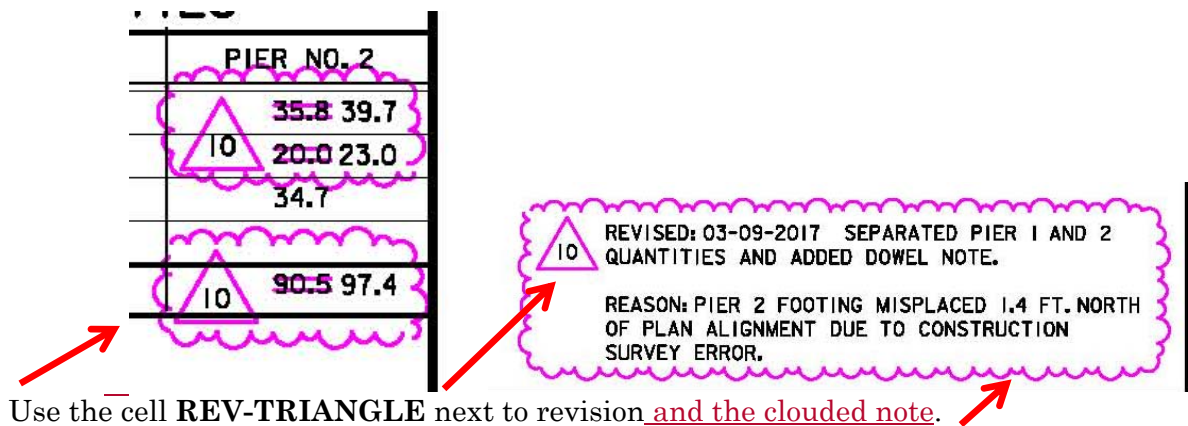


### Creating Plan Revisions – O.B.S. Version

(Prior to 12-1-2015 the RA sheet was labeled 1A)

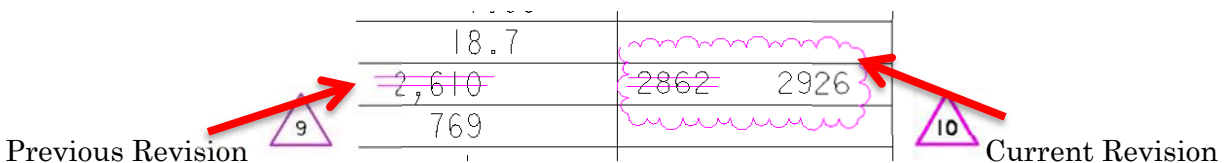
Plan revisions may be needed to document changes, including a different construction method, a plan alteration, or a plan correction. DO NOT DELETE OR MOVE ANY EXISTING DETAILS, ELEMENTS, TEXT OR PLAN SHEETS when creating revisions. The revised text or details are NEVER DELETED, but rather crossed-through (strike-over) with 2 lines and then the NEW INFORMATION IS ADDED using only the Bridge Office “brgRev.....” levels. The CADD cell revision symbol “REV-TRIANGLE” (denoting which revision, i.e. 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>...) is placed as near as possible to the note, lines, views or dimensions that are revised. The cell is located in the Bridge Office “brgFinal.cel” cell library. The Bridge Office process calls out the use of specific Revision Levels that are to be used in CADD, this allows for the “shutting off” of the plan revisions to view the original plan details in the CADD file.

The strike-over and new information is encircled with a cloud using the “brgRevAnnotation” level. Revision dates and a summarized Reason for the change are given on each detail sheet affected by the revision.



When possible, place note in lower right corner of ALL revised and added plan sheets.

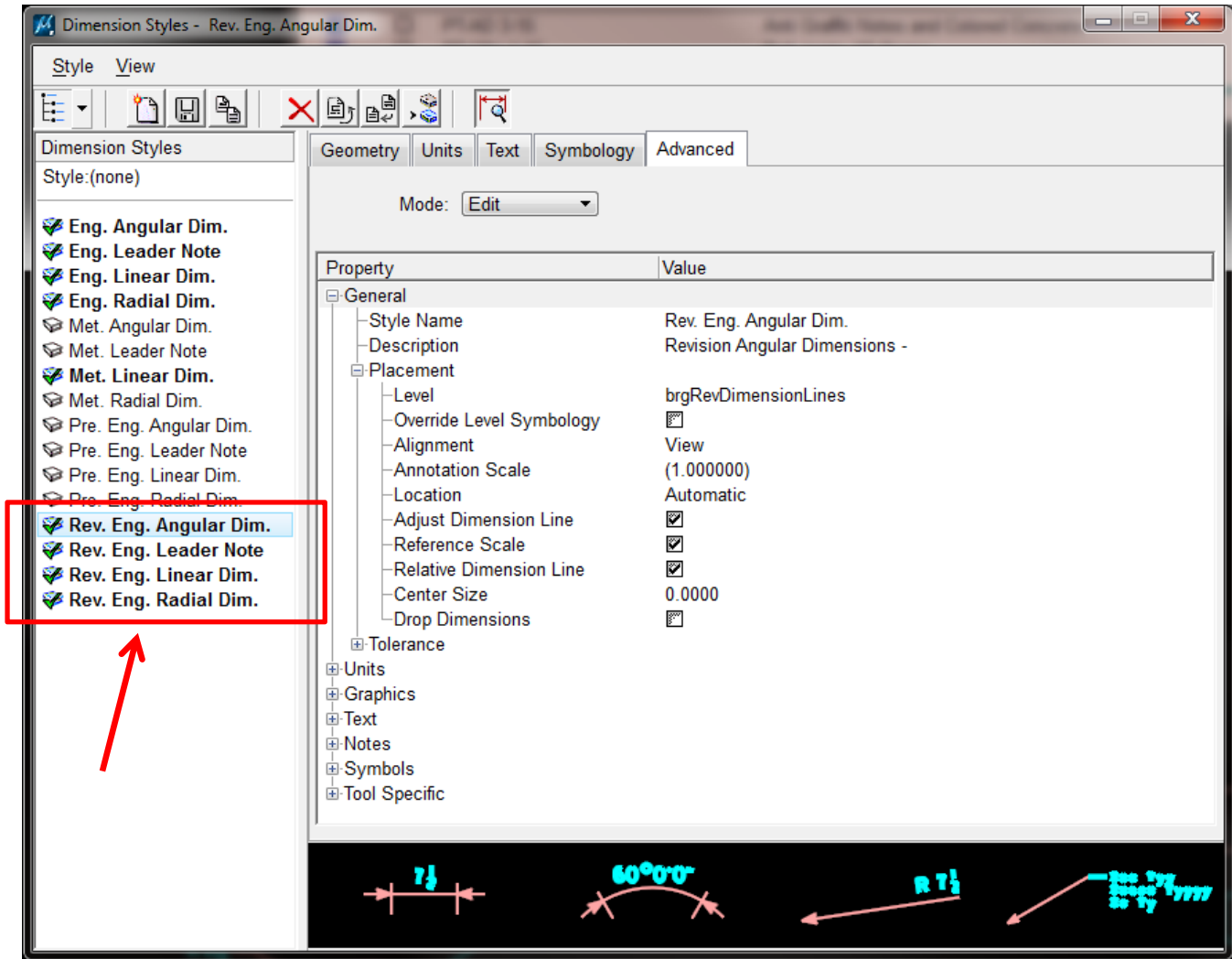
If a sheet is revised and later revised again, the clouds are to be removed from the first, previous, revision corrections leaving the “strike-over”. The second, or latest, revision changes are to be the only items that are both “strike-over and clouded”.



## -Revision Dimensions-

If a new “revision” dimension is required then use the “Rev. Eng.....” dimension styles. These dimensions will look like a standard dimension but they are using brgRevDimensionLines and brgRevTextNormal levels. The dimension “Leader Note” style uses “TextNormal” level whereas all other dimension styles use “DimensionLines” level for display.

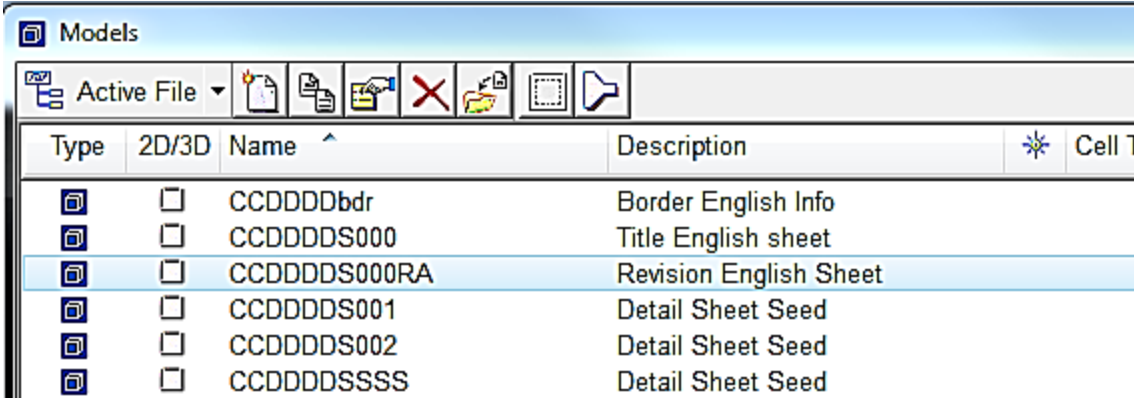
### Revision Dimension Styles



**-Revision Index Sheet-**

The inclusion of the REVISION plan sheet, **RA**, is to be added to the plan set after the Title Sheet. The **brgrevision** (Revision English Sheet) model can be referenced or imported into MicroStation from the **brgSeed.dgn** file.

If there is no Title Sheet, then the **RA** sheet is to be placed after the Quantity Sheet. On sheet **RA**, a more extensive explanation and description of the plan revision should be given. The CADD model name for the Revision Sheet (**SHEET NUMBER RA**) is the same model name as the Title Sheet (or Quantity Sheet) with an '**RA**' added, CCDDDDs000RA (i.e. 420399s000**RA**), indicating the revision sheet. This sheet (**RA**) will follow the Title Sheet model. If more than the single **RA** Revision Sheet is needed the additional Revision Sheet/s should be named **RB**, **RC**, etc. for the plan Sheet Number. The Model names for additional Revision Sheets should be named CCDDDDs000**RB** for the second Revision Sheet and CCDDDDs000**RC** for the third Revision Sheet, etc.

**Example of Model name for Plan Revision Sheet RA.**


Type	2D/3D	Name	Description	Cell T
	<input type="checkbox"/>	CCDDDDbdr	Border English Info	
	<input type="checkbox"/>	CCDDDDs000	Title English sheet	
	<input type="checkbox"/>	CCDDDDs000RA	Revision English Sheet	
	<input type="checkbox"/>	CCDDDDs001	Detail Sheet Seed	
	<input type="checkbox"/>	CCDDDDs002	Detail Sheet Seed	
	<input type="checkbox"/>	CCDDDDSSSS	Detail Sheet Seed	

The addition of Revision Sheet **RA** is to be added to the INDEX OF SHEETS on the Title Sheet and placed after the Title Sheet listing. The revision box on the Title Sheet is to be filled out with the revision date.

**Example of plan revision information added to the Title Sheet.**

REVISIONS

SEE REVISION SHEET RA      03-09-2017




INDEX OF SHEETS	
NO.	DESCRIPTION
1	TITLE SHEET
RA	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

## Example of multiple plan revisions and revision sheets added to the Title Sheet.

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

## Example of Plan Revision Sheet RA.


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	REVISOR CHANGED STRUCTURAL CONCRETE (BRIDGES), 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	REVISOR 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	REVISOR 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	REVISOR 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	RA		REVISOR 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	RB		REVISOR 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	RC		REVISOR 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	RD		REVISOR 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	REVISOR 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	REVISOR 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.
<div style="border: 1px solid black; padding: 5px;"> <b>EXAMPLE OF 1st REVISION.</b> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>STRUCTURAL DESIGN</b>              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: <b>Noms</b> Date: <b>3-9-2017</b>            Printed or Typed Name: _____            My license renewal date is December 31, 2018.            Pages or sheets covered by this seal: SHEETS 1, RA, 2, 3, 7, 8, RA, RB, RC, RD, 9, 10.         </div>			
04-11-2017	2	2	REVISOR CHANGED STRUCTURAL CONCRETE (BRIDGES), 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	2	REVISOR 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	2	REVISOR CHANGED PIER 2 FOOTING LOCATION. REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.
<div style="border: 1px solid black; padding: 5px;"> <b>EXAMPLE OF 2nd REVISION.</b> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>STRUCTURAL DESIGN</b>              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: <b>Noms</b> Date: <b>04-11-2017</b>            Printed or Typed Name: _____            My license renewal date is December 31, 2018.            Pages or sheets covered by this seal: SHEETS 1, RA, 2, 3, 7, 8.         </div>			
<div style="border: 1px solid black; padding: 5px;"> <b>EXAMPLE OF 3rd REVISION.</b> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>STRUCTURAL DESIGN</b>              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: <b>Noms</b> Date: <b>04-11-2017</b>            Printed or Typed Name: _____            My license renewal date is December 31, 2018.            Pages or sheets covered by this seal: SHEETS 1, RA, 2, 3, 7.         </div>			
<div style="border: 1px solid black; padding: 5px;"> <b>EXAMPLE OF MULTIPLE PLAN REVISIONS ON ONE REVISION SHEET.</b> </div>			
03-27-2017	2	2	REVISOR CHANGED STRUCTURAL CONCRETE (BRIDGES), 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	REVISOR 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	REVISOR 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	REVISOR 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.
<div style="border: 1px solid black; padding: 5px;"> <b>EXAMPLE OF 2nd REVISION.</b> </div>			
<div style="border: 1px solid black; padding: 5px;"> <b>PLAN REVISION SHEET TEMPLATE IS LOCATED IN THE "brgseed.dgn" FILE AS "brgrevision" MODEL.</b> </div>			
<div style="border: 1px solid black; padding: 5px;"> <b>REVISION EXAMPLE</b>            THE PLAN DETAILS ARE ARBITRARY. THE REVISION MARK-UPS ARE WHAT IS MEANT TO BE SHOWN.         </div>			
<div style="border: 1px solid black; padding: 5px;"> <b>SAC COUNTY DESIGN NO. 116 REVISION SHEET</b>            IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION         </div>			
<div style="border: 1px solid black; padding: 5px;">           DESIGN TEAM: DESIGNER / CHECKER / DETAILER            FILE NO. 20568            COUNTY: _____ PROJECT NUMBER: NHA-020-20433-28-01            SHEET NUMBER: <b>RA</b> </div>			

REVISED: APRIL 11, 2017

For each revision, an Engineering Seal is to be added with the Revision Date on the signature line and a listing of the revised plan sheet numbers is to be listed in MicroStation Normal Text properties (brgTextNormal level). The Title Sheet, sheet number, does not have to be shown in the listing of revised sheets (unless a change is made to the Title Sheet). The TOTAL SHEETS on the Title Sheet does not change. Changing the total sheets could conflict with the sheet numbers on the original Engineer Seal shown on the Title Sheet. The added sheets will be accounted for on the Revision Sheet **RA** and "signed for" by the Revision Engineer with their seal on the Revision Sheet.

Sheet **RA** will need the revision Engineer's seal with the revision date and a listing of the revised sheets and any new added sheets. If a second revision occurs, the second revision Engineer's seal is to be added to the revision sheet and detailed with the new revision date and a listing of the plan sheets affected in the second revision. Ensure the revision date matches on all sheets that are part of the same revision.

### Engineer Seal

<b>STRUCTURAL DESIGN</b>	
	<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 style="text-align: right;">10-21-2015</p> <p>Signature _____ Date _____</p> <p style="text-align: center;"><b>John P. Sample</b></p> <p>Printed or Typed Name _____</p> <p>My license renewal date is December 31, _____</p> <p>Pages or sheets covered by this seal: _____</p>

The Revision Sheet (**RA**) title block lists the design number being revised. If multiple designs are in this project and a second revision occurs involving other designs, these revised design numbers need to be added to the title block to indicate all the design numbers involved in the revisions. If a second revision occurs, the new revision **DATE**, **SHEET NUMBERS** and **DESCRIPTION OF REVISIONS** will indicate more than one revision has occurred and separate the previous revision from the current revision.

The cell named **REVISED**, which shows the revision date, needs to be attached in the lower right-hand corner of each revised sheet, existing and new, and including the revision sheet **RA** in the plan. If a second revision occurs with a different revision date, the date shown on the **REVISED** cell shown below is to be changed to reflect the date of the second revision. The strike-over is not to be used on the **REVISED** cell. The cell named **REVISED** is not used on the Title Sheet.

### Example of REVISED cell.

<p><b>? COUNTY</b></p> <p><b>DESIGN NO. ?</b></p> <p><b>REVISION SHEET</b></p> <p style="font-size: small;">IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION</p>		<p style="color: red; font-weight: bold;">REVISED: OCTOBER 21, 2015</p>
<p>PROJECT NUMBER ?</p>	<p>SHEET NUMBER <b>RA</b></p>	

**Revision Levels-**

The revision levels used for Bridge Office project files are provided through the level library filter called “Bridge Revisions”. The filter names are listed in the table below.

