

BRIDGE REPLACEMENT - PPCB
NHSN-020-2(143)--2R-81

SAC COUNTY - DESIGN 116/216

LETTING DATE 9/20/2016

LEGEND

- INTERSTATE HIGHWAY
- PRIMARY HIGHWAY-DIVIDED
- PRIMARY HIGHWAY
- PORTLAND CEMENT CONCRETE ROAD
- ASPHALT ROAD
- BITUMINOUS ROAD
- GRAVEL ROAD
- EARTHEN ROAD
- INTERSTATE HIGHWAY (80, 65, 175, S27)
- UNITED STATES HIGHWAY
- STATE HIGHWAY
- COUNTY HIGHWAY
- RAILROAD
- PIPELINE
- AIRPORT
- HYDROLOGY
- BRIDGE
- STATE BOUNDARY
- COUNTY BOUNDARY
- CORPORATE BOUNDARY
- TOWNSHIP LINE
- SECTION LINE
- ROAD NAMES
- UNINCORPORATED PLACE



IOWA DOT
Highway Division
PLANS OF PROPOSED IMPROVEMENTS ON THE
PRIMARY ROAD SYSTEM
SAC COUNTY

EXAMPLE OF TITLE SHEET WITH 4 PLAN REVISIONS.

REVISION EXAMPLE

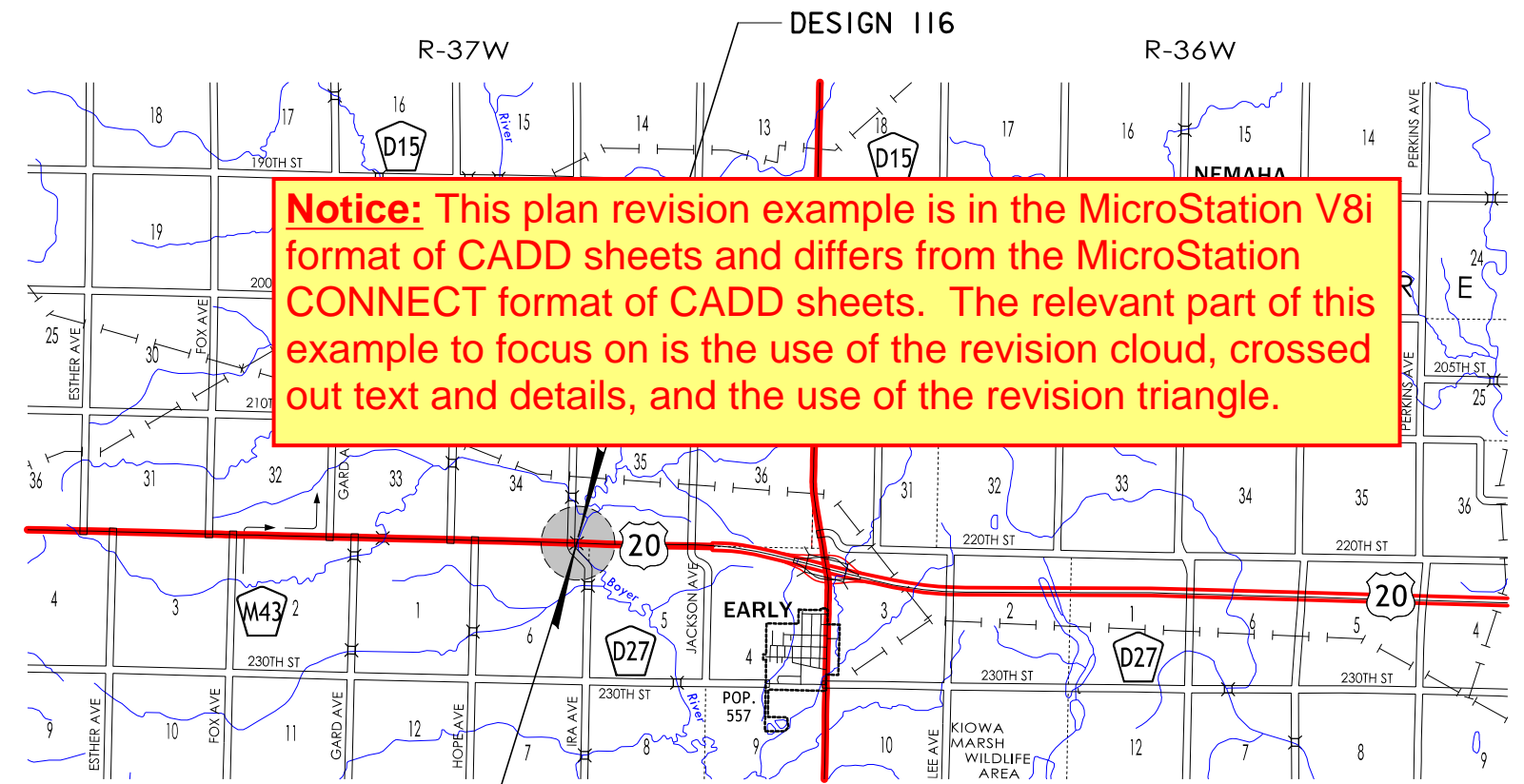
TOTAL SHEETS	65
PROJECT NUMBER	NHSN-020-2(143)--2R-81
R.O.W. PROJECT NUMBER	-
PROJECT IDENTIFICATION NUMBER	98-97-020-010-06

NO.	DESCRIPTION
1	TITLE SHEET
RA-RB	REVISION SHEET
2	ESTIMATE SHEET - DESIGN 116
2 - 30	DESIGN 116
31	ESTIMATE SHEET - DESIGN 216
31 - 59	DESIGN 216
SPS.1-SPS.5	SOIL PROFILE SHEET
C.1	ESTIMATE SHEET FOR ROADWAY
C.1	ROADWAY SHEETS

BRIDGE REPLACEMENT - PPCB
NEW DUAL BRIDGES AS PART OF 4 LANE US 20 PROJECT
OVER BOYER RIVER 1.9 MILES WEST OF US 71

THE IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

SEE REVISION SHEET RA	03-09-2017
SEE REVISION SHEET RA	03-27-2017
SEE REVISION SHEET RA	04-11-2017
SEE REVISION SHEET RB	04-15-2017



Notice: This plan revision example is in the MicroStation V8i format of CADD sheets and differs from the MicroStation CONNECT format of CADD sheets. The relevant part of this example to focus on is the use of the revision cloud, crossed out text and details, and the use of the revision triangle.

IOWA ONE CALL
1-800-292-8989
www.iowaonecall.com
811 Know what's below. Call before you dig.

STANDARD ROAD PLANS
STANDARD ROAD PLANS ARE LISTED ON SHEET NUMBER C.1

REFER TO INDIVIDUAL SITUATION PLANS FOR TRAFFIC DATA INFORMATION.

THE PLAN DETAILS ARE ARBITRARY, THE REVISION MARK-UPS ARE WHAT IS MEANT TO BE SHOWN.

SHEET NO.	NAME	TYPE
1		STRUCTURAL DESIGN
1		HYDRAULIC DESIGN
SPS.1		GEOTECHNICAL DESIGN
C.1		ROADWAY DESIGN

PROJECT DIRECTORY NAME: 9702001098

HYDRAULIC DESIGN

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature: [Redacted] Date: 7/1/2016

Printed or Typed Name: [Redacted]

My license renewal date is December 31, 2016

Pages or sheets covered by this seal: SHEET 5 & 35 OF 65

STRUCTURAL DESIGN

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature: [Redacted] Date: 7/1/2016

Printed or Typed Name: [Redacted]

My license renewal date is December 31, 2016


Pages or sheets covered by this seal: SHEETS 1 THRU 59 OF 65

LISTING OF PROJECT REVISIONS

DATE	SHEET NUMBER	REV. ITEM NUMBER	DESCRIPTION OF REVISIONS
03-09-2017	RA		REVISION SHEET ADDED.
03-09-2017	2	1	REVISION: CHANGED STRUCTURAL CONCRETE (BRIDGE), PILES STEEL HPI0x57 AND REINFORCING STEEL QUANTITIES. ADDED ITEM NO. 19. REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.
03-09-2017	3	1	REVISION: CHANGED PIER 2 REINFORCING STEEL (NON-COATED), PILES STEEL HPI0x57 AND STRUCTURAL CONCRETE QUANTITIES. REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.
03-09-2017	7	1	REVISION: CHANGED PIER 2 FOOTING LOCATION. REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.
03-09-2017	8	1	REVISION: CHANGED TYPICAL PIER TO PIER 1 AND ELEVATION NOTE TO LOOKING EAST. REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.
03-09-2017	8A	1	REVISION: ADDED NEW SHEET, PARTIAL REMOVAL OF PIER 2 FOOTING. REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.
03-09-2017	8B	1	REVISION: ADDED NEW PIER 2 SHEET. REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.
03-09-2017	8C	1	REVISION: ADDED NEW SHEET, PIER 2 FOOTING DETAILS. REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.
03-09-2017	8D	1	REVISION: ADDED NEW PIER 2 SHEET. REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.
03-09-2017	9	1	REVISION: REMOVE EXISTING PIER 2 FOOTING LAYOUT. REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.
03-09-2017	10	1	REVISION: SEPARATED PIER 1 AND 2 QUANTITIES ADDED TABLE AND ADDED ADDITIONAL STEEL NOTE. REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.

DATE	SHEET NUMBER	REV. ITEM NUMBER	DESCRIPTION OF REVISIONS
<div style="border: 2px solid red; padding: 5px; display: inline-block;">EXAMPLE OF 2nd REVISION.</div>			
04-11-2017	2	3	REVISION: CHANGED STRUCTURAL CONCRETE (BRIDGE), PILES STEEL HPI0x57 AND REINFORCING STEEL QUANTITIES. ADDED ITEM NO. 19. REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.
04-11-2017	3	3	REVISION: CHANGED PIER 2 REINFORCING STEEL (NON-COATED), PILES STEEL HPI0x57 AND STRUCTURAL CONCRETE QUANTITIES. REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.
04-11-2017	7	3	REVISION: CHANGED PIER 2 FOOTING LOCATION. REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.

STRUCTURAL DESIGN



First Name
Last Name
12345
IOWA

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

03-27-2017
Date


Signature _____
Printed or Typed Name **Name**

My license renewal date is December 31, 2018

Pages or sheets covered by this seal: SHEETS 1, RA, 2, 3, 7, 8

EXAMPLE OF 1st REVISION.

STRUCTURAL DESIGN



First Name
Last Name
12345
IOWA

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

3-9-2017
Date


Signature _____
Printed or Typed Name **Name**

My license renewal date is December 31, 2018

Pages or sheets covered by this seal: SHEETS 1, RA, 2, 3, 7, 8, 8A, 8B, 8C, 8D, 9, 10

EXAMPLE OF 3rd REVISION.

STRUCTURAL DESIGN



First Name
Last Name
12345
IOWA

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

04-11-2017
Date

Signature _____
Printed or Typed Name **Name**

My license renewal date is December 31, 2018

Pages or sheets covered by this seal: SHEETS 1, RA, 2, 3, 7

EXAMPLE OF MULTIPLE PLAN REVISIONS ON ONE REVISION SHEET.

REVISION EXAMPLE

THE PLAN DETAILS ARE ARBITRARY,
THE REVISION MARK-UPS ARE WHAT
IS MEANT TO BE SHOWN.

PLAN REVISION SHEET TEMPLATE IS LOCATED IN THE "brgseed.dgn" FILE AS "brgrevision" MODEL.

SAC COUNTY

DESIGN NO. 116

REVISION SHEET

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION


EXAMPLE OF 2nd REVISION.

REVISED: APRIL 11, 2017

LISTING OF PROJECT REVISIONS

DATE	SHEET NUMBER	REV. ITEM NUMBER	DESCRIPTION OF REVISIONS	DATE	SHEET NUMBER	REV. ITEM NUMBER	DESCRIPTION OF REVISIONS
04-15-2017	RB		REVISION SHEET ADDED.				
04-15-2017	3	4	REVISION: THIS SHEET VOIDED. REASON: EXCESSIVE CHANGES CREATED AN UNCLEAR QUANTITY SHEET.				
04-15-2017	3A	4	REVISION: THIS SHEET ADDED. REASON: TO PROVIDE CLEAR DETAILS IN RELATION TO THE PREVIOUS HEAVILY REVISED QUANTITY SHEET THAT IS NOW VOIDED SHEET 3.				
04-15-2017	7	4	REVISION: REMOVED 2'-0" x 2'-0" CORNER OF PIER 1. REASON: CORNER REMOVED TO ALLOW CLEARANCE FOR MSE WALL.				
04-15-2017	8	4	REVISION: ADDED 1'-6" HOLE TO COLUMN OF PIER 1. REASON: THIS ALLOWS FOR THE LOCATION OF WATER MAIN TO PASS THROUGH THE PIER.				
04-15-2017	8A	4	REVISION: PILE UPLIFT ANCHOR DETAIL WAS ADDED. REASON: THE ANCHOR DETAIL WAS NEEDED FOR ADDITIONAL REQUIRED PILES DO TO EXISTING SOIL CONDITIONS.				
04-15-2017	8A1	4	REVISION: THIS SHEET ADDED. REASON: WOOD PILES WERE ADDED TO FOOTING DUE TO EXISTING SOIL CONDITIONS.				

EXAMPLE OF 4th REVISION.

STRUCTURAL DESIGN	
	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.
	Signature _____ Date <u>04-15-2017</u>
	Printed or Typed Name <u>Name</u>
	My license renewal date is December 31, <u>2018</u>
Pages or sheets covered by this seal: <u>SHEETS 1, RB, 3, 3A, 7, 8, 8A, 8A1</u>	

REVISION EXAMPLE
 THE PLAN DETAILS ARE ARBITRARY,
 THE REVISION MARK-UPS ARE WHAT
 IS MEANT TO BE SHOWN.

**SAC COUNTY
 DESIGN NO. 116
 REVISION SHEET**
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

REVISED: APRIL 15, 2017

ESTIMATED BRIDGE QUANTITIES

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
1	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	CY	1,083.0	
2	2402-2720000	EXCAVATION, CLASS 20	CY	236	
3	2402-2721000	EXCAVATION, CLASS 21	CY	271	
4	2403-0100010	STRUCTURAL CONCRETE (BRIDGE)	CY	638.2 645.1	
5	2404-7775000	REINFORCING STEEL	LB	28,556 26,164.27,578	
6	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB	107,045	
7	2404-7775009	REINFORCING STEEL, STAINLESS STEEL	LB	4,610	
8	2407-0562890	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTB90	EACH	6	
9	2407-0562905	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTB105	EACH	12	
10	2408-7800000	STRUCTURAL STEEL	LB	6,019	
11	2414-6424110	CONCRETE BARRIER RAILING	LF	642.0	
12	2501-0201057	PILES, STEEL, HP 10 X 57	LF	5,810 6,020	
13	2501-6335010	PREBORED HOLES	LF	140	
14	2507-2638650	BRIDGE WING ARMORING - EROSION STONE	SY	15.3	
15	2507-3250005	ENGINEERING FABRIC	SY	1,732.0	
16	2507-6800061	REVTMENT, CLASS E	TON	1,666.0	
17	2507-8029000	EROSION STONE	TON	20.0	
18	2533-4980005	MOBILIZATION	LS	1.00	
19	2401-6745354	REMOVAL OF CONCRETE FOOTINGS, AS PER PLAN	EACH	1	

ITEM NO.	TOTAL
4	675.0
5	28,560

12	6,143
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REVISION EXAMPLE
 THE PLAN DETAILS ARE ARBITRARY,
 THE REVISION MARK-UPS ARE WHAT
 IS MEANT TO BE SHOWN.

△ 2 REVISD: 03-27-2017 CHANGED STRUCTURAL CONCRETE (BRIDGE), PILES STEEL HP10x57 AND REINFORCING STEEL QUANTITIES. ADDED ITEM NO. 19.
 REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.

△ 3 REVISD: 04-11-2017 CHANGED STRUCTURAL CONCRETE (BRIDGE), PILES STEEL HP10x57 AND REINFORCING STEEL QUANTITIES. ADDED ITEM NO. 19.
 REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.

EXAMPLE OF 3 REVISIONS ON THIS SHEET.

ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	DESCRIPTION
1	2104-2710020	EXCAVATION, CLASS 10, CHANNEL
2	2402-2720000	EXCAVATION, CLASS 20
3	2402-2721000	EXCAVATION, CLASS 21
4	2403-0100010	STRUCTURAL CONCRETE (BRIDGE) INCLUDES COST OF FURNISHING AND PLACING SPLASH BASINS (INCLUDING EXCAVATION, EROSION STONE OR CLASS E REVTMENT, AND ENGINEERING FABRIC). INCLUDES ALL PREFORMED EXPANSION JOINT FILLER REQUIRED. INCLUDES FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), FLOODABLE BACKFILL, POROUS BACKFILL, GEOTEXTILE FABRIC, WATER FLOODING, AND SUBDRAIN OUTLET AT ABUTMENTS AND TOE OF BERM. INCLUDES FURNISHING AND PLACING 3 INCH DIAMETER PVC PLASTIC PIPE AND EXPANDING FOAM IN THE ABUTMENT WINGS.
5	2404-7775000	REINFORCING STEEL
6	2404-7775005	REINFORCING STEEL, EPOXY COATED
7	2404-7775009	REINFORCING STEEL, STAINLESS STEEL
8	2407-0562890	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTB90 INCLUDES PIER AND ABUTMENT BEARING MATERIAL. INCLUDES CONTRACTOR FILLING OUT BEAM NUMBERS BY LOCATION AND BEAM SEAT ELEVATIONS IN "PPC BEAM DATA SPREADSHEET" AND FORWARDING ELECTRONIC SPREADSHEET TO THE ENGINEER.
9	2407-0562905	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTB105 INCLUDES PIER AND ABUTMENT BEARING MATERIAL. INCLUDES CONTRACTOR FILLING OUT BEAM NUMBERS BY LOCATION AND BEAM SEAT ELEVATIONS IN "PPC BEAM DATA SPREADSHEET" AND FORWARDING ELECTRONIC SPREADSHEET TO THE ENGINEER.

