

**CONTRACT: DA00176 TIP PROJECT: F-5506**

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

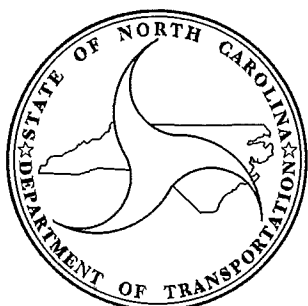
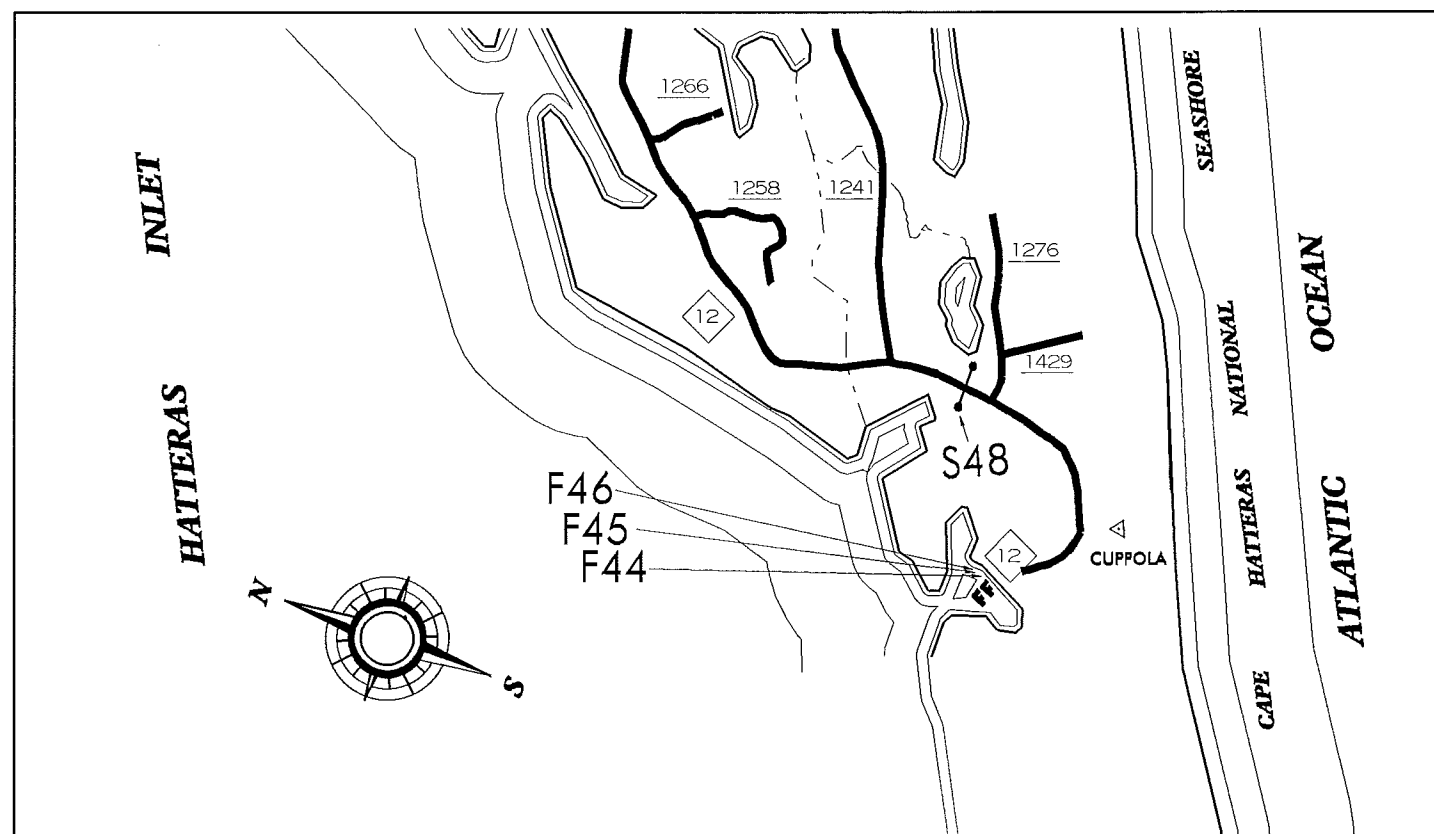


# DARE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	<b>F-5506</b>	1	26
STATE PROJ. NO.		F.A. PROJ. NO.	
44095.1.FR1		FBD-00S (748)	
44095.3.FR1		FBD-00S (748)	
		DESCRIPTION	
		P.E.	
		CONST.	

**LOCATION:** DARE COUNTY FERRY RAMPS #44, #45 AND #46 ON NC12 AT HATTERAS FERRY BASIN.

**TYPE OF WORK:** FERRY RAMP REHABILITATION - CLEANING AND PAINTING OF EXISTING RAMP AND LIFT BENT; STEEL REPAIRS; MECHANICAL AND ELECTRICAL SYSTEM UPGRADE



**DESIGN DATA**

DARE #44: ADT 2011 = 3,200  
 DARE #45: ADT 2011 = 3,200  
 DARE #46: ADT 2011 = 3,200

**PROJECT LENGTH**

DARE #44: 0.007 MILES = 38 FEET  
 DARE #45: 0.007 MILES = 38 FEET  
 DARE #46: 0.007 MILES = 38 FEET

Prepared in the Office of:  
**DEPARTMENT OF TRANSPORTATION**  
**DIVISION OF HIGHWAYS**  
 STRUCTURES MANAGEMENT UNIT - PRESERVATION & REPAIR GROUP  
 1000 BIRCH RIDGE DR. RALEIGH, N.C. 27610

ROY GIROLAMI, P.E.  
PROJECT ENGINEER

2012 STANDARD SPECIFICATIONS

**LETTING DATE:**  
 NOVEMBER 20, 2013

**ENGINEER**

DANIEL MULLER, P.E.  
PROJECT DESIGN ENGINEER

**TIP PROJECT: F-5506**

**CONTRACT: DA00176**

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**DARE COUNTY**

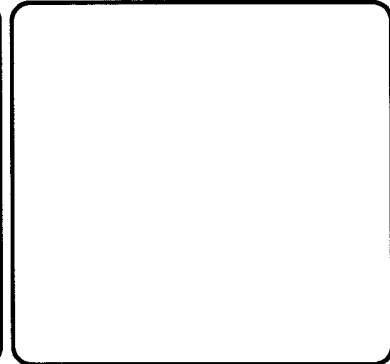
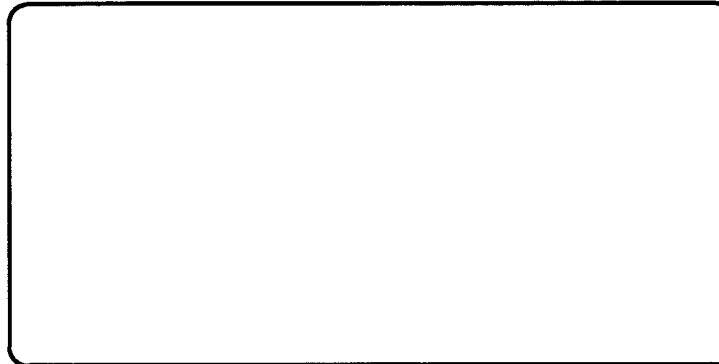
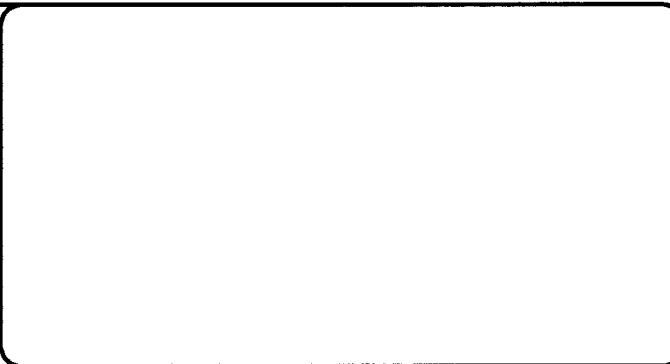
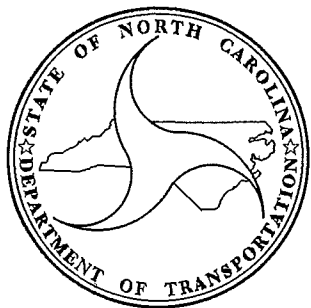
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	F-5506	1A	26
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
44095.1.FR1	FBD-00S (748)	P.E.	
44095.3.FR1	FBD-00S (748)	CONST.	

**LOCATION: DARE COUNTY FERRY RAMPS #44, #45 AND #46 ON NC12 AT HATTERAS FERRY BASIN.**

**TYPE OF WORK: FERRY RAMP REHABILITATION - CLEANING AND PAINTING OF EXISTING RAMP AND LIFT BENT; STEEL REPAIRS; MECHANICAL AND ELECTRICAL SYSTEM UPGRADE**

INDEX OF SHEETS

DESCRIPTION	SHEET NUMBER
TITLE SHEET	1
INDEX OF SHEETS	1A
STRUCTURE SHEETS	S-1 THRU S-14
MECHANICAL AND ELECTRICAL SHEETS	S-15 THRU S-24



NOTES

EXISTING DETAILS INDICATED ON THE PLANS ARE 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 DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING DETAILS SHOWN ON THE PLANS AND THE ACTUAL CONDITION AT THE PROJECT SITE.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.

ALL BOLTS TO BE HIGH STRENGTH (AASHTO M164) UNLESS OTHERWISE NOTED.

ALL PINS, BOLTS, WASHERS, NUTS, RODS AND OTHER HARDWARE SHALL BE GALVANIZED UNLESS OTHERWISE NOTED.

FOR SCOPE OF WORK, 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 SECURING OF VESSELS, SEE SPECIAL PROVISIONS.

FOR PARTIAL REMOVAL OF EXISTING STRUCTURES, SEE SPECIAL PROVISIONS.

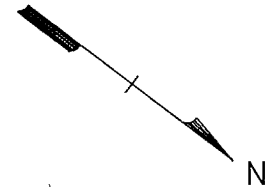
FOR WELD REPAIR, SEE SPECIAL PROVISIONS.

FOR CLEANING AND PAINTING EXISTING RAMPS, SEE SPECIAL PROVISIONS.

FOR CLEANING AND PAINTING EXISTING LIFT BENTS, SEE SPECIAL PROVISIONS.

FOR SKID RESISTANT COATING, SEE SPECIAL PROVISIONS.

CHARPY V-NOTCH TEST REQUIRED FOR ALL W 10 X 68 FLOOR BEAMS IN ACCORDANCE WITH SECTION 1072-7 OF THE STANDARD SPECIFICATIONS.



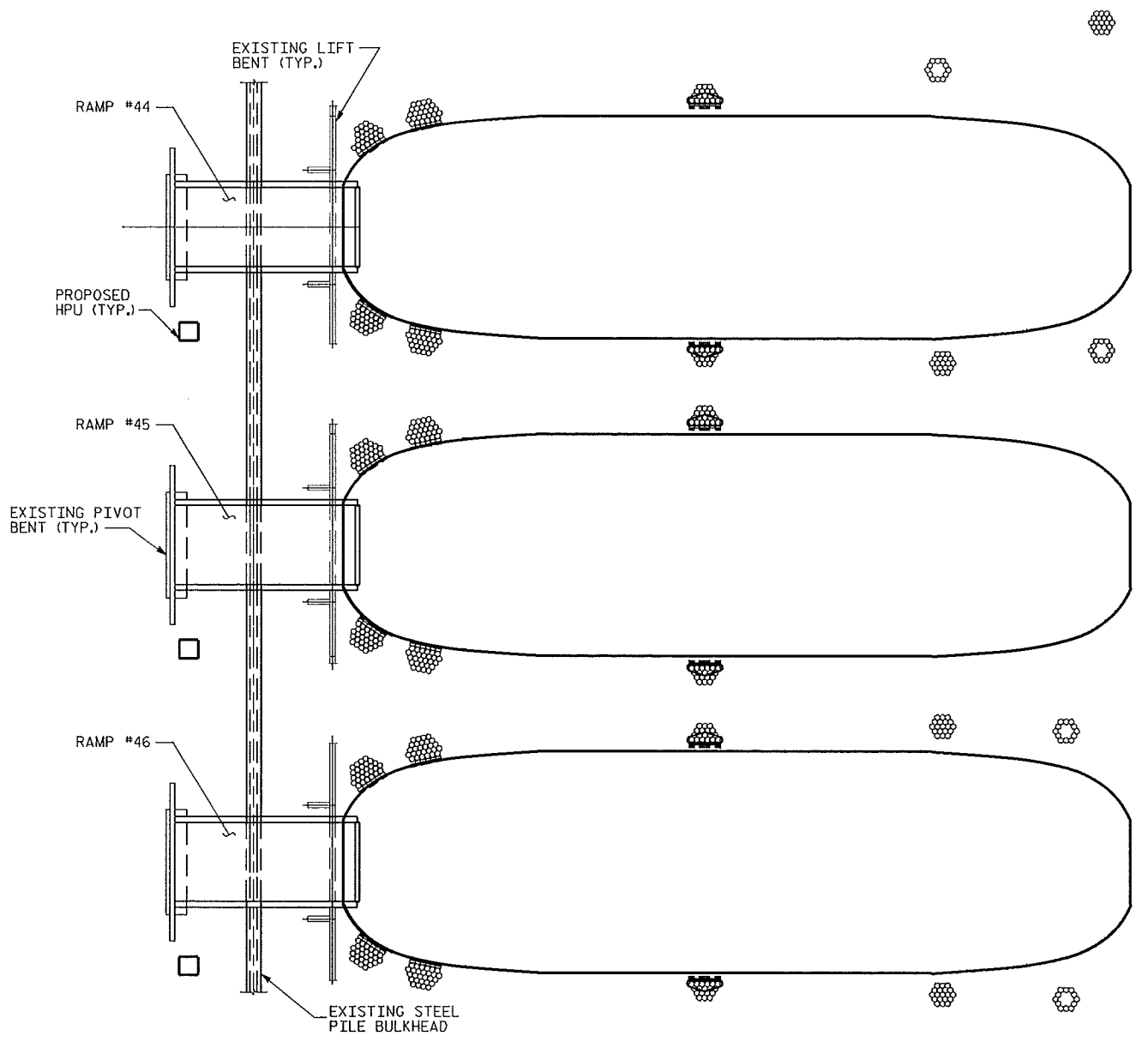
I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

SCOPE OF WORK

- REPLACE EXISTING FLOOR PLATES AND FLOOR BEAMS SPECIFIED IN THE PLANS.
- REPLACE RAMP APRONS.
- REPLACE HANDRAILS, BEARING ASSEMBLIES, CROSS BEAMS, LOWER BRACING, VARIOUS CONNECTIONS, AND STRUCTURAL BOLTS.
- REPLACE MECHANICAL AND ELECTRICAL SYSTEMS.
- PERFORM STRUCTURAL STEEL REPAIRS.
- CLEAN AND PAINT RAMPS AND LIFT BENTS.
- APPLY SKID RESISTANT COATING TO PROPOSED FLOOR PLATES.

CONSTRUCTION SEQUENCE

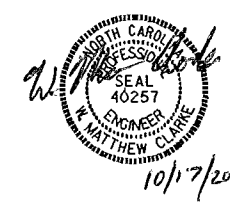
- REMOVE ELECTRICAL AND MECHANICAL SYSTEMS FROM STRUCTURE.
- PERFORM STRUCTURAL STEEL REPAIRS AND REPLACE STRUCTURAL STEEL MEMBERS SPECIFIED IN THE PLANS.
- CLEAN AND PAINT RAMPS AND LIFT BENTS; THE TOP OF FLOOR BEAMS SHALL BE CLEANED AND PRIMED PRIOR TO INSTALLATION OF FLOOR PLATES.
- APPLY SKID RESISTANT COATING.
- INSTALL PROPOSED ELECTRICAL AND MECHANICAL SYSTEMS.



TOTAL BILL OF MATERIAL

	MOBILIZATION	STRUCTURAL STEEL	CLEANING AND PAINTING EXISTING RAMPS	CLEANING AND PAINTING EXISTING LIFT BENTS	ELECTRICAL SYSTEM	MECHANICAL SYSTEM	PARTIAL REMOVAL OF EXISTING STRUCTURES	POLLUTION CONTROL	SKID RESISTANT COATING	WELD REPAIR	BEARING ASSEMBLY REPLACEMENT
	LUMP SUM	APPROX. LBS.	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	EACH
TOTAL	LUMP SUM	74,034	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	50	4

PROJECT NO. F-5506  
 DARE COUNTY  
 BRIDGE NO: 44, 45 & 46



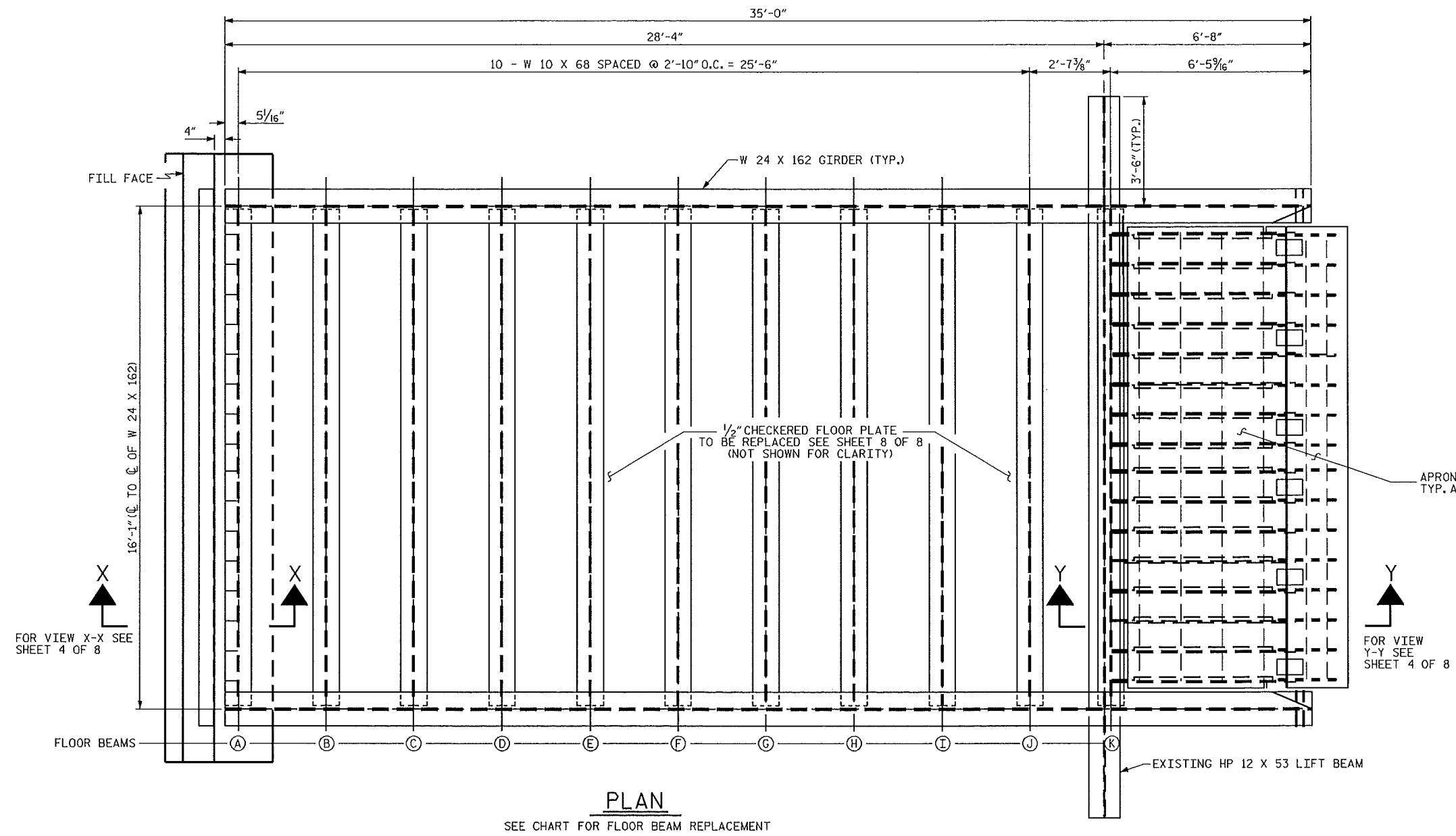
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 HATTERAS FERRY BASIN

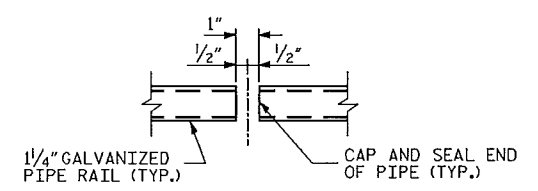
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NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-1
2			4			TOTAL SHEETS 26

DRAWN BY: W. M. CLARKE DATE: 8/2013  
 CHECKED BY: D. MULLER DATE: 8/2013  
 DESIGN ENGINEER OF RECORD: W. M. CLARKE DATE: 8/2013

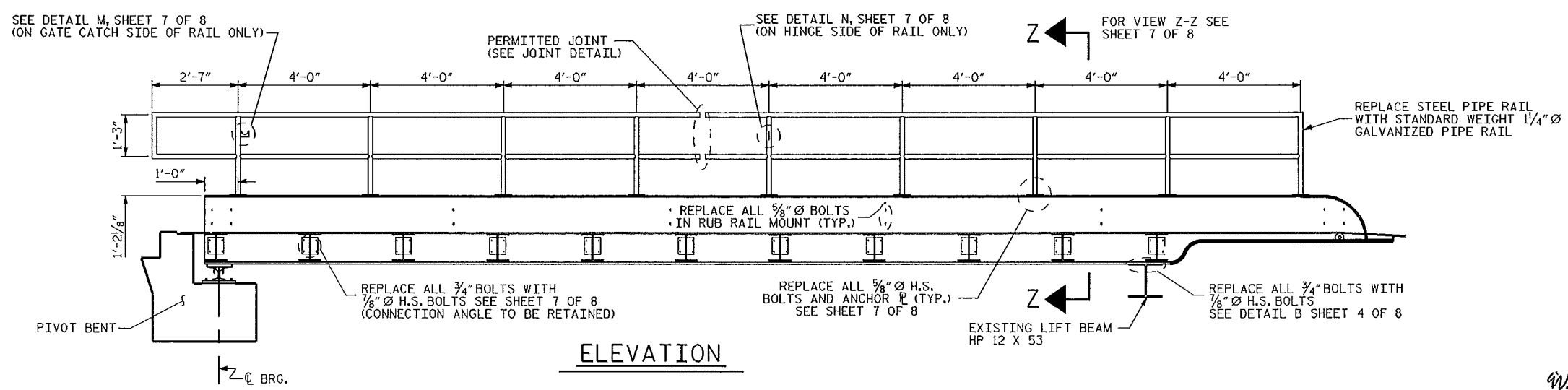
FLOOR BEAM REPLACEMENT		
STRUCTURE	FLOOR BEAM	TOTAL NO.
RAMP #44 (SOUTH)	B,C,D,E,F,G,H	7
RAMP #45 (MIDDLE)	A,B,C,D,E,F,G,H	8
RAMP #46 (NORTH)	E,F,G	3
PROJECT TOTAL		18



**PLAN**  
SEE CHART FOR FLOOR BEAM REPLACEMENT



**JOINT DETAIL**



**ELEVATION**

PROJECT NO. F-5506  
DARE COUNTY  
 BRIDGE NO: 44, 45 & 46

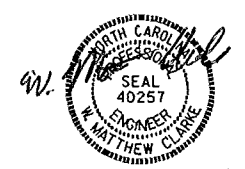
SHEET 1 OF 8

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

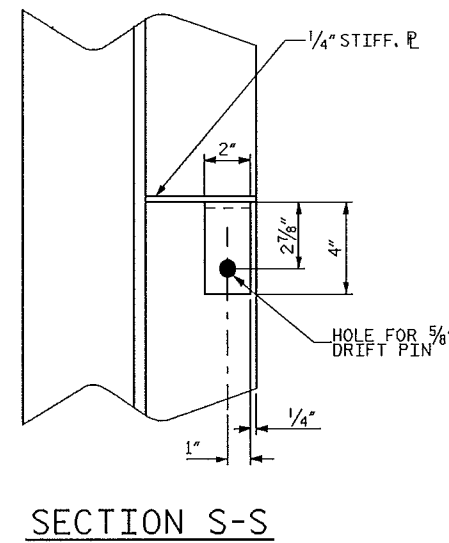
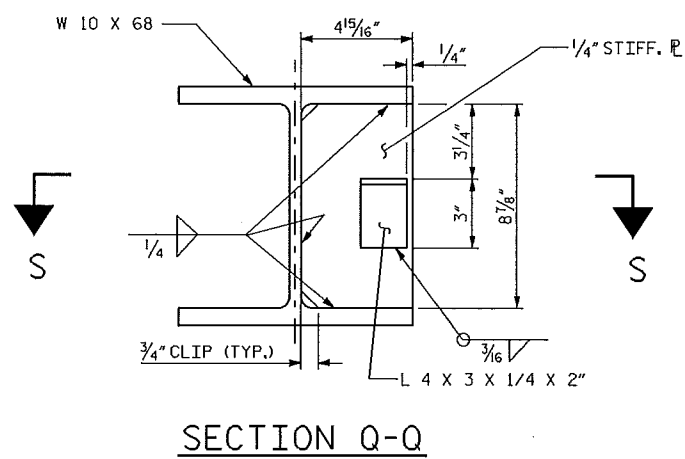
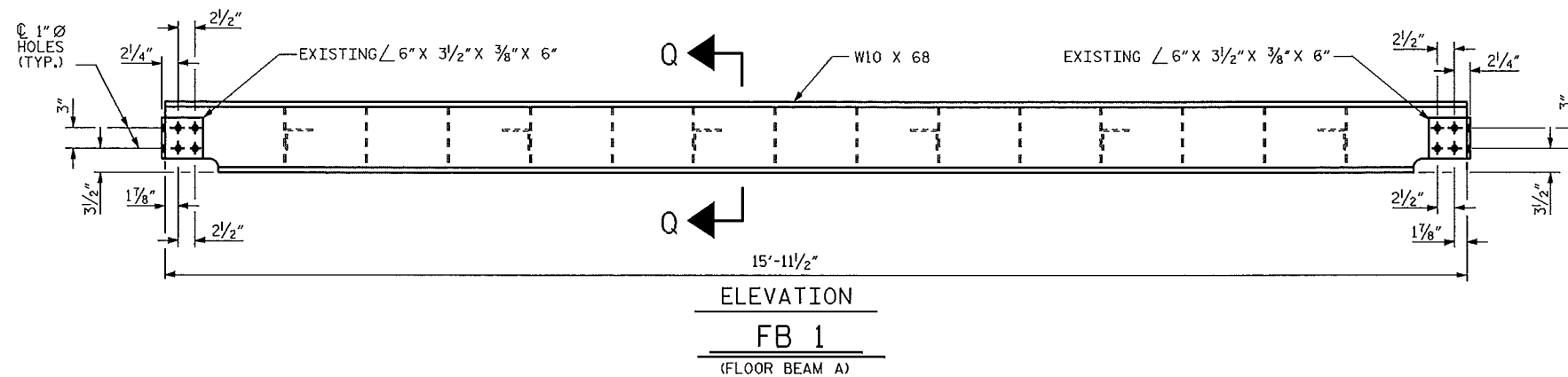
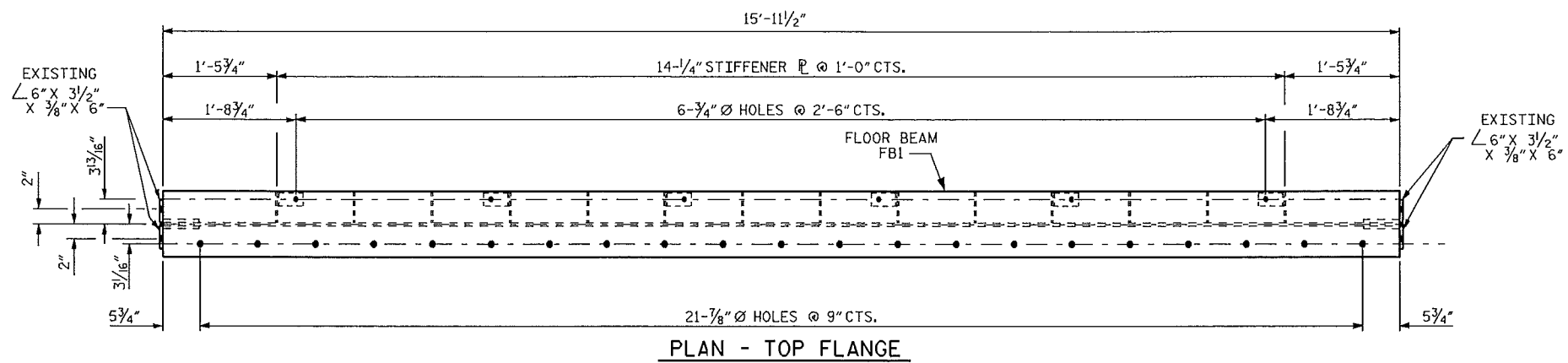
**RAMP PLAN & ELEVATION**

