

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	



PLANS OF PROPOSED IMPROVEMENTS ON THE

PRIMARY ROAD SYSTEM

SAC COUNTY

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.

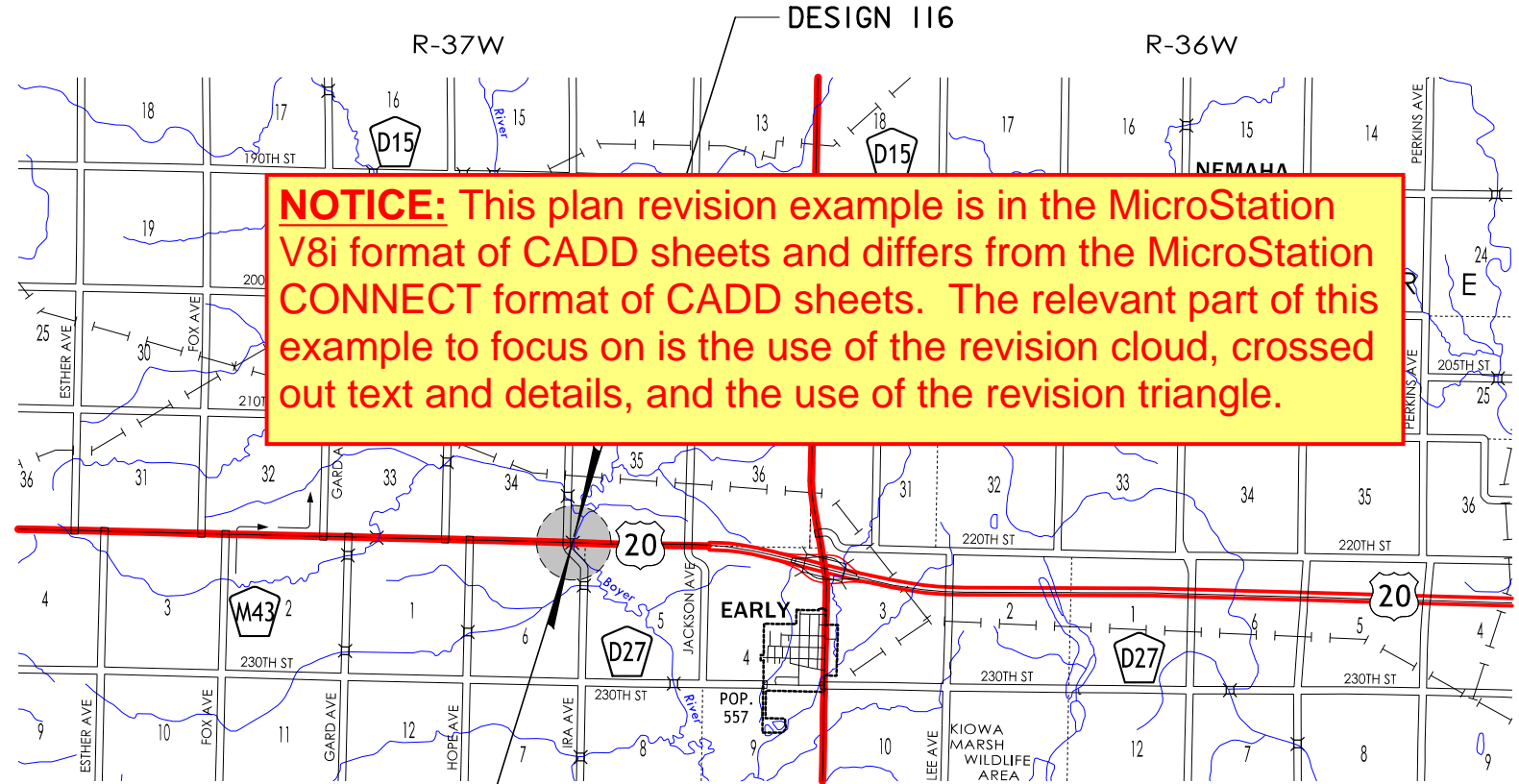
EXAMPLE OF TITLE SHEET
WITH 4 PLAN REVISIONS.

REVISION EXAMPLE

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

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



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.

INDEX OF SEALS		
SHEET NO.	NAME	TYPE
I		STRUCTURAL DESIGN
I		HYDRAULIC DESIGN
SPS.1		GEOTECHNICAL DESIGN
C.1		ROADWAY DESIGN

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

PROJECT DIRECTORY NAME: 9702001098

LISTING OF PROJECT REVISIONS									
DATE	SHEET NUMBER	REV. ITEM NUMBER	DESCRIPTION OF REVISIONS	DATE	SHEET NUMBER	REV. ITEM NUMBER	DESCRIPTION OF REVISIONS		
03-09-2017	RA		REVISION SHEET ADDED.					<div>STRUCTURAL DESIGN</div> <div><div><div>LICENSED PROFESSIONAL ENGINEER</div><div>First Name Last Name 12345</div><div>IOWA</div></div><div>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.<div>Signature<div>Name</div>Date03-27-2017</div><div>Printed or Typed Name</div><div>My license renewal date is December 31, 2018</div></div><div>Pages or sheets covered by this seal: SHEETS 1, RA, 2, 3, 7, 8</div></div>	
03-09-2017	2	1	REVISED: 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.						
03-09-2017	3	1	REVISED: CHANGED PIER 2 REINFORCING STEEL (NON-COATED), PILES STEEL HP10x57 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	REVISED: 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	REVISED: 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	REVISED: 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	REVISED: 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	REVISED: 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	REVISED: 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	REVISED: 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	REVISED: 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.						
EXAMPLE OF 1st REVISION.				EXAMPLE OF 2nd REVISION.					
<div>STRUCTURAL DESIGN</div> <div><div><div>LICENSED PROFESSIONAL ENGINEER</div><div>First Name Last Name 12345</div><div>IOWA</div></div><div>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.<div>Signature<div>Name</div>Date3-9-2017</div><div>Printed or Typed Name</div><div>My license renewal date is December 31, 2018</div></div><div>Pages or sheets covered by this seal: SHEETS 1, RA, 2, 3, 7, 8, 8A, 8B, 8C, 8D, 9, 10</div></div>				04-11-2017	2	3	REVISED: 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.		
				04-11-2017	3	3	REVISED: CHANGED PIER 2 REINFORCING STEEL (NON-COATED), PILES STEEL HP10x57 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	REVISED: CHANGED PIER 2 FOOTING LOCATION. REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.		
				EXAMPLE OF 3rd REVISION.					
				EXAMPLE OF MULTIPLE PLAN REVISIONS ON ONE REVISION SHEET.					
								<div>REVISION EXAMPLE</div> <div>THE PLAN DETAILS ARE ARBITRARY, THE REVISION MARK-UPS ARE WHAT IS MEANT TO BE SHOWN.</div> <div>SAC COUNTY DESIGN NO. 116 REVISION SHEET</div> <div>IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION</div>	
03-27-2017	2	2	REVISED: 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.						
03-27-2017	3	2	REVISED: CHANGED PIER 2 REINFORCING STEEL (NON-COATED), PILES STEEL HP10x57 AND STRUCTURAL CONCRETE QUANTITIES. REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.						
03-27-2017	7	2	REVISED: CHANGED PIER 2 FOOTING LOCATION. REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.						
03-27-2017	8	2	REVISED: 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.						
EXAMPLE OF 2nd REVISION.				PLAN REVISION SHEET TEMPLATE IS LOCATED IN THE "brgseed.dgn" FILE AS "brgrevision" MODEL.					

DESIGN TEAM DESIGNER / CHECKER / DETAILER

FILE NO. 30568

COUNTY

PROJECT NUMBER NHSN-020-2(143)--2R-81

SHEET NUMBER RA

8/14/2017 10:48:10 AM bkloss W:\Highway\Bridge\Cadd\Documentation\Plan Revisions and Examples\81020143-116.brg 810116S000RA example 11x17-.pdf.pltcf

REVISED: APRIL 11, 2017

LISTING OF PROJECT REVISIONS

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

EXAMPLE OF 4th REVISION.

STRUCTURAL DESIGN

LICENSED PROFESSIONAL ENGINEER
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.

SignatureNameDate04-15-2017Printed or Typed NameMy license renewal date is December 31, 2018Pages or sheets covered by this seal: SHEETS 1, RB, 3, 3A, 7, 8, 8A, 8AI

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

REVISION EXAMPLE

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

SAC

DESIGN

**SAC COUNTY
DESIGN NO. 116
REVISION SHEET**

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

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	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

3

2

1

3

REVISION EXAMPLE

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

EXAMPLE OF 3 REVISIONS ON THIS SHEET.

2

REVISED: 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

REVISED: 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.

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

REVISED: 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

DESIGN TEAM DESIGNER / CHECKER / DETAILER

SAC COUNTY PROJECT NUMBER NHSN-020-2(143)--2R-81

SHEET NUMBER 2

8/22/2017 12:59:14 PM bkloss W:\Highway\Bridge\Cadd\Documentation\Plan Revisions and Examples\81020143-116.brg 810116S001 11x17-pdf.pltcf9

REVISED: APRIL 11, 2017

SUMMARY OF CONCRETE QUANTITIES		
LOCATION	STRUCTURAL CONCRETE	HPC STRUCTURAL CONCRETE
BRIDGE DECK + ABUT. & PIER DIAPHRAGMS **	413.4	
ABUTMENT WINGS	7.6	
PIER # 1	90.5	
PIER # 2	90.5 97.4	
WEST ABUTMENT FOOTING	18.1	
EAST ABUTMENT FOOTING	18.1	
TOTAL (CU. YDS.)	638.2 645.1	

** INCLUDES ABUTMENT, PIER DIAPHRAGMS & ABUTMENT WINGS

SUMMARY OF REINFORCING STEEL			
LOCATION	NON-COATED REINFORCING STEEL	STAINLESS STEEL REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
BARRIER RAIL - TWO RAILS		3,842	9,886
BRIDGE DECK + ABUT. & PIER DIAPHRAGMS **	144		95,303
BARRIER RAIL END SECTIONS		768	1,064
ABUTMENT WINGS			792
PIER #1	13,010		
PIER #2	14,429		
TOTAL (LBS.)	27,578	4,610	107,045

** INCLUDES ABUTMENT, PIER DIAPHRAGMS & ABUTMENT WINGS

SUMMARY OF EXCAVATION			
LOCATION	CLASS 20 EXCAVATION	CLASS 21 EXCAVATION	CLASS 10 EXCAVATION
WEST ABUTMENT	50.0		
EAST ABUTMENT	72.0		
CHANNEL			1,083.0
PIER # 1		131.0	
PIER # 2	114.0	140.0	
TOTAL (LBS.)	236.0	271.0	1,083.0

SUMMARY OF FOUNDATIONS					
LOCATION	SUBSTRUCTURE TYPE	FOUNDATION TYPE	NUMBER	LENGTH (LIN. FT.)	TOTAL (LIN. FT.)
WEST ABUTMENT	INTEGRAL ABUTMENT	HP10X57	7	115	805
EAST ABUTMENT	INTEGRAL ABUTMENT	HP10X57	7	115	805
PIER # 1	TEE PIER	HP10X57	19	105	1,995
PIER # 2	TEE PIER	HP10X57	1	105	2,205
			26		6,020
			3		
				TOTAL (LIN.FT.)	5,840


SUMMARY OF STRUCTURAL STEEL	
LOCATION	TOTAL (LBS.)
BRIDGE DECK DRAINS	1,104
DIAPHRAGMS	4,915
TOTAL (CU. YDS.)	6,019

SUMMARY OF BEARINGS			
LOCATION	BEARING TYPE	NUMBER	ASSOCIATED BID ITEM
WEST ABUTMENT	S3 x 7.5	6	INCIDENTAL ITEM
EAST ABUTMENT	S3 x 7.5	6	INCIDENTAL ITEM
PIER # 1	PLAIN NEOPRENE 1"	12	INCIDENTAL ITEM
PIER # 2	PLAIN NEOPRENE 1"	12	INCIDENTAL ITEM

EXAMPLE OF 4 REVISIONS ON THIS SHEET. THIS SHEET BECAME EXCESSIVELY CLUTTERED WITH REVISIONS. THEREFORE IS WAS VOIDED AND A NEW REPLACEMENT SHEET WAS CREATED.

REVISION EXAMPLE

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



4

4 REVISED: 04-15-2017 THIS SHEET VOIDED.
REASON: EXCESSIVE CHANGES CREATED CONFUSING QUANTITY SHEET.

REVISED: 03-27-2017 CHANGED PIER 2 REINFORCING
STEEL (NON-COATED), PILES STEEL HP10x57 AND
STRUCTURAL CONCRETE QUANTITIES.

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

REVISED: 04-11-2017 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.

REVISED: 03-09-2017 CHANGED PIER 2 REINFORCING
STEEL (NON-COATED), PILES STEEL HP10x57 AND
STRUCTURAL CONCRETE QUANTITIES.

