

BRIDGE REPLACEMENT - STEEL GIRDER
BRF-092-7(45)--38-62

MAHASKA COUNTY

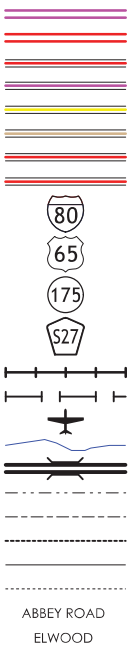
MAHASKA - DESIGN 120

LETTING DATE
12-15-2020

LEGEND

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

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



Highway Division

PLANS OF PROPOSED IMPROVEMENTS ON THE

PRIMARY ROAD SYSTEM

MAHASKA COUNTY

BRIDGE REPLACEMENT - STEEL GIRDER

1A 92 OVER MUCHAKINOCK CREEK

1.3 MI.W.OF 1A 163

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

REVISIONS



1-800-292-8989

www.iowaonecall.com



STANDARD ROAD PLANS

STANDARD ROAD PLANS ARE LISTED
ON SHEET NUMBER C.2

DESIGN DATA RURAL

2021	AADT	3,000	V.P.D.
2041	AADT	3,900	V.P.D.
2041	DHV	--	V.P.H.
TRUCKS		18	%
Total			
Design	ESALS	--	

INDEX OF SEALS

SHEET NO.	NAME	TYPE
I	STANLEY T. STALLSMITH	STRUCTURAL DESIGN
I	DAVID R. CLAMAN	HYDRAULIC DESIGN
SPS.1	DAVID J. HEER	GEOTECHNICAL DESIGN
A.1	ANGELA JOHNSON	ROADWAY DESIGN
CD.1	DAVID R. CLAMAN	HYDRAULIC DESIGN
CS.1	DAVID J. HEER	GEOTECHNICAL DESIGN
RC.1	SEANA K. GODBOLD	LANDSCAPE DESIGN

HYDRAULIC DESIGN

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

Signature *David R. Claman* Date 10-16-2020

Printed or Typed Name David R. Claman

My license renewal date is December 31, 2020

Pages or sheets covered by this seal: SHEETS 7 THRU 9 OF 117

STRUCTURAL DESIGN

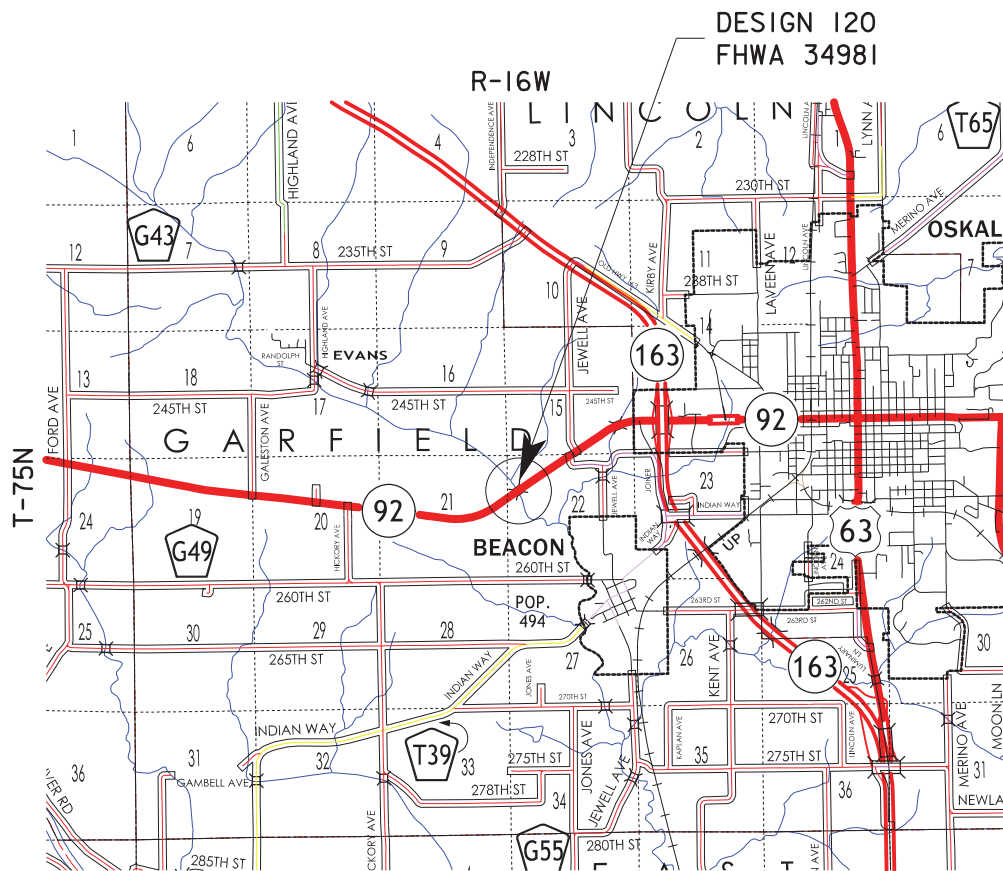
I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature *Stanley T. Stallsmith* Date 10-16-2020

Printed or Typed Name STANLEY T. STALLSMITH

My license renewal date is December 31, 2020

Pages or sheets covered by this seal: SHEETS 1 THRU 43 OF 117



LOCATION MAP

PROJECT DIRECTORY NAME: 6209201013

ESTIMATED BRIDGE QUANTITIES							
ITEM NO.	ITEM CODE	ITEM	UNIT	DIVISION I TOTAL	DIVISION II TOTAL	DIVISION III TOTAL	AS BUILT QUANTITIES
1	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	C.Y.	1,165.9			
2	2401-6745625	REMOVAL OF EXISTING BRIDGE	L.S.	1.00			
3	2402-2720000	EXCAVATION, CLASS 20	C.Y.	234			
4	2403-0100010	STRUCTURAL CONCRETE (BRIDGE)	C.Y.	369.7	108.9		
5	2404-7775000	REINFORCING STEEL	LB.	1,115	32,376	11,003	
6	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB.	119,434	7,726		
7	2404-7775009	REINFORCING STEEL, STAINLESS STEEL	LB.	3,861			
8	2408-7800000	STRUCTURAL STEEL	LB.	364,258			
9	2414-6424110	CONCRETE BARRIER RAILING	L.F.	516.0			
10	2433-0001060	CONCRETE DRILLED SHAFT, 60 IN. DIAMETER	L.F.	85			
11	2433-0003000	DEMONSTRATION SHAFT	L.F.	41			
12	2501-0201274	PILES, STEEL, HP 12 X 74	L.F.	935			
13	2501-6335010	PREBORED HOLES	L.F.	220			
14	2507-2638650	BRIDGE WING ARMORING - EROSION STONE	S.Y.	24.0			
15	2507-3250005	ENGINEERING FABRIC	S.Y.	1,927.4			
16	2507-6800061	REVETMENT, CLASS E	TON	1,550.9			
17	2507-8029000	EROSION STONE	TON	314.7			
18	2526-8285000	CONSTRUCTION SURVEY	L.S.	1.00			
19	2533-4980005	MOBILIZATION	L.S.	1.00			
20	2590-0000020	PROJECT MANAGEMENT	L.S.	1.00			
21	2599-9999003	ULTRA HIGH PERFORMANCE CONCRETE	C.Y.	14.4			
22	2599-9999005	PRECAST ABUTMENT FOOTING	EACH			2	
23	2599-9999005	PRECAST PIER CAP	EACH			1	
24	2599-9999005	PRECAST WINGWALLS	EACH	4			
25	2599-9999010	GROUTED SPLICE COUPLER MOCKUP	L.S.			1.00	
26	2599-9999010	PREFABRICATED BRIDGE SUPERSTRUCTURE MOVE	L.S.	1.00			
27	2599-9999010	PREFABRICATED BRIDGE SUPERSTRUCTURE TEMPORARY WORKS	L.S.	1.00			

ITEM NO.	ESTIMATE REFERENCE INFORMATION
3	QUANTITY FOR "EXCAVATION, CLASS 20" IS BASED ON THE ASSUMPTION THAT SITE GRADING AND SHAPING HAS BEEN COMPLETED TO THE "PROPOSED GROUND LINE" PRIOR TO THE START OF CONSTRUCTION OF ABUTMENTS AND PIER.
4	INCLUDES COST OF FURNISHING AND PLACING SPLASH BASINS (INCLUDING EXCAVATION, EROSION STONE OR CLASS E REVETMENT, AND ENGINEERING FABRIC). INCLUDES FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), FLOODABLE BACKFILL, POROUS BACKFILL, GEOTEXTILE FABRIC, WATER FLOODING, AND SUBDRAIN OUTLET AT ABUTMENTS AND TOE OF BERM.
6	INCLUDES MECHANICAL SPLICERS IN ABUTMENT FOOTING, PIER CAP AND WINGWALLS.
8	INCLUDES 10 DECK DRAINS AT 120 LB EACH. INCLUDES ½ INCH NEOPRENE SHEETS UNDER BEARINGS. INCLUDES PIER AND ABUTMENT BEARING MATERIAL.
9	IF PLACEMENT OF CONCRETE IS DONE BY THE SLIPFORMING METHOD, CLASS BR CONCRETE IS REQUIRED. CAST-IN-PLACE BARRIER RAILS SHALL USE CLASS C MIX. PRICE BID FOR THIS ITEM SHALL INCLUDE THE COST OF CAST-IN-PLACE FORMS IF REQUIRED FOR PLACEMENT OF THE CONCRETE.
10	PAYMENT WILL BE BASED ON THE FINAL LENGTH OF DRILLED SHAFT AS MEASURED IN THE FIELD. IF PERMANENT CASINGS ARE USED THEIR COST WILL BE CONSIDERED INCIDENTAL TO THE COST OF THE DRILLED SHAFT.
12	CAST IN-ONE-PIECE STEEL PILE POINTS ARE REQUIRED FOR THE ABUTMENTS IN ACCORDANCE WITH ARTICLE 4167.02 OF THE CURRENT STANDARD SPECIFICATIONS AND MATERIALS IM 468.
14	INCLUDES FURNISHING AND PLACING ENGINEERING FABRIC, EROSION STONE, AND ALL REQUIRED EXCAVATING, SHAPING AND COMPACTING FOR WING ARMORING.
15	ENGINEERING FABRIC SHALL BE MATERIAL AS SPECIFIED FOR EMBANKMENT EROSION CONTROL IN ACCORDANCE WITH ARTICLE 4196.01,B,3, OF THE STANDARD SPECIFICATIONS.
16,17	ESTIMATED AT 1.6 TON/CY.
21	REFER TO SPECIAL PROVISIONS FOR ULTRA HIGH PERFORMANCE CONCRETE. THE CONTRACTOR HAS THE OPTION TO ADJUST THE FILL/VENT HOLE LOCATIONS AND SIZE FROM THOSE SHOWN IN THE PLANS; HOWEVER, NO ADDITIONAL UHPC QUANTITIES SHALL BE PAID.
22	THIS ITEM INCLUDES ALL COSTS FOR FURNISHING AND PLACING THE PRECAST ABUTMENT FOOTINGS. SEE DETAILS AND QUANTITY BREAKDOWNS SHOWN ELSEWHERE IN THESE PLANS. INCLUDES THE COST TO FURNISH AND PLACE 49.0 LF OF 27" DIAMETER CMP. INCLUDES THE COST TO TEMPORARILY SUPPORT THE PRECAST FOOTING UNTIL THE STRUCTURAL CONCRETE (MISC.) IN THE PILE VOID HAS OBTAINED THE SPECIFIED STRENGTH FOR RELEASE. THE METHOD OF MEASUREMENT AND BASIS OF PAYMENT WILL BE FOR EACH PRECAST ABUTMENT FOOTING FURNISHED AND PLACED.
23	THIS ITEM INCLUDES ALL COSTS FOR FURNISHING AND PLACING THE PRECAST PIER CAP. ALSO INCLUDES STYROFOAM BLOCKOUTS, SPONGE RUBBER, NON-SHRINK GROUT, GROUTED SPLICE COUPLERS, AND STEEL SHIMS. SEE DETAILS AND QUANTITY BREAKDOWNS SHOWN ELSEWHERE IN THESE PLANS. INCLUDES COST TO TEMPORARILY SUPPORT THE PRECAST PIER CAP UNTIL THE NON-SHRINK GROUT HAS OBTAINED THE SPECIFIED STRENGTH FOR RELEASE. THE METHOD OF MEASUREMENT AND BASIS OF PAYMENT WILL BE FOR THE PIER CAP UNIT FURNISHED AND PLACED.
24	THIS ITEM INCLUDES ALL COSTS FOR FURNISHING AND PLACING THE PRECAST WINGWALLS. SEE DETAILS AND QUANTITY BREAKDOWNS SHOWN ELSEWHERE IN THESE PLANS. INCLUDES THE COST TO FURNISH AND PLACE 28.0 LF OF 27" DIAMETER CMP. INCLUDES THE COST TO TEMPORARILY SUPPORT THE PRECAST WINGWALLS UNTIL THE STRUCTURAL CONCRETE (MISC.) IN THE PILE VOID HAS OBTAINED THE SPECIFIED STRENGTH FOR RELEASE. THE METHOD OF MEASUREMENT AND BASIS OF PAYMENT WILL BE FOR EACH PRECAST WINGWALL FURNISHED AND PLACED. INCLUDES FURNISHING AND PLACING 3 INCH DIAMETER PVC PLASTIC PIPE AND EXPANDING FOAM IN THE ABUTMENT WINGS.
25	REFER TO SPECIAL PROVISION FOR GROUTED SPLICE COUPLER MOCKUP.
26,27	REFER TO SPECIAL PROVISIONS FOR PREFABRICATED BRIDGE SUPERSTRUCTURE MOVE.



DIVISIONS:

- I - BID ITEMS THAT ARE COMMON TO ALL CONTRACTOR CHOICES.
- II - BID ALTERNATE AA OPTION 1 IF SELECTING CAST-IN-PLACE SUBSTRUCTURE UNITS.
- III - BID ALTERNATE AA OPTION 2 IF SELECTING PRECAST SUBSTRUCTURE UNITS.
- NOTE: CONTRACTOR WILL BID DIVISION I AND SELECT BID DIVISION II OR DIVISION III.

ROADWAY QUANTITIES SHOWN ELSEWHERE IN THESE PLANS.

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DESIGN FOR 0° SKEW

230'-0 X 44'-0 CONTINUOUS
WELDED GIRDER BRIDGE

115'-0 W. SPAN115'-0 E. SPAN

ESTIMATED QUANTITIES

STA. 985+91.00IA 92 (ML)OCTOBER, 2020

MAHASKA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 42FILE NO. 31191DESIGN NO. 120

SUMMARY OF STRUCTURAL CONCRETE

LOCATION		TOTAL (CU. YDS.)		
	BID DIVISIONS	I	II	III
WEST ABUTMENT FOOTING			24.5	21.0*
EAST ABUTMENT FOOTING			24.5	21.0*
ABUTMENT WINGS		29.6*		
BRIDGE DECK, ABUTMENT & PIER DIAPHRAGMS		369.7		
PIER I			59.9	53.6*
TOTAL (CU. YDS.)		369.7	108.9	-

SUMMARY OF STRUCTURAL CONCRETE (MISC.)

LOCATION		TOTAL (CU. YDS.)		
	BID DIVISIONS	I	II	III
ABUTMENT FOOTING POCKETS				7.0*
ABUTMENT WING POCKETS		4.0*		
TOTAL (CU. YDS.)		-	-	-

SUMMARY OF ULTRA-HIGH PERFORMANCE CONCRETE

LOCATION		TOTAL (CU. YDS.)		
	BID DIVISIONS	I	II	III
WEST ABUTMENT CLOSURE POUR		3.6		
EAST ABUTMENT CLOSURE POUR		3.6		
WEST ABUTMENT WING CLOSURE POUR (2 @ 0.9)		1.8		
EAST ABUTMENT WING CLOSURE POUR (2 @ 0.8)		1.6		
PIER 1 CLOSURE POUR		3.8		
TOTAL (CU. YDS.)		14.4	-	-

* ITEMS ARE INCIDENTAL TO A PRECAST BID ITEM AND SHOWN FOR INFORMATION ONLY.
NOT INCLUDED IN THE QUANTITY TOTALS.

SUMMARY OF STRUCTURAL STEEL

LOCATION	TOTAL (LBS.)
① SUPERSTRUCTURE STEEL	356,418
ABUTMENT BEARING PLATES	2,288
PIER BEARING PLATES	2,048
STAINLESS STEEL PLATE SLIDING SHOES	2,304
BRIDGE DECK DRAINS	1,200
TOTAL (LBS.)	364,258

① INCLUDES GIRDERS, SHEAR STUDS, STIFFENERS, CROSS BRACING, SPLICES AND FLANGE DEFLECTORS.



SUMMARY OF REINFORCING STEEL

LOCATION		NON-COATED REINFORCING STEEL TOTAL (LBS.)			REINFORCING STEEL, EPOXY COATED TOTAL (LBS.)			REINFORCING STEEL, STAINLESS STEEL TOTAL (LBS.)		
	BID DIVISIONS	I	II	III	I	II	III	I	II	III
WEST ABUTMENT FOOTING			73			3,863	4,231 *			
EAST ABUTMENT FOOTING			73			3,863	4,231 *			
WINGWALL					6,039*					
BRIDGE DECK, ABUTMENT & PIER DIAPHRAGMS					110,599					
PIER I			20,102	22,612 *						
DRILLED SHAFTS		1,115	12,128	11,003						
BARRIER RAIL					7,771			3,097		
RAIL END SECTION					1,064			764		
TOTAL (LBS.)		1,115	32,376	11,003	119,434	7,726	-	3,861	-	-

* ITEMS ARE INCIDENTAL TO A PRECAST BID ITEM AND SHOWN FOR INFORMATION ONLY.
NOT INCLUDED IN THE QUANTITY TOTALS.

SUMMARY OF FOUNDATIONS

LOCATION	SUBSTRUCTURE TYPE	FOUNDATION TYPE	NUMBER	LENGTH (LIN. FT.)	TOTAL (LIN. FT.)
WEST ABUTMENT	INTEGRAL	HPI2x74	7	40	280
EAST ABUTMENT	INTEGRAL	HPI2x74	7	45	315
WEST ABUTMENT WINGWALLS	WINGWALLS	HPI2x74	4	40	160
EAST ABUTMENT WINGWALLS	WINGWALLS	HPI2x74	4	45	180
PIER - DRILLED SHAFT NO. 1	FRAME PIER	DRILLED SHAFTS	1	40	40
PIER - DRILLED SHAFT NO. 2	FRAME PIER	DRILLED SHAFTS	1	45	45

SUMMARY OF BEARINGS

[illegible]

■ TEMPORARY & PERMANENT LAMINATED PADS ARE INCIDENTAL TO STRUCTURAL STEEL; LAMINATED NEOPRENE BEARING PAD WEIGHT IS NOT INCLUDED IN STEEL QUANTITY.

● QUANTITY SHOWN IS FOR PERMANENT BEARING PADS. PADS TO BE USED FOR SLIDING SHALL BE PER SPECIAL PROVISIONS FOR PREFABRICATED BRIDGE SUPERSTRUCTURE MOVE.

SUMMARY OF EXCAVATION

LOCATION	CLASS 20 EXCAVATION
WEST ABUTMENT	117
EAST ABUTMENT	117
TOTAL (CU. YDS.)	234

SEE DESIGN SHEET 8 FOR CLASS 10 EXCAVATION QUANTITIES.

DIVISIONS:

I - BID ITEM THAT ARE COMMON TO ALL CONTRACTOR CHOICES.

II - BID ALTERNATE AA OPTION I IF
SELECTING CAST-IN-PLACE
SUBSTRUCTURE UNITS.

III - BID ALTERNATE AA OPTION 2 IF
SELECTING PRECAST ABUTMENT
FOOTINGS.

NOTE: CONTRACTOR WILL BID DIVISION I AND
SELECT BID DIVISION II OR DIVISION III.

DESIGN TEAM IOWA DOT \ HR GREEN, INC.

MAHASKA COUNTY

PROJECT NUMBER	BRF-092-7(45)--38-62
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SHEET NUMBER	3
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DESIGN FOR 0° SKEW

230'-0 X 44'-0 CONTINUOUS
WELDED GIRDER BRIDGE

115'-0 W. SPAN 115'-0 E. SPAN

SUMMARY OF ITEMIZED QUANTITIES

STA. 985+91.00 1A 92 (ML) OCTOBER, 2020

MAHASKA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2 OF 42 FILE NO. 31191 DESIGN NO. 120

GENERAL NOTES:

IT IS THE INTENT OF THIS DESIGN TO CONSTRUCT A 230'-0 x 44'-0 CONTINUOUS WELDED PLATE GIRDER (CWPG) REPLACEMENT BRIDGE, SKEWED 0°, ON IA 92 OVER MUCHAKINOCK CREEK AT STA. 985+91.00.

THIS DESIGN IS FOR THE REPLACEMENT OF THE EXISTING 144'-0 X 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM (PPCB) BRIDGE, DESIGN NO. 1264. ELECTRONIC COPIES OF ORIGINAL DESIGN PLANS ARE AVAILABLE TO THE CONTRACTOR AS PART OF THE E-FILES SUPPLIED WITH THE CONTRACT DOCUMENTS. DIMENSIONS SHOWN ON THESE PLANS ARE BASED ON DESIGN PLANS.

THE LUMP SUM BID FOR "REMOVAL OF EXISTING BRIDGE" SHALL INCLUDE THE REMOVAL OF THE 144'-0 X 30'-0 PPCB BRIDGE, INCLUDING BARRIER RAIL AND ALL PARTS OF GUARDRAIL. REMOVALS SHALL BE IN ACCORDANCE WITH SECTION 2401, OF THE STANDARD SPECIFICATIONS.

FAINT LINES ON PLANS INDICATE THE EXISTING STRUCTURE.

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

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

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

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (S_o1 IS 3/8" 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

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.

GUARDRAIL IS INCLUDED ELSEWHERE IN THESE PLANS.

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

THE CHANNEL EXCAVATION AS SHOWN IS INCLUDED ELSEWHERE IN THESE PLANS, AND SHALL BE COMPLETED BEFORE PILES ARE DRIVEN. THE BRIDGE CONTRACTOR IS TO LEVEL OFF AND SHAPE THE BERMS TO THE ELEVATIONS AND DIMENSIONS SHOWN. DRESSING OF SLOPES OUTSIDE THE BRIDGE AREA NOT DISTRIBUTED BY THE BRIDGE CONTRACTOR SHALL BE PAID FOR AS EXTRA WORK.

CLASS 20 EXCAVATION QUANTITIES ARE BASED ON THE ASSUMPTION THAT THE CHANNEL EXCAVATION IS COMPLETED PRIOR TO STARTING CONSTRUCTION OF PIER AND ABUTMENTS.

THE APPROACH FILLS AS SHOWN ARE INCLUDED ELSEWHERE IN THESE PLANS, AND ARE TO BE IN PLACE BEFORE ABUTMENT PILES ARE DRIVEN. THE BRIDGE CONTRACTOR IS TO LEVEL OFF AND SHAPE THE BERMS TO THE ELEVATIONS AND DIMENSIONS SHOWN. DRESSING OF SLOPES OUTSIDE THE BRIDGE AREA NOT DISTURBED BY THE BRIDGE CONTRACTOR SHALL BE PAID FOR AS EXTRA WORK.

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

CONCRETE BARRIER RAILS PLACED USING 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).

THE BRIDGE CONTRACTOR SHALL PREBORE HOLES FOR ABUTMENT PILES. HOLES SHALL BE BORED TO THE ELEVATIONS SHOWN ON THE "LONGITUDINAL SECTION ALONG CENTERLINE ROADWAY" ON DESIGN SHEET 6. PILES SHALL BE DRIVEN THROUGH THE HOLES TO AT LEAST THE SPECIFICIED DESIGN BEARING.



SPECIFICATIONS:

DESIGN: AASHTO LRFD 8th Ed, SERIES OF 2017, 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.

INCLUDE THE FOLLOWING:
DEVELOPMENTAL SPECIFICATIONS FOR STRUCTURAL CONCRETE (4500 PSI (31 MPa) OR GREATER).
DEVELOPMENTAL SPECIFICATIONS FOR CONSTRUCTION PROGRESS SCHEDULE.
DEVELOPMENTAL SPECIFICATION FOR MASS CONCRETE - CONTROL OF HEAT OF HYDRATION.
SPECIAL PROVISIONS FOR GROUTED SPLICE COUPLER MOCKUP.
SPECIAL PROVISIONS FOR PREFABRICATED BRIDGE SUPERSTRUCTURE MOVE.
SPECIAL PROVISIONS FOR ULTRA HIGH PERFORMANCE CONCRETE.
SUPPLEMENTAL SPECIFICATIONS FOR PROJECT MANAGEMENT.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8th Ed, SERIES OF 2017, EXCEPT AS NOTED IN THE CURRENT IOWA BRIDGE DESIGN MANUAL.

REINFORCING STEEL IN ACCORDANCE WITH AASHTO LRFD SECTION 5, GRADE 60, FOR EPOXY COATED AND NON-COATED, AND GRADE 60 OR 75 FOR STAINLESS.

CONCRETE IN ACCORDANCE WITH AASHTO LRFD SECTION 5, f'c = 4.0 KSI.

PRECAST SUBSTRUCTURE CONCRETE IN ACCORDANCE WITH AASHTO SECTION 5, f'c = 5.0 KSI

ULTRA HIGH PERFORMANCE CONCRETE (UHPC) IN ACCORDANCE WITH SPECIAL PROVISIONS, f'c = 21.0 KSI

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

ALL SPLICE MATERIAL TO BE AASHTO M270 GRADE 50W (ASTM-A709 GRADE 50W) STEEL.

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

VALUE ENGINEERING PROPOSALS:

CONTRACTORS MAY DEVELOP ALTERNATIVE CONSTRUCTION PROPOSALS THAT ALLOW THE STATE TO BENEFIT FROM REDUCED COSTS, WHILE MAINTAINING THE SAME OR REDUCED ABC CONSTRUCTION SCHEDULE FOR THE PROJECT. THE CONTRACTOR SHALL ALSO PERFORM ANY NECESSARY REDESIGN OF BRIDGE COMPONENTS RESULTING FROM THE CHANGES. ONLY ALTERNATE DESIGNS THAT UTILIZE A PREFABRICATED BRIDGE CONSTRUCTED OFF-ALIGNMENT AND MOVED TO THE FINAL POSITION WILL BE ACCEPTED FOR REVIEW UNDER THE VALUE ENGINEERING PROPOSAL. THESE DESIGNS MUST PROVIDE THE REQUIRED PERFORMANCE, RELIABILITY, QUALITY AND CONSTRUCTABILITY.

CHANGES TO THE PREFABRICATD BRIDGE SUPERSTRUCTURE MOVE SYSTEM (e.g. PTFE SLIDE, ROLLERS, SPMT, HEAVY LIFT) ARE NOT SUBJECT TO THE COST SAVINGS SHARING REQUIREMENTS OF VALUE ENGINEERING PROPOSALS AND SHALL BE SUBMITTED PER THE REQUIREMENTS OF THE SPECIAL PROVISION FOR PREFABRICATED BRIDGE SUPERSTRUCTURE MOVE.

SUGGESTED CONSTRUCTION SEQUENCE FOR CRITICAL CLOSURE:

PIER DRILLED SHAFTS, SUPERSTRUCTURE AND PRECAST ELEMENTS ARE TO BE CONSTRUCTED PRIOR TO THE BRIDGE CLOSURE. THE SUGGESTED CONSTRUCTION SEQUENCE FOR THE CRITICAL CLOSURE IS AS FOLLOWS:

- 1. DEMOLISH EXISTING BRIDGE.
- 2. BERM GRADING / DRIVING PILING / PLACE REVETMENT.
- 3. PLACE ABUTMENTS AND PIER.
- 4. MOVE PREFABRICATED BRIDGE SUPERSTRUCTURE.
- 5. CAST UHPC CONNECTIONS AT PIER AND ABUTMENT DIAPHRAGMS.
- 6. PLACE WINGWALLS.
- 7. WINGWALL CLOSURE POUR.
- 8. FLOODED BACKFILL.
- 9. BRIDGE APPROACH PAVING.
- 10. PAVED SHOULDER / GUARDRAIL / LONGITUDINAL GROOVING.

THE SUGGESTED CONSTRUCTION SEQUENCE FOR CRITICAL CLOSURE IS A GENERAL LIST OF MAJOR ACTIVITIES AND NOT AN EXHAUSTIVE LIST OF ALL NECESSARY ACTIVITIES. THIS LIST TAKES INTO CONSIDERATION THAT THE SUPERSTRUCTURE IS CONSTRUCTED AND THAT A SUCCESSFUL TEST LIFT HAS OCCURED PRIOR TO SCHEDULING THE CRITICAL CLOSURE. NON-CRITICAL SITE WORK, GRADING AND REVETMENT CAN BE PERFORMED AFTER THE CRITICAL CLOSURE AS APPROVED AND SCHEDULED WITH THE ENGINEER.

BRIDGE DECK DIMENSIONS TABLE			
NO.	ITEM	UNIT	QUANTITY
1	DECK LENGTH	L.F.	231.8
2	MINIMUM DECK WIDTH	L.F.	47.2
3	MAXIMUM DECK WIDTH	L.F.	47.2
4	DECK AREA	S.F.	10941

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

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: (45)_MAHASKA_Design120_DeckDrains.pdf

1	STRUCTURAL STEEL
2	DECK DRAINS
3	TEMPORARY ERECTION WORK PLANS
4	LAMINATED NEOPRENE BEARINGS
5	SLIDING SHOE (SOLE PLATE) DETAILS
6	PRECAST LIFTING LOCATIONS AND ANCHOR DETAILS (IF NEC.)
7	PRECAST ABUTMENT FOOTING SUPPORT METHOD (IF NEC.)
8	PREFABRICATED BRIDGE SUPERSTRUCTURE MOVE SUBMITTALS
9	UHPC PLACEMENT PLAN
10	UHPC MIX DESIGN
11	GROUTED SPLICE COUPLER MOCKUP

DESIGN HISTORY
AT THIS SITE
(INCLUDES THIS DESIGN)

DES. NO.	TYPE OF WORK
1522	ORIGINAL DESIGN
1264	BRIDGE REPLACEMENT
120	BRIDGE REPLACEMENT

NOTE:
POLLUTION PREVENTION PLAN SHOWN ELSEWHERE IN THESE PLANS.

TRAFFIC CONTROL PLAN
THE ROADWAY WILL BE CLOSED TO THRU TRAFFIC ONLY DURING CRITICAL CLOSURE PERIOD. REFER TO THE TRAFFIC CONTROL PLAN SHOWN ELSEWHERE IN THESE PLANS.

DESIGN FOR 0° SKEW
230'-0 X 44'-0 CONTINUOUS
WELDED GIRDER BRIDGE
115'-0 W. SPAN115'-0 E. SPAN
GENERAL NOTES
STA. 985+91.00IA 92 (ML)OCTOBER, 2020
MAHASKA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 3 OF 42FILE NO. 31191DESIGN NO. 120

WEATHERING STEEL NOTES:

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

STRUCTURAL STEEL SHALL BE PAINTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND AS SHOWN IN THE LIMITS OF PAINTING DETAILS. SEE SUPERSTRUCTURE DETAILS FOR MORE INFORMATION.

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

ALL PIECES COMPRISING THE ABUTMENT AND PIER BEARINGS SHALL COMPLY WITH THE REQUIREMENTS AS STATED IN THE NOTES ON THE BEARING DETAIL SHEETS.

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

THE FINISH ON DECK DRAINS, BEARINGS AND WEATHERING STEEL SHALL BE IN ACCORDANCE WITH THE PLAN NOTES AND SECTION 2408, OF THE STANDARD SPECIFICATIONS. ALL WEATHERING STEEL EMBEDDED INTO AN INTEGRAL ABUTMENT AND CONCRETE PIER DIAPHRAGM ENCASEMENT SHALL BE PAINTED TO A DISTANCE OF ONE FOOT FROM THE CONCRETE FACE AND SEALED BY CAULKING AT THE CONCRETE AND STEEL INTERFACE. EXTERIOR SURFACES OF ALL GALVANIZED COMPONENTS WHICH ARE DESIGNATED IN THE CONTRACT DOCUMENTS TO BE PAINTED SHALL BE PREPARED ACCORDING TO ARTICLE 2509.03, OF THE STANDARD SPECIFICATIONS.

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

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

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

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

MINIMUM AGE FOR CONCRETE LOADING NOTES:

ALL CONCRETE POURS ON THE CRITICAL PATH DURING THE CRITICAL CLOSURE PERIOD SHALL REQUIRE THE USE OF MATURITY METHOD AS DESCRIBED IN ARTICLE 2403.03, N, 2 OF THE STANDARD SPECIFICATIONS AND MATERIALS I.M. 383. THE MATURITY METHOD WILL BE USED TO DETERMINE THE MINIMUM AGE FOR LOADING BASED ON STRENGTH REQUIREMENTS ONLY. ALL COSTS ASSOCIATED WITH IMPLEMENTING THE MATURITY METHOD WILL NOT BE PAID FOR SEPARATELY, BUT WILL BE INCIDENTAL TO THE STRUCTURAL CONCRETE OR PRECAST BID ITEM AS REQUIRED.

MECHANICAL SPLICE ASSEMBLY NOTES:

THE MECHANICAL SPLICE ASSEMBLIES USED SHALL MEET THE REQUIREMENTS OF MATERIALS IM 451 AND STANDARD SPECIFICATION 4151.07. REINFORCING SPLICE BARS SHALL HAVE A MINIMUM DIAMETER EQUAL TO THE DIAMETER OF THE CORRESPONDING BAR WHICH THE SPLICE BAR IS LAPPED WITH. ALL MECHANICAL SPLICE ASSEMBLIES TO BE USED SHALL BE EPOXY COATED. THE COST OF FURNISHING AND INSTALLING ALL MECHANICAL SPLICE ASSEMBLIES IS TO BE INCLUDED IN THE PRICE BID FOR "REINFORCING STEEL, EPOXY COATED." THE WEIGHT OF MECHANICAL SPLICE ASSEMBLIES IS NOT INCLUDED IN THE QUANTITY SHOWN FOR "REINFORCING STEEL, EPOXY COATED." REQUIRED ASSEMBLIES ARE AS FOLLOWS:

- EACH ABUTMENT - 92 SPLICE ASSEMBLIES (7g1 & 7g2 BARS)
- EACH ABUTMENT - 16 ADDITIONAL SPLICE ASSEMBLIES (8f3 & 8f4 BARS)
- EACH WING FOOTING - 8 SPLICE ASSEMBLIES (8f7 & 8f8 BARS)
- EACH WINGWALL - 12 SPLICE ASSEMBLIES (5h1 OR 5h2 & 5h3 BARS)
- PIER CAP - 96 SPLICE ASSEMBLIES (7g1 & 7g2)

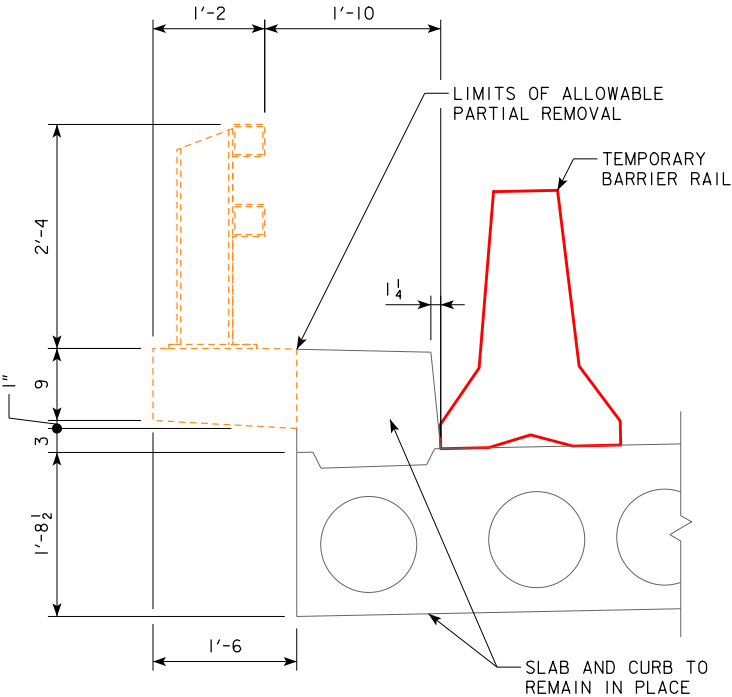
UHPC ADDITIONAL NOTES:



SHADED AREAS SHOW SUGGESTED UHPC AND FILL/VENT LOCATIONS. CONTRACTOR TO SPECIFY SIZE OF FILL/VENT PORTS. UHPC QUANTITIES FOR FILL/VENT HOLES AS SHOWN ARE INCLUDED ON SUMMARY OF QUANTITY SHEET.