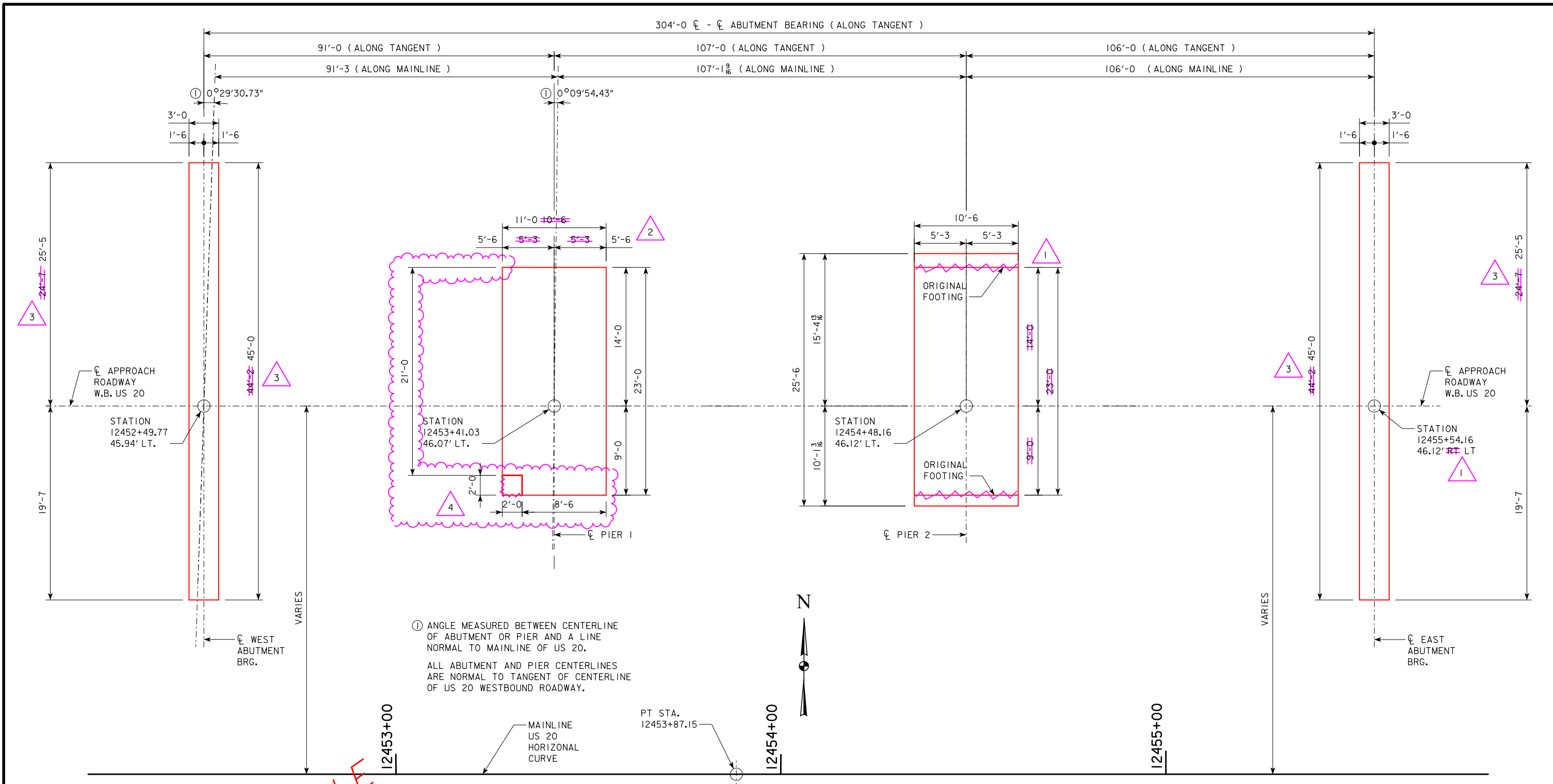
ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	DESCRIPTION
10	2408-7800000	STRUCTURAL STEEL INCLUDES INTERMEDIATE DIAPHRAGM WEIGHT AND DRAIN WEIGHT.
11	2414-6424110	CONCRETE BARRIER RAILING IF PLACEMENT OF CONCRETE IS DONE BY THE SLIPFORMING METHOD, CLASS BR CONCRETE IS REQUIRED. CAST-IN-PLACE BARRIER RAILS SHALL USE CLASS C MIX. PRICE BID FOR THIS ITEM SHALL INCLUDE THE COST OF CAST-IN-PLACE FORMS IF REQUIRED FOR PLACEMENT OF THE CONCRETE.
12	2501-0201057	PILES, STEEL, HP 10 X 57
13	2501-6335010	PREBORED HOLES
14	2507-2638650	BRIDGE WING ARMORING - EROSION STONE INCLUDES FURNISHING AND PLACING ENGINEERING FABRIC, EROSION STONE, AND ALL REQUIRED EXCAVATING, SHAPING AND COMPACTING FOR WING ARMORING.
15	2507-3250005	ENGINEERING FABRIC ENGINEERING FABRIC SHALL BE MATERIAL AS SPECIFIED FOR EMBANKMENT EROSION CONTROL IN ACCORDANCE WITH ARTICLE 4196.01,B,3, OF THE STANDARD SPECIFICATIONS.
16	2507-6800061	REVTMENT, CLASS E ESTIMATED AT 1.6 TON/CY.
17	2507-8029000	EROSION STONE ESTIMATED AT 1.6 TON/CY.
18	2533-4980005	MOBILIZATION
19	2401-6745354	REMOVAL OF CONCRETE FOOTINGS, AS PER PLAN

△ 1 REVISD: 03-09-2017 CHANGED STRUCTURAL CONCRETE (BRIDGE), PILES STEEL HP10x57 AND REINFORCING STEEL QUANTITIES. ADDED ITEM NO. 19.
 REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.

DESIGN FOR 0° SKEW
304'-0 x 41'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
 91'-0 & 106'-0 END SPANS 107'-0 INTERIOR SPAN
ESTIMATED QUANTITIES
 STA. 12454+02.16, 46.12' LT RADIUS=16,000' JULY, 2016
SAC COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 1 OF 58 FILE NO. 30568 DESIGN NO. 116

REVISED: APRIL 11, 2017



① ANGLE MEASURED BETWEEN CENTERLINE OF ABUTMENT OR PIER AND A LINE NORMAL TO MAINLINE OF US 20.
 ALL ABUTMENT AND PIER CENTERLINES ARE NORMAL TO TANGENT OF CENTERLINE OF US 20 WESTBOUND ROADWAY.

STAKING DIAGRAM

EXAMPLE OF 4 REVISIONS ON THIS SHEET.

REVISION EXAMPLE
 THE PLAN DETAILS ARE ARBITRARY,
 THE REVISION MARK-UPS ARE WHAT
 IS MEANT TO BE SHOWN.

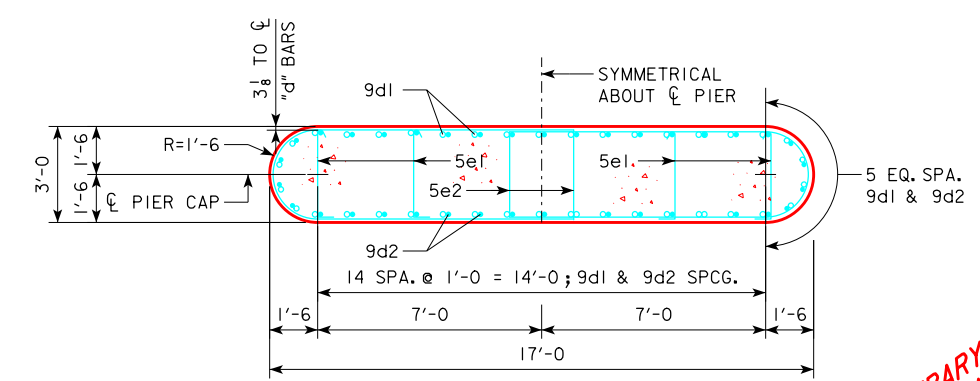
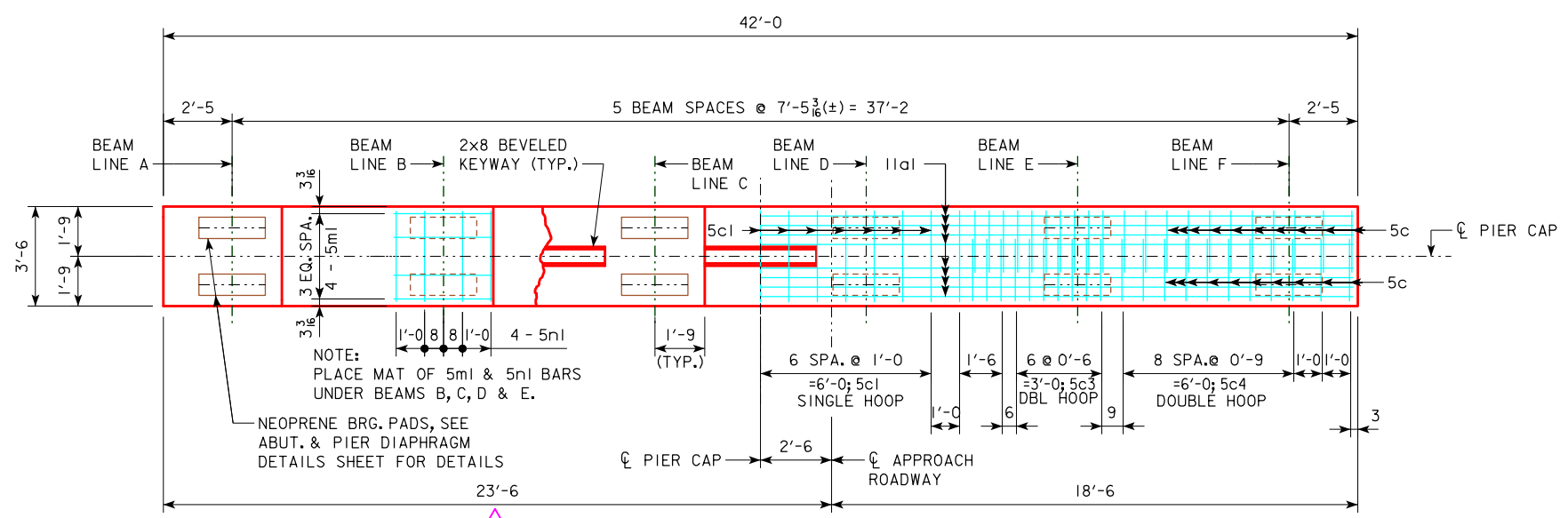
- ④ REVISED: 04-15-2017 REMOVED 2'-0" x 2'-0" CORNER OF PIER 1.
 REASON: CORNER REMOVED TO ALLOW CLEARANCE FOR MSE WALL.
- ③ REVISED: 04-11-2017 LENGTHEN ABUTMENTS 10' TO THE NORTH.
 REASON: ADDED SIDEWALK TO BRIDGE.

- ② REVISED: 03-27-2017 CHANGED PIER 2 LOCATION.
 REASON: PIER 1 FOOTING SIZE CHANGE DUE TO SURVEY ERROR.
- ① REVISED: 03-09-2017 CHANGED PIER 2 LOCATION.
 REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.

DESIGN FOR 0° SKEW
304'-0" x 41'-0" PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
 91'-0" & 106'-0" END SPANS 107'-0" INTERIOR SPAN
STAKING DIAGRAM
 STA. 12454+02.16, 46.12' LT RADIUS=16,000' JULY, 2016
SAC COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 16 OF 58 FILE NO. 30568 DESIGN NO. 116

REVISED: APRIL 15, 2017

EXAMPLE OF 3 REVISIONS ON THIS SHEET.



REVISION EXAMPLE

THE PLAN DETAILS ARE ARBITRARY; THE REVISION MARK-UPS ARE WHAT IS MEANT TO BE SHOWN.

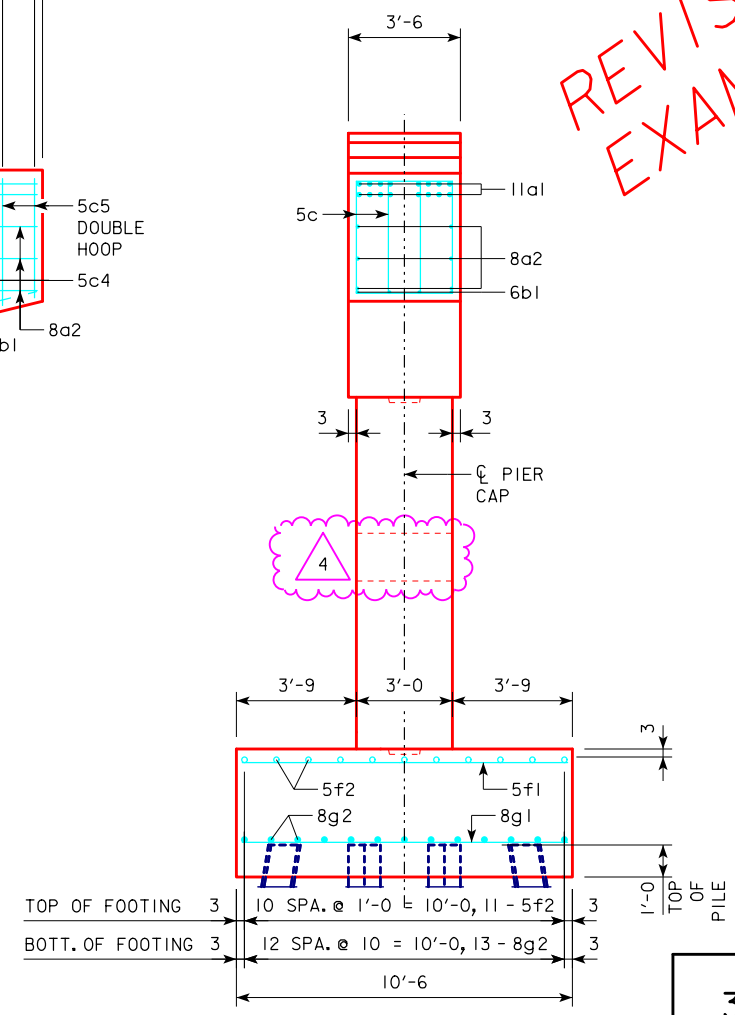
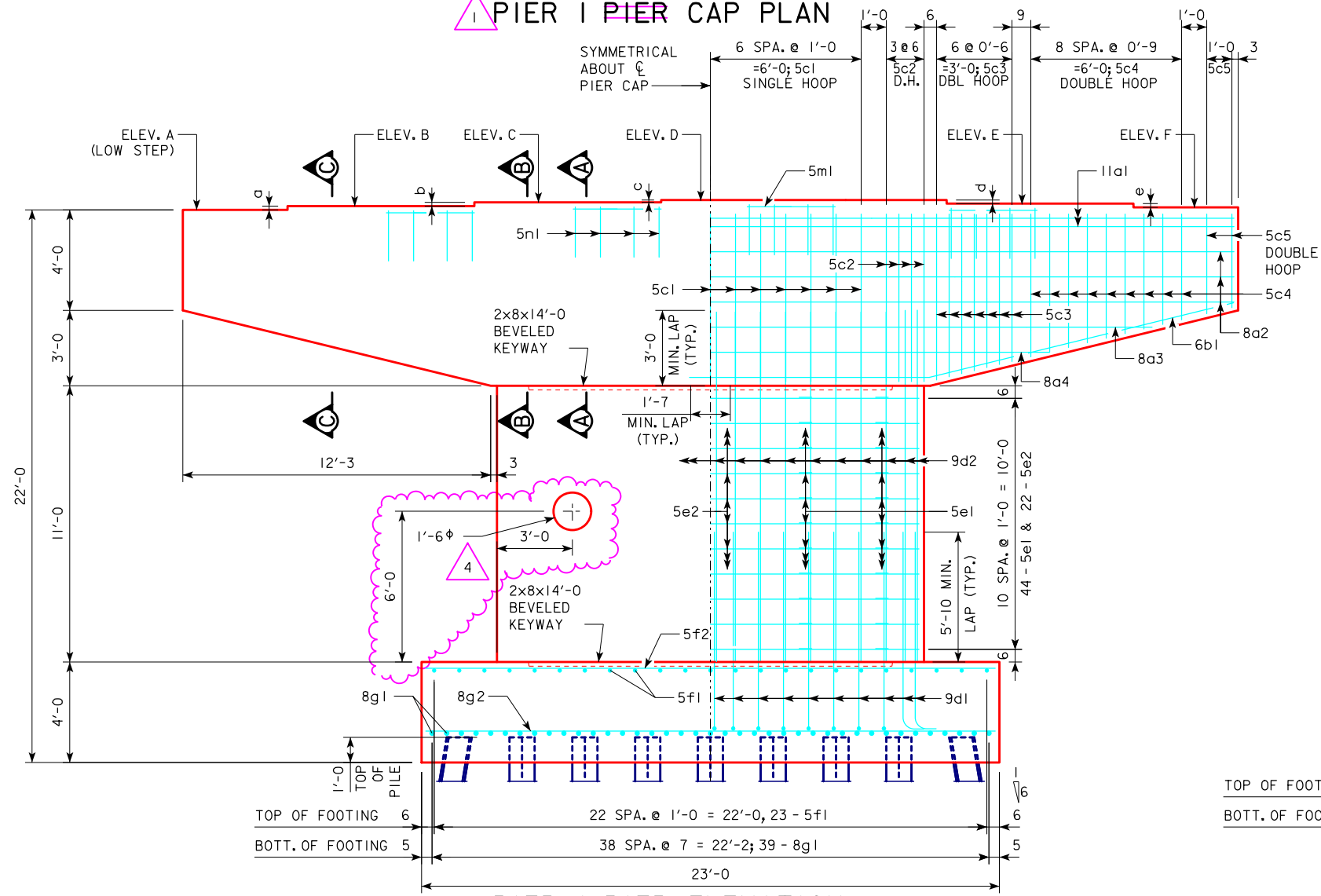


TABLE OF PIER ELEVATIONS

POINT	PIER 1	PIER 2
ELEV. A	1312.28	1312.20
ELEV. B	1312.43	1312.35
ELEV. C	1312.58	1312.50
ELEV. D	1312.67	1312.59
ELEV. E	1312.53	1312.45
ELEV. F	1312.58	1312.30
BOTT. FTG. ELEV.	1290.20	1289.70

TABLE OF PIER STEPS

STEP	PIER 1	PIER 2
a	2 13/16	1 13/16
b	2 13/16	1 13/16
c	2 1/16	1 1/16
d	2 11/16	1 11/16
e	2 13/16	1 13/16

4 REVIS: 04-15-2017 ADDED 1'-6" HOLE TO PIER 1 COLUMN.

REASON: LOCATION FOR WATER MAIN PASS THROUGH.