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
SUMMARY QUANTITIES SHEET
STA. 12454+02.16, 46.12' LT RADIUS=16,000' JULY, 2016
SAC COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 2 OF 58 FILE NO. 30568 DESIGN NO. 116

REVISED: APRIL 15, 2017

SUMMARY OF CONCRETE QUANTITIES

LOCATION	STRUCTURAL CONCRETE	HPC STRUCTURAL CONCRETE
BARRIER RAIL - TWO RAILS	64.6	_____
BRIDGE DECK + ABUT. & PIER DIAPHRAGMS **	457.0	_____
BARRIER RAIL END SECTION	2.6	_____
ABUTMENT WINGS	7.6	_____
PIER #1	90.5	_____
PIER #2	90.5	_____
TOTAL (CU. YDS.)	12,050	_____

** INCLUDES ABUTMENT, PIER DIAPHRAGMS AND ABUTMENT WINGS

SUMMARY OF REINFORCING STEEL

LOCATION	NON-COATED REINFORCING STEEL	STAINLESS STEEL REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
BARRIER RAIL - TWO RAILS	_____	3,842	9,886
BRIDGE DECK + ABUT. & PIER DIAPHRAGMS **	216	_____	96,041
BARRIER RAIL END SECTION	_____	768	1,064
ABUTMENT WINGS	792	_____	_____
PIER #1	12,843	_____	_____
PIER #2	12,843	_____	_____
TOTAL (LBS.)	50,000	4810	107,045

** INCLUDES ABUTMENT, PIER DIAPHRAGMS AND ABUTMENT WINGS

SUMMARY OF EXCAVATION

LOCATION	CLASS 20 EXCAVATION	CLASS 10 EXCAVATION
WEST ABUTMENT	-	_____
EAST ABUTMENT	-	_____
PIER #1	1,255	_____
PIER #2	1,261	_____
TOTAL (CU. YDS.)	2300	_____

SUMMARY OF FOUNDATIONS

[illegible]

EXAMPLE OF NEW ADDED PLAN REVISION SHEET.

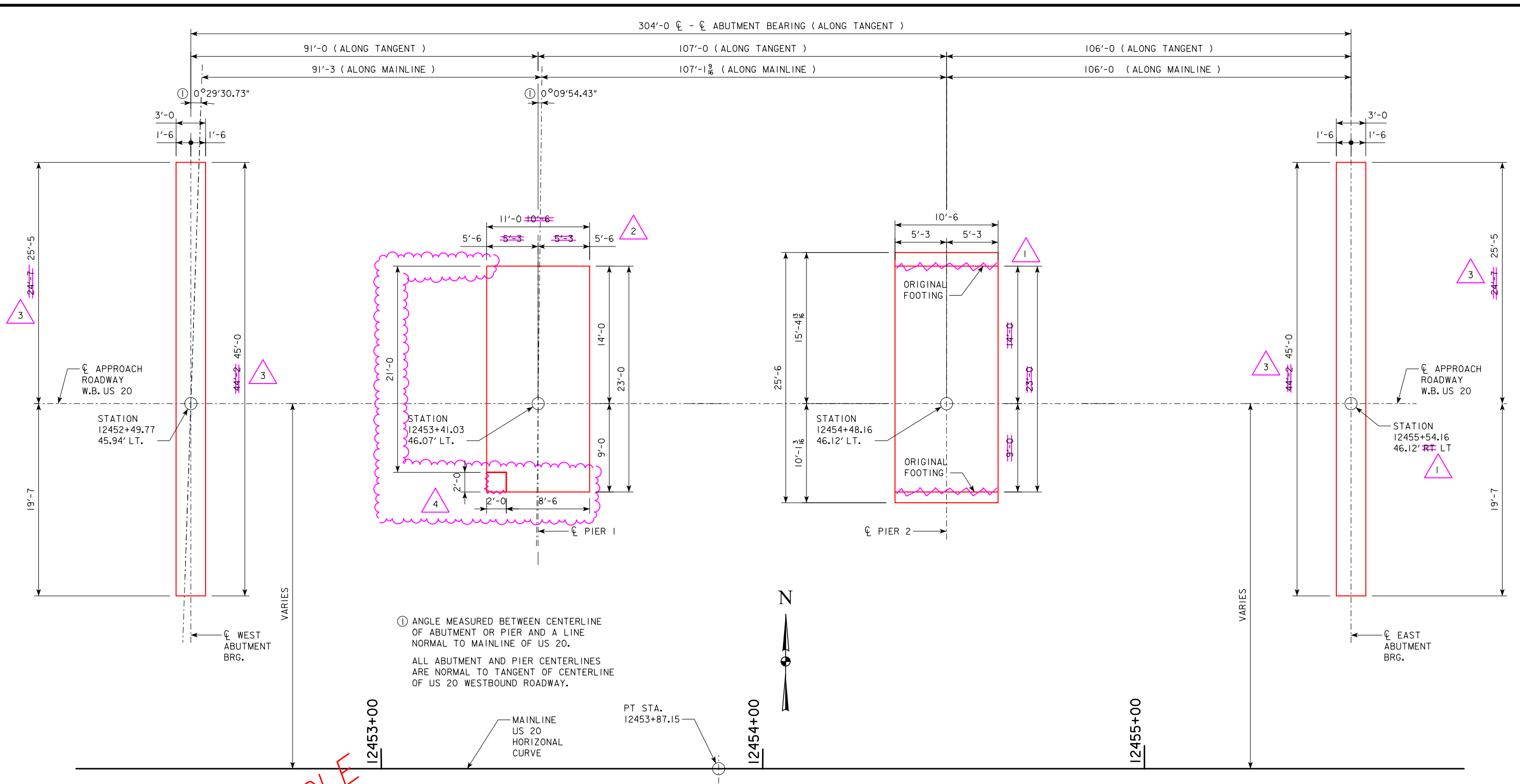
REVISION EXAMPLE

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

4 REVISED: 04-15-2017 THIS SHEET ADDED.
REASON: TO PROVIDE CLEAR DETAIL SHEET
IN RELATION TO PREVIOUS HEAVILY REVISED
QUANTITY SHEET.

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

REVISED: APRIL 15, 2017



STAKING DIAGRAM

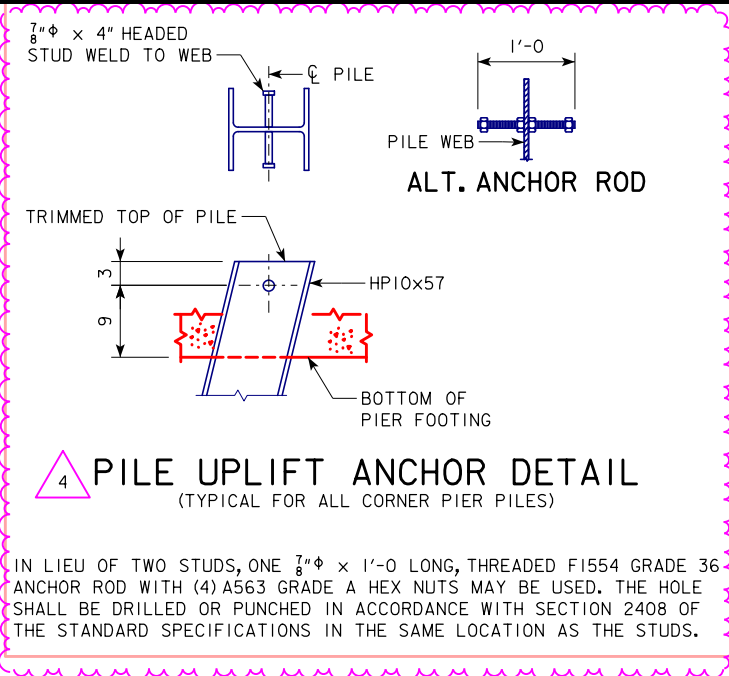
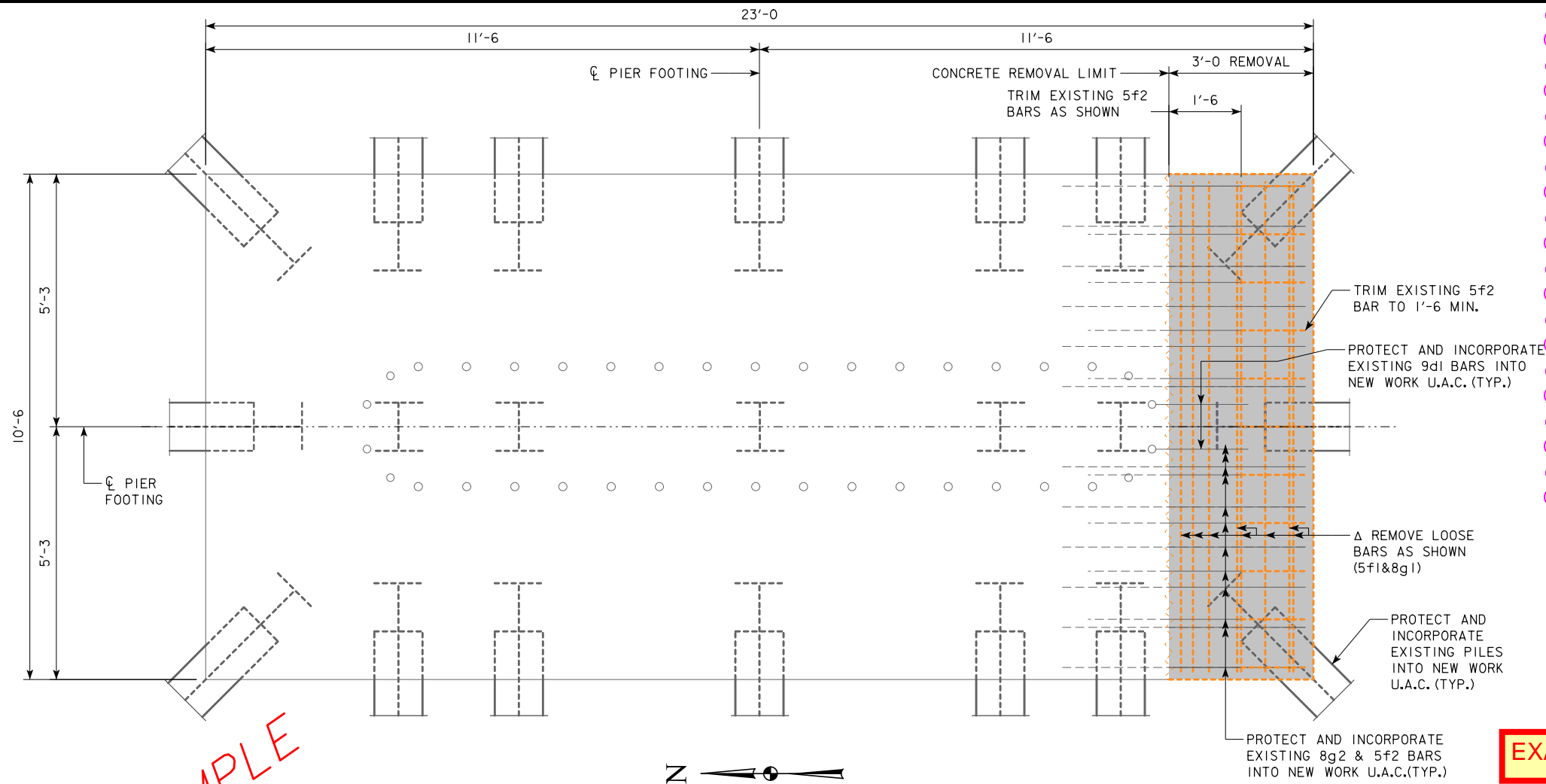
REVISION EXAMPLE
THE PLAN DETAILS ARE ARBITRARY,
THE REVISION MARK-UPS ARE WHAT
IS MEANT TO BE SHOWN.

- 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.

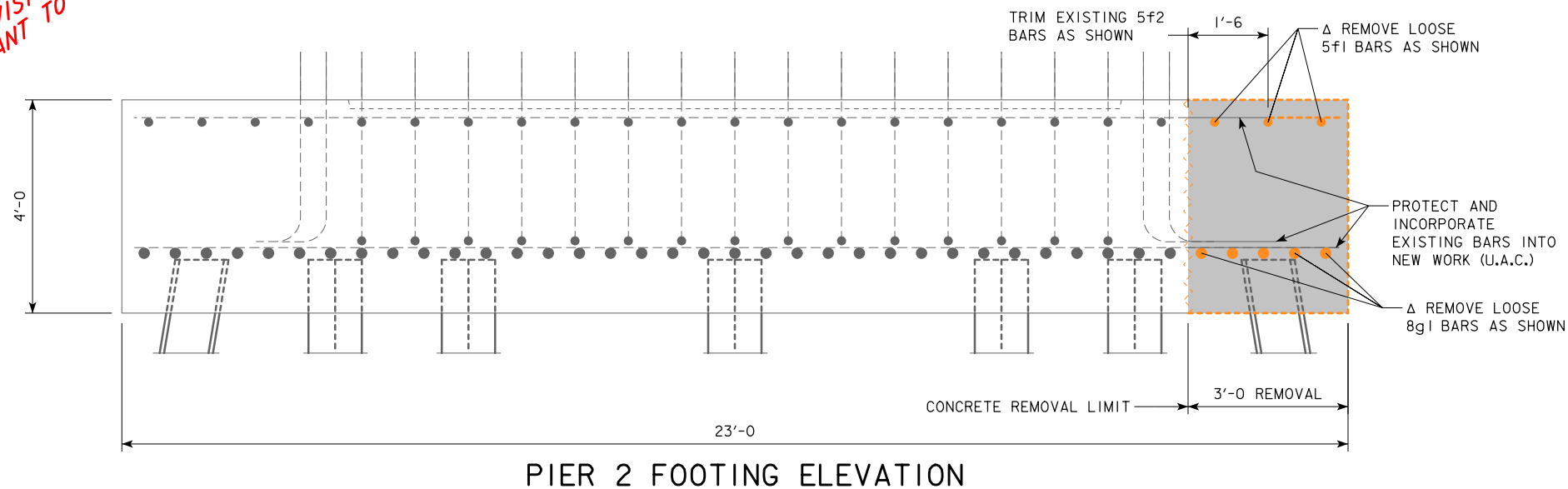
DESIGN FOR 0° SKEW
**304'-0" x 41'-0" PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**
91'-0" & 106'-0" END SPANS 107'-0" INTERIOR SPAN
STAKING DIAGRAM
STA. 12454+02.16, 46.12' LT RADIUS=16,000' JULY, 2016
SAC COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 6 OF 58 FILE NO. 30568 DESIGN NO. 116

REVISED: APRIL 15, 2017



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.