**Bridge Office Levels**

Filter	Name
Bridge [BridgeLevels]	brg*
Bridge Final [BridgeLevels]	brg*-brgPre*-brgRev*-brgSite*-brgBlo*,brgPre*Exist*
Bridge Final Shortlist [BridgeLevels]	brgText*,brgDim*,brgTable*,brgConcrete*,brgRebarBlack,brgRebarEpoxy,brgStructuralSteel*
Bridge Prelim [BridgeLevels]	brgPre*,brgText*,brgDim*,brgTable*,brgGran*,brgFlow*,dsnSho*, dsnEdge*, dsnCellsDikes
Bridge PrelimFinal [BridgeLevels]	brg*-brgRev*-brgSite*-brgBlo*,dsnSho*,dsnEdge*,dsnCellsDikes
<b>Bridge Revisions [BridgeLevels]</b>	<b>brgRev*</b>
Bridge Site [BridgeLevels]	brgSite*

The Bridge Office revision levels that are to be used for placing revised elements and text on existing sheets are shown below, as viewed in MicroStation Level Manager, of the Bridge Office Revisions filter. The colors, style and weight of the levels are provided. Note the revision level ‘**brgRevAnnotation**’ is to be used for strike-over and clouds, and ‘**brgRevTextNormal**’ is to be used for the revision notes within the clouds on the revised sheets. All revision details are to use the revision levels for the appropriate material, dimension lines and text.

**Plan Revisions Level Filter**

Name	Description	Color	Style	Weight
brgRev*				
brgRevAluminum [Bridge]	Aluminum for Revisions	210	0	4
brgRevAnnotation [Bridge]	Clouds and Strikethrough for Revisions	5	0	5
brgRevBentoniteSlurry [Bridge]	Bentonite Slurry for Revisions	213	0	4
brgRevConcrete [Bridge]	Concrete for Revisions	3	0	8
brgRevConcreteRustication [Bridge]	Aesthetic Rustication for Concrete for Revisions	3	0	1
brgRevDimensionLines [Bridge]	Dimension Lines for Revisions	182	0	1
brgRevDirtRock [Bridge]	Dirt, Rock, Soil Backfill for Revisions	28	0	4
brgRevFlowableMortar [Bridge]	Flowable mortar, Grout for Revisions	213	0	4
brgRevGranularMaterial [Bridge]	All Granular Materials for Revisions	188	0	4
brgRevJointMaterial [Bridge]	Joint Material for Revisions	31	0	3
brgRevNeoprene [Bridge]	Bearings, Drain Curtains, Drain Troughs for Revisions	79	0	3
brgRevPostTensionedBars [Bridge]	Post Tensioned Bars for Revisions	200	0	3
brgRevPrestressedStrands [Bridge]	Prestressed Strands for Revisions	209	0	3
brgRevPVC [Bridge]	PVC for Revisions	73	0	3
brgRevRebarBlack [Bridge]	Black Reinforcing Steel for Revisions	4	0	3
brgRevRebarEpoxy [Bridge]	Epoxy Reinforcing Steel for Revisions	18	0	3
brgRevRemovals [Bridge]	Removals for Revisions	228	0	1
brgRevStainless [Bridge]	Stainless Reinforcing Steel, Stainless Structural Steel for Revisions	41	0	3
brgRevStructuralSteel [Bridge]	Structural Steel for Revisions	57	0	4
brgRevStructuralSteelWeathered [Bridge]	Weathered Structural Steel for Revisions	217	0	4
brgRevTemporaryStructures [Bridge]	Falsework, Shoring, Temporary Structures excluding Detour Bridges for Revisions	15	0	3
brgRevTextHeader [Bridge]	Header Text for Revisions	162	0	8
brgRevTextNormal [Bridge]	Normal Text for Revisions	7	0	3
brgRevTimbers [Bridge]	Timbers for Revisions	6	0	4
brgRevUtility [Bridge]	Conduit, Junction Box, Lights, Brackets for Revisions	65	0	3
brgRevWireMesh [Bridge]	Wire Mesh, Welded Wire for Revisions	71	0	3



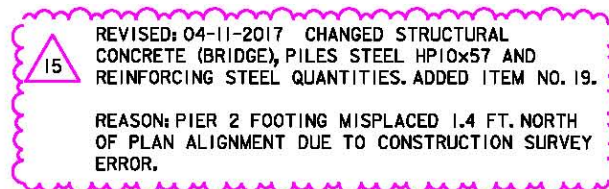
**-Revision Detailing-**

If new details are added to an existing sheet then the new details are added using only the Bridge Office “brgRev.....” levels and the Bridge Office “Rev. Eng.....” dimension styles.

If a plan sheet becomes cluttered with revisions or if the revision is large, such as a pier redesign, then it would be best to void the original plan sheet and add a new revised plan sheet to allow for clear details. With all revision sheets that are new added sheet/s to a plan, an ‘A’ is to be appended to the CADD Model Number, Design Sheet Number and the Plan Sheet Number. For revised sheets requiring a new detail sheet to replace the original (voided) plan sheet, use the voided model number with an ‘A’ appended to the new model number (i.e. 420399s005A). This new added sheet is to follow the voided sheet in the set of plans.

If several new sheets are added but are scattered throughout the plan, they should be placed in the proper plan sheet location and numbered using the model and sheet number of the sheet they follow with an ‘A’ appended to the numbers. If more than one new additional plan sheet is needed in sequence, the other new additional sheet/s would follow the new ‘A’ sheet and would be named in the CADD Model ‘420399s005A01’, ‘420399s005A02’, etc. This will locate any new added design sheets in the correct model order in MicroStation.

When a NEW sheet is added, the normal (non-revision) Bridge Office CADD levels are to be used on all new additional, or replacement sheets. The use of the revision CADD levels are needed when placing revision details to existing plan sheets. The ‘**brgRevAnnotation**’ and ‘**brgRevTextNormal**’ levels are to be used for the clouded note on all sheets.

**Example of clouded note.**

## Example of Void Plan Revision sheet.

SUMMARY OF CONCRETE QUANTITIES			SUMMARY OF REINFORCING STEEL			SUMMARY OF EXCAVATION			
LOCATION	STRUCTURAL CONCRETE	PIER STRUCTURAL CONCRETE	LOCATION	NON-COATED REINFORCING STEEL	EPLOY COATED REINFORCING STEEL	LOCATION	CLASS 30 EXCAVATION	CLASS 40 EXCAVATION	CLASS 10 EXCAVATION
BRIDGE DECK, ABUT. & PIER DIA PHRAGMS **	113.4		BARRELL RAIL - TWO RAILS		3.5/2	WEST ABUTMENT	50.0		
ADJUTMENT WINGS	7.6		BRIDGE DECK - ABUT. & PIER DIA PHRAGMS **	141		EAST ABUTMENT	73.8		1,083.0
PIER #1	90.5		BARRELL RAIL END SECTIONS		782	CHANNEL			
PIER #2	90.5		ADJUTMENT WINGS		782	PIER #1		151.0	
WEST ABUTMENT FOOTING	18.1		PIER #1	15,010		PIER #2	14.0	140.0	
EAST ABUTMENT FOOTING	18.1		PIER #2	15,010					
TOTAL (CU YDS.)	247.3		TOTAL (LBS.)	27,882	4,810	TOTAL (LBS.)	236.0	271.0	1,083.0

SUMMARY OF FOUNDATIONS				
LOCATION	SUBSTRUCTURE TYPE	FOUNDATION TYPE	NUMBER	TOTAL (IN FT.)
WEST ABUTMENT	INTEGRAL ABUTMENT	HP 10x37	7	115
EAST ABUTMENT	INTEGRAL ABUTMENT	HP 10x37	7	115
PIER #1	TEE PIER	HP 10x37	19	189
PIER #2	TEE PIER	HP 10x37	19	189
TOTAL (IN FT.)				608

SUMMARY OF STRUCTURAL STEEL		SUMMARY OF BEARINGS	
LOCATION	TOTAL (LBS.)	LOCATION	BEARING TYPE
BRIDGE DECK DRAPES	1,100	WEST ABUTMENT	SS 17.5
DIA PHRAGMS	4,215	EAST ABUTMENT	SS 17.5
TOTAL (LBS.)	5,315	PIER #1	PLAIN INFRONE 1"
		PIER #2	PLAIN INFRONE 1"

LOCATION	BEARING TYPE	NUMBER	ASSOCIATED ITEM
WEST ABUTMENT	SS 17.5	4	INCIDENTAL ITEM
EAST ABUTMENT	SS 17.5	4	INCIDENTAL ITEM
PIER #1	PLAIN INFRONE 1"	12	INCIDENTAL ITEM
PIER #2	PLAIN INFRONE 1"	12	INCIDENTAL ITEM

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

DESIGN FOR 6" DEEP  
**304'-0" x 41'-0" PRETENSIONED  
 PRESTRESSED CONCRETE BEAM BRIDGE**  
 5'-0" & 10'-0" END SPANS 10'-0" & 10'-0" END SPANS  
 5'-0" & 10'-0" END SPANS 10'-0" & 10'-0" END SPANS  
**SUMMARY QUANTITIES SHEET**  
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
 DESIGN NO. 2 OF 58 FILE NO. 30568 BRIDGE NO. 4

DESIGN TEAM: DES-SHR / CHECKED / DETAILER  
 PROJECT NAME: HIGH-005-21-437-21-81  
 SHEET NUMBER: 3

The word "VOID" and the "X" are placed using the proper Bridge Office revision levels.

If a later revision occurs and the 'A' sheets that were done with the previous revision are voided, or if additional revision sheets are added, then the replacement sheet numbers for the CADD Model Number, Design Sheet Number and Plan Sheet Numbers would be **A1a**, **A2a** (Model 420399s005**A01a**, 420399s005**A02a**) etc. Using capitalized and lower-case letters are to be adhered to when renaming revision sheets.

#### Example CADD Model Numbering for revisions:

Original Plan Sheet; 420399s005

1st Revision Added two plan sheets after original plan sheet;

420399s005A01, 420399s005A02

2nd Revision Added two more plan sheets to the previous 5A01 plan sheet that was added from the first revision;

420399s005A01a, 420399s005A01b

#### Example Plan Sheet Numbering for revisions to the corresponding Models example:

Original Plan Sheet; SHEET NUMBER 6

1st Revision Added two plan sheets after original plan sheet;

SHEET NUMBER 6A01, 6A02

2nd Revision Added two more plan sheets to the previous 6A01 plan sheet that was added from the first revision;

SHEET NUMBER 6A01a, 6A01b



Example Design Sheet Numbering for revisions to the corresponding Models example:

Original Plan Sheet; DESIGN SHEET NO. 5

1st Revision Added two plan sheets after original plan sheet;

DESIGN SHEET NO. 5A01, 5A02

2nd Revision Added two more plan sheets to the previous 6A01 plan sheet that was added from the first revision;

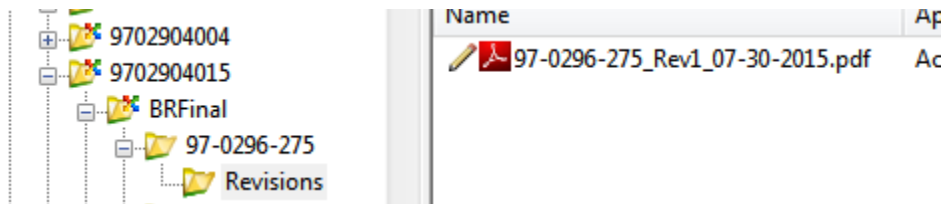
DESIGN SHEET NO. 5A01a, 5A01b

**-Revision PDF in ProjectWise-**

**Note:** A set of only the revised sheets should be made into a multipage PDF file with the revision Engineer's signature. Include the title sheet if there is one. Use the contract ID format, County-Route, federal control Section-Parent (**CC-RRRS-PPP\_Rev1\_date MM-DD-YYYY**).pdf. Do not use the # sign to list the Revision number, use Rev1, Rev2, etc.

Example: IMX-35-3(167)129- -02-77 would be 77-0353-167\_Rev1\_05-12-2014.

Store the revision PDF file in ProjectWise under the contract ID sub-folder titled "Revisions" (CC-RRRS-PPP ex. 77-0353-167) in the Projects Directory. (The "Revisions" subfolder may need to be created.)



### **Quick Guide**

**Revision** – The term “revision” refers to any change on the plans after the plans have been Let. Do not delete or move any original plan details or notes, only cross out and add new details and text.

**Revision Note and Reason** – Each revision is to have a REVISED note showing the date of the revision and what was revised and a REASON for the revision stated in a brief description.

**Revision Date** - The date of the revision will be on every sheet that is revised. Ensure the revision date matches on all sheets that are part of the same revision.

**Revision Number** – Each revision is assigned a number in sequence, starting with 1 then 2 and so on.

**Revision Symbol** – A revision symbol is a Revision Number enclosed in an equilateral triangle. Revision symbols shall be used to located the revision in the plans.

**Revision Symbol Location** – Revision symbols shall be located as near as possible to the notes, lines, views or dimensions that are revised.

**Multiple Changes** – All changes to a plan that are incorporated at the same time shall be identified by the same revision number and symbol.

**Revising a Change** – Whenever a previous revision is revised again then a new revision symbol is placed next to the previous one.

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.

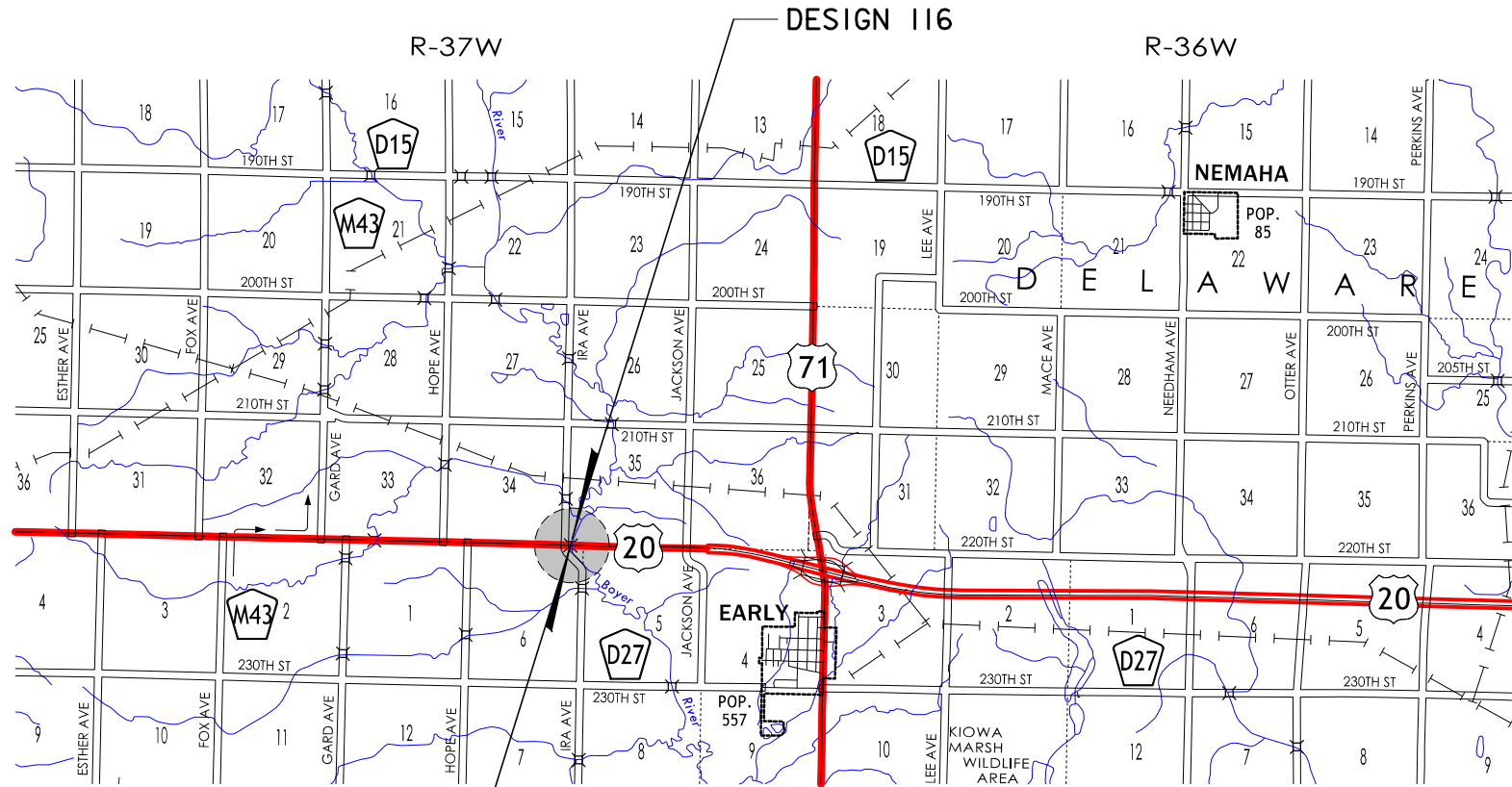
REVISION EXAMPLE

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



#### STANDARD ROAD PLANS

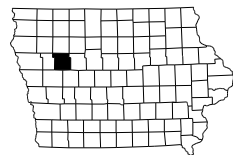
STANDARD ROAD PLANS ARE LISTED  
ON SHEET NUMBER C.1

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



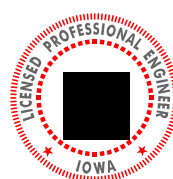
I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

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	
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><div>Signature _____ Date 03-27-2017</div><div>Printed or Typed Name _____</div><div>My license renewal date is December 31, 2018</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.							<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><div>Signature _____ Date 04-11-2017</div><div>Printed or Typed Name _____</div><div>My license renewal date is December 31, 2018</div><div>Pages or sheets covered by this seal: SHEETS 1, RA, 2, 3, 7</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.				
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.	REVISION EXAMPLE THE PLAN DETAILS ARE ARBITRARY, THE REVISION MARK-UPS ARE WHAT IS MEANT TO BE SHOWN.				
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				COUNTY PROJECT NUMBER NHSN-020-2(143)--2R-81				
FILE NO. 30568				SHEET NUMBER RA				

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	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 1. REASON: CORNER REMOVED TO ALLOW CLEARANCE FOR MSE WALL.				
04-15-2017	8	4	REVISED: 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	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	8A1	4	REVISED: THIS SHEET ADDED. REASON: WOOD PILES WERE ADDED TO FOOTING DUE TO EXISTING SOIL CONDITIONS.				
<div>EXAMPLE OF 4th REVISION.</div> <div><div>STRUCTURAL DESIGN</div><div><div><div>PROFESSIONAL ENGINEER</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>Signature Name</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, RB, 3, 3A, 7, 8, 8A, 8A1</div></div></div></div> <div><div>REVISION EXAMPLE</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</div><div>REVISION SHEET</div><div>IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION</div></div></div>							

DESIGN TEAM	DESIGNER / CHECKER / DETAILER	FILE NO. 30568	COUNTY	PROJECT NUMBER NHSN-020-2(143)--2R-81	SHEET NUMBER RB
8/14/2017	10:48:11 AM bkloss	W:\Highway\Bridge\Cadd\Documentation\Plan Revisions and Examples\81020143-116.brg 810116S000RB example 11x17-.pdf.pltcfg			

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	<del>638.2</del> 645.1	
5	2404-7775000	REINFORCING STEEL	LB	<del>26,164</del> 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	<del>5,810</del> 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

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.pltcfgr

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	98.0	90.5
WEST ABUTMENT FOOTING	18.1	
EAST ABUTMENT FOOTING	18.1	
	647.0	645.7
TOTAL ( CU. YDS. )	638.2	645.7

\*\* 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	14,443	14,429	13,010
	27,593	26,164	27,578
TOTAL ( LBS. )		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	24	105	2,415
			26		
			3		
TOTAL ( LIN.FT. )					6,020

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

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

REVISION EXAMPLE

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

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

REVISD: 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.