CONTRACTORS OPTION TO ADJUST FILL/VENT HOLE LOCATION AND SIZE, HOWEVER NO ADDITIONAL QUANTITIES OF UHPC SHALL BE PAID.

LOCATIONS AND SIZE OF FILL/VENT HOLES SHALL BE SHOWN ON SHOP DRAWINGS.

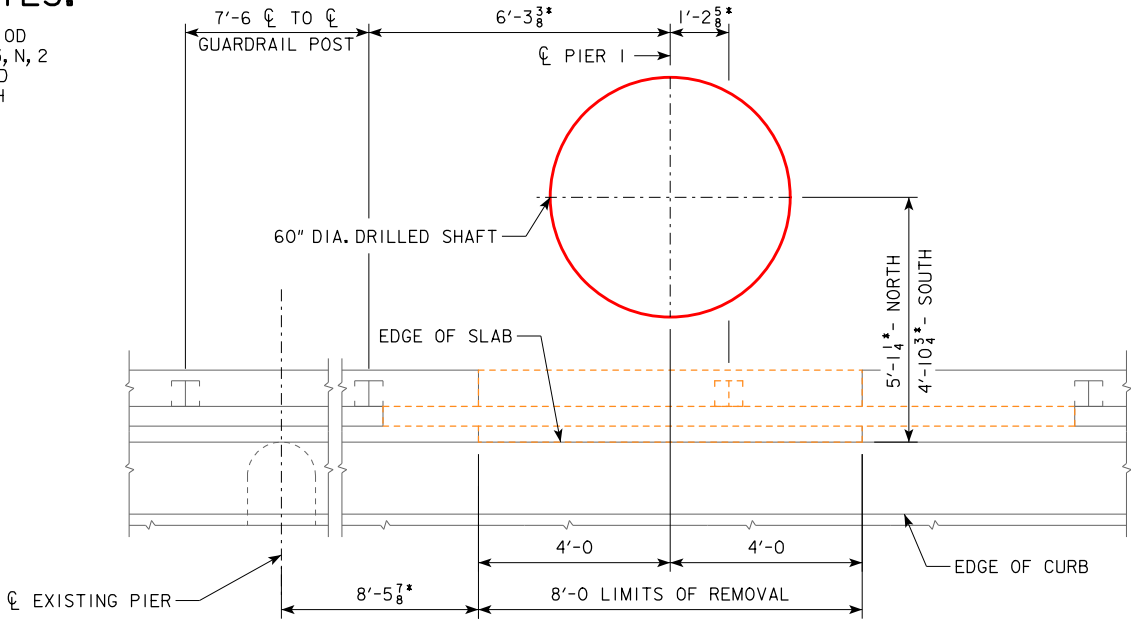


EXISTING BRIDGE OVERHANG REMOVAL DETAIL
(VERIFY ALL FIELD DIMENSIONS)

NOTE:
AT THE CONTRACTOR'S OPTION, PARTIAL REMOVAL OF THE ALUMINUM HANDRAIL, POSTS, AND CONCRETE OVERHANG WILL BE ALLOWED TO FACILITATE DRILLED SHAFT CONSTRUCTION. TRAFFIC WILL BE MAINTAINED ON THE EXISTING BRIDGE DURING, AND FOLLOWING, THE PARTIAL REMOVAL. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL A PARTIAL REMOVAL PLAN BEFORE BEGINNING REMOVAL OPERATIONS.

THE PARTIAL REMOVAL PLAN WILL SHOW THE LOCATION AND PROPOSED EXTENT OF THE PARTIAL REMOVAL, HOW THE REMOVED AREA WILL BE PROTECTED AND INCLUDE ALL TRAFFIC CONTROL REQUIRED DURING, AND FOLLOWING, REMOVAL.

THE COST FOR THE PARTIAL REMOVAL WILL BE CONSIDERED INCIDENTAL TO THE BID ITEM "REMOVAL OF EXISTING BRIDGE" AND NO DIRECT PAYMENT WILL BE MADE. REFER TO THE TRAFFIC CONTROL PLAN SHOWN ELSEWHERE IN THESE PLANS.



EXISTING BRIDGE OVERHANG REMOVAL DETAIL - PLAN VIEW
(VERIFY ALL FIELD DIMENSIONS)
(NORTH DRILLED SHAFT SHOWN, SOUTH DRILLED SHAFT SIMILAR)

* VERIFY IN FIELD



SUBSTRUCTURE PRECASTING:

PRECASTING MATERIALS AND PROCEDURES SHALL CONFORM TO SECTION 2407 OF THE STANDARD SPECIFICATIONS AND MATERIALS I.M. 570 LRFD. SITE CASTING SHALL CONFORM TO ALTERNATE SITE CASTING PROVISIONS LISTED ON ELSEWHERE ON THIS SHEET.

REMOVAL AND STORAGE:

REMOVAL AND STORAGE: ALL PRECAST ELEMENTS SHALL BE REMOVED FROM THE FORMS IN SUCH A MANNER THAT NO DAMAGE OCCURS TO THE ELEMENT. FORM REMOVAL SHALL CONFORM TO THE REQUIREMENTS OF ARTICLE 2407.03F OF THE STANDARD SPECIFICATIONS. ANY MATERIALS FORMING BLOCKOUTS IN THE PRECAST ELEMENTS SHALL BE REMOVED SUCH THAT DAMAGE DOES NOT OCCUR TO THE PRECAST ELEMENTS OR THE BLOCKOUT. PRECAST ELEMENTS SHALL BE STORED IN SUCH A MANNER THAT ADEQUATE SUPPORT IS PROVIDED TO PREVENT CRACKING OR CREEP-INDUCED DEFORMATION (SAGGING). DURING STORAGE FOR LONG PERIODS OF TIME (LONGER THAN ONE MONTH) ALL PRECAST ELEMENTS SHALL BE CHECKED AT LEAST ONCE PER MONTH TO ENSURE CREEP-INDUCED DEFORMATION DOES NOT OCCUR.

LIFTING AND HANDLING:

LIFTING AND HANDLING CALCULATIONS DESIGNED BY THE PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF IOWA SHALL BE SUBMITTED. THE PRECAST FABRICATOR SHALL SUBMIT LIFTING LOCATIONS AND LIFTING ANCHOR DETAILS FOR APPROVAL BY ENGINEER PRIOR TO USE. THE LIFTING ANCHORS SHALL BE HOT-DIPPED GALVANIZED. THE LIFTING ANCHORS SHALL BE REMOVED OR CUT FLUSH WITH THE PRECAST SUBSTRUCTURE. HOLES SHALL BE PATCHED WITH AN APPROVED GROUT. STEEL CUT FLUSH WITH THE CONCRETE SHALL BE REPAIRED IN ACCORDANCE WITH MATERIALS IM 410 - "REPAIR OF DAMAGED HOT DIP GALVANIZED COATINGS."

ALL PRECAST ELEMENTS SHALL BE HANDLED IN SUCH A MANNER AS NOT TO DAMAGE OR OVERSTRESS THE PRECAST ELEMENTS DURING LIFTING OR MOVING. LIFTING ANCHORS CAST INTO THE PRECAST ELEMENTS SHALL BE USED FOR LIFTING AND MOVING THE PRECAST ELEMENTS AT THE FABRICATION PLANT AND IN THE FIELD. THE ANGLE BETWEEN THE TOP SURFACE OF THE PRECAST ELEMENTS AND THE LIFTING LINE SHALL NOT BE LESS THAN SIXTY DEGREES, WHEN MEASURED FROM THE TOP SURFACE OF THE PRECAST ELEMENT TO THE LIFTING LINE. DAMAGE CAUSED TO ANY PRECAST ELEMENTS SHALL BE REPAIRED AT THE EXPENSE OF THE CONTRACTOR TO THE SATISFACTION OF THE ENGINEER.

TRANSPORTATION:

ALL PRECAST ELEMENTS SHALL BE TRANSPORTED IN SUCH A MANNER THAT THE PRECST ELEMENTS WILL NOT BE DAMAGED OR OVERSTRESSED DURING TRANSPORTATION. PRECAST ELEMENTS SHALL BE PROPERLY SUPPORTED DURING TRANSPORTATION SUCH THAT CRACKING OR DEFORMATION (SAGGING) DOES NOT OCCUR. IF MORE THAN ON PRECAST ELEMENT IS TRANSPORTED PER VEHICLE, PROPER SUPPORT AND SEPARATION MUST BE PROVIDED BETWEEN THE INDIVIDUAL PRECAST ELEMENTS. PRECAST ELEMENTS SHALL LIE HORIZONTAL DURING TRANSPORTATION, UNLESS OTHERWISE APPROVED.

REPAIRS:

REPAIRS OF DAMAGE CAUSED TO THE PRECAST ELEMENTS DURING FABRICATION, LIFTING AND HANDLING, OR TRANSPORTATION SHALL BE ADDRESSED ON A CASE-BY-CASE BASIS. DAMAGE WITHIN ACCEPTABLE LIMITS OF THE PRECAST ELMENTS SHALL BE REPAIRED USING MATERIALS I.M. 570 LRFD AT THE FABRICATION PLANT AT THE EXPENSE OF THE FABRICATOR. REPETITIVE DAMAGE TO PRECAST ELEMENTS SHALL BE CAUSED FOR STOPPAGE OF FABRICATION OPERATIONS UNTIL THE CAUSE OF THE DAMAGE CAN BE REMEDIED. ALL PROPOSED REPAIRS SHALL BE APPROVED BY THE ENGINEER IN ADVANCE.

PILE POCKET VOIDS:

PRECAST ABUTMENT FOOTINGS AND WINGWALLS SHALL BE PREFABRICATED WITH CIRCULAR VOIDS TO ALLOW PLACEMENT OF THE PRECAST OVER THE STEEL HP PILING. ALL VOIDS SHALL BE CONSTRUCTED AT THE PILE LOCATIONS SHOWN IN THESE PLANS WITH 27"φ CMP. ALL 27"φ CMP SHALL BE GALVANIZED CORRUGATED STEEL PIPE, STYLE 1, 16 GAGE IN ACCORDANCE WITH STANDARD SPECIFICATIONS 414I AND MATERIAL'S I.M. 441.

ALTERNATE SITE CASTING:

IF THE CONTRACTOR ELECTS TO PRECAST THE ABUTMENT FOOTINGS AND WINGWALLS AT A TEMPORARY CASTING FACILITY, CASTING SHALL COMPLY WITH SECTION 2403 OF THE STANDARD SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS FOR STRUCTURAL CONCRETE 4500 PSI (31 MPa) OR GREATER, AND PROVISIONS LISTED BELOW:

A. EQUIPMENT.

USE EQUIPMENT MEETING THE REQUIREMENTS OF SECTION 200I AND THE FOLLOWING:

1. CASTING FOR PRECAST CONCRETE, USE CASTING BEDS RIGIDLY CONSTRUCTED AND SUPPORTED SO THAT UNDER THE WEIGHT (MASS) OF THE CONCETE THERE WILL BE NO VERTICAL DEFORMATION OF THE BED.

2. FORMS.

USE FORMS FOR PRECAST TRUE TO THE DIMENSIONS AS SHOWN IN THE CONTRACT DOCUMENTS, TRUE TO LINE, MORTAR TIGHT, AND OF SUFFICIENT RIGIDITY TO NOT SAG OR BULGE OUT OF SHAPE UNDER PLACEMENT AND VIBRATION OF CONCRETE. ENSURE INSIDE SURFACES ARE SMOOTH AND FREE OF ANY PROJECTIONS, INDENTATIONS, OR OFFSET THAT MIGHT RESTRICT DIFFERENTIAL MOVEMENTS OF FORMS AND CONCRETE.

B. CURING.

1. USE A METHOD OF CURING THAT PREVENTS LOSS OF MOISTURE AND MAINTAINS AN INTERNAL CONCRETE TEMPERATURE AT LEAST 40°F (4°C) DURING THE CURING PERIOD. OBTAIN THE ENGINEER'S APPROVAL FOR THIS METHOD.

2. WHEN USING ACCELERATED HEAT CURING, DO SO UNDER A SUITABLE ENCLOSURE. USE EQUIPMENT AND PROCEDURES THAT WILL ENSURE UNIFORM CONTROL AND DISTRIBUTION OF HEAT AND PREVENT LOCAL HEATING. ENSURE THE CURING PROCESS IS UNDER THE DIRECT SUPERVISION AND CONTROL OF COMPONENT OPERATORS.

3. WHEN ACCELERATED HEAT IS USED TO OBTAIN TEMPERATURES ABOVE 100°F (38°C):

- i. RECORD THE TEMPERATURE OF THE INTERIOR OF THE CONCRETE USING A SYSTEM CAPABLE OF AUTOMATICALLY PRODUCING A TEMPERATURE RECORD AT INTERVALS OF NO MORE THAT 15 MINUTES DURING THE ENTIRE CURING PERIOD.
- ii. SPACE THE SYSTEM AT A MINIMUM OF ONE LOCATION PER 100 FEET (30 M) OF LENGTH PER UNIT OR FRACTION THEREOF, WITH A MAXIMUM OF THREE LOCATIONS ALONG EACH LINE OF UNITS BEING CURED.
- iii. ENSURE ALL UNITS, WHEN CALIBRATED INDIVIDUALLY, ARE ACCURATE WITHIN ±5°F
- iv. DO NOT ARTIFICIALLY RAISE THE TEMPERATURE OF THE CONCRETE ABOVE 100°F (38°C) FOR A MINIMUM OF 2 HOURS AFTER THE UNITS HAVE BEEN CAST. AFTER THE 2 HOUR PERIOD THE TEMPERATURE OF THE CONCRETE MAY BE RAISED TO A MAXIMUM TEMPERATURE OF 155°F (71°C) AT A RATE NOT TO EXCEED 25°F (15°C) PER HOUR.
- v. LOWER THE TEMPERATURE OF THE CONCRETE AT A RATE NOT TO EXCEED 40°F (22°C) PER HOUR BY REDUCING THE AMOUNT OF HEAT APPLIED UNTIL THE INTERIOR OF THE CONCRETE HAS REACHED THE TEMPERATURE OF THE SURROUNDING AIR.

4. IN ALL CASES, COVER THE CONCRETE AND LEAVE COVERED UNTIL CURING IS COMPLETED. SIDE FORMS AND PANS FORMING THE UNDERSIDE OF CHANNEL SHAPES MAY BE REMOVED DURING THIS PERIOD IF THE COVER IS IMMEDIATELY REPLACED. DO NOT, UNDER ANY CIRCUMSTANCES, REMOVE UNITS FROM THE CASTING BED UNTIL THE STRENGTH REQUIREMENTS ARE MET.

C. REMOVALS OF FORMS

IF FORMS ARE REMOVED BEFORE THE CONCRETE HAS ATTAINED THE STRENGTH WHICH WILL PERMIT THE UNITS TO BE MOVED OR STRESSED, REMOVE PROTECTION ONLY FROM THE IMMEDIATE SECTION FROM WHICH FORMS ARE BEING REMOVED. IMMEDIATELY REPLACE THE PROTECTION ANY TIME BEFORE THE UNITS ATTAIN THE SPECIFIED COMPRESSIVE STRENGTH WHEN THE SURROUNDING AIR TEMPERATURE IS BELOW 20°F (-7°C).

ALTERNATE SITE CASTING: CONT'D

D. TOLERANCES.

LIMIT VARIATION FROM DIMENSIONS SHOWN IN THE CONTRACT DOCUMENTS TO NO MORE THAN 1/8 INCH (3 MM). FOR OVERRUNS, GREATER DEVIATION MAY BE ACCEPTED IF, IN THE ENGINEERS OPINION, IT DOES NOT IMPAIR THE SUITABILITY OF THE MEMBER FOR ITS INTENDED USE, UNLESS SHOWN ELSEWHERE IN THESE PLANS.

E. HANDLING AND STORAGE.

1. WHEN LIFTING AND HANDLING PRECAST UNITS, SUPPORT THEM AT OR NEAR THE POINTS DESIGNATED IN THE APPROVED SHOP/WORKING DRAWINGS.

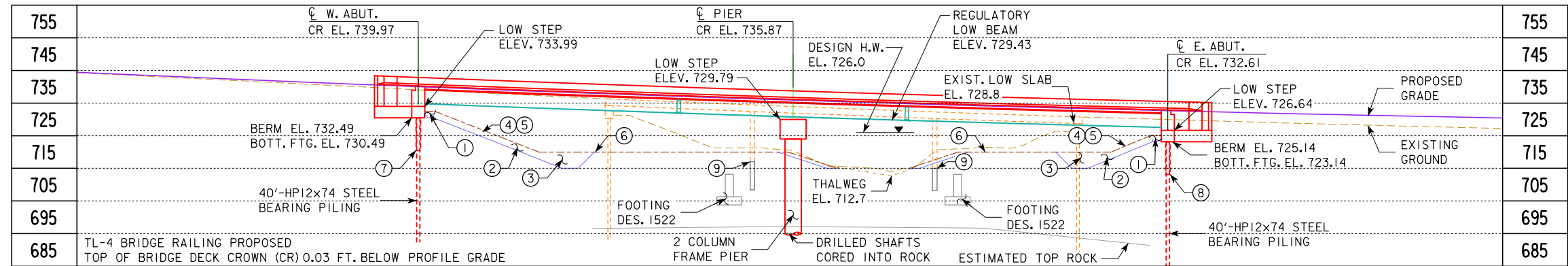
2. DO NOT LIFT OR STRAIN UNITS IN ANY WAY BEFORE THEY HAVE DEVELOPED THE STRENGTH SPECIFIED. IN STORAGE, SUPPORT UNITS AT POINTS ADJACENT TO BEARINGS.

3. DURING FABRICATION, STORAGE, HANDLING AND HAULING TAKE CARE TO PREVENT CRACKING, TWISTING, UNNECESSARY ROUGHNESS, OR OTHER DAMAGE. IN PARTICULAR, DO NOT ALLOW TIEDOWNS TO COME IN DIRECT CONTACT WITH CONCRETE SURFACES. DO NOT SUBJECT UNITS TO EXCESSIVE IMPACT. REPLACE AT NO ADDITIONAL COST TO THE CONTRACTING AUTHORITY UNITS THAT ARE, IN THE ENGINEER'S OPINION, DAMAGED IN A WAY TO IMPAIR THEIR STRENGTH OR SUITABILITY FOR THEIR INTENDED USE.

F. FINISH.

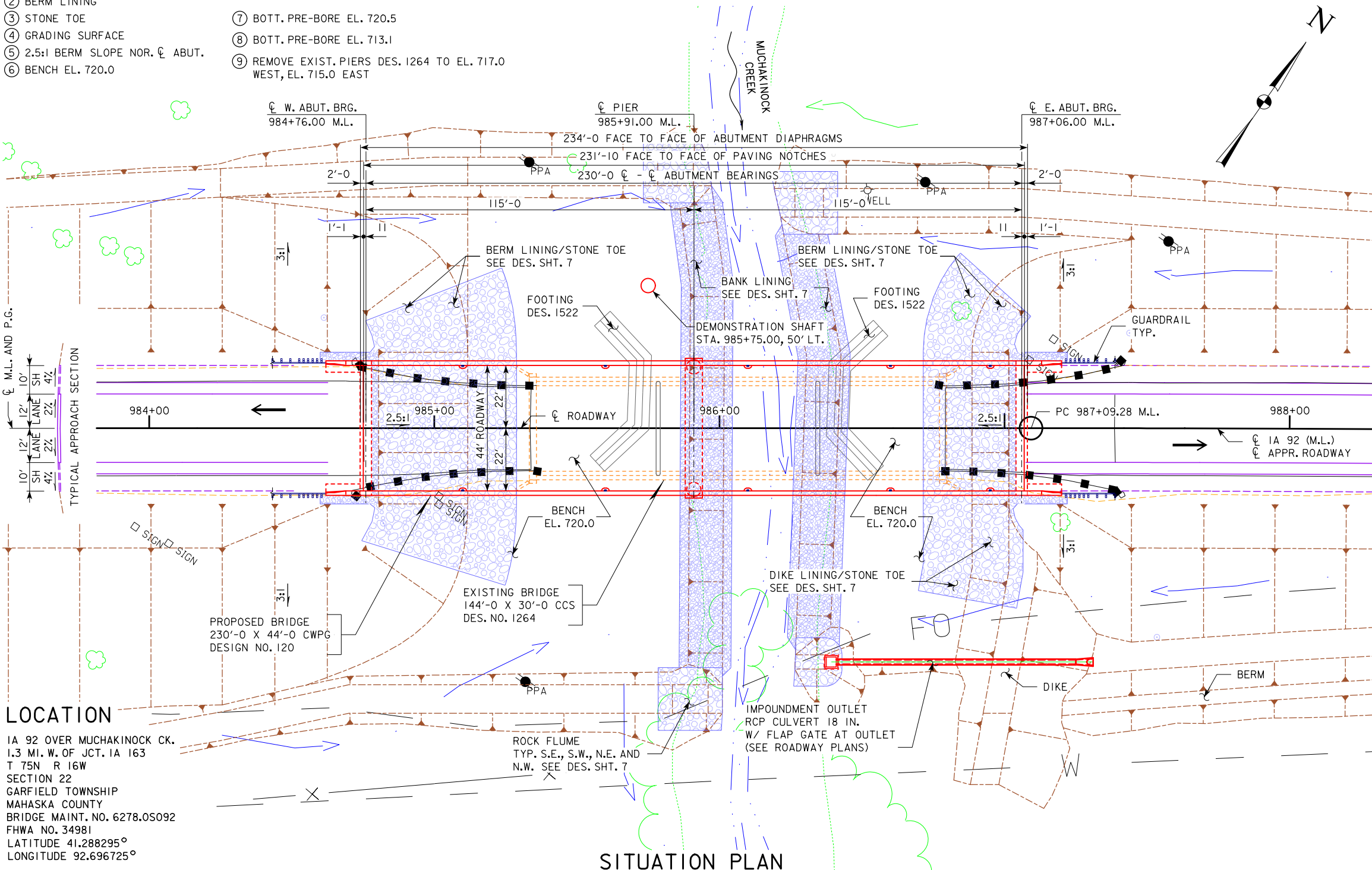
FINISH ALL SURFACES WHICH WILL BE EXPOSED IN THE FINISHED STRUCTURE AS PROVIDED IN ARTICLE 2403.03, P, 2, B, AND ENSURE THEY ARE FREE OF HONEYCOMB OR SURFACE DEFECTS. SUBMIT STRUCTURAL REPAIR PROCEDURES TO THE ENGINEER FOR APPROVAL.





- ① EROSION STONE ABUTMENT FACING
② BERM LINING
③ STONE TOE
④ GRADING SURFACE
⑤ 2.5:1 BERM SLOPE NOR. CL ABUT.
⑥ BENCH EL. 720.0
- ⑦ BOTT. PRE-BORE EL. 720.5
⑧ BOTT. PRE-BORE EL. 713.1
⑨ REMOVE EXIST. PIERS DES. 1264 TO EL. 717.0 WEST, EL. 715.0 EAST

LONGITUDINAL SECTION ALONG CL APPROACH ROADWAY



BENCH MARK:
BM FEN03, FENO MONUMENT IDOT MAINT. GAR.
X=19,535,805.4 Y=7,580,007.9
IOWA RCS ZONE 9 (NEWTON), SURVEY FEET
ELEV. = 757.71 NAVD88/IARTN (GEOID12B)

CURVE DATA

IA 92 (M.L.)
PI STA. 990+09.30
PC STA. 987+09.28
PT STA. 993+09.28
 $\Delta = 1^{\circ}42' 22.63''$ (RT)
T = 300.02'
L = 600.00'
E = 2.23'
R = 20,147.55'
e = NC

-4.9647% +4.4007%

PVI STA 990+50.00
PVI EL. 710.65
LVC = 1,475.00 FT.

PROPOSED GRADE ON IA 92

HYDRAULIC DATA

DRAINAGE AREA = 36.7 SQ. MI.
STREAM SLOPE = 3.14 FT./MI.
AVG. LOW WATER STAGE = EL. 714.7

Q₂₅ = 5,500 CFS
STAGE = EL. 725.6

Q₅₀ = 6,650 CFS
STAGE = EL. 726.0
REGULATORY LOW BEAM = 729.4
BACKWATER = 0.98 FT.
AVG. BRIDGE VELOCITY = 4.7 FPS

Q₁₀₀ = 7,780 CFS
STAGE = EL. 726.4
OPERATIONAL LOW BEAM = 727.0
BACKWATER = 1.15 FT.
AVG. BRIDGE VELOCITY = 5.2 FPS

Q₂₀₀ = 9,980 CFS
STAGE = EL. 727.1
BACKWATER = 1.47 FT.
AVG. BRIDGE VELOCITY = 6.1 FPS
CALCULATED DESIGN SCOUR = EL. 694.4

Q₅₀₀ = 10,780 CFS
STAGE = EL. 727.4
AVG. BRIDGE VELOCITY = 6.3 FPS
CALCULATED CHECK SCOUR = EL. 693.1

ROADWAY OVERTOP 9,000 CFS (150 YR.)
ROADWAY OVERTOP EL. 727.8
STA. 990+94

BACKWATER REFERENCES CHANGE FROM EXISTING CONDITION, EAST FLOODPLAIN, 100' UPSTREAM IA 92

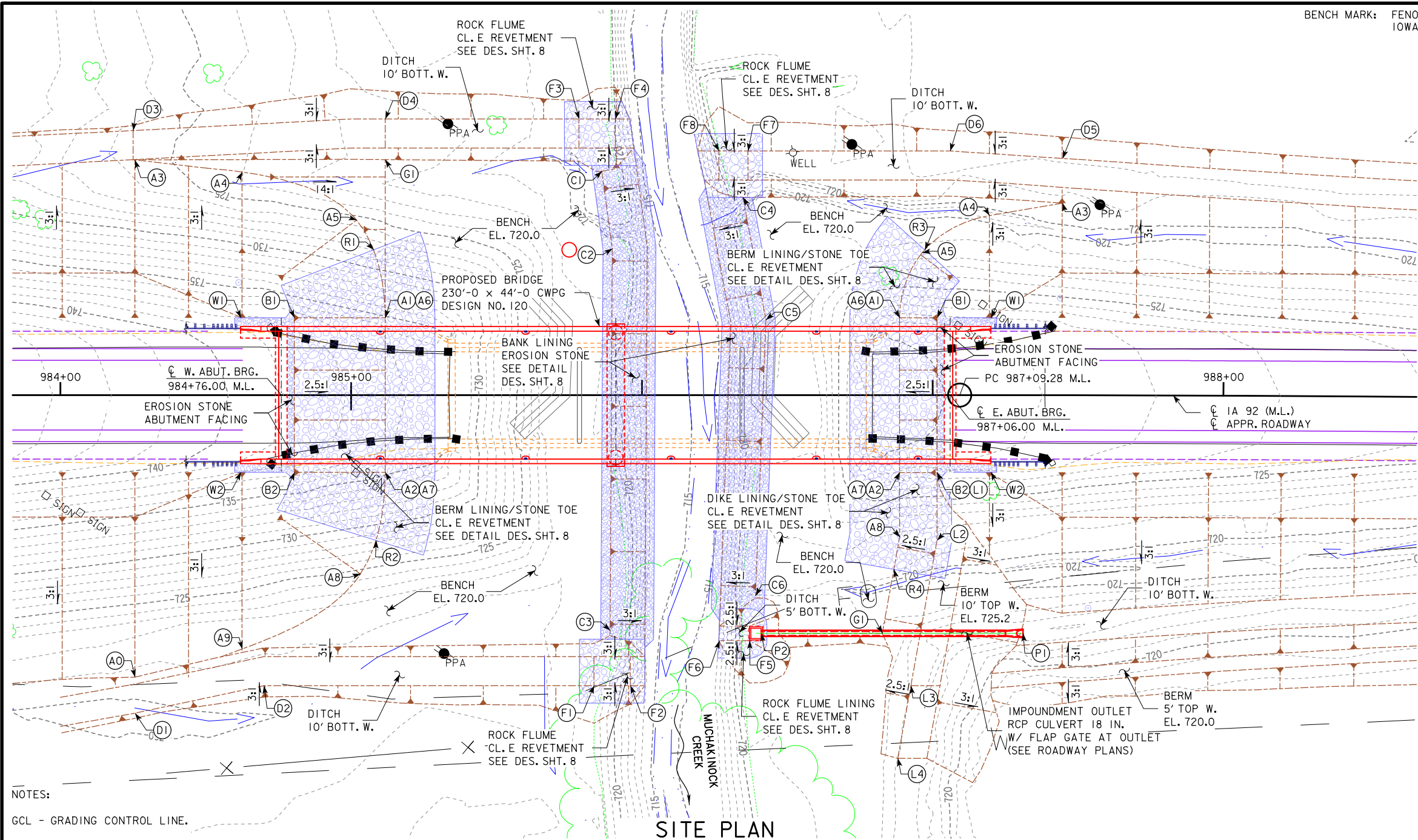
UTILITIES LEGEND

FO - FIBER OPTIC
TV - CABLE
W - WATER LINE
PPA - POWER POLE

TRAFFIC ESTIMATE

2021 AADT 3,000 V.P.D.
2041 AADT 3,900 V.P.D.
2041 DHV -- V.P.H.
TRUCKS 18%
TOTAL DESIGN ESALS --

DESIGN FOR 0° SKEW
230'-0" X 44'-0" CONTINUOUS WELDED GIRDER BRIDGE
115'-0" W. SPAN 115'-0" E. SPAN
STA. 985+91.00 IA 92 (M.L.) OCTOBER, 2020
MAHASKA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 6 OF 42 FILE NO. 31191 DESIGN NO. 120



BENCH MARK: FENO3, FENO MONUMENT IDOT MAINT. GAR. - X=19,535,805.4 Y=7,580,007.9 IOWA RCS ZONE 9 (NEWTON), ELEVATION 757.71 NAVD88/IARTN (GEOID12B)

CULVERT LAYOUT:

- (P1) 987+31.2 M.L., 82.0' RT., END APRON, F.L. EL. 717.0
- (P2) 986+41.0 M.L., 82.0' RT., END CUL/FACE HEADWALL, F.L. EL. 716.8

REVETMENT LAYOUT:

- (R1) EDGE BERM LINING/STONE TOE. TOE BERM, 985+07.8 M.L., 50.0' LT. EDGE PERP. BERM SLOPE.
- (R2) EDGE BERM LINING/STONE TOE. TOE BERM, 985+08.5 M.L., 50.0' RT. EDGE PERP. BERM SLOPE.
- (R3) EDGE BERM LINING/STONE TOE. TOE BERM, 986+97.2 M.L., 50.0' LT. EDGE PERP. BERM SLOPE.
- (R4) EDGE DIKE LINING/STONE TOE. TOE DIKE, 986+86.6 M.L., 60.0' RT. EDGE PERP. DIKE SLOPE.

NOTES:

GCL - GRADING CONTROL LINE.