2 REVIS: 03-27-2017 CHANGED PIER 1 POINT AND STEP ELEVATIONS.

REASON: DUE TO CONSTRUCTION SURVEY ERROR.

1 REVIS: 03-09-2017 CHANGED TYPICAL PIER TO PIER 1 AND ELEVATION NOTE TO LOOKING EAST.

REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.

DESIGN FOR 0° SKEW

304'-0" x 41'-0" PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

91'-0" & 106'-0" END SPANS 107'-0" INTERIOR SPAN

PIER I PIER DETAILS

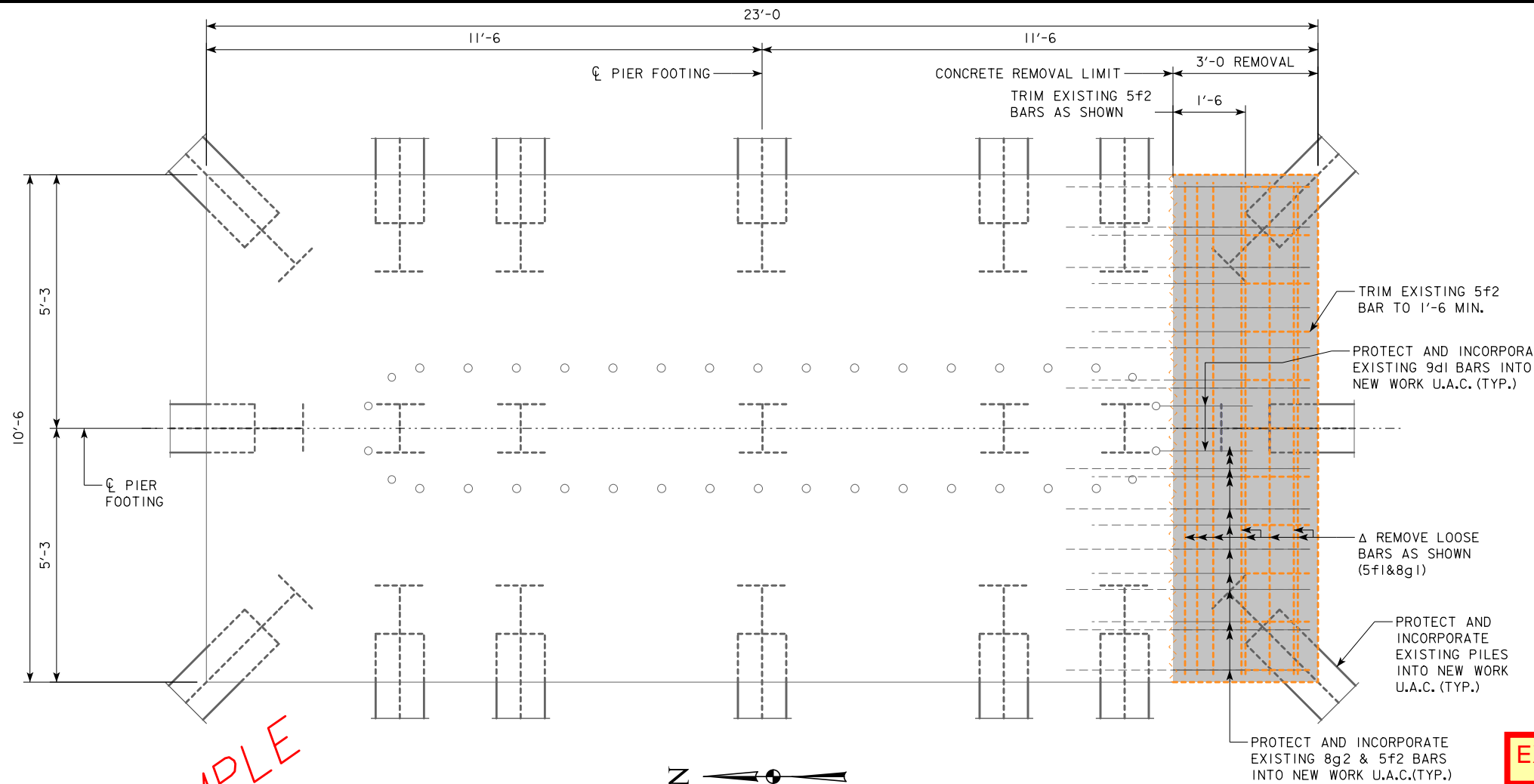
STA. 12454+02.16, 46.12' LT RADIUS=16,000' JULY, 2016

SAC COUNTY

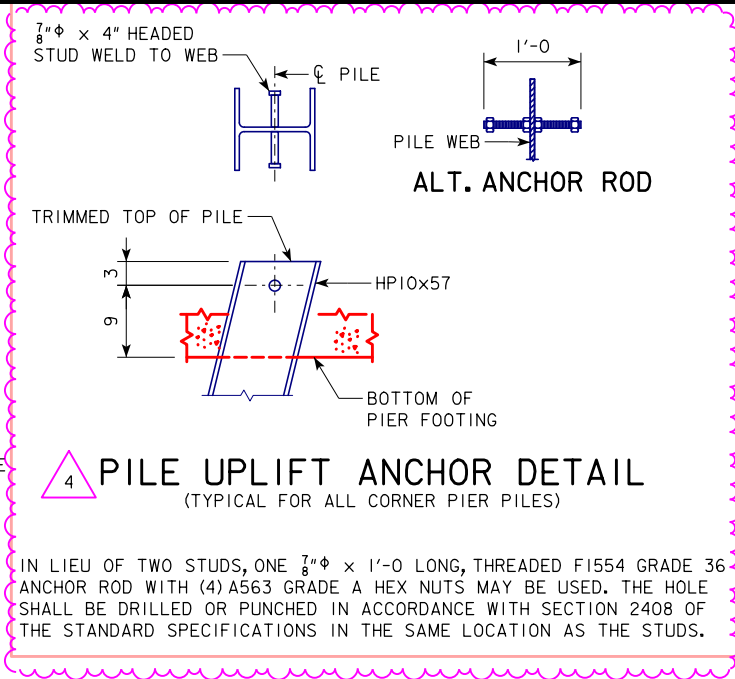
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 7 OF 58 FILE NO. 30568 DESIGN NO. 116

REVIS: APRIL 15, 2017

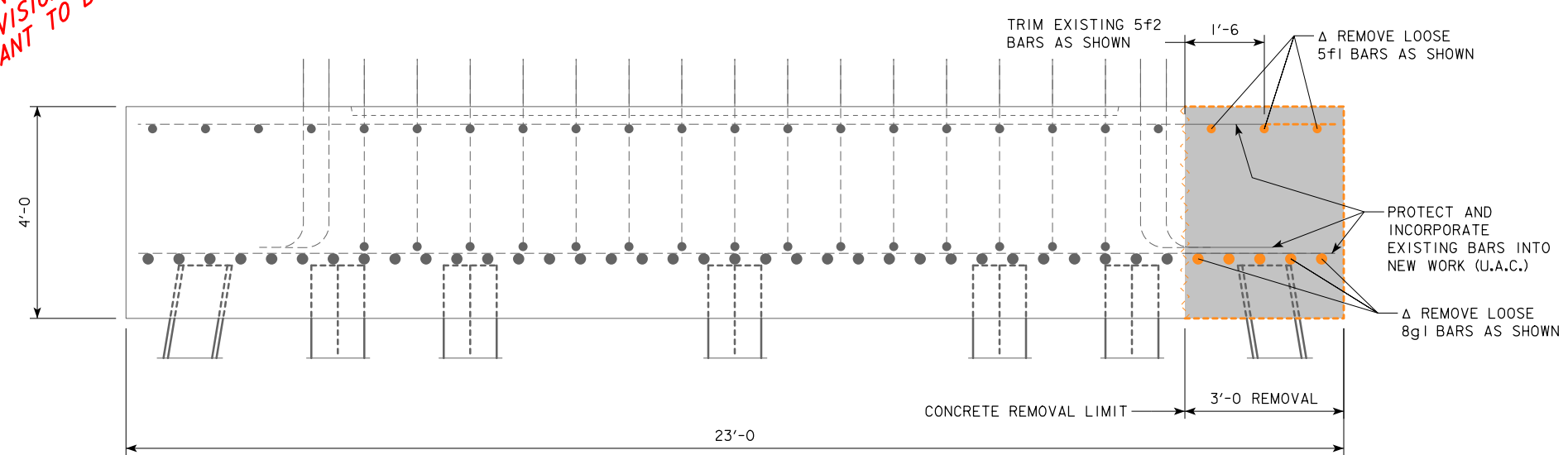


N
PIER 2 PLAN



EXAMPLE OF 2 REVISIONS ON THIS SHEET.

REVISION EXAMPLE
 THE PLAN DETAILS ARE ARBITRARY,
 THE REVISION MARK-UPS ARE WHAT
 IS MEANT TO BE SHOWN.



PIER 2 FOOTING ELEVATION

4 REVIS: 04-15-2017 PILE UPLIFT ANCHOR DETAIL ADDED.
 REASON: ANCHOR DETAIL NEEDED FOR ADDITIONAL REQUIRED PILES.

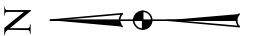
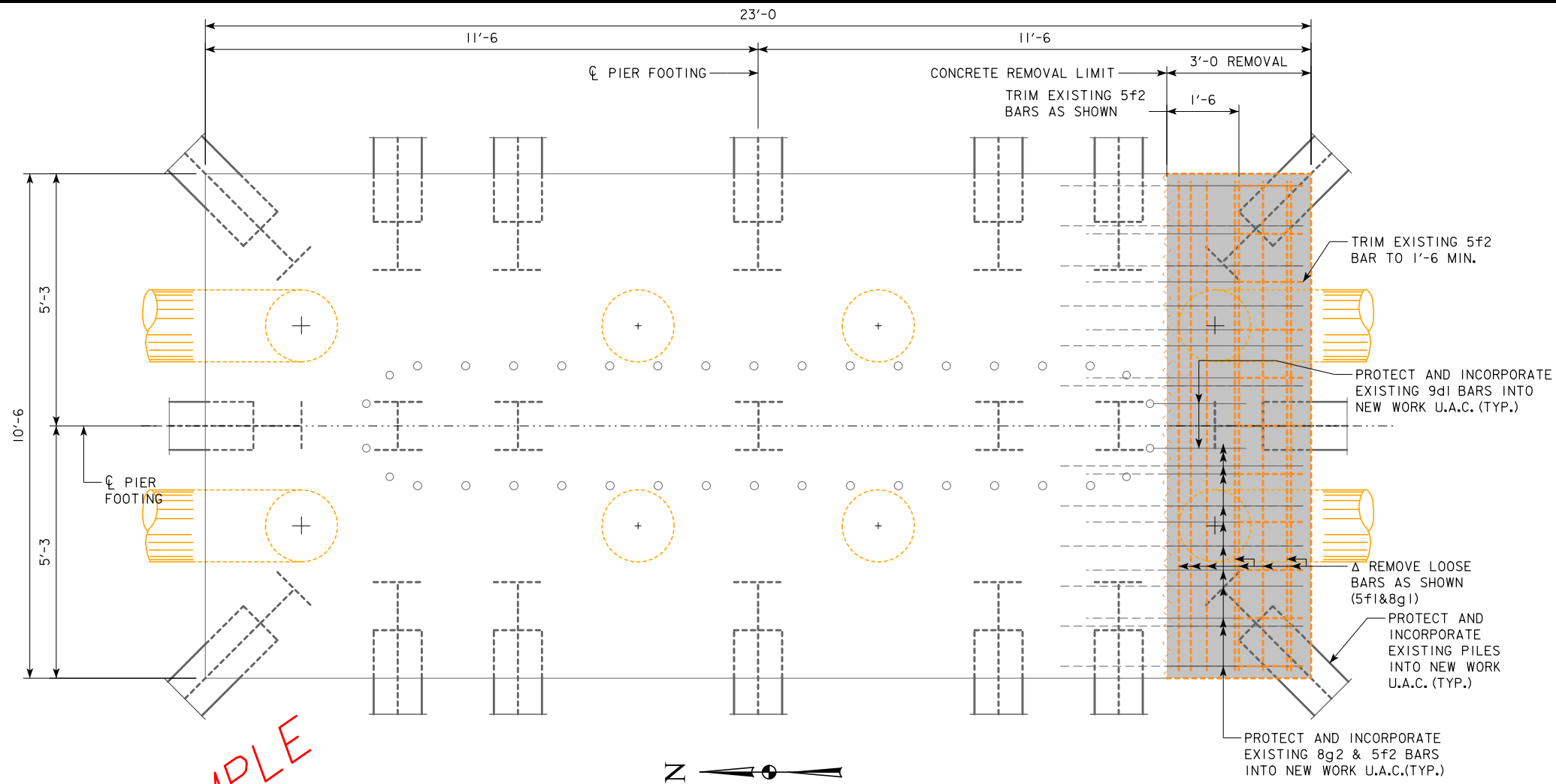


Δ LOOSE BARS 5f1 & 8g1 MAY BE CLEANED AND INCORPORATED INTO THE EXISTING FOOTING AS APPROVED BY THE ENGINEER.

1 REVIS: 03-09-2017 THIS SHEET ADDED.
 REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.

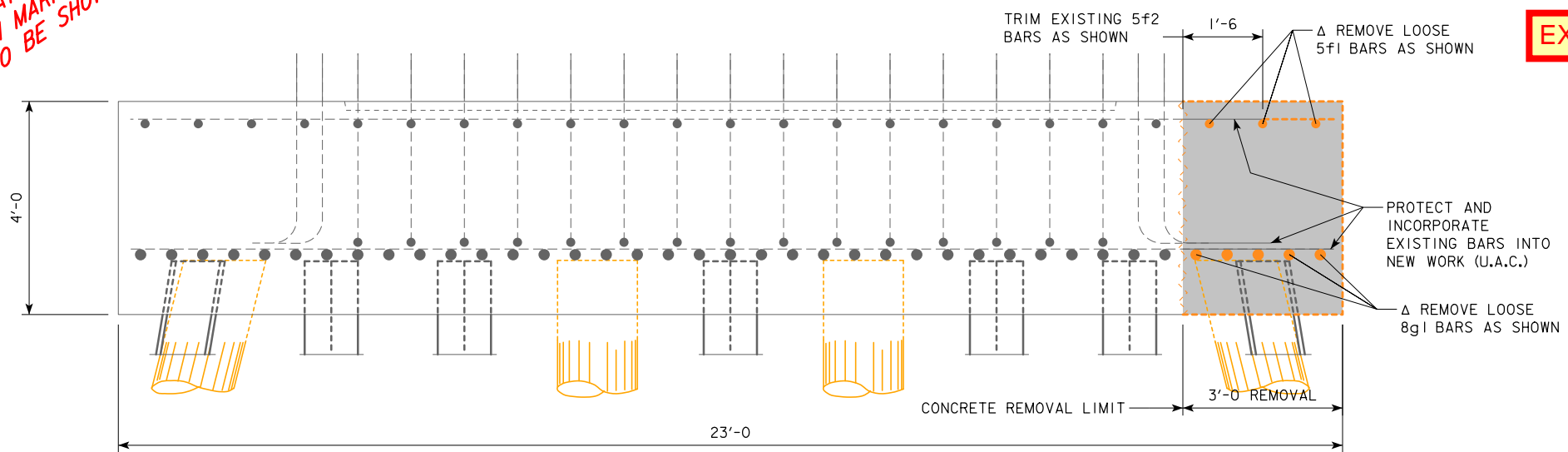
DESIGN FOR 0° SKEW
304'-0" x 41'-0" PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
 91'-0" & 106'-0" END SPANS 107'-0" INTERIOR SPAN
PIER 2 FOOTING REMOVAL
 STA. 12454+02.16, 46.12' LT RADIUS=16,000' JULY, 2016
SAC COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 7A OF 58 FILE NO. 30568 DESIGN NO. 116

REVIS: APRIL 15, 2017



PIER 2 PLAN

REVISION EXAMPLE
 THE PLAN DETAILS ARE ARBITRARY,
 THE REVISION MARK-UPS ARE WHAT
 IS MEANT TO BE SHOWN.



PIER 2 FOOTING ELEVATION

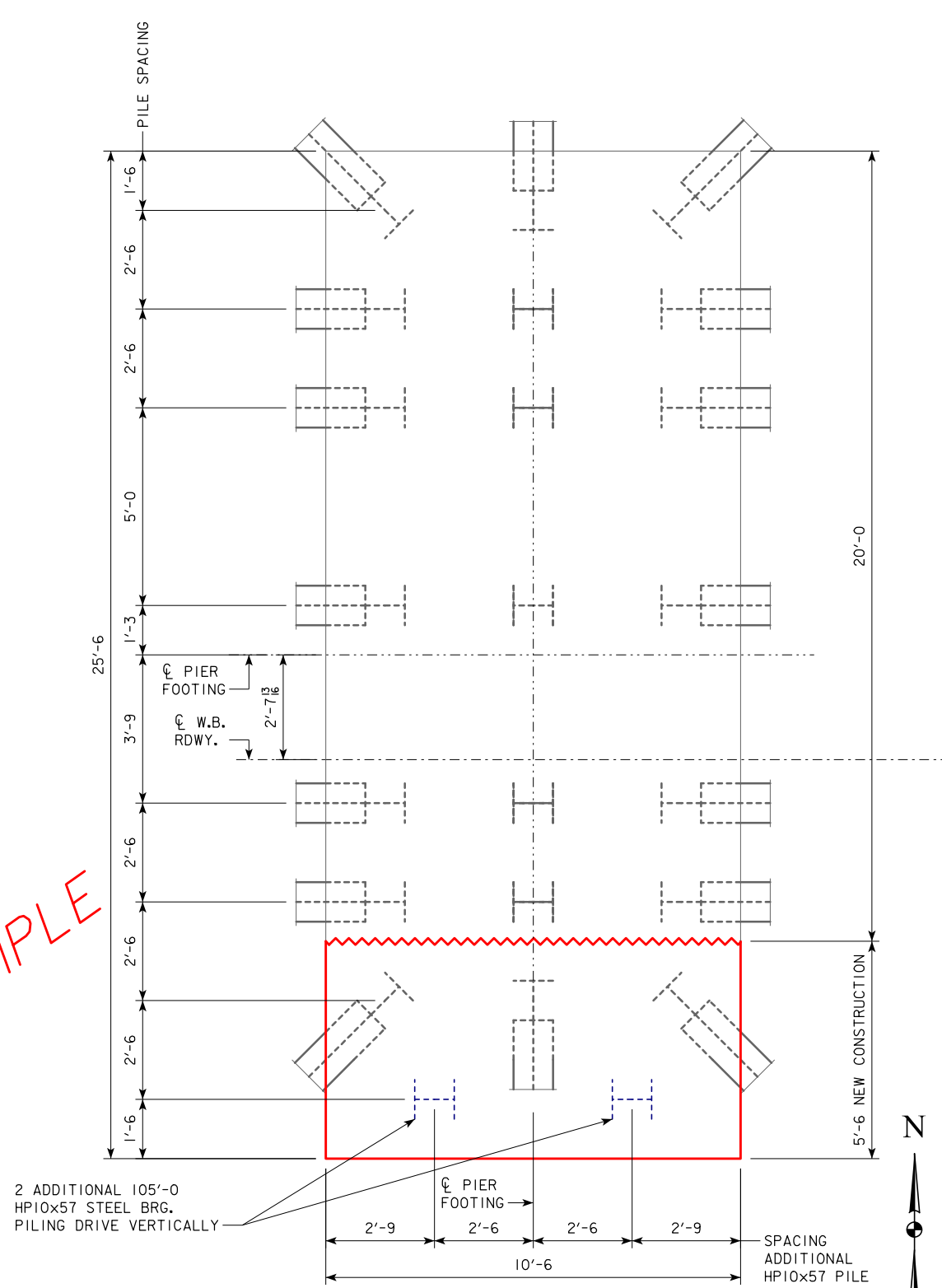
EXAMPLE OF 1 REVISION ON THIS SHEET.