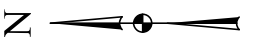
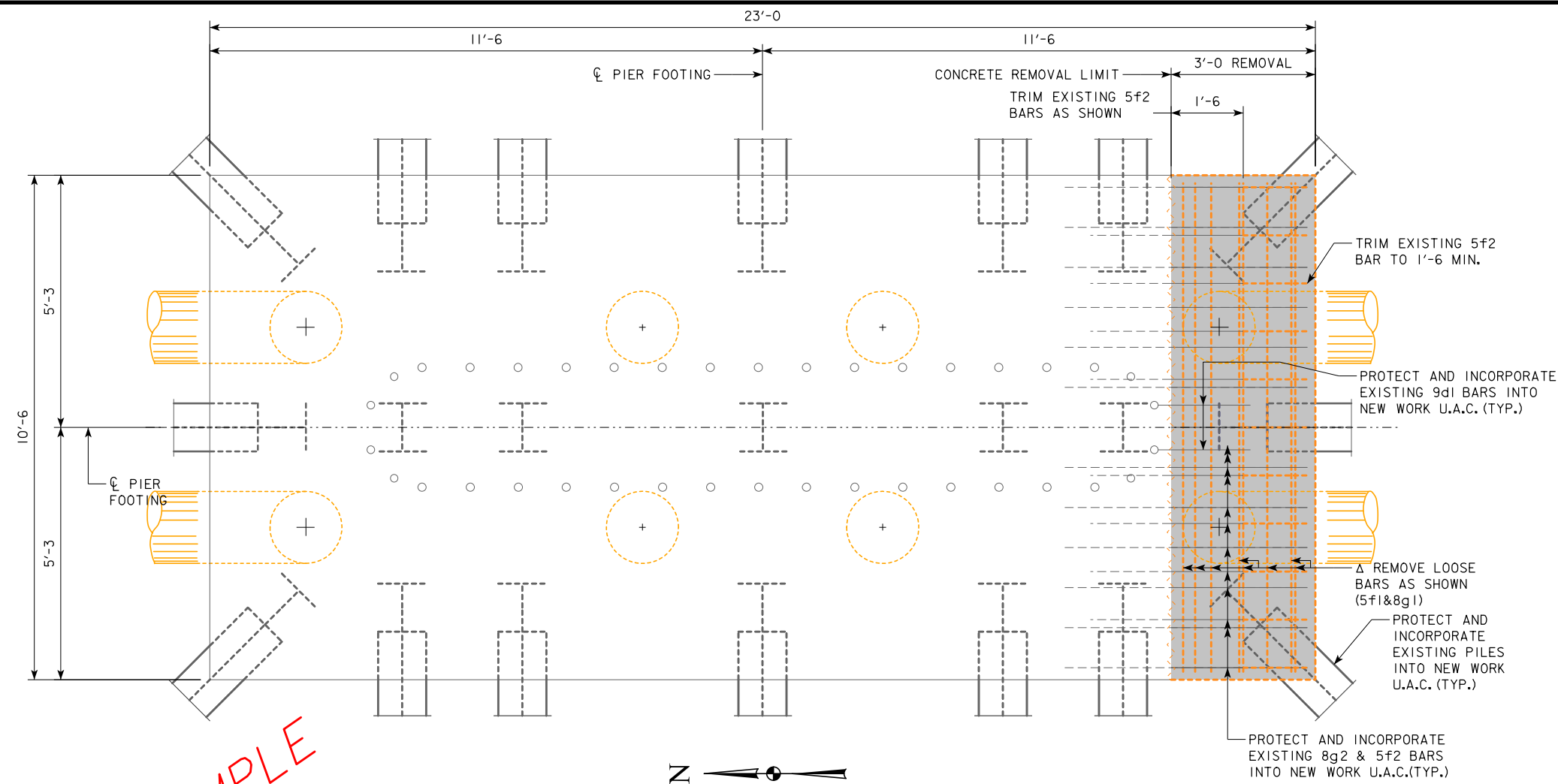
4 REVISED: 04-15-2017 PILE UPLIFT ANCHOR DETAIL ADDED.
REASON: ANCHOR DETAIL NEEDED FOR ADDITIONAL REQUIRED PILES.



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

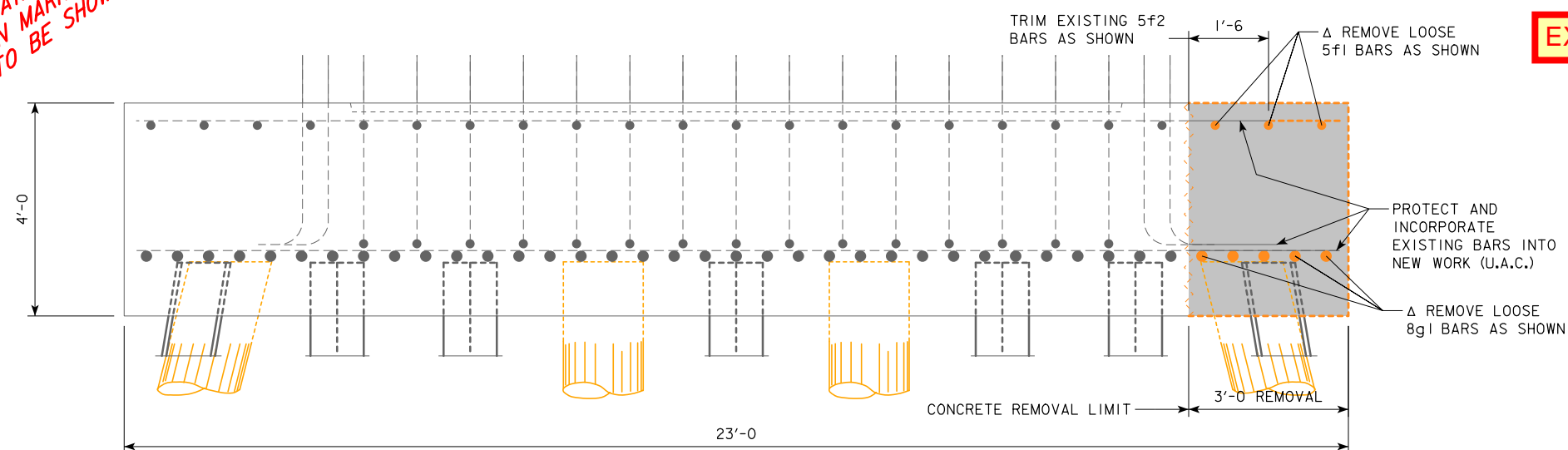
1 REVISED: 03-09-2017 THIS SHEET ADDED.
REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.

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



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

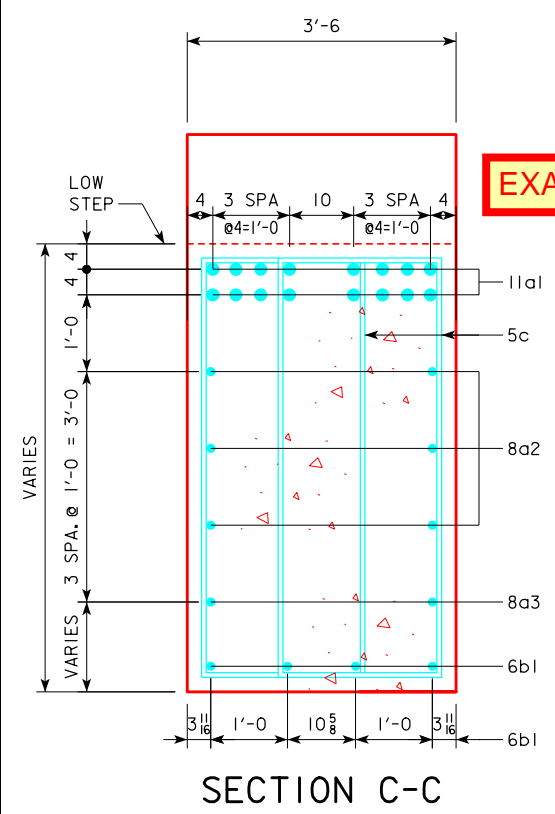
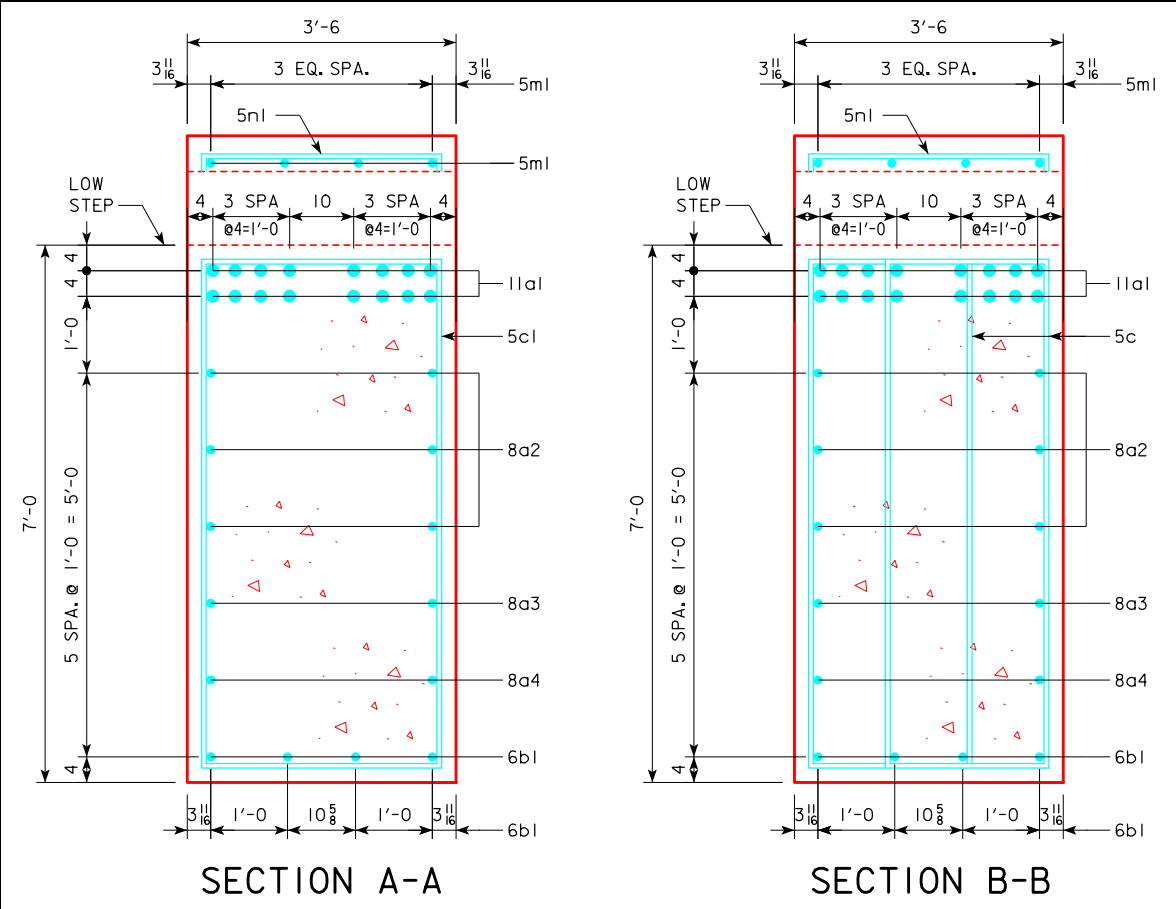
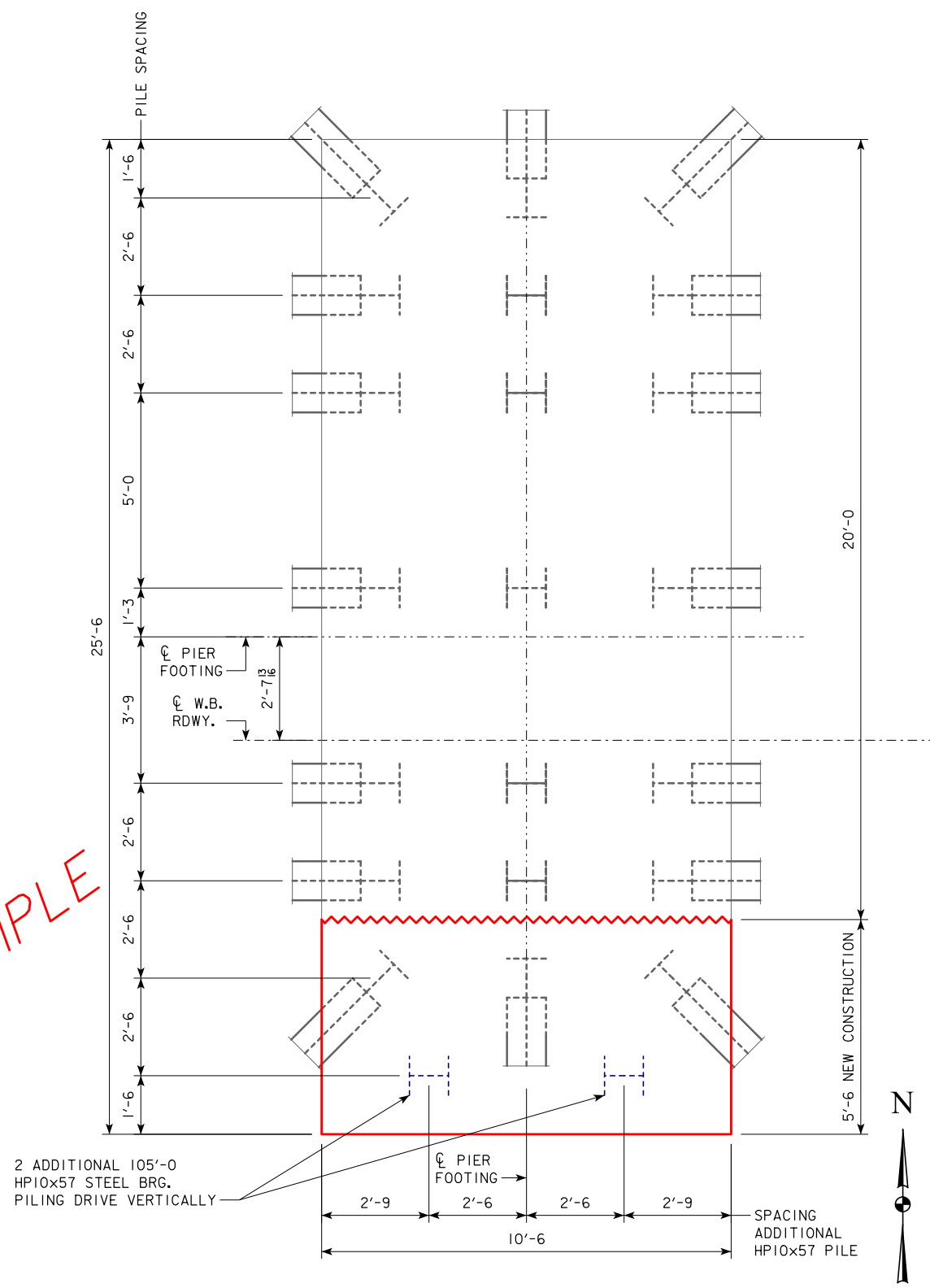
EXAMPLE OF 1 REVISION ON THIS SHEET.