DITCH/FLUME GRADING CONTROL:

- (D1) 984+25.6 M.L., 109.5' RT., BTM/EDGE DITCH, EL. 719.2
- (D2) 984+70.0 M.L., 100.0' RT., BTM/EDGE DITCH, EL. 719.0
- (D3) 984+25.0 M.L., 91.0' LT., BTM/EDGE DITCH, EL. 725.4
- (D4) 985+11.7 M.L., 95.0' LT., BTM/EDGE DITCH, EL. 718.7
- (D5) 987+44.5 M.L., 81.5' LT., BTM/EDGE DITCH, EL. 718.2
- (D6) 987+06.0 M.L., 84.0' LT., BTM/EDGE DITCH, EL. 718.15
- (F1) 985+83.5 M.L., 100.0' RT., BTM/EDGE DITCH, TOP/FLUME 20.0% SLOPE, EL. 718.5
- (F2) 985+96.0 M.L., 100.0' RT., BTM/EDGE DITCH, BTM/FLUME SLOPE, EL. 716.0
- (F3) 985+78.4 M.L., 95.0' LT., BTM/EDGE DITCH, TOP/FLUME 20% SLOPE, EL. 718.5
- (F4) 985+90.9 M.L., 95.0' LT., BTM/EDGE DITCH, BTM/FLUME SLOPE, EL. 716.0

DITCH/FLUME (CONT.):

- (F5) 986+37.0 M.L., 84.5' RT., BTM/EDGE DITCH AT END SIDEWALL, EL. 716.0
- (F6) 986+26.7 M.L., 84.5' RT., BTM/EDGE DITCH AT OUTLET, NO SLOPE, EL. 716.0
- (F7) 986+36.5 M.L., 84.0' LT., BTM/EDGE DITCH, TOP/FLUME 20% SLOPE, EL. 718.0
- (F8) 986+26.5 M.L., 84.0' LT., BTM/EDGE DITCH, BTM/FLUME SLOPE, EL. 716.0

BANK GRADING CONTROL:

- (C1) 985+86.2 M.L., 77.0' LT., TOP BANK, GCL, EL. 720.0
- (C2) 985+89.8 M.L., 50.4' LT., TOP BANK, GCL, EL. 720.0
- (C3) 985+89.1 M.L., 81.0' RT., TOP BANK, GCL, EL. 720.0
- (C4) 986+34.8 M.L., 68.0' LT., TOP BANK, GCL, EL. 720.0
- (C5) 986+42.6 M.L., 25.9' LT., TOP BANK, GCL, EL. 720.0

BANK GRADING (CONT.):

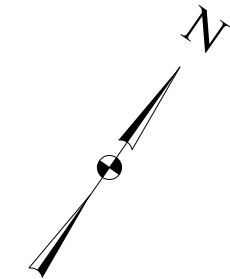
- (C6) 986+39.1 M.L., 69.0' RT., TOP BANK, GCL, EL. 720.0
- (A3) 984+25.6 M.L., 80.9' LT., TOE BERM/DITCH, EL. 725.4
- (A4) 984+62.5 M.L., 76.7' LT., TOE BERM, EL. 723.6
- (A5) 985+01.9 M.L., 60.2' LT., TOE BERM, EL. 720.7
- (A6) 985+11.7 M.L., 26.6' LT., TOE BERM/BENCH, EL. 720.0
- (A7) 985+11.7 M.L., 26.6' RT., TOE BERM/BENCH, EL. 720.0
- (A8) 985+03.2 M.L., 61.5' RT., TOE BERM/BENCH, EL. 720.0
- (A9) 984+62.5 M.L., 87.4' RT., TOE BERM/BENCH, EL. 720.0
- (A0) 984+25.6 M.L., 97.1' RT., TOE BERM/BENCH, EL. 720.0
- (G1) 985+11.7 M.L., 81.0' LT., W. EDGE BENCH, EL. 720.0

WEST BERM/BENCH GRADING CONTROL:

EAST BERM/BENCH GRADING CONTROL:

- (A3) 987+44.5 M.L., 66.1' LT., TOE BERM/BENCH, EL. 720.0
- (A4) 987+19.5 M.L., 61.8' LT., TOE BERM/BENCH, EL. 720.0
- (A5) 986+96.4 M.L., 49.0' LT., TOE BERM/BENCH, EL. 720.0
- (A6) 986+88.6 M.L., 26.6' LT., TOE BERM/BENCH, EL. 720.0
- (A7) 986+88.6 M.L., 26.6' RT., TOE BERM/BENCH, EL. 720.0
- (A8) 986+88.6 M.L., 48.8' RT., TOE DIKE/BENCH, EL. 720.0
- (G1) 986+82.7 M.L., 82.0' RT., TOE DK/S. EDGE BENCH, EL. 720.0
- (L1) 987+01.5 M.L., 26.6' RT., TOP DIKE, GCL, EL. 725.2
- (L2) 987+01.5 M.L., 50.0' RT., TOP DIKE, GCL, EL. 725.2
- (L3) 986+92.5 M.L., 100.0' RT., TOP DIKE, GCL, EL. 725.2
- (L4) 986+88.0 M.L., 125.0' RT., TOP/END DIKE, GCL, EL. 724.0

EAST DIKE GRADING CONTROL:



BERM SLOPE LOCATION TABLE						
WEST ABUTMENT			EAST ABUTMENT			
	STATION	OFFSET	ELEV	STATION	OFFSET	ELEV
A1	985+11.73	26.58' LT	720.00	986+88.60	26.58' LT	720.00
A2	985+11.73	26.58' RT	720.00	986+88.60	26.58' RT	720.00
B1	984+80.50	26.58' LT	732.49	987+01.50	26.58' LT	725.14
B2	984+80.50	26.58' RT	732.49	987+01.50	26.58' RT	725.14
W1	984+62.00	26.58' LT	739.96	987+20.00	26.58' LT	731.72
W2	984+62.00	26.58' RT	739.96	987+20.00	26.58' RT	731.72

BERM SLOPE ELEVATIONS REFLECT GRADING SURFACE

DESIGN FOR 0° SKEW

230'-0 X 44'-0 CONTINUOUS WELDED GIRDER BRIDGE

115'-0 W. SPAN 115'-0 E. SPAN

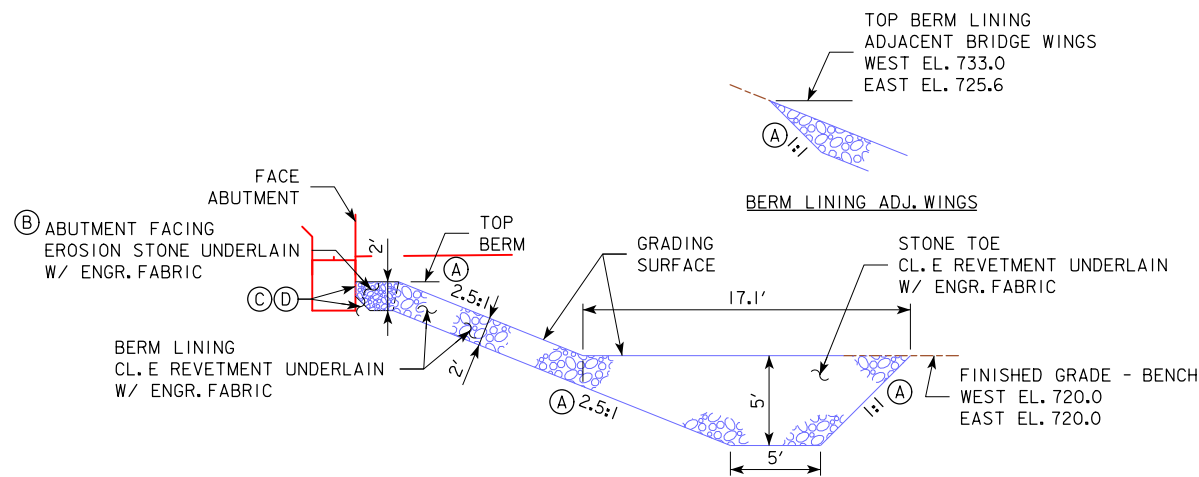
SITUATION PLAN - SITE

STA. 985+91.00 IA 92 (ML) OCTOBER, 2020

MAHASKA COUNTY

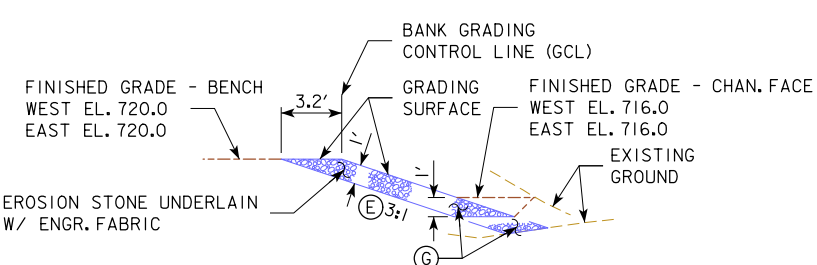
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 7 OF 42 FILE NO. 31191 DESIGN NO. 120

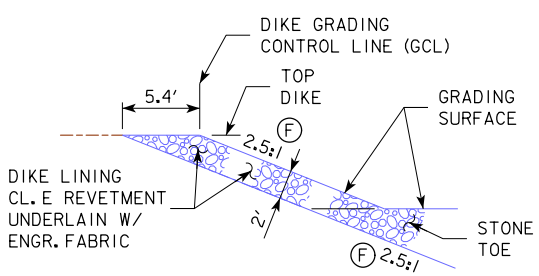


SECTION THROUGH BERM LINING AND STONE TOE

- (A) Slope nor. $\frac{1}{2}$ abut. / grading control line (pt. A3-AX).
- (B) Extend facing out to lateral limits of wing armoring.
- (C) 1' x 1' soil wedge at face abutment.
- (D) Carry engr. fabric up soil wedge and face abutment.
- (E) Slope normal bank grading control line (GCL).
- (F) Slope normal dike grading control line (GCL).
- (G) Carry bank lining to 1' below finished grade in excavated section. In fill section extend down to existing ground.
- (H) 3:1 typ., 2.5:1 S.E.
- (I) 10' typ., 5' S.E.

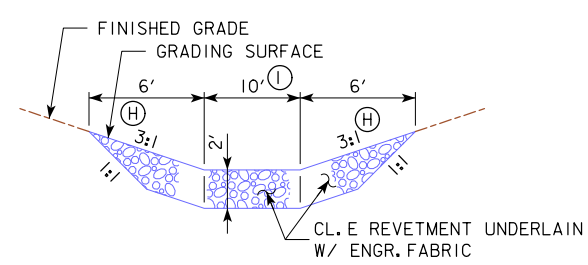


SECTION THROUGH BANK LINING

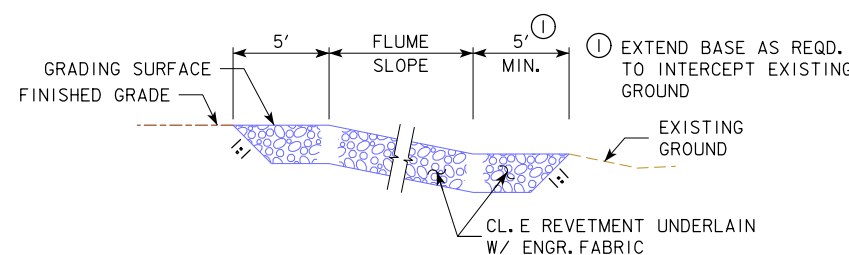


SECTION THROUGH DIKE LINING

BENCH MARK: FENO3, FENO MONUMENT IDOT MAINT. GAR. - X=19,535,805.4 Y=7,580,007.9 IOWA RCS ZONE 9 (NEWTON), ELEVATION 757.71 NAVD88/IARTN (GEOID12B)



SECTION THROUGH ROCK FLUME

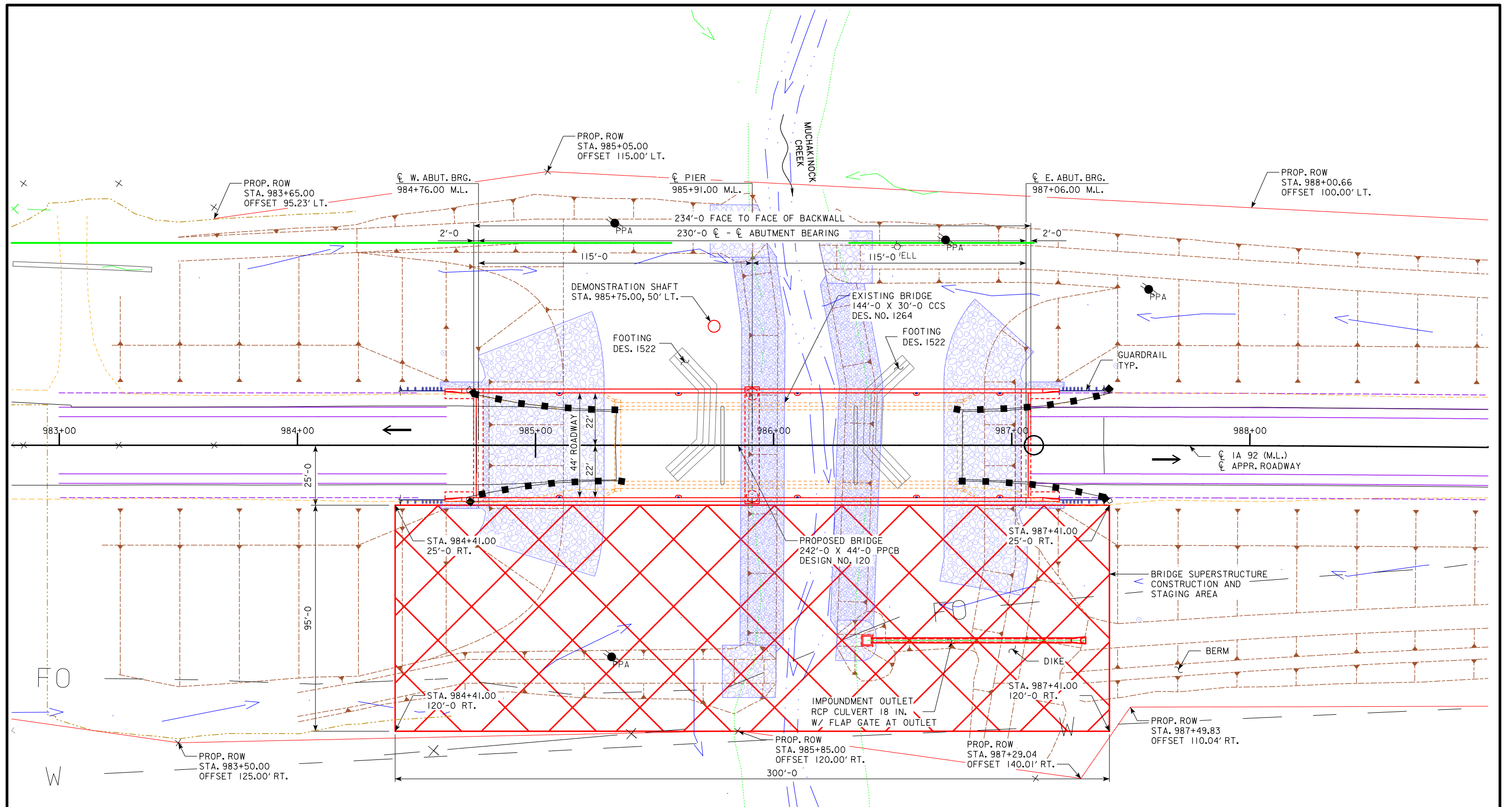


SECTION ALONG ROCK FLUME

REVTMENT QUANTITIES				
REVTMENT TYPE - LOCATION	REVTMENT CL. E (TON)	EROSION STONE (TON)	ENGINEERING FABRIC (SY)	EXCAVATION, CL. 10 (CY)
BERM LINING, STONE TOE - WEST	766.6	14.2	616.2	488.0
BANK LINING - WEST	-	153.0	344.2	95.6
FLUME LINING S.W.	46.1	-	54.9	28.8
FLUME LINING N.W.	47.4	-	56.0	29.6
BERM/DIKE LINING, STONE TOE - EAST	628.8	14.2	477.3	401.8
BANK LINING - EAST	-	133.3	299.9	83.3
FLUME LINING S.E.	19.0	-	27.2	11.9
FLUME LINING N.E.	43.0	-	51.7	26.9
TOTALS	1,550.9	314.7	1,927.4	1,165.9

EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE.
 REVTMENT AND EROSION STONE ESTIMATED AT 1.6 TON/CY

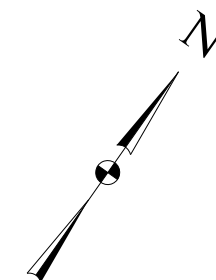
DESIGN FOR 0° SKEW
230'-0 X 44'-0 CONTINUOUS WELDED GIRDER BRIDGE
 115'-0 W. SPAN 115'-0 E. SPAN
SITUATION PLAN - MISCELLANEOUS
 STA. 985+91.00 1A 92 (ML) OCTOBER, 2020
MAHASKA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 8 OF 42 FILE NO. 31191 DESIGN NO. 120



BRIDGE STAGING PLAN

UTILITIES LEGEND

FO - FIBER OPTIC
TV - CABLE
W - WATER LINE
PPA - POWER POLE



DESIGN FOR 0° SKEW

**230'-0" X 44'-0" CONTINUOUS
WELDED GIRDER BRIDGE**

115'-0" W. SPAN 115'-0" E. SPAN

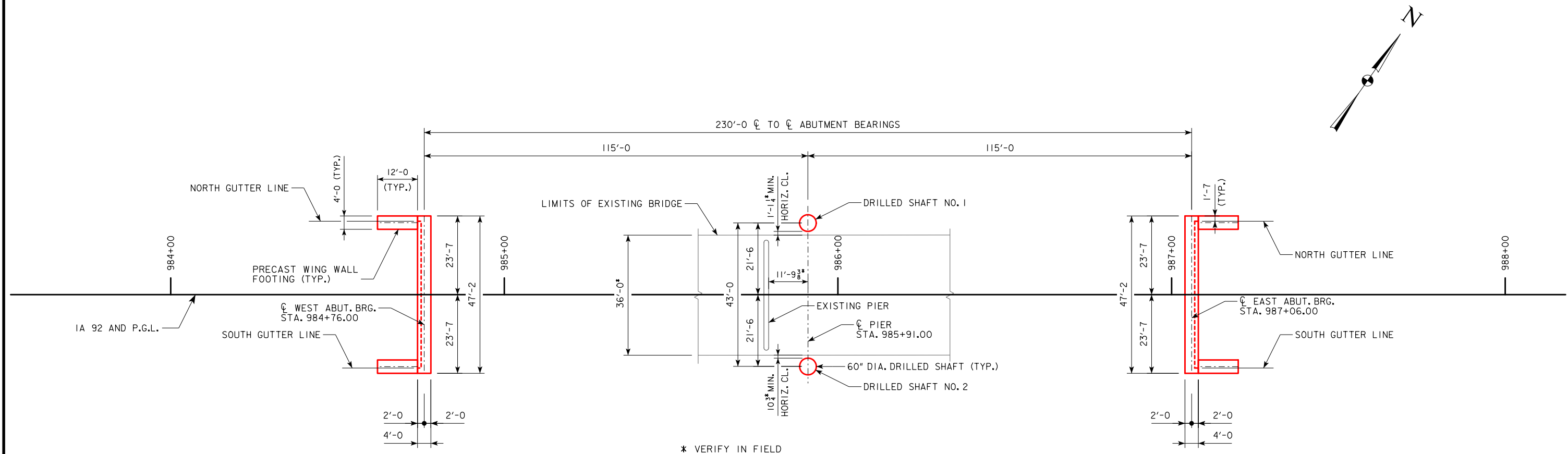
BRIDGE STAGING PLAN

STA. 985+91.00 1A 92 (ML) OCTOBER, 2020

MAHASKA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 9 OF 42 FILE NO. 31191 DESIGN NO. 120



STAKING DIAGRAM

BRIDGE COORDINATES			
LOCATION	℄ W. ABUT. BRG.	℄ PIER 1	℄ E. ABUT. BRG.
NORTH EDGE OF DECK	E=19532861.302 N=7578276.868	E=19532955.519 N=7578342.811	E=19533049.734 N=7578408.753
℄ APPROACH ROADWAY	E=19532874.825 N=7578257.547	E=19532969.050 N=7578323.496	E=19533063.257 N=7578389.432
SOUTH EDGE OF DECK	E=19532888.348 N=7578238.226	E=19532982.580 N=7578304.180	E=19533076.780 N=7578370.111

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

230'-0 X 44'-0 CONTINUOUS
WELDED GIRDER BRIDGE

115'-0 W. SPAN115'-0 E. SPAN

STAKING DIAGRAM

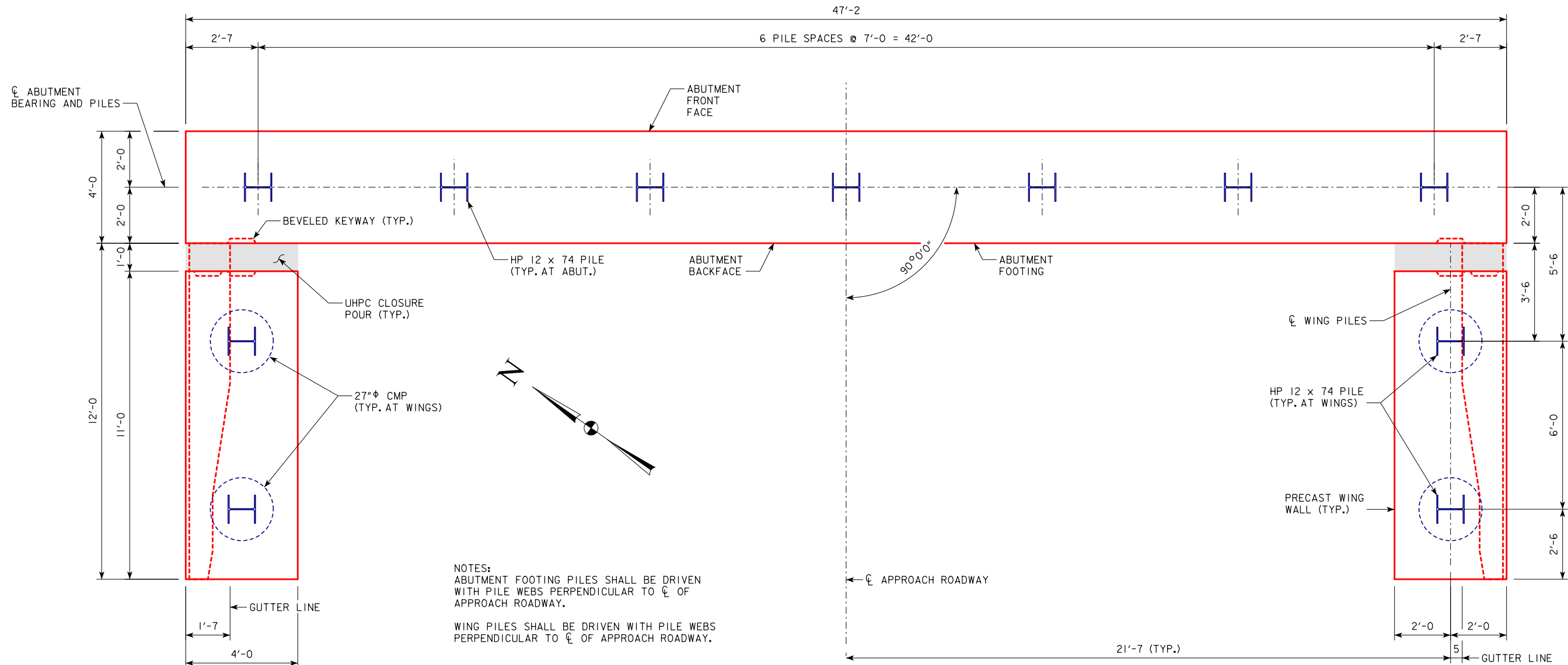
STA. 985+91.00IA 92 (ML)OCTOBER, 2020

MAHASKA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 10 OF 42FILE NO. 31191DESIGN NO. 120





NOTES:
 ABUTMENT FOOTING PILES SHALL BE DRIVEN
 WITH PILE WEBS PERPENDICULAR TO CL OF
 APPROACH ROADWAY.
 WING PILES SHALL BE DRIVEN WITH PILE WEBS
 PERPENDICULAR TO CL OF APPROACH ROADWAY.

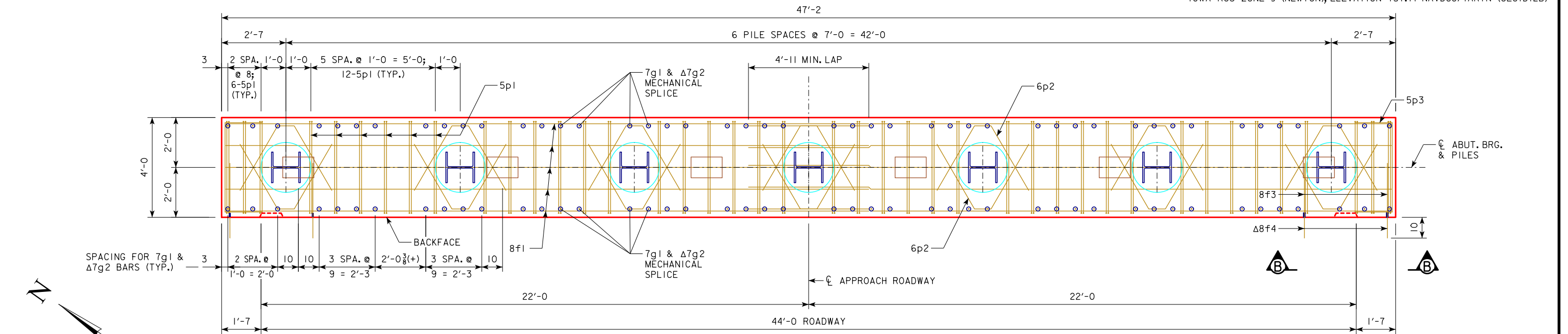
WEST ABUTMENT AND WING WALL PILE PLAN
 (REINFORCING NOT SHOWN)
 (EAST ABUTMENT SIMILAR)

NOTES:
 11 - 40' HP 12 x 74 STEEL BEARING PILING REQUIRED AT WEST
 ABUTMENT FOOTING INCLUDING PRECAST WINGS.
 11 - 45' HP 12 x 74 STEEL BEARING PILING REQUIRED AT EAST
 ABUTMENT FOOTING INCLUDING PRECAST WINGS.
 BARRIER RAIL NOT SHOWN FOR CLARITY.
 SEE DESIGN SHEETS 17 AND 18 FOR WINGWALL DETAILS AND
 QUANTITIES.
 SEE DESIGN SHEET 13 FOR ABUTMENT FOOTING QUANTITIES.

DESIGN FOR 0° SKEW
**230'-0" X 44'-0" CONTINUOUS
 WELDED GIRDER BRIDGE**
 115'-0" W. SPAN 115'-0" E. SPAN
C.I.P. ABUTMENT PILE PLAN
 STA. 985+91.00 1A 92 (ML) OCTOBER, 2020
MAHASKA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 11 OF 42 FILE NO. 31191 DESIGN NO. 120



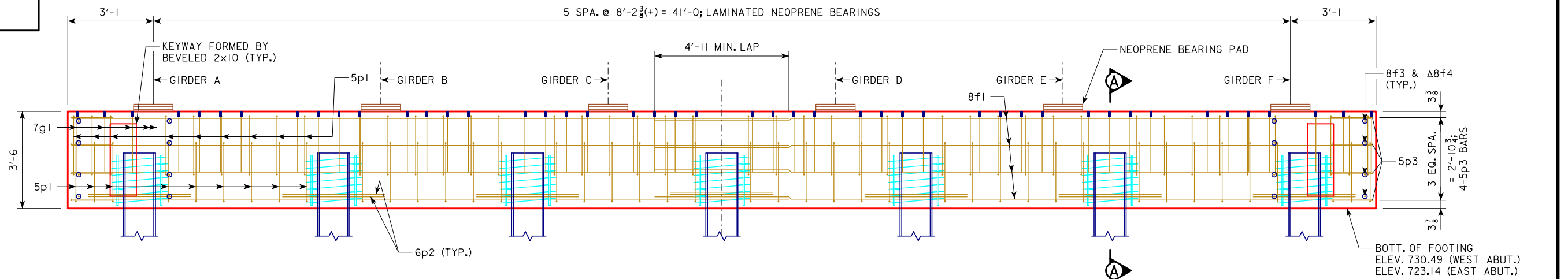
BENCH MARK: FENO03, FENO MONUMENT IDOT MAINT. GAR. - X=19,535,805.4 Y=7,580,007.9
IOWA RCS ZONE 9 (NEWTON), ELEVATION 757.71 NAVD88/IARTN (GEOID12B)



WEST ABUTMENT PLAN VIEW PLAN
(EAST ABUTMENT SIMILAR)

NOTE:
Δ7g2 AND Δ8f4 BARS SUPPLIED
WITH ABUTMENT FOOTING
REINFORCING. SEE GENERAL NOTES
SHEET FOR MECHANICAL SPLICE
DETAILS AND NOTES.

UNFACTORED ABUT. FTG. CAPACITIES:
POS. MOMENT = 797 FT-KIPS
NEG. MOMENT = 942 FT-KIPS
SHEAR = 493 KIPS



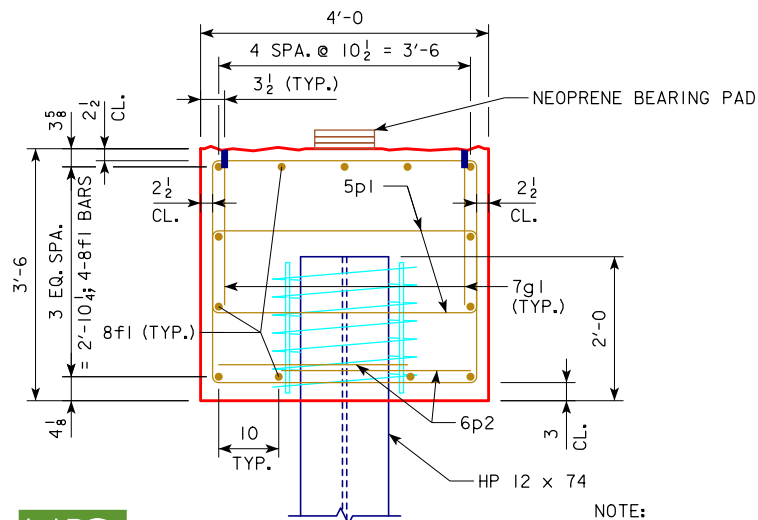
WEST ABUTMENT ELEVATION VIEW
(LOOKING EAST, BACK FACE)
(EAST ABUTMENT SIMILAR)

ROUGHNESS NOTE:

ROUGHEN SURFACE FOR UHPC CONNECTION TO APPROXIMATELY 1" AMPLITUDE. VERIFY ROUGHNESS COMPLIES WITH INTERNATIONAL CONCRETE REPAIR INSTITUTE (ICRI) CONCRETE SURFACE PROFILE (CSP) 9 MINIMUM OR 10.

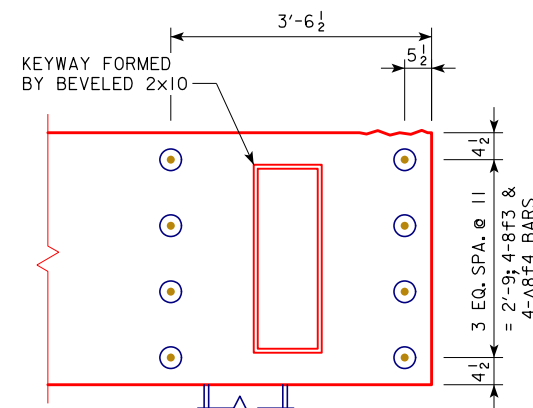
NOTE:
SEE DESIGN SHEET 13 FOR ABUTMENT FOOTING
QUANTITIES AND NOTES.

SEE DESIGN SHEET 25 FOR BEARING PAD DETAILS.



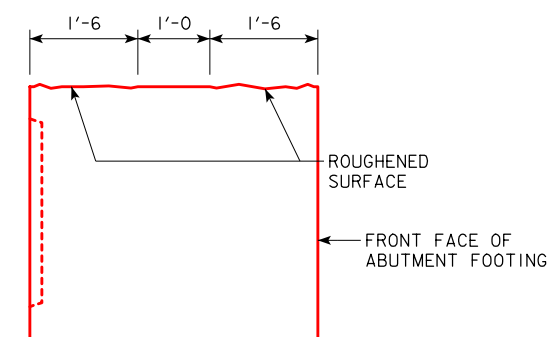
SECTION A-A

NOTE:
THE SPIRAL AT THE TOP OF EACH PILE
IS TO BE 7 TURNS OF NO.2 BAR, 24"
DIAMETER, 3" PITCH WITH 3 - $L_8 \times \frac{7}{8} \times \frac{1}{8}$
SPACERS PUNCHED TO HOLD SPIRAL.



VIEW B-B

(TYP. EACH END OF FOOTING)



ROUGHNESS DETAIL

(UHPC CONNECTION SURFACE)

DESIGN FOR 0° SKEW

230'-0 X 44'-0 CONTINUOUS
WELDED GIRDER BRIDGE

115'-0 W. SPAN 115'-0 E. SPAN

C.I.P. ABUTMENT FOOTING DETAILS

STA. 985+91.00 IA 92 (ML) OCTOBER, 2020

MAHASKA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 12 OF 42 FILE NO. 31191 DESIGN NO. 120

ABUTMENT PILING DESIGN NOTES:

THE CONTRACT LENGTH OF 40 FEET FOR THE WEST ABUTMENT AND 45 FEET FOR THE EAST ABUTMENT PILES IS BASED ON A COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 235 KIPS AT THE WEST ABUTMENT PILES AND 230 KIPS AT THE EAST ABUTMENT PILES, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL AND 0.70 FOR ROCK BEARING AT BOTH ABUTMENTS. TO ACCOUNT FOR SOIL CONSOLIDATION UNDER THE NEW FILL, THE FACTORED AXIAL LOAD INCLUDES A FACTORED DOWNDRAW LOAD OF 42 KIPS AT THE WEST ABUTMENT PILES AND 38 KIPS AT THE EAST ABUTMENT PILES.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.78 FOR SOIL AND 0.70 FOR ROCK END BEARING. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF PREBORE.

ABUTMENT PILE DRIVING NOTES:

THE REQUIRED AXIAL BEARING RESISTANCE IS 172 TONS FOR WEST ABUTMENT PILES AND 180 TONS FOR EAST ABUTMENT PILES 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.

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

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











ABUTMENT NOTES:

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

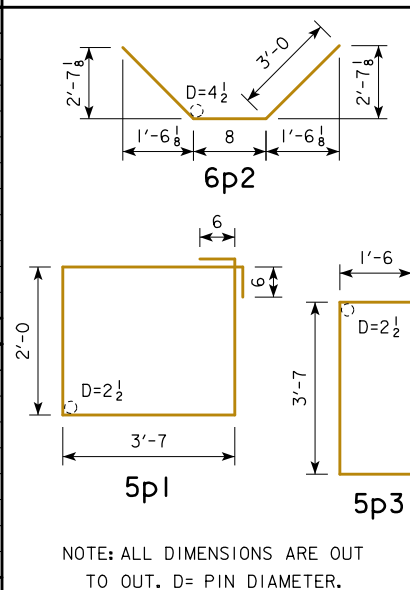
THE CONTRACTOR MAY EMPLOY METHODS SUCH AS THE USE OF A NON-CHLORIDE ACCELERATOR OR SUPPLEMENTAL HEATING AND PROTECTION TO INCREASE EARLY STRENGTH GAIN.

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











REINFORCING BAR LIST - WEST ABUTMENT

EPOXY COATED	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
	8f1	ABUTMENT FOOTING, LONGITUDINAL		26	25'-11	1,799
	8f3	WINGWALL DOWEL		16	3'-9	160
	8f4	WINGWALL DOWEL, SPLICED		16	0'-10	36
	7g1	ABUTMENT FOOTING, VERTICAL		92	2'-7	485
	7g2	ABUTMENT FOOTING, VERTICAL, SPLICED		92	0'-8	125
	5p1	ABUTMENT HOOPS		84	12'-2	1,063
	6p2	ABUTMENT BOTT. AT PILES		14	6'-8	140
5p3	ABUTMENT FOOTING END, HORIZ.		8	6'-7	55	
	REINFORCING STEEL - EPOXY COATED - TOTAL (LBS.)					3,863
NON-COATED	#2	PILE SPIRALS		7	38'-6	46
		SPIRAL SPACERS, $L_8^1 \times \frac{7}{8} \times \frac{1}{8} \times 0.70$		21	1'-10	27
		REINFORCING STEEL - NON-COATED - TOTAL (LBS.)				

BENT BAR DETAILS



REINFORCING BAR LIST - EAST ABUTMENT

EPOXY COATED	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
	8f1	ABUTMENT FOOTING, LONGITUDINAL		26	25'-11	1,799
	8f3	WINGWALL DOWEL		16	3'-9	160
	8f4	WINGWALL DOWEL, SPLICED		16	0'-10	36
	7g1	ABUTMENT FOOTING, VERTICAL		92	2'-7	485
	7g2	ABUTMENT FOOTING, VERTICAL, SPLICED		92	0'-8	125
	5p1	ABUTMENT HOOPS		84	12'-2	1,063
	6p2	ABUTMENT BOT. AT PILES		14	6'-8	140
5p3	ABUTMENT FOOTING END, HORIZ.		8	6'-7	55	
	REINFORCING STEEL - EPOXY COATED - TOTAL (LBS.)					3,863
NON-COATED	#2	PILE SPIRALS		7	38'-6	46
		SPIRAL SPACERS, $L_8 \times \frac{7}{8} \times \frac{1}{8} \times 0.70$		21	1'-10	27
		REINFORCING STEEL - NON-COATED - TOTAL (LBS.)				

