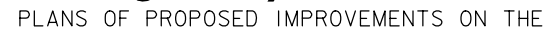
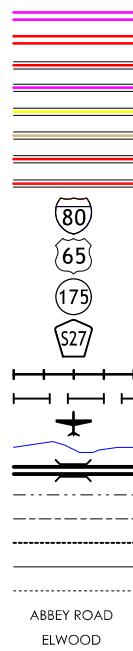


BRIDGE NEW - STEEL GIRDER	LETTING DATE
IM-029-3(192)54--13-78	02-02-2021

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



BRIDGE NEW - STEEL GIRDER

W-S CONNECTOR I-480 TO I-29 OVER 2ND
AVE., SB FRONTAGE RD., AND EB W BROADWAY

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.

ENGLISH STANDARD BRIDGE PLANS

STANDARD	ISSUED	REVISED

REVISIONS	
SEE REVISION SHEET RA	05-06-2022

TOTAL SHEETS
143

PROJECT NUMBER

IM-029-3(192)54--13-78

R.O.W. PROJECT NUMBER

PROJECT IDENTIFICATION NUMBER

04-78-029-010-04

INDEX OF SHEETS

NO.	DESCRIPTION
1	TITLE SHEET
RA	REVISION SHEET
2	ESTIMATE SHEET - DESIGN 1320
2-122	DESIGN 1320
SPS.1-SPS.10	SOIL PROFILE SHEET
C.1	ESTIMATE SHEET FOR ROADWAY
A-U	ROADWAY SHEETS



STANDARD ROAD PLANS

STANDARD ROAD PLANS ARE LISTED
ON SHEET NUMBER C.1

DESIGN DATA URBAN

2015	AADT	<u>9500</u>	V.P.D.
2040	AADT	<u>12,000</u>	V.P.D.
2040	DHV	<u>1630</u>	V.P.H.
TRUCKS		<u>8</u>	%

PROJECT WEBSITE:
http://www.e-Builder.net
ACCESS TO THE PROJECT WEBSITE FOR SUBCONTRACTORS,
FABRICATORS AND SUPPLIERS SHALL BE GRANTED BY THE
PRIME CONTRACTORS.


INDEX OF SEALS

SHEET NO.	NAME	TYPE
I	CHRISTOPHER T. HERSINGER	STRUCTURAL DESIGN
SPS.I	DONALD J. HAMMOND	GEOTECHNICAL DESIGN
A.I	JAMES L. KINDER	ROADWAY DESIGN

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.

 11-02-2020
Signature _____ Date _____
Printed or Typed Name **Christopher T. Hersinger**

My license renewal date is December 31, 2020

Pages or sheets covered by this seal: SHEETS 1 THRU 122 OF 143

ALL WORKING DRAWINGS, INCLUDING SHOP DRAWINGS AND FALSEWORK DRAWINGS, SHALL BE SUBMITTED THROUGH THE PROJECT WEBSITE AND WILL BE REVIEWED BY:

HR GREEN, INC.
5525 MERLE HAY ROAD, SUITE 200
JOHNSTON, IA 50131

PROJECT DIRECTORY NAME: 780290I004

DESIGN TEAM HR GREEN, INC.


ENGLISH	IOWA DOT * BRIDGES AND STRUCTURES BUREAU
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FILE NO. 30170

POTTAWATTAMIE COUNTY

PROJECT NUMBER	IM-029-3(192)54--13-78
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SHEET NUMBER	1
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LISTING OF PROJECT REVISIONS									
DATE	SHEET NUMBER		DESCRIPTION OF REVISIONS	DATE	SHEET NUMBER		DESCRIPTION OF REVISIONS		
05-06-2022	RA		REVISION SHEET ADDED.						
05-06-2022	2	I	REVISED: UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED REINFORCING STEEL QUANTITIES. REASON: REVISIONS TO DECK AND BARRIER RAIL REINFORCEMENT MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION. REINFORCING STEEL QUANTITY REVISED IN RESPONSE TO PRE-BID QUESTION #69.	05-06-2022	100	I	REVISED: UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED REINFORCING STEEL QUANTITIES, COLOR OF REINFORCEMENT, LAP LENGTHS, AND NOTE. REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.		
05-06-2022	3	I	REVISED: UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED REINFORCING STEEL QUANTITIES. REASON: REVISIONS TO DECK AND BARRIER RAIL REINFORCEMENT MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION. REINFORCING STEEL QUANTITY REVISED IN RESPONSE TO PRE-BID QUESTION #69.	05-06-2022	101	I	REVISED: UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED REINFORCING STEEL QUANTITIES, COLOR OF REINFORCEMENT, AND LAP LENGTHS. REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.		
05-06-2022	31	I	REVISED: UPDATED PIER 6 NON-COATED REINFORCING STEEL. CHANGED NON-COATED REINFORCING STEEL QUANTITIES AND BAR LENGTHS. REASON: CHANGE MADE IN RESPONSE TO PRE-BID QUESTION #69.	05-06-2022	102	I	REVISED: UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED REINFORCING STEEL QUANTITIES, COLOR OF REINFORCEMENT, AND LAP LENGTHS. REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.		
05-06-2022	46	I	REVISED: UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED COLOR OF REINFORCEMENT. REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.	05-06-2022	103	I	REVISED: THIS SHEET VOIDED. REASON: EXCESSIVE CHANGES CREATED UNCLEAR REINFORCING STEEL QUANTITY TABLE.		
05-06-2022	47	I	REVISED: UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED COLOR OF REINFORCEMENT. REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.	05-06-2022	103A	I	REVISED: THIS SHEET ADDED TO SHOW UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTION. CHANGED REINFORCING STEEL QUANTITIES AND COLOR OF REINFORCEMENT. REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.		
05-06-2022	48	I	REVISED: UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED COLOR OF REINFORCEMENT. REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.	05-06-2022	106	I	REVISED: UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED COLOR OF REINFORCEMENT AND NOTE. REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.		
05-06-2022	49	I	REVISED: UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED COLOR OF REINFORCEMENT. REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.	05-06-2022	112	I	REVISED: UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED COLOR OF REINFORCEMENT AND NOTE. REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.		
05-06-2022	50	I	REVISED: UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED COLOR OF REINFORCEMENT. REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.						
05-06-2022	86	I	REVISED: UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED COLOR OF REINFORCEMENT AND LAP LENGTHS. REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.						
05-06-2022	87	I	REVISED: UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED COLOR OF REINFORCEMENT AND LAP LENGTHS. REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.						
05-06-2022	88	I	REVISED: UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED REINFORCING STEEL QUANTITIES AND COLOR OF REINFORCEMENT. REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.						
05-06-2022	89	I	REVISED: UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED COLOR OF REINFORCEMENT AND LAP LENGTHS. REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.						
05-06-2022	90	I	REVISED: UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED COLOR OF REINFORCEMENT AND LAP LENGTHS. REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.						
05-06-2022	91	I	REVISED: UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED REINFORCING STEEL QUANTITIES AND COLOR OF REINFORCEMENT. REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.						
<div><div>DESIGN TEAM HR GREEN, INC.</div></div>				<div><div>STRUCTURAL DESIGN</div><div><div><div><div><div>PROFESSIONAL ENGINEER</div><div>Christopher T. Hersinger</div><div>25250</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>Signature</div><div>Christopher T. Hersinger</div><div>Date</div><div>05-06-2022</div></div><div>Printed or Typed Name</div></div><div>My license renewal date is December 31, 2022</div><div>Pages or sheets covered by this seal: SHEETS RA, 2-3, 31, 46-50, 86-91, 100-103, 103A, 106, 112</div></div></div></div></div>				<div><div>POTTAWATTAMIE COUNTY</div><div>DESIGN NO. 1320</div><div>REVISION SHEET</div></div>	
POTTAWATTAMIE COUNTY				PROJECT NUMBER 1M-029-3(192)54--13-78		SHEET NUMBER RA			



ESTIMATED BRIDGE QUANTITIES					
ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUANTITY
1	2402-2720000	EXCAVATION, CLASS 20	C.Y.	123	
2	2403-0100010	STRUCTURAL CONCRETE (BRIDGE)	C.Y.	1,265.1	
3	2403-7000210	HIGH PERFORMANCE STRUCTURAL CONCRETE	C.Y.	3,244.2	
4	2404-7775000	REINFORCING STEEL	LB.	278,176	
5	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB.	951,969	
6	2404-7775009	REINFORCING STEEL, STAINLESS STEEL	LB.	18,587	
7	2405-2705000	EXCAVATE AND DEWATER	L.S.	1.00	
8	2408-7800000	STRUCTURAL STEEL	LB.	3,104,814	
9	2413-1200000	STEEL EXTRUSION JOINT WITH NEOPRENE	L.F.	67.4	
10	2413-1200100	NEOPRENE GLAND INSTALLATION AND TESTING	L.F.	67.4	
11	2414-6424119	CONCRETE BARRIER RAILING, AESTHETIC	L.F.	2,878.2	
12	2434-0000100	DISC BEARING ASSEMBLIES	EACH	50	
13	2499-2300001	DECK DRAINS	L.S.	1.00	
14	2499-9000000	MODULAR EXPANSION JOINT ASSEMBLY	L.F.	83.7	
15	2499-9000100	MODULAR EXPANSION JOINT ASSEMBLY LEAK TESTING	EACH	2	
16	2501-0201253	PILES, STEEL, HP 12 X 53	L.F.	3,120	
17	2501-0201473	PILES, STEEL, HP 14 X 73	L.F.	16,165	
18	2501-8400172	TEMPORARY SHORING	L.S.	1.00	
19	2526-8285000	CONSTRUCTION SURVEY	L.S.	1.00	
20	2533-4980005	MOBILIZATION	L.S.	1.00	
21	2599-9999005	ANCHOR BOLT ASSEMBLY - INSTALL AND SURVEY	EACH	4	
22	2599-9999005	STEEL OVERHEAD SIGN TRUSS, 45 FT. SPAN	EACH	1	
23	2599-9999005	STEEL OVERHEAD SIGN TRUSS, 64 FT. SPAN	EACH	1	
24	2599-9999008	ANCHOR BOLT ASSEMBLY - FURNISH	LB.	2,191	
25	2599-9999010	CONCRETE DEADMAN ANCHOR	L.S.	1.00	
26	2599-9999010	GIRDER ERECTION PLAN	L.S.	1.00	
27	2599-9999018	REVTMENT STONE SLOPE PROTECTION	S.Y.	297.7	

ITEM NO.

ESTIMATE REFERENCE INFORMATION

1

ALL EXCAVATION QUANTITIES ARE BASED ON PROPOSED GROUND CONDITIONS.

2

THIS BID ITEM INCLUDES THE CONCRETE FOR THE PIER FOOTINGS. INCLUDES ALL RESILIENT JOINT FILLER REQUIRED.

3

THIS BID ITEM INCLUDES THE CONCRETE FOR THE DECK, ABUTMENT, PIER CAPS AND COLUMNS, AND WINGWALLS. REFER TO THE DEVELOPMENTAL SPECIFICATION FOR "HIGH PERFORMANCE CONCRETE FOR STRUCTURES" FOR ADDITIONAL INFORMATION. INCLUDES FURNISHING AND PLACING CONCRETE SEALER. INCLUDES FURNISHING AND PLACING 3 INCH DIAMETER PVC PLASTIC PIPE AND EXPANDING FOAM IN THE ABUTMENT WING. INCLUDES FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION),POROUS BACKFILL, GEOTEXTILE FABRIC, AND CONNECTION TO MSE WALL DRAIN. PLACING OF BACKFILL BY FLOODING WILL NOT BE ALLOWED. INCLUDES ALL COSTS ASSOCIATED WITH CONCRETE RUSTICATION, TEXTURING, AND FORM LINERS FOR THE ABUTMENT AND PIERS. INCLUDES MATERIAL AND LABOR ASSOCIATED WITH PROVIDING AND INSTALLING CONDUIT, JUNCTION BOX, AND FITTINGS IN THE PIER AND DECK. INCLUDES 1 JUNCTION BOX, 5 L.F. OF 1 INCH DIAMETER RIGID STEEL CONDUIT, 40 L.F. OF 2 INCH DIAMETER RIGID STEEL CONDUIT AND 90 L.F. OF 1 INCH DIAMETER FIBERGLASS CONDUIT. RIGID STEEL CONDUIT CAN BE REPLACED BY FIBERGLASS CONDUIT, AT THE CONTRACTOR'S OPTION. IF FIBERGLASS CONDUIT IS USED, REFER TO SPECIAL PROVISIONS FOR FIBERGLASS CONDUIT EMBEDDED IN STRUCTURE.

4

INCLUDES MECHANICAL SPLICERS AT PIER 6.

7

FOR PIERS IN ACCORDANCE WITH SECTION 2405 OF THE STANDARD SPECIFICATIONS.

8

INCLUDES NEOPRENE SHEETS UNDER BEARINGS.

9

INCLUDES ALL NECESSARY HARDWARE AND ACCESSORIES INCLUDING THE ANCHORAGE SYSTEM, TEMPORARY ERECTION MATERIAL AND THE 3/8" BARRIER PLATES WITH THEIR ANCHORAGE SYSTEM. EXCLUDES INSTALLATION OF NEOPRENE GLAND. EXPANSION CONDITIONS DO NOT ALLOW THE USE OF THE DS BROWN JOINT FOR THIS INSTALLATION.

10

INCLUDES INSTALLATION OF NEOPRENE GLAND AND WATER TESTING OF JOINT.

11

CAST-IN-PLACE BARRIER RAILS SHALL USE CLASS C MIX. PRICE BID FOR THIS ITEM SHALL INCLUDE THE COST OF CAST-IN-PLACE FORMS. SLIP-FORMING OF THE CONCRETE BARRIER RAILS IS NOT ALLOWED. INCLUDES ALL COSTS ASSOCIATED WITH CONCRETE RUSTICATION, TEXTURING, AND FORM LINER FOR AESTHETIC BARRIER RAILS.

12

INCLUDES DISC BEARING, SOLE PLATE, GUIDE BARS, SLIDER PLATE, MASONRY PLATE, 1/8" PREFORMED MASONRY PADS AND BOLTS.

13

INCLUDES ALL NEW DECK DRAINS. REFER TO DESIGN SHEETS 85, 88, & 105 FOR LOCATION, MATERIALS AND THE DETAILS OF THEIR CONSTRUCTION. MEASUREMENT WILL BE THE LUMP SUM FOR ALL DECK DRAINS REQUIRED AS SPECIFIED IN THE PLANS. THE PAYMENT SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, EQUIPMENT AND LABOR AND FOR PERFORMANCE OF ALL WORK NECESSARY FOR FABRICATING AND INSTALLING THE DECK DRAINS AS PER PLAN. ROCK SPLASH BASINS FOR DECK DRAINS ARE INCLUDED IN THE TIED ROADWAY PROJECT IM-029-3(190)53--13-78.

14

INCLUDES ALL LABOR AND MATERIAL ASSOCIATED WITH THE FABRICATION AND INSTALLATION OF THE MODULAR EXPANSION JOINT INCLUDING THE ANCHORAGE SYSTEM, NEOPRENE GLANDS, TEMPORARY ERECTION MATERIALS AND THE BARRIER COVER PLATES AND THEIR ANCHORAGE SYSTEMS. REFER TO DEVELOPMENTAL SPECIFICATIONS FOR MODULAR EXPANSION JOINT ASSEMBLY.

DESIGN TEAM

HR GREEN, INC.

5/6/2022

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15

REFER TO THE DEVELOPMENTAL SPECIFICATIONS FOR "MODULAR EXPANSION JOINT ASSEMBLY" FOR ADDITIONAL INFORMATION.

16, 17

INCLUDES FURNISHING AND INSTALLING STEEL PILE POINTS. INCLUDES CMP, BLOCKING MATERIALS, INSTALLATION, AND SAND BACK FILLED INTO CMP AT SOUTH ABUTMENT WITHIN THE SPECIAL BACKFILL OF MSE WALL.

18

SOUTH ABUTMENT, PIER 1 AND PIER 2 WILL REQUIRE TEMPORARY SHORING. ITEM DOES NOT INCLUDE SHORING AS REQUIRED FOR THE TIED (190) GRADE AND PAVE PROJECT.

19

ITEM DOES NOT INCLUDE CONSTRUCTION SURVEY AS REQUIRED FOR THE TIED (190) GRADE AND PAVE PROJECT.

20

ITEM DOES NOT INCLUDE MOBILIZATION AS REQUIRED FOR THE TIED (190) GRADE AND PAVE PROJECT.

21

INCLUDES ALL COSTS ASSOCIATED WITH ACCURATELY INSTALLING AND SURVEYING ANCHOR BOLT ASSEMBLIES IN THE SIGN TRUSS PEDESTALS AT PIERS 1 AND 6. SEE STRUCTURAL ALIGNMENT/ TOLERANCE NOTES ON DESIGN SHEET 113 FOR ANCHOR BOLT ASSEMBLY ALIGNMENT DOCUMENTATION REQUIREMENTS.

22, 23

INCLUDES ALL LABOR AND MATERIAL ASSOCIATED WITH THE FABRICATION AND INSTALLATION OF THE OVERHEAD SIGN TRUSSES. SEE DESIGN SHEETS 112-118 FOR ADDITIONAL NOTES AND DETAILS.

24

INCLUDES ALL COSTS OF FURNISHING ANCHOR BOLTS, ANCHOR PLATES, TEMPLATES, NUTS AND WASHERS FOR OVERHEAD SIGN TRUSS PEDESTALS AT PIER 1 AND 6. SEE SIGN TRUSS PEDESTAL NOTES ON DESIGN SHEET 15 FOR ADDITIONAL INFORMATION.

25

INCLUDES ALL COSTS OF FURNISHING AND INSTALLING DEADMAN ANCHOR, INCLUDING ANCHOR TEES, RODS, CLEVIS, TURNBUCKLES, GALVANIZING, CONCRETE, REINFORCING STEEL AND ALL WORK NECESSARY TO COMPLETE THE INSTALLATION OF DEADMAN ANCHOR.

26

REFER TO DEVELOPMENTAL SPECIFICATIONS FOR GIRDER ERECTION PLAN.

27

INCLUDES FURNISHING AND PLACING ENGINEERING FABRIC, REVETMENT STONE, EROSION STONE, AND POROUS OR GRANULAR SUBBASE AT FRONT FACE ABUTMENT FOOTING. INCLUDES ALL REQUIRED EXCAVATION, SHAPING AND COMPACTING TO DIMENSIONS SHOWN IN PLANS.

ROADWAY QUANTITIES SHOWN ELSEWHERE IN THESE PLANS.

INDEX OF SHEETS

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LIGHTING DETAILS	112
SIGN TRUSS DETAILS	113
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REVISED: 05-06-2022 THIS SHEET ADDED TO SHOW UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTION. CHANGED REINFORCING STEEL QUANTITIES.

REASON: REVISIONS TO DECK AND BARRIER RAIL REINFORCEMENT MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION. REINFORCING STEEL QUANTITY REVISED IN RESPONSE TO PRE-BID QUESTION #69.

DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

ESTIMATED QUANTITIES & NOTES

STA. 3546+14.50 @ 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 121 FILE NO. 30170 DESIGN NO. 1320

DESIGN TEAM

HR GREEN, INC.

POTTAWATTAMIE COUNTY

PROJECT NUMBER

IM-029-3(192)54--13-78

SHEET NUMBER

2



REVISED: MAY 6, 2022

SUMMARY OF CONCRETE QUANTITIES

LOCATION	STRUCTURAL CONCRETE	HPC STRUCTURAL CONCRETE
BRIDGE DECK - UNIT 1	-	900.4
BRIDGE DECK - UNIT 2	-	778.2
SOUTH ABUTMENT	-	126.8
PIER 1	120.0	156.7
PIER 2	168.0	163.7
PIER 3	120.0	159.6
PIER 4	102.2	182.2
PIER 5	150.0	182.3
PIER 6	321.5	223.9
PIER 7	155.6	183.0
PIER 8	127.8	187.4
TOTAL (CU. YDS.)	1,265.1	3,244.2

SUMMARY OF REINFORCING STEEL

LOCATION	CLASS 20 EXCAVATION	EXCAVATE AND DEWATER *
SOUTH ABUTMENT	123	
PIER 1		312
PIER 2		447
PIER 3		361
PIER 4		215
PIER 5		292
PIER 6		542
PIER 7		437
PIER 8		305
TOTAL (CU. YDS.)	123	2,911

SUMMARY OF FOUNDATIONS

LOCATION	STEEL EXTRUSION JOINT (LIN. FT.)	MODULAR EXPANSION JOINT (LIN. FT.)
SOUTH ABUTMENT	67.4	-
PIER 4	-	37.8
PIER 8	-	46.0
TOTAL	67.4	83.7

SUMMARY OF STRUCTURAL STEEL

[illegible]

REVISED: 05-06-2022 THIS SHEET ADDED TO SHOW
UPDATED DECK AND BARRIER RAIL REINFORCEMENT
TO BE EPOXY COATED, EXCEPT BARRIER TO
DECK/WING CONNECTION. CHANGED REINFORCING
STEEL QUANTITIES.

REASON: REVISIONS TO DECK AND BARRIER RAIL REINFORCEMENT MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION. REINFORCING STEEL QUANTITY REVISED IN RESPONSE TO PRE-BID QUESTION #69.

DESIGN FOR 0° SKEW

1419'-0" x VARIES CONTINUOUS WELDED GIRDER BRIDGE

UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"

SUMMARY QUANTITIES SHEET

STA. 3546+14.50 @ 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2 OF 121 FILE NO. 30170 DESIGN NO. 1320

REVISÉ: MAY 6, 2022

GENERAL NOTES:

IT IS INTENT OF THIS DESIGN TO CONSTRUCT A 1419'-0 X VARIABLE WIDTH STEEL GIRDER BRIDGE ON I-480 RAMP C OVER 2ND AVE., SB FRONTAGE RD., AND EB W BROADWAY.

ALL REINFORCING BARS AND BARS NOTED AS DOWELS SUPPLIED FOR THIS STRUCTURE SHALL BE DEFORMED REINFORCEMENT UNLESS OTHERWISE NOTED OR SHOWN.

THE BRIDGE CONTRACTOR SHALL DRIVE ABUTMENT PILING BEFORE THE MECHANICALLY STABILIZED EARTH (MSE)WALL IS CONSTRUCTED AND MAINTAIN PROPER POSITION OF PILING WHILE THE MSE WALL IS BEING CONSTRUCTED. THE PILING SHALL BE TIED TOGETHER BY MECHANICAL MEANS AND ANCHORED TO PREVENT DISPLACEMENT DURING BACKFILLING OPERATIONS AND MSE WALL CONSTRUCTION. THE CONTRACTOR SHALL SUBMIT A PLAN TO THE ENGINEER FOR APPROVAL OF THE CONNECTIONS AND ANCHORAGE.

IN ACCORDANCE WITH IOWA DOT STANDARD SPECIFICATIONS SECTION 1105, THE CONTRACTOR SHALL SUBMIT A GIRDER ERECTION PLAN (GEP)CONSISTING OF ERECTION PLANS, ERECTION PROCEDURES, AND ERECTION ENGINEERING CALCULATIONS TO THE ENGINEER ACCORDING TO THE SPECIAL PROVISIONS FOR GIRDER ERECTION PLAN.

THE CITY AND UTILITY COMPANIES WHOSE FACILITIES ARE SHOWN ON THE PLANS OR KNOWN TO BE WITHIN THE CONSTRUCTION LIMITS SHALL BE NOTIFIED BY THE BRIDGE CONTRACTOR OF THE CONSTRUCTION STARTING DATE.

THIS BRIDGE IS DESIGNED FOR HL-93 LOADING, PLUS 20 LBS. PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.

PIERS 2, 3, 4, 5, 6 AND 7 DESIGNED FOR BUOYANCY.

GUARDRAIL IS TO BE PLACED BY OTHERS.

ROADWAY EXCAVATION IS TO BE DONE BY OTHERS AND IS NOT A PART OF THIS CONTRACT. EXCAVATION QUANTITIES FOR THE PIERS ARE BASED ON THE ASSUMPTION THAT ROADWAY EXCAVATION WILL HAVE BEEN COMPLETED AND FILLS ARE IN PLACE PRIOR TO STARTING CONSTRUCTION OF THE PIERS.

IT SHALL BE THE BRIDGE CONTRACTOR'S RESPONSIBILITY TO PROVIDE SITES FOR EXCESS EXCAVATED MATERIAL. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED FOR MATERIAL HAULED TO THESE SITES.

COORDINATE DRIVING OF PILES WITH MSE WALL PROJECT IM-029-3(190)53--13-78.

CAST-IN-PLACE BARRIER RAILS SHALL USE CLASS C MIX. CLASS D CONCRETE IS NOT PERMITTED FOR CONCRETE BARRIER RAILS.

SUBSTRUCTURE CONCRETE SHALL BE PROTECTED FROM STAINING BY A WRAPPING OF POLYETHYLENE OR SIMILAR MATERIALS WHICH SHALL BE LEFT IN PLACE AND KEPT IN A SERVICEABLE CONDITION UNTIL AFTER THE DECK HAS BEEN PLACED. IF SUBSTRUCTURE CONCRETE IS STAINED, THE STAINS SHALL BE REMOVED BY METHODS APPROVED BY THE ENGINEER. ALL COSTS ASSOCIATED WITH THE PROTECTION AND ANY REQUIRED CLEANING OF THE SUBSTRUCTURE CONCRETE SHALL BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL STEEL".

CAST IN-ONE-PIECE STEEL PILE POINTS ARE REQUIRED FOR THE ABUTMENT AND PIER PILES IN ACCORDANCE WITH ARTICLE 4167.02 OF THE CURRENT STANDARD SPECIFICATIONS AND MATERIALS I.M. 468.

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (5d1 IS 5/8 INCH DIAMETER BAR). ENGLISH REINFORCING STEEL RECEIVED IN THE FIELD MAY DISPLAY THE FOLLOWING "BAR DESIGNATION". THE "BAR DESIGNATION" IS THE STAMPED IMPRESSION ON THE REINFORCING BARS, AND IS EQUIVALENT TO THE BAR DIAMETER IN MILLIMETERS.

ENGLISH SIZE	3	4	5	6	7	8	9	10	11
BAR DESIGNATION	10	13	16	19	22	25	29	32	36

THE CONTRACTOR IS RESPONSIBLE TO PROVIDE SUFFICIENT TEMPORARY BRACING TO MINIMIZE LATERAL DEFLECTION AND ROTATION OF EXTERIOR STEEL BEAMS DURING DECK PLACEMENT. LATERAL DEFLECTION AND ROTATION OF EXTERIOR BEAMS MAY RESULT IN THIN DECKS AND AN UPWARDS SHIFT IN BAR MATS WHICH CAN DECREASE CONCRETE COVER. PARTIALLY OR FULLY INSTALLED PERMANENT BRACING AS SHOWN IN THESE DESIGN PLANS SHALL NOT BE ASSUMED SUFFICIENT TO MINIMIZE LATERAL DEFLECTION AND ROTATION OF EXTERIOR BEAMS DURING DECK PLACEMENT. TEMPORARY BRACING SHALL NOT BE WELDED TO THE STEEL BEAMS OR ITS ATTACHMENTS INCLUDING THE STUDS.

THIS STRUCTURE SHALL BE BUILT WITH WEATHERING STEEL. ALL STRUCTURAL STEEL, EXCEPT AS NOTED, SHALL CONFORM TO ASTM A709 GRADE 50W. PAINTING REQUIREMENTS FOR THIS STRUCTURE SHALL BE IN ACCORDANCE WITH ARTICLE 2408.02, Q, OF THE STANDARD SPECIFICATIONS.



KEYWAY DIMENSIONS SHOWN ON THE PLANS ARE BASED ON NOMINAL DIMENSIONS UNLESS STATED OTHERWISE. IN ADDITION, THE BEVEL USED ON THE KEYWAY SHALL BE LIMITED TO A MAXIMUM OF 10 DEGREES FROM VERTICAL.

TEMPORARY SHORING (SHEET PILE OR OTHER)SHALL BE REQUIRED AS NECESSARY TO PREVENT THE EARTH UNDER THE TRAFFIC LANE FROM SLOUGHING IN DURING CONSTRUCTION.

THE CONTRACTOR SHALL SUBMIT A TEMPORARY SHORING PLAN FOR REVIEW. THE TEMPORARY SHORING PLAN SHALL BE DESIGNED AND CERTIFIED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF IOWA.THE CONTRACTOR SHALL NOT PROCEED WITH INSTALLATION OF THE TEMPORARY SHORING WITHOUT NOTICE TO PROCEED FROM THE ENGINEER.

THE TEMPORARY SHORING SUBMITTAL SHALL INCLUDE:

- DESIGN CALCULATIONS (INCLUDING A GLOBAL STABILITY ANALYSIS)
- SOIL PROPERTIES
- SHORING MATERIAL PROPERTIES
- SHORING PLAN LAYOUT (SHOWING LOCATION OF TRAFFIC)
- SHORING DETAILS

TEMPORARY SHORING SHALL BE PAID FOR AS A LUMP SUM INCLUDING ALL COST FOR DESIGNING, FURNISHING, INSTALLING AND REMOVAL. ALL MATERIAL USED FOR SHORING SHALL REMAIN THE PROPERTY OF THE CONTRACTOR. SHORING IS TO BE REMOVED ONLY AFTER BACKFILLING HAS BEEN COMPLETED. IN ADDITION TO THE REQUIREMENTS NOTED ABOVE, ARTICLE 1107.07 OF THE STANDARD SPECIFICATIONS STILL APPLIES.

VIBRATION INDUCED SETTLEMENT IS A CONCERN AT THIS SITE. ANY DAMAGE TO EXISTING STRUCTURES AND/OR UTILITIES CAUSED BY CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED BY CONTRACTOR AT NO COST TO THE OWNER.

VIBRATORY HAMMERS SHALL NOT BE USED TO INSTALL PRODUCTION PILES UNLESS AUTHORIZED IN WRITING BY THE ENGINEER. VIBRATORY HAMMERS SHALL NOT BE USED TO INSTALL TEMPORARY SHORING WITHIN 35 FEET OF THE EXISTING 96-INCH STORM SEWER AT 2ND AVENUE.

TEMPORARY STOCKPILES SHALL NOT BE PLACED WITHIN 50 FEET OF COMPLETED PIER FOUNDATIONS.

BRIDGE DECK DIMENSIONS TABLE			
NO.	ITEM	UNIT	QUANTITY
1	DECK LENGTH	L.F.	1422.0
2	MINIMUM DECK WIDTH	L.F.	39.2
3	MAXIMUM DECK WIDTH	L.F.	69.0
4	DECK AREA	S.F.	63,721

1. DECK LENGTH IS MEASURED FROM FACE OF PAVING NOTCH TO CENTERLINE PIER 8 ALONG THE BASELINE OF THE ROADWAY.
- 2, 3. DECK WIDTHS ARE MEASURED FROM OUT-TO-OUT OF DECK PERPENDICULAR TO THE CENTERLINE OF ROADWAY.
4. DECK AREA IS TO BE BASED ON THE DECK LENGTH DISTANCE AND OUT-TO-OUT DECK DIMENSIONS.

NOTE: THE POLLUTION PREVENTION PLAN IS INCLUDED IN THE TIED ROAD PLANS, PROJECT NO. IM-029-3(190)53--13-78

TRAFFIC CONTROL PLAN
THIS STRUCTURE IS BEING CONSTRUCTED ON A RELOCATION AND THE ROAD WILL NOT BE OPEN TO TRAFFIC UNTIL AFTER COMPLETION OF CONSTRUCTION.

SPECIFICATIONS:

DESIGN: AASHTO LRFD 7th Ed, SERIES OF 2014, EXCEPT AS NOTED IN THE CORRESPONDING EDITION OF THE IOWA BRIDGE DESIGN MANUAL.

CONSTRUCTION: 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

- DEVELOPMENTAL SPECIFICATIONS FOR "MODULAR EXPANSION JOINT ASSEMBLY"
- DEVELOPMENTAL SPECIFICATIONS FOR "HIGH PERFORMANCE CONCRETE FOR STRUCTURES"
- DEVELOPMENTAL SPECIFICATIONS FOR "GIRDER ERECTION PLAN"
- SPECIAL PROVISIONS FOR "E-BUILDER"
- SPECIAL PROVISIONS FOR "FIBERGLASS CONDUIT EMBEDDED IN STRUCTURE"
- SPECIAL PROVISIONS FOR "MASS CONCRETE-CONTROL OF HEAT OF HYDRATION"

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 7th Ed, SERIES OF 2014, EXCEPT AS NOTED IN THE CORRESPONDING EDITION OF THE IOWA BRIDGE DESIGN MANUAL.

REINFORCING STEEL IN ACCORDANCE WITH AASHTO LRFD SECTION 5, GRADE 60 FOR EPOXY COATED AND NON-COATED, AND GRADE 60 OR 75 FOR STAINLESS. CONCRETE IN ACCORDANCE WITH AASHTO LRFD SECTION 5, f'c = 4.0 KSI.

STRUCTURAL STEEL IN ACCORDANCE WITH AASHTO LRFD SECTION 6. ASTM A709 GRADE 36, GRADE 50, AND GRADE 50W (AASHTO M270 GRADE 36, GRADE 50, AND GRADE 50W).

FATIGUE DESIGN BASED ON FATIGUE I LOAD COMBINATION AND INFINITE LIFE.

SHOP DRAWING SUBMITTALS

SHOP DRAWINGS SHALL BE SUBMITTED FOR THE FOLLOWING ITEMS SHOWN IN THE TABLE BELOW. (NOTE ADDITIONAL SHOP DRAWINGS MAY BE REQUIRED IN ACCORDANCE WITH ARTICLE 1105.03 OF THE STANDARD SPECIFICATIONS.)

SUBMITTAL REQUIREMENTS FOR SHOP DRAWINGS SHOULD BE IN ACCORDANCE WITH ARTICLE 1105.03, OF THE STANDARD SPECIFICATIONS, FOR HIGHWAY AND BRIDGE CONSTRUCTION OF THE IOWA DEPARTMENT OF TRANSPORTATION.

SHOP DRAWINGS SHALL BE SUBMITTED WITH THE FOLLOWING NAMING CONVENTION: (Paren).County_DesignNumber_SubmittalDescription.pdf
Example: (192).POTTAWATTAMIE_Design1320_DeckDrains.pdf

1	STRUCTURAL STEEL
2	GIRDER ERECTION PLANS
3	BEARINGS
4	STEEL EXTRUSION JOINT
5	MODULAR EXPANSION JOINTS
6	DECK DRAINS
7	TEMPORARY SHORING
8	FORM LINER FOR AESTHETIC TREATMENT AT PIERS, ABUTMENT AND BARRIERS
9	ABUTMENT PILING ANCHORAGE
10	OVERHEAD SIGN TRUSSES AND ANCHOR BOLTS

DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

GENERAL NOTES

STA. 3546+14.50 @ I-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 3 OF 121 FILE NO. 30170 DESIGN NO. 1320

WEATHERING STEEL NOTES:

ALL STRUCTURAL STEEL, EXCEPT AS NOTED, SHALL CONFORM TO ASTM A709 GRADE 50W. THE MINIMUM YIELD POINT FOR GRADE 50W STRUCTURAL STEEL IS 50 KSI FOR PLATES 4 INCHES AND UNDER IN THICKNESS, AND ALL STRUCTURAL SHAPES. THE GRADE 50W STEEL IS A WEATHERING STEEL AND IS TO REMAIN UNPAINTED, EXCEPT AS NOTED.

DECK DRAINS INCLUDING PLATES WELDED TO THE DRAIN FOR DRAIN SUPPORT ARE TO BE GRADE 36 STEEL.

ALL PIECES COMPRISING THE ABUTMENT AND PIER BEARINGS SHALL COMPLY WITH THE REQUIREMENTS AS STATED IN THE NOTES ON DESIGN SHEET 78.

SHEAR STUDS ARE TO BE OF AN APPROVED TYPE LISTED IN MATERIALS I.M. 453.10, APPENDIX A.

THE FINISH ON DECK DRAINS, BEARINGS AND WEATHERING STEEL SHALL BE IN ACCORDANCE WITH THE PLAN NOTES AND SECTION 2408, OF THE STANDARD SPECIFICATIONS. EXTERIOR SURFACES OF ALL GALVANIZED COMPONENTS WHICH ARE DESIGNATED IN THE CONTRACT DOCUMENTS TO BE PAINTED SHALL BE PREPARED ACCORDING TO ARTICLE 2509.03, OF THE STANDARD SPECIFICATIONS.

BOLTS FOR USE WITH WEATHERING STEEL SHALL BE A325 TYPE III WITH A563 GRADE DH3 NUTS AND F436 TYPE III WASHERS.

BOLTS USED TO SPLICE GIRDER SECTIONS ARE TO BE INSTALLED SUCH THAT NUTS ARE ON THE INSIDE FACE OF THE GIRDER WEBS FOR THE EXTERIOR GIRDERS, AND ON THE TOP OF BOTH TOP AND BOTTOM FLANGES OF ALL THE GIRDERS.

THE STEEL SHALL BE KEPT FREE OF OIL, GREASE, DIRT, CRAYON OR CHALK MARKS, CONCRETE SPATTER AND ANY OTHER FOREIGN MATTER THAT MAY AFFECT THE NATURAL OXIDATION OF THE STEEL. ANY FOREIGN MATTER REMAINING ON THE STEEL AFTER COMPLETION OF BRIDGE CONSTRUCTION SHALL BE REMOVED BY THE BRIDGE CONTRACTOR AS DIRECTED BY THE ENGINEER. THE RESULTANT SURFACE SHALL BE FREE OF ALL VISIBLE RESIDUES. ALL COSTS ASSOCIATED WITH CLEANING STEEL SURFACES SHALL BE BORNE BY THE BRIDGE CONTRACTOR.

SEAL MATERIAL FOR CAULKING SHALL BE NEUTRAL CURE AND NON SAG SILICONE. TWO PRODUCTS MEETING THESE CRITERIA ARE DOW 888, CRAFTCO ROAD SAVER SILICONE, OR CSL342 JOINT SEALANT.

FUTURE JACKING NOTES:

PROVISIONS FOR JACKING THE PROPOSED BRIDGE HAVE BEEN INCLUDED IN THIS DESIGN TO ALLOW FOR FUTURE BEARING MAINTENANCE.

THE JACKING STIFFENERS ARE DESIGNED BASED ON COMBINED DEAD AND LIVE LOAD REACTIONS TABULATED IN THE MOMENT AND REACTION TABLES LISTED IN THESE PLANS.

DESIGN ASSUMES JACKING WILL BE PERFORMED BY PLACING ONE JACK ON EACH SIDE OF THE BEARING ASSEMBLY AT CONTINUOUS SUPPORTS AND BY PLACING A SINGLE JACK IN FRONT OF THE BEARING ASSEMBLY AT END SUPPORTS.

JACKS ARE ASSUMED TO BE CENTERED UNDER THE WEB AND JACKING STIFFENER LOCATIONS SHOWN IN THESE PLANS. SHIM PLATES ARE ASSUMED TO BE USED TO PROVIDE A LEVEL JACKING SURFACE AND TO LIMIT BEARING STRESSES ON CONCRETE IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR PERFORMING THE JACKING TO SIZE AND DESIGN THE REQUIRED JACKING EQUIPMENT AND CRIBBING AND TO ESTABLISH THE PROCEDURE FOR JACKING AND BEARING REPLACEMENT OR REPAIRS SUBJECT TO APPROVAL OF THE ENGINEER. THE ACTUAL DESIGN LOADINGS SHALL BE BASED ON THE LOADINGS EXPECTED FROM THE CONTRACTOR'S PROPOSED JACKING AND MAINTENANCE OF TRAFFIC PLAN AND SHALL CONSIDER ANY ADDITIONAL DEAD LOAD PRODUCED BY IMPOSING DIFFERENTIAL DISPLACEMENTS.

WHEN JACKING AT EXPANSION JOINTS, CONSIDERATION SHOULD BE GIVEN TO PROTECTING ANY BARRIER PLATES, EMBEDDED CONDUIT, AND EXPANSION JOINTS THAT WILL REMAIN.

CONSIDERATION SHALL BE GIVEN TO ANY THERMAL MOVEMENTS AND VIBRATIONS THAT MAY OCCUR AS THE STRUCTURE IS SUPPORTED BY THE JACKS AND/OR CRIBBING.

FUTURE MAINTENANCE OPERATIONS SHALL BE CONDUCTED IN SUCH A MANNER AS TO PREVENT DAMAGE TO THE STRUCTURE.

GENERAL NOTES FOR TEXTURED CONCRETE FORM LINERS:

SEE INDIVIDUAL DESIGN SHEETS FOR SPECIFIC NOTES AND DETAILS DESCRIBING THE FEATURES WHICH INCORPORATE TEXTURED CONCRETE. WORK PERFORMED TO CREATE TEXTURED CONCRETE SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR FORMWORK AND THE FOLLOWING:

FORM THE TEXTURED CONCRETE SURFACE USING A FORM LINER SYSTEM MADE OF HIGH-STRENGTH URETHANE ELASTOMER, PLASTIC OR FLEXIBLE FOAM MATERIALS CAPABLE OF WITHSTANDING ANTICIPATED CONCRETE POUR PRESSURES WITHOUT LEAKAGE OR CAUSING PHYSICAL DEFECTS. FORM LINERS SHALL EASILY ATTACH TO FORMS AND BE REMOVABLE WITHOUT CAUSING CONCRETE SURFACE DAMAGE. IF RECOMMENDED BY THE FORM LINER MANUFACTURER, USE STRUCTURAL BACKERS TO PREVENT DEFORMATION OF THE LINER DURING LOADING OF THE FORMS. THE LINERS SHALL BE DESIGNED TO FORM SURFACES CONFORMING TO THE DESIGN INTENT INCLUDING THE SHAPE, LINES AND DIMENSIONS SHOWN IN THE PLANS AND TO AVOID VISIBLE PATTERN REPEATS, MATCH PATTERN FEATURES AT FORM LINER JOINTS TO MINIMIZE PATTERN REPEATS AND MAKE THE FORMED CONCRETE SURFACE APPEAR UNIFORM AND CONTINUOUS WITHOUT VISIBLE SEAMS AND FORM MARKS. WHEN JOINTS ARE UNAVOIDABLE, MAKE JOINTS ALONG MAIN FEATURES OF THE PATTERN IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

FORM LINER EDGES FOLLOWING CURVES ARE TO BE CUT CLEANLY AND PARALLEL TO THE CURVE. USE ADEQUATE BLOCKING, SEALING AND OTHER MEANS IN ORDER TO MAINTAIN THE APPROPRIATE DEPTH AND CHARACTER OF TEXTURE AT CUT EDGES OF LINERS AND TO PREVENT MORTAR LEAKAGE.

DURING LOADING IN FORMS WITH CONCRETE, TAKE EXTRA CARE TO ADEQUATELY VIBRATE CONCRETE IN ORDER TO MAINTAIN ALL INTENDED FEATURES OF THE FORM LINER IN THE FINAL SURFACE AND TO PREVENT VOIDS. FOLLOWING REMOVAL OF FORMS, FINISH MINOR DEFECTS TO BLEND WITH THE BALANCE OF THE SURFACE TEXTURE. THE COMPLETED SURFACE SHALL BE FREE OF BLEMISHES, SURFACE VOIDS AND CONSPICUOUS FORM MARKS TO THE SATISFACTION OF THE ENGINEER. THE CONTRACTOR SHALL CORRECT, AT HIS OWN COSTS, ANY SURFACE DEFECTS.

VERIFY THAT RELEASE AGENTS USED ARE COMPATIBLE WITH FORM LINER MATERIAL, AND ARE NON-STAINING. APPLY RELEASE AGENT IN ACCORDANCE WITH THE FORM LINER MANUFACTURER'S RECOMMENDATIONS.

IF USED, FORM TIES SHALL BE MADE OF NON-CORROSIVE MATERIALS WHEN THE PORTION PERMANENTLY EMBEDDED IN THE CONCRETE IS LESS THAN 1½ INCHES FROM THE FINISHED SURFACE. POSITION FORM TIES AND ACCESSORIES IN STONE PATTERN MORTAR JOINTS AND AT HIGH POINTS OF FINISHED WALL.

IF HEATING FORMS DURING COLD WEATHER CONSTRUCTION, TAKE SPECIAL CARE TO AVOID DAMAGING FORM LINERS. OVERHEATING CAN WARP OR MELT SOME FORM LINER MATERIALS.

STRIP FORMWORK USING TECHNIQUES IN ACCORDANCE WITH LINER MANUFACTURER'S RECOMMENDATIONS AFTER THE CONCRETE HAS ACHIEVED THE STRENGTHS AND CURE TIMES REQUIRED BY THE PLANS AND APPLICABLE SPECIFICATIONS. CLEAN AND REPAIR FORM LINER SURFACES PRIOR TO USE. DO NOT USE SPLIT, FRAYED, DELAMINATED OR OTHERWISE DAMAGED FORM LINERS.

ALL COSTS ASSOCIATED WITH CONCRETE TEXTURING AND FORM LINERS ARE TO BE INCLUDED IN THE BID ITEM, "HIGH PERFORMANCE STRUCTURAL CONCRETE".

TEXTURED CONCRETE MOCKUP PANEL NOTES:

PRIOR TO BEGINNING ANY PRODUCTION PIER OR ABUTMENT CONCRETE WORK THAT INCLUDES TEXTURE, A TEXTURED CONCRETE MOCKUP PANEL MUST BE REVIEWED AND APPROVED BY THE ENGINEER.

CONSTRUCT A 4-FOOT HIGH, BY 8-INCH WIDE (MIN.), BY 8-FOOT LONG MOCKUP PANEL IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND THESE PLANS. A 4-FOOT WIDE SECTION OF THE PANEL SHALL RECEIVE TEXTURE 'A', AND THE REMAINING SURFACE SHALL RECEIVE TEXTURE 'B'. SEE THE ABUTMENT AND PIER DETAILS SHEETS FOR DETAILS.

CAST THE MOCKUP PANEL(S) ON SITE, USING THE SAME FORMING METHODS, PROCEDURES, FORM LINERS, AND CONCRETE MIXTURE(S) AS ARE PROPOSED FOR THE PRODUCTION WORK. TEXTURED FACES SHALL BE VERTICAL DURING THE CASTING PROCESS. A SINGLE MAT OF NO.5 REINFORCING BARS IN TWO DIRECTIONS SHALL BE SET 2 INCHES CLEAR TO THE BOTTOM OF THE TEXTURED FACE. IF THE MOCKUP PANEL IS REJECTED, CONSTRUCT A NEW MOCKUP PANEL AS DIRECTED BY THE ENGINEER. BEGIN TEXTURED PIER AND ABUTMENT CONCRETE PRODUCTION WORK ONLY AFTER THE MOCKUP HAS BEEN APPROVED BY THE ENGINEER.

AFTER ALL PRODUCTION PIER CONCRETE WORK IS COMPLETE, THE MOCKUP PANEL(S) SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE.

GENERAL NOTES FOR CONCRETE RUSTICATION:

STRIPS AND PANELS USED AS INSERTS WITHIN CONCRETE FORMS TO CREATE THE RUSTICATION FEATURES MAY BE MADE OF WOOD, STEEL, PLASTIC OR OTHER NONPOUROUS MATERIAL CAPABLE OF WITHSTANDING ANTICIPATED CONCRETE POUR PRESSURES WITHOUT PHYSICAL DEFECTS. WOOD INSERTS, IF USED SHALL BE FREE OF WARP, TWIST, CHECKS OR CRACKS AND SHALL BE PRESOAKED PRIOR TO PLACEMENT OF CONCRETE IN THE FORMS.

RUSTICATION INSERTS SHALL EASILY ATTACH TO FORMS AND SHALL NOT ALLOW LEAKAGE OF CONCRETE BETWEEN THE FORM AND THE INSERT. WHEN STEEL FORMS ARE USED, RUSTICATION STRIPS MAY BE RIGIDLY ATTACHED TO THE INSIDE SURFACES OF THE FORMS. WHEN STEEL FORMS ARE NOT USED, RUSTICATION STRIPS AND OTHER INSERTS FOR SMALL RECESSES ON EXPOSED CONCRETE SURFACES SHALL BE FASTENED TO THE FORMS IN A MANNER THAT WILL PERMIT THEM TO REMAIN IN PLACE WHEN THE FORMS ARE REMOVED. LEAVE INSERTS IN PLACE UNTIL THEY CAN BE REMOVED WITHOUT DAMAGE TO THE SURROUNDING CONCRETE.

THE INSERTS SHALL BE DESIGNED TO FORM SURFACES AND FEATURES CONFORMING TO THE DESIGN INTENT INCLUDING THE SHAPE, LINES, DEPTHS, AND DIMENSIONS SHOWN IN THE PLANS. CREATE INSERTS USING A MINIMUM NUMBER OF SPLICE JOINTS IN THEIR LENGTH. SPLICES, IF USED, SHALL BE TIGHTLY JOINED SO AS NOT TO ALLOW GAPS OR LEAKS, AND SHALL NOT CREATE ANY CHANGE IN ALIGNMENT OR SHAPE OF THE RUSTICATION FEATURE.

FOR RUSTICATION FEATURES FOLLOWING THE PERIMETER OF ROUNDED SURFACES, IT MAY BE NECESSARY TO USE MULTIPLE LAYERS OF INSERT MATERIAL IN ORDER TO ACHIEVE THE RADIUS CURVE. THIS IS ACCEPTABLE, PROVIDED THAT THE FINAL SHAPE, LINE, DEPTH, AND DIMENSION OF THE FEATURES ARE MAINTAINED IN THE FINAL RESULT.

DURING LOADING OF FORMS WITH CONCRETE, TAKE EXTRA CARE TO ENSURE PROPER CONSOLIDATION OF CONCRETE AROUND ALL RUSTICATION INSERTS TO PRESERVE THE SHAPE, LINE AND DEPTH OF ALL INTENDED FEATURES IN THE FINAL CONCRETE SURFACE. FOLLOWING REMOVAL OF FORMS, REPAIR ALL DEFECTS TO ACHIEVE THE RUSTICATION FEATURES AS SPECIFIED IN THE PLANS, PATCH VOIDS, HONEYCOMB AREAS, ETC., IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. IF SURFACES WILL NOT RECEIVE A COLORED SEALER COATING, ADD WHITE CEMENT TO THE PATCHING MORTAR TO LIGHTEN IT IN ORDER TO MATCH SURROUNDING CONCRETE WHEN DRY. COMPLETED SURFACE SHALL BE FREE FROM BLEMISHES, SURFACE VOIDS AND CONSPICUOUS FORM MARKS TO THE SATISFACTION FOR THE ENGINEER. THE CONTRACTOR SHALL CORRECT, AT HIS OWN COST, ANY SURFACE DEFECTS.

ALL COSTS ASSOCIATED WITH CONCRETE RUSTICATION ARE TO BE INCLUDED IN THE BID ITEM "HIGH PERFORMACE STRUCTURAL CONCRETE".



DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS

WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

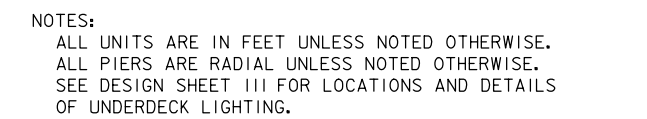
GENERAL NOTES

STA. 3546+14.50 (R 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

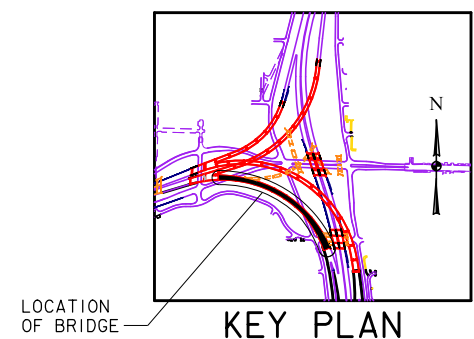
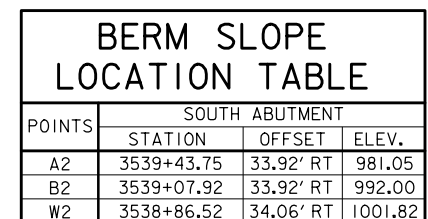
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 4 OF 121 FILE NO. 30170 DESIGN NO. 1320



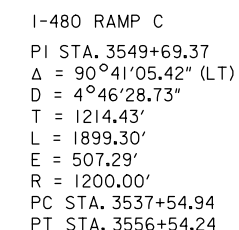
W-S CONNECTOR I-480 TO
I-29 (US 6 E.B.) OVER 2ND AVE.,
S.B. FRONTAGE RD. AND
E.B. W. BROADWAY (I-480 RAMP C)
T-75N R-44W
SECTION 33
KANE TOWNSHIP
POTTAWATTAMIE COUNTY
FHWA NO. 700970
LATITUDE 41.260968°
LONGITUDE -95.909422°

	I-480 RAMP C	
2015	AADT	<u>9500</u> V.P.D.
2040	AADT	<u>12000</u> V.P.D.
2040	DHV	<u>1630</u> V.P.H.
TRUCKS		<u>8</u> %



E2 - IOWA DOT
F03 - SPRINT
F11 - AT&T
F15 - UNITE PRIVATE NETWORK (UPN)
G - BLACK HILLS ENERGY
San. - CITY OF COUNCIL BLUFFS - SANITARY SEWER
St.S.- CITY OF COUNCIL BLUFFS - STORM SEWER
St.S.2 - CITY OF COUNCIL BLUFFS - STORM SEWER
W - COUNCIL BLUFFS WATER WORKS
[] INDICATES UTILITY AS ABANDONED

2ND AVE.
OVERHEAD STATION = 3540+02.75, OFFSET 29.81' LT.
OVERHEAD ELEVATION = 1002.88
DEPTH OF SUPERSTRUCTURE = 7.27'
UNDERPASS STATION = 5000+66.07, OFFSET 19.51' RT.
UNDERPASS ELEVATION = 979.01
MINIMUM VERTICAL CLEARANCE = 16.60'



DESIGN FOR 0° SKEW

1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"

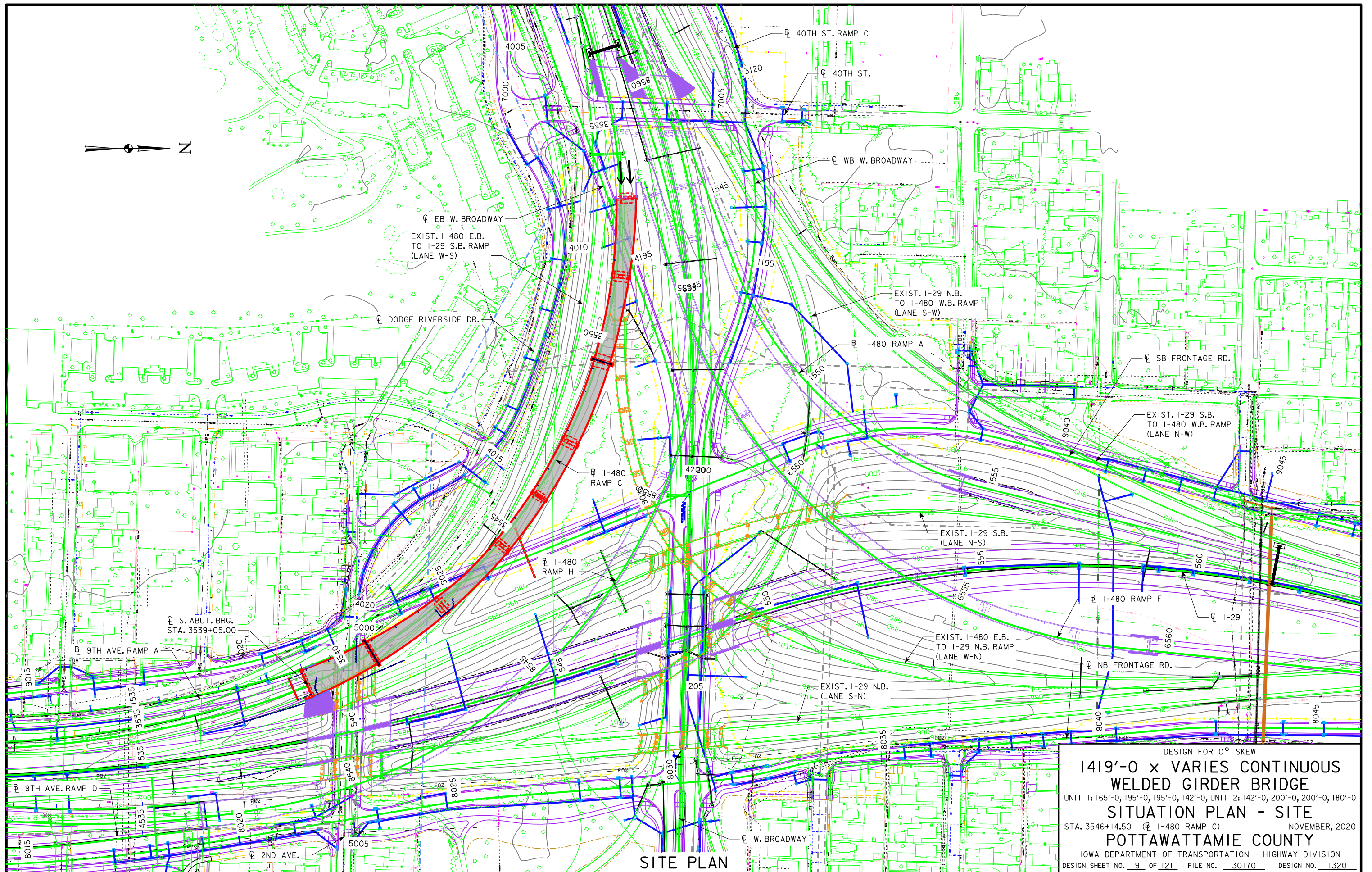
SITUATION PLAN

STA. 3546+14.50 (B 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

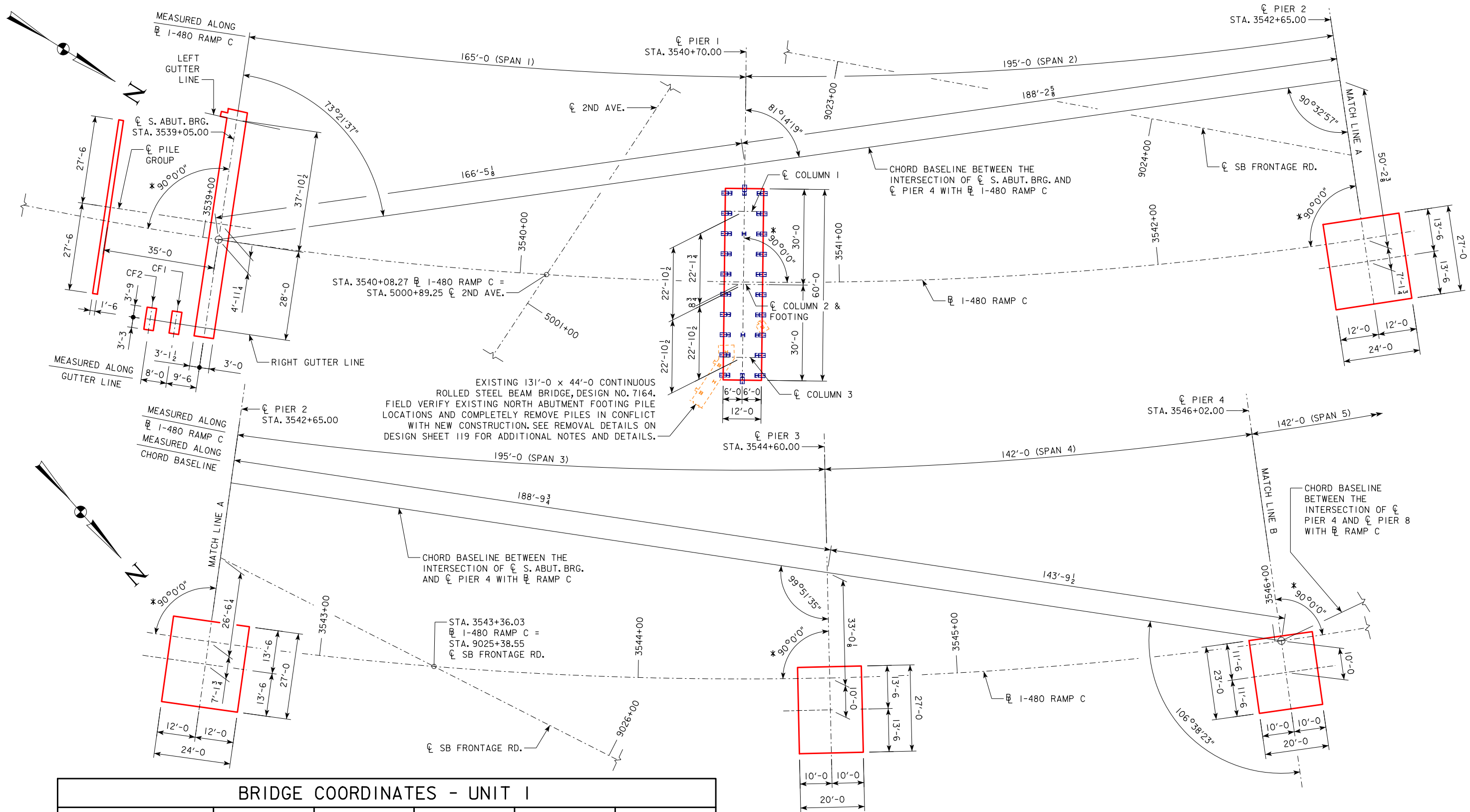
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 5 OF 121 FILE NO. 30170 DESIGN NO. 1320



SITE PLAN

DESIGN FOR 0° SKEW
1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE
UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
SITUATION PLAN - SITE
STA. 3546+14.50 (RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 9 OF 121 FILE NO. 30170 DESIGN NO. 1320



BRIDGE COORDINATES - UNIT 1

LOCATION	CL S. ABUT. BRG.	CL PIER 1	CL PIER 2	CL PIER 3	CL PIER 4
LEFT EDGE OF DECK	E=978501.4263 N=468037.3874	E=978437.4201 N=468184.6733	E=978335.4488 N=468346.9832	E=978202.3335 N=468486.5233	E=978089.3249 N=468570.4824
CL I-480 RAMP C	E=978537.6127 N=468053.1220	E=978461.6385 N=468199.4438	E=978347.0533 N=468356.9609	E=978208.4936 N=468493.8645	E=978094.5752 N=468578.4995
RIGHT EDGE OF DECK	E=978564.7423 N=468064.9186	E=978486.8952 N=468214.8476	E=978369.4851 N=468376.2479	E=978227.5095 N=468516.5266	E=978110.7827 N=468603.2480

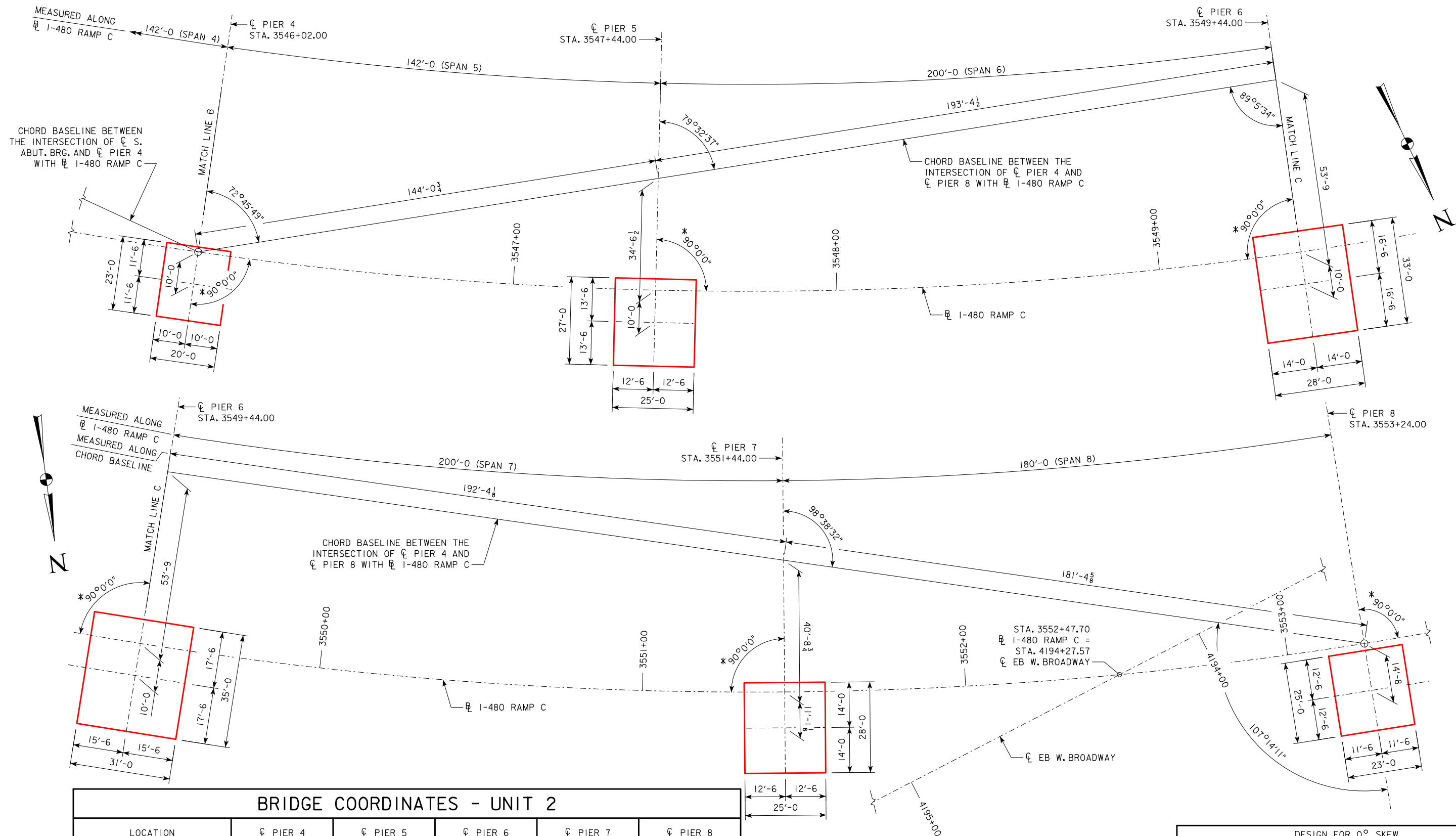
NOTE: AN ELECTRONIC FILE CONTAINING THE BRIDGE COORDINATE DATA IS AVAILABLE AS PART OF THE E-FILES SUPPLIED WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL VERIFY THESE COORDINATES WITH THE PROJECT HORIZONTAL CONTROL INFORMATION PROVIDED IN THE ROAD PLANS.

STAKING DIAGRAM - UNIT 1

* MEASURED WITH RESPECT TO A LINE PERPENDICULAR TO CL I-480 RAMP C LOCAL TANGENT.

DESIGN FOR 0° SKEW
1419'-0" x VARIES CONTINUOUS WELDED GIRDER BRIDGE
 UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
STAKING DIAGRAM - UNIT 1
 STA. 3546+14.50 (CL I-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 10 OF 121 FILE NO. 30170 DESIGN NO. 1320





BRIDGE COORDINATES - UNIT 2

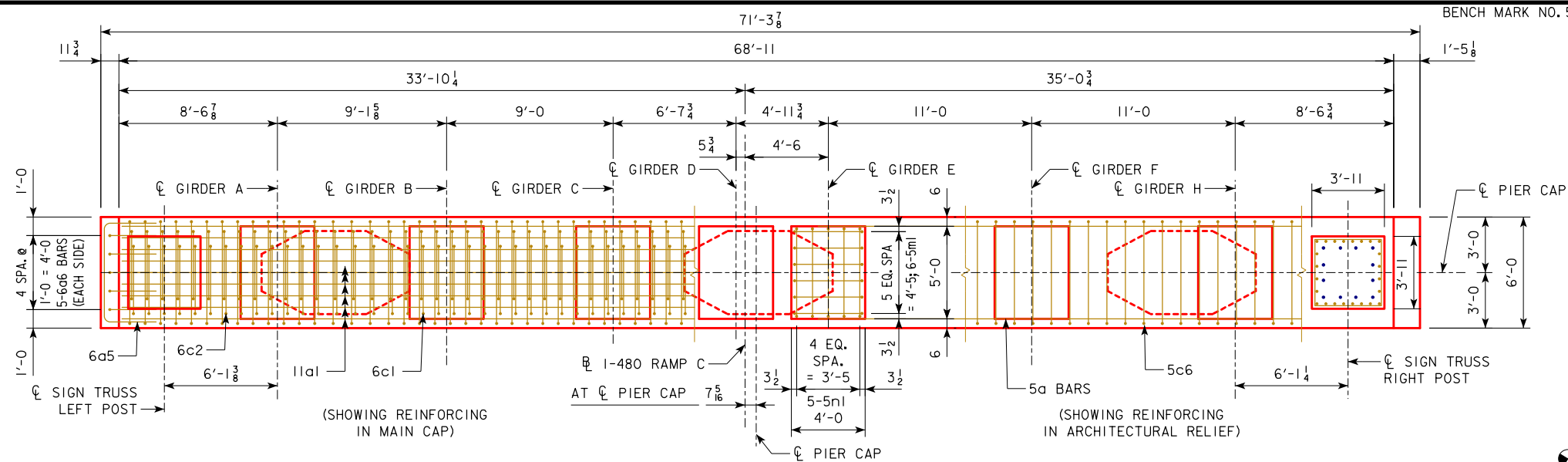
LOCATION	☉ PIER 4	☉ PIER 5	☉ PIER 6	☉ PIER 7	☉ PIER 8
LEFT EDGE OF DECK	E=978089.3249 N=468570.4824	E=977967.1945 N=468640.5128	E=977783.0214 N=468713.6762	E=977589.2628 N=468755.2722	E=977411.1194 N=468764.7470
☉ I-480 RAMP C	E=978094.5752 N=468578.4995	E=977971.4617 N=468649.0937	E=977785.8059 N=468722.8461	E=977590.4874 N=468764.7769	E=977410.9099 N=468774.3280
RIGHT EDGE OF DECK	E=978110.7827 N=468603.2480	E=977984.6341 N=468675.5826	E=977794.4013 N=468751.1532	E=977594.5479 N=468796.2924	E=977410.0837 N=468812.1103

NOTE: AN ELECTRONIC FILE CONTAINING THE BRIDGE COORDINATE DATA IS AVAILABLE AS PART OF THE E-FILES SUPPLIED WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL VERIFY THESE COORDINATES WITH THE PROJECT HORIZONTAL CONTROL INFORMATION PROVIDED IN THE ROAD PLANS.

STAKING DIAGRAM - UNIT 2

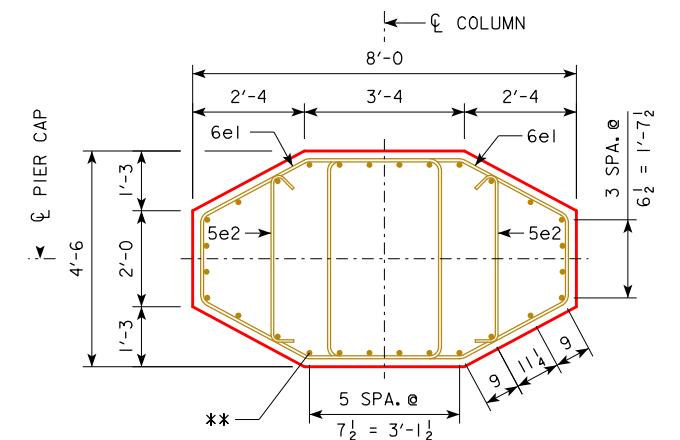
* MEASURED WITH RESPECT TO A LINE PERPENDICULAR TO ☉ I-480 RAMP C LOCAL TANGENT.

DESIGN FOR 0° SKEW
1419'-0" x VARIES CONTINUOUS WELDED GIRDER BRIDGE
 UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
STAKING DIAGRAM - UNIT 2
 STA. 3546+14.50 (☉ I-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 11 OF 121 FILE NO. 30170 DESIGN NO. 1320

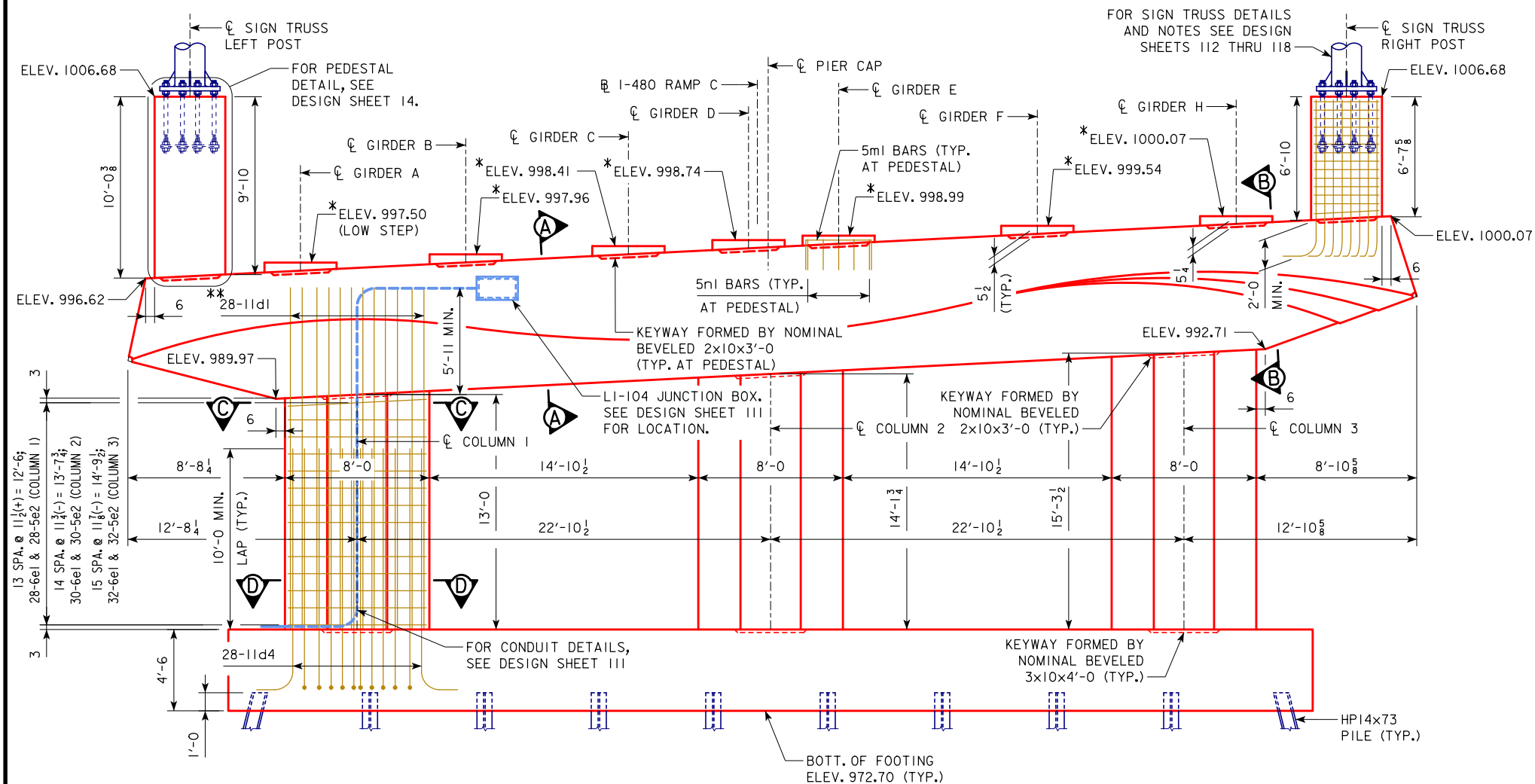
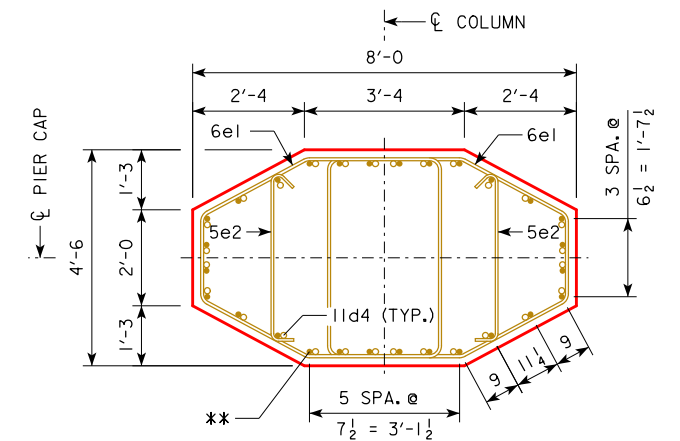


* ELEVATION AND PEDESTAL HEIGHTS DEPENDENT ON FINAL BEARING HEIGHT, WHICH SHALL BE DETERMINED BY BEARING MANUFACTURER. CONTRACTOR SHALL VERIFY BEARING HEIGHT WITH MANUFACTURER AND ADJUST ELEVATIONS IF NECESSARY PRIOR TO PLACING CONCRETE. MINIMUM PEDESTAL HEIGHT SHALL BE 4".

PIER CAP PLAN



SECTION C-C

PIER ELEVATION
(LOOKING UPSTATION)

SECTION D-D

NOTE:
MINOR ADJUSTMENTS MAY BE MADE TO COLUMN/DOWEL BAR SPACING TO ACCOMMODATE 5e2 PLACEMENT. CONTRACTOR SHALL TEST PLACEMENT OF 6e1/5e2 TIES PRIOR TO POURING FOOTING CONCRETE.

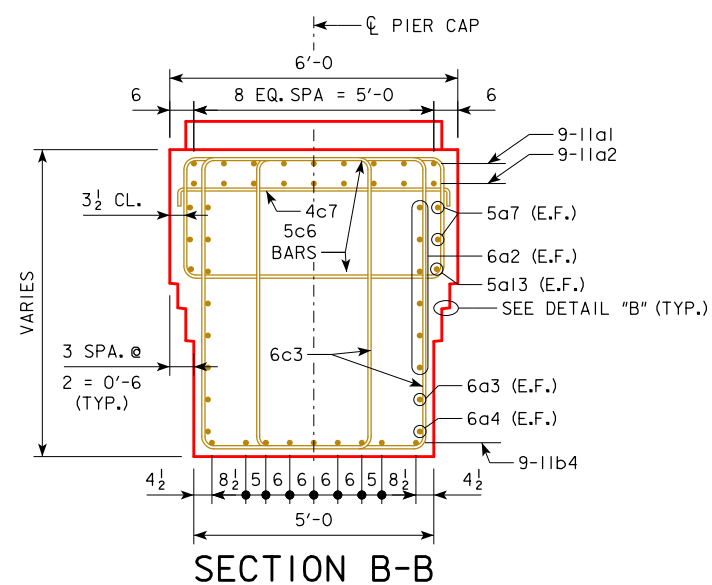
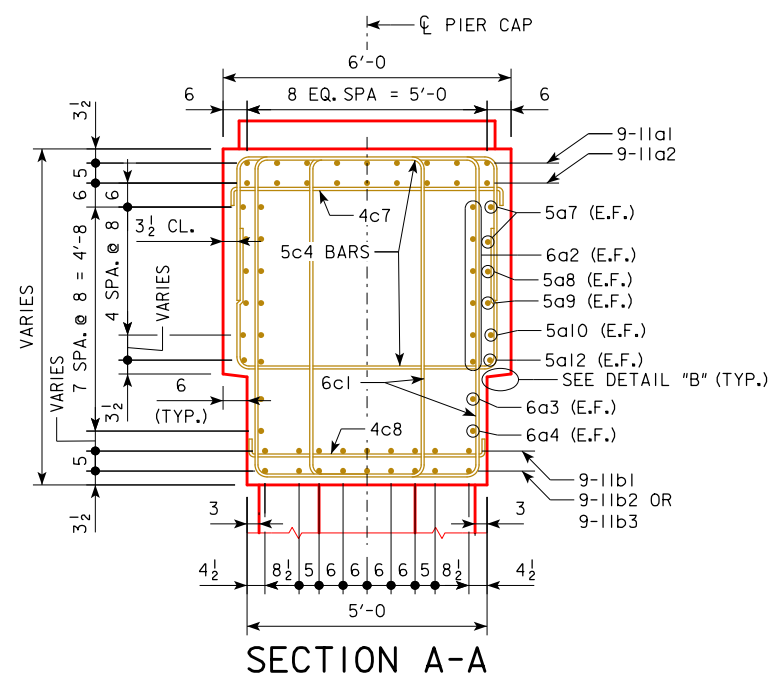
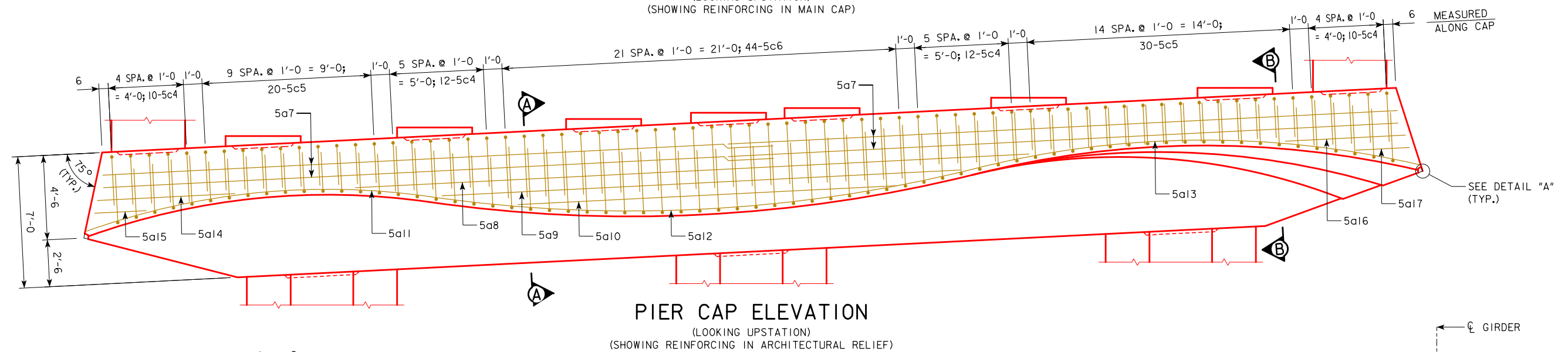
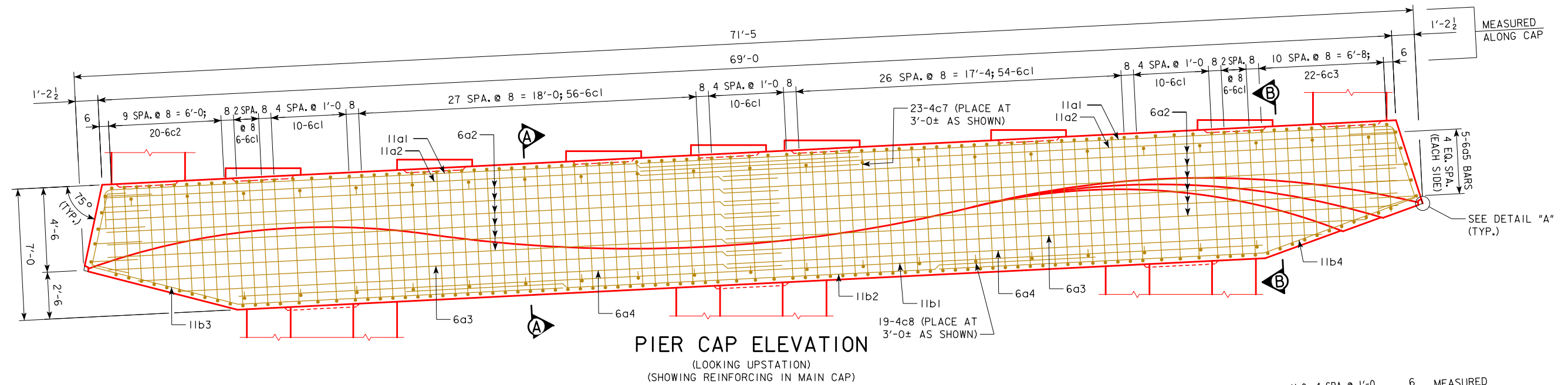
FOR SECTIONS A-A & B-B, SEE DESIGN SHEET 13.

DESIGN FOR 0° SKEW
1419'-0" x VARIES CONTINUOUS WELDED GIRDER BRIDGE
UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
PIER 1 DETAILS
STA. 3546+14.50 (RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 12 OF 121 FILE NO. 30170 DESIGN NO. 1320

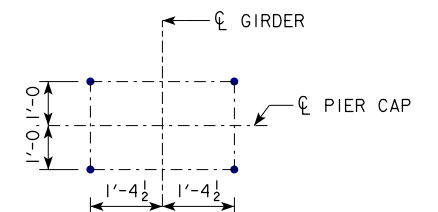
NOTE:
FOR REINFORCING LIST, BENT BAR DETAILS, QUANTITIES AND ADDITIONAL NOTES, SEE DESIGN SHEET 15.



** 11d1 AT COLUMN 1
11d2 AT COLUMN 2
11d3 AT COLUMN 3



MIN. LAP LENGTH	
BAR	LAP
11a1 & 11a2	11'-4
5a BARS	2'-11
6a BARS	3'-6
11b BARS	12'-6
5c HOOPS	1'-7



ANCHOR BOLT LAYOUT

MAINTAIN 0'-6 MIN. EDGE DISTANCE ON ALL SIDES
(FOR ADDITIONAL DETAILS AND NOTES, SEE DESIGN SHEET 78)
REINFORCING m & n BARS MAY BE SHIFTED SLIGHTLY TO
CLEAR ANCHOR BOLTS.

NOTES:
FOR DETAILS "A" & "B", SEE DESIGN SHEET 37.

DESIGN FOR 0° SKEW

1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"

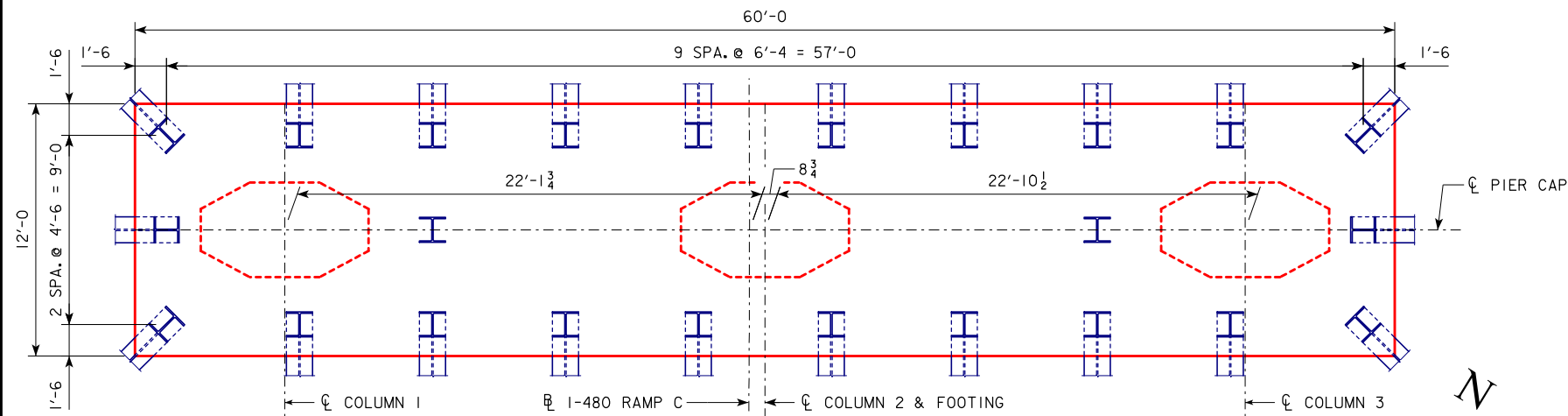
PIER 1 DETAILS

STA. 3546+14.50 (@ 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

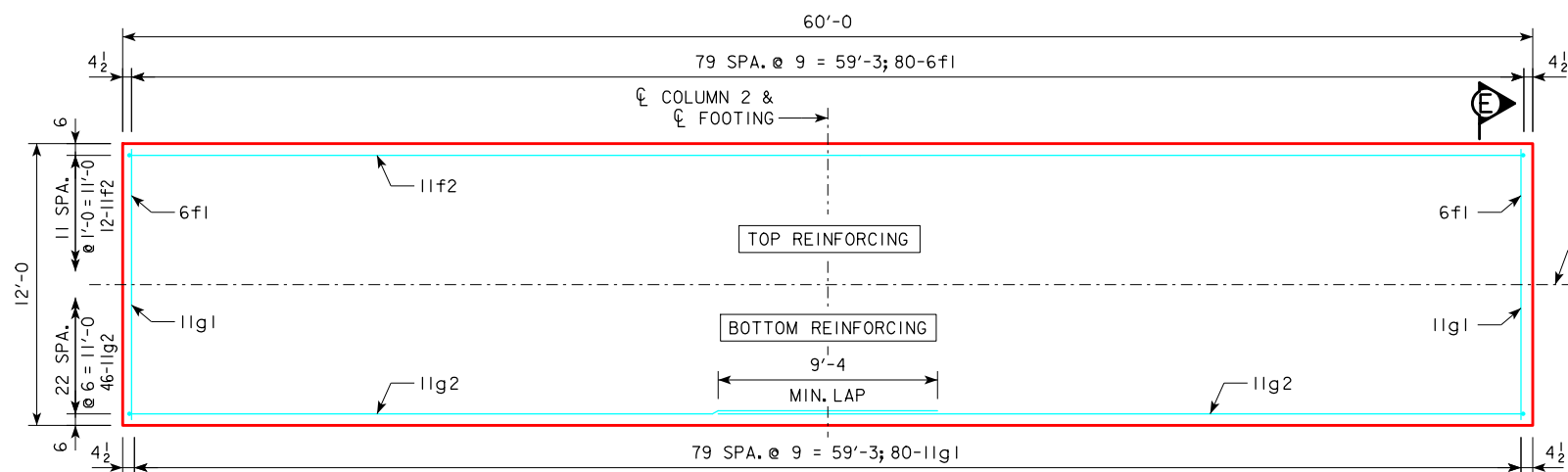
DESIGN SHEET NO. 13 OF 121 FILE NO. 30170 DESIGN NO. 1320



NOTE:
DIMENSIONS SHOWN ON PILE LAYOUT ARE AT
BOTTOM OF FOOTING. BATTER PILES (WHERE
INDICATED) AT 4:1 IN THE DIRECTION
SHOWN.

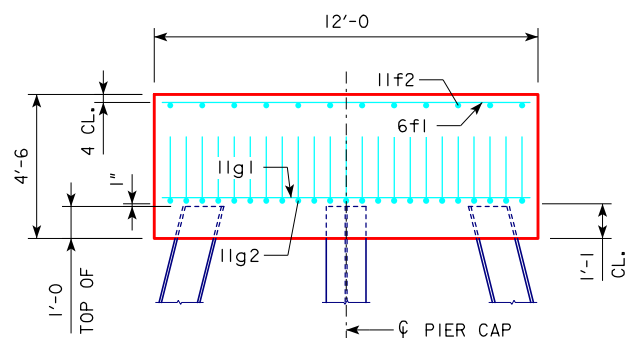
PILE LAYOUT

24 - HP 14x73 PILES REQUIRED



REINFORCING LAYOUT

NOTE:
SHIFT TOP MAT FOOTING g2 & f1 BARS AS NECESSARY TO
ALLOW FOR PROPER PLACEMENT OF COLUMN DOWEL BARS.



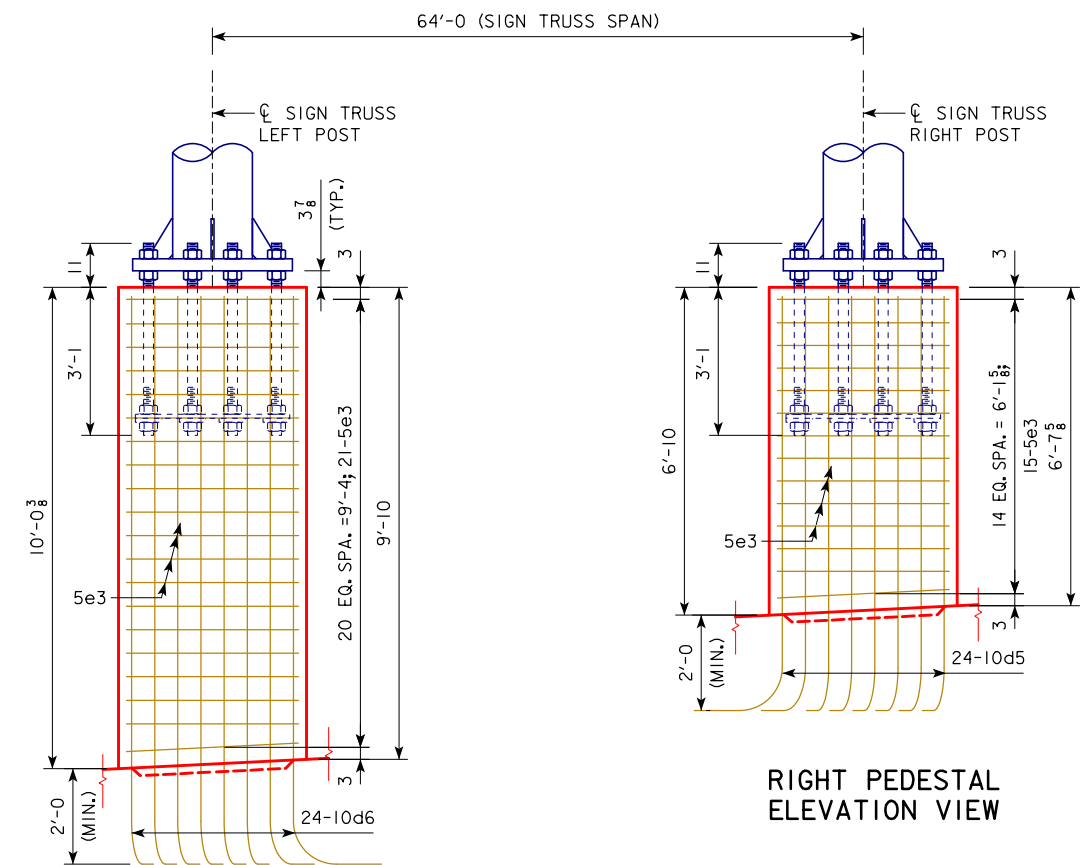
SECTION E-E

NOTE:
FOR REINFORCING LIST, BENT
BAR DETAILS, QUANTITIES
AND ADDITIONAL NOTES,
SEE DESIGN SHEET 15.



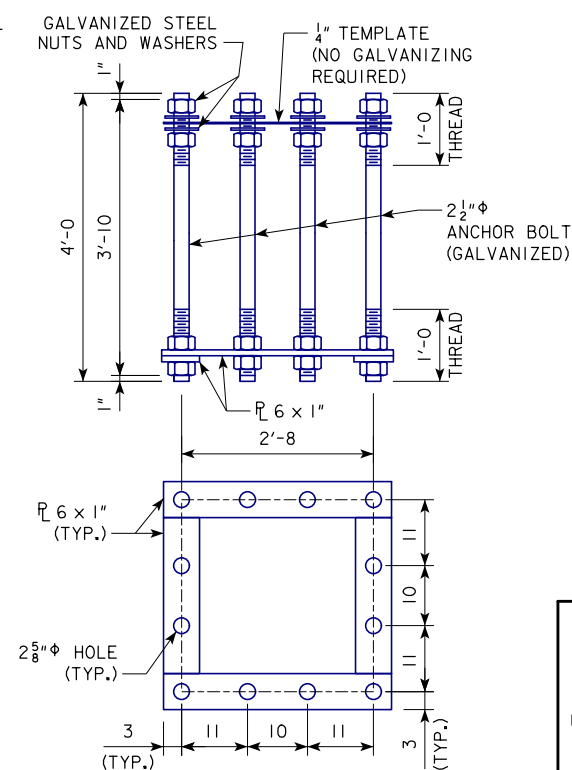
DESIGN TEAM HR GREEN, INC.

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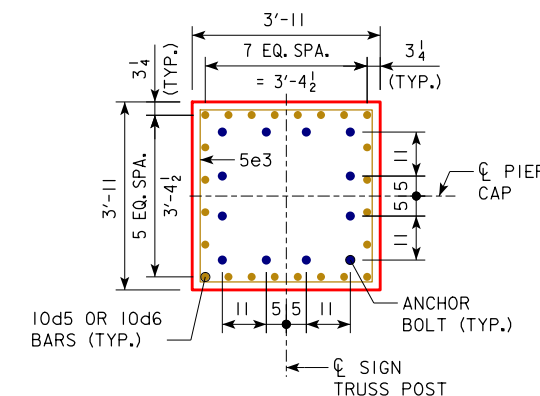


LEFT PEDESTAL ELEVATION VIEW

RIGHT PEDESTAL ELEVATION VIEW



ANCHOR BOLT ASSEMBLY



PARTIAL PLAN SIGN TRUSS PEDESTAL DETAIL

DESIGN FOR 0° SKEW
**1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE**
UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
PIER 1 DETAILS
STA. 3546+14.50 (R 1-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 14 OF 121 FILE NO. 30170 DESIGN NO. 1320

POTTAWATTAMIE COUNTY

PROJECT NUMBER IM-029-3(192)54--13-78

SHEET NUMBER 15

PIER I PILING NOTES:

THE CONTRACT LENGTH OF 100 FEET FOR THE PIER I PILES IS BASED ON A MIXED SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 332 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL AND 0.7 FOR ROCK END BEARING.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A MIXED SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL AND 0.7 FOR ROCK END BEARING. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF FOOTING.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER I PILES IS 246 TONS AT END OF DRIVE OR RETAP. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

PIER NOTES:

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

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

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

CONSTRUCTION JOINTS ARE TO BE FORMED WITH DRESSED AND BEVELED STRIP. SEE PIER DETAILS FOR KEYWAY DIMENSIONS.

STEEL PILE POINTS ARE REQUIRED FOR THE STEEL H-PILES AT THE PIERS.

FORMS FOR THE PIER CAPS SHALL BE REMOVED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. EARLY FORM REMOVAL IS PROHIBITED.

CONCRETE SEALER IS TO BE APPLIED TO THE EXPOSED BRIDGE SEAT AND WASH SURFACES AT PIERS 4 AND 8.

PIER I CONC. PLACEMENT QUANTITIES	
LOCATION	QUANTITY
CAP & PEDESTALS (HIGH PERFORMANCE CONCRETE)*	109.3
COLUMN (HIGH PERFORMANCE CONCRETE)	47.4
FOOTING	120.0
TOTAL (CU. YDS.)	276.7

* QUANTITY IGNORES THE DEDUCTION OF CONCRETE VOLUME DUE TO THE FORM LINER.

NOTE:
CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED ON THE SUMMARY QUANTITIES SHEET.

SIGN TRUSS PEDESTAL NOTES:

FOR OVERHEAD SIGN TRUSS DETAILS, SEE DESIGN SHEETS 112-118.

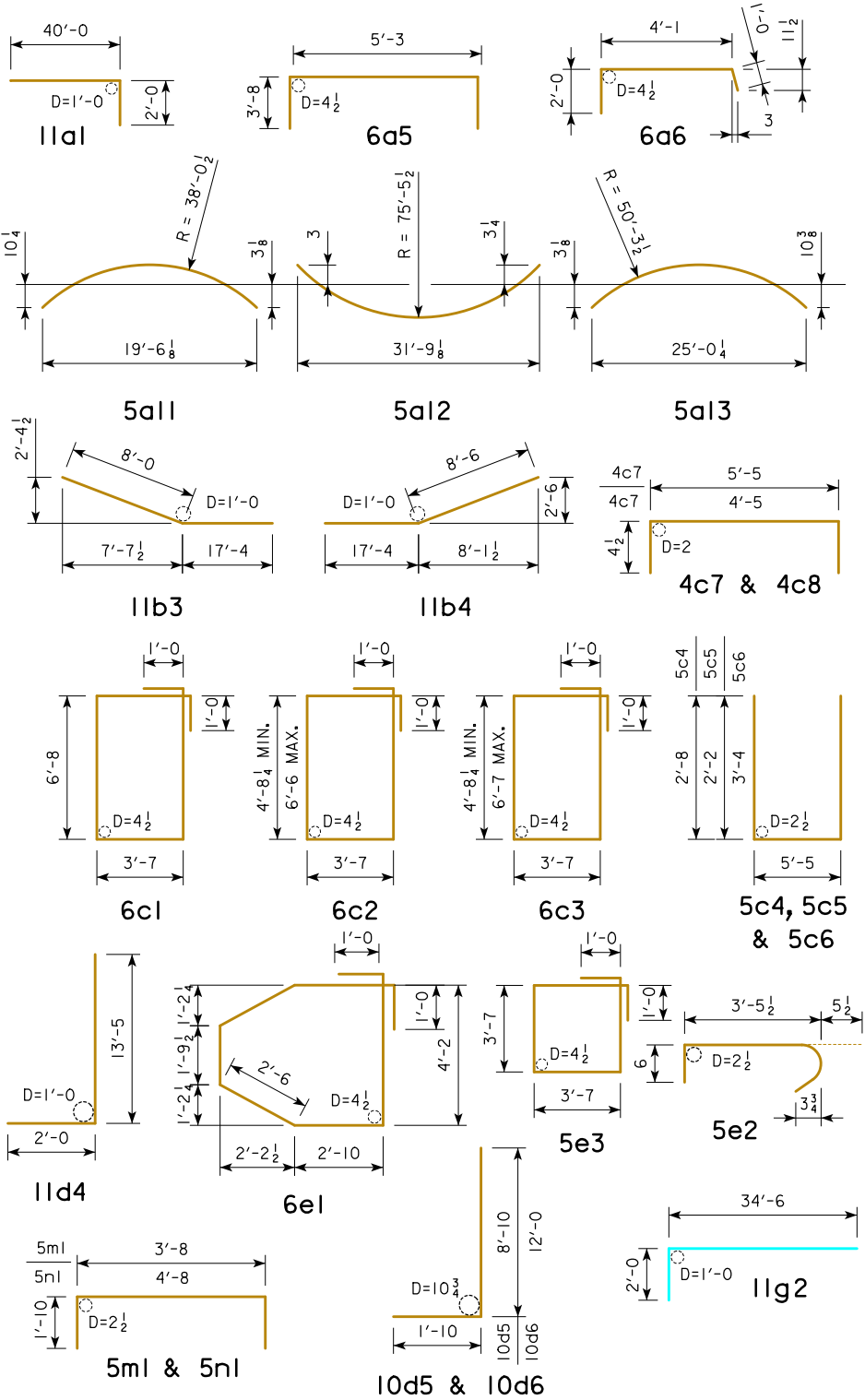
ONE ANCHOR BOLT ASSEMBLY INCLUDING ANCHOR PLATES, TEMPLATES, NUTS (4 PER BOLT) AND WASHERS (4 PER BOLT) ARE REQUIRED PER PEDESTAL.

ALL ANCHOR BOLT MATERIALS AND GALVANIZING SHALL BE IN ACCORDANCE WITH ARTICLE 4187.01, C, 3 OF THE STANDARD SPECIFICATIONS. ANCHOR BOLTS SHALL BE ASTM F1554, GRADE 55, CLASS 2A.

BENDING OR WELDING OF ANCHOR BOLTS SHALL NOT BE ALLOWED.

SEE STRUCTURAL ALIGNMENT / TOLERANCE NOTES ON DESIGN SHEET 113 FOR ANCHOR BOLT ASSEMBLY ALIGNMENT DOCUMENTATION REQUIREMENTS.

BENT BAR DETAILS



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

REINFORCING BAR LIST - PIER I

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
11a1	CAP LONGIT. TOP		18	42'-0	4,017
11a2	CAP LONGIT. TOP		18	40'-1	3,833
6a2	CAP LONGIT. SIDES		24	35'-11	1,295
6a3	CAP LONGIT. SIDES		4	33'-4	200
6a4	CAP LONGIT. SIDES		4	31'-2	187
6a5	CAP TRANSV. ENDS		12	12'-7	227
6a6	CAP VERTICAL ENDS		10	7'-1	106
5a7	CAP LONGIT. SIDES (RELIEF)		8	36'-0	300
5a8	CAP LONGIT. SIDES (RELIEF)		2	37'-4	78
5a9	CAP LONGIT. SIDES (RELIEF)		2	28'-4	59
5a10	CAP LONGIT. SIDES (RELIEF)		2	20'-2	42
5a11	CAP LONGIT. SIDES (RELIEF)		2	19'-9	41
5a12	CAP LONGIT. SIDES (RELIEF)		2	32'-0	67
5a13	CAP LONGIT. SIDES (RELIEF)		2	25'-3	53
5a14	CAP LONGIT. SIDES (RELIEF)		2	7'-9	16
5a15	CAP LONGIT. SIDES (RELIEF)		2	3'-0	6
5a16	CAP LONGIT. SIDES (RELIEF)		2	6'-11	14
5a17	CAP LONGIT. SIDES (RELIEF)		2	3'-1	6
11b1	CAP LONGIT. BOTTOM		9	54'-8	2,614
11b2	CAP LONGIT. BOTTOM		9	45'-1	2,156
11b3	CAP LONGIT. BOTTOM		9	25'-4	1,211
11b4	CAP LONGIT. BOTTOM		9	25'-10	1,235
6c1	CAP HOOPS		152	22'-6	5,137
6c2	CAP HOOPS CANTILEVER		20	VARIES	611
6c3	CAP HOOPS CANTILEVER		22	VARIES	675
5c4	CAP HAIRPINS VERTICAL (RELIEF)		44	10'-9	493
5c5	CAP HAIRPINS VERTICAL (RELIEF)		50	9'-9	508
5c6	CAP HAIRPINS VERTICAL (RELIEF)		44	12'-1	555
4c7	CAP HAIRPINS TOP		23	6'-2	95
4c8	CAP HAIRPINS BOTTOM		19	5'-2	66
11d1	COLUMN 1, VERTICAL		28	19'-2	2,851
11d2	COLUMN 2, VERTICAL		28	20'-3	3,012
11d3	COLUMN 3, VERTICAL		28	21'-5	3,186
11d4	FOOTING TO COLUMN DOWEL		84	15'-5	6,880
10d5	RIGHT SIGN TRUSS PEDESTAL		24	10'-8	1,102
10d6	LEFT SIGN TRUSS PEDESTAL		24	13'-10	1,429
6e1	COLUMN, HOOPS		90	18'-8	2,523
5e2	COLUMN, TIES		90	4'-5	415
5e3	SIGN TRUSS PEDESTAL, HOOPS		36	16'-4	613
5m1	CAP PEDESTAL LONGIT.		42	7'-0	307
5n1	CAP PEDESTAL TRANSV.		35	8'-0	292
REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)					48,513
6f1	FOOTING TRANSV. TOP		80	11'-8	1,402
11f2	FOOTING LONGIT. TOP		12	59'-8	3,804
11g1	FOOTING TRANSV. BOTTOM		80	11'-8	4,959
11g2	FOOTING LONGIT. BOTTOM		46	36'-6	8,921
REINFORCING STEEL - TOTAL (LBS.)					19,086



DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS

WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

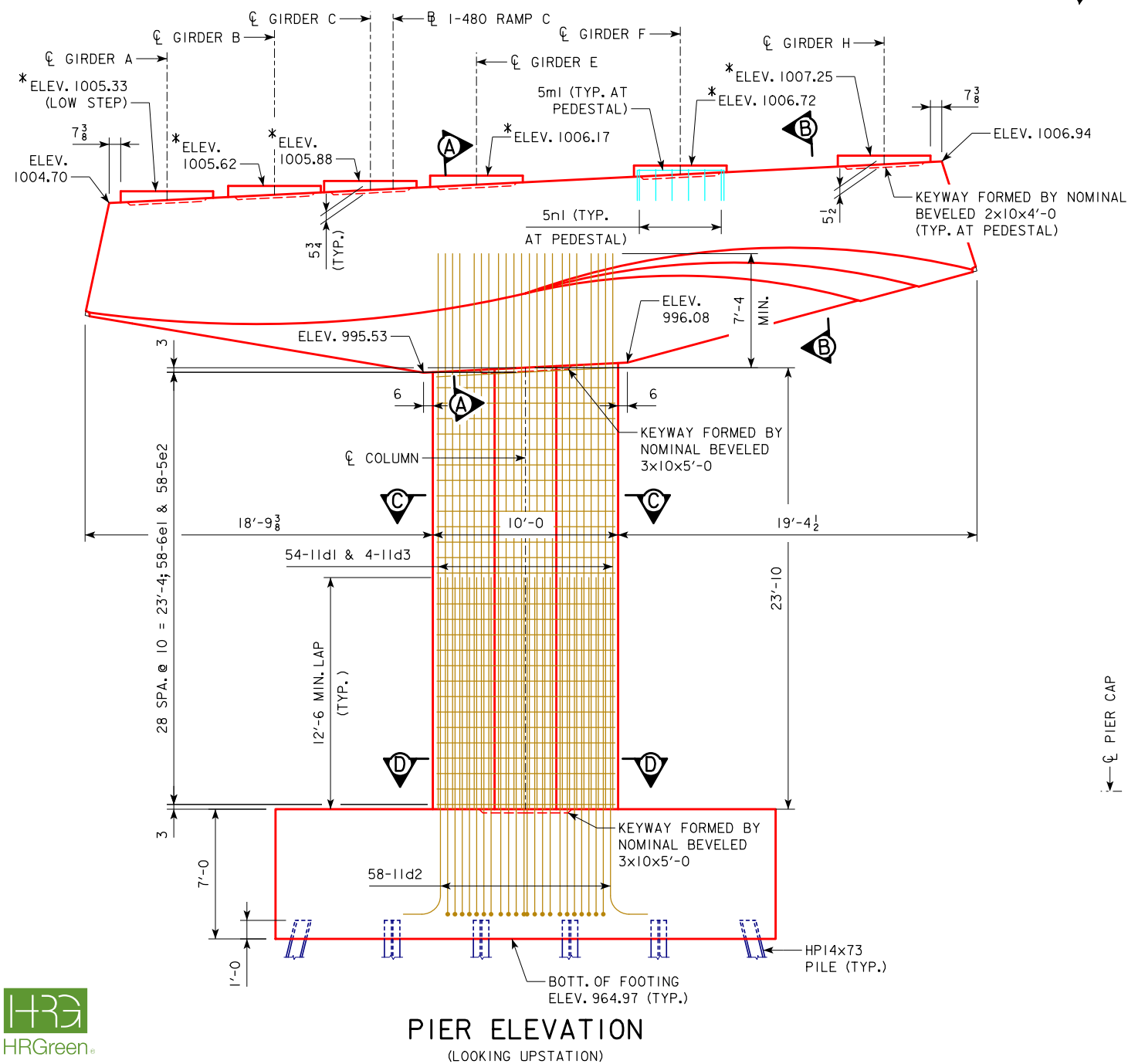
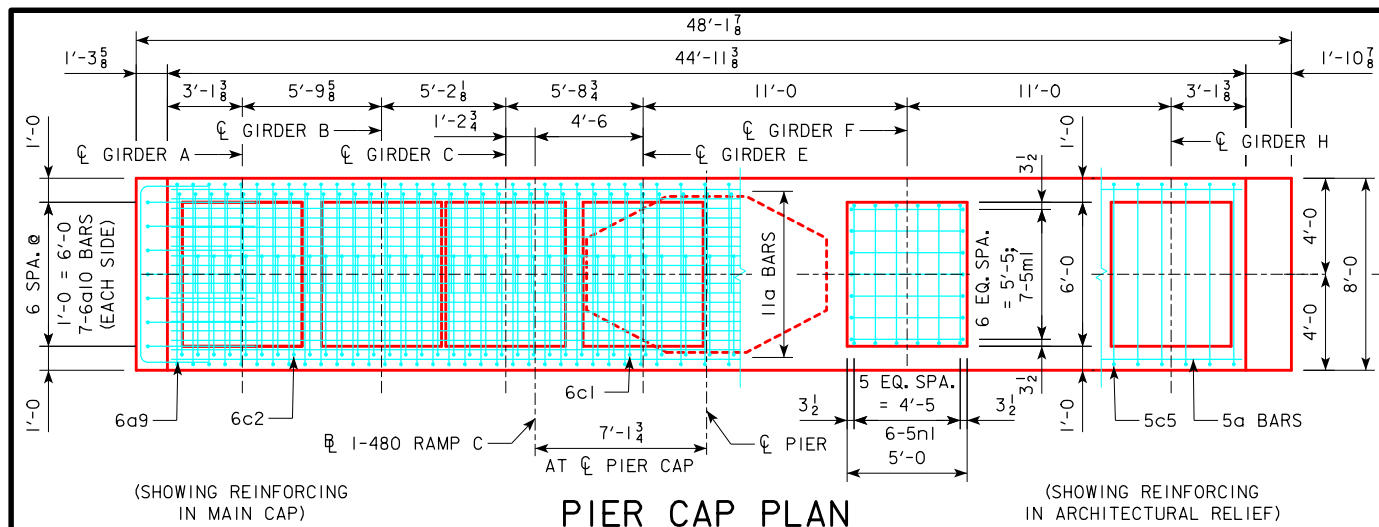
PIER I QUANTITIES

STA. 3546+14.50 (R 1-480 RAMP C) NOVEMBER, 2020

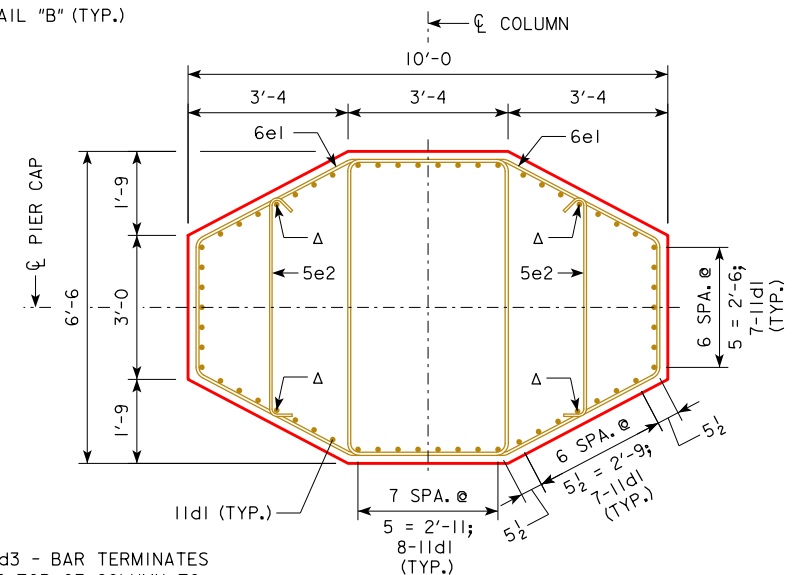
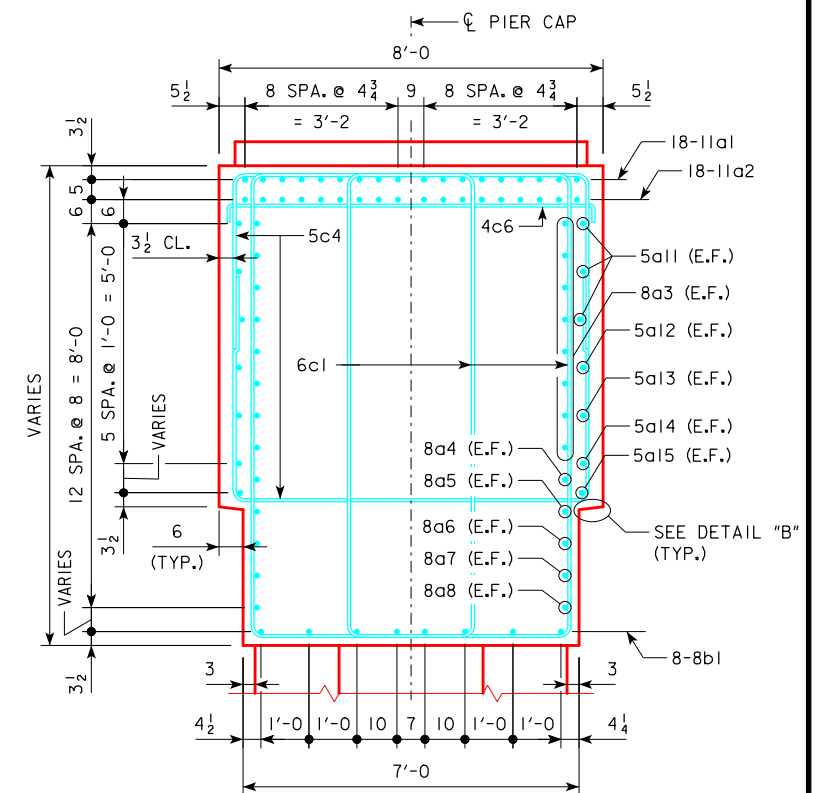
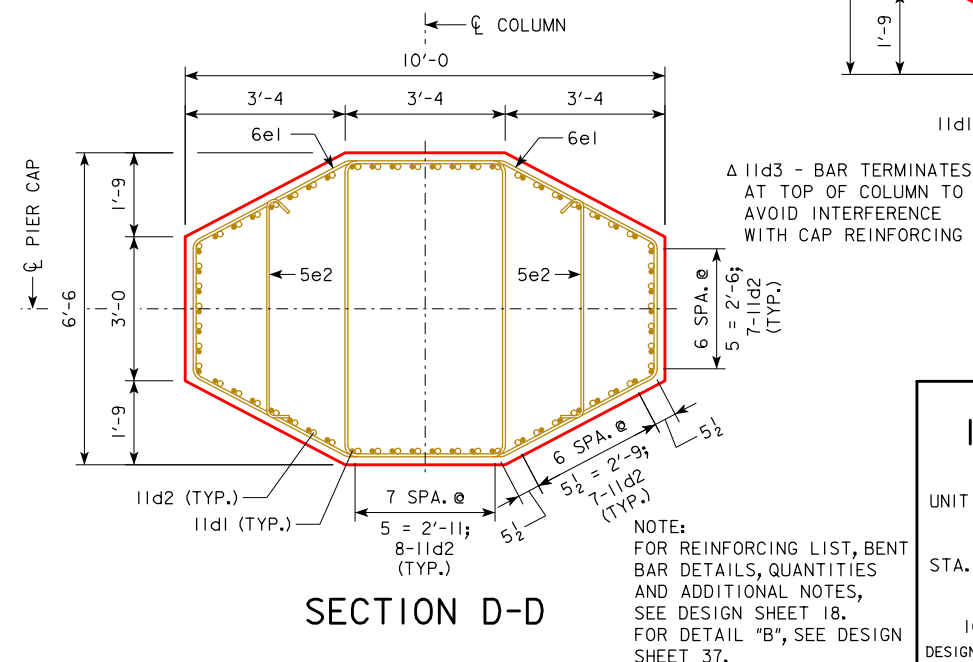
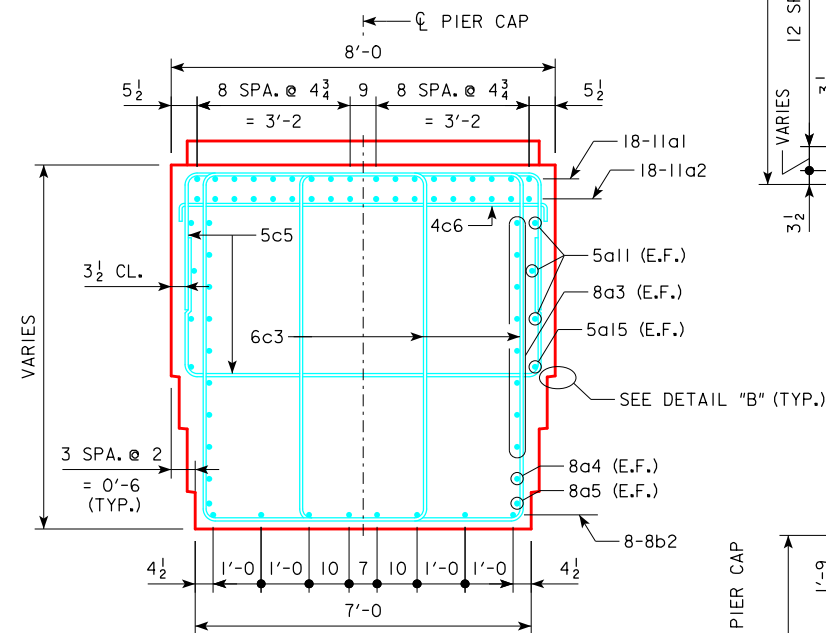
POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 15 OF 121 FILE NO. 30170 DESIGN NO. 1320



* ELEVATION AND PEDESTAL HEIGHTS DEPENDENT ON FINAL BEARING HEIGHT, WHICH SHALL BE DETERMINED BY BEARING MANUFACTURER. CONTRACTOR SHALL VERIFY BEARING HEIGHT WITH MANUFACTURER AND ADJUST ELEVATIONS IF NECESSARY PRIOR TO PLACING CONCRETE. MINIMUM PEDESTAL HEIGHT SHALL BE 4".



NOTE:
MINOR ADJUSTMENTS MAY BE MADE TO COLUMN/DOWEL
BAR SPACING TO ACCOMMODATE 5e2 PLACEMENT.
CONTRACTOR SHALL TEST PLACEMENT OF 6e1/5e2 TIES
PRIOR TO POURING FOOTING CONCRETE.

DESIGN FOR 0° SKEW

1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"

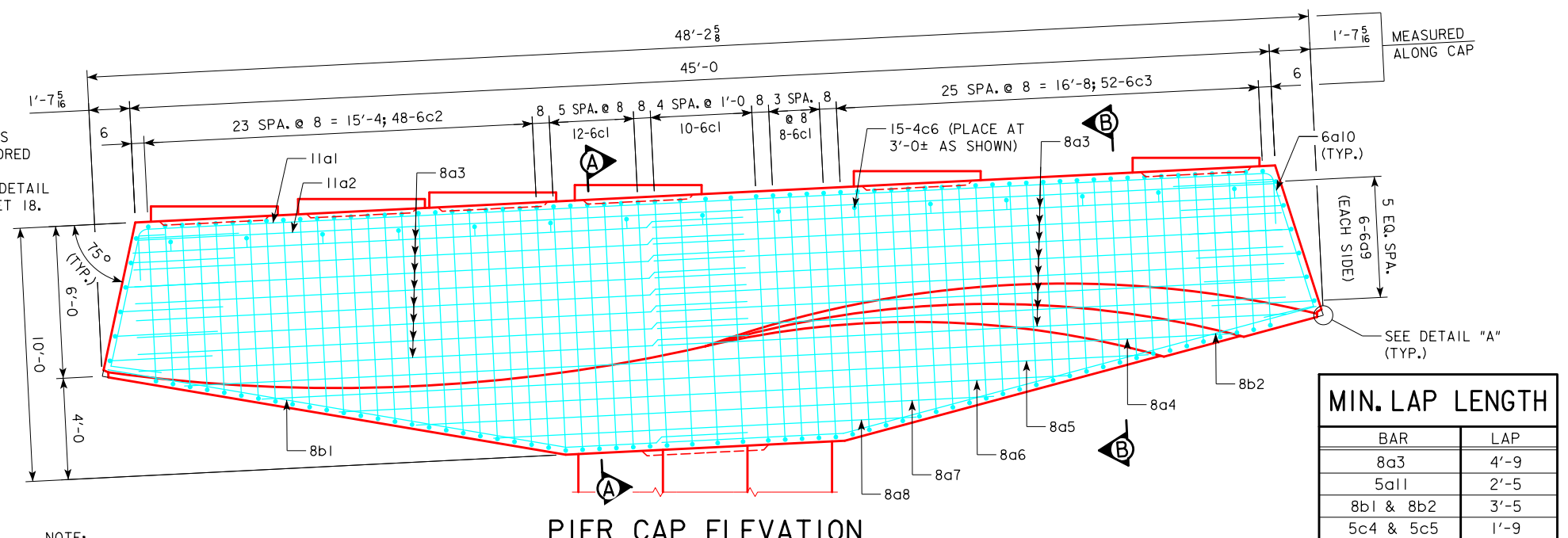
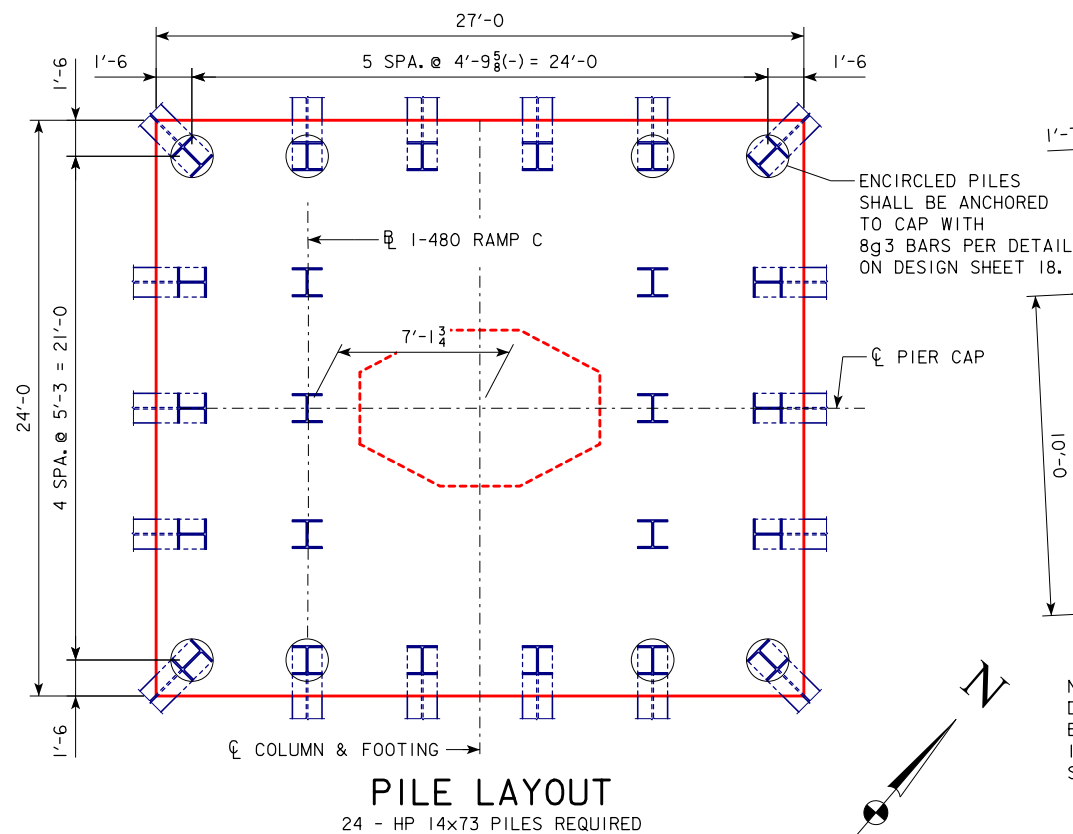
PIER 2 DETAILS

STA. 3546+14.50 (R) 1-480 RAMP C) NOVEMBER, 2020

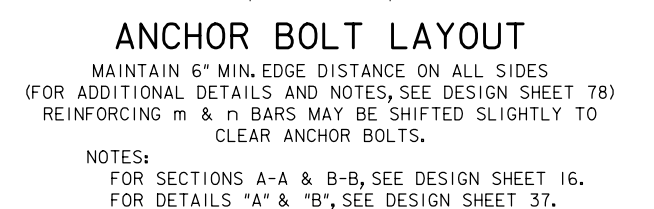
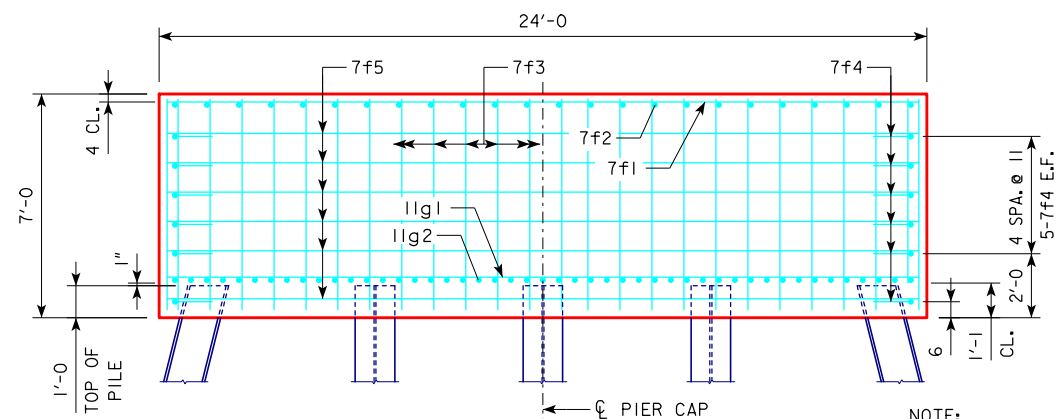
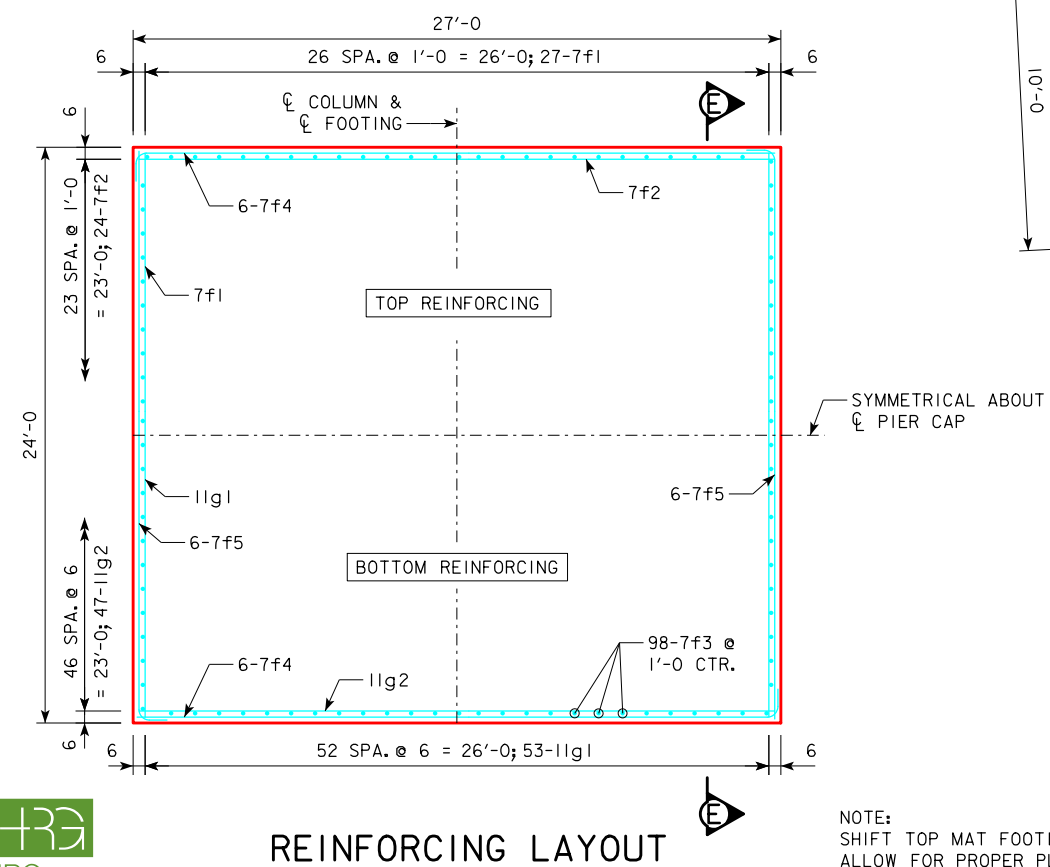
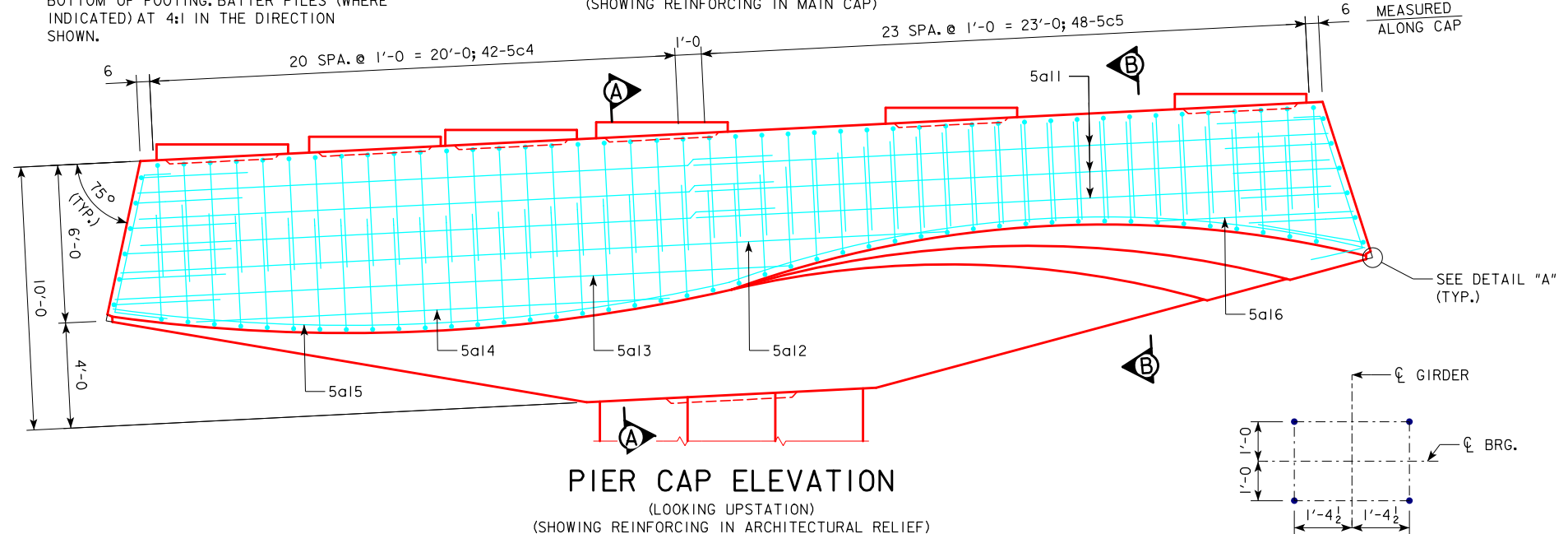
POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 16 OF 121 FILE NO. 30170 DESIGN NO. 1320



MIN. LAP LENGTH	
BAR	LAP
8a3	4'-9
5a11	2'-5
8b1 & 8b2	3'-5
5c4 & 5c5	1'-9



DESIGN FOR 0° SKEW
1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE
UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
PIER 2 DETAILS
STA. 3546+14.50 (R/L 1-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 17 OF 121 FILE NO. 30170 DESIGN NO. 1320

THE CONTRACT LENGTH OF 90 FEET FOR THE PIER 2 PILES IS BASED ON A NON-COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 370 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.7 FOR ROCK END BEARING. PIER 2 PILES ALSO WERE DESIGNED FOR A FACTORED TENSION FORCE OF 39 KIPS.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A NON-COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.7 FOR ROCK END BEARING. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF FOOTING.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER 2 PILES IS 289 TONS AT END OF DRIVE OR RETAP. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. IN NO CASE SHALL A PILE BE EMBEDDED LESS THAN 37 FEET. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

PIER 2 CONC. PLACEMENT QUANTITIES

LOCATION	QUANTITY
CAP & PEDESTALS (HIGH PERFORMANCE CONCRETE)*	116.6
COLUMN (HIGH PERFORMANCE CONCRETE)	47.1
FOOTING	168.0
TOTAL (CU. YDS.)	331.7

NOTE:
CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED
ON THE SUMMARY QUANTITIES SHEET.



