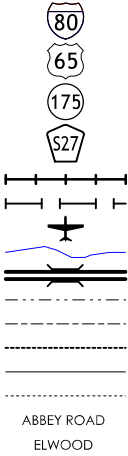


LEGEND

INTERSTATE HIGHWAY
PRIMARY HIGHWAY-DIVIDED
PRIMARY HIGHWAY
PORTLAND CEMENT CONCRETE ROAD
ASPHALT ROAD
BITUMINOUS ROAD
GRAVEL ROAD
EARTHEN ROAD

INTERSTATE HIGHWAY
UNITED STATES HIGHWAY
STATE HIGHWAY
COUNTY HIGHWAY
RAILROAD
PIPELINE
AIRPORT
HYDROLOGY
BRIDGE
STATE BOUNDARY
COUNTY BOUNDARY
CORPORATE BOUNDARY
TOWNSHIP LINE
SECTION LINE
ROAD NAMES
UNINCORPORATED PLACE



PLANS OF PROPOSED IMPROVEMENTS ON THE

PRIMARY ROAD SYSTEM

WRIGHT COUNTY

BRIDGES AND APPROACHES - PPCB

1A 17 OVER PRAIRIE CREEK

0.9 MI N.OF COUNTY ROAD C26

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
H40-03-14	09-14	--
H40-05-14	09-14	--
H40-07-14	09-14	--
H40-09-14	09-14	--
H40-34-14	09-14	--
H40-35-14	09-14	--
H40-38-14	09-14	--
H40-39-14	09-14	--
H40-40-14	09-14	--
H40-41-14	09-14	--
H40-44-14	09-14	--
H40-57-14	09-14	--
H40-58-14	09-14	--

TOTAL SHEETS
61

PROJECT NUMBER

BRFN-017-4(40)--39-99

R.O.W. PROJECT NUMBER

--

PROJECT IDENTIFICATION NUMBER

15-99-017-010

INDEX OF SHEETS

NO.	DESCRIPTION
1	TITLE SHEET
2	ESTIMATE SHEET - DESIGN 223
2-15	DESIGN 223
SPS.1-SPS.3	SOIL PROFILE SHEET
C.1 - C.2	ESTIMATE SHEET - ROADWAY
RC.2	ESTIMATE SHEET - ROADSIDE
A.1-W.12	ROADWAY SHEETS

REVISIONS



1-800-292-8989

www.iowaonecall.com



STANDARD ROAD
PLANS

STANDARD ROAD PLANS ARE LISTED
ON SHEET NUMBER C.3 AND RC.3

DESIGN DATA RURAL

2020	AADT	850	V.P.D.
2040	AADT	1200	V.P.D.
20--	DHV	--	V.P.H.
TRUCKS		37	%
Total	Design ESALS	?	

INDEX OF SEALS

SHEET NO.	NAME	TYPE
1	DAVID R. EVANS	STRUCTURAL DESIGN
6	PATRICIA G. SCHWARZ	HYDRAULIC DESIGN
A.1	PAUL W. FLATTERY	ROADWAY DESIGN
SPS.1	LORAS A. KLOSTERMANN	GEOTECHNICAL DESIGN
RC.1	SEANA K. GODBOLD	LANDSCAPE DESIGN
CS.1	DAVID J. HEER	GEOTECHNICAL DESIGN

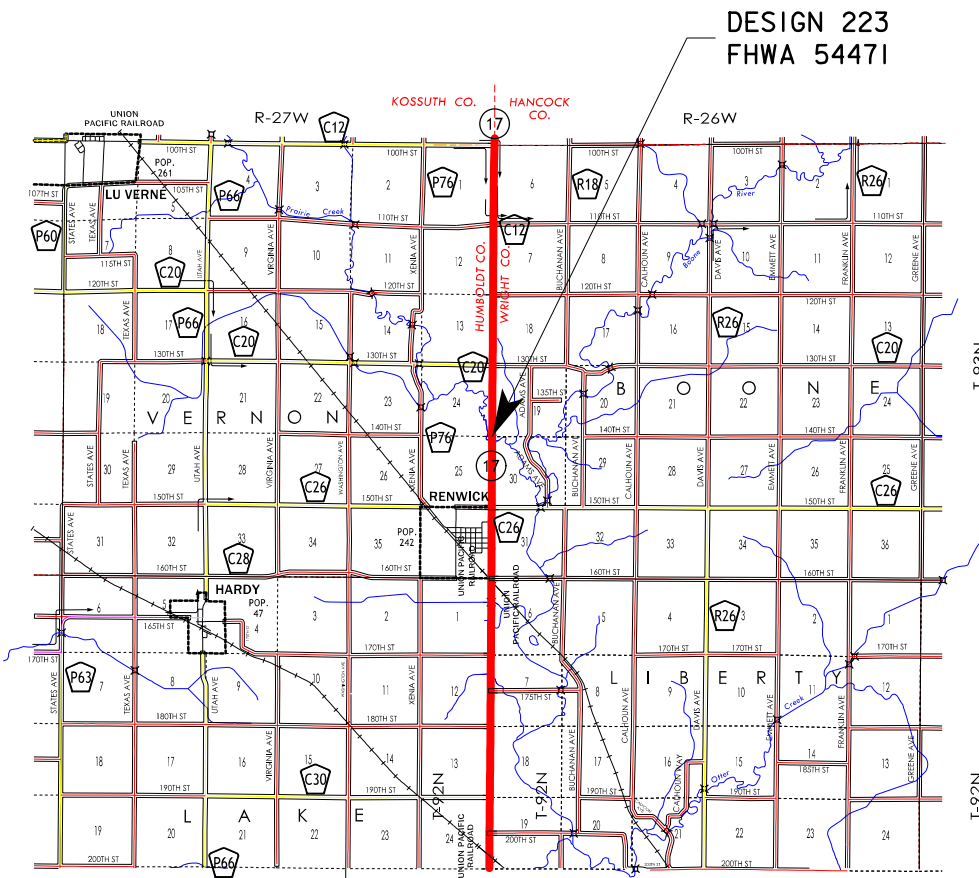
STRUCTURAL DESIGN



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.

Signature David R. Evans 11-01-2021
Printed or Typed Name Date
My license renewal date is December 31, 2021

Pages or sheets covered by this seal: SHEETS 1 THRU 15 OF 61



ESTIMATED BRIDGE QUANTITIES						ESTIMATE REFERENCE INFORMATION		
ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.			
1	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	CY	1714.9				
2	2401-6745625	REMOVAL OF EXISTING BRIDGE	LS	1				
3	2402-2720000	EXCAVATION, CLASS 20	CY	166				
4	2402-2721000	EXCAVATION, CLASS 21	CY	320				
5	2403-0100010	STRUCTURAL CONCRETE (BRIDGE)	CY	441.8				
6	2404-7775000	REINFORCING STEEL	LB	21,156				
7	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB	72,576				
8	2404-7775009	REINFORCING STEEL, STAINLESS STEEL	LB	3033				
9	2407-0551255	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, B55	EACH	12				
10	2407-0551263	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, B63	EACH	6				
11	2408-7800000	STRUCTURAL STEEL	LB	6091				
12	2414-6424110	CONCRETE BARRIER RAILING	LF	386.7				
13	2501-0201057	PILES, STEEL, HP 10 X 57	LF	4530				
14	2501-6335010	PREBORED HOLES	LF	140				
15	2507-2638650	BRIDGE WING ARMORING - EROSION STONE	SY	12.9				
16	2507-3250005	ENGINEERING FABRIC	SY	2642.6				
17	2507-6800061	REVETMENT, CLASS E	TON	2730.4				
18	2507-8029000	EROSION STONE	TON	13.2				
19	2533-4980005	MOBILIZATION	LS	1				

ESTIMATE REFERENCE INFORMATION		
ITEM NO.	ITEM CODE	DESCRIPTION
1	2104-2710020	EXCAVATION, CLASS 10, CHANNEL Excavation below grading surface for installation of Class E revetment.
2	2401-6745625	REMOVAL OF EXISTING BRIDGE --
3	2402-2720000	EXCAVATION, CLASS 20 --
4	2402-2721000	EXCAVATION, CLASS 21 --
5	2403-0100010	STRUCTURAL CONCRETE (BRIDGE) Includes all resilient joint filler required. Includes furnishing and placing subdrain (including excavation), floodable backfill, porous backfill, geotextile fabric, water flooding, and subdrain outlet at abutments. Includes furnishing and placing 3 inch diameter PVC plastic pipe and expanding foam in the abutment wings.
6	2404-7775000	REINFORCING STEEL
7	2404-7775005	REINFORCING STEEL, EPOXY COATED --
8	2404-7775009	REINFORCING STEEL, STAINLESS STEEL --
9	2407-0551255	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, B55 Includes neoprene pads at the piers, anchored curved sole plates at the expansion pier, and S3 x 7.5 bearings at the abutments. Includes Contractor filling out the beam numbers by location and beam seat elevations in "PPC Beam Data Spreadsheet" and forwarding electronic spreadsheet to the Engineer.
10	2407-0551263	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, B63 Includes anchored curved sole plates at the expansion pier, and neoprene pad bearing material at the piers. Includes Contractor filling out the beam numbers by location and beam seat elevations in "PPC Beam Data Spreadsheet" and forwarding electronic spreadsheet to the Engineer.
11	2408-7800000	STRUCTURAL STEEL Includes 8 drains at 96 lbs. each. Includes 1 1/2" pintle plate bearing material at the expansion pier.

ROADWAY QUANTITIES SHOWN ELSEWHERE IN THESE PLANS.

DESIGN FOR 0° SKEW
176'-4 X 40'-0 PRETENSIONED
PRESTRESSED CONC. BEAM BRIDGE
55'-9 END SPANS 64'-10 INTERIOR SPAN
ESTIMATED QUANTITIES
STA. 371+49.00 (1A 17) NOVEMBER, 2021
WRIGHT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION
DESIGN SHEET NO. 1 OF 14 FILE NO. 31881 DESIGN NO. 223

DESIGN TEAM LEG / MRG / ZKA / DRE

WRIGHT COUNTY

PROJECT NUMBER BRFN-017-4(40)--39-99

SHEET NUMBER 2

SUMMARY OF CONCRETE QUANTITIES

LOCATION		STRUCTURAL CONCRETE	HPC STRUCT. CONCRETE
ABUTMENT FOOTINGS		35.0	-----
ABUTMENT WINGS		7.6	-----
DECK + HAUNCH + ABUT. DIAPH. SECT. I & 3		147.8	-----
DECK + HAUNCH SECTION 2		54.0	-----
DECK + HAUNCH + PIER DIAPH. SECTION 4 & 5		54.8	-----
PIER NO. 1	CAP	24.3	-----
	COLUMN	20.2	-----
	FOOTING	26.8	-----
PIER NO. 2	CAP	24.3	-----
	COLUMN	20.2	-----
	FOOTING	26.8	-----
TOTAL (CU. YDS.)		441.8	-----

SUMMARY OF REINFORCING STEEL

LOCATION		NON-COATED REINFORCING STEEL	STAINLESS STEEL REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
SUPERSTRUCTURE AND TWO ABUTMENTS		144	-----	65,730
BARRIER RAIL - TWO RAILS		-----	2265	5782
BARRIER RAIL END SECTIONS		-----	4 @ 192 = 768	4 @ 266 = 1064
PIER NO. 1	CAP	4296	-----	-----
	COLUMN	3131	-----	-----
	FOOTING	3079	-----	-----
PIER NO. 2	CAP	4296	-----	-----
	COLUMN	3131	-----	-----
	FOOTING	3079	-----	-----
TOTAL (LBS.)		21,156	3033	72,576

SUMMARY OF EXCAVATION

LOCATION	CLASS 20 EXCAVATION	CLASS 21 EXCAVATION
SOUTH ABUTMENT	83	-----
NORTH ABUTMENT	83	-----
PIER NO. 1	-----	160
PIER NO. 2	-----	160
TOTAL (CU. YDS.)	166	320

SUMMARY OF FOUNDATIONS

LOCATION	SUBSTRUCTURE TYPE	FOUNDATION TYPE	NUMBER	LENGTH (LIN. FT.)	TOTAL (LIN. FT.)
SOUTH ABUTMENT	INTEGRAL ABUTMENT	HP 10X57	7	95	665
NORTH ABUTMENT	INTEGRAL ABUTMENT	HP 10X57	7	95	665
PIER NO. 1	TEE PIER	HP 10X57	20	80	1600
PIER NO. 2	TEE PIER	HP 10X57	20	80	1600
			TOTAL (LIN. FT.)		4530

* CURVED SOLE PLATE AND LAMINATED
NEOPRENE PADS ARE INCIDENTAL TO
PPC BEAMS

SUMMARY OF STRUCTURAL STEEL

LOCATION	TOTAL (LBS.)
BRIDGE DECK DRAINS 8 @ 96	768
INTERMEDIATE DIAPHRAGMS	4255
PIER NO. I BEARINGS 12 @ 89	1068
TOTAL (LBS.)	6091

SUMMARY OF BEARINGS

[illegible]

DESIGN FOR 0° SKEW

176'-4 X 40'-0 PRETENSIONED
PRESTRESSED CONC. BEAM BRIDGE

55'-9 END SPANS 64'-10 INTERIOR SPAN

SUMMARY QUANTITIES SHEET

STA. 371+49.00 (1A 17) NOVEMBER, 2021

WRIGHT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION

DESIGN SHEET NO. 2 OF 14 FILE NO. 31881 DESIGN NO. 223

GENERAL NOTES:

THIS DESIGN IS FOR THE REPLACEMENT OF THE EXISTING 120'-0 x 26'-0 CONTINUOUS STEEL I-BEAM BRIDGE ON IA 17 OVER PRAIRIE CREEK, DESIGN NO. 548, CONSTRUCTED IN 1949. THE EXISTING BRIDGE SHALL BE REPLACED WITH A NEW 176'-4 X 40'-0 PPCB BRIDGE.

ELECTRONIC PLANS OF THE EXISTING STRUCTURE ARE AVAILABLE TO THE CONTRACTOR AS PART OF THE E-FILES SUPPLIED WITH THE CONTRACT DOCUMENTS.

THE LUMP SUM BID FOR "REMOVAL OF EXISTING BRIDGE" SHALL INCLUDE REMOVING THE EXISTING 120'-0 X 26'-0 I-BEAM BRIDGE AND DESIGN #2 1919 TRUSS BRIDGE ABUTMENT REMNANTS.

REMOVALS SHALL BE IN ACCORDANCE WITH SECTION 240I, OF THE STANDARD SPECIFICATIONS.

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

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

THE BRIDGE CONTRACTOR SHALL PREBORE HOLES FOR ABUTMENT PILES. HOLES SHALL BE BORED TO THE ELEVATIONS SHOWN ON THE "LONGITUDINAL SECTION ALONG CENTERLINE APPROACH ROADWAY" ON DESIGN SHEET 4. PILES SHALL BE DRIVEN THROUGH THE HOLES TO AT LEAST THE SPECIFIED DESIGN BEARING.

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

CONCRETE BARRIER RAILS PLACED USING THE SLIPFORM METHOD WILL REQUIRE THE USE OF A CLASS BR CONCRETE IN ACCORDANCE WITH ARTICLE 2513.03, A, 2, OF THE STANDARD SPECIFICATIONS. CAST-IN-PLACE BARRIER RAILS SHALL USE CLASS C MIX. CLASS D CONCRETE IS NOT PERMITTED FOR CONCRETE BARRIER RAILS (CAST-IN-PLACE OR SLIPFORMED METHOD).

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.

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

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

FAINT LINES ON PLANS INDICATE THE EXISTING STRUCTURE.

AT THE CONTRACTORS OPTION TRANSPARENT STAY-IN-PLACE DECK FORMS MAY BE USED FOR THIS PROJECT. THE STAY-IN-PLACE FORMS SHALL HAVE A MINIMUM AVERAGE TRANSPARENCY OF 70%. ALL STRUCTURAL STEEL MEMBERS USED IN THE FORM ASSEMBLY (INCLUDING COLD-FORMED AND ROLLED) SHALL BE CORROSION PROTECTED. THE FORM ASSEMBLY SHALL HAVE A MAXIMUM UNIT WEIGHT OF 3.5 PSF OVER THE FULL FORM PANEL AREA. SHOP DRAWINGS AND CALCULATIONS SHALL BE SUBMITTED FOR THE ENGINEER'S REVIEW. THE TRANSPARENT STAY-IN-PLACE FORM MATERIAL AND INSTALLATION COST SHALL BE INCLUDED IN THE PAY ITEM FOR STRUCTURAL CONCRETE (BRIDGE), WITH NO ADDITIONAL COST TO THE STATE.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING STABILITY OF PRESTRESSED CONCRETE BEAMS DURING ERECTION AND CONSTRUCTION UP THROUGH THE CONCRETE BRIDGE DECK REACHING ITS FULL 28-DAY STRENGTH. THE CONTRACTOR SHALL PROVIDE SUFFICIENT TEMPORARY ANCHOR BRACING AT BEAM ENDS AND TEMPORARY INTERMEDIATE BRACING AS NEEDED TO ENSURE PRESTRESSED BEAM STABILITY. PARTIALLY OR FULLY INSTALLED PERMANENT BRACING AS SHOWN IN THESE DESIGN PLANS SHALL NOT BE ASSUMED SUFFICIENT TO BRACE PRESTRESSED BEAMS DURING ERECTION AND CONSTRUCTION. TEMPORARY BRACING SHALL NOT BE WELDED TO PRESTRESSED BEAM STIRRUPS.

THE BRIDGE CONTRACTOR IS TO CLEAR AND/OR SHAPE THE CHANNEL WITHIN THE APPROXIMATE LIMITS OF THE AREAS AS SHOWN ON THE "SITUATION PLAN" AND "LONGITUDINAL SECTION ALONG CENTERLINE ROADWAY" ON DESIGN SHEET 5.

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (5aI IS $\frac{5}{8}$ 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 SHALL CONDUCT THEIR OPERATIONS IN SUCH A MANNER THAT ANY PAINT REMOVED DURING DEMOLITION IS CONTAINED, COLLECTED, AND DISPOSED OF IN ACCORDANCE WITH SECTION 2508, OF THE STANDARD SPECIFICATIONS. BEFORE DELIVERY OF ANY SCRAP STEEL THE CONTRACTOR SHALL PROVIDE A WRITTEN NOTICE TO THE RECEIVING FACILITY. THIS NOTICE SHALL AT A MINIMUM INCLUDE:

1. A NOTICE THAT THE SCRAP STEEL IS COATED WITH PAINT THAT HAS REGULATED MATERIALS AT LEVELS WHICH COULD BE HAZARDOUS TO EMPLOYEES OR THE ENVIRONMENT.

2. A COPY OF THE SCRAPE SAMPLE PROVIDED IN THE CONTRACT DOCUMENTS.

3. A SIGNATURE BLOCK FOR THE RECEIVING FACILITY TO CONFIRM THEIR RECEIPT OF THIS INFORMATION.

A COPY OF THIS NOTICE, SIGNED BY THE RECEIVING FACILITY, SHALL BE RETURNED TO THE ENGINEER BEFORE ANY SCRAP STEEL IS REMOVED FROM THE PROJECT.

THE COST OF HANDLING AND DISPOSAL OF ANY PAINTED STEEL OR REMOVED PAINT IS INCIDENTAL TO THE REMOVAL BID ITEM.

A SCRAPE SAMPLE WAS TAKEN FROM AN AREA OF THIS BRIDGE TO GET AN INDICATION OF THE EXISTENCE OF AND LEVEL OF TOTAL LEAD AND TOTAL CHROMIUM. ANALYSIS OF TOTAL LEAD ON THIS SAMPLE WAS 52,000 PARTS PER MILLION (PPM). ANALYSIS OF TOTAL CHROMIUM ON THIS SAMPLE WAS 15 PPM. THESE ANALYSES SHOW THE EXISTENCE OF THESE TWO TOXIC CONSTITUENTS. LEVELS INDICATED BY THESE TESTS COULD CREATE CONDITIONS ABOVE REGULATORY LIMITS FOR HEALTH AND SAFETY REQUIREMENTS. NO OTHER CONSTITUENTS WERE ANALYZED. THE BIDDER SHOULD NOT RELY ON THE IOWA DOT'S TESTING AND ANALYSIS FOR ANY PURPOSE OTHER THAN AS AN INDICATION OF THE EXISTENCE OF THESE TWO TOXIC CONSTITUENTS.

BRIDGE DECK DIMENSIONS TABLE

NO.	ITEM	UNIT	QUANTITY
1	DECK LENGTH	L.F.	179.3
2	MINIMUM DECK WIDTH	L.F.	43.2
3	MAXIMUM DECK WIDTH	L.F.	43.2
4	DECK AREA	S.F.	7746

- DECK LENGTH IS MEASURED FROM FACE-TO-FACE OF PAVING NOTCHES ALONG THE CENTERLINE OF THE ROADWAY.
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 FACE-TO-FACE PAVING NOTCH DISTANCE AND OUT-TO-OUT DECK DIMENSIONS.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 4th Ed, SERIES OF 2007 EXCEPT AS NOTED IN THE CURRENT IOWA BRIDGE DESIGN MANUAL. REINFORCING STEEL IN ACCORDANCE WITH LRFD AASHTO SECTION 5, GRADE 60. CONCRETE IN ACCORDANCE WITH LRFD AASHTO SECTION 5, f'c = 3,500 PSI. FOR STANDARD PRESTRESSED CONCRETE BEAMS, SEE STANDARD SHEET H40-34-14. STRUCTURAL STEEL IN ACCORDANCE WITH AASHTO LRFD SECTION 6. ASTM A709 GRADE 36 AND GRADE 50 (AASHTO M270 GRADE 36 AND GRADE 50.)

SPECIFICATIONS:

DESIGN:
AASHTO LRFD 4th Ed, SERIES OF 2007. EXCEPT AS NOTED IN THE CURRENT 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.

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: (090)_BlackHawk_Design915_DeckDrains.pdf

1	DECK DRAIN DETAILS
2	STEEL INTERMEDIATE DIAPHRAGM DETAILS
3	SOLE PLATES AND PINTLES FOR EXPANSION BEARINGS
4	* TRANSPARENT STAY-IN-PLACE DECK FORMS

DESIGN HISTORY
AT THIS SITE

(INCLUDES THIS DESIGN)

DES. NO.	TYPE OF WORK
548	ORIGINAL I-BEAM BRIDGE
779	BRIDGE DECK OVERLAY
195	A.C.C. RESURFACING
---	2011 PAINTING
223	BRIDGE REPLACEMENT - PPCB

* INCLUDE THIS SHOP DRAWINGS IF THE "TRANSPARENT STAY-IN-PLACE DECK FORMS" IS NECESSARY

404 PERMIT INFORMATION AND THE POLLUTION PREVENTION PLAN SHOWN ELSEWHERE IN THESE PLANS.

TRAFFIC CONTROL PLAN

THE ROADWAY WILL BE CLOSED TO THRU TRAFFIC. REFER TO THE TRAFFIC CONTROL PLAN SHOWN ELSEWHERE IN THESE PLANS.

DESIGN FOR 0° SKEW
176'-4 X 40'-0 PRETENSIONED
PRESTRESSED CONC. BEAM BRIDGE
55'-9 END SPANS 64'-10 INTERIOR SPAN

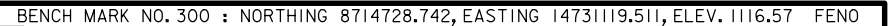
GENERAL NOTES

STA. 371+49.00 (IA 17) NOVEMBER, 2021

WRIGHT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION

DESIGN SHEET NO. 3 OF 14 FILE NO. 31881 DESIGN NO. 223



NOTES:

1. TOP OF BRIDGE DECK CROWN 0.03 BELOW PROFILE GRADE.
 2. AN IOWA DNR FLOOD PLAIN CONSTRUCTION PERMIT IS REQUIRED.
 3. CLASS E REVETMENT STONE IS EMBEDDED.
 4. REMOVE EXISTING 120'X26' CONT. BEAM BRIDGE
- DESIGN NO. 548 (FHWA NO. 54470). REMOVE DESIGN #2 1919 TRUSS
BRIDGE ABUTMENT REMNANTS PER STANDARD SPECIFICATIONS.

HYDRAULIC DATA

DRAINAGE AREA = 141 SQ. MI.
STREAM SLOPE = 1.0 FT./MI.
AVG. LOW WATER STAGE = 1100.7

Q₂₅ = 3520 CFS
STAGE = 1109.0

Q₅₀ = 4210 CFS
STAGE = 1109.5
REGULATORY LOW BEAM = 1113.77
BACKWATER = 0.8 FT.
AVG. BRIDGE VELOCITY = 4.1 FPS

Q₁₀₀ = 4960 CFS
STAGE = 1109.9
OPERATIONAL LOW BEAM = 1113.61
BACKWATER = 0.9 FT.

Q₂₀₀ = 5760 CFS
STAGE = 1110.3
CALCULATED DESIGN SCOUR = 1086.5

Q₅₀₀ = 6640 CFS
STAGE = 1110.7
CALCULATED CHECK SCOUR = 1085.2

ROADWAY OVERTOP 1115.4
STA. 379+00

LOCATION

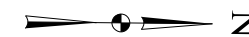
IA 17 OVER PRAIRIE CREEK
T-93N R-26W, SECTION 30
BOONE TOWNSHIP
WRIGHT COUNTY
FHWA NO. 5447I
BRIDGE MAINT. NO. 9985.4S017
LATITUDE 42.848042°
LONGITUDE -93.971450°



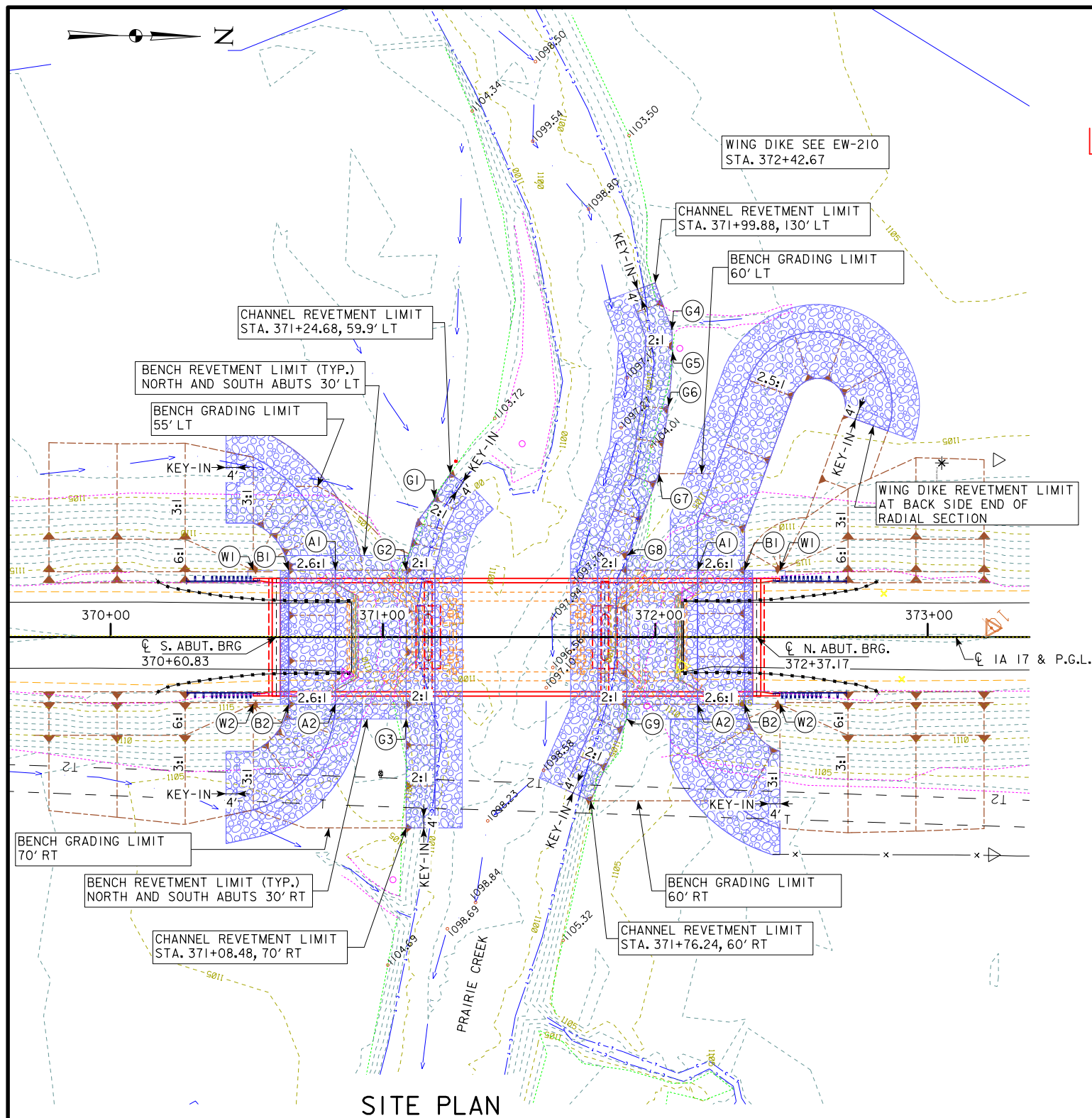
UTILITIES LEGEND:

T - TELEPHONE LINE
T2 - TELEPHONE LINE

UTILITIES SHOWN ON THIS SHEET ARE FOR
INFORMATION ONLY, SEE ROAD DESIGN
SHEETS FOR FINAL UTILITY INFORMATION.