4
REVISED: 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

REVISION EXAMPLE

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



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.

DESIGN FOR 0° SKEW

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

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

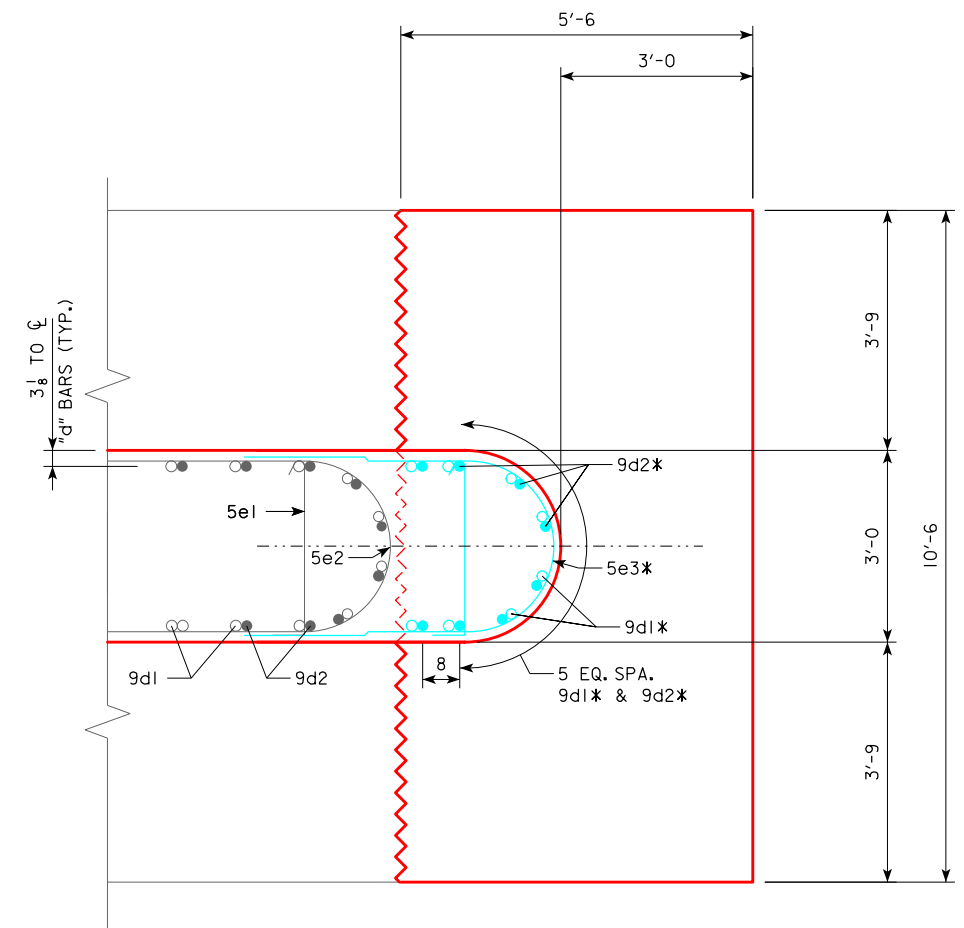
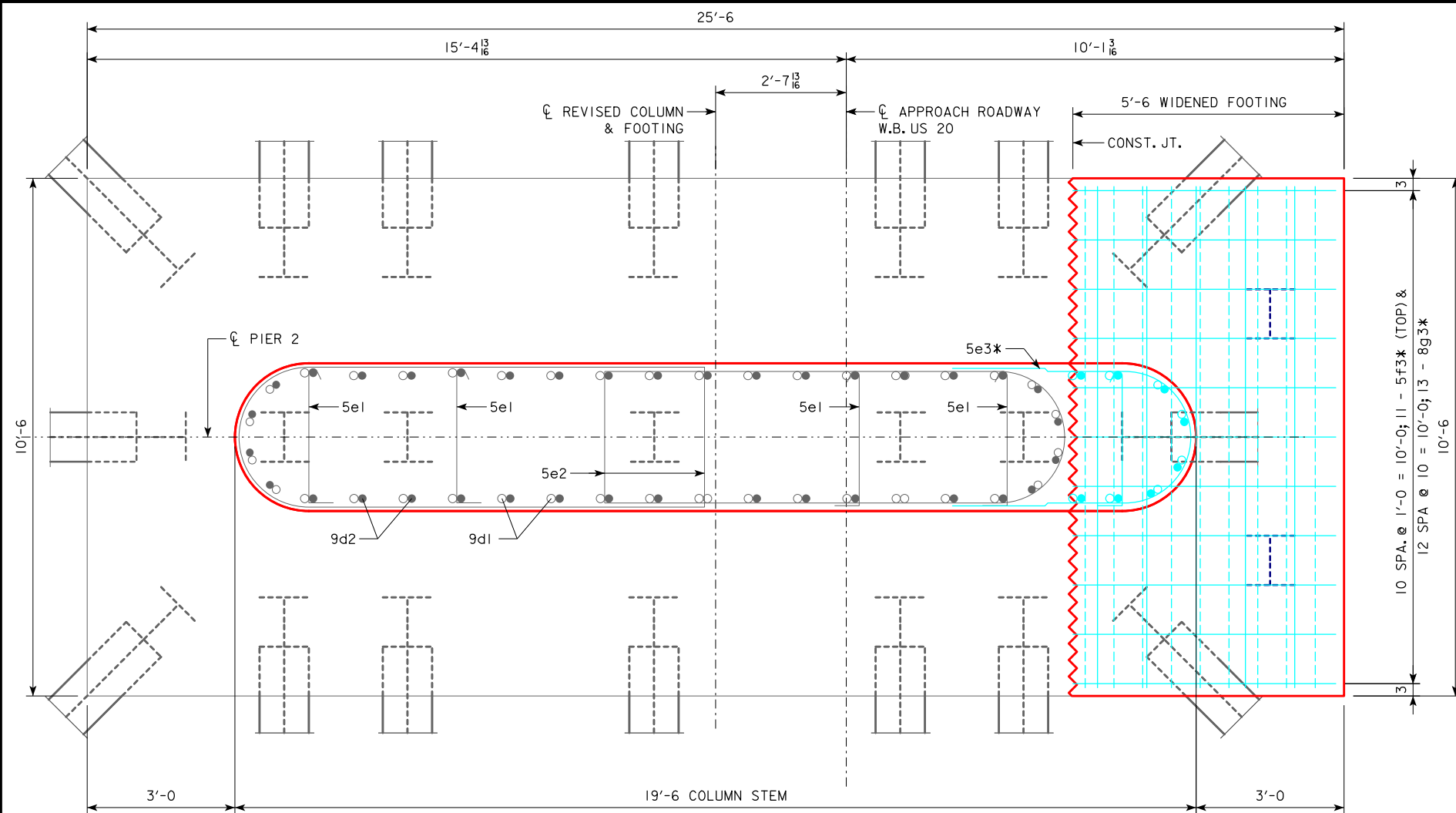
PIER 2 DETAILS

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

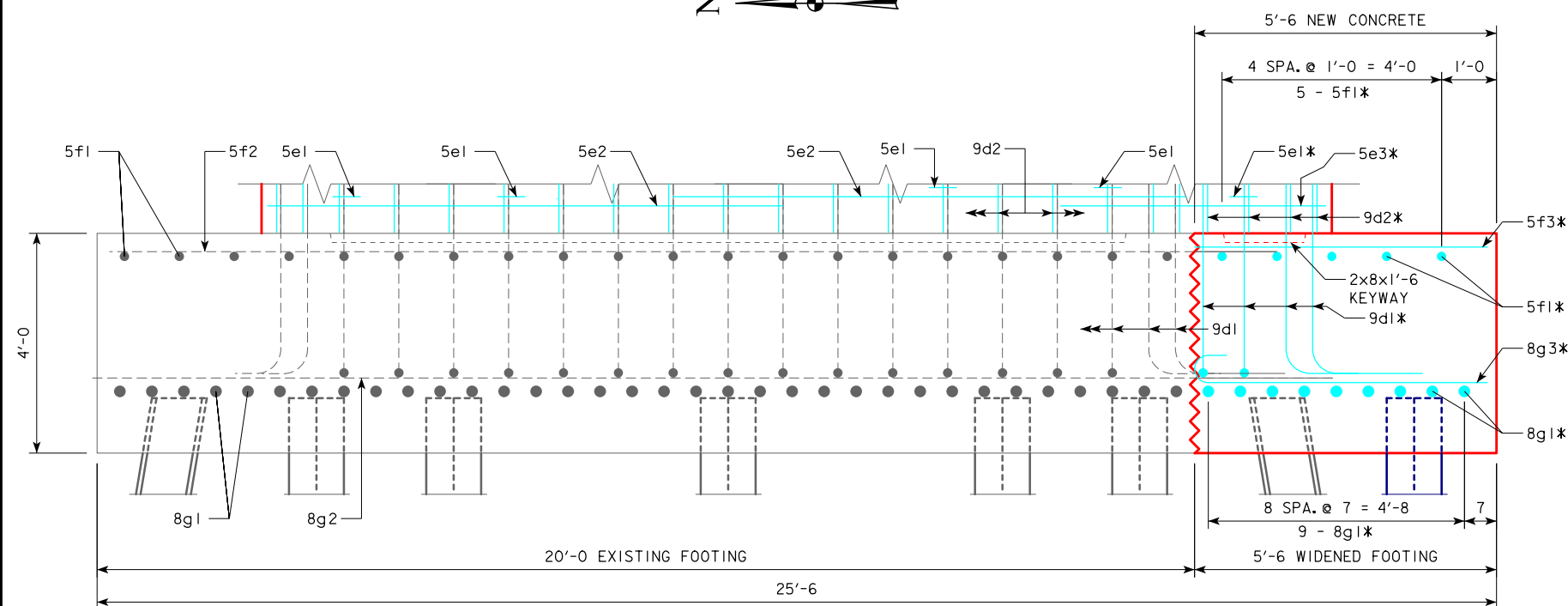
SAC COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

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



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
PROVIDED.
UPDATED R

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OF
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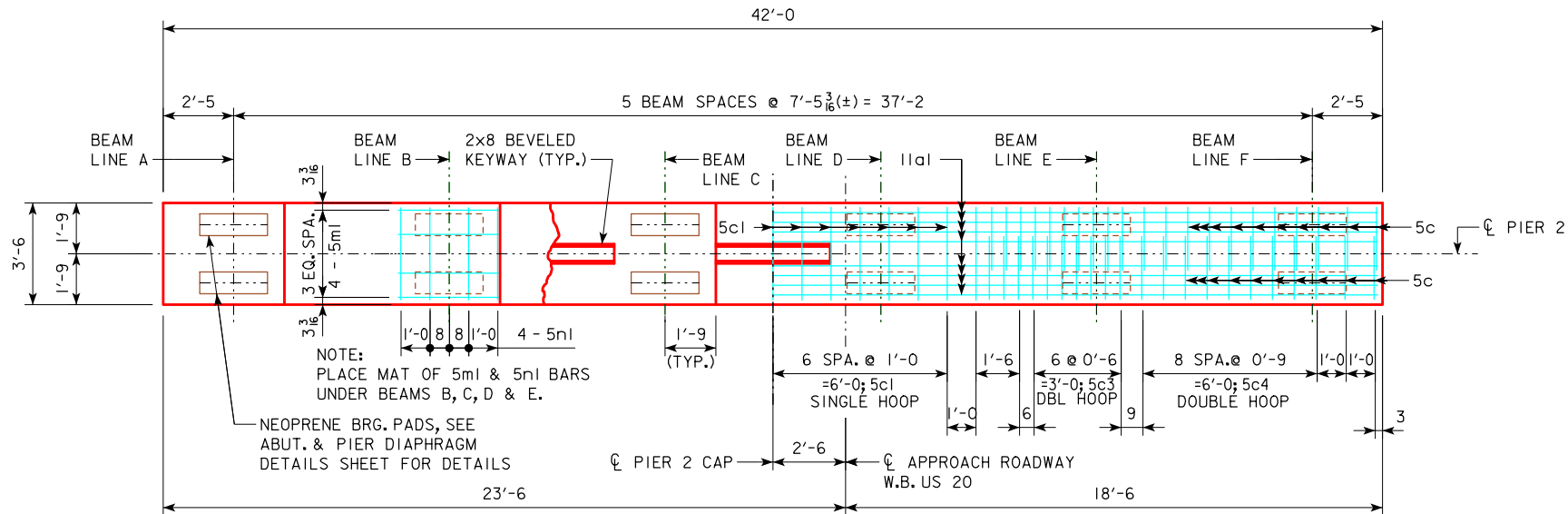
304'-0