REINFORCING BAR LIST - PIER 2

EPOXY COATED	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
	11d1	COLUMN VERTICAL		54	31'-5	9,014
	11d2	FOOTING TO COLUMN DOWEL		58	20'-4	6,266
	11d3	COLUMN VERTICAL		4	23'-7	501
	6e1	COLUMN HOOPS		58	24'-11	2,171
	5e2	COLUMN TIES		58	5'-6	333
	REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)					18,285
NON-COATED BARS	11a1	CAP LONGIT. TOP		18	48'-9	4,662
	11a2	CAP LONGIT. TOP		18	44'-9	4,280
	8a3	CAP LONGIT. SIDES		32	24'-11	2,129
	8a4	CAP LONGIT. SIDES		2	39'-2	209
	8a5	CAP LONGIT. SIDES		2	33'-1	177
	8a6	CAP LONGIT. SIDES		2	26'-11	144
	8a7	CAP LONGIT. SIDES		2	20'-10	111
	8a8	CAP LONGIT. SIDES		2	14'-9	79
	6a9	CAP TRANSV. ENDS		12	15'-3	275
	6a10	CAP VERTICAL ENDS		14	8'-7	180
	5a11	CAP LONGIT. SIDES (RELIEF)		12	23'-9	297
	5a12	CAP LONGIT. SIDES (RELIEF)		2	29'-8	62
	5a13	CAP LONGIT. SIDES (RELIEF)		2	24'-10	52
	5a14	CAP LONGIT. SIDES (RELIEF)		2	15'-3	32
	5a15	CAP LONGIT. SIDES (RELIEF)		2	47'-10	100
	5a16	CAP LONGIT. SIDES (RELIEF)		2	5'-10	12
	8b1	CAP LONGIT. BOTTOM		8	25'-5	543
	8b2	CAP LONGIT. BOTTOM		8	26'-5	564
	6c1	CAP HOOPS		30	30'-8	1,382
	6c2	CAP HOOPS CANTILEVER		48	VARIES	1,941
	6c3	CAP HOOPS CANTILEVER		52	VARIES	2,102
	5c4	CAP HAIRPINS VERTICAL (RELIEF)		42	15'-11	697
	5c5	CAP HAIRPINS VERTICAL (RELIEF)		48	15'-1	755
	4c6	CAP HAIRPINS TOP		15	8'-2	82
	7f1	FOOTING TRANSV. TOP		27	23'-8	1,306
	7f2	FOOTING LONGIT. TOP		24	26'-8	1,308
	7f3	FOOTING SIDE VERTICAL		98	6'-7	1,319
	7f4	FOOTING SIDE HORIZONTAL		12	27'-10	683
	7f5	FOOTING SIDE HORIZONTAL		12	24'-10	609
	11g1	FOOTING TRANSV. BOTTOM		53	23'-8	6,664
11g2	FOOTING LONGIT. BOTTOM		47	26'-8	6,659	
8g3	PILE UPLIFT ANCHORS		24	13'-8	876	
5m1	CAP PEDESTAL LONGIT.		42	8'-4	365	
5n1	CAP PEDESTAL TRANSV.		36	9'-4	350	
	REINFORCING STEEL - TOTAL (LBS.)					41,006

DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

PIER 2 QUANTITIES

STA. 3546+14.50 (B I-480 RAMP C)

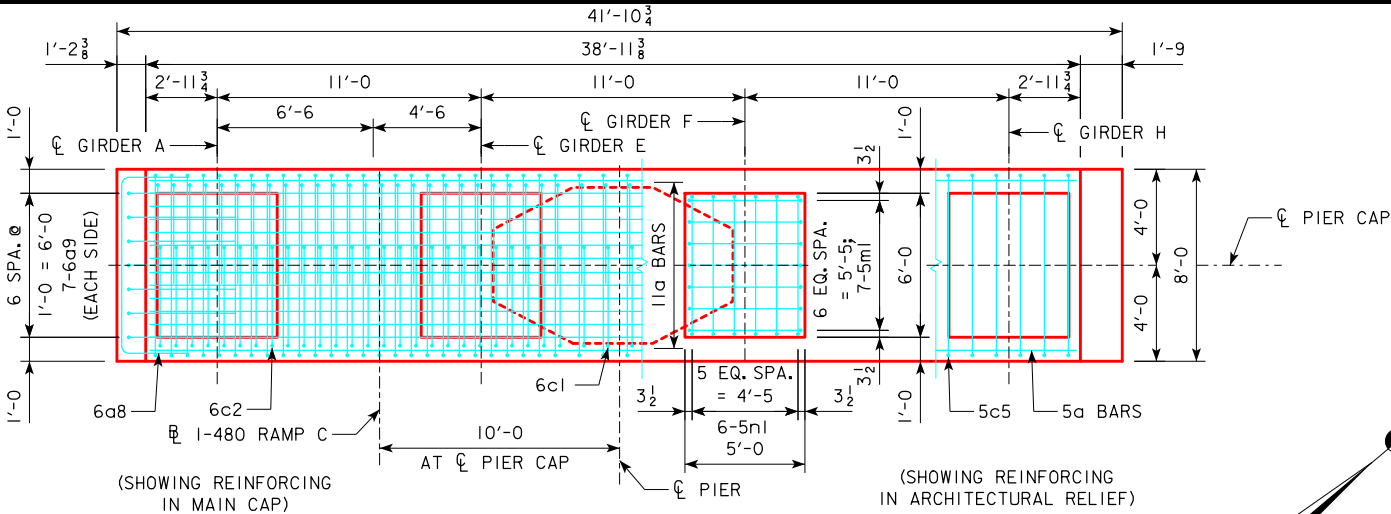
NOVEMBER, 2020

POTTAWATTAMIE COUNTY

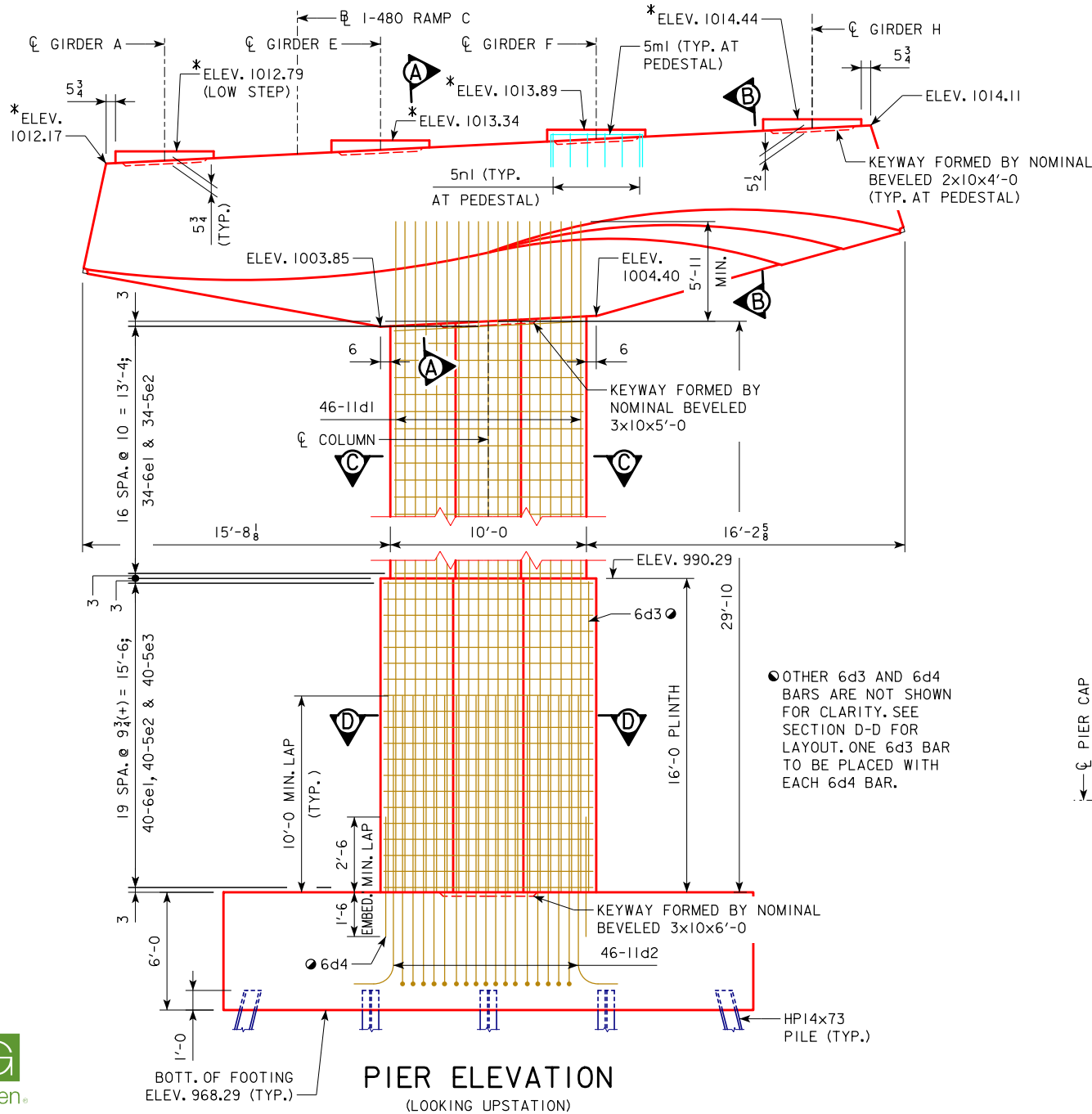
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 18 OF 121 FILE NO. 30170 DESIGN NO. 1320

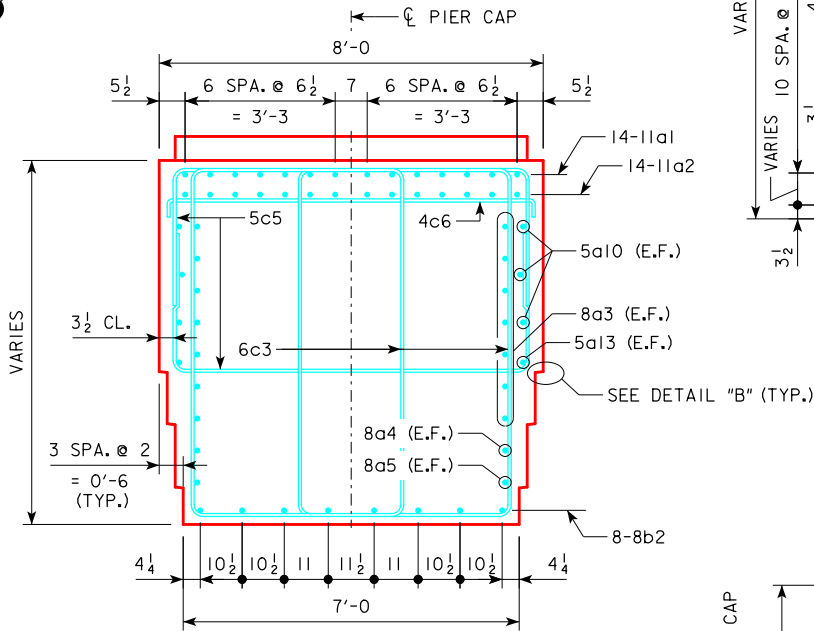
* ELEVATION AND PEDESTAL HEIGHTS DEPENDENT ON FINAL BEARING HEIGHT, WHICH SHALL BE DETERMINED BY BEARING MANUFACTURER. CONTRACTOR SHALL VERIFY BEARING HEIGHT WITH MANUFACTURER AND ADJUST ELEVATIONS IF NECESSARY PRIOR TO PLACING CONCRETE. MINIMUM PEDESTAL HEIGHT SHALL BE 4".



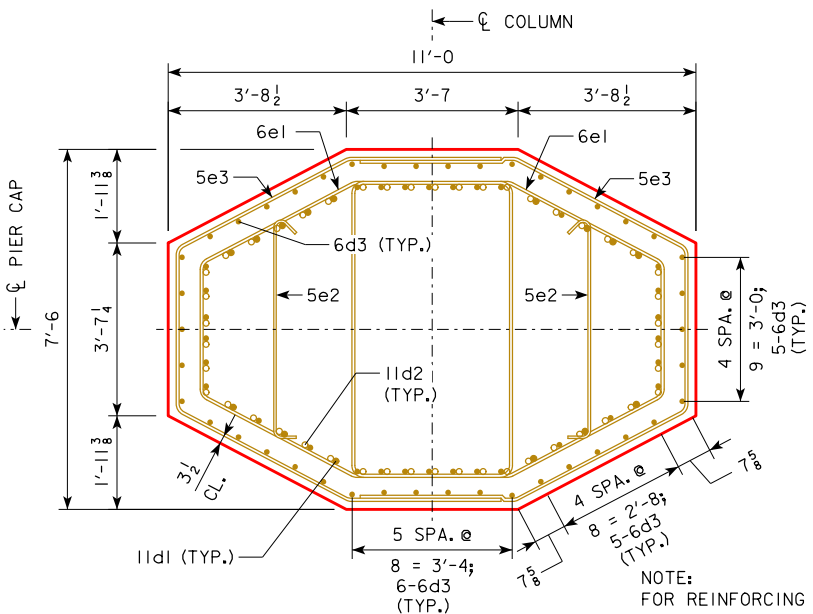
PIER CAP PLAN



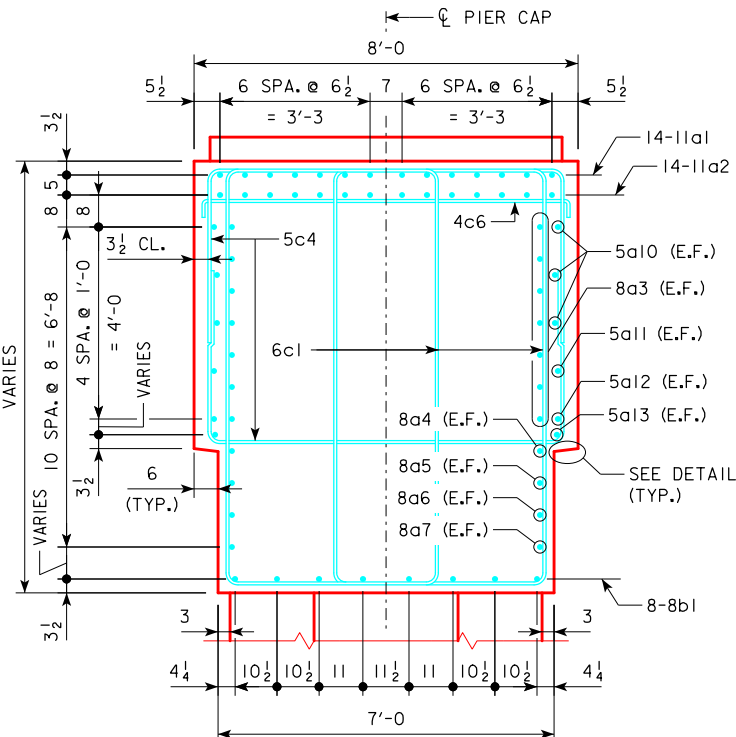
PIER ELEVATION
(LOOKING UPSTATION)



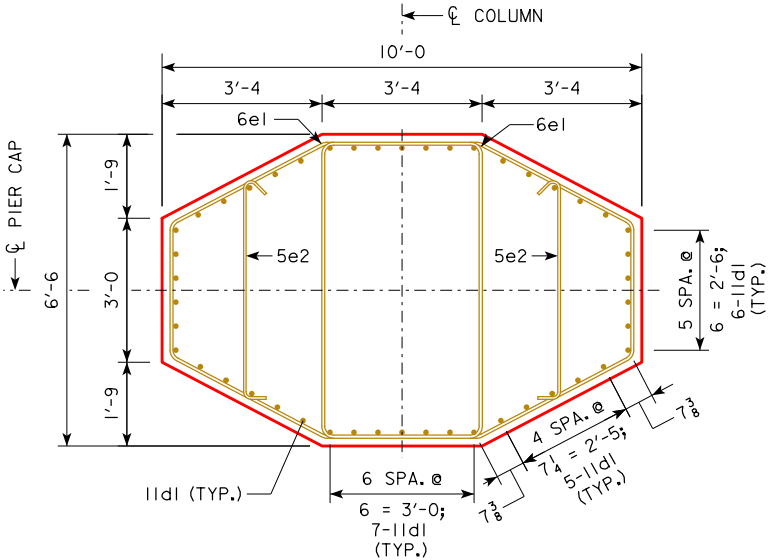
SECTION B-B



SECTION D-D



SECTION A-A

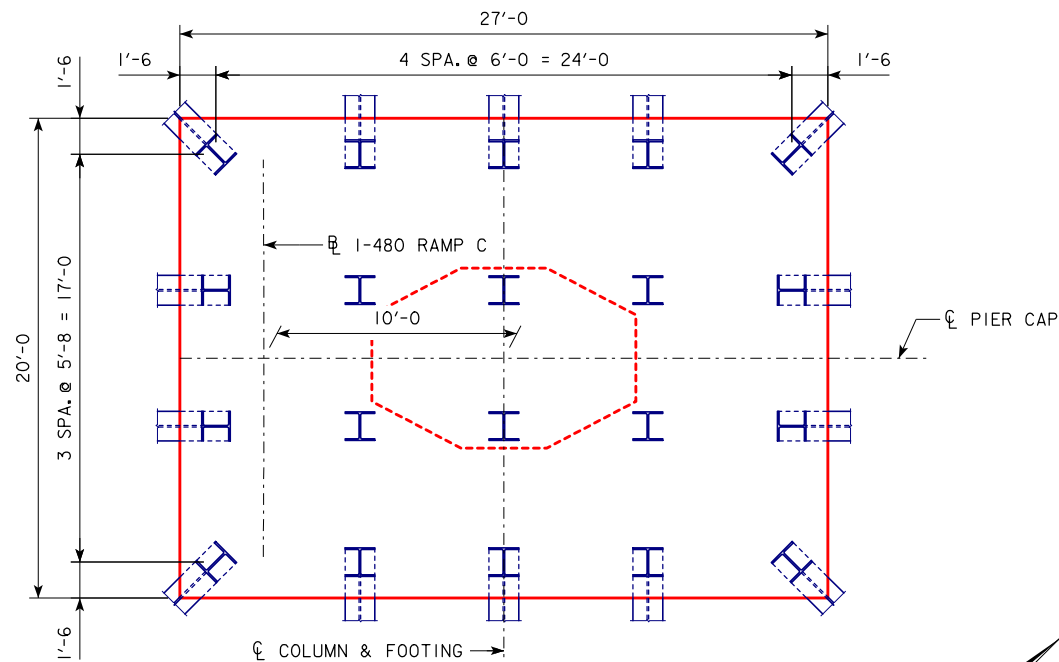


SECTION C-C

NOTE:
MINOR ADJUSTMENTS MAY BE MADE TO COLUMN/DOWEL BAR SPACING TO ACCOMMODATE 5e2 PLACEMENT. CONTRACTOR SHALL TEST PLACEMENT OF 6e1/5e2 TIES PRIOR TO POURING FOOTING CONCRETE.

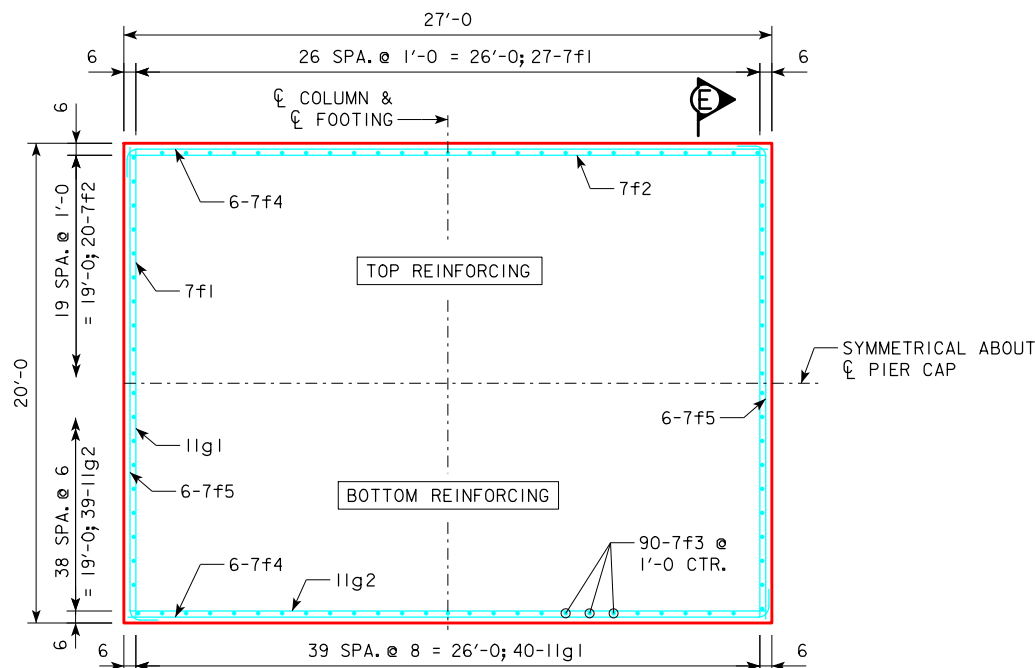
DESIGN FOR 0° SKEW
1419'-0" x VARIES CONTINUOUS WELDED GIRDER BRIDGE
UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0
PIER 3 DETAILS
STA. 3546+14.50 (I-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 19 OF 121 FILE NO. 30170 DESIGN NO. 1320





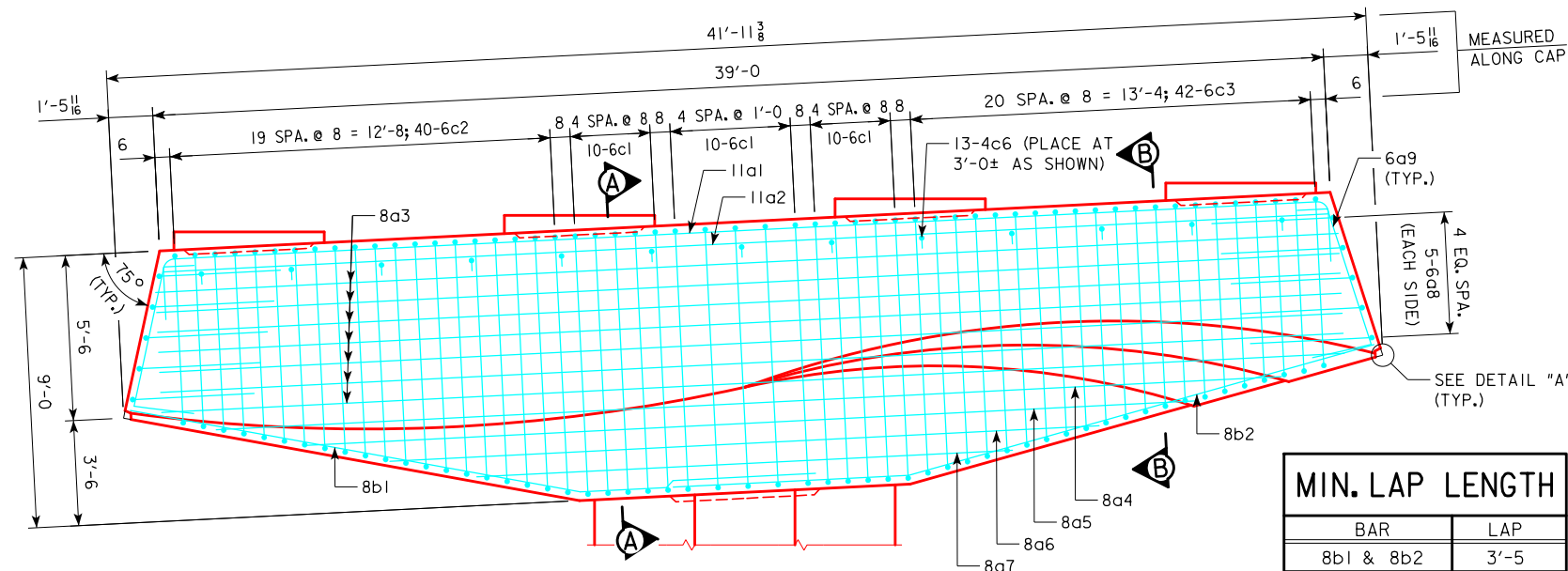
PILE LAYOUT
20 - HP 14x73 PILES REQUIRED

NOTE:
DIMENSIONS SHOWN ON PILE LAYOUT ARE AT
BOTTOM OF FOOTING. BATTER PILES (WHERE
INDICATED) AT 4:1 IN THE DIRECTION
SHOWN.



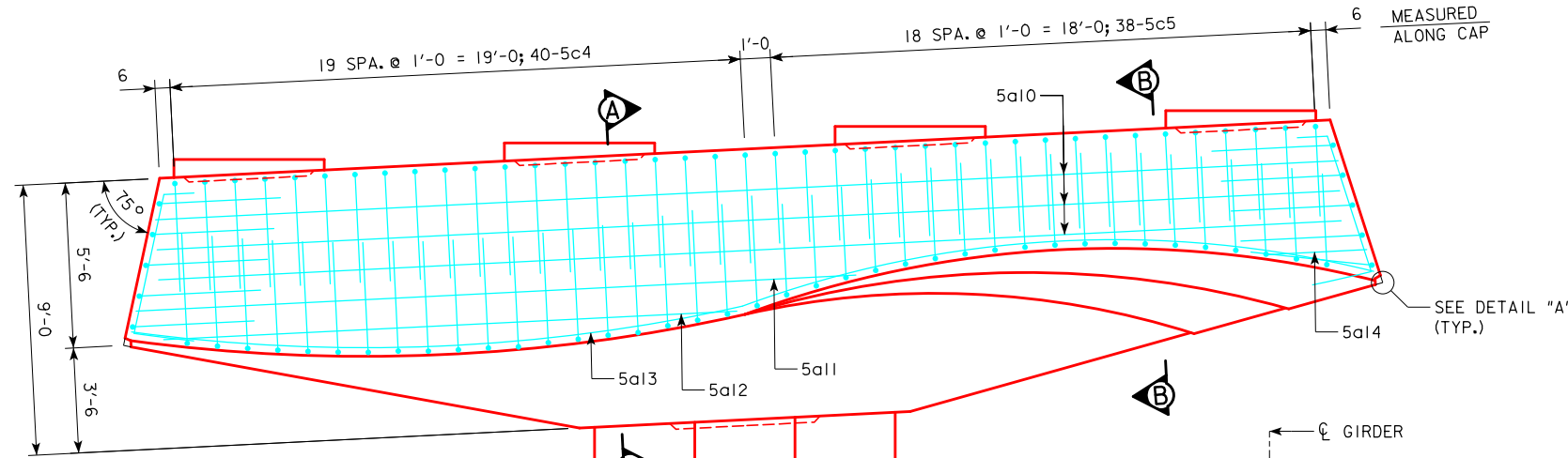
REINFORCING LAYOUT

NOTE:
SHIFT TOP MAT FOOTING f1 & f2 BARS AS NECESSARY TO
ALLOW FOR PROPER PLACEMENT OF COLUMN DOWEL BARS.

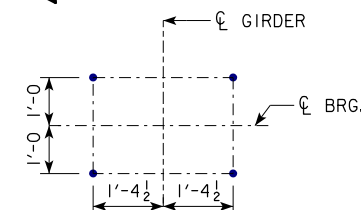


PIER CAP ELEVATION
(LOOKING UPSTATION)
(SHOWING REINFORCING IN MAIN CAP)

MIN. LAP LENGTH	
BAR	LAP
8b1 & 8b2	3'-5
5c4 & 5c5	1'-9
5e3	2'-11



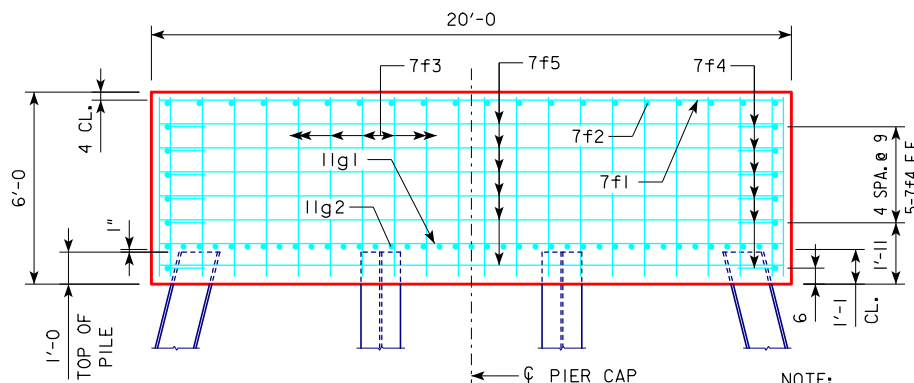
PIER CAP ELEVATION
(LOOKING UPSTATION)
(SHOWING REINFORCING IN ARCHITECTURAL RELIEF)



ANCHOR BOLT LAYOUT

MAINTAIN 6" MIN. EDGE DISTANCE ON ALL SIDES
(FOR ADDITIONAL DETAILS AND NOTES, SEE DESIGN SHEET 78)
REINFORCING m & n BARS MAY BE SHIFTED SLIGHTLY TO
CLEAR ANCHOR BOLTS.

NOTES:
FOR SECTIONS A-A & B-B, SEE DESIGN SHEET 19.
FOR DETAILS "A" & "B", SEE DESIGN SHEET 37.



SECTION E-E

NOTE:
FOR REINFORCING LIST, BENT
BAR DETAILS, QUANTITIES
AND ADDITIONAL NOTES,
SEE DESIGN SHEET 21.

DESIGN FOR 0° SKEW
**1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE**
UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
PIER 3 DETAILS
STA. 3546+14.50 (RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 20 OF 121 FILE NO. 30170 DESIGN NO. 1320



PIER 3 PILING NOTES:

THE CONTRACT LENGTH OF 95 FEET FOR THE PIER 3 PILES IS BASED ON A NON-COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 365 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.7 FOR ROCK END BEARING. PIER 3 PILES ALSO WERE DESIGNED FOR A FACTORED TENSION FORCE OF 24 KIPS.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A NON-COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.7 FOR ROCK END BEARING. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF FOOTING.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER 3 PILES IS 285 TONS AT END OF DRIVE OR RETAP. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. IN NO CASE SHALL A PILE BE EMBEDDED LESS THAN 31 FEET. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

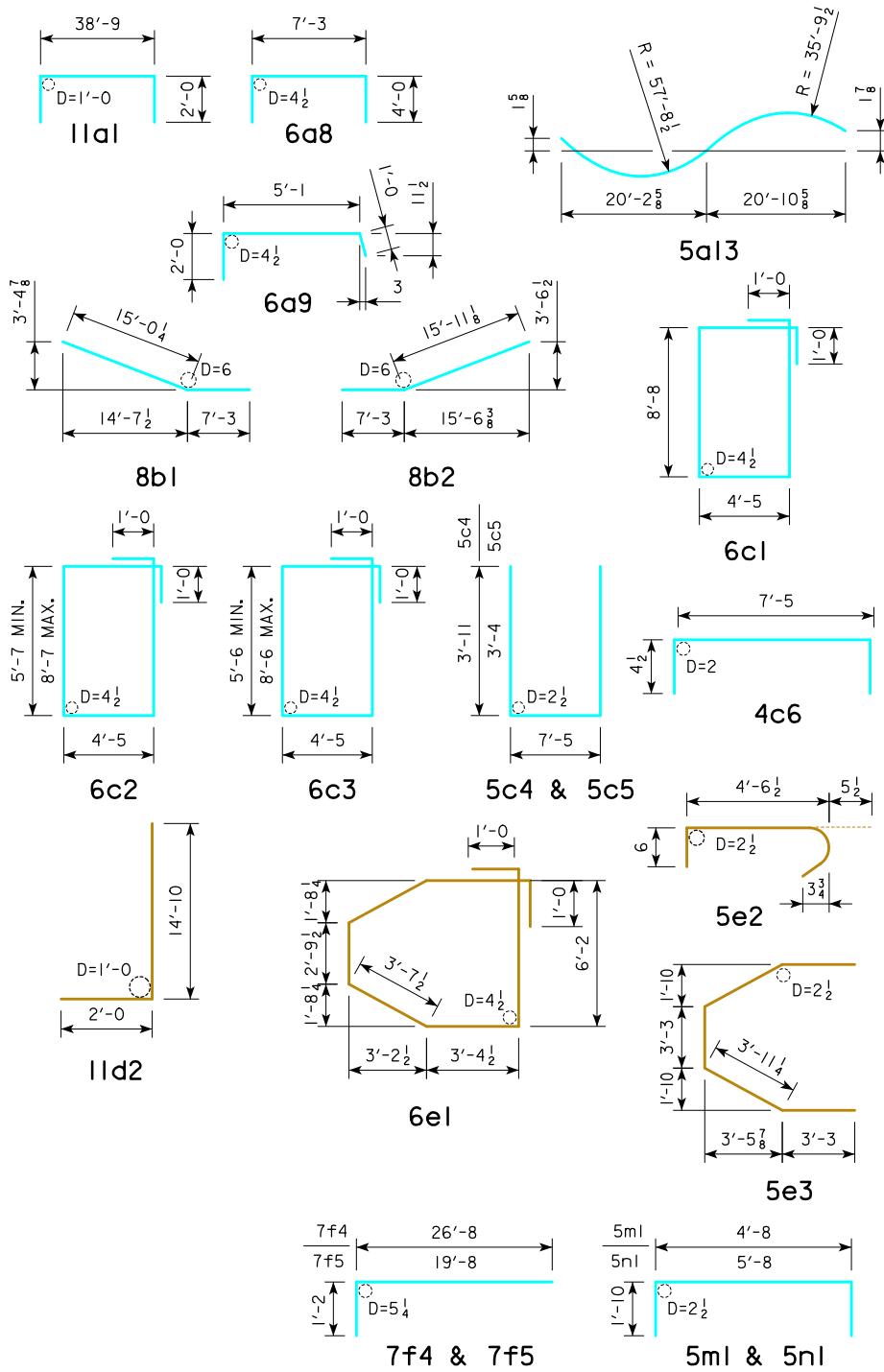
SEE DESIGN SHEET 15 FOR ADDITIONAL PIER NOTES.

PIER 3 CONC. PLACEMENT QUANTITIES	
LOCATION	QUANTITY
CAP & PEDESTALS (HIGH PERFORMANCE CONCRETE)*	92.0
COLUMN (HIGH PERFORMANCE CONCRETE)	67.6
FOOTING	120.0
TOTAL (CU. YDS.)	279.6

* QUANTITY IGNORES THE DEDUCTION OF CONCRETE VOLUME DUE TO THE FORM LINER.

NOTE:
CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED ON THE SUMMARY QUANTITIES SHEET.

BENT BAR DETAILS



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

REINFORCING BAR LIST - PIER 3

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
11d1	COLUMN VERTICAL		46	36'-0	8,798
11d2	FOOTING TO COLUMN DOWEL		46	16'-10	4,114
6d3	PLINTH VERTICAL		42	15'-10	999
6d4	FOOTING TO PLINTH DOWEL		42	4'-0	252
6e1	COLUMN HOOPS		74	25'-0	2,779
5e2	COLUMN TIES		74	5'-6	425
5e3	PLINTH HAIRPINS		40	17'-8	737
REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)					18,104
11a1	CAP LONGIT. TOP		14	42'-9	3,180
11a2	CAP LONGIT. TOP		14	38'-9	2,882
8a3	CAP LONGIT. SIDES		14	39'-1	1,461
8a4	CAP LONGIT. SIDES		2	33'-4	178
8a5	CAP LONGIT. SIDES		2	27'-7	147
8a6	CAP LONGIT. SIDES		2	21'-9	116
8a7	CAP LONGIT. SIDES		2	16'-0	85
6a8	CAP TRANSV. ENDS		10	15'-3	229
6a9	CAP VERTICAL ENDS		14	8'-1	170
5a10	CAP LONGIT. SIDES (RELIEF)		6	39'-1	245
5a11	CAP LONGIT. SIDES (RELIEF)		2	22'-11	48
5a12	CAP LONGIT. SIDES (RELIEF)		2	16'-10	35
5a13	CAP LONGIT. SIDES (RELIEF)		2	41'-6	87
5a14	CAP LONGIT. SIDES (RELIEF)		2	2'-3	5
8b1	CAP LONGIT. BOTTOM		8	22'-3	475
8b2	CAP LONGIT. BOTTOM		8	23'-2	495
6c1	CAP HOOPS		30	28'-2	1,269
6c2	CAP HOOPS CANTILEVER		40	VARIES	1,502
6c3	CAP HOOPS CANTILEVER		42	VARIES	1,567
5c4	CAP HAIRPINS VERTICAL (RELIEF)		40	15'-3	636
5c5	CAP HAIRPINS VERTICAL (RELIEF)		38	14'-1	558
4c6	CAP HAIRPINS TOP		13	8'-2	71
7f1	FOOTING TRANSV. TOP		27	19'-8	1,085
7f2	FOOTING LONGIT. TOP		20	26'-8	1,090
7f3	FOOTING SIDE VERTICAL		90	5'-7	1,027
7f4	FOOTING SIDE HORIZONTAL		12	27'-10	683
7f5	FOOTING SIDE HORIZONTAL		12	20'-10	511
11g1	FOOTING TRANSV. BOTTOM		40	19'-8	4,180
11g2	FOOTING LONGIT. BOTTOM		39	26'-8	5,526
5m1	CAP PEDESTAL LONGIT.		28	8'-4	243
5n1	CAP PEDESTAL TRANSV.		24	9'-4	234
REINFORCING STEEL - TOTAL (LBS.)					30,020



DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS

WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

PIER 3 QUANTITIES

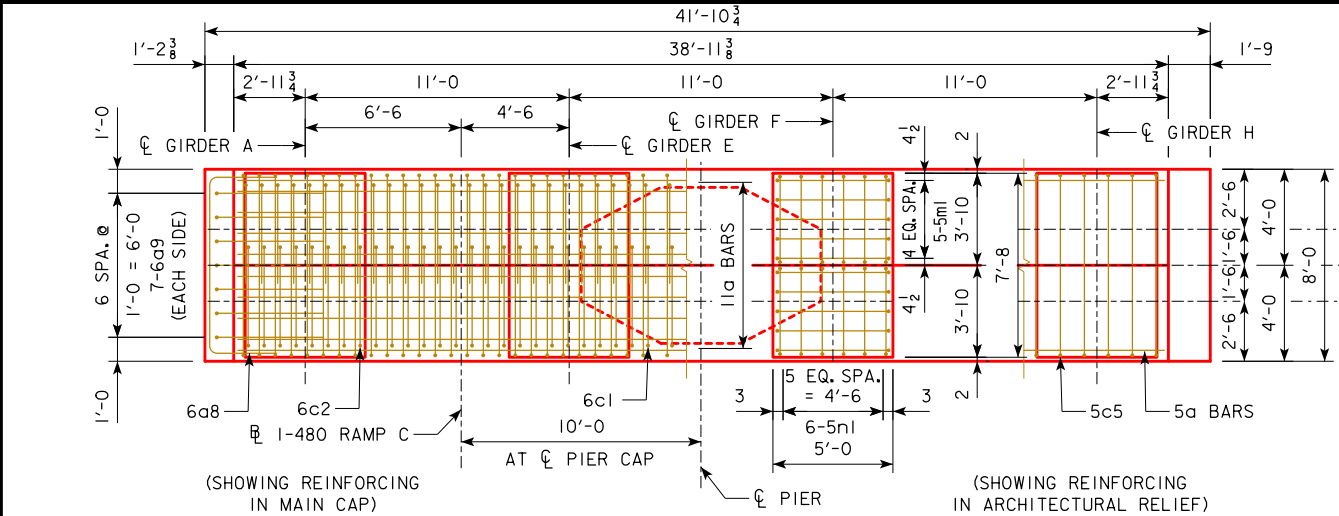
STA. 3546+14.50 (R 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

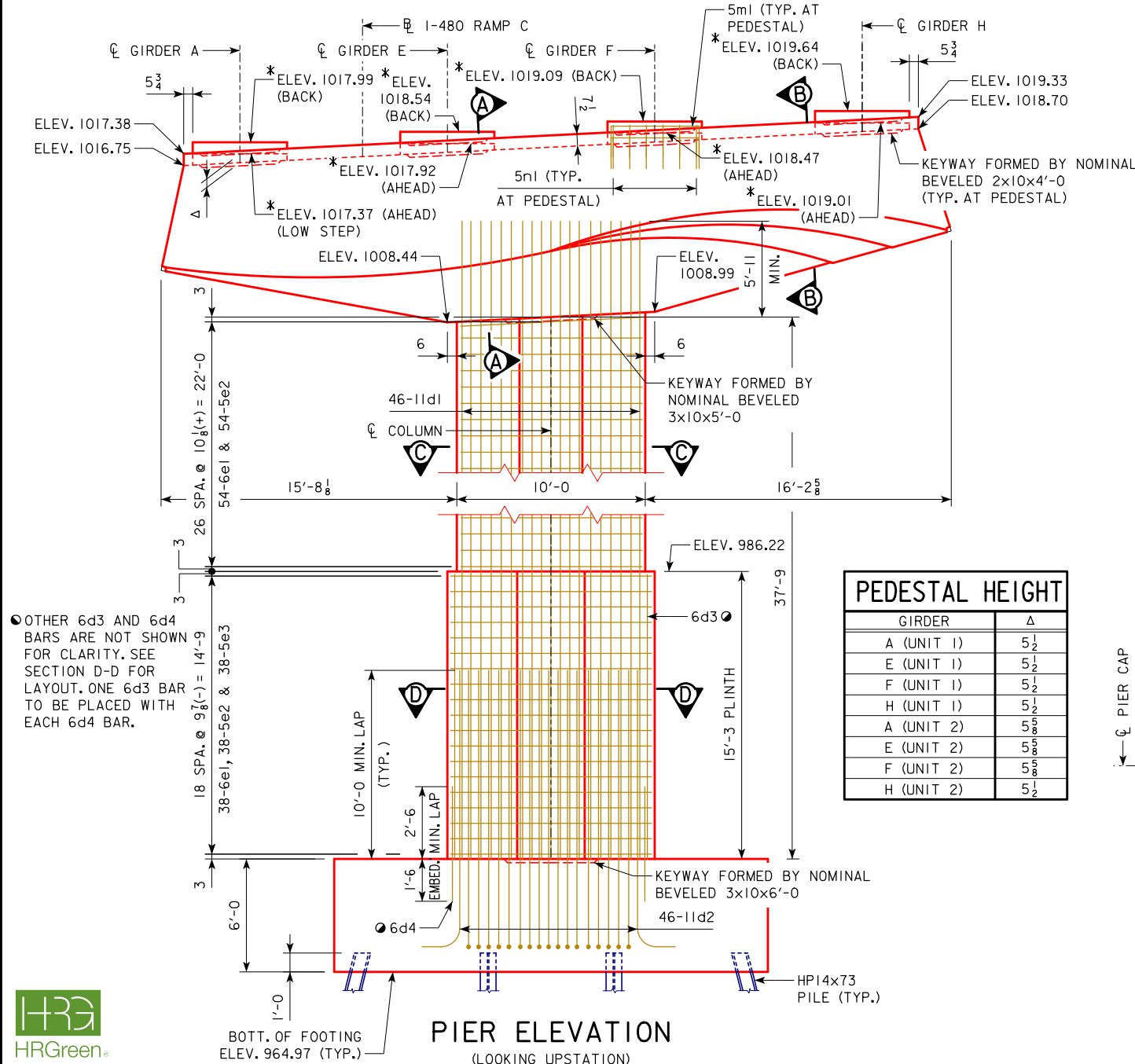
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 21 OF 121 FILE NO. 30170 DESIGN NO. 1320

* ELEVATION AND PEDESTAL HEIGHTS DEPENDENT ON FINAL BEARING HEIGHT, WHICH SHALL BE DETERMINED BY BEARING MANUFACTURER. CONTRACTOR SHALL VERIFY BEARING HEIGHT WITH MANUFACTURER AND ADJUST ELEVATIONS IF NECESSARY PRIOR TO PLACING CONCRETE. MINIMUM PEDESTAL HEIGHT SHALL BE 4".

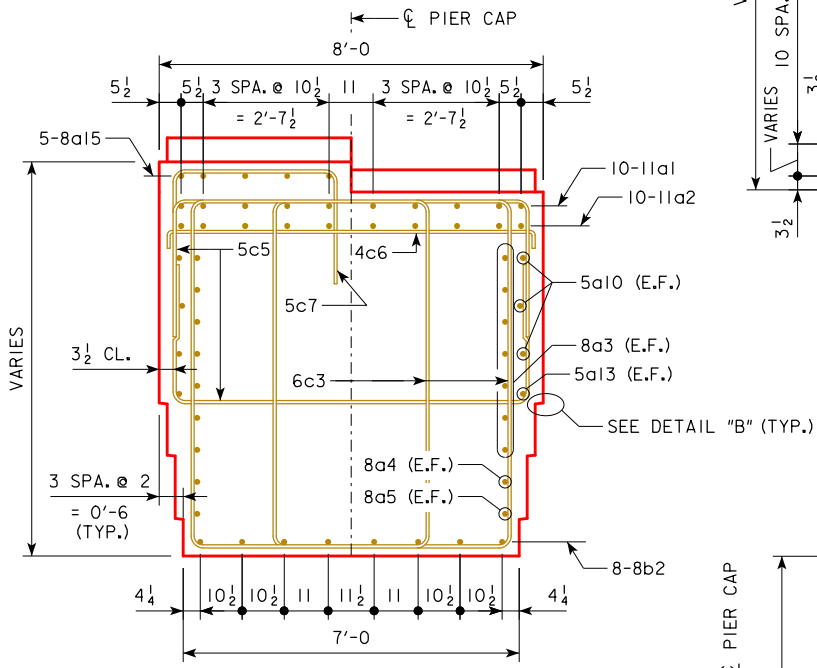
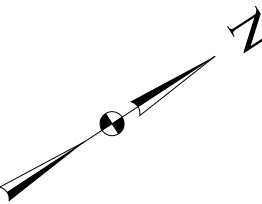


PIER CAP PLAN

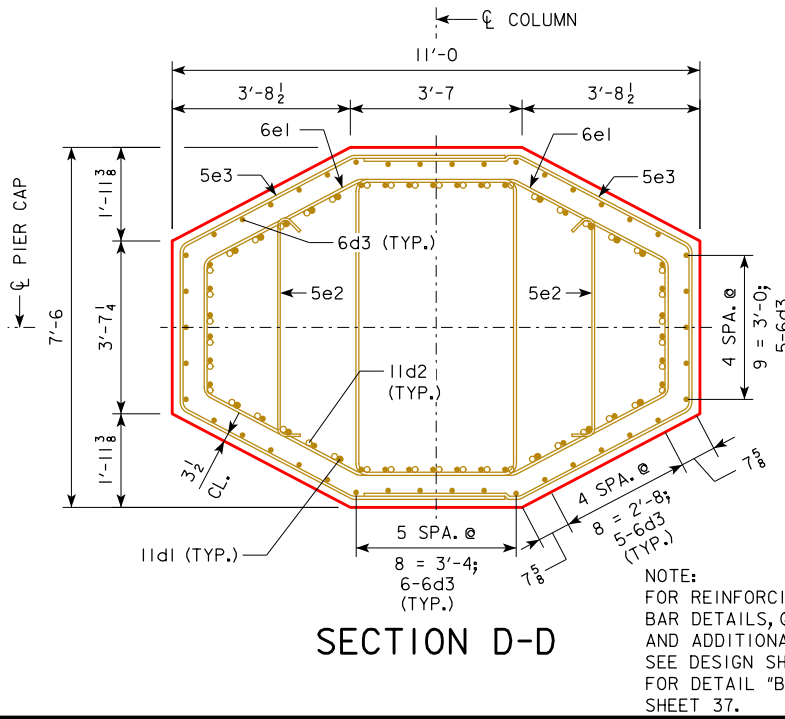


PIER ELEVATION
(LOOKING UPSTATION)

OTHER 6d3 AND 6d4 BARS ARE NOT SHOWN FOR CLARITY. SEE SECTION D-D FOR LAYOUT. ONE 6d3 BAR TO BE PLACED WITH EACH 6d4 BAR.

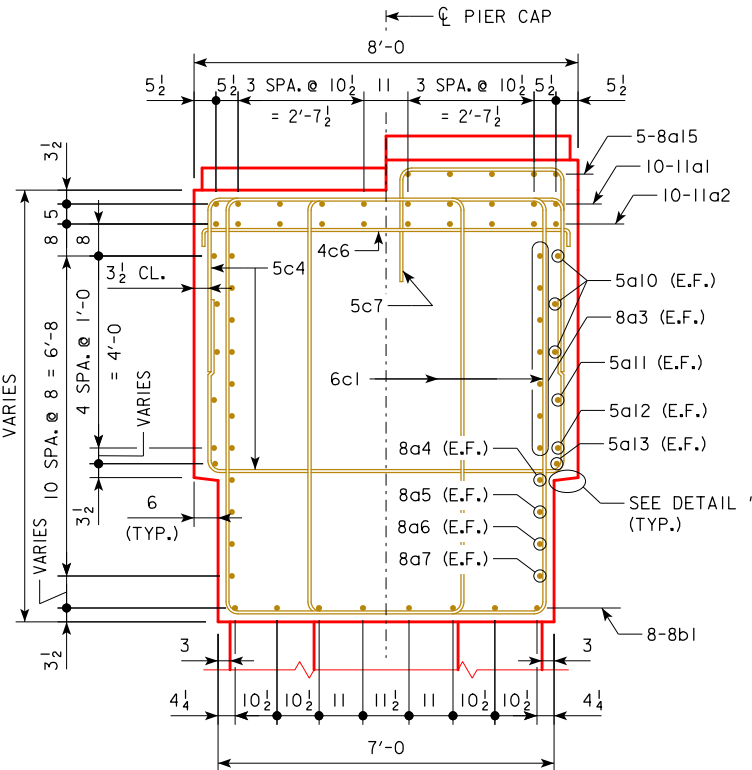


SECTION B-B

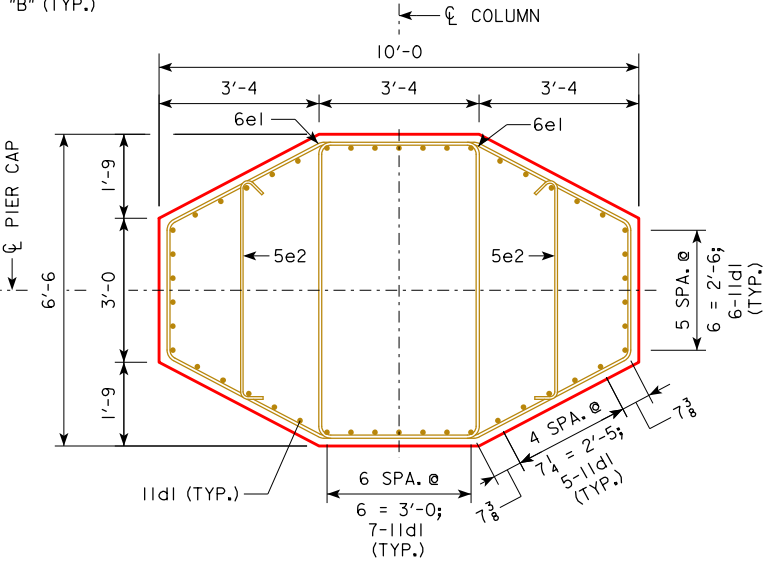


SECTION D-D

NOTE: FOR REINFORCING LIST, BENT BAR DETAILS, QUANTITIES AND ADDITIONAL NOTES, SEE DESIGN SHEET 24. FOR DETAIL "B", SEE DESIGN SHEET 37.



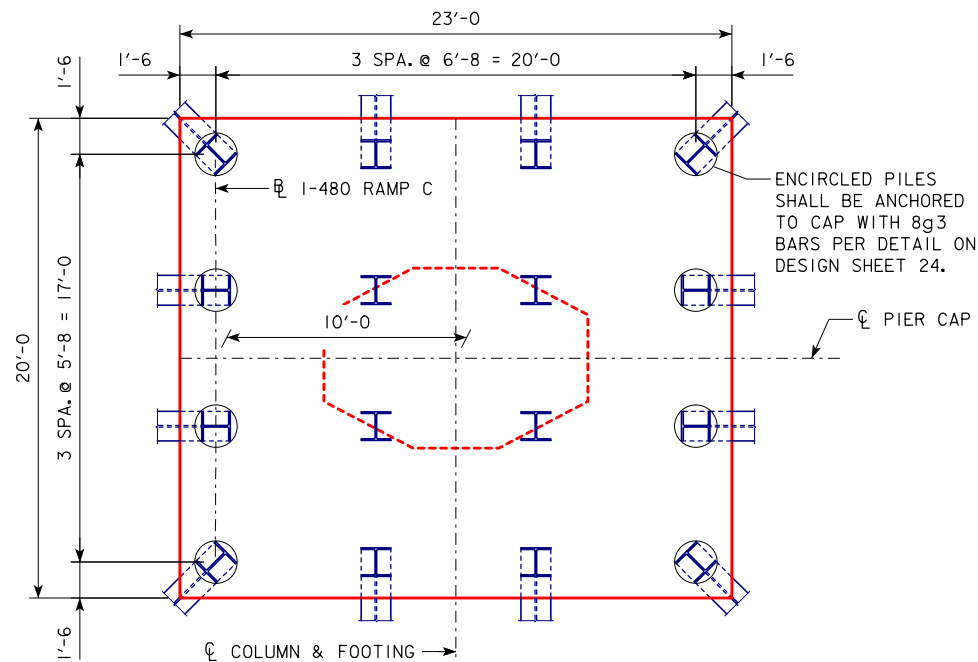
SECTION A-A



SECTION C-C

NOTE: MINOR ADJUSTMENTS MAY BE MADE TO COLUMN/DOWEL BAR SPACING TO ACCOMMODATE 5e2 PLACEMENT. CONTRACTOR SHALL TEST PLACEMENT OF 6e1/5e2 TIES PRIOR TO POURING FOOTING CONCRETE. FOR SECTIONS F-F, SEE DESIGN SHEET 23.

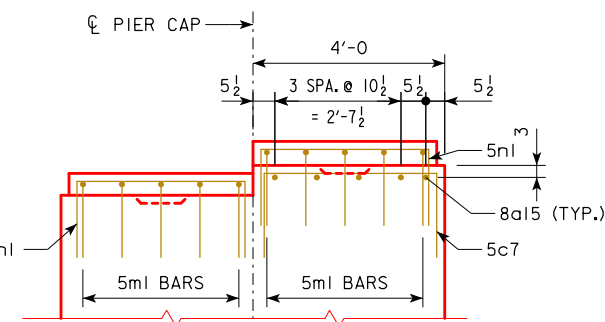
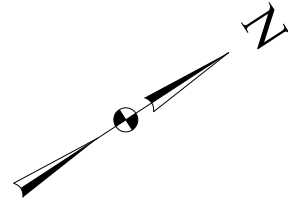
DESIGN FOR 0° SKEW
1419'-0" x VARIES CONTINUOUS WELDED GIRDER BRIDGE
UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
PIER 4 DETAILS
STA. 3546+14.50 (RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 22 OF 121 FILE NO. 30170 DESIGN NO. 1320



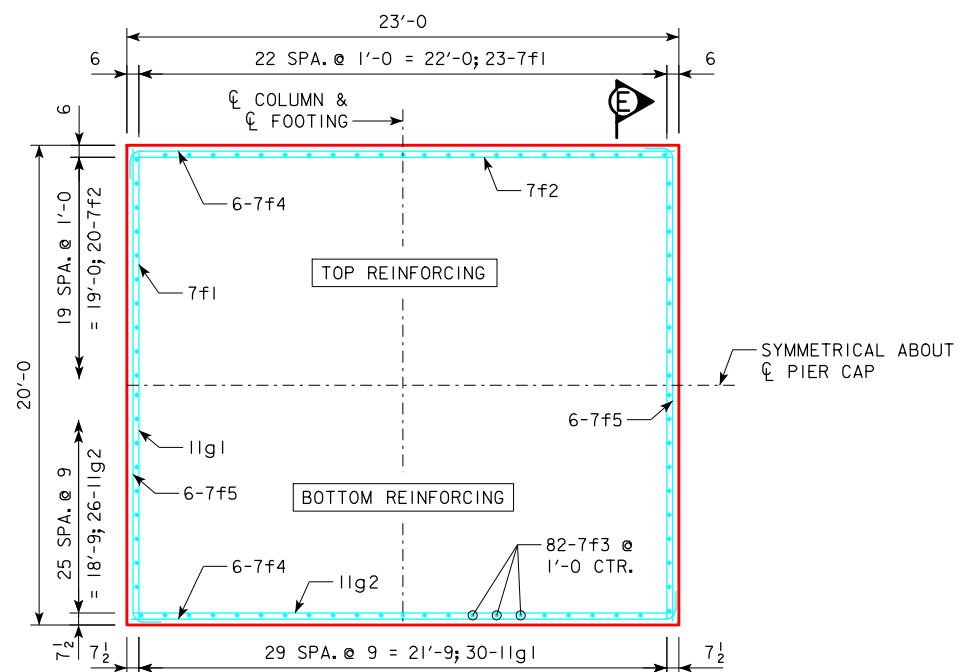
PILE LAYOUT

16 - HP 14x73 PILES REQUIRED

NOTE:
DIMENSIONS SHOWN ON PILE LAYOUT ARE AT
BOTTOM OF FOOTING. BATTER PILES (WHERE
INDICATED) AT 4:1 IN THE DIRECTION
SHOWN.

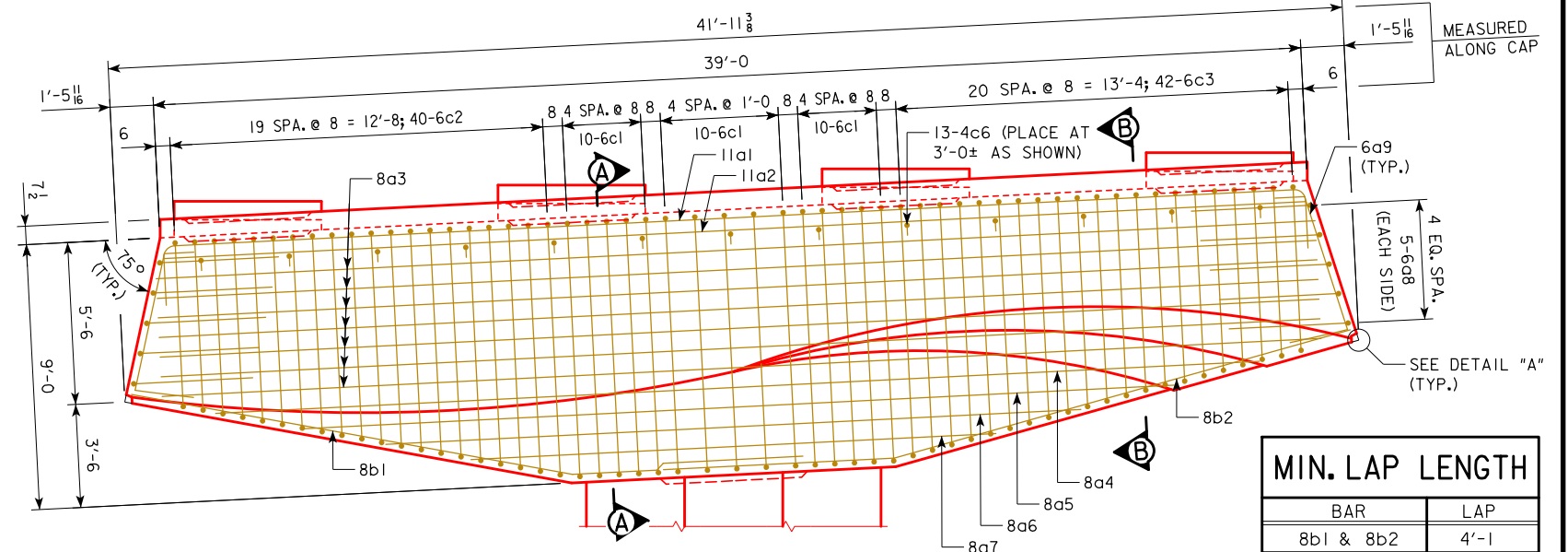


SECTION F-F



REINFORCING LAYOUT

NOTE:
SHIFT TOP MAT FOOTING f1 & f2 BARS AS NECESSARY TO
ALLOW FOR PROPER PLACEMENT OF COLUMN DOWEL BARS.



THE CONTRACT LENGTH OF 90 FEET FOR THE PIER 4 PILES IS BASED ON A NON-COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 315 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.7 FOR ROCK END BEARING. PIER 4 PILES ALSO WERE DESIGNED FOR A FACTORED TENSION FORCE OF 35 KIPS.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A NON-COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.7 FOR ROCK END BEARING. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF FOOTING.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER 4 PILES IS 244 TONS AT END OF DRIVE OR RETAP. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. IN NO CASE SHALL A PILE BE EMBEDDED LESS THAN 48 FEET. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.










































PIER 4 CONC. PLACEMENT QUANTITIES

LOCATION	QUANTITY
CAP & PEDESTALS (HIGH PERFORMANCE CONCRETE)*	99.3
COLUMN (HIGH PERFORMANCE CONCRETE)	82.9
FOOTING	102.2
TOTAL (CU. YDS.)	284.4

NOTE:
CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED
ON THE SUMMARY QUANTITIES SHEET.



REINFORCING BAR LIST - PIER 4

EPOXY COATED BARS	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	
	11a1	CAP LONGIT. TOP		10	42'-9	2,271	
	11a2	CAP LONGIT. TOP		10	38'-9	2,059	
	8a3	CAP LONGIT. SIDES		14	39'-1	1,461	
	8a4	CAP LONGIT. SIDES		2	33'-4	178	
	8a5	CAP LONGIT. SIDES		2	27'-7	147	
	8a6	CAP LONGIT. SIDES		2	21'-9	116	
	8a7	CAP LONGIT. SIDES		2	16'-0	85	
	6a8	CAP TRANSV. ENDS		10	16'-5	247	
	6a9	CAP VERTICAL ENDS		14	8'-1	170	
	5a10	CAP LONGIT. SIDES (RELIEF)		6	39'-1	245	
	5a11	CAP LONGIT. SIDES (RELIEF)		2	22'-11	48	
	5a12	CAP LONGIT. SIDES (RELIEF)		2	16'-10	35	
	5a13	CAP LONGIT. SIDES (RELIEF)		2	41'-6	87	
	5a14	CAP LONGIT. SIDES (RELIEF)		2	2'-3	5	
	8a15	CAP LONGIT. TOP (STEP)		5	38'-8	516	
		8b1	CAP LONGIT. BOTTOM		8	22'-7	482
		8b2	CAP LONGIT. BOTTOM		8	23'-6	502
		6c1	CAP HOOPS		30	29'-2	1,314
		6c2	CAP HOOPS CANTILEVER		40	VARIES	1,562
		6c3	CAP HOOPS CANTILEVER		42	VARIES	1,630
		5c4	CAP HAIRPINS VERTICAL (RELIEF)		40	15'-7	650
		5c5	CAP HAIRPINS VERTICAL (RELIEF)		38	14'-5	571
		4c6	CAP HAIRPINS TOP		13	8'-2	71
		5c7	CAP STEP TRANSV.		39	7'-6	305
		11d1	COLUMN VERTICAL		46	43'-11	10,733
		11d2	FOOTING TO COLUMN DOWEL		46	16'-10	4,114
		6d3	PLINTH VERTICAL		42	15'-1	952
		6d4	FOOTING TO PLINTH DOWEL		42	4'-0	252
	6e1	COLUMN HOOPS		92	25'-0	3,455	
	5e2	COLUMN TIES		92	5'-6	528	
	5e3	PLINTH HAIRPINS		38	17'-8	700	
	5m1	CAP PEDESTAL LONGIT.		40	10'-2	424	
	5n1	CAP PEDESTAL TRANSV.		48	9'-0	451	
		REINFORCING STEEL EPOXY COATED	- TOTAL (LBS.)		36,366		
NON-COATED	7f1	FOOTING TRANSV. TOP		23	19'-8	925	
	7f2	FOOTING LONGIT. TOP		20	22'-8	927	
	7f3	FOOTING SIDE VERTICAL		82	5'-7	936	
	7f4	FOOTING SIDE HORIZONTAL		12	23'-10	585	
	7f5	FOOTING SIDE HORIZONTAL		12	20'-10	511	
	11g1	FOOTING TRANSV. BOTTOM		30	19'-8	3,135	
	11g2	FOOTING LONGIT. BOTTOM		26	22'-8	3,131	
	8g3	PILE UPLIFT ANCHORS		16	11'-4	484	
		REINFORCING STEEL - TOTAL (LBS.)			10,634		

DESIGN FOR 0° SKEW

**1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE**

UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"

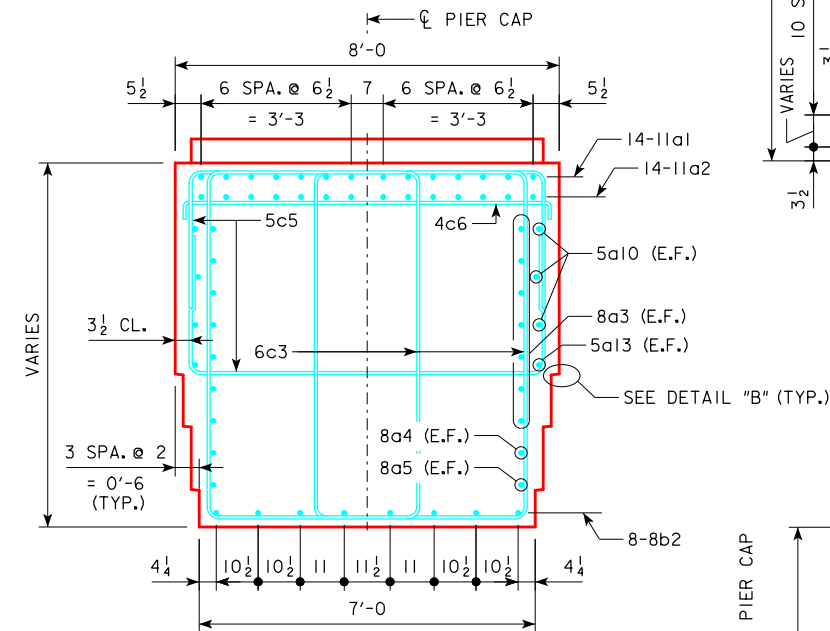
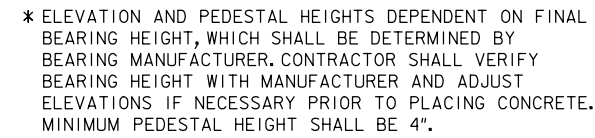
PIER 4 QUANTITIES

STA. 3546+14.50 (R 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 24 OF 121 FILE NO. 30170 DESIGN NO. 1320



Structural drawing of a pier cap showing reinforcement details. The drawing includes dimensions for overall size (8'-0" by 6'-8"), spacing of reinforcement bars (e.g., 6 SPA. @ 6 1/2"), and specific bar callouts (e.g., 5c4, 4c6, 5a10, 8a3, 5a11, 5a12, 5a13, 8a4, 8a5, 8a6, 8a7, 8-8b1). It also indicates "VARIES" for certain dimensions and "SEE DETAIL (TYP.)" for a specific connection.

Technical drawing of a hexagonal pier cap showing dimensions and reinforcement details.

Dimensions:

- Overall width: 11'-0"
- Overall height: 7'-6"
- Top horizontal segment: 3'-8 1/2"
- Right vertical segment: 3'-7"
- Bottom horizontal segment: 3'-8 1/2"
- Left vertical segment: 3'-7 1/4"
- Inner hexagon width: 3'-7"
- Inner hexagon height: 3'-7 1/4"
- Inner hexagon top horizontal segment: 3'-8 1/2"
- Inner hexagon right vertical segment: 3'-7"
- Inner hexagon bottom horizontal segment: 3'-8 1/2"
- Inner hexagon left vertical segment: 3'-7 1/4"

Reinforcement Details:

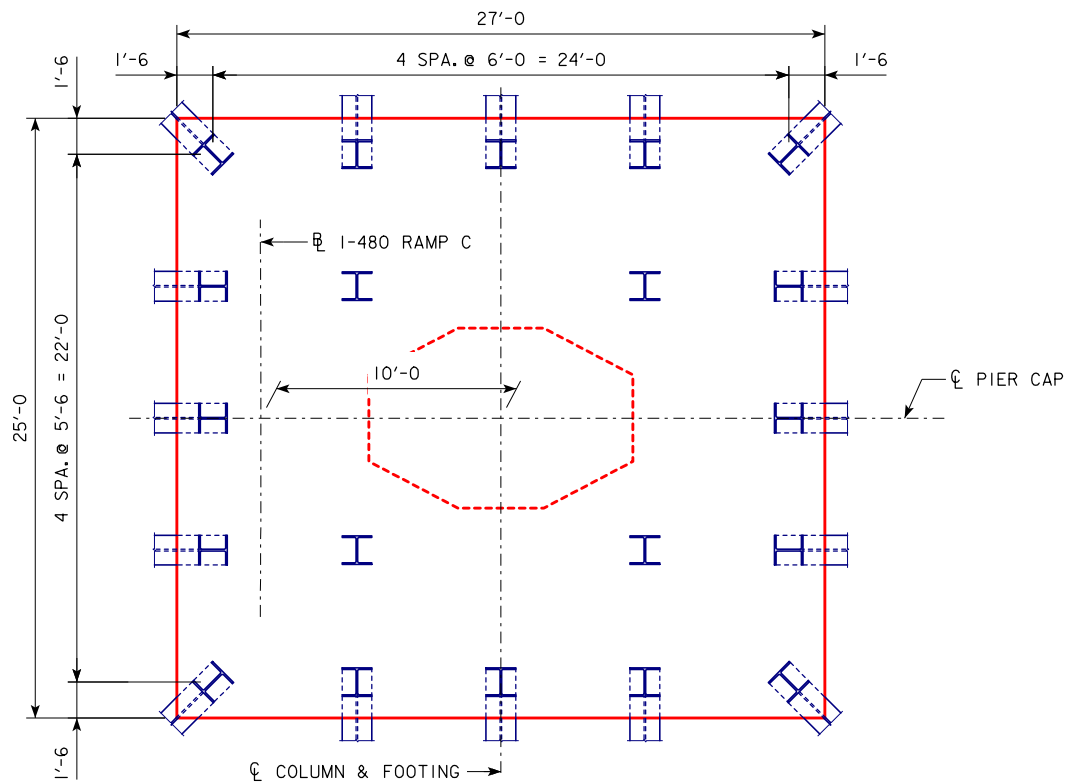
- Outer hexagon: 6e1 (top and bottom horizontal segments), 5e3 (vertical segments), 6d3 (TYP.) (corners).
- Inner hexagon: 5e2 (top and bottom horizontal segments), 5e3 (vertical segments), 6d3 (TYP.) (corners).
- Central square: 11d1 (TYP.) (vertical), 11d2 (TYP.) (horizontal).
- Reinforcement spacing: 4 SPA. @ 7" (outer hexagon), 5 SPA. @ 7" (inner hexagon), 4 SPA. @ 7" (central square).
- Reinforcement spacing: 8 = 3'-4; 6-6d3 (TYP.) (bottom horizontal segment), 8 = 2'-8; 5-6d3 (TYP.) (right vertical segment).

NOTE: FOR REINFORCING

Plan view of a hexagonal pier cap. The overall width is 10'-0" and the overall height is 6'-6". The width is divided into three equal sections of 3'-4" each. The height is divided into three equal sections of 2'-2" each. The reinforcement details include 6e1 bars at the top corners, 5e2 bars at the bottom corners, and 6e1 bars at the bottom corners. The reinforcement is spaced at 5 SPA. @ 6'-11d (TYP.). The bottom corners are labeled 7-11d (TYP.). The bottom corners are labeled 7-11d (TYP.). The bottom corners are labeled 7-11d (TYP.).

NOTE:
MINOR ADJUSTMENTS MAY BE MADE TO COLUMN/DOWEL
BAR SPACING TO ACCOMMODATE 5e2 PLACEMENT.
CONTRACTOR SHALL TEST PLACEMENT OF 6e1/5e2 TIES
PRIOR TO POURING FOOTING CONCRETE.

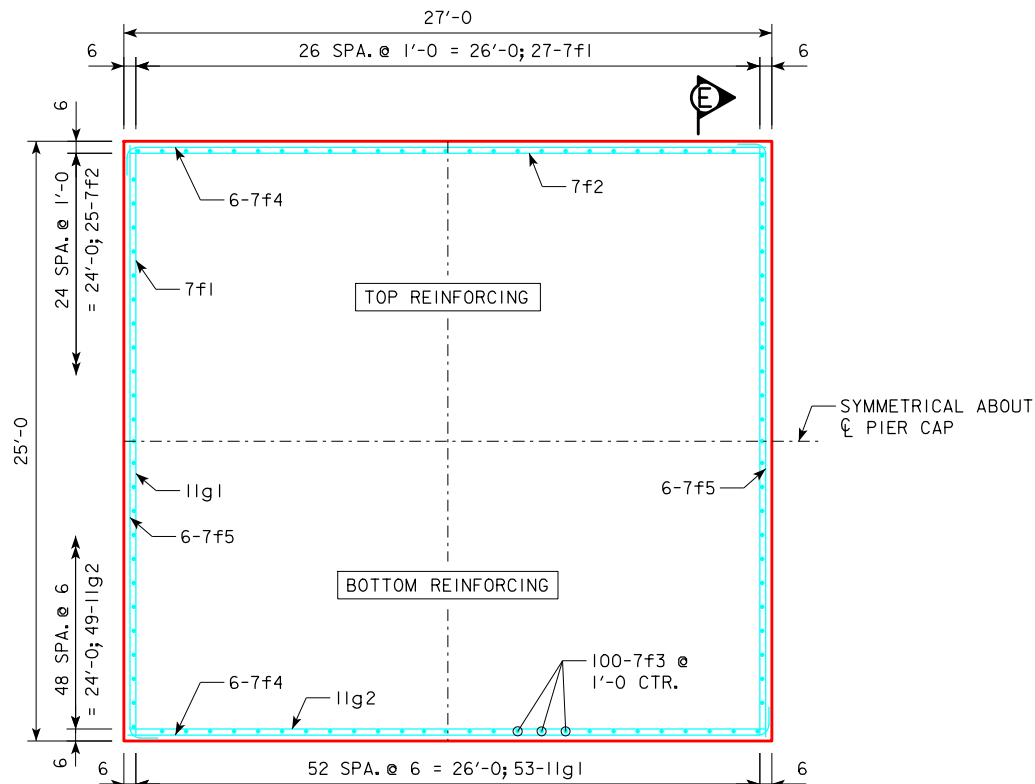




PILE LAYOUT

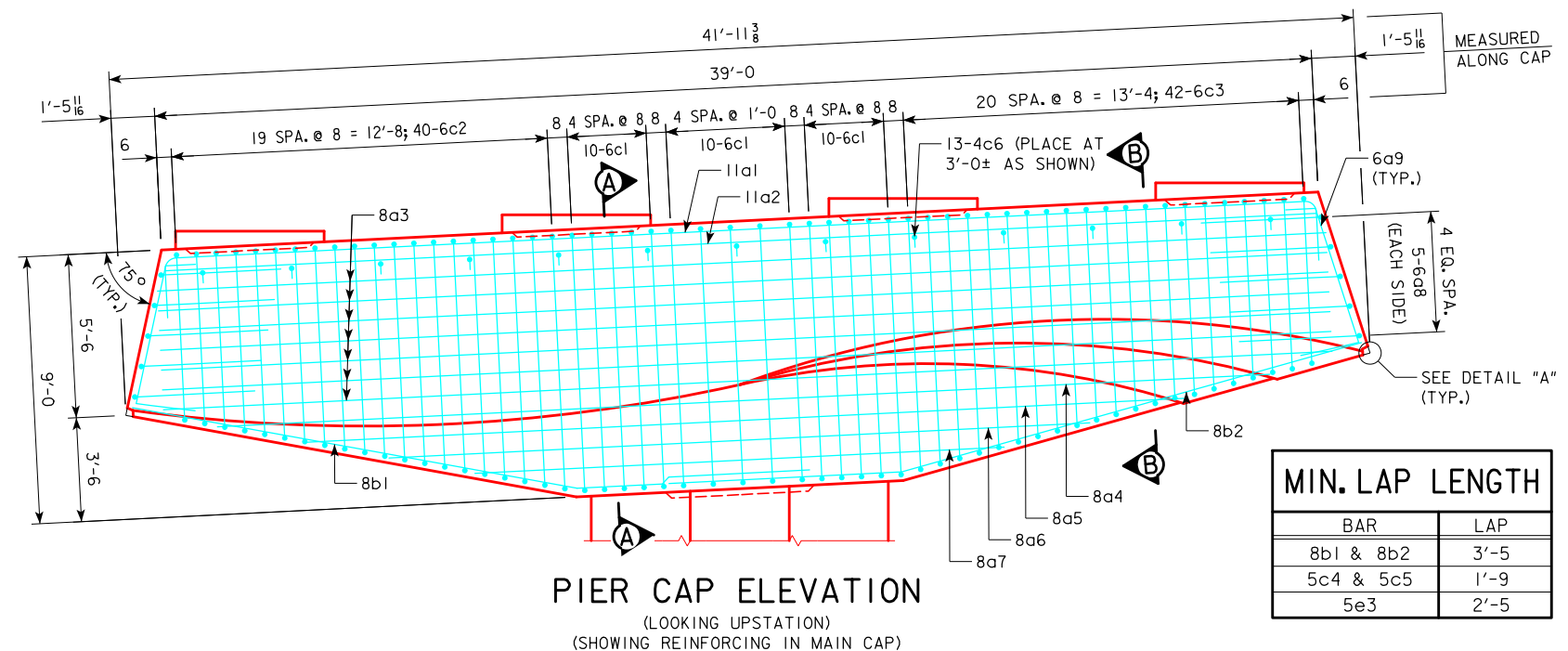
20 - HP 14x73 PILES REQUIRED

NOTE:
DIMENSIONS SHOWN ON PILE LAYOUT ARE AT
BOTTOM OF FOOTING. BATTER PILES (WHERE
INDICATED) AT 4:1 IN THE DIRECTION
SHOWN.



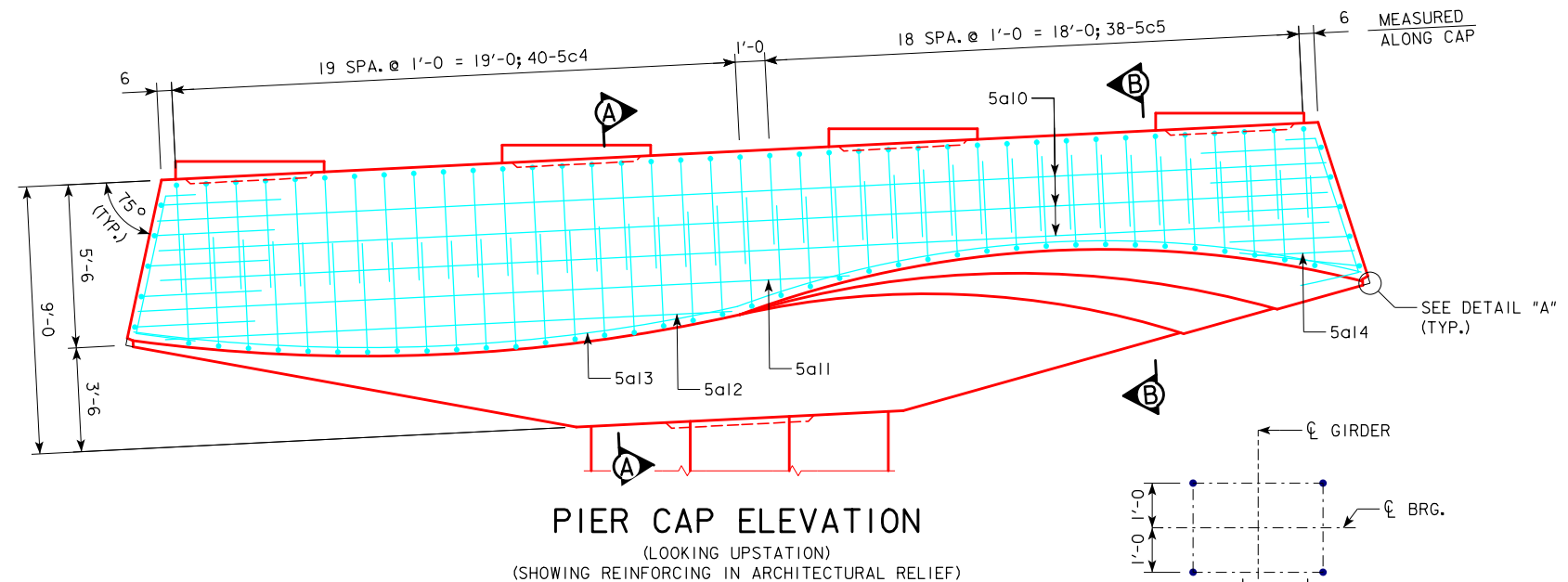
REINFORCING LAYOUT

NOTE:
SHIFT TOP MAT FOOTING f1 & f2 BARS AS NECESSARY TO
ALLOW FOR PROPER PLACEMENT OF COLUMN DOWEL BARS.



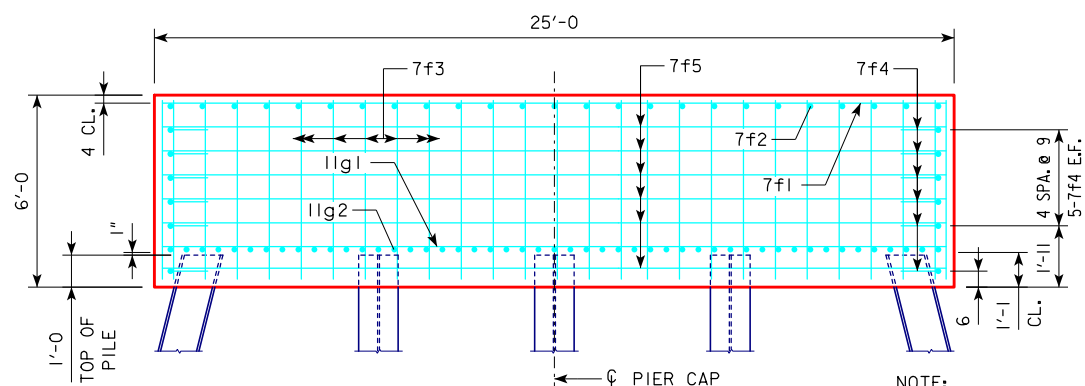
PIER CAP ELEVATION

(LOOKING UPSTATION)
(SHOWING REINFORCING IN MAIN CAP)



PIER CAP ELEVATION

(LOOKING UPSTATION)
(SHOWING REINFORCING IN ARCHITECTURAL RELIEF)



SECTION E-E

NOTE:
FOR REINFORCING LIST, BENT
BAR DETAILS, QUANTITIES
AND ADDITIONAL NOTES,
SEE DESIGN SHEET 27.

ANCHOR BOLT LAYOUT

MAINTAIN 6" MIN. EDGE DISTANCE ON ALL SIDES
(FOR ADDITIONAL DETAILS AND NOTES, SEE DESIGN SHEET 78)
REINFORCING m & n BARS MAY BE SHIFTED SLIGHTLY TO
CLEAR ANCHOR BOLTS.

NOTES:
FOR SECTIONS A-A & B-B, SEE DESIGN SHEET 25.
FOR DETAILS "A" & "B", SEE DESIGN SHEET 37.

DESIGN FOR 0° SKEW
**1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE**
UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
PIER 5 DETAILS
STA. 3546+14.50 (1-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 26 OF 121 FILE NO. 30170 DESIGN NO. 1320



PIER 5 PILING NOTES:

THE CONTRACT LENGTH OF 90 FEET FOR THE PIER 5 PILES IS BASED ON A MIXED SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 355 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL AND 0.7 FOR ROCK END BEARING. PIER 5 PILES ALSO WERE DESIGNED FOR A FACTORED TENSION FORCE OF 24 KIPS.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A MIXED SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL AND 0.7 FOR ROCK END BEARING. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF FOOTING.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER 5 PILES IS 260 TONS AT END OF DRIVE OR RETAP. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. IN NO CASE SHALL A PILE BE EMBEDDED LESS THAN 48 FEET. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

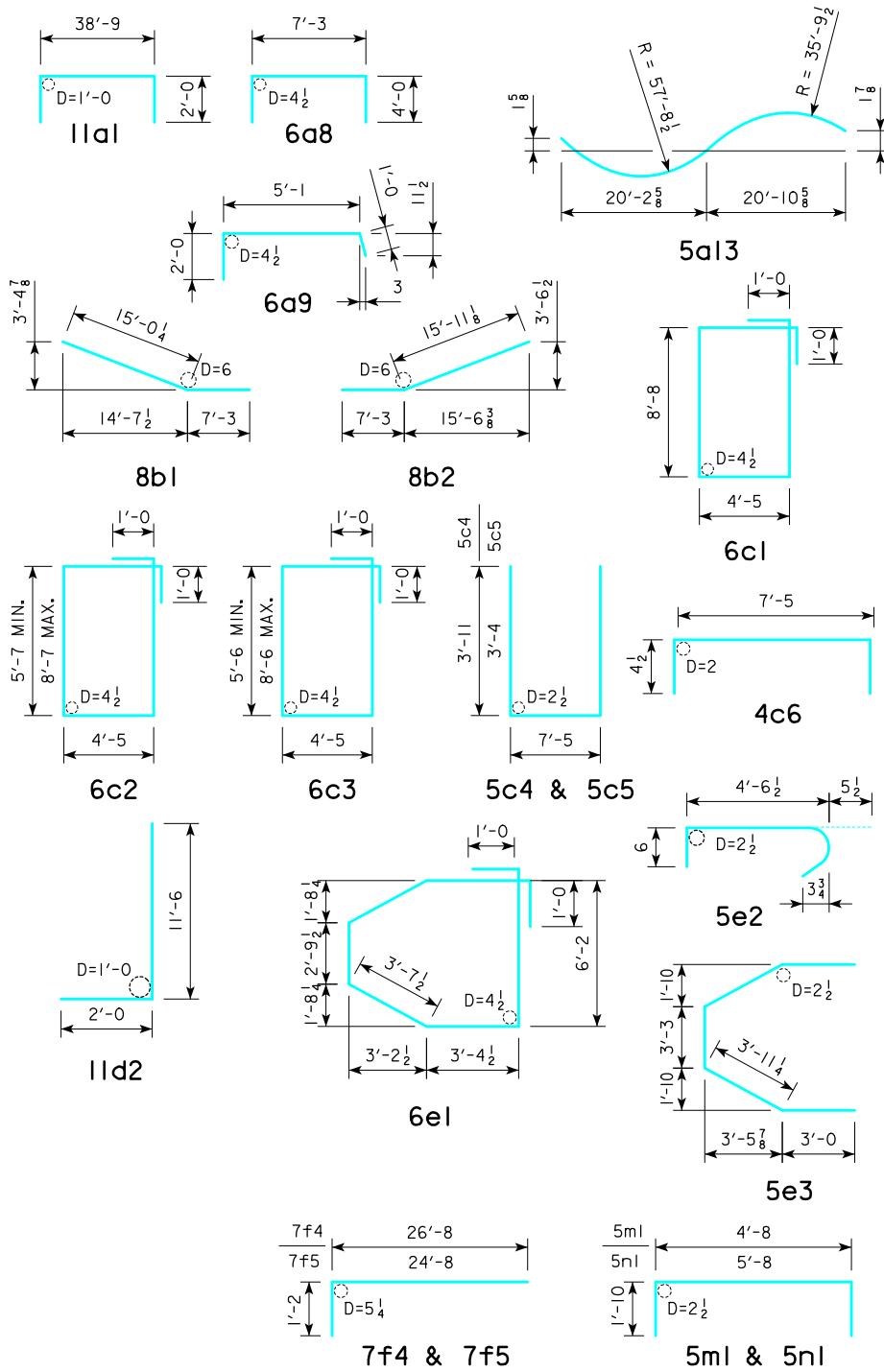
SEE DESIGN SHEET 15 FOR ADDITIONAL PIER NOTES.

PIER 5 CONC. PLACEMENT QUANTITIES	
LOCATION	QUANTITY
CAP & PEDESTALS (HIGH PERFORMANCE CONCRETE)*	92.0
COLUMN (HIGH PERFORMANCE CONCRETE)	90.3
FOOTING	150.0
TOTAL (CU. YDS.)	332.3

* QUANTITY IGNORES THE DEDUCTION OF CONCRETE VOLUME DUE TO THE FORM LINER.

NOTE:
CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED ON THE SUMMARY QUANTITIES SHEET.

BENT BAR DETAILS



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

REINFORCING BAR LIST - PIER 5

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
11a1	CAP LONGIT. TOP		14	42'-9	3,180
11a2	CAP LONGIT. TOP		14	38'-9	2,882
8a3	CAP LONGIT. SIDES		14	39'-1	1,461
8a4	CAP LONGIT. SIDES		2	33'-4	178
8a5	CAP LONGIT. SIDES		2	27'-7	147
8a6	CAP LONGIT. SIDES		2	21'-9	116
8a7	CAP LONGIT. SIDES		2	16'-0	85
6a8	CAP TRANSV. ENDS		10	15'-3	229
6a9	CAP VERTICAL ENDS		14	8'-1	170
5a10	CAP LONGIT. SIDES (RELIEF)		6	39'-1	245
5a11	CAP LONGIT. SIDES (RELIEF)		2	22'-11	48
5a12	CAP LONGIT. SIDES (RELIEF)		2	16'-10	35
5a13	CAP LONGIT. SIDES (RELIEF)		2	41'-6	87
5a14	CAP LONGIT. SIDES (RELIEF)		2	2'-3	5
8b1	CAP LONGIT. BOTTOM		8	22'-3	475
8b2	CAP LONGIT. BOTTOM		8	23'-2	495
6c1	CAP HOOPS		30	28'-2	1,269
6c2	CAP HOOPS CANTILEVER		40	VARIES	1,502
6c3	CAP HOOPS CANTILEVER		42	VARIES	1,567
5c4	CAP HAIRPINS VERTICAL (RELIEF)		40	15'-3	636
5c5	CAP HAIRPINS VERTICAL (RELIEF)		38	14'-1	558
4c6	CAP HAIRPINS TOP		13	8'-2	71
11d1	COLUMN VERTICAL		46	45'-5	11,100
11d2	FOOTING TO COLUMN DOWEL		46	13'-6	3,299
6d3	PLINTH VERTICAL		42	16'-1	1,015
6d4	FOOTING TO PLINTH DOWEL		42	3'-4	210
6e1	COLUMN HOOPS		100	25'-0	3,755
5e2	COLUMN TIES		100	5'-6	574
5e3	PLINTH HAIRPINS		40	17'-2	716
7f1	FOOTING TRANSV. TOP		27	24'-8	1,361
7f2	FOOTING LONGIT. TOP		25	26'-8	1,363
7f3	FOOTING SIDE VERTICAL		100	5'-7	1,141
7f4	FOOTING SIDE HORIZONTAL		12	27'-10	683
7f5	FOOTING SIDE HORIZONTAL		12	25'-10	634
11g1	FOOTING TRANSV. BOTTOM		53	24'-8	6,946
11g2	FOOTING LONGIT. BOTTOM		49	26'-8	6,942
5ml	CAP PEDESTAL LONGIT.		28	8'-4	243
5nl	CAP PEDESTAL TRANSV.		24	9'-4	234
REINFORCING STEEL - TOTAL (LBS.)					55,657



DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS

WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

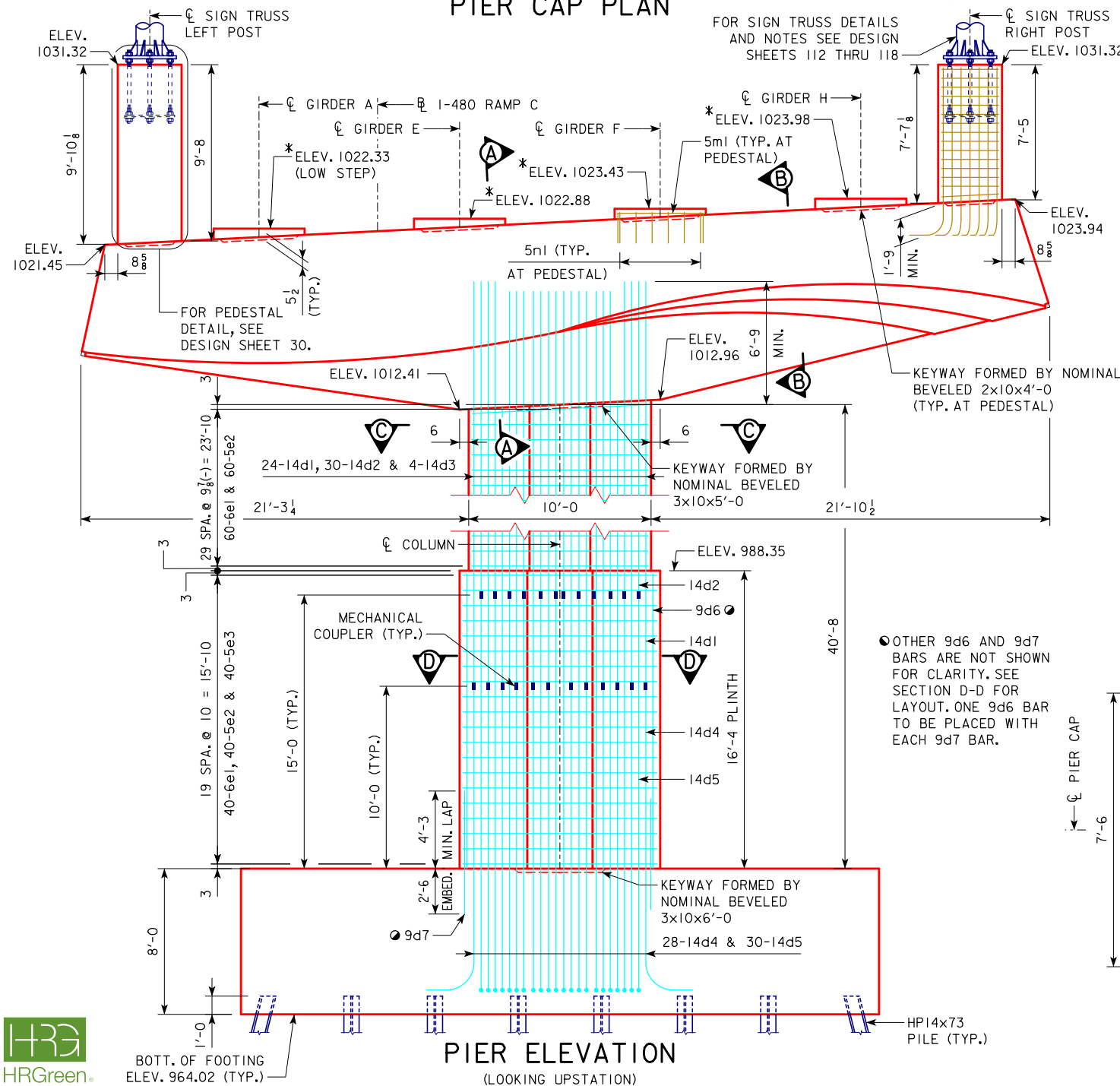
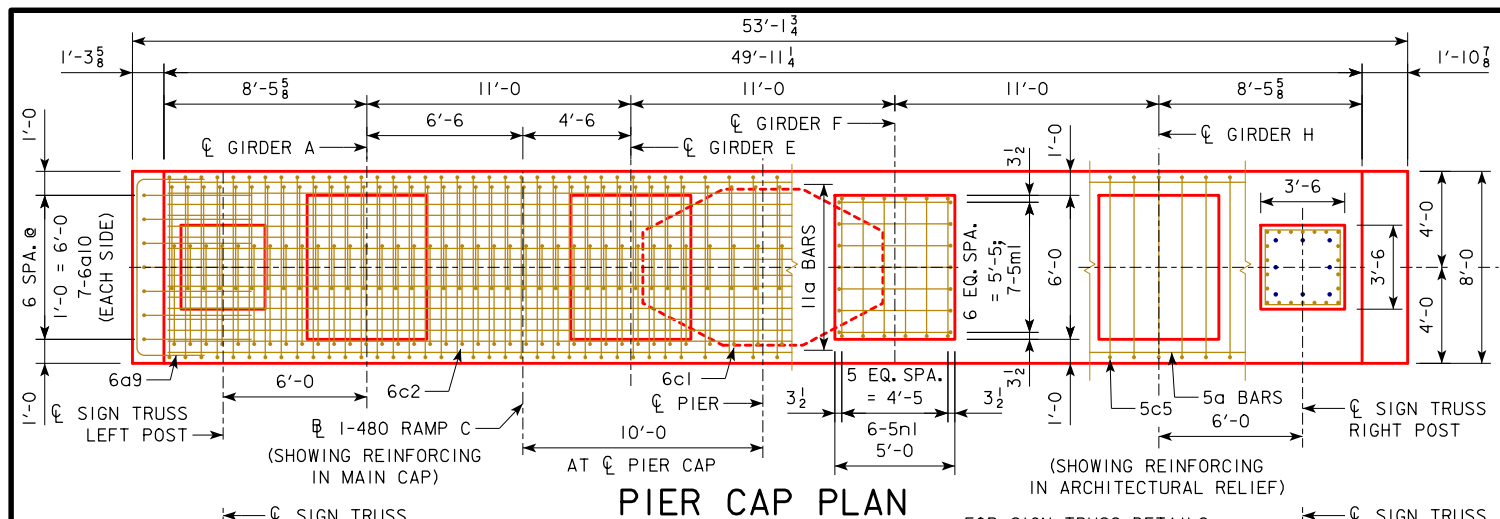
PIER 5 QUANTITIES

STA. 3546+14.50 (R 1-480 RAMP C) NOVEMBER, 2020

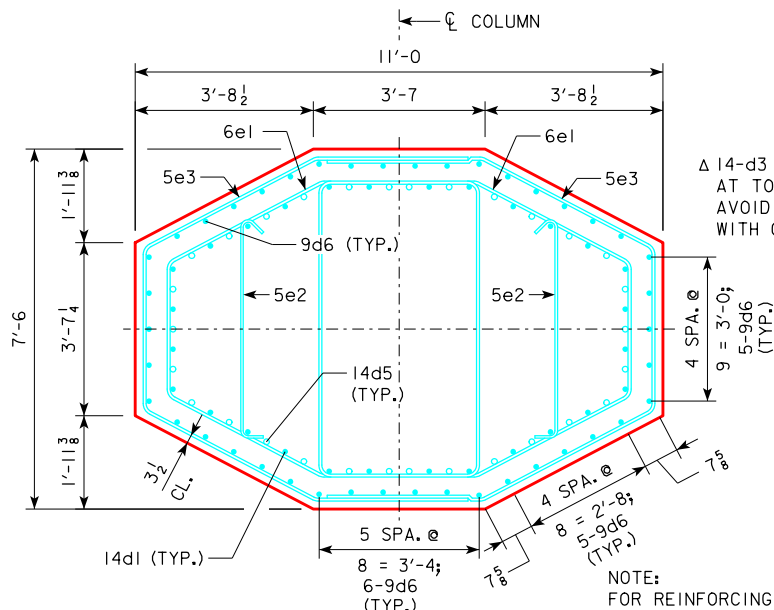
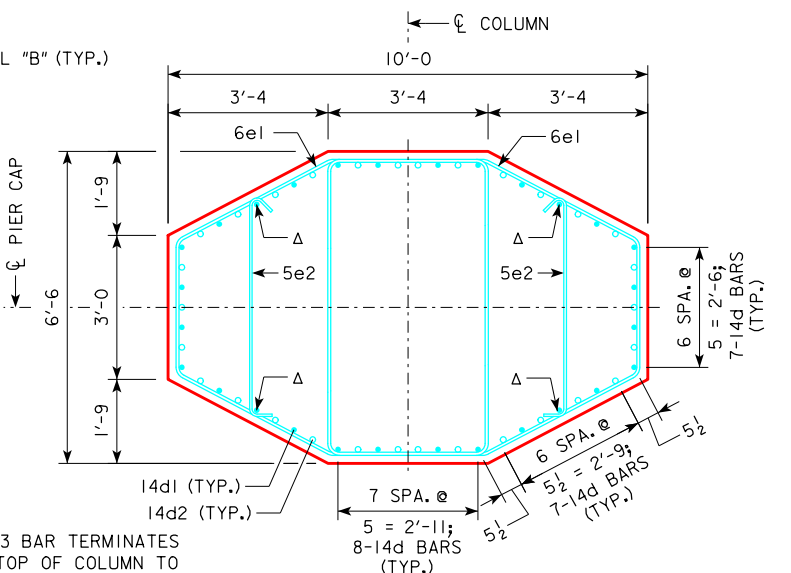
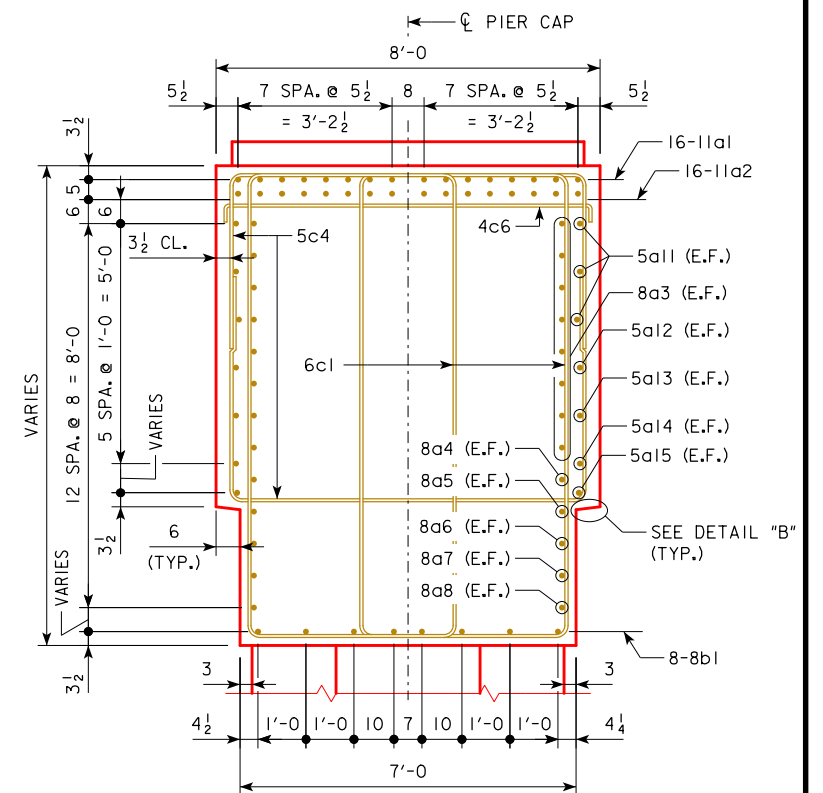
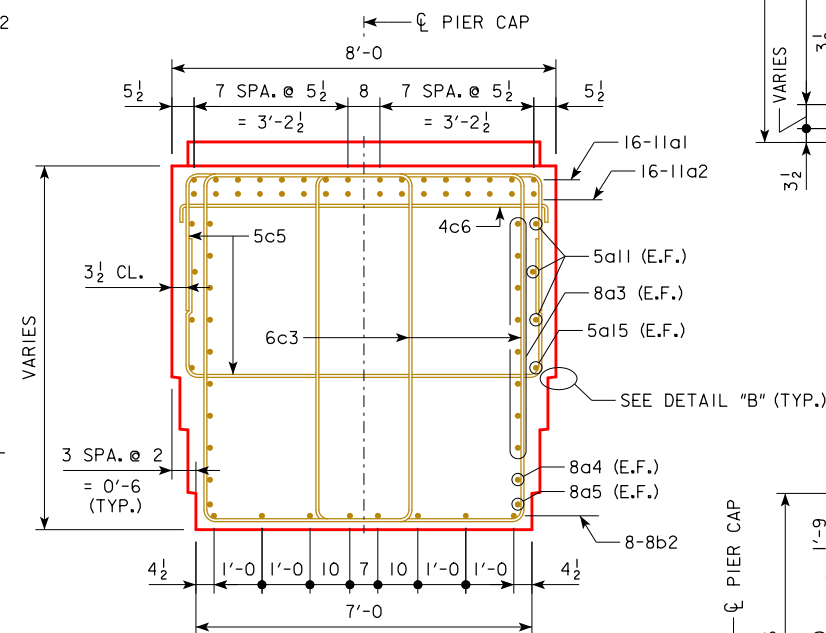
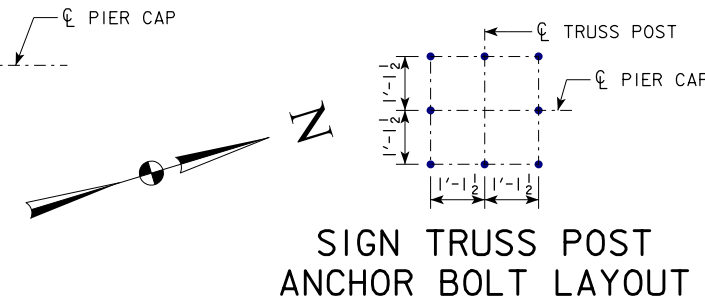
POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 27 OF 121 FILE NO. 30170 DESIGN NO. 1320



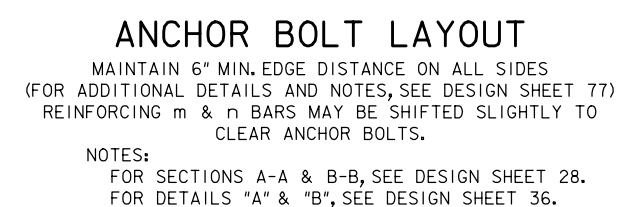
* ELEVATION AND PEDESTAL HEIGHTS DEPENDENT ON FINAL BEARING HEIGHT, WHICH SHALL BE DETERMINED BY BEARING MANUFACTURER. CONTRACTOR SHALL VERIFY BEARING HEIGHT WITH MANUFACTURER AND ADJUST ELEVATIONS IF NECESSARY PRIOR TO PLACING CONCRETE. MINIMUM PEDESTAL HEIGHT SHALL BE 4".



NOTE:
MINOR ADJUSTMENTS MAY BE MADE TO COLUMN/DOWEL
BAR SPACING TO ACCOMMODATE 5e2 PLACEMENT.
CONTRACTOR SHALL TEST PLACEMENT OF 6e1/5e2 TIES
PRIOR TO POURING FOOTING CONCRETE.



MIN. LAP LENGTH	
BAR	LAP
8a3 & 8a4	5'-9
5a11	2'-11
8b1 & 8b2	4'-1
5c4 & 5c5	2'-1
5e3	2'-5



DESIGN FOR 0° SKEW

1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"

PIER 6 DETAILS

STA. 3546+14.50 (R/L 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 29 OF 121 FILE NO. 30170 DESIGN NO. 1320

PIER 6 PILING NOTES:

THE CONTRACT LENGTH OF 85 FEET FOR THE PIER 6 PILES IS BASED ON A MIXED SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 343 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL AND 0.7 FOR ROCK END BEARING. PIER 6 PILES ALSO WERE DESIGNED FOR A FACTORED TENSION FORCE OF 55 KIPS.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A NON-COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.7 FOR ROCK END BEARING. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF FOOTING.

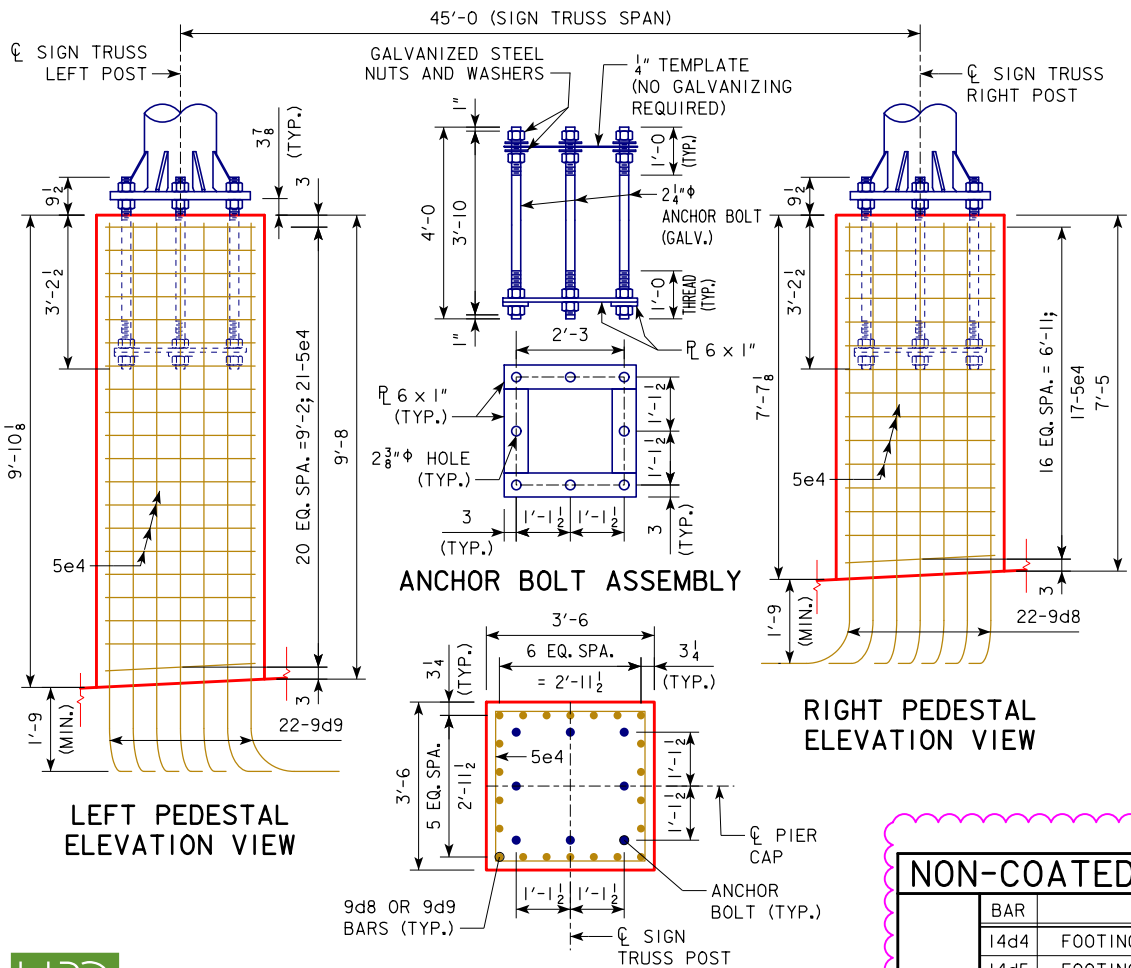
THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER 6 PILES IS 264 TONS AT END OF DRIVE OR RETAP. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. IN NO CASE SHALL A PILE BE EMBEDDED LESS THAN 44 FEET. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

SEE DESIGN SHEET 15 FOR SIGN TRUSS PEDESTAL NOTES AND ADDITIONAL PIER NOTES.

PIER 6 CONC.PLACEMENT QUANTITIES	
LOCATION	QUANTITY
CAP & PEDESTALS (HIGH PERFORMANCE CONCRETE)*	134.7
COLUMN (HIGH PERFORMANCE CONCRETE)	89.2
FOOTING	321.5
TOTAL (CU. YDS.)	545.4

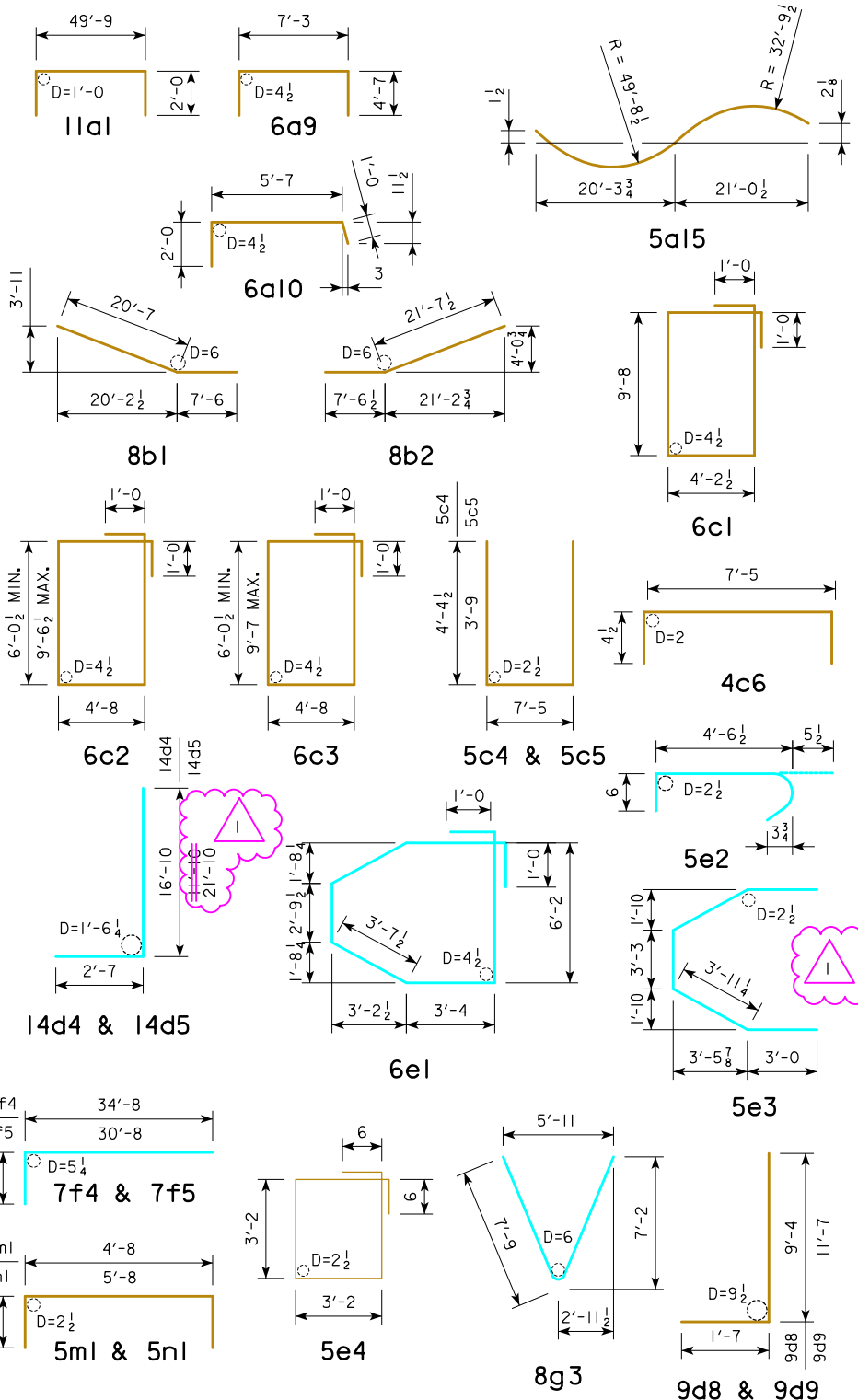
* QUANTITY IGNORES THE DEDUCTION OF CONCRETE VOLUME DUE TO THE FORM LINER.

NOTE:
CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED ON THE SUMMARY QUANTITIES SHEET.



PARTIAL PLAN
SIGN TRUSS PEDESTAL DETAIL

BENT BAR DETAILS



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

NON-COATED REINFORCING BAR LIST - PIER 6					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
14d4	FOOTING TO COLUMN DOWEL		28	19'-5	4,159
14d5	FOOTING TO COLUMN DOWEL		30	24'-5	5,604

REVISED: 05-06-2022 UPDATED PIER 6 NON-COATED REINFORCING STEEL. CHANGED NON-COATED REINFORCING STEEL QUANTITIES AND BAR LENGTHS.

REASON: CHANGE MADE IN RESPONSE TO PRE-BID QUESTION #69.

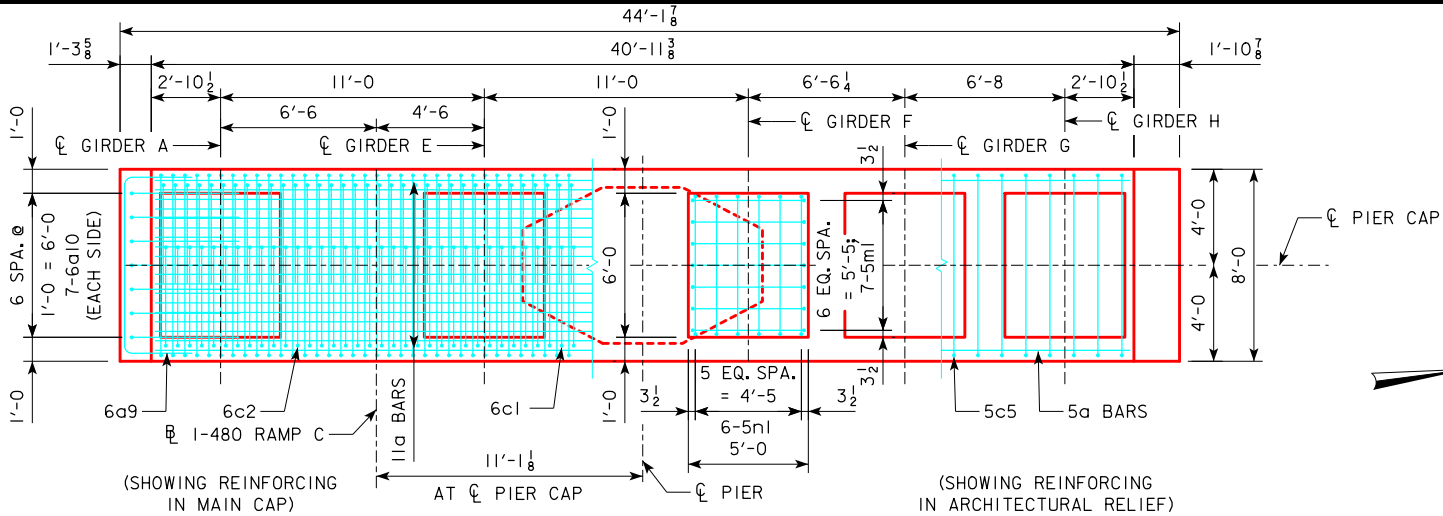
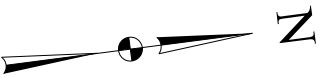
REINFORCING BAR LIST - PIER 6

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
11a1	CAP LONGIT. TOP		16	53'-9	4,569
11a2	CAP LONGIT. TOP		16	50'-0	4,250
8a3	CAP LONGIT. SIDES		32	28'-1	2,399
8a4	CAP LONGIT. SIDES		4	25'-5	271
8a5	CAP LONGIT. SIDES		2	37'-9	202
8a6	CAP LONGIT. SIDES		2	30'-10	165
8a7	CAP LONGIT. SIDES		2	23'-11	128
8a8	CAP LONGIT. SIDES		2	17'-0	91
6a9	CAP TRANSV. ENDS		12	16'-5	296
6a10	CAP VERTICAL ENDS		14	8'-7	180
5a11	CAP LONGIT. SIDES (RELIEF)		12	26'-8	334
5a12	CAP LONGIT. SIDES (RELIEF)		2	32'-7	68
5a13	CAP LONGIT. SIDES (RELIEF)		2	27'-6	57
5a14	CAP LONGIT. SIDES (RELIEF)		2	16'-9	35
5a15	CAP LONGIT. SIDES (RELIEF)		2	53'-1	111
5a16	CAP LONGIT. SIDES (RELIEF)		2	6'-3	13
8b1	CAP LONGIT. BOTTOM		8	28'-1	600
8b2	CAP LONGIT. BOTTOM		8	28'-2	602
6c1	CAP HOOPS		36	29'-9	1,609
6c2	CAP HOOPS CANTILEVER		56	VARIES	2,264
6c3	CAP HOOPS CANTILEVER		60	VARIES	2,429
5c4	CAP HAIRPINS VERTICAL (RELIEF)		50	16'-2	843
5c5	CAP HAIRPINS VERTICAL (RELIEF)		50	14'-11	778
4c6	CAP HAIRPINS TOP		17	8'-2	93
9d8	RIGHT SIGN TRUSS PEDESTAL		22	10'-11	817
9d9	LEFT SIGN TRUSS PEDESTAL		22	13'-2	985
5e4	SIGN TRUSS PEDESTAL, HOOPS		38	14'-8	581
5m1	CAP PEDESTAL LONGIT.		28	8'-4	243
5n1	CAP PEDESTAL TRANSV.		24	9'-4	234
REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)					25,247
14d1	COLUMN VERTICAL		24	37'-8	6,916
14d2	COLUMN VERTICAL		30	32'-8	7,497
14d3	COLUMN VERTICAL		4	30'-5	931
14d4	FOOTING TO COLUMN DOWEL		29	18'-5	4,086
14d5	FOOTING TO COLUMN DOWEL		31	23'-5	5,553
9d6	PLINTH VERTICAL		42	16'-2	2,309
9d7	FOOTING TO PLINTH DOWEL		42	6'-9	964
6e1	COLUMN HOOPS		100	24'-11	3,742
5e2	COLUMN TIES		100	5'-6	574
5e3	PLINTH HAIRPINS		40	17'-2	716
7f1	FOOTING TRANSV. TOP		35	30'-8	2,194
7f2	FOOTING LONGIT. TOP		31	34'-8	2,197
7f3	FOOTING SIDE VERTICAL		128	7'-7	1,984
7f4	FOOTING SIDE HORIZONTAL		14	35'-10	1,025
7f5	FOOTING SIDE HORIZONTAL		14	31'-10	911
11g1	PILE UPLIFT ANCHORS		69	30'-8	11,242
11g2	PILE UPLIFT ANCHORS		61	34'-8	11,235
8g3	PILE UPLIFT ANCHORS		48	15'-6	1,986
REINFORCING STEEL - TOTAL (LBS.)					66,062

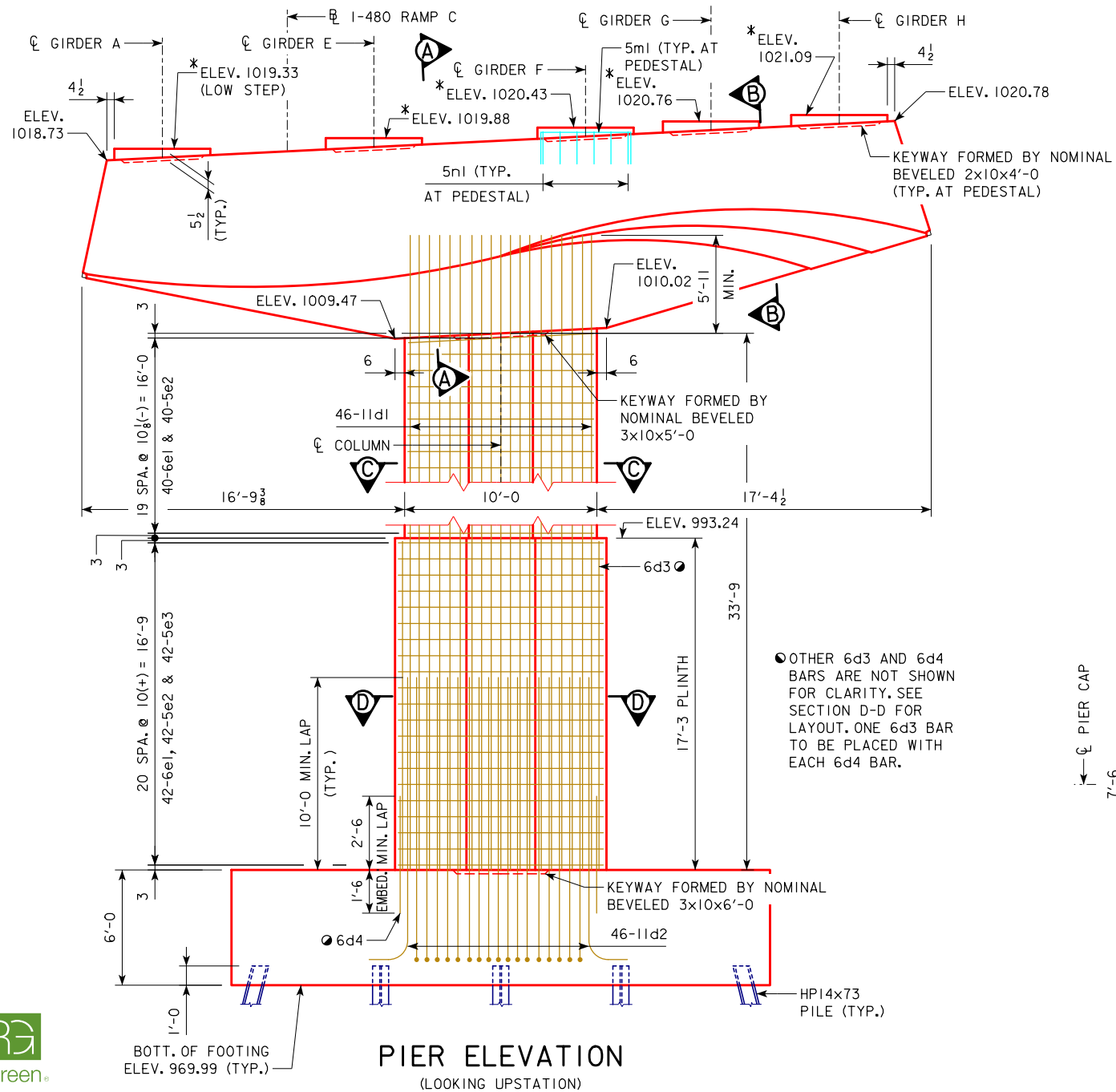
DESIGN FOR 0° SKEW
1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE
UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0
PIER 6 QUANTITIES
STA. 3546+14.50 (R 1-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 30 OF 121 FILE NO. 30170 DESIGN NO. 1320

REVISED: MAY 6, 2022

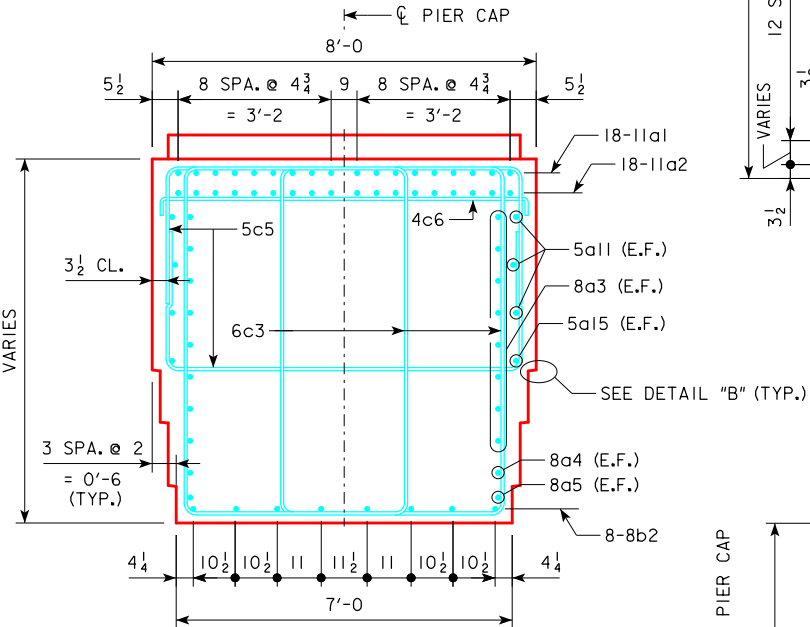
* ELEVATION AND PEDESTAL HEIGHTS DEPENDENT ON FINAL BEARING HEIGHT, WHICH SHALL BE DETERMINED BY BEARING MANUFACTURER. CONTRACTOR SHALL VERIFY BEARING HEIGHT WITH MANUFACTURER AND ADJUST ELEVATIONS IF NECESSARY PRIOR TO PLACING CONCRETE. MINIMUM PEDESTAL HEIGHT SHALL BE 4".



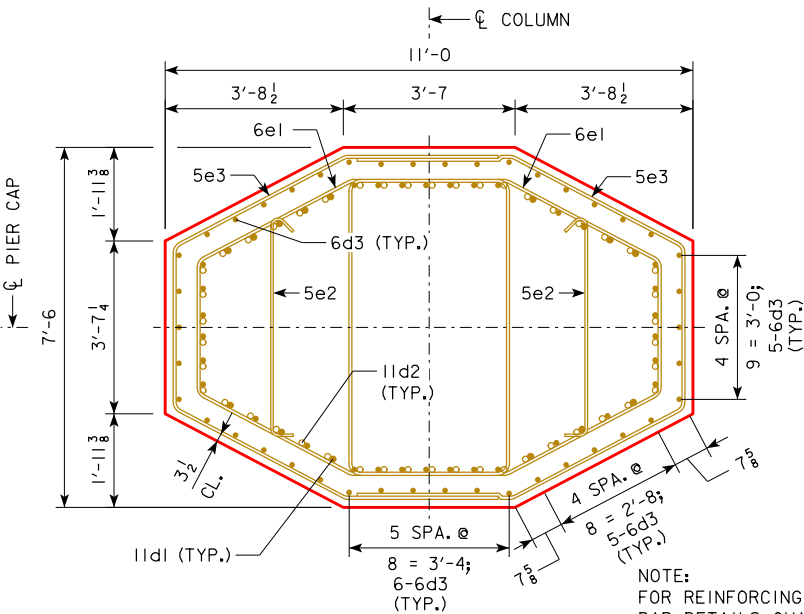
PIER CAP PLAN



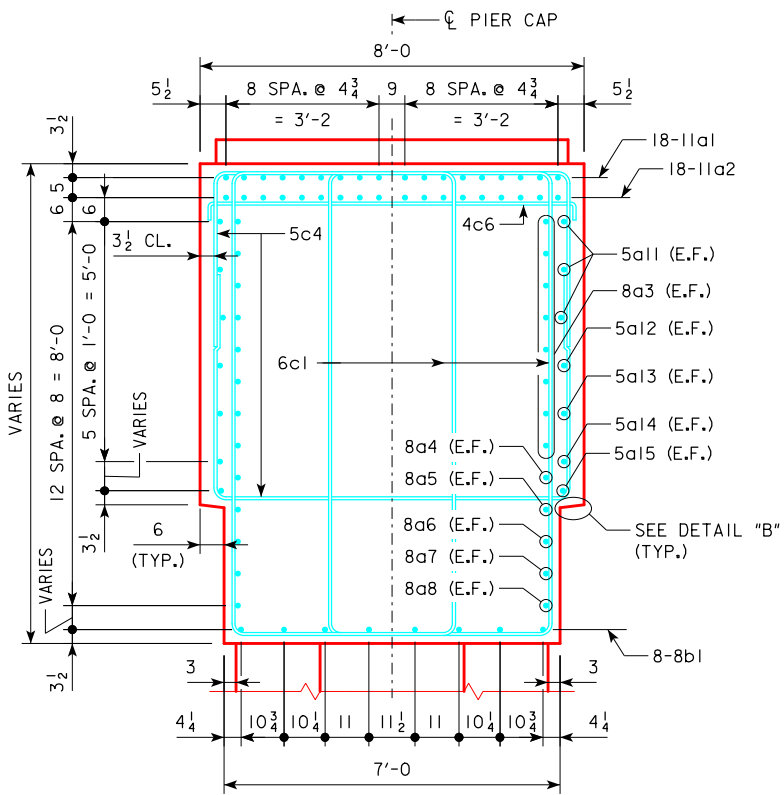
PIER ELEVATION
(LOOKING UPSTATION)



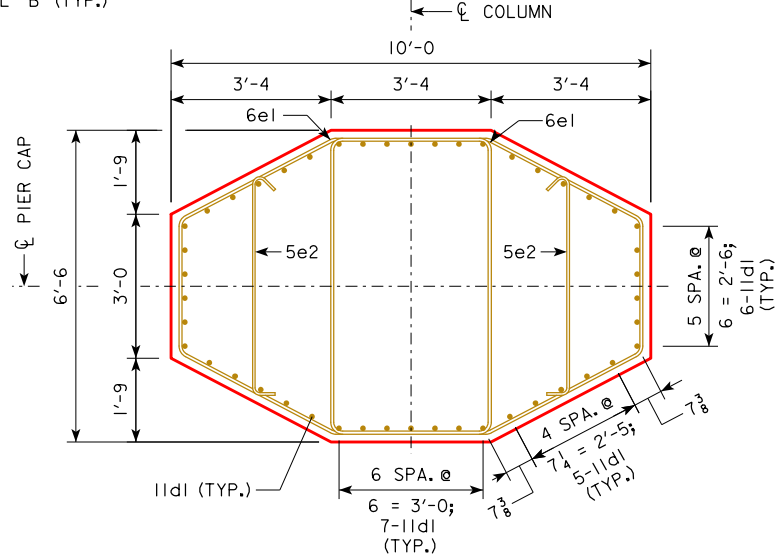
SECTION B-B



SECTION D-D



SECTION A-A

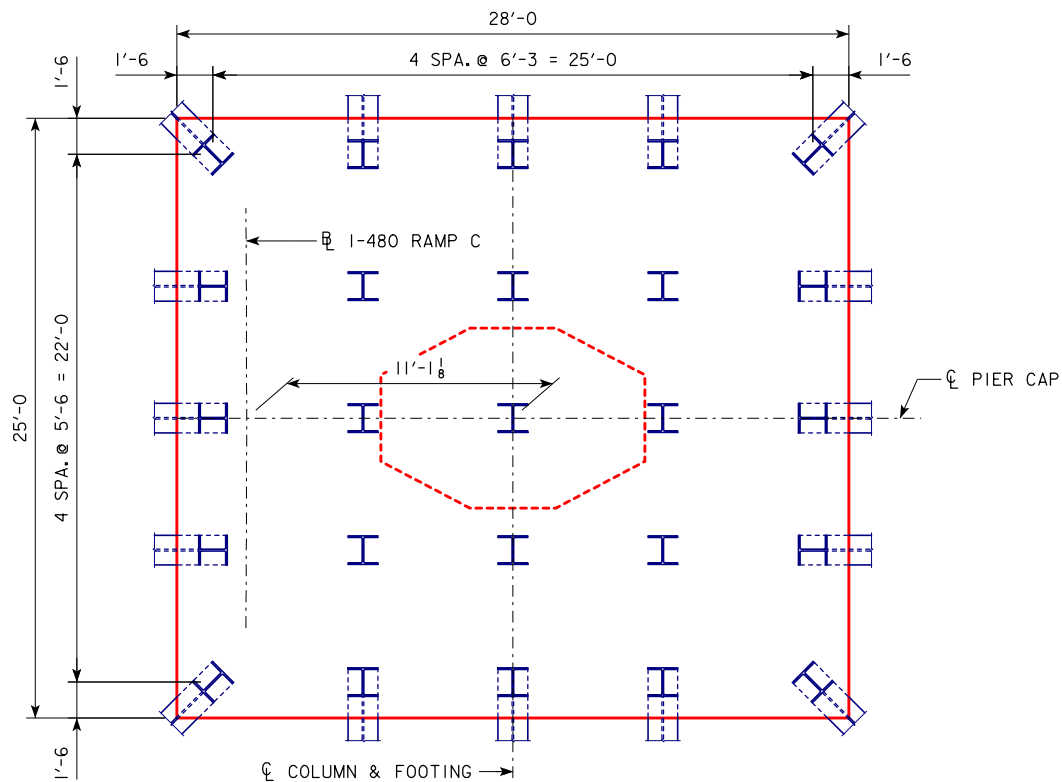


SECTION C-C

NOTE:
MINOR ADJUSTMENTS MAY BE MADE TO COLUMN/DOWEL BAR SPACING TO ACCOMMODATE 5e2 PLACEMENT. CONTRACTOR SHALL TEST PLACEMENT OF 6e1/5e2 TIES PRIOR TO POURING FOOTING CONCRETE.

