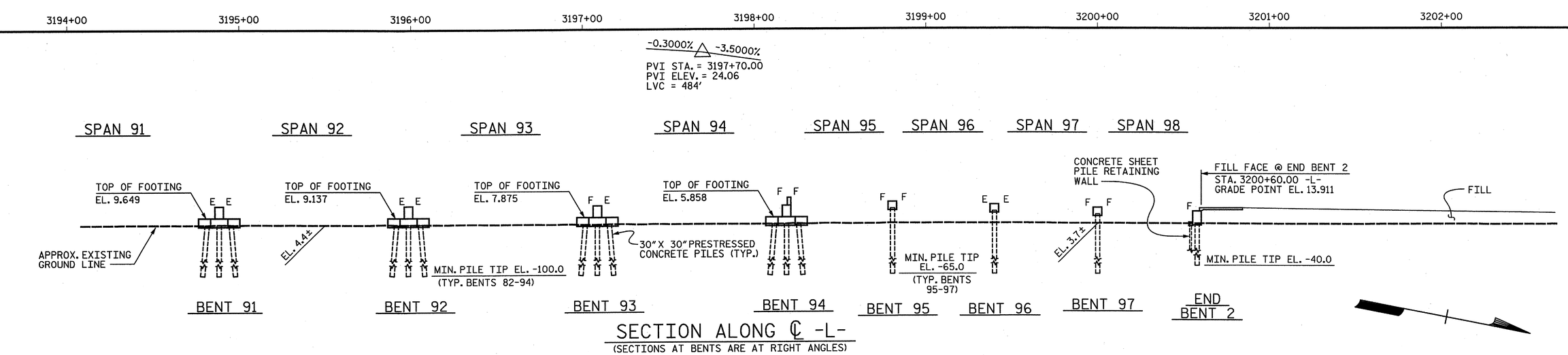
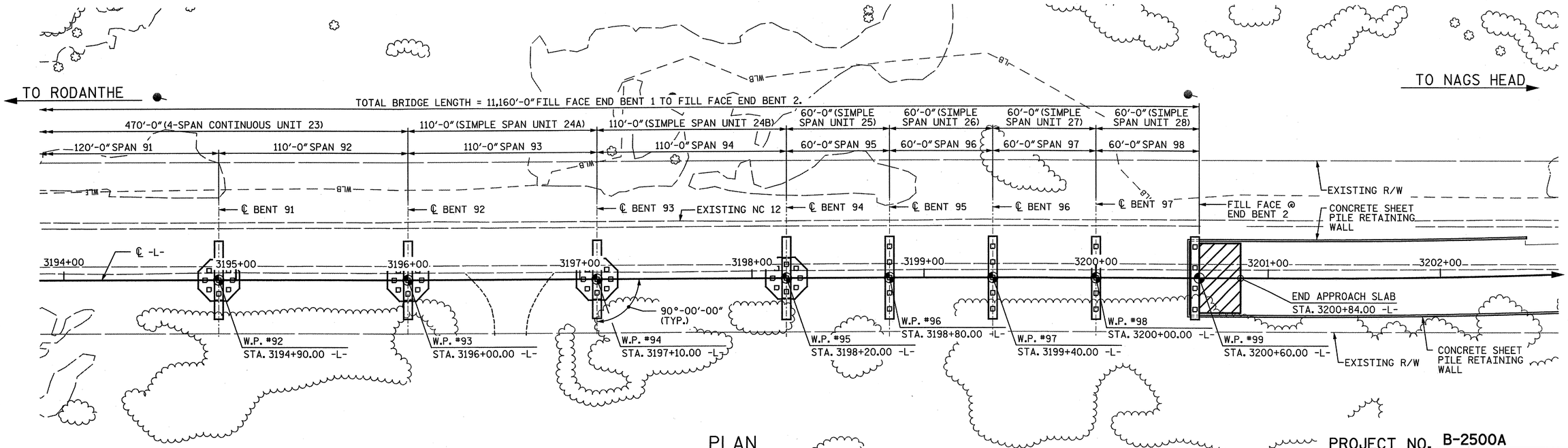


SECTION ALONG ℄ -L-

(SECTIONS AT BENTS ARE AT RIGHT ANGLES)



PLAN

(SPAN LENGTHS MEASURED ALONG -L- LINE)

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.
2. CONTRACTOR HAS THE OPTION TO USE 36"X 36" PRESTRESSED CONCRETE PILES FOR BENT 95, BENT 96, BENT 97 AND END BENT 2. SEE BENT SHEETS FOR ADDITIONAL INFORMATION.
3. FOR RETAINING WALL DETAILS, SEE CONCRETE SHEET PILE RETAINING WALL SHEETS.

DRAWN BY : JDE DATE : 1-12
CHECKED BY : TRL DATE : 3-12

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 13 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING BRIDGE ON NC 12 OVER PEA ISLAND BREACH

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			219

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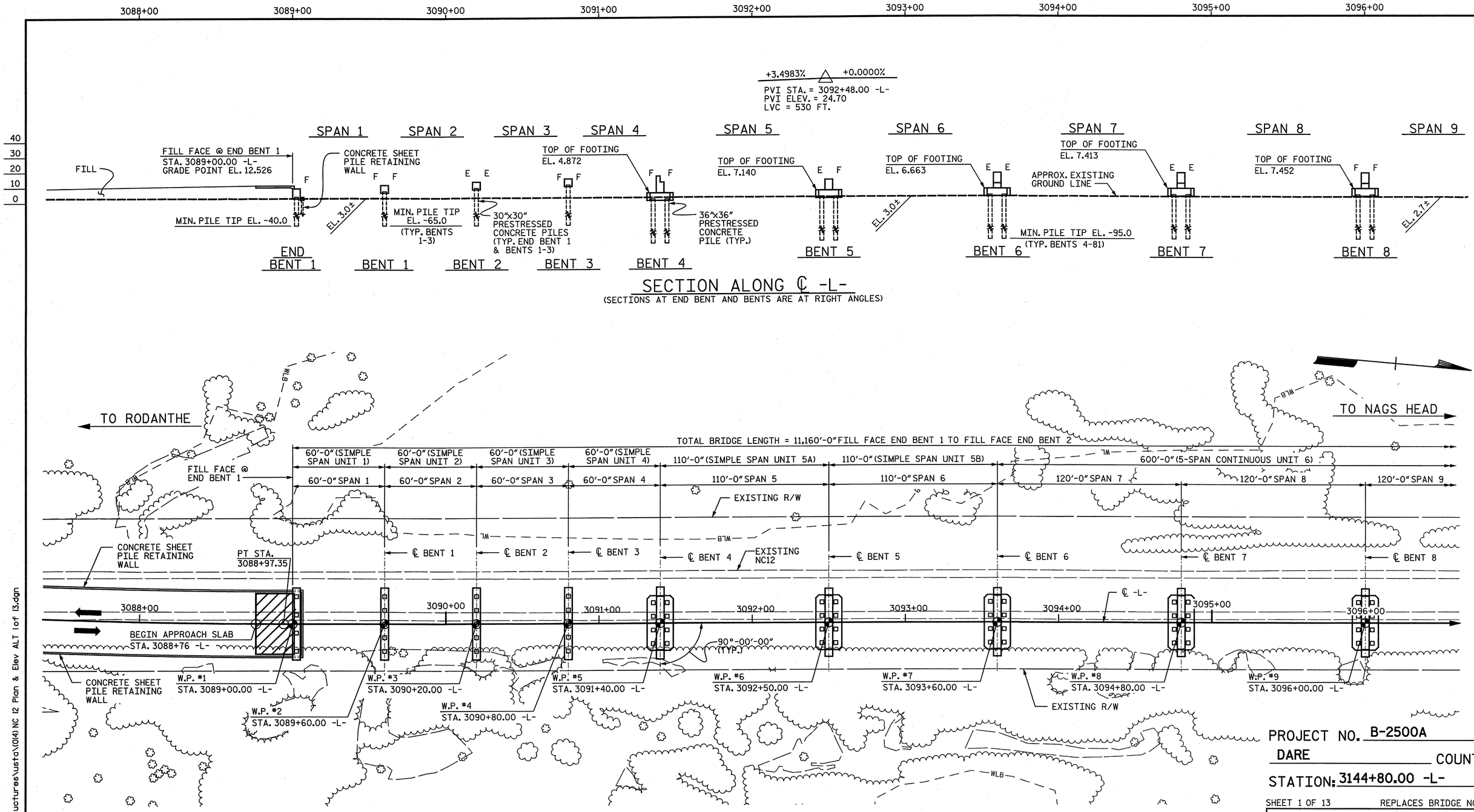

SECTION ALONG ℄ -L-

(SECTIONS AT END BENT AND BENTS ARE AT RIGHT ANGLES)

PLAN

(SPAN LENGTHS MEASURED ALONG -L- LINE)

HORIZONTAL CURVE DATA -L-

PI = 3087+67.38
Δ = 3°-43'-29.5"(LT.)
D = 1°-25'-56.6"
L = 260.04'
T = 130.07'
R = 4,000.00'

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.
2. CONTRACTOR HAS THE OPTION TO USE 36"X 36" PRESTRESSED CONCRETE PILES FOR END BENT 1, BENT 1, BENT 2 AND BENT 3. SEE BENT SHEETS FOR ADDITIONAL INFORMATION.
3. FOR RETAINING WALL DETAILS, SEE CONCRETE SHEET PILE RETAINING WALL SHEETS.

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

DRAWN BY : CLG DATE : 3-12
CHECKED BY : TRL DATE : 3-12

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 1 OF 13 REPLACES BRIDGE NO. 69

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING BRIDGE ON NC 12 OVER PEA ISLAND BREACH ALTERNATE 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			219

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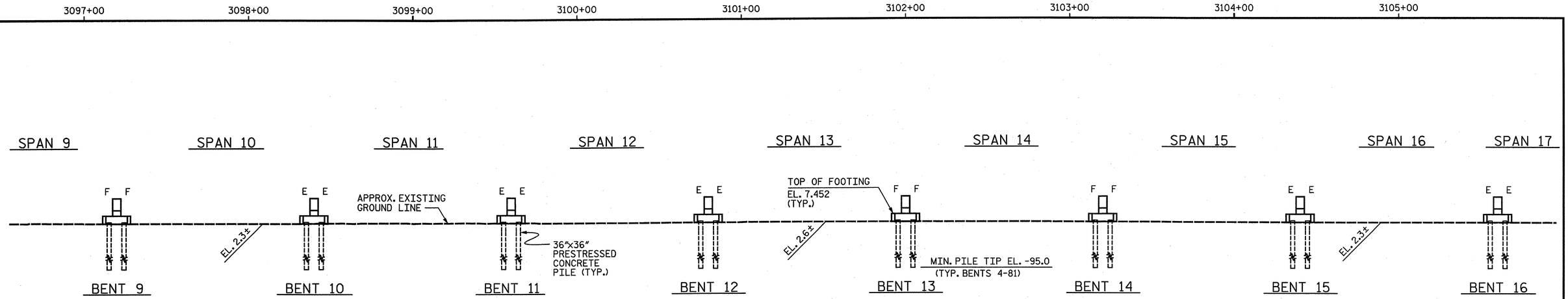
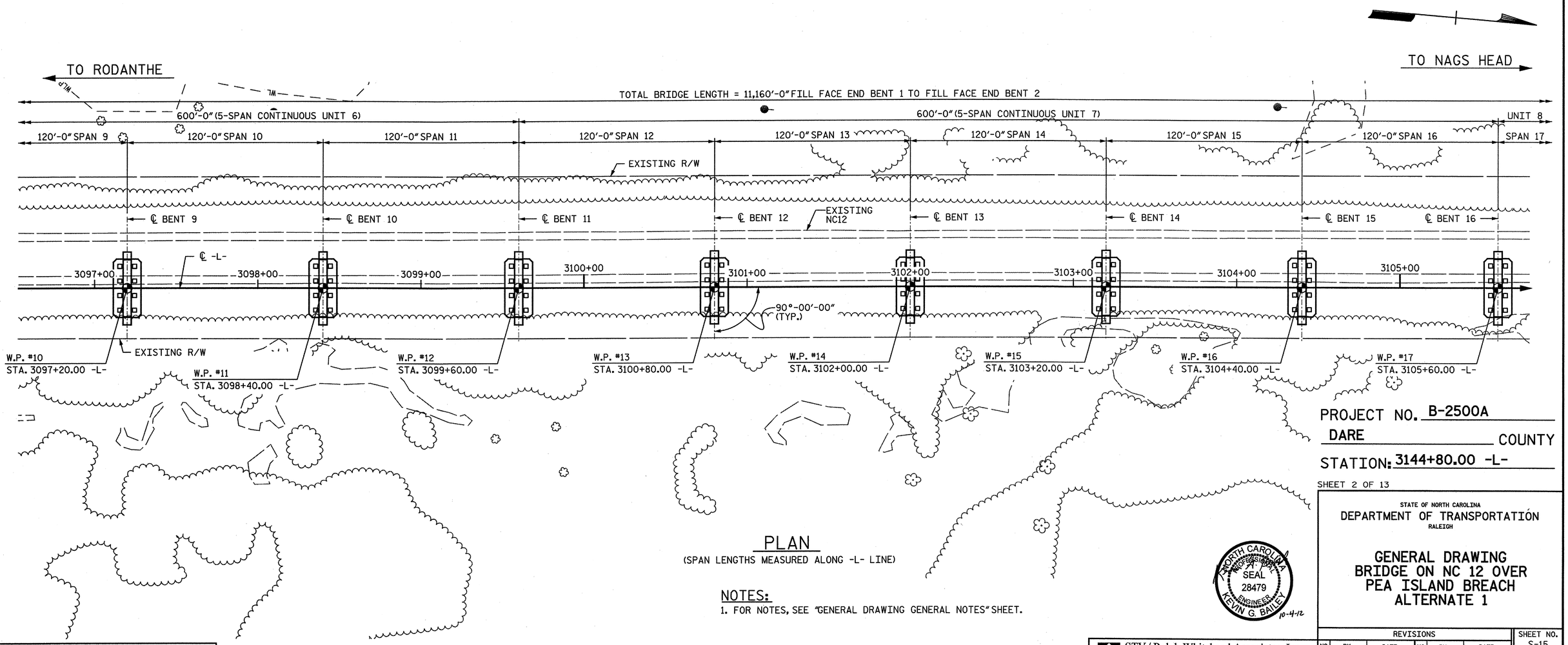


SECTION ALONG ℄ -L-

(SECTIONS AT BENTS ARE AT RIGHT ANGLES)



PLAN

(SPAN LENGTHS MEASURED ALONG -L- LINE)

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING BRIDGE ON NC 12 OVER PEA ISLAND BREACH ALTERNATE 1

DRAWN BY : JDE DATE : 12-11
CHECKED BY : TRL DATE : 3-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			219

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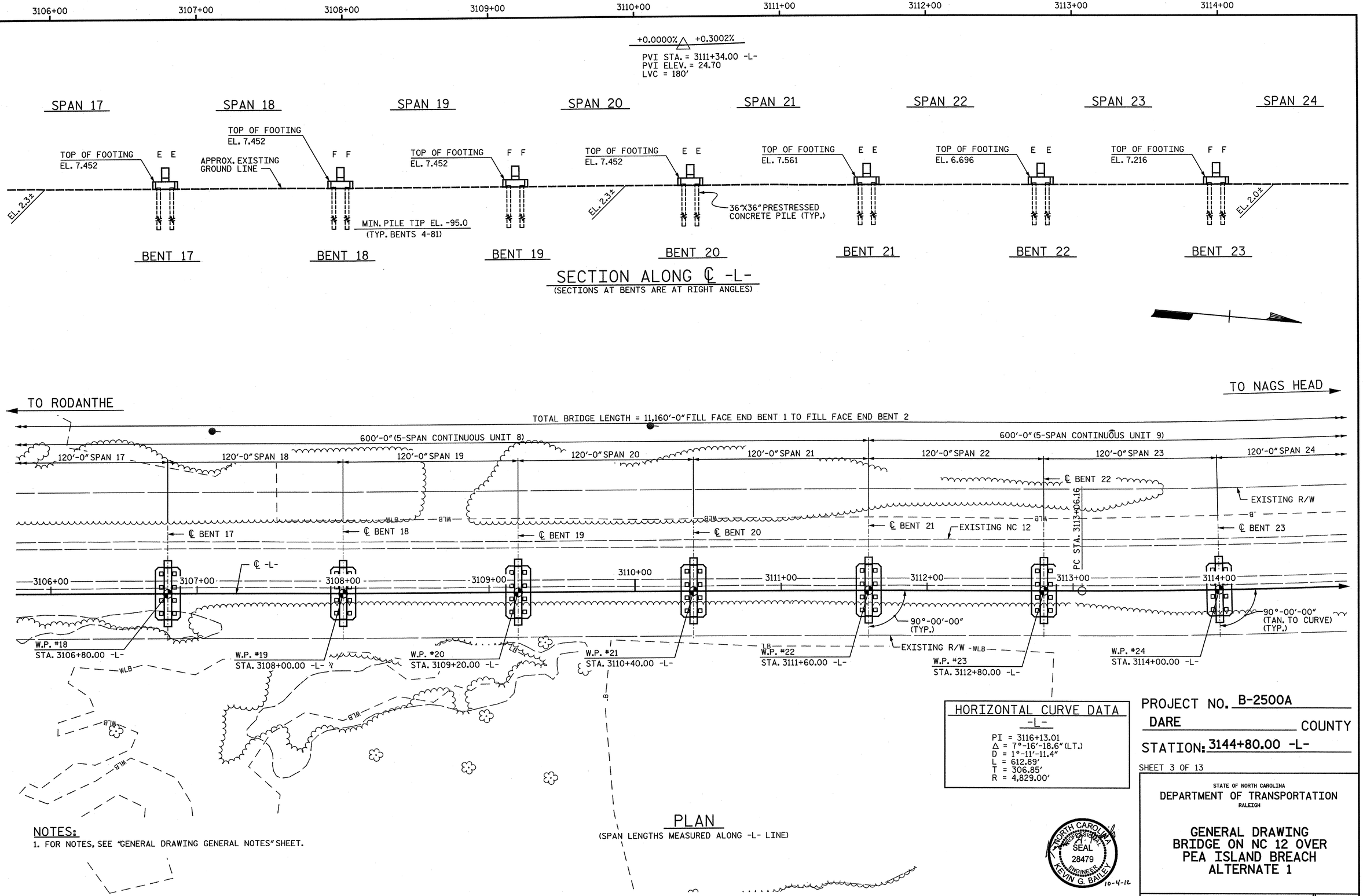

SECTION ALONG ℄ -L-

(SECTIONS AT BENTS ARE AT RIGHT ANGLES)

PLAN

(SPAN LENGTHS MEASURED ALONG -L- LINE)

HORIZONTAL CURVE DATA

-L-

PI = 3116+13.01
Δ = 7°-16'-18.6" (LT.)
D = 1°-11'-11.4"
L = 612.89'
T = 306.85'
R = 4,829.00'

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 3 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE ON NC 12 OVER
PEA ISLAND BREACH
ALTERNATE 1

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : JDE DATE : 3-12
CHECKED BY : TRL DATE : 3-12

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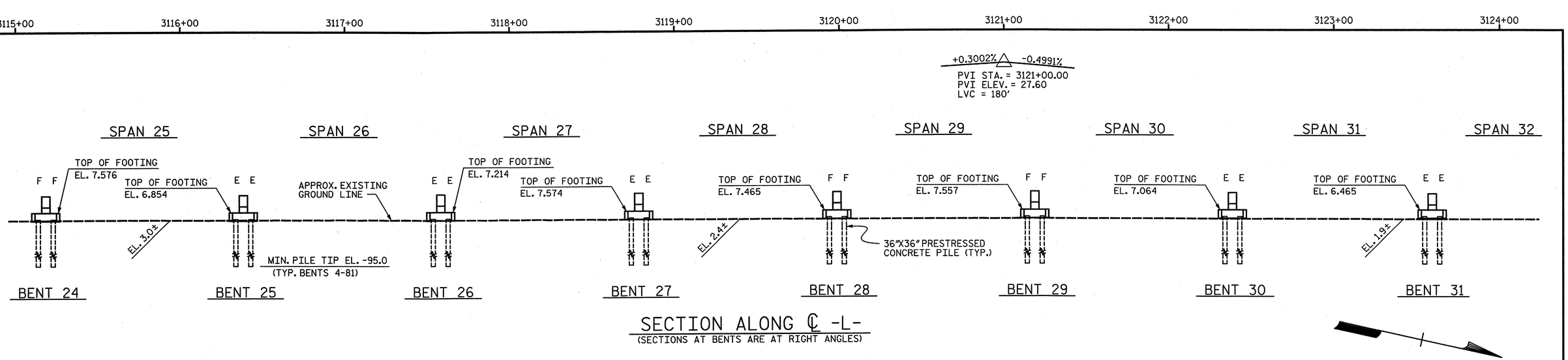
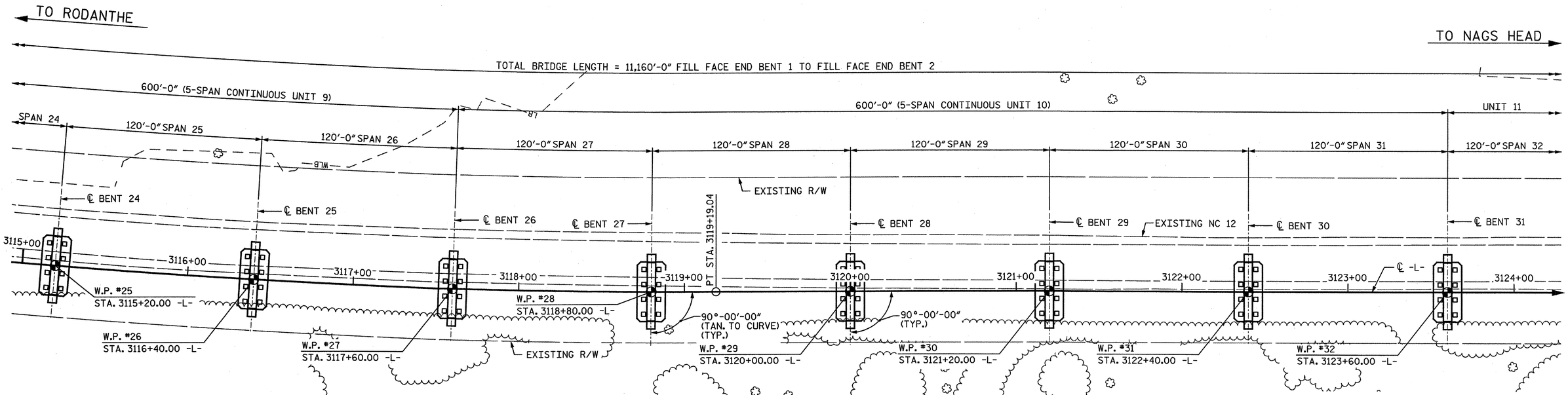


SECTION ALONG ℄ -L-
(SECTIONS AT BENTS ARE AT RIGHT ANGLES)



PLAN
(SPAN LENGTHS MEASURED ALONG -L- LINE)

HORIZONTAL CURVE DATA
-L-

PI = 3116+13.01
Δ = 7°-16'-18.6"(LT.)
D = 1°-11'-11.4"
L = 612.89'
T = 306.85'
R = 4,829.00'

NOTES:
1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

DRAWN BY : JDE DATE : 3-12
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NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 4 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE ON NC 12 OVER PEA ISLAND BREACH ALTERNATE 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			219

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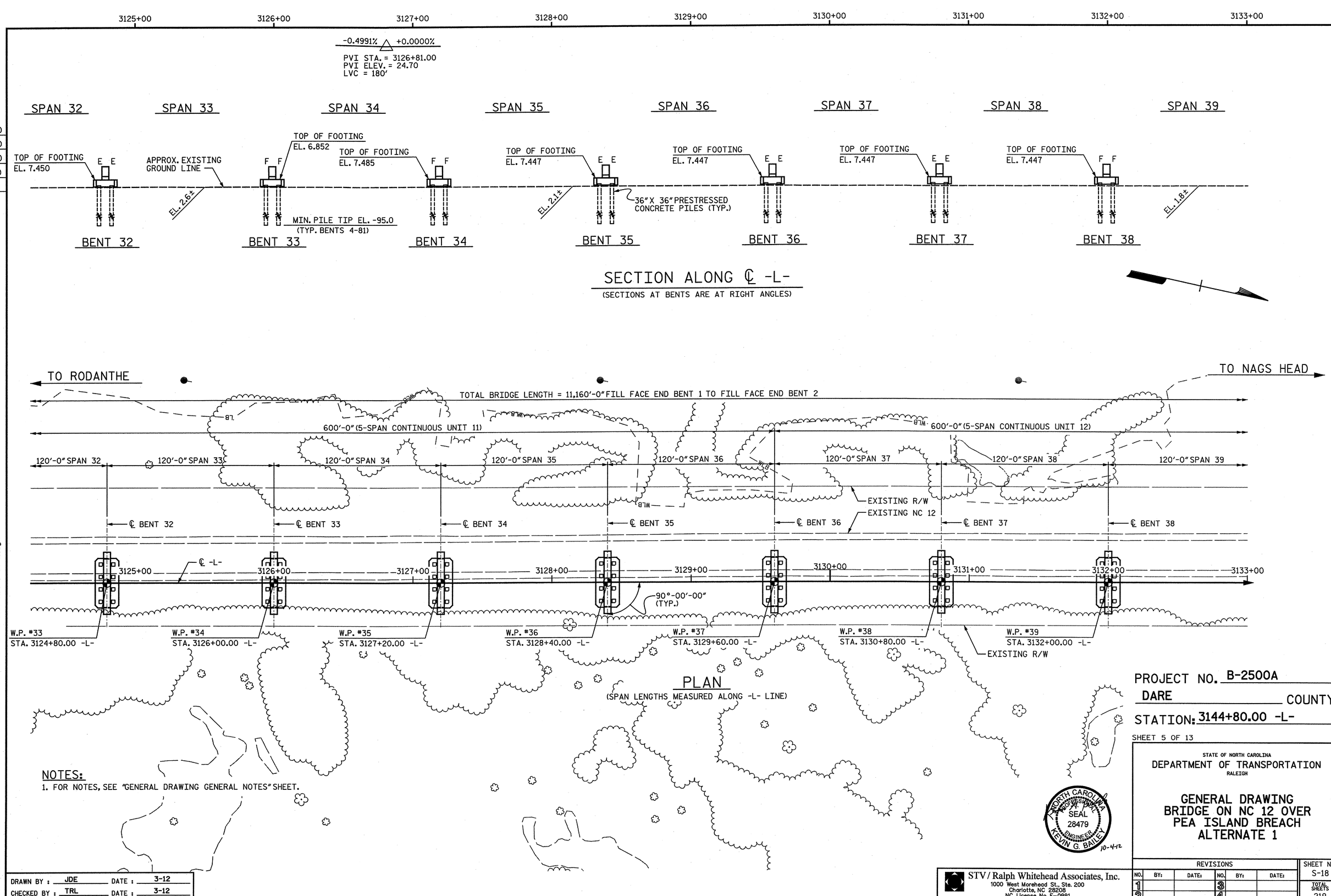

SECTION ALONG ℄ -L-

(SECTIONS AT BENTS ARE AT RIGHT ANGLES)

PLAN

(SPAN LENGTHS MEASURED ALONG -L- LINE)

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 5 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING BRIDGE ON NC 12 OVER PEA ISLAND BREACH ALTERNATE 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			219

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1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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CHECKED BY : TRL DATE : 3-12

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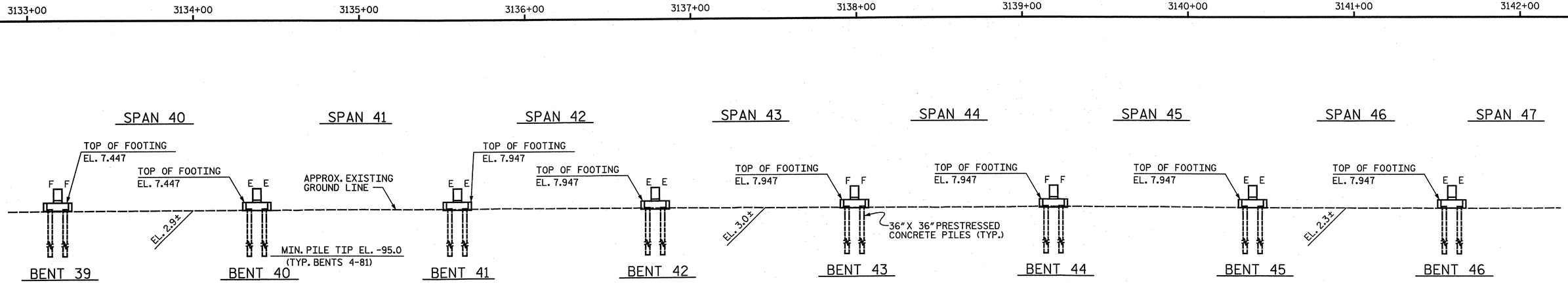


SECTION ALONG ℄ -L-

(SECTIONS AT BENTS ARE AT RIGHT ANGLES)

TO RODANTHE

TO NAGS HEAD

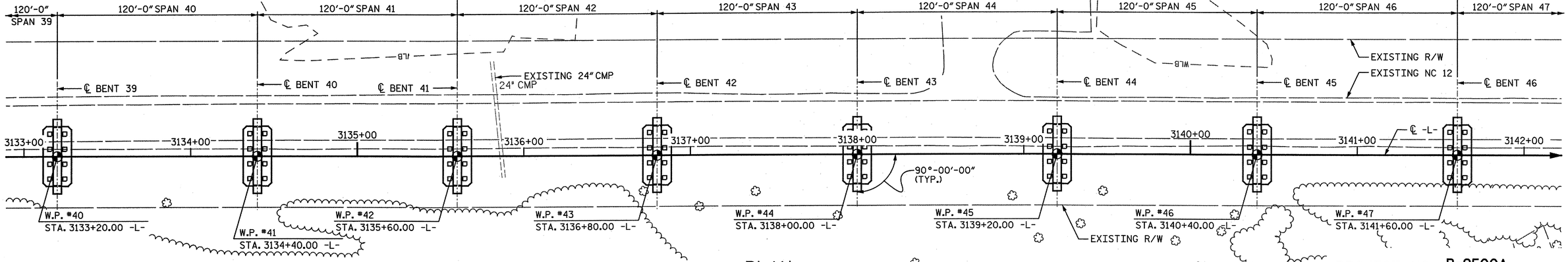
TOTAL BRIDGE LENGTH = 11,160'-0" FILL FACE END BENT 1 TO FILL FACE END BENT 2

600'-0" (5-SPAN CONTINUOUS UNIT 12)

600'-0" (5-SPAN CONTINUOUS UNIT 13)

(UNIT 14)

120'-0" SPAN 39 | 120'-0" SPAN 40 | 120'-0" SPAN 41 | 120'-0" SPAN 42 | 120'-0" SPAN 43 | 120'-0" SPAN 44 | 120'-0" SPAN 45 | 120'-0" SPAN 46 | 120'-0" SPAN 47



PLAN

(SPAN LENGTHS MEASURED ALONG -L- LINE)

A

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 6 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING BRIDGE ON NC 12 OVER PEA ISLAND BREACH ALTERNATE 1

DRAWN BY : JDE DATE : 3-12
CHECKED BY : TRL DATE : 3-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			219

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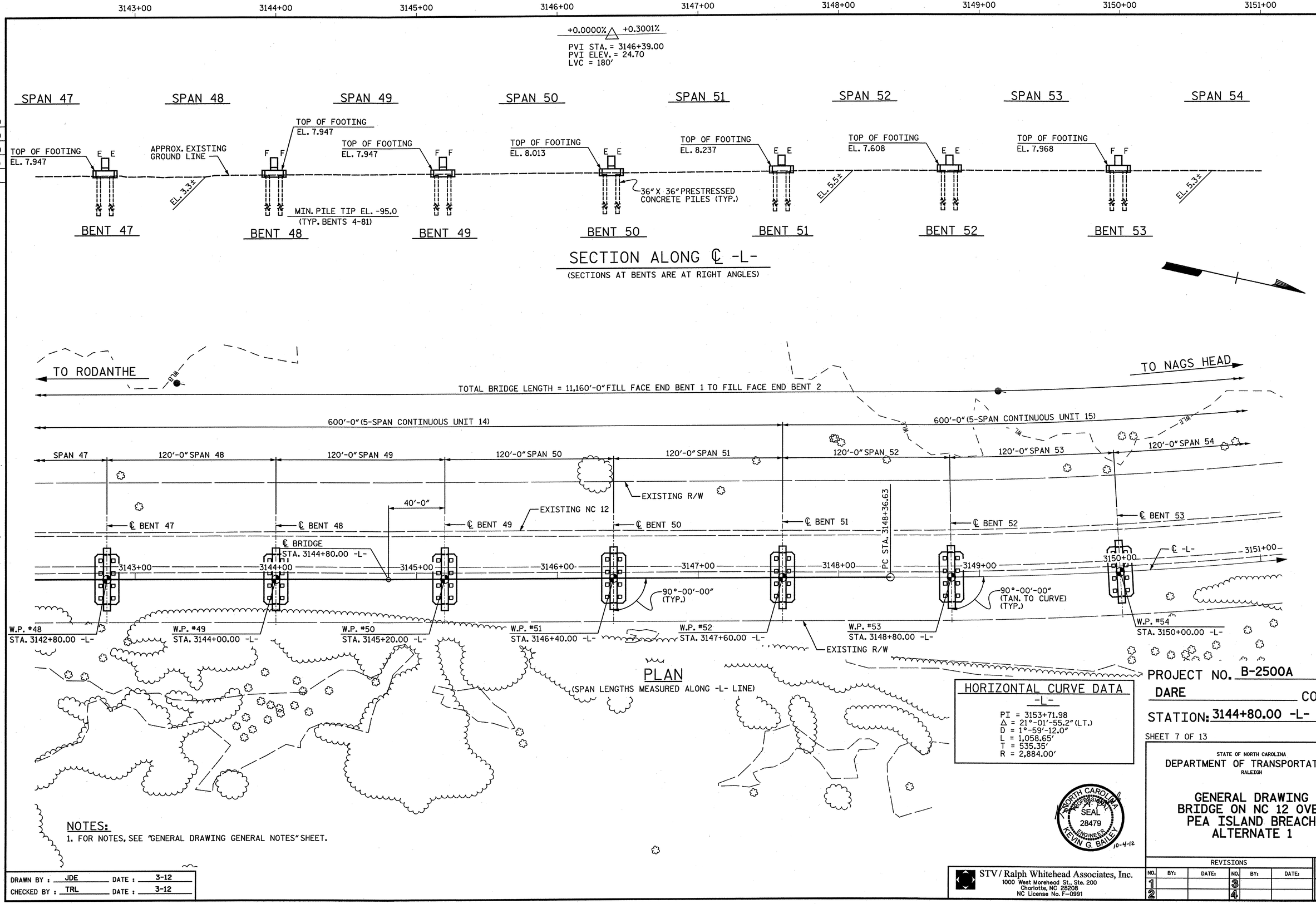

HORIZONTAL CURVE DATA

-L-

PI = 3153+71.98
Δ = 21°-01'-55.2" (LT.)
D = 1°-59'-12.0"
L = 1,058.65'
T = 535.35'
R = 2,884.00'

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 7 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE ON NC 12 OVER PEA ISLAND BREACH
ALTERNATE 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : JDE DATE : 3-12
CHECKED BY : TRL DATE : 3-12

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NC License No. F-0991

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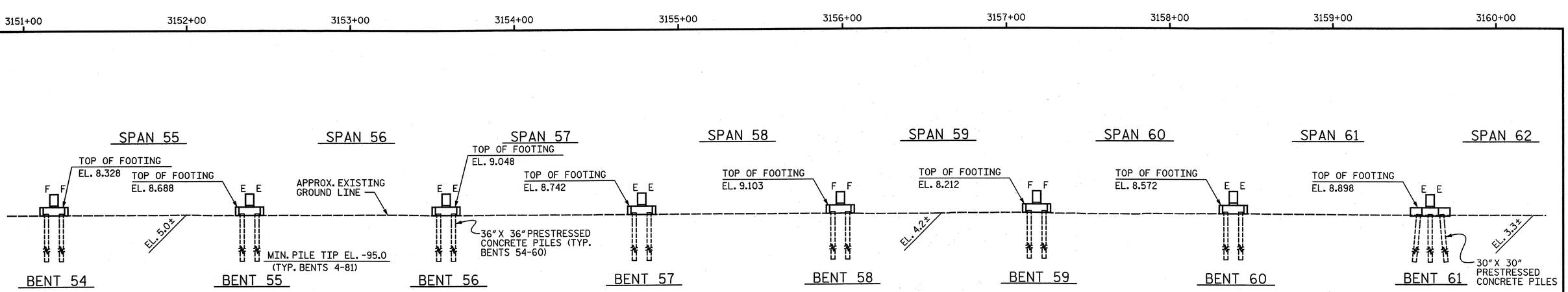
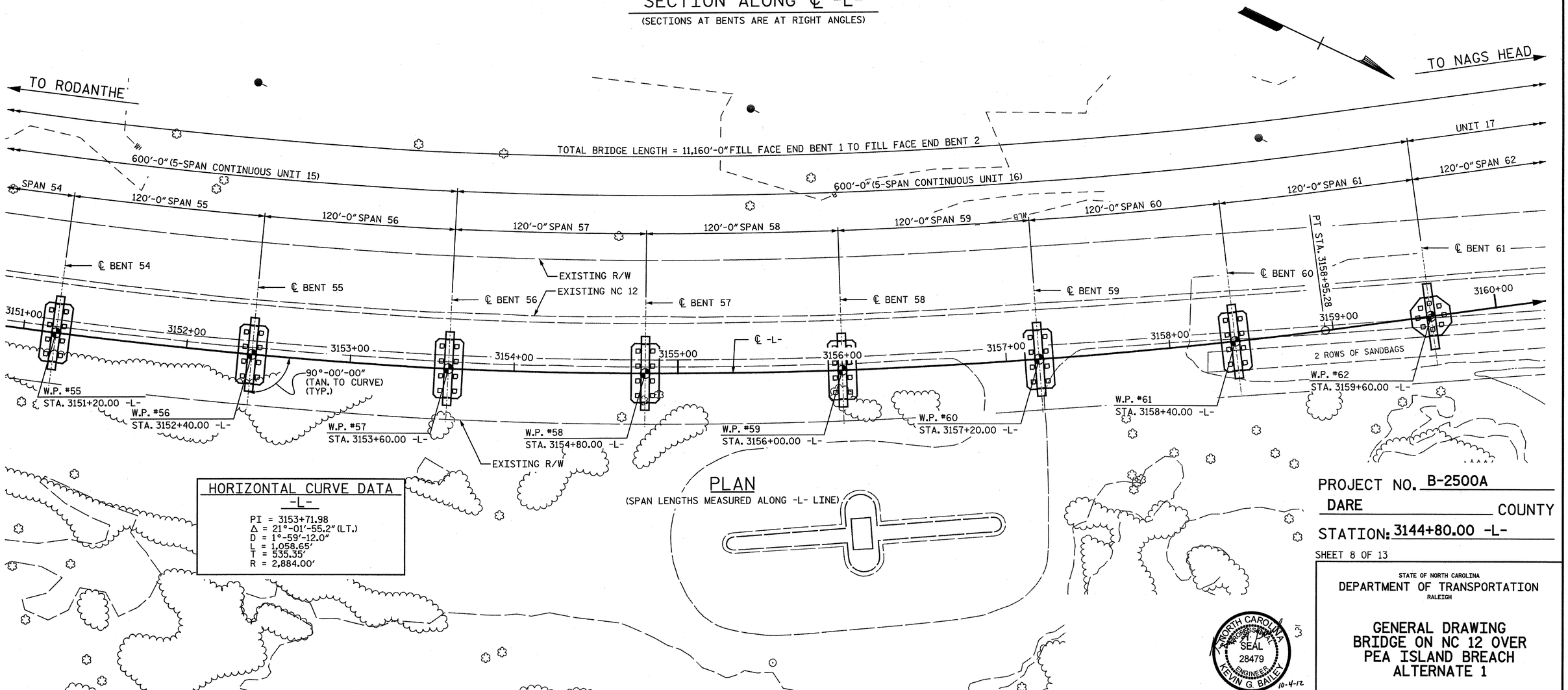


SECTION ALONG ℄ -L-

(SECTIONS AT BENTS ARE AT RIGHT ANGLES)



HORIZONTAL CURVE DATA -L-

PI = 3153+71.98
Δ = 21°-01'-55.2" (LT.)
D = 1°-59'-12.0"
L = 1,058.65'
T = 535.35'
R = 2,884.00'

PLAN

(SPAN LENGTHS MEASURED ALONG -L- LINE)

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 8 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING BRIDGE ON NC 12 OVER PEA ISLAND BREACH ALTERNATE 1

DRAWN BY : JDE DATE : 3-12
CHECKED BY : TRL DATE : 3-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			219

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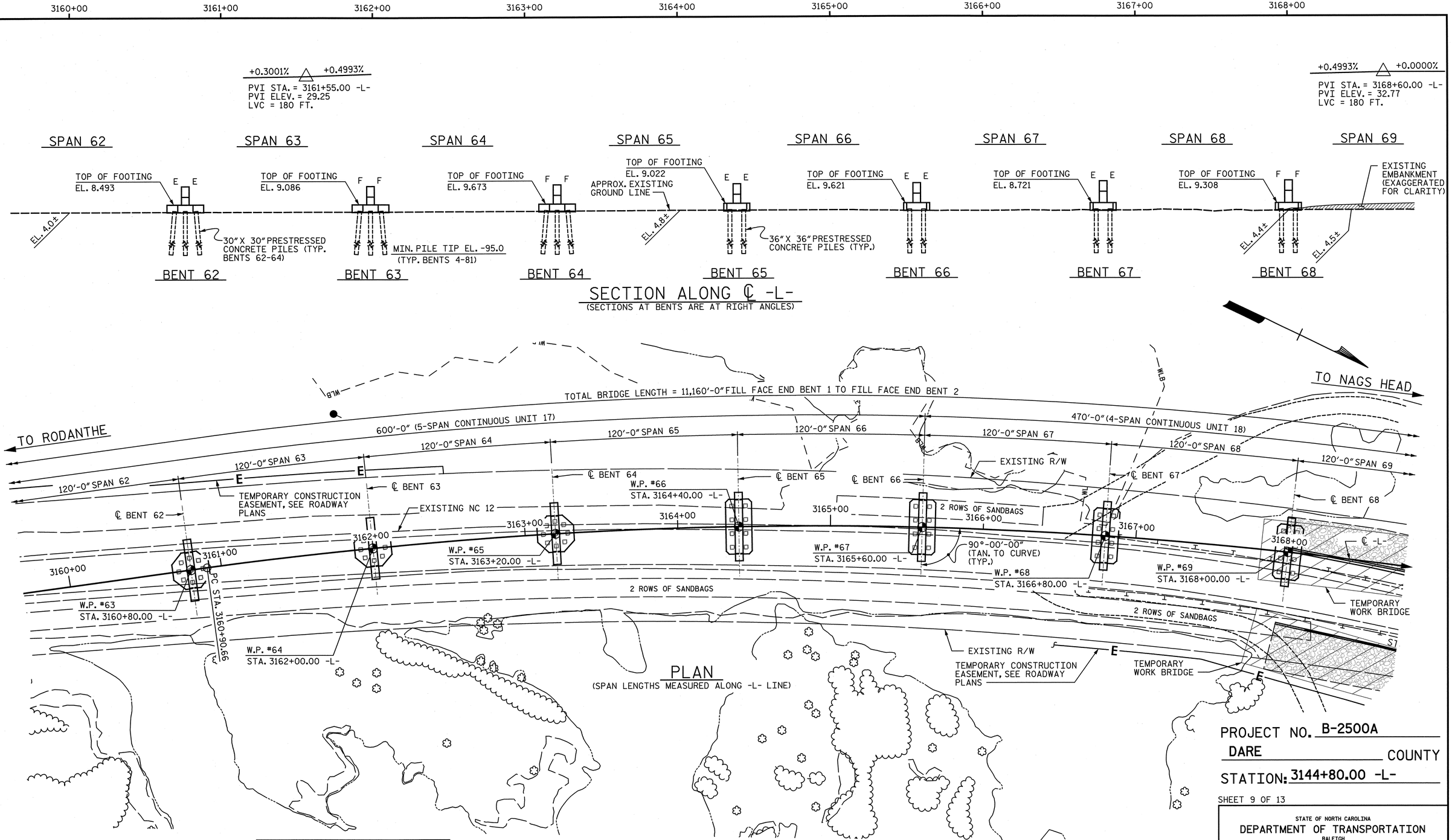

SECTION ALONG ℄ -L-
(SECTIONS AT BENTS ARE AT RIGHT ANGLES)

PLAN
(SPAN LENGTHS MEASURED ALONG -L- LINE)

HORIZONTAL CURVE DATA
-L-

PI = 3170+92.51
Δ = 38°-18'-45.6" (RT.)
D = 1°-59'-12.0"
L = 1,928.48'
T = 1,001.85'
R = 2,884.00'

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.
2. THE EXISTING EMBANKMENT, APPROXIMATELY 40' LEFT OF CENTERLINE -L- SHALL BE REMOVED TO NATURAL GROUND AS DIRECTED BY THE ENGINEER. THE REMOVAL OF THIS UNCLASSIFIED EXCAVATION SHALL BE PAID FOR UNDER UNCLASSIFIED STRUCTURE EXCAVATION PAY ITEM.

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
5-30-13

DRAWN BY : JDE DATE : 3-12
CHECKED BY : TRL DATE : 3-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 9 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING BRIDGE ON NC 12 OVER PEA ISLAND BREACH ALTERNATE 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			219

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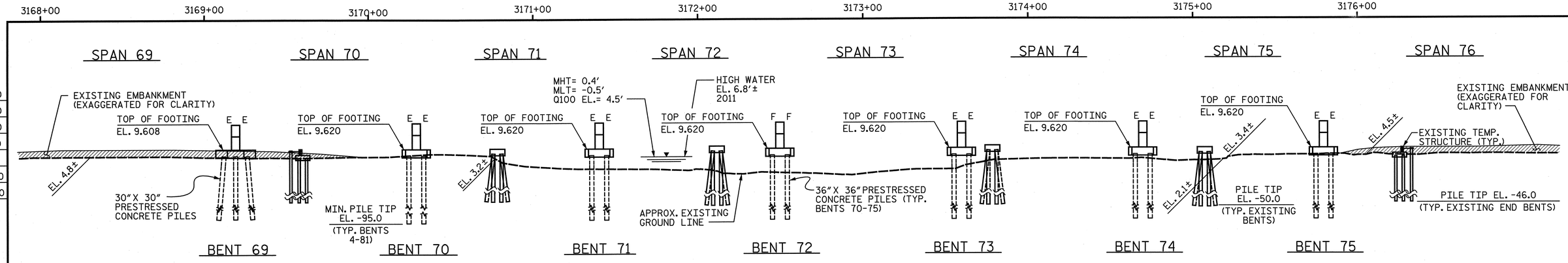
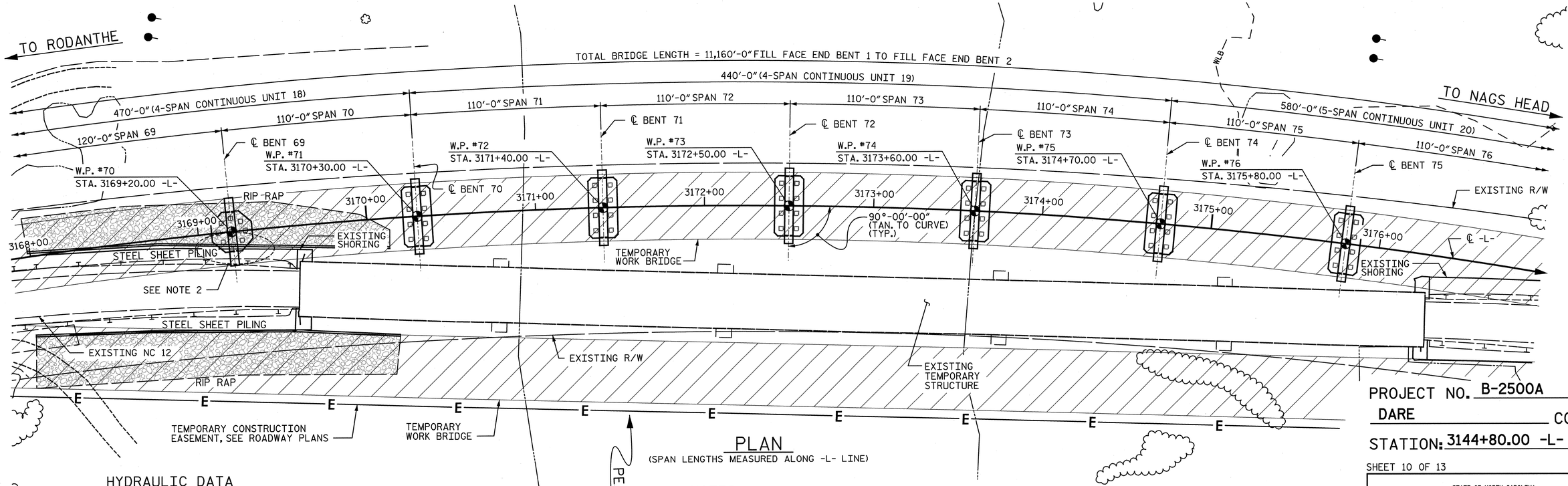


SECTION ALONG ℄ -L-

(SECTIONS AT BENTS ARE AT RIGHT ANGLES)



PLAN

(SPAN LENGTHS MEASURED ALONG -L- LINE)

HYDRAULIC DATA

DESIGN DISCHARGE	= 477,630 CFS
FREQUENCY OF DESIGN FLOOD	= 100 YR.
DESIGN HIGH WATER ELEVATION	= 4.5 FT. NAVD 88
DRAINAGE AREA	= TIDAL
BASIC DISCHARGE (Q100)	= 477,630 CFS
BASIC HIGH WATER ELEVATION	= 4.5'

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= N/A
FREQUENCY OF OVERTOPPING FLOOD	= 500+ YEARS
OVERTOPPING FLOOD ELEVATION	= N/A

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.
2. CONTRACTOR SHALL INSTALL NEW SHEETING IN THE AREA OF THE PROPOSED BENT 69 SUCH THAT THE FOOTING CAN BE CONSTRUCTED AND THE ROADWAY MAINTAINED FOR TRAFFIC. CONTRACTOR SHALL REMOVE PORTION OF EXISTING SHEETING THAT CONFLICTS WITH PROPOSED FOOTING CONSTRUCTION. NEW SHEETING AND INSTALLATION THEREOF FOR PROPOSED CONSTRUCTION AS DESCRIBED HEREIN SHALL BE CONSIDERED INCIDENTAL AND NO ADDITIONAL PAYMENT WILL BE MADE.
3. THE EXISTING EMBANKMENT, APPROXIMATELY 40' LEFT OF CENTERLINE -L- SHALL BE REMOVED TO NATURAL GROUND AS DIRECTED BY THE ENGINEER. THE REMOVAL OF THIS UNCLASSIFIED EXCAVATION SHALL BE PAID FOR UNDER UNCLASSIFIED STRUCTURE EXCAVATION PAY ITEM.

HORIZONTAL CURVE DATA -L-

PI = 3170+92.51
Δ = 38°-18'-45.6" (RT.)
D = 1°-59'-12.0"
L = 1,928.48'
T = 1,001.85'
R = 2,884.00'

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 5-30-13

DRAWN BY : JDE DATE : 3-12
CHECKED BY : TRL DATE : 3-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 10 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING BRIDGE ON NC 12 OVER PEA ISLAND BREACH ALTERNATE 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
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2			4			219

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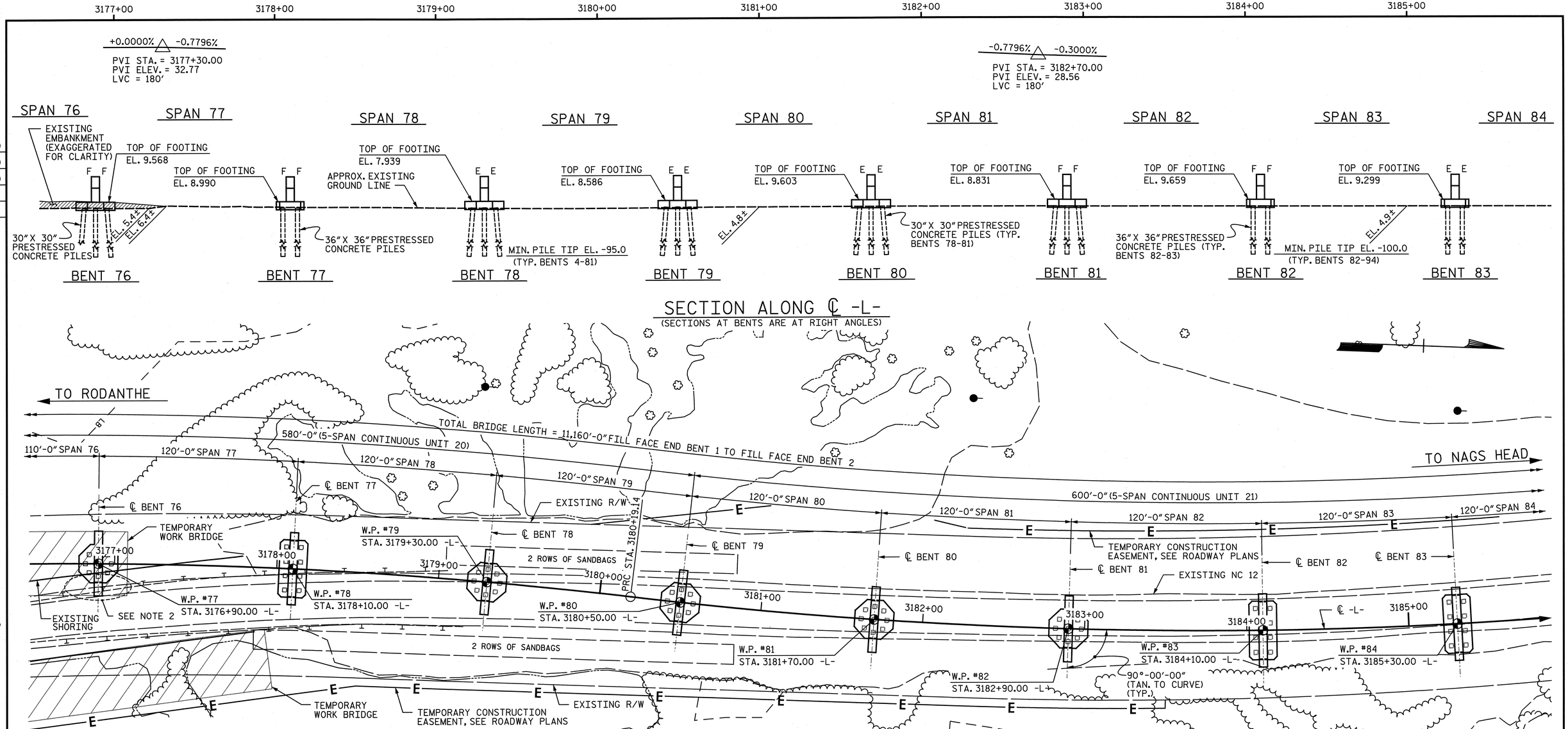

SECTION ALONG ℄ -L-

(SECTIONS AT BENTS ARE AT RIGHT ANGLES)

PLAN

(SPAN LENGTHS MEASURED ALONG -L- LINE)

HORIZONTAL CURVE DATA -L-	HORIZTONAL CURVE DATA -L-
PI = 3170+92.51	PI = 3185+28.08
Δ = 38°-18'-45.6" (RT.)	Δ = 20°-00'-57.9" (LT.)
D = 1°-59'-12.0"	D = 1°-59'-12"
L = 1,928.48'	L = 1,007.52'
T = 1,001.85'	T = 508.94'
R = 2,884.00'	R = 2,884.00'

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.
2. CONTRACTOR SHALL INSTALL NEW SHEETING IN THE AREA OF THE PROPOSED BENT 76 SUCH THAT THE FOOTING CAN BE CONSTRUCTED AND THE ROADWAY MAINTAINED FOR TRAFFIC. CONTRACTOR SHALL REMOVE PORTION OF EXISTING SHEETING THAT CONFLICTS WITH PROPOSED FOOTING CONSTRUCTION. NEW SHEETING AND INSTALLATION THEREOF FOR PROPOSED CONSTRUCTION AS DESCRIBED HEREIN SHALL BE CONSIDERED INCIDENTAL AND NO ADDITIONAL PAYMENT WILL BE MADE.
3. THE EXISTING EMBANKMENT, APPROXIMATELY 40' LEFT OF CENTERLINE -L- SHALL BE REMOVED TO NATURAL GROUND AS DIRECTED BY THE ENGINEER. THE REMOVAL OF THIS UNCLASSIFIED EXCAVATION SHALL BE PAID FOR UNDER UNCLASSIFIED STRUCTURE EXCAVATION PAY ITEM.

DRAWN BY : JDE DATE : 3-12
CHECKED BY : TRL DATE : 3-12

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY ENGINEER
5-30-13

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-

SHEET 11 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING BRIDGE ON NC 12 OVER PEA ISLAND BREACH ALTERNATE 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			219

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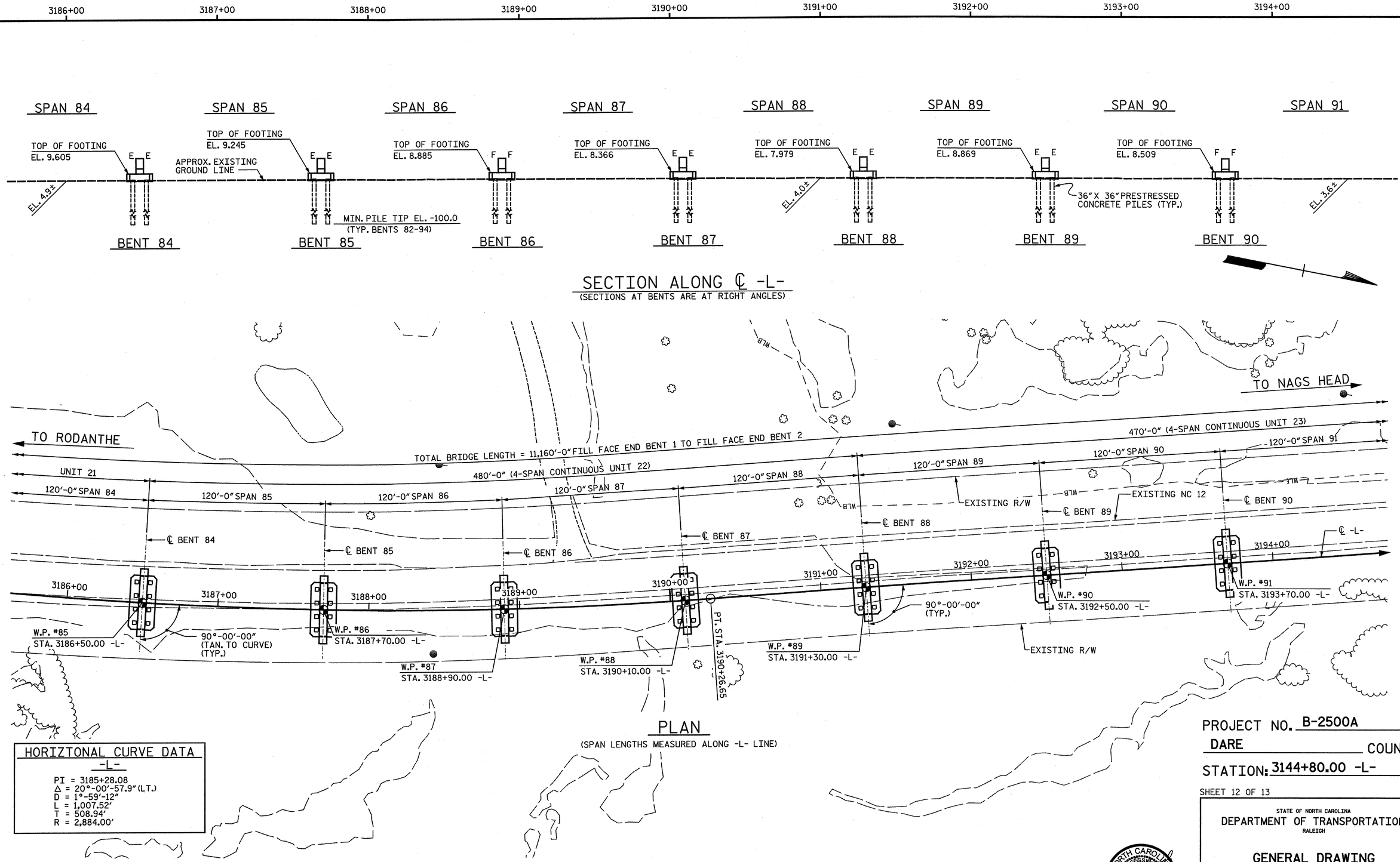

SECTION ALONG ℄ -L-
(SECTIONS AT BENTS ARE AT RIGHT ANGLES)

PLAN
(SPAN LENGTHS MEASURED ALONG -L- LINE)

HORIZTONAL CURVE DATA
-L-

PI = 3185+28.08
Δ = 20°-00'-57.9" (LT.)
D = 1°-59'-12"
L = 1,007.52'
T = 508.94'
R = 2,884.00'

NOTES:
1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-

SHEET 12 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE ON NC 12 OVER PEA ISLAND BREACH ALTERNATE 1

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

DRAWN BY : JDE DATE : 3-12
CHECKED BY : TRL DATE : 3-12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			219

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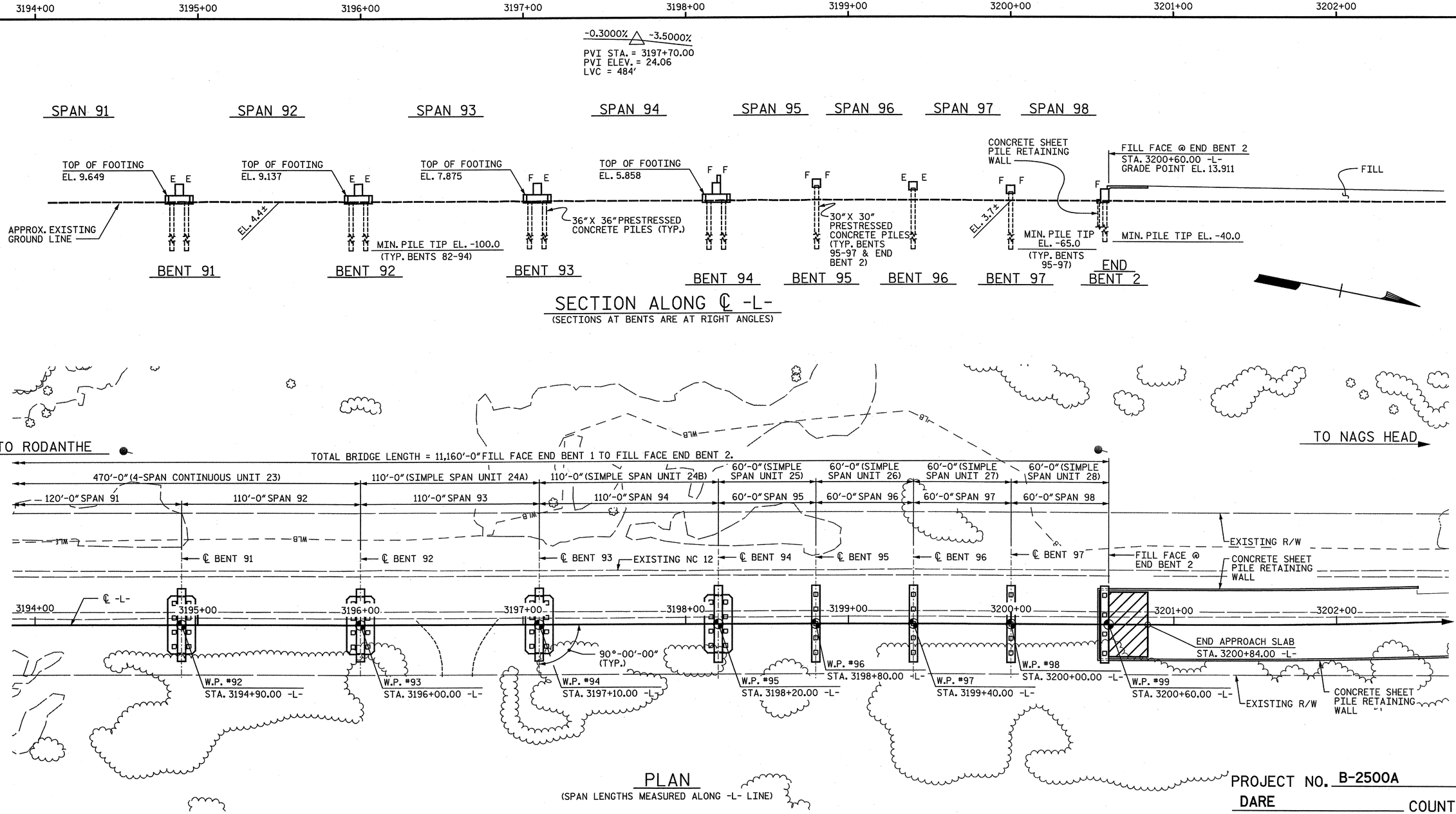

SECTION ALONG ℄ -L-

(SECTIONS AT BENTS ARE AT RIGHT ANGLES)

PLAN

(SPAN LENGTHS MEASURED ALONG -L- LINE)

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 13 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING BRIDGE ON NC 12 OVER PEA ISLAND BREACH ALTERNATE 1

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.
2. CONTRACTOR HAS THE OPTION TO USE 36"X 36" PRESTRESSED CONCRETE PILES FOR BENT 95, BENT 96, BENT 97 AND END BENT 2. SEE BENT SHEETS FOR ADDITIONAL INFORMATION.
3. FOR RETAINING WALL DETAILS, SEE CONCRETE SHEET PILE RETAINING WALL SHEETS.

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

DRAWN BY : JDE DATE : 3-12
CHECKED BY : TRL DATE : 3-12

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1000 West Morehead St. Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			219

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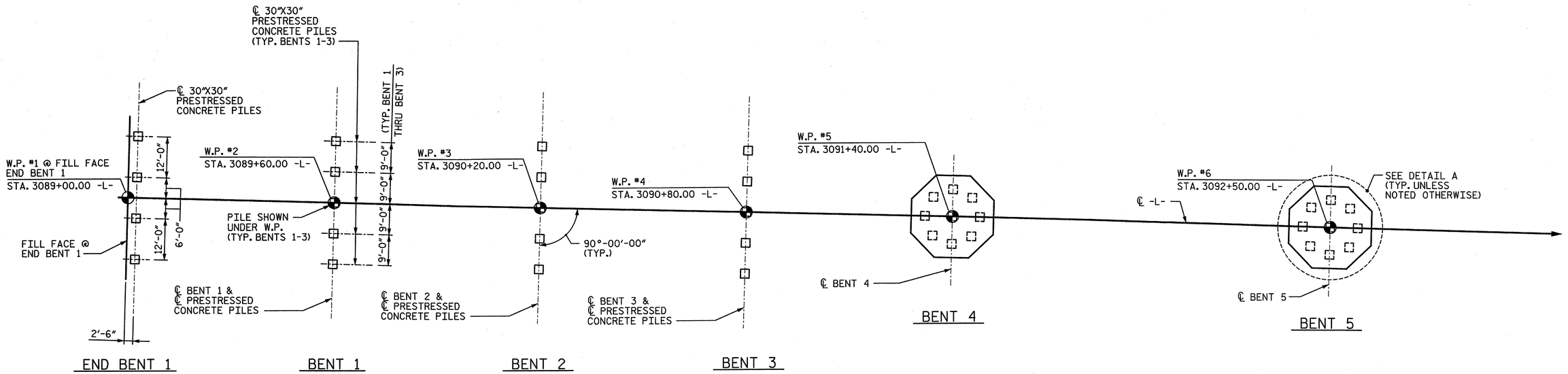
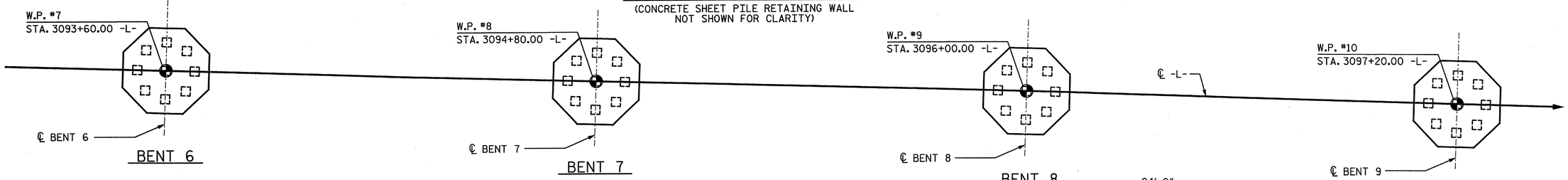
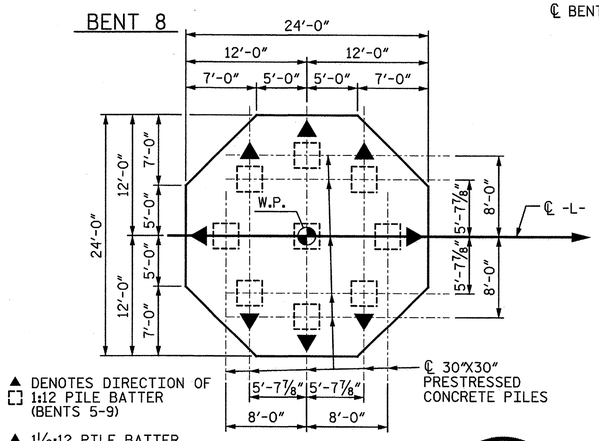


FOUNDATION LAYOUT

(CONCRETE SHEET PILE RETAINING WALL NOT SHOWN FOR CLARITY)



FOUNDATION LAYOUT



DETAIL A
(TYP. TANGENT SECTIONS)

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.
2. CONTRACTOR HAS THE OPTION TO USE 36" X 36" PRESTRESSED CONCRETE PILES FOR END BENT 1, BENT 1, BENT 2, AND BENT 3. SEE BENT SHEETS FOR ADDITIONAL INFORMATION.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOUNDATION LAYOUT BRIDGE ON NC 12 OVER PEA ISLAND BREACH

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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

SHEET NO. S-27

TOTAL SHEETS 219

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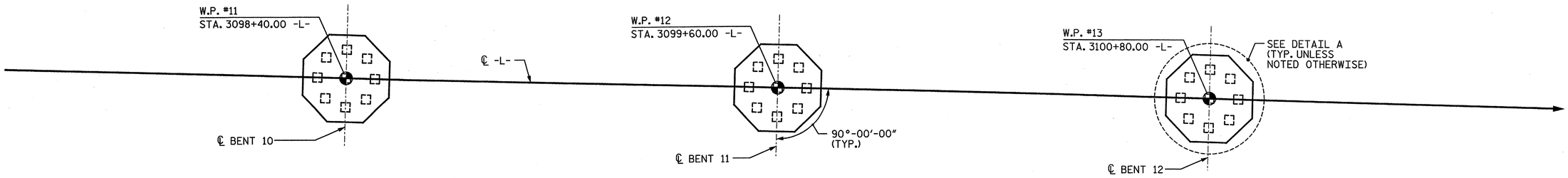
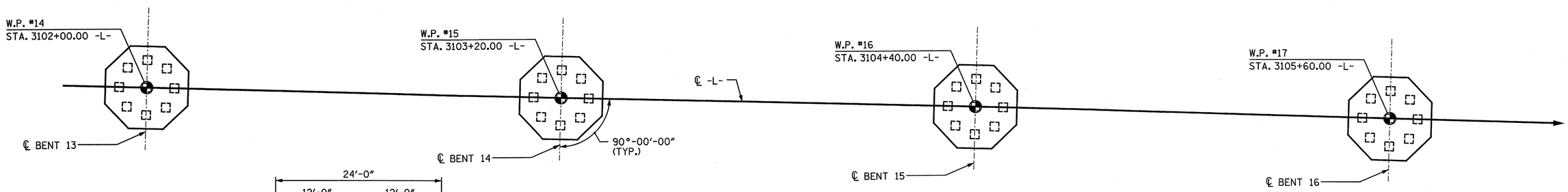


BENT 10

BENT 11

BENT 12

FOUNDATION LAYOUT

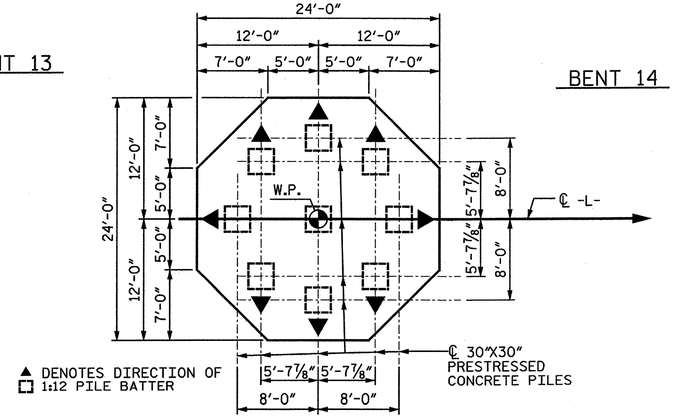


BENT 13

BENT 14

BENT 15

BENT 16



DETAIL A
(TYP. TANGENT SECTIONS)

FOUNDATION LAYOUT

NOTE:
1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOUNDATION LAYOUT
BRIDGE ON NC 12 OVER
PEA ISLAND BREACH

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

DRAWN BY : JDE DATE : 3-12
CHECKED BY : CLG DATE : 3-12

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NC License No. F-0991

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

SHEET NO. S-28
TOTAL SHEETS 219

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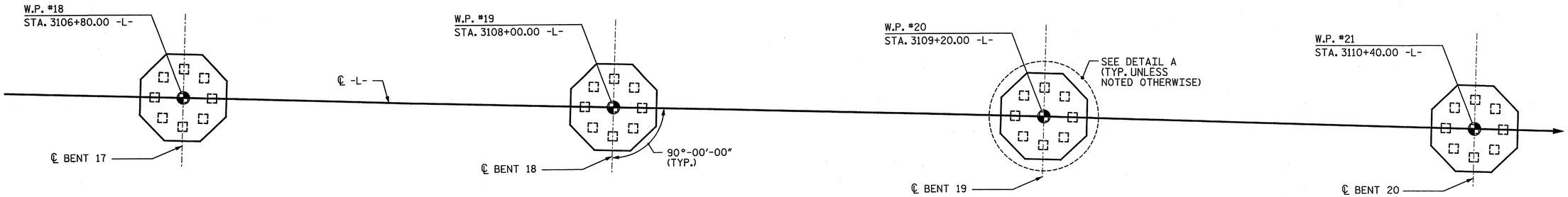
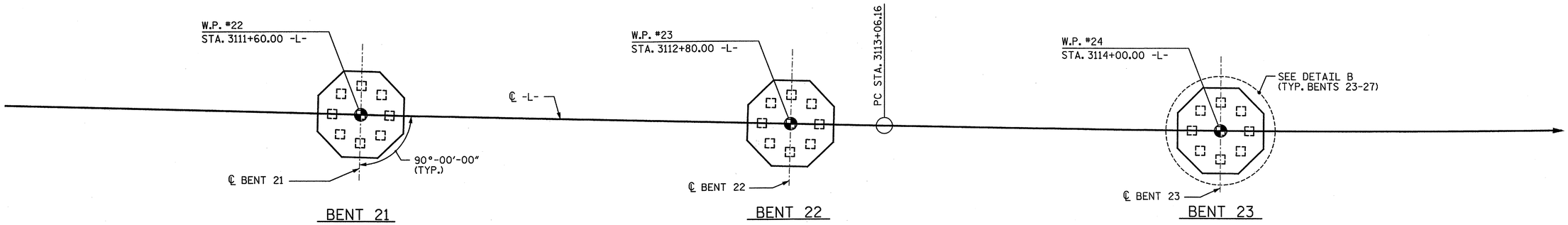


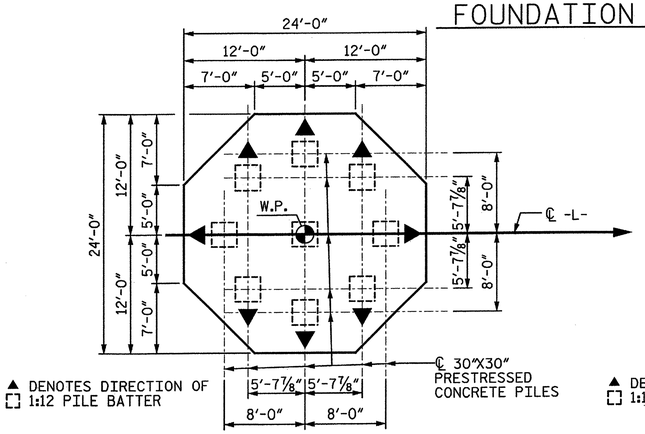
BENT 17 BENT 18 BENT 19 BENT 20

FOUNDATION LAYOUT

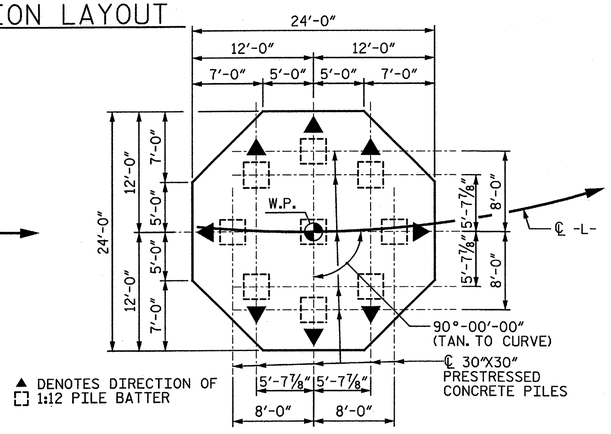


BENT 21 BENT 22 BENT 23

FOUNDATION LAYOUT



DETAIL A
(TYP. TANGENT SECTIONS)



DETAIL B
(-L- LINE EXAGGERATED FOR CLARITY)
(DIMENSIONS TYP. BENTS 23-27)

NOTE:
1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 3 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOUNDATION LAYOUT BRIDGE ON NC 12 OVER PEA ISLAND BREACH

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : JDE DATE : 3-12
CHECKED BY : CLG DATE : 3-12

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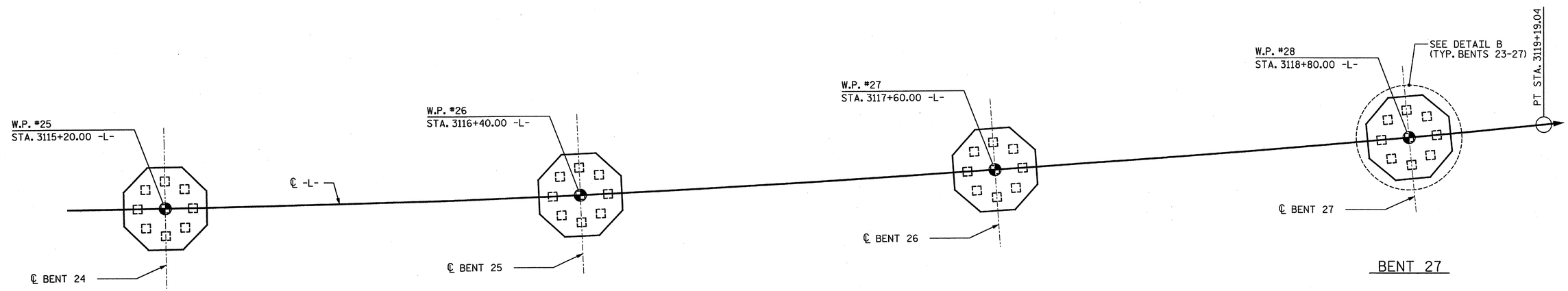

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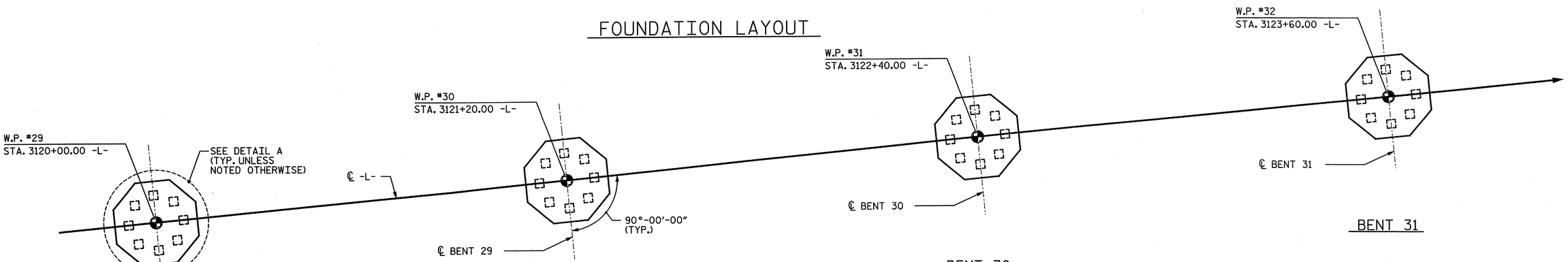

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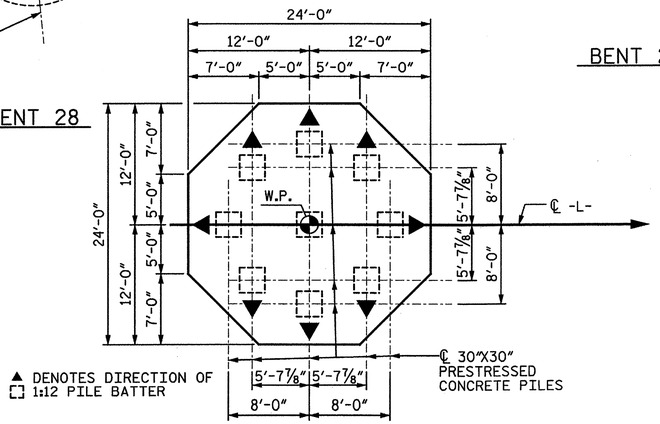
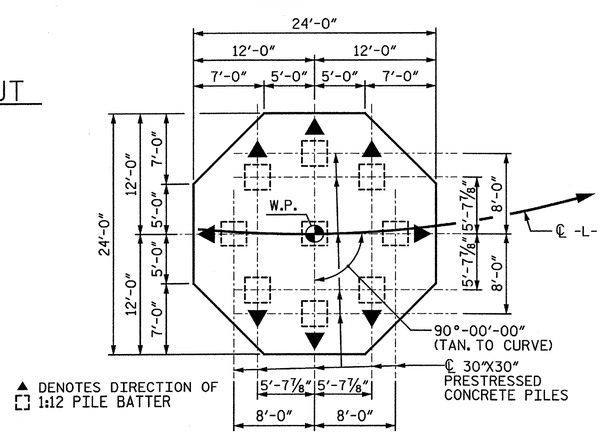


DETAIL A
(TYP. TANGENT SECTIONS)



DETAIL B
(-L- LINE EXAGGERATED FOR CLARITY)
(DIMENSIONS TYP. BENTS 23-27)

NOTE:
1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 4 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOUNDATION LAYOUT
BRIDGE ON NC 12 OVER PEA ISLAND BREACH

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : JDE DATE : 3-12
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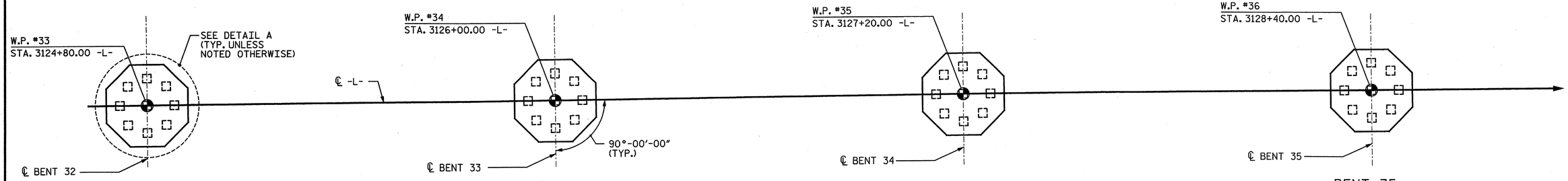
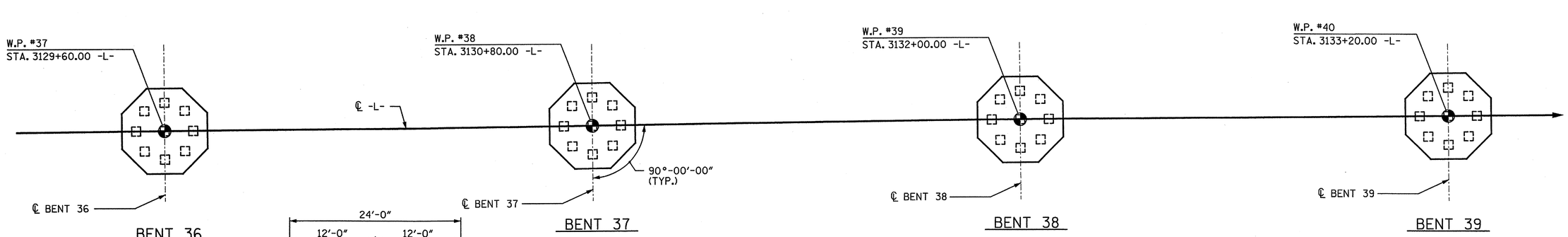


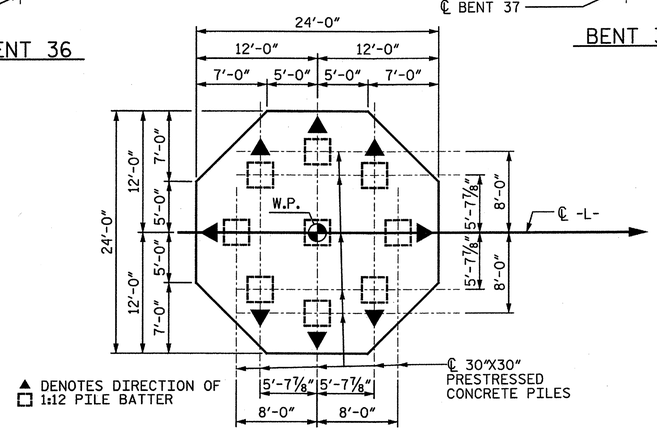
BENT 32 BENT 33 BENT 34 BENT 35

FOUNDATION LAYOUT



BENT 36 BENT 37 BENT 38 BENT 39

FOUNDATION LAYOUT



DETAIL A
(TYP. TANGENT SECTIONS)

NOTE:
1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 5 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOUNDATION LAYOUT
BRIDGE ON NC 12 OVER
PEA ISLAND BREACH

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

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NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : JDE DATE : 3-12
CHECKED BY : CLG DATE : 3-12

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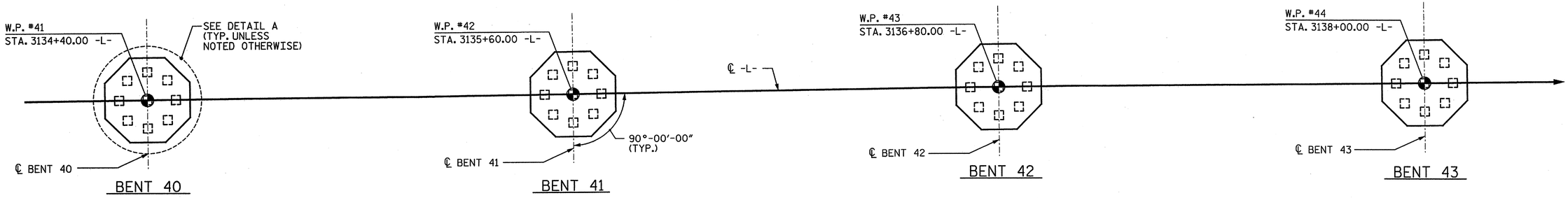

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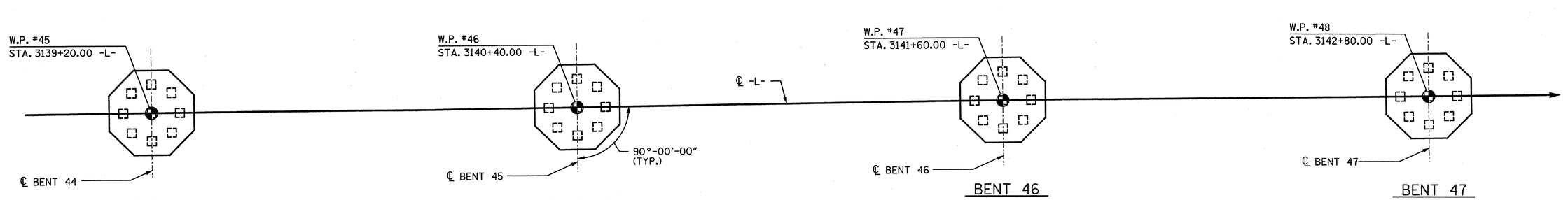

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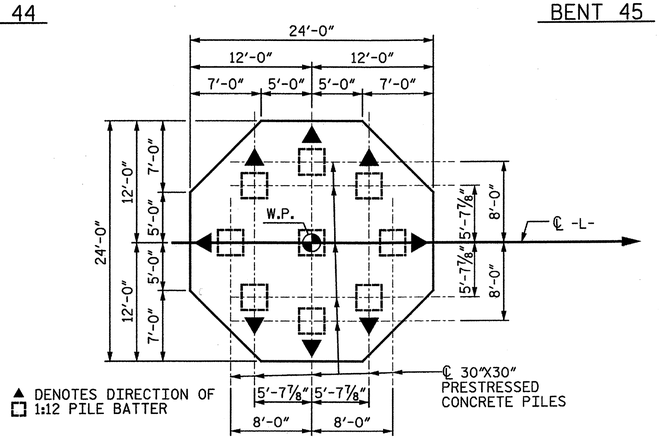

DETAIL A
(TYP. TANGENT SECTIONS)

NOTE:
1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 6 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOUNDATION LAYOUT
BRIDGE ON NC 12 OVER
PEA ISLAND BREACH

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			219

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Charlotte, NC 28208
NC License No. F-0991

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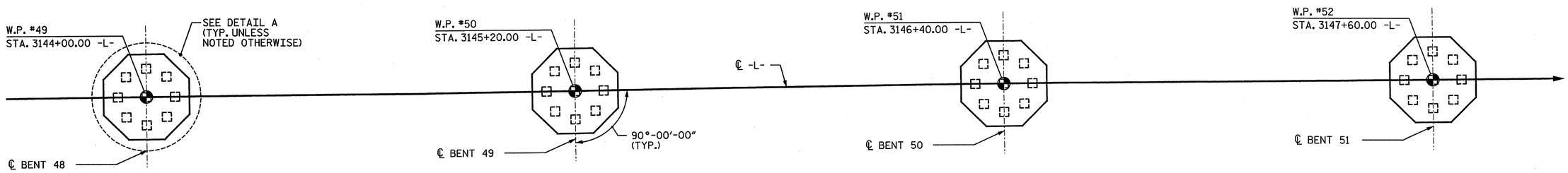
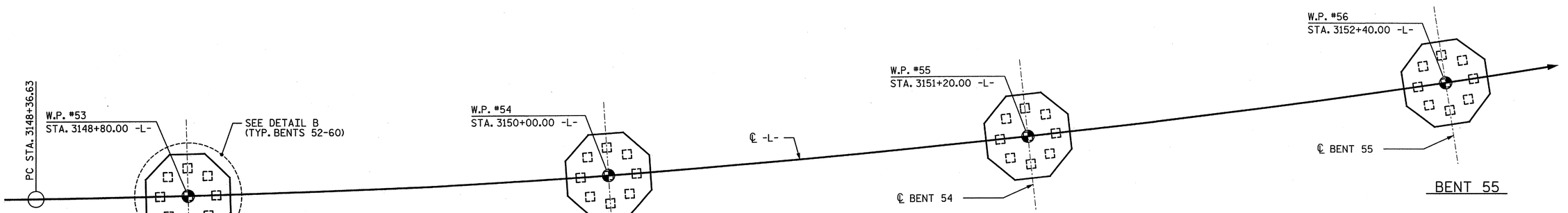
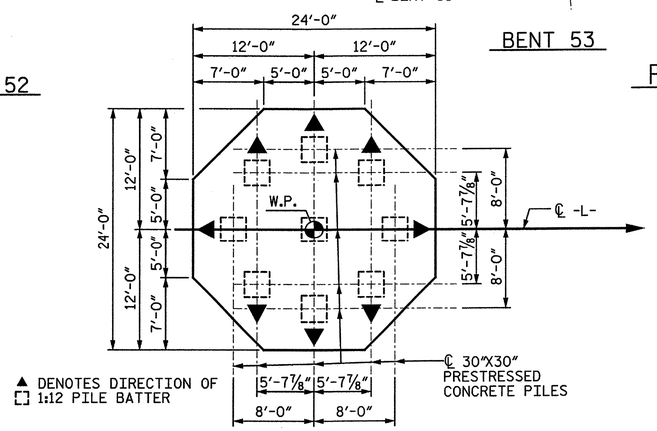


BENT 48 BENT 49 BENT 50 BENT 51

FOUNDATION LAYOUT

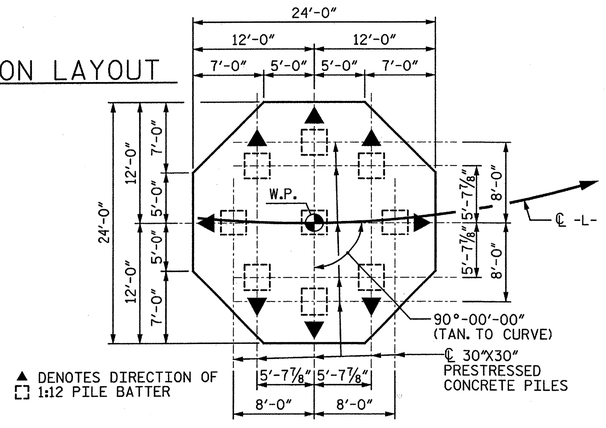


BENT 52 BENT 53 BENT 54 BENT 55



DETAIL A
(TYP. TANGENT SECTIONS)

FOUNDATION LAYOUT



DETAIL B
(-L- LINE EXAGGERATED FOR CLARITY)
(DIMENSIONS TYP. BENTS 52-60)

NOTE:
1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY
10-4-12

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 7 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOUNDATION LAYOUT
BRIDGE ON NC 12 OVER
PEA ISLAND BREACH

DRAWN BY : JDE DATE : 3-12
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Charlotte, NC 28208
NC License No. F-0991

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

SHEET NO. S-33
TOTAL SHEETS 219

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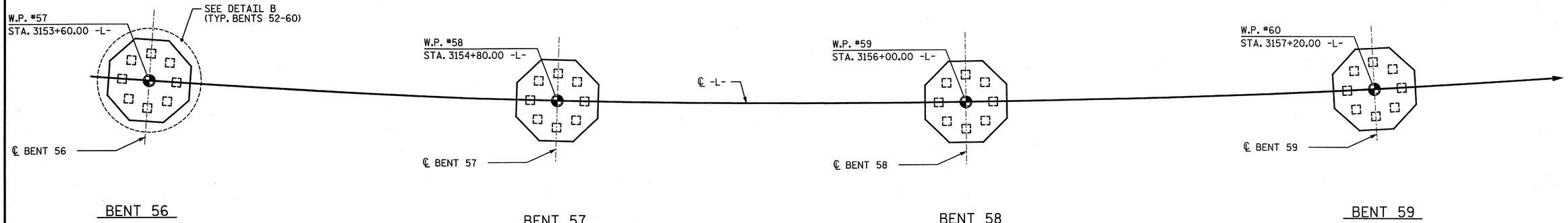
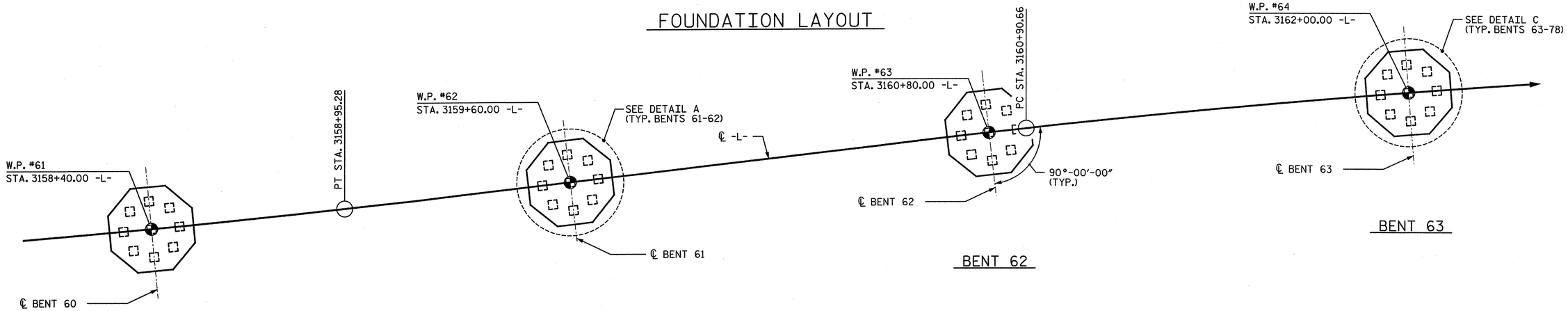


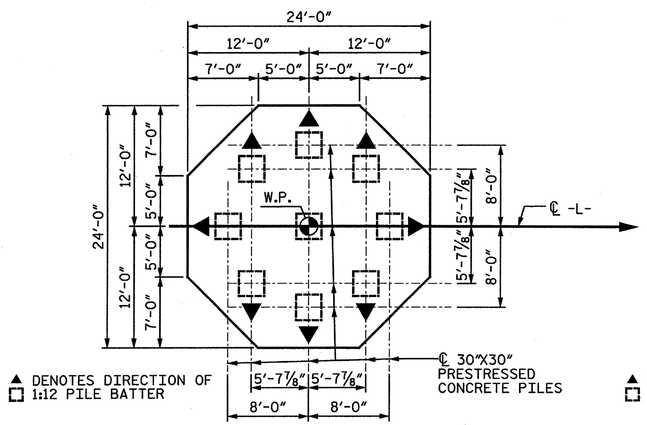
BENT 56 BENT 57 BENT 58 BENT 59

FOUNDATION LAYOUT

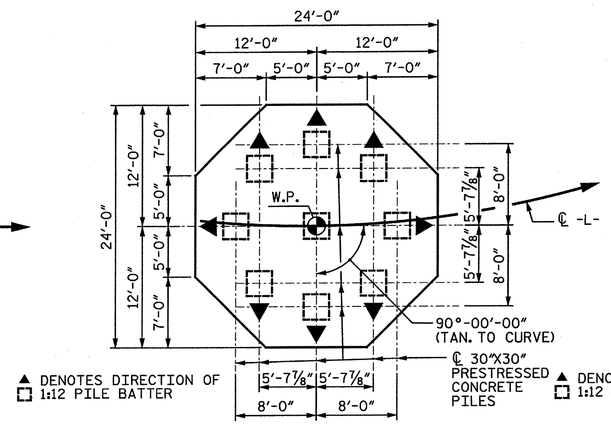


BENT 60 BENT 61 BENT 62 BENT 63

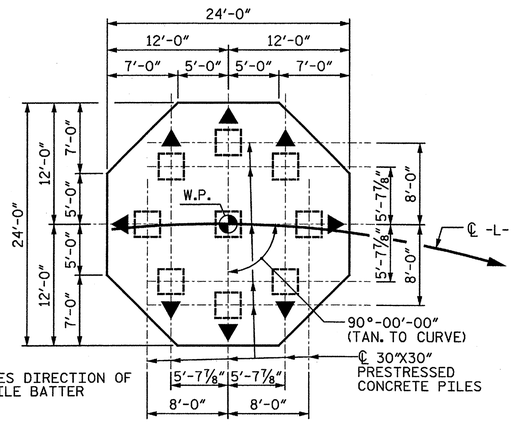
FOUNDATION LAYOUT



DETAIL A
(TYP. TANGENT SECTIONS)



DETAIL B
(-L- LINE EXAGGERATED FOR CLARITY)
(DIMENSIONS TYP. BENTS 52-60)



DETAIL C
(-L- LINE EXAGGERATED FOR CLARITY)
(DIMENSIONS TYP. BENTS 63-78)

NOTE:
1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 8 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOUNDATION LAYOUT BRIDGE ON NC 12 OVER PEA ISLAND BREACH

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

DRAWN BY : JDE DATE : 3-12
CHECKED BY : CLG DATE : 3-12

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Charlotte, NC 28208
NC License No. F-0991

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

SHEET NO. S-34
TOTAL SHEETS 219

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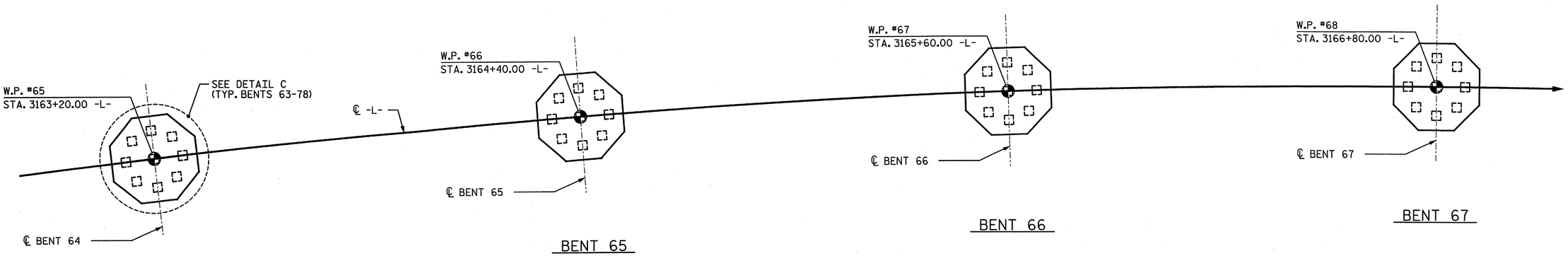
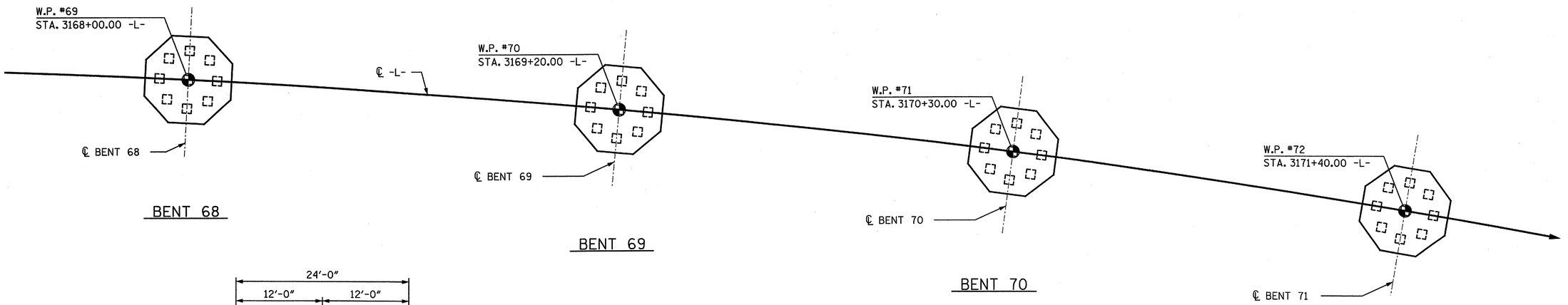


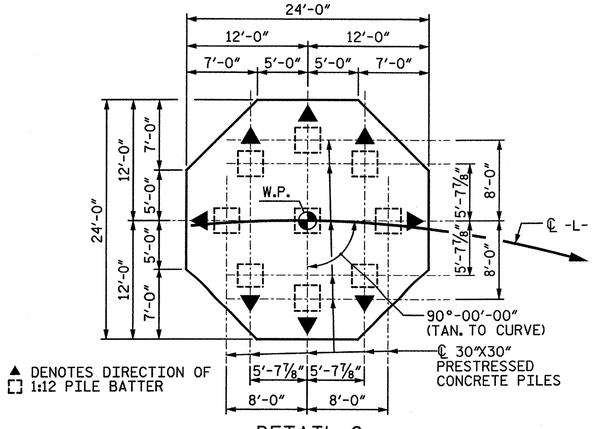
BENT 64 BENT 65 BENT 66 BENT 67

FOUNDATION LAYOUT



BENT 68 BENT 69 BENT 70 BENT 71

FOUNDATION LAYOUT



DETAIL C

(-L- LINE EXAGGERATED FOR CLARITY)
(DIMENSIONS TYP. BENTS 63-78)

NOTE:
1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 9 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOUNDATION LAYOUT BRIDGE ON NC 12 OVER PEA ISLAND BREACH

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

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Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : JDE DATE : 3-12
CHECKED BY : CLG DATE : 3-12

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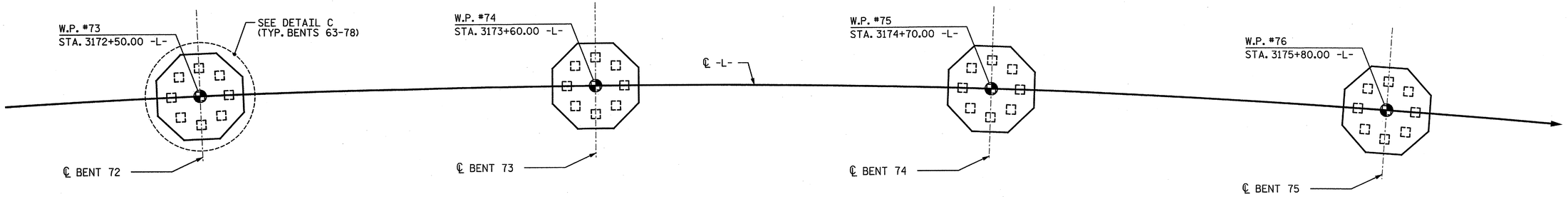
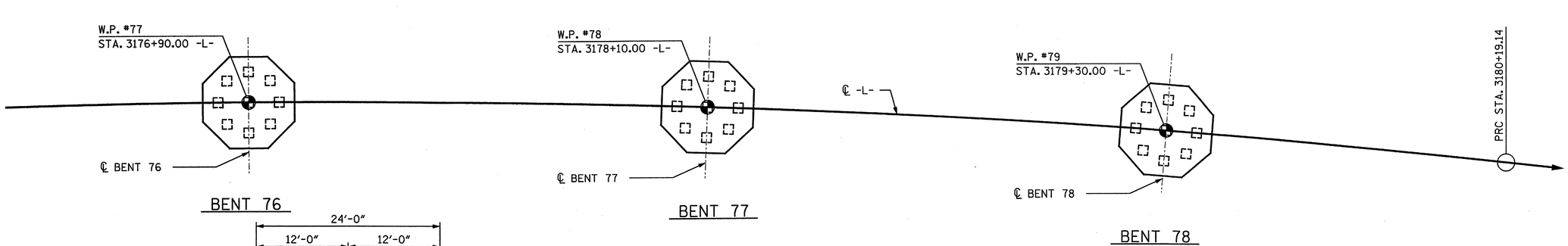


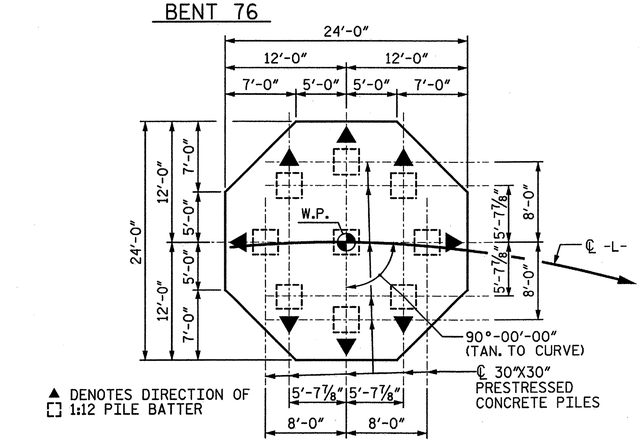
BENT 72 BENT 73 BENT 74 BENT 75

FOUNDATION LAYOUT



BENT 76 BENT 77 BENT 78

FOUNDATION LAYOUT



DETAIL C

(-L- LINE EXAGGERATED FOR CLARITY)
(DIMENSIONS TYP. BENTS 63-78)

NOTE:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 10 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOUNDATION LAYOUT BRIDGE ON NC 12 OVER PEA ISLAND BREACH

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			TOTAL SHEETS
2			4			219

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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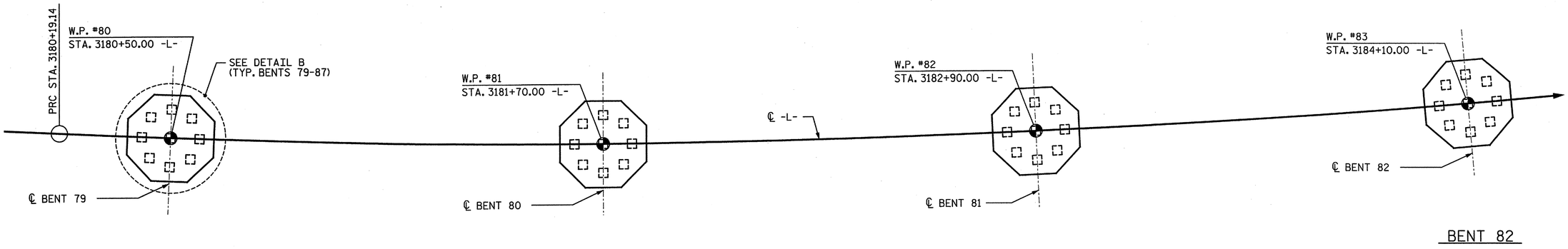
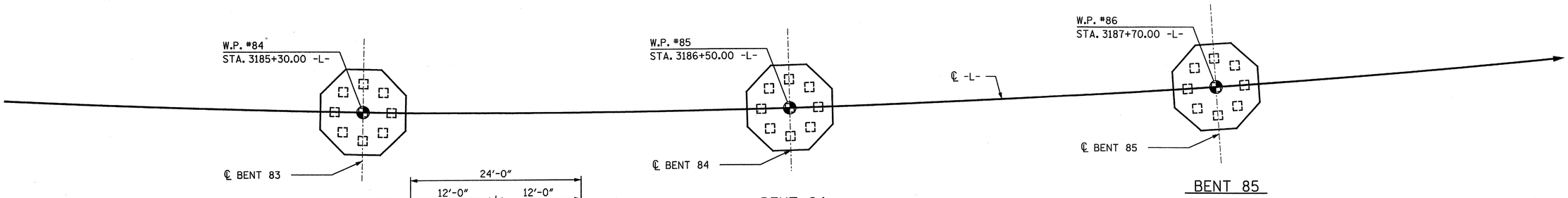
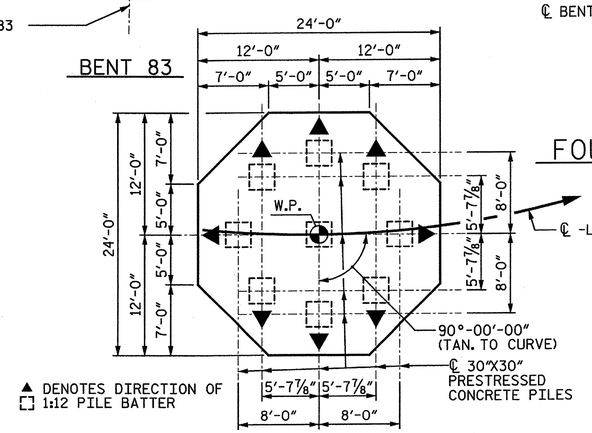


FOUNDATION LAYOUT



FOUNDATION LAYOUT



DETAIL B

(-L- LINE EXAGGERATED FOR CLARITY)
(DIMENSIONS TYP. BENTS 79-87)

NOTE:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 11 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOUNDATION LAYOUT BRIDGE ON NC 12 OVER PEA ISLAND BREACH

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

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Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : JDE DATE : 3-12
CHECKED BY : CLG DATE : 3-12

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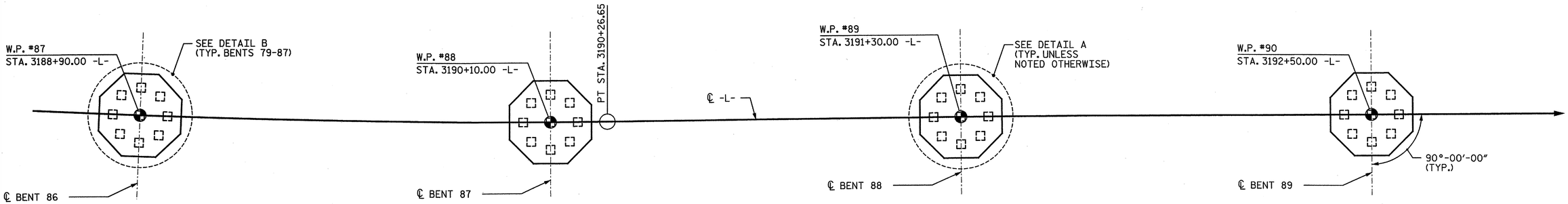
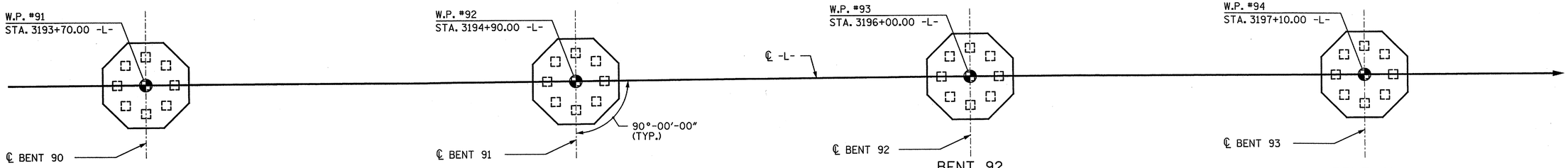
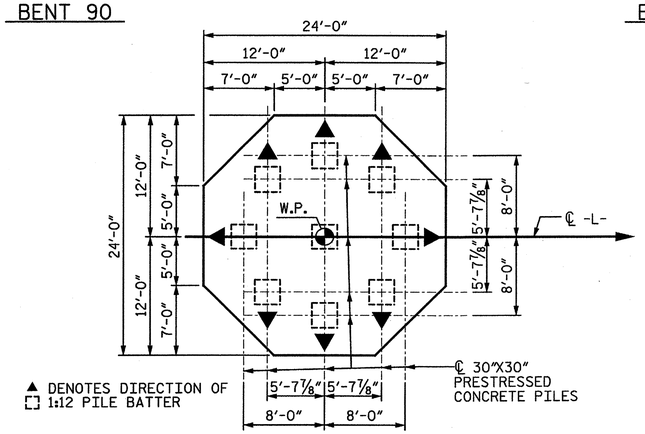


BENT 86 BENT 87 BENT 88 BENT 89

FOUNDATION LAYOUT

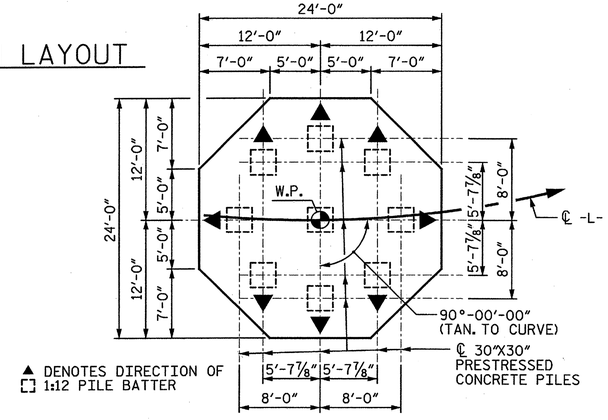


BENT 90 BENT 91 BENT 92 BENT 93



DETAIL A
(TYP. TANGENT SECTIONS)

NOTE:
1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.



DETAIL B
(-L- LINE EXAGGERATED FOR CLARITY)
(DIMENSIONS TYP. BENTS 79-87)

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-

SHEET 12 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOUNDATION LAYOUT
BRIDGE ON NC 12 OVER
PEA ISLAND BREACH

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

DRAWN BY : JDE DATE : 3-12
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			219

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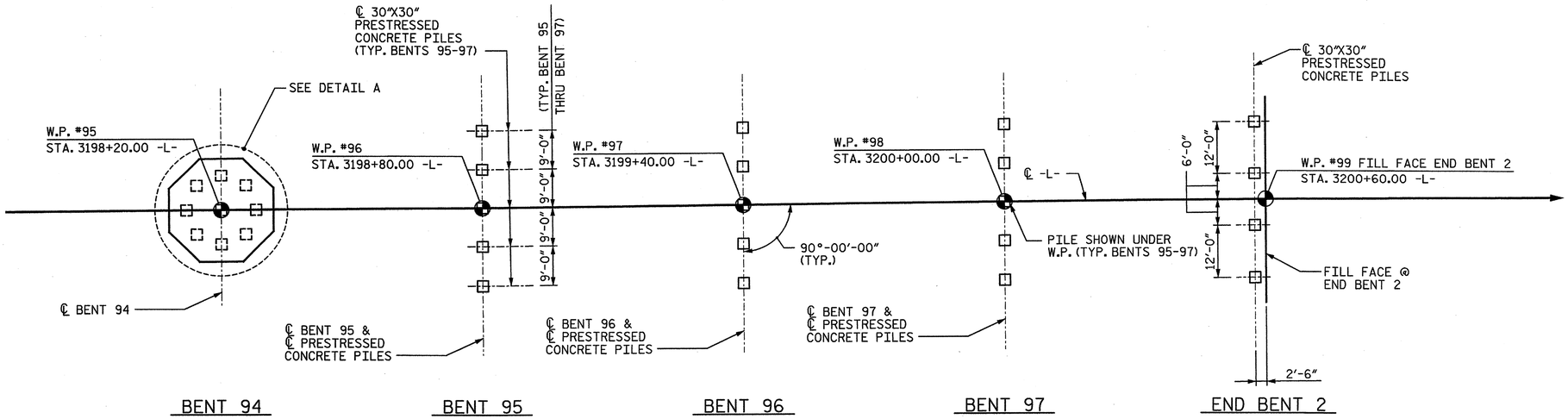

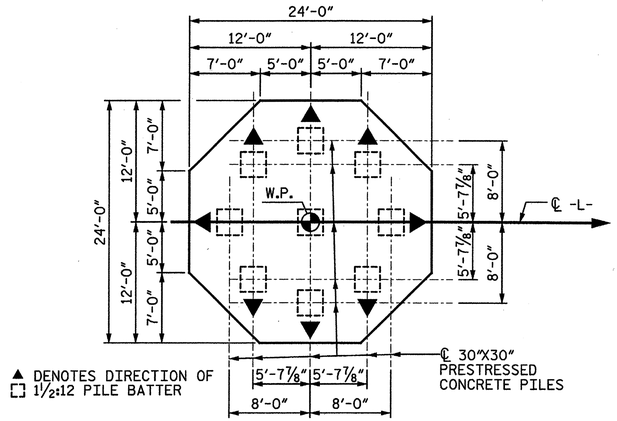

DETAIL A
(TYP. TANGENT SECTIONS)

FOUNDATION LAYOUT

(CONCRETE SHEET PILE RETAINING WALL NOT SHOWN FOR CLARITY)

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.
2. CONTRACTOR HAS THE OPTION TO USE 36" X 36" PRESTRESSED CONCRETE PILES FOR BENT 95, BENT 96, BENT 97, AND END BENT 2. SEE BENT SHEETS FOR ADDITIONAL INFORMATION.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 13 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOUNDATION LAYOUT
BRIDGE ON NC 12 OVER
PEA ISLAND BREACH

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

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1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : JDE DATE : 3-12
CHECKED BY : CLG DATE : 3-12

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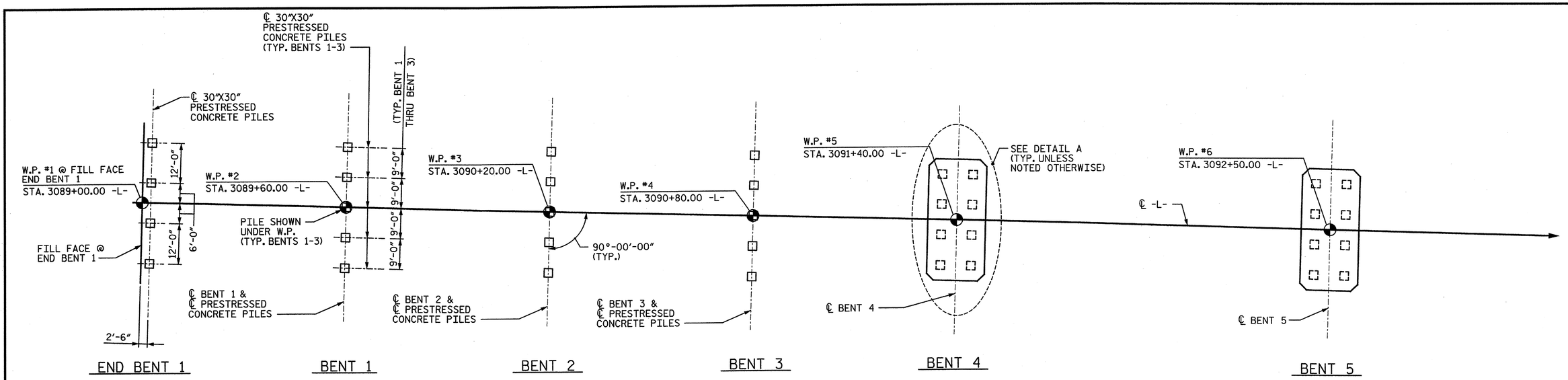
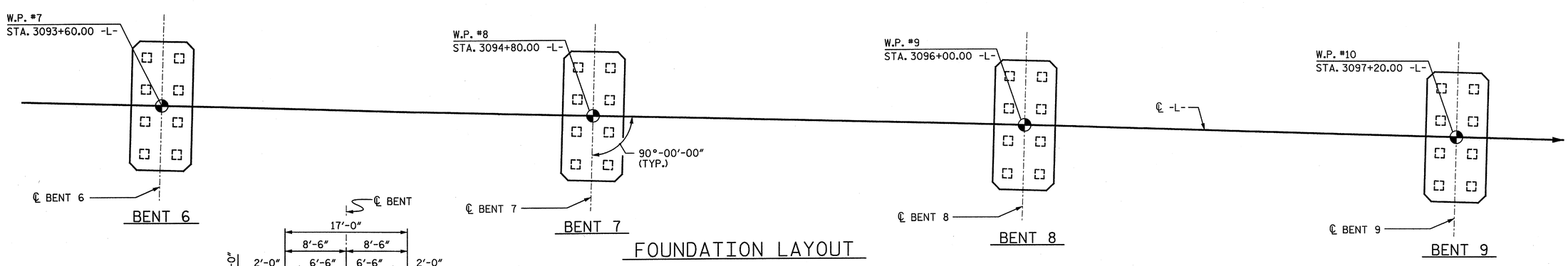
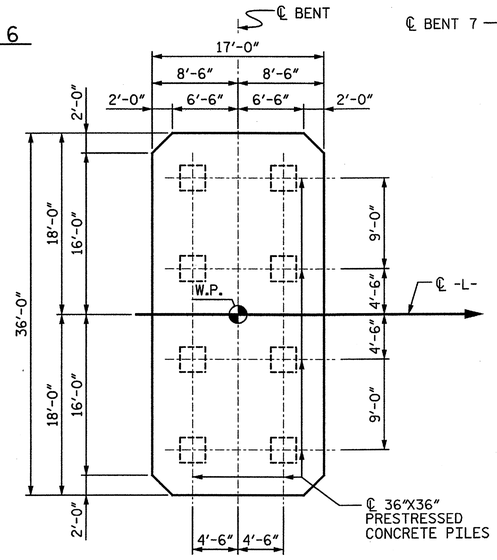


FOUNDATION LAYOUT

(CONCRETE SHEET PILE RETAINING WALL NOT SHOWN FOR CLARITY)



FOUNDATION LAYOUT



DETAIL A

(TYP. TANGENT SECTIONS)

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.
2. CONTRACTOR HAS THE OPTION TO USE 36"X 36" PRESTRESSED CONCRETE PILES FOR END BENT 1, BENT 1, BENT 2, AND BENT 3. SEE BENT SHEETS FOR ADDITIONAL INFORMATION.

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOUNDATION LAYOUT BRIDGE ON NC 12 OVER PEA ISLAND BREACH ALTERNATE 1

DRAWN BY : JDE DATE : 3-12
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NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			219

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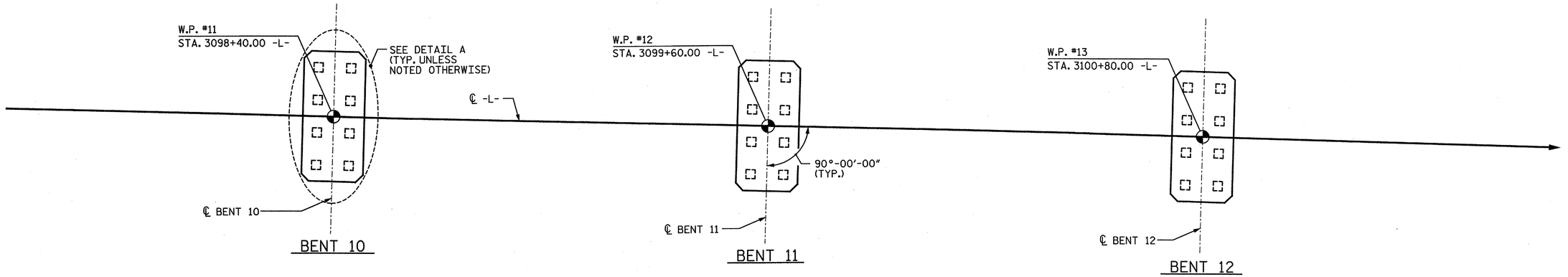

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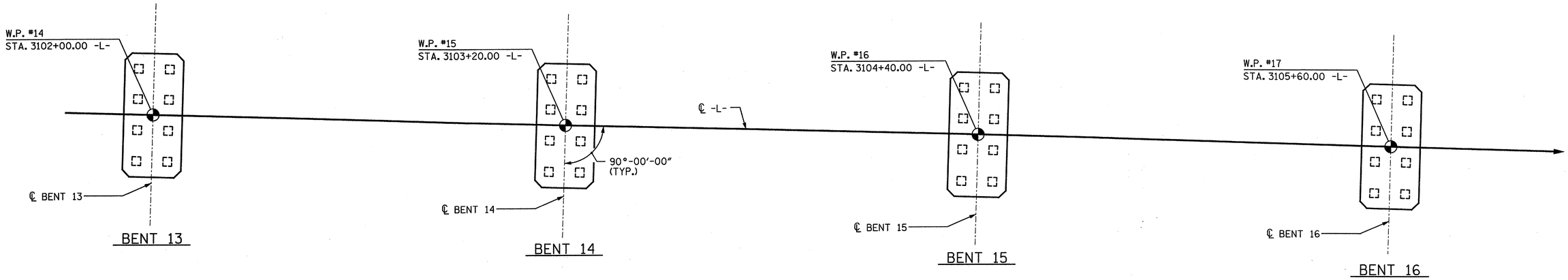

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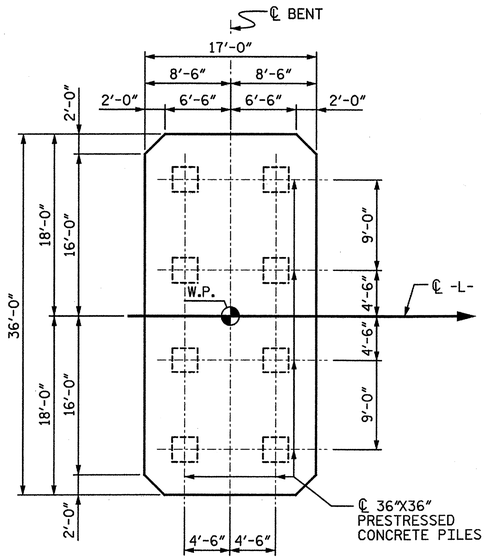

DETAIL A
(TYP. TANGENT SECTIONS)

NOTE:
1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 2 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOUNDATION LAYOUT
BRIDGE ON NC 12 OVER
PEA ISLAND BREACH
ALTERNATE 1

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : JDE DATE : 3-12
CHECKED BY : CLG DATE : 3-12

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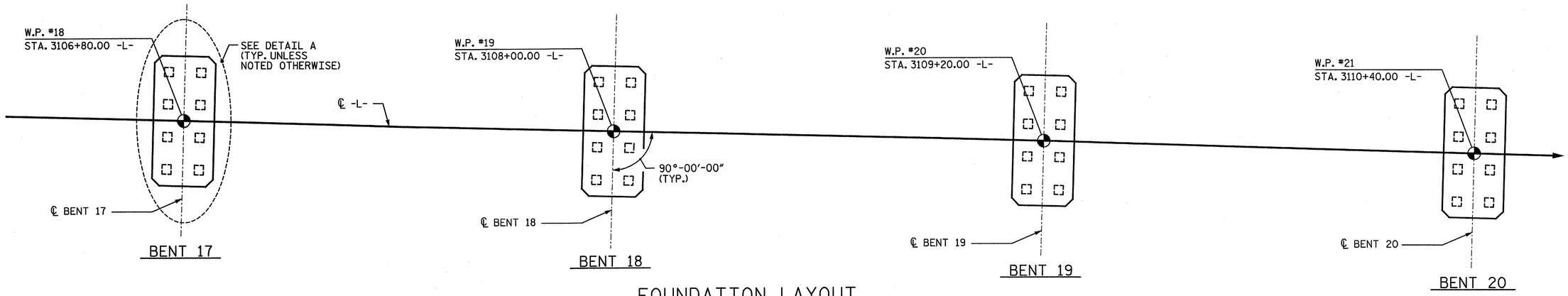
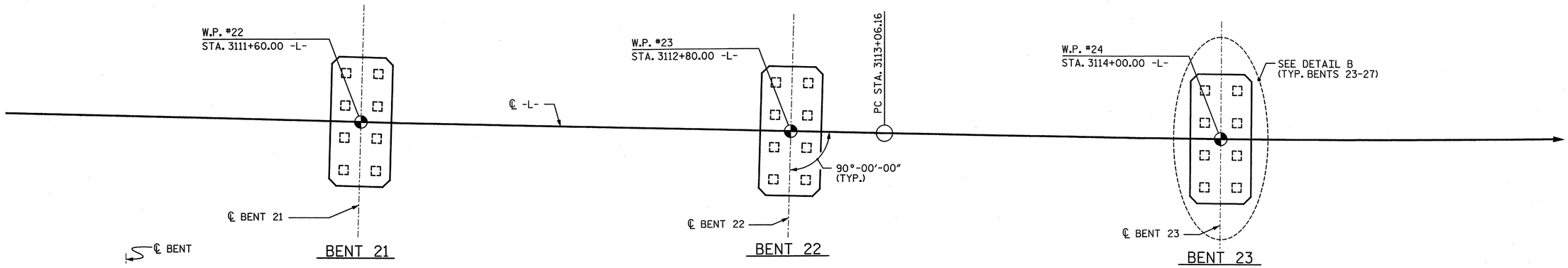
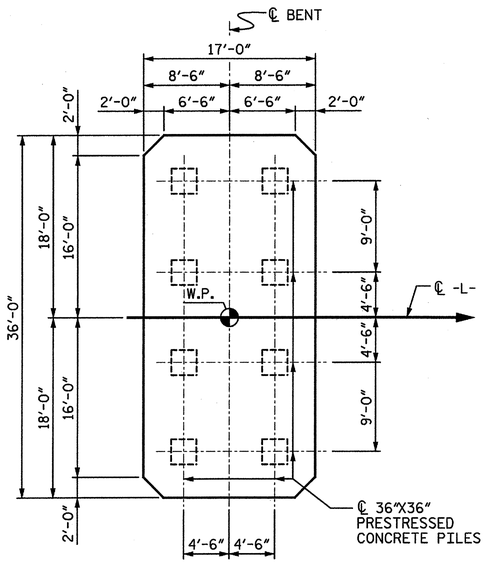


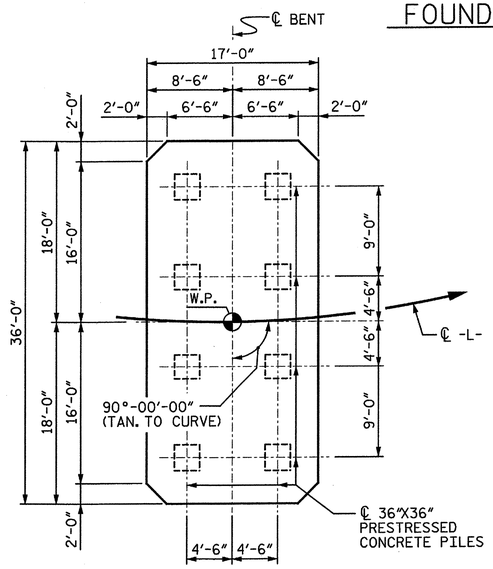
FOUNDATION LAYOUT



FOUNDATION LAYOUT



DETAIL A
(TYP. TANGENT SECTIONS)



DETAIL B
(-L- LINE EXAGGERATED FOR CLARITY)
(DIMENSIONS TYP. BENTS 23-27)

NOTE:
1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY
10-4-12

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 3 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOUNDATION LAYOUT BRIDGE ON NC 12 OVER PEA ISLAND BREACH ALTERNATE 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42
1			3			TOTAL SHEETS
2			4			219

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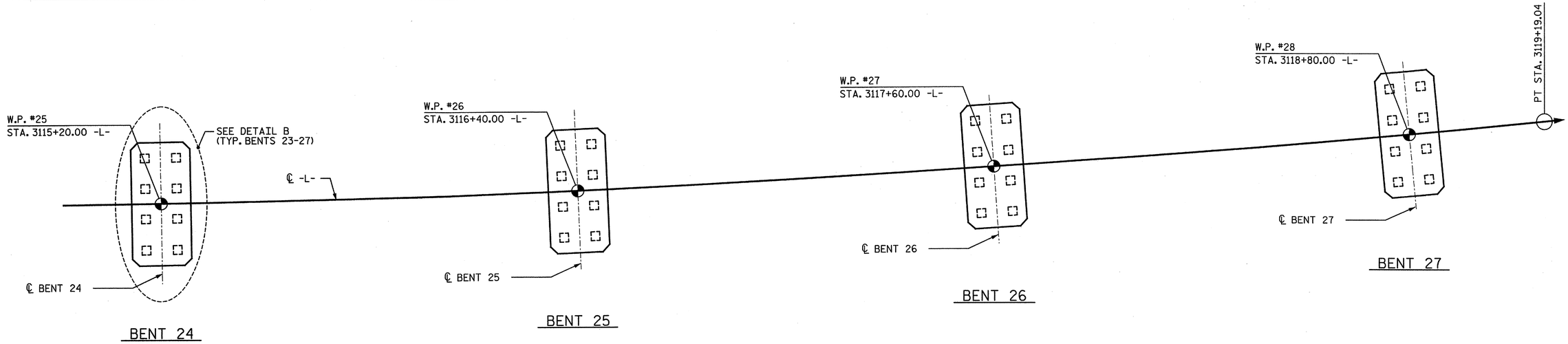
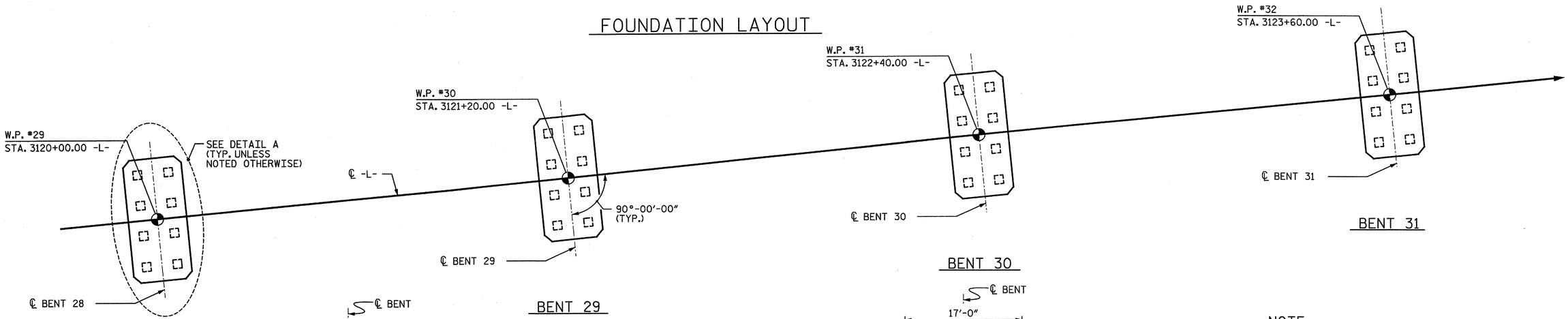


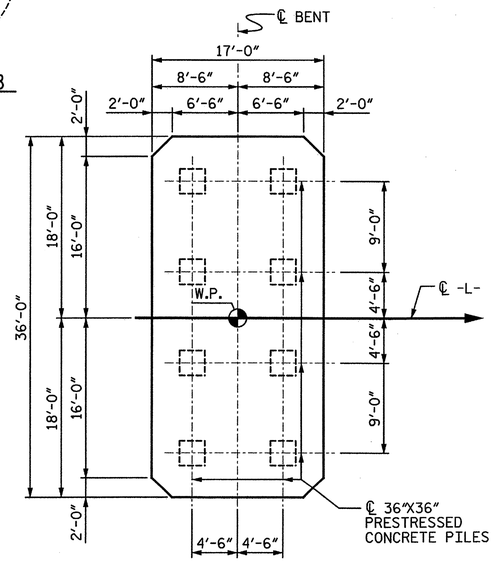
BENT 24 BENT 25 BENT 26 BENT 27

FOUNDATION LAYOUT

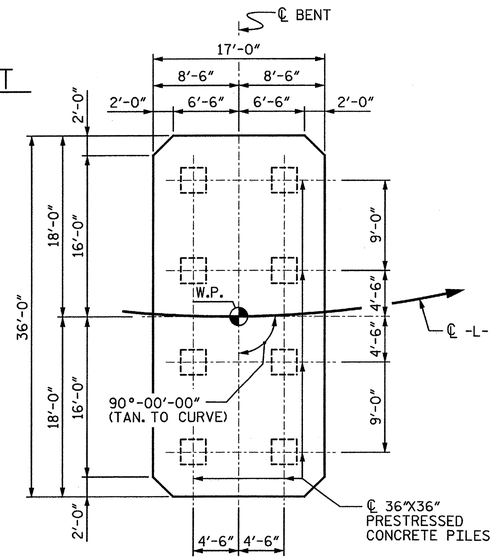


BENT 28 BENT 29 BENT 30 BENT 31

FOUNDATION LAYOUT



DETAIL A
(TYP. TANGENT SECTIONS)



DETAIL B
(-L- LINE EXAGGERATED FOR CLARITY)
(DIMENSIONS TYP. BENTS 23-27)

NOTE:
1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 4 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOUNDATION LAYOUT BRIDGE ON NC 12 OVER PEA ISLAND BREACH ALTERNATE 1

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : JDE DATE : 3-12
CHECKED BY : CLG DATE : 3-12

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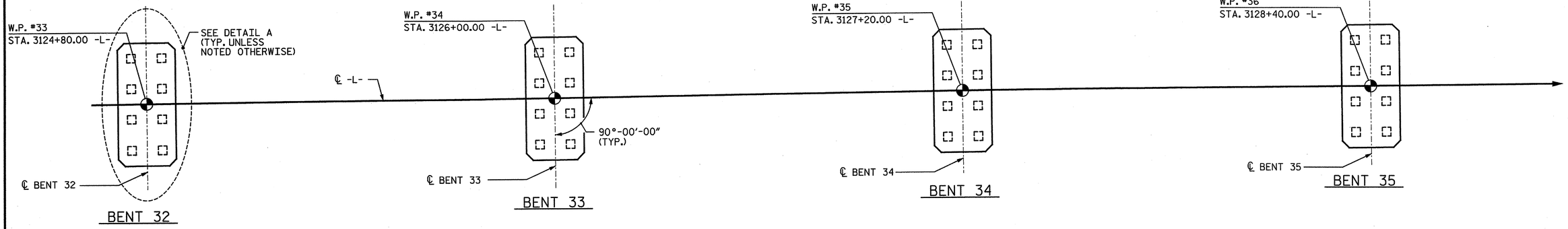
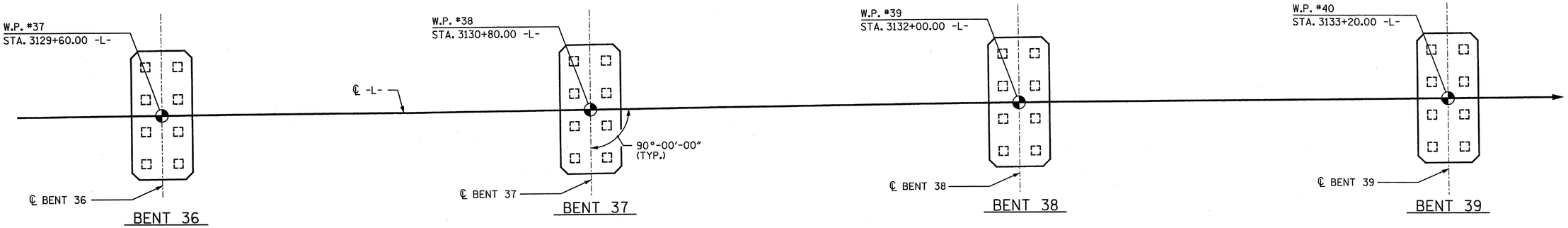
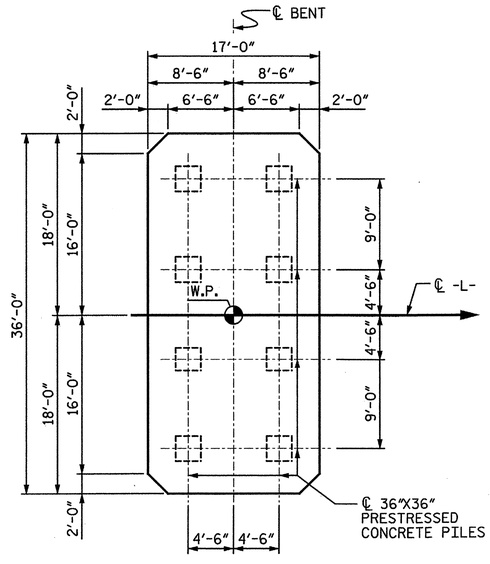


BENT 32 BENT 33 BENT 34 BENT 35

FOUNDATION LAYOUT



BENT 36 BENT 37 BENT 38 BENT 39



DETAIL A
(TYP. TANGENT SECTIONS)

FOUNDATION LAYOUT

NOTE:
1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 5 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOUNDATION LAYOUT
BRIDGE ON NC 12 OVER
PEA ISLAND BREACH
ALTERNATE 1

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : JDE DATE : 3-12
CHECKED BY : CLG DATE : 3-12

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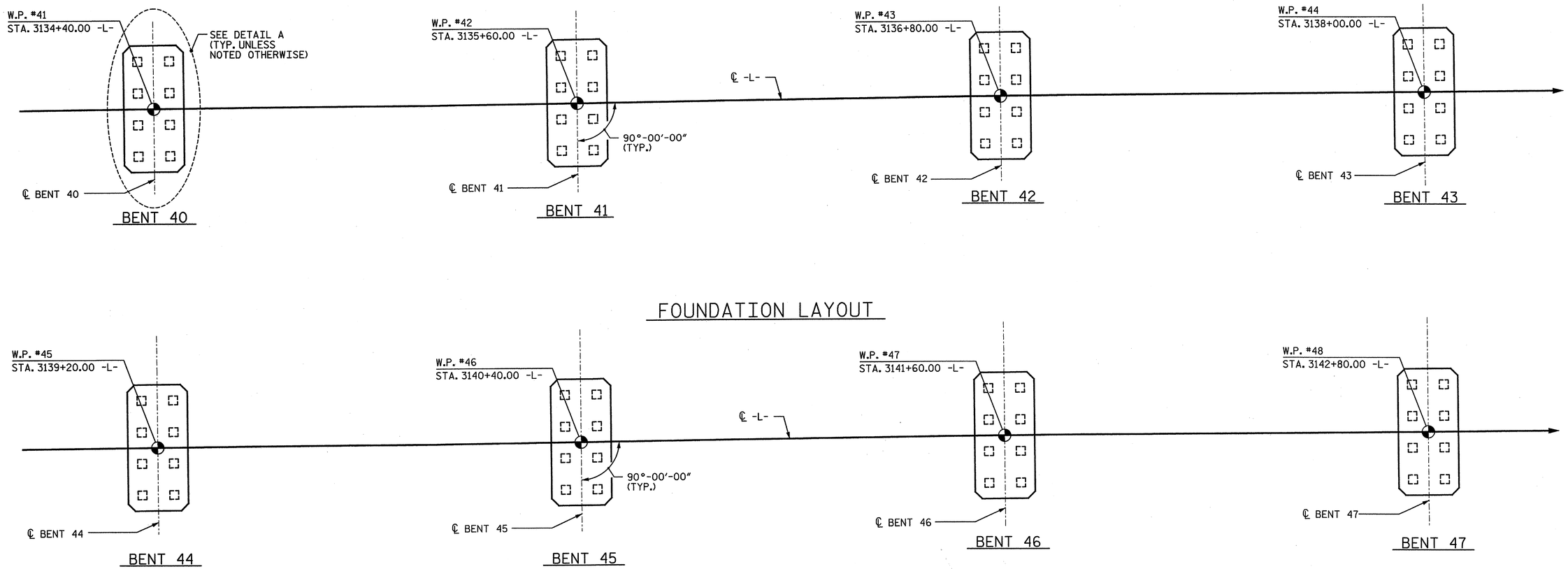

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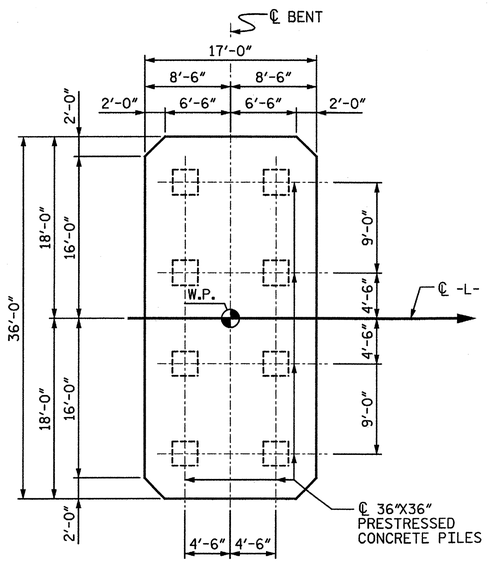

DETAIL A
(TYP. TANGENT SECTIONS)

FOUNDATION LAYOUT

NOTE:
1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 6 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOUNDATION LAYOUT
BRIDGE ON NC 12 OVER
PEA ISLAND BREACH
ALTERNATE 1

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-45
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : JDE DATE : 3-12
CHECKED BY : CLG DATE : 3-12

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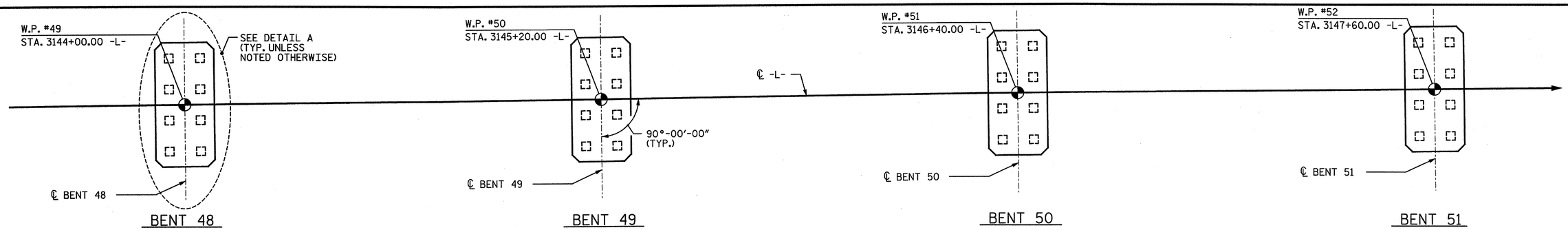
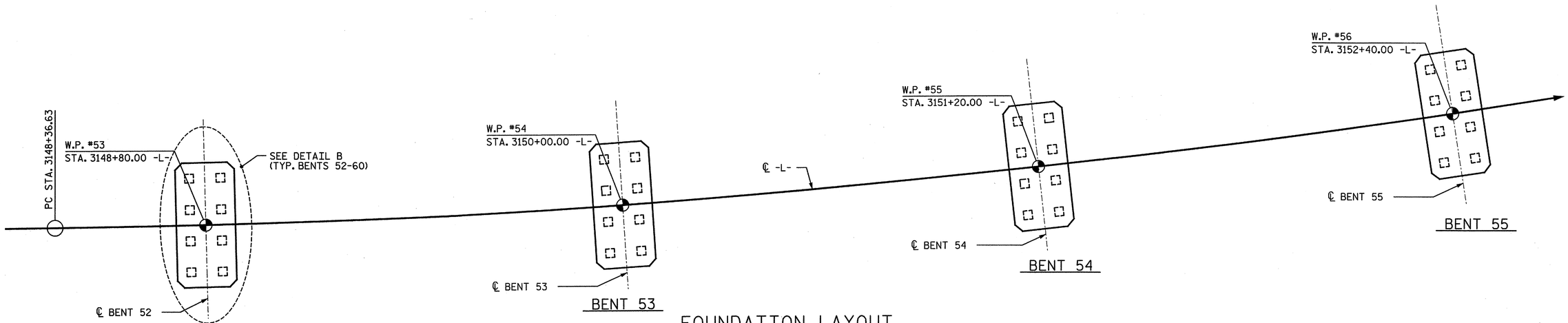
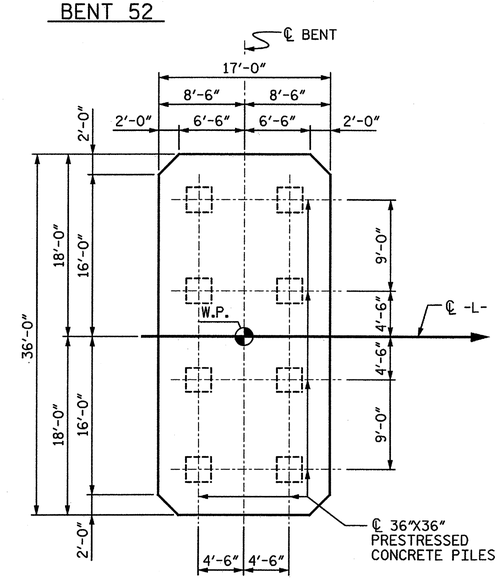


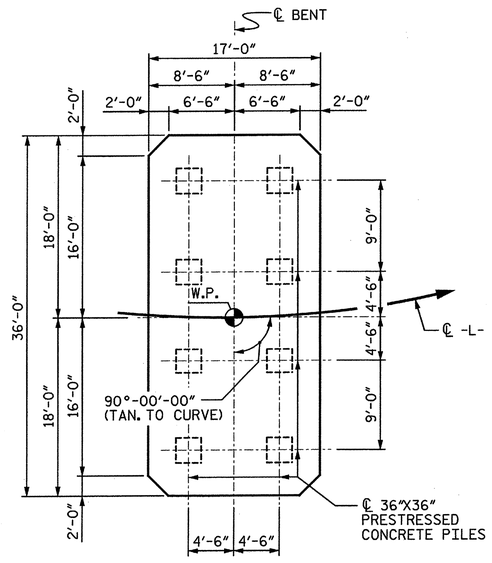
FOUNDATION LAYOUT



FOUNDATION LAYOUT



DETAIL A
(TYP. TANGENT SECTIONS)



DETAIL B
(-L- LINE EXAGGERATED FOR CLARITY)
(DIMENSIONS TYP. BENTS 52-60)

NOTE:
1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 7 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOUNDATION LAYOUT BRIDGE ON NC 12 OVER PEA ISLAND BREACH ALTERNATE 1

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

DRAWN BY : JDE DATE : 3-12
CHECKED BY : CLG DATE : 3-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-46
1			3			TOTAL SHEETS
2			4			219

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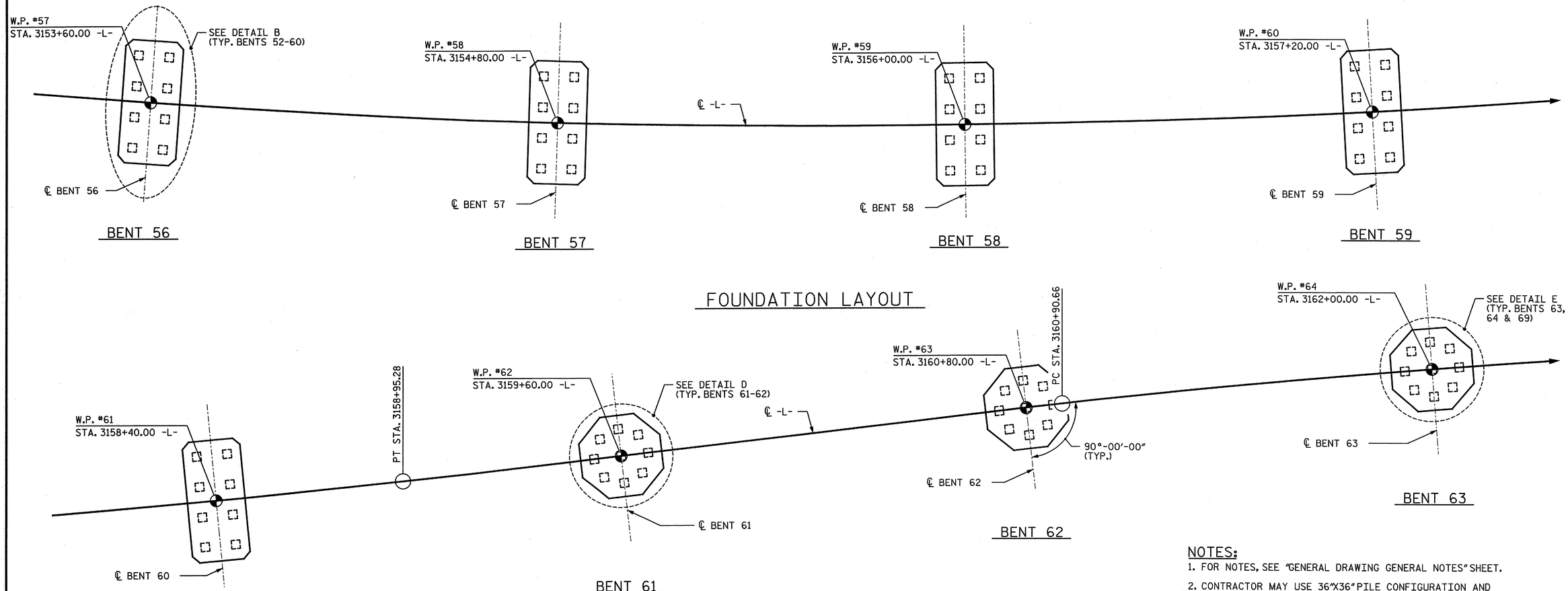


FOUNDATION LAYOUT

BENT 60

BENT 61

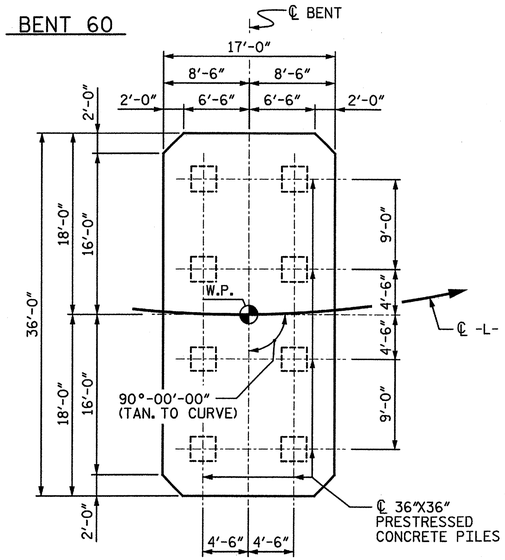
BENT 62

BENT 63

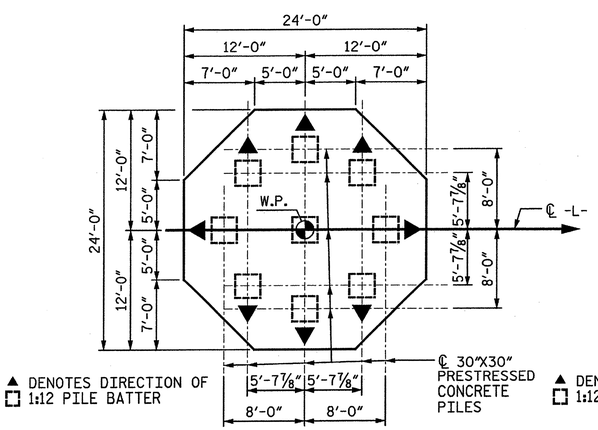
NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.
2. CONTRACTOR MAY USE 36"X36" PILE CONFIGURATION AND RECTANGULAR FOUNDATION IN LIEU OF 30"X30" PILE CONFIGURATION AND OCTAGONAL FOUNDATION. CONTRACTOR SHALL SUBMIT PLAN SHOWING GEOMETRY TO MAINTAIN CLEARANCES AND PROPOSED TRAFFIC PATTERNS FOR APPROVAL PRIOR TO CONSTRUCTION.

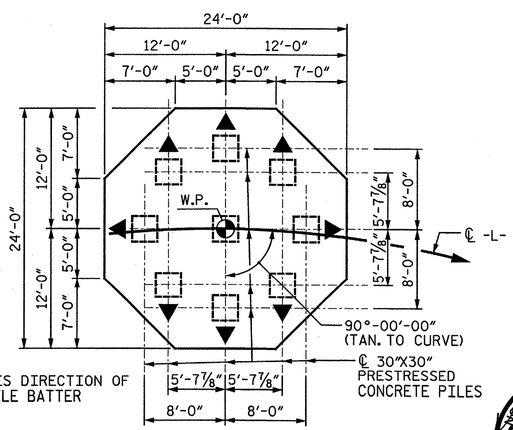
FOUNDATION LAYOUT



DETAIL B
(-L- LINE EXAGGERATED FOR CLARITY)
(DIMENSIONS TYP. BENTS 52-60)



DETAIL D
(DIMENSIONS TYP. BENTS 61 & 62)



DETAIL E
(-L- LINE EXAGGERATED FOR CLARITY)
(DIMENSIONS TYP. BENTS 63, 64 & 69)

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY
10-4-12

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-

SHEET 8 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOUNDATION LAYOUT BRIDGE ON NC 12 OVER PEA ISLAND BREACH ALTERNATE 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-47
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : JDE DATE : 3-12
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Charlotte, NC 28208
NC License No. F-0991

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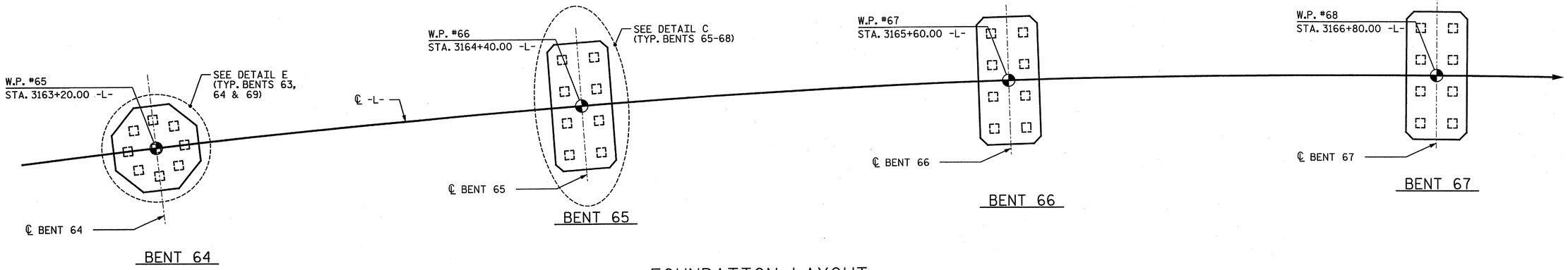
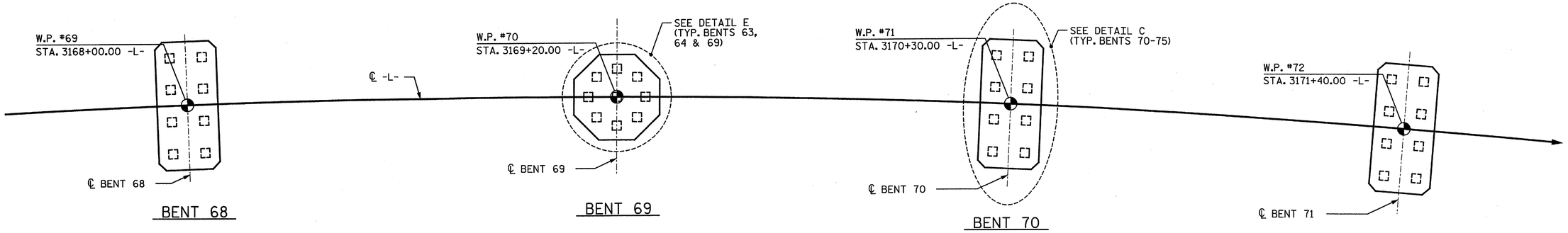


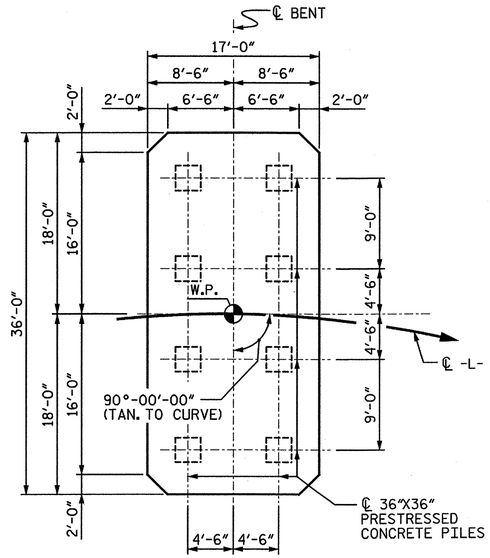
BENT 64 BENT 65 BENT 66 BENT 67

FOUNDATION LAYOUT



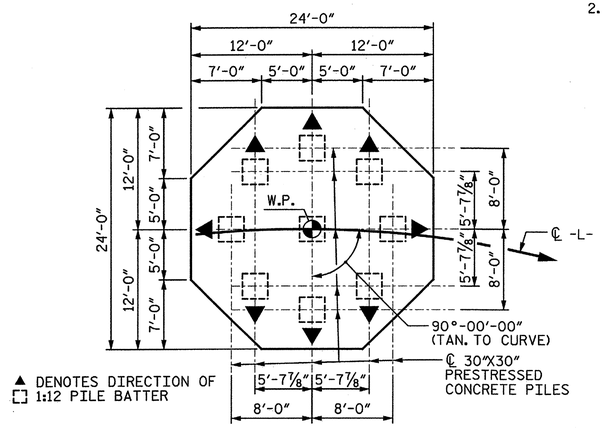
BENT 68 BENT 69 BENT 70 BENT 71

FOUNDATION LAYOUT



DETAIL C

(-L- LINE EXAGGERATED FOR CLARITY)
(DIMENSIONS TYP. BENTS 65-68 & 70-75)



▲ DENOTES DIRECTION OF
□ 1:12 PILE BATTER

DETAIL E

(-L- LINE EXAGGERATED FOR CLARITY)
(DIMENSIONS TYP. BENTS 63, 64 & 69)

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.
2. CONTRACTOR MAY USE 36"X36" PILE CONFIGURATION AND RECTANGULAR FOUNDATION IN LIEU OF 30"X30" PILE CONFIGURATION AND OCTAGONAL FOUNDATION. CONTRACTOR SHALL SUBMIT PLAN SHOWING GEOMETRY TO MAINTAIN CLEARANCES AND PROPOSED TRAFFIC PATTERNS FOR APPROVAL PRIOR TO CONSTRUCTION.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 9 OF 13

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOUNDATION LAYOUT BRIDGE ON NC 12 OVER PEA ISLAND BREACH ALTERNATE 1

DRAWN BY : JDE DATE : 3-12
CHECKED BY : CLG DATE : 3-12

STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			219

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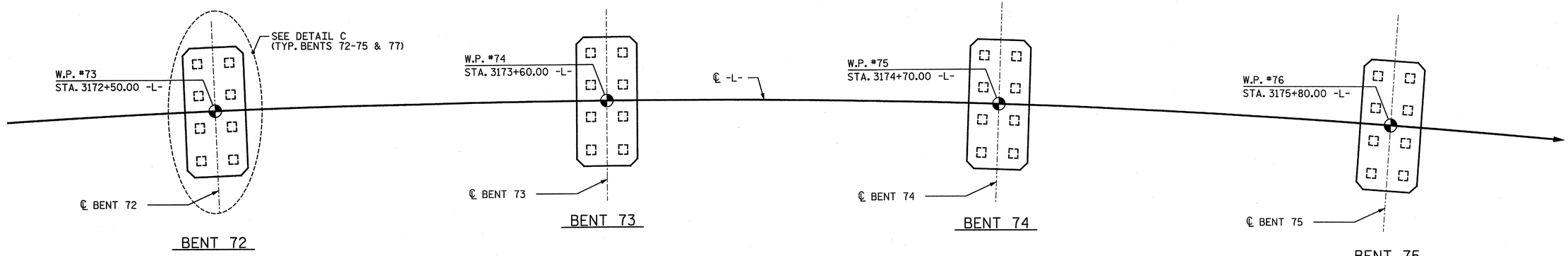
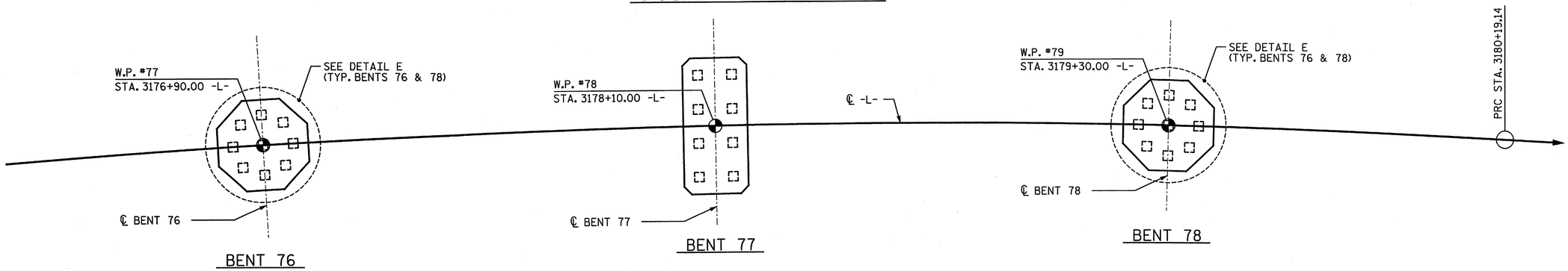
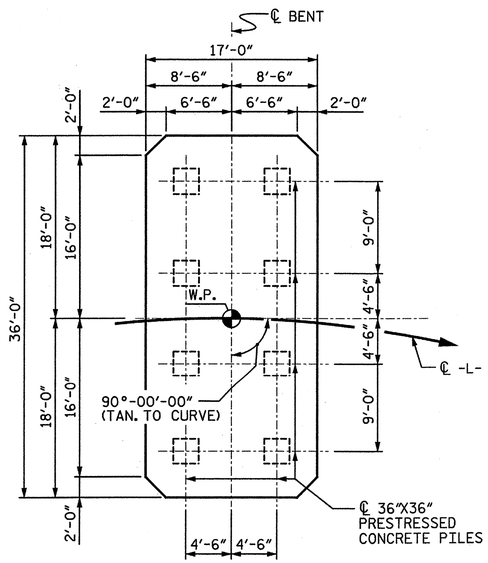


FOUNDATION LAYOUT

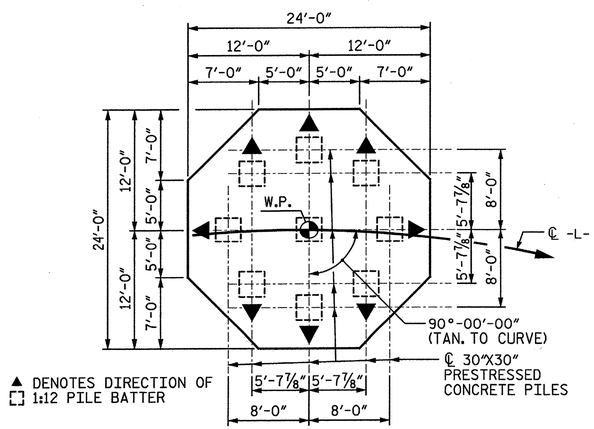


FOUNDATION LAYOUT



DETAIL C

(-L- LINE EXAGGERATED FOR CLARITY)
(DIMENSIONS TYP. BENTS 72-75 & 77)



DETAIL E

(-L- LINE EXAGGERATED FOR CLARITY)
(DIMENSIONS TYP. BENTS 76 & 78)

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.
2. CONTRACTOR MAY USE 36"X36" PILE CONFIGURATION AND RECTANGULAR FOUNDATION IN LIEU OF 30"X30" PILE CONFIGURATION AND OCTAGONAL FOUNDATION. CONTRACTOR SHALL SUBMIT PLAN SHOWING GEOMETRY TO MAINTAIN CLEARANCES AND PROPOSED TRAFFIC PATTERNS FOR APPROVAL PRIOR TO CONSTRUCTION.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 10 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOUNDATION LAYOUT
BRIDGE ON NC 12 OVER
PEA ISLAND BREACH
ALTERNATE 1

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY
10-4-12

DRAWN BY : JDE DATE : 3-12
CHECKED BY : CLG DATE : 3-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-49
1			3			TOTAL SHEETS
2			4			219

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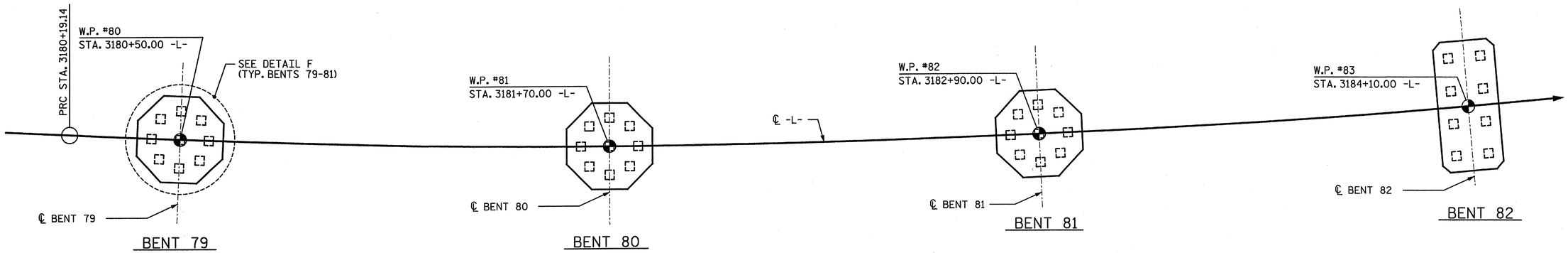
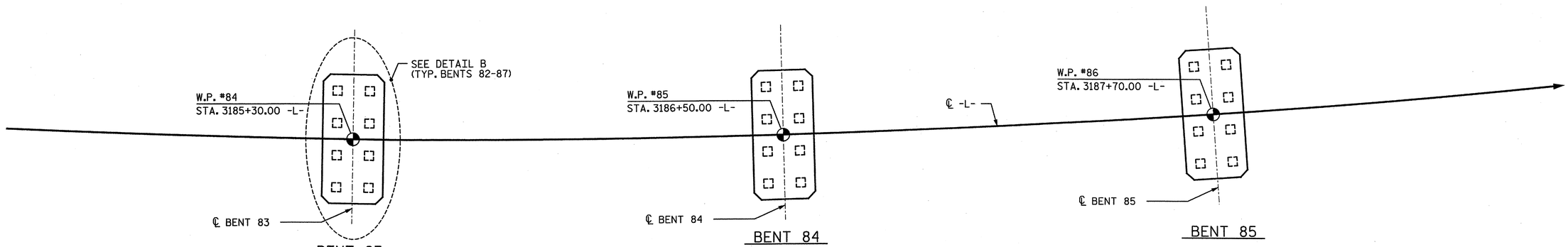


FOUNDATION LAYOUT



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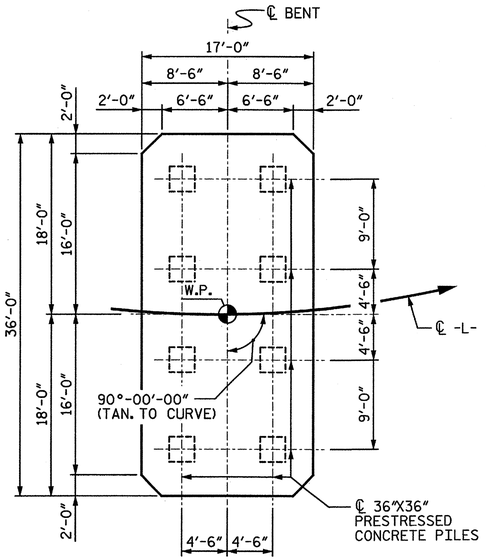
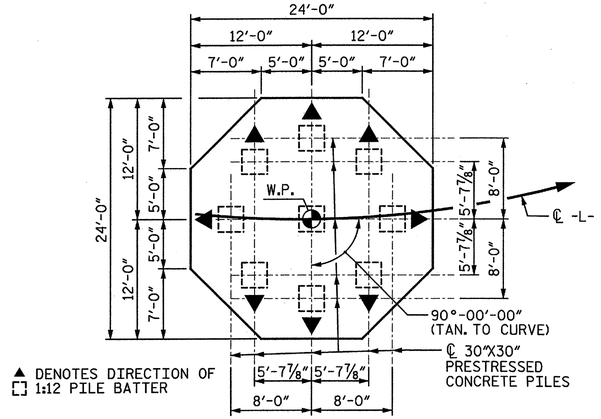


DETAIL B

(-L- LINE EXAGGERATED FOR CLARITY)
(DIMENSIONS TYP. BENTS 82-87)



DETAIL F

(-L- LINE EXAGGERATED FOR CLARITY)
(DIMENSIONS TYP. BENTS 79-81)

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.
2. CONTRACTOR MAY USE 36"X36" PILE CONFIGURATION AND RECTANGULAR FOUNDATION IN LIEU OF 30"X30" PILE CONFIGURATION AND OCTAGONAL FOUNDATION. CONTRACTOR SHALL SUBMIT PLAN SHOWING GEOMETRY TO MAINTAIN CLEARANCES AND PROPOSED TRAFFIC PATTERNS FOR APPROVAL PRIOR TO CONSTRUCTION.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 11 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOUNDATION LAYOUT BRIDGE ON NC 12 OVER PEA ISLAND BREACH ALTERNATE 1

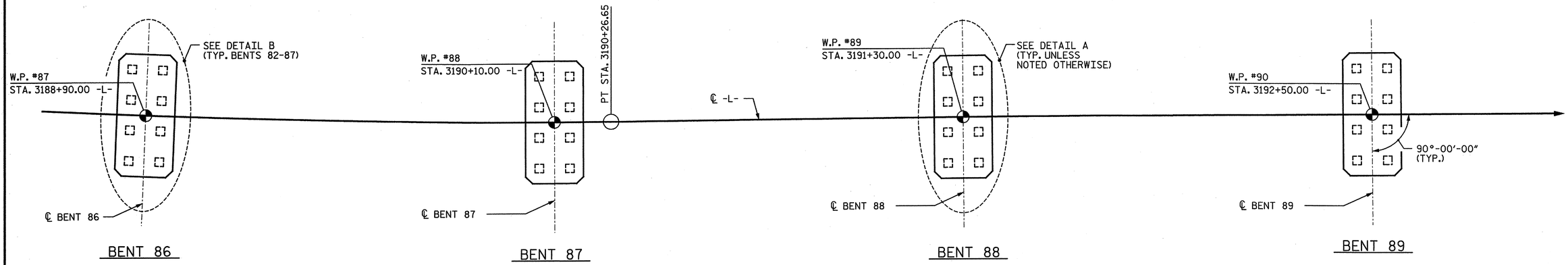
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY
10-4-12

DRAWN BY : JDE DATE : 3-12
CHECKED BY : CLG DATE : 3-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

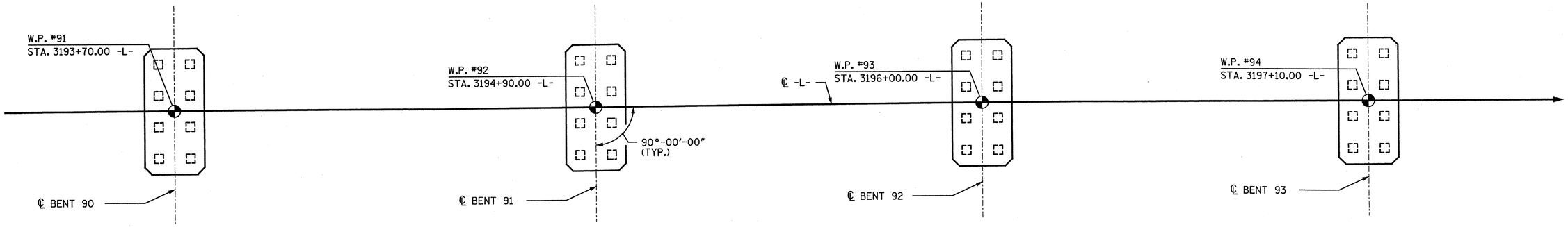
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-50
1			3			TOTAL SHEETS
2			4			219

10/4/2012 12:28:40 PM R:\Structures\ustd\1050) ALT_Foundation Layout 11OF13.dgn



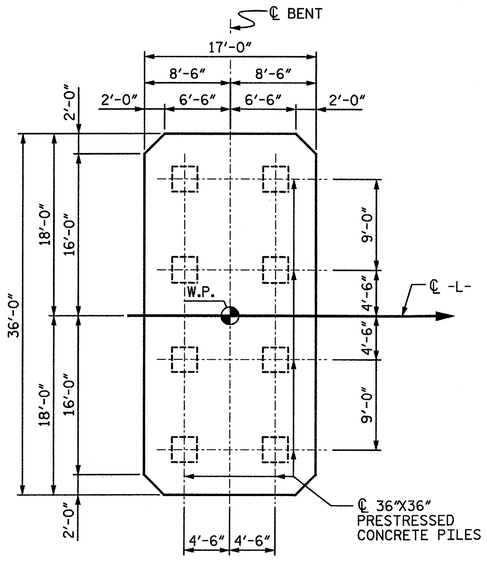
BENT 86 BENT 87 BENT 88 BENT 89

FOUNDATION LAYOUT

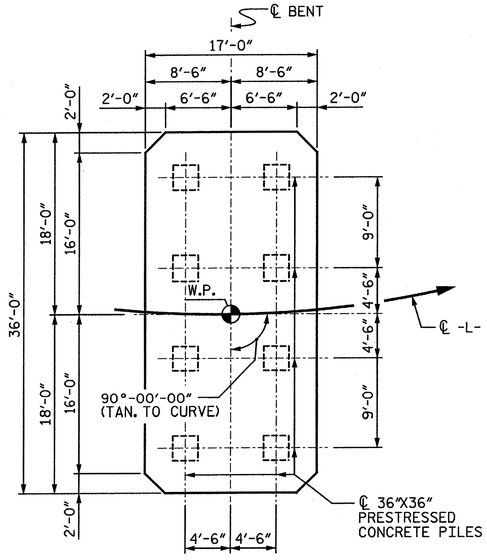


BENT 90 BENT 91 BENT 92 BENT 93

FOUNDATION LAYOUT



DETAIL A
(TYP. TANGENT SECTIONS)



DETAIL B
(-L- LINE EXAGGERATED FOR CLARITY)
(DIMENSIONS TYP. BENTS 82-87)

NOTES:
1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-

SHEET 12 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOUNDATION LAYOUT BRIDGE ON NC 12 OVER PEA ISLAND BREACH ALTERNATE 1

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-51
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : JDE DATE : 3-12
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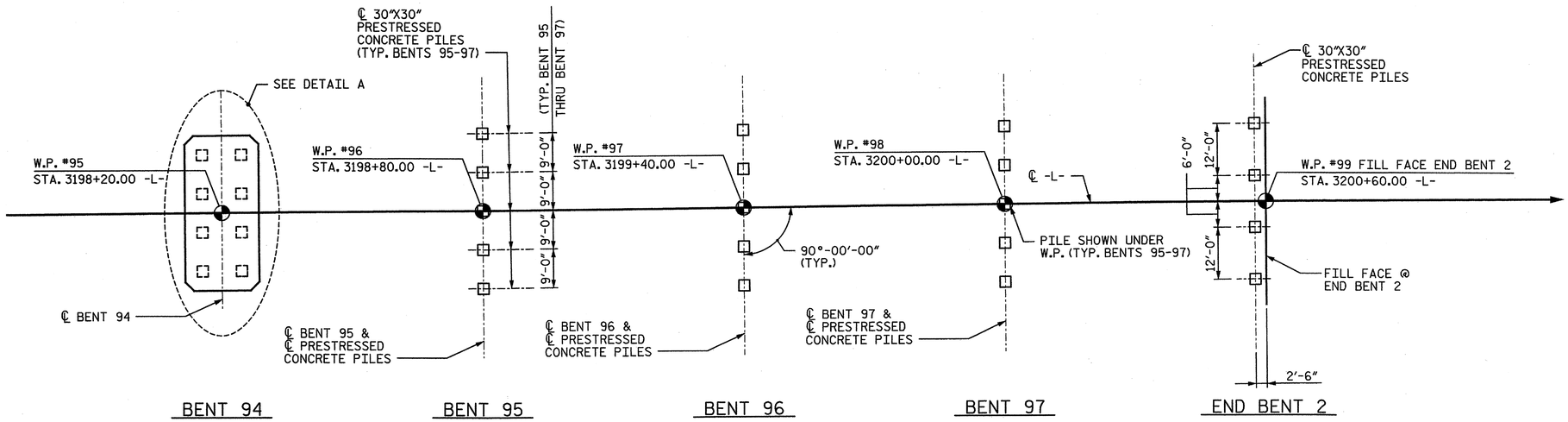
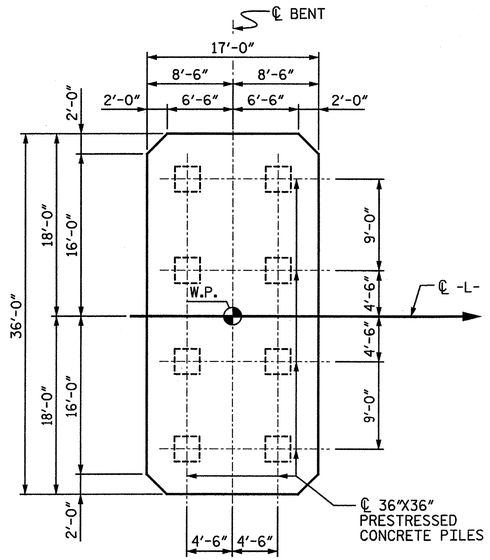


FOUNDATON LAYOUT

(CONCRETE SHEET PILE RETAINING WALL NOT SHOWN FOR CLARITY)



DETAIL A

(TYP. TANGENT SECTIONS)

NOTES:

1. FOR NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.
2. CONTRACTOR HAS THE OPTION TO USE 36" X 36" PRESTRESSED CONCRETE PILES FOR BENT 95, BENT 96, BENT 97, AND END BENT 2. SEE BENT SHEETS FOR ADDITIONAL INFORMATION.