REVISD: 04-11-2017 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.

REVISD: 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.

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.

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

DESIGN TEAM DESIGNER / CHECKER / DETAILER

SAC COUNTY

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

SHEET NUMBER 3

8/14/2017 10:48:14 AM bkloss W:\Highway\Bridge\Cadd\Documentation\Plan Revisions and Examples\81020143-116.brg 810116S002 11x17-pdf.pltcf

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**

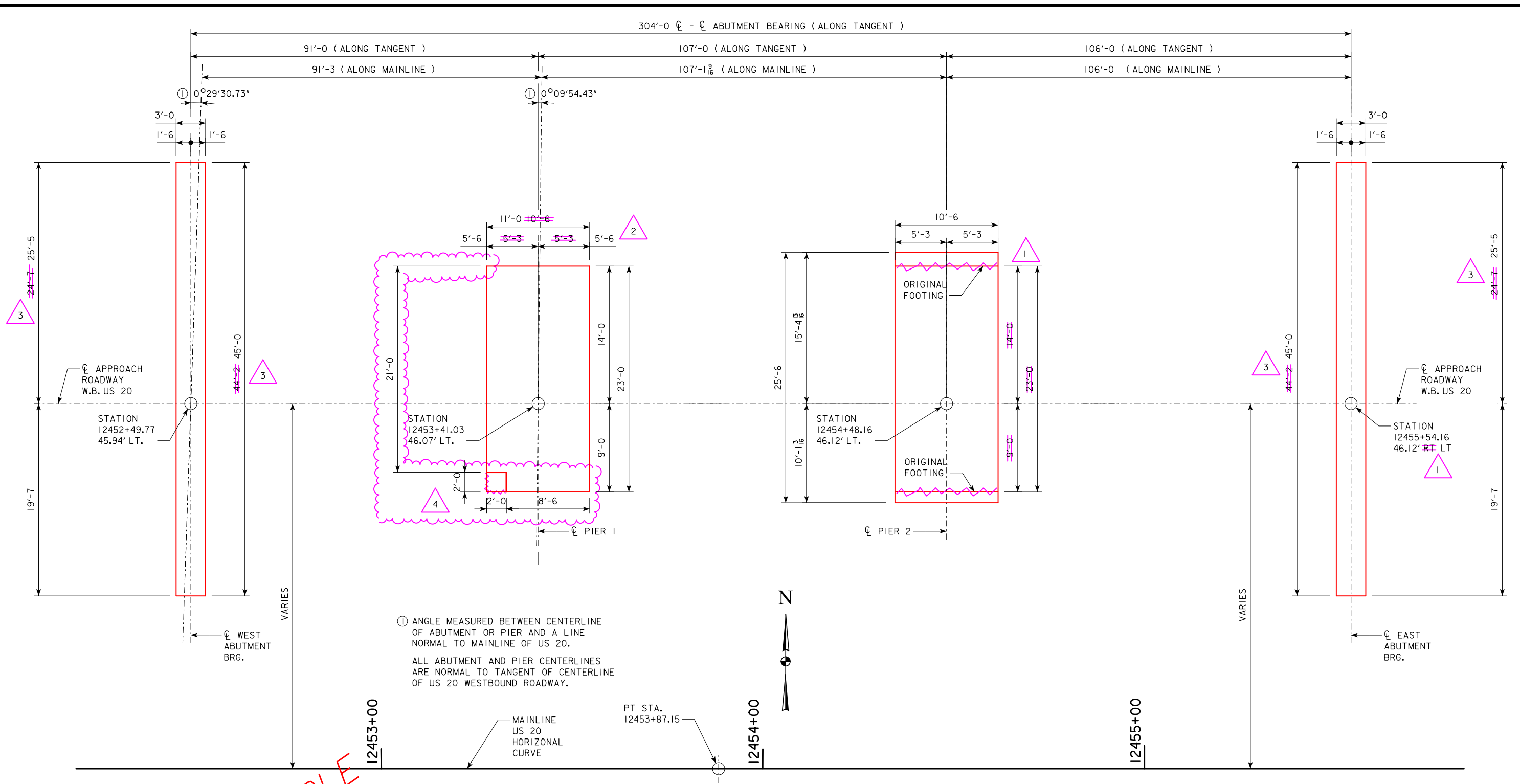
STA. 12454+02.16, 46.12' LT      RADIUS=16,000'      JULY, 2016

**SAC COUNTY**

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2A OF 58      FILE NO. 30568      DESIGN NO. 116

**REVISED: APRIL 15, 2017**



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.

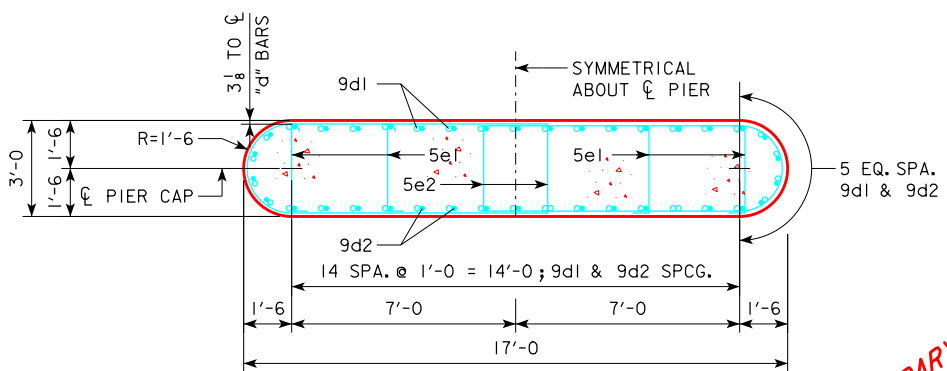
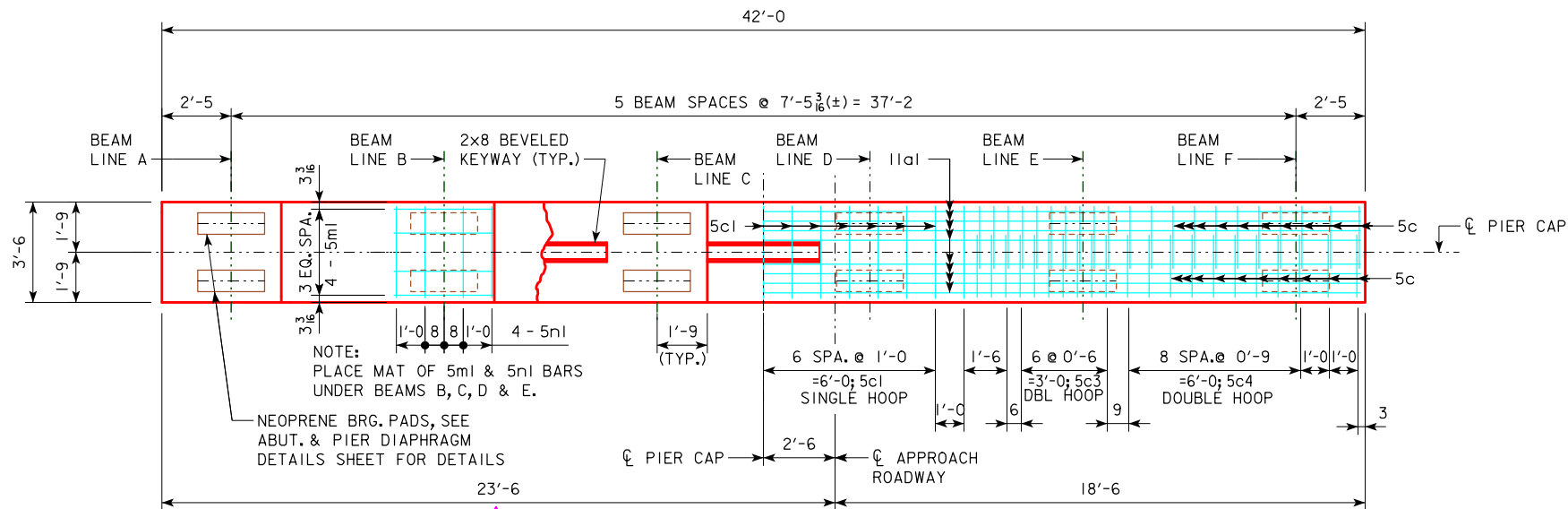
- ④ REVISED: 04-15-2017 REMOVED 2'-0" x 2'-0" CORNER OF PIER 1.  
REASON: CORNER REMOVED TO ALLOW CLEARANCE FOR MSE WALL.
- ③ REVISED: 04-11-2017 LENGTHEN ABUTMENTS 10" TO THE NORTH.  
REASON: ADDED SIDEWALK TO BRIDGE.

- 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. 6 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.

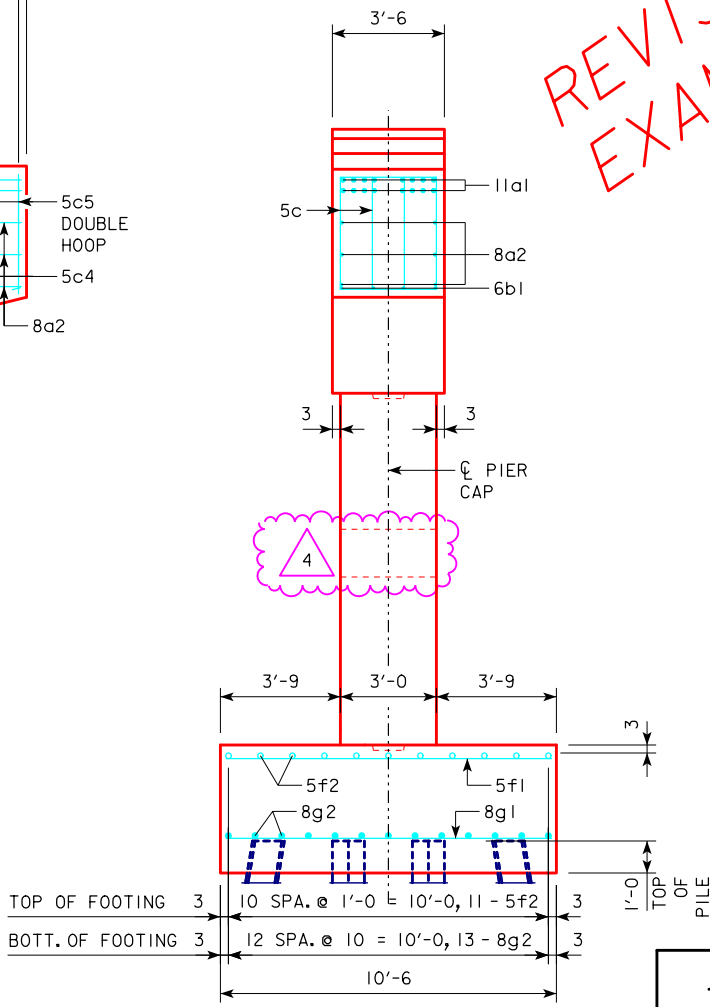
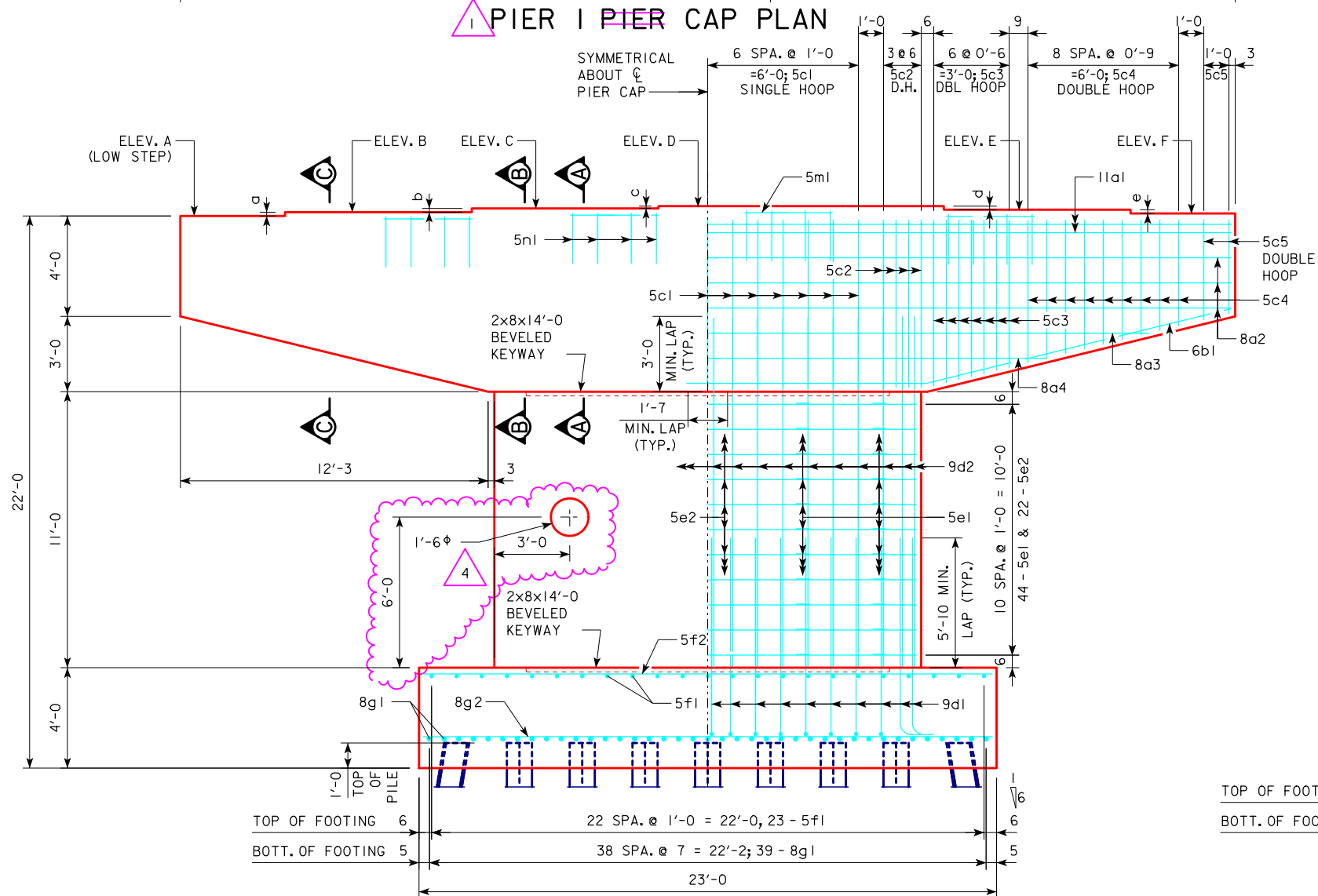


TABLE OF PIER ELEVATIONS			
POINT	PIER 1	PIER 2	
ELEV. A	1312.28	1312.20	1311.70
ELEV. B	1312.43	1312.35	1311.85
ELEV. C	1312.58	1312.50	1312.00
ELEV. D	1312.67	1312.59	1312.09
ELEV. E	1312.53	1312.45	1311.95
ELEV. F	1312.38	1312.30	1311.80
BOTT. FTG. ELEV.	1290.20	1289.70	

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

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

REASON: LOCATION FOR WATER MAIN PASS THROUGH.