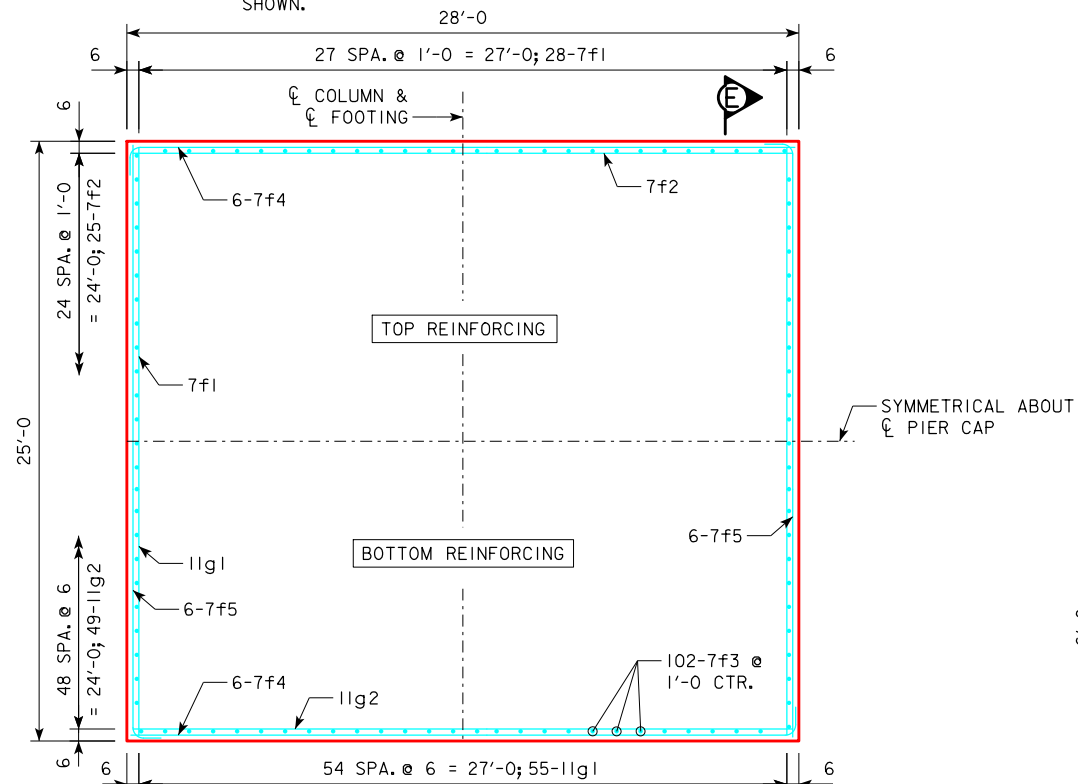
DESIGN FOR 0° SKEW
1419'-0" x VARIES CONTINUOUS WELDED GIRDER BRIDGE
UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
PIER 7 DETAILS
STA. 3546+14.50 (I-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 31 OF 121 FILE NO. 30170 DESIGN NO. 1320





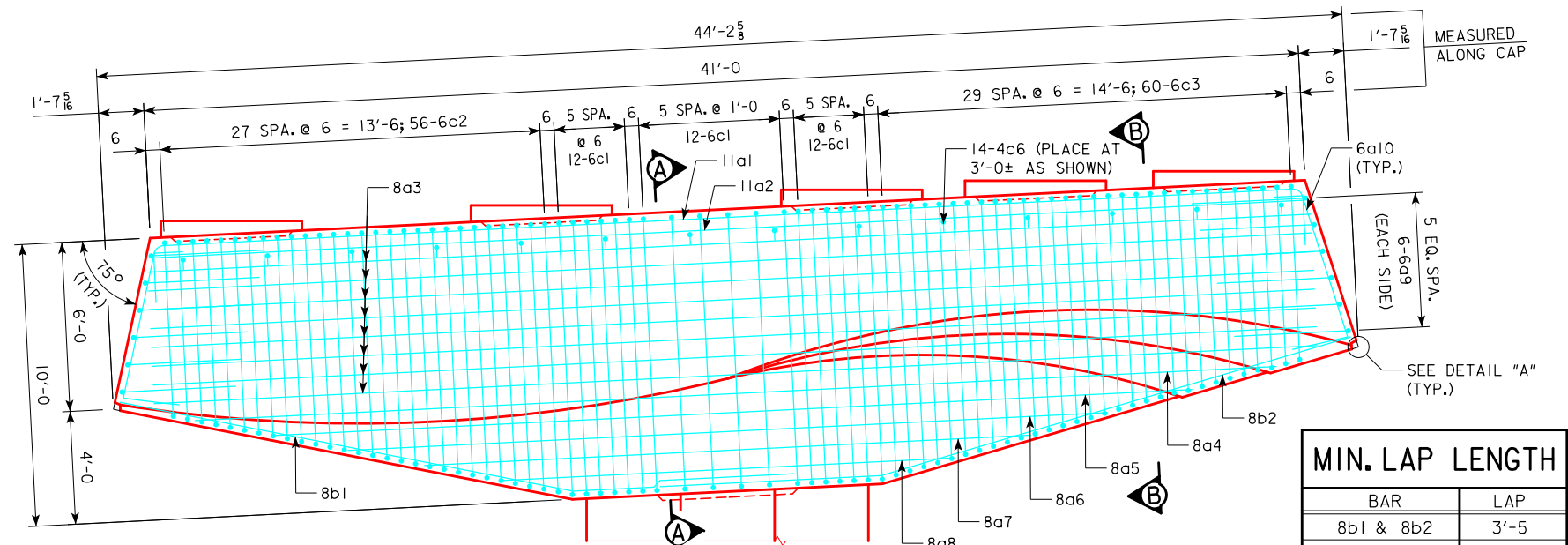
PILE LAYOUT
25 - HP 14x73 PILES REQUIRED

NOTE:
DIMENSIONS SHOWN ON PILE LAYOUT ARE AT
BOTTOM OF FOOTING. BATTER PILES (WHERE
INDICATED) AT 4:1 IN THE DIRECTION
SHOWN.



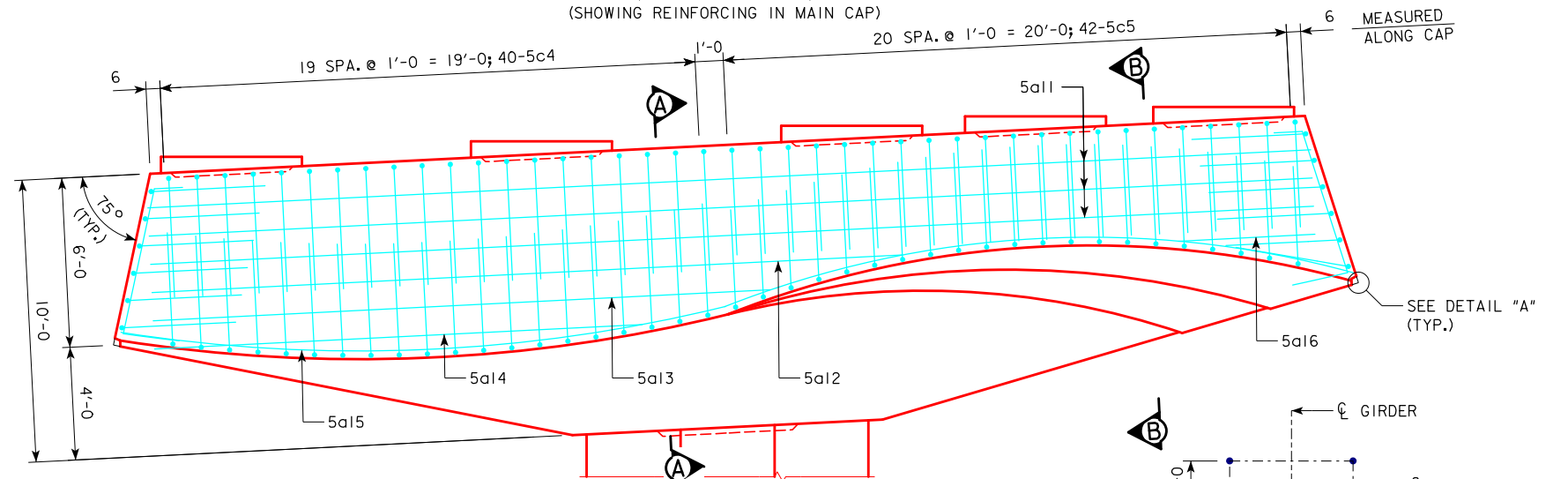
REINFORCING LAYOUT

NOTE:
SHIFT TOP MAT FOOTING f1 & f2 BARS AS NECESSARY TO
ALLOW FOR PROPER PLACEMENT OF COLUMN DOWEL BARS.



PIER CAP ELEVATION
(LOOKING UPSTATION)
(SHOWING REINFORCING IN MAIN CAP)

MIN. LAP LENGTH	
BAR	LAP
8b1 & 8b2	3'-5
5c4 & 5c5	1'-9
5e3	2'-11

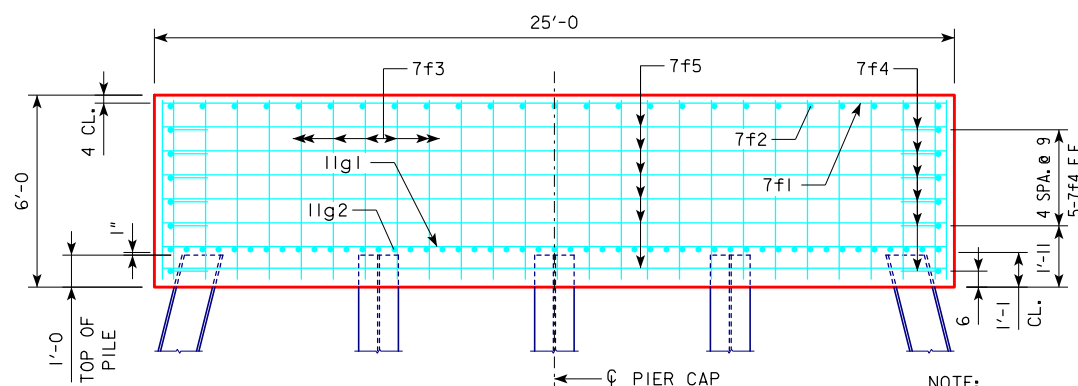


PIER CAP ELEVATION
(LOOKING UPSTATION)
(SHOWING REINFORCING IN ARCHITECTURAL RELIEF)

ANCHOR BOLT LAYOUT

MAINTAIN 6" MIN. EDGE DISTANCE ON ALL SIDES
(FOR ADDITIONAL DETAILS AND NOTES, SEE DESIGN SHEET 78)
REINFORCING m & n BARS MAY BE SHIFTED SLIGHTLY TO
CLEAR ANCHOR BOLTS.

NOTES:
FOR SECTIONS A-A & B-B, SEE DESIGN SHEET 31.
FOR DETAILS "A" & "B", SEE DESIGN SHEET 37.



SECTION E-E

NOTE:
FOR REINFORCING LIST, BENT
BAR DETAILS, QUANTITIES
AND ADDITIONAL NOTES,
SEE DESIGN SHEET 33.

DESIGN FOR 0° SKEW
**1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE**
UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
PIER 7 DETAILS
STA. 3546+14.50 (I-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 32 OF 121 FILE NO. 30170 DESIGN NO. 1320



THE CONTRACT LENGTH OF 95 FEET FOR THE PIER 7 PILES IS BASED ON A COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 363 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL AND 0.7 FOR ROCK END BEARING. PIER 7 PILES ALSO WERE DESIGNED FOR A FACTORED TENSION FORCE OF 22 KIPS.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (ϕ) OF 0.65 FOR SOIL AND 0.7 FOR ROCK END BEARING. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF FOOTING.

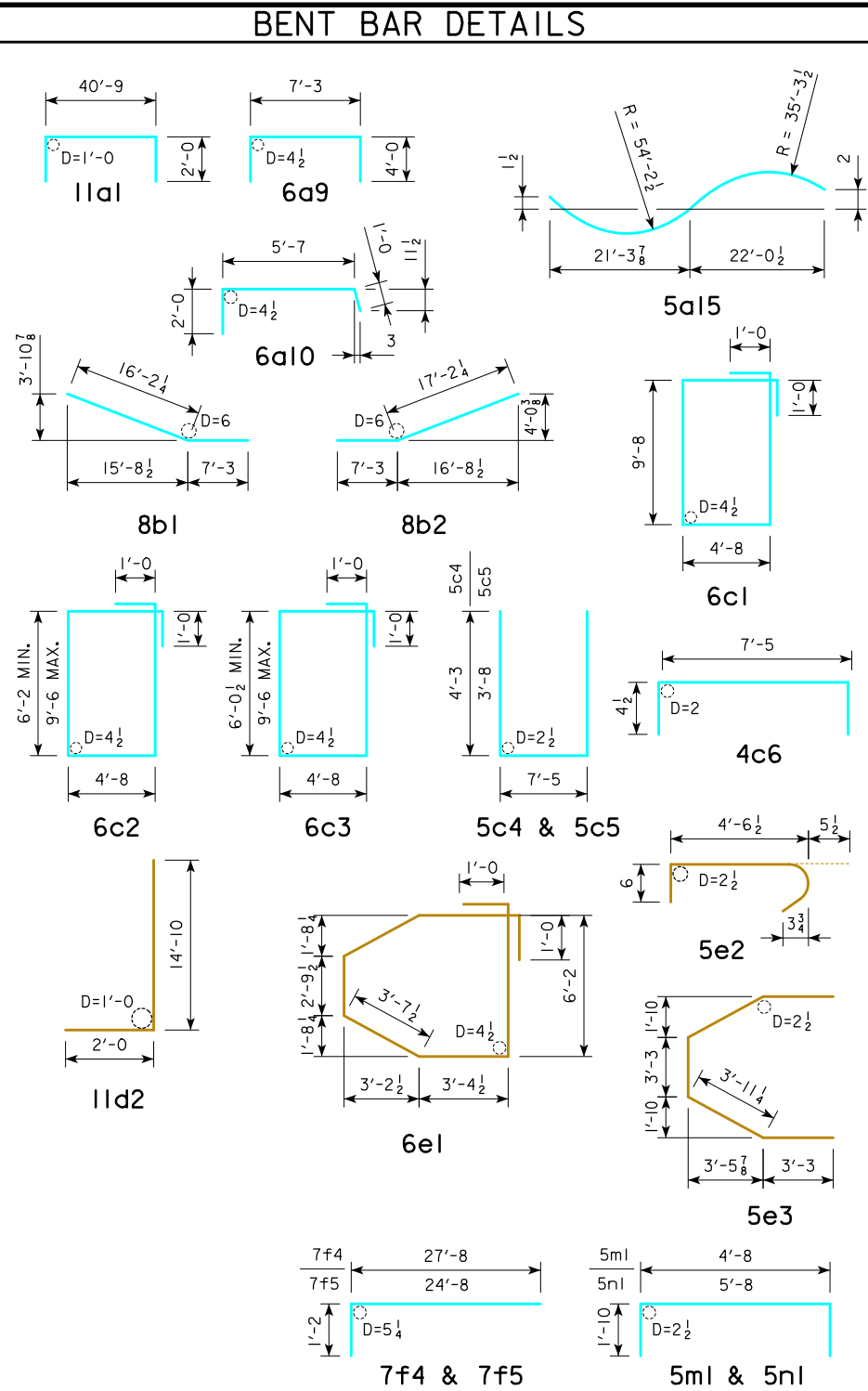
THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER 7 PILES IS 268 TONS AT END OF DRIVE OR RETAP. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. IN NO CASE SHALL A PILE BE EMBEDDED LESS THAN 27 FEET. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

SEE DESIGN SHEET 15 FOR ADDITIONAL PIER NOTES.

PIER 7 CONC. PLACEMENT QUANTITIES	
LOCATION	QUANTITY
CAP & PEDESTALS (HIGH PERFORMANCE CONCRETE)*	106.9
COLUMN (HIGH PERFORMANCE CONCRETE)	76.1
FOOTING	155.6
TOTAL (CU. YDS.)	338.6








* QUANTITY IGNORES THE DEDUCTION OF CONCRETE VOLUME DUE TO THE FORM LINER.

NOTE:
CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED
ON THE SUMMARY QUANTITIES SHEET.



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

EPOXY COATED

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
11d1	COLUMN VERTICAL		46	39'-11	9,756
11d2	FOOTING TO COLUMN DOWEL		46	16'-10	4,114
6d3	PLINTH VERTICAL		42	17'-1	1,078
6d4	FOOTING TO PLINTH DOWEL		42	4'-0	252
6e1	COLUMN HOOPS		82	25'-0	3,079
5e2	COLUMN TIES		82	5'-6	470
5e3	PLINTH HAIRPINS		42	17'-8	774

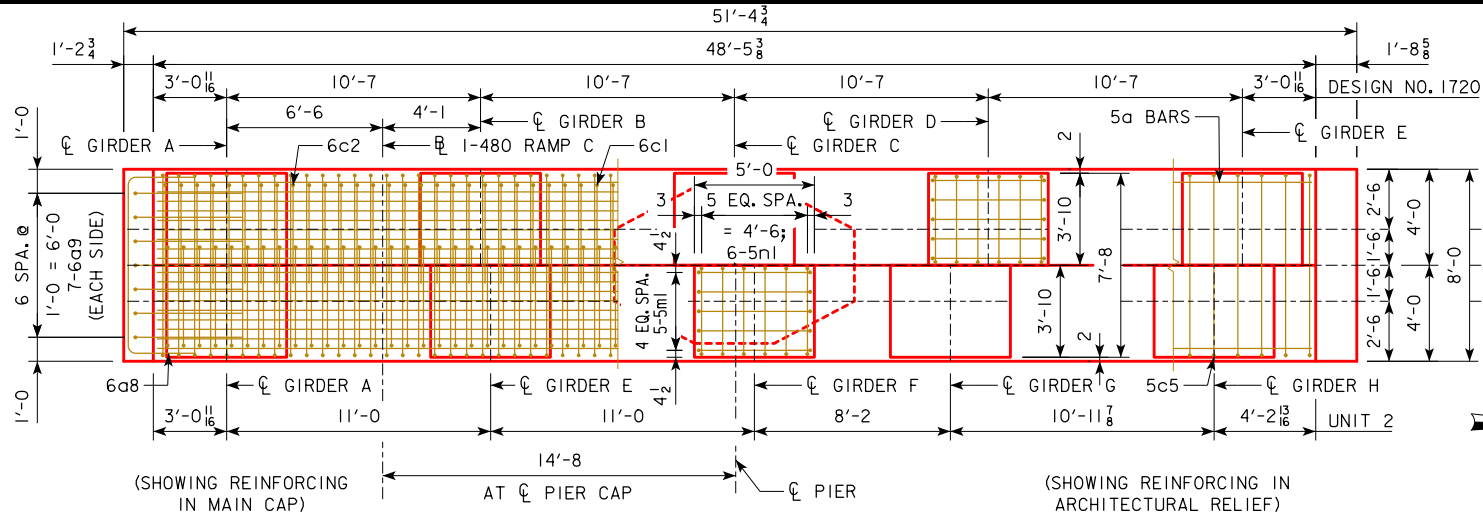
REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)	19,523
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NON-COATED BARS

11a1	CAP LONGIT. TOP		18	44'-9	4,280
11a2	CAP LONGIT. TOP		18	40'-9	3,897
8a3	CAP LONGIT. SIDES		16	41'-0	1,752
8a4	CAP LONGIT. SIDES		2	36'-1	193
8a5	CAP LONGIT. SIDES		2	30'-8	164
8a6	CAP LONGIT. SIDES		2	25'-3	135
8a7	CAP LONGIT. SIDES		2	19'-9	105
8a8	CAP LONGIT. SIDES		2	14'-4	77
6a9	CAP TRANSV. ENDS		12	15'-3	275
6a10	CAP VERTICAL ENDS		14	8'-7	180
5a11	CAP LONGIT. SIDES (RELIEF)		6	41'-0	257
5a12	CAP LONGIT. SIDES (RELIEF)		2	26'-11	56
5a13	CAP LONGIT. SIDES (RELIEF)		2	22'-8	47
5a14	CAP LONGIT. SIDES (RELIEF)		2	13'-11	29
5a15	CAP LONGIT. SIDES (RELIEF)		2	43'-11	92
5a16	CAP LONGIT. SIDES (RELIEF)		2	5'-2	11
8b1	CAP LONGIT. BOTTOM		8	23'-5	500
8b2	CAP LONGIT. BOTTOM		8	24'-5	522
6c1	CAP HOOPS		36	30'-8	1,658
6c2	CAP HOOPS CANTILEVER		56	VARIES	2,271
6c3	CAP HOOPS CANTILEVER		60	VARIES	2,422
5c4	CAP HAIRPINS VERTICAL (RELIEF)		40	15'-11	664
5c5	CAP HAIRPINS VERTICAL (RELIEF)		42	14'-9	646
4c6	CAP HAIRPINS TOP		14	8'-2	76
7f1	FOOTING TRANSV. TOP		28	24'-8	1,412
7f2	FOOTING LONGIT. TOP		25	27'-8	1,414
7f3	FOOTING SIDE VERTICAL		102	5'-7	1,164
7f4	FOOTING SIDE HORIZONTAL		12	28'-10	707
7f5	FOOTING SIDE HORIZONTAL		12	25'-10	634
11g1	FOOTING TRANSV. BOTTOM		55	24'-8	7,208
11g2	FOOTING LONGIT. BOTTOM		49	27'-8	7,203
5m1	CAP PEDESTAL LONGIT.		35	8'-4	304
5n1	CAP PEDESTAL TRANSV.		30	9'-4	292

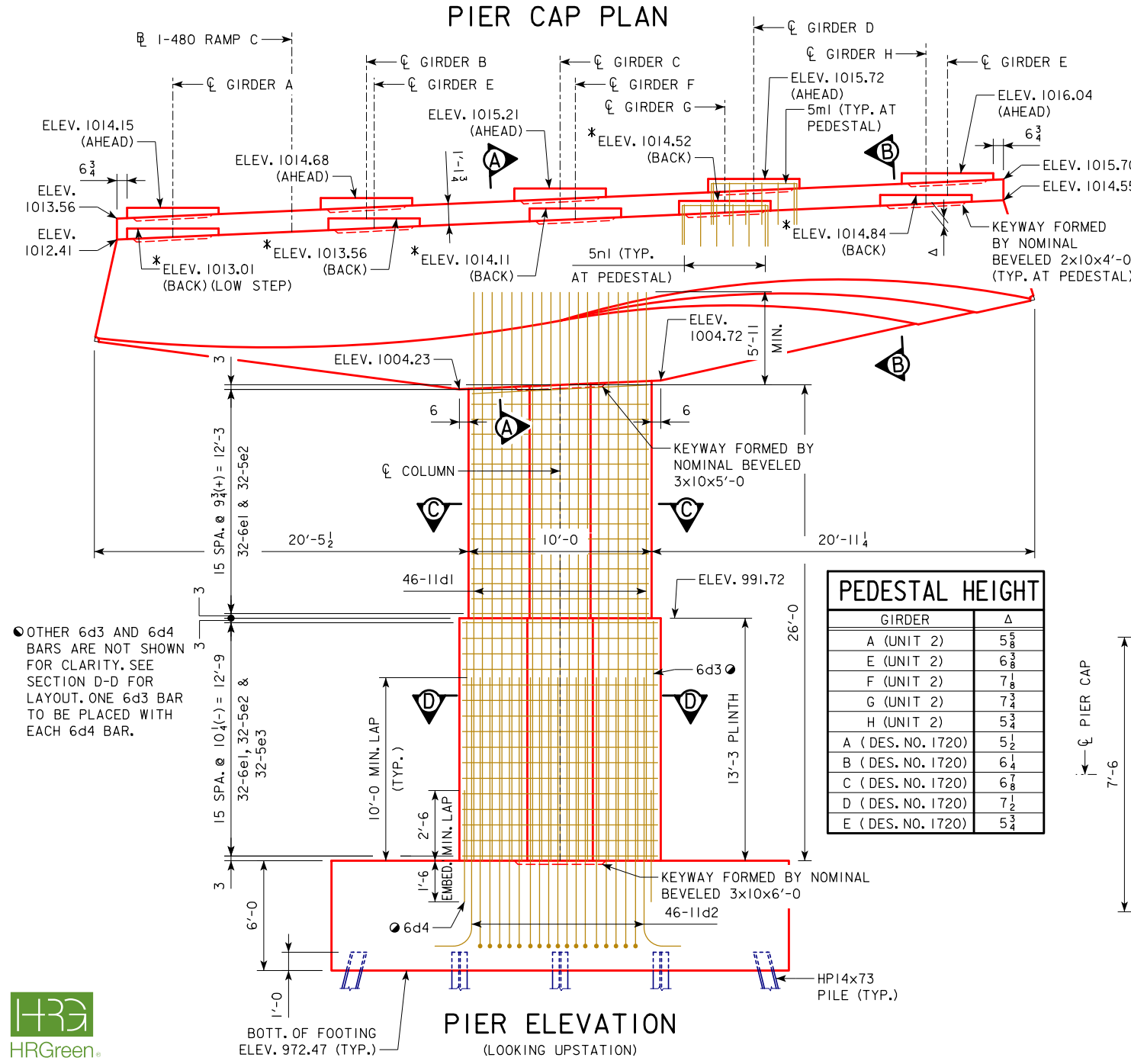
REINFORCING STEEL - TOTAL (LBS.)	40,647
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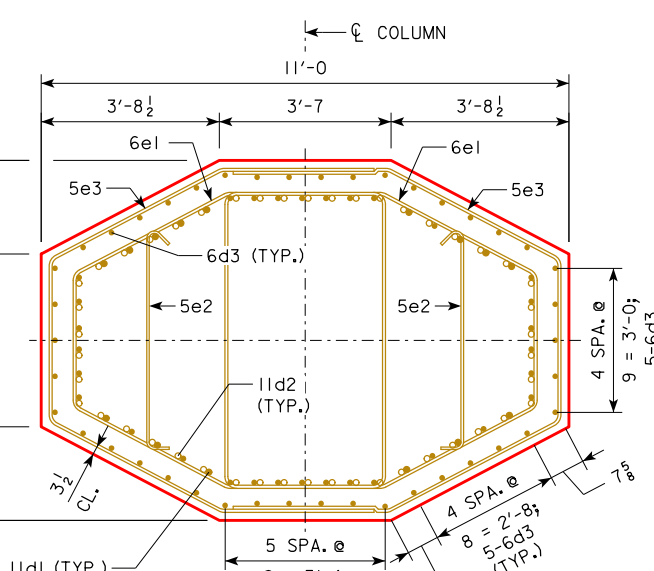
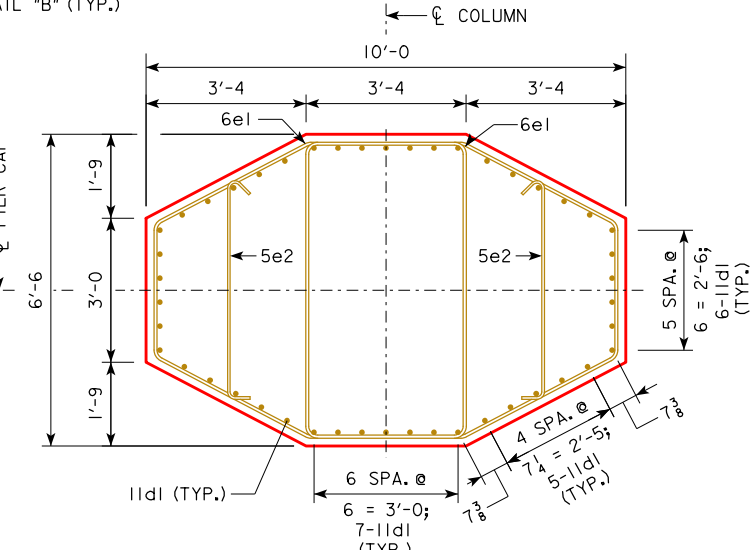
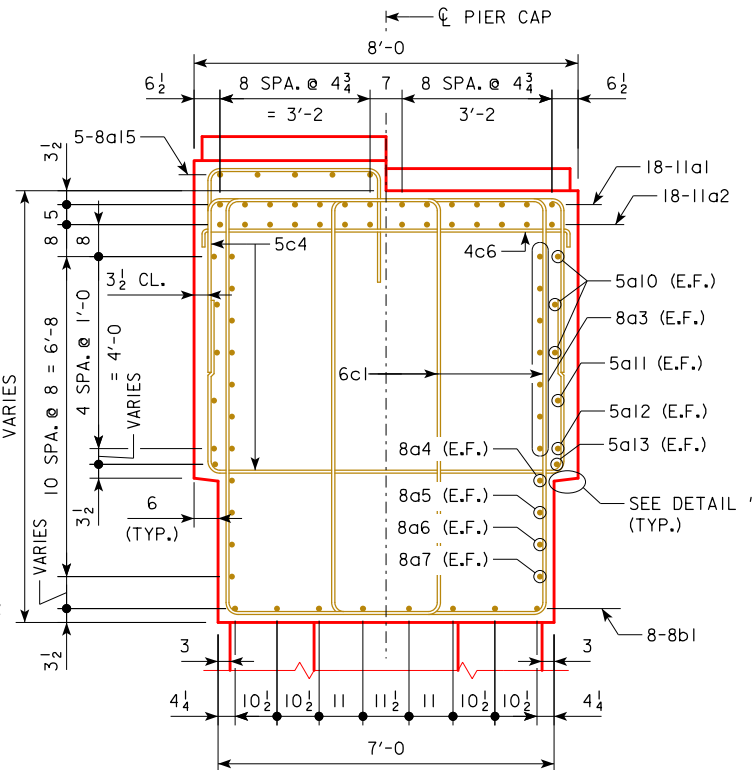
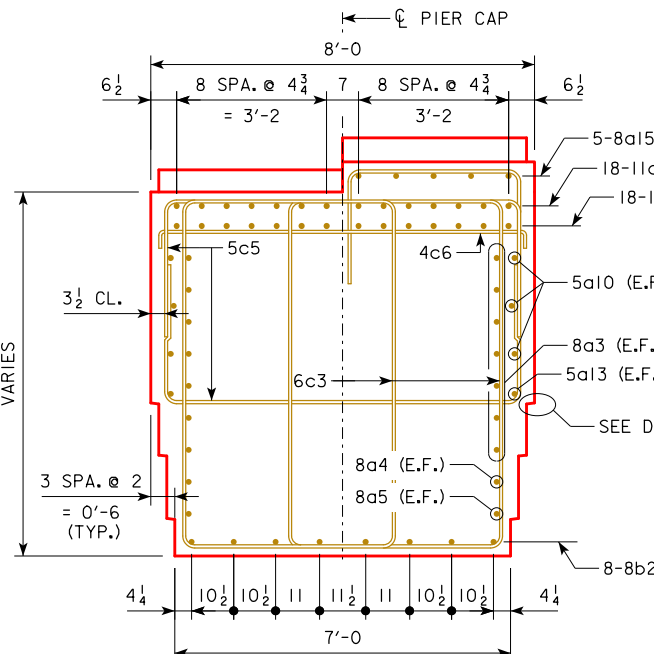


* ELEVATION AND PEDESTAL HEIGHTS DEPENDENT ON FINAL BEARING HEIGHT, WHICH SHALL BE DETERMINED BY BEARING MANUFACTURER. CONTRACTOR SHALL VERIFY BEARING HEIGHT WITH MANUFACTURER AND ADJUST ELEVATIONS IF NECESSARY PRIOR TO PLACING CONCRETE. MINIMUM PEDESTAL HEIGHT SHALL BE 4".

NOTE: FOR DETAILS OF AHEAD BEARINGS, SEE DESIGN NO. 1720 (NOT PART OF THIS DESIGN).



PEDESTAL HEIGHT	
GIRDER	Δ
A (UNIT 2)	5 3/8
E (UNIT 2)	6 3/8
F (UNIT 2)	7 3/8
G (UNIT 2)	7 3/8
H (UNIT 2)	5 3/8
A (DES. NO. 1720)	5 3/8
B (DES. NO. 1720)	6 1/4
C (DES. NO. 1720)	6 3/8
D (DES. NO. 1720)	7 1/2
E (DES. NO. 1720)	5 3/8



NOTE: MINOR ADJUSTMENTS MAY BE MADE TO COLUMN/DOWEL BAR SPACING TO ACCOMMODATE 5e2 PLACEMENT. CONTRACTOR SHALL TEST PLACEMENT OF 6e1/5e2 TIES PRIOR TO POURING FOOTING CONCRETE.

DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

PIER 8 DETAILS

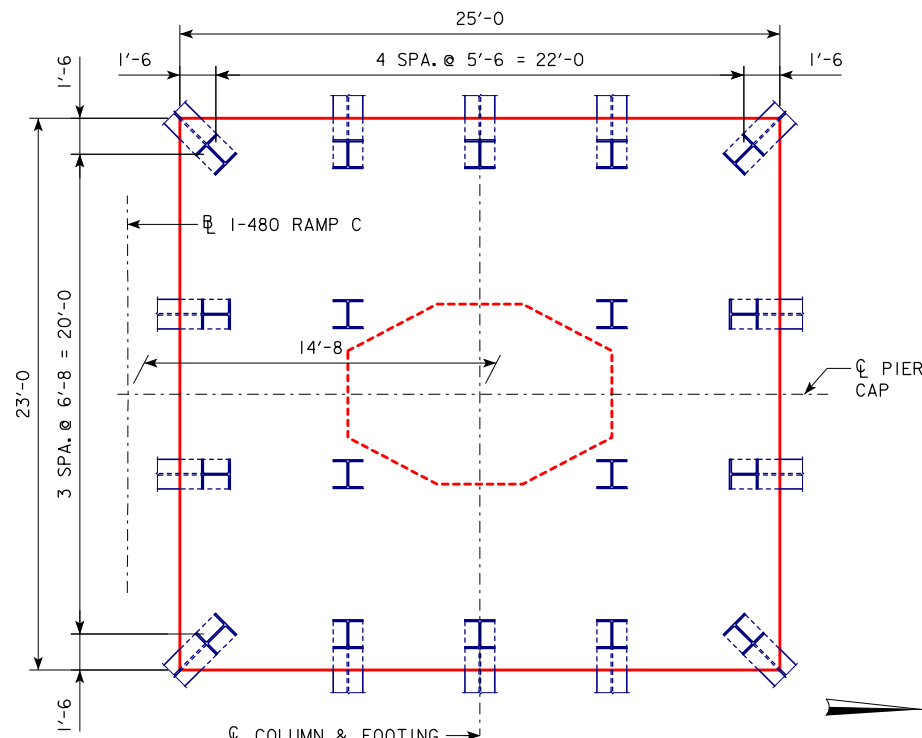
STA. 3546+14.50 (RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

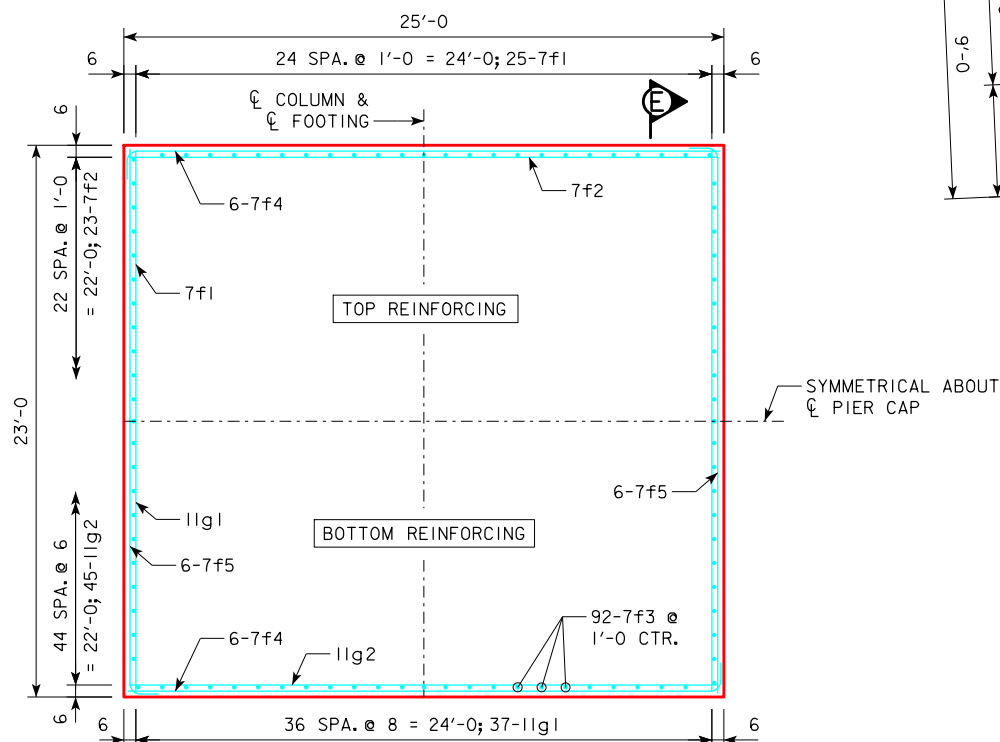
DESIGN SHEET NO. 34 OF 121 FILE NO. 30170 DESIGN NO. 1320





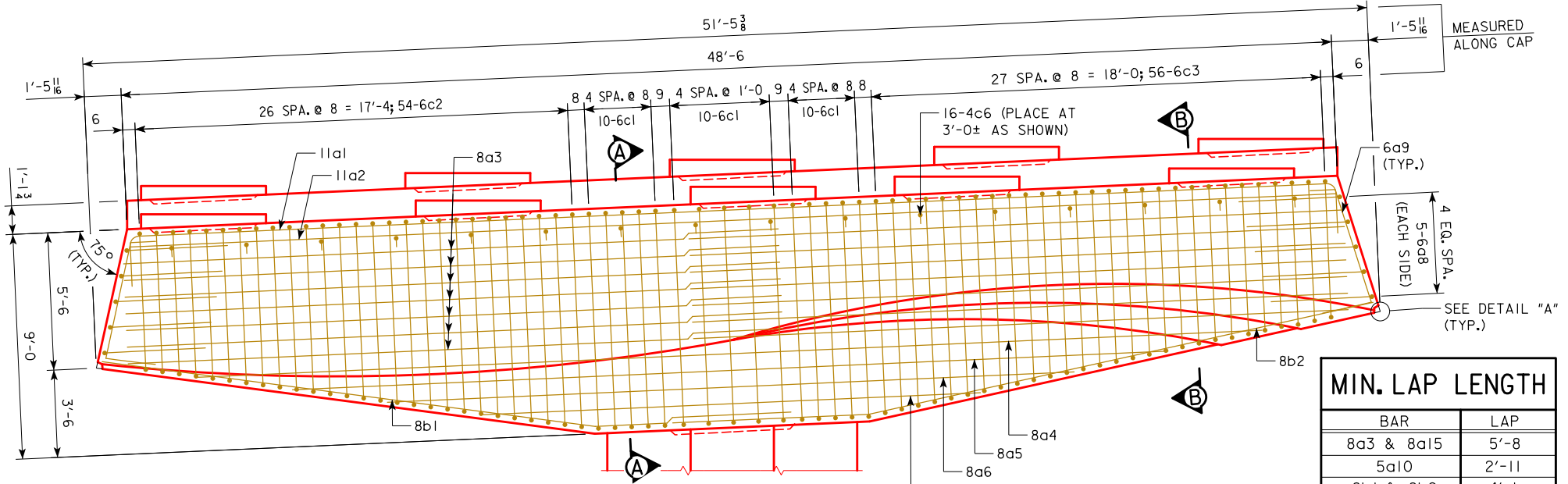
PILE LAYOUT
18 - HP 14x73 PILES REQUIRED

NOTE:
DIMENSIONS SHOWN ON PILE LAYOUT ARE AT
BOTTOM OF FOOTING. BATTER PILES (WHERE
INDICATED) AT 4:1 IN THE DIRECTION
SHOWN.



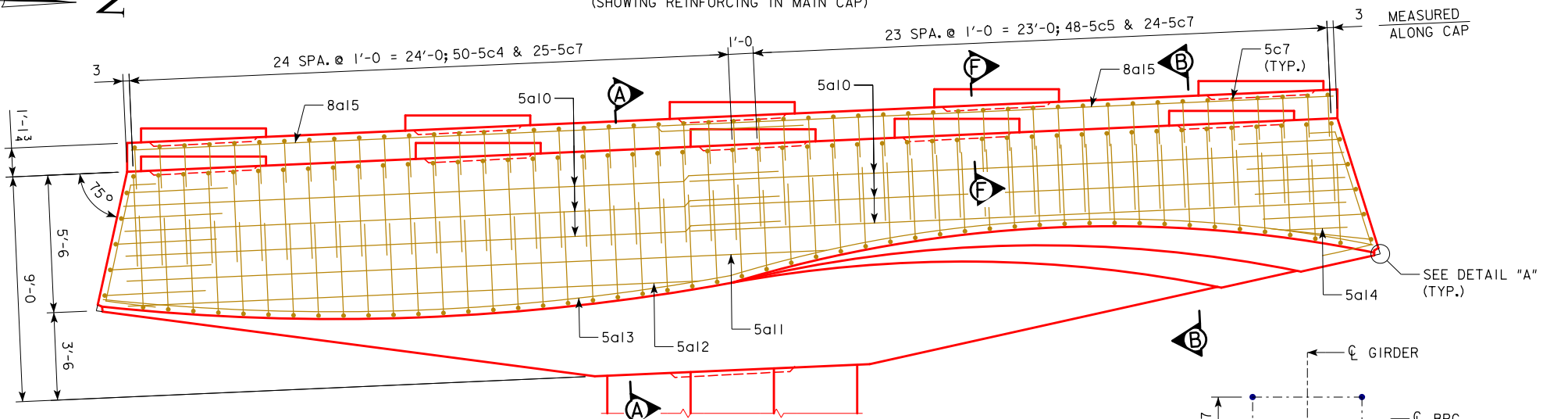
REINFORCING LAYOUT

NOTE:
SHIFT TOP MAT FOOTING f1 & f2 BARS AS NECESSARY TO
ALLOW FOR PROPER PLACEMENT OF COLUMN DOWEL BARS.

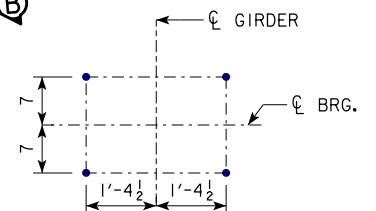


PIER CAP ELEVATION
(LOOKING UPSTATION)
(SHOWING REINFORCING IN MAIN CAP)

MIN. LAP LENGTH	
BAR	LAP
8a3 & 8a15	5'-8
5a10	2'-11
8b1 & 8b2	4'-1
5c4 & 5c5	2'-1
5e3	2'-11



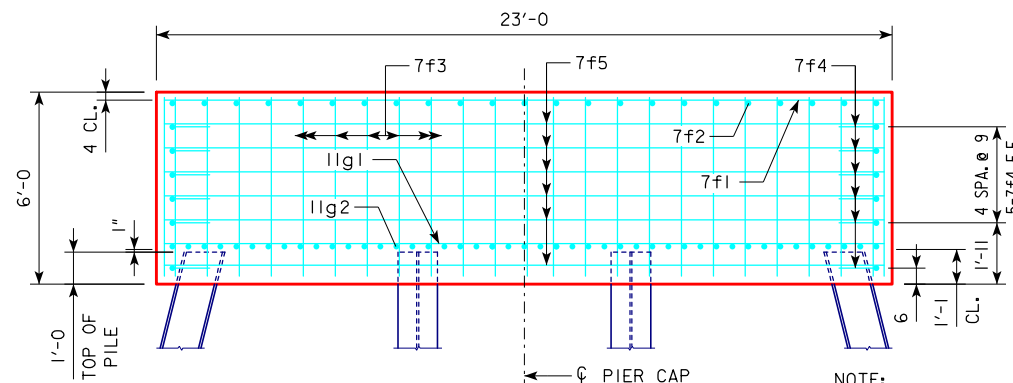
PIER CAP ELEVATION
(LOOKING UPSTATION)
(SHOWING REINFORCING IN ARCHITECTURAL RELIEF)



ANCHOR BOLT LAYOUT
(BACK BEARINGS ONLY)

MAINTAIN 6" MIN. EDGE DISTANCE ON ALL SIDES
(FOR ADDITIONAL DETAILS AND NOTES, SEE DESIGN SHEET 78)
REINFORCING m & n BARS MAY BE SHIFTED SLIGHTLY TO
CLEAR ANCHOR BOLTS.

NOTES:
FOR SECTIONS A-A & B-B, SEE DESIGN SHEET 34.
FOR SECTIONS F-F, SEE DESIGN SHEET 36.
FOR DETAILS "A" & "B", SEE DESIGN SHEET 37.



SECTION E-E

NOTE:
FOR REINFORCING LIST, BENT
BAR DETAILS, QUANTITIES
AND ADDITIONAL NOTES,
SEE DESIGN SHEET 36.

DESIGN FOR 0° SKEW
**1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE**
UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
PIER 8 DETAILS
STA. 3546+14.50 (CL 1-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 35 OF 121 FILE NO. 30170 DESIGN NO. 1320



PIER 8 PILING NOTES:

THE CONTRACT LENGTH OF 95 FEET FOR THE PIER 8 PILES IS BASED ON A NON-COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 350 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.7 FOR ROCK END BEARING.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A NON-COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.7 FOR ROCK END BEARING. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF FOOTING.

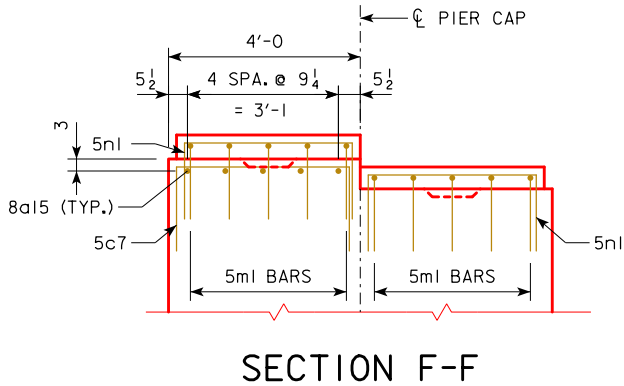
THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER 8 PILES IS 273 TONS AT END OF DRIVE OR RETAP. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

SEE DESIGN SHEET 15 FOR ADDITIONAL PIER NOTES.

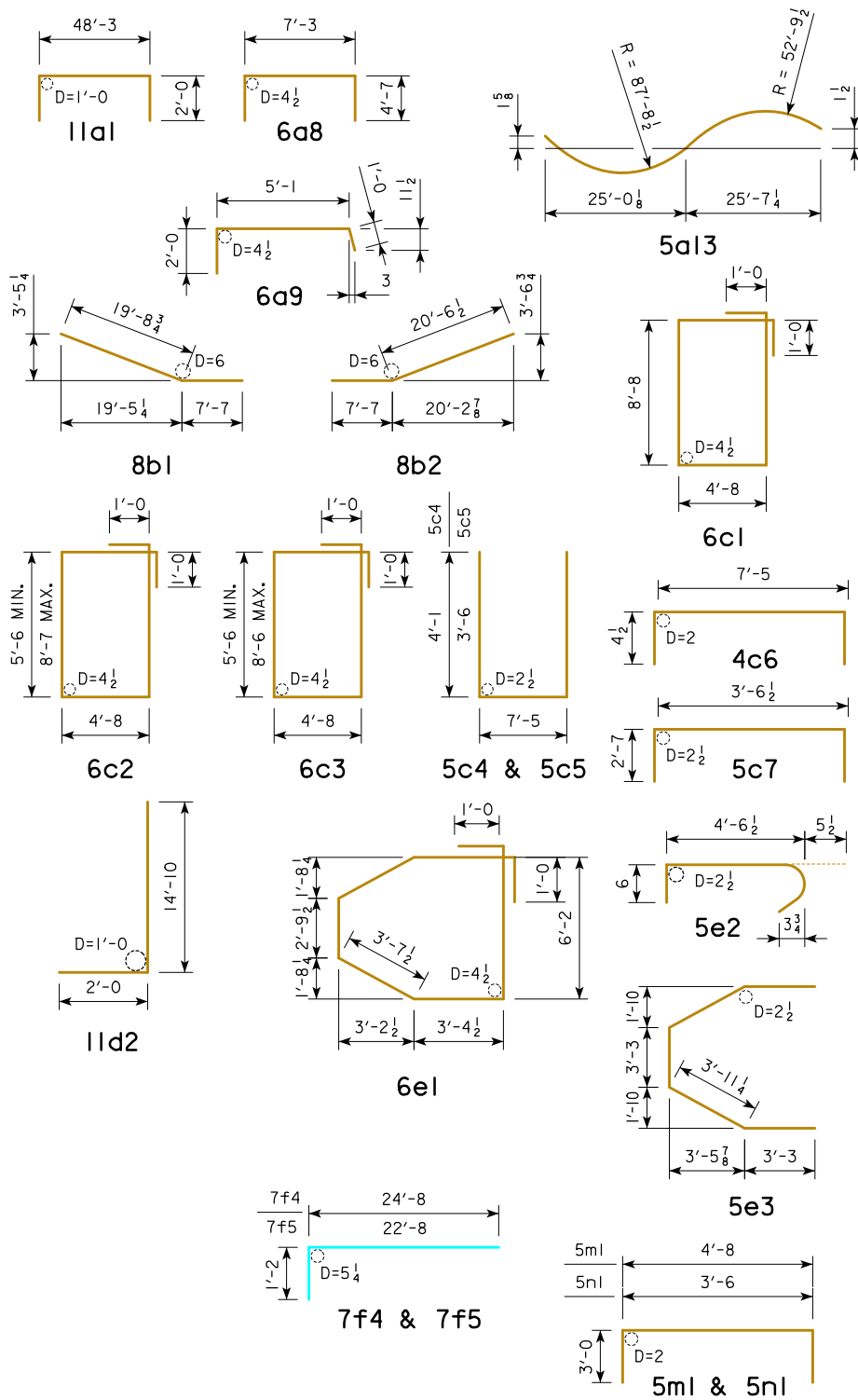
PIER 8 CONC. PLACEMENT QUANTITIES	
LOCATION	QUANTITY
CAP & PEDESTALS (HIGH PERFORMANCE CONCRETE)*	128.8
COLUMN (HIGH PERFORMANCE CONCRETE)	58.6
FOOTING	127.8
TOTAL (CU. YDS.)	315.2

* QUANTITY IGNORES THE DEDUCTION OF CONCRETE VOLUME DUE TO THE FORM LINER.

NOTE:
CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED ON THE SUMMARY QUANTITIES SHEET.



BENT BAR DETAILS



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

REINFORCING BAR LIST - PIER 8

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
11a1	CAP LONGIT. TOP		18	52'-3	4,997
11a2	CAP LONGIT. TOP		18	48'-3	4,614
8a3	CAP LONGIT. SIDES		28	27'-2	2,031
8a4	CAP LONGIT. SIDES		2	40'-3	215
8a5	CAP LONGIT. SIDES		2	32'-8	174
8a6	CAP LONGIT. SIDES		2	25'-1	134
8a7	CAP LONGIT. SIDES		2	17'-7	94
6a8	CAP TRANSV. ENDS		10	16'-5	247
6a9	CAP VERTICAL ENDS		14	8'-1	170
5a10	CAP LONGIT. SIDES (RELIEF)		12	25'-10	323
5a11	CAP LONGIT. SIDES (RELIEF)		2	28'-5	59
5a12	CAP LONGIT. SIDES (RELIEF)		2	20'-9	43
5a13	CAP LONGIT. SIDES (RELIEF)		2	50'-11	106
5a14	CAP LONGIT. SIDES (RELIEF)		2	2'-11	6
8a15	CAP LONGIT. TOP (STEP)		10	26'-11	719
8b1	CAP LONGIT. BOTTOM		8	27'-4	584
8b2	CAP LONGIT. BOTTOM		8	28'-2	602
6c1	CAP HOOPS		30	28'-8	1,292
6c2	CAP HOOPS CANTILEVER		54	VARIES	2,061
6c3	CAP HOOPS CANTILEVER		56	VARIES	2,131
5c4	CAP HAIRPINS VERTICAL (RELIEF)		50	15'-7	813
5c5	CAP HAIRPINS VERTICAL (RELIEF)		48	14'-5	722
4c6	CAP HAIRPINS TOP		16	8'-2	87
5c7	CAP STEP TRANSV.		49	8'-9	447
11d1	COLUMN VERTICAL		46	32'-2	7,861
11d2	FOOTING TO COLUMN DOWEL		46	16'-10	4,114
6d3	PLINTH VERTICAL		42	13'-1	825
6d4	FOOTING TO PLINTH DOWEL		42	4'-0	252
6e1	COLUMN HOOPS		64	25'-0	2,403
5e2	COLUMN TIES		64	5'-6	367
5e3	PLINTH HAIRPINS		32	17'-8	590
5m1	CAP PEDESTAL LONGIT.		50	10'-8	556
5n1	CAP PEDESTAL TRANSV.		60	9'-6	595
REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)				40,234	
7f1	FOOTING TRANSV. TOP		25	22'-8	1,158
7f2	FOOTING LONGIT. TOP		23	24'-8	1,160
7f3	FOOTING SIDE VERTICAL		92	5'-7	1,050
7f4	FOOTING SIDE HORIZONTAL		12	25'-10	634
7f5	FOOTING SIDE HORIZONTAL		12	23'-10	585
11g1	FOOTING TRANSV. BOTTOM		37	22'-8	4,456
11g2	FOOTING LONGIT. BOTTOM		45	24'-8	5,897
REINFORCING STEEL - TOTAL (LBS.)				14,940	

DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

PIER 8 QUANTITIES

STA. 3546+14.50 (R 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 36 OF 121 FILE NO. 30170 DESIGN NO. 1320



PIER CONCRETE TEXTURE NOTES:

THIS WORK CONSISTS OF APPLYING TEXTURED FINISHES ON ALL DESIGNATED CONCRETE SURFACES OF THE PIER CAPS AND PIER PLINTHS SHOWN IN THIS PLAN. SEE "GENERAL NOTES FOR TEXTURED CONCRETE FORM LINERS" ON DESIGN SHEET 4 FOR MORE INFORMATION REGARDING THE USE OF FORM LINERS. THE TEXTURED CONCRETE MOCKUP PANEL MUST BE REVIEWED AND APPROVED BY THE ENGINEER BEFORE BEGINNING PRODUCTION CONCRETE WORK THAT INCLUDES TEXTURE. SEE "TEXTURED CONCRETE MOCKUP PANEL NOTES" ON DESIGN SHEET 4 FOR MORE INFORMATION.

THE FORM LINER USED TO PRODUCE TEXTURE 'A' AS SHOWN IN THE PLAN DETAILS SHALL PRODUCE A TEXTURED EFFECT OF REALISTIC ASHLAR STONE MASONRY SURFACE HAVING CUT STONES OF VARYING SIZE AND SHAPE. MAXIMUM DEPTH OF TEXTURE SHALL BE 1½ INCHES.

OBTAIN TEXTURE 'A' FORM LINER MATERIALS FROM ONE OF THE FOLLOWING MANUFACTURERS:

- 1. CUSTOMROCK INTERNATIONAL (PATTERN NO. 12020)
- 2. FITZGERALD FORMLINERS (PATTERN NO. 1700)
- 3. ARCHITECTURAL POLYMERS (PATTERN NO. 905)
- 4. SPEC FORMLINERS, INC. (PATTERN NO. 1515)
- 5. SUBMIT ALL OTHER MANUFACTURERS AND PATTERNS INCLUDING A 1 FOOT BY 1 FOOT SAMPLE OF PROPOSED FORM LINER TO THE IOWA DEPARTMENT OF TRANSPORTATION, BRIDGES AND STRUCTURES BUREAU, AMES, IOWA. SAMPLE MAY BE EITHER ACTUAL FORM LINER MATERIALS OR FOAM CASTINGS. NO SAMPLES ARE REQUIRED TO BE SUBMITTED FOR MANUFACTURERS AND PATTERNS LISTED ABOVE.

THE FORM LINER USED TO PRODUCE TEXTURE 'B' AS SHOWN IN THE PLAN DETAILS SHALL PRODUCE A TEXTURE EFFECT OF VERTICAL, FRACTURED-FACE RIBS ON APPROXIMATELY 2-INCH CENTERS. MAXIMUM TEXTURE DEPTH SHALL BE 1½ INCHES, AND MINIMUM TEXTURE DEPTH SHALL BE 1⅓ INCHES. ORIENT FORM LINERS IN FORMS SO THAT STRIATIONS ARE SET PLUMB.

OBTAIN TEXTURE 'B' FORM LINER MATERIALS FROM ONE OF THE FOLLOWING MANUFACTURERS:

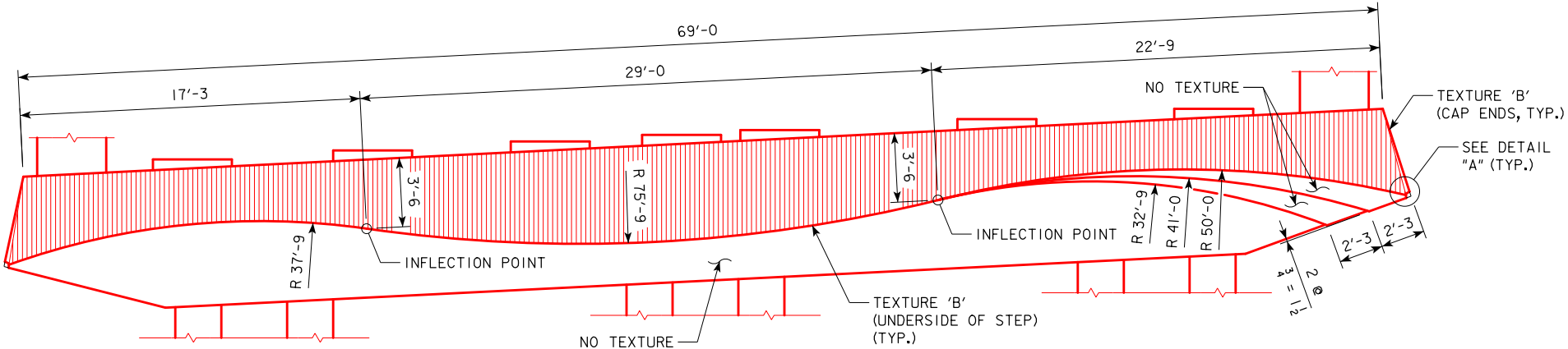
- 1. ARCHITECTURAL POLYMERS (PATTERN NO. 204)
- 2. FITZGERALD FORMLINERS (PATTERN NO. 16959)
- 3. GREENSTREAK (PATTERN NO. 367)
- 4. SCOTT SYSTEM, INC. (PATTERN NO. 129A)
- 5. CUSTOM ROCK INTERNATIONAL (PATTERN NO. 206)
- 6. SUBMIT ALL OTHER UNLISTED MANUFACTURERS AND PATTERNS INCLUDING A 1 FOOT BY 1 FOOT SAMPLE OF PROPOSED FORM LINER TO THE IOWA DEPARTMENT OF TRANSPORTATION, BRIDGES AND STRUCTURES BUREAU, AMES, IOWA. SAMPLE MAY BE EITHER ACTUAL FORM LINER MATERIALS OR FOAM CASTINGS. NO SAMPLES ARE REQUIRED TO BE SUBMITTED FOR MANUFACTURERS AND PATTERNS LISTED ABOVE.

PRIOR TO BEGINNING ANY PRODUCTION WORK THAT INCLUDES TEXTURE, SUBMIT MANUFACTURER'S CUT SHEETS FOR FORM LINERS. SUBMIT SHOP DRAWINGS THAT INDICATE POSITION OF LINERS WITHIN CONCRETE FORMS, LAYOUT OF JOINTS, AND BACKING MATERIAL TYPE AND THICKNESS IF REQUIRED.

DO NOT MIX FORM LINERS FROM DIFFERENT MANUFACTURERS WHEN FORMING ANY INDIVIDUAL TEXTURE ON THE PROJECT.

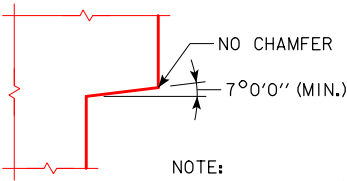
THE PIER SURFACES AS DESIGNATED IN THE PLANS SHALL ALSO RECEIVE CONCRETE RUSTICATION. SEE "GENERAL NOTES FOR CONCRETE RUSTICATION" ON DESIGN SHEET 4 FOR MORE INFORMATION REGARDING APPROVED TECHNIQUES AND METHODS OF CONCRETE RUSTICATION.

ALL COSTS ASSOCIATED WITH CONCRETE TEXTURE AND FORM LINERS, INCLUDING THE MOCKUP PANEL(S), ARE TO BE INCLUDED IN THE BID ITEM, "HIGH PERFORMANCE STRUCTURAL CONCRETE".

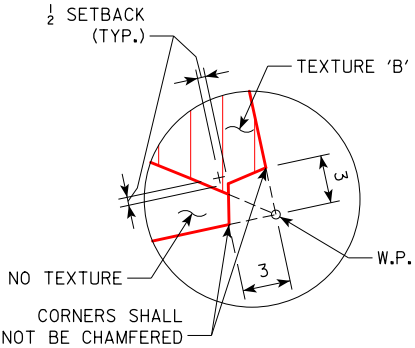


PIER CAP AESTHETIC TREATMENT DIMENSIONS

(PIER 1, LOOKING UPSTATION)
(TYPICAL AT BOTH SIDES OF PIER CAP)



DETAIL "B"



DETAIL "A"



DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS

WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

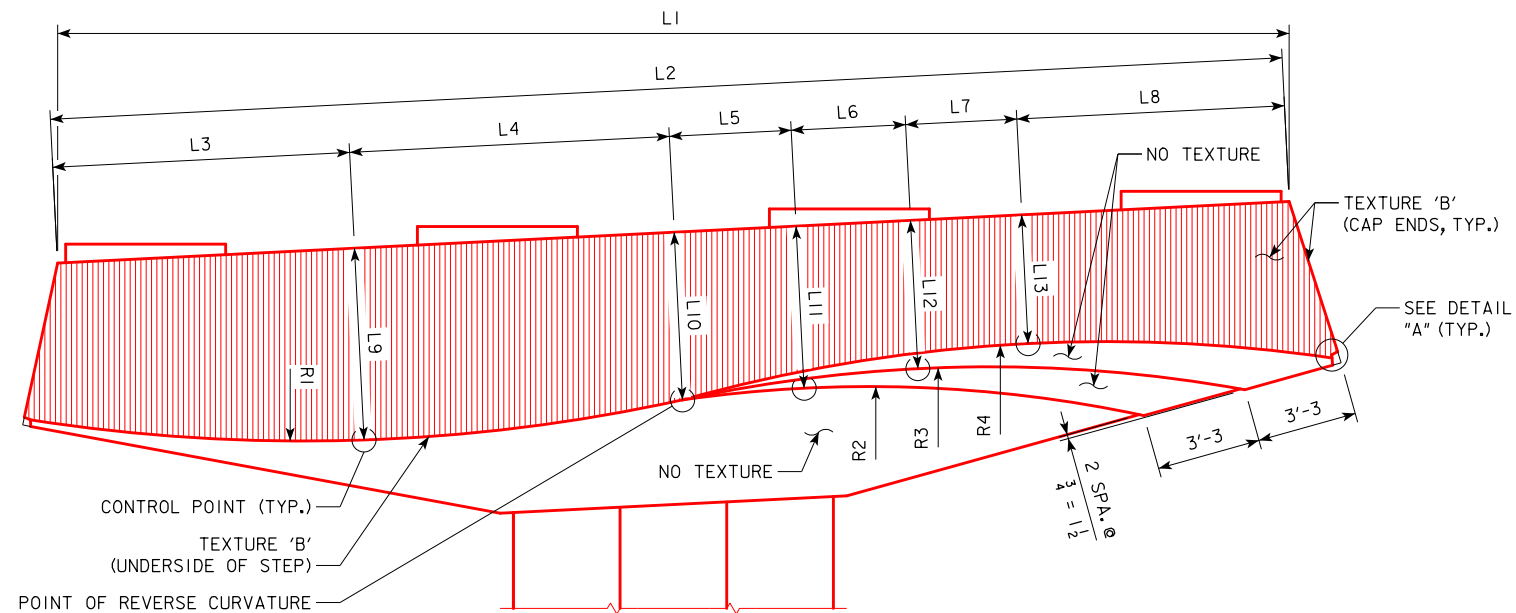
PIER AESTHETIC DETAILS

STA. 3546+14.50 (R 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

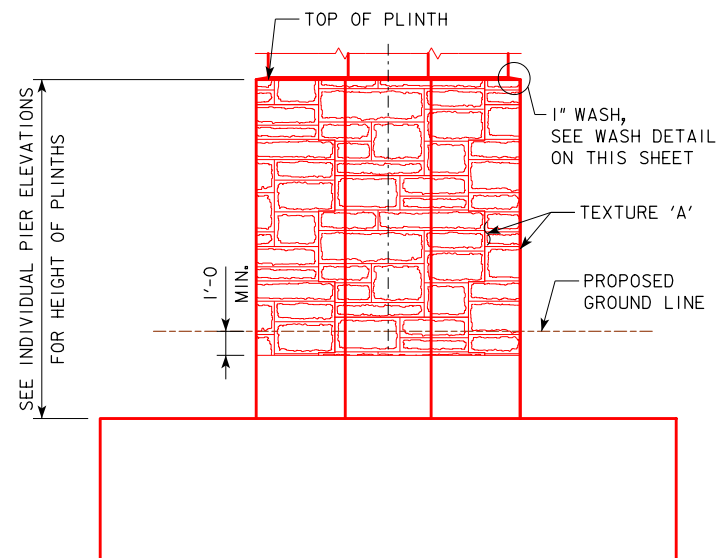
DESIGN SHEET NO. 37 OF 121 FILE NO. 30170 DESIGN NO. 1320



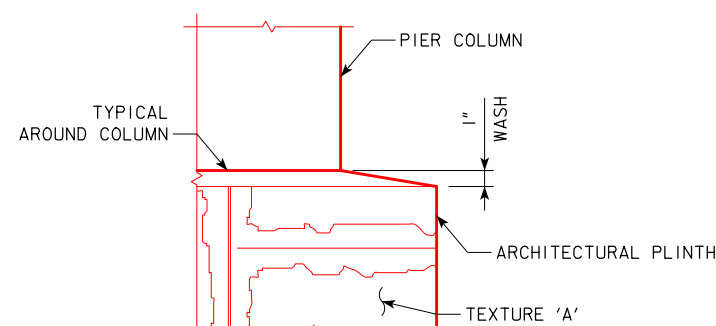
PIER CAP AESTHETIC TREATMENT DIMENSIONS

(PIER 2 - 8, LOOKING UPSTATION)
(TYPICAL BOTH SIDES OF PIER CAP)

PIER	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	R1	R2	R3	R4
2	44'-11 ³ / ₈	45'-0	10'-9 ⁷ / ₈	11'-4 ¹ / ₂	6'-5 ⁷ / ₈	2'-10 ⁷ / ₈	2'-9 ⁵ / ₈	10'-7 ¹ / ₈	7'-0	6'-0	5'-4 ⁷ / ₈	4'-10 ⁴ / ₈	4'-2 ¹ / ₄	65'-0	36'-0	39'-0	42'-0
3 - 5	38'-11 ³ / ₈	39'-0	9'-5	9'-9 ³ / ₄	4'-10 ⁷ / ₈	2'-10 ⁷ / ₈	2'-9 ³ / ₄	9'-1 ³ / ₄	6'-4	5'-6	5'-0 ⁷ / ₈	4'-6 ³ / ₈	3'-10 ¹ / ₂	58'-0	28'-6	32'-0	35'-6
6	49'-11 ³ / ₄	50'-0	11'-8	13'-0 ³ / ₈	7'-7 ³ / ₈	3'-0 ¹ / ₂	2'-9 ⁵ / ₈	11'-10 ¹ / ₈	7'-0	6'-0	5'-4 ³ / ₈	4'-9 ³ / ₄	4'-1 ³ / ₈	79'-0	48'-0	48'-6	49'-0
7	40'-11 ³ / ₈	41'-0	9'-9 ¹ / ₂	10'-4 ⁷ / ₈	5'-6 ¹ / ₈	2'-10 ⁷ / ₈	2'-9 ¹ / ₂	9'-7 ¹ / ₈	7'-0	6'-0	5'-5 ⁵ / ₈	4'-10 ¹ / ₂	4'-1 ⁷ / ₈	54'-6	29'-0	32'-0	35'-0
8	48'-5 ³ / ₈	48'-6	11'-10 ⁷ / ₈	12'-1 ¹ / ₈	7'-0 ³ / ₈	3'-1 ¹ / ₄	2'-10 ⁴ / ₈	11'-6 ¹ / ₈	6'-4	5'-6	5'-0 ⁴ / ₈	4'-6	3'-10 ³ / ₈	88'-0	51'-6	52'-0	52'-6



PIER PLINTH DETAIL

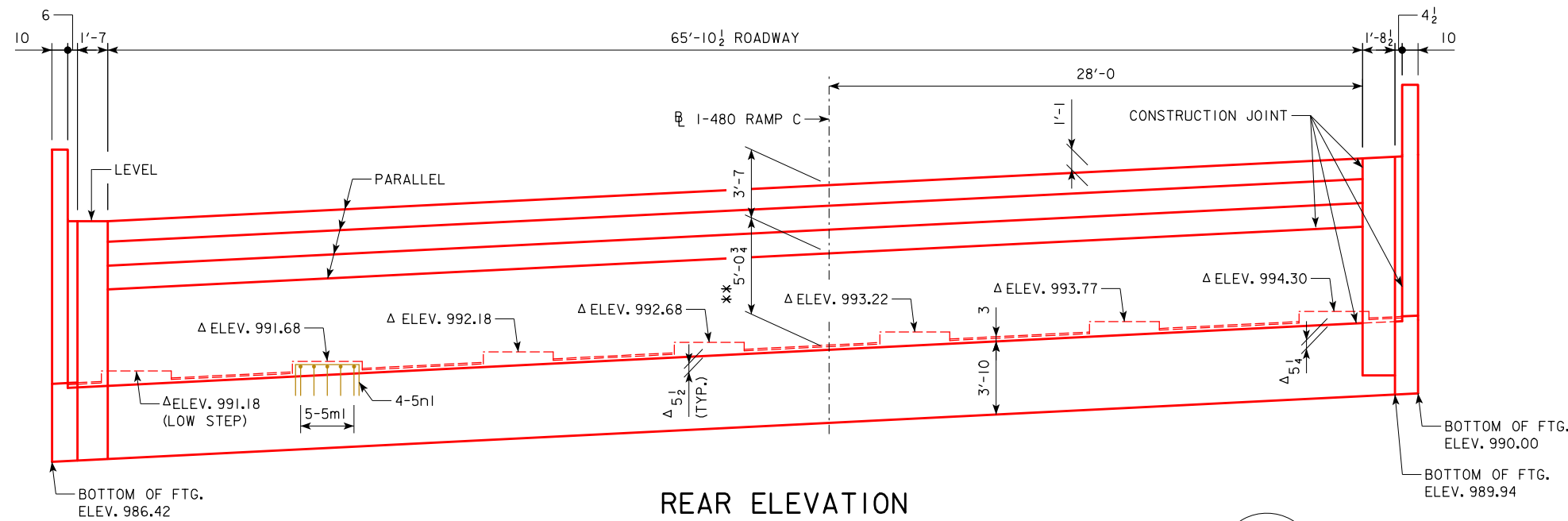


WASH DETAIL

NOTE:
FOR PIER CONCRETE TEXTURE NOTES AND DETAILS "A"
& "B", SEE DESIGN SHEET 37.

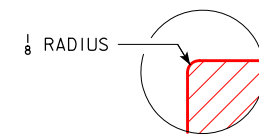
DESIGN FOR 0° SKEW
1419'-0 x VARIES CONTINUOUS WELDED GIRDER BRIDGE
 UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0
PIER AESTHETIC DETAILS
 STA. 3546+14.50 (R 1-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 38 OF 121 FILE NO. 30170 DESIGN NO. 1320



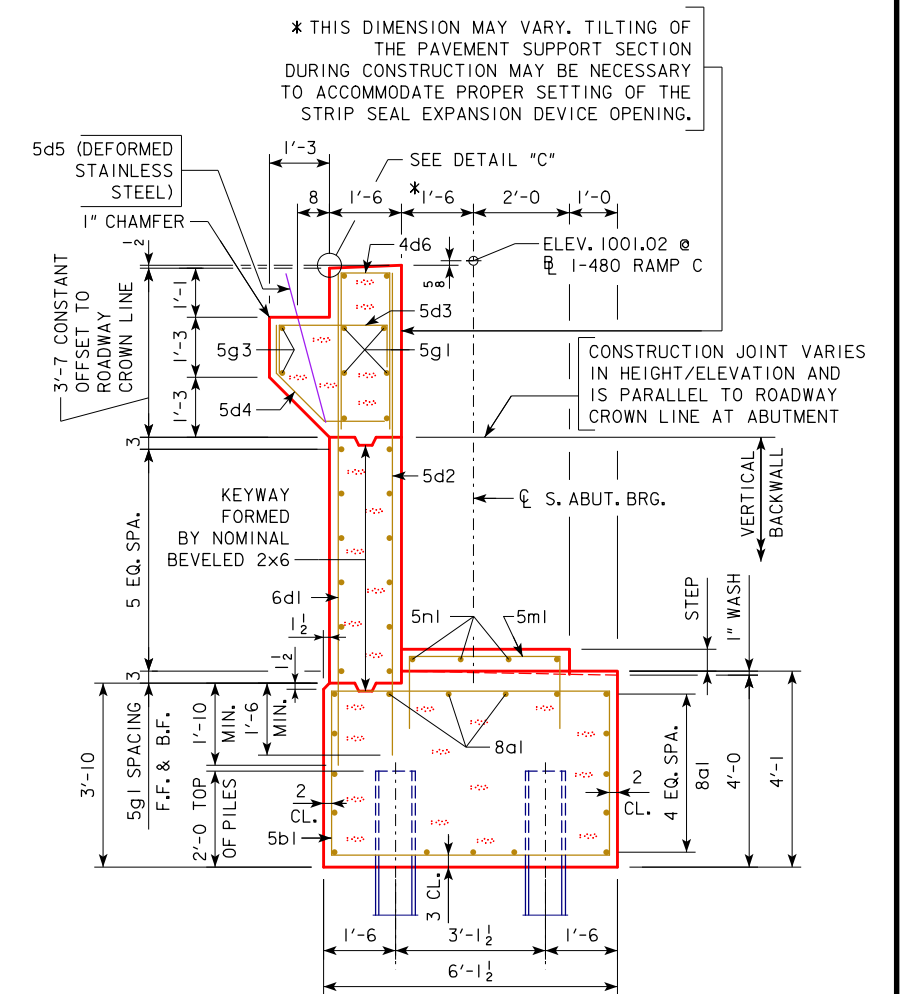


** MEASURED TO BOTTOM OF BACKWALL AT BACK FACE.

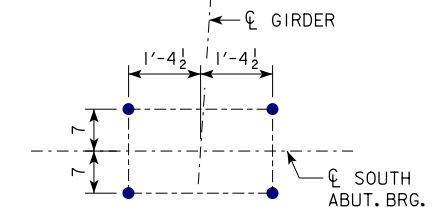
Δ ELEVATIONS & STEP HEIGHTS DEPENDENT ON FINAL BEARING HEIGHT. FINAL BEARING HEIGHT & STEP HEIGHT TO BE DETERMINED BY BEARING MANUFACTURER.



DETAIL C



SECTION THROUGH ABUTMENT
EXPANSION DEVICE NOT SHOWN

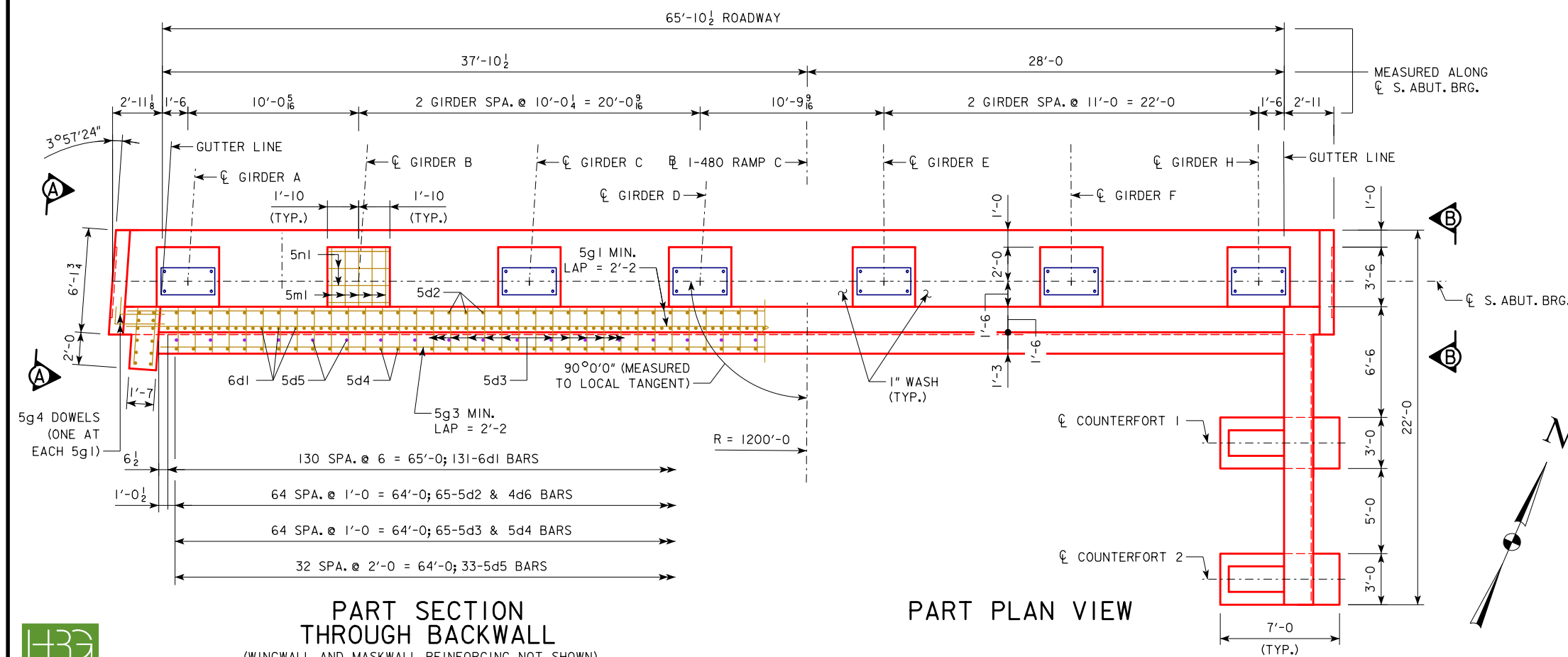


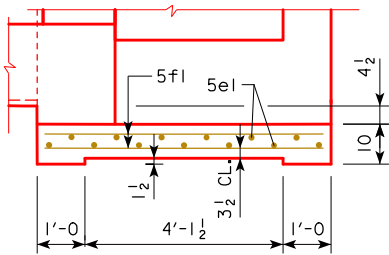
ANCHOR BOLT LAYOUT

(FOR ADDITIONAL DETAILS AND NOTES, SEE DESIGN SHEETS 78 & 79)

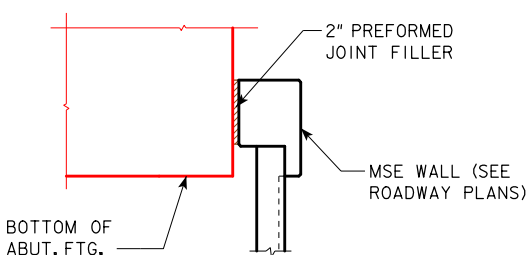
NOTES:

- FOR ABUTMENT NOTES, SEE DESIGN SHEET 44.
- FOR VIEW A-A AND B-B, SEE DESIGN SHEET 41.
- BARRIER RAILS NOT SHOWN IN ABUTMENT DETAILS.
- REINFORCING BARS MUST BE PLACED TO CLEAR ANCHOR BOLTS. SHIFT REINFORCING BARS SLIGHTLY AS REQUIRED.

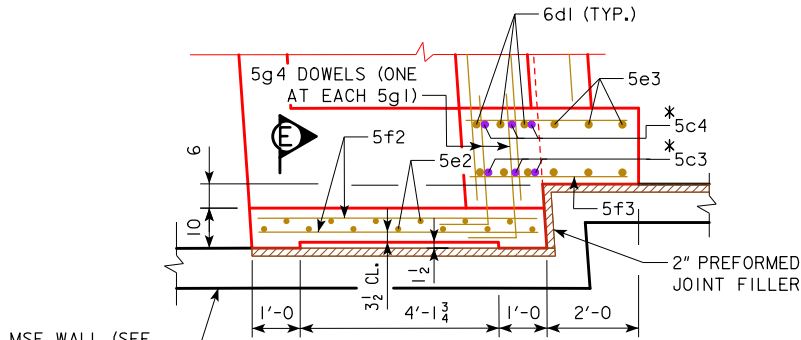




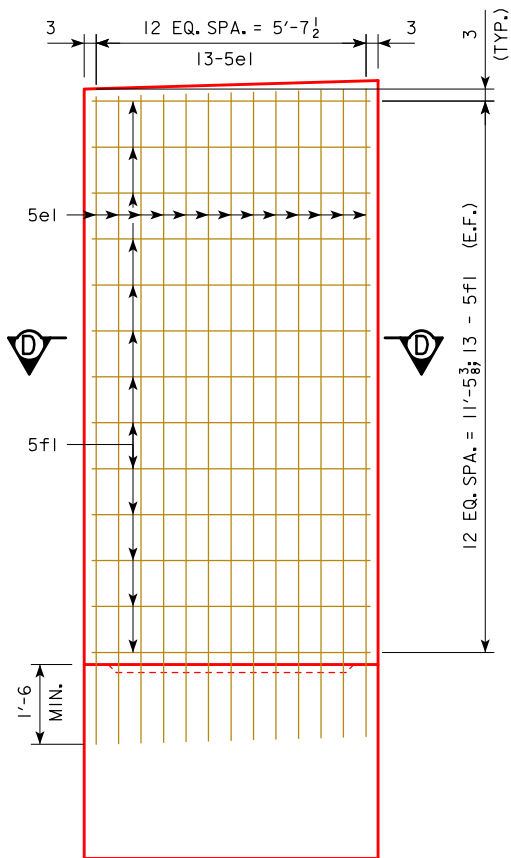
PART SECTION D-D



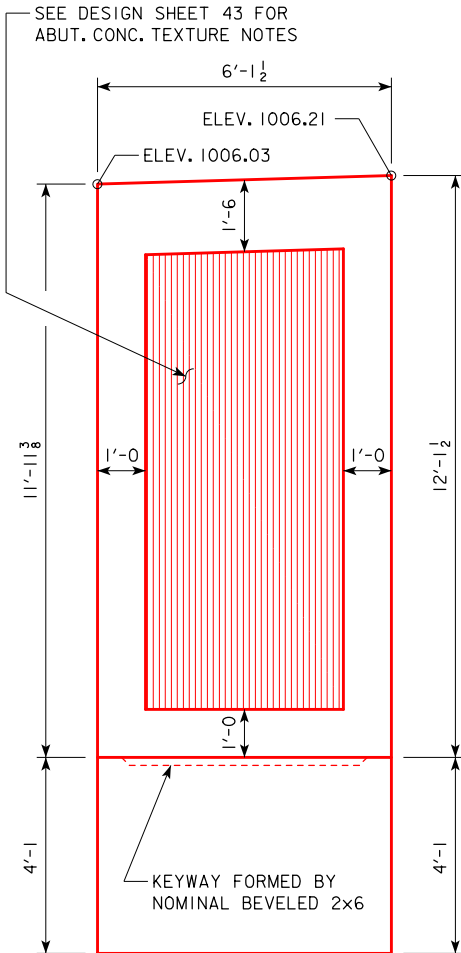
VIEW E-E
(SHOWING MSE WALL CONNECTION)



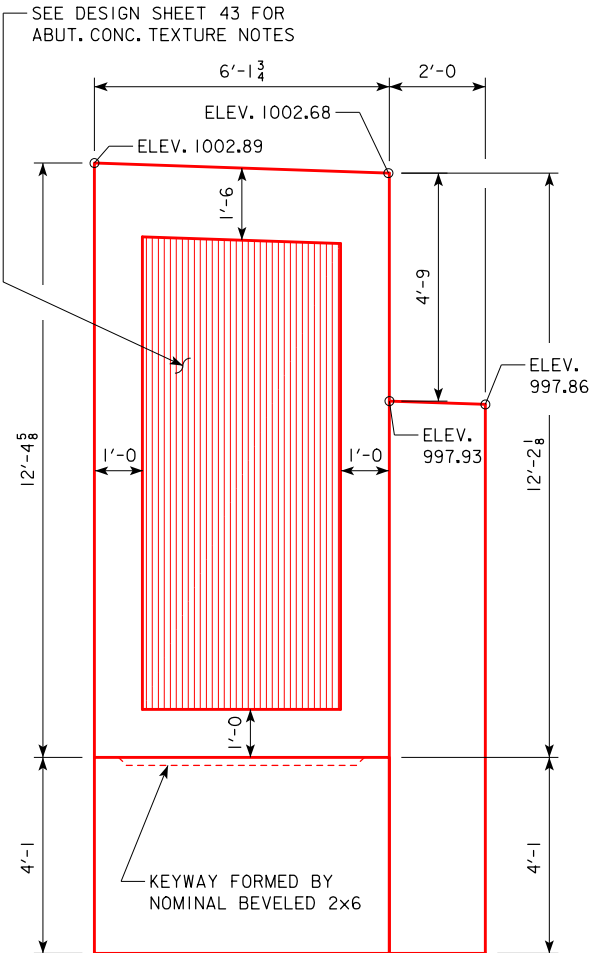
SECTION C-C



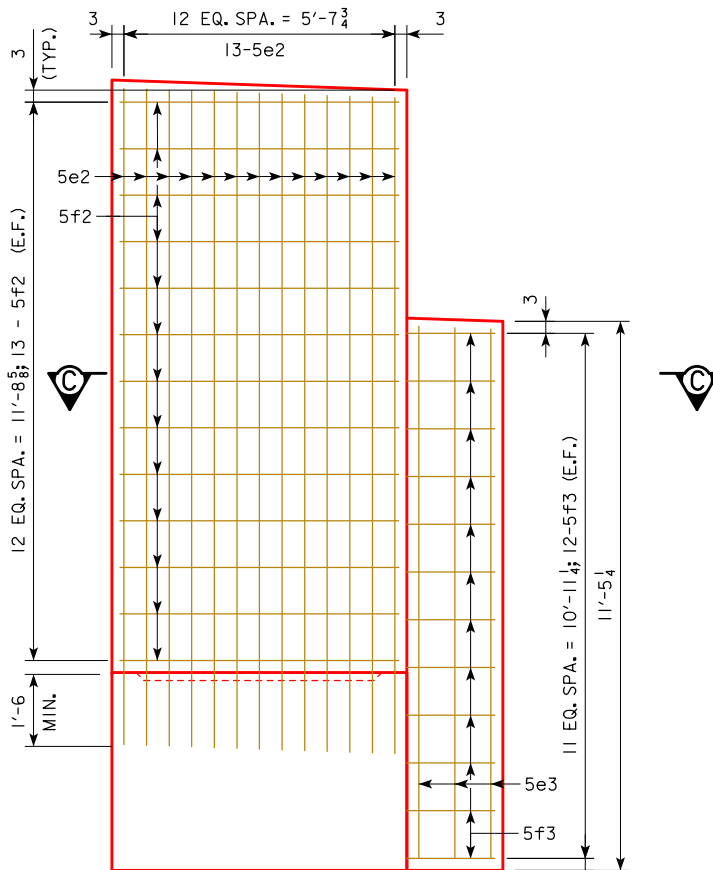
REINFORCING



DIMENSIONS



DIMENSIONS
(MSE WALL NOT SHOWN)



REINFORCING
(MSE WALL NOT SHOWN)

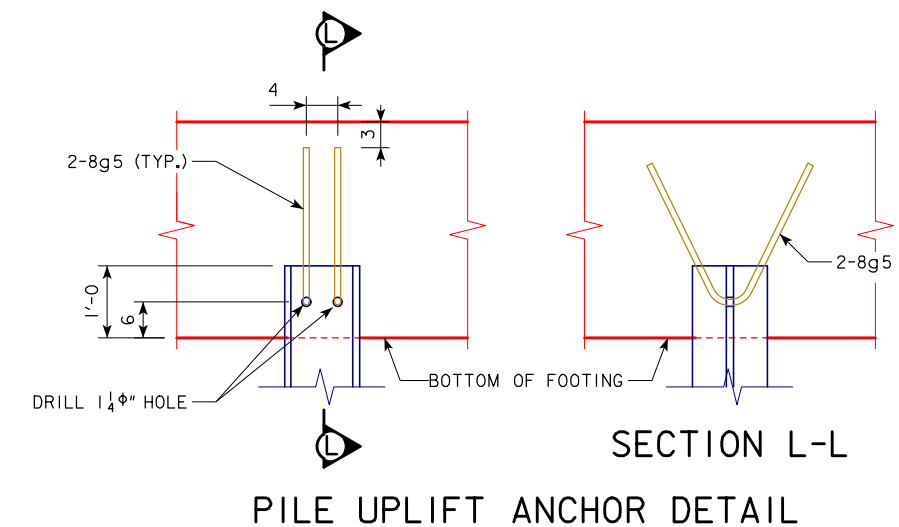
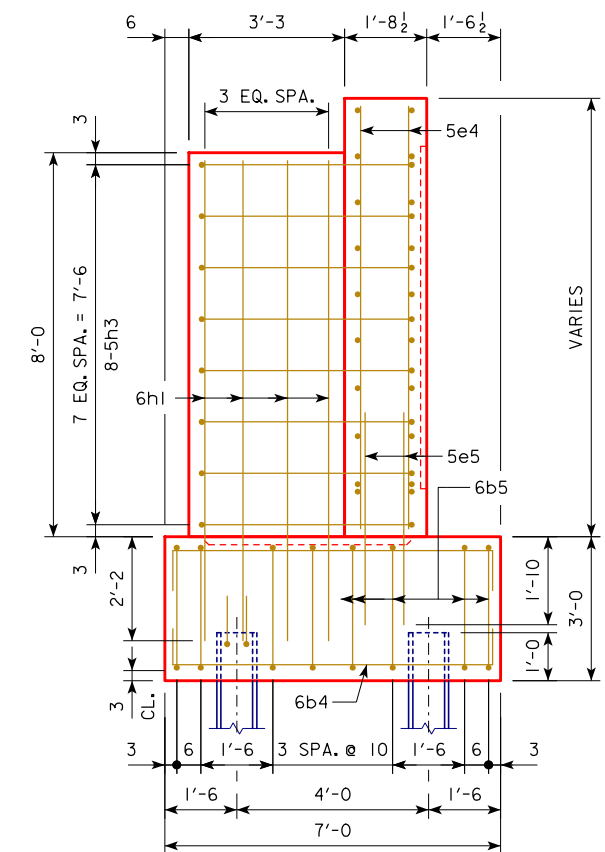
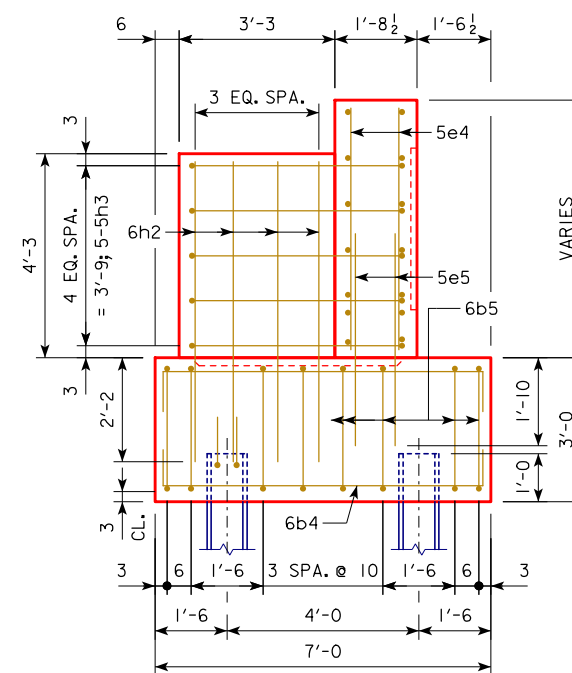
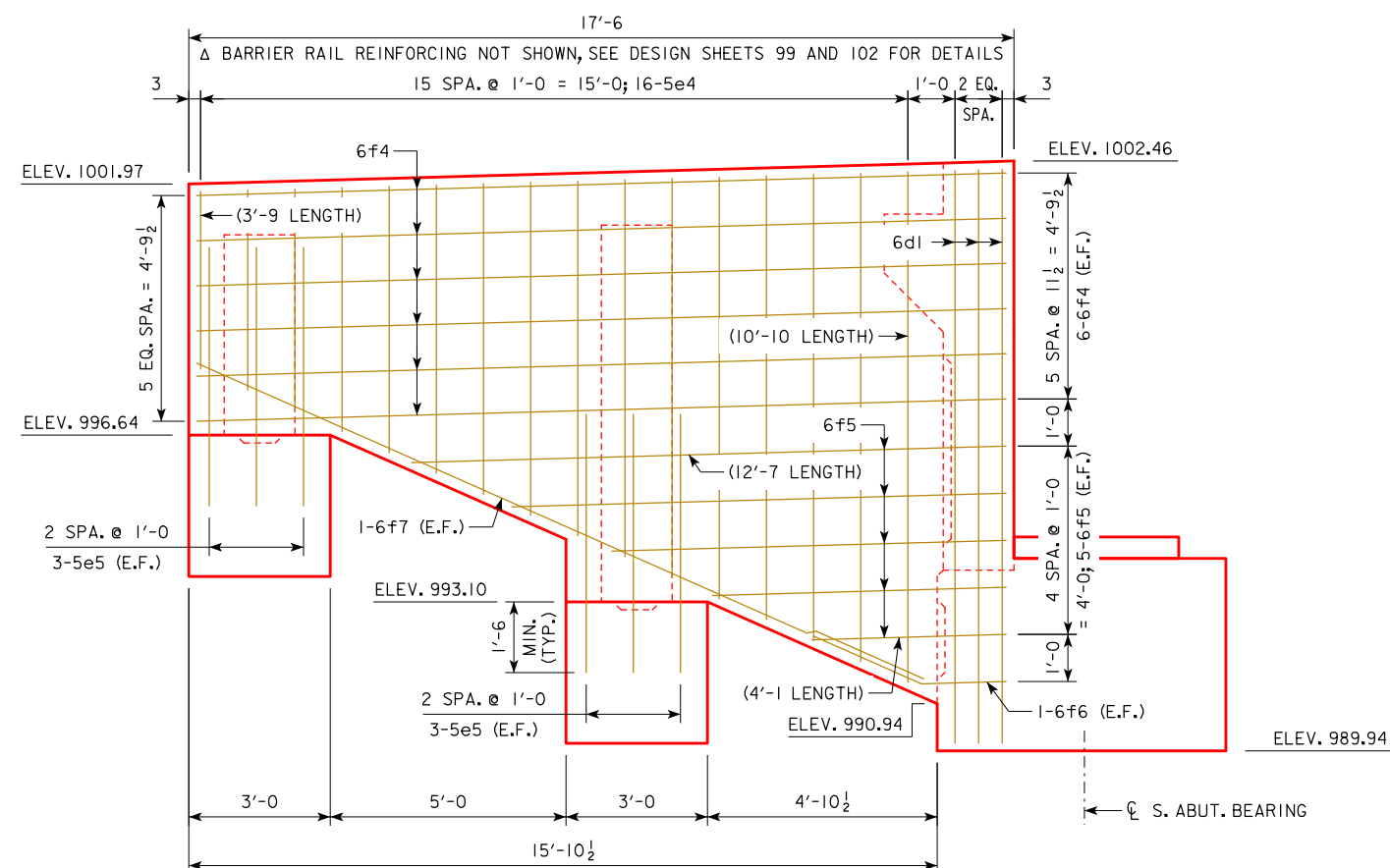
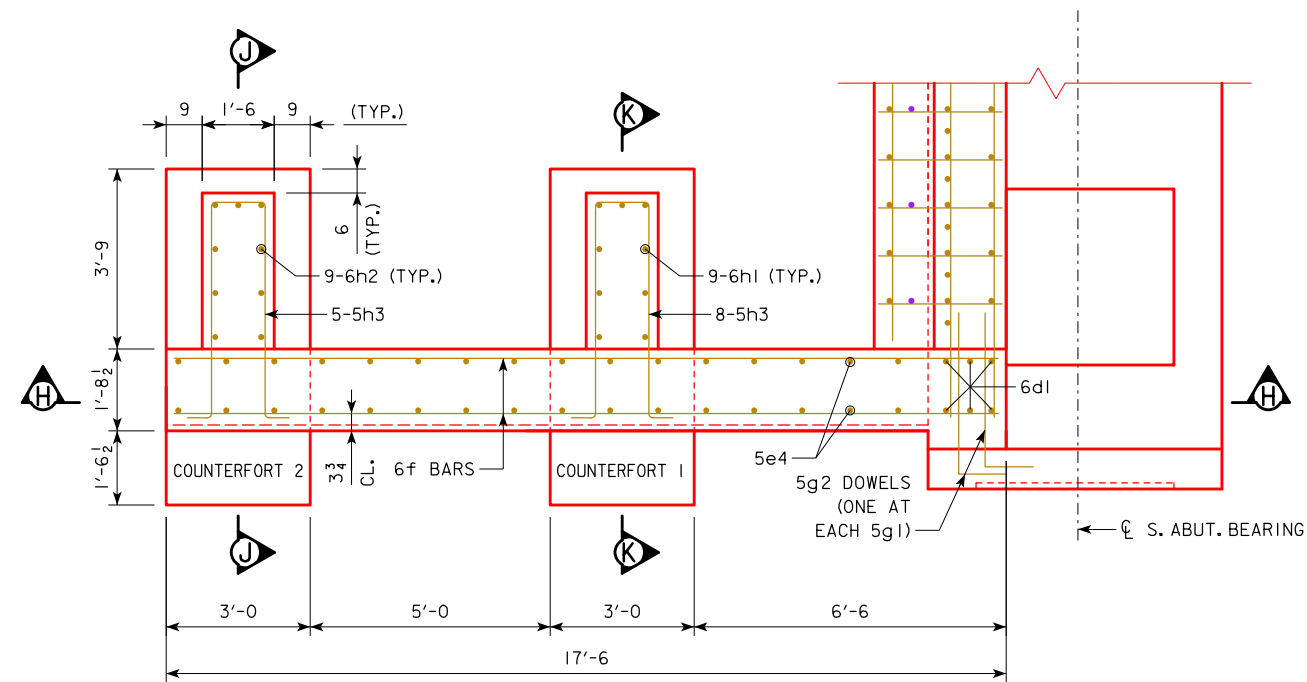
VIEW B-B

VIEW A-A

NOTES:
* BARRIER RAIL BARS TO BE PLACED WITH ABUTMENT INCLUDED IN BARRIER RAIL QUANTITIES. SEE BARRIER BAR SHEETS IN THESE PLANS FOR DETAILS OF THE 5c REINFORCING BARS.

DESIGN FOR 0° SKEW
1419'-0" x VARIES CONTINUOUS WELDED GIRDER BRIDGE
UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
SOUTH ABUTMENT DETAILS
STA. 3546+14.50 (R 1-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 41 OF 121 FILE NO. 30170 DESIGN NO. 1320





NOTE :

Δ ADDITIONAL REINFORCING BARS ARE TO BE PLACED IN THE ABUTMENT BACKWALL AND WING BUT ARE DETAILED WITH THE BARRIER RAIL SHEETS. THESE INCLUDES BARS 5c1, 5c2, 5c3 AND 5c4 IN THE BARRIER RAIL.

DESIGN FOR 0° SKEW

1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"

SOUTH ABUTMENT WING DETAILS

STA. 3546+14.50 (℄ 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 42 OF 121 FILE NO. 30170 DESIGN NO. 1320

ABUTMENT CONCRETE TEXTURE NOTES:

THIS WORK CONSISTS OF APPLYING TEXTURED FINISHES ON ALL DESIGNATED CONCRETE SURFACES OF THE ABUTMENT WING AND MASKWALL SURFACES AS SHOWN IN THIS PLAN. SEE "GENERAL NOTES FOR TEXTURED CONCRETE FORM LINERS" ON DESIGN SHEET 4 FOR MORE INFORMATION REGARDING THE USE OF FORM LINERS. THE TEXTURED CONCRETE MOCKUP PANEL MUST BE REVIEWED AND APPROVED BY THE ENGINEER BEFORE BEGINNING PRODUCTION CONCRETE WORK THAT INCLUDES TEXTURE. SEE "TEXTURED CONCRETE MOCKUP PANEL NOTES" ON DESIGN SHEET 4 FOR MORE INFORMATION.

THE FORM LINER USED TO PRODUCE TEXTURE 'A' AS SHOWN IN THE PLAN DETAILS SHALL PRODUCE A TEXTURED EFFECT OF REALISTIC ASHLAR STONE MASONRY SURFACE HAVING CUT STONES OF VARYING SIZE AND SHAPE. MAXIMUM DEPTH OF TEXTURE SHALL BE 1 1/2 INCHES. PLACE TEXTURE 'A' LINER IN FORMS SO THAT HORIZONTAL MORTAR JOINTS IN PATTERN ARE LEVEL.

OBTAIN TEXTURE 'A' FORM LINER MATERIALS FROM ONE OF THE FOLLOWING MANUFACTURERS:

- 1. CUSTOMROCK INTERNATIONAL (PATTERN NO. 12020)
- 2. FITZGERALD FORMLINERS (PATTERN NO. 17000)
- 3. ARCHITECTURAL POLYMERS (PATTERN NO. 905)
- 4. SPEC FORMLINERS, INC. (PATTERN NO. 1515)
- 5. SUBMIT ALL OTHER UNLISTED MANUFACTURERS AND PATTERNS INCLUDING A 1 FOOT BY 1 FOOT SAMPLE OF PROPOSED FORM LINER TO THE IOWA DEPARTMENT OF TRANSPORTATION, BRIDGES AND STRUCTURES BUREAU, AMES, IOWA. SAMPLE MAY BE EITHER ACTUAL FORM LINER MATERIALS OR FOAM CASTINGS. NO SAMPLES ARE REQUIRED TO BE SUBMITTED FOR MANUFACTURERS AND PATTERNS LISTED ABOVE.

THE FORM LINER USED TO PRODUCE TEXTURE 'B' AS SHOWN IN THE PLAN DETAILS SHALL PRODUCE A TEXTURED EFFECT OF VERTICAL, FRACTURED-FACE RIBS ON APPROXIMATELY 2-INCH CENTERS. MAXIMUM TEXTURE DEPTH SHALL BE 1 1/2 INCHES, AND MINIMUM TEXTURE DEPTH SHALL BE 1 3/8 INCHES.

OBTAIN TEXTURE 'B' FORM LINER MATERIALS FROM ONE OF THE FOLLOWING MANUFACTURERS:

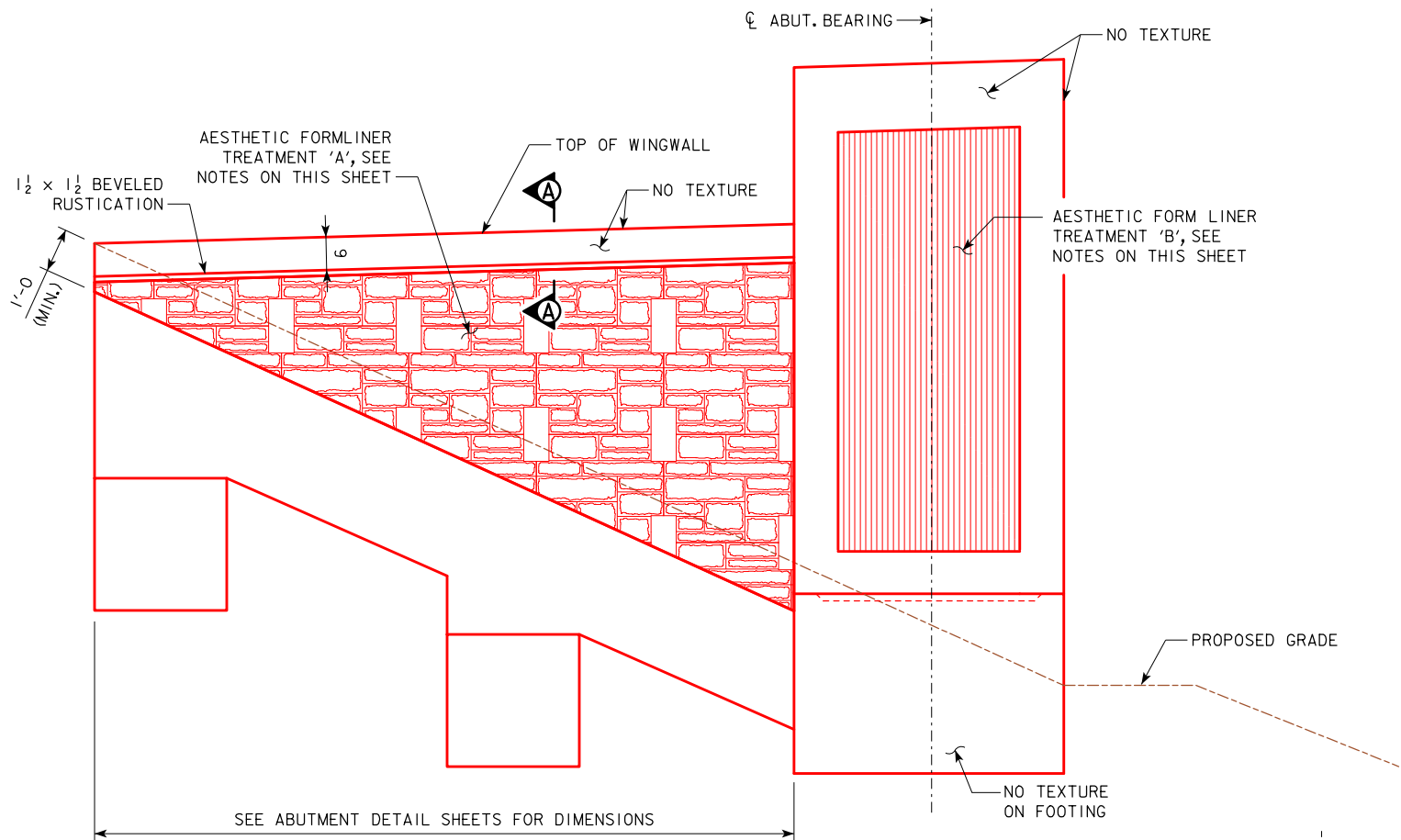
- 1. ARCHITECTURAL POLYMERS (PATTERN NO. 204)
- 2. FITZGERALD FORMLINERS (PATTERN NO. 16959)
- 3. GREENSTREAK (PATTERN NO. 367)
- 4. SCOTT SYSTEM, INC. (PATTERN NO. 129A)
- 5. CUSTOM ROCK INTERNATIONAL (PATTERN NO. 206)
- 6. SUBMIT ALL OTHER UNLISTED MANUFACTURERS AND PATTERNS INCLUDING A 1 FOOT BY 1 FOOT SAMPLE OF PROPOSED FORM LINER TO THE IOWA DEPARTMENT OF TRANSPORTATION, BRIDGES AND STRUCTURES BUREAU, AMES, IOWA. SAMPLE MAY BE EITHER ACTUAL FORM LINER MATERIALS OR FOAM CASTINGS. NO SAMPLES ARE REQUIRED TO BE SUBMITTED FOR MANUFACTURERS AND PATTERNS LISTED ABOVE.

PRIOR TO BEGINNING ANY PRODUCTION CONCRETE WORK THAT INCLUDES TEXTURE, SUBMIT MANUFACTURER'S CUT SHEETS FOR FORM LINERS.

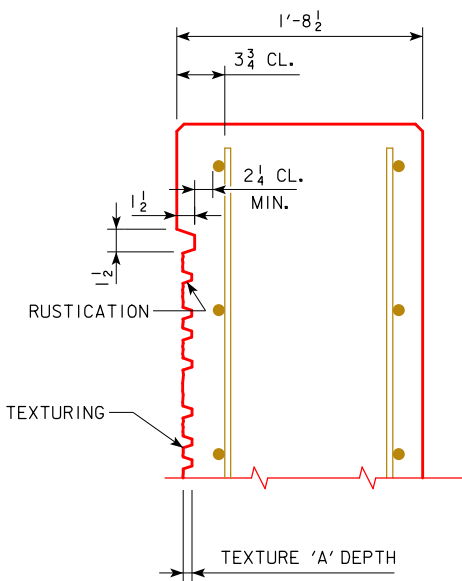
DO NOT MIX FORM LINERS FROM DIFFERENT MANUFACTURERS WHEN FORMING ANY INDIVIDUAL TEXTURE ON THE PROJECT.

THE ABUTMENT SURFACES AS DESIGNATED IN THE PLANS SHALL ALSO RECEIVE CONCRETE RUSTICATION. SEE "GENERAL NOTES FOR CONCRETE RUSTICATION" ON DESIGN SHEET 4 FOR MORE INFORMATION REGARDING APPROVED TECHNIQUES AND METHODS OF CONCRETE RUSTICATION.

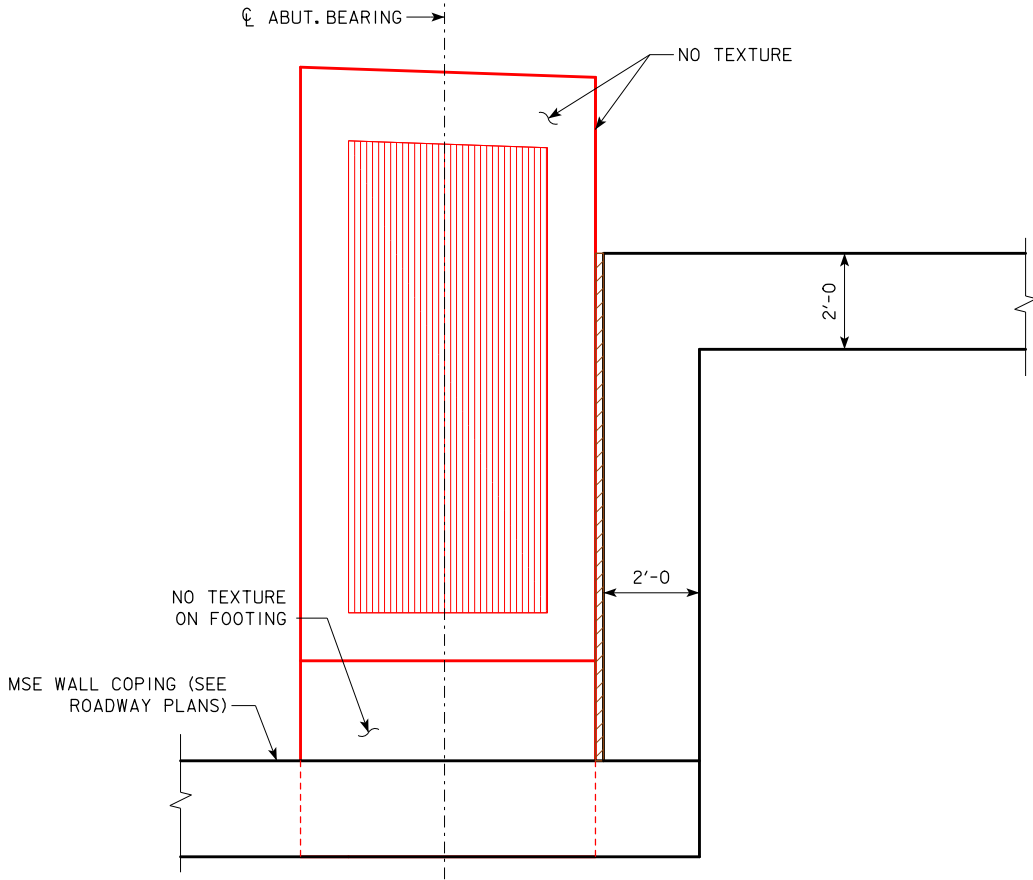
ALL COSTS ASSOCIATED WITH CONCRETE TEXTURE, RUSTICATION AND FORM LINERS INCLUDING THE MOCKUP PANEL ARE TO BE INCLUDED IN THE BID ITEM, "HIGH PERFORMANCE STRUCTURAL CONCRETE".



EAST WINGWALL EXTERIOR ELEVATION
(BARRIER RAIL NOT SHOWN)



SECTION A-A
WINGWALL RUSTICATION
AND TEXTURING DETAIL



WEST MASKWALL EXTERIOR ELEVATION
(BARRIER RAIL NOT SHOWN)

DESIGN FOR 0° SKEW
1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE
UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0
SOUTH ABUT. AESTHETIC DETAILS
STA. 3546+14.50 (CL 1-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
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MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR
REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.
THE MASK WALL IS TO BE POURED BEFORE THE SUPERSTRUCTURE
DECK IS POURED.

THE PORTION OF THE BACKWALL CONTAINING THE ABUTMENT ANCHORAGE OF THE EXPANSION DEVICE IS TO BE PLACED AFTER THE BRIDGE DECK IS PLACED.

CONCRETE SEALER IS TO BE APPLIED TO THE ABUTMENT BRIDGE SEAT IN ACCORDANCE WITH THE CURRENT IOWA D.O.T. STANDARD SPECIFICATIONS.

THE COST OF PREFORMED EXPANSION JOINT FILLER, AND COST OF FURNISHING AND PLACING CONCRETE SEALER IS TO BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL CONCRETE (BRIDGE)".

PAVING NOTCH DOWELS SHALL BE STAINLESS STEEL DEFORMED BAR
GRADE 60, MEETING THE REQUIREMENTS OF MATERIALS I.M. 452.

IF NECESSARY TO PREVENT DAMAGE TO THE END OF THE BRIDGE DECK AND BACKWALL FROM CONSTRUCTION EQUIPMENT, AN APPROPRIATE METHOD OF PROTECTION APPROVED BY THE ENGINEER SHALL BE PROVIDED BY THE BRIDGE CONTRACTOR AT NO EXTRA COST TO THE STATE.

CMP'S ARE REQUIRED AROUND PILES BELOW ABUTMENT WITHIN THE STRAP ZONE OR SPECIAL BACKFILL OF THE MSE WALL. THE CMP SLEEVE SHOULD EXTEND THROUGH ENTIRE STRAP ZONE. AFTER BACKFILLING TO BOTTOM OF FOOTING AND BEFORE CONSTRUCTING FOOTING, FILL CMP'S WITH SAND. CMP WILL NOT BE MEASURED SEPARATELY FOR PAYMENT, BUT WILL BE INCLUDED IN THE PRICE BID FOR STEEL PILING.

BACKFILL BETWEEN ABUTMENT AND DEADMAN ANCHOR WITH SPECIAL
BACKFILL OF THE MSE WALL.

DIMENSIONS SHOWN ON PILING LAYOUT ARE AT BOTTOM OF FOOTING. BATTER WING EXTENSION PILE IN THE DIRECTION SHOWN.

STEEL PILE POINTS ARE REQUIRED FOR THE STEEL H-PILES AT THE SOUTH ABUTMENT.

26-HP12x53 STEEL BEARING PILING REQUIRED.

THE CONTRACT LENGTH OF 120 FEET FOR THE SOUTH ABUTMENT PILES IS BASED ON A NON-COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 189 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.7 FOR ROCK END BEARING. TO ACCOUNT FOR SOIL CONSOLIDATION UNDER THE NEW FILL, THE FACTORED AXIAL LOAD INCLUDES A FACTORED DOWNDRAW LOAD OF 52 KIPS. ABUTMENT PILES ALSO WERE DESIGNED FOR A FACTORED TENSION FORCE OF 60 KIPS.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A NON-COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (ϕ) OF 0.55 FOR SOIL AND 0.7 FOR ROCK END BEARING. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF FOOTING.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR SOUTH ABUTMENT PILES IS 185 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 65 FEET. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

ABUTMENT PILES ARE DESIGNED TO ACCOMMODATE DOWNDRAG FORCE DUE TO SOIL CONSOLIDATION UNDER THE NEW EARTH FILL.

CMP SLEEVES MUST BE INSTALLED AROUND PILES THAT PENETRATE THROUGH MORE THAN 2 FEET OF NEW GRANULAR BACKFILL FOR MSE WALL 3140. CMP SLEEVES SHOULD BE BACKFILLED WITH SAND AFTER GRADE IS RAISED TO THE BOTTOM OF THE FOOTING.

Figure 1 displays 18 different types of bent reinforcement bars, labeled b5b1 through b5g2. Each diagram shows the bar's geometry, dimensions, and bending diameter (D).

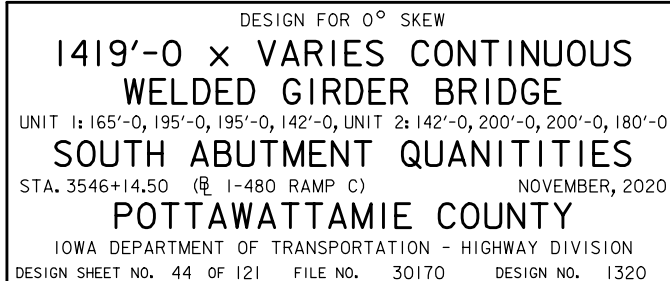
- b5b1:** Dimensions: $5'-8\frac{1}{2}$, $3'-5$, 6 , 6 . Bending diameter: $D=2\frac{1}{2}$.
- b5b2:** Dimensions: $1'-6$, $5'-4\frac{1}{2}$. Bending diameter: $D=2\frac{1}{2}$.
- b5b3:** Dimensions: $1'-6$, $5'-4\frac{1}{2}$, $1'-4$, $1'-4$. Bending diameter: $D=2\frac{1}{2}$.
- b5b4:** Dimensions: $6'-8$, $2'-6$. Bending diameter: $D=4\frac{1}{2}$.
- b5b5:** Dimensions: $2'-8$, 6 , 6 , $2'-6$. Bending diameter: $D=4\frac{1}{2}$.
- b5d3:** Dimensions: $2'-5$, $1'-0$. Bending diameter: $D=2\frac{1}{2}$.
- b5d4:** Dimensions: $1'-0$, $1'-5$, $1'-3$, $1'-0$. Bending diameter: $D=2\frac{1}{2}$.
- b5d6:** Dimensions: $1'-2$, $3'-5$. Bending diameter: $D=2$.
- b5f6:** Dimensions: $2'-6$, $2'-3$, $1'-10$, $1'-0\frac{1}{2}$. Bending diameter: $D=4\frac{1}{2}$.
- b5g2:** Dimensions: $3'-6$, 10 . Bending diameter: $D=3\frac{3}{4}$.
- b5m1:** Dimensions: $3'-2$, $2'-0$. Bending diameter: $D=2\frac{1}{2}$.
- b5n1:** Dimensions: $3'-4$, $2'-0$. Bending diameter: $D=2\frac{1}{2}$.
- b5q4:** Dimensions: $2\frac{7}{8}$, $3'-6$, $3'-5\frac{7}{8}$, 10 . Bending diameter: $D=3\frac{3}{4}$.
- b5q5:** Dimensions: $2'-6$, $1'-3$, $1'-3$, $2'-3$, $2'-6$. Bending diameter: $D=6$.
- b5h3:** Dimensions: $1'-2$, $4'-5\frac{3}{4}$, $1'-0$, $1'-0$. Bending diameter: $D=2\frac{1}{2}$.

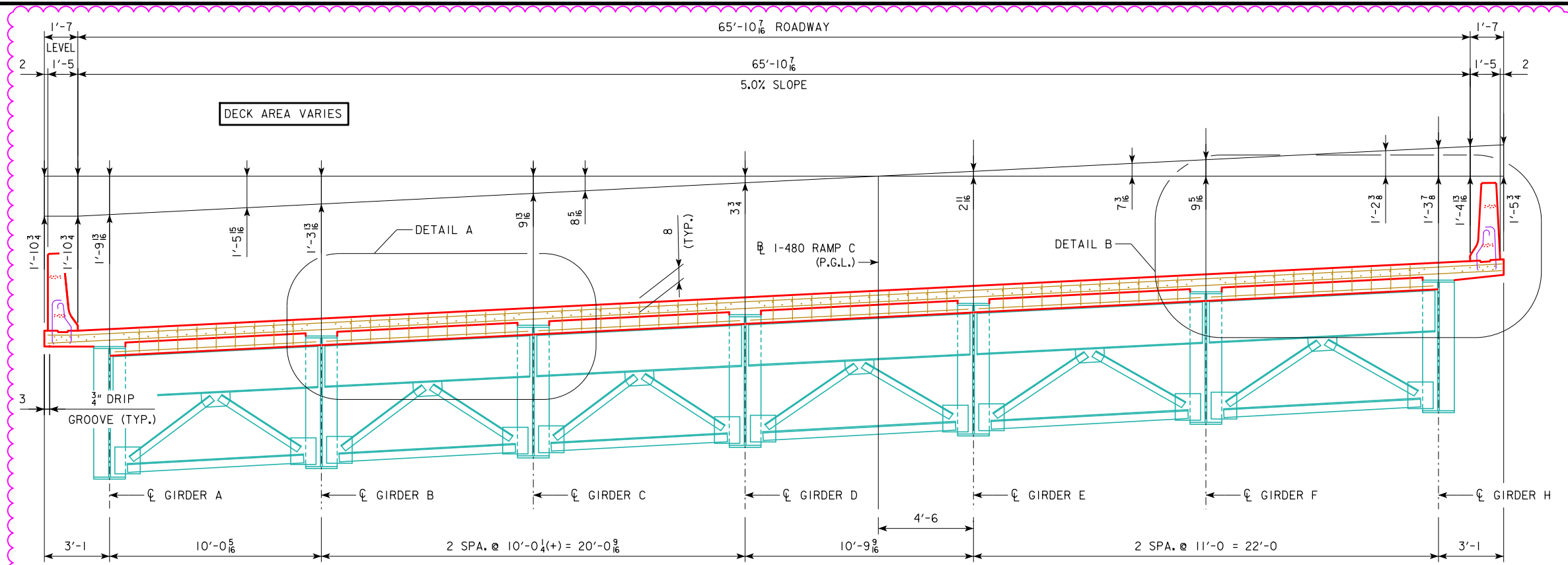
CONCRETE PLACEMENT QUANTITIES	
LOCATION	SOUTH ABUT.
FOOTING AND STEPS	66.4
BACKWALL BELOW CONSTR. JOINT	19.8
BACKWALL ABOVE CONSTR. JOINT	19.7
EAST WING	8.1
WEST WING EXTENSION	1.3
EAST COUNTERFORTS	6.9
EAST MASKWALL	2.3
WEST MASKWALL	2.3
TOTAL (C.Y.)	126.8

NOTE:
CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED
ON THE SUMMARY QUANTITIES SHEET.

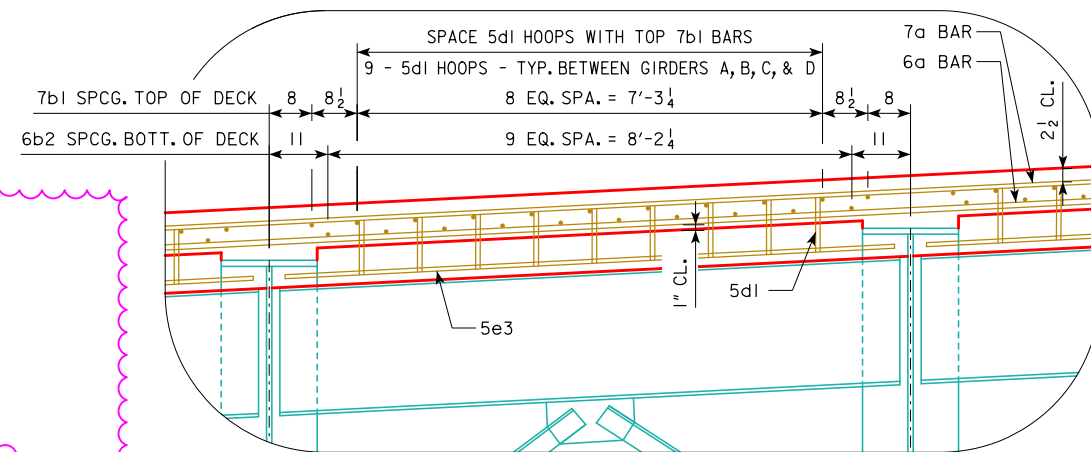


ONE REQUIRED AT TOP AND BOTTOM OF CMP. BOTTOM BLOCKING SHALL BE TREATED MATERIAL AND SHALL REMAIN IN PLACE. TOP BLOCKING SHALL BE REMOVED PRIOR TO BACKFILLING INSIDE THE CMP. COST FOR THIS SHALL BE INCLUDED IN THE PRICE BID FOR STEEL PILING.

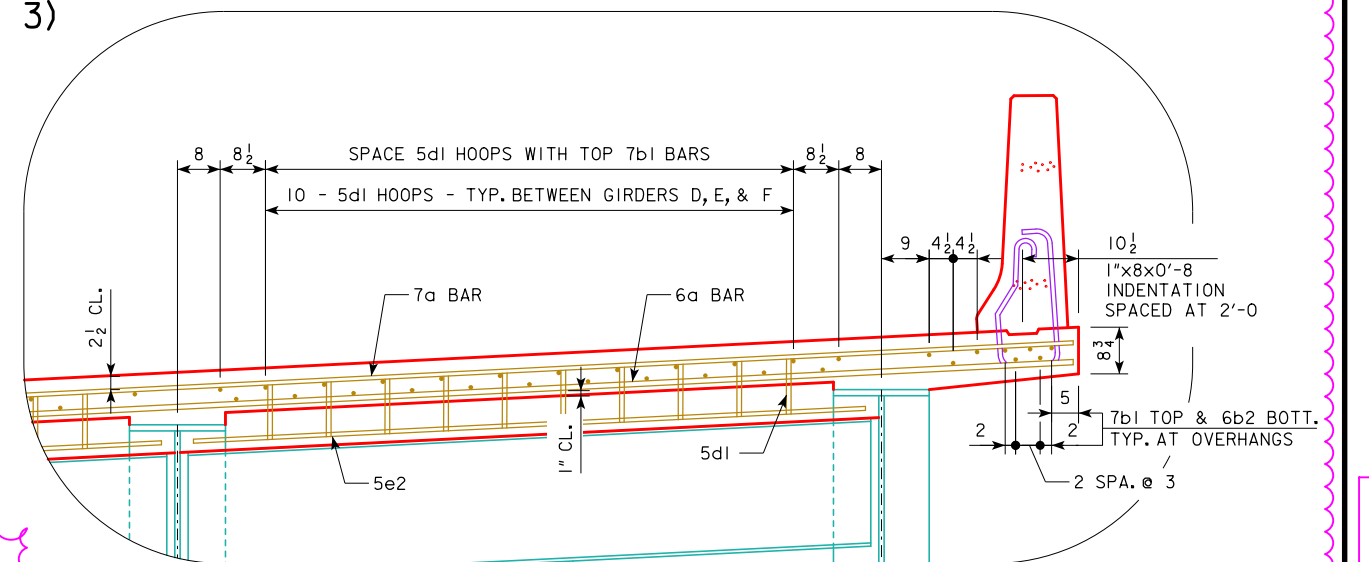




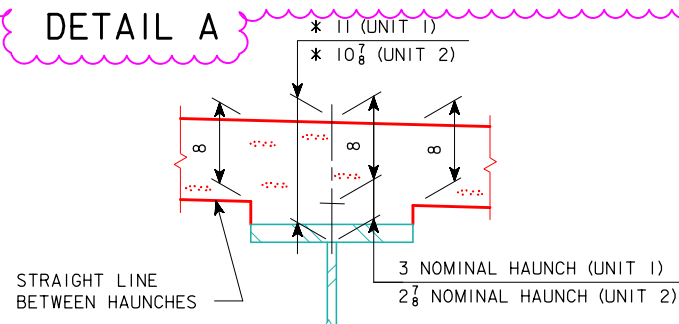
TRANSVERSE SECTION
AT SOUTH ABUTMENT END DIAPHRAGM
(CROSS FRAME TYPE 3)



DETAIL A



DETAIL B



TYP. DECK & HAUNCH DETAIL

* DIMENSION SHOWN IS MEASURED FROM TOP OF DECK TO TOP OF WEB. THEORETICALLY THIS IS A CONSTANT DIMENSION ALONG THE GIRDER AND IS USED BY THE DESIGNER TO SET BRIDGE SEAT ELEVATIONS AND ESTIMATE CONCRETE QUANTITIES. REFER TO THE FIELD HAUNCH DATA DETAIL SHEET FOR ADDITIONAL INFORMATION TO AID THE CONTRACTOR IN SETTING THE FIELD HAUNCHES REQUIRED FOR CONSTRUCTION.

REVISED: 05-06-2022 UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED COLOR OF REINFORCEMENT.

REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.



DESIGN FOR 0° SKEW
**1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE**
UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0
SUPERSTRUCTURE DETAILS
STA. 3546+14.50 (P. 1-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 45 OF 121 FILE NO. 30170 DESIGN NO. 1320

SUPERSTRUCTURE NOTES:

THE BRIDGE DECK AS SHOWN INCLUDES 1/2" INTEGRAL WEARING SURFACE. FORMS FOR THE BRIDGE DECK AND BARRIER RAIL ARE TO BE SUPPORTED BY THE GIRDERS.

CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR SHALL BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.

TOP TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 2 1/2" CLEAR BELOW TOP OF DECK. BOTTOM TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 1" CLEAR ABOVE BOTTOM OF DECK.

TOP AND BOTTOM REINFORCING STEEL IS TO BE SUPPORTED BY INDIVIDUAL BAR CHAIRS SPACED AT NOT MORE THAN 3'-0" CENTERS LONGITUDINALLY AND TRANSVERSELY, OR BY CONTINUOUS ROWS OF BAR HIGH CHAIRS OR DECK BOLSTERS SPACED 4'-0" APART. I.M.451.01 REQUIREMENT SHALL APPLY FOR BAR CHAIRS, HIGH BAR CHAIRS, AND DECK BOLSTERS.

ALL FIELD CONNECTIONS ARE TO BE BOLTED USING "HIGH TENSILE STRENGTH BOLTS". UNLESS OTHERWISE NOTED, ALL OPEN HOLES ARE TO BE 15/16" Ø AND ALL BOLTS ARE TO BE 7/8" Ø.

BOTTOM FLANGES ARE TO BE PERPENDICULAR TO WEBS AT THE REACTION POINTS.

FILL PLATE THICKNESS SHOWN ON PLANS ARE BASED ON NOMINAL GIRDER DIMENSIONS. THESE THICKNESS ARE TO BE VERIFIED OR ADJUSTED DURING FABRICATION TO SECURE A CLOSE FIT. EACH FILL PLATE SHALL FIT TO THE NEAREST 1/16" IN THICKNESS AND SINGLE PLATES ARE REQUIRED AT EACH FILL LOCATION. GIRDERS ARE TO BE TRULY SQUARE AT SPLICE POINTS WITH FLANGES PERPENDICULAR TO WEBS.

THE DESIGN DRAWINGS INDICATE AWS PREQUALIFIED WELDED JOINTS. ALTERNATE JOINT DETAILS MAY BE SUBMITTED FOR APPROVAL.

MAGNETIC PARTICLE INSPECTION OF WELDS, IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, WILL BE REQUIRED.

SHOP WELDED FLANGE SPLICES SHALL BE A MINIMUM OF 6 INCHES FROM A STIFFENER, 6 INCHES FROM A WEB SPLICE, AND 4 INCHES FROM A SHEAR CONNECTOR. WEB SPLICES SHALL BE A MINIMUM OF 6 INCHES FROM A STIFFENER. SPLICES SHALL NOT INTERFERE WITH ANY OTHER BRIDGE COMPONENTS. ALL SHOP WELDED SPLICES SHALL BE SHOWN ON THE SHOP DRAWINGS AND SUBJECT TO APPROVAL BY THE ENGINEER.

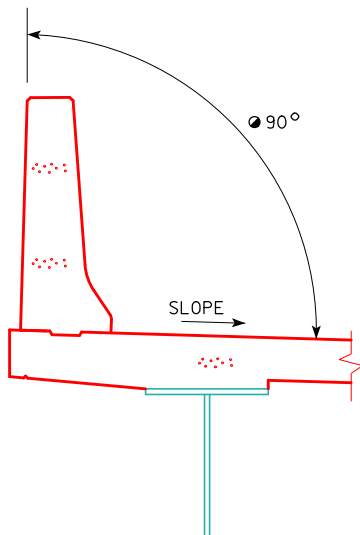
CHARPY V-NOTCH TOUGHNESS REQUIREMENTS IN ACCORDANCE WITH ARTICLE 4152.02, OF THE STANDARD SPECIFICATIONS SHALL APPLY TO ALL CROSS FRAMES AND CONNECTION STIFFENERS AT CROSS FRAMES.

THE BRIDGE CONTRACTOR MAY SHOP DRILL ANY CONNECTION THAT IS SHOWN AS FIELD DRILLED IF PERTINENT DIMENSIONS ARE ACCURATELY FIELD MEASURED AND THE BRIDGE CONTRACTOR CAN ENSURE PROPER FIT BETWEEN NEW AND EXISTING STRUCTURAL STEEL.

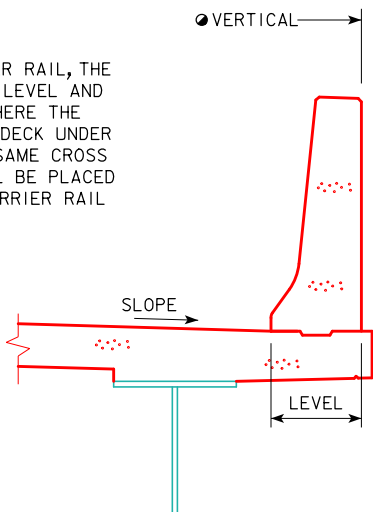
THE GIRDERS ARE TO BE FABRICATED FOR A STEEL DEAD LOAD FIT CONDITION.

REVISED: 05-06-2022 UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED COLOR OF REINFORCEMENT.

REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.



BARRIER RAIL ORIENTATION DETAIL
(SHOWING "DECK SLOPES AWAY FROM THE BARRIER RAIL")



BARRIER RAIL ORIENTATION DETAIL
(SHOWING "DECK SLOPES TOWARD THE BARRIER RAIL")

TEMPORARY DECK OVERHANG BRACKET DETAIL

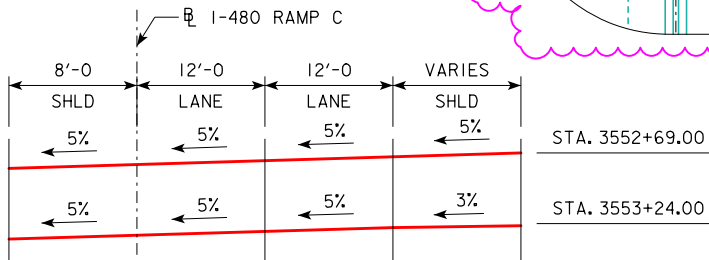
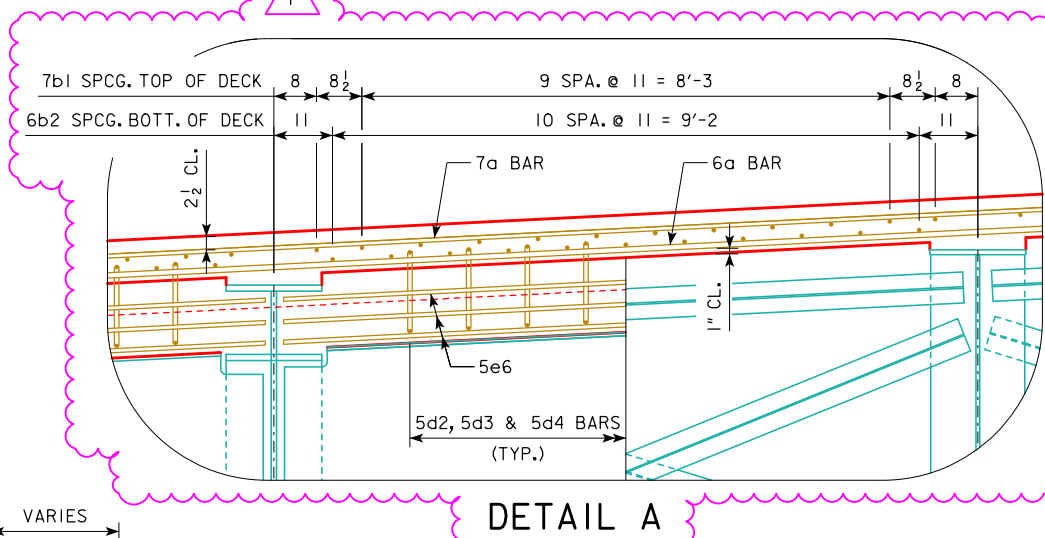
OVERHANG BRACKET NOTES:

A MAXIMUM FINISHING MACHINE LOAD AND THE ANGLE OF THE DIAGONAL MEMBER OF THE OVERHANG BRACKET SHOWN WERE ASSUMED BY THE DESIGNER. THESE ASSUMPTIONS, IN ADDITION TO OTHER CONSTRUCTION LOADINGS, WERE USED TO CHECK THE STRENGTH OF THE EXTERIOR GIRDER DURING CRITICAL STAGES OF CONSTRUCTION. IF THE FINISHING MACHINE LOAD OR ANGLE OF THE DIAGONAL MEMBER OF THE OVERHANG BRACKET DEVIATE SIGNIFICANTLY FROM VALUES SHOWN, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER THIS INFORMATION ON PROPOSED CONSTRUCTION EQUIPMENT TO BE USED.