DESIGN FOR 0° SKEW
176'-4 X 40'-0 PRETENSIONED
PRESTRESSED CONC. BEAM BRIDGE
55'-9 END SPANS 64'-10 INTERIOR SPAN
SITUATION PLAN
STA. 371+49.00 (1A 17) NOVEMBER, 2021
WRIGHT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION
DESIGN SHEET NO. 4 OF 14 FILE NO. 31881 DESIGN NO. 223

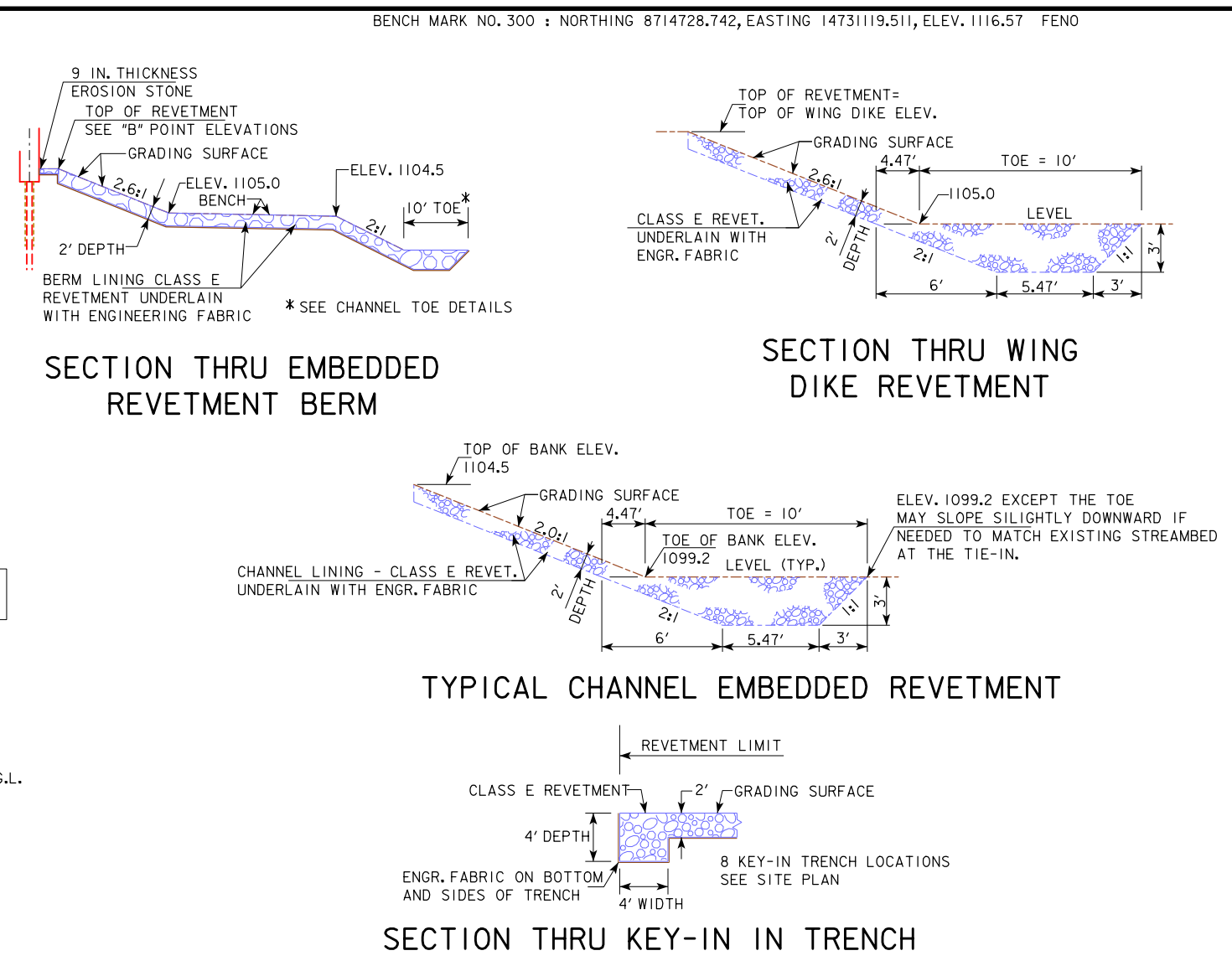


SITE PLAN

BERM SLOPE LOCATION TABLE						
POINTS	SOUTH ABUTMENT			NORTH ABUTMENT		
	STATION	OFFSET	ELEV.	STATION	OFFSET	ELEV.
A1	370+82.48	24.58' LT	1105.00	372+15.49	24.58' LT	1105.00
A2	370+82.48	24.58' RT	1105.00	372+15.49	24.58' RT	1105.00
B1	370+63.83	24.58' LT	1112.09	372+34.17	24.58' LT	1112.10
B2	370+63.83	24.58' RT	1112.09	372+34.17	24.58' RT	1112.10
W1	370+52.33	24.58' LT	1117.64	372+45.57	24.58' LT	1117.65
W2	370+52.33	24.58' RT	1117.64	372+45.57	24.58' RT	1117.65

BERM SLOPE ELEVATIONS REFLECT THE GRADING SURFACE

GRADING CONTROL POINTS:
 G1: 371+18.92, 51' LT, ELEV. 1103.0
 G2: 371+08.48, 24.58' LT, ELEV. 1104.5
 G3: 371+08.48, 30' RT, ELEV. 1104.5
 G4: 372+06.05, 112.77' LT, ELEV.
 G5: 372+06.27, 104.6 LT, ELEV. 1104.0
 G6: 372+04.75, 84.8 LT., ELEV. 1104.0
 G7: 372+01.32, 60' LT, ELEV. 1104.5
 G8: 371+89.49, 30' LT, ELEV. 1104.5
 G9: 371+89.49, 30' RT, ELEV. 1104.5



ESTIMATED BERM ARMORING QUANTITIES				
LOCATION	REVTMENT CL. E (TON)	EROSION STONE (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
BERM/BENCH LINING - SOUTH ABUTMENT	760.1	6.6	749.1	479.2
CHANNEL LINING - SOUTH ABUT.	374.8	0.0	358.8	234.3
BERM/BENCH LINING - NORTH ABUTMENT	529.9	6.6	530.3	335.3
CHANNEL LINING - NORTH ABUT.	547.6	0.0	527.4	342.3
WING DIKE - NORTH ABUTMENT	518.0	0.0	477.0	323.8
TOTALS	2730.4	13.2	2642.6	1714.9

EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE.

HYDRAULIC DESIGN

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

Signature Patricia G. Schwarz Date FEB. 10, 2020

Printed or Typed Name Patricia G. Schwarz

My license renewal date is December 31, 2020

Pages or sheets covered by this seal: 5 AND 6 OF 59

DESIGN FOR 0° SKEW

176'-4 X 40'-0 PRETENSIONED PRESTRESSED CONC. BEAM BRIDGE

55'-9 END SPANS 64'-10 INTERIOR SPAN

SITUATION PLAN - SITE

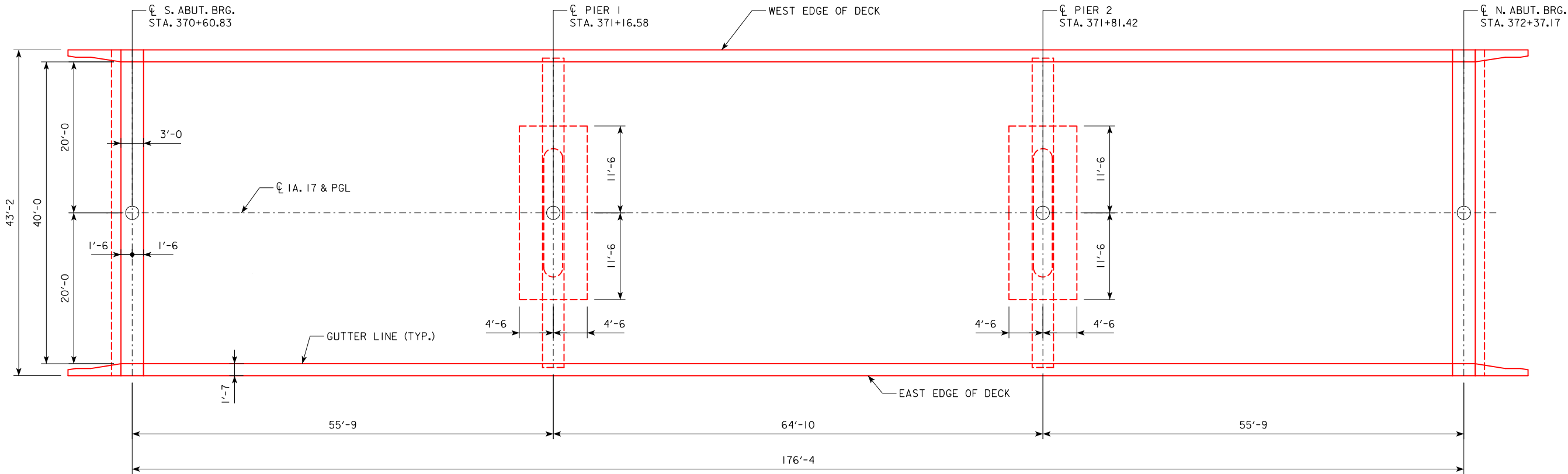
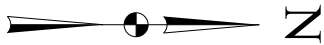
STA. 371+49.00 (IA 17) NOVEMBER, 2021

WRIGHT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION

DESIGN SHEET NO. 5 OF 14 FILE NO. 31881 DESIGN NO. 223

SHEET NUMBER **6**



STAKING DIAGRAM

BRIDGE COORDINATES				
LOCATION	CL S. ABUT. BRG.	CL PIER 1	CL PIER 2	CL N. ABUT. BRG.
LEFT EDGE OF DECK	E=14731129.6089 N=8715790.4543	E=14731129.0669 N=8715846.2016	E=14731128.4366 N=8715911.0319	E=14731127.8946 N=8715966.7793
CL APPROACH ROADWAY	E=14731151.1912 N=8715790.6641	E=14731150.6492 N=8715846.4114	E=14731150.0189 N=8715911.2417	E=14731149.4769 N=8715966.9891
RIGHT EDGE OF DECK	E=14731172.7735 N=8715790.8739	E=14731172.2315 N=8715846.6213	E=14731171.6012 N=8715911.4515	E=14731171.0592 N=8715967.1989

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.

DESIGN FOR 0° SKEW

176'-4 X 40'-0 PRETENSIONED
PRESTRESSED CONC. BEAM BRIDGE

55'-9 END SPANS64'-10 INTERIOR SPAN

STAKING DIAGRAM

STA. 371+49.00 (IA 17)NOVEMBER, 2021

WRIGHT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION

DESIGN SHEET NO. 6 OF 14FILE NO. 31881DESIGN NO. 223

PIER NOTES:

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

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

PIER NO. 1 PILE DESIGN NOTES:

THE CONTRACT LENGTH OF 80 FEET FOR THE PIER NO. 1 PILES IS BASED ON A MIXED CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 128 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL.

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. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF FOOTING.

DESIGN SCOUR (200-YEAR) WAS ASSUMED TO AFFECT THE UPPER 4 FEET OF EMBEDDED PILE LENGTH AND CAUSE 10 KIPS OF DRIVING RESISTANCE.

PIER NO. 1 PILE DRIVING NOTE:

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER NO. 1 PILES IS 103 TONS AT END OF DRIVE. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

PIER NO. 2 PILE DESIGN NOTES:

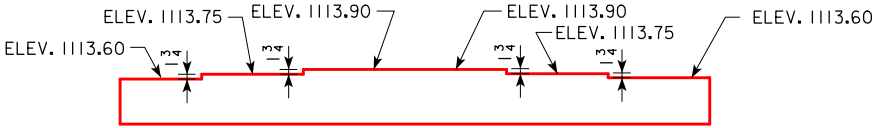
THE CONTRACT LENGTH OF 80 FEET FOR THE PIER NO. 2 PILES IS BASED ON A MIXED SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 128 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL.

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. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF FOOTING.

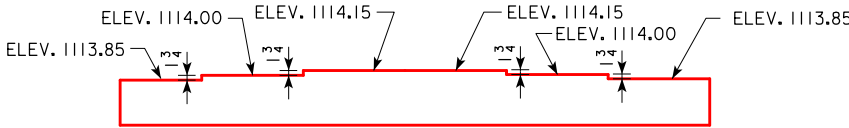
DESIGN SCOUR (200-YEAR) WAS ASSUMED TO AFFECT THE UPPER 4 FEET OF EMBEDDED PILE LENGTH AND CAUSE 10 KIPS OF DRIVING RESISTANCE.

PIER NO. 2 PILE DRIVING NOTE:

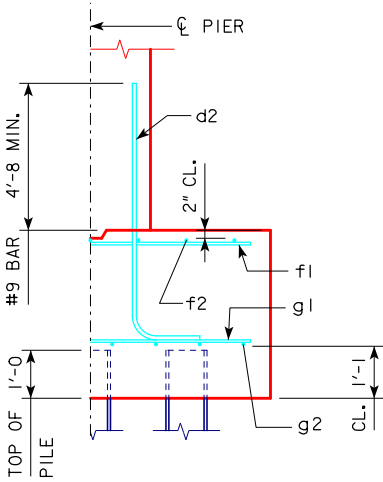
THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER NO. 2 PILES IS 104 TONS AT END OF DRIVE OR RETAP. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.



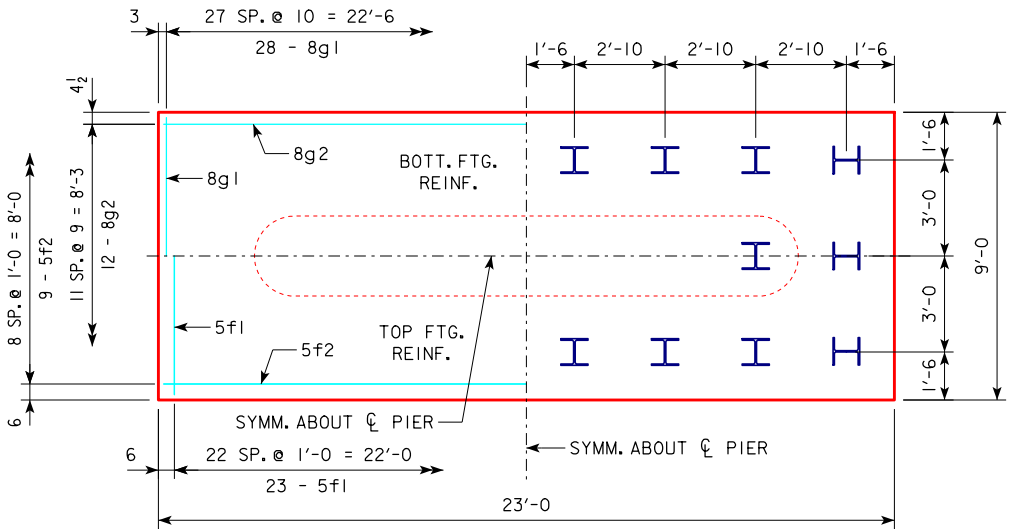
PIER NO. 1 STEP DIAGRAM
LOOKING UP STATION



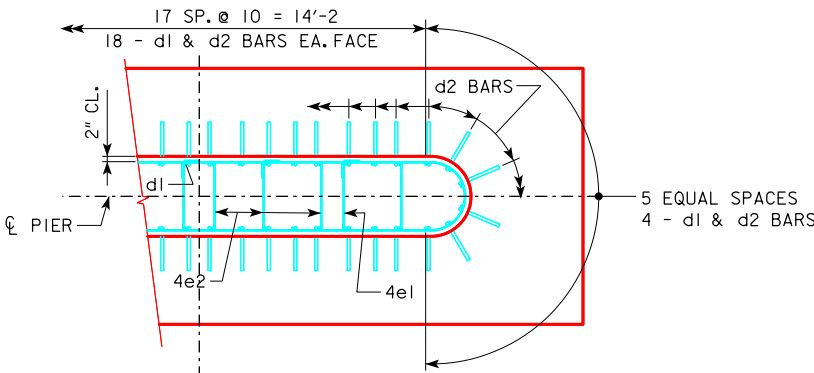
PIER NO. 2 STEP DIAGRAM
LOOKING UP STATION



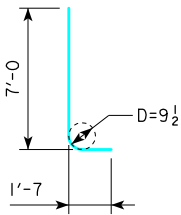
TYPICAL SECTION



3'-6 x 9'-0 x 23'-0 FOR 20A



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H40-57-14.)



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

H IN FT.	CL - CL ABUT. BRG.	PILING (HP10x57)		FOOTING SIZE
		NO. & LAYOUT	① LRFD PU, STRENGTH I DES. LOAD (KIPS)	
19 TO 21				
22 TO 24		20A	141	3'-6 x 9' x 23'

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)					STRUCTURAL CONCRETE (CY)
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	
3'-6 x 9' x 23'	d2	44 - #9 AS SHOWN	8'-7	1284	3079	26.8
	f1	23 - #5 @ 1'-0	8'-8	208		
	f2	9 - #5 @ 1'-0	22'-8	213		
	g1	28 - #8 @ 0'-10	8'-8	648		
	g2	12 - #8 @ 0'-9	22'-8	726		

FOOTING NOTES:

THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON STANDARD SHEET H40-57-14.

20 - HP10X57 STEEL BEARING PILES FOR EACH PIER FOOTING SHALL BE DRIVEN TO THE VALUES IN THE PIER PILE DRIVING NOTES

① NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

DESIGN FOR 0° SKEW

176'-4 X 40'-0 PRETENSIONED
PRESTRESSED CONC. BEAM BRIDGE

55'-9 END SPANS 64'-10 INTERIOR SPAN

PIER FOOTING DETAILS

STA. 371+49.00 (1A 17) NOVEMBER, 2021

WRIGHT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION

DESIGN SHEET NO. 7 OF 14 FILE NO. 31881 DESIGN NO. 223

SOUTH ABUTMENT PILE DESIGN NOTES:

THE CONTRACT LENGTH OF 95 FEET FOR THE SOUTH ABUTMENT PILES IS BASED ON A MIXED SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 142 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL.

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. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF PREBORE.

NORTH ABUTMENT PILE DESIGN NOTES:

THE CONTRACT LENGTH OF 95 FEET FOR THE NORTH ABUTMENT PILES IS BASED ON A MIXED SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 142 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL.

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. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF PREBORE.

ABUTMENT NOTES:

7 - HP10X57 STEEL BEARING PILING AT EACH ABUTMENT SHALL BE DRIVEN TO THE VALUES SHOWN IN ABUTMENT PILE DRIVING NOTES.

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

SOUTH ABUTMENT PILE DRIVING NOTE:

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR SOUTH ABUTMENT PILES IS 109 TONS AT END OF DRIVE. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

NORTH ABUTMENT PILE DRIVING NOTE:

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR NORTH ABUTMENT PILES IS 109 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.

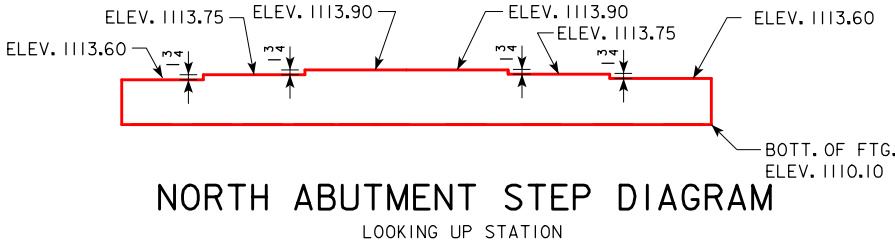
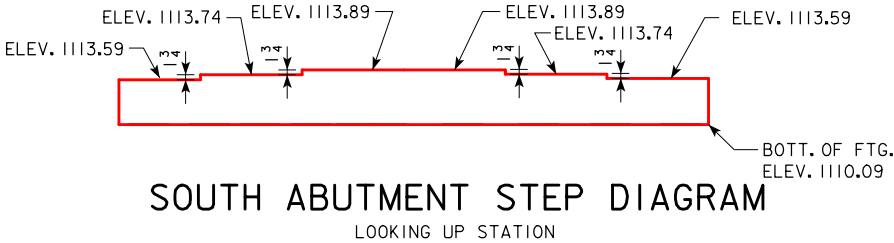


TABLE OF WINGWALL ELEVATIONS

LOCATION	DIM "C"	ELEV. A	ELEV. B
SOUTHWEST	1'-2 3/8	1117.79	1117.77
NORTHWEST	1'-2 3/8	1117.80	1117.78
SOUTHEAST	1'-2 3/8	1117.79	1117.77
NORTHEAST	1'-2 3/8	1117.80	1117.78

DESIGN FOR 0° SKEW

176'-4 X 40'-0 PRETENSIONED
PRESTRESSED CONC. BEAM BRIDGE

55'-9 END SPANS64'-10 INTERIOR SPAN

ABUTMENT FOOTING DETAILS

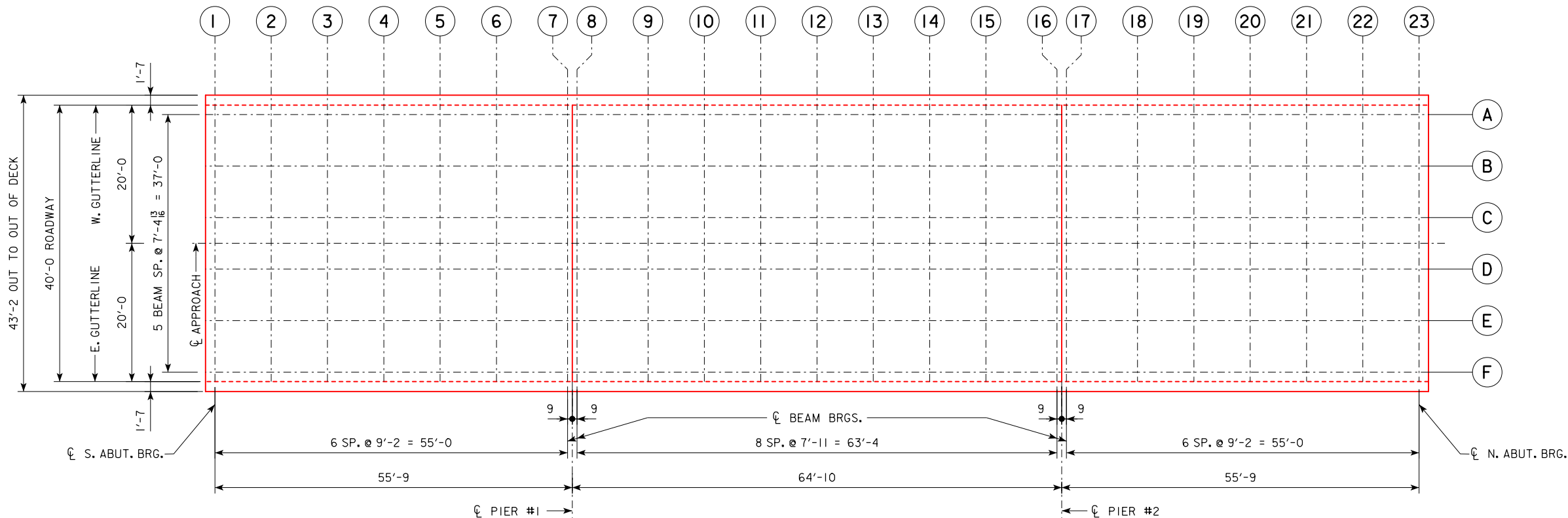
STA. 371+49.00 (1A 17)NOVEMBER, 2021

WRIGHT COUNTY

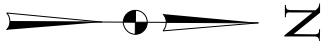
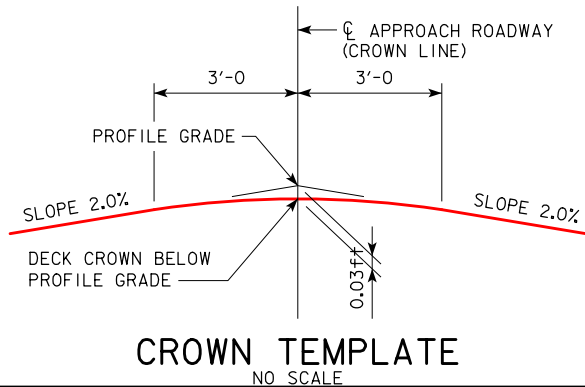
IOWA DEPARTMENT OF TRANSPORTATION

DESIGN SHEET NO. 8 OF 14FILE NO. 31881DESIGN NO. 223

TOP OF DECK ELEVATIONS																							
LOCATION	C.L. S. ABUT. BRG.						C.L. PIER #1 BEARINGS									C.L. PIER #2 BEARINGS							C.L. N. ABUT. BRG.
	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
WEST GUTTER LINE	1117.79	1117.82	1117.84	1117.87	1117.89	1117.91	1117.92	1117.93	1117.94	1117.94	1117.95	1117.95	1117.95	1117.94	1117.94	1117.93	1117.93	1117.91	1117.89	1117.87	1117.85	1117.82	1117.80
BEAM LINE A	1117.82	1117.85	1117.87	1117.90	1117.92	1117.94	1117.95	1117.96	1117.97	1117.97	1117.98	1117.98	1117.98	1117.97	1117.97	1117.96	1117.96	1117.94	1117.92	1117.90	1117.88	1117.85	1117.83
BEAM LINE B	1117.97	1117.99	1118.02	1118.04	1118.07	1118.09	1118.10	1118.10	1118.11	1118.12	1118.13	1118.13	1118.13	1118.12	1118.12	1118.11	1118.10	1118.09	1118.07	1118.05	1118.03	1118.00	1117.98
BEAM LINE C	1118.12	1118.14	1118.17	1118.19	1118.21	1118.23	1118.25	1118.25	1118.26	1118.27	1118.27	1118.28	1118.27	1118.27	1118.26	1118.25	1118.25	1118.24	1118.22	1118.20	1118.17	1118.15	1118.13
CROWN LINE	1118.16	1118.19	1118.21	1118.24	1118.26	1118.28	1118.29	1118.30	1118.31	1118.31	1118.32	1118.32	1118.32	1118.31	1118.31	1118.30	1118.30	1118.28	1118.26	1118.24	1118.22	1118.19	1118.17
BEAM LINE D	1118.12	1118.14	1118.17	1118.19	1118.21	1118.23	1118.25	1118.25	1118.26	1118.27	1118.27	1118.28	1118.27	1118.27	1118.26	1118.25	1118.25	1118.24	1118.22	1118.20	1118.17	1118.15	1118.13
BEAM LINE E	1117.97	1117.99	1118.02	1118.04	1118.07	1118.09	1118.10	1118.10	1118.11	1118.12	1118.13	1118.13	1118.13	1118.12	1118.12	1118.11	1118.10	1118.09	1118.07	1118.05	1118.03	1118.00	1117.98
BEAM LINE F	1117.82	1117.85	1117.87	1117.90	1117.92	1117.94	1117.95	1117.96	1117.97	1117.97	1117.98	1117.98	1117.98	1117.97	1117.97	1117.96	1117.96	1117.94	1117.92	1117.90	1117.88	1117.85	1117.83
EAST GUTTER LINE	1117.79	1117.82	1117.84	1117.87	1117.89	1117.91	1117.92	1117.93	1117.94	1117.94	1117.95	1117.95	1117.95	1117.94	1117.94	1117.93	1117.93	1117.91	1117.89	1117.87	1117.85	1117.82	1117.80



TOP OF DECK ELEVATIONS LAYOUT



NOTE:
THE TOP OF DECK ELEVATIONS, AS SHOWN ON THE DECK ELEVATIONS DETAIL SHEET, FOR THE HIGH POINT ON THE BRIDGE DECK ARE 0.03 FEET BELOW THE HIGH POINT ON THE APPROACH ROADWAY TO ACCOUNT FOR THE ROUNDING OF THE DECK WITH A PARABOLIC TEMPLATE AT THE CROSS SLOPE INTERSECTION.