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

REASON: DUE TO CONSTRUCTION SURVEY ERROR.

REVISOR: 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.

SEE DESIGN SHEET NUMBER 08 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 1 PIER DETAILS

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

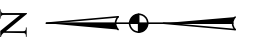
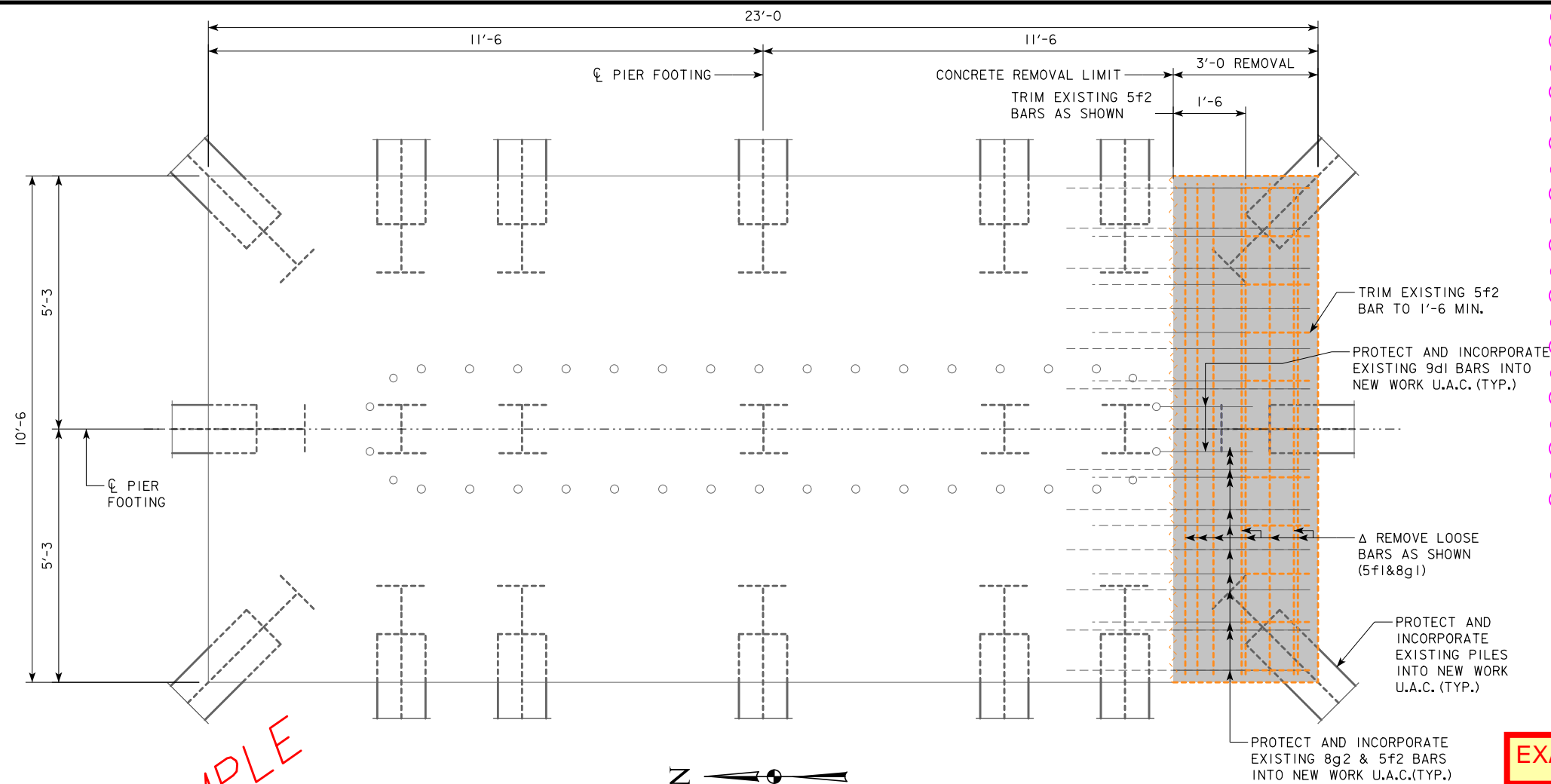
SAC COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

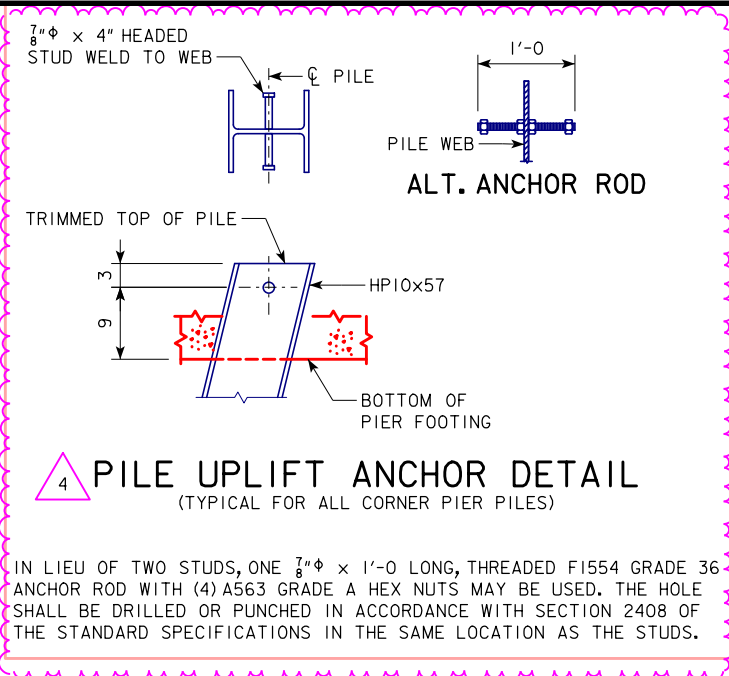
DESIGN SHEET NO. 7 OF 58 FILE NO. 30568 DESIGN NO. 116

REVISED: APRIL 15, 2017





PIER 2 PLAN



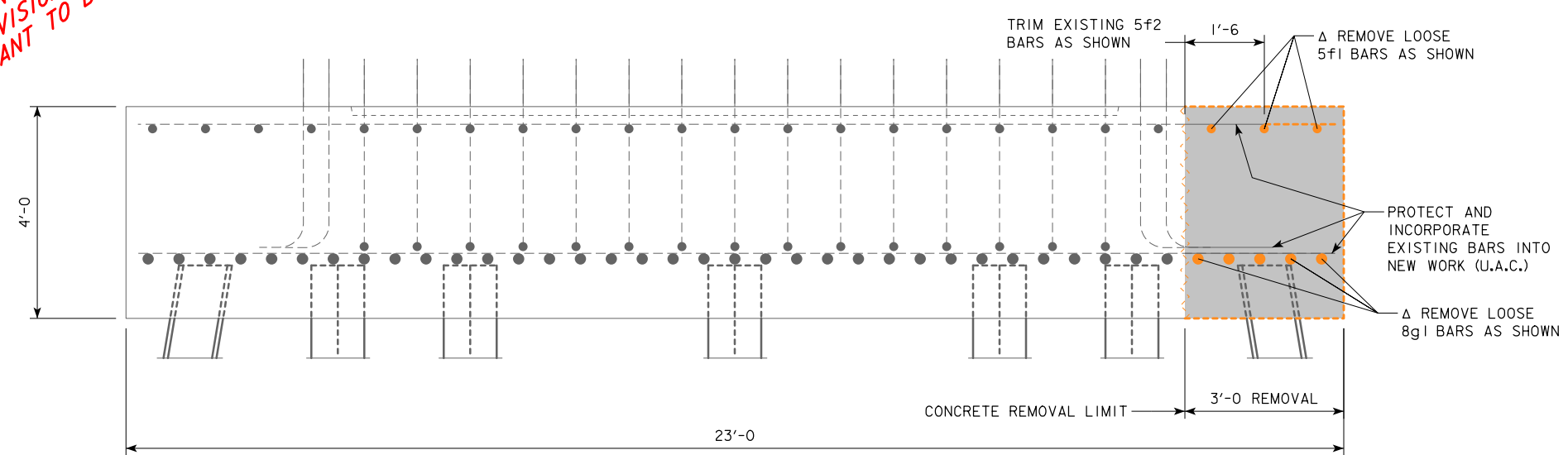
EXAMPLE OF 2 REVISIONS ON THIS SHEET.

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.

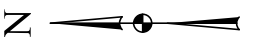
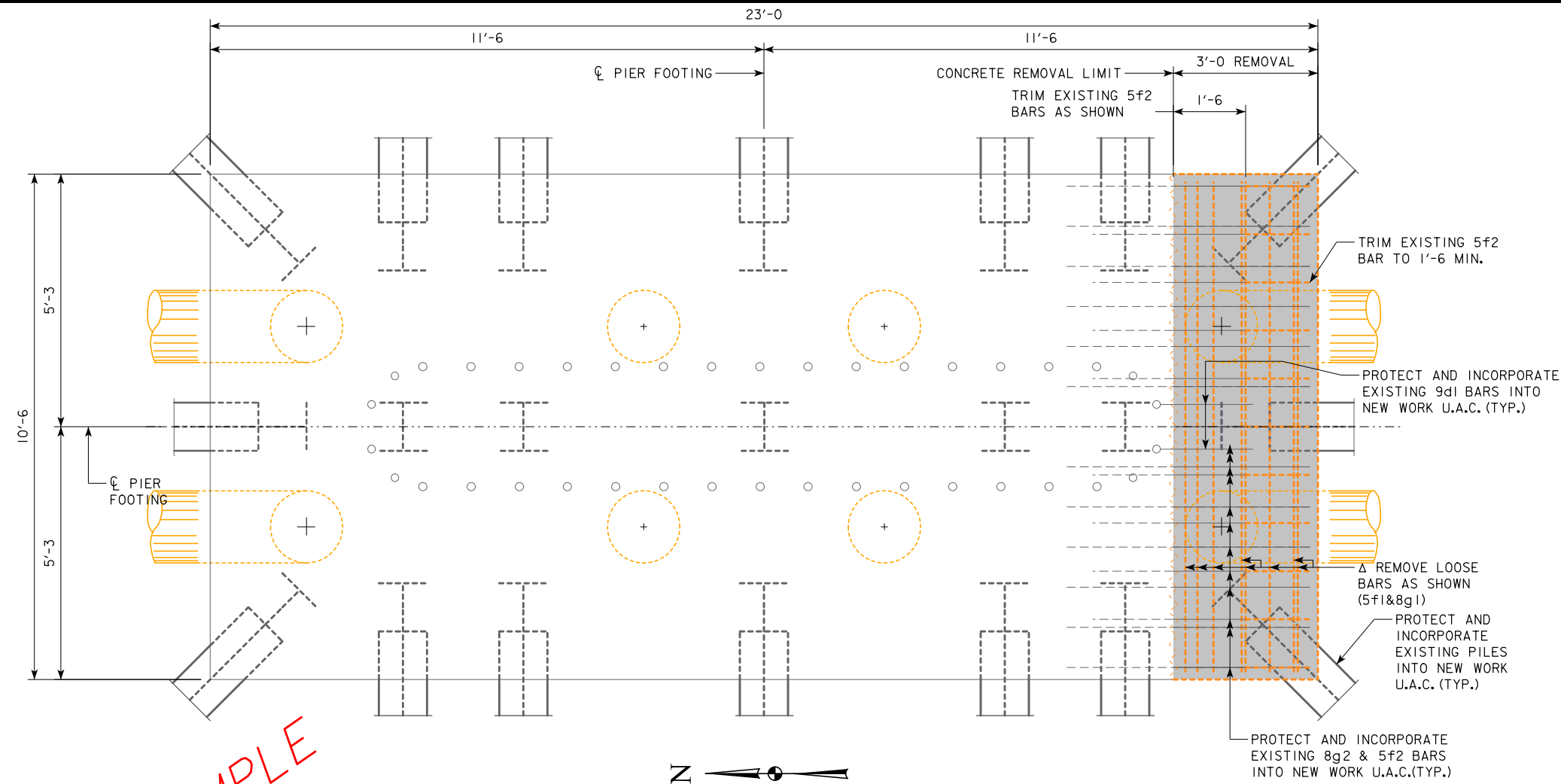


PIER 2 FOOTING ELEVATION

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

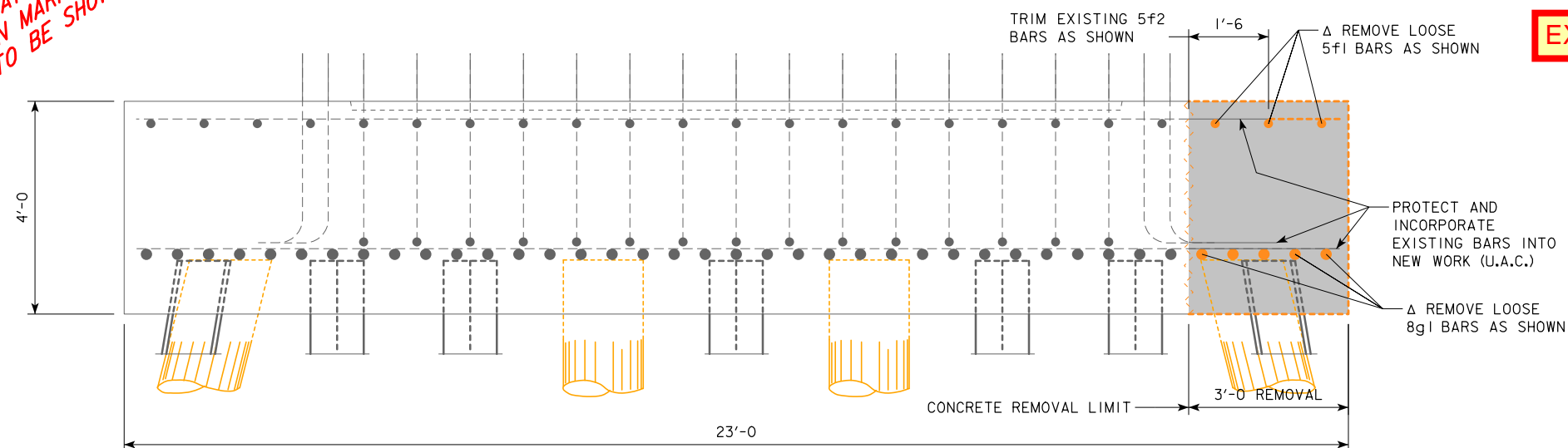
REVISION EXAMPLE  
THE PLAN DETAILS ARE ARBITRARY,  
THE REVISION MARK-UPS ARE WHAT  
IS MEANT TO BE SHOWN.