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

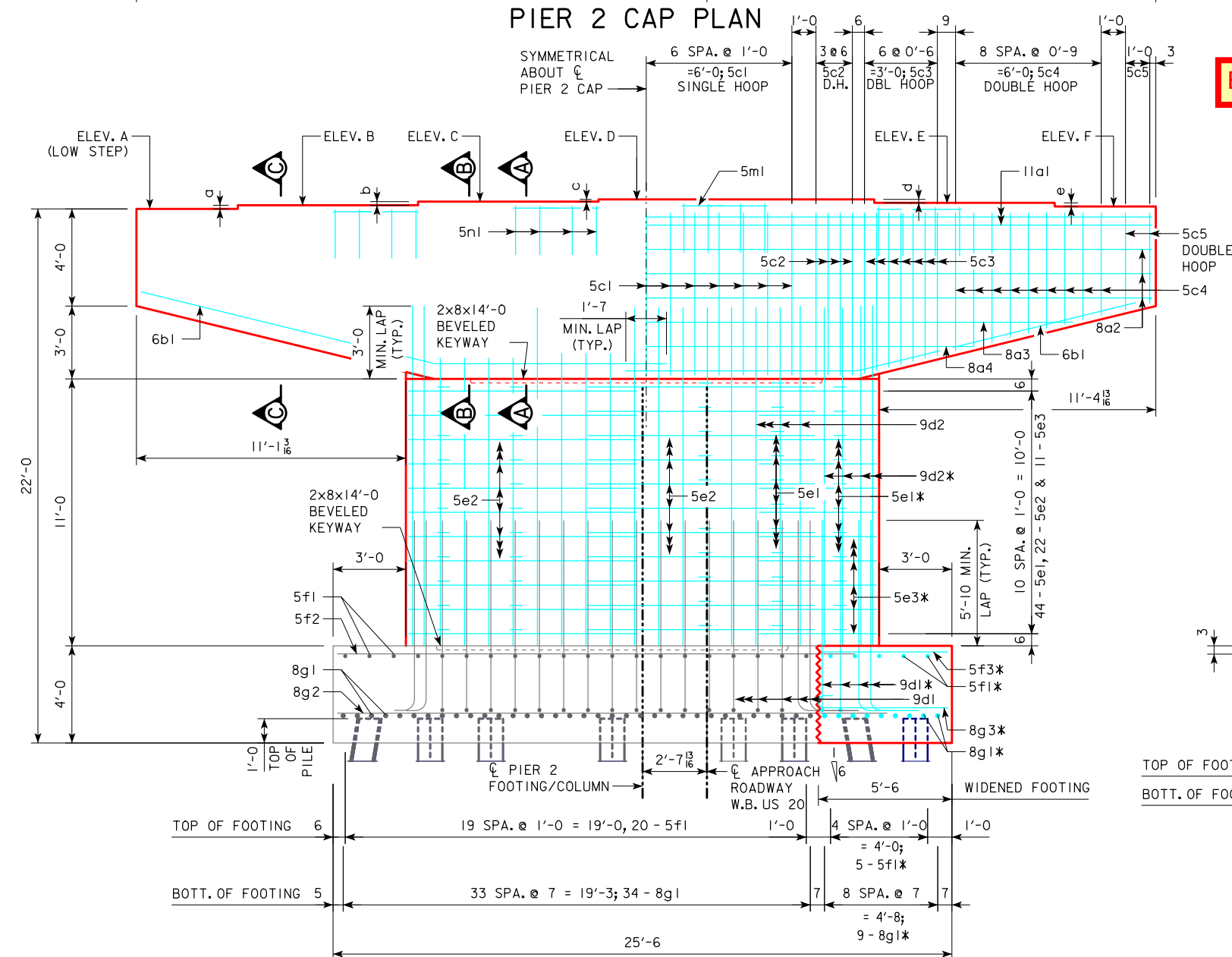
REVISD: 03-09-2017 THIS SHEET ADDED, PIER 2
FOOTING DETAILS.

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

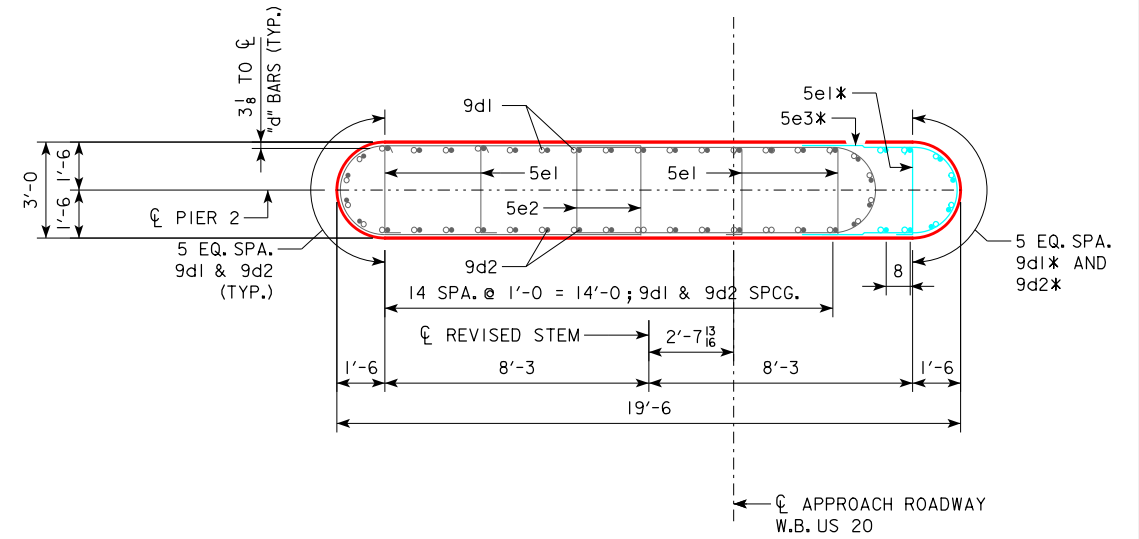
DESIGN FOR 0° SKEW
304'-0" x 41'-0" PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE
91'-0" & 106'-0" END SPANS 107'-0" INTERIOR SPAN
PIER 2 FOOTING REPAIR
STA. 12454+02.16, 46.12' LT RADIUS=16,000' JULY, 2016
SAC COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 7C OF 58 FILE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



PIER 2 CAP PLAN

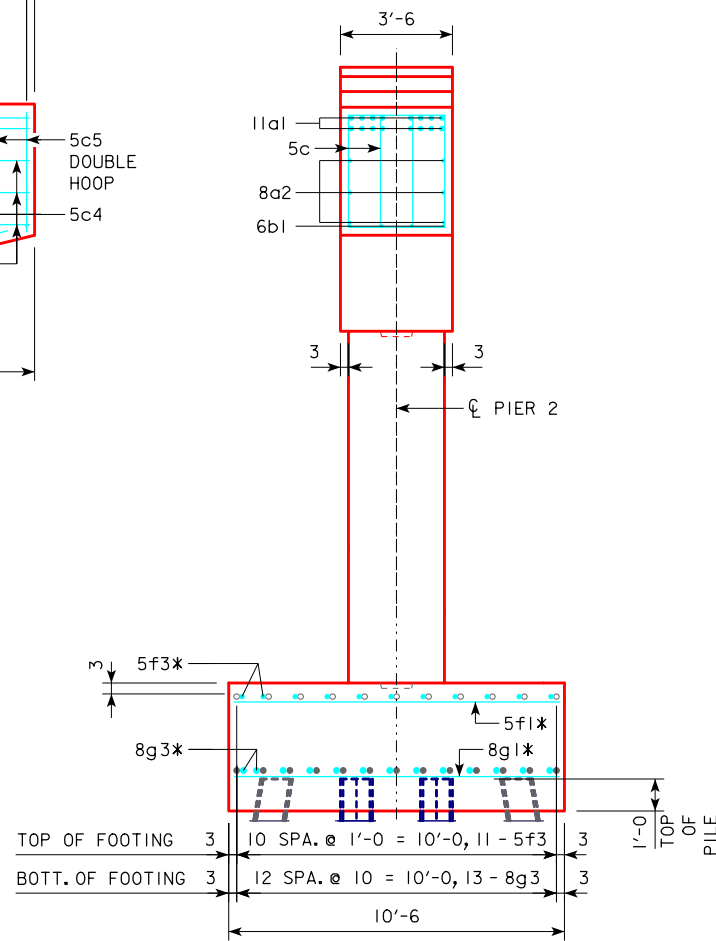


PIER 2 ELEVATION
(LOOKING EAST)



SECTION THRU STEM

EXAMPLE OF 1 REVISION ON THIS SHEET.



END 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.

TABLE OF PIER STEPS	
STEP	PIER 2
a	11' 13/16
b	11' 13/16
c	11' 1/16
d	11' 1/16
e	11' 13/16

TABLE OF PIER ELEVATIONS	
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.

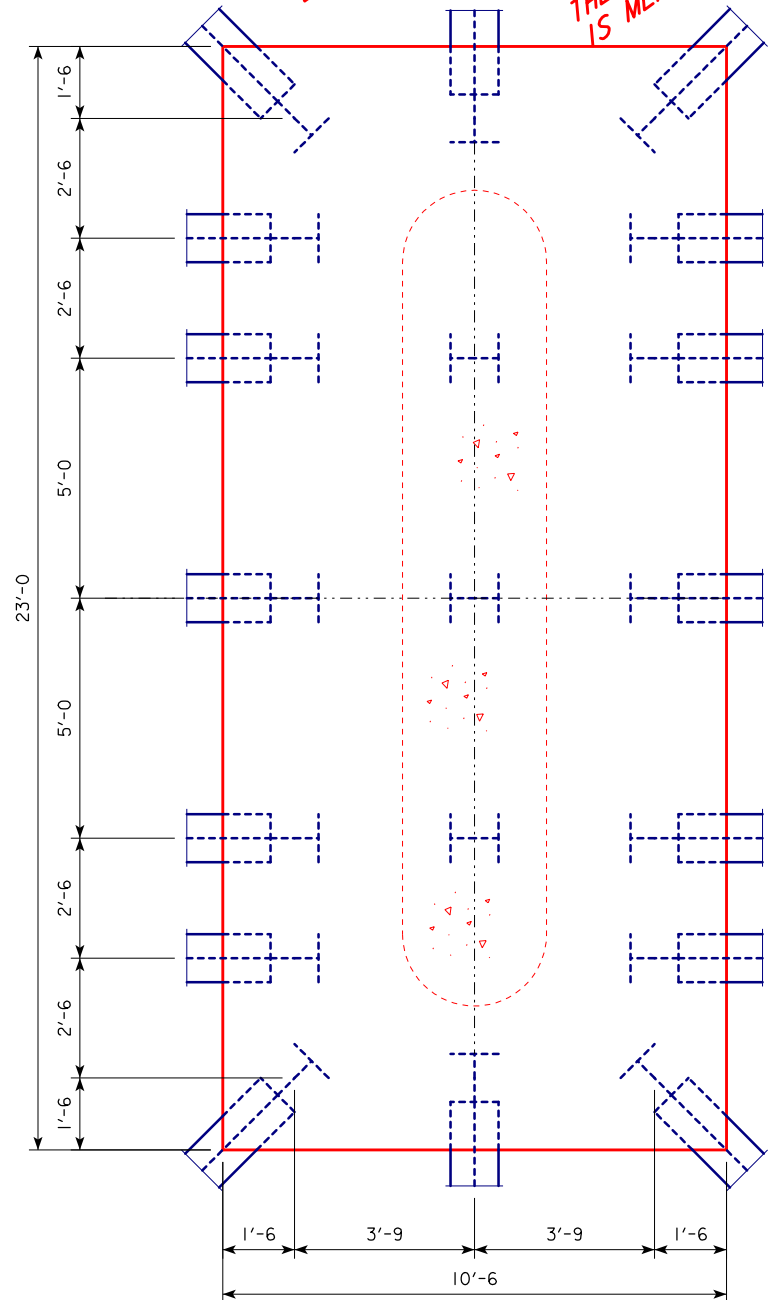
DESIGN FOR 0° SKEW
**304'-0" x 41'-0" PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**
91'-0" & 106'-0" END SPANS 107'-0" INTERIOR SPAN
PIER 2 DETAILS
STA. 12454+02.16, 46.12' LT RADIUS=16,000' JULY, 2016
SAC COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 7D OF 58 FILE NO.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