DESIGN FOR 0° SKEW

176'-4 X 40'-0 PRETENSIONED
PRESTRESSED CONC. BEAM BRIDGE

55'-9 END SPANS 64'-10 INTERIOR SPAN

TOP OF DECK ELEVATIONS

STA. 371+49.00 (IA 17) NOVEMBER, 2021

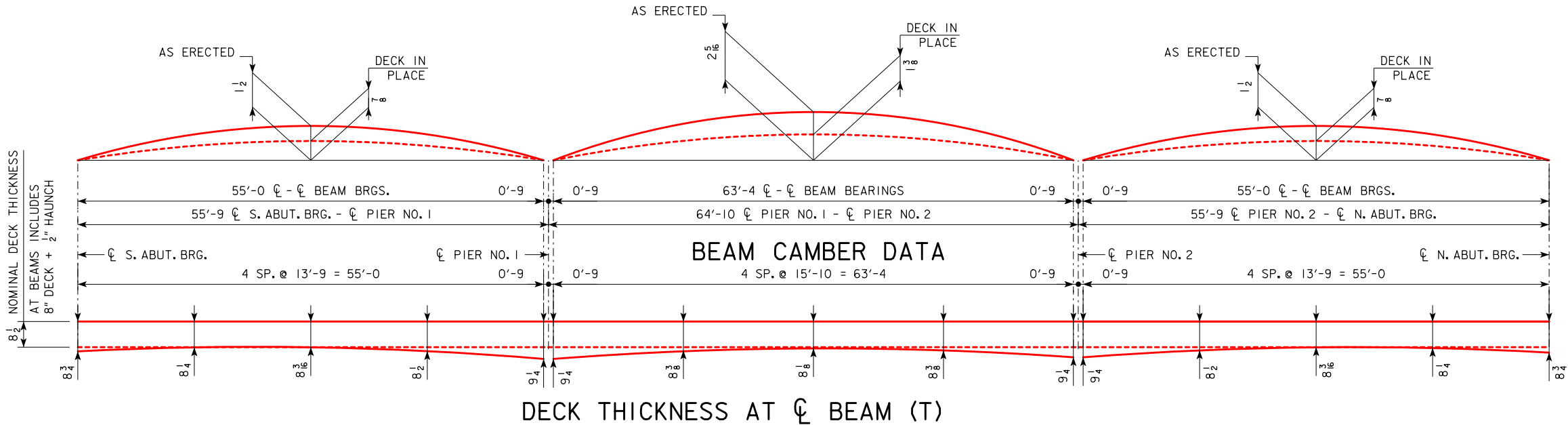
WRIGHT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION

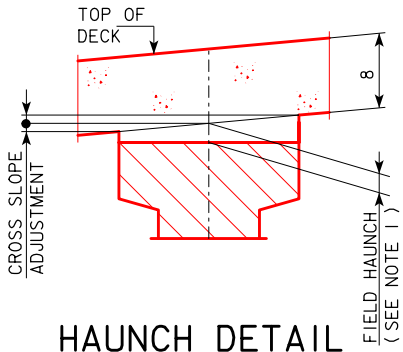
DESIGN SHEET NO. 10 OF 14 FILE NO. 31881 DESIGN NO. 223

BEAM LINE HAUNCH ELEVATIONS																								
LOCATION	C.L. S. ABUT. BRG.						C.L. PIER #1 BEARINGS										C.L. PIER #2 BEARINGS							C.L. N. ABUT. BRG.
	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	
BEAM LINE A	1117.16	1117.21	1117.25	1117.28	1117.30	1117.30	1117.29	1117.29	1117.33	1117.36	1117.38	1117.39	1117.38	1117.36	1117.33	1117.29	1117.29	1117.30	1117.30	1117.29	1117.26	1117.21	1117.16	
BEAM LINE B	1117.30	1117.35	1117.40	1117.43	1117.45	1117.45	1117.43	1117.44	1117.48	1117.51	1117.53	1117.54	1117.53	1117.51	1117.48	1117.44	1117.44	1117.45	1117.45	1117.44	1117.41	1117.36	1117.31	
BEAM LINE C	1117.45	1117.50	1117.55	1117.58	1117.59	1117.59	1117.58	1117.59	1117.63	1117.66	1117.68	1117.69	1117.68	1117.66	1117.63	1117.59	1117.59	1117.60	1117.60	1117.58	1117.55	1117.51	1117.46	
BEAM LINE D	1117.45	1117.50	1117.55	1117.58	1117.59	1117.59	1117.58	1117.59	1117.63	1117.66	1117.68	1117.69	1117.68	1117.66	1117.63	1117.59	1117.59	1117.60	1117.60	1117.58	1117.55	1117.51	1117.46	
BEAM LINE E	1117.30	1117.35	1117.40	1117.43	1117.45	1117.45	1117.43	1117.44	1117.48	1117.51	1117.53	1117.54	1117.53	1117.51	1117.48	1117.44	1117.44	1117.45	1117.45	1117.44	1117.41	1117.36	1117.31	
BEAM LINE F	1117.16	1117.21	1117.25	1117.28	1117.30	1117.30	1117.29	1117.29	1117.33	1117.36	1117.38	1117.39	1117.38	1117.36	1117.33	1117.29	1117.29	1117.30	1117.30	1117.29	1117.26	1117.21	1117.16	

MISCELLANEOUS DATA TABLE																								
	BEAM LINE	S. ABUT. BRGS.						C. PIER NO. 1 BEAM BRGS.									C. PIER NO. 2 BEAM BRGS.							N. ABUT. BRGS.
		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
ANTICIPATED DEFLECTION DUE TO DECK (IN.)	ALL	0	$\frac{5}{16}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{9}{16}$	$\frac{5}{16}$	0	0	$\frac{3}{8}$	$\frac{11}{16}$	$\frac{7}{8}$	$\frac{15}{16}$	$\frac{7}{8}$	$\frac{11}{16}$	$\frac{3}{8}$	0	0	$\frac{5}{16}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{9}{16}$	$\frac{5}{16}$	0
CROSS SLOPE ADJUSTMENTS in. (ft.)	ALL	$\frac{1}{8}$ (0.0104) (A, B, C, D, E & F)																						
ALLOWABLE FIELD HAUNCH in. (ft.) AT C. BEAM	MAX	ALL	2 (0.167)																					
	MIN	ALL	$-\frac{3}{8}$ (-0.031)																					



NOTE :
BRIDGE SEAT ELEVATIONS ARE SET BASED ON THEORETICAL CAMBER AND BEAM DEFLECTIONS. THESE BRIDGE SEATS WILL PROVIDE A THEORETICAL BEAM HAUNCH WITHIN DESIGN PARAMETERS. ACTUAL HAUNCHES ARE DETERMINED USING SURVEYED TOP OF BEAM ELEVATIONS AND "BEAM LINE HAUNCH ELEVATION" DATA. ALLOWABLE MAXIMUM AND MINIMUM "FIELD HAUNCH" VALUES ARE GIVEN IN THE "MISCELLANEOUS DATA" TABLE. "CROSS SLOPE ADJUSTMENT" VALUES FROM THE "MISCELLANEOUS DATA" TABLE WILL AID THE CONTRACTOR IN DETERMINING ACTUAL FORMED HAUNCH DIMENSIONS AT THE EDGES OF THE TOP FLANGE.



NOTE 1 :
TO CALCULATE FIELD HAUNCH REQUIRED AT EACH LOCATION, SURVEY THE BEAM TOPS CONSISTENT WITH THE SPACINGS SHOWN ON THE "TOP OF DECK ELEVATIONS LAYOUT" ON DESIGN SHEET 9. SUBTRACT THE SURVEYED BEAM SHOT FROM THE "BEAM LINE HAUNCH ELEVATION". THIS VALUE WILL BE THE HAUNCH NEEDED (SEE "FIELD HAUNCH" IN HAUNCH DETAIL). THE "BEAM LINE HAUNCH ELEVATIONS" INCLUDE ADJUSTMENTS FOR DECK THICKNESS AND ANTICIPATED DEFLECTIONS. NO ADDITIONAL CALCULATIONS ARE REQUIRED. IF THE FIELD HAUNCH EXCEEDS THE MAXIMUMS AND MINIMUMS INDICATED IN THE MISCELLANEOUS DATA TABLE, ADJUSTMENTS TO THE GRADE OR ADDITIONAL HAUNCH REINFORCEMENT WILL BE REQUIRED.

DESIGN FOR 0° SKEW

176'-4 X 40'-0 PRETENSIONED
PRESTRESSED CONC. BEAM BRIDGE

55'-9 END SPANS64'-10 INTERIOR SPAN

DECK AND CAMBER DATA

STA. 371+49.00 (IA 17)

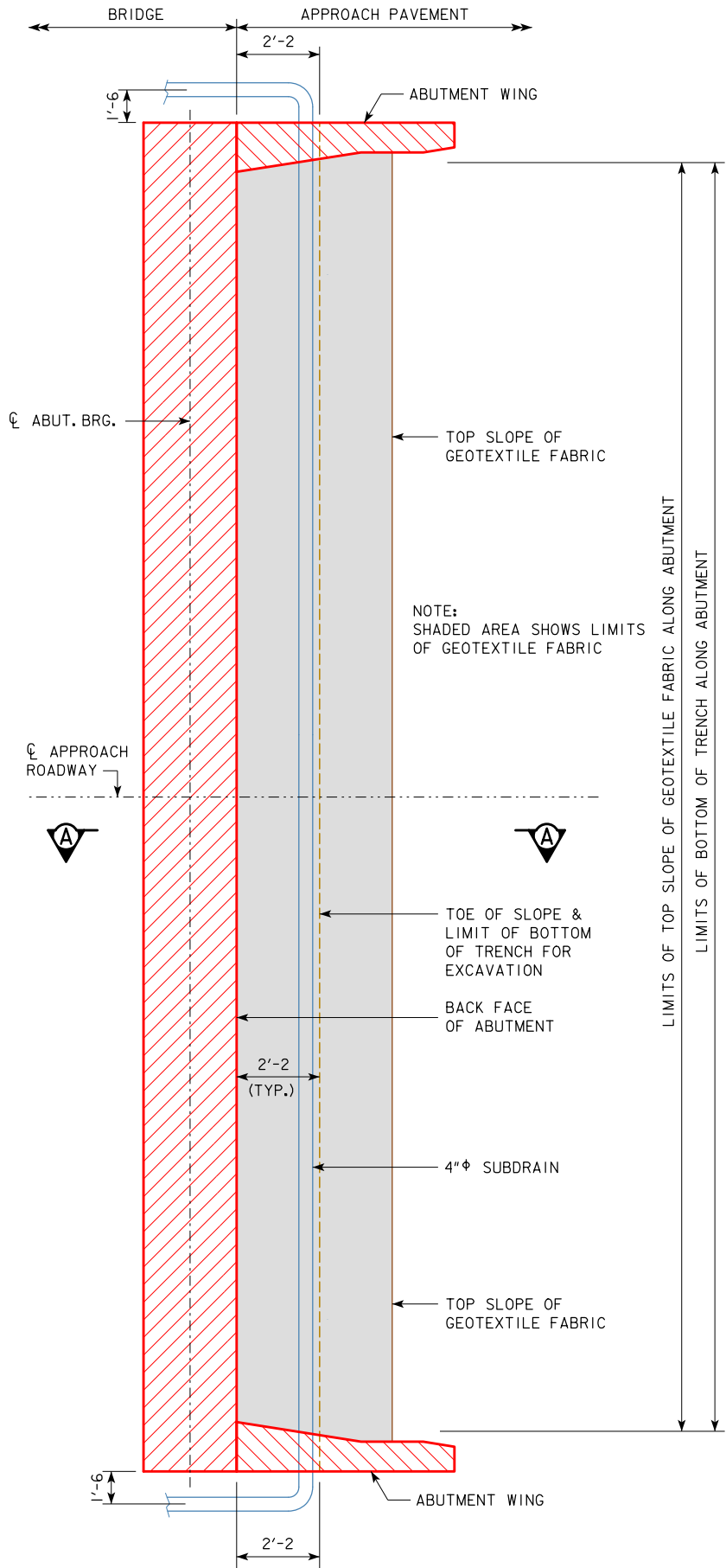
NOVEMBER, 2021

WRIGHT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION

DESIGN SHEET NO. 11 OF 14FILE NO. 31881DESIGN NO. 223

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").
ENGLISHFOREPROTECTIONBRIDGES.DGN - 1007D - THIS SHEET ISSUED 08-07.



ABUTMENT PLAN WITHOUT WING EXTENSIONS

ABUTMENT BACKFILL PROCESS:

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.

THE REMAINING WORK INVOLVES BACKFILLING WITH FLOODABLE BACKFILL, SURFACE FLOODING, AND VIBRATORY COMPACTION. THE FLOODABLE BACKFILL MATERIAL SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. THE FLOODABLE BACKFILL SHALL BE PLACED IN INDIVIDUAL LIFTS, SURFACE FLOODED, AND COMPACTED WITH VIBRATORY COMPACTION TO ENSURE FULL CONSOLIDATION. LIMIT THE LOOSE LIFTS TO NO MORE THAN 2 FEET OF THICKNESS.

START SURFACE FLOODING FOR EACH FLOODABLE BACKFILL LIFT AT THE HIGH POINT OF THE SUBDRAIN AND PROGRESS TO THE LOW POINT WHERE THE SUBDRAIN EXITS THE FABRIC. TO ENSURE UNIFORM SURFACE FLOODING, WATER RUNNING FULL IN A 2-INCH DIAMETER HOSE SHOULD BE SPRAYED IN SUCCESSIVE 6-FOOT TO 8-FOOT INCREMENTS FOR 5 MINUTES WITHIN EACH INCREMENT.

FLOODABLE BACKFILL LIFT PLACEMENT, FLOODING, AND COMPACTION SHALL PROGRESS UNTIL THE REQUIRED FULL THICKNESS OF THE ABUTMENT BACKFILL HAS BEEN COMPLETED.

WATER REQUIRED FOR FLOODING, SUBDRAINS, POROUS BACKFILL, FLOODABLE BACKFILL, AND GEOTEXTILE FABRIC FURNISHED AT THE BRIDGE ABUTMENTS WILL NOT BE MEASURED SEPARATELY FOR PAYMENT.

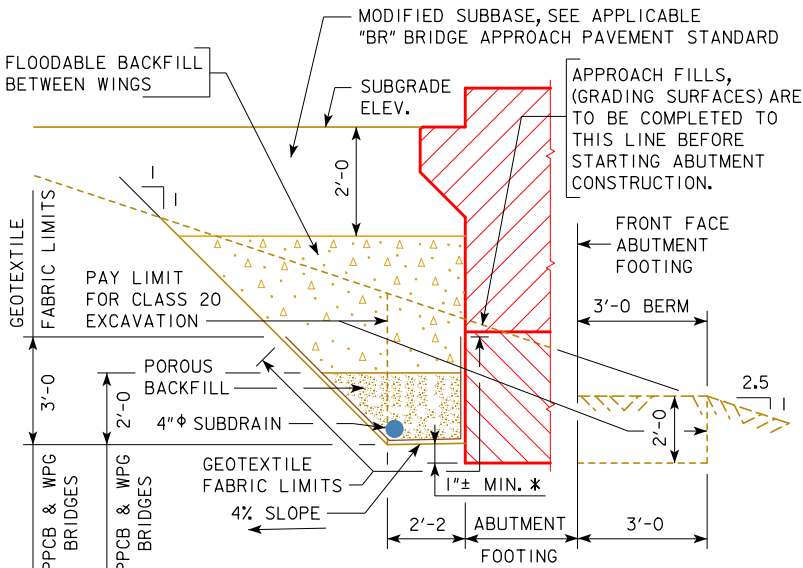
THE COST OF WATER REQUIRED FOR FLOODING, SUBDRAINS, POROUS BACKFILL, FLOODABLE BACKFILL, AND GEOTEXTILE FABRIC FURNISHED AT THE BRIDGE ABUTMENTS SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR STRUCTURAL CONCRETE.

NOTE:

SUBDRAIN SHALL SLOPE DOWNWARD 2% FROM CL APPROACH ROADWAY WHEN OUTLETTING BOTH SIDES OF THE ABUTMENT.

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, SHINGLE FASHION WITH UP SLOPE LAP PIECE ON TOP AND STAPLED FOR CONTINUITY.



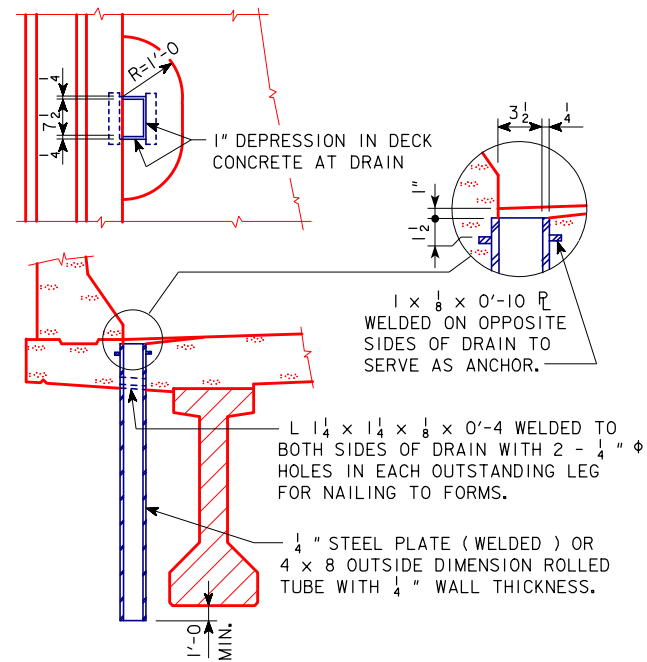
SECTION A-A
BACKFILL DETAILS

NOTE: GEOTEXTILE FABRIC WILL BE ATTACHED TO FACE OF ABUTMENT FOOTING AND WINGS.

* DIMENSION VARIES DUE TO 2% SUBDRAIN SLOPE.

NOTE:
SEE SUBDRAIN DETAILS SHEET FOR DETAILS NOT SHOWN ON THIS SHEET WHICH ARE PERTINENT TO THIS STRUCTURE.

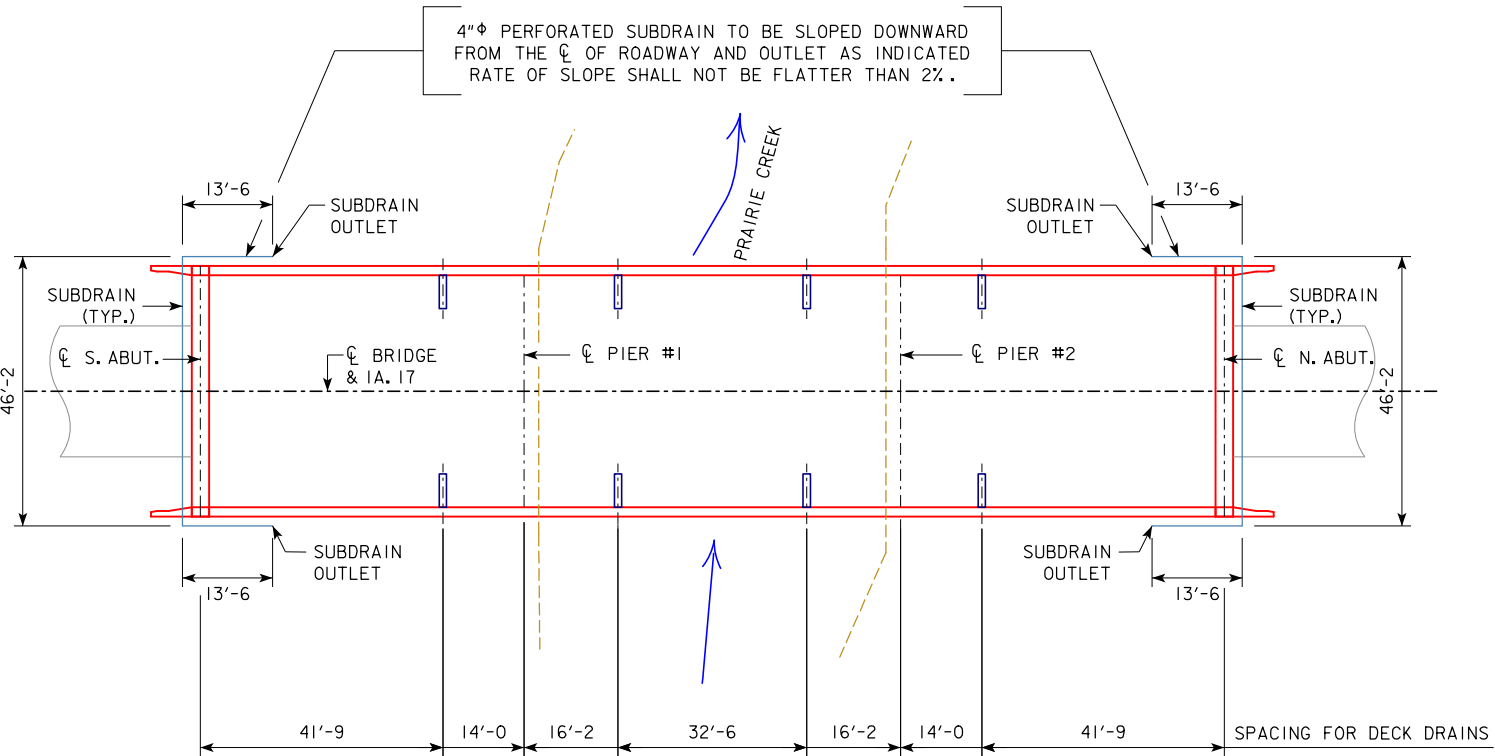
DESIGN FOR 0° SKEW
**176'-4 X 40'-0 PRETENSIONED
PRESTRESSED CONC. BEAM BRIDGE**
55'-9 END SPANS 64'-10 INTERIOR SPAN
ABUTMENT BACKFILL DETAILS
STA. 371+49.00 (IA 17) AT BACKFACE OF ABUTMENTS NOVEMBER, 2021
WRIGHT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION
DESIGN SHEET NO. 12 OF 14 FILE NO. 31881 DESIGN NO. 223



DECK DRAIN DETAILS
USE FOR BARRIER RAIL ONLY.
NOT REQUIRED FOR OPEN RAIL.

NOTE :
DRAINS ARE TO BE GALVANIZED AFTER FABRICATION.
SEE "SITUATION SKETCH" FOR LOCATION OF DRAINS.
WEIGHT OF DRAINS IS INCLUDED IN THE QUANTITY
FOR "STRUCTURAL STEEL" ON THE SUMMARY QUANTITIES
SHEET IN THE PLAN. WEIGHT IS BASED ON ROLLED TUBE.

DATA FOR ONE DRAIN			
BEAM SIZE	A	B	C
WT. LBS.	85	96	106
LENGTH FT.	4'-4 3/4	4'-11 3/4	5'-5 3/4



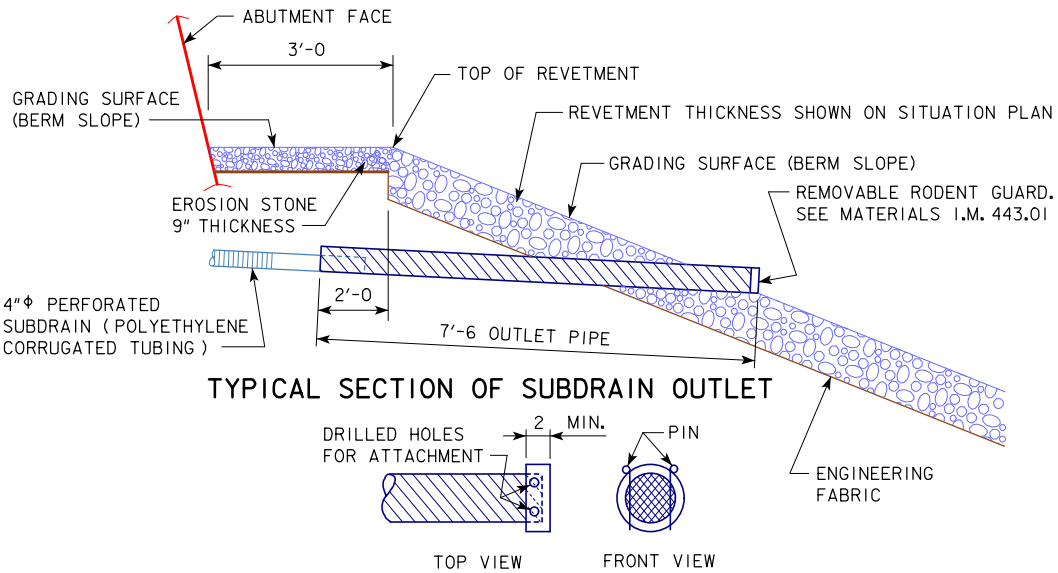
SITUATION PLAN
SHOWING DECK AND SUBDRAIN LOCATIONS



SUBDRAIN NOTES :

THIS PLAN SHEET SHOWS DETAILS FOR PLACING ALL SUBDRAINS AND SUBDRAIN OUTLETS REQUIRED FOR THIS STRUCTURE.
THE SUBDRAINS SHALL BE 4" IN DIAMETER AND SHALL BE IN ACCORDANCE WITH ARTICLE 4143.01, B, OF THE STANDARD SPECIFICATIONS.
THE SUBDRAIN OUTLET SHALL CONSIST OF A LENGTH OF PIPE WITH A REMOVABLE RODENT GUARD AS DETAILED ON THIS SHEET. THE LENGTH OF THE OUTLET PIPE SHALL BE DETERMINED BY THE REVETMENT AND IT'S PLACEMENT LOCATION. THE CONTRACTOR IS TO INSURE THE OUTLET PIPE IS ADEQUATELY STRONG ENOUGH AND WILL NOT BE DAMAGED WHEN REVETMENT IS PLACED. A CHECK WILL BE MADE AT THE SUBDRAIN OUTLET TO INSURE THAT THE SUBDRAIN IS NOT DAMAGED AND IS DRAINING PROPERLY DURING THE BACKFILL FLOODING PROCESS. IF A METAL OUTLET PIPE IS USED, IT SHALL BE 6 INCHES IN DIAMETER AND COUPLED TO THE 4 INCH DIAMETER SUBDRAIN IN ONE OF THE TWO FOLLOWING WAYS.
1. USE AN INSIDE FIT REDUCER COUPLER (COUPLER MUST BE INSERTED A MINIMUM OF 1'-0 INTO THE METAL OUTLET PIPE).
2. INSERT 1'-0 OF THE 4" SUBDRAIN INTO THE 6" METAL OUTLET PIPE, THEN FULLY SEAL THE ENTIRE OPENING WITH GROUT.
THE COST OF FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), GRANULAR BACKFILL, POROUS BACKFILL, AND 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 SUBDRAINS ARE BASED ON THE PROPOSED GRADING LAYOUT OF BRIDGE BERMS. THE DIMENSIONS SHOWN ARE FOR ESTIMATING ONLY. REQUIRED LENGTHS AND GENERAL LOCATIONS OF SUBDRAINS ARE SUBJECT TO CHANGE DUE TO FIELD ADJUSTMENTS OF THE GRADING LAYOUT.