4 REVISION: 04-15-2017 THIS SHEET ADDED.
 REASON: WOOD PILES WERE ADDED TO FOOTING FOR ADDITIONAL SUPPORT.

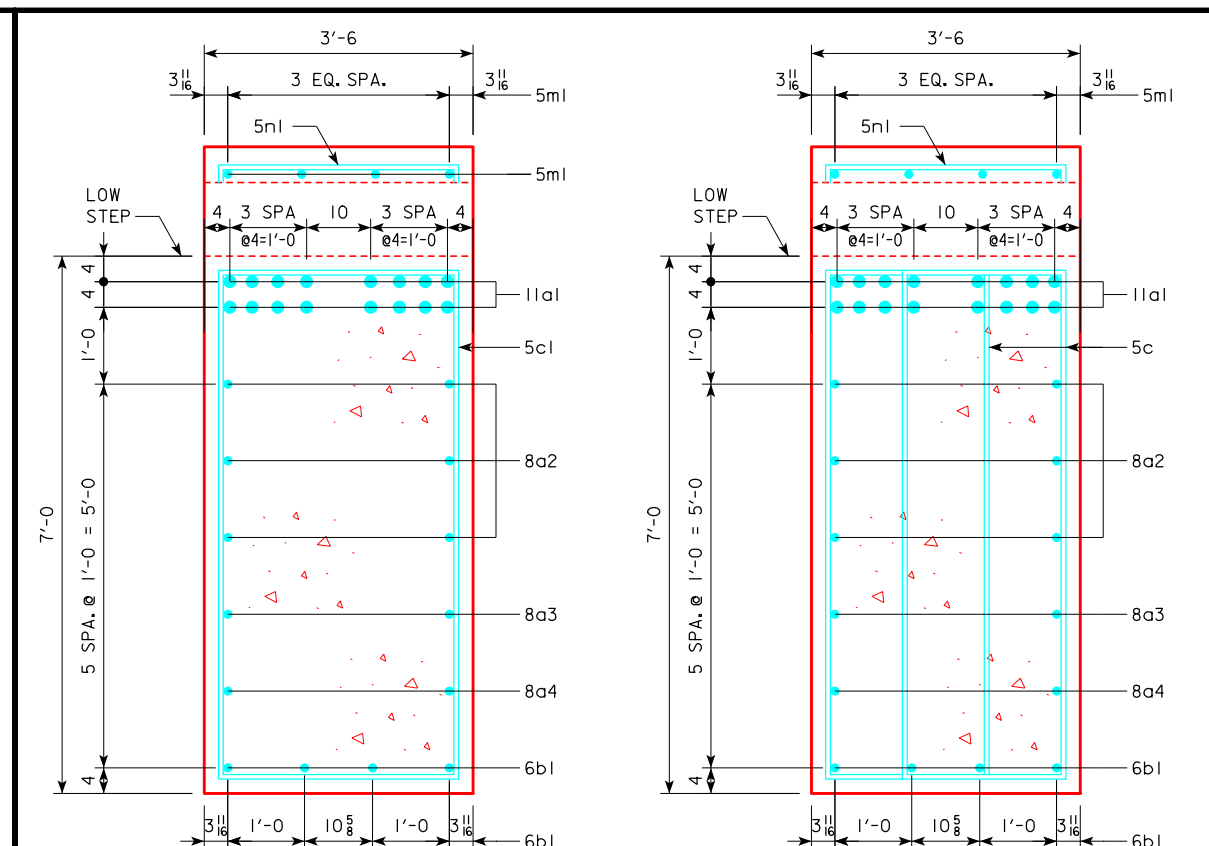
DESIGN FOR 0° SKEW
**304'-0" x 41'-0" PRETENSIONED
 PRESTRESSED CONCRETE BEAM BRIDGE**
 91'-0" & 106'-0" END SPANS 107'-0" INTERIOR SPAN
PIER 2 FOOTING REMOVAL
 STA. 12454+02.16, 46.12' LT RADIUS=16,000' JULY, 2016
SAC COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 7A1 OF 58 FILE NO. 30568 DESIGN NO. 116

REVISED: APRIL 15, 2017

REVISION EXAMPLE
 THE PLAN DETAILS ARE ARBITRARY,
 THE REVISION MARK-UPS ARE WHAT
 IS MEANT TO BE SHOWN.

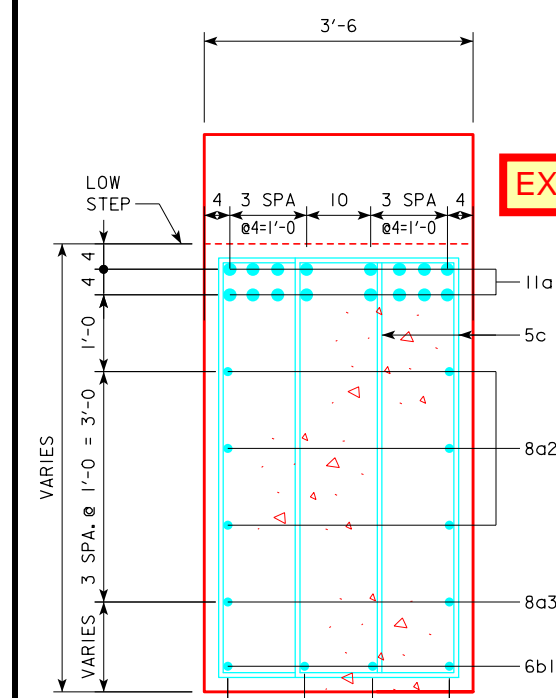


PIER 2 FOOTING LAYOUT
 PILE DIMENSIONS SHOWN ARE AT BOTTOM OF FOOTING. BATTER PILE 1:4 IN DIRECTION SHOWN.
 23 - HP10x57 STEEL BEARING PILES REQUIRED AT PIER NO. 2



SECTION A-A

SECTION B-B



SECTION C-C

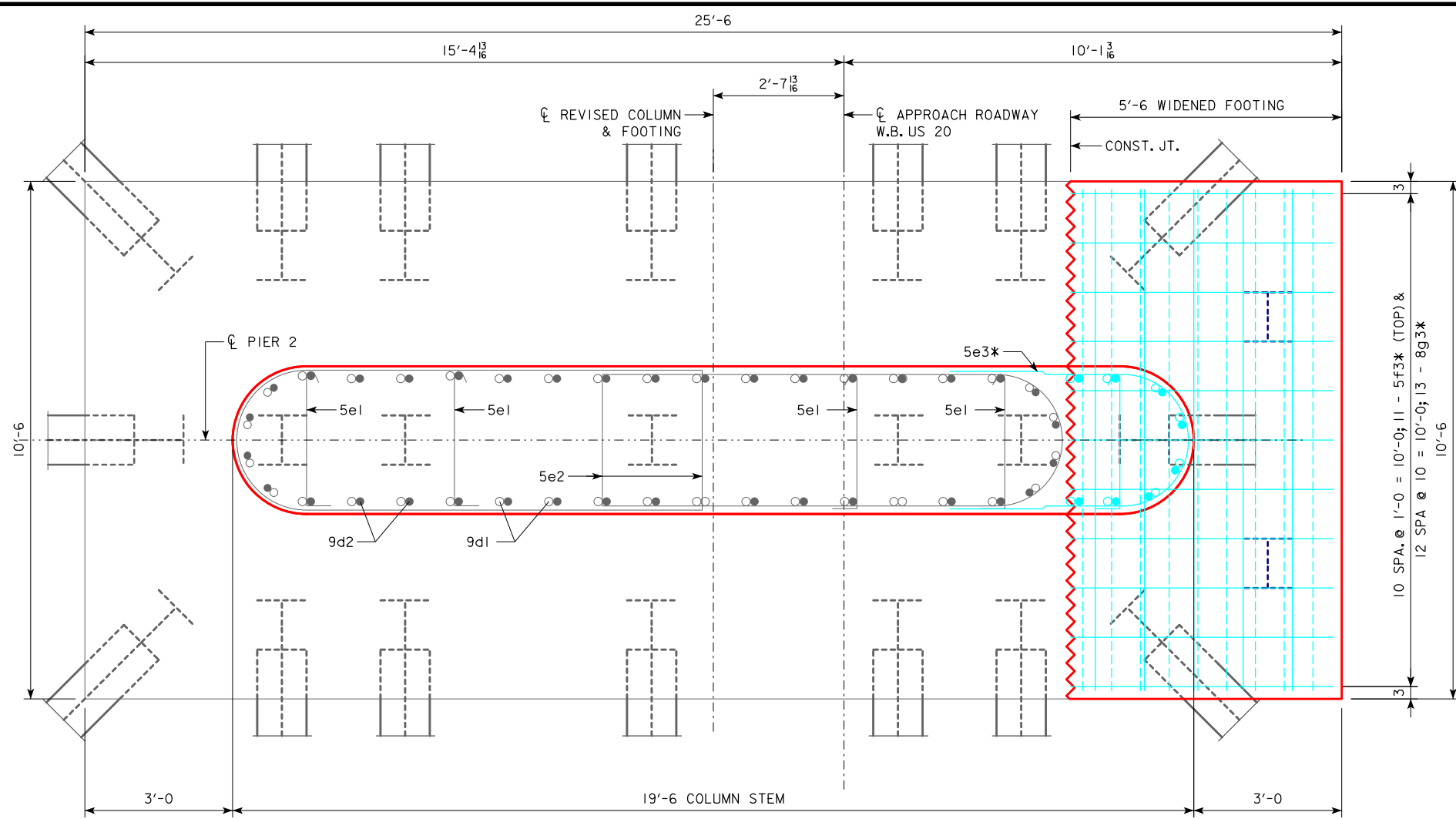
EXAMPLE OF 1 REVISION ON THIS SHEET.

1 REVISED: 03-09-2017 THIS SHEET ADDED.
 REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.

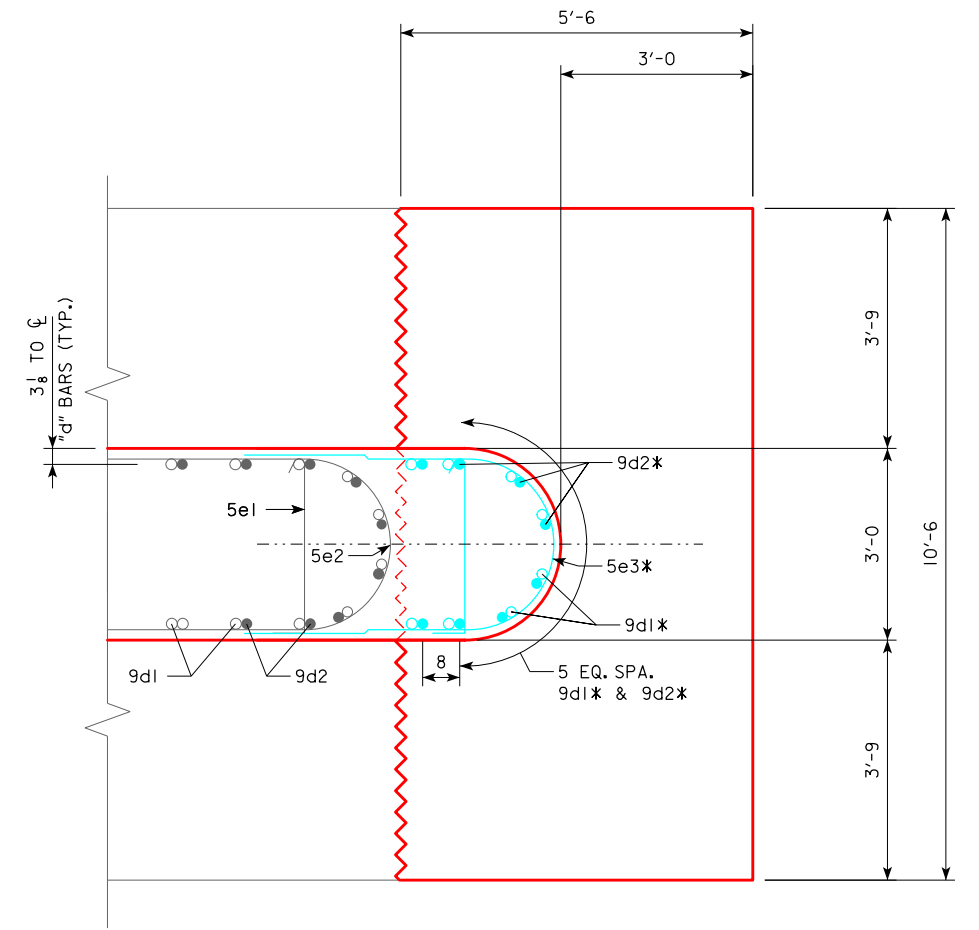
SEE DESIGN SHEET 07D FOR LOCATION OF SECTION A-A, SECTION B-B AND SECTION C-C.

DESIGN FOR 0° SKEW
304'-0" x 41'-0" PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
 91'-0" & 106'-0" END SPANS 107'-0" INTERIOR SPAN
PIER 2 DETAILS
 STA. 12454+02.16, 46.12' LT RADIUS=16,000' JULY, 2016
SAC COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 7B OF 58 FILE NO. 30568 DESIGN NO. 116

REVISED: MARCH 9, 2017

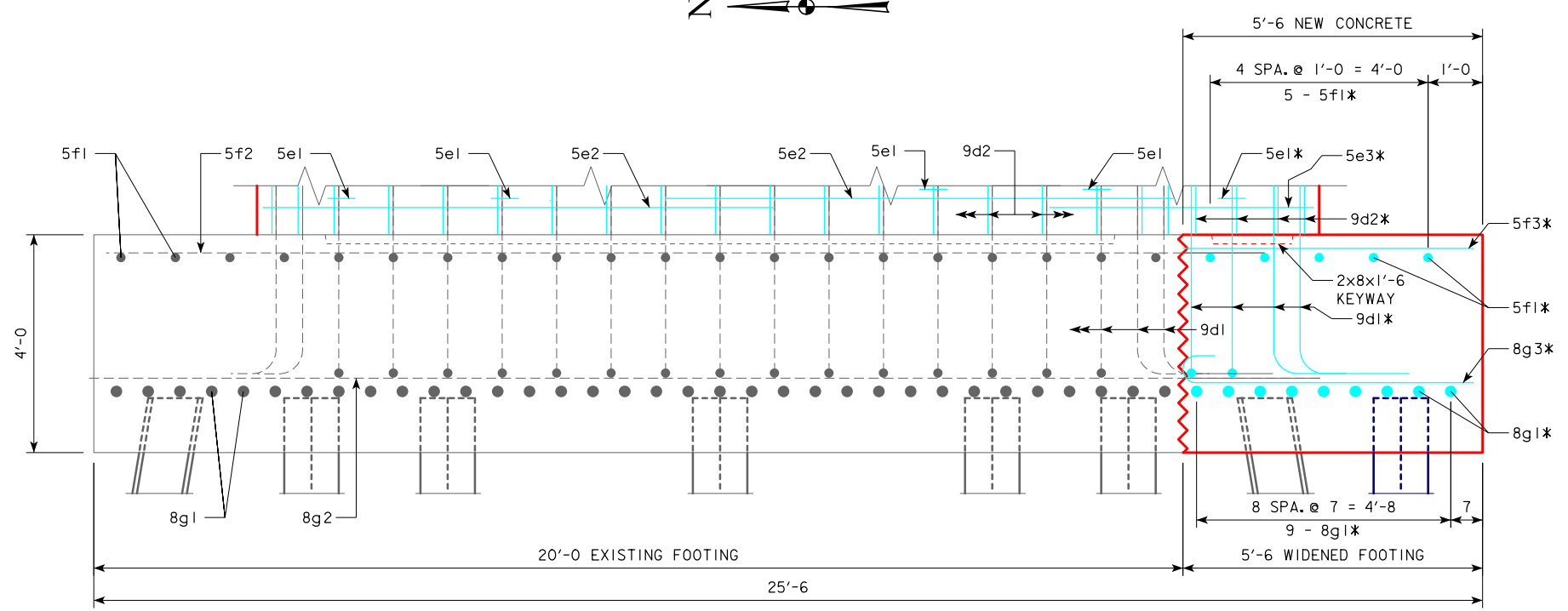


PIER 2 PLAN
CAP NOT SHOWN



EXAMPLE OF 1 REVISION ON THIS SHEET.