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

DRAWN BY : W. M. CLARKE DATE : 7/2013  
 CHECKED BY : D. MULLER DATE : 8/2013  
 DESIGN ENGINEER OF RECORD : W. M. CLARKE DATE : 8/2013



10/17/2013

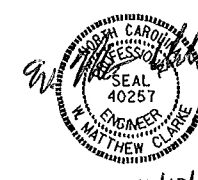


PROJECT NO. F-5506  
DARE COUNTY  
 BRIDGE NO: 44, 45 & 46

SHEET 2 OF 8

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

FLOORBEAMS  
 FB1

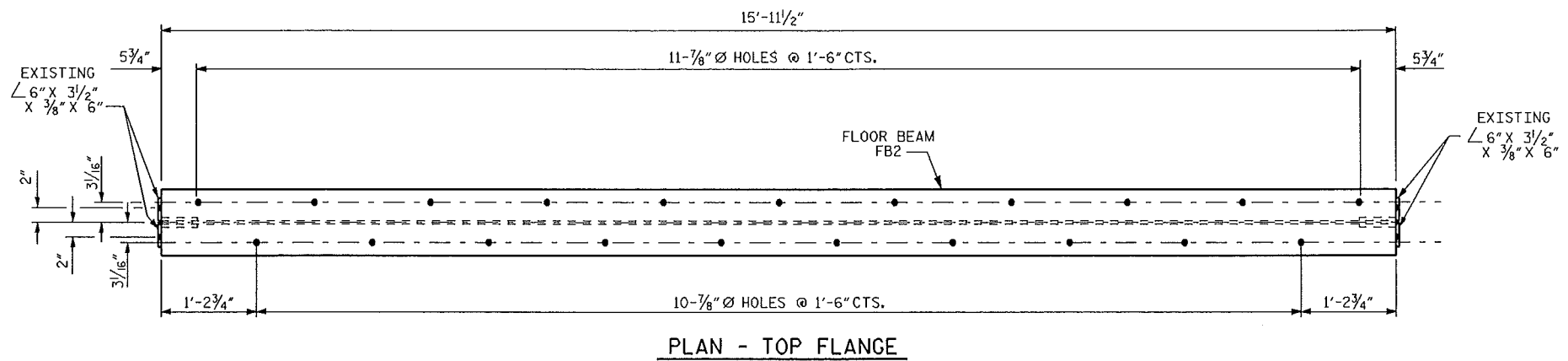


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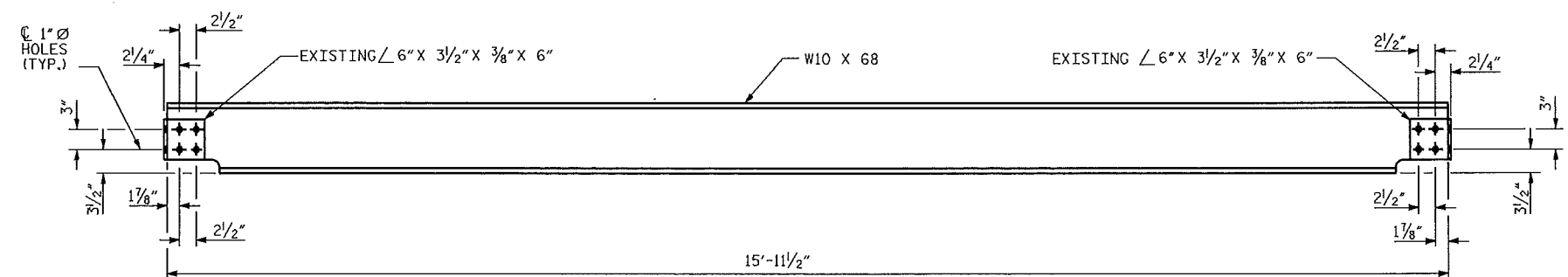
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 DESIGN ENGINEER OF RECORD: W. M. CLARKE DATE: 8/2013

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



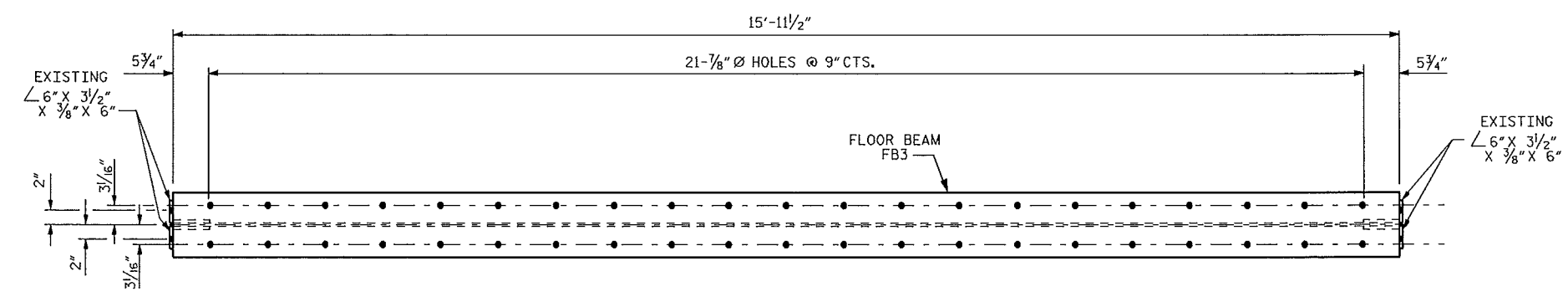
PLAN - TOP FLANGE



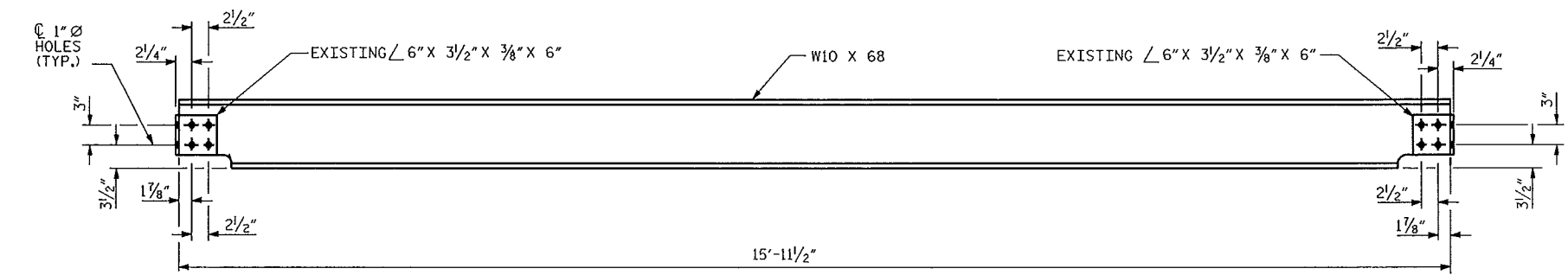
ELEVATION

FB 2

(FLOOR BEAM B, D, F, H)



PLAN - TOP FLANGE



ELEVATION

FB 3

(FLOOR BEAM C, E, G)

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 CHECKED BY : D. MULLER DATE : 8/2013  
 DESIGN ENGINEER OF RECORD : W. M. CLARKE DATE : 8/2013

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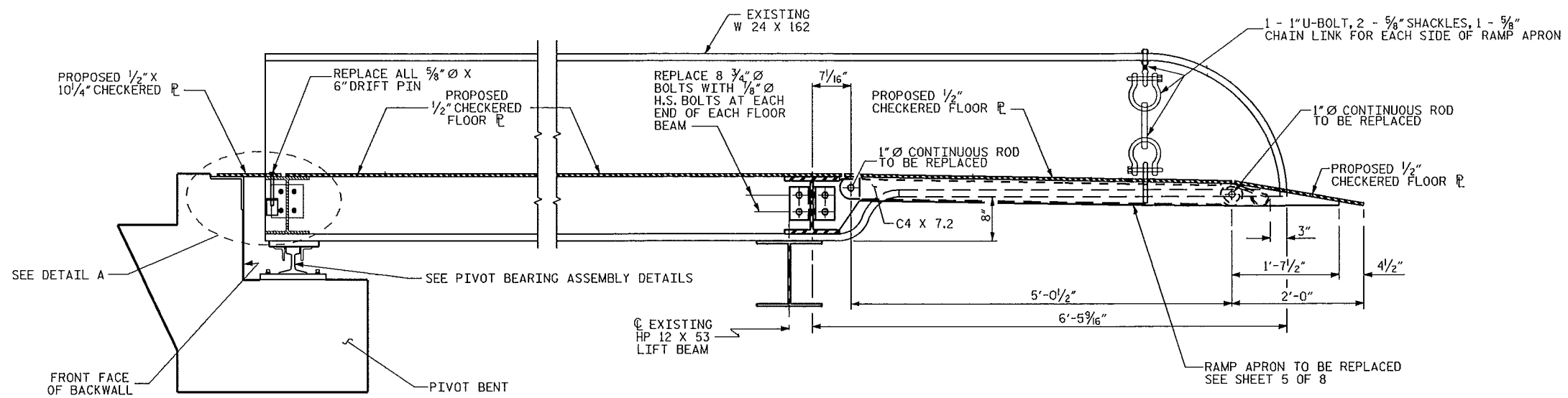
PROJECT NO. F-5506  
 DARE COUNTY  
 BRIDGE NO: 44, 45 & 46

SHEET 3 OF 8

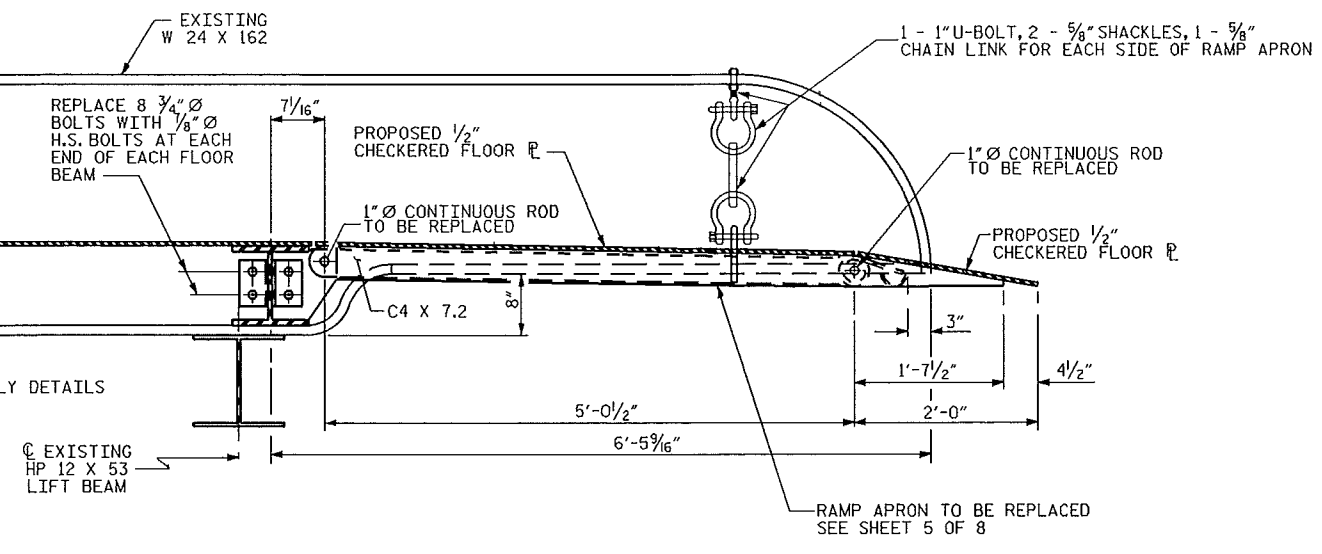
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

FLOORBEAMS  
 FB2 & FB3

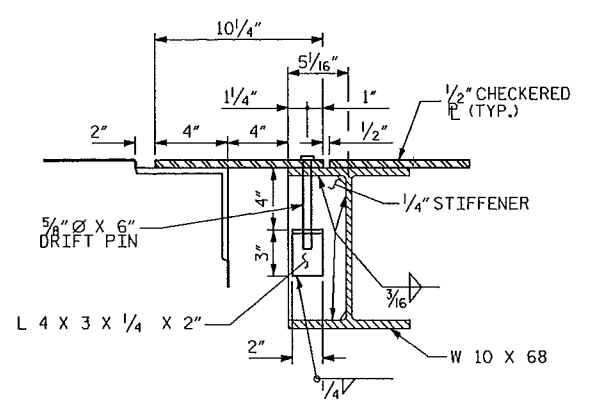
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
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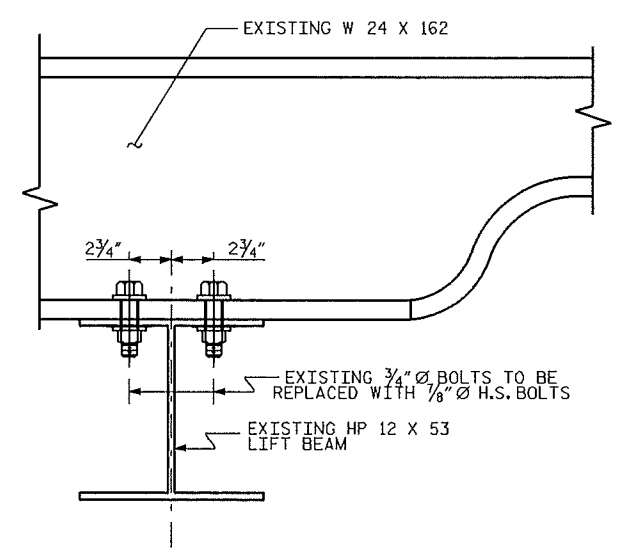
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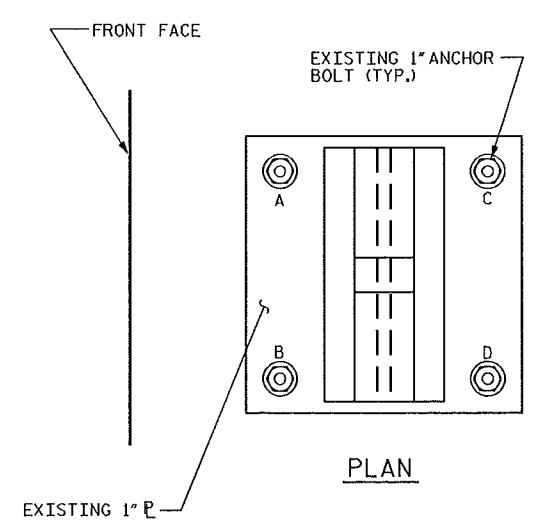
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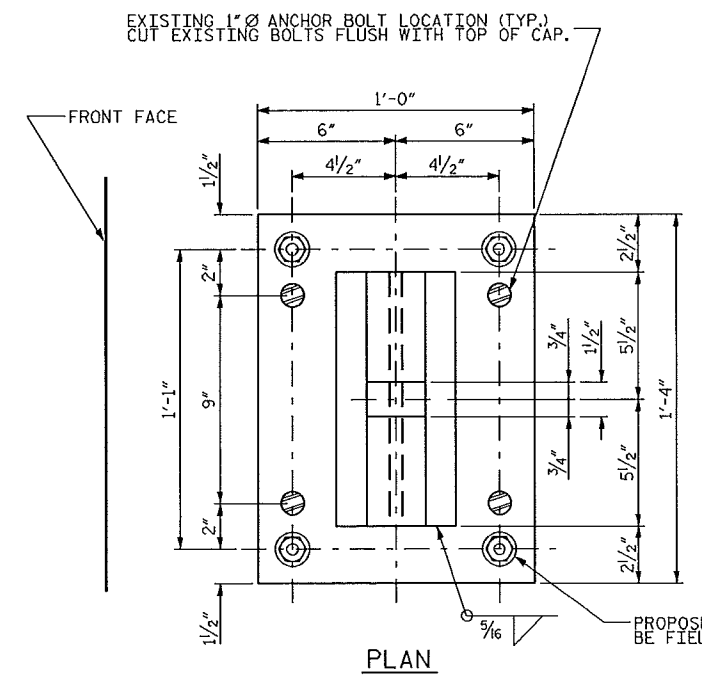
DETAIL A



DETAIL B



PLAN

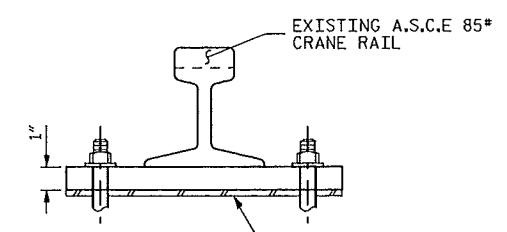


PLAN

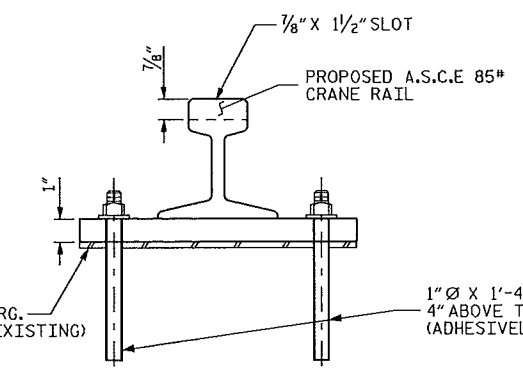
**NOTES**

EXISTING SHIM PLATES ARE LOCATED BELOW VARIOUS EXISTING PIVOT BEARINGS. IF SHIMS ARE PRESENT THEY SHALL BE RETAINED AND REUSED AFTER CLEANING AND PAINTING. THE CONTRACTOR IS TO MATCH THE EXISTING PIVOT BEARING ELEVATION.

PROPOSED PREFORMED BRG. PAD IS CONSIDERED INCIDENTAL TO THE BEARING ASSEMBLY. PAYMENT SHALL BE CONSIDERED INCIDENTAL TO THE PAYMENT FOR BEARING ASSEMBLY REPLACEMENT.



ELEVATION EXISTING



ELEVATION PROPOSED

PIVOT BEARING ASSEMBLY DETAILS

BEARING REPAIR		
STRUCTURE	PIVOT BEARING	DESCRIPTION
RAMP #44 (SOUTH)	SOUTH	REPLACE ANCHOR BOLT NUTS A & B
RAMP #45 (MIDDLE)	NORTH & SOUTH	REPLACE BRG. P, PREFORMED PAD, ANCHOR BOLTS, AND CRANE RAIL.
RAMP #46 (NORTH)	NORTH & SOUTH	REPLACE BRG. P, PREFORMED PAD, ANCHOR BOLTS, AND CRANE RAIL.

PROJECT NO. F-5506  
 DARE COUNTY  
 BRIDGE NO: 44, 45 & 46

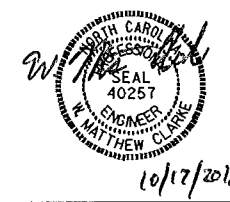
SHEET 4 OF 8

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

HATTERAS FERRY RAMPS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS 26
2			4			

DRAWN BY: W.M. CLARKE DATE: 7/2013  
 CHECKED BY: D. MULLER DATE: 8/2013  
 DESIGN ENGINEER OF RECORD: W. M. CLARKE DATE: 8/2013



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 wclarke

NOTES

ALL PLATES, CHANNELS, AND RODS OF APRON ASSEMBLIES SHALL BE HOT DIPPED GALVANIZED TO AASHTO M111 AFTER FABRICATION.

WASHERS AND OTHER HARDWARE SHALL BE HOT DIPPED GALVANIZED TO AASHTO M232.

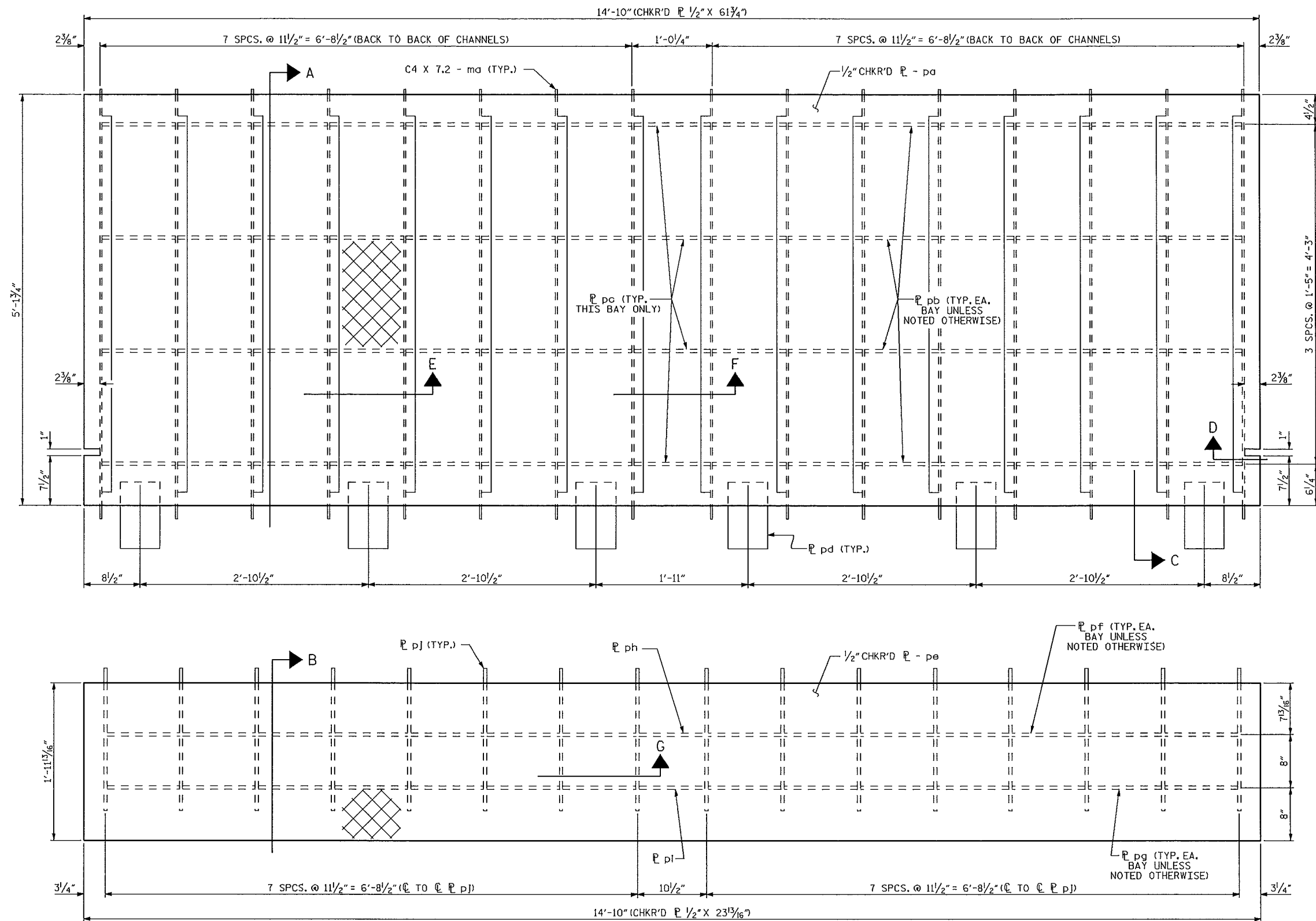
SEAL ALL WELDS PRIOR TO GALVANIZING.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 36.

WASHERS TO BE AASHTO M293 TYPE 1.

VERIFY DIMENSIONS IN FIELD PRIOR TO FABRICATION TO ENSURE A PROPER FIT.

FOR PAINTING THE APRON, SEE SPECIAL PROVISION FOR CLEANING AND PAINTING EXISTING RAMPS.