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 13 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOUNDATION LAYOUT
BRIDGE ON NC 12 OVER
PEA ISLAND BREACH
ALTERNATE 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-52
1			3			TOTAL SHEETS
2			4			219

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NC License No. F-0991

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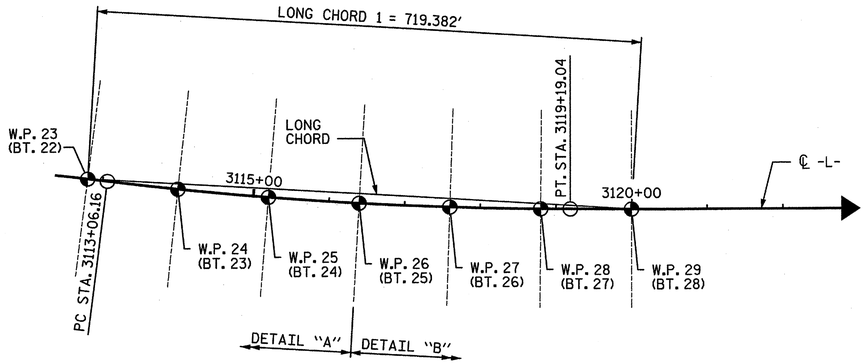
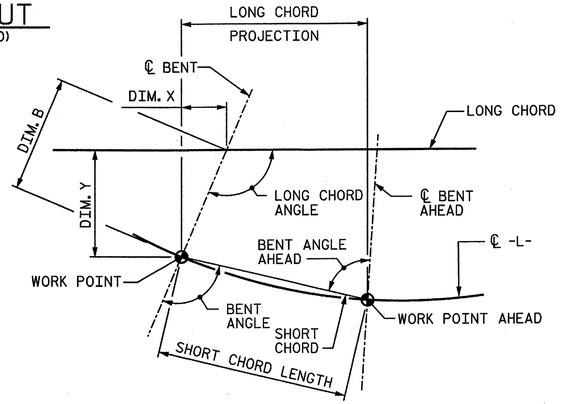


LONG CHORD 1 LAYOUT

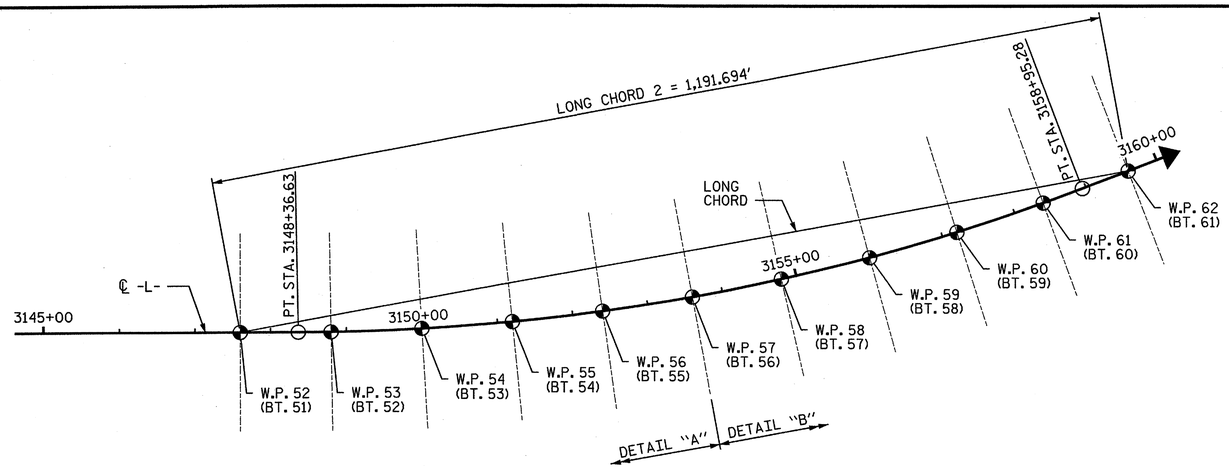
(FROM STATION 3112+80 TO 3120+00)

HORIZ. CURVE DATA -L-

PI = 3116+13.01
Δ = 7°-16'-18.6" (LT)
D = 1°-11'-11.4"
L = 612.89'
T = 306.85'
R = 4,829.00'



DETAIL "A"

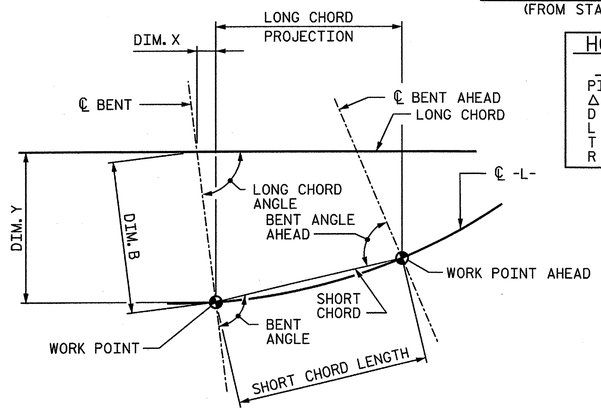


LONG CHORD 2 LAYOUT

(FROM STATION 3147+60 TO 3159+60)

HORIZ. CURVE DATA -L-

PI = 3153+71.98
Δ = 21°-01'-55.2" (LT)
D = 1°-59'-12.0"
L = 1,058.65'
T = 535.35'
R = 2,884.00'



DETAIL "B"

LONG CHORD ANGLES & DIMENSIONS

	WORK POINT NUMBER	23	24	25	26	27	28	29
LONG CHORD 1	BENT NUMBER	BENT 22	BENT 23	BENT 24	BENT 25	BENT 26	BENT 27	BENT 28
	W.P. STATION -L-	3112+80.00	3114+00.00	3115+20.00	3116+40.00	3117+60.00	3118+80.00	3120+00.00
	LONG CHORD ANGLE	93°-54'-46"	92°-47'-57"	91°-22'-32"	89°-57'-06"	88°-31'-40"	87°-06'-15"	86°-38'-27"
	BENT ANGLE	90°-26'-07"	90°-42'-43"	90°-42'-43"	90°-42'-43"	90°-42'-43"	90°-23'-16"	
	BENT ANGLE AHEAD	89°-19'-19"	89°-17'-17"	89°-17'-17"	89°-17'-17"	89°-17'-17"	89°-55'-29"	
	LONG CHORD PROJECTION (FT)	119.777	119.917	119.989	119.986	119.910	119.803	
	SHORT CHORD LENGTH (FT)	119.998	119.997	119.997	119.997	119.997	120.000	
	DIMENSION X (FT)	0.000	0.356	0.280	0.011	0.294	0.348	0.000
	DIMENSION Y (FT)	0.000	7.278	11.649	13.039	11.447	6.874	0.000
	DIMENSION B (FT)	0.000	7.287	11.652	13.039	11.450	6.883	0.000
	W.P. NORTH COORDINATE	716668.3107	716787.7961	716906.9771	717025.7742	717144.1141	717261.9236	717379.2763
	W.P. EAST COORDINATE	3045540.3615	3045529.2870	3045515.3174	3045498.3908	3045478.5176	3045455.7102	3045430.6452

	WORK POINT NUMBER	52	53	54	55	56	57	58	59	60	61	62
LONG CHORD 2	BENT NUMBER	BENT 51	BENT 52	BENT 53	BENT 54	BENT 55	BENT 56	BENT 57	BENT 58	BENT 59	BENT 60	BENT 61
	W.P. STATION -L-	3147+60.00	3148+80.00	3150+00.00	3151+20.00	3152+40.00	3153+60.00	3154+80.00	3156+00.00	3157+20.00	3158+40.00	3159+60.00
	LONG CHORD ANGLE	100°-24'-41"	99°-32'-59"	97°-09'-57"	94°-46'-55"	92°-23'-52"	90°-00'-50"	87°-37'-47"	85°-14'-45"	82°-51'-42"	80°-28'-40"	79°-22'-46"
	BENT ANGLE	90°-09'-21"	91°-11'-31"	91°-11'-31"	91°-11'-31"	91°-11'-31"	91°-11'-31"	91°-11'-31"	91°-11'-31"	91°-11'-31"	90°-50'-43"	
	BENT ANGLE AHEAD	89°-17'-39"	88°-48'-29"	88°-48'-29"	88°-48'-29"	88°-48'-29"	88°-48'-29"	88°-48'-29"	88°-48'-29"	88°-48'-29"	89°-44'-49"	
	LONG CHORD PROJECTION (FT)	118.082	118.717	119.340	119.756	119.965	119.966	119.760	119.346	118.725	118.039	
	SHORT CHORD LENGTH (FT)	119.999	119.991	119.991	119.991	119.991	119.991	119.991	119.991	119.991	119.998	
	DIMENSION X (FT)	0.000	3.594	4.879	4.291	2.463	0.015	2.437	4.276	4.882	3.622	0.000
	DIMENSION Y (FT)	0.000	21.365	38.806	51.294	58.807	61.332	58.865	51.410	38.979	21.595	0.000
	DIMENSION B (FT)	0.000	21.665	39.112	51.473	58.859	61.332	58.916	51.587	39.284	21.897	0.000
	W.P. NORTH COORDINATE	720077.6361	720194.8860	720311.2185	720426.2272	720539.7129	720651.4792	720761.3327	720869.0832	720974.5441	721077.5329	721178.2730
	W.P. EAST COORDINATE	3044850.5983	3044825.0604	3044795.6552	3044761.4364	3044722.4632	3044678.8030	3044630.5315	3044577.7323	3044520.4966	3044458.9237	3044393.7248

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING LONG CHORD LAYOUT BRIDGE ON NC 12 OVER PEA ISLAND BREACH

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

DRAWN BY : CLG DATE : 12-11
CHECKED BY : TRL DATE : 3-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
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1			3			TOTAL SHEETS
2			4			219

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LONG CHORD ANGLES & DIMENSIONS

LONG CHORD 3

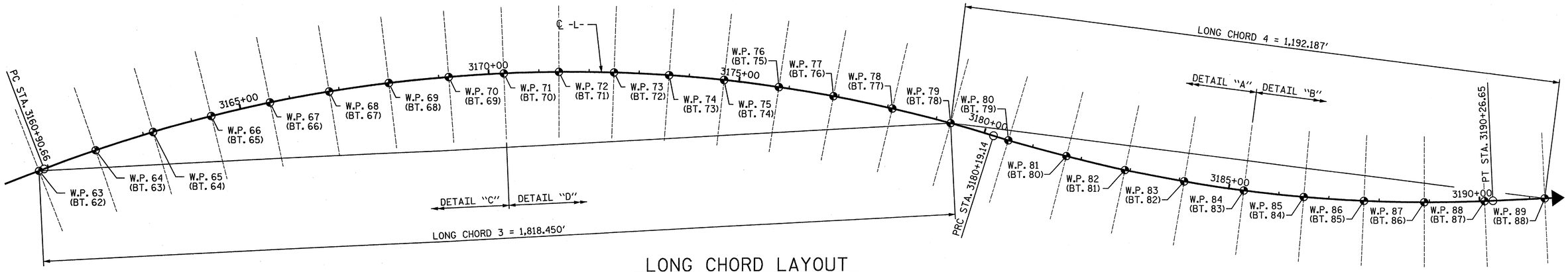
WORK POINT NUMBER	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
BENT NUMBER	BENT 62	BENT 63	BENT 64	BENT 65	BENT 66	BENT 67	BENT 68	BENT 69	BENT 70	BENT 71	BENT 72	BENT 73	BENT 74	BENT 75	BENT 76	BENT 77	BENT 78
W.P. STATION -L-	3160+80.00	3162+00.00	3163+20.00	3164+40.00	3165+60.00	3166+80.00	3168+00.00	3169+20.00	3170+30.00	3171+40.00	3172+50.00	3173+60.00	3174+70.00	3175+80.00	3176+90.00	3178+10.00	3179+30.00
LONG CHORD ANGLE	71°-50′-04″	74°-00′-24″	76°-23′-26″	78°-46′-29″	81°-09′-31″	83°-32′-34″	85°-55′-36″	88°-18′-39″	90°-29′-46″	92°-40′-53″	94°-52′-00″	97°-03′-08″	99°-14′-15″	101°-25′-22″	103°-36′-29″	105°-59′-32″	108°-22′-34″
BENT ANGLE	89°-00′-37″	88°-48′-29″	88°-48′-29″	88°-48′-29″	88°-48′-29″	88°-48′-29″	88°-48′-29″	88°-54′-26″	88°-54′-26″	88°-54′-26″	88°-54′-26″	88°-54′-26″	88°-54′-26″	88°-54′-26″	88°-48′-29″	88°-48′-29″	
BENT ANGLE AHEAD	91°-10′-57″	91°-11′-31″	91°-11′-31″	91°-11′-31″	91°-11′-31″	91°-11′-31″	91°-11′-31″	91°-05′-34″	91°-05′-34″	91°-05′-34″	91°-05′-34″	91°-05′-34″	91°-05′-34″	91°-05′-34″	91°-11′-31″	91°-11′-31″	
LONG CHORD PROJECTION (FT)	114.640	116.010	117.184	118.156	118.924	119.485	119.840	109.987	109.951	109.755	109.399	108.884	108.210	107.380	116.010	114.635	
SHORT CHORD LENGTH (FT)	119.992	119.991	119.991	119.991	119.991	119.991	119.991	109.993	109.993	109.993	109.993	109.993	109.993	109.993	119.991	119.991	
DIMENSION X (FT)	0.000	10.156	16.000	18.237	17.545	14.574	9.954	4.300	1.272	6.740	11.637	15.494	17.835	18.172	16.002	10.160	0.000
DIMENSION Y (FT)	0.000	35.434	66.088	91.890	112.795	128.767	139.778	145.810	146.955	143.906	136.666	125.246	109.662	89.938	66.102	35.451	0.000
DIMENSION B (FT)	0.000	36.861	67.998	93.682	114.152	129.589	140.132	145.873	146.961	144.063	137.160	126.200	111.103	91.756	68.012	36.878	0.000
W.P. NORTH COORDINATE	721278.7262	721380.2912	721484.4160	721590.9312	721699.6524	721810.3913	721922.9564	722037.1527	722143.0968	722250.0915	722357.9810	722466.6085	722575.8159	722685.4443	722795.3344	722915.3251	723035.2291
W.P. EAST COORDINATE	3044328.0806	3044264.1857	3044204.5540	3044149.3051	3044098.5347	3044052.3308	3044010.7732	3043973.9340	3043944.3642	3043918.8558	3043897.4460	3043880.1657	3043867.0402	3043858.0886	3043853.3239	3043852.9091	3043857.4860

LONG CHORD 4

WORK POINT NUMBER	79	80	81	82	83	84	85	86	87	88	89
BENT NUMBER	BENT 78	BENT 79	BENT 80	BENT 81	BENT 82	BENT 83	BENT 84	BENT 85	BENT 86	BENT 87	BENT 88
W.P. STATION -L-	3179+30.00	3180+50.00	3181+70.00	3182+90.00	3184+10.00	3185+30.00	3186+50.00	3187+70.00	3188+90.00	3190+10.00	3191+30.00
LONG CHORD ANGLE	98°-25′-16″	99°-34′-44″	97°-11′-42″	94°-48′-39″	92°-25′-37″	90°-02′-34″	87°-39′-32″	85°-16′-29″	82°-53′-27″	80°-30′-24″	80°-10′-33″
BENT ANGLE	88°-57′-56″	91°-11′-31″	91°-11′-31″	91°-11′-31″	91°-11′-31″	91°-11′-31″	91°-11′-31″	91°-11′-31″	91°-11′-31″	90°-18′-28″	
BENT ANGLE AHEAD	90°-07′-24″	88°-48′-29″	88°-48′-29″	88°-48′-29″	88°-48′-29″	88°-48′-29″	88°-48′-29″	88°-48′-29″	88°-48′-29″	89°-58′-37″	
LONG CHORD PROJECTION (FT)	118.365	118.708	119.333	119.752	119.964	119.967	119.763	119.352	118.734	118.249	
SHORT CHORD LENGTH (FT)	119.995	119.991	119.991	119.991	119.991	119.991	119.991	119.991	119.991	120.000	
DIMENSION X (FT)	0.000	3.327	4.698	4.188	2.430	0.045	2.351	4.143	4.708	3.416	0.000
DIMENSION Y (FT)	0.000	19.713	37.215	49.763	57.337	59.923	57.516	50.121	37.751	20.427	0.000
DIMENSION B (FT)	0.000	19.992	37.510	49.939	57.388	59.923	57.564	50.292	38.044	20.711	0.000
W.P. NORTH COORDINATE	723035.2291	723154.8686	723274.6557	723394.6302	723514.5844	723634.3108	723753.6020	723872.2516	723990.0542	724106.8058	724222.8008
W.P. EAST COORDINATE	3043857.4860	3043866.7175	3043873.7160	3043875.7257	3043872.7430	3043864.7732	3043851.8301	3043833.9360	3043811.1220	3043783.4275	3043752.6843

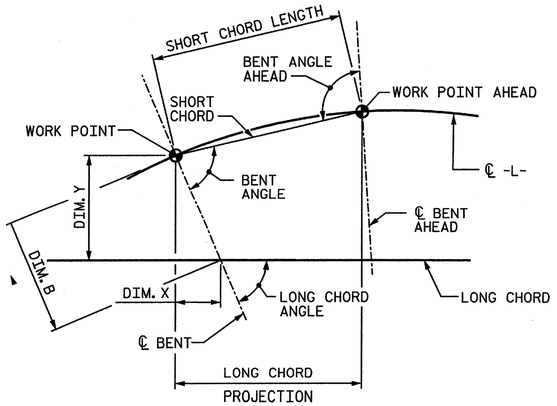
NOTES:

1. FOR DETAIL "A" & "B", SEE SHEET 1 OF 2.

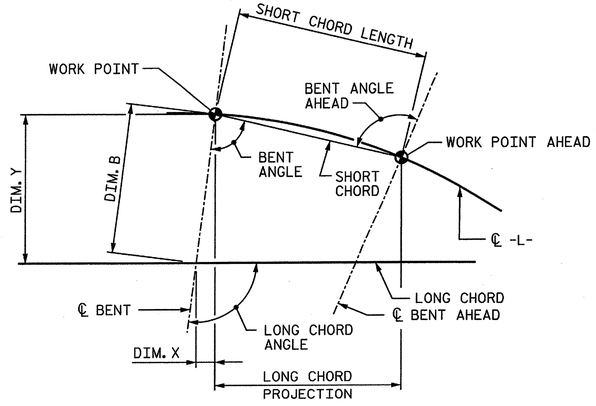


LONG CHORD LAYOUT

(FROM STATION 3160+80 TO 3191+30)



DETAIL "C"



DETAIL "D"

HORIZ. CURVE DATA -L-

PI = 3170+92.51	PI = 3185+28.08
Δ = 38°-18′-45.6″ (RT)	Δ = 20°-00′-57.9″ (LT)
D = 1°-59′-12.0″	D = 1°-59′-12.0″
L = 1,928.48′	L = 1,007.52′
T = 1,001.85′	T = 508.94′
R = 2,884.00′	R = 2,884.00′

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
LONG CHORD LAYOUT
BRIDGE ON NC 12 OVER
PEA ISLAND BREACH

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

STV / Ralph Whitehead Associates, Inc.
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NC License No. F-0991

REVISIONS						SHEET NO.
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2			4			219

DRAWN BY : CLG DATE : 12-11

CHECKED BY : TRL DATE : 3-12

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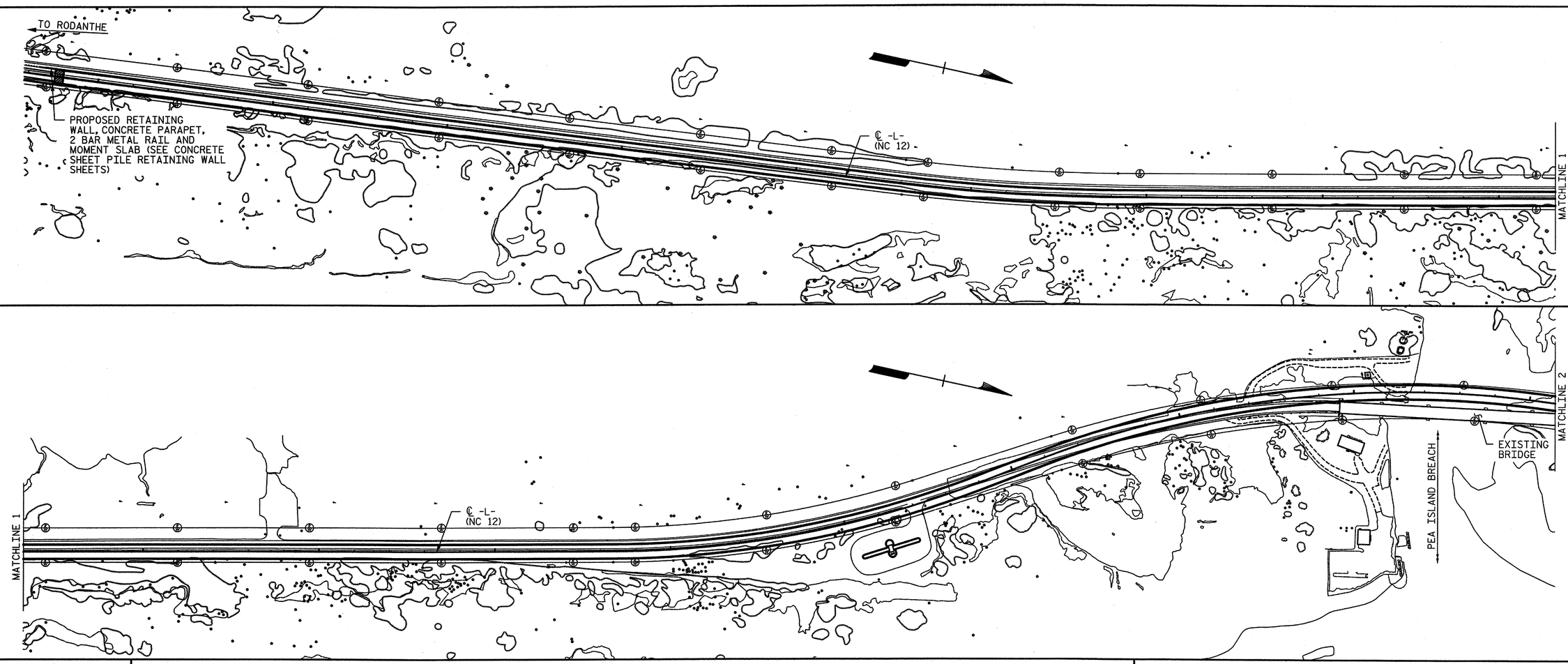
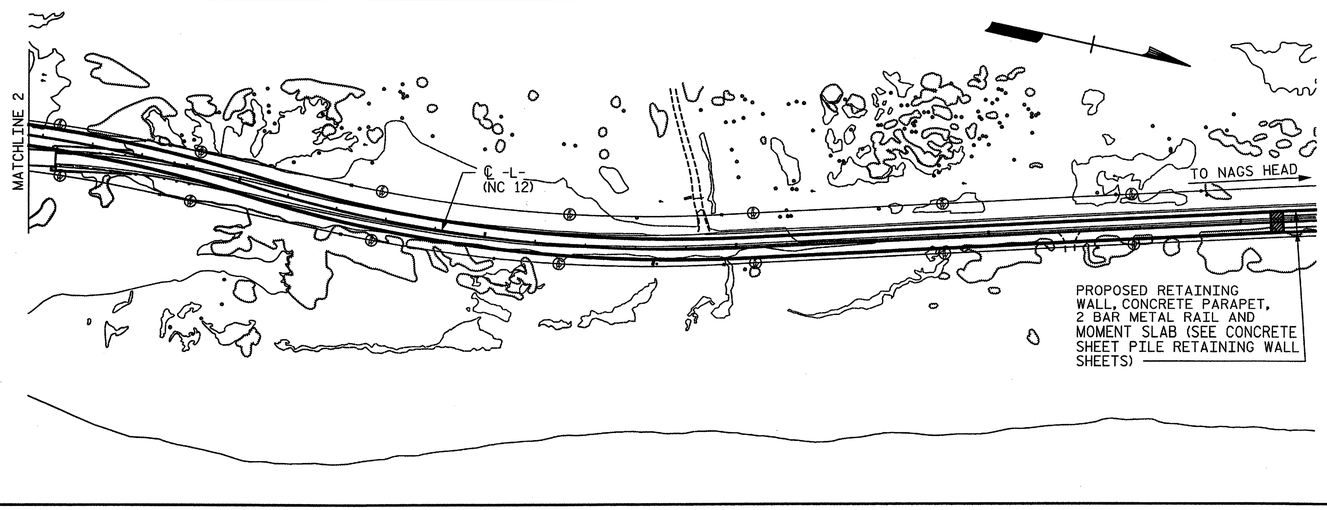
BENCH MARK PI07 5/8"REBAR WITH STANDARD ALUM. CAP, BURIED ± 0.6' DEEP.
(GPS MON PI-07) N 730386.450 E 3041823.433 ELEV 3.150





PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING LOCATION SKETCH BRIDGE ON NC 12 OVER PEA ISLAND BREACH

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

LOCATION SKETCH

DRAWN BY : CLG DATE : 1-12
CHECKED BY : TRL DATE : 3-12

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Charlotte, NC 28208
NC License No. F-0991

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1			3			TOTAL SHEETS
2			4			219

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GENERAL NOTES

GENERAL NOTES:

ALL ELEVATIONS ARE SHOWN IN FEET.

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

DESIGN WIND VELOCITY = 135 mph.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR SEISMIC PERFORMANCE ZONE 1.

BENTS 4, 5 & 94 HAVE BEEN DESIGNED FOR SUPERSTRUCTURE WAVE FORCES EQUAL TO A HORIZONTAL FORCE OF 120 KIPS, VERTICAL FORCE OF 190 KIPS AND MOMENT OF 3000 K-FT APPLIED AT THE LEVEL OF BEARINGS.

ALL REINFORCING STEEL FOR CAST-IN-PLACE OR PRECAST CONCRETE SHALL BE ASTM A-955-12 STAINLESS STEEL WITH Fy=60 KSI EXCEPT FOR CONCRETE PARAPET, MOMENT SLAB, CONCRETE SHEET PILE COPING, PRESTRESSED CONCRETE GIRDERS & PRESTRESSED CONCRETE PILES.

CONCRETE PARAPET, MOMENT SLAB, AND CONCRETE SHEET PILE COPING REINFORCING STEEL SHALL BE EPOXY COATED.

REINFORCING STEEL IN PRESTRESSED CONCRETE PILES AND PRESTRESSED CONCRETE GIRDERS EXCEPT #5S3 BARS SHALL NOT BE EPOXY-COATED.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF A 5 SPAN MABEY TRUSS (2 @ 118', 2 @ 113', AND 1 @ 162') AND LOCATED EAST OF THE PROPOSED STRUCTURE WITH A 24.1' CLEAR ROADWAY WIDTH, SUPPORTED ON INTERIOR BENTS CONSISTING OF CONCRETE FOOTINGS ON 12-2'Ø STEEL PIPE PILES AND END BENTS CONSISTING OF CONCRETE FOOTINGS ON 12-HP14X73 STEEL PILES WITH STEEL PILE BACKWALL, SHALL BE REMOVED. FOR REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISIONS. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE ENGINEER OR THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON THE DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30" SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30" SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. ALL COSTS FOR PROVIDING REINFORCING STEEL SAMPLES SHALL BE CONSIDERED INCIDENTAL AND NO ADDITIONAL PAYMENT WILL BE MADE.

THE WATER/CEMENT RATIO FOR CONCRETE PILES SHALL NOT EXCEED 0.40.

HYDRAULIC DATA:

DESIGN DISCHARGE	477,630 CFS
FREQUENCY OF DESIGN FLOOD	100 YEARS
DESIGN HIGH WATER ELEVATION	4.5' NAVD88
DRAINAGE AREA	TIDAL
BASIC DISCHARGE(Q100)	477,630 CFS
BASIC HIGH WATER ELEVATION	4.5'

OVERTOPPING FLOOD DATA:

OVERTOPPING DISCHARGE	NA
FREQUENCY OF OVERTOPPING FLOOD	500+ YEARS
OVERTOPPING FLOOD ELEVATION	NA

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH THE FLORIDA SCOUR MANUAL.

REMOVABLE FORMS SHALL BE USED TO CONSTRUCT THE DECK SLAB SPANS 5-94 AND SHALL BE IN ACCORDANCE WITH SECTION 420-3 OF THE STANDARD SPECIFICATIONS.

ALL FALSEWORK & FORMS FOR THE CAST-IN-PLACE DECK SLAB CONTINUOUS UNIT SHALL REMAIN IN PLACE UNTIL THE ENTIRE UNIT IS CAST & CURED.

THE EXACT LOCATION AND COMPLETE DESCRIPTION OF ALL INSERTS SHALL BE SHOWN ON WORKING DRAWINGS AND SUBMITTED TO THE DEPARTMENT FOR APPROVAL PRIOR TO CASTING OF CONCRETE MEMBER.

TEMPORARY DIAPHRAGMS SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT PAY ITEM REINFORCED CONCRETE DECK SLABS. NO ADDITIONAL PAYMENT WILL BE MADE.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50. STRUCTURAL STEEL SHALL BE METALLIZED UNLESS OTHERWISE CALLED TO BE GALVANIZED.

STEEL SHEET PILING REQUIRED FOR SHORING SHALL BE HOT ROLLED.

FOR UTILITY INFORMATION, SEE UTILITY PLANS.

FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

THE CONTRACTOR HAS THE OPTION OF USING A PRECAST CAP (AS SHOWN ON SHEETS 203-207) FOR BENTS 62-77 & 79-80 IN LIEU OF A CAST-IN-PLACE BENT CAP. REGARDLESS OF WHICH OPTION IS USED, PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICE FOR THE MATERIALS FOR CAST-IN-PLACE BENT CAP AS DETAILED IN THE PLANS. ANY ADDITIONAL COSTS DUE TO USING THIS OPTION SHALL BE CONSIDERED INCIDENTAL AND NO ADDITIONAL PAYMENT WILL BE MADE.

THE CONTRACTOR HAS THE OPTION TO PROPOSE A PRECAST BENT CAP, OTHER THAN THE DETAILS SHOWN IN THESE PLANS, TO BE USED THROUGHOUT THE BRIDGE. THE PROPOSED PRECAST CAP SHALL BE PREPARED SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN NORTH CAROLINA AND SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO BEGINNING WORK ON THE BENT. REGARDLESS OF WHICH OPTION IS USED, PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICE FOR THE MATERIALS FOR CAST-IN-PLACE BENT CAP AS DETAILED IN THE PLANS. ANY ADDITIONAL COSTS DUE TO PROPOSING, SUBMITTING, OR USING THIS OPTION SHALL BE CONSIDERED INCIDENTAL AND NO ADDITIONAL PAYMENT WILL BE MADE.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS, SEE SPECIAL PROVISIONS.

FOR BRIDGE DECK RIDEABILITY AND GROOVING, SEE SPECIAL PROVISIONS.

FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

FOR CONCRETE WEARING SURFACE, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

FOR FOAM JOINT SEAL, SEE SPECIAL PROVISIONS.

FOR MODULAR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR SECURING OF VESSELS, SEE SPECIAL PROVISIONS.

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.

FOR FIB 72" PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.

FOR STAINLESS STEEL REINFORCING, SEE SPECIAL PROVISIONS.

FOR MASS CONCRETE, SEE SPECIAL PROVISIONS.

FOR CONCRETE SHRINKAGE CONTROL FOR PRECAST CAP, SEE SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

CORROSION PROTECTION NOTES:

FOR CORROSION PROTECTION OF BRIDGE, SEE SPECIAL PROVISIONS.

ALL INCIDENTAL SUPPORTS FOR REINFORCING STEEL INCLUDING, BUT NOT LIMITED TO, CHAIRS, TIES, BOLSTERS, ETC. SHALL BE ASTM A240 GR. 316 STAINLESS STEEL OR APPROVED NON-FERROUS MATERIAL.

PRESTRESSED CONCRETE GIRDERS ARE DESIGNED FOR 0 psi TENSION IN THE PRECOMPRESSED TENSILE ZONE UNDER ALL LOADING CONDITIONS.

ALL INSERTS TO REMAIN IN PLACE EMBEDDED IN CAST-IN-PLACE CONCRETE SHALL BE FORMED OF ASTM A240 GR. 316 STAINLESS STEEL.

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN A MINIMUM OF 25% FLY ASH CLASS F OR A MINIMUM OF 40% GROUND GRANULATED BLAST FURNACE SLAG (GGBFS). MINERAL ADMIXTURES SHALL REPLACE THE CEMENT CONTENT AT A 1:1 RATIO BY WEIGHT. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION, AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE BRIDGE DECK.

THE CONCRETE IN THE PIER WALLS, BENT CAPS, PILE CAPS, FOOTINGS, CONCRETE SHEET PILE COPING, MOMENT SLAB, AND PILES SHALL CONTAIN A MINIMUM OF 25% FLY ASH CLASS F OR A MINIMUM OF 40% GROUND GRANULATED BLAST FURNACE SLAG (GGBFS). ADDITIONALLY, SILICA FUME SHALL BE SUBSTITUTED FOR A MINIMUM 5% OF THE PORTLAND CEMENT BY WEIGHT IN THE PIER WALLS AND FOOTINGS. MINERAL ADMIXTURES SHALL REPLACE THE CEMENT CONTENT AT A 1:1 RATIO BY WEIGHT. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION, AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.

THIS STRUCTURE CONTAINS THE NECESSARY CORROSION PROTECTION REQUIRED FOR A STRUCTURE IN A HIGHLY CORROSIVE AREA.

PRESTRESSED CONCRETE GIRDERS, CORED SLAB UNITS, AND PILES SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR. SEE STANDARD SPECIFICATIONS FOR CALCIUM NITRITE CORROSION INHIBITOR.

ALL METALLIZED SURFACES SHALL RECEIVE A SEAL COATING AS SPECIFIED IN THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

⚠ CLASS AA CONCRETE SHALL BE USED IN ALL CAST-IN-PLACE BRIDGE DECK, PARAPET, PIER WALLS, BENT CAPS, END BENTS, CONCRETE SHEET PILE COPING, MOMENT SLAB AND FOOTINGS. ADDITIONALLY CLASS AA CONCRETE IN BRIDGE DECK, PARAPET, CONCRETE SHEET PILE COPING, AND MOMENT SLAB SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR. FOR CALCIUM NITRITE CORROSION INHIBITOR, SEE STANDARD SPECIFICATIONS.

⚠ REVISED NOTE

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY
11-13-13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
GENERAL NOTES

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-56
1	STV	11-13	3			TOTAL SHEETS
2			4			219

DRAWN BY : VMW DATE : 1-12
CHECKED BY : TRL DATE : 3-12

11/13/2013 2:41:41 PM R:\Structures\Updated & Sealed Plans II-II-13\056) General Drawing & Notes 1of 2.dgn

GENERAL NOTES

FOUNDATION NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

INSTALL PILES TO A TOLERANCE NOT MORE THAN 1/8 INCH PER FOOT FROM THE VERTICAL OR FROM THE BATTER SHOWN ON THE PLANS AND THE TOP OF THE PILE IS NOT OUT OF THE POSITION SHOWN ON THE PLANS BY MORE THAN 3 INCHES HORIZONTAL IN ANY DIRECTION AFTER DRIVING.

PILES AT END BENT NO. 1, END BENT NO. 2, BENT NO. 1 THOUGH BENT NO. 3, AND BENT NO. 95 THROUGH BENT NO. 97 ARE DESIGNED FOR A FACTORED RESISTANCE OF 375 TONS PER PILE COMPRESSION.

PILES AT BENT NO. 4 THROUGH BENT NO. 94 ARE DESIGNED FOR A FACTORED RESISTANCE OF 375 TONS PER PILE COMPRESSION AND A FACTORED RESISTANCE OF 80 TONS PER PILE TENSION.

DRIVE 30 INCH SQUARE PRESTRESSED CONCRETE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 500 TONS PER PILE.

DRIVE 30 INCH SQUARE PRESTRESSED CONCRETE PILES AT BENT NO. 1 THROUGH BENT NO. 3 AND BENT NO. 95 THROUGH BENT NO. 97 TO A REQUIRED DRIVING RESISTANCE OF 850 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

DRIVE 30 INCH SQUARE PRESTRESSED CONCRETE PILES AT BENT NO. 4 THROUGH BENT NO. 6 TO A REQUIRED DRIVING RESISTANCE OF 1075 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

DRIVE 30 INCH SQUARE PRESTRESSED CONCRETE PILES AT BENT NO. 7 THROUGH BENT NO. 10 TO A REQUIRED DRIVING RESISTANCE OF 1000 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

DRIVE 30 INCH SQUARE PRESTRESSED CONCRETE PILES AT BENT NO. 11 THROUGH BENT NO. 21 TO A REQUIRED DRIVING RESISTANCE OF 1075 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

DRIVE 30 INCH SQUARE PRESTRESSED CONCRETE PILES AT BENT NO. 22 THROUGH BENT NO. 81 TO A REQUIRED DRIVING RESISTANCE OF 1000 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

DRIVE 30 INCH SQUARE PRESTRESSED CONCRETE PILES AT BENT NO. 82 THROUGH BENT NO. 89 TO A REQUIRED DRIVING RESISTANCE OF 1075 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

DRIVE 30 INCH SQUARE PRESTRESSED CONCRETE PILES AT BENT NO. 90 THROUGH BENT NO. 94 TO A REQUIRED DRIVING RESISTANCE OF 1150 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

INSTALL PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A TIP ELEVATION NO HIGHER THAN -40.0 FT.

INSTALL PILES AT BENT NO. 1 THROUGH BENT NO. 3 AND BENT NO. 95 THROUGH BENT NO. 97 TO A TIP ELEVATION NO HIGHER THAN -65.0 FT.

INSTALL PILES AT BENT NO. 4 THROUGH BENT NO. 81 TO A TIP ELEVATION NO HIGHER THAN -95.0 FT.

INSTALL PILES AT BENT NO. 82 THROUGH BENT NO. 94 TO A TIP ELEVATION NO HIGHER THAN -100.0 FT.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 400-500 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT ALL INTERIOR BENTS AND 150-250 FT-KIPS AT ALL END BENTS. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT END BENT NO. 1. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 1 THROUGH NO 3. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 4 THROUGH NO 6. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 7 THROUGH NO 10. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 11 THROUGH NO 13. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 14 THROUGH NO 16. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 17 THROUGH NO 21. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 22 THROUGH NO 26. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 27 THROUGH NO 30. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 31 THROUGH NO 33. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 34 THROUGH NO 38. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 39 THROUGH NO 43. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 44 THROUGH NO 46. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 47 THROUGH NO 50. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 51 THROUGH NO 55. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 56 THROUGH NO 60. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 61 THROUGH NO 63. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 64 THROUGH NO 67. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 68 THROUGH NO 71. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 72 THROUGH NO 74. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 75 THROUGH NO 77. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 78 THROUGH NO 81. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 82 THROUGH NO 84. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 85 THROUGH NO 89. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 90 THROUGH NO 94. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 95 THROUGH NO 97. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT END BENT NO. 2. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

WHEN PERFORMING PDA TESTING, PERFORM RESTRIKES WITH THE PDA AT WAIT TIMES OF 4 HOURS, 24 HOURS, AND 72 HOURS AFTER INITIAL DRIVE ON ALL PDA TEST PILES.

FOR JETTING, SEE PILE JETTING SPECIAL PROVISION.

DO NOT JET BELOW ELEVATION -35.0 FT FOR PILES AT END BENT NO. 1 OR END BENT NO. 2.

DO NOT JET BELOW ELEVATION -60.0 FT FOR PILES AT BENT NO. 1 THROUGH BENT NO. 3 AND BENT NO. 95 THROUGH BENT NO. 97.

DO NOT JET BELOW ELEVATION -90.0 FT FOR PILES AT BENT NO. 4 THROUGH BENT NO. 81.

DO NOT JET BELOW ELEVATION -95.0 FT FOR PILES AT BENT NO. 82 THROUGH BENT NO. 94.

DRIVE PILES A MINIMUM OF 5-FT BELOW THE FINAL JET ELEVATION UNLESS PILE REFUSAL IS ENCOUNTERED AND TO THE REQUIRED DRIVING RESISTANCE.

USE JETTING, DRIVING, OR A COMBINATION OF SIMULTANIOUS JETTING AND DRIVING TO ATTAIN THE MINIMUM TIP ELEVATION NO HIGHER THAN REQUIREMENTS. SEE PILE JETTING SPECIAL PROVISION FOR JETTING REQUIREMENTS AND RESTRICTIONS.

THE SCOUR CRITICAL ELEVATIONS FOR BENT NO. 1 THROUGH BENT NO. 5 AND BENT NO. 94 THROUGH BENT NO. 97 ARE ELEVATION -30.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

THE SCOUR CRITICAL ELEVATIONS FOR BENT NO. 6 THROUGH BENT NO. 93 WITH 30 INCH SQUARE PRESTRESSED CONCRETE PILES ARE ELEVATION -53.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

IF THE CONTRACTOR ELECTS TO USE 36 INCH SQUARE PRESTRESSED CONCRETE PILES AT END BENT NO. 1, BENT NO. 1 THROUGH BENT NO. 3, BENT NO. 95 THROUGH BENT NO. 97 AND END BENT NO. 2, USE THE FOLLOWING NOTES:

DRIVE 36 INCH SQUARE PRESTRESSED CONCRETE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 500 TONS PER PILE.

DRIVE 36 INCH SQUARE PRESTRESSED CONCRETE PILES AT BENT NO. 1 THROUGH BENT NO. 3 AND BENT NO. 95 THROUGH BENT NO. 97 TO A REQUIRED DRIVING RESISTANCE OF 900 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

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DRAWN BY : VMW DATE : 1-12
CHECKED BY : TRL DATE : 3-12

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 8-2-13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
GENERAL NOTES

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REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		S-57
1			3				TOTAL SHEETS
2			4				219

GENERAL NOTES

GENERAL NOTES:

ALL ELEVATIONS ARE SHOWN IN FEET.

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

DESIGN WIND VELOCITY = 135 mph.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR SEISMIC PERFORMANCE ZONE 1.

BENTS 4, 5 & 94 HAVE BEEN DESIGNED FOR SUPERSTRUCTURE WAVE FORCES EQUAL TO A HORIZONTAL FORCE OF 120 KIPS, VERTICAL FORCE OF 190 KIPS AND MOMENT OF 3000 K-FT APPLIED AT THE LEVEL OF BEARINGS.

ALL REINFORCING STEEL FOR CAST-IN-PLACE OR PRECAST CONCRETE SHALL BE ASTM A-955-12 STAINLESS STEEL WITH Fy=60 KSI EXCEPT FOR CONCRETE PARAPET, MOMENT SLAB, CONCRETE SHEET PILE COPING, PRESTRESSED CONCRETE GIRDERS & PRESTRESSED CONCRETE PILES.

CONCRETE PARAPET, MOMENT SLAB, AND CONCRETE SHEET PILE COPING REINFORCING STEEL SHALL BE EPOXY COATED.

REINFORCING STEEL IN PRESTRESSED CONCRETE PILES AND PRESTRESSED CONCRETE GIRDERS EXCEPT #5S3 BARS SHALL NOT BE EPOXY-COATED.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF A 5 SPAN MABEY TRUSS (2 @ 118', 2 @ 133' AND 1 @ 162') AND LOCATED EAST OF THE PROPOSED STRUCTURE WITH A 24.1' CLEAR ROADWAY WIDTH, SUPPORTED ON INTERIOR BENTS CONSISTING OF CONCRETE FOOTINGS ON 12-2'Ø STEEL PIPE PILES AND END BENTS CONSISTING OF CONCRETE FOOTINGS ON 12-HP14X73 STEEL PILES WITH STEEL PILE BACKWALL, SHALL BE REMOVED. FOR REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISIONS. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE ENGINEER OR THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON THE DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30" SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30" SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. ALL COSTS FOR PROVIDING REINFORCING STEEL SAMPLES SHALL BE CONSIDERED INCIDENTAL AND NO ADDITIONAL PAYMENT WILL BE MADE.

THE WATER/CEMENT RATIO FOR CONCRETE PILES SHALL NOT EXCEED 0.40.

HYDRAULIC DATA:

DESIGN DISCHARGE---------- 477,630 CFS
FREQUENCY OF DESIGN FLOOD---------- 100 YEARS
DESIGN HIGH WATER ELEVATION---------- 4.5' NAVD88
DRAINAGE AREA---------- TIDAL
BASIC DISCHARGE(Q100)---------- 477,630 CFS
BASIC HIGH WATER ELEVATION---------- 4.5'

OVERTOPPING FLOOD DATA:

OVERTOPPING DISCHARGE---------- NA
FREQUENCY OF OVERTOPPING FLOOD---------- 500+ YEARS
OVERTOPPING FLOOD ELEVATION---------- NA

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH THE FLORIDA SCOUR MANUAL.

REMOVABLE FORMS SHALL BE USED TO CONSTRUCT THE DECK SLAB SPANS 5-94 AND SHALL BE IN ACCORDANCE WITH SECTION 420-3 OF THE STANDARD SPECIFICATIONS.

ALL FALSEWORK & FORMS FOR THE CAST-IN-PLACE DECK SLAB CONTINUOUS UNIT SHALL REMAIN IN PLACE UNTIL THE ENTIRE UNIT IS CAST & CURED.

THE EXACT LOCATION AND COMPLETE DESCRIPTION OF ALL INSERTS SHALL BE SHOWN ON WORKING DRAWINGS AND SUBMITTED TO THE DEPARTMENT FOR APPROVAL PRIOR TO CASTING OF CONCRETE MEMBER.

TEMPORARY DIAPHRAGMS SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT PAY ITEM REINFORCED CONCRETE DECK SLAB. NO ADDITIONAL PAYMENT WILL BE MADE.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50. STRUCTURAL STEEL COMPONENTS SHALL BE METALLIZED UNLESS OTHERWISE CALLED TO BE GALVANIZED.

STEEL SHEET PILING REQUIRED FOR SHORING SHALL BE HOT ROLLED.

FOR UTILITY INFORMATION, SEE UTILITY PLANS.

FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

THE CONTRACTOR HAS THE OPTION OF USING A PRECAST CAP (AS SHOWN ON SHEETS 203-207) FOR BENTS 62-77 & 79-80 IN LIEU OF A CAST-IN-PLACE BENT CAP. REGARDLESS OF WHICH OPTION IS USED, PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICE FOR THE MATERIALS FOR CAST-IN-PLACE BENT CAP AS DETAILED IN THE PLANS. ANY ADDITIONAL COSTS DUE TO USING THIS OPTION SHALL BE CONSIDERED INCIDENTAL AND NO ADDITIONAL PAYMENT WILL BE MADE.

THE CONTRACTOR HAS THE OPTION TO PROPOSE A PRECAST BENT CAP, OTHER THAN THE DETAILS SHOWN IN THESE PLANS, TO BE USED THROUGHOUT THE BRIDGE. THE PROPOSED PRECAST CAP SHALL BE PREPARED SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN NORTH CAROLINA AND SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO BEGINNING WORK ON THE BENT. REGARDLESS OF WHICH OPTION IS USED, PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICE FOR THE MATERIALS FOR CAST-IN-PLACE BENT CAP AS DETAILED IN THE PLANS. ANY ADDITIONAL COSTS DUE TO PROPOSING, SUBMITTING, OR USING THIS OPTION SHALL BE CONSIDERED INCIDENTAL AND NO ADDITIONAL PAYMENT WILL BE MADE.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS, SEE SPECIAL PROVISIONS.

FOR BRIDGE DECK RIDEABILITY AND GROOVING, SEE SPECIAL PROVISIONS.

FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

FOR CONCRETE WEARING SURFACE, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

FOR FOAM JOINT SEAL, SEE SPECIAL PROVISIONS.

FOR MODULAR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR SECURING OF VESSELS, SEE SPECIAL PROVISIONS.

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.

FOR FIB 72" PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.

FOR STAINLESS STEEL REINFORCING, SEE SPECIAL PROVISIONS.

FOR MASS CONCRETE, SEE SPECIAL PROVISIONS.

FOR CONCRETE SHRINKAGE CONTROL FOR PRECAST CAP, SEE SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

CORROSION PROTECTION NOTES:

FOR CORROSION PROTECTION OF BRIDGE, SEE SPECIAL PROVISIONS.

ALL INCIDENTAL SUPPORTS FOR REINFORCING STEEL INCLUDING, BUT NOT LIMITED TO, CHAIRS, TIES, BOLSTERS, ETC. SHALL BE ASTM A240 GR. 316 STAINLESS STEEL OR APPROVED NON-FERROUS MATERIAL.

PRESTRESSED CONCRETE GIRDERS ARE DESIGNED FOR 0 psi TENSION IN THE PRECOMPRESSED TENSILE ZONE UNDER ALL LOADING CONDITIONS.

ALL INSERTS TO REMAIN IN PLACE EMBEDDED IN CAST-IN-PLACE CONCRETE SHALL BE FORMED OF ASTM A240 GR. 316 STAINLESS STEEL.

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN A MINIMUM OF 25% FLY ASH CLASS F OR A MINIMUM OF 40% GROUND GRANULATED BLAST FURNACE SLAG (GGBFS). MINERAL ADMIXTURES SHALL REPLACE THE CEMENT CONTENT AT A 1:1 RATIO BY WEIGHT. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION, AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE BRIDGE DECK.

THE CONCRETE IN THE PIER WALLS, BENT CAPS, PILE CAPS, FOOTINGS, CONCRETE SHEET PILE COPING, MOMENT SLAB, AND PILES SHALL CONTAIN A MINIMUM OF 25% FLY ASH CLASS F OR A MINIMUM OF 40% GROUND GRANULATED BLAST FURNACE SLAG (GGBFS). ADDITIONALLY, SILICA FUME SHALL BE SUBSTITUTED FOR A MINIMUM 5% OF THE PORTLAND CEMENT BY WEIGHT IN THE PIER WALLS AND FOOTINGS. MINERAL ADMIXTURES SHALL REPLACE THE CEMENT CONTENT AT A 1:1 RATIO BY WEIGHT. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION, AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.

THIS STRUCTURE CONTAINS THE NECESSARY CORROSION PROTECTION REQUIRED FOR A STRUCTURE IN A HIGHLY CORROSIVE AREA.

PRESTRESSED CONCRETE GIRDERS, CORED SLAB UNITS, AND PILES SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR. SEE STANDARD SPECIFICATIONS FOR CALCIUM NITRITE CORROSION INHIBITOR.

ALL METALLIZED SURFACES SHALL RECEIVE A SEAL COATING AS SPECIFIED IN THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

⚠ CLASS AA CONCRETE SHALL BE USED IN ALL CAST-IN-PLACE BRIDGE DECK, PARAPET, PIER WALLS, BENT CAPS, END BENTS, CONCRETE SHEET PILE COPING, MOMENT SLAB AND FOOTINGS. ADDITIONALLY CLASS AA CONCRETE IN BRIDGE DECK, PARAPET, CONCRETE SHEET PILE COPING, AND MOMENT SLAB SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR. FOR CALCIUM NITRITE CORROSION INHIBITOR, SEE STANDARD SPECIFICATIONS.

⚠ REVISED NOTE

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
GENERAL NOTES
ALTERNATE 1

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
11-13-13

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-58
1	STV	11-13	3			TOTAL SHEETS
2			4			219

DRAWN BY : JDE DATE : 3-12
CHECKED BY : TRL DATE : 3-12

11/13/2013 2:44:13 PM R:\Structures\Updated & Sealed Plans II-II-13\(058) Alt. General Drawing & Notes 1 of 2.dgn

GENERAL NOTES

FOUNDATION NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

INSTALL PILES TO A TOLERANCE NOT MORE THAN 1/8 INCH PER FOOT FROM THE VERTICAL OR FROM THE BATTER SHOWN ON THE PLANS AND THE TOP OF THE PILE IS NOT OUT OF THE POSITION SHOWN ON THE PLANS BY MORE THAN 3 INCHES HORIZONTAL IN ANY DIRECTION AFTER DRIVING.

PILES AT END BENT NO. 1, END BENT NO. 2, BENT NO. 1 THOUGH BENT NO. 3, AND BENT NO. 95 THROUGH BENT NO. 97 ARE DESIGNED FOR A FACTORED RESISTANCE OF 375 TONS PER PILE COMPRESSION.

PILES AT BENT NO. 4 THROUGH BENT NO. 94 ARE DESIGNED FOR A FACTORED RESISTANCE OF 375 TONS PER PILE COMPRESSION.

DRIVE 30 INCH SQUARE PRESTRESSED CONCRETE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 500 TONS PER PILE.

DRIVE 30 INCH SQUARE PRESTRESSED CONCRETE PILES AT BENT NO. 1 THROUGH BENT NO. 3 AND BENT NO. 95 THROUGH BENT NO. 97 TO A REQUIRED DRIVING RESISTANCE OF 850 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

DRIVE 36 INCH SQUARE PRESTRESSED CONCRETE PILES AT BENT NO. 4 THROUGH BENT NO. 10 TO A REQUIRED DRIVING RESISTANCE OF 1125 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

DRIVE 36 INCH SQUARE PRESTRESSED CONCRETE PILES AT BENT NO. 11 THROUGH BENT NO. 13 TO A REQUIRED DRIVING RESISTANCE OF 1175 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

DRIVE 36 INCH SQUARE PRESTRESSED CONCRETE PILES AT BENT NO. 14 THROUGH BENT NO. 21 TO A REQUIRED DRIVING RESISTANCE OF 1125 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

DRIVE 36 INCH SQUARE PRESTRESSED CONCRETE PILES AT BENT NO. 22 THROUGH BENT NO. 60, BENT NO. 65 THROUGH NO. 68, BENT NO. 70 THROUGH BENT NO. 75, AND BENT NO. 77 TO A REQUIRED DRIVING RESISTANCE OF 1100 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

DRIVE 30 INCH SQUARE PRESTRESSED CONCRETE PILES AT BENT NO. 61 THROUGH BENT NO. 64, BENT NO. 69, BENT NO. 76, AND BENT NO. 78 THROUGH BENT NO. 81 TO A REQUIRED DRIVING RESISTANCE OF 1000 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

DRIVE 36 INCH SQUARE PRESTRESSED CONCRETE PILES AT BENT NO. 82 THROUGH BENT NO. 89 TO A REQUIRED DRIVING RESISTANCE OF 1175 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

DRIVE 36 INCH SQUARE PRESTRESSED CONCRETE PILES AT BENT NO. 90 THROUGH BENT NO. 94 TO A REQUIRED DRIVING RESISTANCE OF 1300 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

INSTALL PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A TIP ELEVATION NO HIGHER THAN -40.0 FT.

INSTALL PILES AT BENT NO. 1 THROUGH BENT NO. 3 AND BENT NO. 95 THROUGH BENT NO. 97 TO A TIP ELEVATION NO HIGHER THAN -65.0 FT.

INSTALL PILES AT BENT NO. 4 THROUGH BENT NO. 81 TO A TIP ELEVATION NO HIGHER THAN -95.0 FT.

INSTALL PILES AT BENT NO. 82 THROUGH BENT NO. 94 TO A TIP ELEVATION NO HIGHER THAN -100.0 FT.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 400-500 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT ALL INTERIOR BENTS AND 150-250 FT-KIPS AT ALL END BENTS. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT END BENT NO. 1. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 1 THROUGH NO 3. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 4 THROUGH NO 6. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 7 THROUGH NO 10. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 11 THROUGH NO 13. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 14 THROUGH NO 16. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 17 THROUGH NO 21. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 22 THROUGH NO 26. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 27 THROUGH NO 30. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 31 THROUGH NO 33. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 34 THROUGH NO 38. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 39 THROUGH NO 43. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 44 THROUGH NO 46. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 47 THROUGH NO 50. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 51 THROUGH NO 55. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 56 THROUGH NO 60. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 61 THROUGH NO 63. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 64 THROUGH NO 67. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 68 THROUGH NO 71. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 72 THROUGH NO 74. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 75 THROUGH NO 77. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 78 THROUGH NO 81. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 82 THROUGH NO 84. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 85 THROUGH NO 89. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 90 THROUGH NO 94. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 95 THROUGH NO 97. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT END BENT NO. 2. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

WHEN PERFORMING PDA TESTING, PERFORM RESTRIKES WITH THE PDA AT WAIT TIMES OF 4 HOURS, 24 HOURS, AND 72 HOURS AFTER INITIAL DRIVE ON ALL PDA TEST PILES.

FOR JETTING, SEE PILE JETTING SPECIAL PROVISION.

DO NOT JET BELOW ELEVATION -35.0 FT FOR PILES AT END BENT NO. 1 OR END BENT NO. 2.

DO NOT JET BELOW ELEVATION -60.0 FT FOR PILES AT BENT NO. 1 THROUGH BENT NO. 3 AND BENT NO. 95 THROUGH BENT NO. 97.

DO NOT JET BELOW ELEVATION -90.0 FT FOR PILES AT BENT NO. 4 THROUGH BENT NO. 81.

DO NOT JET BELOW ELEVATION -95.0 FT FOR PILES AT BENT NO. 82 THROUGH BENT NO. 94.

DRIVE PILES A MINIMUM OF 5-FT BELOW THE FINAL JET ELEVATION UNLESS PILE REFUSAL IS ENCOUNTERED AND TO THE REQUIRED DRIVING RESISTANCE.

USE JETTING, DRIVING, OR A COMBINATION OF SIMULTANIOUS JETTING AND DRIVING TO ATTAIN THE MINIMUM TIP ELEVATION NO HIGHER THAN REQUIREMENTS. SEE PILE JETTING SPECIAL PROVISION FOR JETTING REQUIREMENTS AND RESTRICTIONS.

THE SCOUR CRITICAL ELEVATIONS FOR BENT NO. 1 THROUGH BENT NO. 5 AND BENT NO. 94 THROUGH BENT NO. 97 ARE ELEVATION -30.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

THE SCOUR CRITICAL ELEVATIONS FOR BENT NO. 6 THROUGH BENT NO. 93 WITH 36 INCH SQUARE PRESTRESSED CONCRETE PILES ARE ELEVATION -58.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

THE SCOUR CRITICAL ELEVATIONS FOR BENT NO. 6 THROUGH BENT NO. 93 WITH 30 INCH SQUARE PRESTRESSED CONCRETE PILES ARE ELEVATION -53.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

IF THE CONTRACTOR ELECTS TO USE 36 INCH SQUARE PRESTRESSED CONCRETE PILES AT END BENT NO. 1, BENT NO. 1 THROUGH BENT NO. 3, BENT NO. 95 THROUGH BENT NO. 97 AND END BENT NO. 2, USE THE FOLLOWING NOTES:

DRIVE 36 INCH SQUARE PRESTRESSED CONCRETE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 500 TONS PER PILE.

DRIVE 36 INCH SQUARE PRESTRESSED CONCRETE PILES AT BENT NO. 1 THROUGH BENT NO. 3 AND BENT NO. 95 THROUGH BENT NO. 97 TO A REQUIRED DRIVING RESISTANCE OF 900 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

IF THE CONTRACTOR ELECTS AND RECEIVES APPROVAL TO USE RECTANGULAR FOOTING WITH 36 INCH SQUARE PRESTRESSED CONCRETE PILES AT BENT NO. 61, BENT NO. 62, BENT NO. 63, BENT NO. 64, BENT NO. 69, BENT NO. 76, BENT NO. 78, BENT NO. 79, BENT NO. 80, OR BENT NO. 81, USE THE FOLLOWING NOTE:

DRIVE 36 INCH SQUARE PRESTRESSED CONCRETE PILES AT BENT NO. 61 THROUGH BENT NO. 64, BENT NO. 69, BENT NO. 76, AND BENT NO. 78 THROUGH BENT NO. 81 TO A REQUIRED DRIVING RESISTANCE OF 1100 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

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DRAWN BY : JDE DATE : 3-12
CHECKED BY : TRL DATE : 3-12

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
GENERAL NOTES
ALTERNATE 1

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
8-2-13

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-59
1			3			TOTAL SHEETS
2			4			219

	FOUNDATION EXCAVATION	CLASS AA CONCRETE	30 INCH PRESTRESSED CONCRETE PILES		STAINLESS STEEL REINFORCING	SPIRAL STAINLESS STEEL REINFORCING
	LUMP SUM	CU. YARDS	NO.	LIN. FT.	LBS.	LBS.
BENT 1		45.2	5	425	7,024	534
BENT 2		45.2	5	425	7,024	534
BENT 3		45.2	5	425	7,024	534
BENT 4	LUMP SUM	176.9	9	945	43,066	960
BENT 5	LUMP SUM	151.3	9	945	37,119	960
BENT 6	LUMP SUM	157.3	9	945	38,145	960
BENT 7	LUMP SUM	157.3	9	945	38,145	960
BENT 8	LUMP SUM	157.3	9	945	38,145	960
BENT 9	LUMP SUM	157.3	9	945	38,145	960
BENT 10	LUMP SUM	157.3	9	945	38,145	960
BENT 11	LUMP SUM	157.3	9	945	38,145	960
BENT 12	LUMP SUM	157.3	9	945	38,145	960
BENT 13	LUMP SUM	157.3	9	945	38,145	960
BENT 14	LUMP SUM	157.3	9	945	38,145	960
BENT 15	LUMP SUM	157.3	9	945	38,145	960
BENT 16	LUMP SUM	157.3	9	945	38,145	960
BENT 17	LUMP SUM	157.3	9	945	38,145	960
BENT 18	LUMP SUM	157.3	9	945	38,145	960
BENT 19	LUMP SUM	157.3	9	945	38,145	960
BENT 20	LUMP SUM	157.3	9	945	38,145	960
BENT 21	LUMP SUM	157.3	9	945	38,145	960
BENT 22	LUMP SUM	161.2	9	945	38,796	960
BENT 23	LUMP SUM	161.0	9	945	38,839	960
BENT 24	LUMP SUM	161.0	9	945	38,839	960
BENT 25	LUMP SUM	164.3	9	945	39,420	960
BENT 26	LUMP SUM	164.3	9	945	39,455	960
BENT 27	LUMP SUM	164.3	9	945	39,455	960
BENT 28	LUMP SUM	165.0	9	945	39,175	960
BENT 29	LUMP SUM	165.0	9	945	39,331	960
BENT 30	LUMP SUM	165.0	9	945	39,331	960
BENT 31	LUMP SUM	165.0	9	945	39,331	960
BENT 32	LUMP SUM	160.2	9	945	38,578	960
BENT 33	LUMP SUM	160.2	9	945	38,578	960

	FOUNDATION EXCAVATION	CLASS AA CONCRETE	30 INCH PRESTRESSED CONCRETE PILES		STAINLESS STEEL REINFORCING	SPIRAL STAINLESS STEEL REINFORCING
	LUMP SUM	CU. YARDS	NO.	LIN. FT.	LBS.	LBS.
BENT 34	LUMP SUM	157.3	9	945	38,145	960
BENT 35	LUMP SUM	157.3	9	945	38,145	960
BENT 36	LUMP SUM	157.3	9	945	38,145	960
BENT 37	LUMP SUM	157.3	9	945	38,145	960
BENT 38	LUMP SUM	157.3	9	945	38,145	960
BENT 39	LUMP SUM	157.3	9	945	38,145	960
BENT 40	LUMP SUM	157.3	9	945	38,145	960
BENT 41	LUMP SUM	155.8	9	945	37,848	960
BENT 42	LUMP SUM	155.8	9	945	37,848	960
BENT 43	LUMP SUM	155.8	9	945	37,848	960
BENT 44	LUMP SUM	155.8	9	945	37,848	960
BENT 45	LUMP SUM	155.8	9	945	37,848	960
BENT 46	LUMP SUM	155.8	9	945	37,848	960
BENT 47	LUMP SUM	155.8	9	945	37,848	960
BENT 48	LUMP SUM	155.8	9	945	37,848	960
BENT 49	LUMP SUM	155.8	9	945	37,848	960
BENT 50	LUMP SUM	155.8	9	945	37,848	960
BENT 51	LUMP SUM	156.7	9	945	38,183	960
BENT 52	LUMP SUM	153.8	9	945	37,190	960
BENT 53	LUMP SUM	153.8	9	945	37,190	960
BENT 54	LUMP SUM	153.8	9	945	37,190	960
BENT 55	LUMP SUM	153.8	9	945	37,190	960
BENT 56	LUMP SUM	153.8	9	945	37,190	960
BENT 57	LUMP SUM	155.8	9	945	37,532	960
BENT 58	LUMP SUM	155.8	9	945	37,532	960
BENT 59	LUMP SUM	159.6	9	945	38,036	960
BENT 60	LUMP SUM	159.6	9	945	38,036	960
BENT 61	LUMP SUM	159.9	9	945	38,243	960
BENT 62	LUMP SUM	162.0	9	945	38,536	960
BENT 63	LUMP SUM	161.6	9	945	38,387	960
BENT 64	LUMP SUM	161.6	9	945	38,387	960
BENT 65	LUMP SUM	165.3	9	945	39,047	960
BENT 66	LUMP SUM	165.3	9	945	39,047	960

	FOUNDATION EXCAVATION	CLASS AA CONCRETE	30 INCH PRESTRESSED CONCRETE PILES		STAINLESS STEEL REINFORCING	SPIRAL STAINLESS STEEL REINFORCING
	LUMP SUM	CU. YARDS	NO.	LIN. FT.	LBS.	LBS.
BENT 67	LUMP SUM	169.8	9	945	39,778	960
BENT 68	LUMP SUM	169.8	9	945	39,778	960
BENT 69	LUMP SUM	169.8	9	945	39,778	960
BENT 70	LUMP SUM	169.8	9	945	39,778	960
BENT 71	LUMP SUM	169.8	9	945	39,778	960
BENT 72	LUMP SUM	169.8	9	945	39,778	960
BENT 73	LUMP SUM	169.8	9	945	39,778	960
BENT 74	LUMP SUM	169.8	9	945	39,778	960
BENT 75	LUMP SUM	169.8	9	945	39,778	960
BENT 76	LUMP SUM	169.8	9	945	39,778	960
BENT 77	LUMP SUM	169.8	9	945	39,778	960
BENT 78	LUMP SUM	170.2	9	945	39,779	960
BENT 79	LUMP SUM	165.6	9	945	39,211	960
BENT 80	LUMP SUM	159.6	9	945	38,036	960
BENT 81	LUMP SUM	159.6	9	945	38,036	960
BENT 82	LUMP SUM	155.8	9	990	37,532	960
BENT 83	LUMP SUM	155.8	9	990	37,532	960
BENT 84	LUMP SUM	153.8	9	990	37,190	960
BENT 85	LUMP SUM	153.8	9	990	37,190	960
BENT 86	LUMP SUM	153.8	9	990	37,190	960
BENT 87	LUMP SUM	153.8	9	990	37,190	960
BENT 88	LUMP SUM	159.7	9	990	38,438	960
BENT 89	LUMP SUM	155.8	9	990	37,848	960
BENT 90	LUMP SUM	155.8	9	1080	37,848	960
BENT 91	LUMP SUM	151.3	9	1080	37,119	960
BENT 92	LUMP SUM	151.3	9	1080	37,119	960
BENT 93	LUMP SUM	151.3	9	1080	37,119	960
BENT 94	LUMP SUM	176.9	9	1080	43,066	960
BENT 95		45.2	5	425	7,024	534
BENT 96		45.2	5	425	7,024	534
BENT 97		45.2	5	425	7,024	534

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STA. 3144+80 -L-	REMOVAL OF EXISTING STRUCTURE AT STA. 3144+80 -L-	FOUNDATION EXCAVATION	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION AT STA. 3144+80 -L-	REINFORCED CONCRETE DECK SLAB	CONCRETE WEARING SURFACE	GROOVING BRIDGE FLOORS	CLASS AA CONCRETE	BRIDGE APPROACH SLABS AT STA. 3144+80 -L-	30 INCH PRESTRESSED CONCRETE PILES		PILE REDRIVES	TWO BAR METAL RAIL
	LUMP SUM	LUMP SUM	LUMP SUM	EACH	LUMP SUM	SQ. FT.	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	NO.	LIN. FT.	EACH	LIN. FT.
SUPERSTRUCTURE						455,040.0	19,200	413,563						22,386
END BENT 1			LUMP SUM						61.9		4	200		
BENTS ●(SEE ABOVE)			●						●		●	●		
END BENT 2			LUMP SUM						61.9		4	200		
CONCRETE SHEET PILE WALL														694
TOTAL BRIDGE	LUMP SUM	LUMP SUM	LUMP SUM	37	LUMP SUM	455,040.0	19,200	413,563	14,939.5	LUMP SUM	857	89,980	214	23,080

TOTAL BILL OF MATERIAL (CONT'S)

	1'-2"X 3'-0" CONCRETE PARAPET	ELASTOMERIC BEARINGS	FOAM JOINT SEALS	MODULAR EXPANSION JOINT SEALS	3'-0"x 2'-0" PRESTRESSED CONCRETE CORED SLABS	CONCRETE SHEET PILE WALL	CONCRETE MOMENT SLAB	REINFORCED APPROACH FILLS	OFFSITE JETTING SOIL DISPOSAL	F.I.B 72" PRESTRESSED CONCRETE GIRDERS	STAINLESS STEEL REINFORCING	SPIRAL STAINLESS STEEL REINFORCING
	LIN. FT.	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	SQ. FT.	CU. YDS.	LIN. FT.	LBS.	LBS.
SUPERSTRUCTURE	22,415.3	LUMP SUM	LUMP SUM	LUMP SUM	7,153.13					42,420.8		
END BENT 1											7,459	427
BENTS ●(SEE ABOVE)											●	●
END BENT 2											7,459	427
CONCRETE SHEET PILE WALL	709.00					920.62	709.00					
TOTAL BRIDGE	23,124.3	LUMP SUM	LUMP SUM	LUMP SUM	7,153.13	920.62	709.00	4,800	25,000	42,420.8	3,554,107	91,418

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
TOTAL BILL
OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
5-30-13

DRAWN BY : CLG DATE : 4-12
CHECKED BY : TRL DATE : 4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-60
1			3			TOTAL SHEETS
2			4			219

5/30/2013 5:06:41 PM R:\Structures\usta\1060\Gen Dwg TotalBOM.dgn

	FOUNDATION EXCAVATION	CLASS AA CONCRETE	30 INCH PRESTRESSED CONCRETE PILES		36 INCH PRESTRESSED CONCRETE PILES		STAINLESS STEEL REINFORCING	SPIRAL STAINLESS STEEL REINFORCING
	LUMP SUM	CU. YARDS	NO.	LIN. FT.	NO.	LIN. FT.	LBS.	LBS.
BENT 1		45.2	5	425			7,024	534
BENT 2		45.2	5	425			7,024	534
BENT 3		45.2	5	425			7,024	534
BENT 4	LUMP SUM	200.9			8	840	48,329	1,030
BENT 5	LUMP SUM	175.3			8	840	42,382	1,030
BENT 6	LUMP SUM	181.3			8	840	42,099	1,030
BENT 7	LUMP SUM	181.3			8	840	42,099	1,030
BENT 8	LUMP SUM	181.3			8	840	42,099	1,030
BENT 9	LUMP SUM	181.3			8	840	42,099	1,030
BENT 10	LUMP SUM	181.3			8	840	42,099	1,030
BENT 11	LUMP SUM	181.3			8	840	42,099	1,030
BENT 12	LUMP SUM	181.3			8	840	42,099	1,030
BENT 13	LUMP SUM	181.3			8	840	42,099	1,030
BENT 14	LUMP SUM	181.3			8	840	42,099	1,030
BENT 15	LUMP SUM	181.3			8	840	42,099	1,030
BENT 16	LUMP SUM	181.3			8	840	42,099	1,030
BENT 17	LUMP SUM	181.3			8	840	42,099	1,030
BENT 18	LUMP SUM	181.3			8	840	42,099	1,030
BENT 19	LUMP SUM	181.3			8	840	42,099	1,030
BENT 20	LUMP SUM	181.3			8	840	42,099	1,030
BENT 21	LUMP SUM	181.3			8	840	42,099	1,030
BENT 22	LUMP SUM	185.2			8	840	42,750	1,030
BENT 23	LUMP SUM	185.0			8	840	42,793	1,030
BENT 24	LUMP SUM	185.0			8	840	42,793	1,030
BENT 25	LUMP SUM	188.3			8	840	43,374	1,030
BENT 26	LUMP SUM	188.3			8	840	43,409	1,030
BENT 27	LUMP SUM	188.3			8	840	43,409	1,030
BENT 28	LUMP SUM	189.0			8	840	43,129	1,030
BENT 29	LUMP SUM	189.0			8	840	43,285	1,030
BENT 30	LUMP SUM	189.0			8	840	43,285	1,030
BENT 31	LUMP SUM	189.0			8	840	43,285	1,030
BENT 32	LUMP SUM	184.2			8	840	42,532	1,030
BENT 33	LUMP SUM	184.2			8	840	42,532	1,030

	FOUNDATION EXCAVATION	CLASS AA CONCRETE	30 INCH PRESTRESSED CONCRETE PILES		36 INCH PRESTRESSED CONCRETE PILES		STAINLESS STEEL REINFORCING	SPIRAL STAINLESS STEEL REINFORCING
	LUMP SUM	CU. YARDS	NO.	LIN. FT.	NO.	LIN. FT.	LBS.	LBS.
BENT 34	LUMP SUM	181.3			8	840	42,099	1,030
BENT 35	LUMP SUM	181.3			8	840	42,099	1,030
BENT 36	LUMP SUM	181.3			8	840	42,099	1,030
BENT 37	LUMP SUM	181.3			8	840	42,099	1,030
BENT 38	LUMP SUM	181.3			8	840	42,099	1,030
BENT 39	LUMP SUM	181.3			8	840	42,099	1,030
BENT 40	LUMP SUM	181.3			8	840	42,099	1,030
BENT 41	LUMP SUM	179.8			8	840	41,802	1,030
BENT 42	LUMP SUM	179.8			8	840	41,802	1,030
BENT 43	LUMP SUM	179.8			8	840	41,802	1,030
BENT 44	LUMP SUM	179.8			8	840	41,802	1,030
BENT 45	LUMP SUM	179.8			8	840	41,802	1,030
BENT 46	LUMP SUM	179.8			8	840	41,802	1,030
BENT 47	LUMP SUM	179.8			8	840	41,802	1,030
BENT 48	LUMP SUM	179.8			8	840	41,802	1,030
BENT 49	LUMP SUM	179.8			8	840	41,802	1,030
BENT 50	LUMP SUM	179.8			8	840	41,802	1,030
BENT 51	LUMP SUM	180.7			8	840	42,137	1,030
BENT 52	LUMP SUM	177.8			8	840	41,144	1,030
BENT 53	LUMP SUM	177.8			8	840	41,144	1,030
BENT 54	LUMP SUM	177.8			8	840	41,144	1,030
BENT 55	LUMP SUM	177.8			8	840	41,144	1,030
BENT 56	LUMP SUM	177.8			8	840	41,144	1,030
BENT 57	LUMP SUM	179.8			8	840	41,486	1,030
BENT 58	LUMP SUM	179.8			8	840	41,486	1,030
BENT 59	LUMP SUM	183.6			8	840	41,990	1,030
BENT 60	LUMP SUM	183.6			8	840	41,990	1,030
BENT 61	LUMP SUM	159.9	9	945			38,243	960
BENT 62	LUMP SUM	162.0	9	945			38,536	960
BENT 63	LUMP SUM	161.6	9	945			38,387	960
BENT 64	LUMP SUM	161.6	9	945			38,387	960
BENT 65	LUMP SUM	189.3			8	840	43,001	1,030
BENT 66	LUMP SUM	189.3			8	840	43,001	1,030

	FOUNDATION EXCAVATION	CLASS AA CONCRETE	30 INCH PRESTRESSED CONCRETE PILES		36 INCH PRESTRESSED CONCRETE PILES		STAINLESS STEEL REINFORCING	SPIRAL STAINLESS STEEL REINFORCING
	LUMP SUM	CU. YARDS	NO.	LIN. FT.	NO.	LIN. FT.	LBS.	LBS.
BENT 67	LUMP SUM	193.8			8	840	43,732	1,030
BENT 68	LUMP SUM	193.8			8	840	43,732	1,030
BENT 69	LUMP SUM	169.8	9	945			39,778	960
BENT 70	LUMP SUM	193.8			8	840	43,732	1,030
BENT 71	LUMP SUM	193.8			8	840	43,732	1,030
BENT 72	LUMP SUM	193.8			8	840	43,732	1,030
BENT 73	LUMP SUM	193.8			8	840	43,732	1,030
BENT 74	LUMP SUM	193.8			8	840	43,732	1,030
BENT 75	LUMP SUM	193.8			8	840	43,732	1,030
BENT 76	LUMP SUM	169.8	9	945			39,778	960
BENT 77	LUMP SUM	193.8			8	840	43,732	1,030
BENT 78	LUMP SUM	170.2	9	945			39,779	960
BENT 79	LUMP SUM	165.6	9	945			39,211	960
BENT 80	LUMP SUM	159.6	9	945			38,036	960
BENT 81	LUMP SUM	159.6	9	945			38,036	960
BENT 82	LUMP SUM	179.8			8	880	41,486	1,030
BENT 83	LUMP SUM	179.8			8	880	41,486	1,030
BENT 84	LUMP SUM	177.8			8	880	41,144	1,030
BENT 85	LUMP SUM	177.8			8	880	41,144	1,030
BENT 86	LUMP SUM	177.8			8	880	41,144	1,030
BENT 87	LUMP SUM	178.4			8	880	41,144	1,030
BENT 88	LUMP SUM	183.7			8	880	42,392	1,030
BENT 89	LUMP SUM	179.8			8	880	41,802	1,030
BENT 90	LUMP SUM	179.8			8	960	41,802	1,030
BENT 91	LUMP SUM	175.3			8	960	42,382	1,030
BENT 92	LUMP SUM	175.3			8	960	42,382	1,030
BENT 93	LUMP SUM	175.3			8	960	42,382	1,030
BENT 94	LUMP SUM	200.9			8	960	48,329	1,030
BENT 95		45.2	5	425			7,024	534
BENT 96		45.2	5	425			7,024	534
BENT 97		45.2	5	425			7,024	534

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STA. 3144+80 -L-	REMOVAL OF EXISTING STRUCTURE AT STA. 3144+80 -L-	FOUNDATION EXCAVATION	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION AT STA. 3144+80 -L-	REINFORCED CONCRETE DECK SLAB	CONCRETE WEARING SURFACE	GROOVING BRIDGE FLOORS	CLASS AA CONCRETE	BRIDGE APPROACH SLABS AT STA. 3144+80 -L-	30 INCH PRESTRESSED CONCRETE PILES		PILE REDRIVES	TWO BAR METAL RAIL
	LUMP SUM	LUMP SUM	LUMP SUM	EACH	LUMP SUM	SQ. FT.	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	NO.	LIN. FT.	EACH	LIN. FT.
SUPERSTRUCTURE						455,040.0	19,200	413,563						22,386
END BENT 1			LUMP SUM						61.9		4	200		
BENTS ●(SEE ABOVE)			●						●		●	●		
END BENT 2			LUMP SUM						61.9		4	200		
CONCRETE SHEET PILE WALL														694
TOTAL BRIDGE	LUMP SUM	LUMP SUM	LUMP SUM	37	LUMP SUM	455,040.0	19,200	413,563	16,884.1	LUMP SUM	128	12,400	214	23,080

TOTAL BILL OF MATERIAL (CONT'S)

	1'-2"X 3'-0" CONCRETE PARAPET	ELASTOMERIC BEARINGS	FOAM JOINT SEALS	MODULAR EXPANSION JOINT SEALS	3'-0"x 2'-0" PRESTRESSED CONCRETE CORED SLABS	CONCRETE SHEET PILE WALL	CONCRETE MOMENT SLAB	REINFORCED APPROACH FILLS	OFFSITE JETTING SOIL DISPOSAL	F.I.B 72" PRESTRESSED CONCRETE GIRDERS	36 INCH PRESTRESSED CONCRETE PILES		STAINLESS STEEL REINFORCING	SPIRAL STAINLESS STEEL REINFORCING
	LIN. FT.	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	SQ. FT.	CU. YDS.	LIN. FT.	NO.	LIN. FT.	LBS.	LBS.
SUPERSTRUCTURE	22,415.3	LUMP SUM	LUMP SUM	LUMP SUM	7,153.13					42,420.8				
END BENT 1													7,459	427
BENTS ●(SEE ABOVE)											●	●	●	●
END BENT 2													7,459	427
CONCRETE SHEET PILE WALL	709.00					920.62	709.00							
TOTAL BRIDGE	23,124.3	LUMP SUM	LUMP SUM	LUMP SUM	7,153.13	920.62	709.00	4,800	25,000	42,420.8	648	68,960	3,882,235	97,088

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
TOTAL BILL
OF MATERIAL
ALTERNATE 1

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 5-30-13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-61
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : CLG DATE : 4-12
CHECKED BY : TRL DATE : 4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St. Ste. 200
Charlotte, NC 28208
NC License No. F-0991

5/30/2013 5:07:27 PM R:\Structures\ustr0\06i) Gen Dwg TotalBOM Alt 1.dgn

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	⟨#⟩ CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	⟨1⟩	1.08	--	1.75	0.26	1.16	2,3,4,95,96,97	3 & 13	29.4	0.60	1.35	2,3,4,95,96,97	3 & 13	5.5	0.80	0.26	1.08	2,3,4,95,96,97	3 & 13	29.4	
		HL-93 (OPERATING)	N/A		1.50	--	1.35	0.26	1.50	2,3,4,95,96,97	3 & 13	29.4	0.60	1.80	2,3,4,95,96,97	3 & 13	5.5	N/A	--	--	--	3 & 13	--	
		HS-20 (INVENTORY)	36.000	⟨2⟩	1.37	49.320	1.75	0.26	1.47	2,3,4,95,96,97	3 & 13	29.4	0.60	1.68	2,3,4,95,96,97	3 & 13	5.5	0.80	0.26	1.37	2,3,4,95,96,97	3 & 13	29.4	
		HS-20 (OPERATING)	36.000		1.91	68.760	1.35	0.26	1.91	2,3,4,95,96,97	3 & 13	29.4	0.60	2.23	2,3,4,95,96,97	3 & 13	5.5	N/A	--	--	--	3 & 13	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.94	39.690	1.40	0.26	3.96	2,3,4,95,96,97	3 & 13	29.4	0.60	5.19	2,3,4,95,96,97	3 & 13	5.5	0.80	0.26	2.94	2,3,4,95,96,97	3 & 13	29.4	
		SNGARBS2	20.000		2.25	45.000	1.40	0.26	3.03	2,3,4,95,96,97	3 & 13	29.4	0.60	3.69	2,3,4,95,96,97	3 & 13	5.5	0.80	0.26	2.25	2,3,4,95,96,97	3 & 13	29.4	
		SNAGRIS2	22.000		2.16	47.520	1.40	0.26	2.90	2,3,4,95,96,97	3 & 13	29.4	0.60	3.43	2,3,4,95,96,97	3 & 13	5.5	0.80	0.26	2.16	2,3,4,95,96,97	3 & 13	29.4	
		SNCOTTS3	27.250		1.46	39.785	1.40	0.26	1.97	2,3,4,95,96,97	3 & 13	29.4	0.60	2.50	2,3,4,95,96,97	3 & 13	5.5	0.80	0.26	1.46	2,3,4,95,96,97	3 & 13	29.4	
		SNAGGRS4	34.925		1.25	43.656	1.40	0.26	1.68	2,3,4,95,96,97	3 & 13	29.4	0.60	2.08	2,3,4,95,96,97	3 & 13	5.5	0.80	0.26	1.25	2,3,4,95,96,97	3 & 13	29.4	
		SNS5A	35.550		1.22	43.371	1.40	0.26	1.64	2,3,4,95,96,97	3 & 13	29.4	0.60	2.12	2,3,4,95,96,97	3 & 13	5.5	0.80	0.26	1.22	2,3,4,95,96,97	3 & 13	29.4	
		SNS6A	39.950		1.13	45.144	1.40	0.26	1.52	2,3,4,95,96,97	3 & 13	29.4	0.60	1.93	2,3,4,95,96,97	3 & 13	5.5	0.80	0.26	1.13	2,3,4,95,96,97	3 & 13	29.4	
		SNS7B	42.000		1.07	44.940	1.40	0.26	1.45	2,3,4,95,96,97	3 & 13	29.4	0.60	1.92	2,3,4,95,96,97	3 & 13	5.5	0.80	0.26	1.07	2,3,4,95,96,97	3 & 13	29.4	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.38	45.540	1.40	0.26	1.85	2,3,4,95,96,97	3 & 13	29.4	0.60	2.32	2,3,4,95,96,97	3 & 13	5.5	0.80	0.26	1.38	2,3,4,95,96,97	3 & 13	29.4	
		TNT4A	33.075		1.39	45.974	1.40	0.26	1.87	2,3,4,95,96,97	3 & 13	29.4	0.60	2.26	2,3,4,95,96,97	3 & 13	5.5	0.80	0.26	1.39	2,3,4,95,96,97	3 & 13	29.4	
		TNT6A	41.600		1.14	47.424	1.40	0.26	1.54	2,3,4,95,96,97	3 & 13	29.4	0.60	2.10	2,3,4,95,96,97	3 & 13	5.5	0.80	0.26	1.14	2,3,4,95,96,97	3 & 13	29.4	
		TNT7A	42.000		1.15	48.300	1.40	0.26	1.55	2,3,4,95,96,97	3 & 13	29.4	0.60	1.99	2,3,4,95,96,97	3 & 13	5.5	0.80	0.26	1.15	2,3,4,95,96,97	3 & 13	29.4	
		TNT7B	42.000		1.20	50.400	1.40	0.26	1.62	2,3,4,95,96,97	3 & 13	29.4	0.60	1.85	2,3,4,95,96,97	3 & 13	5.5	0.80	0.26	1.20	2,3,4,95,96,97	3 & 13	29.4	
		TNAGRIT4	43.000		1.14	49.020	1.40	0.26	1.53	2,3,4,95,96,97	3 & 13	29.4	0.60	1.79	2,3,4,95,96,97	3 & 13	5.5	0.80	0.26	1.14	2,3,4,95,96,97	3 & 13	29.4	
		TNAGRT5A	45.000		1.07	48.150	1.40	0.26	1.44	2,3,4,95,96,97	3 & 13	29.4	0.60	1.80	2,3,4,95,96,97	3 & 13	5.5	0.80	0.26	1.07	2,3,4,95,96,97	3 & 13	29.4	
		TNAGRT5B	45.000	⟨3⟩	1.05	47.250	1.40	0.26	1.42	2,3,4,95,96,97	3 & 13	29.4	0.60	1.70	2,3,4,95,96,97	3 & 13	5.5	0.80	0.26	1.05	2,3,4,95,96,97	3 & 13	29.4	

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{DC}	γ_{DW}
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

1. MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.
2. ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

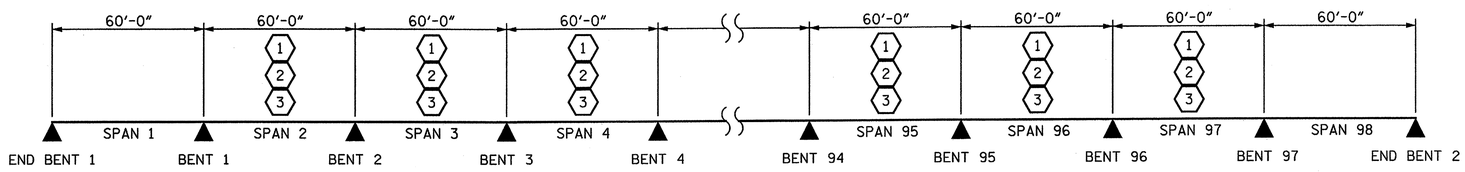
⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE



LRFR SUMMARY

(SPAN LENGTHS ARE ALONG GRADELINE)

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR PRESTRESSED CORED SLAB UNITS

(NON INTERSTATE TRAFFIC)

DRAWN BY : RKL DATE : 3-12

CHECKED BY : SNA DATE : 3-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-62
1			3			TOTAL SHEETS
2			4			219

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LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	⟨#⟩ CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W × RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT					
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	⟨1⟩	1.11	--	1.75	1.03	1.78	53,54,55,68,69,77,78,86,87	E	59.3	1.16	1.24	26,27	I	94.6,23.1	0.80	1.03	1.11	53,54,55,68,69,77,78,86,87	E	59.3	
		HL-93 (OPERATING)	N/A		1.65	--	1.35	1.03	2.31	86,87,53,54,55,68,69,77,78	E	59.3	1.16	1.65	26,27	I	94.6,23.1	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36	⟨2⟩	1.63	58.68	1.75	1.03	2.61	53,54,55,68,69,77,78,86,87	E	59.3	1.16	1.73	26,27	I	94.6,23.1	0.80	1.03	1.63	53,54,55,68,69,77,78,86,87	E	59.3	
		HS-20 (OPERATING)	36		2.28	82.08	1.35	1.03	3.38	86,87,53,54,55,68,69,77,78	E	59.3	1.16	2.28	26,27	I	94.6,23.1	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.5		3.95	53.33	1.40	1.03	7.91	53,54,55,68,69,77,78,86,87	E	59.3	1.16	5.62	26,27	I	94.6,23.1	0.80	1.03	3.95	68,69,77,78,86,87	E	59.3	
		SNGARBS2	20		2.83	56.60	1.40	1.03	5.65	53,54,55,68,69,77,78,86,87	E	59.3	1.16	3.89	26,27	I	94.6,23.1	0.80	1.03	2.83	53,54,55,68,69,77,78,86,87	E	59.3	
		SNAGRIS2	22		2.63	57.86	1.40	1.03	5.25	68,69,77,78,86,87	E	59.3	1.16	3.57	26,27	I	94.6,23.1	0.80	1.03	2.63	53,54,55,68,69,77,78,86,87	E	59.3	
		SNCOTTS3	27.25		1.96	53.41	1.40	1.03	3.93	53,54,55,68,69,77,78,86,87	E	59.3	1.16	2.73	26,27	I	94.6,23.1	0.80	1.03	1.96	53,54,55,68,69,77,78,86,87	E	59.3	
		SNAGGRS4	34.92		1.59	55.52	1.40	1.03	3.19	53,54,55,68,69,77,78,86,87	E	59.3	1.16	2.19	26,27	I	94.6,23.1	0.80	1.03	1.59	53,54,55,68,69,77,78,86,87	E	59.3	
		SNS5A	35.55		1.56	55.46	1.40	1.03	3.12	53,54,55,68,69,77,78,86,87	E	59.3	1.16	2.2	26,27	I	94.6,23.1	0.80	1.03	1.56	53,54,55,68,69,77,78,86,87	E	59.3	
		SNS6A	39.95		1.41	56.33	1.40	1.03	2.83	53,54,55,68,69,77,78,86,87	E	59.3	1.16	1.97	26,27	I	94.6,23.1	0.80	1.03	1.41	53,54,55,68,69,77,78,86,87	E	59.3	
		SNS7B	42		1.35	56.70	1.40	1.03	2.69	53,54,55,68,69,77,78,86,87	E	59.3	1.16	1.91	26,27	I	94.6,23.1	0.80	1.03	1.35	53,54,55,68,69,77,78,86,87	E	59.3	
		SNS7B	42		1.35	56.70	1.40	--	--	--	--	--	--	--	--	--	--	0.80	0.94	1.35	24,25	I	58.9	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33		1.72	56.76	1.40	1.03	3.44	53,54,55,68,69,77,78,86,87	E	59.3	1.16	2.39	26,27	I	94.6,23.1	0.80	1.03	1.72	53,54,55,68,69,77,78,86,87	E	59.3	
		TNT4A	33.08		1.72	56.90	1.40	1.03	3.44	53,54,55,68,69,77,78,86,87	E	59.3	1.16	2.35	26,27	I	94.6,23.1	0.80	1.03	1.72	53,54,55,68,69,77,78,86,87	E	59.3	
		TNT6A	41.6		1.39	57.82	1.40	1.03	2.78	53,54,55,68,69,77,78,86,87	E	59.3	1.16	2.01	26,27	I	94.6,23.1	0.80	1.03	1.39	53,54,55,68,69,77,78,86,87	E	59.3	
		TNT7A	42		1.39	58.38	1.40	1.03	2.78	53,54,55,68,69,77,78,86,87	E	59.3	1.16	1.97	26,27	I	94.6,23.1	0.80	1.03	1.39	53,54,55,68,69,77,78,86,87	E	59.3	
		TNT7A	42		1.39	58.38	1.40	--	--	--	--	--	--	--	--	--	--	0.80	0.94	1.39	24,25	I	58.9	
		TNT7B	42		1.41	59.22	1.40	1.03	2.83	53,54,55,68,69,77,78,86,87	E	59.3	1.16	1.88	26,27	I	94.6,23.1	0.80	1.03	1.41	53,54,55,68,69,77,78,86,87	E	59.3	
		TNAGRIT4	43		1.36	58.48	1.40	1.03	2.72	53,54,55,68,69,77,78,86,87	E	59.3	1.16	1.83	26,27	I	94.6,23.1	0.80	1.03	1.36	53,54,55,68,69,77,78,86,87	E	59.3	
		TNAGRT5A	45		1.29	58.05	1.40	1.03	2.58	53,54,55,68,69,77,78,86,87	E	59.3	1.16	1.79	26,27	I	94.6,23.1	0.80	1.03	1.29	53,54,55,68,69,77,78,86,87	E	59.3	
		TNAGRT5B	45	⟨3⟩	1.28	57.60	1.40	1.03	2.57	53,54,55,68,69,77,78,86,87	E	59.3	1.16	1.73	26,27	I	94.6,23.1	0.80	1.03	1.28	53,54,55,68,69,77,78,86,87	E	59.3	

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{DC}	γ_{DW}
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

1. MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.
2. ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

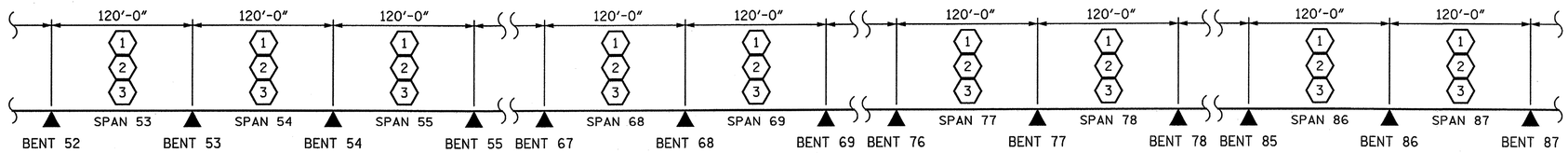
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY

(SPAN LENGTHS ARE ALONG GRADELINE)

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR FIB 72" PRESTRESSED CONCRETE GIRDER UNITS

(NON INTERSTATE TRAFFIC)

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

DRAWN BY : RKL DATE : 3-12
CHECKED BY : SNA DATE : 3-12

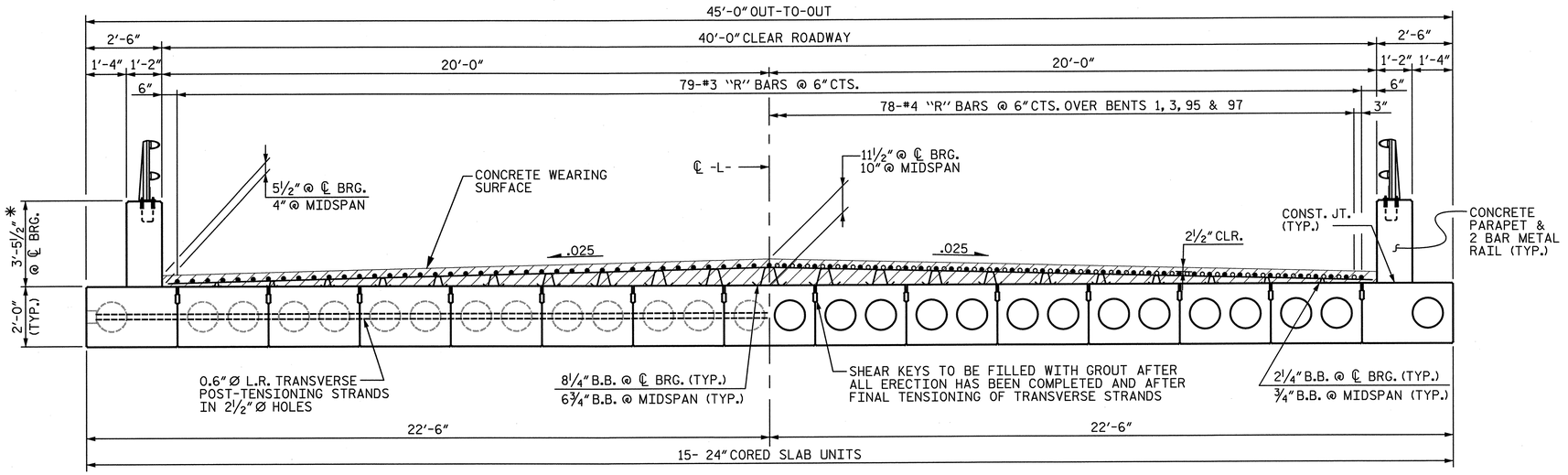
STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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

SHEET NO. S-63

TOTAL SHEETS 219

10/4/2012 12:27:55 PM R:\Structures\usto\1063) FIB Girders LRFR.dgn

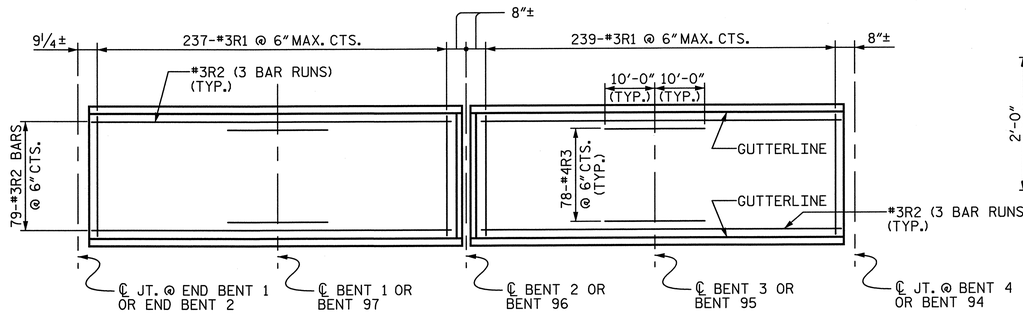


HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

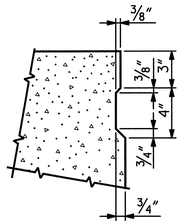
HALF SECTION
THROUGH VOIDS

TYPICAL SECTION

* THE MAXIMUM CONCRETE PARAPET HEIGHT AND CONCRETE THICKNESS IS SHOWN. THE HEIGHT OF THE CONCRETE PARAPET AND CONCRETE THICKNESS VARIES WHILE THE TOP OF THE CONCRETE PARAPET FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR CONCRETE PARAPET DETAILS AND CONCRETE THICKNESS, SEE SHEET 4 OF 4.

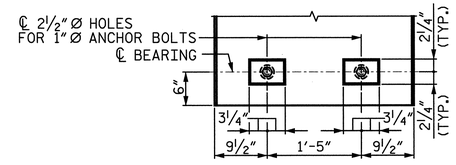


PLAN SHOWING CONCRETE WEARING SURFACE REINFORCING STEEL

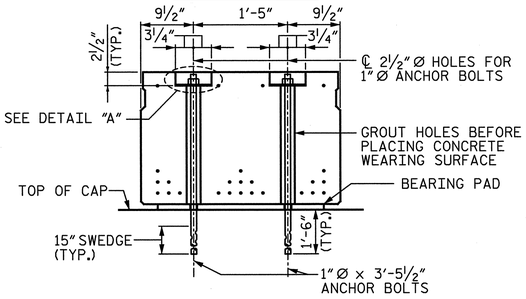


SHEAR KEY DETAIL

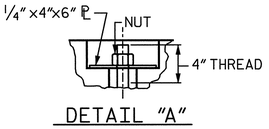
NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.



PLAN VIEW

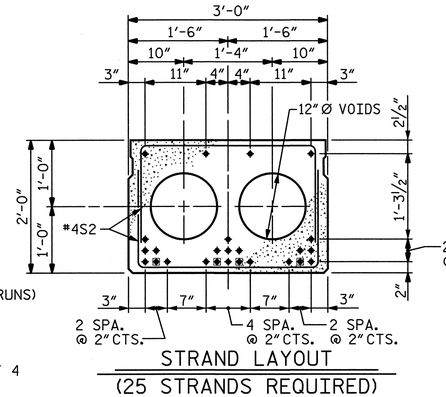


ELEVATION VIEW



DETAIL "A"

CORED SLAB ANCHORAGE DETAIL

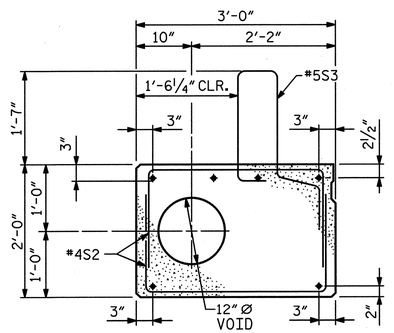


STRAND LAYOUT
(25 STRANDS REQUIRED)

INTERIOR SLAB SECTION
0.6″Ø LOW RELAXATION

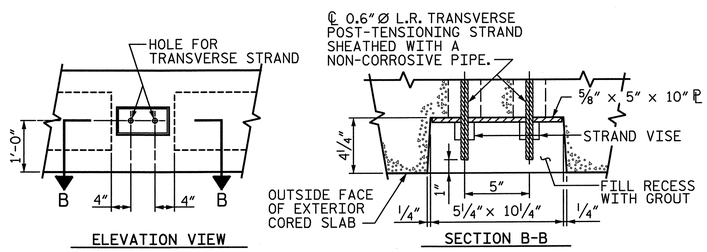
■ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 4′-0″ FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND

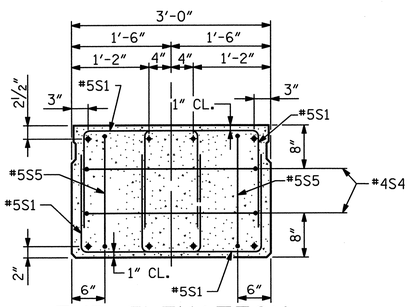


EXTERIOR SLAB SECTION

(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)



GROUTED RECESS AT END OF POST-TENSIONED STRAND OF CORED SLABS



END ELEVATION

SHOWING PLACEMENT OF DOUBLE STIRRUPS (STRAND LAYOUT NOT SHOWN)
INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.
(SEE CORED SLAB ANCHORAGE DETAIL FOR ADDITIONAL INFORMATION.)

NOTES:

1. FOR JOINT DETAILS @ BENTS SEE "SUPERSTRUCTURE DETAILS" SHEETS.

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

UNITS 1-4 & 25-28
3′-0″ X 2′-0″
PRESTRESSED CONCRETE CORED SLAB UNIT

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 5-30-13

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-64
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : LGH DATE : 2-12
CHECKED BY : TJT DATE : 3-12

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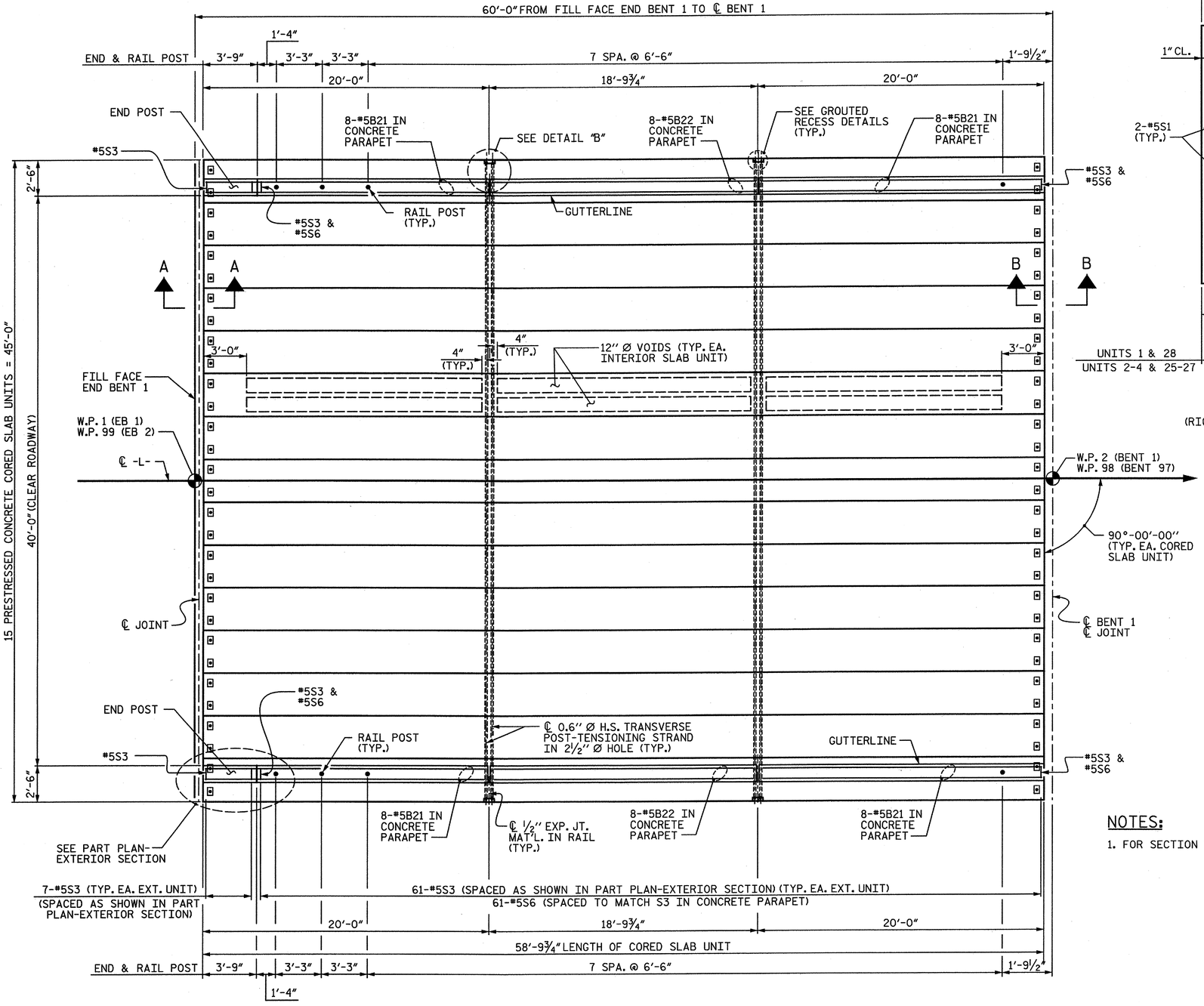
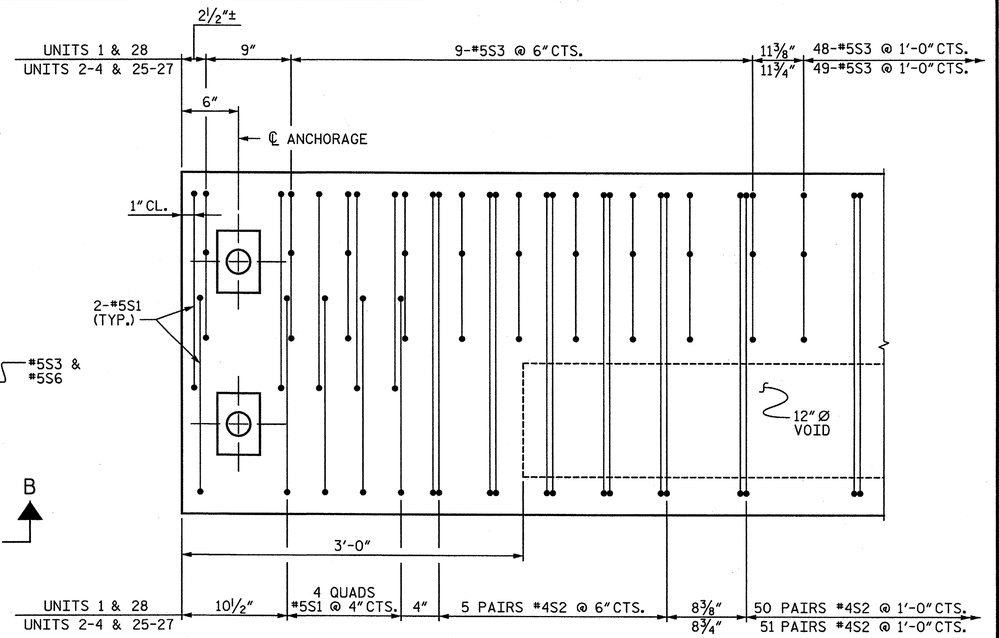


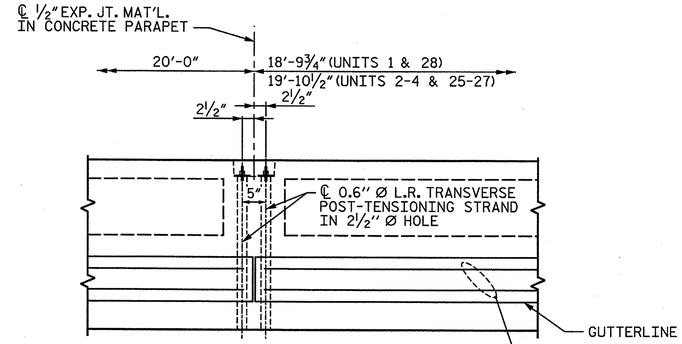
PLAN OF UNIT 1 AND 28

(UNIT 1 SHOWN, UNIT 28 MIRRORED)



PART PLAN-EXTERIOR SECTION

NOTE: EXTERIOR SECTION SHOWN-INTERIOR SECTION SIMILAR EXCEPT OMIT S3 BARS.
(RIGHT EXTERIOR CORED SLAB UNIT SHOWN, LEFT CORED SLAB UNIT S3 BAR LAYOUT FLIPPED)
("S" BAR SPACING/LAYOUT MIRRORED ABOUT ℄ CORED SLAB UNIT)



DETAIL "B"

*4S2 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUTED RECESS AND 2½" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

NOTES:

1. FOR SECTION VIEWS, SEE "SUPERSTRUCTURE DETAILS" SHEET.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

UNITS 1-4 & 25-28 3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLAB UNIT

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		S-65
1			3				TOTAL SHEETS
2			4				219

DRAWN BY : LGH DATE : 2-12
CHECKED BY : TJT DATE : 3-12

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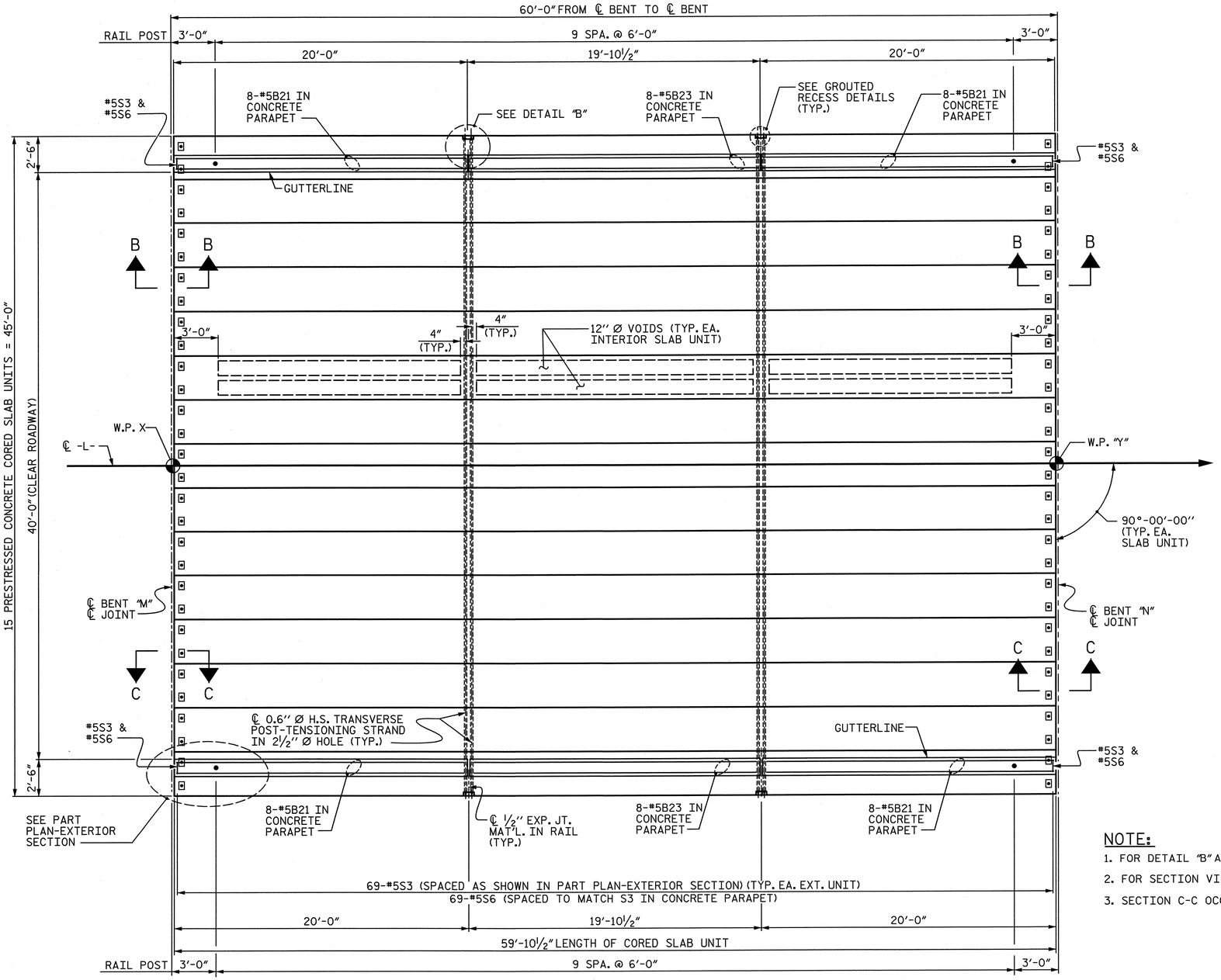
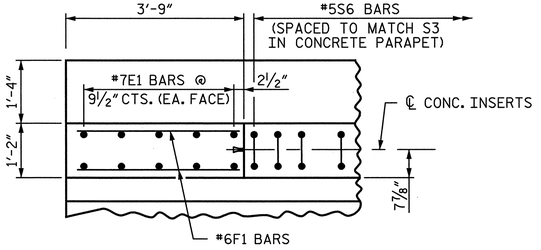
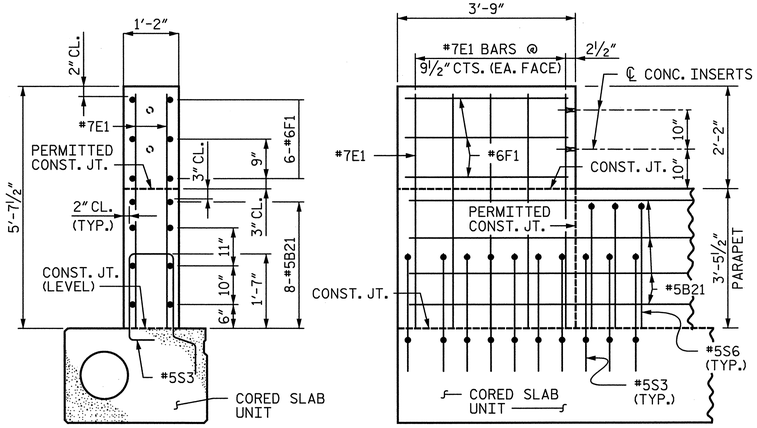
SPAN	"X"	"Y"	"M"	"N"
2	2	3	1	2
3	3	4	2	3
4	4	5	3	4
95	95	96	94	95
96	96	97	95	96
97	97	98	96	97



PLAN OF UNITS 2-4 & 25-27



PLAN OF END BLOCK/PARAPET
(#5S3 & #5B21 BARS NOT SHOWN FOR CLARITY)



PLAN ELEVATION

PARAPET AND END POST FOR TWO BAR METAL RAIL

NOTE:

1. FOR DETAIL "B" AND PART PLAN-EXTENSION SECTION, SEE SHEET 2 OF 4.
2. FOR SECTION VIEWS, SEE "SUPERSTRUCTURE DETAILS" SHEET.
3. SECTION C-C OCCURS AT BENTS 4 & 94.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

UNITS 1-4 & 25-28
3'-0" X 2'-0"
PRESTRESSED CONCRETE
CORED SLAB UNIT

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
5-30-13

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-66
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : LGH DATE : 2-12
CHECKED BY : TJT DATE : 3-12

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GRADE 270 STRANDS	
	0.6″Ø L.R.
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950

CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
UNITS 1 & 28			
EXTERIOR C.S.	4	58′-9¾″	235′-3″
INTERIOR C.S.	26	58′-9¾″	1,529′-1½″
TOTAL	30		1,764′-4½″
UNITS 2-4 & 25-27			
EXTERIOR C.S.	12	59′-10½″	718′-6″
INTERIOR C.S.	78	59′-10½″	4,670′-3″
TOTAL	90		5,388′-9″

DEAD LOAD DEFLECTION AND CAMBER

3′-0″X 2′-0″	UNITS 1 & 28 0.6″Ø L.R. STRAND			UNITS 2-4 & 25-27 0.6″Ø L.R. STRAND		
SLAB	1-3	4-12	13-15	1-3	4-12	13-15
CAMBER (SLAB ALONE IN PLACE) (FT.)	0.163	0.163	0.163	0.163	0.163	0.163
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD (FT.)	-0.055	-0.041	-0.055	-0.059	-0.044	-0.059
FINAL CAMBER (IN.)	1 3/16″	1 7/16″	1 3/16″	1 1/4″	1 7/16″	1 1/4″

GUTTERLINE CONCRETE THICKNESS & PARAPET HEIGHT

	CONCRETE OVERLAY THICKNESS @ MID-SPAN	PARAPET HEIGHT @ MID-SPAN
UNITS 1 & 28	4″	2′-10″
UNITS 2-4 & 25-27	4″	2′-10″

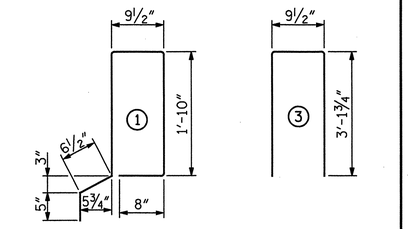
BILL OF MATERIAL FOR CONCRETE PARAPET

BAR	BARS PER SPAN UNIT 1&28	UNIT 2&27	UNIT 3&26	UNIT 4&25	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
✱B21	32	32	32	32	256	#5	STR	19′-7″	5,229
✱B22	16				32	#5	STR	18′-5″	615
✱B23		16	16	16	96	#5	STR	19′-5″	1,944
✱E1	20				40	#7	STR	3′-5″	279
✱F1	24				48	#6	STR	4′-11″	354
✱S6	122	138	138	138	1,072	#5	③	7′-1″	7,920
✱EPOXY COATED REINFORCING STEEL							LBS.		16,341
CLASS AA CONCRETE							CU.YDS.		141.7
TOTAL CONCRETE PARAPET							LN. FT.		955′-3″

BILL OF MATERIAL FOR CONCRETE WEARING SURFACE

BAR	BARS PER BRIDGE END SOUTH END	NORTH END	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
R1	476	476	952	#3	STR	38′-8″	13,841
R2	474	474	948	#3	STR	40′-8″	14,496
R3	156	156	312	#4	STR	20′-0″	4,168
STAINLESS REINFORCING STEEL					LBS.		32,505
CLASS AA CONCRETE					CU.YDS.		457.4
CONCRETE WEARING SURFACE					SQ.FT.		19,200

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

⚠1 ADDED ANCHOR BOLT NOTES

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2½″Ø HOLES AT ENDS OF SLAB SECTIONS SHALL BE FILLED WITH GROUT AT FIXED LOCATIONS ONLY.

WHEN CORED SLABS ARE CAST, AN INTERNAL HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5000 PSI.

ALL REINFORCING STEEL IN CONCRETE PARAPET SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

GROOVED CONTRACTION JOINTS, ½″ IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE CONCRETE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN CONCRETE PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF CONCRETE PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

TRANSVERSE POST TENSIONING OF THE CORED SLAB UNITS SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

MAINTAIN A SYMMETRIC TENSION FORCE BETWEEN EACH PAIR OF TRANSVERSE POST TENSIONING STRANDS IN THE DIAPHRAGM.

THE #4S2 STIRRUPS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1″ CLEAR TO THE GROUTED RECESS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

SEE SUPERSTRUCTURE TYPICAL DETAILS FOR JOINT DETAILS.

SEE "2 BAR METAL RAIL" SHEETS FOR ADDITIONAL RAIL DETAILS.

THE HEIGHT OF THE RAIL VARIES WHILE THE TOP OF THE RAIL FOLLOWS THE GUTTERLINE.

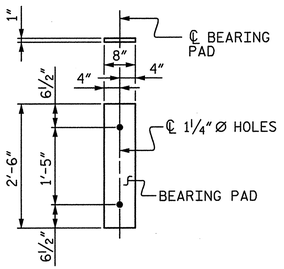
PLACEMENT OF THE CONCRETE WEARING SURFACE SHALL OCCUR AFTER CASTING THE CONCRETE PARAPET. THE COST OF THE #3 & #4 BARS CAST WITH THE CONCRETE WEARING SURFACE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONCRETE WEARING SURFACE. FOR CONCRETE WEARING SURFACE, SEE SPECIAL PROVISION.

CORED SLAB UNITS SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR. SEE STANDARD SPECIFICATIONS FOR CALCIUM NITRITE INHIBITOR.

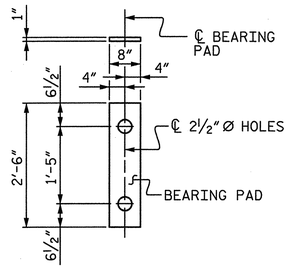
ADDITIONAL HEIGHT OF THE CONCRETE PARAPET ALONG UNITS 1-3 & 95-97 SHALL BE CONSIDERED INCIDENTAL TO THE 1′-2″ X 2′-6″ CONCRETE PARAPET PAY ITEM.

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

⚠1 ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR ASSHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS, WASHERS AND PLATES. SHOP INSPECTION IS REQUIRED.



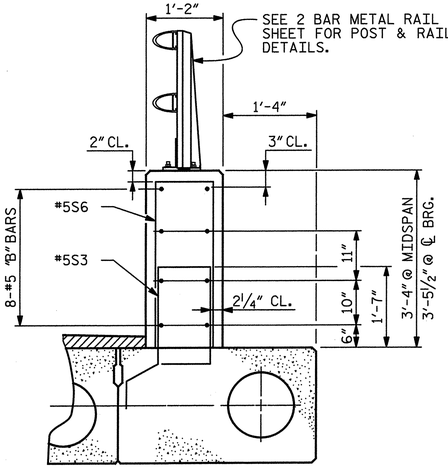
FIXED END
(TYPE I - 180 REQ′D)



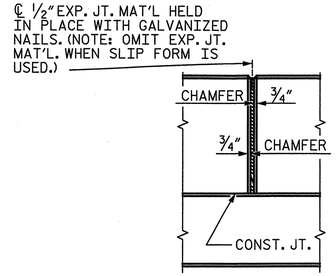
EXPANSION END
(TYPE II - 60 REQ′D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.



SECTION THRU RAIL



ELEVATION AT EXPANSION JOINTS

TWO BAR METAL CONCRETE PARAPET SECTION

BILL OF MATERIAL FOR ONE CORED SLAB UNIT UNITS 1 & 28

BAR	NO.	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
S1	40	#5	②	4′-11″	205	4′-11″	205
S2	120	#4	②	5′-10″	468	5′-10″	468
✱S3	68	#5	①	6′-1″	431		
S4	4	#4	②	5′-9″	15	5′-9″	15
S5	4	#5	②	4′-10½″	13	4′-10½″	13
REINFORCING STEEL		LBS.			701		701
✱EPOXY COATED REINFORCING STEEL		LBS.			431		
6000 P.S.I. CONCRETE		CU. YDS.			11.8		10.5
0.6″Ø L.R. STRANDS		No.			25		25

BILL OF MATERIAL FOR ONE CORED SLAB UNIT UNITS 2-4 & 25-27

BAR	NO.	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
S1	40	#5	②	4′-11″	205	4′-11″	205
S2	122	#4	②	5′-10″	475	5′-10″	475
✱S3	69	#5	①	6′-1″	438		
S4	4	#4	②	5′-9″	15	5′-9″	15
S5	4	#5	②	4′-10½″	13	4′-10½″	13
REINFORCING STEEL		LBS.			708		708
✱EPOXY COATED REINFORCING STEEL		LBS.			438		
6000 P.S.I. CONCRETE		CU. YDS.			12.0		10.7
0.6″Ø L.R. STRANDS		No.			25		25

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

UNITS 1-4 & 25-28 3′-0″X 2′-0″ PRESTRESSED CONCRETE CORED SLAB UNIT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-67
1	STV	11-13	3			TOTAL SHEETS
2			4			219

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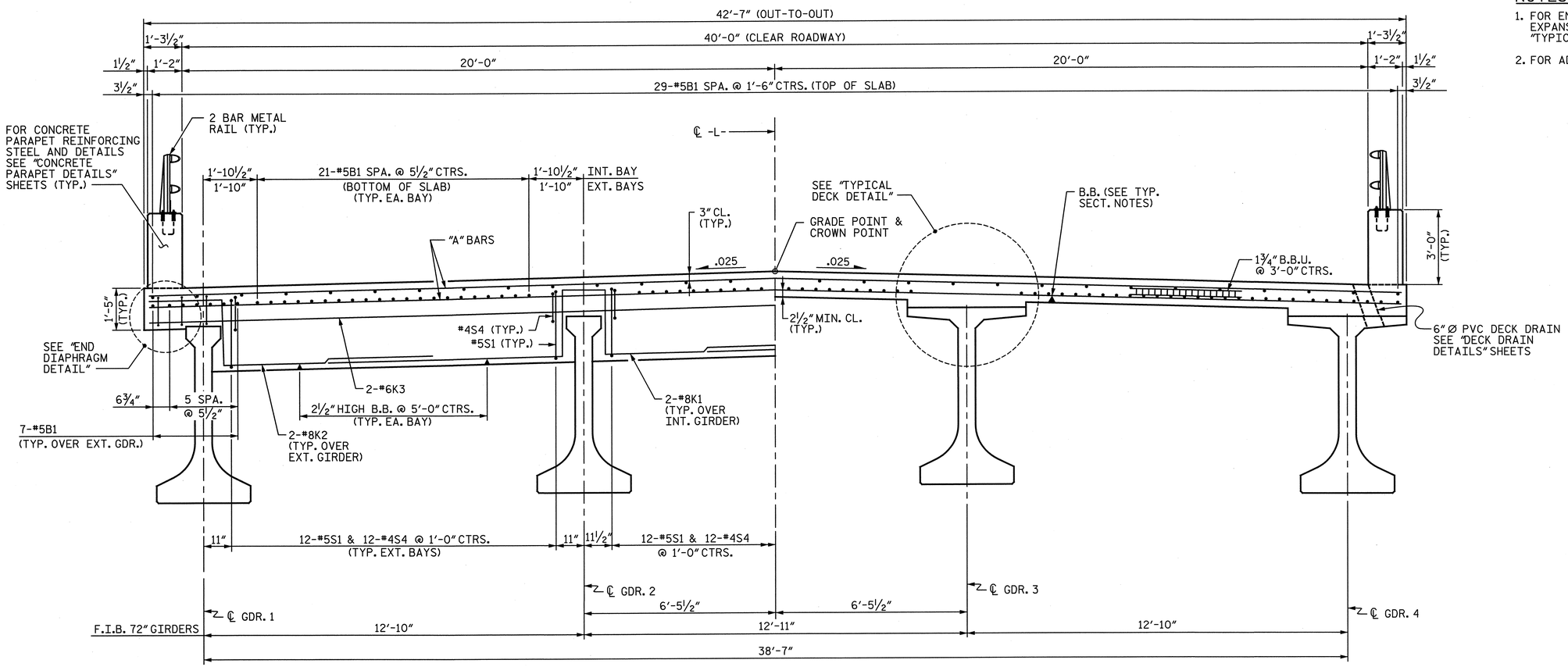
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

DRAWN BY : LGH DATE : 2-12
CHECKED BY : TJT DATE : 3-12

11/13/2013 2:29:17 PM R:\Structures\Updated & Sealed Plans II-II-13\1067) Cored Slab Unit Sht 4 (II-13-13).dgn

NOTES:

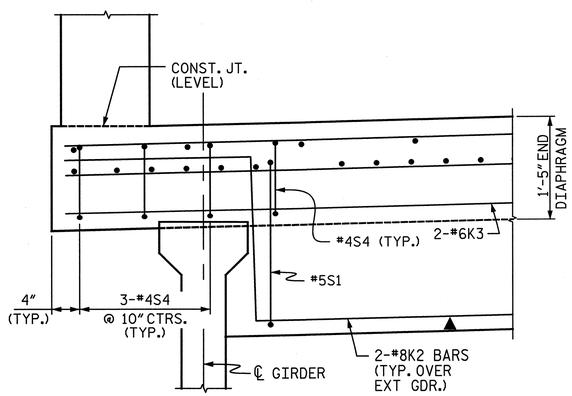
1. FOR END DIAPHRAGM DETAILS (MODULAR EXPANSION JOINT) AT BENTS 6 & 92, SEE "TYPICAL SECTION UNITS 6-8, 11-14 & 23".
2. FOR ADDITIONAL NOTES, SEE SHEET 2 OF 5.



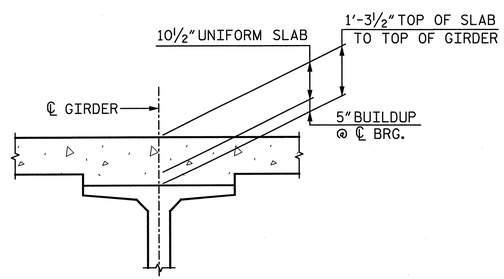
END DIAPHRAGMS
(FOAM EXPANSION JOINT)

AT MIDSPAN

TYPICAL SECTION
(SPANS 5, 6, 93 & 94)



END DIAPHRAGM DETAIL



TYPICAL DECK DETAIL

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION
UNITS 5A, 5B, 24A & 24B

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 5-30-13

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1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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1			3			TOTAL SHEETS
2			4			219

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CHECKED BY : AJP DATE : 3-12

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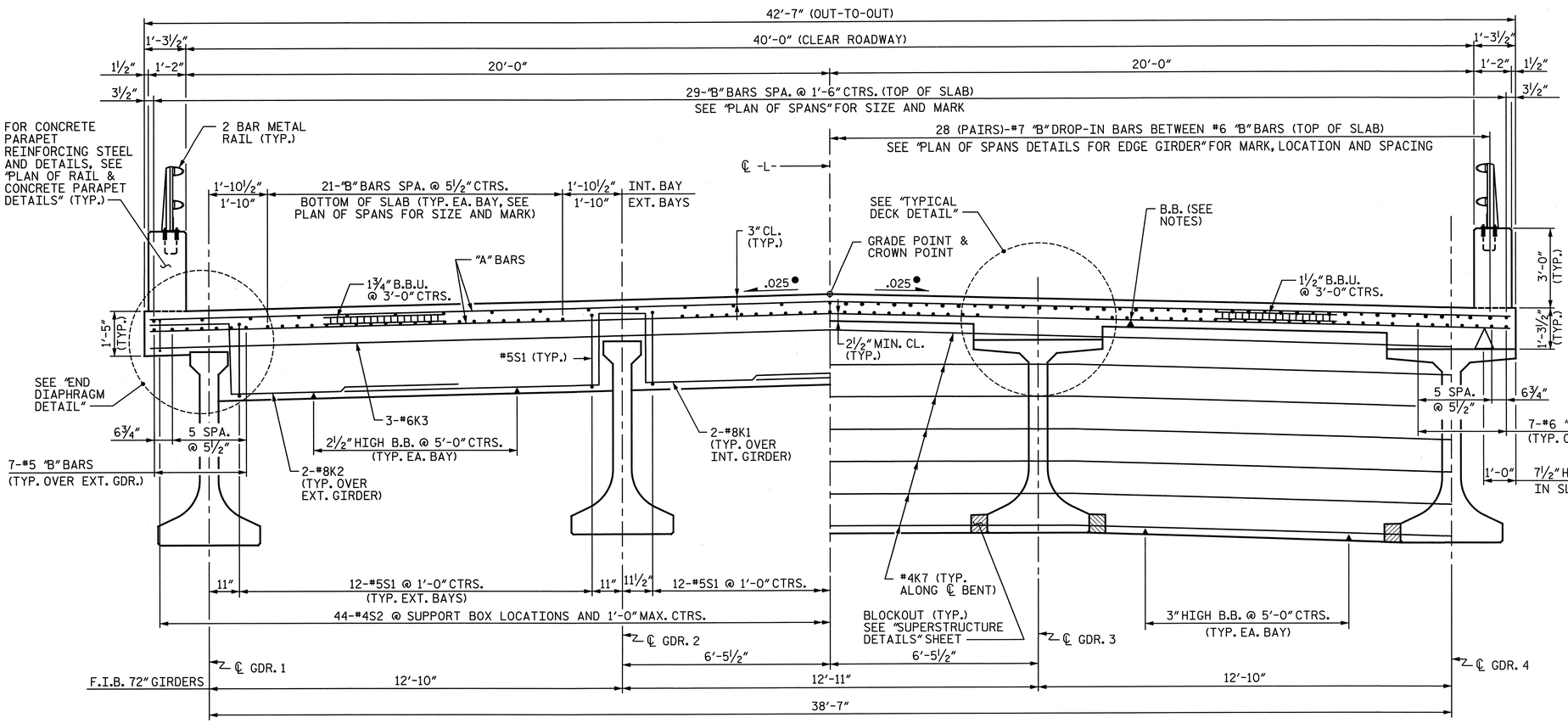


NOTES:

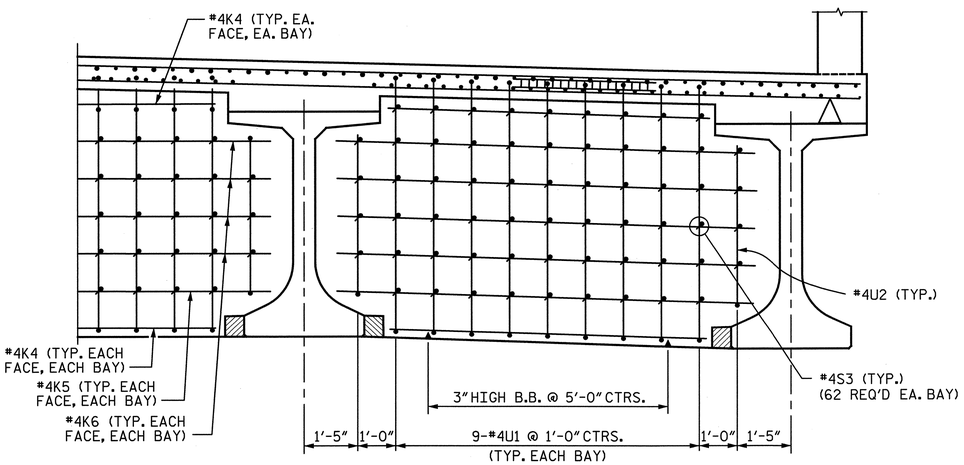
1. PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2½" ABOVE THE TOP OF THE REMOVABLE FORM.
2. LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERANCE WITH DECK DRAINS IN DECK SLAB AND STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.
3. CONCRETE PARAPET IN EACH CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.
4. FOR BARS INDICATED AND NO MARKS SHOWN, SEE PLAN OF SPANS.
5. PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.
6. ANY INCIDENTAL REINFORCING IN THE DECK SHALL BE STAINLESS STEEL.
7. FOR DECK DRAINAGE, SEE "DECK DRAIN DETAILS".
8. HEIGHT OF BEAM BOLSTER & CONTINUOUS HIGH CHAIR IS CALCULATED @ ℄ BENT. CONTRACTOR SHALL ADJUST HEIGHTS, AS NECESSARY TO MAINTAIN PROPER CLEARANCE, DUE TO GIRDER CAMBER OR SUPERELEVATION CHANGE.

END DIAPHRAGMS

TYPICAL SECTION

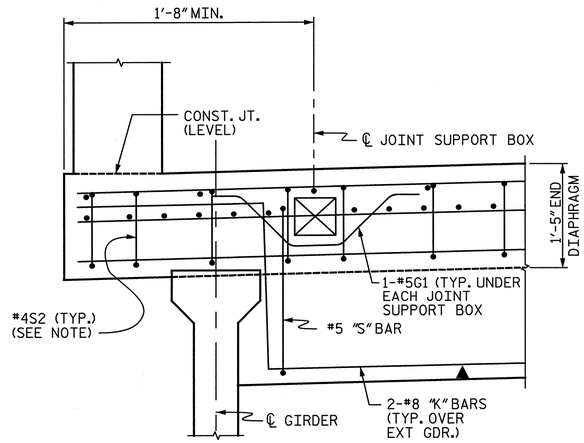
(SPANS 7-21, 31-51 AND 89-92)

CONTINUITY DIAPHRAGMS



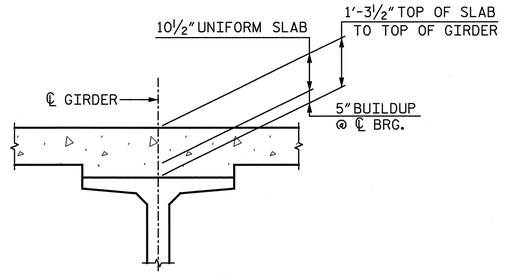
CONTINUITY DIAPHRAGMS

● SUPERELEVATION VARIES BASED ON SPAN. SEE ROADWAY PLANS FOR DETAILS.



END DIAPHRAGM DETAIL

NOTE: PLACE #4S2 BARS AS SHOWN AT SUPPORT BOX LOCATIONS AND @ 1'-0" MAX. CTRS.



TYPICAL DECK DETAIL

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION UNITS 6-8, 11-14 & 23

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 5-30-13

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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1			3			TOTAL SHEETS
2			4			219

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CHECKED BY : AJP DATE : 3-12

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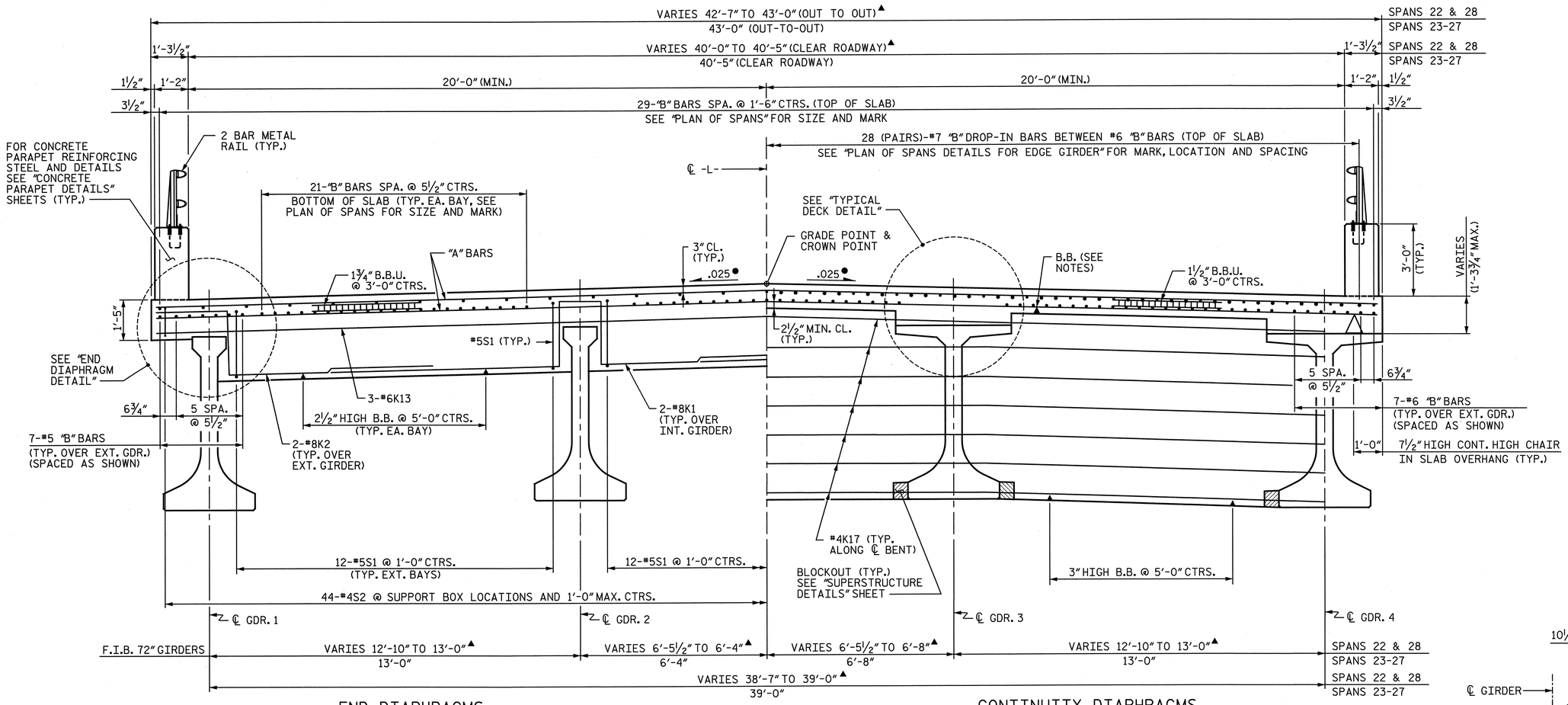


END DIAPHRAGMS

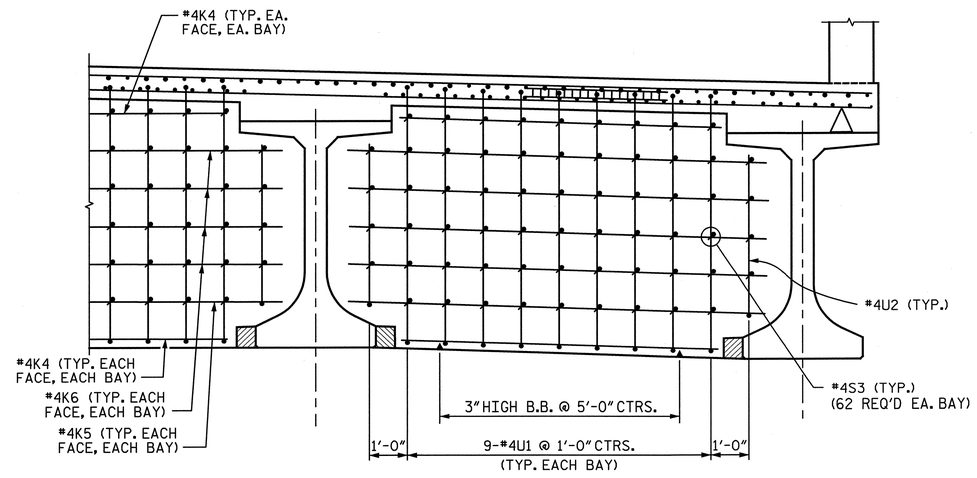
TYPICAL SECTION

(SPANS 22-28)
(FOR SPANS 29-31, SEE "TYPICAL SECTION UNITS 6-8, 11-14 & 23")

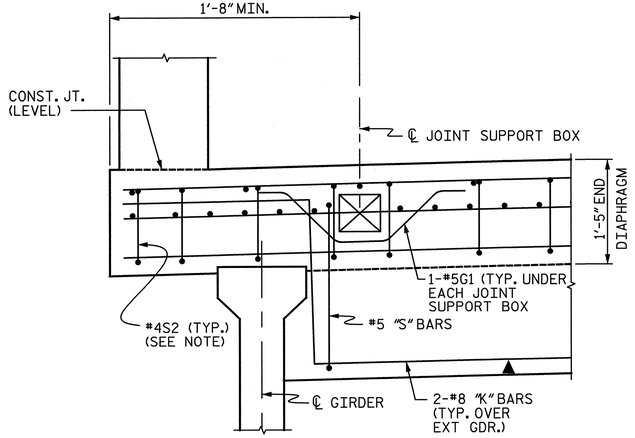
CONTINUITY DIAPHRAGMS

▲ SEE FRAMING PLAN FOR GIRDER SPACING IN INDIVIDUAL SPANS

● SUPERELEVATION VARIES BASED ON SPAN. SEE ROADWAY PLANS FOR DETAILS.

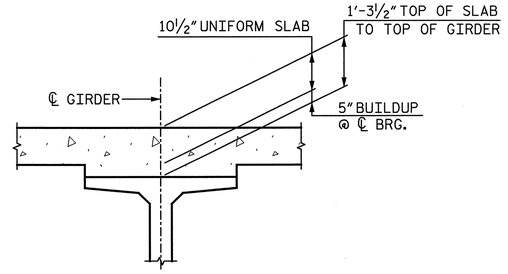


CONTINUITY DIAPHRAGMS



END DIAPHRAGM DETAIL

NOTE: PLACE #4S2 BARS AS SHOWN AT SUPPORT BOX LOCATIONS AND @ 1'-0" MAX. CTRS.



TYPICAL DECK DETAIL

NOTES:

1. FOR NOTES, SEE SHEET 2 OF 5.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION UNITS 9 & 10

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 5-30-13

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1			3			TOTAL SHEETS
2			4			219

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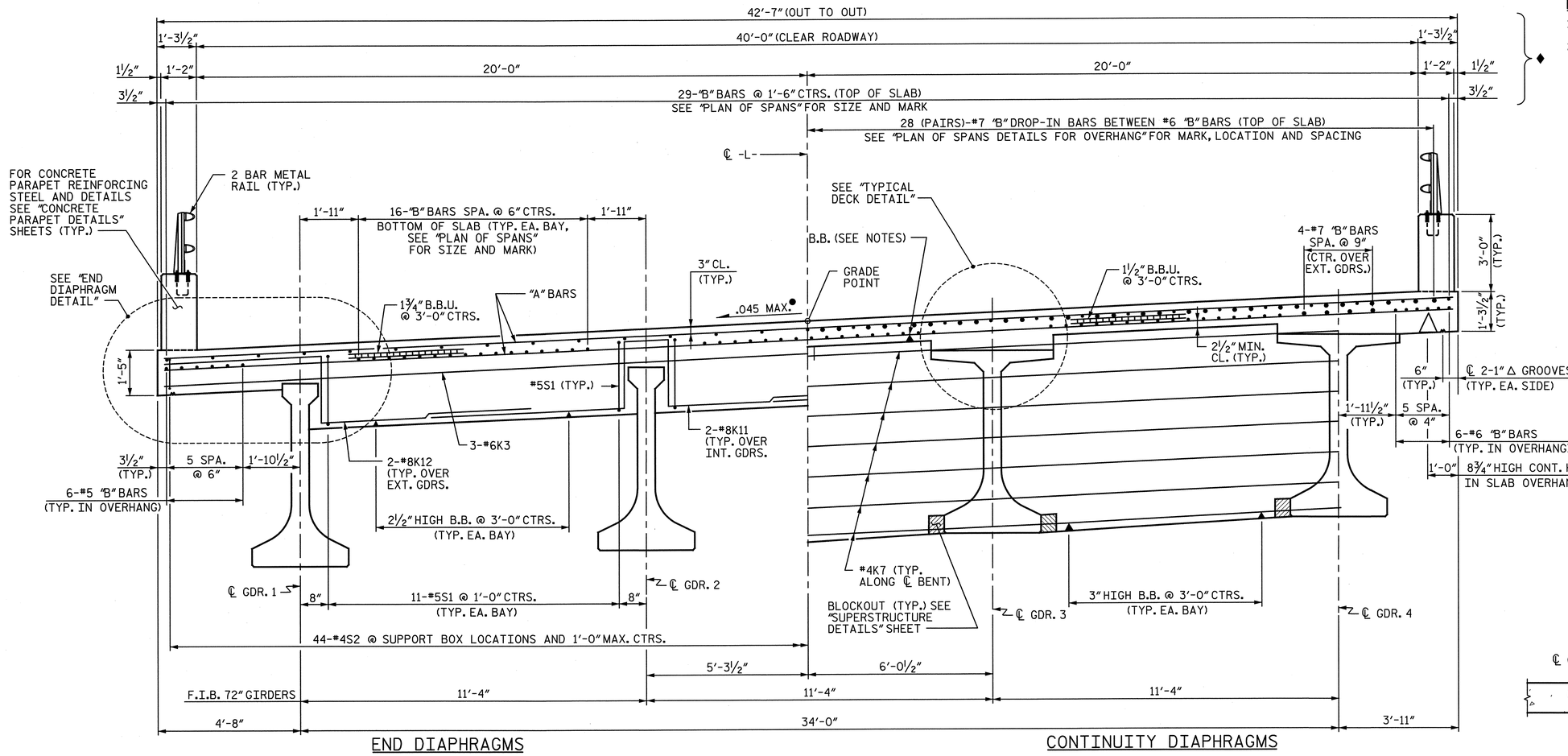
NOTES:

1. FOR ADDITIONAL NOTES, SEE SHEET 2 OF 5.
2. HEIGHT OF BEAM BOLSTER & CONTINUOUS HIGH CHAIR IN OVERHANG IS CALCULATED @ ℄ BENT. CONTRACTOR SHALL ADJUST HEIGHTS, AS NECESSARY TO MAINTAIN PROPER CLEARANCE, DUE TO GIRDER CAMBER OR SUPERELEVATION CHANGE.



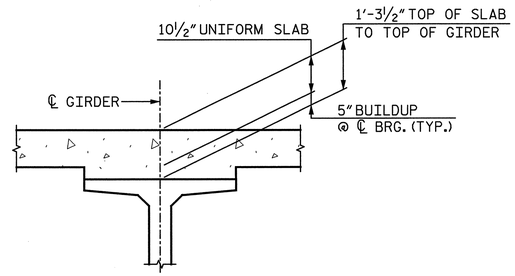
END DIAPHRAGMS

CONTINUITY DIAPHRAGMS

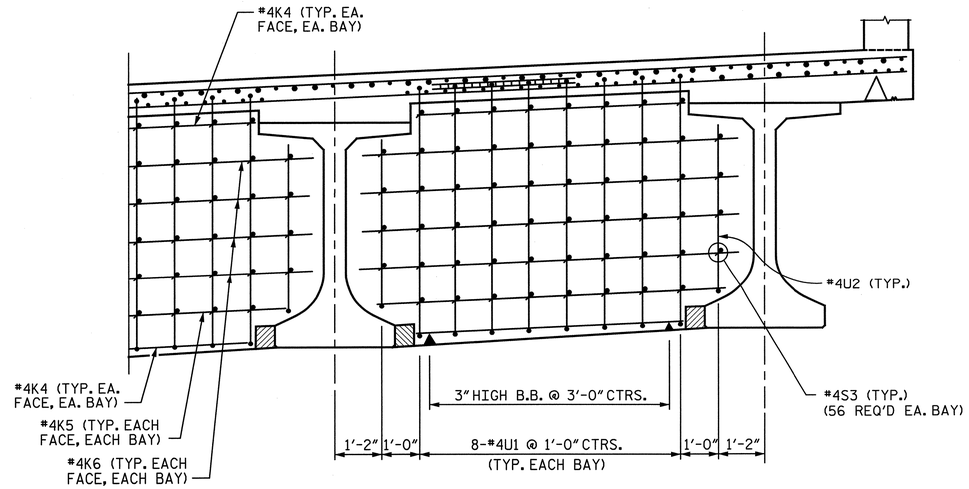
TYPICAL SECTION

(SPANS 52-61, 80-88)

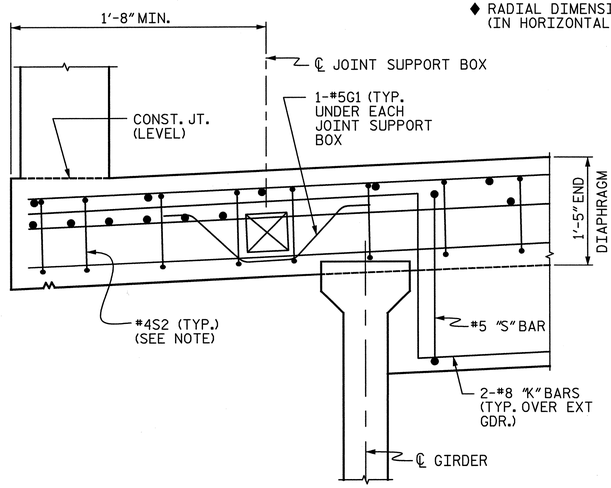
- ● SUPERELEVATION VARIES. SEE ROADWAY PLANS FOR DETAILS.
- ♦ RADIAL DIMENSIONS (IN HORIZONTALLY CURVED SPANS)



TYPICAL DECK DETAIL



CONTINUITY DIAPHRAGMS



END DIAPHRAGM DETAIL

NOTE: PLACE #4S2 BARS AS SHOWN AT SUPPORT BOX LOCATIONS AND @ 1'-0" MAX. CTRS.