SUBDRAIN OUTLET ELEVATIONS	
LOCATION	ELEVATION
SOUTH ABUTMENT	1109.9
NORTH ABUTMENT	1109.9



REMOVABLE RODENT GUARD DETAILS
REVETMENT STONE (EMBEDDED) OUTLET DETAILS

DESIGN FOR 0° SKEW

176'-4 X 40'-0 PRETENSIONED
PRESTRESSED CONC. BEAM BRIDGE

55'-9 END SPANS64'-10 INTERIOR SPAN

DECK AND SUBDRAIN DETAILS

STA. 371+49.00 (I.A. 17) BACKFACE OF ABUTMENTSNOVEMBER, 2021

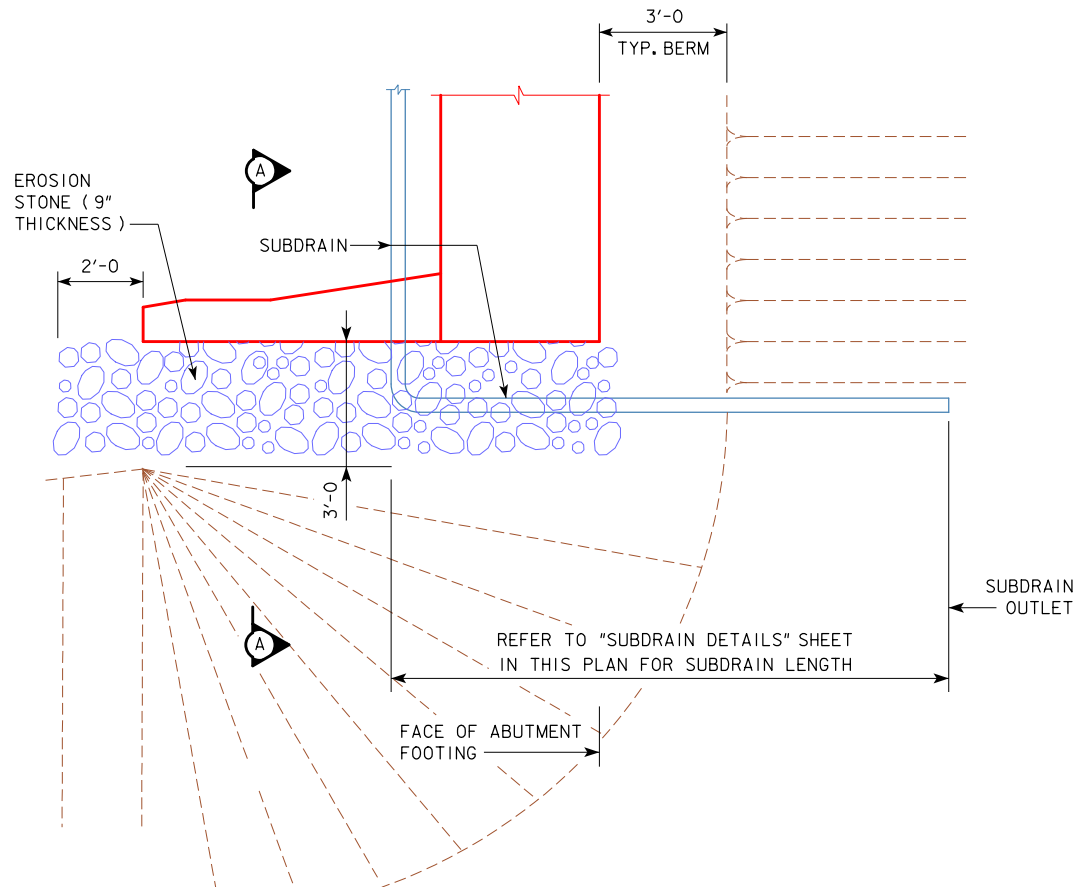
WRIGHT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION

DESIGN SHEET NO. 13 OF 14FILE NO. 31881DESIGN NO. 223

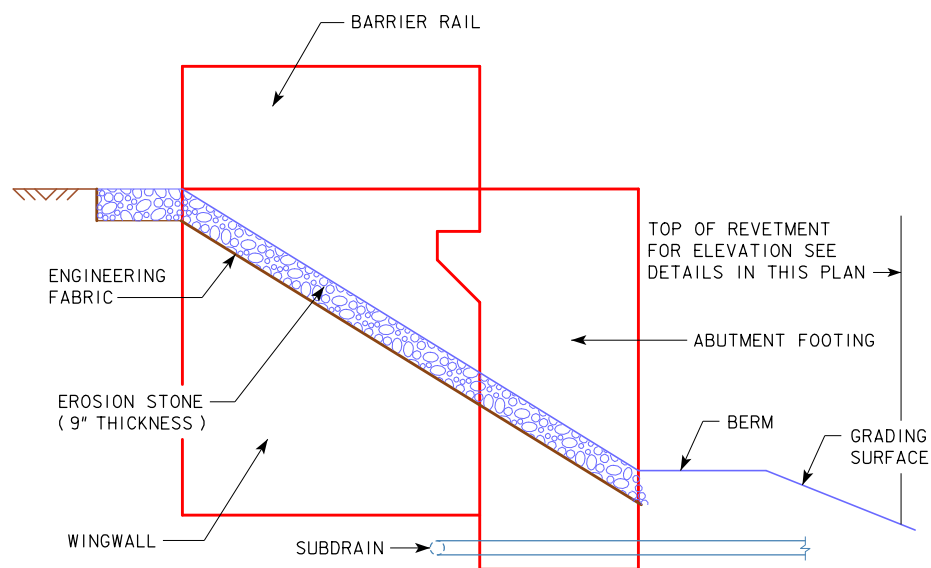
REVISED 10-14 - TWO ADDITIONAL FORESLOPE PROTECTION DETAILS WERE ADDED OUTSIDE OF THE BORDER TO SHOW REVETMENT UP TO BACK OF ABUTMENT FOOTING.
ENGLISH FORESLOPE PROTECTION IONBRIDGES.DGN 1007C - THIS SHEET ISSUED 06-02 FOR WATER CROSSINGS.

REVISED 06-14 - ADDED 2 FEET OF LENGTH OF EROSION STONE IN FRONT OF THE BRIDGE WING.
ENGLISHFORSLOPEPROTECTIONBRIDGES.DGN 1005A - THIS SHEET ISSUED 06-02.

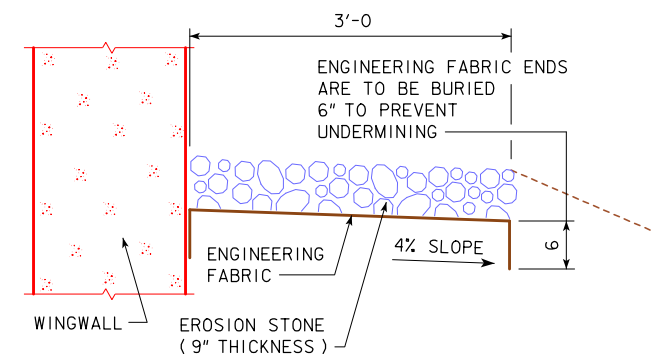


TOP VIEW OF WING ARMORING

A CHECK SHALL BE MADE AT THE SUBDRAIN OUTLET TO INSURE THAT IT IS DRAINING PROPERLY DURING THE BACKFILL FLOODING PROCESS.



PROFILE VIEW OF WING ARMORING
(SHOWN FOR INTEGRAL ABUTMENT)



SECTION A-A

GENERAL NOTES:

EROSION STONE SHALL BE PLACED ALONG THE SIDES OF THE WINGS AND ABUTMENT FOOTING AS SHOWN IN SECTION A-A. THIS IS TYPICAL AT EACH CORNER OF THE BRIDGE UNLESS OTHERWISE NOTED IN THE PLANS. THE EROSION STONE AT THESE LOCATIONS SHALL BE UNDERLAYED WITH ENGINEERING FABRIC IN ACCORDANCE WITH ARTICLE 4196.01, B, 3, OF THE STANDARD SPECIFICATIONS.

THE EROSION STONE SHALL BE IN ACCORDANCE WITH SECTION 4130, OF THE STANDARD SPECIFICATIONS. MATERIAL PASSING THE 3 INCH SCREEN BUT 100% RETAINED ON A 1 INCH SCREEN MAY BE USED AS CHOKE STONE.

THE EROSION STONE SHALL BE DEPOSITED, SPREAD, CONSOLIDATED AND SHAPED BY MECHANICAL OR HAND METHODS THAT WILL PROVIDE UNIFORM 9" DEPTH AND DENSITY AND PROVIDE UNIFORM SURFACE APPEARANCE.

PAYMENT FOR THE BRIDGE WING ARMORING WILL BE BID PER SQUARE YARD. COST WILL INCLUDE ENGINEERING FABRIC, EROSION STONE, EXCAVATION, SHAPING, AND COMPACTION TO DIMENSIONS SHOWN IN THESE PLANS. BID ITEM SHALL BE "BRIDGE WING ARMORING - EROSION STONE".

DESIGN FOR 0° SKEW	
176'-4 X 40'-0 PRETENSIONED PRESTRESSED CONC. BEAM BRIDGE	
55'-9 END SPANS	64'-10 INTERIOR SPAN
BRIDGE WING ARMORING	
STA. 371+49.00 (1A 1A) BACKFACE OF ABUTMENTS NOVEMBER, 2021	
WRIGHT COUNTY	
IOWA DEPARTMENT OF TRANSPORTATION	
DESIGN SHEET NO. 14 OF 14	FILE NO. 31881
DESIGN NO. 223	

GENERAL NOTES:

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

ALL REINFORCING BARS ARE TO BE SECURELY WIRED IN PLACE AND ADEQUATELY SUPPORTED ON BAR CHAIRS BEFORE CONCRETE IS PLACED. I.M. 451.01 REQUIREMENTS SHALL APPLY FOR BAR CHAIRS.

ALL PRESTRESSED CONCRETE BEAMS ARE TO BE SET VERTICAL.

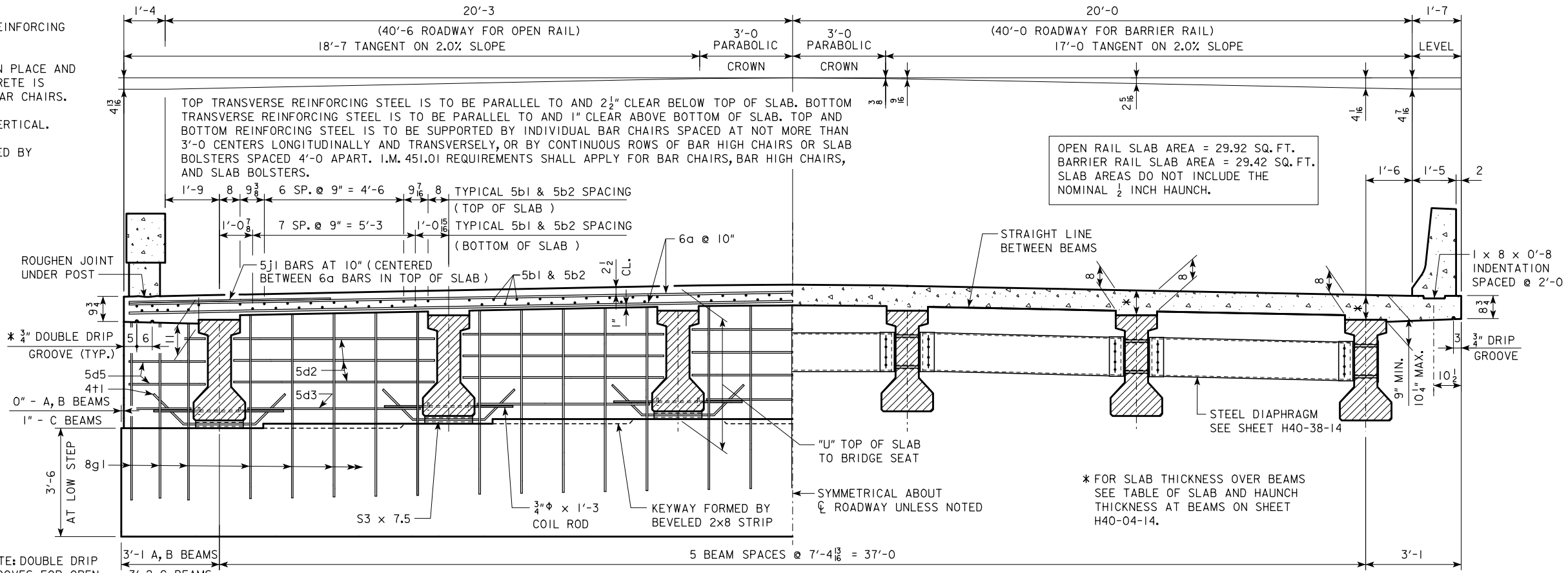
FORMS FOR THE SLAB AND RAILS ARE TO BE SUPPORTED BY THE PRESTRESSED CONCRETE BEAMS.

WEIGHT OF DRAINS IS INCLUDED IN THE STRUCTURAL STEEL QUANTITY.

THE PIER AND ABUTMENT DIAPHRAGM CONCRETE IS TO BE PLACED MONOLITHICALLY WITH THE FLOOR SLAB.

ALL REINFORCING STEEL IS TO BE GRADE 60.

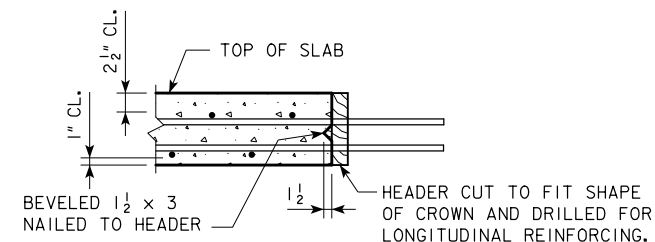
COST OF ALL PREFORMED EXPANSION JOINT FILLER MATERIAL IS TO BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL CONCRETE (BRIDGE)".



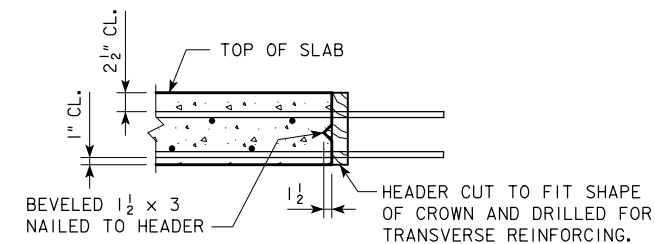
* NOTE: DOUBLE DRIP GROOVES FOR OPEN RAIL OPTION ONLY.

HALF SECTION NEAR ABUTMENT
(OPEN RAIL SHOWN)

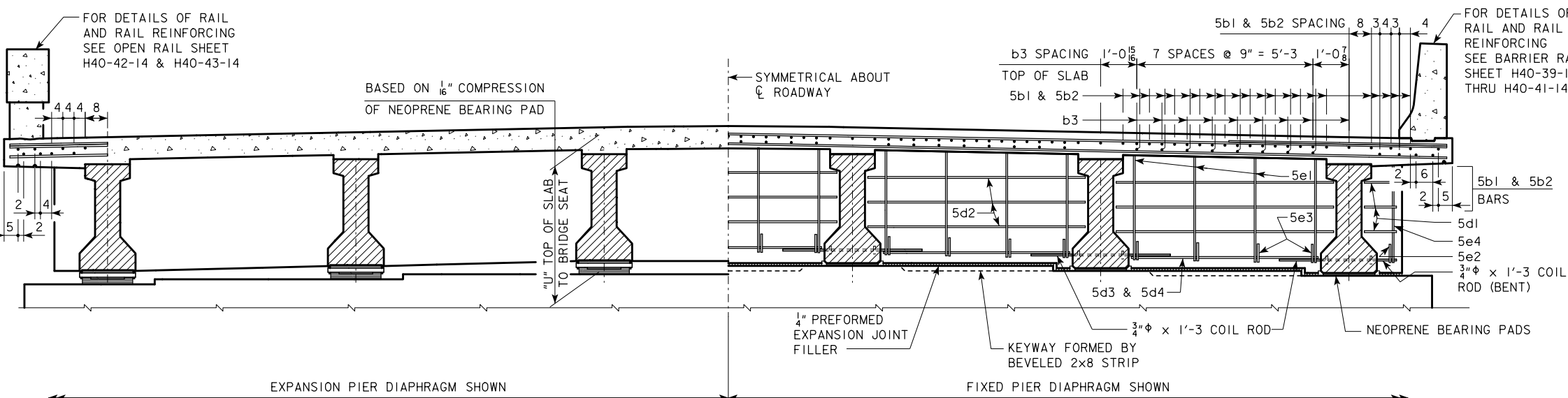
HALF SECTION NEAR MID SPAN
(BARRIER RAIL SHOWN)



TRANSVERSE SLAB
CONSTRUCTION JOINT



LONGITUDINAL SLAB
CONSTRUCTION JOINT



SECTION NEAR PIER

LENGTH OF S3 x 7.5 (ABUTMENT BEAM SEAT)	
BEAM BOTTOM FLANGE WIDTH	LENGTH OF S3 x 7.5
1'-5	1'-3 1/2
1'-8	1'-6 1/2

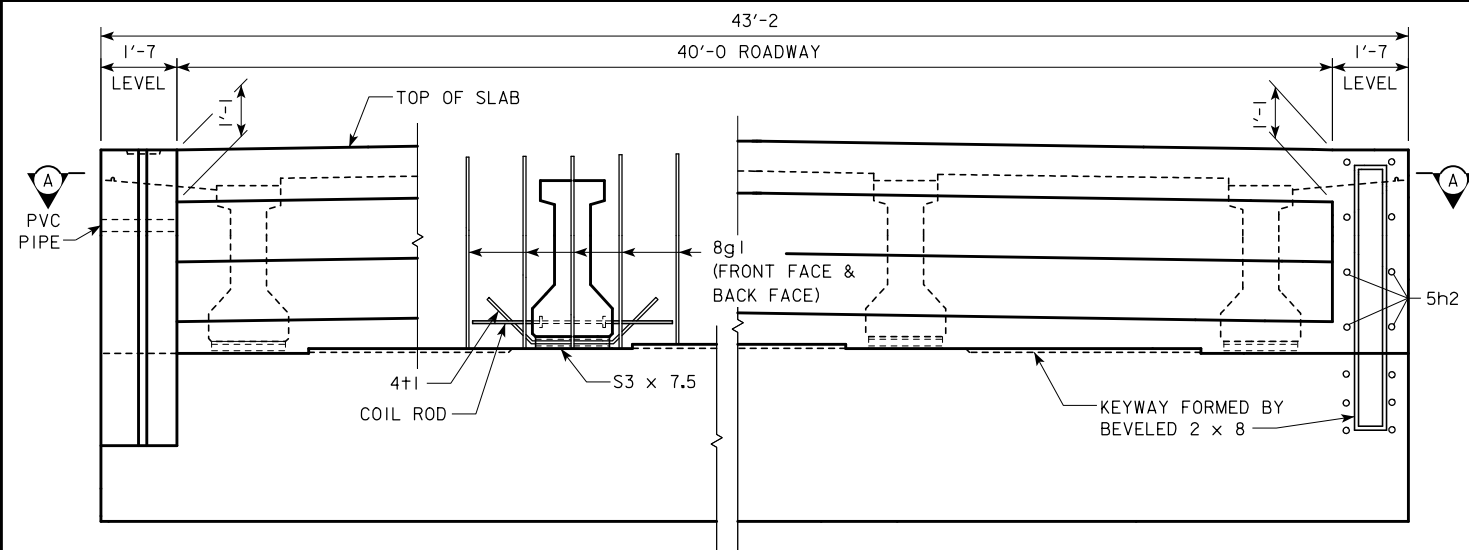
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

STANDARD DESIGN - 40' ROADWAY, THREE SPAN BRIDGE
**PRETENSIONED PRESTRESSED
CONCRETE BEAM BRIDGES**
SEPTEMBER, 2014

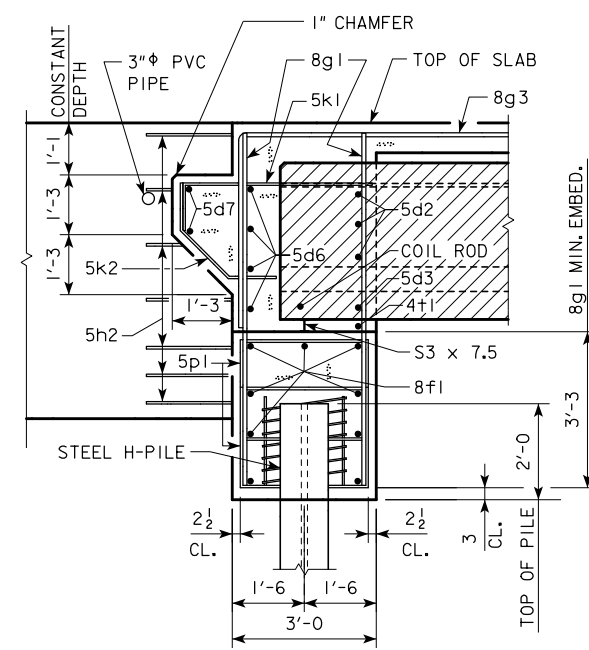
SUPERSTRUCTURE DETAILS

H40-03-14



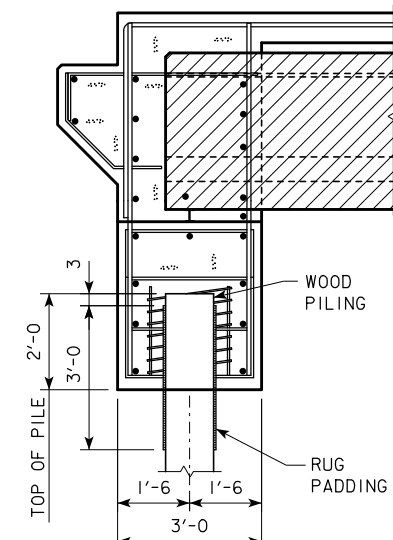
PART REAR ELEVATION AT ABUTMENT

NOTE: TOP OF ABUTMENT SHOWN FOR SOLID BARRIER RAIL



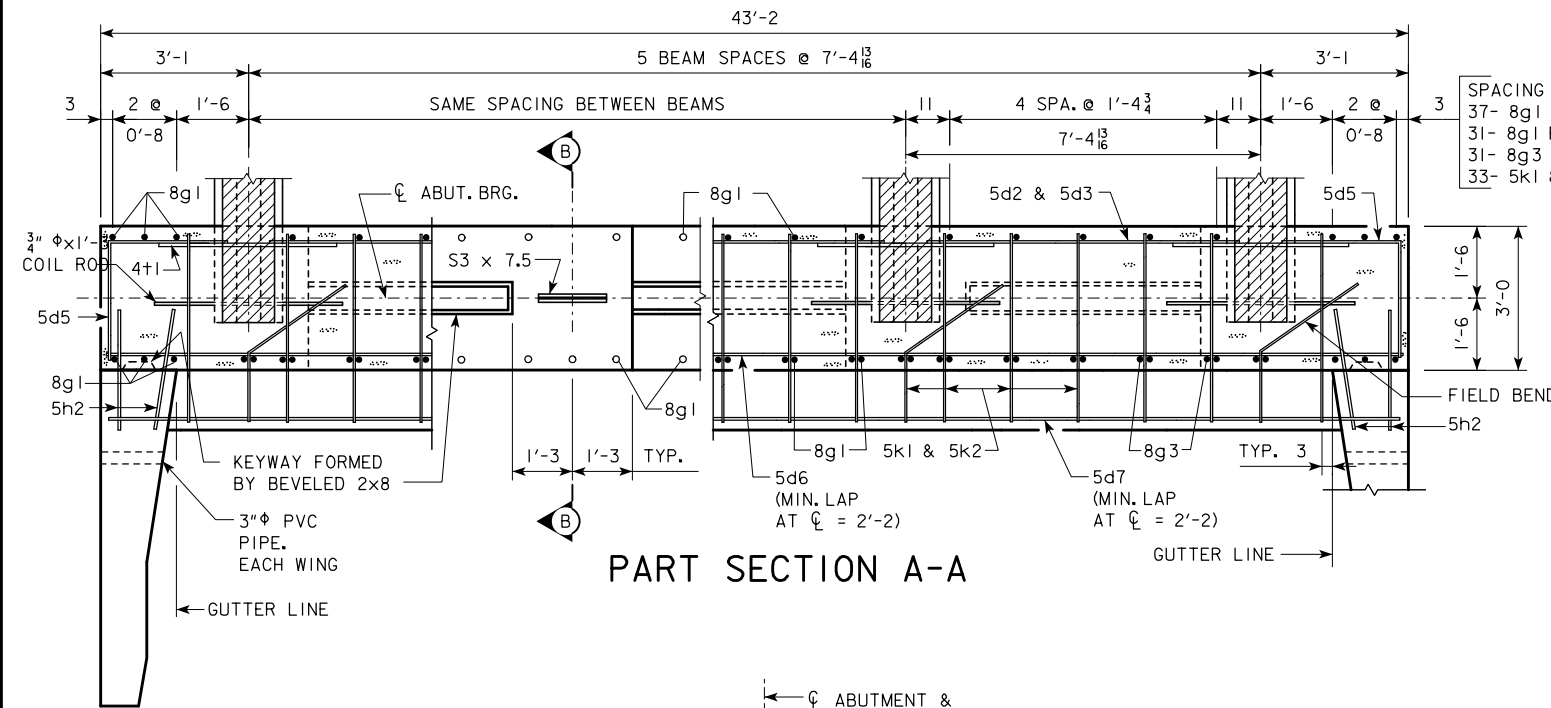
PART SECTION B-B
(FOR STEEL H-PILING)

NOTE:
THE SPIRAL AT THE TOP OF EACH PILE TO
BE 7 TURNS OF NO. 2 BAR, 21\"/>



PART SECTION B-B
(FOR WOOD PILING)

WOOD PILING NOTE:
AFTER PILES ARE CUT OFF, THE UPPER 3',
EXCEPT AS SHOWN, IS TO BE WRAPPED
WITH A DOUBLE THICKNESS OF RUG
PADDING HELD IN PLACE BY TACKING
WITH GALVANIZED ROOFING NAILS AND
WRAPPED WITH #14 GAUGE GALVANIZED
WIRE AT A 4\"/>



PART SECTION A-A

ABUTMENT NOTES:

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE
TO NEAR REINFORCING BAR IS TO BE 2\"/>

IF NECESSARY TO PREVENT DAMAGE TO THE END OF
THE BRIDGE DECK OR 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
COUNTY OR STATE.