REVISED: 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

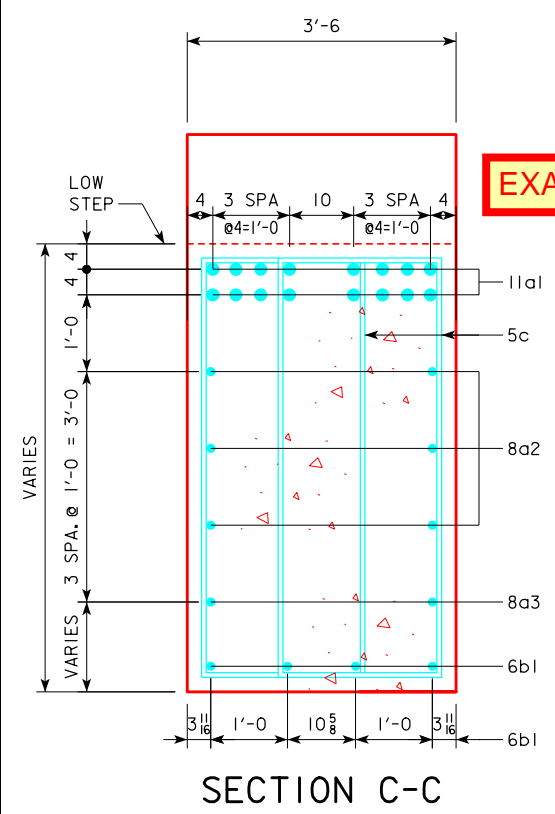
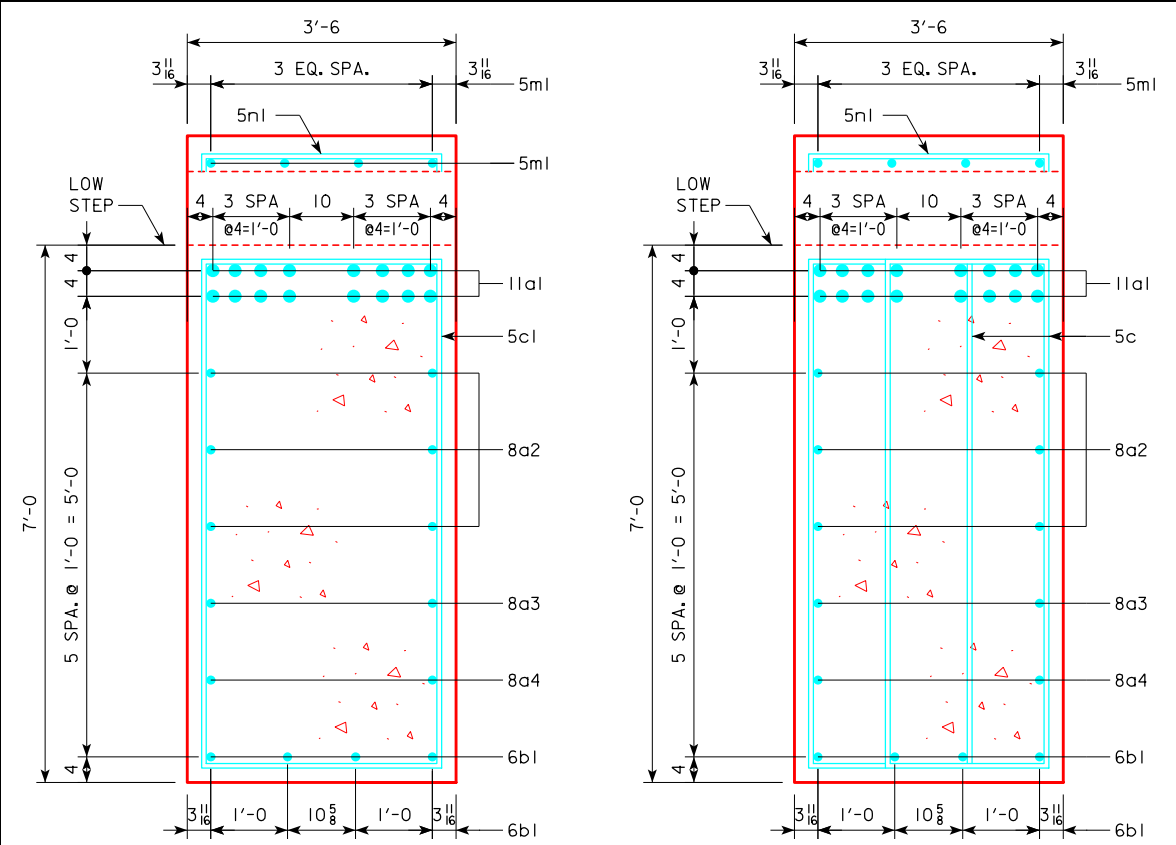
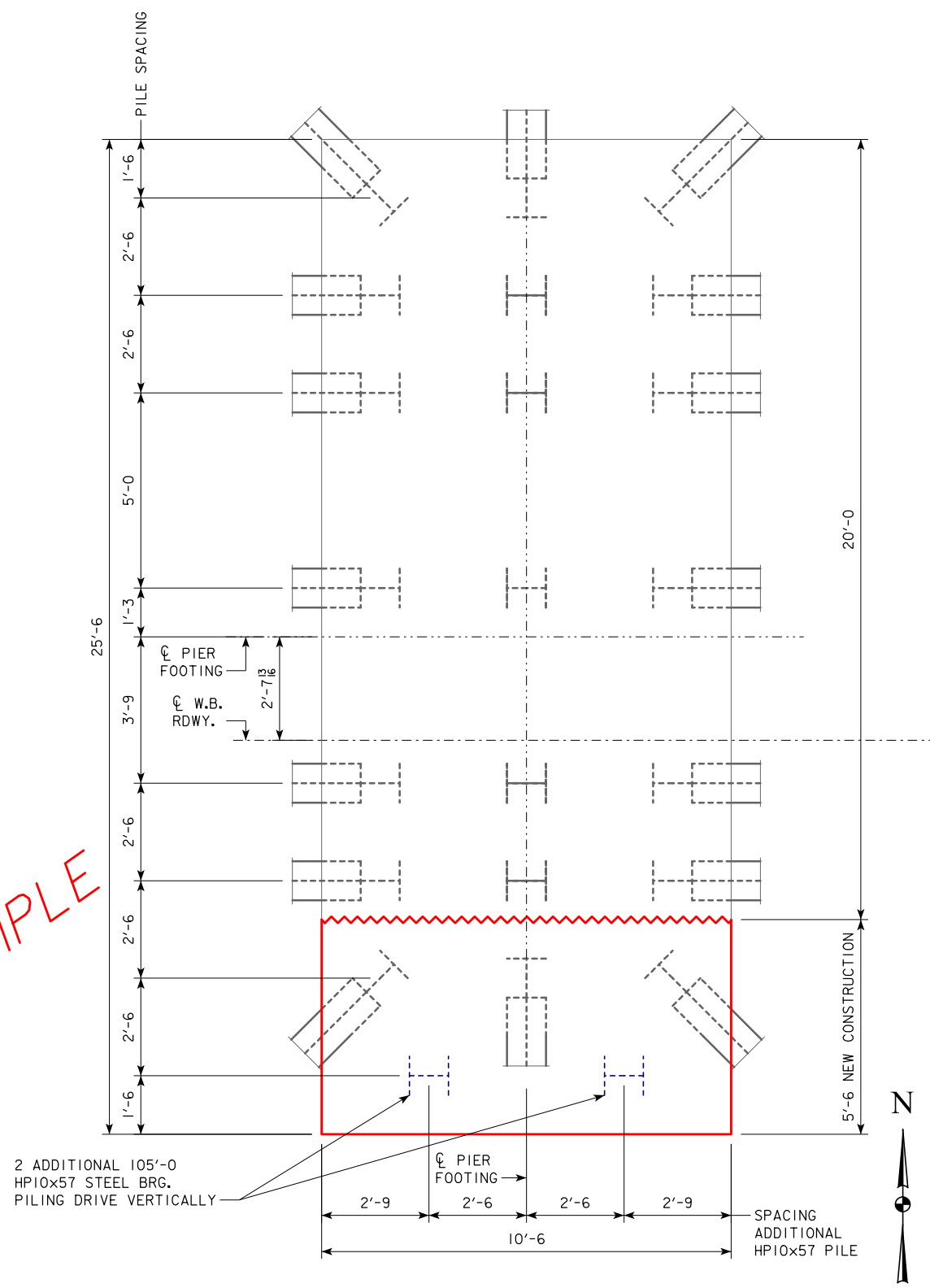
EXAMPLE OF 1 REVISION ON THIS SHEET.

4  
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

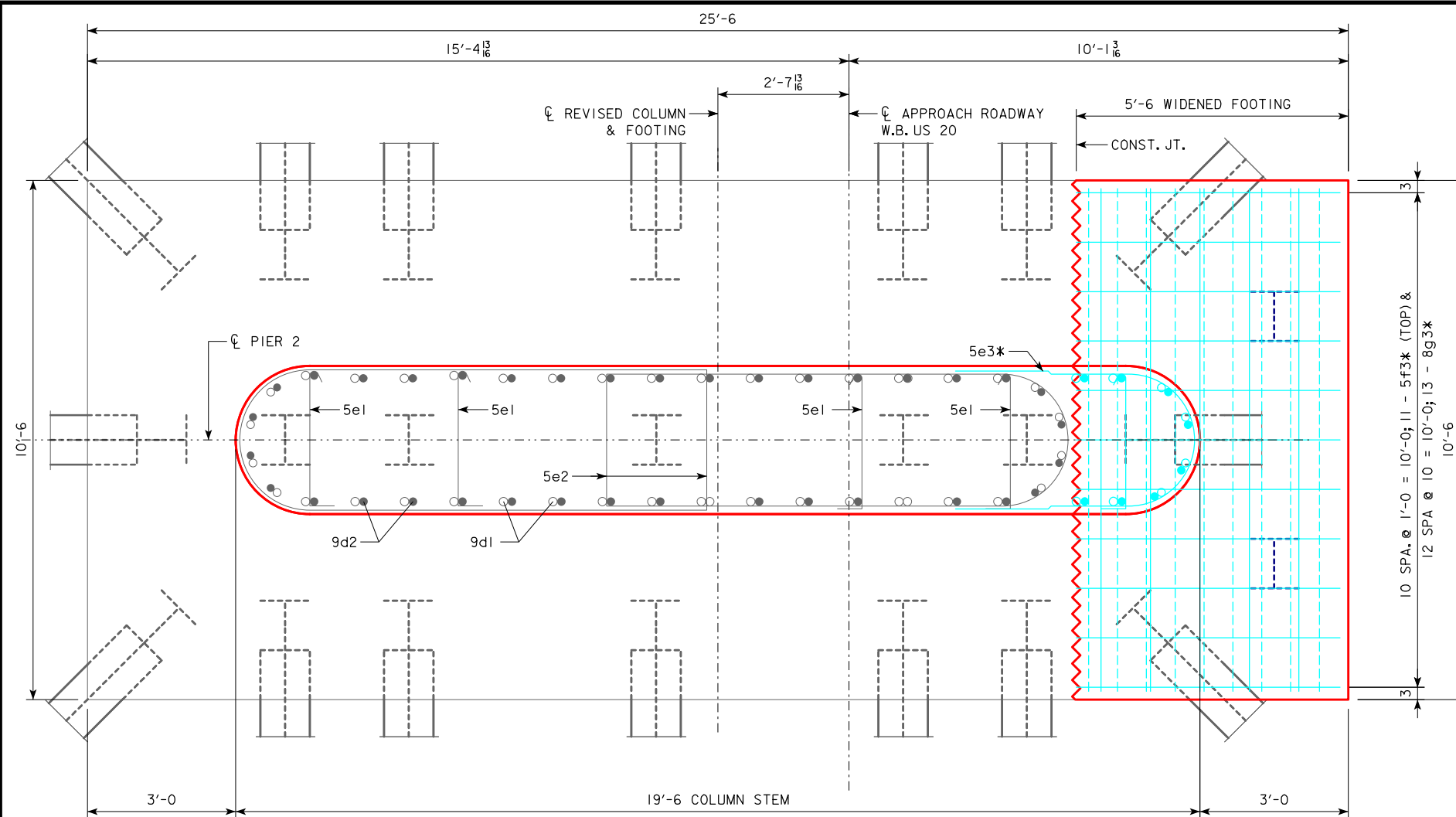
PIER 2 DETAILS

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

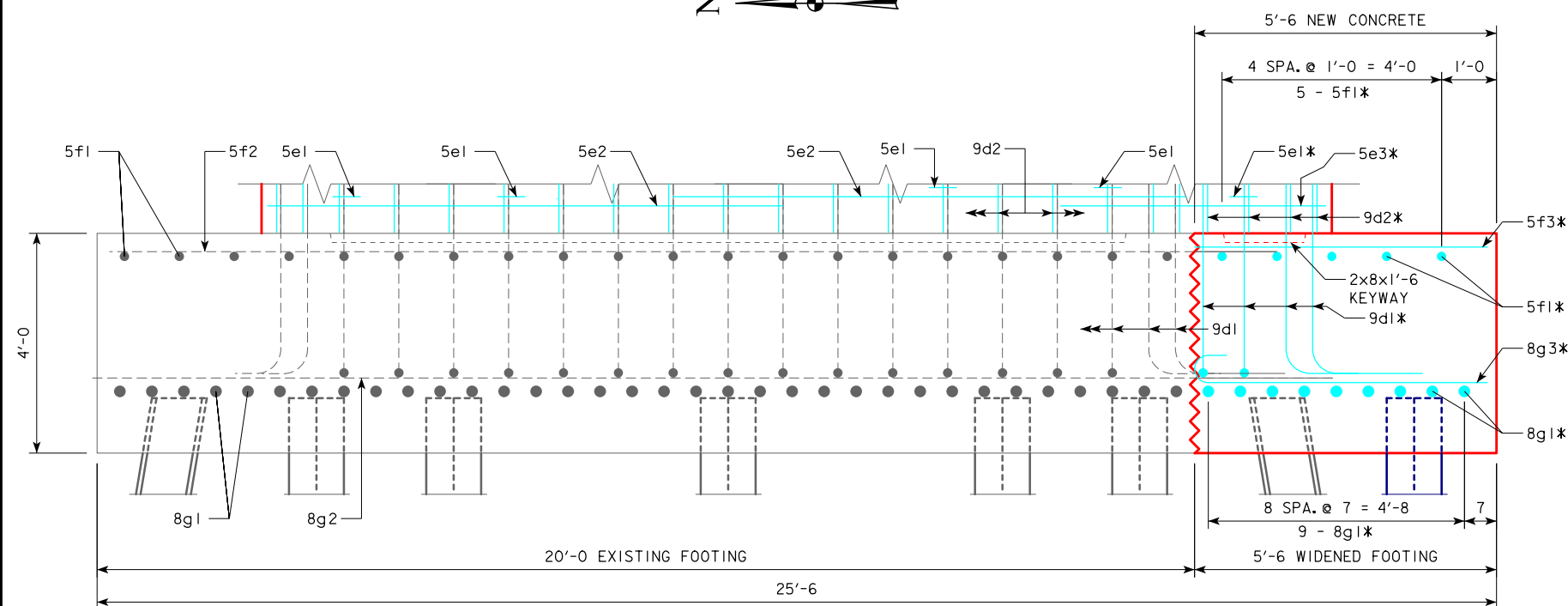
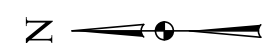
SAC COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

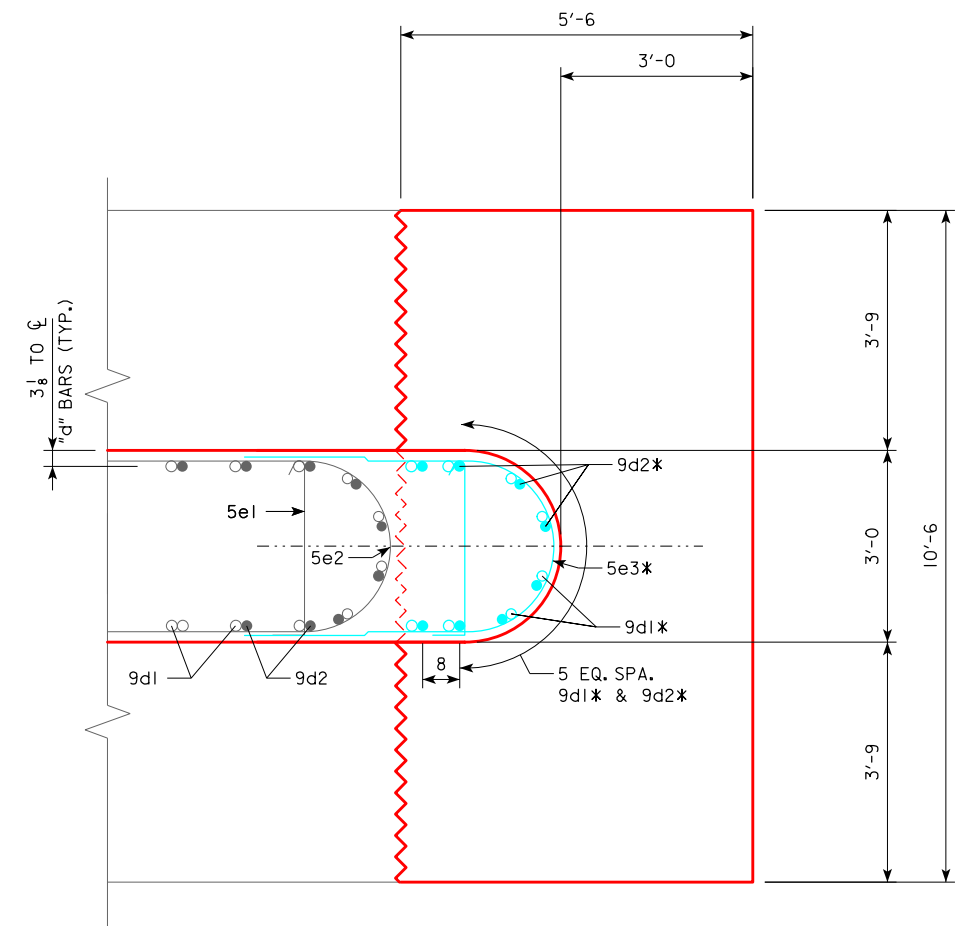
DESIGN SHEET NO. 7B OF 58 FILE NO. 30568 DESIGN NO. 116



PIER 2 PLAN  
CAP NOT SHOWN



PIER 2 FOOTING ELEVATION



EXAMPLE OF 1 REVISION ON THIS SHEET.