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 5-30-13

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION
UNITS 15-16, 21-22

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-71
1			3			TOTAL SHEETS
2			4			219

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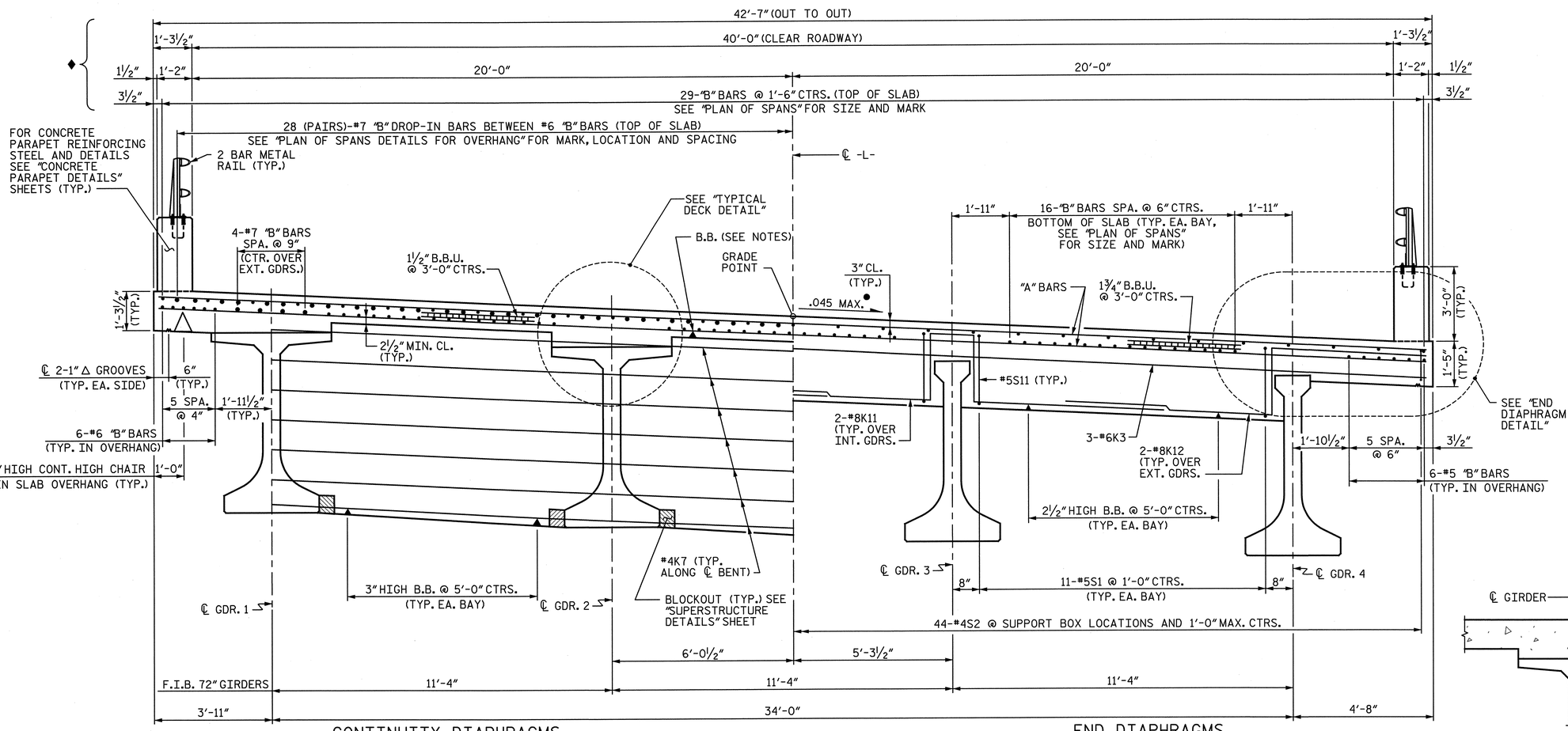
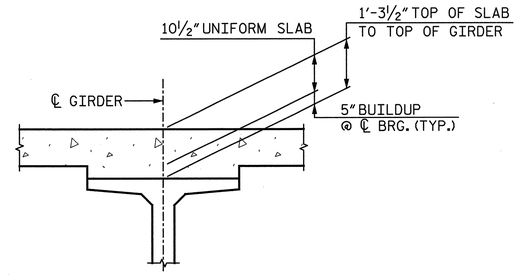
NOTES:

1. FOR NOTES, SEE SHEET 2 OF 5 & SHEET 4 OF 5.



CONTINUITY DIAPHRAGMS

END DIAPHRAGMS

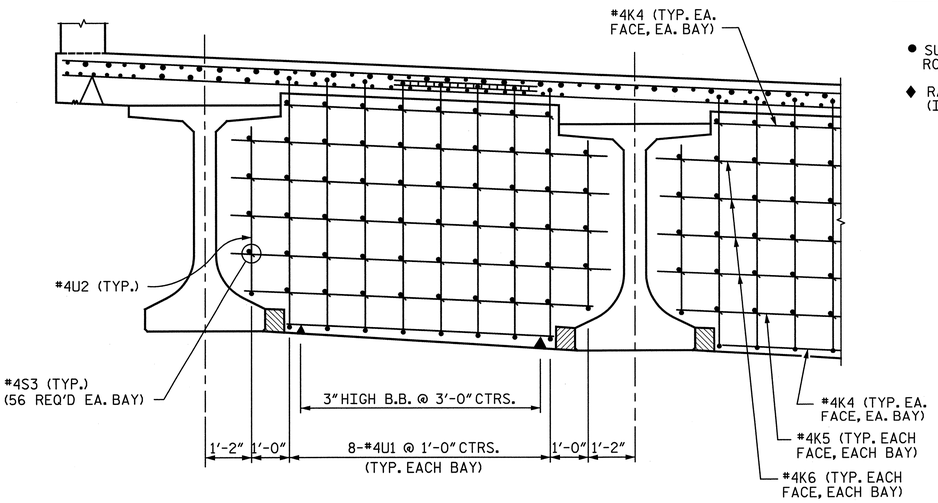


TYPICAL DECK DETAIL

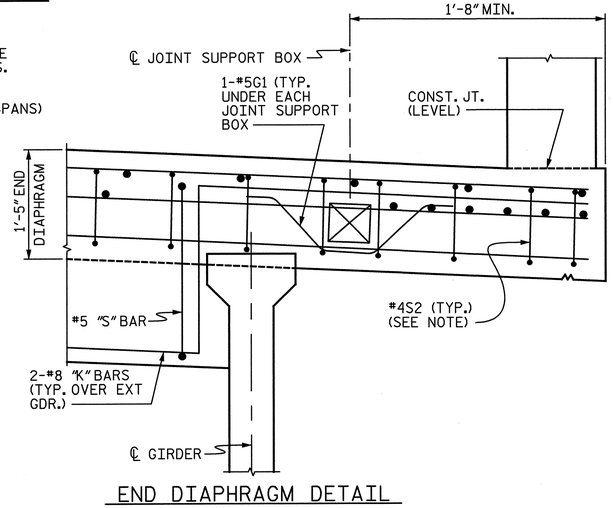
TYPICAL SECTION

(SPANS 62-79)

- ● SUPERELEVATION VARIES. SEE ROADWAY PLANS FOR DETAILS.
- ♦ RADIAL DIMENSIONS (IN HORIZONTALLY CURVED SPANS)



CONTINUITY DIAPHRAGMS



END DIAPHRAGM DETAIL

NOTE: PLACE #4S2 BARS AS SHOWN AT SUPPORT BOX LOCATIONS AND @ 1'-0" MAX. CTRS.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION
UNITS 17-20

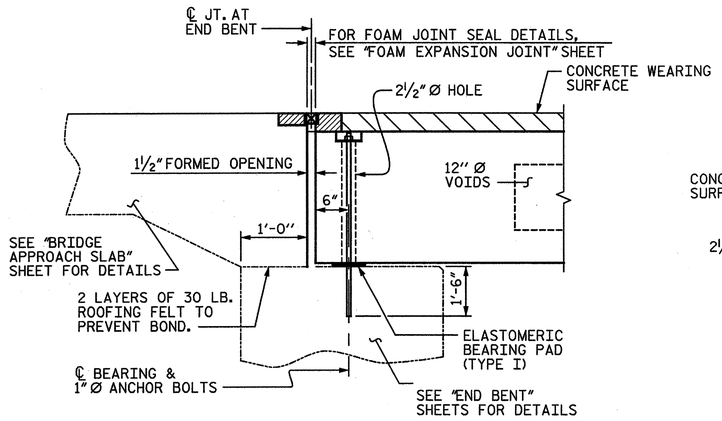
NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 5-30-13

DRAWN BY : ACA DATE : 3-12
CHECKED BY : AJP DATE : 3-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

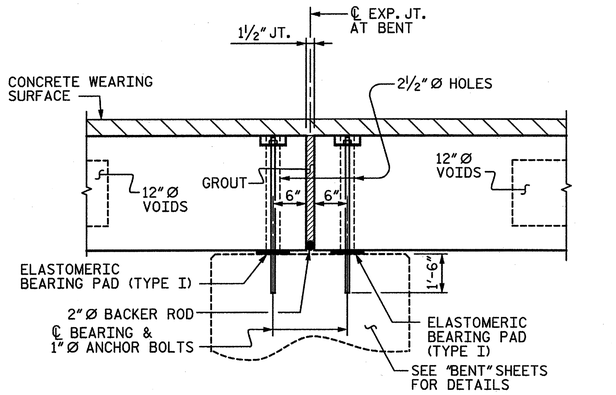
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-72
1			3			TOTAL SHEETS
2			4			219

5/30/2013 3:40:06 PM R:\Structures\usta\072) Typ Sec 17-20 5 of 5.dgn



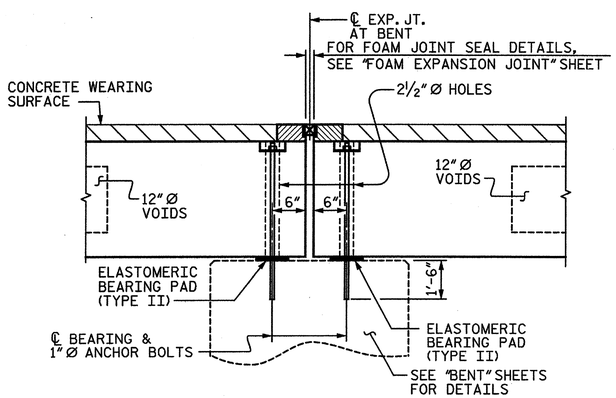
SECTION A-A

END BENTS 1 & 2



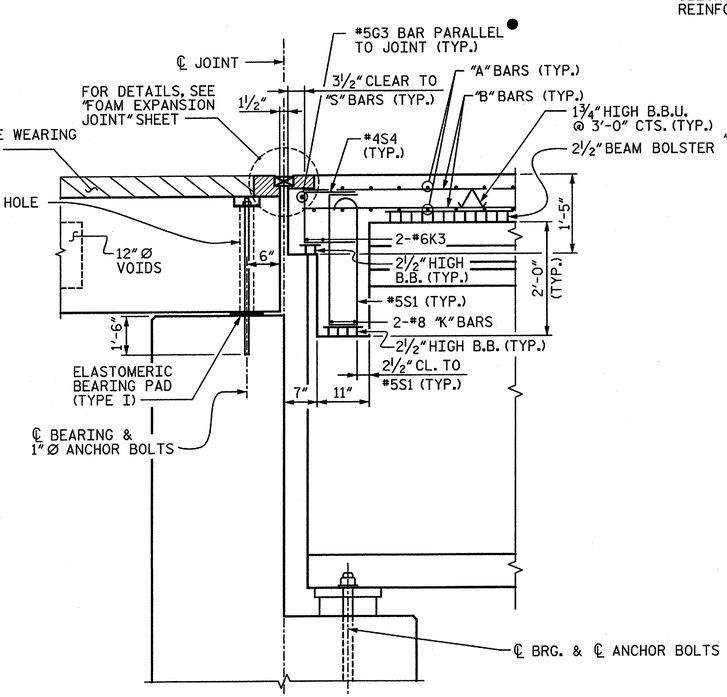
SECTION B-B

BENTS 1, 3, 95 & 97



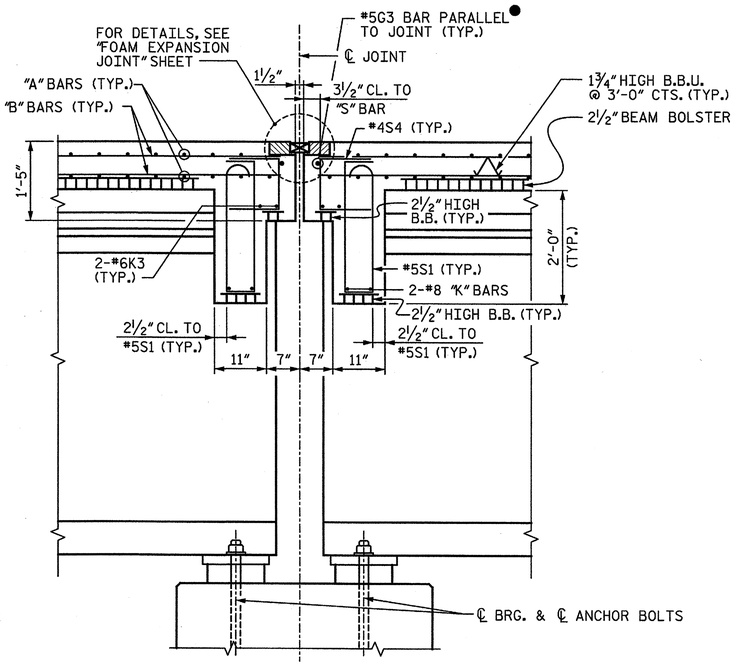
SECTION B-B

BENTS 2 & 96

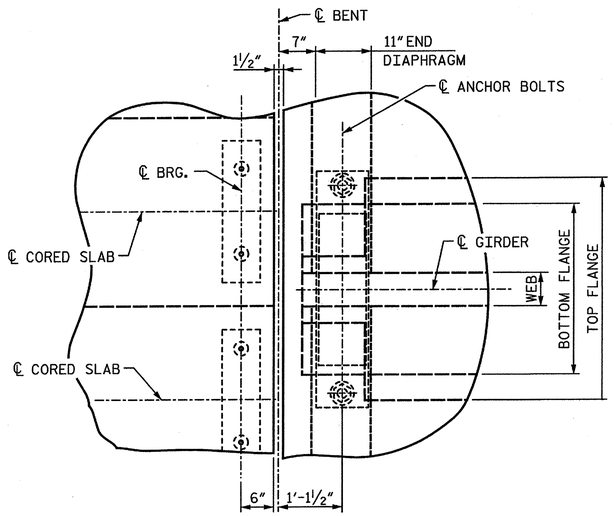


SECTION C-C

● #5 "G" BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS

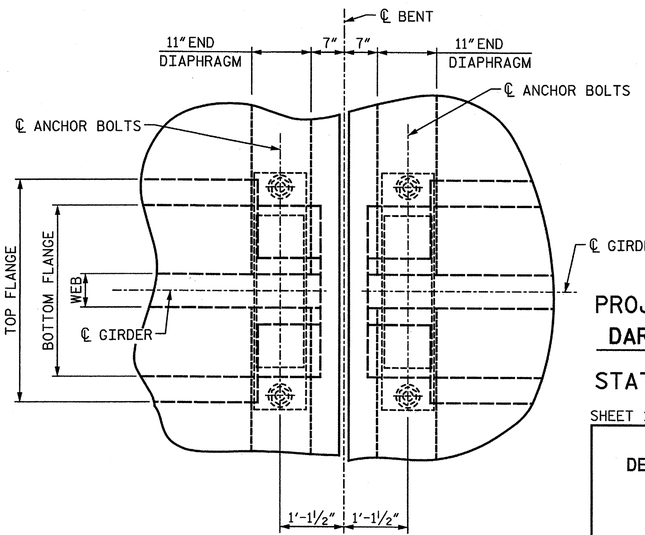


SECTION D-D



PLAN

(BENT CAP NOT SHOWN FOR CLARITY)



PLAN

(BENT CAP NOT SHOWN FOR CLARITY)

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE DETAILS

DRAWN BY : ACA	DATE : 2-12
CHECKED BY : AJP	DATE : 3-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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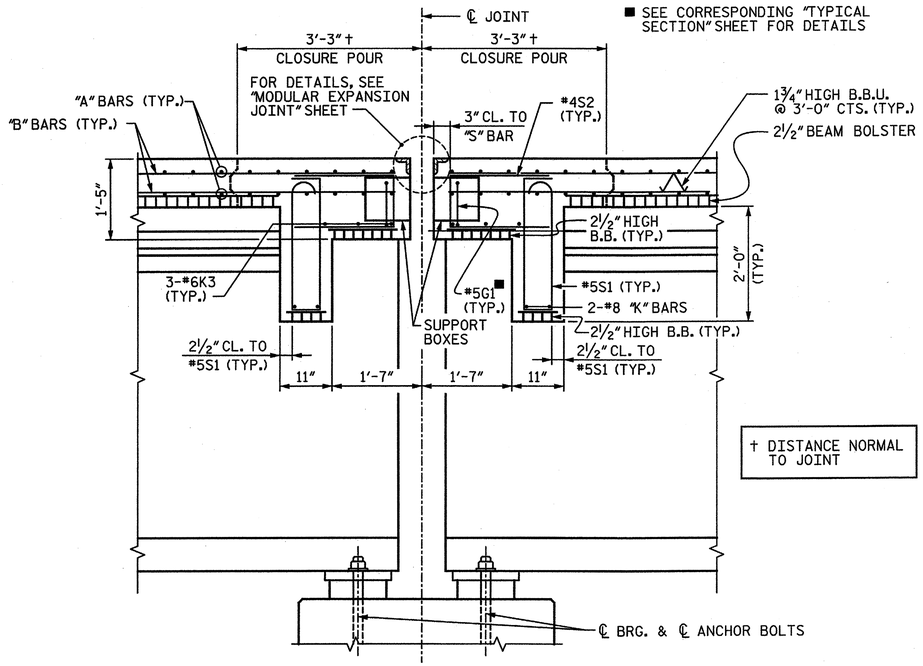
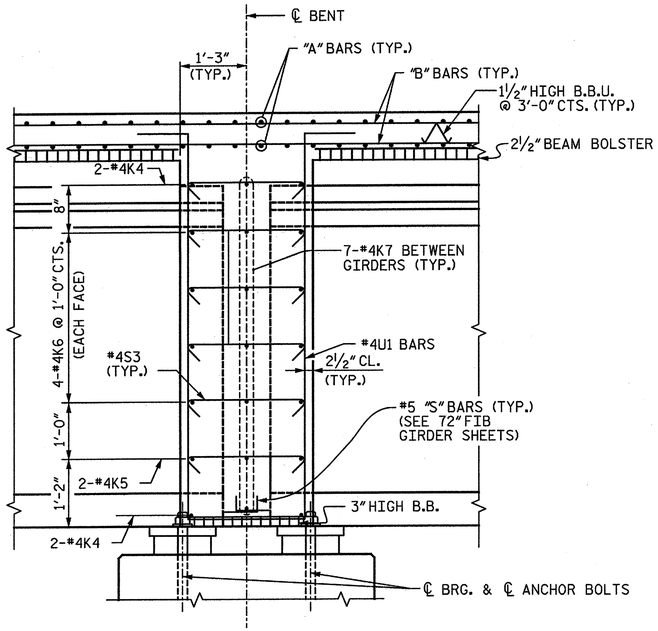


SECTION E-E

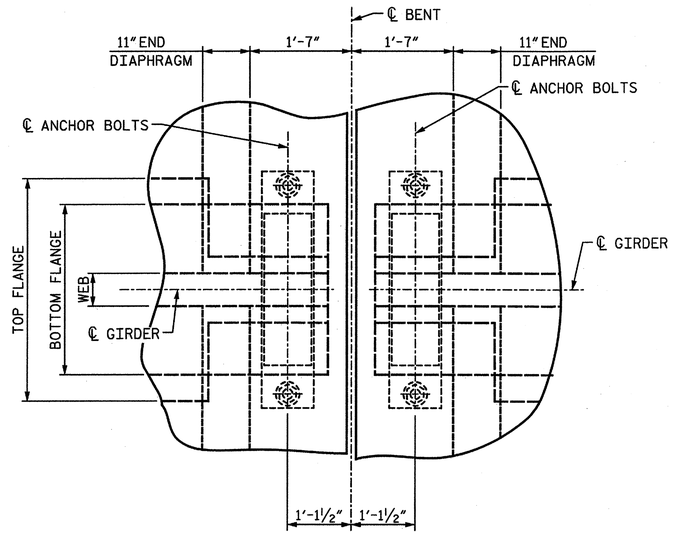
END DIAPHRAGM

† DISTANCE NORMAL TO JOINT



SECTION F-F

CONTINUITY DIAPHRAGM



PLAN

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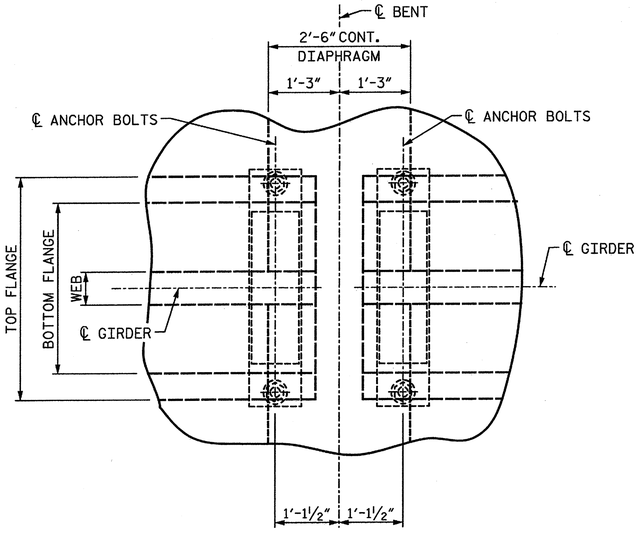
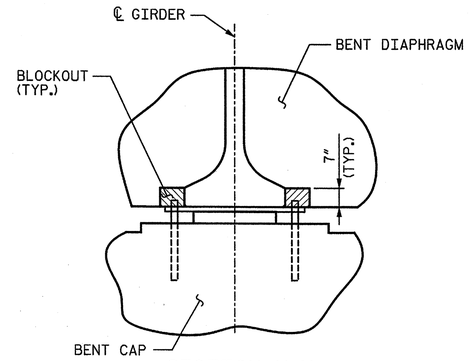


PLAN

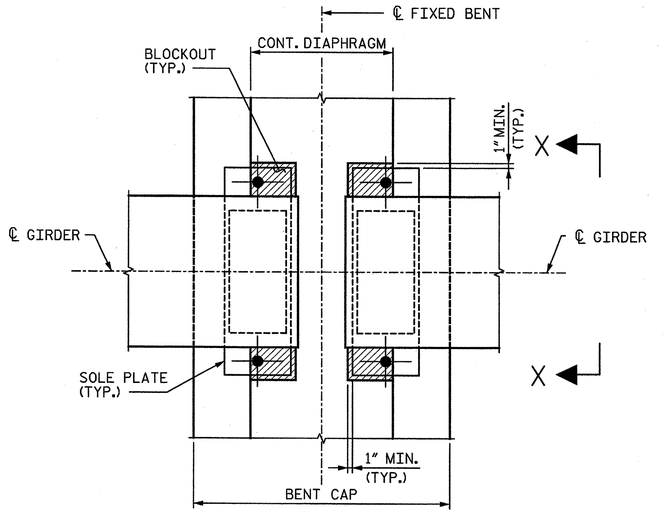
(BENT CAP NOT SHOWN FOR CLARITY)

NOTES:

1. THE "B" BARS IN THE DECK SLAB MAY BE CUT AS DIRECTED BY THE ENGINEER TO CLEAR THE MODULAR JOINT SUPPORT BOXES.



SECTION X-X



PLAN

BENT DIAPHRAGM BLOCKOUT DETAILS

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV/ Ralph Whitehead Associates, Inc.
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NC License No. F-0991

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2			4			219

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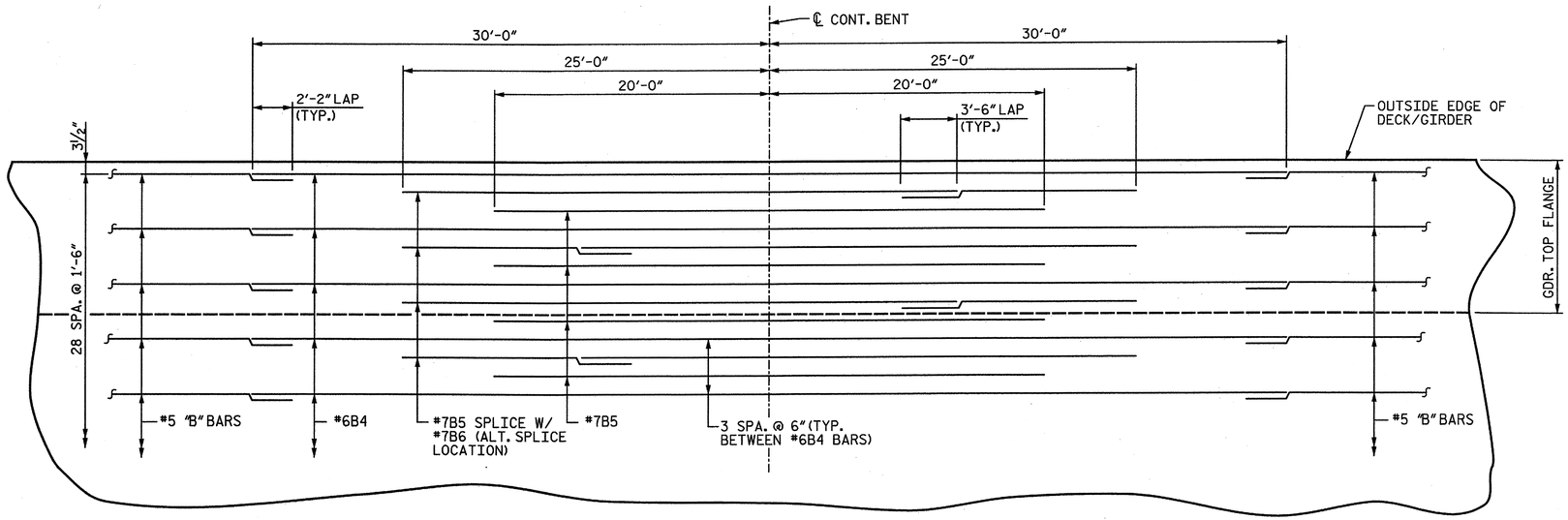
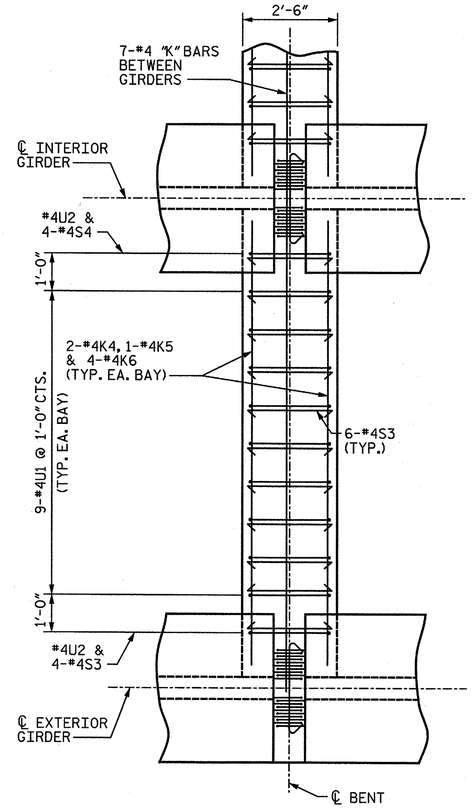
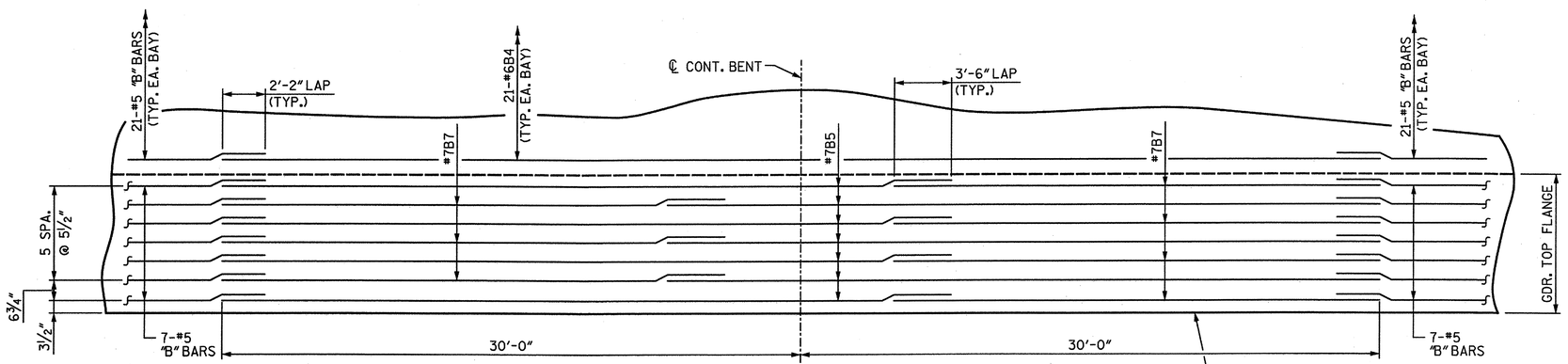


PARTIAL PLAN OF TOP "B" BARS



DETAIL "B"

CONTINUITY DIAPHRAGM AT BENT
(BARRIER RAIL & MAIN DECK SLAB REINFORCING STEEL NOT SHOWN FOR CLARITY)



PARTIAL PLAN OF BOTTOM "B" BARS

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
DETAILS FOR EDGE GIRDER

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-75
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2			4			219

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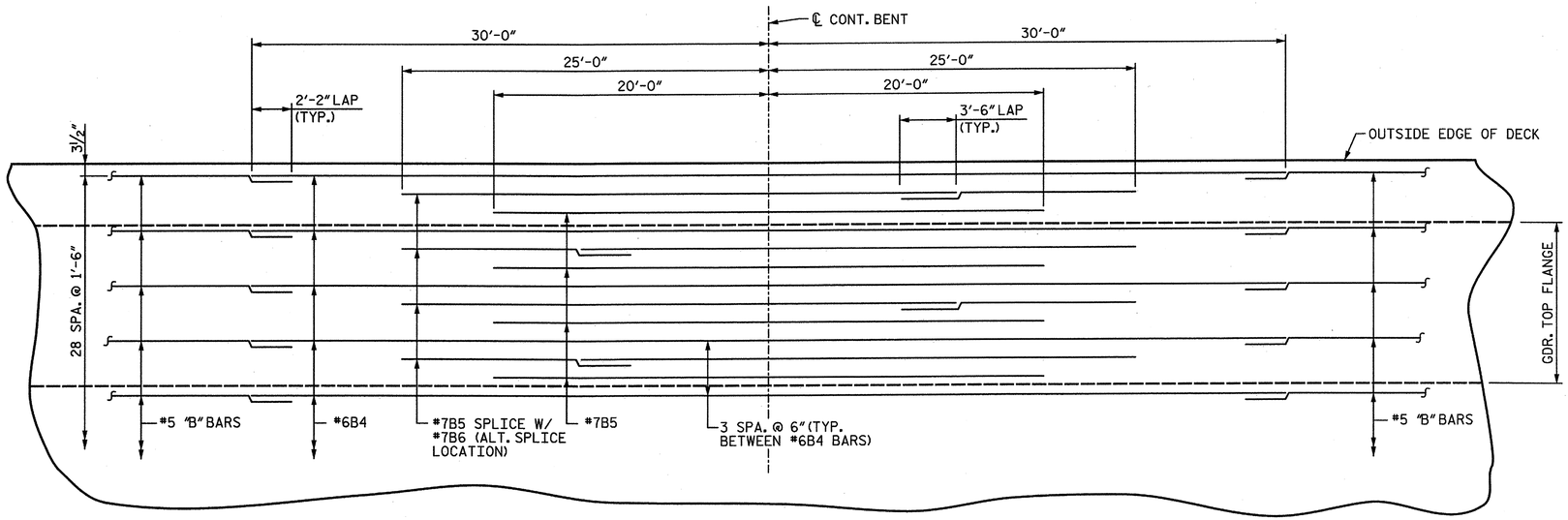
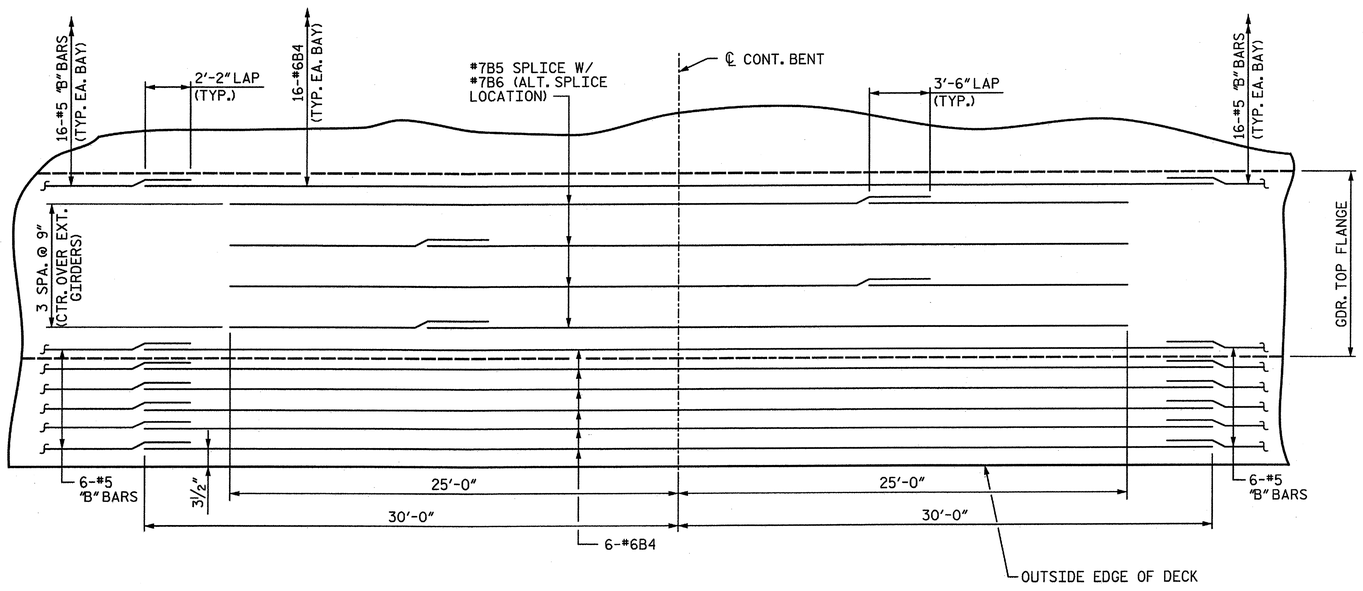
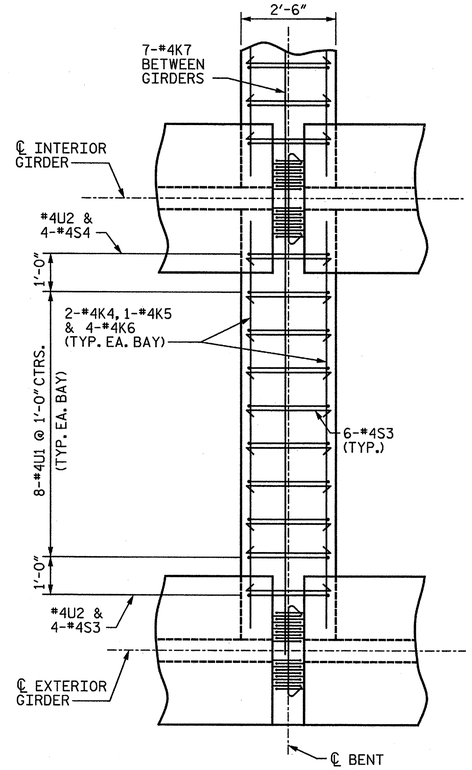


PARTIAL PLAN OF TOP "B" BARS



PARTIAL PLAN OF BOTTOM "B" BARS



DETAIL "B"

CONTINUOUS DIAPHRAGM AT BENT
(BARRIER RAIL & MAIN DECK SLAB REINFORCING STEEL NOT SHOWN FOR CLARITY)

NOTES:

1. SEE SHEET 1 OF 3 FOR NOTES.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
DETAILS FOR OVERHANG

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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2			4			219

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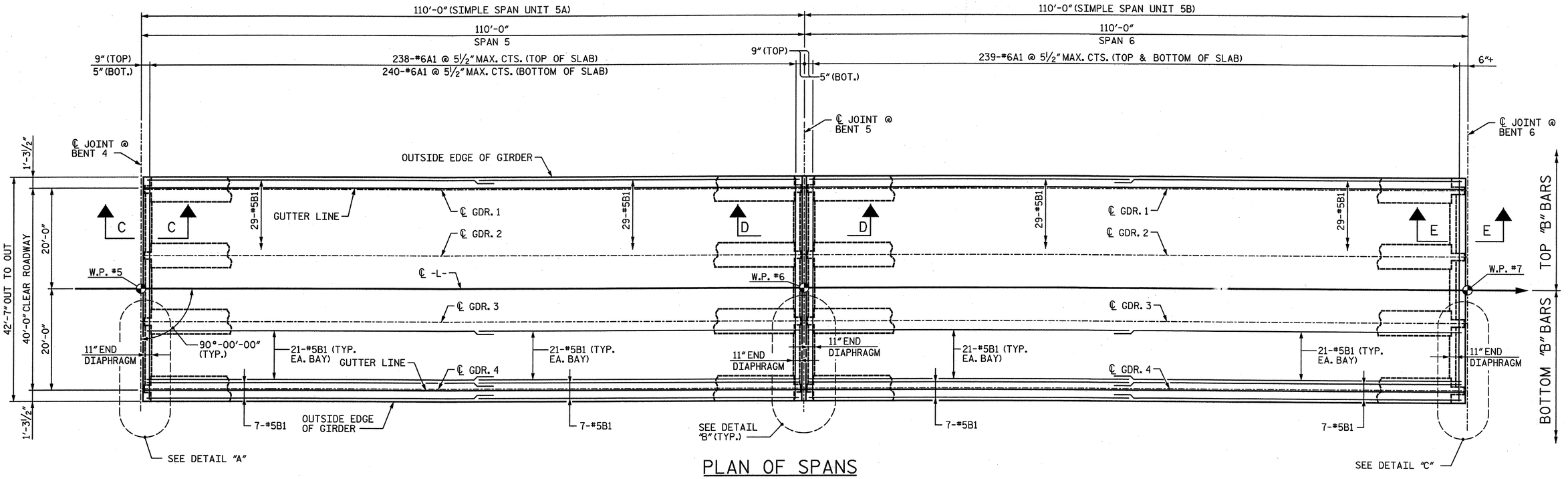
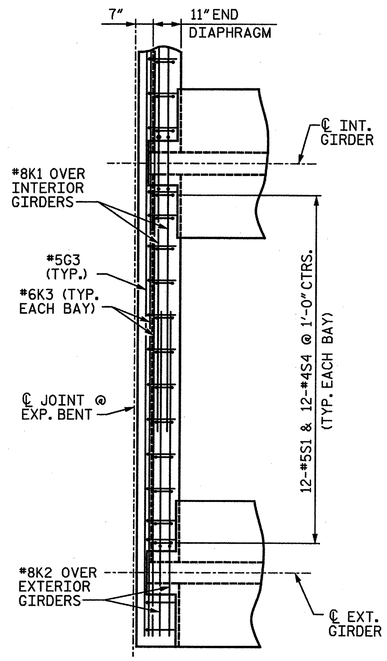
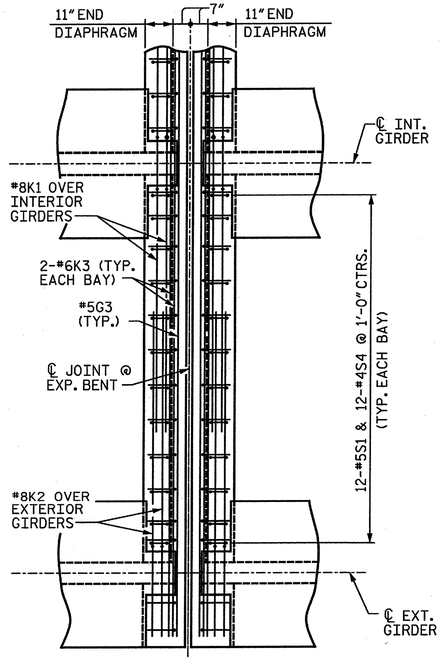


PLAN OF SPANS



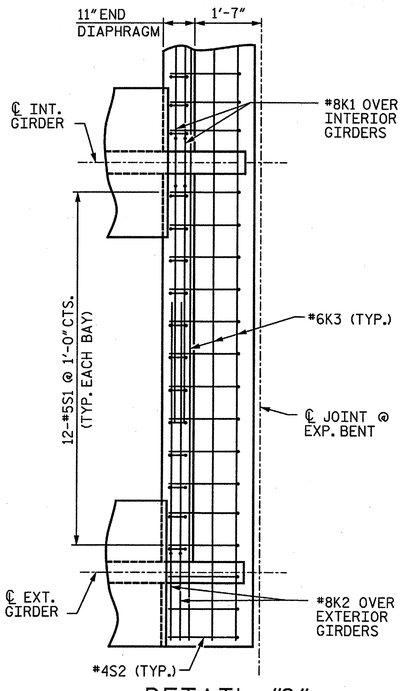
DETAIL "A"

END DIAPHRAGM AT EXP. BENT
(PARAPET & MAIN DECK
SLAB REINFORCING STEEL
NOT SHOWN FOR CLARITY)



DETAIL "B"

END DIAPHRAGMS AT EXP. BENT
(PARAPET & MAIN DECK
SLAB REINFORCING STEEL
NOT SHOWN FOR CLARITY)



DETAIL "C"

END DIAPHRAGM AT EXP. BENT
(PARAPET & MAIN DECK
SLAB REINFORCING STEEL
NOT SHOWN FOR CLARITY)

NOTES:

1. FOR CONCRETE PARAPET DIMENSIONS, REINFORCEMENT AND JOINT SPACING, SEE CORRESPONDING "PLAN OF RAIL & CONCRETE PARAPET" SHEETS.
2. FOR "B" BAR SPACING, SEE CORRESPONDING "TYPICAL SECTION" SHEET.
3. FOR POURING SEQUENCE AND TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB, SEE "DECK POUR DIAGRAMS" SHEET.
4. FOR SECTION VIEWS, SEE "SUPERSTRUCTURE DETAILS" SHEETS.
5. FOR DECK DRAINAGE, SEE "DECK DRAIN DETAILS" SHEET.
6. FOR MINIMUM SPLICE LENGTHS, SEE "SUPERSTRUCTURE BILL OF MATERIAL".

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY
10-4-12

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
UNITS 5A & 5B

DRAWN BY : ACA	DATE : 2-12
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2			4			219

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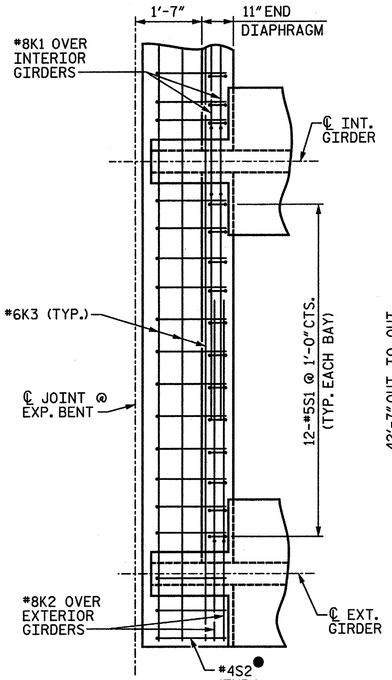
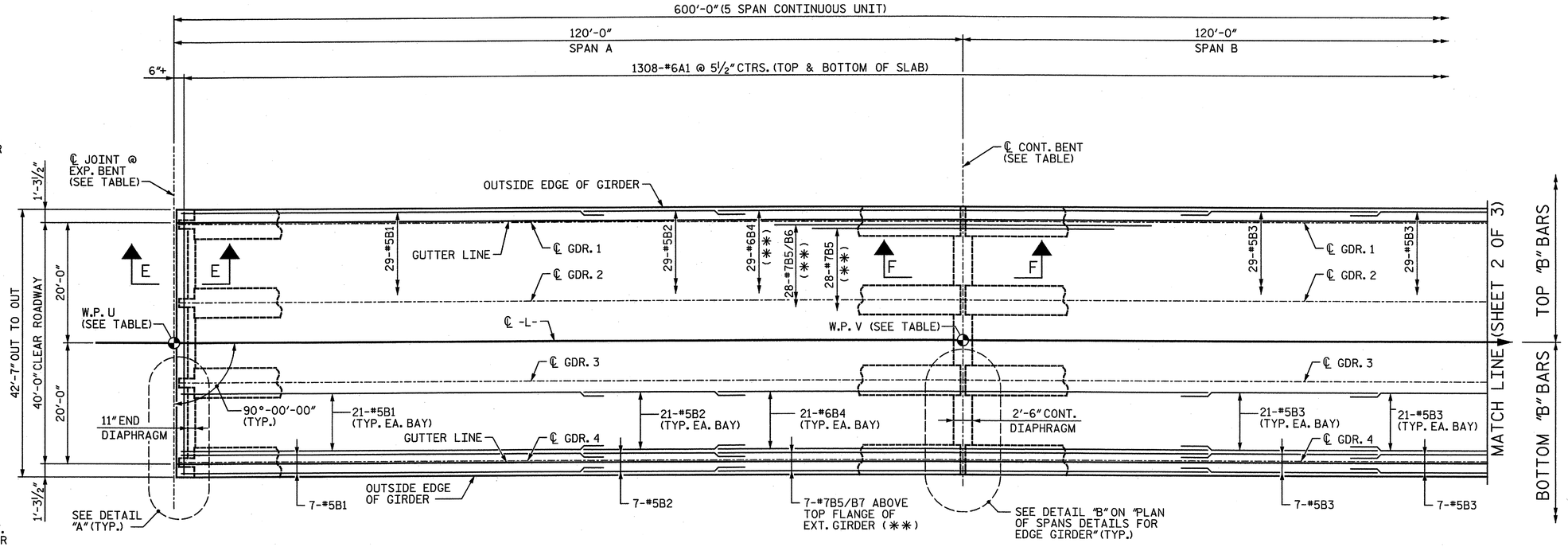


DETAIL "A"

END DIAPHRAGM AT EXP. BENT (PARAPET & MAIN DECK SLAB REINFORCING STEEL NOT SHOWN FOR CLARITY)

● *4S2 BARS TO BE PLACED AS SHOWN IN "END DIAPHRAGM DETAIL" ON CORRESPONDING "TYPICAL SECTION" SHEET



(**) SEE PARTIAL PLAN DETAILS ON "PLAN OF SPANS DETAILS FOR EDGE GIRDER" FOR PLACEMENT OF TOP AND BOTTOM "B" BARS OVER BENT.

PLAN OF SPANS

WORK POINT AND SPAN DESIGNATIONS						
UNIT	SPAN A	SPAN B	W.P. U	W.P. V	EXP. BENT	CONT. BENT
6	7	8	*7	*8	6	7
7	12	13	*12	*13	11	12
8	17	18	*17	*18	16	17
11	32	33	*32	*33	31	32
12	37	38	*37	*38	36	37
13	42	43	*42	*43	41	42
14	47	48	*47	*48	46	47

NOTES:

1. FOR CONCRETE PARAPET DIMENSIONS, REINFORCEMENT AND JOINT SPACING, SEE CORRESPONDING "PLAN OF RAIL & CONCRETE PARAPET" SHEETS.
2. FOR "B" BAR SPACING, SEE CORRESPONDING "TYPICAL SECTION" SHEET.
3. FOR POURING SEQUENCE AND TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB, SEE "DECK POUR DIAGRAMS" SHEET.
4. FOR SECTION VIEWS, SEE "SUPERSTRUCTURE DETAILS" SHEETS.
5. FOR DECK DRAINAGE, SEE "DECK DRAIN DETAILS" SHEET.
6. FOR MINIMUM SPLICE LENGTHS, SEE "SUPERSTRUCTURE BILL OF MATERIAL".

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
UNITS 6-8 & 11-14

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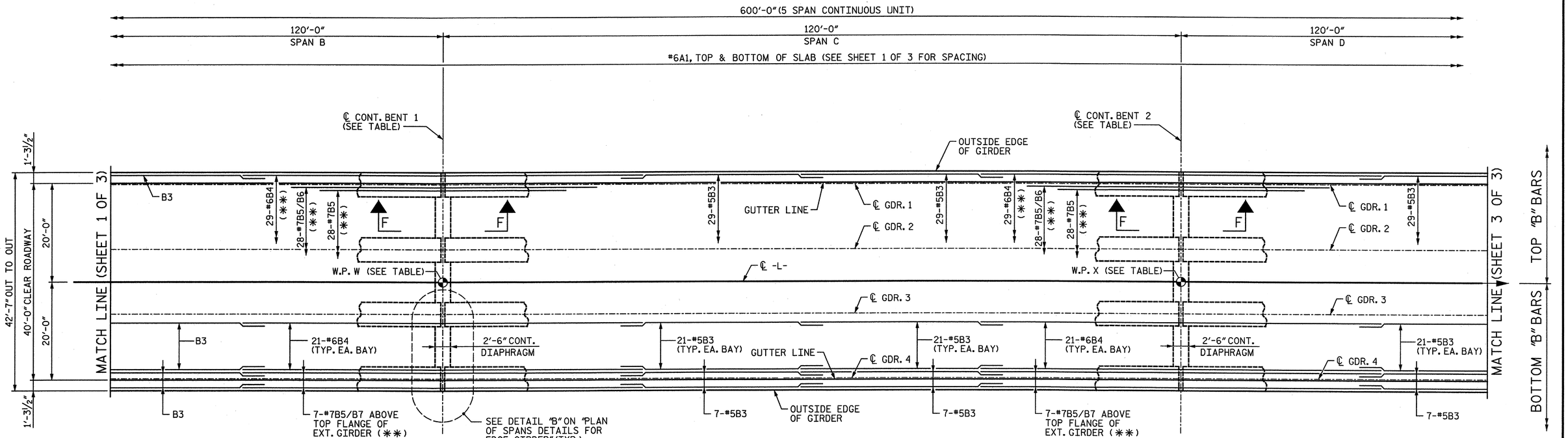

(**) SEE PARTIAL PLAN DETAILS ON "PLAN OF SPANS DETAILS FOR EDGE GIRDER" FOR PLACEMENT OF TOP AND BOTTOM "B" BARS OVER BENT.

PLAN OF SPANS

WORK POINT AND SPAN DESIGNATIONS							
UNIT	SPAN B	SPAN C	SPAN D	W.P. W	W.P. X	CONT. BENT 1	CONT. BENT 2
6	8	9	10	#9	#10	8	9
7	13	14	15	#14	#15	13	14
8	18	19	20	#19	#20	18	19
11	33	34	35	#34	#35	33	34
12	38	39	40	#39	#40	38	39
13	43	44	45	#44	#45	43	44
14	48	49	50	#49	#50	48	49

NOTES:

1. SEE SHEET 1 OF 3 FOR NOTES.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
UNITS 6-8 & 11-14

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

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1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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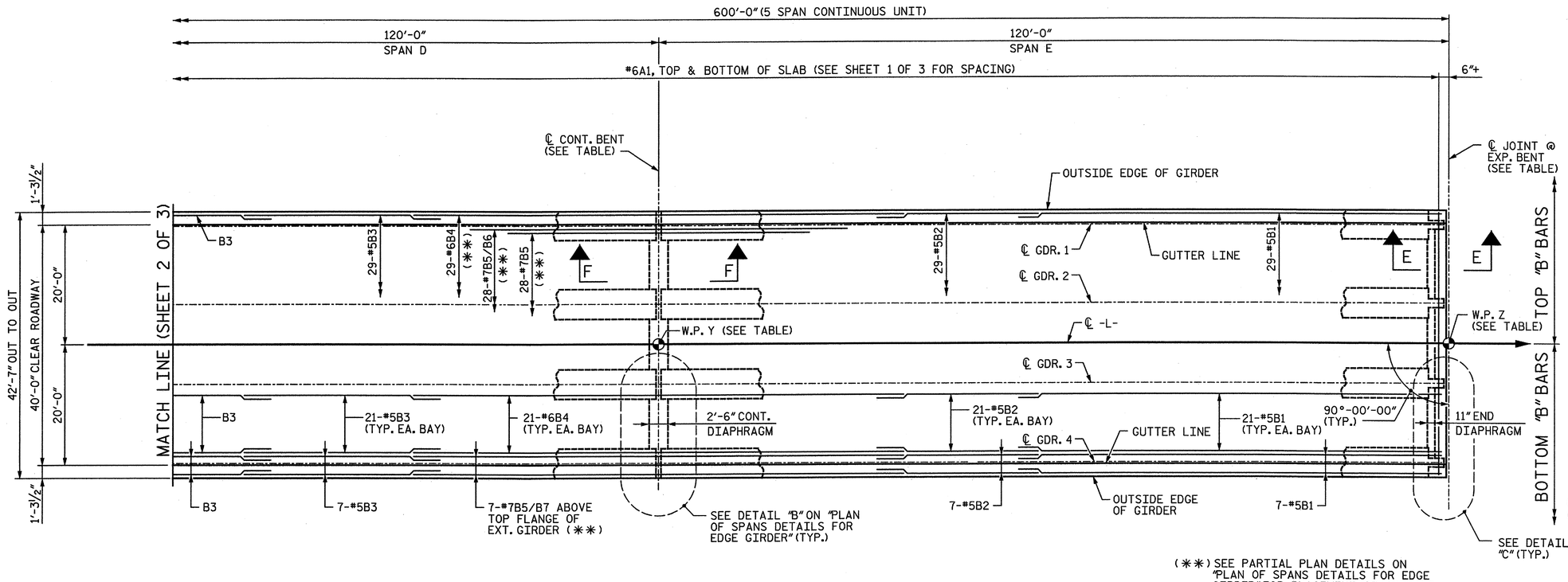
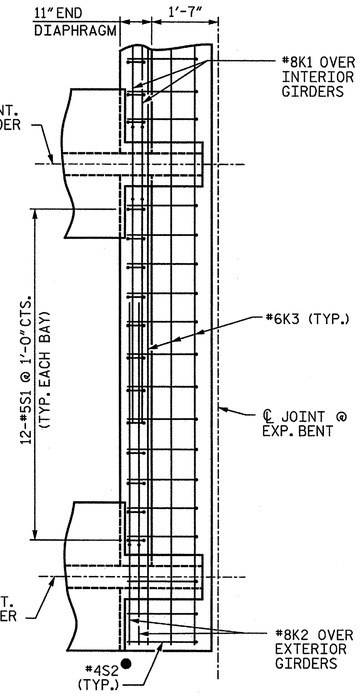


(**) SEE PARTIAL PLAN DETAILS ON "PLAN OF SPANS DETAILS FOR EDGE GIRDER" FOR PLACEMENT OF TOP AND BOTTOM "B" BARS OVER BENT.

NOTES:

1. SEE SHEET 1 OF 3 FOR NOTES.



DETAIL "C"

END DIAPHRAGM AT EXP. BENT (PARAPET & MAIN DECK SLAB REINFORCING STEEL NOT SHOWN FOR CLARITY)

● #4S2 BARS TO BE PLACED AS SHOWN IN "END DIAPHRAGM DETAIL" ON CORRESPONDING "TYPICAL SECTION" SHEET

PLAN OF SPANS

WORK POINT AND SPAN DESIGNATIONS						
UNIT	SPAN D	SPAN E	W.P. Y	W.P. Z	CONT. BENT	EXP. BENT
6	10	11	#11	#12	10	11
7	15	16	#16	#17	15	16
8	20	21	#21	#22	20	21
11	35	36	#36	#37	35	36
12	40	41	#41	#42	40	41
13	45	46	#46	#47	45	46
14	50	51	#51	#52	50	51

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
UNITS 6-8 & 11-14

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
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NC License No. F-0991

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1			3			TOTAL SHEETS
2			4			219

DRAWN BY : ACA DATE : 2-12
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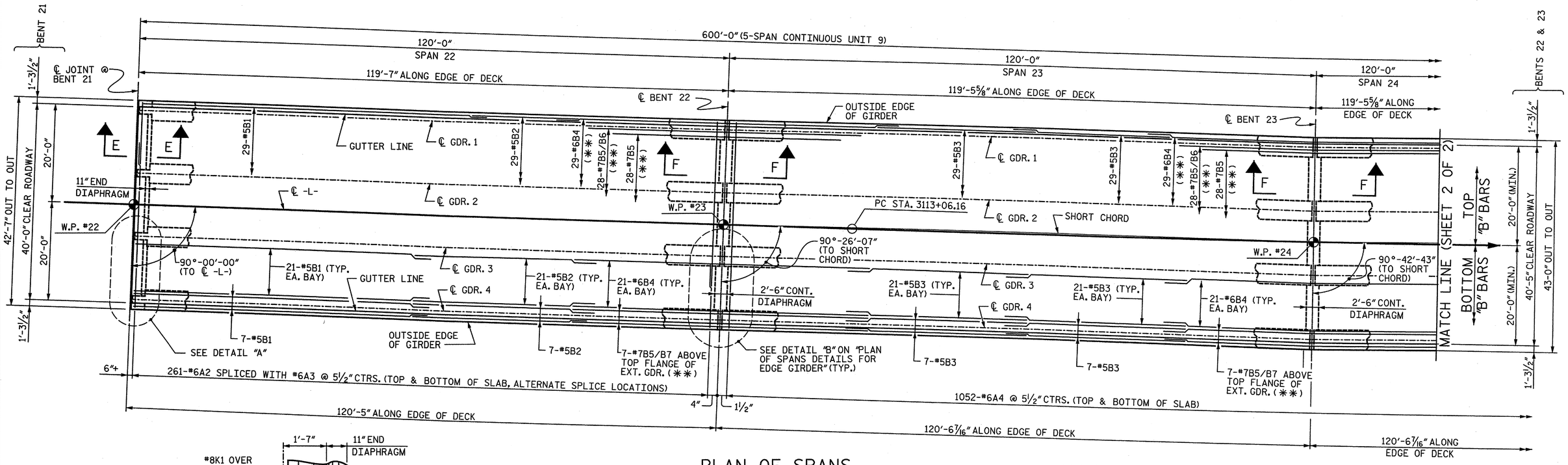
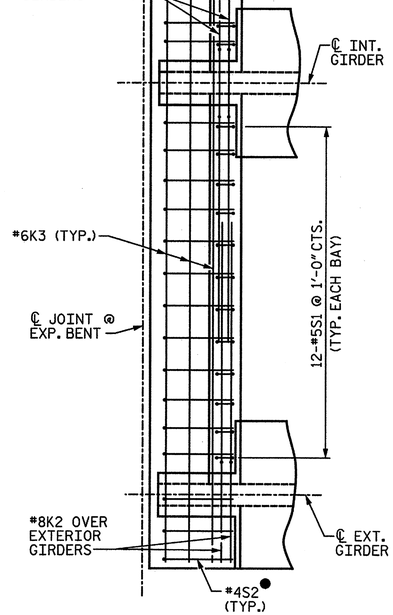


PLAN OF SPANS



DETAIL "A"

END DIAPHRAGM AT EXP. BENT (PARAPET & MAIN DECK SLAB REINFORCING STEEL NOT SHOWN FOR CLARITY)

● #4S2 BARS TO BE PLACED AS SHOWN IN "END DIAPHRAGM DETAIL" ON CORRESPONDING "TYPICAL SECTION" SHEET

(**) SEE PARTIAL PLAN DETAILS ON "PLAN OF SPANS DETAILS FOR EDGE GIRDER" FOR PLACEMENT OF TOP AND BOTTOM "B" BARS OVER BENT.

NOTES:

1. FOR CONCRETE PARAPET DIMENSIONS, REINFORCEMENT AND JOINT SPACING, SEE CORRESPONDING "PLAN OF RAIL & CONCRETE PARAPET" SHEETS.
2. FOR "B" BAR SPACING, SEE CORRESPONDING "TYPICAL SECTION" SHEET.
3. FOR POURING SEQUENCE AND TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB, SEE "DECK POUR DIAGRAMS" SHEET.
4. FOR SECTION VIEWS, SEE "SUPERSTRUCTURE DETAILS" SHEETS.
5. FOR DECK DRAINAGE, SEE "DECK DRAIN DETAILS" SHEET.
6. FOR MINIMUM SPLICE LENGTHS, SEE "SUPERSTRUCTURE BILL OF MATERIAL".

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
UNIT 9

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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1			3			TOTAL SHEETS
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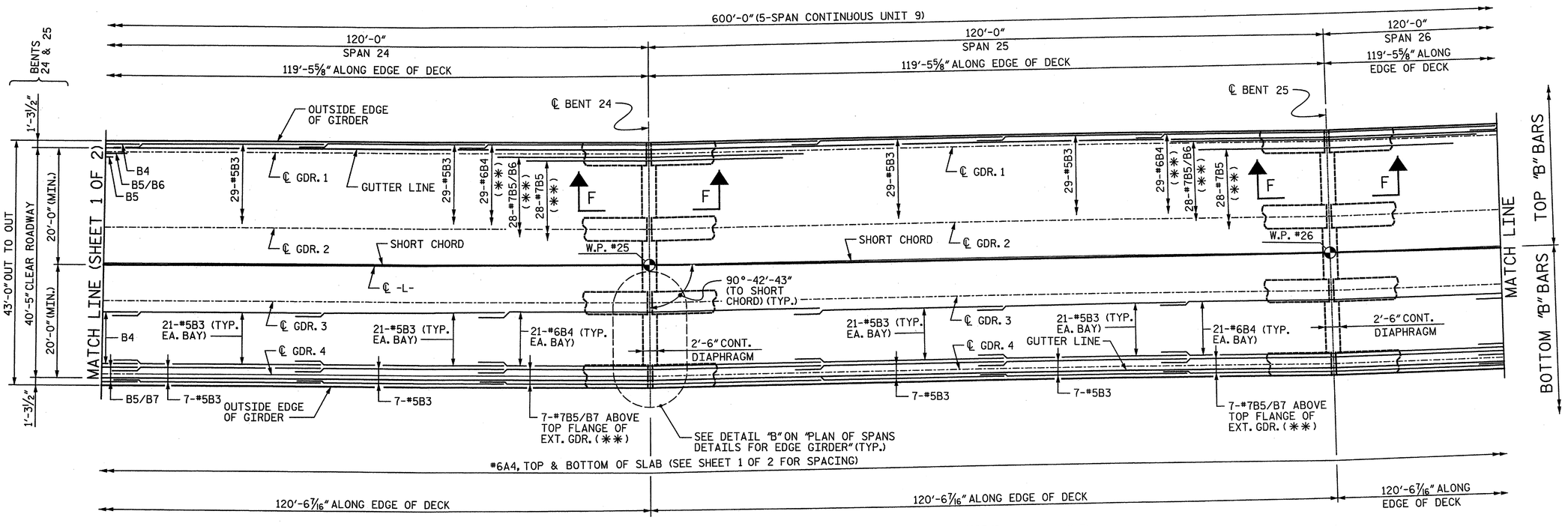
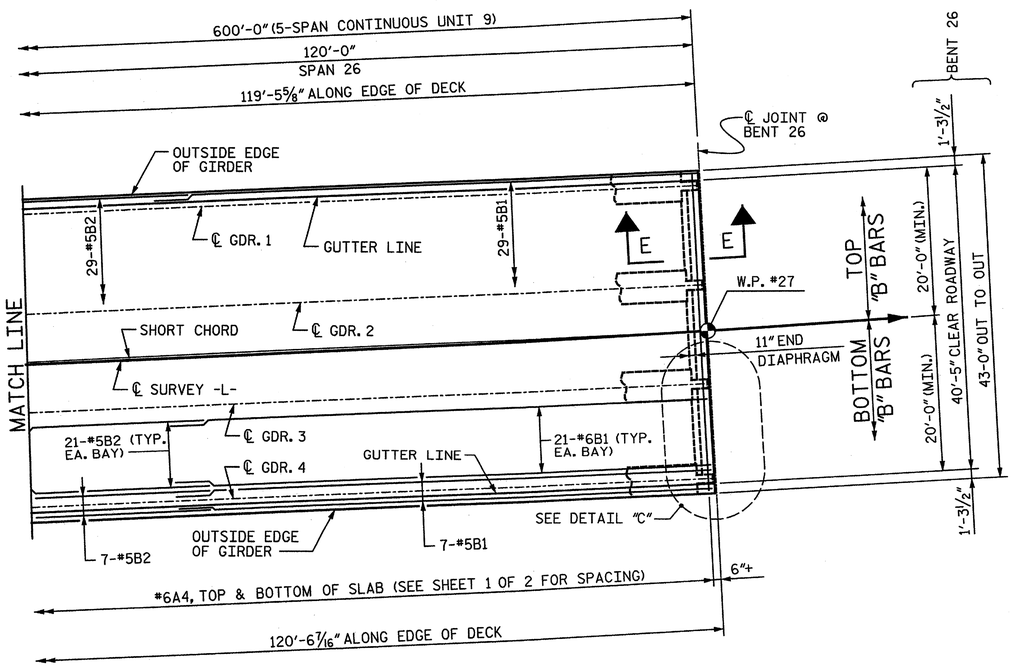
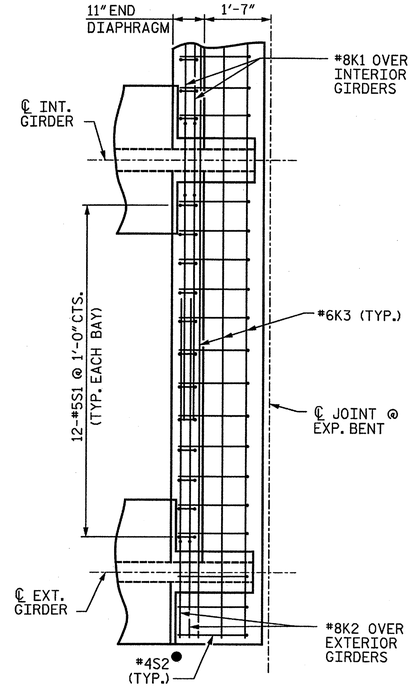


(**) SEE PARTIAL PLAN DETAILS ON "PLAN OF SPANS DETAILS FOR EDGE GIRDER" FOR PLACEMENT OF TOP AND BOTTOM "B" BARS OVER BENT.





DETAIL "C"

END DIAPHRAGM AT EXP. BENT (PARAPET & MAIN DECK SLAB REINFORCING STEEL NOT SHOWN FOR CLARITY)

● #4S2 BARS TO BE PLACED AS SHOWN IN "END DIAPHRAGM DETAIL" ON CORRESPONDING "TYPICAL SECTION" SHEET

NOTES:

FOR NOTES, SEE SHEET 1 OF 2.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS UNIT 9

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

PLAN OF SPANS

DRAWN BY : LGH DATE : 2-12
CHECKED BY : AJP DATE : 3-12

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Charlotte, NC 28208
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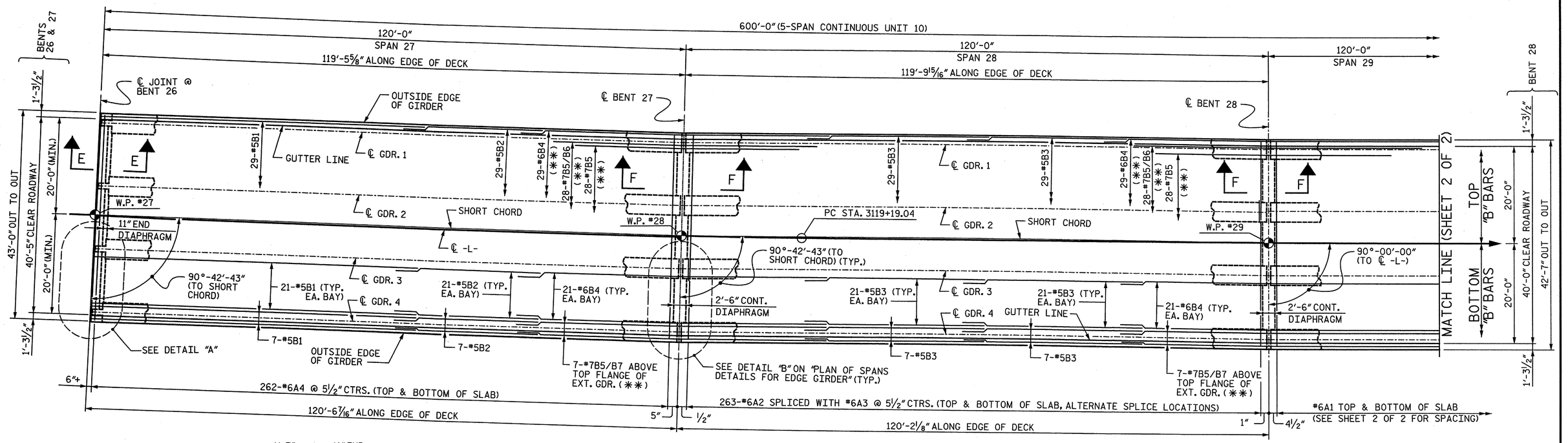

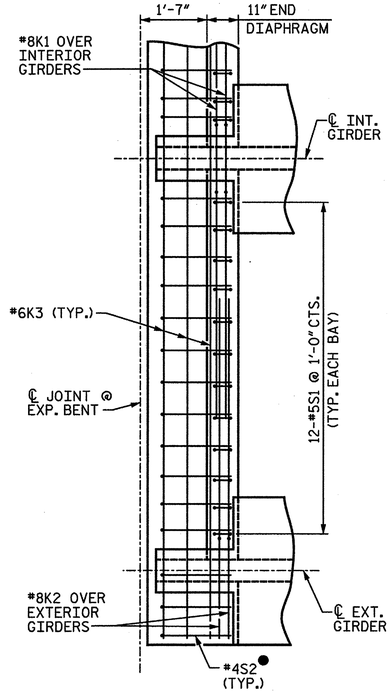

DETAIL "A"

END DIAPHRAGM AT EXP. BENT (PARAPET & MAIN DECK SLAB REINFORCING STEEL NOT SHOWN FOR CLARITY)

●#4S2 BARS TO BE PLACED AS SHOWN IN "END DIAPHRAGM DETAIL" ON CORRESPONDING "TYPICAL SECTION" SHEET

PLAN OF SPANS

(**) SEE PARTIAL PLAN DETAILS ON "PLAN OF SPANS DETAILS FOR EDGE GIRDER" FOR PLACEMENT OF TOP AND BOTTOM "B" BARS OVER BENT.

NOTES:

1. FOR CONCRETE PARAPET DIMENSIONS, REINFORCEMENT AND JOINT SPACING, SEE CORRESPONDING "PLAN OF RAIL & CONCRETE PARAPET" SHEETS.
2. FOR "B" BAR SPACING, SEE CORRESPONDING "TYPICAL SECTION" SHEET.
3. FOR POURING SEQUENCE AND TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB, SEE "DECK POUR DIAGRAMS" SHEET.
4. FOR SECTION VIEWS, SEE "SUPERSTRUCTURE DETAILS" SHEETS.
5. FOR DECK DRAINAGE, SEE "DECK DRAIN DETAILS" SHEET.
6. FOR MINIMUM SPLICE LENGTHS, SEE "SUPERSTRUCTURE BILL OF MATERIAL".

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
UNIT 10

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY
10-4-12

STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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1			3			TOTAL SHEETS
2			4			219

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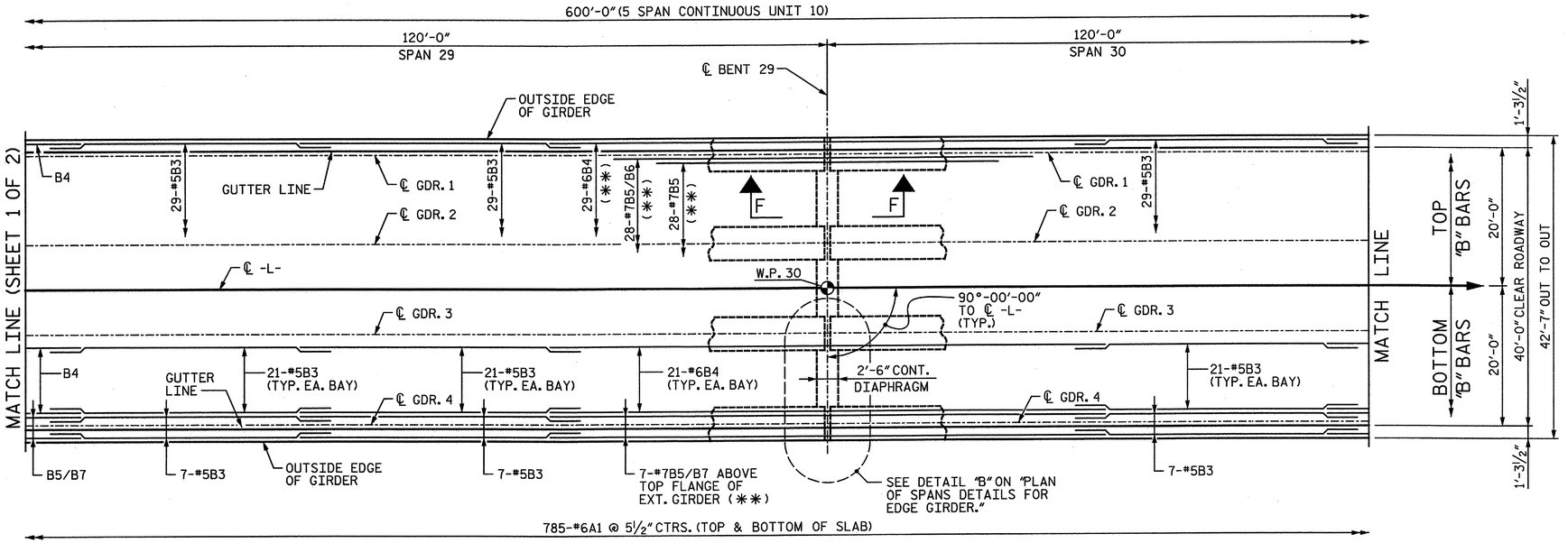
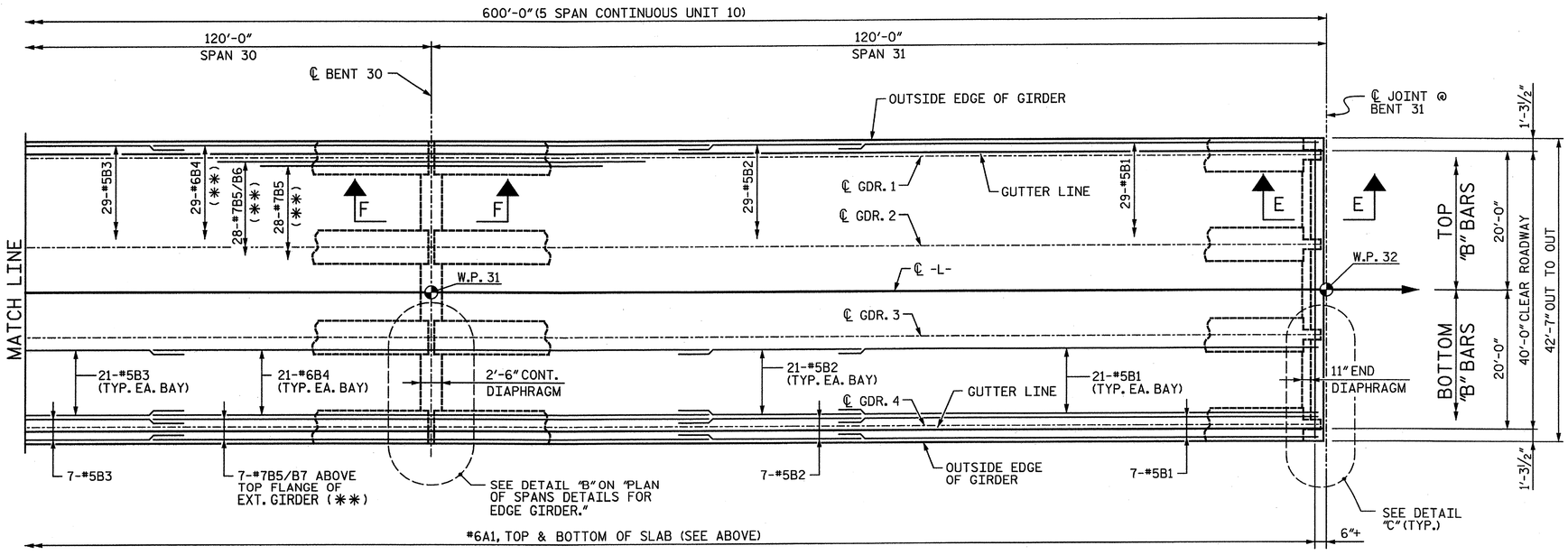


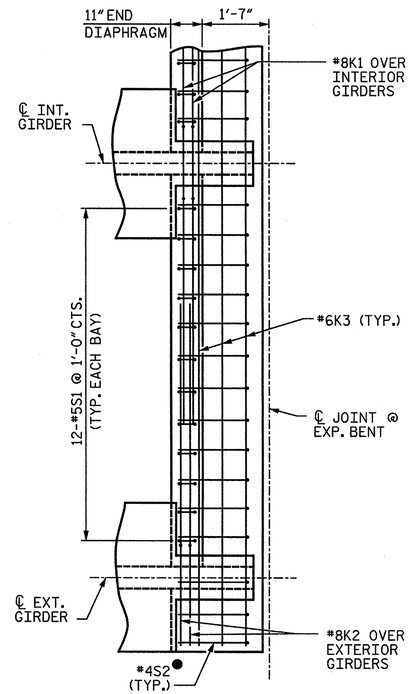
(**) SEE PARTIAL PLAN DETAILS ON "PLAN OF SPANS DETAILS FOR EDGE GIRDER." FOR PLACEMENT OF TOP AND BOTTOM "B" BARS OVER BENT.



PLAN OF SPANS

NOTES:

1. SEE SHEET 1 OF 2 FOR NOTES.



DETAIL "C"

END DIAPHRAGM AT EXP. BENT (PARAPET & MAIN DECK SLAB REINFORCING STEEL NOT SHOWN FOR CLARITY)

● *4S2 BARS TO BE PLACED AS SHOWN IN "END DIAPHRAGM DETAIL" ON CORRESPONDING "TYPICAL SECTION" SHEET

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS UNIT 10

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2			4			219

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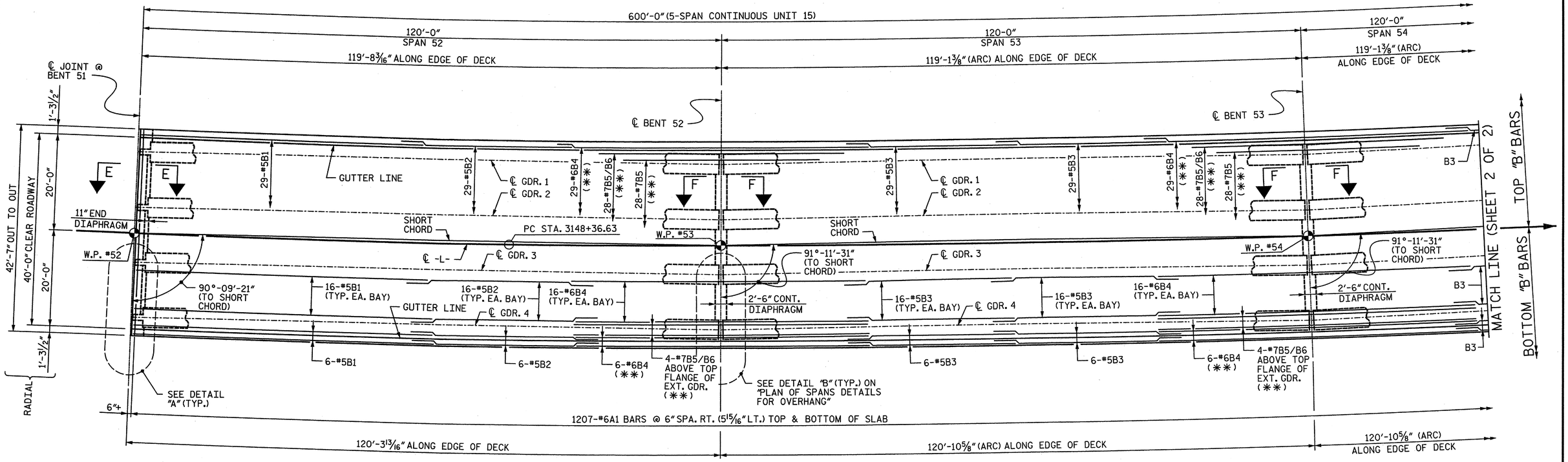
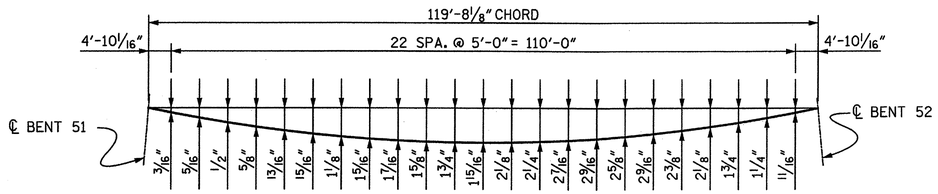
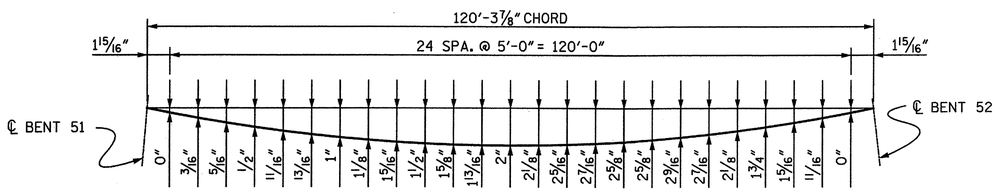


PLAN OF SPAN

(**) NOTE:
SEE PARTIAL PLAN DETAILS ON "PLAN OF SPANS DETAILS FOR OVERHANG" FOR PLACEMENT OF TOP AND BOTTOM "B" BARS OVER BENT.



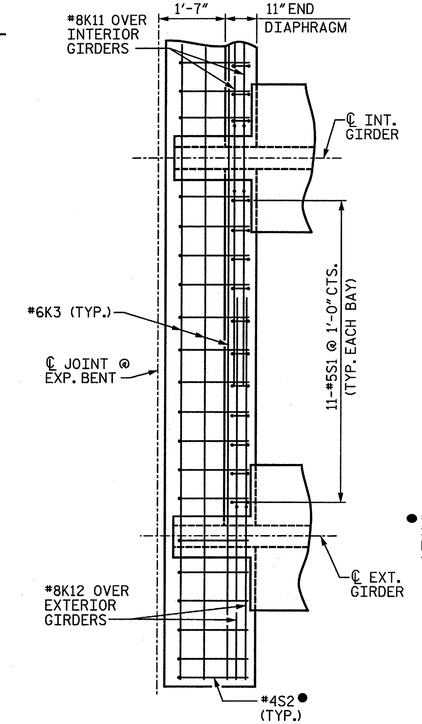
LEFT EDGE OF DECK



RIGHT EDGE OF DECK

ARC OFFSETS - SPAN 52

(SEE SHEET 2 OF 2 FOR ARC OFFSETS - SPAN 53)



DETAIL "A"

END DIAPHRAGM AT EXP. BENT (PARAPET & MAIN DECK SLAB REINFORCING STEEL NOT SHOWN FOR CLARITY)

● #4S2 BARS TO BE PLACED AS SHOWN IN "END DIAPHRAGM DETAIL" ON CORRESPONDING "TYPICAL SECTION" SHEET

NOTES:

1. FOR CONCRETE PARAPET DIMENSIONS, REINFORCEMENT AND JOINT SPACING, SEE CORRESPONDING "PLAN OF RAIL & CONCRETE PARAPET" SHEETS.
2. FOR "B" BAR SPACING, SEE CORRESPONDING "TYPICAL SECTION" SHEET.
3. FOR POURING SEQUENCE AND TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB, SEE "DECK POUR DIAGRAMS" SHEET.
4. FOR SECTION VIEWS, SEE "SUPERSTRUCTURE DETAILS" SHEETS.
5. FOR DECK DRAINAGE, SEE "DECK DRAIN DETAILS" SHEET.
6. FOR MINIMUM SPLICE LENGTHS, SEE "SUPERSTRUCTURE BILL OF MATERIAL".

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
UNIT 15

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

REVISIONS						SHEET NO.
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2			4			219

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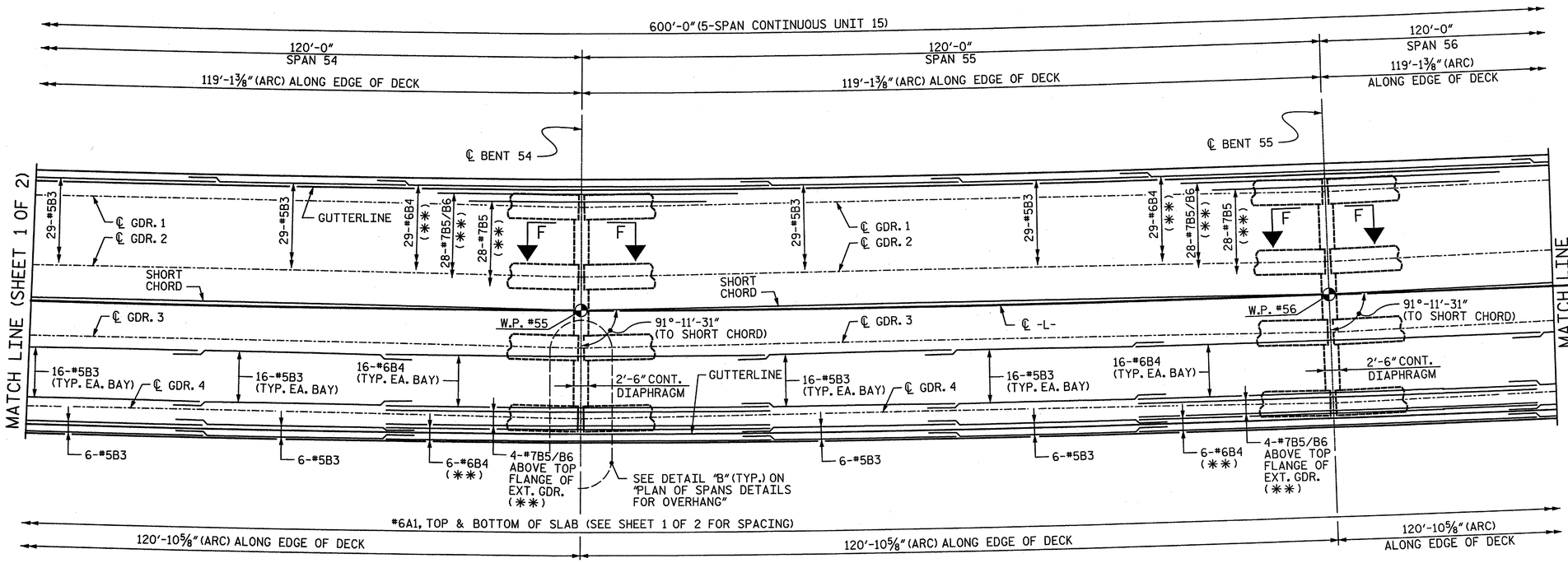
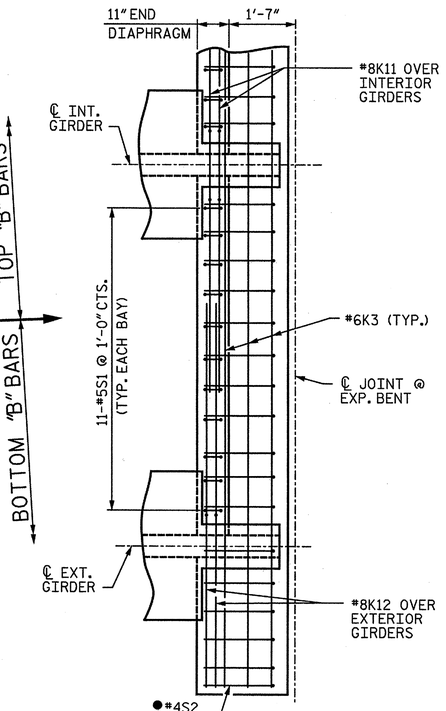


(**) NOTE:
SEE PARTIAL PLAN DETAILS ON "PLAN OF SPANS DETAILS FOR OVERHANG" FOR PLACEMENT OF TOP AND BOTTOM "B" BARS OVER BENT.

NOTES:

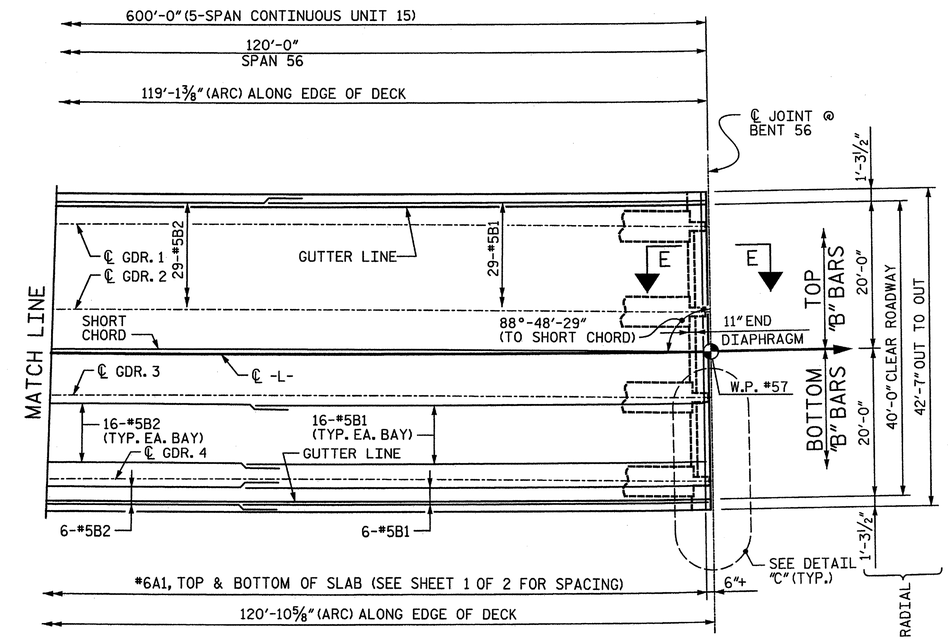
1. FOR NOTES, SEE SHEET 1 OF 2.



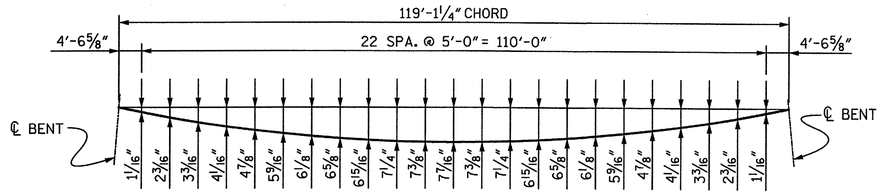
DETAIL "C"

END DIAPHRAGM AT EXP. BENT (PARAPET & MAIN DECK SLAB REINFORCING STEEL NOT SHOWN FOR CLARITY)

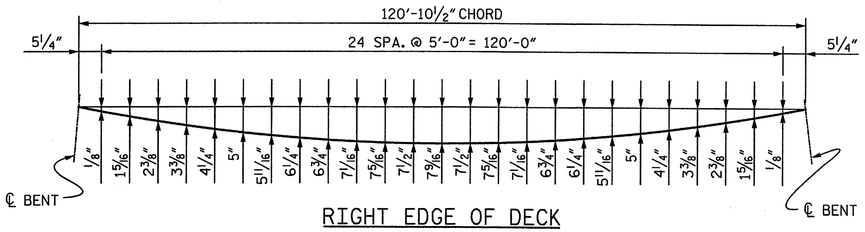
●*4S2 BARS TO BE PLACED AS SHOWN IN "END DIAPHRAGM DETAIL" ON CORRESPONDING "TYPICAL SECTION" SHEET



PLAN OF SPAN



LEFT EDGE OF DECK



RIGHT EDGE OF DECK

ARC OFFSETS - SPANS 53-56

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
UNIT 15

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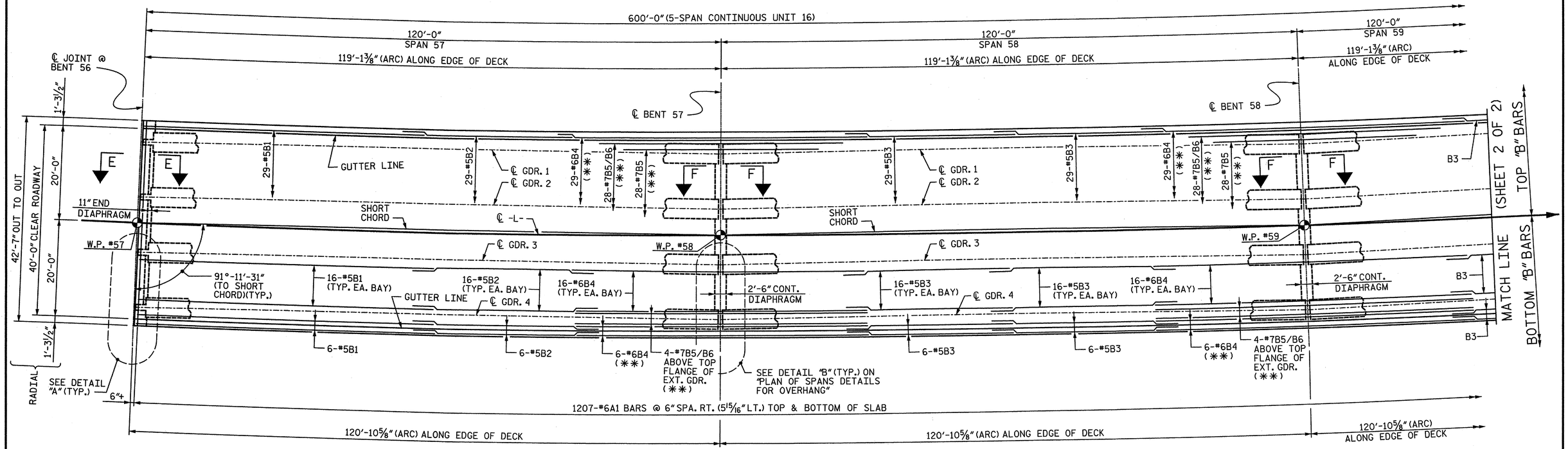
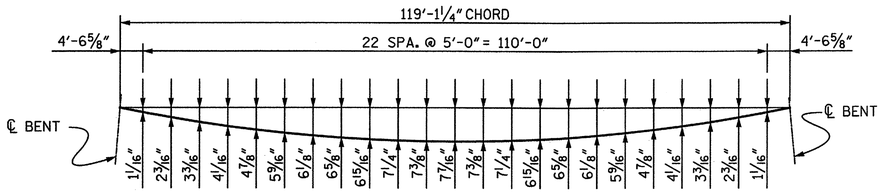
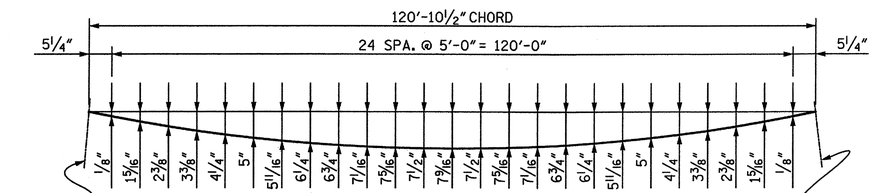


PLAN OF SPANS

(**) NOTE:
SEE PARTIAL PLAN DETAILS ON "PLAN OF SPANS DETAILS FOR OVERHANG" FOR PLACEMENT OF TOP AND BOTTOM "B" BARS OVER BENT.

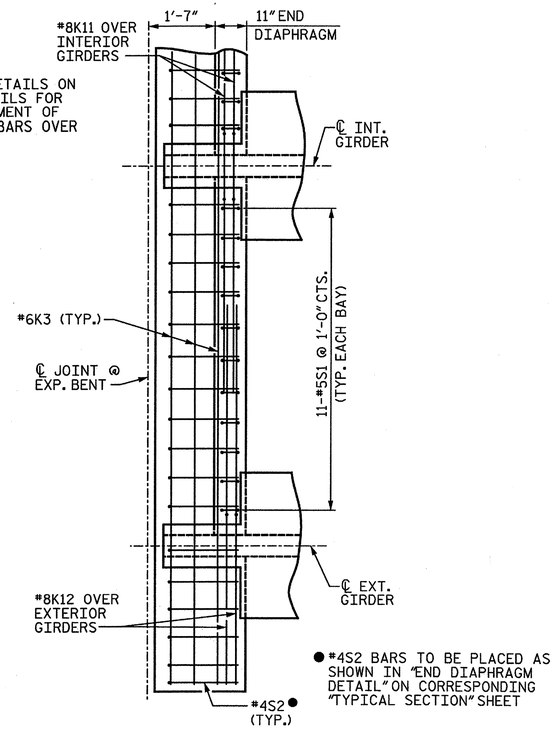


LEFT EDGE OF DECK



RIGHT EDGE OF DECK

ARC OFFSETS - SPANS 57-60



● #4S2 BARS TO BE PLACED AS SHOWN IN "END DIAPHRAGM DETAIL" ON CORRESPONDING "TYPICAL SECTION" SHEET

DETAIL "A"

END DIAPHRAGM AT EXP. BENT (PARAPET & MAIN DECK SLAB REINFORCING STEEL NOT SHOWN FOR CLARITY)

NOTES:

1. FOR CONCRETE PARAPET DIMENSIONS, REINFORCEMENT AND JOINT SPACING, SEE CORRESPONDING "PLAN OF RAIL & CONCRETE PARAPET" SHEETS.
2. FOR "B" BAR SPACING, SEE CORRESPONDING "TYPICAL SECTION" SHEET.
3. FOR POURING SEQUENCE AND TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB, SEE "DECK POUR DIAGRAMS" SHEET.
4. FOR SECTION VIEWS, SEE "SUPERSTRUCTURE DETAILS" SHEETS.
5. FOR DECK DRAINAGE, SEE "DECK DRAIN DETAILS" SHEET.
6. FOR MINIMUM SPLICE LENGTHS, SEE "SUPERSTRUCTURE BILL OF MATERIAL".

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
UNIT 16

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

DRAWN BY : ACA DATE : 3-12
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1			3			TOTAL SHEETS
2			4			219

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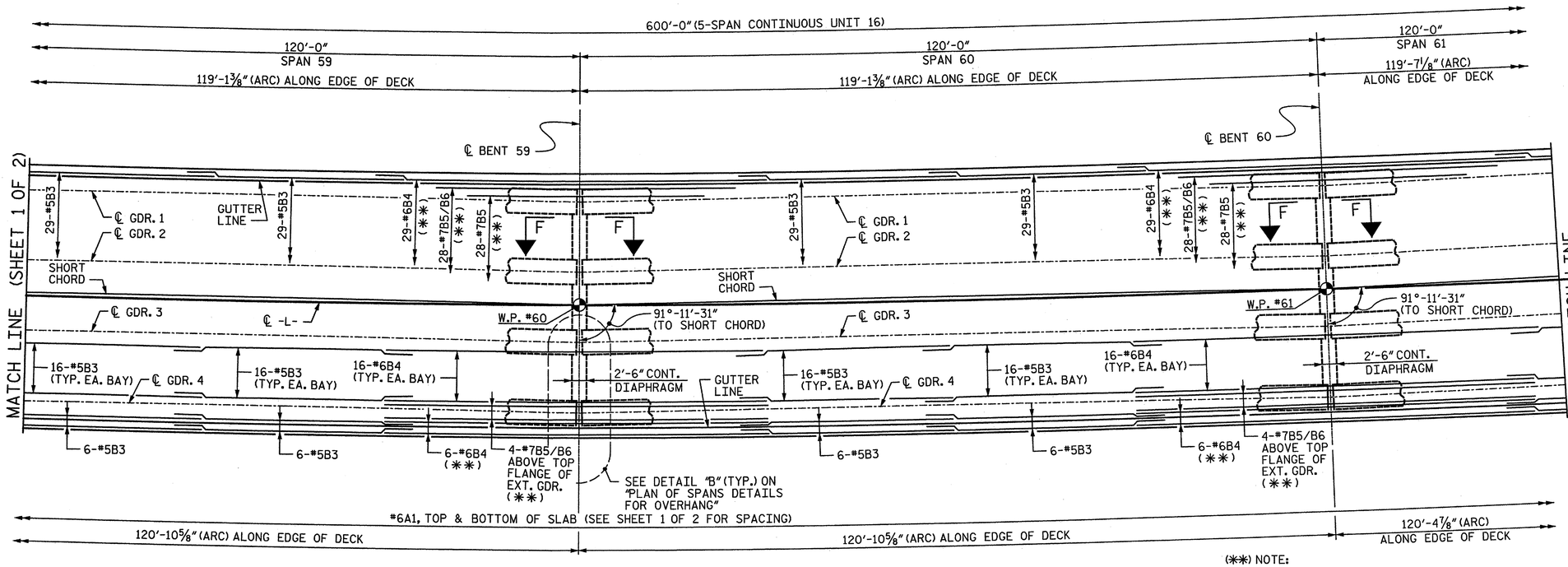
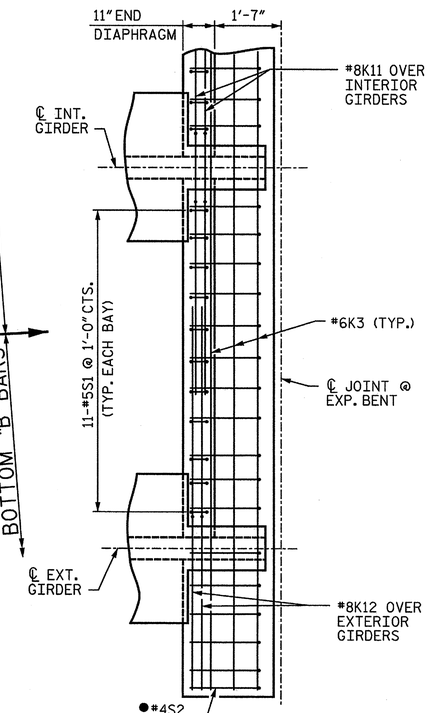
NOTES:

1. FOR NOTES, SEE SHEET 1 OF 2.



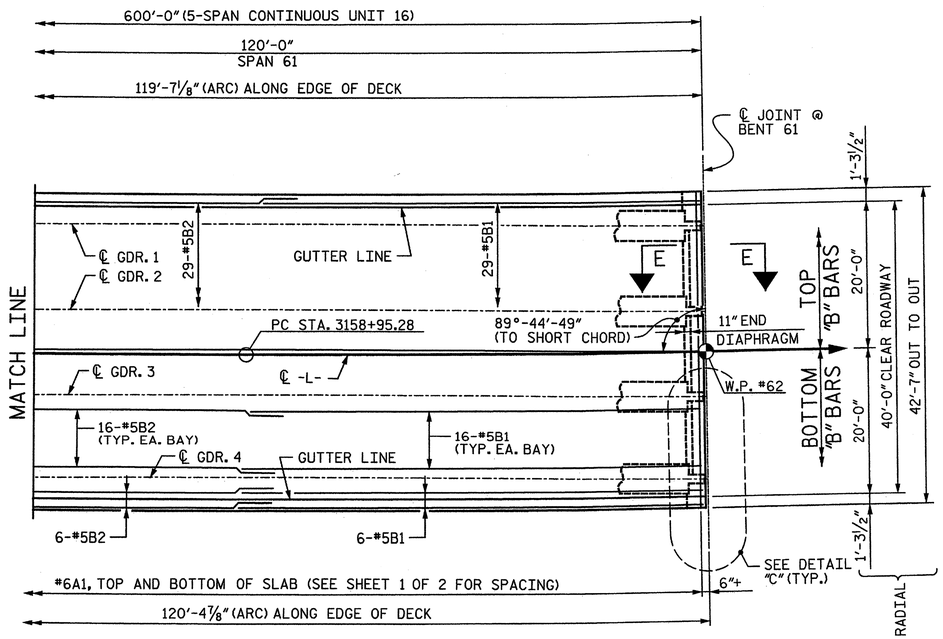
(**) NOTE:
SEE PARTIAL PLAN DETAILS ON "PLAN OF SPANS DETAILS FOR OVERHANG" FOR PLACEMENT OF TOP AND BOTTOM "B" BARS OVER BENT.



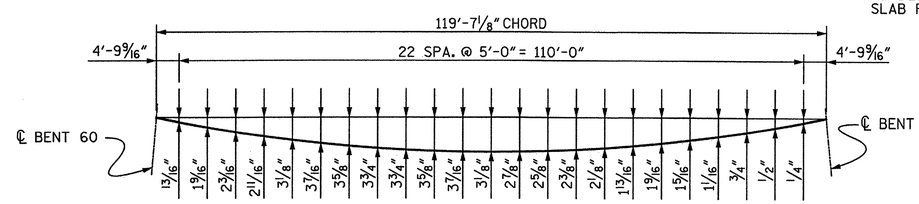
DETAIL "C"

END DIAPHRAGM AT EXP. BENT (PARAPET & MAIN DECK SLAB REINFORCING STEEL NOT SHOWN FOR CLARITY)

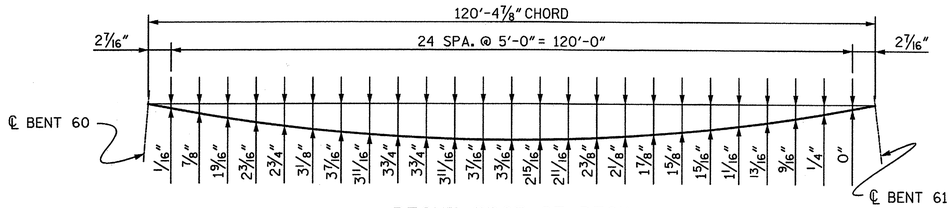
● #4S2 BARS TO BE PLACED AS SHOWN IN "END DIAPHRAGM DETAIL" ON CORRESPONDING "TYPICAL SECTION" SHEET



PLAN OF SPANS



LEFT EDGE OF DECK



RIGHT EDGE OF DECK

ARC OFFSETS - SPAN 61

(SEE SHEET 1 OF 2 FOR ARC OFFSETS - SPANS 57-60)

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS UNIT 16

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1			3			TOTAL SHEETS
2			4			219

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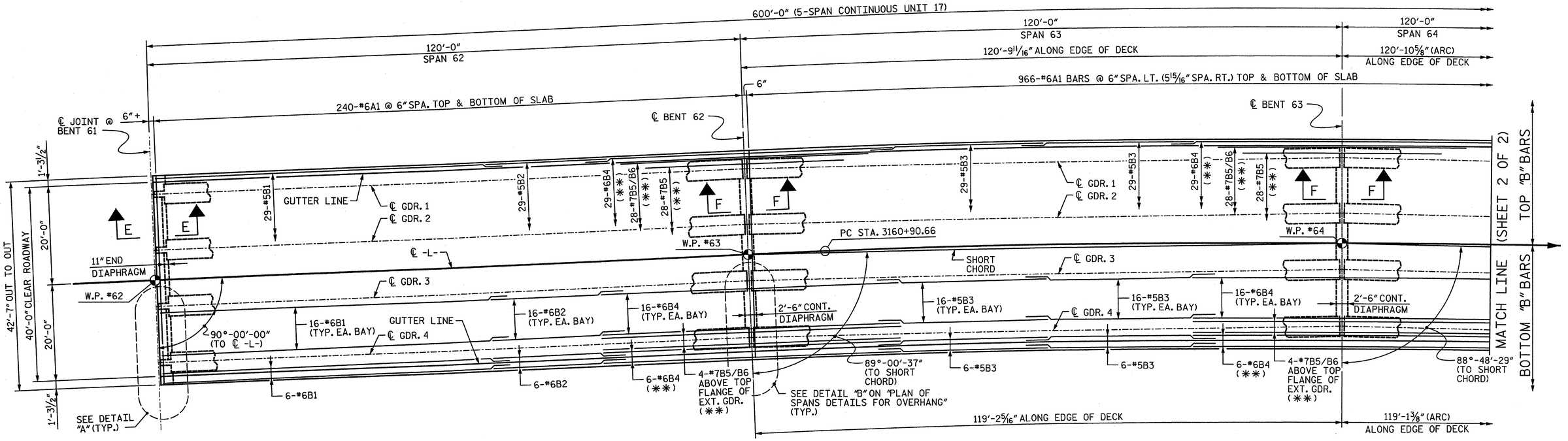
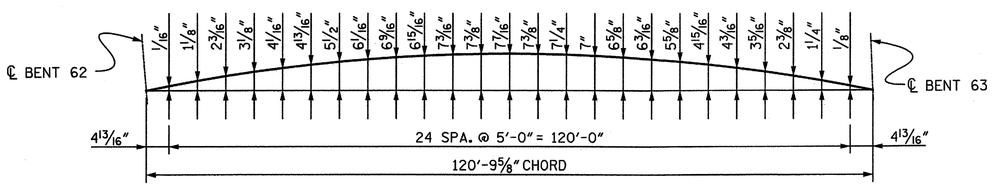
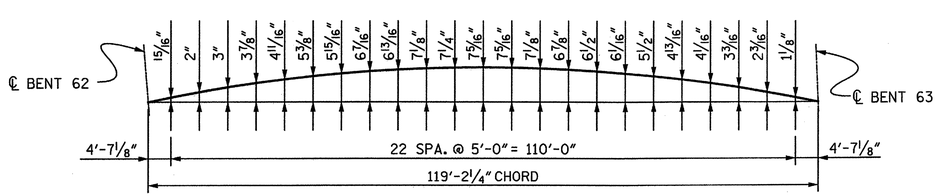


PLAN OF SPANS

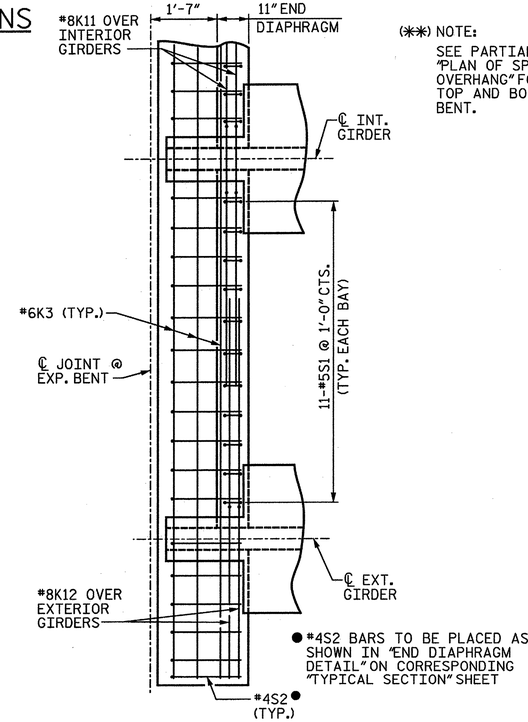


LEFT EDGE OF DECK



RIGHT EDGE OF DECK

ARC OFFSETS - SPAN 63



DETAIL "A"

END DIAPHRAGM AT EXP. BENT (PARAPET & MAIN DECK SLAB REINFORCING STEEL NOT SHOWN FOR CLARITY)

(**) NOTE:
SEE PARTIAL PLAN DETAILS ON "PLAN OF SPANS DETAILS FOR OVERHANG" FOR PLACEMENT OF TOP AND BOTTOM "B" BARS OVER BENT.

NOTES:

1. FOR CONCRETE PARAPET DIMENSIONS, REINFORCEMENT AND JOINT SPACING, SEE CORRESPONDING "PLAN OF RAIL & CONCRETE PARAPET" SHEETS.
2. FOR "B" BAR SPACING, SEE CORRESPONDING "TYPICAL SECTION" SHEET.
3. FOR POURING SEQUENCE AND TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB, SEE "DECK POUR DIAGRAMS" SHEET.
4. FOR SECTION VIEWS, SEE "SUPERSTRUCTURE DETAILS" SHEETS.
5. FOR DECK DRAINAGE, SEE "DECK DRAIN DETAILS" SHEET.
6. FOR MINIMUM SPLICE LENGTHS, SEE "SUPERSTRUCTURE BILL OF MATERIAL".

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
UNIT 17

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

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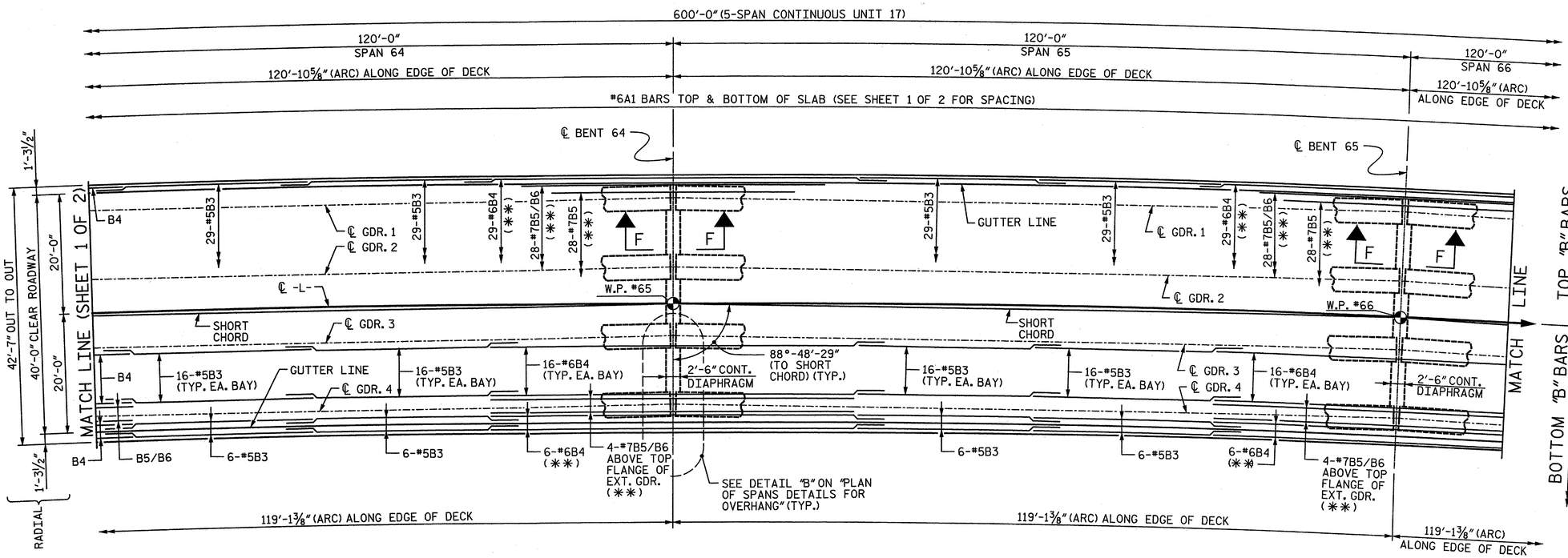
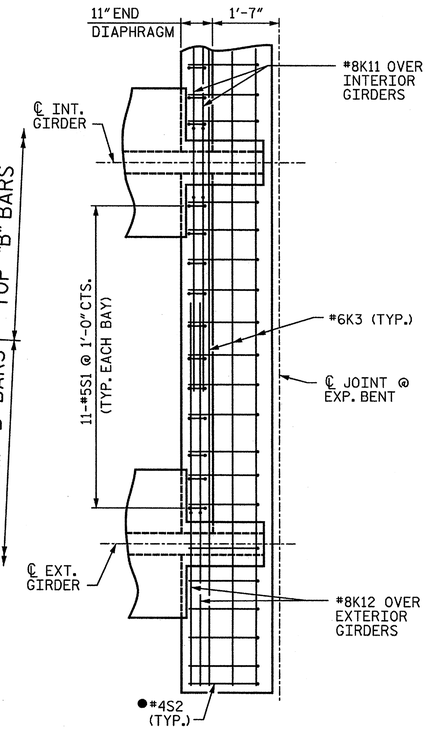


PLAN OF SPANS

(**) NOTE:
SEE PARTIAL PLAN DETAILS ON "PLAN OF SPANS DETAILS FOR OVERHANG" FOR PLACEMENT OF TOP AND BOTTOM "B" BARS OVER BENT.

NOTES:

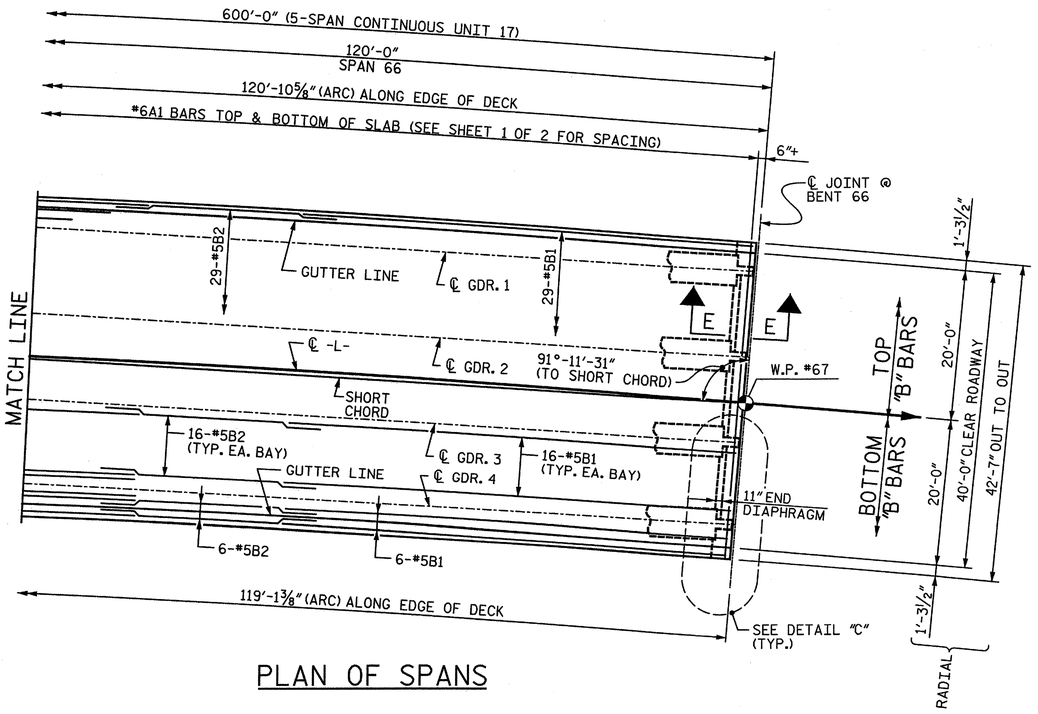
1. FOR NOTES, SEE SHEET 1 OF 2.



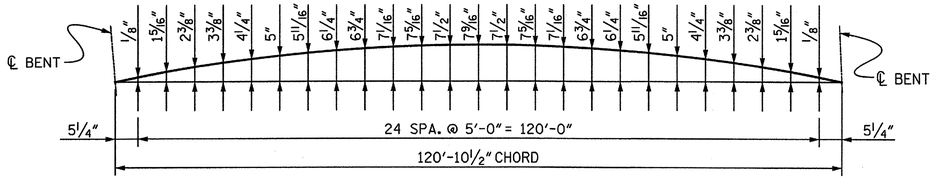
DETAIL "C"

END DIAPHRAGM AT EXP. BENT (PARAPET & MAIN DECK SLAB REINFORCING STEEL NOT SHOWN FOR CLARITY)

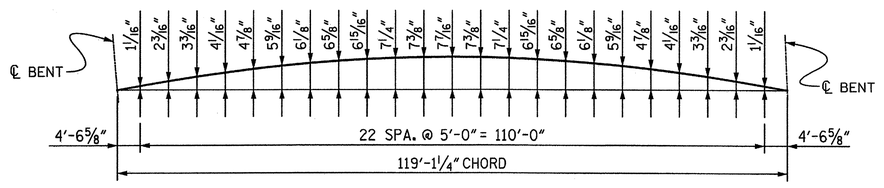
● *4S2 BARS TO BE PLACED AS SHOWN IN "END DIAPHRAGM DETAIL" ON CORRESPONDING "TYPICAL SECTION" SHEET



PLAN OF SPANS



LEFT EDGE OF DECK



RIGHT EDGE OF DECK

ARC OFFSETS - SPAN 64-66

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
UNIT 17

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2			4		

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TOTAL SHEETS 219

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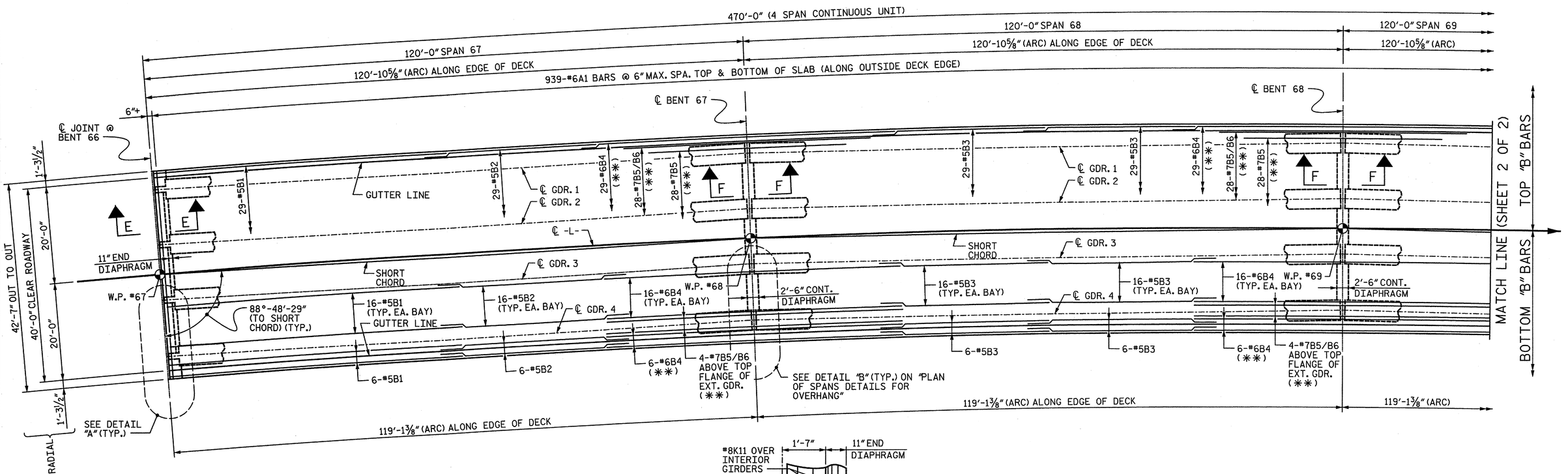
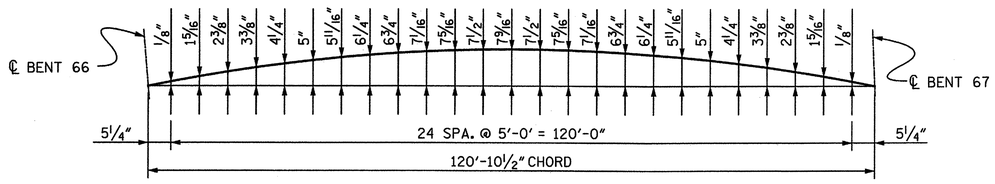


PLAN OF SPANS



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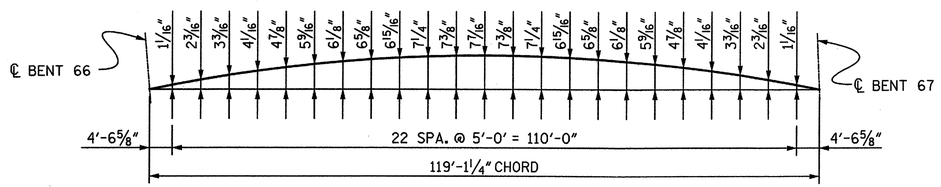
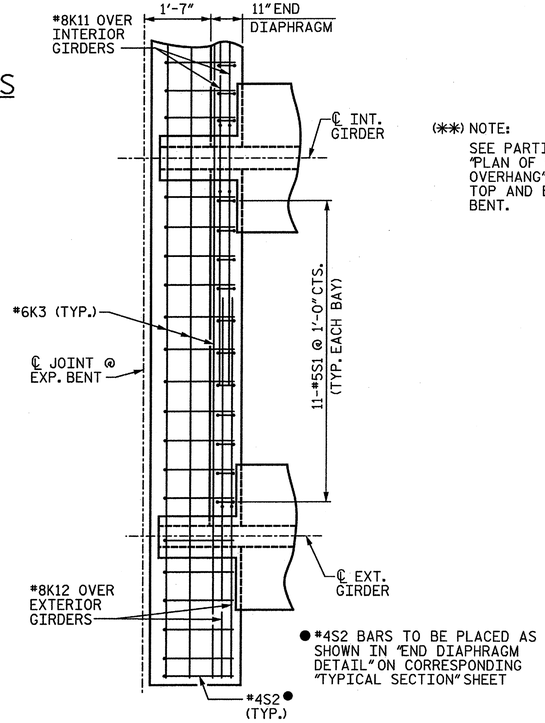


RIGHT EDGE OF DECK

ARC OFFSETS - SPAN 67

(ARC OFFSETS- SPANS 68 & 69 SIMILAR)



DETAIL "A"

END DIAPHRAGM AT EXP. BENT (PARAPET & MAIN DECK SLAB REINFORCING STEEL NOT SHOWN FOR CLARITY)

(**) NOTE:
SEE PARTIAL PLAN DETAILS ON "PLAN OF SPANS DETAILS FOR OVERHANG" FOR PLACEMENT OF TOP AND BOTTOM "B" BARS OVER BENT.

NOTES:

1. FOR CONCRETE PARAPET DIMENSIONS, REINFORCEMENT AND JOINT SPACING, SEE CORRESPONDING "PLAN OF RAIL & CONCRETE PARAPET" SHEETS.
2. FOR "B" BAR SPACING, SEE CORRESPONDING "TYPICAL SECTION" SHEET.
3. FOR POURING SEQUENCE AND TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB, SEE "DECK POUR DIAGRAMS" SHEET.
4. FOR SECTION VIEWS, SEE "SUPERSTRUCTURE DETAILS" SHEETS.
5. FOR DECK DRAINAGE, SEE "DECK DRAIN DETAILS" SHEET.
6. FOR MINIMUM SPLICE LENGTHS, SEE "SUPERSTRUCTURE BILL OF MATERIAL".

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS UNIT 18

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

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NC License No. F-0991

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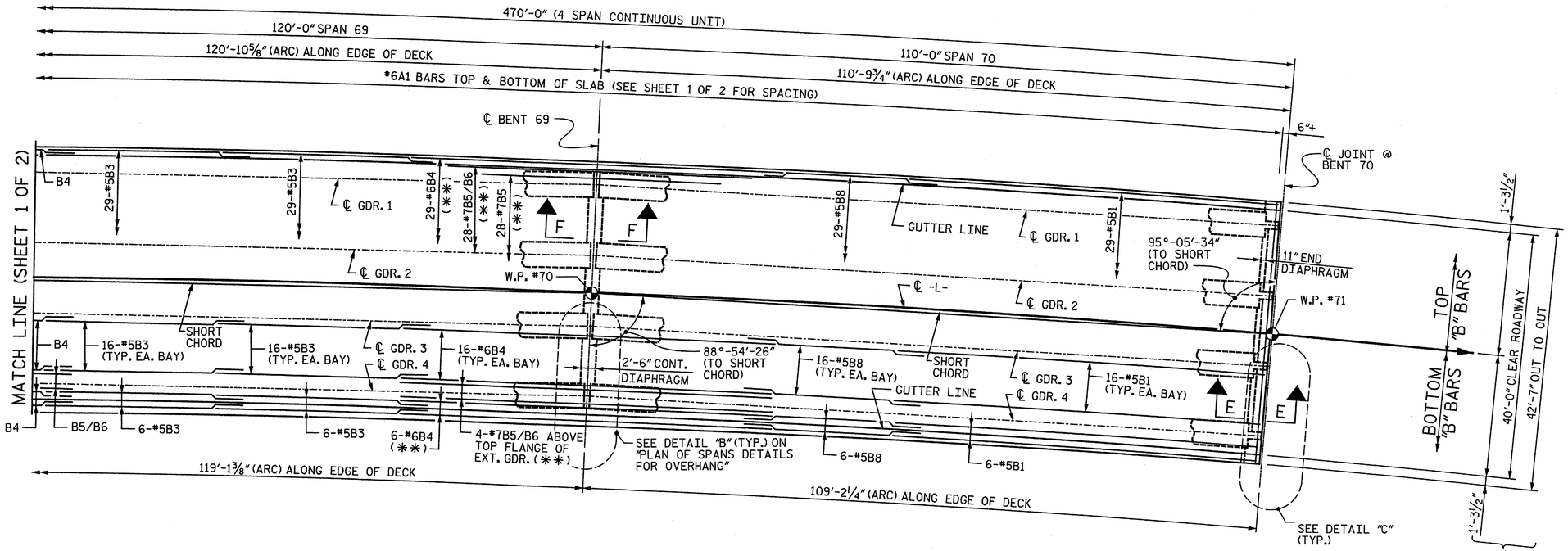
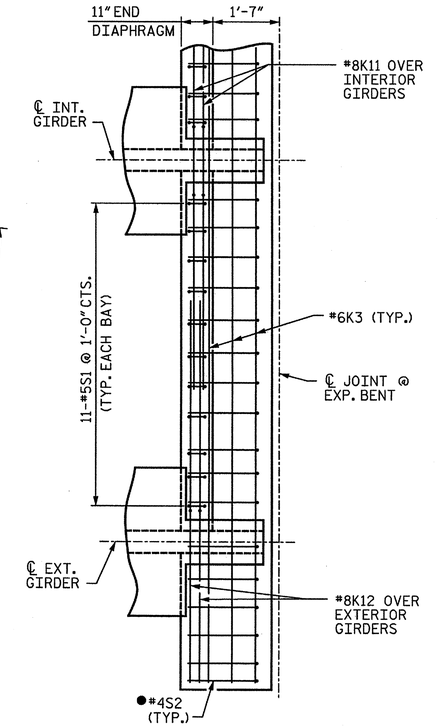
NOTES:

1. FOR NOTES, SEE SHEET 1 OF 3.



PLAN OF SPANS

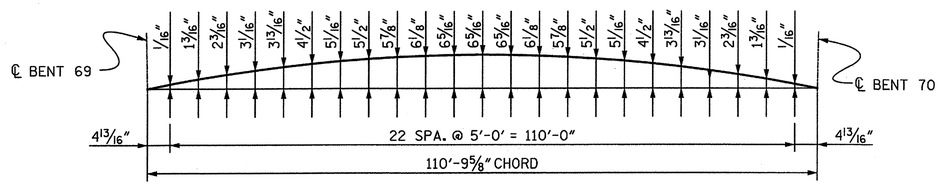
(**) NOTE:
SEE PARTIAL PLAN DETAILS ON "PLAN OF SPANS DETAILS FOR OVERHANG" FOR PLACEMENT OF TOP AND BOTTOM "B" BARS OVER BENT.



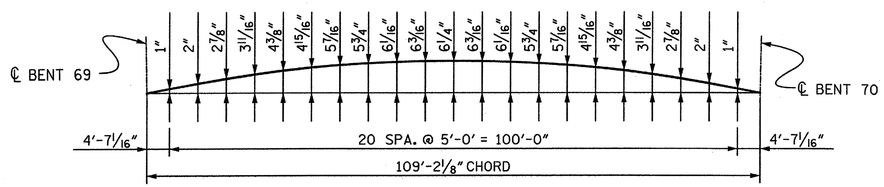
DETAIL "C"

END DIAPHRAGM AT EXP. BENT (PARAPET & MAIN DECK SLAB REINFORCING STEEL NOT SHOWN FOR CLARITY)

●#4S2 BARS TO BE PLACED AS SHOWN IN "END DIAPHRAGM DETAIL" ON CORRESPONDING "TYPICAL SECTION" SHEET



LEFT EDGE OF DECK



RIGHT EDGE OF DECK

ARC OFFSETS - SPAN 70

(SEE SHEET 1 OF 2 FOR ARC OFFSETS - SPAN 69)

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
UNIT 18

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

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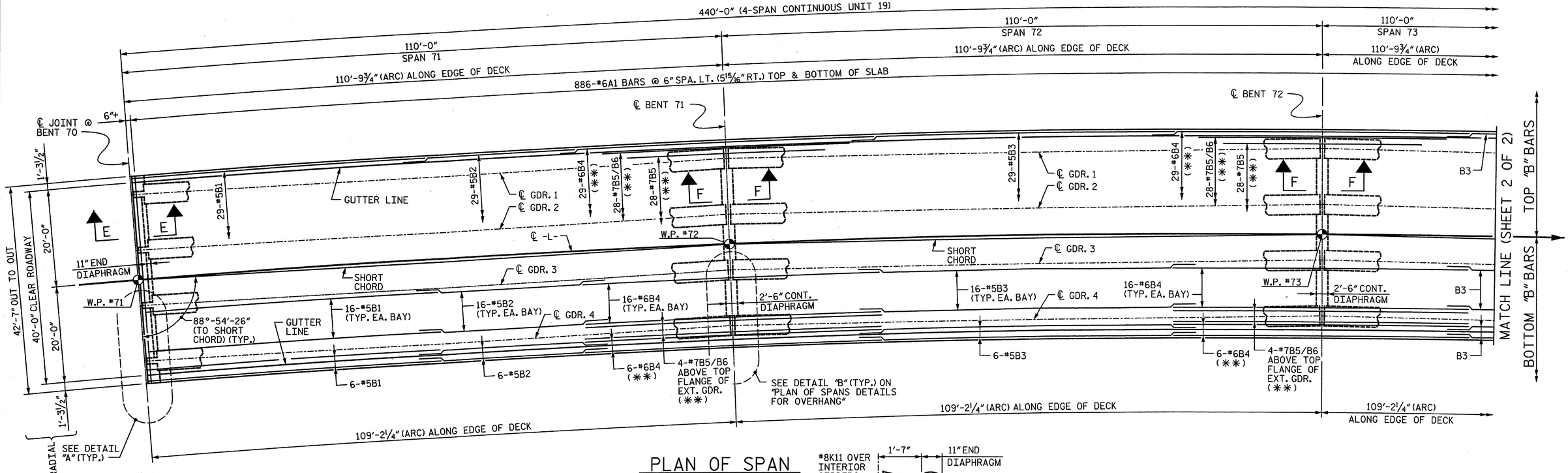
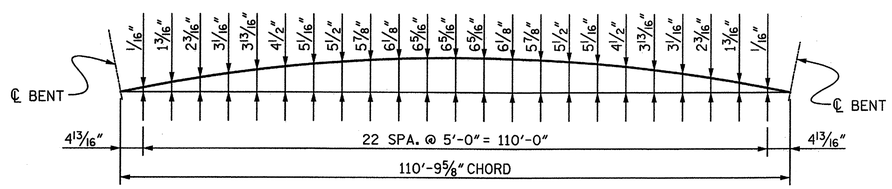
PLAN OF SPAN



(**) NOTE:
SEE PARTIAL PLAN DETAILS ON "PLAN OF SPANS DETAILS FOR OVERHANG" FOR PLACEMENT OF TOP AND BOTTOM "B" BARS OVER BENT.



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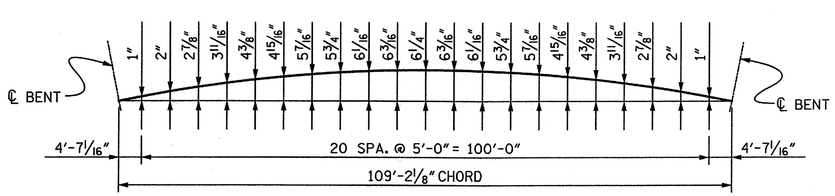
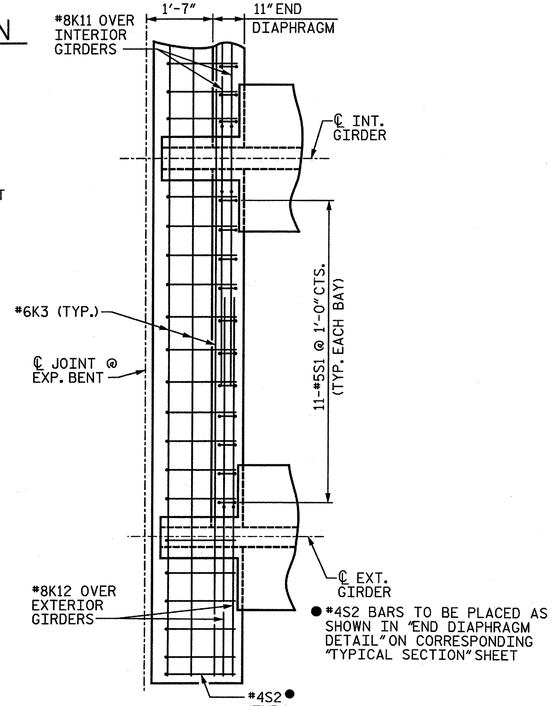


RIGHT EDGE OF DECK

ARC OFFSETS - SPANS 71-74



DETAIL "A"

END DIAPHRAGM AT EXP. BENT (PARAPET & MAIN DECK SLAB REINFORCING STEEL NOT SHOWN FOR CLARITY)

NOTES:

1. FOR CONCRETE PARAPET DIMENSIONS, REINFORCEMENT AND JOINT SPACING, SEE CORRESPONDING "PLAN OF RAIL & CONCRETE PARAPET" SHEETS.
2. FOR "B" BAR SPACING, SEE CORRESPONDING "TYPICAL SECTION" SHEET.
3. FOR POURING SEQUENCE AND TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB, SEE "DECK POUR DIAGRAMS" SHEET.
4. FOR SECTION VIEWS, SEE "SUPERSTRUCTURE DETAILS" SHEETS.
5. FOR DECK DRAINAGE, SEE "DECK DRAIN DETAILS" SHEET.
6. FOR MINIMUM SPLICE LENGTHS, SEE "SUPERSTRUCTURE BILL OF MATERIAL".

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
UNIT 19

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

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1			3			TOTAL SHEETS
2			4			219

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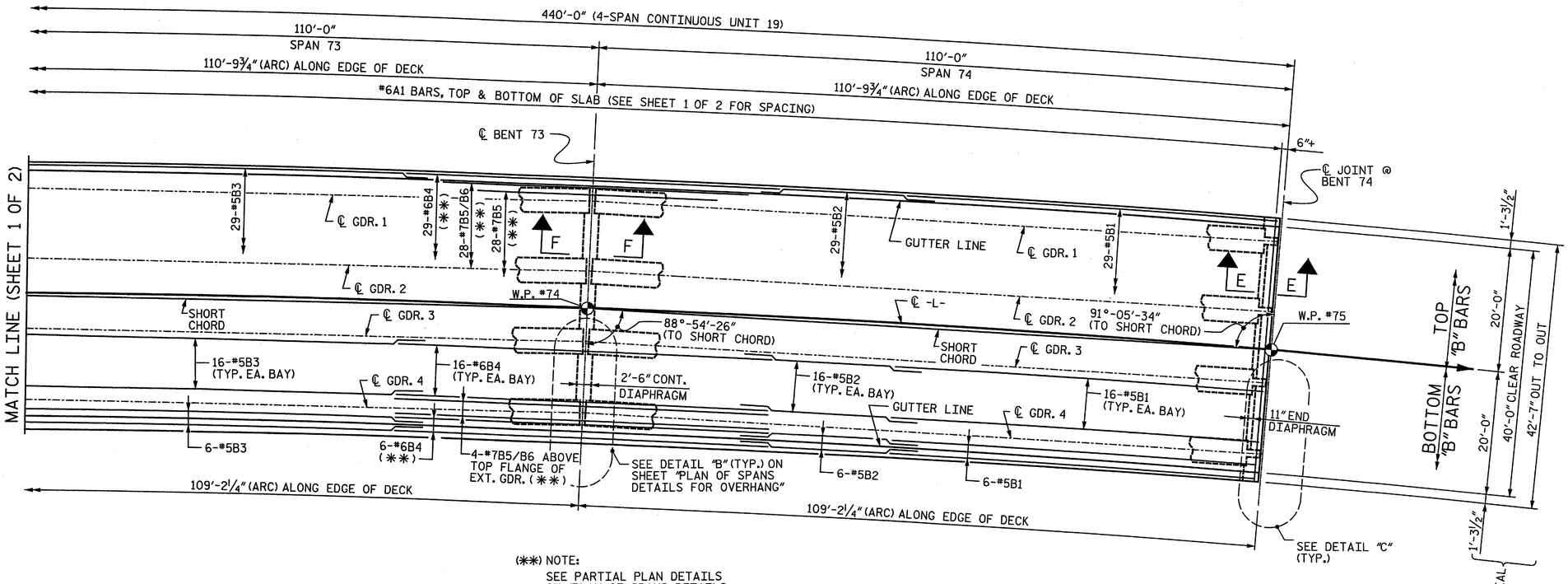
NOTES:

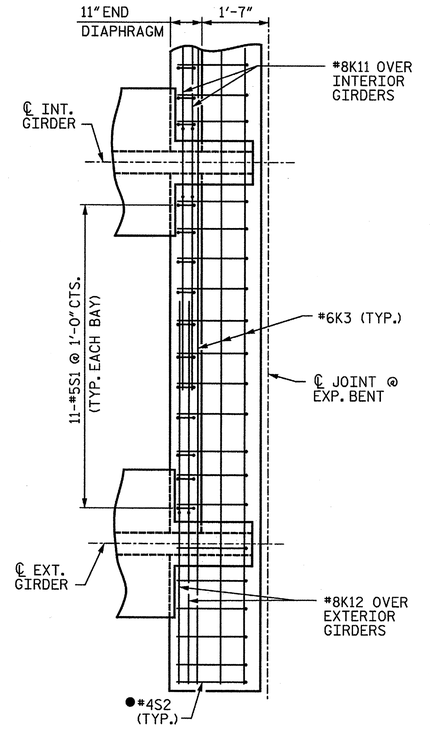
1. FOR NOTES, SEE SHEET 1 OF 2.



(**) NOTE:
SEE PARTIAL PLAN DETAILS ON "PLAN OF SPANS DETAILS FOR OVERHANG" FOR PLACEMENT OF TOP AND BOTTOM "B" BARS OVER BENT.

PLAN OF SPANS

(SEE SHEET 1 OF 2 FOR ARC OFFSETS - SPANS 73-74.)



DETAIL "C"

END DIAPHRAGM AT EXP. BENT (PARAPET & MAIN DECK SLAB REINFORCING STEEL NOT SHOWN FOR CLARITY)

●#4S2 BARS TO BE PLACED AS SHOWN IN "END DIAPHRAGM DETAIL" ON CORRESPONDING "TYPICAL SECTION" SHEET

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
UNIT 19

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

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1			3			TOTAL SHEETS
2			4			219

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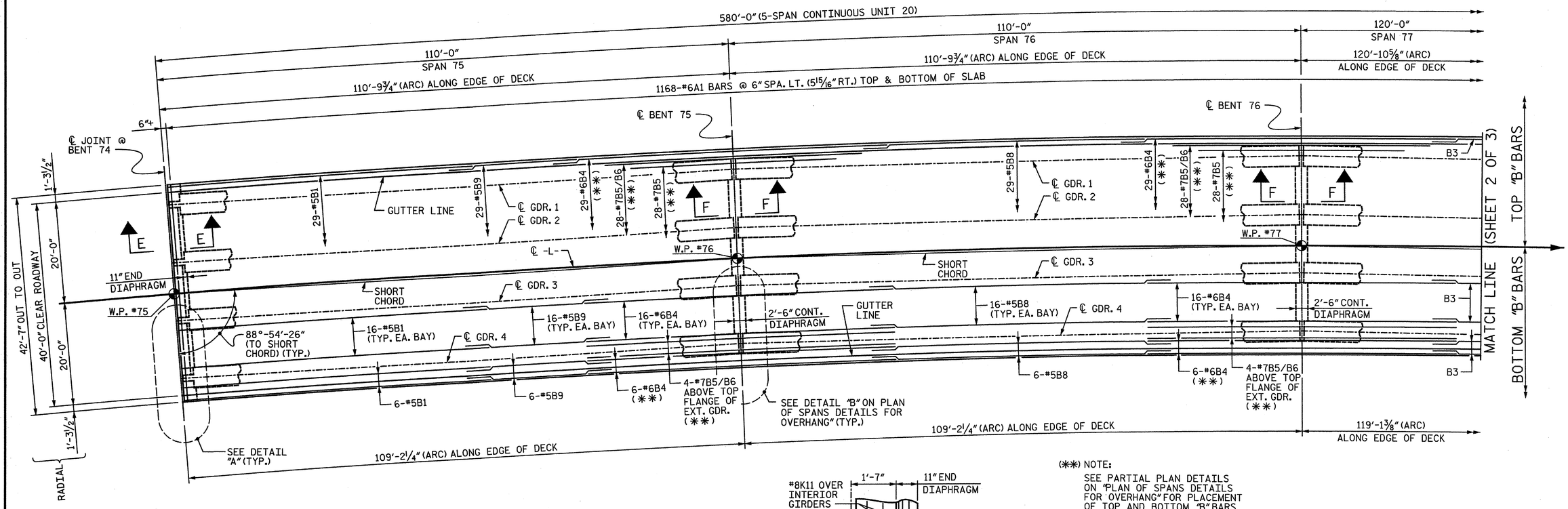
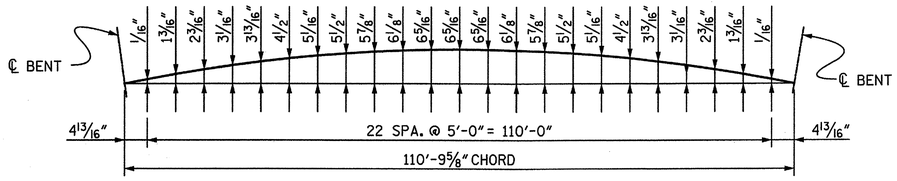
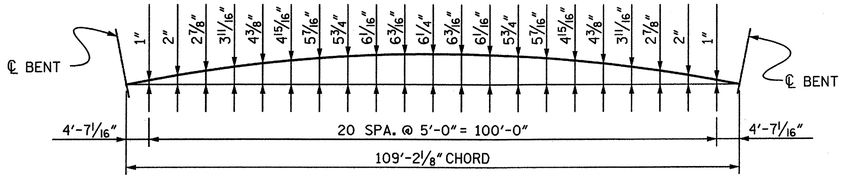


PLAN OF SPAN

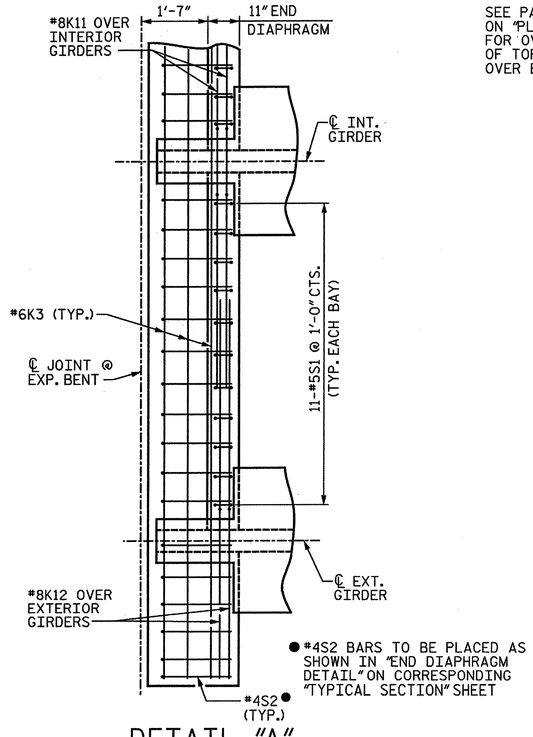


LEFT EDGE OF DECK



RIGHT EDGE OF DECK

ARC OFFSETS - SPAN 75 & 76



● #4S2 BARS TO BE PLACED AS SHOWN IN "END DIAPHRAGM DETAIL" ON CORRESPONDING "TYPICAL SECTION" SHEET

DETAIL "A"

END DIAPHRAGM AT EXP. BENT (PARAPET & MAIN DECK SLAB REINFORCING STEEL NOT SHOWN FOR CLARITY)

(**) NOTE:

SEE PARTIAL PLAN DETAILS ON "PLAN OF SPANS DETAILS FOR OVERHANG" FOR PLACEMENT OF TOP AND BOTTOM "B" BARS OVER BENT.

NOTES:

1. FOR CONCRETE PARAPET DIMENSIONS, REINFORCEMENT AND JOINT SPACING, SEE CORRESPONDING "PLAN OF RAIL & CONCRETE PARAPET" SHEETS.
2. FOR "B" BAR SPACING, SEE CORRESPONDING "TYPICAL SECTION" SHEET.
3. FOR POURING SEQUENCE AND TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB, SEE "DECK POUR DIAGRAMS" SHEET.
4. FOR SECTION VIEWS, SEE "SUPERSTRUCTURE DETAILS" SHEETS.
5. FOR DECK DRAINAGE, SEE "DECK DRAIN DETAILS" SHEET.
6. FOR MINIMUM SPLICE LENGTHS, SEE "SUPERSTRUCTURE BILL OF MATERIAL".

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
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PLAN OF SPANS
UNIT 20

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

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1			3			TOTAL SHEETS
2			4			219

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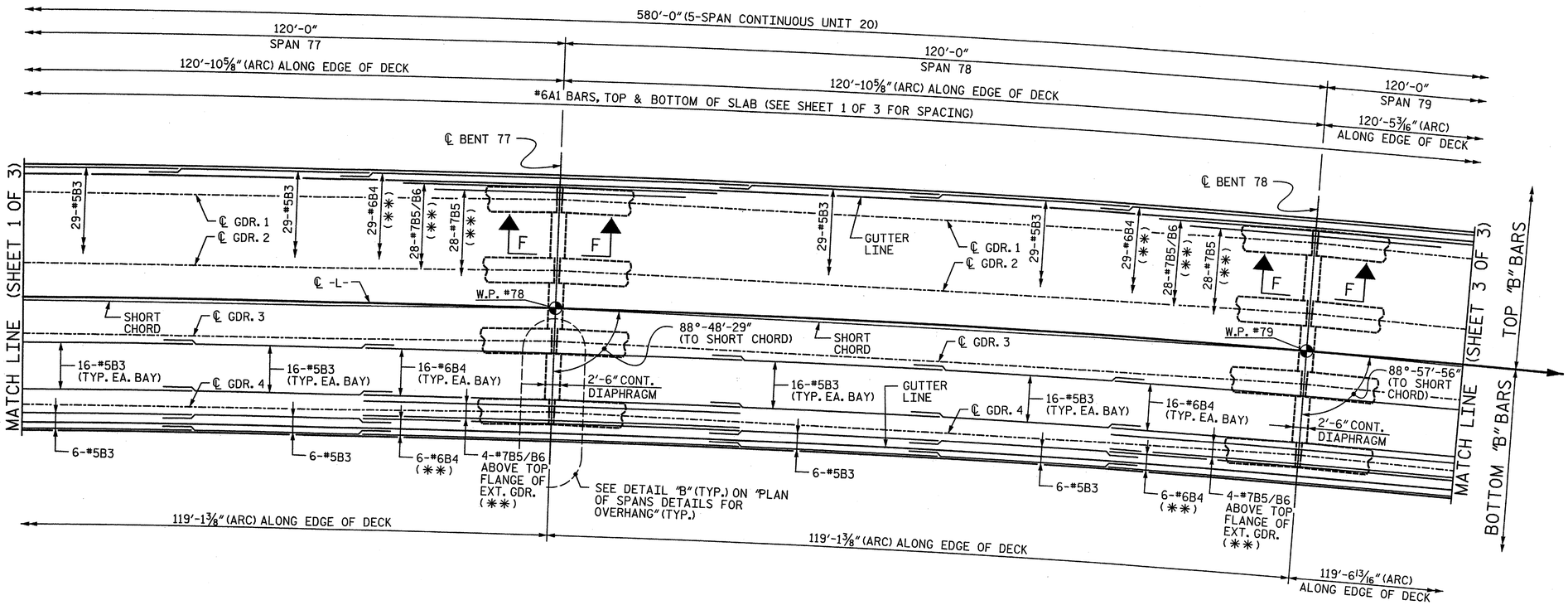
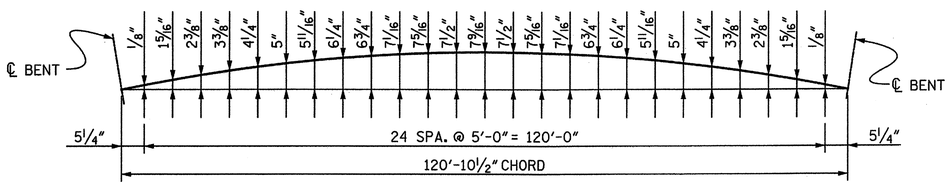
NOTES:

1. FOR NOTES, SEE SHEET 1 OF 3.

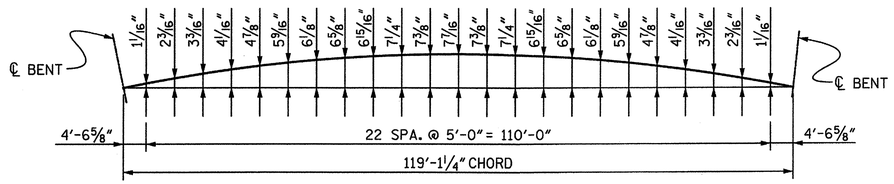


(**) NOTE:
SEE PARTIAL PLAN DETAILS ON "PLAN OF SPANS DETAILS FOR OVERHANG" FOR PLACEMENT OF TOP AND BOTTOM "B" BARS OVER BENT.

PLAN OF SPANS



LEFT EDGE OF DECK



RIGHT EDGE OF DECK

ARC OFFSETS - SPAN 77 & 78

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
UNIT 20

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
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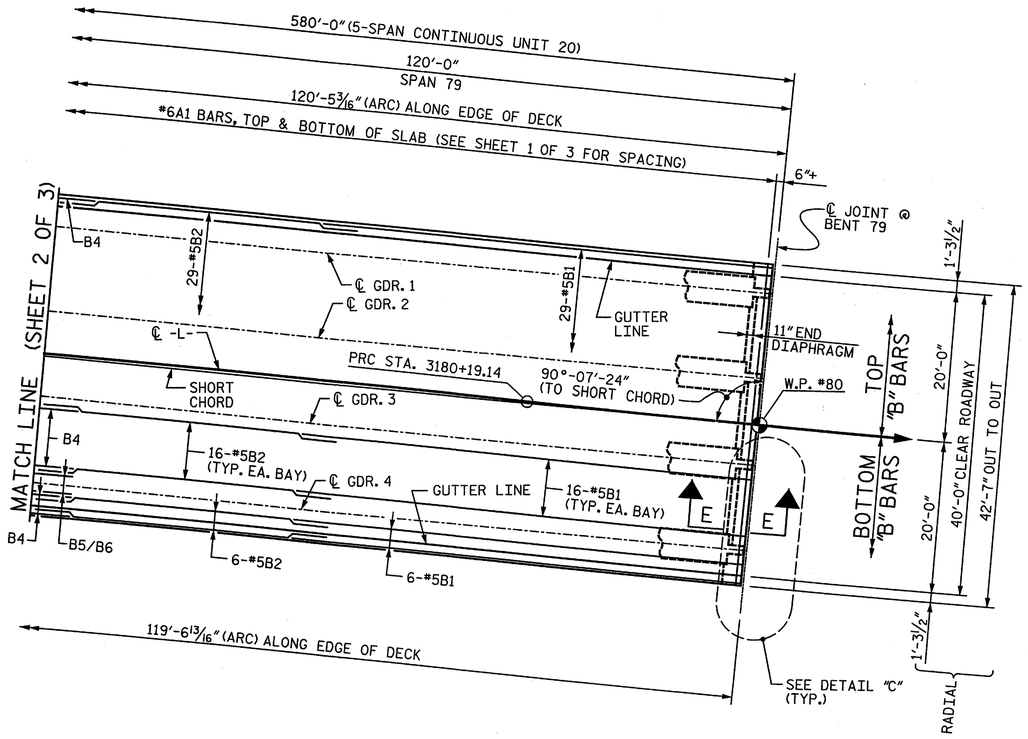
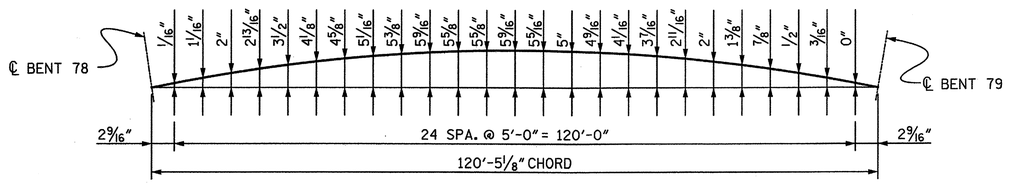
NOTES:

1. FOR NOTES, SEE SHEET 1 OF 3.



PLAN OF SPANS



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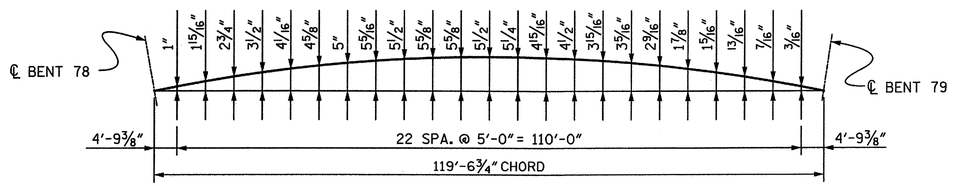
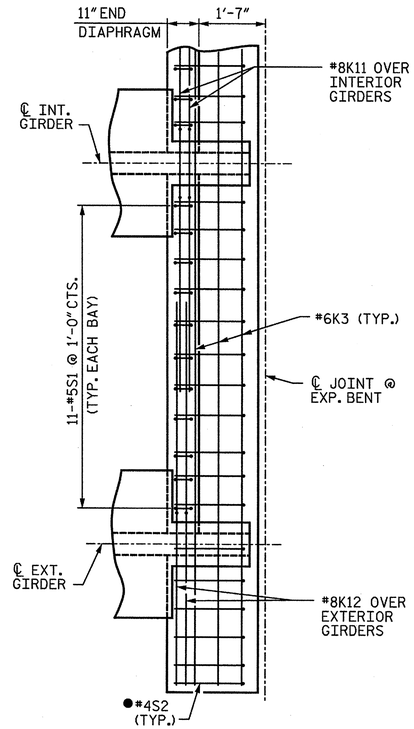


RIGHT EDGE OF DECK

ARC OFFSETS - SPAN 79



DETAIL "C"

END DIAPHRAGM AT EXP. BENT (PARAPET & MAIN DECK SLAB REINFORCING STEEL NOT SHOWN FOR CLARITY)

● #4S2 BARS TO BE PLACED AS SHOWN IN "END DIAPHRAGM DETAIL" ON CORRESPONDING "TYPICAL SECTION" SHEET

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
UNIT 20

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

DRAWN BY : LGH DATE : 3-12
CHECKED BY : AJP/CLG DATE : 3-12

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1			3			TOTAL SHEETS
2			4			219

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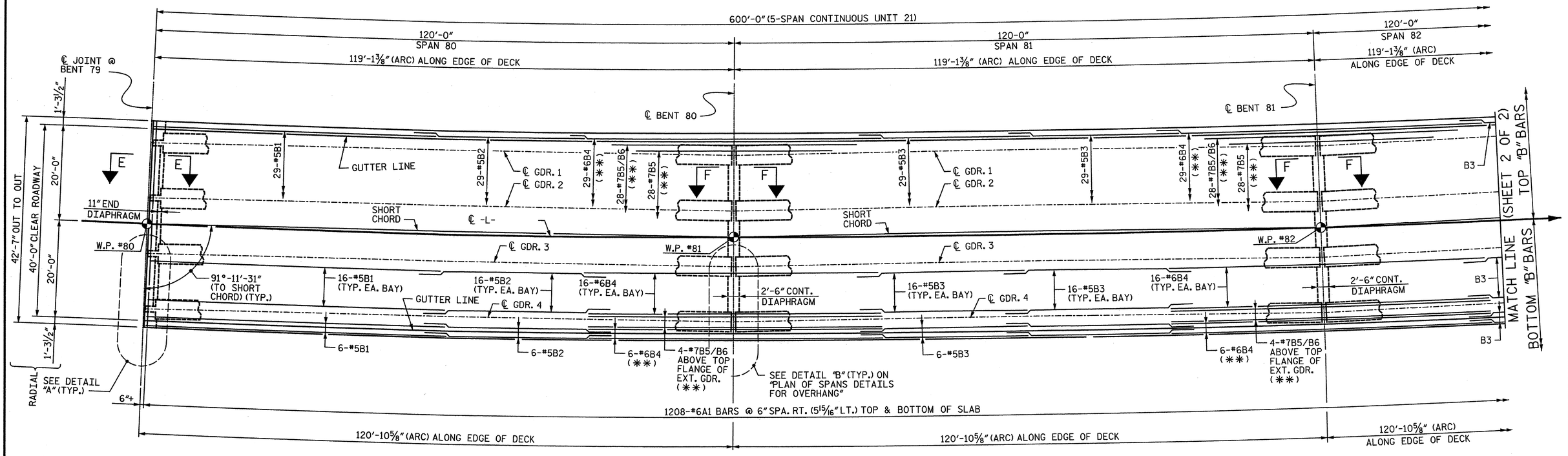
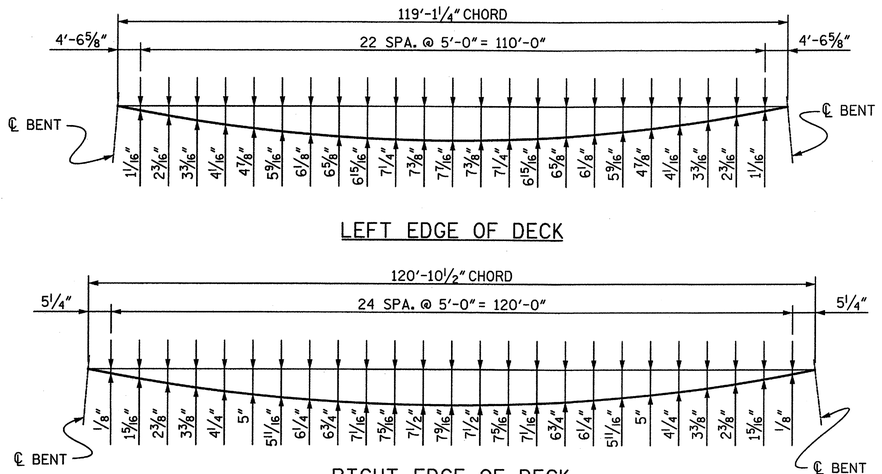


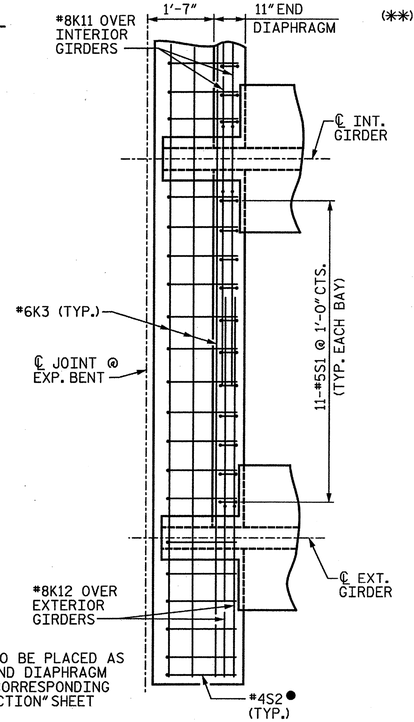
PLAN OF SPAN



LEFT EDGE OF DECK

RIGHT EDGE OF DECK

ARC OFFSETS - SPANS 80-84



DETAIL "A"

END DIAPHRAGM AT EXP. BENT (PARAPET & MAIN DECK SLAB REINFORCING STEEL NOT SHOWN FOR CLARITY)

(**) NOTE:
SEE PARTIAL PLAN DETAILS ON "PLAN OF SPANS DETAILS FOR OVERHANG" FOR PLACEMENT OF TOP AND BOTTOM "B" BARS OVER BENT.

NOTES:

1. FOR CONCRETE PARAPET DIMENSIONS, REINFORCEMENT AND JOINT SPACING, SEE CORRESPONDING "PLAN OF RAIL & CONCRETE PARAPET" SHEETS.
2. FOR "B" BAR SPACING, SEE CORRESPONDING "TYPICAL SECTION" SHEET.
3. FOR POURING SEQUENCE AND TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB, SEE "DECK POUR DIAGRAMS" SHEET.
4. FOR SECTION VIEWS, SEE "SUPERSTRUCTURE DETAILS" SHEETS.
5. FOR DECK DRAINAGE, SEE "DECK DRAIN DETAILS" SHEET.
6. FOR MINIMUM SPLICE LENGTHS, SEE "SUPERSTRUCTURE BILL OF MATERIAL".

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
UNIT 21

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

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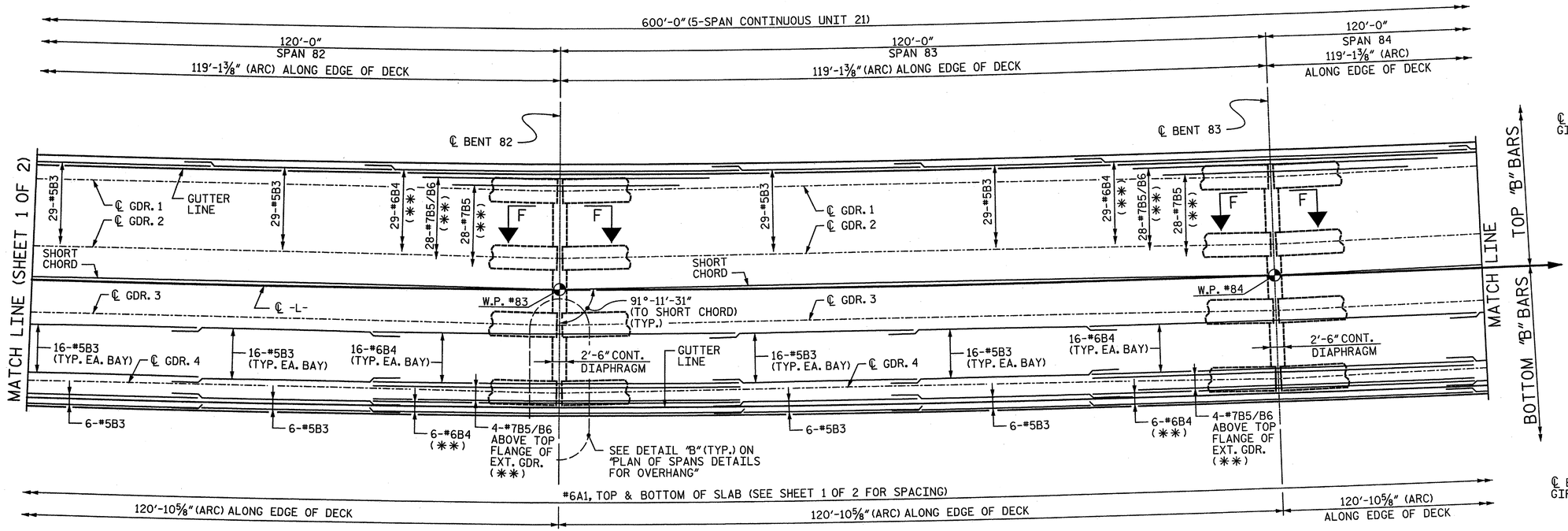
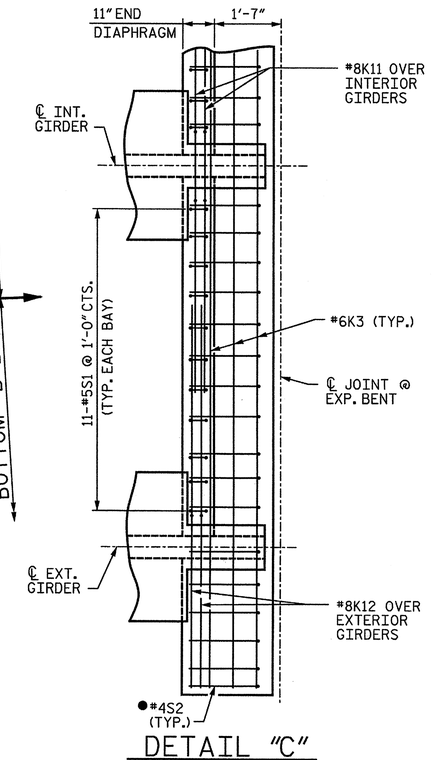




DETAIL "C"

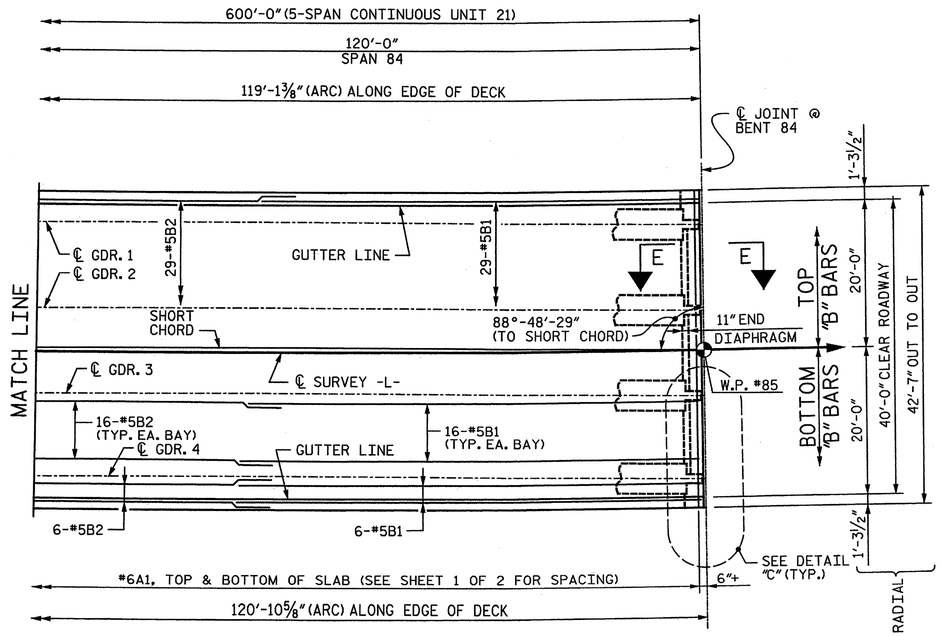
END DIAPHRAGM AT EXP. BENT (PARAPET & MAIN DECK SLAB REINFORCING STEEL NOT SHOWN FOR CLARITY)

● #4S2 BARS TO BE PLACED AS SHOWN IN "END DIAPHRAGM DETAIL" ON CORRESPONDING "TYPICAL SECTION" SHEET

NOTES:

1. FOR NOTES, SEE SHEET 1 OF 2.

(**) NOTE:
SEE PARTIAL PLAN DETAILS ON "PLAN OF SPANS DETAILS FOR OVERHANG" FOR PLACEMENT OF TOP AND BOTTOM "B" BARS OVER BENT.



PLAN OF SPAN

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
UNIT 21

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

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2			4			219

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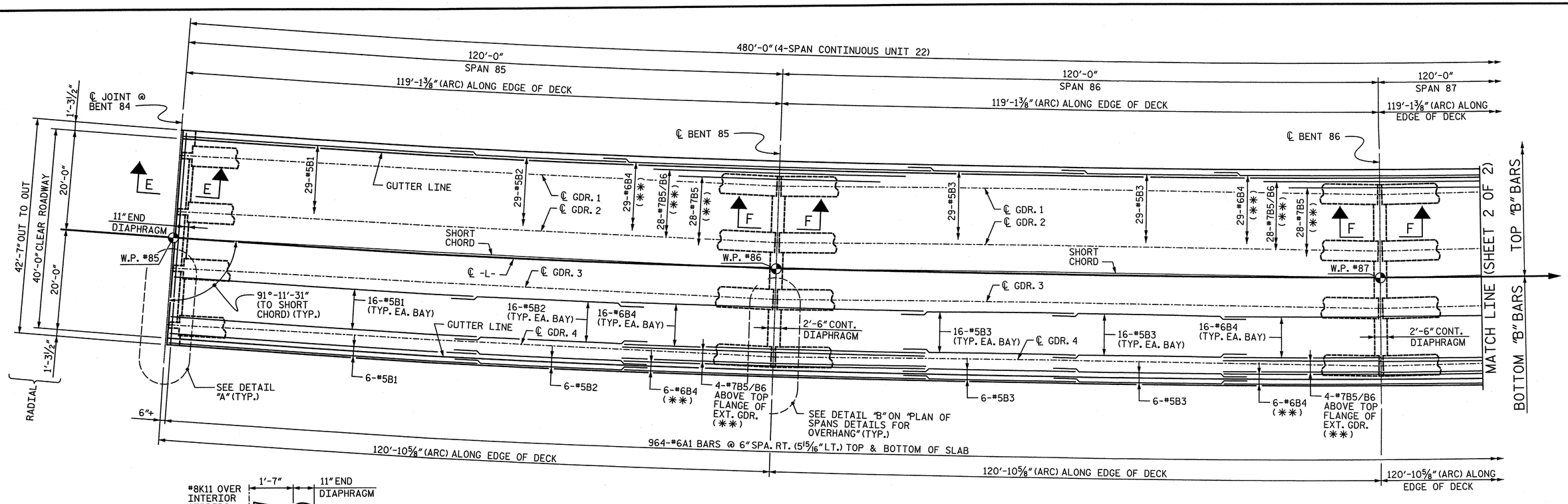


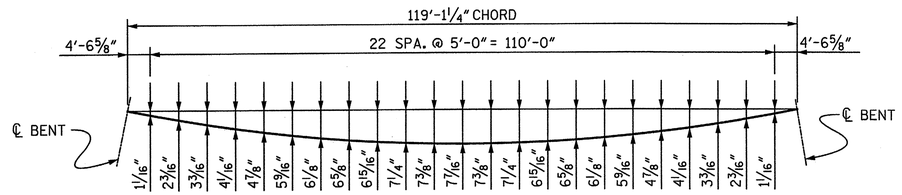
DETAIL "A"

END DIAPHRAGM AT EXP. BENT (PARAPET & MAIN DECK SLAB REINFORCING STEEL NOT SHOWN FOR CLARITY)

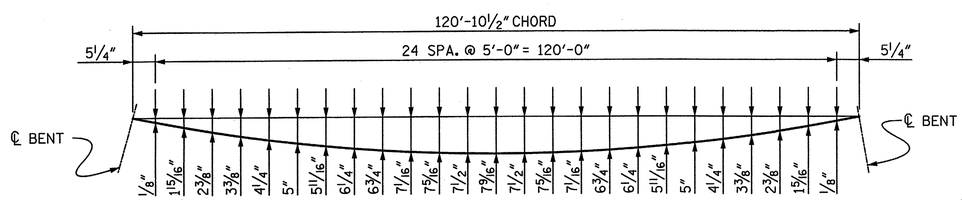
●#4S2 BARS TO BE PLACED AS SHOWN IN "END DIAPHRAGM DETAIL" ON CORRESPONDING "TYPICAL SECTION" SHEET

PLAN OF SPANS

(**) NOTE:
SEE PARTIAL PLAN DETAILS ON "PLAN OF SPANS DETAILS FOR OVERHANG" FOR PLACEMENT OF TOP AND BOTTOM "B" BARS OVER BENT.



LEFT EDGE OF DECK



RIGHT EDGE OF DECK

ARC OFFSETS - SPANS 85-87

NOTES:

1. FOR CONCRETE PARAPET DIMENSIONS, REINFORCEMENT AND JOINT SPACING, SEE CORRESPONDING "PLAN OF RAIL & CONCRETE PARAPET" SHEETS.
2. FOR "B" BAR SPACING, SEE CORRESPONDING "TYPICAL SECTION" SHEET.
3. FOR POURING SEQUENCE AND TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB, SEE "DECK POUR DIAGRAMS" SHEET.
4. FOR SECTION VIEWS, SEE "SUPERSTRUCTURE DETAILS" SHEETS.
5. FOR DECK DRAINAGE, SEE "DECK DRAIN DETAILS" SHEET.
6. FOR MINIMUM SPLICE LENGTHS, SEE "SUPERSTRUCTURE BILL OF MATERIAL".

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
UNIT 22

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

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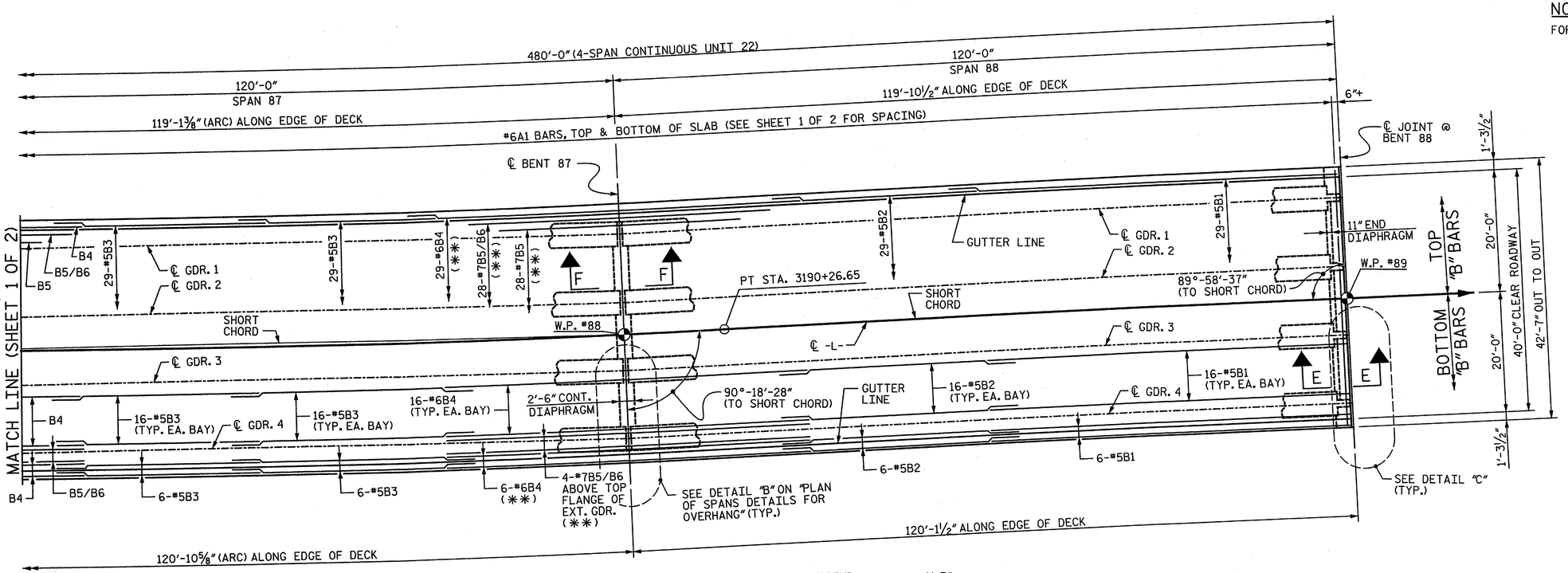
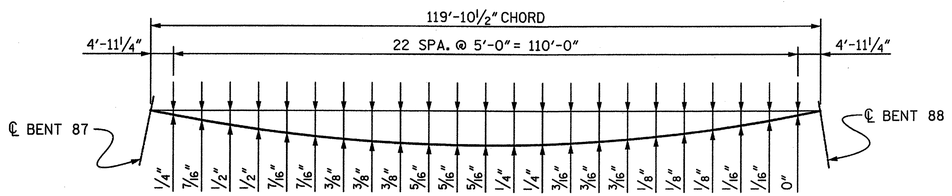
NOTES:

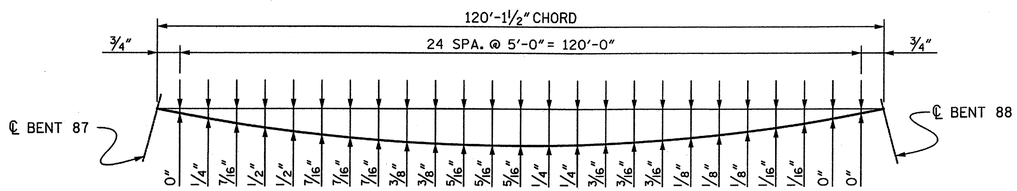
FOR NOTES, SEE SHEET 1 OF 2.



PLAN OF SPANS

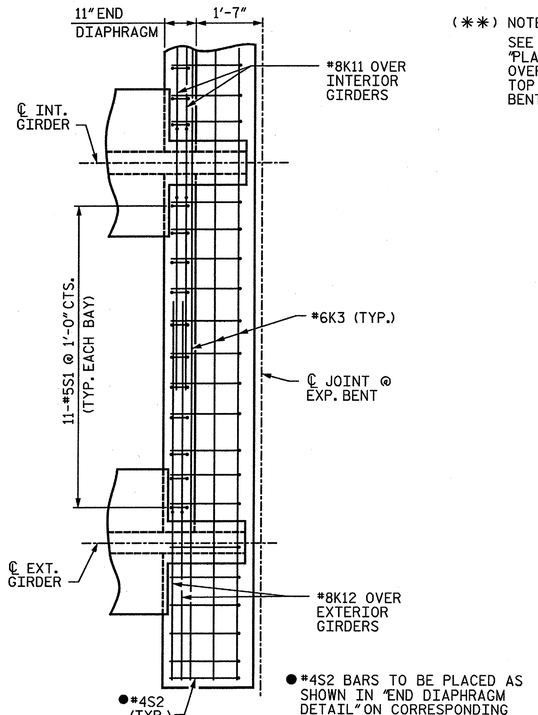


LEFT EDGE OF DECK



RIGHT EDGE OF DECK

ARC OFFSETS - SPAN 88



DETAIL "C"

END DIAPHRAGM AT EXP. BENT (PARAPET & MAIN DECK SLAB REINFORCING STEEL NOT SHOWN FOR CLARITY)

(**) NOTE:

SEE PARTIAL PLAN DETAILS ON "PLAN OF SPANS DETAILS FOR OVERHANG" FOR PLACEMENT OF TOP AND BOTTOM "B" BARS OVER BENT.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
UNIT 22

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
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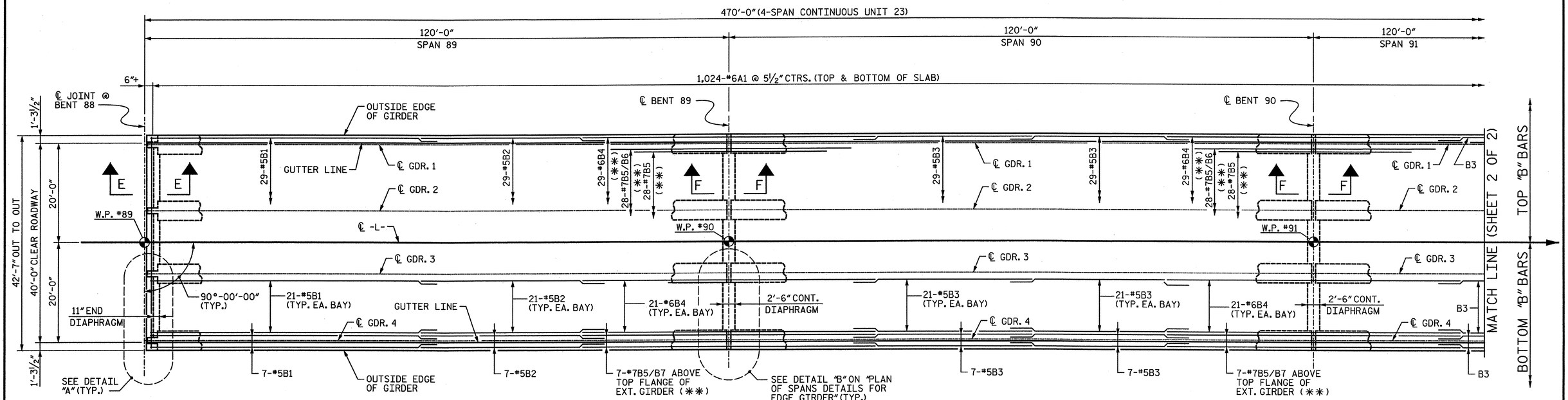

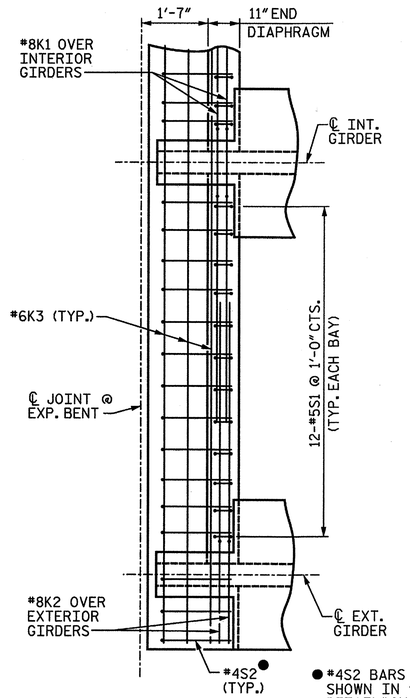

DETAIL "A"

END DIAPHRAGM AT EXP. BENT (PARAPET & MAIN DECK SLAB REINFORCING STEEL NOT SHOWN FOR CLARITY)

● #4S2 BARS TO BE PLACED AS SHOWN IN "END DIAPHRAGM DETAIL" ON CORRESPONDING "TYPICAL SECTION" SHEET

PLAN OF SPANS

(**) SEE PARTIAL PLAN DETAILS ON "PLAN OF SPANS DETAILS FOR EDGE GIRDER" FOR PLACEMENT OF TOP AND BOTTOM "B" BARS OVER BENT.