ABUTMENT PILES SHALL BE DRIVEN TO VALUES SHOWN
IN DESIGN PLANS.

PLACE 5h2 BAR AT 1:6 SLOPE TO MATCH TRAFFIC SIDE
OF ABUTMENT WING FACE. (BOTH SIDES TYPICAL)

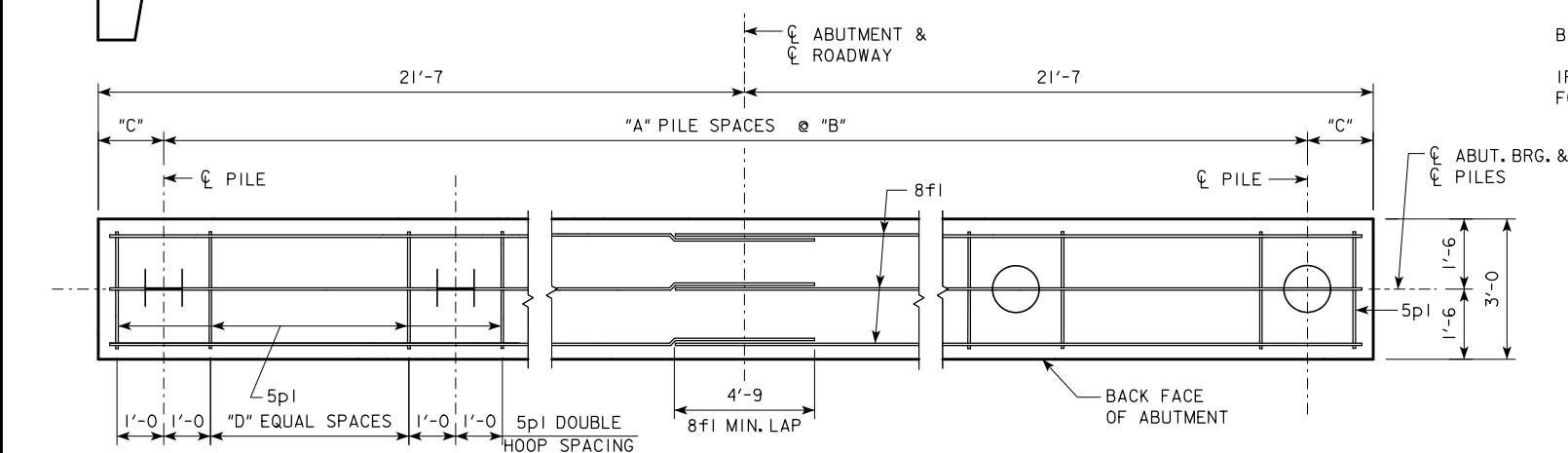
BARRIER RAIL NOT SHOWN IN DETAILS.

IF ROCK IS CLOSER THAN 15' BELOW ABUTMENT
FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.

ABUTMENT PILE SPACING		CL-CL ABUT. BRG.	138'-10	151'-4	163'-10	176'-4	188'-10
WITH WOOD PILES	"A" PILE SPACES		13	14	15	15	16
	"B" (FT. - IN.)		2'-11	2'-9	2'-6	2'-6	2'-6
	"C" (FT. - IN.)		2'-7 1/2	2'-4	2'-10	2'-10	1'-7
	"D" EQUAL SPACES		1	1	1	1	1
	NO. OF PILES PER ABUT.		14	15	16	16	17
	PU, STRENGTH I DESIGN LOAD (KIPS)		56	55	55	57	56
WITH STEEL H-PILES	"A" PILE SPACES		5	6	6	6	7
	"B" (FT. - IN.)		7'-8	6'-5	6'-5	6'-5	5'-6
	"C" (FT. - IN.)		2'-5	2'-4	2'-4	2'-4	2'-4
	"D" EQUAL SPACES		5	4	4	4	3
	NO. OF PILES PER ABUT.		6	7	7	7	8
	PU, STRENGTH I DESIGN LOAD (KIPS)		144	128	137	142	128

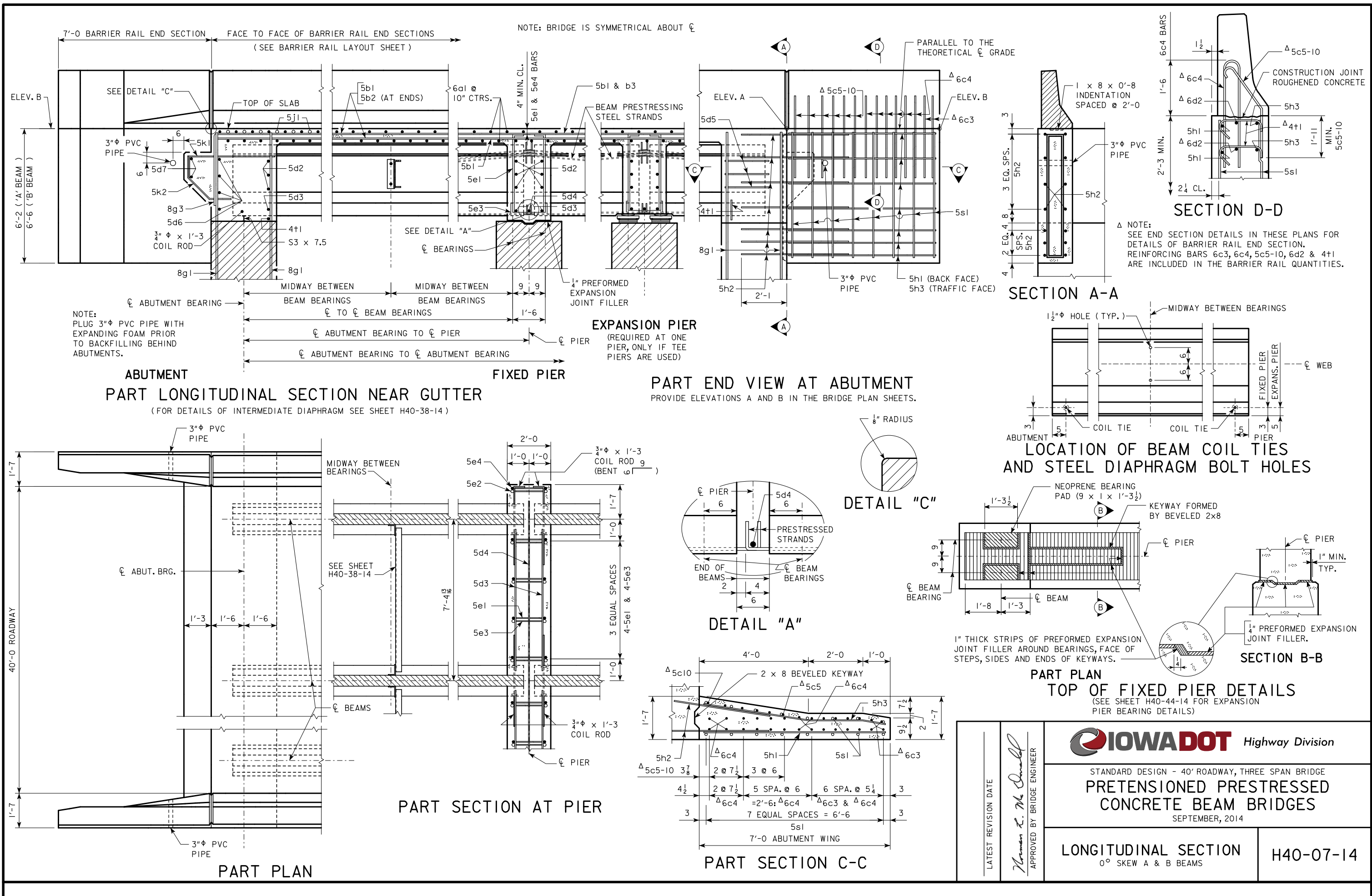
NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED
IN THE FIELD FOR DRIVING PILES.

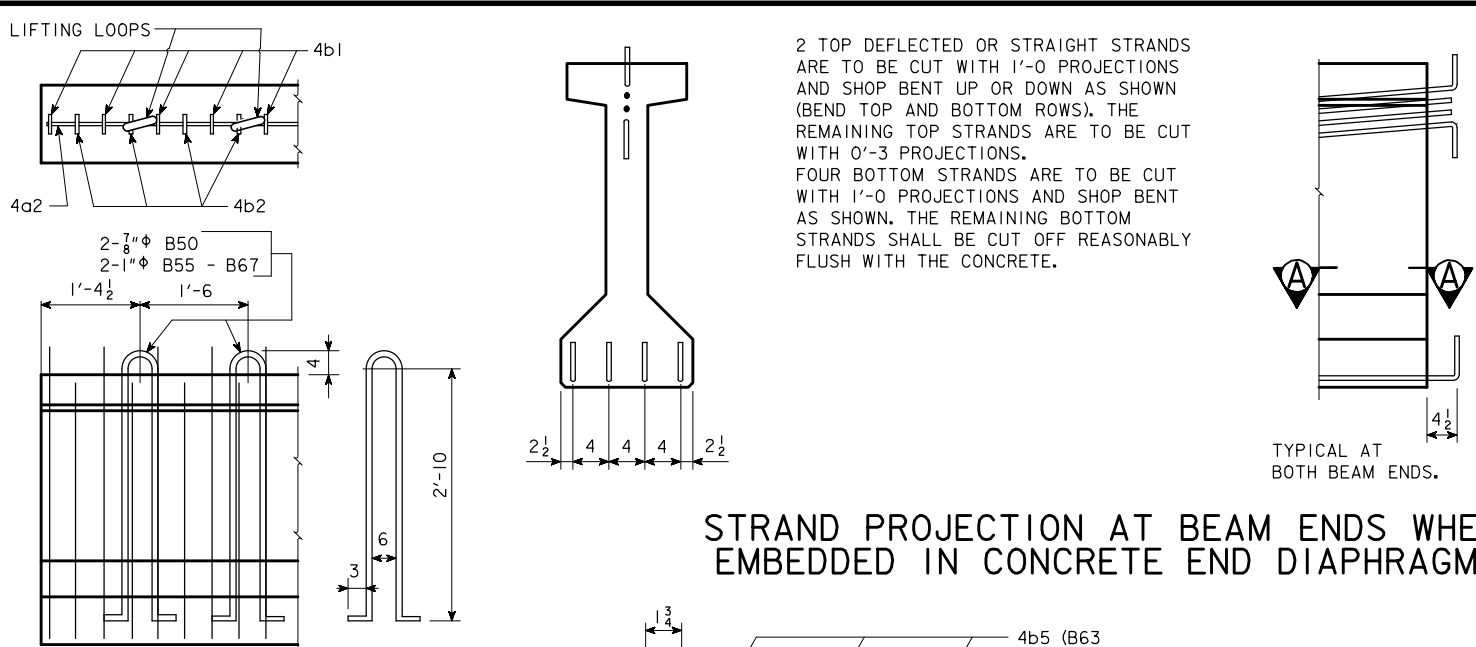
NOTE: THE PILE TYPE AND NUMBER OF PILES ARE TO BE INCLUDED
ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.



ABUTMENT PILE PLAN

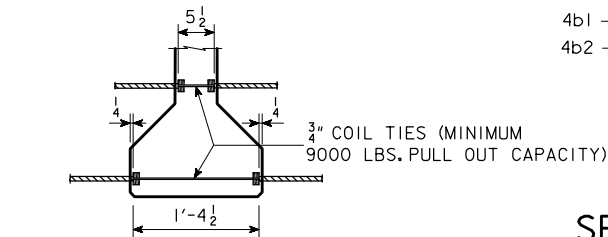
LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, THREE SPAN BRIDGE PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES SEPTEMBER, 2014	
		ABUTMENT DETAILS 0° SKEW A & B BEAMS	
		H40-05-14	





LIFTING LOOP DETAIL

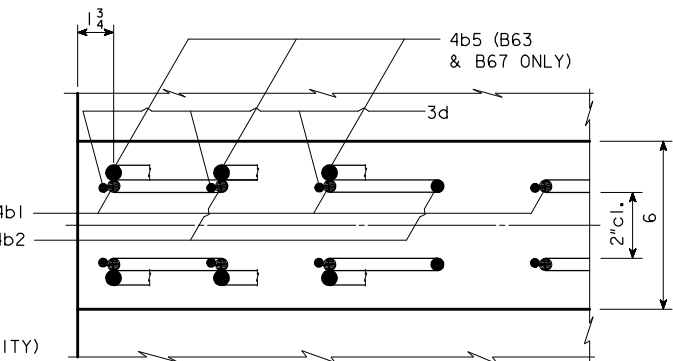
ALTERNATE TYPES MAY BE SUBSTITUTED WITH THE APPROVAL OF THE ENGINEER. LIFTING LOOPS ARE TO BE STRUCTURAL GRADE.



COIL TIE DETAIL

NUMBER AND EXACT LOCATION OF COIL TIES TO BE AS DETAILED ON SPECIFIC BRIDGE DESIGN.

STRAND PROJECTION AT BEAM ENDS WHEN EMBEDDED IN CONCRETE END DIAPHRAGMS



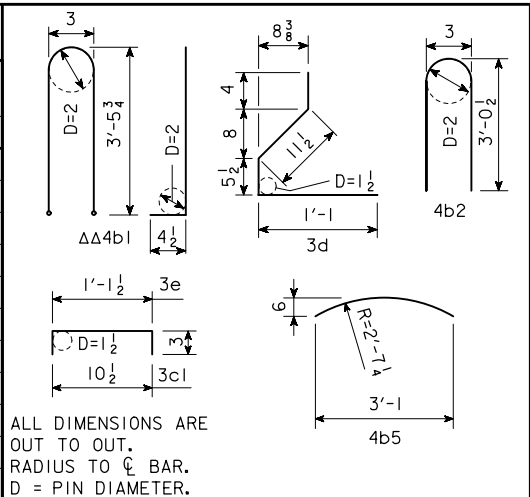
SECTION A-A SHOWING PLACEMENT OF STIRRUPS NEAR END OF BEAM

ΔΔ4b1 BARS TO BE EPOXY COATED.

** WHERE DEFLECTING STRANDS INTERFERE WITH PLACEMENT, SOME IN-PLACE BENDING MAY BE NECESSARY.

REINFORCING BAR LIST

BEAM	SPAN	B50		B55		B59		B63		B67	
		NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH
ΔΔ	6a1	4	27'-3	4	29'-4	4	31'-5	4	33'-6	4	35'-7
	4a2	2	4'-2	2	4'-2	2	4'-2	2	4'-2	2	4'-2
	4b1	44	7'-10	46	7'-10	50	7'-10	52	7'-10	56	7'-10
	4b2	12	6'-2	12	6'-2	12	6'-2	12	6'-2	12	6'-2
**	4b5							12	3'-3	12	3'-3
	3c1	44	1'-5	46	1'-5	50	1'-5	52	1'-5	56	1'-5
	3d	112	2'-10	116	2'-10	124	2'-10	128	2'-10	136	2'-10
	3e	24	1'-8	24	1'-8	24	1'-8	24	1'-8	24	1'-8



ALL DIMENSIONS ARE OUT TO OUT. RADIUS TO ϕ BAR. D = PIN DIAMETER.

B BEAM DATA

BEAM	SPAN LENGTH ϕ-CL BEARING	OVERALL BEAM LENGTH (L)	STRAND SIZE DIA. (inches)	NO. OF STRANDS		TOTAL INITIAL PRESTRESS KIPS ③	HOLD DOWN FORCE-KIPS	CAMBER (in.)				DEFLECTION (in.) Δ _D				PERMISSIBLE SPACING				WEIGHT (TONS)		CONCRETE (C. Y.)	REINFORCING STEEL-(lb)
								AT RELEASE		AFTER LOSSES		IMMEDIATE① (ELASTIC) Δ _I		TIME (PLASTIC) Δ _T ②		HL93 LOADING							
				STRAIGHT	DEFLECTED					CONC. STEEL DIAPH. DIAPH.	CONC. STEEL DIAPH. DIAPH.			CONC. STEEL DIAPH. DIAPH.	CONC. STEEL DIAPH. DIAPH.								
B50	50'-10	51'-10	0.60	8	2	425	10.8	0.67		1.24		0.43	0.39	0.11	0.10			7'-6	7'-6	10.3		5.10	607
*B55	55'-0	56'-0	0.60	8	3	468	14.1	0.85		1.51		0.58	0.54	0.14	0.13			7'-6	7'-6	11.2		5.51	635
*B59	59'-2	60'-2	0.60	10	3	554	13.2	1.12		1.99		0.82	0.77	0.21	0.19			7'-6	7'-6	12.0		5.92	680
*B63	63'-4	64'-4	0.60	12	3	639	12.3	1.30		2.32		0.91	0.84	0.23	0.21			7'-6	7'-6	12.8		6.33	733
*B67	67'-6	68'-6	0.60	14	3	724	11.6	1.69		2.98		1.16	1.09	0.29	0.27			7'-6	7'-6	13.6		6.74	778

⁽¹⁾ DEFLECTIONS AT MID-SPAN DUE TO WEIGHT OF SLAB AND DIAPHRAGM. THE DEFLECTIONS SHOWN ARE FOR A SLAB WEIGHT OF 757 #/FT. (8" SLAB AND 7'-6 BEAM SPACING) AND ONE CONCRETE DIAPHRAGM (2270 #) OR ONE STEEL DIAPHRAGM (285 #) AT ϕ OF SPAN. FOR DIFFERENT SLAB AND DIAPHRAGM WEIGHTS, DEFLECTIONS WILL BE DIRECTLY PROPORTIONAL.

⁽²⁾ DEFLECTIONS DUE TO THE COMBINED EFFECT OF CREEP DUE TO WEIGHT OF SLAB AND SHRINKAGE OF SLAB.

TOTAL BEAM DEFLECTIONS AT ϕ OF SPAN, Δ_D , DUE TO WEIGHT OF SLAB AND DIAPHRAGMS FOR DETAILING PURPOSE:
(A) $\Delta_D = \Delta_I + \Delta_T$ FOR SIMPLE SPAN.
(B) $\Delta_D = \Delta_I + \frac{3}{4}\Delta_T$ FOR END SPANS OF CONTINUOUS BRIDGE.
(C) $\Delta_D = \Delta_I + \frac{1}{2}\Delta_T$ FOR INTERIOR SPANS OF CONTINUOUS BRIDGE.

⁽³⁾ TOTAL INITIAL PRESTRESS IS BASED ON 72.6% f'_s , $f'_s = 270$ ksi AND $A_s = 0.217$ sq. in.

* MINIMUM CONCRETE f'_c (AT 28 DAYS) SHALL BE 7,000 psi. MINIMUM f'_c AT RELEASE SHALL BE 6,000 psi.

SPECIFICATIONS:

CONSTRUCTION: STANDARD SPECIFICATIONS OF THE IOWA DEPARTMENT OF TRANSPORTATION, CURRENT SERIES, WITH CURRENT APPLICABLE SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS.

DESIGN: A.A.S.H.T.O. LRFD, SERIES OF 2007, WITH MINOR MODIFICATIONS.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE TO BE IN ACCORDANCE WITH A.A.S.H.T.O. LRFD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 2007:

REINFORCING STEEL IN ACCORDANCE WITH SECTION 5, GRADE 60.

CONCRETE IN ACCORDANCE WITH SECTION 5, $f'_c = 5000$ psi (EXCEPT AS NOTED)

PRESTRESSING STEEL IN ACCORDANCE WITH SECTION 5, $f'_s = 270,000$ psi.

NOTES:

THESE BEAMS ARE DESIGNED FOR AASHTO LIVE LOADS AS INDICATED IN ABOVE TABLE WITH AN ALLOWANCE OF 20 LB. PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.

HOLD DOWN POINTS FOR DEFLECTED STRANDS MAY BE MOVED TOWARD ENDS OF BEAM A DISTANCE OF 0.05 L MAXIMUM AT PRODUCER'S OPTION.

ALL PRESTRESSING STRANDS SHALL CONFORM TO ASTM A416 GRADE 270 LOW RELAXATION STRANDS.

TOPS OF BEAMS ARE TO BE STRUCK OFF LEVEL AND FINISHED AS PER MATERIALS IM570.

BEARINGS SHALL BE AS DETAILED ON OTHER DESIGN SHEETS.

BEAMS TO BE USED IN BRIDGES MADE CONTINUOUS BY THE POURED IN PLACE FLOOR, ARE TO BE AT LEAST 28 DAYS OLD BEFORE THE FLOOR IS PLACED UNLESS A SHORTER CURING TIME IS APPROVED BY THE BRIDGE ENGINEER.

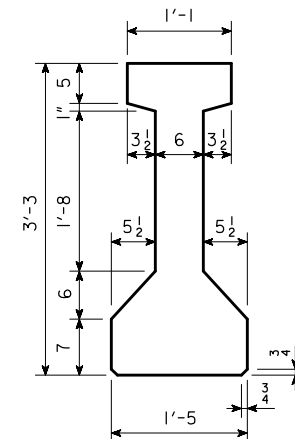
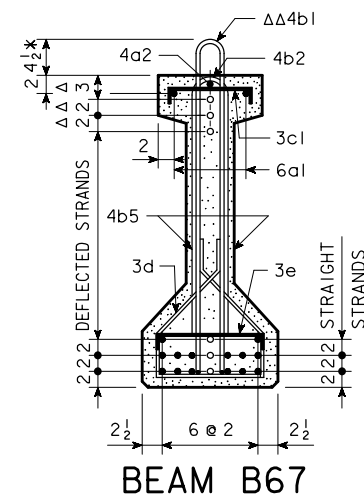
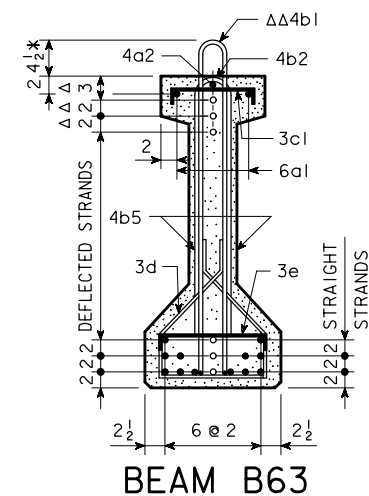
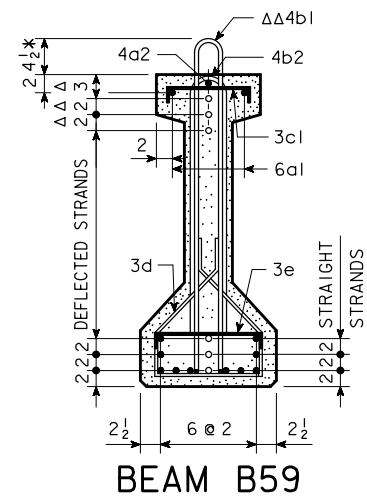
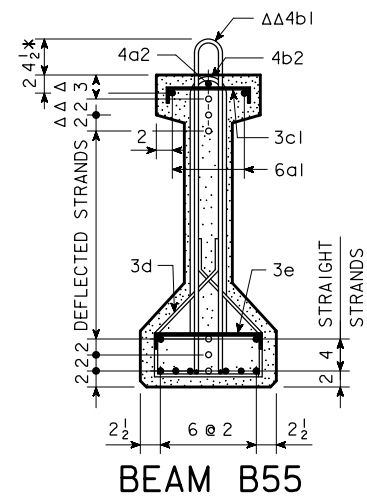
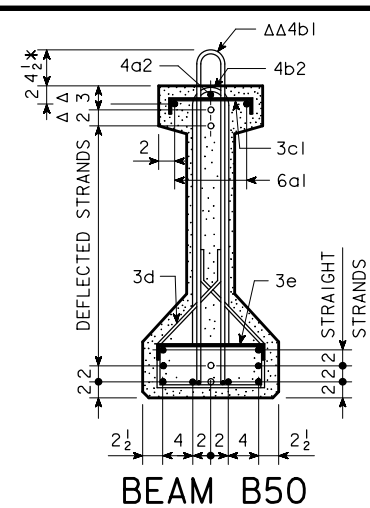
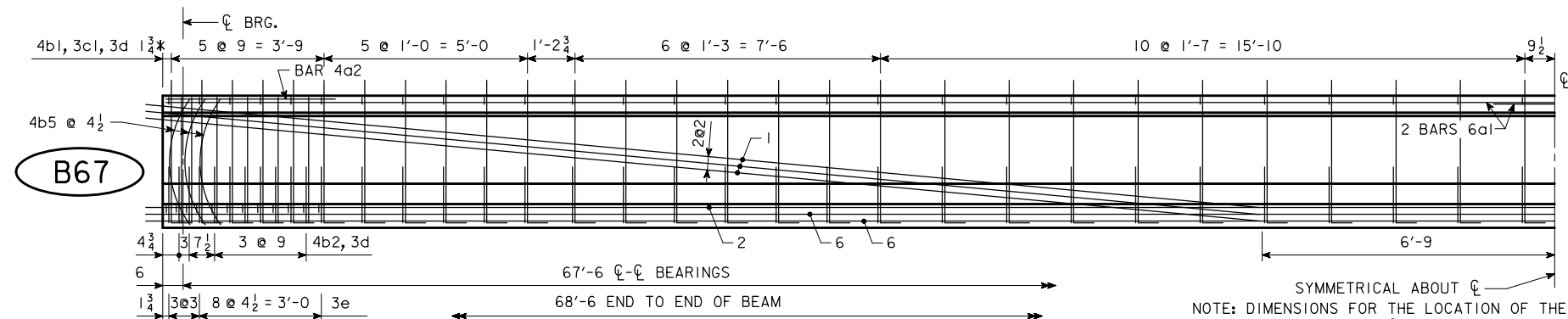
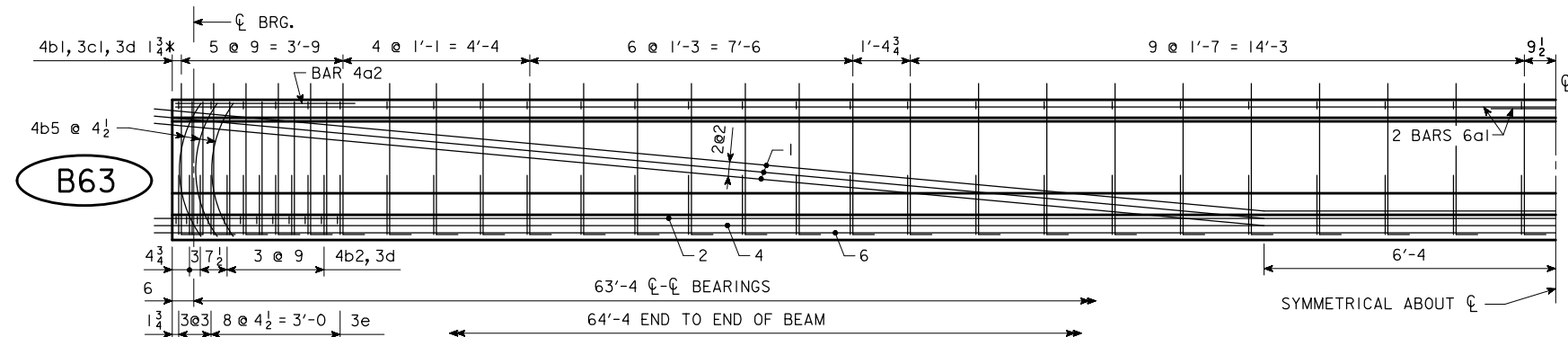
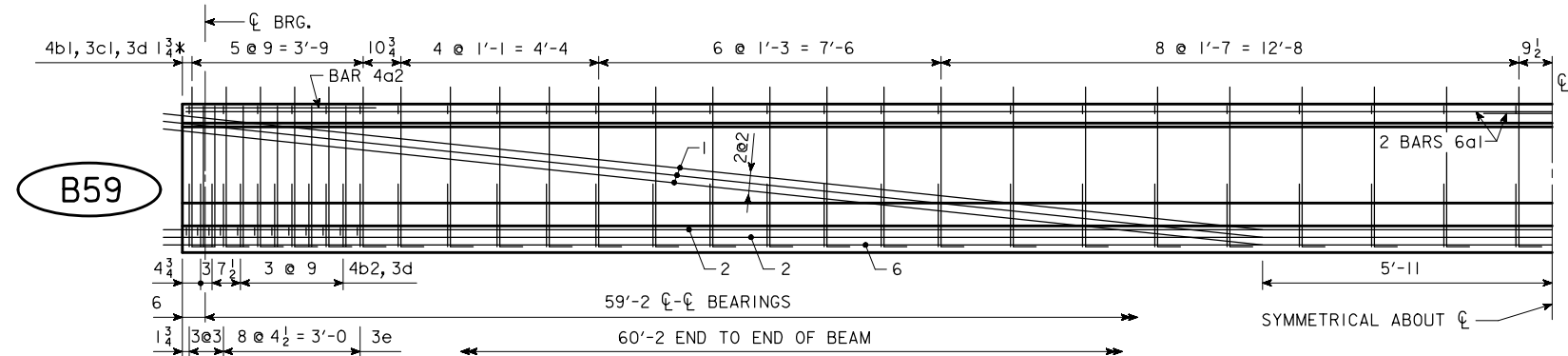
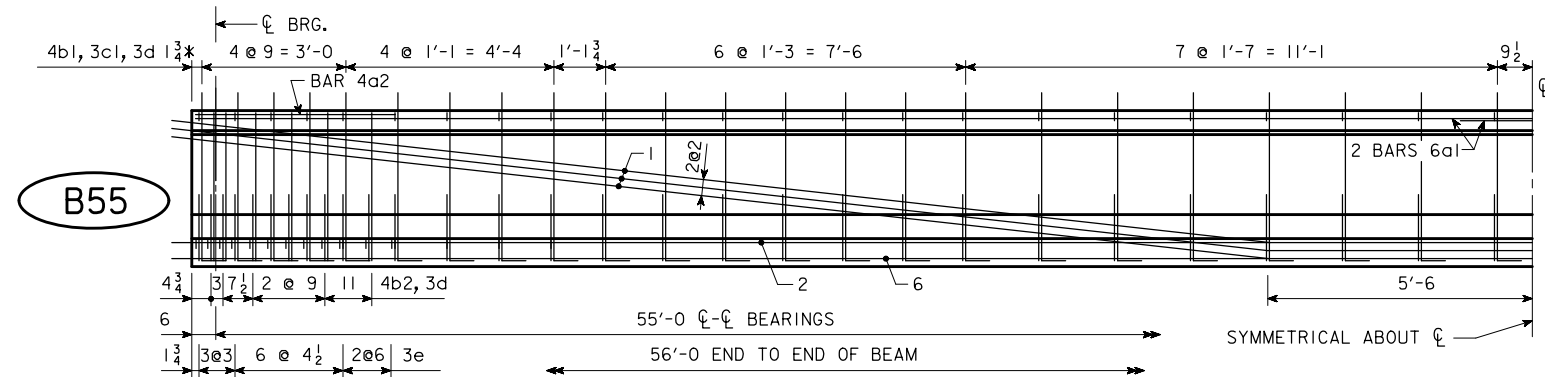
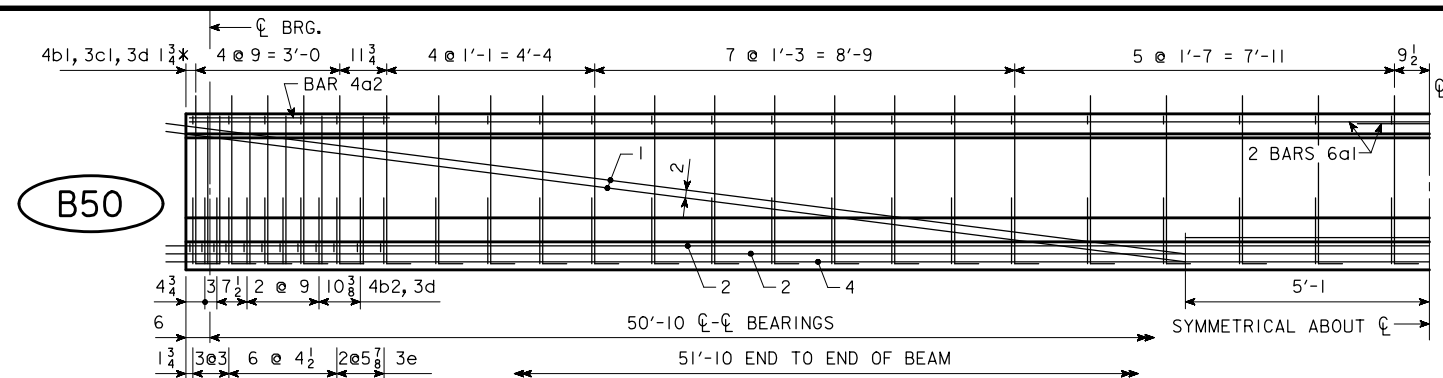
THE PORTIONS OF THE PRESTRESS BEAMS THAT ARE TO BE EMBEDDED IN THE ABUTMENT AND PIER DIAPHRAGMS SHALL BE ROUGHENED FOR A DISTANCE OF 10" FROM THE BEAM END BY SANDBLASTING OR OTHER APPROVED METHODS TO PROVIDE SUITABLE BOND BETWEEN THE BEAM AND THE DIAPHRAGM IN ACCORDANCE WITH ARTICLE 2403.03, I, OF THE STANDARD SPECIFICATIONS.