CONCRETE PLACEMENT QUANTITIES

LOCATION	QUANTITY
WEST C.I.P. ABUTMENT FOOTING	24.5
EAST C.I.P. ABUTMENT FOOTING	24.5
TOTAL (CU. YDS.)	49.0

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



DESIGN FOR 0° SKEW

230'-0 X 44'-0 CONTINUOUS
WELDED GIRDER BRIDGE

115'-0 W. SPAN 115'-0 E. SPAN

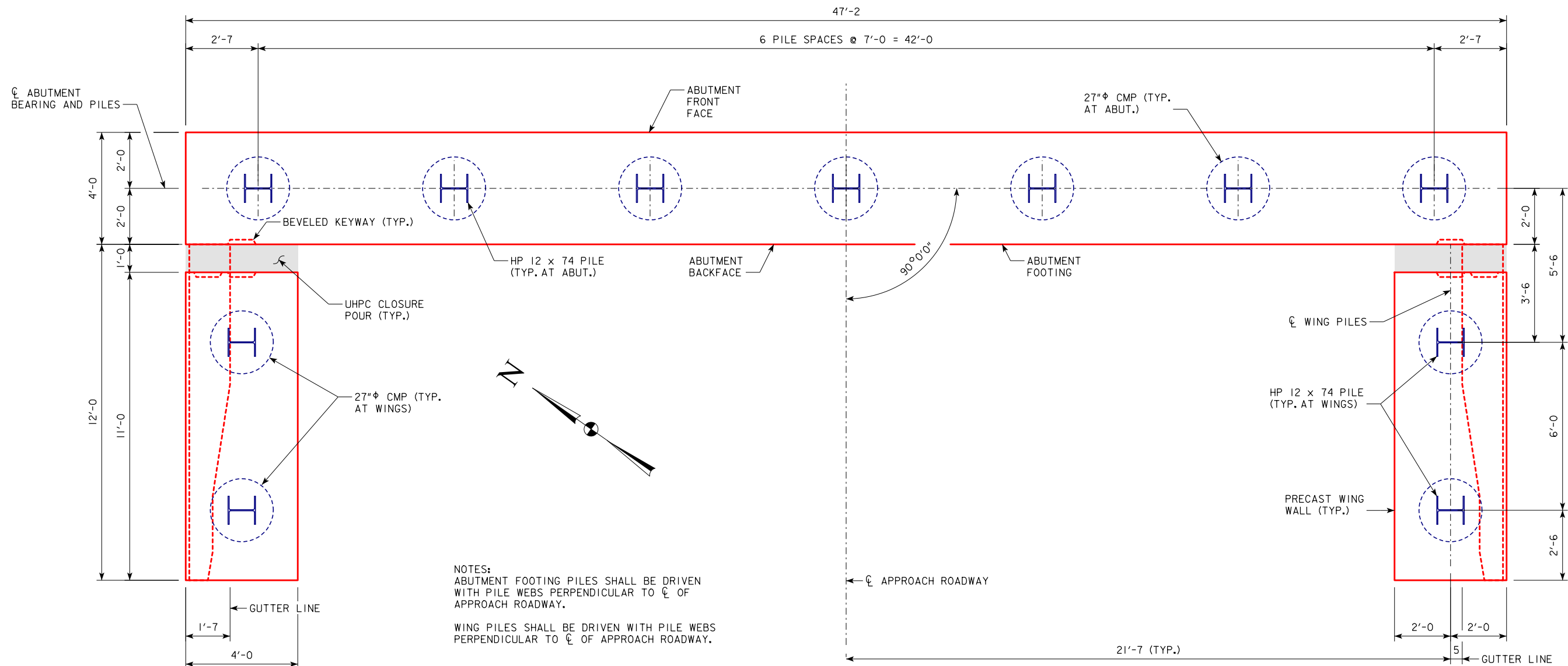
C.I.P. ABUTMENT FOOTING QUANTITIES

STA. 985+91.00 IA 92 (ML) OCTOBER, 2020

MAHASKA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 13 OF 42 FILE NO. 31191 DESIGN NO. 120



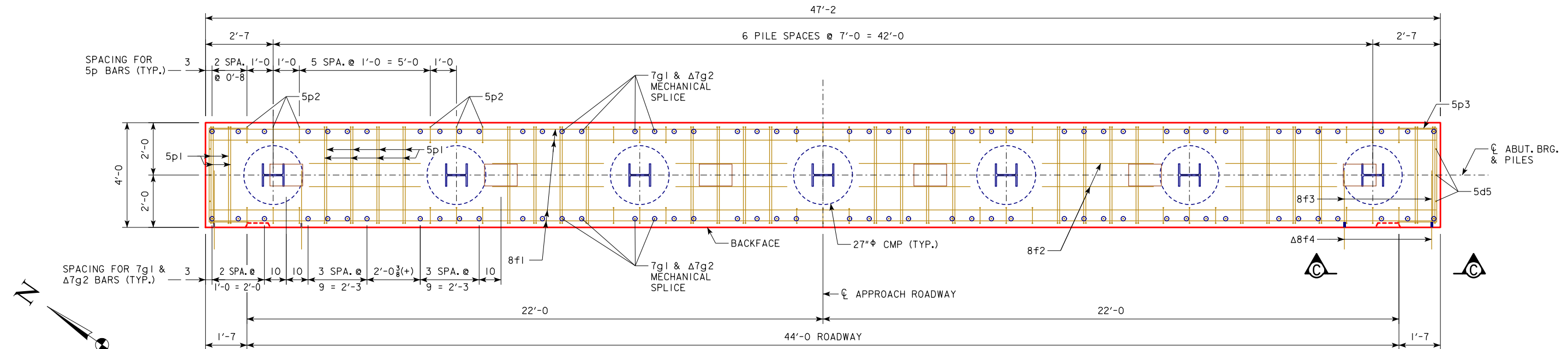
WEST ABUTMENT AND WING WALL PILE PLAN

(REINFORCING NOT SHOWN)
(EAST ABUTMENT SIMILAR)

NOTES:
11 - 40' HP 12 x 74 STEEL BEARING PILING REQUIRED AT WEST ABUTMENT FOOTING INCLUDING PRECAST WINGS.
11 - 45' HP 12 x 74 STEEL BEARING PILING REQUIRED AT EAST ABUTMENT FOOTING INCLUDING PRECAST WINGS.
BARRIER RAIL NOT SHOWN FOR CLARITY.
SEE DESIGN SHEETS 17 AND 18 FOR WINGWALL DETAILS AND QUANTITIES.
SEE DESIGN SHEET 16 FOR ABUTMENT FOOTING QUANTITIES.

DESIGN FOR 0° SKEW
230'-0" X 44'-0" CONTINUOUS WELDED GIRDER BRIDGE
115'-0" W. SPAN 115'-0" E. SPAN
PRECAST ABUTMENT PILE PLAN
STA. 985+91.00 1A 92 (ML) OCTOBER, 2020
MAHASKA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 14 OF 42 FILE NO. 31191 DESIGN NO. 120

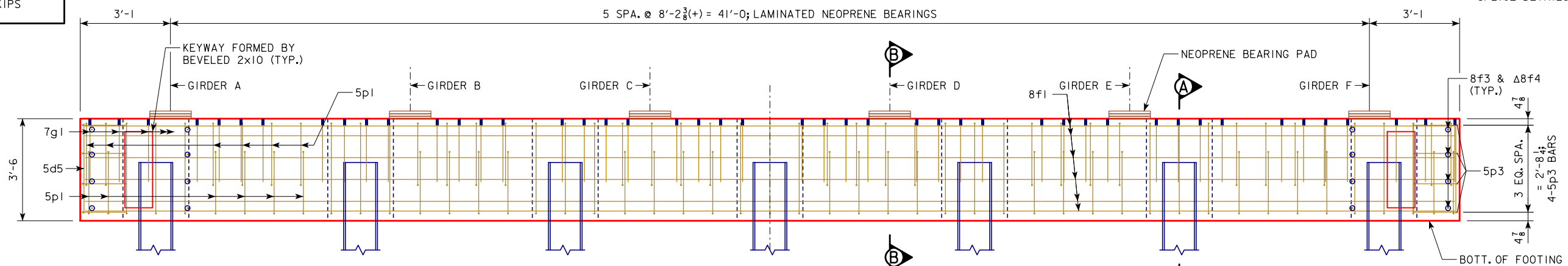




WEST ABUTMENT PLAN VIEW PLAN
(EAST ABUTMENT SIMILAR)

NOTE:
Δ7g2 AND Δ8f4 BAR SUPPLIED
WITH ABUTMENT FOOTING
REINFORCING. SEE GENERAL
NOTES SHEET FOR MECHANICAL
SPlice DETAILS AND NOTES.

UNFACTORED ABUT. FTG. CAPACITIES:
POS. MOMENT = 985 FT-KIPS
NEG. MOMENT = 985 FT-KIPS
SHEAR = 313 KIPS



WEST ABUTMENT ELEVATION VIEW
(LOOKING EAST, BACK FACE)
(EAST ABUTMENT SIMILAR)

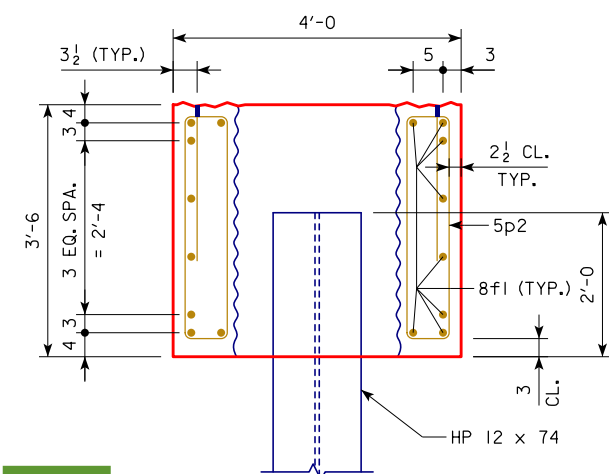
BOTT. OF FOOTING
ELEV. 730.49 (WEST ABUT.)
ELEV. 723.14 (EAST ABUT.)

ROUGHNESS NOTE:

ROUGHEN SURFACE FOR UHPC CONNECTION TO
APPROXIMATELY 1/4" AMPLITUDE. VERIFY ROUGHNESS COMPLIES
WITH INTERNATIONAL CONCRETE REPAIR INSTITUTE (ICRI)
CONCRETE SURFACE PROFILE (CSP) 9 MINIMUM OR 10.

NOTE:
SEE DESIGN SHEET 16 FOR ABUTMENT FOOTING
QUANTITIES AND NOTES.

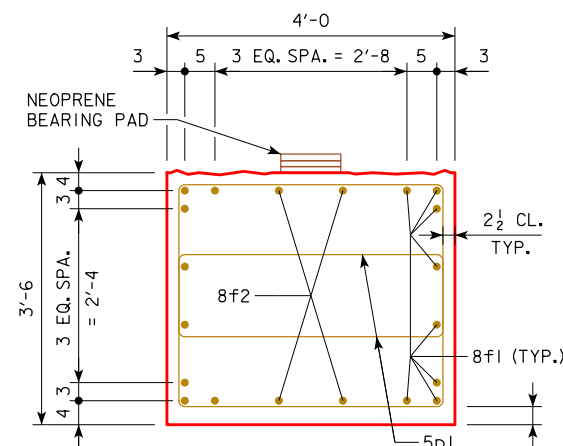
SEE DESIGN SHEET 25 FOR BEARING PAD DETAILS



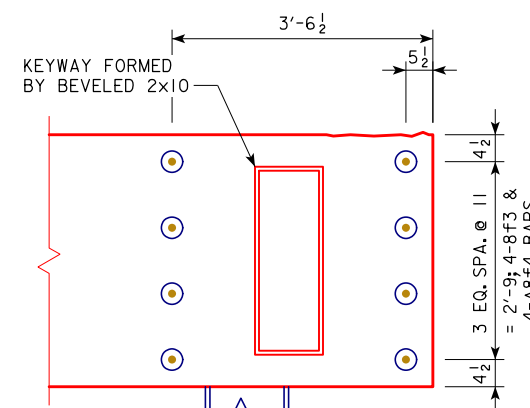
SECTION A-A



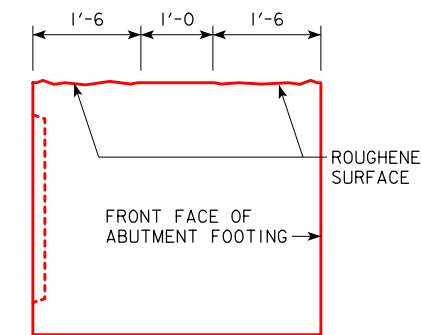
HRGreen (Δ7g2 BARS NOT SHOWN FOR CLARITY)



SECTION B-B



VIEW C-C
(TYP. EACH END OF FOOTING)



ROUGHNESS DETAIL
(UHPC CONNECTION SURFACE)

DESIGN FOR 0° SKEW
**230'-0 X 44'-0 CONTINUOUS
WELDED GIRDER BRIDGE**
115'-0 W. SPAN 115'-0 E. SPAN
PRECAST ABUTMENT FOOTING DETAILS
STA. 985+91.00 IA 92 (ML) OCTOBER, 2020
MAHASKA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 15 OF 42 FILE NO. 31191 DESIGN NO. 120

ABUTMENT PILING DESIGN NOTES:

THE CONTRACT LENGTH OF 40 FEET FOR THE WEST ABUTMENT AND 45 FEET FOR THE EAST ABUTMENT PILES IS BASED ON A COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 230 KIPS AT THE WEST ABUTMENT PILES AND 235 KIPS AT THE EAST ABUTMENT PILES, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL AND 0.70 FOR ROCK BEARING. TO ACCOUNT FOR SOIL CONSOLIDATION UNDER THE NEW FILL, THE FACTORED AXIAL LOAD INCLUDES A FACTORED DOWNDRAG LOAD OF 38 KIPS AT THE WEST ABUTMENT PILES AND 42 KIPS AT THE EAST ABUTMENT PILES.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.78 FOR SOIL AND 0.7 FOR ROCK END BEARING. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF PREBORE.

ABUTMENT PILE DRIVING NOTES:

THE REQUIRED AXIAL BEARING RESISTANCE IS 172 TONS FOR WEST ABUTMENT PILES AND 180 TONS FOR EAST ABUTMENT PILES 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.

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

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

ABUTMENT NOTES:

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

FINAL PILE HEAD POSITION SHALL NOT DEVIATE FROM THE LOCATION DESIGNATED IN THESE PLANS BY MORE THAN 3" IN ANY DIRECTION IN ORDER TO ALLOW THE PRECAST ABUTMENT FOOTING AND WINGS TO BE INSTALLED.

ESTIMATED WEIGHT OF ONE PRECAST ABUTMENT FOOTING IS 49.5 TONS.

THE METHOD OF SUPPORTING THE PRECAST ABUTMENT FOOTING DURING THE ERECTION SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO THE ERECTION. SPECIAL EMPHASIS IS PLACED ON THE CONTRACTORS METHOD OF ELEVATION CONTROL.

THE PRECAST ABUTMENT FOOTING SUPPORT SHALL NOT BE REMOVED UNTIL 4000 PSI COMPRESSIVE STRENGTH HAS BEEN ACHIEVED.

THE STRUCTURAL CONCRETE (MISC.) USED TO FILL THE ABUTMENT PILING ENCASEMENTS SHALL BE CLASS D CONCRETE WITH A HIGH RANGE WATER REDUCER. THE MAXIMUM SLUMP ACHIEVED WITH WATER SHALL BE 2 INCHES. THE HRWR SHALL BE ADDED AT THE POUR SITE. THE MAXIMUM ALLOWABLE SLUMP AFTER ADDITION OF THE HRWR SHALL BE 7 INCHES. COARSE AGGREGATE SHALL BE ½ INCH TOP SIZE.

THE CONTRACTOR MAY EMPLOY METHODS SUCH AS THE USE OF A NON-CHLORIDE ACCELERATOR OR SUPPLEMENTAL HEATING AND PROTECTION TO INCREASE EARLY STRENGTH GAIN.

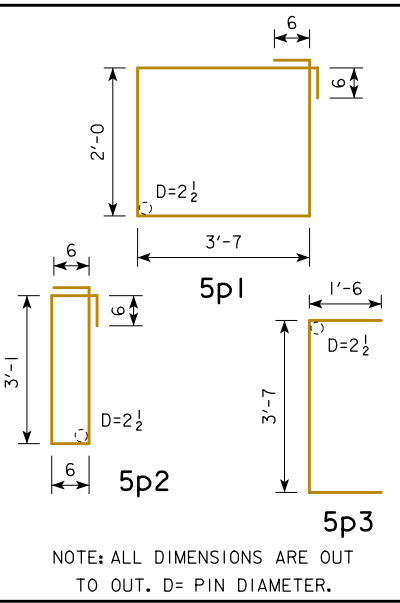
OTHER MIXES MAY BE CONSIDERED PROVIDED THEY HAVE BEEN REVIEWED AND APPROVED BY THE DISTRICT MATERIALS ENGINEER.

ALL CMP ARE GALVANIZED CORRUGATED STEEL PIPE, TYPE 1, 16 GAGE IN ACCORDANCE WITH STANDARD SPECIFICATIONS 414I AND MATERIALS I.M. 44I.



REINFORCING BAR LIST - WEST ABUTMENT						
EPOXY COATED	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
	5d5	ABUTMENT FOOTING END, VERTICAL		6	3'-1	19
	8f1	ABUTMENT FOOTING, LONGITUDINAL		16	46'-9	1,997
	8f2	ABUTMENT FOOTING, LONGITUDINAL		24	4'-6	288
	8f3	WINGWALL DOWEL		16	3'-9	160
	8f4	WINGWALL DOWEL, SPLICED		16	0'-10	36
	7g1	ABUTMENT FOOTING, VERTICAL		92	2'-7	485
	7g2	ABUTMENT FOOTING, VERTICAL, SPLICED		92	0'-8	125
	5p1	ABUTMENT FOOTING HOOPS		56	12'-2	709
	5p2	ABUTMENT FOOTING HOOPS		42	8'-2	357
	5p3	ABUTMENT FOOTING END, HORIZ.		8	6'-7	55
REINFORCING STEEL - EPOXY COATED - TOTAL (LBS.)						4,231

BENT BAR DETAILS



REINFORCING BAR LIST - EAST ABUTMENT						
EPOXY COATED	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
	5d5	ABUTMENT FOOTING END, VERTICAL		6	3'-1	19
	8f1	ABUTMENT FOOTING, LONGITUDINAL		16	46'-9	1,997
	8f2	ABUTMENT FOOTING, LONGITUDINAL		24	4'-6	288
	8f3	WINGWALL DOWEL		16	3'-9	160
	8f4	WINGWALL DOWEL, SPLICED		16	0'-10	36
	7g1	ABUTMENT FOOTING, VERTICAL		92	2'-7	485
	7g2	ABUTMENT FOOTING, VERTICAL, SPLICED		92	0'-8	125
	5p1	ABUTMENT FOOTING HOOPS		56	12'-2	709
	5p2	ABUTMENT FOOTING HOOPS		42	8'-2	357
	5p3	ABUTMENT FOOTING END, HORIZ.		8	6'-7	55
REINFORCING STEEL - EPOXY COATED - TOTAL (LBS.)						4,231

CONCRETE PLACEMENT QUANTITIES	
LOCATION	QUANTITY
WEST PRECAST ABUTMENT FOOTING	21.0
EAST PRECAST ABUTMENT FOOTING	21.0
PILE POCKETS - STRUCTURAL CONCRETE (MISC.)	7.0
TOTAL (CU. YDS.)	49.0

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

DESIGN FOR 0° SKEW

230'-0 X 44'-0 CONTINUOUS
WELDED GIRDER BRIDGE

115'-0 W. SPAN115'-0 E. SPAN

PRECAST ABUTMENT FOOTING QUANTITIES

STA. 985+91.00IA 92 (ML)OCTOBER, 2020

MAHASKA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 16 OF 42FILE NO. 31191DESIGN NO. 120

[illegible]

12'-0"

7'-0" BARRIER END SECTION
(SEE DESIGN SHEET 39)

4'-0" SPECIAL SECTION
(SEE DESIGN SHEET 38)

1'-0" UHPC

1'-0" 2'-0" 4'-0"

VARIES

2'-10"

2 1/2"

6 EQ. SPA. 7-5h1 (B.F.),
7-5h2 (F.F.), 7-Δ5h3 (E.F.)

ELEV. C

6s1 (8'-6" WEST WINGS)
(7'-8" EAST WINGS)

6s1 (8'-1" WEST WINGS)
(7'-11" EAST WINGS)

3" Φ PVC PIPE
Δ5h3 (TYP.)

6s1 (B.F.)
6s2 (F.F.)

6s1 (E.F.)

4p3

8f5 OR 8f7

8f6

4p3

5p4

5d6

5p4

Δ8f8 (TYP.)

6s3

BEVELED KEYWAY (TYP.)

5d6

5p4

3'-6"

2 1/2"

8f5 OR 8f7

8f6

2 EQ. SPA. 3

13 SPA. @ 8" = 8'-8"

2 EQ. SPA. 3

BAR SPACING

2'-6" 6'-0" 2'-6"

11'-0" PRECAST WINGWALL

1'-0" UHPC

4'-0" C.I.P. OR PRECAST
ABUTMENT FOOTING

1'-7"

LEVEL

5h1 (TYP.)

2 CL. (TYP.)

5h2 (TYP.)

6s1

6s2

FIELD BEND

10±

2'-7" MIN. EMBED.

4p3

8f5

2 1/4 CL.

4'-0"

VARIES

3'-6"

BOTT. OF FOOTING
ELEV. 730.49 (WEST ABUT.)
ELEV. 723.14 (EAST ABUT.)

TABLE OF WINGWALL ELEVATIONS			
LOCATION	ELEV. A	ELEV. B	ELEV. C
NORTHWEST WING	739.63	739.67	740.11
SOUTHWEST WING	739.63	739.67	740.11
NORTHEAST WING	732.16	732.13	731.87
SOUTHEAST WING	732.16	732.13	731.87

Figure 10 is a plan view of a rectangular reinforced concrete slab. The slab is 11' 4" wide and 11' 2" deep. It features a central square panel (8' 6" x 8' 6") and four corner panels (8' 5" x 3' 4"). Reinforcement is shown with yellow bars (8f7, 8f6, 8f5) and blue bars (5p4). Red dashed lines indicate the slab's boundaries and internal panel divisions. Dimensions are given in feet and inches.

DESIGN FOR 0° SKEW
230'-0 X 44'-0 CONTINUOUS
WELDED GIRDER BRIDGE
115'-0 W. SPAN 115'-0 E. SPAN
WINGWALL DETAILS
STA. 985+91.00 IA 92 (ML) OCTOBER, 2020
MAHASKA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 17 OF 42 FILE NO. 31191 DESIGN NO. 120

WINGWALL PILING DESIGN NOTES:

THE CONTRACT LENGTH OF 40 FEET FOR THE WEST ABUTMENT WINGWALL PILES AND 45 FEET FOR THE EAST ABUTMENT WINGWALL PILES IS BASED ON A COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 100 KIPS AT WEST ABUTMENT WING PILES AND 96 KIPS AT EAST ABUTMENT WING PILES, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL AND 0.70 FOR ROCK BEARING AT ALL ABUTMENTS WINGWALLS. TO ACCOUNT FOR SOIL CONSOLIDATION UNDER THE NEW FILL, THE FACTORED AXIAL LOAD INCLUDES A FACTORED DOWNDRAG LOAD OF 42 KIPS AT THE WEST ABUTMENT WINGWALL PILES AND 38 KIPS AT THE EAST ABUTMENT WINGWALL PILES.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.78 FOR SOIL AND 0.70 FOR ROCK END BEARING. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF PREBORE.

WINGWALL PILE DRIVING NOTES:

THE REQUIRED AXIAL BEARING RESISTANCE IS 90 TONS FOR WEST ABUTMENT WINGWALL PILES AND 84 TONS FOR EAST ABUTMENT WINGWALL PILES 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.

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

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

WINGWALL NOTES:

THE STRUCTURAL CONCRETE (MISC.) USED TO FILL THE WINGWALL PILING ENCASEMENTS SHALL BE CLASS D CONCRETE WITH A HIGH RANGE WATER REDUCER. THE MAXIMUM SLUMP ACHIEVED WITH WATER SHALL BE 2 INCHES. THE HRWR SHALL BE ADDED AT THE POUR SITE. THE MAXIMUM ALLOWABLE SLUMP AFTER ADDITION OF THE HRWR SHALL BE 7 INCHES. COURSE AGGREGATE SHALL BE ½ INCH TOP SIZE.

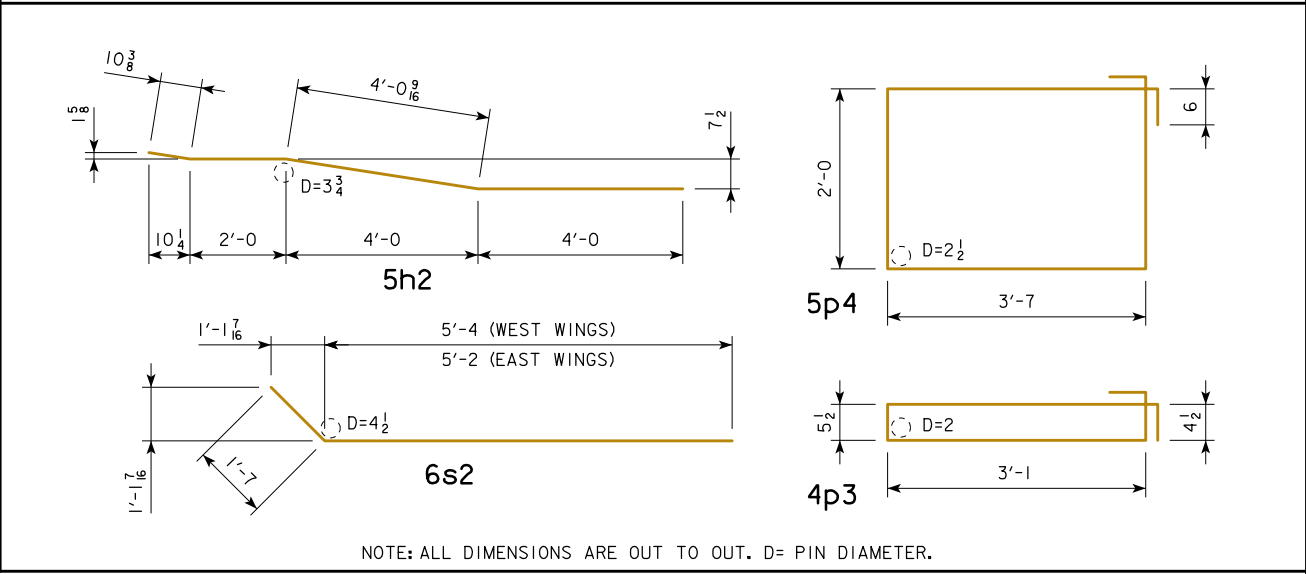
THE CONTRACTOR MAY EMPLOY METHODS SUCH AS THE USE OF A NON-CHLORIDE ACCELERATOR OR SUPPLEMENTAL HEATING AND PROTECTION TO INCREASE EARLY STRENGTH GAIN.

OTHER MIXES MAY BE CONSIDERED PROVIDED THEY HAVE BEEN REVIEWED AND APPROVED BY THE DISTRICT MATERIALS ENGINEER.

ESTIMATED WEIGHT OF ONE PRECAST WINGWALL WITH BARRIER RAIL IS 16.1 TONS.

ALL CMP ARE GALVANIZED COURRUGATED STEEL PIPE, TYPE 1, 16 GAGE IN ACCORDANCE WITH STANDARD SPECIFICATIONS 4141 AND MATERIALS I.M. 441.

BENT BAR DETAILS



REINFORCING BAR LIST - 4 WINGWALLS

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5d6	WING FOOTING END, VERTICAL		24	3'-2	79
8f5	WING FOOTING LONGITUDINAL		32	10'-8	911
8f6	WING FOOTING LONGITUDINAL		16	3'-6	150
8f7	WING FOOTING LONGITUDINAL DOWEL		32	10'-10	926
8f8	WING FOOTING DOWEL, SPLICED		32	0'-10	71
5h1	WINGWALL, HORIZ. DOWEL (B.F.)		28	10'-10	315
5h2	WINGWALL, HORIZ. DOWEL (F.F.)		28	10'-11	318
5h3	WINGWALL, HORIZ. DOWEL, SPLICED (E.F.)		56	0'-10	49
4p3	WING FOOTING HOOP		48	7'-10	252
5p4	WING FOOTING HOOP		96	12.1667	1,215
6s1	VERTICAL (E.F.)		132	VARIABLES	1,592
6s2	VERTICAL (F.F.)		12	VARIABLES	144
6s3	VERTICAL, CLOSURE (E.F.)		8	VARIABLES	106
REINFORCING STEEL - EPOXY COATED - TOTAL (LBS.)					6,128

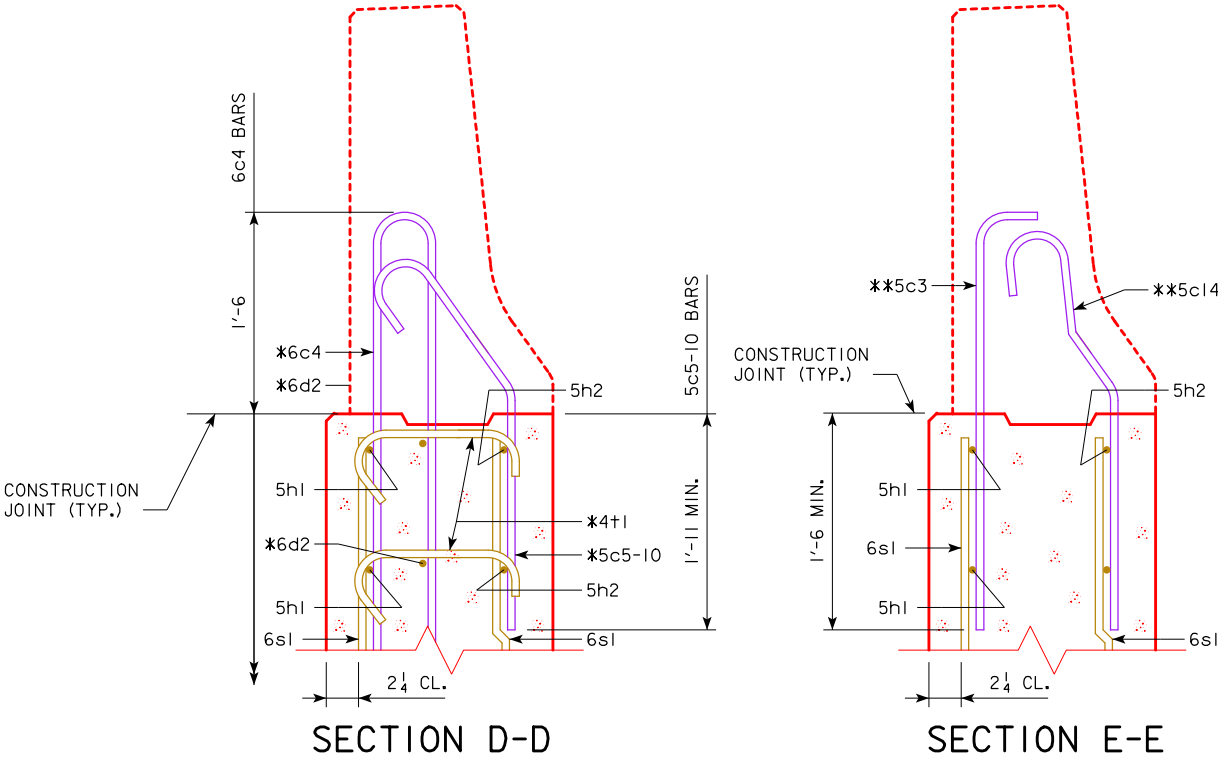
CONCRETE PLACEMENT QUANTITIES - 4 WINGWALLS

LOCATION	QUANTITY
WEST PRECAST WINGWALLS - STRUCTURAL CONCRETE (BRIDGE) 2 @ 7.5	15.0
EAST PRECAST WINGWALLS - STRUCTURAL CONCRETE (BRIDGE) 2 @ 7.3	14.6
PILE POCKETS - STRUCTURAL CONCRETE (MISC.)	4.0
WEST CLOSURE POUR - UHPC 2 @ 0.9	1.8
EAST CLOSURE POUR - UHPC 2 @ 0.8	1.6
TOTAL (CU. YDS.)	37.0

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

BARRIER RAIL CONCRETE IS NOT INCLUDED.

SEE DESIGN SHEET 17 FOR LOCATIONS OF SECTIONS D-D AND E-E.



* BARRIER RAIL END SECTION BARS TO BE PLACED WITH ABUTMENT WING.

THE END SECTION DETAILS IN THESE PLANS FOR DETAILS OF BARRIER RAIL END SECTION. REINFORCING BARS 6c3, 6c4, 5c5-10, 6d2 & 4t1 ARE INCLUDED IN THE BARRIER RAIL END SECTION QUANTITIES.

** BARRIER RAIL SPECIAL SECTION BARS TO BE PLACED WITH ABUTMENT WING.

SEE BARRIER RAIL DETAILS IN THESE PLANS. REINFORCING BARS 5c3 AND 5c14 ARE INCLUDED IN THE BARRIER RAIL QUANTITIES.