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

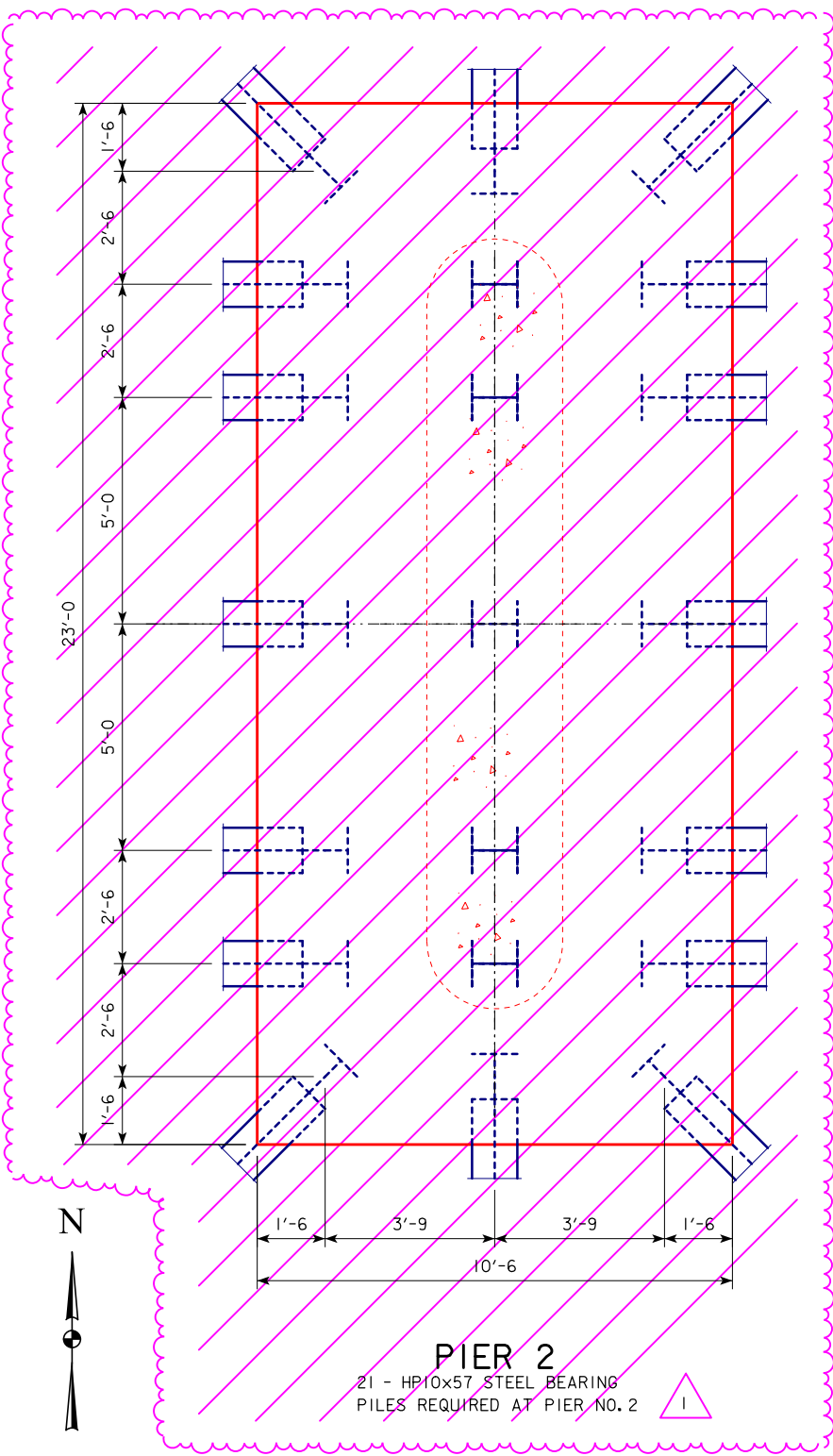
REVISED: MARCH 9, 2017

REVISION
EXAMPLE

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

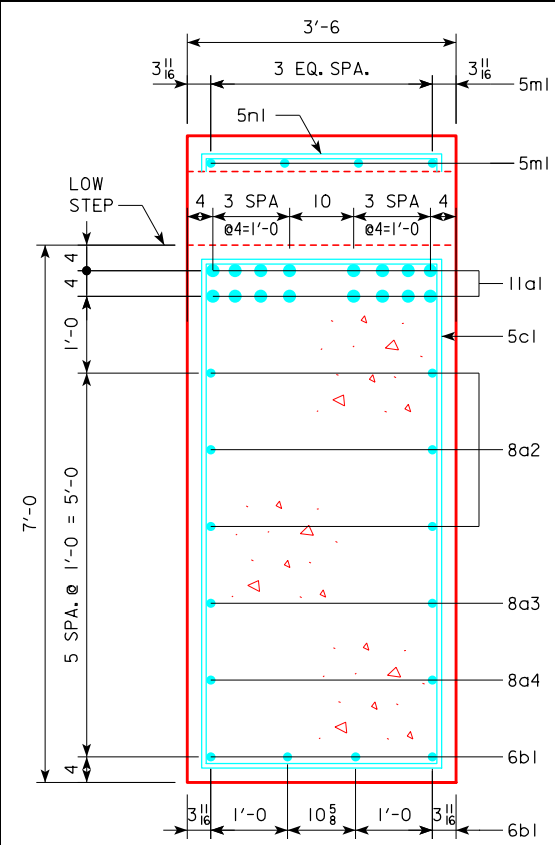


PIER 1
19 - HP10x57 STEEL BEARING
PILES REQUIRED AT PIER NO. 1

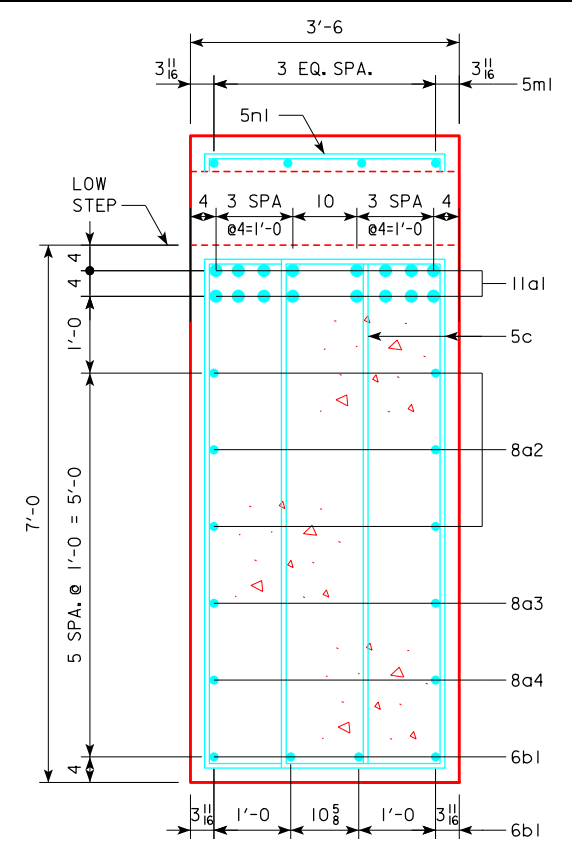


PIER 2
21 - HP10x57 STEEL BEARING
PILES REQUIRED AT PIER NO. 2

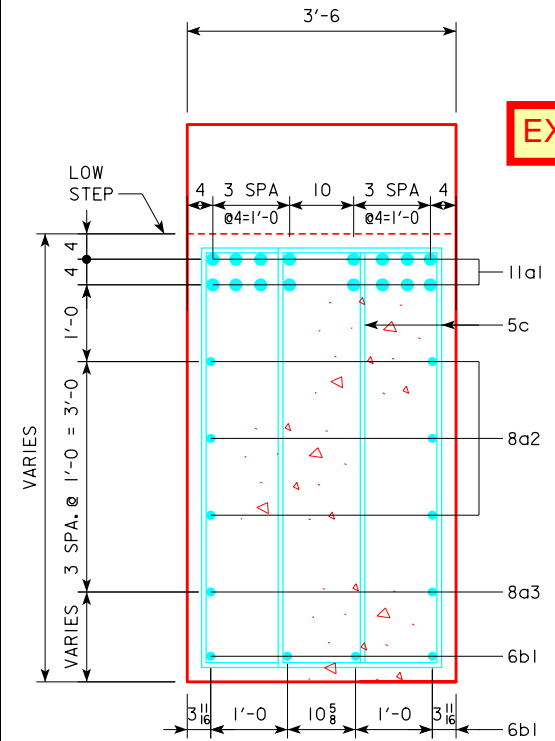
PIER FOOTING LAYOUT
PILE DIMENSIONS SHOWN ARE AT BOTTOM OF
FOOTING. BATTER PILE 1:4 IN DIRECTION SHOWN.



SECTION A-A



SECTION B-B



SECTION C-C

EXAMPLE OF 1 REVISION ON THIS SHEET.

REVISED: 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		38	10'-7	1367
9d2	COLUMN VERTICAL		38	14'-0	1809
5e1	COLUMN TIES		44	3'-8	168
5e2	COLUMN HOOPS		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		8	10'-7	288
9d2	COLUMN VERTICAL		8	14'-0	381
5e1	COLUMN TIES		11	3'-8	42
5e3	COLUMN HOOPS		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		38	10'-7	1367
9d2	COLUMN VERTICAL		38	14'-0	1809
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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.

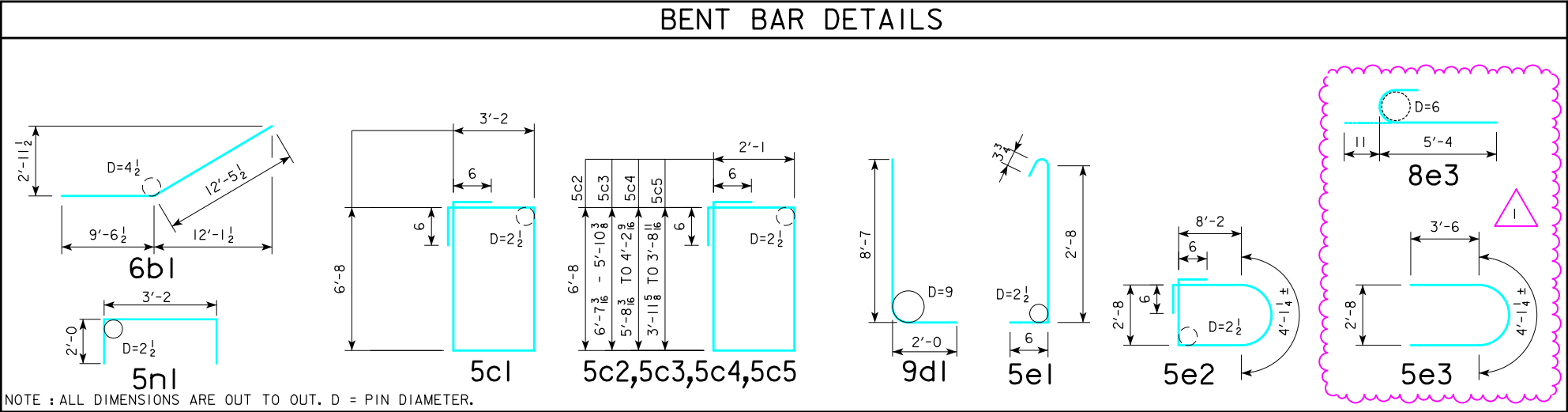
PILE DESIGN NOTES:

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.



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

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	



PLANS OF PROPOSED IMPROVEMENTS ON THE

PRIMARY ROAD SYSTEM

SAC COUNTY

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.

EXAMPLE OF TITLE SHEET
WITH 5 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	

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

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



STANDARD ROAD PLANS

STANDARD ROAD PLANS ARE LISTED
ON SHEET NUMBER C.1

REFER TO INDIVIDUAL SITUATION
PLANS FOR TRAFFIC DATA
INFORMATION.

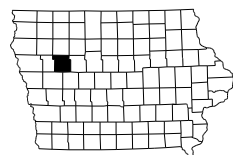
THE PLAN DETAILS ARE ARBITRARY,
THE REVISION MARK-UPS ARE WHAT
IS MEANT TO BE SHOWN.

INDEX OF SEALS

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

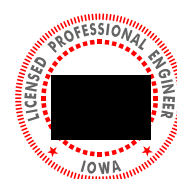
DESIGN 216

LOCATION MAP



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	<div>4</div>	REVISION SHEET ADDED.				
04-15-2017	3		<div>REVISED:</div> THIS SHEET VOIDED. <div>REASON:</div> EXCESSIVE CHANGES CREATED AN UNCLEAR QUANTITY SHEET.				
04-15-2017	3A		<div>REVISED:</div> THIS SHEET ADDED. <div>REASON:</div> TO PROVIDE CLEAR DETAILS IN RELATION TO THE PREVIOUS HEAVILY REVISED QUANTITY SHEET THAT IS NOW VOIDED SHEET 3.				
04-15-2017	7		<div>REVISED:</div> REMOVED 2'-0 x 2'-0 CORNER OF PIER 1. <div>REASON:</div> CORNER REMOVED TO ALLOW CLEARANCE FOR MSE WALL.				
04-15-2017	8		<div>REVISED:</div> ADDED 1'-6" HOLE TO COLUMN OF PIER 1. <div>REASON:</div> THIS ALLOWS FOR THE LOCATION OF WATER MAIN TO PASS THROUGH THE PIER.				
04-15-2017	8A		<div>REVISED:</div> PILE UPLIFT ANCHOR DETAIL WAS ADDED. <div>REASON:</div> THE ANCHOR DETAIL WAS NEEDED FOR ADDITIONAL REQUIRED PILES DO TO EXISTING SOIL CONDITIONS.				
04-15-2017	8A1		<div>REVISED:</div> THIS SHEET ADDED. <div>REASON:</div> WOOD PILES WERE ADDED TO FOOTING DUE TO EXISTING SOIL CONDITIONS.				
<div><div>STRUCTURAL DESIGN</div><div><div><div><div>First Name Last Name 12345</div><div>IOWA</div></div><div><div>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.</div><div><div>04-15-2017</div><div>Date</div></div><div><div>Signature</div><div>Name</div></div><div><div>Printed or Typed Name</div></div><div><div>My license renewal date is December 31, 2018</div></div><div><div>Pages or sheets covered by this seal: SHEETS 1, RB, 3, 3A, 7, 8, 8A, 8A1</div></div></div></div></div></div>							
11-21-2017	A.1, MIT.1-MIT.4		<div>REVISED:</div> ADDED PLAN SHEETS A.1 AND MIT.1 THRU MIT.4. <div>REASON:</div> 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>REVISION EXAMPLE</div> <div>THIS IS SHOWING ADDITION OF REVISION SHEETS FROM AN OFFICE OTHER THAN BRIDGE DESIGN.</div> <div>THE PLAN DETAILS ARE ARBITRARY, THE REVISION MARK-UPS ARE WHAT IS MEANT TO BE SHOWN.</div> <div><div>SAC COUNTY</div><div>DESIGN NO. 116, 216</div><div>REVISION SHEET</div><div>IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION</div></div>
<div><div>STRUCTURAL DESIGN</div><div><div><div><div>First Name Last Name 12345</div><div>IOWA</div></div><div><div>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.</div><div><div>11-21-2017</div><div>Date</div></div><div><div>Signature</div><div>Name</div></div><div><div>Printed or Typed Name</div></div><div><div>My license renewal date is December 31, 2018</div></div><div><div>Pages or sheets covered by this seal: SHEETS 1, RB</div></div></div></div><div>EXAMPLE OF 5th PLAN REVISION INCLUDING NEW ADDED PLAN SHEETS FROM AN OFFICE OTHER THAN BRIDGES AND STRUCTURES.</div></div></div>							
DESIGN TEAM DESIGNER / CHECKER / DETAILER				FILE NO. 30568		COUNTY	
						SHEET NUMBER	RB

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.