ALL BEAMS ARE TO BE INCREASED IN LENGTH TO COMPENSATE FOR ELASTIC SHORTENING, CREEP AND SHRINKAGE.

IF THE STEEL DIAPHRAGM OPTION IS ALLOWED AND USED, HOLES MUST BE CAST IN THE WEB TO ACCOMMODATE THE STEEL DIAPHRAGM ATTACHMENTS AS DETAILED ON THE STEEL DIAPHRAGM DETAIL SHEET.

IF SOLE PLATE IS REQUIRED FOR BEARING, SOLE PLATE IS TO BE SET IN FORMS WHEN BEAM IS CAST AND FORMED OUT BELOW TO EXCLUDE CONCRETE AS DETAILED ON THE BEARING SHEET.

0.6" DIAMETER STRANDS STRESSED TO NOT MORE THAN 5,000 LBS. EACH MAY BE USED IN LIEU OF THE ϕ BARS WHICH RUN THE FULL LENGTH OF THE BEAM IN THE TOP FLANGE.




"B" BEAM
CROSS SECTION


$$A = 382.5 \text{ in.}^2$$
$$Y_b = 17.06 \text{ in.}$$
$$I = 62,000 \text{ in.}^4$$

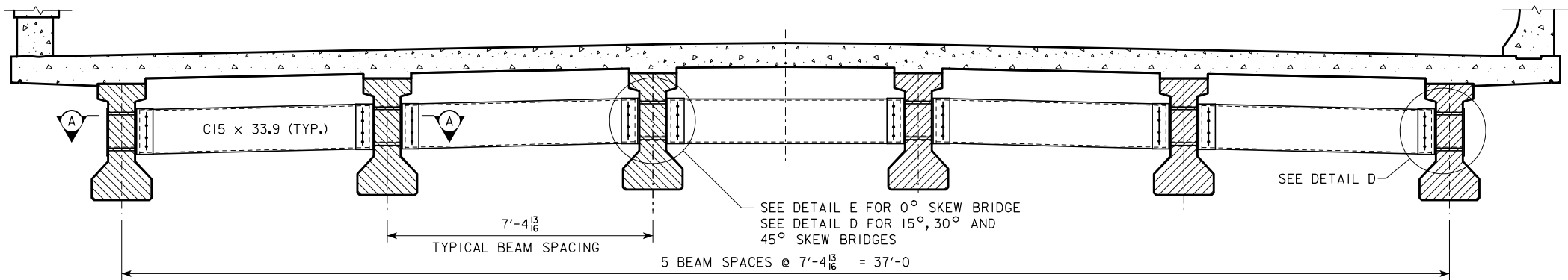
NOTE: BARS 3d ARE TO
BE PLACED IN PAIRS.

- DEFLECTED STRANDS
- * KEEP
- Δ DIMENSIONS AT END OF BEAM
- ΔΔ EPOXY COATED BARS

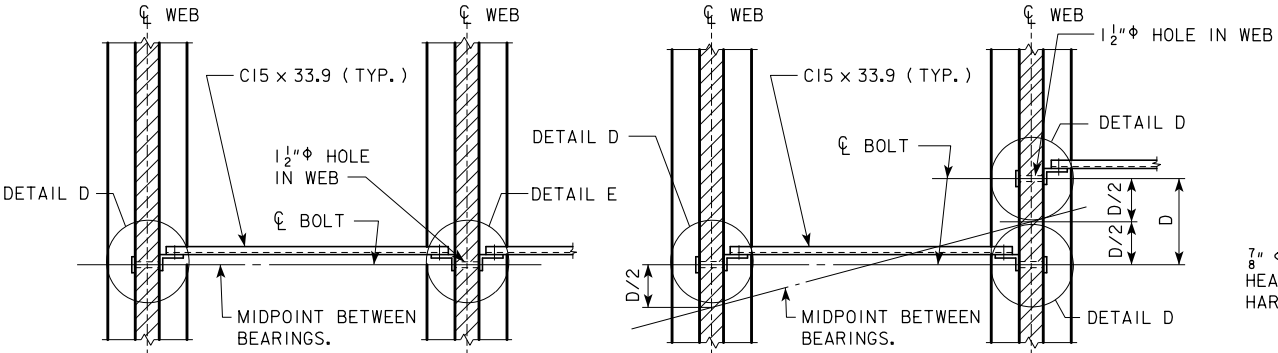
SYMMETRICAL ABOUT ζ 

NOTE: DIMENSIONS FOR THE LOCATION OF THE DEFLECTED STRANDS ARE AT ζ BEAM AND END OF BEAM.

LATEST REVISION DATE <i>Norman L. McDaniel</i> APPROVED BY BRIDGE ENGINEER		
	STANDARD DESIGN - 40' ROADWAY, THREE SPAN BRIDGE PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES SEPTEMBER, 2014	
	B BEAM DETAILS	H40-35-14



SECTION SHOWING INTERMEDIATE DIAPHRAGM



SECTION A-A
FOR 0° SKEW BRIDGES

SECTION A-A
FOR 15°, 30° AND 45° SKEW BRIDGES

INTERMEDIATE DIAPHRAGM STRUCTURAL STEEL

ONE CONNECTION DETAIL "E"

2 - 7/8" ϕ x LENGTH H.S. BOLTS WITH NUTS AND WASHERS			BRIDGE SKEW		BRIDGE SKEW	
WEB THICKNESS (IN.)	LENGTH OF H.S. BOLTS (IN.)	WEIGHT PER DETAIL "E" (LB.)	0°	15°, 30° & 45°	0°	15°, 30° & 45°
6	9	4.30	12	0	51.6	0.0
9	12	5.34	12	0	64.1	0.0
2 - L6 x 4 x 1/2 x 1'-3 1/4 = 41.2 LB			12	0	494.4	0.0

ONE CONNECTION DETAIL "D"

2 - 7/8" ϕ x LENGTH H.S. BOLTS WITH NUTS AND WASHERS			BRIDGE SKEW		BRIDGE SKEW	
WEB THICKNESS (IN.)	LENGTH OF H.S. BOLTS (IN.)	WEIGHT PER DETAIL "D" (LB.)	0°	15°, 30° & 45°	0°	15°, 30° & 45°
6	9	4.30	6	30	25.8	129.0
9	12	5.34	6	30	32.0	160.2
1 - BACKING PL 4 x 3/8 x 1'-3 1/4 = 6.5 LB			6	30	39.0	195.0
1 - L 6 x 4 x 1/2 x 1'-3 1/4 = 20.6 LB			6	30	123.6	618.0

* ONE C15 x 33.9 DIAPHRAGM

WEB THICKNESS (IN.)	BEAM SPACING	LENGTH	NO. OF DIAPH.	UNIT WEIGHT (LB.)	WEIGHT (LB.)
6	7'-4 13/16	6'-7 7/16	15	224.4	3366.2
9	7'-4 13/16	6'-4 1/16	15	215.9	3239.0

DIAPHRAGM CONNECTION BOLTS

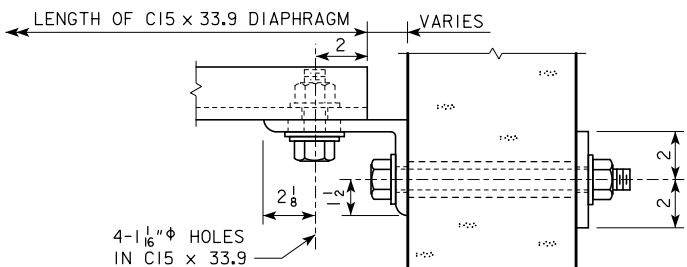
8 - 7/8" ϕ x 0'-2 3/4 H.S. BOLTS WITH NUTS AND WASHERS, PER UNIT DIAPHRAGM = 10.3 LB	NO. OF DIAPH.	WEIGHT (LB.)
	15	154.5

* THE LENGTH OF THE C15 x 33.9 IS BASED ON A VARIABLE CLEARANCE OF 1/16 TO 2/16 BETWEEN THE FACE OF BEAM WEB AND END OF C15 x 33.9.

TOTAL WEIGHT		BRIDGE SKEW	
WEB THICKNESS (IN.)		0°	15°, 30° & 45°
6		4255	4463
9		4147	4367

INTERMEDIATE DIAPHR. STRUCT. STEEL - TOTAL (LB.) =
INTERMEDIATE DIAPHR. STRUCT. STEEL - TOTAL (LB.) =

NOTE:
THE STRUCTURAL STEEL DIAPHRAGM WEIGHTS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.



SECTION B-B

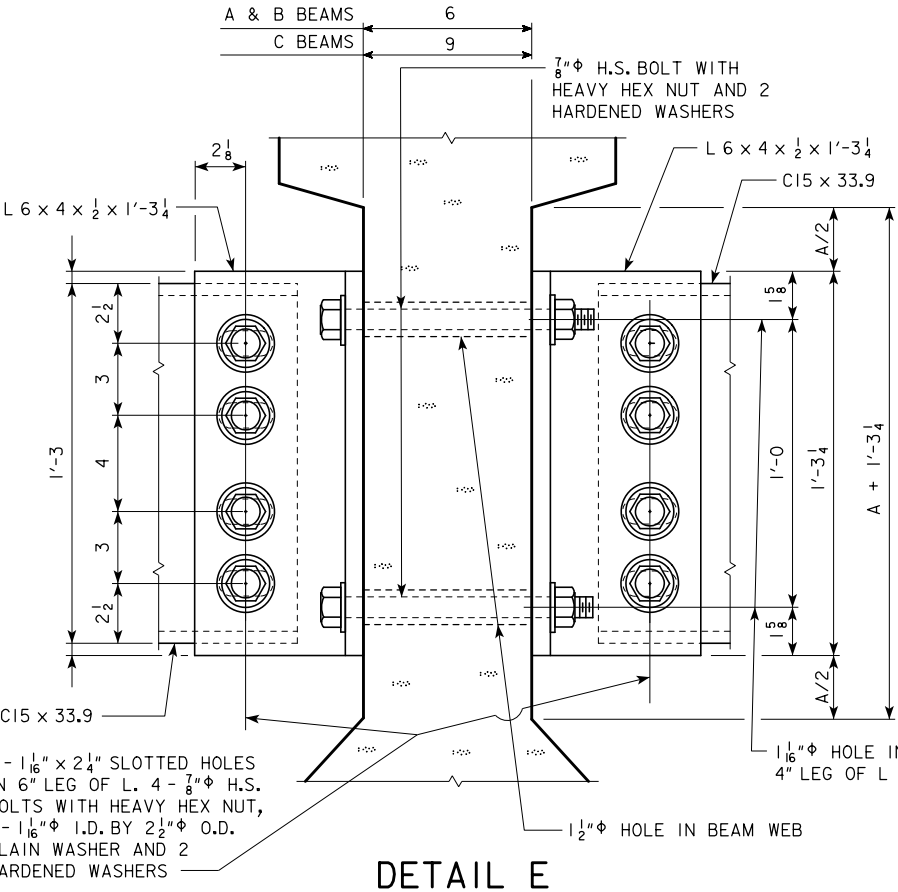
DETAIL D

BEAM SERIES	DIMENSIONS	
	A + 1'-3 1/4	A/2
A	1'-4	3/8
B	1'-8	2 3/8
C	2'-1	4 3/8

NOTES:

- ALL DIAPHRAGM MATERIALS, INCLUDING BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED.
- SHOP DRAWINGS OF THE STEEL DIAPHRAGMS SHOWING LAYOUT AND DETAILS OF THE DIAPHRAGMS SHALL BE SUBMITTED FOR APPROVAL.
- ALL COSTS FOR FURNISHING AND INSTALLING STEEL INTERMEDIATE DIAPHRAGMS SHALL BE INCLUDED IN THE PRICE BID FOR STRUCTURAL STEEL.
- THE 1 1/2" ϕ HOLES FOR THE 7/8" ϕ H.S. BOLTS SHALL BE CAST INTO THE WEB. DRILLING IS NOT ALLOWED.
- THE 7/8" ϕ H.S. BOLTS THROUGH THE WEB SHALL HAVE A THREAD LENGTH OF 3" MIN. AND 4" MAX. AND SHALL MEET THE REQUIREMENTS OF ASTM A449.
- ALL BOLTS ARE TO BE TIGHTENED PRIOR TO PLACING BRIDGE FLOOR CONCRETE.

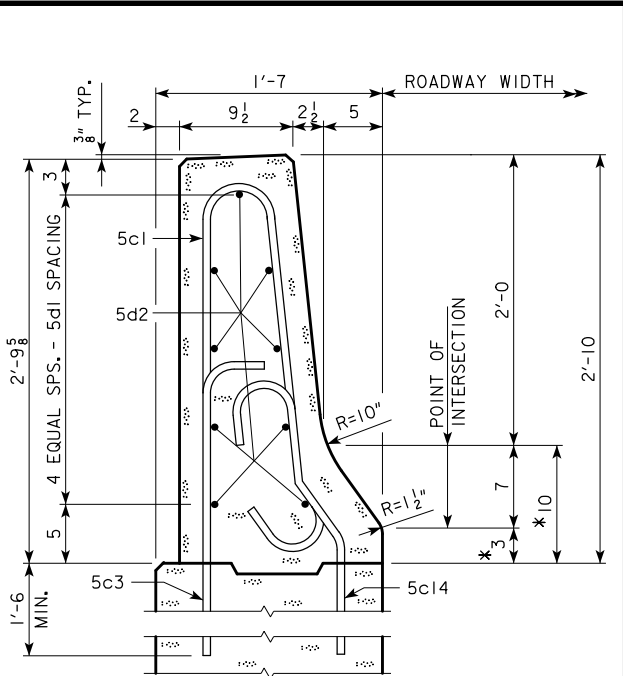
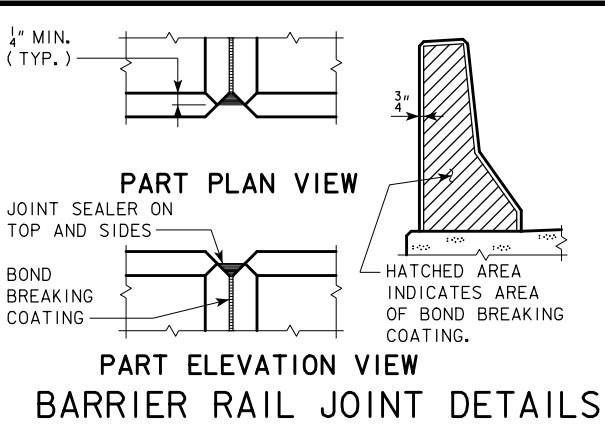
CONCRETE DIAPHRAGM DETAILS SHALL BE PROVIDED IN THE BRIDGE PLANS FOR OVERHEAD BRIDGES. DESIGNER SHALL ADJUST THE CONCRETE, REINFORCING AND STRUCTURAL STEEL QUANTITIES ACCORDINGLY.



DETAIL E

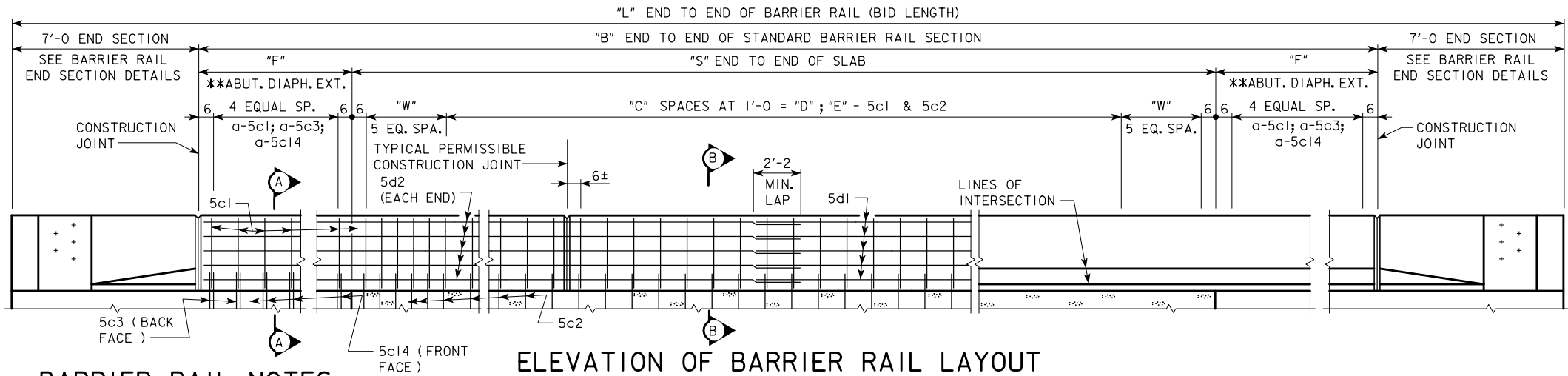
LATEST REVISION DATE	<i>Norman L. McDaniel</i> APPROVED BY BRIDGE ENGINEER		
		STANDARD DESIGN - 40' ROADWAY, THREE SPAN BRIDGE	
		PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES SEPTEMBER, 2014	
		INTERMEDIATE STEEL DIAPHRAGMS	H40-38-14

TABLE OF BARRIER RAIL DIMENSIONS AND NUMBERS																		
℄-℄ ABUT. BRG		138'-10				151'-4				163'-10				176'-4				℄-℄ ABUT. BRG
SKEW		0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°	SKEW
DIMENSION OR NUMBER	L (FT.-IN.)	155'-10	155'-11¼	156'-3⅝	157'-0⅞	168'-4	168'-5¼	168'-9⅝	169'-6⅞	180'-10	180'-11¼	181'-3⅝	182'-0⅞	193'-4	193'-5¼	193'-9⅝	194'-6⅞	L (FT.-IN.)
	B (FT.-IN.)	141'-10	141'-11¼	142'-3⅝	143'-0⅞	154'-4	154'-5¼	154'-9⅝	155'-6⅞	166'-10	166'-11¼	167'-3⅝	168'-0⅞	179'-4	179'-5¼	179'-9⅝	180'-6⅞	B (FT.-IN.)
	S (FT.-IN.)	141'-10	141'-11¼	142'-3⅝	143'-0⅞	154'-4	154'-5¼	154'-9⅝	155'-6⅞	166'-10	166'-11¼	167'-3⅝	168'-0⅞	179'-4	179'-5¼	179'-9⅝	180'-6⅞	S (FT.-IN.)
	C	133	133	133	133	145	145	145	145	158	158	158	158	170	170	170	170	C
	D (FT.-IN.)	133'-0	133'-0	133'-0	133'-0	145'-0	145'-0	145'-0	145'-0	158'-0	158'-0	158'-0	158'-0	170'-0	170'-0	170'-0	170'-0	D (FT.-IN.)
	E	134	134	134	134	146	146	146	146	159	159	159	159	171	171	171	171	E
	F (FT.-IN.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	F (FT.-IN.)
DIMENSION OR NUMBER	W (FT.-IN.)	3'-11	3'-11⅝	4'-1¾	4'-6½	4'-2	4'-2⅝	4'-4¾	4'-9½	3'-11	3'-11⅝	4'-1¾	4'-6½	4'-2	4'-2⅝	4'-4¾	4'-9½	W (FT.-IN.)
	a	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	



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

TABLE OF BARRIER RAIL DIMENSIONS AND NUMBERS																							
℄-℄ ABUT. BRG		188'-10				201'-4				213'-10				226'-4				243'-0				℄-℄ ABUT. BRG	
SKEW		0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°	SKEW	
DIMENSION OR NUMBER	L (FT.-IN.)	205'-10	205'-11¼	206'-3⅝	207'-0⅞	228'-4	228'-4	228'-4	228'-4	240'-10	240'-10	240'-10	240'-10	253'-4	253'-4	253'-4	253'-4	270'-0	270'-0	270'-0	270'-0	L (FT.-IN.)	DIMENSION OR NUMBER
	B (FT.-IN.)	191'-10	191'-11¼	192'-3⅝	193'-0⅞	214'-4	214'-4	214'-4	214'-4	226'-10	226'-10	226'-10	226'-10	239'-4	239'-4	239'-4	239'-4	256'-0	256'-0	256'-0	256'-0	B (FT.-IN.)	
	S (FT.-IN.)	191'-10	191'-11¼	192'-3⅝	193'-0⅞	204'-4	204'-5¼	204'-9⅝	205'-6⅞	216'-10	216'-11¼	217'-3⅝	218'-0⅞	229'-4	229'-5¼	229'-9⅝	230'-6⅞	246'-0	246'-1¼	246'-5⅝	247'-2⅞	S (FT.-IN.)	
	C	183	183	183	183	195	195	195	195	208	208	208	208	220	220	220	220	237	237	237	237	C	
	D (FT.-IN.)	183'-0	183'-0	183'-0	183'-0	195'-0	195'-0	195'-0	195'-0	208'-0	208'-0	208'-0	208'-0	220'-0	220'-0	220'-0	220'-0	237'-0	237'-0	237'-0	237'-0	D (FT.-IN.)	
	E	184	184	184	184	196	196	196	196	209	209	209	209	221	221	221	221	238	238	238	238	E	
	F (FT.-IN.)	0	0	0	0	5'-0	4'-11⅜	4'-9¼	4'-4½	5'-0	4'-11⅜	4'-9¼	4'-4½	5'-0	4'-11⅜	4'-9¼	4'-4½	5'-0	4'-11⅜	4'-9¼	4'-4½	F (FT.-IN.)	
	W (FT.-IN.)	3'-11	3'-11⅝	4'-1¾	4'-6½	4'-2	4'-2⅝	4'-4¾	4'-9½	3'-11	3'-11⅝	4'-1¾	4'-6½	4'-2	4'-2⅝	4'-4¾	4'-9½	4'-0	4'-0⅝	4'-2¾	4'-7½	W (FT.-IN.)	
	a	0	0	0	0	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	a	



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.

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 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.

IF CONDUIT IS REQUIRED IN THIS PLAN THE RIGID STEEL CONDUIT, JUNCTION BOXES AND FITTINGS INCLUDING LABOR AND ANY ADDITIONAL WORK TO DO THE INSTALLATION IS CONSIDERED INCIDENTAL TO THE COST OF THE RAILING.