RAMP APRON ASSEMBLIES

PROJECT NO. F-5506  
 DARE COUNTY  
 BRIDGE NO: 44, 45 & 46

SHEET 5 OF 8

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

APRON ASSEMBLIES



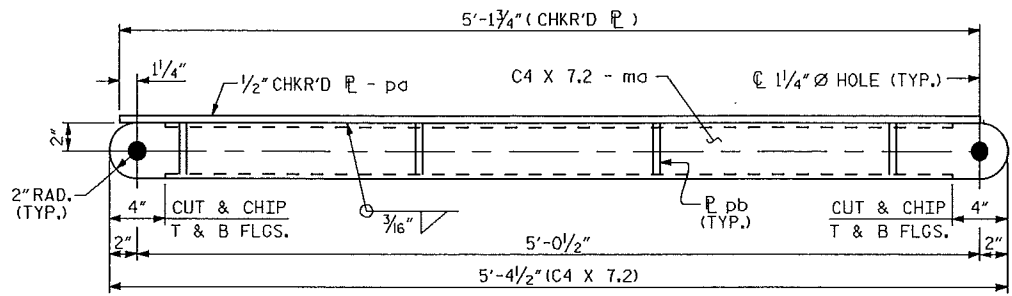
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DRAWN BY: W. M. CLARKE DATE: 8/2013  
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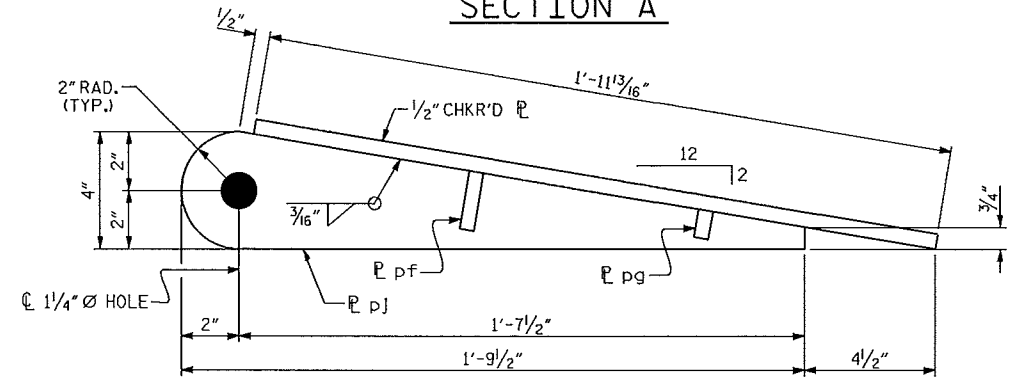
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
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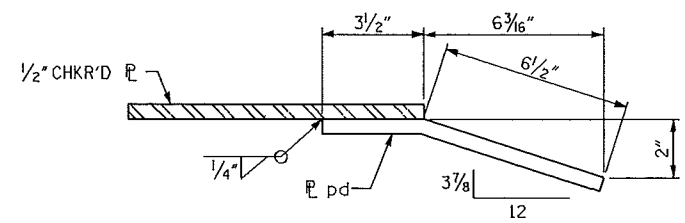




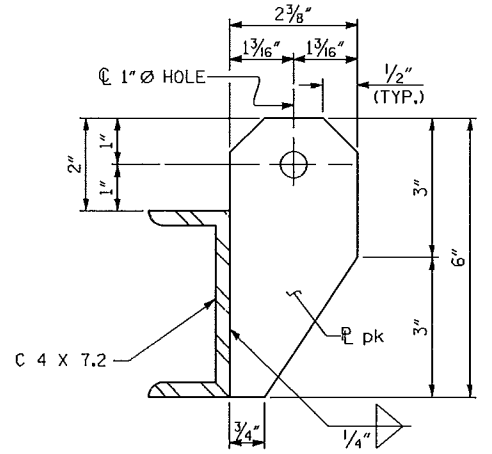
SECTION A



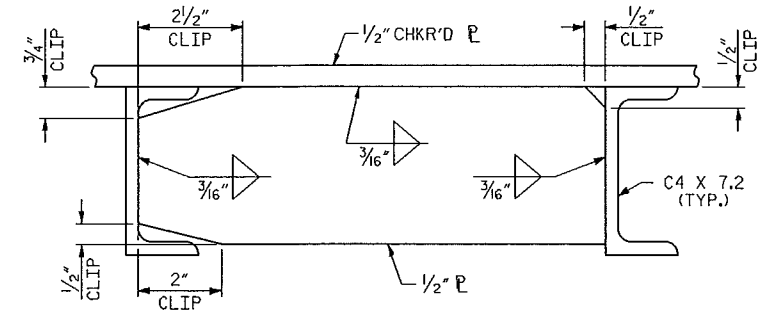
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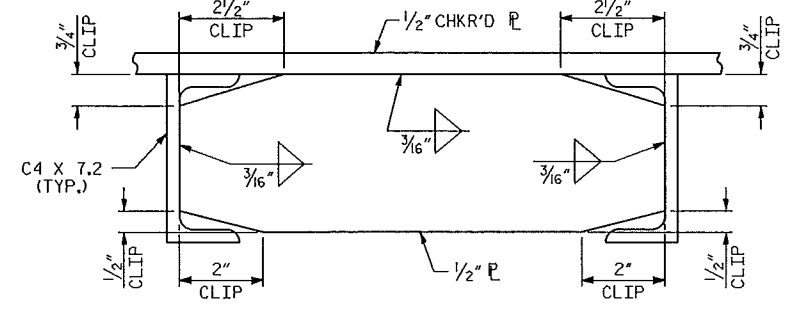
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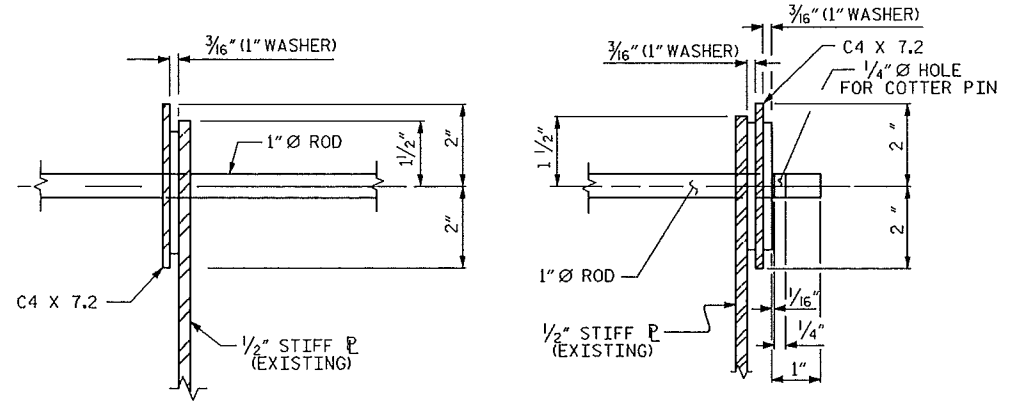
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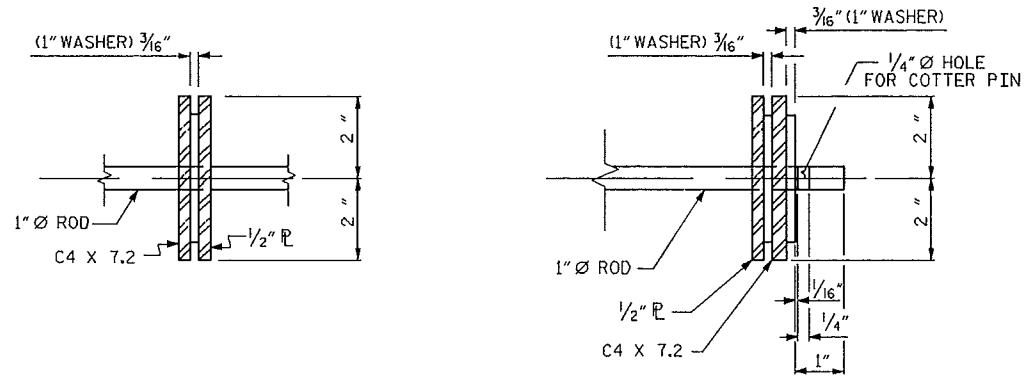
SECTION E



SECTION F



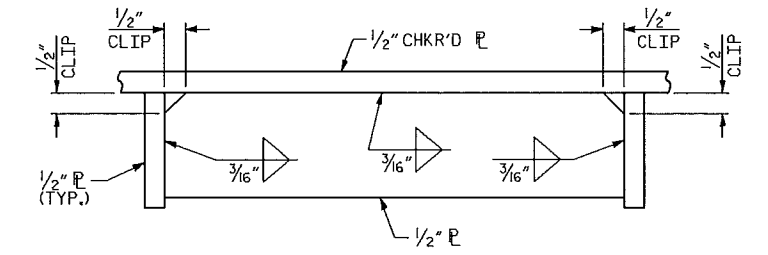
CONNECTION DETAILS @ EXISTING W10 X 68



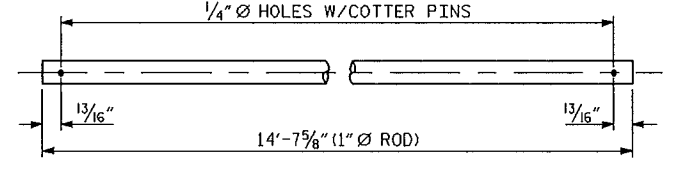
CONNECTION DETAILS BETWEEN RAMP APRON ASSEMBLIES

BILL OF MATERIAL			
(FOR ONE RAMP APRON, 3 REQ'D)			
PIECE	QTY.	SHAPE	LENGTH
pa	1	CPL 1/2" X 61 3/4"	14'-10"
pb	56	PL 1/2" X 3 3/4"	0'-11 3/16"
pc	4	PL 1/2" X 3 3/4"	0'-11 5/8"
pd	6	PL 1/2" X 6"	0'-10"
pe	1	CPL 1/2" X 23 13/16"	14'-10"
pf	14	PL 1/2" X 2"	0'-11"
pg	14	PL 1/2" X 1"	0'-11"
ph	1	PL 1/2" X 2"	0'-10"
pi	1	PL 1/2" X 1"	0'-10"
pj	16	PL 1/2" X 4"	1'-9 1/2"
pk	2	PL 1/2" X 2 3/8"	0'-6"
pa	16	C4 X 7.2	5'-4 1/2"
mb	36	1" STD. WASHERS	-
mc	4	1/4" COTTER PINS	-
ra	2	1" Ø ROD	14'-7 5/8"

NOTE: SEAL ALL WELDS PRIOR TO GALVANIZING.



SECTION G

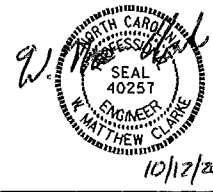


1" Ø RODS

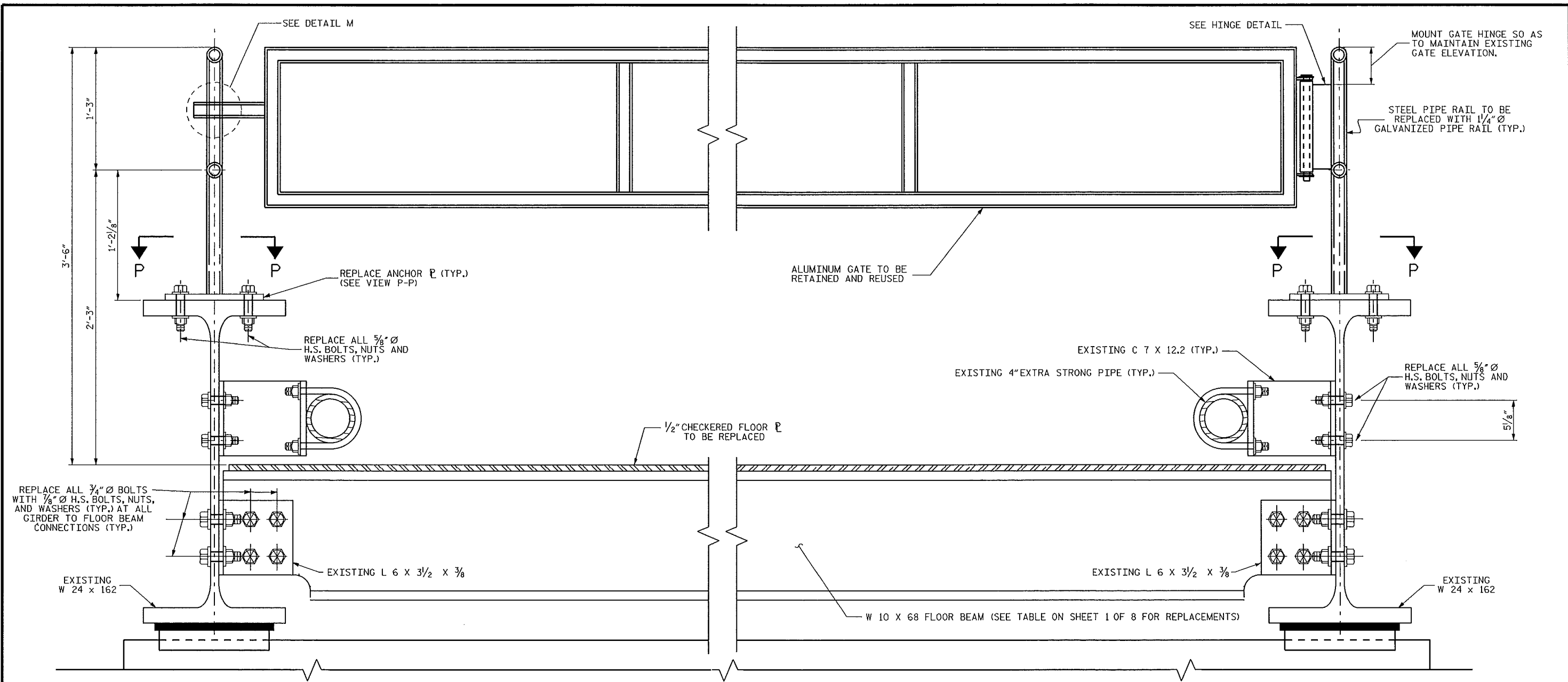
PROJECT NO. F-5506  
 DARE COUNTY  
 BRIDGE NO: 44, 45 & 46

SHEET 6 OF 8

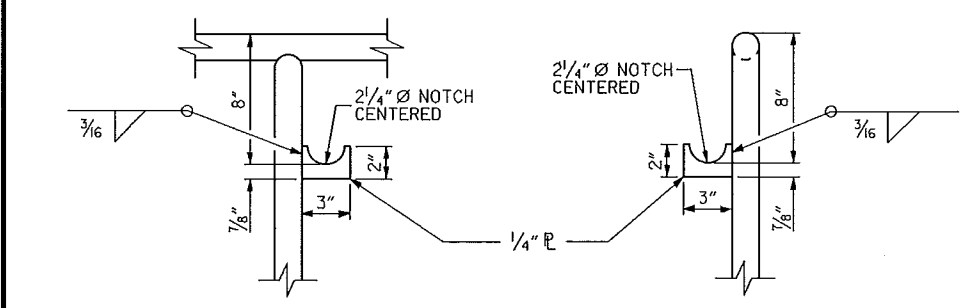
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH			
APRON DETAILS			
REVISIONS			
NO.	BY:	DATE:	NO.
1			3
2			4
SHEET NO. S-7			TOTAL SHEETS 26



DRAWN BY: W. M. CLARKE DATE: 8/2013  
 CHECKED BY: D. MULLER DATE: 8/2013  
 DESIGN ENGINEER OF RECORD: W. M. CLARKE DATE: 8/2013



**VIEW Z-Z**

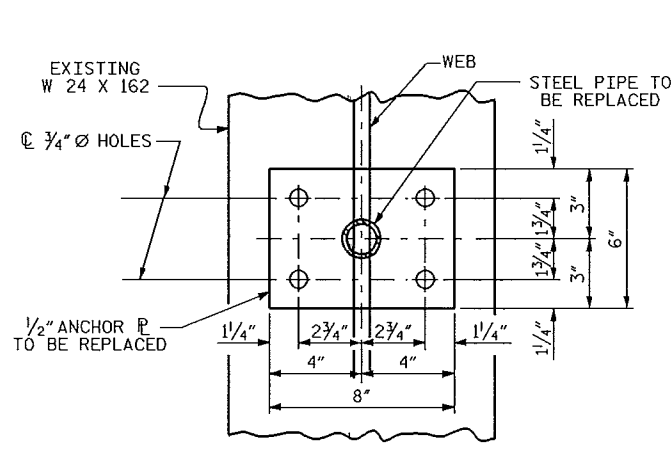


**DETAIL M**

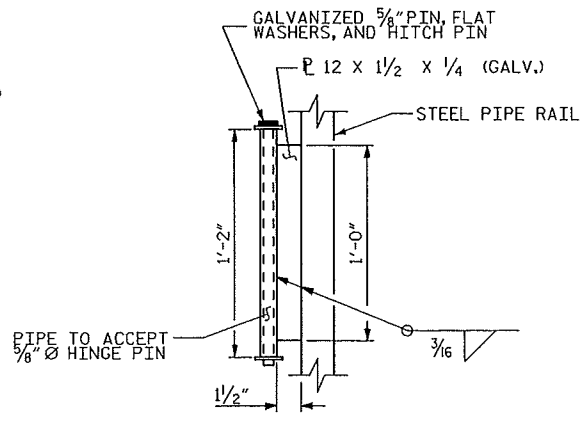
(CATCH USED WHEN GATE IS CLOSED)

**DETAIL N**

(CATCH USED WHEN GATE IS OPEN)

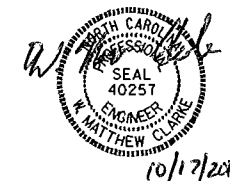


**VIEW P-P**



**HINGE DETAIL**

(CONTRACTOR TO FIELD VERIFY HINGE CONNECTION PRIOR TO FABRICATION; MATCH EXISTING WITH ENGINEER'S APPROVAL)



PROJECT NO. F-5506  
 DARE COUNTY  
 BRIDGE NO: 44, 45 & 46

SHEET 7 OF 8

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

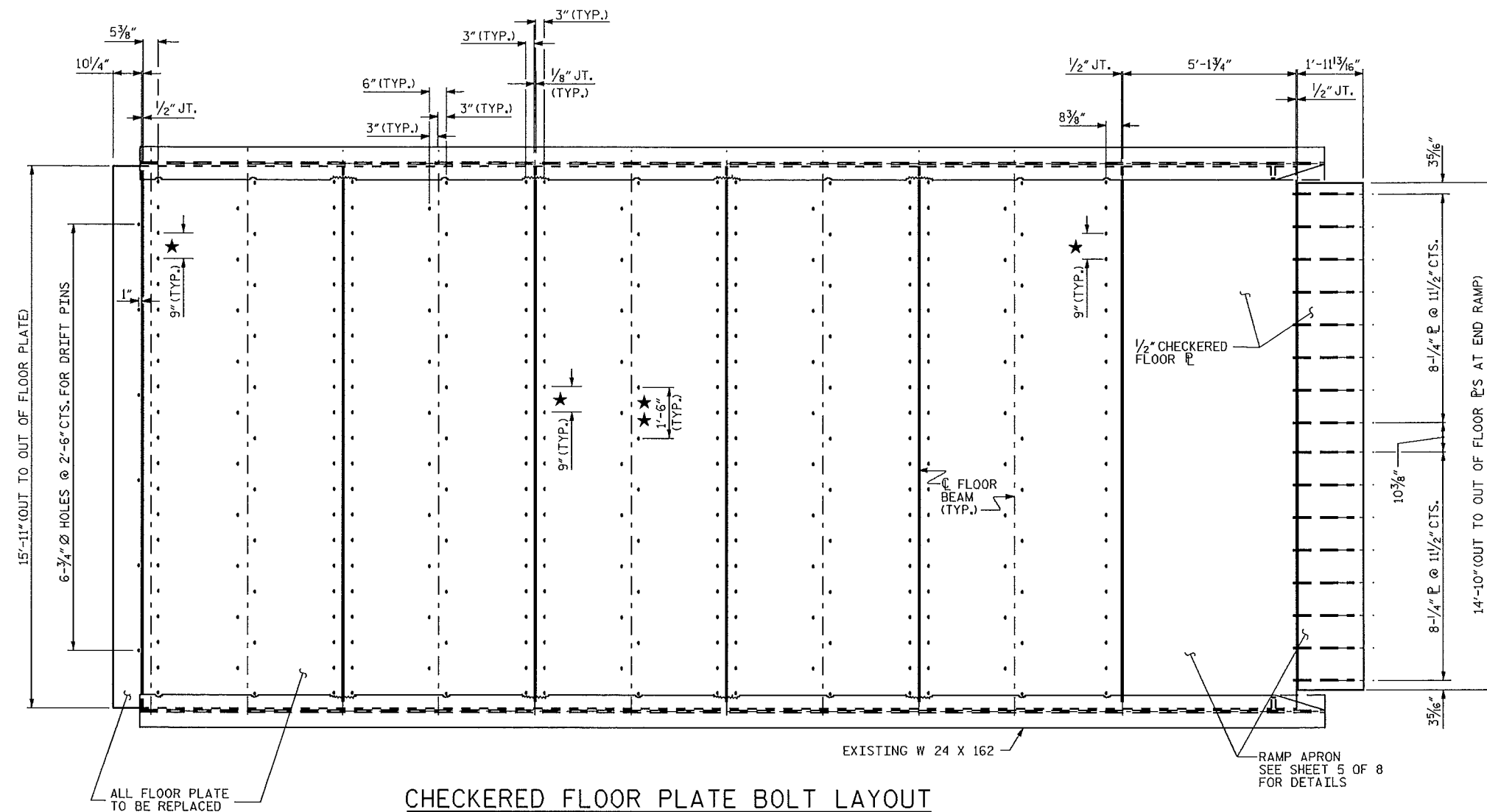
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DRAWN BY : W.M. CLARKE DATE : 7/2013  
 CHECKED BY : D. MULLER DATE : 8/2013  
 DESIGN ENGINEER OF RECORD: W. M. CLARKE DATE : 8/2013

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8	
1			3			TOTAL SHEETS 26	
2			4				

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 wclarke

STRUCTURAL STEEL SUMMARY (3 RAMPS)	
MEMBER	APPROX. WEIGHT (LBS.)
FLOOR BEAMS (FB1, FB2, FB3)	19,584
BOLTS, WASHERS, NUTS, STIFF. P'S	359
CHECKERED FLOOR PLATES (EXCL. APRON)	29,697
BOLTS, WASHERS, NUTS, DRIFT PINS	680
HANDRAILS	1,254
BOLTS, WASHERS, NUTS, ANCHOR P'S	472
HINGE HARDWARE, GATE CATCHES	22
RUB RAIL BOLTS, WASHERS, NUTS	43
LIFT BEAM BOLTS, WASHERS, NUTS	27
RAMP APRONS (FULL ASSEMBLIES)	10,766



**CHECKERED FLOOR PLATE BOLT LAYOUT**

- ★ 3/4" A307 SQUARE NECK CARRIAGE BOLTS @ 9" CTS.  
(TYP. ALL FLOOR P'S @ JOINTS UNLESS OTHERWISE NOTED)
- ★★ 3/4" A307 SQUARE NECK CARRIAGE BOLTS @ 1'-6" CTS.  
(TYP. ALL FLOOR P'S @ MID-SPAN UNLESS OTHERWISE NOTED)

NOTE: THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF ALL BOLT LOCATIONS PRIOR TO FABRICATION

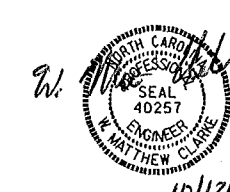
PROJECT NO. F-5506  
 DARE COUNTY  
 BRIDGE NO: 44, 45 & 46

SHEET 8 OF 8

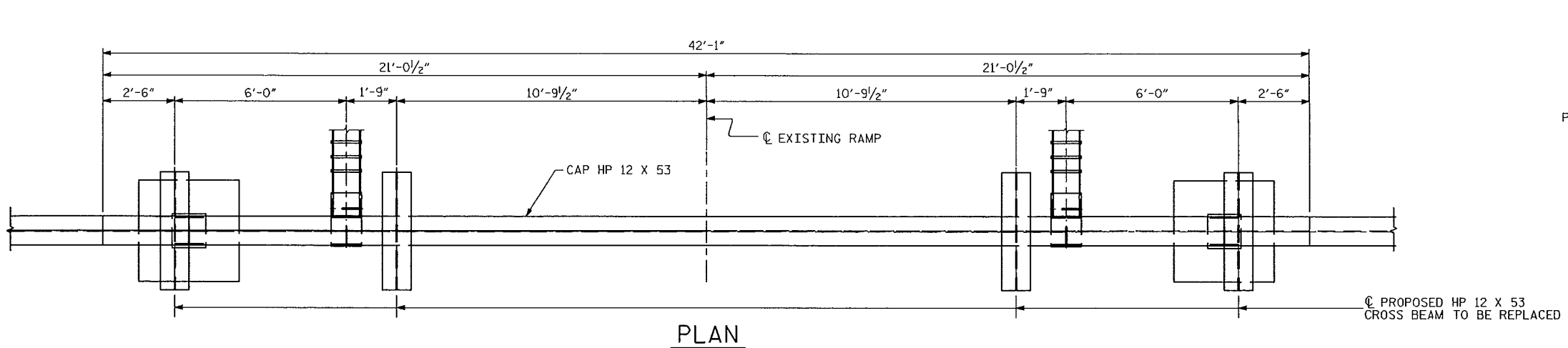
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**CHECKERED FLOOR PLATE**