NOTES:

1. FOR CONCRETE PARAPET DIMENSIONS, REINFORCEMENT AND JOINT SPACING, SEE CORRESPONDING "PLAN OF RAIL & CONCRETE PARAPET" SHEETS.
2. FOR "B" BAR SPACING, SEE CORRESPONDING "TYPICAL SECTION" SHEET.
3. FOR POURING SEQUENCE AND TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB, SEE "DECK POUR DIAGRAMS" SHEET.
4. FOR SECTION VIEWS, SEE "SUPERSTRUCTURE DETAILS" SHEETS.
5. FOR DECK DRAINAGE, SEE "DECK DRAIN DETAILS" SHEET.
6. FOR MINIMUM SPLICE LENGTHS, SEE "SUPERSTRUCTURE BILL OF MATERIAL".

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
UNIT 23

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

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CHECKED BY : CLG	DATE : 3-12

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1			3			TOTAL SHEETS
2			4			219

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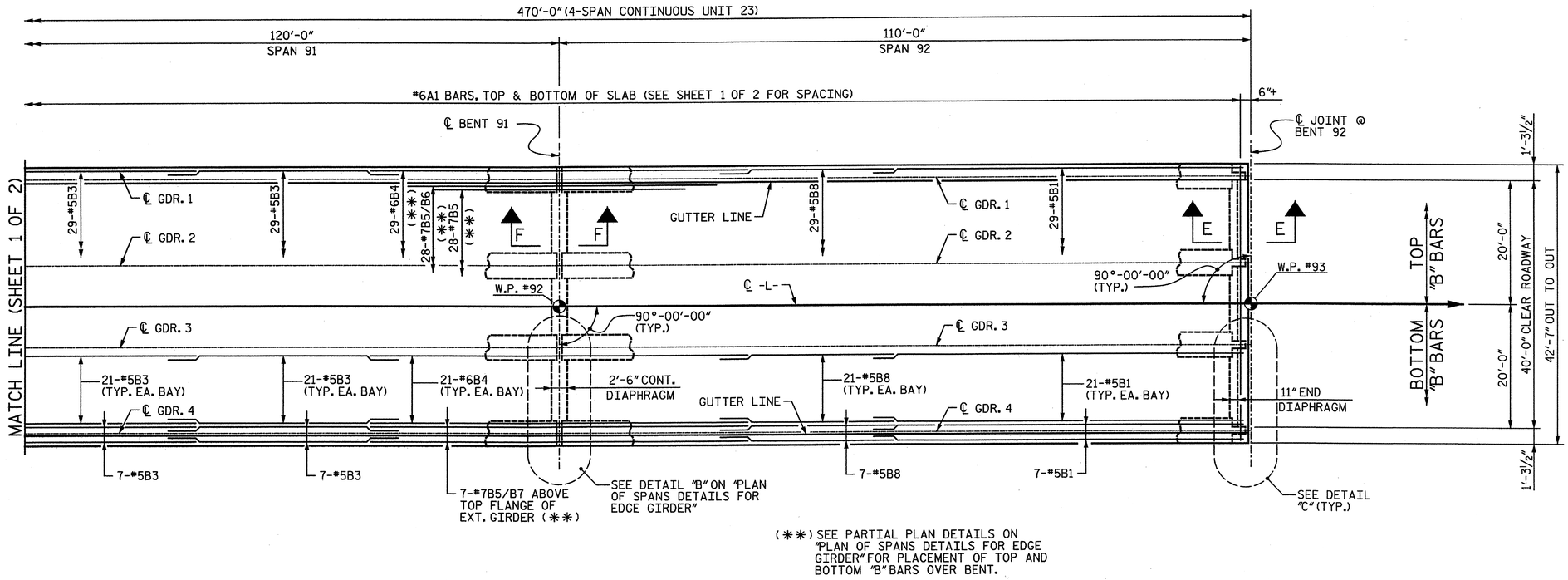
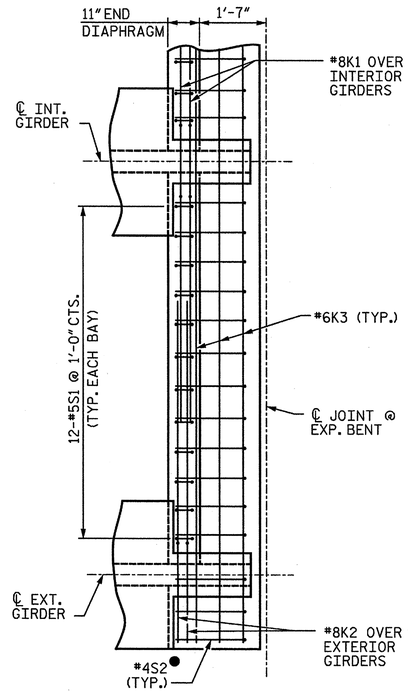
NOTES:

FOR NOTES, SEE SHEET 1 OF 2.



(**) SEE PARTIAL PLAN DETAILS ON "PLAN OF SPANS DETAILS FOR EDGE GIRDER" FOR PLACEMENT OF TOP AND BOTTOM "B" BARS OVER BENT.

PLAN OF SPANS



DETAIL "C"

END DIAPHRAGM AT EXP. BENT (PARAPET & MAIN DECK SLAB REINFORCING STEEL NOT SHOWN FOR CLARITY)

● *4S2 BARS TO BE PLACED AS SHOWN IN "END DIAPHRAGM DETAIL" ON CORRESPONDING "TYPICAL SECTION" SHEET

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
UNIT 23

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

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NC License No. F-0991

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2			4			219

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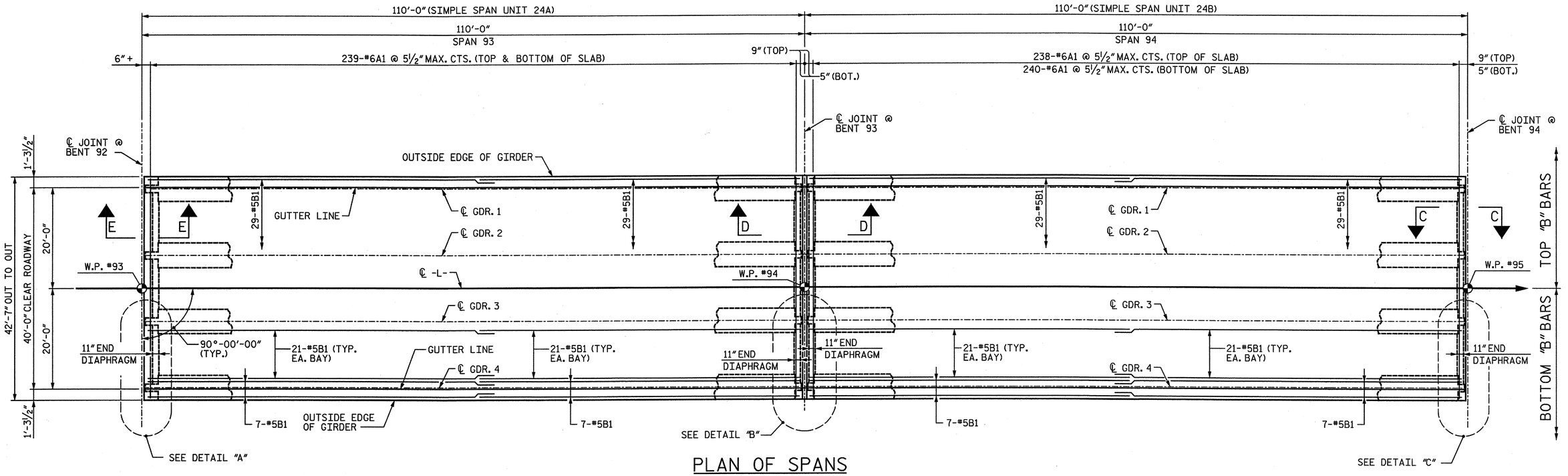
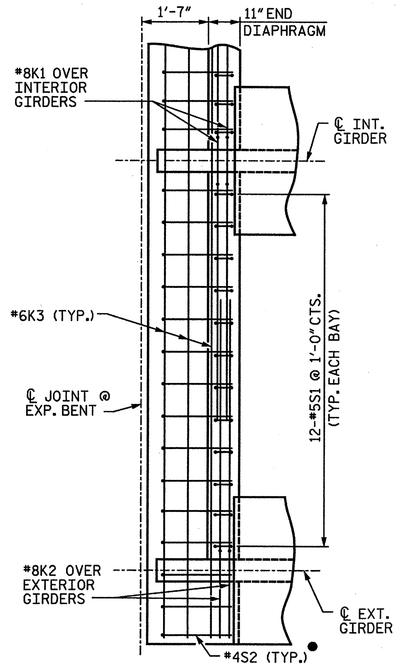


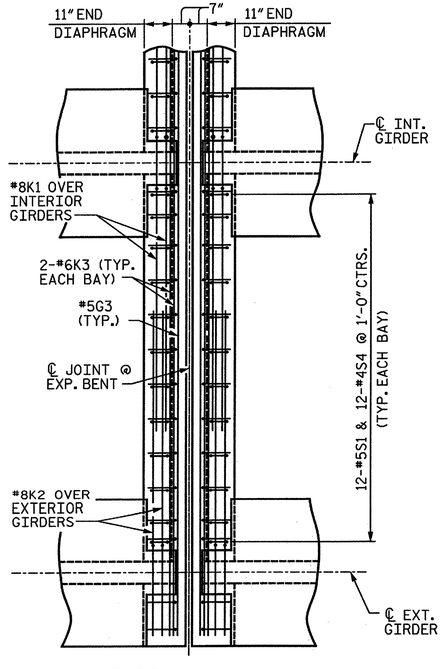
PLAN OF SPANS



DETAIL "A"

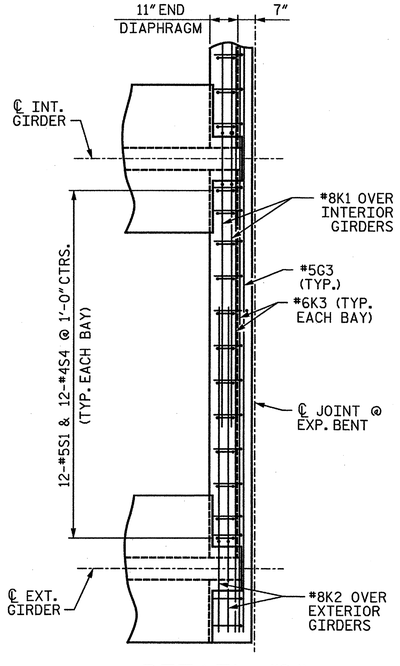
END DIAPHRAGM AT EXP. BENT
(BARRIER RAIL & MAIN DECK
SLAB REINFORCING STEEL
NOT SHOWN FOR CLARITY)

● #4S2 BARS TO BE PLACED AS SHOWN IN "END DIAPHRAGM DETAIL" ON "TYPICAL SECTION UNITS 6-8, 11-14 & 23" SHEET



DETAIL "B"

END DIAPHRAGMS AT EXP. BENT
(PARAPET & MAIN DECK
SLAB REINFORCING STEEL
NOT SHOWN FOR CLARITY)



DETAIL "C"

END DIAPHRAGM AT EXP. BENT
(PARAPET & MAIN DECK
SLAB REINFORCING STEEL
NOT SHOWN FOR CLARITY)

NOTES:

1. FOR CONCRETE PARAPET DIMENSIONS, REINFORCEMENT AND JOINT SPACING, SEE CORRESPONDING "PLAN OF RAIL & CONCRETE PARAPET" SHEETS.
2. FOR "B" BAR SPACING, SEE CORRESPONDING "TYPICAL SECTION" SHEET.
3. FOR POURING SEQUENCE AND TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB, SEE "DECK POUR DIAGRAMS" SHEET.
4. FOR SECTION VIEWS, SEE "SUPERSTRUCTURE DETAILS" SHEETS.
5. FOR DECK DRAINAGE, SEE "DECK DRAIN DETAILS" SHEET.
6. FOR MINIMUM SPLICE LENGTHS, SEE "SUPERSTRUCTURE BILL OF MATERIAL".

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
UNIT 24A & 24B

DRAWN BY : ACA DATE : 2-12
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NC License No. F-0991

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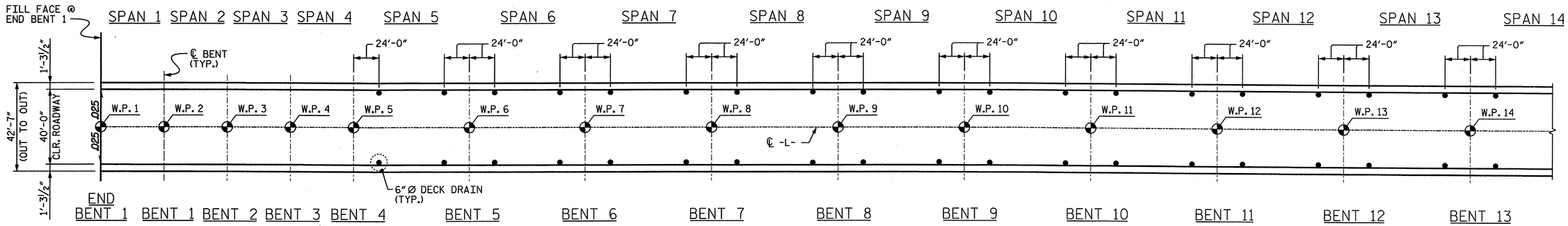
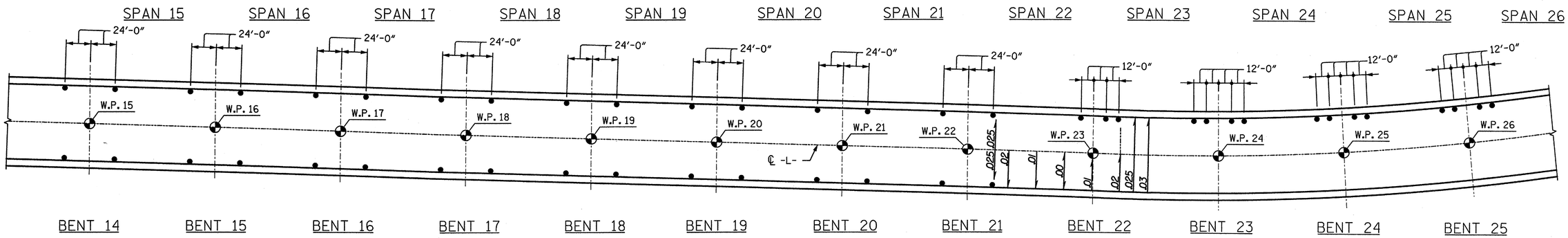
NO.	BY:	DATE:	NO.	BY:	DATE:	S-104
1			3			TOTAL SHEETS
2			4			219

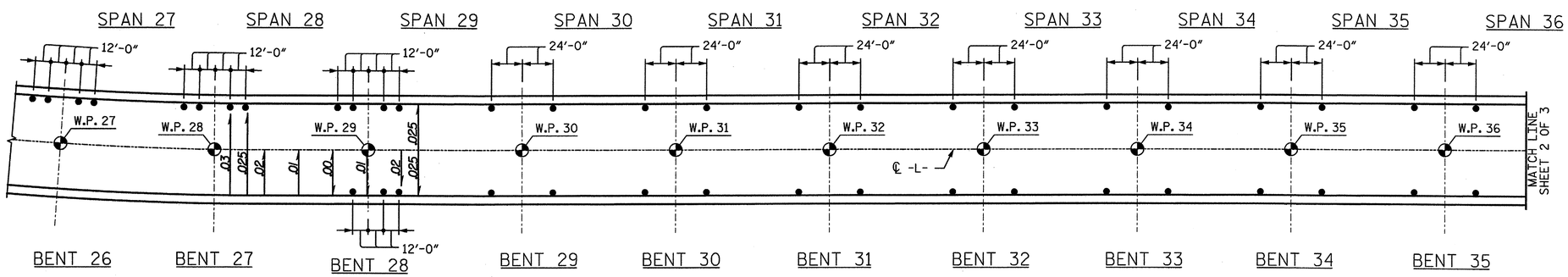
10/4/2012 12:25:58 PM R:\Structures\usta\104) Plan of Spans Unit 24 1of 1.dgn

NOTES:

1. DECK DRAIN DIMENSIONS ARE MEASURED ALONG OUTSIDE EDGE OF SLAB.
2. FOR ADDITIONAL NOTES SEE SHEET 3 OF 3.







DECK DRAINAGE PLAN

DECK DRAINS SHALL BE PLACED AS SHOWN, SPACING IS THE SAME ON EACH SIDE OF BRIDGE, UNLESS NOTED OTHERWISE.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DECK DRAIN DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-105
1			3			TOTAL SHEETS
2			4			219

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CHECKED BY : AJP DATE : 3-12

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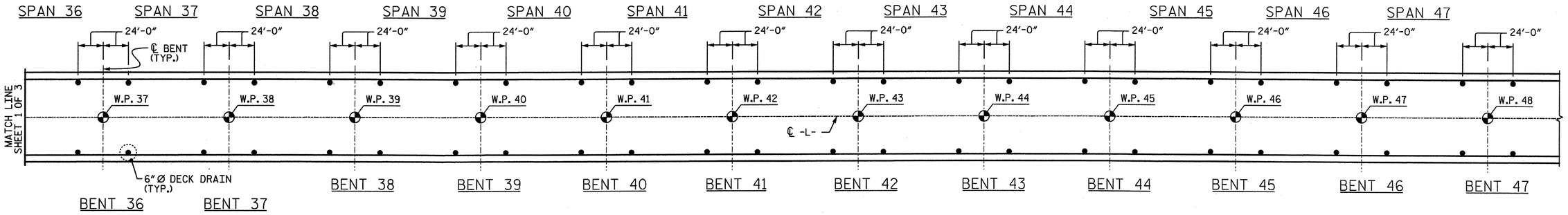
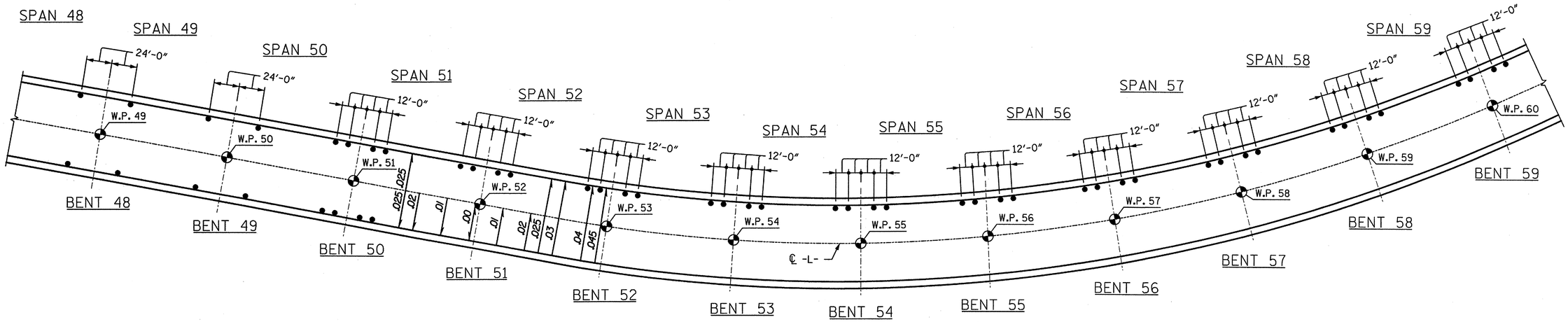
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

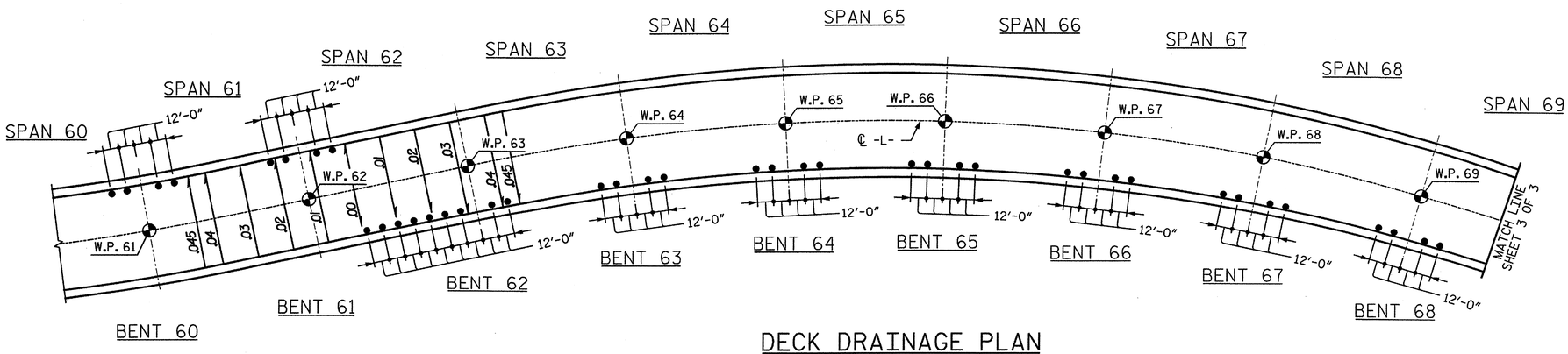
10/4/2012 12:25:54 PM R:\Structures\usta\105\Deck Drainage Loc 1of 3.dgn

NOTES:

1. DECK DRAIN DIMENSIONS ARE MEASURED ALONG OUTSIDE EDGE OF SLAB.
2. FOR ADDITIONAL NOTES SEE SHEET 3 OF 3.







DECK DRAINAGE PLAN

DECK DRAINS SHALL BE PLACED AS SHOWN, SPACING IS THE SAME ON EACH SIDE OF BRIDGE, UNLESS NOTED OTHERWISE.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DECK DRAIN DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

DRAWN BY : ACA	DATE : 3-12
CHECKED BY : AJP	DATE : 3-12

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NC License No. F-0991

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1			3			TOTAL SHEETS
2			4			219

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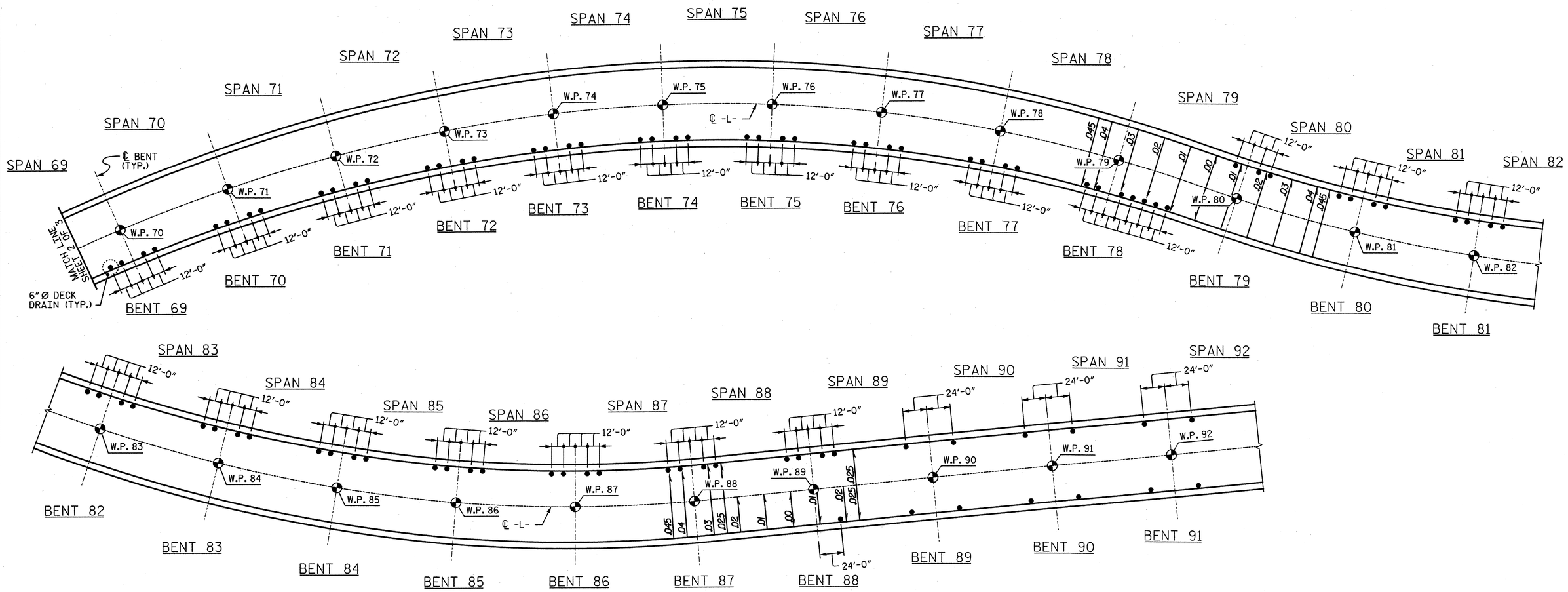
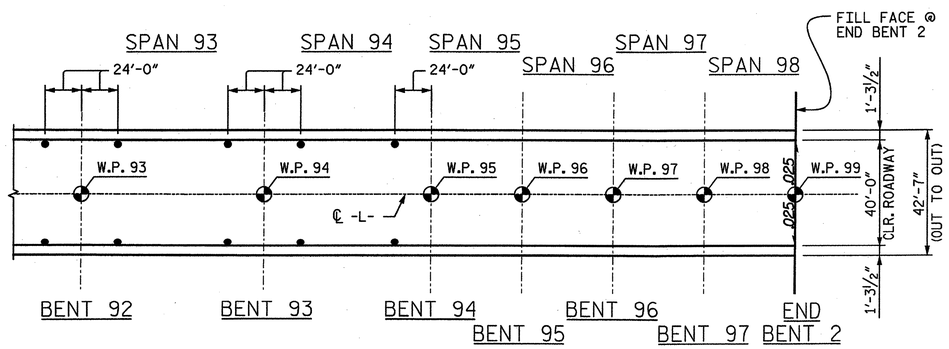
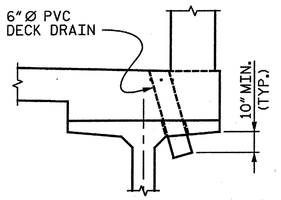


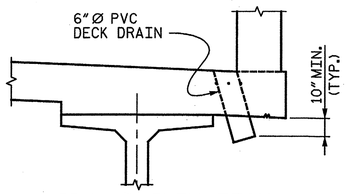


DECK DRAINAGE PLAN

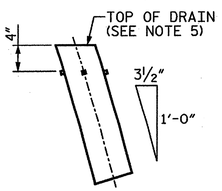
DECK DRAINS SHALL BE PLACED AS SHOWN, SPACING IS THE SAME ON EACH SIDE OF BRIDGE, UNLESS NOTED OTHERWISE.



EDGE GIRDER ELEVATION



OVERHANG ELEVATION



6"Ø PVC DECK DRAIN DETAIL
(374 REQUIRED)

DECK DRAIN DETAILS

NOTES:

1. TOP OF DECK DRAINS TO BE SET ⅜" BELOW SURFACE OF SLAB.
2. 4 - ½" SQUARE LUGS TO BE GLUED TO THE PVC PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM THE TOP OF THE PIPE.
3. THE 6"Ø PVC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.
4. COUPLING IN THE DRAIN PIPE SHALL BE PERMITTED AS APPROVED BY THE ENGINEER.
5. SET TO MATCH SLOPE OF TOP OF SLAB.
6. DECK DRAIN DIMENSIONS ARE MEASURED ALONG OUTSIDE EDGE OF SLAB.
7. FOR DECK DRAINS EXTENDING THROUGH GIRDER FLANGE, ACTUAL DISTANCE FROM ℄ BENT MAY VARY AS NECESSARY TO AVOID GIRDER REINFORCING, SEE "F.I.B. 72" GIRDER DRAINAGE DETAILS".

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DECK DRAIN DETAILS

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1			3				TOTAL SHEETS
2			4				219

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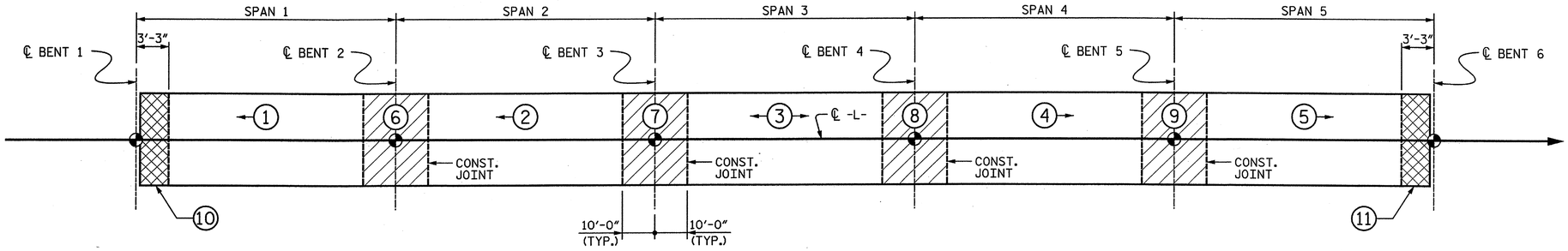
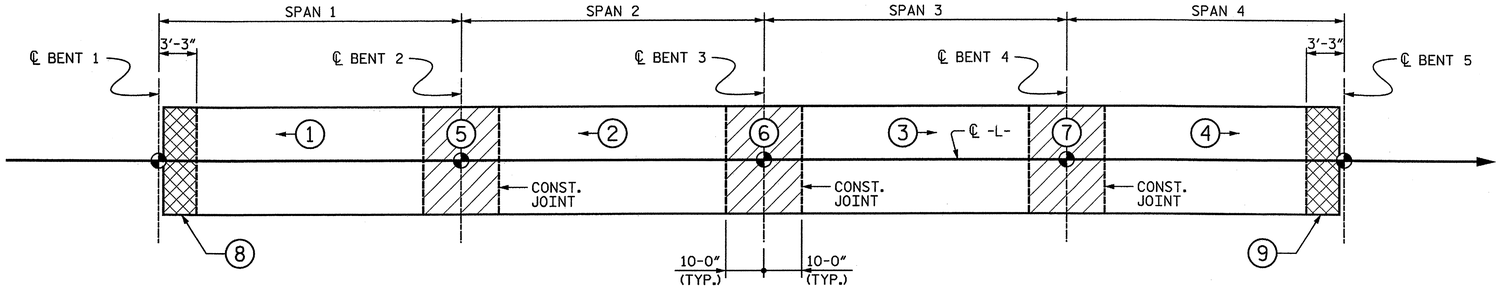
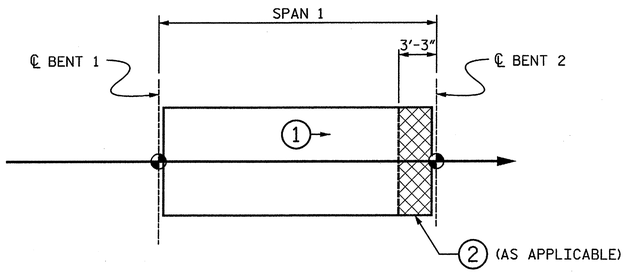


TYPICAL 5 SPAN UNIT

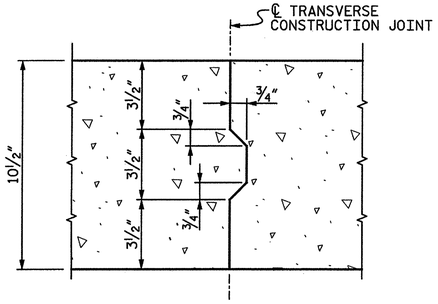


TYPICAL 4 SPAN UNIT



TYPICAL SIMPLE SPAN UNIT

(SOUTH END OF BRIDGE SHOWN, NORTH END MIRRORED)



NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. ALL LONGITUDINAL REINFORCING STEEL SHALL EXTEND THROUGH CONSTRUCTION JOINT AND MAY BE SPLICED WITH MECHANICAL COUPLERS.

TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB

DECK POUR CONCRETE QUANTITIES

	POUR QUANTITY (CU. YDS.)											
LOCATION	1	2	3	4	5	6	7	8	9	10	11	TOTAL
UNIT 5A	176.3											176.3
UNIT 5B	168.6	8.2										176.8
UNIT 6-8	165.4	155.3	155.3	155.3	165.4	52.2	52.2	52.2	52.2	8.4	8.4	1,022.3
UNIT 9	165.5	156.0	156.7	156.7	166.9	52.2	52.7	52.7	52.7	8.4	8.5	1,029.0
UNIT 10	166.9	156.0	155.3	155.3	165.5	52.7	52.2	52.2	52.2	8.5	8.4	1,025.1
UNIT 11-14	165.4	155.3	155.3	155.3	165.4	52.2	52.2	52.2	52.2	8.4	8.4	1,022.3
UNIT 15-17	171.6	161.1	161.1	161.1	171.6	50.6	50.6	50.6	50.6	8.0	8.0	1,044.9
UNIT 18	171.6	161.1	161.1	155.5	50.6	50.6	50.6	8.0	8.0			817.1
UNIT 19	155.5	145.0	145.0	155.5	50.6	50.6	50.6	8.0	8.0			768.8
UNIT 20	155.5	145.0	161.1	161.1	171.6	50.6	50.6	50.6	50.6	8.0	8.0	1,012.7
UNIT 21	171.6	161.1	161.1	161.1	171.6	50.6	50.6	50.6	50.6	8.0	8.0	1,044.9
UNIT 22	171.6	161.1	161.1	171.6	50.6	50.6	50.6	8.0	8.0			833.2
UNIT 23	165.5	155.3	155.3	150.0	52.2	52.2	52.2	8.4	8.4			799.4
UNIT 24A	168.6	8.2										176.8
UNIT 24B	176.3											176.3
TOTAL CLASS AA CONCRETE (CU. YDS.)												18,327.4

DECK CLOSURE POUR AT MODULAR JOINTS

DECK CLOSURE POUR AT CONTINUOUS BENTS

NOTES:

1. SPAN AND BENT DESIGNATIONS ARE INDICATED IN REGARD TO A UNIT, NOT THE ENTIRE BRIDGE.
2. CONTRACTOR HAS THE OPTION OF POURING FROM THE MIDDLE SPAN(S) OF A UNIT OUTWARD TO THE ENDS OF THE UNITS. CLOSURE POURS SHALL STILL COME AFTER ALL OTHER POURS.
3. NO CLOSURE POURS SHALL OCCUR UNTIL THE CONCRETE IN ADJACENT SPANS HAVE OBTAINED A STRENGTH OF 3 KSI.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE DECK POUR DIAGRAMS

DRAWN BY : LGH DATE : 2-12

CHECKED BY : TJT DATE : 3-12

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1			3			TOTAL SHEETS
2			4			219

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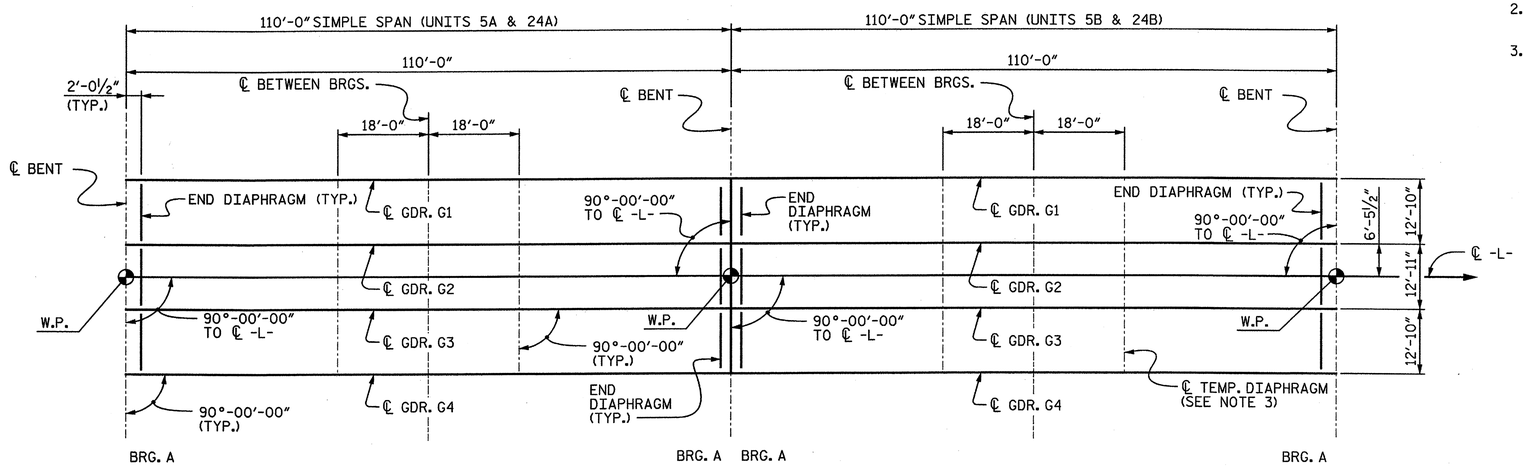

UNIT	BENT	W.P.	SP			
5	4	5	P13			FIX
24	92	93	P1			EXP

SPAN
5
93

		SP	BENT	W.P.	SP		
EXP		P11	5	6	P12		FIX
FIX		P14	93	94	P1		EXP

SPAN
6
94

		SP	BENT	W.P.	UNIT
EXP		P1	6	7	5
FIX		P6	94	95	24

NOTES:

1. SP DENOTES SOLE PLATE MARK.
2. FOR SOLE PLATE AND BEARING DIMENSIONS, SEE "ELASTOMERIC BEARING DETAILS" SHEET.
3. FOR TEMPORARY DIAPHRAGMS SEE SHEET TITLED "TEMPORARY STEEL DIAPHRAGM DETAILS." DIAPHRAGMS SHALL BE INSTALLED DURING ERECTION & CONSTRUCTION. ONCE DECK HAS BEEN POURED & CURED, CONTRACTOR SHALL REMOVE DIAPHRAGMS.

FRAMING PLAN
UNITS 5A, 5B, 24A & 24B

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

FRAMING PLAN
UNITS 5A, 5B, 24A & 24B

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

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Charlotte, NC 28208
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SHEET NO. S-109

TOTAL SHEETS 219

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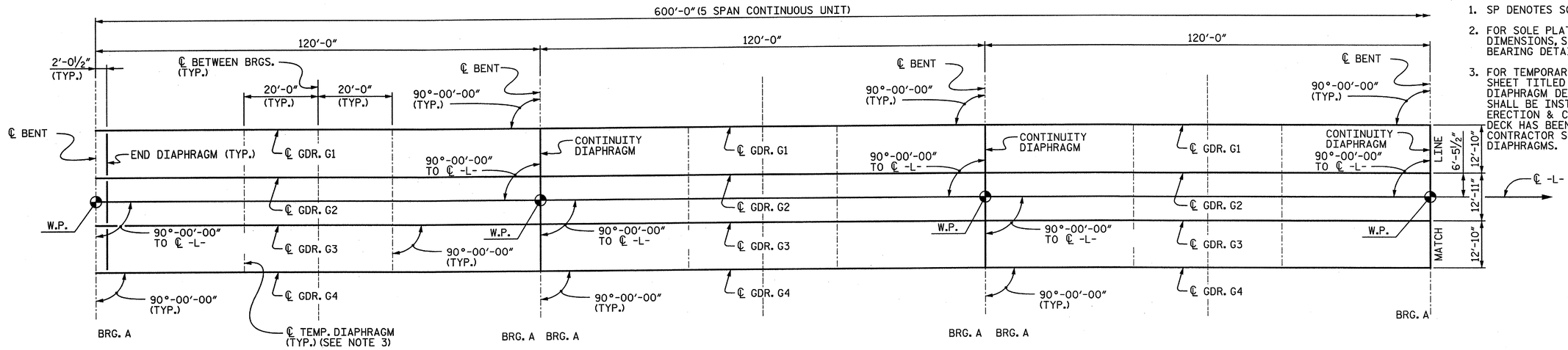

NOTES:

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3. FOR TEMPORARY DIAPHRAGMS SEE SHEET TITLED "TEMPORARY STEEL DIAPHRAGM DETAILS." DIAPHRAGMS SHALL BE INSTALLED DURING ERECTION & CONSTRUCTION. ONCE DECK HAS BEEN POURED & CURED, CONTRACTOR SHALL REMOVE DIAPHRAGMS.

UNIT	BENT	W.P.	SP			
6	6	7	P8			EXP
7	11	12	P2			EXP
8	16	17	P2			EXP
11	31	32	P2			EXP
12	36	37	P1			EXP
13	41	42	P1			EXP
14	46	47	P1			EXP

SPAN
7
12
17
32
37
42
47

		SP	BENT	W.P.	SP		
EXP		P2	7	8	P1		EXP
EXP		P2	12	13	P2		EXP
EXP		P2	17	18	P2		EXP
EXP		P5	32	33	P2		EXP
EXP		P1	37	38	P1		EXP
EXP		P1	42	43	P1		EXP
EXP		P1	47	48	P1		EXP

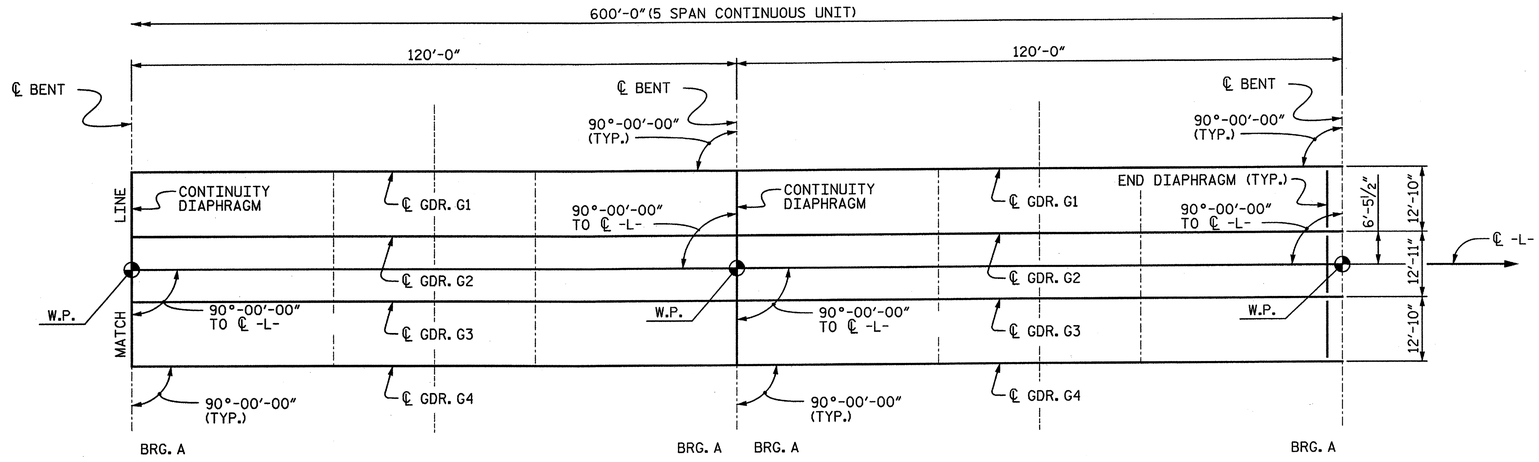
SPAN
8
13
18
33
38
43
48

		SP	BENT	W.P.	SP		
FIX		P3	8	9	P3		FIX
FIX		P3	13	14	P3		FIX
FIX		P3	18	19	P3		FIX
FIX		P6	33	34	P3		FIX
FIX		P4	38	39	P4		FIX
FIX		P4	43	44	P4		FIX
FIX		P4	48	49	P4		FIX

SPAN
9
14
19
34
39
44
49

		SP	BENT	W.P.	UNIT
FIX		P3	9	10	6
FIX		P3	14	15	7
FIX		P3	19	20	8
FIX		P4	34	35	11
FIX		P4	39	40	12
FIX		P4	44	45	13
FIX		P4	49	50	14

FRAMING PARTIAL PLAN



UNIT	BENT	W.P.	SP			
6	9	10	P3			FIX
7	14	15	P3			FIX
8	19	20	P3			FIX
11	34	35	P3			FIX
12	39	40	P4			FIX
13	44	45	P4			FIX
14	49	50	P4			FIX

SPAN
10
15
20
35
40
45
50

		SP	BENT	W.P.	SP		
EXP		P2	10	11	P2		EXP
EXP		P2	15	16	P2		EXP
EXP		P2	20	21	P2		EXP
EXP		P1	35	36	P1		EXP
EXP		P1	40	41	P1		EXP
EXP		P1	45	46	P1		EXP
EXP		P1	50	51	P5		EXP

SPAN
11
16
21
36
41
46
51

		SP	BENT	W.P.	UNIT
EXP		P2	11	12	6
EXP		P2	16	17	7
EXP		P2	21	22	8
EXP		P1	36	37	11
EXP		P1	41	42	12
EXP		P1	46	47	13
EXP		P2	51	52	14

FRAMING PARTIAL PLAN

DRAWN BY : ACA DATE : 2-12
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NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-

SHEET 2 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

FRAMING PLAN UNITS 6-8 & 11-14

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-110
1			3			TOTAL SHEETS
2			4			219

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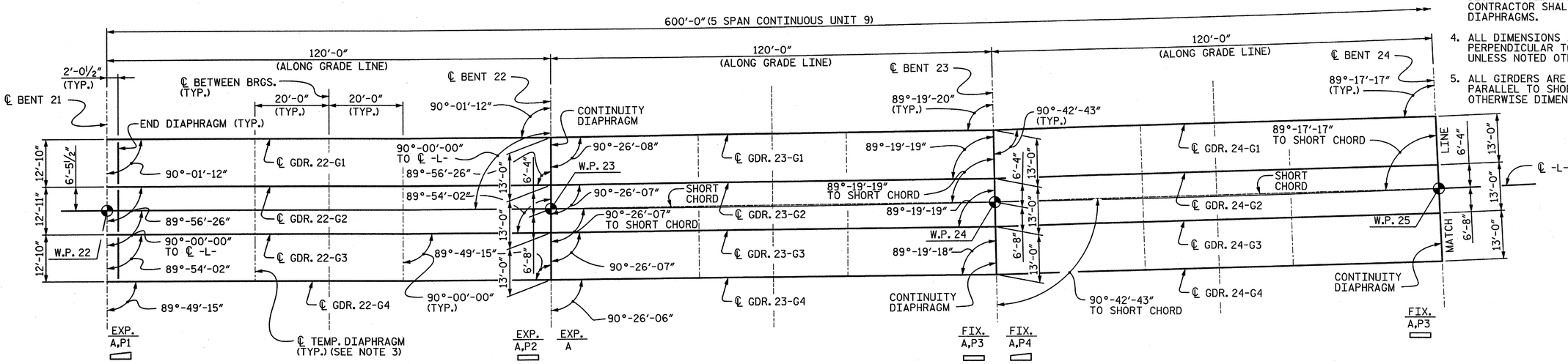
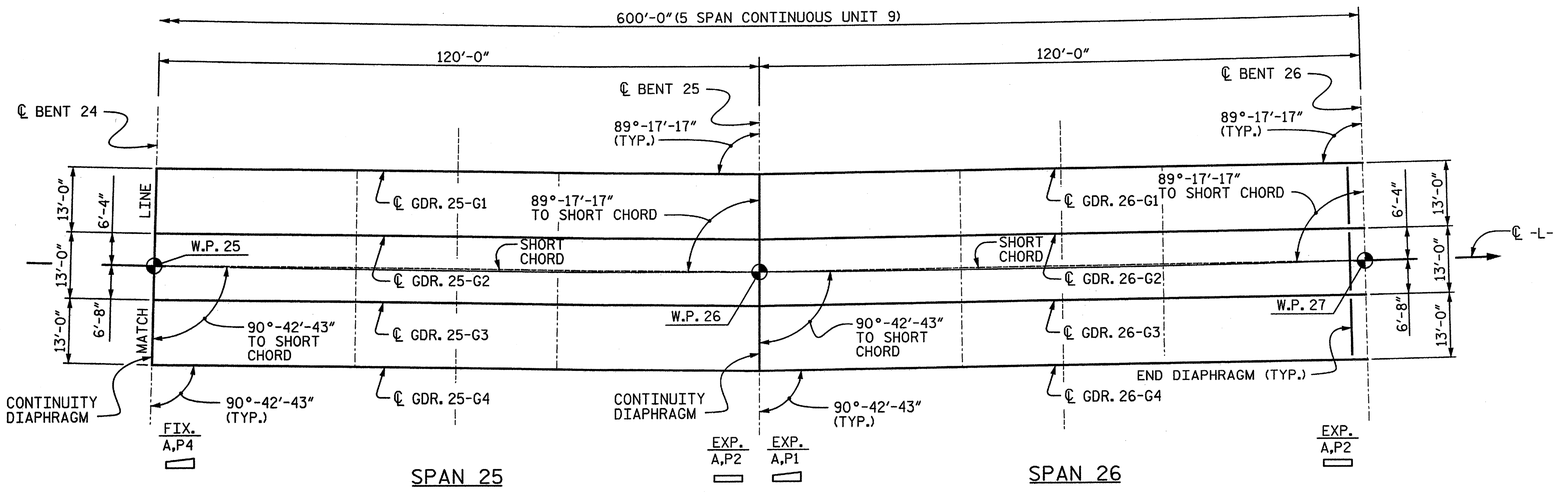
NOTES:

1. SP DENOTES SOLE PLATE MARK.
2. FOR SOLE PLATE AND BEARING DIMENSIONS, SEE "ELASTOMERIC BEARING DETAILS" SHEET.
3. FOR TEMPORARY DIAPHRAGMS SEE SHEET TITLED "TEMPORARY STEEL DIAPHRAGM DETAILS." DIAPHRAGMS SHALL BE INSTALLED DURING ERECTION & CONSTRUCTION. ONCE DECK HAS BEEN POURED & CURED, CONTRACTOR SHALL REMOVE DIAPHRAGMS.
4. ALL DIMENSIONS ARE PERPENDICULAR TO SHORT CHORD UNLESS NOTED OTHERWISE.
5. ALL GIRDERS ARE TO BE PLACED PARALLEL TO SHORT CHORD UNLESS OTHERWISE DIMENSIONED.



GDR.	SP	
1	P1	
2	P1	
3	P1	
4	P7	

FRAMING PARTIAL PLAN



FRAMING PARTIAL PLAN

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 3 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

FRAMING PLAN
UNIT 9

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

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1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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1			3			TOTAL SHEETS
2			4			219

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NOTES:

1. SP DENOTES SOLE PLATE MARK.
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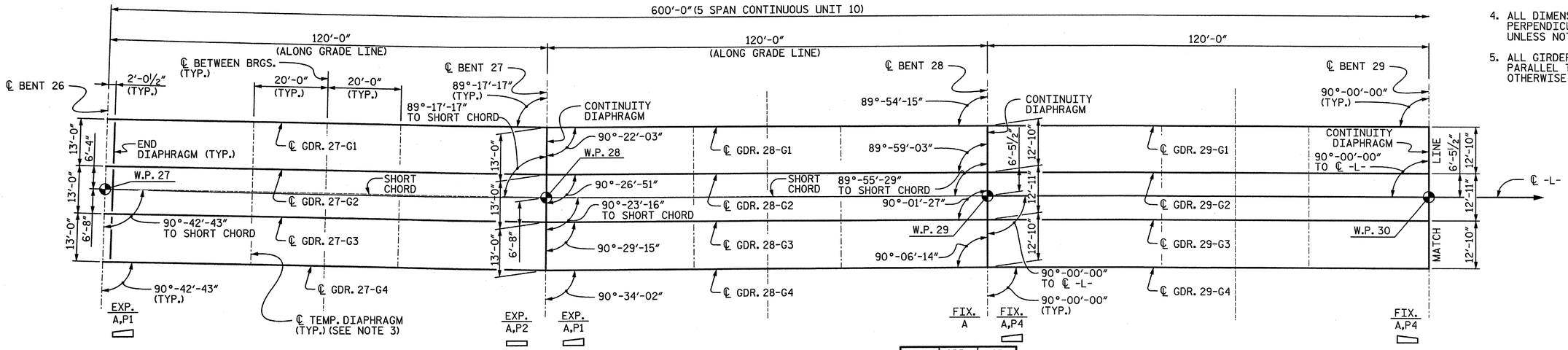
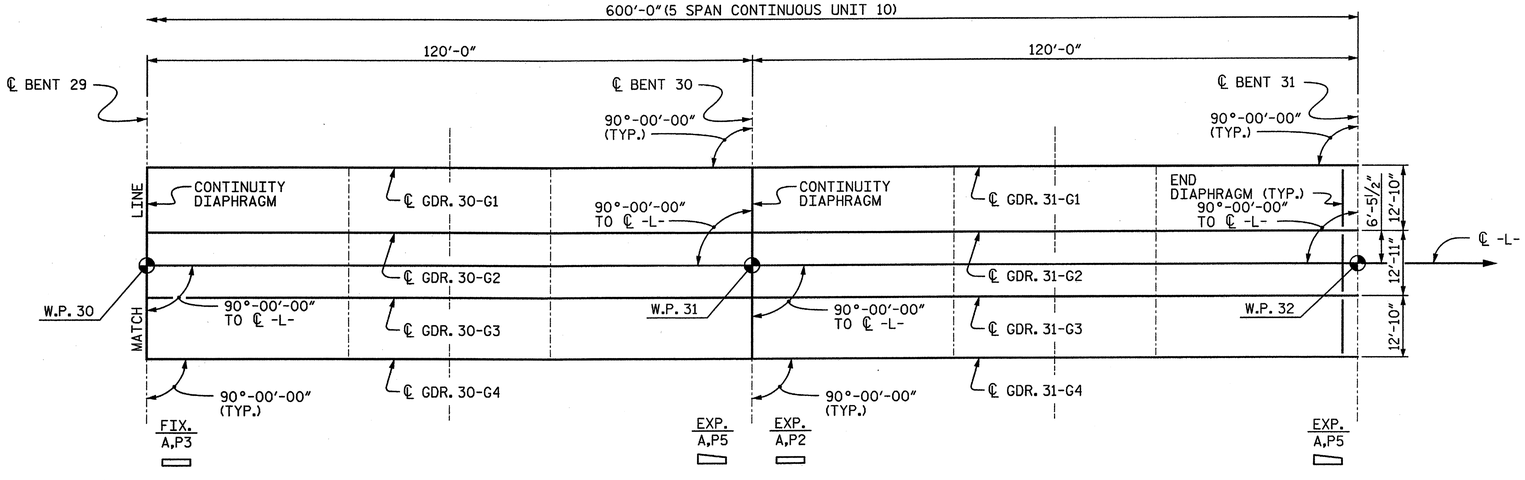
4. ALL DIMENSIONS ARE PERPENDICULAR TO SHORT CHORD UNLESS NOTED OTHERWISE.
5. ALL GIRDERS ARE TO BE PLACED PARALLEL TO SHORT CHORD UNLESS OTHERWISE DIMENSIONED.



SPAN 27 SPAN 28 SPAN 29

FRAMING PARTIAL PLAN

	GDR.	SP
	1	P3
	2	P3
	3	P3
	4	P6



SPAN 30 SPAN 31

FRAMING PARTIAL PLAN

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 4 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

FRAMING PLAN
UNIT 10

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-112
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : ACA DATE : 2-12
CHECKED BY : TRL DATE : 3-12

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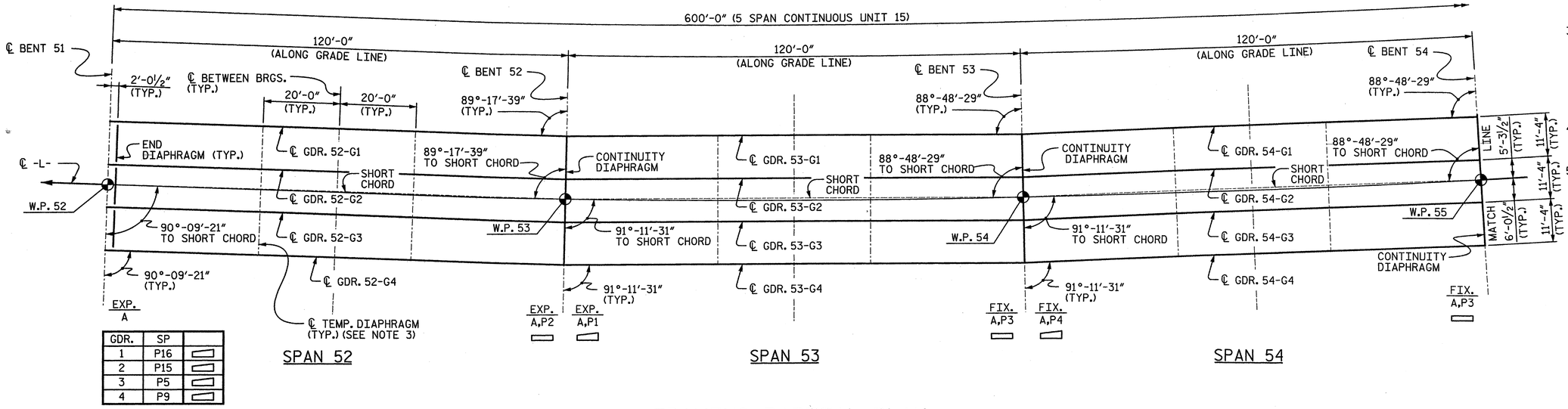
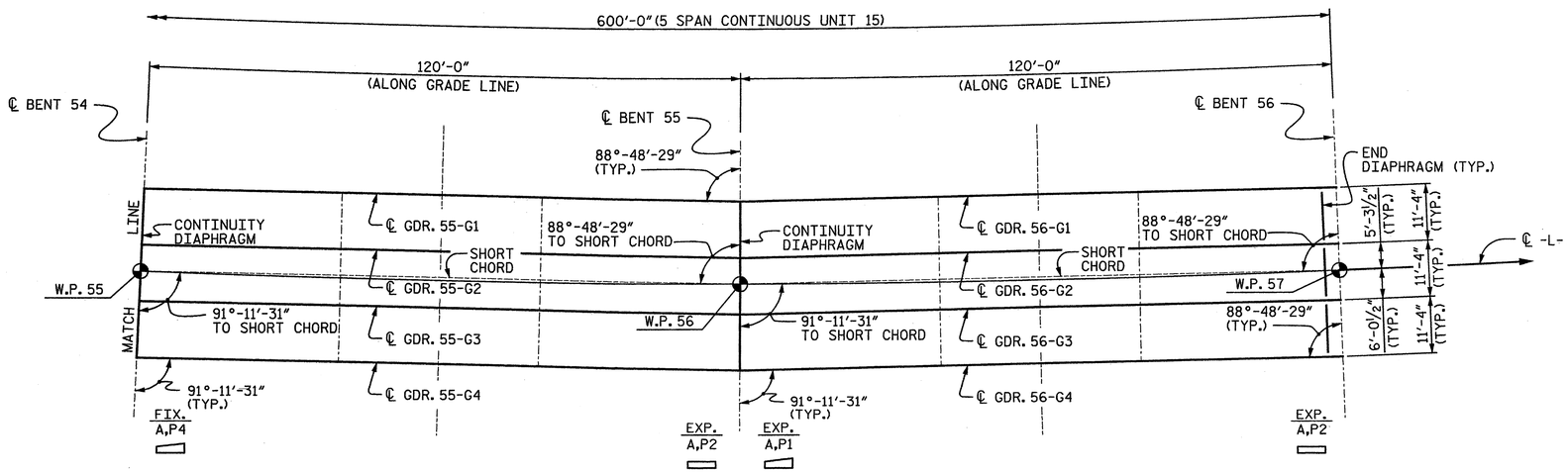


GDR.	SP	
1	P16	
2	P15	
3	P5	
4	P9	

FRAMING PARTIAL PLAN



FRAMING PARTIAL PLAN

NOTES:

1. SP DENOTES SOLE PLATE MARK.
2. FOR SOLE PLATE AND BEARING DIMENSIONS, SEE "ELASTOMERIC BEARING DETAILS" SHEET.
3. FOR TEMPORARY DIAPHRAGMS SEE SHEET TITLED "TEMPORARY STEEL DIAPHRAGM DETAILS." DIAPHRAGMS SHALL BE INSTALLED DURING ERECTION & CONSTRUCTION. ONCE DECK HAS BEEN POURED & CURED, CONTRACTOR SHALL REMOVE DIAPHRAGMS.
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PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 5 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

FRAMING PLAN
UNIT 15

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

DRAWN BY : ACA DATE : 2-12
CHECKED BY : TRL DATE : 3-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-113
1			3			TOTAL SHEETS
2			4			219

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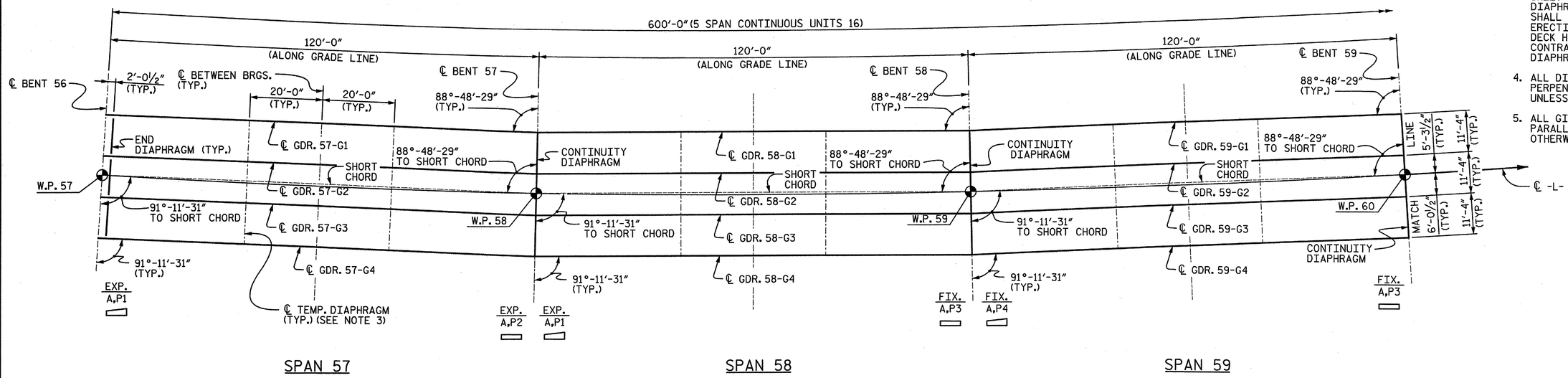

SPAN 57 SPAN 58 SPAN 59

NOTES:

1. SP DENOTES SOLE PLATE MARK.
2. FOR SOLE PLATE AND BEARING DIMENSIONS, SEE "ELASTOMERIC BEARING DETAILS" SHEET.
3. FOR TEMPORARY DIAPHRAGMS SEE SHEET TITLED "TEMPORARY STEEL DIAPHRAGM DETAILS." DIAPHRAGMS SHALL BE INSTALLED DURING ERECTION & CONSTRUCTION. ONCE DECK HAS BEEN POURED & CURED, CONTRACTOR SHALL REMOVE DIAPHRAGMS.
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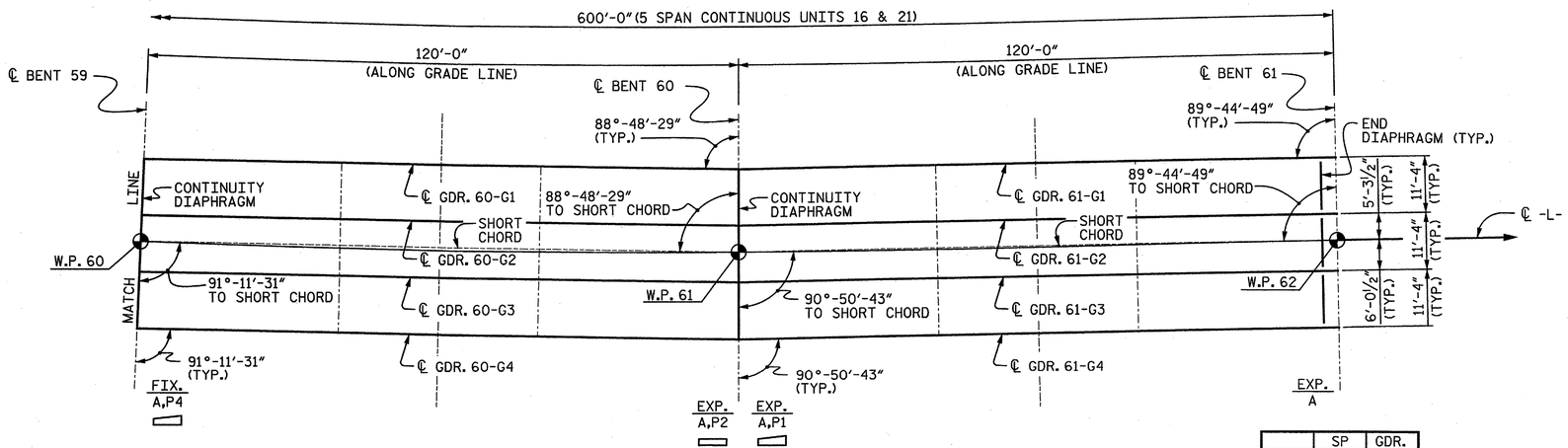
FRAMING PARTIAL PLAN



SPAN 60 SPAN 61

	SP	GDR.
	P2	1
	P2	2
	P5	3
	P9	4

FRAMING PARTIAL PLAN

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 6 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

FRAMING PLAN
UNITS 16

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-114
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : ACA DATE : 2-12
CHECKED BY : TRL DATE : 3-12

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NOTES:

1. SP DENOTES SOLE PLATE MARK.
2. FOR SOLE PLATE AND BEARING DIMENSIONS, SEE "ELASTOMERIC BEARING DETAILS" SHEET.
3. FOR TEMPORARY DIAPHRAGMS SEE SHEET TITLED "TEMPORARY STEEL DIAPHRAGM DETAILS." DIAPHRAGMS SHALL BE INSTALLED DURING ERECTION & CONSTRUCTION. ONCE DECK HAS BEEN POURED & CURED, CONTRACTOR SHALL REMOVE DIAPHRAGMS.
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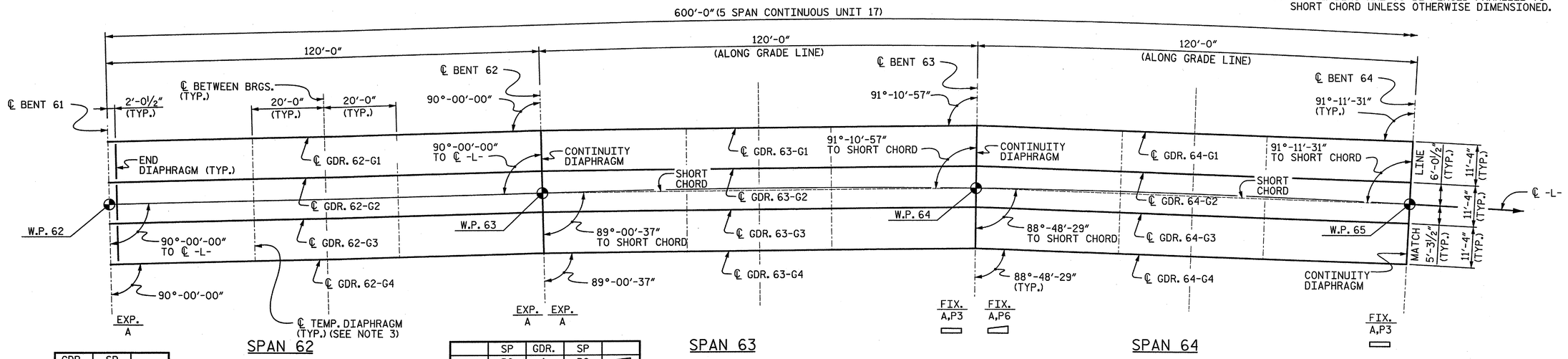
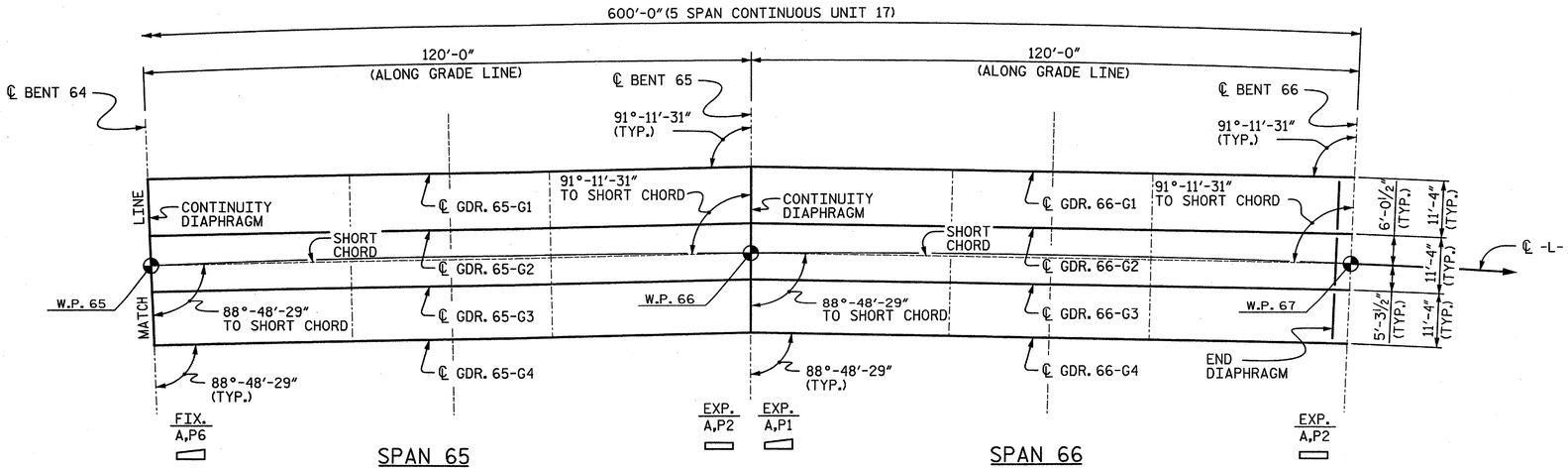


GDR.	SP	
1	P5	
2	P1	
3	P1	
4	P1	

	SP	GDR.	SP	
	P2	1	P9	
	P2	2	P5	
	P2	3	P1	
	P5	4	P1	

FRAMING PARTIAL PLAN



FRAMING PARTIAL PLAN

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 7 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

FRAMING PLAN UNIT 17

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-115
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : ACA DATE : 2-12
CHECKED BY : TRL DATE : 3-12

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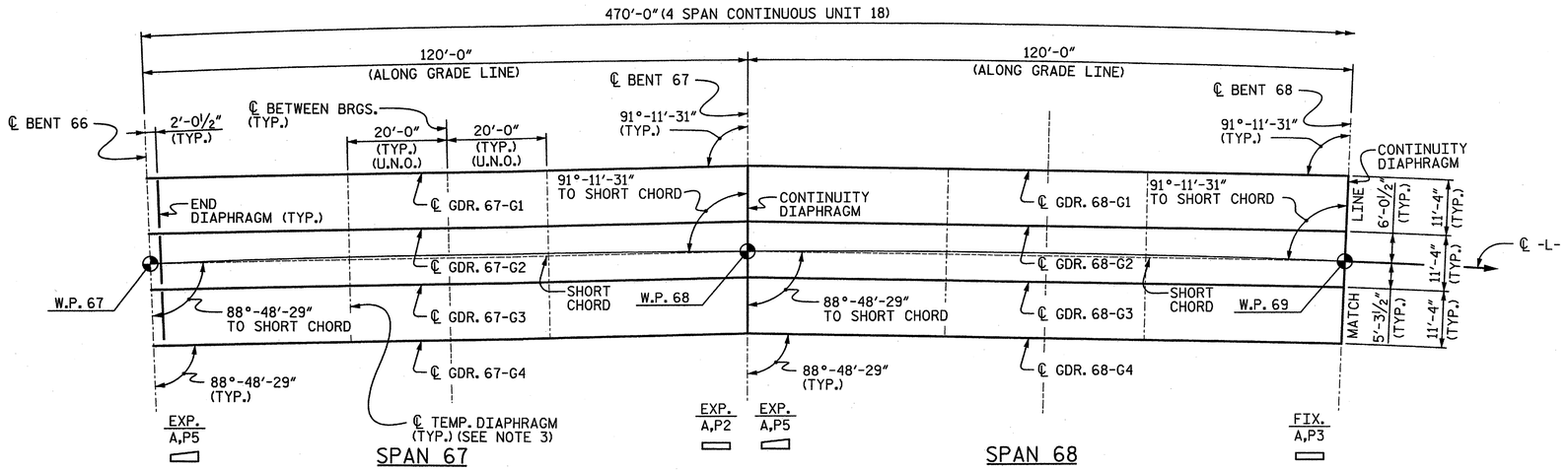

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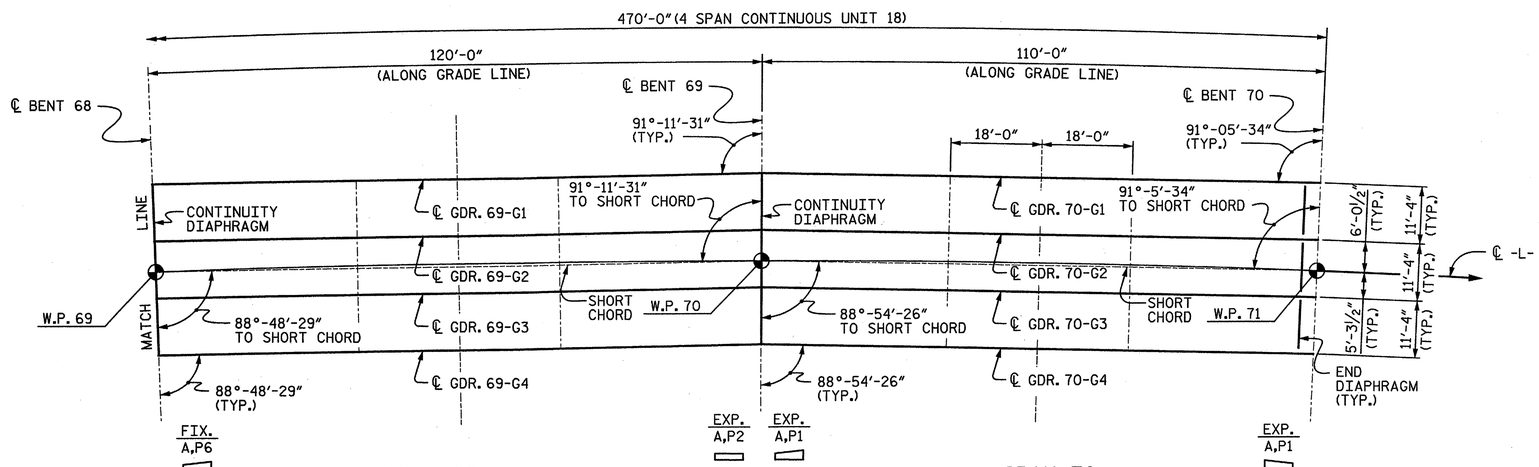

FRAMING PARTIAL PLAN

NOTES:

1. SP DENOTES SOLE PLATE MARK.
2. FOR SOLE PLATE AND BEARING DIMENSIONS, SEE "ELASTOMERIC BEARING DETAILS" SHEET.
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6. U.N.O. = UNLESS NOTED OTHERWISE

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 8 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

FRAMING PLAN
UNIT 18

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-116
1			3			TOTAL SHEETS
2			4			219

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

DRAWN BY : ACA DATE : 2-12
CHECKED BY : TRL DATE : 3-12

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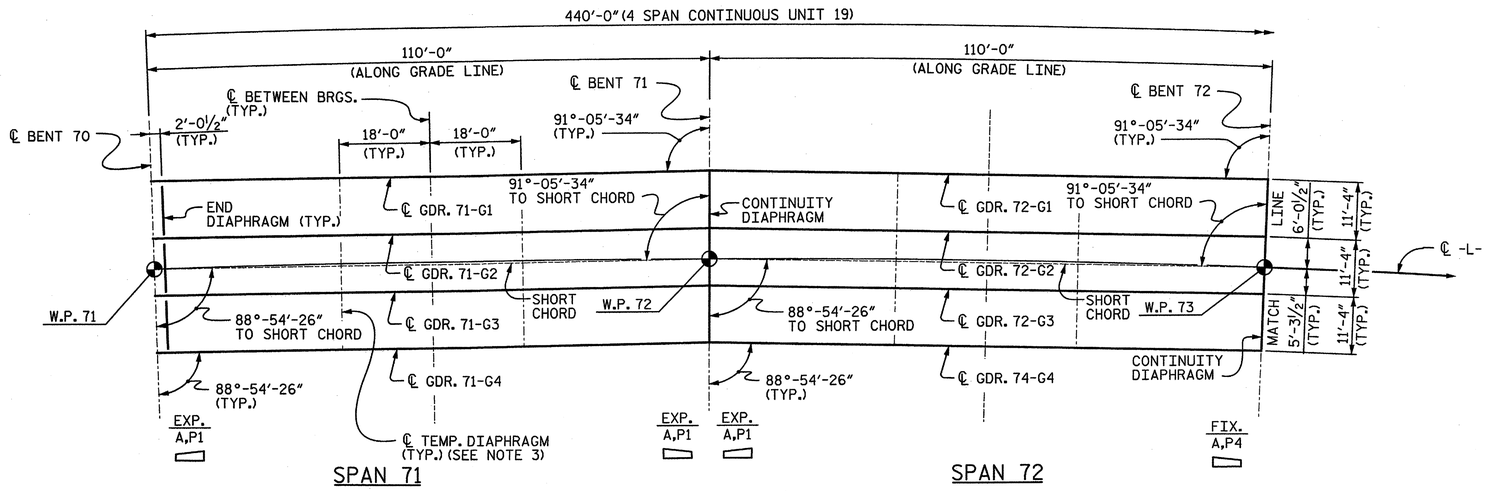

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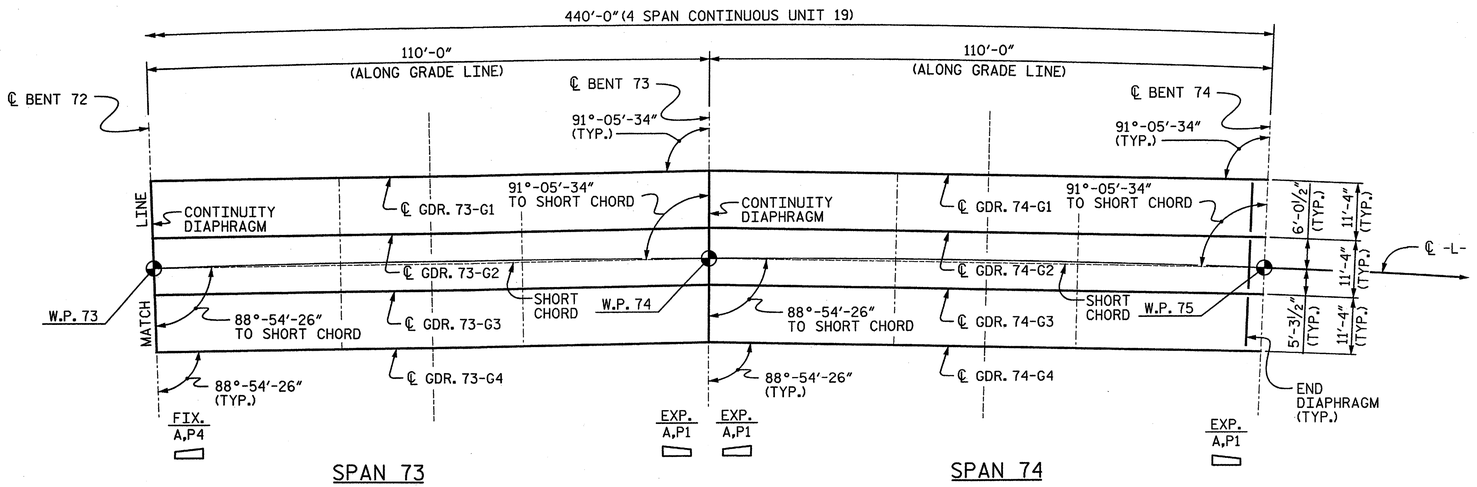

FRAMING PARTIAL PLAN

NOTES:

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PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 9 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

FRAMING PLAN
UNIT 19

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-117
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : ACA DATE : 2-12
CHECKED BY : TRL DATE : 3-12

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NOTES:

1. SP DENOTES SOLE PLATE MARK.
2. FOR SOLE PLATE AND BEARING DIMENSIONS, SEE "ELASTOMERIC BEARING DETAILS" SHEET.
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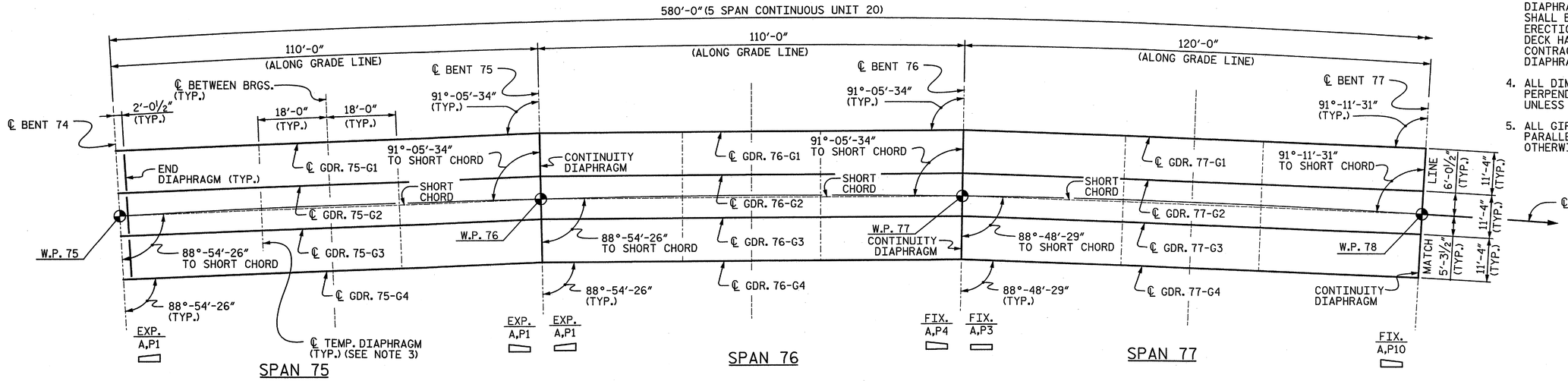

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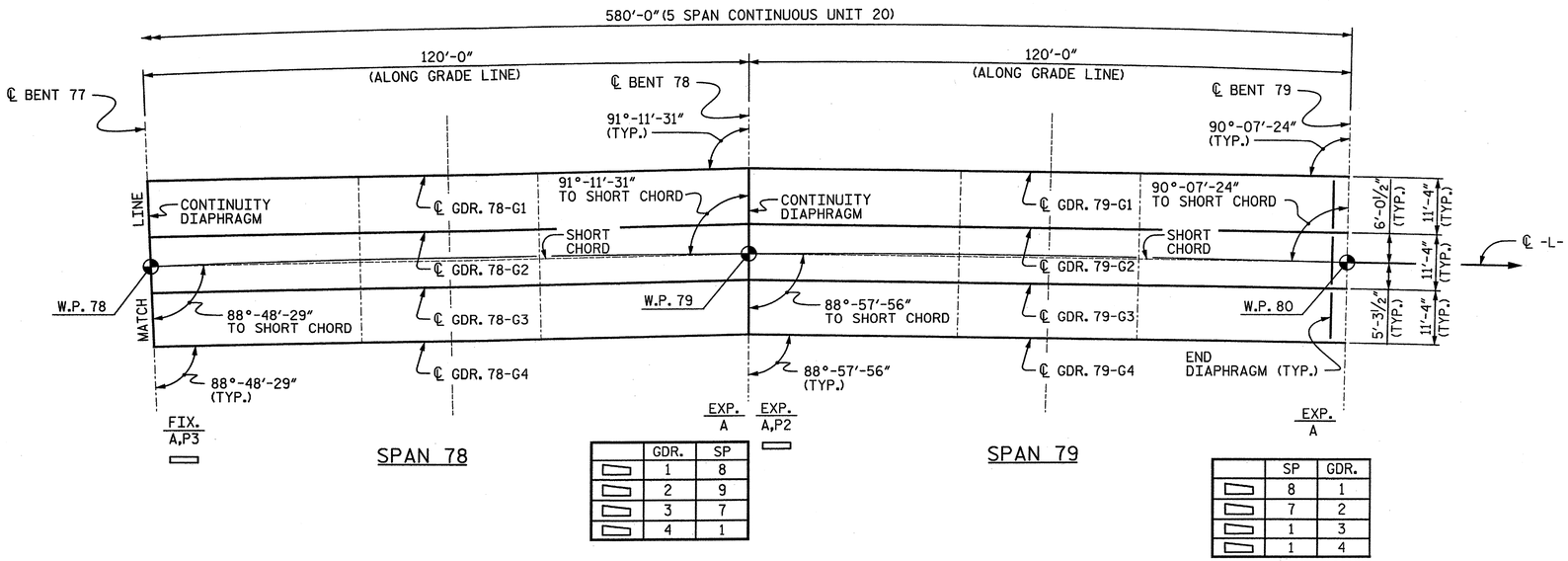

	GDR.	SP
	1	8
	2	9
	3	7
	4	1

	SP	GDR.
	8	1
	7	2
	1	3
	1	4

FRAMING PARTIAL PLAN

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 10 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

FRAMING PLAN
UNIT 20

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY
10-4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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

SHEET NO. S-118

TOTAL SHEETS 219

DRAWN BY : ACA DATE : 2-12

CHECKED BY : TRL DATE : 3-12

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NOTES:

1. SP DENOTES SOLE PLATE MARK.
2. FOR SOLE PLATE AND BEARING DIMENSIONS, SEE "ELASTOMERIC BEARING DETAILS" SHEET.
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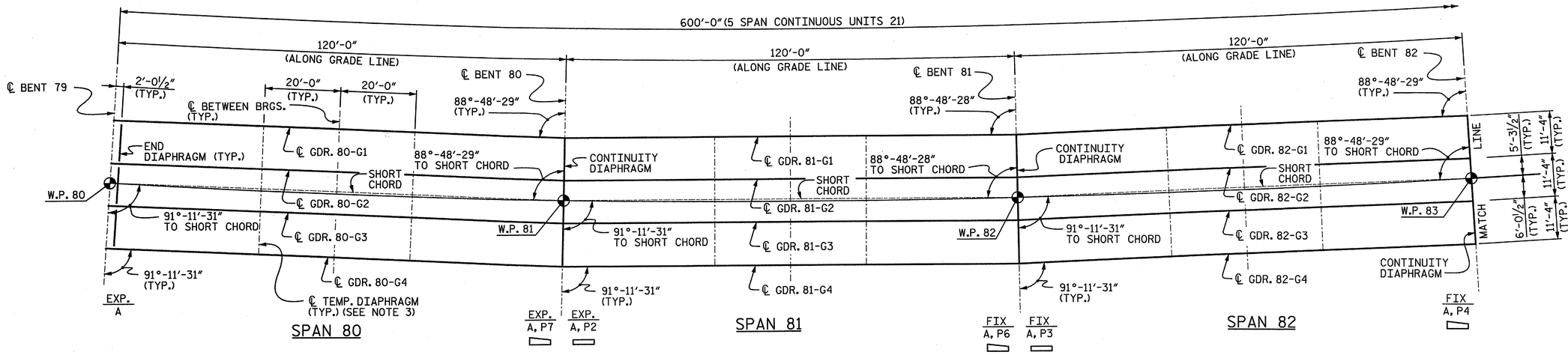
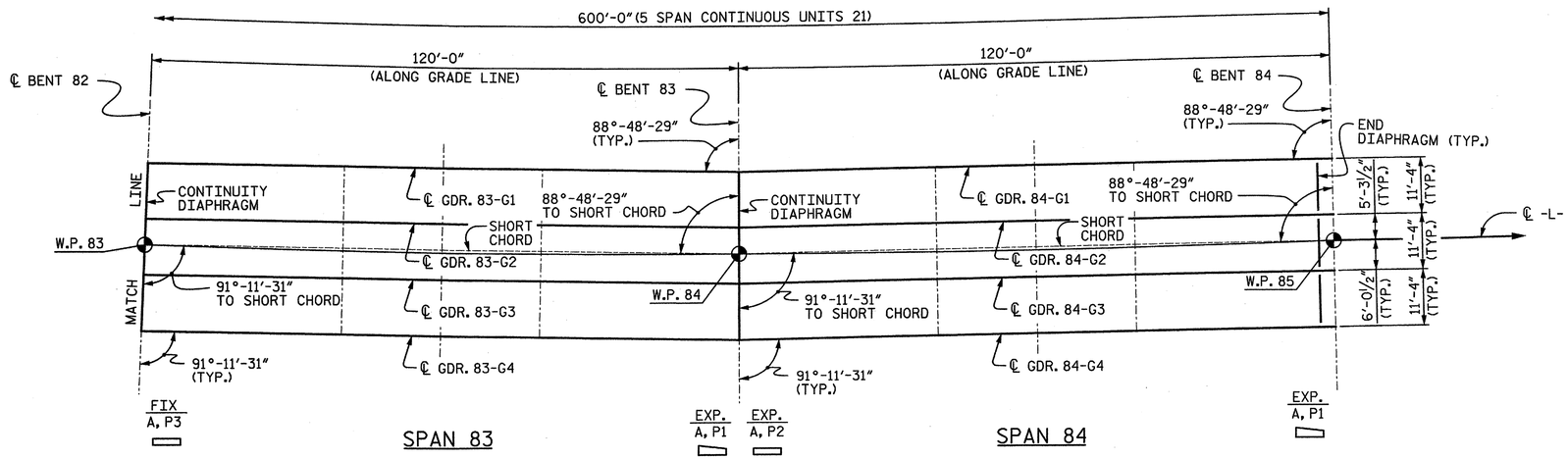


GDR.	SP	
1	2	▭
2	2	▭
3	2	▭
4	5	▱

FRAMING PARTIAL PLAN



FRAMING PARTIAL PLAN

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 11 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

FRAMING PLAN
UNITS 21

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-119
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : CLG DATE : 3-12
CHECKED BY : TRL DATE : 3-12

10/4/2012 12:25:13 PM R:\Structures\usta\119 Gdr. Framing Unit 21.dgn

NOTES:

1. SP DENOTES SOLE PLATE MARK.
2. FOR SOLE PLATE AND BEARING DIMENSIONS, SEE "ELASTOMERIC BEARING DETAILS" SHEET.
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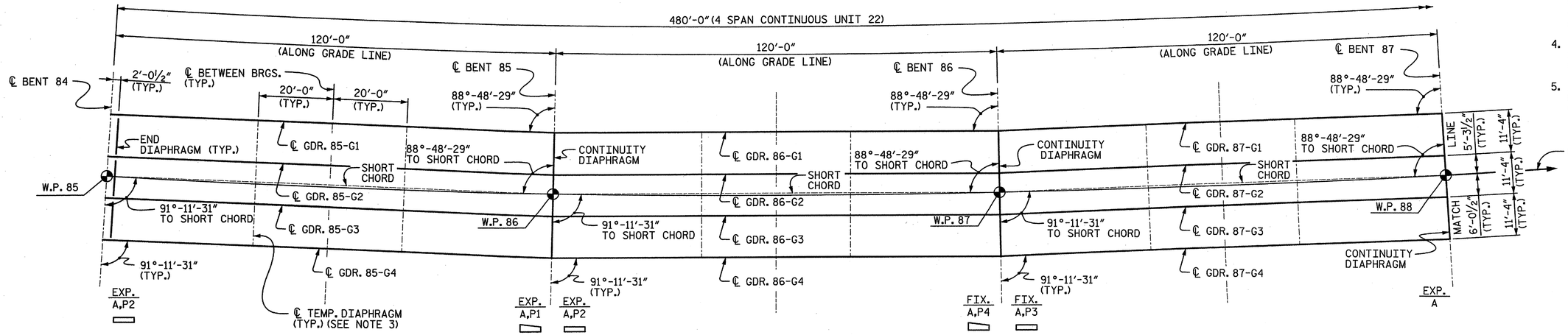
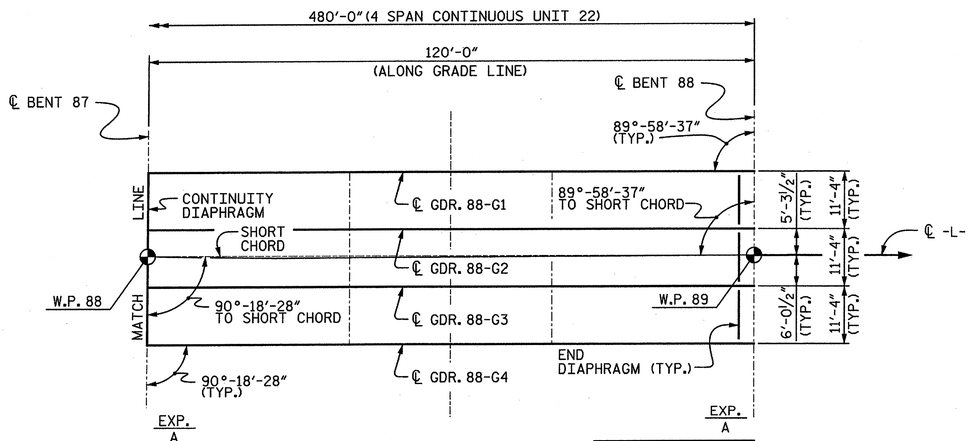


	SP	GDR.
	1	1
	1	2
	5	3
	9	4

FRAMING PARTIAL PLAN



GDR.	SP	
1	7	
2	2	
3	2	
4	2	

	SP	GDR.
	16	1
	8	2
	7	3
	15	4

FRAMING PARTIAL PLAN

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

DRAWN BY : ACA DATE : 2-12
CHECKED BY : TRL DATE : 3-12

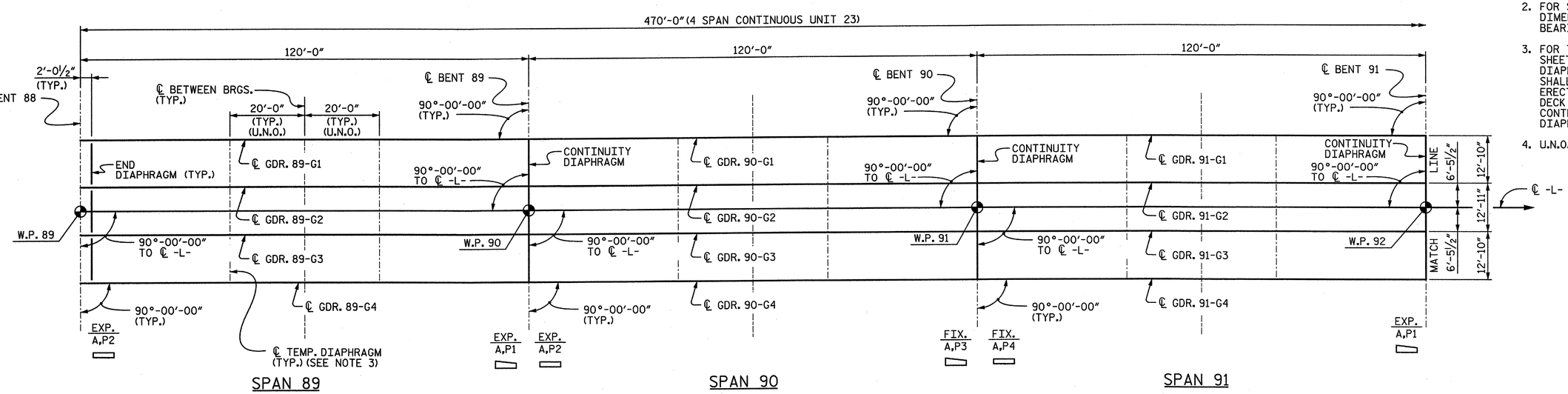
PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 12 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

FRAMING PLAN
UNIT 22

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-120
1			3			TOTAL SHEETS
2			4			219

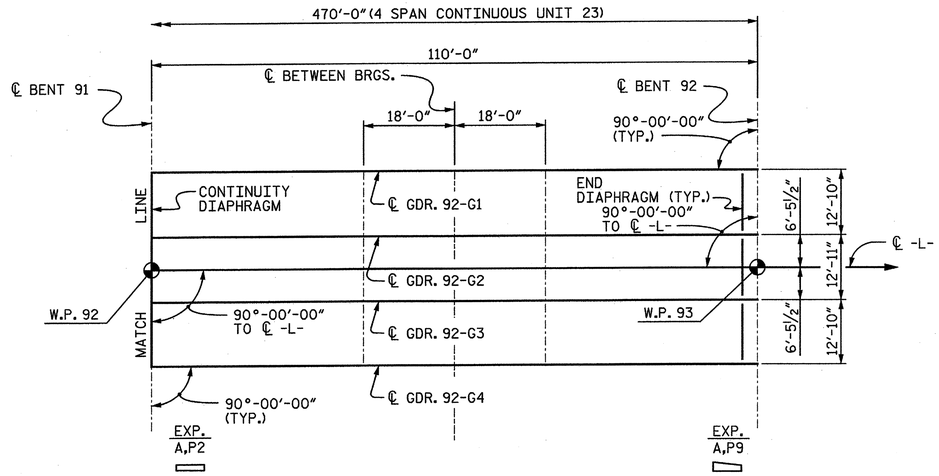
10/4/2012 2:32:30 PM R:\Structures\usta\U120 Gdr. Framing Unit 22.dgn



FRAMING PARTIAL PLAN

NOTES:

1. SP DENOTES SOLE PLATE MARK.
2. FOR SOLE PLATE AND BEARING DIMENSIONS, SEE "ELASTOMERIC BEARING DETAILS" SHEET.
3. FOR TEMPORARY DIAPHRAGMS SEE SHEET TITLED "TEMPORARY STEEL DIAPHRAGM DETAILS." DIAPHRAGMS SHALL BE INSTALLED DURING ERECTION & CONSTRUCTION. ONCE DECK HAS BEEN POURED & CURED, CONTRACTOR SHALL REMOVE DIAPHRAGMS.
4. U.N.O. = UNLESS NOTED OTHERWISE



SPAN 92

FRAMING PARTIAL PLAN

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 13 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

FRAMING PLAN
UNIT 23

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-121
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : ACA DATE : 2-12
CHECKED BY : TRL DATE : 3-12

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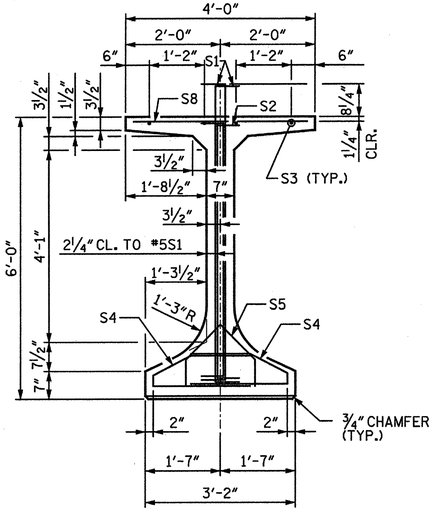
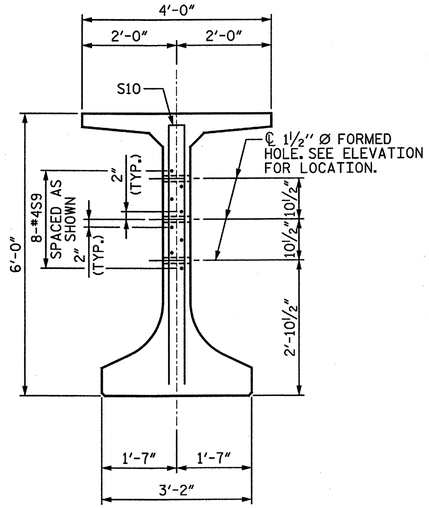
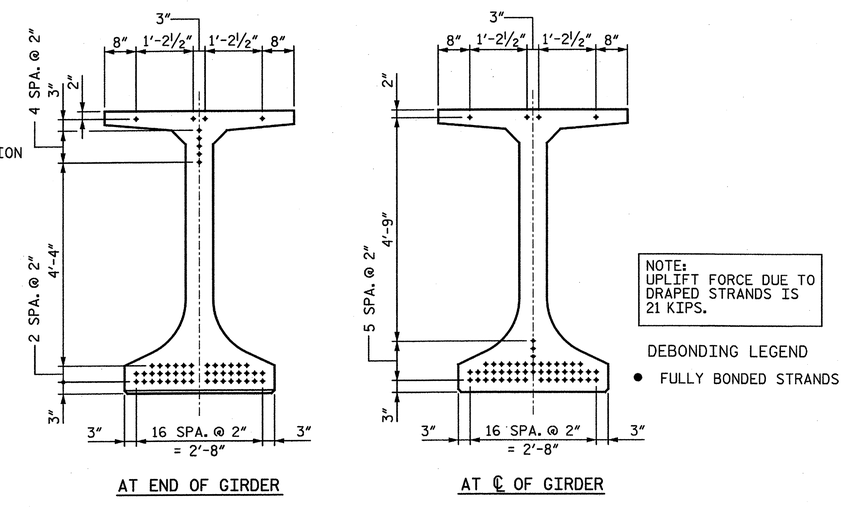


SECTION A-A



SECTION C-C

(S1, S4 AND S8 BARS NOT SHOWN)
(SEE PARTIAL ELEVATION ON SHEET 8 OF 10)

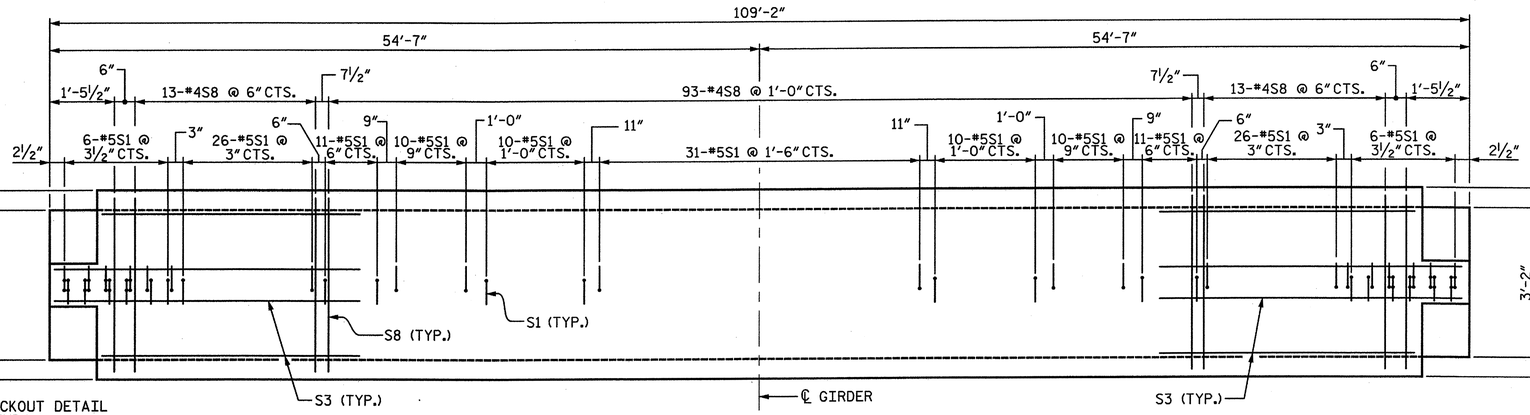


0.6" Ø LOW RELAXATION STRAND LAYOUT

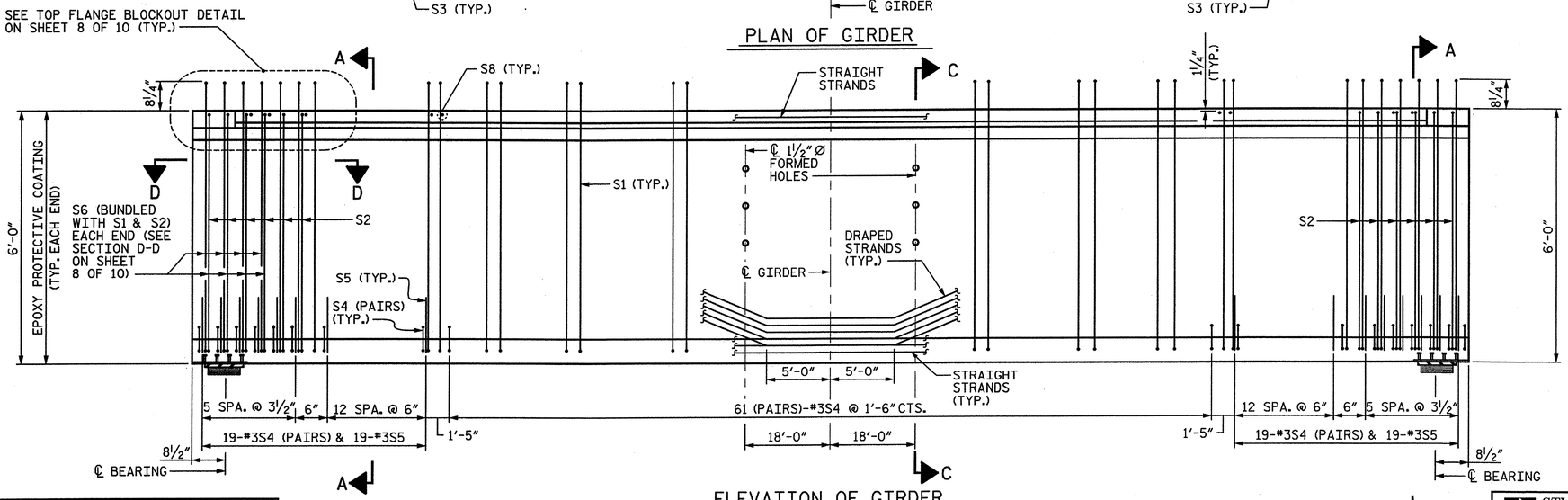
NOTE:
UPLIFT FORCE DUE TO DRAPED STRANDS IS 21 KIPS.

DEBONDING LEGEND

● FULLY BONDED STRANDS



PLAN OF GIRDER



ELEVATION OF GIRDER

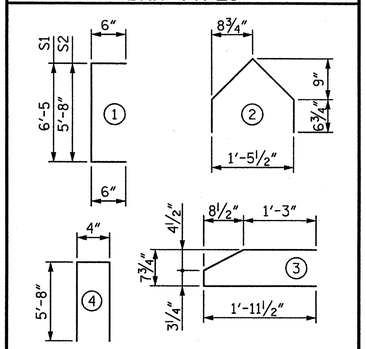
(FOR SECTION D-D, SEE SHEET 8 OF 10)

0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	157	#5	①	7'-5"	1214
S2	12	#5	①	6'-8"	83
S3	8	#6	STR	26'-0"	312
S4	198	#3	③	4'-3"	316
S5	38	#3	②	3'-3"	46
S6	16	#5	STR	5'-6"	92
S8	121	#4	STR	3'-8"	296
S9	16	#4	STR	8'-0"	86
S10	8	#5	④	11'-8"	97

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT.

QUANTITIES FOR ONE GIRDER

REINFORCING STEEL	8,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
LB.	C.Y.	No.
2,542	29.7	53

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
8	109'-2"	873'-4"

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 10

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

F.I.B. 72" PRESTRESSED CONCRETE GIRDER

(SPANS 5, 94)

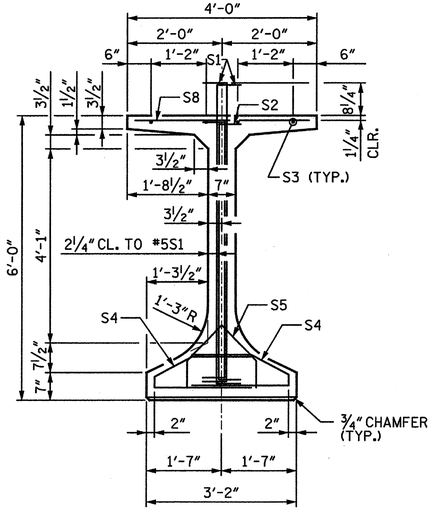
NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

DRAWN BY : MJK	DATE : 2-12
CHECKED BY : TJT	DATE : 3-12

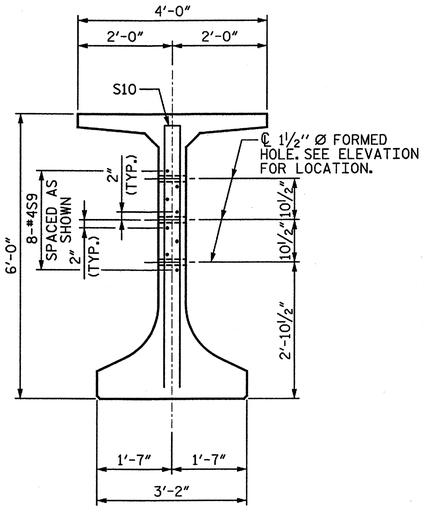
STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-122
1			3			TOTAL SHEETS
2			4			219

10/4/2012 12:25:06 PM R:\Structures\usta\1122 FIB 72 110 Span End Span Girder (1 of 10).dgn

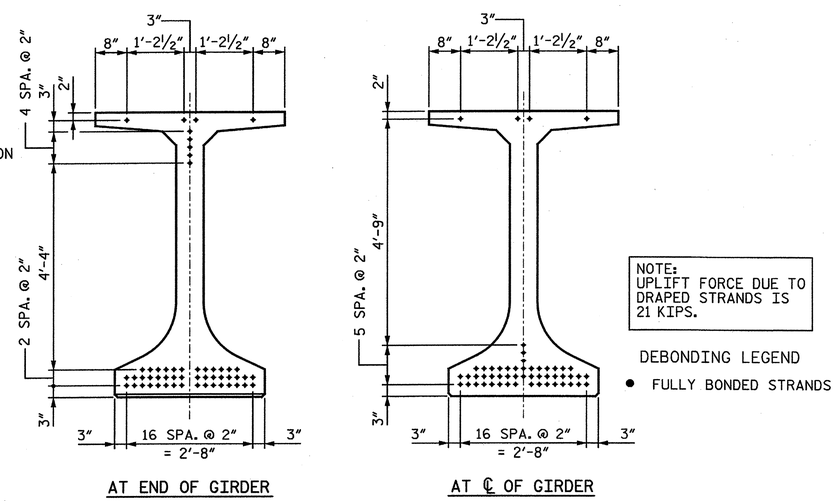


SECTION A-A



SECTION C-C

(S1, S4 AND S8 BARS NOT SHOWN)
(SEE PARTIAL ELEVATION ON SHEET 8 OF 10)

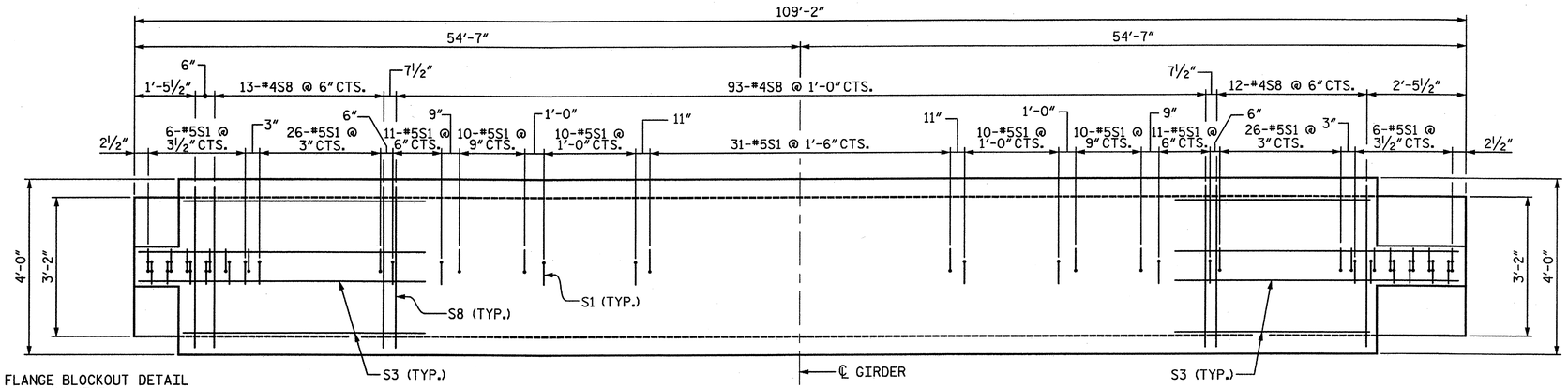


NOTE:
UPLIFT FORCE DUE TO DRAPED STRANDS IS 21 KIPS.

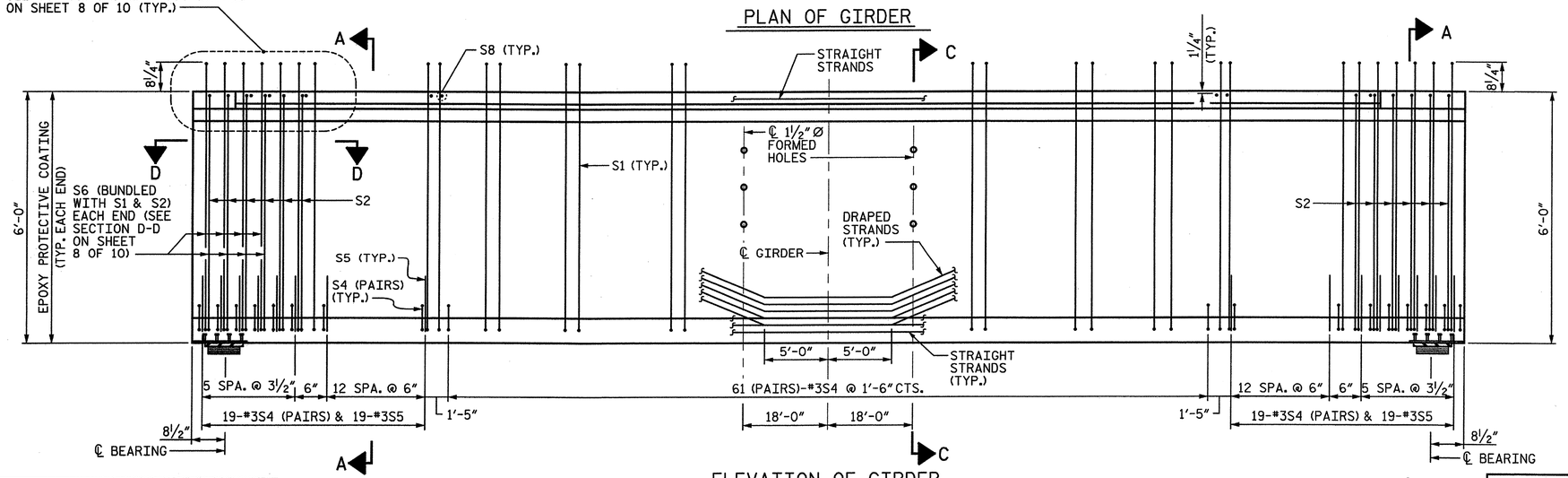
DEBONDING LEGEND

- FULLY BONDED STRANDS

0.6" Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER

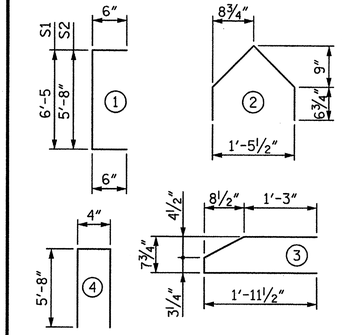
(FOR SECTION D-D, SEE SHEET 8 OF 10)

0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	157	#5	①	7'-5"	1214
S2	12	#5	①	6'-8"	83
S3	8	#6	STR	26'-0"	312
S4	198	#3	③	4'-3"	316
S5	38	#3	②	3'-3"	46
S6	16	#5	STR	5'-6"	92
S8	119	#4	STR	3'-8"	291
S9	16	#4	STR	8'-0"	86
S10	8	#5	④	11'-8"	97

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT.

QUANTITIES FOR ONE GIRDER

REINFORCING STEEL	8,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
LB.	C.Y.	No.
2,537	29.7	53

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
8	109'-2"	873'-4"

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 10

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

F.I.B. 72"
PRESTRESSED CONCRETE GIRDER

(SPANS 6, 93)

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

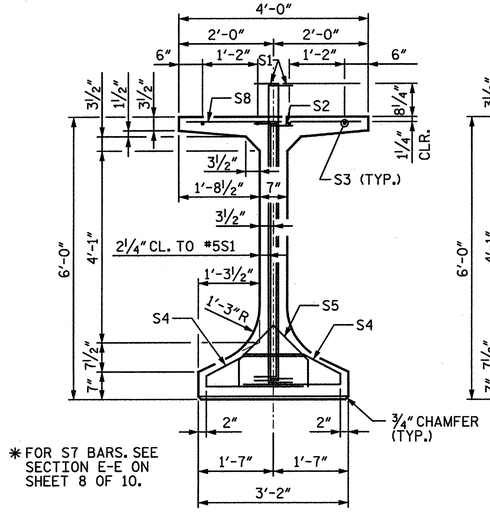
DRAWN BY : MJK DATE : 2-12
CHECKED BY : TJT DATE : 3-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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

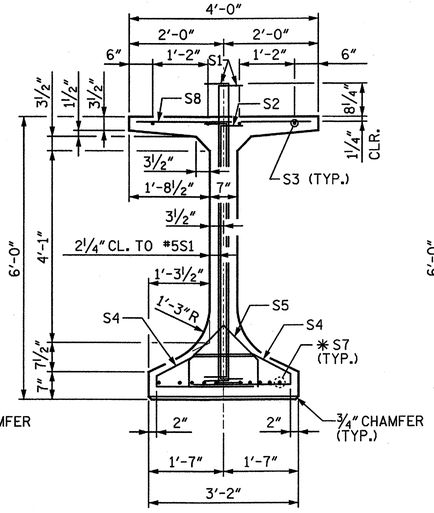
SHEET NO. S-123
TOTAL SHEETS 219

10/4/2012 12:25:03 PM R:\Structures\ustqv\123) FIB 72 110 Span End Span Girder (2 of 10).dgn

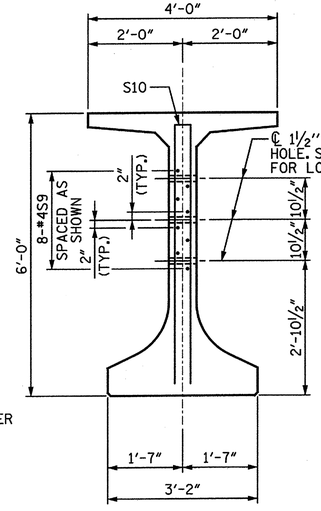


✱ FOR S7 BARS. SEE SECTION E-E ON SHEET 8 OF 10.

SECTION A-A

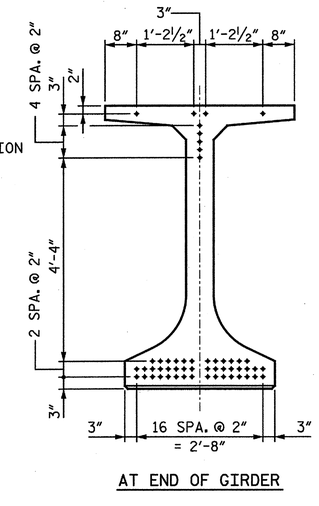


SECTION B-B

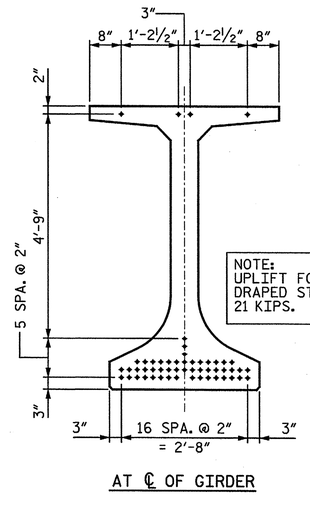


SECTION C-C

(S1, S4 AND S8 BARS NOT SHOWN)
(SEE PARTIAL ELEVATION ON SHEET 8 OF 10)



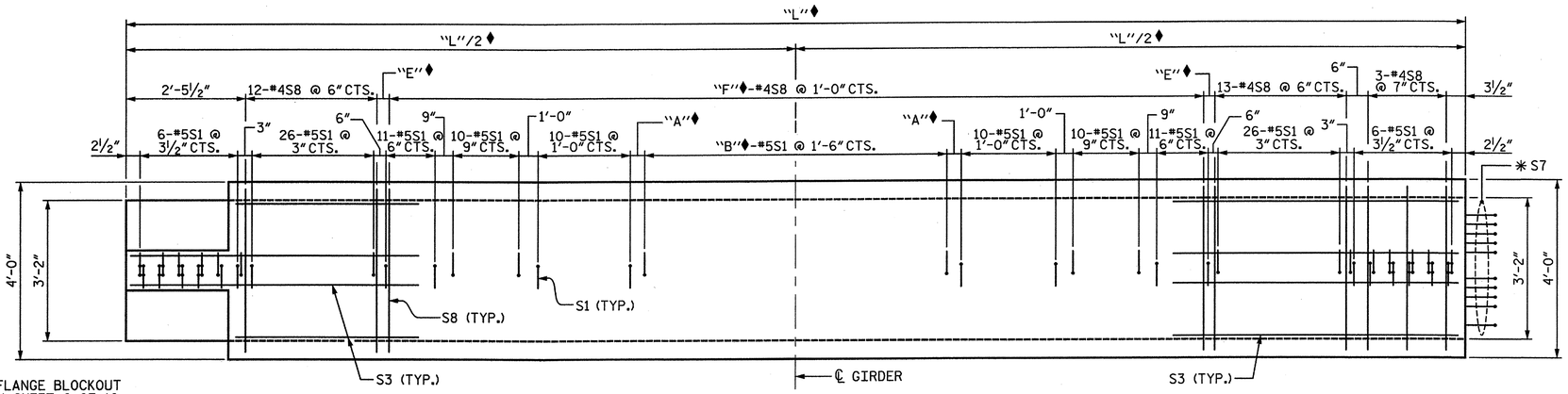
AT END OF GIRDER



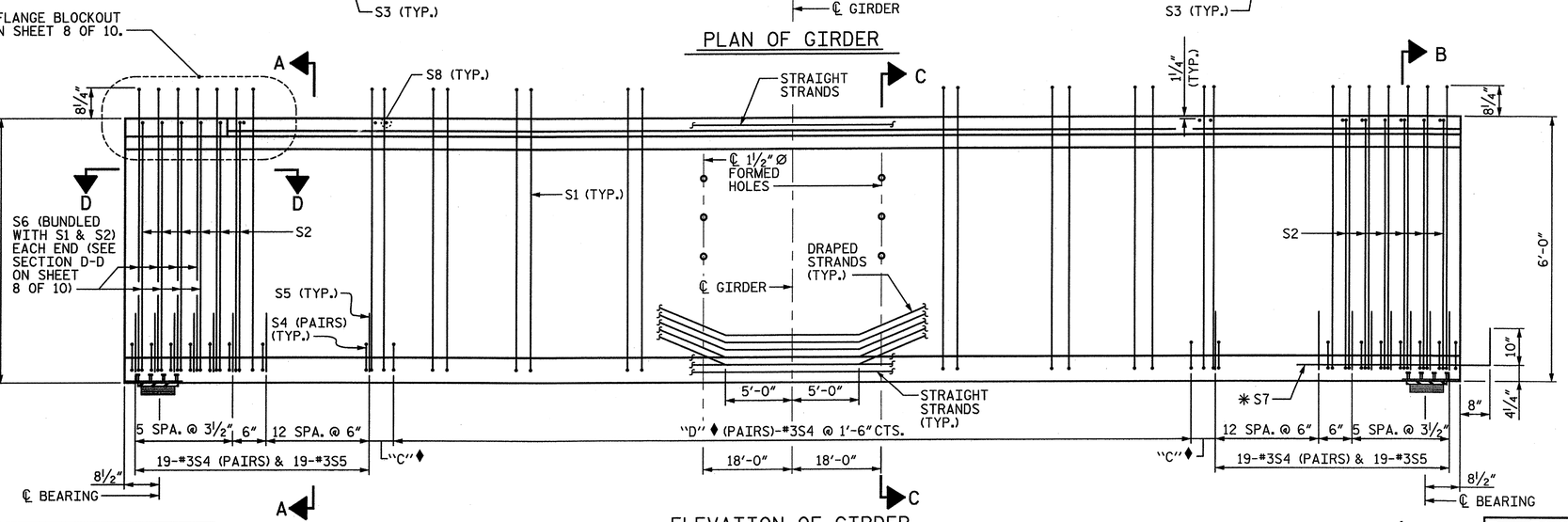
AT ℄ OF GIRDER

NOTE:
UPLIFT FORCE DUE TO DRAPED STRANDS IS 21 KIPS.

0.6" Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER

(FOR SECTION D-D, SEE SHEET 8 OF 10)

DEBONDING LEGEND

● FULLY BONDED STRANDS

♦ SEE GIRDER TABLES ON SHEET 7 OF 10 FOR VALUES.

0.6" Ø L. R. GRADE 270 STRANDS

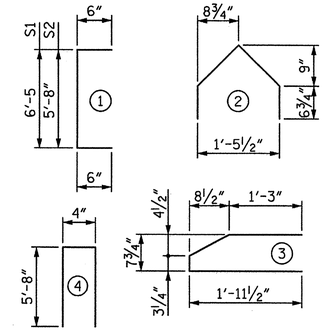
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	♦	#5	①	7'-5"	♦
S2	12	#5	①	6'-8"	83
S3	8	#6	STR	26'-0"	312
S4	♦	#3	③	4'-3"	♦
S5	38	#3	②	3'-3"	46
S6	16	#5	STR	5'-6"	92
✱S7	10	#5	STR	3'-8"	38
S8	♦	#4	STR	3'-8"	♦
S9	16	#4	STR	8'-0"	86
S10	8	#5	④	11'-8"	97

✱NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT.

QUANTITIES FOR ONE GIRDER

REINFORCING STEEL	8,000 PSI CONCRETE	0.6"Ø L.R. STRANDS
LB.	C.Y.	No.
♦	♦	53

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
20	♦	2,183'-5"

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 3 OF 10

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

F.I.B. 72"
PRESTRESSED CONCRETE GIRDER

(SPANS 70, 71, 74, 75, 92,)

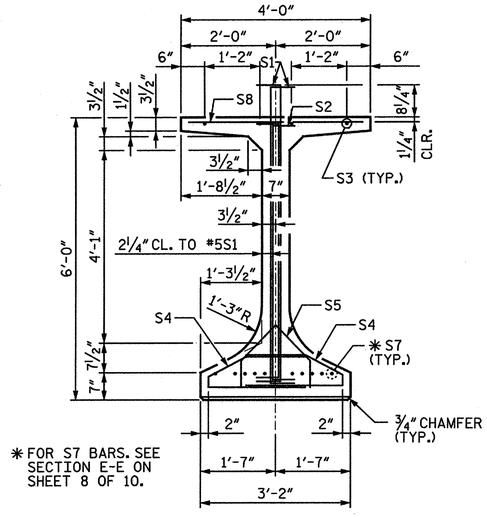
NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-124
1			3			TOTAL SHEETS
2			4			219

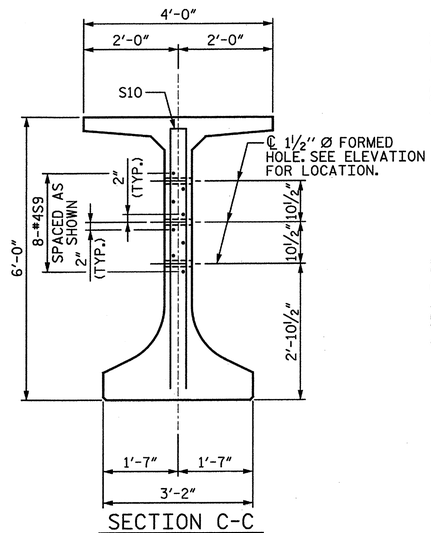
DRAWN BY : MJK DATE : 2-12
CHECKED BY : TJT DATE : 3-12

10/4/2012 12:25:00 PM R:\Structures\ustq\1124) FIB 72 110 Span End Span Girder t3 of 10.dgn



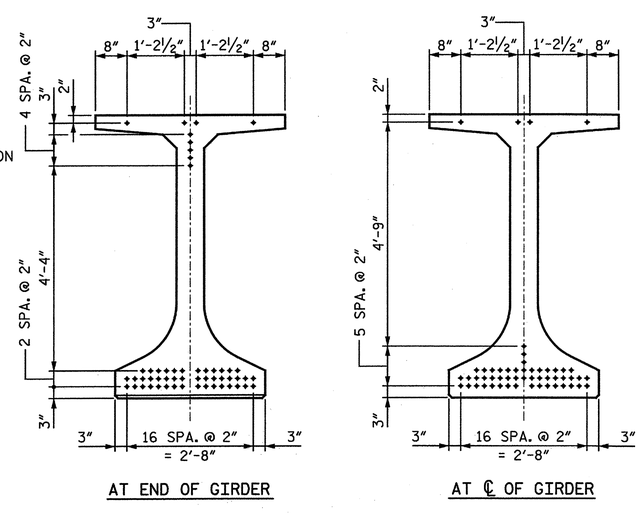
✱FOR S7 BARS. SEE SECTION E-E ON SHEET 8 OF 10.

SECTION A-A



SECTION C-C

(S1, S4 AND S8 BARS NOT SHOWN)
(SEE PARTIAL ELEVATION ON SHEET 8 OF 10.)



AT END OF GIRDER

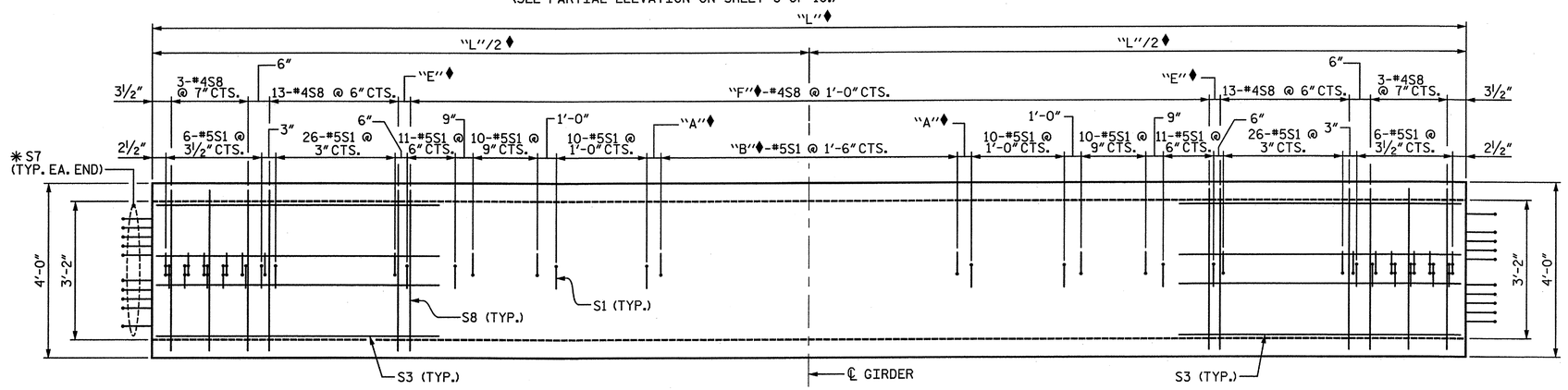
AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

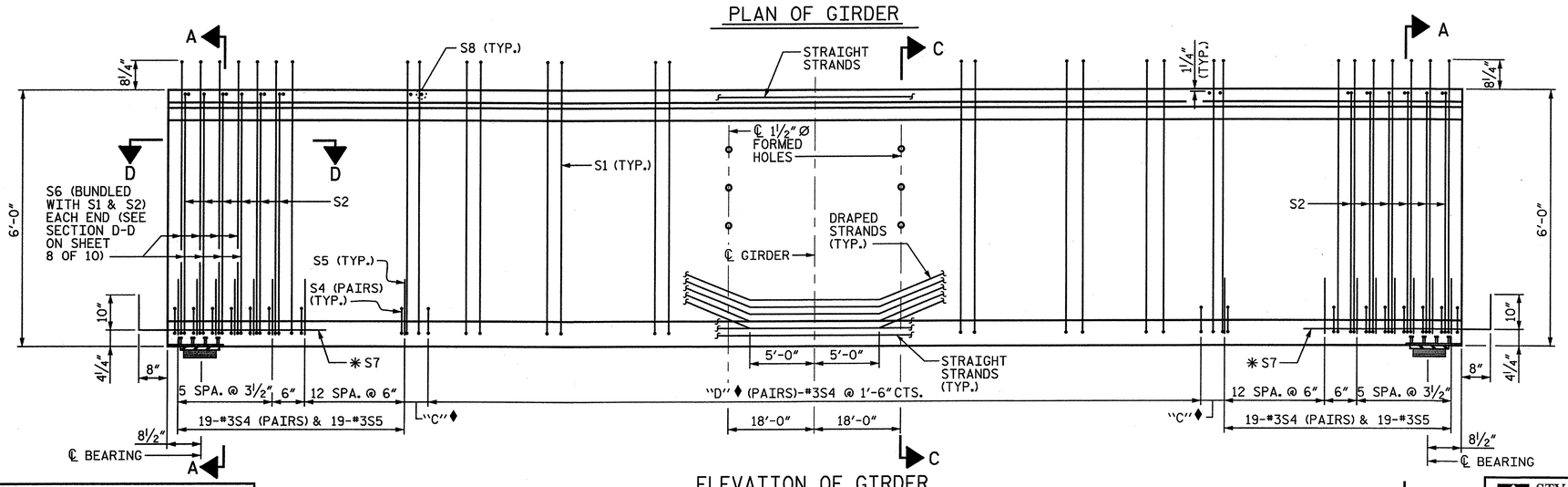
NOTE:
UPLIFT FORCE DUE TO DRAPED STRANDS IS 21 KIPS.

DEBONDING LEGEND

- FULLY BONDED STRANDS



PLAN OF GIRDER



ELEVATION OF GIRDER

(FOR SECTION D-D, SEE SHEET 8 OF 10)

♦ SEE GIRDER TABLES ON SHEET 7 OF 10 FOR VALUES.

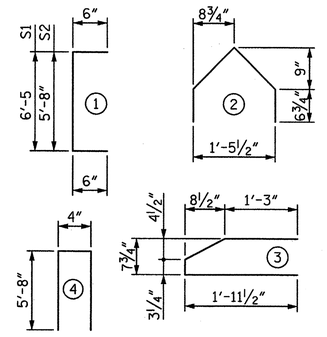
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	♦	#5	①	7'-5"	♦
S2	12	#5	①	6'-8"	83
S3	8	#6	STR	26'-0"	312
S4	♦	#3	③	4'-3"	♦
S5	38	#3	②	3'-3"	46
S6	16	#5	STR	5'-6"	92
✱S7	20	#5	STR	3'-8"	76
S8	♦	#4	STR	3'-8"	♦
S9	16	#4	STR	8'-0"	86
S10	8	#5	④	11'-8"	97

✱NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT.

QUANTITIES FOR ONE GIRDER

REINFORCING STEEL	8,000 PSI CONCRETE	0.6"Ø L.R. STRANDS
LB.	C.Y.	No.
♦	♦	53

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
12	♦	1,310'-0¾"

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 4 OF 10

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

F.I.B. 72" PRESTRESSED CONCRETE GIRDER

(SPANS 72, 73, 76)

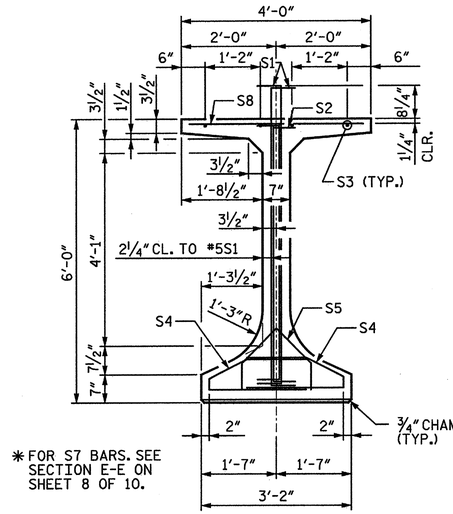
NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-125
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : MJK DATE : 2-12
CHECKED BY : TJT DATE : 3-12

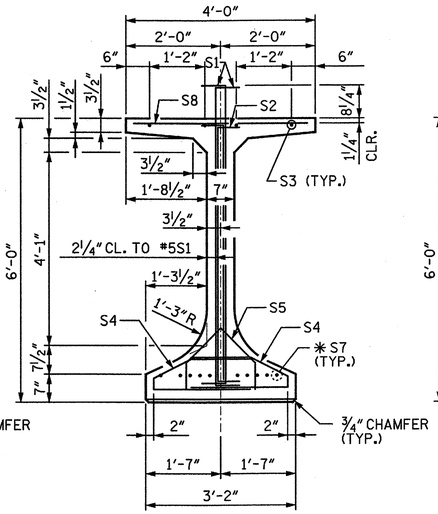
STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

10/4/2012 5:01:09 PM R:\Structures\usra\(125) FIB 72 110 Span Int Span Girder (4 of 10).dgn

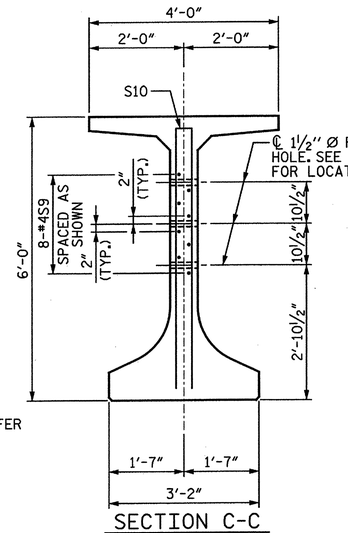


* FOR S7 BARS. SEE SECTION E-E ON SHEET 8 OF 10.

SECTION A-A

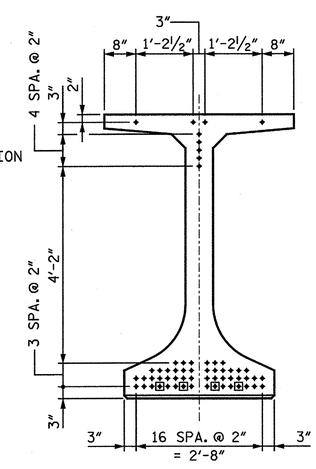


SECTION B-B

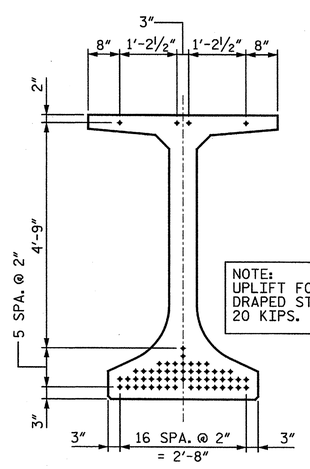


SECTION C-C

(S1, S4 AND S8 BARS NOT SHOWN)
(SEE PARTIAL ELEVATION ON SHEET 8 OF 10.)



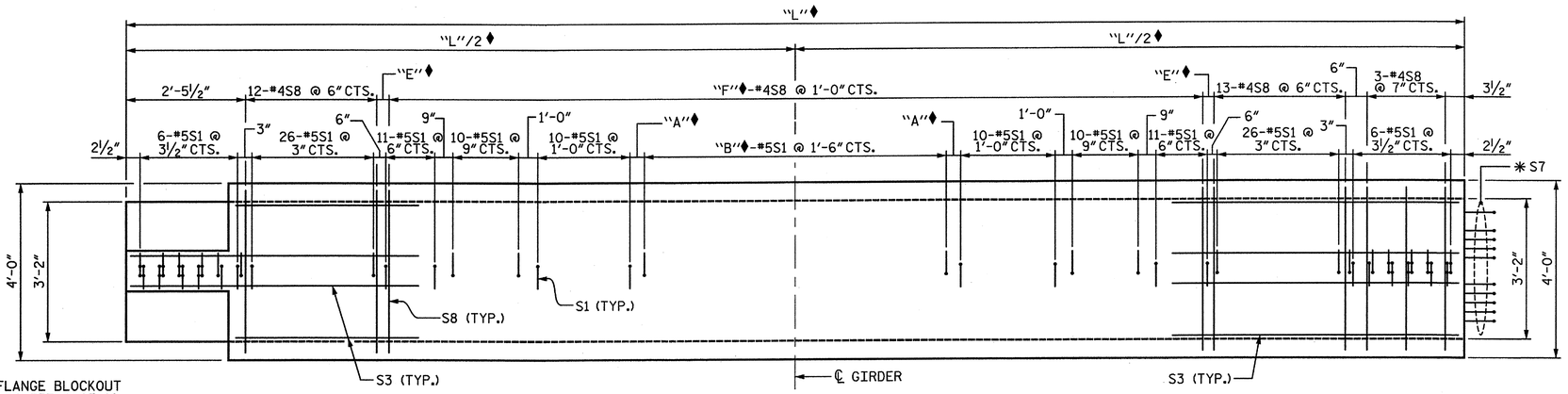
AT END OF GIRDER



AT ℄ OF GIRDER

NOTE:
UPLIFT FORCE DUE TO DRAPED STRANDS IS 20 KIPS.

0.6" Ø LOW RELAXATION STRAND LAYOUT

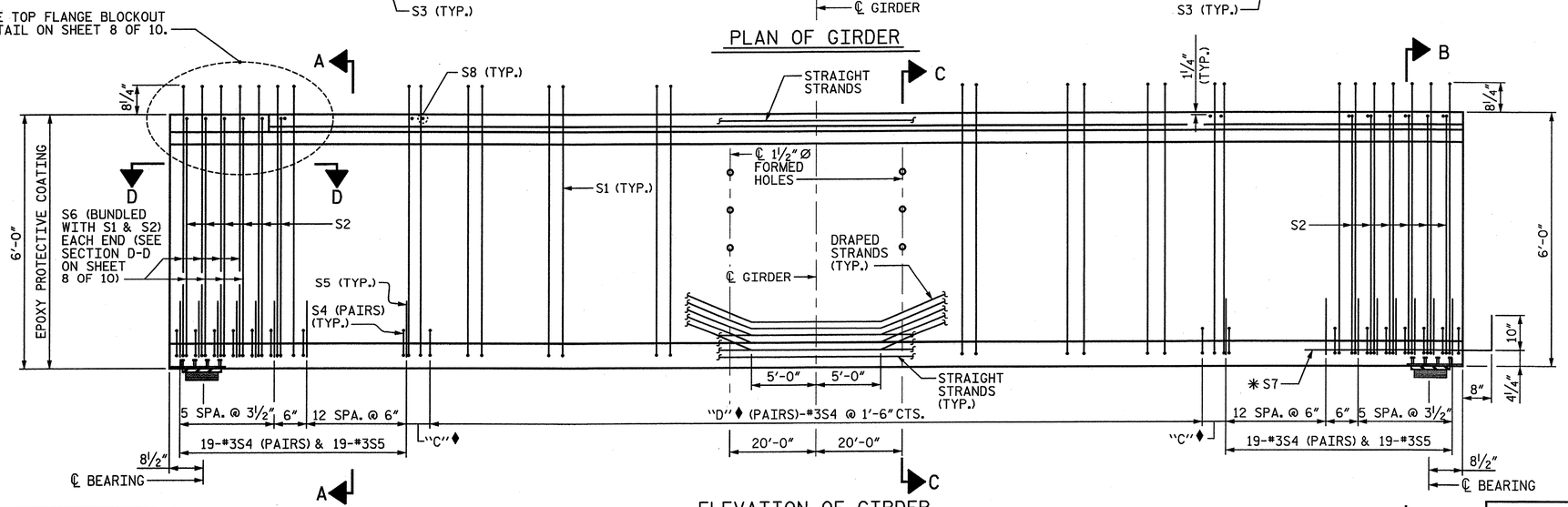


PLAN OF GIRDER

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ⊡ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER

♦ SEE GIRDER TABLES ON SHEET 7 OF 10 FOR VALUES.



ELEVATION OF GIRDER

(FOR SECTION D-D, SEE SHEET 8 OF 10)

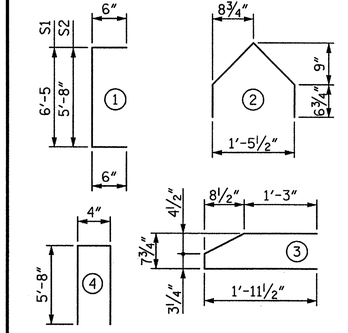
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	♦	#5	①	7'-5"	♦
S2	12	#5	①	6'-8"	83
S3	8	#6	STR	26'-0"	312
S4	♦	#3	③	4'-3"	♦
S5	38	#3	②	3'-3"	46
S6	16	#5	STR	5'-6"	92
* S7	10	#5	STR	3'-8"	38
S8	♦	#4	STR	3'-8"	♦
S9	16	#4	STR	8'-0"	86
S10	8	#5	④	11'-8"	97

* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT.

QUANTITIES FOR ONE GIRDER

REINFORCING STEEL	8,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
LB.	C.Y.	No.
♦	♦	59

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
124	♦	14,776'-10¾"

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 5 OF 10

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

F.I.B. 72" PRESTRESSED CONCRETE GIRDER

(SPANS 7, 11, 12, 16, 17, 21, 22, 26, 27, 31, 32, 36, 37, 41, 42, 46, 47, 51, 52, 56, 57, 61, 62, 66, 67, 79, 80, 84, 85, 88, 89)

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

DRAWN BY : MJK DATE : 2-12
CHECKED BY : TJT DATE : 3-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-126
1			3			TOTAL SHEETS
2			4			219

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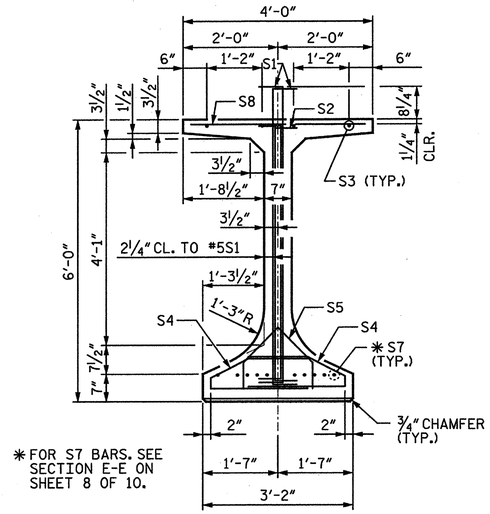
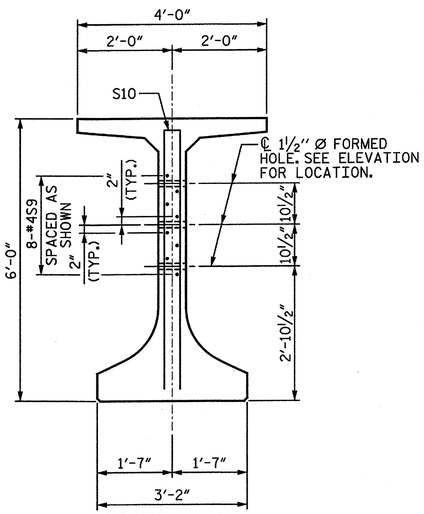


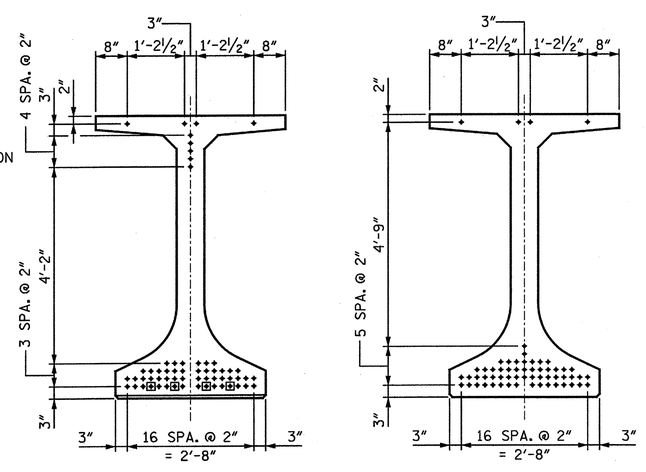
✱FOR S7 BARS. SEE SECTION E-E ON SHEET 8 OF 10.

SECTION A-A



SECTION C-C

(S1, S4 AND S8 BARS NOT SHOWN)
(SEE PARTIAL ELEVATION ON SHEET 8 OF 10.)



AT END OF GIRDER

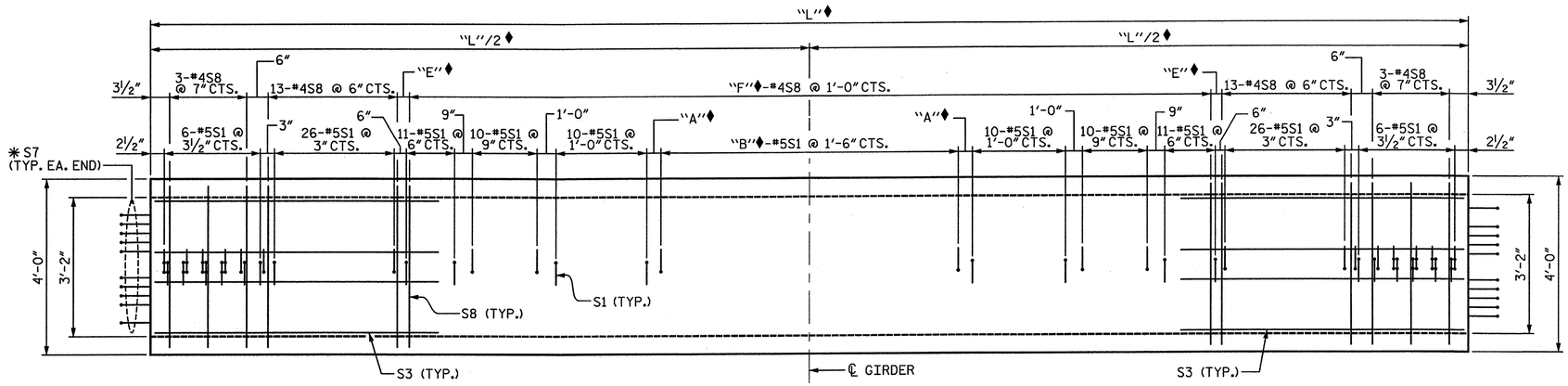
AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

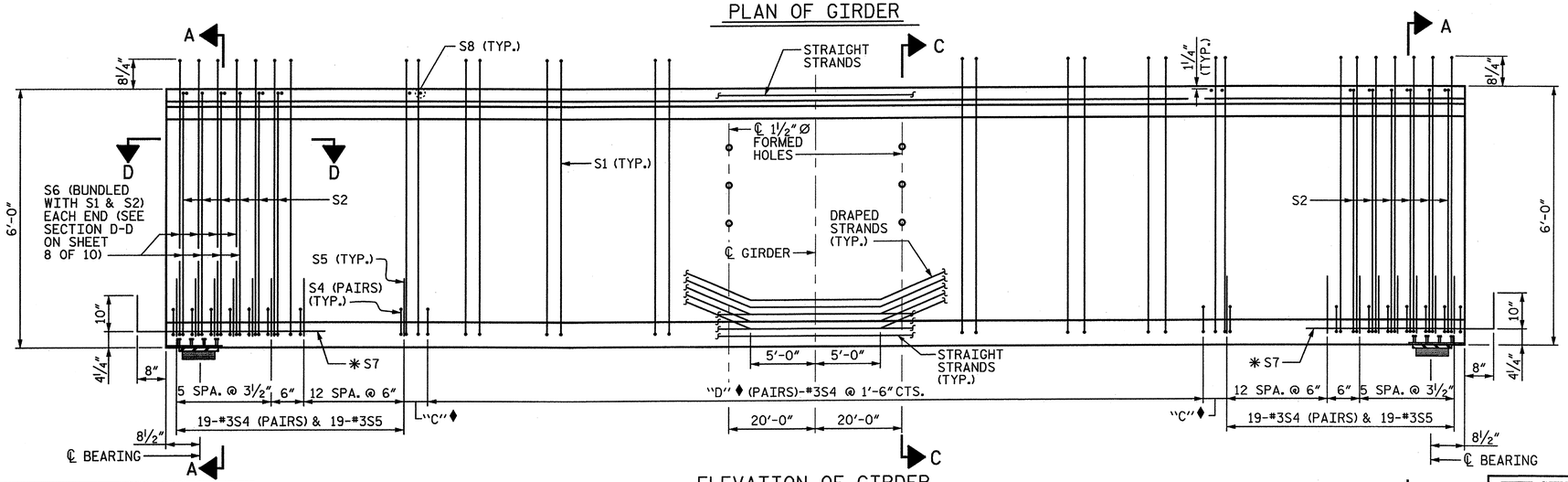
NOTE:
UPLIFT FORCE DUE TO DRAPED STRANDS IS 20 KIPS.

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ⊡ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER



PLAN OF GIRDER



ELEVATION OF GIRDER

(FOR SECTION D-D, SEE SHEET 8 OF 10)

♦ SEE GIRDER TABLES ON SHEET 7 OF 10 FOR VALUES.

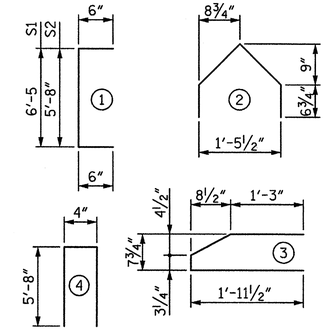
0.6"Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	♦	#5	①	7'-5"	♦
S2	12	#5	①	6'-8"	83
S3	8	#6	STR	26'-0"	312
S4	♦	#3	③	4'-3"	♦
S5	38	#3	②	3'-3"	46
S6	16	#5	STR	5'-6"	92
✱S7	20	#5	STR	3'-8"	76
S8	♦	#4	STR	3'-8"	♦
S9	16	#4	STR	8'-0"	86
S10	8	#5	④	11'-8"	97

✱NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT.

QUANTITIES FOR ONE GIRDER

REINFORCING STEEL	8,000 PSI CONCRETE	0.6"Ø L.R. STRANDS
LB.	C.Y.	No.
♦	♦	59

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
188	♦	22,403'-8¾"

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 6 OF 10

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

F.I.B. 72" PRESTRESSED CONCRETE GIRDER

(SPANS 8-10, 13-15, 18-20, 23-25, 28-30, 33-35, 38-40, 43-45, 48-50, 53-55, 58-60, 63-65, 68-69, 77-78, 81-83, 86-87, 90-91)

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

DRAWN BY : MJK DATE : 2-12
CHECKED BY : TJT DATE : 3-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-127
1			3			TOTAL SHEETS
2			4			219

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GIRDER TABLE

SPAN	GDR. NO.	GDR. SHT.	"L"	"A"	"B"	"C"	"D"	"E"	"F"	S1 BARS NO.	S1 BARS WEIGHT (LBS)	S4 BARS NO.	S4 BARS WEIGHT (LBS)	S8 BARS NO.	S8 BARS WEIGHT (LBS)	REINF. STEEL (LBS)	8,000 PSI CONCRETE (C.Y.)
7, 11-12, 16	1	5	119'-2"	1'-5"	37	1'-2"	68	7 1/2"	103	163	1261	212	339	131	321	2675	32.4
17, 21-22, 31-32,	2	5	119'-2"	1'-5"	37	1'-2"	68	7 1/2"	103	163	1261	212	339	131	321	2675	32.4
36-37, 41-42, 46	3	5	119'-2"	1'-5"	37	1'-2"	68	7 1/2"	103	163	1261	212	339	131	321	2675	32.4
47, 51, 62, 89	4	5	119'-2"	1'-5"	37	1'-2"	68	7 1/2"	103	163	1261	212	339	131	321	2675	32.4
8-10, 13-15, 18-20,	1	6	119'-2"	1'-5"	37	1'-2"	68	7 1/2"	103	163	1261	212	339	135	331	2723	32.4
29-30, 33-35,	2	6	119'-2"	1'-5"	37	1'-2"	68	7 1/2"	103	163	1261	212	339	135	331	2723	32.4
38-40, 43-45,	3	6	119'-2"	1'-5"	37	1'-2"	68	7 1/2"	103	163	1261	212	339	135	331	2723	32.4
48-50, 90-91	4	6	119'-2"	1'-5"	37	1'-2"	68	7 1/2"	103	163	1261	212	339	135	331	2723	32.4
23	1	6	118'-9 1/2"	1'-2 3/4"	37	11 3/4"	68	11 1/4"	102	163	1261	212	339	134	328	2720	32.3
	2	6	119'-0 1/2"	1'-4 1/4"	37	1'-1 1/4"	68	6 3/4"	103	163	1261	212	339	135	331	2723	32.4
	3	6	119'-3 1/2"	1'-5 3/4"	37	1'-2 3/4"	68	8 1/4"	103	163	1261	212	339	135	331	2723	32.5
	4	6	119'-6 1/2"	10 1/4"	38	1'-4 1/4"	68	9 3/4"	103	164	1269	212	339	135	331	2731	32.5
24-25	1	6	118'-8 1/4"	1'-2 1/8"	37	11 1/8"	68	10 5/8"	102	163	1261	212	339	134	328	2720	32.3
	2	6	119'-0"	1'-4"	37	1'-1"	68	6 1/2"	103	163	1261	212	339	135	331	2723	32.4
	3	6	119'-4"	1'-6"	37	1'-3"	68	8 1/2"	103	163	1261	212	339	135	331	2723	32.5
	4	6	119'-7 3/4"	10 7/8"	38	1'-4 7/8"	68	10 3/8"	103	164	1269	212	339	135	331	2731	32.6
26-27	1	5	118'-8 1/4"	1'-2 1/8"	37	11 1/8"	68	10 5/8"	102	163	1261	212	339	130	318	2672	32.3
	2	5	119'-0"	1'-4"	37	1'-1"	68	6 1/2"	103	163	1261	212	339	131	321	2675	32.4
	3	5	119'-4"	1'-6"	37	1'-3"	68	8 1/2"	103	163	1261	212	339	131	321	2675	32.5
	4	5	119'-7 3/4"	10 7/8"	38	1'-4 7/8"	68	10 3/8"	103	164	1269	212	339	131	321	2683	32.6
28	1	6	119'-0"	1'-4"	37	1'-1"	68	6 1/2"	103	163	1261	212	339	135	331	2723	32.4
	2	6	119'-1 1/2"	1'-4 3/4"	37	1'-1 3/4"	68	7 1/4"	103	163	1261	212	339	135	331	2723	32.4
	3	6	119'-2 3/4"	1'-5 3/8"	37	1'-2 3/8"	68	7 7/8"	103	163	1261	212	339	135	331	2723	32.5
	4	6	119'-4"	1'-6"	37	1'-3"	68	8 1/2"	103	163	1261	212	339	135	331	2723	32.5
52	1	5	118'-11"	1'-3 1/2"	37	1'-0 1/2"	68	6"	103	163	1261	212	339	131	321	2675	32.4
	2	5	119'-1"	1'-4 1/2"	37	1'-1 1/2"	68	7"	103	163	1261	212	339	131	321	2675	32.4
	3	5	119'-3"	1'-5 1/2"	37	1'-2 1/2"	68	8"	103	163	1261	212	339	131	321	2675	32.5
	4	5	119'-5"	9 1/2"	38	1'-3 1/2"	68	9"	103	164	1269	212	339	131	321	2683	32.5
53-55, 58-60, 81-83, 86-87	1	6	118'-5 1/2"	1'-0 3/4"	37	9 3/4"	68	9 1/4"	102	163	1261	212	339	134	328	2720	32.3
	2	6	118'-11 1/4"	1'-3 5/8"	37	1'-0 5/8"	68	6 1/8"	103	163	1261	212	339	135	331	2723	32.4
	3	6	119'-5"	9 1/2"	38	1'-3 1/2"	68	9"	103	164	1269	212	339	135	331	2731	32.5
	4	6	119'-10 1/2"	1'-0 1/4"	38	9 1/4"	69	11 3/4"	103	164	1269	214	342	135	331	2734	32.6
56-57, 80, 84-85	1	5	118'-5 1/2"	1'-0 3/4"	37	9 3/4"	68	9 1/4"	102	163	1261	212	339	130	318	2672	32.3
	2	5	118'-11 1/4"	1'-3 5/8"	37	1'-0 5/8"	68	1'-0 1/8"	102	163	1261	212	339	130	318	2672	32.4
	3	5	119'-5"	9 1/2"	38	1'-3 1/2"	68	9"	103	164	1269	212	339	131	321	2683	32.5
	4	5	119'-10 1/2"	1'-0 1/4"	38	9 1/4"	69	11 3/4"	103	164	1269	214	342	131	321	2686	32.6

GIRDER TABLE

SPAN	GDR. NO.	GDR. SHT.	"L"	"A"	"B"	"C"	"D"	"E"	"F"	S1 BARS NO.	S1 BARS WEIGHT (LBS)	S4 BARS NO.	S4 BARS WEIGHT (LBS)	S8 BARS NO.	S8 BARS WEIGHT (LBS)	REINF. STEEL (LBS)	8,000 PSI CONCRETE (C.Y.)
61	1	5	118'-10 1/4"	1'-3 1/8"	37	1'-0 1/8"	68	5 5/8"	103	163	1261	212	339	131	321	2675	32.4
	2	5	119'-0 3/4"	1'-4 3/8"	37	1'-1 3/8"	68	6 7/8"	103	163	1261	212	339	131	321	2675	32.4
	3	5	119'-3 1/4"	1'-5 5/8"	37	1'-2 5/8"	68	8 1/8"	103	163	1261	212	339	131	321	2675	32.5
	4	5	119'-6"	10"	38	1'-4"	68	9 1/2"	103	164	1269	212	339	131	321	2683	32.5
63	1	6	119'-9 3/4"	11 7/8"	38	1'-5 7/8"	68	11 3/8"	103	164	1269	212	339	135	331	2731	32.6
	2	6	119'-4 3/4"	9 3/8"	38	1'-3 3/8"	68	8 7/8"	103	164	1269	212	339	135	331	2731	32.5
	3	6	118'-11 1/2"	1'-3 3/4"	37	1'-0 3/4"	68	6 1/4"	103	163	1261	212	339	135	331	2723	32.4
	4	6	118'-6 1/4"	1'-1 1/8"	37	10 1/8"	68	9 5/8"	102	163	1261	212	339	134	328	2720	32.3
64-65, 68 69, 77-78	1	6	119'-10 1/2"	1'-0 1/4"	38	9 1/4"	69	11 3/4"	103	164	1269	214	342	135	331	2734	32.6
	2	6	119'-5"	9 1/2"	38	1'-3 1/2"	68	9"	103	164	1269	212	339	135	331	2731	32.5
	3	6	118'-11 1/4"	1'-3 5/8"	37	1'-0 5/8"	68	6 1/8"	103	163	1261	212	339	135	331	2723	32.4
	4	6	118'-5 1/2"	1'-0 3/4"	37	9 3/4"	68	9 1/4"	102	163	1261	212	339	134	328	2720	32.3
66-67	1	5	119'-10 1/2"	1'-0 1/4"	38	9 1/4"	69	11 3/4"	103	164	1269	214	342	131	321	2686	32.6
	2	5	119'-5"	9 1/2"	38	1'-3 1/2"	68	9"	103	164	1269	212	339	131	321	2683	32.5
	3	5	118'-11 1/4"	1'-3 5/8"	37	1'-0 5/8"	68	6 1/8"	103	163	1261	212	339	131	321	2675	32.4
	4	5	118'-5 1/2"	1'-0 3/4"	37	9 3/4"	68	9 1/4"	102	163	1261	212	339	130	318	2672	32.3
70-71, 74-75	1	3	109'-9 3/4"	1'-2 7/8"	31	11 7/8"	62	11 3/8"	93	157	1214	200	320	121	296	2584	29.9
	2	3	109'-4 3/4"	1'-0 3/8"	31	9 3/8"	62	8 7/8"	93	157	1214	200	320	121	296	2584	29.8
	3	3	108'-11 1/2"	9 3/4"	31	1'-3 3/4"	61	6 1/4"	93	157	1214	198	316	121	296	2580	29.7
	4	3	108'-6 1/4"	1'-4 1/8"	30	1'-1 1/8"	61	9 5/8"	92	156	1207	198	316	120	294	2571	29.5
72-73, 76	1	4	109'-9 3/4"	1'-2 7/8"	31	11 7/8"	62	11 3/8"	93	157	1214	200	320	125	306	2632	29.9
	2	4	109'-4 3/4"	1'-0 3/8"	31	9 3/8"	62	8 7/8"	93	157	1214	200	320	125	306	2632	29.8
	3	4	108'-11 1/2"	9 3/4"	31	1'-3 3/4"	61	6 1/4"	93	157	1214	198	316	125	306	2628	29.7
	4	4	108'-6 1/4"	1'-4 1/8"	30	1'-1 1/8"	61	9 5/8"	92	156	1207	198	316	124	304	2619	29.5
79	1	5	119'-6 1/4"	10 1/8"	38	1'-4 1/8"	68	9 5/8"	103	164	1269	212	339	131	321	2683	32.5
	2	5	119'-3 1/2"	1'-5 3/4"	37	1'-2 3/4"	68	8 1/4"	103	163	1261	212	339	131	321	2675	32.5
	3	5	119'-0 3/4"	1'-4 3/8"	37	1'-1 3/8"	68	6 7/8"	103	163	1261	212	339	131	321	2675	32.4
	4	5	118'-10"	1'-3"	37	1'-0"	68	5 1/2"	103	163	1261	212	339	131	321	2675	32.4
88	1	5	119'-0 3/4"	1'-4 3/8"	37	1'-1 3/8"	68	6 7/8"	103	163	1261	212	339	131	321	2675	32.4
	2	5	119'-1 3/4"	1'-4 7/8"	37	1'-1 7/8"	68	7 3/8"	103	163	1261	212	339	131	321	2675	32.4
	3	5	119'-2 1/2"	1'-5 1/4"	37	1'-2 1/4"	68	7 3/4"	103	163	1261	212	339	131	321	2675	32.5
	4	5	119'-3 1/4"	1'-5 5/8"	37	1'-2 5/8"	68	8 1/8"	103	163	1261	212	339	131	321	2675	32.5
92	1	3	109'-2"	11"	31	1'-5"	61	7 1/2"	93	157	1214	198	316	121	296	2580	29.7
	2	3	109'-2"	11"	31	1'-5"	61	7 1/2"	93	157	1214	198	316	121	296	2580	29.7
	3	3	109'-2"	11"	31	1'-5"	61	7 1/2"	93	157	1214	198	316	121	296	2580	29.7
	4	3	109'-2"	11"	31	1'-5"	61	7 1/2"	93	157	1214	198	316	121	296	2580	29.7

	SPAN	"P"
CONDITION 2	5	1 1/2"
	6	1"
	7	1/2"
	22-28, 51-63, 69	1/4"
	64-68	3/8"
CONDITION 3	34, 77, 82-92	1/4"
	30-33	3/8"
	78-81	1/2"
	93	3/4"
	94	1 3/8"

NOTES: SPANS NOT LISTED IN TABLE ARE CONDITION 1.
FOR CONDITION DIAGRAMS SEE SHEET 8 OF 10.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 7 OF 10

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

F.I.B. 72" GIRDER TABLES

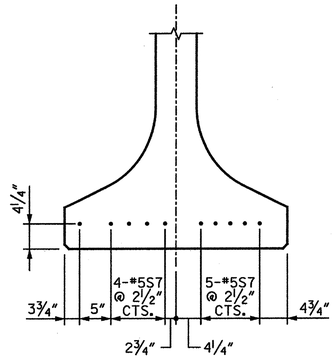
NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

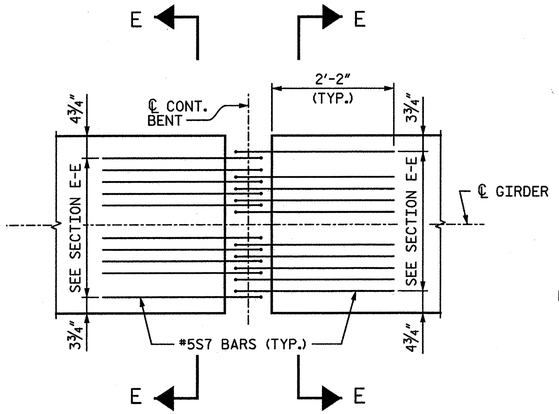
DRAWN BY : TJT DATE : 2-12
CHECKED BY : TRL DATE : 3-12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-128
1			3			TOTAL SHEETS
2			4			219

10/4/2012 12:24:49 PM R:\Structures\usta\(28) FIB 72 Girder Table (7 of 10).dgn

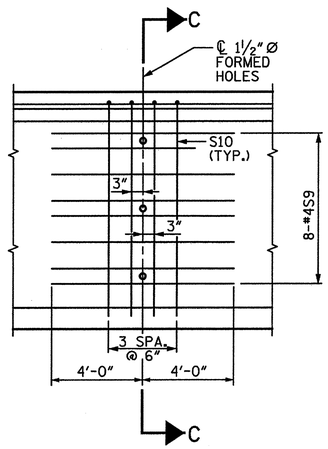


SECTION E-E



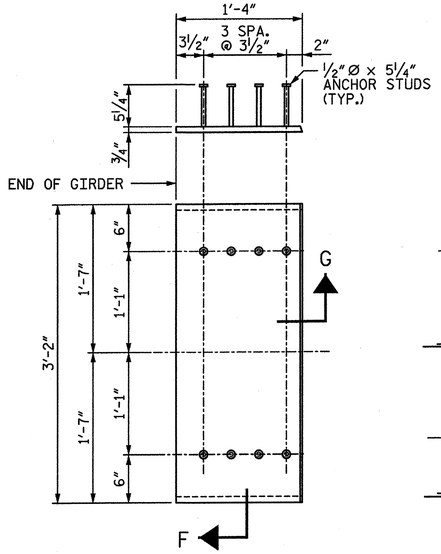
PLAN- BOTTOM FLANGE

EXTERIOR S7 BARS SHOWN, OTHERS OMITTED FOR CLARITY.



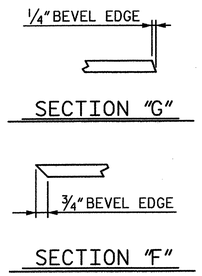
PARTIAL ELEVATION

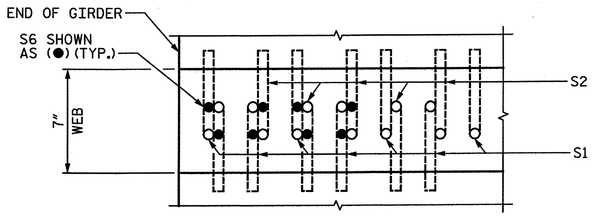
SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1-4



EMBEDDED PLATE "B-1" DETAILS

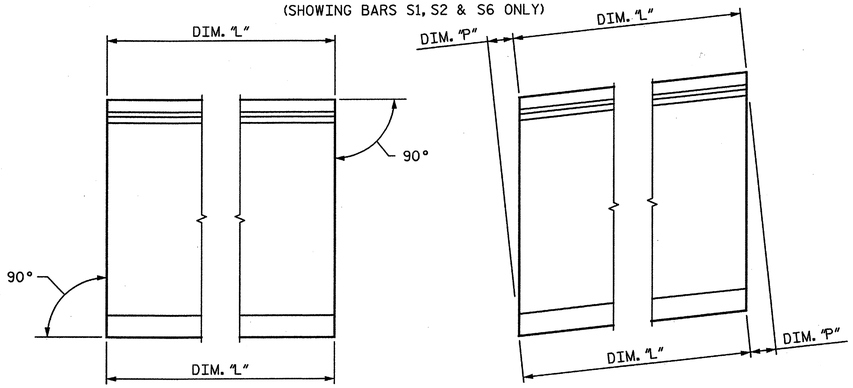
(2 REQ'D PER GIRDER)





SECTION D-D

(SHOWING BARS S1, S2 & S6 ONLY)



CONDITION 1

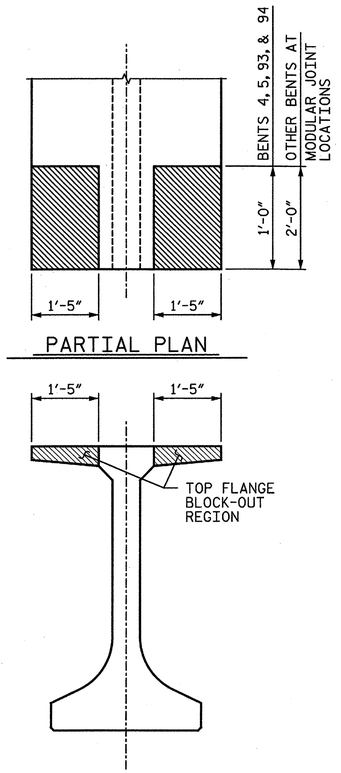
(DIM "P" = 0.0)

CONDITION 2

CONDITION 3

SCHEMATIC END ELEVATIONS OF BEAMS

(SHOWING VERTICAL BEVEL OF BEAM END)
FOR DIM "P", SEE TABLE ON SHEET 7 OF 10.



PARTIAL PLAN

END ELEVATION

TOP FLANGE BLOCK-OUT DETAIL

NOTE: TOP FLANGES IN CONTINUITY DIAPHRAGMS SHALL NOT BE BLOCKED OUT.