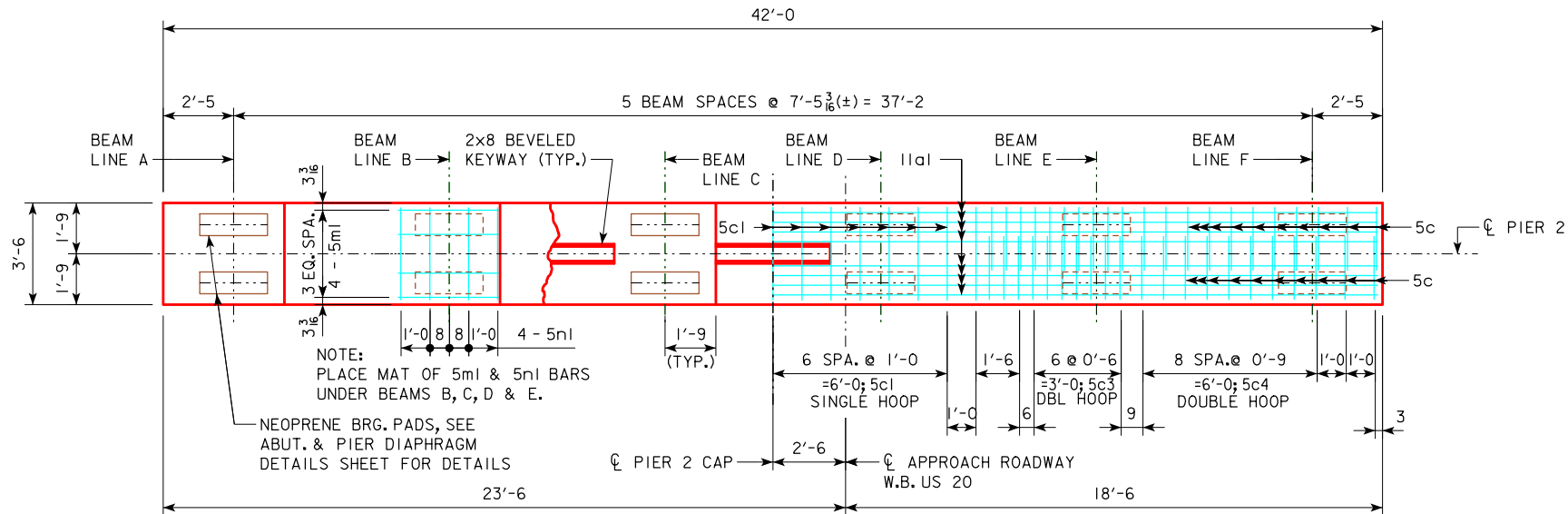
PART PIER 2 PLAN  
PILES, FOOTING LONGIT. AND TRANS. BARS NOT SHOWN

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

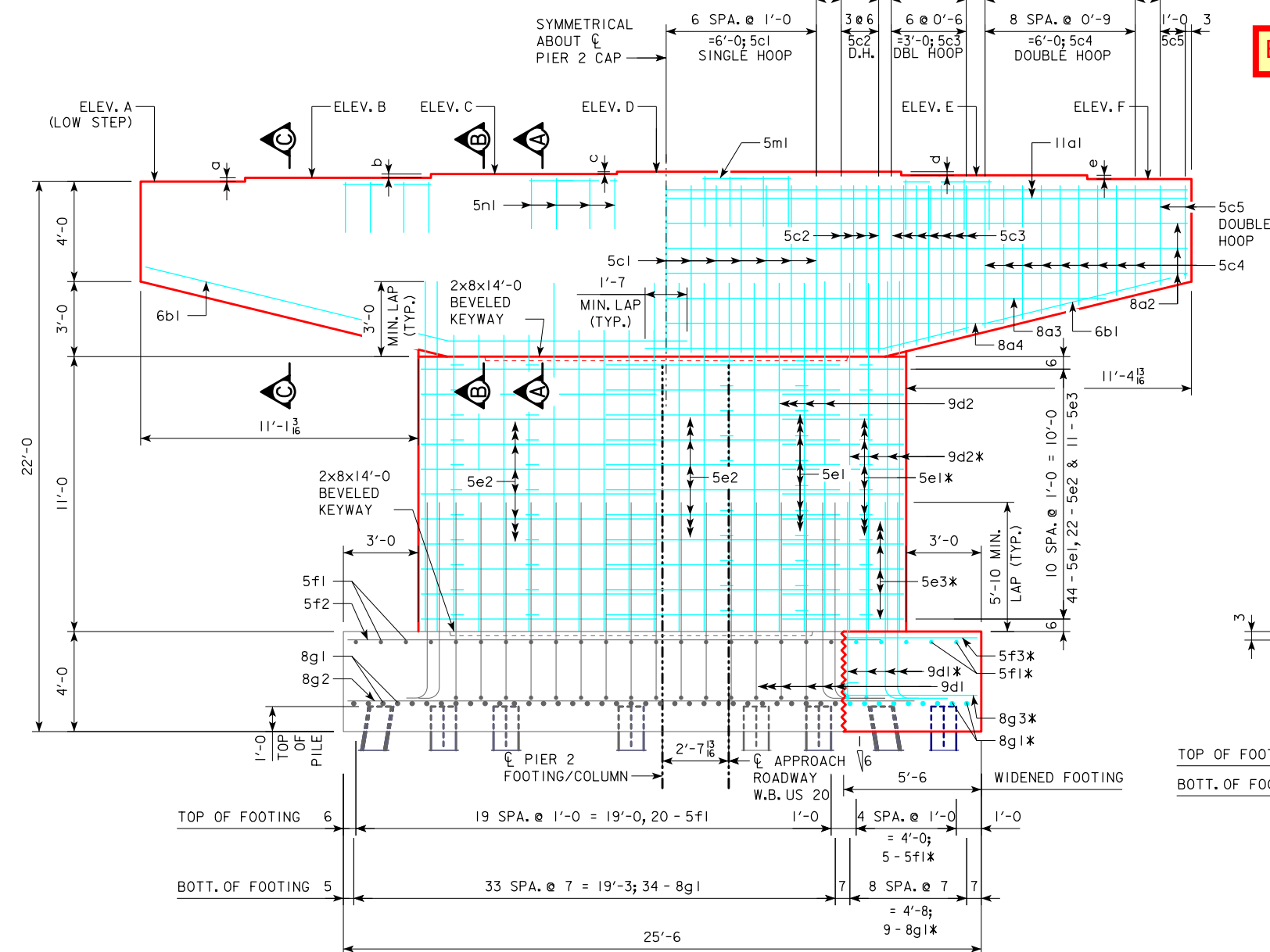
\* NOTE:  
ADDITIONAL REINFORCING BARS TO BE  
PROVIDED. SEE DESIGN SHEET 9 FOR  
UPDATED REINFORCING STEEL TABLE.

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.

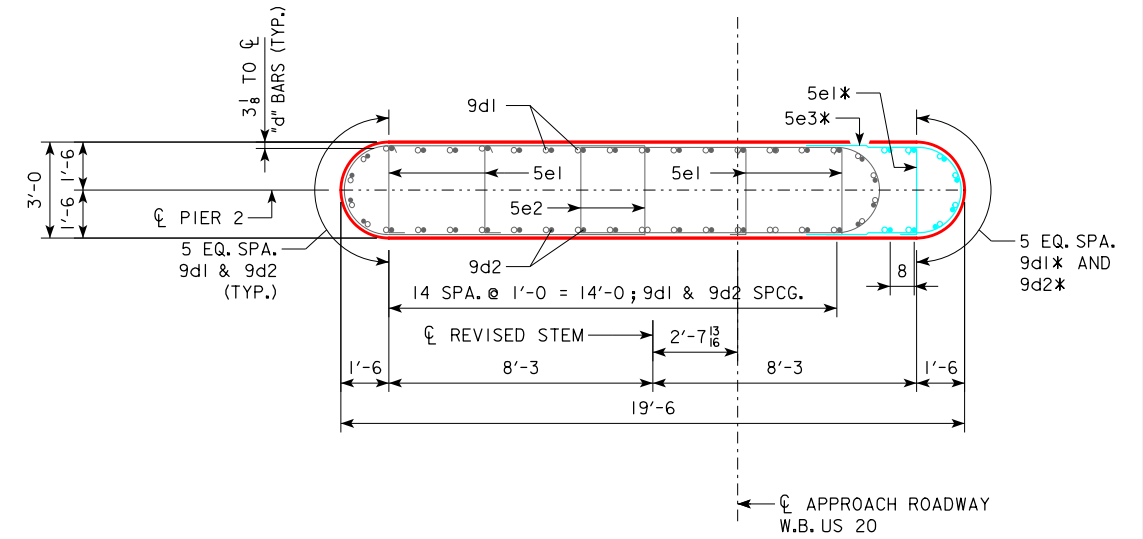
DESIGN FOR 0° SKEW  
**304'-0" x 41'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
91'-0" & 106'-0" END SPANS 107'-0" INTERIOR SPAN  
**PIER 2 FOOTING REPAIR**  
STA. 12454+02.16, 46.12' LT RADIUS=16,000' JULY, 2016  
**SAC COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN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



PIER 2 CAP PLAN

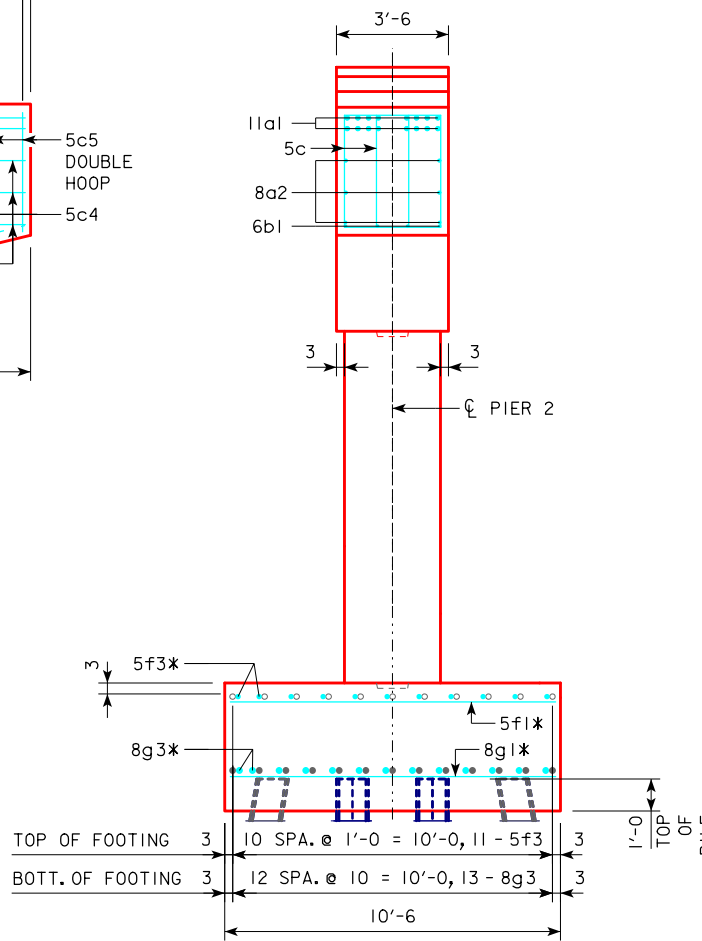


PIER 2 ELEVATION  
(LOOKING EAST)



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.

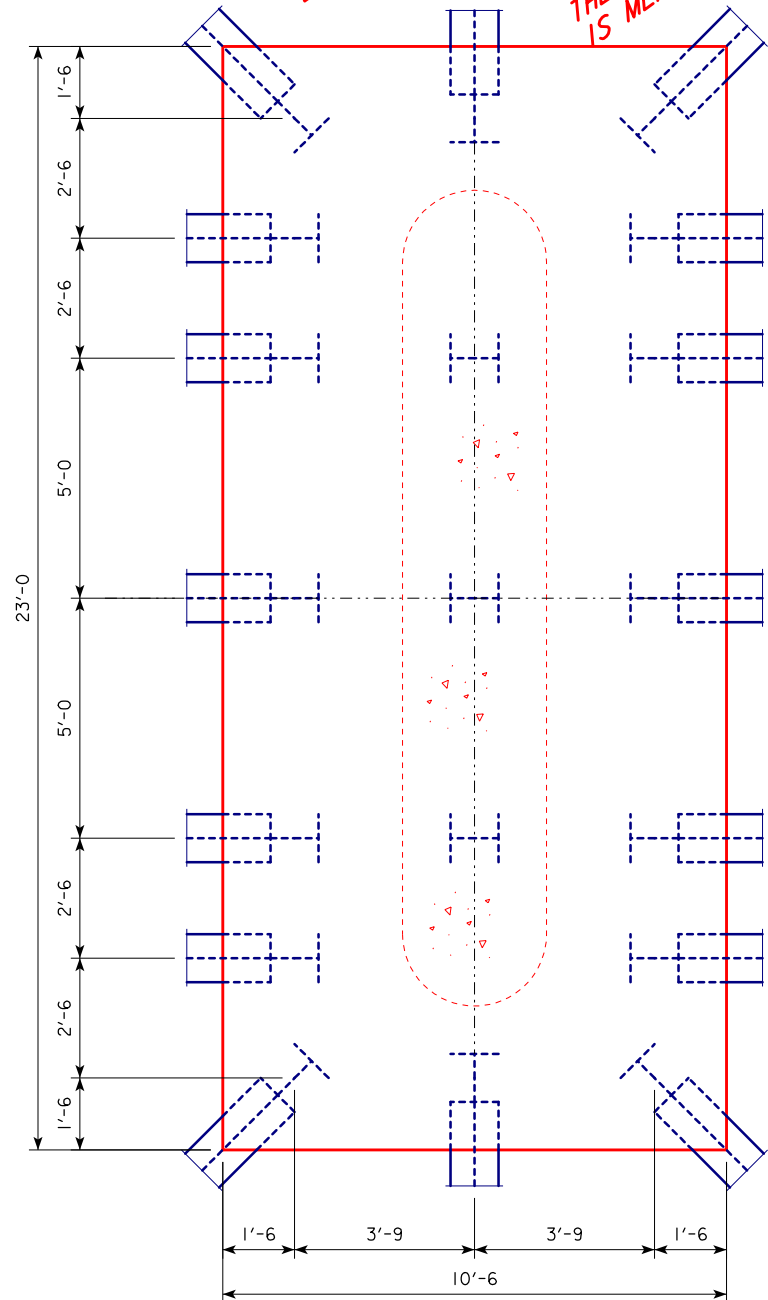
REASON: PIER 2 FOOTING MISPLACED 1.4 FT. NORTH OF PLAN ALIGNMENT DUE TO CONSTRUCTION SURVEY ERROR.