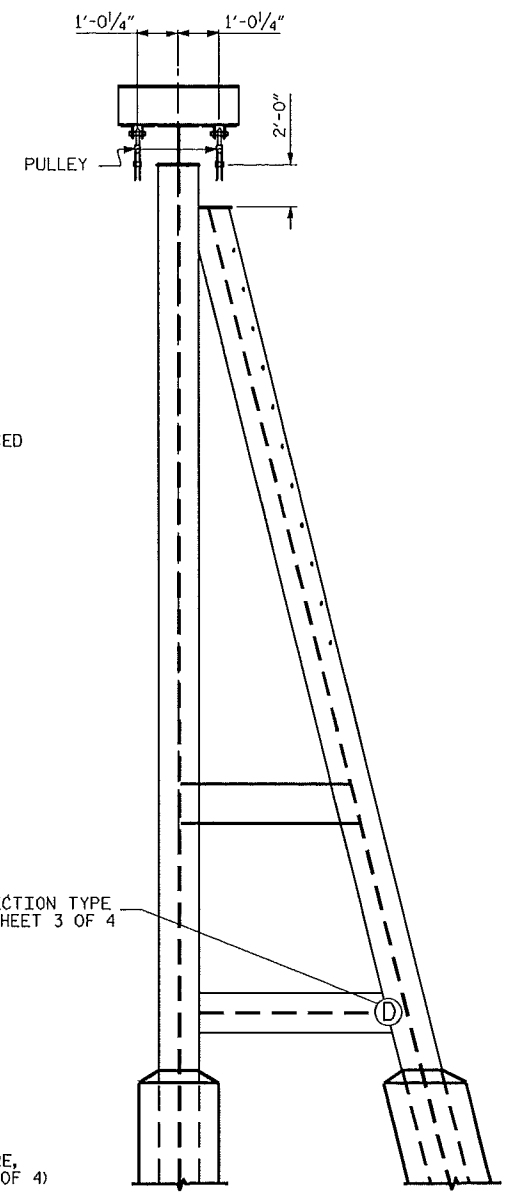
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2			4			26



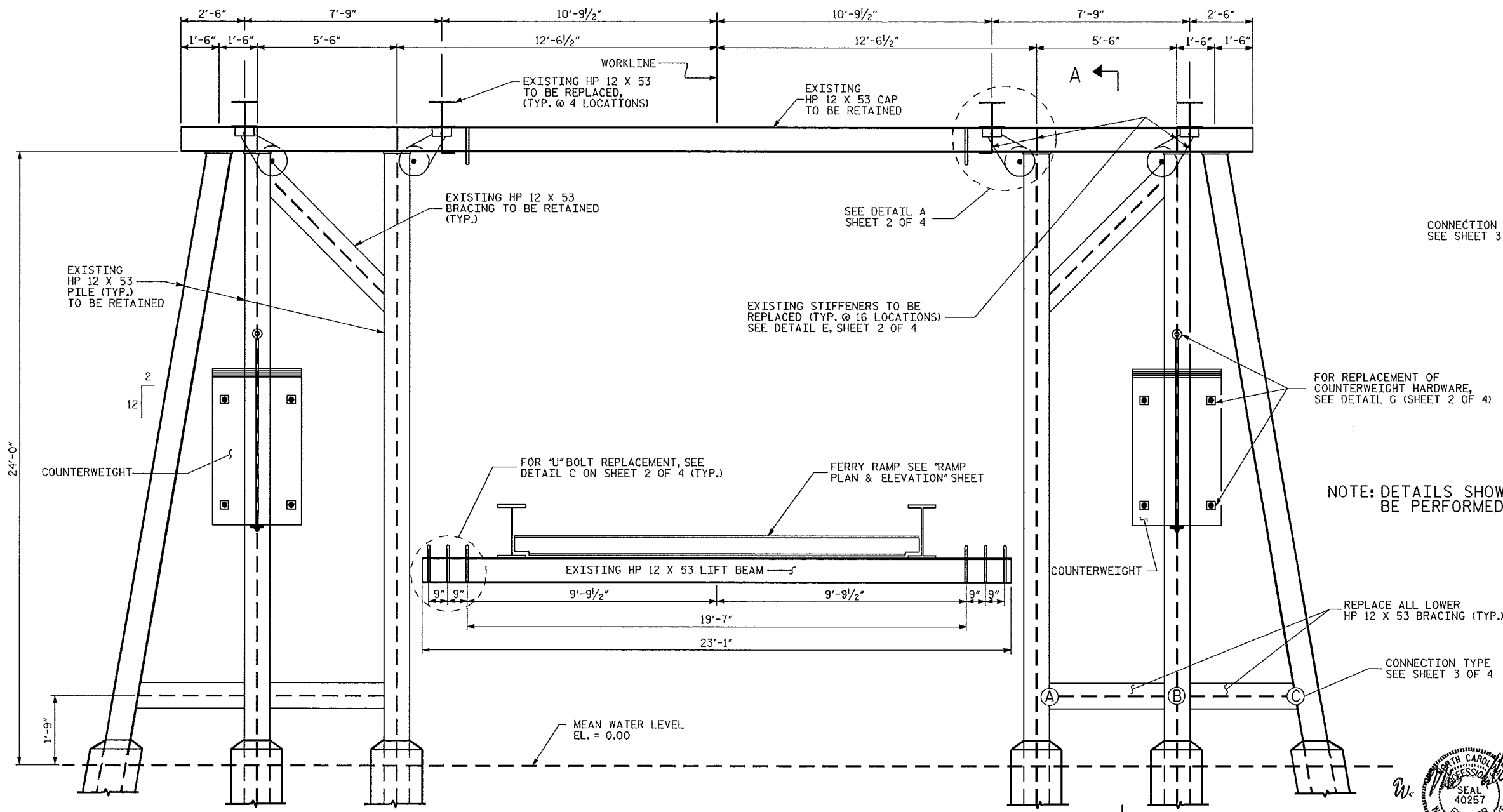
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 CHECKED BY: D. MULLER DATE: 8/2013  
 DESIGN ENGINEER OF RECORD: W. M. CLARKE DATE: 8/2013



PLAN



VIEW A-A



ELEVATION

NOTE: DETAILS SHOWN ON SHEETS 1-4 TO BE PERFORMED ON EACH RAMP.

PROJECT NO. F-5506  
DARE COUNTY  
 BRIDGE NO: 44, 45 & 46

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 HATTERAS FERRY RAMPS  
 LIFT BENT

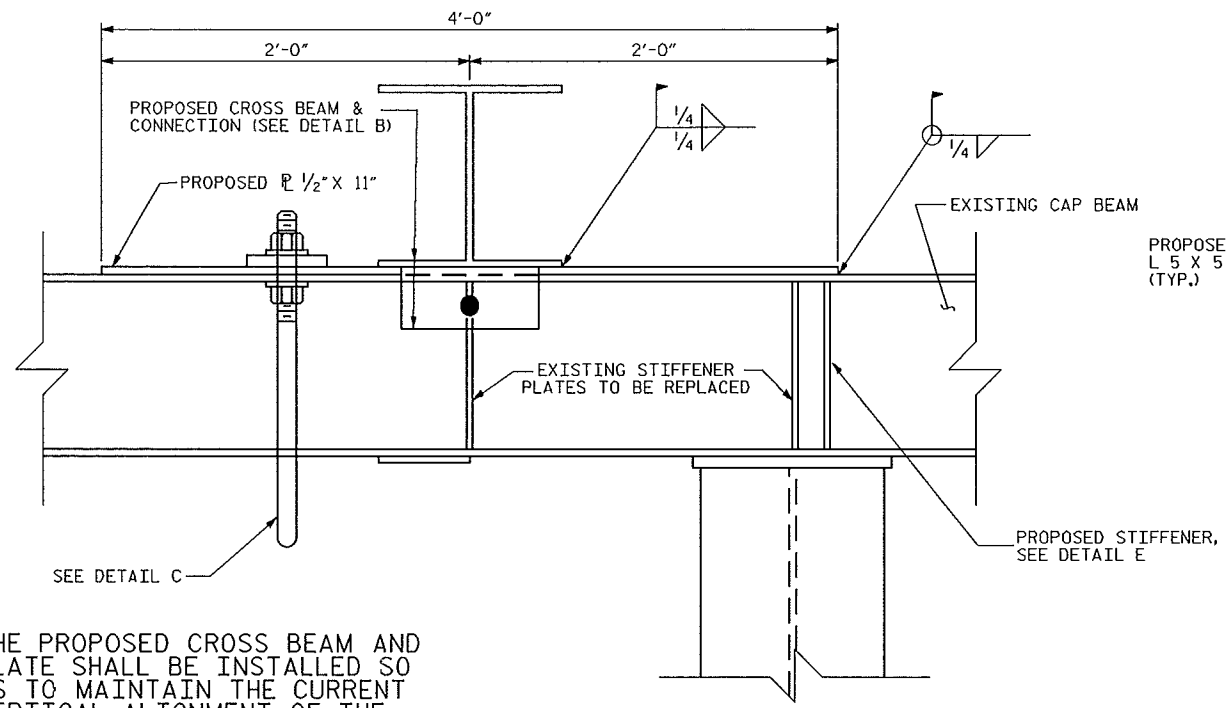


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 DESIGN ENGINEER OF RECORD: W. M. CLARKE DATE: 8/2013

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 wclarke

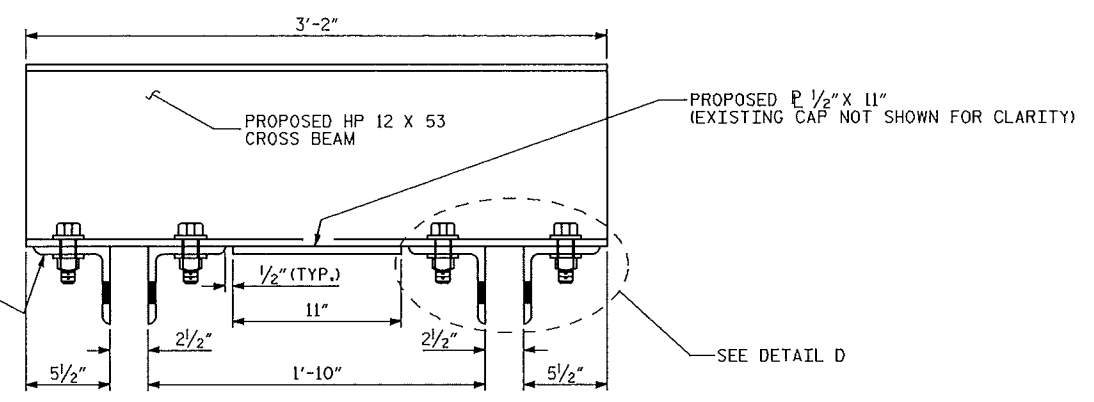
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2			4			SHEETS	

10/17/2013

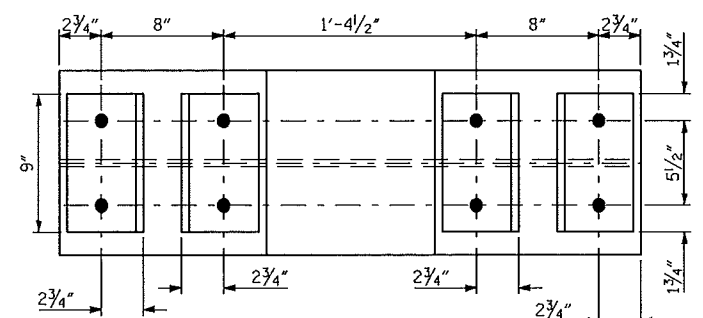


NOTE: THE PROPOSED CROSS BEAM AND PLATE SHALL BE INSTALLED SO AS TO MAINTAIN THE CURRENT VERTICAL ALIGNMENT OF THE LIFT CABLE

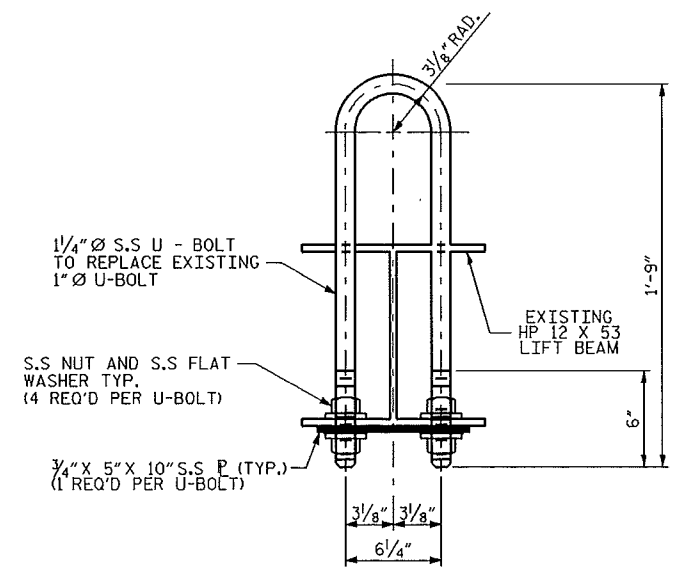
**DETAIL A**  
(PULLEY NOT SHOWN FOR CLARITY)



**ELEVATION**

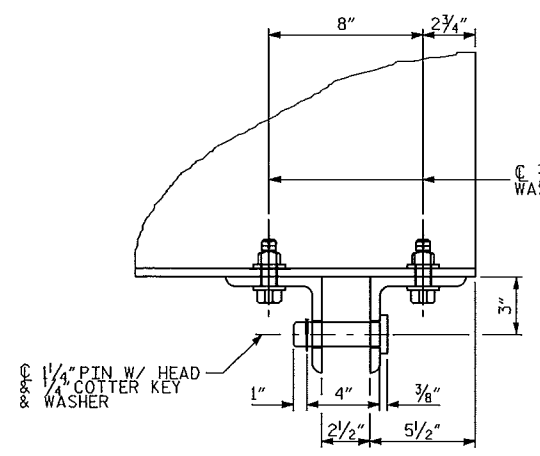


**DETAIL B**  
(4 REQ'D PER LIFT BENT)

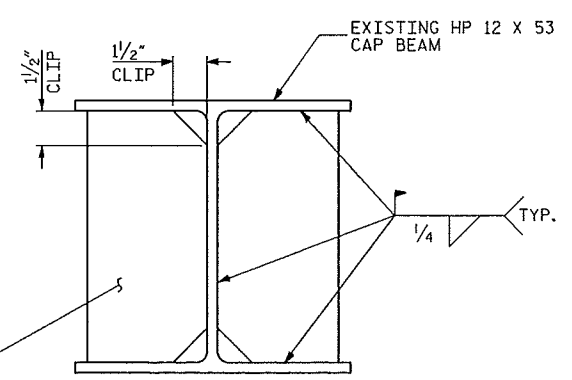


**DETAIL C**

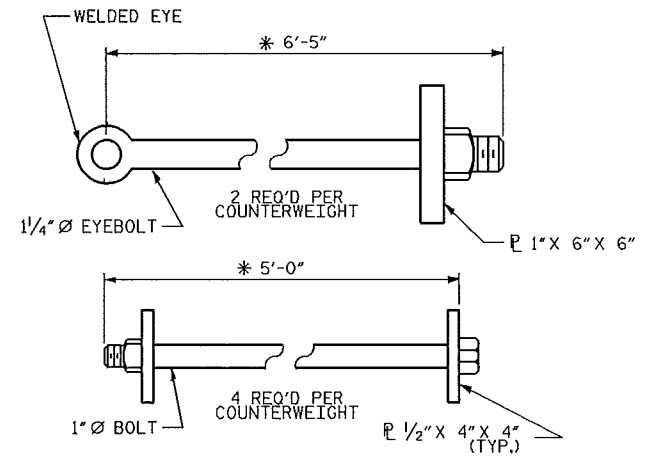
NOTE: REPLACE 8 U-BOLTS ON EACH LIFT BENT



**DETAIL D**



**DETAIL E**



\* CONTRACTOR TO FIELD VERIFY

**DETAIL G**

ALL COUNTERWEIGHT HARDWARE TO BE TYPE 316 STAINLESS STEEL.  $1 \text{"} \phi$  BOLTS &  $\frac{1}{4} \text{'}$  EYEBOLTS SHALL BE IN ACCORDANCE WITH ASTM F-593 GROUP 2.



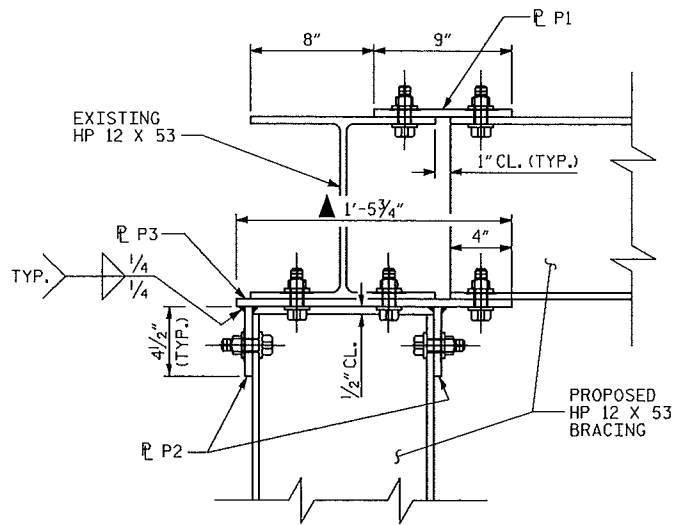
10/17/2013

PROJECT NO. F-5506  
 DARE COUNTY  
 BRIDGE NO: 44, 45 & 46

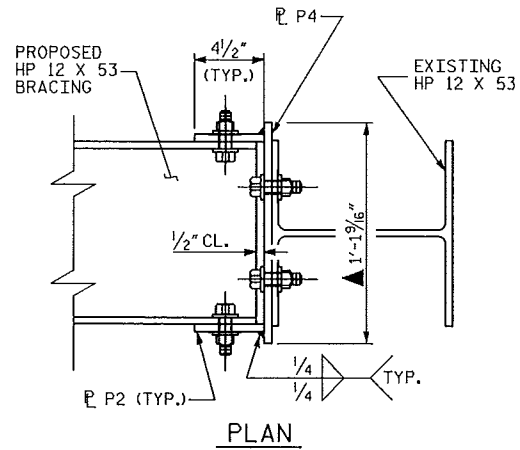
SHEET 2 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
LIFT BENT DETAILS						S-11
REVISIONS						TOTAL SHEETS
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2			4			

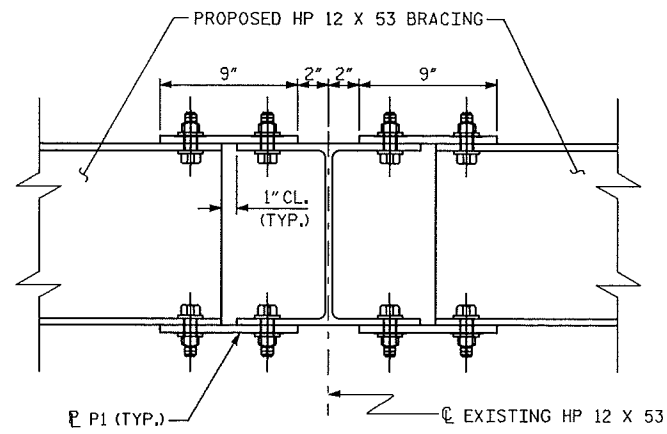
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 CHECKED BY : D. MULLER DATE : 8/2013  
 DESIGN ENGINEER OF RECORD : W. M. CLARKE DATE : 8/2013



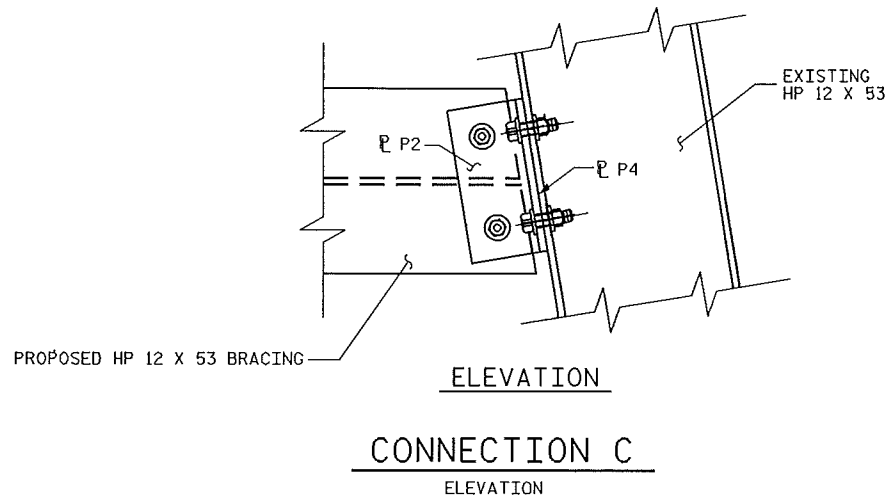
**CONNECTION A**  
PLAN VIEW



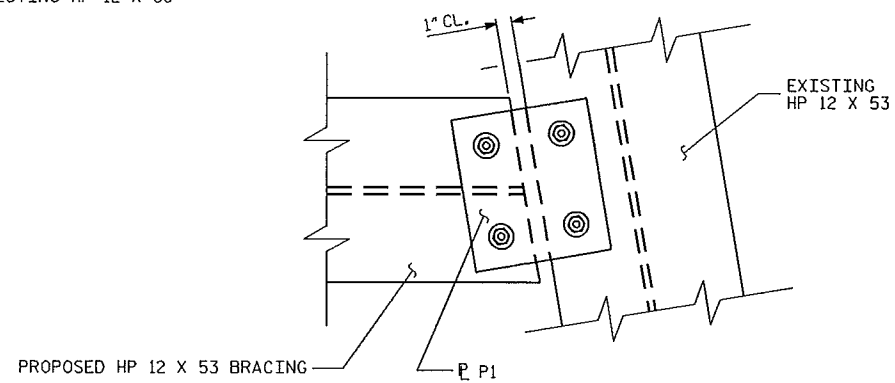
**CONNECTION C**  
PLAN



**CONNECTION B**  
PLAN VIEW



**CONNECTION C**  
ELEVATION



**CONNECTION D**  
ELEVATION

STRUCTURAL STEEL SUMMARY (3 LIFT BENTS)	
MEMBER	APPROX. WEIGHT (LBS.)
CROSS BEAMS, SHEAVE ANGLES, 1/2" PS	3,500
BOLTS, WASHERS, NUTS, PINS	102
LOWER BRACING (HP 12 X 53)	4,374
LOWER BRACING CONNECTION PS	1,040
BOLTS, WASHERS, NUTS	197
HP 12 X 53 CAP STIFF, PS	309
U-BOLTS, WASHERS, NUTS, PS	696
COUNTERWEIGHT EYE BOLTS, NUTS, PS	480
COUNTERWEIGHT BOLTS, NUTS, PS	432

▲ SEE NOTE ON SHEET 4 OF 4  
NOTE: FOR CONNECTION PLATE DETAILS AND DIMENSIONS SEE SHEET 4 OF 4

DRAWN BY : W. M. CLARKE DATE : 7/2013  
CHECKED BY : D. MULLER DATE : 8/2013  
DESIGN ENGINEER OF RECORD : W. M. CLARKE DATE : 8/2013

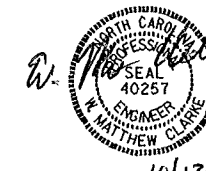
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PROJECT NO. F-5506  
DARE COUNTY  
BRIDGE NO: 44, 45 & 46

SHEET 3 OF 4

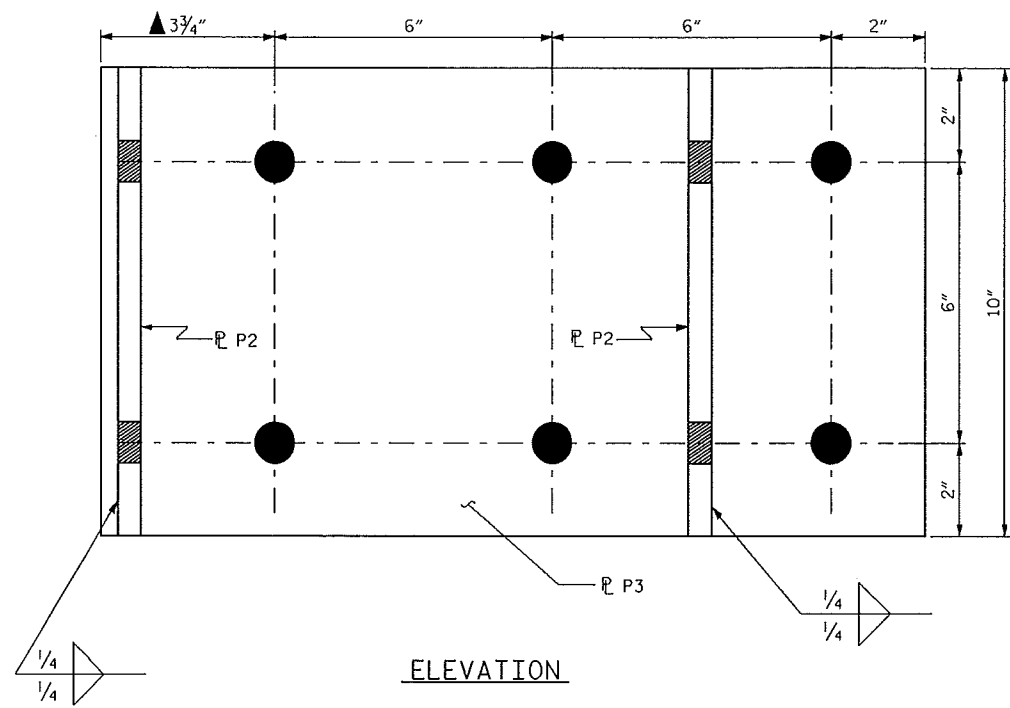
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