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.	

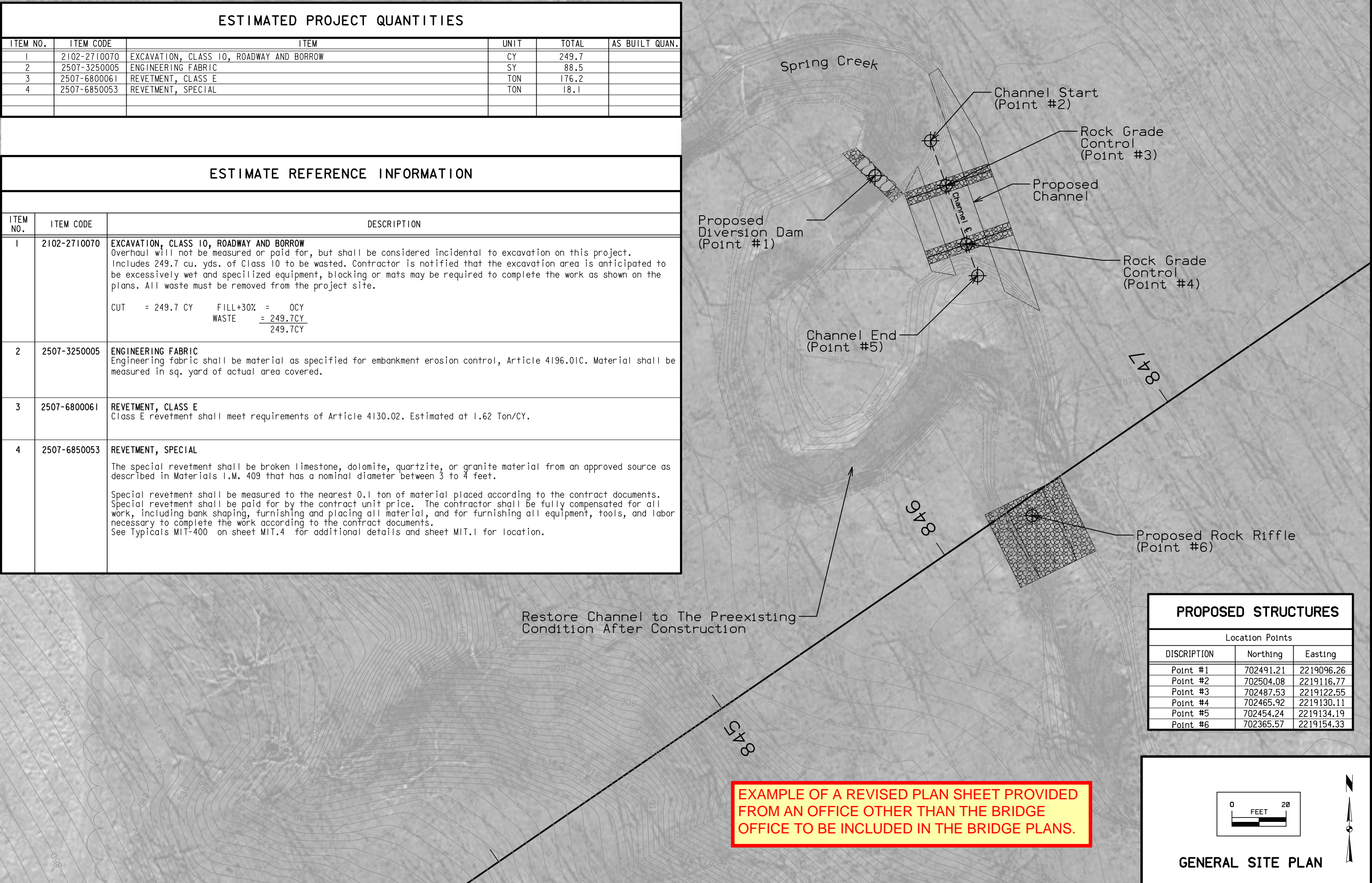
EXAMPLE OF A REVISED PLAN SHEET PROVIDED FROM AN OFFICE OTHER THAN THE BRIDGE OFFICE TO BE INCLUDED IN THE BRIDGE PLANS.

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.
	Signature _____ Date <u>11/21/17</u>
	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> $\begin{array}{rcl} \text{CUT} & = & 249.7 \text{ CY} \\ & & \text{FILL+30\%} = 0\text{CY} \\ & & \text{WASTE} = \frac{249.7\text{CY}}{249.7\text{CY}} \end{array}$
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</p> <p>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>



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

PROPOSED STRUCTURES		
Location Points		
DISCRIPTION	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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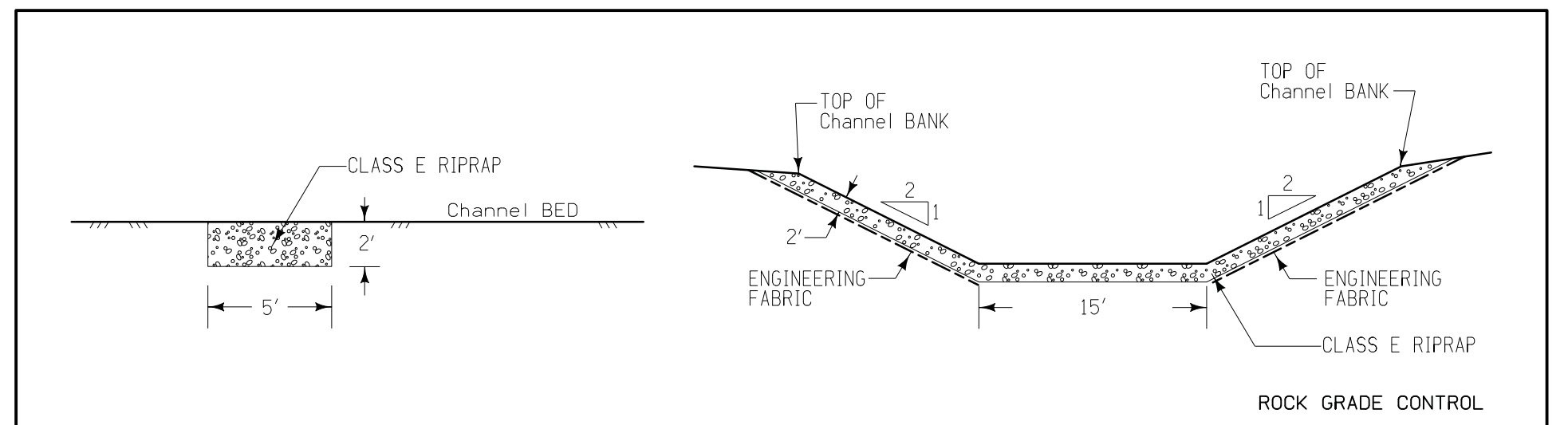
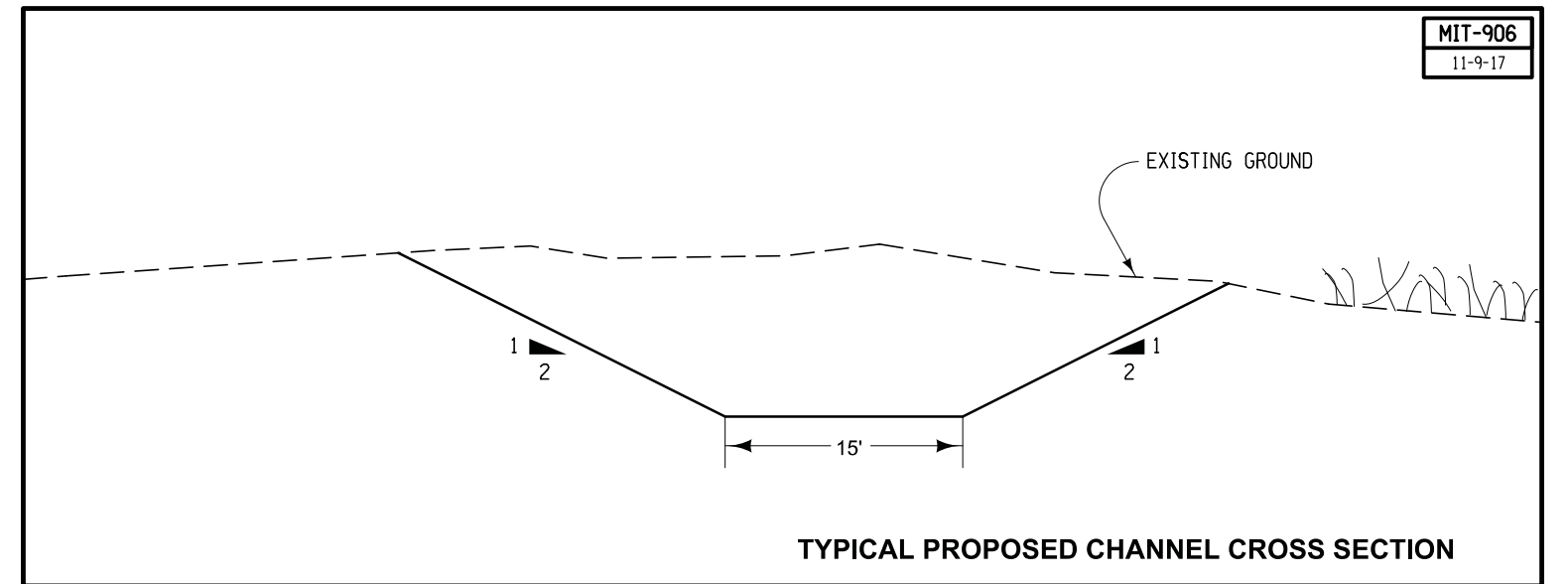
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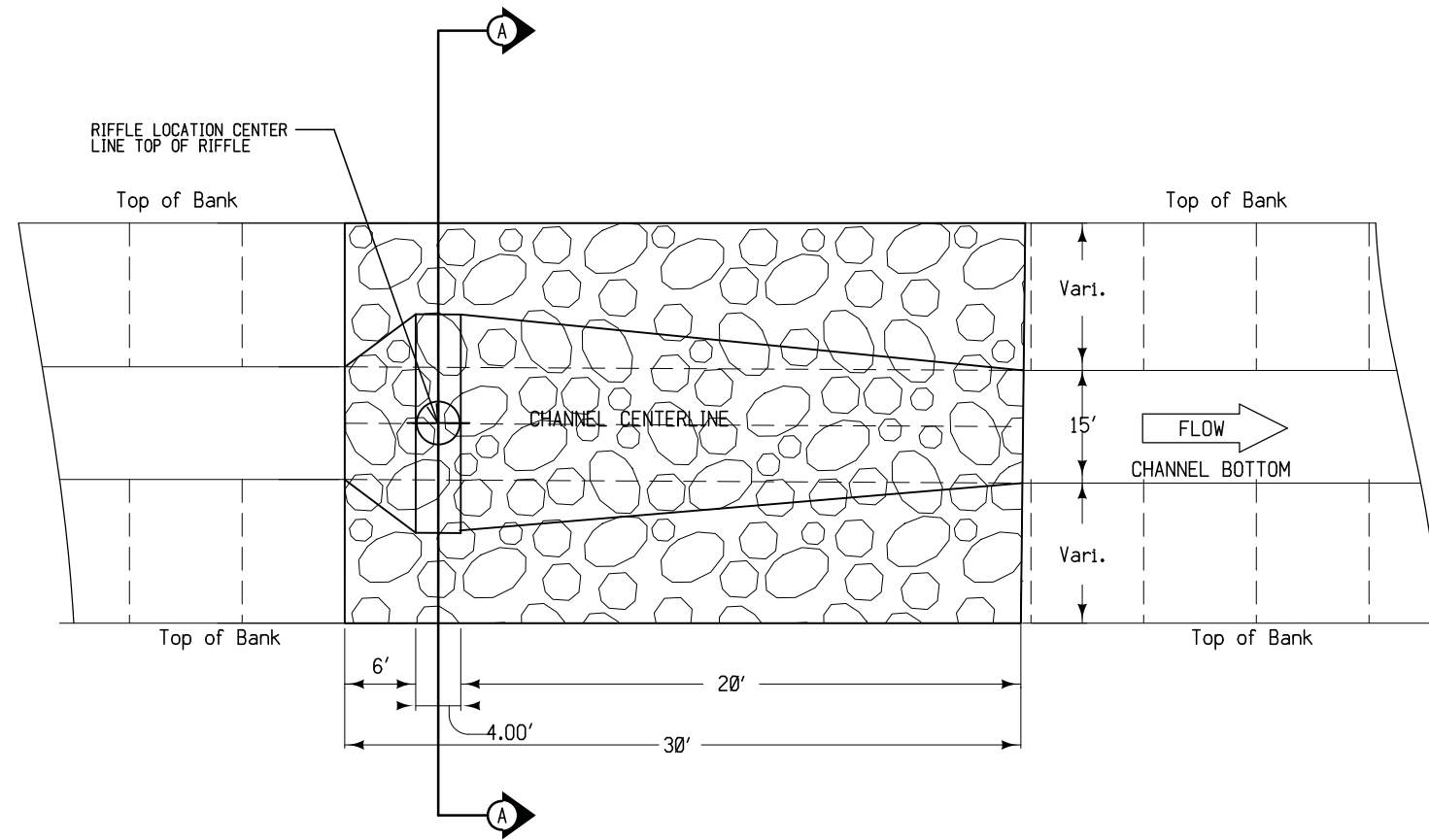
Point #5	702454.24	2219134.19
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0 FEET 20