IF THE VERTICAL HEIGHT OF THE OVERHANG BRACKET IS ADJUSTABLE, THE BASE OF THE BRACKET IS TO BE LOCATED AS CLOSE AS POSSIBLE TO THE BOTTOM FLANGE OF THE GIRDER.

HALF SECTION AT PIER 4 DIAPHRAGM (CROSS FRAME TYPE 2)

HALF SECTION TYPICAL CROSS FRAME (CROSS FRAME TYPE 1)



DECK SLOPE TRANSITION SECTIONS
(UNIT 2)

DESIGN FOR 0° SKEW

1419'-0" x VARIES CONTINUOUS WELDED GIRDER BRIDGE

UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"

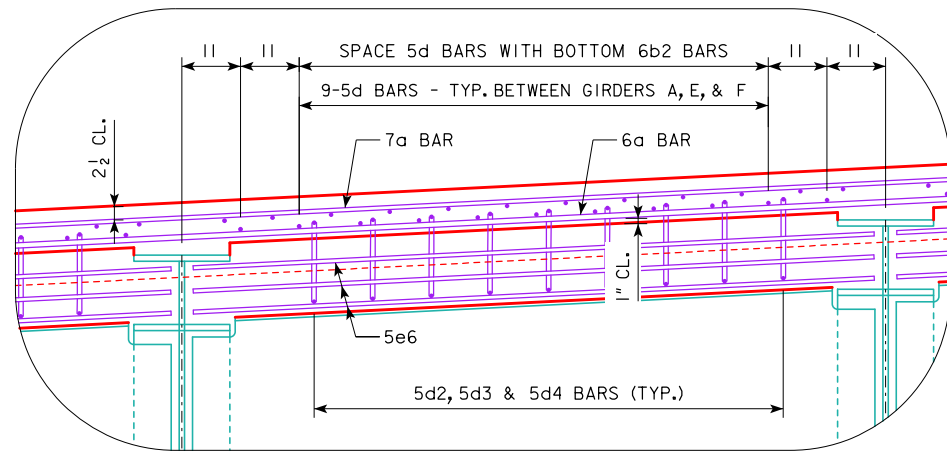
SUPERSTRUCTURE DETAILS

STA. 3546+14.50 (CL 1-480 RAMP C) NOVEMBER, 2020

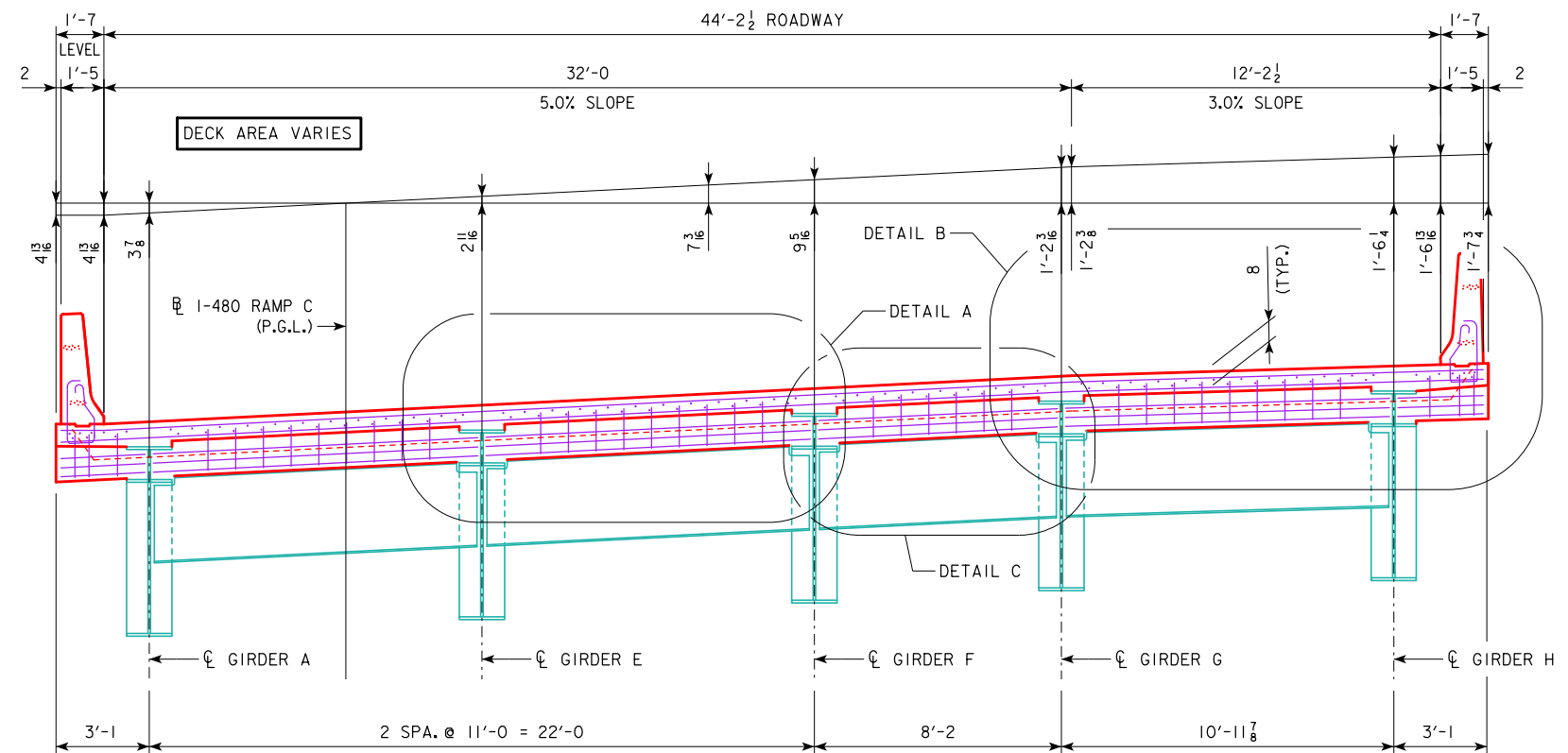
POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

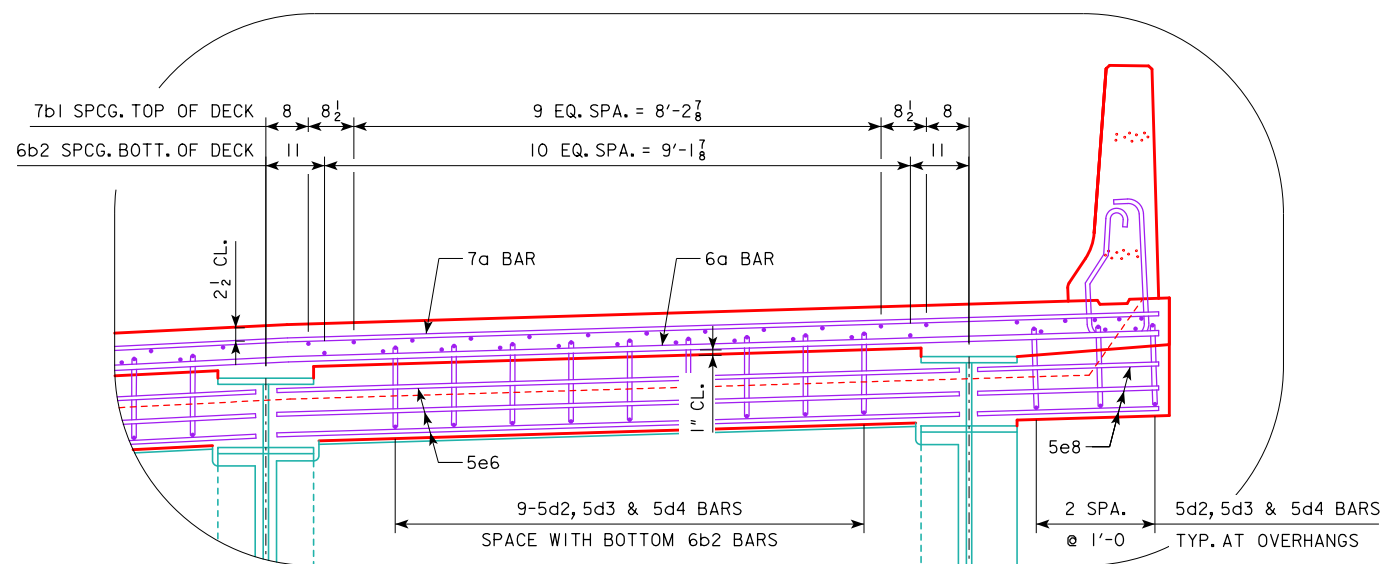
DESIGN SHEET NO. 46 OF 121 FILE NO. 30170 DESIGN NO. 1320



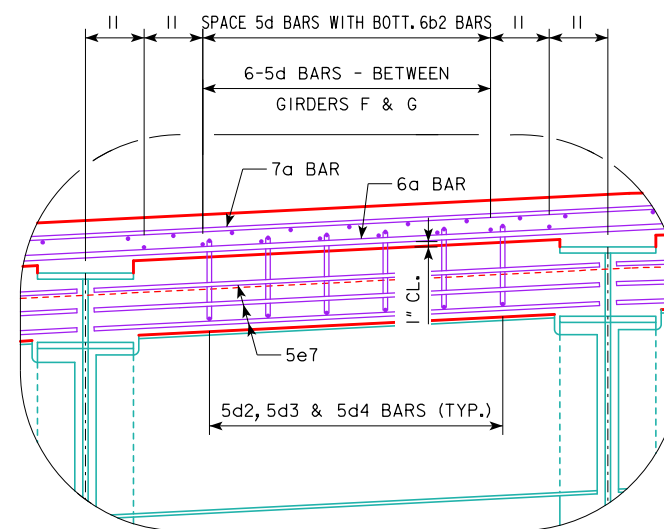
DETAIL A



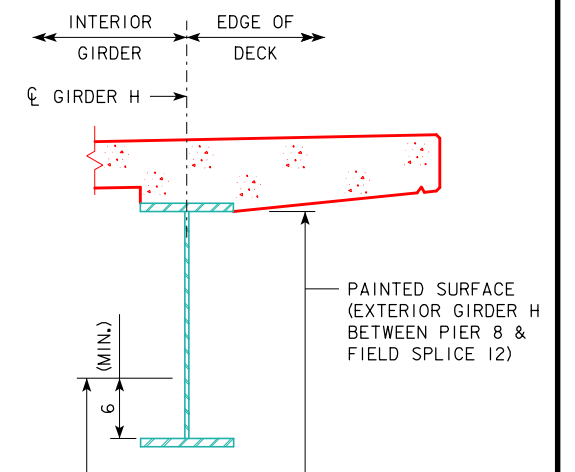
TRANSVERSE SECTION
AT PIER 8 END DIAPHRAGM
(CROSS FRAME TYPE 2)



DETAIL B



DETAIL C



EXTERIOR GIRDER
LIMITS OF PAINTING DETAIL
(BARRIER RAIL NOT SHOWN)

DESIGN FOR 0° SKEW
1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE
UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
SUPERSTRUCTURE DETAILS
STA. 3546+14.50 (CL I-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 47 OF 121 FILE NO. 30170 DESIGN NO. 1320



FOR DETAILS OF SOUTH ABUTMENT
STRIP SEAL EXPANSION JOINT
SEE DESIGN SHEETS 95 AND 96

END DIAPHRAGM
REINFORCING NOT
SHOWN. SEE DESIGN
SHEET 86 FOR DETAILS

EXPANSION BEARING (DISC TYPE)
FOR DETAILS, SEE DESIGN
SHEET 78

TOP OF DECK

EXPANSION BEARING (DISC TYPE)
FOR DETAILS, SEE DESIGN
SHEET 78

CL SOUTH ABUT. BRG.

CL PIER 1

FIXED BEARING (DISC TYPE)
FOR DETAILS, SEE DESIGN
SHEET 78

CL PIER 2

EXPANSION BEARING (DISC TYPE)
FOR DETAILS, SEE DESIGN
SHEET 78

CL PIER 3

CL BACK BRG.

CL AHEAD BRG.

CL PIER 4

EXPANSION BEARING (DISC TYPE)
FOR DETAILS, SEE DESIGN
SHEET 78

FOR DETAILS OF PIER 4
MODULAR EXPANSION JOINT
SEE DESIGN SHEETS 97 AND 98

END DIAPHRAGM
REINFORCING NOT
SHOWN. SEE DESIGN
SHEET 86 FOR DETAILS

EXPANSION BEARING (DISC TYPE)
FOR DETAILS, SEE DESIGN
SHEET 78

PART LONGITUDINAL SECTION NEAR BARRIER RAIL

(LOOKING AT NORTH BARRIER) (PIER DIAPHRAGMS & ABUTMENT DIAPHRAGMS NOT SHOWN)

BEARING AND EXPANSION DEVICE SETTING (INCHES)

TEMPERATURE AT TIME OF SETTING *	SOUTH ABUTMENT	SOUTH ABUTMENT	PIER 1	PIER 2	PIER 3	BACK BRG. PIER 4	PIER 4
10°F	4 7/16	-1 1/8	-0 5/8	0	-0 5/8	-1 1/16	11 1/8
50°F	3 5/16	0	0	0	0	0	9
90°F	2 1/4	1 1/8	0 5/8	0	0 5/8	1 1/16	6 7/8

NOTES:

BEARING AND EXPANSION DEVICE SETTINGS SHALL BE MADE IN EARLY MORNING, PREFERABLY BEFORE
SUN HEAT AFFECTS LENGTH. FOR EXPANSION DEVICE SETTINGS, SEE DESIGN SHEETS 95 THRU 98.
SET SOLE PLATES IN DIRECTION SHOWN FOR TEMPERATURE ABOVE 50°F., IN THE OPPOSITE
DIRECTION FOR TEMPERATURE BELOW 50°F.
SETTINGS FOR OTHER TEMPERATURE ARE PROPORTIONAL.
* TEMPERATURE OF STRUCTURE (STEEL AND/OR DECK), NOT AIR TEMPERATURE.



REVISED: 05-06-2022 UPDATED DECK AND
BARRIER RAIL REINFORCEMENT TO BE EPOXY
COATED, EXCEPT BARRIER TO DECK/WING
CONNECTIONS. CHANGED COLOR OF
REINFORCEMENT.

REASON: CHANGE MADE IN THE BEST INTEREST
OF THE PUBLIC TO KEEP THE PROJECT ON
SCHEDULE AND AVOID SIGNIFICANT DELAYS IN
PROJECT COMPLETION.

DESIGN FOR 0° SKEW

1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"

LONGITUDINAL SECTION - UNIT 1

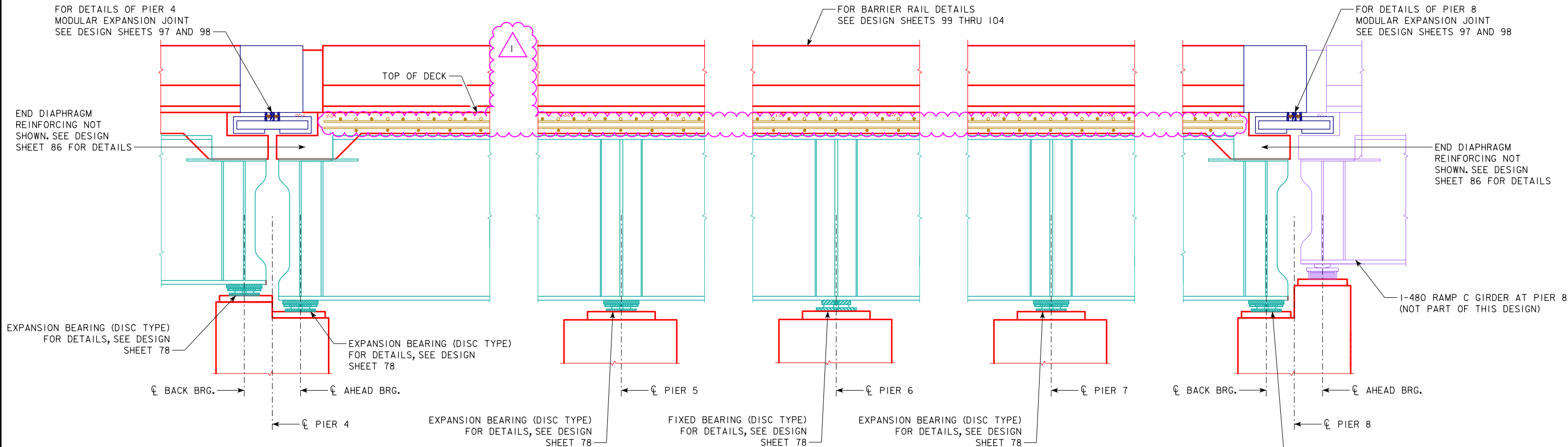
STA. 3546+14.50 (CL 1-480 RAMP C)

NOVEMBER, 2020

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 48 OF 121 FILE NO. 30170 DESIGN NO. 1320





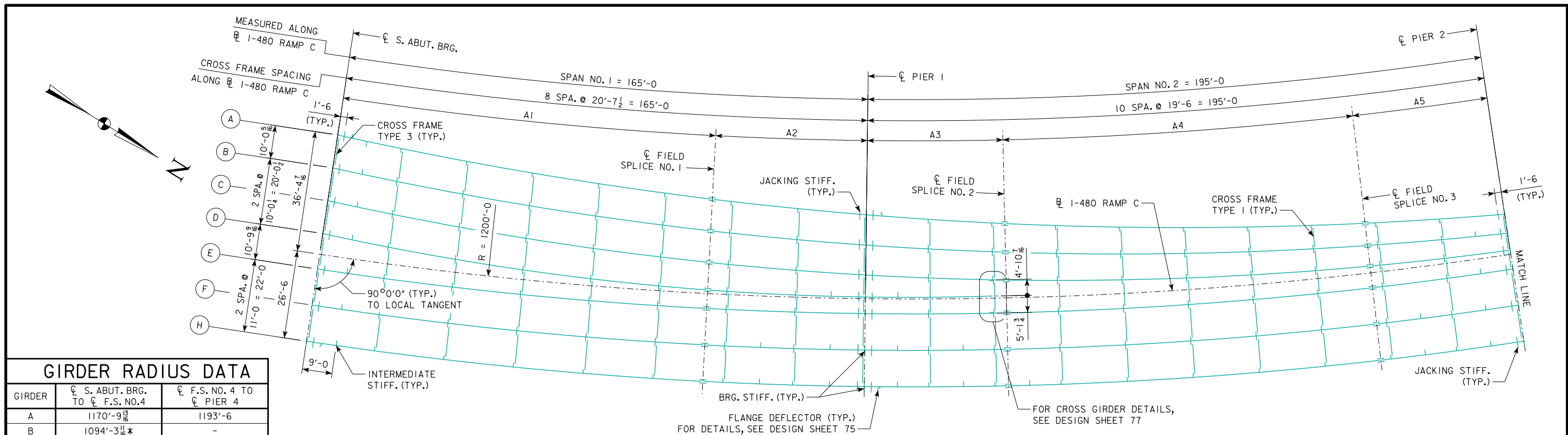
PART LONGITUDINAL SECTION NEAR BARRIER RAIL
 (LOOKING AT NORTH BARRIER) (PIER DIAPHRAGMS & ABUTMENT DIAPHRAGMS NOT SHOWN)

BEARING AND EXPANSION DEVICE SETTING (INCHES)						
TEMPERATURE AT TIME OF SETTING *	AHEAD BRG. PIER 4	PIER 5	PIER 6	PIER 7	BACK BRG. PIER 8	PIER 8
10°F	-1 1/16	-0 5/8	0	-0 5/8	-1 3/16	7 1/8
50°F	0	0	0	0	0	5 1/2
90°F	1 1/16	0 5/8	0	0 5/8	1 3/16	3 3/8

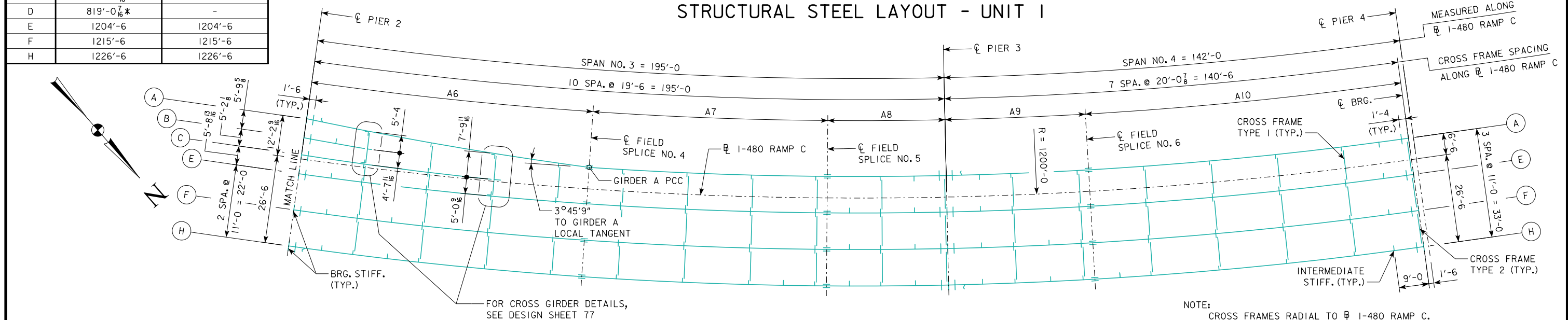
NOTES:
 BEARING AND EXPANSION DEVICE SETTINGS SHALL BE MADE IN EARLY MORNING, PREFERABLY BEFORE SUN HEAT AFFECTS LENGTH. FOR EXPANSION DEVICE SETTINGS, SEE DESIGN SHEETS 95 AND 98.
 SET SOLE PLATES IN DIRECTION SHOWN FOR TEMPERATURE ABOVE 50°F., IN THE OPPOSITE DIRECTION FOR TEMPERATURE BELOW 50°F.
 SETTINGS FOR OTHER TEMPERATURE ARE PROPORTIONAL.
 * TEMPERATURE OF STRUCTURE (STEEL AND/OR DECK), NOT AIR TEMPERATURE.

1 REVISED: 05-06-2022 UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED COLOR OF REINFORCEMENT.
 REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.

DESIGN FOR 0° SKEW
1419'-0 x VARIES CONTINUOUS WELDED GIRDER BRIDGE
 UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0
LONGITUDINAL SECTION - UNIT 2
 STA. 3546+14.50 (I-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 49 OF 121 FILE NO. 30170 DESIGN NO. 1320



STRUCTURAL STEEL LAYOUT - UNIT 1



STRUCTURAL STEEL LAYOUT - UNIT 1

NOTE:
CROSS FRAMES RADIAL TO ℄ I-480 RAMP C.
ALL CROSS FRAMES SHALL BE TYPE 1 UNLESS NOTED OTHERWISE.
ALL INTERMEDIATE STIFFENERS SHALL BE AT EQUAL SPACES BETWEEN CROSS FRAMES UNLESS NOTED OTHERWISE.
DIMENSIONS SHOWN ARE HORIZONTAL WITH NO ALLOWANCE FOR GRADE.
CHARPY V-NOTCH TOUGHNESS REQUIREMENTS IN ACCORDANCE WITH ARTICLE 4152.02 OF THE STANDARD SPECIFICATIONS SHALL APPLY TO ALL CROSS FRAMES AND CONNECTION STIFFENERS AT CROSS FRAMES.

GIRDER RADIUS DATA		
GIRDER	℄ S. ABUT. BRG. TO ℄ F.S. NO. 4	℄ F.S. NO. 4 TO ℄ PIER 4
A	1170'-9 13/16	1193'-6
B	1094'-3 11/16*	-
C	1018'-8 5/16*	-
D	819'-0 7/16*	-
E	1204'-6	1204'-6
F	1215'-6	1215'-6
H	1226'-6	1226'-6

GIRDER DATA - UNIT 1

GIRDER DATA - UNIT 1														
GIRDER	SPAN NO. 1			SPAN NO. 2				SPAN NO. 3				SPAN NO. 4		
	A1	A2	SPAN LENGTH	A3	A4	A5	SPAN LENGTH	A6	A7	A8	SPAN LENGTH	A9	A10	SPAN LENGTH
A	114'-6 $\frac{1}{16}$	46'-7 $\frac{5}{8}$	161'-1 $\frac{11}{16}$	41'-9	108'-6 $\frac{7}{16}$	42'-1 $\frac{3}{8}$	192'-4 $\frac{13}{16}$	86'-4 $\frac{1}{4}$	71'-9 $\frac{3}{16}$	35'-9 $\frac{11}{16}$	192'-11 $\frac{1}{8}$	42'-10 $\frac{7}{8}$	96'-9 $\frac{7}{8}$	139'-8 $\frac{3}{4}$
B	115'-5 $\frac{5}{16}$	46'-11 $\frac{3}{8}$	162'-5 $\frac{1}{16}$	42'-0 $\frac{7}{16}$	109'-1 $\frac{5}{8}$	42'-3 $\frac{3}{8}$	193'-5 $\frac{7}{16}$	19'-5 $\frac{1}{16}$ *	-	-	19'-5 $\frac{1}{16}$ *	-	-	-
C	116'-4 $\frac{1}{2}$	47'-3 $\frac{13}{16}$	163'-8 $\frac{5}{16}$	42'-3 $\frac{3}{4}$	109'-8 $\frac{11}{16}$	42'-5 $\frac{7}{16}$	194'-5 $\frac{7}{8}$	58'-5 $\frac{9}{16}$ *	-	-	58'-5 $\frac{9}{16}$ *	-	-	-
D	117'-2 $\frac{5}{8}$	47'-6 $\frac{13}{16}$	164'-9 $\frac{7}{16}$	38'-11 $\frac{13}{16}$ *	-	-	38'-11 $\frac{13}{16}$ *	-	-	-	-	-	-	-
E	117'-10 $\frac{3}{16}$	47'-9 $\frac{1}{4}$	165'-7 $\frac{7}{16}$	42'-7 $\frac{7}{8}$	110'-4 $\frac{15}{16}$	42'-7 $\frac{15}{16}$	195'-8 $\frac{3}{4}$	87'-2	72'-5 $\frac{1}{8}$	36'-1 $\frac{5}{8}$	195'-8 $\frac{3}{4}$	43'-3 $\frac{5}{8}$	97'-8 $\frac{3}{4}$	141'-0 $\frac{3}{8}$
F	118'-11 $\frac{1}{16}$	48'-2 $\frac{1}{2}$	167'-1 $\frac{9}{16}$	43'-0 $\frac{5}{8}$	111'-5 $\frac{1}{16}$	43'-0 $\frac{9}{16}$	197'-6 $\frac{1}{4}$	87'-11 $\frac{9}{16}$	73'-1 $\frac{1}{8}$	36'-5 $\frac{9}{16}$	197'-6 $\frac{1}{4}$	43'-8 $\frac{3}{8}$	98'-7 $\frac{5}{8}$	142'-4
H	120'-0	48'-7 $\frac{3}{4}$	168'-7 $\frac{3}{4}$	43'-5 $\frac{1}{4}$	112'-5 $\frac{3}{8}$	43'-5 $\frac{1}{4}$	199'-3 $\frac{11}{16}$	88'-9 $\frac{1}{8}$	73'-9	36'-9 $\frac{9}{16}$	199'-3 $\frac{11}{16}$	44'-1 $\frac{1}{8}$	99'-6 $\frac{1}{2}$	143'-7 $\frac{5}{8}$

DESIGN FOR 0° SKEW

1419'-0" x VARIES CONTINUOUS WELDED GIRDER BRIDGE

UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"

FRAMING PLAN - UNIT 1

STA. 3546+14.50 (℄ I-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

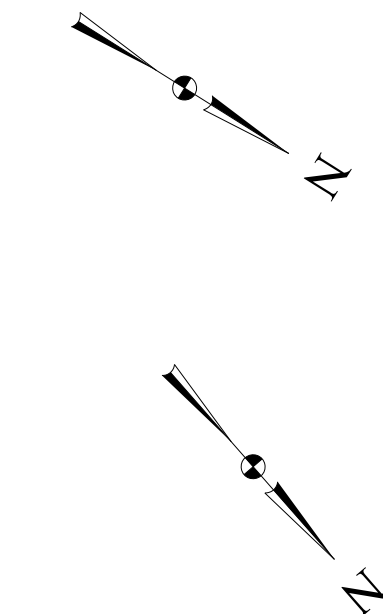
DESIGN SHEET NO. 50 OF 121 FILE NO. 30170 DESIGN NO. 1320



BEARING STIFFENER ORIENTATION TABLE

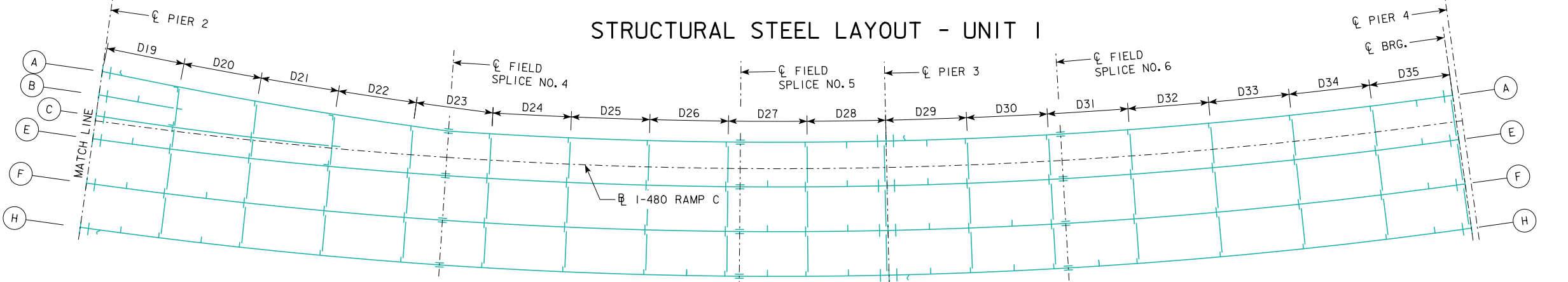
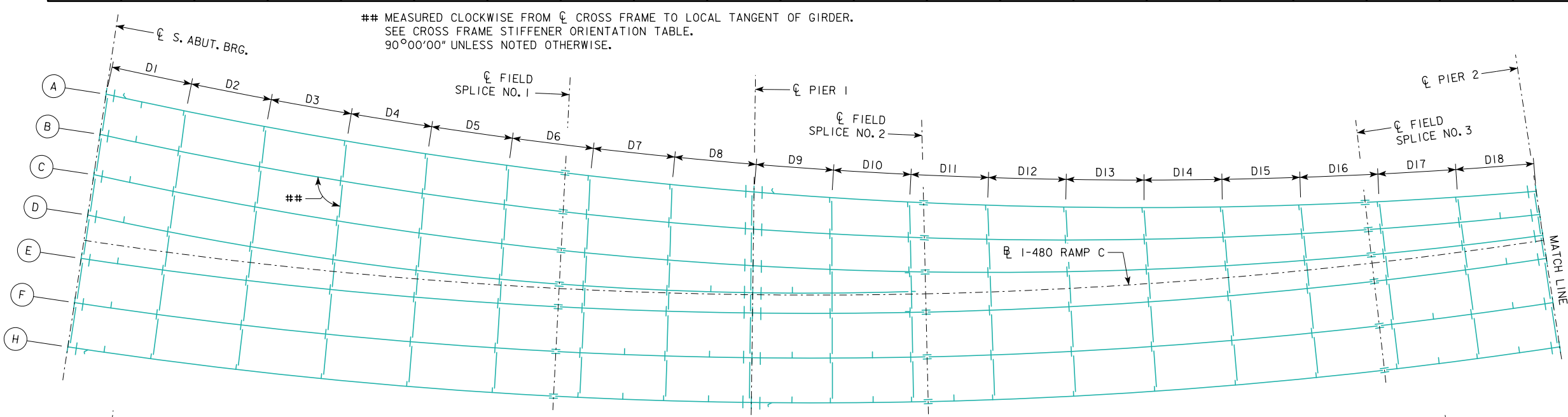
LOCATION	GIRDER	Δ
SOUTH ABUTMENT	A	86°3'19"
	B	86°5'20"
	C	86°7'18"
	D	86°9'15"
	E-H	90°0'0"
PIER 1	A	86°3'47"
	B	86°42'53"
	C	87°27'1"
	D	89°48'12"
	E-H	90°0'0"
PIER 2	A	86°10'4"
	B	87°31'58"
	C	89°4'44"
	E-H	90°0'0"
PIER 3	A-H	90°0'0"
PIER 4	A	89°55'41"
	E	89°55'43"
	F	89°55'45"
	H	89°55'48"

Δ MEASURED WITH RESPECT TO LOCAL TANGENT AND C. BRG. SEE WELDING DETAIL SHEETS.



CROSS FRAME STIFFENER ORIENTATION TABLE

GIRDER	CROSS FRAME BAY																					
	D1 - D2	D2 - D3	D3 - D4	D4 - D5	D5 - D6	D6 - D7	D7 - D8	D9 - D10	D10 - D11	D11 - D12	D12 - D13	D13 - D14	D14 - D15	D15 - D16	D16 - D17	D17 - D18	D19 - D20	D20 - D21	D21 - D22	D22 - D23		
A	93°36'52"	93°56'59"	93°57'02"	93°57'00"	93°56'55"	93°56'45"	93°56'31"	93°55'52"	93°55'27"	93°54'59"	93°54'26"	93°53'51"	93°53'11"	93°52'28"	93°51'41"	93°50'50"	93°48'57"	93°47'56"	93°46'51"	93°45'42"		
B	93°50'12"	93°45'40"	93°41'04"	93°36'24"	93°31'40"	93°26'53"	93°22'01"	93°12'25"	93°07'40"	93°02'52"	92°58'02"	92°53'08"	92°48'12"	92°43'13"	92°38'12"	92°33'08"	92°22'53"	-	-	-		
C	93°42'56"	92°33'06"	93°23'13"	93°13'17"	93°03'17"	92°53'14"	92°43'07"	92°23'20"	92°13'40"	92°03'58"	91°54'13"	91°44'27"	91°34'40"	91°24'51"	19°15'00"	91°05'09"	90°45'23"	90°35'29"	90°25'34"	-		
D	93°23'30"	92°56'12"	92°28'52"	92°01'30"	91°34'06"	91°06'40"	90°39'14"	89°45'50"	89°19'53"	-	-	-	-	-	-	-	-	-	-	-		



CROSS FRAME SPACING DATA

SPCG. ALONG GIRDER	SPAN NO. 1								SPAN NO. 2												
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	D16	D17	D18	D19	D20	D21
A	20'-0 ¹¹ / ₁₆	20'-1	20'-1 ⁵ / ₁₆	20'-1 ⁹ / ₁₆	20'-1 ⁷ / ₈	20'-2 ¹ / ₈	20'-2 ⁷ / ₁₆	20'-2 ¹¹ / ₁₆	19'-1 ³ / ₄	19'-2	19'-2 ¹ / ₄	19'-2 ¹ / ₂	19'-2 ³ / ₄	19'-3	19'-3 ¹ / ₄	19'-3 ¹ / ₂	19'-3 ³ / ₄	19'-4	19'-4 ¹ / ₄	19'-4 ¹ / ₂	19'-4 ³ / ₄
B	20'-2 ³ / ₄	20'-3	20'-3 ¹ / ₄	20'-3 ¹ / ₂	20'-3 ³ / ₄	20'-4	20'-4 ¹ / ₄	20'-4 ⁷ / ₁₆	19'-3 ⁵ / ₁₆	19'-3 ¹ / ₂	19'-3 ¹¹ / ₁₆	19'-3 ⁷ / ₈	19'-4 ¹ / ₁₆	19'-4 ¹ / ₄	19'-4 ⁷ / ₁₆	19'-4 ⁹ / ₁₆	19'-4 ³ / ₄	19'-4 ⁷ / ₈	19'-5 ¹ / ₁₆	-	-
C	20'-4 ¹³ / ₁₆	20'-5 ¹ / ₁₆	20'-5 ¹ / ₄	20'-5 ⁷ / ₁₆	20'-5 ¹¹ / ₁₆	20'-5 ⁷ / ₈	20'-6	20'-6 ³ / ₁₆	19'-4 ¹⁵ / ₁₆	19'-5 ¹ / ₁₆	19'-5 ³ / ₁₆	19'-5 ¹ / ₄	19'-5 ³ / ₈	19'-5 ¹ / ₂	19'-5 ⁹ / ₁₆	19'-5 ⁵ / ₈	19'-5 ¹¹ / ₁₆	19'-5 ³ / ₄	19'-5 ¹³ / ₁₆	19'-5 ⁷ / ₈	19'-5 ⁷ / ₈
D	20'-6 ¹³ / ₁₆	20'-6 ¹⁵ / ₁₆	20'-7 ¹ / ₁₆	20'-7 ¹ / ₁₆	20'-7 ¹ / ₄	20'-7 ⁵ / ₁₆	20'-7 ³ / ₈	20'-7 ³ / ₈	19'-5 ¹⁵ / ₁₆	19'-5 ¹⁵ / ₁₆	-	-	-	-	-	-	-	-	-	-	
E	20'-8 ⁷ / ₁₆	20'-8 ⁷ / ₁₆	20'-8 ⁷ / ₁₆	20'-8 ⁷ / ₁₆	20'-8 ⁷ / ₁₆	20'-8 ⁷ / ₁₆	20'-8 ⁷ / ₁₆	20'-8 ⁷ / ₁₆	19'-6 ⁷ / ₈	19'-6 ⁷ / ₈	19'-6 ⁷ / ₈	19'-6 ⁷ / ₈	19'-6 ⁷ / ₈	19'-6 ⁷ / ₈	19'-6 ⁷ / ₈	19'-6 ⁷ / ₈	19'-6 ⁷ / ₈	19'-6 ⁷ / ₈	19'-6 ⁷ / ₈	19'-6 ⁷ / ₈	19'-6 ⁷ / ₈
F	20'-10 ¹¹ / ₁₆	20'-10 ¹¹ / ₁₆	20'-10 ¹¹ / ₁₆	20'-10 ¹¹ / ₁₆	20'-10 ¹¹ / ₁₆	20'-10 ¹¹ / ₁₆	20'-10 ¹¹ / ₁₆	20'-10 ¹¹ / ₁₆	19'-9	19'-9	19'-9	19'-9	19'-9	19'-9	19'-9	19'-9	19'-9	19'-9	19'-9	19'-9	19'-9
H	21'-0 ¹⁵ / ₁₆	21'-0 ¹⁵ / ₁₆	21'-0 ¹⁵ / ₁₆	21'-0 ¹⁵ / ₁₆	21'-0 ¹⁵ / ₁₆	21'-0 ¹⁵ / ₁₆	21'-0 ¹⁵ / ₁₆	21'-0 ¹⁵ / ₁₆	19'-11 ³ / ₁₆	19'-11 ³ / ₁₆	19'-11 ³ / ₁₆	19'-11 ³ / ₁₆	19'-11 ³ / ₁₆	19'-11 ³ / ₁₆	19'-11 ³ / ₁₆	19'-11 ³ / ₁₆	19'-11 ³ / ₁₆	19'-11 ³ / ₁₆	19'-11 ³ / ₁₆	19'-11 ³ / ₁₆	19'-11 ³ / ₁₆
SPCG. ALONG GIRDER	SPAN NO. 3								SPAN NO. 4							NOTE: DIMENSIONS SHOWN ARE HORIZONTAL WITH NO ALLOWANCE FOR GRADE.					
	D22	D23	D24	D25	D26	D27	D28	D29	D30	D31	D32	D33	D34	D35							
A	19'-5	19'-4 ¹⁵ / ₁₆	19'-4 ³ / ₄	19'-4 ³ / ₄	19'-4 ³ / ₄	19'-4 ³ / ₄	19'-4 ³ / ₄	19'-11 ⁹ / ₁₆	19'-11 ⁹ / ₁₆	19'-11 ⁹ / ₁₆	19'-11 ⁹ / ₁₆	19'-11 ⁹ / ₁₆	19'-11 ⁹ / ₁₆	19'-11 ⁹ / ₁₆							
E	19'-6 ⁷ / ₈	19'-6 ⁷ / ₈	19'-6 ⁷ / ₈	19'-6 ⁷ / ₈	19'-6 ⁷ / ₈	19'-6 ⁷ / ₈	19'-6 ⁷ / ₈	20'-1 ³ / ₄	20'-1 ³ / ₄	20'-1 ³ / ₄	20'-1 ³ / ₄	20'-1 ³ / ₄	20'-1 ³ / ₄	20'-1 ³ / ₄							
F	19'-9	19'-9	19'-9	19'-9	19'-9	19'-9	19'-9	20'-3 ¹⁵ / ₁₆	20'-3 ¹⁵ / ₁₆	20'-3 ¹⁵ / ₁₆	20'-3 ¹⁵ / ₁₆	20'-3 ¹⁵ / ₁₆	20'-3 ¹⁵ / ₁₆	20'-3 ¹⁵ / ₁₆							
H	19'-11 ³ / ₁₆	19'-11 ³ / ₁₆	19'-11 ³ / ₁₆	19'-11 ³ / ₁₆	19'-11 ³ / ₁₆	19'-11 ³ / ₁₆	19'-11 ³ / ₁₆	20'-6 ³ / ₁₆	20'-6 ³ / ₁₆	20'-6 ³ / ₁₆	20'-6 ³ / ₁₆	20'-6 ³ / ₁₆	20'-6 ³ / ₁₆	20'-6 ³ / ₁₆							

NOTE: DIMENSIONS SHOWN ARE HORIZONTAL WITH NO ALLOWANCE FOR GRADE.

DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

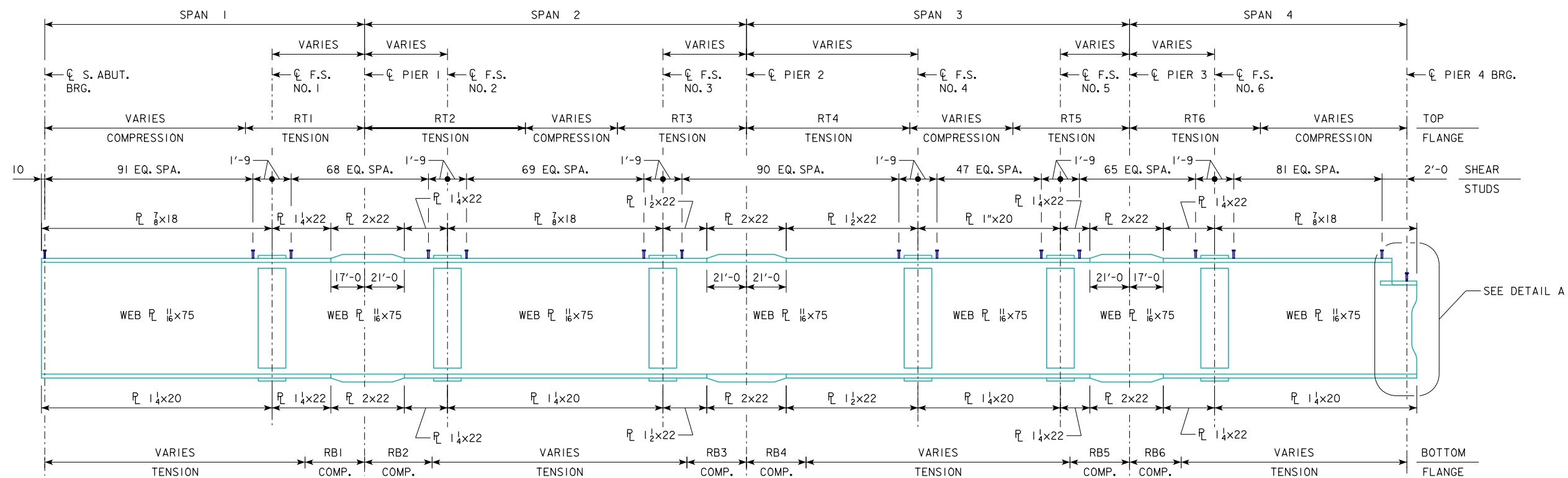
FRAMING PLAN - UNIT 1

STA. 3546+14.50 (R 1-480 RAMP C) NOVEMBER, 2020

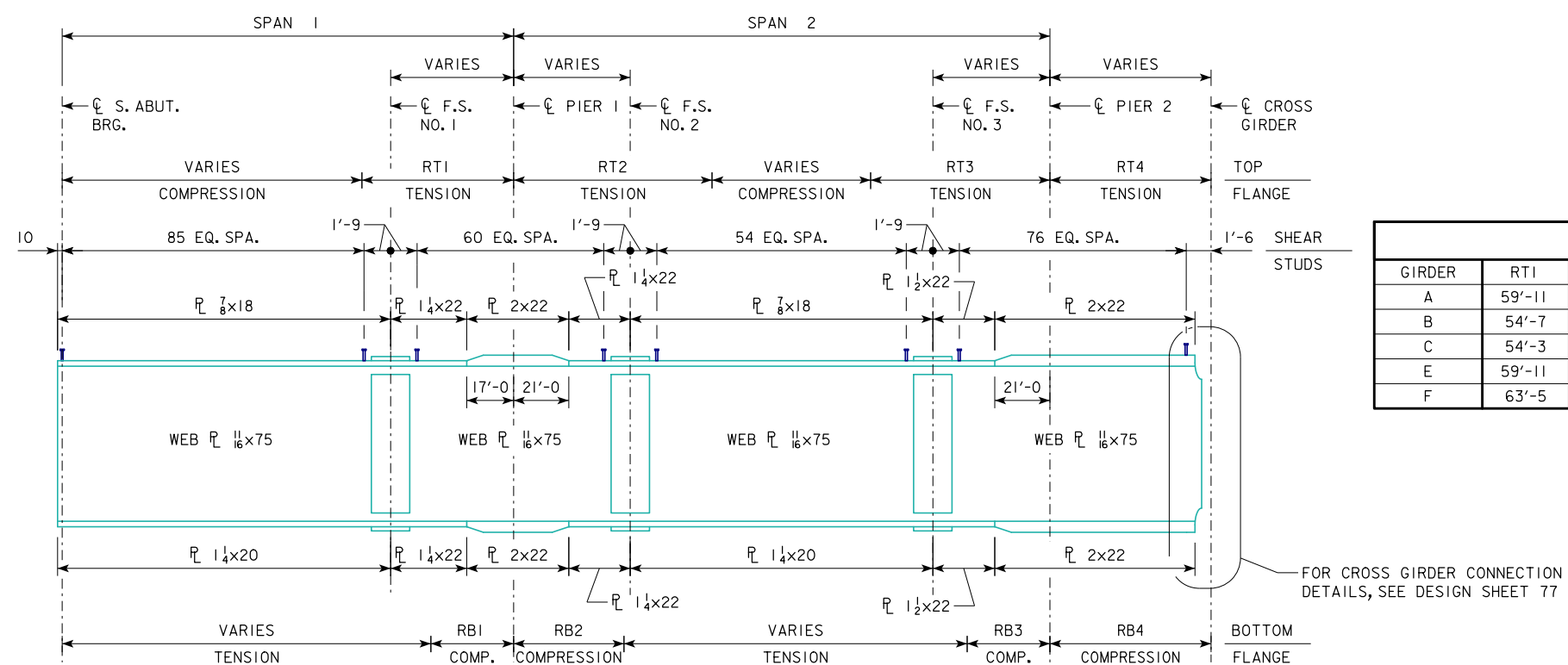
POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 51 OF 121 FILE NO. 30170 DESIGN NO. 1320



GIRDER A, E & F ELEVATION



GIRDER B & C ELEVATION

TENSION AND COMPRESSION ZONE DIMENSIONS												
GIRDER	RT1	RT2	RT3	RT4	RT5	RT6	RB1	RB2	RB3	RB4	RB5	RB6
A	59'-11	78'-4	62'-3	77'-11	62'-1	65'-1	27'-11	31'-10	26'-2	37'-0	26'-5	25'-2
B	54'-7	71'-7	63'-1	19'-5	-	-	28'-8	38'-0	29'-5	19'-5	-	-
C	54'-3	69'-9	64'-0	58'-6	-	-	30'-1	41'-3	30'-10	36'-4	-	-
E	59'-11	73'-8	69'-1	64'-4	59'-8	59'-2	35'-2	34'-3	31'-5	29'-8	32'-6	23'-3
F	63'-5	81'-2	77'-0	64'-9	56'-5	68'-5	28'-10	33'-10	29'-6	29'-9	28'-1	27'-2

NOTE:
FOR DETAIL A, SEE DESIGN SHEET 53.

DESIGN FOR 0° SKEW

1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"

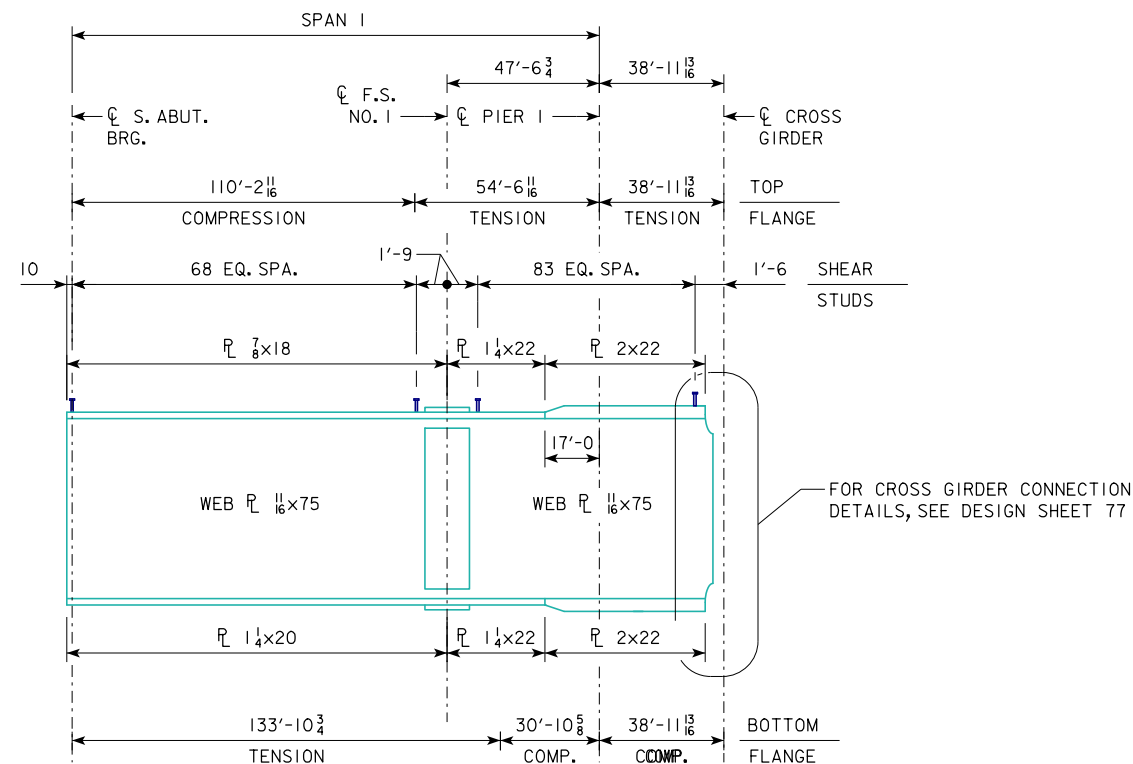
GIRDER ELEVATION - UNIT 1

STA. 3546+14.50 (R/L 1-480 RAMP C) NOVEMBER, 2020

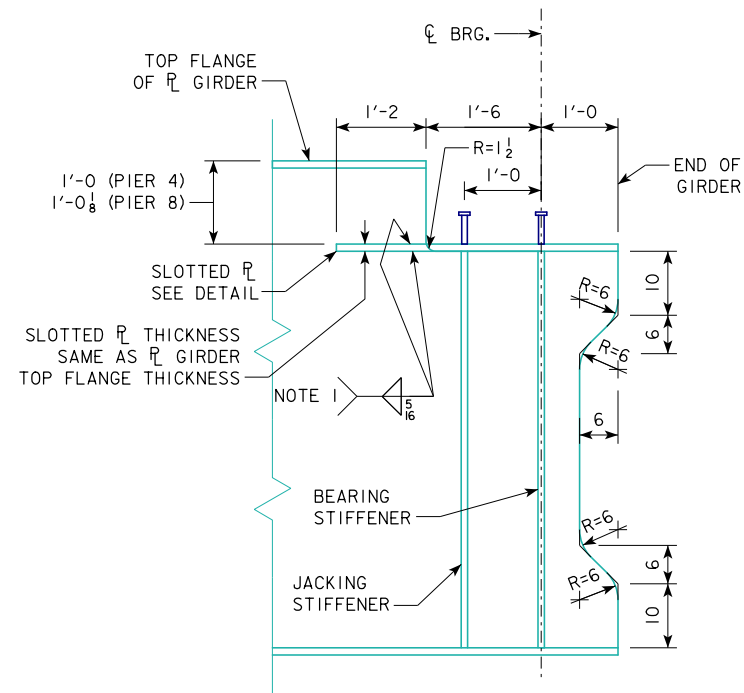
POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

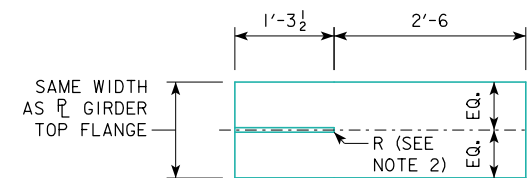
DESIGN SHEET NO. 52 OF 121 FILE NO. 30170 DESIGN NO. 1320



GIRDER D ELEVATION

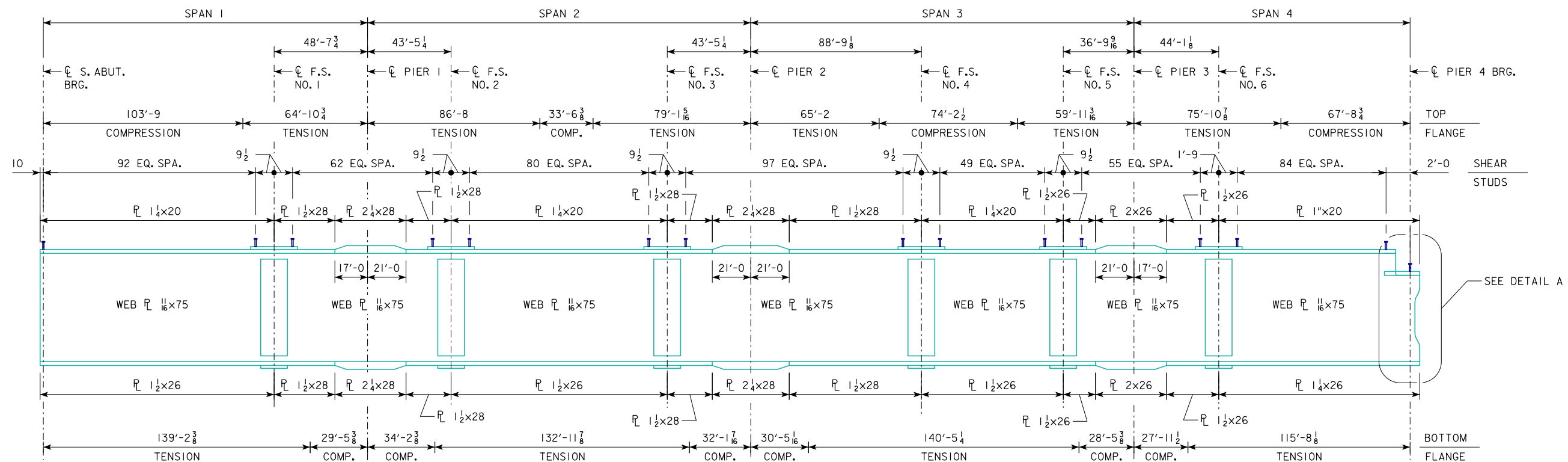


DETAIL A



SLOTTED PLATE

- NOTES:
1. TERMINATE WELD ON TOP FACE $\frac{1}{4}$ FROM EDGE OF WEB. FILL VOID WITH MOLTEN ZINC AFTER WELDING.
 2. GENERATE RADIUS BY DRILLING $\frac{3}{4}$ HOLE. GRIND AS REQUIRED TO FIT ONTO WEB.



GIRDER H ELEVATION

DESIGN FOR 0° SKEW
1419'-0 x VARIES CONTINUOUS WELDED GIRDER BRIDGE
 UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0
GIRDER ELEVATION - UNIT 1
 STA. 3546+14.50 (R 1-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 53 OF 121 FILE NO. 30170 DESIGN NO. 1320



MOMENT TABLE (UNIT 1) (FT-KIPS)																												
LOCATION	POSITIVE MOMENT SPAN 1							NEGATIVE MOMENT PIER 1							POSITIVE MOMENT SPAN 2							NEGATIVE MOMENT PIER 2						
	GIRD. A	GIRD. B	GIRD. C	GIRD. D	GIRD. E	GIRD. F	GIRD. H	GIRD. A	GIRD. B	GIRD. C	GIRD. D	GIRD. E	GIRD. F	GIRD. H	GIRD. A	GIRD. B	GIRD. C	GIRD. D	GIRD. E	GIRD. F	GIRD. H	GIRD. A	GIRD. B	GIRD. C	GIRD. D	GIRD. E	GIRD. F	GIRD. H
DC1	2061	2167	2270	2365	2395	2364	3452	-4385	-4357	-4330	-4555	-4480	-4789	-6338	1192	1285	1357	-	1359	1296	1836	-3120	-3341	-3524	-	-3904	-4438	-5867
DC2	284	295	283	267	287	333	429	-580	-503	-467	-452	-456	-495	-740	244	239	234	-	247	254	300	-629	-620	-580	-	-603	-688	-1005
DW	304	332	335	320	343	378	459	-527	-512	-511	-519	-505	-503	-658	221	214	209	-	219	219	247	-441	-451	-428	-	-438	-487	-680
LL + IMPACT (TRUCK + LANE)	3300	2776	2258	2130	2370	3160	4376	-2576	-2203	-2091	-2086	-2377	-3008	-4707	2081	1800	1692	-	2209	2948	4141	-2673	-2614	-2180	-	-2582	-3324	-5523
LL + IMPACT (TANDEM + LANE)	2747	2364	1938	1816	2033	2723	3693	-1949	-1612	-1540	-1513	-1708	-2150	-3334	1789	1539	1423	-	1932	2548	3503	-2057	-1985	-1631	-	-1878	-2457	-4213
TOTAL	5949	5570	5146	5082	5395	6235	8716	-8068	-7575	-7399	-7612	-7818	-8795	-12443	3738	3538	3492	-	4034	4717	6524	-6863	-7026	-6712	-	-7527	-8937	-13075

MOMENT TABLE (UNIT 1)(FT-KIPS)																					
LOCATION	POSITIVE MOMENT SPAN 3							NEGATIVE MOMENT PIER 3							POSITIVE MOMENT SPAN 4						
	GIRD. A	GIRD. B	GIRD. C	GIRD. D	GIRD. E	GIRD. F	GIRD. H	GIRD. A	GIRD. B	GIRD. C	GIRD. D	GIRD. E	GIRD. F	GIRD. H	GIRD. A	GIRD. B	GIRD. C	GIRD. D	GIRD. E	GIRD. F	GIRD. H
DC1	1490	-	-	-	1764	1929	2676	-3959	-	-	-	-4246	-4462	-5177	1545	-	-	-	1562	1540	1805
DC2	343	-	4	-	424	459	589	-732	-	-	-	-764	-796	-941	329	-	-	-	355	357	386
DW	208	-	-	-	260	284	366	-457	-	-	-	-480	-503	-596	215	-	-	-	232	233	252
LL + IMPACT (TRUCK + LANE)	3091	-	1025	-	2860	3073	4339	-3674	-	-	-	-3036	-3172	-4453	3020	-	-	-	2642	2795	3748
LL + IMPACT (TANDEM + LANE)	2628	-	966	-	2472	2652	3678	-2601	-	-	-	-2177	-2312	-3242	2551	-	-	-	2276	2413	3164
TOTAL	5132	-	1029	-	5308	5745	7970	-8822	-	-	-	-8526	-8933	-11167	5109	-	-	-	4791	4925	6191

REACTION TABLE (UNIT 1)(KIPS)																					
LOCATION	REACTION SOUTH ABUTMENT							REACTION PIER 1							REACTION PIER 2						
	GIRD. A	GIRD. B	GIRD. C	GIRD. D	GIRD. E	GIRD. F	GIRD. H	GIRD. A	GIRD. B	GIRD. C	GIRD. D	GIRD. E	GIRD. F	GIRD. H	GIRD. A	GIRD. B	GIRD. C	GIRD. D	GIRD. E	GIRD. F	GIRD. H
DC1	70	76	78	81	84	82	104	266	243	248	250	234	272	311	161	280	157	-	212	264	303
DC2	11	9	9	7	9	10	15	41	30	27	22	27	30	45	32	51	25	-	29	36	53
DW	10	11	11	11	11	12	14	33	30	31	31	30	30	36	21	39	20	-	23	27	34
LL + IMPACT (TRUCK + LANE)	88	105	107	111	128	140	124	173	168	160	140	188	235	248	135	207	114	-	186	243	269
LL + IMPACT (TANDEM + LANE)	74	92	96	101	117	126	103	128	136	132	110	158	197	178	102	152	89	-	156	202	194
TOTAL	179	201	205	210	232	244	257	513	471	466	443	479	567	640	349	577	316	-	450	570	659

REACTION TABLE (UNIT 1)(KIPS)														
LOCATION	REACTION PIER 3							REACTION PIER 4 - BACK BEARING						
	GIRD. A	GIRD. B	GIRD. C	GIRD. D	GIRD. E	GIRD. F	GIRD. H	GIRD. A	GIRD. B	GIRD. C	GIRD. D	GIRD. E	GIRD. F	GIRD. H
DC1	259	-	-	-	265	278	278	63	-	-	-	68	68	73
DC2	52	-	-	-	50	52	55	13	-	-	-	14	14	15
DW	33	-	-	-	32	33	35	9	-	-	-	9	9	10
LL + IMPACT (TRUCK + LANE)	242	-	-	-	240	245	245	107	-	-	-	138	139	121
LL + IMPACT (TANDEM + LANE)	171	-	-	-	197	201	174	89	-	-	-	123	124	100
TOTAL	586	-	-	-	587	608	613	192	-	-	-	229	230	219

NOTES:
MOMENTS AND REACTIONS ARE UNFACTORED.
DC1 COMPRISES ALL NON-COMPOSITE DEAD LOADS DUE TO GIRDER AND DECK DEAD WEIGHT.
DC2 COMPRISES COMPOSITE DEAD LOAD DUE TO BARRIER RAILS.
DW COMPRISES COMPOSITE DEAD LOAD DUE TO FUTURE WEARING SURFACE.



DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

MOMENT & REACTION TABLE - UNIT 1

STA. 3546+14.50 (R 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 54 OF 121 FILE NO. 30170 DESIGN NO. 1320

DEFLECTION ORDINATES DUE TO WEIGHT OF DECK AND BARRIERS (UNIT 1) (DOWNWARD DEFLECTIONS ARE POSITIVE) (INCHES)

LOCATION	℄ SOUTH ABUT. BRG.	SPAN 1												℄ F.S. NO. 1	SPAN 1				℄ PIER 1	SPAN 2				℄ F.S. NO. 2	SPAN 2				
	LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6	LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12	LINE 13	LINE 14	LINE 15	LINE 16	LINE 17	LINE 18	LINE 19	LINE 20	LINE 21	LINE 22	LINE 23	LINE 24	LINE 25	LINE 26			
GIRDER LINE A	0.00	0.63	1.22	1.75	2.19	2.52	2.74	2.84	2.81	2.66	2.41	2.07	1.67	1.25	0.85	0.49	0.20	0.00	-0.05	-0.03	0.06	0.20	0.38	0.59	0.81	1.02			
GIRDER LINE B	0.00	0.68	1.31	1.88	2.35	2.70	2.93	3.03	3.00	2.84	2.57	2.21	1.78	1.33	0.90	0.52	0.22	0.00	-0.07	-0.06	0.01	0.15	0.33	0.56	0.80	1.03			
GIRDER LINE C	0.00	0.71	1.38	1.98	2.48	2.85	3.09	3.19	3.15	2.99	2.70	2.32	1.87	1.40	0.95	0.55	0.23	0.00	-0.08	-0.09	-0.03	0.09	0.27	0.52	0.78	1.04			
GIRDER LINE D	0.00	0.74	1.44	2.06	2.58	2.97	3.22	3.32	3.28	3.10	2.80	2.40	1.93	1.44	0.98	0.56	0.23	0.00	-0.08	-0.06	0.05	0.19	-	-	-	-			
GIRDER LINE E	0.00	0.77	1.49	2.13	2.66	3.06	3.31	3.41	3.37	3.18	2.87	2.46	1.97	1.47	1.00	0.57	0.24	0.00	-0.08	-0.09	-0.02	0.11	0.29	0.55	0.82	1.09			
GIRDER LINE F	0.00	0.79	1.53	2.19	2.73	3.14	3.41	3.52	3.47	3.29	2.97	2.54	2.04	1.53	1.03	0.59	0.24	0.00	-0.07	-0.06	0.03	0.18	0.38	0.64	0.91	1.17			
GIRDER LINE H	0.00	0.80	1.55	2.22	2.78	3.20	3.47	3.59	3.55	3.35	3.03	2.59	2.07	1.55	1.04	0.59	0.24	0.00	-0.07	-0.05	0.05	0.22	0.43	0.69	0.97	1.22			
LOCATION	SPAN 2									℄ F.S. NO. 3	SPAN 2				℄ PIER 2	SPAN 3										℄ F.S. NO. 4	SPAN 3		
	LINE 27	LINE 28	LINE 29	LINE 30	LINE 31	LINE 32	LINE 33	LINE 34	LINE 35	LINE 36	LINE 37	LINE 38	LINE 39	LINE 40	LINE 41	LINE 42	LINE 43	LINE 44	LINE 45	LINE 46	LINE 47	LINE 48	LINE 49	LINE 50	LINE 51	LINE 52			
GIRDER LINE A	1.20	1.34	1.43	1.45	1.42	1.33	1.18	1.00	0.78	0.57	0.38	0.21	0.08	0.00	0.01	0.08	0.22	0.42	0.66	0.91	1.16	1.40	1.61	1.78	1.87	1.90			
GIRDER LINE B	1.23	1.39	1.48	1.51	1.48	1.38	1.22	1.02	0.79	0.57	0.36	0.19	0.07	0.00	0.04	0.14	-	-	-	-	-	-	-	-	-	-			
GIRDER LINE C	1.26	1.43	1.54	1.57	1.53	1.42	1.25	1.04	0.79	0.56	0.36	0.18	0.06	0.00	0.03	0.14	0.30	0.52	0.77	1.03	1.30	-	-	-	-				
GIRDER LINE D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
GIRDER LINE E	1.32	1.49	1.59	1.63	1.58	1.46	1.28	1.05	0.80	0.56	0.34	0.17	0.05	0.00	0.06	0.20	0.40	0.65	0.93	1.22	1.50	1.76	1.97	2.13	2.23	2.25			
GIRDER LINE F	1.39	1.55	1.65	1.68	1.62	1.49	1.30	1.06	0.78	0.53	0.31	0.14	0.03	0.00	0.10	0.29	0.54	0.84	1.16	1.49	1.80	2.07	2.29	2.45	2.55	2.56			
GIRDER LINE H	1.44	1.59	1.68	1.69	1.62	1.48	1.27	1.01	0.73	0.47	0.26	0.10	0.01	0.00	0.13	0.35	0.63	0.97	1.33	1.70	2.04	2.34	2.58	2.75	2.84	2.84			
LOCATION	SPAN 3					℄ F.S. NO. 5	SPAN 3				℄ PIER 3	SPAN 4				℄ F.S. NO. 6	SPAN 4										℄ PIER 4 BRG.		
	LINE 53	LINE 54	LINE 55	LINE 56	LINE 57	LINE 58	LINE 59	LINE 60	LINE 61	LINE 62	LINE 63	LINE 64	LINE 65	LINE 66	LINE 67	LINE 68	LINE 69	LINE 70	LINE 71	LINE 72	LINE 73	LINE 74	LINE 75	LINE 76	LINE 77				
GIRDER LINE A	1.86	1.75	1.58	1.35	1.08	0.79	0.51	0.27	0.10	0.00	0.03	0.14	0.32	0.53	0.77	1.02	1.24	1.38	1.44	1.41	1.28	1.06	0.76	0.40	0.00				
GIRDER LINE B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
GIRDER LINE C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
GIRDER LINE D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
GIRDER LINE E	2.19	2.06	1.85	1.58	1.27	0.93	0.61	0.34	0.12	0.00	0.02	0.12	0.29	0.51	0.75	1.02	1.24	1.40	1.47	1.45	1.32	1.10	0.79	0.41	0.00				
GIRDER LINE F	2.49	2.33	2.09	1.79	1.44	1.06	0.70	0.39	0.15	0.00	0.00	0.09	0.25	0.47	0.71	0.98	1.21	1.38	1.46	1.44	1.32	1.10	0.79	0.41	0.00				
GIRDER LINE H	2.75	2.56	2.30	1.96	1.58	1.18	0.79	0.44	0.17	0.00	-0.02	0.05	0.20	0.41	0.64	0.92	1.15	1.32	1.41	1.40	1.28	1.07	0.77	0.40	0.00				



DESIGN FOR 0° SKEW

1419'-0 × VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

CAMBER & BLOCKING - UNIT 1

STA. 3546+14.50 (R) 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 55 OF 121 FILE NO. 30170 DESIGN NO. 1320

DEFLECTION ORDINATES DUE TO WEIGHT OF STRUCTURAL STEEL (UNIT 1) (DOWNWARD DEFLECTIONS ARE POSITIVE) (INCHES)																											
LOCATION	☉ SOUTH ABUT. BRG.	SPAN 1											☉ F.S. NO. 1	SPAN 1				☉ PIER 1	SPAN 2				☉ F.S. NO. 2	SPAN 2			
	LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6	LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12	LINE 13	LINE 14	LINE 15	LINE 16	LINE 17	LINE 18	LINE 19	LINE 20	LINE 21	LINE 22	LINE 23	LINE 24	LINE 25	LINE 26	
GIRDER LINE A	0.00	0.18	0.35	0.49	0.61	0.70	0.76	0.78	0.76	0.71	0.63	0.54	0.42	0.31	0.20	0.11	0.04	0.00	0.01	0.05	0.10	0.17	0.25	0.35	0.44	0.52	
GIRDER LINE B	0.00	0.19	0.38	0.54	0.67	0.77	0.83	0.85	0.83	0.78	0.70	0.59	0.47	0.35	0.23	0.12	0.05	0.00	0.00	0.03	0.07	0.14	0.22	0.31	0.40	0.48	
GIRDER LINE C	0.00	0.21	0.40	0.58	0.72	0.83	0.89	0.92	0.90	0.85	0.76	0.65	0.52	0.38	0.26	0.14	0.06	0.00	-0.01	0.01	0.05	0.10	0.18	0.27	0.36	0.45	
GIRDER LINE D	0.00	0.22	0.43	0.61	0.76	0.88	0.95	0.98	0.96	0.91	0.81	0.69	0.56	0.41	0.28	0.16	0.06	0.00	-0.01	0.02	0.07	0.13	-	-	-	-	
GIRDER LINE E	0.00	0.23	0.45	0.64	0.80	0.92	0.99	1.02	1.00	0.94	0.85	0.72	0.58	0.43	0.29	0.16	0.07	0.00	-0.01	0.00	0.03	0.08	0.15	0.24	0.33	0.41	
GIRDER LINE F	0.00	0.24	0.47	0.67	0.84	0.97	1.05	1.08	1.06	1.00	0.90	0.77	0.62	0.47	0.32	0.18	0.07	0.00	-0.02	-0.01	0.02	0.08	0.14	0.23	0.31	0.38	
GIRDER LINE H	0.00	0.26	0.50	0.71	0.89	1.02	1.10	1.14	1.12	1.06	0.96	0.82	0.66	0.50	0.34	0.20	0.08	0.00	-0.02	-0.01	0.02	0.07	0.13	0.21	0.28	0.35	
LOCATION	SPAN 2								☉ F.S. NO. 3	SPAN 2				☉ PIER 2	SPAN 3									☉ F.S. NO. 4	SPAN 3		
	LINE 27	LINE 28	LINE 29	LINE 30	LINE 31	LINE 32	LINE 33	LINE 34	LINE 35	LINE 36	LINE 37	LINE 38	LINE 39	LINE 40	LINE 41	LINE 42	LINE 43	LINE 44	LINE 45	LINE 46	LINE 47	LINE 48	LINE 49	LINE 50	LINE 51	LINE 52	
GIRDER LINE A	0.59	0.63	0.66	0.66	0.64	0.59	0.53	0.44	0.35	0.27	0.18	0.10	0.04	0.00	-0.01	0.01	0.05	0.12	0.20	0.28	0.37	0.44	0.51	0.57	0.60	0.60	
GIRDER LINE B	0.55	0.60	0.63	0.63	0.61	0.56	0.49	0.41	0.32	0.24	0.16	0.09	0.03	0.00	0.01	0.04	-	-	-	-	-	-	-	-	-	-	
GIRDER LINE C	0.52	0.57	0.59	0.60	0.57	0.53	0.46	0.38	0.29	0.21	0.14	0.07	0.03	0.00	0.01	0.05	0.11	0.18	0.27	0.36	0.45	-	-	-	-	-	
GIRDER LINE D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
GIRDER LINE E	0.48	0.53	0.56	0.56	0.53	0.49	0.42	0.34	0.26	0.18	0.11	0.05	0.01	0.00	0.03	0.08	0.16	0.25	0.34	0.44	0.54	0.63	0.70	0.75	0.79	0.79	
GIRDER LINE F	0.44	0.48	0.50	0.50	0.47	0.42	0.36	0.28	0.20	0.13	0.07	0.02	0.00	0.00	0.05	0.13	0.23	0.34	0.46	0.58	0.69	0.79	0.87	0.93	0.97	0.97	
GIRDER LINE H	0.40	0.44	0.45	0.44	0.41	0.35	0.29	0.21	0.13	0.07	0.02	-0.01	-0.02	0.00	0.07	0.17	0.29	0.43	0.57	0.71	0.84	0.96	1.05	1.11	1.15	1.14	
LOCATION	SPAN 3					☉ F.S. NO. 5	SPAN 3				☉ PIER 3	SPAN 4				☉ F.S. NO. 6	SPAN 4									☉ PIER 4 BRG.	
	LINE 53	LINE 54	LINE 55	LINE 56	LINE 57	LINE 58	LINE 59	LINE 60	LINE 61	LINE 62	LINE 63	LINE 64	LINE 65	LINE 66	LINE 67	LINE 68	LINE 69	LINE 70	LINE 71	LINE 72	LINE 73	LINE 74	LINE 75	LINE 76	LINE 77		
GIRDER LINE A	0.59	0.55	0.49	0.42	0.34	0.25	0.16	0.09	0.03	0.00	0.01	0.03	0.08	0.13	0.19	0.26	0.32	0.36	0.38	0.37	0.34	0.28	0.20	0.11	0.00		
GIRDER LINE B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
GIRDER LINE C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
GIRDER LINE D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
GIRDER LINE E	0.76	0.71	0.64	0.54	0.44	0.32	0.22	0.13	0.05	0.00	-0.01	0.01	0.05	0.10	0.16	0.23	0.29	0.34	0.36	0.36	0.33	0.28	0.20	0.10	0.00		
GIRDER LINE F	0.93	0.87	0.78	0.66	0.54	0.40	0.27	0.16	0.07	0.00	-0.02	-0.01	0.02	0.07	0.13	0.20	0.27	0.32	0.34	0.35	0.32	0.27	0.20	0.10	0.00		
GIRDER LINE H	1.10	1.02	0.92	0.78	0.64	0.48	0.33	0.20	0.08	0.00	-0.03	-0.03	0.00	0.04	0.10	0.17	0.24	0.29	0.32	0.33	0.31	0.26	0.19	0.10	0.00		



DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

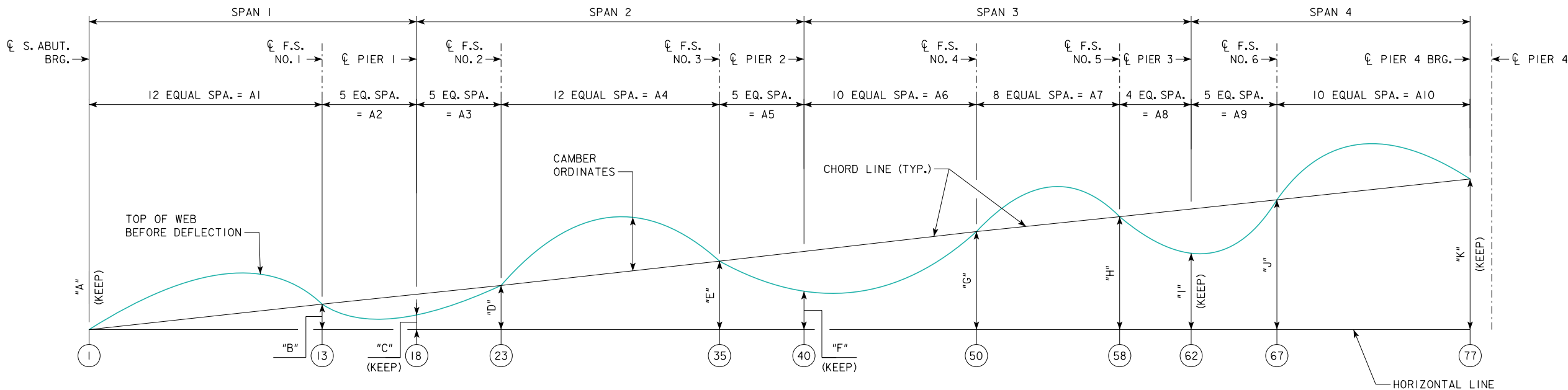
CAMBER & BLOCKING - UNIT 1

STA. 3546+14.50 (☉ 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 56 OF 121 FILE NO. 30170 DESIGN NO. 1320



CAMBER & BLOCKING DIAGRAM GIRDERS A, E, F & H (UNIT 1)

CAMBER ORDINATES (UNIT 1) (INCHES)

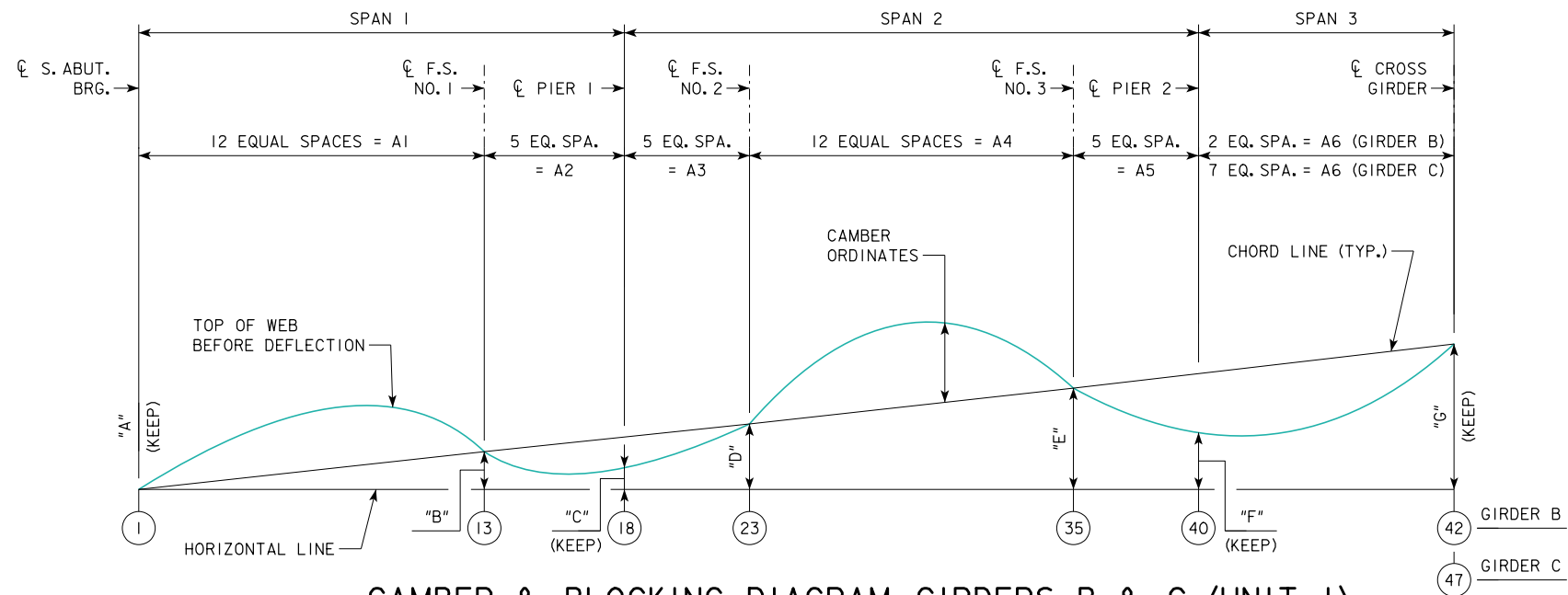
LOCATION	℄ SOUTH ABUT. BRG.	SPAN 1												℄ F.S. NO. 1	SPAN 1				℄ PIER 1	SPAN 2				℄ F.S. NO. 2	SPAN 2			
	LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6	LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12	LINE 13	LINE 14	LINE 15	LINE 16	LINE 17	LINE 18	LINE 19	LINE 20	LINE 21	LINE 22	LINE 23	LINE 24	LINE 25	LINE 26		
GIRDER LINE A	0.00	0.14	0.33	0.56	0.78	0.97	1.13	1.23	1.25	1.12	0.85	0.46	0.00	-0.37	-0.72	-1.02	-1.21	-1.29	-1.20	-1.00	-0.73	-0.39	0.00	0.28	0.56	0.82		
GIRDER LINE B	0.00	0.20	0.46	0.74	0.99	1.21	1.37	1.47	1.46	1.29	0.97	0.53	0.00	-0.37	-0.72	-1.01	-1.21	-1.29	-1.20	-1.01	-0.74	-0.40	0.00	0.30	0.61	0.90		
GIRDER LINE C	0.00	0.27	0.58	0.90	1.19	1.43	1.60	1.69	1.66	1.46	1.09	0.59	0.00	-0.36	-0.70	-0.99	-1.18	-1.26	-1.17	-0.99	-0.73	-0.40	0.00	0.33	0.68	0.99		
GIRDER LINE D	0.00	0.37	0.78	1.18	1.52	1.79	1.97	2.05	1.99	1.73	1.29	0.70	0.00	-0.30	-0.61	-0.86	-1.02	-1.08	-0.95	-0.70	-0.36	0.00	-	-	-	-		
GIRDER LINE E	0.00	0.28	0.61	0.94	1.25	1.49	1.66	1.74	1.71	1.49	1.11	0.60	0.00	-0.42	-0.82	-1.15	-1.36	-1.44	-1.34	-1.13	-0.84	-0.45	0.00	0.29	0.61	0.90		
GIRDER LINE F	0.00	0.30	0.65	1.01	1.32	1.58	1.76	1.84	1.80	1.57	1.17	0.64	0.00	-0.45	-0.87	-1.22	-1.44	-1.54	-1.43	-1.20	-0.88	-0.47	0.00	0.30	0.61	0.91		
GIRDER LINE H	0.00	0.32	0.68	1.05	1.39	1.66	1.84	1.93	1.89	1.64	1.23	0.66	0.00	-0.46	-0.90	-1.26	-1.49	-1.59	-1.47	-1.24	-0.91	-0.48	0.00	0.32	0.64	0.94		
LOCATION	SPAN 2								℄ F.S. NO. 3	SPAN 2				℄ PIER 2	SPAN 3								℄ F.S. NO. 4	SPAN 3				
	LINE 27	LINE 28	LINE 29	LINE 30	LINE 31	LINE 32	LINE 33	LINE 34	LINE 35	LINE 36	LINE 37	LINE 38	LINE 39	LINE 40	LINE 41	LINE 42	LINE 43	LINE 44	LINE 45	LINE 46	LINE 47	LINE 48	LINE 49	LINE 50	LINE 51	LINE 52		
GIRDER LINE A	1.03	1.18	1.25	1.23	1.13	0.95	0.69	0.36	0.00	-0.36	-0.70	-1.01	-1.28	-1.47	-1.55	-1.54	-1.43	-1.25	-1.02	-0.77	-0.53	-0.31	-0.13	0.00	0.29	0.49		
GIRDER LINE B	1.13	1.30	1.38	1.36	1.24	1.04	0.75	0.40	0.00	-0.16	-0.31	-0.42	-0.47	-0.45	-0.25	0.00	-	-	-	-	-	-	-	-	-	-		
GIRDER LINE C	1.25	1.43	1.51	1.49	1.36	1.13	0.82	0.43	0.00	-0.33	-0.64	-0.91	-1.12	-1.25	-1.25	-1.17	-1.01	-0.79	-0.53	-0.27	0.00	-	-	-	-	-		
GIRDER LINE D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
GIRDER LINE E	1.15	1.32	1.40	1.38	1.26	1.05	0.75	0.39	0.00	-0.44	-0.84	-1.19	-1.47	-1.66	-1.69	-1.62	-1.47	-1.25	-0.99	-0.73	-0.47	-0.25	-0.09	0.00	0.33	0.56		
GIRDER LINE F	1.15	1.32	1.40	1.38	1.26	1.05	0.75	0.39	0.00	-0.48	-0.92	-1.29	-1.59	-1.77	-1.78	-1.67	-1.48	-1.23	-0.95	-0.67	-0.41	-0.20	-0.06	0.00	0.37	0.62		
GIRDER LINE H	1.18	1.35	1.42	1.39	1.27	1.04	0.74	0.39	0.00	-0.52	-0.98	-1.37	-1.66	-1.85	-1.84	-1.73	-1.52	-1.25	-0.94	-0.64	-0.37	-0.16	-0.03	0.00	0.40	0.67		
LOCATION	SPAN 3					℄ F.S. NO. 5	SPAN 3			℄ PIER 3	SPAN 4				℄ F.S. NO. 6	SPAN 4								℄ PIER 4 BRG.				
	LINE 53	LINE 54	LINE 55	LINE 56	LINE 57	LINE 58	LINE 59	LINE 60	LINE 61	LINE 62	LINE 63	LINE 64	LINE 65	LINE 66	LINE 67	LINE 68	LINE 69	LINE 70	LINE 71	LINE 72	LINE 73	LINE 74	LINE 75	LINE 76	LINE 77			
GIRDER LINE A	0.59	0.61	0.54	0.40	0.21	0.00	-0.35	-0.65	-0.88	-1.00	-0.95	-0.81	-0.59	-0.30	0.00	0.46	0.87	1.20	1.42	1.52	1.49	1.35	1.09	0.63	0.00			
GIRDER LINE B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
GIRDER LINE C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
GIRDER LINE D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
GIRDER LINE E	0.68	0.70	0.62	0.46	0.24	0.00	-0.39	-0.72	-0.97	-1.10	-1.05	-0.90	-0.65	-0.34	0.00	0.47	0.89	1.23	1.46	1.57	1.54	1.40	1.12	0.65	0.00			
GIRDER LINE F	0.75	0.77	0.68	0.50	0.27	0.00	-0.42	-0.77	-1.04	-1.18	-1.13	-0.97	-0.71	-0.37	0.00	0.47	0.89	1.24	1.47	1.58	1.56	1.42	1.14	0.66	0.00			
GIRDER LINE H	0.81	0.83	0.73	0.54	0.28	0.00	-0.44	-0.81	-1.09	-1.24	-1.19	-1.02	-0.74	-0.39	0.00	0.46	0.88	1.22	1.46	1.57	1.55	1.41	1.13	0.65	0.00			

NOTES:
FOR BLOCKING DATA TABLE, SEE DESIGN SHEET 58.
FOR CAMBER & BLOCKING DIAGRAM OF DISCONTINUOUS GIRDERS, SEE DESIGN SHEET 58.
FOR UNIT 1 DEFLECTION ORDINATES, SEE DESIGN SHEETS 55 AND 56.
CAMBER ORDINATES ARE MEASURED FROM A CHORD LINE BETWEEN FIELD SPLICES. UPWARD CAMBERS ARE POSITIVE.
DEFLECTION ORDINATES FOR CAMBER INCLUDE DEFLECTIONS DUE TO ALL DEAD LOADS EXCEPT FUTURE WEARING SURFACE. DOWNWARD DEFLECTIONS ARE POSITIVE.
TOP OF GIRDER ELEVATIONS FOR HAUNCH CALCULATIONS SHALL BE SURVEYED PRIOR TO THE PLACEMENT OF FORMS.
FOR LOCATION OF POINTS, SEE TOP OF DECK DIAGRAMS ON TOP OF DECK ELEVATION SHEETS.

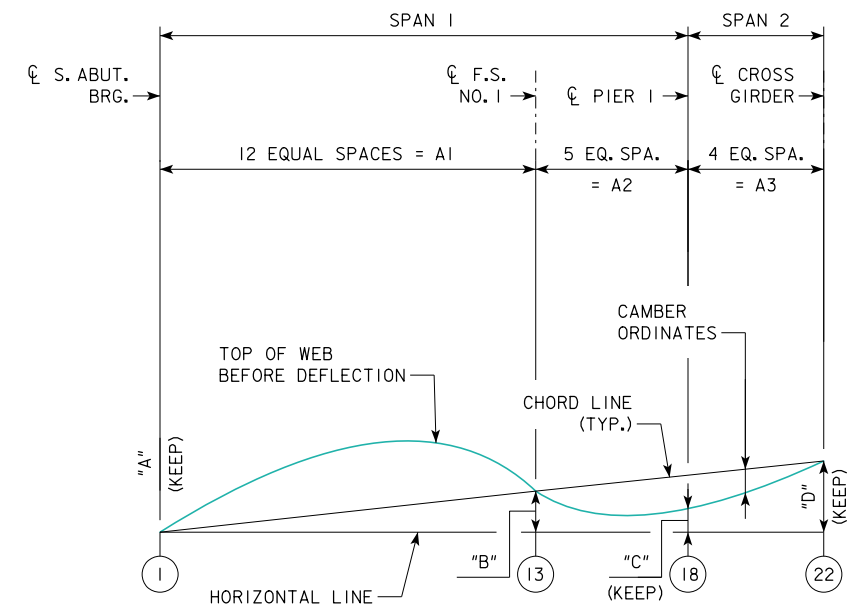
HAUNCH THICKENING DIAGRAM NOT PROVIDED BECAUSE THE HAUNCH DIMENSION FROM BOTTOM OF DECK TO TOP OF GIRDER WEB SHOULD THEORETICALLY BE A CONSTANT DIMENSION. (SEE TYPICAL DECK AND NOMINAL HAUNCH DETAIL, DESIGN SHEET 45). GIRDER WEB SHALL BE CUT TO COMPENSATE FOR DEAD LOAD DEFLECTION AND VERTICAL CURVE CORRECTION.
CAMBER VALUES MUST BE MAINTAINED AT THE CENTER LINE OF ABUTMENT AND PIER BEARINGS.
CAMBER VALUES ARE GIVEN FOR THE GIRDERS IN THE NO LOAD POSITION. FOR INDIVIDUAL GIRDER SPAN LENGTHS AND DISTANCE TO FIELD SPLICES, SEE GIRDER FRAMING AND GIRDER ELEVATION SHEETS.

DESIGN FOR 0° SKEW
1419'-0 x VARIES CONTINUOUS WELDED GIRDER BRIDGE
UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0
CAMBER & BLOCKING - UNIT 1
STA. 3546+14.50 (CL 1-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 57 OF 121 FILE NO. 30170 DESIGN NO. 1320





CAMBER & BLOCKING DIAGRAM GIRDERS B & C (UNIT 1)



CAMBER & BLOCKING DIAGRAM GIRDER D (UNIT 1)

BLOCKING DATA (UNIT 1) (FEET)											
LOCATION	CL SOUTH ABUT. BRG. "A"	CL F.S. NO. 1 "B"	CL PIER 1 "C"	CL F.S. NO. 2 "D"	CL F.S. NO. 3 "E"	CL PIER 2 "F"	CL F.S. NO. 4 "G"	CL F.S. NO. 5 "H"	CL PIER 3 "I"	CL F.S. NO. 6 "J"	CL BRG. PIER 4 "K"
GIRDER LINE A	0.00	4.65	6.39	8.15	12.60	14.22	17.89	20.44	21.68	23.35	26.81
GIRDER LINE B	0.00	4.64	6.34	8.07	12.44	14.00	14.78*	-	-	-	-
GIRDER LINE C	0.00	4.63	6.29	7.98	12.25	13.76	16.10*	-	-	-	-
GIRDER LINE D	0.00	4.55	6.12	7.58 *	-	-	-	-	-	-	-
GIRDER LINE E	0.00	4.29	5.83	7.43	11.53	13.01	16.44	18.96	20.18	21.85	25.32
GIRDER LINE F	0.00	4.30	5.83	7.44	11.53	13.01	16.49	18.98	20.18	21.84	25.32
GIRDER LINE H	0.00	4.31	5.83	7.44	11.52	13.01	16.53	19.00	20.18	21.83	25.32

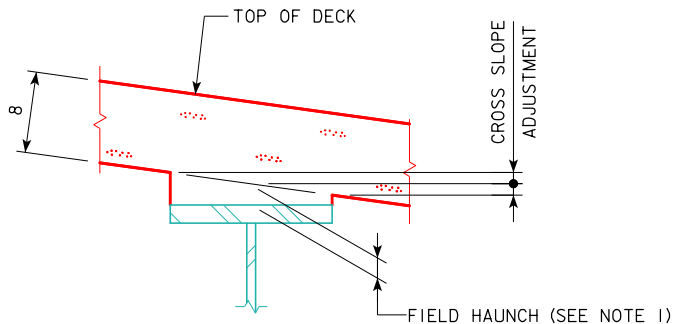
* GIRDER STOPS BEFORE SPLICE.



DESIGN FOR 0° SKEW
1419'-0" x VARIES CONTINUOUS WELDED GIRDER BRIDGE
 UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
CAMBER & BLOCKING - UNIT 1
 STA. 3546+14.50 (CL 1-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 58 OF 121 FILE NO. 30170 DESIGN NO. 1320

BENCH MARK NO. 563 STA. 540+68.14, 75.977' LT. CUT X NE HNDRL. I-29 SB BRIDGE OVER 2ND AVE. ELEV. 1003.120																														
TABLE OF GIRDER LINE HAUNCH ELEVATIONS (UNIT 1)																														
LOCATION	☼ SOUTH ABUT. BRG.	SPAN 1												☼ F.S. NO. 1	SPAN 1					☼ PIER 1	SPAN 2					☼ F.S. NO. 2	SPAN 2			
	LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6	LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12	LINE 13	LINE 14	LINE 15	LINE 16	LINE 17	LINE 18	LINE 19	LINE 20	LINE 21	LINE 22	LINE 23	LINE 24	LINE 25	LINE 26				
GIRDER LINE A	998.53	998.92	999.31	999.70	1000.10	1000.49	1000.89	1001.28	1001.67	1002.05	1002.42	1002.79	1003.15	1003.49	1003.84	1004.20	1004.55	1004.92	1005.26	1005.60	1005.95	1006.30	1006.66	1007.04	1007.43	1007.82				
GIRDER LINE B	999.03	999.42	999.81	1000.21	1000.61	1001.00	1001.40	1001.79	1002.18	1002.56	1002.92	1003.28	1003.63	1003.98	1004.32	1004.67	1005.02	1005.38	1005.71	1006.04	1006.39	1006.73	1007.08	1007.47	1007.85	1008.23				
GIRDER LINE C	999.53	999.93	1000.32	1000.72	1001.12	1001.51	1001.91	1002.30	1002.68	1003.05	1003.42	1003.77	1004.12	1004.45	1004.79	1005.13	1005.47	1005.83	1006.15	1006.48	1006.82	1007.16	1007.50	1007.88	1008.25	1008.63				
GIRDER LINE D	1000.04	1000.43	1000.82	1001.22	1001.62	1002.01	1002.40	1002.78	1003.15	1003.52	1003.87	1004.21	1004.54	1004.86	1005.18	1005.50	1005.83	1006.16	1006.51	1006.87	1007.24	1007.60	-	-	-	-				
GIRDER LINE E	1000.58	1000.94	1001.30	1001.67	1002.04	1002.41	1002.78	1003.14	1003.50	1003.84	1004.18	1004.50	1004.82	1005.13	1005.44	1005.76	1006.08	1006.41	1006.71	1007.03	1007.34	1007.67	1008.00	1008.36	1008.72	1009.07				
GIRDER LINE F	1001.13	1001.49	1001.86	1002.23	1002.60	1002.97	1003.34	1003.70	1004.06	1004.40	1004.73	1005.06	1005.38	1005.68	1005.99	1006.31	1006.63	1006.96	1007.26	1007.58	1007.90	1008.22	1008.55	1008.91	1009.27	1009.63				
GIRDER LINE H	1001.68	1002.04	1002.41	1002.78	1003.15	1003.52	1003.89	1004.26	1004.61	1004.96	1005.29	1005.61	1005.93	1006.24	1006.54	1006.86	1007.18	1007.51	1007.82	1008.13	1008.45	1008.78	1009.11	1009.47	1009.83	1010.19				
LOCATION	SPAN 2								☼ F.S. NO. 3	SPAN 2				☼ PIER 2	SPAN 3									☼ F.S. NO. 4	SPAN 3					
	LINE 27	LINE 28	LINE 29	LINE 30	LINE 31	LINE 32	LINE 33	LINE 34	LINE 35	LINE 36	LINE 37	LINE 38	LINE 39	LINE 40	LINE 41	LINE 42	LINE 43	LINE 44	LINE 45	LINE 46	LINE 47	LINE 48	LINE 49	LINE 50	LINE 51	LINE 52				
GIRDER LINE A	1008.20	1008.58	1008.96	1009.33	1009.69	1010.05	1010.41	1010.76	1011.11	1011.43	1011.76	1012.08	1012.41	1012.75	1013.10	1013.45	1013.81	1014.18	1014.55	1014.92	1015.28	1015.65	1016.02	1016.38	1016.72	1017.05				
GIRDER LINE B	1008.61	1008.98	1009.35	1009.71	1010.07	1010.42	1010.77	1011.11	1011.45	1011.76	1012.08	1012.39	1012.71	1013.04	1013.42	1013.81	-	-	-	-	-	-	-	-	-	-				
GIRDER LINE C	1009.00	1009.37	1009.73	1010.08	1010.43	1010.77	1011.10	1011.43	1011.76	1012.06	1012.37	1012.67	1012.98	1013.30	1013.61	1013.94	1014.26	1014.59	1014.93	1015.26	1015.59	-	-	-	-					
GIRDER LINE D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
GIRDER LINE E	1009.43	1009.78	1010.13	1010.47	1010.80	1011.13	1011.45	1011.77	1012.09	1012.38	1012.67	1012.97	1013.28	1013.58	1013.91	1014.24	1014.58	1014.92	1015.26	1015.60	1015.95	1016.29	1016.62	1016.96	1017.30	1017.63				
GIRDER LINE F	1009.99	1010.34	1010.68	1011.02	1011.36	1011.68	1012.00	1012.32	1012.64	1012.93	1013.22	1013.52	1013.82	1014.13	1014.46	1014.80	1015.14	1015.48	1015.83	1016.18	1016.52	1016.86	1017.20	1017.53	1017.87	1018.21				
GIRDER LINE H	1010.54	1010.89	1011.24	1011.57	1011.91	1012.23	1012.55	1012.87	1013.18	1013.47	1013.77	1014.07	1014.37	1014.68	1015.01	1015.35	1015.70	1016.04	1016.39	1016.74	1017.09	1017.44	1017.78	1018.11	1018.45	1018.78				
LOCATION	SPAN 3					☼ F.S. NO. 5	SPAN 3				☼ PIER 3	SPAN 4				☼ F.S. NO. 6	SPAN 4											☼ PIER 4 BRG.		
	LINE 53	LINE 54	LINE 55	LINE 56	LINE 57	LINE 58	LINE 59	LINE 60	LINE 61	LINE 62	LINE 63	LINE 64	LINE 65	LINE 66	LINE 67	LINE 68	LINE 69	LINE 70	LINE 71	LINE 72	LINE 73	LINE 74	LINE 75	LINE 76	LINE 77					
GIRDER LINE A	1017.38	1017.70	1018.02	1018.33	1018.64	1018.95	1019.26	1019.57	1019.89	1020.21	1020.53	1020.86	1021.19	1021.52	1021.86	1022.24	1022.62	1022.99	1023.35	1023.71	1024.05	1024.39	1024.72	1025.04	1025.34					
GIRDER LINE B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
GIRDER LINE C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
GIRDER LINE D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
GIRDER LINE E	1017.96	1018.28	1018.59	1018.90	1019.21	1019.51	1019.82	1020.13	1020.44	1020.76	1021.08	1021.40	1021.74	1022.07	1022.41	1022.79	1023.17	1023.54	1023.90	1024.26	1024.61	1024.95	1025.28	1025.59	1025.89					
GIRDER LINE F	1018.53	1018.85	1019.16	1019.47	1019.77	1020.07	1020.38	1020.68	1020.99	1021.31	1021.63	1021.95	1022.28	1022.62	1022.96	1023.34	1023.72	1024.09	1024.45	1024.81	1025.16	1025.50	1025.83	1026.14	1026.45					
GIRDER LINE H	1019.10	1019.42	1019.73	1020.04	1020.34	1020.63	1020.93	1021.23	1021.54	1021.86	1022.18	1022.50	1022.83	1023.16	1023.50	1023.88	1024.26	1024.63	1025.00	1025.36	1025.71	1026.05	1026.38	1026.69	1027.00					

NOTE:
HAUNCH LOCATIONS ARE AT THE SAME LOCATION AS THE ENCIRCLED LETTERS AND NUMBERS SHOWN ON TOP OF DECK ELEVATIONS SHEET.



FIELD HAUNCH DETAIL

NOTES:

TO CALCULATE FIELD HAUNCH NEEDED AT EACH LOCATION, SURVEY THE TOP OF GIRDER TOP FLANGES AT THE POINTS AND FIELD SPlice LOCATIONS AS INDICATED IN THE TABLE OF GIRDER LINE HAUNCH ELEVATIONS. SUBTRACT THE SURVEYED GIRDER SHOT FROM THE "GIRDER LINE HAUNCH ELEVATION". THIS VALUE WILL BE THE FIELD HAUNCH NEEDED (SEE "FIELD HAUNCH" IN THE HAUNCH DETAIL). THE "GIRDER LINE HAUNCH ELEVATION" INCLUDES ADJUSTMENT FOR DECK THICKNESS AND ANTICIPATED DEFLECTIONS. NO ADDITIONAL CALCULATIONS ARE REQUIRED. IF THE FIELD HAUNCH EXCEEDS THE MAXIMUMS AND MINIMUMS INDICATED IN THE MISC. DATA TABLE, ADJUSTMENTS TO THE GRADE OR ADDITIONAL HAUNCH REINFORCEMENT WILL BE REQUIRED.

FIELD HAUNCHES ARE DETERMINED USING SURVEYED TOP OF GIRDER TOP FLANGE ELEVATIONS AND "GIRDER LINE HAUNCH ELEVATION" DATA. ALLOWABLE MAXIMUM AND MINIMUM "FIELD HAUNCH" VALUES ARE GIVEN IN THE "MISCELLANEOUS DATA" TABLE FOR EACH UNIT. "CROSS SLOPE ADJUSTMENT" VALUES WILL AID THE CONTRACTOR IN DETERMINING ACTUAL FORMED HAUNCH DIMENSIONS AT THE EDGES OF THE TOP FLANGE.

DOWNWARD DEFLECTIONS ARE POSITIVE.



DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

FIELD HAUNCH DATA - UNIT 1

STA. 3546+14.50 (R 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 59 OF 121 FILE NO. 30170 DESIGN NO. 1320

MISCELLANEOUS DATA TABLE (UNIT 1)

		GIRDER LINE	℄ S. ABUT. BRG.	SPAN 1												℄ F.S. NO. 1	SPAN 1					℄ PIER 1	SPAN 2					℄ F.S. NO. 2	SPAN 2		
			LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6	LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12	LINE 13	LINE 14	LINE 15	LINE 16	LINE 17	LINE 18	LINE 19	LINE 20	LINE 21	LINE 22	LINE 23	LINE 24	LINE 25	LINE 26			
ANTICIPATED DEFLECTION DUE TO DECK AND BARRIER (INCHES)		A	0	5 8	1 4	1 4	2 3 16	2 2	2 4	2 13 16	2 13 16	2 11 16	2 7 16	2 1 16	1 11 16	1 4	7 8	1 2	3 16	0	- 1 16	0	1 16	3 16	3 8	9 16	13 16	1			
		B	0	11 16	1 5 16	1 8	2 3 8	2 11 16	2 15 16	3	3	2 13 16	2 9 16	2 3 16	1 3 4	1 5 16	1 6	7 8	1 2	3 16	0	- 1 16	- 1 16	0	1 8	5 16	9 16	13 16	1		
		C	0	11 16	1 3 8	2	2 1 2	2 7 8	3 1 16	3 3 16	3 1 8	3	2 11 16	2 5 16	1 7 8	1 3 8	15 16	9 16	1 4	0	- 1 16	- 1 16	0	1 16	1 4	1 2	13 16	1 1 16			
		D	0	3 4	1 7 16	2 1 8	2 9 16	2 15 16	3 3 16	3 5 16	3 1 4	3 1 8	2 13 16	2 3 8	1 15 16	1 7 16	1	9 16	1 4	0	- 1 16	- 1 16	1 16	3 16	-	-	-	-			
		E	0	3 4	1 2	2 1 8	2 11 16	3 1 16	3 1 16	3 7 16	3 3 8	3 3 16	2 7 8	2 1 16	2	1 2	1	9 16	1 4	0	- 1 16	- 1 16	0	1 8	5 16	9 16	13 16	1 1 16			
		F	0	13 16	1 1 2	2 3 16	2 4	3 1 8	3 7 16	3 1 2	3 1 2	3 5 16	3	2 9 16	2 1 16	1 1 2	1	9 16	1 4	0	- 1 16	- 1 16	0	3 16	3 8	5 8	15 16	1 3 16			
CROSS SLOPE ADJUSTMENTS (INCHES)		A, E, F	7 16	16 16	7 16	7 16	7 16	7 16	7 16	7 16	7 16	7 16	7 16	7 16	9 16	9 16	9 16	9 16	9 16	9 16	9 16	9 16	9 16	9 16	9 16	9 16	7 16	7 16	1 4		
		B, C	7 16	7 16	7 16	7 16	7 16	7 16	7 16	7 16	7 16	7 16	7 16	7 16	9 16	9 16	9 16	9 16	9 16	9 16	9 16	9 16	9 16	9 16	9 16	9 16	7 16	7 16	7 16		
		D	7 16	7 16	7 16	7 16	7 16	7 16	7 16	7 16	7 16	7 16	7 16	7 16	9 16	9 16	9 16	9 16	9 16	9 16	9 16	9 16	9 16	9 16	-	-	-	-	-		
		H	1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2	11 16	11 16	11 16	11 16	11 16	11 16	11 16	11 16	11 16	11 16	11 16	11 16	1 2	1 2	1 2		
ALLOWABLE FIELD HAUNCH IN. (FT.)		MAX	A, E, F	2 16 (0.225)												2 16 (0.225)										2 16 (0.225)					
			B, C	2 16 (0.225)												2 16 (0.225)										2 16 (0.225)					
			D	2 16 (0.225)												2 16 (0.225)										-					
			H	2 16 (0.225)												2 16 (0.225)										2 16 (0.225)					
		MIN	A, E, F	- 1 16 (-0.004)												1 16 (0.004)										- 1 16 (-0.004)					
			B, C	- 1 16 (-0.004)												1 16 (0.004)										- 1 16 (-0.004)					
D	- 1 16 (-0.004)												1 16 (0.004)										-								
		H	0 (0)												3 16 (0.017)										0 (0)						
		GIRDER LINE	SPAN 2								℄ F.S. NO. 3	SPAN 2					℄ PIER 2	SPAN 3													
			LINE 27	LINE 28	LINE 29	LINE 30	LINE 31	LINE 32	LINE 33	LINE 34	LINE 35	LINE 36	LINE 37	LINE 38	LINE 39	LINE 40	LINE 41	LINE 42	LINE 43	LINE 44											
ANTICIPATED DEFLECTION DUE TO DECK AND BARRIER (INCHES)		A	1 3 16	1 5 16	1 7 16	1 7 16	1 7 16	1 5 16	1 3 16	1	3 4	9 16	3 8	3 16	1 16	0	0	1 16	1 4	7 16											
		B	1 4	1 3 8	1 2	1 2	1 2	1 3 8	1 4	1	13 16	9 16	3 8	3 16	1 16	0	1 16	1 8	-	-											
		C	1 4	1 16	1 16	1 9 16	1 9 16	1 7 16	1 4	1 16	13 16	9 16	3 8	3 16	1 16	0	1 16	1 8	5 16	1 2											
		D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
		E	1 5 16	1 1 2	1 5 8	1 5 8	1 9 16	1 7 16	1 5 16	1 1 16	13 16	9 16	5 16	3 16	1 16	0	1 16	3 16	3 8	5 8											
		F	1 3 8	1 9 16	1 5 8	1 11 16	1 5 8	1 1 2	1 5 16	1 1 16	13 16	9 16	5 16	1 8	0	0	1 8	5 16	9 16	13 16											
CROSS SLOPE ADJUSTMENTS (INCHES)		A, E, F	7 16	7 16	7 16	7 16	7 16	7 16	7 16	7 16	7 16	9 16	9 16	9 16	9 16	9 16	9 16	9 16	9 16	9 16											
		B, C	7 16	7 16	7 16	7 16	7 16	7 16	7 16	7 16	9 16	9 16	9 16	9 16	9 16	9 16	9 16	9 16	9 16	9 16											
		D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
		H	1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2	11 16	11 16	11 16	11 16	11 16	11 16	11 16	11 16	11 16	11 16	11 16										
ALLOWABLE FIELD HAUNCH IN. (FT.)		MAX	A, E, F	2 16 (0.225)								2 16 (0.225)					2 16 (0.225)														
			B, C	2 16 (0.225)								2 16 (0.225)					2 16 (0.225)														
			D	-								-					-														
			H	2 16 (0.225)								2 16 (0.225)					2 16 (0.225)														
		MIN	A, E, F	- 1 16 (-0.004)								1 16 (0.004)					1 16 (0.004)														
			B, C	- 1 16 (-0.004)								1 16 (0.004)					1 16 (0.004)														
D	-								-					-																	
		H	0 (0)								3 16 (0.017)					3 16 (0.017)															

MISCELLANEOUS DATA TABLE (UNIT 1)

		GIRDER LINE	SPAN 3					℄ F.S. NO. 4	SPAN 3							℄ F.S. NO. 5	SPAN 3			℄ PIER 3	SPAN 4				℄ F.S. NO. 6	SPAN 4		
			LINE 45	LINE 46	LINE 47	LINE 48	LINE 49	LINE 50	LINE 51	LINE 52	LINE 53	LINE 54	LINE 55	LINE 56	LINE 57	LINE 58	LINE 59	LINE 60	LINE 61	LINE 62	LINE 63	LINE 64	LINE 65	LINE 66	LINE 67	LINE 68	LINE 69	LINE 70
ANTICIPATED DEFLECTION DUE TO DECK AND BARRIER (INCHES)		A	$\frac{11}{16}$	$\frac{15}{16}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{9}{16}$	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{13}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{8}$	0	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{5}{16}$	$\frac{9}{16}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{8}$
		B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		C	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		E	$\frac{15}{16}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{16}$	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{9}{16}$	$\frac{1}{4}$	$\frac{15}{16}$	$\frac{5}{8}$	$\frac{5}{16}$	$\frac{1}{8}$	0	0	$\frac{1}{8}$	$\frac{5}{16}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{8}$
		F	$\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{16}$	$\frac{2}{16}$	$\frac{2}{16}$	$\frac{2}{16}$	$\frac{2}{16}$	$\frac{2}{16}$	$\frac{2}{16}$	$\frac{2}{16}$	$\frac{2}{16}$	$\frac{2}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{11}{16}$	$\frac{3}{8}$	$\frac{1}{8}$	0	0	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{7}{16}$	$\frac{11}{16}$	$\frac{1}{2}$	$\frac{1}{16}$
CROSS SLOPE ADJUSTMENTS (INCHES)		A, E, F	$\frac{9}{16}$	$\frac{9}{16}$	$\frac{2}{16}$	$\frac{2}{16}$	$\frac{2}{16}$	$\frac{2}{16}$	$\frac{2}{16}$	$\frac{2}{16}$	$\frac{2}{16}$	$\frac{2}{16}$	$\frac{2}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{9}{16}$	$\frac{7}{16}$	$\frac{3}{16}$	0	0	$\frac{1}{16}$	$\frac{3}{16}$	$\frac{7}{16}$	$\frac{5}{8}$	$\frac{15}{16}$	$\frac{1}{8}$	$\frac{1}{16}$
		B, C	$\frac{9}{16}$	$\frac{9}{16}$	$\frac{9}{16}$	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		H	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	
ALLOWABLE FIELD HAUNCH IN. (FT.)	MAX	A, E, F	$2 \frac{11}{16}$ (0.225)					$2 \frac{11}{16}$ (0.225)							$2 \frac{11}{16}$ (0.225)										$2 \frac{11}{16}$ (0.225)			
		B, C	$2 \frac{11}{16}$ (0.225)					-							-										-			
		D	-					-							-										-			
		H	$2 \frac{11}{16}$ (0.225)					$2 \frac{11}{16}$ (0.225)							$2 \frac{11}{16}$ (0.225)										$2 \frac{11}{16}$ (0.225)			
	MIN	A, E, F	$\frac{1}{16}$ (0.004)					0 (0)							$\frac{1}{16}$ (0.004)										$-\frac{1}{16}$ (-0.004)			
		B, C	$\frac{1}{16}$ (0.004)					-							-										-			
		D	-					-							-										-			
		H	$\frac{3}{16}$ (0.017)					0 (0)							$\frac{1}{8}$ (0.013)										0 (0)			
ANTICIPATED DEFLECTION DUE TO DECK AND BARRIER (INCHES)	GIRDER LINE	SPAN 4						℄ PIER 4 BRG.																				
		LINE 71	LINE 72	LINE 73	LINE 74	LINE 75	LINE 76	LINE 77																				
	A	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{1}{16}$	$\frac{3}{4}$	$\frac{3}{8}$	0																				
	B	-	-	-	-	-	-	-																				
	C	-	-	-	-	-	-	-																				
	D	-	-	-	-	-	-	-																				
	E	$\frac{1}{2}$	$\frac{7}{16}$	$\frac{5}{16}$	$\frac{1}{8}$	$\frac{13}{16}$	$\frac{7}{16}$	0																				
	F	$\frac{1}{16}$	$\frac{7}{16}$	$\frac{5}{16}$	$\frac{1}{8}$	$\frac{13}{16}$	$\frac{7}{16}$	0																				
	H	$\frac{1}{16}$	$\frac{3}{8}$	$\frac{5}{16}$	$\frac{1}{16}$	$\frac{3}{4}$	$\frac{3}{8}$	0																				
	CROSS SLOPE ADJUSTMENTS (INCHES)	A, E, F	$\frac{7}{16}$	$\frac{7}{16}$	$\frac{7}{16}$	$\frac{7}{16}$	$\frac{7}{16}$	$\frac{7}{16}$	$\frac{7}{16}$																			
B, C		-	-	-	-	-	-	-																				
D		-	-	-	-	-	-	-																				
H		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$																				
ALLOWABLE FIELD HAUNCH IN. (FT.)	MAX	A, E, F	$2 \frac{11}{16}$ (0.225)																									
		B, C	-																									
		D	-																									
		H	$2 \frac{11}{16}$ (0.225)																									
	MIN	A, E, F	$-\frac{1}{16}$ (-0.004)																									
		B, C	-																									
		D	-																									
		H	0 (0)																									



DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

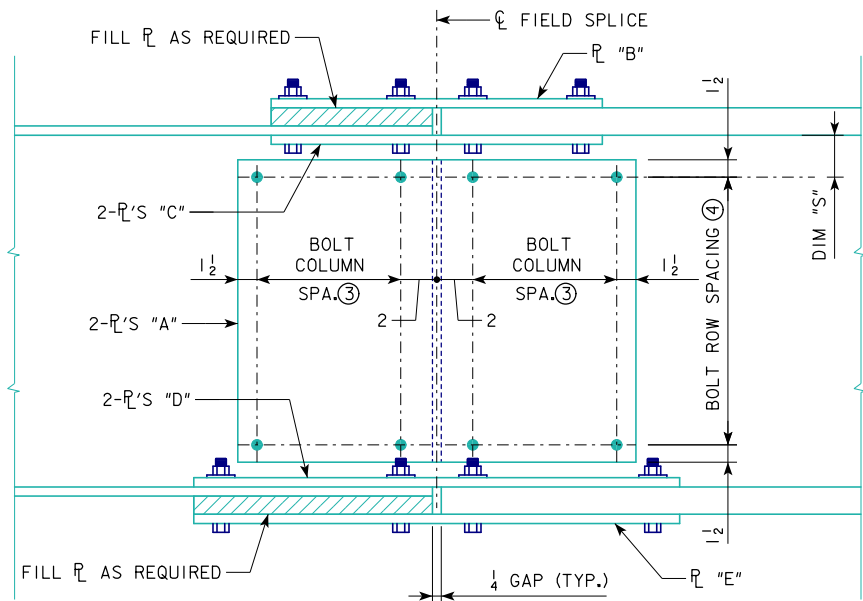
FIELD HAUNCH DATA - UNIT 1

STA. 3546+14.50 (℄ 1-480 RAMP C) NOVEMBER, 2020

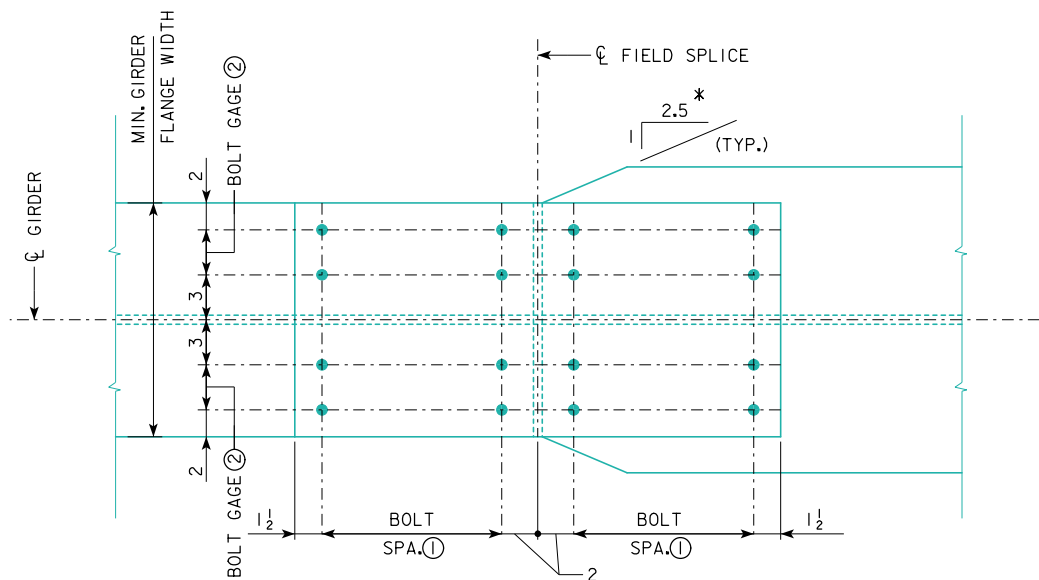
POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 61 OF 121 FILE NO. 30170 DESIGN NO. 1320



FIELD SPLICE ELEVATION



FLANGE SPLICE 18" TO 26" MIN. GIRDER FLANGE WIDTH

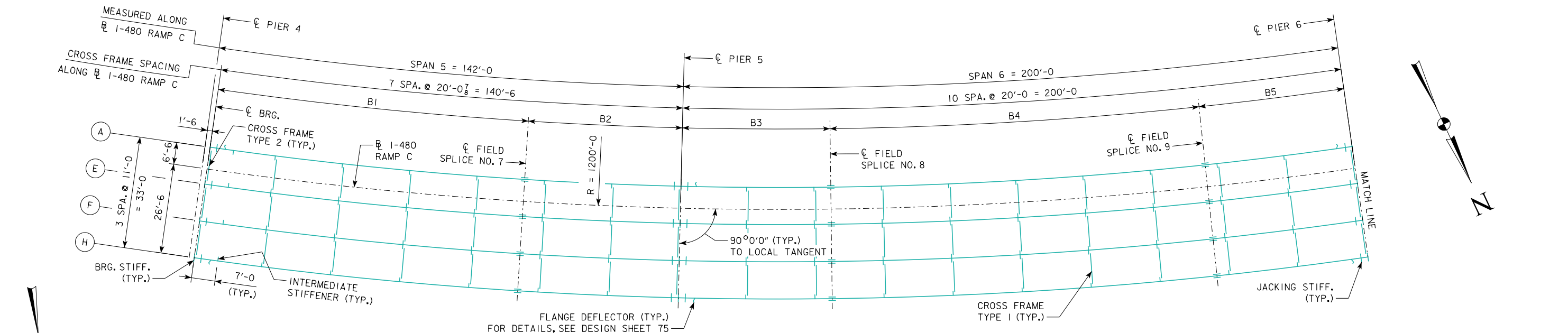
* IF THE DIFFERENCE BETWEEN TOP OR BOTTOM FLANGE WIDTHS ON EITHER SIDE OF THE FIELD SPLICE IS GREATER THAN 2 INCHES, THEN CLIP AT 1:1, OTHERWISE CLIP AT 1:2.5

FIELD SPLICE SCHEDULE (UNIT 1)												
FIELD SPLICE NO.	GIRDER	TOP FLANGE SPLICE										
		MIN. GIRDER FLANGE WIDTH	PLATE "B"			PLATE "C" (2 REQ'D)			BOLT SPACING			BOLT GAGE
									①			
			+ (in.)	w (in.)	L	+ (in.)	w (in.)	L	# OF SPC.	SPC. (in.)	L (in.)	
1 - 3	A, B, C, E, F	18	$\frac{7}{16}$	18	2'-7	$\frac{1}{2}$	8	2'-7	4	3	12	4
4 - 5	A, E, F	20	$\frac{1}{2}$	20	3'-1	$\frac{9}{16}$	9	3'-1	5	3	15	5
6	A, E, F	18	$\frac{7}{16}$	18	2'-7	$\frac{1}{2}$	8	2'-7	4	3	12	4
1	D	18	$\frac{7}{16}$	18	2'-7	$\frac{1}{2}$	8	2'-7	4	3	12	4
1 - 5	H	20	$\frac{5}{8}$	20	3'-7	$\frac{11}{16}$	9	3'-7	6	3	18	5
6	H	20	$\frac{1}{2}$	20	3'-1	$\frac{9}{16}$	9	3'-1	5	3	15	5

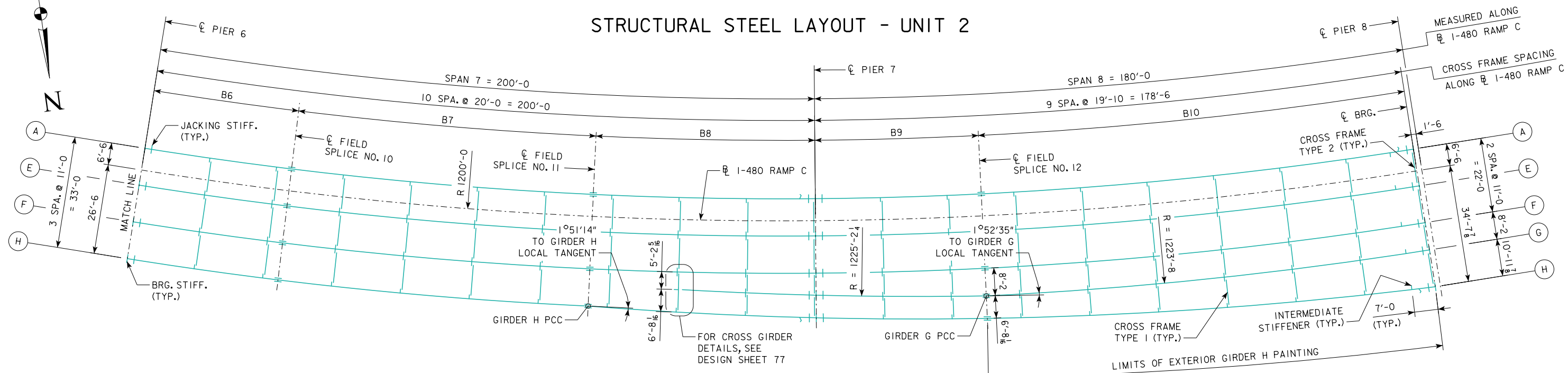
FIELD SPLICE SCHEDULE (UNIT 1)											
FIELD SPLICE NO.	GIRDER	WEB PLATE SPLICE									DIM. S
		WEB PLATE "A" (2 REQ'D)			BOLT COLUMN SPACING ③			BOLT ROW SPACING ④			
		† (in.)	w (in.)	L	# OF SPC.	SPC. (in.)	L (in.)	# OF SPC.	SPC. (in.)	L	
1	A, B, C, D, E, F, H	$\frac{7}{16}$	19	5'-11	2	3	6	17	4	5'-8	3 $\frac{1}{2}$
2 - 3	A, B, C, E, F, H	$\frac{7}{16}$	19	5'-11	2	3	6	17	4	5'-8	3 $\frac{1}{2}$
4 - 6	A, E, F, H	$\frac{7}{16}$	19	5'-11	2	3	6	17	4	5'-8	3 $\frac{1}{2}$

FIELD SPLICE SCHEDULE (UNIT 1)												
FIELD SPLICE NO.	GIRDER	BOTTOM FLANGE SPLICE										
		MIN. GIRDER FLANGE WIDTH	PLATE "D" (2 REQ'D)			PLATE "E"			BOLT SPACING			BOLT GAGE
									①			
			+ (in.)	w (in.)	L	+ (in.)	w (in.)	L	# OF SPC.	SPC. (in.)	L (in.)	
1 - 2	A, B, C, E, F	20	11 16	9	3'-1	5 8	20	3'-1	5	3	15	5
3	A, B, C, E, F	20	11 16	9	3'-7	5 8	20	3'-7	6	3	18	5
4	A, E, F	20	3 4	9	3'-7	5 8	20	3'-7	6	3	18	5
5 - 6	A, E, F	20	11 16	9	3'-1	5 8	20	3'-1	5	3	15	5
1	D	20	11 16	9	3'-1	5 8	20	3'-1	5	3	15	5
1 - 3, 5 - 6	H	26	3 4	12	3'-1	11 16	26	3'-1	5	3	15	2 @ 4
4	H	26	7 8	12	3'-1	3 4	26	3'-1	5	3	15	2 @ 4





STRUCTURAL STEEL LAYOUT - UNIT 2



STRUCTURAL STEEL LAYOUT - UNIT 2

GIRDER DATA - UNIT 2

GIRDER	SPAN 5			SPAN 6			SPAN LENGTH
	B1	B2		B3	B4	B5	
A	93'-5 ³ / ₄	46'-3	139'-8 ³ / ₄	44'-3 ³ / ₄	110'-10 ³ / ₄	43'-9 ¹ / ₈	198'-11
E	94'-4 ⁵ / ₁₆	46'-8 ¹ / ₁₆	141'-0 ³ / ₈	44'-8	111'-11	44'-2	200'-9
F	95'-2 ¹³ / ₁₆	47'-1 ³ / ₁₆	142'-4	45'-0 ⁷ / ₈	112'-11 ⁵ / ₁₆	44'-6 ³ / ₁₆	202'-7
G	---	---	---	---	---	---	---
H	96'-1 ⁵ / ₁₆	47'-6 ⁵ / ₁₆	143'-7 ⁵ / ₈	45'-5 ³ / ₈	113'-11 ¹ / ₂	44'-11 ¹¹ / ₁₆	204'-5
GIRDER	SPAN 7			SPAN 8			SPAN LENGTH
	B6	B7	B8	B9	B10		
A	43'-9 ¹ / ₈	89'-6 ¹ / ₄	65'-7 ⁵ / ₈	198'-11	49'-0 ³ / ₄	128'-5 ¹ / ₂	177'-6 ⁵ / ₁₆
E	44'-2	90'-4 ¹ / ₈	66'-2 ⁷ / ₈	200'-9	49'-6 ¹ / ₄	129'-7 ⁷ / ₈	179'-2 ¹ / ₈
F	44'-6 ¹³ / ₁₆	91'-2	66'-10 ³ / ₈	202'-7	49'-11 ⁵ / ₁₆	130'-10 ⁴ / ₁₆	180'-9 ⁷ / ₈
G	---	---	40'-8 ¹³ / ₁₆ **	---	50'-3 ⁹ / ₁₆	131'-8 ⁵ / ₁₆	182'-0 ² / ₈
H	44'-11 ⁵ / ₈	91'-11 ⁵ / ₁₆	67'-6 ⁹ / ₁₆	204'-6 ¹ / ₈	50'-6 ³ / ₈	132'-9 ³ / ₈	183'-4 ⁴ / ₁₆

GIRDER RADIUS DATA

GIRDER	CL BRG. PIER 4 TO CL F.S. NO. 11	CL F.S. NO. 11 TO CL BRG. PIER 8
A	1193'-6	1193'-6
E	1204'-6	1204'-6
F	1215'-6	1215'-6
G	---	*
H	1226'-6	1231'-10 ¹ / ₄

* SEE STRUCTURAL STEEL LAYOUT.

** FROM BEGINNING OF GIRDER TO PIER.

NOTE:

CROSS FRAMES RADIAL TO CL 1-480 RAMP C.
ALL CROSS FRAMES SHALL BE TYPE 1 UNLESS NOTED OTHERWISE.
DIMENSIONS SHOWN ARE HORIZONTAL WITH NO ALLOWANCE FOR GRADE.
CHARPY V-NOTCH TOUGHNESS REQUIREMENTS IN ACCORDANCE WITH ARTICLE 4152.02 OF THE STANDARD SPECIFICATIONS SHALL APPLY TO ALL CROSS FRAMES AND CONNECTION STIFFENERS AT CROSS FRAMES.
SEE DESIGN SHEET 47 FOR PAINTING LIMITS.

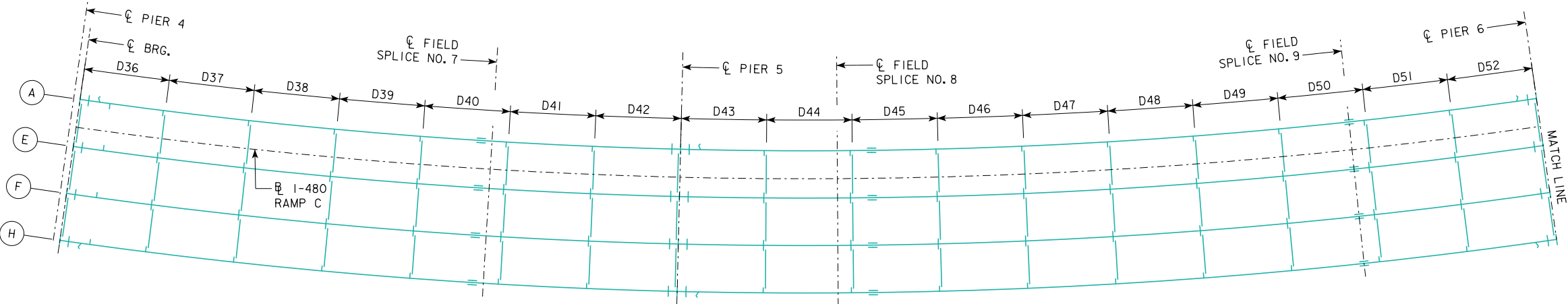
DESIGN FOR 0° SKEW
1419'-0 x VARIES CONTINUOUS WELDED GIRDER BRIDGE
UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0
FRAMING PLAN - UNIT 2
STA. 3546+14.50 (CL 1-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 63 OF 121 FILE NO. 30170 DESIGN NO. 1320



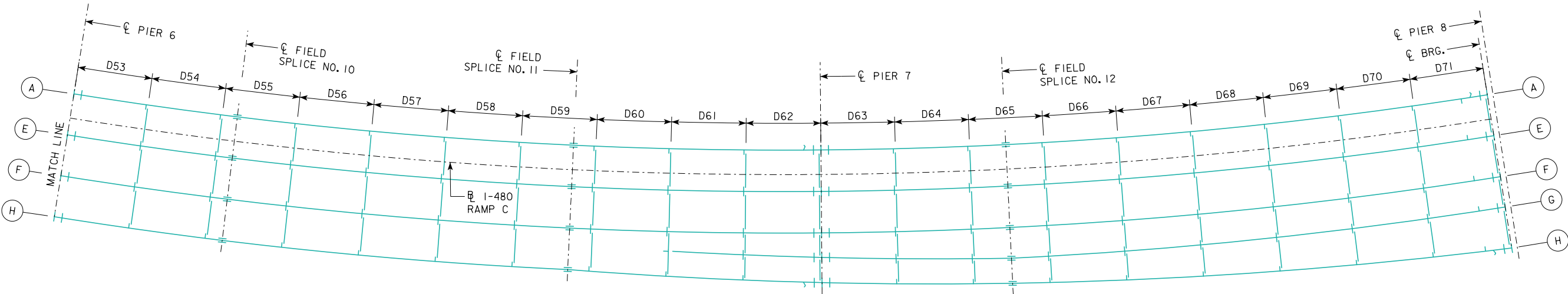
BEARING STIFFENER
ORIENTATION TABLE

LOCATION	GIRDER	Δ
PIER 4	A	90°4'19"
	E	90°4'17"
	F	90°4'15"
	H	90°4'12"
PIER 5	A-H	90°0'0"
PIER 6	A-H	90°0'0"
PIER 7	A-F	90°0'0"
	G	88°7'36"
PIER 8	H	88°8'13"
	A	89°55'40"
	E	89°55'42"
	F	89°55'45"
	G	89°55'47"
	H	88°4'14"

Δ MEASURED WITH RESPECT TO
LOCAL TANGENT AND ℄ BRG.