LIFT BENT BRACING  
CONNECTIONS

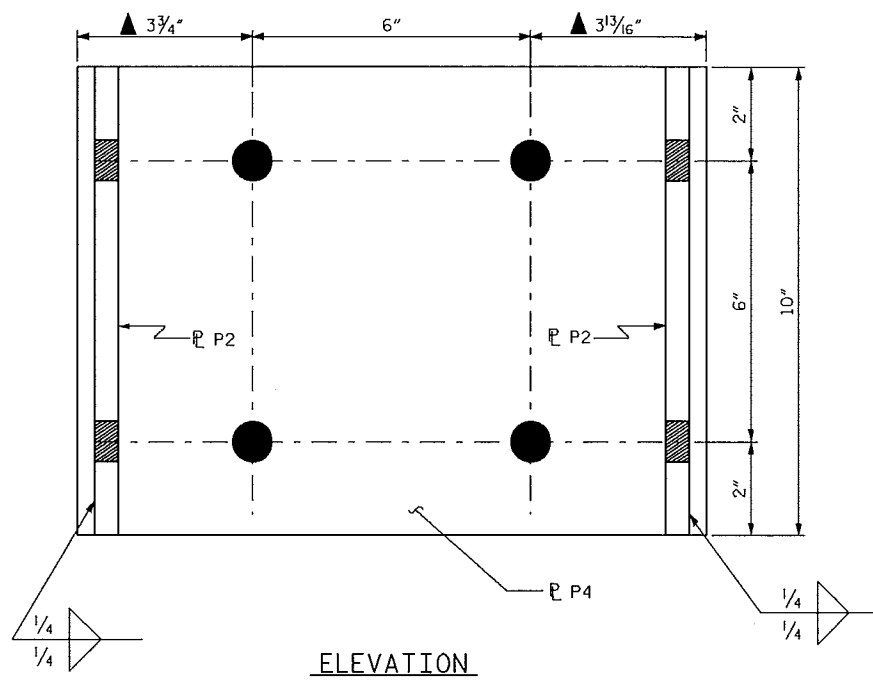


10/17/2013

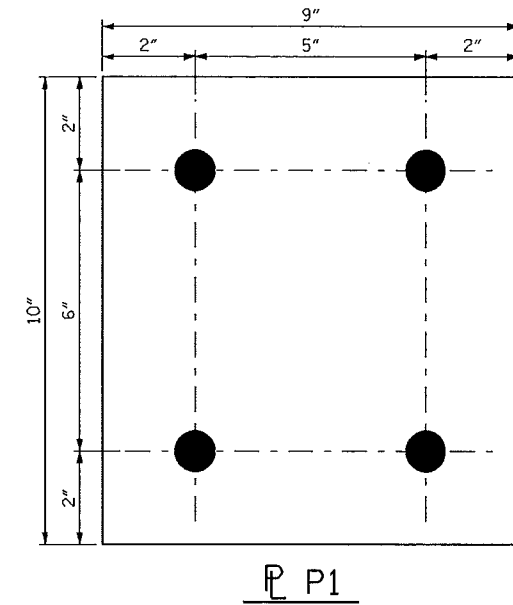
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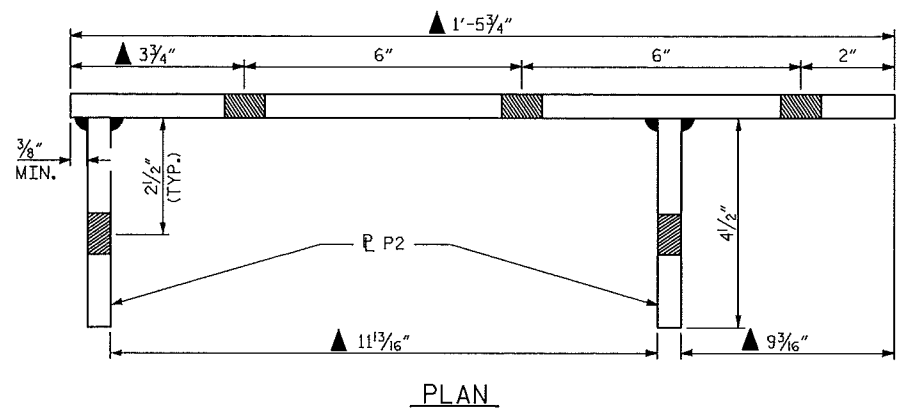
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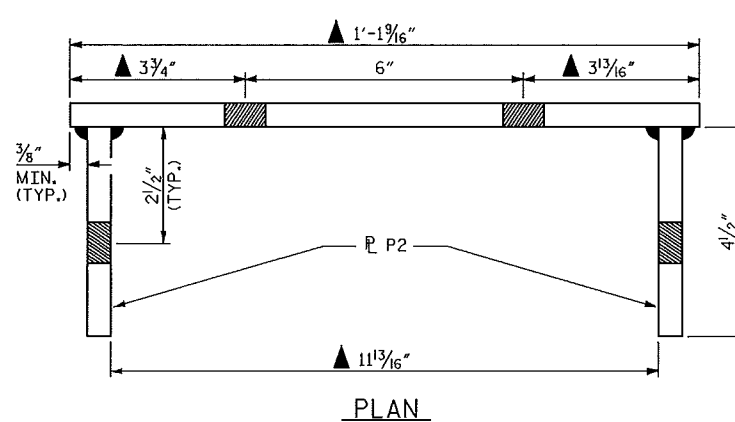
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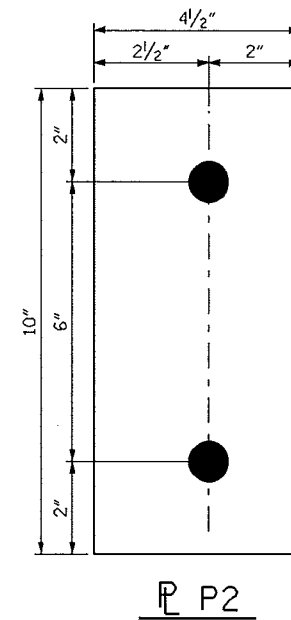
P1



PLAN  
CONNECTION A  
(LOWER PORTION)



PLAN  
CONNECTION C

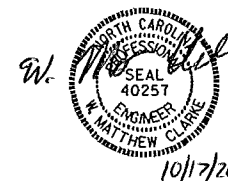


P2

▲ THE FABRICATOR IS TO VERIFY THE BRACING DIMENSIONS PRIOR TO CONNECTION ASSEMBLY

CONNECTION NOTES

- ALL CONNECTION PLATES SHALL BE 1/2" THICK
- ALL BOLTS SHALL BE 3/4" Ø H.S. BOLTS
- ALL STRUCTURAL STEEL & H.S. BOLTS SHALL BE GALVANIZED
- CONNECTOR PLATES SHALL BE SHOP FABRICATED; HOLES IN PROPOSED BRACING AND EXISTING PILES SHALL BE FIELD DRILLED TO ENSURE ALIGNMENT. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF EXISTING PILE ALIGNMENT.



PROJECT NO. F-5506  
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 BRIDGE NO: 44, 45 & 46

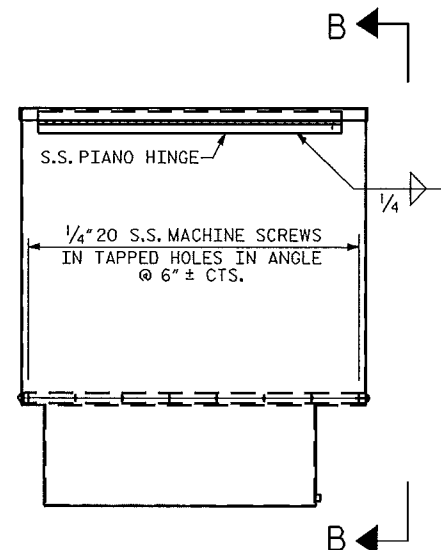
SHEET 4 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
LIFT BENT BRACING CONNECTION DETAILS						S-13
REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	26
1			3			
2			4			

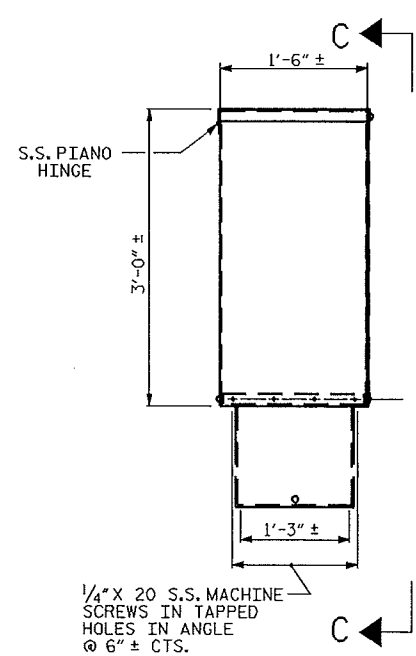
DRAWN BY: W. M. CLARKE DATE: 7/2013  
 CHECKED BY: D. MULLER DATE: 8/2013  
 DESIGN ENGINEER OF RECORD: W. M. CLARKE DATE: 8/2013

**NOTES**

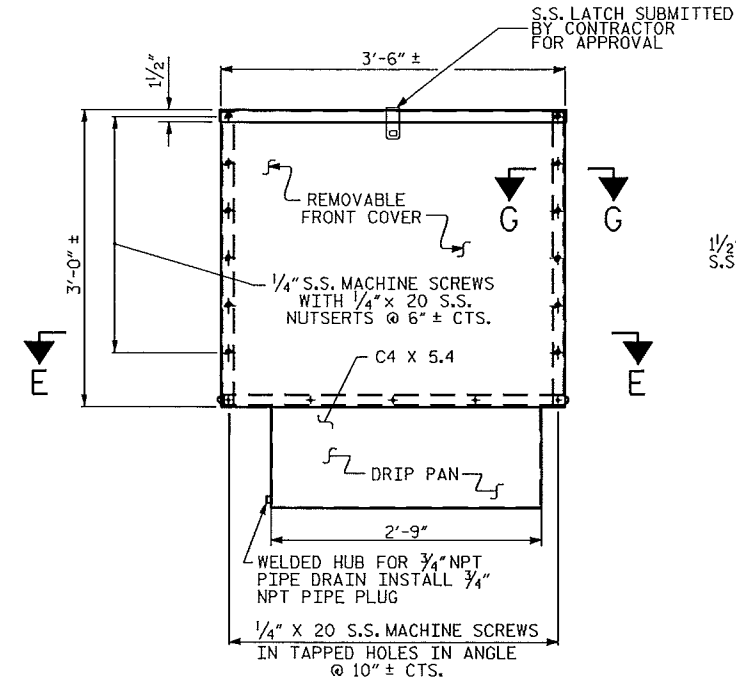
ALL DIMENSIONS ARE TO BE VERIFIED BY CONTRACTOR TO ENSURE HYDRAULIC UNIT PROPOSED WILL BE COMPATIBLE WITH BOX SIZE.  
 ALL TUBING MATERIALS FOR RAMP LIFT AND LUBRICATION SYSTEM TO BE STAINLESS STEEL, SEE SPECIAL PROVISION FOR MECHANICAL SPECIFICATIONS.  
 FOR HYDRAULIC SYSTEM, SEE SPECIAL PROVISION FOR MECHANICAL SPECIFICATIONS.



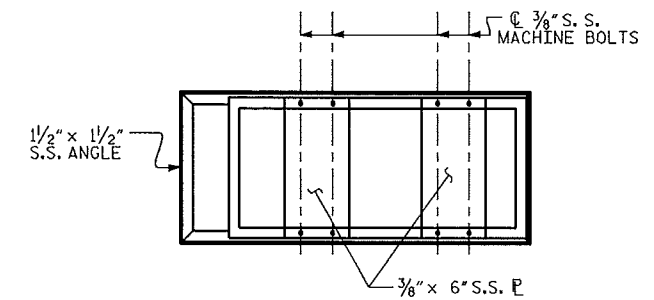
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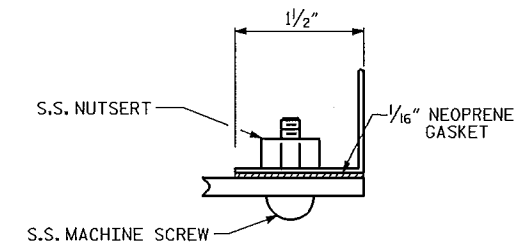
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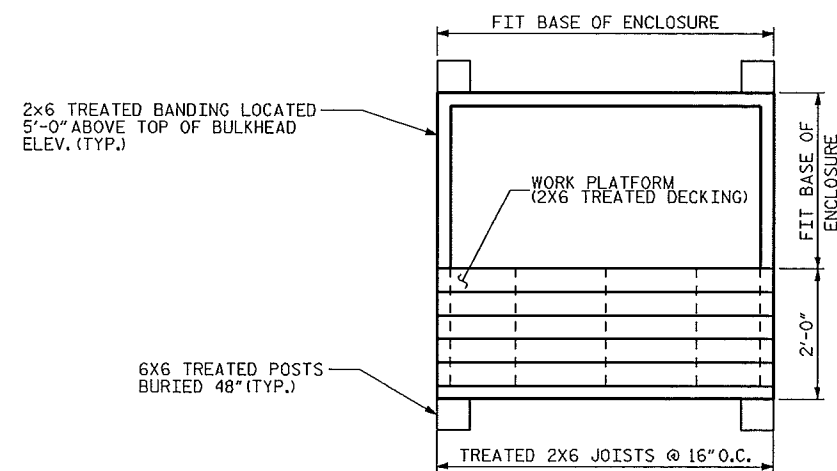
**VIEW C-C**



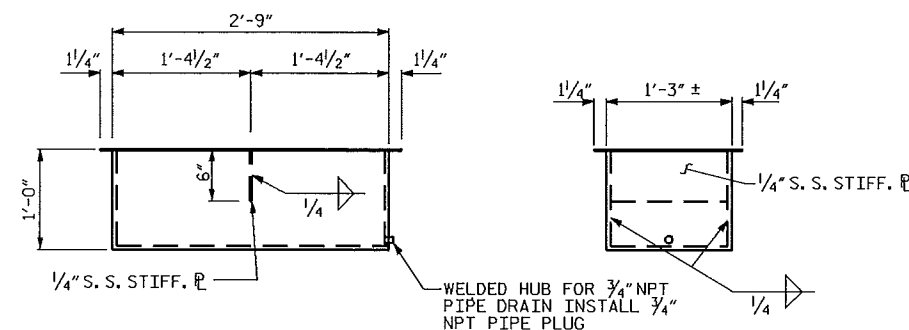
**SECTION E-E**



**SECTION G-G**



**POWER UNIT STAND**



**DRIP PAN DETAIL**

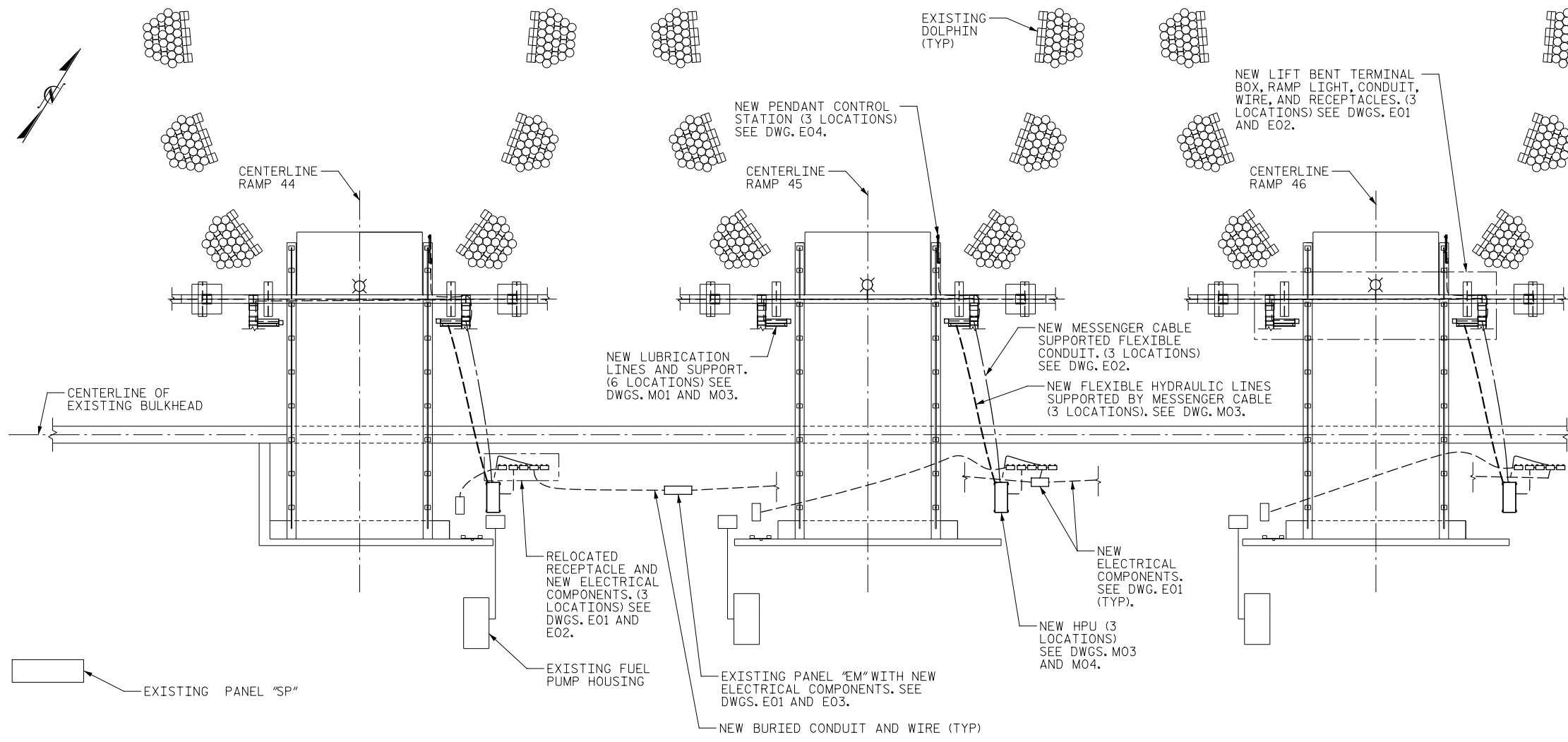
PROJECT NO. F-5506  
 DARE COUNTY  
 BRIDGE NO: 44, 45 & 46

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						HYDRAULIC POWER ENCLOSURE	
REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	
1			3			S-14	
2			4			TOTAL SHEETS 26	

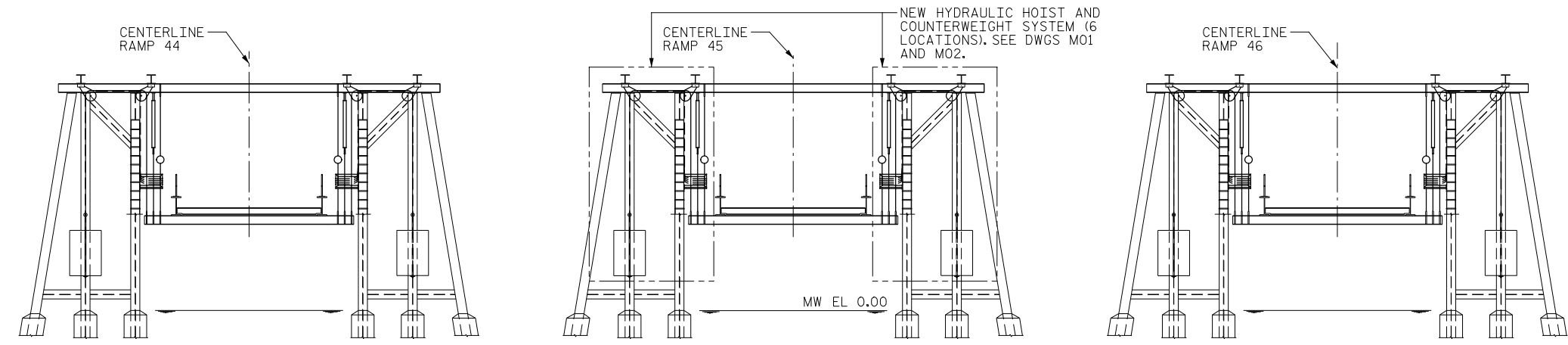
Professional Engineer Seal: Matthew Clarke, No. 40257, dated 10/17/2013.

DRAWN BY: W. M. CLARKE DATE: 9/2013  
 CHECKED BY: D. MULLER DATE: 9/2013  
 DESIGN ENGINEER OF RECORD: W. M. CLARKE DATE: 9/2013





**GENERAL PLAN**  
NOT TO SCALE



**GENERAL ELEVATION**  
NOT TO SCALE

**NOTES:**

1. FOR ADDITIONAL REQUIREMENTS, SEE THE SPECIAL PROVISIONS.
2. THE CONTRACTOR SHALL FIELD VERIFY EXISTING EQUIPMENT MEASUREMENTS PRIOR TO SUBMITTING SHOP DRAWINGS OF THE NEW MECHANICAL AND ELECTRICAL EQUIPMENT FOR APPROVAL.
3. REMOVAL, PROVIDING NEW EQUIPMENT, INSTALLATION, AND TESTING OF ALL MECHANICAL EQUIPMENT SHALL BE PAID FOR UNDER GENERIC STRUCTURE ITEM (MECHANICAL SYSTEM).
4. REMOVAL, PROVIDING NEW EQUIPMENT, INSTALLATION, AND TESTING OF ALL ELECTRICAL EQUIPMENT SHALL BE PAID FOR UNDER GENERIC STRUCTURE ITEM (ELECTRICAL SYSTEM).
5. ALL MECH/ELEC WORK SHALL BE PROPERLY COORDINATED WITH STRUCTURAL REPAIRS.

**SCOPE OF MECH. & ELEC. WORK:**

1. PRIOR TO ANY STRUCTURAL, MECHANICAL, AND ELECTRICAL WORK ON THE RAMP, INSTALL LOAD CELLS TO MEASURE AND RECORD THE IMBALANCE BETWEEN THE RAMP AND COUNTERWEIGHTS AT EACH RAMP. REMOVE LOAD CELLS AFTER TESTING.
2. SECURE RAMP IN THE RAISED POSITION WITH THE COUNTERWEIGHTS RESTING ON THE HORIZONTAL MEMBERS. CONTRACTOR TO PROVIDE NECESSARY DUNNAGE BETWEEN COUNTERWEIGHT AND HORIZONTAL MEMBERS TO SUPPORT COUNTERWEIGHT. THE ESTIMATED WEIGHT OF THE RAMP IS 45,000 LBS.
3. LOCKOUT/TAGOUT RAMP ELECTRICAL EQUIPMENT.
4. REMOVE ALL MECHANICAL EQUIPMENT. MECHANICAL EQUIPMENT INCLUDES HPUS, HYDRAULIC TUBING, HYDRAULIC CYLINDERS, SHEAVE BLOCKS, WIRE ROPE, LUBRICATION LINES, CHAINS, SHACKLES, AND ALL MISCELLANEOUS FASTENERS AND HARDWARE.
5. ALL HYDRAULIC CYLINDERS, HPUS, AND SHEAVE BLOCKS TO REMAIN PROPERTY OF HATTERAS ISLAND FERRY OPERATIONS. REMAINING MECHANICAL COMPONENTS SHALL BE PROPERLY DISPOSED OF BY THE CONTRACTOR IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS.
6. WHILE THE RAMP IS SECURED, REMOVE AND PROPERLY DISPOSE OF ALL ELECTRICAL EQUIPMENT (UNLESS NOTED ON THE PLANS TO KEEP EXISTING) IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS. ELECTRICAL EQUIPMENT INCLUDES CONDUIT, WIRE, RAMP LIGHTS, OUTLETS, CABINETS, AND ALL MISCELLANEOUS FASTENERS AND HARDWARE.
7. REMOVAL OF THE EXISTING MECHANICAL AND ELECTRICAL EQUIPMENT IS REQUIRED PRIOR TO BLASTING AND PAINTING OF THE RAMP AND LIFT BENT STRUCTURAL COMPONENTS. COMPLETE STRUCTURAL REPAIR SCOPE OF WORK PRIOR TO INSTALLATION OF THE NEW MECHANICAL AND ELECTRICAL EQUIPMENT ON THE RAMP. THE NEW CROSS BEAM BOLT HOLES FOR THE NEW ANGLES SHALL NOT BE DRILLED UNTIL INSTALLATION AND ALIGNMENT OF THE SHEAVE BLOCKS, WIRE, AND CYLINDERS ARE ACCEPTABLE. DRILL AND REAM FOR ANGLE BOLTS AND INSTALL NEW FASTENERS.
8. PROVIDE NEW MECHANICAL AND ELECTRICAL EQUIPMENT AS SPECIFIED IN THE PLANS AND SPECIAL PROVISIONS.
9. FOLLOWING INSTALLATION OF THE MECHANICAL AND ELECTRICAL EQUIPMENT, INSTALL LOAD CELLS TO MEASURE AND RECORD THE IMBALANCE BETWEEN THE RAMP AND COUNTERWEIGHTS AT EACH RAMP.
10. THE CONTRACTOR SHALL SUBMIT BALANCE CALCULATIONS, INCLUDING ANY NECESSARY ADJUSTMENTS, TO RESTORE THE IMBALANCE AT EACH CYLINDER TO BETWEEN 2,000 AND 2,200LBS.
11. AFTER MAKING NECESSARY BALANCE ADJUSTMENTS, USE LOAD CELLS TO VERIFY BALANCE CONDITION AT EACH RAMP. ADJUST AS NECESSARY TO ACHIEVE FINAL DESIRED BALANCE CONDITION AS APPROVED BY THE ENGINEER. ONCE COMPLETE, REMOVE LOAD CELLS.
12. FIELD TEST MECHANICAL AND ELECTRICAL EQUIPMENT. MAKE ANY NECESSARY ADJUSTMENTS FOR PROPER OPERATION. PERFORM FINAL ACCEPTANCE TESTING.