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL SHALL BE GRADE 60.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.

ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6,400 PSI.

DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4', SHALL BE RAKED TO A DEPTH OF ¼".

WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN ½" OF THE THEORETICAL LOCATION SHOWN.

AFTER DECK HAS BEEN CAST AND REACHED A COMPRESSIVE STRENGTH OF 4,000 PSI, TEMPORARY DIAPHRAGMS SHALL BE REMOVED. THE HOLES FOR THE TEMPORARY DIAPHRAGMS SHALL BE FILLED WITH A NON-METALLIC NON-SHRINK GROUT APPROVED BY NCDOT.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 8 OF 10

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

F.I.B. 72"
GIRDER DETAILS

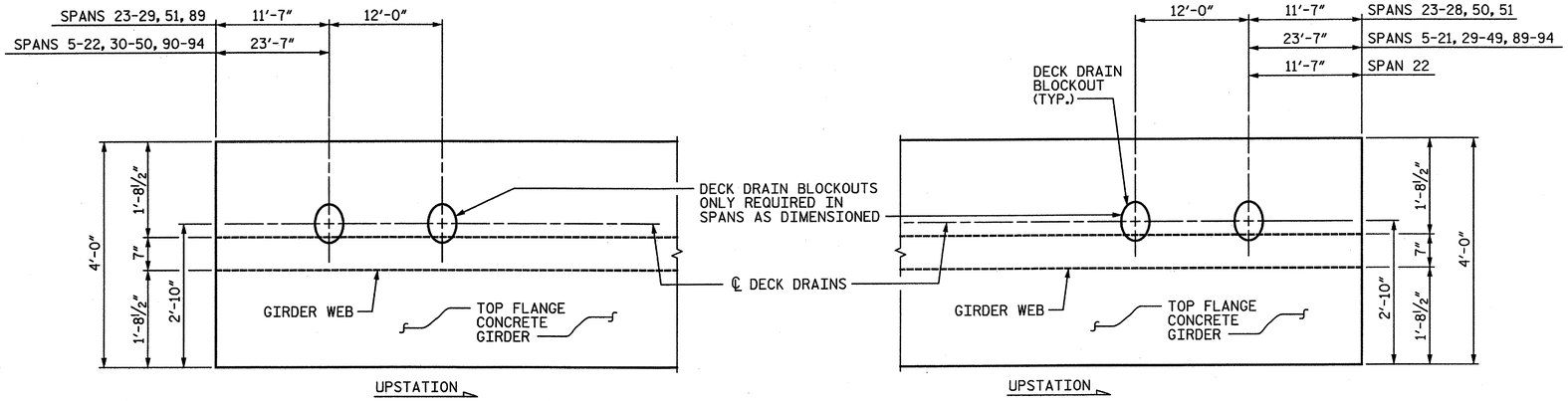
NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-129
1			3			TOTAL SHEETS
2			4			219

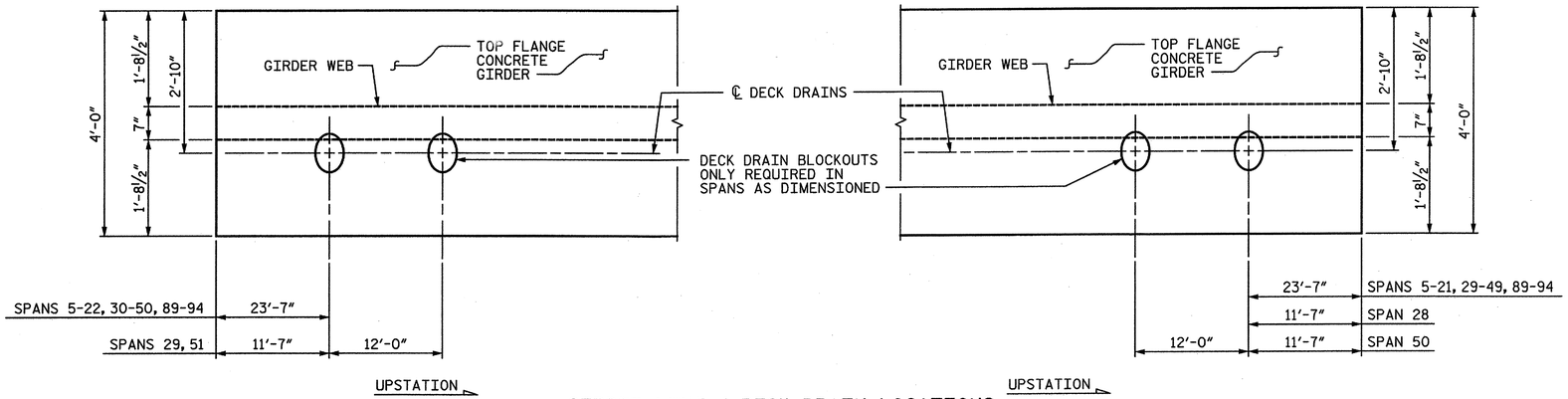
STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

DRAWN BY : TJT DATE : 2-12
CHECKED BY : AJP DATE : 3-12

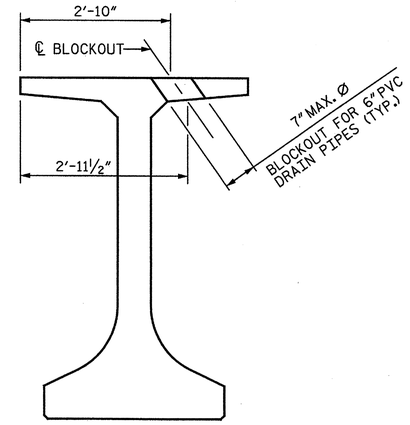
10/4/2012 12:24:46 PM R:\Structures\usta\(29) FIB 72 Girder Details (8 of 10).dgn



GIRDER LINE 1 DECK DRAIN LOCATIONS



GIRDER LINE 4 DECK DRAIN LOCATIONS



GIRDER BLOCKOUT DETAIL

NOTES:

1. DECK DRAIN BLOCKOUTS MAY BE SHIFTED 6"± TO BE CENTERED BETWEEN NEAREST S8 BARS IN GIRDER TOP FLANGE.
2. THE SPACE BETWEEN THE DRAIN PIPE AND THE DECK DRAIN BLOCKOUT SHALL BE FILLED/SEALED WITH AN EPOXY SYSTEM CAPABLE OF CREATING A WATER TIGHT SEAL BETWEEN THE GIRDER CONCRETE AND THE DRAIN PIPE. EPOXY SYSTEM SHALL BE AN APPROVED PRODUCT FOR NCDOT PROJECTS.
3. SEE "DECK DRAIN DETAILS" SHEETS FOR ADDITIONAL DETAILS.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 9 OF 10

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

F.I.B. 72" GIRDER DRAINAGE DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-130
1			3			TOTAL SHEETS
2			4			219

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1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

DRAWN BY : LGH DATE : 2-12
CHECKED BY : TJT DATE : 3-12

10/4/2012 12:24:44 PM R:\Structures\usta\(130) FIB 72 Drain Sht 119 of 101.dgn

SPANS 5-6 & 92-94

		0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
GIRDERS 1 & 4	CAMBER (GIRDER ALONE IN PLACE) (FT.)	0.000	0.047	0.092	0.126	0.161	0.186	0.209	0.225	0.238	0.245	0.247	0.245	0.238	0.225	0.209	0.186	0.161	0.126	0.092	0.047	0.000
	DEFLECTION DUE TO SUPERIMPOSED D.L. (FT.)	0.000	-0.013	-0.027	-0.040	-0.052	-0.063	-0.072	-0.080	-0.085	-0.088	-0.090	-0.088	-0.085	-0.080	-0.072	-0.063	-0.052	-0.040	-0.027	-0.013	0.000
	FINAL CAMBER (IN.)	0″	3/8″	3/4″	1 1/16″	1 5/16″	1 1/2″	1 5/8″	1 3/4″	1 13/16″	1 7/8″	1 7/8″	1 7/8″	1 13/16″	1 3/4″	1 5/8″	1 1/2″	1 5/16″	1 1/16″	3/4″	3/8″	0″

GIRDERS 2 & 3	CAMBER (GIRDER ALONE IN PLACE) (FT.)	0.000	0.047	0.092	0.126	0.161	0.186	0.209	0.225	0.238	0.245	0.247	0.245	0.238	0.225	0.209	0.186	0.161	0.126	0.092	0.047	0.000
	DEFLECTION DUE TO SUPERIMPOSED D.L. (FT.)	0.000	-0.019	-0.037	-0.056	-0.074	-0.088	-0.102	-0.112	-0.120	-0.125	-0.126	-0.125	-0.120	-0.112	-0.102	-0.088	-0.074	-0.056	-0.037	-0.019	0.000
	FINAL CAMBER (IN.)	0″	5/16″	5/8″	13/16″	1 1/16″	1 3/16″	1 5/16″	1 3/8″	1 7/16″	1 7/16″	1 7/16″	1 7/16″	1 7/16″	1 3/8″	1 5/16″	1 3/16″	1 1/16″	13/16″	5/8″	5/16″	0″

SPANS 7-51 & 89-91

		0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
GIRDERS 1 & 4	CAMBER (GIRDER ALONE IN PLACE) (FT.)	0.000	0.060	0.118	0.161	0.206	0.237	0.267	0.287	0.303	0.312	0.315	0.312	0.303	0.287	0.267	0.237	0.206	0.161	0.118	0.060	0.000
	DEFLECTION DUE TO SUPERIMPOSED D.L. (FT.)	0.000	-0.020	-0.039	-0.057	-0.075	-0.090	-0.104	-0.114	-0.122	-0.126	-0.128	-0.126	-0.122	-0.114	-0.104	-0.090	-0.075	-0.057	-0.039	-0.020	0.000
	FINAL CAMBER (IN.)	0″	1/2″	15/16″	1 1/4″	1 9/16″	1 3/4″	1 15/16″	2 1/16″	2 3/16″	2 1/4″	2 1/4″	2 1/4″	2 3/16″	2 1/16″	1 15/16″	1 3/4″	1 9/16″	1 1/4″	15/16″	1/2″	0″

GIRDERS 2 & 3	CAMBER (GIRDER ALONE IN PLACE) (FT.)	0.000	0.060	0.118	0.161	0.206	0.237	0.267	0.287	0.303	0.312	0.315	0.312	0.303	0.287	0.267	0.237	0.206	0.161	0.118	0.060	0.000
	DEFLECTION DUE TO SUPERIMPOSED D.L. (FT.)	0.000	-0.027	-0.054	-0.081	-0.105	-0.127	-0.145	-0.160	-0.171	-0.178	-0.180	-0.178	-0.171	-0.160	-0.145	-0.127	-0.105	-0.081	-0.054	-0.027	0.000
	FINAL CAMBER (IN.)	0″	3/8″	3/4″	15/16″	1 3/16″	1 5/16″	1 7/16″	1 1/2″	1 9/16″	1 5/8″	1 5/8″	1 5/8″	1 9/16″	1 1/2″	1 7/16″	1 5/16″	1 3/16″	1 1/16″	15/16″	3/4″	3/8″	0″

SPANS 70-76

		0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
GIRDERS 1 & 4	CAMBER (GIRDER ALONE IN PLACE) (FT.)	0.000	0.047	0.092	0.127	0.161	0.187	0.210	0.226	0.239	0.246	0.249	0.246	0.239	0.226	0.210	0.187	0.161	0.127	0.092	0.047	0.000
	DEFLECTION DUE TO SUPERIMPOSED D.L. (FT.)	0.000	-0.017	-0.034	-0.051	-0.067	-0.081	-0.093	-0.102	-0.109	-0.114	-0.115	-0.114	-0.109	-0.102	-0.093	-0.081	-0.067	-0.051	-0.034	-0.017	0.000
	FINAL CAMBER (IN.)	0″	3/8″	11/16″	7/8″	1 1/8″	1 1/4″	1 3/8″	1 1/2″	1 9/16″	1 9/16″	1 5/8″	1 9/16″	1 9/16″	1 1/2″	1 3/8″	1 1/4″	1 1/8″	7/8″	11/16″	3/8″	0″

GIRDERS 2 & 3	CAMBER (GIRDER ALONE IN PLACE) (FT.)	0.000	0.047	0.092	0.127	0.161	0.187	0.210	0.226	0.239	0.246	0.249	0.246	0.239	0.226	0.210	0.187	0.161	0.127	0.092	0.047	0.000
	DEFLECTION DUE TO SUPERIMPOSED D.L. (FT.)	0.000	-0.018	-0.035	-0.052	-0.068	-0.082	-0.095	-0.104	-0.111	-0.116	-0.117	-0.116	-0.111	-0.104	-0.095	-0.082	-0.068	-0.052	-0.035	-0.018	0.000
	FINAL CAMBER (IN.)	0″	3/8″	11/16″	7/8″	1 1/8″	1 1/4″	1 3/8″	1 7/16″	1 9/16″	1 9/16″	1 9/16″	1 9/16″	1 9/16″	1 7/16″	1 3/8″	1 1/4″	1 1/8″	7/8″	11/16″	3/8″	0″

SPANS 52-69 & 77-88

		0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
GIRDERS 1 & 4	CAMBER (GIRDER ALONE IN PLACE) (FT.)	0.000	0.060	0.119	0.162	0.207	0.238	0.268	0.288	0.304	0.314	0.316	0.314	0.304	0.288	0.268	0.238	0.207	0.162	0.119	0.060	0.000
	DEFLECTION DUE TO SUPERIMPOSED D.L. (FT.)	0.000	-0.025	-0.049	-0.073	-0.096	-0.115	-0.132	-0.146	-0.155	-0.162	-0.163	-0.162	-0.155	-0.146	-0.132	-0.115	-0.096	-0.073	-0.049	-0.025	0.000
	FINAL CAMBER (IN.)	0″	7/16″	13/16″	1 1/16″	1 5/16″	1 1/2″	1 5/8″	1 11/16″	1 13/16″	1 13/16″	1 13/16″	1 13/16″	1 13/16″	1 11/16″	1 5/8″	1 1/2″	1 5/16″	1 1/16″	13/16″	7/16″	0″

GIRDERS 2 & 3	CAMBER (GIRDER ALONE IN PLACE) (FT.)	0.000	0.060	0.119	0.162	0.207	0.238	0.268	0.288	0.304	0.314	0.316	0.314	0.304	0.288	0.268	0.238	0.207	0.162	0.119	0.060	0.000
	DEFLECTION DUE TO SUPERIMPOSED D.L. (FT.)	0.000	-0.025	-0.050	-0.075	-0.097	-0.117	-0.134	-0.148	-0.158	-0.164	-0.166	-0.164	-0.158	-0.148	-0.134	-0.117	-0.097	-0.075	-0.050	-0.025	0.000
	FINAL CAMBER (IN.)	0″	7/16″	13/16″	1 1/16″	1 5/16″	1 7/16″	1 5/8″	1 11/16″	1 3/4″	1 13/16″	1 13/16″	1 13/16″	1 3/4″	1 11/16″	1 5/8″	1 7/16″	1 5/16″	1 1/16″	13/16″	7/16″	0″

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 10 OF 10

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

F.I.B. 72″ GIRDER CAMBER

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St. Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-131
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : TJT DATE : 3-12
CHECKED BY : TRL DATE : 3-12

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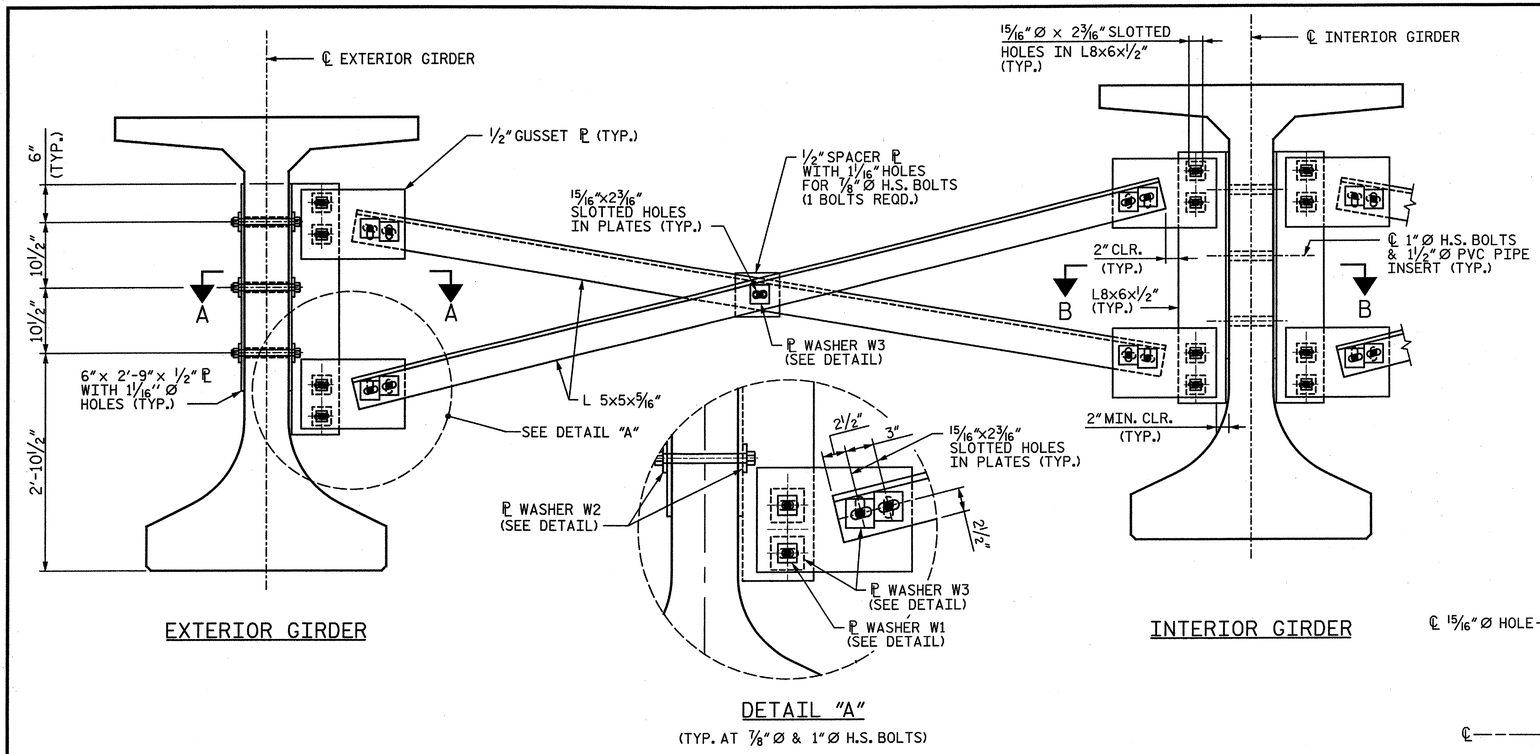


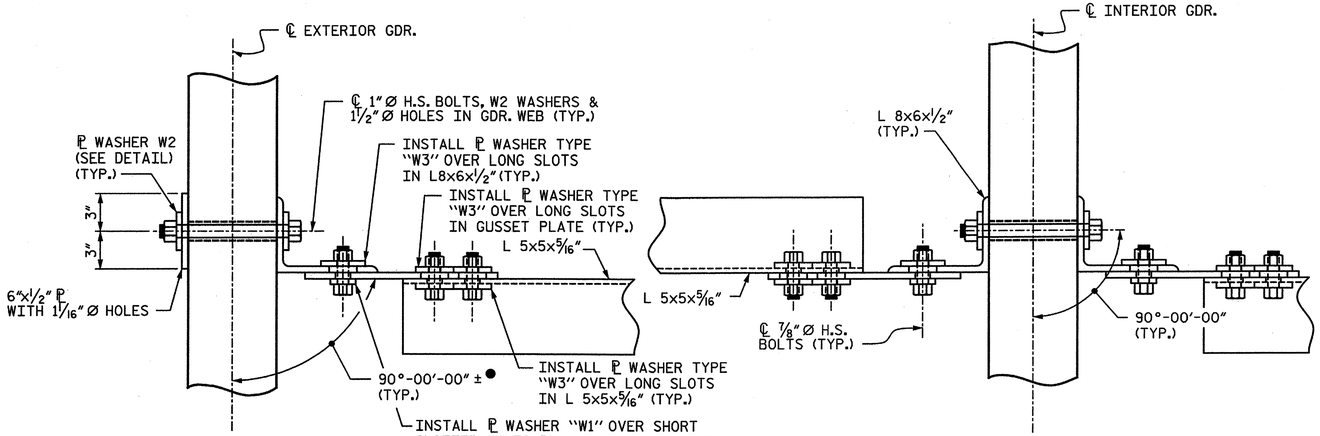
EXTERIOR GIRDER

INTERIOR GIRDER

DETAIL "A"

(TYP. AT 7⁄8" Ø & 1" Ø H.S. BOLTS)

PART SECTION AT TEMPORARY INTERMEDIATE DIAPHRAGM

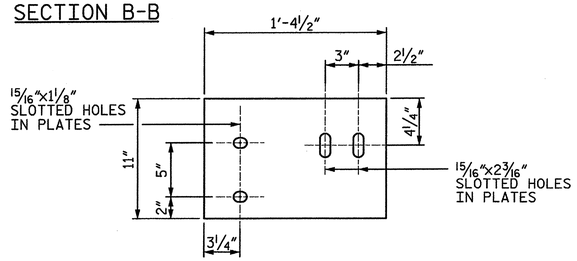


SECTION A-A

SECTION B-B

CONNECTOR PLATE LAYOUT

● ANGLE VARIES SLIGHTLY IN SPANS 23 AND 28. CONTRACTOR MAY BEND GUSSET PLATE SLIGHTLY TO ALLOW FOR PROPER BOLT HOLE ALIGNMENT.



GUSSET PLATE DETAILS

STRUCTURAL STEEL NOTES

ALL INTERMEDIATE DIAPHRAGM STEEL, CONNECTOR PLATES AND PLATE WASHERS SHALL BE AASHTO M270 GRADE 50 OR APPROVED EQUAL.

TENSION ON THE AASHTO M164 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL 1⁄4 TURN.

USE A MINIMUM 7⁄16" THICK PLATE WASHER WITH STANDARD HOLES UNDER EACH BOLT HEAD AND NUT. THE PLATE WASHERS SHALL HAVE SUFFICIENT SIZE TO COVER THE HOLES AFTER INSTALLATION.

FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1⁄4" PROJECTION BEYOND THE NUT.

TEMPORARY INTERMEDIATE DIAPHRAGM ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

CONTRACTOR SHALL SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE TEMPORARY INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

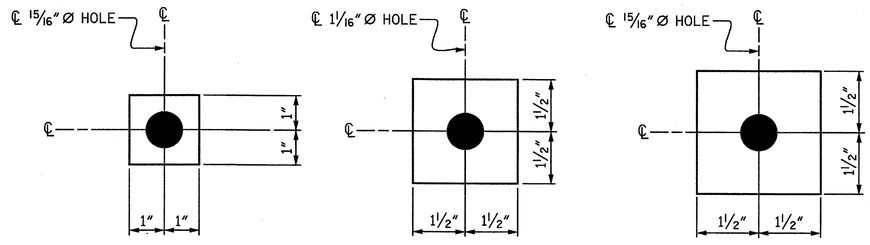
IN THE EXTERIOR BAYS, TEMPORARY STRUTS MAY BE PLACED BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS IF NECESSARY TO ACCOMMODATE CONSTRUCTION LOADING.

CONTRACTOR MAY PROPOSE ALTERNATE DIAPHRAGM CONFIGURATION/SYSTEM FOR APPROVAL BY THE ENGINEER. PROPOSED SYSTEM SHALL USE FORMED HOLES IN THE PRESTRESSED CONCRETE GIRDERS AS DETAILED IN THESE PLANS.

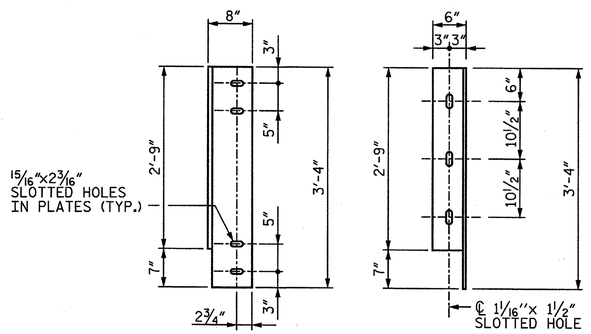
ALL TEMPORARY DIAPHRAGMS AND STRUTS SHALL REMAIN IN PLACE UNTIL THE DECK CONCRETE FOR ITS ENTIRE CONTINUOUS UNIT HAS REACHED ITS 28-DAY COMPRESSIVE STRENGTH.

ONCE THE DECK CONCRETE FOR AN ENTIRE CONTINUOUS UNIL HAS CURED, THE CONTRACTOR SHALL REMOVE ALL TEMPORARY DIAPHRAGMS, STRUTS, AND ALL CORRESPONDING HARDWARE. ALL HOLES IN GIRDER WEB SHALL BE FILLED WITH A NON-METALLIC, NON-SHRINK GROUT.

THE CONTRACTOR HAS THE OPTION TO PROPOSE AN ALTERNATE TEMPORARY INTERMEDIATE DIAPHRAGM FOR APPROVAL OF THE ENGINEER. ALTERNATE TEMPORARY DIAPHRAGM PLANS SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED AND REGISTERED IN NC.



WASHER DETAILS



DIAPHRAGM FACE

WEB FACE

CONNECTOR PLATE DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TEMPORARY INTERMEDIATE STEEL DIAPHRAGM DETAILS

DRAWN BY :	TJT	DATE :	2-12
CHECKED BY :	TRL	DATE :	3-12

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1000 West Morehead St. Ste. 200
Charlotte, NC 28208
NC License No. F-0891

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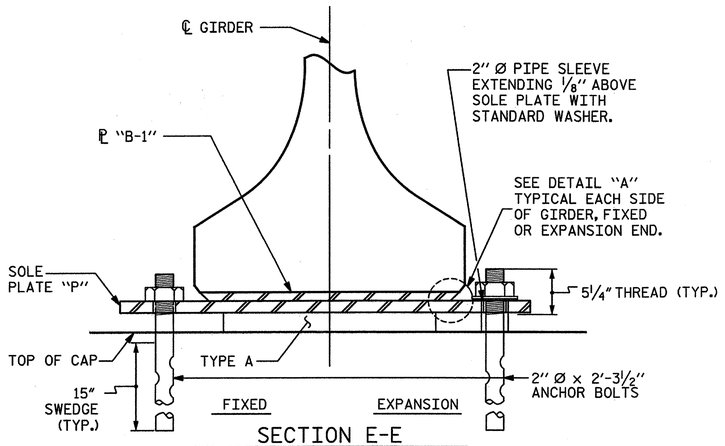
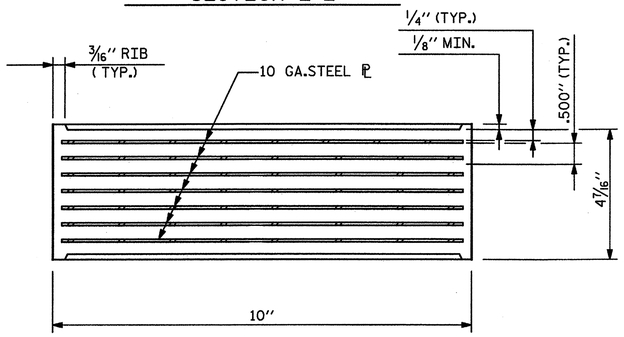
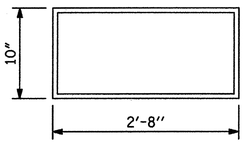


SECTION E-E



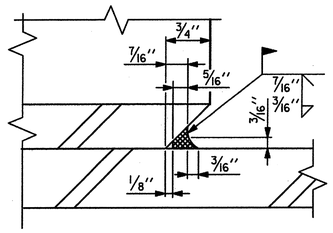
TYPICAL SECTION OF ELASTOMERIC BEARINGS



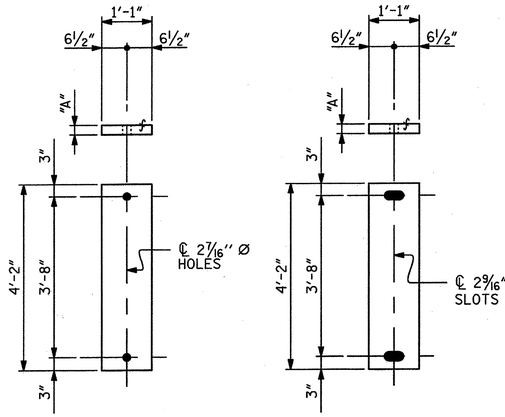
PLAN VIEW OF ELASTOMERIC BEARING

TYPE A

(720 REQ'D)



DETAIL "A"



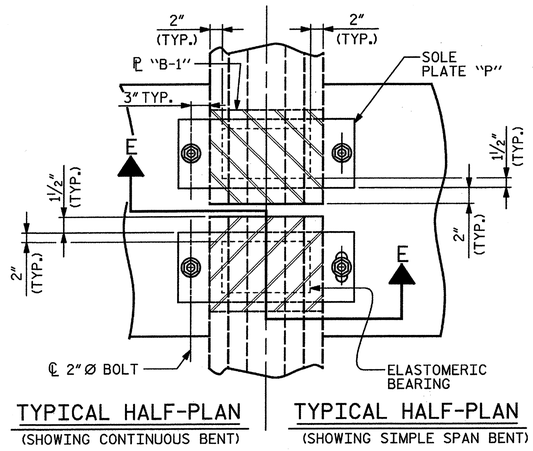
P3
(FIX. = FIXED)

P2
(EXP. = EXPANSION)

P4,P6,P10,P12,P13,P14
(FIX. = FIXED)

P1,P5,P7,P8,
P9,P11,P15,P16
(EXP. = EXPANSION)

SOLE PLATE DETAILS ("P")



TYPICAL HALF-PLAN
(SHOWING CONTINUOUS BENT)

TYPICAL HALF-PLAN
(SHOWING SIMPLE SPAN BENT)

SOLE PLATE				
SOLE ℄	"A"	"B"	# REQ'D	TYPE
P1	1 1/4"	1 3/8"	209	EXP.
P2	1 1/4"	-	175	EXP.
P3	1 1/4"	-	123	FIX.
P4	1 1/4"	1 3/8"	108	FIX.
P5	1 5/16"	1 7/16"	31	EXP.
P6	1 5/16"	1 7/16"	25	FIX.
P7	1 3/8"	1 1/2"	9	EXP.
P8	1 1/2"	1 5/8"	7	EXP.
P9	1 7/16"	1 9/16"	9	EXP.
P10	1 3/8"	1 1/2"	4	FIX.
P11	1 1/4"	1 1/2"	4	EXP.
P12	1 11/16"	1 15/16"	4	FIX.
P13	1 1/4"	1 5/8"	4	FIX.
P14	1 9/16"	1 13/16"	4	FIX.
P15	1 5/8"	1 3/4"	2	EXP.
P16	2 1/16"	2 3/16"	2	EXP.

NOTES

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

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

PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, 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.

SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

STEEL PLATES IN BEARING PADS SHALL CONFORM TO ASTM A1011 GRADE 36, TYPE I

ELASTOMER IN BEARING PAD SHALL HAVE A SHEAR MODULUS (G) OF 160 psi.

— LOAD RATINGS —	
	MAX.D.L.+ L.L.
TYPE A	355 K

PROJECT NO. B-2500A

DARE COUNTY

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ELASTOMERIC BEARING DETAILS
PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

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1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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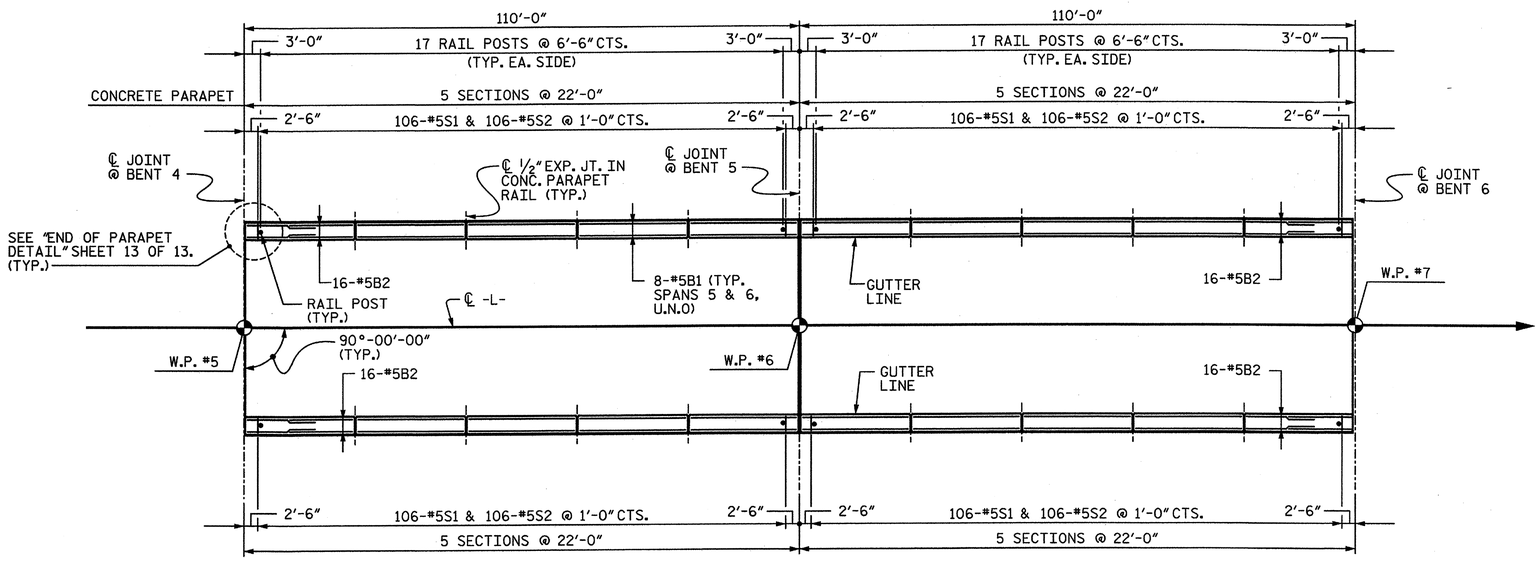
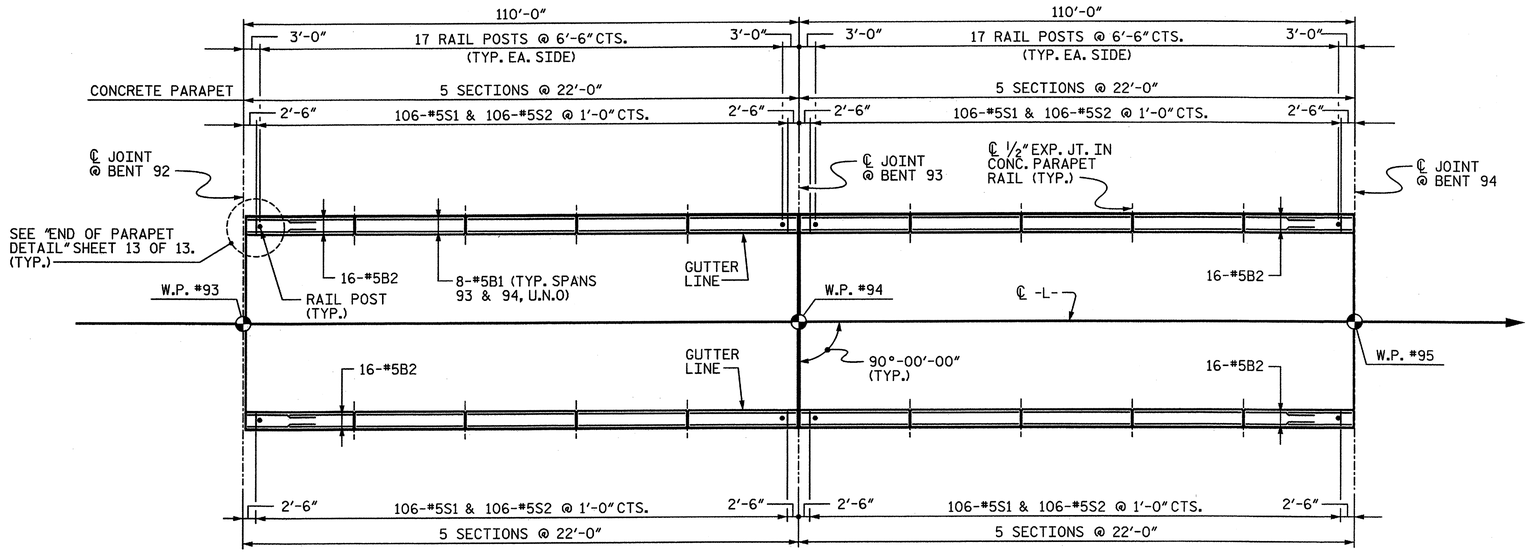
NOTES:

1. FOR CONCRETE PARAPET ON CORED SLAB SPANS, SEE CORED SLAB SHEETS.
2. CONCRETE PARAPET SECTIONS ARE MEASURED ALONG OUTSIDE EDGE OF DECK.
3. RAIL POSTS ARE MEASURED ALONG OUTSIDE EDGE OF CONCRETE PARAPET.
4. U.N.O. = UNLESS NOTED OTHERWISE.
5. FOR ADDITIONAL NOTES, SEE SHEET 13 OF 13.



SPAN 5 SPAN 6

PLAN UNITS 5A & 5B



SPAN 93 SPAN 94

PLAN UNITS 24A & 24B

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF RAIL & CONCRETE PARAPET UNITS 5A, 5B, 24A, & 24B

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

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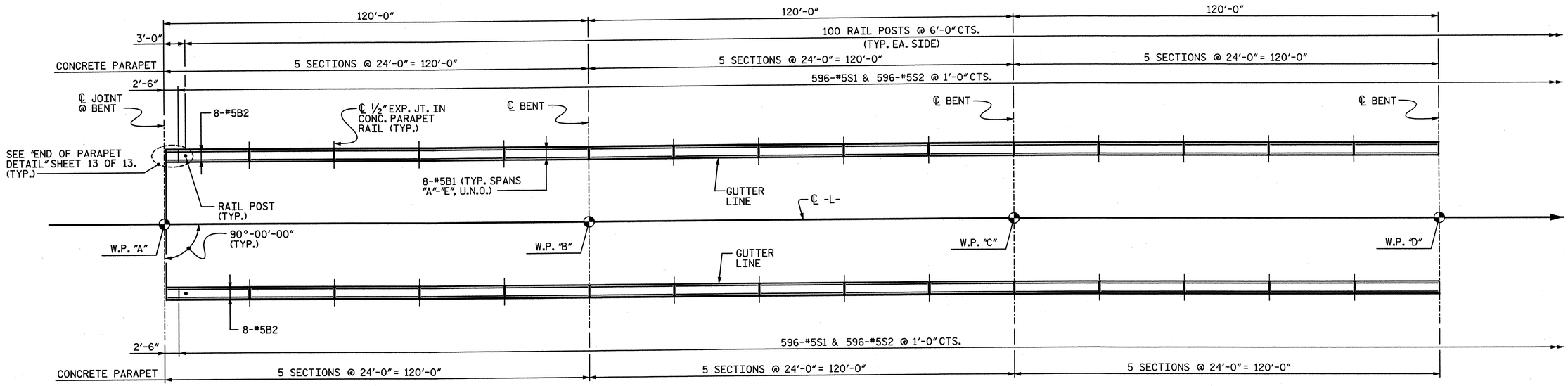
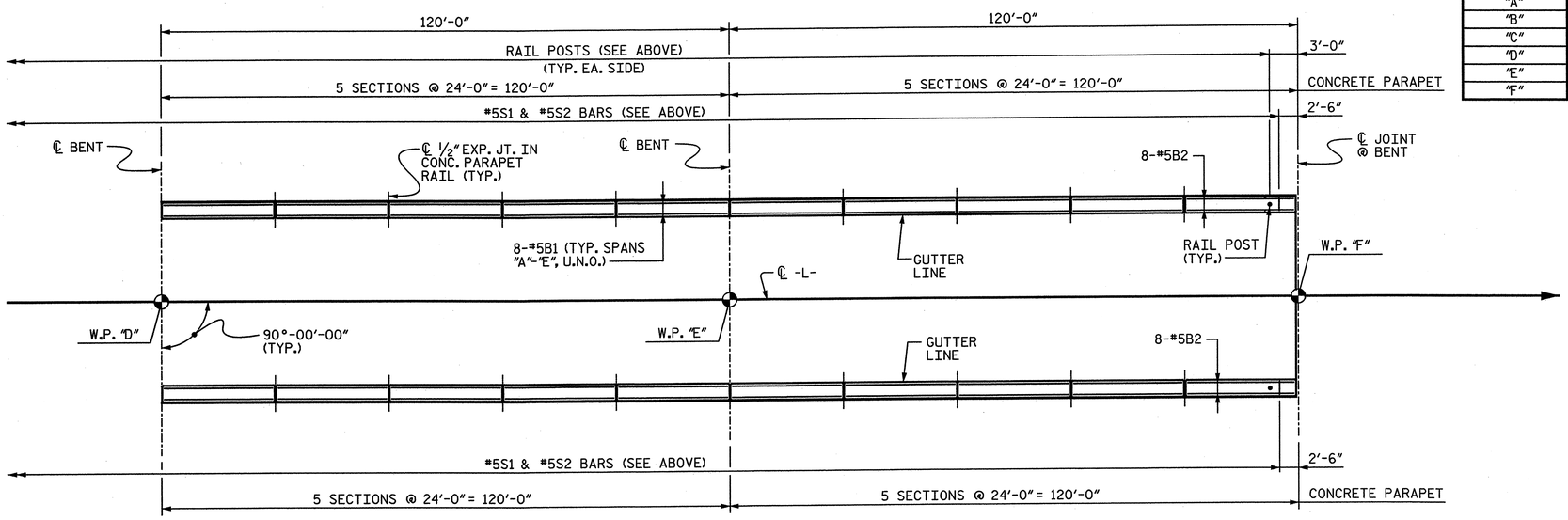
NOTES:
1. SEE SHEET 1 OF 13 FOR NOTES.



SPAN "A" SPAN "B" SPAN "C"

PLAN



SPAN "D" SPAN "E"

PLAN

TABLE FOR WORK POINTS

	UNIT 6	UNIT 7	UNIT 8	UNIT 11	UNIT 12	UNIT 13	UNIT 14
"A"	7	12	17	32	37	42	47
"B"	8	13	18	33	38	43	48
"C"	9	14	19	34	39	44	49
"D"	10	15	20	35	40	45	50
"E"	11	16	21	36	41	46	51
"F"	12	17	22	37	42	47	52

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 2 OF 13

STATE OF NORTH CAROLINA
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PLAN OF RAIL & CONCRETE PARAPET UNITS 6-8 & 11-14

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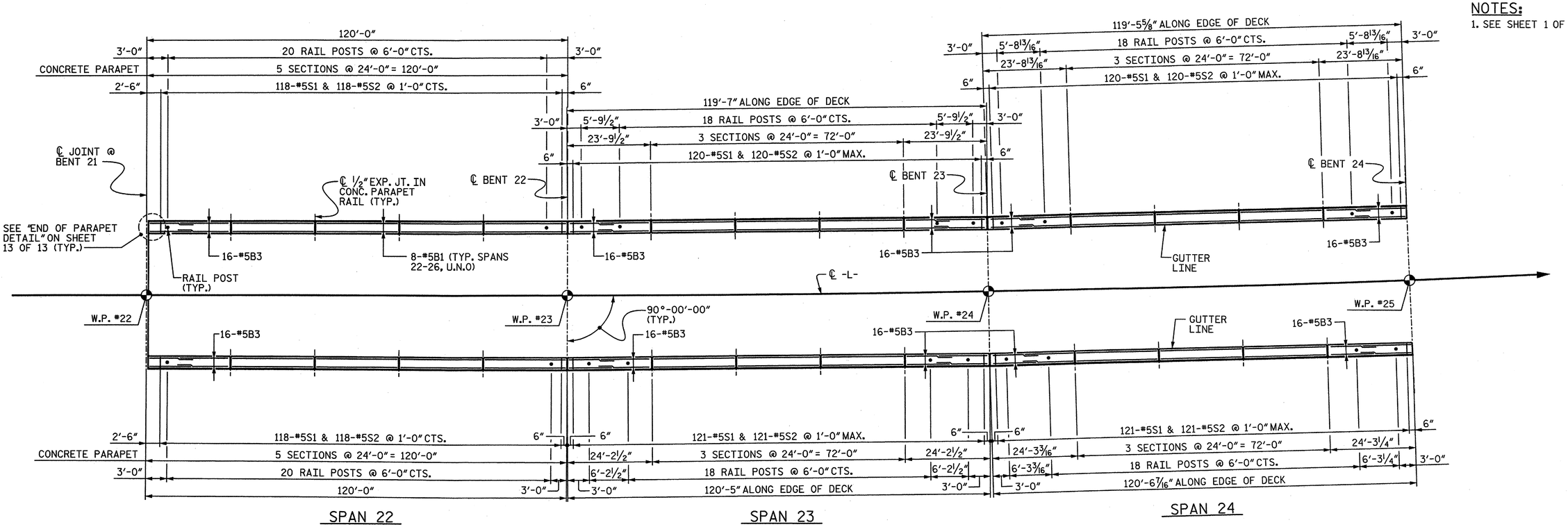
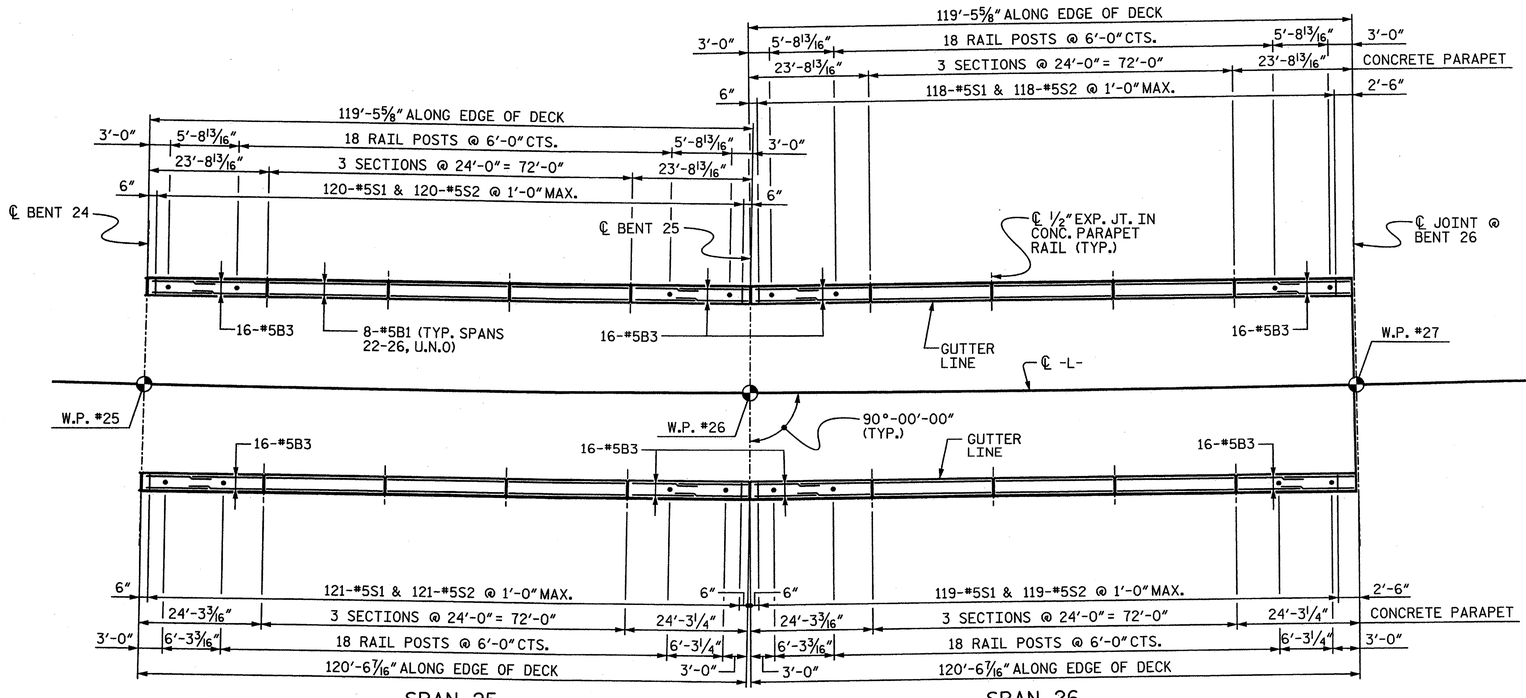
NOTES:

1. SEE SHEET 1 OF 13 FOR NOTES.



PLAN



PLAN

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 3 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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PLAN OF RAIL & CONCRETE PARAPET UNIT 9

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

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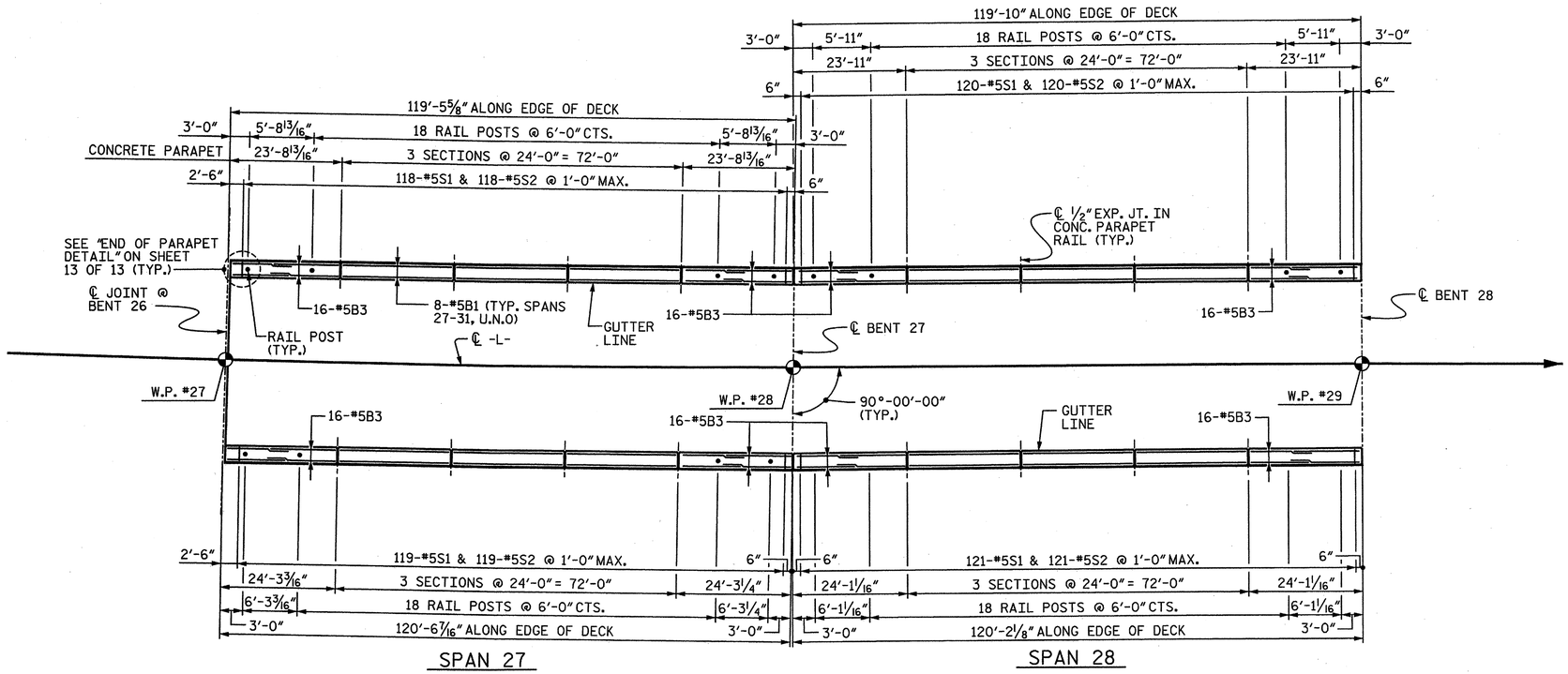
NOTES:

1. SEE SHEET 1 OF 13 FOR NOTES.



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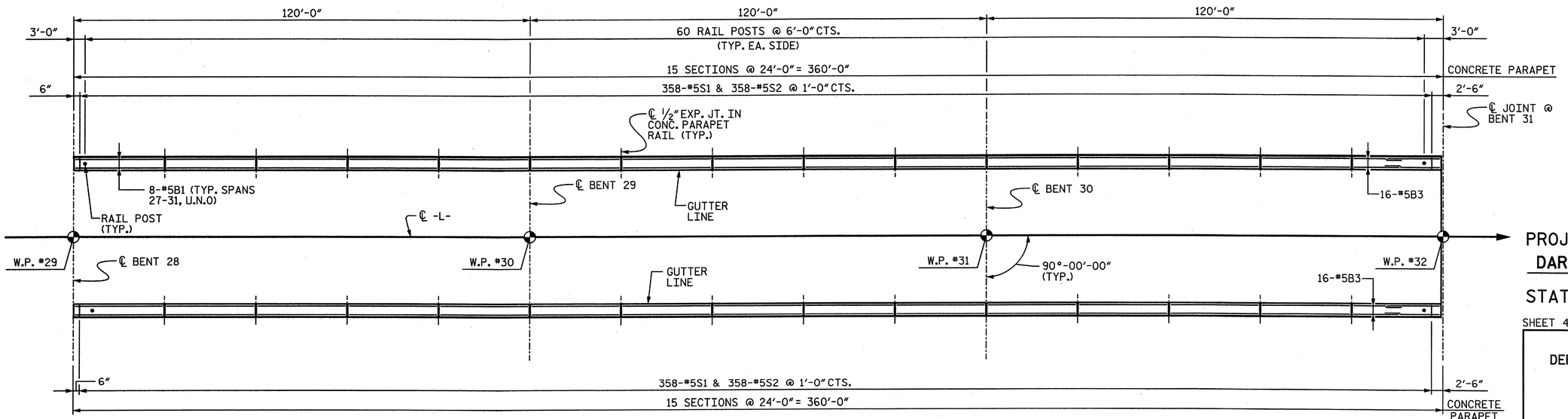

PLAN

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

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SHEET 4 OF 13

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PLAN OF RAIL & CONCRETE PARAPET UNIT 10

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1			3			TOTAL SHEETS
2			4			219

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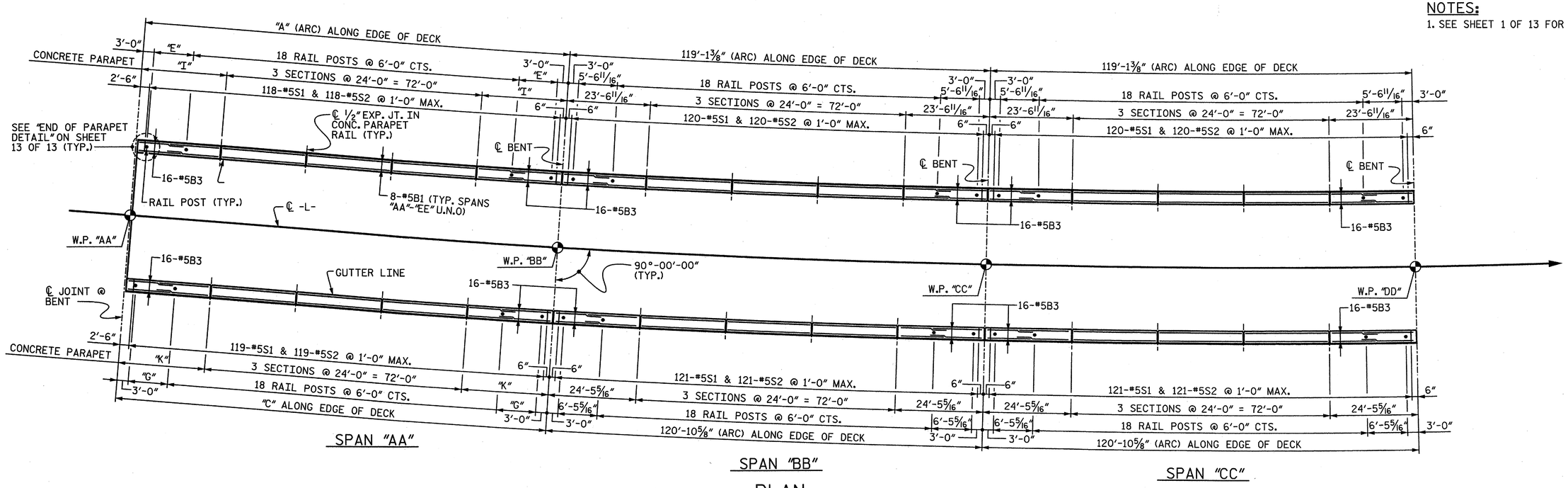
NOTES:
1. SEE SHEET 1 OF 13 FOR NOTES.



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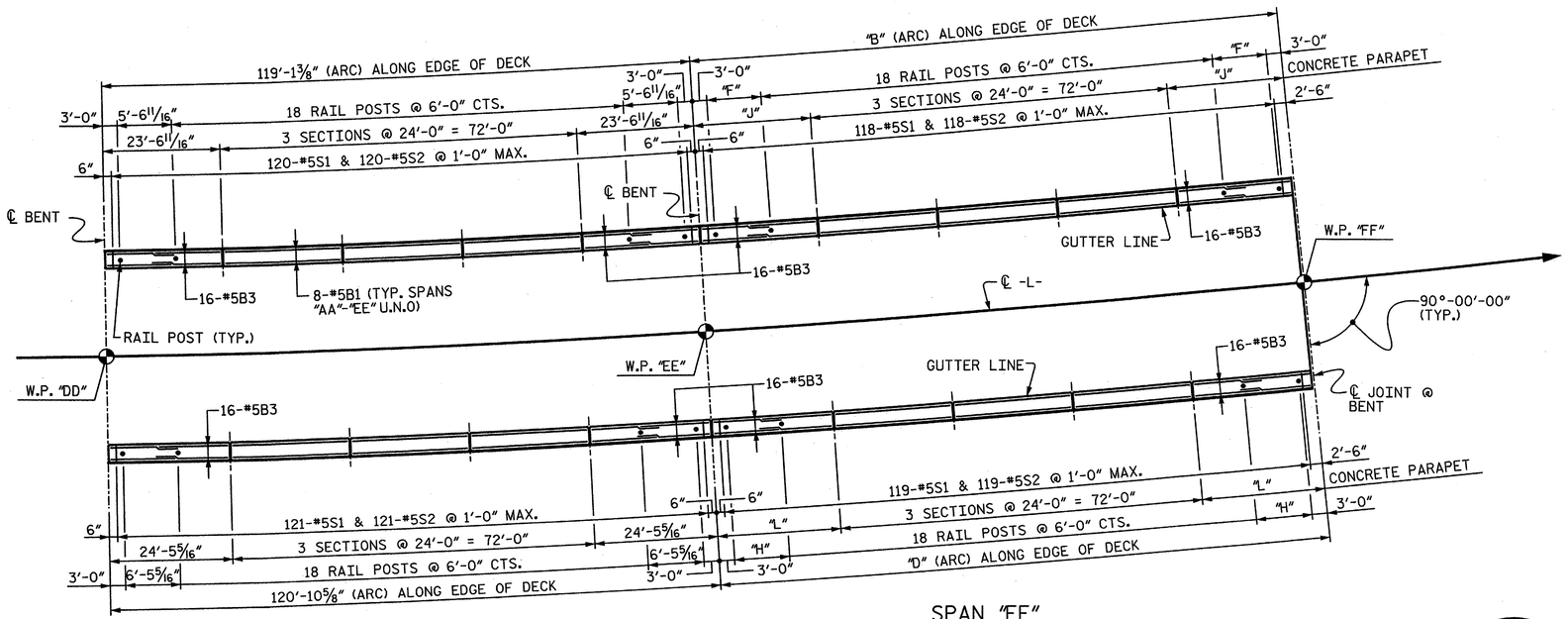

PLAN

TABLE	UNIT 15	UNIT 16	UNIT 21
"A"	119'-8 3/16"	119'-1⅜"	119'-1⅜"
"B"	119'-1⅜"	119'-7 1/8"	119'-1⅜"
"C"	120'-3 13/16"	120'-10⅝"	120'-10⅝"
"D"	120'-10⅝"	120'-4 7/8"	120'-10⅝"
"E"	5'-10 1/8"	5'-6 11/16"	5'-6 11/16"
"F"	5'-6 11/16"	5'-9 9/16"	5'-6 11/16"
"G"	6'-1 7/8"	6'-5 5/16"	6'-5 5/16"
"H"	6'-5 5/16"	6'-2 7/16"	6'-5 5/16"
"I"	23'-10 1/8"	23'-6 11/16"	23'-6 11/16"
"J"	23'-6 11/16"	23'-9 9/16"	23'-6 11/16"
"K"	24'-1 7/8"	24'-5 5/16"	24'-5 5/16"
"L"	24'-5 5/16"	24'-2 7/16"	24'-5 5/16"
"AA"	52	57	80
"BB"	53	58	81
"CC"	54	59	82
"DD"	55	60	83
"EE"	56	61	84
"FF"	57	62	85

PROJECT NO. B-2500A
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SHEET 5 OF 13

STATE OF NORTH CAROLINA
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PLAN OF RAIL & CONCRETE PARAPET UNITS 15, 16, & 21

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY
10-4-12

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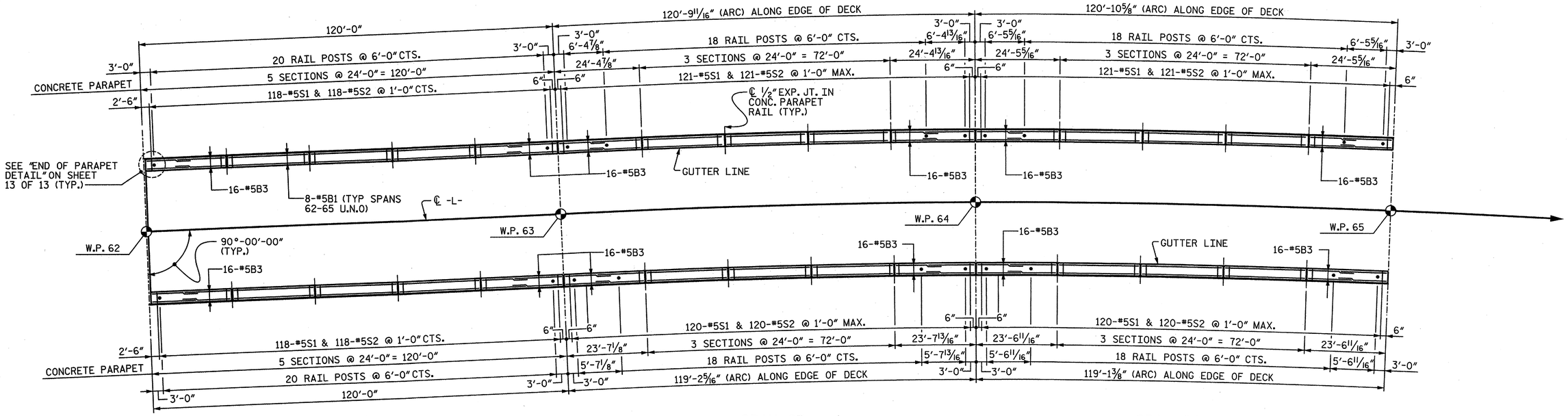
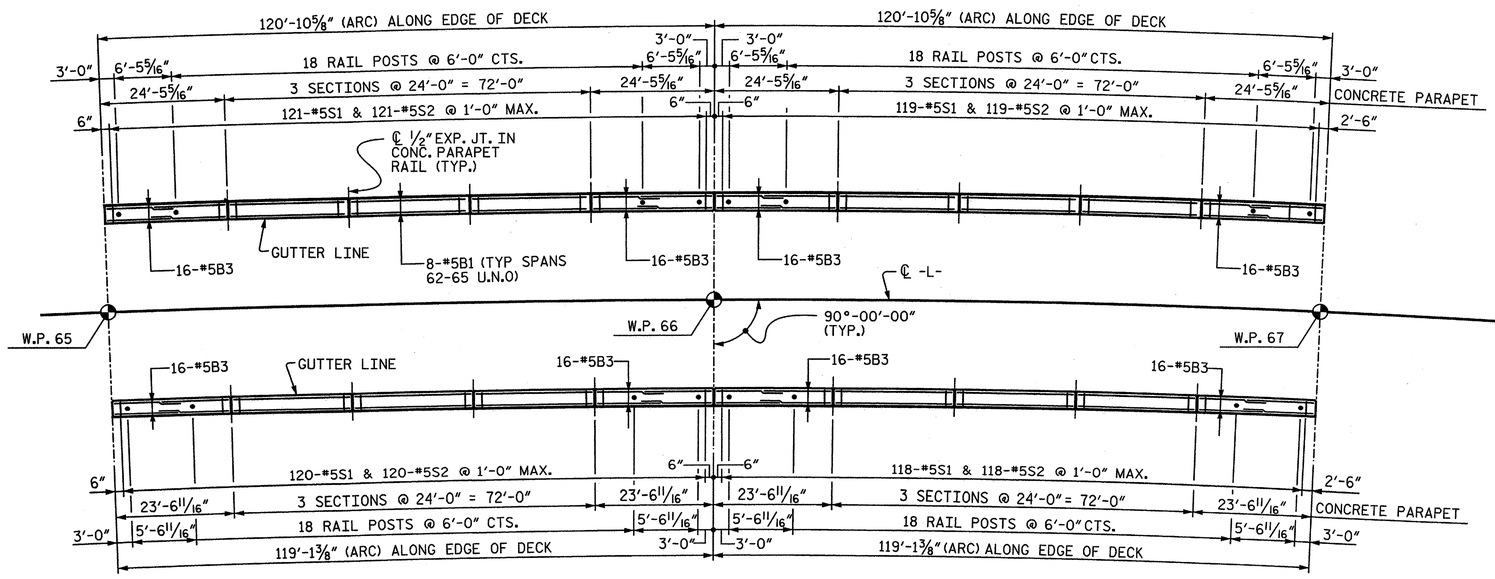
NOTES:
1. SEE SHEET 1 OF 13 FOR NOTES.



PLAN



PLAN

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 6 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF RAIL & CONCRETE PARAPET UNIT 17

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

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SHEET NO. S-139
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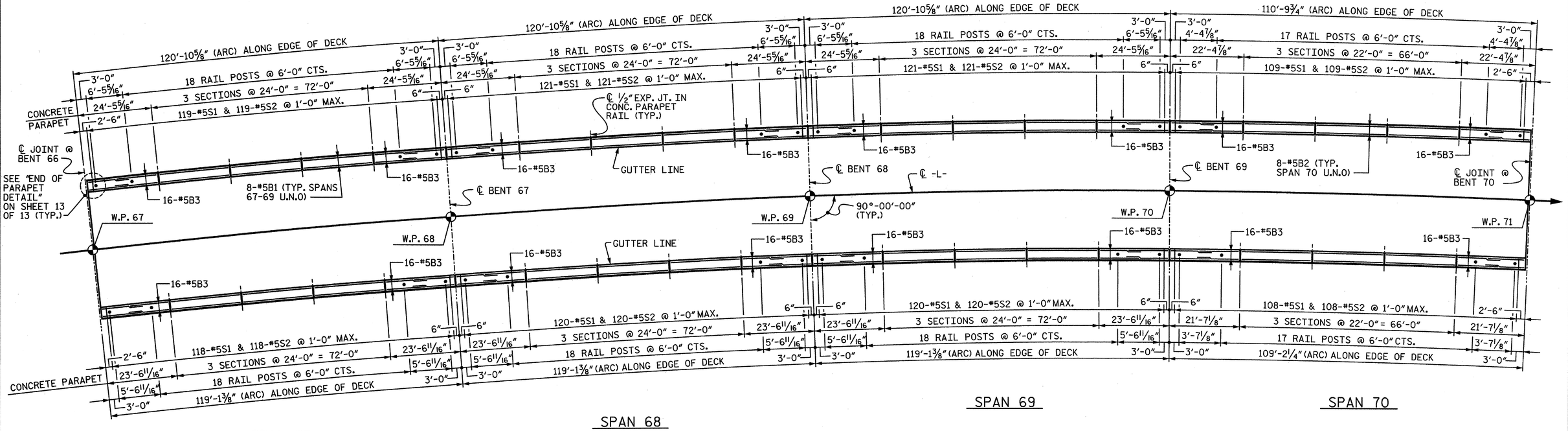
NOTES:
1. SEE SHEET 1 OF 13 FOR NOTES.



PLAN

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DARE COUNTY
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SHEET 7 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF RAIL & CONCRETE PARAPET UNIT 18

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

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1000 West Morehead St., Ste. 200
Charlotte, NC 28208
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SHEET NO. S-140
TOTAL SHEETS 219

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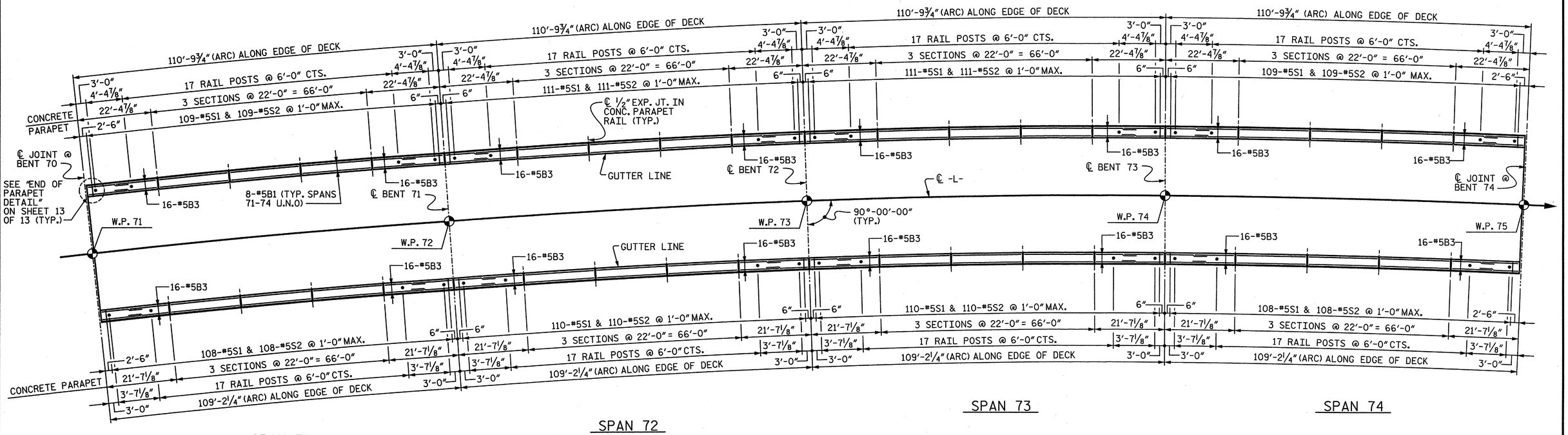
NOTES:
1. SEE SHEET 1 OF 13 FOR NOTES.



PLAN

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SHEET 8 OF 13

STATE OF NORTH CAROLINA
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RALEIGH

PLAN OF RAIL & CONCRETE PARAPET UNIT 19

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

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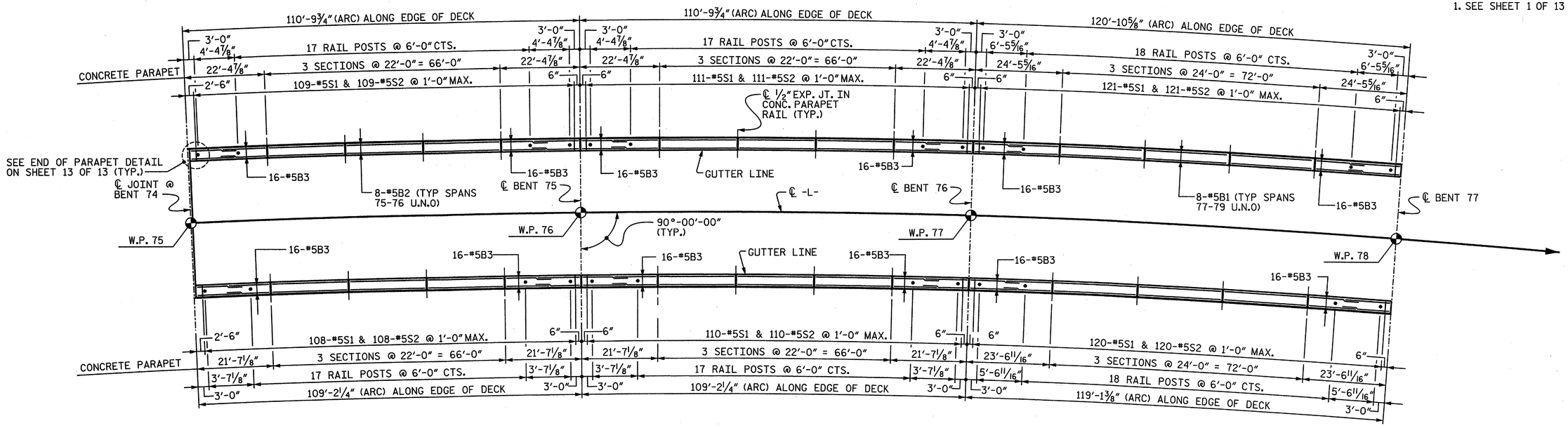
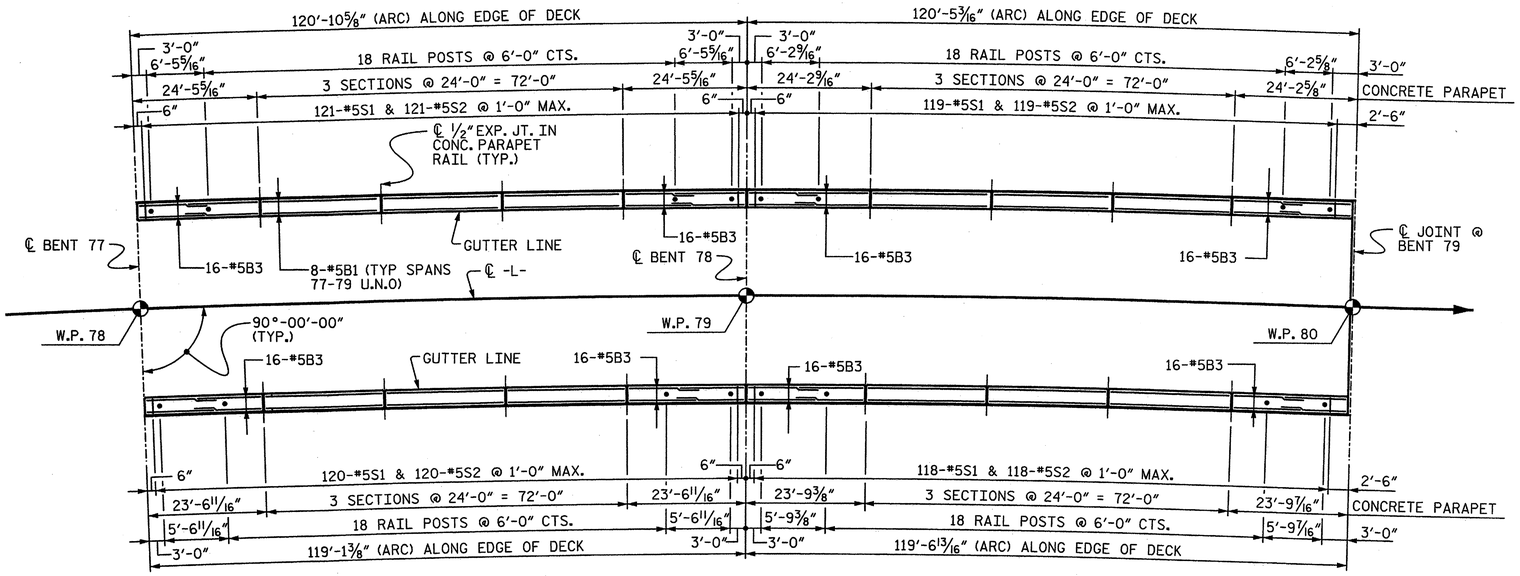
NOTES:
1. SEE SHEET 1 OF 13 FOR NOTES.



SPAN 75 SPAN 76 SPAN 77

PLAN



SPAN 78 SPAN 79

PLAN

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 9 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF RAIL & CONCRETE PARAPET UNIT 20

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

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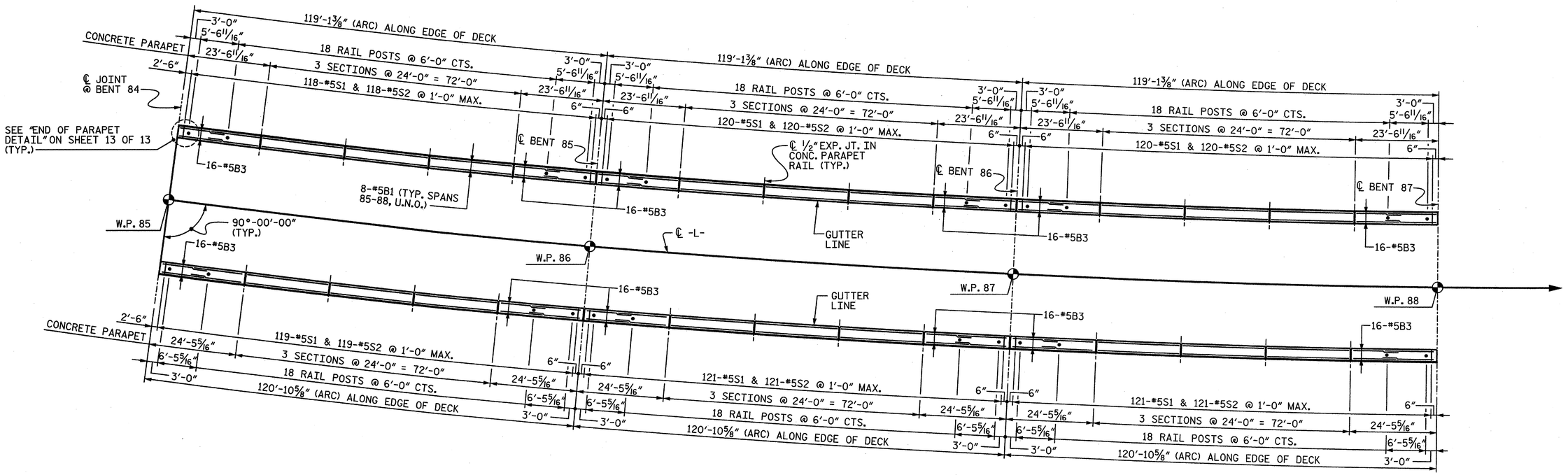
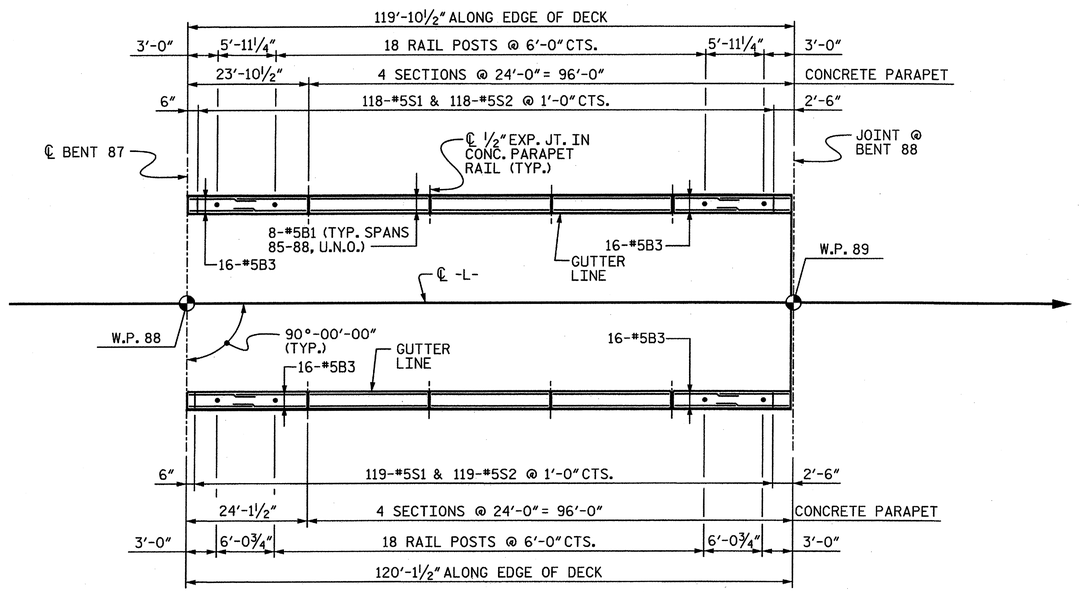
NOTES:

1. SEE SHEET 1 OF 13 FOR NOTES.



SPAN 85 SPAN 86 SPAN 87

PLAN



SPAN 88

PLAN

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 10 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF RAIL & CONCRETE PARAPET UNIT 22

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

DRAWN BY : TRL DATE : 3-12
CHECKED BY : AJP DATE : 4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-143
1			3			TOTAL SHEETS
2			4			219

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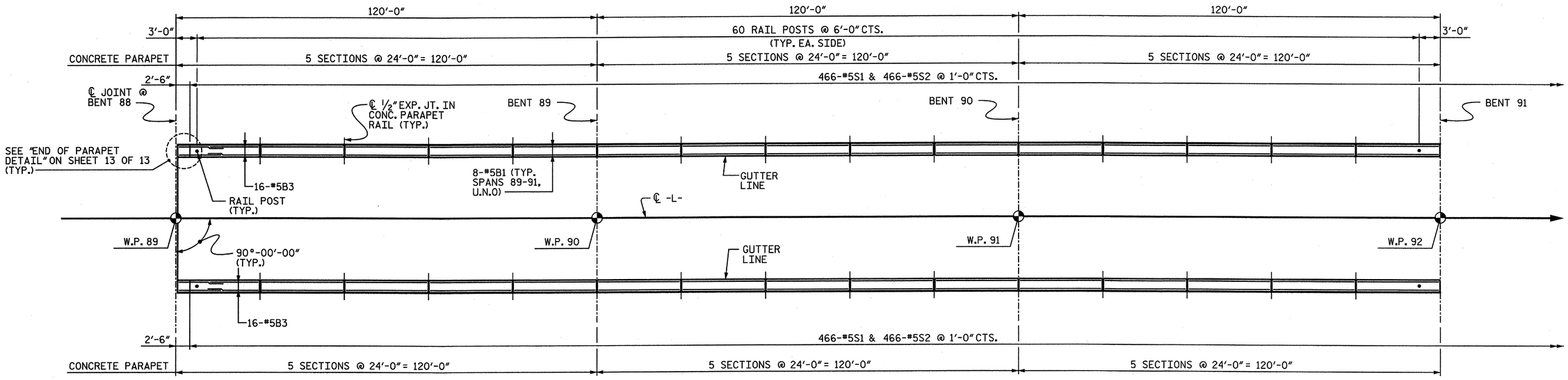
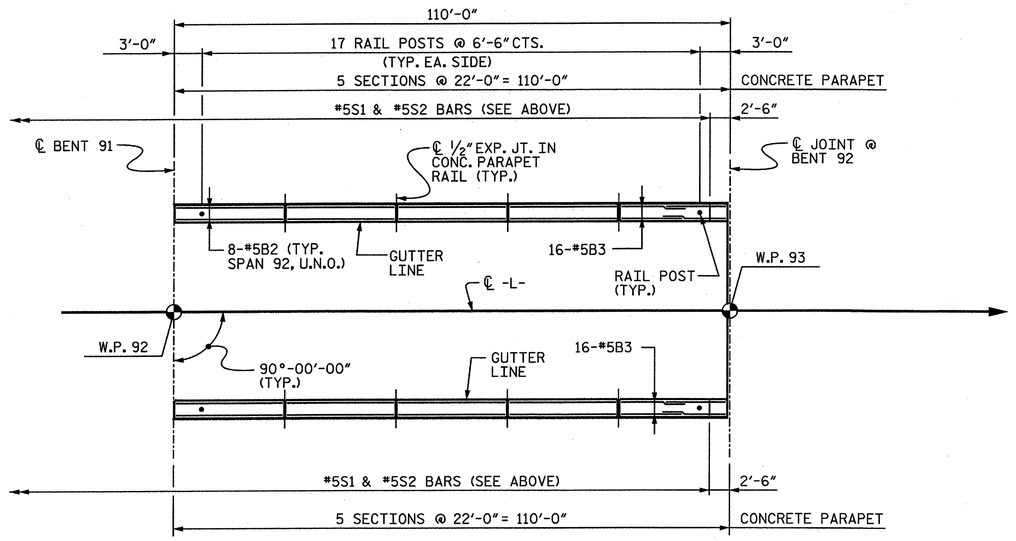
NOTES:
1. SEE SHEET 1 OF 13 FOR NOTES.



SPAN 89 SPAN 90 SPAN 91

PLAN



SPAN 92

PLAN

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 11 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF RAIL & CONCRETE PARAPET UNIT 23

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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1			3			TOTAL SHEETS
2			4			219

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CHECKED BY : AJP DATE : 4-12

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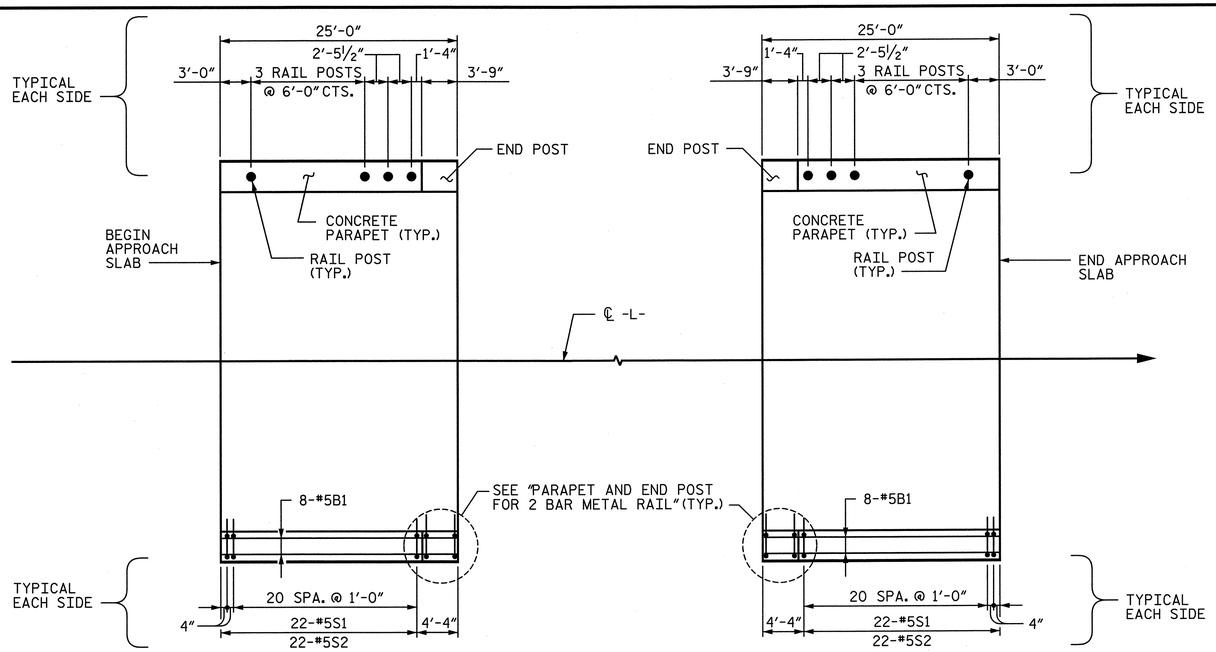


PLAN

APPROACH SLAB @ END BENT 1

(CONCRETE SHEET PILE RETAINING WALL NOT SHOWN FOR CLARITY)

PLAN

APPROACH SLAB @ END BENT 2

(CONCRETE SHEET PILE RETAINING WALL NOT SHOWN FOR CLARITY)

NOTES:

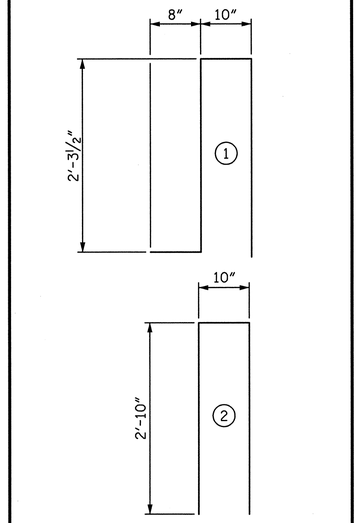
1. FOR SECTION THRU PARAPET, SEE SHEET 13 OF 13.
2. SEE "BRIDGE APPROACH SLAB" SHEET FOR ADDITIONAL APPROACH SLAB DETAILS.

NOTE: #5S1 BARS MAY BE ROTATED SLIGHTLY AS NECESSARY TO AVOID CONFLICT WITH OTHER BARS.

BILL OF MATERIAL FOR RAIL FOR ONE APPROACH SLAB

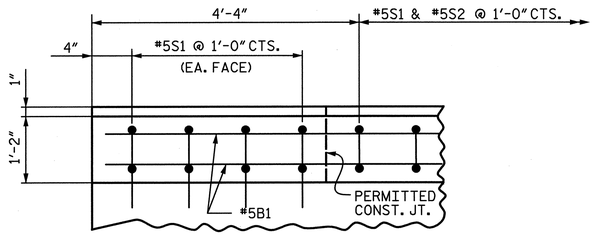
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	16	#5	STR	24'-6"	409
✳E1	20	#7	STR	4'-10"	198
✳F1	12	#6	STR	3'-5"	62
✳S1	52	#5	①	6'-1"	330
✳S2	44	#5	②	6'-6"	298

✳EPOXY COATED REINFORCING STEEL	LBS.	1297
CLASS AA CONCRETE	C. Y.	7.2
CONCRETE PARAPET	L.F.	50.0

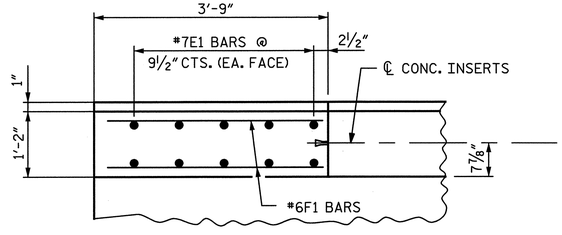


BAR TYPES

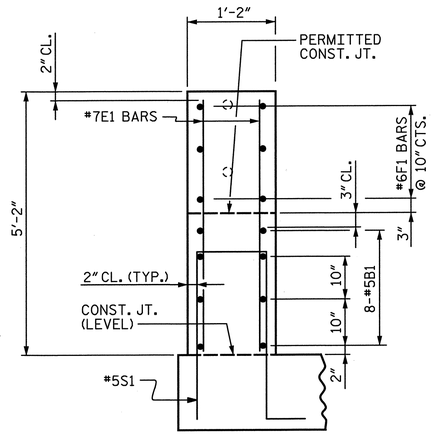
ALL BAR DIMENSIONS ARE OUT-TO-OUT



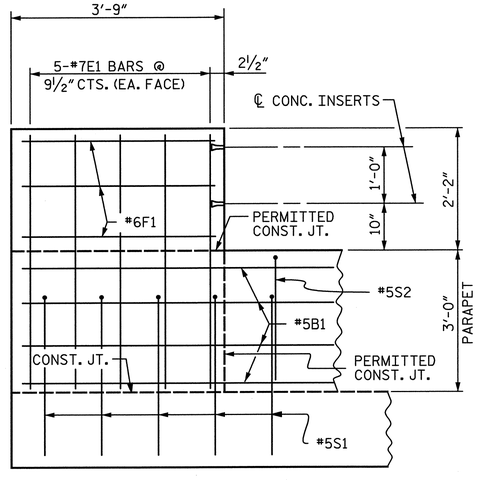
PLAN OF PARAPET



PLAN OF END POST



END VIEW



ELEVATION

PARAPET AND END POST FOR TWO BAR METAL RAIL

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 12 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF RAIL & CONCRETE PARAPET ON APPROACH SLAB

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 5-30-13

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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DRAWN BY : TRL DATE : 4-12

CHECKED BY : AJP DATE : 4-12

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BILL OF MATERIAL PER UNIT
UNITS 5A, 5B, 24A, & 24B

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	64	#5	STR	21′-6″	1,435
✳B2	32	#5	STR	12′-6″	417
✳S1	220	#5	①	6′-5″	1,472
✳S2	220	#5	②	6′-6″	1,491
✳EPOXY COATED REINFORCING STEEL				LBS.	4,815
CLASS "AA" CONCRETE				CU. YDS.	28.5
CONCRETE PARAPET				L.F.	220

BILL OF MATERIAL PER UNIT
UNITS 6-8 & 11-14

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	368	#5	STR	23′-6″	9,020
✳B2	32	#5	STR	23′-4″	779
✳S1	1200	#5	①	6′-5″	8,031
✳S2	1200	#5	②	6′-6″	8,135
✳EPOXY COATED REINFORCING STEEL				LBS.	25,965
CLASS "AA" CONCRETE				CU. YDS.	155.6
CONCRETE PARAPET				L.F.	1,200

BILL OF MATERIAL PER UNIT
UNIT 9

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	256	#5	STR	23′-6″	6,275
✳B3	288	#5	STR	13′-8″	4,105
✳S1	1204	#5	①	6′-5″	8,058
✳S2	1204	#5	②	6′-6″	8,163
✳EPOXY COATED REINFORCING STEEL				LBS.	26,601
CLASS "AA" CONCRETE				CU. YDS.	155.6
CONCRETE PARAPET				L.F.	1,200

BILL OF MATERIAL PER UNIT
UNIT 10

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	320	#5	STR	23′-6″	7,843
✳B3	160	#5	STR	13′-8″	2,281
✳S1	1202	#5	①	6′-5″	8,044
✳S2	1202	#5	②	6′-6″	8,149
✳EPOXY COATED REINFORCING STEEL				LBS.	26,317
CLASS "AA" CONCRETE				CU. YDS.	155.6
CONCRETE PARAPET				L.F.	1,200

BILL OF MATERIAL PER UNIT
UNITS 15, 16, & 21

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	240	#5	STR	23′-6″	5,883
✳B3	320	#5	STR	13′-9″	4,589
✳S1	1205	#5	①	6′-5″	8,065
✳S2	1205	#5	②	6′-6″	8,169
✳EPOXY COATED REINFORCING STEEL				LBS.	26,706
CLASS "AA" CONCRETE				CU. YDS.	155.6
CONCRETE PARAPET				L.F.	1,200

BILL OF MATERIAL PER UNIT
UNIT 17

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	240	#5	STR	23′-6″	5,883
✳B3	320	#5	STR	13′-9″	4,589
✳S1	1204	#5	①	6′-5″	8,058
✳S2	1204	#5	②	6′-6″	8,163
✳EPOXY COATED REINFORCING STEEL				LBS.	26,693
CLASS "AA" CONCRETE				CU. YDS.	155.6
CONCRETE PARAPET				L.F.	1,200

BILL OF MATERIAL PER UNIT
UNIT 18

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	144	#5	STR	23′-6″	3,530
✳B2	48	#5	STR	21′-6″	1,076
✳B3	256	#5	STR	13′-9″	3,671
✳S1	944	#5	①	6′-5″	6,318
✳S2	944	#5	②	6′-6″	6,400
✳EPOXY COATED REINFORCING STEEL				LBS.	20,995
CLASS "AA" CONCRETE				CU. YDS.	121.9
CONCRETE PARAPET				L.F.	940

BILL OF MATERIAL PER UNIT
UNIT 19

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	192	#5	STR	21′-6″	4,306
✳B3	256	#5	STR	12′-9″	3,404
✳S1	884	#5	①	6′-5″	5,916
✳S2	884	#5	②	6′-6″	5,993
✳EPOXY COATED REINFORCING STEEL				LBS.	19,619
CLASS "AA" CONCRETE				CU. YDS.	114.1
CONCRETE PARAPET				L.F.	880

BILL OF MATERIAL PER UNIT
UNIT 20

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	144	#5	STR	23′-6″	3,530
✳B2	96	#5	STR	21′-6″	2,153
✳B3	320	#5	STR	13′-9″	4,589
✳S1	1165	#5	①	6′-5″	7,797
✳S2	1165	#5	②	6′-6″	7,898
✳EPOXY COATED REINFORCING STEEL				LBS.	25,967
CLASS "AA" CONCRETE				CU. YDS.	150.4
CONCRETE PARAPET				L.F.	1,160

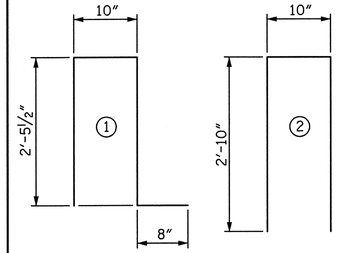
BILL OF MATERIAL PER UNIT
UNIT 22

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	192	#5	STR	23′-6″	4,706
✳B3	256	#5	STR	13′-9″	3,671
✳S1	964	#5	①	6′-5″	6,452
✳S2	964	#5	②	6′-6″	6,535
✳EPOXY COATED REINFORCING STEEL				LBS.	21,364
CLASS "AA" CONCRETE				CU. YDS.	124.4
CONCRETE PARAPET				L.F.	960

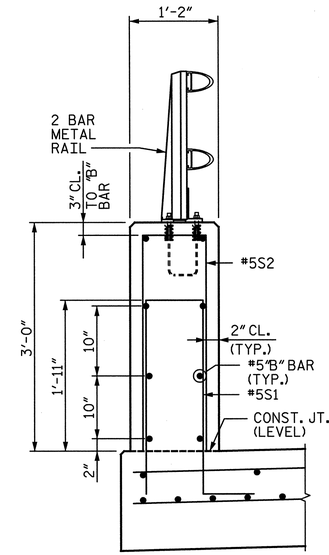
BILL OF MATERIAL PER UNIT
UNIT 23

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	224	#5	STR	23′-6″	5,490
✳B2	64	#5	STR	21′-6″	1,435
✳B3	64	#5	STR	13′-6″	901
✳S1	940	#5	①	6′-5″	6,291
✳S2	940	#5	②	6′-6″	6,373
✳EPOXY COATED REINFORCING STEEL				LBS.	20,490
CLASS "AA" CONCRETE				CU. YDS.	121.9
CONCRETE PARAPET				L.F.	940

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT



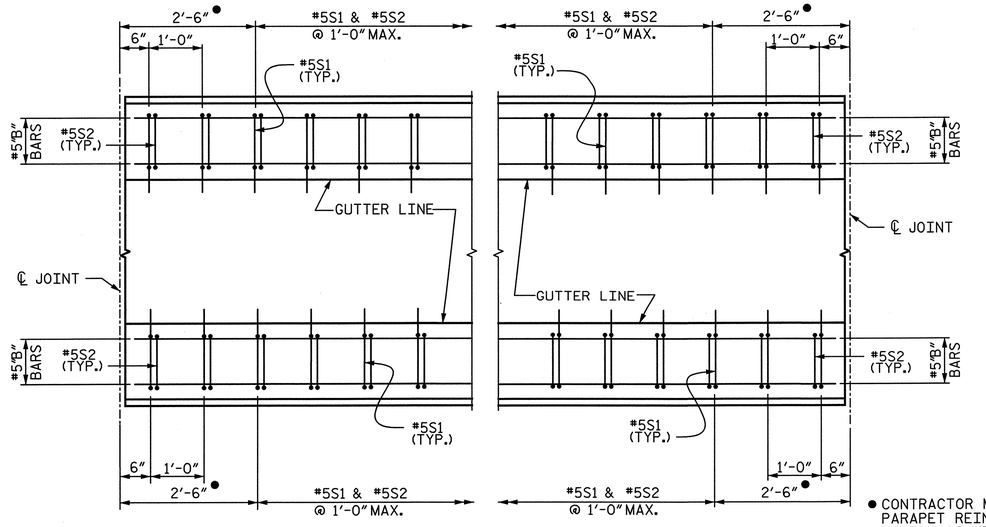
SECTION THRU PARAPET

CONCRETE PARAPET DETAILS

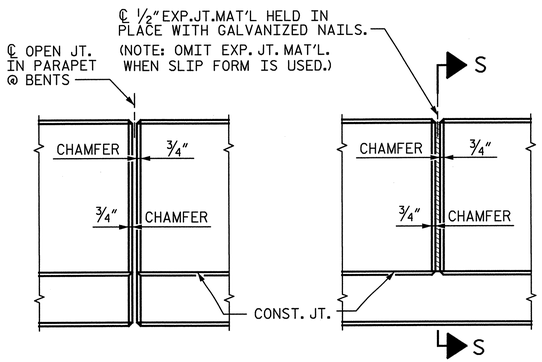
(SEE 2 BAR METAL RAIL SHEETS FOR ADDITIONAL DETAILS)

NOTES:

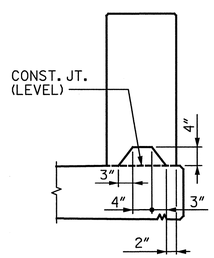
1. THE CONCRETE PARAPET IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
2. WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF CONCRETE PARAPET.
3. AT FOAM JOINT LOCATIONS, CONTRACTOR SHALL BE PREPARED TO USE HAND TOOLS TO SAW THE JOINT OPENING IMMEDIATELY ADJACENT TO CONCRETE PARAPET.
4. ALL REINFORCING STEEL IN CONCRETE PARAPET SHALL BE EPOXY COATED.
5. GROOVED CONTRACTION JOINTS, ½″ IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE CONCRETE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN CONCRETE PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF CONCRETE PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.
6. FOR CONCRETE PARAPET ON CORED SLAB SPANS, SEE CORED SLAB SHEETS.



END OF PARAPET DETAIL



ELEVATION AT EXPANSION JOINTS



SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

● CONTRACTOR MAY SUBMIT ALTERNATE PARAPET REINFORCING IN THIS REGION AS NECESSARY TO ACCOMMODATE MODULAR JOINTS. ANY MODIFICATION SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO INSTALLATION.

CONCRETE PARAPET DETAILS

(2 BAR METAL RAIL NOT SHOWN FOR CLARITY)

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 5-30-13

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 13 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF RAIL & CONCRETE PARAPET DETAILS

DRAWN BY : TJT DATE : 4-12

CHECKED BY : AJP DATE : 4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
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2			4			219

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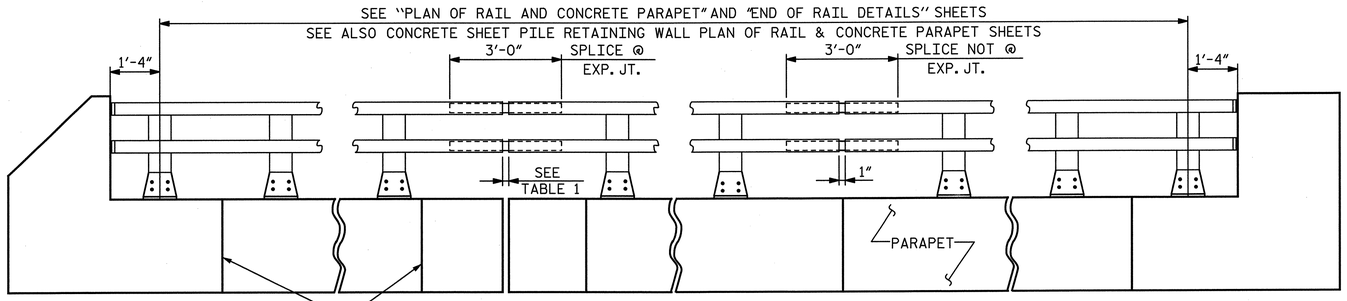
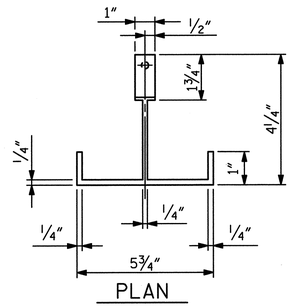


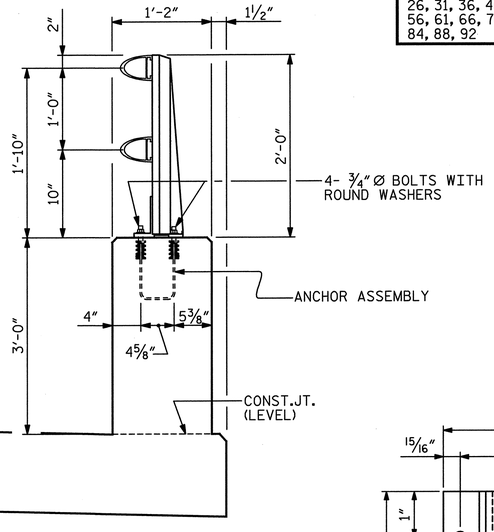
ELEVATION

NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE "END OF RAIL DETAILS" SHEET.

TABLE 1	
℄ EXP. JT. @	RAIL OPENING
BENT No. 2, 4, 5, 93, 94, 96	1½"
BENT No. 6, 11, 16, 21, 26, 31, 36, 41, 46, 51, 56, 61, 66, 70, 74, 79, 84, 88, 92	5"

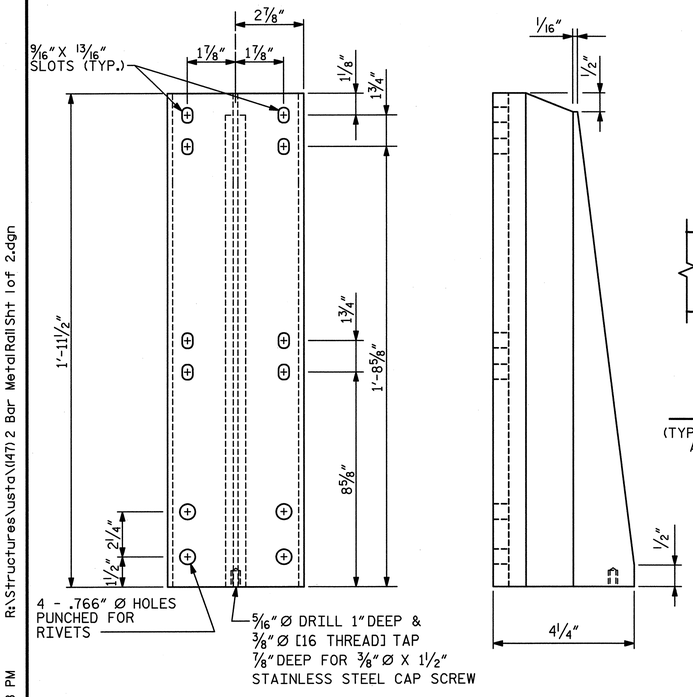


PLAN



SECTION THRU PARAPET AND RAIL

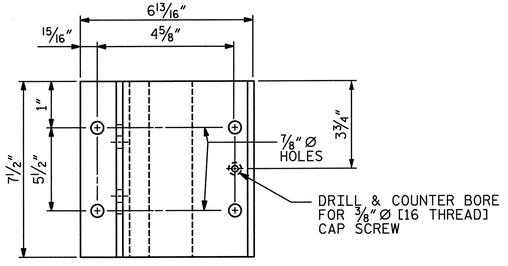
(TYPICAL SECTION ON BRIDGE SHOWN, SECTIONS ON APPROACH SLAB AND MOMENT SLAB SIMILAR)



FRONT ELEVATION

SIDE ELEVATION

DETAILS OF POST



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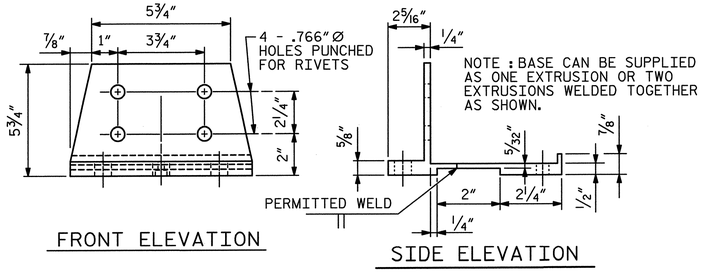
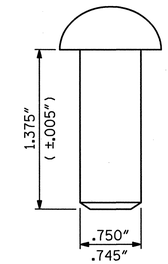


FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

NOTES

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6.

MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

GENERAL NOTES

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR2.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

METHOD OF MEASUREMENT FOR METAL RAILS: FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS.

CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAINS VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

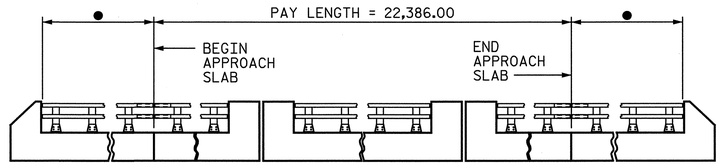
ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

FABRICATOR SHALL CURVE OR BEND SPLICE AS NECESSARY TO ALIGN WITH CONCRETE PARAPET.

PAY LENGTH = 22,386.00 LIN. FT.



PAY LENGTH LAYOUT

● SEE CONCRETE SHEET PILE RETAINING WALL DETAILS, SHEET S-214, FOR PAY LENGTH

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

2 BAR METAL RAIL

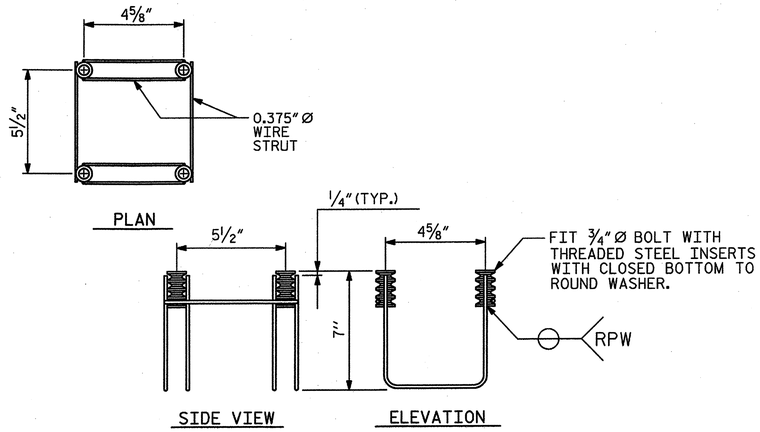
NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 5-30-13

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-147
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : JDE DATE : 4-12
CHECKED BY : TRL DATE : 4-12

5/30/2013 3:39:58 PM R:\Structures\usta\147) 2 Bar MetalRail Sht 1of 2.dgn



4-BOLT METAL RAIL ANCHOR ASSEMBLY

(3858 ASSEMBLIES REQUIRED)

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. FERRULES SHALL BE MADE FROM GRADE 316 STAINLESS STEEL AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR ¾" FERRULES.

B. 4 - ¾" Ø X 2½" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE ASTM A240 GRADE 316 STAINLESS STEEL.

C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

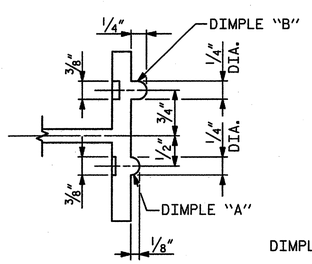
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.

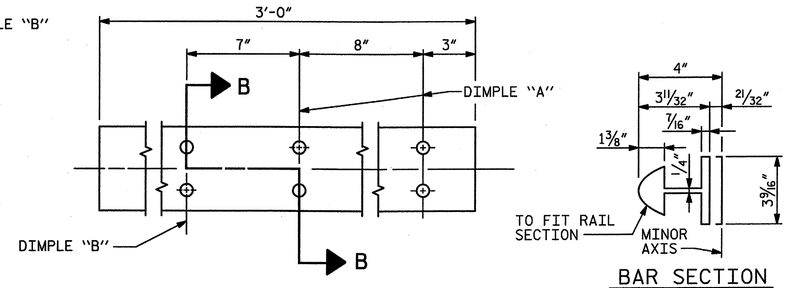
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE ¾" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

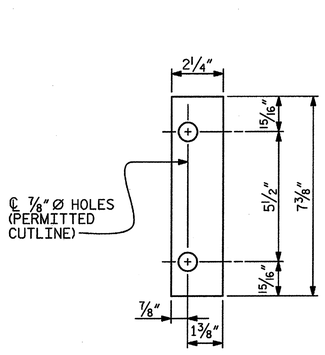


SECTION B-B

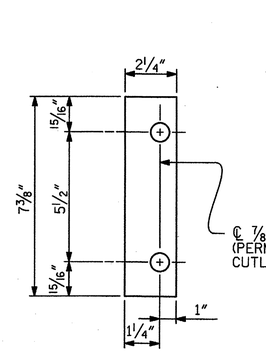


BAR SECTION

EXPANSION BAR DETAILS



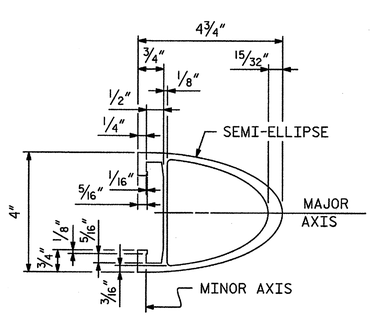
FRONT PLATE



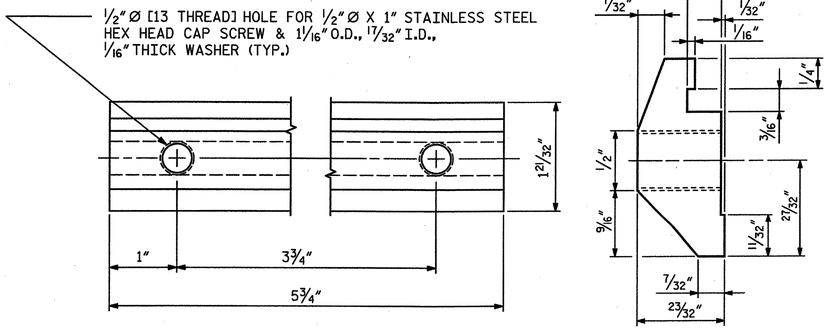
REAR PLATE

SHIM DETAILS

NOTE :
SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.

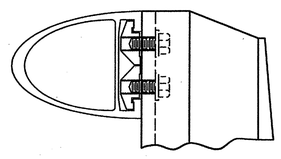


RAIL SECTION

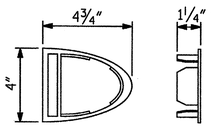


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

2 BAR METAL RAIL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY
10-4-12

DRAWN BY : JDE DATE : 4-12
CHECKED BY : TJT DATE : 4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-148
1			3			TOTAL SHEETS
2			4			219

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SEE "PLAN OF RAIL AND CONCRETE PARAPET" SHEETS FOR RAIL POST SPACING.

NOTES

STRUCTURAL CONCRETE INSERT

THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. FERRULES SHALL BE MADE FROM GRADE 316 STAINLESS STEEL AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1½".

B. 1 - ¾"Ø X 1⅝" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE ¾"Ø X 1⅝" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16"Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES

METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. ½" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.

B. ¾" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A ¾"Ø X 1⅝" BOLT WITH 2" O.D. WASHER IN PLACE. THE ¾"Ø X 1⅝" BOLT SHALL HAVE N. C. THREADS.

CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F.

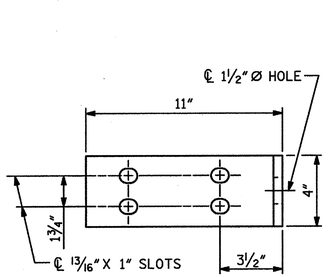
STANDARD CLAMP BARS (SEE 2 BAR METAL RAIL SHEET).

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 2 BAR METAL RAILS.

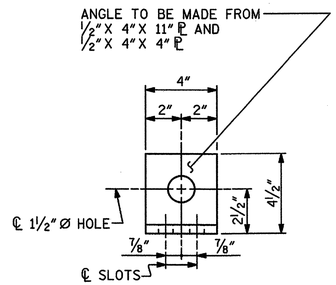
THE ¾" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE ¾" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE ½" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

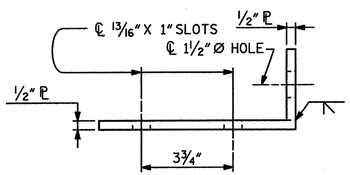
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE ¾"Ø X 1⅝" BOLT WITH WASHER SHALL BE REPLACED WITH A ¾"Ø X 6½" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE ¾"Ø X 1⅝" BOLT SHALL APPLY TO THE ¾"Ø X 6½" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



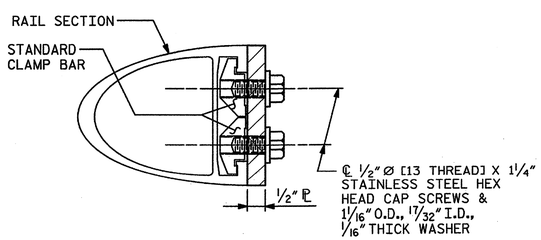
ELEVATION



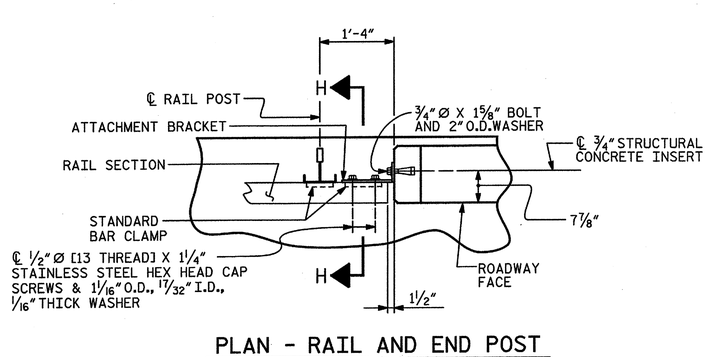
END VIEW



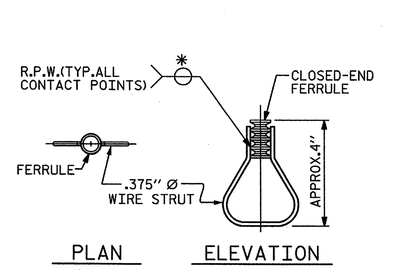
TOP VIEW



SECTION H-H



PLAN - RAIL AND END POST



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

*EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

FIXED

DETAILS FOR ATTACHING METAL RAIL TO END POST

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

END OF RAIL DETAILS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-149
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : JDE DATE : 4-12
CHECKED BY : TRL DATE : 4-12

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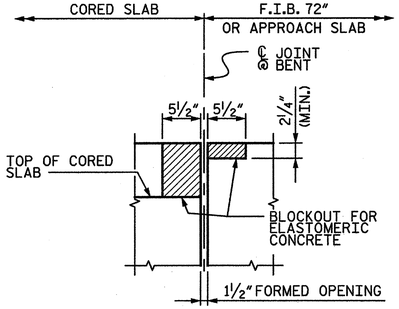
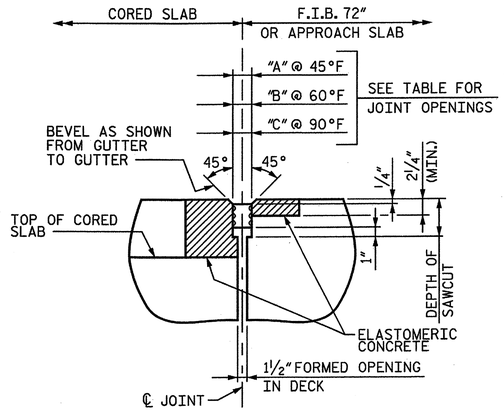


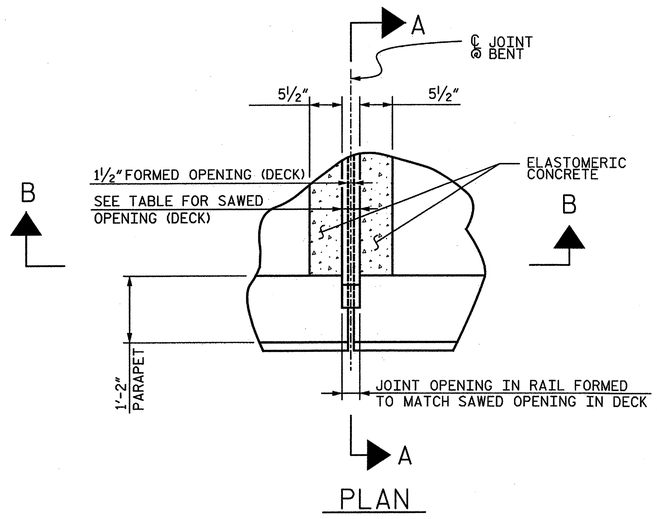
SECTION B-B

FOAM JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)
(BENT 4 & END BENT 2 SHOWN, END BENT 1 & BENT 94 SYMMETRIC ABOUT ℄ JOINT)



SECTION B-B

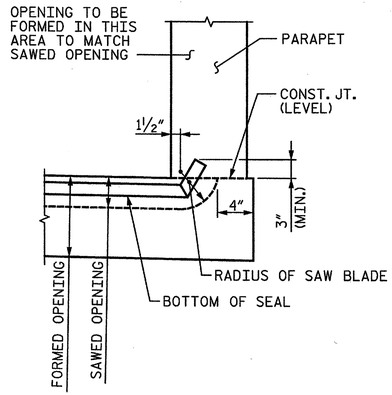
FOAM JOINT SEAL
(BENT 4 & END BENT 2 SHOWN, END BENT 1 & BENT 94 SYMMETRIC ABOUT ℄ JOINT)



PLAN

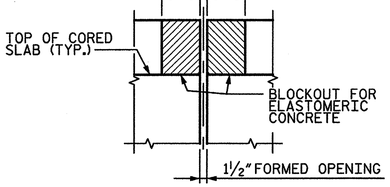
NOTES:

1. FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.
2. FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.
3. CONTRATOR SHALL BE PREPARED TO USE HAND TOOLS TO SAW THE JOINT OPENING IMMEDIATELY ADJACENT TO CONCRETE PARAPET.



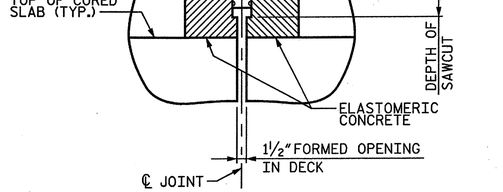
SECTION A-A

FOAM JOINT SEAL TO BE CUT, HEAT WELDED, AND TURNED UP AT A 60° ANGLE FROM THE BASE OF THE PARAPET.



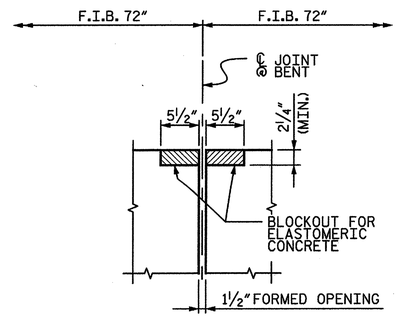
SECTION B-B

FOAM JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)
(BENT 2 & BENT 96 SHOWN)



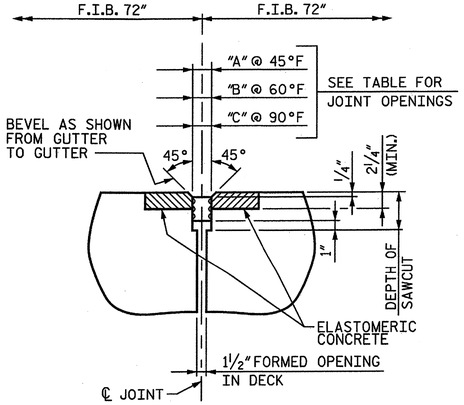
SECTION B-B

FOAM JOINT SEAL
(BENT 2 & BENT 96 SHOWN)



SECTION B-B

FOAM JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)
(BENT 5 & BENT 93 SHOWN)



SECTION B-B

FOAM JOINT SEAL
(BENT 5 & BENT 93 SHOWN)

MOVEMENT AND SETTING AT FOAM JOINT

BENT NO.	SKEW ANGLE	NOMINAL UNCOMPRESSED SEAL WIDTH	TOTAL MOVEMENT (ALONG ℄ RDWY.)	PERPENDICULAR JOINT OPENING AT 45°F ("A")	PERPENDICULAR JOINT OPENING AT 60°F ("B")	PERPENDICULAR JOINT OPENING AT 90°F ("C")
EB1	90°-00'-00"	3 7/16"	0"	2 3/4"	2 3/4"	2 3/4"
B2	90°-00'-00"	3 7/16"	1"	2 15/16"	2 3/4"	2 3/8"
B4	90°-00'-00"	3 7/16"	0"	2 3/4"	2 3/4"	2 3/4"
B5	90°-00'-00"	3 7/16"	1"	2 15/16"	2 3/4"	2 3/8"
B93	90°-00'-00"	3 7/16"	1"	2 15/16"	2 3/4"	2 3/8"
B94	90°-00'-00"	3 7/16"	0"	2 3/4"	2 3/4"	2 3/4"
B96	90°-00'-00"	3 7/16"	1"	2 15/16"	2 3/4"	2 3/8"
EB2	90°-00'-00"	3 7/16"	0"	2 3/4"	2 3/4"	2 3/4"

BILL OF MATERIAL

BENT NO.	ELASTOMERIC CONCRETE * (CU.FT.)
EB1	16.4
B2	26.0
B4	16.4
B5	6.9
B93	6.9
B94	16.4
B96	26.0
EB2	16.4

*BASED ON MINIMUM BLOCKOUT SHOWN FOR APPROACH SLAB & SPANS 5, 6, 93 & 94, FOR SPANS 1-4, 95-98, BASED ON MINIMUM BLOCKOUT WIDTH SHOWN AND AVERAGE CONCRETE WEARING THICKNESS.

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

FOAM JOINT DETAILS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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

SHEET NO. S-150
TOTAL SHEETS 219

DRAWN BY : ACA DATE : 2-12
CHECKED BY : TJT DATE : 3-12

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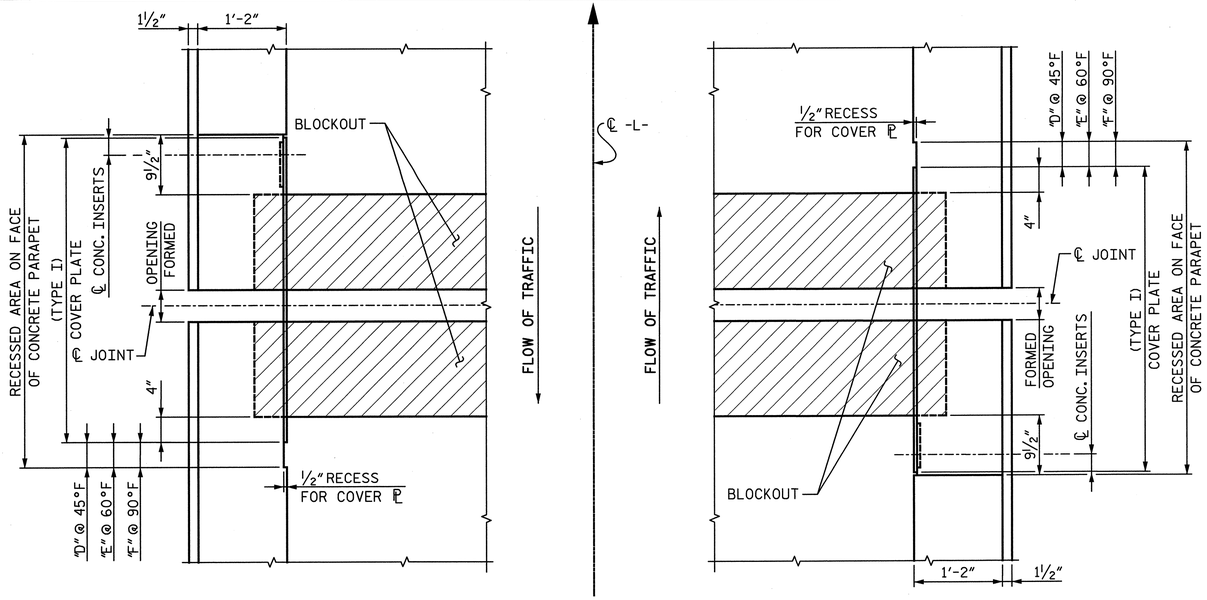
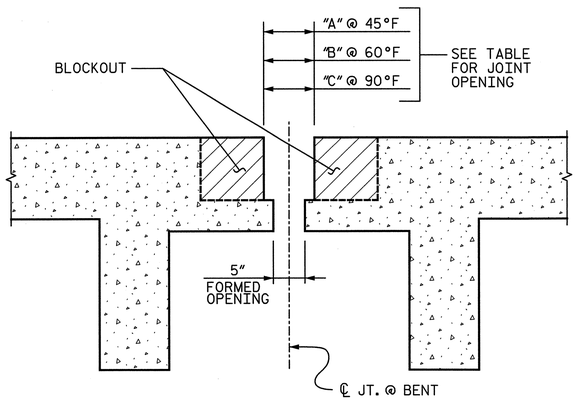
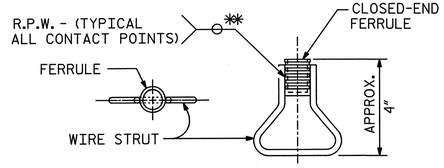


PLAN OF MODULAR EXPANSION JOINT SEAL



SECTION THRU SLAB
(NORMAL TO JOINT)

NOTE: MODULAR EXPANSION JOINT SEAL IS REQUIRED AT THIS JOINT BUT NOT SHOWN, SEE SKETCH SHOWING LIMITS OF MODULAR EXPANSION JOINT SEAL-PARAPET.



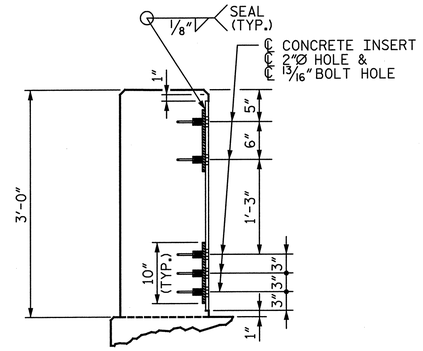
PLAN ELEVATION

CONCRETE INSERT

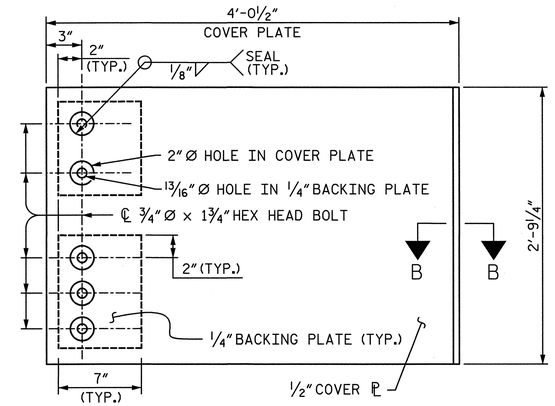
** EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

NOTES:

1. FOR MODULAR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. THE STEEL PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 OR APPROVED EQUAL AND BE METALLIZED IN ACCORDANCE WITH THE SPECIAL PROVISIONS. SEE SPECIAL PROVISIONS FOR THERMAL SPRAYED COATINGS (METALLIZATION).
3. THE ¾"Ø HEX HEAD BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL.
4. THE ¾" CONCRETE INSERTS SHALL BE CLOSED-END FERRULES WITH LOOPED WIRE STRUTS ATTACHED TO THEM. THE INSERTS SHALL BE GRADE 316 STAINLESS STEEL AND SHALL HAVE A TENSILE WORKING LOAD CAPACITY OF 3000 LB.
5. NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE COVER PLATE. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR "MODULAR EXPANSION JOINT SEALS."
6. COVER ℄ LENGTH IS BASED ON A BLOCKOUT WIDTH OF 1'-3". CONTRACTOR SHALL ADJUST PLATE LENGTH FOR ACTUAL BLOCKOUT LENGTH USED.

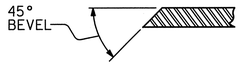


END VIEW

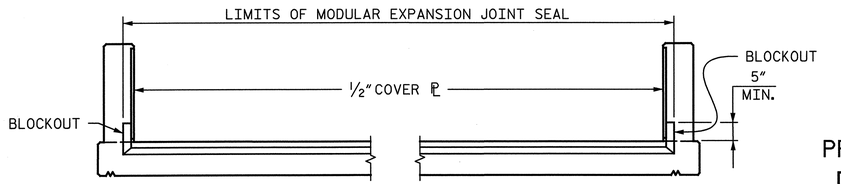


TYPE I - ELEVATION VIEW FROM ROADWAY

COVER PLATE DETAILS



SECTION B-B



SKETCH SHOWING LIMITS OF MODULAR EXPANSION JOINT SEAL-PARAPET

MOVEMENT AND SETTING AT JOINT

BENT NO.	*SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY.)	PERPENDICULAR JOINT OPENING AT 45°F ("A")	PERPENDICULAR JOINT OPENING AT 60°F ("B")	PERPENDICULAR JOINT OPENING AT 90°F ("C")	COVER PLATE OPENING AT 45°F ("D")	COVER PLATE OPENING AT 60°F ("E")	COVER PLATE OPENING AT 90°F ("F")
6	90°-00'-00"	5 5/16"	9/16"	8 1/8"	6 1/4"	4 1/16"	3 1/8"	1 1/4"
11,16,21,26, 31,36,41,46, 51,56,61	90°-00'-00"	5"	9"	8 1/8"	6 3/8"	4"	3 1/8"	1 3/8"
66	90°-00'-00"	4 7/16"	8 15/16"	8 1/8"	6 9/16"	3 15/16"	3 1/8"	1 9/16"
70	90°-00'-00"	3 3/4"	8 13/16"	8 1/8"	6 13/16"	3 13/16"	3 1/8"	1 13/16"
74	90°-00'-00"	4 1/4"	8 7/8"	8 1/8"	6 5/8"	3 7/8"	3 1/8"	1 5/8"
79	90°-00'-00"	4 1/8"	9"	8 1/8"	6 3/8"	4"	3 1/8"	1 3/8"
84	90°-00'-00"	4 1/2"	8 15/16"	8 1/8"	6 9/16"	3 15/16"	3 1/8"	1 9/16"
88	90°-00'-00"	3 15/16"	8 13/16"	8 1/8"	6 3/4"	3 13/16"	3 1/8"	1 3/4"
92	90°-00'-00"	4 3/4"	8 15/16"	8 1/8"	6 7/16"	3 15/16"	3 1/8"	1 7/16"

*SKEW ANGLE AT BENTS IN HORIZONTAL CURVES ARE GIVEN TANGENT TO THE CURVE

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MODULAR EXPANSION JOINT DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 5-30-13

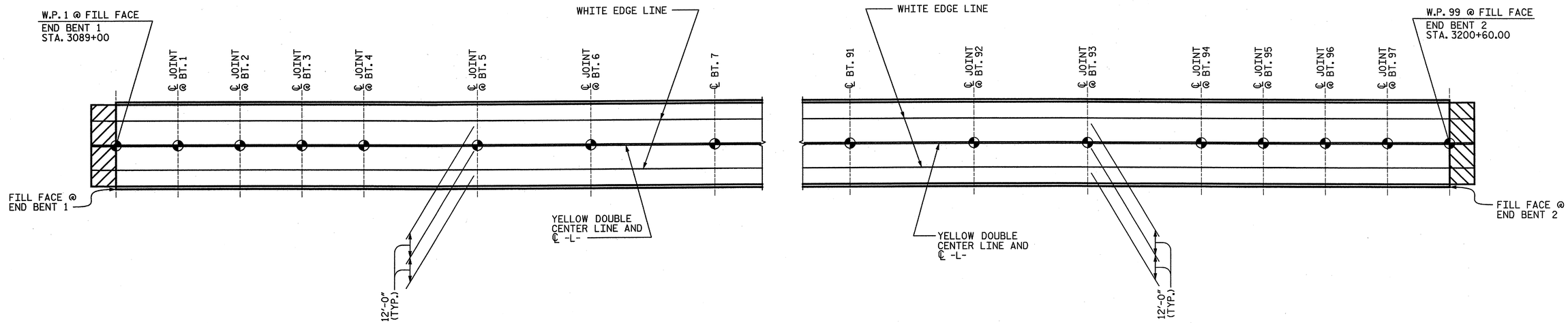
STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-151
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : ACA DATE : 2-12

CHECKED BY : TJT DATE : 3-12

5/30/2013 3:39:55 PM R:\Structures\usta\151 Modular Joint Details.dgn



PAVEMENT MARKING ALIGNMENT

NOTES:

1. FOR ADDITIONAL DETAILS & MATERIALS, SEE PAVEMENT MARKING PLANS.
2. FOR PAY ITEM FOR PAVEMENT MARKING, SEE ROADWAY PLANS.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY

10-4-12

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PAVEMENT MARKING ALIGNMENT

DRAWN BY : ACA DATE : 4-12

CHECKED BY : TRL DATE : 4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-152
1			3			TOTAL SHEETS
2			4			219

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REINFORCING BAR SCHEDULE FOR UNITS 5A & 24B

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	478	6	STR	42'-1"	30,214
B1	212	5	STR	56'-0"	12,382
K1	8	8	①	22'-8"	484
K2	8	8	②	13'-0"	278
K3	4	6	STR	42'-1"	253
G3	2	5	STR	42'-1"	88
S1	72	5	⑤	5'-11"	444
S4	84	4	④	2'-7"	145
STAINLESS STEEL REINFORCING (LBS)					44,162

REINFORCING BAR SCHEDULE FOR UNITS 5B & 24A

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	478	6	STR	42'-1"	30,214
B1	212	5	STR	56'-0"	12,382
K1	8	8	①	22'-8"	484
K2	8	8	②	13'-0"	278
K3	5	6	STR	42'-1"	316
G1	10	5	③	3'-8"	38
G3	1	5	STR	42'-1"	44
S1	72	5	⑤	5'-11"	444
S2	44	4	④	4'-5"	130
S4	42	4	④	2'-7"	72
STAINLESS STEEL REINFORCING (LBS)					44,402

REINFORCING BAR SCHEDULE FOR UNITS 6-8 & 11-14

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	2,616	6	STR	42'-1"	165,355
B1	212	5	STR	60'-0"	13,267
B2	212	5	STR	34'-4"	7,592
B3	636	5	STR	33'-3"	22,056
B4	368	6	STR	60'-0"	33,164
B5	280	7	STR	40'-0"	22,893
B6	112	7	STR	13'-6"	3,091
B7	56	7	STR	23'-6"	2,690
K1	8	8	①	22'-8"	484
K2	8	8	②	13'-0"	278
K3	6	6	STR	42'-1"	379
K4	48	4	STR	8'-1"	259
K5	24	4	STR	11'-0"	176
K6	96	4	STR	11'-10"	759
K7	28	4	STR	38'-7"	722
U1	108	4	①	16'-9"	1,208
U2	24	4	④	11'-1"	178
G1	20	5	③	3'-8"	76
S1	72	5	⑤	5'-11"	444
S2	88	4	④	4'-5"	260
S3	744	4	⑥	2'-10"	1,408
STAINLESS STEEL REINFORCING (LBS)					276,739

REINFORCING BAR SCHEDULE FOR UNIT 9

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A2	522	6	STR	30'-0"	23,521
A3	522	6	STR	15'-1"	11,826
A4	2,104	6	STR	42'-6"	134,309
B1	212	5	STR	60'-0"	13,267
B2	212	5	STR	34'-4"	7,592
B3	636	5	STR	33'-7"	22,277
B4	368	6	STR	60'-0"	33,164
B5	280	7	STR	40'-0"	22,893
B6	112	7	STR	13'-6"	3,091
B7	56	7	STR	23'-6"	2,690
K1	8	8	①	22'-8"	484
K2	8	8	②	13'-0"	278
K3	3	6	STR	42'-1"	190
K4	48	4	STR	8'-1"	259
K5	24	4	STR	11'-0"	176
K6	96	4	STR	11'-10"	759
K7	7	4	STR	38'-7"	180
K13	3	6	STR	42'-6"	192
K17	21	4	STR	39'-0"	547
U1	108	4	①	16'-9"	1,208
U2	24	4	④	11'-1"	178
G1	20	5	③	3'-8"	76
S1	72	5	⑤	5'-11"	444
S2	88	4	④	4'-5"	260
S3	744	4	⑥	2'-10"	1,408
STAINLESS STEEL REINFORCING (LBS)					281,269

REINFORCING BAR SCHEDULE FOR UNIT 10

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	1,570	6	STR	42'-1"	99,238
A2	526	6	STR	30'-0"	23,702
A3	526	6	STR	15'-1"	11,917
A4	524	6	STR	42'-6"	33,450
B1	212	5	STR	60'-0"	13,267
B2	212	5	STR	34'-4"	7,592
B3	636	5	STR	33'-7"	22,277
B4	368	6	STR	60'-0"	33,164
B5	280	7	STR	40'-0"	22,893
B6	112	7	STR	13'-6"	3,091
B7	56	7	STR	23'-6"	2,690
K1	8	8	①	22'-8"	484
K2	8	8	②	13'-0"	278
K3	3	6	STR	42'-1"	190
K4	48	4	STR	8'-1"	259
K5	24	4	STR	11'-0"	176
K6	96	4	STR	11'-10"	759
K7	7	4	STR	38'-7"	180
K13	3	6	STR	42'-6"	192
K17	21	4	STR	39'-0"	547
U1	108	4	①	16'-9"	1,208
U2	24	4	④	11'-1"	178
G1	20	5	③	3'-8"	76
S1	72	5	⑤	5'-11"	444
S2	88	4	④	4'-5"	260
S3	744	4	⑥	2'-10"	1,408
STAINLESS STEEL REINFORCING (LBS)					279,920

REINFORCING BAR SCHEDULE FOR UNITS 15 & 16

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	2,414	6	STR	42'-1"	152,587
B1	178	5	STR	60'-0"	11,139
B2	178	5	STR	34'-9"	6,451
B3	534	5	STR	33'-9"	18,797
B4	356	6	STR	60'-0"	32,083
B5	256	7	STR	40'-0"	20,931
B6	144	7	STR	13'-6"	3,974
K3	6	6	STR	42'-1"	379
K4	48	4	STR	6'-11"	222
K5	24	4	STR	9'-6"	152
K6	96	4	STR	10'-4"	663
K7	28	4	STR	34'-0"	636
K11	8	8	①	21'-2"	452
K12	8	8	②	14'-1"	301
U1	96	4	①	16'-9"	1,074
U2	24	4	④	11'-1"	178
G1	20	5	③	3'-8"	76
S1	66	5	⑤	5'-11"	407
S2	88	4	④	4'-5"	260
S3	672	4	⑥	2'-10"	1,272
STAINLESS STEEL REINFORCING (LBS)					252,034

REINFORCING BAR SCHEDULE FOR UNIT 17

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	2,412	6	STR	42'-1"	152,461
B1	178	5	STR	60'-0"	11,139
B2	178	5	STR	34'-9"	6,451
B3	534	5	STR	33'-9"	18,797
B4	356	6	STR	60'-0"	32,083
B5	256	7	STR	40'-0"	20,931
B6	144	7	STR	13'-6"	3,974
K3	6	6	STR	42'-1"	379
K4	48	4	STR	6'-11"	222
K5	24	4	STR	9'-6"	152
K6	96	4	STR	10'-4"	663
K7	28	4	STR	34'-0"	636
K11	8	8	①	21'-2"	452
K12	8	8	②	14'-1"	301
U1	96	4	①	16'-9"	1,074
U2	24	4	④	11'-1"	178
G1	20	5	③	3'-8"	76
S1	66	5	⑤	5'-11"	407
S2	88	4	④	4'-5"	260
S3	672	4	⑥	2'-10"	1,272
STAINLESS STEEL REINFORCING (LBS)					251,908

REINFORCING BAR SCHEDULE FOR UNIT 18

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	1,878	6	STR	42'-1"	118,707
B1	178	5	STR	60'-0"	11,139
B2	89	5	STR	34'-9"	3,226
B3	356	5	STR	33'-9"	12,532
B4	267	6	STR	60'-0"	24,062
B5	192	7	STR	40'-0"	15,698
B6	108	7	STR	13'-6"	2,980
B8	89	5	STR	24'-9"	2,297
K3	6	6	STR	42'-1"	379
K4	36	4	STR	6'-11"	166
K5	18	4	STR	9'-6"	114
K6	72	4	STR	10'-4"	497
K7	21	4	STR	34'-0"	477
K11	8	8	①	21'-2"	452
K12	8	8	②	14'-1"	301
U1	72	4	①	16'-9"	806
U2	18	4	④	11'-1"	133
G1	20	5	③	3'-8"	76
S1	66	5	⑤	5'-11"	407
S2	88	4	④	4'-5"	260
S3	504	4	⑥	2'-10"	954
STAINLESS STEEL REINFORCING (LBS)					195,663

REINFORCING BAR SCHEDULE FOR UNIT 19

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	1,772	6	STR	42'-1"	112,007
B1	178	5	STR	60'-0"	11,139
B2	178	5	STR	24'-9"	4,595
B3	178	5	STR	55'-2"	10,242
B4	267	6	STR	60'-0"	24,062
B5	192	7	STR	40'-0"	15,698
B6	108	7	STR	13'-6"	2,980
K3	6	6	STR	42'-1"	379
K4	36	4	STR	6'-11"	166
K5	18	4	STR	9'-6"	114
K6	72	4	STR	10'-4"	497
K7	21	4	STR	34'-0"	477
K11	8	8	①	21'-2"	452
K12	8	8	②	14'-1"	301
U1	72	4	①	16'-9"	806
U2	18	4	④	11'-1"	133
G1	20	5	③	3'-8"	76
S1	66	5	⑤	5'-11"	407
S2	88	4	④	4'-5"	260
S3	504	4	⑥	2'-10"	954
STAINLESS STEEL REINFORCING (LBS)					185,745

REINFORCING BAR SCHEDULE FOR UNIT 20

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	2,336	6	STR	42'-1"	147,657
B1	178	5	STR	60'-0"	11,139
B2	89	5	STR	34'-9"	3,226
B3	356	5	STR	33'-9"	12,532
B4	356	6	STR	60'-0"	32,083
B5	256	7	STR	40'-0"	20,931
B6	144	7	STR	13'-6"	3,974
B8	89	5	STR	55'-2"	5,121
B9	89	5	STR	24'-9"	2,297
K3	6	6	STR	42'-1"	379
K4	48	4	STR	6'-11"	222
K5	24	4	STR	9'-6"	152
K6	96	4	STR	10'-4"	663
K7	28	4	STR	34'-0"	636
K11	8	8	①	21'-2"	452
K12	8	8	②	14'-1"	301
U1	96	4	①	16'-9"	1,074
U2	24	4	④	11'-1"	178
G1	20	5	③	3'-8"	76
S1	66	5	⑤	5'-11"	407
S2	88	4	④	4'-5"	260
S3	672	4	⑥	2'-10"	1,272
STAINLESS STEEL REINFORCING (LBS)					245,032

REINFORCING BAR SCHEDULE FOR UNIT 21

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	2,416	6	STR	42'-1"	152,713
B1	178	5	STR	60'-0"	11,139
B2	178	5	STR	34'-9"	6,451
B3	534	5	STR	33'-9"	18,797
B4	356	6	STR	60'-0"	32,083
B5	256	7	STR	40'-0"	20,931
B6	144	7	STR	13'-6"	3,974
K3	6	6	STR	42'-1"	379
K4	48	4	STR	6'-11"	222
K5	24	4	STR	9'-6"	152
K6	96	4	STR	10'-4"	663
K7	28	4	STR	34'-0"	636
K11	8	8	①	21'-2"	452
K12	8	8	②	14'-1"	301
U1	96	4	①	16'-9"	1,074
U2	24	4	④	11'-1"	178
G1	20	5	③	3'-8"	76
S1	66	5	⑤	5'-11"	407
S2	88	4	④	4'-5"	260
S3	672	4	⑥	2'-10"	1,272
STAINLESS STEEL REINFORCING (LBS)					252,160

NOTE: QUANTITIES ARE FOR ONE UNIT ONLY.

DRAWN BY : ACA DATE : 4-12

CHECKED BY : AJP DATE : 4-12

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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

SHEET NO. S-153

TOTAL SHEETS 219

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REINFORCING BAR SCHEDULE FOR UNIT 22

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	1,928	6	STR	42'-1"	121,867
B1	178	5	STR	60'-0"	11,139
B2	178	5	STR	34'-9"	6,451
B3	356	5	STR	33'-9"	12,532
B4	267	6	STR	60'-0"	24,062
B5	192	7	STR	40'-0"	15,698
B6	108	7	STR	13'-6"	2,980
K3	6	6	STR	42'-1"	379
K4	36	4	STR	6'-11"	166
K5	18	4	STR	9'-6"	114
K6	72	4	STR	10'-4"	497
K7	21	4	STR	34'-0"	477
K11	8	8	①	21'-2"	452
K12	8	8	②	14'-1"	301
U1	72	4	①	16'-9"	806
U2	18	4	④	11'-1"	133
G1	20	5	③	3'-8"	76
S1	66	5	⑤	5'-11"	407
S2	88	4	④	4'-5"	260
S3	504	4	⑥	2'-10"	954
STAINLESS STEEL REINFORCING (LBS)					199,751

REINFORCING BAR SCHEDULE FOR UNIT 23

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	2,048	6	STR	42'-1"	129,452
B1	212	5	STR	60'-0"	13,267
B2	106	5	STR	34'-4"	3,796
B3	424	5	STR	33'-3"	14,704
B4	276	6	STR	60'-0"	24,873
B5	210	7	STR	40'-0"	17,170
B6	84	7	STR	13'-6"	2,318
B7	42	7	STR	23'-6"	2,017
B8	106	5	STR	24'-4"	2,690
K1	8	8	①	22'-8"	484
K2	8	8	②	13'-0"	278
K3	6	6	STR	42'-1"	379
K4	36	4	STR	8'-1"	194
K5	18	4	STR	11'-0"	132
K6	72	4	STR	11'-10"	569
K7	21	4	STR	38'-7"	541
U1	81	4	①	16'-9"	906
U2	18	4	④	11'-1"	133
G1	20	5	③	3'-8"	76
S1	72	5	⑤	5'-11"	444
S2	88	4	④	4'-5"	260
S3	558	4	⑥	2'-10"	1,056
STAINLESS STEEL REINFORCING (LBS)					215,739

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			

GROOVING BRIDGE FLOORS

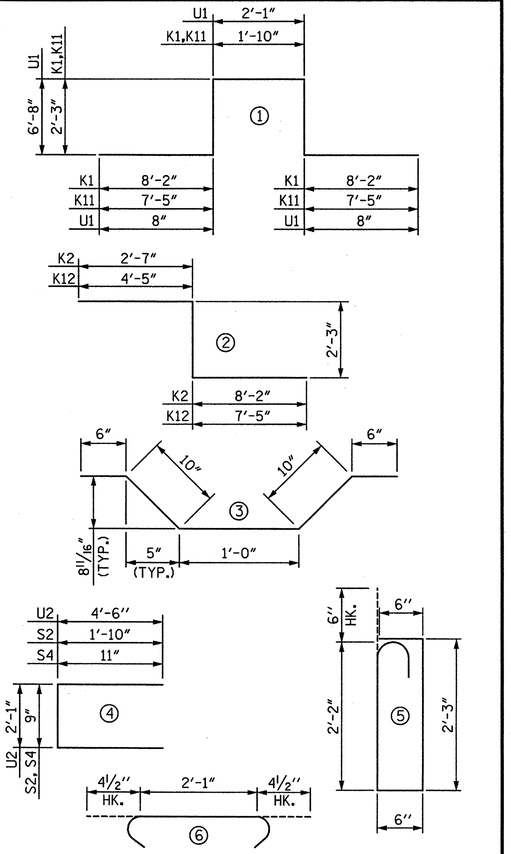
APPROACH SLABS	1754.4	SQ.FT.
BRIDGE DECK	411,808.6	SQ.FT.
TOTAL	413,563.0	SQ.FT.

SUPERSTRUCTURE BILL OF MATERIAL

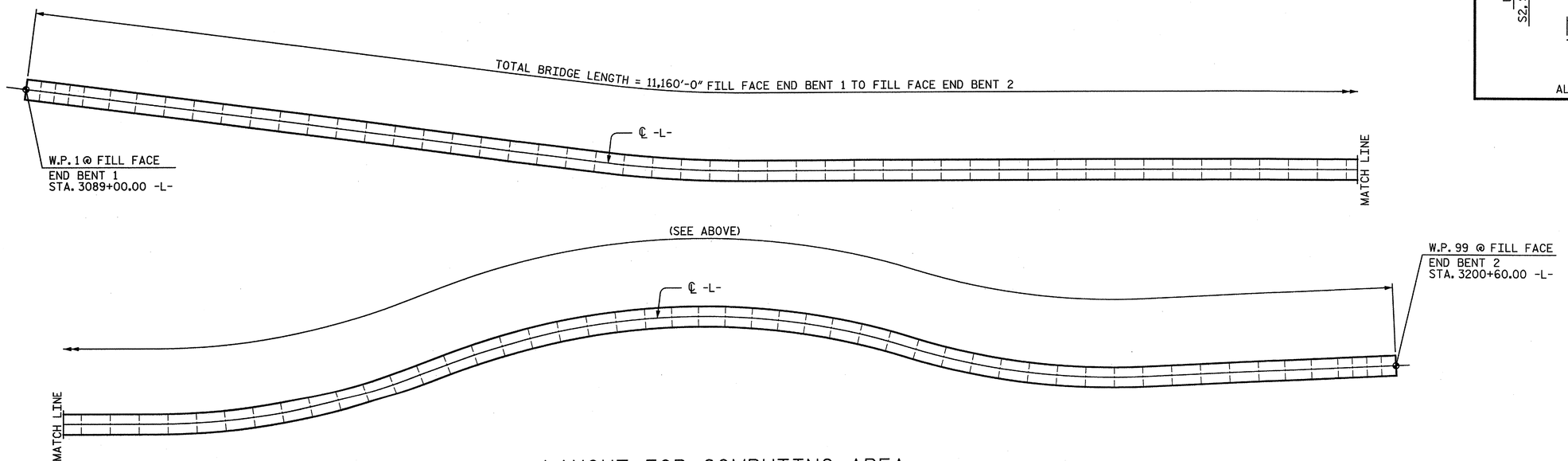
UNIT	CLASS AA CONCRETE	STAINLESS STEEL REINFORCING	REINF. CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS
	(CU. YDS.)	(LBS.)	(SQ. FT.)	(SQ. FT.)
1				2,129.8
2				2,196.8
3				2,196.8
4				2,194.6
5A	176.3	44,162	4,684.2	4,019.1
5B	176.8	44,402	4,684.2	4,019.1
6	1,022.3	276,739	25,550.0	22,153.7
7	1,022.3	276,739	25,550.0	22,153.7
8	1,022.3	276,739	25,550.0	22,153.7
9	1,029.0	281,269	25,725.0	22,328.5
10	1,025.2	279,920	25,625.0	22,228.5
11	1,022.3	276,739	25,550.0	22,153.7
12	1,022.3	276,739	25,550.0	22,153.7
13	1,022.3	276,739	25,550.0	22,153.7
14	1,022.3	276,739	25,550.0	22,153.7
15	1,045.3	252,034	25,550.0	22,153.7
16	1,045.3	252,034	25,550.0	22,153.7
17	1,045.3	251,908	25,550.0	22,153.7
18	817.4	195,663	20,014.2	17,343.7
19	769.1	185,745	18,736.7	16,233.7
20	1,013.1	245,032	24,698.3	21,413.7
21	1,045.3	252,160	25,550.0	22,153.7
22	833.5	199,751	20,440.0	17,713.7
23	799.5	215,739	20,014.2	17,343.7
24A	176.8	44,402	4,684.2	4,019.1
24B	176.3	44,162	4,684.2	4,019.1
25				2,194.6
26				2,196.8
27				2,196.8
28				2,129.8
TOTAL*	18,330.2	4,725,556	455,040.0	411,808.6

*QUANTITIES FOR CONCRETE PARAPET ARE NOT INCLUDED

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 455,040.0)

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL

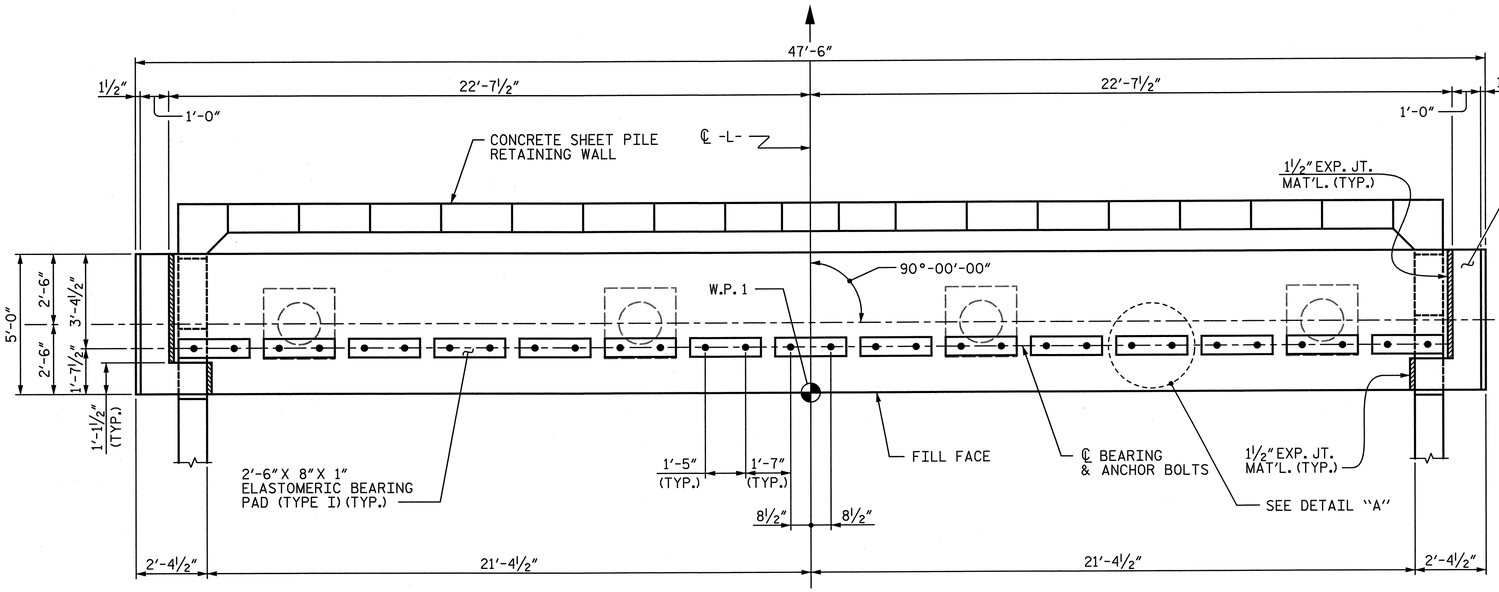
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY
10-4-12

DRAWN BY : ACA DATE : 4-12
CHECKED BY : AJP DATE : 4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

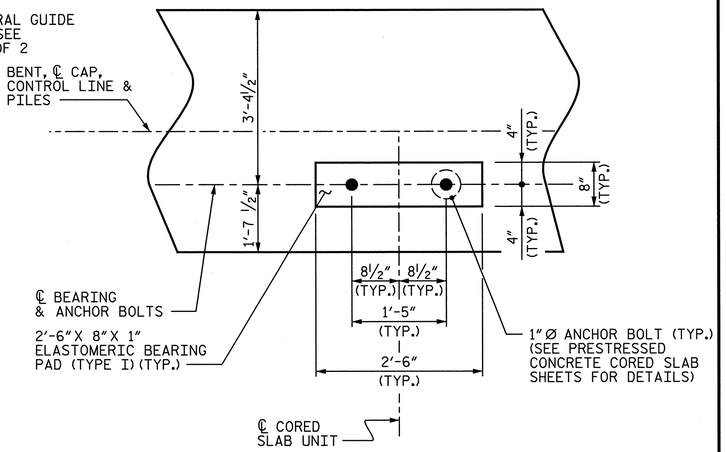
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-154
1			3			TOTAL SHEETS
2			4			219

10/4/2012 12:23:39 PM R:\Structures\usta\I154 Superstructure BOM Sheet 2 of 2.dgn



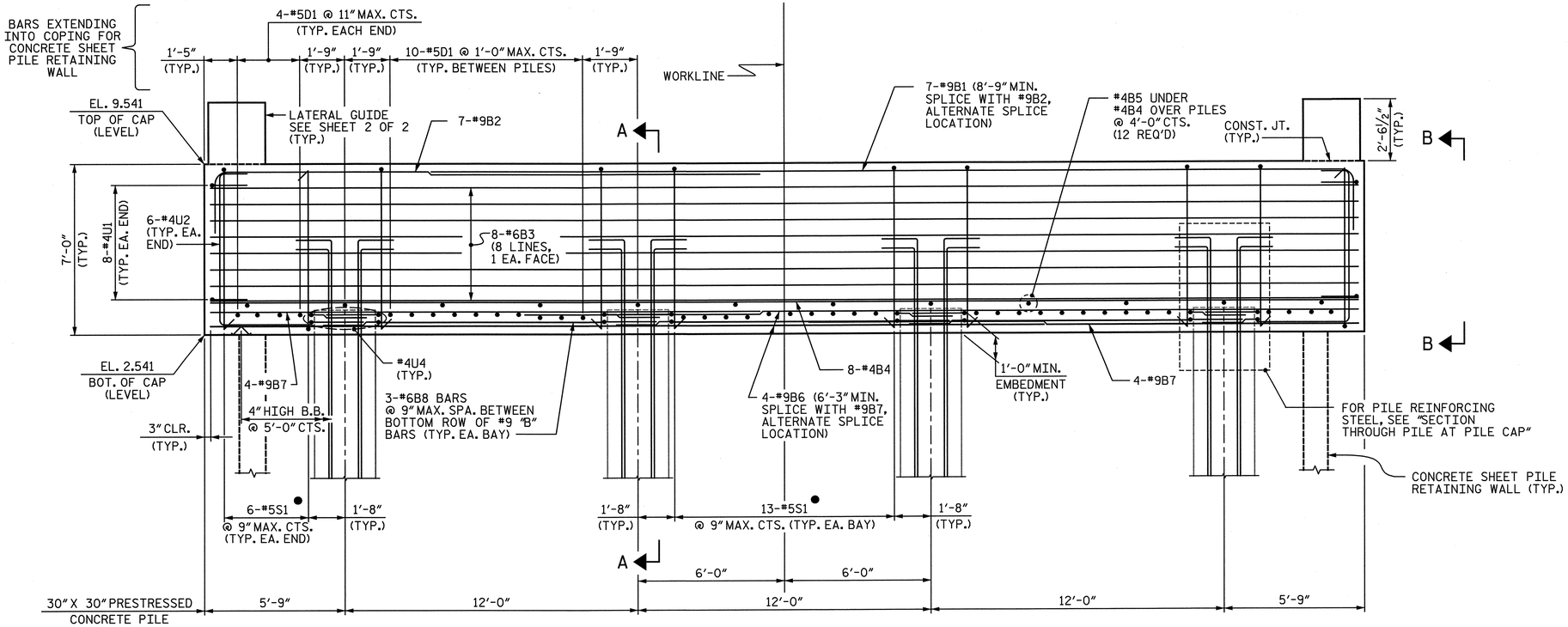
PLAN

(COPING FOR CONCRETE SHEET PILE RETAINING WALL NOT SHOWN FOR CLARITY)



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)



● INVERT ALTERNATE STIRRUPS.

ELEVATION

(FOR SECTION DETAILS, SEE SHEET 2 OF 2)

NOTES:

1. STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
2. THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.
3. THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.
4. THE CONTRACTOR HAS THE OPTION TO USE 36" X 36" PRESTRESSED CONCRETE PILES IN LIEU OF 30" X 30" PRESTRESSED CONCRETE PILES. NO ADDITIONAL PAYMENT WILL BE MADE FOR SUBSTITUTING 36" X 36" PRESTRESSED CONCRETE PILES FOR 30" X 30" PRESTRESSED CONCRETE PILES.
5. #5D1 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR STIRRUPS.
6. FOR RETAINING WALL DETAILS, SEE CONCRETE SHEET PILE RETAINING WALL SHEETS.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE END BENT 1

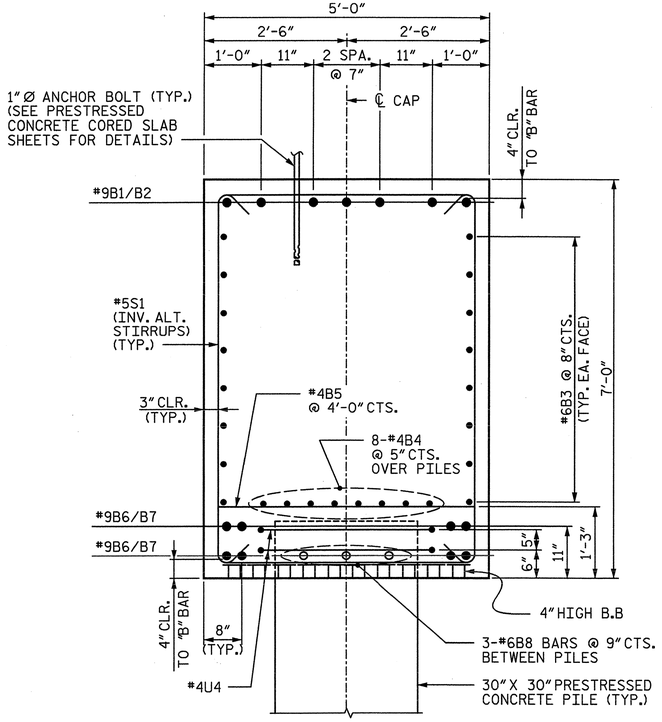
NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
5-30-13

DRAWN BY : VMW DATE : 3-12
CHECKED BY : TRL DATE : 3-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

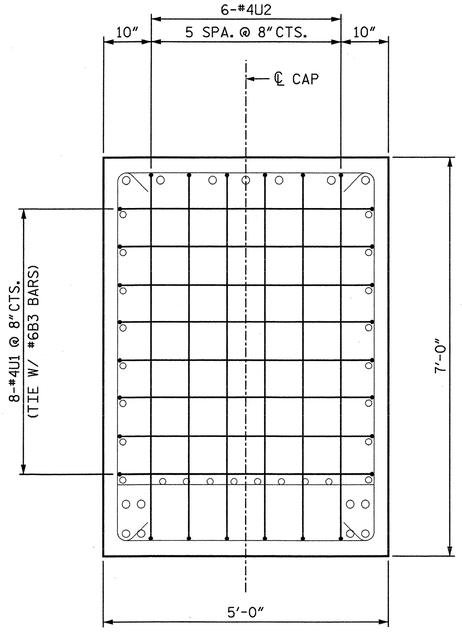
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-155
1			3			TOTAL SHEETS
2			4			219

5/30/2013 3:39:51PM R:\Structures\usta\U155) End Bent 1Sht 1of 2.dgn



SECTION A-A

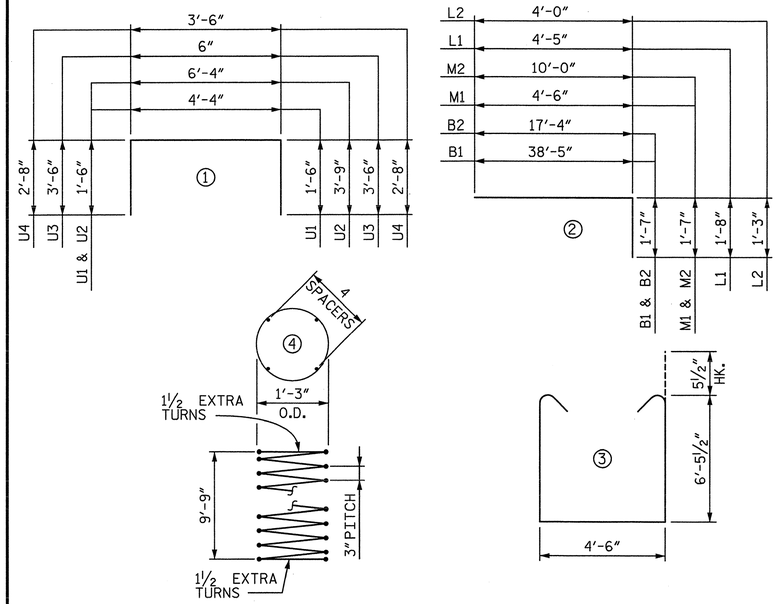
(PILE REINFORCING STEEL NOT SHOWN FOR CLARITY)
(#5D1 NOT SHOWN FOR CLARITY, SEE D1 DETAIL FOR BARS EXTENDING INTO COPING FOR CONCRETE SHEET PILE RETAINING WALL)



END VIEW B-B

(TYPICAL EACH ENDS)

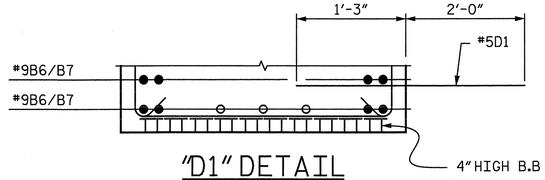
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#9	②	40'-0"	952
B2	7	#9	②	18'-11"	450
B3	16	#6	STR.	47'-0"	1130
B4	8	#4	STR.	47'-0"	251
B5	12	#4	STR.	4'-6"	36
B6	8	#9	STR.	32'-0"	870
B7	8	#9	STR.	21'-3"	578
B8	9	#6	STR.	8'-6"	115
D1	38	#5	STR.	3'-3"	129
L1	6	#4	②	6'-1"	25
L2	6	#4	②	5'-3"	21
M1	16	#9	②	6'-1"	331
M2	32	#9	②	11'-7"	1260
S1	51	#5	③	18'-4"	975
U1	16	#4	①	7'-4"	78
U2	12	#4	①	11'-7"	93
U3	14	#4	①	7'-6"	71
U4	16	#4	①	8'-10"	94
SP-1	4	*	④	159'-9"	427



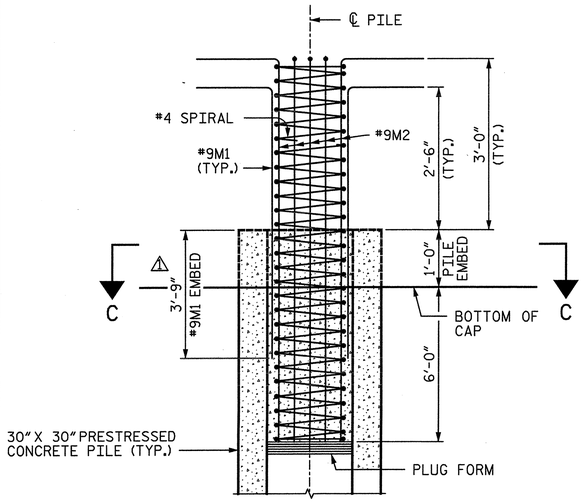
"D1" DETAIL

QUANTITIES

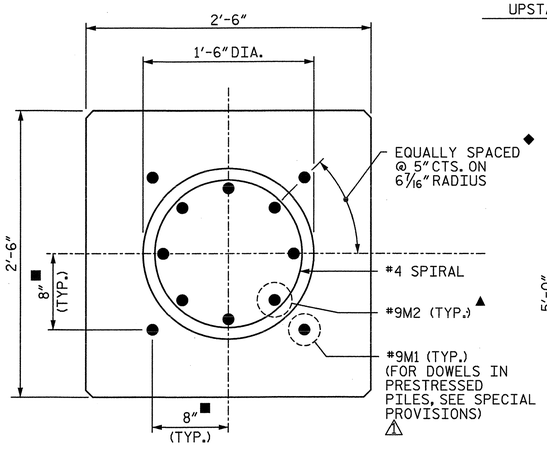
			END BENT 1
STAINLESS STEEL REINFORCING		LBS.	7459
SPIRAL STAINLESS STEEL REINFORCING		LBS.	427
CLASS AA CONCRETE :	POUR 1 - CAP	CU. YDS.	60.7
	POUR 2 - LATERAL GUIDES	CU. YDS.	1.2
	TOTAL	CU. YDS.	61.9
30" X 30" PRESTRESSED CONCRETE PILES		NO.	4
		FT.	200

* THE SP-1 SPIRAL STAINLESS STEEL REINFORCING SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

⚠ ADDED NOTE AND MODIFIED EMBEDMENT FOR DOWELS IN PRESTRESSED PILES



SECTION THROUGH PILE AT PILE CAP



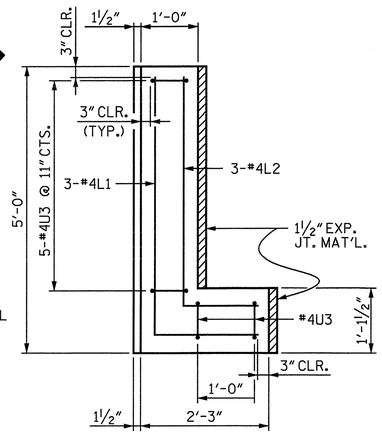
SECTION C-C

▲ ROTATE #9M2 BARS AS NECESSARY TO MAINTAIN 3" MIN. CLR. DISTANCE TO FACE OF CAP

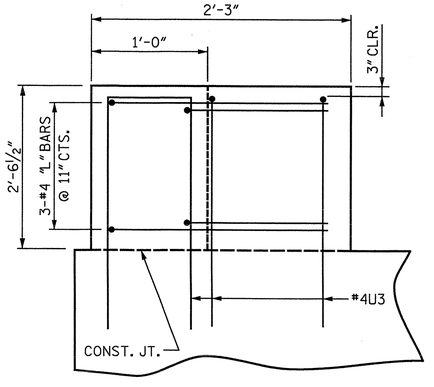
■ FOR 36"X36" PILE, INCREASE 8" DIMENSION TO 10"

◆ FOR 36"X36" PILE, #9M2 BARS SHALL BE EQUALLY SPACED @ 6¼" CTS. ON 7 15/16" RADIUS

UPSTATION



PLAN



ELEVATION

LATERAL GUIDE DETAILS

(LEFT LATERAL GUIDE SHOWN, RIGHT SIDE SIMILAR)

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 11-13-13

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE END BENT 1 DETAILS AND BILL OF MATERIAL

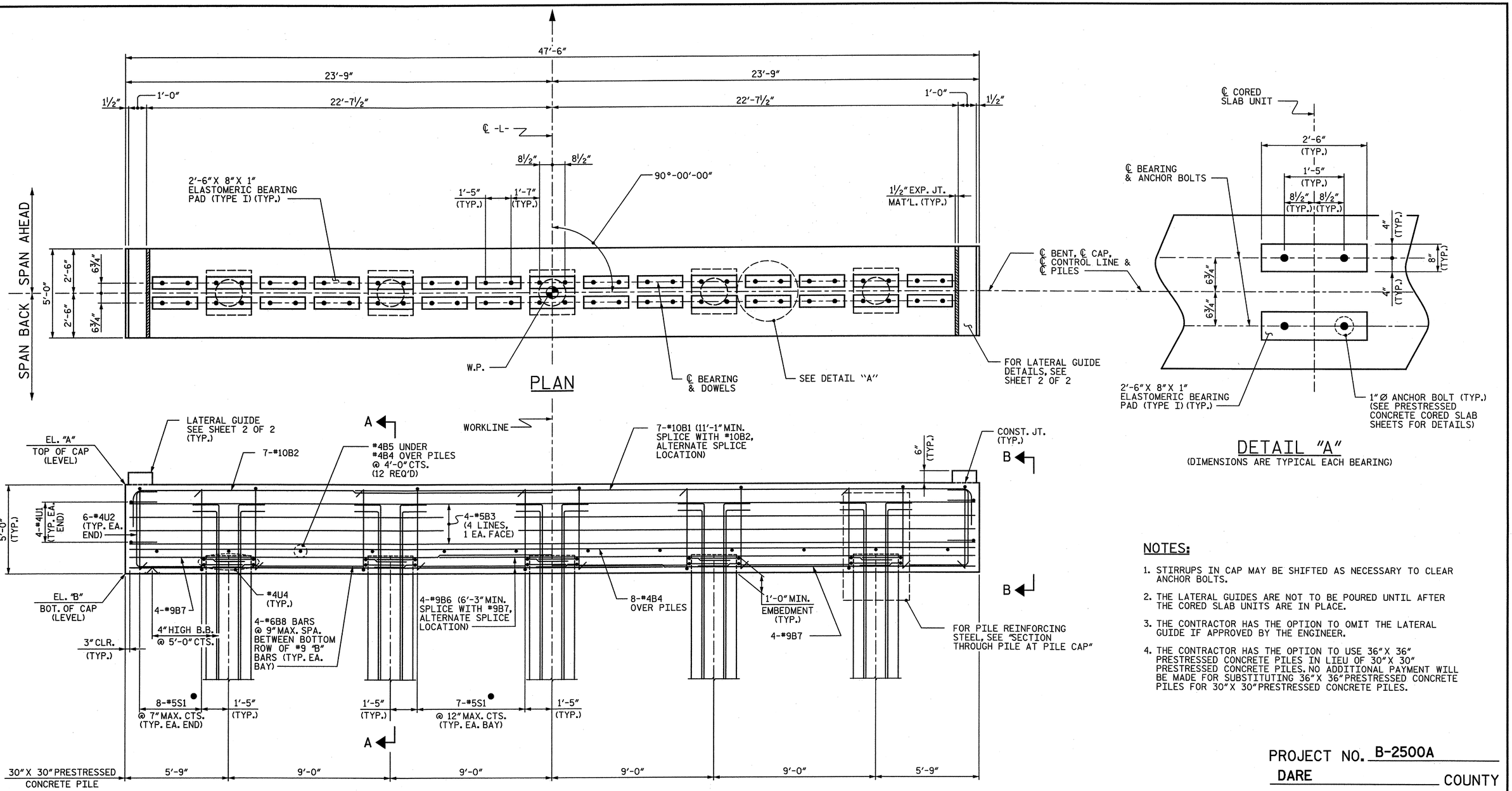
DRAWN BY : VMW DATE : 3-12
CHECKED BY : TRL DATE : 3-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1	STV	11-13	3		
2			4		

SHEET NO. S-156
TOTAL SHEETS 219

11/13/2013 1:39:15 PM R:\Structures\Updated & Sealed Plans II-II-13\(156) End Bent 1Sht 2 of 2.dgn



● INVERT ALTERNATE STIRRUPS.