DESIGN FOR 0° SKEW

230'-0 X 44'-0 CONTINUOUS WELDED GIRDER BRIDGE

115'-0 W. SPAN115'-0 E. SPAN

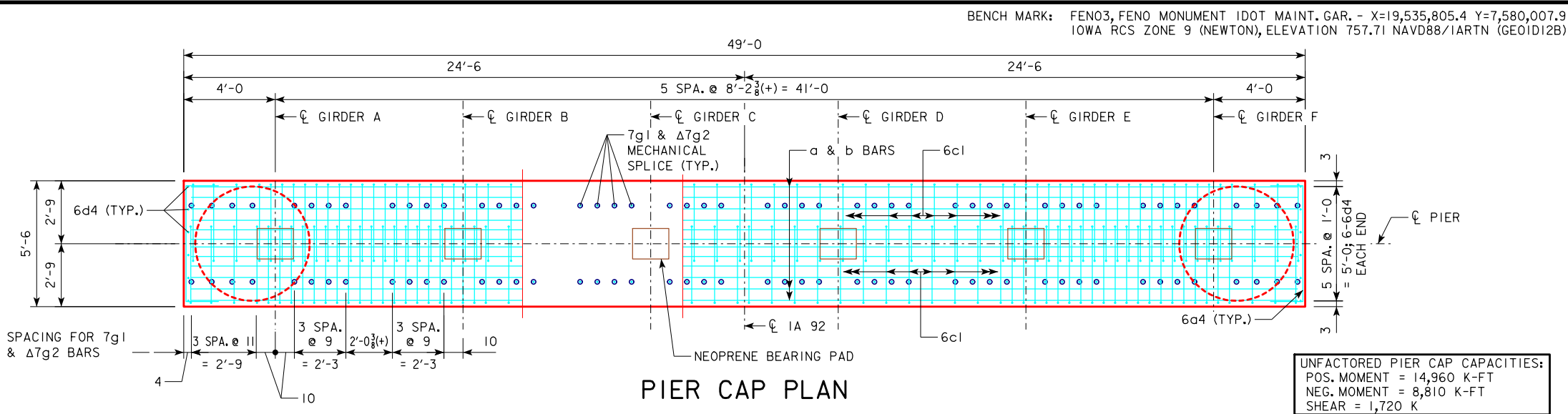
WINGWALL QUANTITIES

STA. 985+91.00IA 92 (ML)OCTOBER, 2020

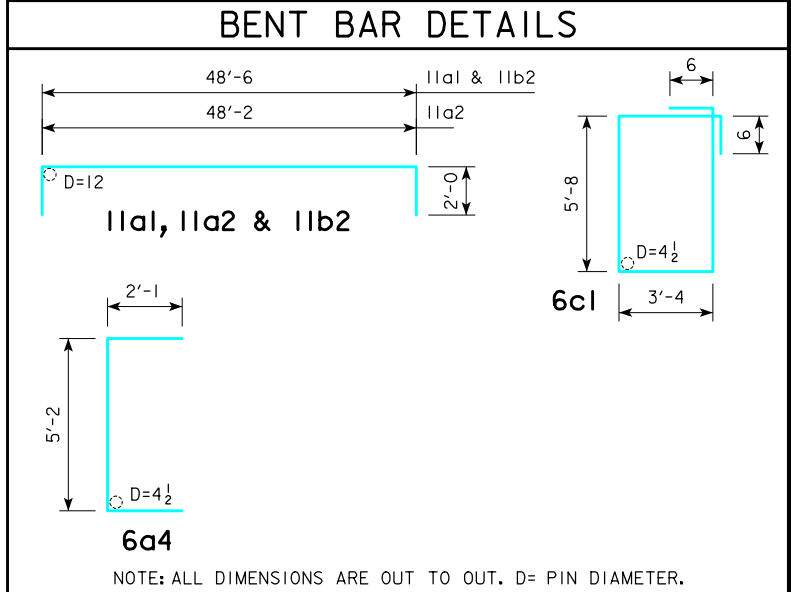
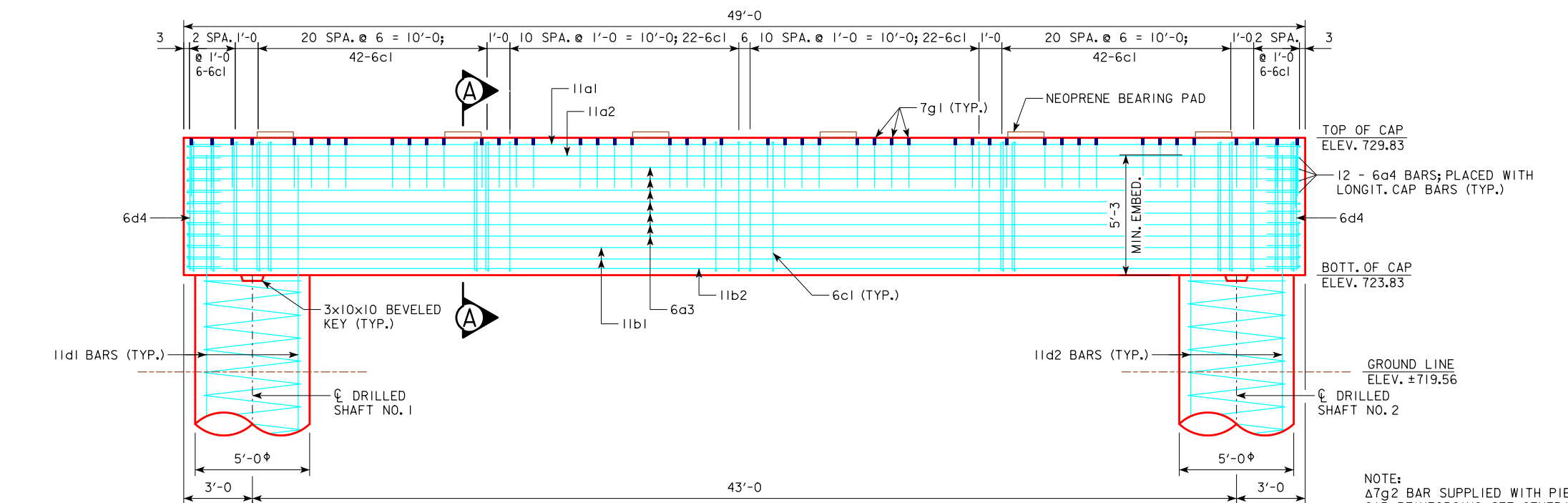
MAHASKA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 18 OF 42FILE NO. 31191DESIGN NO. 120



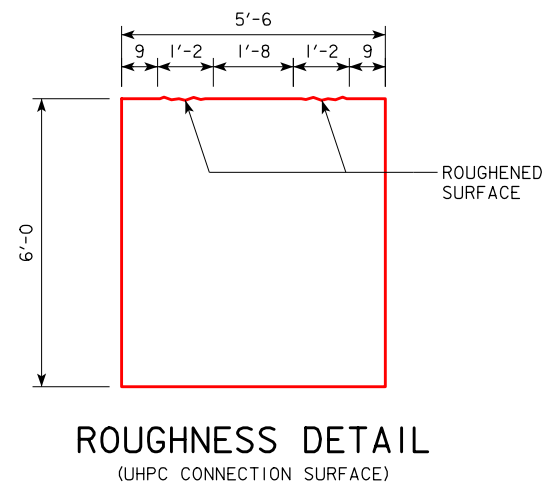
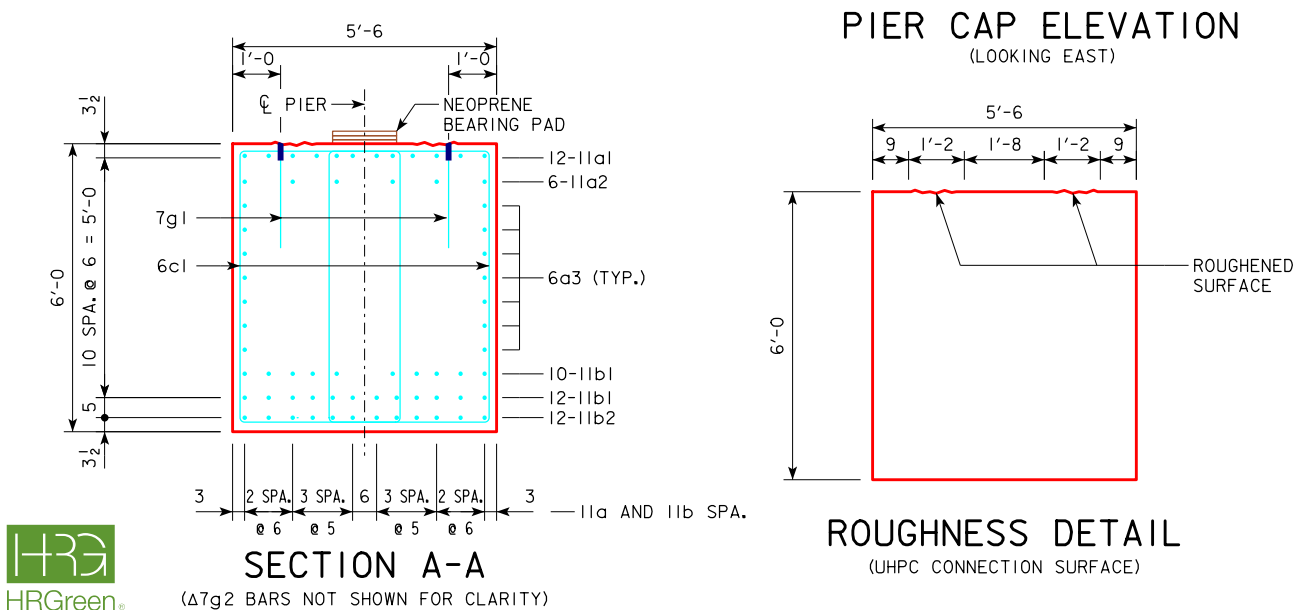
REINFORCING BAR LIST - C.I.P. PIER CAP					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
11a1	CAP LONGIT., TOP		12	52'-6"	3,345
11a2	CAP LONGIT., TOP		6	52'-2"	1,662
6a3	CAP LONGIT., SIDE		14	48'-6"	1,019
6a4	CAP TRANSV. END		24	9'-4"	336
11b1	CAP LONGIT., BOT.		22	48'-6"	5,666
11b2	CAP LONGIT., BOT.		12	52'-6"	3,345
6c1	CAP TRANSV. HOOP		140	19'-0"	3,990
6d4	PIER CAP, VERTICAL, END		12	5'-8"	102
7g1	PIER CAP, VERTICAL		96	2'-7"	506
7g2	PIER CAP, VERTICAL, SPLICED		96	0'-8"	131
REINFORCING STEEL - NON-COATED - TOTAL (LBS.)					20,102

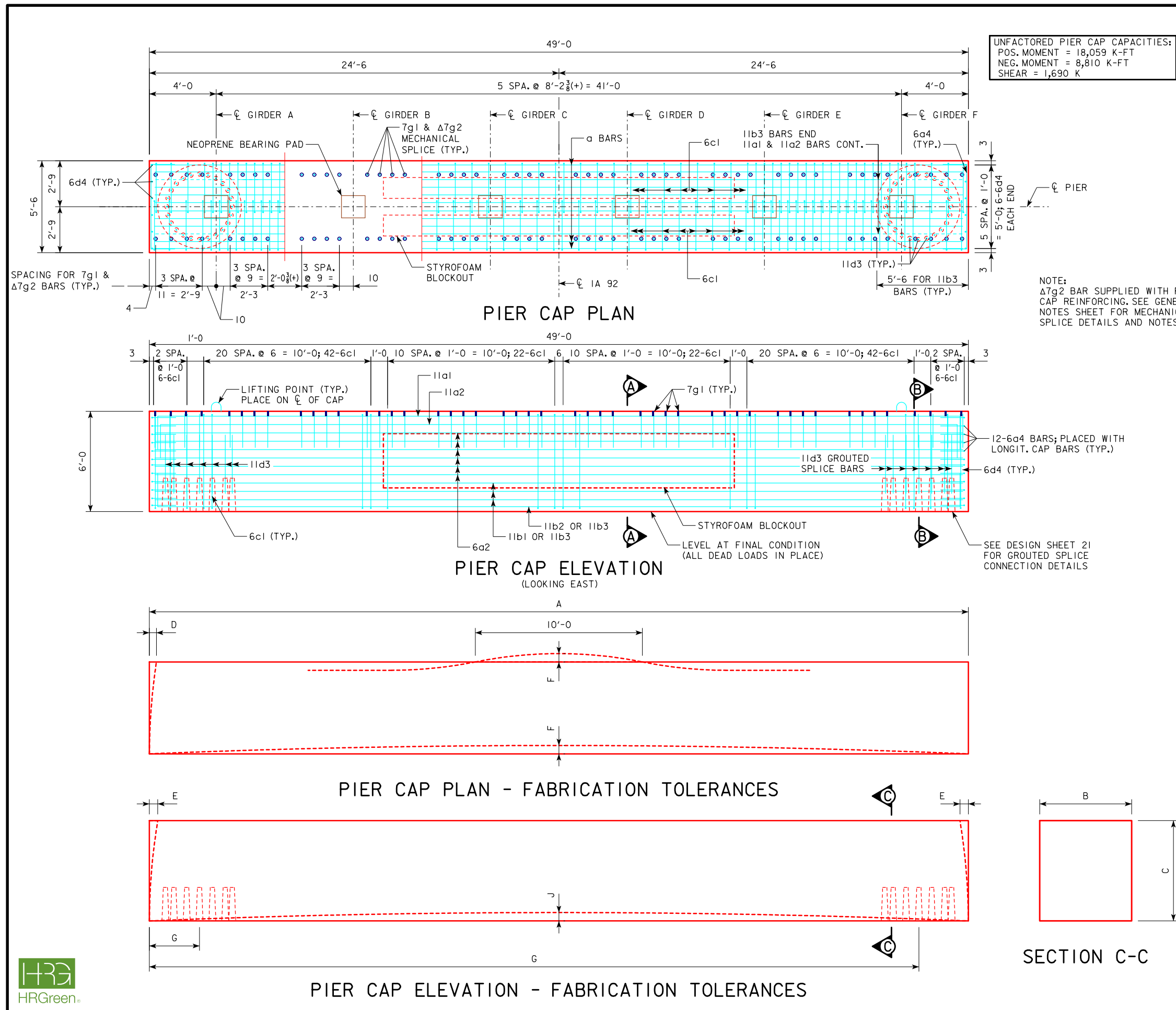


CONCRETE PLACEMENT QUANTITIES	
LOCATION	QUANTITY
PIER CAP	59.9
TOTAL (CU. YDS.)	
59.9	

NOTES:
SEE DESIGN SHEET 22 FOR DRILLED SHAFT DETAILS AND NOTES.
SEE DESIGN SHEET 25 FOR NEOPRENE BEARING PAD DETAILS.
CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED ON THE SUMMARY QUANTITIES SHEET.

ROUGHNESS NOTE:
ROUGHEN SURFACE FOR UHPC CONNECTION TO APPROXIMATELY 1/4" AMPLITUDE. VERIFY ROUGHNESS COMPLIES WITH INTERNATIONAL CONCRETE REPAIR INSTITUTE (ICRI) CONCRETE SURFACE PROFILE (CSP) 9 MINIMUM OR 10.





PIER CAP FABRICATION TOLERANCES		
A	LENGTH	+/- 3/4"
B	WIDTH (OVERALL)	+/- 1/4"
C	DEPTH (OVERALL)	+/- 1/4"
D	VARIATION FROM SPECIFIED PLAN END SQUARENESS OR SKEW	+/- 1/16" PER 1'-0" WIDTH +/- 1/2" MAXIMUM
E	VARIATION FROM SPECIFIED ELEVATION END SQUARENESS OR SKEW	+/- 1/16" PER 1'-0" WIDTH +/- 1/2" MAXIMUM
F	SWEEP	+/- 1/8" PER 10'-0" WIDTH +/- 3/4" MAXIMUM
G	LOCATION OF GROUTED SPLICE COUPLER MEASURED FROM A COMMON REFERENCE POINT	+/- 1/4"
H	LOCAL SMOOTHNESS OF ANY SURFACE	+/- 1/4" IN 10'-0"
J	VARIATION FROM SPECIFIED CAMBER	+/- 3/4" MAXIMUM

SECTION A-A PRECAST PIER CAP
(11d3 BARS NOT SHOWN FOR CLARITY)

SECTION B-B PRECAST PIER CAP
(11d3 BARS NOT SHOWN FOR CLARITY)

NOTE:
SEE DESIGN SHEET 21 FOR PIER CAP QUANTITIES AND NOTES.
SEE DESIGN SHEET 25 FOR BEARING PAD DETAILS.
ESTIMATED WEIGHT OF ONE PRECAST PIER CAP IS 108.5 TONS.

DESIGN FOR 0° SKEW

230'-0" X 44'-0" CONTINUOUS WELDED GIRDER BRIDGE

115'-0" W. SPAN 115'-0" E. SPAN

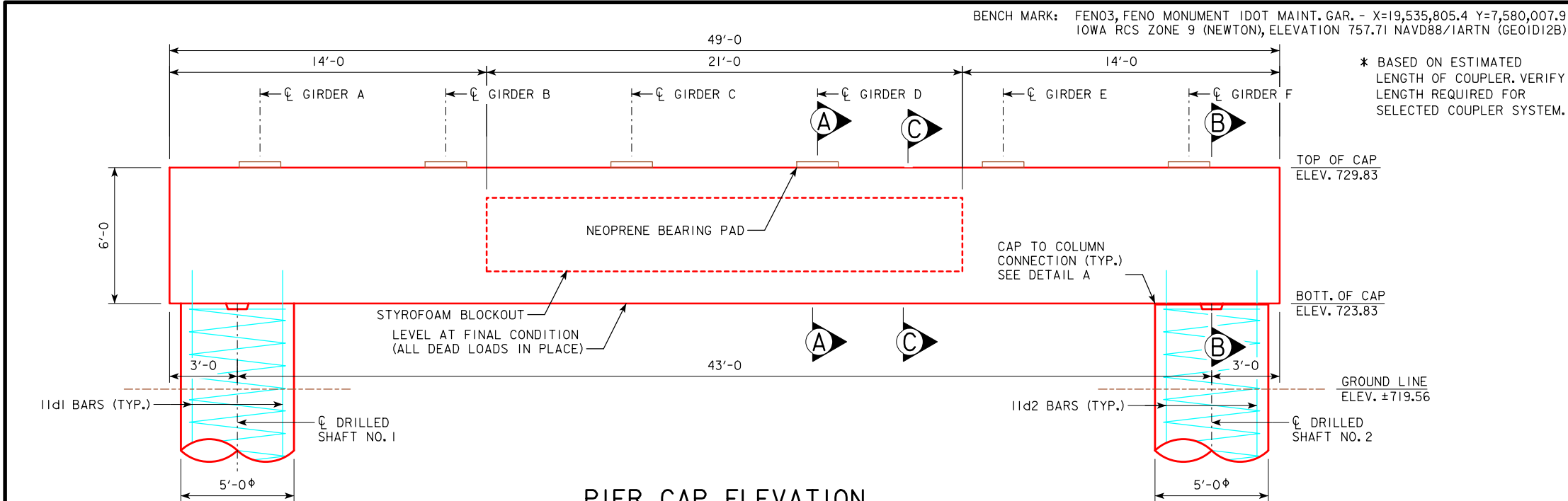
PRECAST PIER DETAILS

STA. 985+91.00 1A 92 (ML) OCTOBER, 2020

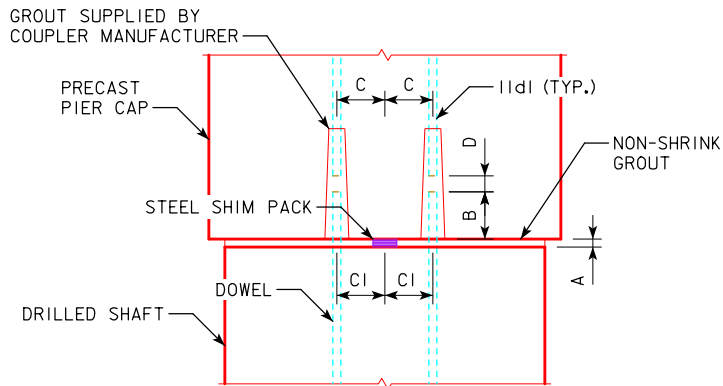
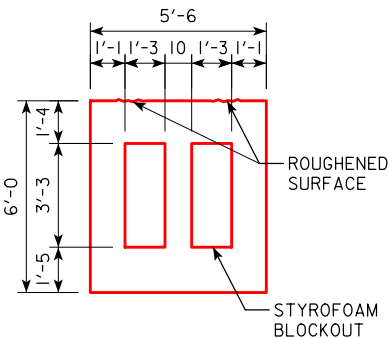
MAHASKA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

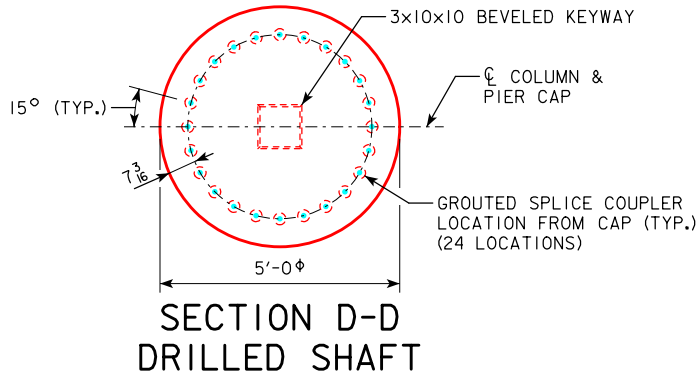
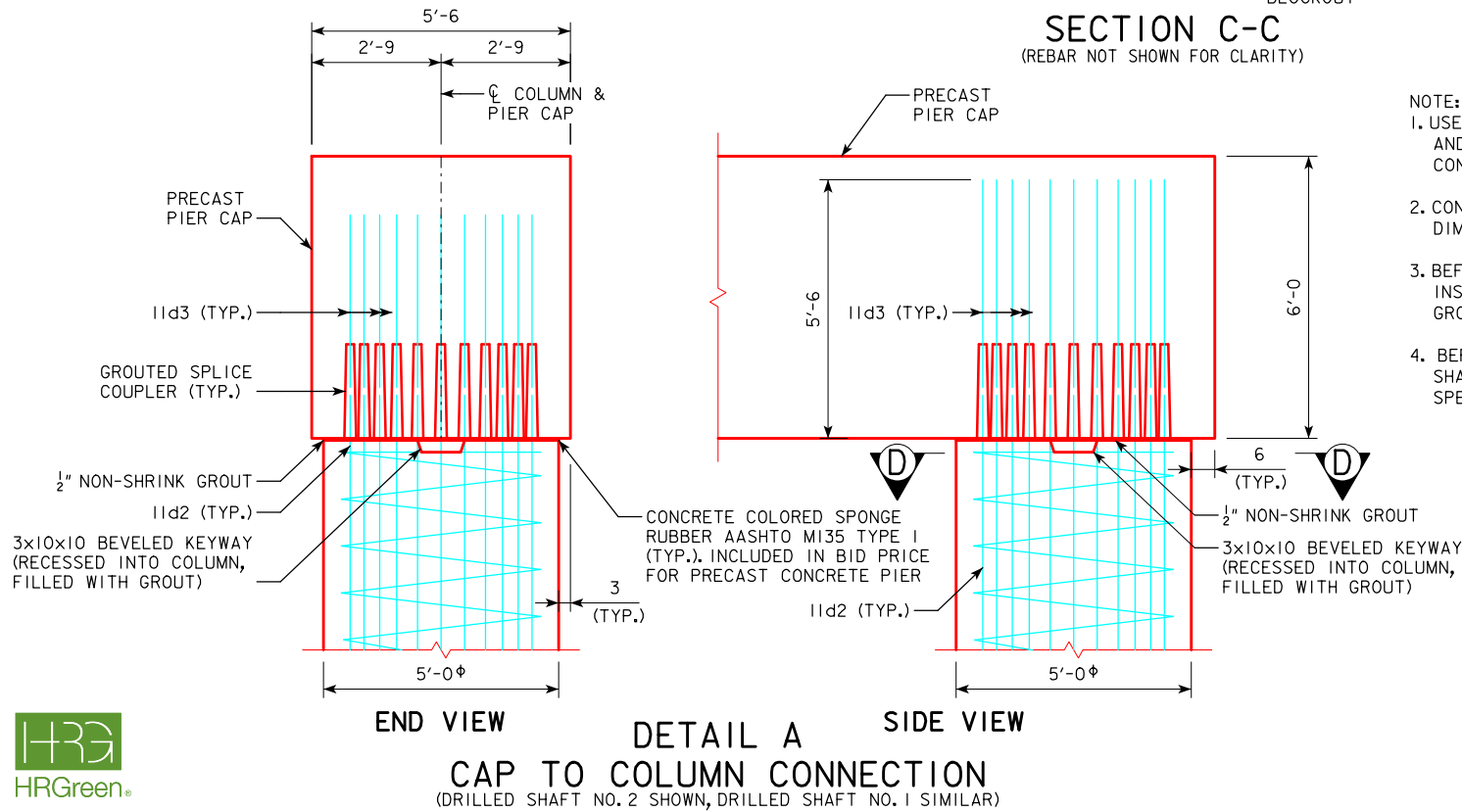
DESIGN SHEET NO. 20 OF 42 FILE NO. 31191 DESIGN NO. 120



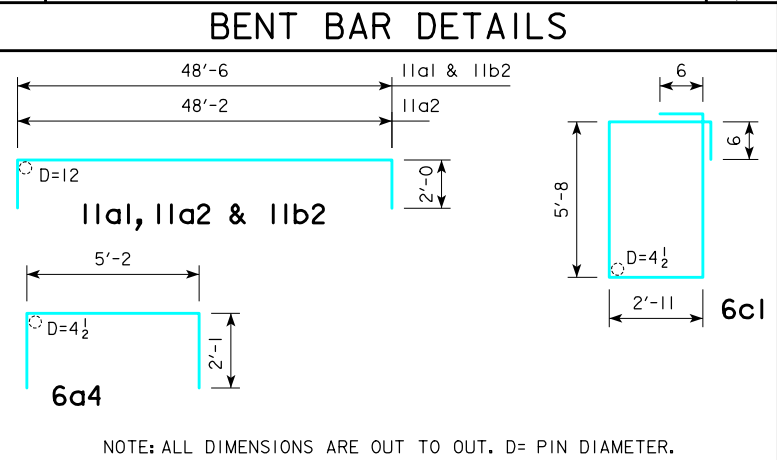
TOP OF CAP ELEVATIONS AT ϕ	
STAGE	ELEVATION
AT ERECTION	729.84
FINAL	729.83
ELEVATIONS ARE BASED ON THE FOLLOWING DEFLECTIONS: PIER CAP SELF WEIGHT = 0.044 IN. SUPERSTRUCTURE = 0.115 IN.	



- NOTE:
- USE MATCHING TEMPLATES FOR THE LOCATION OF COLUMN REINFORCEMENT AND GROUTED SPLICE COUPLER PLACEMENT WITHIN THE ELEMENT TO CONTROL CRITICAL DIMENSION "C" AND "CI", WHICH WOULD BE IDENTICAL.
 - CONSULT MANUFACTURER OF THE GROUTED SPLICE COUPLER FOR PROPER DIMENSIONS "B" AND "D" AND FOR TOLERANCE ON THESE DIMENSIONS.
 - BEFORE EXECUTING GROUTED SPLICE COUPLER ASSEMBLIES, ALWAYS SEEK INSTALLATION RECOMMENDATIONS FROM THE MANUFACTURER OF THE GROUTED SPLICE COUPLER USED.
 - BEFORE EXECUTING GROUTED SPLICE COUPLER ASSEMBLIES, CONTRACTOR SHALL PROVIDE A MOCKUP TO THE ENGINEER FOR APPROVAL. REFER TO SPECIAL PROVISION FOR GROUTED SPLICE COUPLER MOCKUP.



REINFORCING BAR LIST - PRECAST PIER CAP						
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	
11a1	CAP LONGIT., TOP		12	52'-6"	3,345	
11a2	CAP LONGIT., TOP		6	52'-2"	1,662	
6a3	CAP LONGIT., SIDE		12	48'-6"	873	
6a4	CAP TRANSV. END		24	9'-4"	336	
11b1	CAP LONGIT., BOTT.		26	48'-6"	6,696	
11b2	CAP LONGIT., BOTT.		10	52'-6"	2,788	
11b3	CAP LONGIT., BOTT.		6	38'-0"	1,211	
6c1	CAP TRANSV. HOOP		140	18'-2"	3,815	
11d3	PIER CAP, GROUTED SPLICE		48	4'-6"	1,147	
6d4	PIER CAP, VERTICAL, END		12	5'-8"	102	
7g1	PIER CAP, VERTICAL		96	2'-7"	506	
7g2	PIER CAP, VERTICAL, SPLICED		96	0'-8"	131	
REINFORCING STEEL - NON-COATED - TOTAL (LBS.)				22,612		



GROUTED SPLICE COUPLER TOLERANCES		
A	SHIM PACK HEIGHT	$\frac{3}{4} \pm \frac{3}{8}$
B	DOWEL HEIGHT	CONSULT MANUFACTURER
C	LOCATION OF COLUMN REINFORCING, GROUTED SPLICE COUPLER, AND DRILLED SHAFT DOWELS MEASURED FROM A COMMON REFERENCE POINT	$\pm \frac{1}{4}$
CI		
D	GAP BETWEEN DOWELS AND COLUMN REINF.	CONSULT MANUFACTURER

CONCRETE PLACEMENT QUANTITIES	
LOCATION	QUANTITY
PRECAST PIER CAP	53.6
TOTAL (CU. YDS.)	53.6

NOTE:
SEE DESIGN SHEET 19 FOR ROUGHNESS DETAILS AND NOTES.
SEE DESIGN SHEET 20 FOR SECTIONS A-A & B-B.
SEE DESIGN SHEET 22 FOR DRILLED SHAFT DETAILS AND NOTES.
SEE DESIGN SHEET 25 FOR BEARING PAD DETAILS.
CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED ON THE SUMMARY QUANTITIES SHEET.

DESIGN FOR 0° SKEW
230'-0 X 44'-0 CONTINUOUS WELDED GIRDER BRIDGE
115'-0 W. SPAN 115'-0 E. SPAN
PRECAST PIER DETAILS
STA. 985+91.00 IA 92 (ML) OCTOBER, 2020
MAHASKA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 21 OF 42 FILE NO. 31191 DESIGN NO. 120



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

CONSTRUCTION JOINT KEYWAYS ARE TO BE FORMED WITH BEVELED 2x8's, UNLESS SHOWN OTHERWISE.

GRADED SPICE COUPLERS FOR PRECAST PIER CAP INCLUDED IN PRICE BID FOR PRECAST PIER CAP.

DRILLED SHAFTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 2433 OF THE STANDARD SPECIFICATIONS. EXCAVATION METHOD SHALL BE DETERMINED BY THE CONTRACTOR FROM THE APPROVED METHODS LISTED IN THE SPECIFICATION AND SHALL BE SUBJECT TO THE ENGINEER'S APPROVAL. SAFETY AND CONSTRUCTABILITY OF THE EXCAVATION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. TEMPORARY EXCAVATION CASING MAY BE REQUIRED. REFER TO THE SOIL DESIGN SHEETS SHOWN ELSEWHERE IN THESE PLANS.

SPIRAL REINFORCING IS TO BE NO. 4 BAR WITH 3'-11 $\frac{1}{2}$ " 1'-0" PITCH WITH 4 EQUALLY SPACED
L $\frac{1}{8}$ " \times $\frac{1}{8}$ " SPACERS PUNCHED TO HOLD SPIRALS. SPIRALS ARE TO HAVE 1 $\frac{1}{2}$ EXTRA TURNS AT TOP AND
BOTTOM COLUMNS AND SHAFTS.

THE SPIRAL REINFORCING MAY BE SPLICED BY LAPPING 1'-6. THE LENGTH OF THE SPIRAL SHOWN DOES NOT INCLUDE THE LAPPED LENGTH OF THE SPLICES. THE COST OF THE LAPS AT SPLICES IS TO BE INCLUDED IN THE PRICE BID FOR OTHER REINFORCEMENT.

COLUMN/SHAFT TIES SPACED AT 1'-0" CENTERS MAY BE SUBSTITUTED FOR THE SPIRAL REINFORCEMENT. PAYMENT WILL BE BASED ON THE WEIGHT OF SPIRAL REINFORCEMENT. NO ADJUSTMENTS IN REINFORCING STEEL PAY WEIGHT WILL BE ALLOWED. SEE BENT BAR DETAILS FOR SPLICE LAP LENGTH.

11d1 AND 11d2 BARS SHALL BE SECURED IN PLACE PRIOR TO POURING DRILLED SHAFT CONCRETE.

DRILLED SHAFT ROCK SOCKETS SHALL BE BRUSHED BUT SHALL NOT BE GROOVED.

THE USE OF TEMPORARY OR PERMANENT CASINGS FOR CONSTRUCTION OF THE DRILLED SHAFTS IS REQUIRED ADJACENT TO SANDY SOIL (LAYERS C AND D IN BORING B-2) ADJACENT TO THE EXISTING PIER FOOTING. THIS IS TO PREVENT SOIL LOSS INTO THE DRILLED SHAFT EXCAVATION, AND UNDERMINING OF THE EXISTING PIER FOUNDATION. THE CASING SHALL EXTEND 1'-0" INTO ROCK.

PAYMENT FOR THE BID ITEM "CONCRETE DRILLED SHAFT, 60 IN. DIAMETER" WILL BE BASED ON THE FINAL LENGTH OF DRILLED SHAFTS, AS MEASURED IN THE FIELD. IF PERMANENT CASINGS ARE USED THEIR COST WILL BE CONSIDERED INCIDENTAL TO THE COST OF THE DRILLED SHAFTS.

THE PLAN QUANTITY FOR THE BID ITEM "REINFORCING STEEL" IS BASED ON THE PLAN QUANTITY FOR "CONCRETE DRILLED SHAFT, 60 IN. DIAMETER". IF THE PAID QUANTITY FOR "CONCRETE DRILLED SHAFT, 60 IN. DIAMETER" VARIES FROM THE PLAN QUANTITY, AN ADJUSTMENT OF 136 POUNDS OF "REINFORCING STEEL" WILL BE MADE FOR EVERY ONE FOOT CHANGE IN "CONCRETE DRILLED SHAFT, 60 IN. DIAMETER" FROM THE PLAN QUANTITY.

ENSURE DRILLED SHAFT IS WITHIN 1" OF PLAN POSITION AT TOP OF SHAFT.

FORMED FINISH REQUIRED FROM TOP OF DRILLED SHAFT TO 1'-0" BELOW GROUND SURFACE, TYPICAL.

CROSSHOLE SONIC LOG (C.S.L. TESTING SHALL BE REQUIRED AT EACH DRILLED SHAFT. TESTING SHALL BE IN ACCORDANCE WITH ARTICLE 2433.03, J, OF THE STANDARD SPECIFICATIONS.

THE TOP OF THE CSL TUBES ARE TO BE RECESSED 3 INCHES AFTER THE SHAFT ACCEPTANCE AND PRIOR TO GROUTING.

THE CONTRACTOR MAY ELECT TO REMOVE A PORTION OF THE EXISTING DECK OVERHANG TO FACILITATE SHAFT INSTALLATION. SEE DESIGN SHEET 4 FOR DETAILS.

THE DRILLED SHAFTS ARE DESIGNED TO SUPPORT THE FOLLOWING MAXIMUM FACTORED AXIAL LOADS WHICH INCLUDE THE SELF-WEIGHT OF THE SHAFT:

- STRENGTH I COMBINATION OF 1,570 KIPS
- SERVICE I COMBINATION OF 1,262 KIPS

DEMONSTRATION SHAFT SHALL CONFORM TO DETAILS FOR THE 60 INCH DIAMETER DRILLED SHAFT ON THIS SHEET. DEMONSTRATION SHAFT SHALL BE CONSTRUCTED AT THE LOCATION SHOWN ON DESIGN SHEET 6 TO A TOP OF SHAFT ELEV. 720.00. LENGTH OF ROCK SOCKET SHALL BE 16.0 FEET.

THE PORTION OF THE DEMONSTRATION SHAFT BELOW ELEV. 717.00 MAY REMAIN IN PLACE.

ALL COSTS NOTED AS SUBSIDIARY TO "CONCRETE DRILLED SHAFT, 60 IN. DIAMETER" SHALL ALSO BE SUBSIDIARY TO THE BID ITEM "DEMONSTRATION SHAFT."



BENT BAR DETAILS

1'-6"
MIN. LAP

90°

R = 1'-10 $\frac{3}{4}$ "
TO \bar{C} BAR

4'-6"

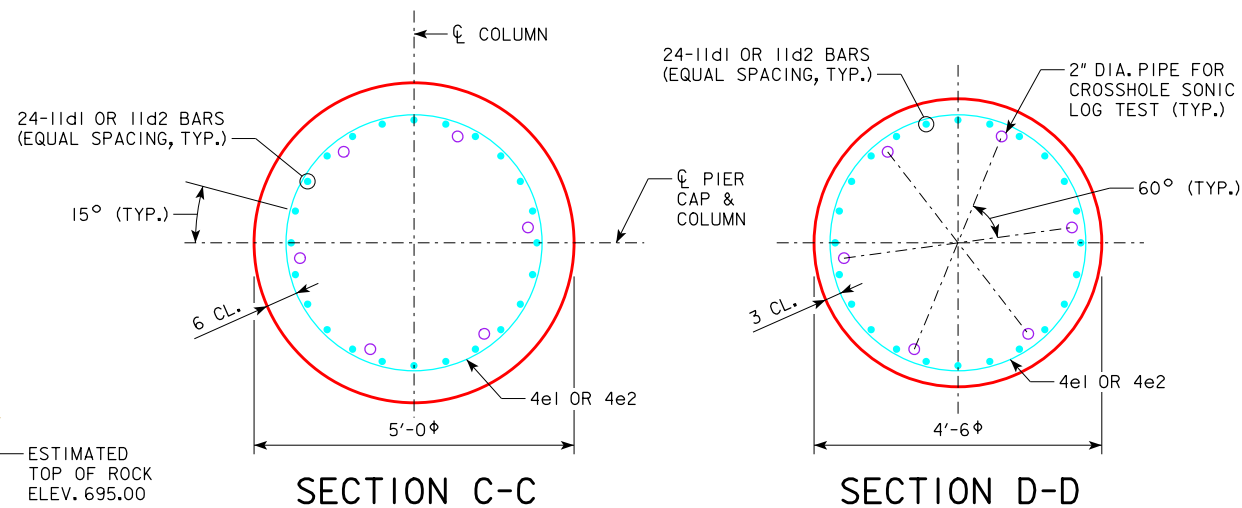
90°

ROTATE LAP
EVERY LAYER
WHEN PLACING BAR.