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 BRIDGE NO: 44, 45 & 46

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL PLAN  
SCOPE OF WORK**

**HATTERAS  
FERRY LANDING**

REVISIONS

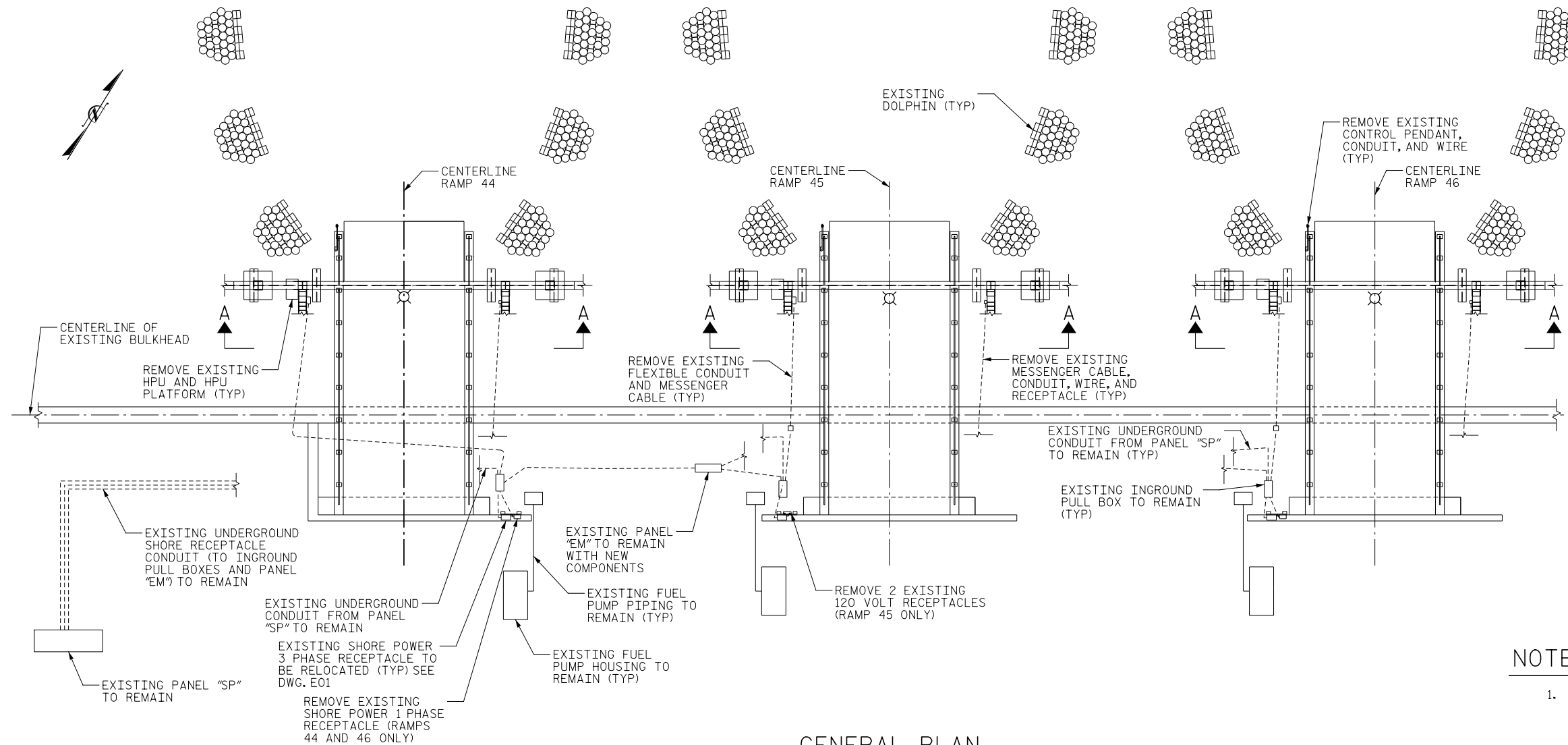
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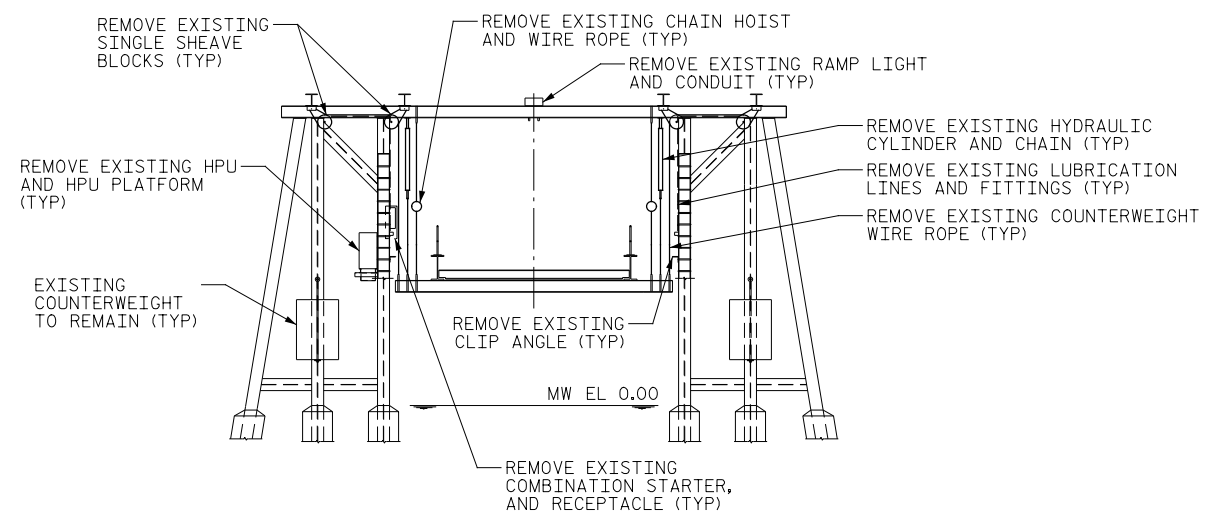
DRAWN BY: J. BIDDLE DATE: 10/11/13  
 CHECKED BY: D. NEELY DATE: 10/11/13  
 DESIGN ENGINEER OF RECORD: S. REYNOLDS DATE: 10/11/13

DWG NUMBER G01	TOTAL DWGS 10
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11 OCTOBER 2013



GENERAL PLAN



SECTION A-A

EXISTING HYDRAULIC LINES TO BE REMOVED (NOT SHOWN FOR CLARITY)

NOTES:

1. ALL EXISTING COMPONENTS THAT ARE TO REMAIN SHALL BE PROTECTED. THESE ITEMS INCLUDE, BUT ARE NOT LIMITED TO, WATER LINES, FUEL SYSTEM, COUNTERWEIGHT, IN GROUND PULL BOXES, AND CONDUIT.
2. THE CONTRACTOR SHALL REPAIR OR REPLACE, AS DIRECTED BY THE ENGINEER, ANY DAMAGE DONE TO THE EXISTING EQUIPMENT THAT IS TO REMAIN.
3. REFER TO STRUCTURAL DRAWINGS FOR DETAILS OF STRUCTURAL DEMOLITION.
4. UNLESS NOTED OTHERWISE, ALL ELEMENTS DEPICTED ON THIS SHEET ARE NOT TO SCALE.
5. FOR ADDITIONAL REQUIREMENTS, SEE THE SPECIAL PROVISIONS.

PROJECT NO. F-5506  
DARE COUNTY  
 BRIDGE NO: 44, 45 & 46

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 DEMOLITION PLAN  
 HATTERAS  
 FERRY LANDING

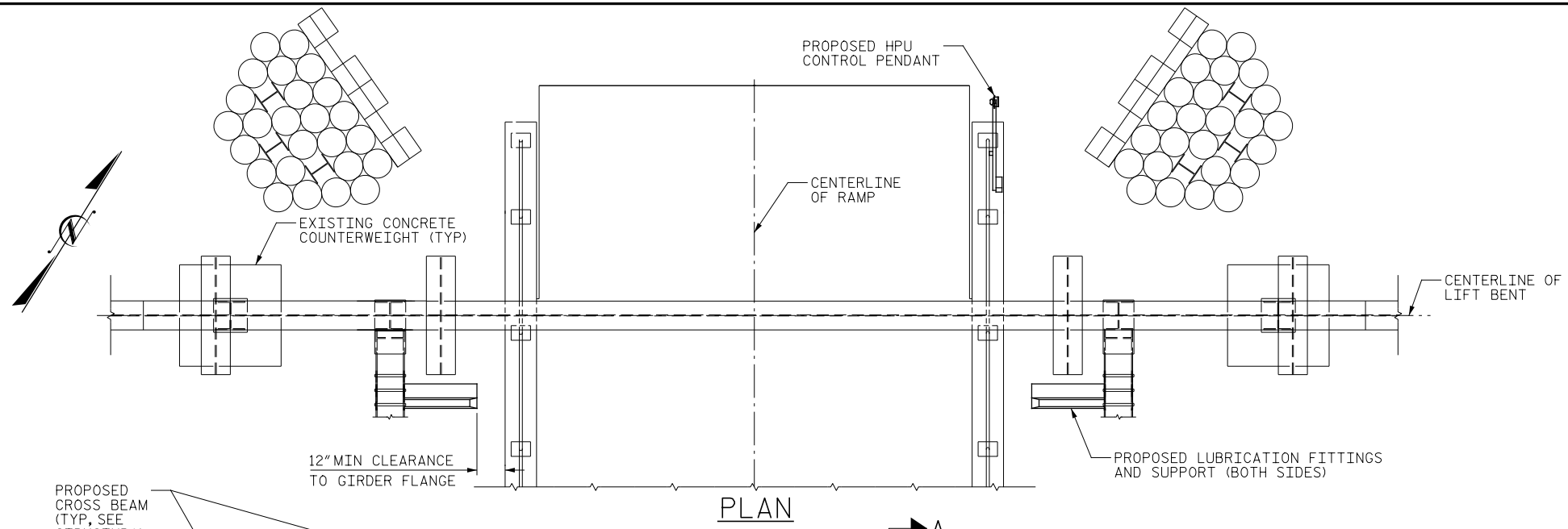
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2			4			26



11 OCTOBER 2013

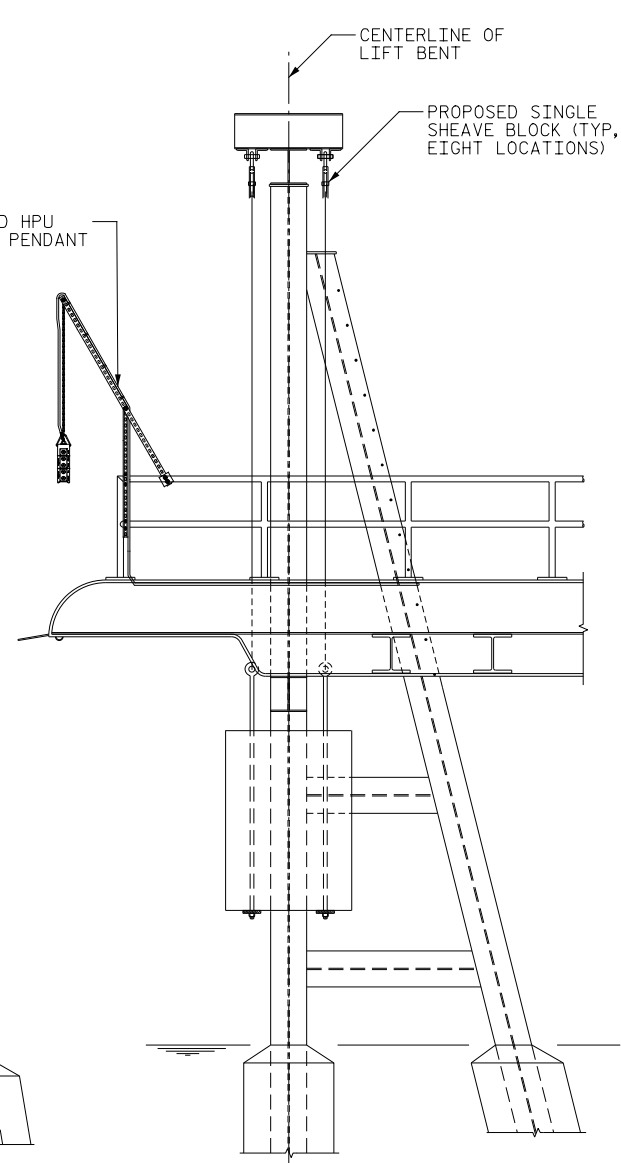
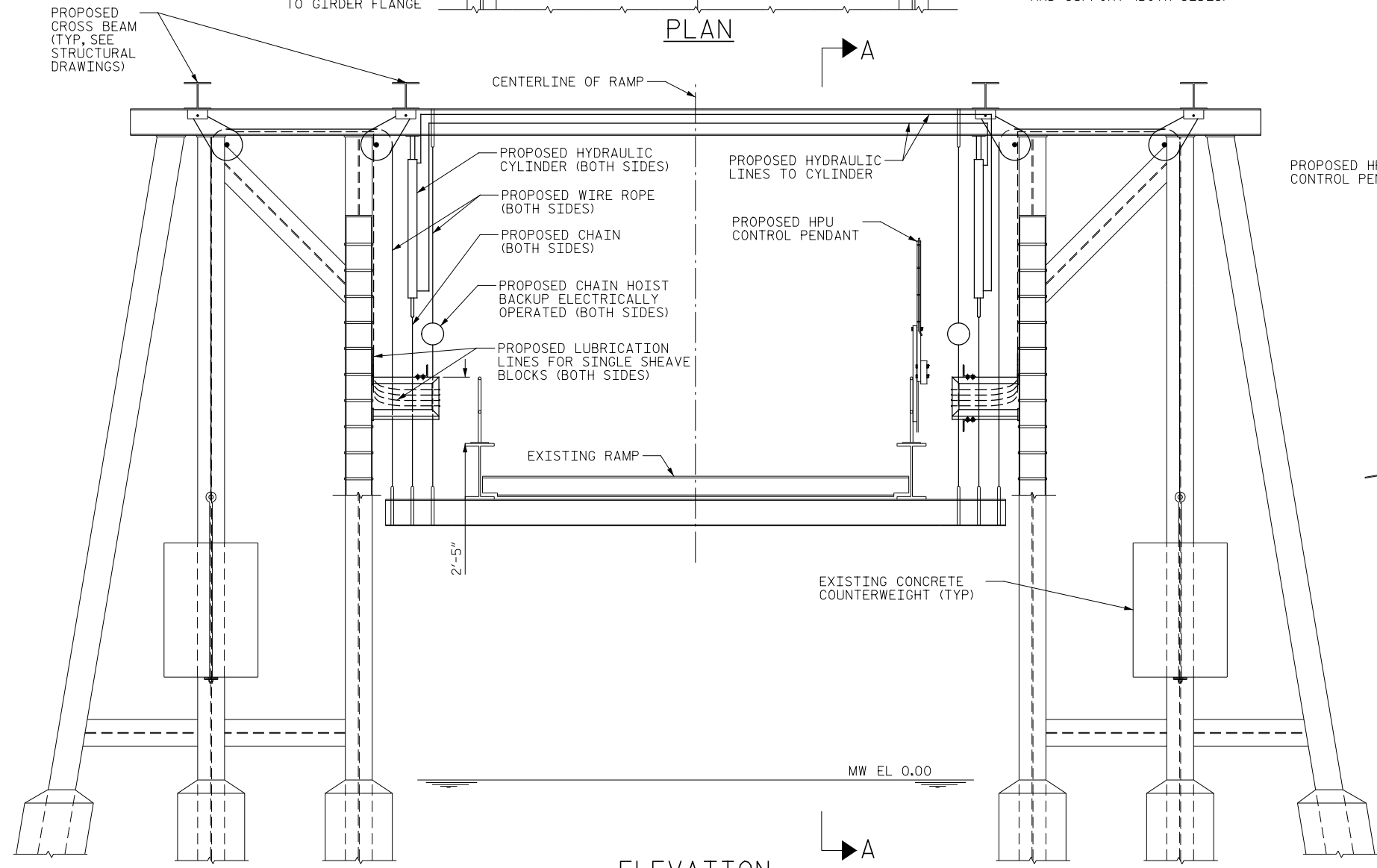
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 DESIGN ENGINEER OF RECORD: S. REYNOLDS DATE: 10/11/13

DWG NUMBER	TOTAL DWGS
G02	10



**NOTES:**

1. UNLESS NOTED OTHERWISE, ALL ELEMENTS DEPICTED ON THIS SHEET ARE NOT TO SCALE.
2. FOR ADDITIONAL REQUIREMENTS, SEE THE SPECIAL PROVISIONS.



RAMP 44 SHOWN, RAMPS 45 & 46 SIMILAR RAMP IN RAISED POSITION

PROJECT NO. F-5506  
DARE COUNTY  
 BRIDGE NO: 44, 45 & 46  
 SHEET 1 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**MECHANICAL LAYOUT**

HATTERAS FERRY LANDING

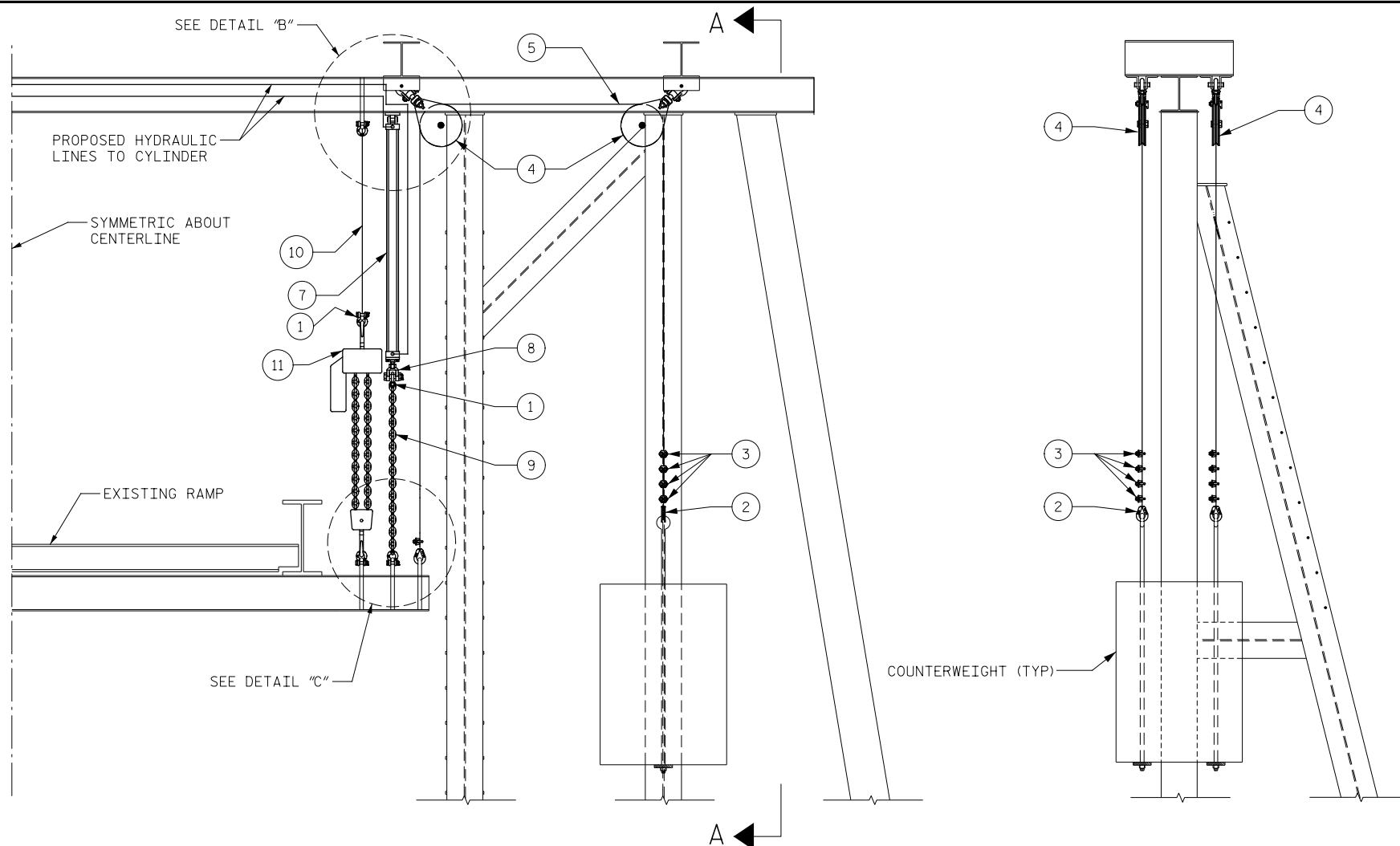


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 DESIGN ENGINEER OF RECORD: S. REYNOLDS DATE: 10/11/13

DWG NUMBER M01 TOTAL DWGS 10

11 OCTOBER 2013

REVISIONS						SHEET NO.
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2			4			26



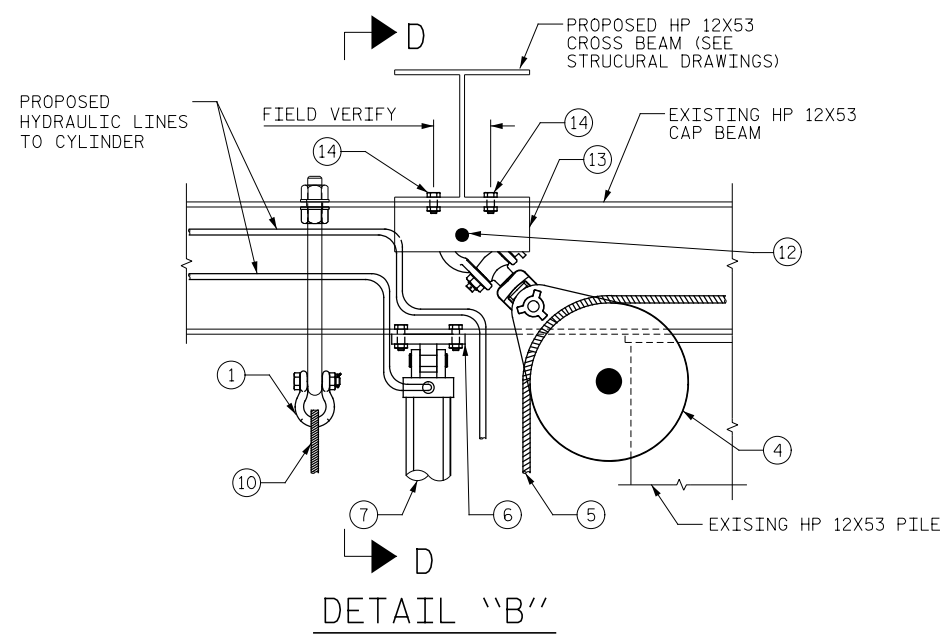
**ELEVATION**

RAMP 44 SHOWN, RAMPS 45 & 46 SIMILAR  
VIEW FROM WATER

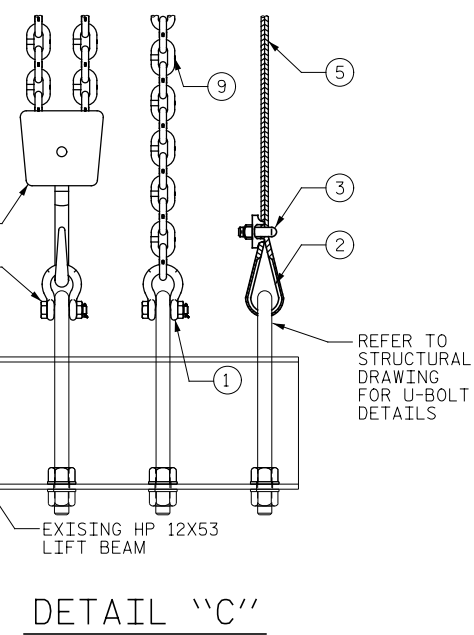
**SECTION A-A**

BILL OF MATERIALS			
(QUANTITIES FOR ONE RAMP, 3 RAMPS REQ'D)			
ITEM NO.	QUANTITY	DESCRIPTION	MATERIAL / MODEL NUMBER
1	10	BOLT TYPE ANCHOR SHACKLE, 5/8" SIZE BY CROSBY	STOCK NUMBER G-2130, MODEL NUMBER 1019490
2	6	WIRE ROPE THIMBLE, 3/4" SIZE BY CROSBY	STOCK NUMBER G-414, MODEL NUMBER 1037773
3	18	FORGED WIRE ROPE CLIPS, 3/4" SIZE BY CROSBY (MINIMUM 4 PER WIRE ROPE END)	STOCK NUMBER G-450, MODEL NUMBER 1010195
4	8	SINGLE SHEAVE BLOCK WITH STRAIGHT ROLLER BEARING, 3/4" WIRE ROPE AND 14" DIAMETER BY MCKISSICK	MODEL N-419-S SHACKLE (STOCK NO. 804237)
5	2	LENGTHS OF GALVANIZED 3/4" IWRC WIRE ROPE 6X19 CLASSIFICATION WITH MINIMUM STRENGTH 46,000 LBS	IMPROVED PLOW STEEL
6	2	HYDRAULIC CYLINDER EYE BRACKET (SEE "VIEW E-E" FOR MODIFIED DIMENSIONS) AND PIN BY PARKER	EYE BRACKET - P/N 0938700000 PIN - P/N 0938840000
7	2	HYDRAULIC CYLINDER WITH 3.25" BORE, 72" STROKE BY PARKER	MODEL NUMBER 3.25-CBB SHLU 18ACX72.00
8	2	SS ROD CLEVIS, 1-3/4" - 12, (W/STAINLESS STEEL PIN, 1-3/8" DIA X 4.13", WASHERS AND COTTER PINS) BY PARKER	ROD CLEVIS - P/N 0938530000 PIN - P/N 0938850000
9	2	APPROX. 7' LENGTH OF 5/8" SIZE ALLOY CHAIN BY CROSBY (CONTRACTOR TO FIELD VERIFY LENGTH)	GRADE 80, SPECTRUM 8 ALLOY CHAIN
10	2	APPROX. 8' MECHANICALLY SPLICED SLING OF 3/4" IWRC 6X19 CLASSIFICATION WIRE ROPE (CONTRACTOR TO VERIFY LENGTH)	IMPROVED PLOW STEEL
11	2	ELECTRIC CHAIN HOIST, 115V, 2 TON, 10FT. LIFT @ 8 FPM BY DAYTON (BACKUP)	MODEL NUMBER 2GXH6
12	8	1-1/4" PIN W/HEAD AND COTTER KEYS, PIN TO HAVE ANSI LC3 FIT WITH ANGLE (ITEM 13)	PH 17-4 STAINLESS STEEL
13	16	L5x5x1/2", 12" LONG, GALVANIZED	ASTM A709 GRADE 50
14	40	3/4" DIA. HIGH STRENGTH STRUCTURAL BOLTS W/ NUT AND WASHER, GALVANIZED	ASTM A325

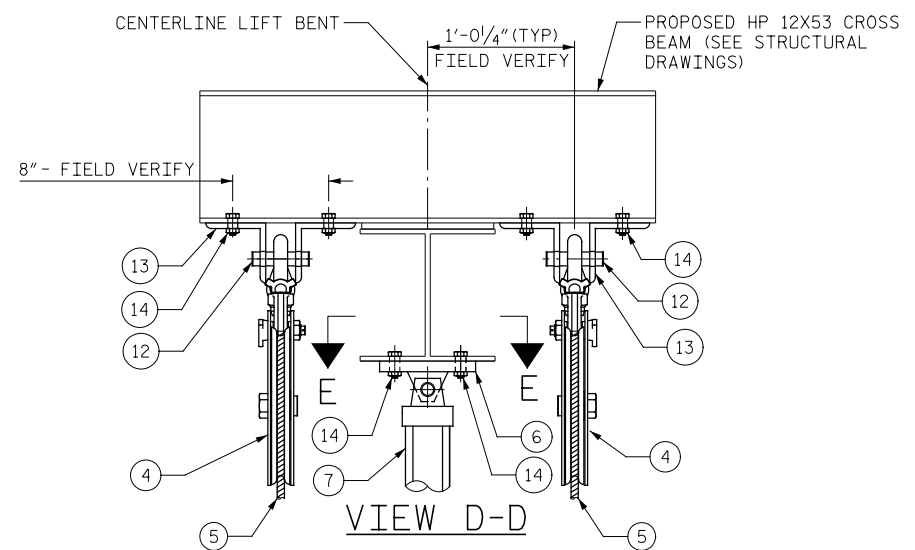
- NOTES:**
- CONTRACTOR SHALL FIELD VERIFY ALL MEASUREMENTS PRIOR TO SUBMITTING SHOP DRAWINGS.
  - UNLESS NOTED OTHERWISE, ALL ELEMENTS DEPICTED ON THIS SHEET ARE NOT TO SCALE.
  - ITEM 11 SHALL BE INSTALLED TO PROVIDE RAMP MOVEMENT OF AT LEAST 5 FEET ABOVE AND BELOW THE HORIZONTAL.
  - FOR ADDITIONAL REQUIREMENTS, SEE THE SPECIAL PROVISIONS.
  - ENSURE THAT THE CENTERLINES OF THE PROPOSED SHEAVES ARE ERECTED IN THE SAME LOCATION (X, Y, AND Z AXIS) AS THE EXISTING SHEAVES BEFORE DRILLING HOLES IN THE CROSS BEAM FOR ITEM 14.