REVISED: MARCH 9, 2017

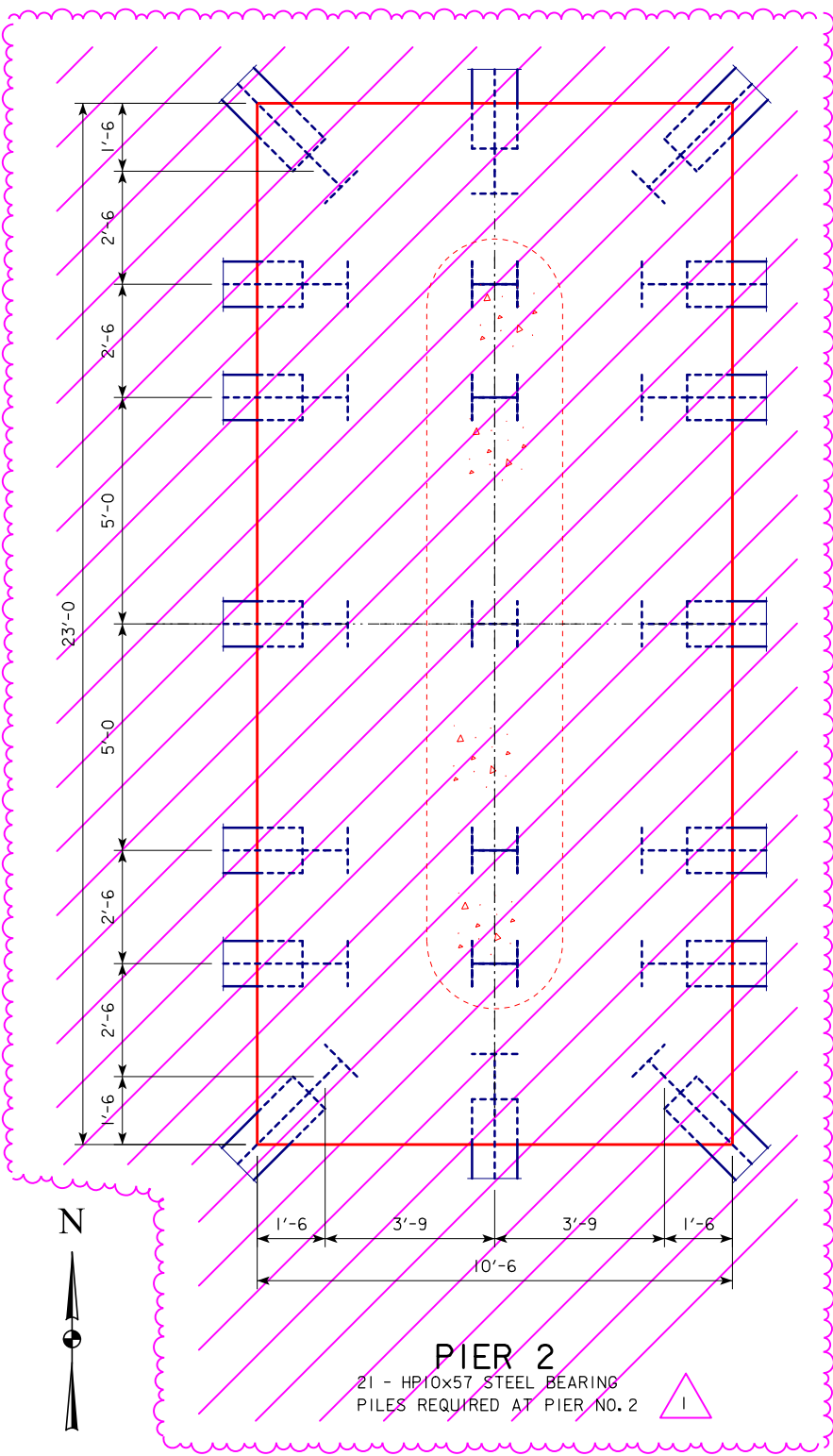


REVISION  
EXAMPLE

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

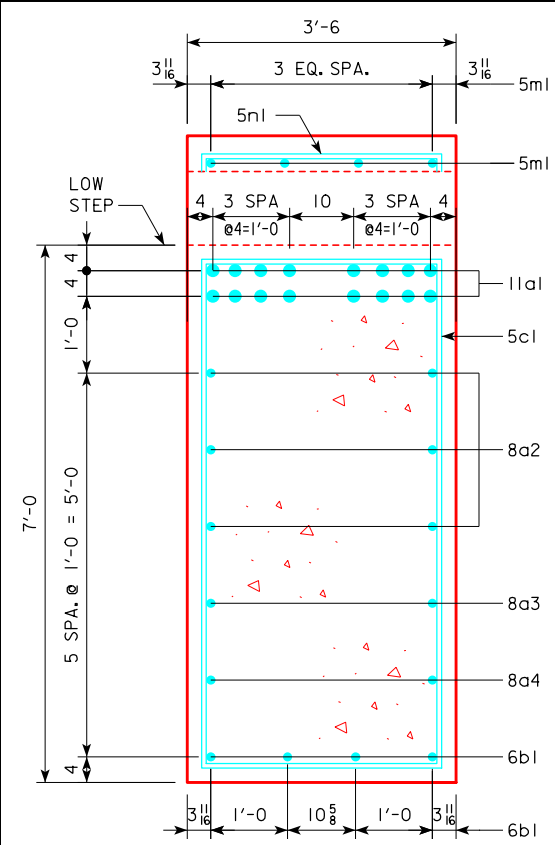


**PIER 1**  
19 - HP10x57 STEEL BEARING  
PILES REQUIRED AT PIER NO. 1

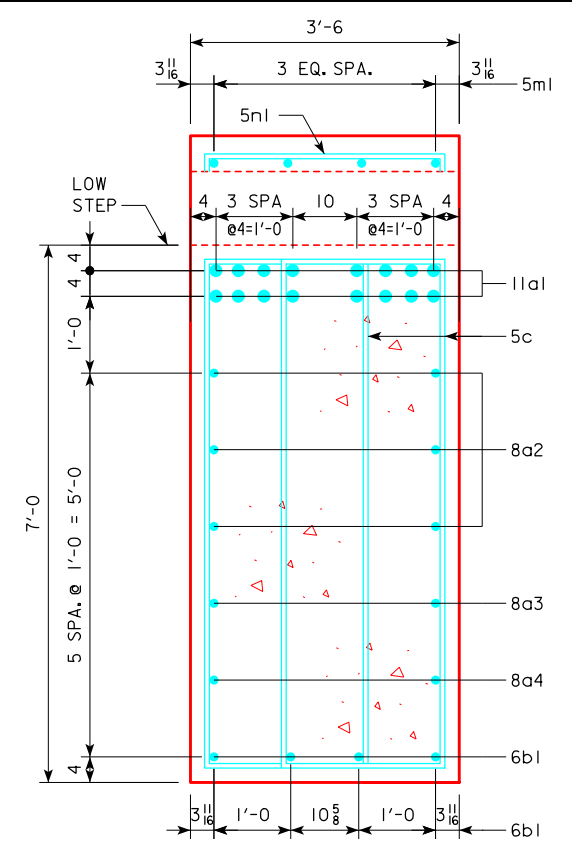


**PIER 2**  
21 - HP10x57 STEEL BEARING  
PILES REQUIRED AT PIER NO. 2

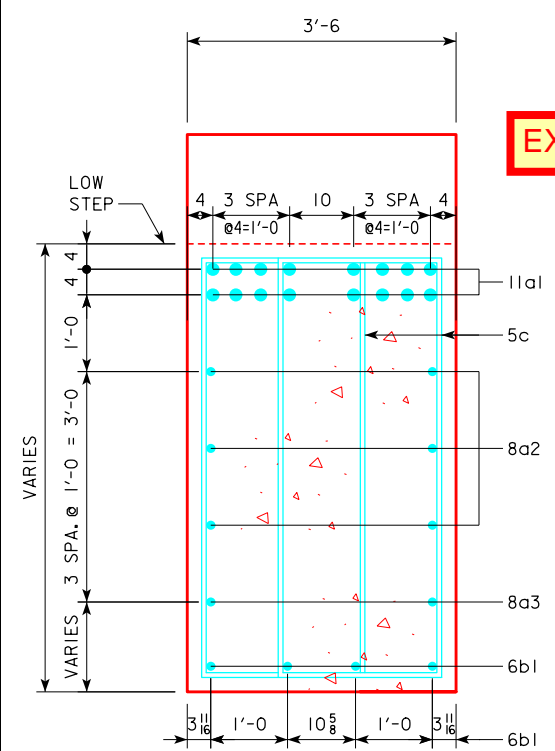
**PIER FOOTING LAYOUT**  
PILE DIMENSIONS SHOWN ARE AT BOTTOM OF  
FOOTING. BATTER PILE 1:4 IN DIRECTION SHOWN.



**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, BOT., 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, BOT., TRANSV. & LONGIT.		39	10'-2	1059
8g2	FOOTING, BOT., 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, BOT., TRANSV.		9	10'-2	244
8g3	FOOTING, BOT., 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, BOT., 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, BOT., TRANSV. & LONGIT.		39	10'-2	1059
8g2	FOOTING, BOT., 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

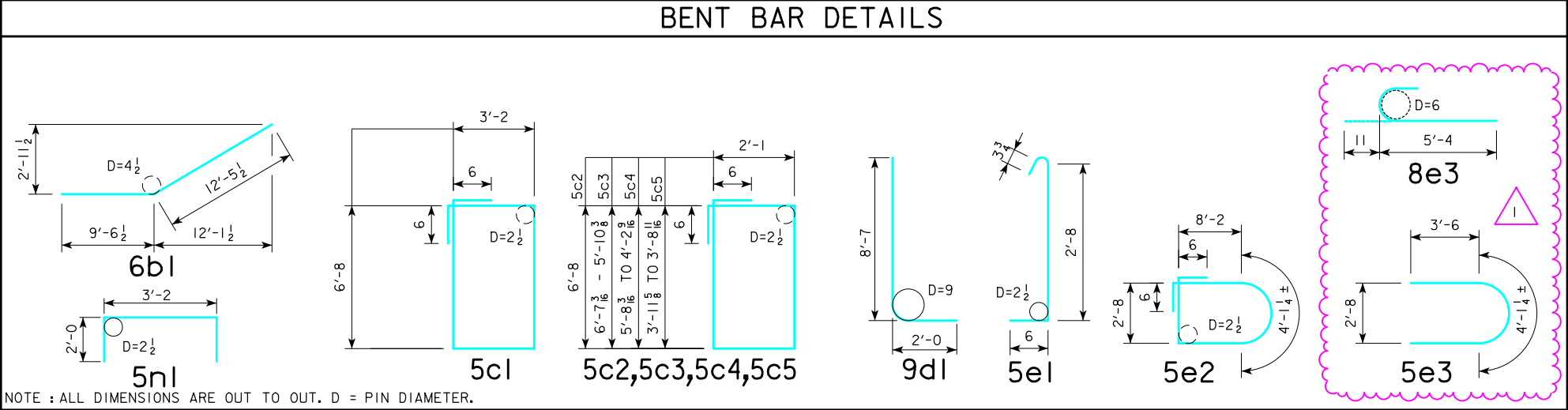
REVISION EXAMPLE  
THE PLAN DETAILS ARE ARBITRARY,  
THE REVISION MARK-UPS ARE WHAT  
IS MEANT TO BE SHOWN.

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.



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

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

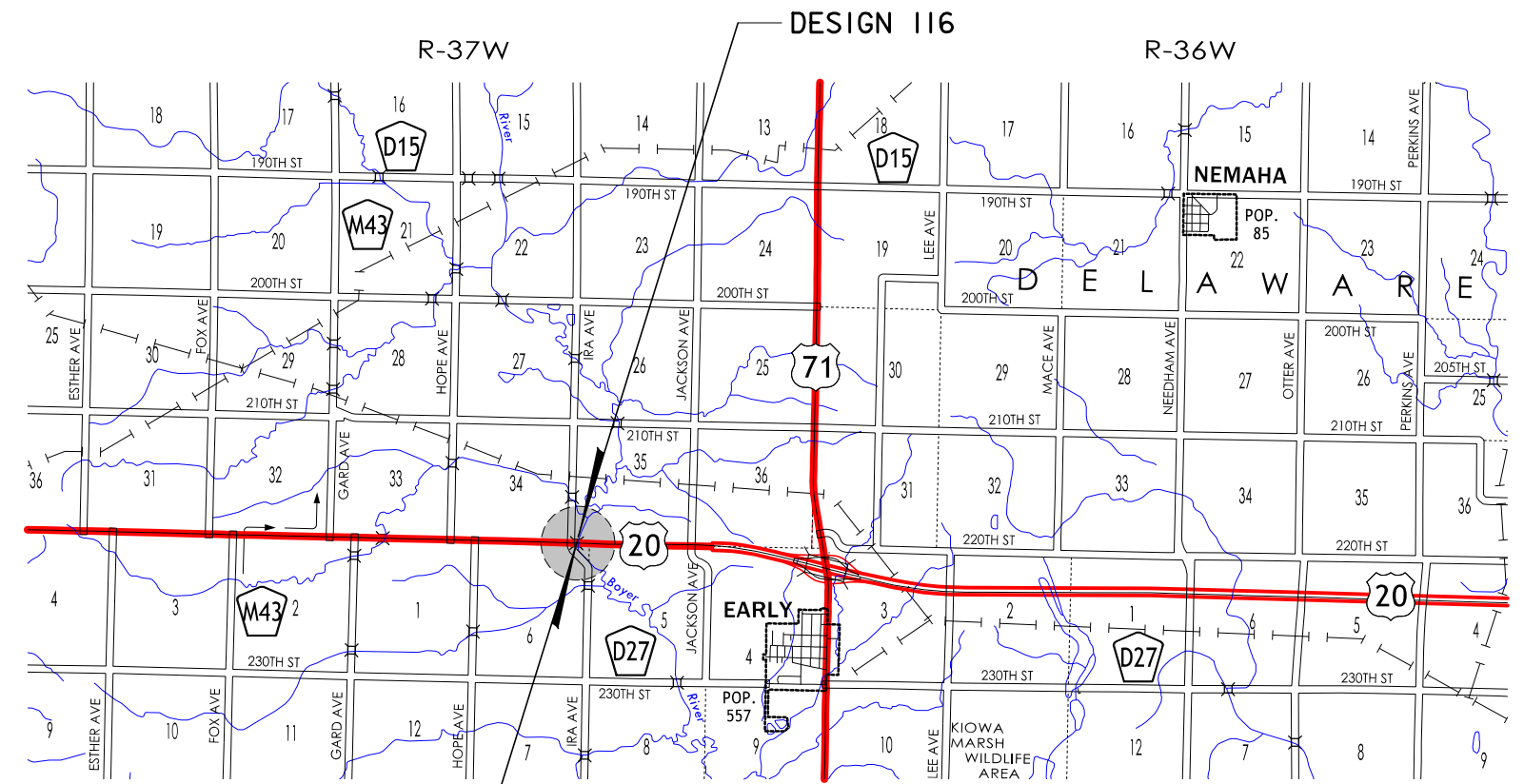
BRIDGE REPLACEMENT - PPCB  
**NEW DUAL BRIDGES AS PART OF 4 LANE US 20 PROJECT**  
**OVER BOYER RIVER 1.9 MILES WEST OF US 71**

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



## LISTING OF PROJECT REVISIONS

REVISION SHEET				REVISION SHEET			
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	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 1. REASON: CORNER REMOVED TO ALLOW CLEARANCE FOR MSE WALL.				
04-15-2017	8	4	REVISED: 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	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.				
<div>STRUCTURAL DESIGN</div> <div><div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div><div>6</div><div>7</div><div>8</div><div>9</div><div>10</div><div>11</div><div>12</div><div>13</div><div>14</div><div>15</div><div>16</div><div>17</div><div>18</div><div>19</div><div>20</div><div>21</div><div>22</div><div>23</div><div>24</div><div>25</div><div>26</div><div>27</div><div>28</div><div>29</div><div>30</div><div>31</div><div>32</div><div>33</div><div>34</div><div>35</div><div>36</div><div>37</div><div>38</div><div>39</div><div>40</div><div>41</div><div>42</div><div>43</div><div>44</div><div>45</div><div>46</div><div>47</div><div>48</div><div>49</div><div>50</div><div>51</div><div>52</div><div>53</div><div>54</div><div>55</div><div>56</div><div>57</div><div>58</div><div>59</div><div>60</div><div>61</div><div>62</div><div>63</div><div>64</div><div>65</div><div>66</div><div>67</div><div>68</div><div>69</div><div>70</div><div>71</div><div>72</div><div>73</div><div>74</div><div>75</div><div>76</div><div>77</div><div>78</div><div>79</div><div>80</div><div>81</div><div>82</div><div>83</div><div>84</div><div>85</div><div>86</div><div>87</div><div>88</div><div>89</div><div>90</div><div>91</div><div>92</div><div>93</div><div>94</div><div>95</div><div>96</div><div>97</div><div>98</div><div>99</div><div>100</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>Signature</div><div>Name</div><div>Date</div><div>Printed or Typed Name</div><div>My license renewal date is December 31, 2018</div><div>Pages or sheets covered by this seal: SHEETS 1, RB, 3, 3A, 7, 8, 8A, 8AI</div></div></div></div>				<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>SAC COUNTY DESIGN NO. 116, 216 REVISION SHEET</div> <div>IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION</div>			
11-21-2017	A.1, MIT.1-MIT.4		REVISED: 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>STRUCTURAL DESIGN</div> <div><div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div><div>6</div><div>7</div><div>8</div><div>9</div><div>10</div><div>11</div><div>12</div><div>13</div><div>14</div><div>15</div><div>16</div><div>17</div><div>18</div><div>19</div><div>20</div><div>21</div><div>22</div><div>23</div><div>24</div><div>25</div><div>26</div><div>27</div><div>28</div><div>29</div><div>30</div><div>31</div><div>32</div><div>33</div><div>34</div><div>35</div><div>36</div><div>37</div><div>38</div><div>39</div><div>40</div><div>41</div><div>42</div><div>43</div><div>44</div><div>45</div><div>46</div><div>47</div><div>48</div><div>49</div><div>50</div><div>51</div><div>52</div><div>53</div><div>54</div><div>55</div><div>56</div><div>57</div><div>58</div><div>59</div><div>60</div><div>61</div><div>62</div><div>63</div><div>64</div><div>65</div><div>66</div><div>67</div><div>68</div><div>69</div><div>70</div><div>71</div><div>72</div><div>73</div><div>74</div><div>75</div><div>76</div><div>77</div><div>78</div><div>79</div><div>80</div><div>81</div><div>82</div><div>83</div><div>84</div><div>85</div><div>86</div><div>87</div><div>88</div><div>89</div><div>90</div><div>91</div><div>92</div><div>93</div><div>94</div><div>95</div><div>96</div><div>97</div><div>98</div><div>99</div><div>100</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>Signature</div><div>Name</div><div>Date</div><div>Printed or Typed Name</div><div>My license renewal date is December 31, 2018</div><div>Pages or sheets covered by this seal: SHEETS 1, RB</div></div></div><div>EXAMPLE OF 5th PLAN REVISION INCLUDING NEW ADDED PLAN SHEETS FROM AN OFFICE OTHER THAN BRIDGES AND STRUCTURES.</div></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.