ELEVATION

(FOR SECTION DETAILS, SEE SHEET 2 OF 2)

NOTES:

1. STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
2. THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.
3. THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.
4. THE CONTRACTOR HAS THE OPTION TO USE 36"X 36" PRESTRESSED CONCRETE PILES IN LIEU OF 30"X 30" PRESTRESSED CONCRETE PILES. NO ADDITIONAL PAYMENT WILL BE MADE FOR SUBSTITUTING 36"X 36" PRESTRESSED CONCRETE PILES FOR 30"X 30" PRESTRESSED CONCRETE PILES.

TABLE A

ELEVATIONS

	BENT 1	BENT 2	BENT 3	BENT 95	BENT 96	BENT 97
"A"	11.563	13.618	15.454	16.578	14.881	12.945
"B"	6.563	8.618	10.454	11.578	9.881	7.945

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENTS 1-3 & 95-97 PLAN AND ELEVATION

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-157
1			3			TOTAL SHEETS
2			4			219

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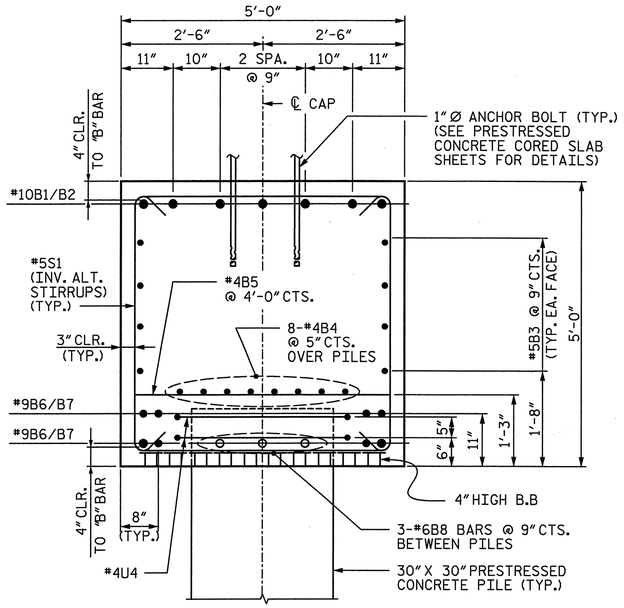
Charlotte, NC 28208
NC License No. F-0991

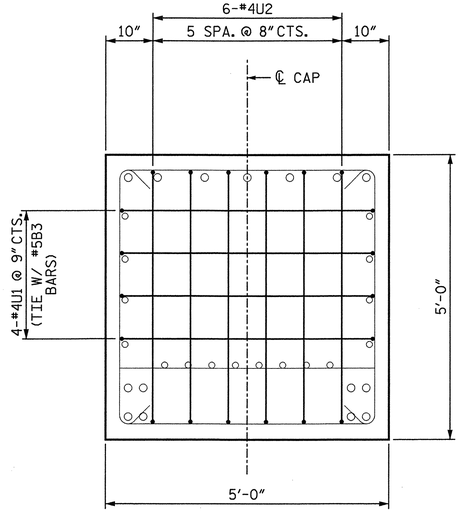
DRAWN BY : VMW DATE : 3-12
CHECKED BY : SB DATE : 3-12

10/4/2012 12:23:29 PM R:\Structures\usto\(157) Bents 1-3, 95-97 Sht 1of 2.dgn



SECTION A-A

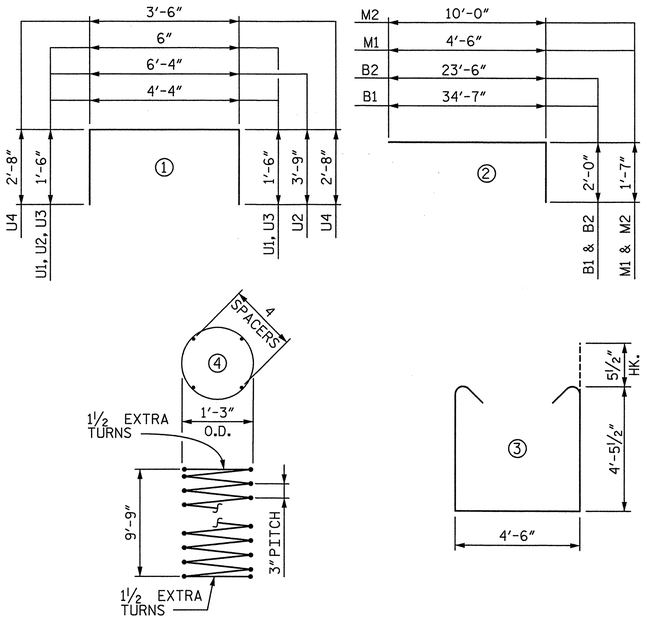
(PILE REINFORCING STEEL NOT SHOWN FOR CLARITY)



END VIEW B-B

(TYPICAL BOTH ENDS)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR ONE BENT (6 REQUIRED)

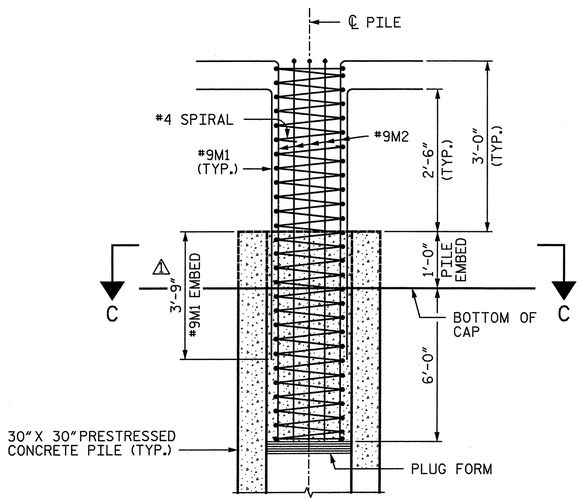
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#10	②	36'-7"	1102
B2	7	#10	②	25'-6"	768
B3	8	#5	STR.	47'-0"	392
B4	8	#4	STR.	47'-0"	251
B5	12	#4	STR.	4'-6"	36
B6	8	#9	STR.	29'-9"	809
B7	8	#9	STR.	23'-6"	639
B8	12	#6	STR.	5'-6"	99
M1	20	#9	②	6'-1"	414
M2	40	#9	②	11'-7"	1575
S1	44	#5	③	14'-4"	658
U1	8	#4	①	7'-4"	39
U2	12	#4	①	9'-7"	77
U3	20	#4	①	3'-6"	47
U4	20	#4	①	8'-10"	118
SP-1	5	*	④	159'-9"	534

QUANTITIES

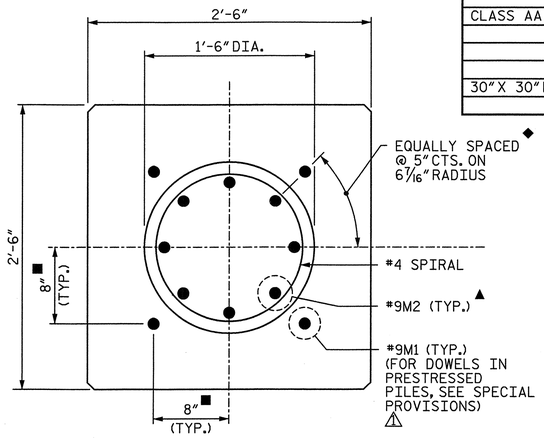
		BENT 1	BENT 2	BENT 3	BENT 95	BENT 96	BENT 97
STAINLESS STEEL REINFORCING	LBS.	7024	7024	7024	7024	7024	7024
SPIRAL STAINLESS STEEL REINFORCING	LBS.	534	534	534	534	534	534
CLASS AA CONCRETE : POUR 1 - CAP	CU. YDS.	45.1	45.1	45.1	45.1	45.1	45.1
POUR 2 - LATERAL GUIDES	CU. YDS.	0.1	0.1	0.1	0.1	0.1	0.1
TOTAL	CU. YDS.	45.2	45.2	45.2	45.2	45.2	45.2
30" X 30" PRESTRESSED CONCRETE PILES	NO.	5	5	5	5	5	5
	FT.	425	425	425	425	425	425

*THE SP-1 SPIRAL STAINLESS STEEL REINFORCING SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

⚠ ADDED NOTE AND MODIFIED EMBEDMENT FOR DOWELS IN PRESTRESSED PILES



SECTION THROUGH PILE AT PILE CAP

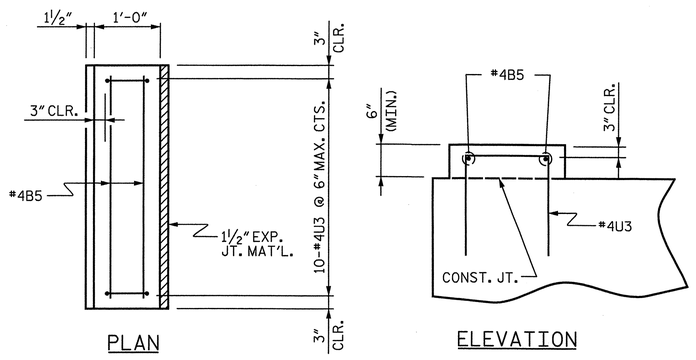


SECTION C-C

▲ ROTATE #9M2 BARS AS NECESSARY TO MAINTAIN 3" MIN. CLR. DISTANCE TO FACE OF CAP

■ FOR 36"X36" PILE, INCREASE 8" DIMENSION TO 10"

◆ FOR 36"X36" PILE, #9M2 BARS SHALL BE EQUALLY SPACED @ 6¼" CTS. ON 7 15/16" RADIUS



LATERAL GUIDE DETAILS

(LEFT LATERAL GUIDE SHOWN, RIGHT SIDE SIMILAR)

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENTS 1-3 & 95-97 DETAILS AND BILL OF MATERIALS

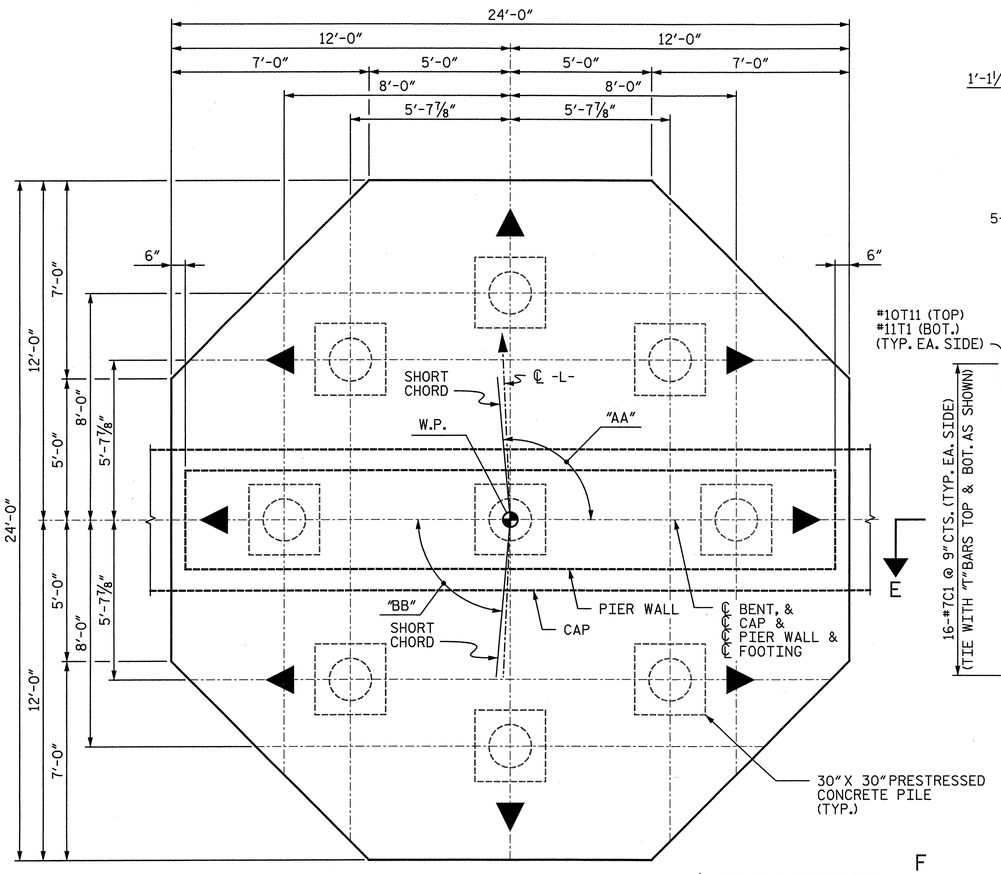
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-158
1	STV	11-13	3			TOTAL SHEETS
2			4			219

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

DRAWN BY : VMW DATE : 3-12

CHECKED BY : SB DATE : 3-12

11/13/2013 1:42:00 PM R:\Structures\Updated & Sealed Plans II-II-13\I158) Bents 1-3, 95-97 Sht 2 of 2.dgn

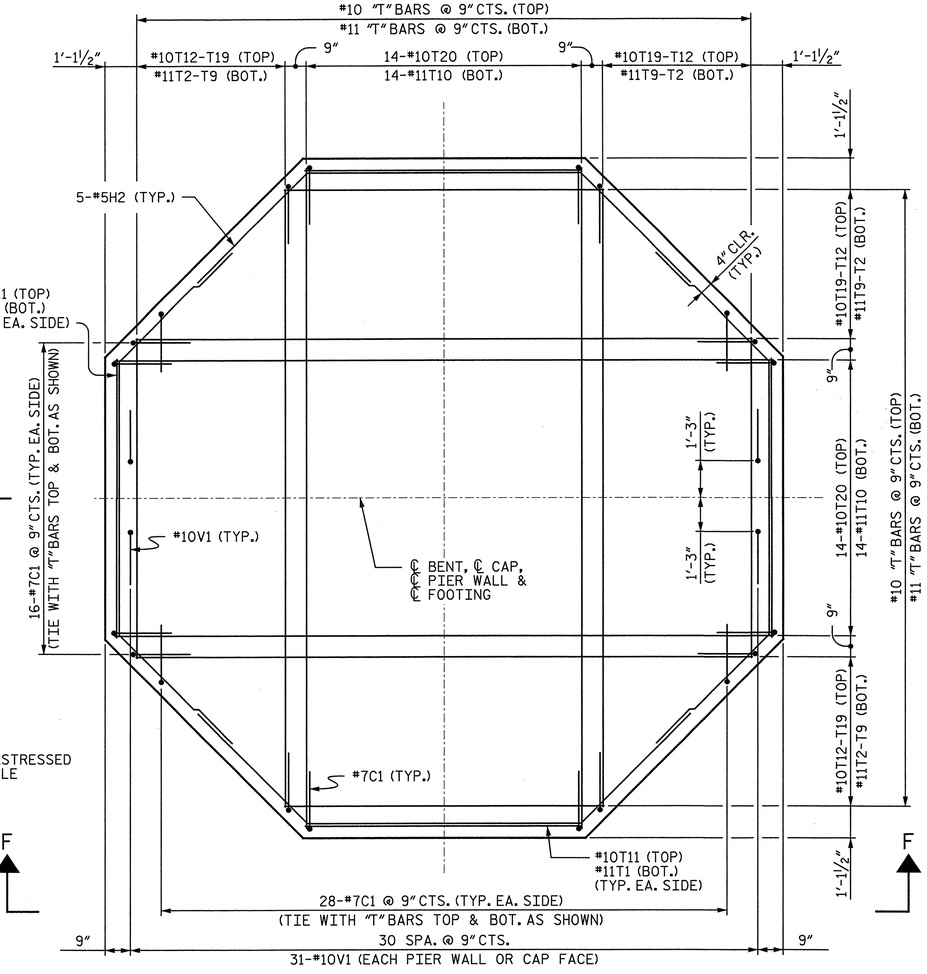


▲ DENOTES DIRECTION OF 1:12 BATTER BENTS 5-93

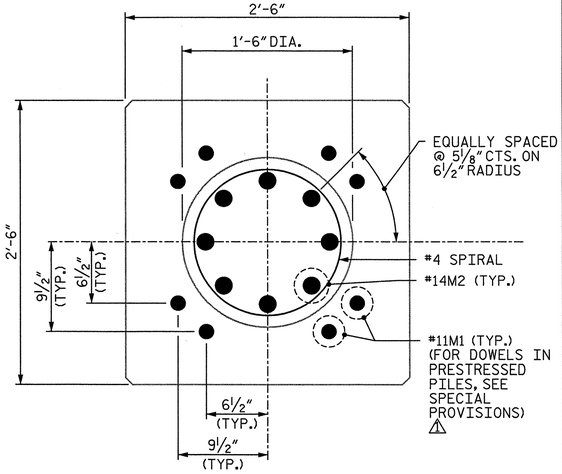
▲ DENOTES DIRECTION OF 1½:12 BATTER BENTS 4 & 94

FOOTING PLAN

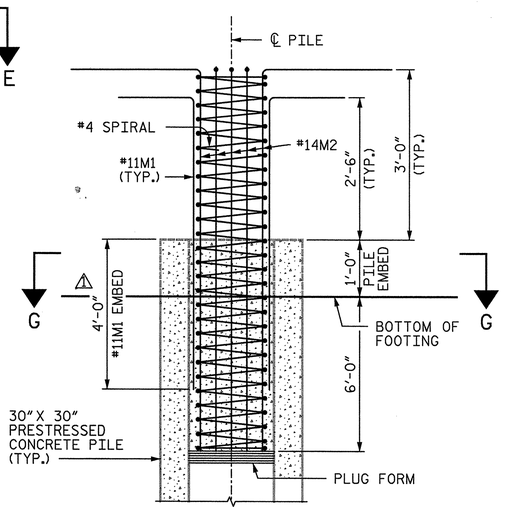
(NO PIER WALL FOR BENTS 4, 5, 91-94 ONLY)



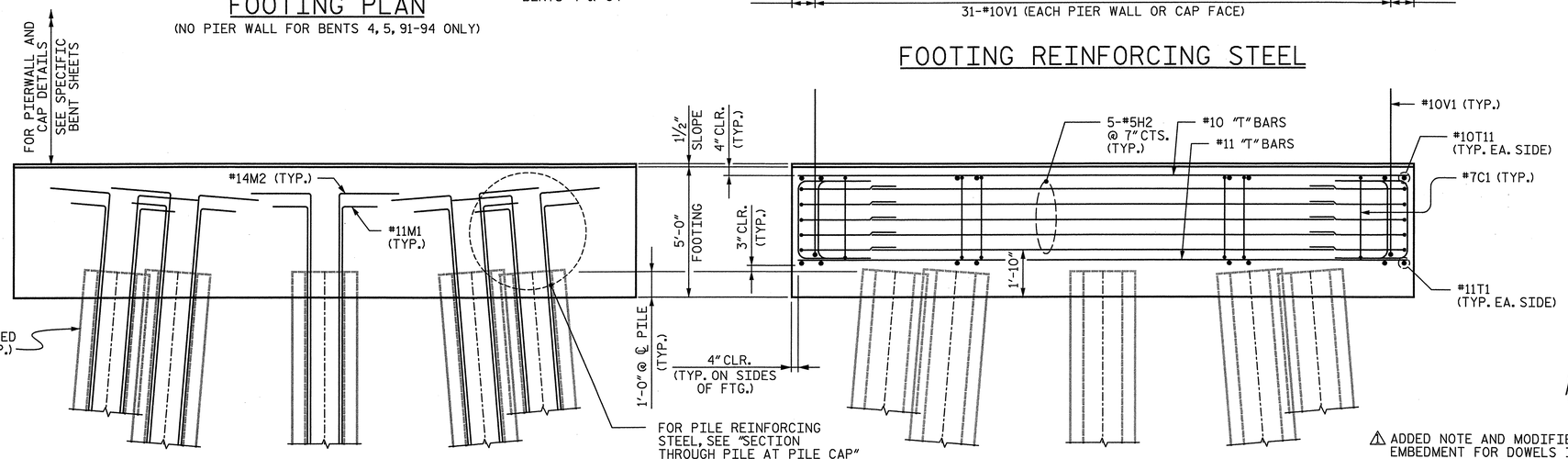
FOOTING REINFORCING STEEL



SECTION G-G



SECTION THROUGH PILE AT PILE CAP



SECTION E-E

(FOOTING AND PIER WALL REINFORCING STEEL NOT SHOWN FOR CLARITY)

END VIEW F-F

⚠ ADDED NOTE AND MODIFIED EMBEDMENT FOR DOWELS IN PRESTRESSED PILES

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 11-13-13

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE FOOTING PLAN AND DETAILS

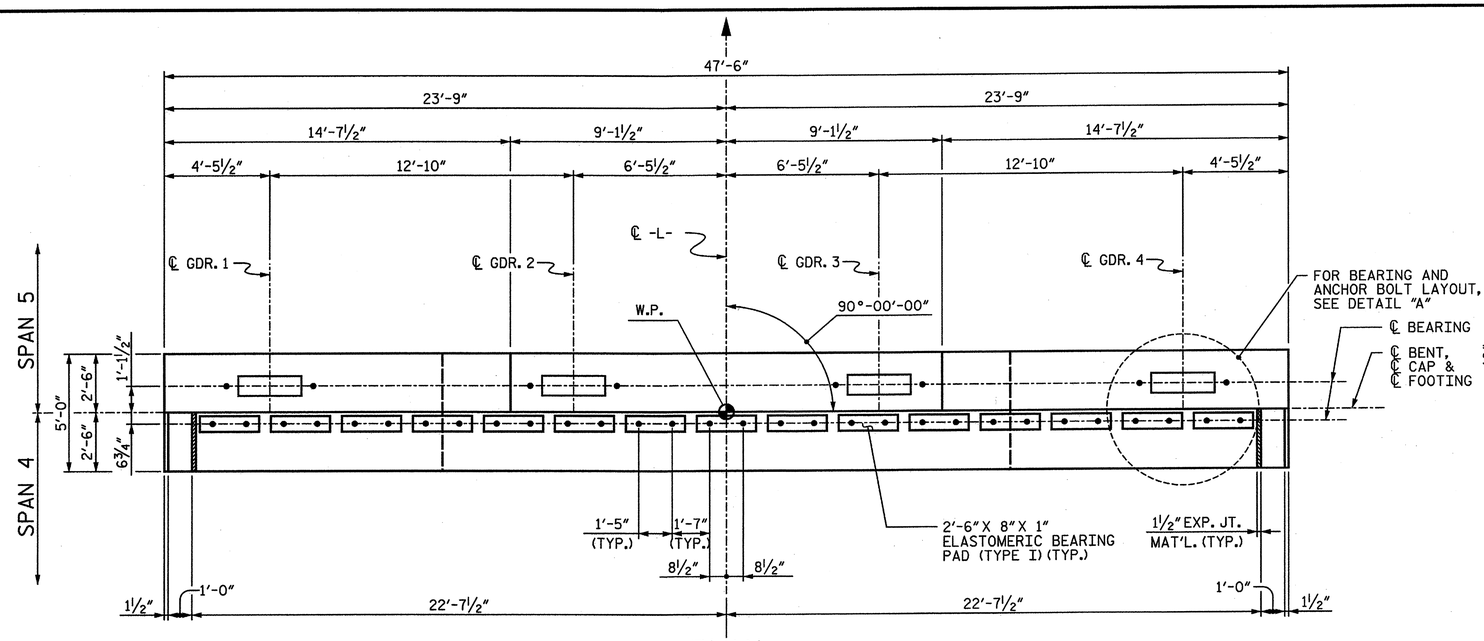
DRAWN BY : VMW DATE : 2-12

CHECKED BY : AJP DATE : 2-12

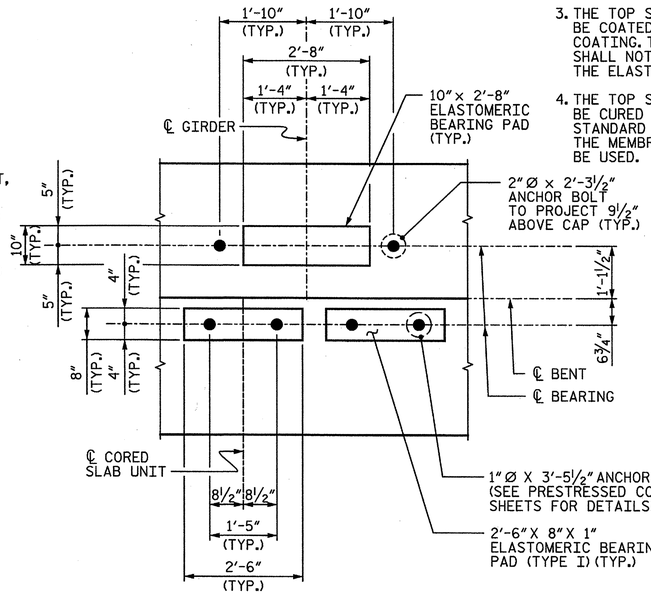
STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-159
1	STV	11-13	3			TOTAL SHEETS
2			4			219

11/13/2013 11:44:53 PM R:\Structures\Updated & Sealed Plans 11-11-13\I159) Bent Footing Sht 1of 1.dgn



PLAN



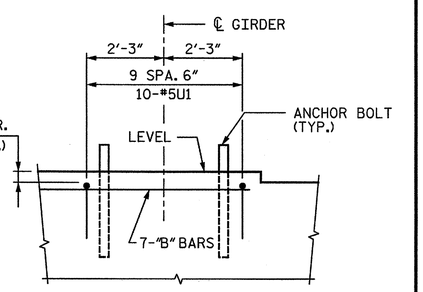
DETAIL "A"

NOTES:

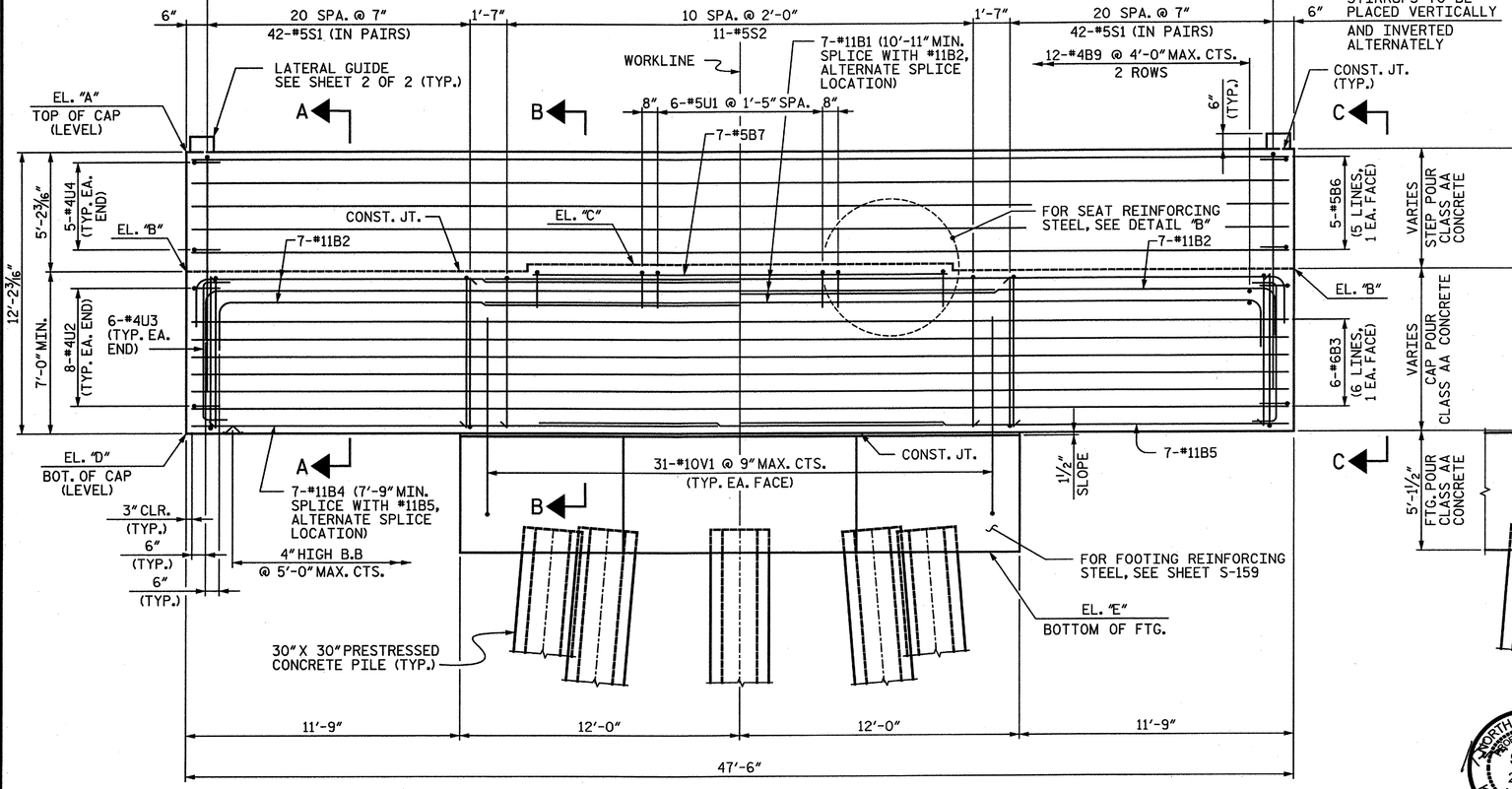
1. FOR SECTION VIEWS, SEE SHEET 2 OF 2.
2. FOR PILE AND FOOTING DETAILS, SEE SHEET S-159.
3. THE TOP SURFACE OF THE BENT CAP SHALL BE COATED WITH EPOXY PROTECTIVE COATING. THE EPOXY PROTECTIVE COATING SHALL NOT BE APPLIED TO THE AREA UNDER THE ELASTOMERIC BEARINGS.
4. THE TOP SURFACE OF THE BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND SHALL NOT BE USED.

TABLE A

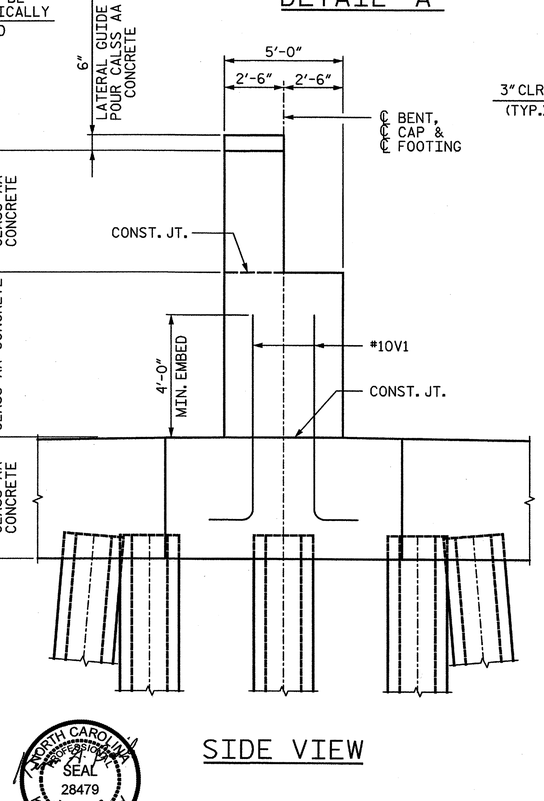
ELEVATIONS	
	BENT 4
"A"	17.052
"B"	11.872
"C"	12.193
"D"	4.872
"E"	-0.253



DETAIL "B"
(SEAT @ GIRDER 3 SHOWN, OTHER GIRDERS SIMILAR)



ELEVATION



SIDE VIEW

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT 4 PLAN AND ELEVATION

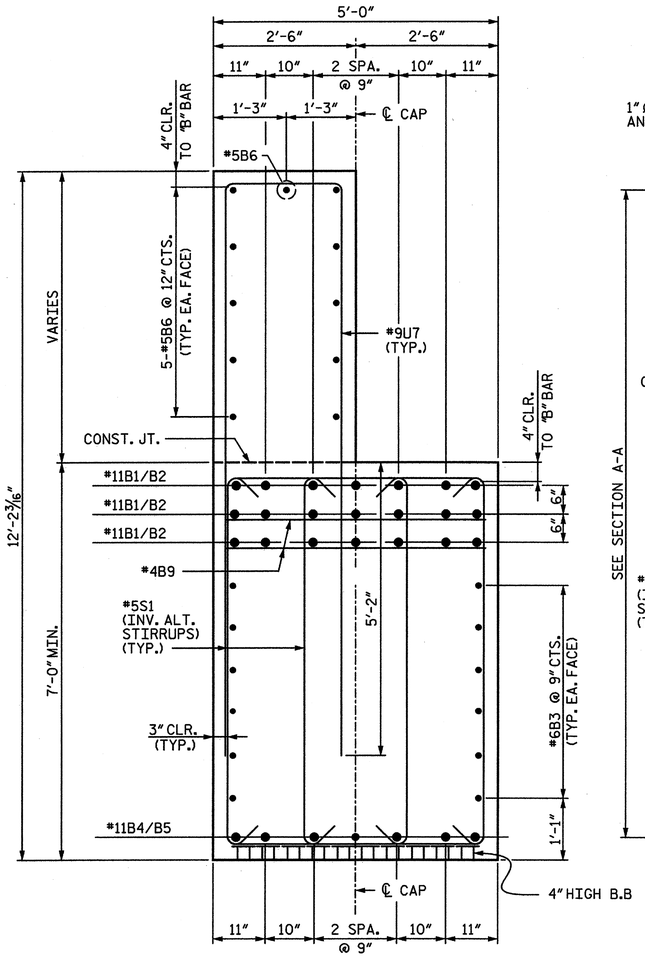
NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

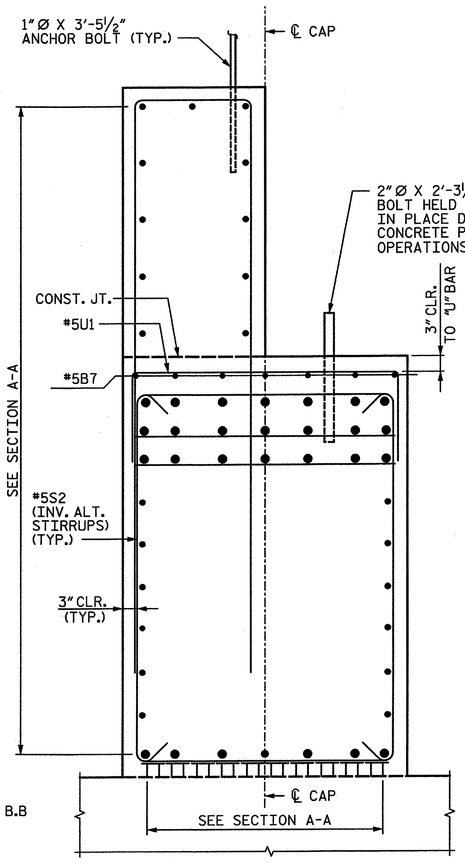
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-160
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : VMW DATE : 3-12
CHECKED BY : PEK DATE : 4-12

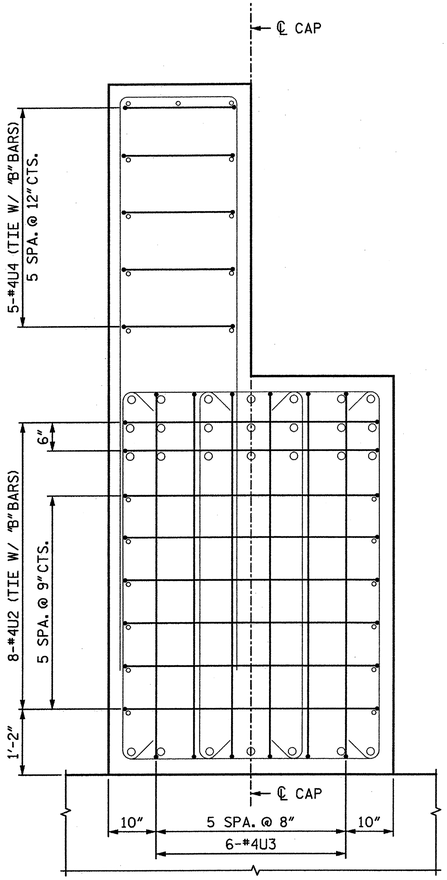
10/4/2012 12:23:21 PM R:\Structures\usta\160 Bents 4 Sht 1of 2.dgn



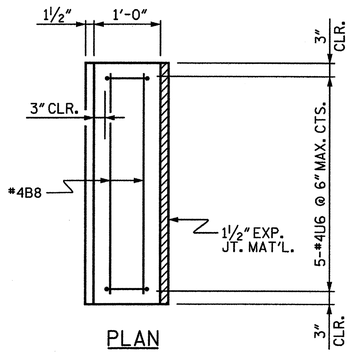
SECTION A-A



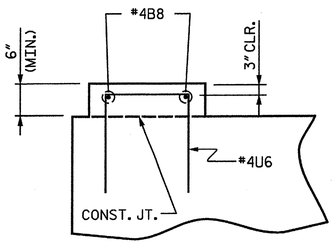
SECTION B-B



END VIEW C-C



PLAN



ELEVATION

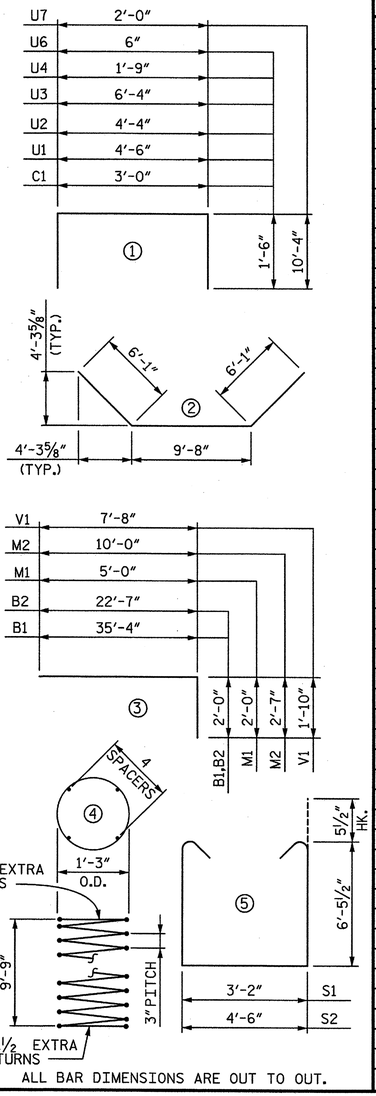
LATERAL GUIDE DETAILS

(LEFT LATERAL GUIDE SHOWN, RIGHT SIDE SIMILAR)

QUANTITIES

		BENT 4
STAINLESS STEEL REINFORCING	LBS.	43066
SPIRAL STAINLESS STEEL REINFORCING	LBS.	960
CLASS AA CONCRETE : LATERAL GUIDE POUR	CU. YDS.	0.1
STEP POUR	CU. YDS.	22.2
CAP POUR	CU. YDS.	62.7
FOOTING POUR	CU. YDS.	91.9
TOTAL	CU. YDS.	176.9
30"X 30" PRESTRESSED CONCRETE PILES	NO.	9
	FT.	945

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR BENT 4

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	21	#11	③	37'-4"	4165
B2	21	#11	③	24'-7"	2743
B3	12	#6	STR.	47'-0"	847
B4	7	#11	STR.	32'-3"	1199
B5	7	#11	STR.	22'-6"	837
B6	11	#5	STR.	47'-0"	539
B7	7	#5	STR.	17'-9"	130
B8	4	#4	STR.	1'-11"	5
B9	24	#4	STR.	4'-6"	72
C1	88	#7	①	6'-0"	1079
H2	20	#5	②	21'-10"	455
M1	72	#11	③	7'-0"	2678
M2	72	#14	③	12'-7"	6931
S1	84	#5	⑤	17'-0"	1489
S2	11	#5	⑤	18'-4"	210
T1	4	#11	STR.	9'-8"	205
T2	4	#11	STR.	11'-3"	239
T3	4	#11	STR.	12'-9"	271
T4	4	#11	STR.	14'-3"	303
T5	4	#11	STR.	15'-9"	335
T6	4	#11	STR.	17'-3"	367
T7	4	#11	STR.	18'-9"	398
T8	4	#11	STR.	20'-3"	430
T9	4	#11	STR.	21'-9"	462
T10	28	#11	STR.	23'-4"	3471
T11	4	#10	STR.	9'-8"	166
T12	4	#10	STR.	11'-3"	194
T13	4	#10	STR.	12'-9"	219
T14	4	#10	STR.	14'-3"	245
T15	4	#10	STR.	15'-9"	271
T16	4	#10	STR.	17'-3"	297
T17	4	#10	STR.	18'-9"	323
T18	4	#10	STR.	20'-3"	349
T19	4	#10	STR.	21'-9"	374
T20	28	#10	STR.	23'-4"	2811
U1	46	#5	①	7'-6"	360
U2	16	#4	①	7'-4"	78
U3	12	#4	①	9'-4"	75
U4	10	#4	①	4'-9"	32
U6	10	#4	①	3'-6"	23
U7	63	#9	①	22'-8"	4855
V1	62	#10	③	9'-6"	2534
SP-1	9	*	④	159'-9"	960

* THE SP-1 SPIRAL STAINLESS STEEL REINFORCING SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT 4 DETAILS AND BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

DRAWN BY : VMW DATE : 3-12
CHECKED BY : PEK DATE : 4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St. Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			219

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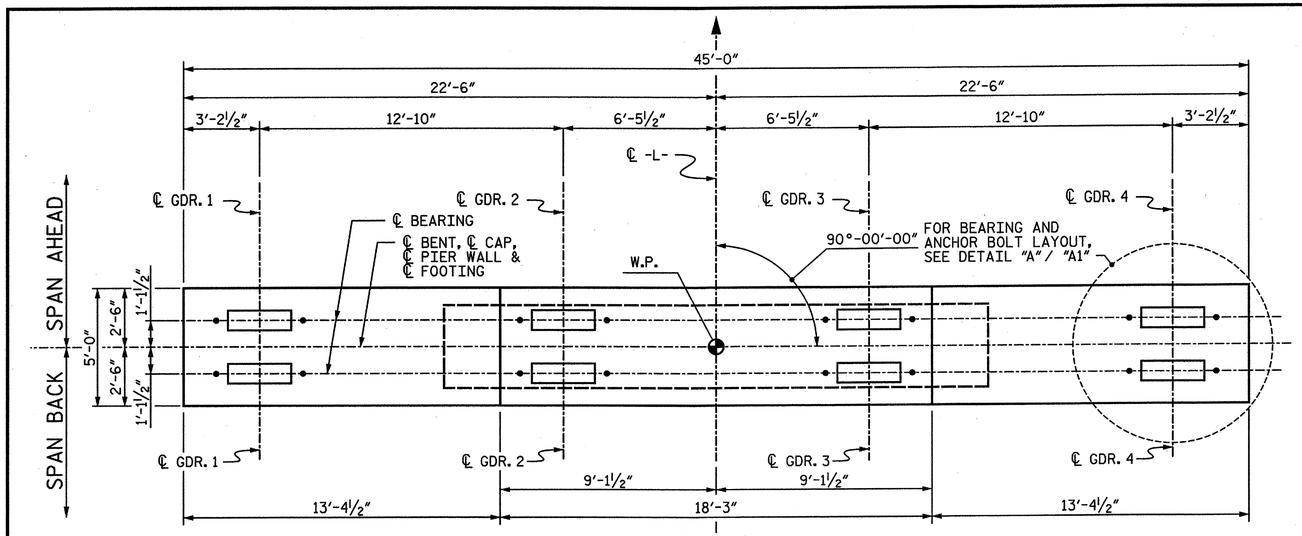
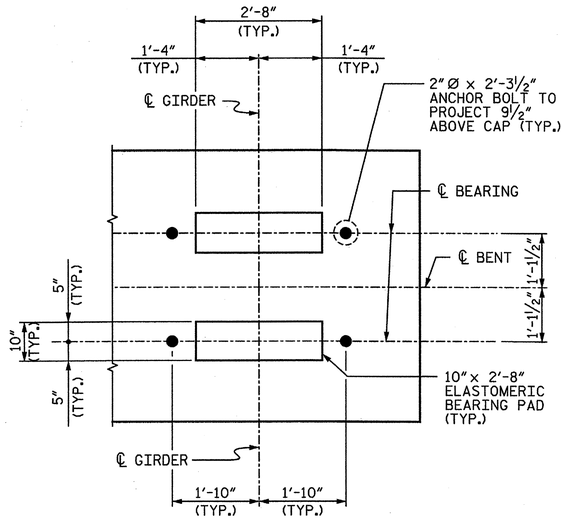


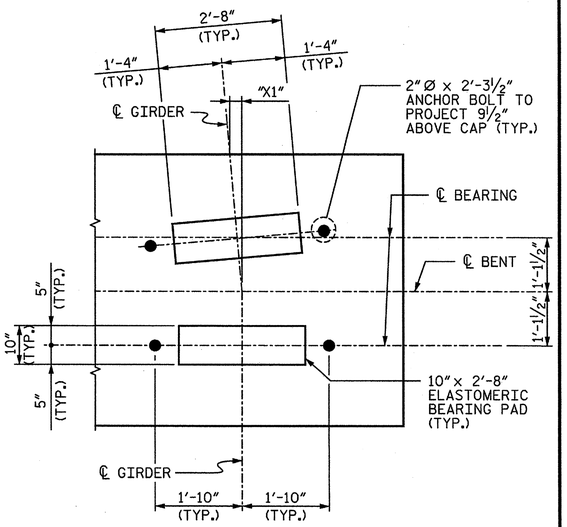
PLAN

(BENTS 5-20, 29-50 & 89-93 SHOWN, BENT 21 SIMILAR)



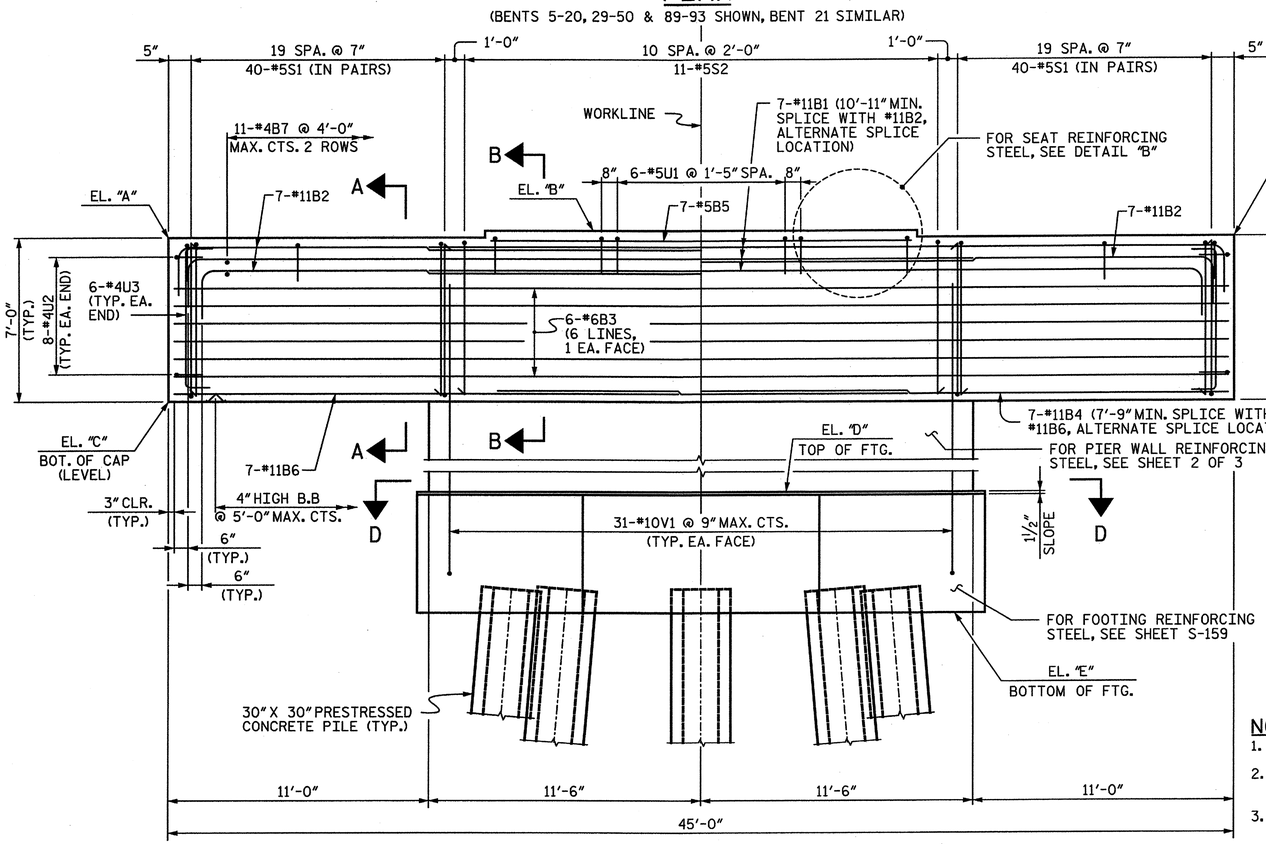
DETAIL "A"

(TYPICAL EACH SEAT BENTS 5-20, 29-50 & 89-93)

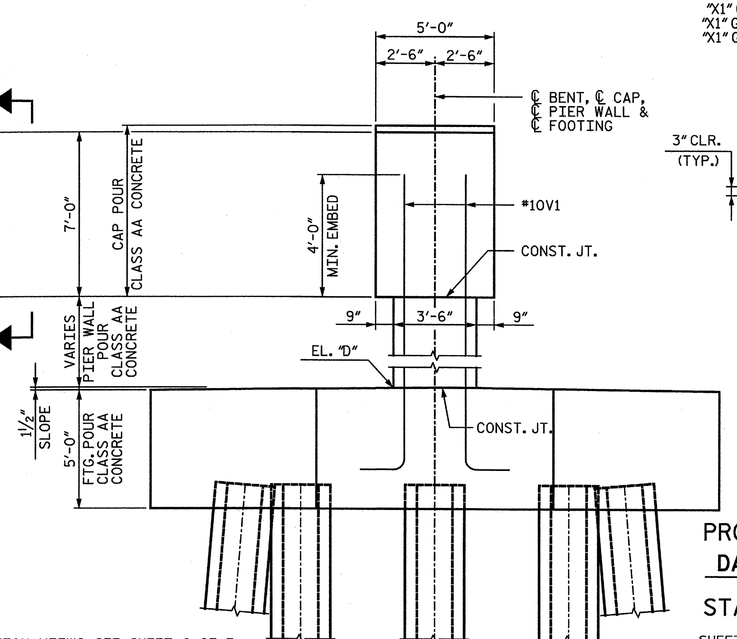


DETAIL "A1"

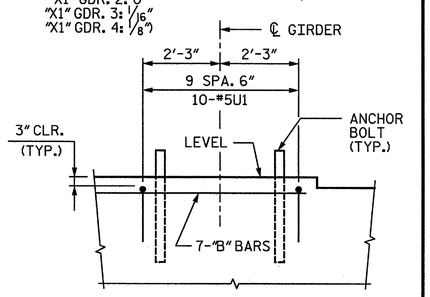
(TYPICAL EACH SEAT BENT 21)
("X1" GDR. 1: 0"
"X1" GDR. 2: 0"
"X1" GDR. 3: 1/16"
"X1" GDR. 4: 1/8")



ELEVATION



SIDE VIEW



DETAIL "B"

(SEAT @ GIRDER 3 SHOWN, GIRDERS 1, 2 & 4 SIMILAR)

NOTES:

1. FOR SECTION VIEWS, SEE SHEET 2 OF 3.
2. FOR ELEVATIONS, DIMENSIONS AND ANGLES TABLE, SEE SHEET 3 OF 3.
3. FOR PILE AND FOOTING DETAILS, SEE SHEET S-159.
4. FOR BENTS 5, 6, 11, 16, 21, 31, 36, 41, 46, 92 & 93, THE TOP SURFACE OF THE BENT CAP SHALL BE COATED WITH EPOXY PROTECTIVE COATING. THE EPOXY PROTECTIVE COATING SHALL NOT BE APPLIED TO THE AREA UNDER THE ELASTOMERIC BEARINGS.
5. FOR BENTS 5, 6, 11, 16, 21, 31, 36, 41, 46, 92 & 93, THE TOP SURFACE OF THE BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND SHALL NOT BE USED.

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENTS 5-21, 29-50 & 89-93 PLAN AND ELEVATION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-162
1			3			TOTAL SHEETS
2			4			219

STV / Ralph Whitehead Associates, Inc.
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Charlotte, NC 28208
NC License No. F-0991

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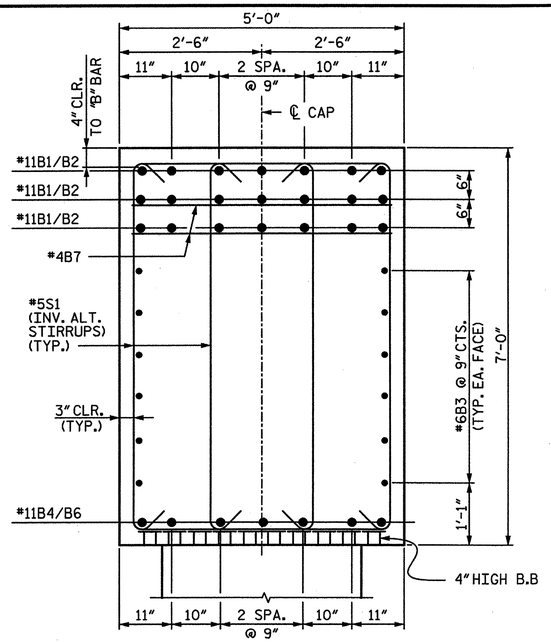
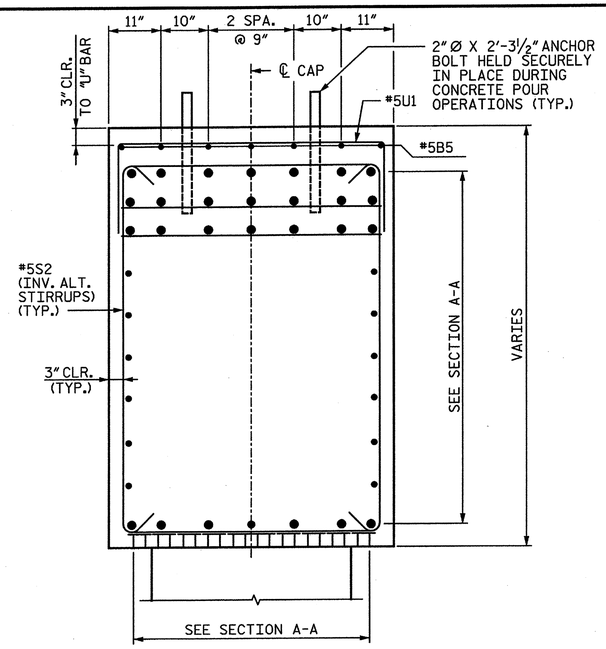
CHECKED BY : SB DATE : 3-12

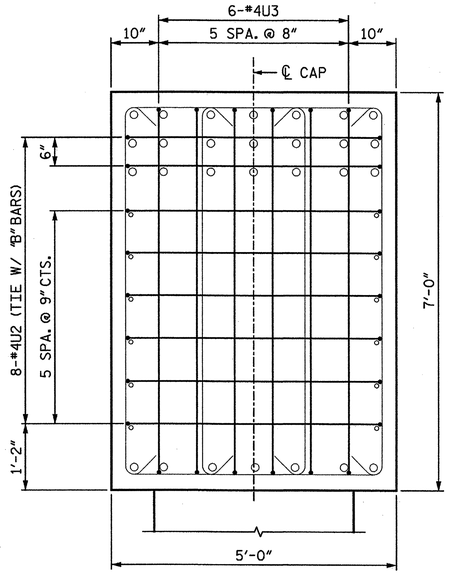
10/4/2012 12:23:16 PM R:\Structures\ustq\U162) Bents 5-21, 29-50, 89-93 Sht 1of 3.dgn



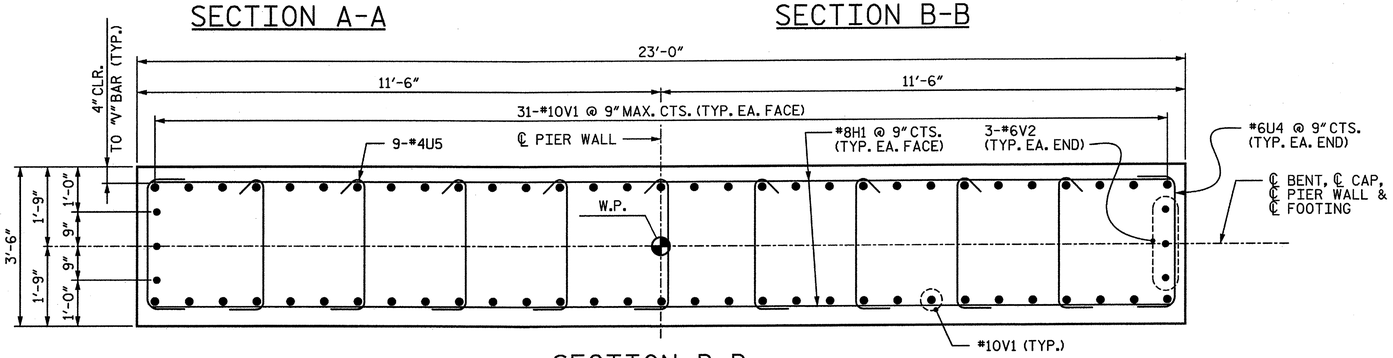
SECTION A-A



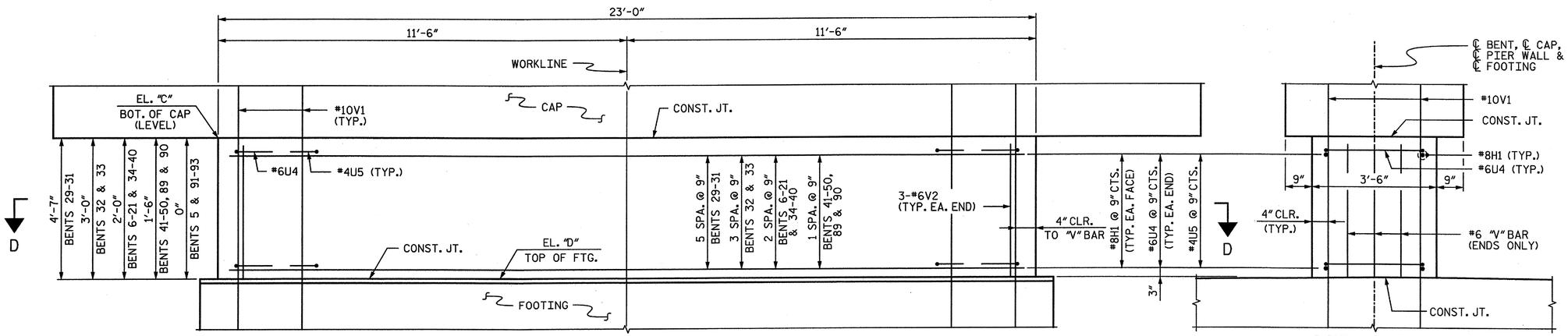
SECTION B-B



END VIEW C-C



SECTION D-D



PIER WALL ELEVATION

SIDE VIEW

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENTS 5-21, 29-50 & 89-93 DETAILS

DRAWN BY : VMW	DATE : 2-12
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NC License No. F-0991

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1			3			TOTAL SHEETS
2			4			219

10/4/2012 12:23:13 PM R:\Structures\usta\163) Bents 5-21, 29-50, 89-93 Sht 2 of 3.dgn

TABLE A

ELEVATIONS

BENT	"A"	"B"	"C"	"D"	"E"
5	14.140	14.461	7.140	7.140	2.015
6	15.663	15.984	8.663	6.663	1.538
7	16.413	16.734	9.413	7.413	2.288
8	16.452	16.773	9.452	7.452	2.327
9	16.452	16.773	9.452	7.452	2.327
10	16.452	16.773	9.452	7.452	2.327
11	16.452	16.773	9.452	7.452	2.327
12	16.452	16.773	9.452	7.452	2.327
13	16.452	16.773	9.452	7.452	2.327
14	16.452	16.773	9.452	7.452	2.327
15	16.452	16.773	9.452	7.452	2.327
16	16.452	16.773	9.452	7.452	2.327
17	16.452	16.773	9.452	7.452	2.327
18	16.452	16.773	9.452	7.452	2.327
19	16.452	16.773	9.452	7.452	2.327
20	16.452	16.773	9.452	7.452	2.327
21	16.561	16.882	9.561	7.561	2.436
29	19.140	19.461	12.140	7.557	2.432
30	18.647	18.968	11.647	7.064	1.939
31	18.048	18.369	11.048	6.465	1.340
32	17.450	17.771	10.450	7.450	2.325
33	16.852	17.173	9.852	6.852	1.727
34	16.485	16.806	9.485	7.485	2.360
35	16.447	16.768	9.447	7.447	2.322
36	16.447	16.768	9.447	7.447	2.322
37	16.447	16.768	9.447	7.447	2.322
38	16.447	16.768	9.447	7.447	2.322
39	16.447	16.768	9.447	7.447	2.322
40	16.447	16.768	9.447	7.447	2.322
41	16.447	16.768	9.447	7.947	2.822
42	16.447	16.768	9.447	7.947	2.822
43	16.447	16.768	9.447	7.947	2.822
44	16.447	16.768	9.447	7.947	2.822
45	16.447	16.768	9.447	7.947	2.822
46	16.447	16.768	9.447	7.947	2.822
47	16.447	16.768	9.447	7.947	2.822
48	16.447	16.768	9.447	7.947	2.822
49	16.447	16.768	9.447	7.947	2.822
50	16.513	16.834	9.513	8.013	2.888
89	17.369	17.690	10.369	8.869	3.744
90	17.009	17.330	10.009	8.509	3.384
91	16.649	16.970	9.649	9.649	4.524
92	16.137	16.458	9.137	9.137	4.012
93	14.875	15.196	7.875	7.875	2.750

TABLE B

	H1		U4		U5		V1			V2	
BENT	▲	●	▲	●	▲	●	◆	■	●	■	●
5	--	--	--	--	--	--	7'-8"	9'-6"	2534	--	--
6	6	358	6	53	27	65	9'-8"	11'-6"	3068	1'-9"	16
7	6	358	6	53	27	65	9'-8"	11'-6"	3068	1'-9"	16
8	6	358	6	53	27	65	9'-8"	11'-6"	3068	1'-9"	16
9	6	358	6	53	27	65	9'-8"	11'-6"	3068	1'-9"	16
10	6	358	6	53	27	65	9'-8"	11'-6"	3068	1'-9"	16
11	6	358	6	53	27	65	9'-8"	11'-6"	3068	1'-9"	16
12	6	358	6	53	27	65	9'-8"	11'-6"	3068	1'-9"	16
13	6	358	6	53	27	65	9'-8"	11'-6"	3068	1'-9"	16
14	6	358	6	53	27	65	9'-8"	11'-6"	3068	1'-9"	16
15	6	358	6	53	27	65	9'-8"	11'-6"	3068	1'-9"	16
16	6	358	6	53	27	65	9'-8"	11'-6"	3068	1'-9"	16
17	6	358	6	53	27	65	9'-8"	11'-6"	3068	1'-9"	16
18	6	358	6	53	27	65	9'-8"	11'-6"	3068	1'-9"	16
19	6	358	6	53	27	65	9'-8"	11'-6"	3068	1'-9"	16
20	6	358	6	53	27	65	9'-8"	11'-6"	3068	1'-9"	16
21	6	358	6	53	27	65	9'-8"	11'-6"	3068	1'-9"	16
29	12	716	12	105	54	129	12'-3"	14'-1"	3757	4'-4"	39
30	12	716	12	105	54	129	12'-3"	14'-1"	3757	4'-4"	39
31	12	716	12	105	54	129	12'-3"	14'-1"	3757	4'-4"	39
32	8	477	8	70	36	86	10'-8"	12'-6"	3335	2'-9"	25
33	8	477	8	70	36	86	10'-8"	12'-6"	3335	2'-9"	25
34	6	358	6	53	27	65	9'-8"	11'-6"	3068	1'-9"	16
35	6	358	6	53	27	65	9'-8"	11'-6"	3068	1'-9"	16
36	6	358	6	53	27	65	9'-8"	11'-6"	3068	1'-9"	16
37	6	358	6	53	27	65	9'-8"	11'-6"	3068	1'-9"	16
38	6	358	6	53	27	65	9'-8"	11'-6"	3068	1'-9"	16
39	6	358	6	53	27	65	9'-8"	11'-6"	3068	1'-9"	16
40	6	358	6	53	27	65	9'-8"	11'-6"	3068	1'-9"	16
41	4	239	4	35	18	43	9'-2"	11'-0"	2935	1'-3"	11
42	4	239	4	35	18	43	9'-2"	11'-0"	2935	1'-3"	11
43	4	239	4	35	18	43	9'-2"	11'-0"	2935	1'-3"	11
44	4	239	4	35	18	43	9'-2"	11'-0"	2935	1'-3"	11
45	4	239	4	35	18	43	9'-2"	11'-0"	2935	1'-3"	11
46	4	239	4	35	18	43	9'-2"	11'-0"	2935	1'-3"	11
47	4	239	4	35	18	43	9'-2"	11'-0"	2935	1'-3"	11
48	4	239	4	35	18	43	9'-2"	11'-0"	2935	1'-3"	11
49	4	239	4	35	18	43	9'-2"	11'-0"	2935	1'-3"	11
50	4	239	4	35	18	43	9'-2"	11'-0"	2935	1'-3"	11
89	4	239	4	35	18	43	9'-2"	11'-0"	2935	1'-3"	11
90	4	239	4	35	18	43	9'-2"	11'-0"	2935	1'-3"	11
91	--	--	--	--	--	--	7'-8"	9'-6"	2534	--	--
92	--	--	--	--	--	--	7'-8"	9'-6"	2534	--	--
93	--	--	--	--	--	--	7'-8"	9'-6"	2534	--	--

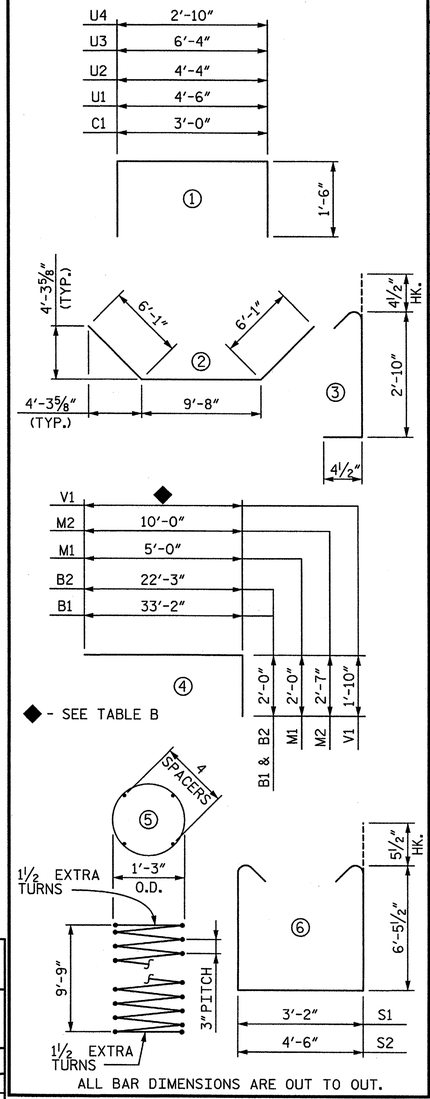
QUANTITIES

BENT	STAINLESS STEEL REINFORCING	SPIRAL STAINLESS STEEL REINFORCING	CAP POUR	PIER WALL POUR	FOOTING POUR	TOTAL	30"X 30" PRESTRESSED CONCRETE PILES	
	LBS.	LBS.	CU. YDS.	CU. YDS.	CU. YDS.	CU. YDS.	NO.	FT.
5	37119	960	59.4	0.0	91.9	151.3	9	945
6	38145	960	59.4	6.0	91.9	157.3	9	945
7	38145	960	59.4	6.0	91.9	157.3	9	945
8	38145	960	59.4	6.0	91.9	157.3	9	945
9	38145	960	59.4	6.0	91.9	157.3	9	945
10	38145	960	59.4	6.0	91.9	157.3	9	945
11	38145	960	59.4	6.0	91.9	157.3	9	945
12	38145	960	59.4	6.0	91.9	157.3	9	945
13	38145	960	59.4	6.0	91.9	157.3	9	945
14	38145	960	59.4	6.0	91.9	157.3	9	945
15	38145	960	59.4	6.0	91.9	157.3	9	945
16	38145	960	59.4	6.0	91.9	157.3	9	945
17	38145	960	59.4	6.0	91.9	157.3	9	945
18	38145	960	59.4	6.0	91.9	157.3	9	945
19	38145	960	59.4	6.0	91.9	157.3	9	945
20	38145	960	59.4	6.0	91.9	157.3	9	945
21	38145	960	59.4	6.0	91.9	157.3	9	945
29	39331	960	59.4	13.7	91.9	165.0	9	945
30	39331	960	59.4	13.7	91.9	165.0	9	945
31	39331	960	59.4	13.7	91.9	165.0	9	945
32	38578	960	59.4	8.9	91.9	160.2	9	945

QUANTITIES

BENT	STAINLESS STEEL REINFORCING	SPIRAL STAINLESS STEEL REINFORCING	CAP POUR	PIER WALL POUR	FOOTING POUR	TOTAL	30"X 30" PRESTRESSED CONCRETE PILES	
	LBS.	LBS.	CU. YDS.	CU. YDS.	CU. YDS.	CU. YDS.	NO.	FT.
33	38578	960	59.4	8.9	91.9	160.2	9	945
34	38145	960	59.4	6.0	91.9	157.3	9	945
35	38145	960	59.4	6.0	91.9	157.3	9	945
36	38145	960	59.4	6.0	91.9	157.3	9	945
37	38145	960	59.4	6.0	91.9	157.3	9	945
38	38145	960	59.4	6.0	91.9	157.3	9	945
39	38145	960	59.4	6.0	91.9	157.3	9	945
40	38145	960	59.4	6.0	91.9	157.3	9	945
41	37848	960	59.4	4.5	91.9	155.8	9	945
42	37848	960	59.4	4.5	91.9	155.8	9	945
43	37848	960	59.4	4.5	91.9	155.8	9	945
44	37848	960	59.4	4.5	91.9	155.8	9	945
45	37848	960	59.4	4.5	91.9	155.8	9	945
46	37848	960	59.4	4.5	91.9	155.8	9	945
47	37848	960	59.4	4.5	91.9	155.8	9	945
48	37848	960	59.4	4.5	91.9	155.8	9	945
49	37848	960	59.4	4.5	91.9	155.8	9	945
50	37848	960	59.4	4.5	91.9	155.8	9	945
89	37848	960	59.4	4.5	91.9	155.8	9	990
90	37848	960	59.4	4.5	91.9	155.8	9	1080
91	37119	960	59.4	0.0	91.9	151.3	9	1080
92	37119	960	59.4	0.0	91.9	151.3	9	1080
93	37119	960	59.4	0.0	91.9	151.3	9	1080

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR ONE BENT (44 REQUIRED)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	21	#11	④	35'-2"	3924
B2	21	#11	④	24'-3"	2706
B3	12	#6	STR.	44'-6"	802
B4	7	#11	STR.	22'-3"	827
B5	7	#5	STR.	17'-9"	130
B6	7	#11	STR.	30'-0"	1116
B7	22	#4	STR.	4'-6"	66
C1	88	#7	①	6'-0"	1079
H1	▲	#8	STR.	22'-4"	●
H2	20	#5	②	21'-10"	455
M1	72	#11	④	7'-0"	2678
M2	72	#14	④	12'-7"	6931
S1	80	#5	⑥	17'-0"	1418
S2	11	#5	⑥	18'-4"	210
T1	4	#11	STR.	9'-8"	205
T2	4	#11	STR.	11'-3"	239
T3	4	#11	STR.	12'-9"	271
T4	4	#11	STR.	14'-3"	303
T5	4	#11	STR.	15'-9"	335
T6	4	#11	STR.	17'-3"	367
T7	4	#11	STR.	18'-9"	398
T8	4	#11	STR.	20'-3"	430
T9	4	#11	STR.	21'-9"	462
T10	28	#11	STR.	23'-4"	3471
T11	4	#10	STR.	9'-8"	166
T12	4	#10	STR.	11'-3"	194
T13	4	#10	STR.	12'-9"	219
T14	4	#10	STR.	14'-3"	245
T15	4	#10	STR.	15'-9"	271
T16	4	#10	STR.	17'-3"	297
T17	4	#10	STR.	18'-9"	323
T18	4	#10	STR.	20'-3"	349
T19	4	#10	STR.	21'-9"	374
T20	28	#10	STR.	23'-4"	2811
U1	46	#5	①	7'-6"	360
U2	16	#4	①	7'-4"	78
U3	12	#4	①	9'-4"	75
U4	▲	#6	①	5'-10"	●
U5	▲	#4	③	3'-7"	●
V1	62	#10	④	■	●
V2	6	#6	STR.	■	●
SP-1	9	✳	⑤	159'-9"	960

NOTE: ▲, ● & ■ - SEE TABLE B.

✳ THE SP-1 SPIRAL STAINLESS STEEL REINFORCING SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

NOTE: ALL CONCRETE SHALL BE CLASS AA.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENTS 5-21, 29-50 & 89-93 ELEVATIONS AND BILL OF MATERIAL

DRAWN BY : VMW DATE : 2-12

CHECKED BY : SB DATE : 3-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-164
1			3			TOTAL SHEETS
2			4			219

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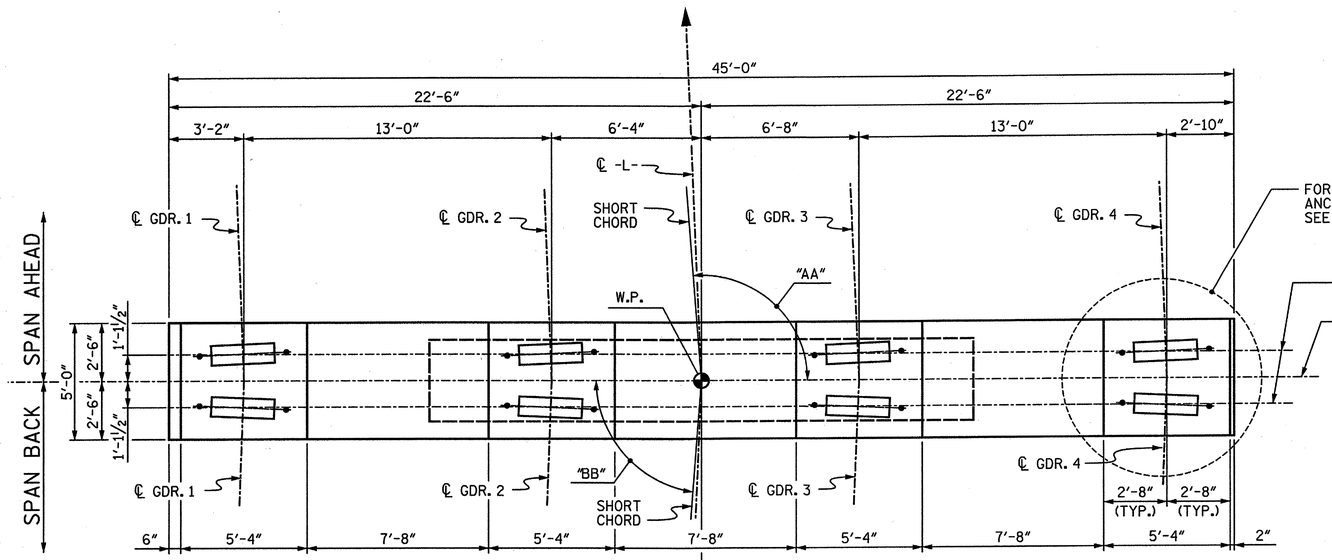
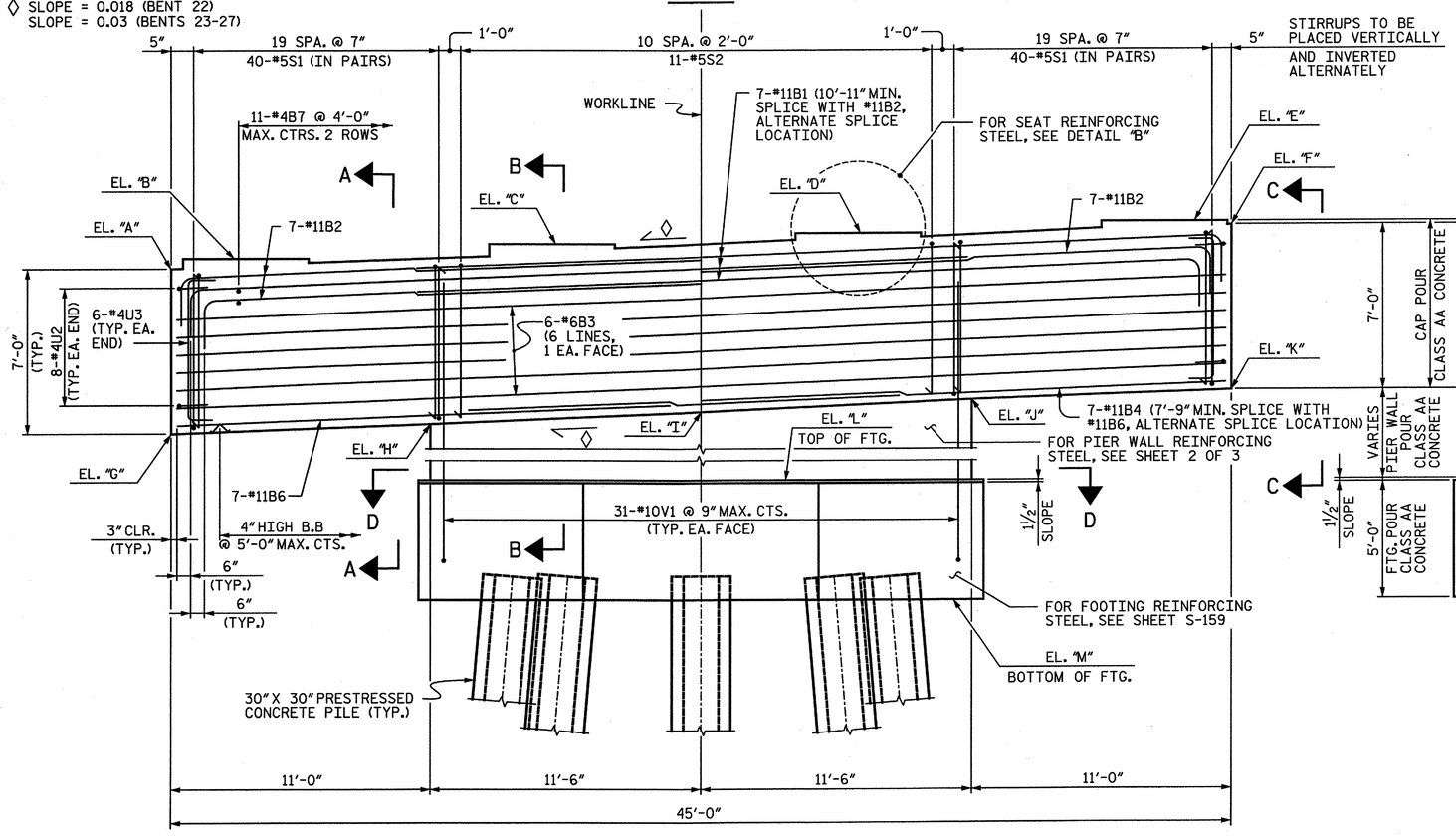
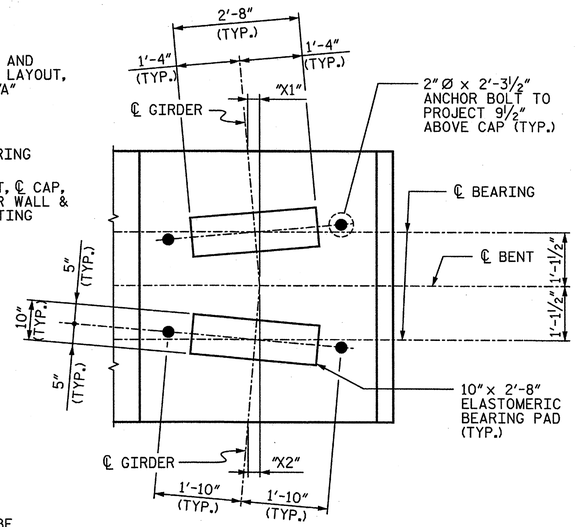


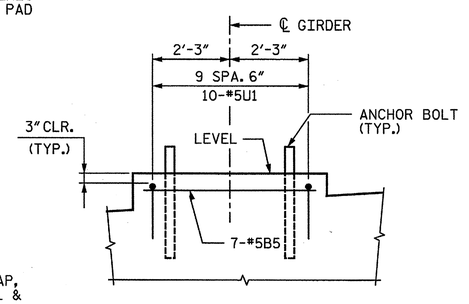
PLAN



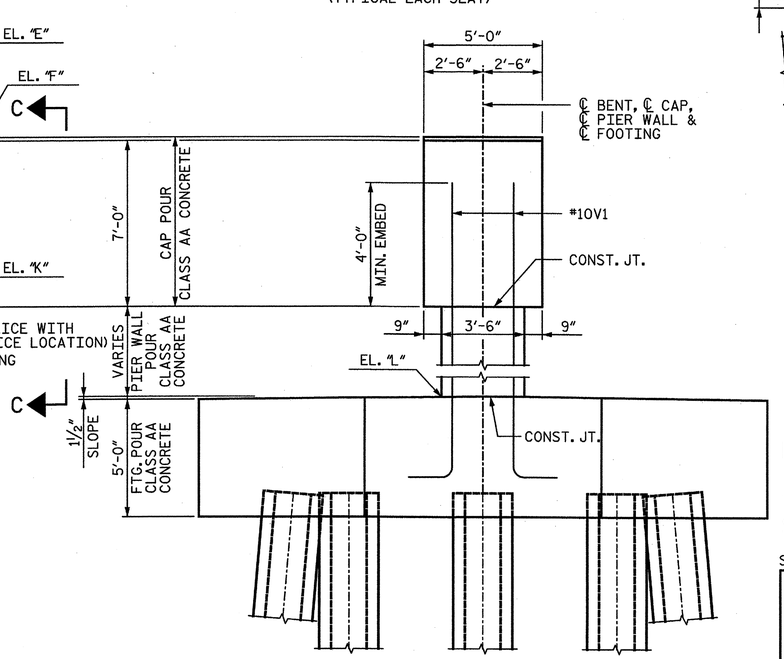
ELEVATION



DETAIL "A"
(TYPICAL EACH SEAT)



DETAIL "B"
(TYPICAL EACH SEAT)



SIDE VIEW

NOTES:

1. FOR SECTION VIEWS, SEE SHEET 2 OF 3.
2. FOR ELEVATIONS, DIMENSIONS AND ANGLES TABLE, SEE SHEET 3 OF 3.
3. FOR PILE AND FOOTING DETAILS, SEE SHEET S-159.
4. FOR BENT 26, THE TOP SURFACE OF THE BENT CAP SHALL BE COATED WITH EPOXY PROTECTIVE COATING. THE EPOXY PROTECTIVE COATING SHALL NOT BE APPLIED TO THE AREA UNDER THE ELASTOMERIC BEARINGS.
5. FOR BENT 26, THE TOP SURFACE OF THE BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND SHALL NOT BE USED.

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENTS 22-27 PLAN AND ELEVATION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-165
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : VMW DATE : 2-12
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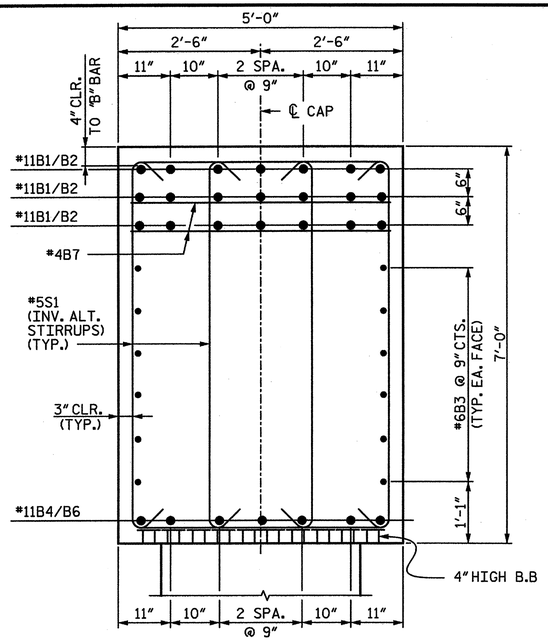
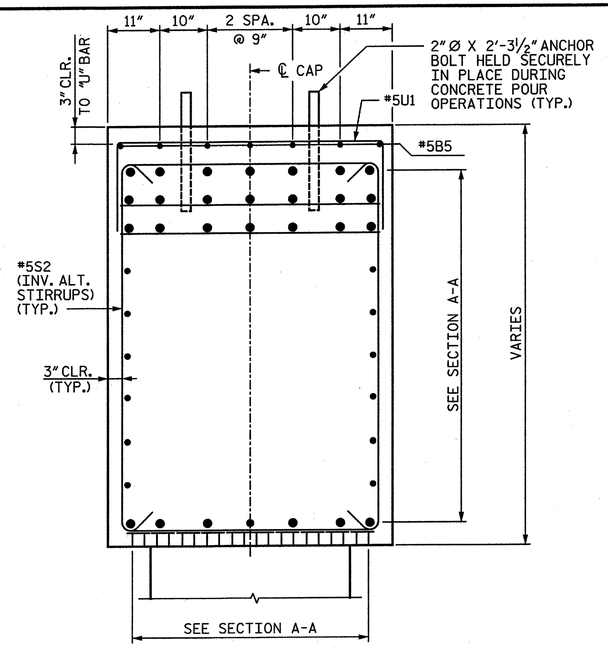
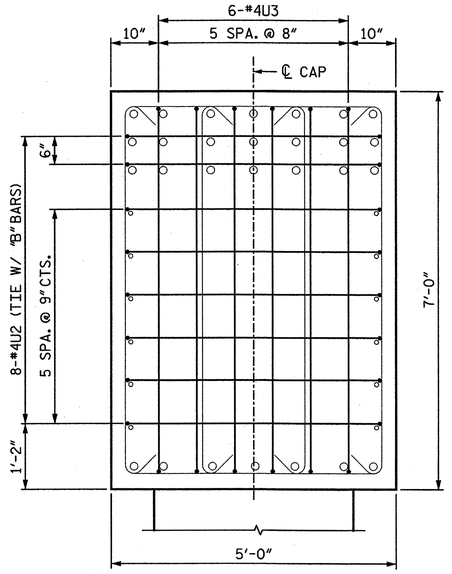


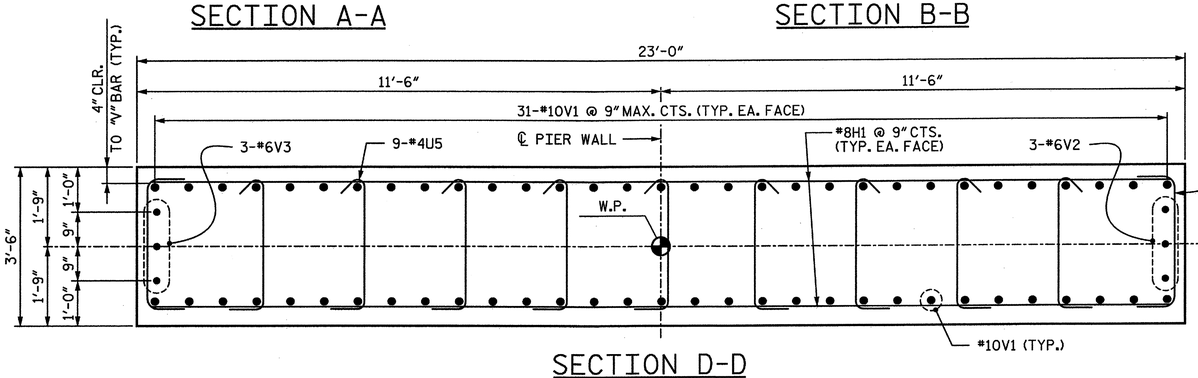
SECTION A-A



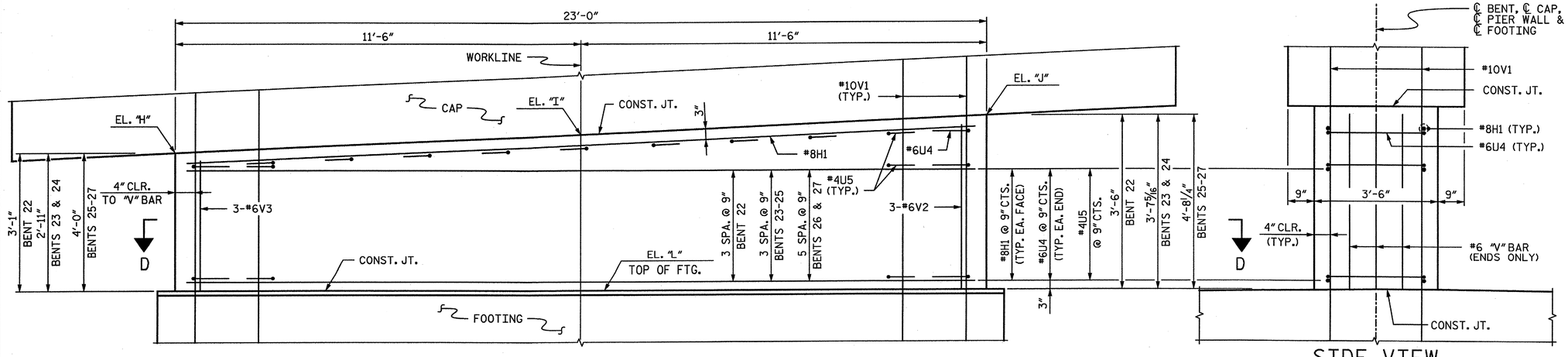
SECTION B-B



END VIEW C-C



SECTION D-D



PIER WALL ELEVATION

SIDE VIEW

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENTS 22-27 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-166
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : VMW DATE : 2-12
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TABLE A

ELEVATIONS

	BENT 22	BENT 23	BENT 24	BENT 25	BENT 26	BENT 27
"A"	16.581	16.803	17.163	17.524	17.884	18.244
"B"	16.887	17.149	17.509	17.870	18.230	18.590
"C"	17.208	17.539	17.899	18.260	18.620	18.980
"D"	17.432	17.929	18.289	18.650	19.010	19.370
"E"	17.558	18.319	18.679	19.040	19.400	19.760
"F"	17.391	18.153	18.513	18.874	19.234	19.594
"G"	9.581	9.803	10.163	10.524	10.884	11.244
"H"	9.779	10.133	10.493	10.854	11.214	11.574
"I"	9.986	10.478	10.838	11.199	11.559	11.919
"J"	10.193	10.823	11.183	11.544	11.904	12.264
"K"	10.391	11.153	11.513	11.874	12.234	12.594
"L"	6.696	7.216	7.576	6.854	7.214	7.574
"M"	1.571	2.091	2.451	1.729	2.089	2.449
DIMENSIONS AND ANGLES						
"AA"	90°-26'-07"	90°-42'-43"	90°-42'-43"	90°-42'-43"	90°-42'-43"	90°-29'-15"
"BB"	90°-00'-00"	89°-19'-19"	89°-17'-17"	89°-17'-17"	89°-17'-17"	89°-17'-17"
"X1"	1/4"	3/8"	3/8"	3/8"	3/8"	1/4"
"X2"	SEE TABLE BELOW	7/16"	3/8"	3/8"	3/8"	3/8"

TABLE B

		BENT 22	BENT 23	BENT 24	BENT 25	BENT 26	BENT 27
H1	▲	10	10	10	14	14	14
	●	596	596	596	835	835	835
U4	▲	9	9	9	9	13	13
	●	79	79	79	79	114	114
U5	▲	45	45	45	63	63	63
	●	108	108	108	151	151	151
V1	◆	11'-1"	11'-3"	11'-3"	12'-4"	12'-4"	12'-4"
	■	12'-11"	13'-1"	13'-1"	14'-2"	14'-2"	14'-2"
	●	3446	3490	3490	3779	3779	3779
V2	■	3'-3"	3'-4"	3'-4"	4'-5"	4'-5"	4'-5"
	●	15	15	15	20	20	20
V3	■	2'-10"	2'-8"	2'-8"	3'-9"	3'-9"	3'-9"
	●	13	12	12	17	17	17

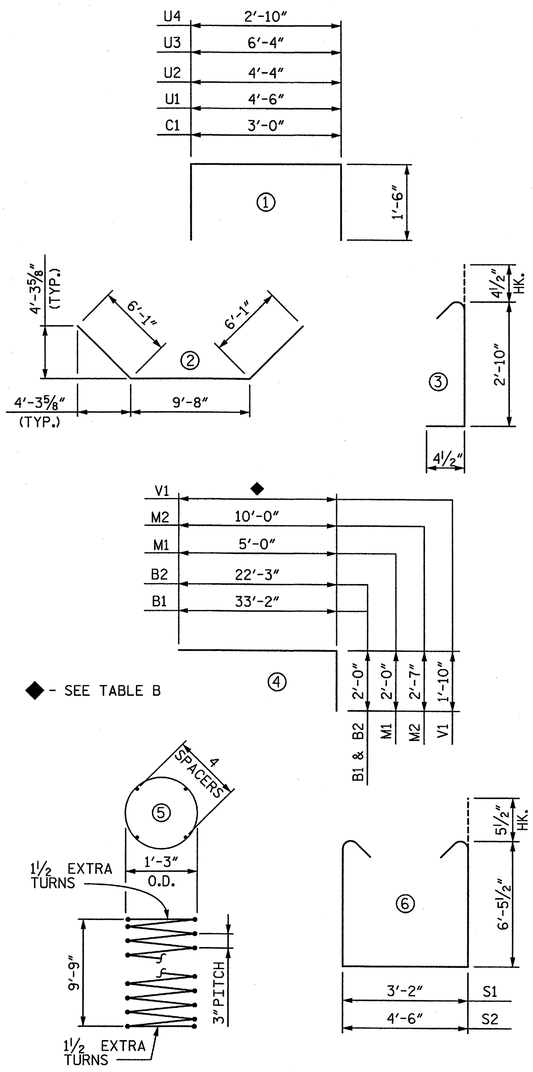
BENT 22 "X2"

GIRDER	DIMENSIONS
1	0"
2	0"
3	1/16"
4	1/8"

QUANTITIES

		BENT 22	BENT 23	BENT 24	BENT 25	BENT 26	BENT 27
STAINLESS STEEL REINFORCING	LBS.	38796	38839	38839	39420	39455	39455
SPIRAL STAINLESS STEEL REINFORCING	LBS.	960	960	960	960	960	960
CLASS AA CONCRETE : CAP POUR	CU. YDS.	59.4	59.4	59.4	59.4	59.4	59.4
PIER WALL POUR	CU. YDS.	9.9	9.7	9.7	13.0	13.0	13.0
FOOTING POUR	CU. YDS.	91.9	91.9	91.9	91.9	91.9	91.9
TOTAL	CU. YDS.	161.2	161.0	161.0	164.3	164.3	164.3
30"X 30"PRESTRESSED CONCRETE PILES	NO.	9	9	9	9	9	9
	FT.	945	945	945	945	945	945

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR ONE BENT (5 REQUIRED)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	21	#11	④	35'-2"	3924
B2	21	#11	④	24'-3"	2706
B3	12	#6	STR.	44'-6"	802
B4	7	#11	STR.	22'-3"	827
B5	28	#5	STR.	4'-6"	131
B6	7	#11	STR.	30'-0"	1116
B7	22	#4	STR.	4'-6"	66
C1	88	#7	①	6'-0"	1079
H1	▲	#8	STR.	22'-4"	●
H2	20	#5	②	21'-10"	455
M1	72	#11	④	7'-0"	2678
M2	72	#14	④	12'-7"	6931
S1	80	#5	⑥	17'-0"	1418
S2	11	#5	⑥	18'-4"	210
T1	4	#11	STR.	9'-8"	205
T2	4	#11	STR.	11'-3"	239
T3	4	#11	STR.	12'-9"	271
T4	4	#11	STR.	14'-3"	303
T5	4	#11	STR.	15'-9"	335
T6	4	#11	STR.	17'-3"	367
T7	4	#11	STR.	18'-9"	398
T8	4	#11	STR.	20'-3"	430
T9	4	#11	STR.	21'-9"	462
T10	28	#11	STR.	23'-4"	3471
T11	4	#10	STR.	9'-8"	166
T12	4	#10	STR.	11'-3"	194
T13	4	#10	STR.	12'-9"	219
T14	4	#10	STR.	14'-3"	245
T15	4	#10	STR.	15'-9"	271
T16	4	#10	STR.	17'-3"	297
T17	4	#10	STR.	18'-9"	323
T18	4	#10	STR.	20'-3"	349
T19	4	#10	STR.	21'-9"	374
T20	28	#10	STR.	23'-4"	2811
U1	40	#5	①	7'-6"	313
U2	16	#4	①	7'-4"	78
U3	12	#4	①	9'-4"	75
U4	▲	#6	①	5'-10"	●
U5	▲	#4	③	3'-7"	●
V1	62	#10	④	■	●
V2	3	#6	STR.	■	●
V3	3	#6	STR.	■	●
SP-1	9	✳	⑤	159'-9"	960

NOTE: ▲, ● & ■ - SEE TABLE B.

✳THE SP-1 SPIRAL STAINLESS STEEL REINFORCING SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENTS 22-27 ELEVATIONS AND BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-167
1			3			TOTAL SHEETS
2			4			219

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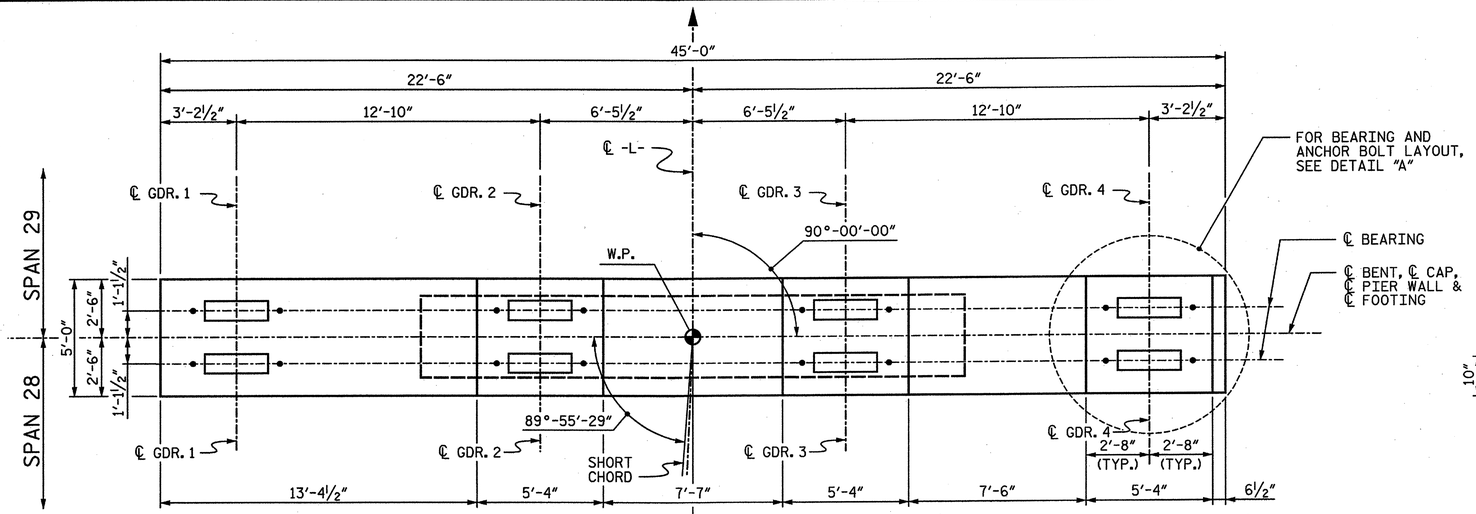
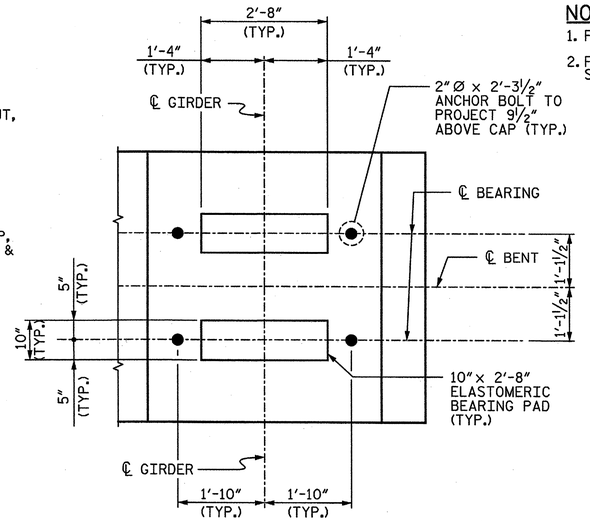


PLAN



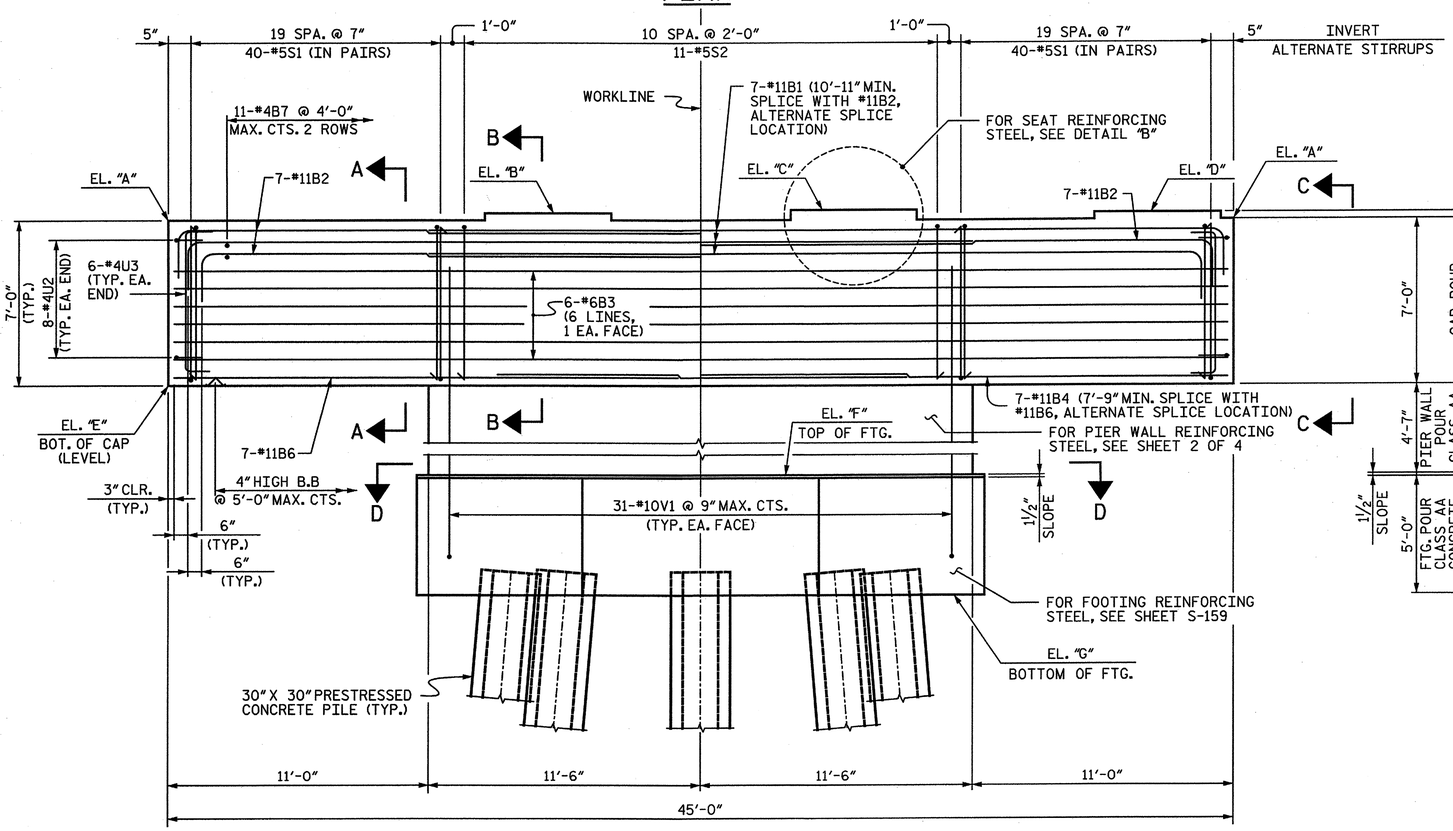
DETAIL "A"
(TYPICAL EACH SEAT)

NOTES:

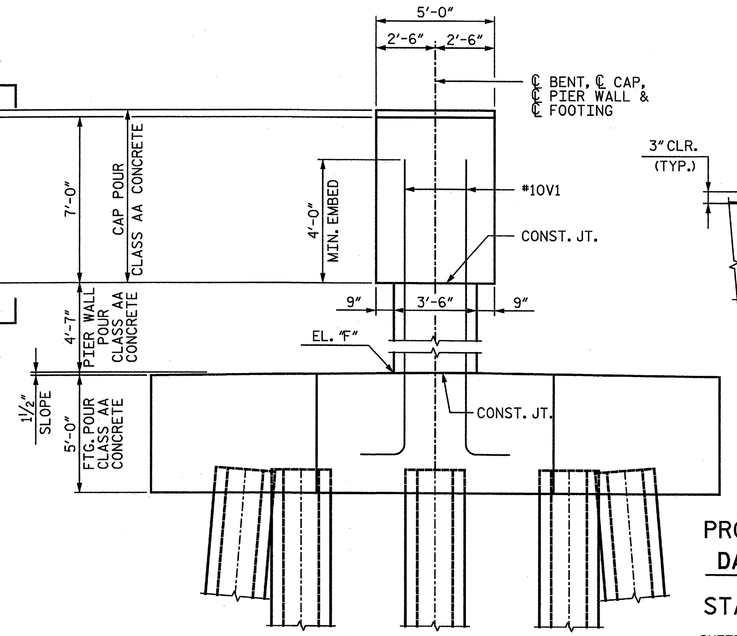
1. FOR SECTION VIEWS, SEE SHEET 2 OF 3.
2. FOR PILE AND FOOTING DETAILS, SEE SHEET S-159.

TABLE A

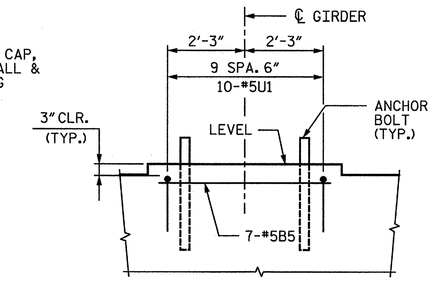
ELEVATIONS	
	BENT 28
"A"	19.048
"B"	19.369
"C"	19.463
"D"	19.324
"E"	12.048
"F"	7.465
"G"	2.340



ELEVATION



SIDE VIEW



DETAIL "B"
(SEAT @ GIRDER 2, 3 & 4 SHOWN)

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT 28 PLAN AND ELEVATION

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St. Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-168
1			3			TOTAL SHEETS
2			4			219

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CHECKED BY : PEK DATE : 3-12

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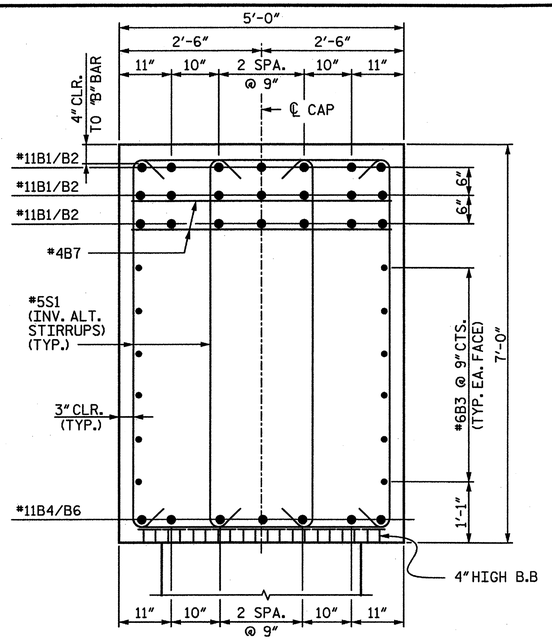
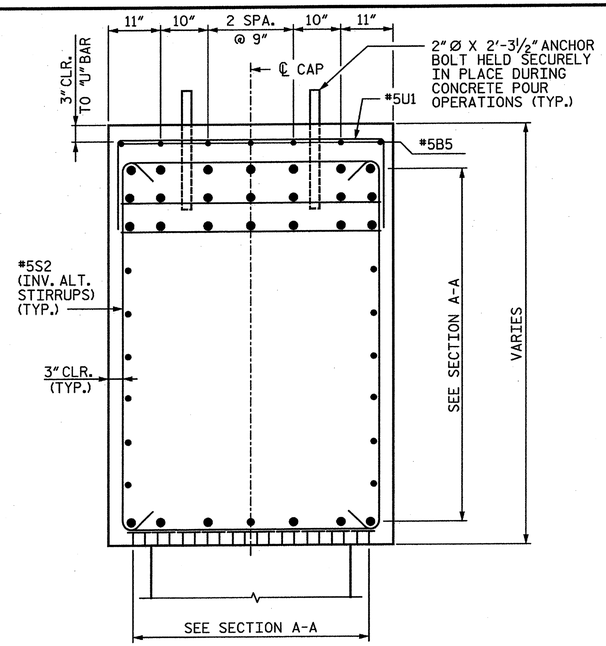
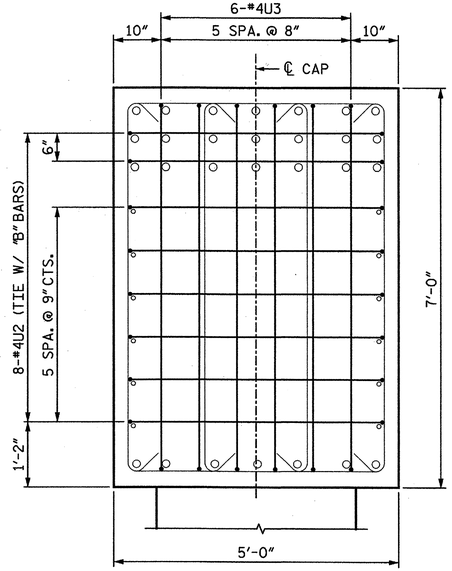


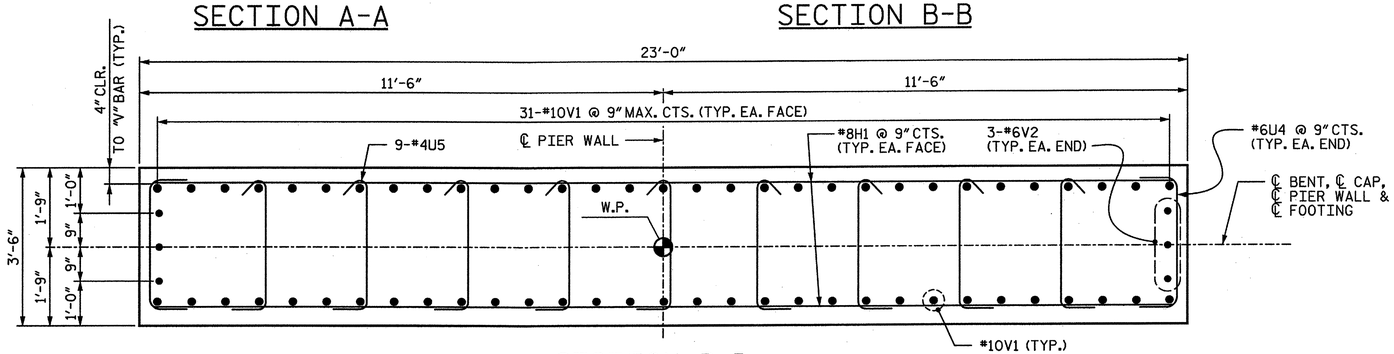
SECTION A-A



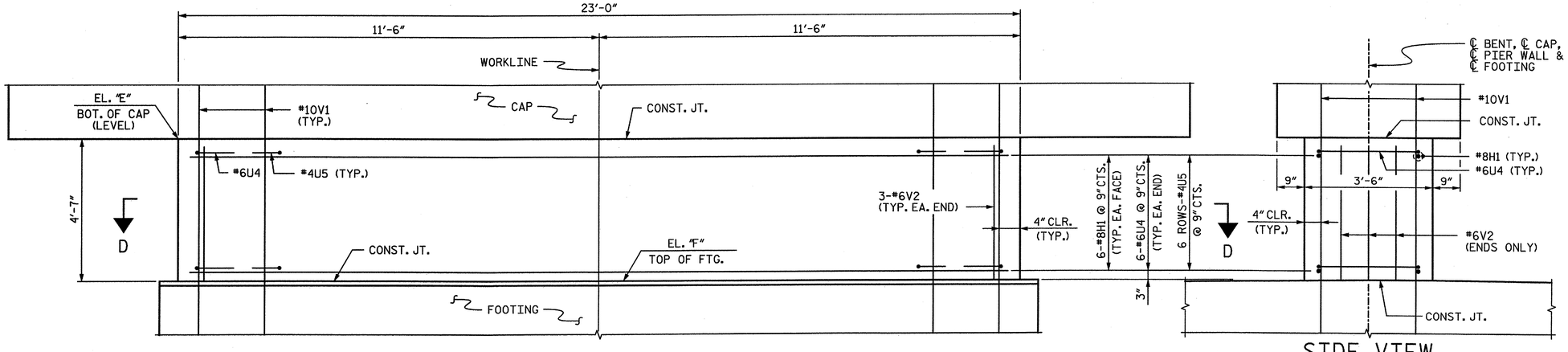
SECTION B-B



END VIEW C-C



SECTION D-D



PIER WALL ELEVATION

SIDE VIEW

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT 28 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-169
1			3			TOTAL SHEETS
2			4			219

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Charlotte, NC 28208
NC License No. F-0991

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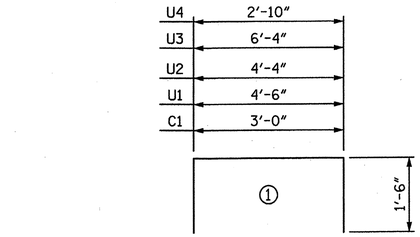
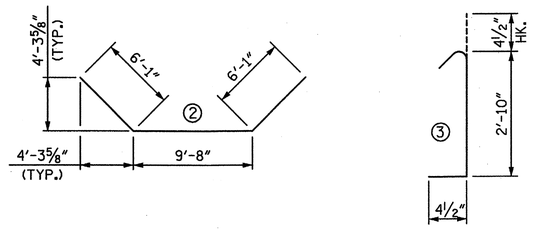
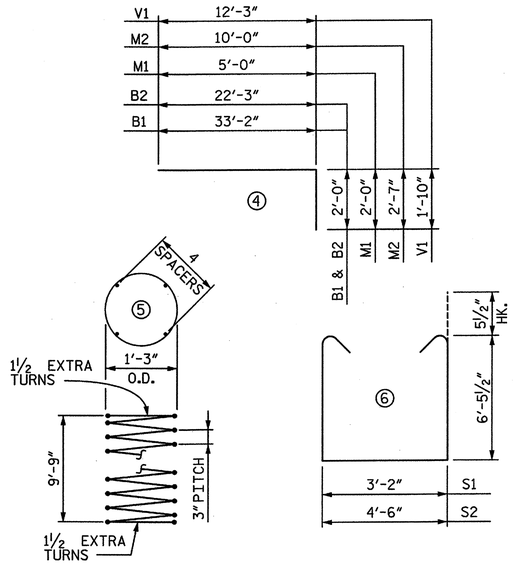
BAR TYPES







ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR BENT 28

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	21	#11	④	35'-2"	3924
B2	21	#11	④	24'-3"	2706
B3	12	#6	STR.	44'-6"	802
B4	7	#11	STR.	22'-3"	827
B5	21	#5	STR.	4'-6"	99
B6	7	#11	STR.	30'-0"	1116
B7	22	#4	STR.	4'-6"	66
C1	88	#7	①	6'-0"	1079
H1	12	#8	STR.	22'-4"	716
H2	20	#5	②	21'-10"	455
M1	72	#11	④	7'-0"	2678
M2	72	#14	④	12'-7"	6931
S1	80	#5	⑥	17'-0"	1418
S2	11	#5	⑥	18'-4"	210
T1	4	#11	STR.	9'-8"	205
T2	4	#11	STR.	11'-3"	239
T3	4	#11	STR.	12'-9"	271
T4	4	#11	STR.	14'-3"	303
T5	4	#11	STR.	15'-9"	335
T6	4	#11	STR.	17'-3"	367
T7	4	#11	STR.	18'-9"	398
T8	4	#11	STR.	20'-3"	430
T9	4	#11	STR.	21'-9"	462
T10	28	#11	STR.	23'-4"	3471
T11	4	#10	STR.	9'-8"	166
T12	4	#10	STR.	11'-3"	194
T13	4	#10	STR.	12'-9"	219
T14	4	#10	STR.	14'-3"	245
T15	4	#10	STR.	15'-9"	271
T16	4	#10	STR.	17'-3"	297
T17	4	#10	STR.	18'-9"	323
T18	4	#10	STR.	20'-3"	349
T19	4	#10	STR.	21'-9"	374
T20	28	#10	STR.	23'-4"	2811
U1	30	#5	①	7'-6"	235
U2	16	#4	①	7'-4"	78
U3	12	#4	①	9'-4"	75
U4	12	#6	①	5'-10"	105
U5	54	#4	③	3'-7"	129
V1	62	#10	④	14'-1"	3757
V2	6	#6	STR.	4'-4"	39
SP-1	9	*	⑤	159'-9"	960

NOTE:
* THE SP-1 SPIRAL STAINLESS STEEL REINFORCING SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

QUANTITIES

		BENT 28
STAINLESS STEEL REINFORCING	LBS.	39175
SPIRAL STAINLESS STEEL REINFORCING	LBS.	960
CLASS AA CONCRETE : CAP POUR	CU. YDS.	59.4
PIER WALL POUR	CU. YDS.	13.7
FOOTING POUR	CU. YDS.	91.9
TOTAL	CU. YDS.	165.0
30"X 30" PRESTRESSED CONCRETE PILES	NO.	9
	FT.	945

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 28
BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			219

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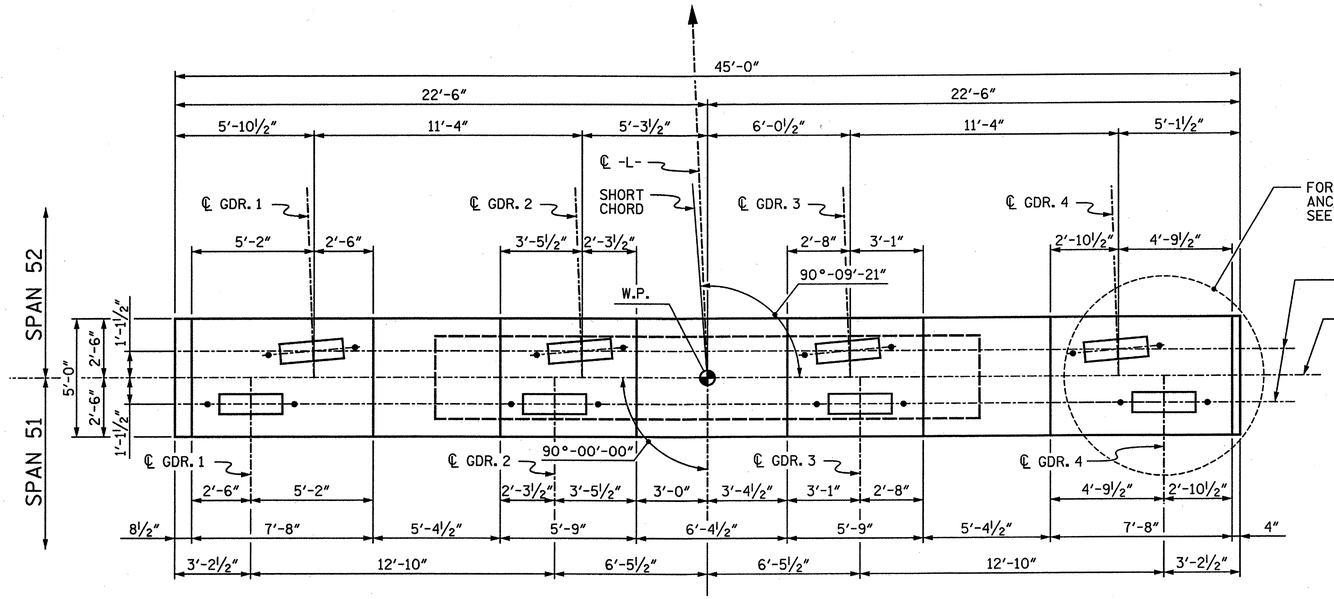
10/4/2012 12:22:55 PM R:\Structures\usta\(170) Bent 28 Sht 3 of 3.dgn

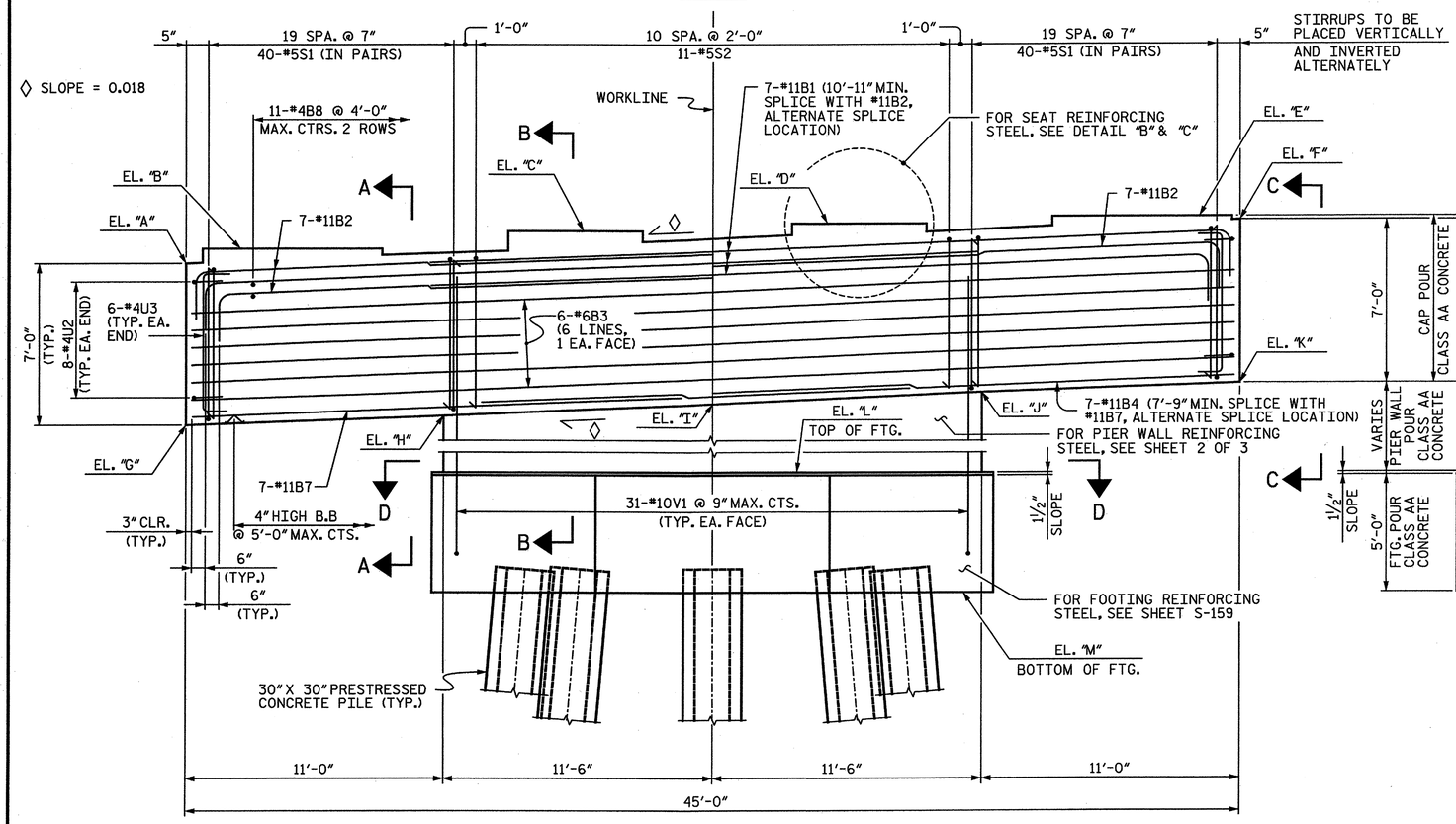
NOTES:

1. FOR SECTION VIEWS, SEE SHEET 2 OF 3.
2. FOR PILE AND FOOTING DETAILS, SEE SHEET S-159.
3. THE TOP SURFACE OF THE BENT CAP SHALL BE COATED WITH EPOXY PROTECTIVE COATING. THE EPOXY PROTECTIVE COATING SHALL NOT BE APPLIED TO THE AREA UNDER THE ELASTOMERIC BEARINGS.
4. THE TOP SURFACE OF THE BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND SHALL NOT BE USED.

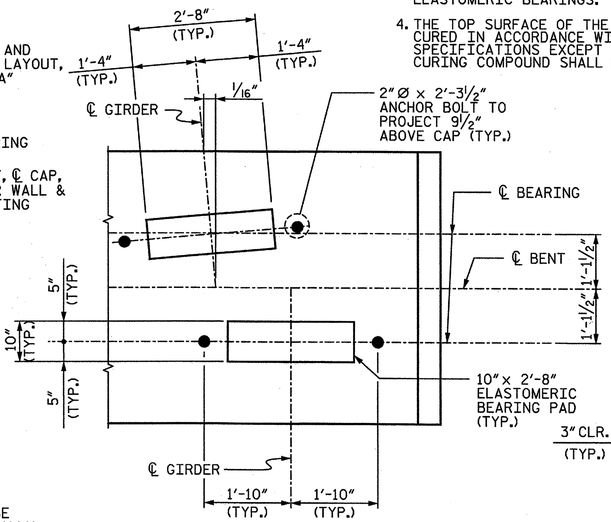
TABLE A	
ELEVATIONS	
	BENT 51
"A"	16.332
"B"	16.812
"C"	17.132
"D"	17.300
"E"	17.309
"F"	17.142
"G"	9.332
"H"	9.530
"I"	9.737
"J"	9.944
"K"	10.142
"L"	8.237
"M"	3.112



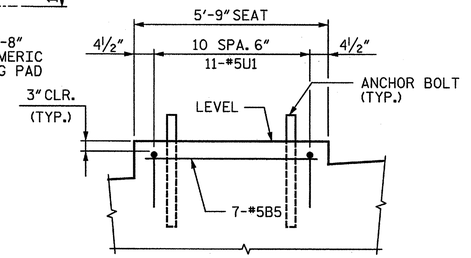
PLAN



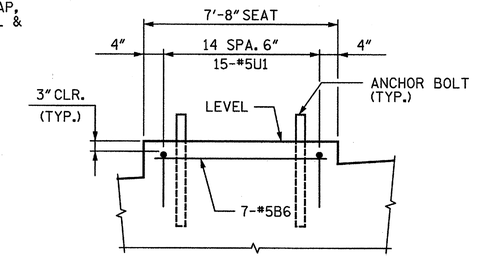
ELEVATION



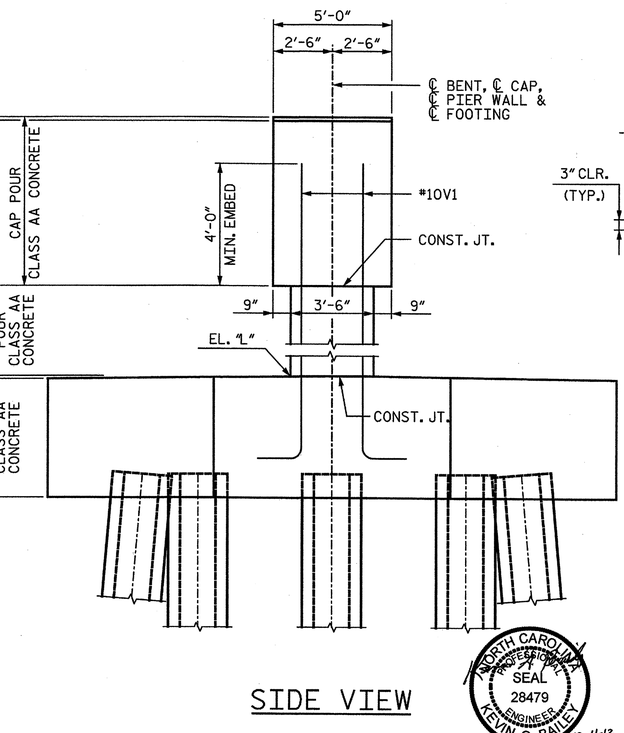
DETAIL "A"
(TYPICAL EACH SEAT)



DETAIL "B"
(SEAT @ GIRDER 2 & 3 SHOWN)



DETAIL "C"
(SEAT @ GIRDER 1 & 4 SHOWN)



SIDE VIEW

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT 51 PLAN AND ELEVATION

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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1			3			TOTAL SHEETS
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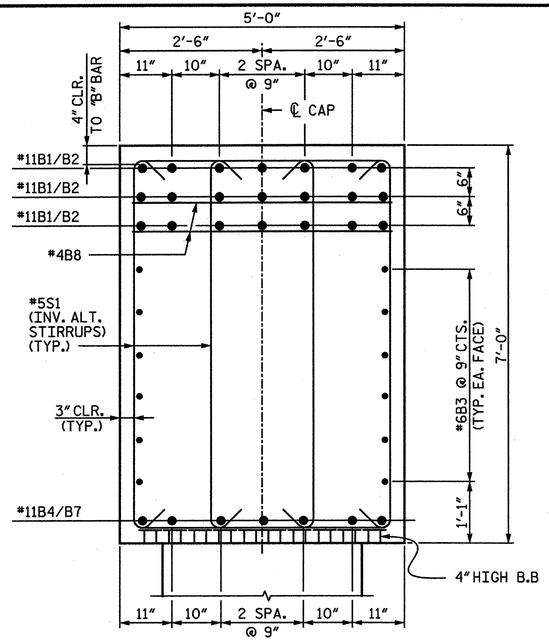
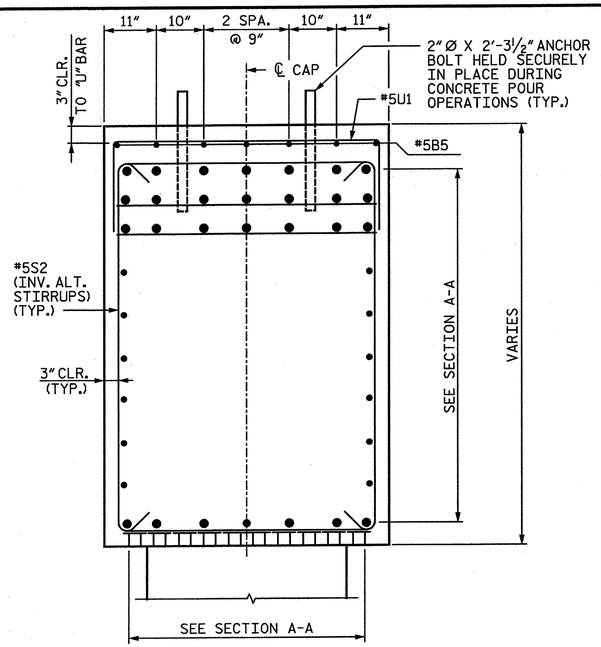
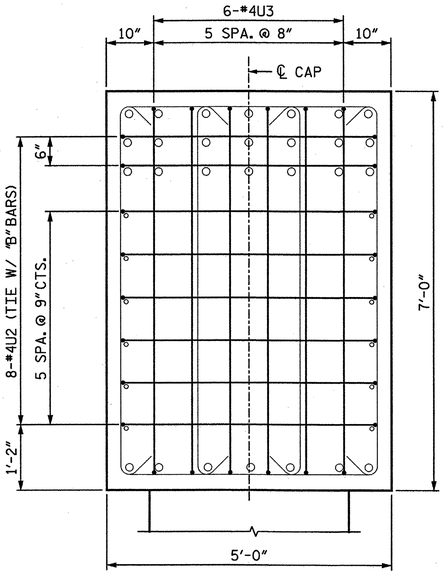


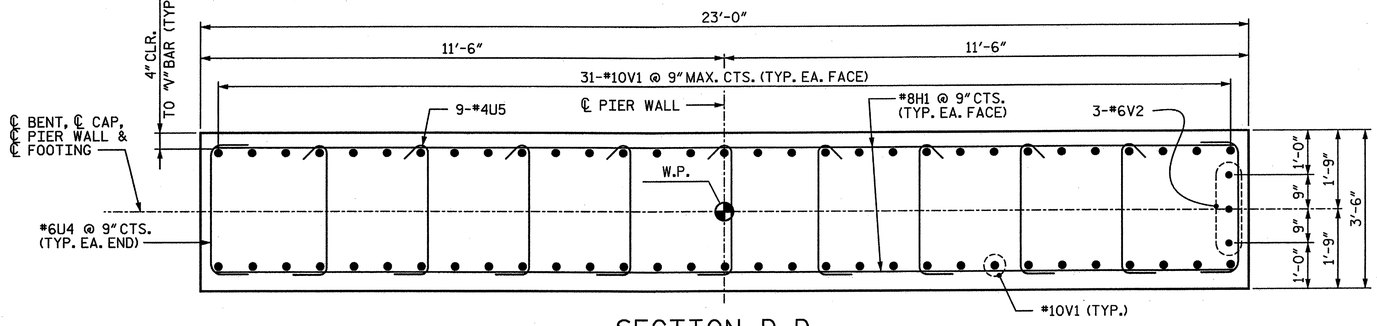
SECTION A-A



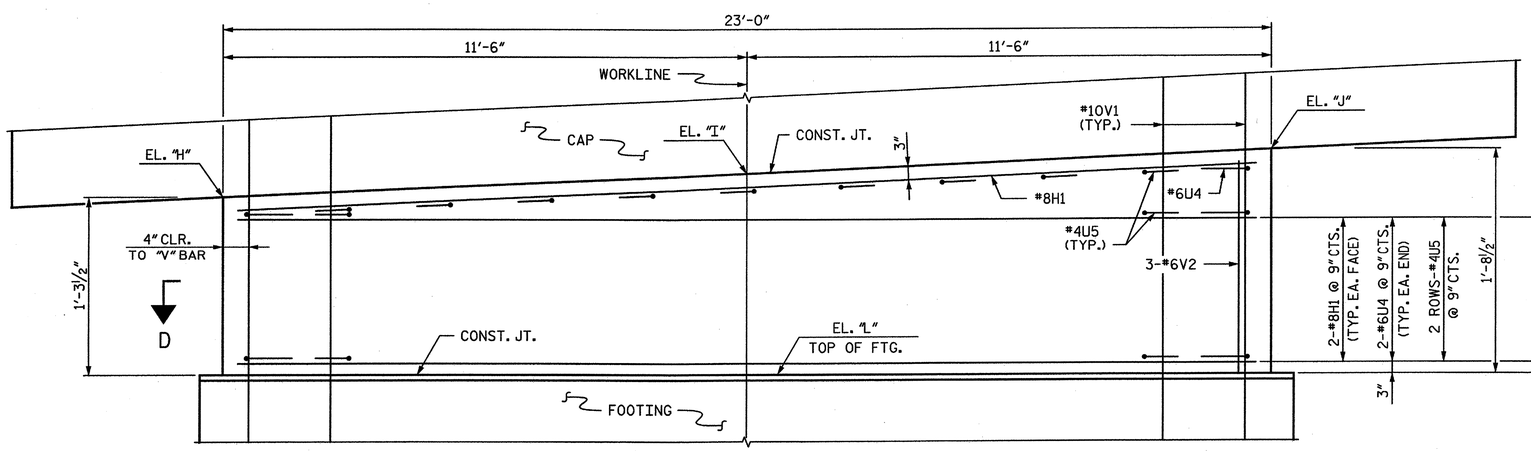
SECTION B-B



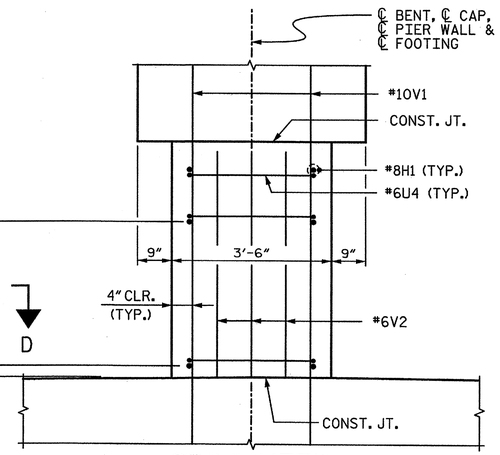
END VIEW C-C



SECTION D-D



PIER WALL ELEVATION



SIDE VIEW

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT 51 DETAILS

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1			3			TOTAL SHEETS
2			4			219

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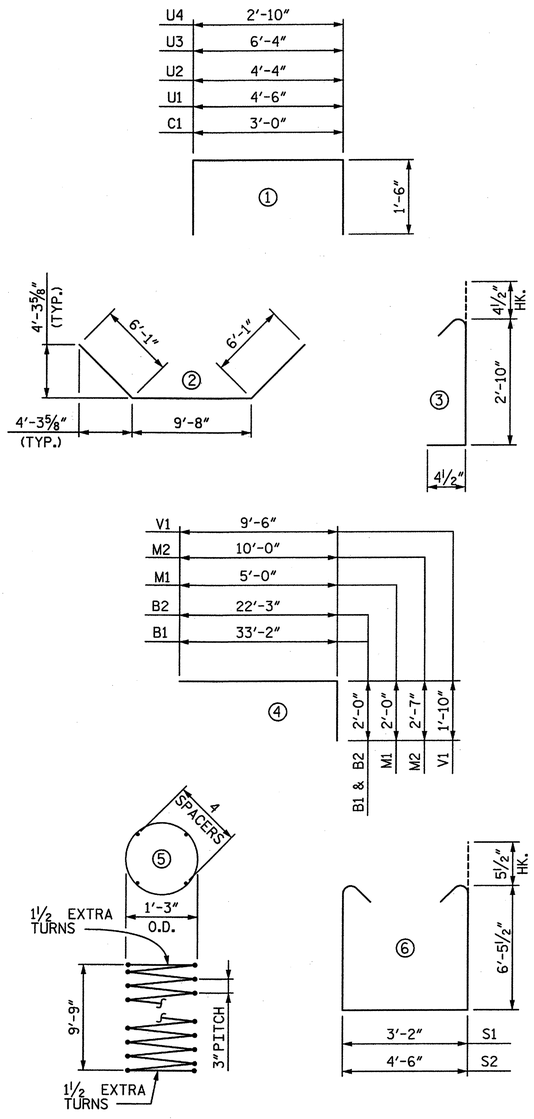
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR BENT 51

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	21	#11	④	35'-2"	3924
B2	21	#11	④	24'-3"	2706
B3	12	#6	STR.	44'-6"	802
B4	7	#11	STR.	22'-3"	827
B5	14	#5	STR.	5'-3"	77
B6	14	#5	STR.	7'-3"	106
B7	7	#11	STR.	30'-0"	1116
B8	22	#4	STR.	4'-6"	66
C1	88	#7	①	6'-0"	1079
H1	6	#8	STR.	22'-4"	358
H2	20	#5	②	21'-10"	455
M1	72	#11	④	7'-0"	2678
M2	72	#14	④	12'-7"	6931
S1	80	#5	⑥	17'-0"	1418
S2	11	#5	⑥	18'-4"	210
T1	4	#11	STR.	9'-8"	205
T2	4	#11	STR.	11'-3"	239
T3	4	#11	STR.	12'-9"	271
T4	4	#11	STR.	14'-3"	303
T5	4	#11	STR.	15'-9"	335
T6	4	#11	STR.	17'-3"	367
T7	4	#11	STR.	18'-9"	398
T8	4	#11	STR.	20'-3"	430
T9	4	#11	STR.	21'-9"	462
T10	28	#11	STR.	23'-4"	3471
T11	4	#10	STR.	9'-8"	166
T12	4	#10	STR.	11'-3"	194
T13	4	#10	STR.	12'-9"	219
T14	4	#10	STR.	14'-3"	245
T15	4	#10	STR.	15'-9"	271
T16	4	#10	STR.	17'-3"	297
T17	4	#10	STR.	18'-9"	323
T18	4	#10	STR.	20'-3"	349
T19	4	#10	STR.	21'-9"	374
T20	28	#10	STR.	23'-4"	2811
U1	52	#5	①	7'-6"	407
U2	16	#4	①	7'-4"	78
U3	12	#4	①	9'-4"	75
U4	5	#6	①	5'-10"	44
U5	27	#4	③	3'-7"	65
V1	62	#10	④	11'-4"	3024
V2	3	#6	STR.	1'-6"	7
SP-1	9	*	⑤	159'-9"	960

NOTE:
* THE SP-1 SPIRAL STAINLESS STEEL REINFORCING SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

QUANTITIES

		BENT 51
STAINLESS STEEL REINFORCING	LBS.	38183
SPIRAL STAINLESS STEEL REINFORCING	LBS.	960
CLASS AA CONCRETE : CAP POUR	CU. YDS.	60.3
PIER WALL POUR	CU. YDS.	4.5
FOOTING POUR	CU. YDS.	91.9
TOTAL	CU. YDS.	156.7
30"X 30"PRESTRESSED CONCRETE PILES	NO.	9
	FT.	945

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 51
BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

DRAWN BY : VMW DATE : 2-12
CHECKED BY : PEK DATE : 3-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-173
1			3			TOTAL SHEETS
2			4			219

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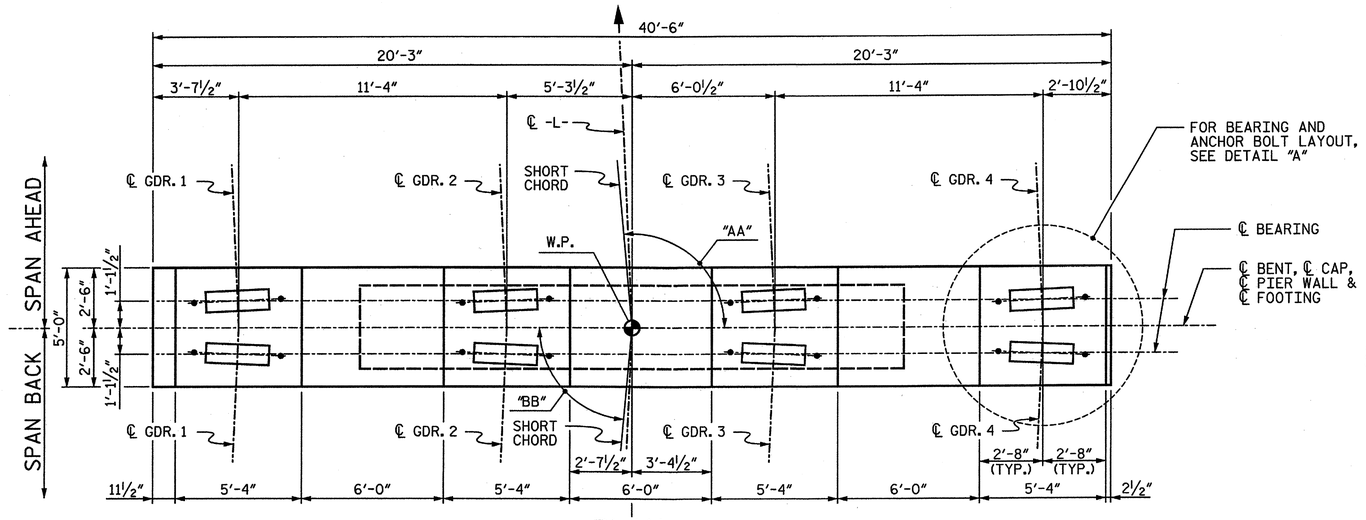
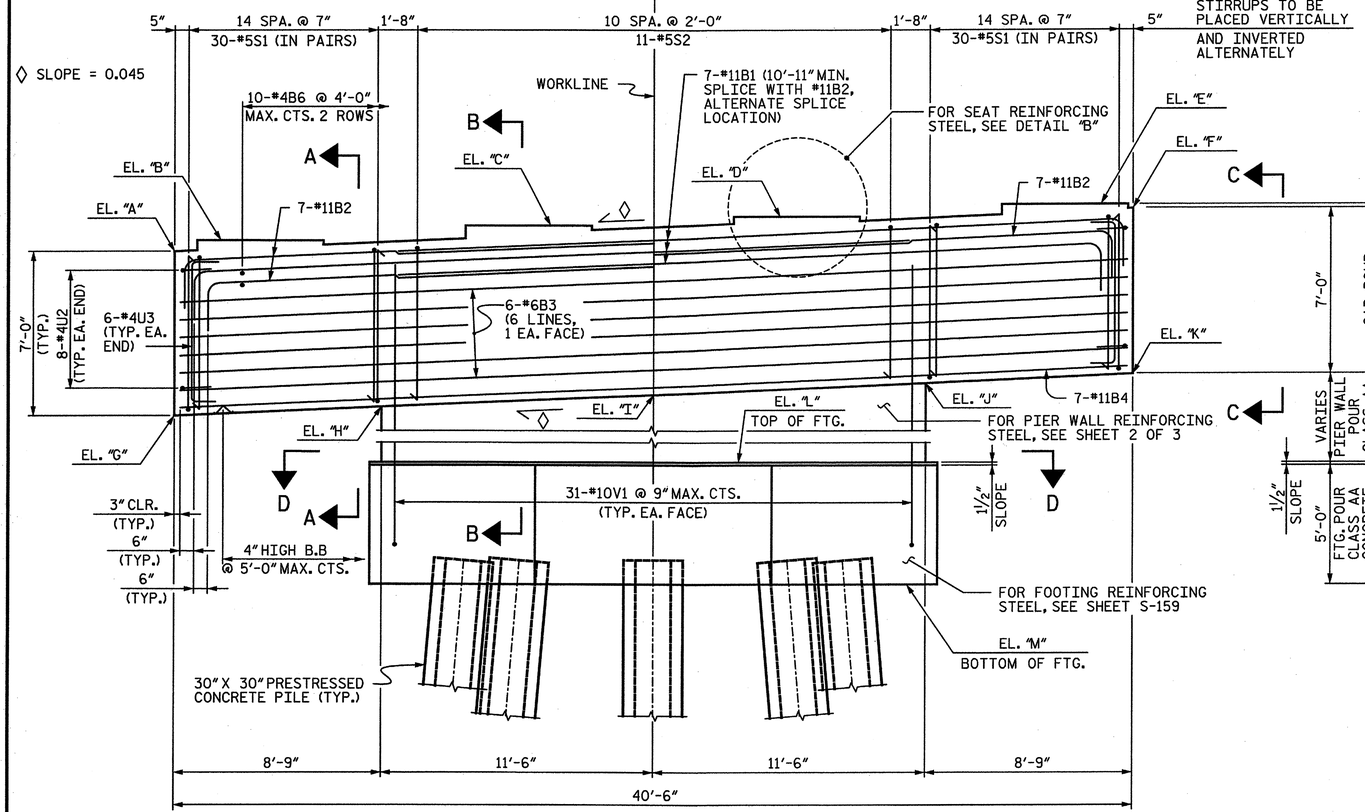
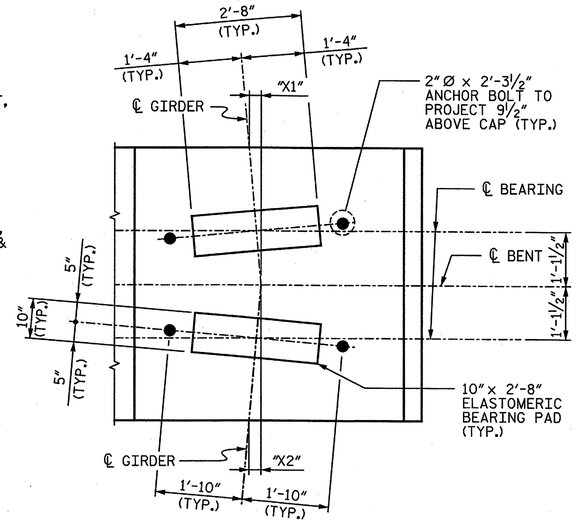


PLAN



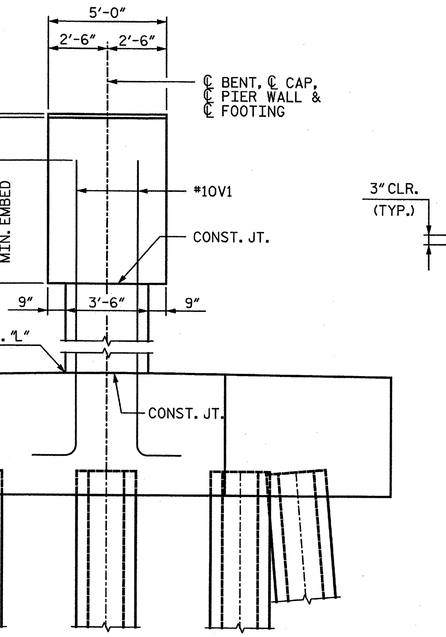
ELEVATION



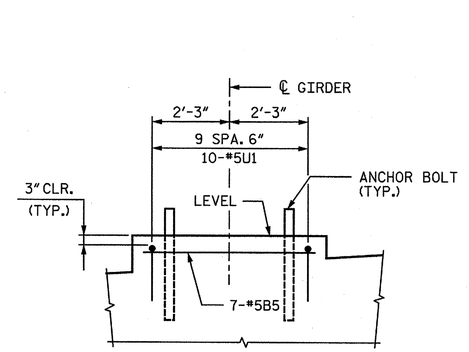
DETAIL "A"
(TYPICAL EACH SEAT)

NOTES:

1. FOR SECTION VIEWS, SEE SHEET 2 OF 3.
2. FOR ELEVATIONS, DIMENSIONS AND ANGLES TABLE, SEE SHEET 3 OF 3.
3. FOR PILE AND FOOTING DETAILS, SEE SHEET S-159.
4. CONTRACTOR SHALL VERIFY THE END OF CAP (ANY PORTION OF) IS BEHIND OR PROTECTED BY THE TEMPORARY ROADWAY BARRIER AND IS TO ADJUST BARRIER SLIGHTLY TO PREVENT THE END OF CAP FROM PROJECTING IN FRONT OF THE TOP TRAFFIC FACE OF BARRIER.
5. CONTRACTOR SHALL PROPOSE A FORMWORK/FALSEWORK SYSTEM THAT DOES NOT PROJECT BEYOND TOP TRAFFIC FACE OF TEMPORARY ROADWAY BARRIER. FORMWORK/FALSEWORK SYSTEM SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. IF CONTRACTOR CANNOT PROPOSE AN ACCEPTABLE FORMWORK/FALSEWORK SYSTEM TO MEET CLEARANCES DESCRIBED, THE PRECAST CAP SHALL BE USED, SEE SHEETS S-204 TO S-208. SEE GENERAL NOTES FOR ADDITIONAL INFORMATION AND PAYMENT REQUIREMENTS.
6. FOR BENTS 86 & 84, THE TOP SURFACE OF THE BENT CAP SHALL BE COATED WITH EPOXY PROTECTIVE COATING. THE EPOXY PROTECTIVE COATING SHALL NOT BE APPLIED TO THE AREA UNDER THE ELASTOMERIC BEARINGS.
7. FOR BENTS 86 & 84, THE TOP SURFACE OF THE BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND SHALL NOT BE USED.



SIDE VIEW



DETAIL "B"
(TYPICAL EACH SEAT)

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENTS 52-60 & 80-87 PLAN AND ELEVATION

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

DRAWN BY : VMW	DATE : 2-12
CHECKED BY : PEK	DATE : 3-12

STV / Ralph Whitehead Associates, Inc.
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2			4		

SHEET NO. S-174

TOTAL SHEETS 219

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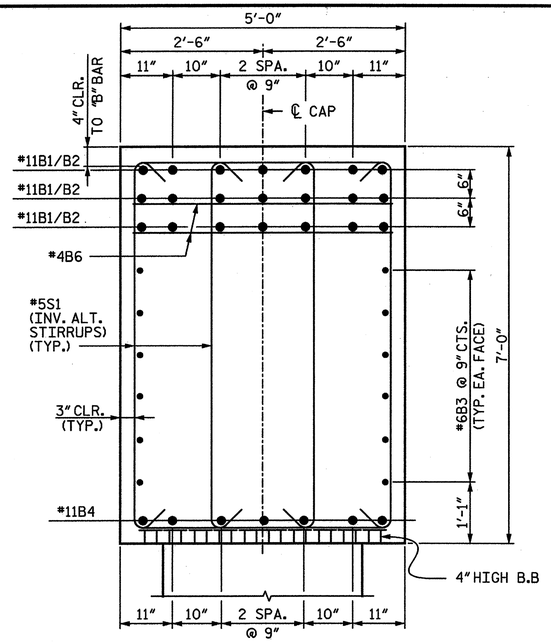
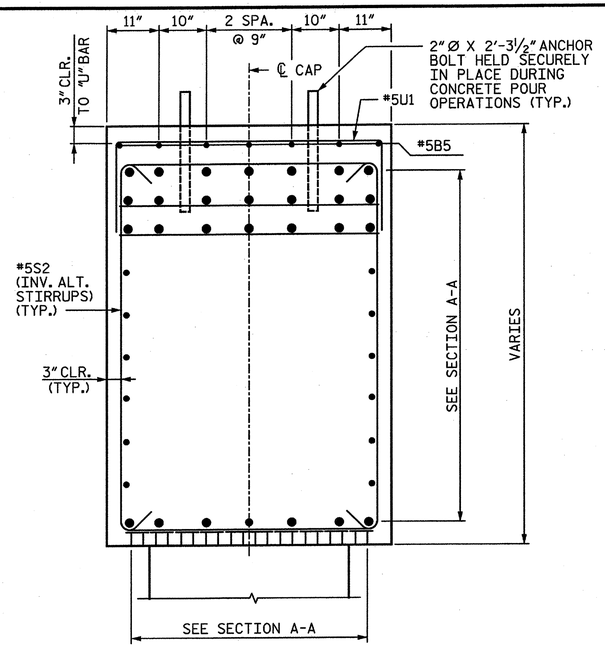


SECTION A-A



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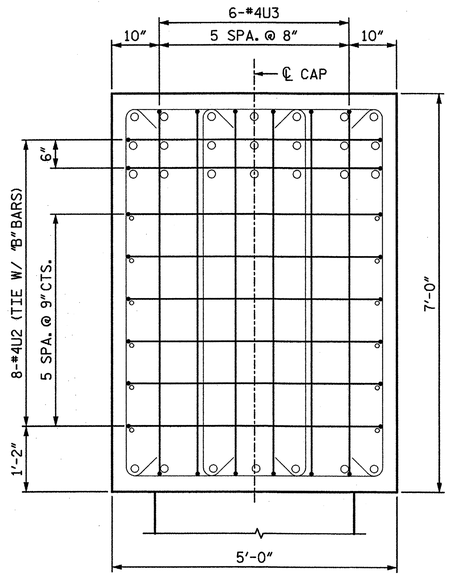
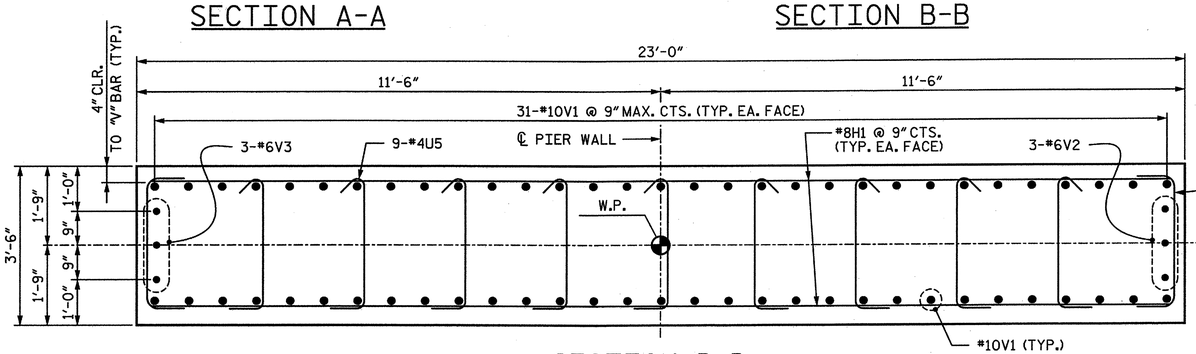


END VIEW C-C



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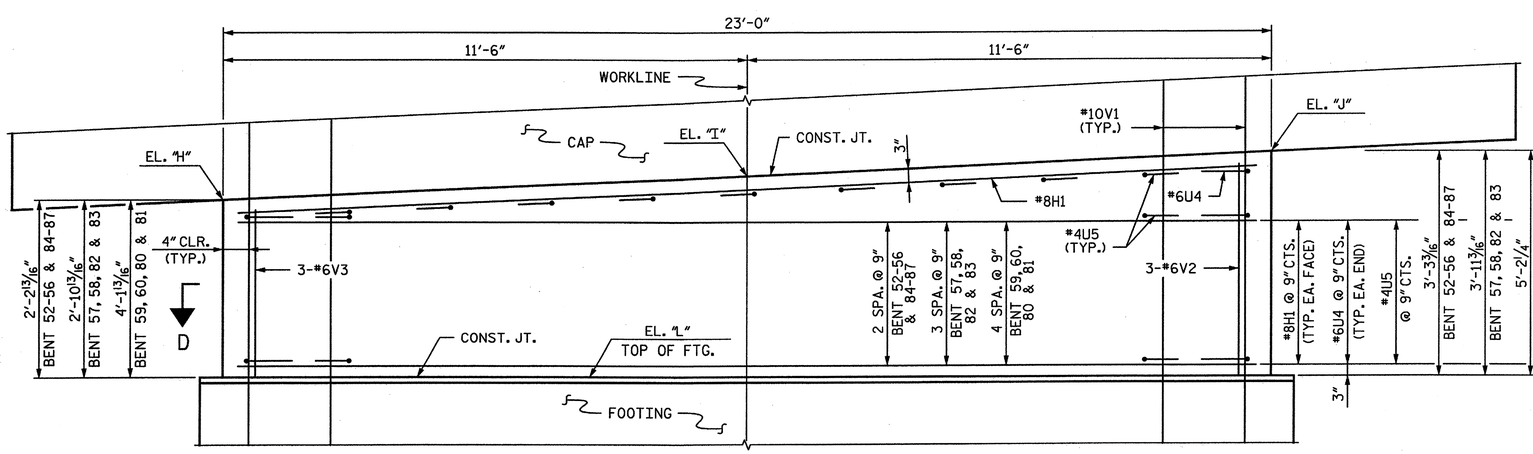
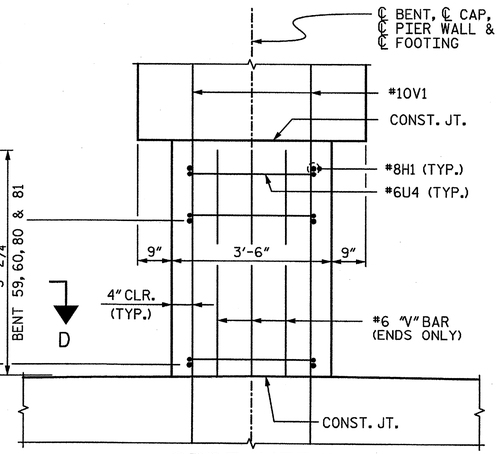


PIER WALL ELEVATION



SIDE VIEW

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENTS 52-60 & 80-87 DETAILS

DRAWN BY : VMW DATE : 2-12
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1000 West Morehead St., Ste. 200
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NC License No. F-0991

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			219

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TABLE A

ELEVATIONS

	BENT 52	BENT 53	BENT 54	BENT 55	BENT 56	BENT 57	BENT 58	BENT 59	BENT 60	BENT 80	BENT 81	BENT 82	BENT 83	BENT 84	BENT 85	BENT 86	BENT 87
"A"	16.447	16.807	17.167	17.527	17.887	18.247	18.608	18.968	19.328	20.359	19.587	19.164	18.804	18.444	18.084	17.724	17.204
"B"	16.906	17.266	17.626	17.986	18.346	18.706	19.067	19.427	19.787	20.818	20.046	19.623	19.263	18.903	18.543	18.183	17.960
"C"	17.416	17.776	18.136	18.496	18.856	19.216	19.577	19.937	20.297	21.328	20.556	20.133	19.773	19.413	19.053	18.693	18.378
"D"	17.926	18.286	18.646	19.006	19.366	19.726	20.087	20.447	20.807	21.838	21.066	20.643	20.283	19.923	19.563	19.203	18.788
"E"	18.436	18.796	19.156	19.516	19.876	20.236	20.597	20.957	21.317	22.348	21.576	21.153	20.793	20.433	20.073	19.713	19.194
"F"	18.270	18.630	18.990	19.350	19.710	20.070	20.431	20.791	21.151	22.182	21.410	20.987	20.627	20.267	19.907	19.547	19.027
"G"	9.447	9.807	10.167	10.527	10.887	11.247	11.608	11.968	12.328	13.359	12.587	12.164	11.804	11.444	11.084	10.724	10.204
"H"	9.841	10.201	10.561	10.921	11.281	11.641	12.002	12.362	12.722	13.753	12.981	12.558	12.198	11.838	11.478	11.118	10.598
"I"	10.358	10.718	11.078	11.438	11.798	12.158	12.519	12.879	13.239	14.270	13.498	13.075	12.715	12.355	11.995	11.635	11.116
"J"	10.876	11.236	11.596	11.956	12.316	12.676	13.037	13.397	13.757	14.788	14.016	13.593	13.233	12.873	12.513	12.153	11.633
"K"	11.270	11.630	11.990	12.350	12.710	13.070	13.431	13.791	14.151	15.182	14.410	13.987	13.627	13.267	12.907	12.547	12.027
"L"	7.608	7.968	8.328	8.688	9.048	8.742	9.103	8.212	8.572	9.603	8.831	9.659	9.299	9.605	9.245	8.885	8.366
"M"	2.483	2.843	3.203	3.563	3.923	3.617	3.978	3.087	3.447	4.478	3.706	4.534	4.174	4.480	4.120	3.760	3.241

DIMENSIONS AND ANGLES

"AA"	91°-11'-31"	91°-11'-31"	91°-11'-31"	91°-11'-31"	91°-11'-31"	91°-11'-31"	91°-11'-31"	91°-11'-31"	90°-50'-43"	91°-11'-31"	91°-11'-31"	91°-11'-31"	91°-11'-31"	91°-11'-31"	91°-11'-31"	91°-11'-31"	90°-18'-28"
"BB"	89°-17'-39"	88°-48'-29"	88°-48'-29"	88°-48'-29"	88°-48'-29"	88°-48'-29"	88°-48'-29"	88°-48'-29"	88°-48'-29"	88°-48'-29"	88°-48'-29"	88°-48'-29"	88°-48'-29"	88°-48'-29"	88°-48'-29"	88°-48'-29"	88°-48'-29"
"X1"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	7/16"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	3/16"
"X2"	3/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"

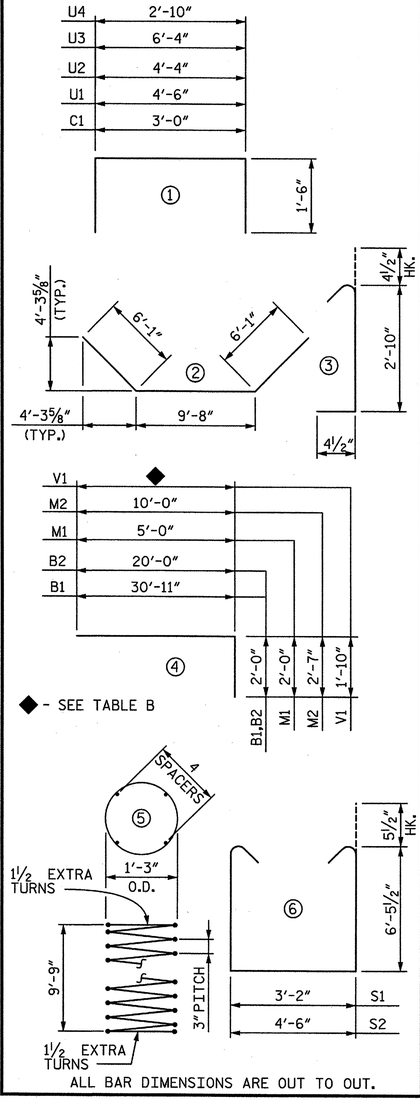
TABLE B

		BENT 52	BENT 53	BENT 54	BENT 55	BENT 56	BENT 57	BENT 58	BENT 59	BENT 60	BENT 80	BENT 81	BENT 82	BENT 83	BENT 84	BENT 85	BENT 86	BENT 87
H1	▲	8	8	8	8	8	10	10	12	12	12	12	10	10	8	8	8	8
	●	477	477	477	477	477	596	596	716	716	716	716	596	596	477	477	477	477
U4	▲	7	7	7	7	7	9	9	11	11	11	11	9	9	7	7	7	7
	●	61	61	61	61	61	79	79	96	96	96	96	79	79	61	61	61	61
U5	▲	36	36	36	36	36	45	45	54	54	54	54	45	45	36	36	36	36
	●	86	86	86	86	86	108	108	129	129	129	129	108	108	86	86	86	86
V1	◆	10'-11"	10'-11"	10'-11"	10'-11"	10'-11"	11'-7"	11'-7"	12'-10"	12'-10"	12'-10"	12'-10"	11'-7"	11'-7"	10'-11"	10'-11"	10'-11"	10'-11"
	■	12'-9"	12'-9"	12'-9"	12'-9"	12'-9"	13'-5"	13'-5"	14'-8"	14'-8"	14'-8"	14'-8"	13'-5"	13'-5"	12'-9"	12'-9"	12'-9"	12'-9"
	●	3402	3402	3402	3402	3402	3579	3579	3913	3913	3913	3913	3579	3579	3402	3402	3402	3402
V2	■	3'-0"	3'-0"	3'-0"	3'-0"	3'-0"	3'-8"	3'-8"	5'-0"	5'-0"	5'-0"	5'-0"	3'-8"	3'-8"	3'-0"	3'-0"	3'-0"	3'-0"
	●	14	14	14	14	14	17	17	23	23	23	23	17	17	14	14	14	14
V3	■	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-8"	2'-8"	3'-11"	3'-11"	3'-11"	3'-11"	2'-8"	2'-8"	2'-0"	2'-0"	2'-0"	2'-0"
	●	9	9	9	9	9	12	12	18	18	18	18	12	12	9	9	9	9

QUANTITIES

		BENT 52	BENT 53	BENT 54	BENT 55	BENT 56	BENT 57	BENT 58	BENT 59	BENT 60	BENT 80	BENT 81	BENT 82	BENT 83	BENT 84	BENT 85	BENT 86	BENT 87
STAINLESS STEEL REINFORCING	LBS.	37190	37190	37190	37190	37190	37532	37532	38036	38036	38036	38036	37532	37532	37190	37190	37190	37190
SPIRAL STAINLESS STEEL REINFORCING	LBS.	960	960	960	960	960	960	960	960	960	960	960	960	960	960	960	960	960
CLASS AA CONCRETE : CAP POUR	CU. YDS.	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	54.3
PIER WALL POUR	CU. YDS.	8.2	8.2	8.2	8.2	8.2	10.2	10.2	14.0	14.0	14.0	14.0	10.2	10.2	8.2	8.2	8.2	8.2
FOOTING POUR	CU. YDS.	91.9	91.9	91.9	91.9	91.9	91.9	91.9	91.9	91.9	91.9	91.9	91.9	91.9	91.9	91.9	91.9	91.9
TOTAL	CU. YDS.	153.8	153.8	153.8	153.8	153.8	155.8	155.8	159.6	159.6	159.6	159.6	155.8	155.8	153.8	153.8	153.8	153.8
30"X 30" PRESTRESSED CONCRETE PILES	NO.	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
	FT.	945	945	945	945	945	945	945	945	945	945	945	990	990	990	990	990	990

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR ONE BENT (17 REQUIRED)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	21	#11	④	32'-11"	3673
B2	21	#11	④	22'-0"	2455
B3	12	#6	STR.	40'-0"	721
B4	7	#11	STR.	40'-0"	1488
B5	28	#5	STR.	4'-6"	131
B6	20	#4	STR.	4'-6"	60
C1	88	#7	①	6'-0"	1079
H1	▲	#8	STR.	22'-4"	●
H2	20	#5	②	21'-10"	455
M1	72	#11	④	7'-0"	2678
M2	72	#14	④	12'-7"	6931
S1	60	#5	⑥	17'-0"	1064
S2	11	#5	⑥	18'-4"	210
T1	4	#11	STR.	9'-8"	205
T2	4	#11	STR.	11'-3"	239
T3	4	#11	STR.	12'-9"	271
T4	4	#11	STR.	14'-3"	303
T5	4	#11	STR.	15'-9"	335
T6	4	#11	STR.	17'-3"	367
T7	4	#11	STR.	18'-9"	398
T8	4	#11	STR.	20'-3"	430
T9	4	#11	STR.	21'-9"	462
T10	28	#11	STR.	23'-4"	3471
T11	4	#10	STR.	9'-8"	166
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T14	4	#10	STR.	14'-3"	245
T15	4	#10	STR.	15'-9"	271
T16	4	#10	STR.	17'-3"	297
T17	4	#10	STR.	18'-9"	323
T18	4	#10	STR.	20'-3"	349
T19	4	#10	STR.	21'-9"	374
T20	28	#10	STR.	23'-4"	2811
U1	40	#5	①	7'-6"	313
U2	16	#4	①	7'-4"	78
U3	12	#4	①	9'-4"	75
U4	▲	#6	①	5'-10"	●
U5	▲	#4	③	3'-7"	●
V1	62	#10	④	■	●
V2	3	#6	STR.	■	●
V3	3	#6	STR.	■	●
SP-1	9	*	⑤	159'-9"	960

NOTE: ▲, ● & ■ - SEE TABLE B.