ALTERNATE SHAFT #4 TIE DETAIL

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

* BASED ON ESTIMATED LENGTH OF COUPLER. VERIFY LENGTH REQUIRED FOR SELECTED COUPLER SYSTEM.



NOTE:
BOTTOM OF SHAFT ELEVATIONS, SHAFT LENGTH AND SHAFT
QUANTITIES ARE BASED ON THE MINIMUM EMBEDMENT DEPTH
BELOW THE ESTIMATED TOP OF ROCK ELEVATIONS FROM THE
BORING LOGS. FINAL BOTTOM OF SHAFT ELEVATIONS, SHAFT
LENGTH AND SHAFT QUANTITIES ARE DEPENDENT ON ROCK
ELEVATIONS DETERMINED IN THE FIELD.

DESIGN FOR 0° SKEW

230'-0 X 44'-0 CONTINUOUS
WELDED GIRDER BRIDGE

115'-0 W. SPAN 115'-0 E. SPAN

FOUNDATION DETAILS

STA. 985+91.00 IA 92 (ML) OCTOBER, 2020

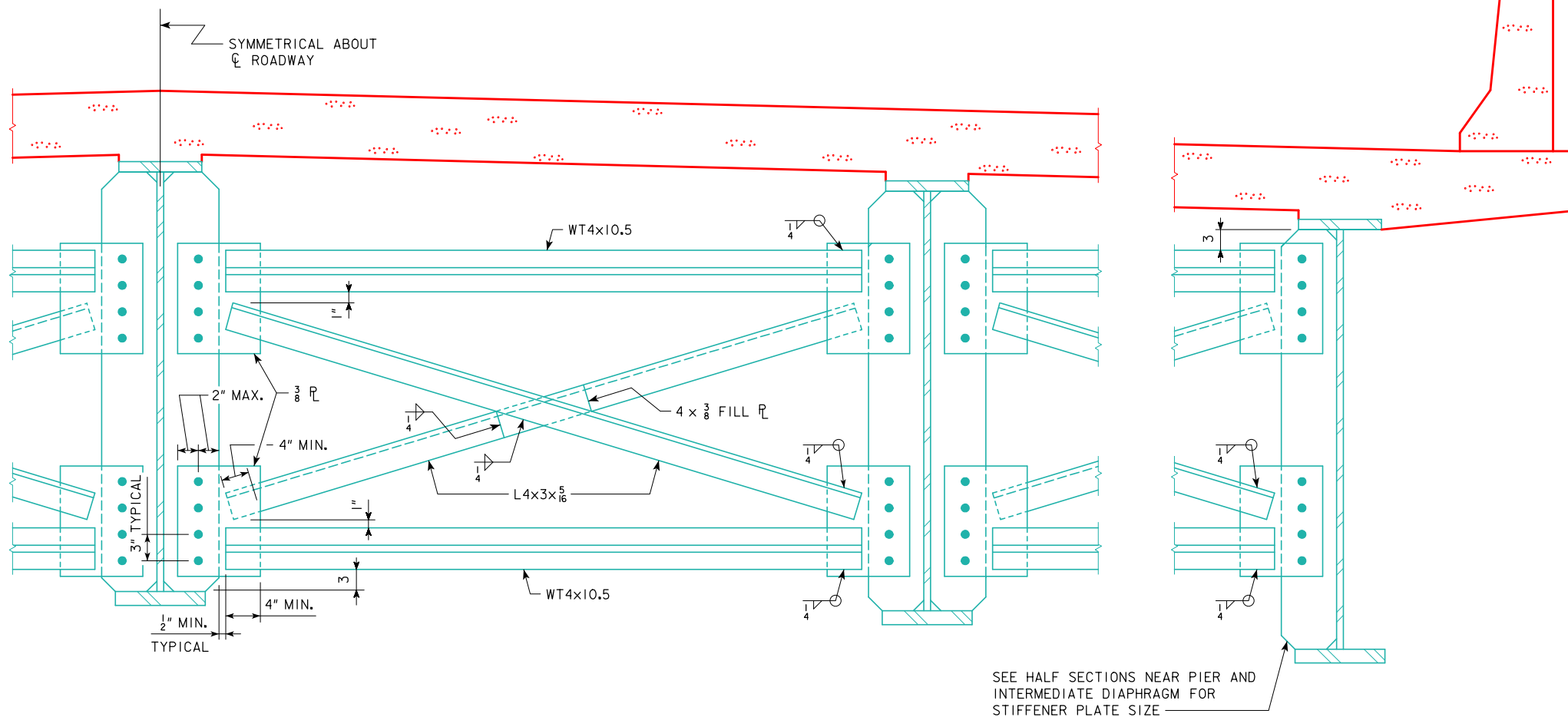
MAHASKA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 22 OF 42 FILE NO. 31191 DESIGN NO. 120

DESIGN FOR 0° SKEW
230'-0 X 44'-0 CONTINUOUS
WELDED GIRDER BRIDGE
115'-0 W. SPAN 115'-0 E. SPAN
SUPERSTRUCTURE DETAILS
STA. 985+91.00 IA 92 (ML) OCTOBER, 2020
MAHASKA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 23 OF 42 FILE NO. 31191 DESIGN NO. 120

REVISED 08-12 - MAGNETIC PARTICLE INSPECTION OF WELDS NOTE WAS CHANGED.
REVISED 07-2018 FINISHING MACHINE LOAD IN TEMPORARY DECK OVERHANG BRACKET DETAIL CHANGED TO 9000 LBS. (WAS 6000 LBS.).
ENGLISHSTUBBRIDGES.DGN - 4305A THIS SHEET ISSUED 04-07.



ALTERNATE INTERMEDIATE DIAPHRAGM PART SECTION THRU DECK
(SHOWING ONE DIAPHRAGM BETWEEN GIRDERS)

NOTE:
THIS CANNOT BE WELDED FROM ONE SIDE. CROSS FRAME
MUST BE TURNED OVER TO ADD SECOND ANGLE.

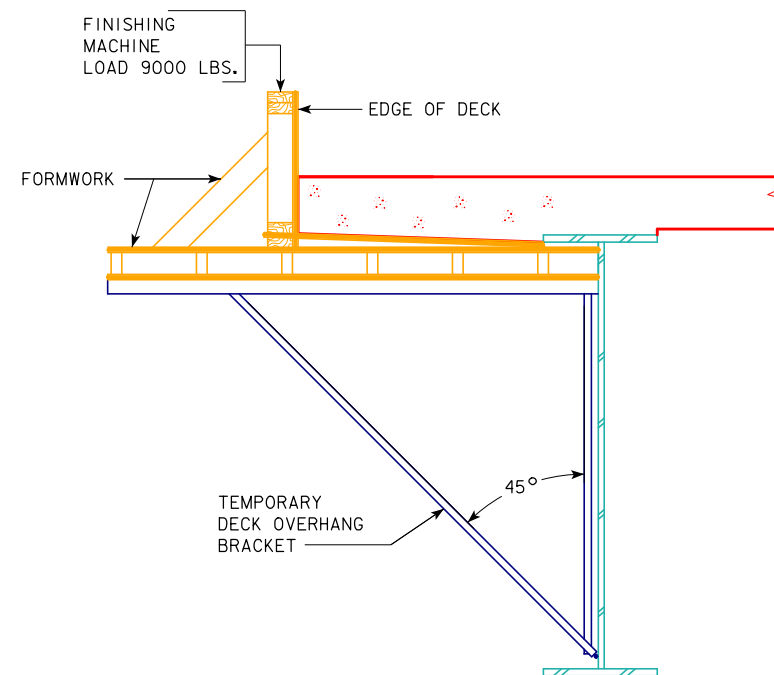
ALTERNATE INTERMEDIATE DIAPHRAGM NOTES:

ALL FIELD CONNECTIONS ARE TO BE BOLTED USING "HIGH TENSILE STRENGTH BOLTS". UNLESS OTHERWISE NOTED, ALL OPEN HOLES ARE TO BE $\frac{15}{16}$ " ϕ AND ALL BOLTS ARE TO BE $\frac{7}{8}$ " ϕ .

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

MAGNETIC PARTICLE INSPECTION OF WELDS SHALL BE IN ACCORDANCE WITH ARTICLE 2408.03, B, OF THE STANDARD SPECIFICATIONS.

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



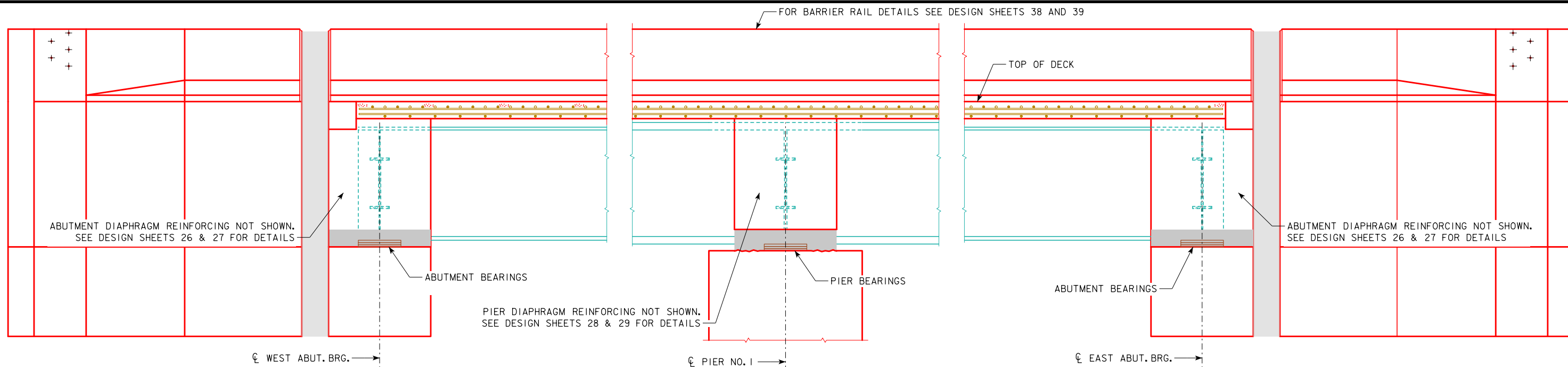
TEMPORARY DECK
OVERHANG BRACKET DETAIL

OVERHANG BRACKET NOTES:

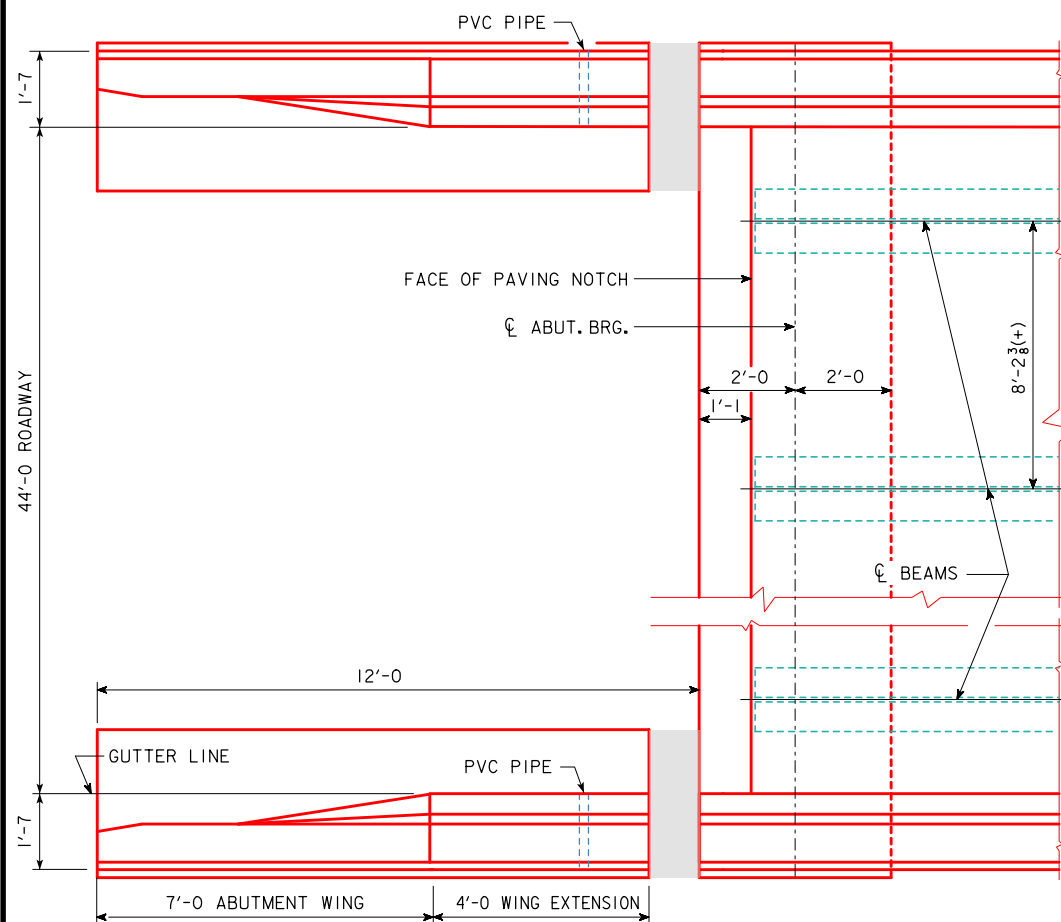
A MAXIMUM FINISHING MACHINE LOAD AND THE ANGLE OF THE DIAGONAL MEMBER OF THE OVERHANG BRACKET SHOWN WERE ASSUMED BY THE DESIGNER. THESE ASSUMPTIONS, IN ADDITION TO OTHER CONSTRUCTION LOADINGS, WERE USED TO CHECK THE STRENGTH OF THE EXTERIOR GIRDER DURING CRITICAL STAGES OF CONSTRUCTION. IF THE FINISHING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

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

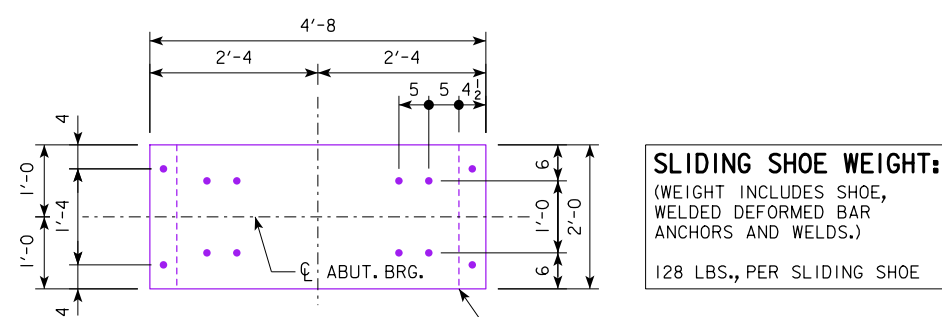
DESIGN FOR 0° SKEW	
230'-0 X 44'-0 CONTINUOUS WELDED GIRDER BRIDGE	
115'-0 W. SPAN	115'-0 E. SPAN
ALT. DIAPH. & TEMP. OVERHANG BRACKET	
STA. 985+91.00	IA 92 (ML) OCTOBER, 2020
MAHASKA COUNTY	
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION	
DESIGN SHEET NO. 24 OF 42	FILE NO. 31191 DESIGN NO. 120



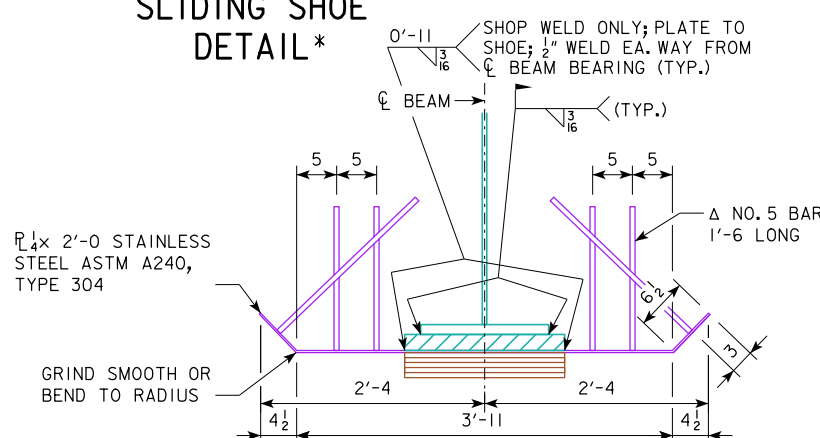
PART LONGITUDINAL SECTION NEAR BARRIER RAIL
(LOOKING AT NORTH BARRIER)



PART PLAN



SLIDING SHOE DETAIL*



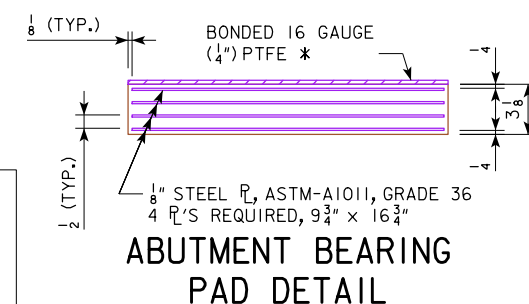
STAINLESS STEEL PLATE
SLIDING SHOE*

(6 @ EACH ABUTMENT AND PIER)

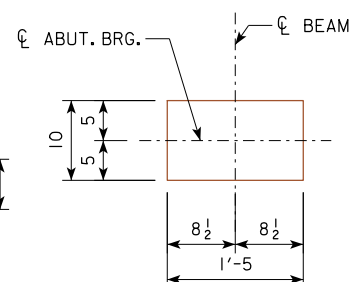
SLIDING SHOE STEEL, FABRICATION AND PLACEMENT SHALL BE CONSIDERED INCIDENTAL, INCLUDED IN THE CONTRACT UNIT PRICE BID FOR "STRUCTURAL STEEL".

Δ WELD (12) DEFORMED BAR TO SHOE; BARS AND WELDS SHALL BE CONSIDERED INCIDENTAL, INCLUDED IN THE CONTRACT PRICE BID FOR "STRUCTURAL STEEL".

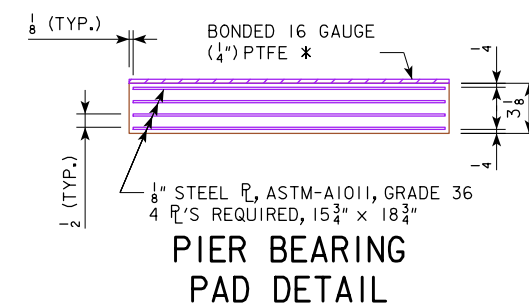
* IF THE CONTRACTOR CHOOSES A PREFABRICATED BRIDGE MOVE SYSTEM THAT DOES NOT REQUIRE SLIDING THE BRIDGE, THE LAMINATED NEOPRENE BEARING USED FOR FINAL BEARING CONDITION SHALL NOT HAVE PTFE ATTACHED. IF THE PTFE IS OMITTED, ADJUST FOOTING ELEVATION ACCORDINGLY.



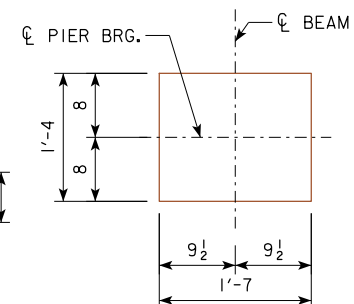
ABUTMENT BEARING
PAD DETAIL



ABUTMENT BEARING
PAD ORIENTATION



PIER BEARING
PAD DETAIL



PIER BEARING
PAD ORIENTATION

NOTE:
MATERIAL FOR NEOPRENE BEARING PADS TO BE 60 DUROMETER NEOPRENE.

SEE DESIGN SHEET 23 OR 24 FOR DETAILS OF INTERMEDIATE DIAPHRAGMS.

DESIGN FOR 0° SKEW
230'-0" X 44'-0" CONTINUOUS
WELDED GIRDER BRIDGE

115'-0" W. SPAN 115'-0" E. SPAN

LONGITUDINAL SECTION

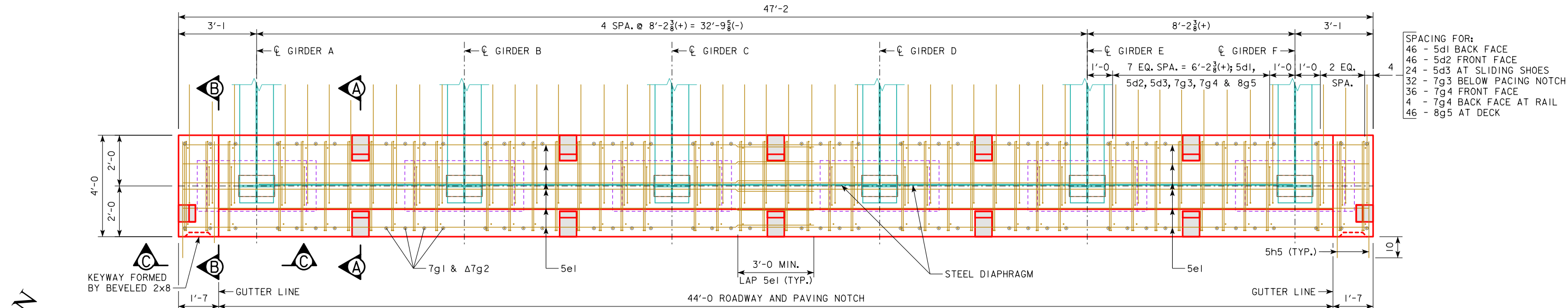
STA. 985+91.00 1A 92 (ML) OCTOBER, 2020

MAHASKA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 25 OF 42 FILE NO. 31191 DESIGN NO. 120



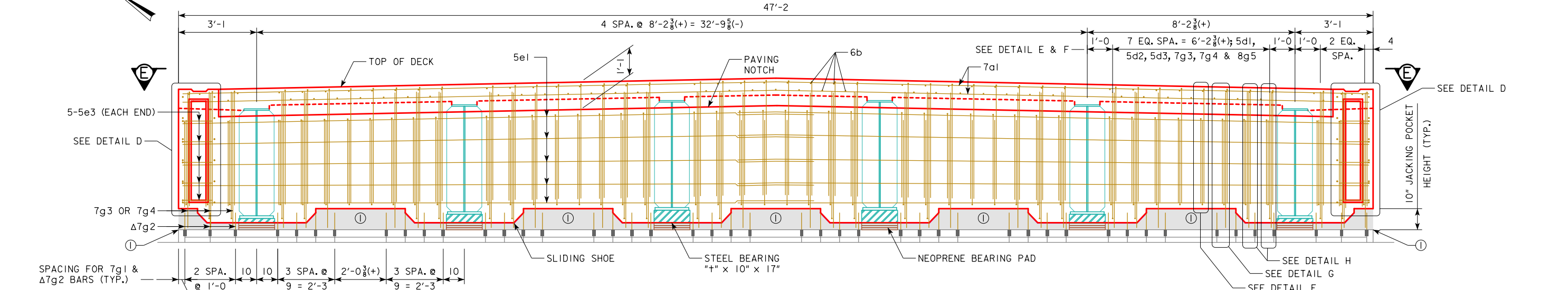


WEST ABUTMENT DIAPHRAGM REINFORCING PLAN

(DECK BARS NOT SHOWN FOR CLARITY)
(EAST ABUTMENT SIMILAR)

SPACING FOR:
46 - 5d1 BACK FACE
46 - 5d2 FRONT FACE
24 - 5d3 AT SLIDING SHOES
32 - 7g3 BELOW PAVING NOTCH
36 - 7g4 FRONT FACE
4 - 7g4 BACK FACE AT RAIL
46 - 8g5 AT DECK

UNFACTORED ABUT. DIAPH. CAPACITIES:
POS. MOMENT = 782 FT-KIPS
NEG. MOMENT = 1,471 FT-KIPS
SHEAR = 869 KIPS



WEST ABUTMENT DIAPHRAGM REINFORCING ELEVATION

LOOKING EAST, BACK FACE OF ABUTMENT
(EAST ABUTMENT SIMILAR)
(STEEL DIAPHRAGM NOT SHOWN FOR CLARITY)

① DENOTES MANDATORY JACKING POINTS FOR DESIGN AS SHOWN. SEE NOTE 4 BELOW.

NOTES:

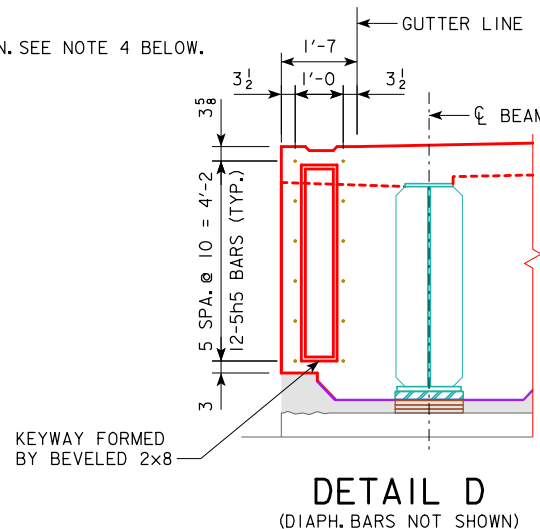
- SEE DESIGN SHEETS 11 THRU 16 FOR ABUTMENT FOOTING DETAILS AND REINFORCEMENT.
- SEE DESIGN SHEET 25 FOR BEARING PAD AND SLIDING SHOE DETAILS.
- SEE DESIGN SHEET 27 FOR SECTIONS A-A, B-B, C-C & E-E AND FOR DETAILS F, G & H.
- THE GENERAL INTENT IS THE JACKS WILL BE CENTERED IN THE JACKING POCKET. THE DESIGN AS SHOWN IS ALSO CAPABLE OF SUPPORTING JACKS DIRECTLY AT THE BEAMS. ALL OTHER LOCATIONS ARE AT CONTRACTOR'S OPTION PER THE SPECIAL PROVISION FOR "PREFABRICATED BRIDGE SUPERSTRUCTURE MOVE" AND APPROVAL OF THE ENGINEER. JACKING LOADS SHALL BE DETERMINED BY THE CONTRACTOR'S TEMPORARY WORKS ENGINEER.

BEARING THICKNESS		
LOCATION	"+" (IN.)	WEIGHT
GIRDER A BEARING	2	96
GIRDER B BEARING	3 15/16	190
GIRDER C BEARING	5 15/16	286
GIRDER D BEARING	5 15/16	286
GIRDER E BEARING	3 15/16	190
GIRDER F BEARING	2	96
TOTAL (LBS.)		1,144

NOTE:
BEARING PLATE WEIGHT FOR ONE ABUTMENT BEARING.

BEARING WEIGHTS AND WELD WEIGHTS SHALL BE CONSIDERED INCIDENTAL, INCLUDED IN THE CONTRACT UNIT PRICE BID FOR "STRUCTURAL STEEL". WEIGHTS ARE INCLUDED ON THE SUMMARY QUANTITIES SHEET.

SUGGESTED UHPC AND FILL/VENT POINT LOCATIONS.
SEE GENERAL NOTES SHEET.



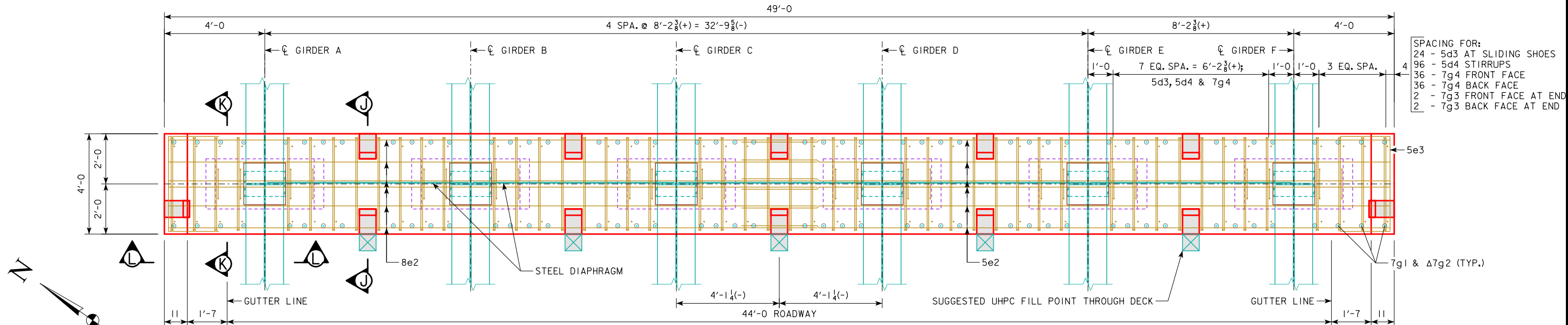
DETAIL D
(DIAPH. BARS NOT SHOWN)

NOTE:
Δ7g2 BAR SUPPLIED WITH ABUTMENT FOOTING REINFORCING. SEE GENERAL NOTES SHEET FOR MECHANICAL SPLICE DETAILS AND NOTES.

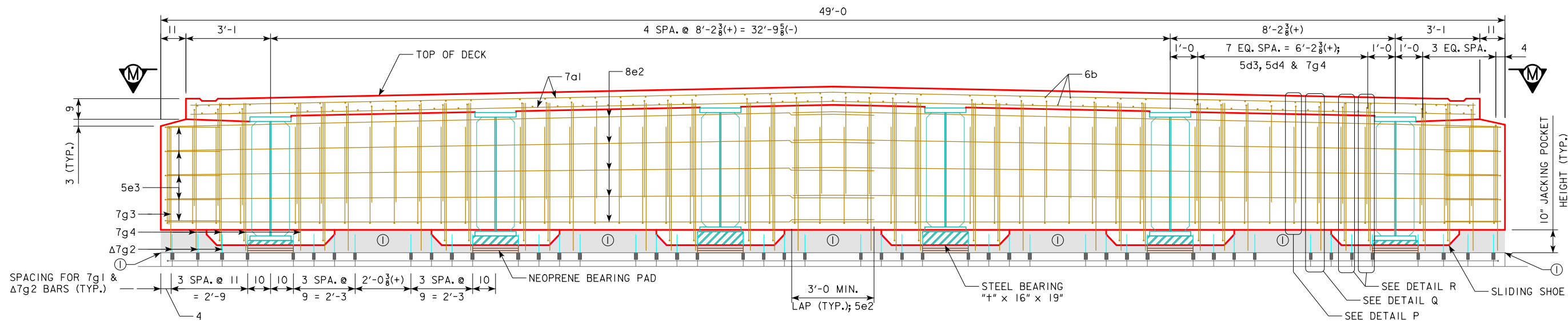
AT THE CONTRACTOR'S OPTION, THE 7g3 & 7g4 BARS MAY USE A MECHANICAL SPLICER TO CONNECT THE PORTION OF THE BAR EXTENDING INTO THE JACKING POCKET. CONTRACTOR TO VERIFY CLEARANCES REQUIRED FOR SUPERSTRUCTURE MOVE OPERATIONS PRIOR TO CONSTRUCTION. NO ADDITIONAL COMPENSATION WILL BE MADE.

DESIGN FOR 0° SKEW
230'-0" X 44'-0" CONTINUOUS WELDED GIRDER BRIDGE
115'-0" W. SPAN 115'-0" E. SPAN
ABUTMENT DIAPHRAGM DETAILS
STA. 985+91.00 IA 92 (ML) OCTOBER, 2020
MAHASKA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 26 OF 42 FILE NO. 31191 DESIGN NO. 120





PIER DIAPHRAGM REINFORCING PLAN
(DECK BARS NOT SHOWN FOR CLARITY)



PIER DIAPHRAGM REINFORCING ELEVATION
(LOOKING EAST, DOWNSTATION FACE OF PIER)
(STEEL DIAPHRAGM NOT SHOWN FOR CLARITY)

① DENOTES MANDATORY JACKING POINTS FOR DESIGN AS SHOWN. SEE NOTE 4 BELOW.

UNFACTORED PIER DIAPH. CAPACITIES:
POS. MOMENT = 1,024 FT-KIPS
NEG. MOMENT = 2,856 FT-KIPS
SHEAR = 615 KIPS

NOTES:

- SEE DESIGN SHEETS 19 THRU 21 FOR PIER CAP DETAILS AND REINFORCEMENT.
- SEE DESIGN SHEET 25 FOR BEARING PAD AND SLIDING SHOE DETAILS.
- SEE DESIGN SHEET 29 FOR SECTIONS J-J, K-K, L-L & M-M AND FOR DETAILS P, Q, & R.
- THE GENERAL INTENT IS THE JACKS WILL BE CENTERED IN THE JACKING POCKET. THE DESIGN AS SHOWN IS ALSO CAPABLE OF SUPPORTING JACKS DIRECTLY AT THE BEAMS. ALL OTHER LOCATIONS ARE AT CONTRACTOR'S OPTION PER THE SPECIAL PROVISIONS FOR "PREFABRICATED BRIDGE SUPERSTRUCTURE MOVE" AND APPROVAL OF THE ENGINEER. JACKING LOADS SHALL BE DETERMINED BY THE CONTRACTOR'S TEMPORARY WORKS ENGINEER.

BEARING THICKNESS

LOCATION	"+" (IN.)	WEIGHT
GIRDER A BEARING	2	172
GIRDER B BEARING	3 ⁵ / ₈	340
GIRDER C BEARING	5 ⁵ / ₈	512
GIRDER D BEARING	5 ⁵ / ₈	512
GIRDER E BEARING	3 ⁵ / ₈	340
GIRDER F BEARING	2	172
TOTAL (LBS.)		2,048

NOTE:
BEARING WEIGHTS AND WELD WEIGHTS SHALL BE CONSIDERED INCIDENTAL, INCLUDED IN THE CONTRACT UNIT PRICE BID FOR "STRUCTURAL STEEL". WEIGHTS ARE INCLUDED ON THE SUMMARY QUANTITIES SHEET.