PART PIER 2 PLAN
PILES, FOOTING LONGIT. AND TRANS. BARS NOT SHOWN



PIER 2 FOOTING ELEVATION

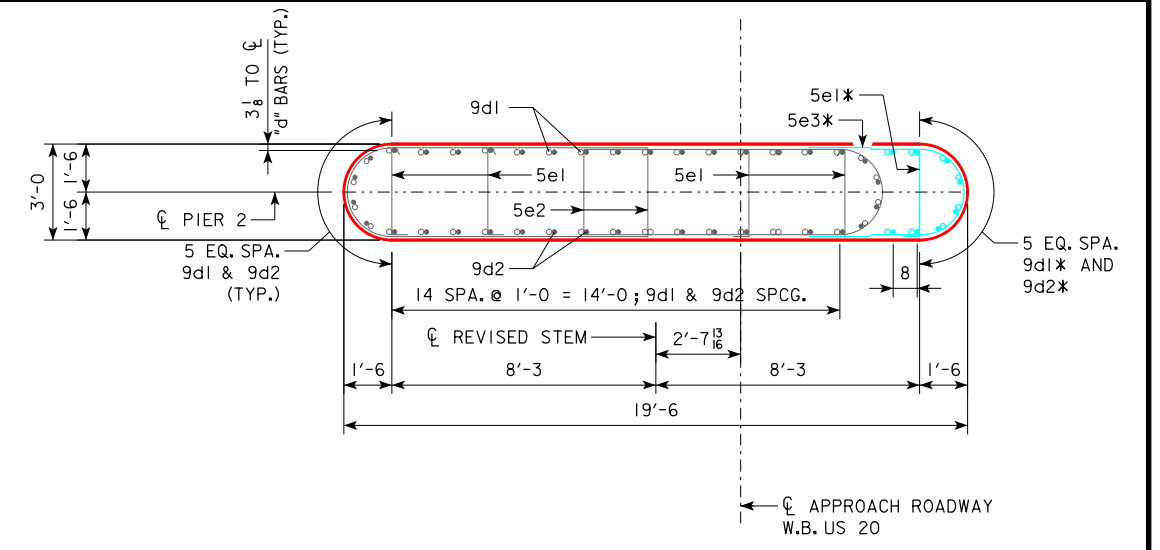
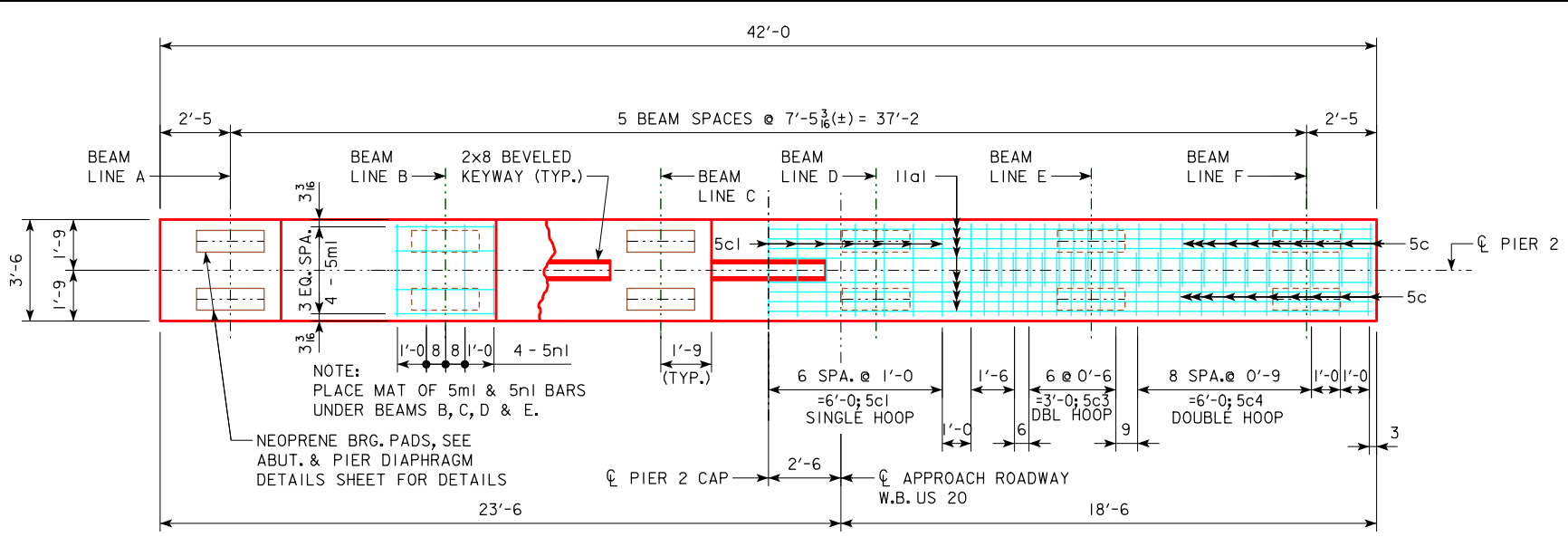
REVISION EXAMPLE
THE PLAN DETAILS ARE ARBITRARY,
THE REVISION MARK-UPS ARE WHAT
IS MEANT TO BE SHOWN.

* NOTE:
ADDITIONAL REINFORCING BARS TO BE
PROVIDED. SEE DESIGN SHEET 9 FOR
UPDATED REINFORCING STEEL TABLE.

REVISION 1
REVISED: 03-09-2017 THIS SHEET ADDED, PIER 2
FOOTING DETAILS.
REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH
OF PLAN ALIGNMENT DUE TO CONSTRUCTION
SURVEY ERROR.

DESIGN FOR 0° SKEW
**304'-0" x 41'-0" PRETENSIONED
 PRESTRESSED CONCRETE BEAM BRIDGE**
 91'-0" & 106'-0" END SPANS 107'-0" INTERIOR SPAN
PIER 2 FOOTING REPAIR
 STA. 12454+02.16, 46.12' LT RADIUS=16,000' JULY, 2016
SAC COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 7C OF 58 FILE NO. 30568 DESIGN NO. 116

REVISED: MARCH 9, 2017



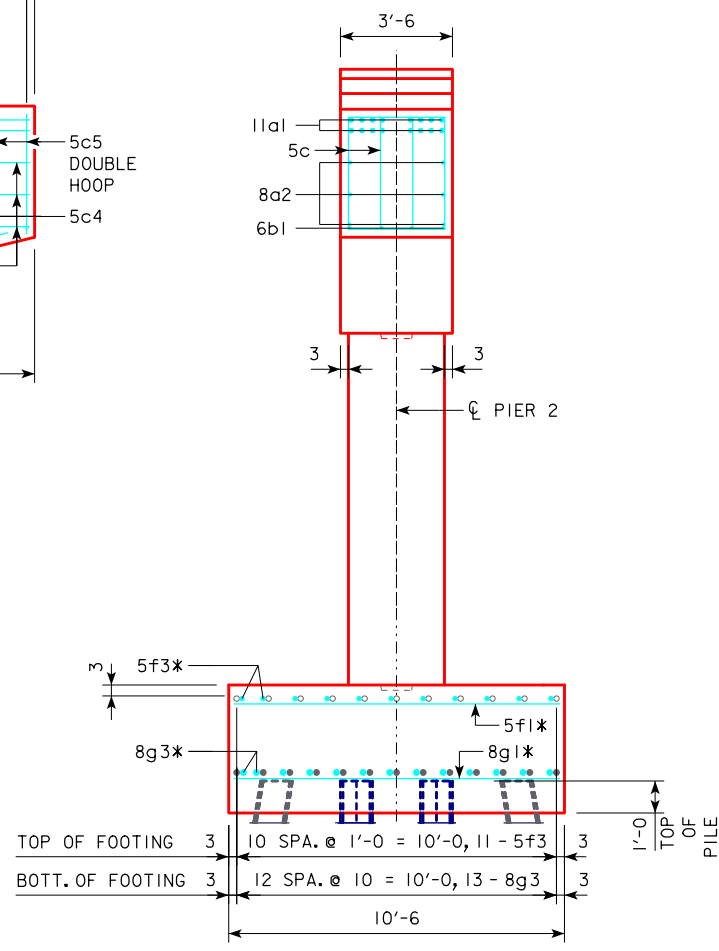
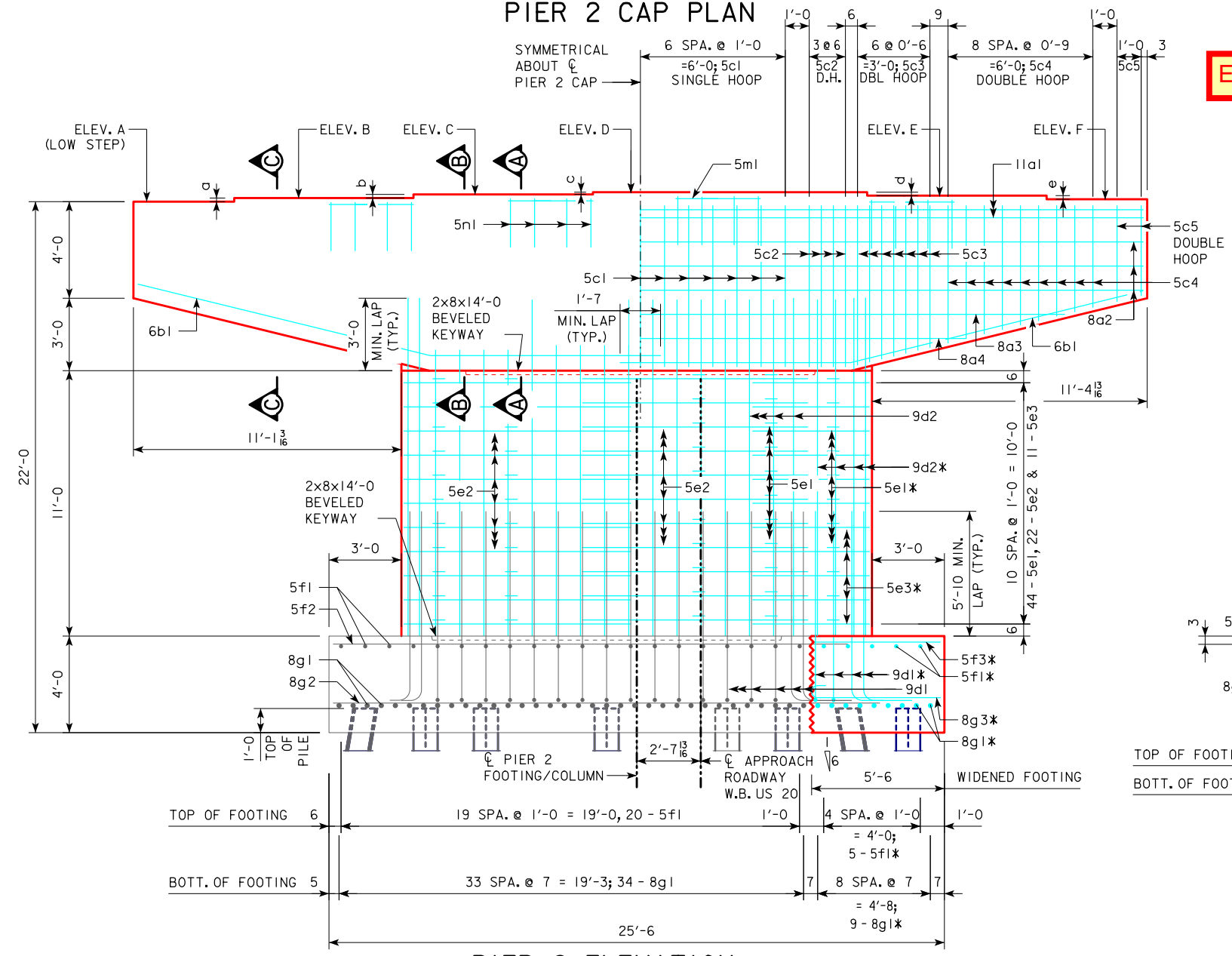
PIER 2 CAP PLAN

SECTION THRU STEM

EXAMPLE OF 1 REVISION ON THIS SHEET.

REVISION EXAMPLE

THE PLAN DETAILS ARE ARBITRARY, THE REVISION MARK-UPS ARE WHAT IS MEANT TO BE SHOWN.



* NOTE: ADDITIONAL REINFORCING BARS TO BE PROVIDED. SEE DESIGN SHEET 9 FOR UPDATED REINFORCING STEEL TABLE.

STEP	PIER 2
a	11 ¹³ / ₁₆
b	11 ¹³ / ₁₆
c	11 ¹⁶ / ₁₆
d	11 ¹¹ / ₁₆
e	11 ¹³ / ₁₆

POINT	PIER 2
ELEV. A	1311.70
ELEV. B	1311.85
ELEV. C	1312.00
ELEV. D	1312.09
ELEV. E	1311.95
ELEV. F	1311.80
BOTT. FTG. ELEV.	1289.70

SEE DESIGN SHEET NUMBER 07B FOR SECTION A-A, SECTION B-B, SECTION C-C AND FOOTING LAYOUT.

DESIGN FOR 0° SKEW

304'-0" x 41'-0" PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

91'-0" & 106'-0" END SPANS 107'-0" INTERIOR SPAN

PIER 2 DETAILS

STA. 12454+02.16, 46.12' LT RADIUS=16,000' JULY, 2016

SAC COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 7D OF 58 FILE NO. 30568 DESIGN NO. 116

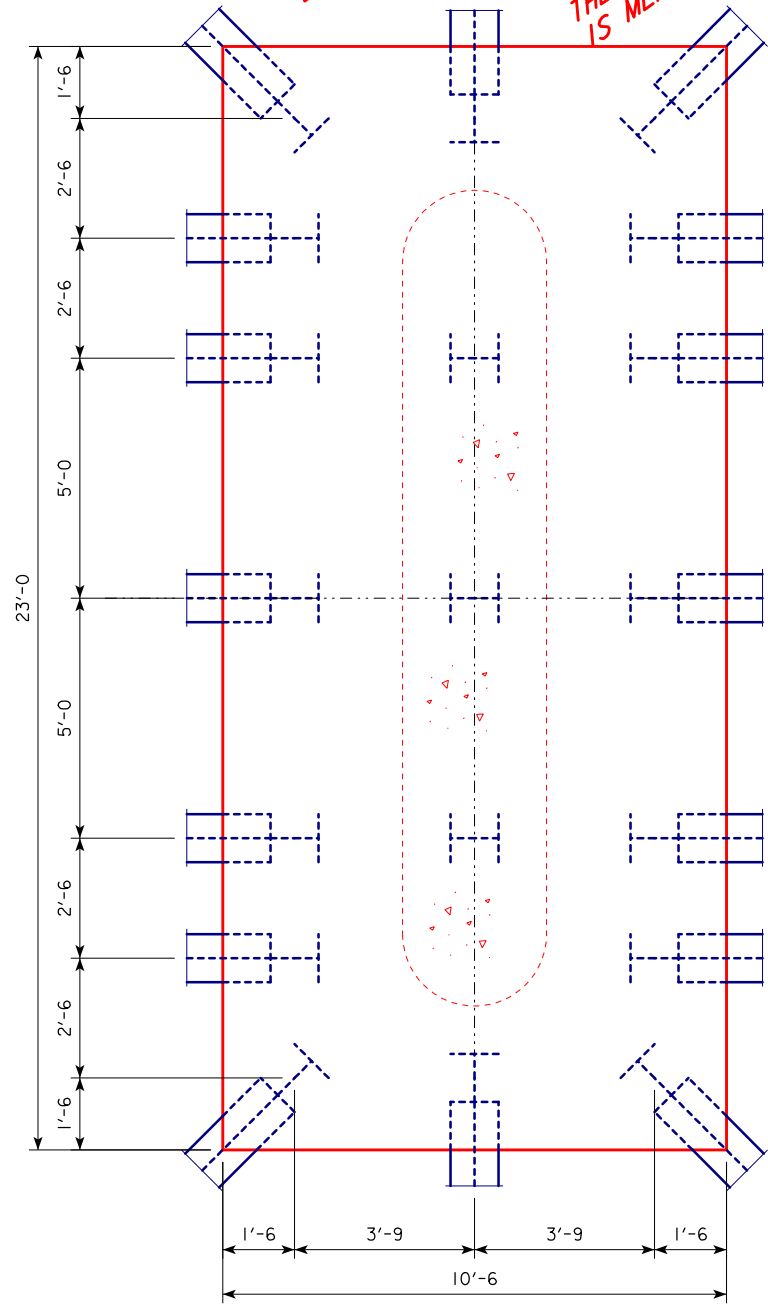
REVISOR: 03-09-2017 THIS SHEET ADDED.

REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.