STRUCTURAL STEEL LAYOUT - UNIT 2



STRUCTURAL STEEL LAYOUT - UNIT 2

CROSS FRAME SPACING DATA

CROSS FRAME SPACING DATA																			
SPCG. ALONG GIRDER	SPAN NO. 5							SPAN NO. 6											
	D36	D37	D38	D39	D40	D41	D42	D43	D44	D45	D46	D47	D48	D49	D50	D51	D52		
A	19'-11 ⁷ ₁₆	19'-11 ⁹ ₁₆	19'-11 ⁹ ₁₆	19'-11 ⁹ ₁₆	19'-11 ⁹ ₁₆	19'-11 ⁹ ₁₆	19'-11 ⁹ ₁₆	19'-10 ¹¹ ₁₆	19'-10 ¹¹ ₁₆	19'-10 ¹¹ ₁₆	19'-10 ¹¹ ₁₆	19'-10 ¹¹ ₁₆	19'-10 ¹¹ ₁₆	19'-10 ¹¹ ₁₆	19'-10 ¹¹ ₁₆	19'-10 ¹¹ ₁₆	19'-10 ¹¹ ₁₆		
E	20'-1 ¹³ ₁₆	20'-1 ³ ₄	20'-1 ³ ₄	20'-1 ³ ₄	20'-1 ³ ₄	20'-1 ³ ₄	20'-1 ³ ₄	20'-0 ⁷ ₈	20'-0 ⁷ ₈	20'-0 ⁷ ₈	20'-0 ⁷ ₈	20'-0 ⁷ ₈	20'-0 ⁷ ₈	20'-0 ⁷ ₈	20'-0 ⁷ ₈	20'-0 ⁷ ₈	20'-0 ⁷ ₈		
F	20'-4 ³ ₁₆	20'-3 ¹⁵ ₁₆	20'-3 ¹⁵ ₁₆	20'-3 ¹⁵ ₁₆	20'-3 ¹⁵ ₁₆	20'-3 ¹⁵ ₁₆	20'-3 ¹⁵ ₁₆	20'-3 ¹ ₈	20'-3 ¹ ₈	20'-3 ¹ ₈	20'-3 ¹ ₈	20'-3 ¹ ₈	20'-3 ¹ ₈	20'-3 ¹ ₈	20'-3 ¹ ₈	20'-3 ¹ ₈	20'-3 ¹ ₈		
G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
H	20'-6 ⁹ ₁₆	20'-6 ³ ₁₆	20'-6 ³ ₁₆	20'-6 ³ ₁₆	20'-6 ³ ₁₆	20'-6 ³ ₁₆	20'-6 ³ ₁₆	20'-5 ⁵ ₁₆	20'-5 ⁵ ₁₆	20'-5 ⁵ ₁₆	20'-5 ⁵ ₁₆	20'-5 ⁵ ₁₆	20'-5 ⁵ ₁₆	20'-5 ⁵ ₁₆	20'-5 ⁵ ₁₆	20'-5 ⁵ ₁₆	20'-5 ⁵ ₁₆		
SPCG. ALONG GIRDER	SPAN NO. 7										SPAN NO. 8								
	D53	D54	D55	D56	D57	D58	D59	D60	D61	D62	D63	D64	D65	D66	D67	D68	D69	D70	D71
A	19'-10 ¹¹ ₁₆	19'-10 ¹¹ ₁₆	19'-10 ¹¹ ₁₆	19'-10 ¹¹ ₁₆	19'-10 ¹¹ ₁₆	19'-10 ¹¹ ₁₆	19'-10 ¹¹ ₁₆	19'-10 ¹¹ ₁₆	19'-10 ¹¹ ₁₆	19'-10 ¹¹ ₁₆	19'-8 ¹¹ ₁₆	19'-8 ¹¹ ₁₆	19'-8 ¹¹ ₁₆	19'-8 ¹¹ ₁₆	19'-8 ¹¹ ₁₆	19'-8 ¹¹ ₁₆	19'-8 ¹¹ ₁₆	19'-8 ¹¹ ₁₆	19'-8 ⁵ ₈
E	20'-0 ⁷ ₈	20'-0 ⁷ ₈	20'-0 ⁷ ₈	20'-0 ⁷ ₈	20'-0 ⁷ ₈	20'-0 ⁷ ₈	20'-0 ⁷ ₈	20'-0 ⁷ ₈	20'-0 ⁷ ₈	20'-0 ⁷ ₈	19'-10 ⁷ ₈	19'-10 ⁷ ₈	19'-10 ⁷ ₈	19'-10 ⁷ ₈	19'-10 ⁷ ₈	19'-10 ⁷ ₈	19'-10 ⁷ ₈	19'-10 ⁷ ₈	19'-10 ¹⁵ ₁₆
F	20'-3 ¹ ₈	20'-3 ¹ ₈	20'-3 ¹ ₈	20'-3 ¹ ₈	20'-3 ¹ ₈	20'-3 ¹ ₈	20'-3 ¹ ₈	20'-3 ¹ ₈	20'-3 ¹ ₈	20'-3 ¹ ₈	20'-1 ¹ ₁₆	20'-1 ¹ ₁₆	20'-1 ¹ ₁₆	20'-1 ¹ ₁₆	20'-1 ¹ ₁₆	20'-1 ¹ ₁₆	20'-1 ¹ ₁₆	20'-1 ¹ ₁₆	20'-1 ⁵ ₁₆
G	-	-	-	-	-	-	-	-	-	20'-4 ⁵ ₁₆	20'-4 ⁷ ₁₆	20'-2 ⁹ ₁₆	20'-2 ¹¹ ₁₆	20'-2 ¹¹ ₁₆	20'-2 ¹¹ ₁₆	20'-2 ¹¹ ₁₆	20'-2 ¹¹ ₁₆	20'-2 ¹¹ ₁₆	20'-3 ¹ ₁₆
H	20'-5 ⁵ ₁₆	20'-5 ⁵ ₁₆	20'-5 ⁵ ₁₆	20'-5 ⁵ ₁₆	20'-5 ⁵ ₁₆	20'-5 ⁵ ₁₆	20'-5 ³ ₈	20'-5 ⁹ ₁₆	20'-5 ¹¹ ₁₆	20'-5 ¹³ ₁₆	20'-3 ⁷ ₈	20'-4	20'-4 ¹ ₈	20'-4 ¹ ₈	20'-4 ⁷ ₁₆	20'-4 ⁹ ₁₆	20'-4 ¹¹ ₁₆	20'-4 ¹³ ₁₆	20'-5 ⁷ ₁₆

NOTE:
DIMENSIONS SHOWN ARE HORIZONTAL WITH NO ALLOWANCE FOR GRADE.

DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

FRAMING PLAN - UNIT 2

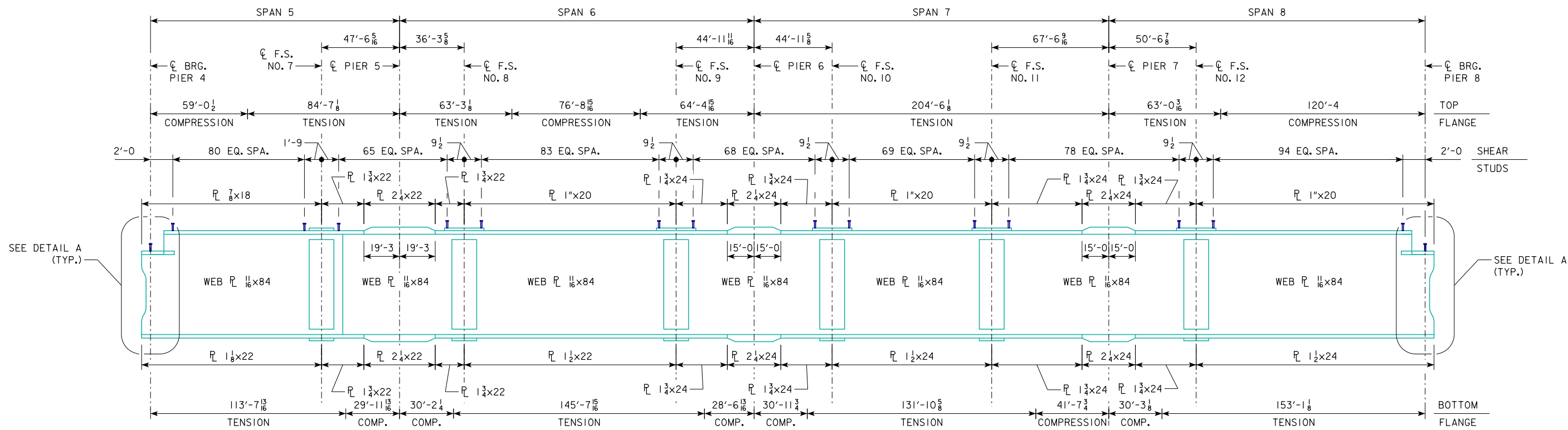
STA. 3546+14.50 (℄ 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 64 OF 121 FILE NO. 30170 DESIGN NO. 1320





GIRDER H ELEVATION

NOTE:
FOR DETAIL A, SEE DESIGN SHEET 53.

DESIGN FOR 0° SKEW

1419'-0" x VARIES CONTINUOUS WELDED GIRDER BRIDGE

UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"

GIRDER ELEVATION - UNIT 2

STA. 3546+14.50 (R 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 66 OF 121 FILE NO. 30170 DESIGN NO. 1320



MOMENT TABLE (UNIT 2) (FT-KIPS)																				
LOCATION	POSITIVE MOMENT SPAN 5					NEGATIVE MOMENT PIER 5					POSITIVE MOMENT SPAN 6					NEGATIVE MOMENT PIER 6				
	GIRD. A	GIRD. E	GIRD. F	GIRD. G	GIRD. H	GIRD. A	GIRD. E	GIRD. F	GIRD. G	GIRD. H	GIRD. A	GIRD. E	GIRD. F	GIRD. G	GIRD. H	GIRD. A	GIRD. E	GIRD. F	GIRD. G	GIRD. H
DC1	1369	1383	1387	-	1536	-4600	-4944	-5210	-	-5654	1779	1962	2143	-	2608	-5080	-5172	-5205	-	-5402
DC2	305	338	349	-	363	-805	-842	-878	-	-970	431	501	540	-	604	-956	-947	-961	-	-1042
DW	193	212	218	-	226	-521	-546	-571	-	-632	282	331	358	-	402	-597	-575	-575	-	-621
LL + IMPACT (TRUCK + LANE)	3088	2636	2847	-	3795	-4018	-3254	-3436	-	-4691	3561	3202	3429	-	4460	-4644	-3631	-3871	-	-5394
LL + IMPACT (TANDEM + LANE)	2615	2267	2445	-	3214	-2898	-2385	-2545	-	-3440	3031	2743	2957	-	3796	-3465	-2691	-2897	-	-4144
TOTAL	4955	4569	4801	-	5920	-9944	-9586	-10095	-	-11947	6053	5996	6470	-	8074	-11277	-10325	-10612	-	-12459

MOMENT TABLE (UNIT 2) (FT-KIPS)															
LOCATION	POSITIVE MOMENT SPAN 7					NEGATIVE MOMENT PIER 7					POSITIVE MOMENT SPAN 8				
	GIRD. A	GIRD. E	GIRD. F	GIRD. G	GIRD. H	GIRD. A	GIRD. E	GIRD. F	GIRD. G	GIRD. H	GIRD. A	GIRD. E	GIRD. F	GIRD. G	GIRD. H
DC1	1716	1528	1351	-	1316	-5672	-5536	-5284	-5528	-5341	2601	2841	3051	3100	3753
DC2	405	417	408	-	414	-844	-847	-858	-902	-925	401	505	555	547	668
DW	236	230	213	-	206	-659	-665	-680	-731	-742	394	499	552	545	667
LL + IMPACT (TRUCK + LANE)	3629	3203	3364	-	4354	-4587	-3457	-3069	-3329	-4023	4048	3422	2989	2911	4097
LL + IMPACT (TANDEM + LANE)	3086	2740	2899	-	3702	-3268	-2521	-2300	-2462	-2936	3430	2918	2583	2466	3483
TOTAL	5986	5378	5336	-	6290	-11762	-10505	-9891	-10490	-11031	7444	7267	7147	7103	9185

REACTION TABLE (UNIT 2) (KIPS)																									
LOCATION	REACTION PIER 4 - FRONT BEARING					REACTION PIER 5					REACTION PIER 6					REACTION PIER 7					REACTION PIER 8 - BACK BEARING				
	GIRD. A	GIRD. E	GIRD. F	GIRD. G	GIRD. H	GIRD. A	GIRD. E	GIRD. F	GIRD. G	GIRD. H	GIRD. A	GIRD. E	GIRD. F	GIRD. G	GIRD. H	GIRD. A	GIRD. E	GIRD. F	GIRD. G	GIRD. H	GIRD. A	GIRD. E	GIRD. F	GIRD. G	GIRD. H
DC1	60	65	66	-	65	282	285	299	-	278	300	292	297	-	274	325	295	288	296	226	81	91	93	92	106
DC2	13	14	14	-	15	54	53	55	-	55	58	56	56	-	56	51	47	49	51	45	13	15	16	15	19
DW	8	9	9	-	9	35	34	35	-	35	37	35	35	-	34	41	38	39	43	36	12	15	15	15	19
LL + IMPACT (TRUCK + LANE)	116	133	135	-	128	258	238	248	-	253	277	245	260	-	274	275	242	215	181	188	125	138	119	97	124
LL + IMPACT (TANDEM + LANE)	97	117	119	-	107	188	192	200	-	183	204	201	210	-	203	203	197	171	136	139	105	122	106	86	104

NOTES:
MOMENTS AND REACTIONS ARE UNFACTORED.
DC1 COMPRISES ALL NON-COMPOSITE DEAD LOADS DUE TO GIRDER AND DECK DEAD WEIGHT.
DC2 COMPRISES COMPOSITE DEAD LOAD DUE TO BARRIER RAILS.
DW COMPRISES COMPOSITE DEAD LOAD DUE TO FUTURE WEARING SURFACE.



DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

MOMENT & REACTION TABLE - UNIT 2

STA. 3546+14.50 (@ 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 67 OF 121 FILE NO. 30170 DESIGN NO. 1320

DEFLECTION ORDINATES DUE TO WEIGHT OF DECK AND BARRIERS (UNIT 2) (DOWNWARD DEFLECTIONS ARE POSITIVE) (INCHES)																															
LOCATION	℄ PIER 4 BRG.	SPAN 5										℄ F.S. NO. 7	SPAN 5					℄ PIER 5	SPAN 6					℄ F.S. NO. 8	SPAN 6						
	LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6	LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12	LINE 13	LINE 14	LINE 15	LINE 16	LINE 17	LINE 18	LINE 19	LINE 20	LINE 21	LINE 22	LINE 23	LINE 24	LINE 25	LINE 26	LINE 27				
GIRDER LINE A	0.00	0.30	0.57	0.80	0.97	1.07	1.10	1.06	0.95	0.79	0.60	0.40	0.22	0.08	0.00	0.00	0.12	0.31	0.55	0.82	1.11	1.42	1.70	1.94	2.13	2.24	2.28				
GIRDER LINE E	0.00	0.32	0.62	0.86	1.04	1.15	1.18	1.13	1.01	0.83	0.62	0.41	0.22	0.07	-0.01	0.00	0.14	0.35	0.62	0.94	1.26	1.61	1.93	2.21	2.42	2.55	2.60				
GIRDER LINE F	0.00	0.34	0.65	0.90	1.09	1.20	1.22	1.17	1.04	0.85	0.62	0.40	0.20	0.06	-0.02	0.00	0.16	0.39	0.70	1.04	1.40	1.79	2.14	2.45	2.68	2.84	2.90				
GIRDER LINE G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
GIRDER LINE H	0.00	0.35	0.67	0.93	1.12	1.23	1.25	1.19	1.04	0.84	0.60	0.37	0.17	0.03	-0.03	0.00	0.17	0.43	0.76	1.13	1.53	1.95	2.33	2.67	2.93	3.10	3.18				
LOCATION	SPAN 6					℄ F.S. NO. 9	SPAN 6					℄ PIER 6	SPAN 7					℄ F.S. NO. 10	SPAN 7										℄ F.S. NO. 11	SPAN 7	
	LINE 28	LINE 29	LINE 30	LINE 31	LINE 32	LINE 33	LINE 34	LINE 35	LINE 36	LINE 37	LINE 38	LINE 39	LINE 40	LINE 41	LINE 42	LINE 43	LINE 44	LINE 45	LINE 46	LINE 47	LINE 48	LINE 49	LINE 50	LINE 51	LINE 52	LINE 53	LINE 54				
GIRDER LINE A	2.24	2.13	1.95	1.71	1.42	1.10	0.80	0.53	0.29	0.11	0.00	0.01	0.09	0.24	0.42	0.63	0.85	1.06	1.25	1.39	1.49	1.53	1.51	1.43	1.30	1.12	0.90				
GIRDER LINE E	2.57	2.45	2.25	1.98	1.66	1.30	0.96	0.64	0.36	0.14	0.00	-0.02	0.03	0.15	0.31	0.50	0.70	0.90	1.07	1.20	1.29	1.31	1.28	1.20	1.06	0.88	0.67				
GIRDER LINE F	2.87	2.74	2.52	2.23	1.88	1.49	1.11	0.75	0.44	0.18	0.00	-0.06	-0.03	0.05	0.19	0.35	0.53	0.71	0.87	0.98	1.05	1.07	1.03	0.93	0.79	0.60	0.39				
GIRDER LINE G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
GIRDER LINE H	3.14	3.01	2.78	2.47	2.09	1.66	1.25	0.86	0.50	0.21	0.00	-0.09	-0.11	-0.05	0.05	0.19	0.35	0.50	0.64	0.74	0.80	0.80	0.75	0.64	0.50	0.32	0.12				
LOCATION	SPAN 7					℄ PIER 7	SPAN 8					℄ F.S. NO. 12	SPAN 8												℄ PIER 8 BRG.						
	LINE 55	LINE 56	LINE 57	LINE 58	LINE 59	LINE 60	LINE 61	LINE 62	LINE 63	LINE 64	LINE 65	LINE 66	LINE 67	LINE 68	LINE 69	LINE 70	LINE 71	LINE 72	LINE 73	LINE 74	LINE 75	LINE 76	LINE 77	LINE 78	LINE 79	LINE 80					
GIRDER LINE A	0.67	0.44	0.23	0.08	-0.01	0.00	0.13	0.32	0.57	0.87	1.19	1.52	1.88	2.20	2.47	2.67	2.79	2.82	2.75	2.59	2.33	1.99	1.57	1.09	0.56	0.00					
GIRDER LINE E	0.45	0.25	0.08	-0.03	-0.06	0.00	0.17	0.41	0.70	1.04	1.40	1.76	2.15	2.51	2.80	3.01	3.14	3.16	3.08	2.90	2.61	2.22	1.75	1.21	0.62	0.00					
GIRDER LINE F	0.19	0.02	-0.09	-0.14	-0.11	0.00	0.21	0.49	0.82	1.19	1.58	1.98	2.40	2.78	3.09	3.32	3.45	3.47	3.37	3.17	2.85	2.42	1.91	1.32	0.68	0.00					
GIRDER LINE G	-0.05	-0.12	-0.16	-0.17	-0.12	0.00	0.23	0.54	0.89	1.29	1.71	2.13	2.58	2.98	3.31	3.54	3.67	3.69	3.58	3.36	3.02	2.57	2.02	1.40	0.71	0.00					
GIRDER LINE H	-0.06	-0.20	-0.27	-0.27	-0.18	0.00	0.26	0.58	0.96	1.38	1.82	2.26	2.74	3.16	3.51	3.76	3.90	3.92	3.81	3.57	3.21	2.73	2.15	1.49	0.76	0.00					



DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

CAMBER & BLOCKING - UNIT 2

STA. 3546+14.50 (℄ 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 68 OF 121 FILE NO. 30170 DESIGN NO. 1320

DEFLECTION ORDINATES DUE TO WEIGHT OF STRUCTURAL STEEL (UNIT 2) (DOWNWARD DEFLECTIONS ARE POSITIVE) (INCHES)																															
LOCATION	℄ PIER 4 BRG.	SPAN 5										℄ F.S. NO. 7	SPAN 5					℄ PIER 5	SPAN 6					℄ F.S. NO. 8	SPAN 6						
	LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6	LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12	LINE 13	LINE 14	LINE 15	LINE 16	LINE 17	LINE 18	LINE 19	LINE 20	LINE 21	LINE 22	LINE 23	LINE 24	LINE 25	LINE 26	LINE 27				
GIRDER LINE A	0.00	0.08	0.15	0.20	0.25	0.27	0.27	0.26	0.23	0.19	0.14	0.09	0.05	0.01	0.00	0.00	0.04	0.10	0.18	0.27	0.35	0.44	0.53	0.59	0.64	0.67	0.67				
GIRDER LINE E	0.00	0.08	0.15	0.20	0.24	0.27	0.27	0.25	0.22	0.17	0.12	0.07	0.03	0.00	-0.01	0.00	0.05	0.13	0.22	0.32	0.42	0.53	0.63	0.71	0.77	0.80	0.81				
GIRDER LINE F	0.00	0.08	0.15	0.20	0.24	0.26	0.26	0.24	0.20	0.15	0.10	0.05	0.01	-0.01	-0.02	0.00	0.06	0.15	0.26	0.37	0.49	0.62	0.73	0.82	0.89	0.93	0.95				
GIRDER LINE G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
GIRDER LINE H	0.00	0.08	0.14	0.20	0.24	0.25	0.25	0.22	0.18	0.13	0.08	0.03	-0.01	-0.03	-0.03	0.00	0.08	0.18	0.30	0.43	0.57	0.71	0.83	0.94	1.02	1.07	1.08				
LOCATION	SPAN 6					℄ F.S. NO. 9	SPAN 6					℄ PIER 6	SPAN 7					℄ F.S. NO. 10	SPAN 7										℄ F.S. NO. 11	SPAN 7	
	LINE 28	LINE 29	LINE 30	LINE 31	LINE 32	LINE 33	LINE 34	LINE 35	LINE 36	LINE 37	LINE 38	LINE 39	LINE 40	LINE 41	LINE 42	LINE 43	LINE 44	LINE 45	LINE 46	LINE 47	LINE 48	LINE 49	LINE 50	LINE 51	LINE 52	LINE 53	LINE 54				
GIRDER LINE A	0.66	0.62	0.56	0.48	0.40	0.31	0.22	0.14	0.08	0.03	0.00	0.01	0.05	0.10	0.17	0.24	0.32	0.39	0.45	0.50	0.53	0.54	0.53	0.51	0.46	0.40	0.33				
GIRDER LINE E	0.79	0.75	0.68	0.60	0.50	0.39	0.29	0.19	0.11	0.04	0.00	0.00	0.02	0.06	0.12	0.18	0.24	0.30	0.36	0.40	0.42	0.42	0.41	0.38	0.34	0.28	0.21				
GIRDER LINE F	0.93	0.88	0.81	0.71	0.60	0.47	0.36	0.24	0.14	0.06	0.00	-0.02	-0.01	0.02	0.06	0.11	0.16	0.22	0.26	0.29	0.31	0.30	0.29	0.25	0.21	0.15	0.09				
GIRDER LINE G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
GIRDER LINE H	1.07	1.02	0.93	0.83	0.70	0.56	0.42	0.29	0.18	0.08	0.00	-0.03	-0.04	-0.02	0.00	0.04	0.09	0.13	0.16	0.18	0.19	0.18	0.16	0.13	0.08	0.03	-0.03				
LOCATION	SPAN 7					℄ PIER 7	SPAN 8					℄ F.S. NO. 12	SPAN 8												℄ PIER 8 BRG.						
	LINE 55	LINE 56	LINE 57	LINE 58	LINE 59	LINE 60	LINE 61	LINE 62	LINE 63	LINE 64	LINE 65	LINE 66	LINE 67	LINE 68	LINE 69	LINE 70	LINE 71	LINE 72	LINE 73	LINE 74	LINE 75	LINE 76	LINE 77	LINE 78	LINE 79	LINE 80					
GIRDER LINE A	0.25	0.17	0.10	0.04	0.01	0.00	0.04	0.10	0.17	0.27	0.37	0.47	0.58	0.68	0.76	0.83	0.87	0.88	0.86	0.81	0.73	0.62	0.49	0.34	0.17	0.00					
GIRDER LINE E	0.14	0.08	0.03	-0.01	-0.02	0.00	0.06	0.14	0.24	0.36	0.48	0.60	0.73	0.85	0.95	1.02	1.06	1.07	1.04	0.98	0.88	0.75	0.59	0.41	0.21	0.00					
GIRDER LINE F	0.03	-0.02	-0.05	-0.06	-0.05	0.00	0.08	0.19	0.31	0.45	0.59	0.74	0.89	1.02	1.13	1.21	1.25	1.26	1.22	1.14	1.03	0.87	0.69	0.47	0.24	0.00					
GIRDER LINE G	-0.06	-0.07	-0.08	-0.07	-0.05	0.00	0.10	0.22	0.36	0.51	0.68	0.84	1.01	1.15	1.27	1.36	1.40	1.40	1.36	1.27	1.14	0.97	0.76	0.52	0.27	0.00					
GIRDER LINE H	-0.08	-0.12	-0.13	-0.12	-0.08	0.00	0.11	0.25	0.40	0.57	0.75	0.92	1.11	1.27	1.41	1.50	1.55	1.56	1.51	1.41	1.27	1.08	0.85	0.59	0.30	0.00					



DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

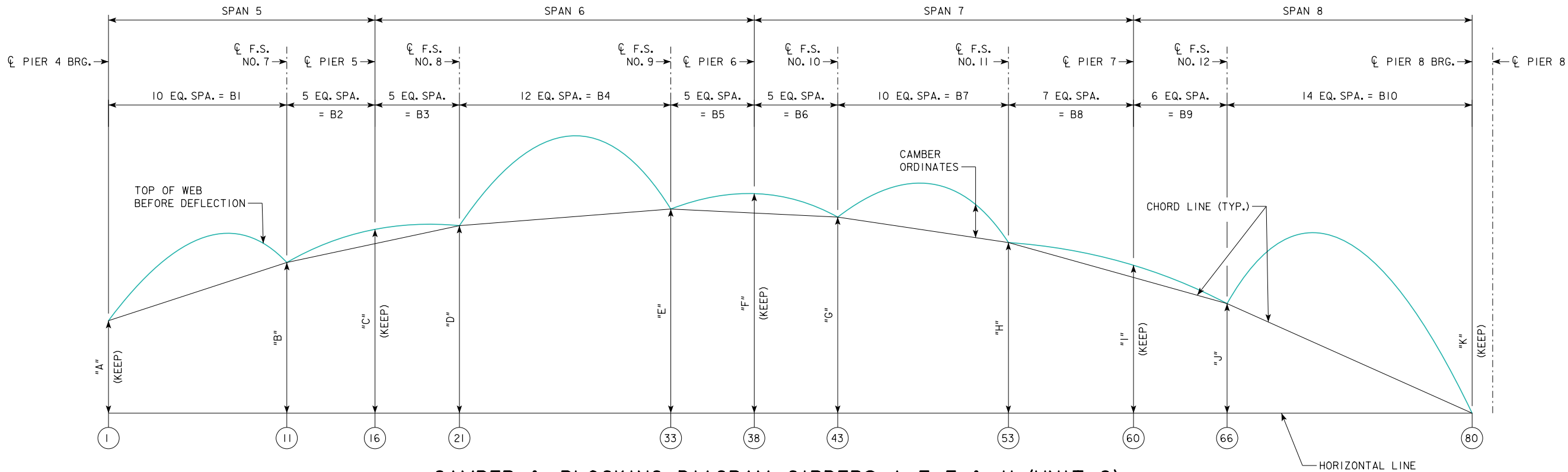
CAMBER & BLOCKING - UNIT 2

STA. 3546+14.50 (℄ 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 69 OF 121 FILE NO. 30170 DESIGN NO. 1320



CAMBER & BLOCKING DIAGRAM GIRDERS A, E, F & H (UNIT 2)

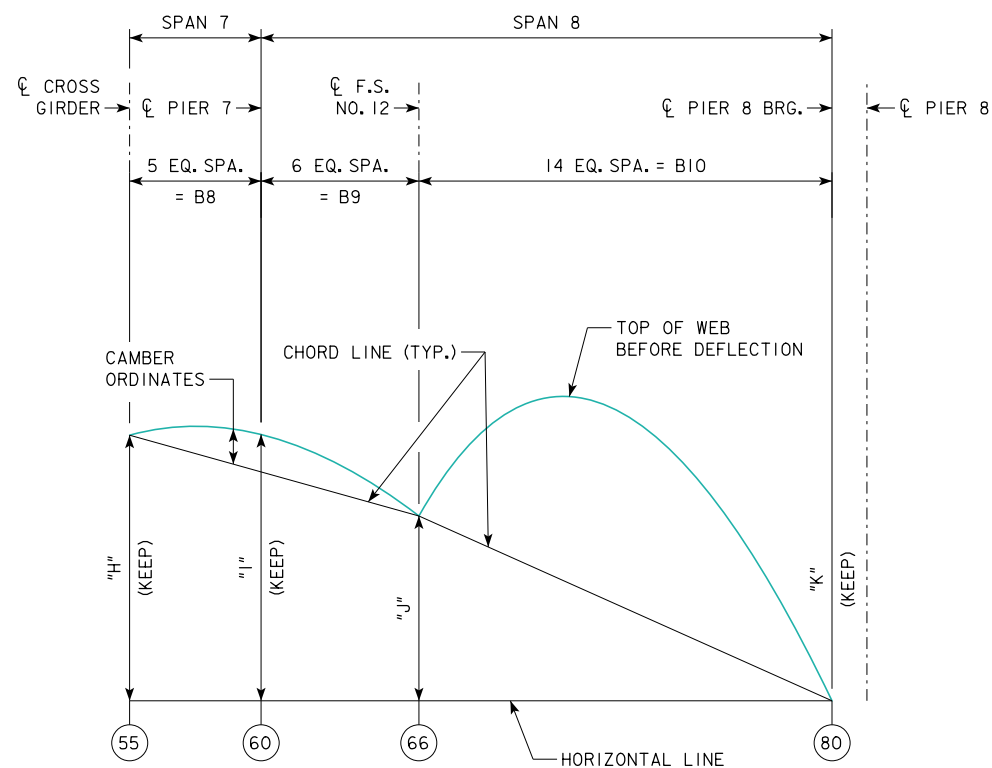
CAMBER ORDINATES (UNIT 2) (INCHES)

LOCATION	CL PIER 4 BRG.	SPAN 5										CL F.S. NO. 7	SPAN 5					CL PIER 5	SPAN 6					CL F.S. NO. 8	SPAN 6						
	LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6	LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12	LINE 13	LINE 14	LINE 15	LINE 16	LINE 17	LINE 18	LINE 19	LINE 20	LINE 21	LINE 22	LINE 23	LINE 24	LINE 25	LINE 26	LINE 27				
GIRDER LINE A	0.00	0.83	1.51	2.01	2.32	2.43	2.33	2.03	1.53	0.84	0.00	0.18	0.28	0.30	0.29	0.26	0.28	0.29	0.27	0.18	0.00	1.03	1.92	2.63	3.15	3.47	3.58				
GIRDER LINE E	0.00	0.85	1.55	2.07	2.40	2.51	2.40	2.09	1.57	0.86	0.00	0.15	0.20	0.21	0.18	0.15	0.18	0.21	0.20	0.14	0.00	1.09	2.02	2.77	3.33	3.67	3.78				
GIRDER LINE F	0.00	0.87	1.59	2.12	2.45	2.56	2.45	2.13	1.60	0.88	0.00	0.11	0.14	0.12	0.08	0.05	0.09	0.13	0.15	0.12	0.00	1.13	2.11	2.90	3.49	3.85	3.97				
GIRDER LINE G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
GIRDER LINE H	0.00	0.88	1.61	2.15	2.49	2.60	2.49	2.16	1.62	0.89	0.00	0.08	0.08	0.05	0.00	-0.03	0.01	0.07	0.10	0.09	0.00	1.18	2.20	3.03	3.65	4.03	4.16				
LOCATION	SPAN 6					CL F.S. NO. 9	SPAN 6					CL PIER 6	SPAN 7					CL F.S. NO. 10	SPAN 7										CL F.S. NO. 11	SPAN 7	
	LINE 28	LINE 29	LINE 30	LINE 31	LINE 32	LINE 33	LINE 34	LINE 35	LINE 36	LINE 37	LINE 38	LINE 39	LINE 40	LINE 41	LINE 42	LINE 43	LINE 44	LINE 45	LINE 46	LINE 47	LINE 48	LINE 49	LINE 50	LINE 51	LINE 52	LINE 53	LINE 54				
GIRDER LINE A	3.47	3.15	2.63	1.92	1.03	0.00	0.13	0.19	0.19	0.17	0.14	0.17	0.19	0.18	0.13	0.00	0.71	1.31	1.76	2.05	2.17	2.10	1.85	1.41	0.79	0.00	0.33				
GIRDER LINE E	3.67	3.34	2.78	2.03	1.09	0.00	0.12	0.17	0.16	0.13	0.10	0.13	0.15	0.15	0.11	0.00	0.70	1.29	1.73	2.02	2.13	2.06	1.81	1.38	0.77	0.00	0.28				
GIRDER LINE F	3.86	3.51	2.93	2.14	1.15	0.00	0.12	0.15	0.14	0.11	0.07	0.10	0.12	0.13	0.10	0.00	0.69	1.26	1.70	1.98	2.09	2.02	1.77	1.35	0.75	0.00	0.23				
GIRDER LINE G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
GIRDER LINE H	4.05	3.68	3.07	2.24	1.20	0.00	0.12	0.15	0.13	0.10	0.06	0.08	0.10	0.12	0.09	0.00	0.67	1.24	1.66	1.94	2.04	1.97	1.73	1.31	0.73	0.00	0.17				
LOCATION	SPAN 7					CL PIER 7	SPAN 8					CL F.S. NO. 12	SPAN 8												CL PIER 8 BRG.						
	LINE 55	LINE 56	LINE 57	LINE 58	LINE 59	LINE 60	LINE 61	LINE 62	LINE 63	LINE 64	LINE 65	LINE 66	LINE 67	LINE 68	LINE 69	LINE 70	LINE 71	LINE 72	LINE 73	LINE 74	LINE 75	LINE 76	LINE 77	LINE 78	LINE 79	LINE 80					
GIRDER LINE A	0.52	0.60	0.60	0.53	0.45	0.37	0.37	0.36	0.35	0.30	0.19	0.00	1.35	2.53	3.54	4.34	4.92	5.27	5.38	5.25	4.89	4.30	3.50	2.50	1.32	0.00					
GIRDER LINE E	0.44	0.50	0.49	0.44	0.37	0.31	0.32	0.33	0.32	0.28	0.18	0.00	1.43	2.69	3.76	4.60	5.22	5.59	5.70	5.57	5.18	4.55	3.70	2.64	1.40	0.00					
GIRDER LINE F	0.35	0.39	0.40	0.37	0.33	0.28	0.30	0.32	0.32	0.29	0.19	0.00	1.51	2.83	3.96	4.85	5.50	5.88	6.00	5.85	5.44	4.78	3.88	2.76	1.46	0.00					
GIRDER LINE G	0.00	0.07	0.09	0.07	0.05	0.03	0.09	0.14	0.19	0.20	0.14	0.00	1.57	2.95	4.11	5.04	5.71	6.10	6.22	6.07	5.64	4.94	4.01	2.85	1.50	0.00					
GIRDER LINE H	0.25	0.26	0.25	0.22	0.19	0.17	0.21	0.24	0.26	0.24	0.17	0.00	1.80	3.41	4.80	5.94	6.82	7.41	7.72	7.73	7.16	6.23	5.02	3.55	1.87	0.00					

NOTES:
FOR CAMBER NOTES, SEE DESIGN SHEET 57.
FOR BLOCKING DATA TABLE, SEE DESIGN SHEET 71.
FOR CAMBER & BLOCKING DIAGRAM OF DISCONTINUOUS GIRDER, SEE DESIGN SHEET 71.
FOR UNIT 2 DEFLECTION ORDINATES, SEE DESIGN SHEETS 68 AND 69.



DESIGN FOR 0° SKEW
1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE
UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0
CAMBER & BLOCKING - UNIT 2
STA. 3546+14.50 (CL 1-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 70 OF 121 FILE NO. 30170 DESIGN NO. 1320



CAMBER & BLOCKING DIAGRAM GIRDERS G (UNIT 2)

BLOCKING DATA (UNIT 2) (FEET)											
LOCATION	CL BRG. PIER 4	CL F.S. NO. 7	CL PIER 5	CL F.S. NO. 8	CL F.S. NO. 9	CL PIER 6	CL F.S. NO. 10	CL F.S. NO. 11	CL PIER 7	CL F.S. NO. 12	CL BRG. PIER 8
	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"I"	"J"	"K"
GIRDER LINE A	4.34	7.08	7.98	8.80	9.58	9.40	9.19	8.01	6.40	5.15	0.00
GIRDER LINE E	4.34	7.08	7.98	8.82	9.61	9.40	9.17	7.98	6.40	5.18	0.00
GIRDER LINE F	4.34	7.08	7.98	8.84	9.63	9.40	9.16	7.94	6.40	5.21	0.00
GIRDER LINE G	-	-	-	-	-	-	-	- *	6.32	5.23	0.00
GIRDER LINE H	4.14	6.87	7.78	8.65	9.45	9.20	8.94	7.71	6.31	5.24	0.00

* GIRDER STOPS BEFORE SPLICE.



DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

CAMBER & BLOCKING - UNIT 2

STA. 3546+14.50 (CL 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 71 OF 121 FILE NO. 30170 DESIGN NO. 1320

TABLE OF GIRDER LINE HAUNCH ELEVATIONS (UNIT 2)									
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LOCATION	℄ PIER 4 BRG.	SPAN 5										℄ F.S. NO. 7	SPAN 5					℄ PIER 5	SPAN 6					℄ F.S. NO. 8	SPAN 6						
	LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6	LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12	LINE 13	LINE 14	LINE 15	LINE 16	LINE 17	LINE 18	LINE 19	LINE 20	LINE 21	LINE 22	LINE 23	LINE 24	LINE 25	LINE 26	LINE 27				
GIRDER LINE A	1025.45	1025.78	1026.11	1026.42	1026.71	1027.00	1027.26	1027.51	1027.74	1027.96	1028.17	1028.37	1028.55	1028.74	1028.91	1029.08	1029.25	1029.42	1029.58	1029.73	1029.88	1030.02	1030.15	1030.27	1030.38	1030.46	1030.54				
GIRDER LINE E	1026.00	1026.33	1026.66	1026.97	1027.27	1027.55	1027.82	1028.07	1028.30	1028.52	1028.72	1028.92	1029.10	1029.28	1029.46	1029.63	1029.80	1029.97	1030.13	1030.29	1030.44	1030.59	1030.72	1030.84	1030.95	1031.04	1031.12				
GIRDER LINE F	1026.55	1026.89	1027.21	1027.53	1027.82	1028.11	1028.37	1028.62	1028.85	1029.07	1029.27	1029.47	1029.65	1029.83	1030.01	1030.18	1030.35	1030.52	1030.69	1030.85	1031.00	1031.15	1031.29	1031.41	1031.52	1031.61	1031.69				
GIRDER LINE G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
GIRDER LINE H	1027.10	1027.44	1027.76	1028.08	1028.38	1028.66	1028.92	1029.17	1029.40	1029.62	1029.82	1030.01	1030.20	1030.38	1030.56	1030.73	1030.91	1031.08	1031.24	1031.41	1031.56	1031.71	1031.85	1031.98	1032.09	1032.19	1032.26				
LOCATION	SPAN 6					℄ F.S. NO. 9	SPAN 6					℄ PIER 6	SPAN 7					℄ F.S. NO. 10	SPAN 7										℄ F.S. NO. 11	SPAN 7	
	LINE 28	LINE 29	LINE 30	LINE 31	LINE 32	LINE 33	LINE 34	LINE 35	LINE 36	LINE 37	LINE 38	LINE 39	LINE 40	LINE 41	LINE 42	LINE 43	LINE 44	LINE 45	LINE 46	LINE 47	LINE 48	LINE 49	LINE 50	LINE 51	LINE 52	LINE 53	LINE 54				
GIRDER LINE A	1030.60	1030.64	1030.67	1030.68	1030.68	1030.66	1030.64	1030.61	1030.58	1030.54	1030.51	1030.47	1030.43	1030.38	1030.33	1030.28	1030.21	1030.14	1030.05	1029.95	1029.84	1029.72	1029.58	1029.43	1029.26	1029.08	1028.88				
GIRDER LINE E	1031.17	1031.22	1031.24	1031.25	1031.25	1031.23	1031.21	1031.17	1031.14	1031.10	1031.06	1031.01	1030.97	1030.93	1030.87	1030.82	1030.75	1030.67	1030.59	1030.49	1030.37	1030.25	1030.11	1029.96	1029.79	1029.61	1029.41				
GIRDER LINE F	1031.75	1031.79	1031.81	1031.82	1031.82	1031.80	1031.77	1031.73	1031.69	1031.65	1031.61	1031.56	1031.52	1031.47	1031.41	1031.35	1031.29	1031.21	1031.12	1031.02	1030.91	1030.78	1030.64	1030.48	1030.32	1030.14	1029.94				
GIRDER LINE G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
GIRDER LINE H	1032.32	1032.36	1032.38	1032.39	1032.38	1032.36	1032.33	1032.29	1032.25	1032.20	1032.16	1032.11	1032.06	1032.01	1031.95	1031.89	1031.82	1031.74	1031.65	1031.55	1031.43	1031.31	1031.16	1031.01	1030.84	1030.66	1030.48				
LOCATION	SPAN 7					℄ PIER 7	SPAN 8					℄ F.S. NO. 12	SPAN 8										℄ PIER 8 BRG.								
	LINE 55	LINE 56	LINE 57	LINE 58	LINE 59	LINE 60	LINE 61	LINE 62	LINE 63	LINE 64	LINE 65	LINE 66	LINE 67	LINE 68	LINE 69	LINE 70	LINE 71	LINE 72	LINE 73	LINE 74	LINE 75	LINE 76	LINE 77	LINE 78	LINE 79	LINE 80					
GIRDER LINE A	1028.67	1028.45	1028.22	1027.99	1027.75	1027.51	1027.30	1027.09	1026.88	1026.67	1026.45	1026.22	1025.95	1025.68	1025.38	1025.08	1024.77	1024.46	1024.15	1023.84	1023.53	1023.22	1022.91	1022.60	1022.29	1021.98					
GIRDER LINE E	1029.20	1028.98	1028.76	1028.53	1028.30	1028.06	1027.86	1027.65	1027.44	1027.23	1027.01	1026.79	1026.53	1026.25	1025.96	1025.66	1025.33	1024.99	1024.64	1024.26	1023.87	1023.45	1023.03	1022.58	1022.13	1021.66					
GIRDER LINE F	1029.73	1029.51	1029.29	1029.07	1028.84	1028.61	1028.41	1028.21	1028.00	1027.79	1027.58	1027.36	1027.10	1026.82	1026.54	1026.23	1025.91	1025.57	1025.21	1024.83	1024.44	1024.02	1023.59	1023.14	1022.68	1022.21					
GIRDER LINE G	1029.82	1029.65	1029.47	1029.30	1029.12	1028.94	1028.75	1028.56	1028.38	1028.18	1027.98	1027.78	1027.52	1027.25	1026.96	1026.66	1026.34	1026.00	1025.64	1025.26	1024.86	1024.44	1024.01	1023.56	1023.09	1022.61					
GIRDER LINE H	1030.29	1030.09	1029.89	1029.69	1029.48	1029.27	1029.09	1028.90	1028.72	1028.52	1028.33	1028.12	1027.88	1027.63	1027.36	1027.07	1026.76	1026.44	1026.09	1025.73	1025.32	1024.88	1024.43	1023.95	1023.46	1022.96					

NOTE:
HAUNCH LOCATIONS ARE AT THE
SAME LOCATION AS THE ENCIRCLED
LETTERS AND NUMBERS SHOWN ON
TOP OF DECK ELEVATIONS SHEET.

NOTES:

FOR FIELD HAUNCH DETAIL AND NOTES, SEE DESIGN SHEET 59.

DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

FIELD HAUNCH DATA - UNIT 2

STA. 3546+14.50 (B I-480 RAMP C) NOVEMBER, 2020

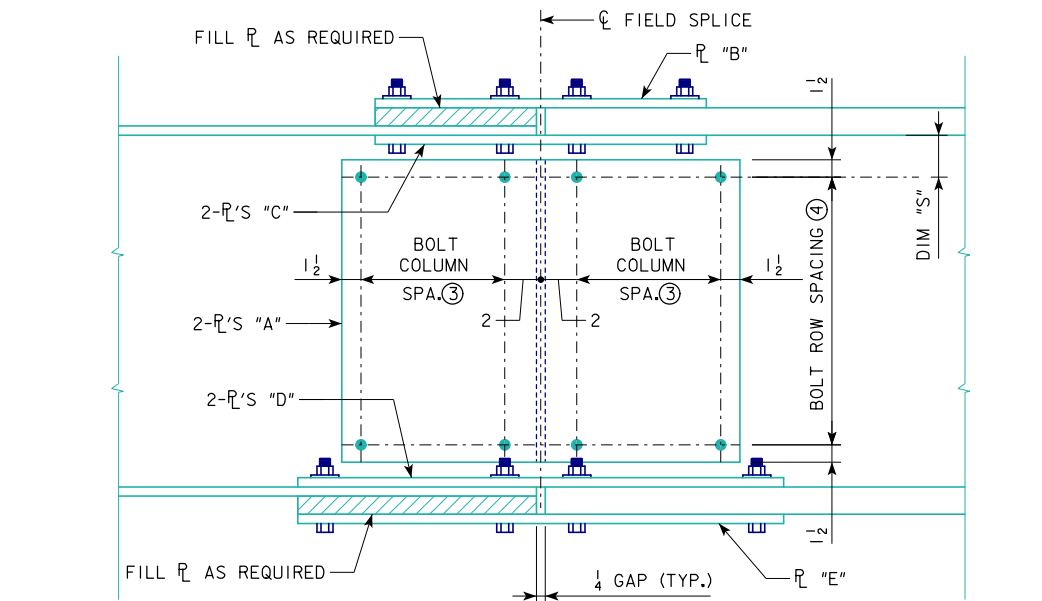
POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

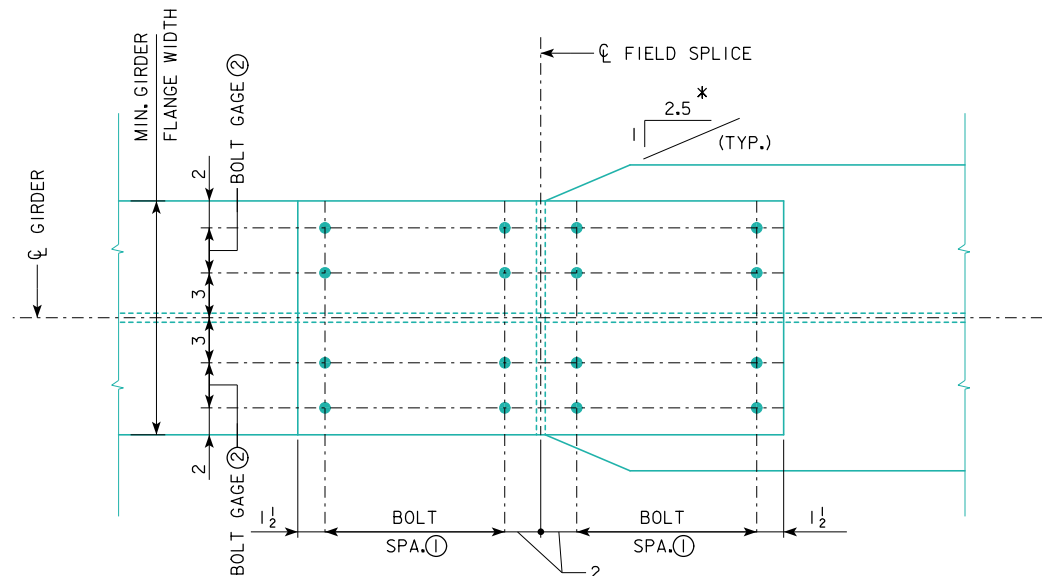
DESIGN SHEET NO. 72 OF 121 FILE NO. 30170 DESIGN NO. 1320



MISCELLANEOUS DATA TABLE (UNIT 2)																																
		GIRDER LINE	℄ PIER 4 BRG.	SPAN 5								℄ F.S. NO. 7	SPAN 5					℄ PIER 5	SPAN 6					℄ F.S. NO. 8	SPAN 6							
			LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6	LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12	LINE 13	LINE 14	LINE 15	LINE 16	LINE 17	LINE 18	LINE 19	LINE 20	LINE 21	LINE 22	LINE 23	LINE 24	LINE 25	LINE 26	LINE 27	LINE 28	LINE 29	
ANTICIPATED DEFLECTION DUE TO DECK AND BARRIER (IN.)		A	0	5/16	9/16	13/16	15/16	1/16	1/8	1/16	15/16	13/16	5/8	3/8	1/4	1/16	0	0	1/8	5/16	9/16	13/16	1/8	1/16	1/16	15/16	2/8	2/4	2/4	2/4	2/8	
		E	0	5/16	5/8	7/8	1/16	1/8	1/16	1/8	1/16	13/16	5/8	3/8	3/16	1/16	0	0	1/8	3/8	5/8	15/16	1/4	1/8	1/16	2/3/16	2/7/16	2/9/16	2/5/8	2/9/16	2/7/16	
		F	0	5/16	5/8	7/8	1/16	1/16	1/3/16	1/4	1/3/16	1/16	7/8	5/8	3/8	3/16	1/16	0	0	1/8	3/8	11/16	1/16	1/3/8	1/13/16	2/8	2/7/16	2/11/16	2/13/16	2/7/8	2/7/8	2/3/4
		G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		H	0	3/8	11/16	15/16	1/8	1/4	1/4	1/16	1/3/16	1/16	13/16	5/8	3/8	3/16	0	-1/16	0	3/16	7/16	3/4	1/8	1/2	1/15/16	2/5/16	2/11/16	2/15/16	3/8	3/3/16	3/8	3
CROSS SLOPE ADJUSTMENT (INCHES)		A, E, F	7/16	7/16	7/16	7/16	7/16	7/16	7/16	7/16	7/16	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	
		G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		H	7/16	7/16	7/16	7/16	7/16	7/16	7/16	7/16	7/16	7/16	9/16	9/16	9/16	9/16	9/16	9/16	9/16	9/16	9/16	9/16	9/16	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
ALLOWABLE FIELD HAUNCH IN. (FT.)	MAX	A, E, F	2 11/16 (0.225)										2 11/16 (0.225)										2 11/16 (0.225)									
		G	-										-										-									
		H	2 11/16 (0.225)										2 11/16 (0.225)										2 11/16 (0.225)									
	MIN	A, E, F	- 1/16 (-0.004)										0 (0)										0 (0)									
		H	-										-										-									



FIELD SPLICE ELEVATION



FLANGE SPLICE 18" TO 24" MIN. GIRDER FLANGE WIDTH

* IF THE DIFFERENCE BETWEEN TOP OR BOTTOM FLANGE WIDTHS ON EITHER SIDE OF THE FIELD SPLICE IS GREATER THAN 2 INCHES, THEN CLIP AT 1:1, OTHERWISE CLIP AT 1:2.5

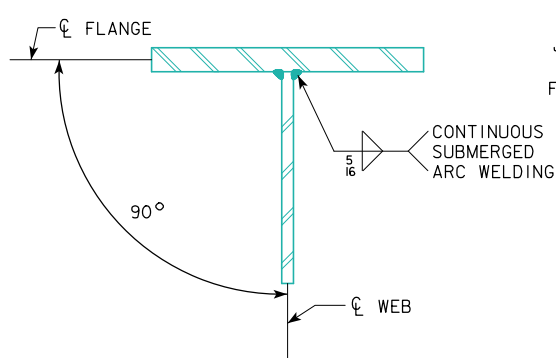
FIELD SPLICE SCHEDULE (UNIT 2)												
FIELD SPLICE NO.	GIRDER	TOP FLANGE SPLICE										
		MIN. GIRDER FLANGE WIDTH	PLATE "B"			PLATE "C" (2 REQ'D)			BOLT SPACING			BOLT GAGE
									①			
			+ (in.)	w (in.)	L	+ (in.)	w (in.)	L	# OF SPC.	SPC. (in.)	L (in.)	
7	A, E, F, H	18	$\frac{7}{16}$	18	3'-1	$\frac{1}{2}$	8	3'-1	5	3	15	4
8 - 12	A, E, F, H	20	$\frac{1}{2}$	20	3'-7	$\frac{9}{16}$	9	3'-7	6	3	18	5
12	G	20	$\frac{1}{2}$	20	3'-7	$\frac{9}{16}$	9	3'-7	6	3	18	5

FIELD SPLICE SCHEDULE (UNIT 2)											
FIELD SPLICE NO.	GIRDER	WEB PLATE SPLICE									
		WEB PLATE "A" (2 REQ'D)			BOLT COLUMN SPACING ③			BOLT ROW SPACING ④			DIM. S
		+ (in.)	w (in.)	L	# OF SPC.	SPC. (in.)	L (in.)	# OF SPC.	SPC. (in.)	L	
7 - 11	A, E, F, H	$\frac{7}{16}$	19	6'-7 1/2	2	3	6	18	4 $\frac{1}{4}$	6'-4 1/2	3 $\frac{3}{4}$
12	A, E, F, G, H	$\frac{7}{16}$	19	6'-7 1/2	2	3	6	18	4 $\frac{1}{4}$	6'-4 1/2	3 $\frac{3}{4}$

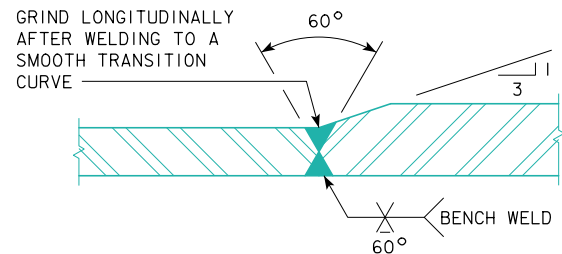
FIELD SPLICE SCHEDULE (UNIT 2)												
FIELD SPLICE NO.	GIRDER	BOTTOM FLANGE SPLICE										
		MIN. GIRDER FLANGE WIDTH	PLATE "D" (2 REQ'D)			PLATE "E"			BOLT SPACING			BOLT GAGE
									①			
			† (in.)	w (in.)	L	† (in.)	w (in.)	L	# OF SPC.	SPC. (in.)	L (in.)	
7	A, E, F	20	$\frac{9}{16}$	9	3'-7	$\frac{1}{2}$	20	3'-7	6	3	18	5
8 - 9	A, E, F	20	$\frac{11}{16}$	9	4'-1	$\frac{5}{8}$	20	4'-1	7	3	21	5
10 - 12	A, E, F	22	$\frac{11}{16}$	10	4'-1	$\frac{5}{8}$	22	4'-1	7	3	21	6
12	G	22	$\frac{11}{16}$	10	4'-1	$\frac{5}{8}$	22	4'-1	7	3	21	6
7	H	22	$\frac{5}{8}$	10	4'-1	$\frac{9}{16}$	22	4'-1	7	3	21	6
8 - 9	H	22	$\frac{3}{4}$	10	3'-1	$\frac{11}{16}$	22	3'-1	5	3	15	2 @ 3
10 - 12	H	24	$\frac{3}{4}$	11	3'-1	$\frac{11}{16}$	24	3'-1	5	3	15	2 @ 3 $\frac{1}{2}$



REVISED 04-12 - ADDED A THIRD CAULKING COMPANY TO THE LISTING FOR THE FLANGE DEFLECTOR.
ENGLISHBEAMS.DGN 1021W - THIS SHEET ISSUED 03-11.

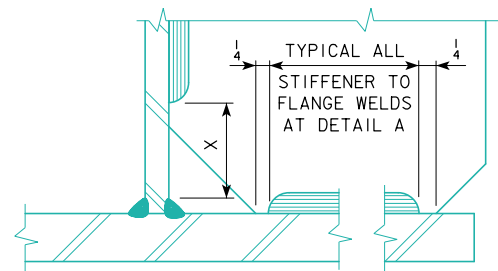


FLANGE TO WEB
WELD DETAIL

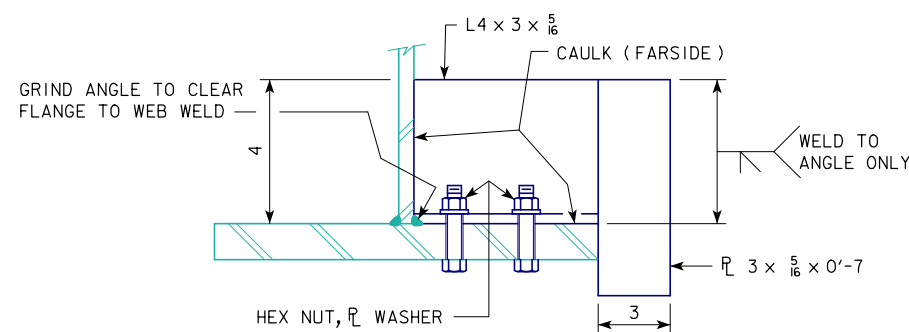


FLANGE PLATE TRANSITION
AT SHOP SPLICES

ALL FLANGE BUTT WELDED JOINTS SUBJECT TO TENSION OR REVERSAL OF STRESS ARE TO BE RADIOGRAPHED FULL WIDTH. ALL BUTT WELDED JOINTS SUBJECT TO COMPRESSION ONLY ARE TO BE RADIOGRAPHED FOR A MINIMUM OF 50 PERCENT OF THE WIDTH. FOR TENSION AND COMPRESSION LIMITS OF GIRDERS, SEE GIRDER ELEVATIONS.

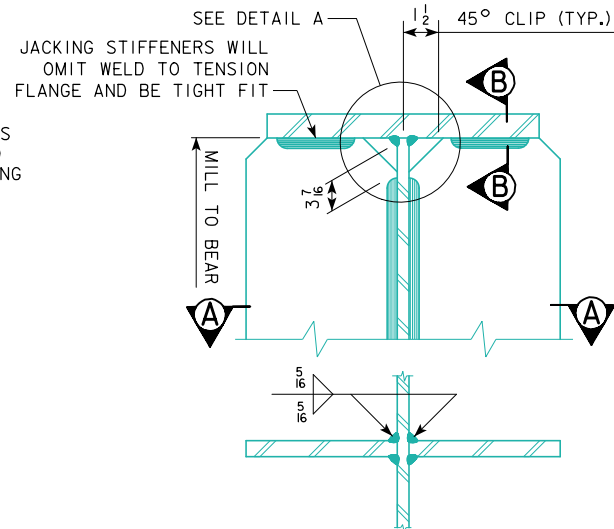


DETAIL A

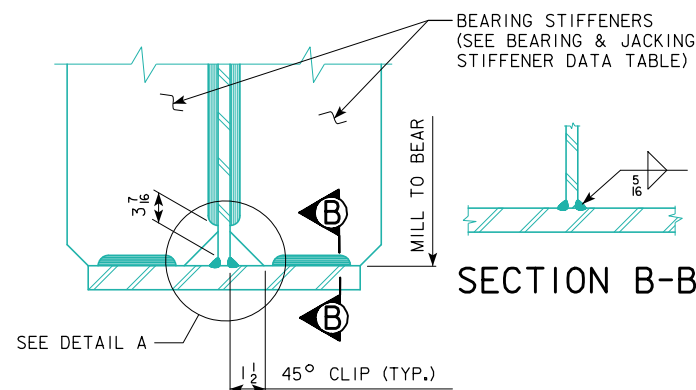


SECTION G-G

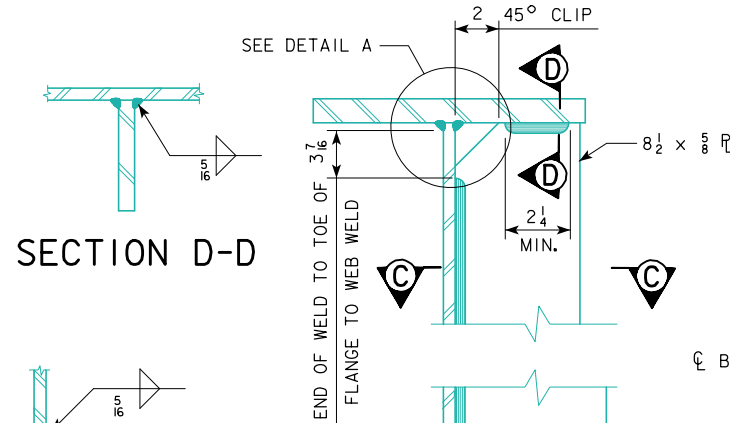
FLANGE DEFLECTORS ARE REQUIRED ON THE OUTSIDE OF THE EXTERIOR GIRDERS AT THE ABUTMENTS AND PIERS AS SHOWN ON THE STRUCTURAL STEEL LAYOUT.



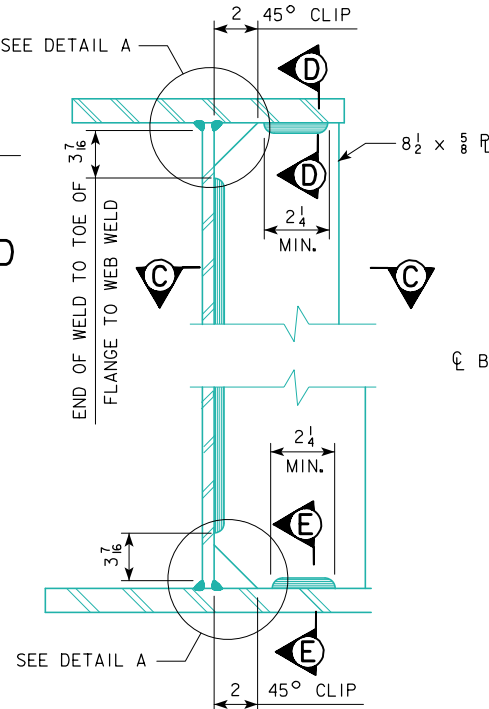
SECTION A-A



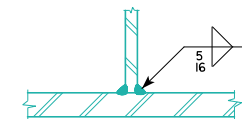
BEARING AND
JACKING STIFFENER



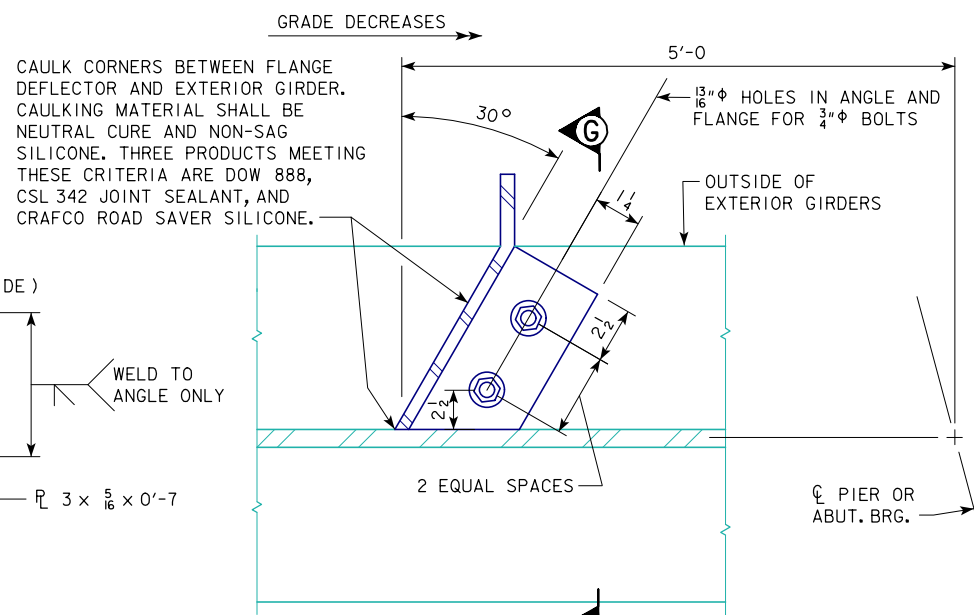
SECTION D-D



CROSS FRAME,
INTERMEDIATE OR
DIAPHRAGM STIFFENER

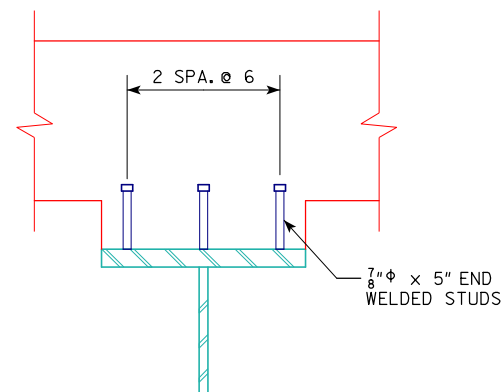


SECTION E-E



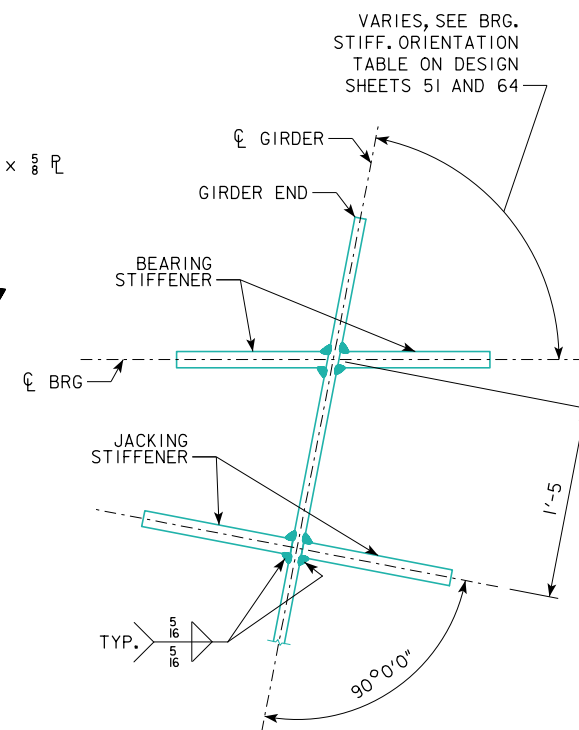
FLANGE DEFLECTOR DETAILS

(8 REQUIRED UNIT 1)
(10 REQUIRED UNIT 2)

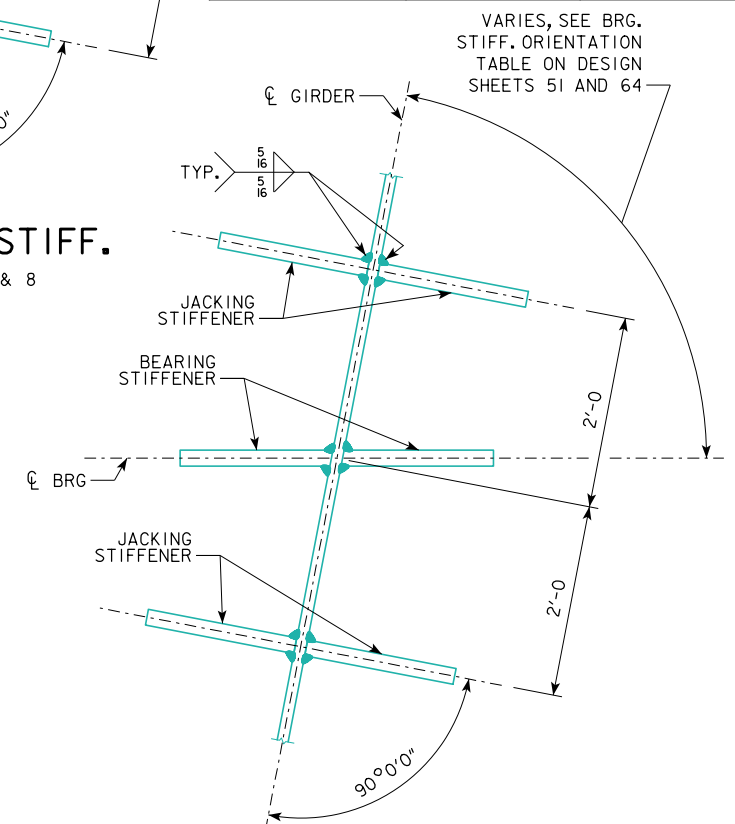


SHEAR STUD DETAIL

T - WEB THICKNESS	X = 5T WITH 2 1/4" MINIMUM
3/8	2 1/4
7/16	2 1/4
1/2	2 1/2
9/16	2 3/4
5/8	3 1/8
11/16	3 1/4
3/4	3 1/2



BRG. & JACKING STIFF.
SOUTH ABUTMENT, PIER 4 & 8

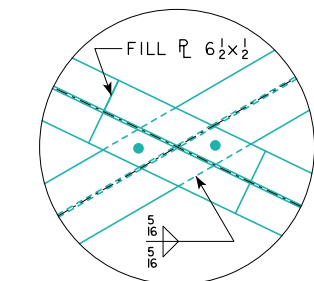
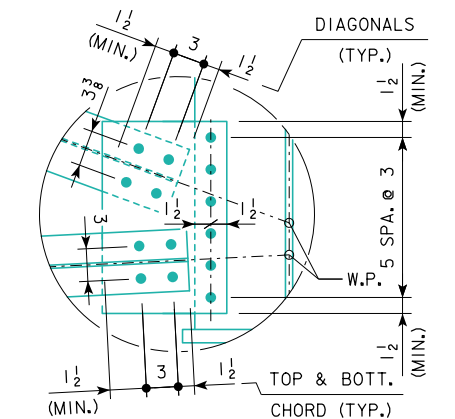
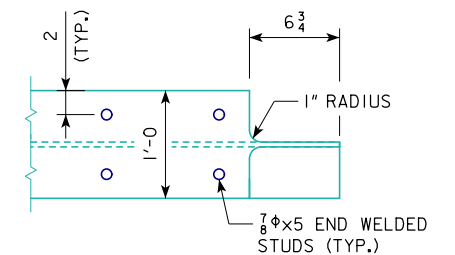
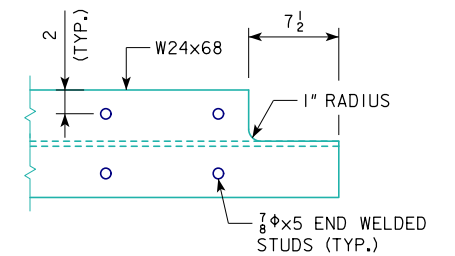
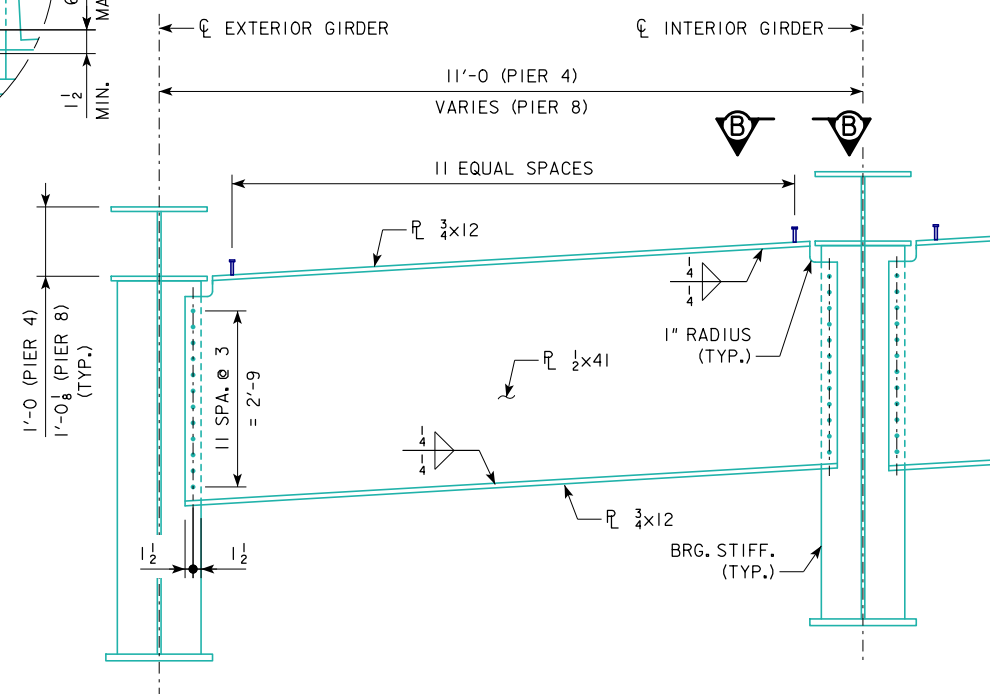
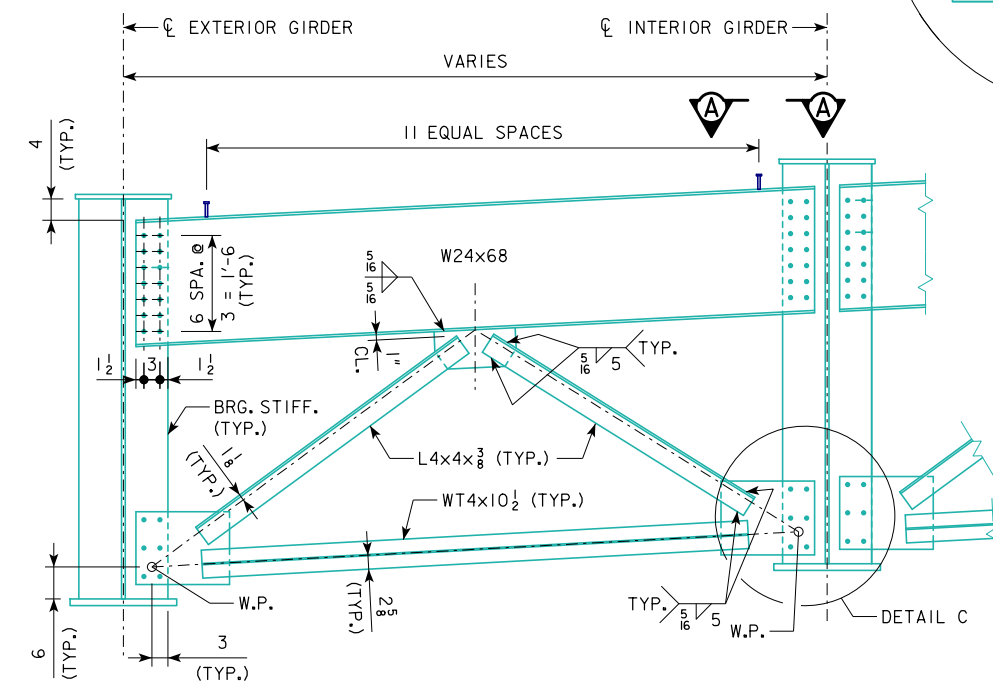
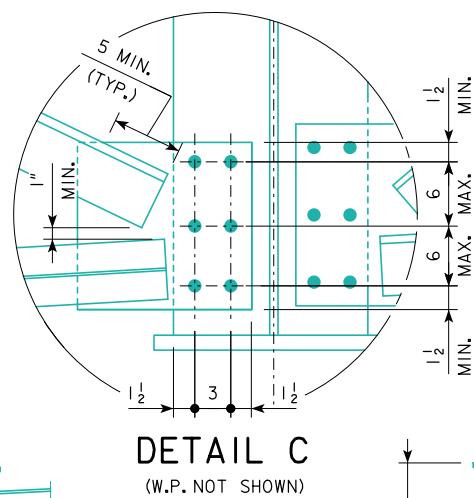
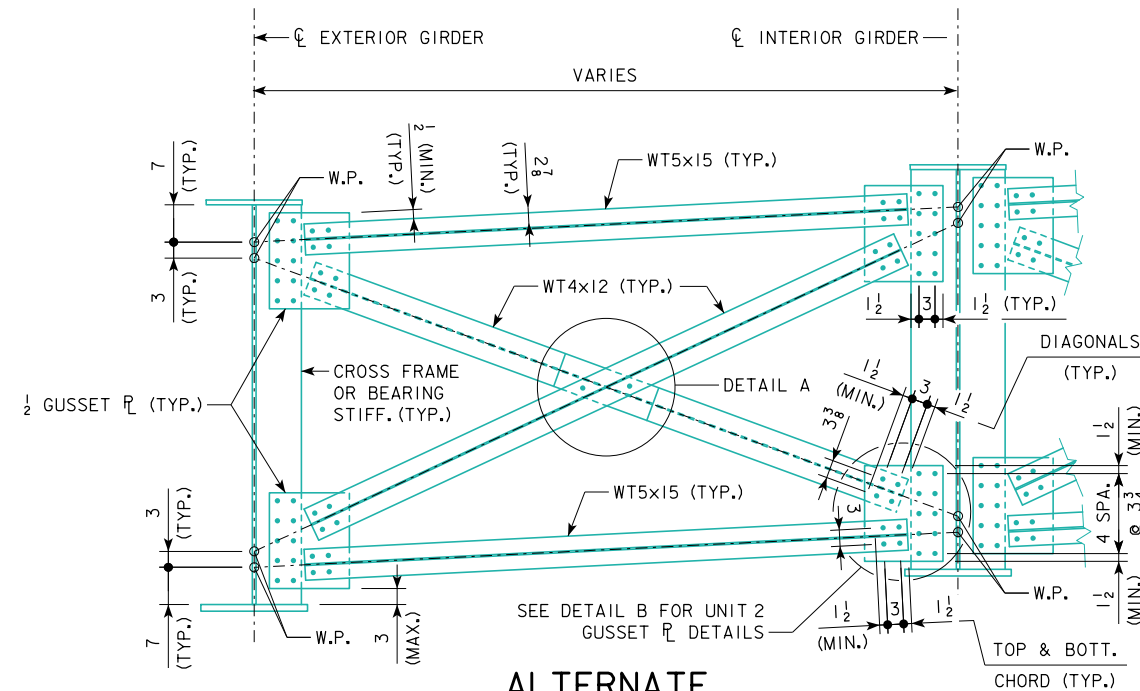
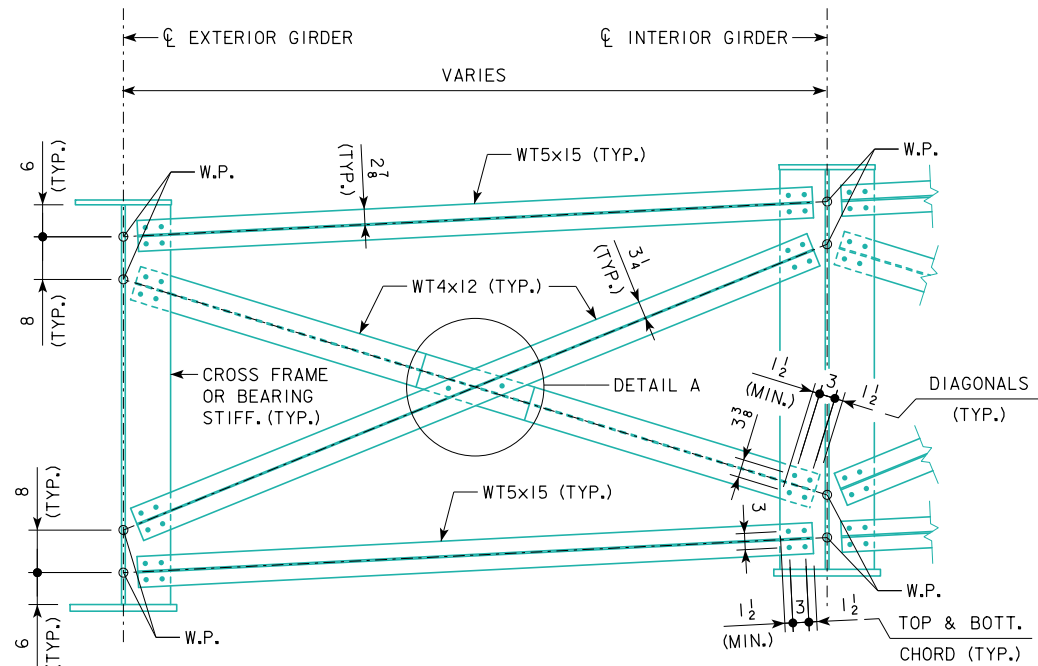


BRG. & JACKING STIFF.

PIER 1, 2, 3, 5, 6 & 7

NOTE:
THIS SHEET IS PRIMARILY FOR THE USE OF FABRICATOR'S WORKMEN AND IOWA DEPARTMENT OF TRANSPORTATION INSPECTORS IN INTERPRETING PLAN DETAILS. IT COVERS THE LOCATIONS OF WELD TERMINI THAT ARE NOT SPECIFIED BY TYPICAL WELD SYMBOLS. THE ACCEPTABILITY AND USE OF THE WELD TREATMENT SHOWN ON THIS SHEET FOR ANY SPECIFIC PROJECT IS THE RESPONSIBILITY OF THE DESIGNING ENGINEER.

DESIGN FOR 0° SKEW
1419'-0" x VARIES CONTINUOUS WELDED GIRDER BRIDGE
UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
WELDING DETAILS
STA. 3546+14.50 (RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 75 OF 121 FILE NO. 30170 DESIGN NO. 1320



NOTE:
STRUCTURAL STEEL QUANTITIES ARE BASED ON THE CROSS FRAME
TYPE I SHOWN ON TYPICAL CROSS SECTION ELSEWHERE IN THESE
PLANS. NO ADJUSTMENT TO QUANTITIES WILL BE MADE IF THE
CONTRACTOR USES THIS ALTERNATE CROSS FRAME TYPE I DETAIL.

DESIGN FOR 0° SKEW

1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"

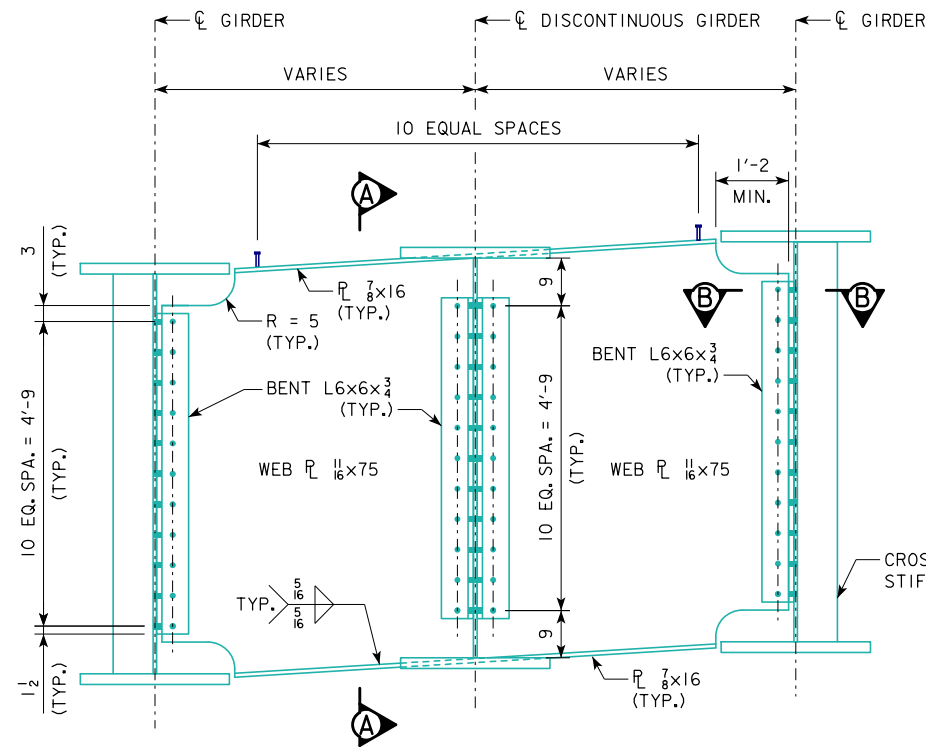
CROSS FRAME DETAILS

STA. 3546+14.50 (R/L 1-480 RAMP C) NOVEMBER, 2020

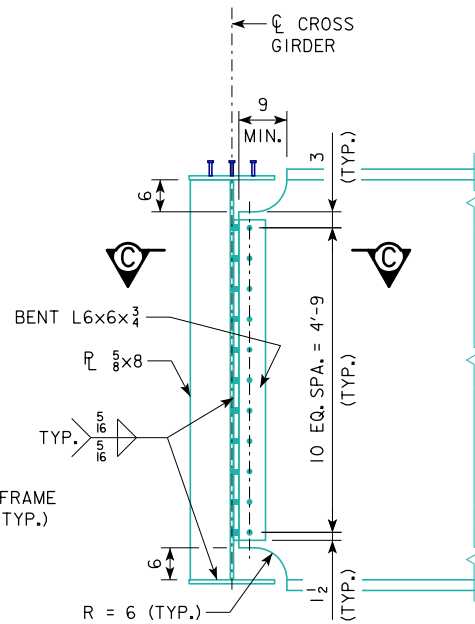
POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

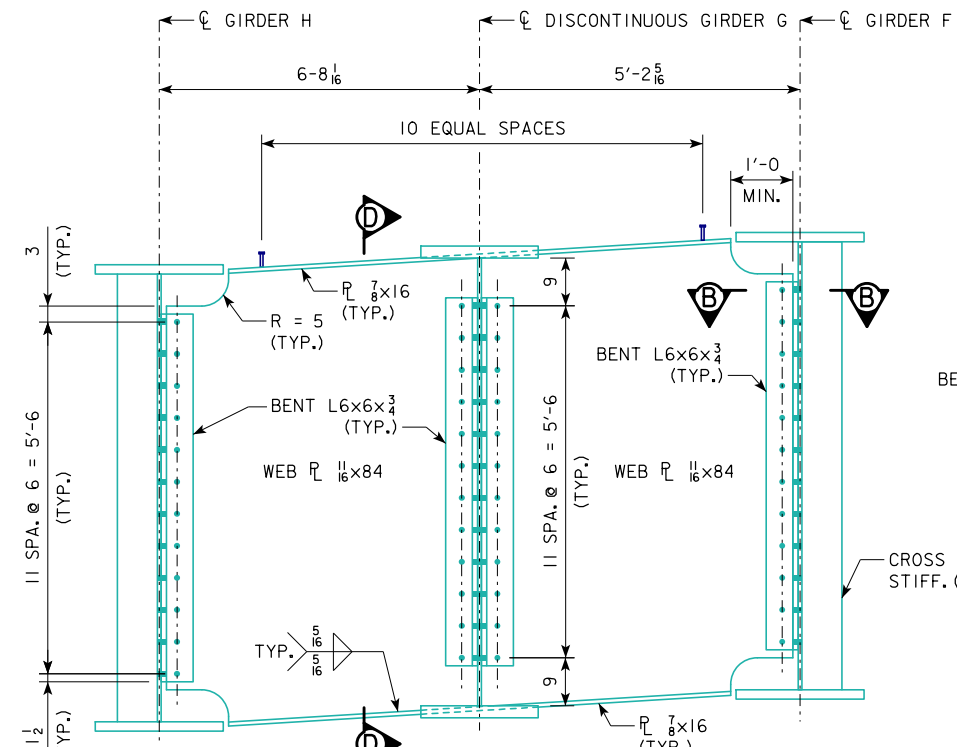
DESIGN SHEET NO. 76 OF 121 FILE NO. 30170 DESIGN NO. 1320



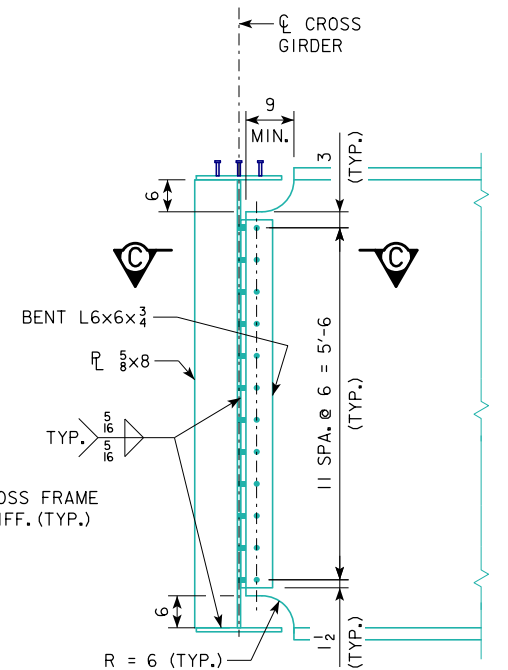
ELEVATION - UNIT 1
(LOOKING AHEAD STATION)



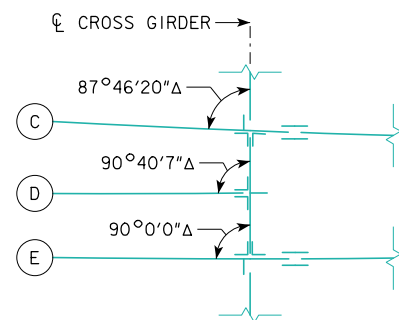
SECTION A-A



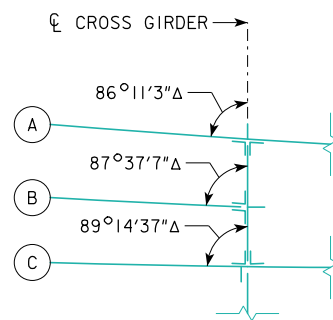
ELEVATION - UNIT 2
(LOOKING BEHIND STATION)



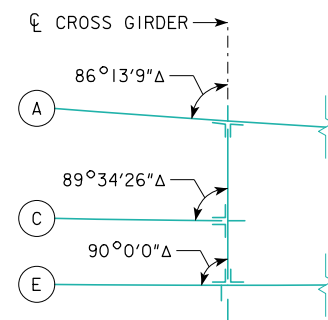
SECTION D-D



DISCONTINUOUS GIRDER D

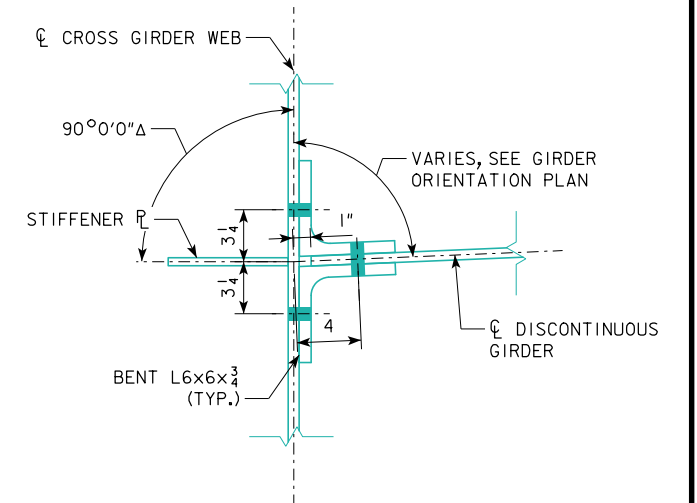


DISCONTINUOUS GIRDER B

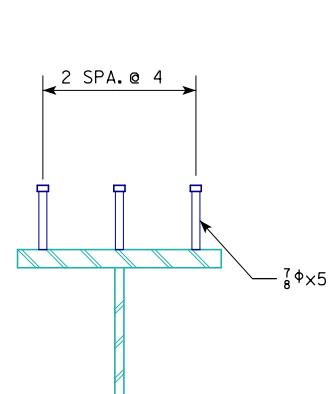


DISCONTINUOUS GIRDER C

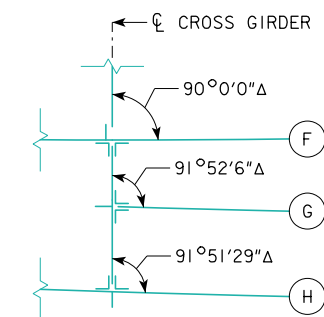
NOTES:
CROSS GIRDERS AND CONNECTIONS ANGLES SHALL MEET CHARPY V-NOTCH TOUGHNESS REQUIREMENTS IN ACCORDANCE WITH ARTICLE 4152.02.
Δ MEASURED WITH RESPECT TO LOCAL TANGENT.



SECTION C-C



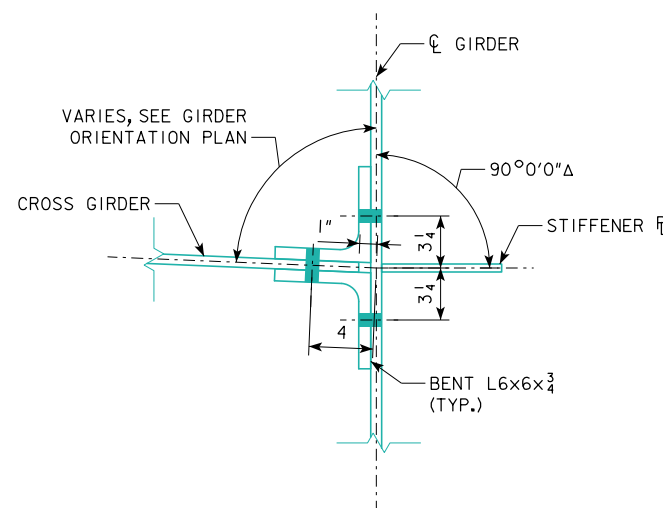
SHEAR STUD DETAIL



DISCONTINUOUS GIRDER G

UNIT 2

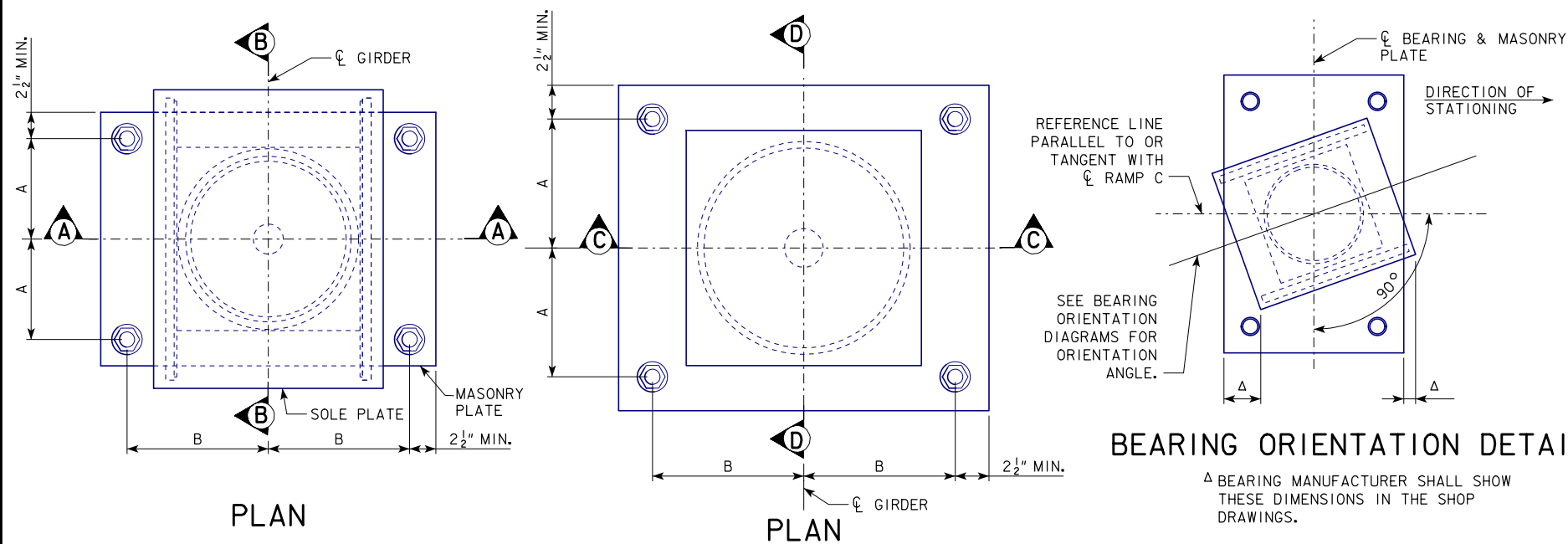
CROSS GIRDER ORIENTATION PLAN



SECTION B-B

DESIGN FOR 0° SKEW
1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE
UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
CROSS GIRDER DETAILS
STA. 3546+14.50 (RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 77 OF 121 FILE NO. 30170 DESIGN NO. 1320





DISC BEARING NOTES:

THE SOLE PLATES SHALL BE TAPERED TO THE LONGITUDINAL SLOPE SHOWN, AND SHALL BE SIZED FOR THE MOVEMENTS SHOWN IN THE BEARING DATA TABLE. ADDITIONALLY, THE SOLE PLATES SHALL EXTEND BEYOND THE EDGE OF THE GIRDER BOTTOM FLANGE BY AT LEAST 1 INCH TO ALLOW THE PLACEMENT OF A HORIZONTAL WELD.

BEARINGS SHALL BE DESIGNED TO ACCOMMODATE A ROTATION OF 0.02 RADIAN.

ALL BEARINGS SHALL BE FULLY REMOVABLE. THE PLATE CONFIGURATION SHOWN ON THE PLANS MAY BE USED, OR AN ALTERNATE PLAN CONFIGURATION MAY BE SUBSTITUTED, AS LONG AS THE BEARING CAN BE REMOVED UNDER A MAXIMUM JACKING HEIGHT OF 4". RECESSED PLATES WILL NOT BE ACCEPTED. NO ADDITIONAL COMPENSATION WILL BE PROVIDED IF ALTERNATE DETAILS ARE SUBSTITUTED. FOR FUTURE JACKING NOTES, SEE GENERAL NOTES.

FOR GUIDED EXPANSION BEARINGS, STAINLESS STEEL SURFACES SHALL EXTEND A MINIMUM OF 1 INCH EACH WAY BEYOND THE SPECIFIED MOVEMENT RANGE.

TOTAL MOVEMENT SHOWN IN THE BEARING DATA TABLE REPRESENT THE COMBINED MOVEMENT RANGE FOR BRIDGE EXPANSION (50° F TO 125° F) AND BRIDGE CONTRACTION (50° F TO -25° F).

AT 50° F, THE SOLE PLATE SHALL BE CENTERED OVER THE LOWER BEARING ASSEMBLY. FOR OTHER INSTALLATION TEMPERATURES, THE SOLE PLATE POSITION SHALL BE ADJUSTED AS NOTED ON DESIGN SHEET 48 AND 49.

ALL BEARINGS SHALL BE MARKED PRIOR TO SHIPPING. THE MARKS SHALL INCLUDE THE BEARING LOCATION ON THE BRIDGE, AND A DIRECTION ARROW THAT POINTS UPSTATION. ALL MARKS SHALL BE PERMANENT AND BE VISIBLE AFTER THE BEARING IS INSTALLED. THE MARKS SHALL BE ON THE TOP PLATE OF THE BEARING.

THE GAP BETWEEN THE GUIDE BARS AND THE BEARINGS SHALL BE 1/8 INCH.

NON-STAINLESS STEEL COMPONENTS OF BEARING ASSEMBLIES SHALL BE OF ASTM A709 GRADE 50W STEEL.

THE BEARING HEIGHT NOTED IN THE BEARING DATA TABLE REPRESENTS THE ASSUMED TOTAL HEIGHT OF THE BEARING ASSEMBLY PLUS THE 1/8 INCH PREFORMED MASONRY PAD. THIS MINIMUM HEIGHT WAS USED BY THE DESIGNER TO ESTABLISH THE PEDESTAL ELEVATIONS AS NOTED ON PIER AND ABUTMENT DETAIL SHEETS. THE MINIMUM PEDESTAL HEIGHT SHALL NOT BE CHANGED WITHOUT WRITTEN APPROVAL OF THE ENGINEER. THE ACTUAL BEARING HEIGHT DETERMINED BY THE BEARING MANUFACTURER SHALL BE USED TO SET THE TOP OF PEDESTAL ELEVATIONS TO ACHIEVE THE PROPER TOP OF BEARING ELEVATIONS GIVEN IN THE BEARING DATA TABLE. THE TOP OF PEDESTAL ELEVATIONS SHALL BE SHOWN ON THE SHOP DRAWINGS. 9" MINIMUM BEARING HEIGHT SHALL BE PROVIDED TO ACCOMMODATE FUTURE JACKING OPERATIONS FOR BEARING REPLACEMENT.

IN ORDER TO COORDINATE TOP OF PEDESTAL ELEVATIONS AND ANCHOR BOLT LOCATIONS, PIERS AND ABUTMENTS SHALL NOT BE POURED PRIOR TO RECEIVING APPROVED BEARING SHOP DRAWINGS FOR THIS CONTRACT.

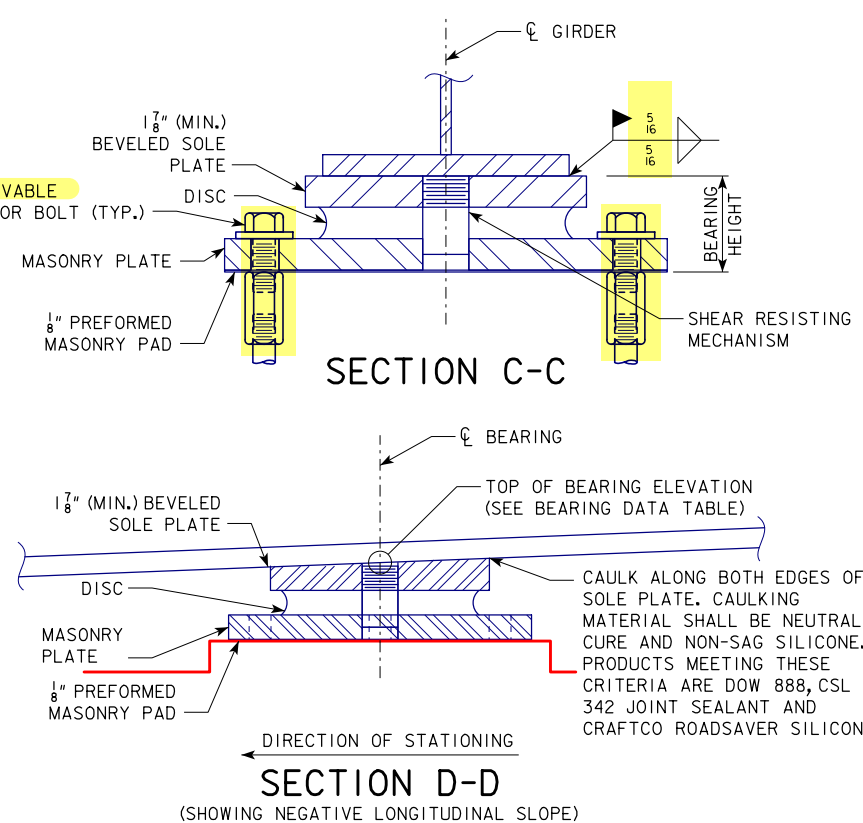
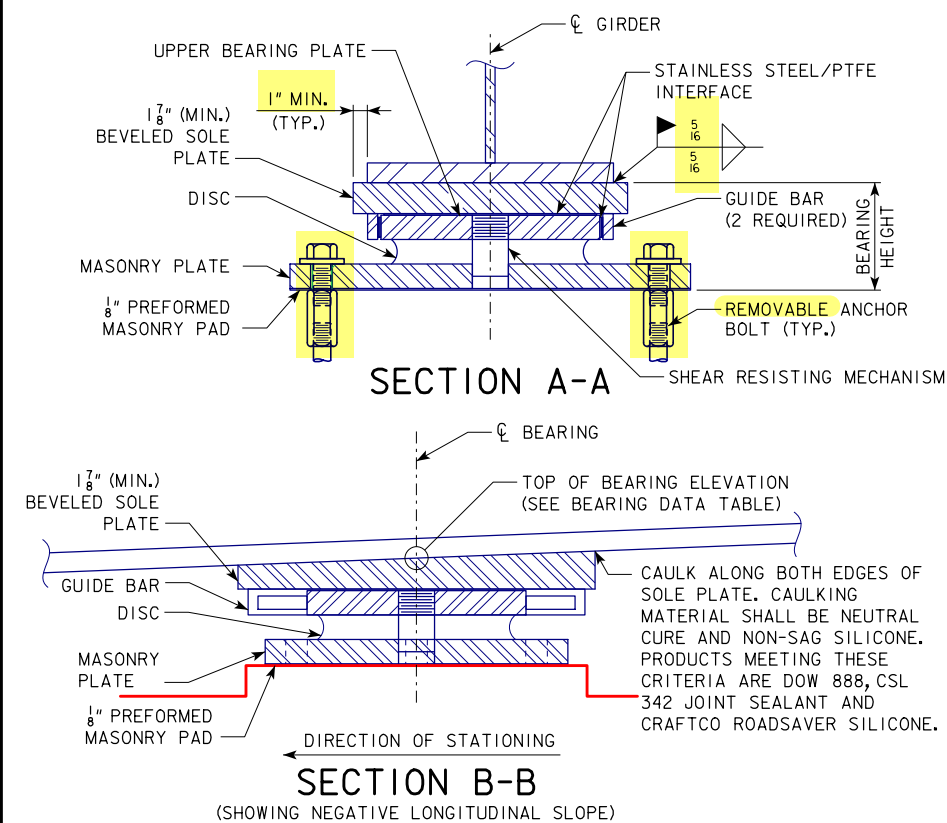
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF I.M. 453.08. ANCHOR BOLTS FOR PIER 6 SHALL BE PER ASTM F1554, GRADE 55. ANCHOR BOLT LAYOUT SHOWN IN THE DETAILS IS BASED ON A PRELIMINARY BEARING DESIGN. THE ANCHOR BOLT LAYOUT WAS USED IN SETTING THE GEOMETRY OF THE PIER AND ABUTMENT REINFORCING WHICH SHOULD ALLOW THE ANCHOR BOLTS TO BE INSTALLED WITHOUT CONFLICT WITH THE REINFORCING. ANY CHANGES TO THE ANCHOR BOLT PATTERN MAY REQUIRE A PLAN CHANGE TO THE REINFORCING LAYOUT.

ANCHOR BOLTS SHALL BE EMBEDDED IN CONCRETE A MINIMUM DISTANCE AS SPECIFIED IN THE BEARING DATA TABLE. FABRICATOR SHALL DETERMINE REQUIRED ANCHOR BOLT LENGTH BASED ON BEARING DETAILS AND REQUIRED ANCHOR BOLT EMBEDMENT. SHOP DRAWINGS SHALL SHOW ANCHOR BOLT EMBEDMENT, PROJECTION, THREAD LENGTH, AND TOTAL BOLT LENGTH.

FOR DIMENSIONS "A" AND "B" SEE DESIGN SHEETS 79 AND 80.

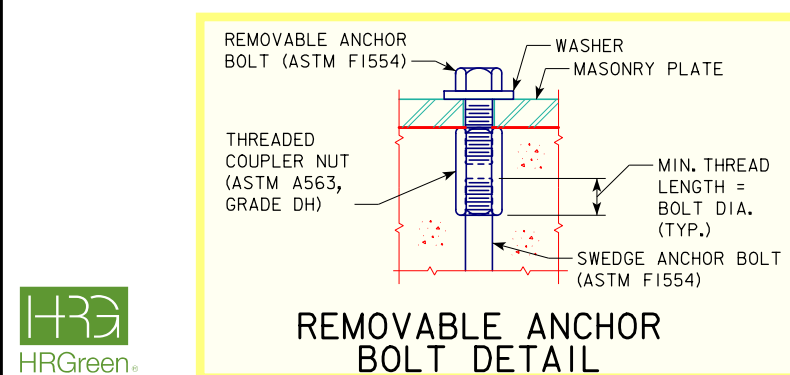
THE COST OF FURNISHING AND INSTALLING THE THREADED COUPLER NUTS SHALL BE INCLUDED IN THE PRICE BID FOR "DISC BEARING ASSEMBLIES".

FIELD WELDING SHALL MEET THE REQUIREMENTS OF MATERIALS I.M. 558.

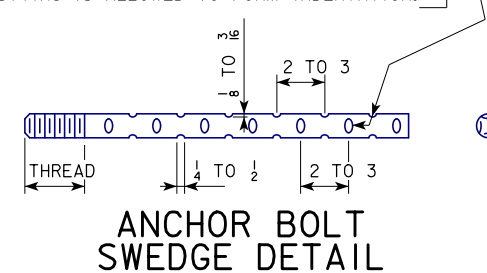


GUIDED EXPANSION BEARING DETAILS - TYPE GE

FIXED BEARING DETAILS - TYPE FX



INDENTATION SHALL BE FORMED BY DISPLACEMENT OF METAL IN A STAGGERED PATTERN. NO CUTTING IS ALLOWED TO FORM INDENTATION.



NOTE:
SEE DESIGN SHEET 79 & 80 FOR BEARING DATA TABLES.

DESIGN FOR 0° SKEW

1419'-0" x VARIES CONTINUOUS WELDED GIRDER BRIDGE

UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"

DISC BEARING DETAILS

STA. 3546+14.50 (RAMP C) NOVEMBER, 2020

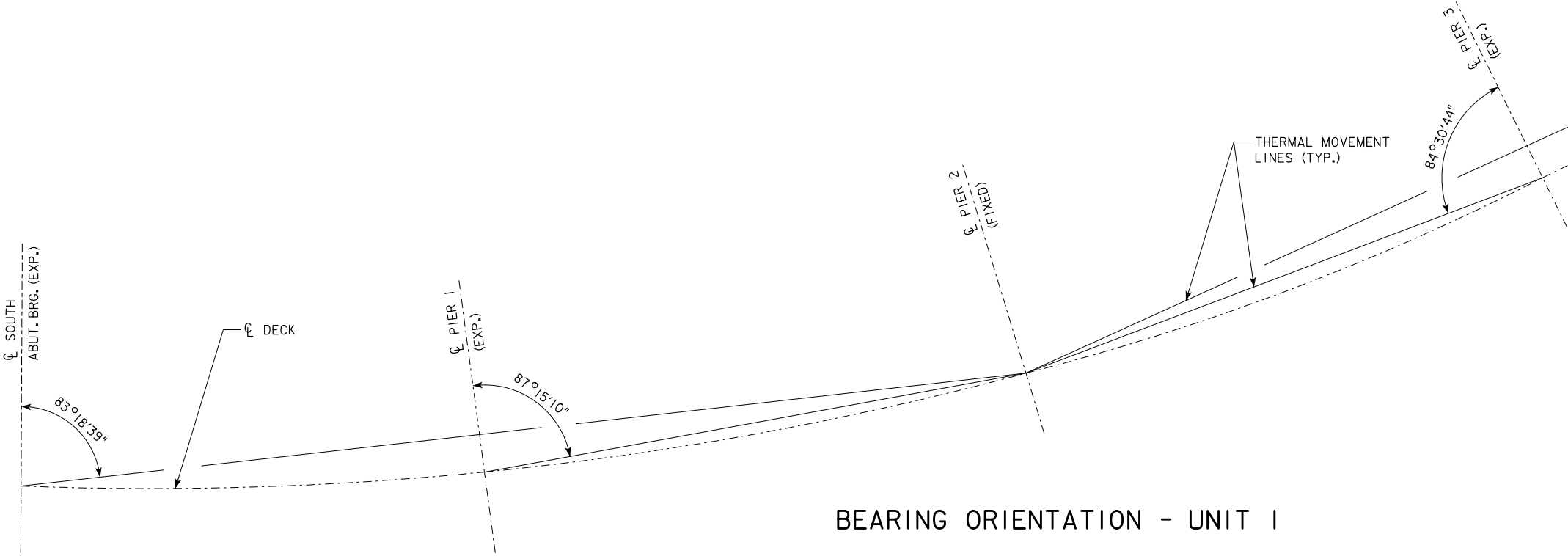
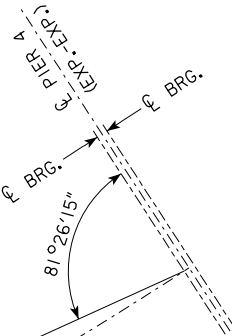
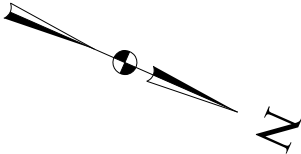
POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 78 OF 121 FILE NO. 30170 DESIGN NO. 1320

BEARING DATA TABLE (UNIT 1)																				
LOCATION	TYPE	GIRDER LINE	TOP OF BEARING ELEVATION	LONGITUDINAL SLOPE OF SOLE PLATE (%)	* MIN. BRG. HEIGHT (INCHES)	STRENGTH				EXTREME EVENT		SERVICE				TOTAL LONGITUDINAL MOVEMENT (INCHES)	ANCHOR BOLTS			
						VERTICAL LOAD		HORIZONTAL LOAD (KIPS)		HORIZONTAL LOAD (KIPS)		VERTICAL LOAD		HORIZONTAL LOAD (KIPS)			DIM. "A" (INCHES)	DIM. "B" (INCHES)	NUMBER AND SIZE (EACH BEARING)	MINIMUM EMBEDMENT
						MAX (KIPS)	MIN (KIPS)	TRANSV.	LONGIT.	TRANSV.	LONGIT.	MAX (KIPS)	MIN (KIPS)	TRANSV.	LONGIT.					
SOUTH ABUTMENT	GE	"A"	991.93	+3.04	9	392	79	13	10	21	8	298	107	11	9	4.1	7.0	16.5	4-1½ϕ	1'-3
		"B"	992.43																	
		"C"	992.93																	
		"D"	993.43																	
		"E"	993.97																	
		"F"	994.52																	
PIER 1	GE	"A"	998.25	+3.68	9	951	295	26	24	61	24	729	361	15	24	2.3	12.0	16.5	4-1½ϕ	1'-3
		"B"	998.71																	
		"C"	999.16																	
		"D"	999.49																	
		"E"	999.74																	
		"F"	1000.29																	
PIER 2	FX	"A"	1006.08	+3.68	9	986	269	33	71	61	170	755	341	19	47	0.0	12.0	16.5	4-1½ϕ	1'-3
		"B"	1006.37																	
		"C"	1006.63																	
		"E"	1006.92																	
		"F"	1007.47																	
		"H"	1008.00																	
PIER 3	GE	"A"	1013.54	+3.68	9	915	307	40	21	57	22	700	359	24	21	2.3	12.0	16.5	4-1½ϕ	1'-3
		"E"	1014.09																	
		"F"	1014.64																	
		"H"	1015.19																	
PIER 4 BACK BRG.	GE	"A"	1018.74	+3.45	9	364	61	20	4	15	6	275	78	16	4	3.9	7.0	16.5	4-1½ϕ	1'-3
		"E"	1019.29																	
		"F"	1019.84																	
		"H"	1020.39																	

* 9" MINIMUM DISC BEARING HEIGHT MUST BE MAINTAINED TO ACCOMMODATE FUTURE JACKING REQUIREMENTS.



BEARING ORIENTATION - UNIT 1



DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

DISC BEARING DETAILS - UNIT 1

STA. 3546+14.50 (CL 1-480 RAMP C) NOVEMBER, 2020

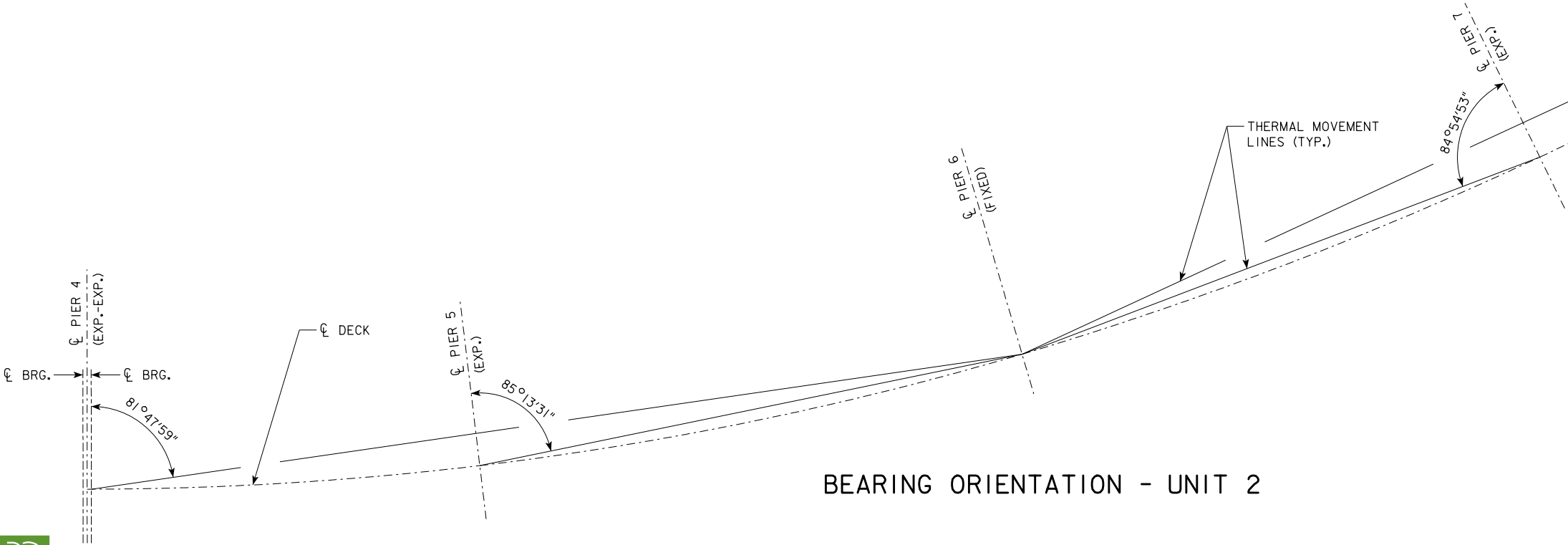
POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 79 OF 121 FILE NO. 30170 DESIGN NO. 1320

BEARING DATA TABLE (UNIT 2)																				
LOCATION	TYPE	GIRDER LINE	TOP OF BEARING ELEVATION	LONGITUDINAL SLOPE OF SOLE PLATE (%)	* MIN. BRG. HEIGHT (INCHES)	STRENGTH				EXTREME EVENT		SERVICE				TOTAL LONGITUDINAL MOVEMENT (INCHES)	ANCHOR BOLTS			
						VERTICAL LOAD		HORIZONTAL LOAD (KIPS)		HORIZONTAL LOAD (KIPS)		VERTICAL LOAD		HORIZONTAL LOAD (KIPS)			DIM. "A" (INCHES)	DIM. "B" (INCHES)	NUMBER AND SIZE (EACH BEARING)	MINIMUM EMBEDMENT
						MAX (KIPS)	MIN (KIPS)	TRANSV.	LONGIT.	TRANSV.	LONGIT.	MAX (KIPS)	MIN (KIPS)	TRANSV.	LONGIT.					
PIER 4 AHEAD BRG.	GE	"A"	1018.12	+3.31	9	353	54	21	3	14	5	267	72	16	4	4.0	7.0	16.5	4-1½ϕ	1'-3
		"E"	1018.67																	
		"F"	1019.22																	
		"H"	1019.76																	
PIER 5	GE	"A"	1021.66	+1.77	9	949	324	43	23	61	24	727	381	25	23	2.3	12.0	16.5	4-1½ϕ	1'-3
		"E"	1022.21																	
		"F"	1022.76																	
		"H"	1023.31																	
PIER 6	FX	"A"	1023.08	-0.44	9	1006	308	50	106	61	228	770	368	28	67	0.0	12.0	16.5	4-1½ϕ	1'-10
		"E"	1023.63																	
		"F"	1024.18																	
		"H"	1024.73																	
PIER 7	GE	"A"	1020.08	-2.65	9	1033	315	39	25	65	26	791	377	22	25	2.3	12.0	16.5	4-1½ϕ	1'-3
		"E"	1020.63																	
		"F"	1021.18																	
		"G"	1021.51																	
PIER 8 BACK BRG.	GE	"H"	1021.84	-4.52	9	408	95	19	7	22	9	310	116	15	7	4.4	7.0	16.5	4-1½ϕ	1'-3
		"A"	1013.76																	
		"E"	1014.31																	
		"F"	1014.86																	
		"G"	1015.27																	
"H"	1015.59																			

* 9" MINIMUM DISC BEARING HEIGHT MUST BE MAINTAINED TO ACCOMODATE FUTURE JACKING REQUIREMENTS.



BEARING ORIENTATION - UNIT 2



DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

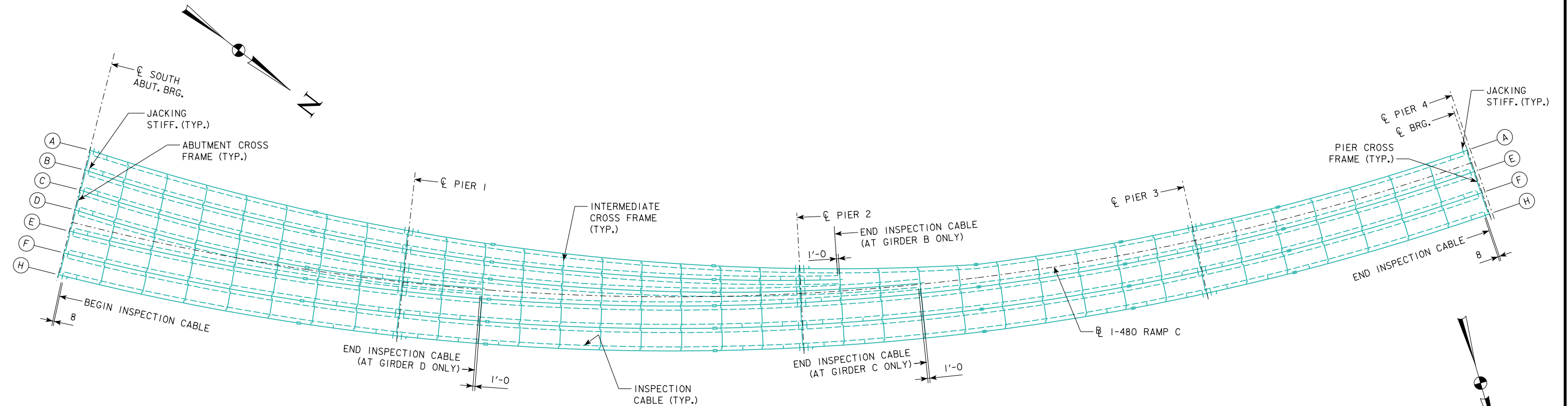
DISC BEARING DETAILS - UNIT 2

STA. 3546+14.50 (R 1-480 RAMP C) NOVEMBER, 2020

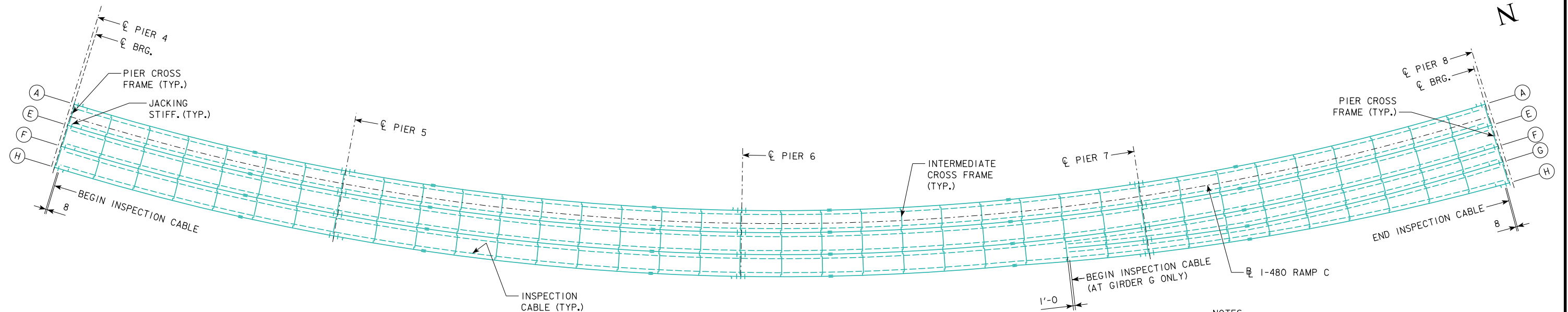
POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 80 OF 121 FILE NO. 30170 DESIGN NO. 1320



INSPECTION ACCESS LAYOUT - UNIT 1

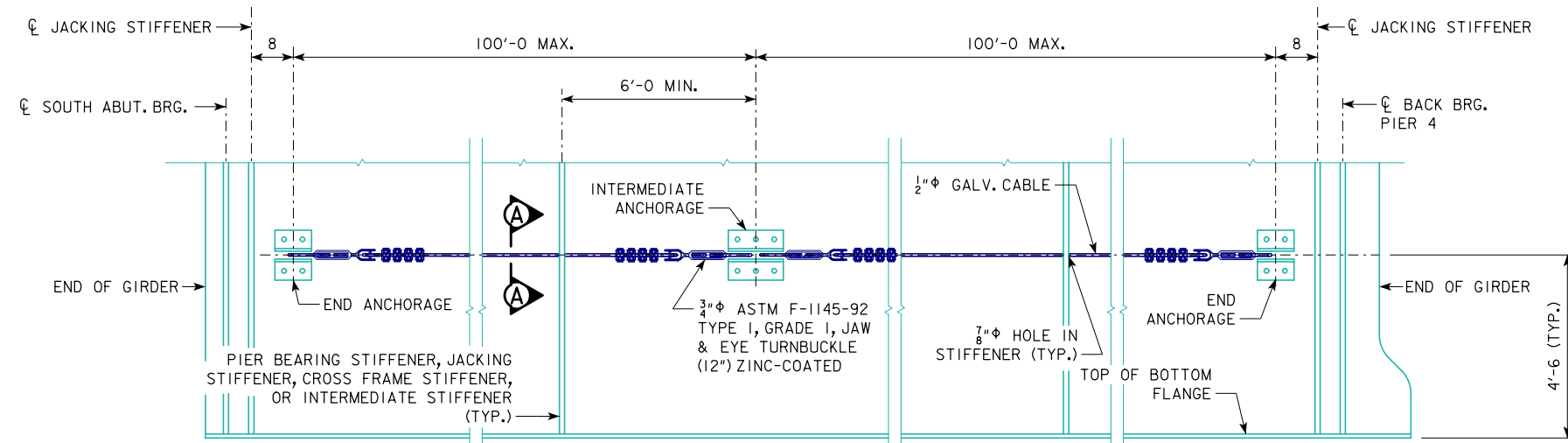


INSPECTION ACCESS LAYOUT - UNIT 2

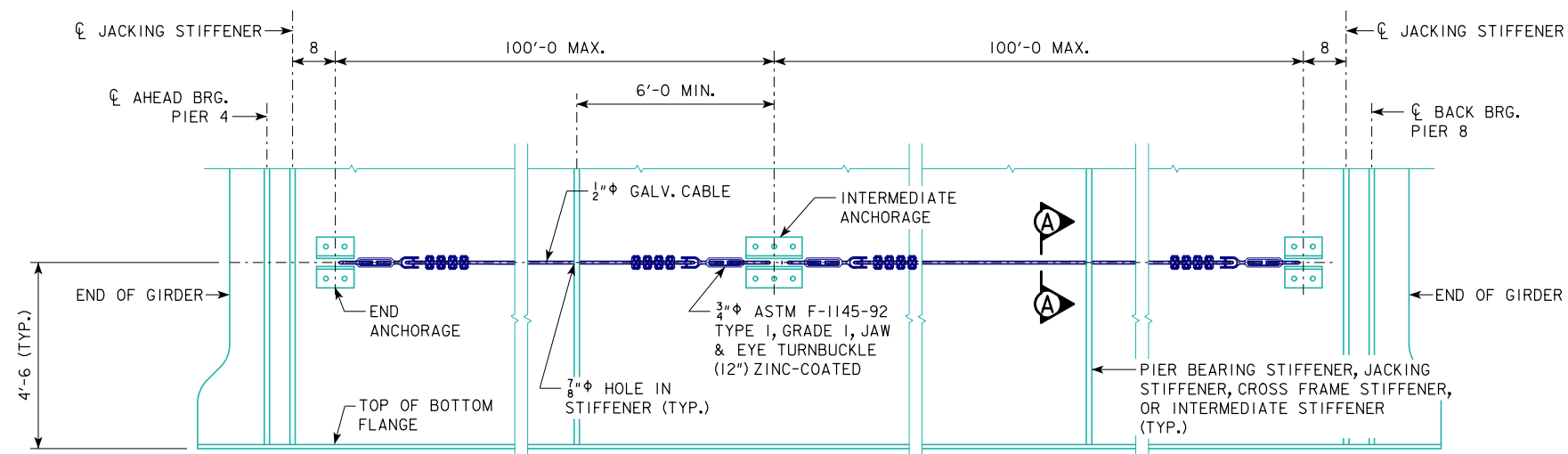
NOTES:
 FOR GIRDER GEOMETRY AND CROSS FRAME LOCATIONS, SEE FRAMING PLAN SHEETS.
 FOR CROSS FRAME DETAILS, SEE CROSS FRAME DETAILS SHEETS.
 FOR ADDITIONAL INSPECTION CABLE DETAILS & NOTES, SEE DESIGN SHEETS 82, 83 & 84.

DESIGN FOR 0° SKEW
1419'-0" x VARIES CONTINUOUS WELDED GIRDER BRIDGE
 UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
INSPECTION CABLE DETAILS
 STA. 3546+14.50 (RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 81 OF 121 FILE NO. 30170 DESIGN NO. 1320





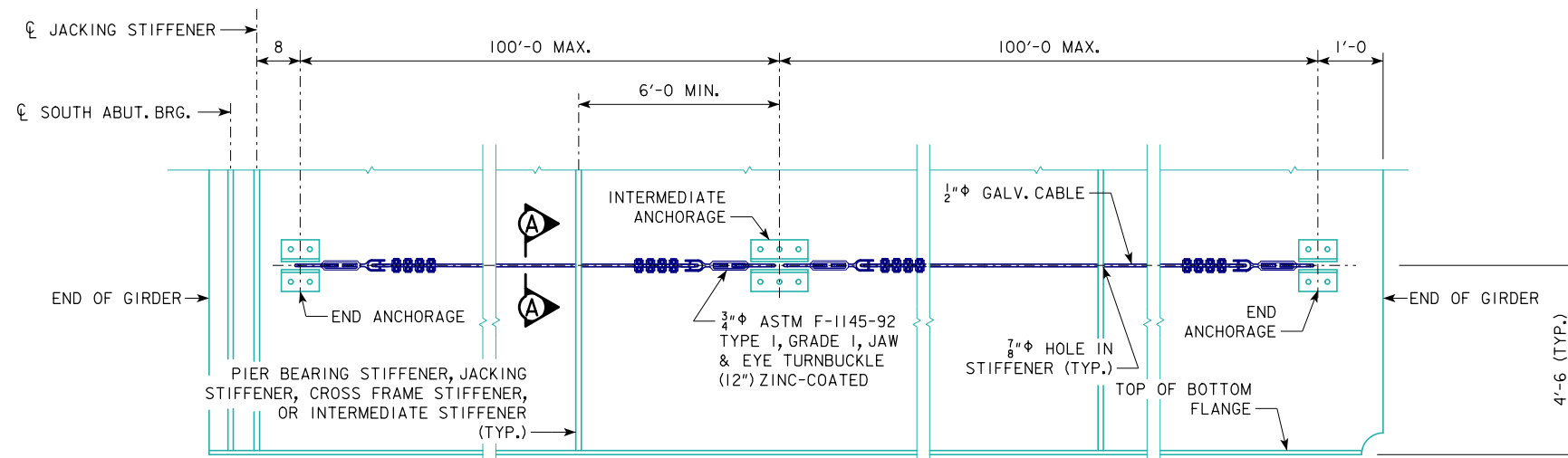
TYPICAL INSPECTION CABLE ELEVATION - UNIT 1 (GIRDERS A, E, F & H)



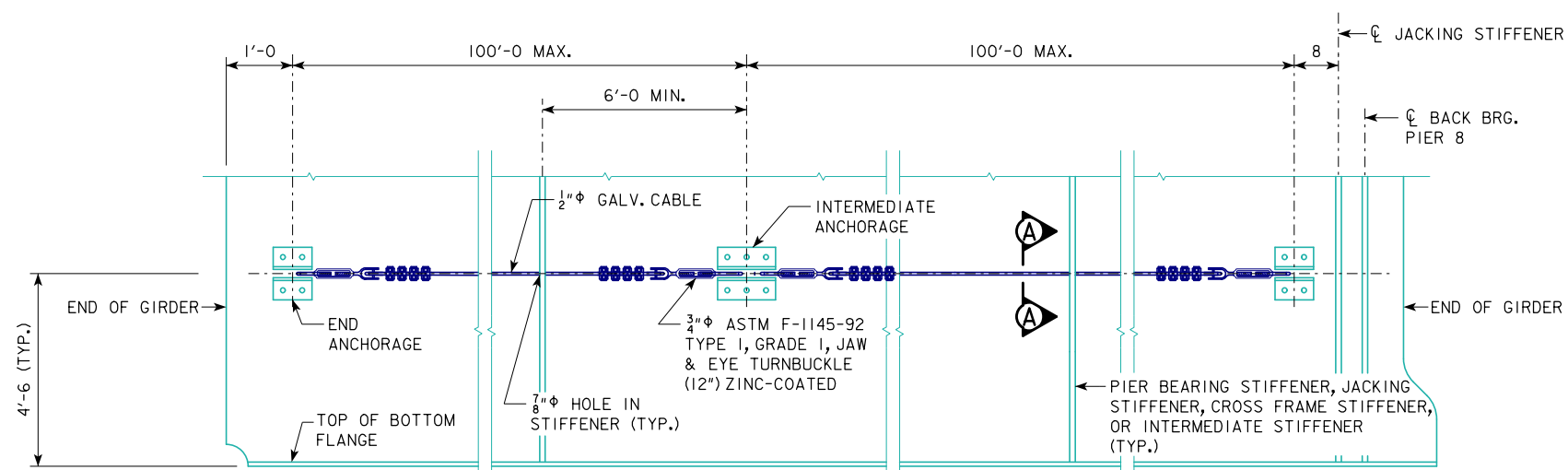
TYPICAL INSPECTION CABLE ELEVATION - UNIT 2 (GIRDERS A, E, F, & H)

NOTES:
 FOR GIRDER DETAILS, SEE GIRDER ELEVATION SHEETS.
 FOR STIFFENER DETAILS, SEE MISC. SUPERSTRUCTURE DETAILS SHEETS.
 FOR ADDITIONAL NOTES, SEE DESIGN SHEET 81.
 FOR INSPECTION CABLE ANCHORAGE DETAILS AND NOTES, SEE DESIGN SHEET 84.
 FOR SECTION A-A, SEE DESIGN SHEET 84.





TYPICAL INSPECTION CABLE ELEVATION - UNIT 1 (GIRDERS B, C & D)

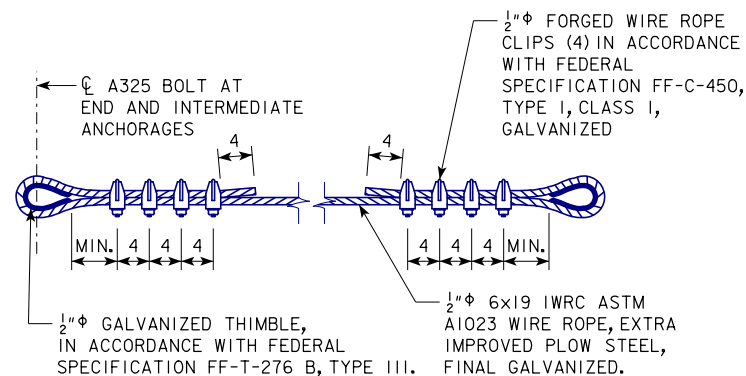


TYPICAL INSPECTION CABLE ELEVATION - UNIT 2 (GIRDER G)

NOTES:
 FOR GIRDER DETAILS, SEE GIRDER ELEVATION SHEETS.
 FOR STIFFENER DETAILS, SEE MISC. SUPERSTRUCTURE DETAILS SHEETS.
 FOR ADDITIONAL NOTES, SEE DESIGN SHEET 81.
 FOR INSPECTION CABLE ANCHORAGE DETAILS AND NOTES, SEE DESIGN SHEET 84.
 FOR SECTION A-A, SEE DESIGN SHEET 84.

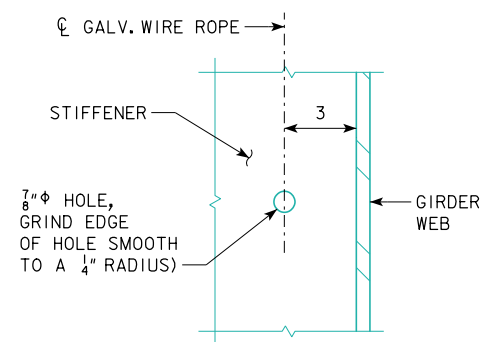


DESIGN FOR 0° SKEW
1419'-0" x VARIES CONTINUOUS WELDED GIRDER BRIDGE
 UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
INSPECTION CABLE DETAILS
 STA. 3546+14.50 (RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 83 OF 121 FILE NO. 30170 DESIGN NO. 1320

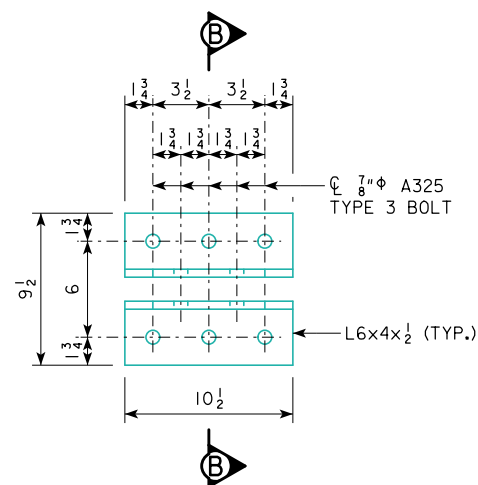


NOTE: WIRE ROPE CLIPS TO BE TIGHTENED TO 65 FT-LBS OF TORQUE.