ALL BARRIER RAIL REINFORCING STEEL IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

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

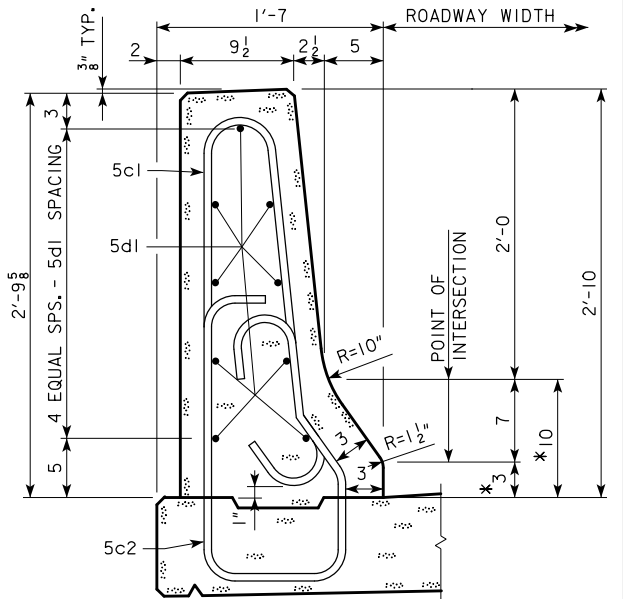
THE JOINT SEALER SHALL BE LIGHT GRAY NONSAG LATEX CAULKING SEALER MARKETING FOR OUTDOOR USE. NO TESTING OR CERTIFICATION IS REQUIRED.

TOP OF THE BARRIER RAIL IS TO BE PARALLEL TO THE THEORETICAL ℄ GRADE.

CROSS SECTIONAL AREA OF THE STANDARD SECTION OF THE BARRIER RAIL = 2.84 SQUARE FEET.

CONCRETE BARRIER RAILS PLACED USING THE SLIPFORM METHOD WILL REQUIRE THE USE OF A CLASS BR CONCRETE IN ACCORDANCE WITH ARTICLE 2513.03, A, 2, OF THE STANDARD SPECIFICATIONS. CAST-IN-PLACE BARRIER RAILS SHALL USE CLASS C MIX. CLASS D CONCRETE IS NOT PERMITTED FOR CONCRETE BARRIER RAILS (CAST-IN-PLACE OR SLIPFORMED METHOD).

** APPLIES TO 201'-4, 213'-10, 226'-4 & 243'-0 BRIDGES ONLY.




PART SECTION B-B

LATEST REVISION DATE	<i>Norman L. McDaniel</i> APPROVED BY BRIDGE ENGINEER		
		STANDARD DESIGN - 40' ROADWAY, THREE SPAN BRIDGE PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES SEPTEMBER, 2014	
		BARRIER RAIL DETAILS SHEET 1 OF 3	H40-39-14



PART VIEW F-F

SECTION D-D

LATEST REVISION DATE	<i>Norman L. McDaniel</i> APPROVED BY BRIDGE ENGINEER	 IOWA DOT Highway Division	
		STANDARD DESIGN - 40' ROADWAY, THREE SPAN BRIDGE PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES SEPTEMBER, 2014	
		BARRIER RAIL END SECTION DETAILS SHEET 2 OF 3	H40-40-14

(NOTE: THESE REINFORCING BARS TO BE USED ON ALL SKEWS)

EPOXY COATED REINFORCING STEEL TOTAL LBS.		4,581		5,004		5,400		5,782		6,218		6,887		7,282		7,705		8,228
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(NOTE: THESE REINFORCING BARS TO BE USED ON ALL SKEWS)

STAINLESS STEEL REINFORCING STEEL TOTAL LBS.		1,802		1,952		2,115		2,265		2,428		2,726		2,889		3,039		3,252
--	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------

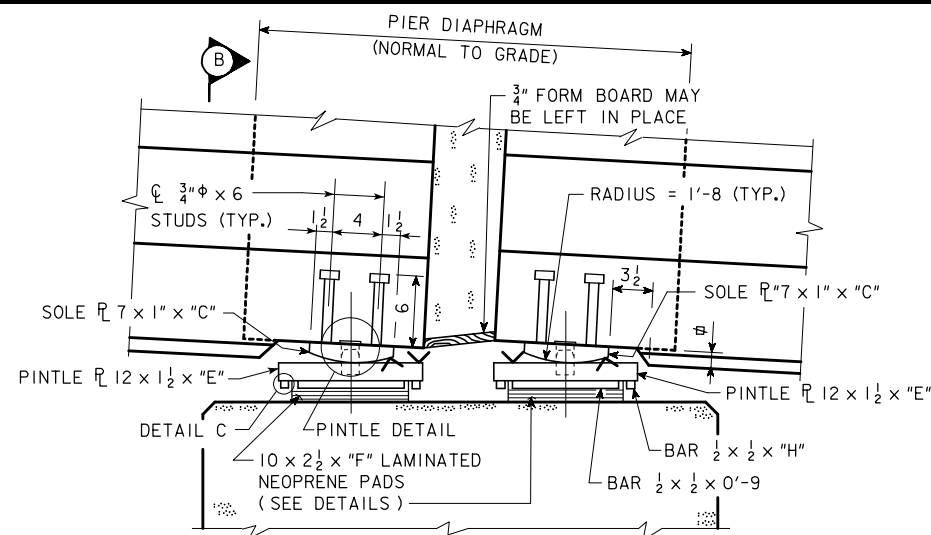
NOTE: REINFORCING STEEL QUANTITIES ARE TO BE INCLUDED
ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.



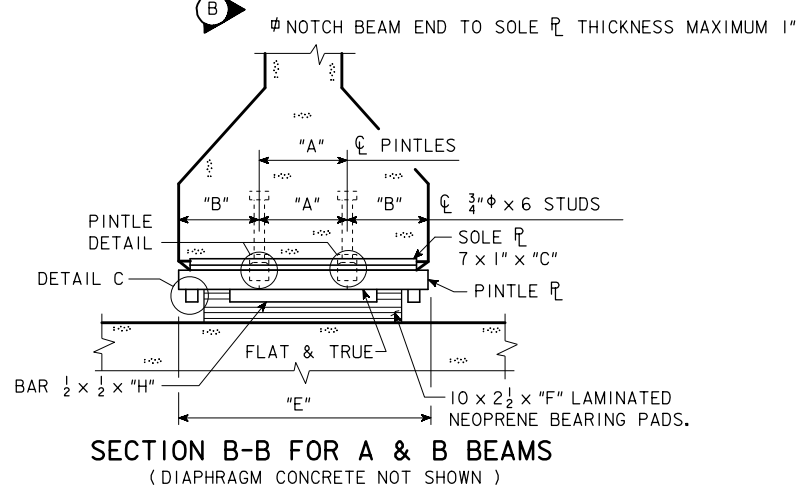
BRIDGE LENGTH		138'-10	151'-4	163'-10	176'-4	188'-10	201'-4	213'-10	226'-4	243'-0
STANDARD SECTION	* 2 x "B" @ 0.1052 C.Y. PER FT.	30.1	32.7	35.4	38.0	40.6	45.1	47.7	50.4	53.9
BARRIER RAIL END SECTION	4 @ 0.65 C.Y.	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
TOTAL C.Y.		32.7	35.3	38.0	40.6	43.2	47.7	50.3	53.0	56.5

CONCRETE BARRIER RAIL QUANTITIES - L.F.									
BRIDGE LENGTH	138'-10	151'-4	163'-10	176'-4	188'-10	201'-4	213'-10	226'-4	243'-0
CONCRETE BARRIER RAILING 0° SKEW	311.7	336.7	361.7	386.7	411.7	456.7	481.7	506.7	540.0
CONCRETE BARRIER RAILING 15° SKEW	311.9	336.9	361.9	386.9	411.9	456.7	481.7	506.7	540.0
CONCRETE BARRIER RAILING 30° SKEW	312.6	337.6	362.6	387.6	412.6	456.7	481.7	506.7	540.0
CONCRETE BARRIER RAILING 45° SKEW	314.2	339.2	364.2	389.2	414.2	456.7	481.7	506.7	540.0

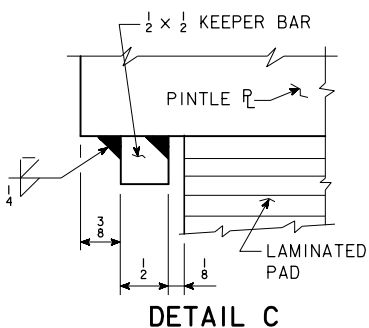
Norman L. Mc Donald
APPROVED BY BRIDGE ENGINEER



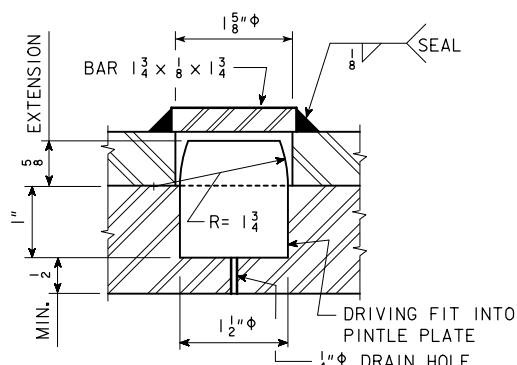
PART ELEVATION



SECTION B-B FOR A & B BEAMS
(DIAPHRAGM CONCRETE NOT SHOWN)



DETAIL C

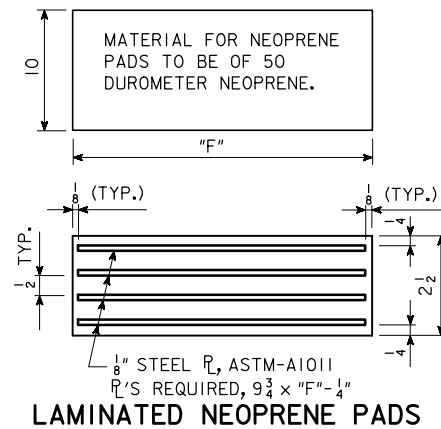


PINTLE DETAIL

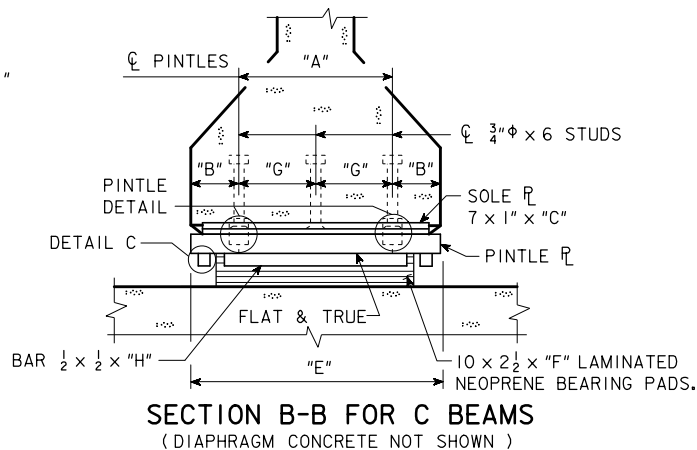
EXPANSION PIER BEARING NOTES:

SURFACES MARKED "V" SHALL BE FINISHED ANSI 250.
PINTLE PLATES ARE A PART OF THE SUPERSTRUCTURE "STRUCTURAL STEEL QUANTITY".
COSTS OF ANCHORED CURVED SOLE PLATES AND NEOPRENE PADS ARE TO BE INCLUDED IN THE PRICE BID FOR "PRETENSIONED PRESTRESSED CONCRETE BEAMS".
THE SOLE PLATES AND PINTLE PLATES SHALL BE GALVANIZED. ALL WELDING SHALL BE COMPLETED PRIOR TO GALVANIZING. THE SURFACE OF THE PINTLE PLATE IN CONTACT WITH THE LAMINATED NEOPRENE PADS SHALL BE FREE OF PROJECTIONS DUE TO THE GALVANIZING.
SOLE PLATES ARE TO BE SET IN FORMS WHEN BEAMS ARE CAST AND THE BOTTOM OF BEAMS FORMED OUT AS SHOWN TO EXCLUDE CONCRETE.
SOLE PLATES SHALL COMPLY WITH ONE OF THE FOLLOWING :
ASTM A 514 GRADE B
ASTM A 709 GRADE HPS 70W

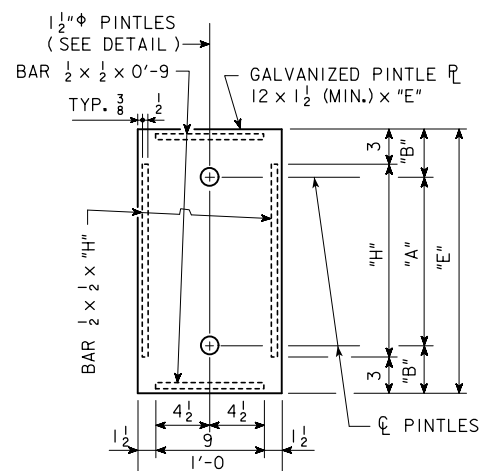
EXPANSION PIER LAMINATED NEOPRENE PAD / CURVED SOLE PLATE ASSEMBLY



LAMINATED NEOPRENE PADS

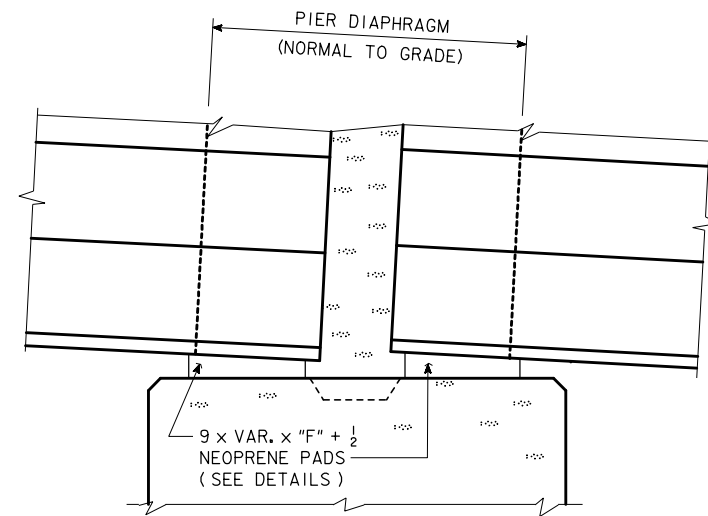


SECTION B-B FOR C BEAMS
(DIAPHRAGM CONCRETE NOT SHOWN)

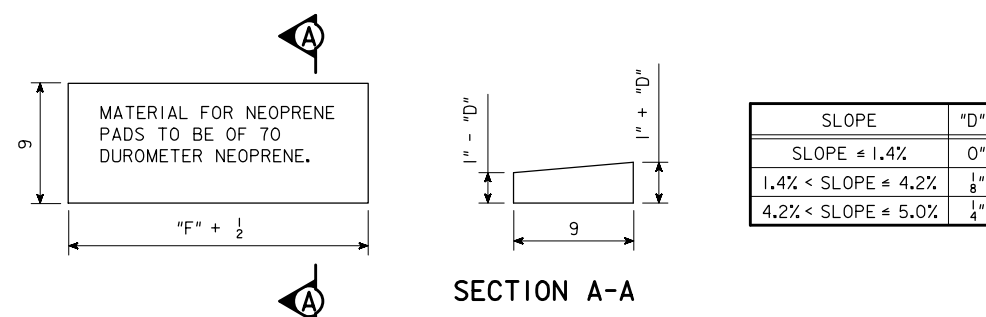


PLAN OF PINTLE PLATE

STRUCTURAL STEEL			
DATA FOR ONE BEARING			
BEAM SIZE	A	B	C
WEIGHT (LBS.)	89	89	106
DOES NOT INCLUDE CURVED SOLE PLATE			
NOTE: STRUCTURAL STEEL WEIGHT IS INCLUDED ON THE SUMMARY QUANTITIES SHEET.			



PART ELEVATION



SECTION A-A

PLAN OF NEOPRENE PAD

$$\text{SLOPE}_{\text{SPAN 1}} = 100\% \frac{\text{P/G ELEV. @ NEAR ABUT.} - \text{P/G ELEV. @ PIER 1}}{\text{SPAN 1 LENGTH}}$$

$$\text{SLOPE}_{\text{SPAN 2}} = 100\% \frac{\text{P/G ELEV. @ PIER 1} - \text{P/G ELEV. @ PIER 2}}{\text{SPAN 2 LENGTH}}$$

$$\text{SLOPE}_{\text{SPAN 3}} = 100\% \frac{\text{P/G ELEV. @ PIER 2} - \text{P/G ELEV. @ FAR ABUT.}}{\text{SPAN 3 LENGTH}}$$

SLOPE CALCULATION FORMULA

FIXED PIER

FIXED PIER BEARING NOTES:

IF CALCULATED SLOPE FOR A GIVEN SPAN EXCEEDS 1.4%, THE NEOPRENE BEARING PADS AT THE FIXED PIER FOR THAT SPAN SHALL BE TAPERED. REFER TO TABLE FOR DIMENSIONS OF TAPERED PADS.
COST OF NEOPRENE PADS SHALL BE INCLUDED IN THE PRICE BID FOR "PRETENSIONED PRESTRESSED CONCRETE BEAMS".

VARIABLE DIMENSIONS

	BEAM BOTTOM FLANGE WIDTH	
	A & B BEAMS 1'-5"	C BEAMS 1'-8"
"A"	0'-6"	1'-0"
"B"	0'-5 1/2"	0'-4"
"C"	1'-3 1/2"	1'-6 1/2"
"E"	1'-5"	1'-8"
"F"	1'-3"	1'-6"
"G"		0'-6"
"H"	0'-11"	1'-2"

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

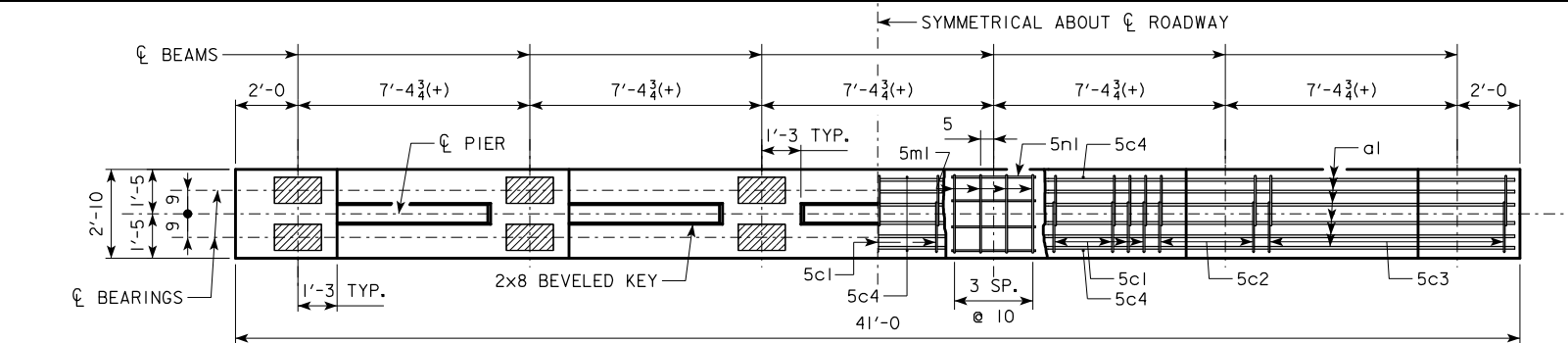
STANDARD DESIGN - 40' ROADWAY, THREE SPAN BRIDGE

**PRETENSIONED PRESTRESSED
CONCRETE BEAM BRIDGES**

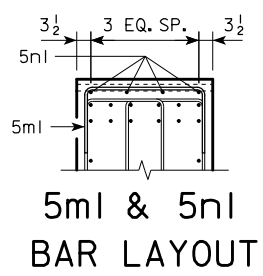
SEPTEMBER, 2014

PIER BEARING DETAILS

H40-44-14

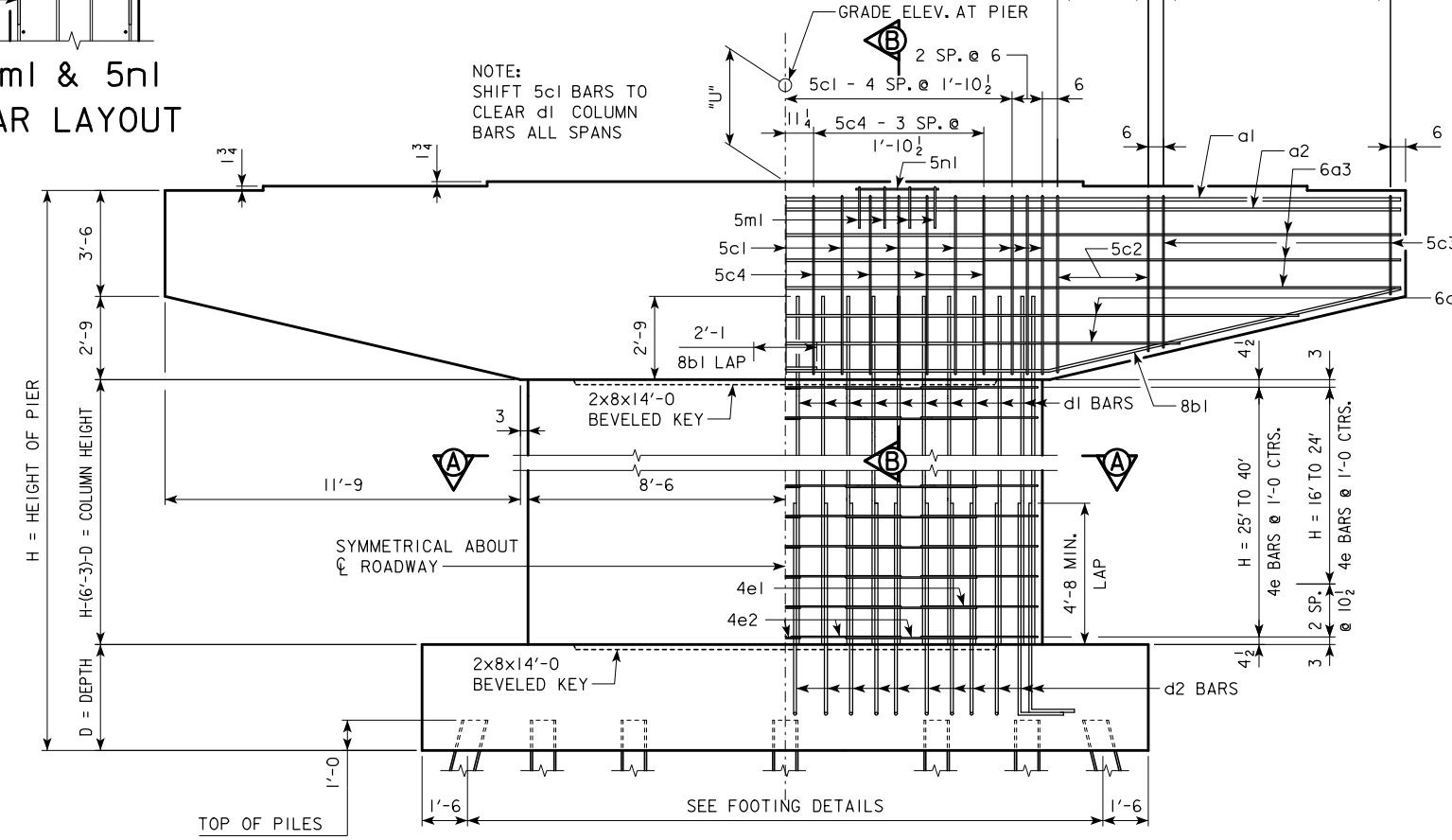


CAP PLAN

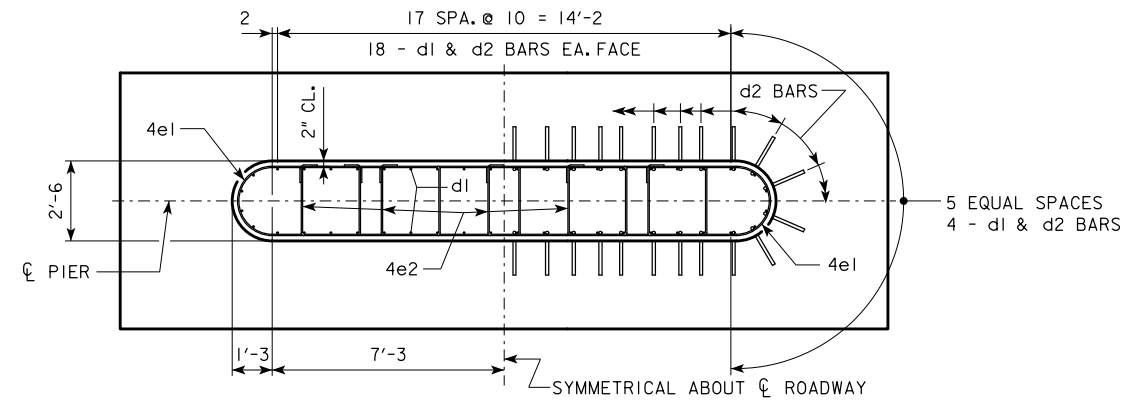


5m1 & 5n1
BAR LAYOUT

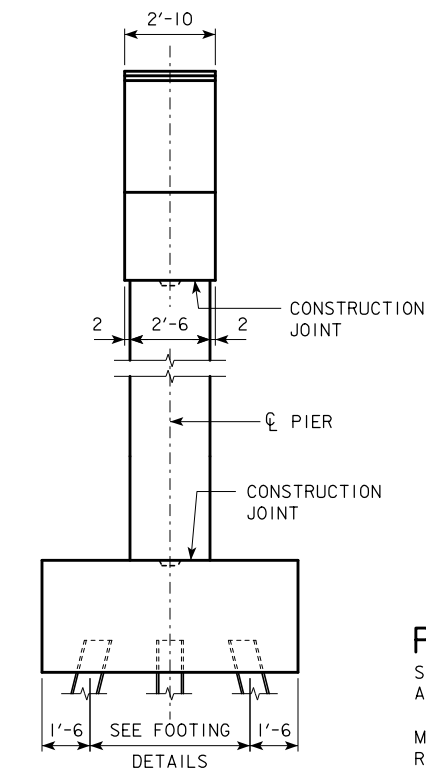
5c2 - 3 SP. @ 1'-0" = 3'-0" - 138'-10", 151'-4", 163'-10", 176'-4", 188'-10",
201'-4", 213'-10", 226'-4" - 5c3
5c2 - 4 SP. @ 9" = 3'-0" - 176'-4", 188'-10", 201'-4"
5c2 - 6 SP. @ 6" = 3'-0" - 213'-10", 226'-4", 243'-0"



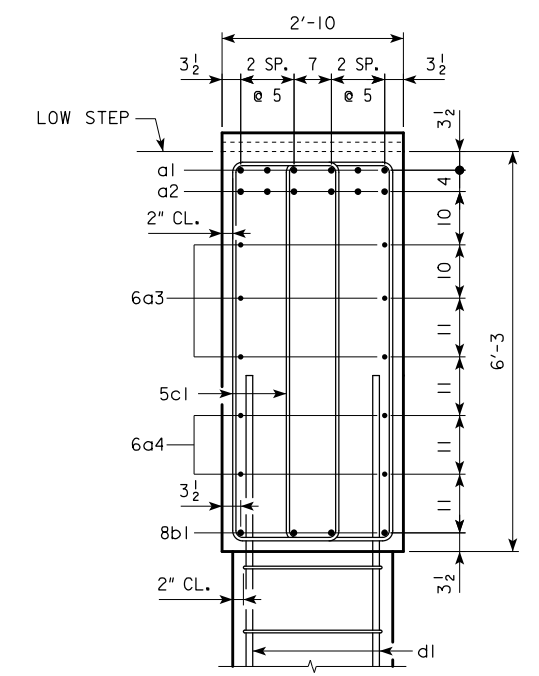
FRONT ELEVATION



SECTION A-A



END ELEVATION

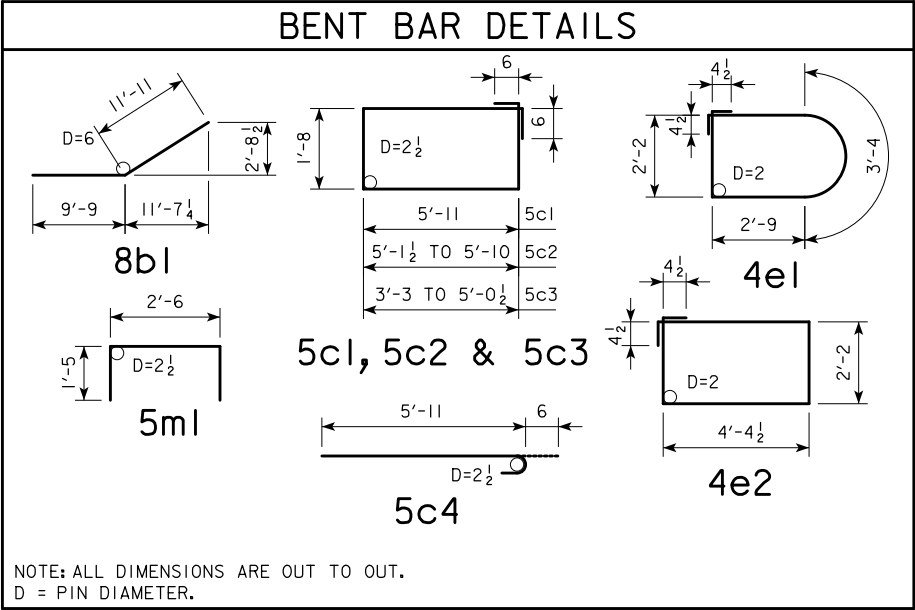


SECTION B-B

PIER NOTES:












- SEE "TEE PIER NOTES" ON H40-02-14 FOR NOTES REGARDING APPLICATION OF THESE PIER STANDARDS.
- MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR SHALL BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.
- ELIMINATE 2X8 BEVELED KEYWAY ON TOP OF CAP FOR EXPANSION PIERS.
- FOR SIZE OF BEARING PADS, SEE H40-44-14.
- SEE SHEET H40-09-14 FOR "U" DIMENSION.