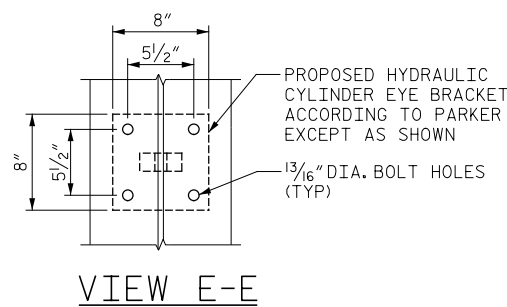
**DETAIL "B"**



**DETAIL "C"**



**VIEW D-D**



**VIEW E-E**

DRAWN BY: R. HESS DATE: 10/11/13  
 CHECKED BY: D. NEELY DATE: 10/11/13  
 DESIGN ENGINEER OF RECORD: S. REYNOLDS DATE: 10/11/13



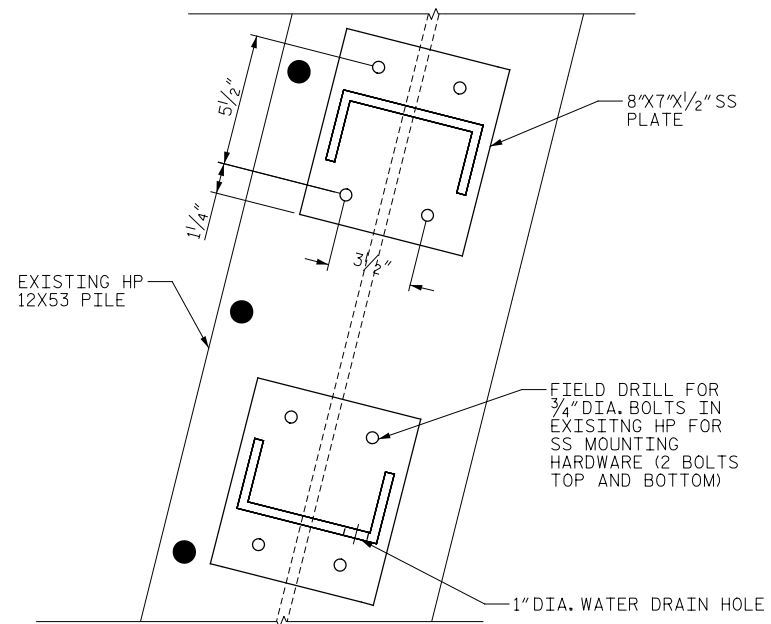
PROJECT NO. F-5506  
 DARE COUNTY  
 BRIDGE NO: 44, 45 & 46

SHEET 2 OF 4

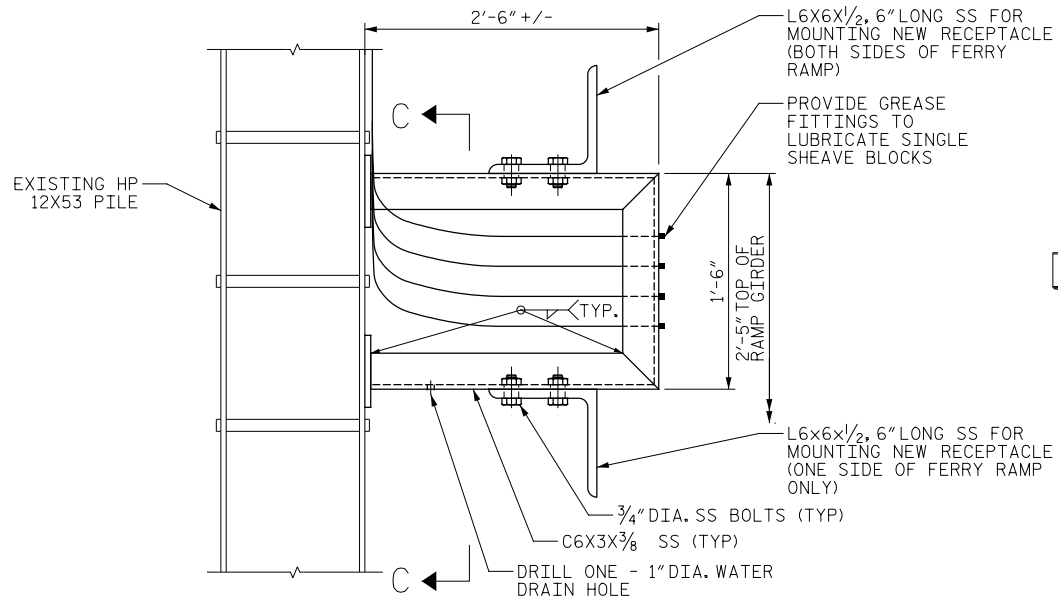
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
RAMP LIFT SYSTEM					
HATTERAS FERRY LANDING					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 26

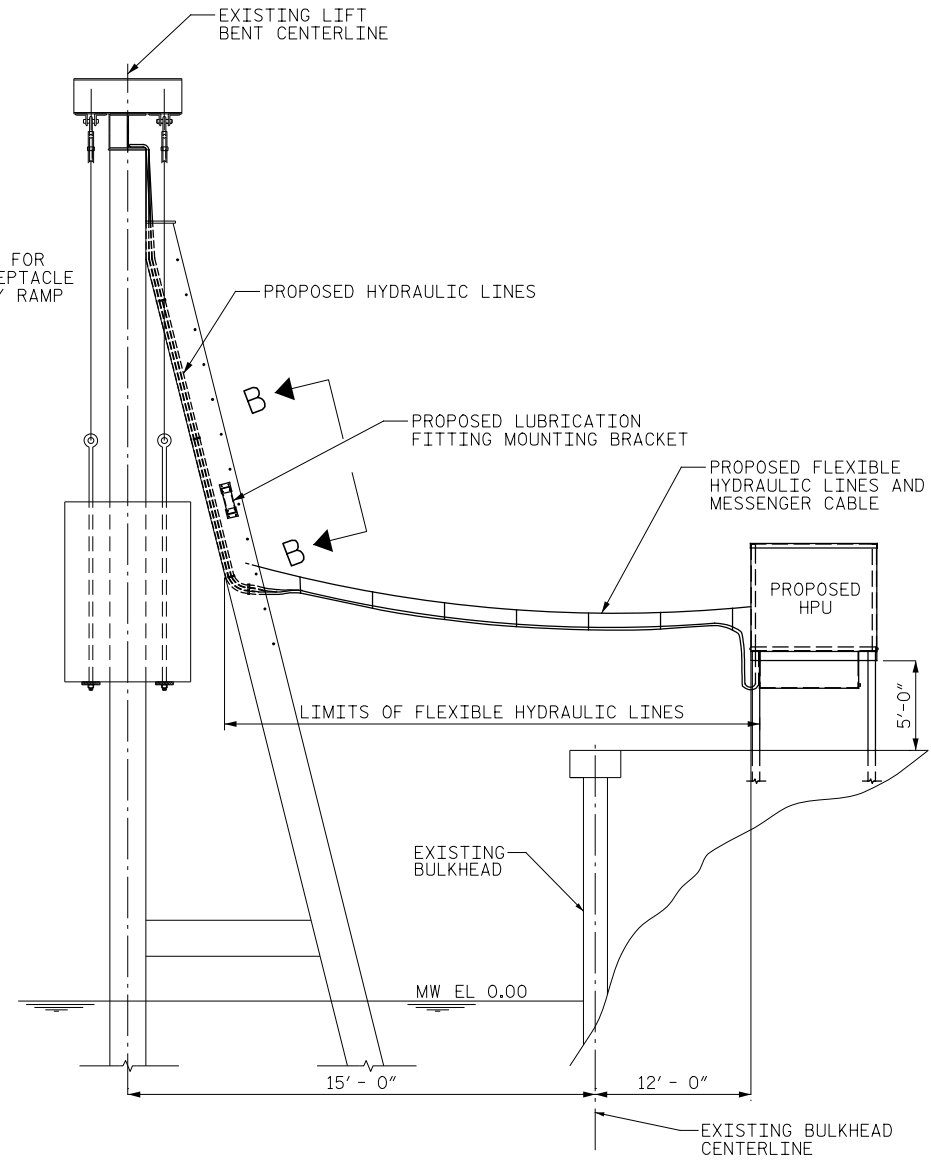
DWG NUMBER M02	TOTAL DWGS 10
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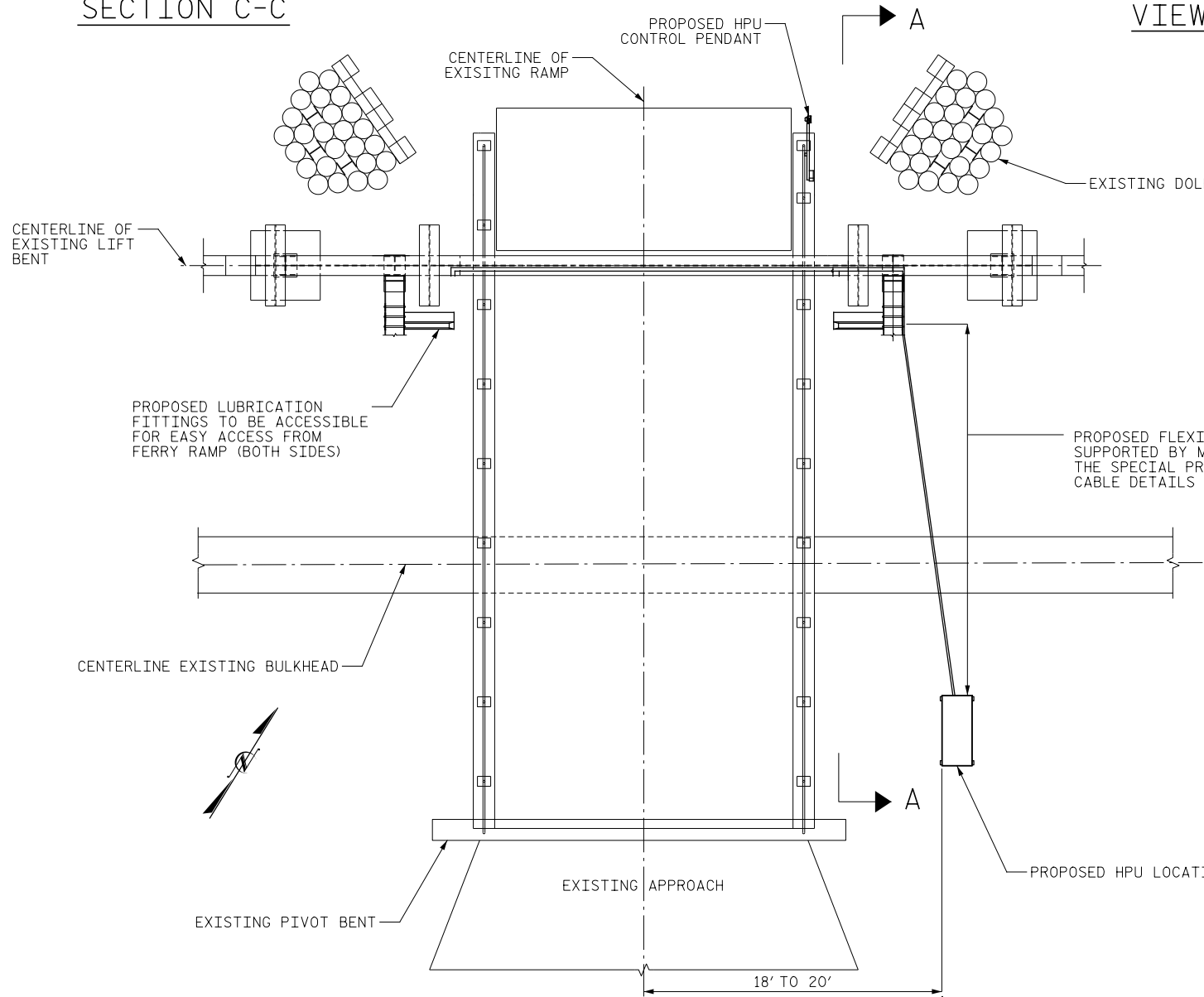
SECTION C-C



VIEW B-B



SECTION A-A  
RAMP NOT SHOWN FOR CLARITY



PLAN

RAMP 44 SHOWN, RAMPS 45 & 46 SIMILAR

- NOTES:**
- GREASE LINES SHALL HAVE STAINLESS STEEL BRAIDED FLEXIBLE LINES AT FITTING CONNECTION AND AT SINGLE SHEAVE BLOCK CONNECTION.
  - REMAINDER OF GREASE LINES SHALL BE STAINLESS STEEL TUBING RIGIDLY CLAMPED WITH STAINLESS STEEL HARDWARE TO THE STRUCTURE AND SHALL NOT EXCEED 2 FT. SPACING.
  - STAINLESS STEEL HYDRAULIC LINES SHALL BE RIGIDLY CLAMPED WITH STAINLESS STEEL HARDWARE TO THE STRUCTURE AND SHALL NOT EXCEED 4 FT. SPACING.
  - UNLESS NOTED OTHERWISE, ALL ELEMENTS DEPICTED ON THIS SHEET ARE NOT TO SCALE.
  - THE CONTRACTOR SHALL FIELD VERIFY ALL MEASUREMENTS PRIOR TO SUBMITTING SHOP DRAWINGS.
  - RECEPTACLE SUPPORT ANGLES SHALL BE INSTALLED SUCH THAT ONCE INSTALLED, THE RECEPTACLE DOES NOT ENCR OACH IN THE 12" CLEAR ZONE.
  - FOR ADDITIONAL REQUIREMENTS, SEE THE SPECIAL PROVISIONS.

PROJECT NO. F-5506  
DARE COUNTY  
 BRIDGE NO: 44, 45 & 46

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**HYDRAULIC AND LUBRICATION LINES**

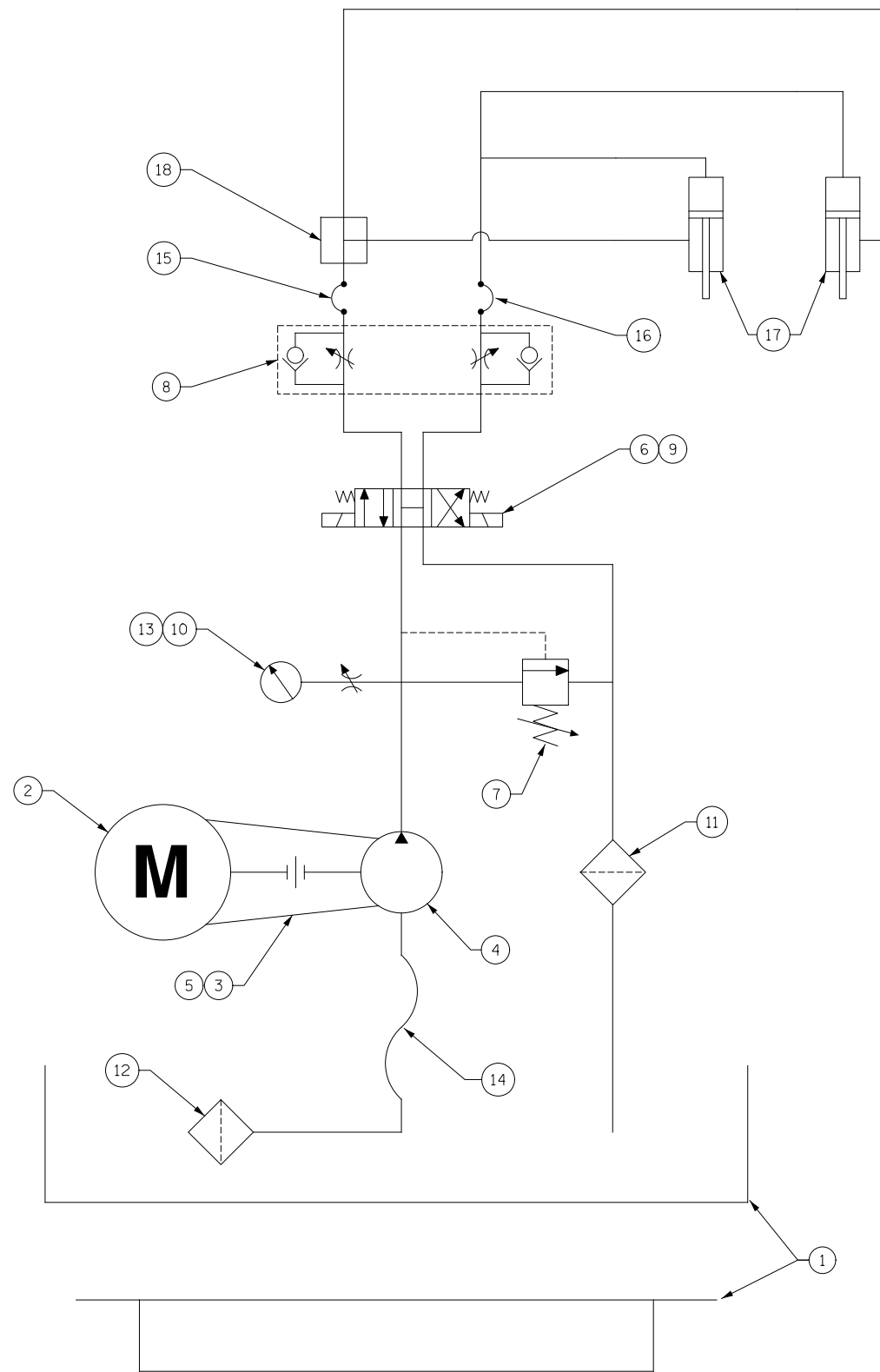
**HATTERAS FERRY LANDING**

REVISIONS						SHEET NO. S-19
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1			3			TOTAL SHEETS 26
2			4			



DRAWN BY: R. HESS DATE: 10/11/13  
 CHECKED BY: D. NEELY DATE: 10/11/13  
 DESIGN ENGINEER OF RECORD: S. REYNOLDS DATE: 10/11/13

DWG NUMBER M03	TOTAL DWGS 10
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BILL OF MATERIALS			
(QUANTITIES FOR ONE RAMP, 3 RAMPS REQ'D)			
ITEM NO.	QUANTITY	DESCRIPTION	MATERIAL / MODEL NUMBER
1	1	30 GALLON RESERVOIR BY HPU MANUFACTURER	---
2	1	ELECTRIC MOTOR BY BALDOR	5HP, 1800 RPM, TEFC, 240, 60/10, 184TC
3	1	MOTOR TO PUMP ADAPTOR BY VESCOR	1960 P/M ADAPTOR 184 TC x SAE 2A-5.0
4	1	FIXED DISPLACEMENT UNIDIRECTIONAL SELF-PRIMING EXTERNAL GEAR PUMP BY BOSCH-REXROTH	AZPF-016RRR12MB
5	1	MOTOR TO PUMP ADAPTOR COUPLING BY MAGNALOY	M200 3/4-3/16 x 1-1/8-1/4
6	1	SINGLE STATION MANIFOLD BY HPU MANUFACTURER	---
7	1	RELIEF VALVE BY SUN	RDDA - LAN
8	1	DUAL FLOW CONTROL BY SUN	NCCB - KCN
9	1	SOLENOID OPERATED DIRECTIONAL VALVE BY BOSCH-REXROTH	4WE6H6X / W110N9
10	1	2-1/2", 3000 PSI, 1/4" BOTTOM MOUNT PRESSURE GAGE BY WIKA	213.40
11	1	MEDIUM PRESSURE 10 MICRON RETURN LINE FILTER WITH 3 PSI BYPASS BY DONALDSON COMPANY, INC.	P164378 FILTER WITH P166416 HEAD
12	1	SUCTION STRAINER WITH 3 PSI RELIEF VALVE BY DONALDSON COMPANY, INC.	P173912
13	1	GAGE SNUBBER BY SUN	NSAB - KXV - BA
14	1	1/2" INSIDE DIAMETER TUBE AT-ISO 1436 TYPE 2AT EN 853 TYPE 2SN 4,250 PSI HOSE BY PARKER	381 - 8
15	1		
16	1		
17	2	HYDRAULIC CYLINDER	SEE "M02 RAMP LIFT SYSTEM" DRAWING FOR DETAILS
18	1	FLOW INTEGRATOR BY BRAND	B300 - 1/2

**NOTES:**

1. REFER TO STRUCTURAL DRAWINGS FOR HPU ENCLOSURE, DRIP PAN, AND SUPPORTING DETAILS.
2. UNLESS NOTED OTHERWISE, ALL ELEMENTS DEPICTED ON THIS SHEET ARE NOT TO SCALE.
3. FOR ADDITIONAL REQUIREMENTS, SEE THE SPECIAL PROVISIONS.

PROJECT NO. F-5506  
DARE COUNTY  
 BRIDGE NO: 44, 45 & 46

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

HYDRAULIC SCHEMATIC

HATTERAS  
 FERRY LANDING

REVISIONS

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

SHEET NO.  
S-20

TOTAL SHEETS  
26



11 OCTOBER 2013

DRAWN BY: R. HESS DATE: 10/11/13  
 CHECKED BY: D. NEELY DATE: 10/11/13  
 DESIGN ENGINEER OF RECORD: S. REYNOLDS DATE: 10/11/13

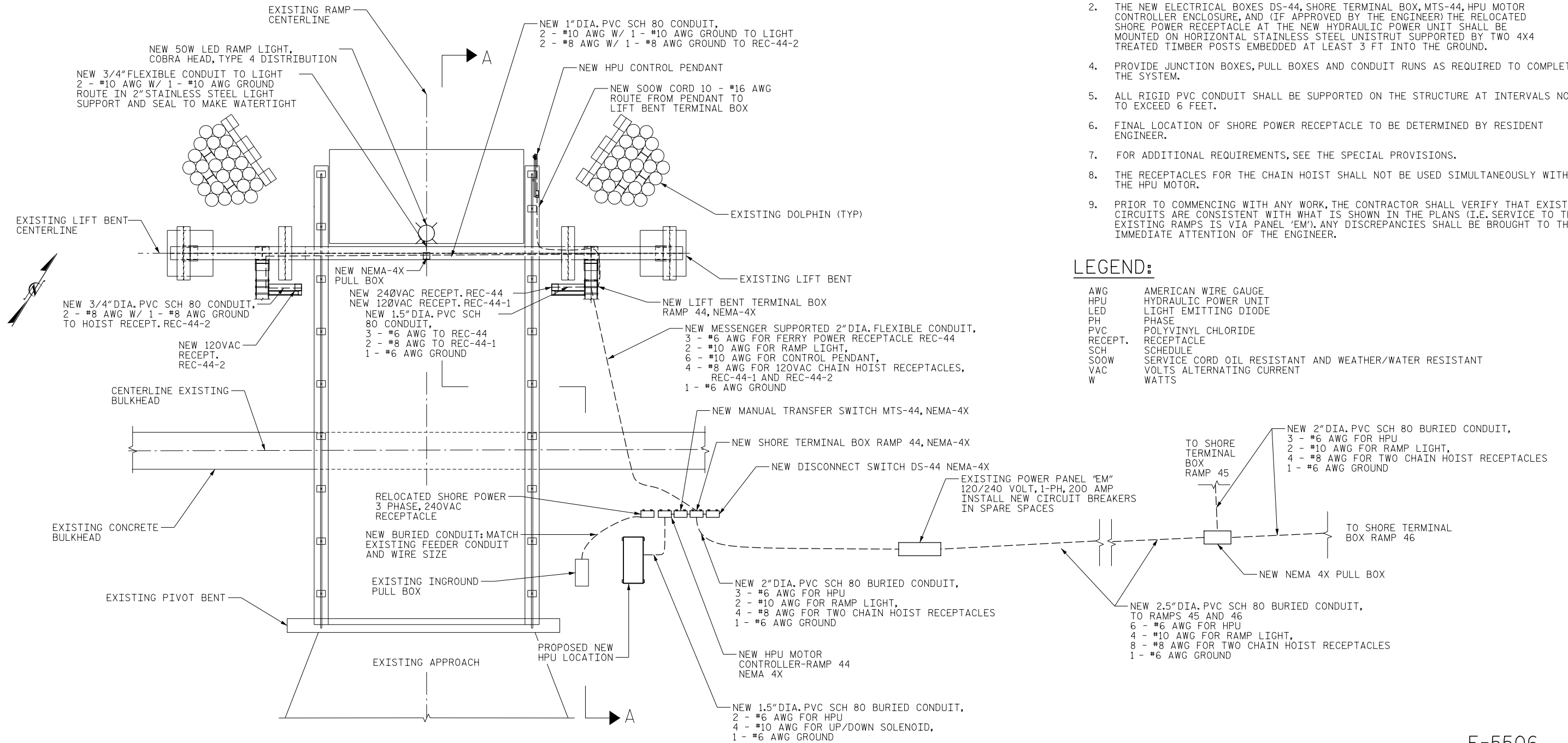
DWG NUMBER M04	TOTAL DWGS 10
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**NOTES:**

1. ALL WORK SHALL BE INSTALLED IN COMPLIANCE WITH NFPA 70: THE NATIONAL ELECTRICAL CODE.
2. THE NEW ELECTRICAL BOXES DS-44, SHORE TERMINAL BOX, MTS-44, HPU MOTOR CONTROLLER ENCLOSURE, AND (IF APPROVED BY THE ENGINEER) THE RELOCATED SHORE POWER RECEPTACLE AT THE NEW HYDRAULIC POWER UNIT SHALL BE MOUNTED ON HORIZONTAL STAINLESS STEEL UNISTRUT SUPPORTED BY TWO 4X4 TREATED TIMBER POSTS EMBEDDED AT LEAST 3 FT INTO THE GROUND.
4. PROVIDE JUNCTION BOXES, PULL BOXES AND CONDUIT RUNS AS REQUIRED TO COMPLETE THE SYSTEM.
5. ALL RIGID PVC CONDUIT SHALL BE SUPPORTED ON THE STRUCTURE AT INTERVALS NOT TO EXCEED 6 FEET.
6. FINAL LOCATION OF SHORE POWER RECEPTACLE TO BE DETERMINED BY RESIDENT ENGINEER.
7. FOR ADDITIONAL REQUIREMENTS, SEE THE SPECIAL PROVISIONS.
8. THE RECEPTACLES FOR THE CHAIN HOIST SHALL NOT BE USED SIMULTANEOUSLY WITH THE HPU MOTOR.
9. PRIOR TO COMMENCING WITH ANY WORK, THE CONTRACTOR SHALL VERIFY THAT EXISTING CIRCUITS ARE CONSISTENT WITH WHAT IS SHOWN IN THE PLANS (I.E. SERVICE TO THE EXISTING RAMPS IS VIA PANEL 'EM'). ANY DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ENGINEER.