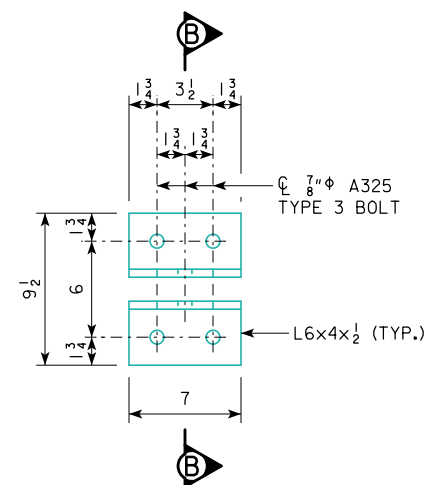
TYPICAL CABLE ASSEMBLY



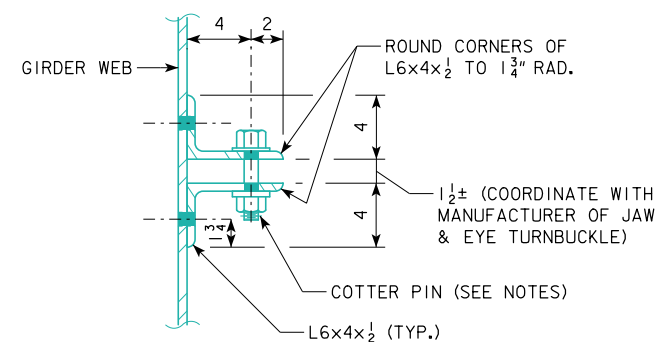
SECTION A-A



TYPICAL INTERMEDIATE ANCHORAGE



TYPICAL END ANCHORAGE



SECTION B-B

INSPECTION CABLE NOTES:

INSPECTION CABLE SHALL BE $\frac{1}{2}$ " ϕ 6x19 IWRC ASTM A1023 WIRE ROPE, EXTRA IMPROVED PLOW STEEL, FINAL GALVANIZED.

INSPECTION CABLE IS TO BE INSTALLED ON THE INTERIOR FACE OF THE FASCIA GIRDERS AND ON EACH FACE OF THE INTERIOR GIRDERS, AS SHOWN ON DESIGN SHEET 81.

ANCHORAGES AND INTERMEDIATE SUPPORT ANGLES SHALL BE WEATHERING STEEL, CONFORMING TO ASTM A709 GRADE 50W.

PROVIDE ONE TURNBUCKLE FOR EACH LENGTH OF CABLE. CABLES SHALL BE TIGHTENED TO REMOVE SLACK. TOLERANCE SHALL BE $\frac{1}{2}$ INCH MAXIMUM SAG AT MIDPOINT BETWEEN SUPPORTS WITH NO VERTICAL LOAD OTHER THAN THE SELF-WEIGHT OF THE CABLE SYSTEM. BOLTS CONNECTING CABLES OR TURNBUCKLES TO ANCHORAGES SHALL BE SNUG-TIGHT SO AS NOT TO DAMAGE THIMBLES, TURNBUCKLES OR CABLE. COTTER PIN MAY BE SUBSTITUTED WITH A LOCK NUT OR DOUBLE NUT.

THE INSPECTION CABLE SYSTEM IS DESIGNED TO BE USED TO PROVIDE FALL PROTECTION FOR A MAXIMUM OF TWO WORKERS BETWEEN ANCHORAGES. WEIGHT OF ONE WORKER, INCLUDING TOOLS AND EQUIPMENT, SHALL NOT EXCEED 310 LBS. WORKERS SHALL BE CONNECTED TO THE INSPECTION CABLE BY PERSONAL FALL PROTECTION EQUIPMENT THAT LIMITS THE MAXIMUM ARRESTING FORCE TO 900 LBS. THE TOTAL ALLOWABLE ARRESTING FORCE IS 1800 LBS.

THE COST OF FURNISHING AND INSTALLING THE INSPECTION CABLE SYSTEM SHALL BE INCLUDED WITH THE PRICE BID FOR "STRUCTURAL STEEL". METHOD OF MEASUREMENT AND BASIS OF PAYMENT SHALL BE IN ACCORDANCE WITH SECTIONS 2408.04C AND 2408.05C OF THE STANDARD SPECIFICATIONS RESPECTIVELY.

INSPECTION CABLE SYSTEM SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 2408 OF THE STANDARD SPECIFICATIONS.

ALL HOLES FOR $\frac{7}{8}$ " ϕ BOLTS SHALL BE $\frac{15}{16}$ " ϕ UNLESS OTHERWISE NOTED.

NOTES:
FOR ADDITIONAL NOTES, SEE DESIGN SHEETS 81 THRU 83.
FOR LOCATIONS OF SECTION A-A AND INSPECTION CABLE ANCHORAGES, SEE DESIGN SHEETS 82 AND 83.



DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

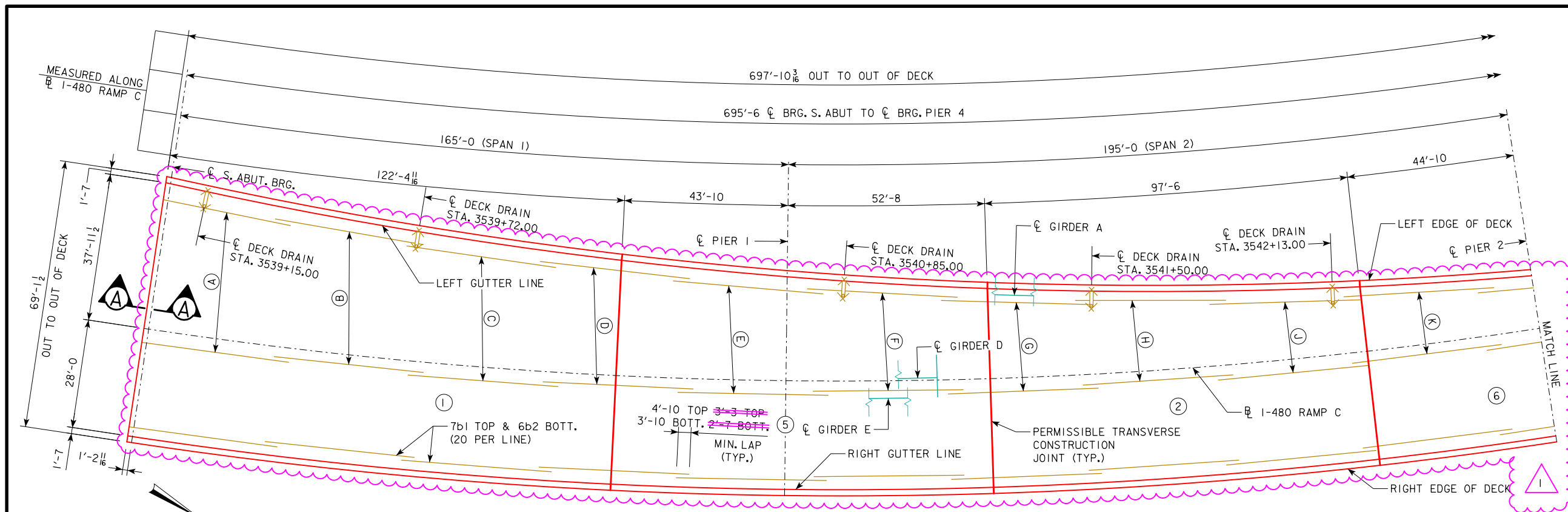
INSPECTION CABLE DETAILS

STA. 3546+14.50 (R 1-480 RAMP C) NOVEMBER, 2020

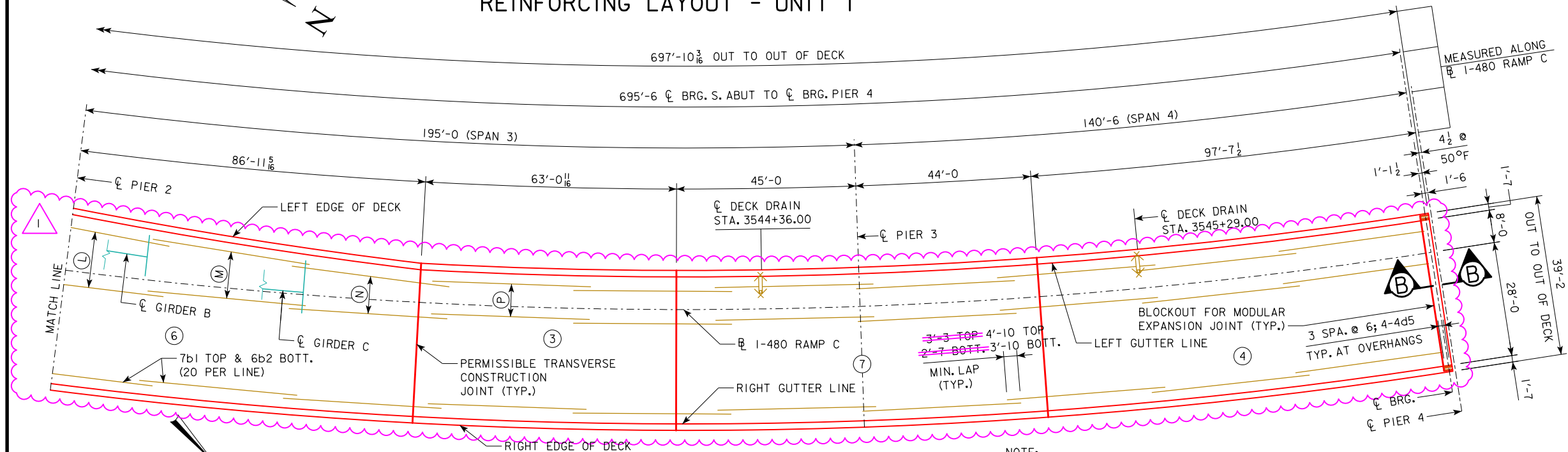
POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 84 OF 121 FILE NO. 30170 DESIGN NO. 1320



CONCRETE PLACEMENT DIAGRAM AND LONGITUDINAL
REINFORCING LAYOUT - UNIT 1



CONCRETE PLACEMENT DIAGRAM AND LONGITUDINAL
REINFORCING LAYOUT - UNIT 1

REVISED: 05-06-2022 UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED COLOR OF REINFORCEMENT AND LAP LENGTHS.

REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.

DECK REINFORCING

REGION	GIRDER BAY	NO. OF BARS TOP	NO. OF BARS BOTT
A	A-B	11	10
	B-C	11	10
	C-D	11	10
	D-E	12	11
B	A-B	11	10
	B-C	11	10
	C-D	11	10
	D-E	10	9
C	A-B	11	10
	B-C	11	10
	C-D	11	10
	D-E	8	7
D	A-B	11	10
	B-C	11	10
	C-D	10	9
	D-E	7	6
E	A-B	11	10
	B-C	11	10
	C-D	9	8
	D-E	6	5
F	A-B	10	9
	B-C	10	9
	C-D	7	6
	D-E	6	5
G	A-B	10	9
	B-C	10	9
	C-E	11	10
H	A-B	9	8
	B-C	9	8
	C-E	10	9
J	A-B	9	8
	B-C	8	7
	C-E	9	8
K	A-B	8	7
	B-C	7	6
	C-E	8	7
L	A-B	7	6
	B-C	7	6
	C-E	8	7
M	A-C	11	10
	C-E	6	5
N	A-C	9	8
	C-E	6	5
P	A-E	12	11

NOTE:
FOR CONCRETE PLACEMENT QUANTITIES, SEE DESIGN SHEET 87.
ALL DIMENSIONS SHOWN ARE MEASURED IN A HORIZONTAL PLANE UNLESS NOTED OTHERWISE.
FOR PERMISSIBLE TRANSVERSE CONST. JOINT DETAILS, SEE DESIGN SHEET 89.
FOR SECTION A-A & B-B, SEE DESIGN SHEET 86.

NOTE:
CONCRETE DECK SHALL BE PLACED IN SECTIONS AND SEQUENCES INDICATED. ALTERNATE PROCEDURES FOR PLACING DECK CONCRETE MAY BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF THE PROPOSED METHOD AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULTS. THE BRIDGE ENGINEER SHALL REVIEW ANY ALTERNATE PROCEDURES. THE COST OF ANY ADDITIONAL ANALYSIS AND PLAN MODIFICATIONS SHALL BE PAID FOR BY THE CONTRACTOR. THE ENGINEER SHALL DETERMINE IF A RETARDING ADMIXTURE IS REQUIRED TO MAINTAIN PLASTICITY OF THE CONCRETE DECK DURING PLACEMENT.
THERE SHALL BE A 2-DAY WAITING PERIOD BETWEEN SUBSEQUENT POURS AND CONCRETE SHOULD HAVE REACHED A STRENGTH OF 0.75f'c.

DESIGN FOR 0° SKEW
1419'-0" x VARIES CONTINUOUS WELDED GIRDER BRIDGE
UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
DECK PLAN AND REINFORCING - UNIT 1
STA. 3546+14.50 (CL I-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 85 OF 121 FILE NO. 30170 DESIGN NO. 1320



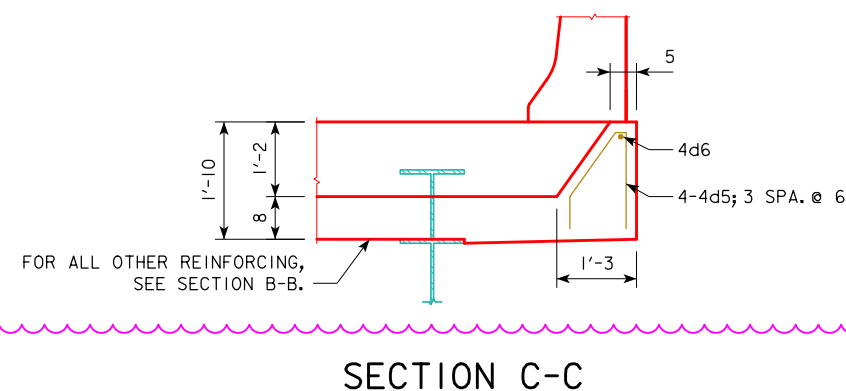
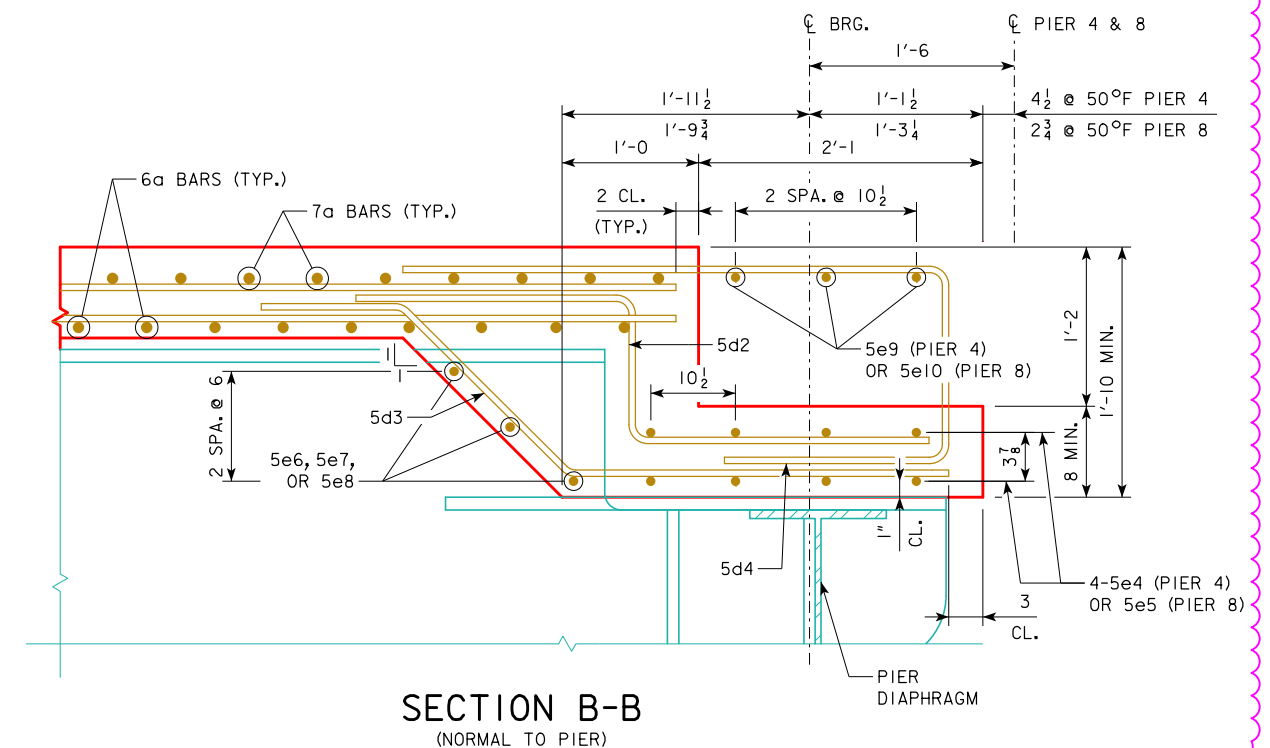
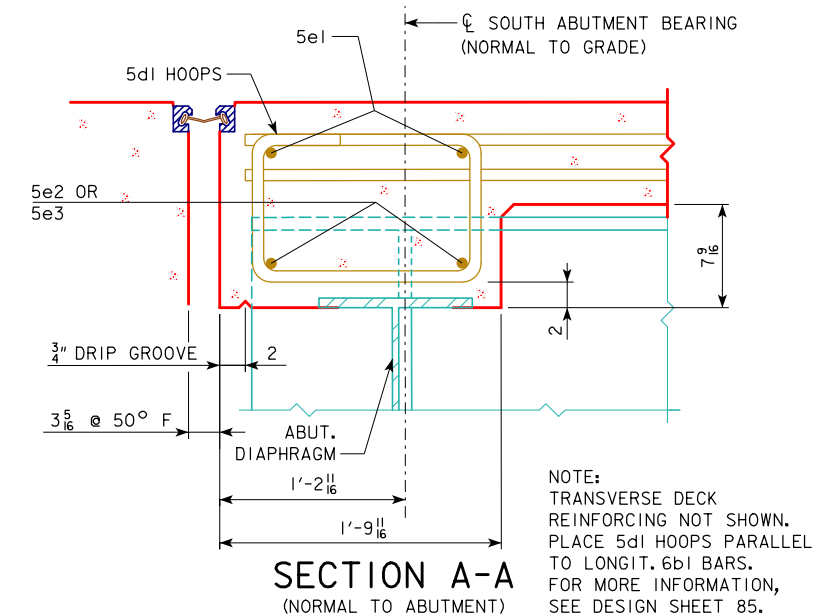
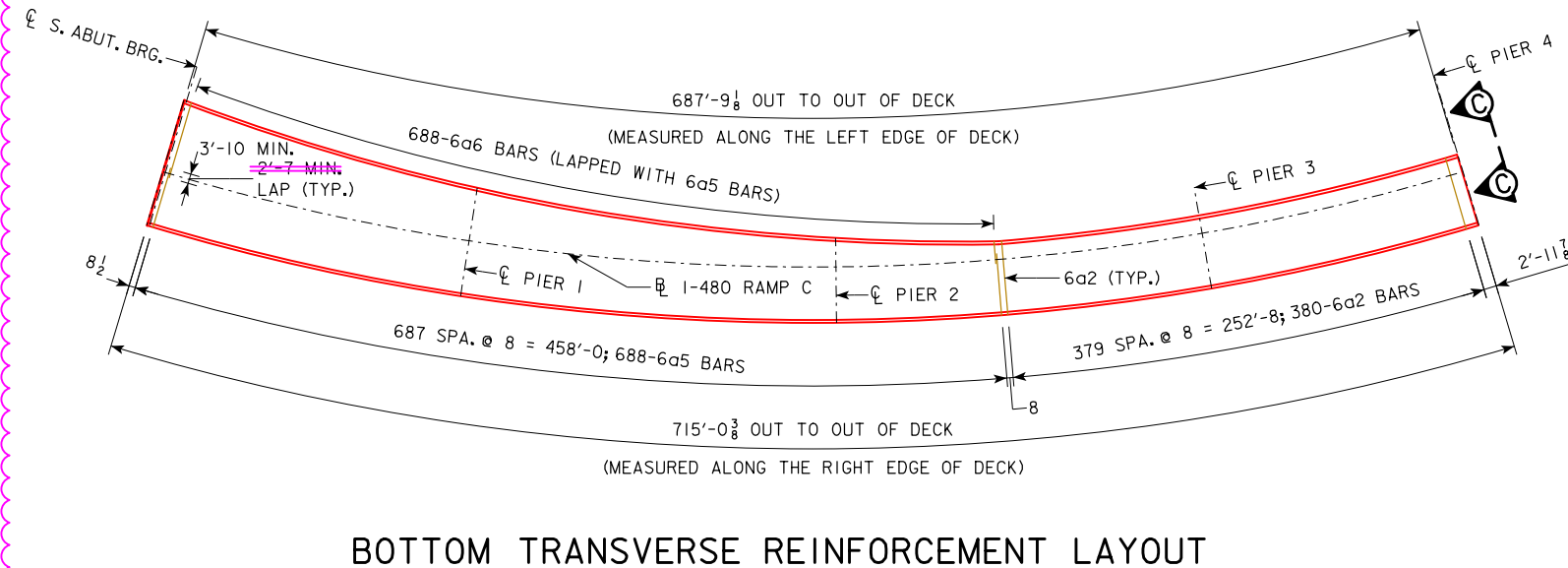
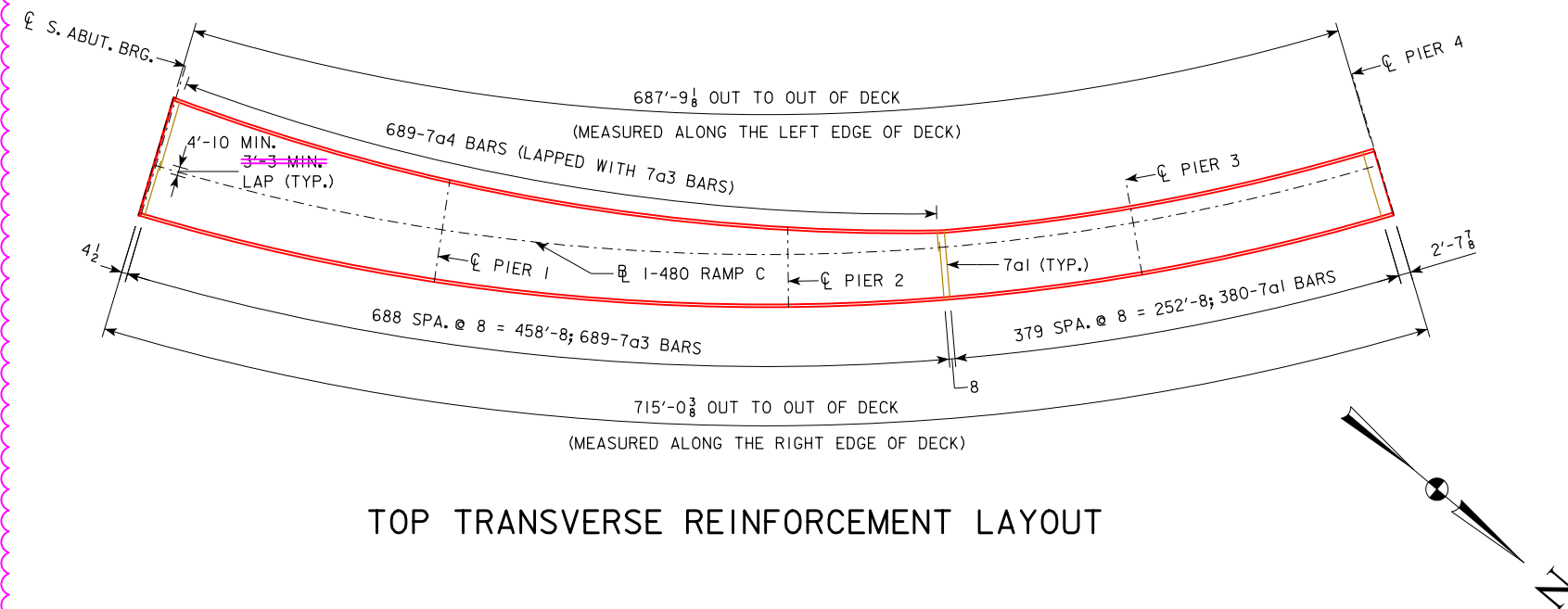
DESIGN TEAM HR GREEN, INC.

POTTAWATTAMIE COUNTY

PROJECT NUMBER IM-029-3(192)54--13-78

SHEET NUMBER 86

REVISED: MAY 6, 2022



REVISED: 05-06-2022 UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED COLOR OF REINFORCEMENT AND LAP LENGTHS.

REASON: CHANGE MADE IN THE BEST INTEREST
OF THE PUBLIC TO KEEP THE PROJECT ON
SCHEDULE AND AVOID SIGNIFICANT DELAYS IN
PROJECT COMPLETION.

NOTE:
FOR LOCATION OF SECTION A-A,
SEE DESIGN SHEET 85.

FOR LOCATIONS OF SECTION B-B,
SEE DESIGN SHEETS 85 AND 88.

NOTE:
PLACE 5d1, 5d2 & 5d3 BARS PARALLEL TO LONGIT. 6b1 BARS. FOR
MORE INFORMATION, SEE DESIGN SHEET 85.

TRANSVERSE REINFORCEMENT IS PLACED PERPENDICULAR TO THE BASELINE.

DESIGN FOR 0° SKEW

1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"

DECK PLAN AND REINFORCING - UNIT 1

STA. 3546+14.50 (ELEV. 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

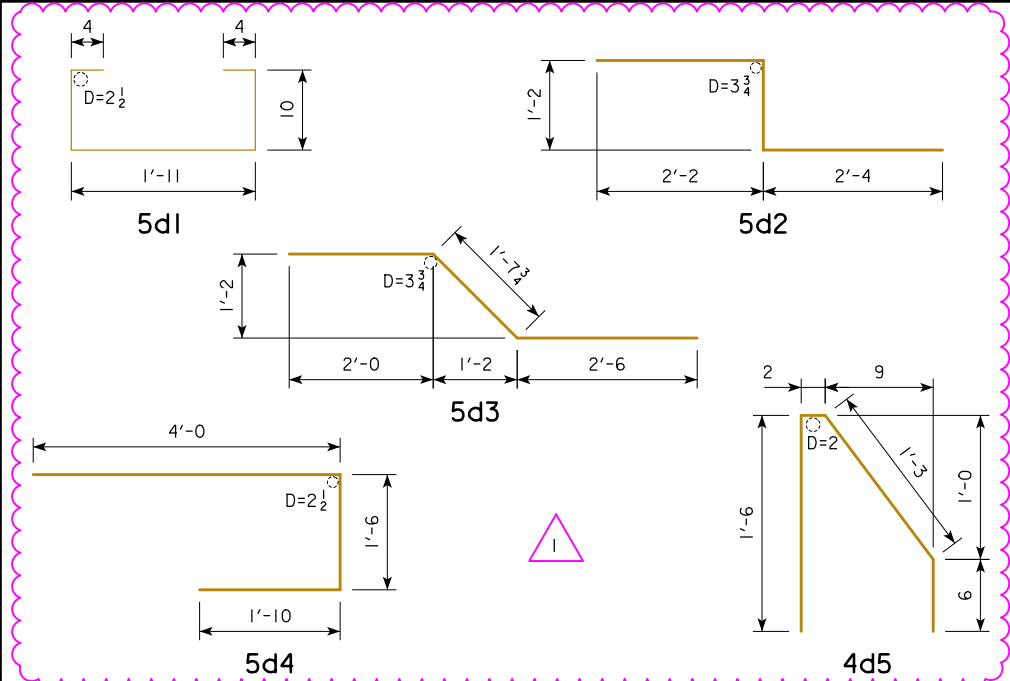
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 86 OF 121 FILE NO. 30170 DESIGN NO. 1320

REVISÉ: MAY 6, 2022



BENT BAR DETAILS



VARYING BAR LENGTHS		
BAR	MIN.	MAX.
7a4	11'-4	41'-3
6a6	11'-4	41'-2

BAR LIST - SUPERSTRUCTURE (UNIT 1)

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
7a1	DECK, TRANSV. TOP		380	38'-10	30,163
6a2	DECK, TRANSV. BOTTOM		380	38'-10	22,165
7a3	DECK, TRANSV. TOP		689	30'-10	43,423
7a4	DECK, TRANSV. TOP		689	VARIES	37,027
6a5	DECK, TRANSV. BOTTOM		688	30'-2	31,174
6a6	DECK, TRANSV. BOTTOM		688	VARIES	27,126
5a7	DECK AT DRAINS		28	3'-0	88
				40'-4	95,962
7b1	DECK, LONGIT. TOP		1164	38'-9	92,195
6b2	DECK, LONGIT. BOTTOM		994	38'-1	56,858
				39'-4	58,724
5d1	ABUTMENT DIAPHRAGM, HOOPS		57	4'-3	253
5d2	DECK AT BLOCKOUT, STIRRUPS		27	5'-8	160
5d3	DECK AT BLOCKOUT, STIRRUPS		27	6'-2	174
5d4	EXPANSION JOINT BLOCKOUT, STIRRUPS		27	7'-4	207
4d5	END DAM DIAPHRAGM		8	3'-5	18
4d6	END DAM DIAPHRAGM		2	4'-6	6
5e1	END DAM DIAPHRAGM, LONGIT. TOP		4	36'-7	153
5e2	END DAM DIAPHRAGM, LONGIT. BOTTOM		6	10'-8	67
5e3	END DAM DIAPHRAGM, LONGIT. BOTTOM		6	9'-9	61
5e4	DECK AT BLOCKOUT, TRANSV. TOP & BOTTOM		8	38'-10	324
5e6	DECK AT BLOCKOUT, TRANSV. TOP & BOTTOM		9	10'-8	100
5e8	DECK AT BLOCKOUT, TRANSV. TOP & BOTTOM		6	2'-9	17
5e9	EXPANSION JOINT BLOCKOUT, TRANSV. TOP		3	38'-10	122
					351,035
REINFORCING STEEL STAINLESS STEEL - TOTAL (LBS.)					341,881
EPOXY-COATED					

EPOXY-COATED STAINLESS BARS

CONC. PLACEMENT QUANTITIES

LOCATION	QUANTITY
SECTION 1, DECK & END DAM	209.8
SECTION 2, DECK	131.1
SECTION 3, DECK	65.7
SECTION 4, DECK & END DAM	104.7
SECTION 5, DECK	145.3
SECTION 6, DECK	151.3
SECTION 7, DECK	92.5
TOTAL (CU. YDS.)	900.4

NOTE:
CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED ON THE SUMMARY QUANTITIES SHEET.

REVISED: 05-06-2022 UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED REINFORCING STEEL QUANTITIES AND COLOR OF REINFORCEMENT.

REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.

DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

DECK REINF. BAR LIST & QUANT. - UNIT 1

STA. 3546+14.50 (R 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

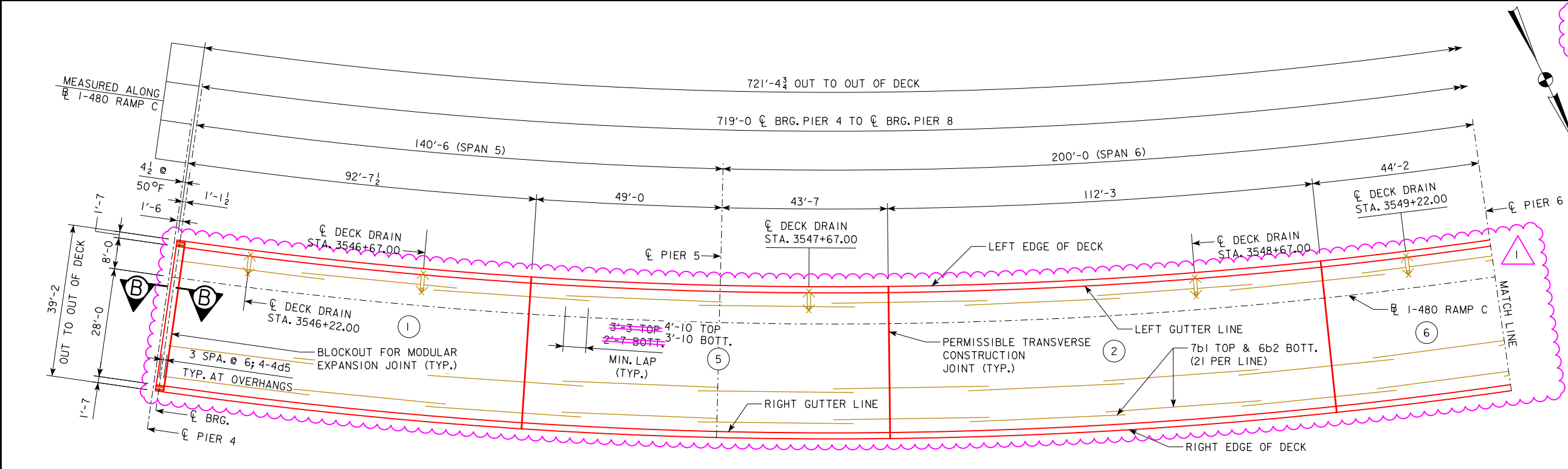
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 87 OF 121 FILE NO. 30170 DESIGN NO. 1320

REVISED: MAY 6, 2022

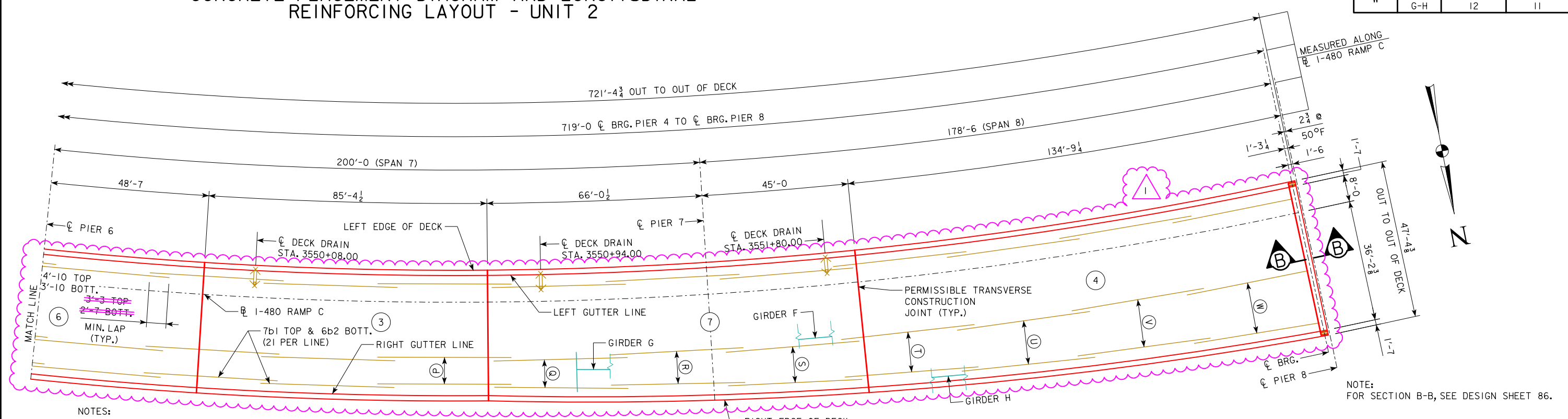
REVISD: 05-06-2022 UPDATED
DECK AND BARRIER RAIL
REINFORCEMENT TO BE EPOXY
COATED, EXCEPT BARRIER TO
DECK/WING CONNECTIONS. CHANGED
COLOR OF REINFORCEMENT AND
LAP LENGTHS.

REASON: CHANGE MADE IN THE
BEST INTEREST OF THE PUBLIC
TO KEEP THE PROJECT ON
SCHEDULE AND AVOID SIGNIFICANT
DELAYS IN PROJECT COMPLETION.



DECK REINFORCING			
REGION	GIRDER BAY	NO. OF BARS TOP	NO. OF BARS BOTT
P	F-H	13	12
Q	F-G	7	6
	G-H	8	7
R	F-G	8	7
	G-H	8	7
S	F-G	9	8
	G-H	8	7
T	F-G	9	8
	G-H	9	8
U	F-G	9	8
	G-H	10	9
V	F-G	9	8
	G-H	11	10
W	F-G	9	8
	G-H	12	11

CONCRETE PLACEMENT DIAGRAM AND LONGITUDINAL
REINFORCING LAYOUT - UNIT 2

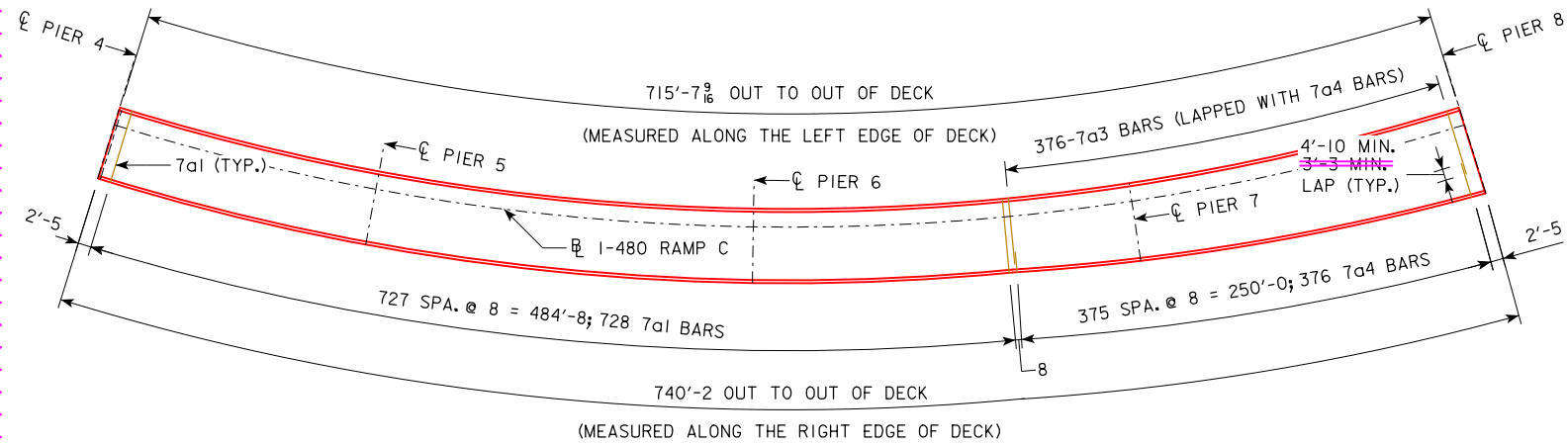


NOTES:
CONCRETE DECK SHALL BE PLACED IN SECTIONS AND SEQUENCES INDICATED. ALTERNATE PROCEDURES FOR PLACING DECK CONCRETE MAY BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF THE PROPOSED METHOD AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULTS. THE BRIDGE ENGINEER SHALL REVIEW ANY ALTERNATE PROCEDURES. THE COST OF ANY ADDITIONAL ANALYSIS AND PLAN MODIFICATIONS SHALL BE PAID FOR BY THE CONTRACTOR. THE ENGINEER SHALL DETERMINE IF A RETARDING ADMIXTURE IS REQUIRED TO MAINTAIN PLASTICITY OF THE CONCRETE DECK DURING PLACEMENT.
THERE SHALL BE A 2-DAY WAITING PERIOD BETWEEN SUBSEQUENT POURS AND CONCRETE SHOULD HAVE REACHED A STRENGTH OF 0.75f'c.
FOR CONCRETE PLACEMENT QUANTITIES, SEE DESIGN SHEET 90.
ALL DIMENSIONS SHOWN ARE MEASURED IN A HORIZONTAL PLANE UNLESS NOTED OTHERWISE.
FOR PERMISSIBLE TRANSVERSE CONST. JOINT DETAIL, SEE DESIGN SHEET 89.

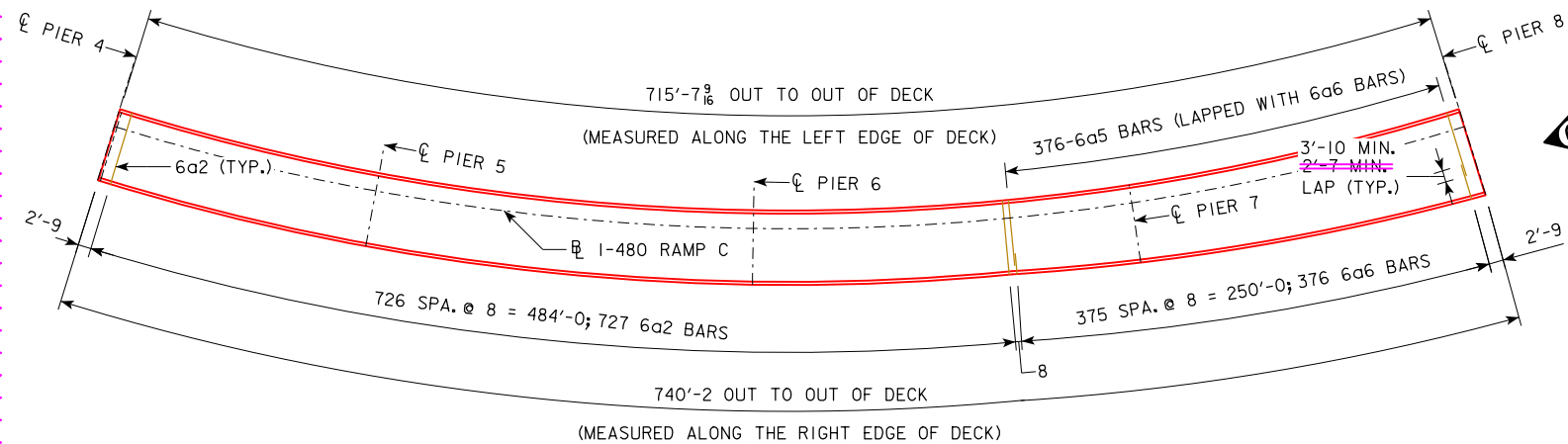
CONCRETE PLACEMENT DIAGRAM AND LONGITUDINAL
REINFORCING LAYOUT - UNIT 2

DESIGN FOR 0° SKEW
**1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE**
UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
DECK PLAN AND REINFORCING - UNIT 2
STA. 3546+14.50 (I-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 88 OF 121 FILE NO. 30170 DESIGN NO. 1320

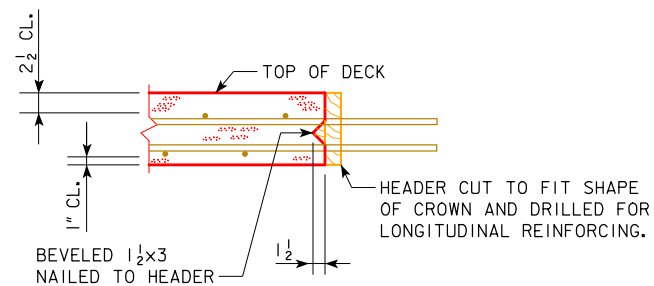
REVISED: MAY 6, 2022



TOP TRANSVERSE REINFORCEMENT LAYOUT



BOTTOM TRANSVERSE REINFORCEMENT LAYOUT



PERMISSIBLE TRANSVERSE DECK CONSTRUCTION JOINT



REVISED: 05-06-2022 UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED COLOR OF REINFORCEMENT AND LAP LENGTHS.

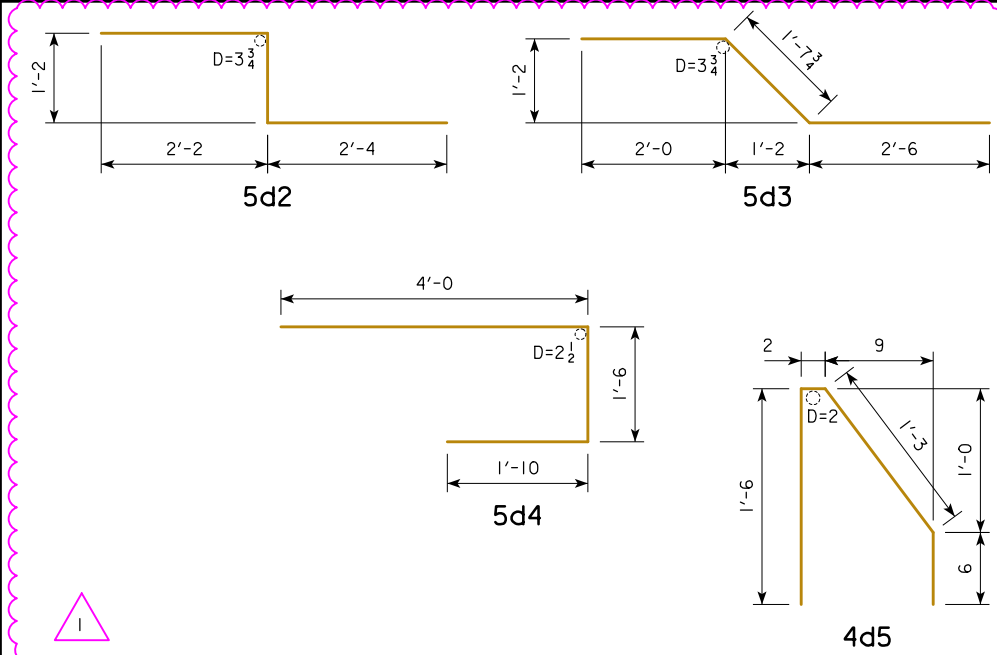
REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.

NOTE:
FOR SECTION C-C, SEE DESIGN SHEET 86.

DESIGN FOR 0° SKEW
1419'-0 x VARIES CONTINUOUS WELDED GIRDER BRIDGE
UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0
DECK PLAN AND REINFORCING - UNIT 2
STA. 3546+14.50 (RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 89 OF 121 FILE NO. 30170 DESIGN NO. 1320

REVISED: MAY 6, 2022

BENT BAR DETAILS



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

VARYING BAR LENGTHS

BAR	MIN.	MAX.
7a4	10'-4	18'-5
6a6	10'-4	18'-5

BAR LIST - SUPERSTRUCTURE (UNIT 2)

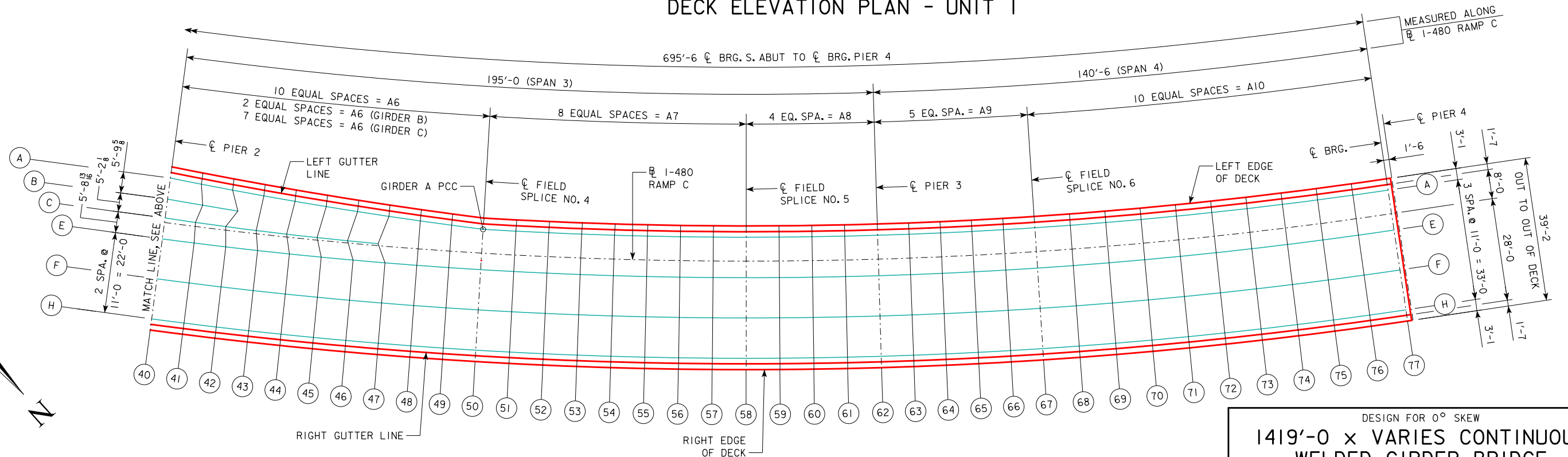
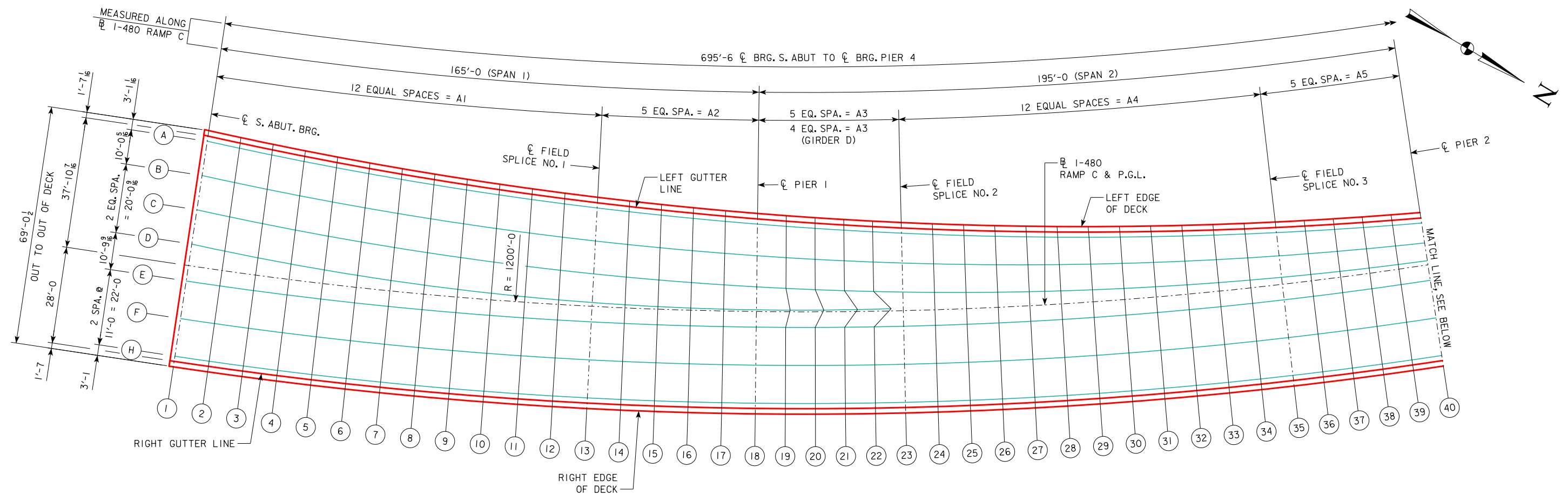
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
7a1	DECK, TRANSV. TOP		728	38'-10	57,785
6a2	DECK, TRANSV. BOTTOM		727	38'-10	42,404
7a3	DECK, TRANSV. TOP		376	33'-5	25,682
7a4	DECK, TRANSV. TOP		376	VARIES	11,048
6a5	DECK, TRANSV. BOTTOM		376	32'-5	18,307
6a6	DECK, TRANSV. BOTTOM		376	VARIES	8,118
5a7	DECK AT DRAINS		32	3'-0	100
				39'-9	81,980
7b1	DECK, LONGIT. TOP		1009	38'-2	78,715
6b2	DECK, LONGIT. BOTTOM		855	37'-6	48,158
				38'-9	49,763
5d2	DECK AT BLOCKOUT, STIRRUPS		60	5'-8	355
5d3	DECK AT BLOCKOUT, STIRRUPS		60	6'-2	386
5d4	EXPANSION JOINT BLOCKOUT, STIRRUPS		60	7'-4	459
4d5	END DAM DIAPHRAGM		16	3'-5	37
4d6	END DAM DIAPHRAGM		4	4'-6	12
5e4	DECK AT BLOCKOUT, TRANSV. TOP & BOTTOM		8	38'-10	324
5e5	DECK AT BLOCKOUT, TRANSV. TOP & BOTTOM		8	47'-1	393
5e6	DECK AT BLOCKOUT, TRANSV. TOP & BOTTOM		18	10'-8	200
5e7	DECK AT BLOCKOUT, TRANSV. TOP & BOTTOM		3	7'-10	25
5e8	DECK AT BLOCKOUT, TRANSV. TOP & BOTTOM		12	2'-9	34
5e9	EXPANSION JOINT BLOCKOUT, TRANSV. TOP		3	38'-10	122
5e10	EXPANSION JOINT BLOCKOUT, TRANSV. TOP		3	47'-1	147
					297,681
REINFORCING STEEL - STAINLESS STEEL - TOTAL (LBS.)					290,888
EPOXY-COATED					

CONC. PLACEMENT QUANTITIES

LOCATION	QUANTITY
SECTION 1, DECK & END DAM	98.7
SECTION 2, DECK	116.0
SECTION 3, DECK	88.3
SECTION 4, DECK & END DAM	163.8
SECTION 5, DECK	95.7
SECTION 6, DECK	95.7
SECTION 7, DECK	120.0
TOTAL (CU. YDS.)	778.2

NOTE:
CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED
ON THE SUMMARY QUANTITIES SHEET.





NOTE:
THE NUMBERED POINTS ARE EQUALLY SPACED
ALONG EACH LINE OF INTEREST AND BETWEEN
THE FIELD SPLICE AND PIER LOCATION
SHOWN.



FOR SEGMENT LENGTH DIMENSIONS, SEE
DESIGN SHEET 50.

DESIGN FOR 0° SKEW

1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"

DECK ELEVATIONS - UNIT 1

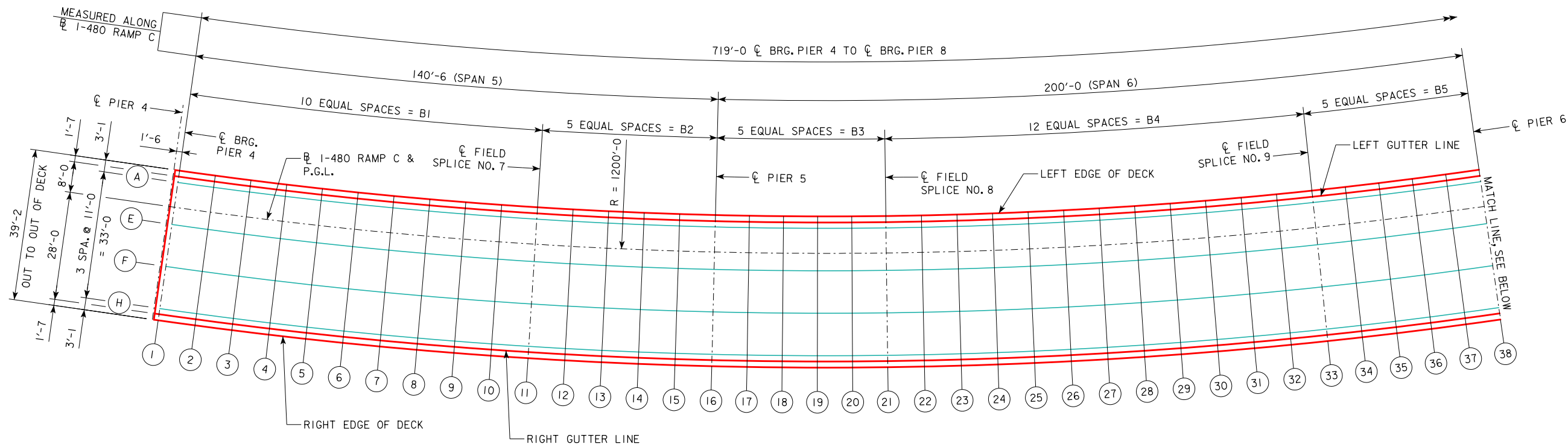
STA. 3546+14.50 (R) 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

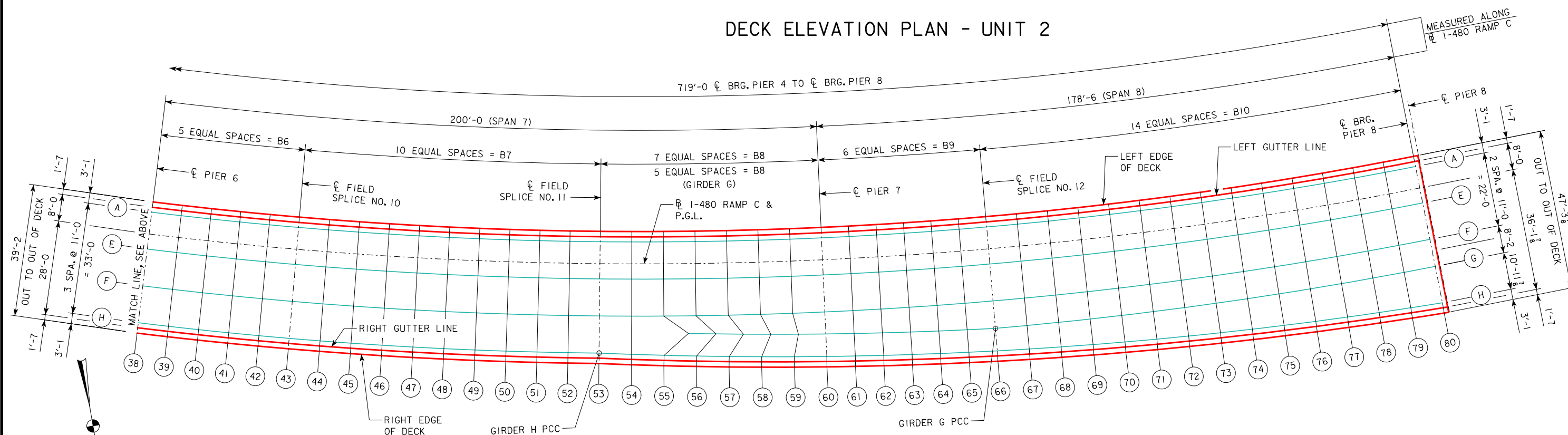
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 91 OF 121 FILE NO. 30170 DESIGN NO. 1320

BENCH MARK NO. 563 STA. 540+68.14, 75.977' LT. CUT X NE HNDRL. I-29 SB BRIDGE OVER 2ND AVE. ELEV. 1003.120																														
TABLE OF TOP OF DECK ELEVATIONS (UNIT 1)																														
LOCATION	☐ SOUTH ABUT. BRG.	SPAN 1												☐ F.S. NO. 1	SPAN 1					☐ PIER 1	SPAN 2					☐ F.S. NO. 2	SPAN 2			
	LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6	LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12	LINE 13	LINE 14	LINE 15	LINE 16	LINE 17	LINE 18	LINE 19	LINE 20	LINE 21	LINE 22	LINE 23	LINE 24	LINE 25	LINE 26				
LEFT EDGE OF DECK	999.12	999.46	999.80	1000.15	1000.51	1000.87	1001.25	1001.64	1002.03	1002.42	1002.82	1003.21	1003.60	1003.98	1004.36	1004.75	1005.13	1005.51	1005.85	1006.19	1006.54	1006.88	1007.22	1007.59	1007.96	1008.32				
LEFT GUTTER LINE	999.12	999.46	999.80	1000.15	1000.51	1000.87	1001.25	1001.64	1002.03	1002.42	1002.82	1003.21	1003.60	1003.98	1004.36	1004.75	1005.13	1005.51	1005.85	1006.19	1006.54	1006.88	1007.22	1007.59	1007.96	1008.32				
GIRDER A	999.20	999.53	999.87	1000.22	1000.58	1000.95	1001.33	1001.71	1002.11	1002.50	1002.89	1003.28	1003.67	1004.06	1004.44	1004.82	1005.20	1005.59	1005.93	1006.27	1006.61	1006.95	1007.29	1007.66	1008.03	1008.40				
GIRDER B	999.70	1000.03	1000.37	1000.72	1001.08	1001.45	1001.82	1002.21	1002.60	1002.99	1003.38	1003.76	1004.15	1004.53	1004.91	1005.29	1005.67	1006.04	1006.38	1006.72	1007.05	1007.39	1007.72	1008.09	1008.45	1008.81				
GIRDER C	1000.20	1000.53	1000.87	1001.22	1001.58	1001.94	1002.32	1002.70	1003.09	1003.47	1003.86	1004.24	1004.63	1005.00	1005.38	1005.75	1006.12	1006.49	1006.82	1007.16	1007.49	1007.82	1008.14	1008.50	1008.85	1009.21				
GIRDER D	1000.70	1001.03	1001.37	1001.71	1002.07	1002.43	1002.79	1003.17	1003.55	1003.92	1004.30	1004.67	1005.04	1005.40	1005.76	1006.12	1006.47	1006.83	1007.19	1007.54	1007.90	1008.25	-	-	-	-				
PROFILE GRADE LINE	1001.02	1001.32	1001.62	1001.94	1002.26	1002.60	1002.94	1003.30	1003.66	1004.02	1004.38	1004.74	1005.10	1005.45	1005.80	1006.15	1006.50	1006.85	1007.16	1007.48	1007.79	1008.10	1008.41	1008.75	1009.09	1009.43				
GIRDER E	1001.24	1001.54	1001.85	1002.16	1002.49	1002.82	1003.17	1003.52	1003.88	1004.24	1004.60	1004.96	1005.32	1005.67	1006.02	1006.37	1006.72	1007.07	1007.39	1007.70	1008.01	1008.33	1008.64	1008.98	1009.31	1009.65				
GIRDER F	1001.79	1002.09	1002.40	1002.71	1003.04	1003.37	1003.72	1004.07	1004.43	1004.79	1005.15	1005.51	1005.87	1006.22	1006.57	1006.92	1007.27	1007.62	1007.94	1008.25	1008.56	1008.88	1009.19	1009.53	1009.86	1010.20				
GIRDER H	1002.34	1002.64	1002.95	1003.26	1003.59	1003.92	1004.27	1004.62	1004.98	1005.34	1005.70	1006.06	1006.42	1006.77	1007.12	1007.47	1007.82	1008.17	1008.49	1008.80	1009.11	1009.43	1009.74	1010.08	1010.41	1010.75				
RIGHT GUTTER LINE	1002.42	1002.72	1003.02	1003.34	1003.66	1004.00	1004.34	1004.70	1005.06	1005.42	1005.78	1006.14	1006.50	1006.85	1007.20	1007.55	1007.90	1008.25	1008.56	1008.88	1009.19	1009.50	1009.81	1010.15	1010.49	1010.83				
RIGHT EDGE OF DECK	1002.50	1002.79	1003.10	1003.42	1003.74	1004.08	1004.42	1004.78	1005.14	1005.50	1005.86	1006.22	1006.58	1006.93	1007.28	1007.63	1007.98	1008.33	1008.64	1008.95	1009.27	1009.58	1009.89	1010.23	1010.57	1010.90				
LOCATION	SPAN 2									☐ F.S. NO. 3	SPAN 2				☐ PIER 2	SPAN 3									☐ F.S. NO. 4	SPAN 3				
	LINE 27	LINE 28	LINE 29	LINE 30	LINE 31	LINE 32	LINE 33	LINE 34	LINE 35	LINE 36	LINE 37	LINE 38	LINE 39	LINE 40	LINE 41	LINE 42	LINE 43	LINE 44	LINE 45	LINE 46	LINE 47	LINE 48	LINE 49	LINE 50	LINE 51	LINE 52				
LEFT EDGE OF DECK	1008.69	1009.06	1009.43	1009.80	1010.17	1010.53	1010.90	1011.27	1011.63	1011.98	1012.32	1012.66	1013.00	1013.34	1013.69	1014.04	1014.39	1014.74	1015.09	1015.43	1015.78	1016.13	1016.48	1016.83	1017.16	1017.49				
LEFT GUTTER LINE	1008.69	1009.06	1009.43	1009.80	1010.17	1010.53	1010.90	1011.27	1011.63	1011.98	1012.32	1012.66	1013.00	1013.34	1013.69	1014.04	1014.39	1014.74	1015.09	1015.43	1015.78	1016.13	1016.48	1016.83	1017.16	1017.49				
GIRDER A	1008.77	1009.14	1009.51	1009.87	1010.24	1010.61	1010.98	1011.34	1011.71	1012.05	1012.39	1012.73	1013.07	1013.42	1013.76	1014.11	1014.46	1014.81	1015.16	1015.51	1015.85	1016.20	1016.55	1016.90	1017.23	1017.56				
GIRDER B	1009.17	1009.53	1009.89	1010.25	1010.61	1010.97	1011.33	1011.69	1012.05	1012.38	1012.71	1013.04	1013.37	1013.71	1014.08	1014.46	-	-	-	-	-	-	-	-	-	-				
GIRDER C	1009.56	1009.91	1010.26	1010.62	1010.97	1011.31	1011.66	1012.01	1012.36	1012.68	1013.00	1013.32	1013.64	1013.96	1014.28	1014.59	1014.90	1015.22	1015.53	1015.84	1016.15	-	-	-	-	-				
GIRDER D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
PROFILE GRADE LINE	1009.76	1010.10	1010.44	1010.78	1011.11	1011.45	1011.79	1012.12	1012.46	1012.77	1013.09	1013.40	1013.71	1014.03	1014.35	1014.66	1014.98	1015.30	1015.62	1015.94	1016.26	1016.58	1016.90	1017.22	1017.55	1017.89				
GIRDER E	1009.99	1010.33	1010.66	1011.00	1011.34	1011.67	1012.01	1012.35	1012.69	1013.00	1013.31	1013.63	1013.94	1014.25	1014.57	1014.89	1015.21	1015.53	1015.85	1016.17	1016.49	1016.81	1017.13	1017.45	1017.78	1018.11				
GIRDER F	1010.54	1010.88	1011.21	1011.55	1011.89	1012.22	1012.56	1012.90	1013.24	1013.55	1013.86	1014.18	1014.49	1014.80	1015.12	1015.44	1015.76	1016.08	1016.40	1016.72	1017.04	1017.36	1017.68	1018.00	1018.33	1018.66				
GIRDER H	1011.09	1011.43	1011.76	1012.10	1012.44	1012.77	1013.11	1013.45	1013.79	1014.10	1014.41	1014.73	1015.04	1015.35	1015.67	1015.99	1016.31	1016.63	1016.95	1017.27	1017.59	1017.91	1018.23	1018.55	1018.88	1019.21				
RIGHT GUTTER LINE	1011.16	1011.50	1011.84	1012.18	1012.51	1012.85	1013.19	1013.52	1013.86	1014.17	1014.49	1014.80	1015.11	1015.43	1015.75	1016.06	1016.38	1016.70	1017.02	1017.34	1017.66	1017.98	1018							



DECK ELEVATION PLAN - UNIT 2



DECK ELEVATION PLAN - UNIT 2

NOTE:
THE NUMBERED POINTS ARE EQUALLY SPACED
ALONG EACH LINE OF INTEREST AND BETWEEN
THE FIELD SPLICE AND PIER LOCATION
SHOWN.

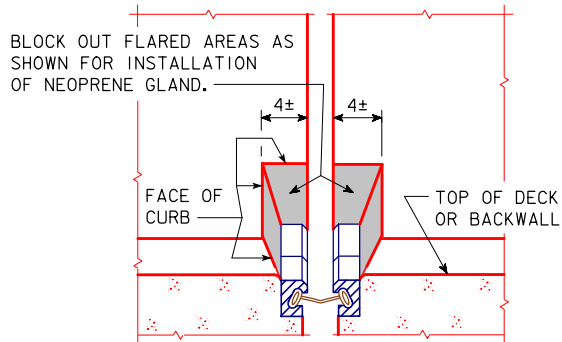
FOR SEGMENT LENGTH DIMENSIONS, SEE
DESIGN SHEET 63.



DESIGN FOR 0° SKEW
1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE
UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
DECK ELEVATIONS - UNIT 2
STA. 3546+14.50 (CL I-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 93 OF 121 FILE NO. 30170 DESIGN NO. 1320

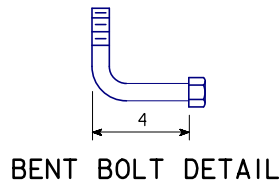
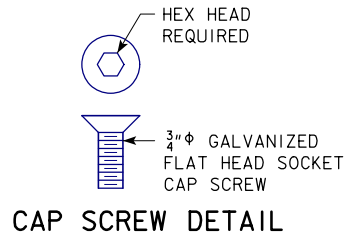
BENCH MARK NO. 563 STA. 540+68.14, 75.977' LT. CUT X NE HNDRL. I-29 SB BRIDGE OVER 2ND AVE. ELEV. 1003.120																													
TABLE OF TOP OF DECK ELEVATIONS (UNIT 2)																													
LOCATION	℄ BRG. PIER 4	SPAN 5									℄ F.S. NO. 7	SPAN 5				℄ PIER 5	SPAN 6				℄ F.S. NO. 8	SPAN 6							
	LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6	LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12	LINE 13	LINE 14	LINE 15	LINE 16	LINE 17	LINE 18	LINE 19	LINE 20	LINE 21	LINE 22	LINE 23	LINE 24	LINE 25	LINE 26	LINE 27		
LEFT EDGE OF DECK	1026.04	1026.35	1026.65	1026.94	1027.23	1027.50	1027.76	1028.01	1028.26	1028.49	1028.71	1028.93	1029.13	1029.32	1029.50	1029.68	1029.83	1029.98	1030.12	1030.25	1030.37	1030.49	1030.60	1030.70	1030.79	1030.87	1030.94		
LEFT GUTTER LINE	1026.04	1026.35	1026.65	1026.94	1027.23	1027.50	1027.76	1028.01	1028.26	1028.49	1028.71	1028.93	1029.13	1029.32	1029.50	1029.68	1029.83	1029.98	1030.12	1030.25	1030.37	1030.49	1030.60	1030.70	1030.79	1030.87	1030.94		
GIRDER A	1026.11	1026.42	1026.73	1027.02	1027.30	1027.57	1027.84	1028.09	1028.33	1028.56	1028.79	1029.00	1029.20	1029.39	1029.58	1029.75	1029.91	1030.06	1030.20	1030.33	1030.45	1030.57	1030.68	1030.78	1030.86	1030.94	1031.02		
PROFILE GRADE LINE	1026.44	1026.75	1027.05	1027.34	1027.63	1027.90	1028.16	1028.41	1028.66	1028.89	1029.11	1029.33	1029.53	1029.72	1029.90	1030.08	1030.23	1030.38	1030.52	1030.65	1030.77	1030.89	1031.00	1031.10	1031.19	1031.27	1031.34		
GIRDER E	1026.66	1026.97	1027.28	1027.57	1027.85	1028.12	1028.39	1028.64	1028.88	1029.11	1029.34	1029.55	1029.75	1029.94	1030.13	1030.30	1030.46	1030.61	1030.75	1030.88	1031.00	1031.12	1031.23	1031.33	1031.41	1031.49	1031.57		
GIRDER F	1027.21	1027.52	1027.83	1028.12	1028.40	1028.67	1028.94	1029.19	1029.43	1029.66	1029.89	1030.10	1030.30	1030.49	1030.68	1030.85	1031.01	1031.16	1031.30	1031.43	1031.55	1031.67	1031.78	1031.88	1031.96	1032.04	1032.12		
GIRDER G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
GIRDER H	1027.76	1028.07	1028.38	1028.67	1028.95	1029.22	1029.48	1029.74	1029.98	1030.21	1030.44	1030.65	1030.85	1031.04	1031.23	1031.40	1031.56	1031.71	1031.85	1031.98	1032.10	1032.22	1032.33	1032.43	1032.51	1032.59	1032.67		
RIGHT GUTTER LINE	1027.84	1028.15	1028.45	1028.74	1029.02	1029.30	1029.56	1029.81	1030.06	1030.29	1030.51	1030.73	1030.93	1031.12	1031.30	1031.48	1031.63	1031.78	1031.92	1032.05	1032.17	1032.29	1032.40	1032.50	1032.59	1032.67	1032.74		
RIGHT EDGE OF DECK	1027.92	1028.23	1028.53	1028.82	1029.10	1029.38	1029.64	1029.89	1030.14	1030.37	1030.59	1030.80	1031.01	1031.20	1031.38	1031.56	1031.71	1031.86	1032.00	1032.13	1032.25	1032.37	1032.48	1032.58	1032.67	1032.75	1032.82		
LOCATION	SPAN 6					℄ F.S. NO. 9	SPAN 6					℄ PIER 6	SPAN 7				℄ F.S. NO. 10	SPAN 7										℄ F.S. NO. 11	SPAN 7
	LINE 28	LINE 29	LINE 30	LINE 31	LINE 32	LINE 33	LINE 34	LINE 35	LINE 36	LINE 37	LINE 38	LINE 39	LINE 40	LINE 41	LINE 42	LINE 43	LINE 44	LINE 45	LINE 46	LINE 47	LINE 48	LINE 49	LINE 50	LINE 51	LINE 52	LINE 53	LINE 54		
LEFT EDGE OF DECK	1031.00	1031.05	1031.09	1031.13	1031.15	1031.16	1031.17	1031.16	1031.15	1031.13	1031.10	1031.06	1031.01	1030.95	1030.89	1030.82	1030.73	1030.64	1030.54	1030.43	1030.31	1030.18	1030.04	1029.90	1029.74	1029.58	1029.40		
LEFT GUTTER LINE	1031.00	1031.05	1031.09	1031.13	1031.15	1031.16	1031.17	1031.16	1031.15	1031.13	1031.10	1031.06	1031.01	1030.95	1030.89	1030.82	1030.73	1030.64	1030.54	1030.43	1030.31	1030.18	1030.04	1029.90	1029.74	1029.58	1029.40		
GIRDER A	1031.08	1031.13	1031.17	1031.20	1031.22	1031.24	1031.24	1031.24	1031.22	1031.20	1031.17	1031.13	1031.09	1031.03	1030.96	1030.89	1030.81	1030.72	1030.61	1030.50	1030.38	1030.26	1030.12	1029.97	1029.82	1029.65	1029.47		
PROFILE GRADE LINE	1031.40	1031.45	1031.49	1031.53	1031.55	1031.56	1031.57	1031.56	1031.55	1031.53	1031.50	1031.46	1031.41	1031.35	1031.29	1031.22	1031.13	1031.04	1030.94	1030.83	1030.71	1030.58	1030.44	1030.30	1030.14	1029.98	1029.80		
GIRDER E	1031.63	1031.68	1031.72	1031.75	1031.77	1031.79	1031.79	1031.79	1031.77	1031.75	1031.72	1031.68	1031.64	1031.58	1031.51	1031.44	1031.36	1031.27	1031.16	1031.05	1030.93	1030.81	1030.67	1030.52	1030.37	1030.20	1030.02		
GIRDER F	1032.18	1032.23	1032.27	1032.30	1032.32	1032.34	1032.34	1032.34	1032.32	1032.30	1032.27	1032.23	1032.19	1032.13	1032.06	1031.99	1031.91	1031.82	1031.71	1031.60	1031.48	1031.36	1031.22	1031.07	1030.92	1030.75	1030.57		
GIRDER G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
GIRDER H	1032.73	1032.78	1032.82	1032.85	1032.87	1032.89	1032.89	1032.89	1032.87	1032.85	1032.82	1032.78	1032.74	1032.68	1032.61	1032.54	1032.46	1032.37	1032.26	1032.15	1032.03	1031.91	1031.77	1031.62	1031.47	1031.30	1031.14		
RIGHT GUTTER LINE	1032.80	1032.85	1032.89	1032.93	1032.95	1032.96	1032.97	1032.96	1032.95	1032.93	1032.90	1032.86	1032.81	1032.75	1032.69	1032.62	1032.53	1032.44	1032.34	1032.23	1032.11	1031.98	1031.84	1031.70	1031.54	1031.38	1031.21		
RIGHT EDGE OF DECK	1032.88	1032.93	1032.97	1033.01	1033.03	1033.04	1033.05	1033.04	1033.03	1033.01	1032.98	1032.94	1032.89	1032.83	1032.77	1032.70	1032.61	1032.52	1032.42	1032.31	1032.19	1032.06	1031.92	1031.78	1031.62	1031.46	1031.29		
LOCATION	SPAN 7					℄ PIER 7	SPAN 8					℄ F.S. NO. 12	SPAN 8													℄ BRG. PIER 8			
	LINE 55	LINE 56	LINE 57	LINE 58	LINE 59	LINE 60	LINE 61	LINE 62	LINE 63	LINE 64	LINE 65	LINE 66	LINE 67	LINE 68	LINE 69	LINE 70	LINE 71	LINE 72	LINE 73	LINE 74	LINE 75	LINE 76	LINE 77	LINE 78	LINE 79	LINE 80			
LEFT EDGE OF DECK	1029.21	1029.00	1028.79	1028.57	1028.34	1028.10	1027.88	1027.66	1027.43	1027.19	1026.94	1026.68	1026.39	1026.08	1025.77	1025.45	1025.11	1024.77	1024.42	1024.06	1023.69	1023.31	1022.92	1022.52	1022.12	1021.70			
LEFT GUTTER LINE	1029.21	1029.00	1028.79	1028.57	1028.34	1028.10	1027.88	1027.66	1027.43	1027.19	1026.94	1026.68	1026.39	1026.08	1025.77	1025.45	1025.11	1024.77	1024.42	1024.06	1023.69	1023.31	1022.92	1022.52	1022.12	1021.70			
GIRDER A	1029.28	1029.08	1028.87	1028.65	1																								

REVISION 08-13 - ADDED A CORRESPONDING MAXIMUM DECK TEMPERATURE COLUMN TO EXPANSION DEVICE TABLE. ADDED A SPLICE DETAIL TO THE PART PLAN VIEWS. ENGLISHDECKRAILBRIDGES.DGN 1026 - THIS SHEET ISSUED 03-02.

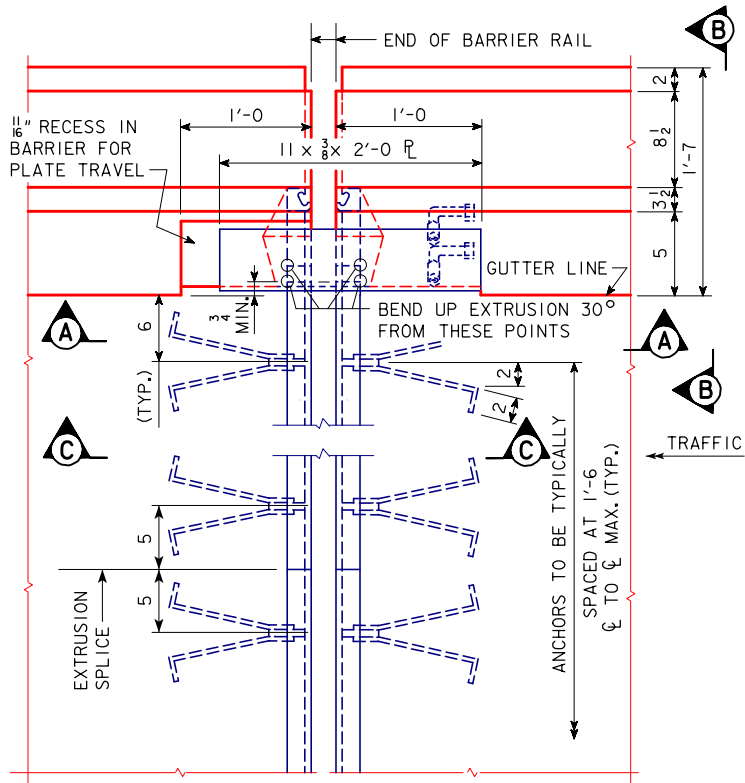


BLOCKOUT DETAIL

CONTRACTOR TO NOTE THAT THE CAP SCREW ANCHORAGE SYSTEM FOR THE $\frac{3}{8}$ " BARRIER PLATES ARE ALWAYS TO BE PLACED ON THE ONCOMING TRAFFIC SIDE.



NOTE: IT IS INTENDED THAT THE $\frac{1}{16}$ INCH RECESSED AREA BE FORMED SO THAT WHEN THE $\frac{3}{8}$ " BENT PLATE IS INSTALLED THE PLATE WILL BE ABLE TO MOVE FREELY IN THIS RECESSED AREA.

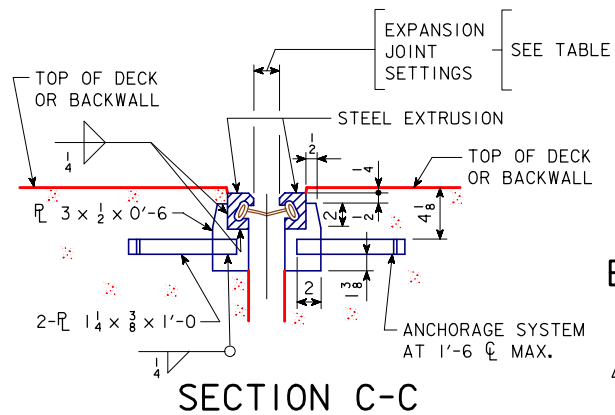


PART PLAN VIEW OF EXPANSION DEVICE AT SOUTH ABUTMENT

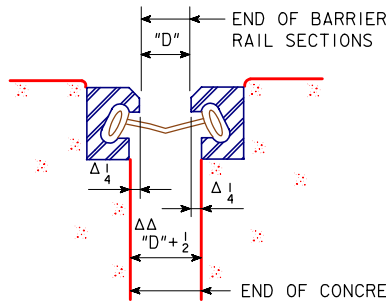
BARRIER PLATE NOTE:

THE MATERIAL USED FOR THE BARRIER PLATES IS TO BE ASTM A36 STEEL. THE BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A307. THE PLATES, BOLTS, NUTS AND CAP SCREWS ARE TO BE GALVANIZED IN ACCORDANCE WITH ARTICLE 4100.07 OF THE STANDARD SPECIFICATIONS.

NOTE: JOINT SETTINGS FOR OTHER TEMPERATURES ARE PROPORTIONAL. TEMPERATURES SHOWN ARE CONCRETE DECK TEMPERATURES ON THE UNDERSIDE OR SHADED PORTION OF THE DECK.



SECTION C-C



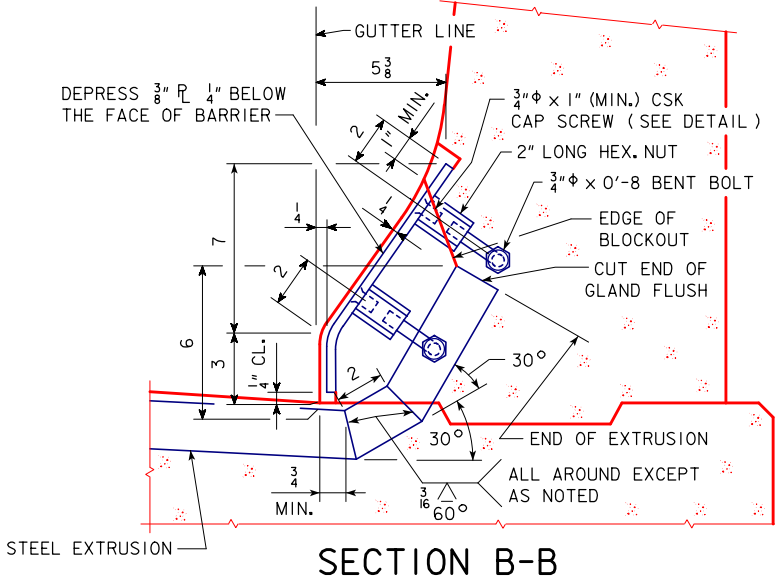
EXPANSION OPENING DETAIL

Δ THIS DIMENSION MAY VARY SLIGHTLY DEPENDING ON MANUFACTURER FURNISHING THE JOINT.
 $\Delta\Delta$ USED FOR ALL OUT TO OUT DIMENSIONS OF DECK. THE DIMENSION MAY VARY SLIGHTLY DEPENDING ON MANUFACTURER FURNISHING THE JOINT.

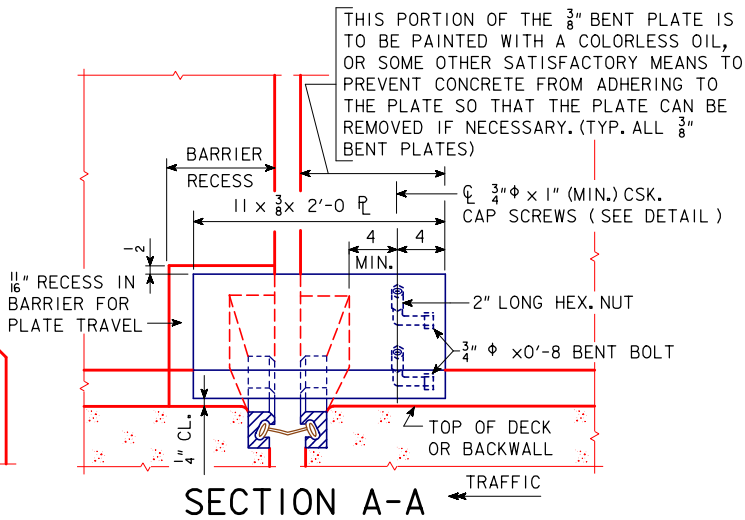
TABLE OF APPROVED EXPANSION DEVICES

MANUFACTURER	TYPE OF STEEL EXTRUSION	NEOPRENE GLAND	MINIMUM OPENING FOR GLAND INSTALLATION	CORRESPONDING MAXIMUM DECK TEMPERATURE	EXPANSION JOINT SETTINGS		
WATSON-BOWMAN & ACME CORP.	A	SE-500	2"	80° F.	1 3/4" AT 90° F.	2 1/8" AT 50° F.	3 1/8" AT 10° F.
APPROVED EQUAL							

NOTE:
SEE STANDARD SHEET 1026s2 ON DESIGN SHEET 96 FOR EXPANSION DEVICE NOTES CONTAINING THE STEEL EXTRUSION NOTES, NEOPRENE GLAND NOTES, AND WATERTIGHT INTEGRITY TESTING AND REPAIR NOTES.



SECTION B-B



SECTION A-A

THE CONTRACTOR SHALL SUBMIT FOR APPROVAL SHOP DRAWINGS OF THE EXPANSION DEVICES SHOWING LAYOUT, MATERIAL TO BE USED, AND PROVISIONS FOR THE HOLDING DEVICE DURING PLACEMENT OF CONCRETE.

THE EXPANSION DEVICE IS TO BE PARALLEL TO GRADE.

BLOCKOUT DETAILS MAY BE ALTERED FROM THOSE SHOWN PROVIDED THE GLAND MAY BE INSTALLED AND REMOVED IF NECESSARY AND THE CURB AREA REMAINS WATERTIGHT.

THE NUMBER OF FEET OF STEEL EXTRUSION INSTALLED SHALL BE PAID FOR AT THE CONTRACT PRICE PER FOOT BASED ON PLAN QUANTITIES. THE PRICE BID FOR "STEEL EXTRUSION JOINT W/NEOPRENE" SHALL INCLUDE THE COST OF FURNISHING BUT NOT THE COST OF INSTALLING THE NEOPRENE GLAND. THE CONTRACT PRICE BID FOR "STEEL EXTRUSION JOINT W/NEOPRENE" SHALL BE FULL COMPENSATION FOR FURNISHING AND INSTALLING STEEL EXTRUSIONS. THIS WORK WILL CONSIST OF FURNISHING ALL REQUIRED MATERIALS, (INCLUDING THE $\frac{3}{4}$ " PLATES AT THE CURBS AND THEIR ANCHORAGE SYSTEMS), AND THE INSTALLATION AND ADJUSTMENT OF THE EXPANSION JOINTS IN ACCORDANCE WITH THE DETAILS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER. THE FURNISHING AND INSTALLATION OF ALL NECESSARY HARDWARE AND ACCESSORIES AS SUPPLIED BY THE EXPANSION JOINT MANUFACTURER ARE TO BE INCLUDED IN THIS WORK, INCLUDING THE ANCHORAGE SYSTEM AND ANY TEMPORARY ERECTION MATERIAL. ALL WORK AND MATERIALS FOR THE INSTALLATION OF THE EXPANSION JOINTS ARE TO COMPLY WITH THE WRITTEN RECOMMENDATIONS OF THE EXPANSION JOINT MANUFACTURER.

IF THE STEEL EXTRUSION IS SPLICED IN THE FIELD, THE SPLICE LOCATION SHALL BE DETAILED ON THE SHOP DRAWINGS. THE CONNECTION DETAILS SHALL INCLUDE TAB PLATES AND PREPARED ENDS TO ACCOMMODATE THE NECESSARY WELDING. SEE DETAILS IN THESE PLANS.

THE NEOPRENE GLAND IS TO BE PLACED AS ONE CONTINUOUS PIECE FROM END TO END OF THE STEEL EXTRUSION.

THE CONTRACTOR SHALL INSTALL THE GLAND ABOVE THE MINIMUM TEMPERATURE OF 45° AND THE MINIMUM JOINT OPENING AND CORRESPONDING MAXIMUM DECK TEMPERATURE SHOWN IN THESE PLANS. THE DECK TEMPERATURE SHALL BE MEASURED BY RECORDING THE SURFACE TEMPERATURES ON THE UNDERSIDE OF THE DECK ADJACENT TO THE JOINTS. IF THE DECK TEMPERATURE DOES NOT FALL WITHIN THE SPECIFIED TEMPERATURE RANGE BEFORE THE CONTRACTOR HAS COMPLETED ALL OTHER REQUIRED WORK, IT WILL BE NECESSARY FOR THE CONTRACTOR TO RETURN TO THE PROJECT SITE TO COMPLETE INSTALLATION AND TESTING OF THE NEOPRENE GLAND. IF THE CONTRACTOR IS REQUIRED TO RETURN TO THE PROJECT SITE AFTER ALL OTHER REQUIRED WORK HAS BEEN COMPLETED, THE CONTRACTOR SHALL COMPLETE INSTALLATION AND TESTING OF NEOPRENE GLAND AT NO EXTRA CHARGE TO THE STATE.

THE NUMBER OF FEET OF NEOPRENE GLAND INSTALLED SHALL BE PAID FOR AT THE CONTRACT PRICE PER FOOT BASED ON PLAN QUANTITIES. THE PRICE FOR "NEOPRENE GLAND INSTALLATION AND TESTING" SHALL BE FULL COMPENSATION FOR INSTALLING AND TESTING OF THE NEW NEOPRENE GLAND. THIS WORK WILL CONSIST OF CLEANING THE EXTRUSION, INSTALLATION OF THE NEOPRENE GLAND AND WATER TIGHT TESTING OF THE EXPANSION JOINT SYSTEM. ALL WORK AND MATERIALS NECESSARY FOR THE INSTALLATION OF THE NEOPRENE GLAND SHALL COMPLY WITH THE RECOMMENDATIONS OF THE EXPANSION JOINT MANUFACTURER. THE PRICE BID FOR "NEOPRENE GLAND INSTALLATION AND TESTING" SHALL INCLUDE ALL WATERTIGHT INTEGRITY TESTING, LEAK REPAIRS AS DIRECTED BY THE ENGINEER, AND SUBSEQUENT WATERTIGHT TESTING UNTIL A LEAK FREE INSTALLATION IS ACHIEVED.

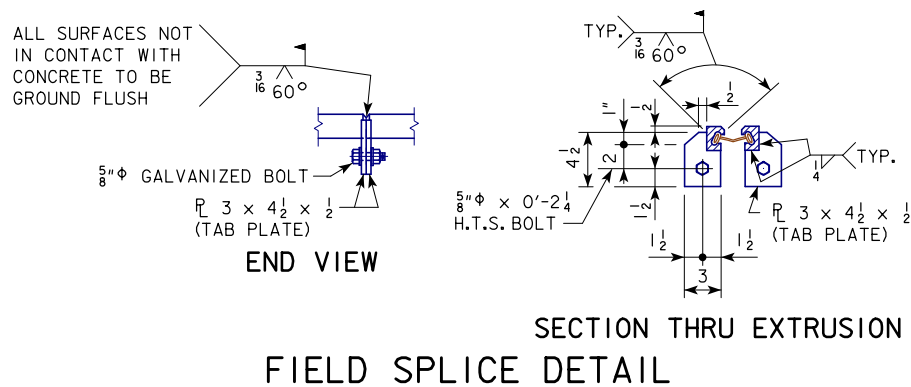
AFTER INSTALLATION OF EACH NEOPRENE GLAND, THE CONTRACTOR SHALL PERFORM WATERTIGHT INTEGRITY TESTS AT THE DECK LEVEL TO DETECT ANY LEAKAGE. THE TESTS ARE TO CHECK FOR LEAKAGE AT THE UPTURNED ENDS OF THE EXPANSION DEVICE AND FOR LEAKAGE ALONG THE EXPANSION DEVICE ACROSS THE DECK AND ANY MEDIANS OR SIDEWALKS. THE CONTRACTOR MAY CONDUCT A SINGLE TEST OF THE ENTIRE DEVICE INCLUDING UPTURNED ENDS OR MAY CONDUCT SEPARATE TESTS OF UPTURNED ENDS AND ONE OR MORE TESTS OF OVERLAPPING LENGTHS BETWEEN THE UPTURNED ENDS.

AT EACH UPTURNED END OF THE EXPANSION DEVICE, THE CONTRACTOR SHALL BLOCK OUT ON THE DECK AT LEAST 3 FEET OF THE EXPANSION DEVICE LEADING TO THE UPTURNED END AND FLOOD THE AREA. A MINIMUM WATER DEPTH OF 3" SHALL BE MAINTAINED AT THE GUTTERLINE FOR AT LEAST 30 MINUTES. DURING THE TEST, THE INSPECTOR SHALL OBSERVE FOR ANY OVERFLOW AT THE UPTURNED END. AT THE CONCLUSION OF THE TEST THE INSPECTOR WILL EXAMINE THE UNDERSIDE OF THE JOINT FOR LEAKAGE. THE EXPANSION DEVICE IS CONSIDERED WATERTIGHT IF THE INSPECTOR OBSERVES NO OVERFLOW DURING THE TEST AND IF NO DRIPPING WATER OR WATER DROPLETS ARE VISIBLE IN THE UNDERDECK AREAS NEAR THE UPTURNED END.

THE CONTRACTOR SHALL TEST THE EXPANSION DEVICE BETWEEN UPTURNED ENDS BY BLOCKING OUT AND COVERING THE DEVICE WITH PONDED OR FLOWING WATER TO A DEPTH OF AT LEAST 1" AT ALL POINTS, FOR AT LEAST 30 MINUTES. VERTICAL CURB SURFACES MAY BE TESTED WITH AN UNNOZZLED HOSE DELIVERING APPROXIMATELY ONE GALLON PER MINUTE DIRECTED TO FLOW OVER THE ENTIRE CURB HEIGHT FOR 30 MINUTES. AT THE CONCLUSION OF THE TEST, THE INSPECTOR WILL EXAMINE THE UNDERSIDE OF THE JOINT FOR LEAKAGE. THE EXPANSION DEVICE IS CONSIDERED WATERTIGHT IF NO DRIPPING WATER OR WATER DROPLETS ARE VISIBLE IN THE UNDERDECK AREAS ALONG THE FULL LENGTH OF THE EXPANSION JOINT. DAMP CONCRETE THAT DOES NOT SHOW DRIPPING WATER OR WATER DROPLETS IS NOT CONSIDERED A SIGN OF LEAKAGE.

IF THE EXPANSION DEVICE LEAKS AT AN UPTURNED END OR ALONG ITS LENGTH, THE CONTRACTOR SHALL LOCATE THE LEAK(S) AND TAKE REPAIR MEASURES TO STOP THE LEAKAGE. THE REPAIR MEASURES SHALL BE AS RECOMMENDED BY THE MANUFACTURER AND APPROVED BY THE ENGINEER PRIOR TO BEGINNING CORRECTIVE WORK.

IF MEASURES TO ELIMINATE LEAKAGE ARE TAKEN, THE CONTRACTOR SHALL PERFORM SUBSEQUENT WATERTIGHT INTEGRITY TESTS SUBJECT TO THE SAME CONDITIONS AS THE ORIGINAL TEST.



DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

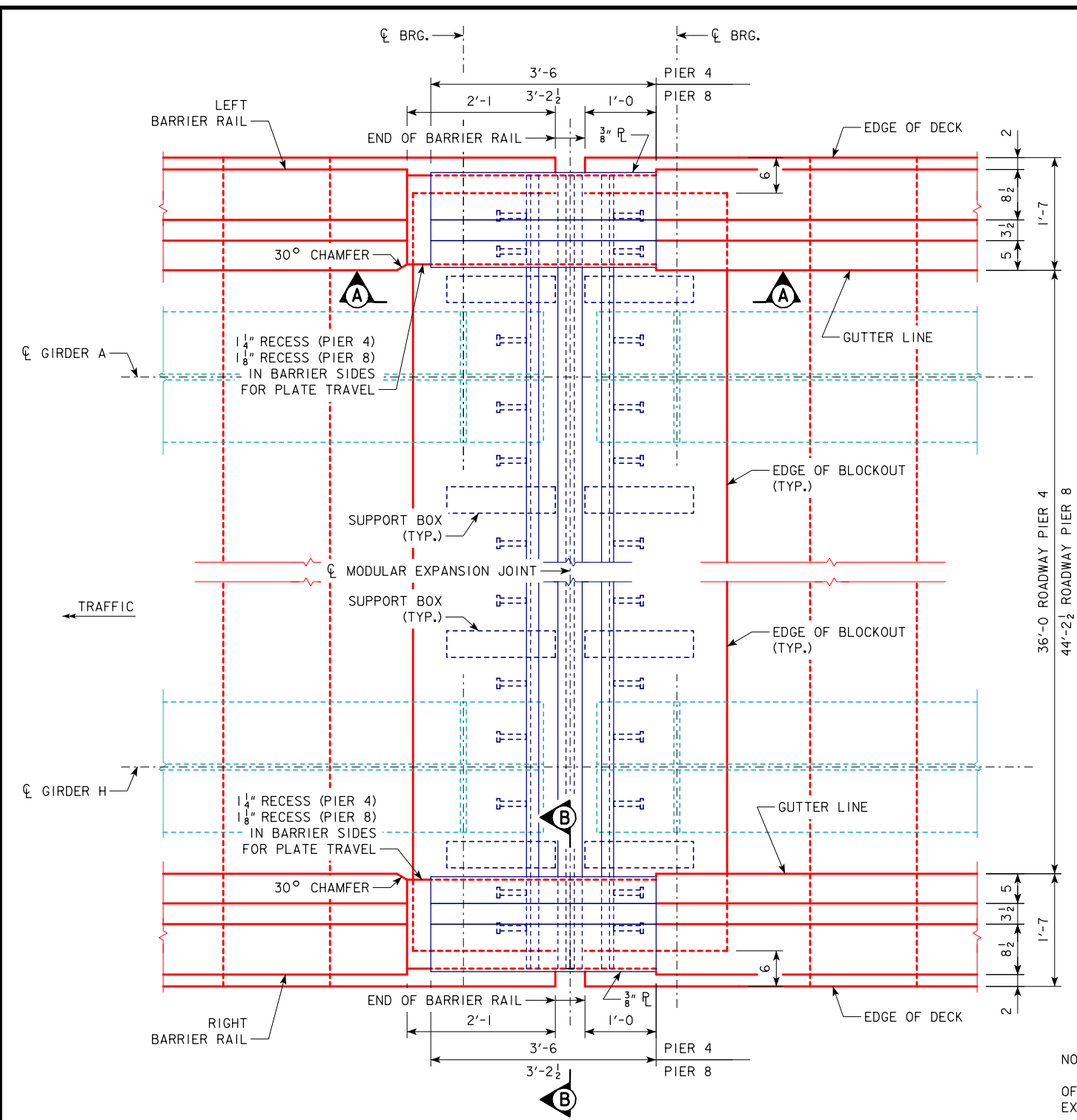
ABUT. STRIP SEAL JOINT DETAILS

STA. 3546+14.50 (B) 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 96 OF 121 FILE NO. 30170 DESIGN NO. 1320



EXPANSION DEVICE PLAN

MOVEMENT TABLE			
LOCATION	TOTAL MOVEMENT (IN)	TEMP. CHANGE FOR 1/8 INCH ADJUSTMENT (°F)	DIM "C" (IN)
PIER 4	7.86	2.4	9.0
PIER 8	6.14	3.1	5.5

NOTE:
DIMENSIONS MARKED THUS (*) ARE AT 50°F WITH 1/8" VARIATION FOR THE TEMPERATURE SHOWN IN THE MOVEMENT TABLE. INCREASE GAP FOR A DECREASE IN TEMPERATURE AND DECREASE GAP FOR AN INCREASE IN TEMPERATURE.
** DIMENSIONS TO BE SET BY JOINT MANUFACTURER.

DECK JOINT SEALS	
MANUFACTURER	DESIGNATION
D.S. BROWN	STEEL FLEX D-240
WATSON BOWMAN & ACME CORP.	WABO D-900

DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

MODULAR EXPANSION JOINT DETAILS

STA. 3546+14.50 (R 1-480 RAMP C) NOVEMBER, 2020

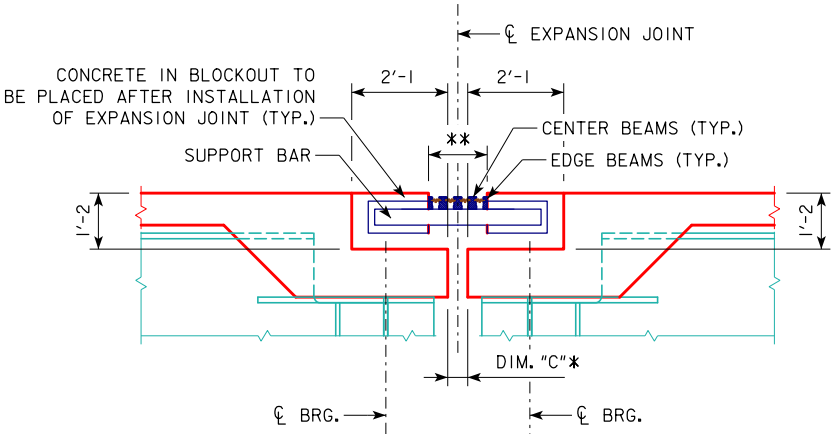
POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 97 OF 121 FILE NO. 30170 DESIGN NO. 1320

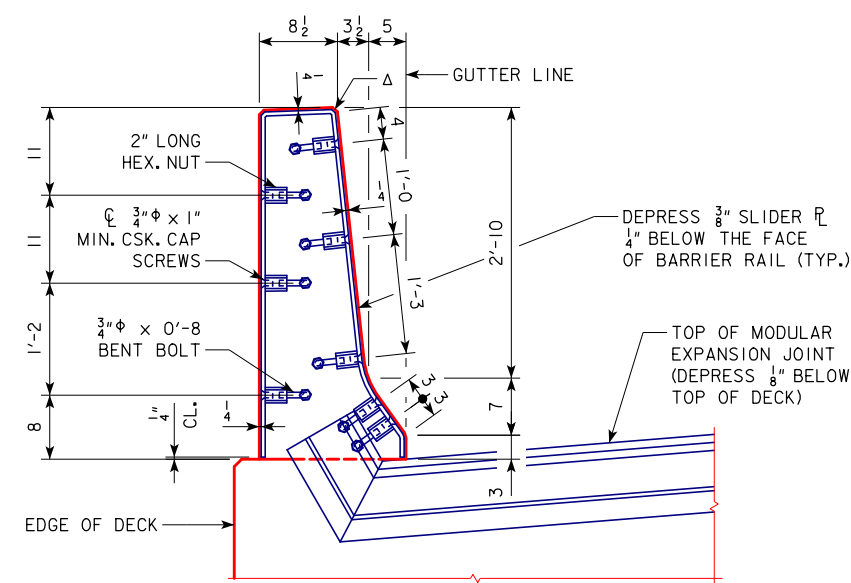
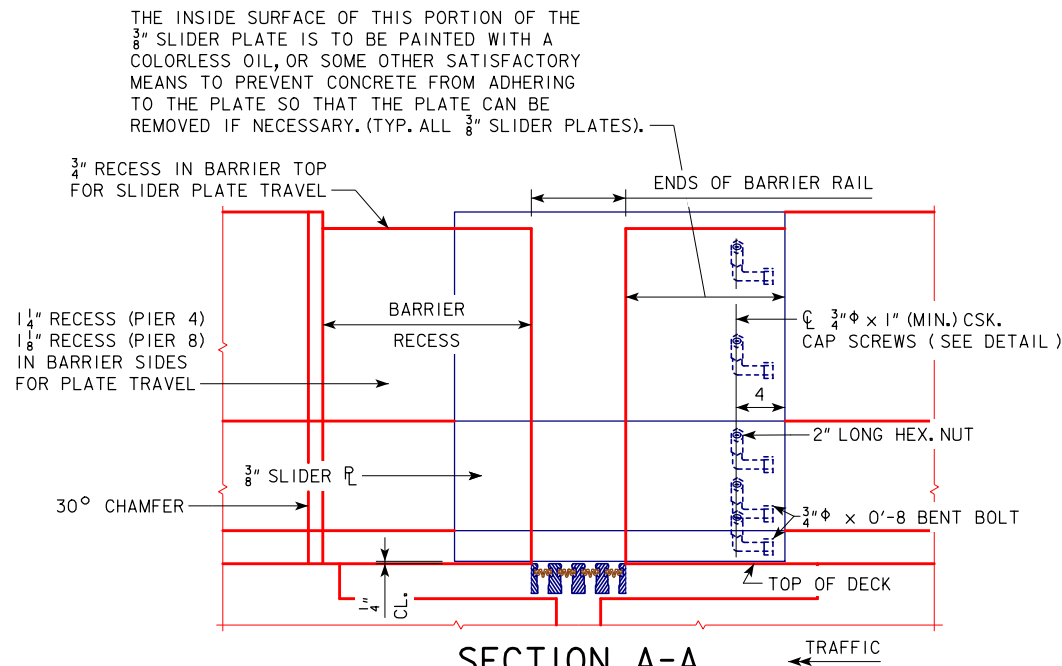
MODULAR EXPANSION DEVICE NOTES:

- THE CONTRACTOR SHALL SUBMIT FOR APPROVAL SHOP DRAWINGS OF THE EXPANSION DEVICES SHOWING LAYOUT, MATERIAL TO BE USED, AND PROVISIONS FOR HOLDING DEVICE DURING PLACEMENT OF CONCRETE.
- THE MODULAR EXPANSION DEVICE SHALL BE GALVANIZED AFTER WELDING.
- THE MODULAR EXPANSION DEVICE IS TO BE PARALLEL TO GRADE.
- CAP SCREWS SHALL BE COUNTERSUNK 1/16" BELOW TOP OF THE PLATE.
- THE MINIMUM GRADE OF STRUCTURAL STEEL FOR EXPANSION DEVICE SHALL BE ASTM A-36.
- BLOCKOUT DETAILS MAY BE ALTERED FROM THOSE SHOWN PROVIDED THE GLAND MAY BE INSTALLED AND REMOVED IF NECESSARY AND THE CURB AREA REMAINS WATERTIGHT.
- SHOP AND OR FIELD SPLICES OF THE MODULAR EXPANSION DEVICE RAILS WILL BE PERMITTED. FIELD WELDS ON GALVANIZED ITEMS SHALL BE COATED WITH A ZINC RICH MATERIAL APPROVED BY THE ENGINEER. PIECES OF MODULAR EXPANSION DEVICE RAILS IN THE 15 FT. TO 22 FT. RANGE SHALL BE USED TO FORM THE REQUIRED GUTTER TO GUTTER LENGTH. THE INDIVIDUAL LENGTH OF PIECES SHALL BE CHOSEN SO THAT A MINIMUM NUMBER OF SPLICES IS REQUIRED. ALL PIECES SHALL BE JOINED WITH A PREQUALIFIED PARTIAL PENETRATION SINGLE GROOVE WELD, AND ALL SURFACES NOT IN CONTACT WITH CONCRETE ARE TO BE GROUND FLUSH. NO WELD SHALL BE PERMITTED IN THE INTERNAL SECTION OF THE EXTRUSION WHERE THE NEOPRENE GLAND IS TO BE LOCATED.
- THE NUMBER OF FEET OF MODULAR EXPANSION DEVICE INSTALLED SHALL BE PAID FOR AT THE CONTRACT PRICE PER FOOT BASED ON PLAN QUANTITIES. THE CONTRACT PRICE BID FOR "MODULAR EXPANSION JOINT ASSEMBLY" SHALL BE FULL COMPENSATION FOR FURNISHING AND INSTALLING THE MODULAR EXPANSION DEVICE RAILS, NEOPRENE GLANDS, SUPPORT BEAMS, BARRIER COVER PLATES AND ALL ASSOCIATED HARDWARE. THIS WORK WILL CONSIST OF FURNISHING ALL REQUIRED MATERIALS, (INCLUDING THE 3/8" PLATES AT THE CURBS AND THEIR ANCHORAGE SYSTEMS), AND THE INSTALLATION AND ADJUSTMENT OF THE MODULAR EXPANSION JOINTS IN ACCORDANCE WITH THE DETAILS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER. THE FURNISHING AND INSTALLATION OF ALL NECESSARY HARDWARE AND ACCESSORIES AS SUPPLIED BY THE MODULAR EXPANSION JOINT MANUFACTURER ARE TO BE INCLUDED IN THIS WORK, INCLUDING THE ANCHORAGE SYSTEM AND ANY TEMPORARY ERECTION MATERIAL. ALL WORK AND MATERIALS FOR THE INSTALLATION OF THE MODULAR EXPANSION JOINTS ARE TO COMPLY WITH THE WRITTEN RECOMMENDATIONS OF THE MODULAR EXPANSION JOINT MANUFACTURER.
- TOTAL THERMAL MOVEMENTS SHOWN IN THE MOVEMENT TABLE ARE BASED ON A TEMPERATURE RANGE OF 150 DEGREES AND OCCUR ALONG A LINE FROM THE ASSUMED POINT OF ZERO MOVEMENT TO THE ADJACENT EXPANSION JOINT AS SHOWN ON DESIGN SHEETS 79 & 80. MANUFACTURER SHALL DESIGN THE EXPANSION DEVICE TO ACCOMMODATE THE TOTAL THERMAL MOVEMENTS IN THE DIRECTION INDICATED AND ELIMINATE RACKING.
- MODULAR EXPANSION JOINT ASSEMBLIES SHALL BE INSTALLED AFTER THE GIRDER ERECTION AND DECK CONCRETE PLACEMENT IS COMPLETED FOR THE ENTIRE BRIDGE.
- COORDINATE INSTALLATION OF MODULAR EXPANSION JOINT ASSEMBLY WITH PROJECT IM-480-1(166)0--13-78

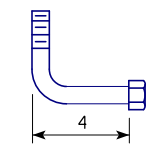
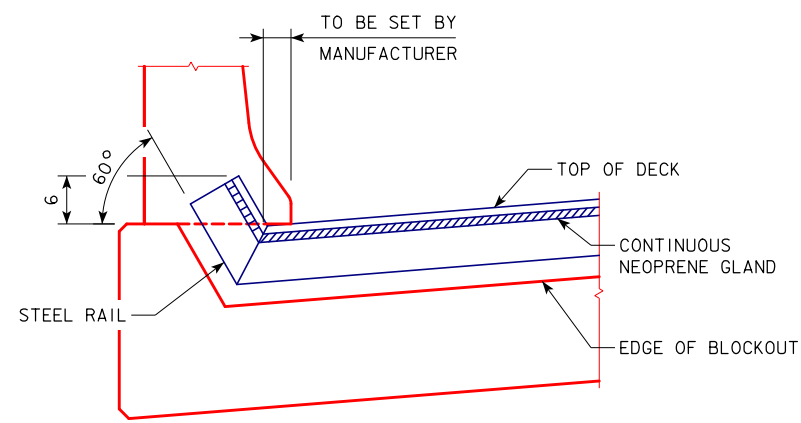
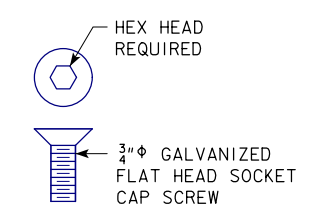
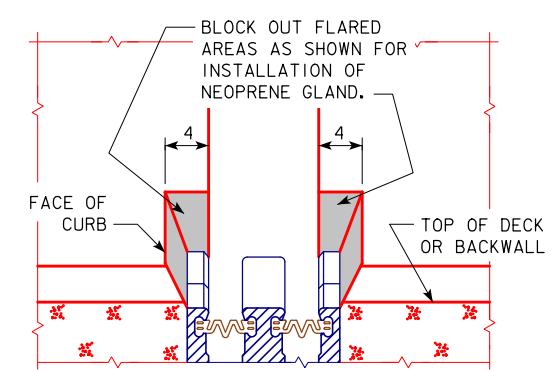


SECTION AT PIER





Δ CAULK (NO WELD). CAULKING MATERIAL SHALL BE NEUTRAL CURE AND NON-SAG SILICONE. TWO PRODUCTS MEETING THESE CRITERIA ARE DOW 888 OR CSL342 JOINT SEALANT.

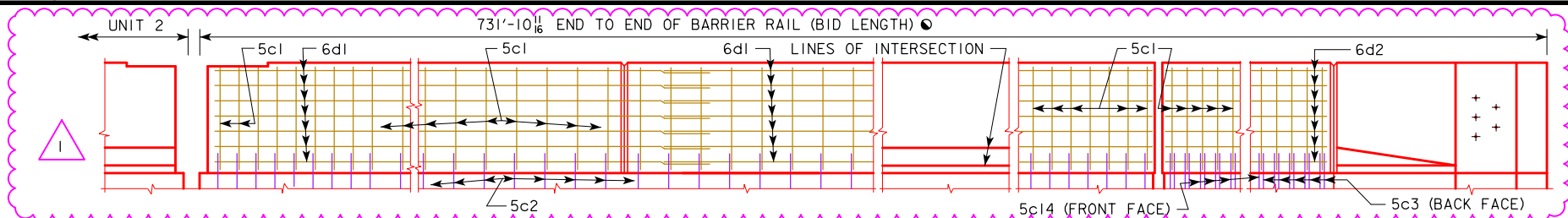


NOTES:
 THE MATERIAL USED FOR THE SLIDER PLATES IS TO BE ASTM A36 STEEL. THE BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A307. THE PLATES, BOLTS, NUTS AND CAP SCREWS ARE TO BE GALVANIZED IN ACCORDANCE WITH ARTICLE 4100.07 OF THE STANDARD SPECIFICATIONS.
 CONTRACTOR TO NOTE THAT THE CAP SCREW ANCHORAGE SYSTEM FOR THE $\frac{3}{8}$ " BARRIER PLATES ARE ALWAYS TO BE PLACED ON THE ONCOMING TRAFFIC SIDE.
 IT IS INTENDED THAT THE RECESSED AREA BE FORMED SO THAT WHEN THE $\frac{3}{8}$ " BENT PLATE IS INSTALLED THE PLATE WILL BE ABLE TO MOVE FREELY IN THIS RECESSED AREA.
 CAP SCREWS SHALL BE COUNTERSUNK $\frac{1}{16}$ " BELOW TOP OF PLATE.

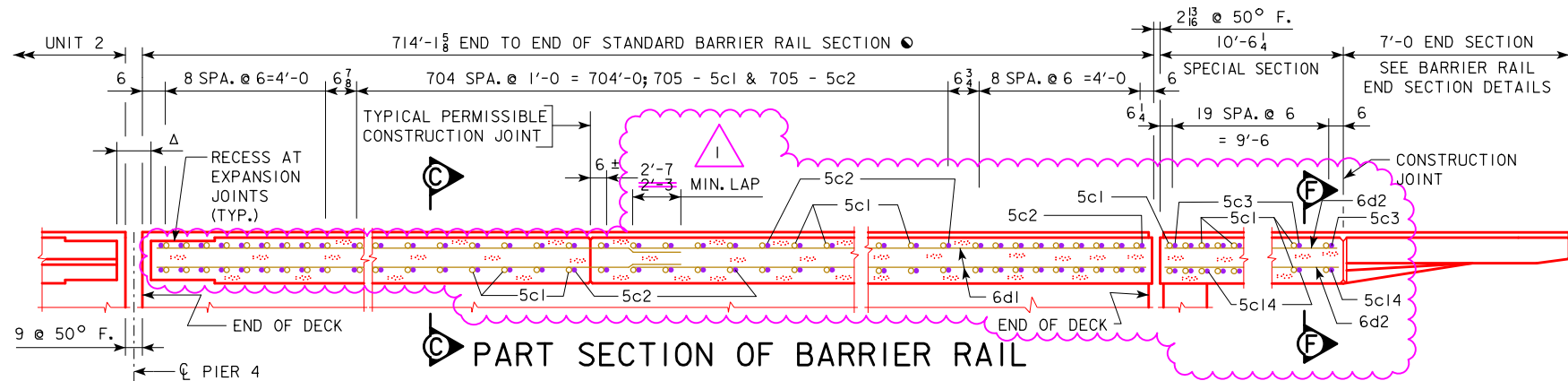
DESIGN FOR 0° SKEW
1419'-0" x VARIES CONTINUOUS WELDED GIRDER BRIDGE
 UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
MODULAR EXPANSION JOINT DETAILS
 STA. 3546+14.50 (RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 98 OF 121 FILE NO. 30170 DESIGN NO. 1320



ENGLISHDECKRAILBRIDGES.DGN 1020SE - THIS SHEET ISSUED 04-14 - ADDED STAINLESS STEEL REINFORCING BAR LIST AND CHANGED 5c2, 5c3, 5c14 BARS TO STAINLESS STEEL...



ELEVATION OF BARRIER RAIL



PART SECTION OF BARRIER RAIL

NOTE:

- MEASURED ALONG GUTTER LINE. FOR BID LENGTH PURPOSES, ASSUME DIMENSION MEASURED TO END OF DECK AT MODULAR EXPANSION JOINTS.

Δ DIMENSION TO BE SET BY JOINT MANUFACTURER.

BARRIER RAIL NOTES:

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

THE PERMISSIBLE CONSTRUCTION JOINTS ARE TO BE PLACED BETWEEN VERTICAL BARS AT A MINIMUM SPACING OF 20 FEET. CONSTRUCTION JOINT CONTACT SURFACES ARE TO BE COATED WITH AN APPROVED BOND BREAKER. COST OF THE JOINT SEALER AND BOND BREAKER SHALL BE CONSIDERED INCIDENTAL TO OTHER CONSTRUCTION.

ALL BARRIER RAIL REINFORCING STEEL IS TO BE STAINLESS STEEL AS SHOWN. THE STAINLESS STEEL REINFORCING STEEL SHALL BE DEFORMED BAR GRADE 60 MEETING THE REQUIREMENTS OF MATERIALS I.M. 452.

THE CONCRETE BARRIER RAIL IS TO BE BID ON A LINEAL FOOT BASIS. THE NUMBER OF LINEAL FEET OF BARRIER RAIL INSTALLED WILL BE PAID FOR AT THE CONTRACT PRICE PER LINEAL FOOT BASED ON PLAN QUANTITIES. PRICE BID FOR "CONCRETE BARRIER RAILING, AESTHETIC" SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, EXCLUDING REINFORCING STEEL, AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO ERECT THE RAIL IN ACCORDANCE WITH THESE PLANS AND CURRENT SPECIFICATIONS. SEE DESIGN SHEETS 103 AND 104 FOR BARRIER RAIL AESTHETIC TREATMENT DETAILS.

THE JOINT SEALER SHALL BE LIGHT GRAY NONSAG LATEX CAULKING SEALER MARKETING FOR OUTDOOR USE. NO TESTING OR CERTIFICATION IS REQUIRED.

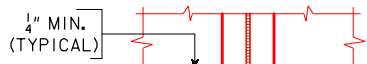
TOP OF THE BARRIER RAIL IS TO BE PARALLEL TO THE THEORETICAL CL GRADE, EXCEPT AT THE SPECIAL SECTIONS.

CROSS SECTIONAL AREA OF THE STANDARD SECTION OF THE BARRIER RAIL = 3.46 SQUARE FEET. SEE "CONCRETE PLACEMENT SUMMARY" TABLES ON THIS SHEET AND DESIGN SHEETS 100, 101 AND 102 FOR ADDITIONAL CONCRETE REQUIRED FOR AESTHETIC TREATMENT.

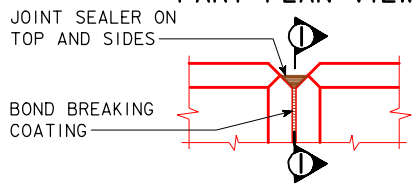
DUE TO THE INCLUSION OF CONCRETE TEXTURE AND SPECIAL SHAPING, SLIP FORMING OF THE TRAFFIC BARRIERS IS NOT ALLOWED.

EPOXY-COATED REINF. STEEL - RIGHT RAIL

SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STANDARD SECTIONS	5c1	RAIL, VERTICAL	U	723	7'-5	5593
	6d1	RAIL, LONGITUDINAL	—	247	40'-1	14871
SPECIAL SECTION	5c1	RAIL, VERTICAL	U	20	7'-5	155
	6d2	RAIL, LONGITUDINAL	—	13	10'-2	199
TOTAL (LBS.)						20818

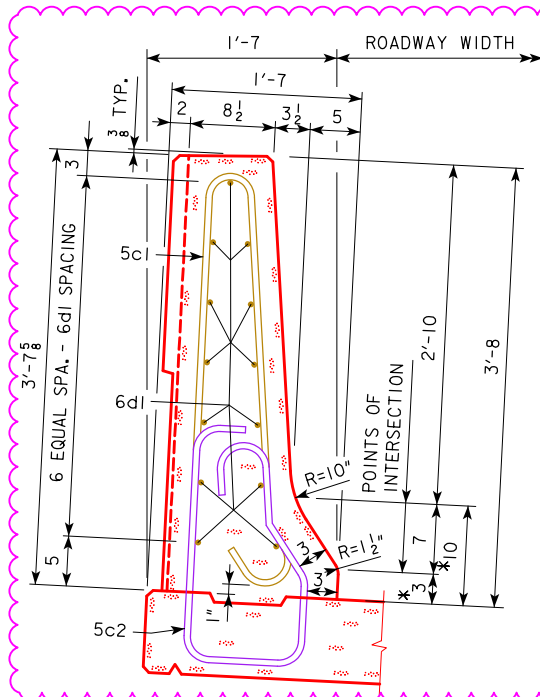


PART PLAN VIEW

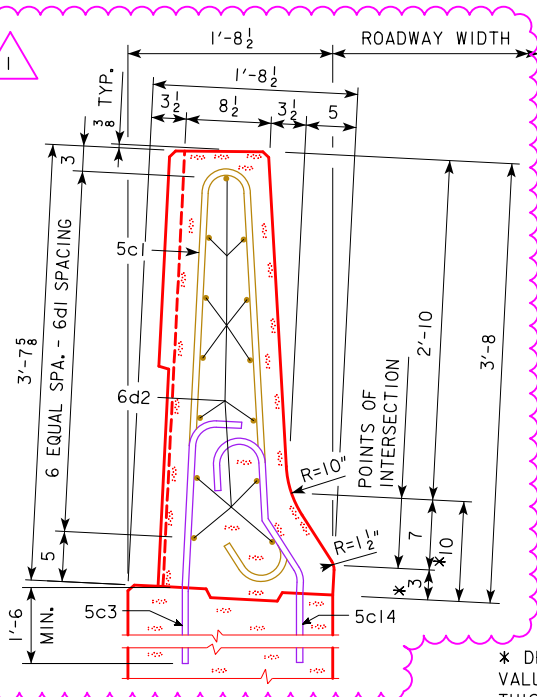


PART ELEVATION VIEW
BARRIER RAIL JOINT DETAILS

SECTION I-I



PART SECTION C-C

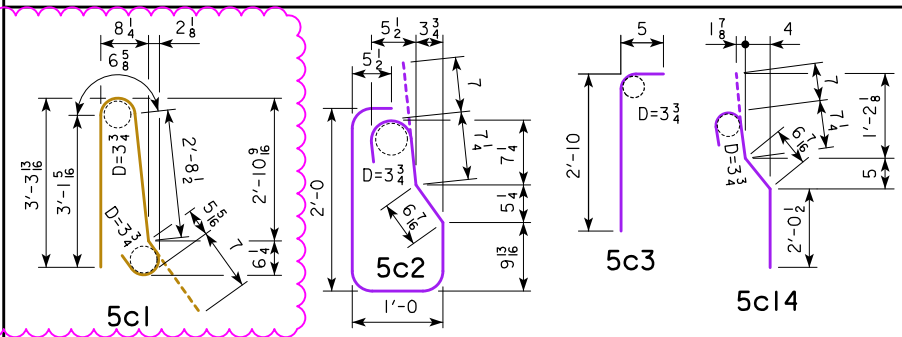


PART SECTION F-F

STAINLESS STEEL REINF. STEEL - RIGHT RAIL

SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STANDARD SECTIONS	5c1	RAIL, VERTICAL	U	723	7'-5	5593
	5c2	RAIL, VERTICAL	U	723	6'-0	4525
	6d1	RAIL, LONGITUDINAL	—	247	39'-9	14747
SPECIAL SECTION	5c1	RAIL, VERTICAL	U	20	7'-5	155
	5c3	RAIL, VERTICAL	U	20	3'-3	68
	5c14	RAIL, VERTICAL	U	20	3'-10	80
	6d2	RAIL, LONGITUDINAL	—	13	10'-2	199
STAINLESS STEEL TOTAL (LBS.)						25367

BENT BAR DETAILS



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

CONCRETE PLACEMENT SUMMARY

SECTION		QUANTITY
STANDARD SECTION	714.14' AT 0.1281 CU. YDS. PER FT.	91.5
SPECIAL SECTION	10.52' AT 0.1281 CU. YDS. PER FT.	1.3
AESTHETIC TREATMENT	724.66' AT 0.0113 CU. YDS. PER FT.	8.2
TOTAL (CU. YD.)		101.0

CONCRETE BARRIER RAIL QUANTITIES

ITEM	UNIT	TOTAL
CONCRETE BARRIER RAILING, AESTHETIC	LIN. FT.	731.9

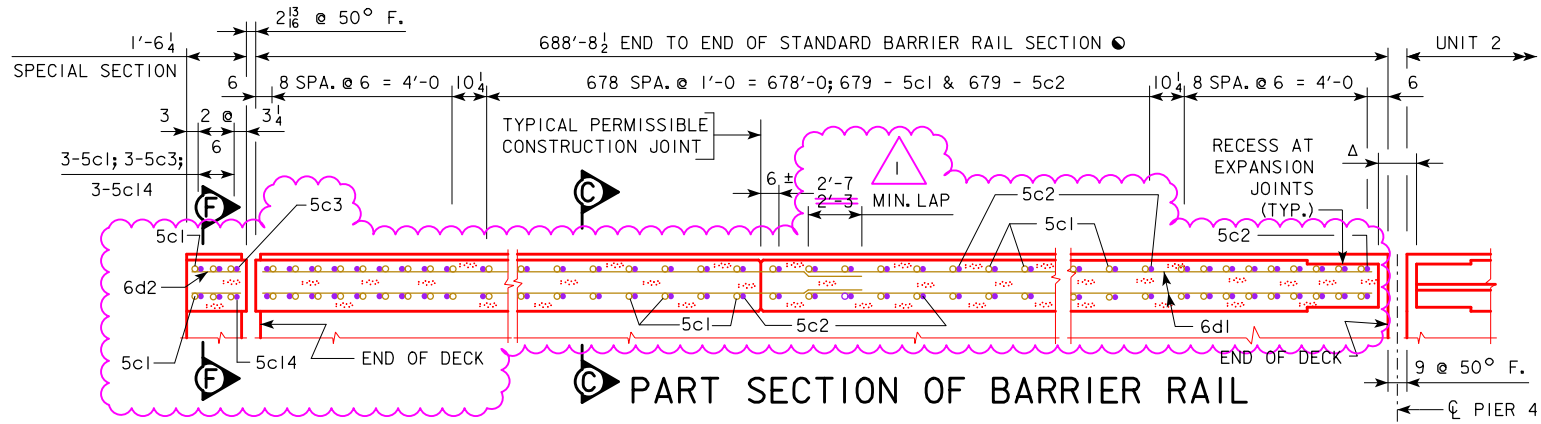
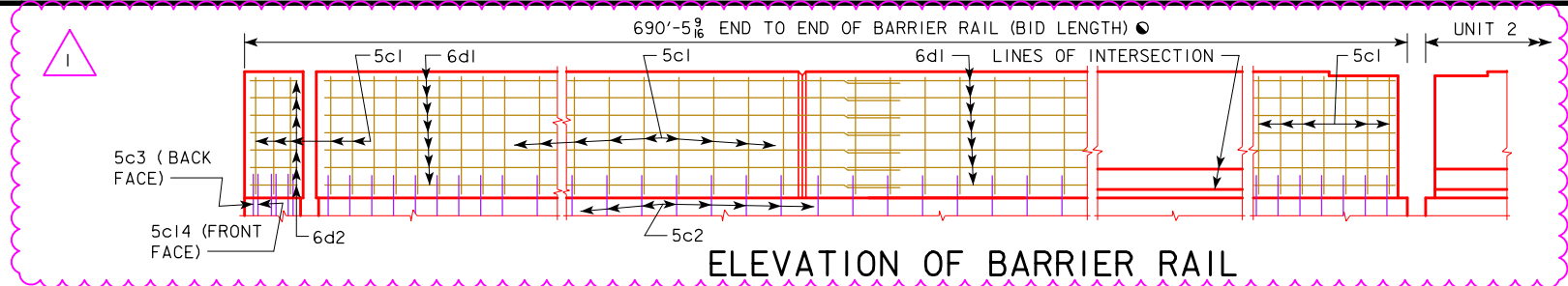
- VOLUME BASED ON ESTIMATED AVERAGE CROSS SECTIONAL AREA OF 0.306 SQ.FT. FOR AESTHETIC TREATMENT WITH NO DEDUCTION FOR FORM LINER.

REVISED: 05-06-2022 UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED REINFORCING STEEL QUANTITIES, COLOR OF REINFORCEMENT, LAP LENGTHS, AND NOTE.

REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.

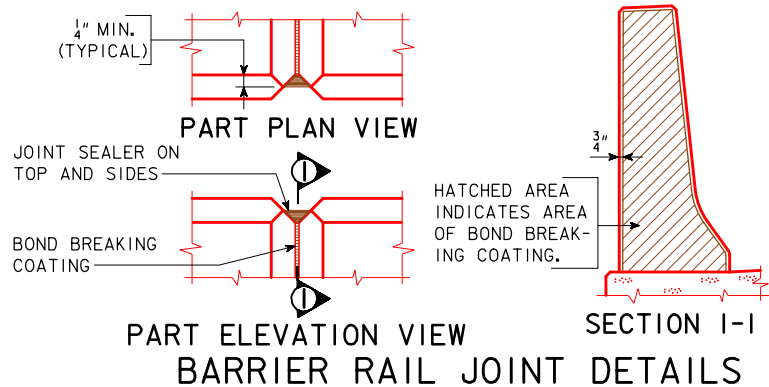
DESIGN FOR 0° SKEW
1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE
UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0
RIGHT BARRIER RAIL - UNIT 1
STA. 3546+14.50 (RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 99 OF 121 FILE NO. 30170 DESIGN NO. 1320

ENGLISHDECKRAILBRIDGES.DGN 1020SE - THIS SHEET ISSUED 04-14 - ADDED STAINLESS STEEL REINFORCING BAR LIST AND CHANGED 5c2, 5c3, 5c14 BARS TO STAINLESS STEEL...



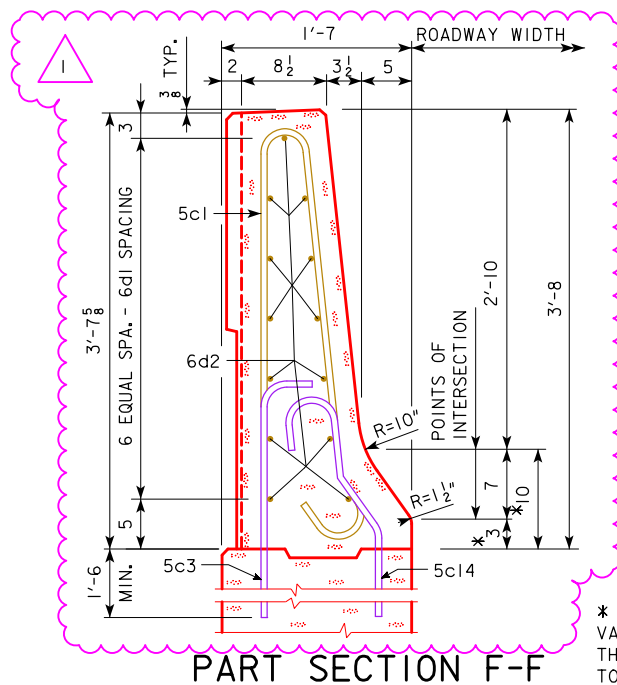
NOTE:
● MEASURED ALONG GUTTER LINE. FOR BID LENGTH PURPOSES, ASSUME DIMENSION MEASURED TO END OF DECK AT MODULAR EXPANSION JOINTS.
Δ DIMENSION TO BE SET BY JOINT MANUFACTURER.

BARRIER RAIL NOTES:
SEE DESIGN SHEET 99 FOR BARRIER RAIL NOTES.

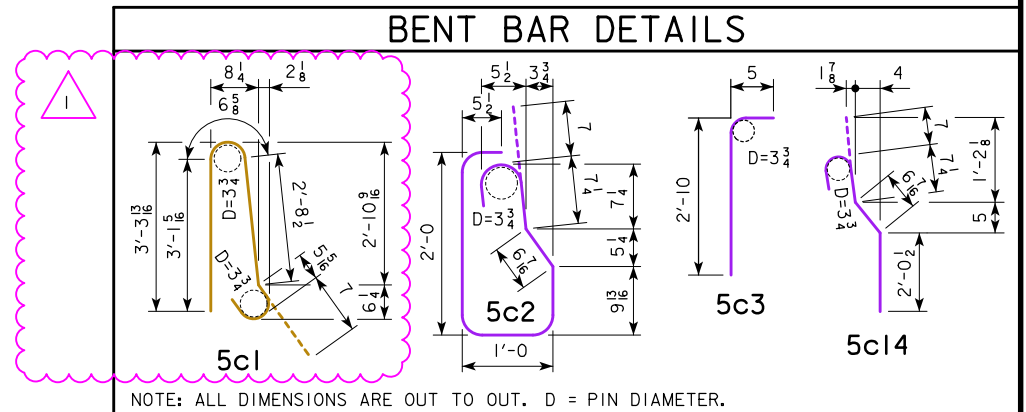


EPOXY-COATED REINF. STEEL - LEFT RAIL						
SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STANDARD SECTIONS	5c1	RAIL, VERTICAL	1	697	7'-5	5392
	6d1	RAIL, LONGITUDINAL	2	247	38'-9	14376
SPECIAL SECTION	5c1	RAIL, VERTICAL	1	3	7'-5	23
	6d2	RAIL, LONGITUDINAL	2	13	1'-2	23
TOTAL (LBS.)						19814

REVISED: 05-06-2022 UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED REINFORCING STEEL QUANTITIES, COLOR OF REINFORCEMENT, AND LAP LENGTHS.
REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.