* THE SP-1 SPIRAL STAINLESS STEEL REINFORCING SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENTS 52-60 & 80-87 ELEVATIONS AND BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

DRAWN BY : VMW DATE : 2-12
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REVISIONS					
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SHEET NO. S-176
TOTAL SHEETS 219

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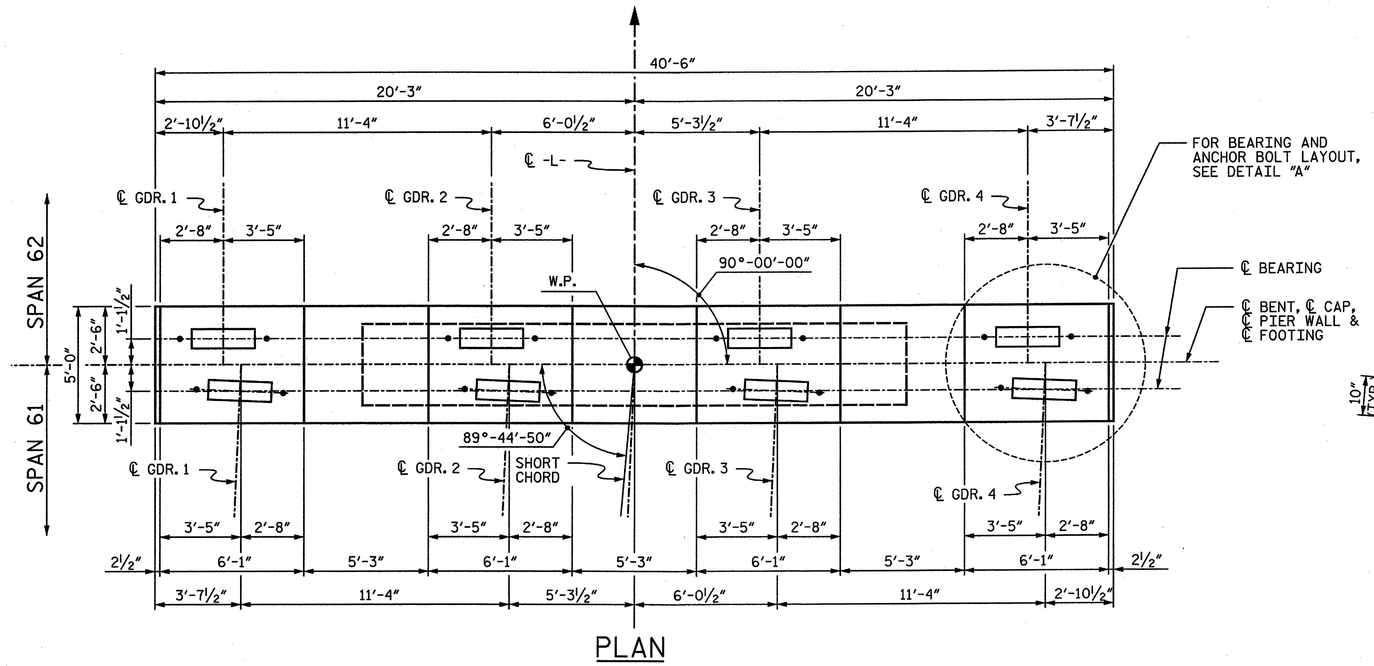
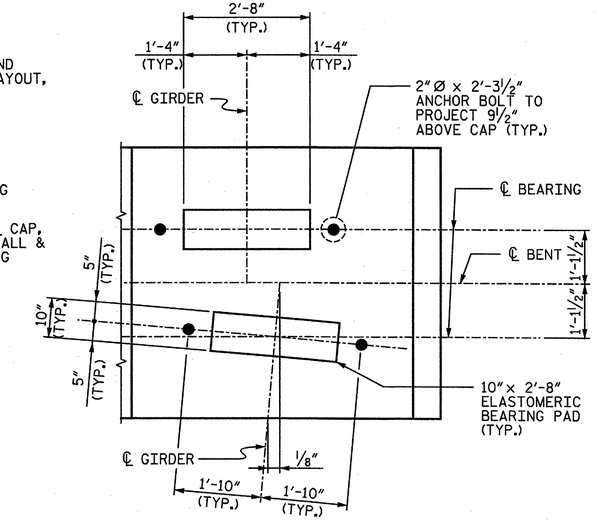


PLAN

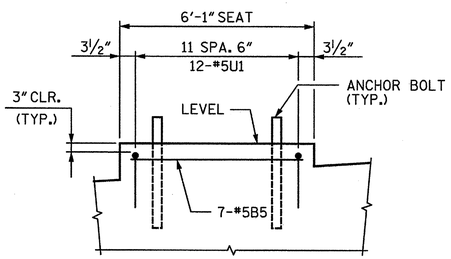


DETAIL "A"
(TYPICAL EACH SEAT)

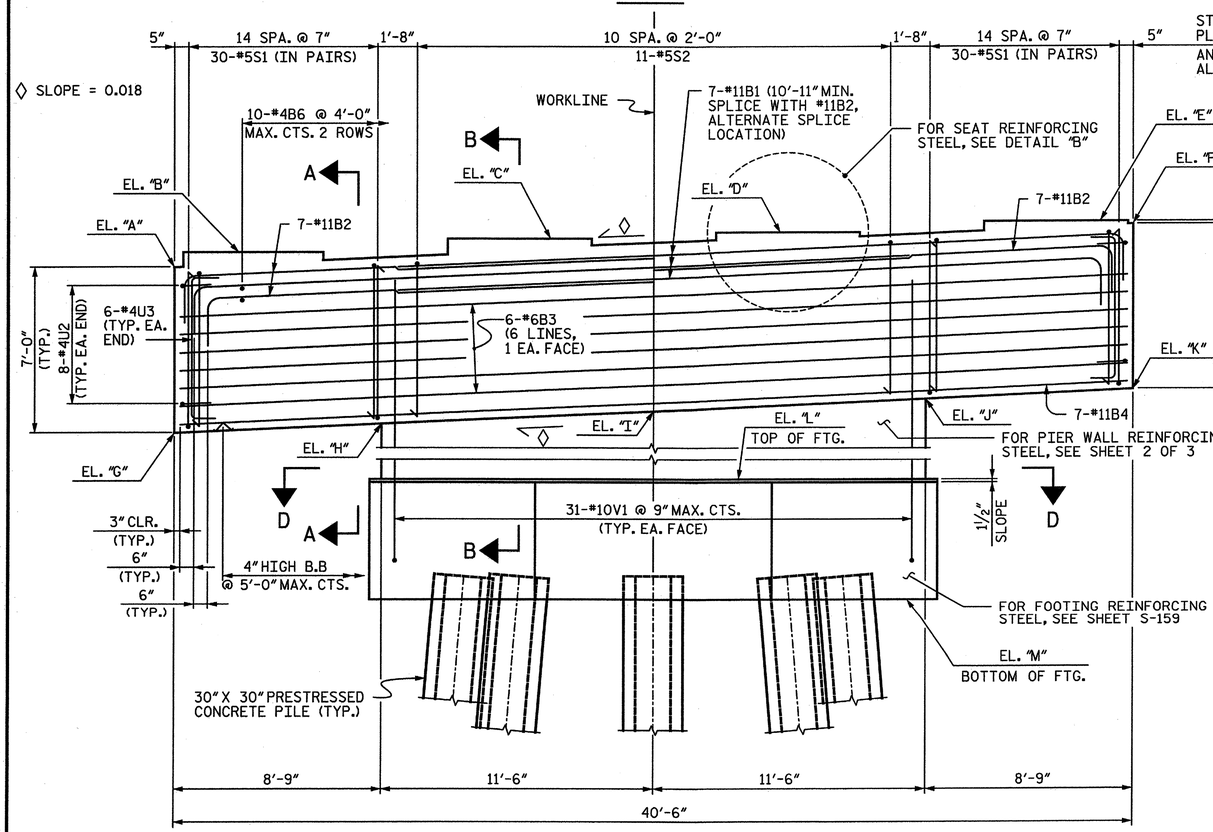
NOTES:

1. FOR SECTION VIEWS, SEE SHEET 2 OF 3.
2. FOR PILE AND FOOTING DETAILS, SEE SHEET S-159.
3. THE TOP SURFACE OF THE BENT CAP SHALL BE COATED WITH EPOXY PROTECTIVE COATING. THE EPOXY PROTECTIVE COATING SHALL NOT BE APPLIED TO THE AREA UNDER THE ELASTOMERIC BEARINGS.
4. THE TOP SURFACE OF THE BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND SHALL NOT BE USED.

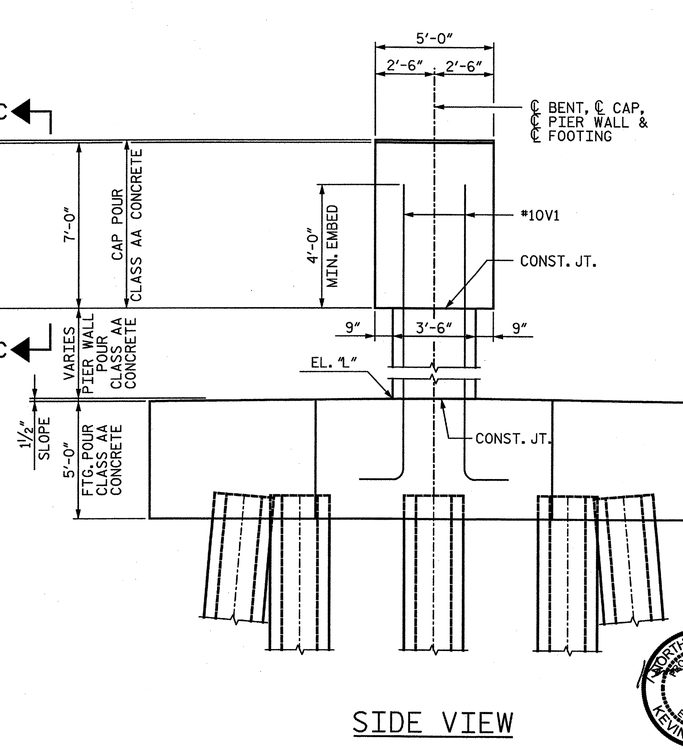
TABLE A	
ELEVATIONS	
	BENT 61
"A"	20.200
"B"	20.683
"C"	20.825
"D"	20.960
"E"	21.096
"F"	20.929
"G"	13.200
"H"	13.358
"I"	13.565
"J"	13.772
"K"	13.929
"L"	8.898
"M"	3.773



DETAIL "B"
(TYPICAL EACH SEAT)



ELEVATION



SIDE VIEW

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT 61 PLAN AND ELEVATION

DRAWN BY : VMW DATE : 2-12
CHECKED BY : PEK DATE : 3-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			219

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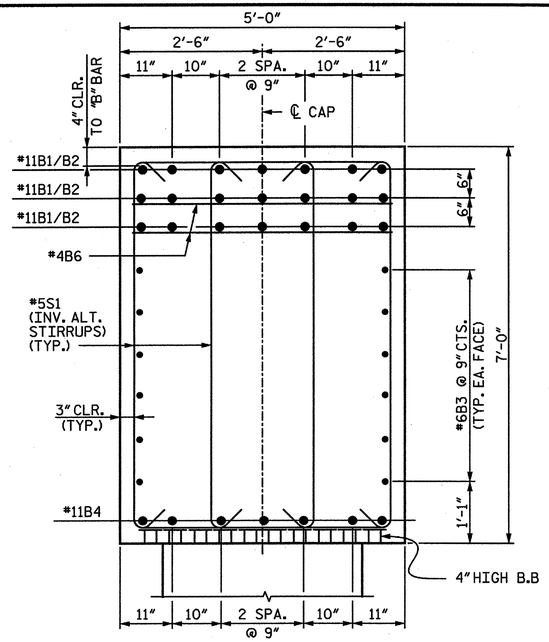
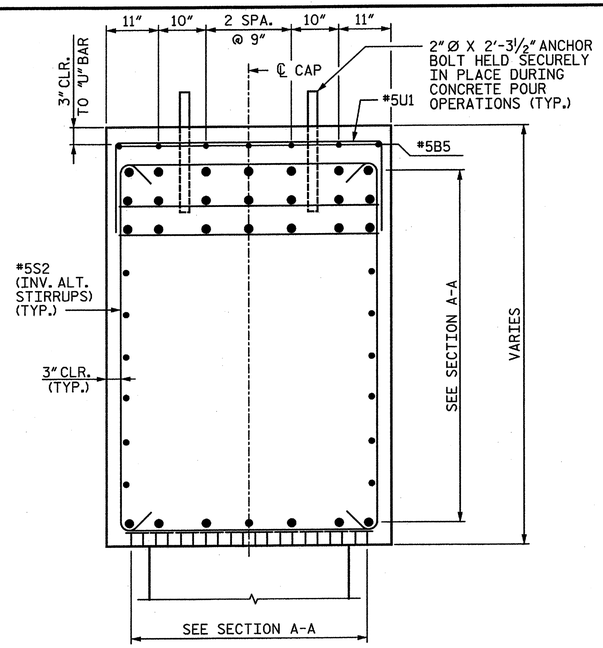
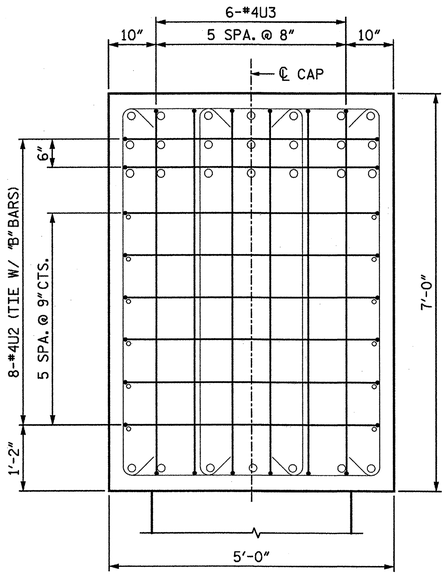


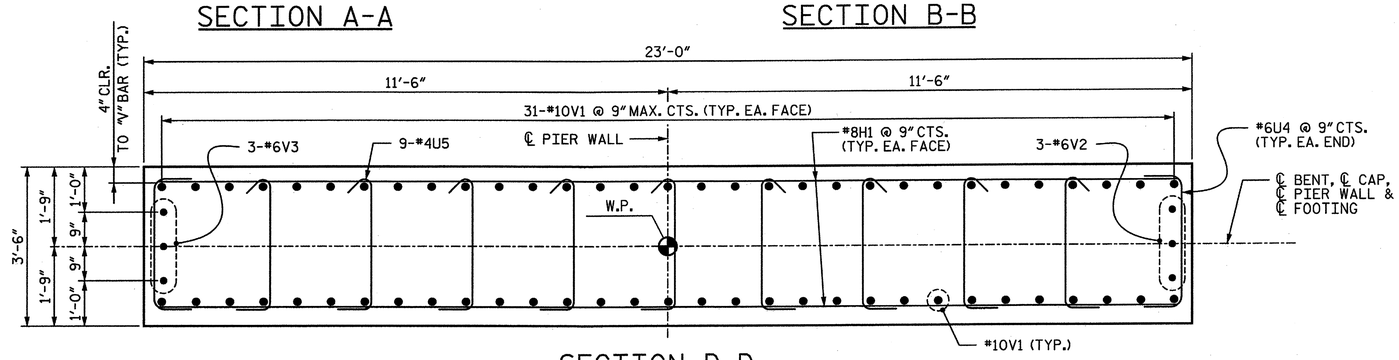
SECTION A-A



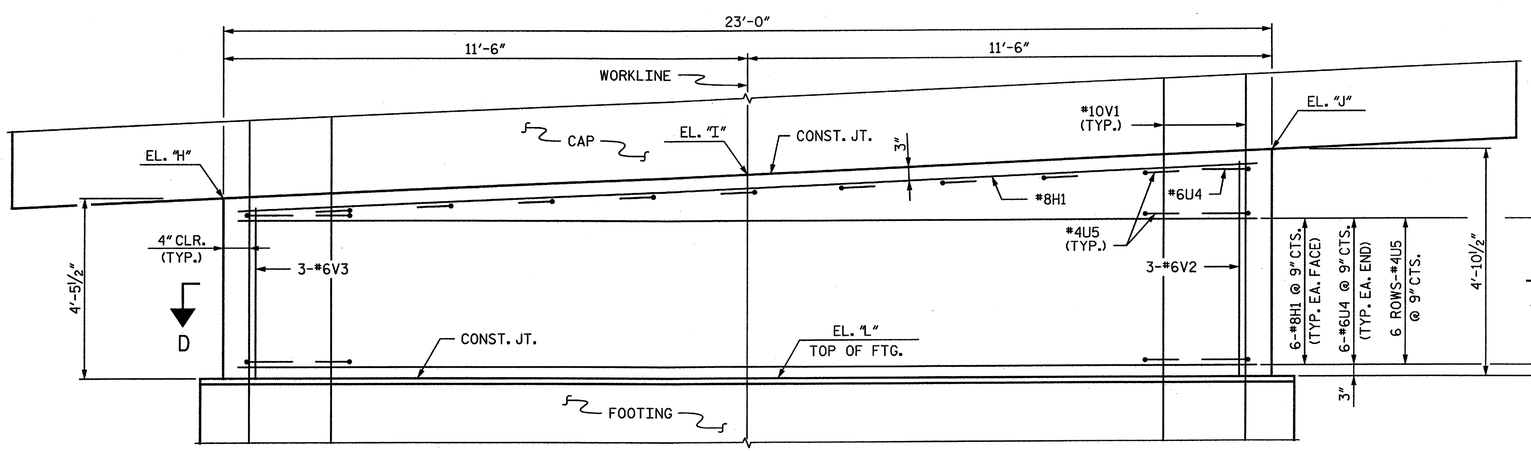
SECTION B-B



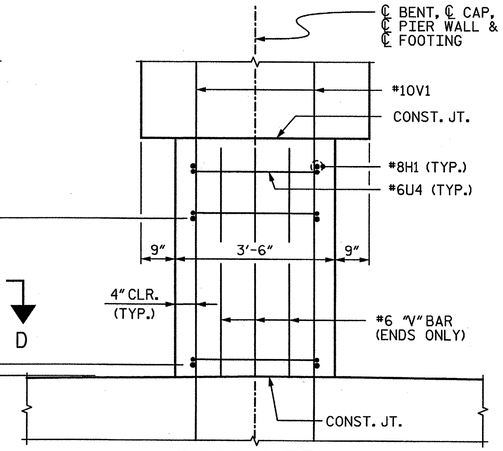
END VIEW C-C



SECTION D-D



PIER WALL ELEVATION



SIDE VIEW

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT 61 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-178
1			3			TOTAL SHEETS
2			4			219

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1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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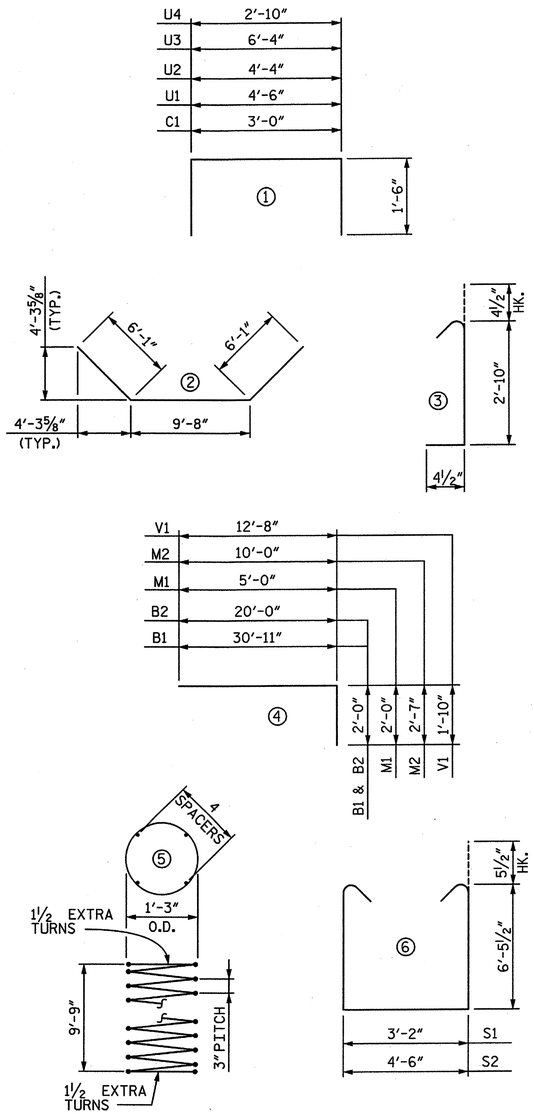
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR BENT 61

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	21	#11	④	32'-11"	3673
B2	21	#11	④	22'-0"	2455
B3	12	#6	STR.	40'-0"	721
B4	7	#11	STR.	40'-0"	1488
B5	28	#5	STR.	5'-7"	163
B6	20	#4	STR.	4'-6"	60
C1	88	#7	①	6'-0"	1079
H1	14	#8	STR.	22'-4"	835
H2	20	#5	②	21'-10"	455
M1	72	#11	④	7'-0"	2678
M2	72	#14	④	12'-7"	6931
S1	60	#5	⑥	17'-0"	1064
S2	11	#5	⑥	18'-4"	210
T1	4	#11	STR.	9'-8"	205
T2	4	#11	STR.	11'-3"	239
T3	4	#11	STR.	12'-9"	271
T4	4	#11	STR.	14'-3"	303
T5	4	#11	STR.	15'-9"	335
T6	4	#11	STR.	17'-3"	367
T7	4	#11	STR.	18'-9"	398
T8	4	#11	STR.	20'-3"	430
T9	4	#11	STR.	21'-9"	462
T10	28	#11	STR.	23'-4"	3471
T11	4	#10	STR.	9'-8"	166
T12	4	#10	STR.	11'-3"	194
T13	4	#10	STR.	12'-9"	219
T14	4	#10	STR.	14'-3"	245
T15	4	#10	STR.	15'-9"	271
T16	4	#10	STR.	17'-3"	297
T17	4	#10	STR.	18'-9"	323
T18	4	#10	STR.	20'-3"	349
T19	4	#10	STR.	21'-9"	374
T20	28	#10	STR.	23'-4"	2811
U1	48	#5	①	7'-6"	375
U2	16	#4	①	7'-4"	78
U3	12	#4	①	9'-4"	75
U4	13	#6	①	5'-10"	114
U5	63	#4	③	3'-7"	151
V1	62	#10	④	14'-6"	3868
V2	3	#6	STR.	4'-7"	21
V3	3	#6	STR.	4'-2"	19
SP-1	9	*	⑤	159'-9"	960

NOTE:

* THE SP-1 SPIRAL STAINLESS STEEL REINFORCING SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

QUANTITIES

		BENT 61
STAINLESS STEEL REINFORCING	LBS.	38243
SPIRAL STAINLESS STEEL REINFORCING	LBS.	960
CLASS AA CONCRETE : CAP POUR	CU. YDS.	54.0
PIER WALL POUR	CU. YDS.	14.0
FOOTING POUR	CU. YDS.	91.9
TOTAL	CU. YDS.	159.9
30"X 30"PRESTRESSED CONCRETE PILES	NO.	9
	FT.	945

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 61
BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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1			3			TOTAL SHEETS
2			4			219

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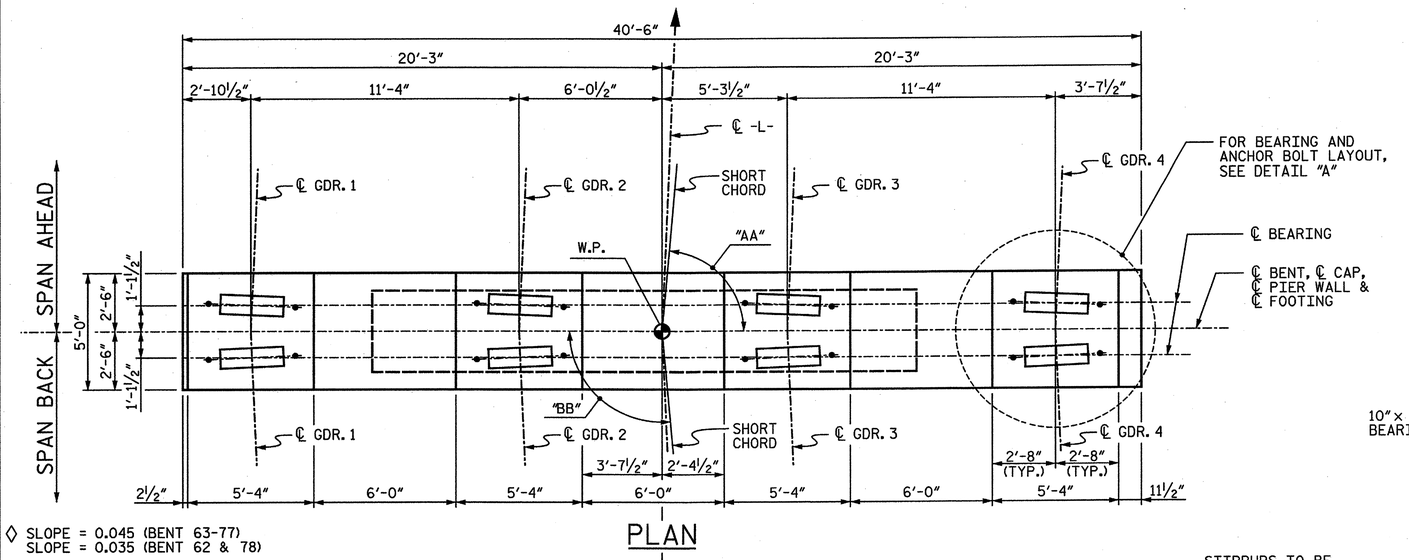
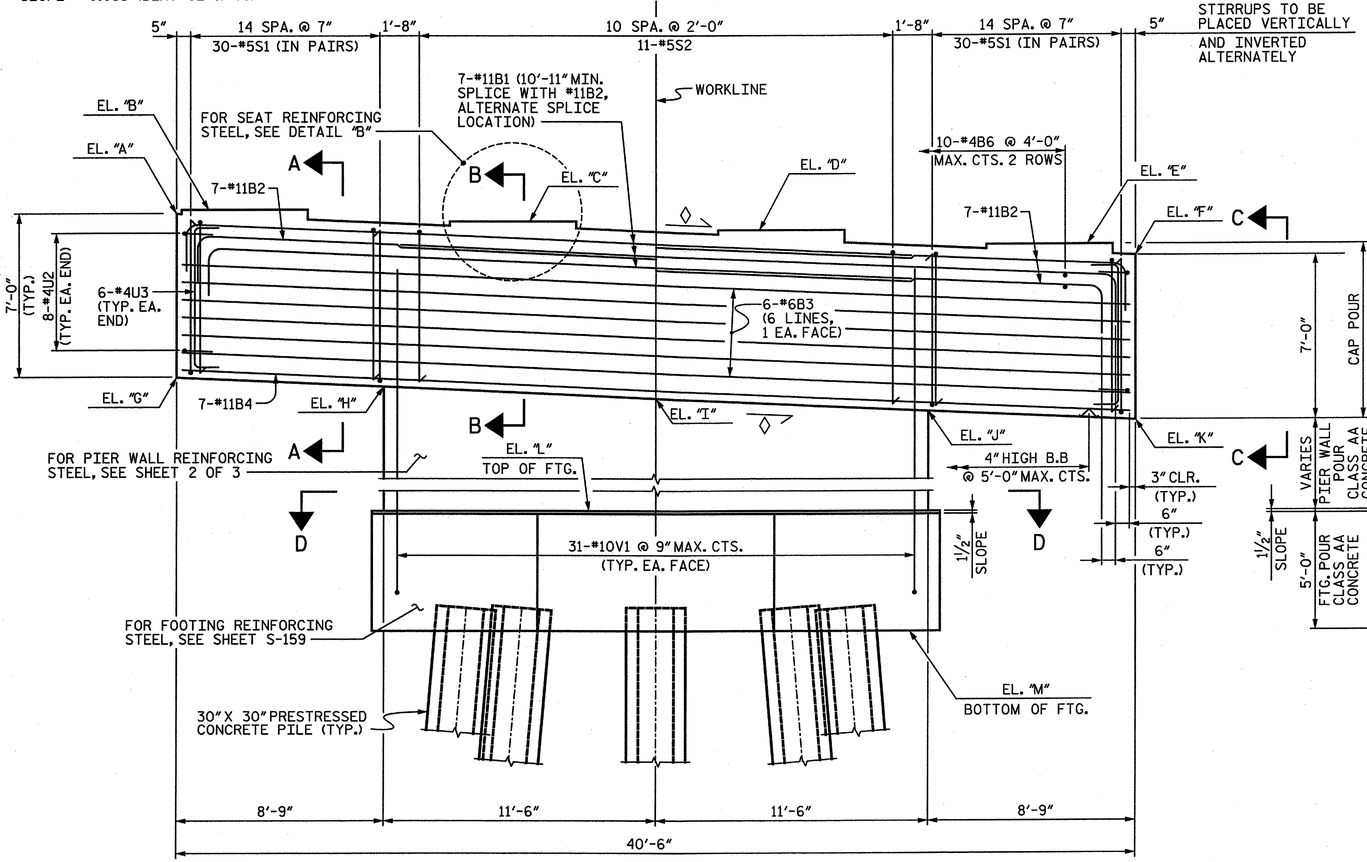
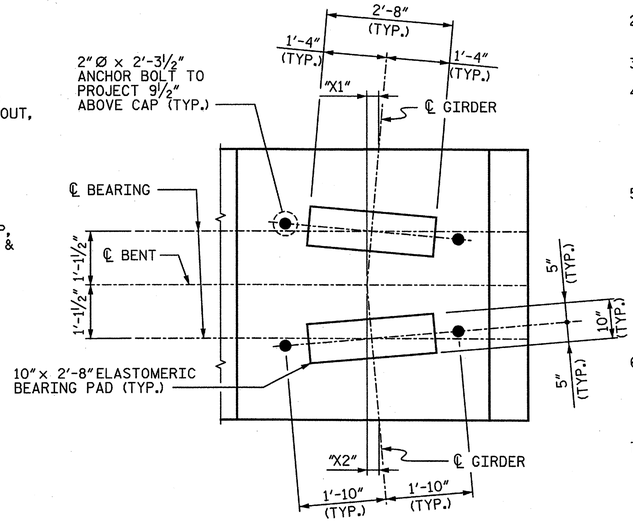


PLAN

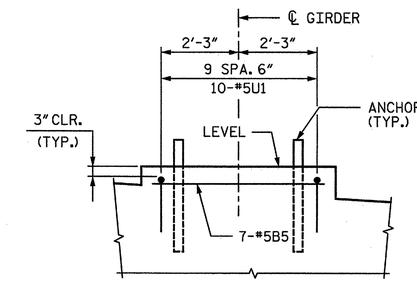
◊ SLOPE = 0.045 (BENT 63-77)
SLOPE = 0.035 (BENT 62 & 78)



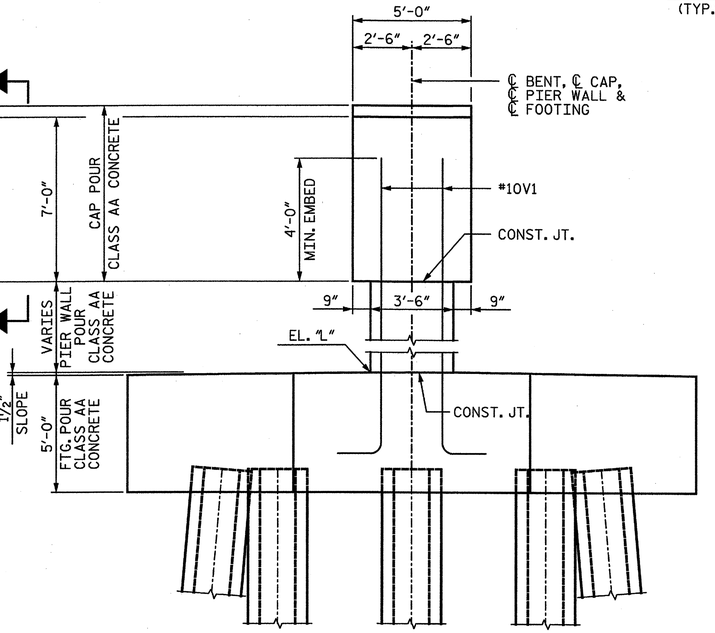
ELEVATION



DETAIL "A"
(TYPICAL EACH SEAT)



DETAIL "B"
(TYPICAL EACH SEAT)



SIDE VIEW

NOTES:

1. FOR SECTION VIEWS, SEE SHEET 2 OF 3.
2. FOR ELEVATIONS, DIMENSIONS AND ANGLES TABLE, SEE SHEET 3 OF 3.
3. FOR PILE AND FOOTING DETAILS, SEE SHEET S-159.
4. CONTRACTOR SHALL VERIFY THE END OF CAP (ANY PORTION OF) IS BEHIND OR PROTECTED BY THE TEMPORARY ROADWAY BARRIER AND IS TO ADJUST BARRIER SLIGHTLY TO PREVENT THE END OF CAP FROM PROJECTING IN FRONT OF THE TOP TRAFFIC FACE OF BARRIER.
5. CONTRACTOR SHALL PROPOSE A FORMWORK/FALSEWORK SYSTEM THAT DOES NOT PROJECT BEYOND TOP TRAFFIC FACE OF TEMPORARY ROADWAY BARRIER. FORMWORK/FALSEWORK SYSTEM SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. IF CONTRACTOR CANNOT PROPOSE AN ACCEPTABLE FORMWORK/FALSEWORK SYSTEM TO MEET CLEARANCES DESCRIBED, THE PRECAST CAP SHALL BE USED, SEE SHEETS S-204 TO S-208. SEE GENERAL NOTES FOR ADDITIONAL INFORMATION AND PAYMENT REQUIREMENTS.
6. FOR BENTS 66, 70 & 74, THE TOP SURFACE OF THE BENT CAP SHALL BE COATED WITH EPOXY PROTECTIVE COATING. THE EPOXY PROTECTIVE COATING SHALL NOT BE APPLIED TO THE AREA UNDER THE ELASTOMERIC BEARINGS.
7. FOR BENTS 66, 70 & 74, THE TOP SURFACE OF THE BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND SHALL NOT BE USED.

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-
SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENTS 62-78 PLAN AND ELEVATION

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-180
1			3			TOTAL SHEETS
2			4			219

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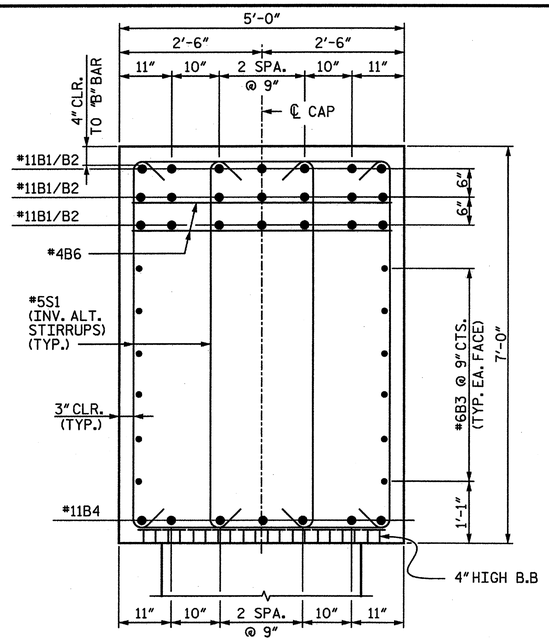
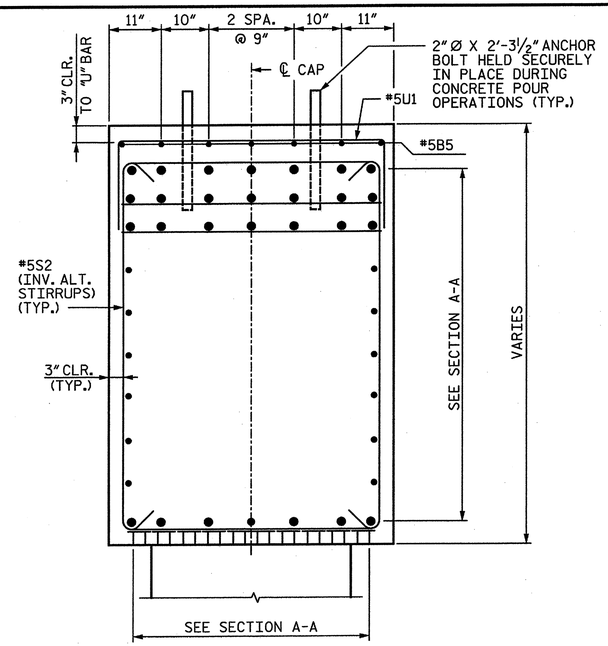
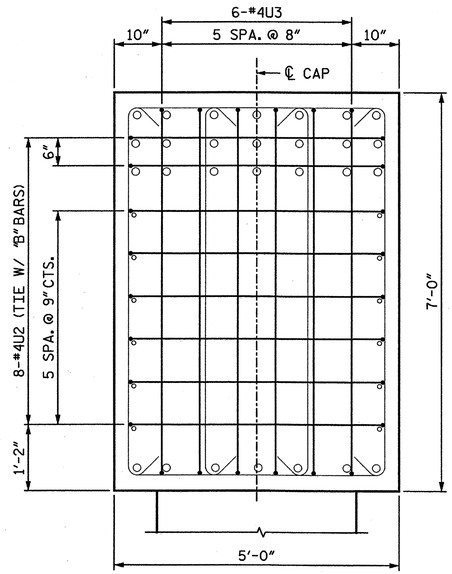


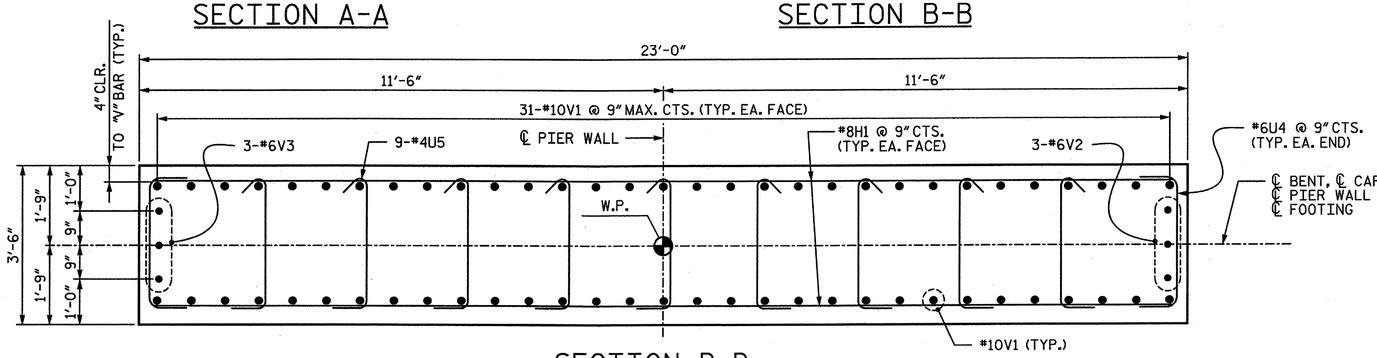
SECTION A-A



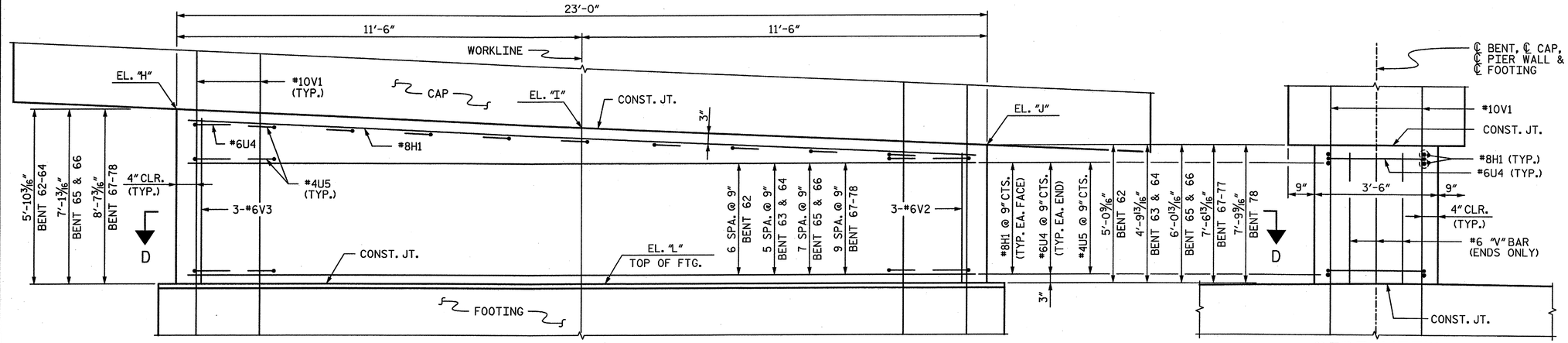
SECTION B-B



END VIEW C-C



SECTION D-D



PIER WALL ELEVATION

SIDE VIEW

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENTS 62-78 DETAILS

DRAWN BY : VMW	DATE : 2-12
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1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS					
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1			3		
2			4		

SHEET NO. S-181

TOTAL SHEETS 219

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TABLE A

ELEVATIONS

	BENT 62	BENT 63	BENT 64	BENT 65	BENT 66	BENT 67	BENT 68	BENT 69	BENT 70	BENT 71	BENT 72	BENT 73	BENT 74	BENT 75	BENT 76	BENT 77	BENT 78
"A"	21.650	22.330	22.918	23.517	24.117	24.716	25.302	25.602	25.614	25.614	25.614	25.614	25.614	25.614	25.562	24.985	23.846
"B"	21.817	22.497	23.084	23.683	24.283	24.882	25.469	25.769	25.781	25.781	25.781	25.781	25.781	25.781	25.729	25.151	24.013
"C"	21.452	21.987	22.574	23.173	23.772	24.372	24.959	25.259	25.271	25.271	25.271	25.271	25.271	25.271	25.219	24.641	23.639
"D"	21.084	21.477	22.064	22.663	23.262	23.862	24.449	24.749	24.761	24.761	24.761	24.761	24.761	24.761	24.709	24.131	23.263
"E"	20.710	20.967	21.554	22.153	22.752	23.352	23.939	24.239	24.251	24.251	24.251	24.251	24.251	24.251	24.199	23.621	22.889
"F"	20.233	20.508	21.095	21.694	22.293	22.893	23.480	23.780	23.792	23.792	23.792	23.792	23.792	23.792	23.740	23.162	22.429
"G"	14.650	15.330	15.918	16.517	17.117	17.716	18.302	18.602	18.614	18.614	18.614	18.614	18.614	18.614	18.562	17.985	16.846
"H"	14.344	14.936	15.524	16.123	16.723	17.322	17.908	18.209	18.221	18.221	18.221	18.221	18.221	18.221	18.169	17.591	16.540
"I"	13.942	14.419	15.006	15.605	16.205	16.804	17.391	17.691	17.703	17.703	17.703	17.703	17.703	17.703	17.651	17.073	16.137
"J"	13.539	13.901	14.489	15.088	15.687	16.287	16.873	17.174	17.186	17.186	17.186	17.186	17.186	17.186	17.134	16.556	15.735
"K"	13.233	13.508	14.095	14.694	15.293	15.893	16.480	16.780	16.792	16.792	16.792	16.792	16.792	16.792	16.740	16.162	15.429
"L"	8.493	9.086	9.673	9.022	9.621	8.721	9.308	9.608	9.620	9.620	9.620	9.620	9.620	9.620	9.568	8.990	7.939
"M"	3.368	3.961	4.548	3.897	4.496	3.596	4.183	4.483	4.495	4.495	4.495	4.495	4.495	4.495	4.443	3.865	2.814

DIMENSIONS AND ANGLES

"AA"	89°-0'-37"	88°-48'-29"	88°-48'-29"	88°-48'-29"	88°-48'-29"	88°-48'-29"	88°-48'-29"	88°-54'-26"	88°-54'-26"	88°-54'-26"	88°-54'-26"	88°-54'-26"	88°-54'-26"	88°-54'-26"	88°-48'-29"	88°-48'-29"	88°-57'-56"
"BB"	90°-0'-0"	91°-10'-57"	91°-11'-31"	91°-11'-31"	91°-11'-31"	91°-11'-31"	91°-11'-31"	91°-11'-31"	91°-5'-34"	91°-5'-34"	91°-5'-34"	91°-5'-34"	91°-5'-34"	91°-5'-34"	91°-5'-34"	91°-11'-31"	91°-11'-31"
"X1"	1/2"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	9/16"	9/16"	9/16"	9/16"	9/16"	9/16"	5/8"	5/8"	9/16"
"X2"	0"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	9/16"	9/16"	9/16"	9/16"	9/16"	9/16"	5/8"	5/8"	5/8"

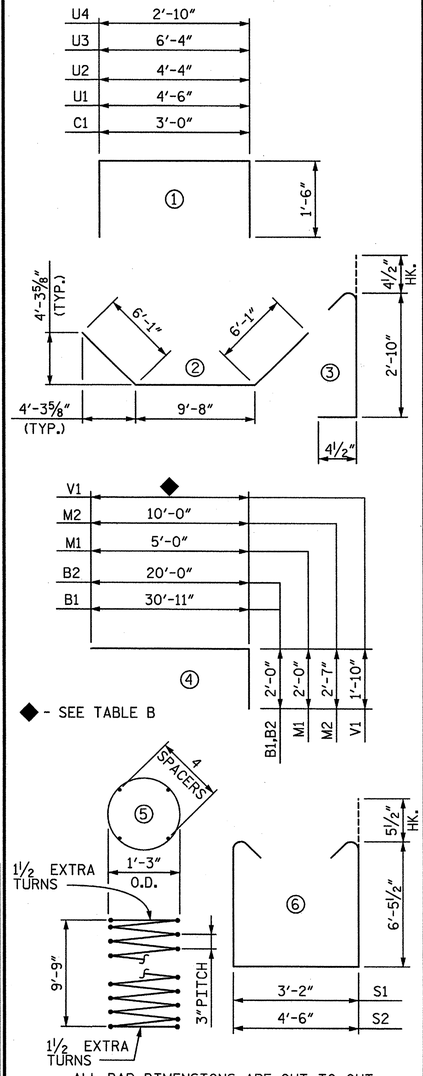
TABLE B

		BENT 62	BENT 63	BENT 64	BENT 65	BENT 66	BENT 67	BENT 68	BENT 69	BENT 70	BENT 71	BENT 72	BENT 73	BENT 74	BENT 75	BENT 76	BENT 77	BENT 78
H1	▲	16	14	14	18	18	22	22	22	22	22	22	22	22	22	22	22	22
	●	954	835	835	1073	1073	1312	1312	1312	1312	1312	1312	1312	1312	1312	1312	1312	1312
U4	▲	15	14	14	18	18	22	22	22	22	22	22	22	22	22	22	22	22
	●	131	123	123	158	158	193	193	193	193	193	193	193	193	193	193	193	193
U5	▲	72	63	63	81	81	99	99	99	99	99	99	99	99	99	99	99	99
	●	172	151	151	194	194	237	237	237	237	237	237	237	237	237	237	237	237
V1	◆	13'-6"	13'-6"	13'-6"	14'-9"	14'-9"	16'-3"	16'-3"	16'-3"	16'-3"	16'-3"	16'-3"	16'-3"	16'-3"	16'-3"	16'-3"	16'-3"	16'-3"
	■	15'-4"	15'-4"	15'-4"	16'-7"	16'-7"	18'-1"	18'-1"	18'-1"	18'-1"	18'-1"	18'-1"	18'-1"	18'-1"	18'-1"	18'-1"	18'-1"	18'-1"
	●	4091	4091	4091	4424	4424	4824	4824	4824	4824	4824	4824	4824	4824	4824	4824	4824	4824
V2	■	4'-10"	4'-7"	4'-7"	5'-10"	5'-10"	7'-4"	7'-4"	7'-4"	7'-4"	7'-4"	7'-4"	7'-4"	7'-4"	7'-4"	7'-4"	7'-4"	7'-7"
	●	22	21	21	26	26	33	33	33	33	33	33	33	33	33	33	33	34
V3	■	5'-7"	5'-7"	5'-7"	6'-10"	6'-10"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"
	●	25	25	25	31	31	38	38	38	38	38	38	38	38	38	38	38	38

QUANTITIES

		BENT 62	BENT 63	BENT 64	BENT 65	BENT 66	BENT 67	BENT 68	BENT 69	BENT 70	BENT 71	BENT 72	BENT 73	BENT 74	BENT 75	BENT 76	BENT 77	BENT 78
STAINLESS STEEL REINFORCING	LBS.	38536	38387	38387	39047	39047	39778	39778	39778	39778	39778	39778	39778	39778	39778	39778	39778	39779
SPIRAL STAINLESS STEEL REINFORCING	LBS.	960	960	960	960	960	960	960	960	960	960	960	960	960	960	960	960	960
CLASS AA CONCRETE : CAP POUR	CU. YDS.	53.9	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.9
PIER WALL POUR	CU. YDS.	16.2	15.9	15.9	19.6	19.6	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.4
FOOTING POUR	CU. YDS.	91.9	91.9	91.9	91.9	91.9	91.9	91.9	91.9	91.9	91.9	91.9	91.9	91.9	91.9	91.9	91.9	91.9
TOTAL	CU. YDS.	162.0	161.6	161.6	165.3	165.3	169.8	169.8	169.8	169.8	169.8	169.8	169.8	169.8	169.8	169.8	169.8	170.2
30"X 30" PRESTRESSED CONCRETE PILES	NO.	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
	FT.	945	945	945	945	945	945	945	945	945	945	945	945	945	945	945	945	945

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR ONE BENT (17 REQUIRED)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	21	#11	④	32'-11"	3673
B2	21	#11	④	22'-0"	2455
B3	12	#6	STR.	40'-0"	721
B4	7	#11	STR.	40'-0"	1488
B5	28	#5	STR.	4'-6"	131
B6	20	#4	STR.	4'-6"	60
C1	88	#7	①	6'-0"	1079
H1	▲	#8	STR.	22'-4"	●
H2	20	#5	②	21'-10"	455
M1	72	#11	④	7'-0"	2678
M2	72	#14	④	12'-7"	6931
S1	60	#5	⑥	17'-0"	1064
S2	11	#5	⑥	18'-4"	210
T1	4	#11	STR.	9'-8"	205
T2	4	#11	STR.	11'-3"	239
T3	4	#11	STR.	12'-9"	271
T4	4	#11	STR.	14'-3"	303
T5	4	#11	STR.	15'-9"	335
T6	4	#11	STR.	17'-3"	367
T7	4	#11	STR.	18'-9"	398
T8	4	#11	STR.	20'-3"	430
T9	4	#11	STR.	21'-9"	462
T10	28	#11	STR.	23'-4"	3471
T11	4	#10	STR.	9'-8"	166
T12	4	#10	STR.	11'-3"	194
T13	4	#10	STR.	12'-9"	219
T14	4	#10	STR.	14'-3"	245
T15	4	#10	STR.	15'-9"	271
T16	4	#10	STR.	17'-3"	297
T17	4	#10	STR.	18'-9"	323
T18	4	#10	STR.	20'-3"	349
T19	4	#10	STR.	21'-9"	374
T20	28	#10	STR.	23'-4"	2811
U1	40	#5	①	7'-6"	313
U2	16	#4	①	7'-4"	78
U3	12	#4	①	9'-4"	75
U4	▲	#6	①	5'-10"	●
U5	▲	#4	③	3'-7"	●
V1	62	#10	④	■	●
V2	3	#6	STR.	■	●
V3	3	#6	STR.	■	●
SP-1	9	*	⑤	159'-9"	960

NOTE: ▲, ● & ■ - SEE TABLE B.

* THE SP-1 SPIRAL STAINLESS STEEL REINFORCING SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENTS 62-78 ELEVATIONS AND BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-182
1			3			TOTAL SHEETS
2			4			219

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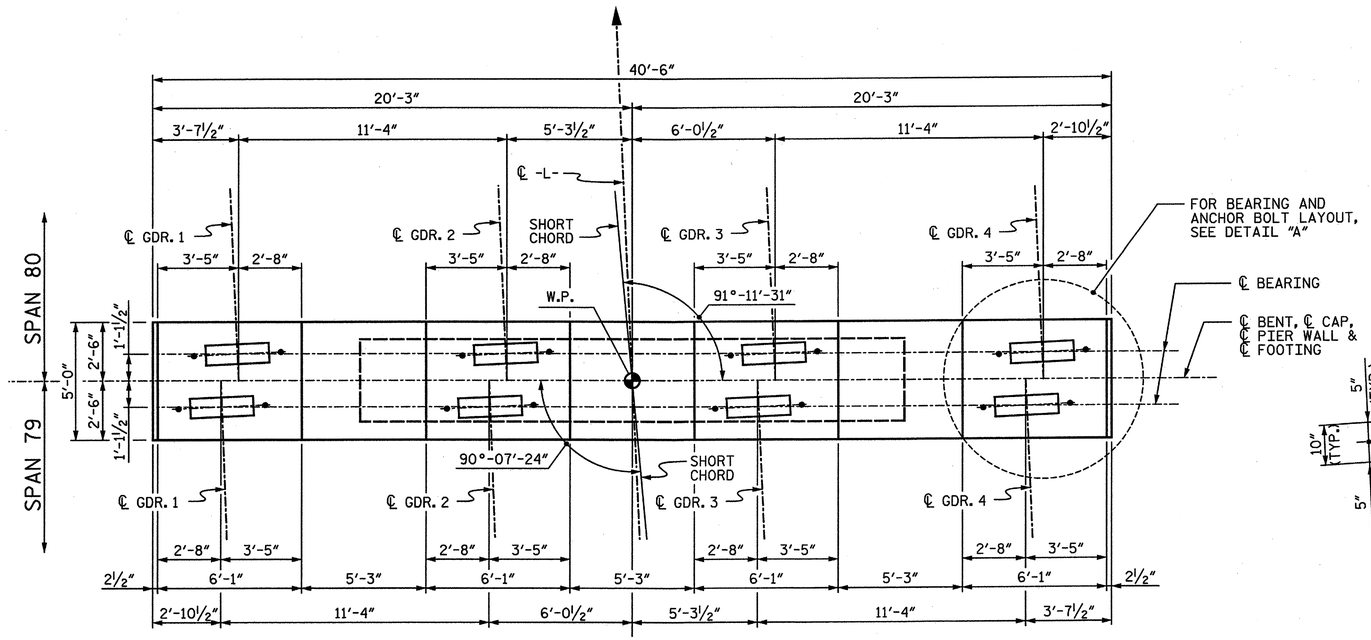
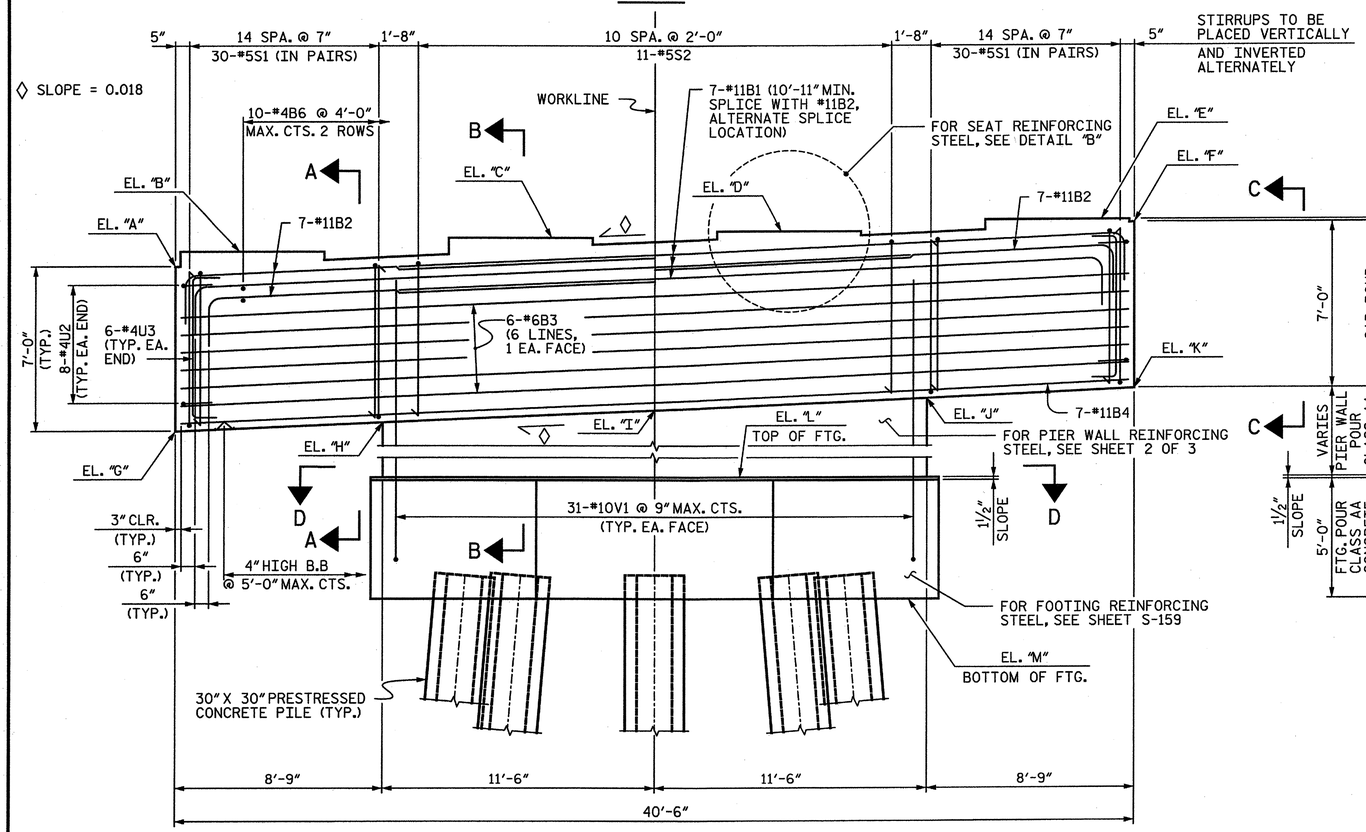
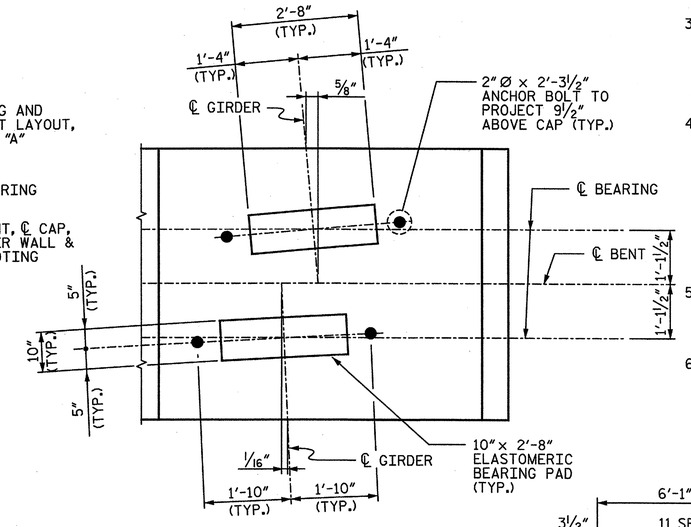
10/4/2012 12:22:22 PM R:\Structures\usta\182 Bents 62-78 Sht 3 of 3.dgn



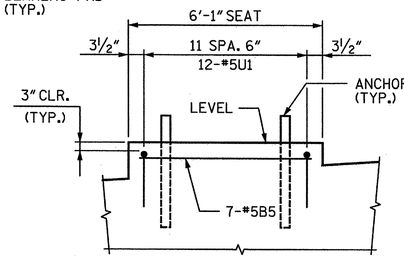
PLAN

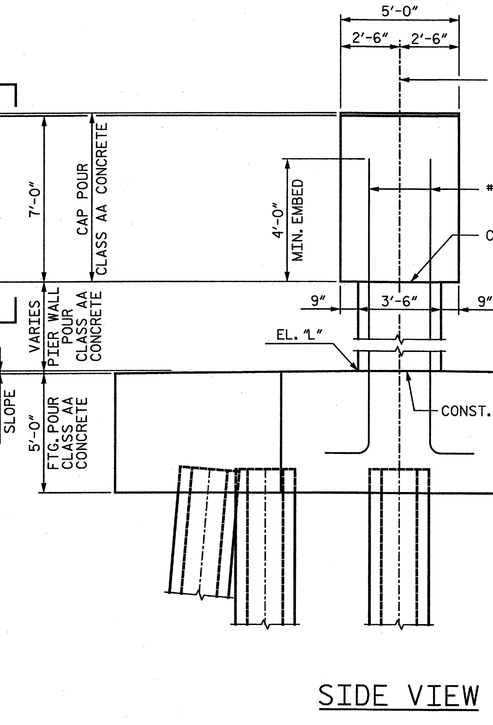


ELEVATION



DETAIL "A"
(TYPICAL EACH SEAT)





DETAIL "B"
(TYPICAL EACH SEAT)

SIDE VIEW

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

NOTES:

1. FOR SECTION VIEWS, SEE SHEET 2 OF 3.
2. FOR PILE AND FOOTING DETAILS, SEE SHEET S-159.
3. CONTRACTOR SHALL VERIFY THE END OF CAP (ANY PORTION OF) IS BEHIND OR PROTECTED BY THE TEMPORARY ROADWAY BARRIER AND IS TO ADJUST BARRIER SLIGHTLY TO PREVENT THE END OF CAP FROM PROJECTING IN FRONT OF THE TOP TRAFFIC FACE OF BARRIER.
4. CONTRACTOR SHALL PROPOSE A FORMWORK/FALSEWORK SYSTEM THAT DOES NOT PROJECT BEYOND TOP TRAFFIC FACE OF TEMPORARY ROADWAY BARRIER. FORMWORK/FALSEWORK SYSTEM SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. IF CONTRACTOR CANNOT PROPOSE AN ACCEPTABLE FORMWORK/FALSEWORK SYSTEM TO MEET CLEARANCES DESCRIBED. THE PRECAST CAP SHALL BE USED, SEE SHEETS S-204 TO S-208. SEE GENERAL NOTES FOR ADDITIONAL INFORMATION AND PAYMENT REQUIREMENTS.
5. THE TOP SURFACE OF THE BENT CAP SHALL BE COATED WITH EPOXY PROTECTIVE COATING. THE EPOXY PROTECTIVE COATING SHALL NOT BE APPLIED TO THE AREA UNDER THE ELASTOMERIC BEARINGS.
6. THE TOP SURFACE OF THE BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND SHALL NOT BE USED.

TABLE A

ELEVATIONS

	BENT 79
"A"	21.805
"B"	22.301
"C"	22.437
"D"	22.574
"E"	22.701
"F"	22.534
"G"	14.805
"H"	14.962
"I"	15.169
"J"	15.376
"K"	15.534
"L"	8.586
"M"	3.461

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT 79 PLAN AND ELEVATION

DRAWN BY : VMW DATE : 2-12
CHECKED BY : PEK DATE : 4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-183
1			3			TOTAL SHEETS
2			4			219

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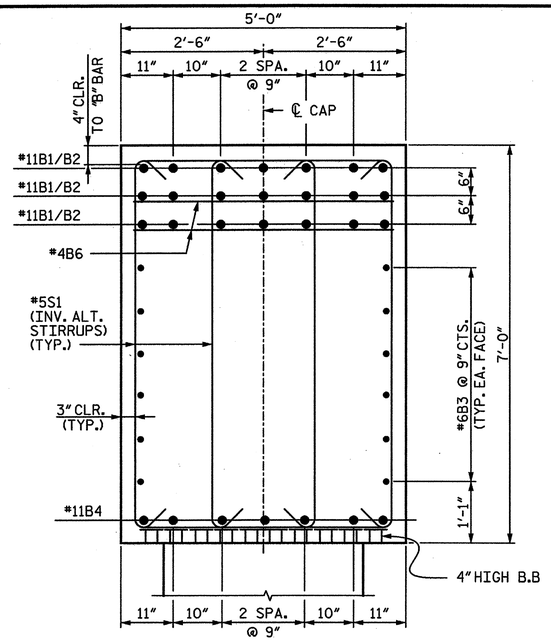
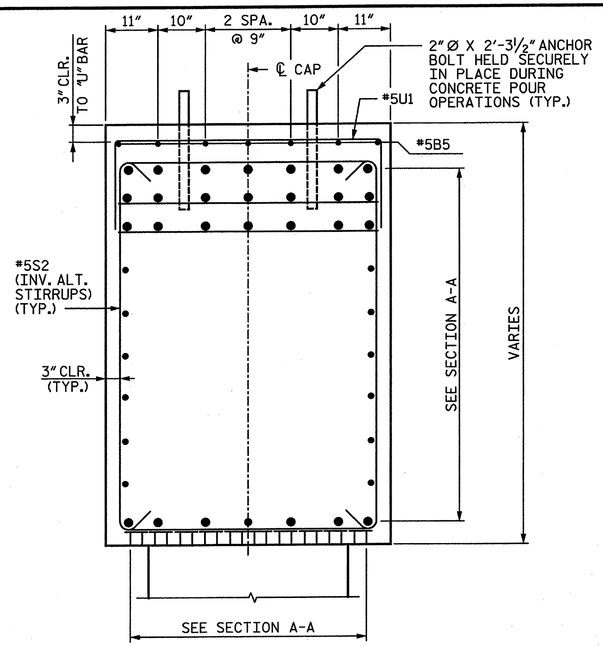
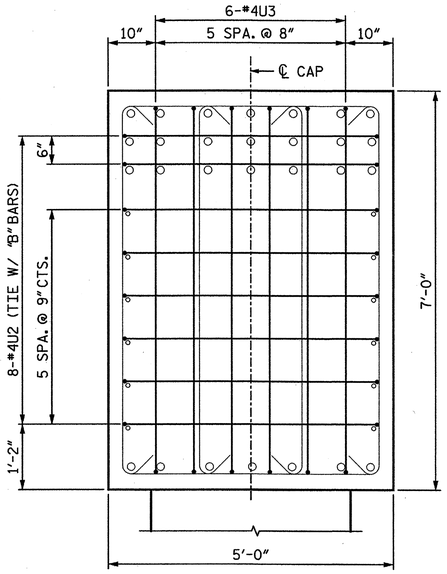


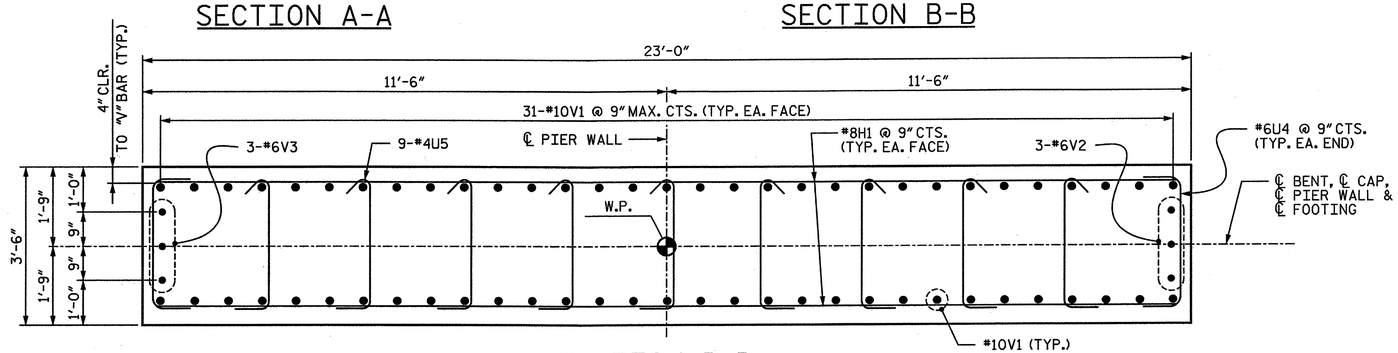
SECTION A-A



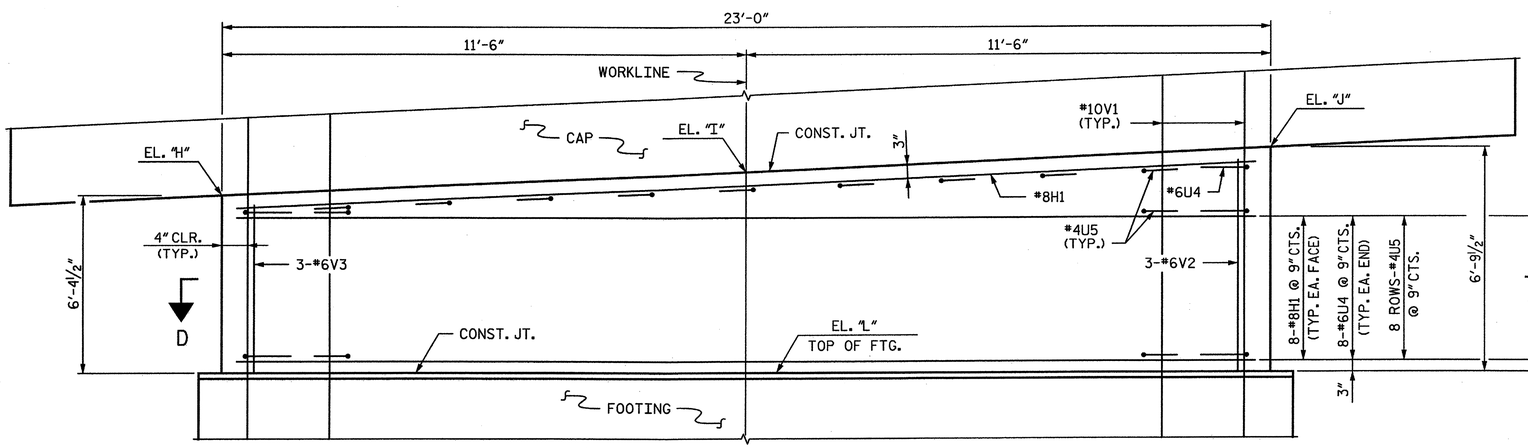
SECTION B-B



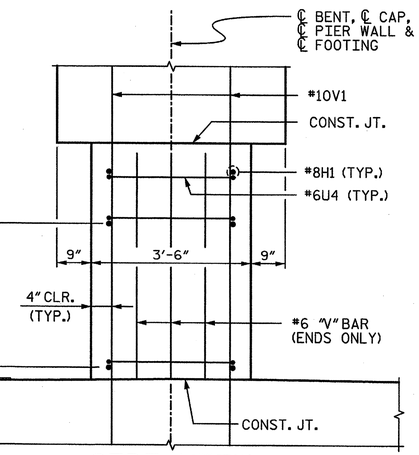
END VIEW C-C



SECTION D-D



PIER WALL ELEVATION



SIDE VIEW

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY
10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT 79 DETAILS

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NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-184
1			3			TOTAL SHEETS
2			4			219

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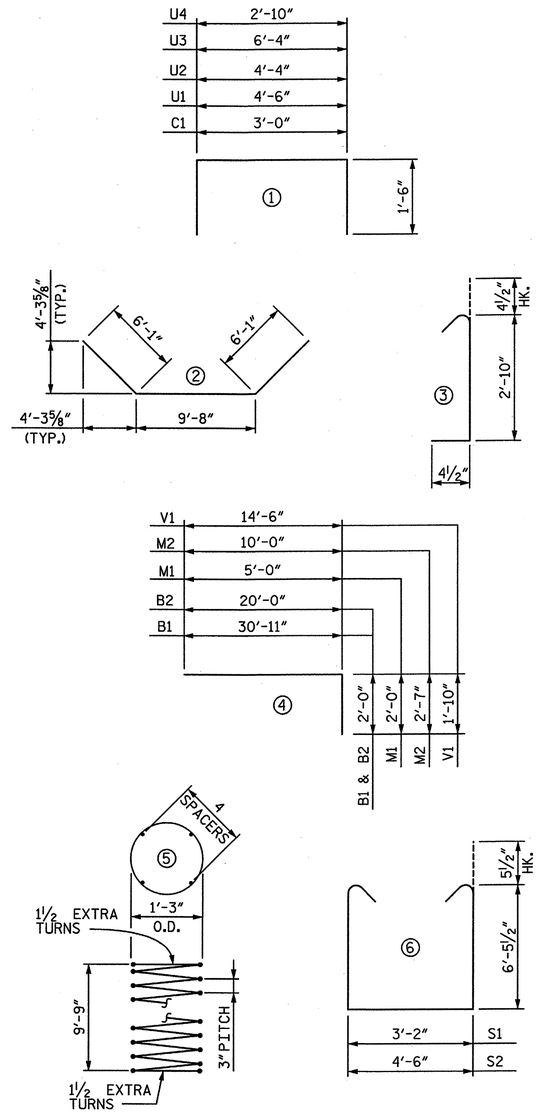
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR BENT 79

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	21	#11	④	32'-11"	3673
B2	21	#11	④	22'-0"	2455
B3	12	#6	STR.	40'-0"	721
B4	7	#11	STR.	40'-0"	1488
B5	28	#5	STR.	5'-7"	163
B6	20	#4	STR.	4'-6"	60
C1	88	#7	①	6'-0"	1079
H1	20	#8	STR.	22'-4"	1193
H2	20	#5	②	21'-10"	455
M1	72	#11	④	7'-0"	2678
M2	72	#14	④	12'-7"	6931
S1	60	#5	⑥	17'-0"	1064
S2	11	#5	⑥	18'-4"	210
T1	4	#11	STR.	9'-8"	205
T2	4	#11	STR.	11'-3"	239
T3	4	#11	STR.	12'-9"	271
T4	4	#11	STR.	14'-3"	303
T5	4	#11	STR.	15'-9"	335
T6	4	#11	STR.	17'-3"	367
T7	4	#11	STR.	18'-9"	398
T8	4	#11	STR.	20'-3"	430
T9	4	#11	STR.	21'-9"	462
T10	28	#11	STR.	23'-4"	3471
T11	4	#10	STR.	9'-8"	166
T12	4	#10	STR.	11'-3"	194
T13	4	#10	STR.	12'-9"	219
T14	4	#10	STR.	14'-3"	245
T15	4	#10	STR.	15'-9"	271
T16	4	#10	STR.	17'-3"	297
T17	4	#10	STR.	18'-9"	323
T18	4	#10	STR.	20'-3"	349
T19	4	#10	STR.	21'-9"	374
T20	28	#10	STR.	23'-4"	2811
U1	48	#5	①	7'-6"	375
U2	16	#4	①	7'-4"	78
U3	12	#4	①	9'-4"	75
U4	20	#6	①	5'-10"	175
U5	81	#4	③	3'-7"	194
V1	62	#10	④	16'-4"	4358
V2	3	#6	STR.	6'-6"	29
V3	3	#6	STR.	6'-1"	27
SP-1	9	*	⑤	159'-9"	960

NOTE:

* THE SP-1 SPIRAL STAINLESS STEEL REINFORCING SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

QUANTITIES

		BENT 79
STAINLESS STEEL REINFORCING	LBS.	39211
SPIRAL STAINLESS STEEL REINFORCING	LBS.	960
CLASS AA CONCRETE : CAP POUR	CU. YDS.	54.0
PIER WALL POUR	CU. YDS.	19.7
FOOTING POUR	CU. YDS.	91.9
TOTAL	CU. YDS.	165.6
30"X 30"PRESTRESSED CONCRETE PILES	NO.	9
	FT.	945

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 79
BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-185
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2			4			219

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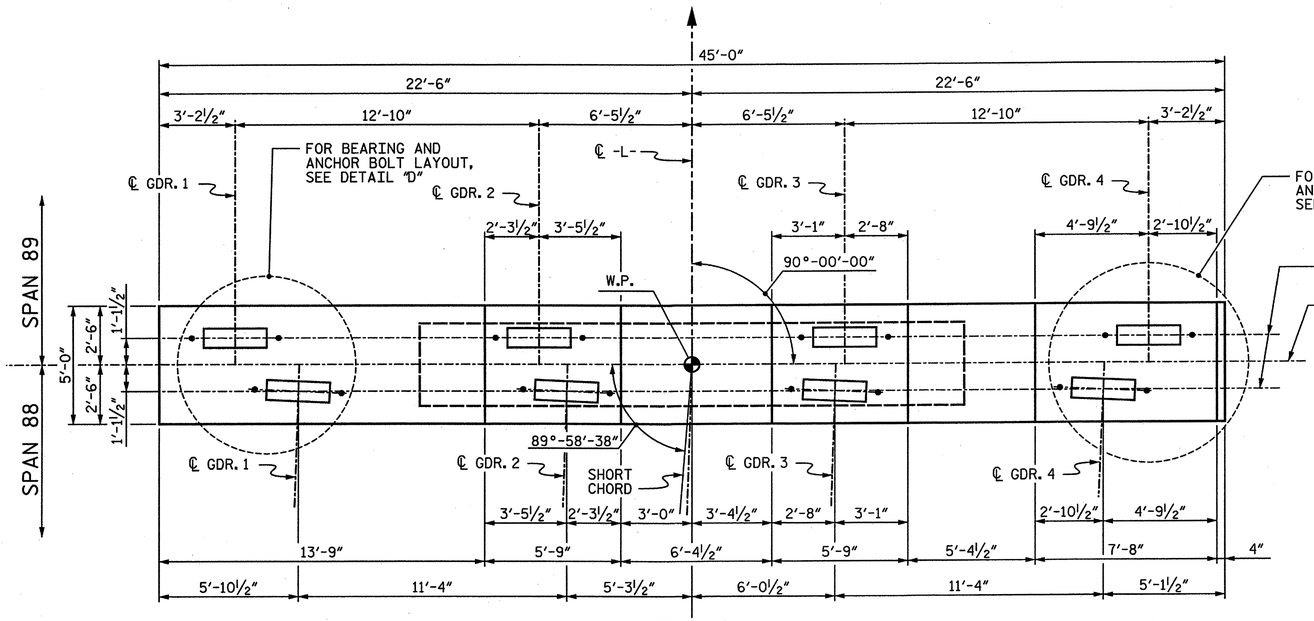
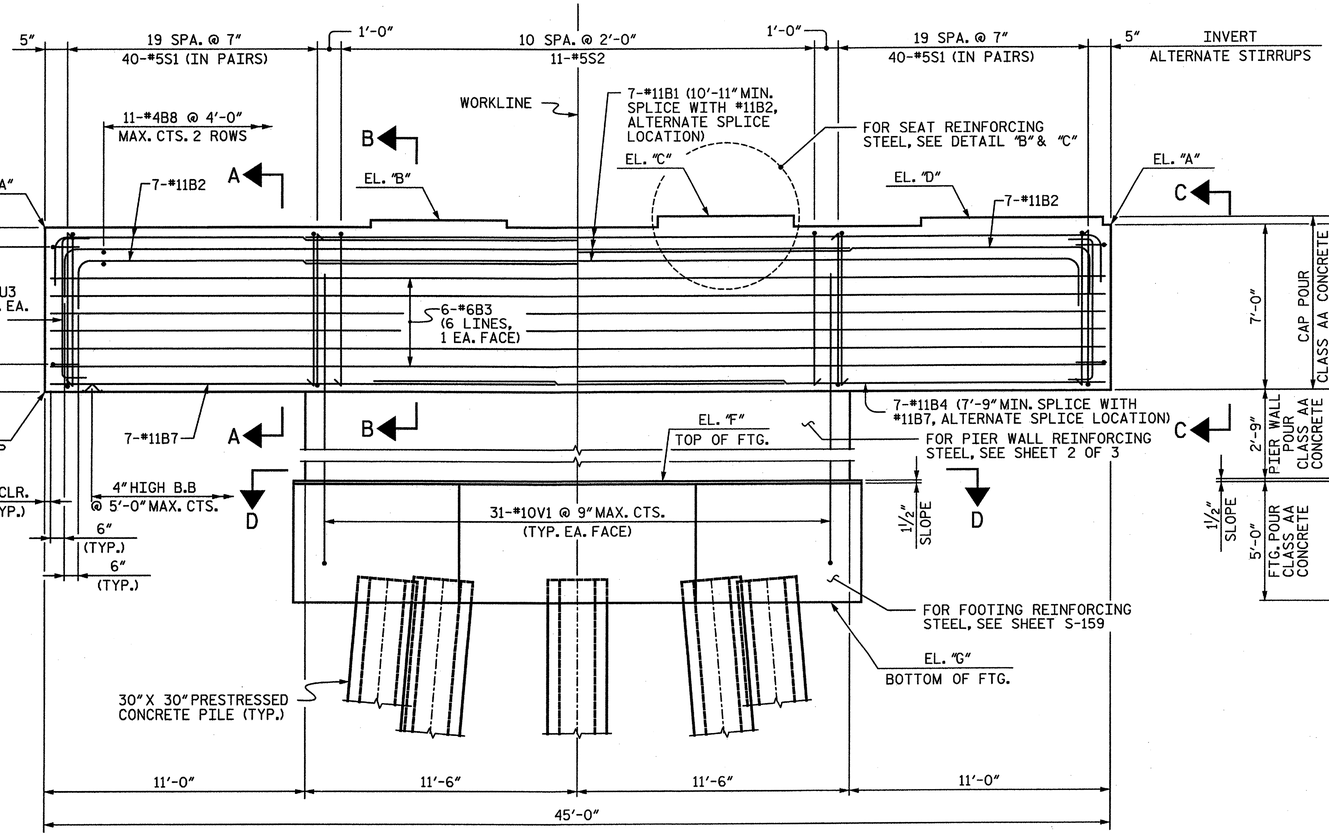
NOTES:

1. FOR SECTION VIEWS, SEE SHEET 2 OF 3.
2. FOR PILE AND FOOTING DETAILS, SEE SHEET S-159.
3. SEE SHEET 2 OF 3 FOR DETAIL "D".
4. THE TOP SURFACE OF THE BENT CAP SHALL BE COATED WITH EPOXY PROTECTIVE COATING. THE EPOXY PROTECTIVE COATING SHALL NOT BE APPLIED TO THE AREA UNDER THE ELASTOMERIC BEARINGS.
5. THE TOP SURFACE OF THE BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND SHALL NOT BE USED.

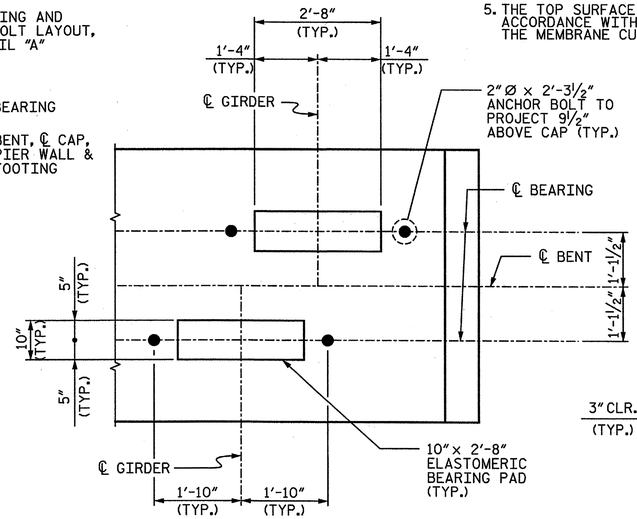
TABLE A	
ELEVATIONS	
	BENT 88
"A"	17.729
"B"	18.050
"C"	18.151
"D"	18.034
"E"	10.729
"F"	7.979
"G"	2.854



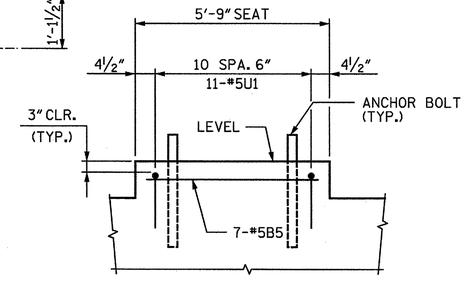
PLAN



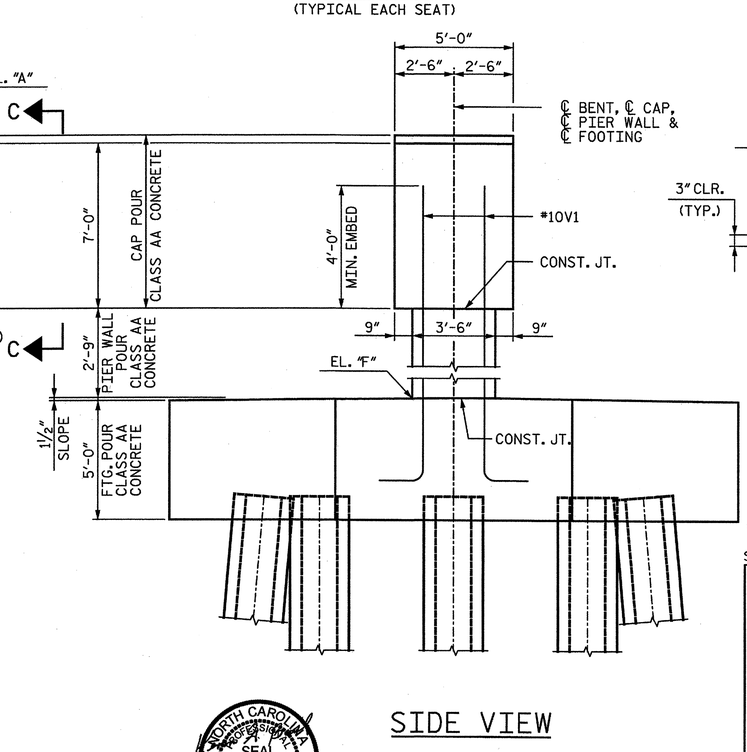
ELEVATION



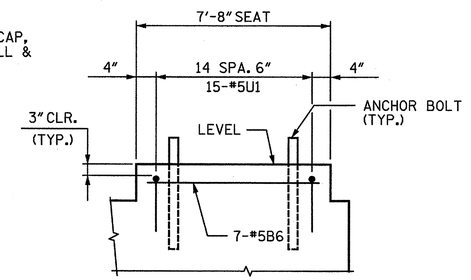
DETAIL "A"
(TYPICAL EACH SEAT)



DETAIL "B"
(SEAT @ GIRDER 2 & 3 SHOWN)



SIDE VIEW



DETAIL "C"
(SEAT @ GIRDER 4 SHOWN)

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT 88 PLAN AND ELEVATION

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			219

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CHECKED BY : PEK DATE : 4-12

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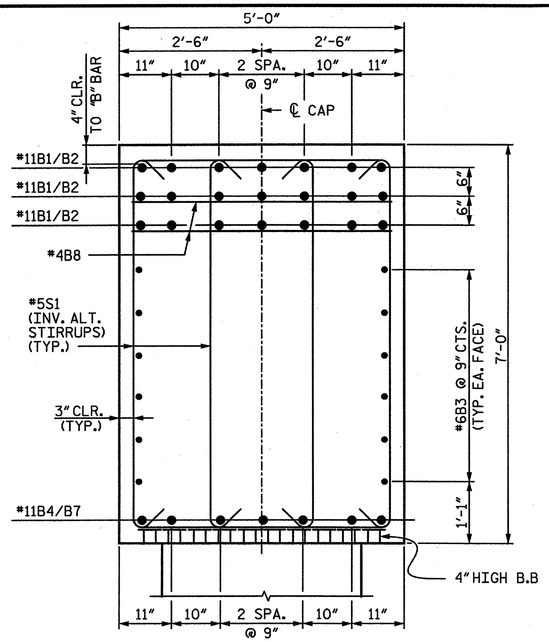
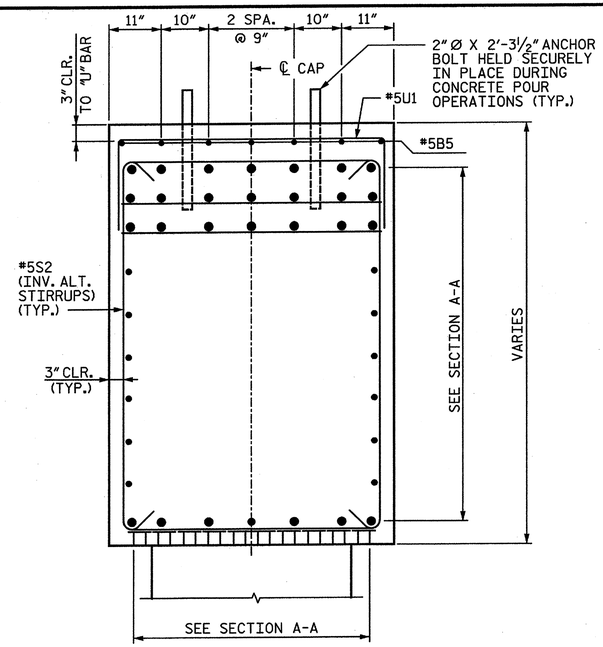
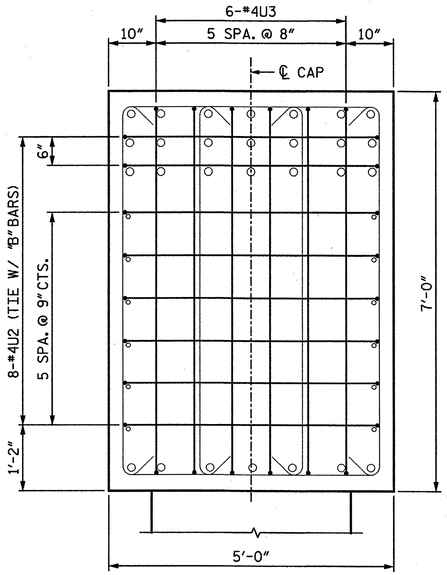


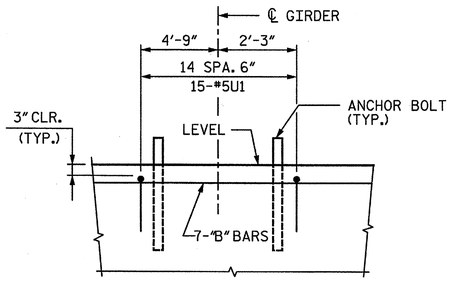
SECTION A-A



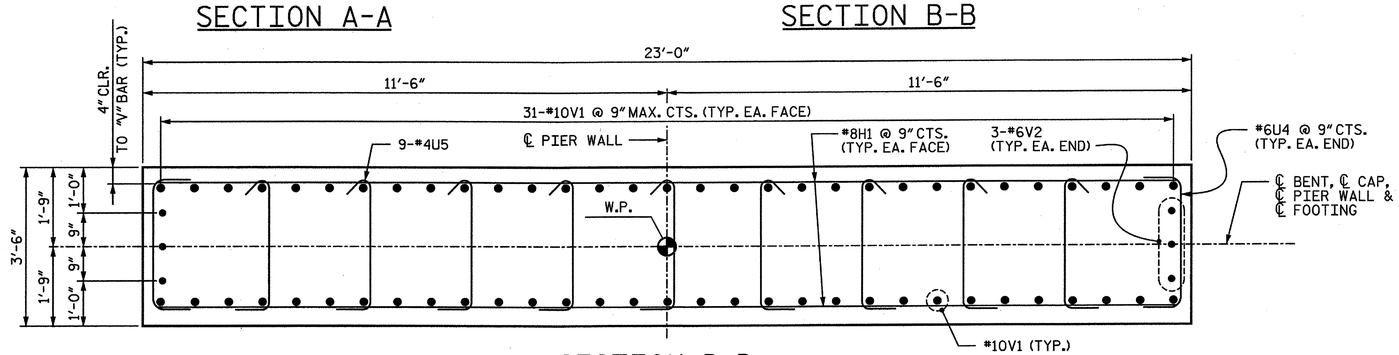
SECTION B-B



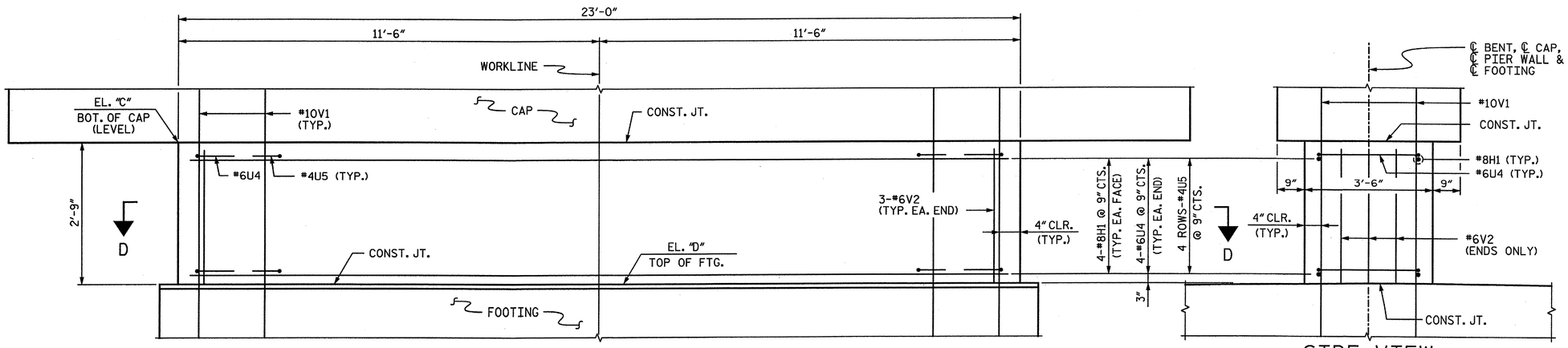
END VIEW C-C



DETAIL "D"
(SEAT @ GIRDER 1 SHOWN)



SECTION D-D



PIER WALL ELEVATION

SIDE VIEW

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT 88 DETAILS

DRAWN BY : VMW DATE : 2-12
CHECKED BY : PEK DATE : 4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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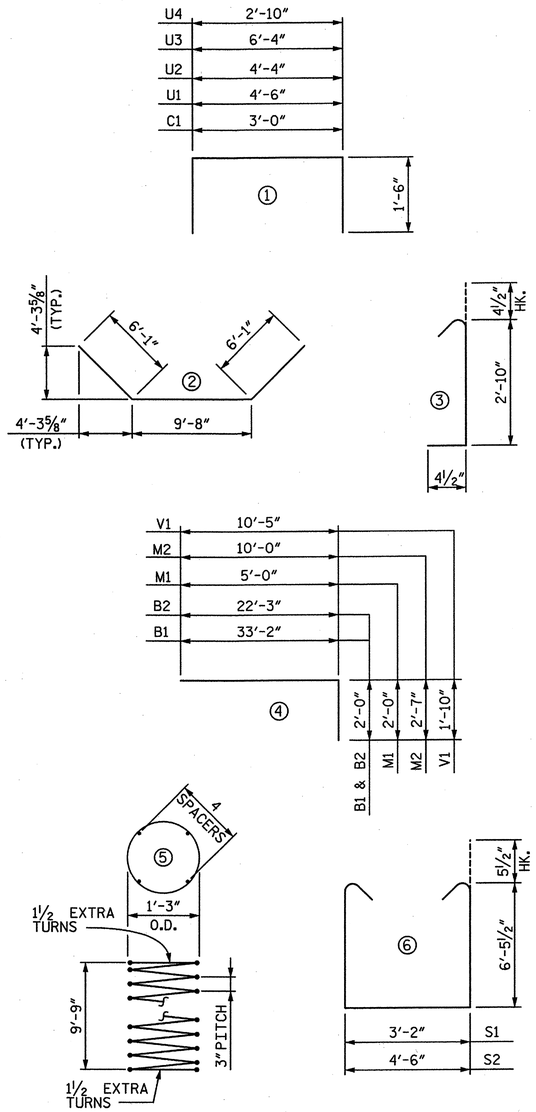
2			4			219

10/4/2012 12:22:08 PM R:\Structures\Vusta\(187) Bent 88 Sht 2 of 3.dgn

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR BENT 88

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	21	#11	④	35'-2"	3924
B2	21	#11	④	24'-3"	2706
B3	12	#6	STR.	44'-6"	802
B4	7	#11	STR.	22'-3"	827
B5	14	#5	STR.	5'-3"	77
B6	7	#5	STR.	7'-2"	52
B7	7	#11	STR.	30'-0"	1116
B8	22	#4	STR.	4'-6"	66
C1	88	#7	①	6'-0"	1079
H1	8	#8	STR.	22'-4"	477
H2	20	#5	②	21'-10"	455
M1	72	#11	④	7'-0"	2678
M2	72	#14	④	12'-7"	6931
S1	80	#5	⑥	17'-0"	1418
S2	11	#5	⑥	18'-4"	210
T1	4	#11	STR.	9'-8"	205
T2	4	#11	STR.	11'-3"	239
T3	4	#11	STR.	12'-9"	271
T4	4	#11	STR.	14'-3"	303
T5	4	#11	STR.	15'-9"	335
T6	4	#11	STR.	17'-3"	367
T7	4	#11	STR.	18'-9"	398
T8	4	#11	STR.	20'-3"	430
T9	4	#11	STR.	21'-9"	462
T10	28	#11	STR.	23'-4"	3471
T11	4	#10	STR.	9'-8"	166
T12	4	#10	STR.	11'-3"	194
T13	4	#10	STR.	12'-9"	219
T14	4	#10	STR.	14'-3"	245
T15	4	#10	STR.	15'-9"	271
T16	4	#10	STR.	17'-3"	297
T17	4	#10	STR.	18'-9"	323
T18	4	#10	STR.	20'-3"	349
T19	4	#10	STR.	21'-9"	374
T20	28	#10	STR.	23'-4"	2811
U1	37	#5	①	7'-6"	290
U2	16	#4	①	7'-4"	78
U3	12	#4	①	9'-4"	75
U4	8	#6	①	5'-10"	70
U5	36	#4	③	3'-7"	86
V1	62	#10	④	12'-3"	3268
V2	6	#6	STR.	2'-6"	23
SP-1	9	*	⑤	159'-9"	960

NOTE:

* THE SP-1 SPIRAL STAINLESS STEEL REINFORCING SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

QUANTITIES

		BENT 88
STAINLESS STEEL REINFORCING	LBS.	38438
SPIRAL STAINLESS STEEL REINFORCING	LBS.	960
CLASS AA CONCRETE : CAP POUR	CU. YDS.	59.6
PIER WALL POUR	CU. YDS.	8.2
FOOTING POUR	CU. YDS.	91.9
TOTAL	CU. YDS.	159.7
30"X 30" PRESTRESSED CONCRETE PILES	NO.	9
	FT.	990

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 88
BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-188
1			3			TOTAL SHEETS
2			4			219

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NC License No. F-0991

DRAWN BY : VMW DATE : 2-12
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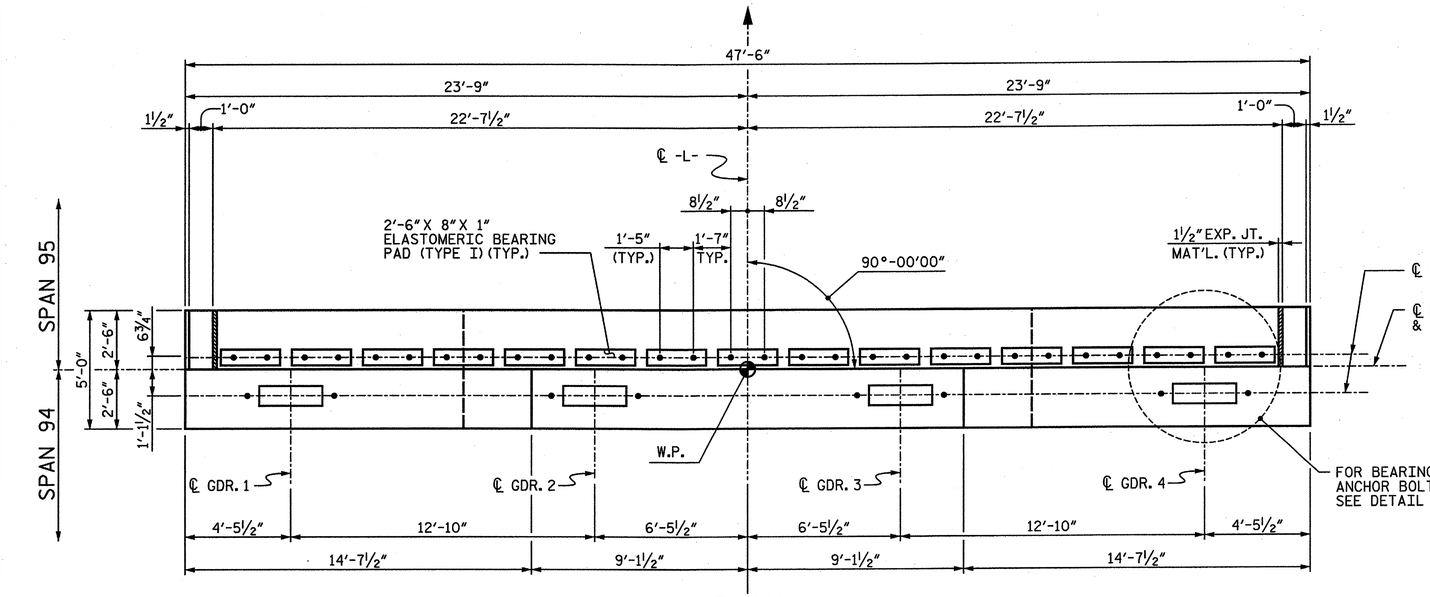
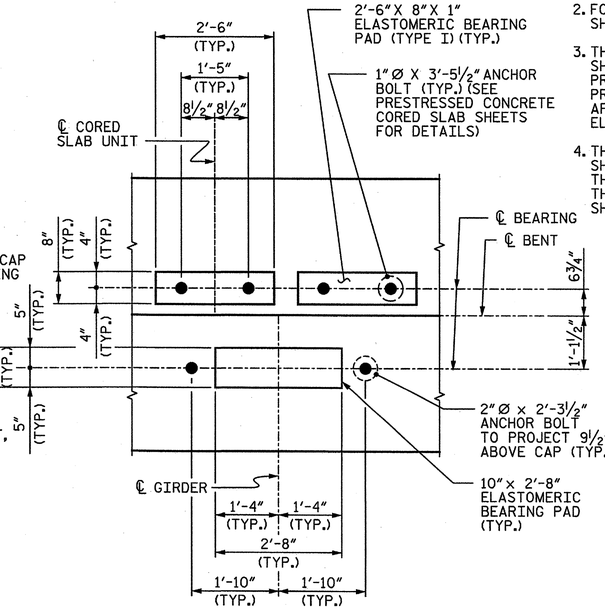


PLAN



DETAIL "A"

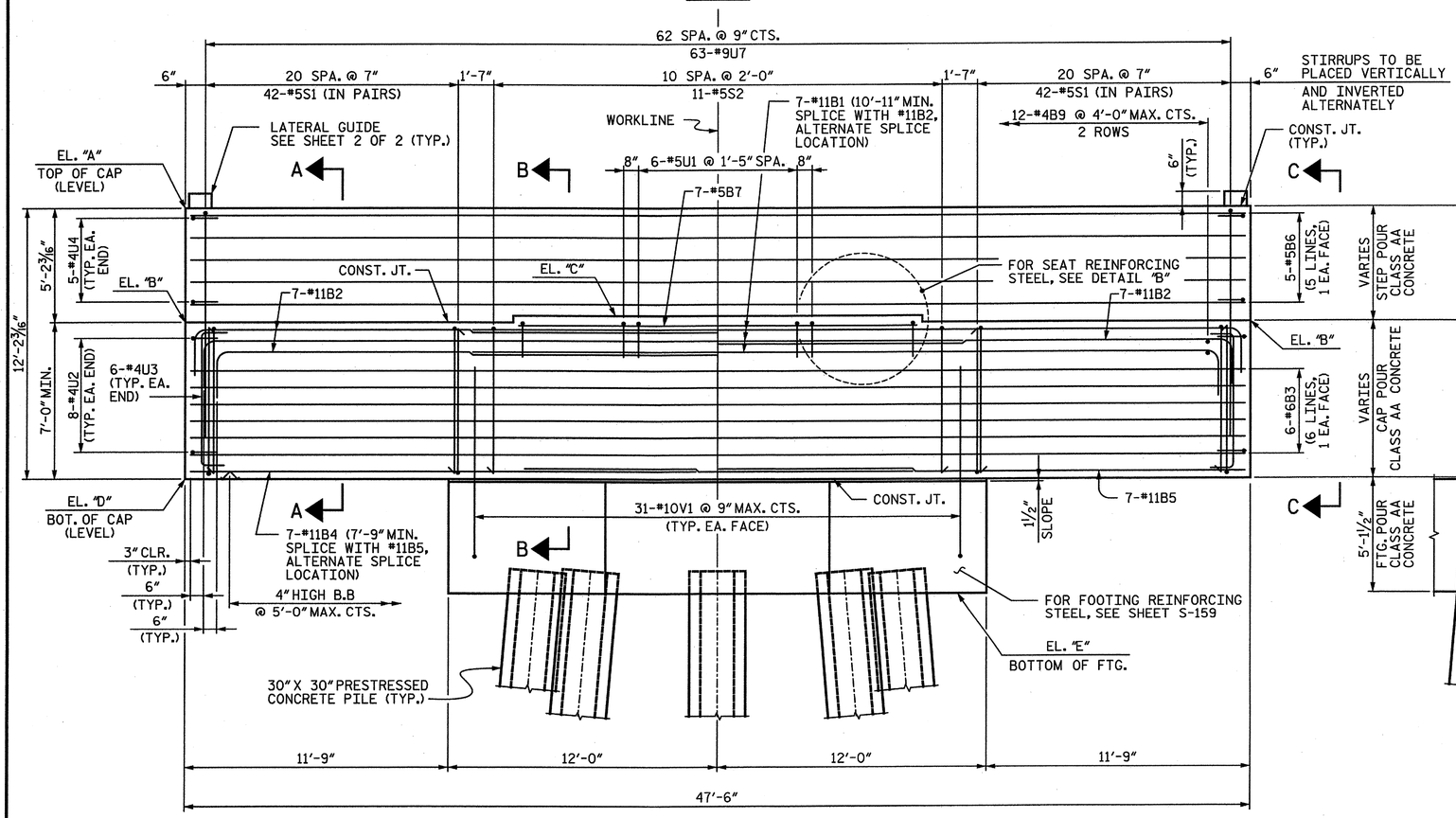
NOTES:

1. FOR SECTION VIEWS, SEE SHEET 2 OF 2.
2. FOR PILE AND FOOTING DETAILS, SEE SHEET S-159.
3. THE TOP SURFACE OF THE BENT CAP SHALL BE COATED WITH EPOXY PROTECTIVE COATING. THE EPOXY PROTECTIVE COATING SHALL NOT BE APPLIED TO THE AREA UNDER THE ELASTOMERIC BEARINGS.
4. THE TOP SURFACE OF THE BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND SHALL NOT BE USED.

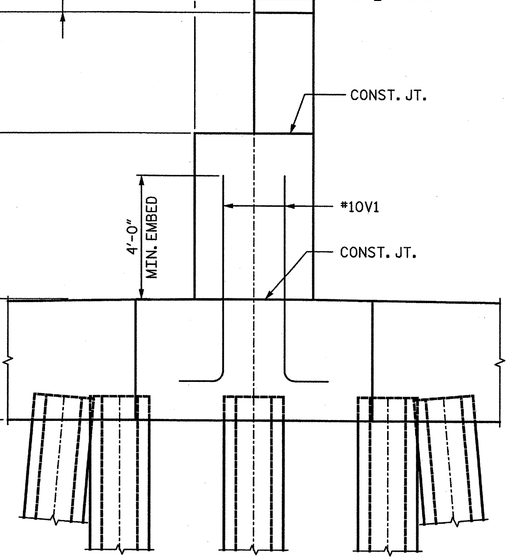
TABLE A

ELEVATIONS

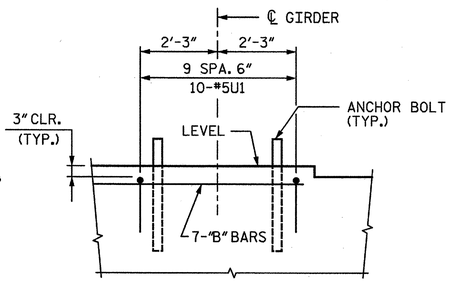
	BENT 94
"A"	18.038
"B"	12.858
"C"	13.179
"D"	5.858
"E"	0.733



ELEVATION



SIDE VIEW



DETAIL "B"
(SEAT @ GIRDER 3 SHOWN, OTHER GIRDERS SIMILAR)

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT 94 PLAN AND ELEVATION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-189
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2			4			219

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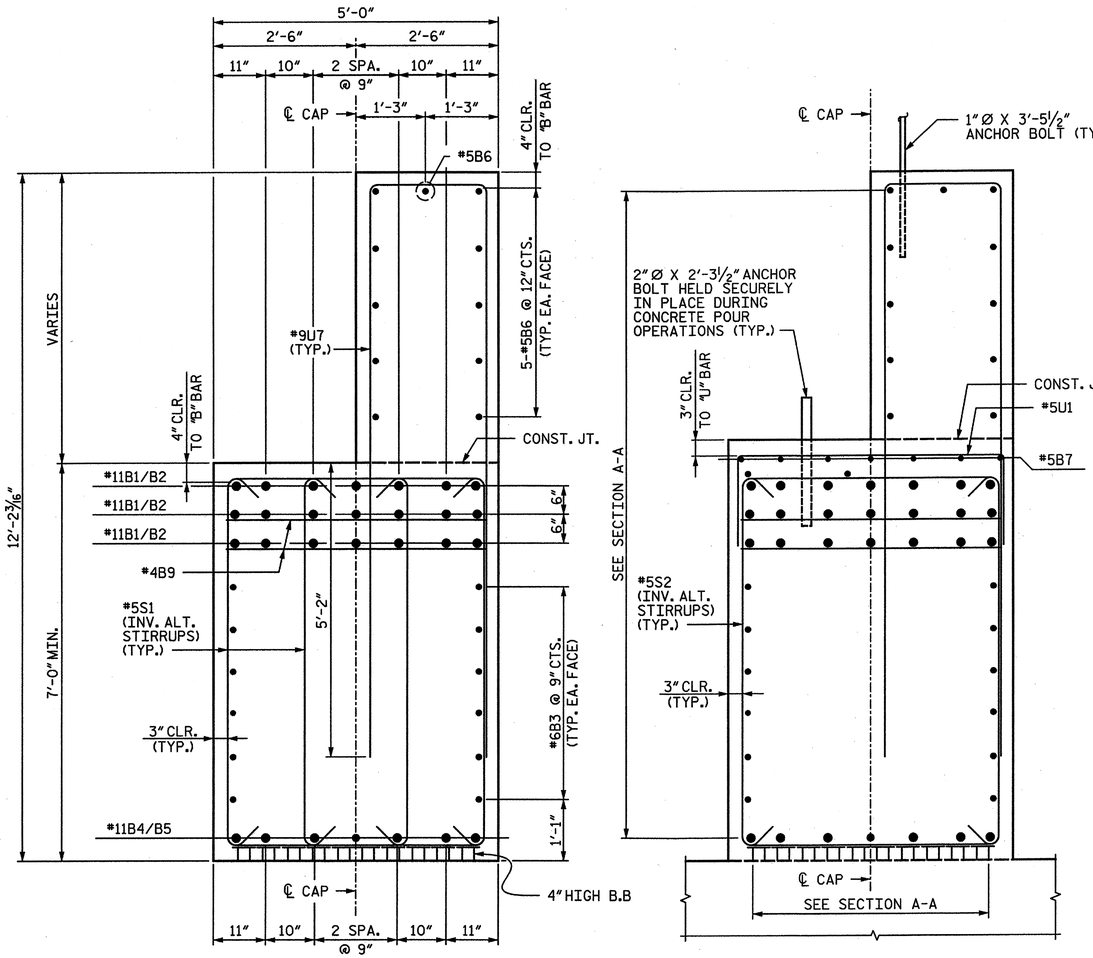
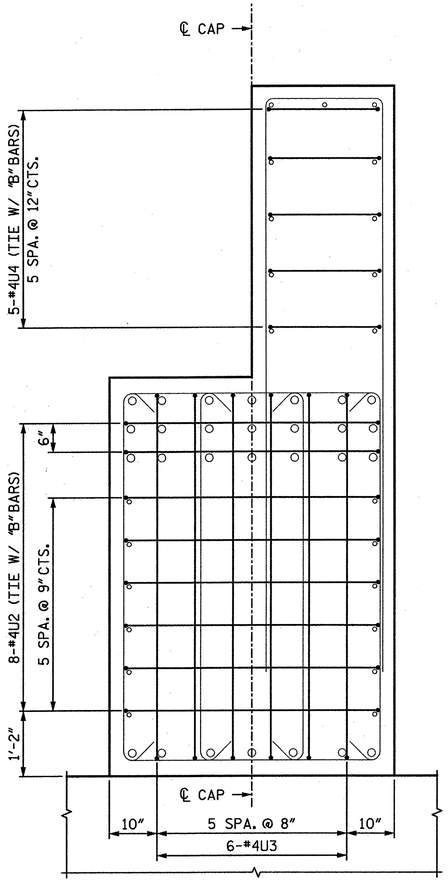
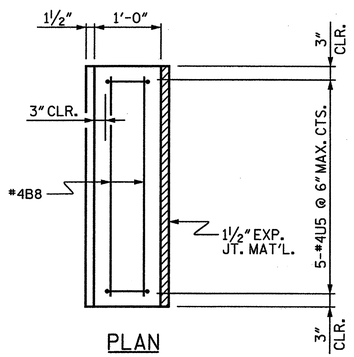


SECTION A-A

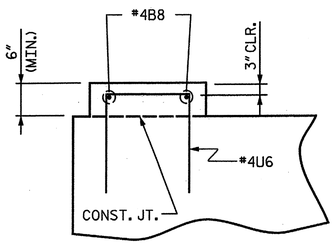
SECTION B-B



END VIEW C-C



PLAN

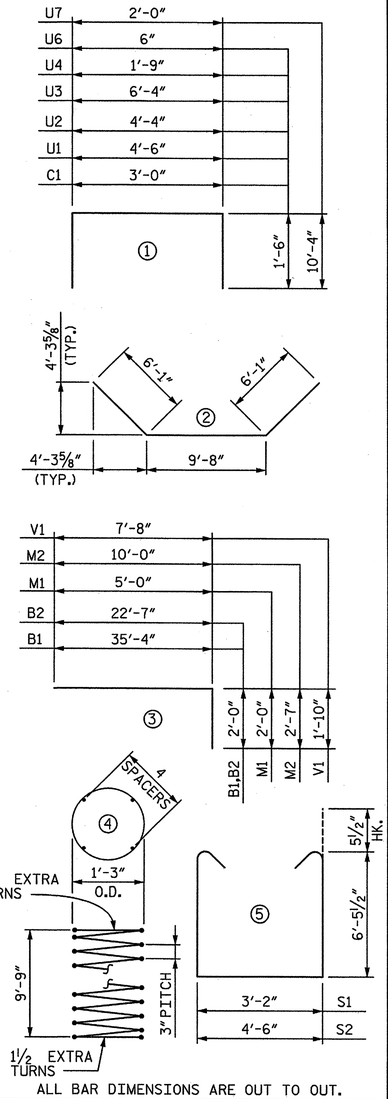


ELEVATION

LATERAL GUIDE DETAILS

(LEFT LATERAL GUIDE SHOWN, RIGHT SIDE SIMILAR)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR BENT 94

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	21	#11	③	37'-4"	4165
B2	21	#11	③	24'-7"	2743
B3	12	#6	STR.	47'-0"	847
B4	7	#11	STR.	32'-3"	1199
B5	7	#11	STR.	22'-6"	837
B6	11	#5	STR.	47'-0"	539
B7	7	#5	STR.	17'-9"	130
B8	4	#4	STR.	1'-11"	5
B9	24	#4	STR.	4'-6"	72
C1	88	#7	①	6'-0"	1079
H2	20	#5	②	21'-10"	455
M1	72	#11	③	7'-0"	2678
M2	72	#14	③	12'-7"	6931
S1	84	#5	⑤	17'-0"	1489
S2	11	#5	⑤	18'-4"	210
T1	4	#11	STR.	9'-8"	205
T2	4	#11	STR.	11'-3"	239
T3	4	#11	STR.	12'-9"	271
T4	4	#11	STR.	14'-3"	303
T5	4	#11	STR.	15'-9"	335
T6	4	#11	STR.	17'-3"	367
T7	4	#11	STR.	18'-9"	398
T8	4	#11	STR.	20'-3"	430
T9	4	#11	STR.	21'-9"	462
T10	28	#11	STR.	23'-4"	3471
T11	4	#10	STR.	9'-8"	166
T12	4	#10	STR.	11'-3"	194
T13	4	#10	STR.	12'-9"	219
T14	4	#10	STR.	14'-3"	245
T15	4	#10	STR.	15'-9"	271
T16	4	#10	STR.	17'-3"	297
T17	4	#10	STR.	18'-9"	323
T18	4	#10	STR.	20'-3"	349
T19	4	#10	STR.	21'-9"	374
T20	28	#10	STR.	23'-4"	2811
U1	46	#5	①	7'-6"	360
U2	16	#4	①	7'-4"	78
U3	12	#4	①	9'-4"	75
U4	10	#4	①	4'-9"	32
U6	10	#4	①	3'-6"	23
U7	63	#9	①	22'-8"	4855
V1	62	#10	③	9'-6"	2534
SP-1	9	*	④	159'-9"	960

QUANTITIES

		BENT 94
STAINLESS STEEL REINFORCING	LBS.	43066
SPIRAL STAINLESS STEEL REINFORCING	LBS.	960
CLASS AA CONCRETE : LATERAL GUIDE POUR	CU. YDS.	0.1
STEP POUR	CU. YDS.	22.2
CAP POUR	CU. YDS.	62.7
FOOTING POUR	CU. YDS.	91.9
TOTAL	CU. YDS.	176.9
30"X 30" PRESTRESSED CONCRETE PILES	NO.	9
	FT.	1080

* THE SP-1 SPIRAL STAINLESS STEEL REINFORCING SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT 94 DETAILS AND BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

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NC License No. F-0991

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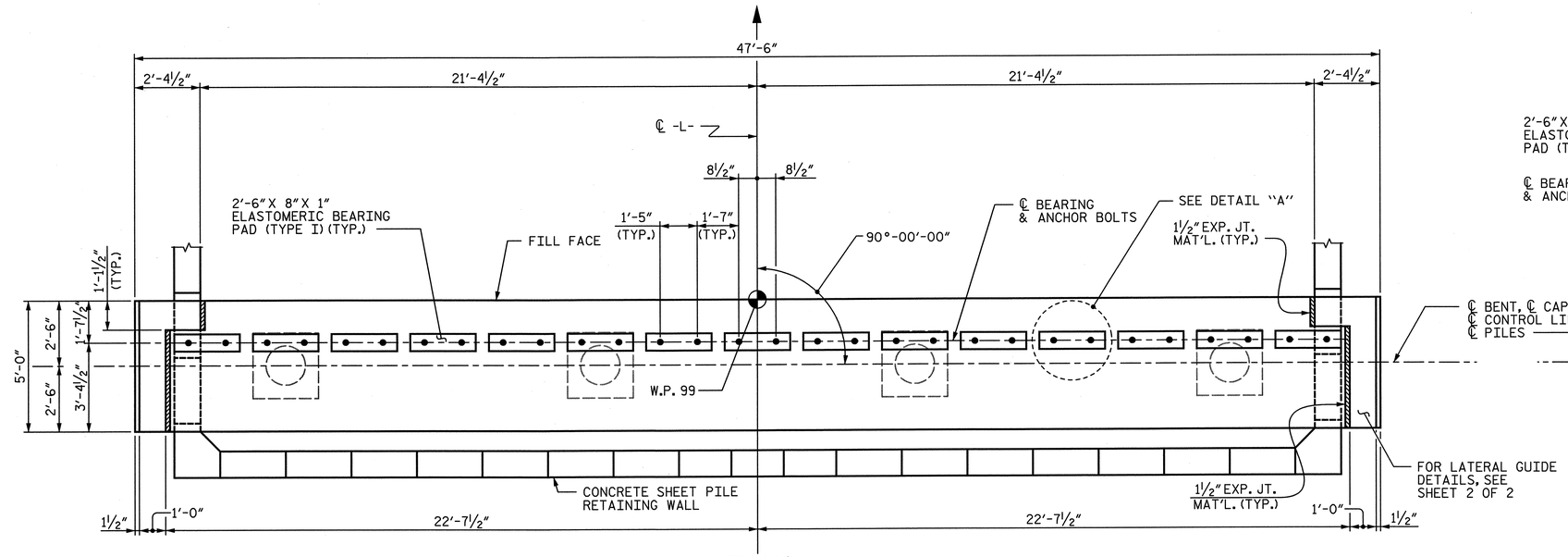
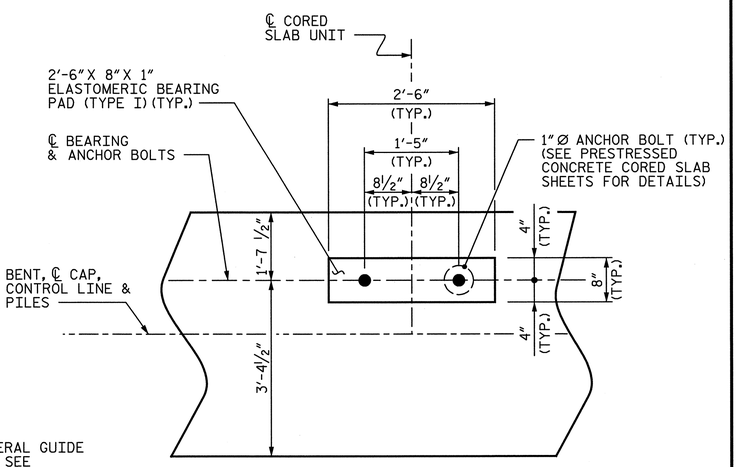


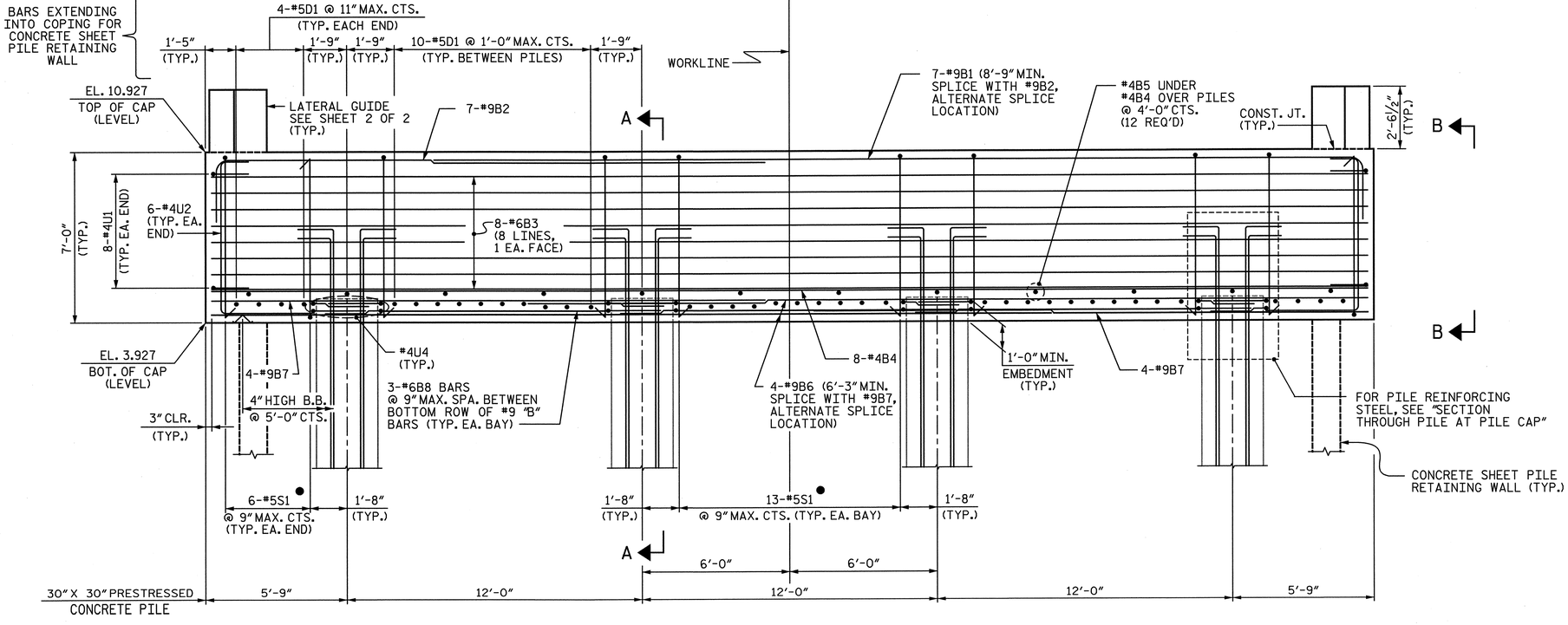
PLAN

(COPING FOR CONCRETE SHEET PILE RETAINING WALL NOT SHOWN FOR CLARITY)



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)



● INVERT ALTERNATE STIRRUPS.

ELEVATION

(FOR SECTION DETAILS, SEE SHEET 2 OF 2)

NOTES:

1. STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
2. THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.
3. THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.
4. THE CONTRACTOR HAS THE OPTION TO USE 36"X 36" PRESTRESSED CONCRETE PILES IN LIEU OF 30"X 30" PRESTRESSED CONCRETE PILES. NO ADDITIONAL PAYMENT WILL BE MADE FOR SUBSTITUTING 36"X 36" PRESTRESSED CONCRETE PILES FOR 30"X 30" PRESTRESSED CONCRETE PILES.
5. #5D1 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR STIRRUPS.
6. FOR RETAINING WALL DETAILS, SEE CONCRETE SHEET PILE RETAINING WALL SHEETS.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE END BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 5-30-13

DRAWN BY : VMW DATE : 3-12
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1			3			TOTAL SHEETS
2			4			219

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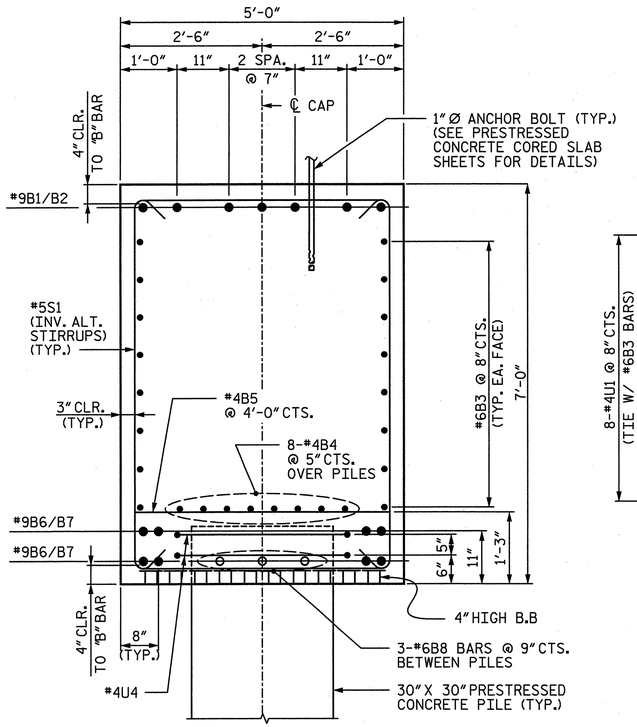
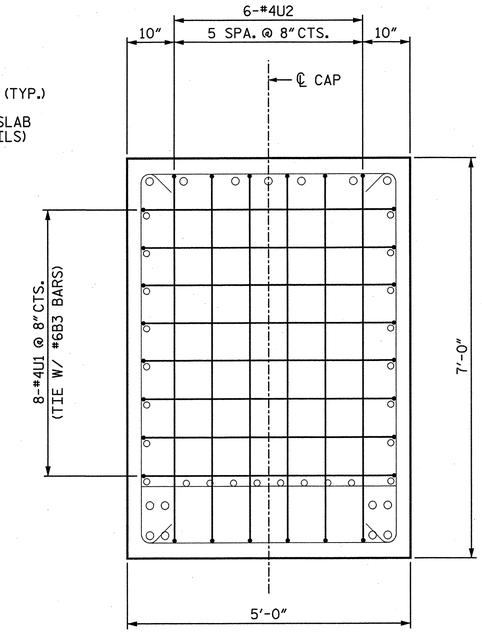


SECTION A-A

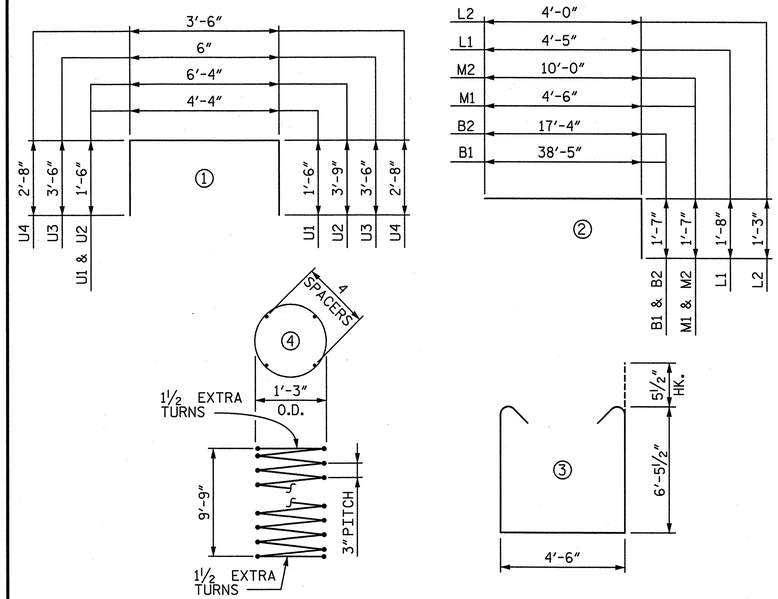
(PILE REINFORCING STEEL NOT SHOWN FOR CLARITY)
(#5D1 NOT SHOWN FOR CLARITY, SEE D1 DETAIL FOR BARS EXTENDING INTO COPING FOR CONCRETE SHEET PILE RETAINING WALL)



END VIEW B-B

(TYPICAL EACH ENDS)

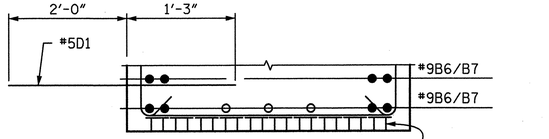
BAR TYPES



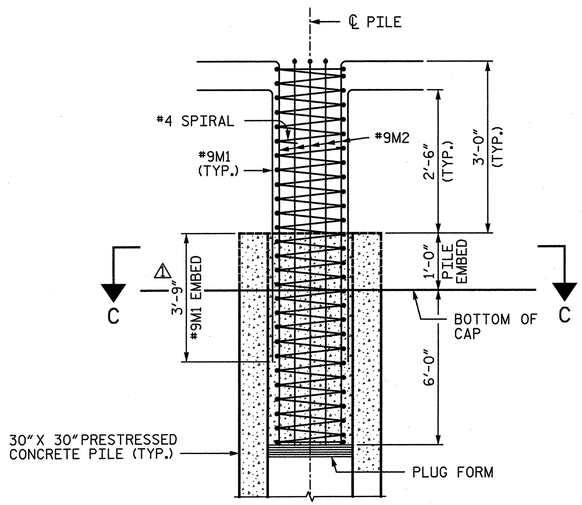
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR END BENT 2

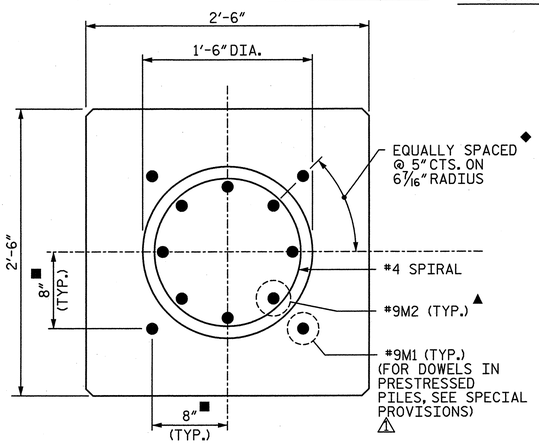
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#9	②	40'-0"	952
B2	7	#9	②	18'-11"	450
B3	16	#6	STR.	47'-0"	1130
B4	8	#4	STR.	47'-0"	251
B5	12	#4	STR.	4'-6"	36
B6	8	#9	STR.	32'-0"	870
B7	8	#9	STR.	21'-3"	578
B8	9	#6	STR.	8'-6"	115
D1	38	#5	STR.	3'-3"	129
L1	6	#4	②	6'-1"	25
L2	6	#4	②	5'-3"	21
M1	16	#9	②	6'-1"	331
M2	32	#9	②	11'-7"	1260
S1	51	#5	③	18'-4"	975
U1	16	#4	①	7'-4"	78
U2	12	#4	①	11'-7"	93
U3	14	#4	①	7'-6"	71
U4	16	#4	①	8'-10"	94
SP-1	4	*	④	159'-9"	427



"D1" DETAIL



SECTION THROUGH PILE AT PILE CAP



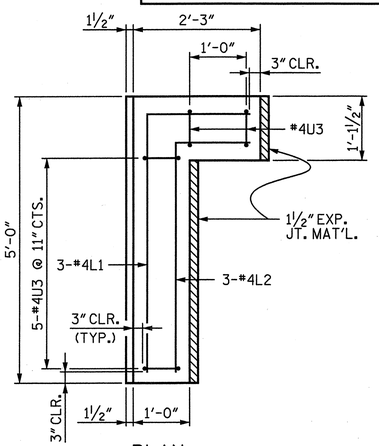
SECTION C-C

▲ ROTATE #9M2 BARS AS NECESSARY TO MAINTAIN 3" MIN. CLR. DISTANCE TO FACE OF CAP

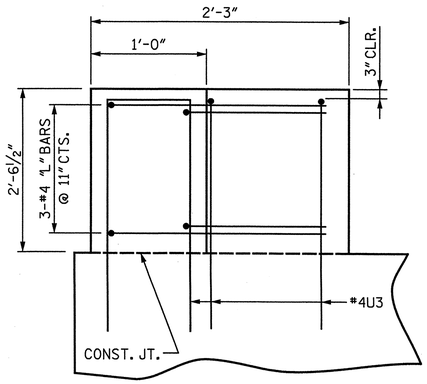
■ FOR 36"X36" PILE, INCREASE 8" DIMENSION TO 10"

◆ FOR 36"X36" PILE, #9M2 BARS SHALL BE EQUALLY SPACED @ 6¼" CTS. ON 7 15/16" RADIUS

UPSTATION



PLAN



ELEVATION

LATERAL GUIDE DETAILS

(LEFT LATERAL GUIDE SHOWN, RIGHT SIDE SIMILAR)

QUANTITIES

		END BENT 2
STAINLESS STEEL REINFORCING	LBS.	7459
SPIRAL STAINLESS STEEL REINFORCING	LBS.	427
CLASS AA CONCRETE : POUR 1 - CAP	CU. YDS.	60.7
POUR 2 - LATERAL GUIDES	CU. YDS.	1.2
TOTAL	CU. YDS.	61.9
30" X 30" PRESTRESSED CONCRETE PILES	NO.	4
	FT.	200

* THE SP-1 SPIRAL STAINLESS STEEL REINFORCING SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

⚠ ADDED NOTE AND MODIFIED EMBEDMENT FOR DOWELS IN PRESTRESSED PILES

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 11-14-13

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

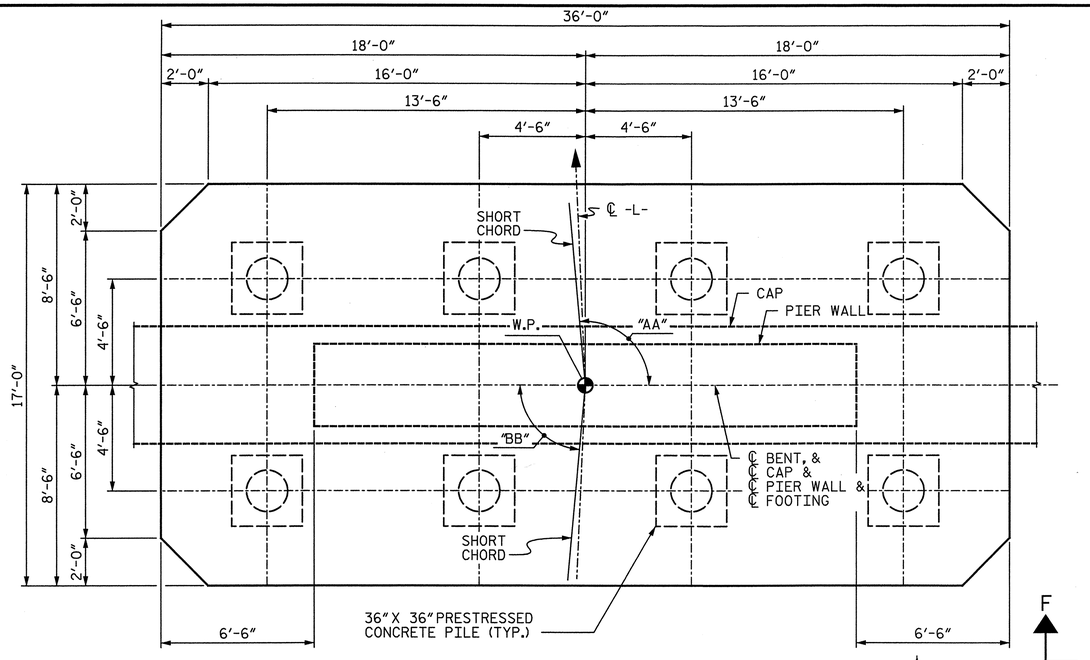
SUBSTRUCTURE END BENT 2 DETAILS AND BILL OF MATERIAL

DRAWN BY : VMW DATE : 3-12
CHECKED BY : TRL DATE : 3-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

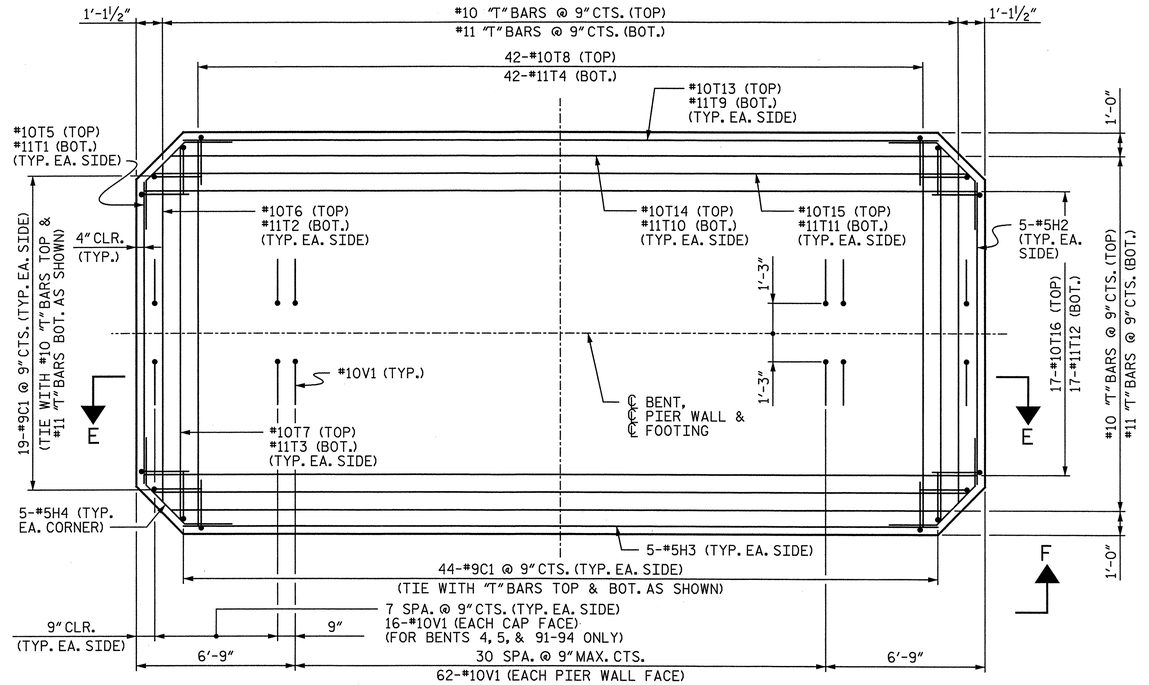
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-192
1	STV	11-13	3			TOTAL SHEETS
2			4			219

11/14/2013 9:44:14 AM R:\Structures\Updated & Sealed Plans II-II-13\U192) End Bent 2 Sht 2 of 2.dgn

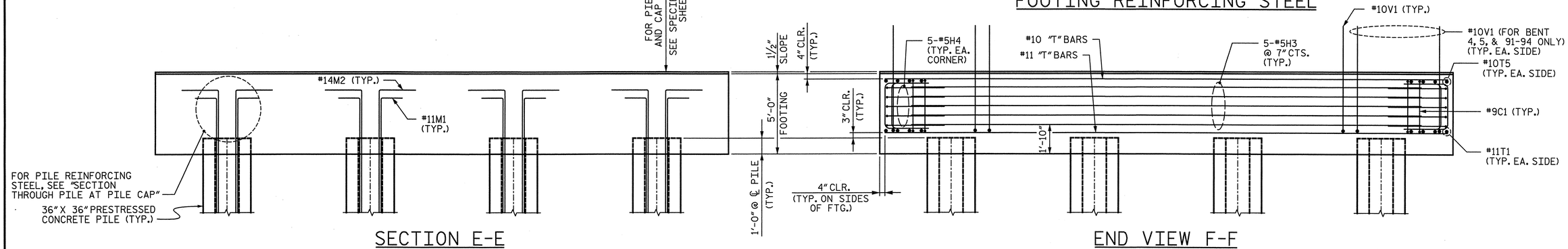


FOOTING PLAN
(NO PIER WALL FOR BENTS 4, 5, 91-94 ONLY)

FOR PIER WALL AND CAP DETAILS SEE SPECIFIC BENT SHEETS

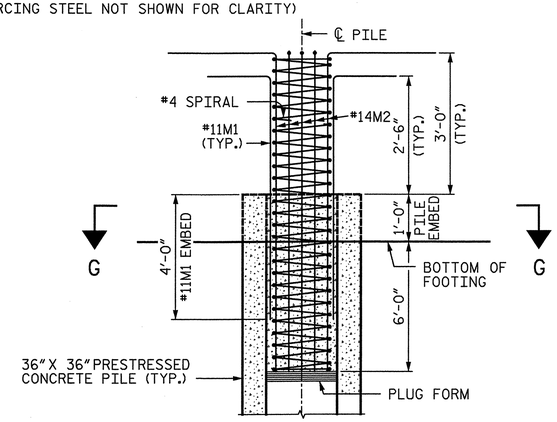


FOOTING REINFORCING STEEL

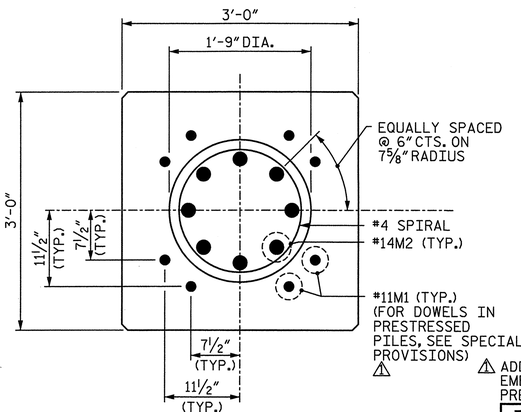


SECTION E-E
(FOOTING REINFORCING STEEL NOT SHOWN FOR CLARITY)

END VIEW F-F



SECTION THROUGH PILE AT PILE CAP



SECTION G-G

⚠ ADDED NOTE AND MODIFIED EMBEDMENT FOR DOWELS IN PRESTRESSED PILES

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 11-13-13

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE FOOTING PLAN AND DETAILS ALTERNATE 1

DRAWN BY : VMW	DATE : 3-12
CHECKED BY : TJT	DATE : 4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

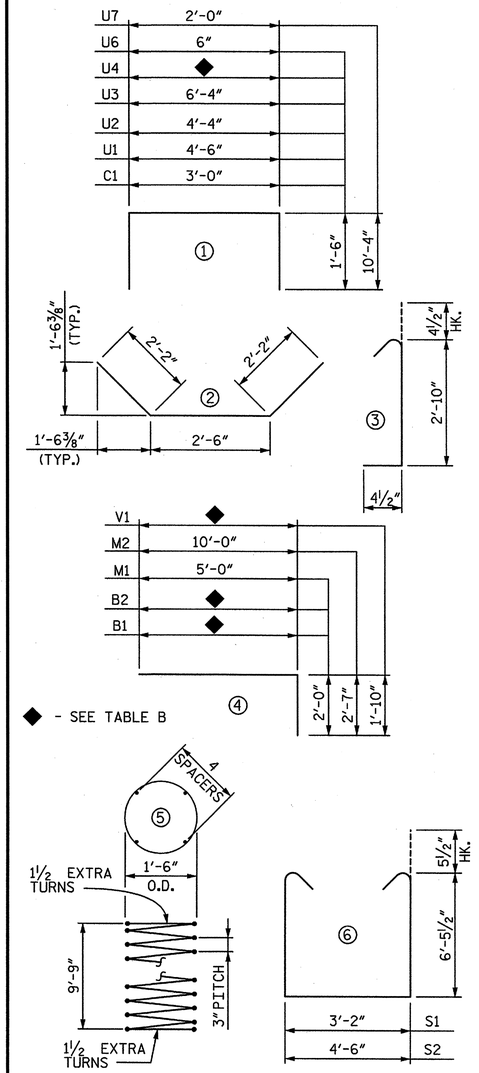
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-193
1	STV	11-13	3			TOTAL SHEETS
2			4			219

11/3/2013 1:49:50 PM R:\Structures\Updated & Sealed Plans II-H-13\193 Bent Footing ALT. Sht 1of 4.dgn

TABLE B

BAR		BENT 4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
B1	◆	35′-4″	33′-2″	33′-2″	33′-2″	33′-2″	33′-2″	33′-2″	33′-2″	33′-2″	33′-2″	33′-2″	33′-2″	33′-2″	33′-2″	33′-2″	33′-2″	33′-2″	33′-2″	33′-2″	33′-2″	33′-2″	33′-2″
	■	37′-4″	35′-2″	35′-2″	35′-2″	35′-2″	35′-2″	35′-2″	35′-2″	35′-2″	35′-2″	35′-2″	35′-2″	35′-2″	35′-2″	35′-2″	35′-2″	35′-2″	35′-2″	35′-2″	35′-2″	35′-2″	35′-2″
	●	4165	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924
B2	◆	22′-7″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″
	■	24′-7″	24′-3″	24′-3″	24′-3″	24′-3″	24′-3″	24′-3″	24′-3″	24′-3″	24′-3″	24′-3″	24′-3″	24′-3″	24′-3″	24′-3″	24′-3″	24′-3″	24′-3″	24′-3″	24′-3″	24′-3″	24′-3″
	●	2743	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706
B3	■	47′-0″	44′-6″	44′-6″	44′-6″	44′-6″	44′-6″	44′-6″	44′-6″	44′-6″	44′-6″	44′-6″	44′-6″	44′-6″	44′-6″	44′-6″	44′-6″	44′-6″	44′-6″	44′-6″	44′-6″	44′-6″	44′-6″
	●	847	802	802	802	802	802	802	802	802	802	802	802	802	802	802	802	802	802	802	802	802	802
B4	■	32′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″	22′-3″
	●	1199	827	827	827	827	827	827	827	827	827	827	827	827	827	827	827	827	827	827	827	827	827
B5	▲	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	28	28	28	28
	✦	#11	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5
	■	22′-6″	17′-9″	17′-9″	17′-9″	17′-9″	17′-9″	17′-9″	17′-9″	17′-9″	17′-9″	17′-9″	17′-9″	17′-9″	17′-9″	17′-9″	17′-9″	17′-9″	17′-9″	4′-6″	4′-6″	4′-6″	4′-6″
	●	837	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	131	131	131	131
B6	▲	11	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	✦	#5	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11
	■	47′-0″	30′-0″	30′-0″	30′-0″	30′-0″	30′-0″	30′-0″	30′-0″	30′-0″	30′-0″	30′-0″	30′-0″	30′-0″	30′-0″	30′-0″	30′-0″	30′-0″	30′-0″	30′-0″	30′-0″	30′-0″	30′-0″
	●	539	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116
B7	▲	7	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
	✦	#5	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4
	■	17′-9″	4′-6″	4′-6″	4′-6″	4′-6″	4′-6″	4′-6″	4′-6″	4′-6″	4′-6″	4′-6″	4′-6″	4′-6″	4′-6″	4′-6″	4′-6″	4′-6″	4′-6″	4′-6″	4′-6″	4′-6″	4′-6″
	●	130	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66
B8	▲	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	✦	#4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	■	1′-11″	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	●	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
H1	▲	--	--	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	10	10	10	14
	●	--	--	358	358	358	358	358	358	358	358	358	358	358	358	358	358	358	358	596	596	596	835
S1	▲	84	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
	●	1489	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418
U1	▲	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	40	40	40	40
	●	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	313	313	313	313
U4	◆	1′-9″	--	2′-10″	2′-10″	2′-10″	2′-10″	2′-10″	2′-10″	2′-10″	2′-10″	2′-10″	2′-10″	2′-10″	2′-10″	2′-10″	2′-10″	2′-10″	2′-10″	2′-10″	2′-10″	2′-10″	2′-10″	2′-10″
	▲	10	--	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	9	9	9	9
	✦	#4	--	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6
	■	4′-9″	--	5′-10″	5′-10″	5′-10″	5′-10″	5′-10″	5′-10″	5′-10″	5′-10″	5′-10″	5′-10″	5′-10″	5′-10″	5′-10″	5′-10″	5′-10″	5′-10″	5′-10″	5′-10″	5′-10″	5′-10″	5′-10″
	●	32	--	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	79	79	79	79
U5	▲	--	--	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	45	45	45	63
	●	--	--	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	108	108	108	151
V1	◆	7′-8″	7′-8″	9′-8″	9′-8″	9′-8″	9′-8″	9′-8″	9′-8″	9′-8″	9′-8″	9′-8″	9′-8″	9′-8″	9′-8″	9′-8″	9′-8″	9′-8″	9′-8″	11′-1″	11′-3″	11′-3″	12′-4″
	▲	94	94	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62
	■	9′-6″	9′-6″	11′-6″	11′-6″	11′-6″	11′-6″	11′-6″	11′-6″	11′-6″	11′-6″	11′-6″	11′-6″	11′-6″	11′-6″	11′-6″	11′-6″	11′-6″	11′-6″	12′-11″	13′-1″	13′-1″	14′-2″
	●	3843	3843	3068	3068	3068	3068	3068	3068	3068	3068	3068	3068	3068	3068	3068	3068	3068	3068	3446	3490	3490	3779
V2	▲	--	--	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	3	3	3	3
	■	--	--	1′-9″	1′-9″	1′-9″	1′-9″	1′-9″	1′-9″	1′-9″	1′-9″	1′-9″	1′-9″	1′-9″	1′-9″	1′-9″	1′-9″	1′-9″	1′-9″	3′-3″	3′-4″	3′-4″	4′-5″
	●	--	--	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	15	15	20
V3	▲	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3	3	3	3
	■	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2′-10″	2′-8″	2′-8″	3′-9″
	●	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	13	12	12	17

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR ONE BENT (81 REQUIRED)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	21	#11	④	■	●
B2	21	#11	④	■	●
B3	12	#6	STR.	■	●
B4	7	#11	STR.	■	●
B5	▲	✦	STR.	■	●
B6	▲	✦	STR.	■	●
B7	▲	✦	STR.	■	●
B8	▲	✦	STR.	■	●
B9	24	#4	STR.	4′-6″	72
C1	126	#9	①	6′-0″	2570
H1	▲	#8	STR.	22′-4″	●
H2	10	#5	STR.	12′-9″	133
H3	10	#5	STR.	31′-9″	331
H4	20	#5	②	6′-10″	143
M1	64	#11	④	7′-0″	2380
M2	64	#14	④	12′-7″	6161
S1	▲	#5	⑥	17′-0″	●
S2	11	#5	⑥	18′-4″	210
T1	2	#11	STR.	12′-9″	135
T2	2	#11	STR.	14′-4″	152
T3	2	#11	STR.	15′-10″	168
T4	42	#11	STR.	16′-4″	3645
T5	2	#10	STR.	12′-9″	110
T6	2	#10	STR.	14′-4″	123
T7	2	#10	STR.	15′-10″	136
T8	42	#10	STR.	16′-4″	2952
T9	2	#11	STR.	31′-9″	337
T10	2	#11	STR.	33′-1″	352
T11	2	#11	STR.	34′-7″	367
T12	17	#11	STR.	35′-4″	3191
T13	2	#10	STR.	31′-9″	273
T14	2	#10	STR.	33′-1″	285
T15	2	#10	STR.	34′-7″	298
T16	17	#10	STR.	35′-4″	2585
U1	▲	#5	①	7′-6″	●
U2	16	#4	①	7′-4″	78
U3	12	#4	①	9′-4″	75
U4	▲	✦	①	■	●
U5	▲	#4	③	3′-7″	●
U6	10	#4	①	3′-6″	23
U7	63	#9	①	22′-8″	4855
V1	▲	#10	④	■	●
V2	▲	#6	STR.	■	●
V3	▲	#6	STR.	■	●
SP-1	8	✱	⑤	192′-9″	1030

QUANTITIES

		BENT	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
STAINLESS STEEL REINFORCING		LBS.	48329	42382	42099	42099	42099	42099	42099	42099	42099	42099	42099	42099	42099	42099	42099	42099	42099	42099	42750	42793	42793	43374
SPIRAL STAINLESS STEEL REINFORCING		LBS.	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030
CLASS AA CONCRETE :	LATERAL GUIDE POUR	CU. YDS.	0.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	STEP POUR	CU. YDS.	22.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	CAP POUR	CU. YDS.	62.7	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4
	PIER WALL POUR	CU. YDS.	--	--	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	9.9	9.7	9.7	9.7	13.0
	FOOTING POUR	CU. YDS.	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9
	TOTAL	CU. YDS.	200.9	175.3	181.3	181.3	181.3	181.3	181.3	181.3	181.3	181.3	181.3	181.3	181.3	181.3	181.3	181.3	181.3	185.2	185.0	185.0	188.3	
36″X 36″PRESTRESSED CONCRETE PILES		NO.	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
		FT.	840	840	840	840	840	840	840	840	840	840	840	840	840	840	840	840	840	840	840	840	840	840

✱ THE SP-1 SPIRAL STAINLESS STEEL REINFORCING SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

NOTES:

1. ▲, ✦, ■ & ● - SEE TABLE B.
2. B9, U6, & U7 FOR BENT 4 & 94 ONLY.

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BILL OF MATERIAL ALTERNATE 1

DRAWN BY : VMW DATE : 3-12
CHECKED BY : CLG DATE : 4-12

STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-194
1			3			TOTAL SHEETS
2			4			219

10/4/2012 12:21:49 PM R:\Structures\usta\(84) Bent Footing ALT. Sht 2 of 4.dgn

TABLE B

BAR		BENT 26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
B1	◆	33'-2"	33'-2"	33'-2"	33'-2"	33'-2"	33'-2"	33'-2"	33'-2"	33'-2"	33'-2"	33'-2"	33'-2"	33'-2"	33'-2"	33'-2"	33'-2"	33'-2"	33'-2"	33'-2"	33'-2"	33'-2"	33'-2"	33'-2"	33'-2"	33'-2"	33'-2"	30'-11"	30'-11"
	■	35'-2"	35'-2"	35'-2"	35'-2"	35'-2"	35'-2"	35'-2"	35'-2"	35'-2"	35'-2"	35'-2"	35'-2"	35'-2"	35'-2"	35'-2"	35'-2"	35'-2"	35'-2"	35'-2"	35'-2"	35'-2"	35'-2"	35'-2"	35'-2"	35'-2"	35'-2"	32'-11"	32'-11"
	●	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3924	3673	3673
B2	◆	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	20'-0"	20'-0"
	■	24'-3"	24'-3"	24'-3"	24'-3"	24'-3"	24'-3"	24'-3"	24'-3"	24'-3"	24'-3"	24'-3"	24'-3"	24'-3"	24'-3"	24'-3"	24'-3"	24'-3"	24'-3"	24'-3"	24'-3"	24'-3"	24'-3"	24'-3"	24'-3"	24'-3"	24'-3"	22'-0"	22'-0"
	●	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2706	2455	2455
B3	■	44'-6"	44'-6"	44'-6"	44'-6"	44'-6"	44'-6"	44'-6"	44'-6"	44'-6"	44'-6"	44'-6"	44'-6"	44'-6"	44'-6"	44'-6"	44'-6"	44'-6"	44'-6"	44'-6"	44'-6"	44'-6"	44'-6"	44'-6"	44'-6"	44'-6"	44'-6"	40'-0"	40'-0"
	●	802	802	802	802	802	802	802	802	802	802	802	802	802	802	802	802	802	802	802	802	802	802	802	802	802	802	721	721
B4	■	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	40'-0"	40'-0"
	●	827	827	827	827	827	827	827	827	827	827	827	827	827	827	827	827	827	827	827	827	827	827	827	827	827	827	1488	1488
B5	▲	28	28	21	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	14	28	28
	✦	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5
	■	4'-6"	4'-6"	4'-6"	17'-9"	17'-9"	17'-9"	17'-9"	17'-9"	17'-9"	17'-9"	17'-9"	17'-9"	17'-9"	17'-9"	17'-9"	17'-9"	17'-9"	17'-9"	17'-9"	17'-9"	17'-9"	17'-9"	17'-9"	17'-9"	17'-9"	5'-3"	4'-6"	4'-6"
	●	131	131	99	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	77	131	131
B6	▲	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	14	20	20
	✦	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#11	#5	#4	#4
	■	30'-0"	30'-0"	30'-0"	30'-0"	30'-0"	30'-0"	30'-0"	30'-0"	30'-0"	30'-0"	30'-0"	30'-0"	30'-0"	30'-0"	30'-0"	30'-0"	30'-0"	30'-0"	30'-0"	30'-0"	30'-0"	30'-0"	30'-0"	30'-0"	30'-0"	7'-3"	4'-6"	4'-6"
	●	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	106	60	60
B7	▲	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	7	--	--
	✦	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#11	--	--
	■	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	30'-0"	--	--
	●	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	1116	--	--
B8	▲	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	22	--	--
	✦	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	#4	--	--
	■	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4'-6"	--	--
	●	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	66	--	--
H1	▲	14	14	12	12	12	12	8	8	6	6	6	6	6	6	6	4	4	4	4	4	4	4	4	4	4	6	8	8
	●	835	835	716	716	716	716	477	477	358	358	358	358	358	358	358	239	239	239	239	239	239	239	239	239	239	358	477	477
S1	▲	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	60	60
	●	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1418	1064	1064
U1	▲	40	40	30	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	52	40	40
	●	313	313	235	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	407	313	313
U4	◆	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"
	▲	13	13	12	12	12	12	8	8	6	6	6	6	6	6	6	4	4	4	4	4	4	4	4	4	4	5	7	7
	✦	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6
	■	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"
	●	114	114	105	105	105	105	70	70	53	53	53	53	53	53	53	35	35	35	35	35	35	35	35	35	35	44	61	61
U5	▲	63	63	54	54	54	54	36	36	27	27	27	27	27	27	27	18	18	18	18	18	18	18	18	18	18	27	36	36
	●	151	151	129	129	129	129	86	86	65	65	65	65	65	65	65	43	43	43	43	43	43	43	43	43	43	65	86	86
V1	◆	12'-4"	12'-4"	12'-3"	12'-3"	12'-3"	12'-3"	10'-8"	10'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-2"	9'-2"	9'-2"	9'-2"	9'-2"	9'-2"	9'-2"	9'-2"	9'-2"	9'-2"	9'-6"	10'-11"	10'-11"
	▲	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62
	■	14'-2"	14'-2"	14'-1"	14'-1"	14'-1"	14'-1"	12'-6"	12'-6"	11'-6"	11'-6"	11'-6"	11'-6"	11'-6"	11'-6"	11'-6"	11'-0"	11'-0"	11'-0"	11'-0"	11'-0"	11'-0"	11'-0"	11'-0"	11'-0"	11'-0"	11'-4"	12'-9"	12'-9"
	●	3779	3779	3757	3757	3757	3757	3335	3335	3068	3068	3068	3068	3068	3068	3068	2935	2935	2935	2935	2935	2935	2935	2935	2935	2935	3024	3402	3402
V2	▲	3	3	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	3	3	3
	■	4'-5"	4'-5"	4'-4"	4'-4"	4'-4"	4'-4"	2'-9"	2'-9"	1'-9"	1'-9"	1'-9"	1'-9"	1'-9"	1'-9"	1'-9"	1'-3"	1'-3"	1'-3"	1'-3"	1'-3"	1'-3"	1'-3"	1'-3"	1'-3"	1'-3"	1'-6"	3'-0"	3'-0"
	●	20	20	39	39	39	39	25	25	16	16	16	16	16	16	16	11	11	11	11	11	11	11	11	11	11	7	14	14
V3	▲	3	3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3	3
	■	3'-9"	3'-9"	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2'-0"	2'-0"
	●	17	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9	9

NOTES:

1. FOR BAR TYPES AND BILL OF MATERIAL SEE SHEET 2 OF 4.

QUANTITIES

		BENT	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
STAINLESS STEEL REINFORCING		LBS.	43409	43409	43129	43285	43285	43285	42532	42532	42099	42099	42099	42099	42099	42099	42099	41802	41802	41802	41802	41802	41802	41802	41802	41802	41802	42137	41144	41144
SPIRAL STAINLESS STEEL REINFORCING		LBS.	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030
CLASS AA CONCRETE :	LATERAL GUIDE POUR	CU. YDS.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	STEP POUR	CU. YDS.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	CAP POUR	CU. YDS.	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	59.4	60.3	53.7	53.7
	PIER WALL POUR	CU. YDS.	13.0	13.0	13.7	13.7	13.7	13.7	8.9	8.9	6.0	6.0	6.0	6.0	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	8.2	8.2
	FOOTING POUR	CU. YDS.	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9
	TOTAL	CU. YDS.	188.3	188.3	189.0	189.0	189.0	189.0	184.2	184.2	181.3	181.3	181.3	181.3	181.3	181.3	181.3	179.8	179.8	179.8	179.8	179.8	179.8	179.8	179.8	179.8	179.8	180.7	177.8	177.8
36"X 36"PRESTRESSED CONCRETE PILES		NO.	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
		FT.	840	840	840	840	840	840	840	840	840	840	840	840	840	840	840	840	840	840	840	840	840	840	840	840	840	840	840	840

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NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BILL OF MATERIAL
ALTERNATE 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-195
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : VMW DATE : 3-12
CHECKED BY : CLG DATE : 4-12

10/4/2012 12:21:46 PM R:\Structures\usra\(195) Bent Footing ALT. Sht 3 of 4.dgn

TABLE B

BAR		BENT																														
		54	55	56	57	58	59	60	65	66	67	68	70	71	72	73	74	75	77	82	83	84	85	86	87	88	89	90	91	92	93	94
B1	◆	30'-11"	30'-11"	30'-11"	30'-11"	30'-11"	30'-11"	30'-11"	30'-11"	30'-11"	30'-11"	30'-11"	30'-11"	30'-11"	30'-11"	30'-11"	30'-11"	30'-11"	30'-11"	30'-11"	30'-11"	30'-11"	30'-11"	30'-11"	30'-11"	33'-2"	33'-2"	33'-2"	33'-2"	33'-2"	33'-2"	35'-4"
	■	32'-11"	32'-11"	32'-11"	32'-11"	32'-11"	32'-11"	32'-11"	32'-11"	32'-11"	32'-11"	32'-11"	32'-11"	32'-11"	32'-11"	32'-11"	32'-11"	32'-11"	32'-11"	32'-11"	32'-11"	32'-11"	32'-11"	32'-11"	32'-11"	35'-2"	35'-2"	35'-2"	35'-2"	35'-2"	35'-2"	37'-4"
	●	3673	3673	3673	3673	3673	3673	3673	3673	3673	3673	3673	3673	3673	3673	3673	3673	3673	3673	3673	3673	3673	3673	3673	3673	3924	3924	3924	3924	3924	3924	4165
B2	◆	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-7"
	■	22'-0"	22'-0"	22'-0"	22'-0"	22'-0"	22'-0"	22'-0"	22'-0"	22'-0"	22'-0"	22'-0"	22'-0"	22'-0"	22'-0"	22'-0"	22'-0"	22'-0"	22'-0"	22'-0"	22'-0"	22'-0"	22'-0"	22'-0"	22'-0"	24'-3"	24'-3"	24'-3"	24'-3"	24'-3"	24'-3"	24'-7"
	●	2455	2455	2455	2455	2455	2455	2455	2455	2455	2455	2455	2455	2455	2455	2455	2455	2455	2455	2455	2455	2455	2455	2455	2455	2706	2706	2706	2706	2706	2706	2743
B3	■	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	44'-6"	44'-6"	44'-6"	44'-6"	44'-6"	44'-6"	47'-0"
	●	721	721	721	721	721	721	721	721	721	721	721	721	721	721	721	721	721	721	721	721	721	721	721	721	802	802	802	802	802	802	847
B4	■	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	22'-3"	32'-3"
	●	1488	1488	1488	1488	1488	1488	1488	1488	1488	1488	1488	1488	1488	1488	1488	1488	1488	1488	1488	1488	1488	1488	1488	1488	827	827	827	827	827	827	1199
B5	▲	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	14	7	7	7	7	7	7
	✦	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#11
	■	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	5'-3"	17'-9"	17'-9"	17'-9"	17'-9"	17'-9"	22'-6"
	●	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	77	130	130	130	130	130	837
B6	▲	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	7	7	7	7	7	7	11
	✦	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5	#11	#11	#11	#11	#11	#5
	■	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	7'-2"	30'-0"	30'-0"	30'-0"	30'-0"	30'-0"	47'-0"
	●	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	52	1116	1116	1116	1116	1116	539
B7	▲	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7	22	22	22	22	22	7
	✦	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	#11	#4	#4	#4	#4	#4	#5
	■	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	30'-0"	4'-6"	4'-6"	4'-6"	4'-6"	4'-6"	17'-9"
	●	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1116	66	66	66	66	66	130
B8	▲	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	22	--	--	--	--	--	4
	✦	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	#4	--	--	--	--	--	#4
	■	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4'-6"	--	--	--	--	--	1'-11"
	●	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	66	--	--	--	--	--	5
H1	▲	8	8	8	10	10	12	12	18	18	22	22	22	22	22	22	22	22	22	10	10	8	8	8	8	8	4	4	--	--	--	--
	●	477	477	477	596	596	716	716	1073	1073	1312	1312	1312	1312	1312	1312	1312	1312	1312	596	596	477	477	477	477	477	239	239	--	--	--	--
S1	▲	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	80	80	80	80	80	80	84
	●	1064	1064	1064	1064	1064	1064	1064	1064	1064	1064	1064	1064	1064	1064	1064	1064	1064	1064	1064	1064	1064	1064	1064	1064	1418	1418	1418	1418	1418	1418	1489
U1	▲	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	37	46	46	46	46	46	46
	●	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	290	360	360	360	360	360	360
U4	◆	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	2'-10"	--	--	--	1'-9"
	▲	7	7	7	9	9	11	11	18	18	22	22	22	22	22	22	22	22	22	9	9	7	7	7	7	8	4	4	--	--	--	10
	✦	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	--	--	--	#4
	■	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	5'-10"	--	--	--	4'-9"
	●	61	61	61	79	79	96	96	158	158	193	193	193	193	193	193	193	193	193	79	79	61	61	61	61	70	35	35	--	--	--	32
U5	▲	36	36	36	45	45	54	54	81	81	99	99	99	99	99	99	99	99	99	45	45	36	36	36	36	36	18	18	--	--	--	--
	●	86	86	86	108	108	129	129	194	194	237	237	237	237	237	237	237	237	237	108	108	86	86	86	86	86	43	43	--	--	--	--
V1	◆	10'-11"	10'-11"	10'-11"	11'-7"	11'-7"	12'-10"	12'-10"	14'-9"	14'-9"	16'-3"	16'-3"	16'-3"	16'-3"	16'-3"	16'-3"	16'-3"	16'-3"	16'-3"	11'-7"	11'-7"	10'-11"	10'-11"	10'-11"	10'-11"	10'-5"	9'-2"	9'-2"	7'-8"	7'-8"	7'-8"	7'-8"
	▲	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	94	94	94	94
	■	12'-9"	12'-9"	12'-9"	13'-5"	13'-5"	14'-8"	14'-8"	16'-7"	16'-7"	18'-1"	18'-1"	18'-1"	18'-1"	18'-1"	18'-1"	18'-1"	18'-1"	18'-1"	13'-5"	13'-5"	12'-9"	12'-9"	12'-9"	12'-9"	12'-3"	11'-0"	11'-0"	9'-6"	9'-6"	9'-6"	9'-6"
	●	3402	3402	3402	3579	3579	3913	3913	4424	4424	4824	4824	4824	4824	4824	4824	4824	4824	4824	3579	3579	3402	3402	3402	3402	3268	2935	2935	3843	3843	3843	3843
V2	▲	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	6	6	6	--	--	--	--
	■	3'-0"	3'-0"	3'-0"	3'-8"	3'-8"	5'-0"	5'-0"	5'-10"	5'-10"	7'-4"	7'-4"	7'-4"	7'-4"	7'-4"	7'-4"	7'-4"	7'-4"	7'-4"	3'-8"	3'-8"	3'-0"	3'-0"	3'-0"	3'-0"	2'-6"	1'-3"	1'-3"	--	--	--	--
	●	14	14	14	17	17	23	23	26	26	33	33	33	33	33	33	33	33	33	17	17	14	14	14	14	23	11	11	--	--	--	--
V3	▲	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	--	--	--	--	--	--	--
	■	2'-0"	2'-0"	2'-0"	2'-8"	2'-8"	3'-11"	3'-11"	6'-10"	6'-10"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	2'-8"	2'-8"	2'-0"	2'-0"	2'-0"	2'-0"	--	--	--	--	--	--	--
	●	9	9	9	12	12	18	18	31	31	38	38	38	38	38	38	38	38	38	12	12	9	9	9	9	--	--	--	--	--	--	--

NOTES:

1. FOR BAR TYPES AND BILL OF MATERIAL SEE SHEET 2 OF 4.

QUANTITIES

		BENT	54	55	56	57	58	59	60	65	66	67	68	70	71	72	73	74	75	77	82	83	84	85	86	87	88	89	90	91	92	93	94
STAINLESS STEEL REINFORCING	LBS.		41144	41144	41144	41486	41486	41990	41990	43001	43001	43732	43732	43732	43732	43732	43732	43732	43732	43732	41486	41486	41144	41144	41144	41144	42392	41802	41802	42382	42382	42382	48329
SPIRAL STAINLESS STEEL REINFORCING	LBS.		1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030	1030
CLASS AA CONCRETE :																																	
LATERAL GUIDE POUR	CU. YDS.		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.1
STEP POUR	CU. YDS.		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	22.2
CAP POUR	CU. YDS.		53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.7	53.7	53.7	53.7	53.7	54.3	59.6	59.4	59.4	59.4	59.4	59.4	62.7
PIER WALL POUR	CU. YDS.		8.2	8.2	8.2	10.2	10.2	14.0	14.0	19.6	19.6	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	10.2	10.2	8.2	8.2	8.2	8.2	8.2	4.5	4.5	--	--	--	--
FOOTING POUR	CU. YDS.		115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.9
TOTAL	CU. YDS.		177.8	177.8	177.8	179.8	179.8	183.6	183.6	189.3	189.3	193.8	193.8	193.8	193.8	193.8	193.8	193.8	193.8	193.8	179.8	179.8	177.8	177.8	177.8	178.4	183.7	179.8	179.8	175.3	175.3	175.3	200.9
36" X 36" PRESTRESSED CONCRETE PILES	NO.		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	FT.		840	840	840	840	840	840	840	840	840	840	840	840	840	840	840	840	840	840	880	880	880	880	880	880	880	880	960	960	960	960	960

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

DRAWN BY : VMW DATE : 3-12
CHECKED BY : CLG DATE : 4-12

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BILL OF MATERIAL
ALTERNATE 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-196
1			3			TOTAL SHEETS
2			4			219

R:\Structures\Vusta\V196) Bent Footing ALT.Sht 4 of 4.dgn
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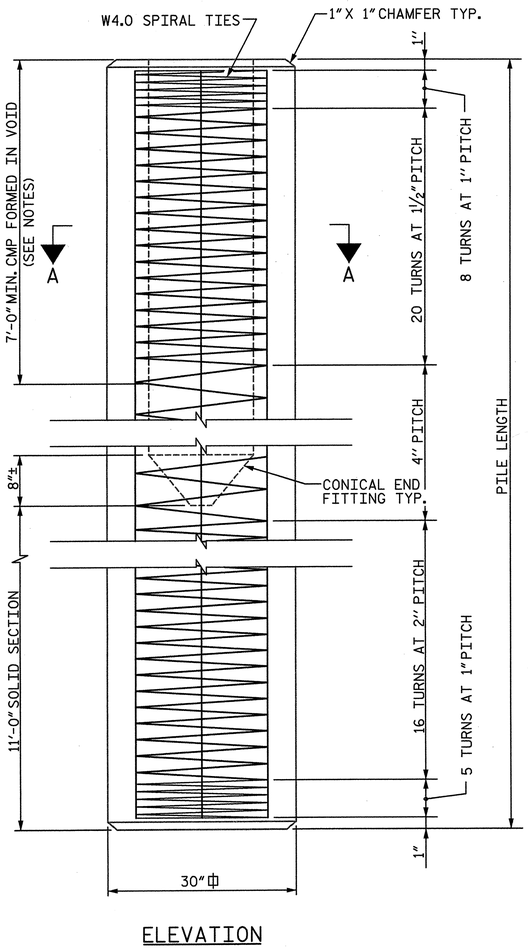
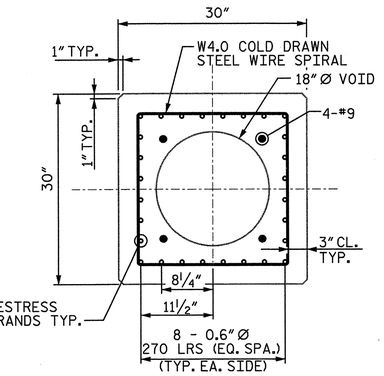


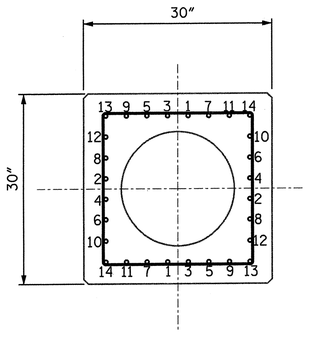
ELEVATION

QUANTITIES FOR ONE 30" SQUARE PILE								
	CONCRETE	PILE WT.	ONE POINT PICK-UP		TWO POINT PICK-UP		THREE POINT PICK-UP	
LENGTH	CU. YDS.	TONS	0.3L	0.7L	0.207L	0.586L	0.145L	0.355L
25'-0"	4.14	8.39	7'-6"	17'-6"				
30'-0"	4.97	10.07	9'-0"	21'-0"				
35'-0"	5.80	11.75	10'-6"	24'-6"				
40'-0"	6.63	13.43	12'-0"	28'-0"				
45'-0"	7.46	15.11	13'-6"	31'-6"				
50'-0"	8.29	16.78	15'-0"	35'-0"				
55'-0"	9.12	18.46	16'-6"	38'-6"				
60'-0"	9.95	20.14	18'-0"	42'-0"				
65'-0"	10.78	21.82	19'-6"	45'-6"				
70'-0"	11.60	23.50	21'-0"	49'-0"				
75'-0"	12.43	25.18			15'-6½"	43'-11"		
80'-0"	13.26	26.86			16'-6½"	46'-11"		
85'-0"	14.09	28.53			17'-7"	49'-10"		
90'-0"	14.92	30.21			18'-7½"	52'-9"		
95'-0"	15.75	31.89			19'-8"	55'-8"		
100'-0"	16.58	33.57			20'-8½"	58'-7"		
105'-0"	17.41	35.25					15'-3"	37'-3"
110'-0"	18.24	36.93					15'-11½"	39'-0½"
115'-0"	19.06	38.60					16'-8"	40'-10"
120'-0"	19.89	40.28					17'-5"	42'-7"

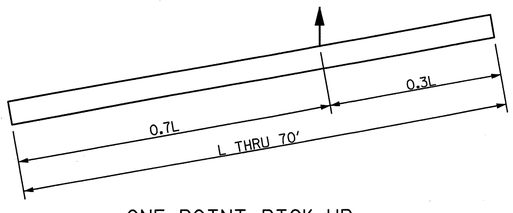


SECTION A-A

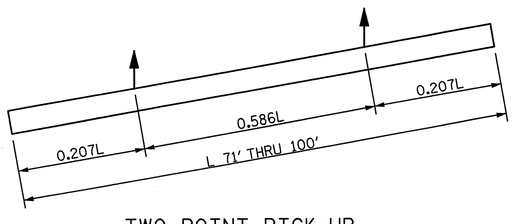
28 - 0.6" Ø GRADE 270 L.R. PRESTRESS STRANDS



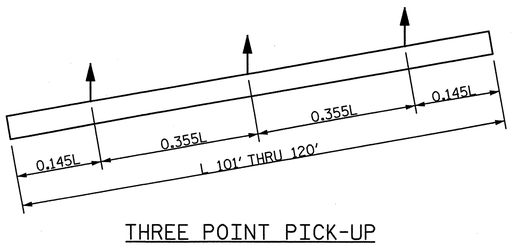
TYPICAL PATTERN FOR BURNING STRANDS



ONE POINT PICK-UP



TWO POINT PICK-UP



THREE POINT PICK-UP

PICK-UP POINTS

NOTES:

PRESTRESSED CONCRETE STRENGTH : f'c = 10,000 PSI
BUILD-UP CONCRETE STRENGTH : f'c = 10,000 PSI

STRAND DATA:

SIZE	GRADE	AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS FORCE
0.6"	270 L.R.	0.217	58,600# PER STRAND	43,940# PER STRAND

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 STRANDS CONFORMING TO AASHTO M203. STRAND SAMPLING REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

THE SLIP-FORM METHOD OF CASTING PILES WILL NOT BE PERMITTED.