**LEGEND:**

AWG	AMERICAN WIRE GAUGE
HPU	HYDRAULIC POWER UNIT
LED	LIGHT EMITTING DIODE
PH	PHASE
PVC	POLYVINYL CHLORIDE
RECEPT.	RECEPTACLE
SCH	SCHEDULE
SOOW	SERVICE CORD OIL RESISTANT AND WEATHER/WATER RESISTANT
VAC	VOLTS ALTERNATING CURRENT
W	WATTS



**PLAN**  
RAMP 44 SHOWN, RAMPS 45 & 46 SIMILAR

PROJECT NO. F-5506  
DARE COUNTY  
 BRIDGE NO: 44, 45 & 46

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

ELECTRICAL LAYOUT I

HATTERAS  
 FERRY LANDING

REVISIONS

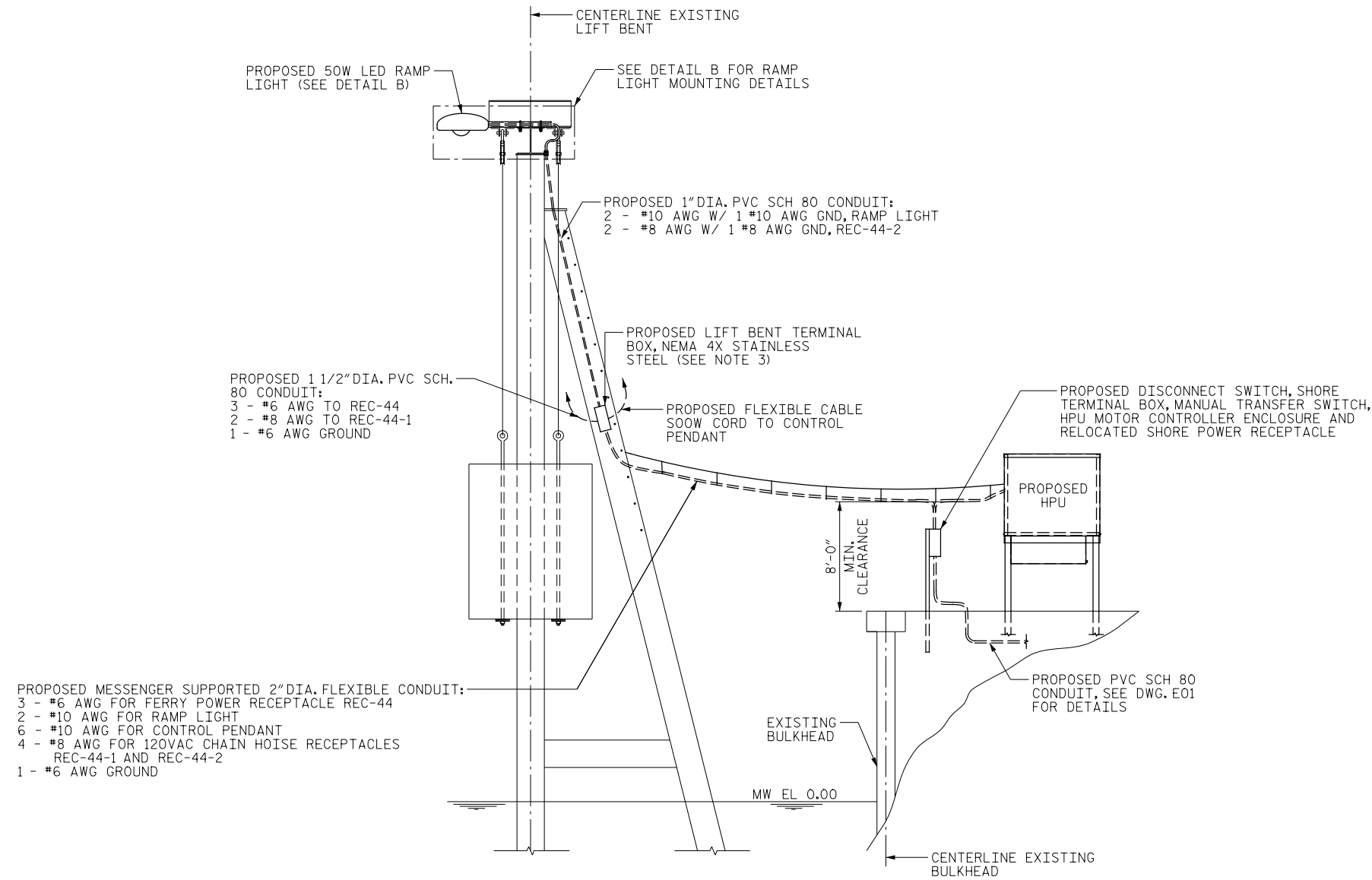
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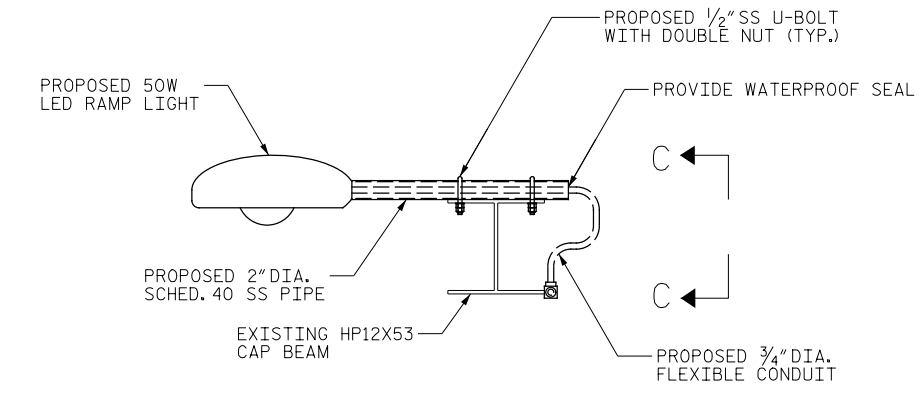
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 DESIGN ENGINEER OF RECORD: S. REYNOLDS DATE: 10/11/13

DWG NUMBER	TOTAL DWGS
E01	10

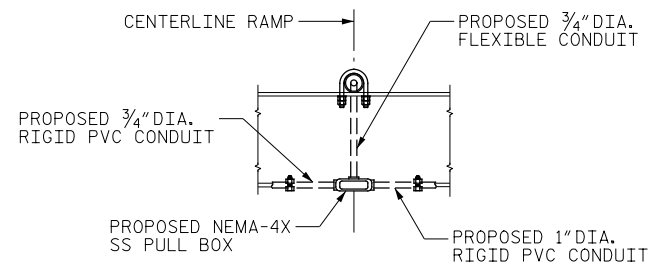
11 OCTOBER 2013



SECTION A-A  
RAMP NOT SHOWN FOR CLARITY



DETAIL B



VIEW C-C

NOTES:

1. ALL WORK SHALL BE INSTALLED IN COMPLIANCE WITH NFPA 70, THE NATIONAL ELECTRICAL CODE.
2. PROPOSED DS-44 SHORE TERMINAL BOX AT NEW HYDRAULIC POWER UNIT SHALL BE MOUNTED ON HORIZONTAL STAINLESS STEEL UNISTRUT SUPPORTED BY TWO 4X4 TREATED TIMBER POSTS EMBEDDED AT LEAST 3 FT INTO THE GROUND.
3. PROPOSED LIFT BENT TERMINAL BOX MOUNTED ON EXISTING LIFT BENT SUPPORT NEAR MESSENGER CABLE SHALL BE SUPPORTED BY 2 1/2 INCH DIAMETER STAINLESS STEEL BOLTS.
4. PROVIDE JUNCTION BOXES, PULL BOXES AND CONDUIT RUNS AS REQUIRED TO COMPLETE THE SYSTEM.
5. ALL RIGID PVC CONDUIT SHALL BE SUPPORTED ON STRUCTURE AND ON BULKHEAD AT INTERVALS NOT TO EXCEED 6 FEET.
6. FINAL LOCATION OF SHORE RECEPTACLES TO BE DETERMINED BY RESIDENT ENGINEER.
7. UNLESS NOTED OTHERWISE, ALL ELEMENTS DEPICTED ON THIS SHEET ARE NOT TO SCALE.
8. FOR ADDITIONAL REQUIREMENTS, SEE THE SPECIAL PROVISIONS.

LEGEND:

- AWG AMERICAN WIRE GAUGE
- DIA DIAMETER
- GND GROUND
- HPU HYDRAULIC POWER UNIT
- LED LIGHT EMITTING DIODE
- PVC POLYVINYL CHLORIDE
- SCH SCHEDULE
- SOOW SERVICE CORD OIL RESISTANT AND WEATHER/WATER RESISTANT
- W WATT

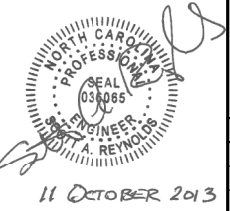
PROJECT NO. F-5506  
DARE COUNTY  
 BRIDGE NO: 44, 45 & 46

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

ELECTRICAL LAYOUT II

HATTERAS FERRY LANDING



DRAWN BY: C. SVARA DATE: 10/11/13  
 CHECKED BY: D. NEELY DATE: 10/11/13  
 DESIGN ENGINEER OF RECORD: S. REYNOLDS DATE: 10/11/13

DWG NUMBER E02	TOTAL DWGS 10
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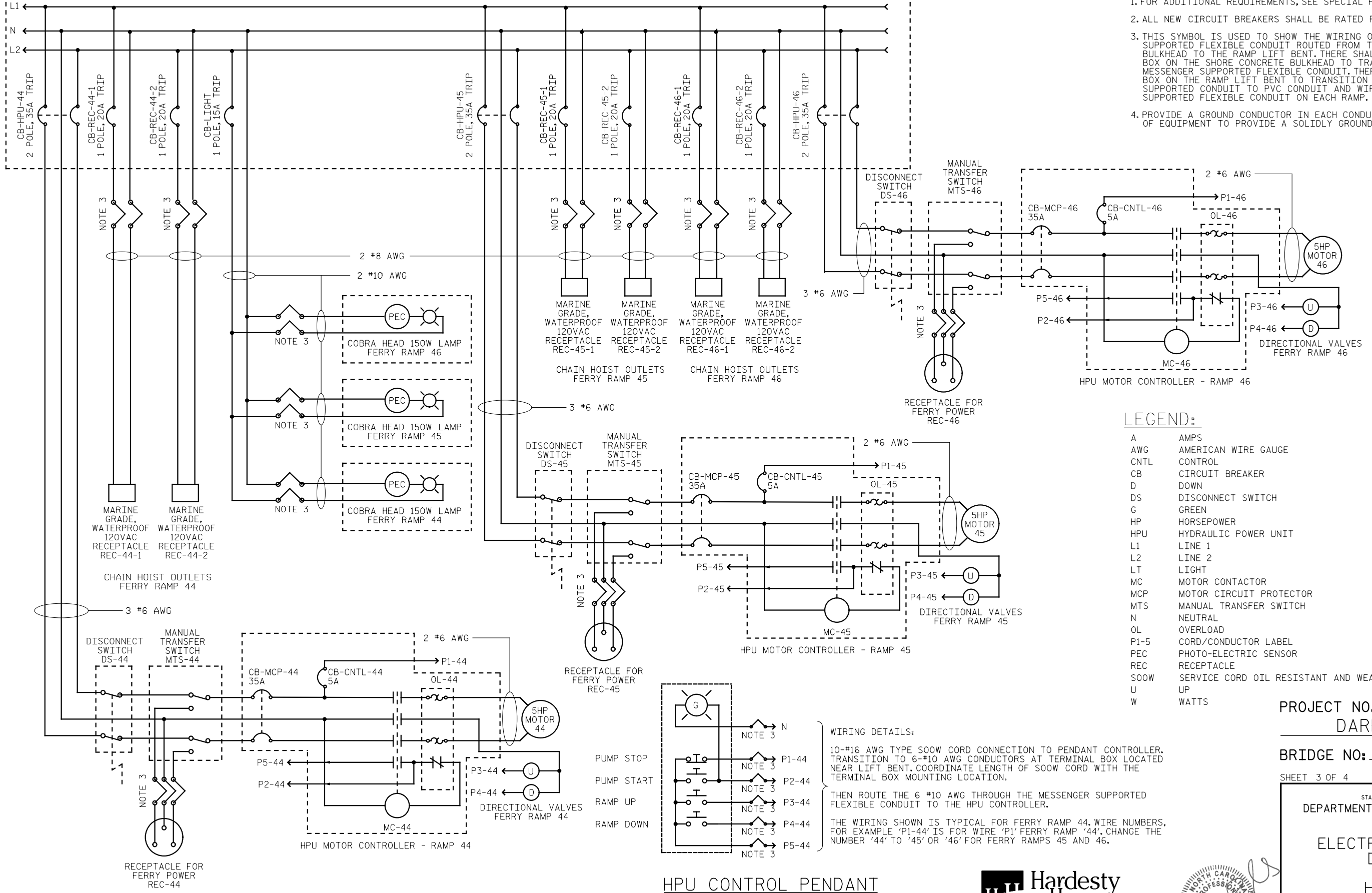
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			26



**NOTES:**

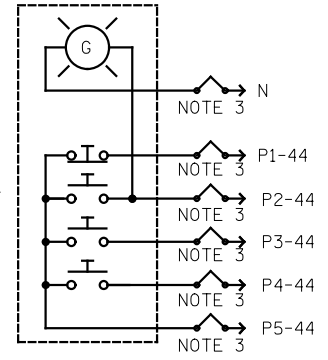
1. FOR ADDITIONAL REQUIREMENTS, SEE SPECIAL PROVISIONS.
2. ALL NEW CIRCUIT BREAKERS SHALL BE RATED FOR 100A FRAMES.
3. THIS SYMBOL IS USED TO SHOW THE WIRING ON THE MESSENGER SUPPORTED FLEXIBLE CONDUIT ROUTED FROM THE SHORE CONCRETE BULKHEAD TO THE RAMP LIFT BENT. THERE SHALL BE A TERMINAL BOX ON THE SHORE CONCRETE BULKHEAD TO TRANSITION TO THE MESSENGER SUPPORTED FLEXIBLE CONDUIT. THERE SHALL BE A TERMINAL BOX ON THE RAMP LIFT BENT TO TRANSITION FROM THE MESSENGER SUPPORTED FLEXIBLE CONDUIT TO PVC CONDUIT AND WIRE. THERE IS ONE MESSENGER SUPPORTED FLEXIBLE CONDUIT ON EACH RAMP.
4. PROVIDE A GROUND CONDUCTOR IN EACH CONDUIT TO EACH PIECE OF EQUIPMENT TO PROVIDE A SOLIDLY GROUND SYSTEM.

EXISTING PANEL EM, 120/240 VAC SINGLE PHASE POWER PANEL, ALL CIRCUIT BREAKERS SHOWN ARE NEW - NOT ALL EXISTING CIRCUIT BREAKERS ARE SHOWN



**LEGEND:**

- A AMPS
- AWG AMERICAN WIRE GAUGE
- CNTL CONTROL
- CB CIRCUIT BREAKER
- D DOWN
- DS DISCONNECT SWITCH
- G GREEN
- HP HORSEPOWER
- HPU HYDRAULIC POWER UNIT
- L1 LINE 1
- L2 LINE 2
- LT LIGHT
- MC MOTOR CONTACTOR
- MCP MOTOR CIRCUIT PROTECTOR
- MTS MANUAL TRANSFER SWITCH
- N NEUTRAL
- OL OVERLOAD
- P1-5 CORD/CONDUCTOR LABEL
- PEC PHOTO-ELECTRIC SENSOR
- REC RECEPTACLE
- SOOW SERVICE CORD OIL RESISTANT AND WEATHER/WATER RESISTANT
- U UP
- W WATTS



**WIRING DETAILS:**

10-#16 AWG TYPE SOOW CORD CONNECTION TO PENDANT CONTROLLER. TRANSITION TO 6-#10 AWG CONDUCTORS AT TERMINAL BOX LOCATED NEAR LIFT BENT. COORDINATE LENGTH OF SOOW CORD WITH THE TERMINAL BOX MOUNTING LOCATION.

THEN ROUTE THE 6 #10 AWG THROUGH THE MESSENGER SUPPORTED FLEXIBLE CONDUIT TO THE HPU CONTROLLER.

THE WIRING SHOWN IS TYPICAL FOR FERRY RAMP 44. WIRE NUMBERS, FOR EXAMPLE 'P1-44' IS FOR WIRE 'P1' FERRY RAMP '44'. CHANGE THE NUMBER '44' TO '45' OR '46' FOR FERRY RAMPS 45 AND 46.

**HPU CONTROL PENDANT**  
GREEN LIGHT AND 4 PUSH BUTTONS

PROJECT NO. F-5506  
DARE COUNTY  
BRIDGE NO: 44, 45 & 46

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

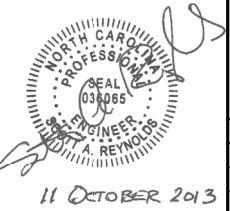
**ELECTRICAL WIRING DIAGRAM**

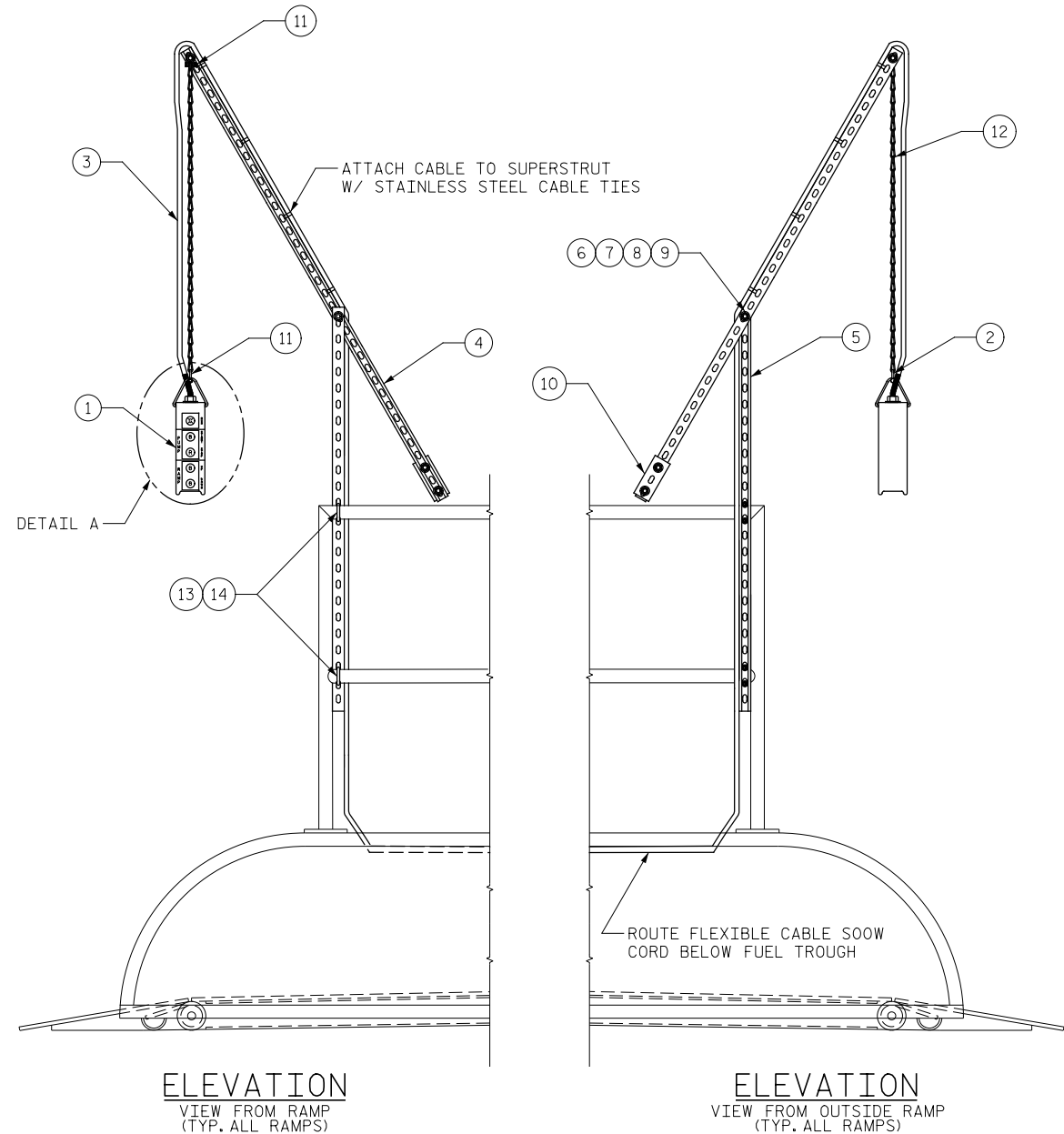
HATTERAS FERRY LANDING

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			26

DRAWN BY: C. SVARA DATE: 10/11/13  
CHECKED BY: D. NEELY DATE: 10/11/13  
DESIGN ENGINEER OF RECORD: S. REYNOLDS DATE: 10/11/13

DWG NUMBER	TOTAL DWGS
E03	10





BILL OF MATERIALS			
(QUANTITIES SHOWN ARE FOR ONE RAMP, 3 RAMPS REQUIRED)			
ITEM NO.	QUANTITY	DESCRIPTION	MATERIAL / MODEL NUMBER
1	1	PENDANT STATION NEMA 4X ENCLOSURE, CLASS 9001 BY SQUARE D	TYPE SKYP4
1	1	LEGEND PLATE (CUSTOM), CLASS 9001 BY SQUARE D RAMP - UP - DOWN	TYPE SKN299
1	1	LEGEND PLATE (CUSTOM), CLASS 9001 BY SQUARE D, PUMP - START - STOP	TYPE SKN299
1	1	LEGEND PLATE, CLASS 9001 BY SQUARE D, RUN	SKN124
1	1	LED PILOT LIGHT, GREEN, CLASS 9001 BY SQUARE D	TYPE SKP38LGG9
1	1	OPERATOR PUSH BUTTON, CLASS 9001 BY SQUARE D	TYPE SKRU-1
1	3	BLACK RUBBER BOOT, CLASS 9001 BY SQUARE D	TYPE KU-1
1	1	RED RUBBER BOOT, CLASS 9001 BY SQUARE D	TYPE KU-2
1	1	OPERATOR PUSH BUTTON, CLASS 9001 BY SQUARE D	TYPE SKRU-10
2	1	DELUXE LIQUID-TIGHT CORD GRIP, SS/AL, BY KELLEMS	07401017
3	12 TO 16 FT	FLEXIBLE CABLE, 10 CONDUCTOR, BY A.I.W CORP	16AWG-10C-S00W
4	5 TO 6 FT	STAINLESS STEEL SUPERSTRUT, 12 GA 1 - 5/8" X 1 3/16", BY THOMAS & BETTS	A-1200-HS-SS
5	3 FT	STAINLESS STEEL SUPERSTRUT, 12 GA 1 - 5/8" X 1 3/16", BY THOMAS & BETTS	A-1200-HS-SS
6	3 IN	1/2" IP STAINLESS STEEL PIPE	N/A
7	4 IN	1/2" IP STAINLESS STEEL PIPE	N/A
8	10 IN	THREADED ROD, STAINLESS STEEL, 5/8" - 11	N/A
9	4	HEX NUT AND LOCK WASHER, STAINLESS STEEL, 5/8" - 11	N/A
10	12 LBS	COUNTERWEIGHT, 2.5" X 2.5" X 7", STAINLESS STEEL TYPE 316, DRILL/TAP 2 3/16" HOLES, BY MCMASTER-CARR	89075K481
11	2	3/16" SHACKLE, STAINLESS STEEL TYPE 316, BY MCMASTER-CARR	35355T13
12	2 TO 3 FT	CHAIN, STAINLESS STEEL TYPE 316L, BY MCMASTER-CARR	3618T14
13	AS REQUIRED	U-BOLTS, STAINLESS STEEL, 3/16" - 16, BY MCMASTER-CARR	8896T56
14	AS REQUIRED	FENDER WASHERS, STAINLESS STEEL, 3/8" X 1 1/4" OD, BY MCMASTER-CARR	90313A114

**NOTES:**

- BILL OF MATERIALS IS NOT ALL INCLUSIVE. ADDITIONAL HARDWARE AND/OR COMPONENTS MAY BE REQUIRED. CONTRACTOR SHALL VERIFY ALL COMPONENTS AND DIMENSIONS.
- ALL HARDWARE SHALL BE STAINLESS STEEL.
- UNLESS NOTED OTHERWISE, ALL ELEMENTS DEPICTED ON THIS SHEET ARE NOT TO SCALE.
- FOR ADDITIONAL REQUIREMENTS, SEE THE SPECIAL PROVISIONS.

PROJECT NO. F-5506  
DARE COUNTY  
 BRIDGE NO: 44, 45 & 46  
 SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

CONTROL  
 PENDANT DETAILS

HATTERAS  
 FERRY LANDING

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			26



DRAWN BY: C. SVARA DATE: 10/11/13  
 CHECKED BY: D. NEELY DATE: 10/11/13  
 DESIGN ENGINEER OF RECORD: S. REYNOLDS DATE: 10/11/13

DWG NUMBER E04	TOTAL DWGS 10
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11 OCTOBER 2013