STAINLESS STEEL REINF. STEEL - LEFT RAIL						
SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STANDARD SECTIONS	5c1	RAIL, VERTICAL	1	697	7'-5	5392
	5c2	RAIL, VERTICAL	2	697	6'-0	4362
	6d1	RAIL, LONGITUDINAL	2	247	38'-5	14252
SPECIAL SECTION	5c1	RAIL, VERTICAL	1	3	7'-5	23
	5c3	RAIL, VERTICAL	1	3	3'-3	10
	5c14	RAIL, VERTICAL	1	3	3'-10	12
	6d2	RAIL, LONGITUDINAL	2	13	1'-2	23
STAINLESS STEEL TOTAL (LBS.)						24074



CONCRETE PLACEMENT SUMMARY		
SECTION		QUANTITY
STANDARD SECTION	688.71' AT 0.1281 CU. YDS. PER FT.	88.2
SPECIAL SECTION	1.52' AT 0.1281 CU. YDS. PER FT.	0.2
AESTHETIC TREATMENT	690.23' AT 0.0113 CU. YDS. PER FT.	7.8
TOTAL (CU. YD.)		96.2

CONCRETE BARRIER RAIL QUANTITIES		
ITEM	UNIT	TOTAL
CONCRETE BARRIER RAILING, AESTHETIC	LIN. FT.	690.5

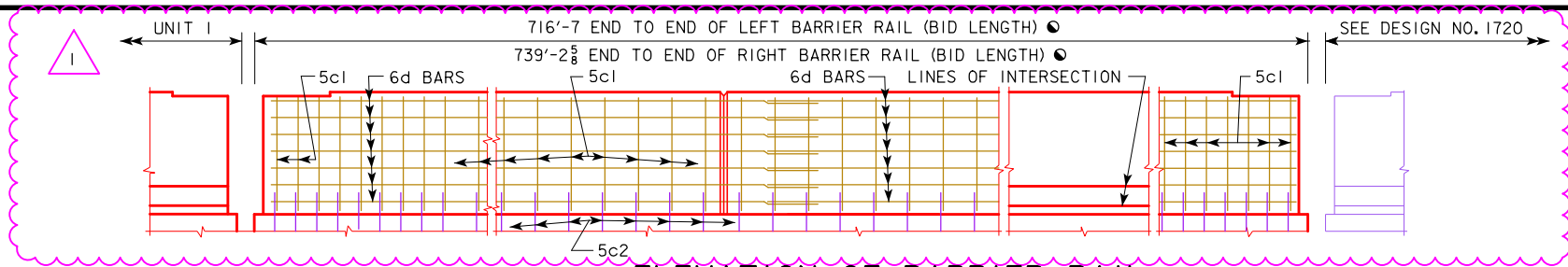
■ VOLUME BASED ON ESTIMATED AVERAGE CROSS SECTIONAL AREA OF 0.306 SQ.FT. FOR AESTHETIC TREATMENT WITH NO DEDUCTION FOR FORM LINER.

DESIGN FOR 0° SKEW
1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE
UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0
LEFT BARRIER RAIL - UNIT 1
STA. 3546+14.50 (RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 100 OF 121 FILE NO. 30170 DESIGN NO. 1320

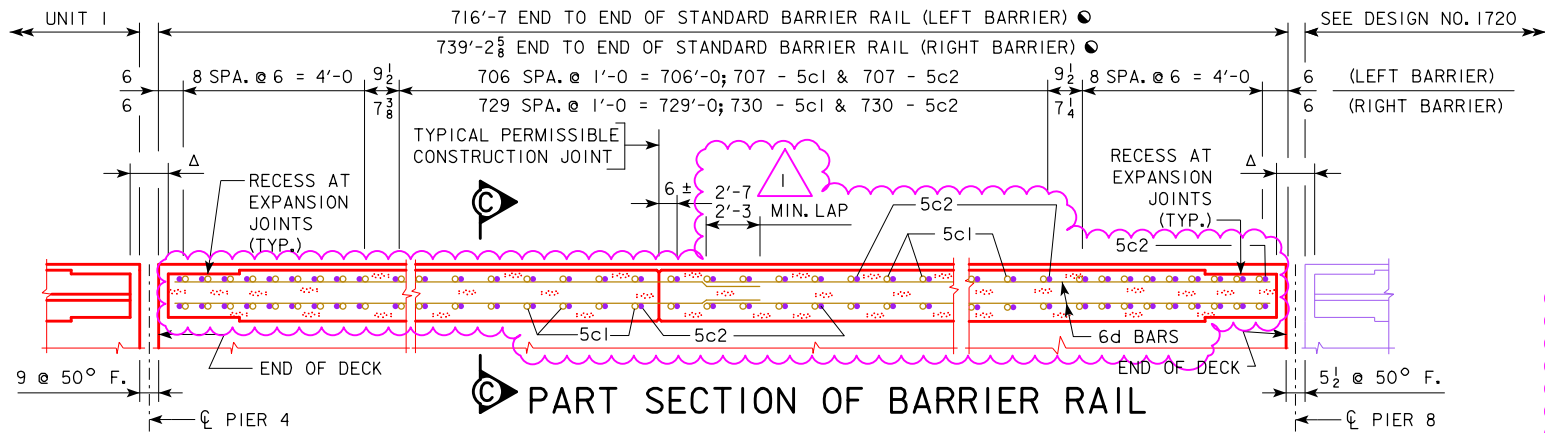
* DENOTES THE MAXIMUM VALUE FOR THIS DIMENSION. THIS DIMENSION MAY VARY DUE TO CONSTRUCTION INACCURACIES.

REVISED: MAY 6, 2022

ENGLISHDECKRAILBRIDGES.DGN 1020SE - THIS SHEET ISSUED 04-14 - ADDED STAINLESS STEEL REINFORCING BAR LIST AND CHANGED 5c2, 5c3, 5c14 BARS TO STAINLESS STEEL...



ELEVATION OF BARRIER RAIL



PART SECTION OF BARRIER RAIL

NOTE:

● MEASURED ALONG GUTTER LINE. FOR BID LENGTH PURPOSES, ASSUME DIMENSION MEASURED TO END OF DECK AT MODULAR EXPANSION JOINTS.

Δ DIMENSION TO BE SET BY JOINT MANUFACTURER.

BARRIER RAIL NOTES:

SEE DESIGN SHEET 99 FOR BARRIER RAIL NOTES.

EPOXY-COATED REINF. STEEL - LEFT RAIL

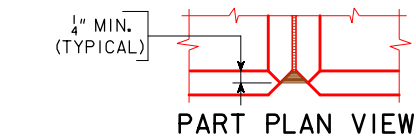
SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STANDARD SECTIONS	5c1	RAIL, VERTICAL		725	7'-5	5608
	6d1	LEFT RAIL, LONGITUDINAL		247	40'-2	14902
TOTAL (LBS.)						20510

EPOXY-COATED REINF. STEEL - RIGHT RAIL

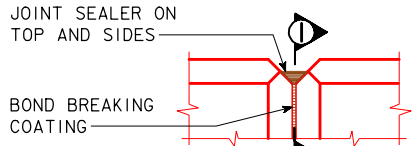
SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STANDARD SECTIONS	5c1	RAIL, VERTICAL		748	7'-5	5786
	6d2	RIGHT RAIL, LONGITUDINAL		260	39'-6	15426
TOTAL (LBS.)						21212

REVISD: 05-06-2022 UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED REINFORCING STEEL QUANTITIES, COLOR OF REINFORCEMENT, AND LAP LENGTHS.

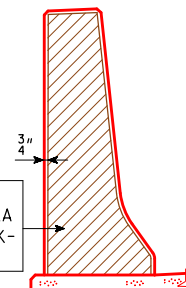
REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.



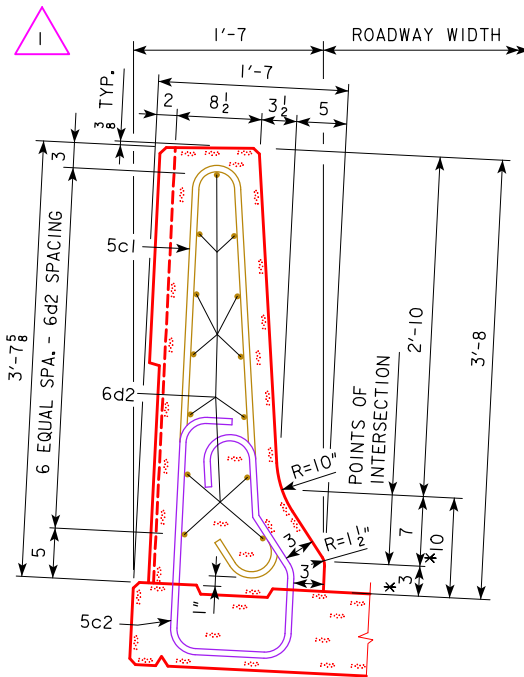
PART PLAN VIEW



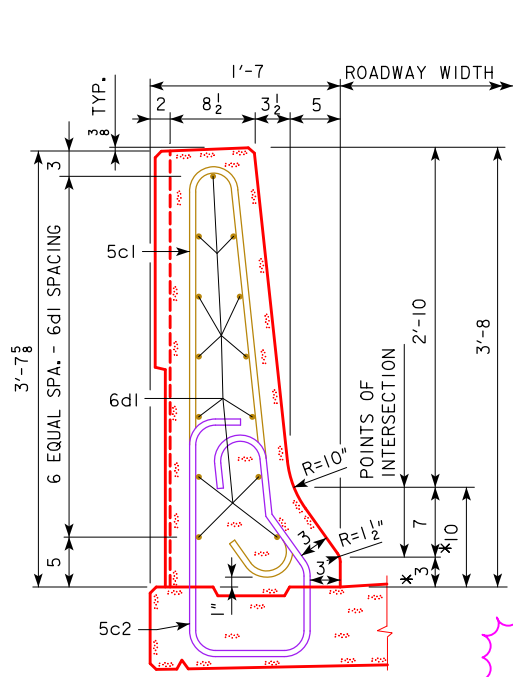
PART ELEVATION VIEW
BARRIER RAIL JOINT DETAILS



SECTION I-I



PART SECTION C-C
(RIGHT RAIL)



PART SECTION C-C
(LEFT RAIL)

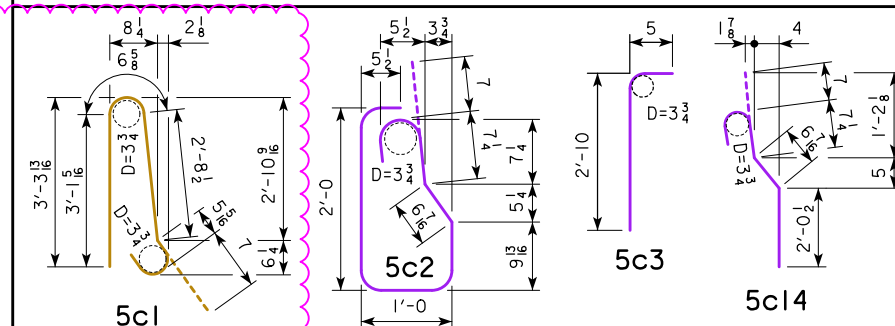
STAINLESS STEEL REINF. STEEL - LEFT RAIL

SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STANDARD SECTIONS	5c1	RAIL, VERTICAL		725	7'-5	5608
	5c2	RAIL, VERTICAL		725	6'-0	4537
	6d1	LEFT RAIL, LONGITUDINAL		247	39'-10	14778
STAINLESS STEEL TOTAL (LBS.)						24923

STAINLESS STEEL REINF. STEEL - RIGHT RAIL

SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STANDARD SECTIONS	5c1	RAIL, VERTICAL		748	7'-5	5786
	5c2	RAIL, VERTICAL		748	6'-0	4681
	6d2	RIGHT RAIL, LONGITUDINAL		260	39'-2	15295
STAINLESS STEEL TOTAL (LBS.)						25762

BENT BAR DETAILS



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

CONCRETE PLACEMENT SUMMARY

SECTION		QUANTITY
STANDARD SECTION	1455.8' AT 0.1281 CU. YDS. PER FT.	186.5
AESTHETIC TREATMENT (LEFT RAIL)	716.58' AT 0.0113 CU. YDS. PER FT.	8.1
AESTHETIC TREATMENT (RIGHT RAIL)	739.22' AT 0.0113 CU. YDS. PER FT.	8.4
TOTAL (CU. YD.)		203.0

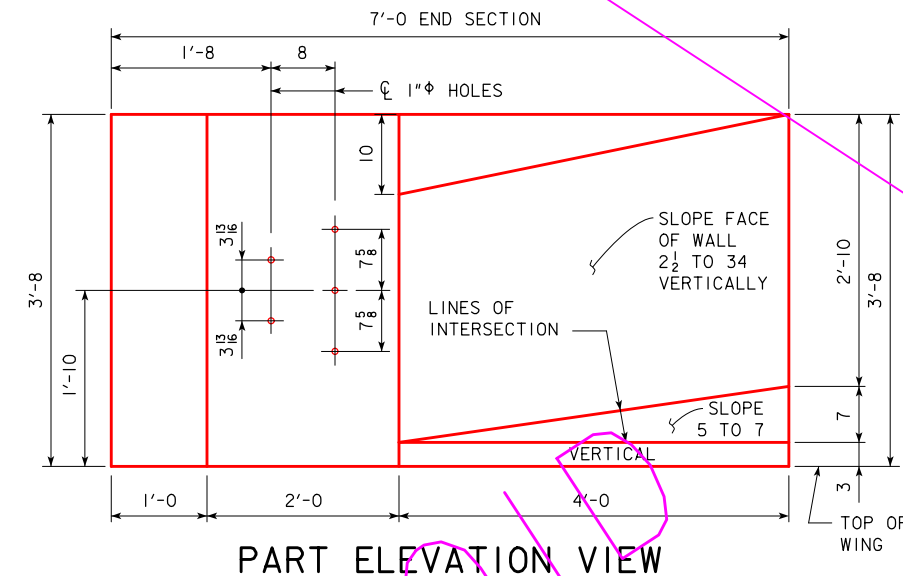
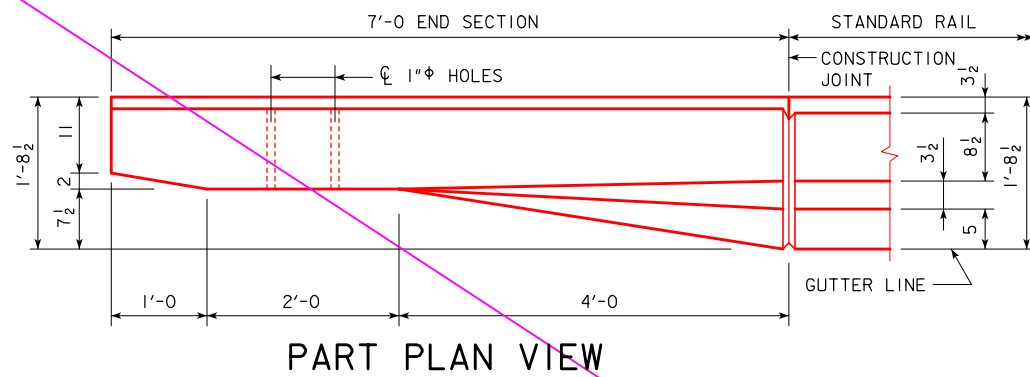
CONCRETE BARRIER RAIL QUANTITIES

ITEM	UNIT	TOTAL
CONCRETE BARRIER RAILING, AESTHETIC (LEFT RAIL)	LIN. FT.	716.6
CONCRETE BARRIER RAILING, AESTHETIC (RIGHT RAIL)	LIN. FT.	739.2

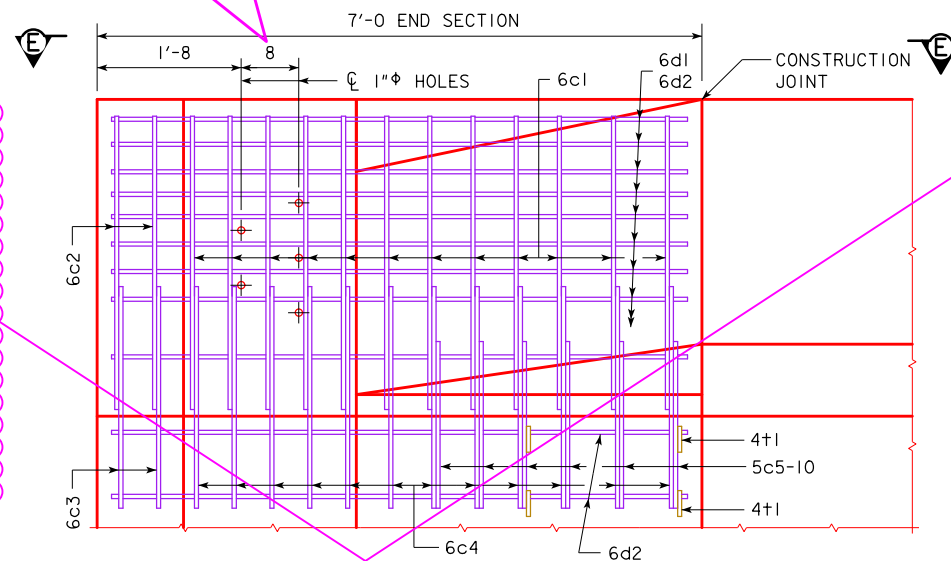
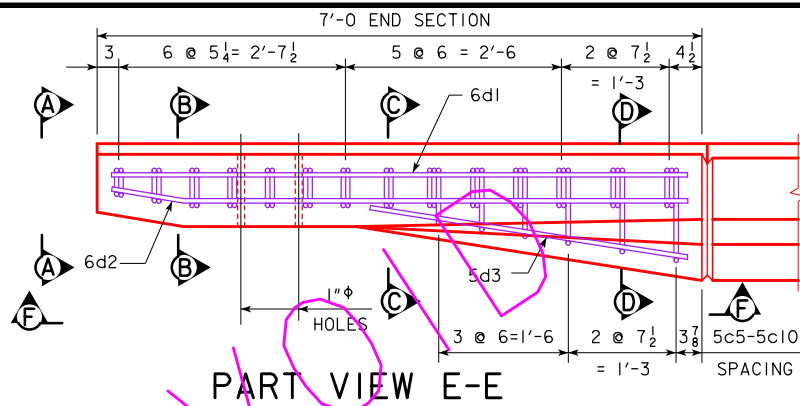
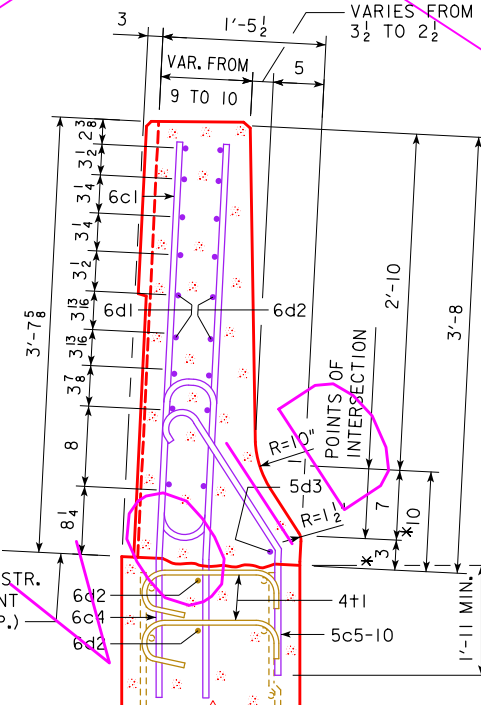
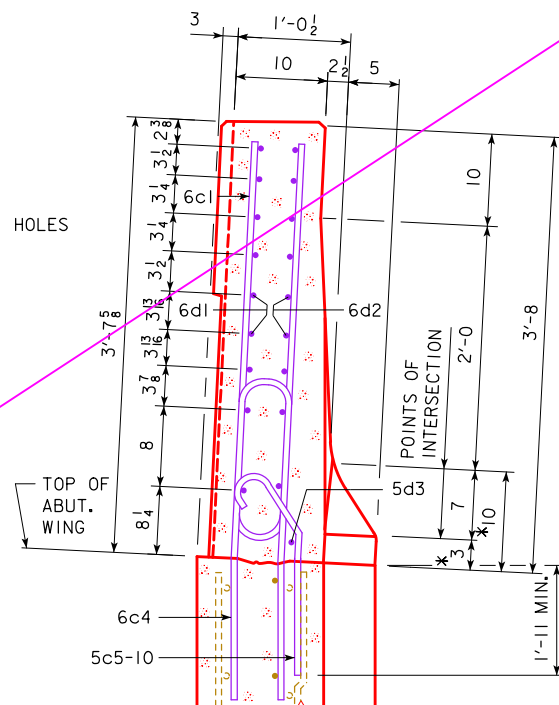
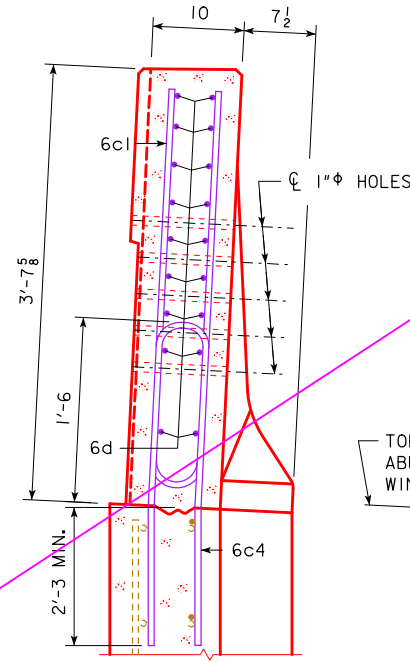
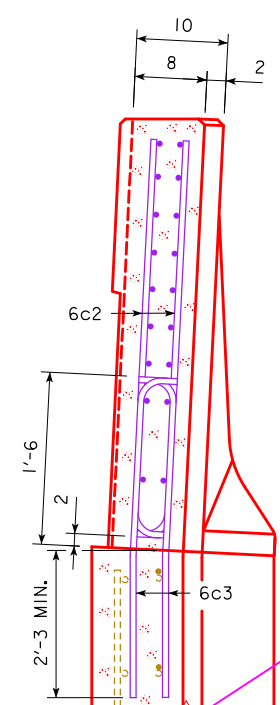
■ VOLUME BASED ON ESTIMATED AVERAGE CROSS SECTIONAL AREA OF 0.306 SQ.FT. FOR AESTHETIC TREATMENT WITH NO DEDUCTION FOR FORM LINER.

* DENOTES THE MAXIMUM VALUE FOR THIS DIMENSION. THIS DIMENSION MAY VARY DUE TO CONSTRUCTION INACCURACIES.

DESIGN FOR 0° SKEW
1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE
UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0
BARRIER RAIL DETAILS - UNIT 2
STA. 3546+14.50 (RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 101 OF 121 FILE NO. 30170 DESIGN NO. 1320



PROVIDE 5 HOLES FORMED WITH 1"Ø PLASTIC CONDUIT. COST TO BE INCLUDED IN PRICE BID FOR CONCRETE BARRIER RAILING.



REVISED:
05-06-2022
THIS
SHEET
VOIDED.

REASON:
EXCESSIVE
CHANGES
CREATED
UNCLEAR
REINFORCING
STEEL
QUANTITY
TABLE.

NOTE:
4#1 PLACEMENT- 2 BARS EACH
LEVEL OF 6d2 IN WING FOOTING.









NOTE:
CONSTRUCTION JOINT BETWEEN
TOP OF WING AND BARRIER
RAIL IS ROUGHENED CONCRETE.


~~NOTE:
THE 10" RADIUS AND 1 1/2" RADIUS
ARE TYPICAL AND SHALL BE
USED WHEN CONSTRUCTING THE
CORNERS FOR VIEW A-A,
SECTION B-B, SECTION C-C AND
SECTION D-D.~~

NOTE:
THE 6c4, 6c3, 5c5-10, 2 - 6d2 AND
4+1 BARS ARE TO BE PLACED
WITH THE ABUTMENT WING. THE
DETAILS FOR PLACEMENT ARE
SHOWN ON THE WING ABUTMENT
SHEET.

NOTE:
DASHED LINES BELOW THE TOP OF
WING ARE THE ABUTMENT WING
REINFORCING STEEL. SEE WING
ABUTMENT SHEET FOR PLACEMENT.

* DENOTES THE MAXIMUM
VALUE FOR THIS DIMENSION.
THIS DIMENSION MAY VARY DUE
TO CONSTRUCTION INACCURACIES.

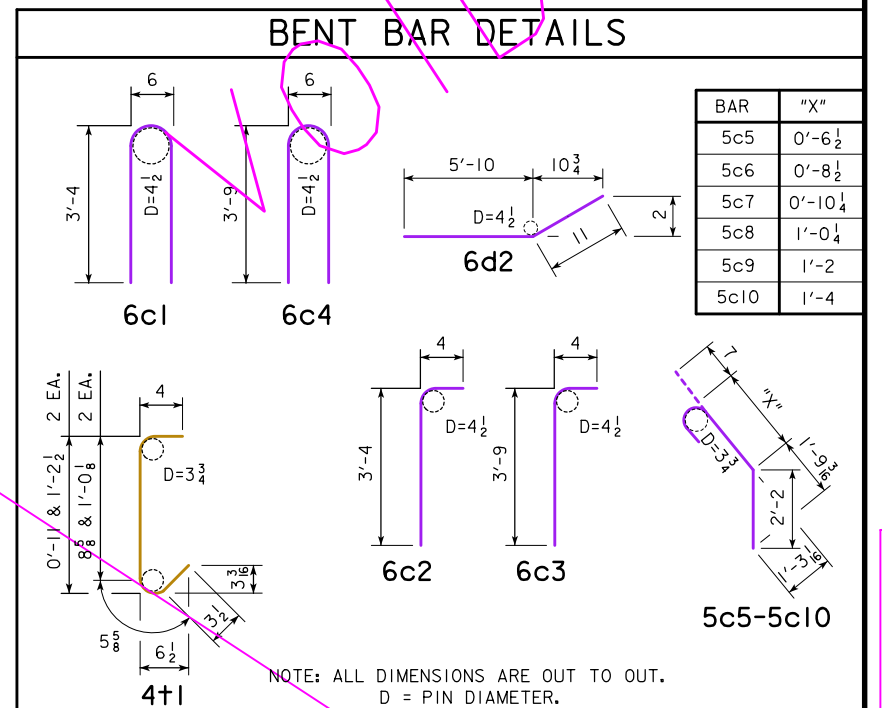
STAINLESS STEEL REINF. STEEL - RIGHT END SECT.					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6c1	RAIL, VERTICAL		12	7'-2	129
6c2	RAIL, VERTICAL		4	3'-8	22
6c3	RAIL, VERTICAL		4	4'-1	25
6c4	RAIL, VERTICAL		12	8'-0	144
5c5-10	RAIL, VERTICAL		6	VARIES	23
6d1	RAIL, HORIZONTAL		9	6'-8	90
6d2	RAIL, HORIZONTAL		11	6'-9	112
5d3	RAIL, HORIZONTAL		1	3'-9	4
STAINLESS STEEL TOTAL WEIGHT (LBS.)					549

EPOXY COATED REINF. STEEL - RIGHT END SECT.					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
4#1	RAIL, ABUTMENT WING TIE BARS		4	VARIES	5
EPOXY REINF. TOTAL WEIGHT (LBS.)					5

NOTE: REINFORCING STEEL QUANTITIES ARE INCLUDED ON THE SUMMARY QUANTITIES SHEET.

CONCRETE PLACEMENT SUMMARY	
SECTION	TOTAL
STANDARD BARRIER RAIL RIGHT END SECTION	0.9 CU. YD.
AESTHETIC TREATMENT 7' AT 0.0113 CU. YDS. PER FT.	0.2 CU. YD.

☒ VOLUME BASED ON ESTIMATED AVERAGE CROSS SECTIONAL AREA OF 0.306 SQ.FT. FOR AESTHETIC TREATMENT WITH NO DEDUCTION FOR FORM LINER.



DESIGN FOR 0° SKEW

1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"

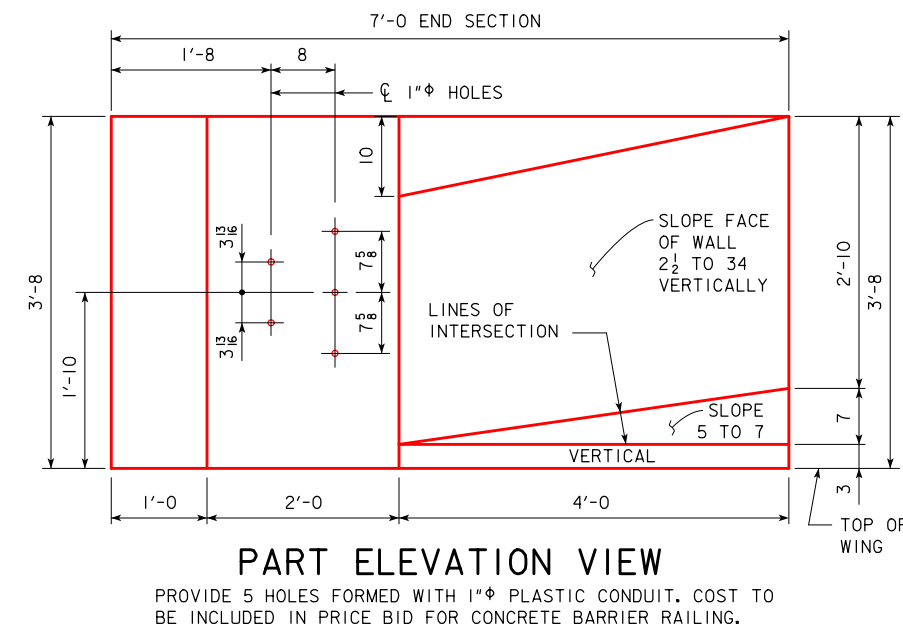
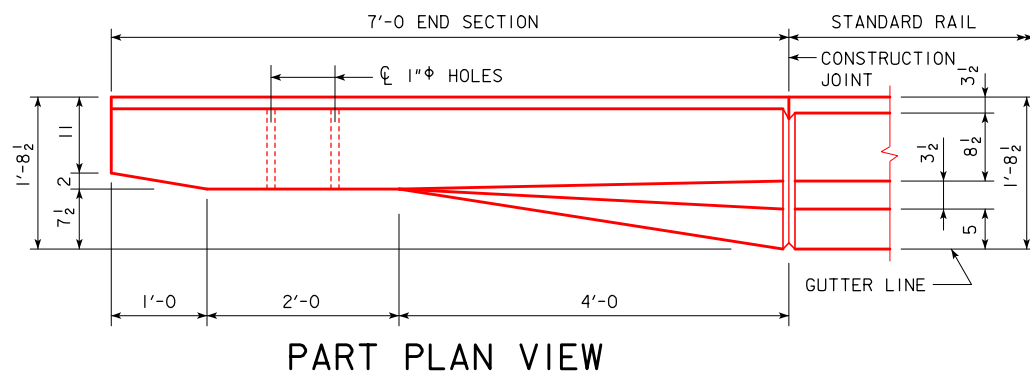
RIGHT BARRIER END SECTION DETAILS

STA. 3546+14.50 (R/L 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

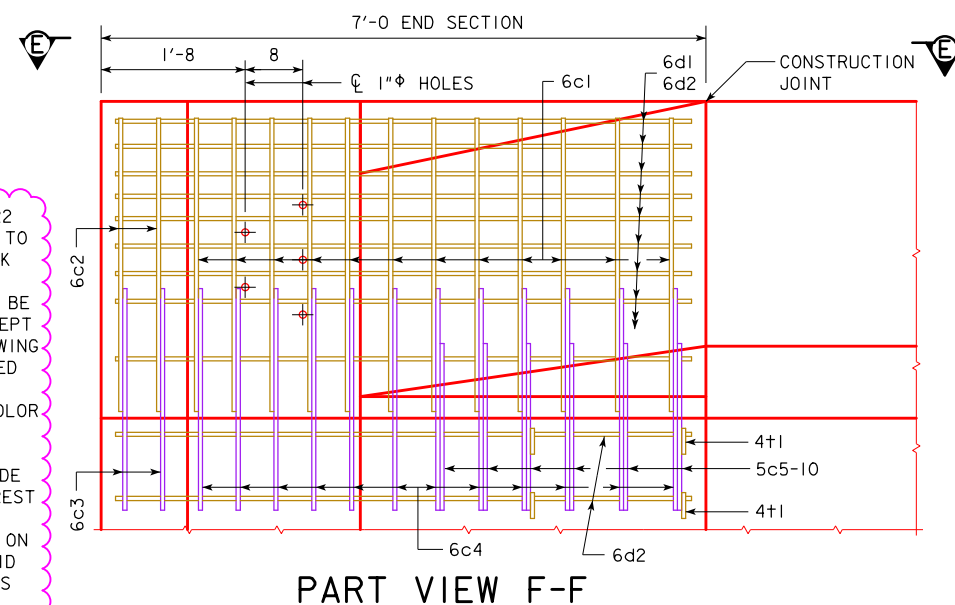
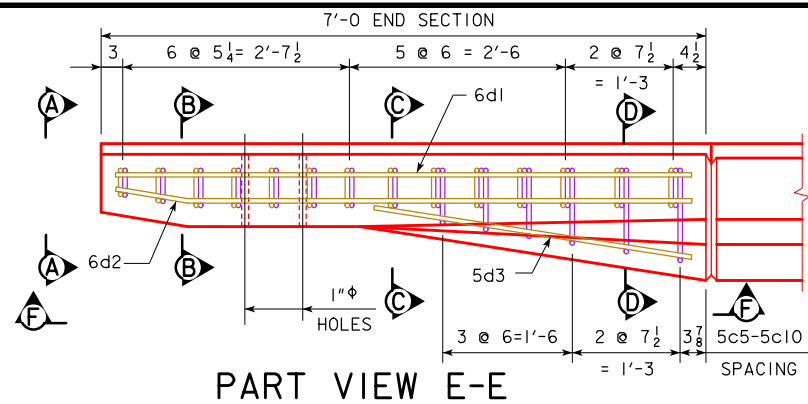
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 102 OF 121 FILE NO. 30170 DESIGN NO. 1320



REVISED: 05-06-2022
THIS SHEET ADDED TO
SHOW UPDATED DECK
AND BARRIER RAIL
REINFORCEMENT TO BE
EPOXY COATED, EXCEPT
BARRIER TO DECK/WIND
CONNECTION. CHANGED
REINFORCING STEEL
QUANTITIES AND COLOR
OF REINFORCEMENT.

REASON: CHANGE MADE
IN THE BEST INTEREST
OF THE PUBLIC TO
KEEP THE PROJECT ON
SCHEDULE AND AVOID
SIGNIFICANT DELAYS
IN PROJECT
COMPLETION.



NOTE:
4#1 PLACEMENT- 2 BARS EACH
LEVEL OF 6d2 IN WING FOOTING.

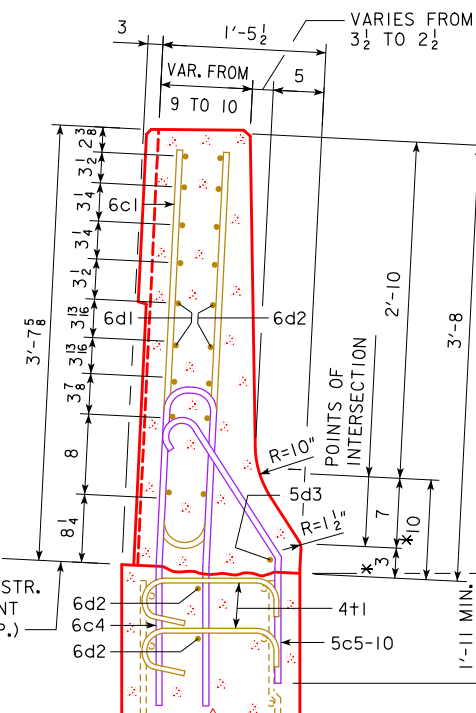
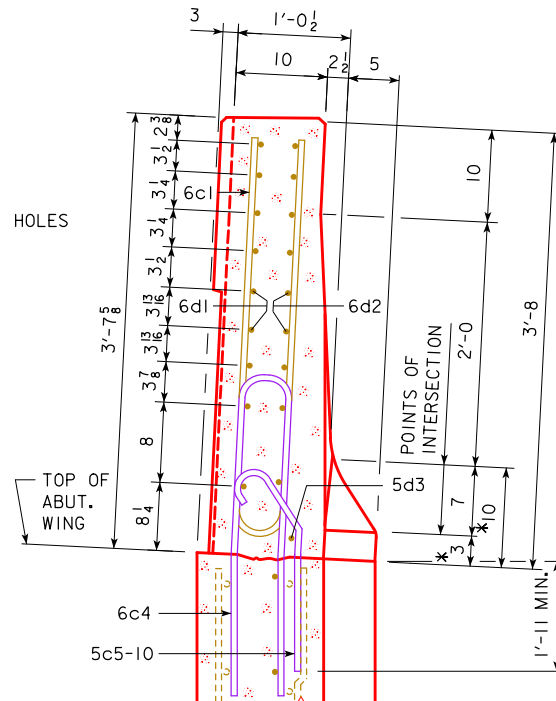
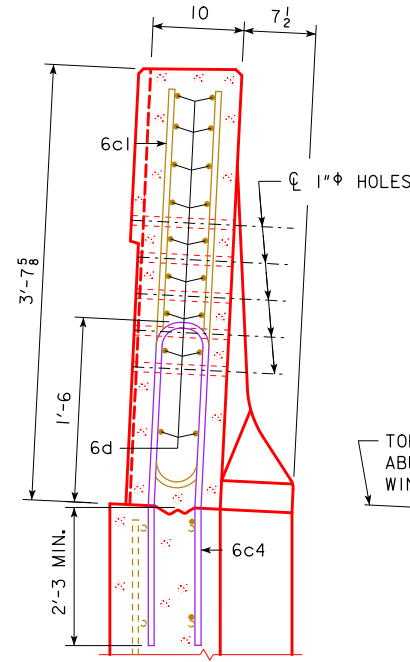
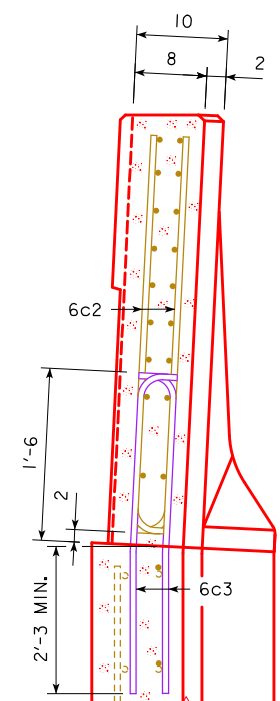
NOTE:
CONSTRUCTION JOINT BETWEEN
TOP OF WING AND BARRIER
RAIL IS ROUGHENED CONCRETE.

NOTE:
THE 10" RADIUS AND 1 1/2" RADIUS
ARE TYPICAL AND SHALL BE
USED WHEN CONSTRUCTING THE
CORNERS FOR VIEW A-A,
SECTION B-B, SECTION C-C AND
SECTION D-D.







NOTE:
THE 6c4, 6c3, 5c5-10, 2 - 6d2 AND
4+1 BARS ARE TO BE PLACED
WITH THE ABUTMENT WING. THE
DETAILS FOR PLACEMENT ARE
SHOWN ON THE WING ABUTMENT
SHEET.

NOTE:
DASHED LINES BELOW THE TOP OF
WING ARE THE ABUTMENT WING
REINFORCING STEEL. SEE WING
ABUTMENT SHEET FOR PLACEMENT.




* DENOTES THE MAXIMUM
VALUE FOR THIS DIMENSION.
THIS DIMENSION MAY VARY DUE
TO CONSTRUCTION INACCURACIES.



EPOXY COATED REINF. STEEL - RIGHT END SECT.

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6c1	RAIL, VERTICAL		12	7'-2	129
6c2	RAIL, VERTICAL		4	3'-8	22
6d1	RAIL, HORIZONTAL		9	6'-8	90
6d2	RAIL, HORIZONTAL		11	6'-9	112
5d3	RAIL, HORIZONTAL		1	3'-9	4
4+1	RAIL, ABUTMENT WING TIE BARS		4	VARIES	5
EPOXY REINF. TOTAL WEIGHT (LBS.)					362

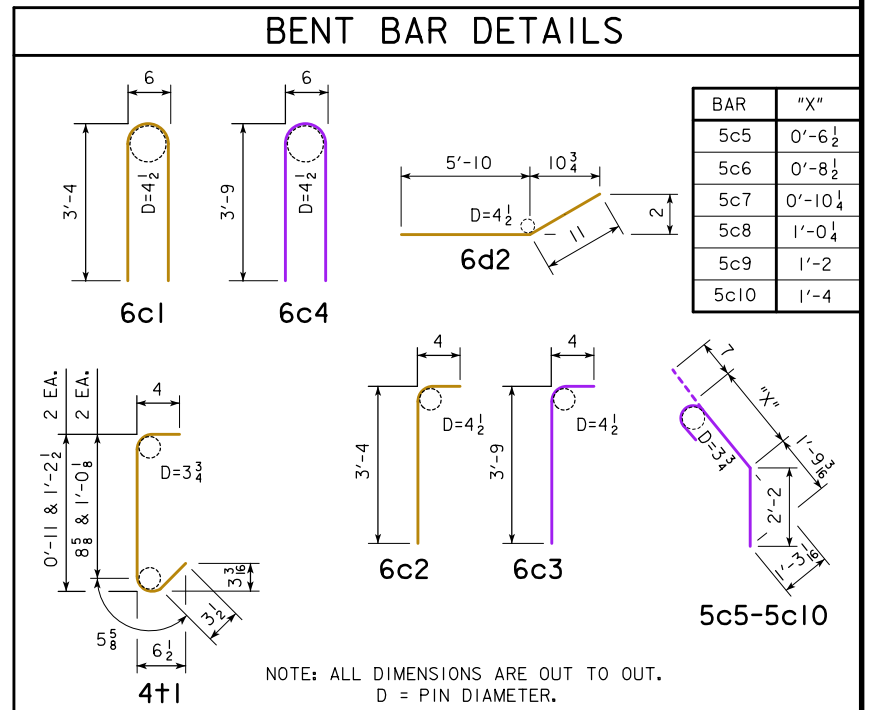
STAINLESS STEEL REINF. STEEL - RIGHT END SECT.

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6c3	RAIL, VERTICAL		4	4'-1	25
6c4	RAIL, VERTICAL		12	8'-0	144
5c5-10	RAIL, VERTICAL		6	VARIES	23
STAINLESS STEEL TOTAL WEIGHT (LBS.)					192

NOTE: REINFORCING STEEL QUANTITIES ARE INCLUDED ON THE SUMMARY QUANTITIES SHEET.

CONCRETE PLACEMENT SUMMARY	
SECTION	TOTAL
STANDARD BARRIER RAIL RIGHT END SECTION	0.9 CU. YD.
AESTHETIC TREATMENT 7' AT 0.0113 CU. YDS. PER FT.	0.2 CU. YD.

☑ VOLUME BASED ON ESTIMATED AVERAGE CROSS SECTIONAL AREA OF 0.306 SQ.FT. FOR AESTHETIC TREATMENT WITH NO DEDUCTION FOR FORM LINER.



DESIGN FOR 0° SKEW

1419'-0" x VARIES CONTINUOUS WELDED GIRDER BRIDGE

UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"

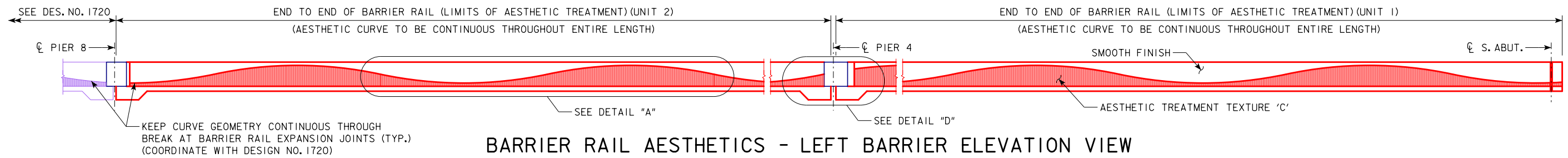
RIGHT BARRIER END SECTION DETAILS

STA. 3546+14.50 (R/L 1-480 RAMP C) NOVEMBER, 2020

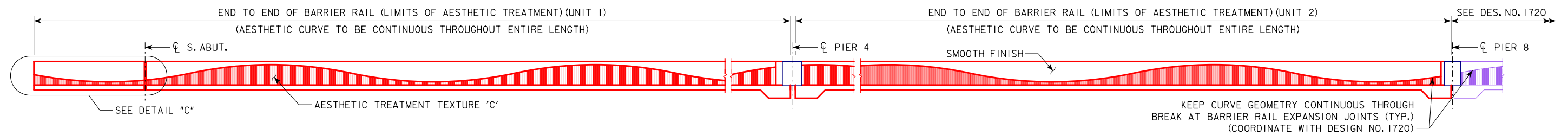
POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

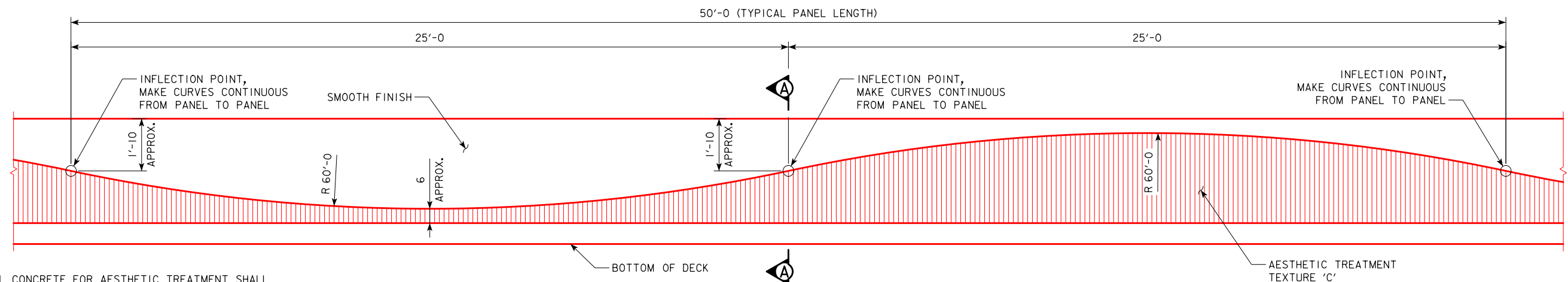
DESIGN SHEET NO. 102A OF 121 FILE NO. 30170 DESIGN NO. 1320



BARRIER RAIL AESTHETICS - LEFT BARRIER ELEVATION VIEW

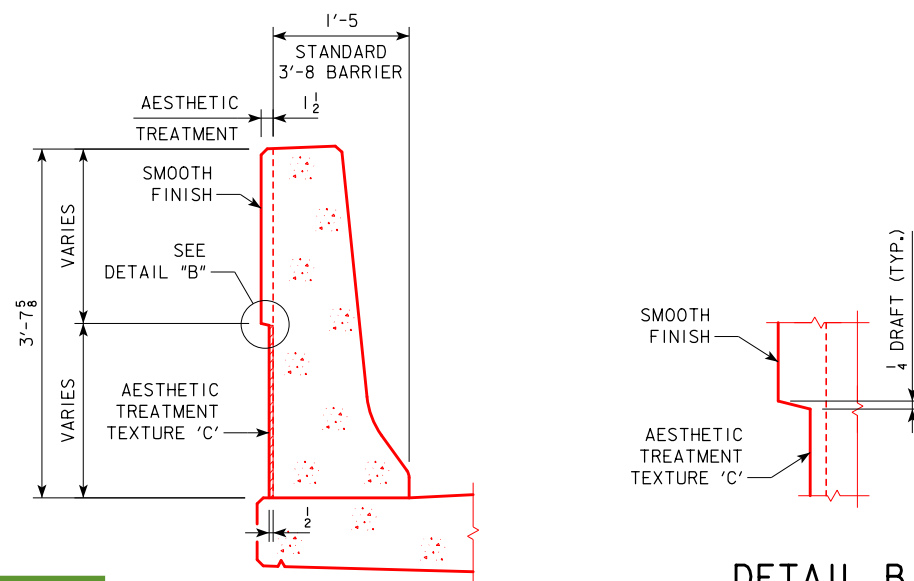


BARRIER RAIL AESTHETICS - RIGHT BARRIER ELEVATION VIEW



DETAIL A

NOTE:
ADDITIONAL CONCRETE FOR AESTHETIC TREATMENT SHALL
BE PLACED MONOLITHICALLY WITH STANDARD 3'-8 RAIL.



DETAIL B

SECTION A-A

NOTE:
FOR BARRIER CONCRETE TEXTURE NOTES, SEE DESIGN SHEET 4.
FOR DETAILS C & D, SEE DESIGN SHEET 104.

DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

BARRIER RAIL AESTHETIC DETAILS

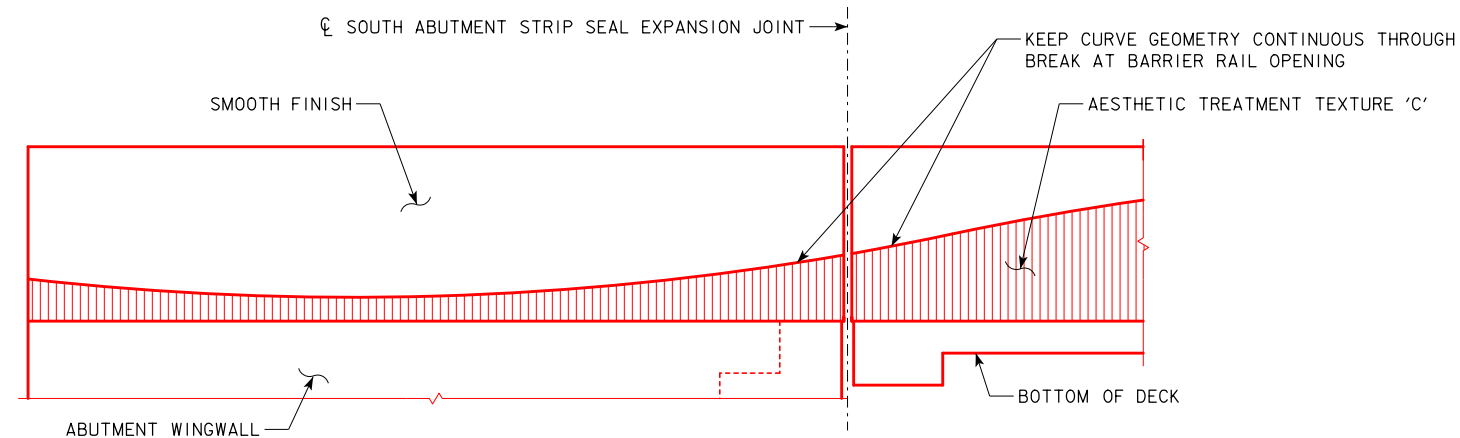
STA. 3546+14.50 (R 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

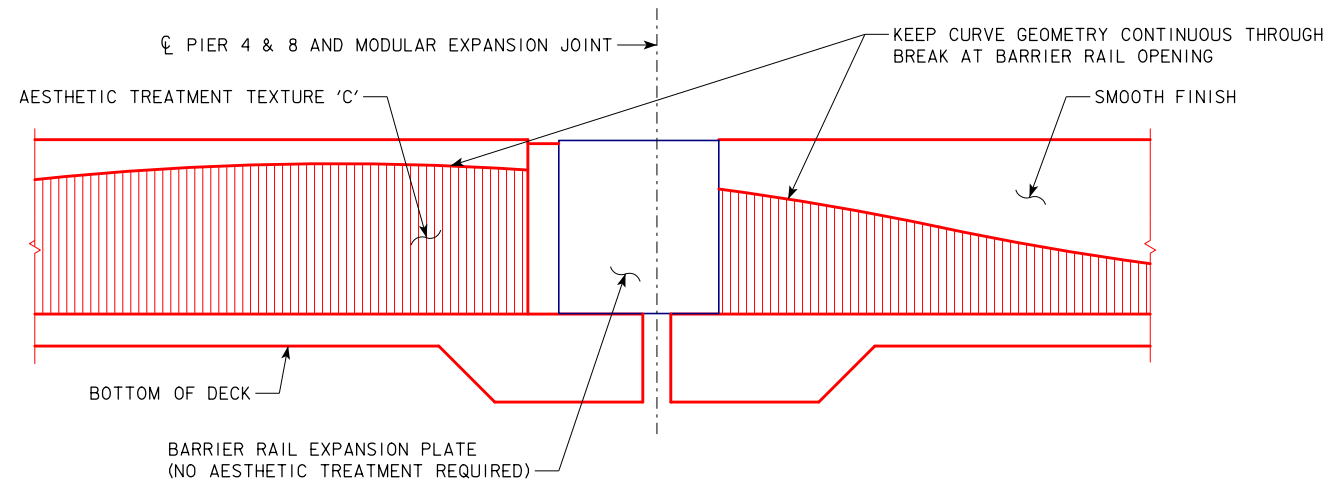
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 103 OF 121 FILE NO. 30170 DESIGN NO. 1320





DETAIL C
BARRIER RAIL AESTHETICS AT ABUTMENT



DETAIL D
BARRIER RAIL AESTHETICS AT PIER 4 & 8

BARRIER CONCRETE TEXTURE NOTES:

THIS WORK CONSISTS OF APPLYING TEXTURED FINISHES ON ALL DESIGNATED CONCRETE SURFACES OF THE BARRIERS AS SHOWN IN THIS PLAN. SEE "GENERAL NOTES FOR TEXTURED CONCRETE FORM LINERS" ON DESIGN SHEET 4 FOR MORE INFORMATION REGARDING THE USE OF FORM LINERS. THE TEXTURED BARRIER MOCKUP MUST BE REVIEWED AND APPROVED BY THE ENGINEER BEFORE BEGINNING PRODUCTION BARRIER CONCRETE WORK THAT INCLUDES TEXTURE.

THE FORM LINER USED TO PRODUCE TEXTURE 'C' AS SHOWN IN THE PLAN DETAILS SHALL PRODUCE A FRACTURED RIB TEXTURED EFFECT. MAXIMUM DEPTH OF TEXTURE SHALL BE $\frac{1}{2}$ INCH. ORIENT FORM LINERS IN FORMS SO THAT STRIATIONS ARE SET PERPENDICULAR TO THE TOP OF BRIDGE DECK.

OBTAIN TEXTURE 'C' FORM LINER MATERIALS FROM ONE OF THE FOLLOWING MANUFACTURERS:

1. SCOTT SYSTEM, INC. (PATTERN NO. 149)
2. FITZGERALD FORM LINERS (PATTERN NO. 16960)
3. ARCHITECTURAL POLYMERS (PATTERN NO. 209)
4. SUBMIT ALL OTHER UNLISTED MANUFACTURERS AND PATTERNS INCLUDING A 1 FOOT BY 1 FOOT SAMPLE OF PROPOSED FORMLINER TO THE IOWA DEPARTMENT OF TRANSPORTATION, BRIDGES AND STRUCTURES BUREAU, AMES, IOWA. SAMPLE MAY BE EITHER ACTUAL FORMLINER MATERIALS OR FOAM CASTINGS. NO SAMPLES ARE REQUIRED TO BE SUBMITTED FOR MANUFACTURERS AND PATTERNS LISTED ABOVE.

TEXTURE 'C' FORM LINER MATERIALS SHALL MATCH THE FORM LINER USED ON THE BARRIER OF DESIGN NO. 1420 & 1720. NO SUBSTITUTIONS WILL BE ALLOWED.

PRIOR TO BEGINNING ANY PRODUCTION CONCRETE WORK THAT INCLUDES TEXTURE, SUBMIT MANUFACTURER'S CUT SHEETS FOR FORM LINERS. SUBMIT SHOP DRAWINGS THAT INDICATE POSITION OF LINERS WITHIN CONCRETE FORMS, LAYOUT OF JOINTS, AND BACKING MATERIAL TYPE AND THICKNESS IF REQUIRED.

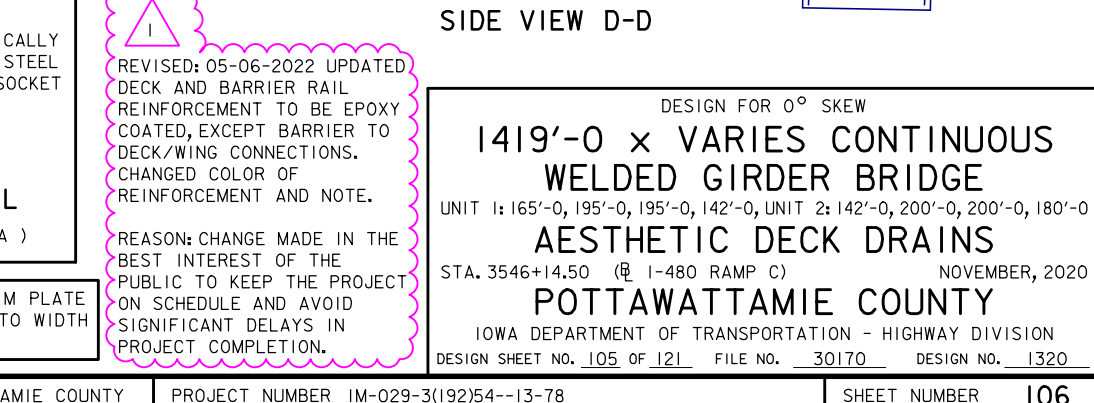
DO NOT MIX FORM LINERS FROM DIFFERENT MANUFACTURERS WHEN FORMING ANY INDIVIDUAL TEXTURE ON THE PROJECT.

ALL COSTS ASSOCIATED WITH BARRIER CONCRETE TEXTURE AND FORM LINERS INCLUDING THE TEXTURED BARRIER MOCKUP ARE TO BE INCLUDED IN THE BID ITEM, "CONCRETE BARRIER RAIL, AESTHETIC".

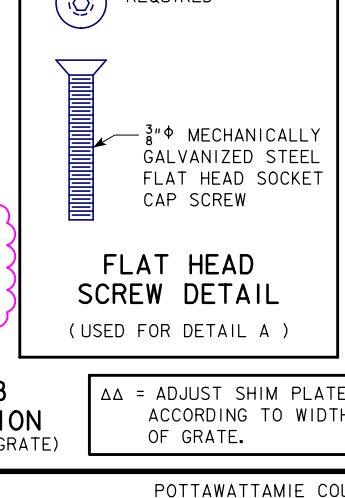
NOTE:
FOR LOCATION OF DETAILS, SEE DESIGN SHEET 103.

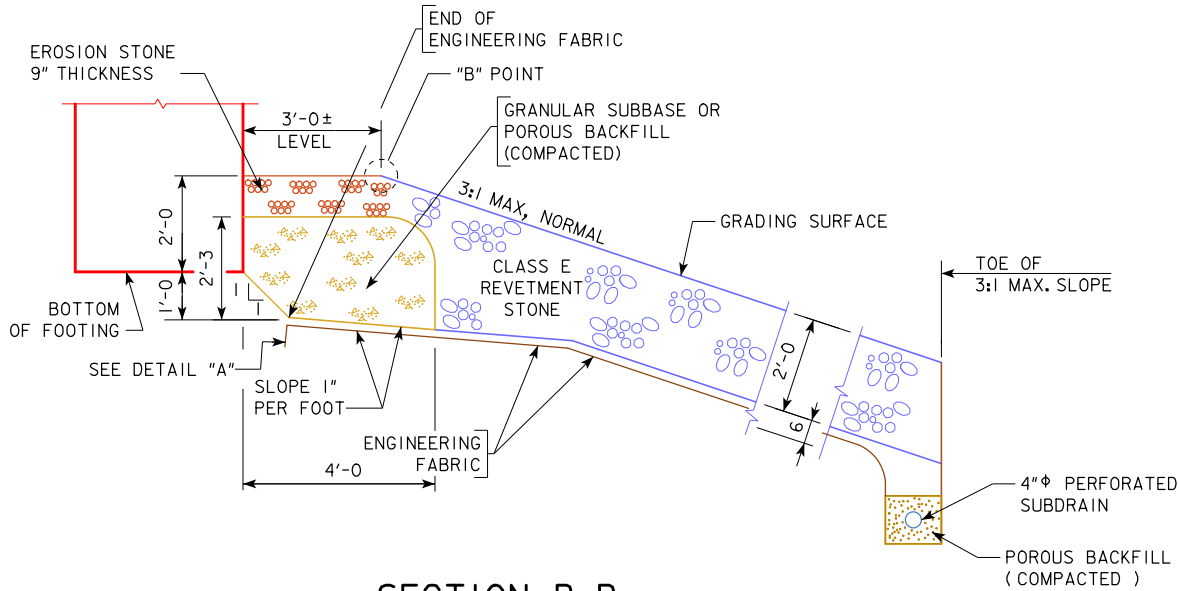


DESIGN FOR 0° SKEW		
1419'-0 x VARIES CONTINUOUS		
WELDED GIRDER BRIDGE		
UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0		
BARRIER RAIL AESTHETIC DETAILS		
STA. 3546+14.50 (R 1-480 RAMP C)	NOVEMBER, 2020	
POTTAWATTAMIE COUNTY		
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION		
DESIGN SHEET NO. 104 OF 121	FILE NO. 30170	DESIGN NO. 1320

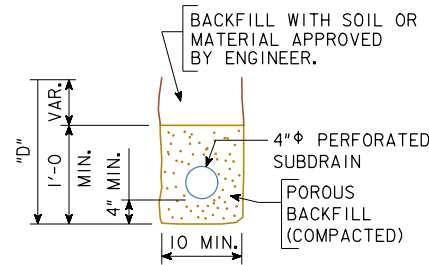


The diagram consists of two parts, each enclosed in a rectangular box. The top part is titled 'HEX HEAD BOLT DETAIL' and shows a side view of a bolt with a hexagonal head and a threaded shank. An arrow points to the head with the text 'HEX HEAD REQUIRED'. Another arrow points to the shank with the text ' $\frac{3}{8}$ " ϕ MECHANICALLY GALVANIZED STEEL HEX HEAD BOLT'. The bottom part is titled 'FLAT HEAD SCREW DETAIL' and shows a side view of a screw with a flat, circular head and a threaded shank. An arrow points to the head with the text 'HEX DRIVE REQUIRED'. Another arrow points to the shank with the text ' $\frac{3}{8}$ " ϕ MECHANICALLY GALVANIZED STEEL FLAT HEAD SOCKET CAP SCREW'. Below the boxes, there is a note: ' $\Delta\Delta$ = ADJUST SHIM PLATE ACCORDING TO WIDTH OF GRATE.'



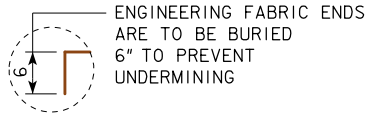


SECTION B-B

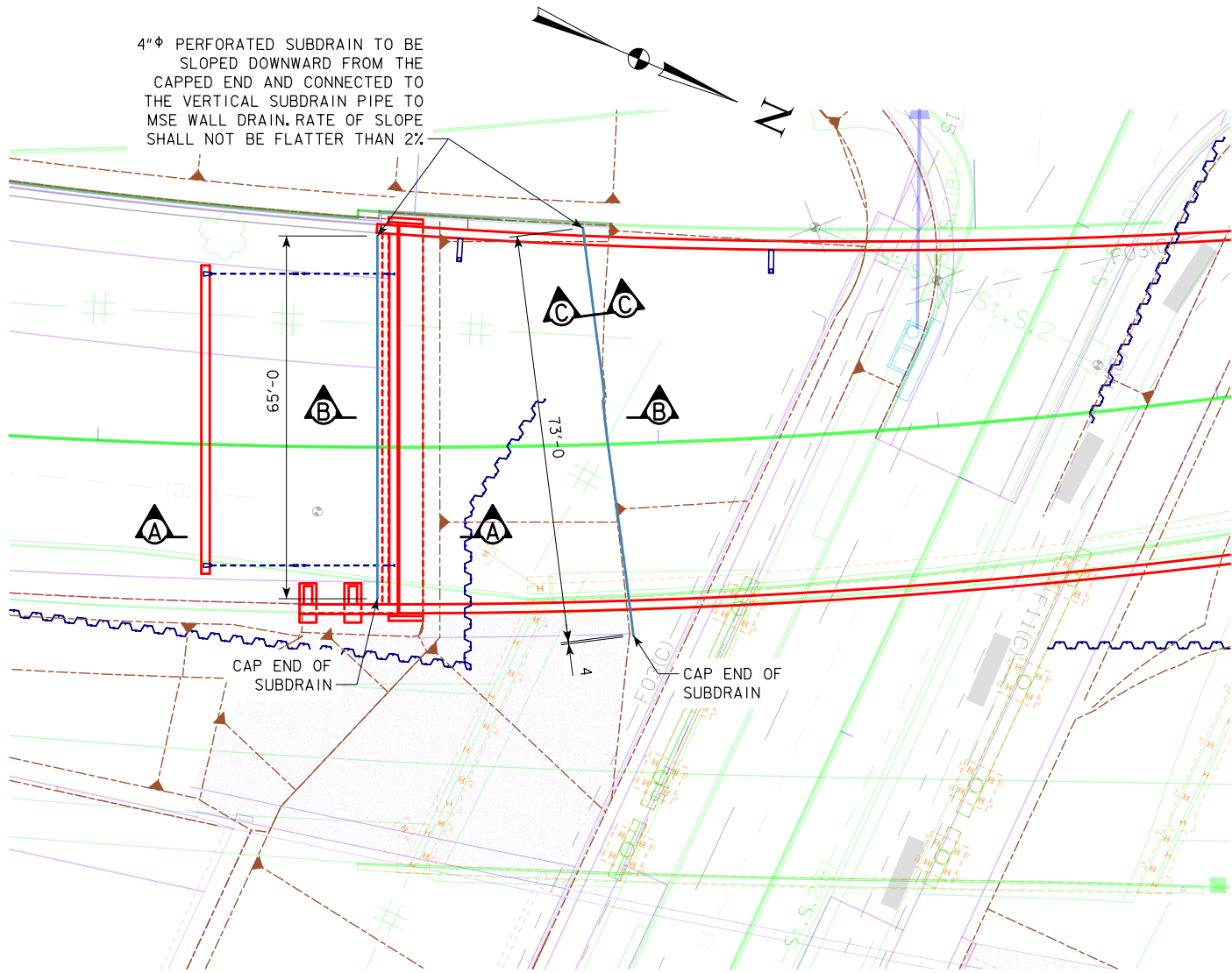


SECTION C-C

"D" = DEPTH REQUIRED TO PROVIDE PROPER FLOW LINE FOR SUBDRAIN.



DETAIL "A"



SITUATION PLAN
SHOWING SUBDRAIN LOCATIONS

SUBDRAIN OUTLET ELEVATIONS

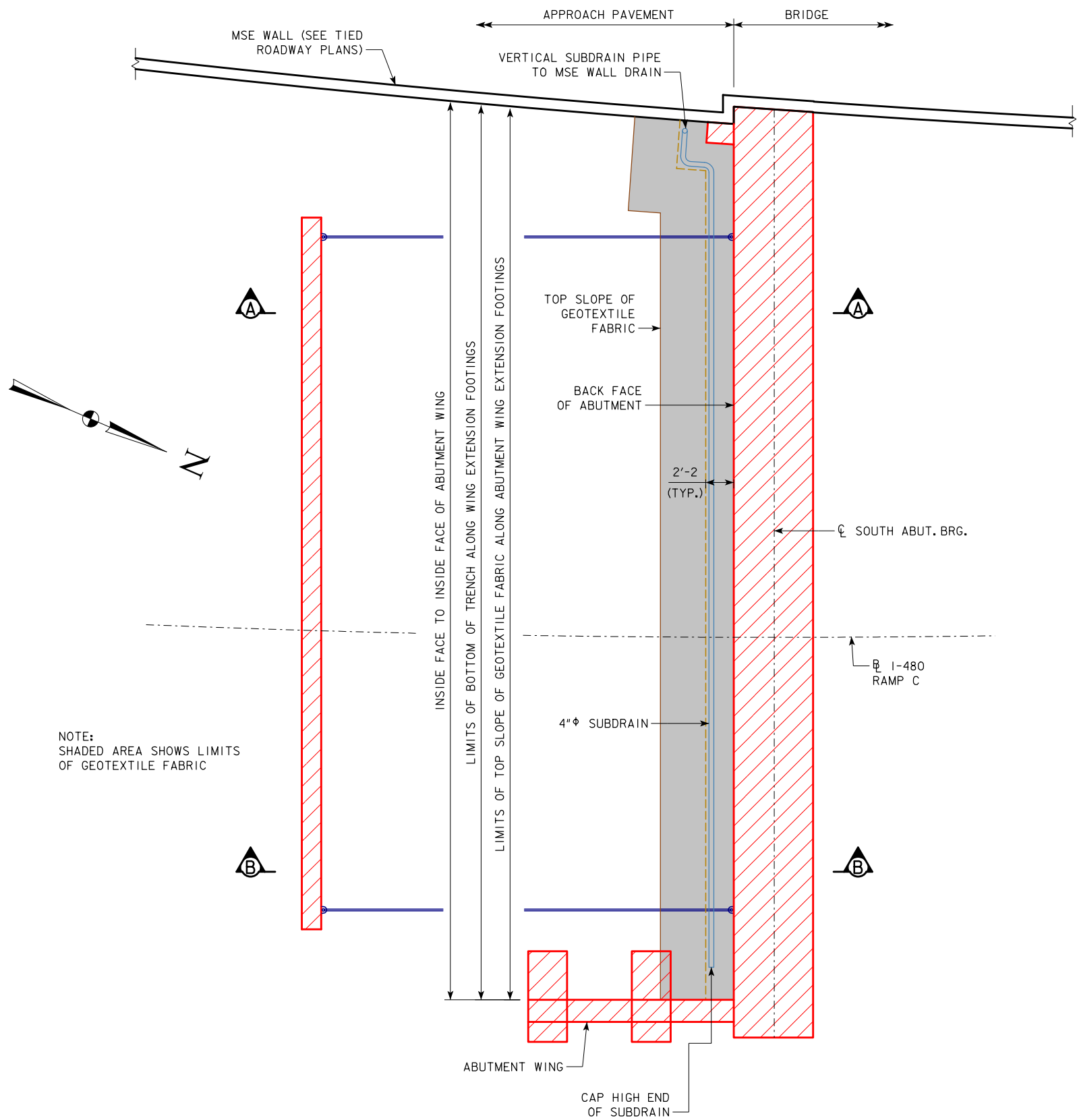
LOCATION	ELEVATION
SOUTH ABUTMENT	970.00 ±
MSE WALL ON S. SIDE OF 2ND AVE.	970.00 ±

NOTE:
COORDINATE SUBDRAIN LAYOUT
WITH MSE WALL CONSTRUCTION
IN TIED ROADWAY PROJECT
IM-029-3(190)53--13-78

NOTE:
SECTION A-A IS SHOWN ON ABUTMENT
BACKFILL DETAILS SHEET.

DESIGN FOR 0° SKEW
**1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE**
UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
SUBDRAIN DETAILS
STA. 3546+14.50 (R 1-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 106 OF 121 FILE NO. 30170 DESIGN NO. 1320

REVISED 09-14 - THE TECHNICAL DATA INFORMATION TABLE WAS REMOVED AND IS LOCATED IN THE STANDARD SPECIFICATIONS. CHANGED SURFACE FLOODING TIME TO 5 MINUTE INCREMENTS.
REVISED 09-2016 - CHANGED THE BRIDGE APPROACH PAVEMENT STANDARD TO "BR" (WAS "RK").
ENGLISHFORSLOPEPROTECTIONBRIDGES.DGN - 1007E - THIS SHEET ISSUED 08-07.



SOUTH ABUTMENT PLAN

ABUTMENT BACKFILL PROCESS:

PLACEMENT OF BACKFILL BY FLOODING IS NOT ALLOWED.

THE BASE OF THE EXCAVATION SUBGRADE BEHIND THE ABUTMENT IS TO BE GRADED WITH A 4% SLOPE AWAY FROM THE ABUTMENT FOOTING AND A 2% CROSS SLOPE IN THE DIRECTION OF THE SUBDRAIN OUTLET. THIS EXCAVATION SHAPING IS TO BE DONE PRIOR TO BEGINNING INSTALLATION OF THE GEOTEXTILE AND BACKFILL MATERIAL.

AFTER THE SUBGRADE HAS BEEN SHAPED, THE GEOTEXTILE FABRIC SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAILS SHOWN. THE FABRIC IS INTENDED TO BE INSTALLED IN THE BASE OF THE EXCAVATION AND EXTENDED VERTICALLY UP THE ABUTMENT BACKWALL, ABUTMENT WING WALLS, AND EXCAVATION FACE TO A HEIGHT THAT WILL BE APPROXIMATELY 1 TO 2 FOOT HIGHER THAN THE HEIGHT OF THE POROUS BACKFILL PLACEMENT AS SHOWN IN THE "BACKFILL DETAILS" ON THIS SHEET. THE STRIPS OF THE FABRIC PLACED SHALL OVERLAP APPROXIMATELY 1 FOOT AND SHALL BE PINNED IN PLACE. THE FABRIC SHALL BE ATTACHED TO THE ABUTMENT BY USING LATH FOLDED IN THE FABRIC AND SECURED TO THE CONCRETE WITH SHALLOW CONCRETE NAILS. THE FABRIC PLACED AGAINST THE EXCAVATION FACE SHALL BE PINNED.

WHEN THE FABRIC IS IN PLACE, THE SUBDRAIN SHALL BE INSTALLED DIRECTLY ON THE FABRIC AT THE TOE OF THE REAR EXCAVATION SLOPE. A SLOT WILL NEED TO BE CUT IN THE FABRIC AT THE POINT WHERE THE SUBDRAIN EXITS THE FABRIC NEAR THE END OF THE ABUTMENT WING WALL.

POROUS BACKFILL IS THEN PLACED AND LEVELED, NO COMPACTION IS REQUIRED.

BACKFILL SHALL BE THE SAME MATERIAL AS PLACED FOR THE MSE WALL AND IT SHALL BE PLACED AND COMPACTED IN THE SAME WAY AS THE MSE WALL BACKFILL MATERIAL. SEE ROADWAY PLAN AS PART OF THE TIED IM-029-3(190)53--13-78 GRADE AND PAVE PROJECT FOR PAYMENT OF BACKFILL.

THE COST OF SUBDRAINS, POROUS BACKFILL, AND GEOTEXTILE FABRIC FURNISHED AT THE BRIDGE ABUTMENTS SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR STRUCTURAL CONCRETE (BRIDGE).

SUBDRAIN NOTES:

THE SUBDRAINS SHALL BE 4" IN DIAMETER AND SHALL BE IN ACCORDANCE WITH ARTICLE 4143.01, B, OF THE STANDARD SPECIFICATIONS. FOR SUBDRAIN OUTLET, SEE MSE WALL PLANS IN PROJECT IM-029-3(190)53--13-78.

THE COST OF FURNISHING AND PLACING SUBDRAIN (INCLUDING POROUS BACKFILL AND THE CONNECTION TO THE VERTICAL MSE WALL SUBDRAIN OUTLET) IS TO BE INCLUDED IN THE PRICE BID FOR STRUCTURAL CONCRETE (BRIDGE). NO EXTRA PAYMENT WILL BE MADE.

THE DIMENSIONS SHOWN FOR THE PROPOSED SUBDRAIN ARE FOR ESTIMATION ONLY. REQUIRED LENGTHS AND GENERAL LOCATIONS OF SUBDRAINS ARE SUBJECT TO CHANGE DUE TO FIELD ADJUSTMENTS OF GRADING LAYOUT.

THE HIGH END OF THE PERFORATED SUBDRAIN SHALL BE CAPPED AS APPROVED BY THE ENGINEER. SEE MSE WALL PLANS AS PART OF THE TIED PROJECT IM-029-3(190)53--13-78.

NOTE:

SUBDRAIN SHALL SLOPE DOWNWARD 2% FROM HIGH END WHEN OUTLETTING AT ONE END OF THE ABUTMENT.

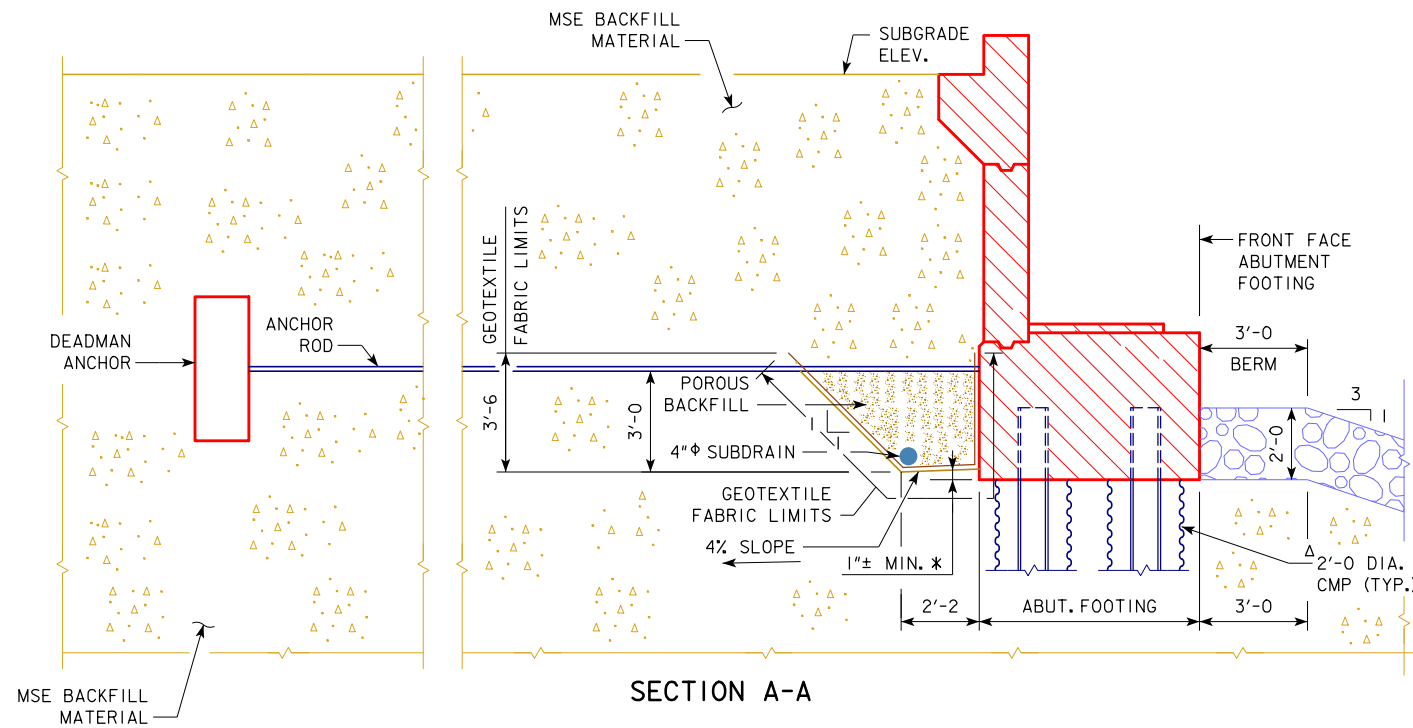
THE GEOTEXTILE FABRIC SHALL BE IN ACCORDANCE WITH ARTICLE 4196.01, B, 6 OF THE STANDARD SPECIFICATIONS. IF THE ENGINEERING FABRIC IS LAPPED THE LAPS SHALL BE A MINIMUM OF ONE FOOT IN LENGTH, SINGLE FASHION WITH UP SLOPE LAP PIECE ON TOP AND STAPLED FOR CONTINUITY.

FOR SECTION A-A, SECTION B-B AND BACKFILL SECTION SEE DESIGN SHEET 108.

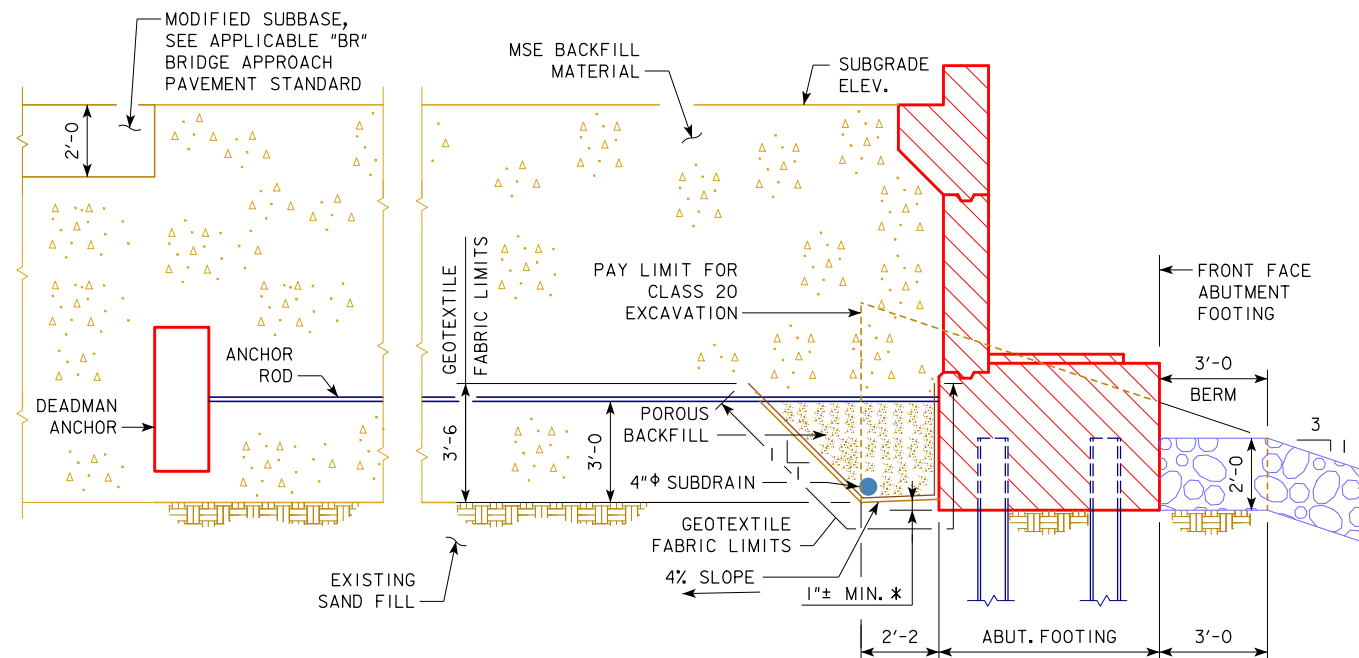
THESE BACKFILL DETAILS WILL NEED TO BE COORDINATED WITH THE MSE WALL PROJECT IM-029-3(190)53--13-78.

NOTE:
SEE SUBDRAIN DETAILS SHEET FOR DETAILS NOT SHOWN ON THIS SHEET WHICH ARE PERTINENT TO THIS STRUCTURE.

DESIGN FOR 0° SKEW
1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE
UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0
ABUTMENT BACKFILL DETAILS
STA. 3546+14.50 (R 1-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 107 OF 121 FILE NO. 30170 DESIGN NO. 1320



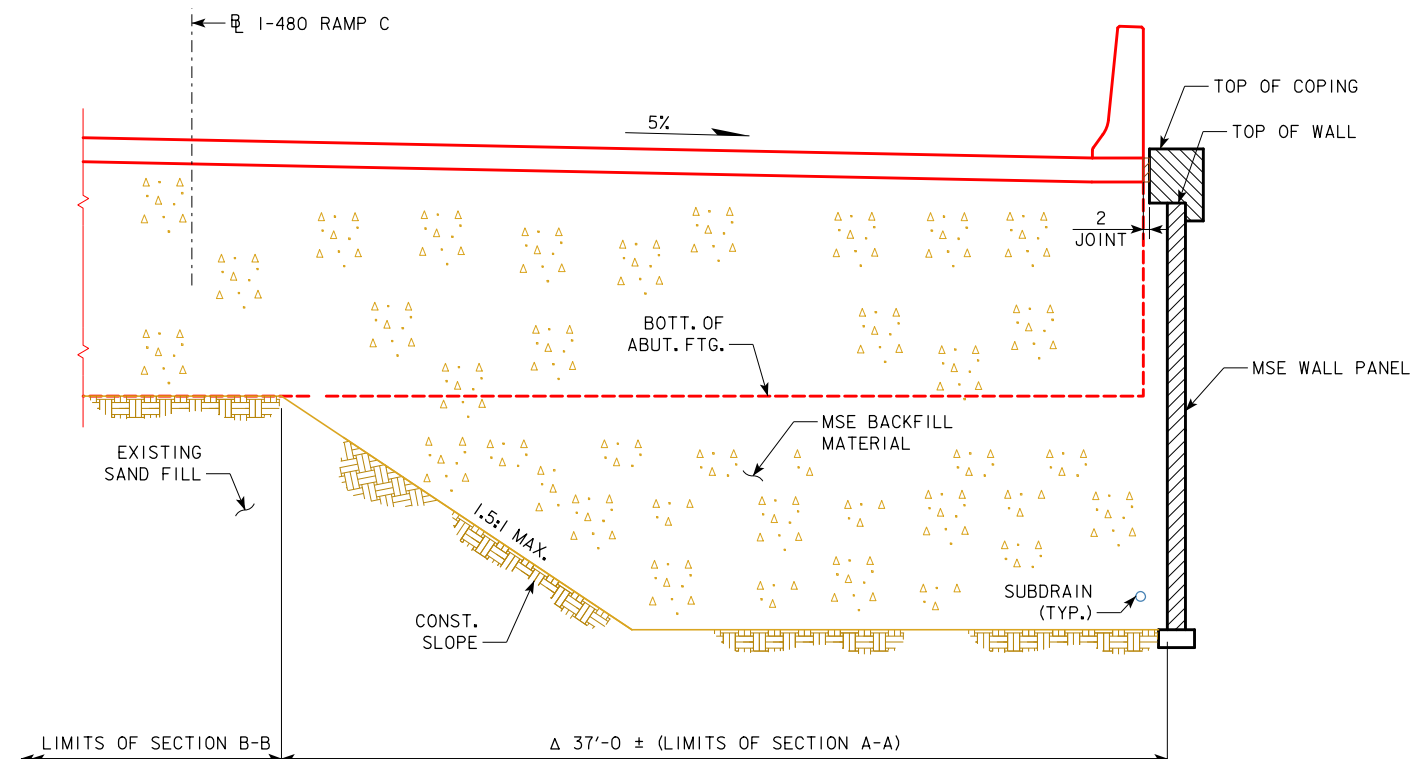
Δ CMP'S ARE REQUIRED BELOW THE ABUTMENT WITHIN THE MSE WALL STRAP ZONE AND THE SPECIAL BACKFILL OF THE MSE WALL. FOR CMP DETAILS SEE DESIGN SHEET 44.



BACKFILL DETAILS

NOTE: GEOTEXTILE FABRIC WILL BE ATTACHED TO FACE OF ABUTMENT FOOTING AND WINGS.

* DIMENSION VARIES DUE TO 2% SUBDRAIN SLOPE.



BACKFILL SECTION BEHIND ABUTMENT

(LOOKING BACK STATION AND NORMAL TO Δ 1-480 RAMP C)
(PILES NOT SHOWN)

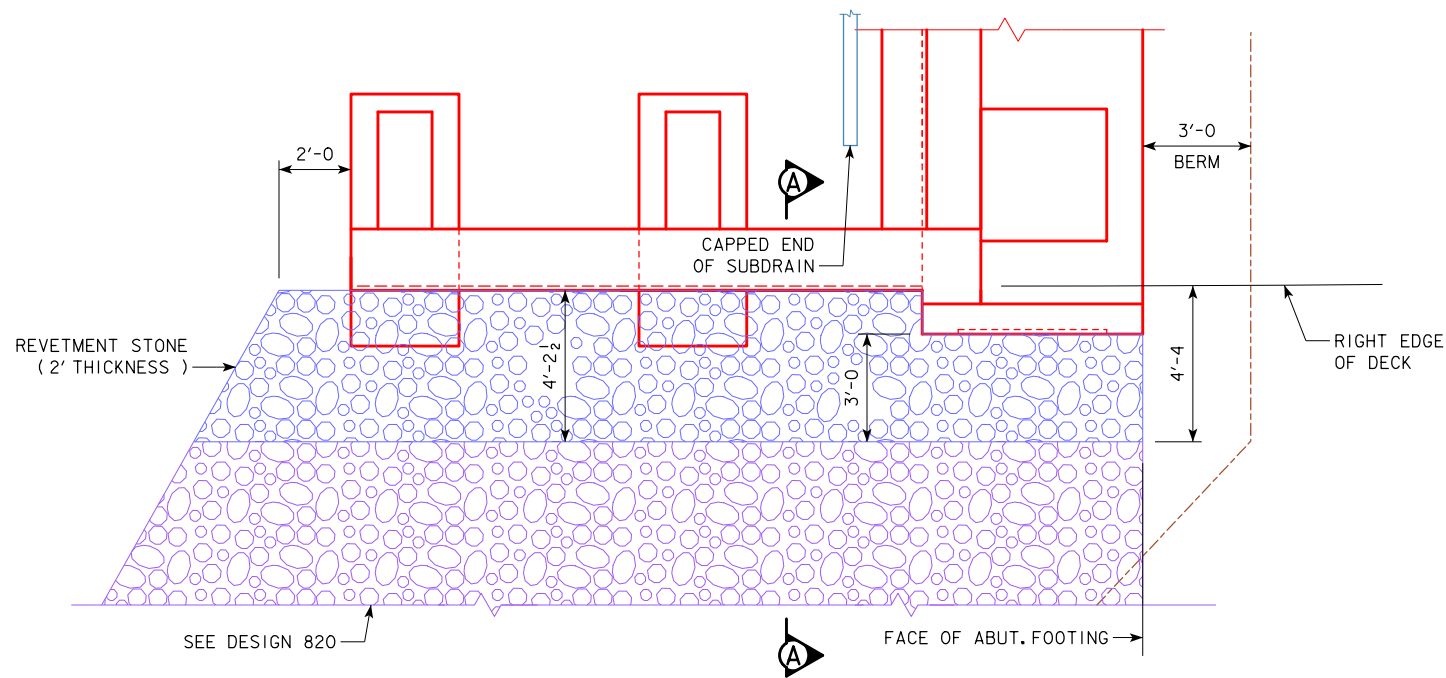
NOTE: DIMENSIONS WILL BE PROVIDED BY MSE WALL MANUFACTURER AS PART OF MSE WALL PROJECT IM-029-3(190)53--13-78.

Δ CLASS 20 EXCAVATION QUANTITY IS BASED ON THIS ASSUMED DIMENSION. ACTUAL DIMENSION WILL BE PROVIDED BY MSE WALL MANUFACTURER.

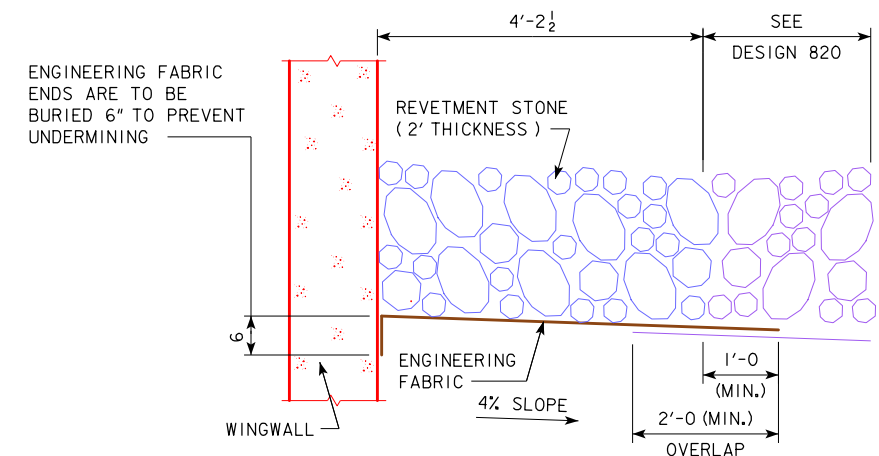
THESE BACKFILL DETAILS WILL NEED TO BE COORDINATED WITH THE MSE WALL PROJECT IM-029-3(190)53--13-78.



DESIGN FOR 0° SKEW
1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE
UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
ABUTMENT BACKFILL DETAILS
STA. 3546+14.50 (Δ 1-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 108 OF 121 FILE NO. 30170 DESIGN NO. 1320



TOP VIEW OF WING ARMORING
AT SOUTH ABUTMENT, EAST WING



SECTION A-A

GENERAL NOTES:

REVTMENT STONE SHALL BE PLACED ALONG THE SIDE OF THE WING AND ABUTMENT FOOTING AS SHOWN IN SECTION A-A. THIS IS TYPICAL AT EACH CORNER OF THE BRIDGE ON THE SOUTH SIDE IN THE PLANS. THE REVTMENT STONE AT THESE LOCATIONS SHALL BE UNDERLAYED WITH ENGINEERING FABRIC IN ACCORDANCE WITH ARTICLE 4196.01, B, 3, OF THE STANDARD SPECIFICATIONS.

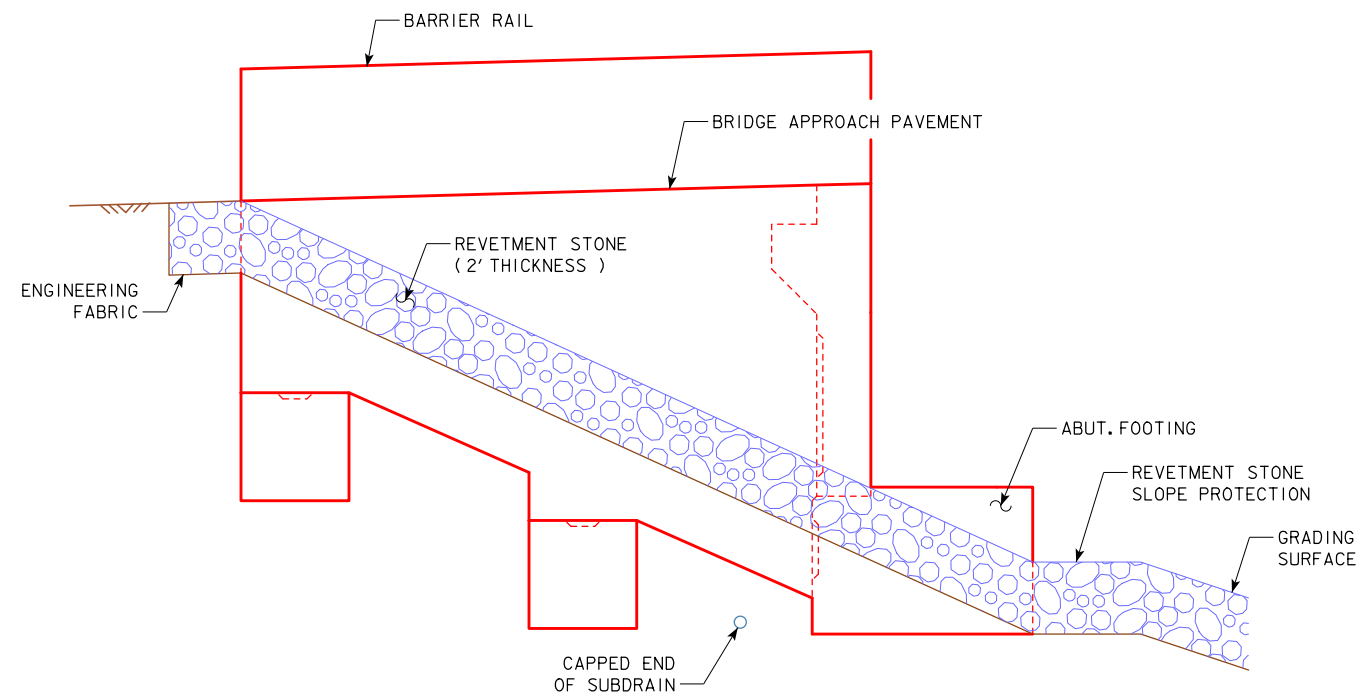
THE REVTMENT STONE SHALL BE CLASS E, EMBEDDED 2'-0" THICK IN ACCORDANCE WITH SECTION 4130 OF THE STANDARD SPECIFICATIONS.

THE REVTMENT STONE SHALL BE DEPOSITED, SPREAD, CONSOLIDATED AND SHAPED BY MECHANICAL OR HAND METHODS THAT WILL PROVIDE UNIFORM 2'-0" DEPTH AND DENSITY AND PROVIDE UNIFORM SURFACE APPEARANCE.

PAYMENT FOR "REVTMENT STONE SLOPE PROTECTION" WILL BE MADE ON A PER SY BASIS FOR THE BRIDGE WING ARMORING. THE UNIT PRICE BID PER SY SHALL INCLUDE ALL COSTS FOR MATERIAL AND LABOR REQUIRED TO CONSTRUCT THE BRIDGE WING ARMORING SHOWN ON THESE PLANS.

ESTIMATED QUANTITIES

DESCRIPTION	LOCATION	QUANTITY
REVTMENT STONE SLOPE PROTECTION	SOUTH ABUT.	11.8 S.Y.
	TOTAL	11.8 S.Y.



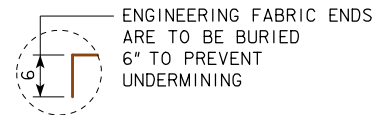
PROFILE VIEW OF WING ARMORING
AT SOUTH ABUTMENT, EAST WING

A CHECK SHALL BE MADE AT THE SUBDRAIN OUTLET TO INSURE THAT IT IS DRAINING PROPERLY.

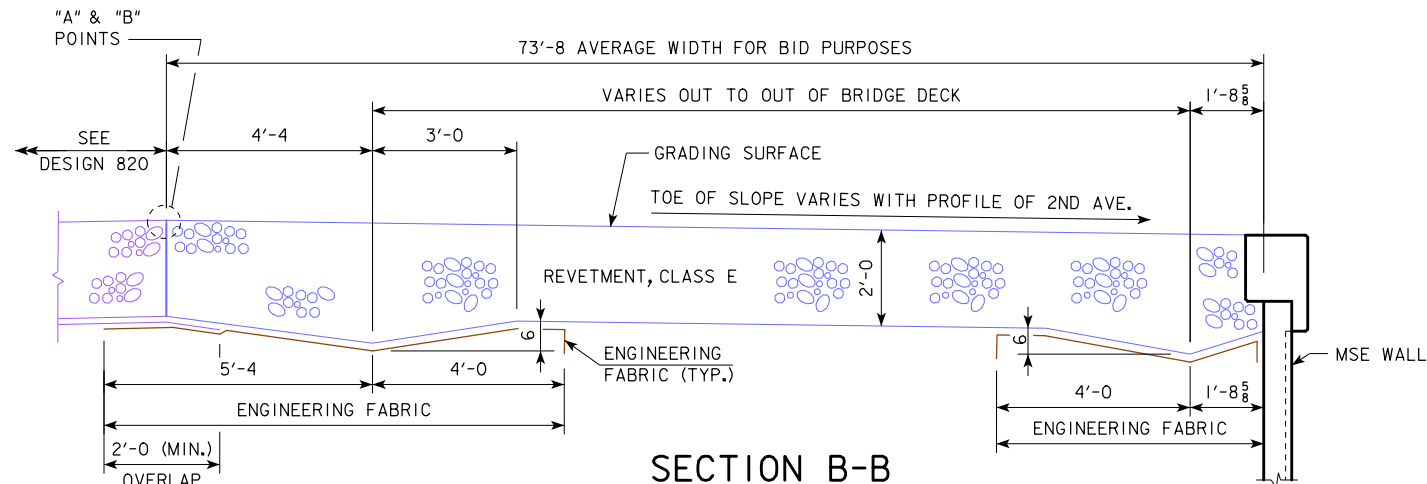




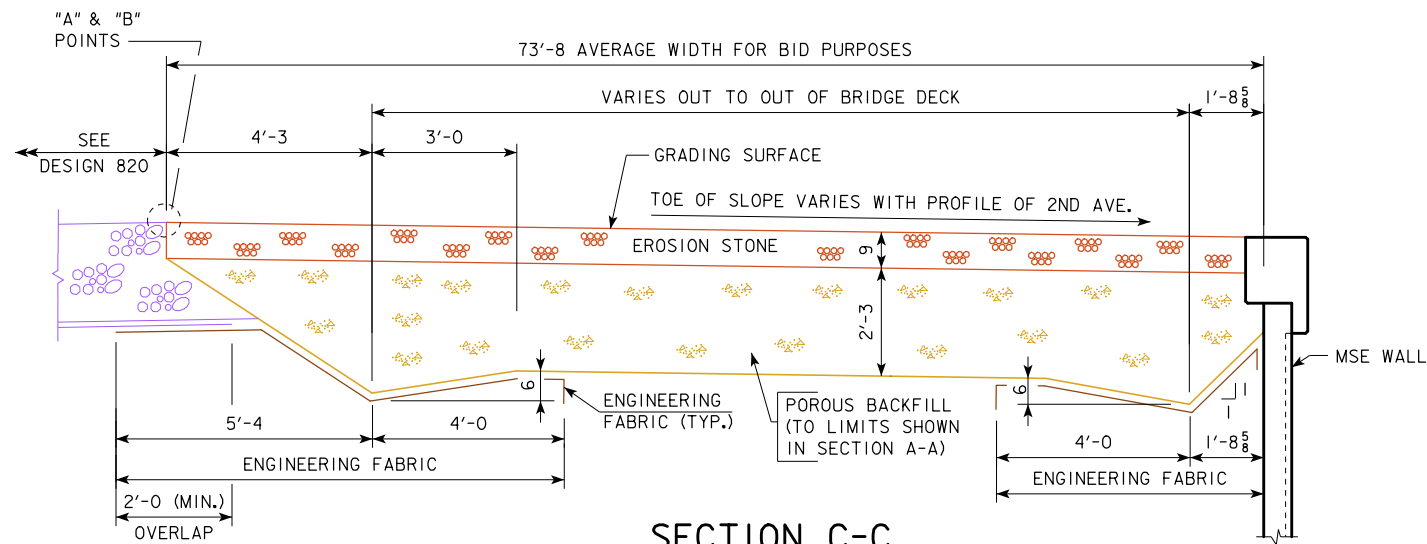
FOR ELEVATION AND LOCATION OF
"A" AND "B" POINTS SEE DESIGN
SHEET 5.



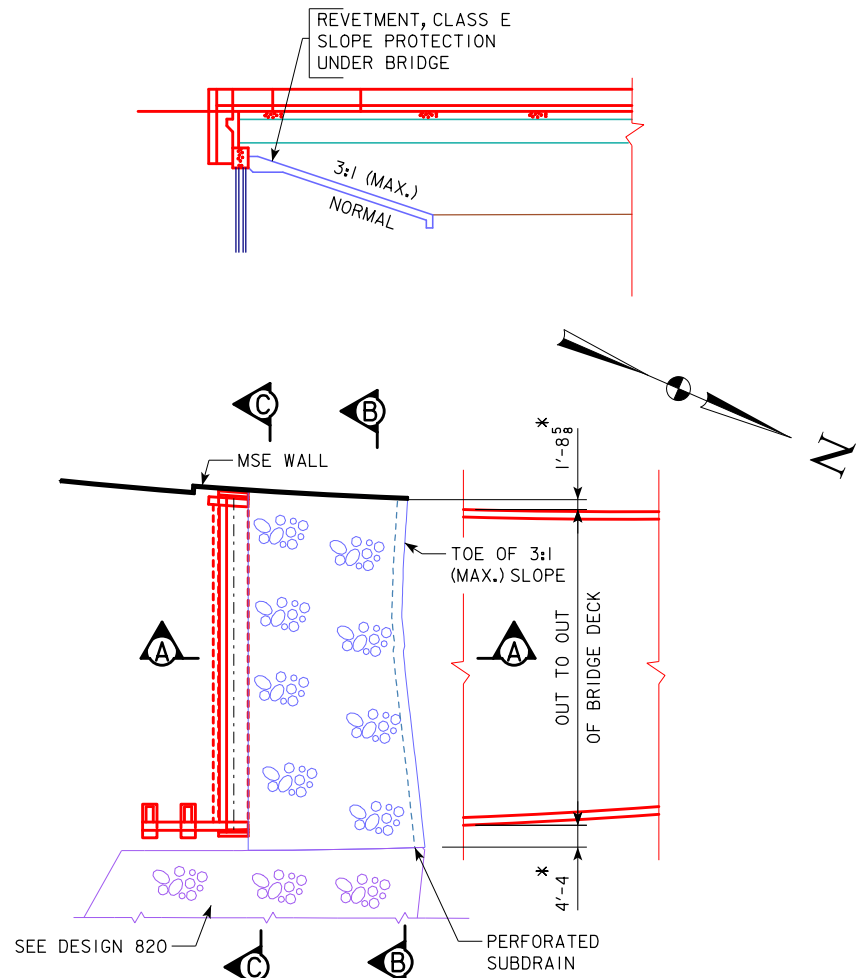
DETAIL "A"



SECTION B-B



SECTION C-C



SLOPE PROTECTION LAYOUT

* MEASURED PERPENDICULAR TO BRIDGE EDGE OF DECK.

GENERAL NOTES:

THIS PLAN SHEET SHOWS DETAILS FOR PLACING A "REVETMENT STONE SLOPE PROTECTION" UNDER OVERHEAD STRUCTURES.

THE BRIDGE BERM FORESLOPE SHALL BE COMPACTED AND SHAPED AS SHOWN ON THIS SHEET, SHAPING WILL INCLUDE EXCAVATION, FROM THE GRADING SURFACE SHOWN, THE SITUATION PLAN, AND AS DIRECTED BY THE ENGINEER. THE BERM FORESLOPE SHALL BE FIRM WHEN THE ENGINEERING FABRIC AND REVETMENT STONE ARE PLACED.

THE ENGINEERING FABRIC SHALL BE IN ACCORDANCE WITH ARTICLE 4196.01, B, 3, OF THE STANDARD SPECIFICATIONS. IF THE ENGINEERING FABRIC IS LAPPED, THE LAPS SHALL BE A MINIMUM OF ONE FOOT IN LENGTH, SHINGLE FASHION WITH UP SLOPE LAP PIECE ON TOP AND STAPLED FOR CONTINUITY.

THE EROSION STONE PLACED AT THE TOP OF BERM SHALL BE IN ACCORDANCE WITH SECTION 4130 OF THE STANDARD SPECIFICATIONS. MATERIAL PASSING THE 3 INCH SCREEN BUT 100 PERCENT RETAINED ON A 1 INCH SCREEN MAY BE USED AS CHOKO STONE.

THE REVETMENT STONE SHALL BE CLASS E IN ACCORDANCE WITH SECTION 4130 OF THE STANDARD SPECIFICATIONS AND SHALL BE EMBEDDED 2'-0 THICK.

THE REVETMENT STONE SHALL BE DEPOSITED, SPREAD, CONSOLIDATED AND SHAPED BY MECHANICAL OR HAND METHODS THAT WILL PROVIDE UNIFORM DEPTH AND DENSITY AND PROVIDE UNIFORM SURFACE APPEARANCE.

PAYMENT FOR "REVETMENT STONE SLOPE PROTECTION" WILL BE MADE ON A PER SY BASIS FOR SLOPE PROTECTION CONSTRUCTED. THE UNIT PRICE BID PER SY SHALL INCLUDE ALL COSTS FOR MATERIAL AND LABOR REQUIRED TO CONSTRUCT THE SLOPE PROTECTION SHOWN ON THESE PLANS.

THE BERM FORESLOPE SHAPING AND COMPACTING AND THE DISPOSAL OF EXCESS SOIL FROM SHAPING OR TRENCHING SHALL BE CONSIDERED INCIDENTAL TO PLACING THE SLOPE PROTECTION.

WHERE EROSION CONTROL WORK HAS BEEN COMPLETED THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY PLANT MATERIALS DESTROYED ADJACENT TO THE SLOPE PROTECTION AREA. THE CONTRACTOR SHALL REPLANT, RESEED AND REMULCH ALL DISTURBED AREAS, DESIGNATED BY THE ENGINEER, IN ACCORDANCE WITH SECTION 2601, OF THE STANDARD SPECIFICATIONS, AT THE CONTRACTOR'S EXPENSE.

THE BRIDGE CONTRACTOR IS TO INSTALL SUBDRAINS AS DETAILED ON THE SUBDRAIN DETAILS SHEET.

ESTIMATED QUANTITIES

DESCRIPTION	LOCATION	QUANTITY
REVETMENT STONE SLOPE PROTECTION	SOUTH ABUT.	285.9 S.Y.
	TOTAL	285.9 S.Y.

ITEMS TO BE INCLUDED IN "REVETMENT STONE SLOPE PROTECTION":
EXCAVATING, SHAPING AND COMPACTING
ENGINEERING FABRIC
CLASS E REVETMENT STONE
EROSION STONE
POROUS BACKFILL OR GRANULAR SUBBASE BACKFILL AT
FRONT FACE ABUTMENT FOOTING

DESIGN FOR 0° SKEW

1419'-0 × VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

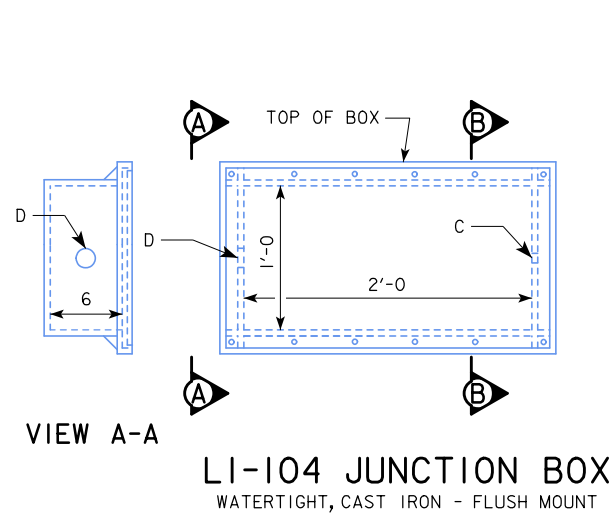
REVETMENT STONE SLOPE PROTECTION

STA. 3546+14.50 (R/L 1-480 RAMP C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 110 OF 121 FILE NO. 30170 DESIGN NO. 1320



BOSS FOR	HOLE	FOR CONDUIT SIZE
5 THREADS	C	1" ϕ RIGID STEEL**
5 THREADS	D	2" ϕ RIGID STEEL**

REVISED: 05-06-2022 UPDATED DECK AND BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED, EXCEPT BARRIER TO DECK/WING CONNECTIONS. CHANGED COLOR OF REINFORCEMENT AND NOTE.

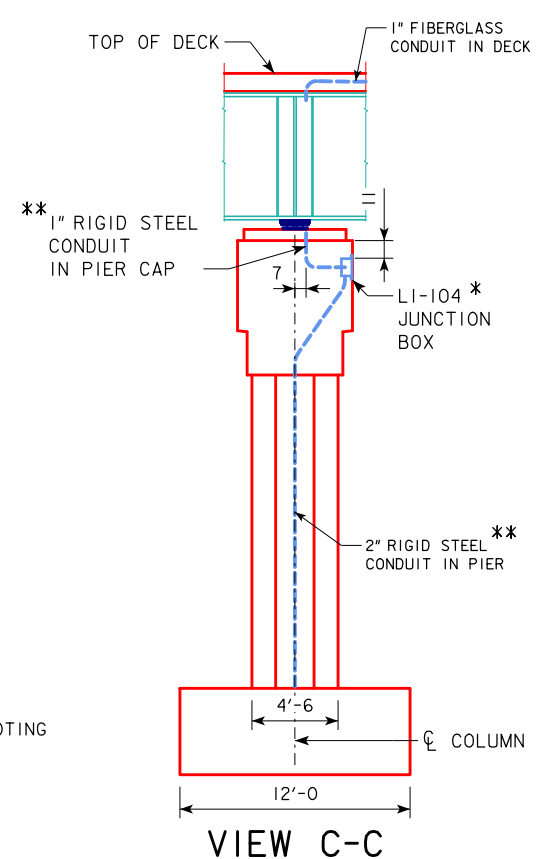
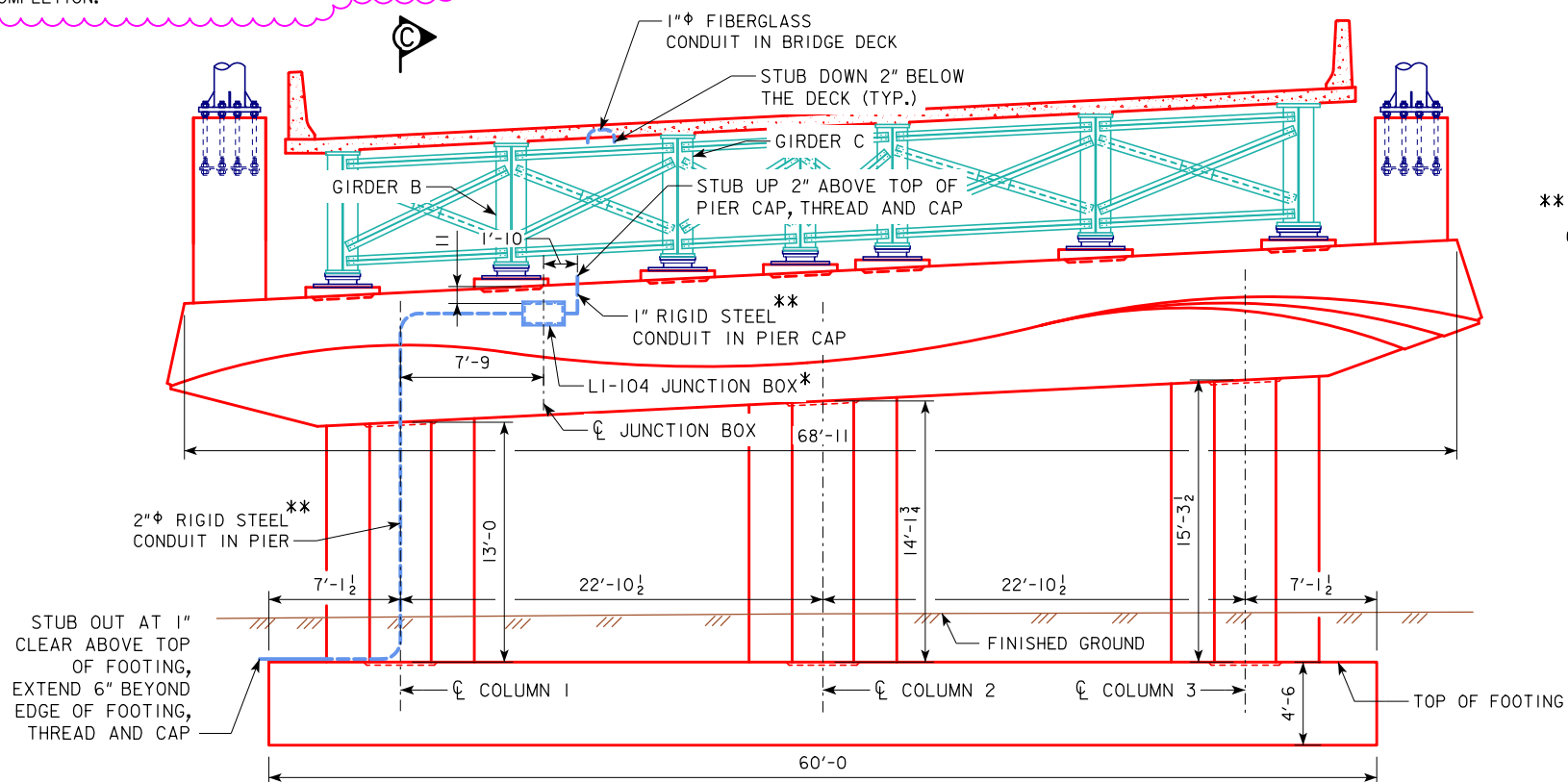
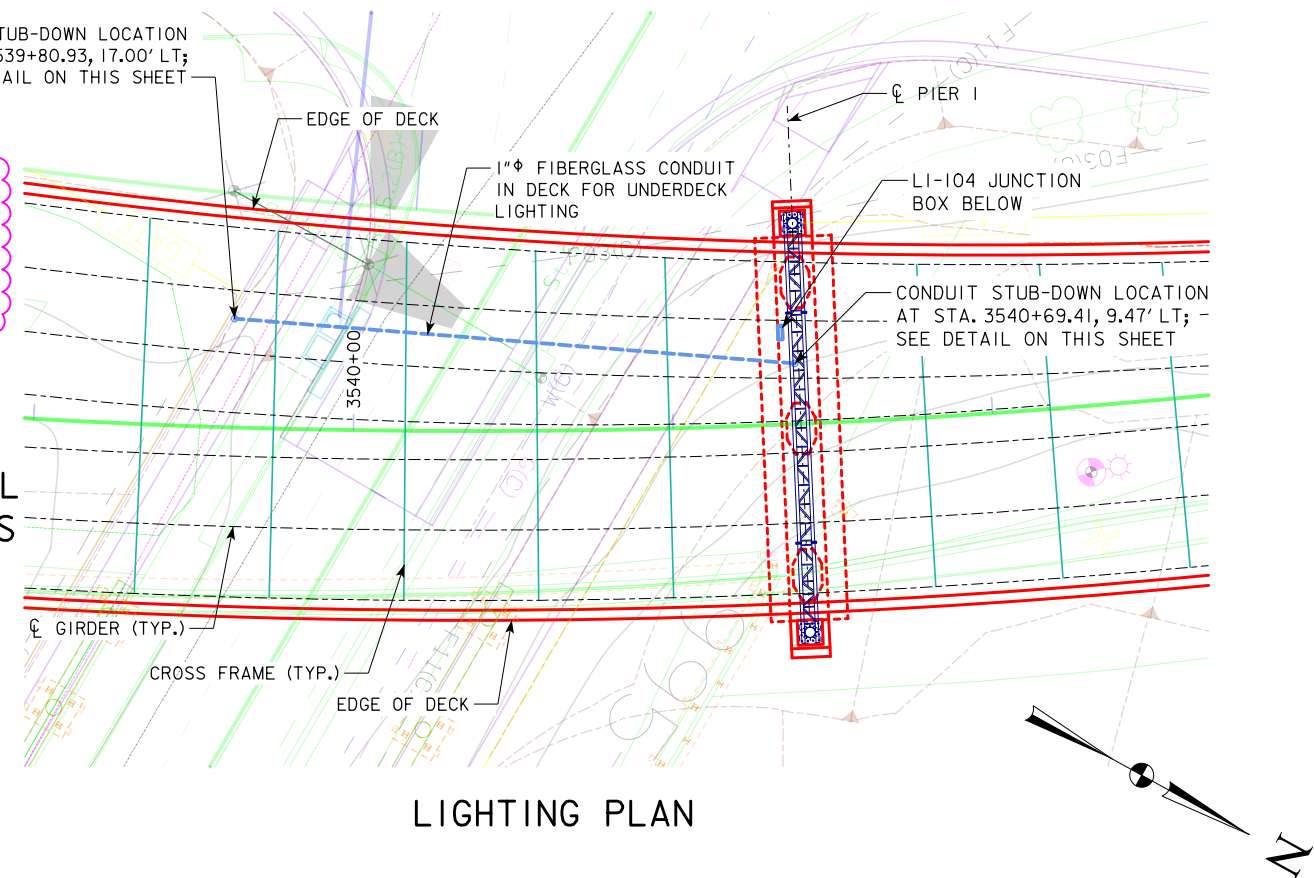
REASON: CHANGE MADE IN THE BEST INTEREST OF THE PUBLIC TO KEEP THE PROJECT ON SCHEDULE AND AVOID SIGNIFICANT DELAYS IN PROJECT COMPLETION.

SECTION B-B

TYPICAL CONDUIT STUB-DOWN DETAIL AT UNDER-DECK LIGHTING LOCATIONS

* TRIM 5a7 AND 5c4 BARS AS NECESSARY TO ACCOMMODATE JUNCTION BOX

** CONDUIT EMBEDDED IN PIER MAY BE RIGID GALVANIZED STEEL OR FIBERGLASS, AT THE CONTRACTOR'S OPTION. IF FIBERGLASS IS USED, REFER TO SPECIAL PROVISIONS FOR FIBERGLASS CONDUIT EMBEDDED IN STRUCTURE.



LIGHTING NOTES:

SEE LI-104 STANDARD ROAD PLAN FOR ADDITIONAL INFORMATION ON JUNCTION BOXES.

CONSTRUCTION SHALL CONFORM TO THE CURRENT IOWA D.O.T. STANDARD AND SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS.

CONDUIT INSTALLATION SHALL BE IN ACCORDANCE WITH ARTICLE 2523.03, N, OF THE STANDARD SPECIFICATIONS. PROVIDE FIBERGLASS CONDUIT AS SPECIFIED IN SPECIAL PROVISION.

ALL ENTRANCE HOLES IN JUNCTION BOXES INDICATED TO BE THREADED SHALL BE DRILLED AND TAPPED FOR THE SPECIFIED CONDUIT SIZE. ALL OTHER HOLES SHALL HAVE A CONCRETE-TIGHT SLIP FIT. CONDUIT ENDS SHALL NOT PROTRUDE INTO JUNCTION BOX MORE THAN 1/4". GROUNDING BUTTONS SHALL BE LOCATED APPROXIMATELY 3" FROM THE INSIDE SURFACE OF THE BOX WALL, AND NOT CLOSER THAN 3" TO THE EDGE OF ANY HOLE IN THE BOX FLOOR. TYPICAL DETAILS ARE SHOWN ON THIS SHEET.

THE RIGID STEEL CONDUIT, FIBERGLASS CONDUIT, JUNCTION BOXES AND FITTINGS INCLUDING LABOR AND ANY ADDITIONAL WORK TO DO THE INSTALLATION IS CONSIDERED INCIDENTAL TO THE COST OF "HIGH PERFORMANCE STRUCTURAL CONCRETE".

COST OF FURNISHING AND INSTALLING POLES, LIGHTS, AND LIGHTING CONDUCTOR IS NOT A PART OF THIS CONTRACT.

ALL REINFORCING STEEL IN THE PIERS IS EPOXY COATED AND GRADE 60. ALL REINFORCING STEEL IN THE BRIDGE DECK IS ~~STAINLESS STEEL~~ EPOXY COATED.

STAINLESS-STEEL REINFORCEMENT SHALL NOT BE ALLOWED TO BE IN CONTACT WITH UNCOATED REINFORCEMENT, BARE METAL FORMING HARDWARE, OR GALVANIZED ATTACHMENTS OR GALVANIZED CONDUIT.

JUNCTION BOX TO BE PLACED WITHIN THE "TEXTURE B" AREA OF THE PIER CAP, SEE PIER DETAILS.

PIER AESTHETICS AND REINFORCING ARE NOT SHOWN IN THIS SHEET FOR CLARITY.

DESIGN FOR 0° SKEW
1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE
UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
LIGHTING DETAILS
STA. 3546+14.50 (RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 111 OF 121 FILE NO. 30170 DESIGN NO. 1320



GENERAL NOTES:

SIGN TRUSS PEDESTALS ARE DESIGNED TO ACCOMMODATE THE MINNESOTA DOT STANDARD OVERHEAD SIGN STRUCTURE - DESIGN D.

THE MAXIMUM ALLOWABLE TOTAL SIGN AREA FOR THE PIER 1 OVERHEAD SIGN STRUCTURE IS 550 SF FOR A 64-FT SPAN, TYPE A TRUSS WITH 30-FT TALL, TYPE 5 POSTS ON EACH PEDESTAL.

THE MAXIMUM ALLOWABLE TOTAL SIGN AREA FOR THE PIER 6 OVERHEAD SIGN STRUCTURE IS 500 SF FOR A 45-FT SPAN, TYPE A TRUSS WITH 30-FT TALL, TYPE 4 POSTS ON EACH PEDESTAL.

SHOP DRAWINGS SHALL BE SUBMITTED BY THE CONTRACTOR IN ACCORDANCE WITH ARTICLE 1105.03 OF THE STANDARD SPECIFICATIONS.

THE OVERHEAD SIGN STRUCTURE NOTES AND DETAILS SHOWN ON DESIGN SHEETS 114 - 118 ARE FROM THE MINNESOTA DOT STANDARD PLANS 5-297.761 THROUGH 5-297.766 (NOT INCLUDING STANDARD PLAN 5-297.763) AND ARE INCLUDED TO SHOW SIGN STRUCTURE DETAILS ONLY. ALL REFERENCES TO THE STANDARD SPECIFICATIONS ON DESIGN SHEETS 114 - 118 ARE IN REFERENCE TO THE MINNESOTA DOT STANDARD SPECIFICATIONS, AND ALL REFERENCES TO THE STANDARD PLANS ARE IN REFERENCE TO THE MINNESOTA DOT STANDARD PLANS. THE NOTES ON DESIGN SHEETS 112 AND 113 SHALL GOVERN THE DESIGN, FABRICATION, AND INSTALLATION OF THE SIGN TRUSSES.

IN ADDITION TO THE NOTES ON DESGIN SHEETS 112 AND 113, THE REQUIREMENTS IN SECTION 2423 OF THE STANDARD SPECIFICATIONS SHALL APPLY. SHOULD THERE BE A DISCREPANCY BETWEEN NOTES ON DESIGN SHEETS 114 - 118 AND NOTES ON DESIGN SHEETS 112 AND 113 OR THE IOWA DOT STANDARD SPECIFICATIONS, THE NOTES ON DESIGN SHEETS 112 AND 113 OR THE IOWA DOT STANDARD SPECIFICATIONS SHALL GOVERN.

NO HANDHOLES ARE TO BE PLACED IN THE POSTS.

GALVANIZED STEEL NOTES:

ALL STEEL POSTS SHALL COMPLY WITH ASTM A500 GRADE B, ASTM A500 GRADE C, ASTM A1085, API 5L GRADE X42 OR API 5L GRADE X52. THESE MEMBERS DESIGNATED AS HOLLOW STRUCTURAL SECTIONS (HSS) SHALL HAVE A MINIMUM YIELD STRENGTH OF 42 KSI.

ALL STEEL ANGLES, BARS AND PLATES SHALL COMPLY WITH ASTM A36, ASTM A572 GRADE 50, ASTM A709 GRADE 36 OR ASTM A709 GRADE 50. ALL STEEL W-SECTIONS SHALL COMPLY WITH ASTM A992, ASTM A36, ASTM A572 GRADE 50, ASTM A709 GRADE 36, ASTM A709 GRADE 50, OR ASTM A709 GRADE 50S.

STEEL WELDING SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE AWS SPECIFICATIONS D1.1, STRUCTURAL WELDING CODE--STEEL.

ALL STEEL SECTIONS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. PROVIDE VENT HOLES FOR GALVANIZING. SHOW LOCATION AND SIZE OF VENT HOLES ON SHOP DRAWINGS.

GALVANIZED STEEL FASTENER NOTES:

GALVANIZED STEEL FASTENERS SHALL BE IN ACCORDANCE WITH ARTICLE 2408.03, S AND ARTICLE 4187.01, C, 2 OF THE STANDARD SPECIFICATIONS. REGULAR NUTS SHALL BE ASTM A563 GRADE DH HEAVY HEX. ASTM A449 TYPE 1 BOLTS OR ASTM F3125 GRADE A325-T TYPE 1 BOLTS MAY BE SUBSTITUTED FOR ASTM F3125 GRADE A325 TYPE 1 BOLTS WHERE NECESSARY TO ASSURE PROPER BOLT LENGTH AND THREAD LENGTH.

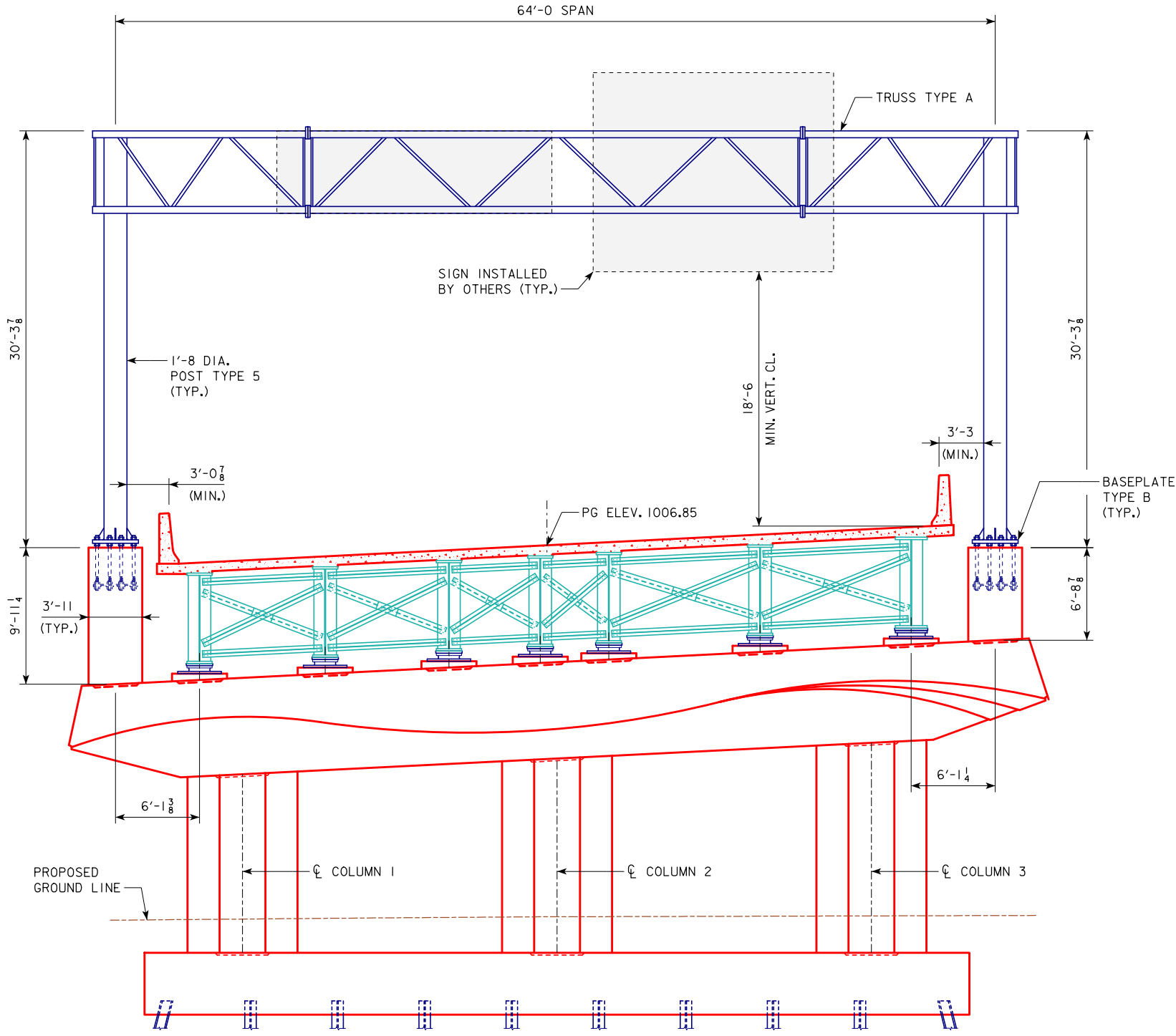
UNLESS OTHERWISE NOTED ON THE PLANS, GALVANIZED STEEL FASTENERS SHALL BE TENSIONED BY TURN-OF-NUT METHOD.

SPECIFICATIONS:

DESIGN: AASHTO LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, FIRST EDITION WITH 2015, 2016, 2018, AND 2019 INTERIM REVISIONS.

DESIGN STRESSES:

DESIGN STRESSES FOR MATERIALS ARE IN ACCORDANCE WITH AASHTO LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, FIRST EDITION WITH 2015, 2016, 2018, AND 2019 INTERIM REVISIONS.



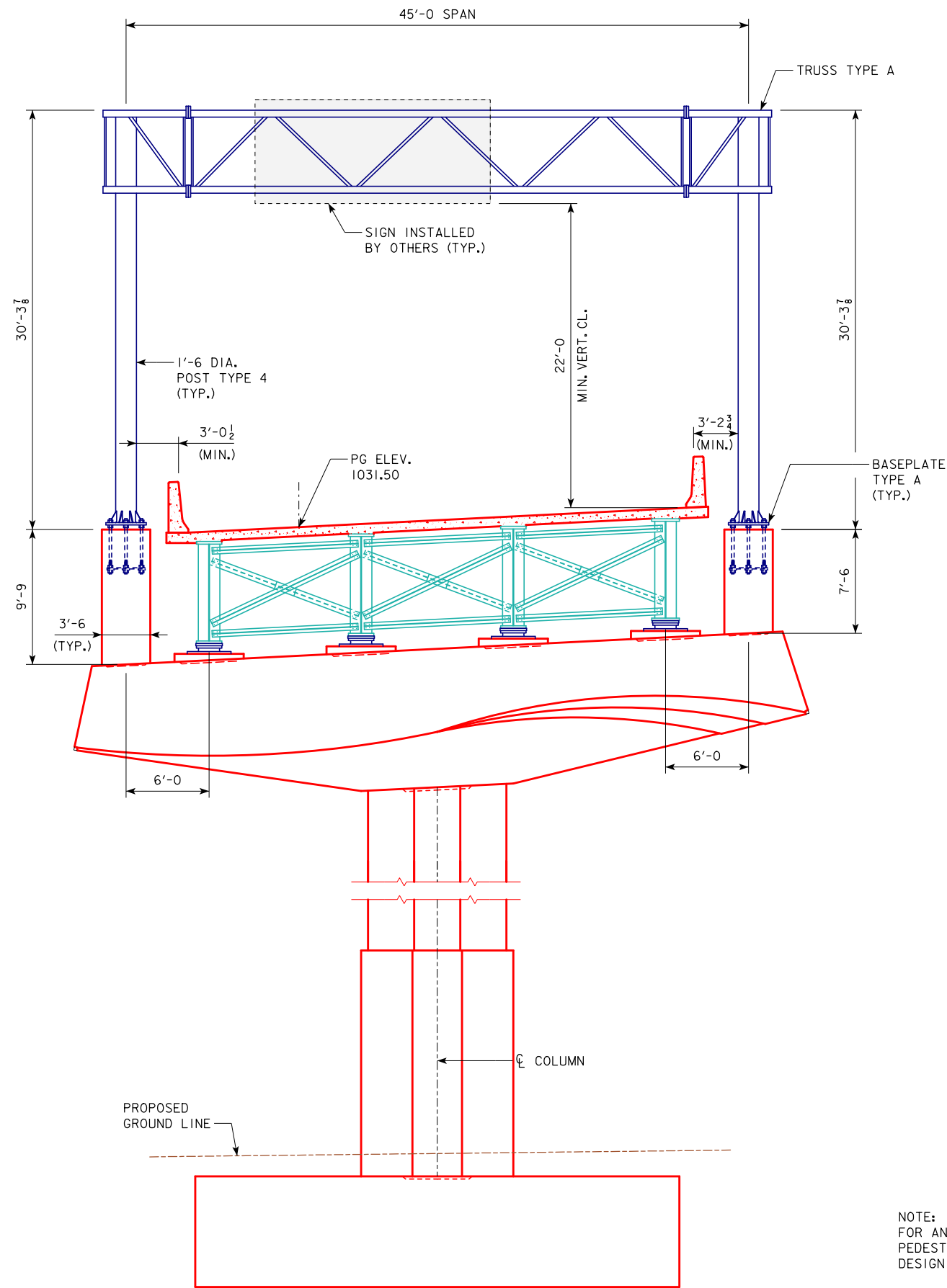
TYPICAL SECTION THROUGH TRUSS

PIER 1 ELEVATION VIEW

NOTE:
FOR ANCHOR BOLT AND SIGN TRUSS PEDESTAL DETAILS AND NOTES SEE DESIGN SHEETS 14 AND 15.
FOR SIGN TRUSS DETAILS SEE DESIGN SHEETS 114 THRU 118.
FOR ADDITIONAL SIGN TRUSS NOTES SEE DESIGN SHEET 113.

DESIGN FOR 0° SKEW
1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE
UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0
PIER 1 - OH SIGN TRUSS DETAIL
STA. 3546+14.50 (CL 1-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 112 OF 121 FILE NO. 30170 DESIGN NO. 1320





TYPICAL SECTION
THROUGH TRUSS

PIER 6 ELEVATION VIEW

STRUCTURAL ALIGNMENT/TOLERANCE NOTES:

THE PRECISE INSTALLATION AND ALIGNMENT OF ALL COMPONENTS OF THE OVERHEAD SIGN TRUSS AND ITS SUPPORTS SHALL BE CONSIDERED ESSENTIAL. THE CONTRACTOR SHALL SUBMIT DOCUMENTATION TO THE ENGINEER SHOWING THAT THE VARIOUS COMPONENTS HAVE BEEN MEASURED AND ARE LOCATED WITHIN THE TOLERANCES LISTED BELOW.

- 1) EACH PEDESTAL SHALL BE ACCURATELY LOCATED, WITH THE CENTER OF THE ANCHOR BOLT GROUP NOT MORE THAN 1 INCH FROM THE PLAN LOCATION IN THE DIRECTION PARALLEL WITH THE TRUSS AND NOT MORE THAN 1 INCH FROM THE PLAN LOCATION IN THE DIRECTION PERPENDICULAR TO THE TRUSS.
- 2) ANCHOR BOLTS SHALL BE PLUMB WITHIN $\frac{1}{4}$ INCH PER FOOT FROM VERTICAL.
- 3) ANCHOR BOLTS SHALL PROJECT ABOVE TOP OF FOUNDATION WITHIN $\frac{1}{4}$ INCH OF THE PLAN DIMENSION.
- 4) EACH TRUSS SUPPORT POST SHALL BE PLUMB WITHIN $\frac{1}{16}$ INCH PER FOOT OF VERTICAL IN TWO PERPENDICULAR DIRECTIONS.
- 5) THE OVERHEAD TRUSS SHALL BE SQUARE WITHIN SUPPORT POSTS. THE HORIZONTAL LINES BETWEEN CHORDS SHALL BE LEVEL WITHIN $\frac{1}{16}$ INCH PER FOOT OF HORIZONTAL, AND THE VERTICAL LINES BETWEEN CHORDS SHALL BE PLUMB WITHIN $\frac{1}{16}$ INCH PER FOOT OF VERTICAL.