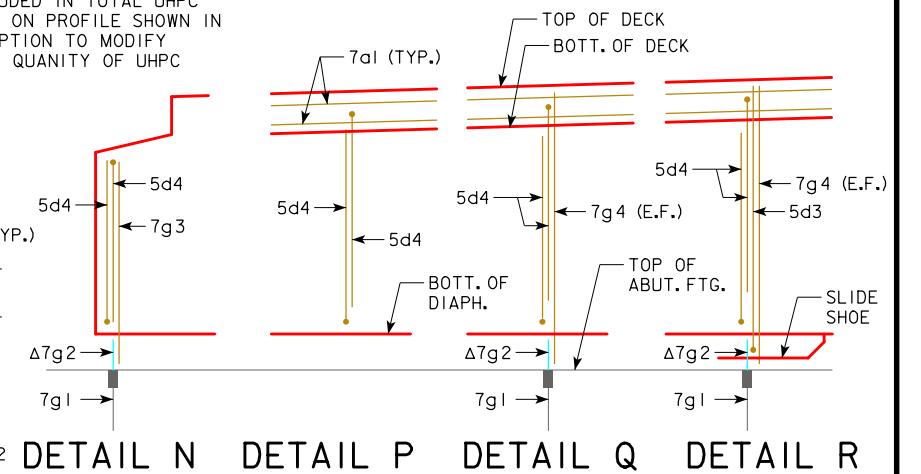
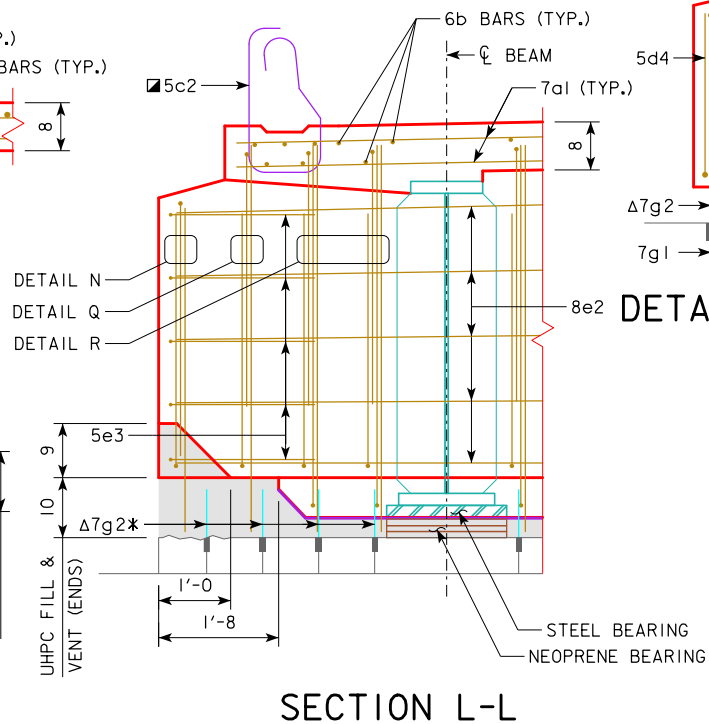
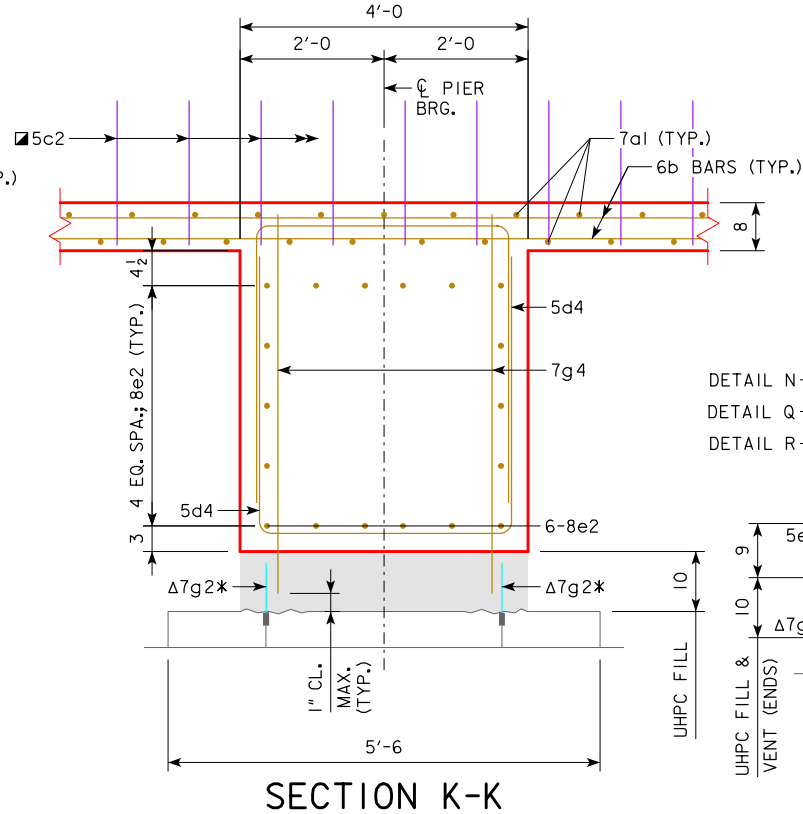
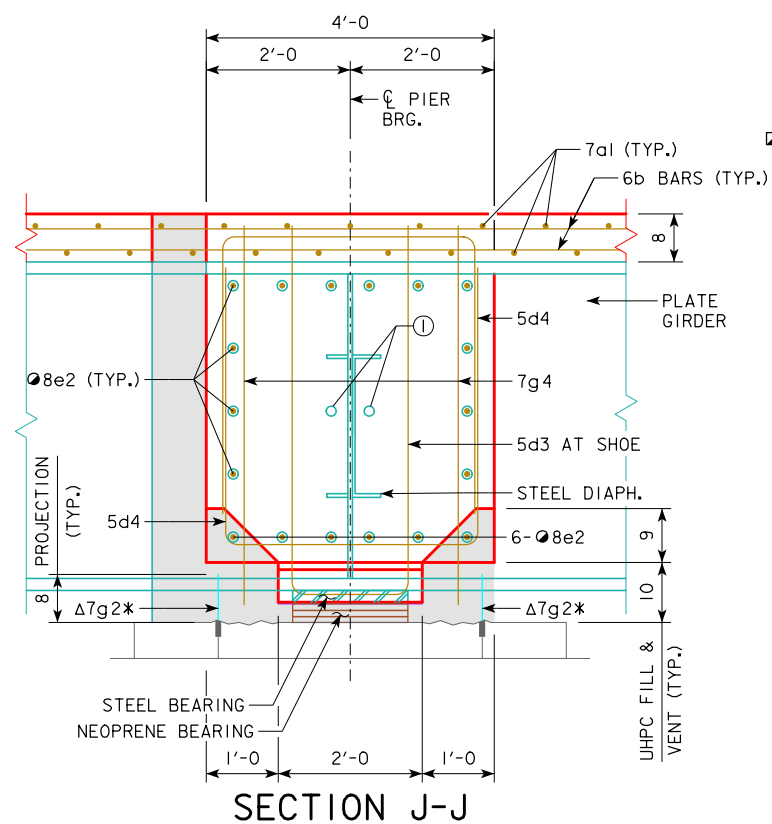
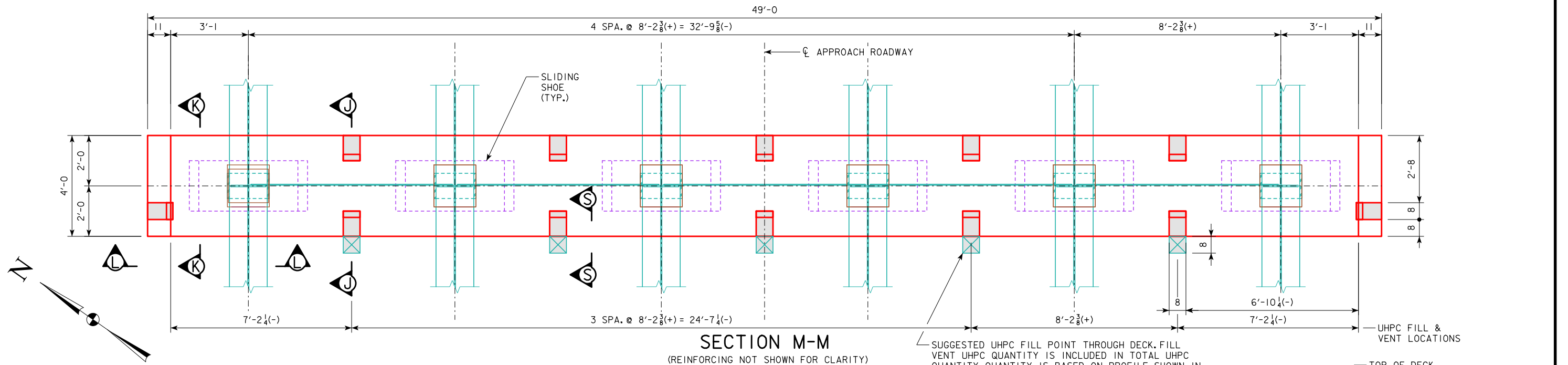
NOTE:
Δ7g2 BAR SUPPLIED WITH PIER CAP REINFORCING. SEE GENERAL NOTES SHEET FOR MECHANICAL SPLICE DETAILS AND NOTES.

AT THE CONTRACTOR'S OPTION, THE 7g3 & 7g4 BARS MAY USE A MECHANICAL SPLICER TO CONNECT THE PORTION OF THE BAR EXTENDING INTO THE JACKING POCKET. CONTRACTOR TO VERIFY CLEARANCES REQUIRED FOR SUPERSTRUCTURE MOVE OPERATIONS PRIOR TO CONSTRUCTION. NO ADDITIONAL COMPENSATION WILL BE MADE.

SUGGESTED UHPC AND FILL/VENT POINT LOCATIONS. SEE GENERAL NOTES SHEET.

DESIGN FOR 0° SKEW
230'-0" X 44'-0" CONTINUOUS
WELDED GIRDER BRIDGE

115'-0" W. SPAN 115'-0" E. SPAN
PIER DIAPHRAGM DETAILS
STA. 985+91.00 IA 92 (ML) OCTOBER, 2020
MAHASKA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 28 OF 42 FILE NO. 31191 DESIGN NO. 120



NOTES:

C.I.P. PIER CAP SHOWN, PRECAST PIER CAP SIMILAR.

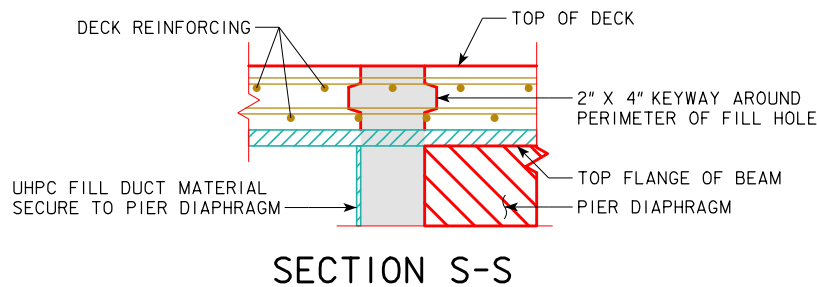
SEE DESIGN SHEETS 19 THRU 21 FOR PIER CAP DETAILS AND REINFORCEMENT.

SEE DESIGN SHEET 25 FOR BEARING PAD AND SLIDING SHOE DETAILS.

SEE DESIGN SHEET 28 FOR LOCATIONS OF SECTION M-M, DETAILS P, Q AND R.

SEE DESIGN SHEET 30 FOR SUPERSTRUCTURE BAR LIST AND REINFORCING DETAILS.

Δ7g2 BAR INCLUDED WITH PIER CAP REINFORCING. SEE DESIGN SHEET 4 FOR MECHANICAL SPLICE DETAILS AND NOTES. 8" PROJECTION ABOVE TOP OF ABUTMENT FOOTING (MIN.), THE LENGTH OF REINFORCING IN SPLICE IS INCIDENTAL AND WEIGHT IS NOT INCLUDED TO ALLOW FOR DIFFERENT SPLICERS.



SUGGESTED UHPc AND FILL/VENT POINT LOCATIONS. SEE GENERAL NOTES SHEET.

DESIGN FOR 0° SKEW

230'-0" X 44'-0" CONTINUOUS WELDED GIRDER BRIDGE

115'-0" W. SPAN 115'-0" E. SPAN

PIER DIAPHRAGM SECTIONS

STA. 985+91.00 IA 92 (ML) OCTOBER, 2020

MAHASKA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

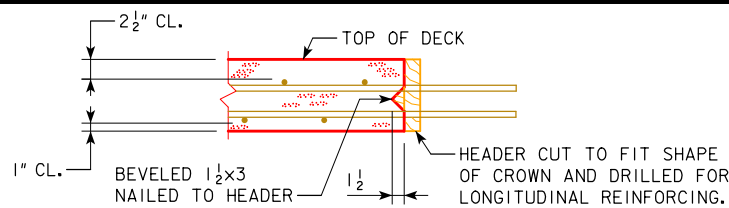
DESIGN SHEET NO. 29 OF 42 FILE NO. 31191 DESIGN NO. 120

* CONTRACTOR'S WAYS AND MEANS SHALL CONSIDER HOW TO INSTALL 7g2 BARS SO FINAL PROJECTION ABOVE THE FOOTING IS MAINTAINED.

8e2 BARS THROUGH BEAM, 1 1/4" DIA. PREDRILLED HOLES AS NEEDED

5c2 BARS INCLUDED WITH BARRIER RAIL. SEE DESIGN SHEET 38.

① JACKING RODS & HOLES THRU BEAMS PER CONTRACTOR'S WAYS & MEANS. THE CONTRACTOR SHALL COORDINATE REQUIRED HOLES & LOCATIONS FOR JACKING RODS, ETC. WITH THE STEEL SUPPLIER. LOCATIONS SHOWN ABOVE ARE FOR SCHEMATIC PURPOSES ONLY.



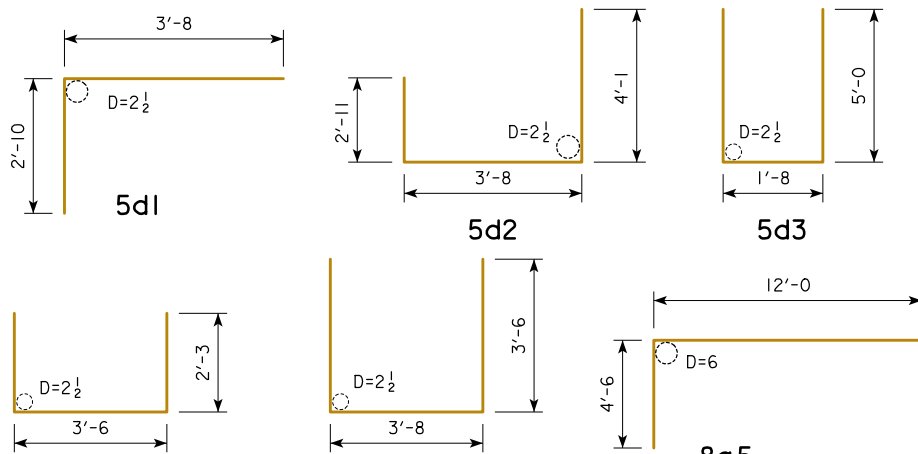
PERMISSIBLE TRANSVERSE DECK CONSTRUCTION JOINT

CONCRETE PLACEMENT DIAGRAM:

NOTE: CONCRETE DECK SHALL BE PLACED IN SECTIONS IN THE FOLLOWING SEQUENCES:

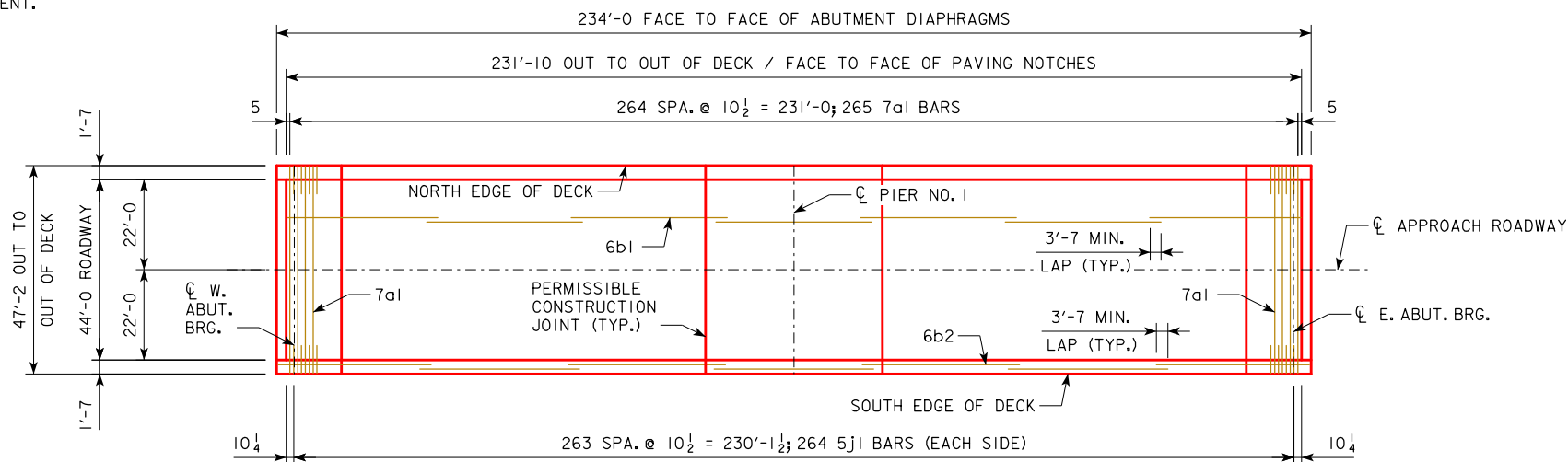
- A. SECTION 1 AND SECTION 2 SHALL BE PLACED IN THE SAME DAY. HOWEVER, THE SECTION PLACED FIRST MUST REMAIN PLASTIC UNTIL THE OTHER SECTION IS COMPLETELY PLACED.
- B. SECTIONS 3, 4 AND 5 MAY NOT BE PLACED UNTIL SECTIONS 1 AND 2 HAVE CURED FOR A MINIMUM OF 48 HOURS AND ACHIEVED A MINIMUM STRENGTH OF 75% OF THE 28 DAY DECK CONCRETE STRENGTH. DECK HEADERS SHALL ONLY BE REMOVED AFTER MEETING THESE REQUIREMENTS.

AN APPROVED ALTERNATE PROCEDURE IS TO PLACE THE CONCRETE DECK IN ONE CONTINUOUS POUR BEGINNING AT ONE END OF THE BRIDGE. ALTERNATE PROCEDURES FOR PLACING DECK CONCRETE MAY BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF THE PROPOSED METHOD AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULTS. THE BRIDGE ENGINEER SHALL REVIEW ANY ALTERNATE PROCEDURES. THE COST OF ANY ADDITIONAL ANALYSIS AND PLAN MODIFICATIONS SHALL BE PAID FOR BY THE CONTRACTOR. THE ENGINEER SHALL DETERMINE IF A RETARDING ADMIXTURE IS REQUIRED TO MAINTAIN PLASTICITY OF THE CONCRETE DECK DURING PLACEMENT.

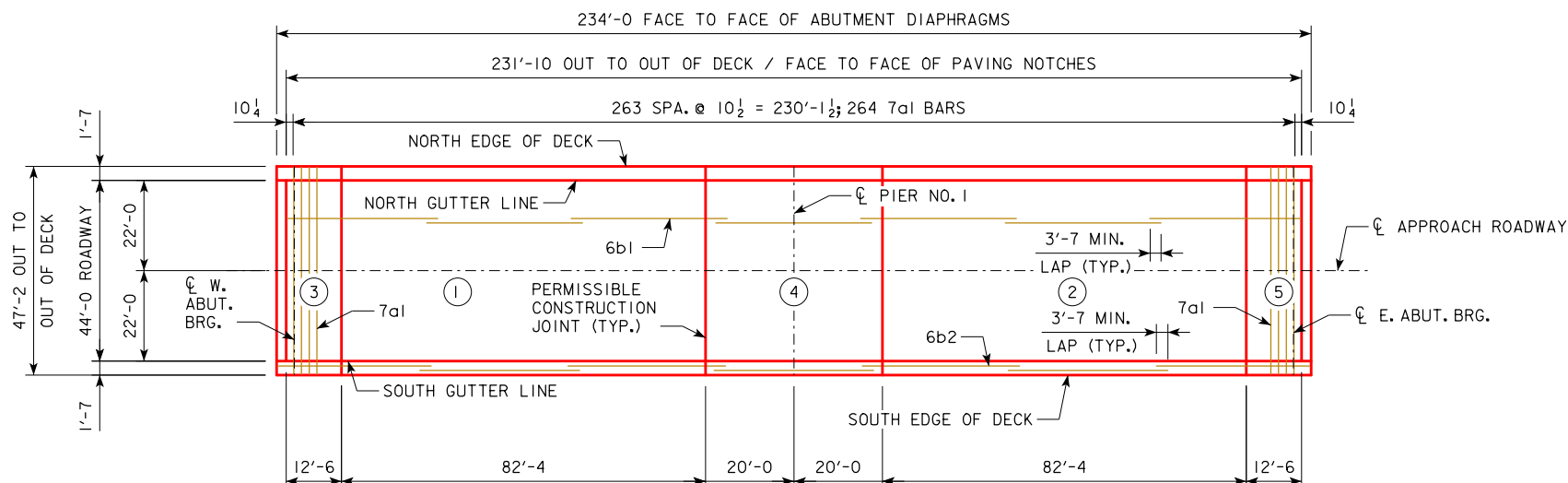


NOTE: ALL DIMENSIONS ARE OUT TO OUT. D= PIN DIAMETER.

BENT BAR DETAILS



DECK TOP REINFORCING LAYOUT



DECK BOTTOM REINFORCING LAYOUT & CONCRETE PLACEMENT DIAGRAM

REINFORCING BAR LIST

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
7a1	DECK TRANS. TOP & BOTTOM		529	46'-10	50,541
6b1	DECK LONGIT. TOP & BOTTOM		707	36'-3	38,443
6b2	DECK LONGIT. TOP & BOTTOM (AT RAIL)		70	36'-6	3,833
5d1	ABUT. DIAPH., HOOP		92	6'-6	622
5d2	ABUT. DIAPH., HOOP		92	10'-8	1,021
5d3	ABUT. & PIER DIAPH., HOOP		72	11'-8	874
5d4	PIER DIAPH. HOOP		96	10'-8	1,065
5e1	ABUT. DIAPH., LONGIT.		60	24'-11	1,555
8e2	PIER DIAPH., LONGIT.		36	25'-9	2,475
5e3	ABUT. & PIER DIAPH., END		30	8'-0	250
7g3	ABUT. & PIER DIAPH., VERTICAL		68	4'-2	578
7g4	ABUT. & PIER DIAPH., VERTICAL		152	5'-3	1,628
8g5	ABUT. DIAPH., DECK TIES		92	16'-6	4,053
5h5	ABUT. DIAPH., DOWEL		48	4'-7	229
5j1	TOP OF DECK TRANSV. (AT RAIL)		528	6'-3	3,432
REINFORCING STEEL - EPOXY COATED - TOTAL (LBS.)					110,599

STRUCT. CONC. PLACEMENT QTYS.

LOCATION	QUANTITY
SECTION 1, DECK	99.5
SECTION 2, DECK	99.5
SECTION 3, DECK & WEST ABUT. DIAPH.	45.7
SECTION 4, DECK & PIER DIAPH.	79.3
SECTION 5, DECK & EAST ABUT. DIAPH.	45.7
TOTAL (CU. YDS.)	369.7

UHPC CONC. PLACEMENT QUANTITIES

LOCATION	QUANTITY
WEST ABUTMENT CLOSURE POUR	3.6
EAST ABUTMENT CLOSURE POUR	3.6
PIER 1 CLOSURE POUR	3.8
TOTAL (CU. YDS.)	11.0

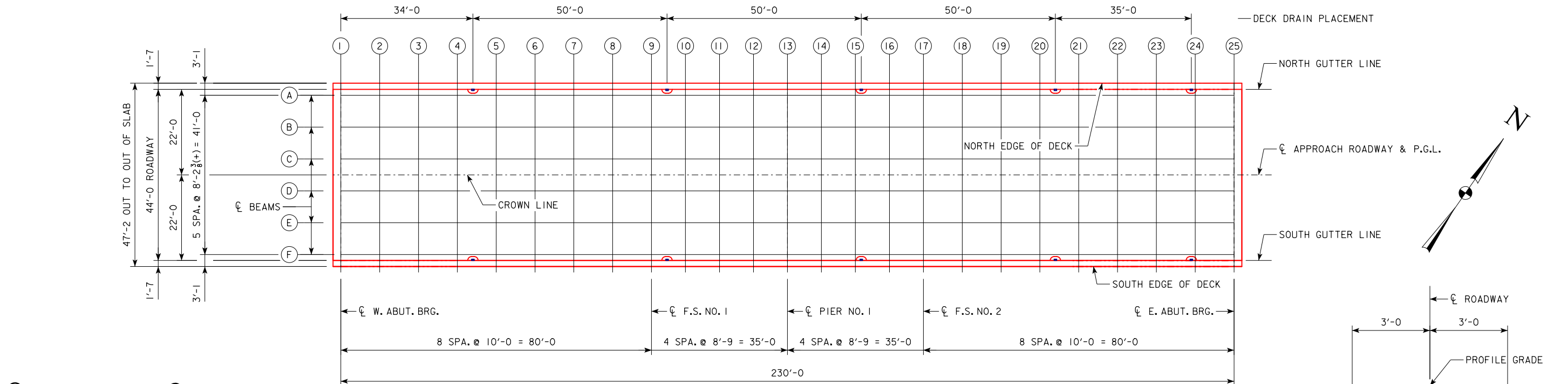
NOTE:
CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED
ON THE SUMMARY QUANTITIES SHEET.

DESIGN FOR 0° SKEW 230'-0 X 44'-0 CONTINUOUS WELDED GIRDER BRIDGE

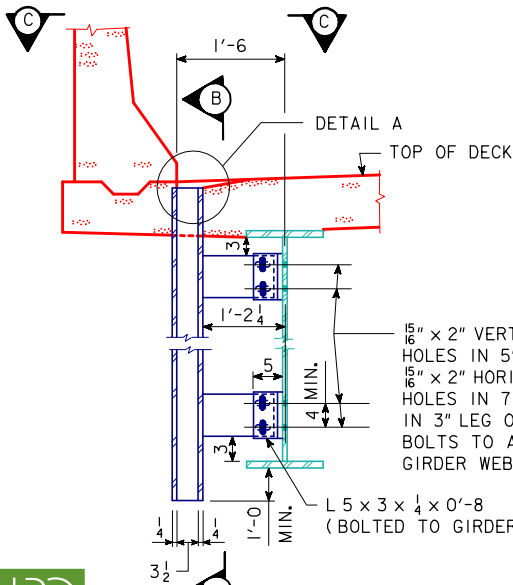
115'-0 W. SPAN 115'-0 E. SPAN
DECK, ABUT. & DIAPH. DETAILS
STA. 985+91.00 IA 92 (ML) OCTOBER, 2020
MAHASKA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 30 OF 42 FILE NO. 31191 DESIGN NO. 120



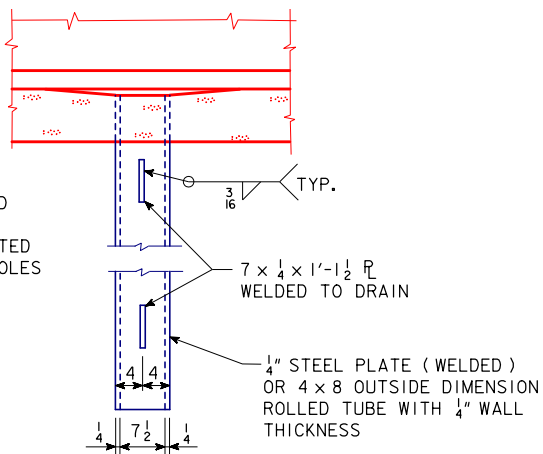
TABLE OF TOP OF DECK ELEVATION																											
LOCATION	W. ABUT. ℄ BRG.	SPAN 1								℄ F.S. NO. 1	SPAN 1			℄ PIER NO. 1	SPAN 2			℄ F.S. NO. 2	SPAN 2								E. ABUT. ℄ BRG.
	LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6	LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12	LINE 13	LINE 14	LINE 15	LINE 16	LINE 17	LINE 18	LINE 19	LINE 20	LINE 21	LINE 22	LINE 23	LINE 24	LINE 25		
NORTH GUTTER LINE	739.56	739.17	738.78	738.41	738.04	737.67	737.31	736.96	736.62	736.32	736.03	735.74	735.46	735.18	734.91	734.64	734.38	734.09	733.80	733.52	733.24	732.97	732.71	732.45	732.20		
BEAM LINE A	739.59	739.20	738.81	738.44	738.07	737.70	737.34	736.99	736.65	736.35	736.06	735.77	735.49	735.21	734.94	734.67	734.41	734.12	733.83	733.55	733.27	733.00	732.74	732.48	732.23		
BEAM LINE B	739.75	739.36	738.98	738.60	738.23	737.87	737.51	737.16	736.81	736.52	736.22	735.94	735.65	735.38	735.10	734.84	734.57	734.28	733.99	733.71	733.44	733.17	732.90	732.65	732.40		
BEAM LINE C	739.91	739.52	739.14	738.76	738.39	738.03	737.67	737.32	736.98	736.68	736.39	736.10	735.82	735.54	735.27	735.00	734.74	734.44	734.16	733.87	733.60	733.33	733.07	732.81	732.56		
CROWN LINE	739.97	739.58	739.19	738.82	738.45	738.08	737.72	737.37	737.03	736.73	736.44	736.15	735.87	735.59	735.32	735.05	734.79	734.50	734.21	733.93	733.65	733.38	733.12	732.86	732.61		
BEAM LINE D	739.91	739.52	739.14	738.76	738.39	738.03	737.67	737.32	736.98	736.68	736.39	736.10	735.82	735.54	735.27	735.00	734.74	734.44	734.16	733.87	733.60	733.33	733.07	732.81	732.56		
BEAM LINE E	739.75	739.36	738.98	738.60	738.23	737.87	737.51	737.16	736.81	736.52	736.22	735.94	735.65	735.38	735.10	734.84	734.57	734.28	733.99	733.71	733.44	733.17	732.90	732.65	732.40		
BEAM LINE F	739.59	739.20	738.81	738.44	738.07	737.70	737.34	736.99	736.65	736.35	736.06	735.77	735.49	735.21	734.94	734.67	734.41	734.12	733.83	733.55	733.27	733.00	732.74	732.48	732.23		
SOUTH GUTTER LINE	739.56	739.17	738.78	738.41	738.04	737.67	737.31	736.96	736.62	736.32	736.03	735.74	735.46	735.18	734.91	734.64	734.38	734.09	733.80	733.52	733.24	732.97	732.71	732.45	732.20		



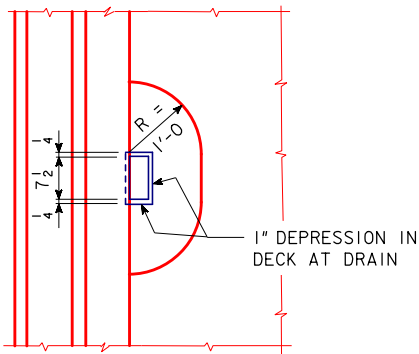
LOCATION OF TOP OF DECK ELEVATION



DRAIN DETAILS

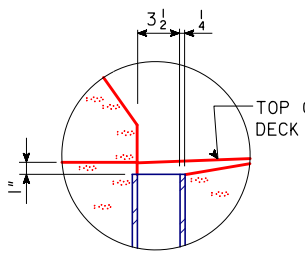


SECTION B-B



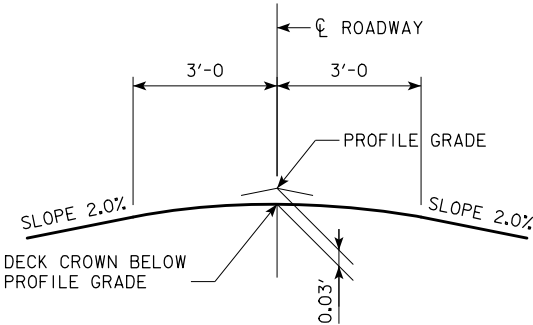
VIEW C-C

NOTE: DRAIN WEIGHTS ARE INCLUDED ON THE SUMMARY QUANTITIES SHEET.



DETAIL A

DATA FOR ONE DRAIN	
BEAM SIZE	CWPG
DRAIN WEIGHT (LBS.)	120
DRAIN LENGTH (FT.)	6'-0 3/4



CROWN TEMPLATE

NOTE: DRAINS ARE TO BE GALVANIZED AND PAINTED ACCORDING TO SECTION 2509 OF THE STANDARD SPECIFICATIONS. 10 DRAINS ARE REQUIRED. WEIGHT OF ONE DRAIN = 120 LBS. WEIGHT OF DRAINS IS BASED ON ROLLED TUBE. LENGTH OF DRAIN IS TO BE 6'-0 3/4. WEIGHT OF DRAIN INCLUDES ANGLES AND PLATES.