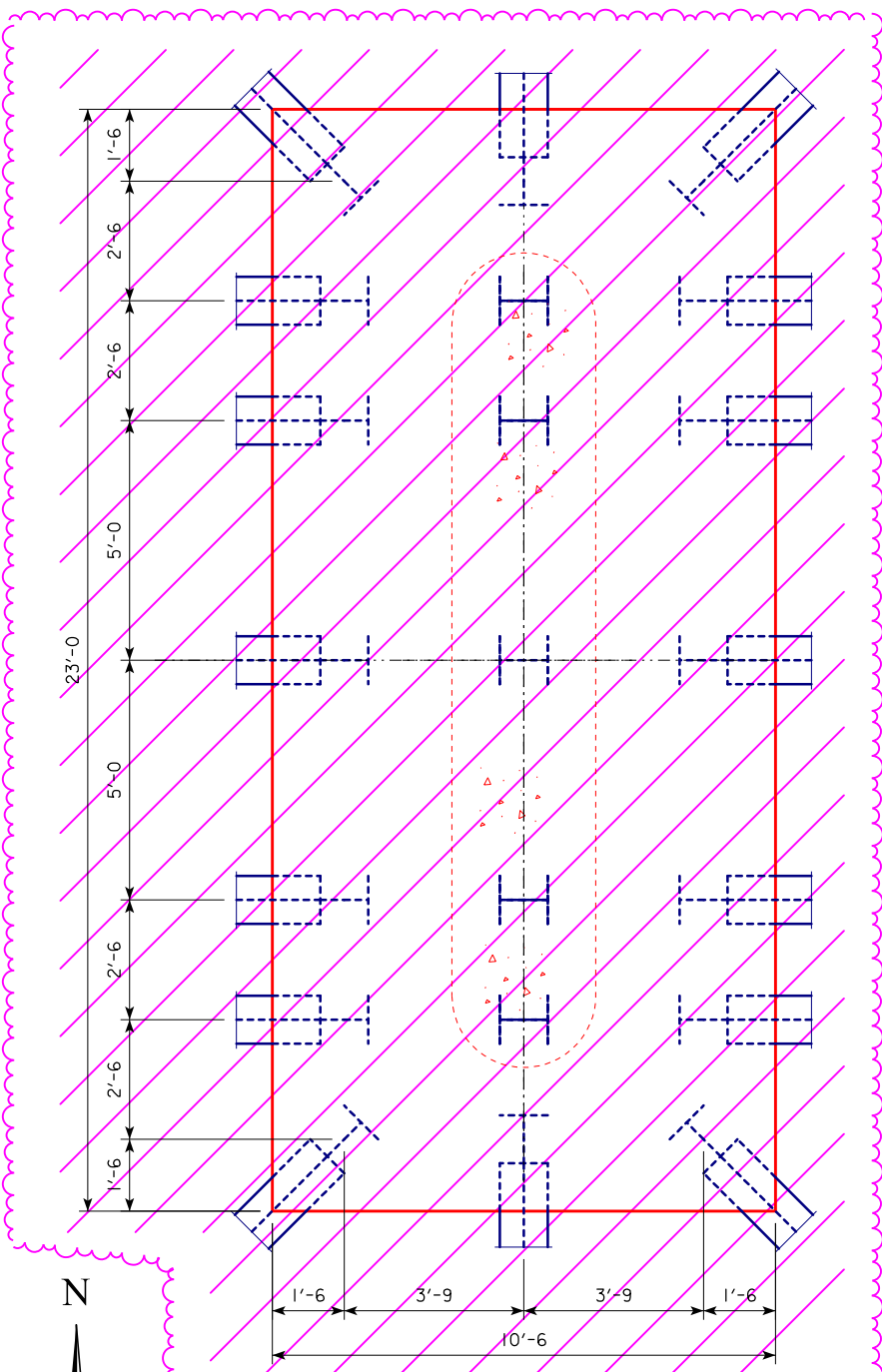
REVISED: MARCH 9, 2017

**REVISION
EXAMPLE**

**THE PLAN DETAILS ARE ARBITRARY,
THE REVISION MARK-UPS ARE WHAT
IS MEANT TO BE SHOWN.**

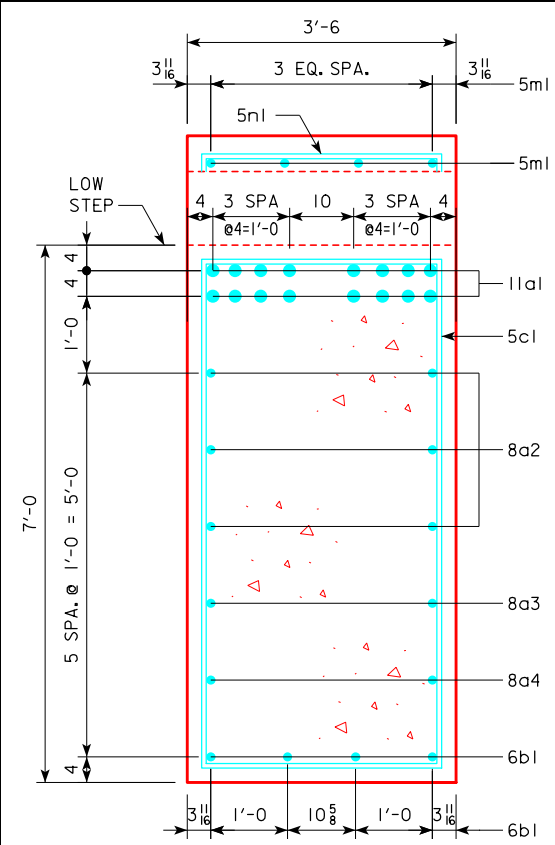


PIER 1
19 - HP10x57 STEEL BEARING
PILES REQUIRED AT PIER NO. 1

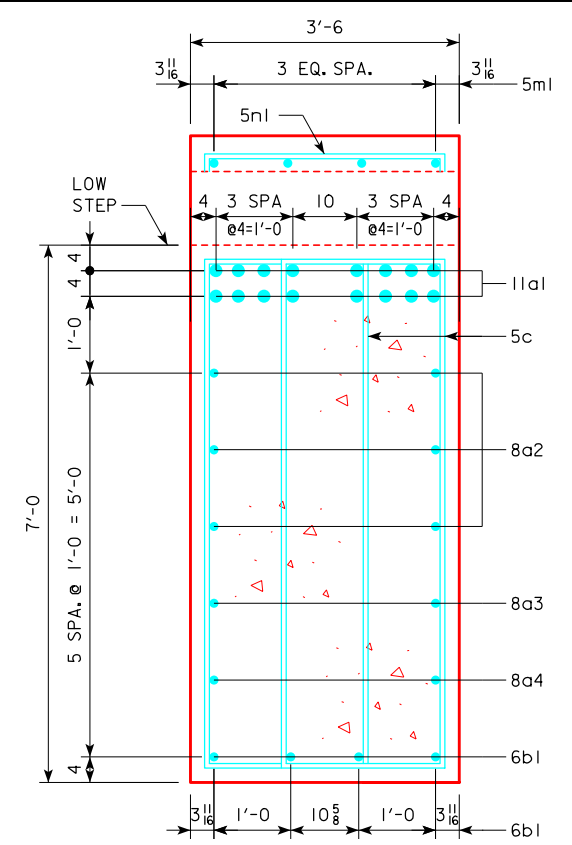


PIER 2
21 - HP10x57 STEEL BEARING
PILES REQUIRED AT PIER NO. 2

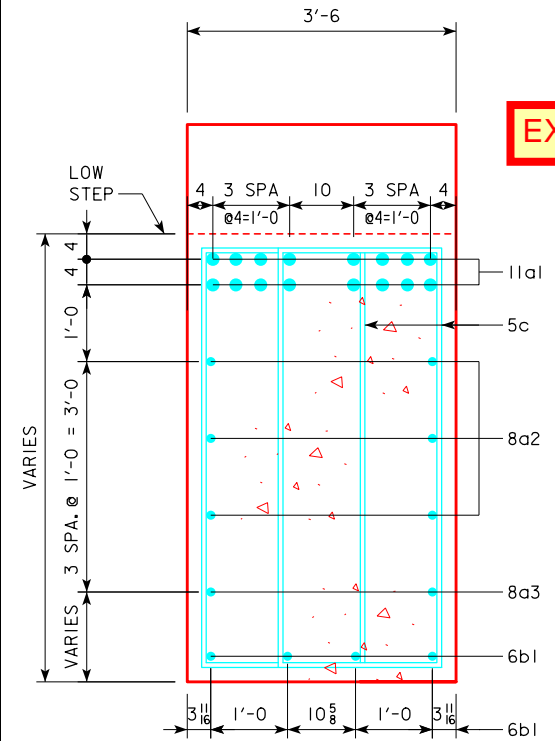
PIER FOOTING LAYOUT
PILE DIMENSIONS SHOWN ARE AT BOTTOM OF
FOOTING. BATTER PILE 1:4 IN DIRECTION SHOWN.



SECTION A-A



SECTION B-B



SECTION C-C

EXAMPLE OF 1 REVISION ON THIS SHEET.

REVISOR: 03-09-2017 REMOVE PIER 2 FOOTING.
REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH
OF PLAN ALIGNMENT DUE TO CONSTRUCTION
SURVEY ERROR.

SEE DESIGN SHEET 07 FOR
LOCATION OF SECTION A-A,
SECTION B-B AND SECTION C-C.

DESIGN FOR 0° SKEW
**304'-0" x 41'-0" PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**
91'-0" & 106'-0" END SPANS 107'-0" INTERIOR SPAN
PIER DETAILS
STA. 12454+02.16, 46.12' LT RADIUS=16,000' JULY, 2016
SAC COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 8 OF 58 FILE NO. 30568 DESIGN NO. 116

REVISED: MARCH 9, 2017

REINFORCING STEEL - PIER 2					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
11a1	CAP, TOP, LONGIT.	—	16	41'-8"	3542
8a2	CAP, SIDES, LONGIT.	—	6	41'-8"	668
8a3	CAP, SIDES, LONGIT.	—	2	35'-2"	188
8a4	CAP, SIDES, LONGIT.	—	2	27'-0"	144
6b1	CAP, BOTTL., LONGIT.	—	8	22'-0"	264
5c1	CAP HOOPS	□	13	20'-8"	280
5c2	CAP HOOPS	□	16	18'-6"	309
5c3	CAP HOOPS	□	28	VARIES	515
5c4	CAP HOOPS	□	36	VARIES	566
5c5	CAP HOOPS	□	8	VARIES	107
9d1	FOOTING TO COLUMN DOWEL	L	38	10'-7"	1367
9d2	COLUMN VERTICAL	—	38	14'-0"	1809
5e1	COLUMN TIES	⌋	44	3'-8"	168
5e2	COLUMN HOOPS	D	22	24'-2"	555
5f1	FOOTING, TOP, TRANSV. & LONGIT.	—	23	10'-2"	244
5f2	FOOTING, TOP, TRANSV. & LONGIT.	—	11	22'-8"	260
8g1	FOOTING, BOTTL., TRANSV. & LONGIT.	—	39	10'-2"	1059
8g2	FOOTING, BOTTL., TRANSV. & LONGIT.	—	13	22'-8"	787
5m1	CAP, STEPS, LONGIT.	—	16	3'-6"	58
5n1	CAP, STEPS, TRANSV.	⌋	16	7'-2"	120
REINFORCING STEEL TOTAL (LBS.)					13,010

REINFORCING STEEL - PIER 2 *					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
9d1	FOOTING TO COLUMN DOWEL	L	8	10'-7"	288
9d2	COLUMN VERTICAL	—	8	14'-0"	381
5e1	COLUMN TIES	⌋	11	3'-8"	42
5e3	COLUMN HOOPS	D	11	11'-2"	128
5f1	FOOTING, TOP, TRANSV.	—	5	10'-2"	53
5f3	FOOTING, TOP, LONGIT.	—	11	5'-4"	61
8g1	FOOTING, BOTTL., TRANSV.	—	9	10'-2"	244
8g3	FOOTING, BOTTL., LONGIT.	—	13	6'-3"	217
REINFORCING STEEL TOTAL (LBS.)*					1,414
TOTAL (LBS.)					14,424



* NOTE:
ADDITIONAL REINFORCING BARS TO BE PROVIDED FOR WIDENED FOOTING. SEE DESIGN SHEETS 7C & 7D.

REINFORCING STEEL - ONE PIER 1					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
11a1	CAP, TOP, LONGIT.	—	16	41'-8"	3542
8a2	CAP, SIDES, LONGIT.	—	6	41'-8"	668
8a3	CAP, SIDES, LONGIT.	—	2	35'-2"	188
8a4	CAP, SIDES, LONGIT.	—	2	27'-0"	144
6b1	CAP, BOTTL., LONGIT.	—	8	22'-0"	264
5c1	CAP HOOPS	□	13	20'-8"	280
5c2	CAP HOOPS	□	16	18'-6"	309
5c3	CAP HOOPS	□	28	VARIES	515
5c4	CAP HOOPS	□	36	VARIES	566
5c5	CAP HOOPS	□	8	VARIES	107
9d1	FOOTING TO COLUMN DOWEL	L	38	10'-7"	1367
9d2	COLUMN VERTICAL	—	38	14'-0"	1809
5e1	COLUMN TIES	⌋	44	3'-8"	168
5e2	COLUMN HOOPS	D	22	24'-2"	555
5f1	FOOTING, TOP, TRANSV. & LONGIT.	—	23	10'-2"	244
5f2	FOOTING, TOP, TRANSV. & LONGIT.	—	11	22'-8"	260
8g1	FOOTING, BOTTL., TRANSV. & LONGIT.	—	39	10'-2"	1059
8g2	FOOTING, BOTTL., TRANSV. & LONGIT.	—	13	22'-8"	787
5m1	CAP, STEPS, LONGIT.	—	16	3'-6"	58
5n1	CAP, STEPS, TRANSV.	⌋	16	7'-2"	120
REINFORCING STEEL TOTAL (LBS.)					13,010

REVISION EXAMPLE
THE PLAN DETAILS ARE ARBITRARY, THE REVISION MARK-UPS ARE WHAT IS MEANT TO BE SHOWN.

CONCRETE PLACEMENT QUANTITIES		
LOCATION	PIER NO. 1	PIER NO. 2
FOOTING	35.8	35.8 39.7
STEM	20.0	20.0 23.0
CAP & STEPS	34.7	34.7
TOTAL - CU. YDS.	90.5	90.5 97.4

PIER NOTES:

ALL EXPOSED CORNERS OF 90° OR SHARPER ARE TO BE FILLETED WITH A 3/4" DRESSED AND BEVELED STRIP.

ALL BATTERED PILE SHALL BE TRIMMED TO A HORIZONTAL LINE TO AID IN PLACING OF REINFORCING.

REINFORCING IS TO BE SECURELY WIRED IN PLACE BEFORE CONCRETE IS POURED.

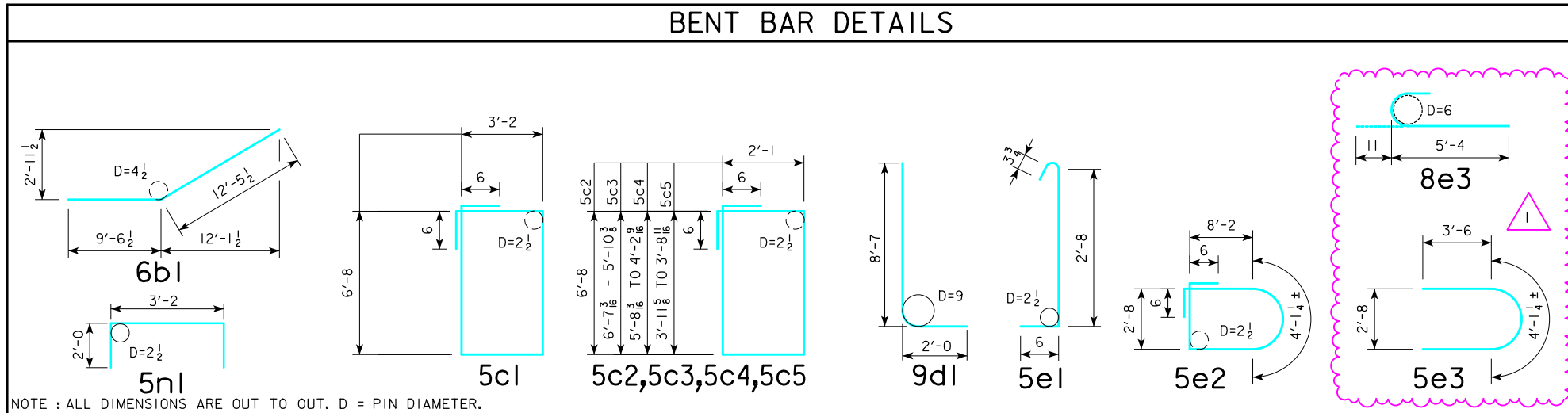
PILE DESIGN NOTES:

THE CONTRACT LENGTH OF 105 FEET FOR THE PIERS PILES IS BASED ON A MIXED SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 219 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A MIXED SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.76. DESIGN SCOUR (100-YEAR) WAS ASSUMED TO AFFECT THE UPPER 9 FEET OF EMBEDDED PILE LENGTH AND CAUSE 18 KIPS OF DRIVING RESISTANCE.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIERS PILES IS 154 TONS AT END OF DRIVE. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. IN NO CASE SHALL A PILE BE EMBEDDED LESS THAN 50 FEET. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

EXAMPLE OF 1 REVISION ON THIS SHEET.



NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

REVISION 1
REVISED: 03-09-2017 SEPARATED PIER 1 AND 2 QUANTITIES AND ADDED DOWEL NOTE.
REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.

DESIGN FOR 0° SKEW
304'-0" x 41'-0" PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
 91'-0" & 106'-0" END SPANS 107'-0" INTERIOR SPAN
PIER QUANTITIES
 STA. 12454+02.16, 46.12' LT RADIUS=16,000' JULY, 2016
SAC COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 9 OF 58 FILE NO. 30568 DESIGN NO. 116

REVISED: MARCH 9, 2017

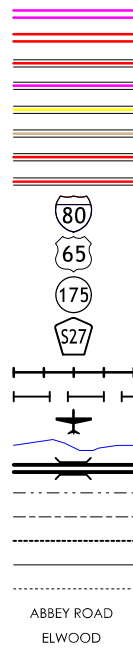
BRIDGE REPLACEMENT - PPCB
NHSN-020-2(143)--2R-81

SAC COUNTY - DESIGN 116/216

DESIGN TEAM DESIGNER / CHECKER / DETAILER

LEGEND

- INTERSTATE HIGHWAY
- PRIMARY HIGHWAY-DIVIDED
- PRIMARY HIGHWAY
- PORTLAND CEMENT CONCRETE ROAD
- ASPHALT ROAD
- BITUMINOUS ROAD
- GRAVEL ROAD
- EARTHEN ROAD
- INTERSTATE HIGHWAY
- UNITED STATES HIGHWAY
- STATE HIGHWAY
- COUNTY HIGHWAY
- RAILROAD
- PIPELINE
- AIRPORT
- HYDROLOGY
- BRIDGE
- STATE BOUNDARY
- COUNTY BOUNDARY
- CORPORATE BOUNDARY
- TOWNSHIP LINE
- SECTION LINE
- ROAD NAMES
- UNINCORPORATED PLACE



Highway Division
PLANS OF PROPOSED IMPROVEMENTS ON THE
PRIMARY ROAD SYSTEM
SAC COUNTY

EXAMPLE OF TITLE SHEET WITH 5 PLAN REVISIONS.