**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.	

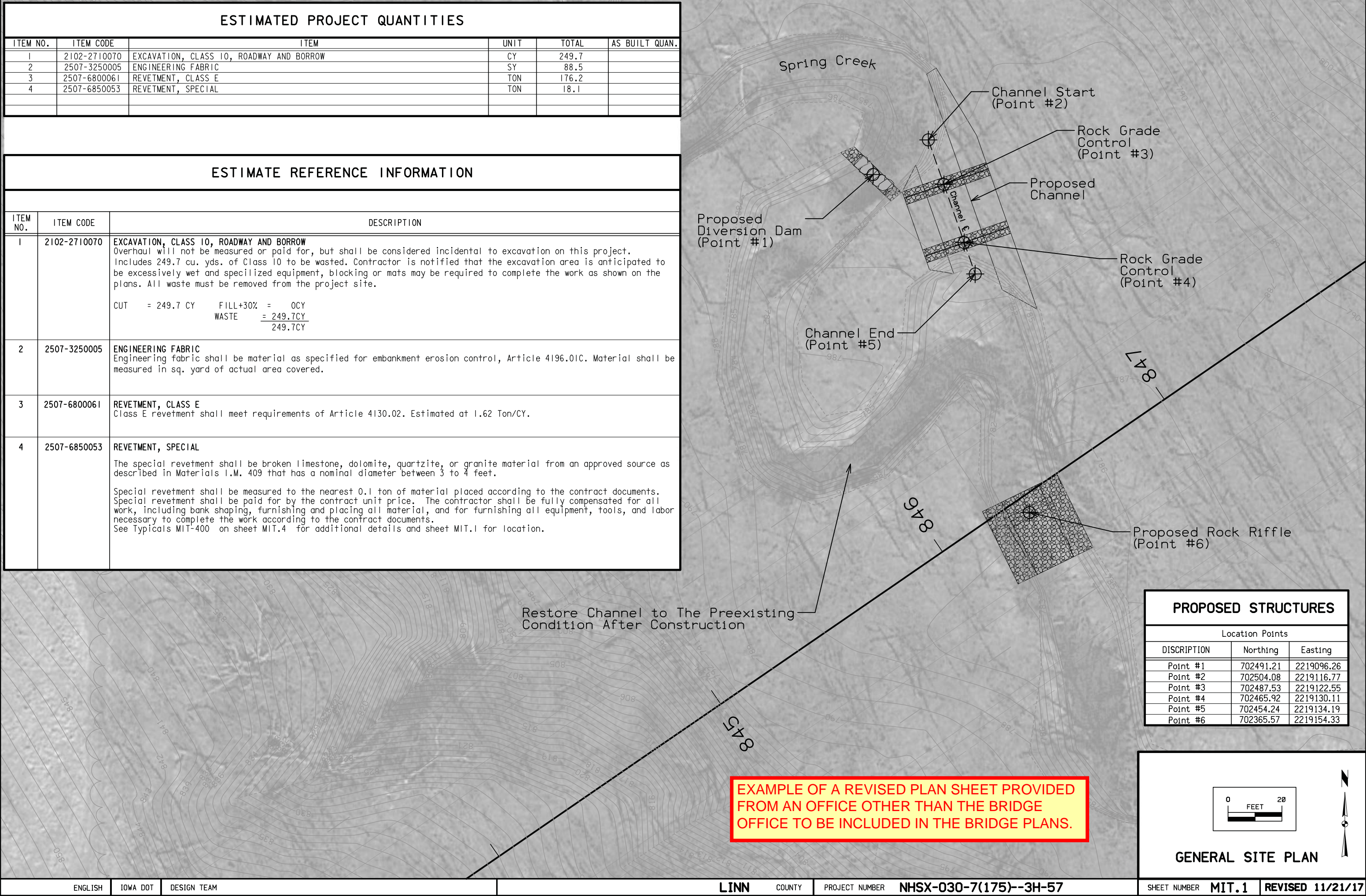
EXAMPLE OF A REVISED PLAN SHEET PROVIDED FROM AN OFFICE OTHER THAN THE BRIDGE OFFICE TO BE INCLUDED IN THE BRIDGE PLANS.

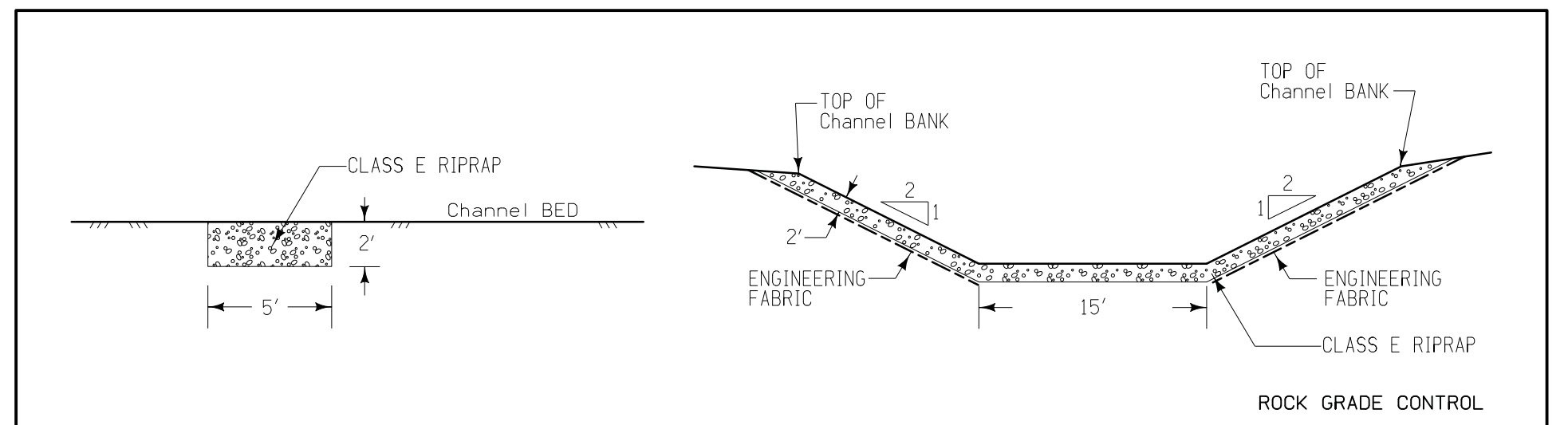
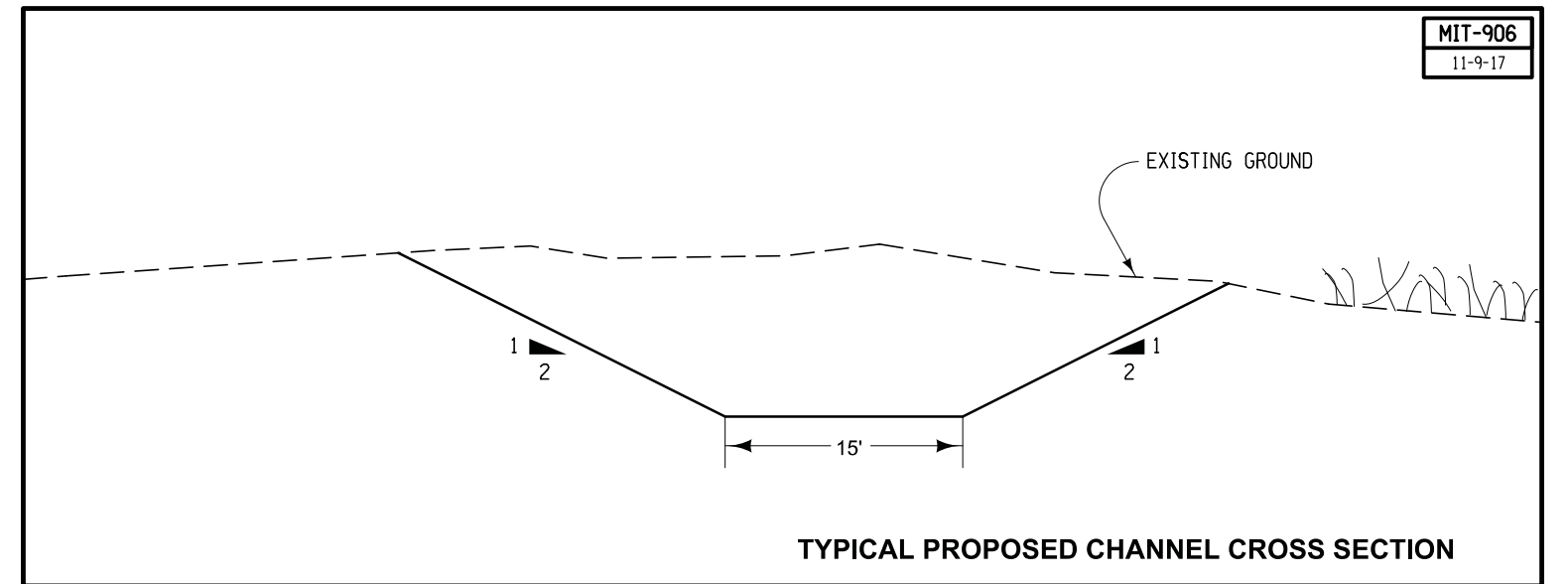
MITIGATION DESIGN	
	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.
	Signature _____ Date <u>11/21/17</u>
	Printed or Typed Name _____
	My license renewal 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	<b>EXCAVATION, CLASS 10, ROADWAY AND BORROW</b> 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 specilized 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.  CUT     = 249.7 CY     FILL+30%   =     OCY WASTE         = <u>249.7CY</u> 249.7CY
2	2507-3250005	<b>ENGINEERING FABRIC</b> 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.
3	2507-6800061	<b>REVTMENT, CLASS E</b> Class E revetment shall meet requirements of Article 4130.02. Estimated at 1.62 Ton/CY.
4	2507-6850053	<b>REVTMENT, SPECIAL</b>  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.  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 Typicals MIT-400 on sheet MIT.4 for additional details and sheet MIT.1 for location.



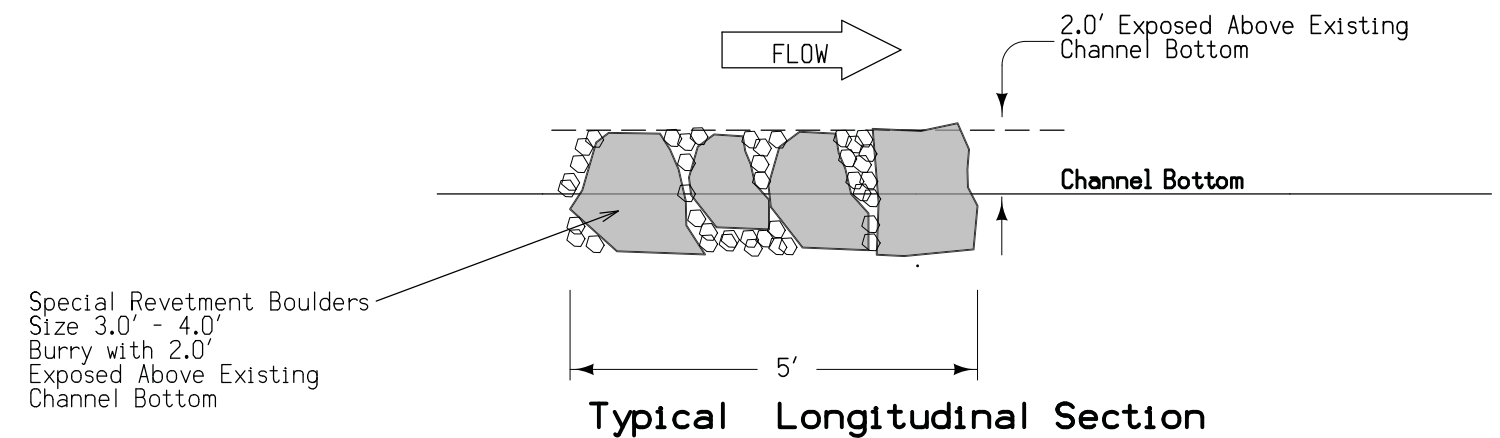
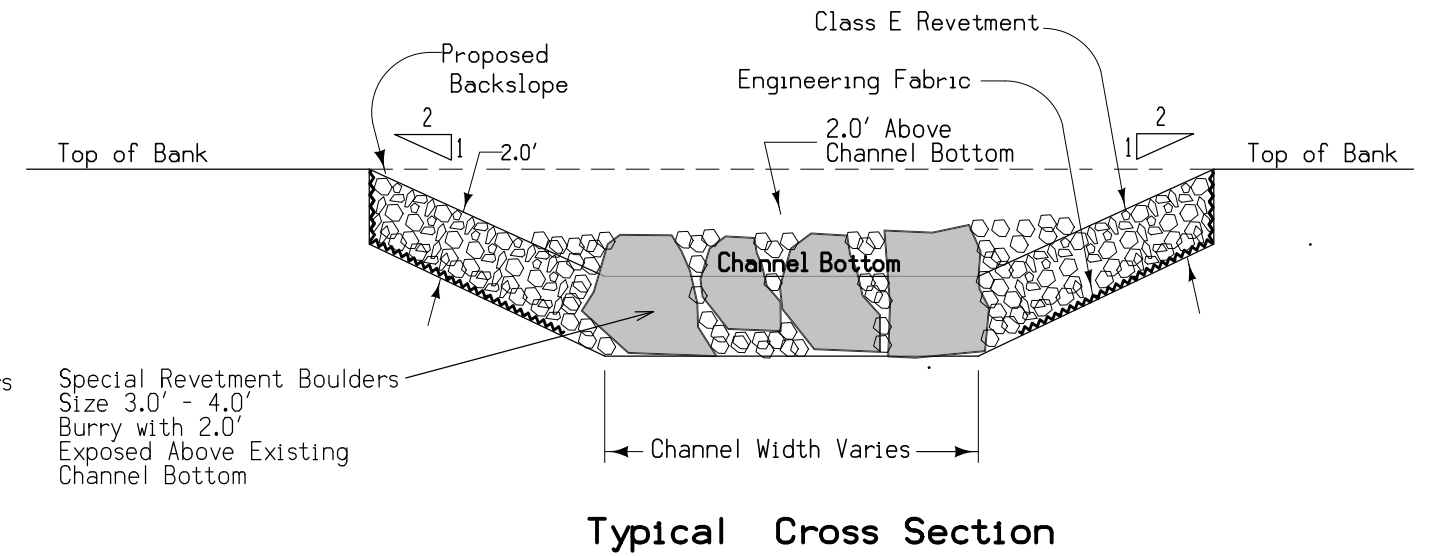
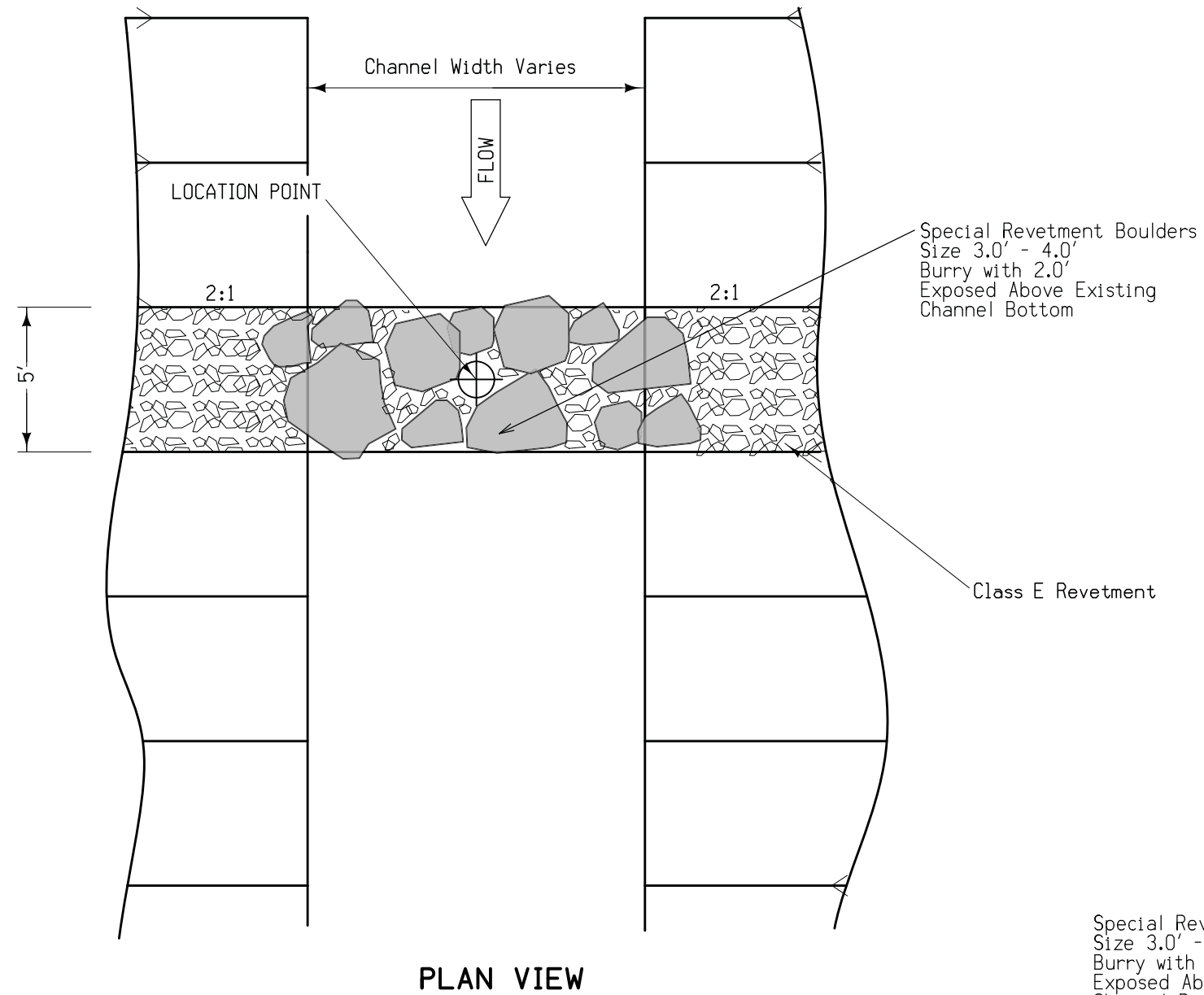


**EXAMPLE OF A REVISED PLAN SHEET PROVIDED FROM AN OFFICE OTHER THAN THE BRIDGE OFFICE TO BE INCLUDED IN THE BRIDGE PLANS.**





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



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