TRANSFER THE LOAD FROM THE ANCHORAGES TO THE PILE AFTER THE CONCRETE HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 8,000 PSI.

IF STRAND STRESS IS RELIEVED BY BURNING, THE STRANDS SHALL BE BURNED IN OPPOSITE PAIRS AS INDICATED IN THE TYPICAL PATTERN SHOWN. FOR ANY NUMBER OF STRANDS, BURN IN OPPOSITE PAIRS AND SYMMETRICALLY ABOUT BOTH THE VERTICAL AND HORIZONTAL AXES, STRANDS 1-1 SHALL BE BURNED BEFORE 2-2, ETC. NOT MORE THAN 4 STRANDS, SAY 5-5 AND 6-6, MAY BE BURNED AT ANY ONE SECTION BEFORE THESE SAME PAIRS OF STRANDS ARE BURNED AT BOTH ENDS OF THE BED AND BETWEEN EACH PAIR OF PILES IN THE BED.

PROPOSED DEVICES FOR LIFTING PILES, RECESS DETAILS, AND PATCHING MATERIAL SHALL BE DETAILED IN SHOP DRAWINGS. AFTER ATTACHMENTS HAVE BEEN REMOVED, OPENINGS SHALL BE REPAIRED SUCH THAT THE APPEARANCE OF THE PILE IS UNIFORM.

WHERE CAST-IN-PLACE LIFTING DEVICES ARE NOT USED, PICK-UP POINTS ARE TO BE INDICATED WITH A 2" WIDE BLACK MARK.

DRIVE PILES USING A METHOD APPROVED BY THE ENGINEER, WHEREBY THE HEAD OF THE PILE IS NOT DAMAGED.

⚠ VENTING DURING DRIVING SHALL BE PROVIDED BY THE USE OF A 1" Ø PVC CONDUIT THROUGH TWO (2) OPPOSITE FACES OF THE PILE LOCATED 2'-6" FROM TOP OF PILE.

AFTER THE PILE IS DRIVEN AND CUT TO GRADE, THE TOP 7'-0" OF THE 18" Ø VOID SHALL BE FILLED WITH CONCRETE. PRIOR TO FILLING THE TOP 7'-0" OF THE 18" Ø VOID WITH CONCRETE, STRIP THE CARDBOARD FORM MATERIAL FROM THE VOID. A STAY-IN-PLACE CORRUGATED THIN WALL GALVANIZED PIPE MAY BE USED TO FORM THE VOID IN LIEU OF THE CARDBOARD FORM MATERIAL. THE CONCRETE FILL MATERIAL SHALL BE OF THE SAME TYPE AND STRENGTH AS CALLED FOR IN THE PILE CAP AND PAID FOR AS SUBSTRUCTURE CONCRETE.

⚠ REVISED NOT FOR VENTING

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

30" PRESTRESSED CONCRETE PILE

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY
11-11-13

DRAWN BY : M.M. DATE : 03-12
CHECKED BY : K.J.G. DATE : 03-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-197
1	STV	11-13	3			TOTAL SHEETS
2			4			219

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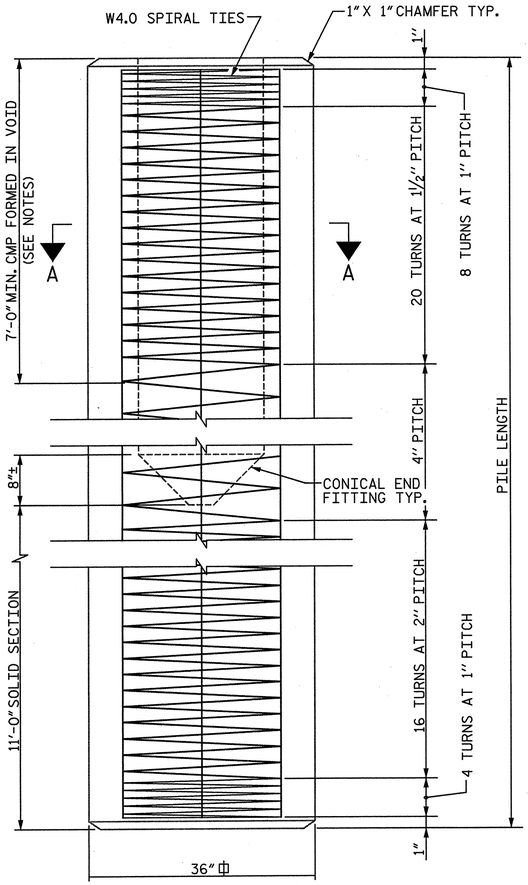
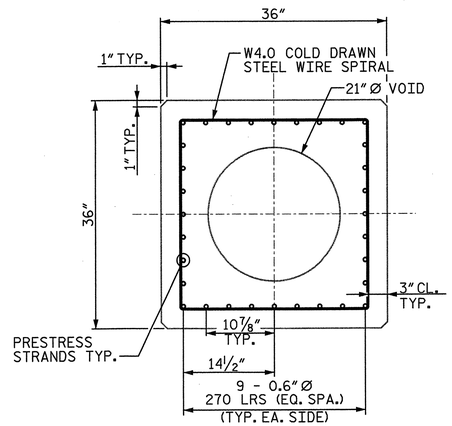
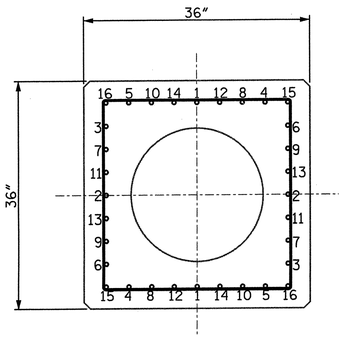


ELEVATION

QUANTITIES FOR ONE 36'' SQUARE PILE								
	CONCRETE	PILE WT.	ONE POINT PICK-UP		TWO POINT PICK-UP		THREE POINT PICK-UP	
LENGTH	CU. YDS.	TONS	0.3L	0.7L	0.207L	0.586L	0.145L	0.355L
25'-0''	6.10	12.35	7'-6"	17'-6"				
30'-0''	7.32	14.82	9'-0"	21'-0"				
35'-0''	8.54	17.29	10'-6"	24'-6"				
40'-0''	9.76	19.76	12'-0"	28'-0"				
45'-0''	10.98	22.23	13'-6"	31'-6"				
50'-0''	12.20	24.70	15'-0"	35'-0"				
55'-0''	13.42	27.17	16'-6"	38'-6"				
60'-0''	14.64	29.64	18'-0"	42'-0"				
65'-0''	15.86	32.12	19'-6"	45'-6"				
70'-0''	17.08	34.59	21'-0"	49'-0"				
75'-0''	18.30	37.06			15'-6½"	43'-11"		
80'-0''	19.52	39.53			16'-6½"	46'-11"		
85'-0''	20.74	42.00			17'-7"	49'-10"		
90'-0''	21.96	44.47			18'-7½"	52'-9"		
95'-0''	23.18	46.94			19'-8"	55'-8"		
100'-0''	24.40	49.41			20'-8½"	58'-7"		
105'-0''	25.62	51.88					15'-3"	37'-3"
110'-0''	26.84	54.35					15'-11½"	39'-0½"
115'-0''	28.06	56.82					16'-8"	40'-10"
120'-0''	29.28	59.29					17'-5"	42'-7"

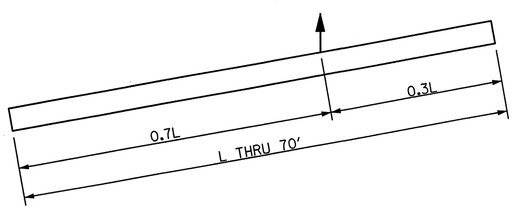


SECTION A-A

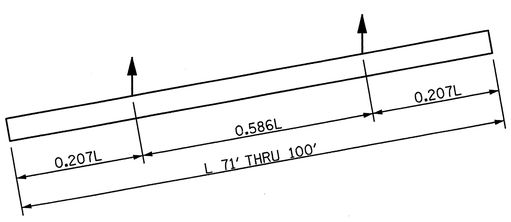


TYPICAL PATTERN FOR BURNING STRANDS

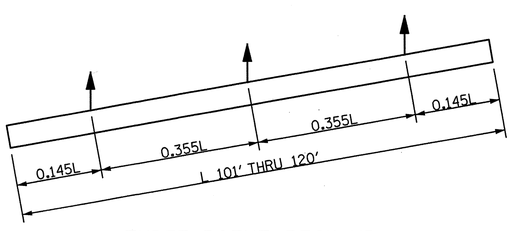
32 - 0.6" Ø GRADE 270 L.R. PRESTRESS STRANDS



ONE POINT PICK-UP



TWO POINT PICK-UP



THREE POINT PICK-UP

PICK-UP POINTS

NOTES:

PRESTRESSED CONCRETE STRENGTH : f'c = 10,000 PSI
BUILD-UP CONCRETE STRENGTH : f'c = 10,000 PSI

STRAND DATA:

SIZE	GRADE	AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS FORCE
0.6"	270 L.R.	0.217	58.600# PER STRAND	43.940# PER STRAND

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 STRANDS CONFORMING TO AASHTO M203. STRAND SAMPLING REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

THE SLIP-FORM METHOD OF CASTING PILES WILL NOT BE PERMITTED.

TRANSFER THE LOAD FROM THE ANCHORAGES TO THE PILE AFTER THE CONCRETE HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 8,000 PSI.

IF STRAND STRESS IS RELIEVED BY BURNING, THE STRANDS SHALL BE BURNED IN OPPOSITE PAIRS AS INDICATED IN THE TYPICAL PATTERN SHOWN. FOR ANY NUMBER OF STRANDS, BURN IN OPPOSITE PAIRS AND SYMMETRICALLY ABOUT BOTH THE VERTICAL AND HORIZONTAL AXES, STRANDS 1-1 SHALL BE BURNED BEFORE 2-2, ETC. NOT MORE THAN 4 STRANDS, SAY 5-5 AND 6-6, MAY BE BURNED AT ANY ONE SECTION BEFORE THESE SAME PAIRS OF STRANDS ARE BURNED AT BOTH ENDS OF THE BED AND BETWEEN EACH PAIR OF PILES IN THE BED.

PROPOSED DEVICES FOR LIFTING PILES, RECESS DETAILS, AND PATCHING MATERIAL SHALL BE DETAILED IN SHOP DRAWINGS. AFTER ATTACHMENTS HAVE BEEN REMOVED, OPENINGS SHALL BE REPAIRED SUCH THAT THE APPEARANCE OF THE PILE IS UNIFORM.

WHERE CAST-IN-PLACE LIFTING DEVICES ARE NOT USED, PICK-UP POINTS ARE TO BE INDICATED WITH A 2'' WIDE BLACK MARK.

DRIVE PILES USING A METHOD APPROVED BY THE ENGINEER, WHEREBY THE HEAD OF THE PILE IS NOT DAMAGED.

CORRUGATED METAL PIPE (CMP) SHALL BE FORMED IN VOID AS SHOWN. CMP SHALL BE GALVANIZED AND SHALL HAVE AN AMPLITUDE OF ½".

⚠ VENTING DURING DRIVING SHALL BE PROVIDED BY THE USE OF A 1" Ø PVC CONDUIT THROUGH TWO (2) OPPOSITE FACES OF THE PILE LOCATED 3'-0" FROM TOP OF PILE.

AFTER THE PILE IS DRIVEN AND CUT TO GRADE, THE TOP 7'-0" OF THE 21" Ø VOID SHALL BE FILLED WITH CONCRETE. PRIOR TO FILLING THE TOP 7'-0" OF THE 21" Ø VOID WITH CONCRETE, STRIP THE CARDBOARD FORM MATERIAL FROM THE VOID. A STAY-IN-PLACE CORRUGATED THIN WALL GALVANIZED PIPE MAY BE USED TO FORM THE VOID IN LIEU OF THE CARDBOARD FORM MATERIAL. THE CONCRETE FILL MATERIAL SHALL BE OF THE SAME TYPE AND STRENGTH AS CALLED FOR IN THE PILE CAP AND PAID FOR AS SUBSTRUCTURE CONCRETE.

⚠ REVISED NOTE FOR VENTING

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

36" PRESTRESSED CONCRETE PILE

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
11-11-13

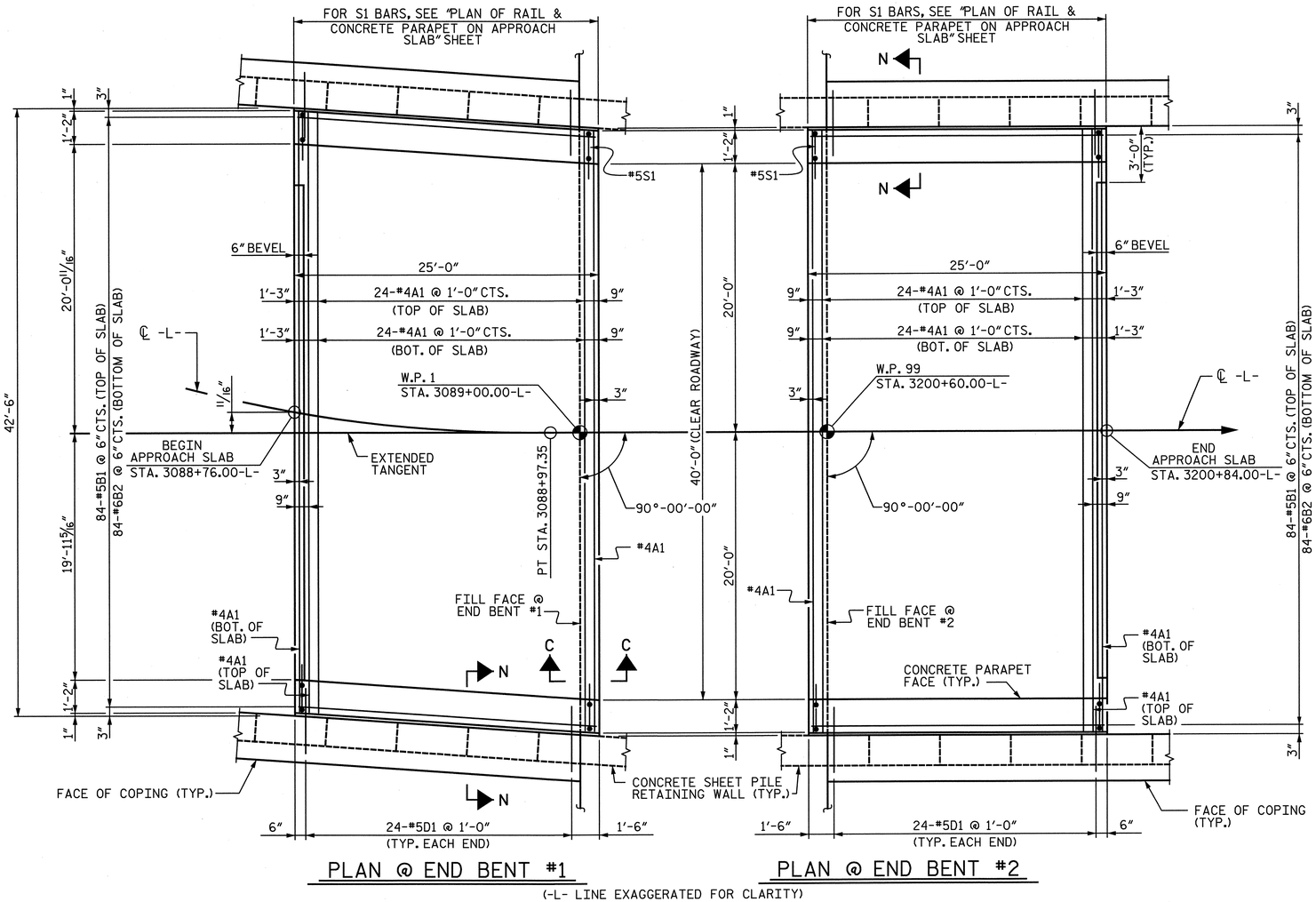
DRAWN BY : M.M. DATE : 03-12
CHECKED BY : K.J.G. DATE : 03-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1	STV	11-13	3		
2			4		

SHEET NO. S-198
TOTAL SHEETS 219

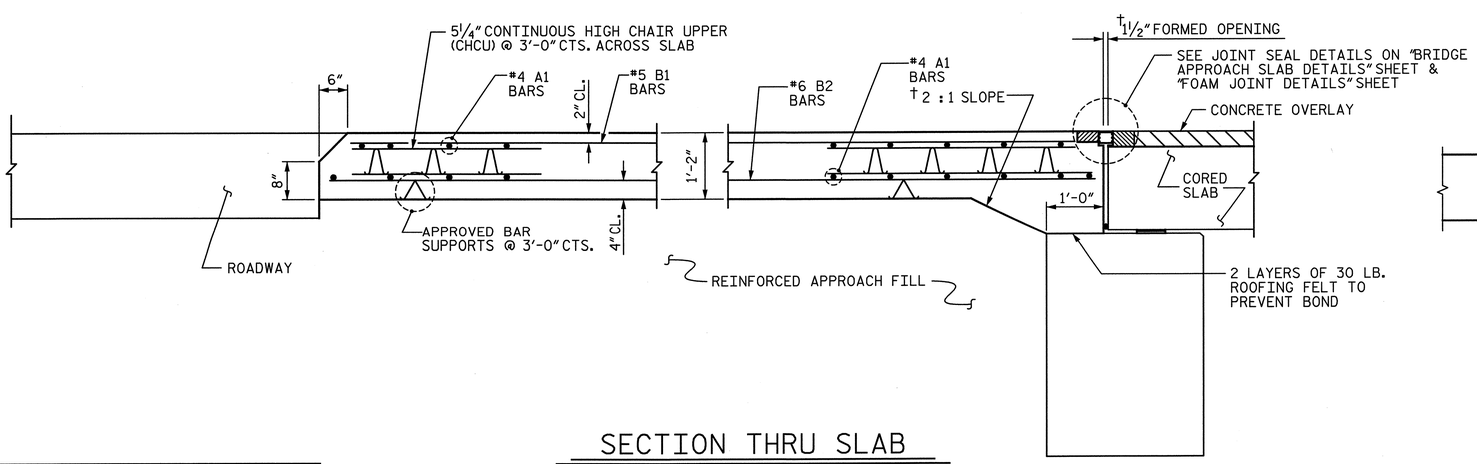
11/11/2013 4:16:23 PM R:\Structures\Updated & Sealed Plans 11-1-13\(198) 36 in prestressed conc pile_1.dgn



PLAN @ END BENT #1

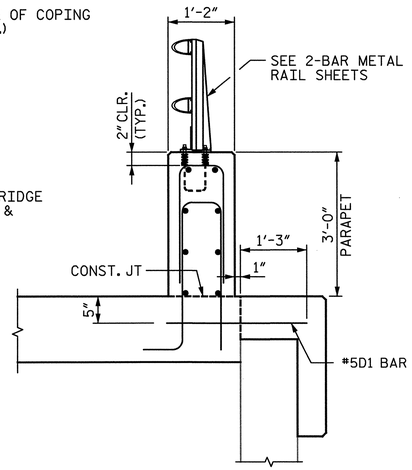
PLAN @ END BENT #2

(-L- LINE EXAGGERATED FOR CLARITY)



SECTION THRU SLAB

(CONCRETE SHEET PILE RETAINING WALL AND COPING NOT SHOWN FOR CLARITY)
(CONCRETE PARAPET AND RAIL NOT SHOWN FOR CLARITY)



SECTION N-N

NOTES:

1. FOR JOINT DETAILS, SEE "FOAM JOINT DETAILS" SHEETS.
2. FOR THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL, SEE "FOAM JOINT DETAILS" SHEET.
3. FOR RETAINING WALL DETAILS, SEE CONCRETE SHEET PILE RETAINING WALL SHEETS.
4. FOR CONCRTE PARAPET AND RAIL DETAILS, SEE "PLAN OF RAIL & CONCRETE PARAPET ON APPROACH SLAB" SHEET.
5. THE CONCRETE PARAPET SHALL NOT BE CAST UNTIL THE CONCRETE IN THE APPROACH SLAB HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
6. FOR REINFORCED APPROACH FILLS, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL
APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	51	#4	STR	42'-0"	1,431
B1	84	#5	STR	24'-6"	2,146
B2	84	#6	STR	24'-6"	3,091
D1	48	#5	STR	2'-6"	125
STAINLESS REINFORCING STEEL				LBS.	6,793
CLASS AA CONCRETE				C. Y.	51.9

APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	51	#4	STR	42'-0"	1,431
B1	84	#5	STR	24'-6"	2,146
B2	84	#6	STR	24'-6"	3,091
D1	48	#5	STR	2'-6"	125
STAINLESS REINFORCING STEEL				LBS.	6,793
CLASS AA CONCRETE				C. Y.	51.9

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 5-30-13

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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1			3			TOTAL SHEETS
2			4			219

DRAWN BY : ACA DATE : 3-12
CHECKED BY : TRL DATE : 3-12

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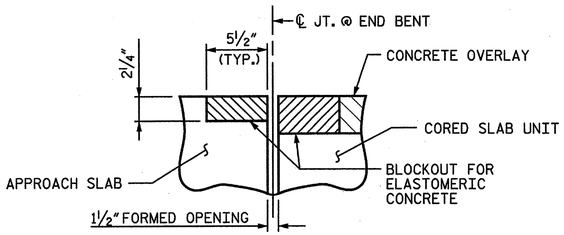
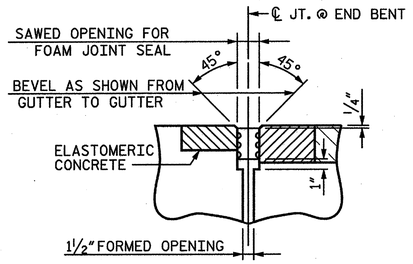


SECTION C-C

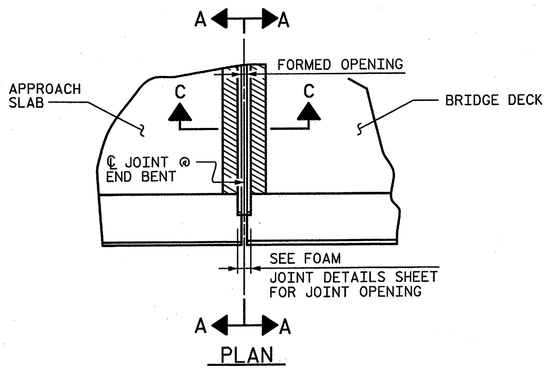
FOAM JOINT SEAL
(PRE-SAWED ELASTOMERIC
CONCRETE DIMENSIONS)



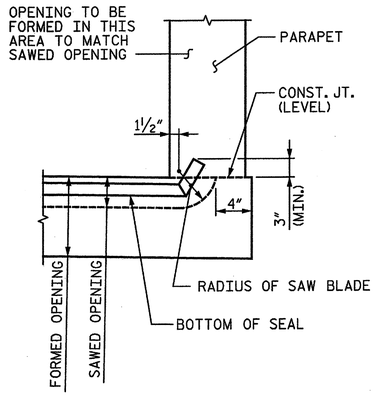
SECTION C-C

FOAM JOINT SEAL

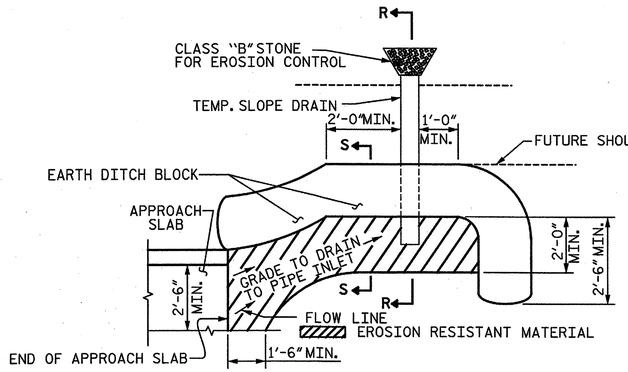
NOTE: FOR JOINT DETAILS SEE "FOAM JOINT DETAILS" SHEET



PLAN

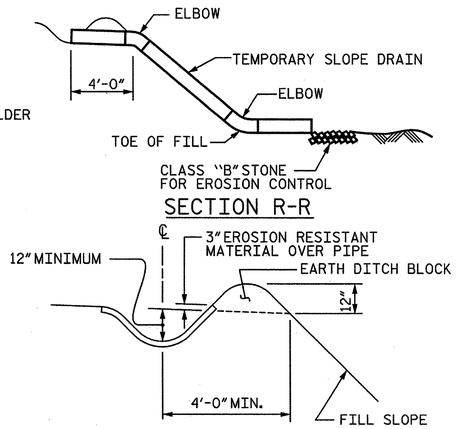


SECTION A-A



NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.

PLAN VIEW

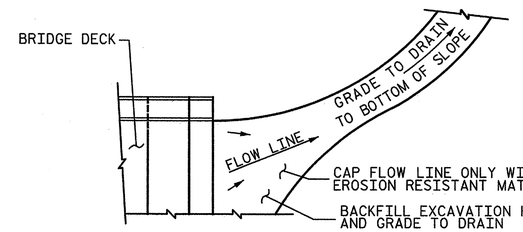


SECTION R-R

SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

TEMPORARY DRAINAGE DETAIL

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			219

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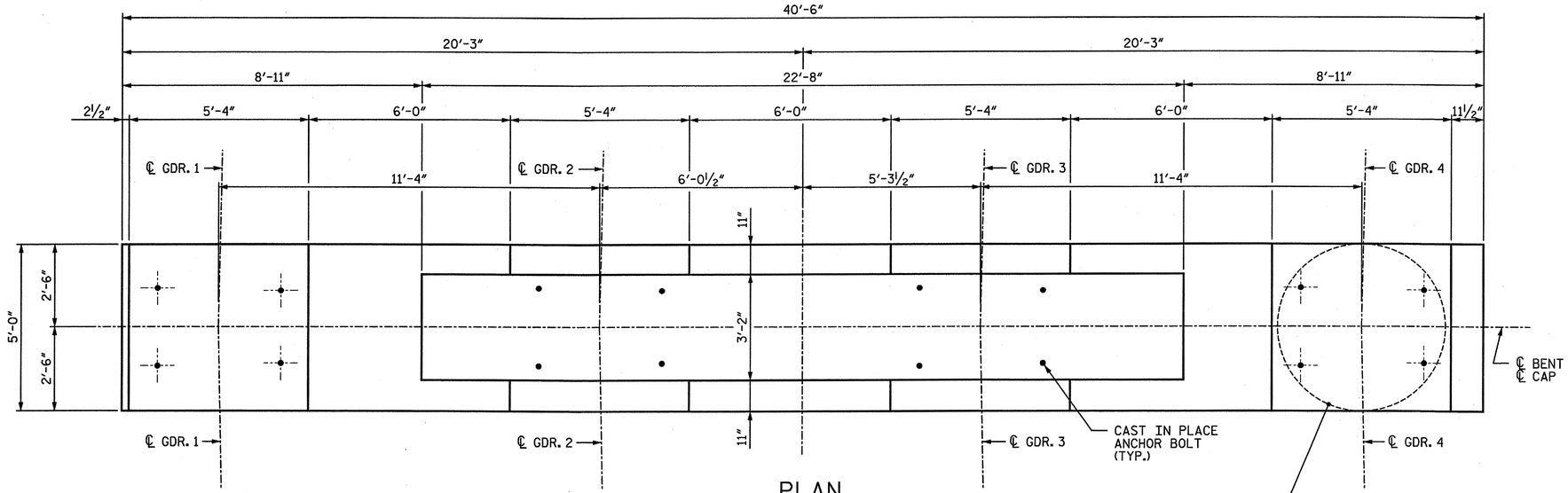
10/4/2012 12:21:33 PM R:\Structures\ustg\1200 AppSlab Details 2of2.dgn

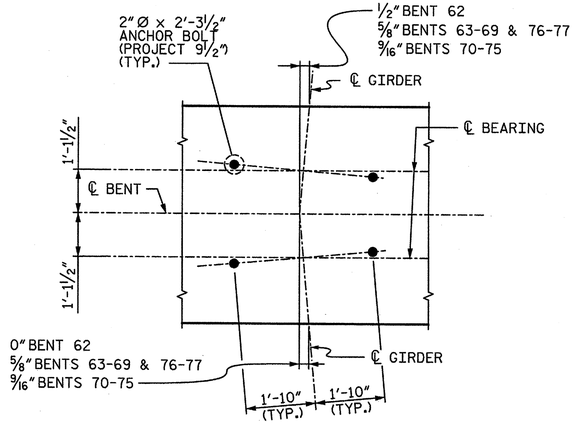
NOTES:

1. PRECAST SHELL CAP MAY BE USED FOR BENTS 62-77.
2. FOR CAST IN PLACE ANCHOR BOLT LAYOUT & BENT SPECIFIC DETAILS, SEE PLANS FOR BENTS 62-77.
3. FOR SECTIONS AND VIEWS, SEE SHEET 4 OF 5.
4. FOR ADDITIONAL NOTES SEE SHEET 5 OF 5.



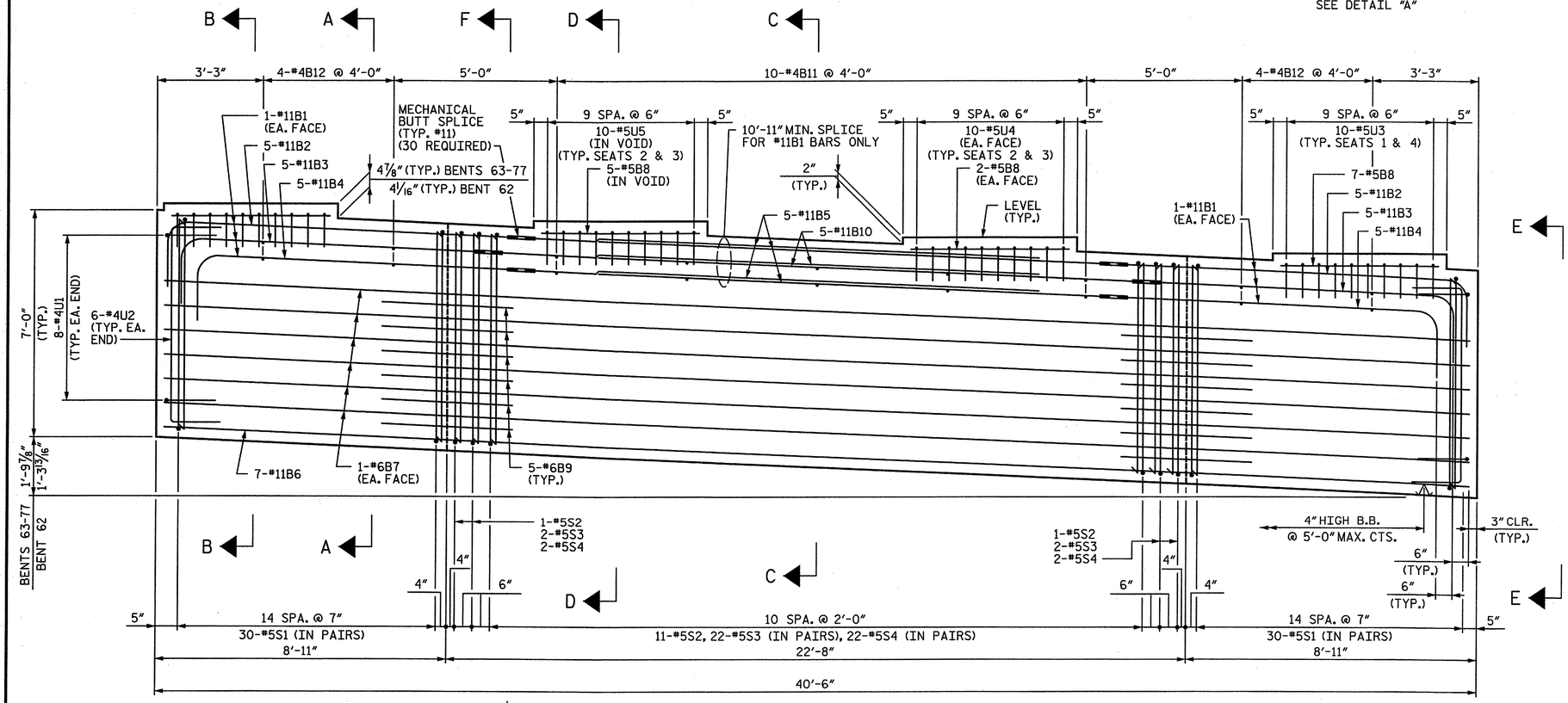
PLAN

(CAST-IN-PLACE ANCHOR BOLTS SHOWN FOR INFORMATION ONLY)



DETAIL "A"

(TYPICAL EACH SEAT)



ELEVATION

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRECAST CAP OPTION FOR BENTS 62-77

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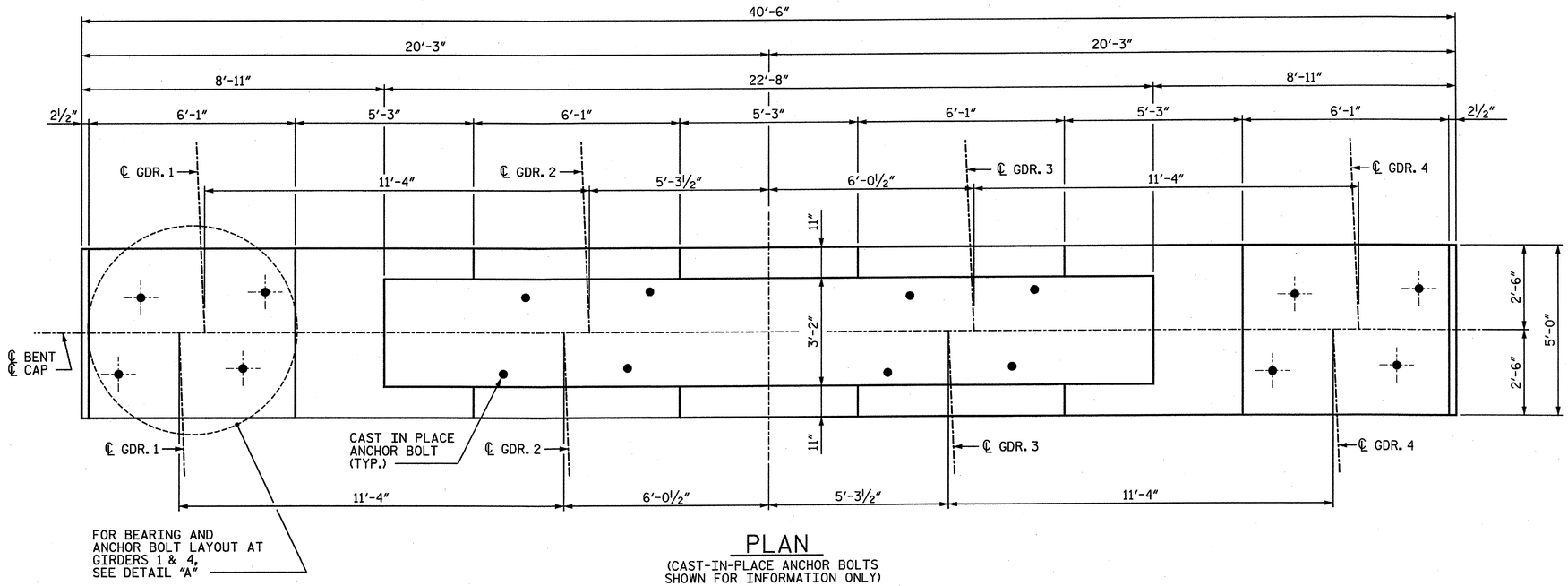
1			3		
2			4		

SHEET NO. S-201

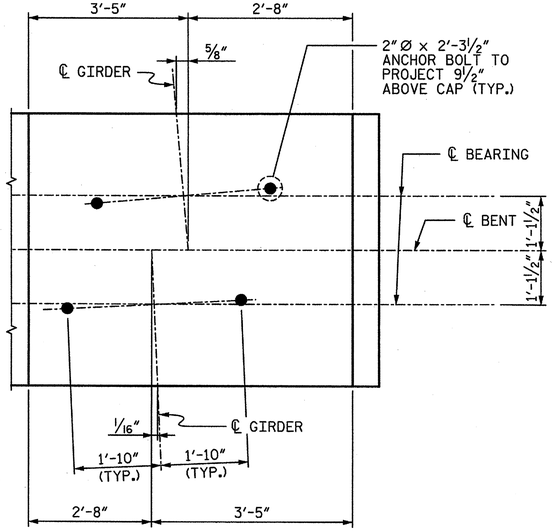
TOTAL SHEETS 219

10/4/2012 5:07:24 PM R:\Structures\usrta\2011 Precast Shell Cap Bents 62-77 Sht 1 of 5.dgn



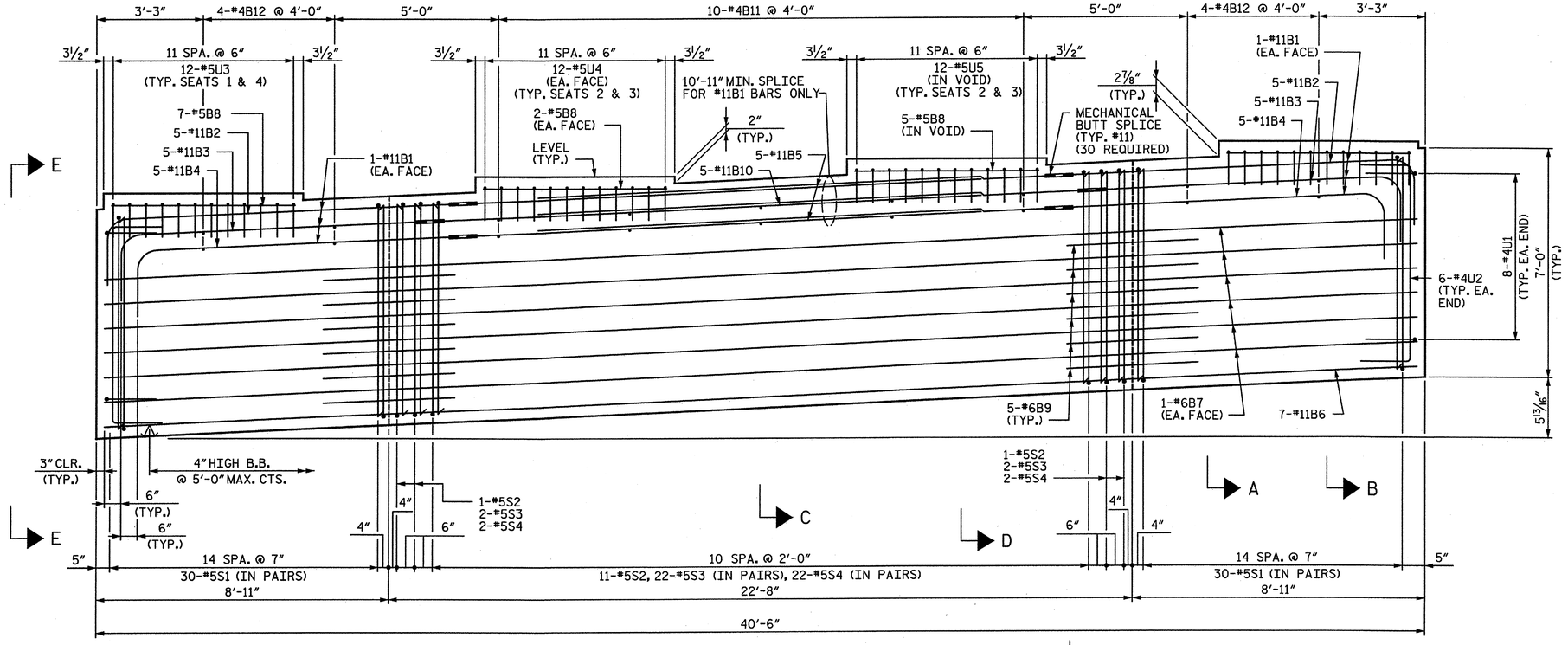
PLAN

(CAST-IN-PLACE ANCHOR BOLTS SHOWN FOR INFORMATION ONLY)



DETAIL "A"

(TYPICAL EACH SEAT)



ELEVATION

NOTES:

1. PRECAST SHELL CAP MAY BE USED FOR BENT 79.
2. FOR CAST IN PLACE ANCHOR BOLT LAYOUT & BENT SPECIFIC DETAILS, SEE PLANS FOR BENT 79.
3. FOR SECTIONS AND VIEWS, SEE SHEET 4 OF 5.
4. FOR ADDITIONAL NOTES SEE SHEET 5 OF 5.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRECAST CAP OPTION FOR BENT 79

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

DRAWN BY : TRL DATE : 4-12
CHECKED BY : TJT DATE : 4-12

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REVISIONS						SHEET NO.
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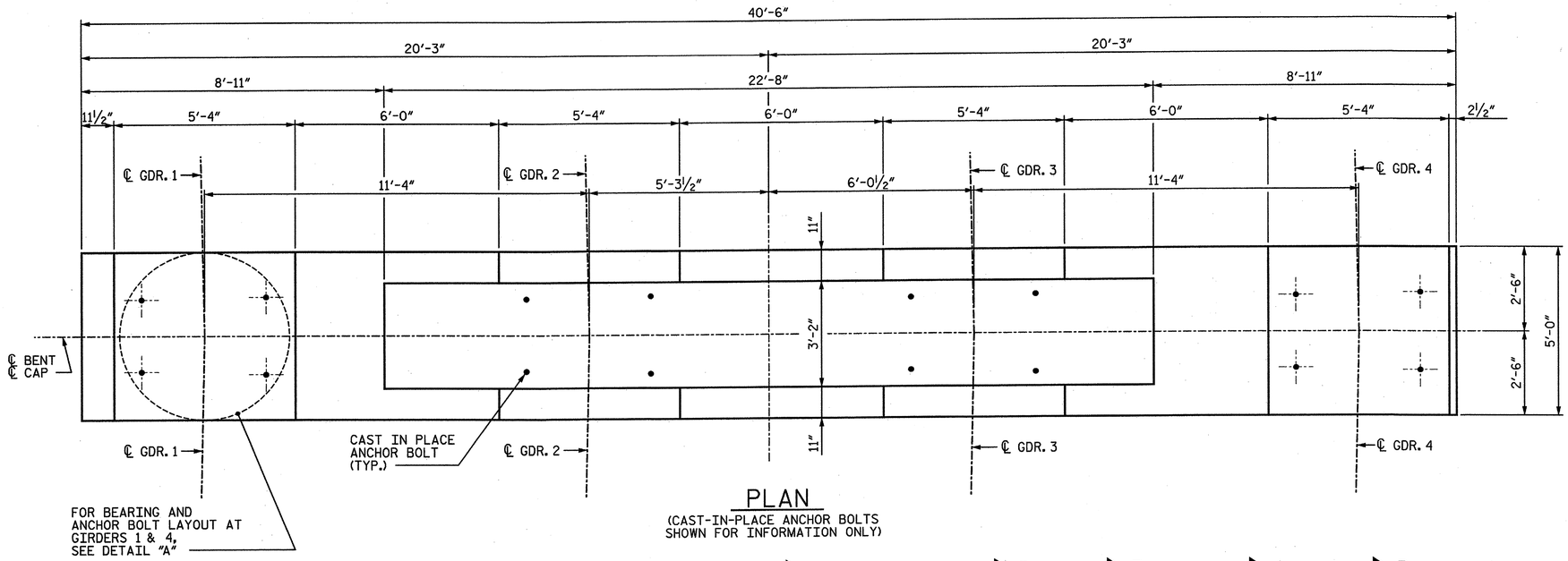
1			3			TOTAL SHEETS
2			4			219

10/4/2012 12:2h:27 PM R:\Structures\ustg\(202) Precast Shell Cap Bents 79 Sht 2 of 5.dgn

NOTES:

1. PRECAST SHELL CAP MAY BE USED FOR BENT 80.
2. FOR CAST IN PLACE ANCHOR BOLT LAYOUT & BENT SPECIFIC DETAILS, SEE PLANS FOR BENT 80.
3. FOR SECTIONS AND VIEWS, SEE SHEET 4 OF 5.
4. FOR ADDITIONAL NOTES SEE SHEET 5 OF 5.



PLAN
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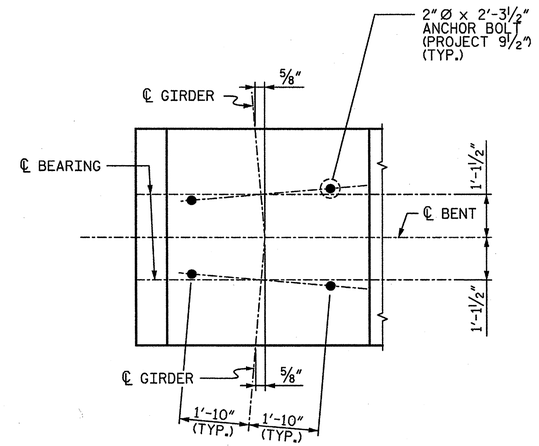
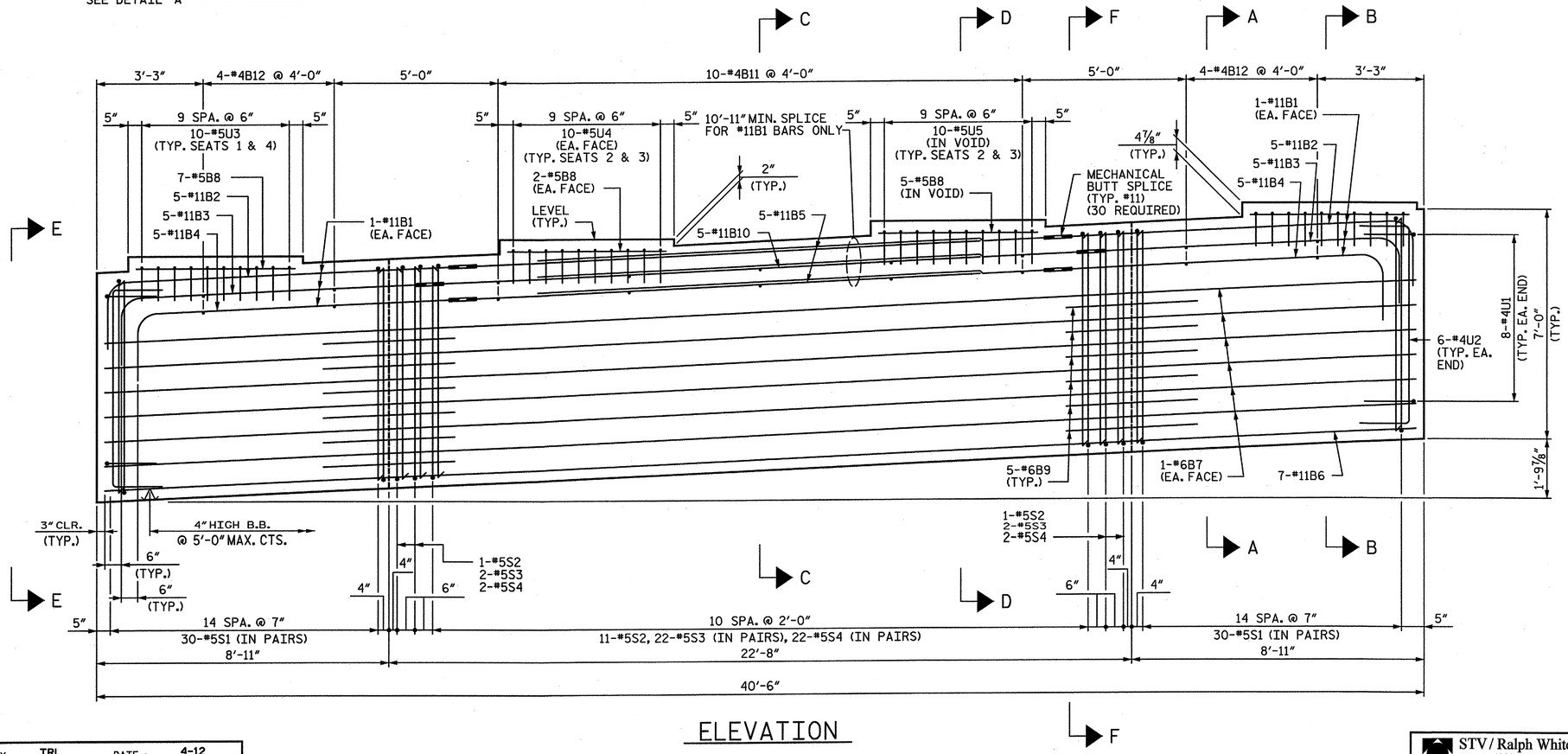


DETAIL "A"
(TYPICAL EACH SEAT)



ELEVATION

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRECAST CAP OPTION FOR BENT 80

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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1			3			TOTAL SHEETS
2			4			219

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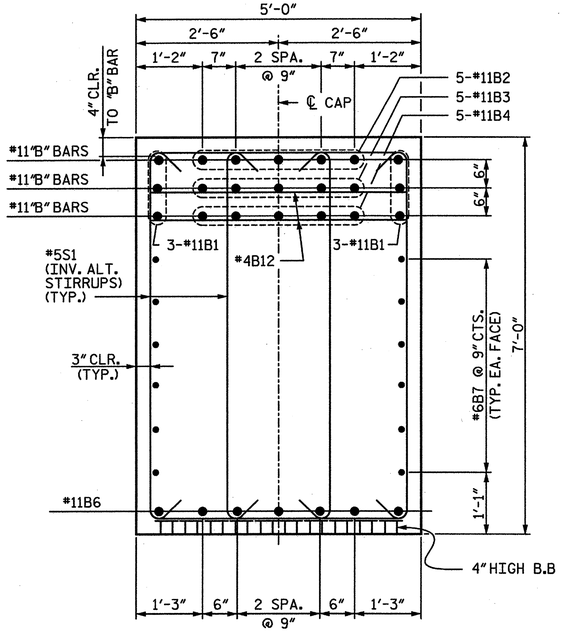
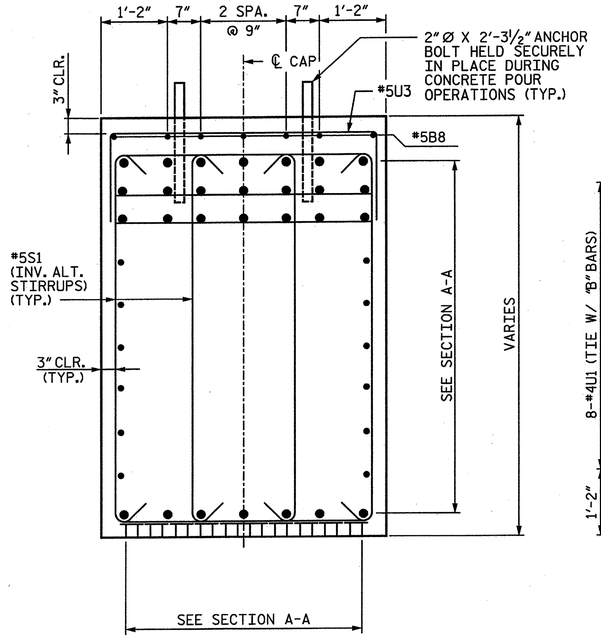
NOTES:

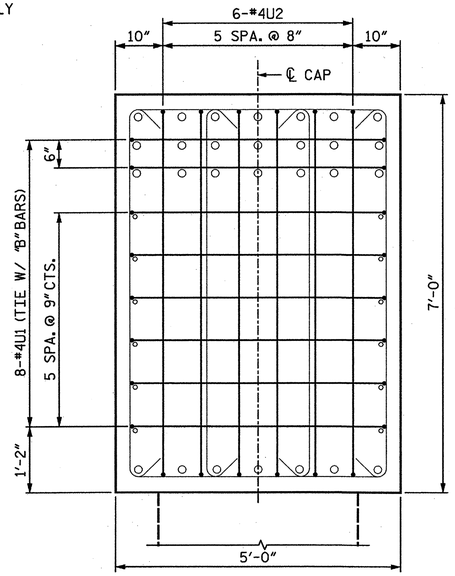
1. FOR NOTES SEE SHEET 5 OF 5.



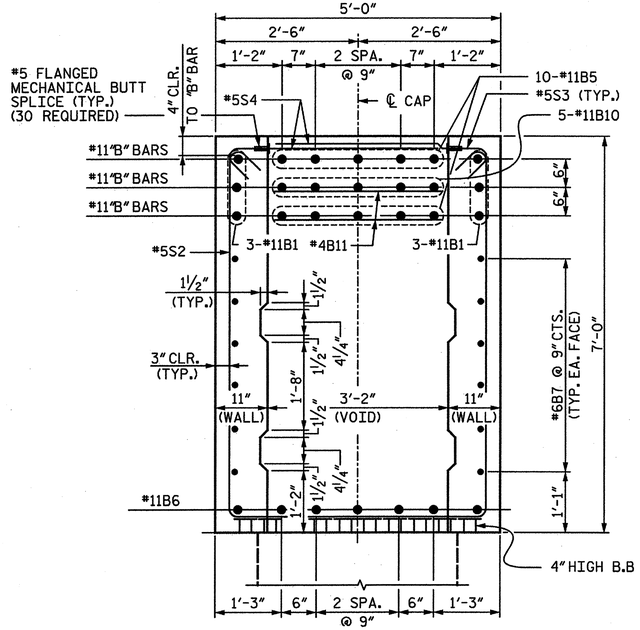
SECTION A-A



SECTION B-B



END VIEW E-E



SECTION C-C

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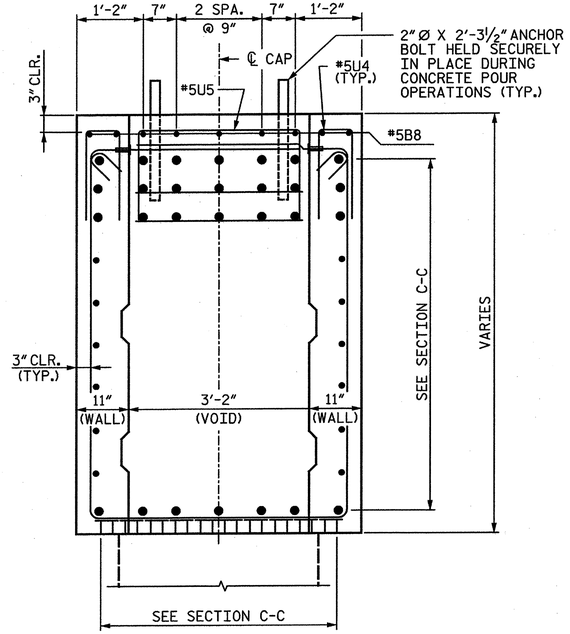
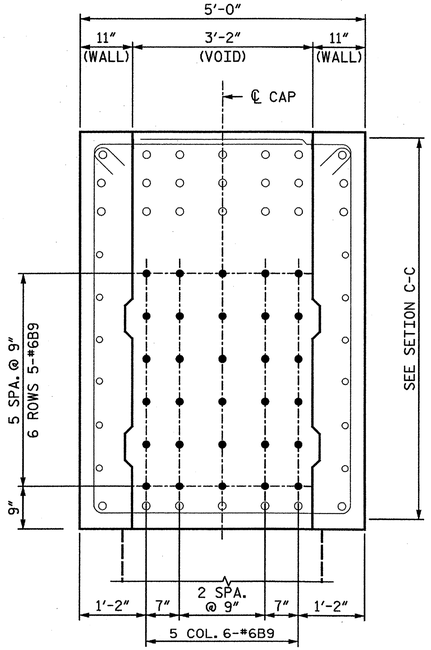


SECTION D-D



SECTION F-F

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRECAST CAP OPTION FOR BENTS 62-77, 79-80

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

DRAWN BY : TJT DATE : 3-12

CHECKED BY : PEK DATE : 4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

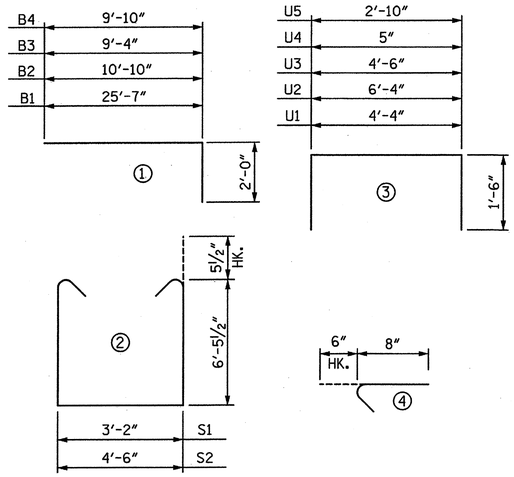
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-204
1			3			TOTAL SHEETS
2			4			219

10/4/2012 12:21:21 PM R:\Structures\usta\2204 Precast Shell Cap Bents 62-77, 79-80 Sht 4 of 5.dgn

NOTES:

1. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR THE PRECAST CAP FOR REVIEW BY THE ENGINEER PRIOR TO PRODUCING ANY PRECAST CAPS. CONTRACTOR SHALL SUBMIT LIFTING/TRANSPORT PLANS AND CALCULATIONS FOR THE PRECAST SHELL CAP TO THE ENGINEER FOR REVIEW. THE PLANS AND CALCULATIONS SHALL BE SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE ON NORTH CAROLINA.
2. PRECAST SHELL CAP SHALL BE SUPPORTED BY FALSE WORK SYSTEM PRIOR TO FILLING VOID. FALSE WORK SYSTEM SHALL NOT INFRINGE ON DETOUR ROADWAY AND RESULT IN NO DAMAGE TO BENT FOOTING OR PIER WALL.
3. ALL REINFORCING STEEL SHALL BE A-955-12 STAINLESS STEEL WITH Fy = 60 KSI. FOR STAINLESS REINFORCING STEEL, SEE SPECIAL PROVISIONS.
4. CONCRETE PLACED IN VOID SHALL BE PROPORTIONED TO REDUCE SHRINKAGE. SEE SPECIAL PROVISIONS FOR CONCRETE SHRINKAGE CONTROL FOR PRECAST CAP.
5. FOR CAP ELEVATIONS, PIER WALL DETAILS, AND FOOTING SEE SPECIFIC BENT SHEETS.
6. MECHANICAL BUTT SPLICES SHALL BE STAINLESS STEEL AND CAPABLE OF DEVELOPING 125% OF THE BAR STRENGTH. FOR MECHANICAL BUTT SPLICES, SEE THE STANDARD SPECIFICATIONS.
7. TOP OF BENT CAP SHALL BE COATED WITH AN EPOXY PROTECTIVE COATING. SEE STANDARD SPECIFICATIONS.
8. INTERIOR SURFACES OF PRECAST CAP SHELL SHALL BE INTENTIONALLY ROUGHENED TO AN AMPLITUDE OF 1/4".
9. CONTRACTOR SHALL PROVIDE A CURING SYSTEM THAT WILL MAINTAIN THE INTERNAL TEMPERATURE OF THE VOID CONCRETE BETWEEN 60 AND 90 DEGREES DURING CURING.
10. CONTRACTOR MAY PROPOSE AN ALTERNATE PRECAST CAP SYSTEM TO THE ENGINEER FOR APPROVAL.
11. BEFORE POURING VOID CONCRETE, CONTRACTOR SHALL INSTALL A TIE SYSTEM CONNECTING THE WALLS ON EITHER SIDE OF THE VOID AS SHOWN IN THE TEMPORARY SUPPORT DETAIL AND SECTION G-G. THE CONTRACTOR MAY SUBMIT AN ALTERNATE SYSTEM TO THE ENGINEER FOR APPROVAL.
12. ALL HOLES AND RECESSES IN THE PRECAST CAP, PIER WALL, OR FOOTING USED TO FACILITATE THE CONSTRUCTION OF THE BENT SHALL BE FILLED WITH A NON-SHRINK, NON-METALLIC GROUT. FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
13. SEE GENERAL NOTES FOR PAYMENT INFORMATION.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR PRECAST CAP BENTS 62-77 & 80

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#11	①	27'-7"	1759
✱B2	10	#11	①	12'-10"	682
✱B3	10	#11	①	11'-4"	602
✱B4	10	#11	①	11'-10"	629
✱B5	20	#11	STR	14'-9"	1567
✱B6	7	#11	STR	40'-0"	1488
B7	12	#6	STR	40'-0"	721
✱B8	32	#5	STR	4'-10"	161
✱B9	60	#6	STR	4'-0"	360
✱B10	10	#11	STR	15'-9"	837
✱B11	10	#4	STR	2'-10"	19
B12	8	#4	STR	4'-6"	24
S1	60	#5	②	17'-0"	1064
✱S2	15	#5	②	18'-4"	287
✱S3	30	#5	④	1'-2"	37
✱S4	30	#5	STR	3'-0"	94
U1	16	#4	③	7'-4"	78
U2	12	#4	③	9'-4"	75
U3	20	#5	③	7'-6"	156
U4	40	#5	③	3'-5"	143
✱U5	20	#5	③	5'-10"	122

BILL OF MATERIAL FOR PRECAST CAP BENT 79

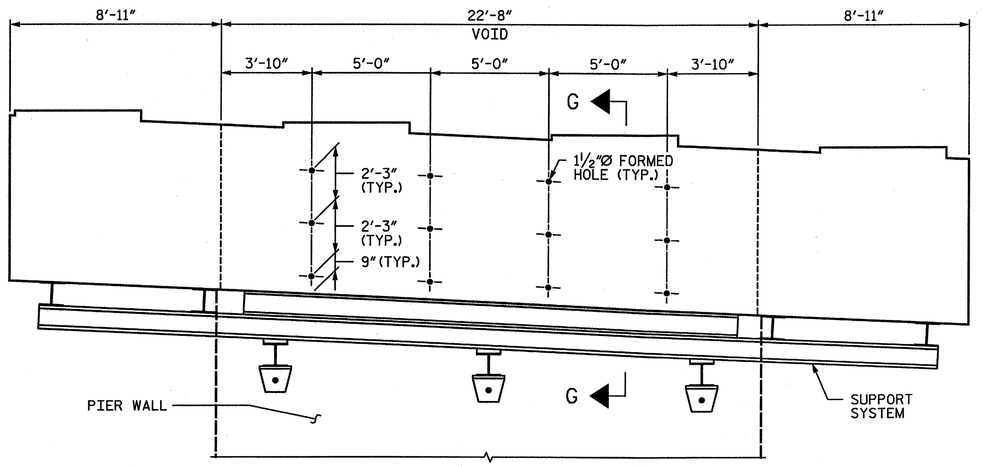
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#11	①	27'-7"	1759
✱B2	10	#11	①	12'-10"	682
✱B3	10	#11	①	11'-4"	602
✱B4	10	#11	①	11'-10"	629
✱B5	20	#11	STR	14'-9"	1567
✱B6	7	#11	STR	40'-0"	1488
B7	12	#6	STR	40'-0"	721
✱B8	32	#5	STR	5'-7"	186
✱B9	60	#6	STR	4'-0"	360
✱B10	10	#11	STR	15'-9"	837
✱B11	10	#4	STR	2'-10"	19
B12	8	#4	STR	4'-6"	24
S1	60	#5	②	17'-0"	1064
✱S2	15	#5	②	18'-4"	287
✱S3	30	#5	④	1'-2"	37
✱S4	30	#5	STR	3'-0"	94
U1	16	#4	③	7'-4"	78
U2	24	#4	③	9'-4"	75
U3	24	#5	③	7'-6"	188
U4	48	#5	③	3'-5"	171
✱U5	24	#5	③	5'-10"	146

QUANTITIES BENTS 62-77, & 80

✱STAINLESS STEEL REINFORCING	LBS.	6,885
REINFORCING STEEL	LBS.	4,020
CLASS AA CONCRETE :		
POUR 1 (SHELL)	CU. YDS.	34.8
POUR 2 (VOID)	CU. YDS.	19.0
TOTAL	CU. YDS.	53.8

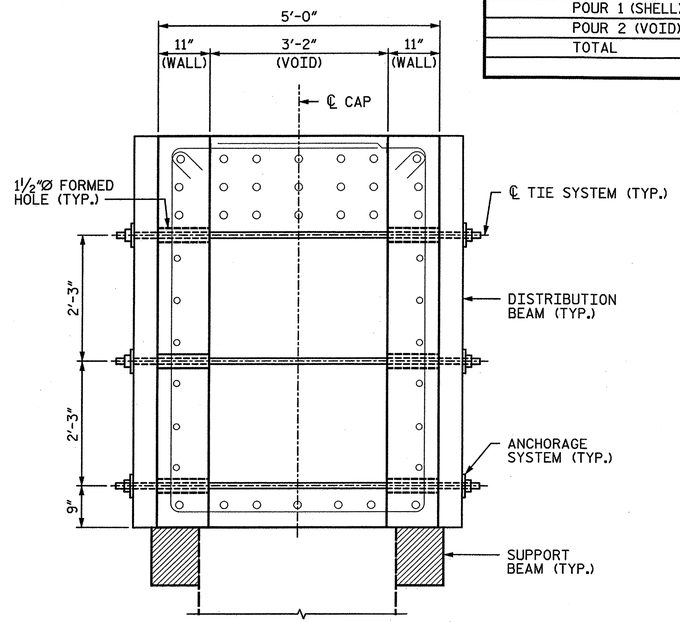
QUANTITIES BENTS 79

✱STAINLESS STEEL REINFORCING	LBS.	6,934
REINFORCING STEEL	LBS.	4,080
CLASS AA CONCRETE :		
POUR 1 (SHELL)	CU. YDS.	34.8
POUR 2 (VOID)	CU. YDS.	19.0
TOTAL	CU. YDS.	53.8



TEMPORARY SUPPORT DETAIL

NOTES: THE TEMPORARY SUPPORT DETAIL SHOWN IS CONCEPTUAL AND SHOULD BE CONSIDERED A MINIMUM. THE CONTRACTOR SHALL PROVIDE PLANS AND CALCULATIONS FOR THE SUPPORT SYSTEM OF THE PRECAST CAP TO THE ENGINEER FOR APPROVAL PRIOR TO PERFORMING ANY WORK ON THE BENT. TEMPORARY SUPPORT PLANS AND CALCULATIONS SHALL BE SIGNED AND SEALED BY A LICENSED PROFESSIONAL ENGINEER REGISTERED IN NORTH CAROLINA. TEMPORARY SUPPORT SYSTEM SHALL BE CONSIDERED INCIDENTAL TO PRECAST CAP OPTION AND NO ADDITIONAL PAYMENT WILL BE MADE.



SECTION G-G

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRECAST CAP OPTION FOR BENTS 62-77, 79-80

DRAWN BY : TJT DATE : 3-12
CHECKED BY : PEK DATE : 4-12

STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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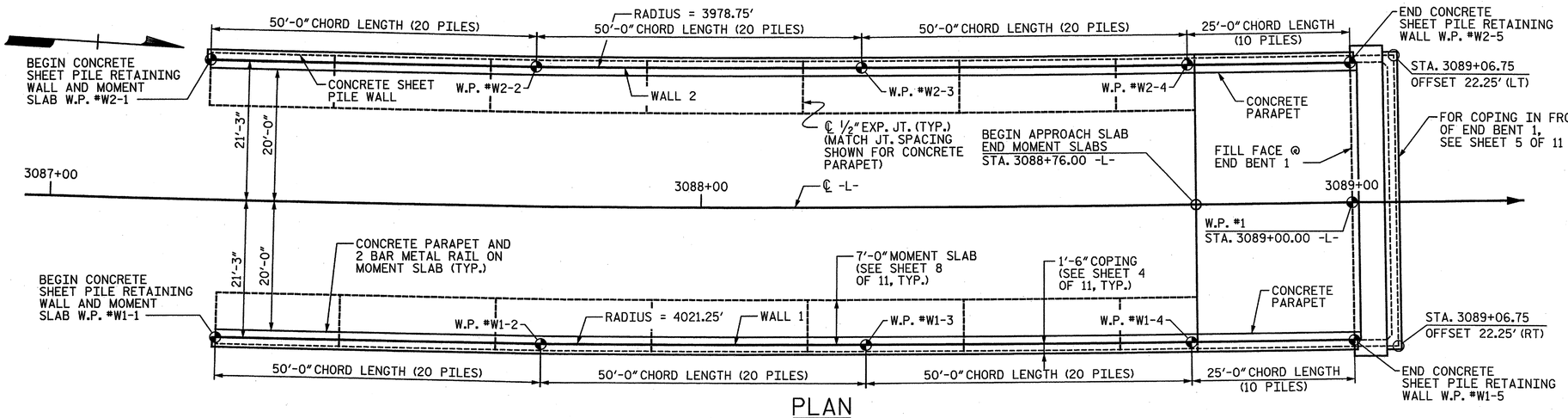
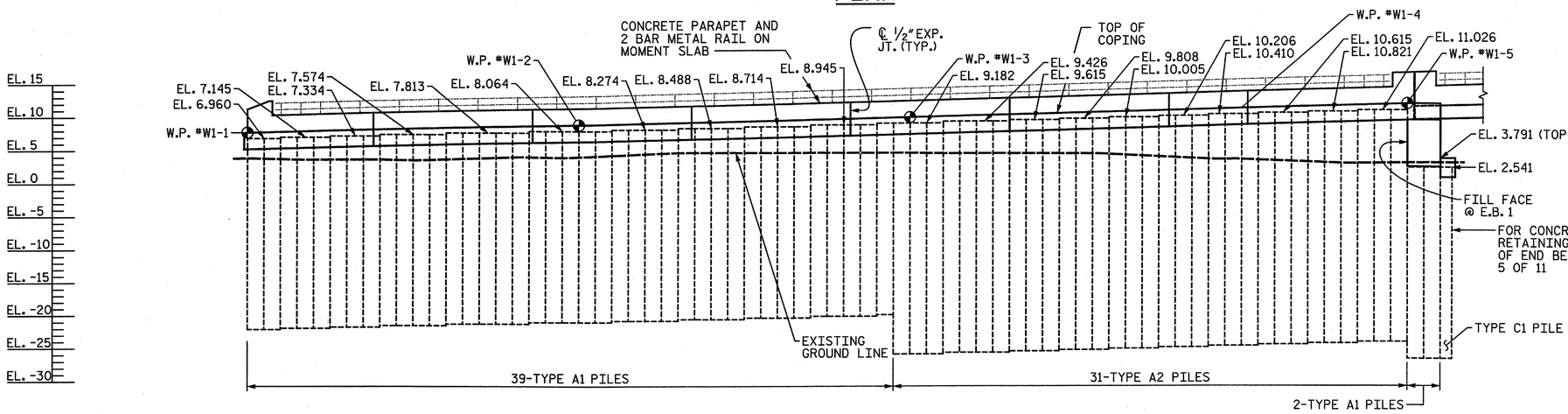
2			4		

SHEET NO. S-205
TOTAL SHEETS 219

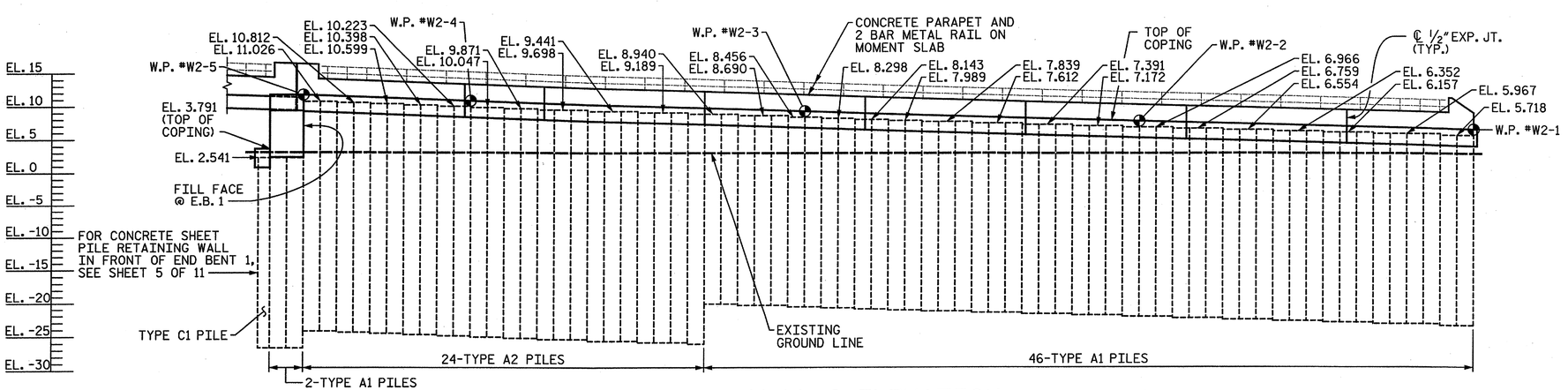
10/4/2012 12:2148 PM R:\Structures\usto\(205) Precast Shell Cap Bents 62-77, 79-80 Sht 5 of 5.dgn



PLAN



WALL 1 ELEVATION



WALL 2 ELEVATION

NOTES:

1. FOR GENERAL NOTES AND NOTES REGARDING MATERIALS AND CORROSION PROTECTION, SEE GENERAL DRAWINGS.
2. FOR CONCRETE SHEET PILE DESIGN PARAMETERS, SEE SHEET 3 OF 11.
3. FOR CONCRETE SHEET PILE FOUNDATION NOTES, SEE SHEET 3 OF 11.
4. THE 2'-6" AND 2'-0" SHEET PILE DIMENSIONS ARE NOMINAL. THESE DIMENSIONS MAY BE SHORTENED BY THE MANUFACTURER UP TO 1/2" TO ALLOW FOR SHEET PILE FIT-UP IN ITS FINAL POSITION. NO CHANGES SHALL BE MADE TO THE TONGUES OR GROOVES.
5. FOR CONCRETE SHEET PILE WALL, SEE SPECIAL PROVISIONS.

WORK POINT TABLE

W.P. #	-L- STATION	-L- OFFSET	TOP OF COPING ELEVATION
W.P. *W1-1	3087+25.91	21.25 R	7.839
W.P. *W1-2	3087+75.65	21.25 R	8.967
W.P. *W1-3	3088+25.38	21.25 R	10.063
W.P. *W1-4	3088+75.12	21.25 R	11.342
W.P. *W1-5	3089+00.00	21.25 R	12.026
W.P. *W2-1	3087+24.08	21.25 L	6.595
W.P. *W2-2	3087+74.35	21.25 L	7.894
W.P. *W2-3	3088+24.61	21.25 L	9.378
W.P. *W2-4	3088+74.88	21.25 L	11.047
W.P. *W2-5	3089+00.00	21.25 L	12.026

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 1 OF 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE SHEET PILE RETAINING WALL WALL 1 & 2

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

DRAWN BY : AFM DATE : 09-12
CHECKED BY : GVK DATE : 09-12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-206
1			3			TOTAL SHEETS
2			4			219

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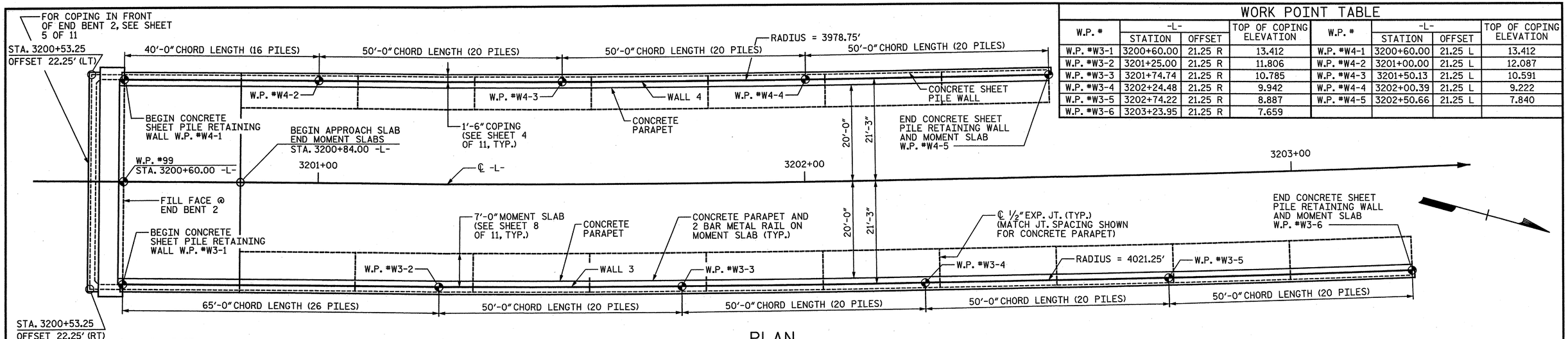
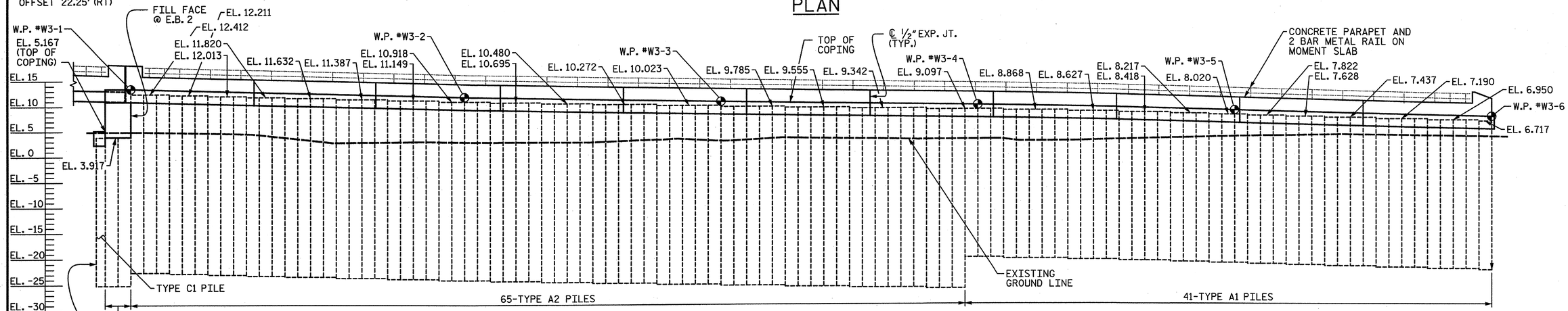
WORK POINT TABLE

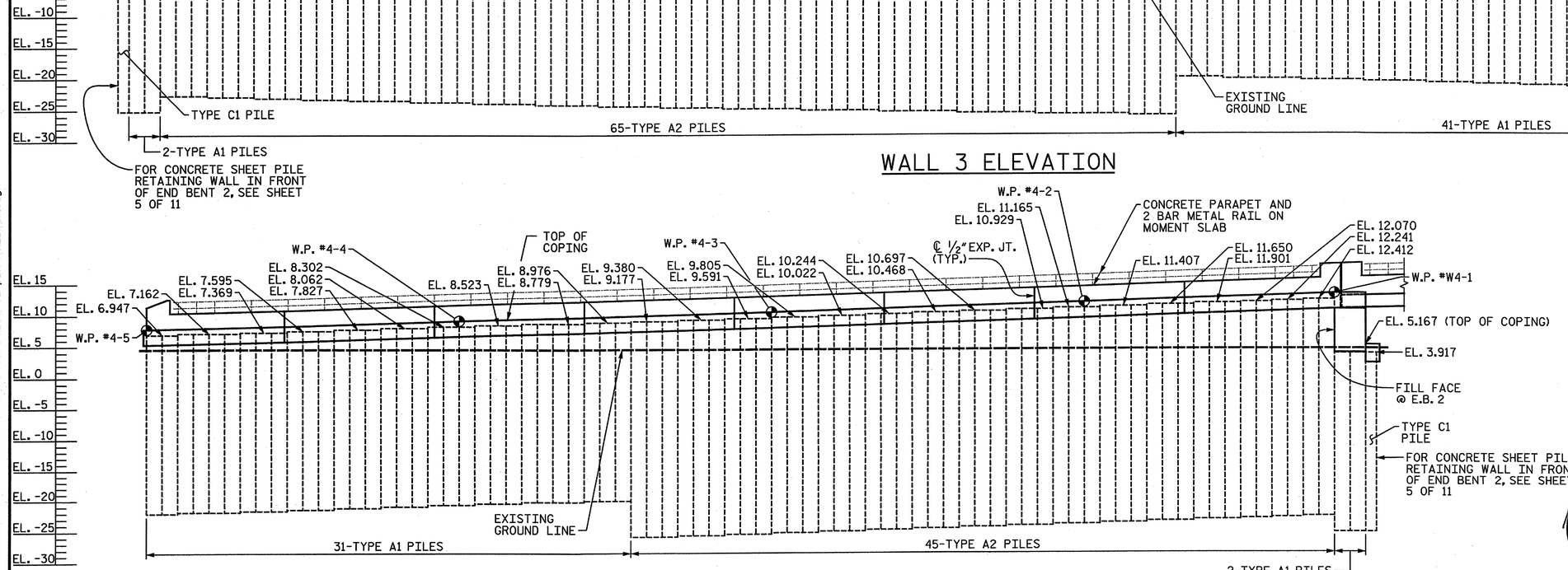
W.P. #	-L- STATION	-L- OFFSET	TOP OF COPING ELEVATION	W.P. #	-L- STATION	-L- OFFSET	TOP OF COPING ELEVATION
W.P. *W3-1	3200+60.00	21.25 R	13.412	W.P. *W4-1	3200+60.00	21.25 L	13.412
W.P. *W3-2	3201+25.00	21.25 R	11.806	W.P. *W4-2	3201+00.00	21.25 L	12.087
W.P. *W3-3	3201+74.74	21.25 R	10.785	W.P. *W4-3	3201+50.13	21.25 L	10.591
W.P. *W3-4	3202+24.48	21.25 R	9.942	W.P. *W4-4	3202+00.39	21.25 L	9.222
W.P. *W3-5	3202+74.22	21.25 R	8.887	W.P. *W4-5	3202+50.66	21.25 L	7.840
W.P. *W3-6	3203+23.95	21.25 R	7.659				



PLAN



WALL 3 ELEVATION



WALL 4 ELEVATION

NOTES:

1. FOR NOTES, SEE SHEET 1 OF 11.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 2 OF 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE SHEET PILE RETAINING WALL WALL 3 & 4

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

DRAWN BY : AFM DATE : 09-12
CHECKED BY : GVK DATE : 09-12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-207
1			3			TOTAL SHEETS
2			4			219

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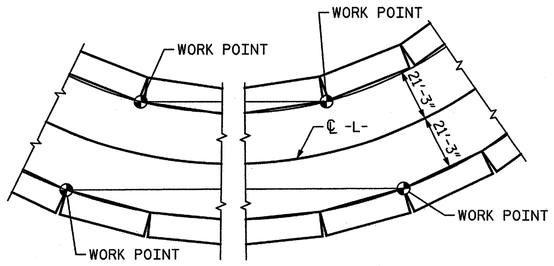
CONCRETE SHEET PILE DATA				
TYPE	NUMBER REQUIRED	L (FT.)	X (FT.)	TOTAL LIN. FT.
A1	193	29'-0"	7'-6"	5,597
A1 MOD.	6	29'-0"	7'-6"	174
A2	165	35'-0"	10'-4"	5,775
STARTER	*	29'-0"	7'-6"	*
STARTER	*	35'-0"	10'-4"	*
C1	4	29'-0"	7'-6"	116

* CONTRACTOR HAS THE OPTION TO SUBSTITUTE STARTER PILES FOR A1 AND A2 PILES EXCEPT AT FILL FACE OF END BENTS. CONTRACTOR SHALL ADJUST PILE QUANTITIES ACCORDINGLY.



CONCRETE SHEET PILE LAYOUT

(EXAGGERATED FOR CLARITY)
(TYPICAL LAYOUT BETWEEN WORKPOINTS)

DESIGN PARAMETERS:

CONCRETE COMPRESSIVE STRENGTH AT 28 DAYS:	8000 PSI (MIN.)
CONCRETE COMPRESSIVE STRENGTH AT RELEASE OF PRESTRESSING:	5600 PSI (MIN.)
UNIFORM COMPRESSION AFTER PRESTRESSED LOSSES:	1000 PSI (MIN.)
PICK-UP, STORAGE, AND TRANSPORTATION:	0.0 PSI TENSION WITH 1.5 TIMES SELF WEIGHT

ALL PRESTRESSING STRANDS SHALL BE 0.6"DIA, 7-WIRE LOW RELAXATION GRADE 270 STRANDS CONFORMING TO AASHTO M203. STRAND SAMPLING REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

PROPOSED DEVICES FOR LIFTING PILES, RECESS DETAILS, AND PATCHING MATERIAL SHALL BE DETAILED IN SHOP DRAWINGS. AFTER ATTACHMENTS HAVE BEEN REMOVED, OPENINGS SHALL BE REPAIRED SUCH THAT THE APPEARANCE OF THE PILE IS UNIFORM.

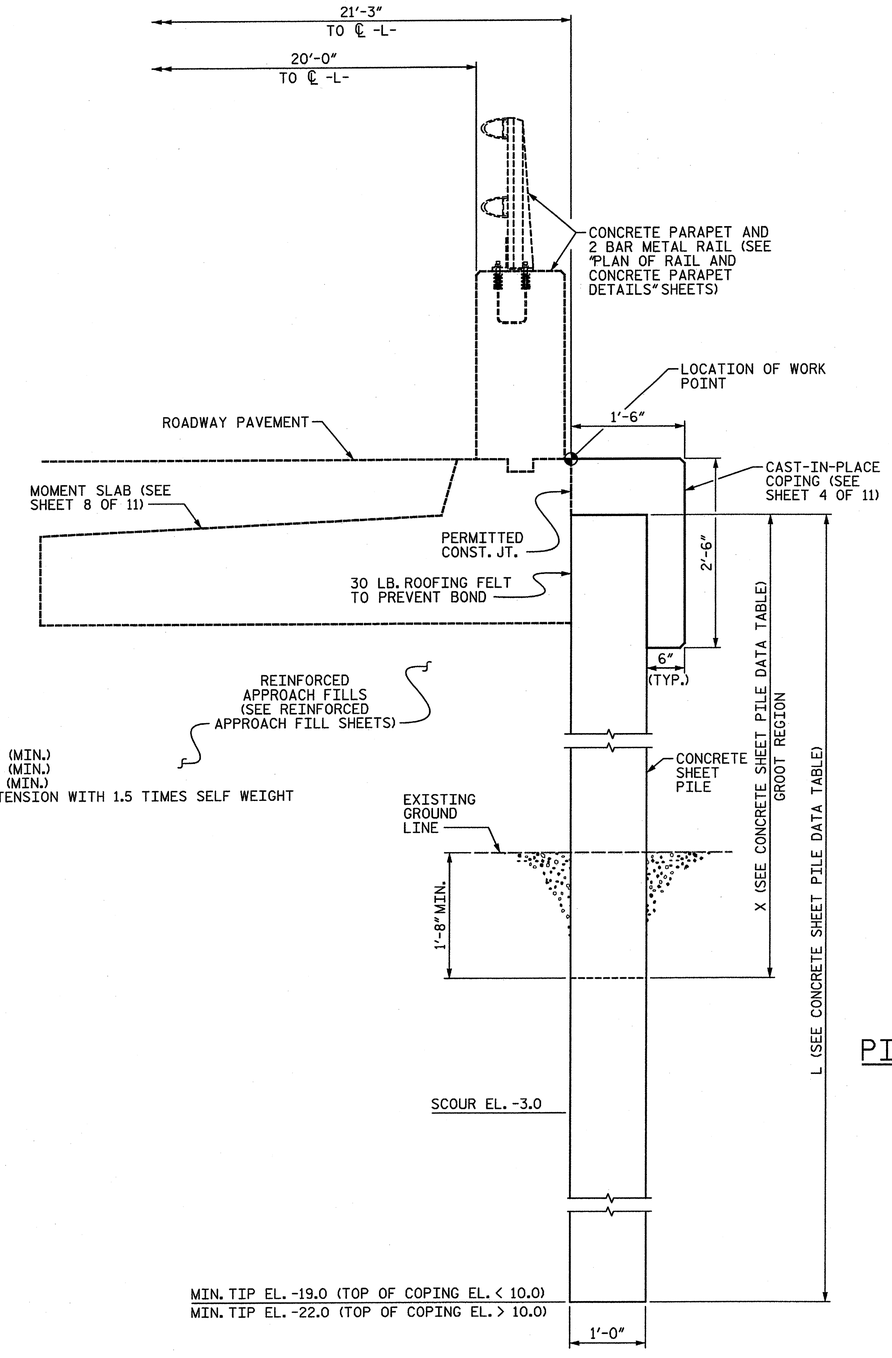
INSTALL PILES USING A METHOD APPROVED BY THE ENGINEER, WHEREBY THE HEAD OF THE PILE IS NOT DAMAGED.

ALL CORNERS TO BE CHAMFERED ¾"U.N.O.

PICK-UP OF PILE MAY BE EITHER A SINGLE POINT PICK-UP OR A TWO POINT PICK-UP AS SHOWN.

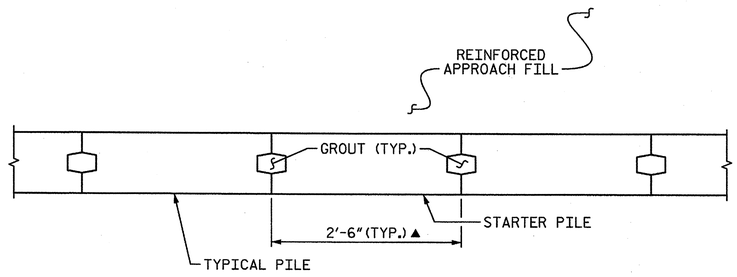
FOUNDATION NOTES:

1. CONSTRUCT CONCRETE SHEET PILE RETAINING WALLS IN ACCORDANCE WITH SECTION 452 OF THE STANDARD SPECIFICATIONS EXCEPT USE CONCRETE SHEET PILES IN LIEU OF STEEL SHEET PILES.
2. INSTALL CONCRETE SHEET PILES TO TIP ELEVATIONS NO HIGHER THAN AS SHOWN ON THE PLANS.
3. USE JETTING, DRIVING, OR A COMBINATION OF SIMULTANEOUS JETTING AND DRIVING TO ATTAIN THE MINIMUM TIP ELEVATION NO HIGHER THAN REQUIREMENTS. SEE PILE JETTING SPECIAL PROVISION FOR JETTING REQUIREMENTS AND RESTRICTIONS.
4. IF USING IMPACT HAMMERS FOR CONCRETE SHEET PILE INSTALLATION, SUBMIT DRIVING EQUIPMENT AS OUTLINED IN SECTION 450-3 OF THE STANDARD SPCIFICATIONS.
5. FOR JETTING, SEE PILE JETTING SPECIAL PROVISION.
6. INSTALL CONCRETE SHEET PILE RETAINING WALLS PRIOR TO INSTALLING BRIDGE END BENT PILES.
7. THE SCOUR CRITICAL ELEVATION FOR ALL CONCRETE SHEET PILE WALLS IS ELEVATION -3.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.
8. A CONCRETE PARAPET AND 2 BAR METAL RAIL WITH MOMENT SLAB IS REQUIRED ABOVE RETAINING WALLS. SEE PLANS FOR CONCRETE PARAPET AND 2 BAR METAL RAIL WITH MOMENT SLAB DETAILS.



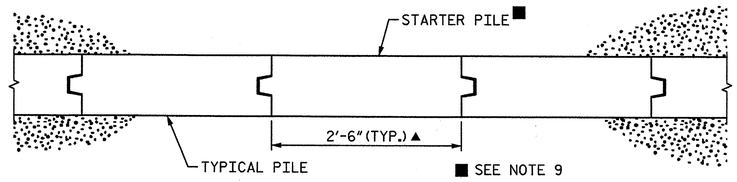
TYPICAL SECTION

(SECTION AT MOMENT SLAB SHOWN, SECTION AT APPROACH SLAB SIMILAR)

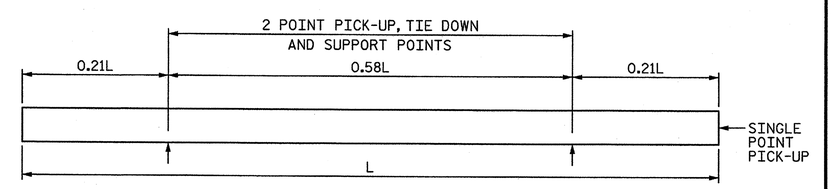


SECTION TAKEN ABOVE DIMENSION "X"

▲ DIMENSION IS 2'-0" FOR MODIFIED TYPE A1 PILES



SECTION TAKEN BELOW DIMENSION "X"



PILE STORAGE AND TRANSPORTATION SUPPORT DETAILS

CONCRETE SHEET PILE WALL
PAY LENGTH = 920.62 LIN FT

PROJECT NO. B-2500A
DARE COUNTY
STATION: 3144+80.00 -L-

SHEET 3 OF 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE SHEET PILE RETAINING WALL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
10-4-12

DRAWN BY : AFM DATE : 09-12
CHECKED BY : GVK DATE : 09-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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SHEET NO. S-208
TOTAL SHEETS 219

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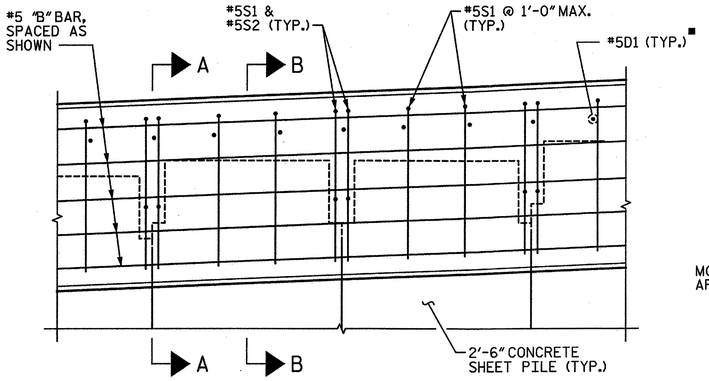
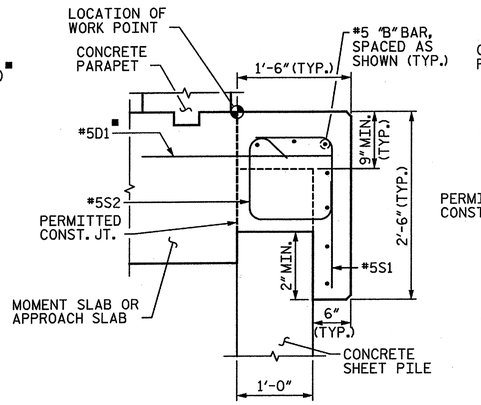
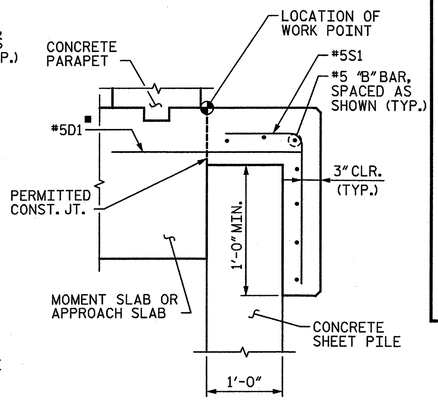


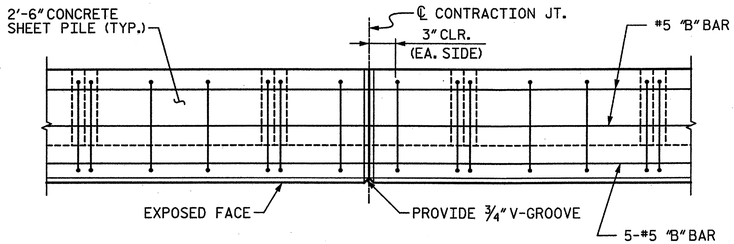
COPING PARTIAL ELEVATION



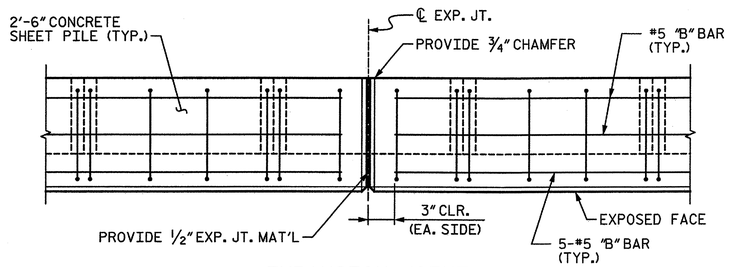
SECTION A-A



SECTION B-B



CONTRACTION JOINT



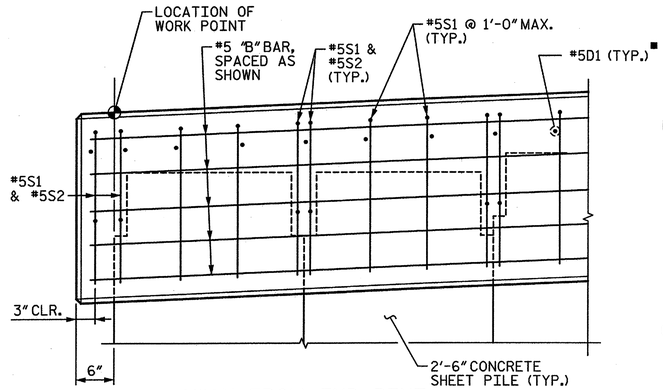
EXPANSION JOINT

COPING JOINT DETAILS

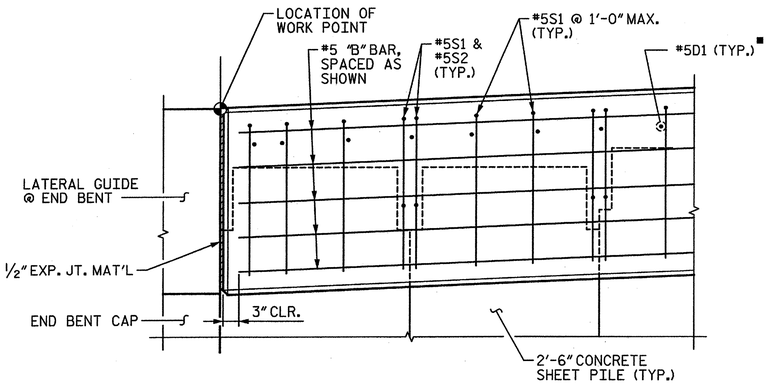
(#5D1 BARS NOT SHOWN)

COPING JOINT NOTES:

1. EXPANSION JOINTS SHALL BE PROVIDED IN COPING TO MATCH CONCRETE PARAPET. SEE CONCRETE SHEET PILE RETAINING WALL, PLAN OF RAILS & CONCRETE PARAPET DETAILS, FOR EXPANSION JOINT LOCATIONS.
2. ¾" V-GROOVE CONTRACTION JOINTS, AS SHOWN, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE CONCRETE COPING AND IN ACCORDANCE WITH ARTICLE B25-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED TO MATCH THOSE DETAILED IN CONCRETE PARAPET ON WALL. SEE CONCRETE PARAPET ON WALL DETAILS AND NOTES.
3. EXTEND V-GROOVE FOR FULL HEIGHT OF COPING.
4. SEE SHEET 1 OF 11 FOR ADDITIONAL NOTES.



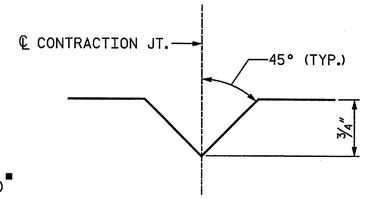
AWAY FROM END BENT



AT END BENT

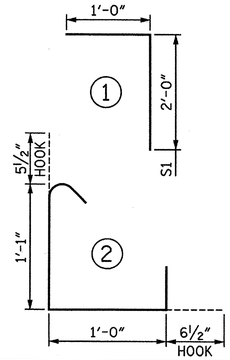
COPING END DETAILS

■ #5D1 BARS TO BE SPACED AT 1'-0" MAX. CTS. SEE APPROACH SLAB DETAILS AND MOMENT SLAB DETAILS FOR #5D1 BARS.



V-GROOVE DETAIL

BAR TYPES



BILL OF MATERIAL

WALL 1 COPING

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	42	#5	STR.	23'-5"	1026
B2	7	#5	STR.	18'-11"	138
B3	7	#5	STR.	11'-5"	83
S1	281	#5	①	3'-0"	879
S2	140	#5	②	3'-1"	450
EPOXY COATED REINFORCING STEEL				LBS.	2,576
CLASS AA CONCRETE				CU. YDS.	15.0

WALL 2 COPING

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	42	#5	STR.	23'-5"	1026
B2	7	#5	STR.	18'-11"	138
B3	7	#5	STR.	11'-5"	83
S1	281	#5	①	3'-0"	879
S2	140	#5	②	3'-1"	450
EPOXY COATED REINFORCING STEEL				LBS.	2,576
CLASS AA CONCRETE				CU. YDS.	15.0

WALL 3 COPING

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	70	#5	STR.	23'-5"	1710
B4	7	#5	STR.	24'-11"	182
S1	425	#5	①	3'-0"	1330
S2	212	#5	②	3'-1"	682
EPOXY COATED REINFORCING STEEL				LBS.	3,904
CLASS AA CONCRETE				CU. YDS.	22.7

WALL 4 COPING

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	49	#5	STR.	23'-5"	1197
B5	7	#5	STR.	21'-11"	160
S1	305	#5	①	3'-0"	954
S2	152	#5	②	3'-1"	489
EPOXY COATED REINFORCING STEEL				LBS.	2,802
CLASS AA CONCRETE				CU. YDS.	16.3

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 4 OF 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE SHEET PILE RETAINING WALL COPING DETAILS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY
10-4-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-209
1			3			TOTAL SHEETS
2			4			219

DRAWN BY : AFM DATE : 09-12
CHECKED BY : GVK DATE : 09-12

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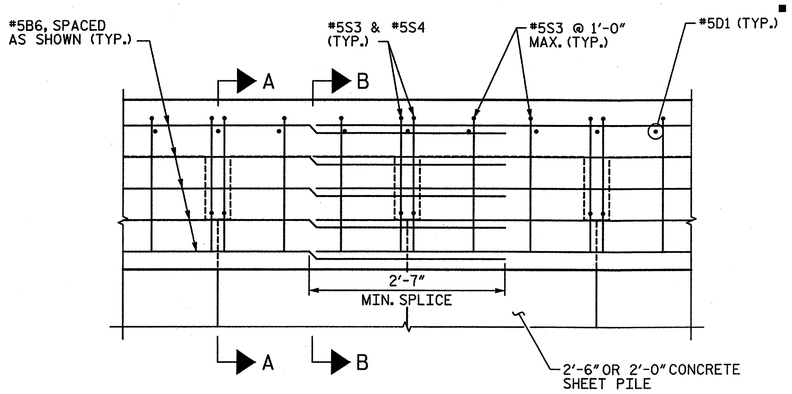
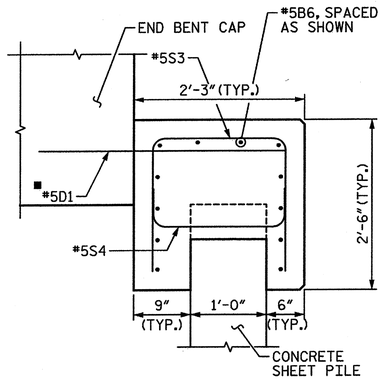
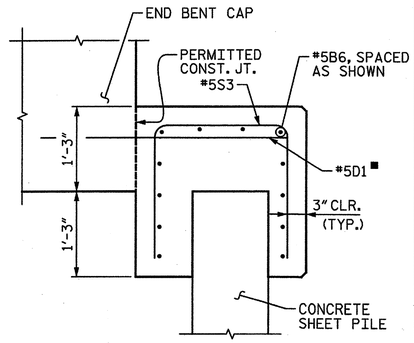


COPING PARTIAL ELEVATION

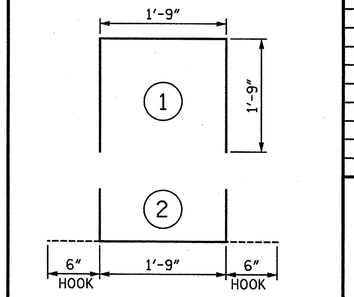


SECTION A-A



SECTION B-B

■ SEE END BENT SHEETS FOR #5D1 DETAILS



BILL OF MATERIAL

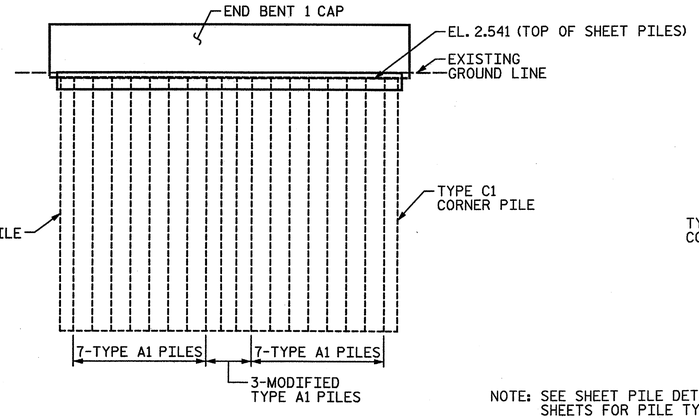
FRONT FACE COPING

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B6	24	#5	STR	23'-10"	597
S3	72	#5	①	5'-3"	394
S4	72	#5	②	2'-9"	207
REINFORCING STEEL				LBS.	1,198
CLASS AA CONCRETE				CU. YDS.	7.3

NOTE: QUANTITIES ARE FOR ONE END BENT, 2 REQUIRED.

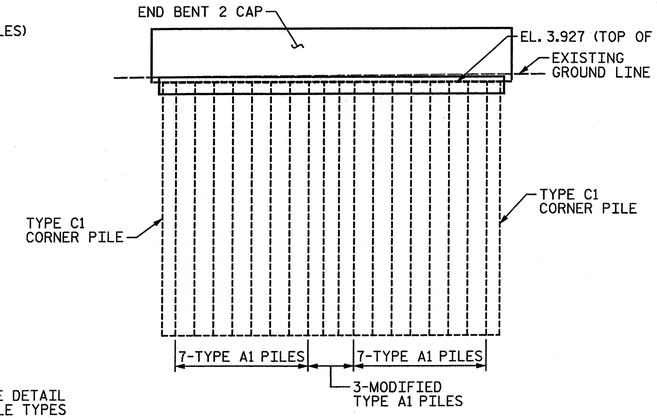
NOTES:

1. FOR NOTES, SEE SHEETS 1 AND 4 OF 11.

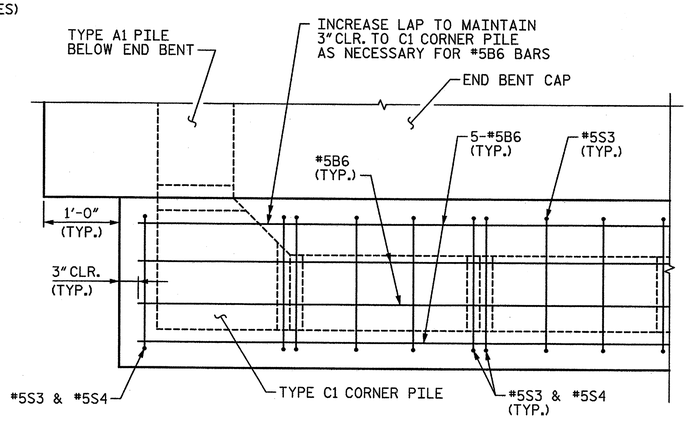


END BENT 1 FRONT FACE ELEVATION

NOTE: SEE SHEET PILE DETAIL SHEETS FOR PILE TYPES



END BENT 2 FRONT FACE ELEVATION



COPING END DETAIL

(TYPICAL EACH END)
(#5D1 BARS NOT SHOWN)

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 5 OF 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE SHEET PILE RETAINING WALL
WALL AND COPING DETAILS AT END BENTS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

DRAWN BY : AFM	DATE : 09-12
CHECKED BY : GVK	DATE : 09-12

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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

SHEET NO. S-210

TOTAL SHEETS 219

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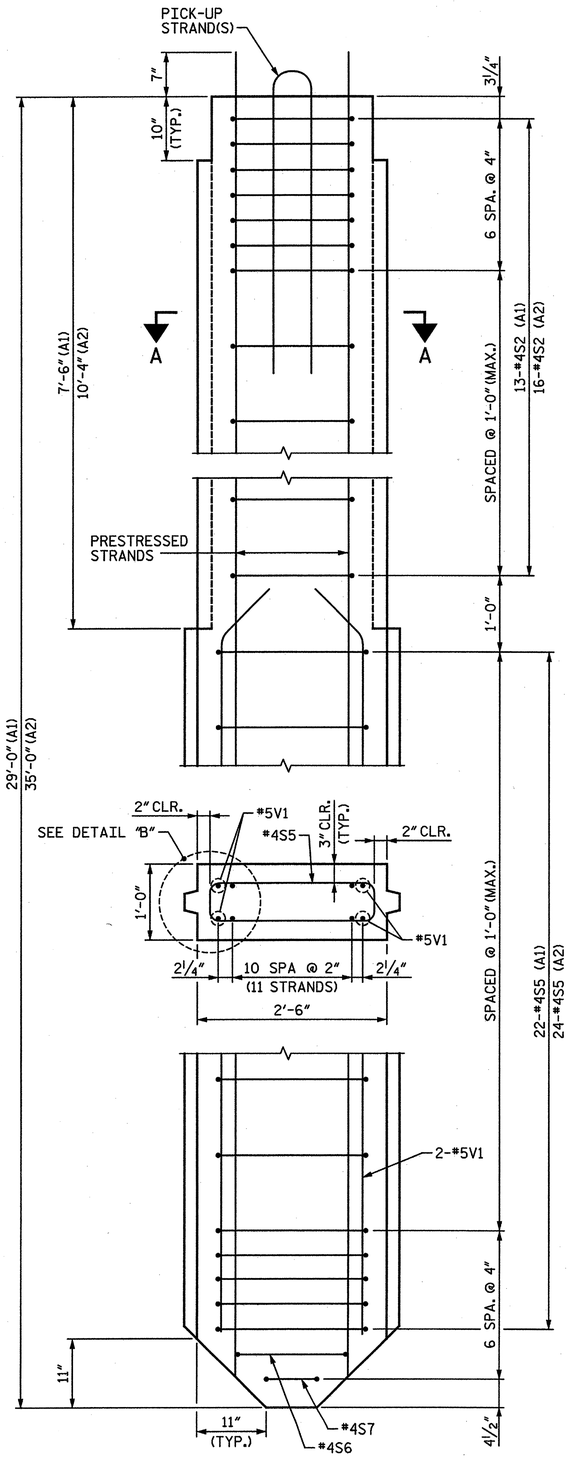
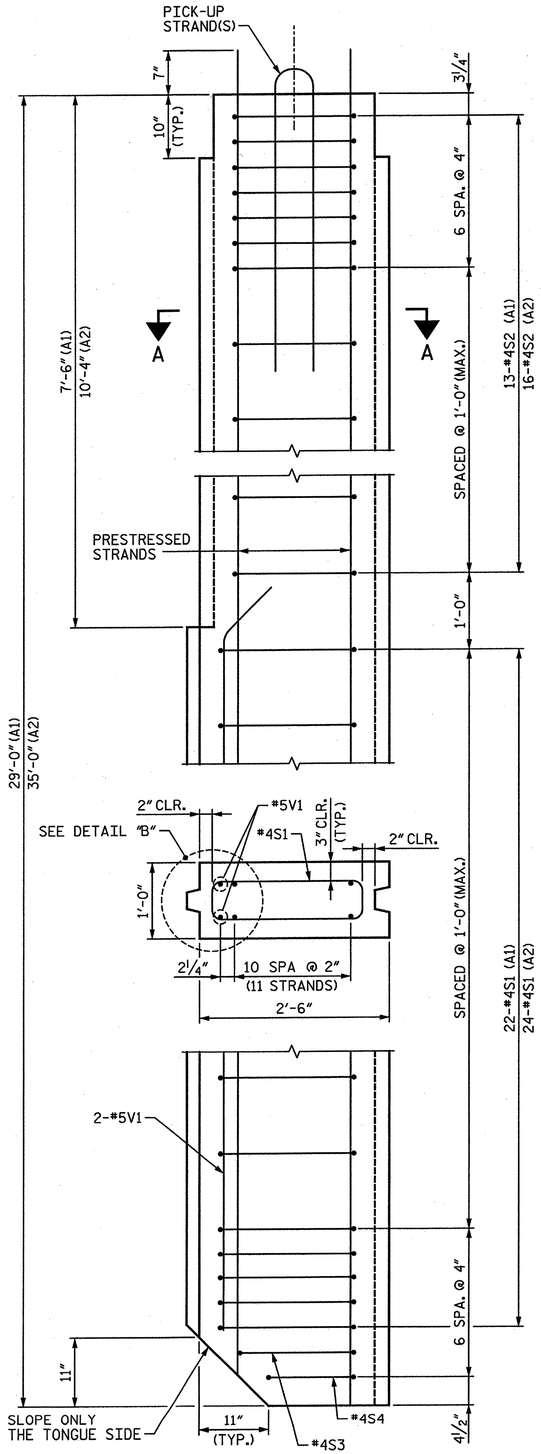
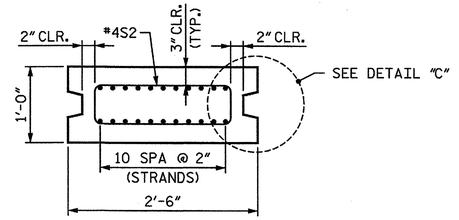


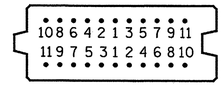
A1 & A2 STARTER PILE



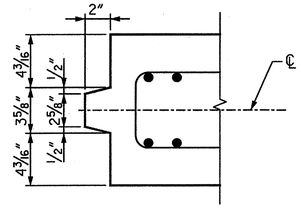
A1 & A2 TYPICAL PILE



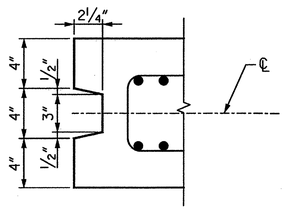
SECTION A-A



PATTERN FOR BURNING



DETAIL "B"
(TYPICAL TONGUE)



DETAIL "C"
(TYPICAL GROOVE)

BILL OF MATERIAL

A1 TYPICAL PILE

BAR	NUMBER	SIZE	TYPE	LENGTH
S1	22	#4	②	5'-7 1/2"
S2	13	#4	②	5'-3"
S3	1	#4	②	5'-5 1/2"
S4	1	#4	②	4'-9 1/2"
V1	2	#5	①	21'-7"

A2 TYPICAL PILE

BAR	NUMBER	SIZE	TYPE	LENGTH
S1	24	#4	②	5'-7 1/2"
S2	16	#4	②	5'-3"
S3	1	#4	②	5'-5 1/2"
S4	1	#4	②	4'-9 1/2"
V1	2	#5	①	24'-9"

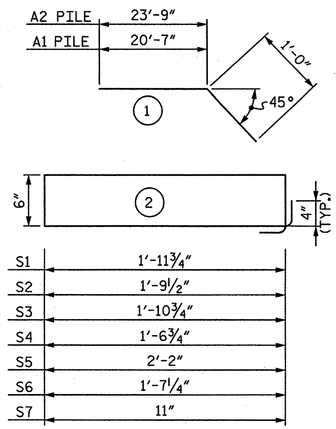
A1 STARTER PILE

BAR	NUMBER	SIZE	TYPE	LENGTH
S2	13	#4	②	5'-3"
S5	22	#4	②	6'-0"
S6	1	#4	②	4'-10 1/2"
S7	1	#4	②	3'-6"
V1	4	#5	①	21'-7"

A2 STARTER PILE

BAR	NUMBER	SIZE	TYPE	LENGTH
S2	16	#4	②	5'-3"
S5	24	#4	②	6'-0"
S6	1	#4	②	4'-10 1/2"
S7	1	#4	②	3'-6"
V1	4	#5	①	24'-9"

BAR TYPES



ALL BAR DIMENSIONING ARE OUT-TO-OUT

NOTES:
1. FOR NOTES, SEE SHEET 1 OF 11.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 6 OF 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE SHEET PILE RETAINING WALL SHEET PILE DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-211
1			3			TOTAL SHEETS
2			4			219

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

DRAWN BY : AA DATE : 09-12
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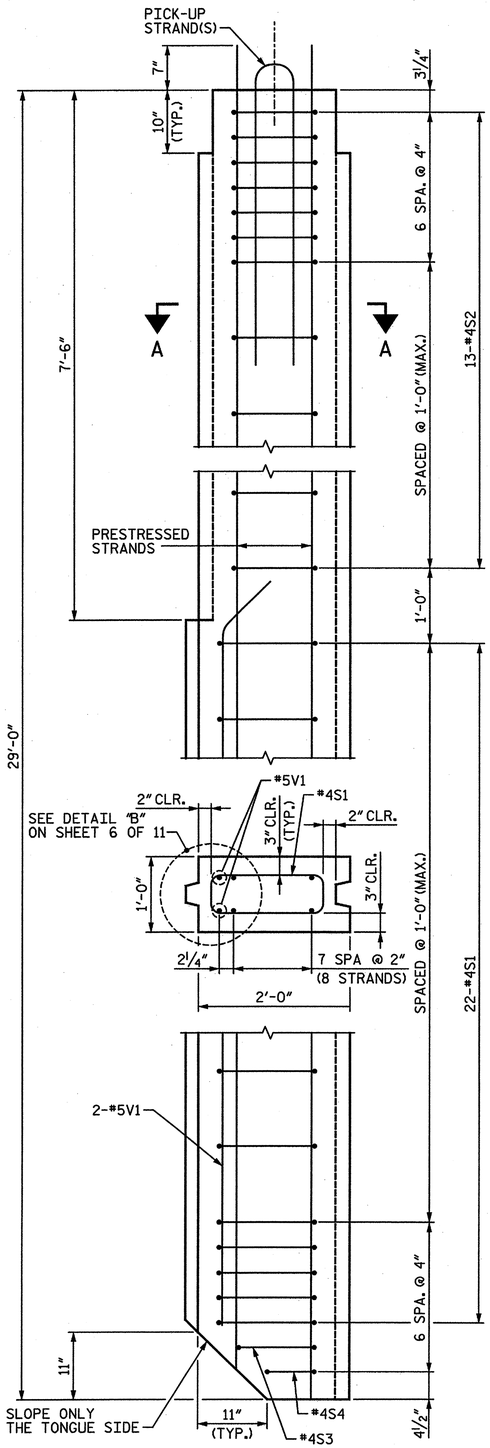
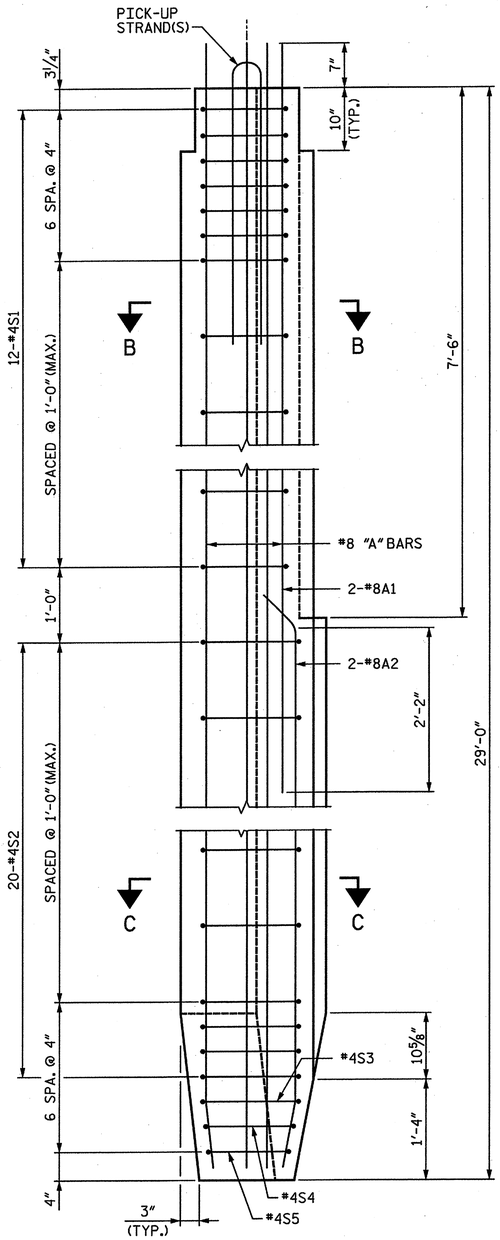
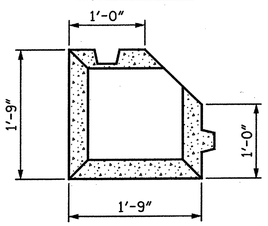


A1 MOD (2'-0") PILE

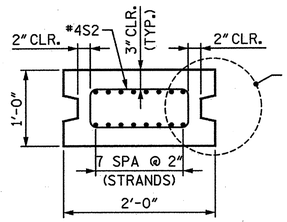


ELEVATION

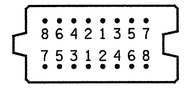


END VIEW

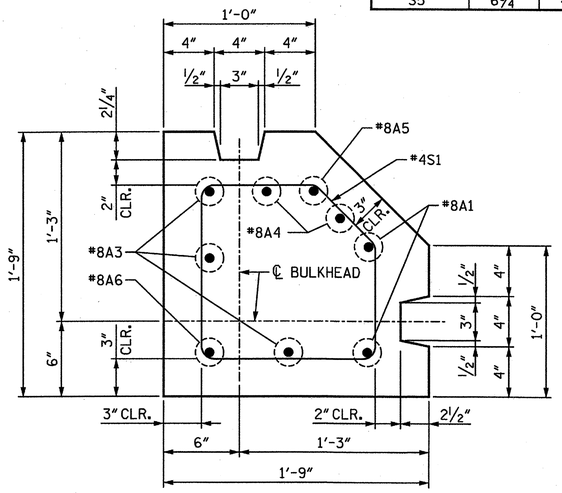
C1 CORNER PILE



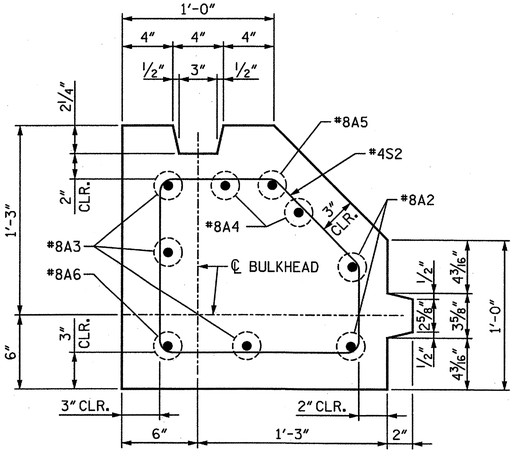
SECTION A-A



PATTERN FOR BURNING



SECTION B-B



SECTION B-B

NOTES:

1. FOR NOTES, SEE SHEET 1 OF 11.

CORNER PILE STIRRUP DIMENSIONS

BAR	R1	R2	R3
S1	9"	4¾"	9"
S2	9"	7"	6¾"
S3	8¼"	6¼"	6¾"
S4	7½"	5½"	6¾"
S5	6¾"	4¾"	6¾"

BILL OF MATERIAL

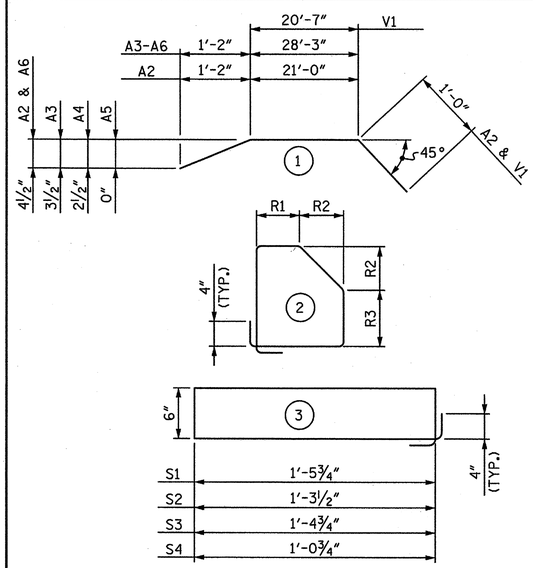
A1 MOD (2'-0") PILE

BAR	NUMBER	SIZE	TYPE	LENGTH
S1	22	#4	③	4'-7½"
S2	13	#4	③	4'-3"
S3	1	#4	③	4'-5½"
S4	1	#4	③	3'-9½"
V1	2	#5	①	21'-7"

C1 CORNER PILE

BAR	NUMBER	SIZE	TYPE	LENGTH
A1	2	#8	①	10'-6"
A2	2	#8	①	23'-2¾"
A3	3	#8	①	29'-5⅜"
A4	2	#8	①	29'-5¼"
A5	1	#8	①	29'-5"
A6	1	#8	①	29'-5¾"
S1	12	#4	②	5'-0³⁄₁₆"
S2	20	#4	②	5'-3⅜"
S3	1	#4	②	4'-11⁵⁄₁₆"
S4	1	#4	②	4'-7¼"
S5	1	#4	②	4'-3³⁄₁₆"

BAR TYPES



ALL BAR DIMENSIONING ARE OUT-TO-OUT

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 7 OF 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE SHEET PILE RETAINING WALL PILE DETAILS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

DRAWN BY : AA DATE : 9-12

CHECKED BY : CJ DATE : 9-12

STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-212
1			3			TOTAL SHEETS
2			4			219

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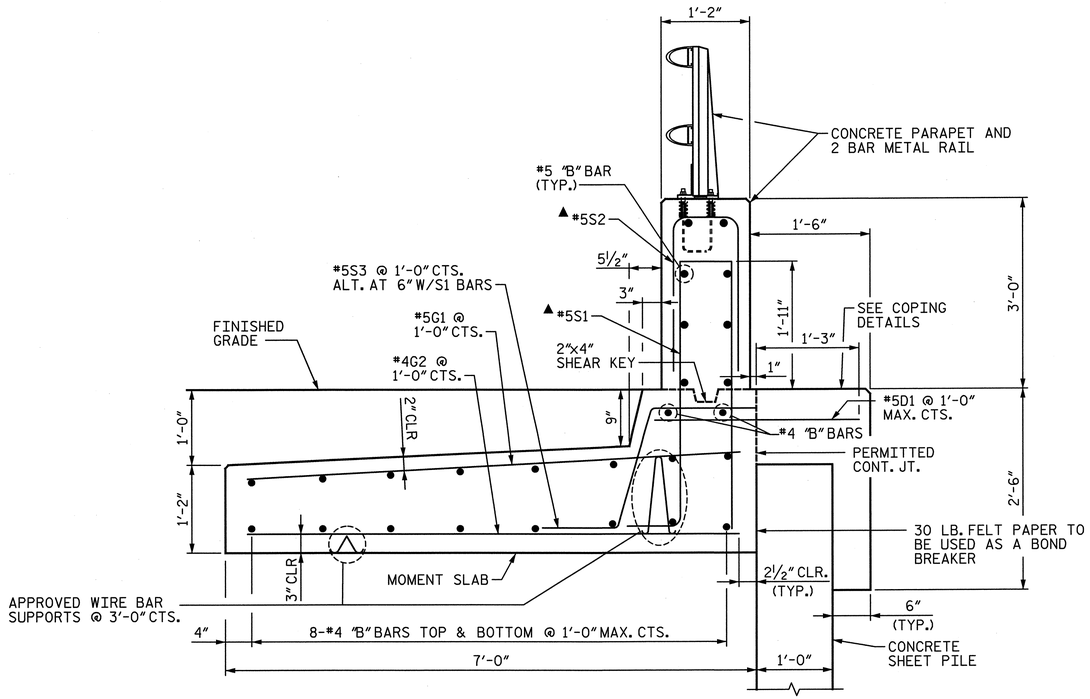
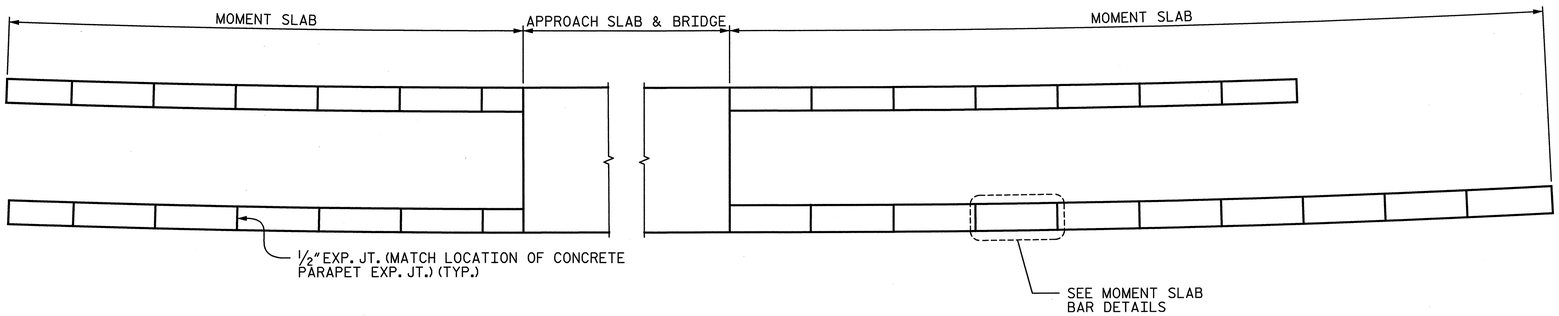


TYPICAL SECTION THROUGH MOMENT SLAB

MOMENT SLAB
PAY LENGTH = 709.00 LIN FT



MOMENT SLAB LAYOUT - PLAN VIEW

NOTES:

FOR CONCRETE MOMENT SLAB, SEE SPECIAL PROVISIONS.

FOR DETAILS OF CONCRETE PARAPET AND 2 BAR METAL RAIL, SEE CONCRETE SHEET PILE RETAINING WALL, PLAN OF RAIL AND CONCRETE PARAPET DETAIL SHEETS.

EXPANSION JOINTS FOR THE MOMENT SLAB SHALL BE PROVIDED TO MATCH EXPANSION JOINTS IN CONCRETE. SEE CONCRETE SHEET PILE RETAINING WALL, PLAN OF RAIL AND CONCRETE PARAPET DETAIL SHEETS.

THE PARAPET WALL SHALL NOT BE CAST UNTIL THE MOMENT SLAB HAS ATTAINED AN AGE OF THREE CURING DAYS OR A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI. IN ADDITION, NO FILL MATERIAL, ASPHALT, OR CONSTRUCTION EQUIPMENT IS ALLOWED ON THE MOMENT SLAB PRIOR TO SATISFYING THE MINIMUM CONCRETE CURING AND STRENGTH REQUIREMENTS.

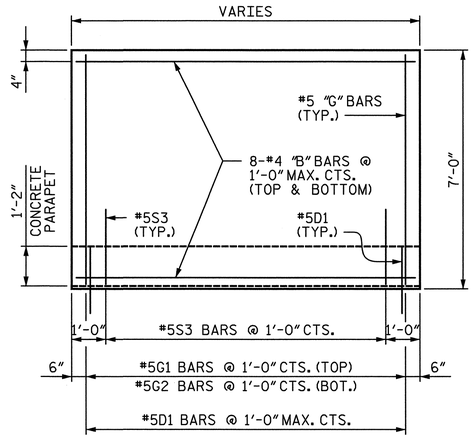
ALL REINFORCING STEEL IN THE MOMENT SLAB SHALL BE EPOXY COATED.

IF EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, BARRIERS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH CONCRETE PARAPET WALL WITH MOMENT SLAB DETAILS SHALL BE REVISED AND SUBMITTED FOR APPROVAL.

FOR ADDITIONAL NOTES, SEE SHEET 1 OF 11.

▲ SEE CONCRETE SHEET PILE RETAINING WALL, PLAN OF RAIL AND CONCRETE PARAPET SHEETS.

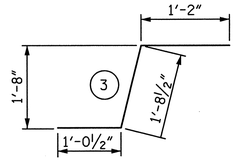
■ SEE COPING DETAIL SHEETS FOR ADDITIONAL DETAILS



MOMENT SLAB BAR DETAIL

(TYPICAL MOMENT SLAB SECTION)
(FOR #5S1 BARS, SEE CONCRETE SHEET PILE RETAINING WALL, CONCRETE PARAPET DETAILS)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	450	#4	STR	23'-7"	7089
B2	36	#4	STR	18'-7"	447
B3	36	#4	STR	11'-7"	279
B4	18	#4	STR	24'-7"	296
B5	18	#4	STR	21'-7"	260
D1	709	#5	STR	2'-6"	1849
G1	709	#5	STR	6'-7"	4868
G2	709	#4	STR	6'-7"	3118
S3	678	#5	③	3'-11"	2770
EPOXY COATED REINFORCING STEEL					20,976 LBS.
CLASS AA CONCRETE MOMENT SLAB					275.7 CY

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 8 OF 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE SHEET PILE RETAINING WALL MOMENT SLAB DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
5-30-13

DRAWN BY : AA DATE : 9-12
CHECKED BY : CJ DATE : 9-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-213
1			3			TOTAL SHEETS
2			4			219

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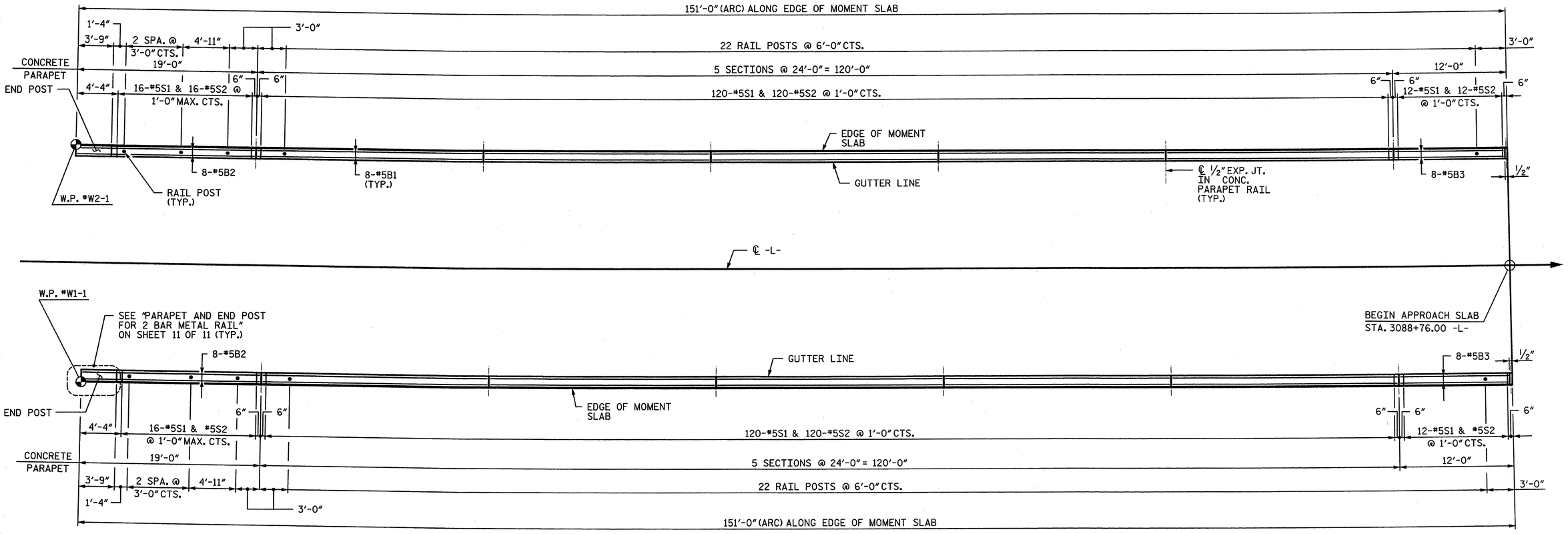
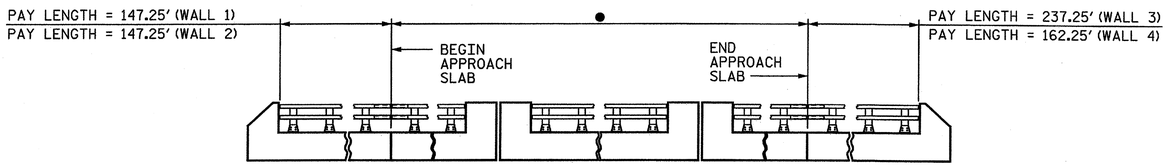


NOTES:

1. FOR NOTES, SEE SHEET 11 OF 11.

PLAN



PAY LENGTH LAYOUT

● SEE 2 BAR METAL RAIL DETAILS, SHEET S-147, FOR PAY LENGTH

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 10-4-12

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 9 OF 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE SHEET PILE RETAINING WALL PLAN OF RAIL & CONCRETE PARAPET

DRAWN BY : CLG	DATE : 9-12
CHECKED BY : AJP	DATE : 9-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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1			3		
2			4		

SHEET NO. S-214

TOTAL SHEETS 219

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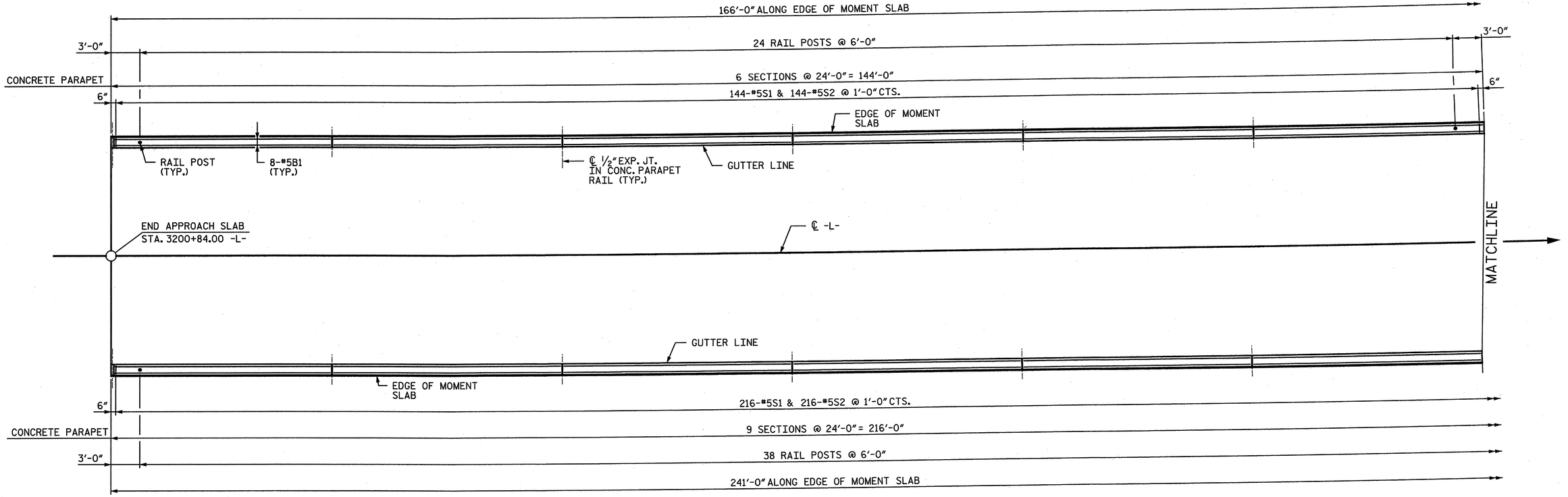

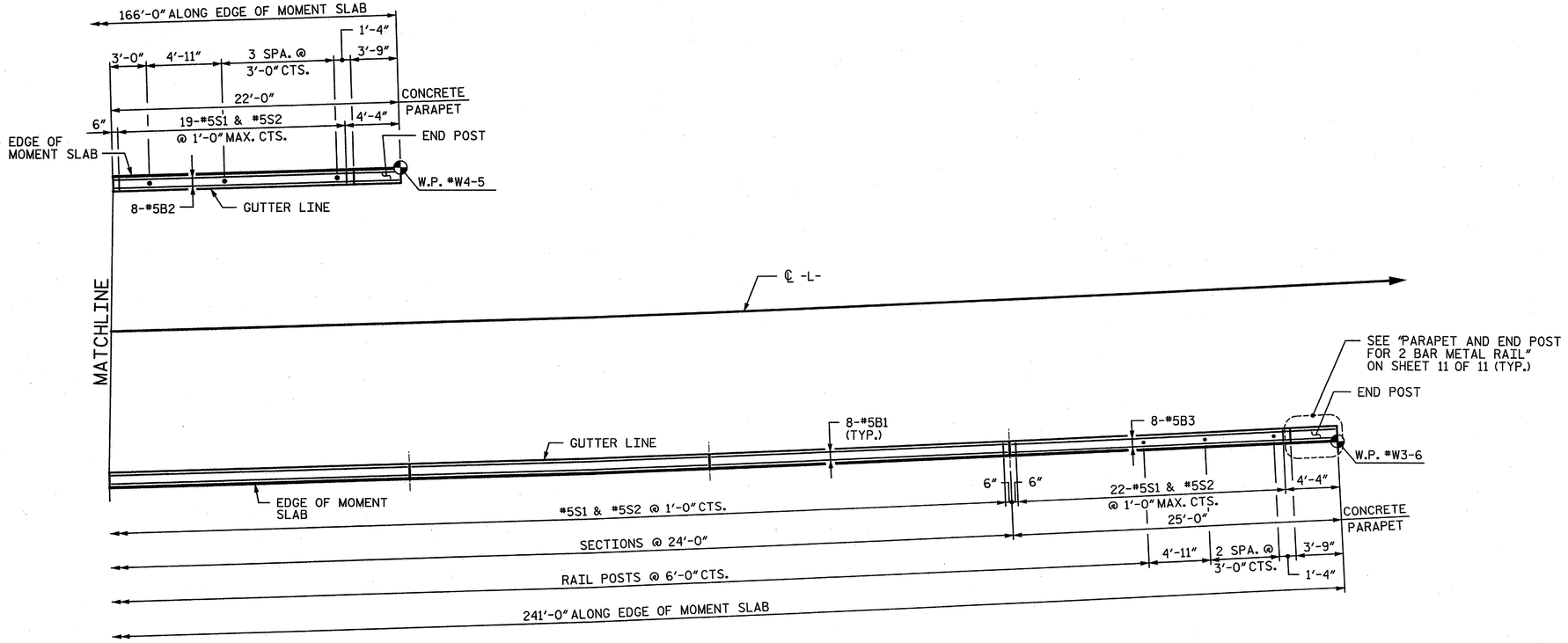

NOTES:

1. FOR NOTES, SEE SHEET 11 OF 11.

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 10 OF 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE SHEET PILE RETAINING WALL PLAN OF RAIL & CONCRETE PARAPET

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 10-4-12

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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2			4			219

DRAWN BY : CLG DATE : 9-12
CHECKED BY : AJP DATE : 9-12

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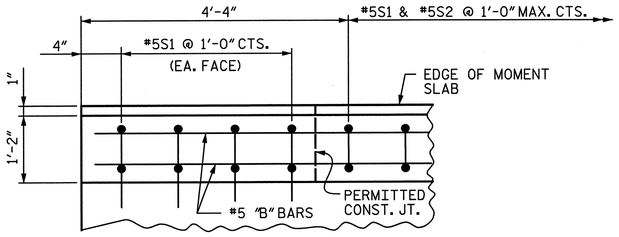
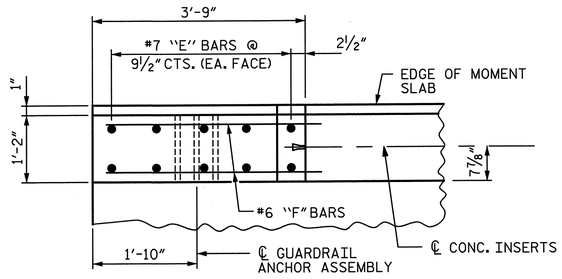


PLAN OF PARAPET



PLAN OF END POST

NOTE:

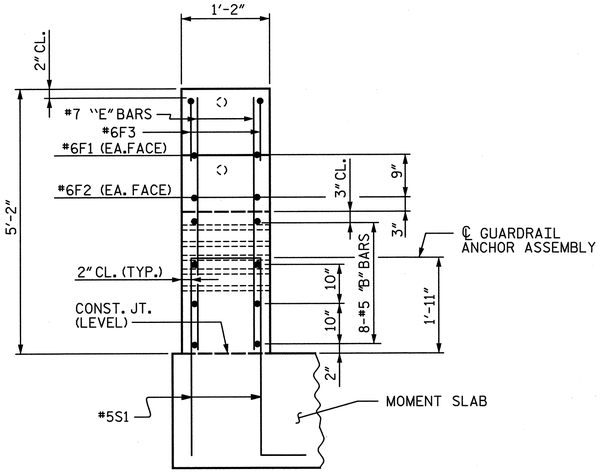
1. ALL REINFORCING IN CONCRETE PARAPET SHALL BE EPOXY COATED.
2. GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE CONCRETE PARAPET AND IN ACCORDANCE WITH ARTICLE B25-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN CONCRETE PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF CONCRETE PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.
3. FOR 2 BAR METAL RAIL DETAILS, SEE 2 BAR METAL RAIL SHEETS.
4. SEE ADDITIONAL NOTES ON SHEETS 1 AND 8 OF 11.

BILL OF MATERIAL FOR RAIL ON WALLS 1 & 2

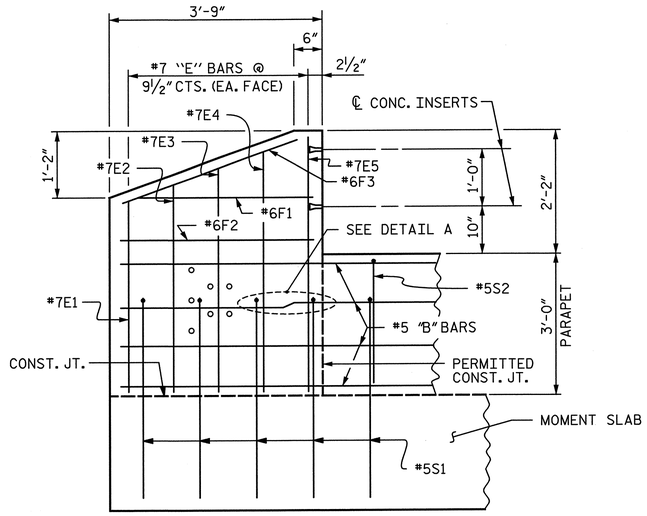
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	80	#5	STR	23'-7"	1,968
✳B2	16	#5	STR	18'-7"	310
✳B3	16	#5	STR	11'-7"	193
✳E1	4	#7	STR	3'-9"	31
✳E2	4	#7	STR	4'-0"	33
✳E3	4	#7	STR	4'-4"	35
✳E4	4	#7	STR	4'-7"	37
✳E5	4	#7	STR	4'-10"	40
✳F1	4	#6	STR	3'-1"	19
✳F2	4	#6	STR	3'-5"	21
✳F3	4	#6	STR	3'-3"	20
✳S1	304	#5	①	9'-0"	2,854
✳S2	296	#5	②	6'-6"	2,007
✳EPOXY COATED REINFORCING STEEL				LBS.	7,568
CLASS AA CONCRETE				C. Y.	39.1
CONCRETE PARAPET				L.F.	302.0

BILL OF MATERIAL FOR RAIL ON WALLS 3 & 4

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	120	#5	STR	23'-7"	2,952
✳B2	8	#5	STR	21'-7"	180
✳B3	8	#5	STR	24'-7"	205
✳E1	4	#7	STR	3'-9"	31
✳E2	4	#7	STR	4'-0"	33
✳E3	4	#7	STR	4'-4"	35
✳E4	4	#7	STR	4'-7"	37
✳E5	4	#7	STR	4'-10"	40
✳F1	4	#6	STR	3'-1"	19
✳F2	4	#6	STR	3'-5"	21
✳F3	4	#6	STR	3'-3"	20
✳S1	409	#5	①	9'-0"	3,839
✳S2	401	#5	②	6'-6"	2,719
✳EPOXY COATED REINFORCING STEEL				LBS.	10,131
CLASS AA CONCRETE				C. Y.	52.8
CONCRETE PARAPET				L.F.	407.0



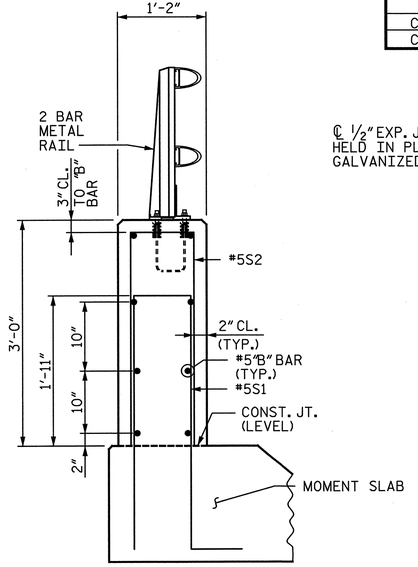
END VIEW



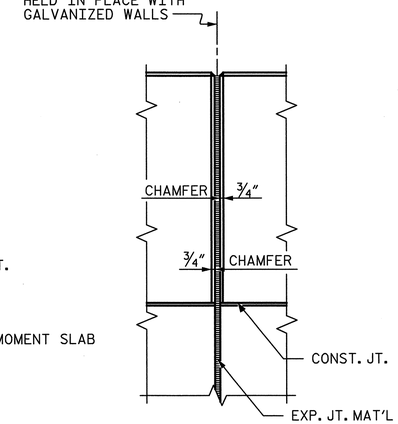
ELEVATION

PARAPET AND END POST FOR TWO BAR METAL RAIL

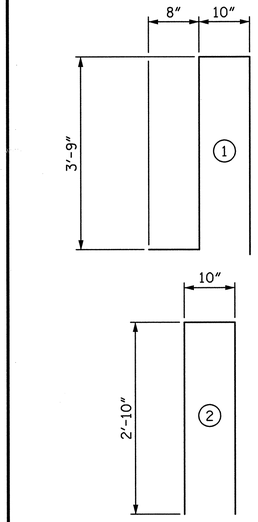
NOTE: #5S1 BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO AVOID CONFLICT WITH OTHER BARS.



SECTION THRU PARAPET



ELEV. @ EXP. JOINTS

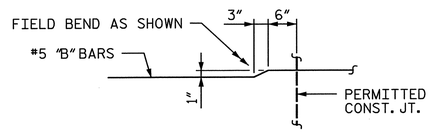


BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT

CONCRETE PARAPET DETAILS

(RETAINING WALL AND COPING NOT SHOWN FOR CLARITY)



DETAIL A

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

SHEET 11 OF 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE SHEET PILE RETAINING WALL PLAN OF RAIL AND CONCRETE PARAPET DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
5-30-13

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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1			3			TOTAL SHEETS
2			4			219

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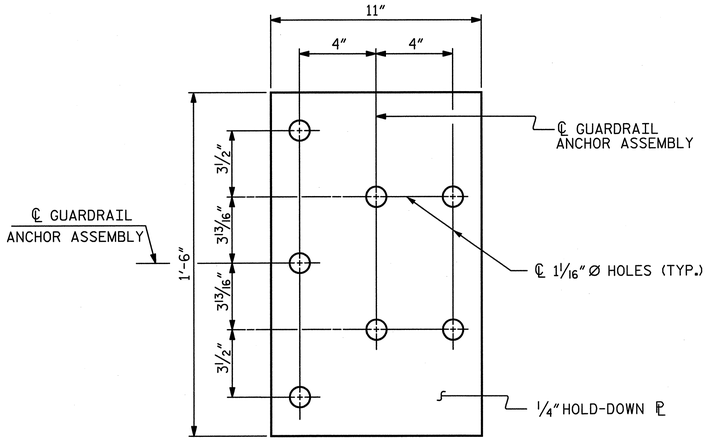
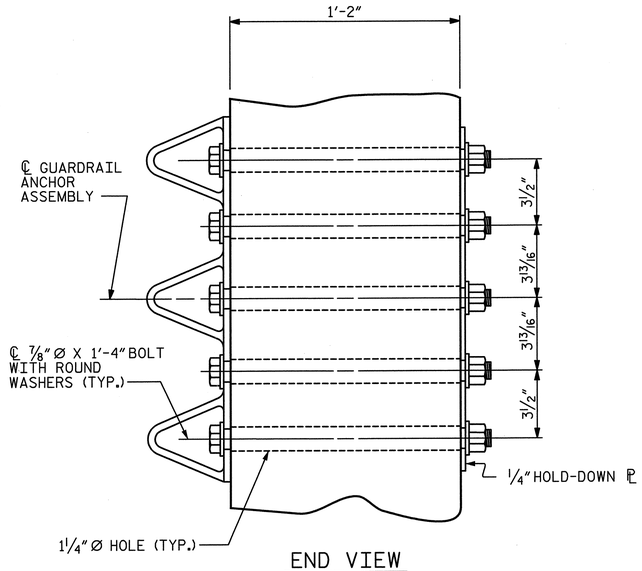


PLAN



END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A ¼" HOLD DOWN PLATE AND 7-⅞"Ø BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE ⅞"Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

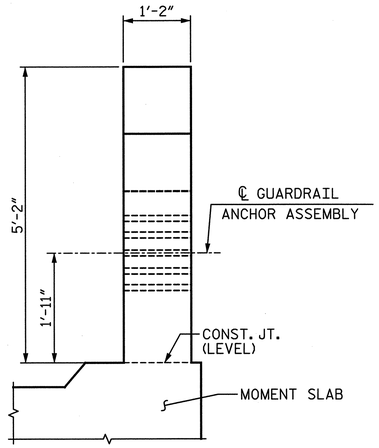
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

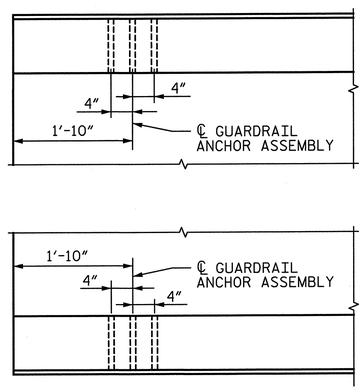
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

THE 1¼"Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

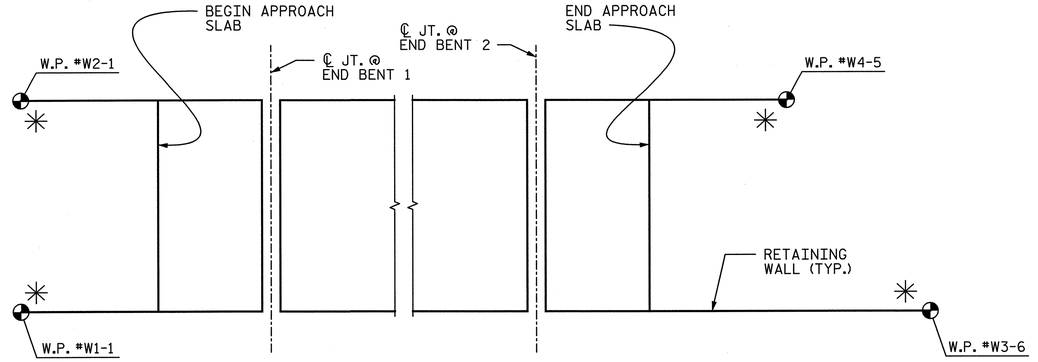


END VIEW



PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST



SKETCH SHOWING POINTS OF ATTACHMENT

*LOCATION OF GUARDRAIL ATTACHMENT

PROJECT NO. B-2500A

DARE COUNTY

STATION: 3144+80.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GUARDRAIL ANCHORAGE DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
5-30-13

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License No. F-0991

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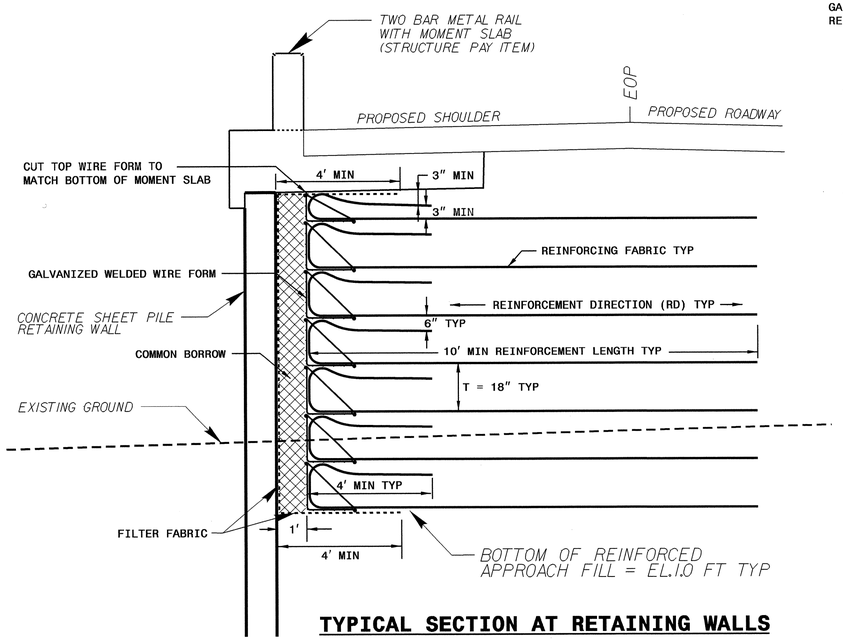
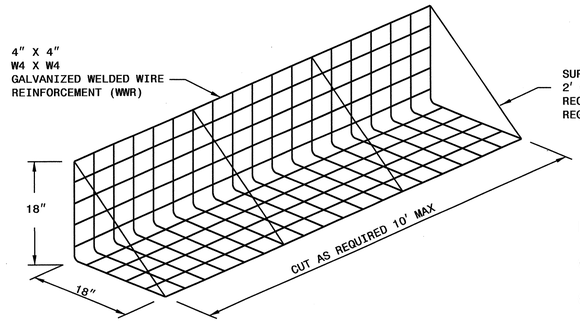
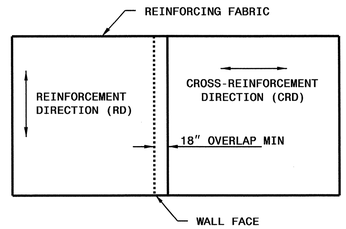


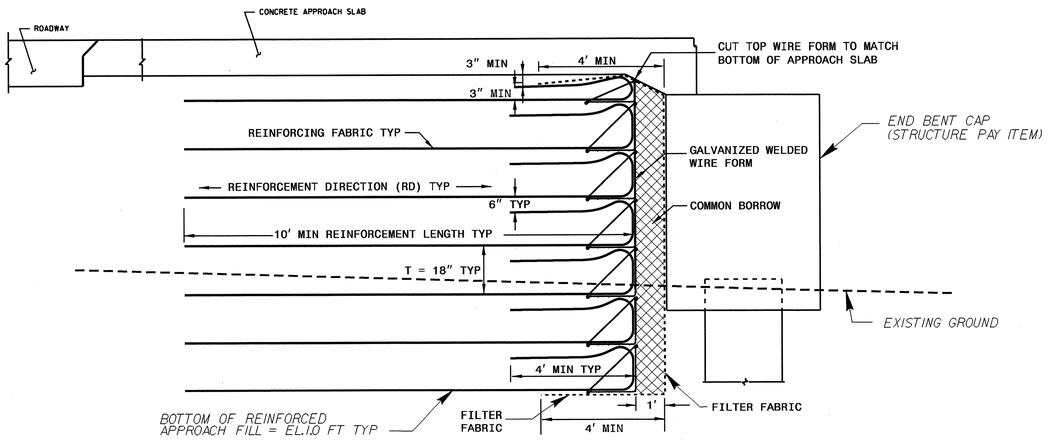
TYPICAL SECTION AT RETAINING WALLS



WELDED WIRE FORM



PLAN VIEW OF FABRIC OVERLAP



TYPICAL SECTION AT END BENTS

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032672 MICHAEL D. VALIQUETTE

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

NOTES

FOR REINFORCED APPROACH FILLS, SEE REINFORCED APPROACH FILLS SPECIAL PROVISION.

CONTROL DRAINAGE DURING CONSTRUCTION IN THE VICINITY OF REINFORCED APPROACH FILLS.

COLLECT AND DIRECT RUNOFF AWAY FROM REINFORCED APPROACH BACKFILL.

INSTALL CONCRETE SHEET PILE RETAINING WALLS AND END BENT CAPS PRIOR TO CONSTRUCTING REINFORCED APPROACH FILLS.

EXCAVATE AS NECESSARY TO CONSTRUCT BOTTOM OF REINFORCED APPROACH FILLS TO THE ELEVATION SHOWN ON THE PLANS.

DO NOT PLACE BACKFILL OR FIRST REINFORCEMENT LAYER UNTIL OBTAINING APPROVAL OF THE EXCAVATION DEPTH AND FOUNDATION MATERIAL.

ERECT FACINGS AND FORMS AS SHOWN ON THE REINFORCED APPROACH FILL DETAILS.

STAGGER VERTICAL JOINTS OF FACINGS AND FORMS TO CREATE A RUNNING BOND WHEN POSSIBLE UNLESS SHOWN OTHERWISE ON THESE DETAILS.

PLACE FACINGS AND FORMS AS NEAR TO VERTICAL AS POSSIBLE WITH NO NEGATIVE BATTER. CONSTRUCT REINFORCED APPROACH FILLS WITH A VERTICAL AND HORIZONTAL TOLERANCE OF 3" WHEN MEASURED WITH A 10'-0" STRAIGHT EDGE AND AN OVERALL VERTICAL PLUMBNESS (BATTER) AND HORIZONTAL ALIGNMENT OF LESS THAN 6".

OFFSET FACE OF REINFORCED APPROACH FILL TO MAINTAIN 1' OF CLEAR DISTANCE FROM BACK FACE OF CONCRETE SHEET PILING OR END BENT CAPS.

CONSTRUCT REINFORCED APPROACH FILLS FULL HEIGHT PRIOR TO FILLING 1' SPACE BETWEEN FACE OF REINFORCED APPROACH FILL AND BACK OF CONCRETE SHEET PILING OR END BENT CAPS WITH COMMON BORROW.

INSTALL FILTER FABRIC UP BACK FACE OF CONCRETE SHEET PILE RETAINING WALL AND END BENT CAPS AS SHOWN ON TYPICAL SECTION DURING CONSTRUCTION OF REINFORCED APPROACH FILL. SUBMIT CONSTRUCTION ADHESIVE TO THE ENGINEER FOR REVIEW AND APPROAVAL TO HOLD FILTER FABRIC IN PLACE UNTIL 1' SPACE BETWEEN APPROACH FILL FACING AND CONCRETE WALLS HAS BEEN BACKFILLED.

OVERLAP FILTER FABRIC A MINIMUM OF 18".

FILTER FABRIC SHALL MEET THE REQUIREMENTS OF TYPE 1 GEOTEXTILE AS SHOWN IN TABLE 1056-1 OF THE STANDARD SPECIFICATIONS.

PLACE REINFORCEMENT AT LOCATIONS AND ELEVATIONS SHOWN ON THE REINFORCED APPROACH FILL DETAILS AND IN SLIGHT TENSION FREE OF KINKS, FOLDS, WRINKLES OR CREASES.

DO NOT SPLICE REINFORCEMENT IN THE REINFORCEMENT DIRECTION (RD), i.e., PARALLEL TO THE REINFORCED APPROACH FILL FACE. SEAMS ARE ALLOWED IN THE CROSS-REINFORCEMENT DIRECTION (CRD).

PLACE BACKFILL IN 8" TO 10" THICK LIFTS AND COMPACT IN ACCORDANCE WITH SUBARTICLE 235-4(C) OF THE STANDARD SPECIFICATIONS. USE ONLY HAND OPERATED COMPACTION EQUIPMENT WITHIN 3'-0" OF THE REINFORCED APPROACH FILL FACE.

BACKFILL WITHIN REINFORCED APPROACH FILL SHALL BE COMMON BORROW.

DO NOT DAMAGE REINFORCEMENT WHEN PLACING AND COMPACTING BACKFILL. DO NOT OPERATE HEAVY EQUIPMENT ON REINFORCEMENT UNTIL IT IS COVERED WITH AT LEAST 10" OF BACKFILL. DO NOT USE SHEEPSFOOT, GRID ROLLERS OR OTHER TYPES OF COMPACTION EQUIPMENT WITH FEET.

COVER REINFORCING WITH AT LEAST 3" OF BACKFILL.

PROJECT NO.: 13201.1028011

DARE ***COUNTY***

STATION: 3144+80.00 -L-

SHEET 2 OF 2

PREPARED BY: MDV	DATE: 10/12
REVIEWED BY: CAK	DATE: 10/12

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

☒ ***EASTERN REGIONAL OFFICE***

☐ ***WESTERN REGIONAL OFFICE***

☐ ***CONTRACT OFFICE***

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

REINFORCED APPROACH FILLS

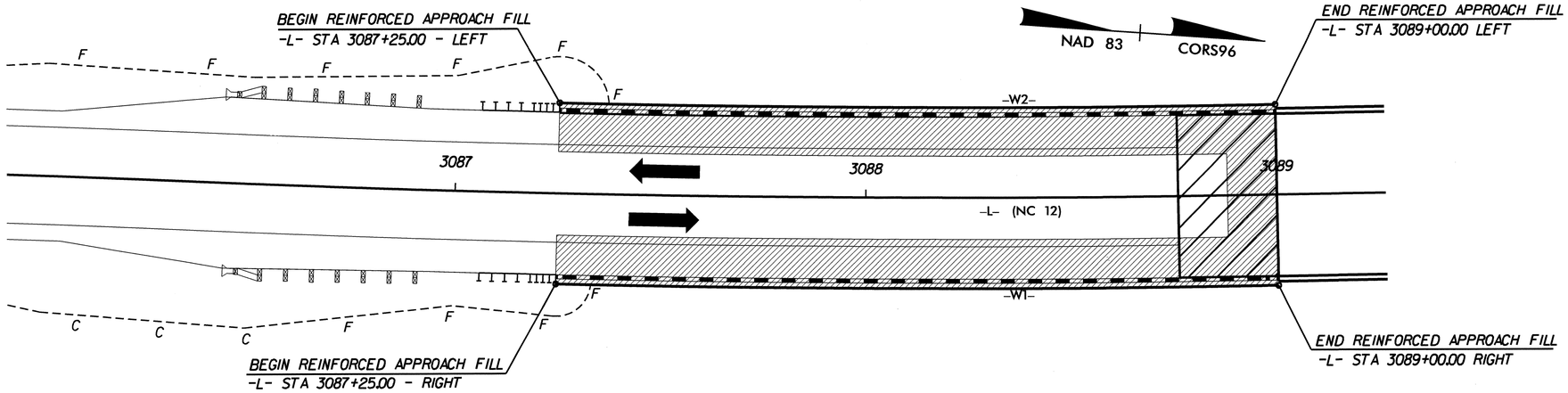
REVISIONS

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

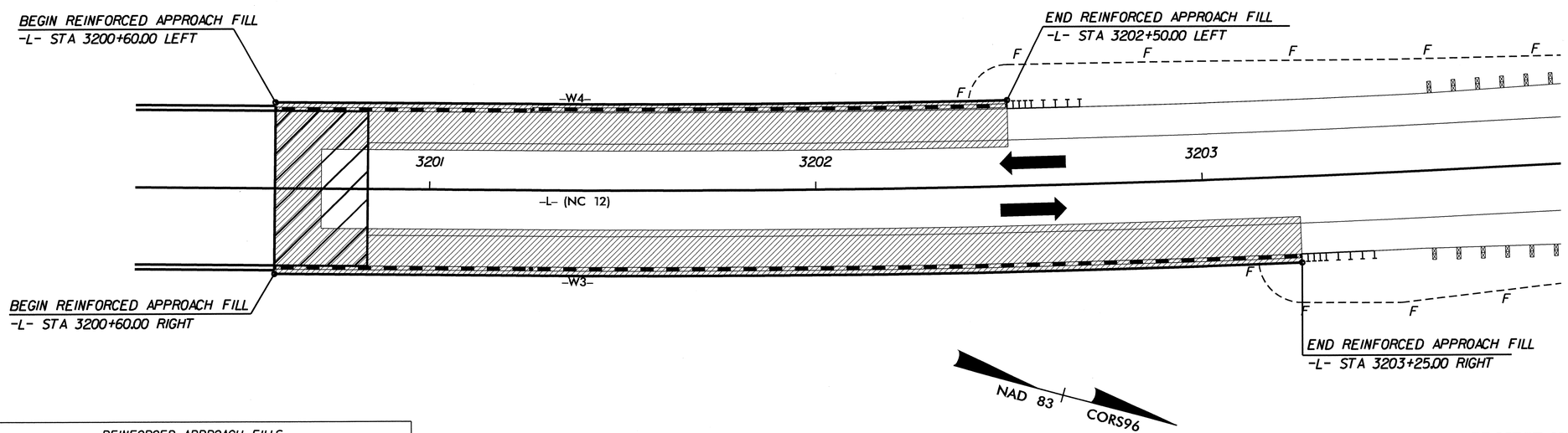
SHEET NO. S-218

TOTAL SHEETS 219

GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032672 MICHAEL D. VALIQUETTE SIGNATURE DATE	SIGNATURE DATE



REINFORCED APPROACH FILL AT END BENT 1
N.T.S.



REINFORCED APPROACH FILL AT END BENT 2
N.T.S.

REINFORCED APPROACH FILLS
ESTIMATED QUANTITES

"REINFORCED APPROACH FILLS" AT EB1	1,880 SQ.FT.
"REINFORCED APPROACH FILLS" AT EB2	2,920 SQ.FT.
TOTAL "REINFORCED APPROACH FILLS"	4,800 SQ.FT.

PREPARED BY: MDV	DATE: 10/12
REVIEWED BY: CAK	DATE: 10/12

PROJECT NO.: 13201.1028011
DARE ***COUNTY***
STATION: 3144+80.00 -L-
SHEET 1 OF 2

GEOTECHNICAL ENGINEERING UNIT
☒ *EASTERN REGIONAL OFFICE*
☐ *WESTERN REGIONAL OFFICE*
☐ *CONTRACT OFFICE*
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

REINFORCED APPROACH FILLS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-219
1			3			TOTAL SHEETS
2			4			219

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

STD. NO. SN

REV. 6-16-95 EEM @ RGW REV. 5-7-03 RWW @ JTE REV. 10-1-11 MAA @ GW
REV. 8-16-99 RWW @ LES REV. 5-1-06 TLA @ GW