REVISION EXAMPLE

BRIDGE REPLACEMENT - PPCB
NEW DUAL BRIDGES AS PART OF 4 LANE US 20 PROJECT
OVER BOYER RIVER 1.9 MILES WEST OF US 71

THE IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

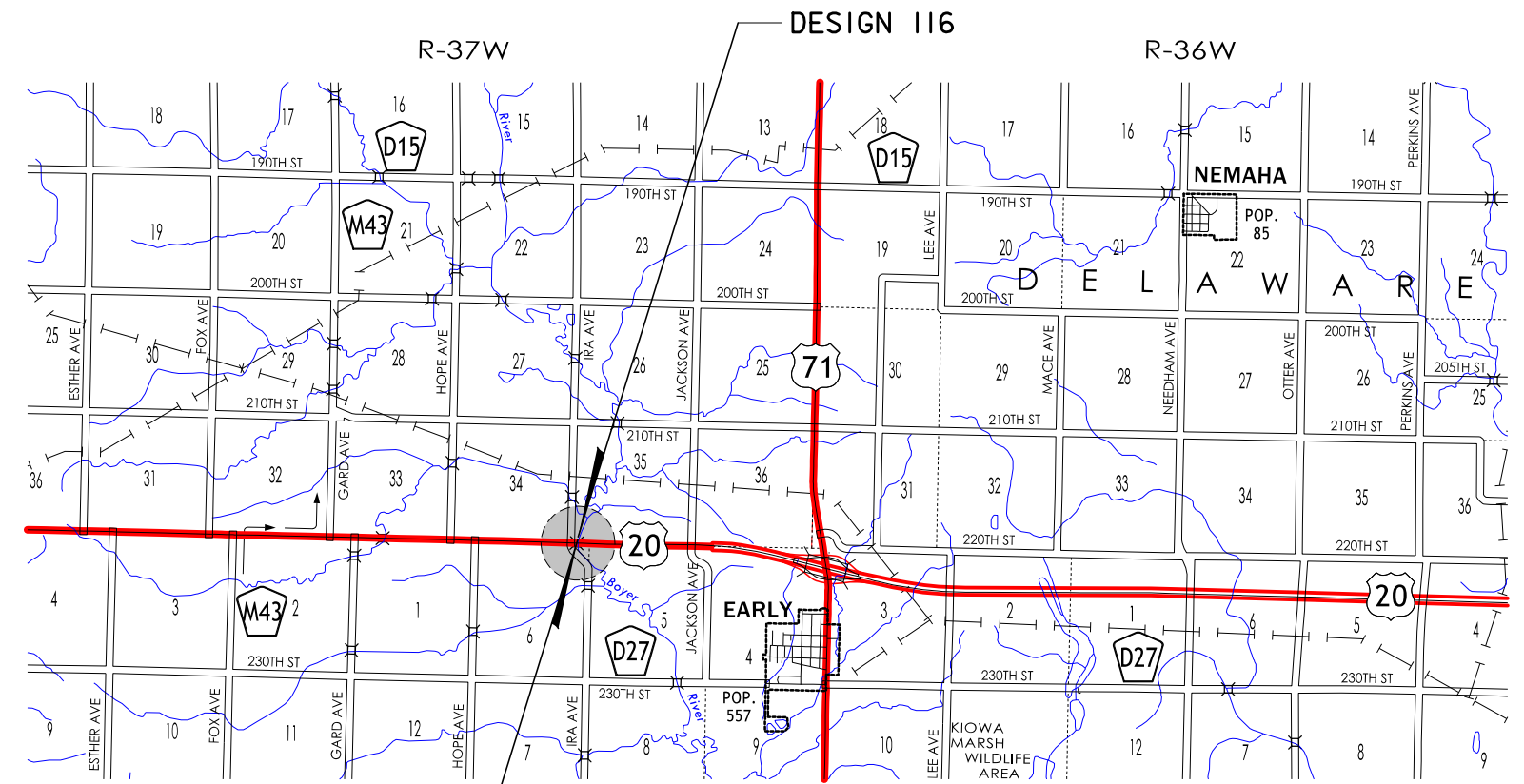
REVISIONS

SEE REVISION SHEET RA	03-09-2017
SEE REVISION SHEET RA	03-27-2017
SEE REVISION SHEET RA	04-11-2017
SEE REVISION SHEET RB	04-15-2017
SEE REVISION SHEET RB	11-21-2017

TOTAL SHEETS	65
PROJECT NUMBER	NHSN-020-2(143)--2R-81
R.O.W. PROJECT NUMBER	-
PROJECT IDENTIFICATION NUMBER	98-97-020-010-06

INDEX OF SHEETS

NO.	DESCRIPTION
1	TITLE SHEET
RA-RB	REVISION SHEET
2	ESTIMATE SHEET - DESIGN 116
2 - 30	DESIGN 116
31	ESTIMATE SHEET - DESIGN 216
31 - 59	DESIGN 216
SPS.1-SPS.5	SOIL PROFILE SHEET
C.1	ESTIMATE SHEET FOR ROADWAY
C.1	ROADWAY SHEETS



IOWA ONE CALL
1-800-292-8989
www.iowaonecall.com
811 Know what's below. Call before you dig.

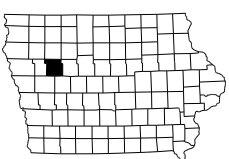
STANDARD ROAD PLANS
STANDARD ROAD PLANS ARE LISTED ON SHEET NUMBER C.1

REFER TO INDIVIDUAL SITUATION PLANS FOR TRAFFIC DATA INFORMATION.

THE PLAN DETAILS ARE ARBITRARY, THE REVISION MARK-UPS ARE WHAT IS MEANT TO BE SHOWN.

INDEX OF SEALS

SHEET NO.	NAME	TYPE
1		STRUCTURAL DESIGN
1		HYDRAULIC DESIGN
SPS.1		GEOTECHNICAL DESIGN
C.1		ROADWAY DESIGN



PROJECT DIRECTORY NAME: 9702001098

HYDRAULIC DESIGN

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature: [Redacted] Date: 7/1/2016

Printed or Typed Name: [Redacted]

My license renewal date is December 31, 2016

Pages or sheets covered by this seal: SHEET 5 & 35 OF 65

STRUCTURAL DESIGN

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.



Signature: [Redacted] Date: 7/1/2016

Printed or Typed Name: [Redacted]

My license renewal date is December 31, 2016

Pages or sheets covered by this seal: SHEETS 1 THRU 59 OF 65

LISTING OF PROJECT REVISIONS

DATE	SHEET NUMBER	REV. ITEM NUMBER	DESCRIPTION OF REVISIONS	DATE	SHEET NUMBER	REV. ITEM NUMBER	DESCRIPTION OF REVISIONS
04-15-2017	RB		REVISION SHEET ADDED.				
04-15-2017	3	4	REVISION: THIS SHEET VOIDED. REASON: EXCESSIVE CHANGES CREATED AN UNCLEAR QUANTITY SHEET.				
04-15-2017	3A	4	REVISION: THIS SHEET ADDED. REASON: TO PROVIDE CLEAR DETAILS IN RELATION TO THE PREVIOUS HEAVILY REVISED QUANTITY SHEET THAT IS NOW VOIDED SHEET 3.				
04-15-2017	7	4	REVISION: REMOVED 2'-0" x 2'-0" CORNER OF PIER 1. REASON: CORNER REMOVED TO ALLOW CLEARANCE FOR MSE WALL.				
04-15-2017	8	4	REVISION: ADDED 1'-6" HOLE TO COLUMN OF PIER 1. REASON: THIS ALLOWS FOR THE LOCATION OF WATER MAIN TO PASS THROUGH THE PIER.				
04-15-2017	8A	4	REVISION: PILE UPLIFT ANCHOR DETAIL WAS ADDED. REASON: THE ANCHOR DETAIL WAS NEEDED FOR ADDITIONAL REQUIRED PILES DO TO EXISTING SOIL CONDITIONS.				
04-15-2017	8A1	4	REVISION: THIS SHEET ADDED. REASON: WOOD PILES WERE ADDED TO FOOTING DUE TO EXISTING SOIL CONDITIONS.				
<div data-bbox="677 788 1401 1124" data-label="Form"> <p style="text-align: center;">STRUCTURAL DESIGN</p> <div style="display: flex; justify-content: space-between;"> <div style="text-align: center;">  <p>First Name Last Name 12345 IOWA</p> </div> <div> <p>I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.</p> <p>Signature _____ Date 04-15-2017</p> <p>Printed or Typed Name Name</p> <p>My license renewal date is December 31, 2018</p> <p>Pages or sheets covered by this seal: SHEETS 1, RB, 3, 3A, 7, 8, 8A, 8A1</p> </div> </div> </div>							
11-21-2017	A.1, MIT.1-MIT.4		REVISION: ADDED PLAN SHEETS A.1 AND MIT.1 THRU MIT.4. REASON: SHEET A.1 - ADDED LISTING OF PROJECT REVISIONS AND SIGNATURE BLOCK FOR REVISIONS. SHEET MIT.1, MIT.2, MIT.3, MIT.4 - ADD CHANNEL STRAIGHTENING DESIGN AND THE STREAM MITIGATION REQUIRED BY THE REVISION OF THE SECTION 404 PERMIT NO. 2016-1018 IN ORDER TO ACCOMMODATE THE CONSTRUCTION OF THE BRIDGE PIER FOOTING.				
<div data-bbox="677 1346 1401 1683" data-label="Form"> <p style="text-align: center;">STRUCTURAL DESIGN</p> <div style="display: flex; justify-content: space-between;"> <div style="text-align: center;">  <p>First Name Last Name 12345 IOWA</p> </div> <div> <p>I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.</p> <p>Signature _____ Date 11-21-2017</p> <p>Printed or Typed Name Name</p> <p>My license renewal date is December 31, 2018</p> <p>Pages or sheets covered by this seal: SHEETS 1, RB</p> </div> </div> </div>							
<div data-bbox="606 1703 1460 1844" data-label="Text" style="border: 2px solid red; padding: 5px;"> <p style="text-align: center; color: red; font-weight: bold;">EXAMPLE OF 5th PLAN REVISION INCLUDING NEW ADDED PLAN SHEETS FROM AN OFFICE OTHER THAN BRIDGES AND STRUCTURES.</p> </div>							

REVISION EXAMPLE

THIS IS SHOWING ADDITION OF REVISION SHEETS FROM AN OFFICE OTHER THAN BRIDGE DESIGN.

THE PLAN DETAILS ARE ARBITRARY, THE REVISION MARK-UPS ARE WHAT IS MEANT TO BE SHOWN.

SAC COUNTY
DESIGN NO. 116, 216
REVISION SHEET

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION


REVISED: NOVEMBER 21, 2017

LISTING OF PROJECT REVISIONS

111-23
10-17-17

Date	Sheet No.	Description of Revisions
11/21/2017	A.1	Added listing of project revisions and signature block for revisions.
11/21/2017	MIT.1-MIT.4	Add channel straightening design and the stream mitigation required by the revision of the Section 404 Permit #: 2016-1018 in order to accommodate the construction of the bridge pier footing.

EXAMPLE OF A REVISED PLAN SHEET PROVIDED FROM AN OFFICE OTHER THAN THE BRIDGE OFFICE TO BE INCLUDED IN THE BRIDGE PLANS.

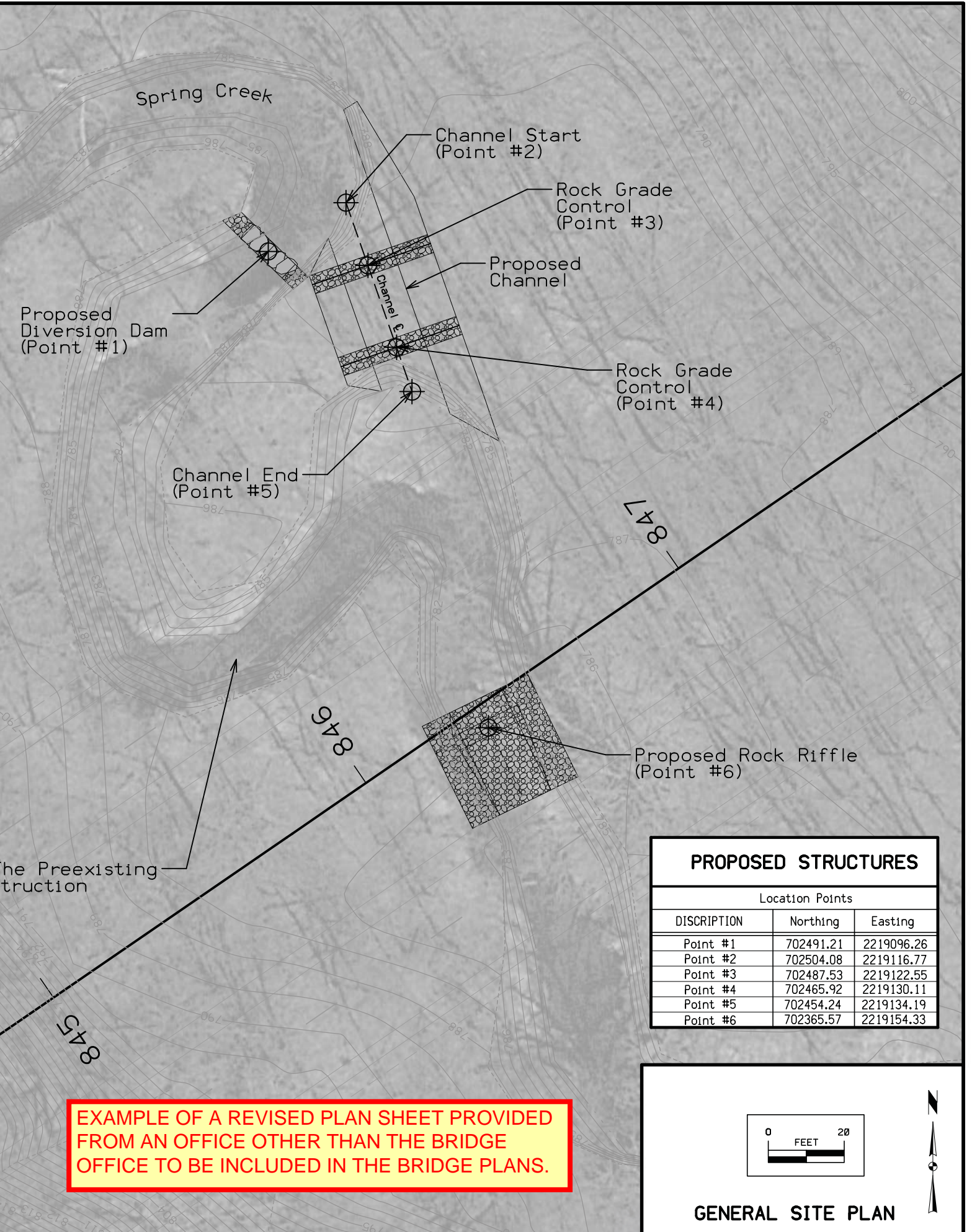
MITIGATION DESIGN	
	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.
	11/21/17 Date
	_____ Signature
	_____ Printed or Typed Name
My license renewal date is December 31, 20 <u>17</u>	
Pages or sheets covered by this seal: <u>A.1, MIT.1-MIT.4</u>	

ESTIMATED PROJECT QUANTITIES

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
1	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	249.7	
2	2507-3250005	ENGINEERING FABRIC	SY	88.5	
3	2507-6800061	REVTMENT, CLASS E	TON	176.2	
4	2507-6850053	REVTMENT, SPECIAL	TON	18.1	

ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	DESCRIPTION
1	2102-2710070	<p>EXCAVATION, CLASS 10, ROADWAY AND BORROW Overhaul will not be measured or paid for, but shall be considered incidental to excavation on this project. Includes 249.7 cu. yds. of Class 10 to be wasted. Contractor is notified that the excavation area is anticipated to be excessively wet and specialized equipment, blocking or mats may be required to complete the work as shown on the plans. All waste must be removed from the project site.</p> <p>CUT = 249.7 CY FILL+30% = 0CY WASTE = 249.7CY 249.7CY</p>
2	2507-3250005	<p>ENGINEERING FABRIC Engineering fabric shall be material as specified for embankment erosion control, Article 4196.01C. Material shall be measured in sq. yard of actual area covered.</p>
3	2507-6800061	<p>REVTMENT, CLASS E Class E revetment shall meet requirements of Article 4130.02. Estimated at 1.62 Ton/CY.</p>
4	2507-6850053	<p>REVTMENT, SPECIAL The special revetment shall be broken limestone, dolomite, quartzite, or granite material from an approved source as described in Materials I.M. 409 that has a nominal diameter between 3 to 4 feet.</p> <p>Special revetment shall be measured to the nearest 0.1 ton of material placed according to the contract documents. Special revetment shall be paid for by the contract unit price. The contractor shall be fully compensated for all work, including bank shaping, furnishing and placing all material, and for furnishing all equipment, tools, and labor necessary to complete the work according to the contract documents. See Typical MIT-400 on sheet MIT.4 for additional details and sheet MIT.1 for location.</p>

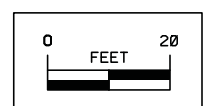


Restore Channel to The Preexisting Condition After Construction

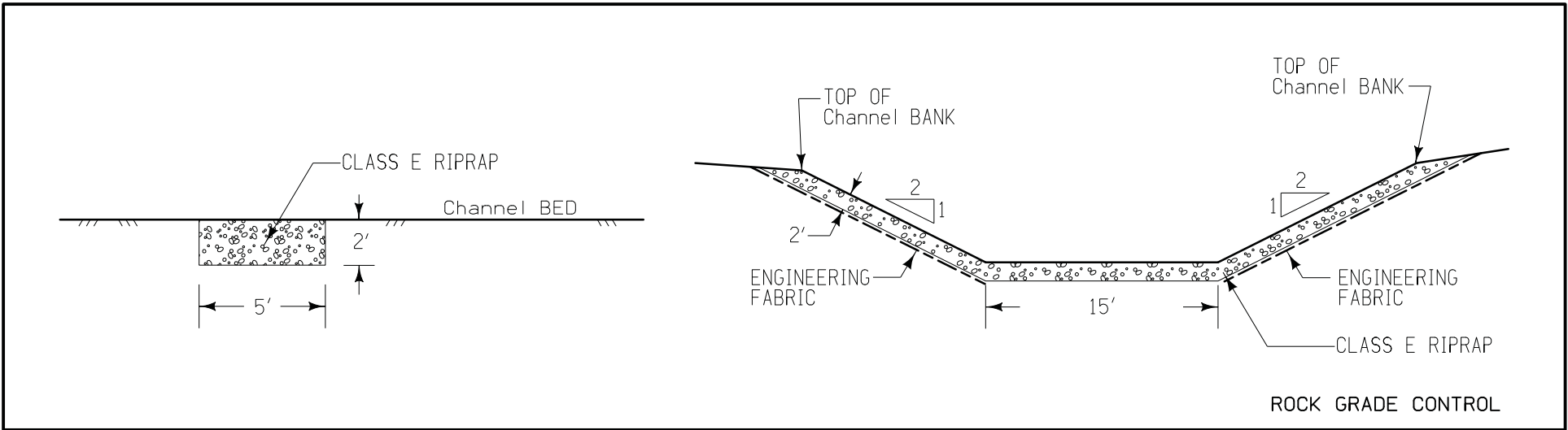
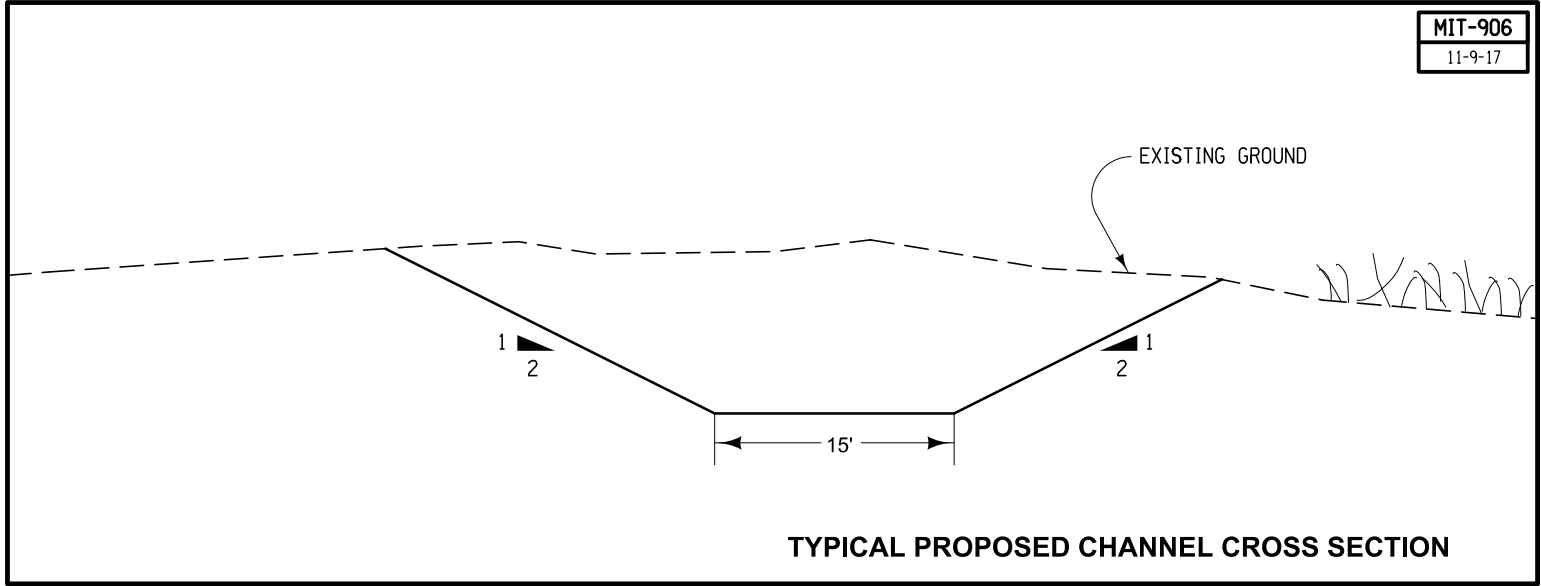
PROPOSED STRUCTURES