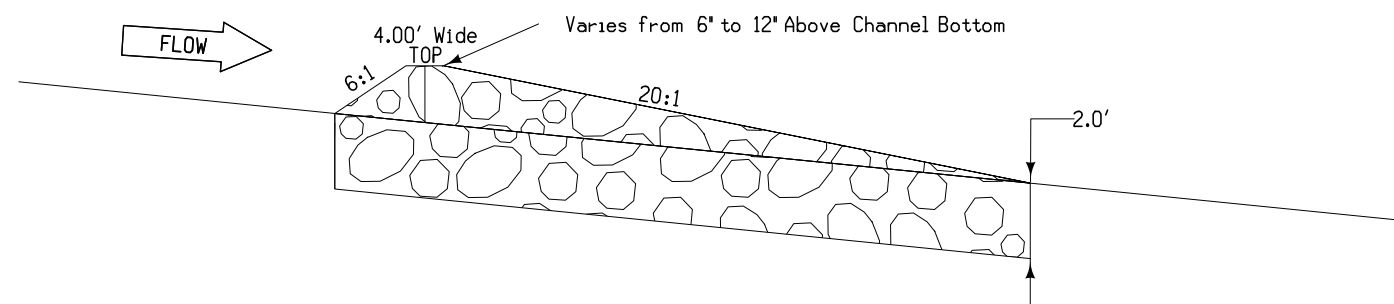
GENERAL SITE PLAN



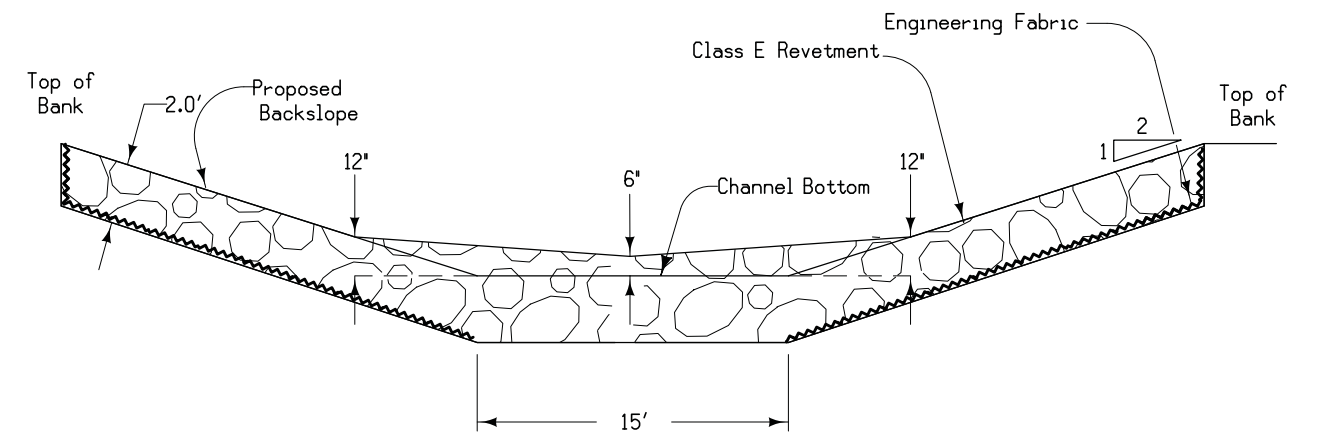
EXAMPLE OF A REVISED PLAN SHEET PROVIDED FROM AN OFFICE OTHER THAN THE BRIDGE OFFICE TO BE INCLUDED IN THE BRIDGE PLANS.



PLAN VIEW



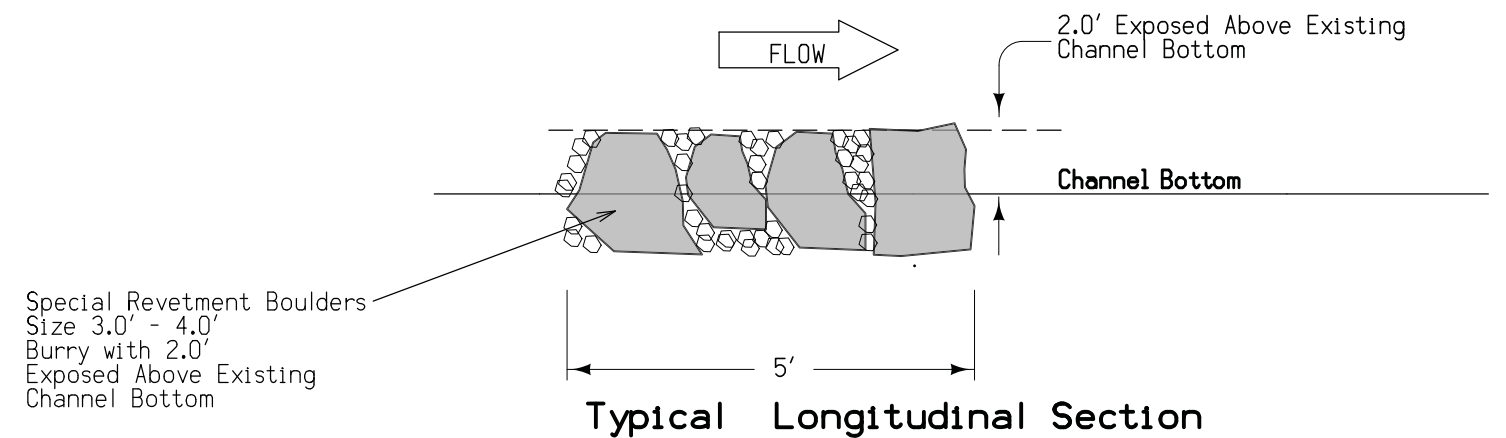
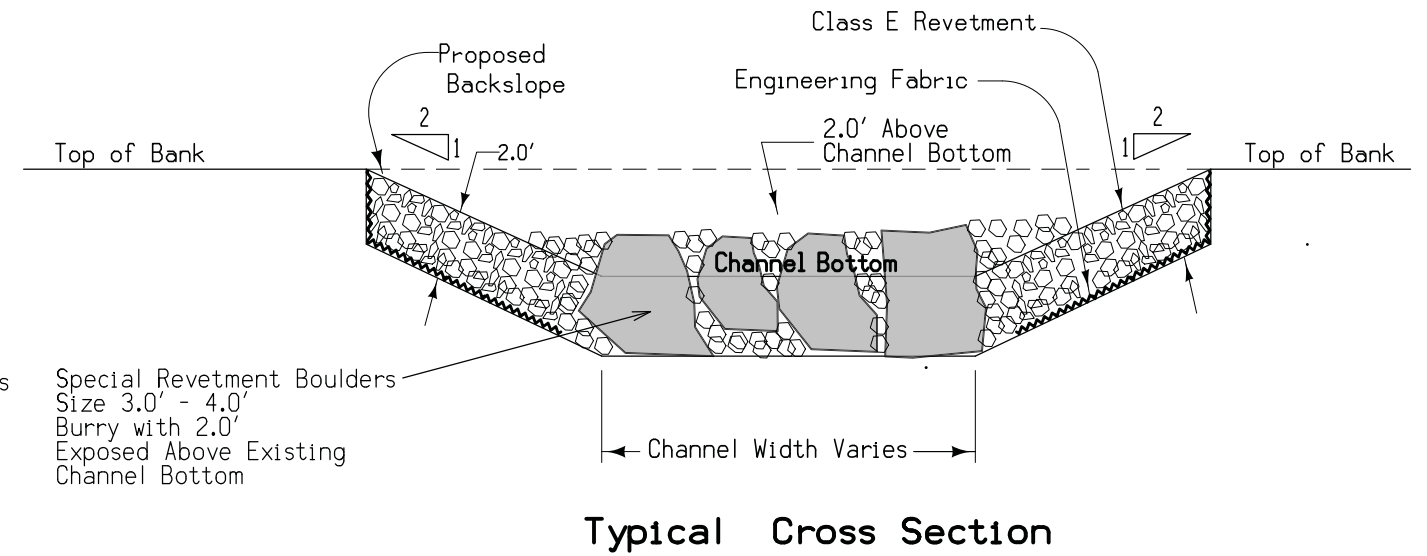
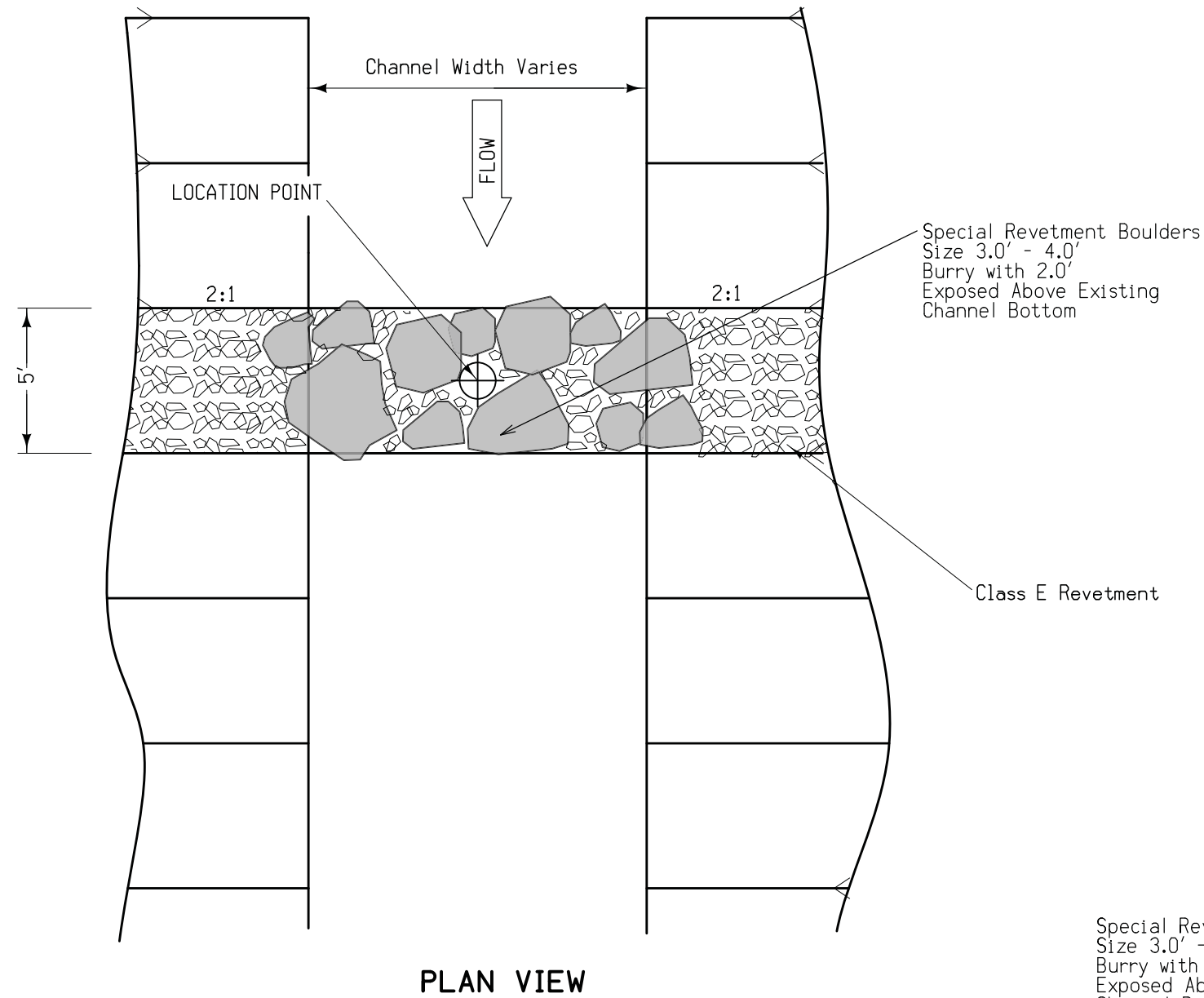
Typical Profile View



Typical Cross Section A-A

TYPICAL ROCK RIFFLE STRUCTURE

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



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

TYPICAL DIVERSION DIKE