LATEST REVISION DATE	<i>Norman L. McDaniel</i> APPROVED BY BRIDGE ENGINEER		
		STANDARD DESIGN - 40' ROADWAY, THREE SPAN BRIDGE PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES SEPTEMBER, 2014	
		TEE PIER CAP AND COLUMN 0° SKEW	H40-57-14



NOTE: THE REINFORCING STEEL QUANTITIES FOR THE CAP AND COLUMN ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITIES FOR THE CAP AND COLUMN ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

CAP																														
REINFORCING STEEL	CL - CL ABUT. BEARINGS			138'-10			151'-4			163'-10			176'-4			188'-10			201'-4			213'-10			226'-4			243'-0		
	BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
	a1	40'-8		6	9	830	6	9	830	6	10	1050	6	10	1050	6	10	1050	6	11	1296	6	11	1296	6	11	1296	6	11	1296
	a2	40'-8		6	9	830	6	9	830	6	9	830	6	9	830	6	10	1050	6	10	1050	6	10	1050	6	11	1296	6	11	1296
	6a3	40'-8		6	6	366	6	6	366	6	6	366	6	6	366	6	6	366	6	6	366	6	6	366	6	6	366	6	6	366
	6a4	VARIES		4	6	182	4	6	182	4	6	182	4	6	182	4	6	182	4	6	182	4	6	182	4	6	182	4	6	182
	8b1	21'-8		8	8	463	8	8	463	8	8	463	8	8	463	8	8	463	8	8	463	8	8	463	8	8	463	8	8	463
	5c1	16'-2		26	5	438	26	5	438	26	5	438	26	5	438	26	5	438	26	5	438	26	5	438	26	5	438	26	5	438
	5c2	VARIES		16	5	255	16	5	255	16	5	255	20	5	319	20	5	319	20	5	319	28	5	447	28	5	447	28	5	447
	5c3	VARIES		36	5	474	36	5	474	36	5	474	36	5	474	36	5	474	36	5	474	36	5	474	36	5	474	40	5	527
5c4	6'-5		16	5	107	16	5	107	16	5	107	16	5	107	16	5	107	16	5	107	16	5	107	16	5	107	16	5	107	
5m1	5'-4		8	5	45	8	5	45	8	5	45	8	5	45	8	5	45	8	5	45	8	5	45	8	5	45	8	5	45	
5n1	2'-8		8	5	22	8	5	22	8	5	22	8	5	22	8	5	22	8	5	22	8	5	22	8	5	22	8	5	22	
TOTAL (LB.)				4012			4012			4232			4296			4516			4762			4890			5136			5189		
STRUCTURAL CONCRETE (CY)				24.3			24.3			24.3			24.3			24.3			24.3			24.3			24.3			24.3		

COLUMN																
H IN FEET	COLUMN HEIGHT	STRUCTURAL CONCRETE (CY)	REINFORCING STEEL													
			d1 BAR 				4e1 BAR 				4e2 BAR 				TOTAL WEIGHT (LB.)	
			NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT		
16	6'-3	9.5	44	9	9'-0	1346	14	4	11'-9	110	28	4	13'-10	259	1715	
17	7'-3	11.1	44	9	10'-0	1496	16	4	11'-9	126	32	4	13'-10	296	1918	
18	8'-3	12.6	44	9	11'-0	1646	18	4	11'-9	141	36	4	13'-10	333	2120	
19	9'-3	14.1	44	9	12'-0	1795	20	4	11'-9	157	40	4	13'-10	370	2322	
20	10'-3	15.6	44	9	13'-0	1945	22	4	11'-9	173	44	4	13'-10	407	2525	
21	11'-3	17.1	44	9	14'-0	2094	24	4	11'-9	188	48	4	13'-10	444	2726	
22	12'-3	18.7	44	9	15'-0	2244	26	4	11'-9	204	52	4	13'-10	481	2929	
23	13'-3	20.2	44	9	16'-0	2394	28	4	11'-9	220	56	4	13'-10	517	3131	
24	14'-3	21.7	44	9	17'-0	2543	30	4	11'-9	235	60	4	13'-10	554	3332	
25	14'-9	22.5	44	9	17'-6	2618	30	4	11'-9	235	60	4	13'-10	554	3407	
26	15'-9	24.0	44	9	18'-6	2768	32	4	11'-9	251	64	4	13'-10	591	3610	
27	16'-9	25.5	44	9	19'-6	2917	34	4	11'-9	267	68	4	13'-10	628	3812	
28	17'-9	27.1	44	9	20'-6	3067	36	4	11'-9	283	72	4	13'-10	665	4015	
29	18'-9	28.6	44	9	21'-6	3216	38	4	11'-9	298	76	4	13'-10	702	4216	
30	19'-9	30.1	44	9	22'-6	3366	40	4	11'-9	314	80	4	13'-10	739	4419	
31	20'-9	31.6	44	9	23'-6	3516	42	4	11'-9	330	84	4	13'-10	776	4622	
32	21'-9	33.2	44	9	24'-6	3665	44	4	11'-9	345	88	4	13'-10	813	4823	
33	22'-9	34.7	44	9	25'-6	3815	46	4	11'-9	361	92	4	13'-10	850	5026	
34	23'-9	36.2	44	9	26'-6	3964	48	4	11'-9	377	96	4	13'-10	887	5228	
35	24'-9	37.7	44	9	27'-6	4114	50	4	11'-9	392	100	4	13'-10	924	5430	
36	25'-9	39.3	44	9	28'-6	4264	52	4	11'-9	408	104	4	13'-10	961	5633	
37	26'-9	40.8	44	9	29'-6	4413	54	4	11'-9	424	108	4	13'-10	998	5835	
38	27'-9	42.3	44	9	30'-6	4563	56	4	11'-9	440	112	4	13'-10	1035	6038	
39	28'-9	43.8	44	9	31'-6	4712	58	4	11'-9	455	116	4	13'-10	1072	6239	
40	29'-9	45.4	44	9	32'-6	4862	60	4	11'-9	471	120	4	13'-10	1109	6442	

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

STANDARD DESIGN - 40' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED
CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

TEE PIER
CAP AND COLUMN

0° SKEW

H40-58-14

THIS SHEET IS INCLUDED TO SHOW SOIL INFORMATION. DETAILS AND NOTES SHOWN ELSEWHERE IN THESE PLANS SHALL BE USED FOR STRUCTURE CONSTRUCTION.

Water Level Observations (Ft.)				
Boring No.	Date Drilled	Station & Offset	While Drilling	End of Drilling
DH-1	1-23-18	370+57 6' RT.	21.50	17.50
DH-2	1-25-18	371+20 7' LT.	16.58	16.58
DH-3	1-26-18	371+81 7' RT.	16.83	16.83
DH-4	1-24-18	372+42 7.5' LT.	20.00	14.33

-H₂O-

WATER

- DRY

DRY

- <

PLUGGED

M

MOISTURE

[Pattern]

SHELBY

[Pattern]

BLOW COUNT

[Pattern]

DENS. CORE

[Symbol]

SAMPLE

BLOW COUNT

LAYER - NO. BLOWS

82 5

[Symbol]

DIAMOND CORE

[Pattern]

SAND

[Pattern]

GRAVELLY SAND

[Pattern]

BOULDERS

SOIL REMEDIATION AREA

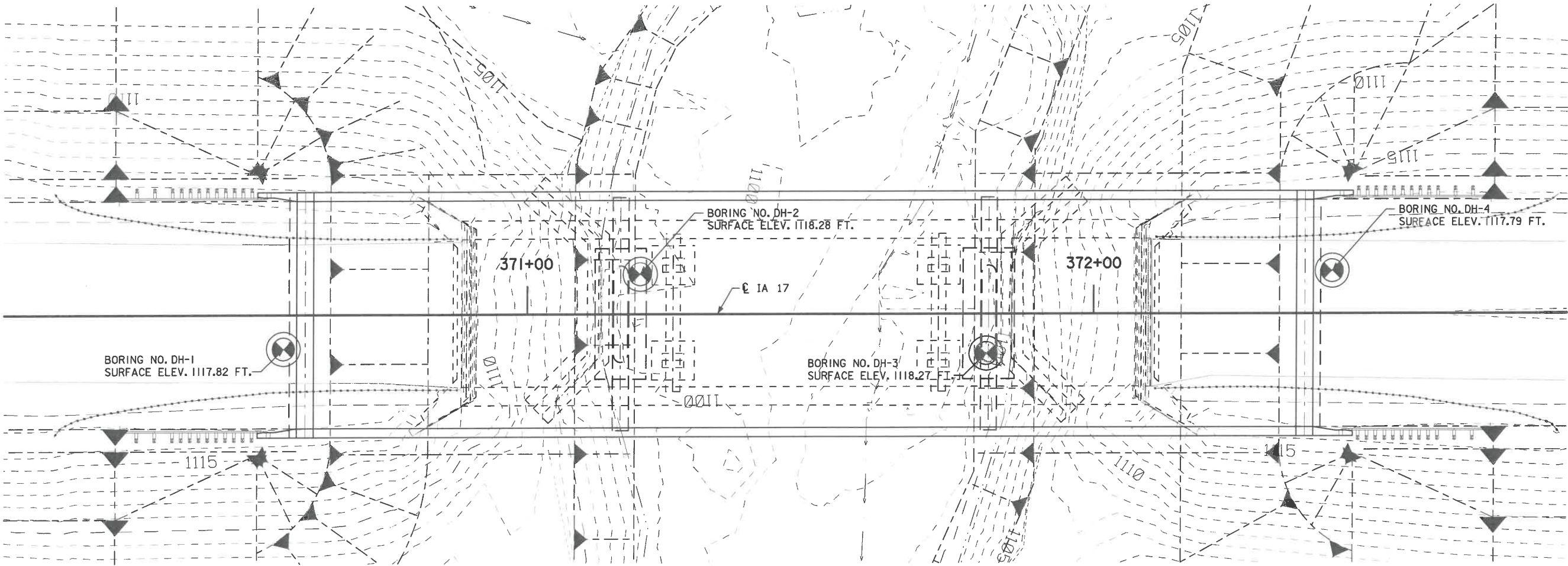
LIMESTONE (LS.)

BROKEN & WEATHERED LS.

SANDSTONE

SHALE

SANDY SOIL



BORING LOCATION PLAN

LOCATION

IA 17 OVER PRAIRIE CREEK
T-93N R-27W, SECTION 25
VERNON TOWNSHIP
HUMBOLDT COUNTY
T-93N R-26W, SECTION 30
BOONE TOWNSHIP
WRIGHT COUNTY
FHWA NO. 54471
BRIDGE MAINT. NO. 9985.4S017
LATITUDE 42.848042°
LONGITUDE -93.971450°

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.

Loras A. Klostermann 10/22/2021
Signature Date
Loras A. Klostermann
Printed or Typed Name
My license renewal date is December 31, 2022

Pages or sheets covered by this seal: SPS.1, SPS.2, AND SPS.3



DESIGN FOR 0° SKEW

176'-4 X 40'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

55'-9 END SPANS (B- BEAM) 64'-10 INTERIOR SPAN

SOIL PROFILE

STA. 371+49.00 (IA. 17)

WRIGHT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 3 FILE NO. 31881 DESIGN NO. 223

DH-1	
LAYER	THICKNESS
A	1.0
B	2.0
C	2.0
D	3.0
E	3.0
F	5.0
G	2.5
H	2.5
I	2.5
J	9.5
K	4.0
L	11.0
M	14.0
N	5.0
O	1.0
P	4.0
Q	5.0
R	11.0
S	6.0

DH-2	
LAYER	THICKNESS
A	0.75
B-AIR GAP	19.25
C	2.0
D	3.0
E	10.0
F	5.0
G	10.0
H	10.0
I	5.0
J	1.0
K	6.0
L	5.0

DH-3	
LAYER	THICKNESS
A	0.75
B-AIR GAP	18.75
C	9.5
D	6.0
E	14.0
F	2.0
G	5.0
H	5.0
I	4.0
J	7.0
K	8.0
L	8.5

DH-4	
LAYER	THICKNESS
A	1.0
B	3.0
C	2.5
D	2.5
E	5.0
F	4.0
G	6.0
H	3.0
I	6.0
J	10.0
K	14.0
L	6.0
M	4.0
N	1.0
O	5.0
P	15.0
Q	6.0
R	2.0

	WATER
	DRY
	PLUGGED
	MOISTURE
	SHELBY
	BLOW COUNT
	DENSITY CORRECTION
	SAMPLE

BLOW COUNT
LAYER - NO. BLOWS

B2 5

DIAMOND
CORE

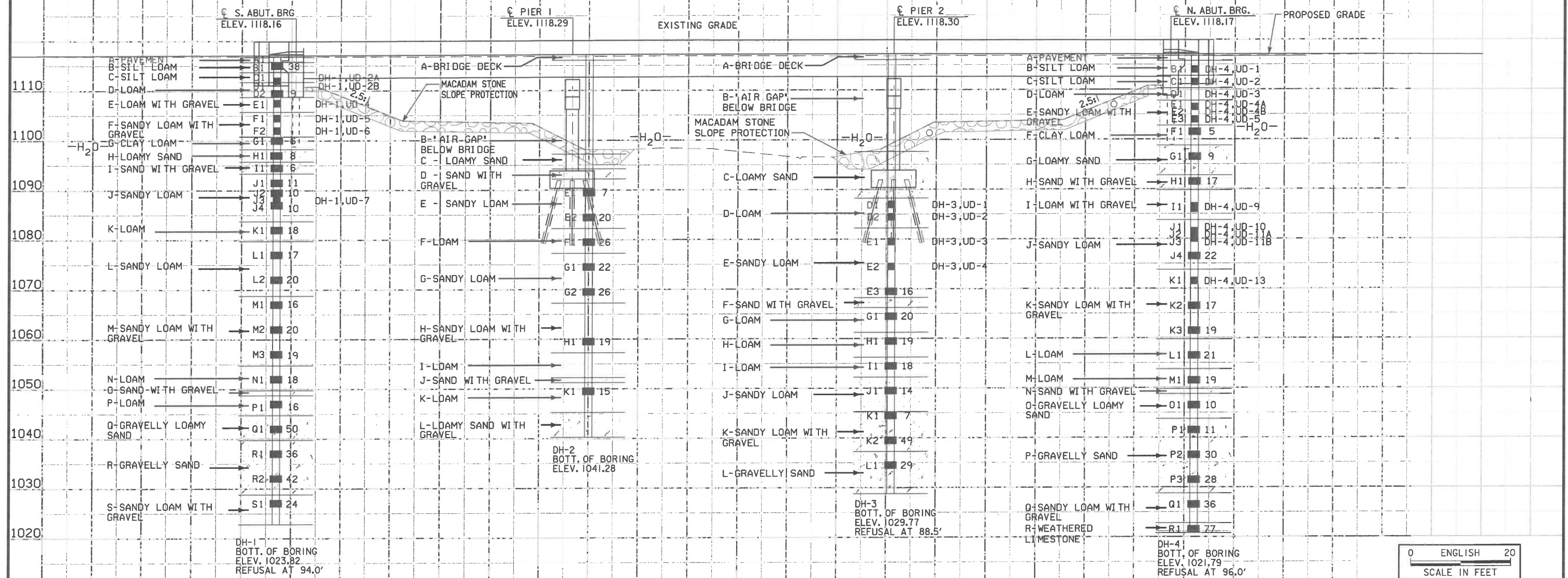
SAND

GRAVEL
SAND

BOULDER

LEGEND

	SOIL REMEDIATION AREA
	LIMESTONE (LS.)
	BROKEN & WEATHERED LS.
	SANDSTONE
	SHALE
	SANDY SOIL



DESIGN FOR 0° SKEW
176'-4 X 40'-0 PRETENSIONED PRESTRESSED
CONCRETE BEAM BRIDGE
55'-9 END SPANS (B- BEAM) 64'-10 INTERIOR SPAN
SOIL PROFILE
STA. 371+49.00 (A. 17)
WRIGHT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 2 OF 3 FILE NO. 31881 DESIGN NO. 223

SHELBY TUBE CORE DATA							
CORE NO.	DH-1, UD-2A	DH-1, UD-2B	DH-1, UD-4	DH-1, UD-5	DH-1, UD-6	DH-1, UD-12	DH-3, UD-1
DEPTH IN FEET	4.0 - 5.0	5.0 - 5.5	8.5 - 10.0	11.5 - 13.0	14.0 - 15.5	28.0 - 29.0	29.5 - 31.0
CLASSIFICATION (AASHTO)	A-7-6(20)	A-7-6(30)	A-7-6(5)	A-6 (3)	A-6(3)	A-4 (1)	A-6
COEFF.CONSO. (SQ.FT /DAY)			1.129				
COHESION (PSF)	UC 1350			UC 470			
EFFECTIVE FRICTION COEFF.							
MOISTURE CONTENT %	27.9		20.2	16.9			13.5
DRY DENSITY - PCF	94.6		102.1	97.1			
CU-CONSOLIDATED UNDRAINED							
UU-UNCONSOLIDATED UNDRAINED							
UC-UNCONFINED COMPRESSION (C=1/2 QU)							

SHELBY TUBE CORE DATA							
CORE NO.	DH-3, UD-2	DH-3, UD-3	DH-3, UD-4	DH-4, UD-1	DH-4, UD-2	DH-4, UD-3	DH-4, UD-4A
DEPTH IN FEET	32.0 - 33.5	37.0 - 38.5	42.0 - 43.5	2.0 - 3.5	4.5 - 6.0	7.0 - 8.5	9.5 - 10.0
CLASSIFICATION (AASHTO)	A-6	A-4 (0)	A-4 (0)	A-6(8)	A-7-6	A-7-6	A-6
COEFF.CONSO. (SQ.FT /DAY)							
COHESION (PSF)				UC 2782	UC 2676	CU 714	CU 714
EFFECTIVE FRICTION COEFF.						0.509	0.509
MOISTURE CONTENT %	12.0	13.6		17.9	19.3	18.7	21.1
DRY DENSITY - PCF		117.1		106.7	108.9	105.3	101.8
CU-CONSOLIDATED UNDRAINED							
UU-UNCONSOLIDATED UNDRAINED							
UC-UNCONFINED COMPRESSION (C=1/2 QU)							

SHELBY TUBE CORE DATA							
CORE NO.	DH-4, UD-4b	DH-4, UD-5	DH-4, UD-9	DH-4, UD-10	DH-4, UD-11a	DH-4, UD-11b	DH-4, UD-13
DEPTH IN FEET	10.0 - 11.0	12.0 - 13.5	29.5 - 31.5	34.5 - 36.0	36.0 - 36.5	36.5 - 37.5	44.5 - 46.0
CLASSIFICATION (AASHTO)	A-6	A-6	A-6	A-6(1)	A-6(1)	A-6(1)	A-4(0)
COEFF.CONSO. (SQ.FT /DAY)							
COHESION (PSF)	CU 714		UU 581		UU 581	UU 581	UC 733
EFFECTIVE FRICTION COEFF.	0.509		0.791		0.791	0.791	
MOISTURE CONTENT %	18.9		13		11.1	11.1	12.1
DRY DENSITY - PCF	99.5		126.2		128.8	128.6	123.5
CU-CONSOLIDATED UNDRAINED							
UU-UNCONSOLIDATED UNDRAINED							
UC-UNCONFINED COMPRESSION (C=1/2 QU)							

H₂O

WATER

DRY

DRY

PLUGGED

PLUGGED

MOISTURE

MOISTURE

SHELBY

SHELBY

BLOW COUNT

BLOW COUNT

DENS. CORE

DENS. CORE

SAMPLE

SAMPLE

BLOW COUNT

LAYER - NO. BLOWS

B2 5

DIAMOND CORE

SAND

GRAVELLY SAND

BOULDERS

SOIL REMEDIATION AREA

LIMESTONE (LS.)

BROKEN & WEATHERED LS.

SANDSTONE

SHALE

SANDY SOIL

THIS SHEET IS INCLUDED TO SHOW SOIL INFORMATION. DETAILS AND NOTES SHOWN ELSEWHERE IN THESE PLANS SHALL BE USED FOR STRUCTURE CONSTRUCTION.

DESIGN FOR 0° SKEW

176'-4 X 40'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

55'-9 END SPANS (B- BEAM) 64'-10 INTERIOR SPAN

SOIL PROFILE

STA. 371+49.00 (1A. 17)

WRIGHT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 3 OF 3 FILE NO. 31881 DESIGN NO. 223

FILE NO. 31881

ENGLISH

DESIGN TEAM SHANNON & WILSON / SCHEMMER

WRIGHT COUNTY

PROJECT NUMBER BRFN-017-4(40)-39-99

SHEET NUMBER SPS.3

3:31:05 PM 10/22/2021 ksnook T:\Projects\07192001\Soils\S4Submittal\SPS_99017040_SCHEMMER_Z04.dgn

ESTIMATED PROJECT QUANTITIES AND REFERENCE NOTES

Roadway :

Item no.	Item Code	Item	Unit	Quantities	Estimate Reference Notes
				Estimated	
				Roadway	
1	2101-0850001	CLEARING AND GRUBBING	ACRE	1.5	Includes all disturbed areas.
2	2102-2625000	EMBANKMENT-IN-PLACE	CY	4,423	See Tab 107-28 in the T sheets for locations and details.
3	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	1,333	
4	2102-2712015	EXCAVATION, CLASS 12, BOULDERS OR ROCK FRAGMENTS	CY	5	A. See Tab. 103-7 in the CS sheets for locations and details.
5	2105-8425011	TOPSOIL, SPREAD	CY	1,312	See Tab 107-28 in the T sheets for locations and details.
6	2105-8425020	TOPSOIL, STRIP AND STOCKPILE	CY	1,748	See the CS sheet and Tab 107-28 in the T sheets for locations and details.
7	2107-0875100	COMPACTION WITH MOISTURE CONTROL	CY	5,448	
8	2121-7425010	GRANULAR SHOULDERS, TYPE A	TON	18	See Tab 112-9 in the C sheets for locations and details.
9	2122-5190008	PAVED SHOULDER, P.C. CONCRETE, 8 IN.	SY	679.1	
10	2123-7450000	SHOULDER CONSTRUCTION, EARTH	STA	7.8	
11	2301-0690203	BRIDGE APPROACH, BR-203	SY	632.1	See Tab 112-6 in the C sheets for locations and details
12	2412-0000100	LONGITUDINAL GROOVING IN CONCRETE	SY	1,310.1	See Tab 100-28 in the C sheets for locations and details.
13	2502-6745952	REMOVAL OF SUBDRAIN	LF	122	See Tab RLS-2 in the CS sheets for locations and details.
14	2502-8212034	SUBDRAIN, LONGITUDINAL, (SHOULDER) 4 IN. DIA.	LF	60	See Tab 104-9 in the CS sheets for locations and details.
15	2502-8221306	SUBDRAIN OUTLET, DR-306	EACH	2	
16	2503-0500402	BRIDGE END DRAIN, DR-402	EACH	4	See Tab 104-8A in the C sheets for locations and details.
17	2505-4008120	REMOVAL OF STEEL BEAM GUARDRAIL	LF	300	See Tab 110-7A in the C sheets for locations and details.
18	2505-4008300	STEEL BEAM GUARDRAIL	LF	100	See Tab 108-8A in the C sheets for locations and details.
19	2505-4008410	STEEL BEAM GUARDRAIL BARRIER TRANSITION SECTION, BA-201	EACH	4	
20	2505-4021010	STEEL BEAM GUARDRAIL END ANCHOR, BOLTED	EACH	4	
21	2505-4021720	STEEL BEAM GUARDRAIL TANGENT END TERMINAL, BA-205	EACH	4	
22	2510-6745850	REMOVAL OF PAVEMENT	SY	522.5	See Tab 110-1 and Tab 102-5 in the C sheets for locations and details.

Item no.	Item Code	Item	Unit	Quantities	Estimate Reference Notes
				Estimated	
				Roadway	
23	2519-3300600	FENCE, SAFETY	LF	124	<p>Install safety fence at specified areas in the plans prior to construction. See the D sheets and Tab. SF-I in the C sheets for locations and details. All safety fence is to remain at the conclusion of this contract.</p> <p>The fence shall be attached to steel posts by a minimum of three zip ties. The posts shall be spaced at a minimum of 10 ft. apart.</p> <p>Method of Measurement: The Engineer shall measure the length of fence installed in linear feet.</p> <p>Basis of Payment: Payment is full compensation for furnishing all material for construction of fence as provided herein.</p> <p>Fencing material shall follow Article 4188.03 of the standard specifications.</p>
24	2520-3350010	FIELD LABORATORY	EACH	1	
25	2527-9263109	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED	STA	7.2	See Tab. 108-22 in the C sheets for locations and details.
26	2528-2518000	SAFETY CLOSURE	EACH	2	See Tab 108-13A in the C sheets for locations and details.
27	2528-8445110	TRAFFIC CONTROL	LS	1	See the J sheets for details.
28	2533-4980005	MOBILIZATION	LS	1	

REMOVAL OF STEEL BEAM GUARDRAIL

REMOVAL OF PAVEMENT

BRIDGE APPROACH SECTION

SCOUR PROTECTION OR ROCK FLUME FOR BRIDGE END DRAIN

C.4