ANCHOR-BOLT NUT TIGHTENING PROCEDURE:

- 1) THIS WORK SHALL BE PERFORMED ONLY ON DAYS WITH WINDS LESS THAN 15 MPH. ALL TIGHTENING OF THE NUTS IS TO BE DONE IN THE PRESENCE OF THE INSPECTOR. ONCE THE TIGHTENING PROCEDURE IS STARTED IT MUST BE COMPLETED ON ALL OF THE BASE PLATE NUTS WITHOUT PAUSE OR DELAY.
- 2) PROPERLY SIZED WRENCHES DESIGNED FOR TIGHTENING NUTS AND/OR BOLTS SHALL BE USED TO AVOID ROUNDING OR OTHER DAMAGE TO THE NUTS. ADJUSTABLE END WRENCHES OR PIPE WRENCHES SHALL NOT BE USED.
- 3) BASE PLATE, ANCHOR BOLTS AND NUTS ARE TO BE FREE OF ANY DIRT OR DEBRIS.
- 4) APPLY STICK WAX OR BEES WAX TO THE THREADS AND BEARING SURFACES OF THE ANCHOR BOLTS, NUTS AND WASHERS.
- 5) TIGHTEN TOP NUTS SO THEY FULLY CONTACT THE BASE PLATE. TIGHTEN LEVELING NUTS TO SNUG TIGHT CONDITION. SNUG TIGHT IS DEFINED AS THE FULL EFFORT OF ONE PERSON ON A WRENCH WITH A LENGTH EQUAL TO 14 TIMES THE BOLT DIAMETER BUT NOT LESS THAN 18 INCHES. APPLY FORCE AS CLOSE TO THE END OF THE WRENCH AS POSSIBLE. PULL FIRMLY BY LEANING BACK AND USING ENTIRE BODY WEIGHT ON THE END OF THE WRENCH UNTIL THE NUT STOPS ROTATING. USE A MINIMUM OF TWO SEPARATE PASSES OF TIGHTENING. SEQUENCE THE TIGHTENING IN EACH PASS SO THAT THE NUT ON THE OPPOSITE SIDE, TO THE EXTENT POSSIBLE, WILL BE SUBSEQUENTLY TIGHTENED UNTIL ALL NUTS IN THAT PASS HAVE BEEN TIGHTENED.
- 6) TORQUE TOP NUTS IN STEPS OF 20%, 60%, AND 100% (AS SHOWN IN TABLE BELOW), EACH INDIVIDUALLY IN A STAR PATTERN.
- 7) ALLOW ANCHOR BOLTS TO RELAX FOR 10 MINUTES.
- 8) RE-TIGHTEN TOP NUTS TO 100% TORQUE.

BOLT Φ	BOLT GRADE	20% TORQUE (FT-LBS)	60% TORQUE (FT-LBS)	100% TORQUE (FT-LBS)
2 1/4"	GRADE 55	483	1448	2413
2 1/2"	GRADE 55	660	1980	3300

NOTE:
FOR ANCHOR BOLT AND SIGN TRUSS
PEDESTAL DETAILS AND NOTES SEE
DESIGN SHEETS 15 AND 30.

FOR SIGN TRUSS DETAILS SEE DESIGN
SHEETS 114 THRU 118.

FOR ADDITIONAL SIGN TRUSS NOTES
SEE DESIGN SHEET 112.

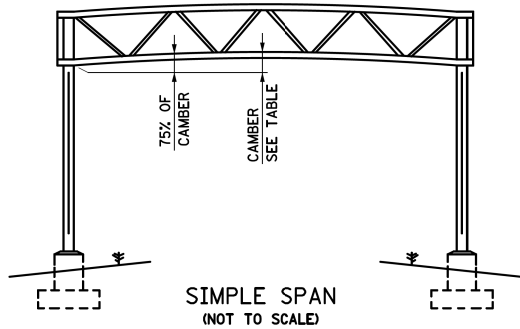
DESIGN FOR 0° SKEW
**1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE**
UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
PIER 6 - OH SIGN TRUSS DETAIL
STA. 3546+14.50 (R 1-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 113 OF 121 FILE NO. 30170 DESIGN NO. 1320



SIMPLE SPAN TRUSS CAMBER (INCHES)													
SPAN (FEET)	40'	50'	60'	70'	80'	90'	100'	110'	120'	130'	140'	150'	
CAMBER	1/4	7/16	5/8	13/16	1 1/16	1 3/8	1 1/2	2	2 3/8	2 13/16	3 1/4	3 3/4	
DL DEFLECTION	0	1/16	1/8	1/4	3/8	1/2	5/8	1	1 1/8	1 1/2	2 1/16	2 1/8	
RESIDUAL CAMBER	1/4	3/8	5/8	1 1/16	1 3/8	1 1/2	1 5/8	2 1/4	2 3/8	2 13/16	3 1/4	3 3/4	

NOTE:

CAMBER AND DEFLECTIONS SHOWN AT $\frac{1}{4}$ SPAN. THE DEFLECTIONS AND CAMBER AT THE QUARTER POINTS TO BE APPROXIMATELY 75% OF THESE VALUES.



TRUSS QUANTITIES*		
USE LENGTH FROM $\frac{1}{4}$ POST WHEN CALCULATING TOTAL WEIGHTS.		
TRUSS TYPE A	TRUSS TYPE B	TRUSS TYPE C
123 LB./FT.	168 LB./FT.	196 LB./FT.

* FOR STRUCTURES WITH DMS, THE TOTAL QUANTITY OF TRUSS STEEL REQUIRED IS EQUAL TO THE WEIGHT OF THE TRUSS COMBINED WITH THE WEIGHT OF THE DMS MOUNTING ANGLES. CALCULATE THE WEIGHT OF THE DMS MOUNTING ANGLES AS 40 LBS./FT. x LENGTH OF DMS. SEE STANDARD PLAN 5-297.772 FOR DMS MOUNTING ANGLE DETAILS.

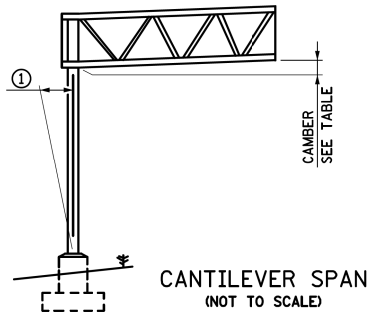
PANEL MOUNTING POST QUANTITIES INCLUDES MOUNTING ANGLES	
PANEL HEIGHT	WEIGHT/POST
6' 6"	70 LBS
7' 0"	74 LBS
7' 6"	78 LBS
8' 0"	82 LBS
8' 6"	86 LBS
9' 0"	90 LBS
9' 6"	93 LBS
10' 0"	97 LBS
10' 6"	101 LBS
11' 0"	105 LBS
11' 6"	160 LBS
12' 0"	166 LBS
12' 6"	172 LBS
13' 0"	178 LBS
13' 6"	184 LBS
14' 0"	190 LBS
14' 6"	196 LBS
15' 0"	202 LBS

CANTILEVER TRUSS CAMBER (INCHES)					
SPAN (FEET)	15'	20'	30'	40'	45'
CAMBER	1/8	1/4	5/8	1 1/16	1 1/4
DL DEFLECTION	0	0	1/16	3/16	1/4
RESIDUAL CAMBER	1/8	1/4	5/8	7/8	1

NOTE:

CAMBER AND DEFLECTIONS SHOWN ARE AT THE END OF CANTILEVER.

① WHEN ERECTING CANTILEVER TRUSSES, SET THE POST 1/8" PER FOOT OUT OF PLUMB AWAY FROM THE TRAFFIC LANE UNDER THE SUPPORTED SIGN TO COMPENSATE FOR DEFLECTION OF THE POST.



POST TYPE			
POST TYPE	BASEPLATE TYPE	PERMISSIBLE PIPE SECTIONS	
		OUTSIDE DIAMETER (INCH)	WALL THICKNESS (INCH)
1	A	18	0.250
2	A	18	0.312
3	A	18	0.375
4	A	18	0.500
5	B	20	0.500
6	B	24	0.500
WALL THICKNESS IS MINIMUM. THINNER WALLS WILL NOT BE APPROVED.			

GENERAL NOTE:

FOR FOUNDATION QUANTITIES, SEE STANDARD PLAN 5-297.763.

WALKWAY SUPPORT QUANTITIES		
TRUSS TYPE (WEIGHT/SUPPORT)		
A	B	C
96 LBS	103 LBS	108 LBS

WALKWAY WEIGHTS:

- USE 3' 4 3/4" WIDE GRATING @ 64 LB./FT. FOR FIXED HANDRAIL (INCLUDES TOE ANGLES).
- USE 3' 4 3/4" WIDE GRATING @ 60 LB./FT. FOR FOLDING HANDRAIL (INCLUDES TOE ANGLES).

POST TYPE NOTES:

NO SPLICES OF ANY KIND WILL BE PERMITTED IN POSTS INTENDED FOR USE IN CANTILEVER TYPE STRUCTURES.

ONE OF TWO POSTS FOR SIMPLE SPAN STRUCTURES MAY INCORPORATE ONE WELDED CIRCUMFERENTIAL BUTT SPLICE CONFORMING TO AWS D1.1 DETAIL B-U2 IN THE UPPER 1/2 OF ITS LENGTH. BACK UP RINGS FOR THESE WELDED SPLICES SHALL BE COMMERCIAL PRODUCTS. BUTT WELDS REQUIRE RADIOGRAPHIC INSPECTION (SPEC. 2471.3).

ALL RADIOGRAPHIC INSPECTIONS AND MAGNETIC PARTICLE TESTING REPORTS AND RADIOGRAPHIC FILMS SHALL BECOME THE PROPERTY OF THE DEPARTMENT.

SEE STANDARD PLAN 5-297.764 FOR BASEPLATE DETAILS.

POST QUANTITIES						
QUANTITIES INCLUDE ANCHORAGE ASSEMBLY AND TRUSS CONNECTION PLATES. PAY LENGTH OF POSTS IS FROM THE BOTTOM OF THE BASE PLATE TO THE TOP OF THE TRUSS. ADD 15 LBS TO THE CALCULATED TOTAL FOR TYPE 'E' POSTS.						
POST TYPE	CANTILEVER			SIMPLE SPAN		
	TRUSS TYPE A	TRUSS TYPE B	TRUSS TYPE C	TRUSS TYPE A	TRUSS TYPE B	TRUSS TYPE C
1	1800+47 LBS/FT	N/A	N/A	1860+47 LBS/FT	1910+47 LBS/FT	1930+47 LBS/FT
2	1800+59 LBS/FT	N/A	N/A	1860+59 LBS/FT	1910+59 LBS/FT	1930+59 LBS/FT
3	1800+71 LBS/FT	N/A	N/A	1860+71 LBS/FT	1910+71 LBS/FT	1930+71 LBS/FT
4	1800+94 LBS/FT	1830+94 LBS/FT	N/A	1860+94 LBS/FT	1910+94 LBS/FT	1930+94 LBS/FT
5	3050+105 LBS/FT	3080+105 LBS/FT	3140+105 LBS/FT	3110+105 LBS/FT	3160+105 LBS/FT	3180+105 LBS/FT
6	N/A	3060+126 LBS/FT	3130+126 LBS/FT	N/A	3190+126 LBS/FT	3210+126 LBS/FT

REVISION:
APPROVED: MARCH 5, 2020 <i>Kevin Western</i> KEVIN WESTERN STATE BRIDGE ENGINEER



STANDARD PLAN 5-297.762

1 OF 1

THOMAS TYBRICKI
STATE DESIGN ENGINEER

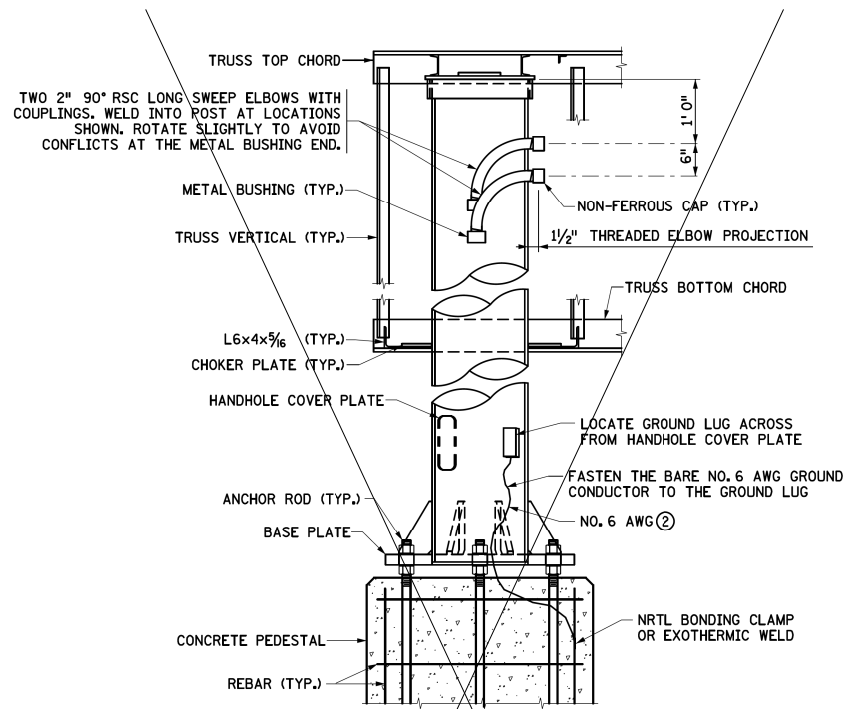
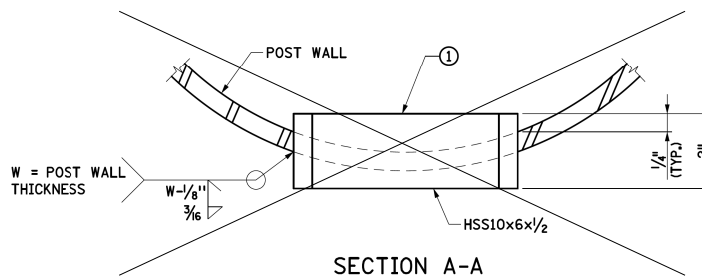
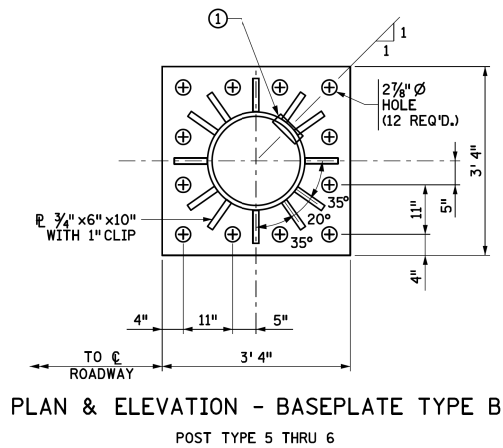
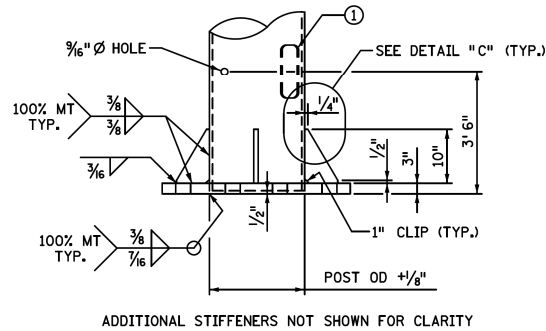
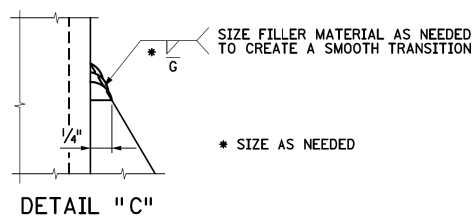
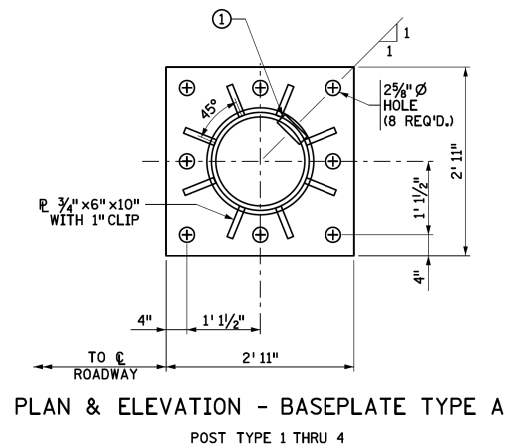
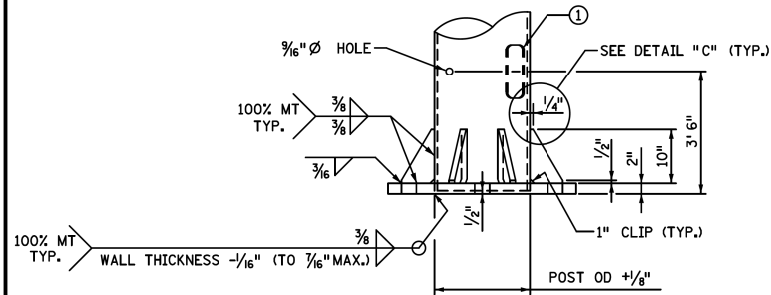
APPROVED: 3-5-2020
REVISED:

STATE PROJ. NO.

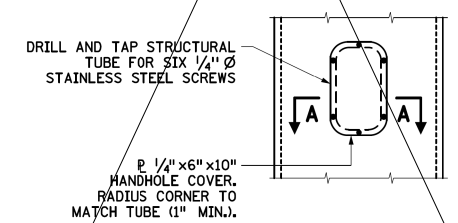
STANDARD OVERHEAD SIGN
STRUCTURES - DESIGN D
CAMBER, POST TYPE, AND ESTIMATED QUANTITIES

(TH) SHEET NO. OF SHEETS

DESIGN FOR 0° SKEW
1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE
UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0
MnDOT OVERHEAD SIGN STRUCTURES
STA. 3546+14.50 (RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 115 OF 121 FILE NO. 30170 DESIGN NO. 1320



ELECTRICAL GROUNDING AND CONDUIT DETAILS



HANDHOLE & COVER PLATE DETAIL (TYPE 'E' POSTS)

- NOTES:
- FOR POSTS LABELED WITH E: LOCATE 45° AWAY FROM TRAFFIC. 10"x6"x1/2" STRUCTURAL TUBE OR EQUAL WITH 1/4" RUBBER GASKET.
 - FOR POSTS LABELED WITH E, F&I NO. 6 AWG CONNECTION TO 20' OF CONTINUOUS REBAR EMBEDDED IN THE CONCRETE FOUNDATION USING A NRTL BONDING CLAMP OR EXOTHERMIC WELD CONNECTION. TERMINATE THE OTHER END OF THE NO. 6 AWG AT THE GROUND LUG INSIDE THE POST. FOLLOW NEC FOR GROUNDING OF CONCRETE-ENCASED ELECTRODE.

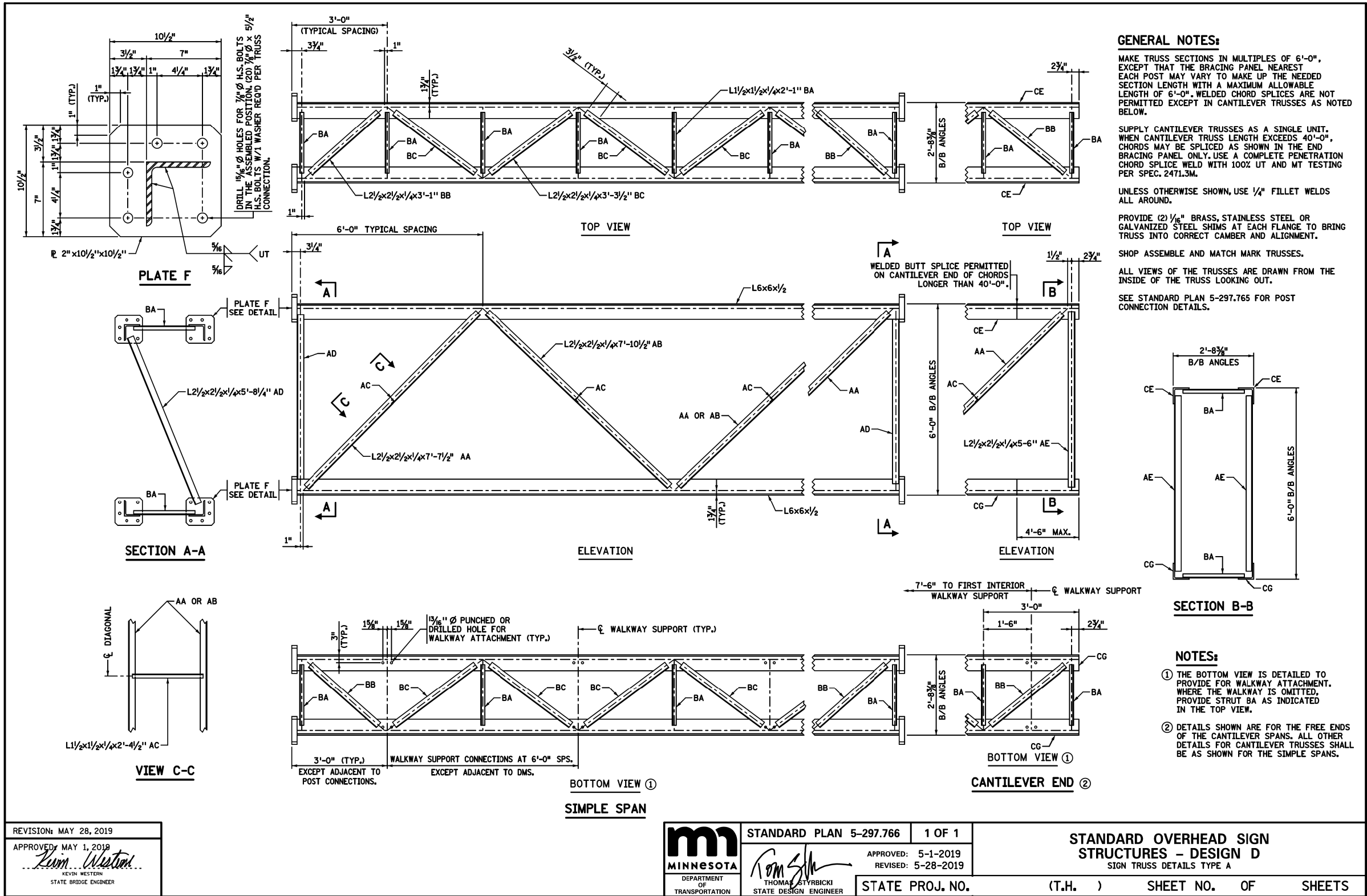
REVISION:
APPROVED: MARCH 5, 2020 <i>Kevin Western</i> KEVIN WESTERN STATE BRIDGE ENGINEER



STANDARD PLAN 5-297.764	1 OF 1
APPROVED: 3-5-2020 REVISID:	
STATE PROJ. NO.	(TH)

STANDARD OVERHEAD SIGN STRUCTURES - DESIGN D			
BASE PLATE, HANDHOLE, ELECTRICAL, AND COVER PLATE DETAILS			
SHEET NO.	OF	SHEETS	

DESIGN FOR 0° SKEW
1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE
UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0
MnDOT OVERHEAD SIGN STRUCTURES
STA. 3546+14.50 (R 1-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 116 OF 121 FILE NO. 30170 DESIGN NO. 1320



DESIGN FOR 0° SKEW

1419'-0 x VARIES CONTINUOUS WELDED GIRDER BRIDGE

UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0

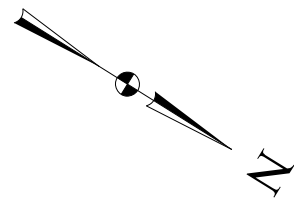
MnDOT OVERHEAD SIGN STRUCTURES

STA. 3546+14.50 (Ramp C) NOVEMBER, 2020

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 118 OF 121 FILE NO. 30170 DESIGN NO. 1320



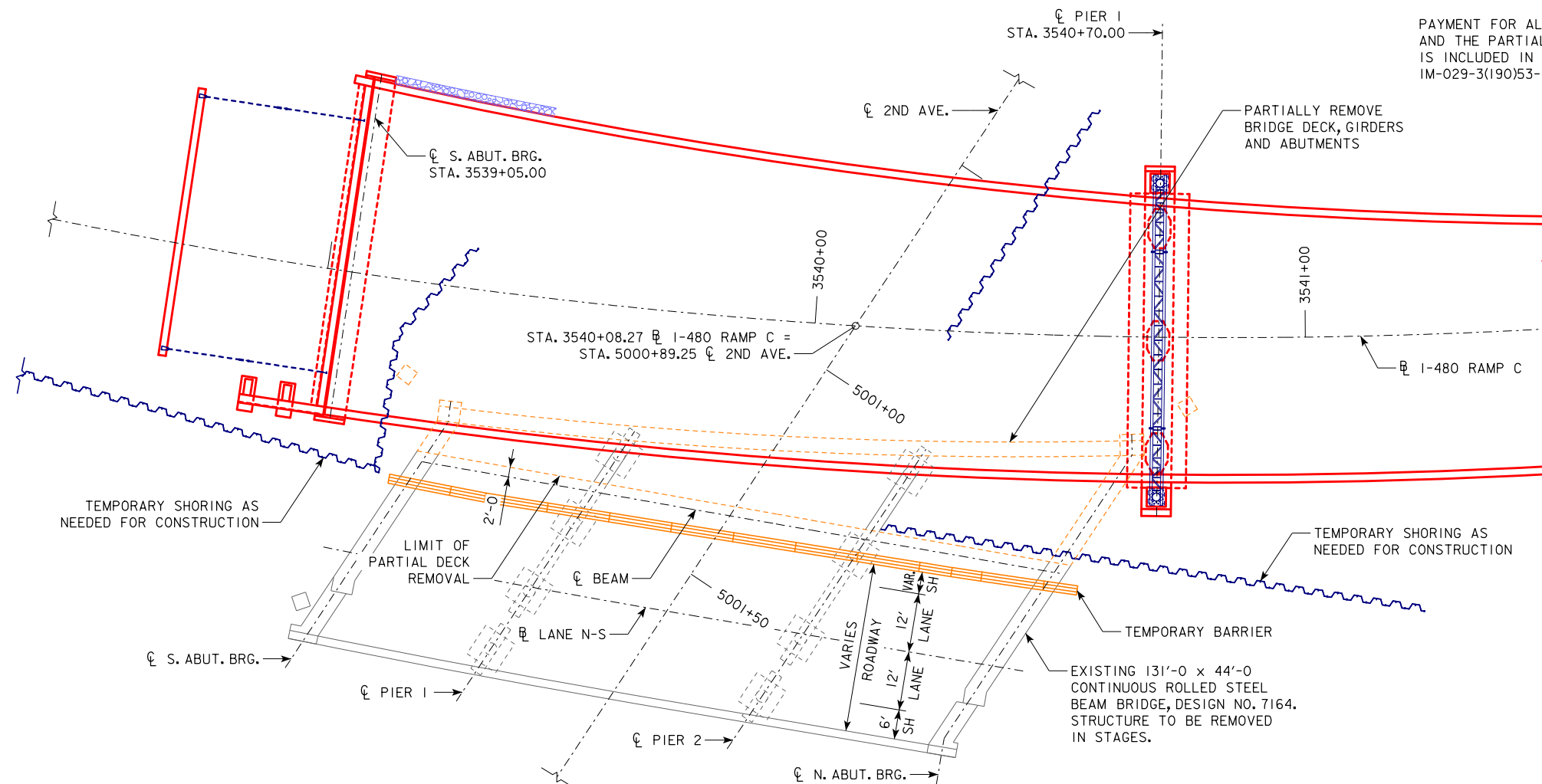
REMOVAL NOTES :

SEE ROADWAY STAGING PLANS AND NOTES LOCATED IN THE J SHEETS OF THE TIED PROJECT IM-029-3(190)53--13-78 PLANS FOR ADDITIONAL INFORMATION RELATED TO LANE CLOSURES AND OTHER CONSTRUCTION STAGING COORDINATION ITEMS.

PARTIAL REMOVAL OF THE EXISTING STRUCTURE, DESIGN NO. 7164, IS SCHEDULED TO BEGIN DURING STAGE 2A AS DEFINED IN THE TIED PROJECT IM-029-3(190)53--13-78.

REMOVALS ARE TO BE COMPLETED IN STAGES TO THE LIMITS NOTED AND SHOWN. IT IS THE INTENT OF THIS DESIGN TO MINIMIZE STAGE 2A REMOVALS IN EFFORT TO PRESERVE THE INTEGRITY OF THE EXISTING STRUCTURE UNDER THE STAGE 2A TRAFFIC LOADS.

PAYMENT FOR ALL COSTS ASSOCIATED WITH TRAFFIC CONTROL AND THE PARTIAL AND COMPLETE REMOVAL OF DESIGN NO. 7164 IS INCLUDED IN THE TIED ROADWAY PROJECT IM-029-3(190)53--13-78.

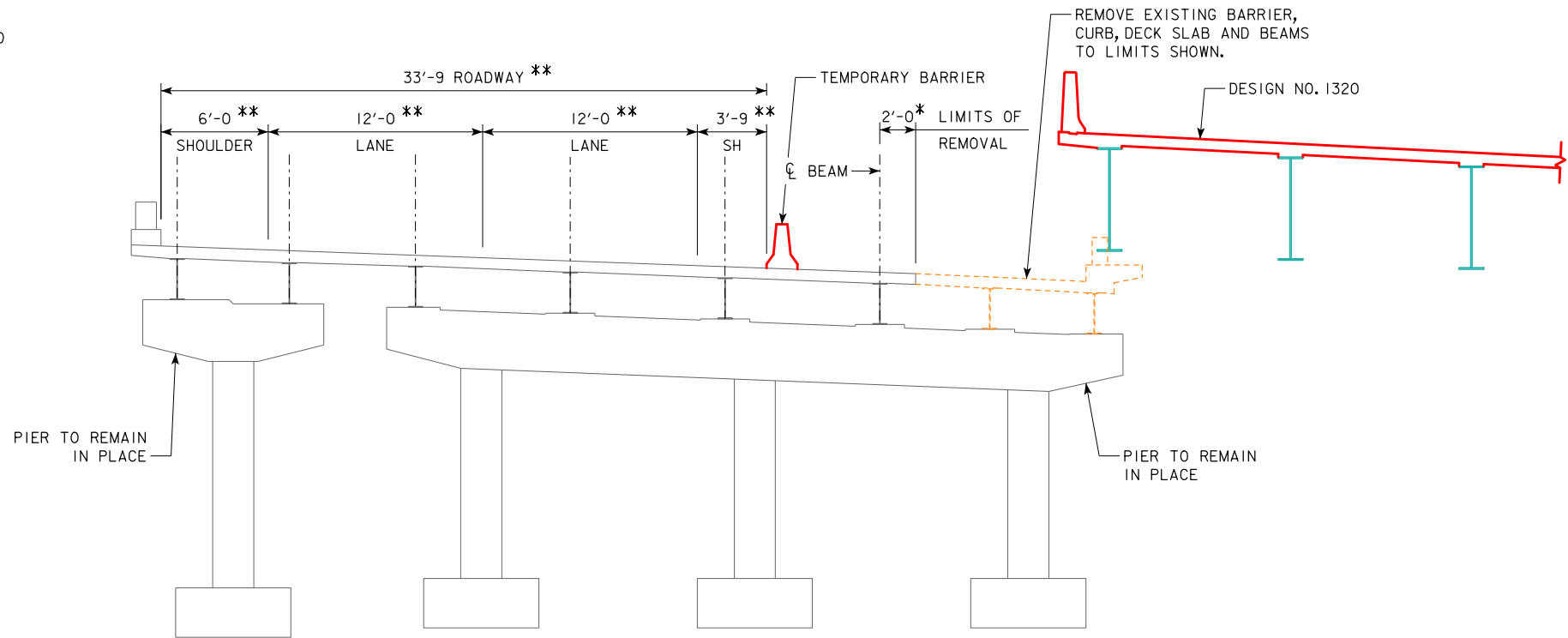


PARTIAL BRIDGE REMOVAL PLAN
STAGE 2A (BRIDGE 7164)

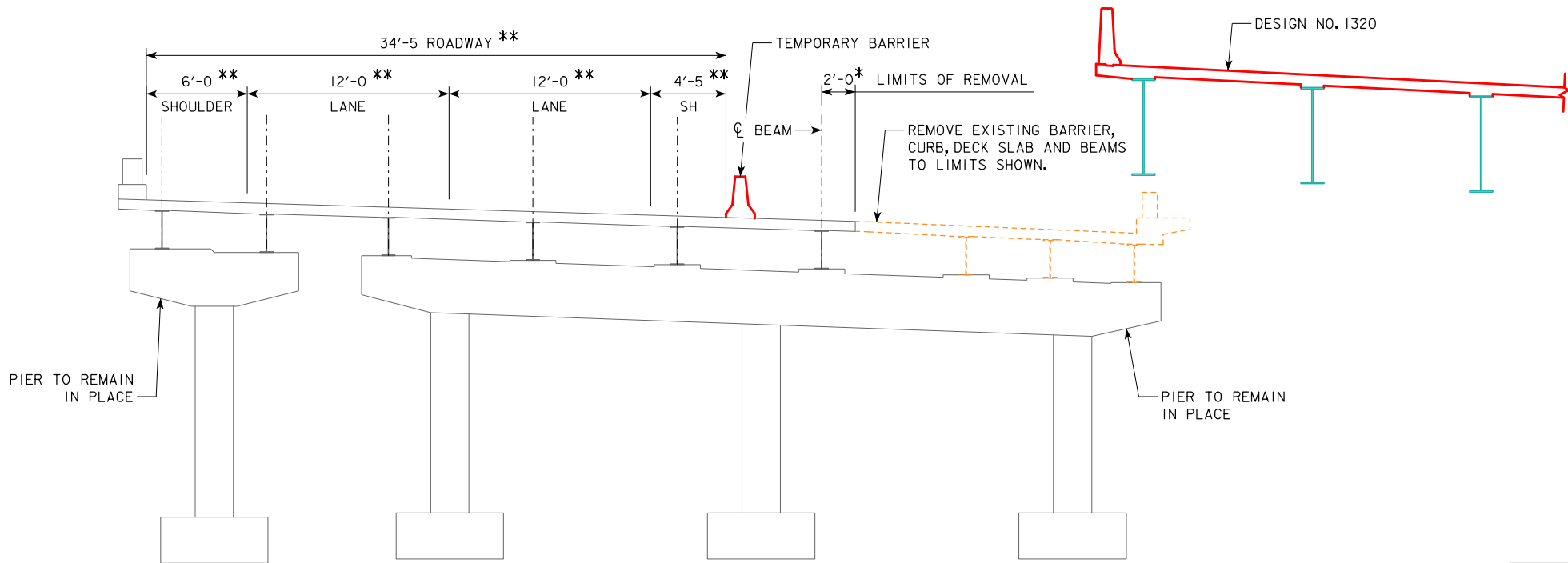


DESIGN FOR 0° SKEW	
1419'-0" x VARIES CONTINUOUS WELDED GIRDER BRIDGE	
UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"	
REMOVAL PLAN	
STA. 3546+14.50 (R I-480 RAMP C)	NOVEMBER, 2020
POTTAWATTAMIE COUNTY	
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION	
DESIGN SHEET NO. 119 OF 121	FILE NO. 30170 DESIGN NO. 1320

* DIMENSION PERPENDICULAR TO CL BEAM D
** DIMENSION NORMAL TO CL LANE N-S



STAGE 2A
PIER 1 REMOVAL
(LOOKING SOUTH)

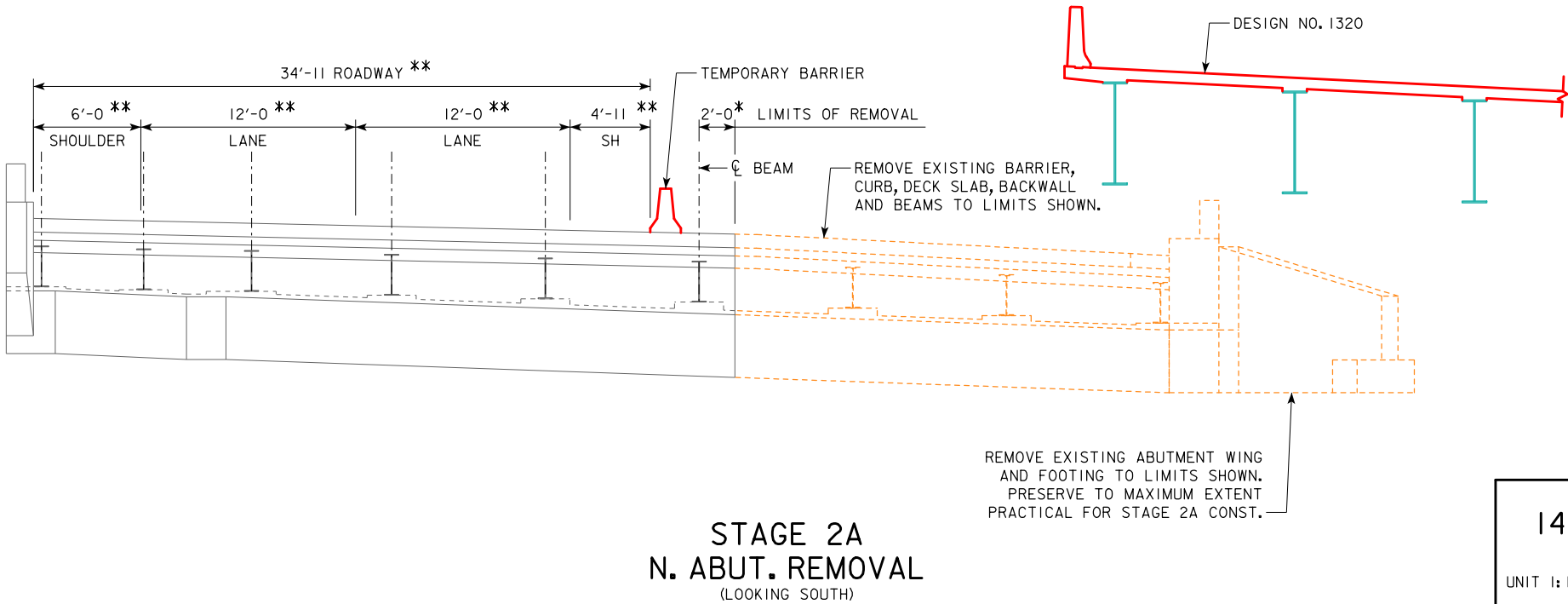
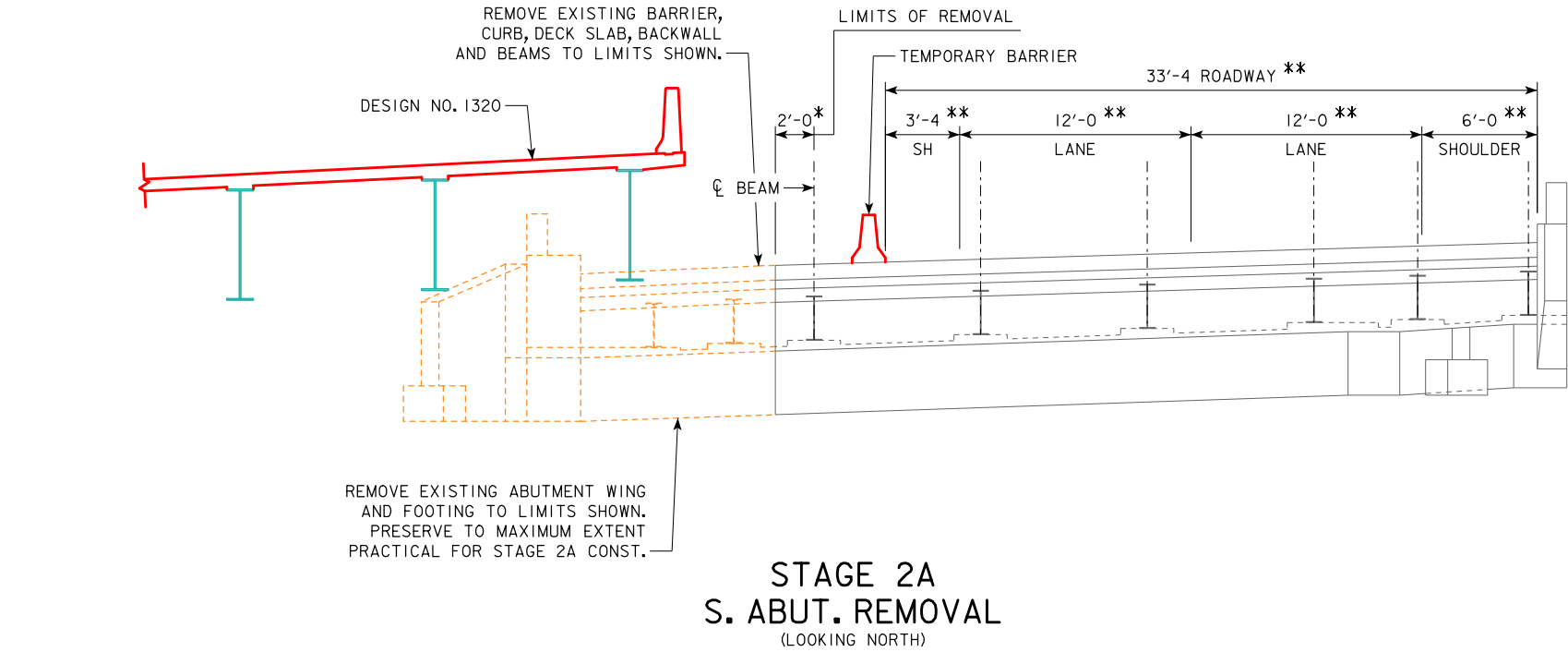


STAGE 2A
PIER 2 REMOVAL
(LOOKING SOUTH)



DESIGN FOR 0° SKEW
1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE
UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"
REMOVAL PLAN
STA. 3546+14.50 (CL 1-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 120 OF 121 FILE NO. 30170 DESIGN NO. 1320

* DIMENSION PERPENDICULAR TO CL BEAM D
** DIMENSION NORMAL TO CL LANE N-S



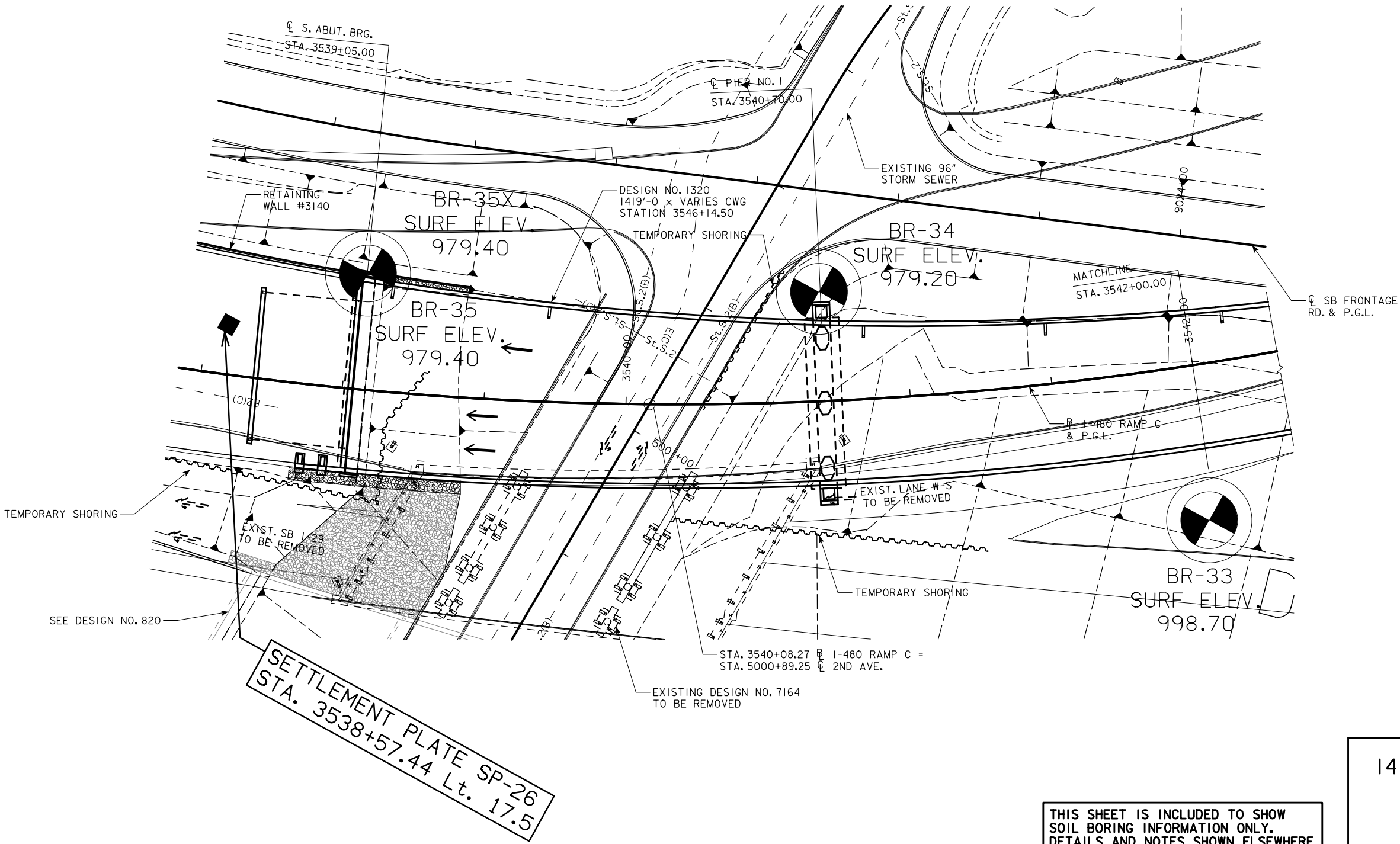
DESIGN FOR 0° SKEW
**1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE**
UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0, UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0
REMOVAL PLAN
STA. 3546+14.50 (CL 1-480 RAMP C) NOVEMBER, 2020
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 121 OF 121 FILE NO. 30170 DESIGN NO. 1320

GEOTECHNICAL DESIGN



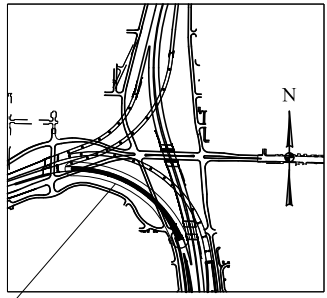
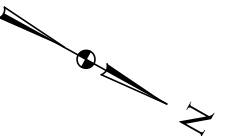
I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature: *Donald J. Hammond* Date: 06-12-2020
Printed or Typed Name: Donald J. Hammond
My license renewal date is December 31, 2020
Pages or sheets covered by this seal: SHEETS SPS.1 THRU SPS.10



LOCATION

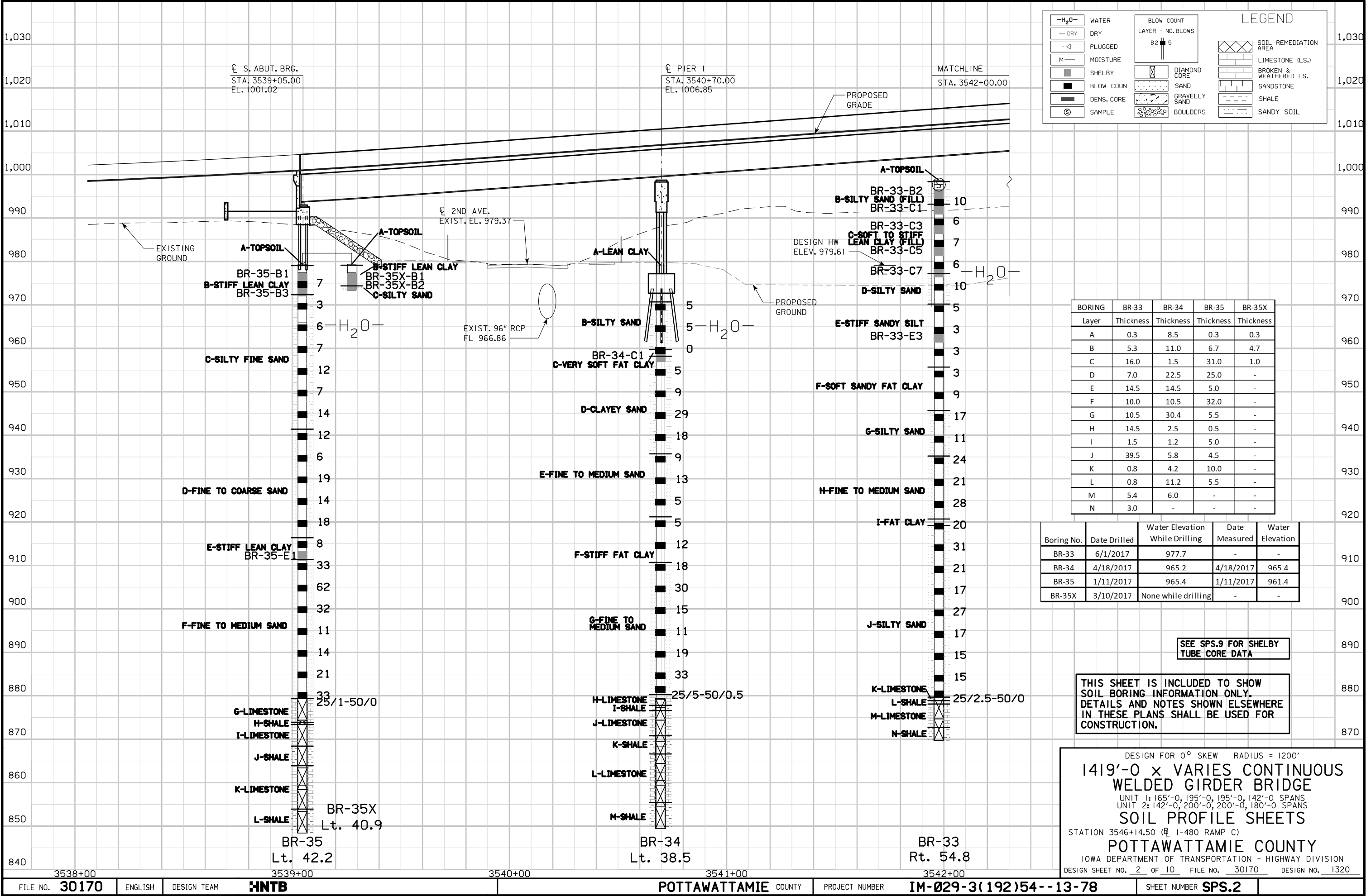
W-S CONNECTOR I-480 TO I-29 (US 6 E.B.) OVER 2ND AVE., S.B. FRONTAGE RD. AND E.B. W. BROADWAY (I-480 RAMP C) T-75N R-44W SECTION 33 KANE TOWNSHIP POTTAWATTAMIE COUNTY FHWA NO. 700970 LATITUDE 41.260968° LONGITUDE -95.909422°



LOCATION OF BRIDGE KEY PLAN

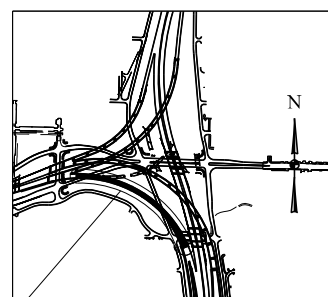
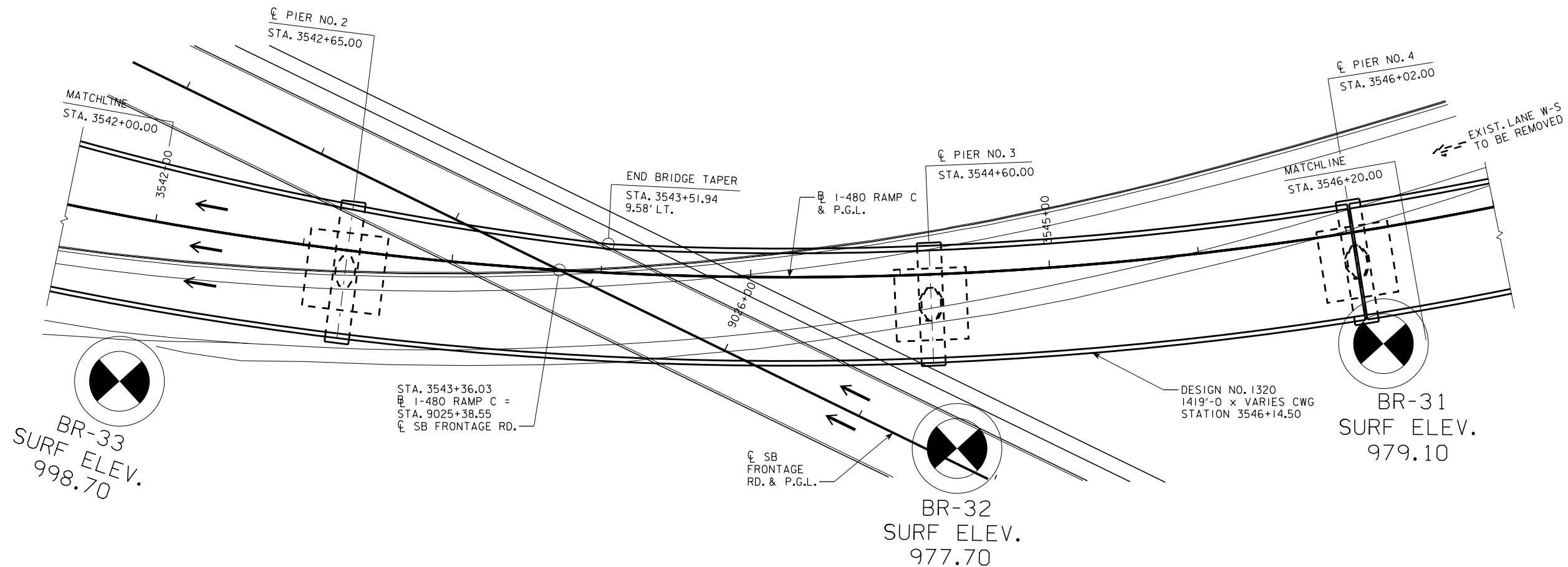
THIS SHEET IS INCLUDED TO SHOW SOIL BORING INFORMATION ONLY. DETAILS AND NOTES SHOWN ELSEWHERE IN THESE PLANS SHALL BE USED FOR CONSTRUCTION.

DESIGN FOR 0° SKEW RADIUS = 1200'
1419'-0" x VARIES CONTINUOUS WELDED GIRDER BRIDGE
UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0" SPANS
UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0" SPANS
SOIL PROFILE SHEETS
STATION 3546+14.50 (CL I-480 RAMP C)
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 1 OF 10 FILE NO. 30170 DESIGN NO. 1320



LOCATION

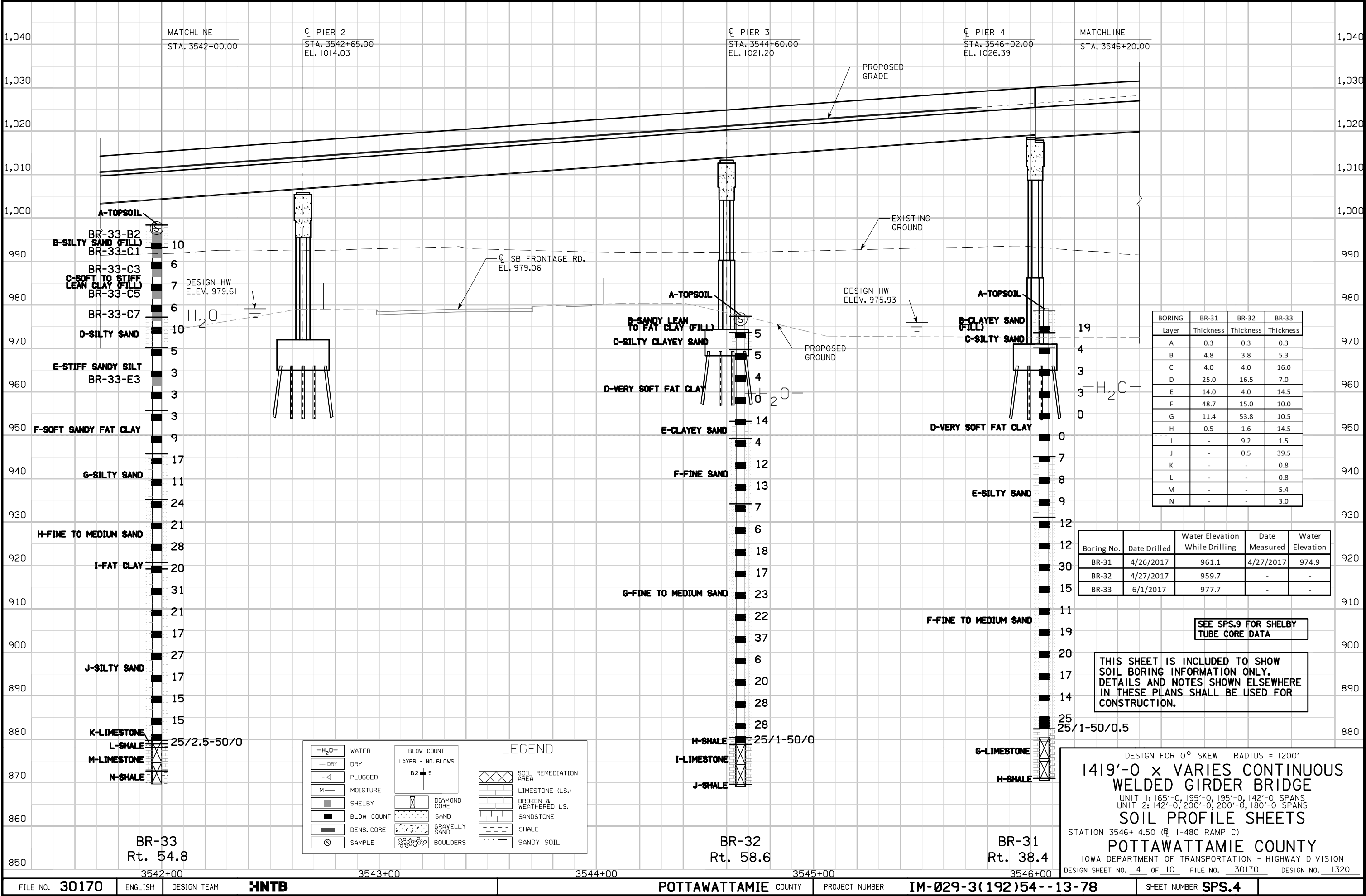
W-S CONNECTOR I-480 TO
I-29 (US 6 E.B.) OVER 2ND AVE.,
S.B. FRONTAGE RD. AND
E.B. W. BROADWAY (I-480 RAMP C)
T-75N R-44W
SECTION 33
KANE TOWNSHIP
POTTAWATTAMIE COUNTY
FHWA NO. 700970
LATITUDE 41.260968°
LONGITUDE -95.909422°

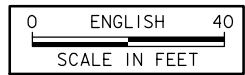
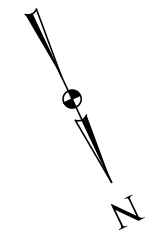
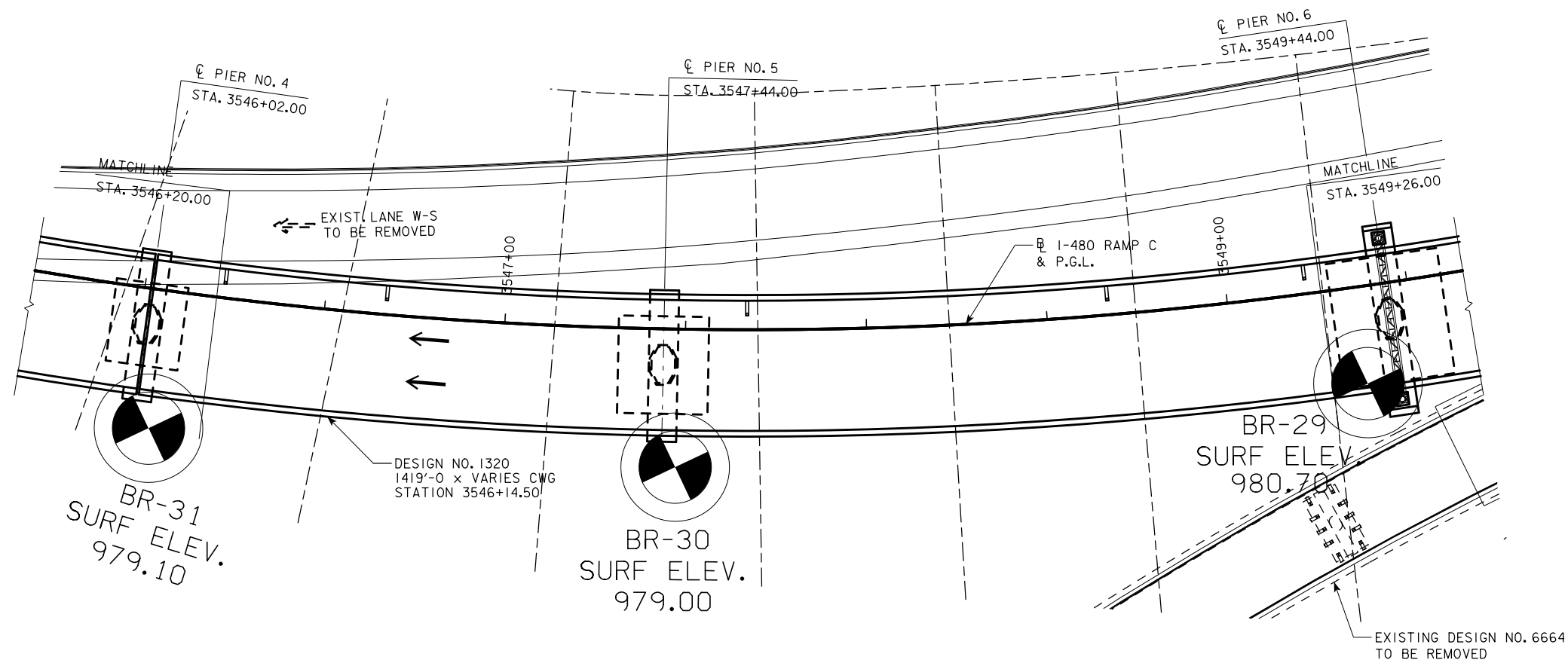


LOCATION OF BRIDGE

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DETAILS AND NOTES SHOWN ELSEWHERE
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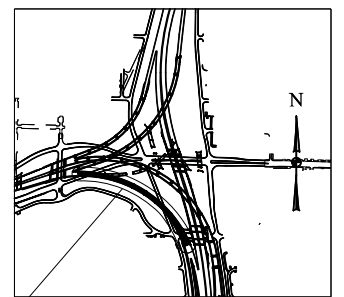
DESIGN FOR 0° SKEW RADIUS = 1200'
1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE
UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0" SPANS
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SOIL PROFILE SHEETS
STATION 3546+14.50 (I-480 RAMP C)
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 3 OF 10 FILE NO. 30170 DESIGN NO. 1320





LOCATION

W-S CONNECTOR I-480 TO
I-29 (US 6 E.B.) OVER 2ND AVE.,
S.B. FRONTAGE RD. AND
E.B. W. BROADWAY (I-480 RAMP C)
T-75N R-44W
SECTION 33
KANE TOWNSHIP
POTTAWATTAMIE COUNTY
FHWA NO. 700970
LATITUDE 41.260968°
LONGITUDE -95.909422°

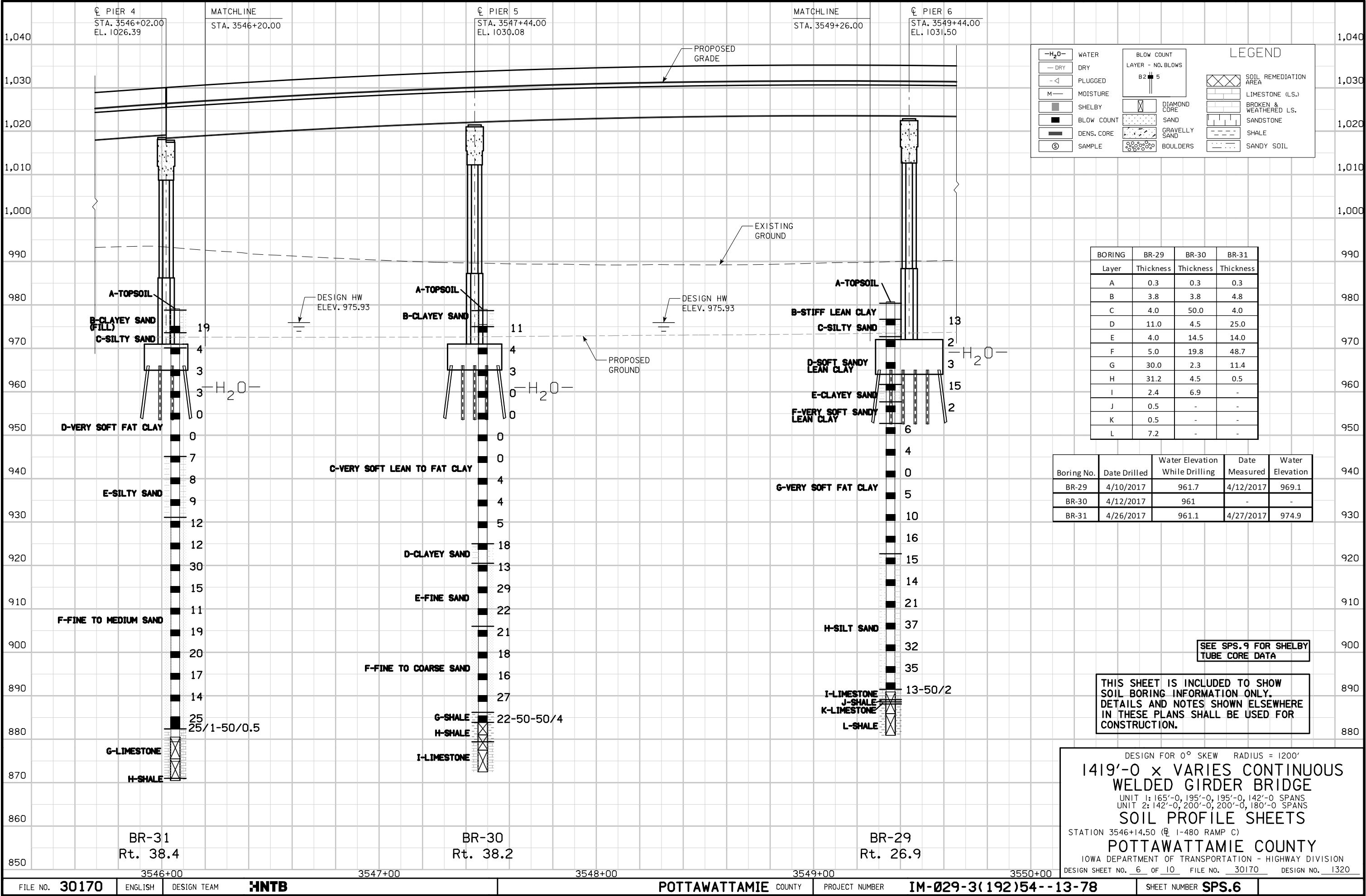


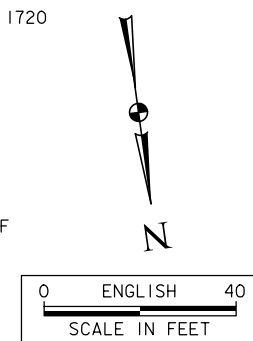
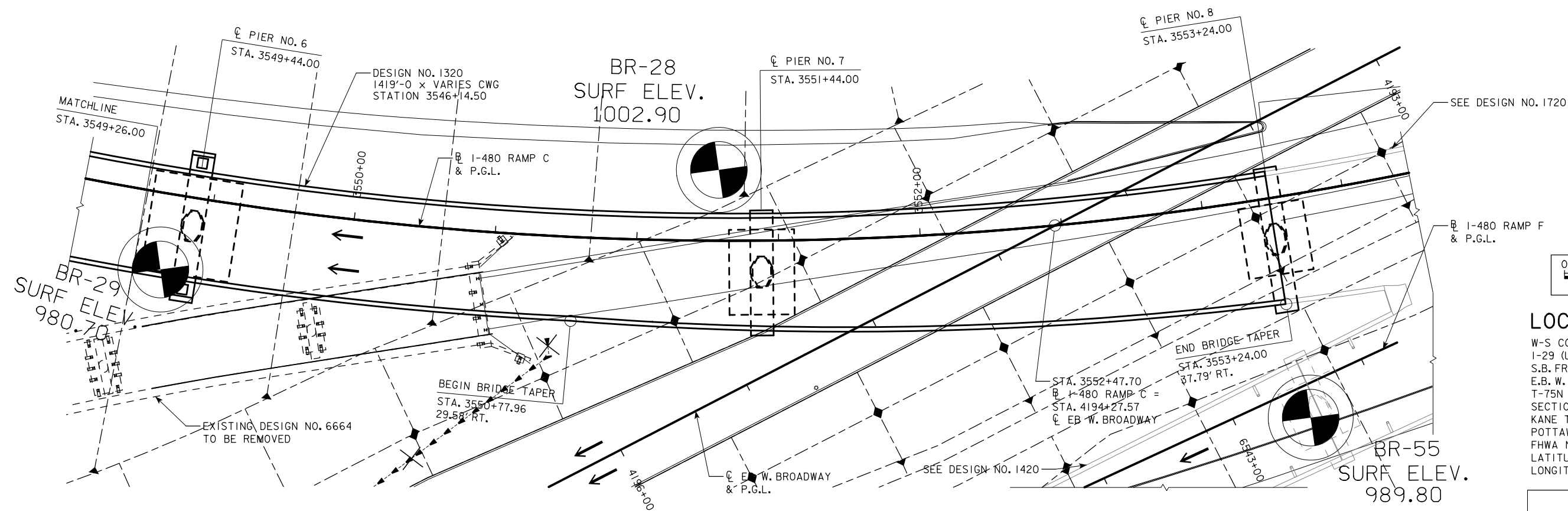
LOCATION
OF BRIDGE

KEY PLAN

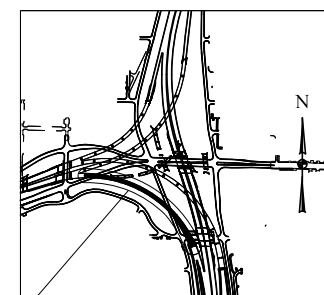
THIS SHEET IS INCLUDED TO SHOW
SOIL BORING INFORMATION ONLY.
DETAILS AND NOTES SHOWN ELSEWHERE
IN THESE PLANS SHALL BE USED FOR
CONSTRUCTION.

DESIGN FOR 0° SKEW RADIUS = 1200'
**1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE**
UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0 SPANS
UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0 SPANS
SOIL PROFILE SHEETS
STATION 3546+14.50 (℄ I-480 RAMP C)
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 5 OF 10 FILE NO. 30170 DESIGN NO. 1320





LOCATION
W-S CONNECTOR I-480 TO
I-29 (US 6 E.B.) OVER 2ND AVE.,
S.B. FRONTAGE RD. AND
E.B. W. BROADWAY (I-480 RAMP C)
T-75N R-44W
SECTION 33
KANE TOWNSHIP
POTTAWATTAMIE COUNTY
FHWA NO. 700970
LATITUDE 41.260968°
LONGITUDE -95.909422°

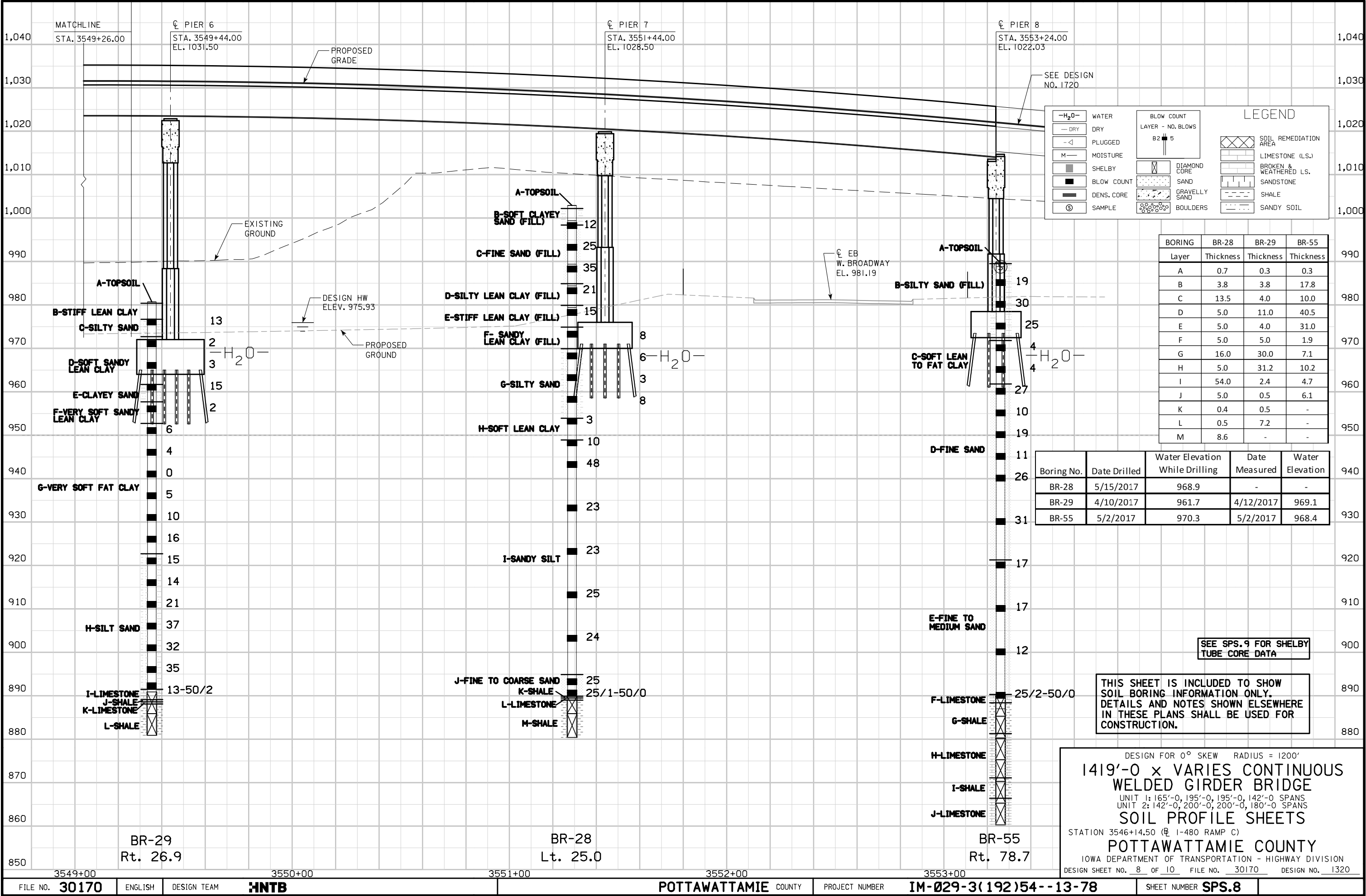


LOCATION
OF BRIDGE

KEY PLAN

THIS SHEET IS INCLUDED TO SHOW
SOIL BORING INFORMATION ONLY.
DETAILS AND NOTES SHOWN ELSEWHERE
IN THESE PLANS SHALL BE USED FOR
CONSTRUCTION.

DESIGN FOR 0° SKEW RADIUS = 1200'
**1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE**
UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0" SPANS
UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0" SPANS
SOIL PROFILE SHEETS
STATION 3546+14.50 (E I-480 RAMP C)
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 7 OF 10 FILE NO. 30170 DESIGN NO. 1320



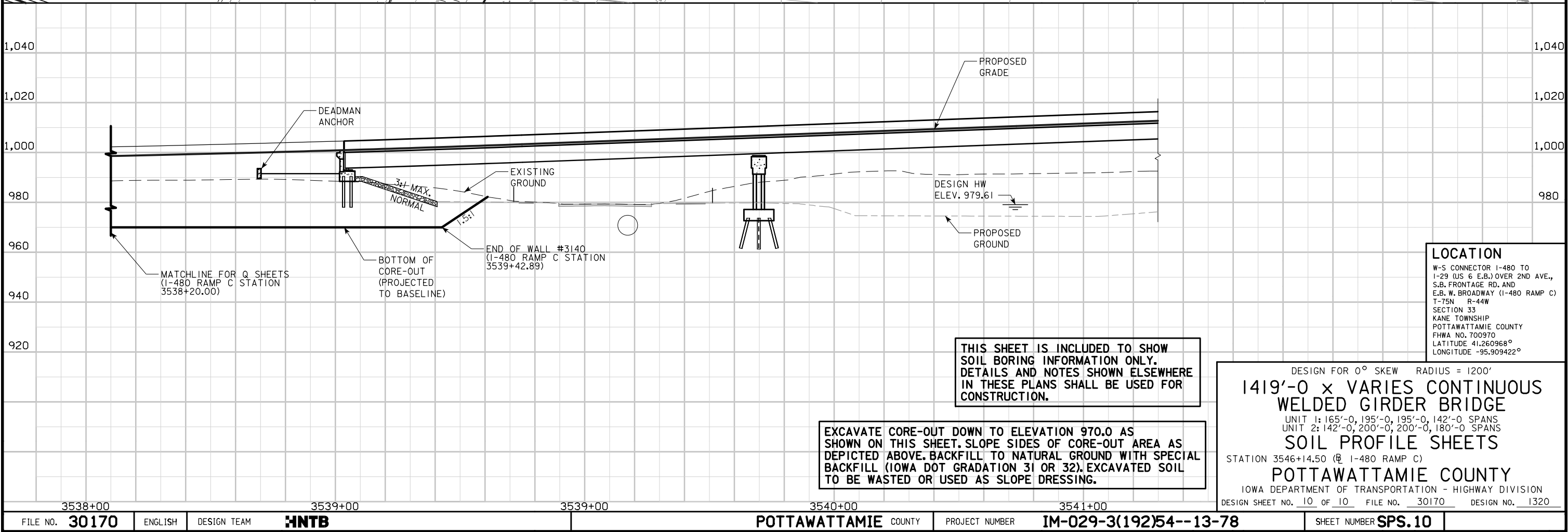
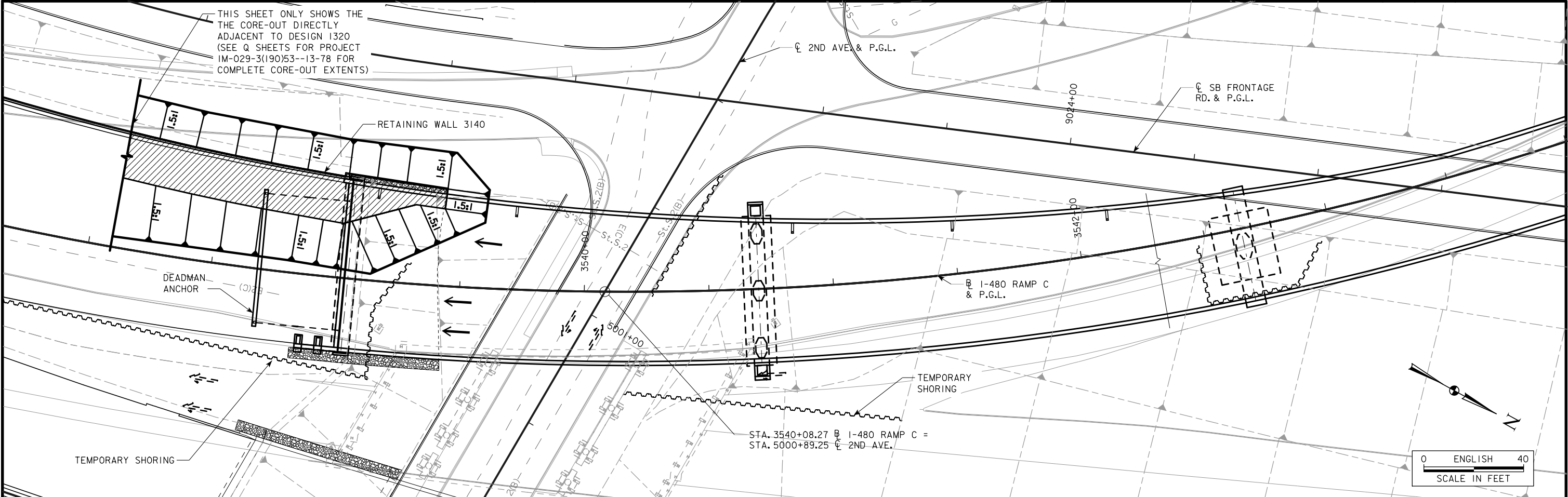
ROCK CORE INFORMATION					
Boring	Approx. Surf. El. (ft)	Run No.	Interval (ft)	Recovery (%)	RQD (%)
BR-28	1002.9	1	113 - 117	69	37
		2	117 - 122.5	91	75
BR-29	980.7	1	89.8 - 94.8	95	62
		2	94.8 - 99.8	93	93
BR-30	979.0	1	95.1 - 98	43	18
		2	98 - 101.5	100	75
		3	101.5 - 106.5	93	92
BR-31	979.1	1	98.6 - 103.6	100	99
		2	103.6 - 108.6	100	92
BR-32	977.7	1	98.6 - 103.6	100	46
		2	103.6 - 108.6	100	74
BR-33	998.7	1	119 - 124	95	56
		2	124 - 129	100	83
BR-34	979.2	1	99.8 - 104.8	93	79
		2	104.8 - 109.8	98	94
		3	109.8 - 114.8	97	92
		4	114.8 - 119.8	100	85
		5	119.8 - 124.8	98	92
		6	124.8 - 129.8	100	94
BR-35	979.4	1	100.1 - 105	83	41
		2	105 - 106	92	93
		3	106 - 111	100	94
		4	111 - 116	100	80
		5	116 - 121	98	91
		6	121 - 126	95	96
		7	126 - 131	100	58
BR-55	989.8	1	99.5 - 104.5	100	77
		2	104.5 - 109.5	93	91
		3	109.5 - 114.5	95	96
		4	114.5 - 119.5	95	96
		5	119.5 - 124.5	97	78
		6	124.5 - 129.5	100	91

SHELBY TUBE CORE DATA

CORE NO.	BR-32-B2	BR-33-C1	BR-33-C3	BR-33-C5	BR-33-C7	BR-35-B3	BR-35X-B1	BR-35X-B2
DEPTH IN FEET	1 - 3.5	5.5 - 7.5	10 - 12	15 - 17	20 - 22	5 - 7	2 - 4	4 - 6
CLASSIFICATION (AASHTO)	A-6 (10)	A-6 (14)	-	A-6 (16)	-	A-6 (13)	A-7-6 (29)	A-7-6 (23)
COEFF. CONSOL. (SQ. FT /DAY)	-	-	-	-	-	-	0.15	-
TRIAXIAL COMPRESSION	-	-	-	-	-	-	CU	-
COHESION - PSF	-	-	-	-	-	-	446	-
FRICTION COEFF.	-	-	-	-	-	-	0.422	-
MOISTURE CONTENT %	26.7	14.3	19.0	24.2	28.2	28.6	27.2	28.3
DRY DENSITY - PCF	-	108.5	105.7	99.7	97.9	92.5	96.2	94.4
CU - CONSOLIDATED UNDRAINED								
UU - UNCONSOLIDATED UNDRAINED								
UC - UNCONFINED COMPRESSION								

ROCK CORE COMPRESSIVE STRENGTH AND TESTING REPORT						
Boring Number	Run No.	Sample Elevation (ft)	Unconfined Compressive Strength (psi)	Moisture (%)	Dry Density (pcf)	Rock Type
BR-34	1	878.2	11454	0	164.6	LIMESTONE
BR-34	1	877.2	451	3	147.0	SHALE
BR-34	2	873.4	4616	3	155.6	LIMESTONE
BR-34	2	871	2442	4	148.7	LIMESTONE
BR-34	4	862.2	14816	2	162.5	LIMESTONE
BR-34	5	856.2	2563	9	137.3	LIMESTONE
BR-34	6	853.8	2873	9	111.7	SHALE
BR-35	3	870.4	4364	4	150.2	LIMESTONE
BR-35	4	866.4	331	6	143.0	SHALE
BR-35	5	861.4	8929	2	163.1	LIMESTONE
BR-35	6	857.4	9095	6	144.4	LIMESTONE
BR-35	7	851.4	2226	10	110.2	SHALE

DESIGN FOR 0° SKEW RADIUS = 1200'
1419'-0 x VARIES CONTINUOUS
WELDED GIRDER BRIDGE
UNIT 1: 165'-0, 195'-0, 195'-0, 142'-0 SPANS
UNIT 2: 142'-0, 200'-0, 200'-0, 180'-0 SPANS
SOIL PROFILE SHEETS
STATION 3546+14.50 (R 1-480 RAMP C)
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 9 OF 10 FILE NO. 30170 DESIGN NO. 1320

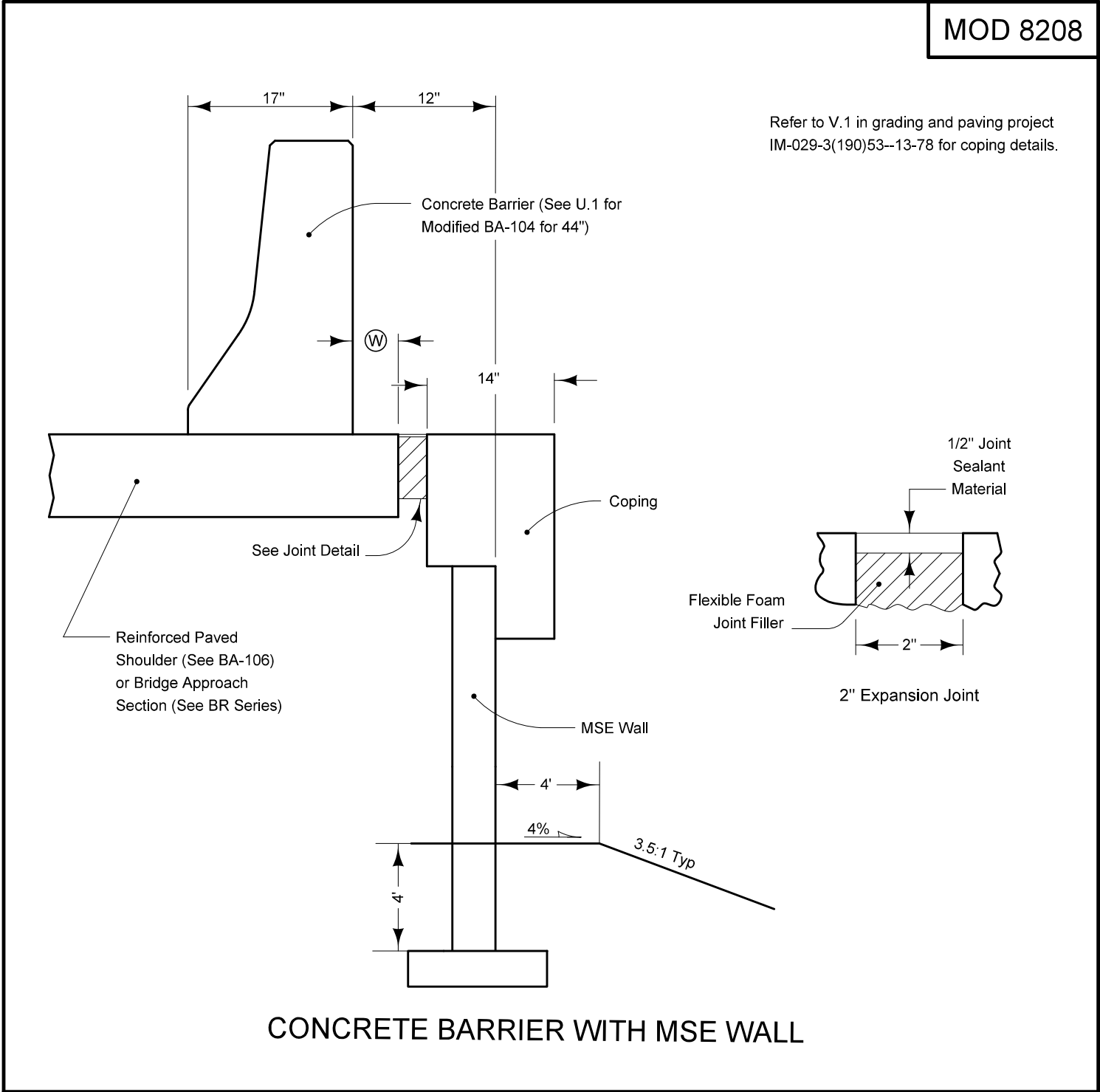




INDEX OF SHEETS	
No.	DESCRIPTION
A Sheets	Title Sheets
A.1	Title Sheet
B Sheets	Typical Cross Sections and Details
B.1	Typical Cross Sections and Details
C Sheets	Quantities And General Information
C.1	Project Description and General Information
C.2	Tabulations
G Sheets	Survey Sheets
G.1	Reference Ties, Bench Marks and Alignment Data
J Sheets	Traffic Control and Staging Sheets
J.1	Traffic Control Plan
K Sheets	Ramp Plan and Profile Sheets
*K.1	Plan and Profile Legend and Symbol Info Sheet
*K.2	I-480 Ramp C Plan and Profile
L Sheets	Geometric, Staking and Jointing Sheets
*L.1	Staking Details
*L.2	Jointing and Bridge Approach Details
U Sheets	Modified Standards and Detail Sheets
U.1	Modified BA-104
* Color Plan Sheet	

ROADWAY 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.
	<div>Signature: <i>James L. Kinder</i> Date: 11/4/2020</div>
	James L. Kinder
	Printed or Typed Name
	My license Renewal date is December 31, 2020
Page or sheets covered by this seal: A.1, B.1, C.1-C.2, G.1, J.1, K.1-K.2, L.1-L.2, U.1	

SEE GRADING AND PAVING PROJECT IM-029-3(190)53--13-78 FOR ADDITIONAL TYPICAL SECTIONS



100-1D 10-18-05					
PROJECT DESCRIPTION					
This project includes the construction of the I-480 Ramp C bridge (Design No. 1320), the construction of bridge approach slabs and longitudinal grooving. Approach embankment, Retaining Walls, Construction Staging and all other related work are included in the Grade and Paving project IM-029-3(190)53--13-78.					

100-0A 10-28-97					
ESTIMATED ROADWAY QUANTITIES (1 DIVISION PROJECT)					
Item No.	Item Code	Item	Unit	Total	As Built Qty.
1	2301-0690203	BRIDGE APPROACH, BR-203	SY	464.5	
2	2412-0000100	LONGITUDINAL GROOVING IN CONCRETE	SY	6528.9	
3	2513-0474990	CONCRETE BARRIER, REINFORCED, PER PLAN	LF	19.2	

100-4A 10-29-02		
ESTIMATE REFERENCE INFORMATION		
Item No.	Item Code	Description
1	2301-0690203	BRIDGE APPROACH, BR-203
		Refer to Tab. 112-6 on sheet C.2 for location and details. Includes 191.7 sq. yds. of Non-reinforced pavement, 124.2 sq. yds. Of single reionforced pavement, and 148.6 sq. yds. Of double reinforced pavement.
-	-	-
2	2412-0000100	LONGITUDINAL GROOVING IN CONCRETE
		Refer to Tab. 100-28 on sheet C.2 for location and details.
-	-	-
3	2513-0474990	CONCRETE BARRIER, REINFORCED, PER PLAN
		This bid item is for 44 inch concrete barrier tied to approach slab. Refer to Tab. 108-18B on sheet C.2 and special details on sheet U.1.
-	-	-

105-4 10-18-11		
STANDARD ROAD PLANS		
The following Standard Road Plans apply to construction work on this project.		
Number	Date	Title
BA-102	04-21-20	44" Concrete Barrier (Half Section)
BA-106	10-21-14	Reinforced Paved Shoulder for Concrete Barrier
BA-150	10-15-19	Side Obstacle Protection with Concrete Barrier and Guardrail
BR-203	10-17-17	Double Reinforced 12" Approach
BR-211	10-17-17	Bridge Approach (Abutting PCC or Composite Pavement)
PV-101	04-21-20	Joints
TC-1	10-15-19	Work Not Affecting Traffic (Two-Lane or Multi-Lane)
Note: Additional applicable Standard Road Plans can be found in grading and paving project IM-029-3(190)53--13-78		


111-25 10-18-11		
INDEX OF TABULATIONS		
Tabulation	Tabulation Title	Sheet No.
100-0A	ESTIMATED ROADWAY QUANTITIES (1 DIVISION PROJECT)	C.1
100-1D	PROJECT DESCRIPTION	C.1
100-4A	ESTIMATE REFERENCE INFORMATION	C.1
100-28	LONGITUDINAL GROOVING	C.2
105-4	STANDARD ROAD PLANS	C.1
108-18B	CONCRETE BARRIER AT SIDE LOCATIONS	C.2
108-20	CONCRETE BARRIER WITH MSE WALL	C.2
110-12A	POLLUTION PREVENTION PLAN	C.1
111-25	INDEX OF TABULATIONS	C.1
112-6	BRIDGE APPROACH SECTION	C.2
262-5	UTILITIES (POINT 25 PROJECT)	C.1
281-1	SECTION 404 PERMIT AND CONDITIONS	C.1

262-5 10-18-05
UTILITIES (POINT 25 PROJECT)
This is a POINT 25 project and is subject to the provisions of IAC 761-115.25.

281-1 10-18-16
SECTION 404 PERMIT AND CONDITIONS
Construct this project according to the requirements of U.S. Army Corps of Engineers NWP 14, Permit No. _____. A copy of this permit is available from the Iowa DOT website (http://www.envpermits.iowadot.gov/). The U.S. Army Corps of Engineers reserves the right to visit the site without prior notice.

110-12A 04-16-19
POLLUTION PREVENTION PLAN
See Project No. IM-029-3(190)53--13-78

[illegible][illegible]

Station to Station		Side		Remarks
			IN	
3538+83.67	3539+03.45	RT	2 (A)	S Approach 1320
(A) See Sheet Number B.1 for Modified Detail 8208 and Sheet Number U.1 for Modified BA-104				

[illegible]

SEE GRADING AND PAVING PROJECT IM-029-3(190)53--13-78 FOR SURVEY AND ALIGNMENT INFORMATION

108-23A
08-01-08

TRAFFIC CONTROL PLAN

See Project No. IM-029-3(190)53--13-78

108-26A
08-01-08

STAGING NOTES

See Project No. IM-029-3(190)53--13-78

111-01
04-17-12

COORDINATED OPERATIONS

Other work in progress during the same period of time will include the construction of the projects listed. Coordinate operations with those of other contractors working within the same area.

Project	Type of Work
IM-029-3(70)53--13-78	Design No. 520 & 620
IM-029-3(71)54--13-78	Design No. 720 & 820
IM-029-3(73)54--13-78	Design No. 920 & 1020
IM-029-3(74)54--13-78	Design No. 1120 & 1220
IM-029-3(221)54--13-78	Design No. 1420
IM-029-3(193)54--13-78	Design No. 1520
IM-029-3(222)54--13-78	Design No. 1620
IM-480-1(166)0--13-78	Design No. 1720
IM-480-1(167)0--13-78	Design No. 1820
IM-029-3(190)53--13-78	Grade and Paving
IM-029-3(218)53--13-78	Signing
IM-029-3(219)53--13-78	Signals
IM-029-3(220)53--13-78	Lighting

108-25
10-21-14

511 TRAVEL RESTRICTIONS

Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No., Structure ID, or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
See Project No. IM-029-3(190)53--13-78												

SURVEY SYMBOLS

- IN Storm Sewer Intake
- MH Utility Access (Manhole)
- PIP Pipe Culvert
- MIS Miscellaneous
- INB Storm Sewer Beehive Intake
- PLG Location of General Photo
- OUT Tile Outlet
- BRG Bridge
- CON Concrete or A/C Slab
- CU Back of Curb
- GU Gutter In Front of Curb
- EP Edge of Paved Roads (ML or SR)
- UE Utility Elevation
- WV Water Valve
- FHD Fire Hydrants
- LIN Miscellaneous Line
- SI Sign
- TLNR Tree Line Right
- LUM Luminaire
- UB Utility Box
- FCL Chain Link and Security Fence
- TDC Tree Deciduous
- TPD Telephone Pedestal
- GP Guard Post (Less Than 4 Posts)
- HDG Hedge Row
- RET Retaining Walls
- UV Underground Utility Vault
- GDL Guard Rail Steel
- GPR Guard Post (4 or More Posts)
- FWD Wood Fence
- SHR Shrub
- EB Electrical Box
- TEV Evergreen Tree
- STP Stump
- TLNL Tree Line Left
- FW Wire Fence
- SL Speed Limit Sign
- LC Lot Corner
- SNP Unpaved Shoulder
- SWK Sidewalk
- ENP Edge Paved Entrance & Park Lot
- ENU Edge Unpaved Entrance & Parking
- EG Edge of Gravel Road
- ENT Centerline BL of Entrance
- DU Centerline Draw or Stream (Up)
- TW Top of Water

SURVEYED UTILITY OWNER SYMBOLS

- EB Electrical Box
- FHD Fire Hydrant
- GV Gas Valve
- IN Storm Sewer Intake
- LUM Luminaire
- MH Utility Access (Manhole)
- PPA Power Pole
- TCB Traffic Signal Box
- TPC Telephone Pole AT&T
- TPD Telephone Pedestal
- UB Utility Box
- Water Valve
- AT&T
Lenny Vohs
1425 Oak Street
Kansas City, MO 64106
816-275-4014
lv2121@att.com
- Iowa Communications Network
Dave Augspurger
Grimes State Office Bldg
400 E. 14th St.
Des Moines, IA 50319
515-725-4604
david.augspurger@iowa.gov
- Black Hills Energy
Chris Dewey
1414 W. Broadway
P.O. Box 68
Council Bluffs, IA 51502
712-325-3022
chris.dewey@blackhillscorp.com
- Iowa DOT
Chris Haynes
2501 N. 25th Street
Council Bluffs, IA 51501
712-322-7543
christopher.haynes@iowadot.us
- CenturyLink
Sean Hostetter
210 S 3rd Street
Ames, IA 50010
515-233-6404
sean.hostetter@centurylink.com
- MidAmerican Energy Company
Adam Fritz
Council Bluffs Service Center
3003 S. 11th St.
Council Bluffs, IA 51501
712-366-5627
acfritz@midamerican.com
- City of Council Bluffs - Power/Signals
Andy Wicks
Public Works Operations
1001 10th Avenue
Council Bluffs, IA 51501
712-328-4645
awicks@councilbluffs-ia.gov
- Sprint
Mike Chebul
810 South 7th Street
Omaha, NE 68108
402-522-2607
michael.j.chebul@sprint.com
- City of Council Bluffs - Sanitary Sewer
Dave Vermillion
City of Council Bluffs Public Works
209 Pearl Street
Council Bluffs, IA 51503
712-328-4635 ex 3153#
dvermillion@councilbluffs-ia.gov
- TeleCom
Unknown
- Unite Private Network (UPN)
Shanon Morris
402-575-1239
shanon.morris@upnfiber.com
- City of Council Bluffs - Storm Sewer
Dave Vermillion
City of Council Bluffs Public Works
209 Pearl Street
Council Bluffs, IA 51503
712-328-4635 ex 3153#
dvermillion@councilbluffs-ia.gov
- Windstream
Derek Stork
9850 M Street
Omaha, NE 68127
402-827-6355
derek.w.stork@windstream.com
- Council Bluffs Water Works
Brian Cady
2000 N. 25th St.
P.O. Box 309
Council Bluffs, IA 51502
712-328-1006 x.1039
bcady@cbwaterworks.com
- Unknown
- Indicates Utility As Abandoned
- Cox Communications
Andrew Aschenbrener
3031 N 120th Street
Omaha, NE 68164
402-934-0395
andrew.aschenbrener@cox.com

PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Topographic Features and Labels
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)	Existing Utilities
Rust	(206)	Class E Revetment
Lavender	(207)	Macadam Stone Slope Protection
Gray, Light-White (48-0)		Mill and Overlay

SHADING	Design Color No.	
Yellow	(4)	Highlight for Critical Notes or Features
Red	(3)	Delineates Restricted Areas
Lavender	(9)	Temporary Pavement Shading
Gray, Light	(48)	Proposed Pavement Shading
Gray, Med	(80)	Proposed Granular Shading
Gray, Dark	(112)	Proposed Bridge Shading
Brown, Light	(236)	Grading Shading
Tan	(8)	Proposed Sidewalk Shading
Blue, Light	(230)	Proposed Sidewalk Landing Shading
Pink	(11)	Proposed Sidewalk Ramp Shading

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Ground Line Profile
Blue	(1)	Proposed Profile and Annotation
Magenta	(5)	Existing Utilities
Blue, Light	(230)	Proposed Ditch Grades, Left
Black	(0)	Proposed Ditch Grades, Median
Rust	(14)	Proposed Ditch Grades, Right
Gray, Dark	(112)	Proposed Bridge Shading

Reference Point

Survey Line

Station

Reference Point

Section Corner

Ground Line Intercept

Saw Cut

Guardrail

Trench Drain

HighTension Cable Guardrail

Sheet Pile

Pavement Removal

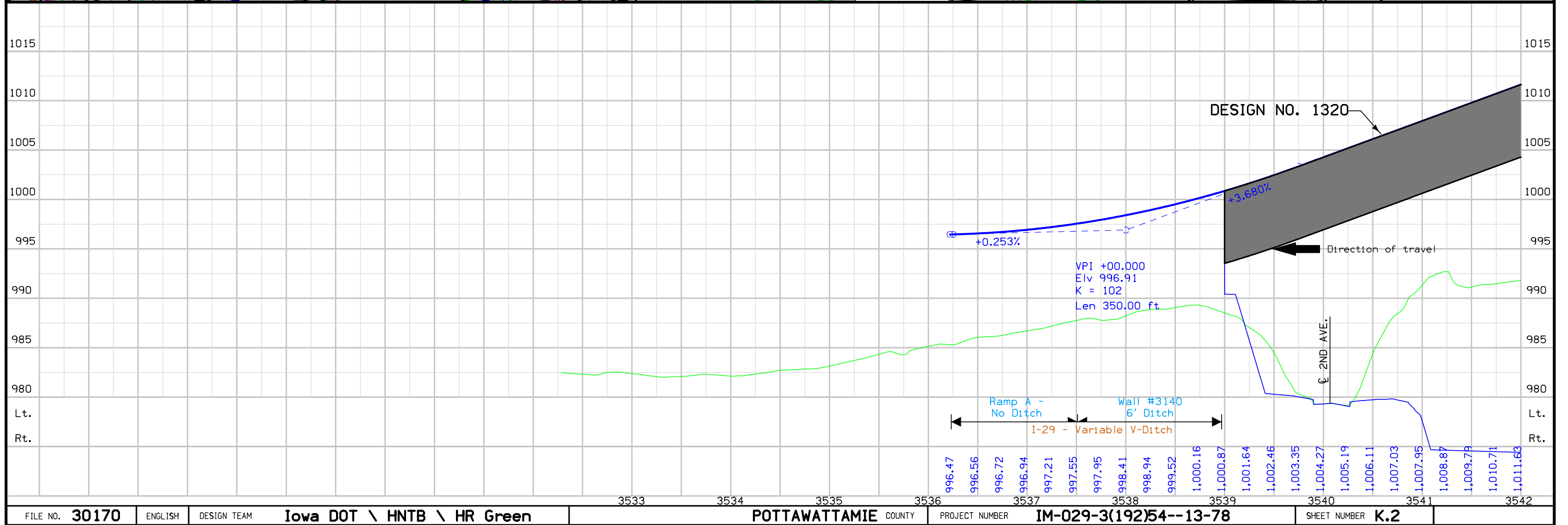
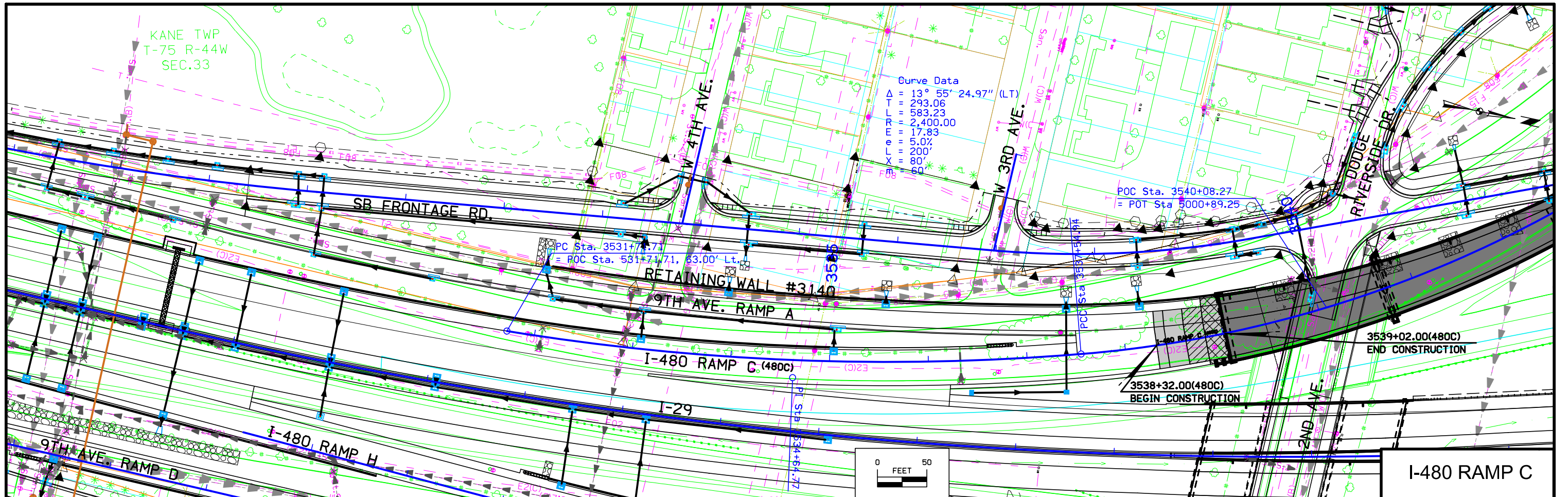
Clearing & Grubbing Area

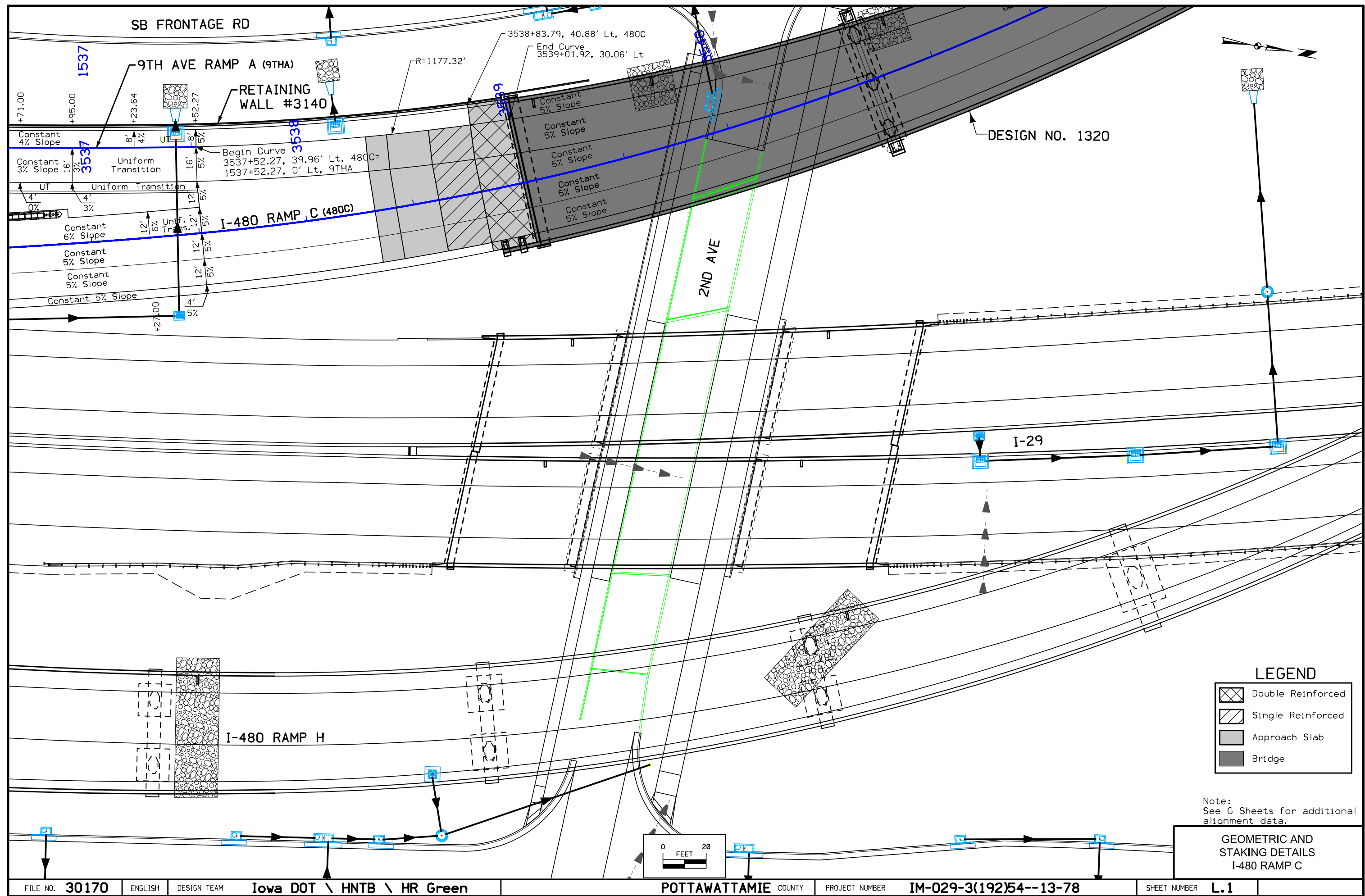
RIGHT-OF-WAY LEGEND

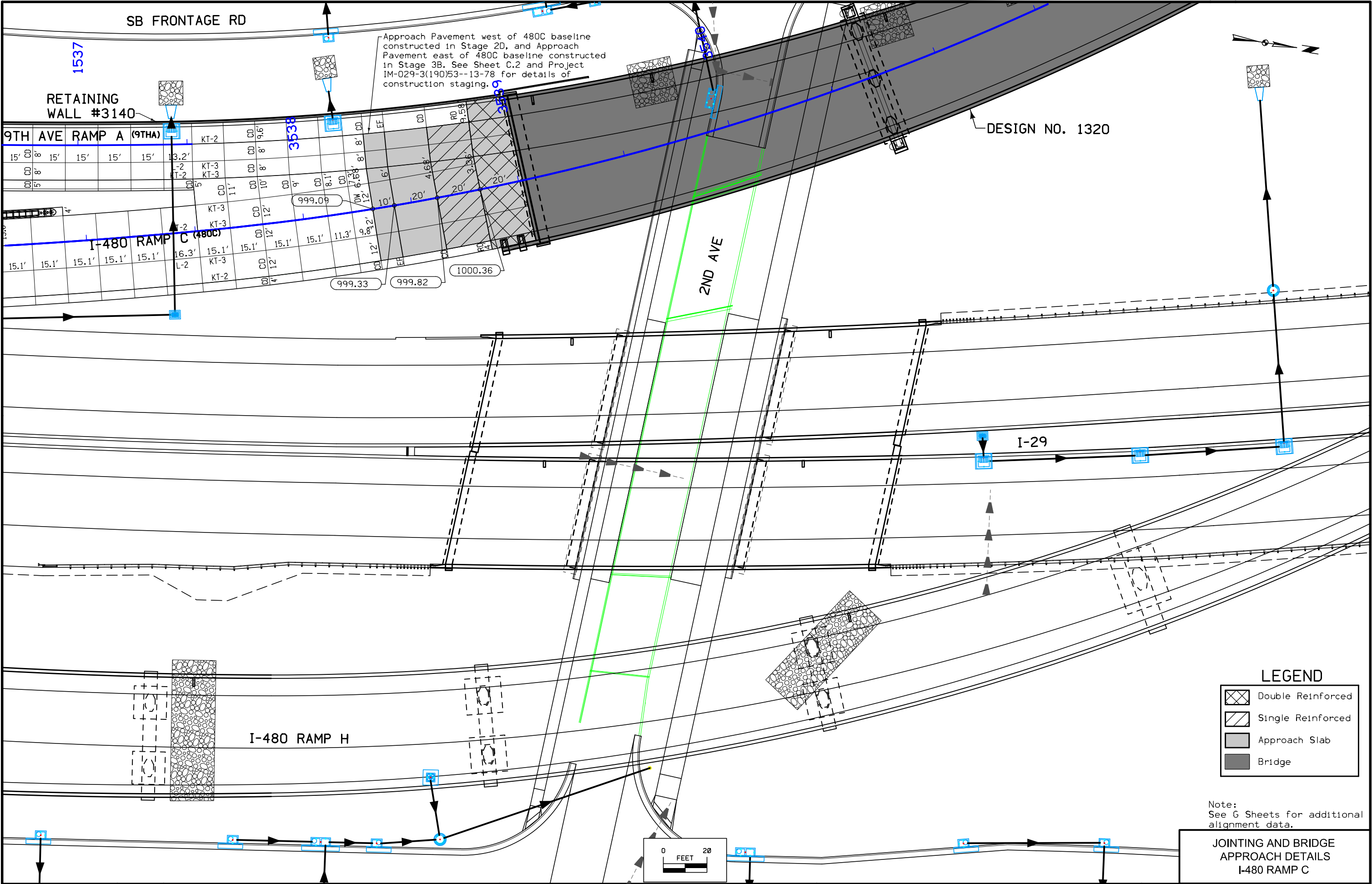
-
- Proposed Right-of-Way
-
- Existing Right of Way
-
- Existing and Proposed Right-of-Way
-
- Easement and Existing Right-of-Way
-
- Easement (Temporary)
-
- Easement
-
- Access Control
-
- Property Line

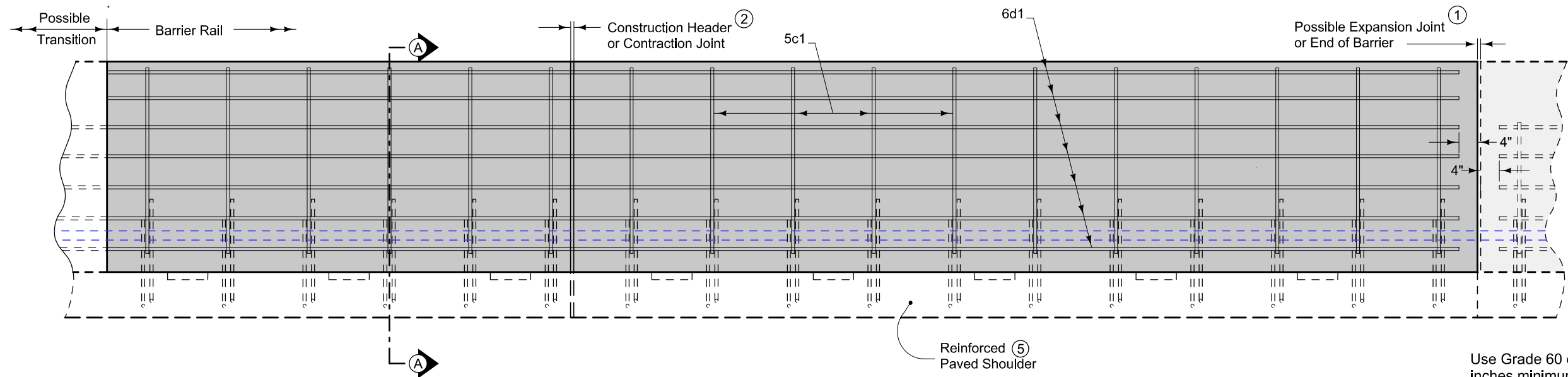
PLAN AND PROFILE
LEGEND AND SYMBOL
INFORMATION SHEET

(COVERS SHEET SERIES D, E, & K)

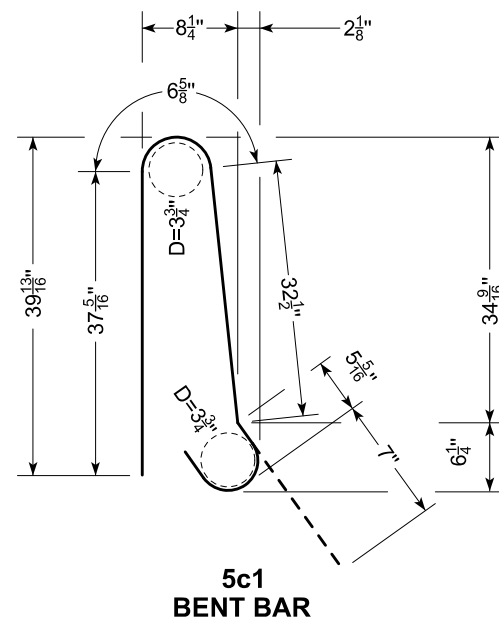




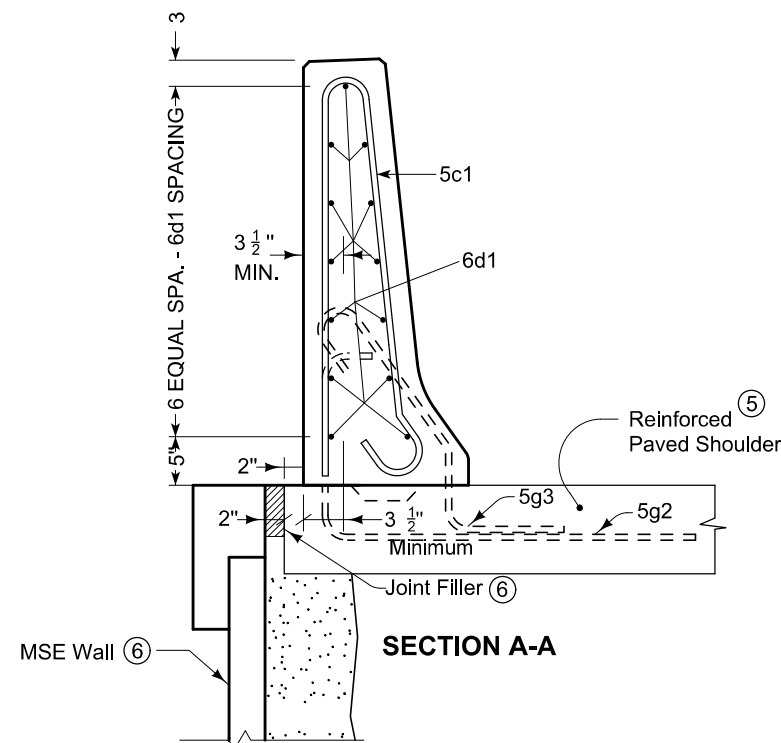




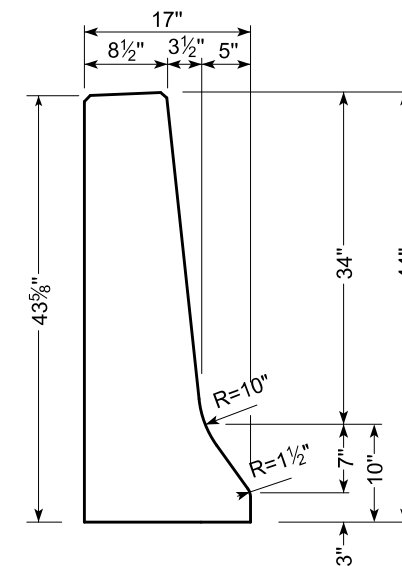
ELEVATION



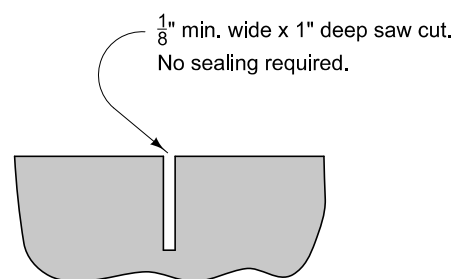
**5c1
BENT BAR**



SECTION A-A



BARRIER FACE



SAWED CONTRACTION JOINT

Saw cut top and front face. Saw cut back if exposed.

Use Grade 60 epoxy-coated reinforcing bars. Provide 2 inches minimum cover. Anchor all reinforcement to prevent movement. Secure each section at the front, back, and at 3'-6" intervals using a method approved by the Engineer.

- ① Expansion joints are necessary only where specifically required by project plans. Conform expansion material to the shape of the barrier. No sealer is required.
- ② Where abutting sections are placed as separate pours, a butt joint may be used. Extend longitudinal reinforcement into the abutting section a minimum of 1'-6". Contraction joint locations shall match pavement joint locations.
- ③ Fillet all exposed corners with a $\frac{3}{4}$ inch dressed and beveled strip.
- ④ Place barrier markers at 100 foot increments in areas with non-continuous lighting, or 250 foot increments in areas with continuous lighting. Marker color to be the same as adjacent edge line.
- ⑤ Refer to BA-106 for details of 5g2 bars, 5g3 bars, and reinforced paved shoulder.
- ⑥ Refer to B sheets for joint filler details and MSE wall typical sections with barrier.

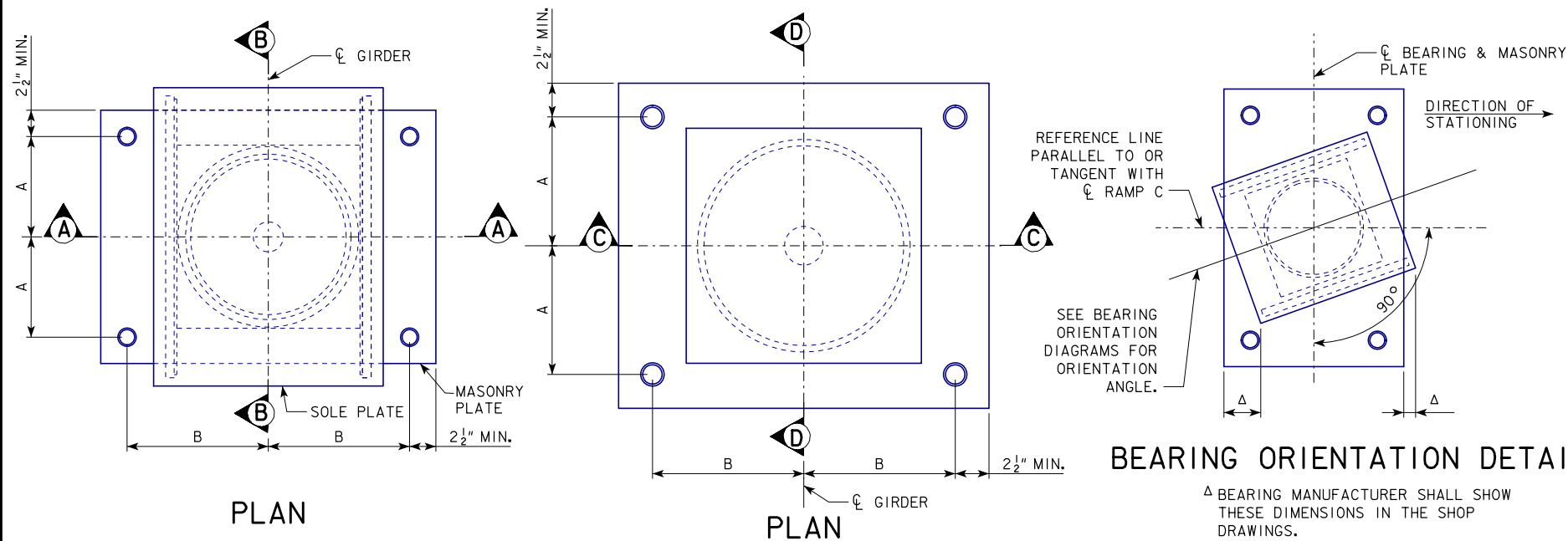
Possible Contract Item:
Concrete Barrier, Reinforced, As Per Plan

Possible Tabulation:
108-18B

ESTIMATED QUANTITIES FOR BARRIER Per Linear Foot	
Concrete - Cu. Yds.	0.13
Reinforcing Steel - Lbs.	27.3

REINFORCING BAR LIST Per Section (Approximately 20')			
Bar	Number of Bars	Length	Spacing
5c1	20	7'-5"	1'-0"
6d1	13	19'-4"	—

**44" CONCRETE BARRIER
FOR USE WITH
REINFORCED PAVED SHOULDER**



BEARING ORIENTATION DETAIL

Δ BEARING MANUFACTURER SHALL SHOW THESE DIMENSIONS IN THE SHOP DRAWINGS.

DISC BEARING NOTES:

THE SOLE PLATES SHALL BE TAPERED TO THE LONGITUDINAL SLOPE SHOWN, AND SHALL BE SIZED FOR THE MOVEMENTS SHOWN IN THE BEARING DATA TABLE. ADDITIONALLY, THE SOLE PLATES SHALL EXTEND BEYOND THE EDGE OF THE GIRDER BOTTOM FLANGE BY AT LEAST $\frac{1}{2}$ INCH TO ALLOW THE PLACEMENT OF A HORIZONTAL WELD.

BEARINGS SHALL BE DESIGNED TO ACCOMMODATE A ROTATION OF 0.02 RADIAN.

ALL BEARINGS SHALL BE FULLY REMOVABLE.

FOR GUIDED EXPANSION BEARINGS, STAINLESS STEEL SURFACES SHALL EXTEND A MINIMUM OF 1 INCH EACH WAY BEYOND THE SPECIFIED MOVEMENT RANGE.

TOTAL MOVEMENT SHOWN IN THE BEARING DATA TABLE REPRESENT THE COMBINED MOVEMENT RANGE FOR BRIDGE EXPANSION (50° F TO 125° F) AND BRIDGE CONTRACTION (50° F TO -25° F).

AT 50° F, THE SOLE PLATE SHALL BE CENTERED OVER THE LOWER BEARING ASSEMBLY. FOR OTHER INSTALLATION TEMPERATURES, THE SOLE PLATE POSITION SHALL BE ADJUSTED AS NOTED ON DESIGN SHEET 48 AND 49.

ALL BEARINGS SHALL BE MARKED PRIOR TO SHIPPING. THE MARKS SHALL INCLUDE THE BEARING LOCATION ON THE BRIDGE, AND A DIRECTION ARROW THAT POINTS UPSTATION. ALL MARKS SHALL BE PERMANENT AND BE VISIBLE AFTER THE BEARING IS INSTALLED. THE MARKS SHALL BE ON THE TOP PLATE OF THE BEARING.

THE GAP BETWEEN THE GUIDE BARS AND THE BEARINGS SHALL BE $\frac{1}{8}$ INCH.

STEEL COMPONENTS OF BEARING ASSEMBLIES SHALL BE OF ASTM A709 GRADE 50W STEEL.

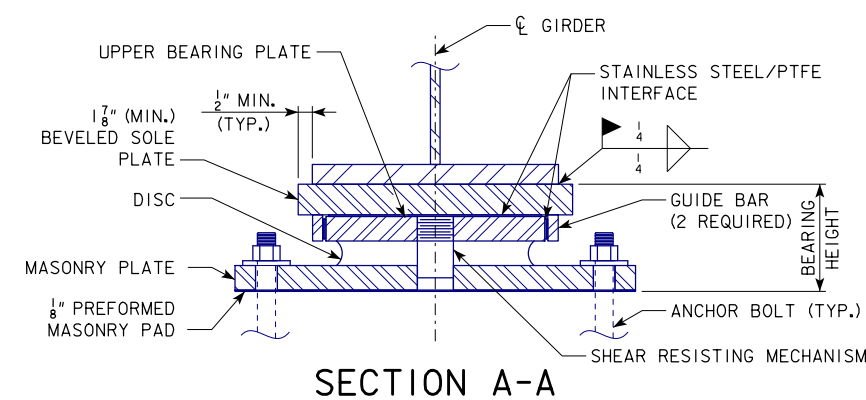
THE BEARING HEIGHT NOTED IN THE BEARING DATA TABLE REPRESENTS THE ASSUMED TOTAL HEIGHT OF THE BEARING ASSEMBLY PLUS THE $\frac{1}{8}$ INCH PREFORMED MASONRY PAD. THIS MINIMUM HEIGHT WAS USED BY THE DESIGNER TO ESTABLISH THE PEDESTAL ELEVATIONS AS NOTED ON PIER AND ABUTMENT DETAIL SHEETS. THE MINIMUM PEDESTAL HEIGHT SHALL NOT BE CHANGED WITHOUT WRITTEN APPROVAL OF THE ENGINEER. THE ACTUAL BEARING HEIGHT DETERMINED BY THE BEARING MANUFACTURER SHALL BE USED TO SET THE TOP OF PEDESTAL ELEVATIONS TO ACHIEVE THE PROPER TOP OF BEARING ELEVATIONS GIVEN IN THE BEARING DATA TABLE. THE TOP OF PEDESTAL ELEVATIONS SHALL BE SHOWN ON THE SHOP DRAWINGS. 9" MINIMUM BEARING HEIGHT SHALL BE PROVIDED TO ACCOMMODATE FUTURE JACKING OPERATIONS FOR BEARING REPLACEMENT.

IN ORDER TO COORDINATE TOP OF PEDESTAL ELEVATIONS AND ANCHOR BOLT LOCATIONS, PIERS AND ABUTMENTS SHALL NOT BE POURED PRIOR TO RECEIVING APPROVED BEARING SHOP DRAWINGS FOR THIS CONTRACT.

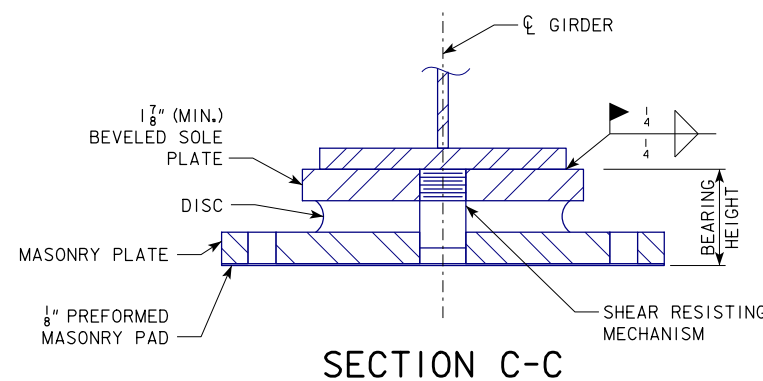
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF I.M. 453.08. ANCHOR BOLTS FOR PIER 6 SHALL BE PER ASTM F1554, GRADE 55. ANCHOR BOLT LAYOUT SHOWN IN THE DETAILS IS BASED ON A PRELIMINARY BEARING DESIGN. THE ANCHOR BOLT LAYOUT WAS USED IN SETTING THE GEOMETRY OF THE PIER AND ABUTMENT REINFORCING WHICH SHOULD ALLOW THE ANCHOR BOLTS TO BE INSTALLED WITHOUT CONFLICT WITH THE REINFORCING. ANY CHANGES TO THE ANCHOR BOLT PATTERN MAY REQUIRE A PLAN CHANGE TO THE REINFORCING LAYOUT.

ANCHOR BOLTS SHALL BE EMBEDDED IN CONCRETE A MINIMUM DISTANCE AS SPECIFIED IN THE BEARING DATA TABLE. FABRICATOR SHALL DETERMINE REQUIRED ANCHOR BOLT LENGTH BASED ON BEARING DETAILS AND REQUIRED ANCHOR BOLT EMBEDMENT. SHOP DRAWINGS SHALL SHOW ANCHOR BOLT EMBEDMENT, PROJECTION, THREAD LENGTH, AND TOTAL BOLT LENGTH.

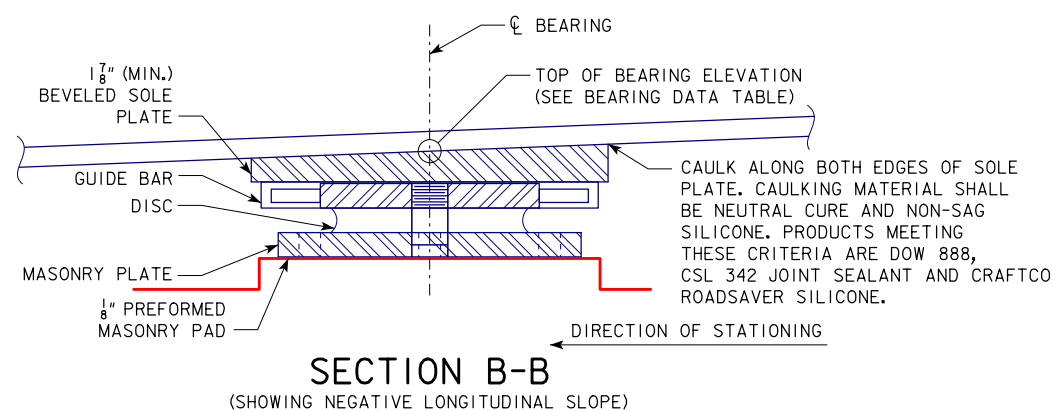
FOR DIMENSIONS "A" AND "B" SEE DESIGN SHEETS 79 AND 80.



SECTION A-A



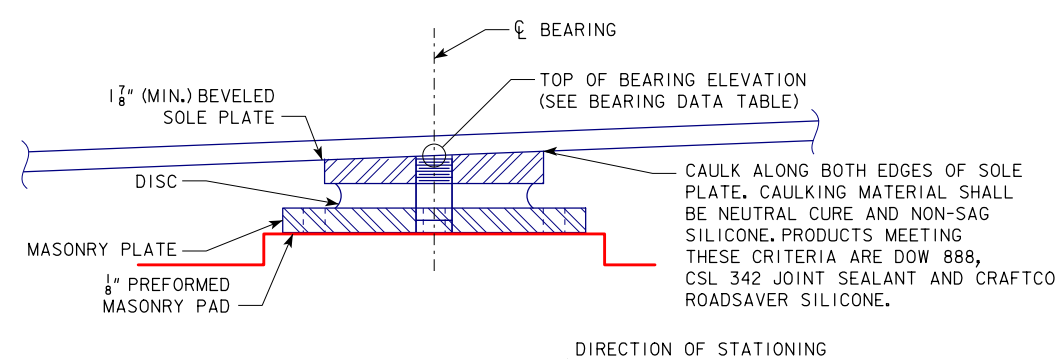
SECTION C-C



SECTION B-B

(SHOWING NEGATIVE LONGITUDINAL SLOPE)

GUIDED EXPANSION BEARING DETAILS (TYPE GE)

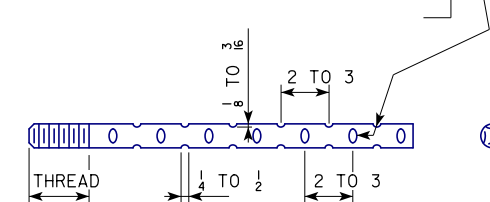


SECTION D-D

(SHOWING NEGATIVE LONGITUDINAL SLOPE)

FIXED BEARING DETAILS (TYPE FX)

INDENTATION SHALL BE FORMED BY DISPLACEMENT OF METAL IN A STAGGERED PATTERN. NO CUTTING IS ALLOWED TO FORM INDENTATION.



ANCHOR BOLT SWEDGE DETAIL

DESIGN FOR 0° SKEW
1419'-0" x VARIES CONTINUOUS
WELDED GIRDER BRIDGE

UNIT 1: 165'-0", 195'-0", 195'-0", 142'-0", UNIT 2: 142'-0", 200'-0", 200'-0", 180'-0"

STA. 3

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DESIGN

- VOID -
REPLACED BY ADDENDUM NO. 2

2020

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