DISCRIPTION	Location Points	
	Northing	Easting
Point #1	702491.21	2219096.26
Point #2	702504.08	2219116.77
Point #3	702487.53	2219122.55
Point #4	702465.92	2219130.11
Point #5	702454.24	2219134.19
Point #6	702365.57	2219154.33

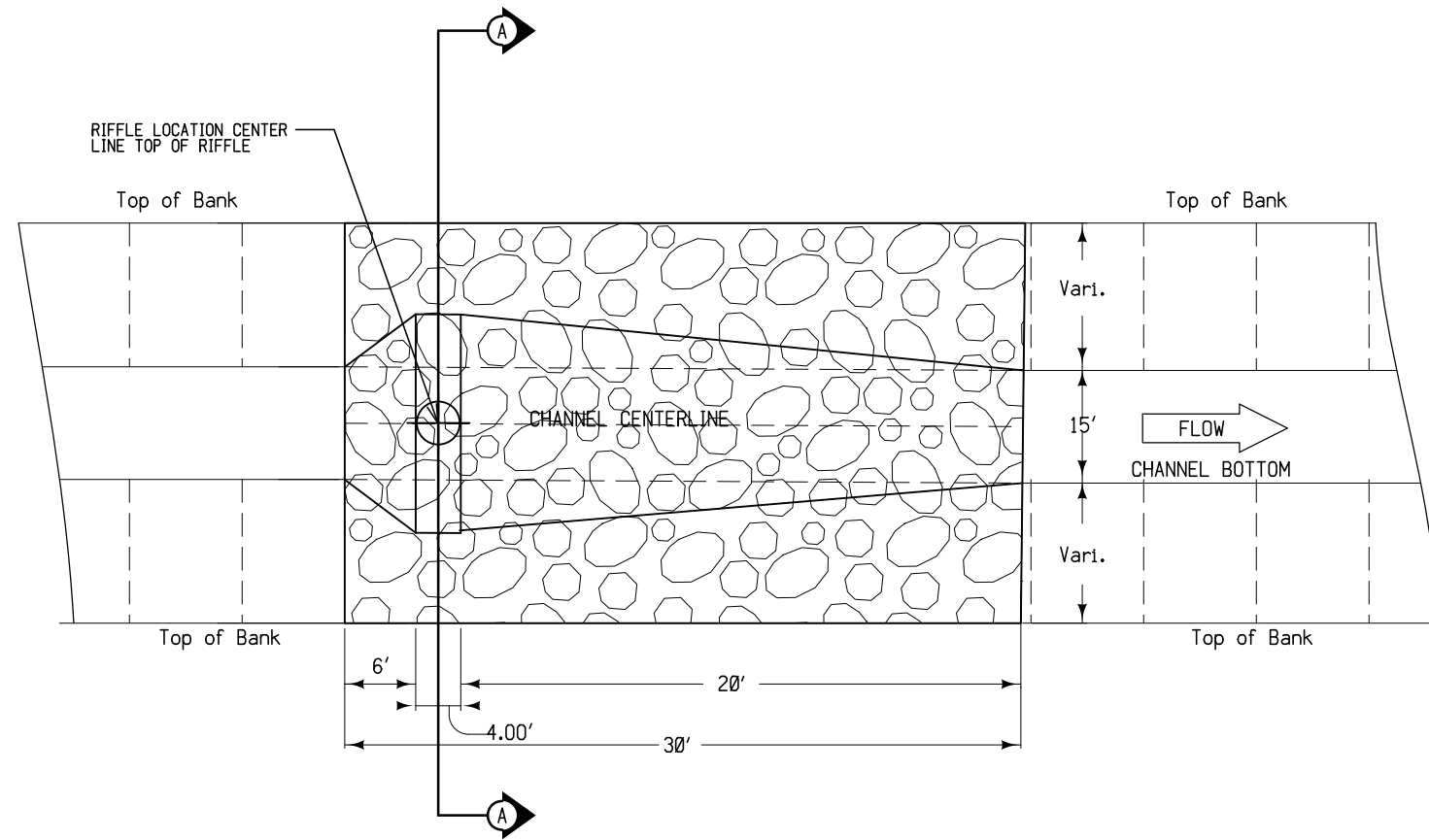
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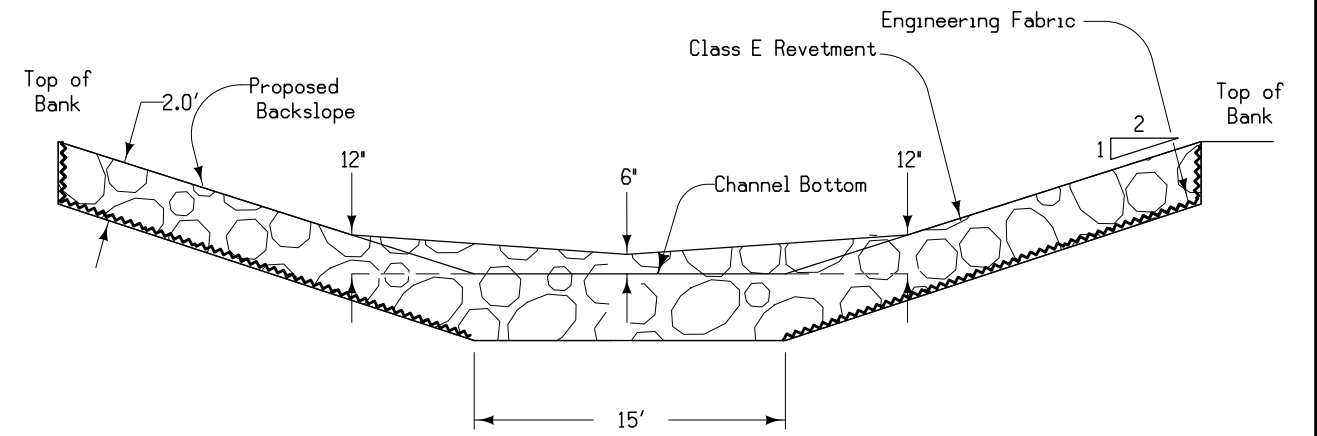
GENERAL SITE PLAN



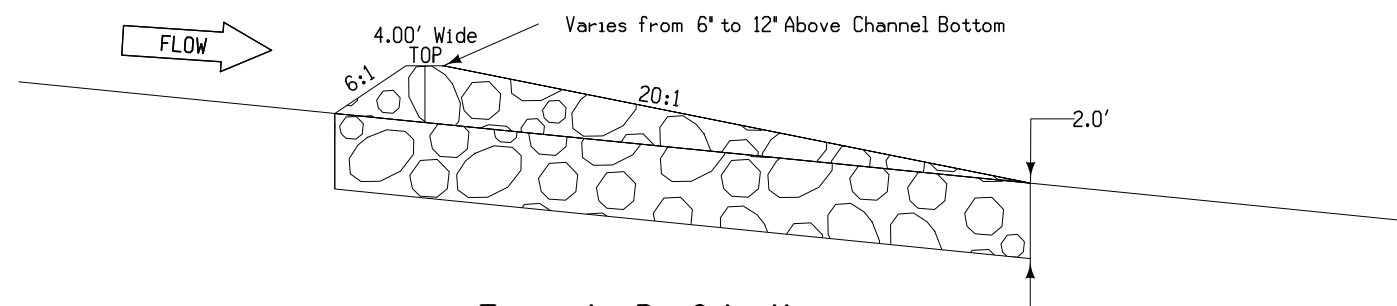
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PLAN VIEW



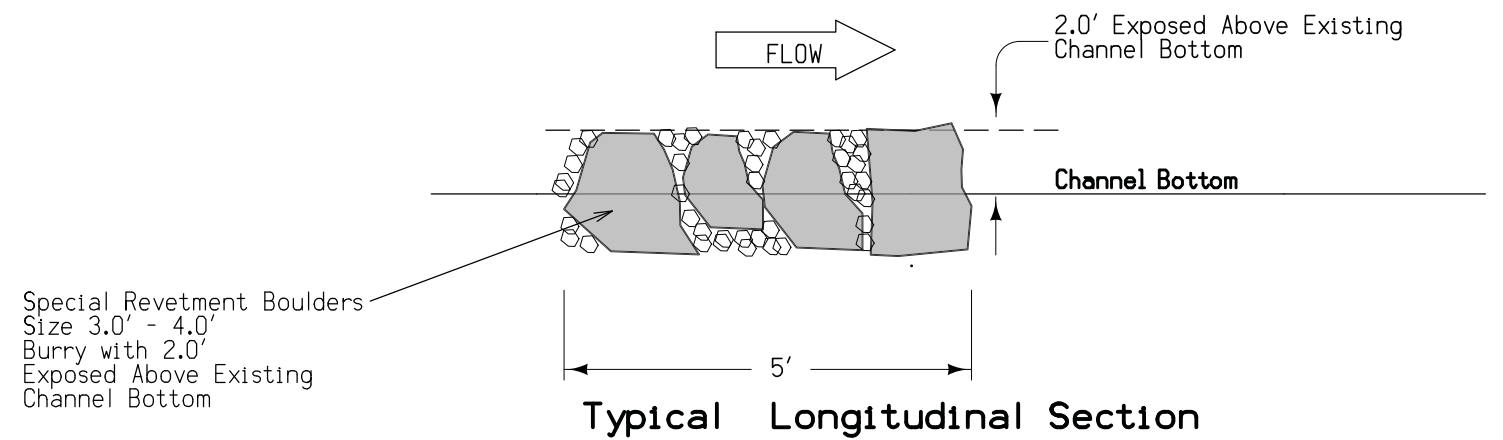
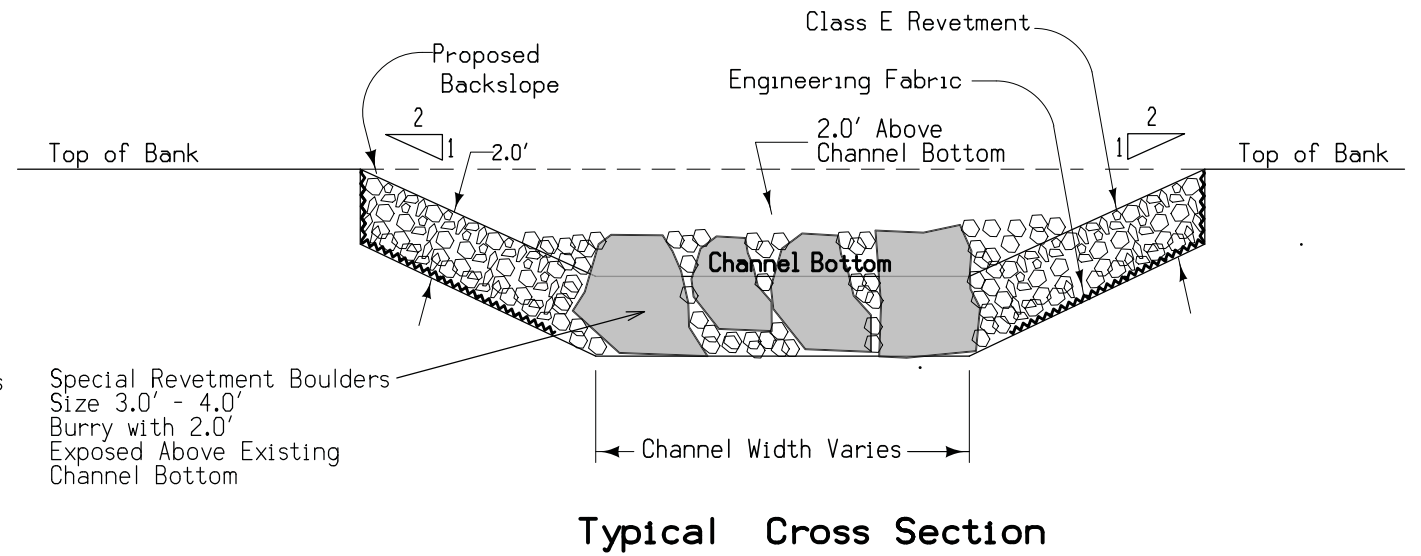
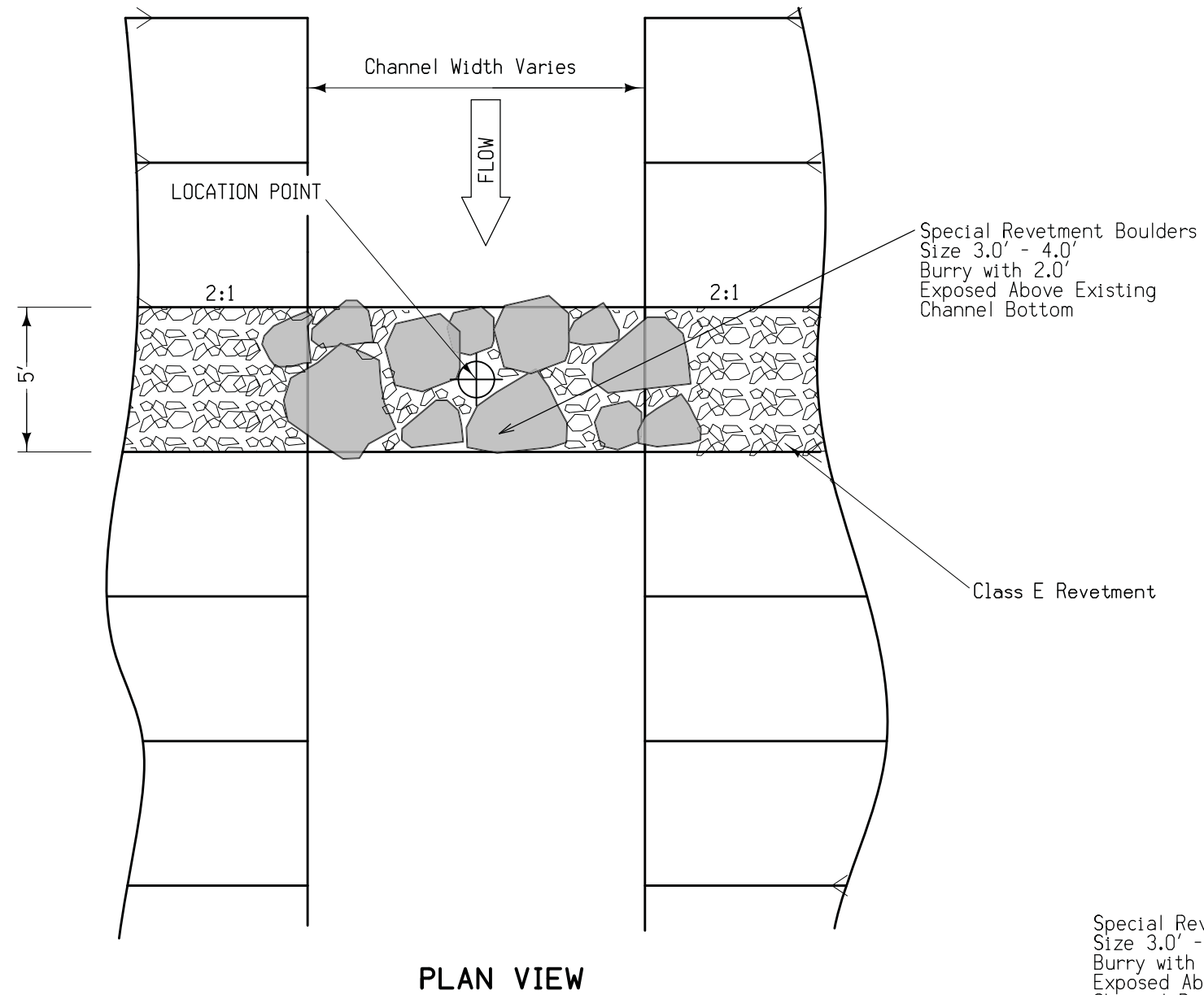
Typical Cross Section A-A



Typical Profile View

TYPICAL ROCK RIFFLE STRUCTURE

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TYPICAL DIVERSION DIKE