DESIGN FOR 0° SKEW

230'-0 X 44'-0 CONTINUOUS WELDED GIRDER BRIDGE

115'-0 W. SPAN 115'-0 E. SPAN

TOP OF DECK ELEVATIONS

STA. 985+91.00 IA 92 (ML) OCTOBER, 2020

MAHASKA COUNTY

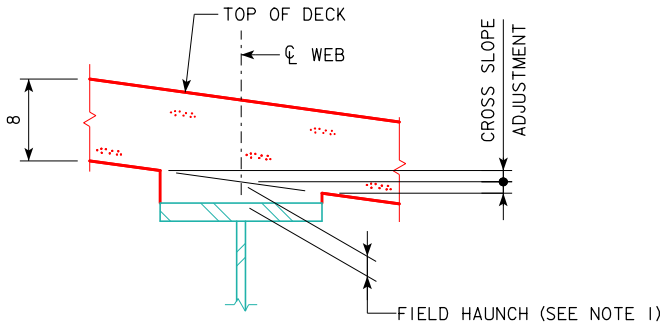
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 31 OF 42 FILE NO. 31191 DESIGN NO. 120



TABLE OF GIRDER LINE HAUNCH ELEVATIONS																									
LOCATION	☐ WEST ABUT. BRG.	SPAN 1							☐ F.S. NO. 1	SPAN 1			☐ PIER 1	SPAN 2			☐ F.S. NO. 2	SPAN 2							☐ EAST 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	LINE 24	LINE 25
GIRDER LINE A	738.92	738.57	738.22	737.87	737.51	737.15	736.78	736.41	736.04	735.72	735.41	735.11	734.82	734.55	734.29	734.04	733.80	733.53	733.27	732.99	732.72	732.43	732.15	731.86	731.57
GIRDER LINE B	739.08	738.73	738.39	738.04	737.68	737.32	736.95	736.58	736.21	735.89	735.58	735.28	734.99	734.72	734.46	734.21	733.97	733.70	733.43	733.16	732.89	732.60	732.31	732.02	731.69
GIRDER LINE C	739.25	738.90	738.55	738.20	737.85	737.49	737.12	736.75	736.37	736.05	735.74	735.44	735.15	734.88	734.62	734.38	734.14	733.87	733.60	733.33	733.05	732.77	732.48	732.19	731.85
GIRDER LINE D	739.25	738.90	738.55	738.20	737.85	737.49	737.12	736.75	736.37	736.05	735.74	735.44	735.15	734.88	734.62	734.38	734.14	733.87	733.60	733.33	733.05	732.77	732.48	732.19	731.85
GIRDER LINE E	739.08	738.73	738.39	738.04	737.68	737.32	736.95	736.58	736.21	735.89	735.58	735.28	734.99	734.72	734.46	734.21	733.97	733.70	733.43	733.16	732.89	732.60	732.31	732.02	731.69
GIRDER LINE F	738.92	738.57	738.22	737.87	737.51	737.15	736.78	736.41	736.04	735.72	735.41	735.11	734.82	734.55	734.29	734.04	733.80	733.53	733.27	732.99	732.72	732.43	732.15	731.86	731.53

MISCELLANEOUS DATA TABLE																											
		GIRDER LINE	☐ WEST ABUT. BRG.	SPAN 1							☐ F.S. NO. 1	SPAN 1			☐ PIER 1	SPAN 2			☐ F.S. NO. 2	SPAN 2							☐ EAST 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	LINE 24	LINE 25
ANTICIPATED DEFLECTION DUE TO DECK AND BARRIER (INCHES)		A, F	0	$\frac{7}{16}$	$\frac{7}{8}$	$1\frac{3}{16}$	$1\frac{5}{16}$	$1\frac{3}{8}$	$1\frac{1}{4}$	1	$\frac{3}{4}$	$\frac{7}{16}$	$\frac{1}{4}$	$\frac{1}{16}$	0	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{7}{16}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{5}{16}$	$1\frac{3}{16}$	$\frac{7}{8}$	$\frac{7}{16}$	0
		B - E	0	$\frac{1}{2}$	$\frac{15}{16}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{7}{16}$	$1\frac{5}{16}$	$1\frac{1}{16}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{16}$	0	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{16}$	$1\frac{5}{16}$	$1\frac{7}{16}$	$1\frac{3}{8}$	$1\frac{1}{4}$	$\frac{15}{16}$	$\frac{1}{2}$	0
CROSS SLOPE ADJUSTMENTS (INCHES)		ALL	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{16}$	
ALLOWABLE FIELD HAUNCH IN. (FT.)	MAX	ALL	$2\frac{15}{16}$ (0.245)	$2\frac{15}{16}$ (0.245)	$2\frac{15}{16}$ (0.245)	$2\frac{15}{16}$ (0.245)	$2\frac{15}{16}$ (0.245)	$2\frac{15}{16}$ (0.245)	$2\frac{15}{16}$ (0.245)	$2\frac{15}{16}$ (0.245)	$2\frac{15}{16}$ (0.245)	$2\frac{15}{16}$ (0.245)	$2\frac{15}{16}$ (0.245)	$2\frac{15}{16}$ (0.245)	$2\frac{15}{16}$ (0.245)	$2\frac{15}{16}$ (0.245)	$2\frac{15}{16}$ (0.245)	$2\frac{15}{16}$ (0.245)	$2\frac{15}{16}$ (0.245)	$2\frac{15}{16}$ (0.245)	$2\frac{15}{16}$ (0.245)	$2\frac{15}{16}$ (0.245)	$2\frac{15}{16}$ (0.245)	$2\frac{15}{16}$ (0.245)	$2\frac{15}{16}$ (0.245)	$2\frac{15}{16}$ (0.245)	
	MIN	ALL	$-\frac{5}{16}$ (-0.028)	$-\frac{5}{16}$ (-0.028)	$-\frac{5}{16}$ (-0.028)	$-\frac{5}{16}$ (-0.028)	$-\frac{5}{16}$ (-0.028)	$-\frac{5}{16}$ (-0.028)	$-\frac{5}{16}$ (-0.028)	$-\frac{5}{16}$ (-0.028)	$-\frac{5}{16}$ (-0.027)	$-\frac{5}{16}$ (-0.027)	$-\frac{5}{16}$ (-0.027)	$-\frac{5}{16}$ (-0.027)	$-\frac{5}{16}$ (-0.027)	$-\frac{5}{16}$ (-0.027)	$-\frac{5}{16}$ (-0.027)	$-\frac{5}{16}$ (-0.027)	$-\frac{5}{16}$ (-0.027)	$-\frac{5}{16}$ (-0.028)	$-\frac{5}{16}$ (-0.028)	$-\frac{5}{16}$ (-0.028)	$-\frac{5}{16}$ (-0.028)	$-\frac{5}{16}$ (-0.028)	$-\frac{5}{16}$ (-0.028)	$-\frac{5}{16}$ (-0.028)	



FIELD HAUNCH DETAIL

NOTES:

1. TO CALCULATE FIELD HAUNCH NEEDED AT EACH LOCATION, SURVEY THE TOP OF GIRDER TOP FLANGES AT THE POINTS AND FIELD SPLICE LOCATIONS AS INDICATED IN THE TABLE OF GIRDER LINE HAUNCH ELEVATIONS. SUBTRACT THE SURVEYED GIRDER SHOT FROM THE "GIRDER LINE HAUNCH ELEVATION". THIS VALUE WILL BE THE FIELD HAUNCH NEEDED (SEE "FIELD HAUNCH" IN THE HAUNCH DETAIL). THE "GIRDER LINE HAUNCH ELEVATION" INCLUDES ADJUSTMENT FOR DECK THICKNESS AND ANTICIPATED DEFLECTIONS. NO ADDITIONAL CALCULATIONS ARE REQUIRED. IF THE FIELD HAUNCH EXCEEDS THE MAXIMUMS AND MINIMUMS INDICATED IN THE MISC. DATA TABLE, ADJUSTMENTS TO THE GRADE OR ADDITIONAL HAUNCH REINFORCEMENT WILL BE REQUIRED.
2. FIELD HAUNCHES ARE DETERMINED USING SURVEYED TOP OF GIRDER TOP FLANGE ELEVATIONS AND "GIRDER LINE HAUNCH ELEVATION" DATA. ALLOWABLE MAXIMUM AND MINIMUM "FIELD HAUNCH" VALUES ARE GIVEN IN THE "MISCELLANEOUS DATA" TABLE FOR EACH UNIT. "CROSS SLOPE ADJUSTMENT" VALUES WILL AID THE CONTRACTOR IN DETERMINING ACTUAL FORMED HAUNCH DIMENSIONS AT THE EDGES OF THE TOP FLANGE.
3. DOWNWARD DEFLECTIONS ARE POSITIVE.

DESIGN FOR 0° SKEW

230'-0 X 44'-0 CONTINUOUS
WELDED GIRDER BRIDGE

115'-0 W. SPAN115'-0 E. SPAN

FIELD HAUNCH DATA

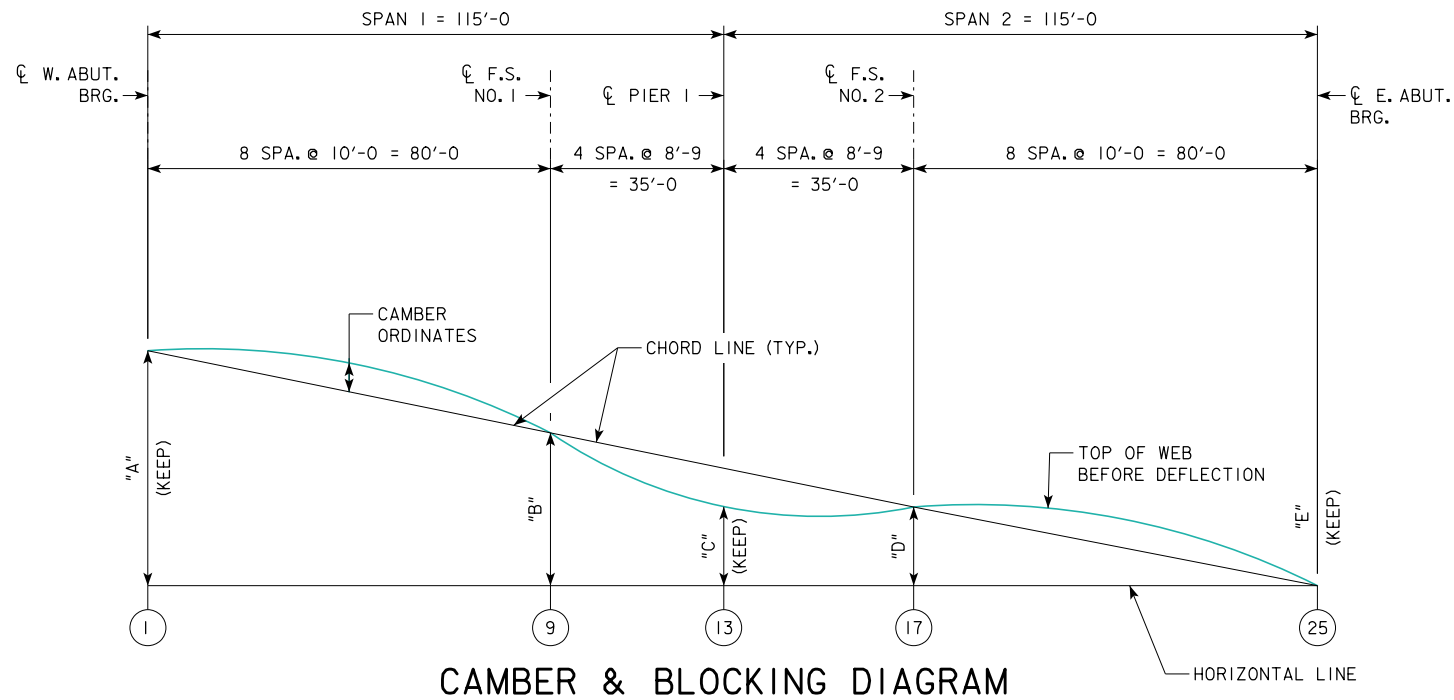
STA. 985+91.00IA 92 (ML)OCTOBER, 2020

MAHASKA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 32 OF 42FILE NO. 31191DESIGN NO. 120





CAMBER & BLOCKING DIAGRAM

CAMBER ORDINATES (INCHES)

LOCATION	☐ WEST ABUT. BRG.	SPAN 1							☐ F.S. NO. 1	SPAN 1			☐ PIER 1	SPAN 2				☐ F.S. NO. 2	SPAN 2						☐ EAST 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	LINE 24	LINE 25
GIRDER LINE A	0.00	0.22	0.44	0.59	0.65	0.61	0.46	0.24	0.00	-0.56	-1.01	-1.30	-1.41	-1.30	-1.00	-0.56	0.00	0.24	0.46	0.61	0.65	0.59	0.44	0.22	0.00
GIRDER LINE B	0.00	0.24	0.47	0.64	0.70	0.65	0.49	0.26	0.00	-0.57	-1.03	-1.33	-1.45	-1.33	-1.02	-0.57	0.00	0.26	0.49	0.65	0.70	0.64	0.47	0.24	0.00
GIRDER LINE C	0.00	0.25	0.49	0.66	0.73	0.68	0.51	0.27	0.00	-0.58	-1.05	-1.35	-1.47	-1.35	-1.04	-0.58	0.00	0.27	0.51	0.68	0.73	0.66	0.49	0.25	0.00
GIRDER LINE D	0.00	0.25	0.49	0.66	0.73	0.68	0.51	0.27	0.00	-0.58	-1.05	-1.35	-1.47	-1.35	-1.04	-0.58	0.00	0.27	0.51	0.68	0.73	0.66	0.49	0.25	0.00
GIRDER LINE E	0.00	0.24	0.47	0.64	0.70	0.65	0.49	0.26	0.00	-0.57	-1.03	-1.33	-1.45	-1.33	-1.02	-0.57	0.00	0.26	0.49	0.65	0.70	0.64	0.47	0.24	0.00
GIRDER LINE F	0.00	0.22	0.44	0.59	0.65	0.61	0.46	0.24	0.00	-0.56	-1.01	-1.30	-1.41	-1.30	-1.00	-0.56	0.00	0.24	0.46	0.61	0.65	0.59	0.44	0.22	0.00

BLOCKING DATA (FEET)

LOCATION	☐ WEST ABUT. BRG.	☐ F.S. NO. 1	☐ PIER 1	☐ F.S. NO. 2	☐ EAST ABUT. BRG.
	"A"	"B"	"C"	"D"	"E"
GIRDER LINE A	7.35	4.49	3.26	2.25	0.00
GIRDER LINE B	7.35	4.50	3.26	2.26	0.00
GIRDER LINE C	7.35	4.50	3.26	2.26	0.00
GIRDER LINE D	7.35	4.50	3.26	2.26	0.00
GIRDER LINE E	7.35	4.50	3.26	2.26	0.00
GIRDER LINE F	7.35	4.49	3.26	2.25	0.00

NOTES:

CAMBER ORDINATES ARE MEASURED FROM A CHORD LINE BETWEEN FIELD SPLICES. UPWARD CAMBERS ARE POSITIVE. TOP OF GIRDER ELEVATIONS FOR HAUNCH CALCULATIONS SHALL BE SURVEYED PRIOR TO THE PLACEMENT OF FORMS. FOR LOCATION OF POINTS, SEE TOP OF SLAB DIAGRAMS ON TOP OF SLAB ELEVATION SHEETS.

HAUNCH THICKENING DIAGRAM NOT PROVIDED BECAUSE THE HAUNCH DIMENSION FROM BOTTOM OF SLAB TO TOP OF GIRDER WEB SHOULD THEORETICALLY BE A CONSTANT DIMENSION. (SEE TYPICAL SLAB AND NOMINAL HAUNCH DETAIL, DESIGN SHEET 24). GIRDER WEB SHALL BE CUT TO COMPENSATE FOR DEAD LOAD DEFLECTION AND VERTICAL CURVE CORRECTION. CAMBER VALUES MUST BE MAINTAINED AT THE CENTER LINE OF ABUTMENT AND PIER BEARINGS. CAMBER VALUES ARE GIVEN FOR THE GIRDERS IN THE NO LOAD POSITION. FOR INDIVIDUAL GIRDER SPAN LENGTHS AND DISTANCE TO FIELD SPLICES, SEE GIRDER FRAMING AND GIRDER ELEVATION SHEETS.



DESIGN FOR 0° SKEW

230'-0 X 44'-0 CONTINUOUS
WELDED GIRDER BRIDGE

115'-0 W. SPAN115'-0 E. SPAN

CAMBER & BLOCKING

STA. 985+91.00IA 92 (ML)OCTOBER, 2020

MAHASKA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 34 OF 42FILE NO. 31191DESIGN NO. 120

DEFLECTION ORDINATES DUE TO WEIGHT OF DECK AND BARRIERS (DOWNWARD DEFLECTIONS ARE POSITIVE) (INCHES)																									
LOCATION	☐ WEST ABUT. BRG.	SPAN 1							☐ F.S. NO. 1	SPAN 1			☐ PIER 1	SPAN 2			☐ F.S. NO. 2	SPAN 2							☐ EAST 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	LINE 24	LINE 25
GIRDER LINE A	0.00	0.46	0.87	1.17	1.33	1.36	1.25	1.02	0.72	0.45	0.22	0.06	0.00	0.06	0.23	0.45	0.72	1.02	1.25	1.36	1.33	1.17	0.87	0.46	0.00
GIRDER LINE B	0.00	0.49	0.91	1.23	1.40	1.43	1.31	1.07	0.76	0.47	0.23	0.07	0.00	0.07	0.24	0.47	0.76	1.07	1.31	1.43	1.40	1.23	0.91	0.49	0.00
GIRDER LINE C	0.00	0.50	0.94	1.26	1.44	1.46	1.34	1.10	0.78	0.49	0.24	0.07	0.00	0.07	0.25	0.49	0.78	1.10	1.34	1.46	1.44	1.26	0.94	0.50	0.00
GIRDER LINE D	0.00	0.50	0.94	1.26	1.44	1.46	1.34	1.10	0.78	0.49	0.24	0.07	0.00	0.07	0.25	0.49	0.78	1.10	1.34	1.46	1.44	1.26	0.94	0.50	0.00
GIRDER LINE E	0.00	0.49	0.91	1.23	1.40	1.43	1.31	1.07	0.76	0.47	0.23	0.07	0.00	0.07	0.24	0.47	0.76	1.07	1.31	1.43	1.40	1.23	0.91	0.49	0.00
GIRDER LINE F	0.00	0.46	0.87	1.17	1.33	1.36	1.25	1.02	0.72	0.45	0.22	0.06	0.00	0.06	0.23	0.45	0.72	1.02	1.25	1.36	1.33	1.17	0.87	0.46	0.00

DEFLECTION ORDINATES DUE TO WEIGHT OF STRUCTURAL STEEL (DOWNWARD DEFLECTIONS ARE POSITIVE) (INCHES)																									
LOCATION	℄ WEST ABUT. BRG.	SPAN 1							℄ F.S. NO. 1	SPAN 1			℄ PIER 1	SPAN 2			℄ F.S. NO. 2	SPAN 2							℄ EAST 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	LINE 24	LINE 25
GIRDER LINE A	0.00	0.14	0.26	0.35	0.40	0.41	0.38	0.31	0.22	0.14	0.07	0.02	0.00	0.02	0.07	0.14	0.22	0.31	0.38	0.41	0.40	0.35	0.26	0.14	0.00
GIRDER LINE B	0.00	0.14	0.26	0.35	0.40	0.41	0.38	0.31	0.22	0.14	0.07	0.02	0.00	0.02	0.07	0.14	0.22	0.31	0.38	0.41	0.40	0.35	0.26	0.14	0.00
GIRDER LINE C	0.00	0.14	0.26	0.35	0.40	0.41	0.38	0.31	0.22	0.14	0.07	0.02	0.00	0.02	0.07	0.14	0.22	0.31	0.38	0.41	0.40	0.35	0.26	0.14	0.00
GIRDER LINE D	0.00	0.14	0.26	0.35	0.40	0.41	0.38	0.31	0.22	0.14	0.07	0.02	0.00	0.02	0.07	0.14	0.22	0.31	0.38	0.41	0.40	0.35	0.26	0.14	0.00
GIRDER LINE E	0.00	0.14	0.26	0.35	0.40	0.41	0.38	0.31	0.22	0.14	0.07	0.02	0.00	0.02	0.07	0.14	0.22	0.31	0.38	0.41	0.40	0.35	0.26	0.14	0.00
GIRDER LINE F	0.00	0.14	0.26	0.35	0.40	0.41	0.38	0.31	0.22	0.14	0.07	0.02	0.00	0.02	0.07	0.14	0.22	0.31	0.38	0.41	0.40	0.35	0.26	0.14	0.00



DESIGN FOR 0° SKEW

230'-0 X 44'-0 CONTINUOUS
WELDED GIRDER BRIDGE

115'-0 W. SPAN115'-0 E. SPAN

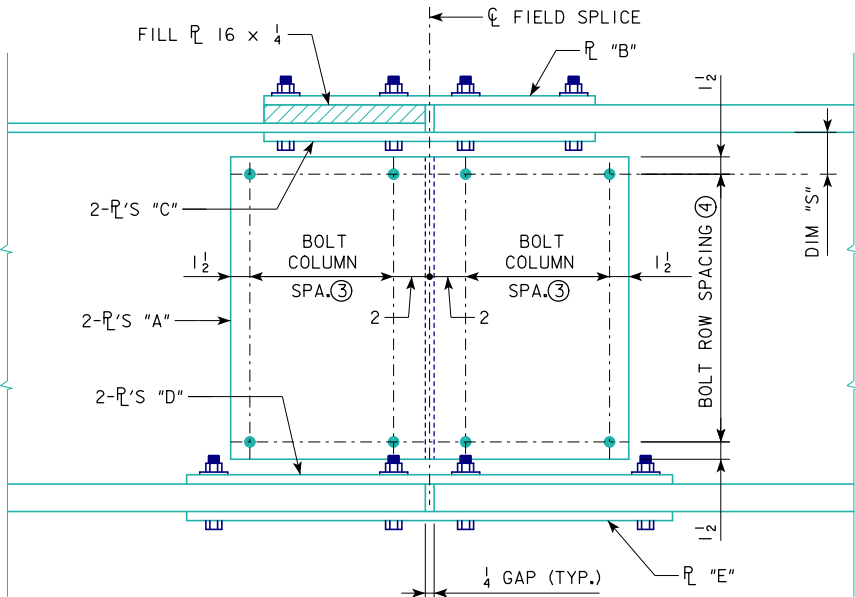
DEAD LOAD DEFLECTIONS

STA. 985+91.001A 92 (ML)OCTOBER, 2020

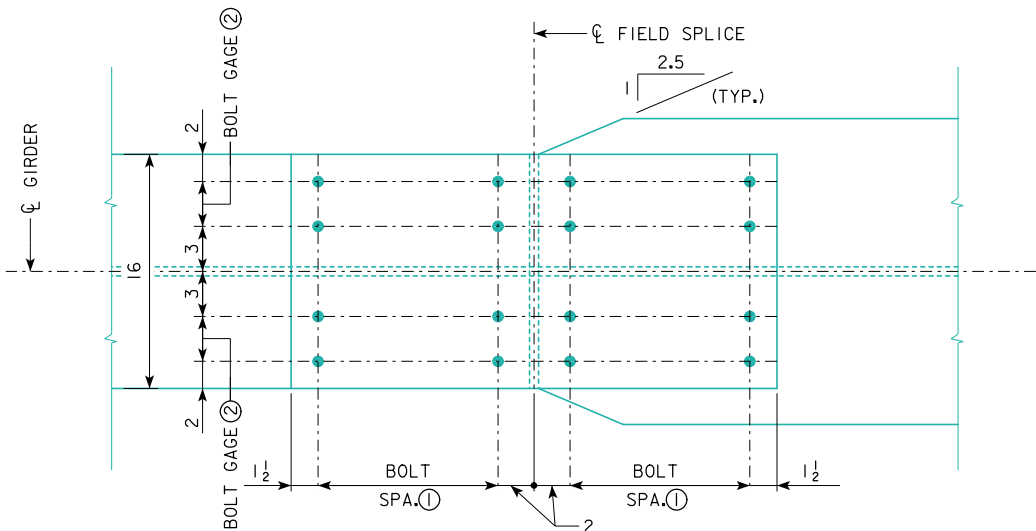
MAHASKA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 35 OF 42FILE NO. 31191DESIGN NO. 120



FIELD SPLICE ELEVATION



FLANGE SPLICE 16" MIN. GIRDER FLANGE WIDTH

MOMENT TABLE (FT-KIPS)

LOCATION	POSITIVE MOMENT SPAN 1						NEGATIVE MOMENT PIER 1						POSITIVE MOMENT SPAN 2					
	GIRD. A	GIRD. B	GIRD. C	GIRD. D	GIRD. E	GIRD. F	GIRD. A	GIRD. B	GIRD. C	GIRD. D	GIRD. E	GIRD. F	GIRD. A	GIRD. B	GIRD. C	GIRD. D	GIRD. E	GIRD. F
DC1	861	892	914	914	892	861	-1990	-2083	-2127	-2127	-2083	-1990	861	894	914	914	894	861
DC2	138	139	139	139	139	138	-218	-219	-219	-219	-219	-218	138	139	139	139	139	138
DW	143	143	143	143	143	143	-225	-226	-226	-226	-226	-225	143	143	143	143	143	143
LL + IMPACT (TRUCK + LANE)	1689	1460	1467	1467	1460	1689	-1971	-1685	-1707	-1707	-1685	-1971	1689	1458	1464	1464	1458	1689
LL + IMPACT (TANDEM + LANE)	1440	1256	1262	1262	1256	1440	-1258	-1067	-1086	-1086	-1067	-1258	1440	1255	1260	1260	1255	1440
TOTAL	2831	2634	2663	2663	2634	2831	-4404	-4213	-4279	-4279	-4213	-4404	2831	2634	2660	2660	2634	2831

REACTION TABLE (KIPS)

LOCATION	REACTION WEST ABUTMENT						REACTION PIER 1						REACTION EAST ABUTMENT					
	GIRD. A	GIRD. B	GIRD. C	GIRD. D	GIRD. E	GIRD. F	GIRD. A	GIRD. B	GIRD. C	GIRD. D	GIRD. E	GIRD. F	GIRD. A	GIRD. B	GIRD. C	GIRD. D	GIRD. E	GIRD. F
DC1	43	45	46	46	45	43	156	165	168	168	165	156	43	45	46	46	45	43
DC2	6	6	6	6	6	6	20	20	20	20	20	20	6	6	6	6	6	6
DW	6	6	6	6	6	6	21	21	21	21	21	21	6	6	6	6	6	6
LL + IMPACT (TRUCK + LANE)	80	79	81	81	79	80	158	146	151	151	146	158	80	79	81	81	79	80
LL + IMPACT (TANDEM + LANE)	65	65	67	67	65	65	109	109	113	113	109	109	65	65	67	67	65	65
TOTAL	135	136	139	139	136	135	355	352	360	360	352	355	135	136	139	139	136	135

FIELD SPLICE SCHEDULE

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

FIELD SPLICE SCHEDULE

FIELD SPLICE NO.	GIRDER	WEB PLATE SPLICE									DIM. S
		WEB PLATE "A" (2 REQ'D)			BOLT COLUMN SPACING ③			BOLT ROW SPACING ④			
		+ (in.)	w (in.)	L	# OF SPC.	SPC. (in.)	L (in.)	# OF SPC.	SPC. (in.)	L	
1 - 2	A, B, C, D, E, F	$\frac{1}{2}$	13	3'-11	1	3	3	8	$5\frac{1}{2}$	3'-8	3

FIELD SPLICE SCHEDULE

FIELD SPLICE NO.	GIRDER	BOTTOM FLANGE SPLICE										
		MIN. GIRDER FLANGE WIDTH	PLATE "D" (2 REQ'D)			PLATE "E"			BOLT SPACING ①			BOLT GAGE ②
			+ (in.)	w (in.)	L	+ (in.)	w (in.)	L	# OF SPC.	SPC. (in.)	L (in.)	
1 - 2	A, B, C, D, E, F	16	$\frac{13}{16}$	7	2'-7	$\frac{3}{4}$	16	2'-7	4	3	12	3

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

FOR GENERAL NOTES, SEE DESIGN SHEET 3.

FOR WEATHERING STEEL NOTES, SEE DESIGN SHEET 4.

FOR FRAMING PLAN, SEE DESIGN SHEET 33.

ALL SPLICE MATERIAL TO BE AASHTO M270 GRADE 50W (ASTM-A709 GRADE 50W) STEEL.

ALL BOLTS SHALL BE 7/8" DIA. AASHTO 64 (ASTM A325) TYPE III, IN. 15/16" DIA. HOLES.

DESIGN FOR 0° SKEW

230'-0 X 44'-0 CONTINUOUS
WELDED GIRDER BRIDGE

115'-0 W. SPAN115'-0 E. SPAN

MISCELLANEOUS BEAM DETAILS

STA. 985+91.00IA 92 (ML)OCTOBER, 2020

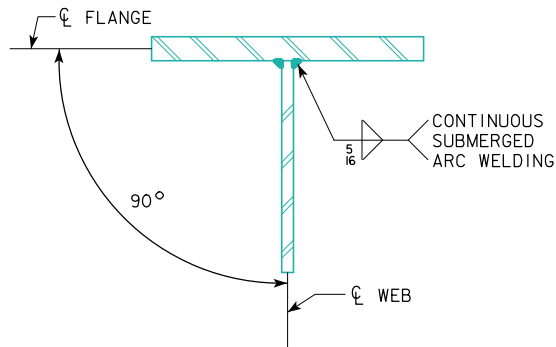
MAHASKA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

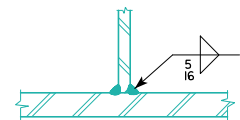
DESIGN SHEET NO. 36 OF 42FILE NO. 31191DESIGN NO. 120



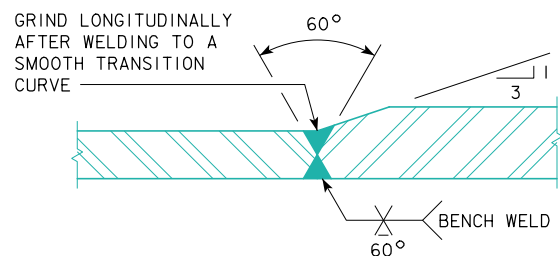
REVISED 04-12 - ADDED A THIRD CAULKING COMPANY TO THE LISTING FOR THE FLANGE DEFLECTOR.
ENGLISHBEAMS.DGN 1021W - THIS SHEET ISSUED 03-11.



FLANGE TO WEB
WELD DETAIL

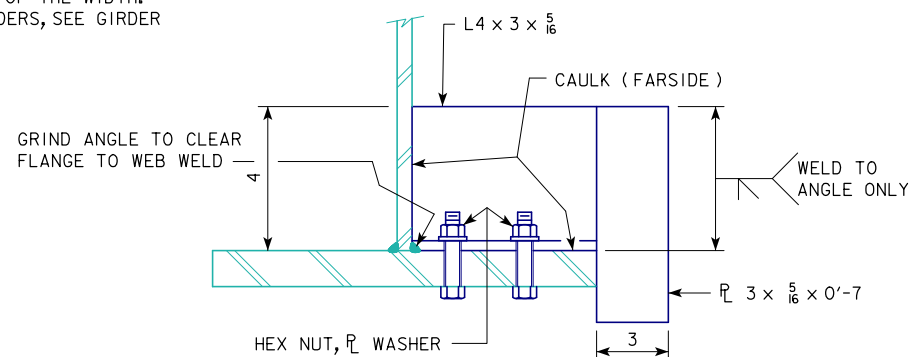


SECTION B-B



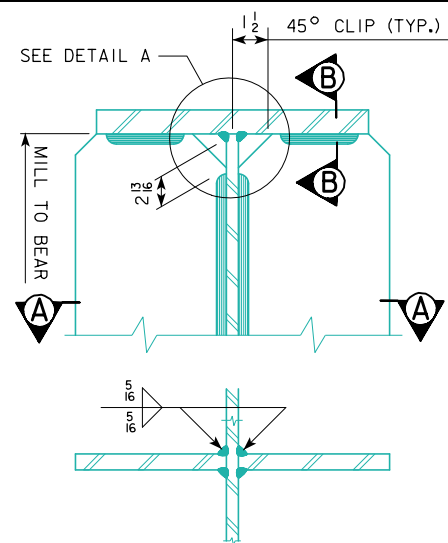
FLANGE PLATE TRANSITION
AT SHOP SPLICES

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



SECTION G-G

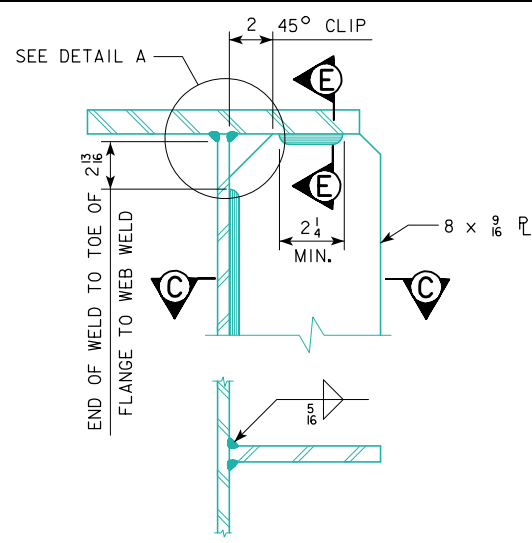
FLANGE DEFLECTORS ARE REQUIRED ON THE OUTSIDE OF THE EXTERIOR GIRDERS AT THE EAST ABUTMENT AND PIER 1 AS SHOWN ON THE STRUCTURAL STEEL LAYOUT.



SECTION A-A

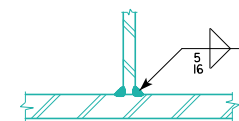
BEARING
STIFFENER

BEARING STIFFENERS
(SEE BEARING
STIFFENER DATA TABLE)

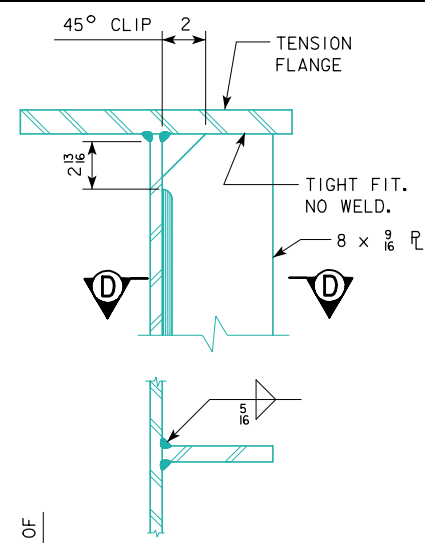


SECTION C-C

INTERMEDIATE STIFFENER
(WITH CROSS FRAME)

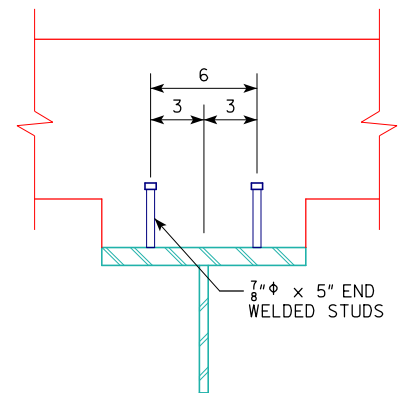


SECTION E-E

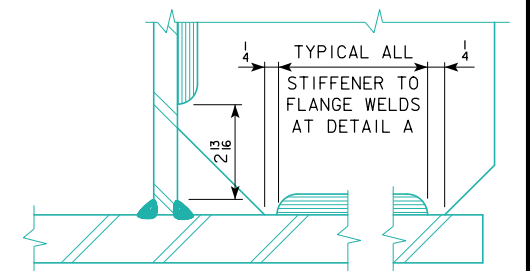


SECTION D-D

INTERMEDIATE STIFFENER
(WITHOUT CROSS FRAME)



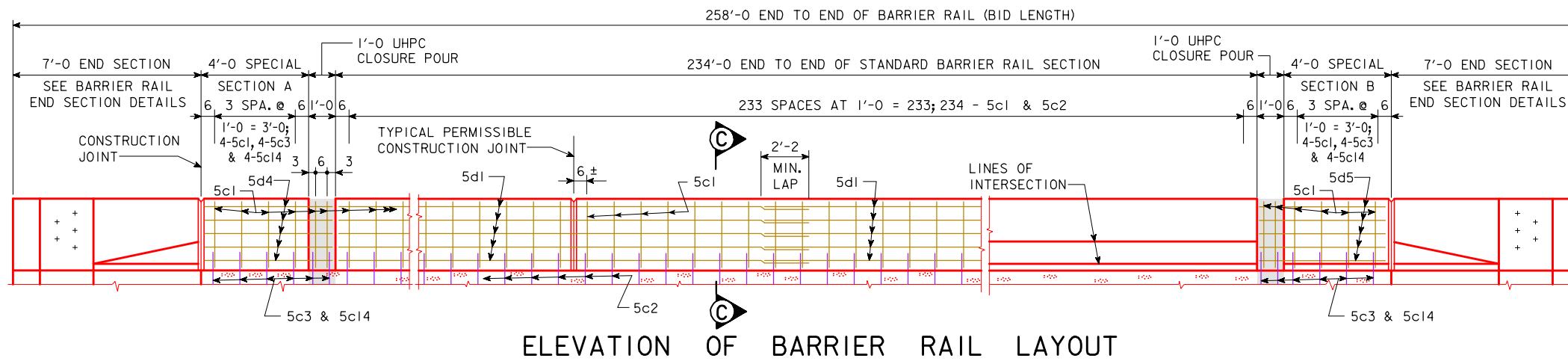
SHEAR STUD DETAIL



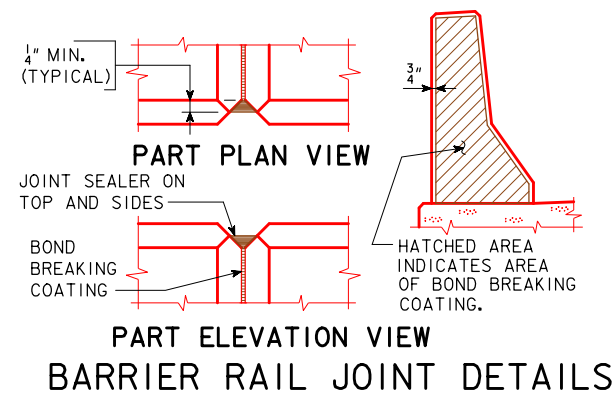
DETAIL A

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

DESIGN FOR 0° SKEW
**230'-0 X 44'-0 CONTINUOUS
WELDED GIRDER BRIDGE**
115'-0 W. SPAN 115'-0 E. SPAN
WELDING DETAILS
STA. 985+91.00 IA 92 (ML) OCTOBER, 2020
MAHASKA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 37 OF 42 FILE NO. 31191 DESIGN NO. 120



ELEVATION OF BARRIER RAIL LAYOUT



BARRIER RAIL NOTES:

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

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

COST OF THE JOINT SEALER AND BOND BREAKER SHALL BE CONSIDERED
INCIDENTAL TO OTHER CONSTRUCTION.

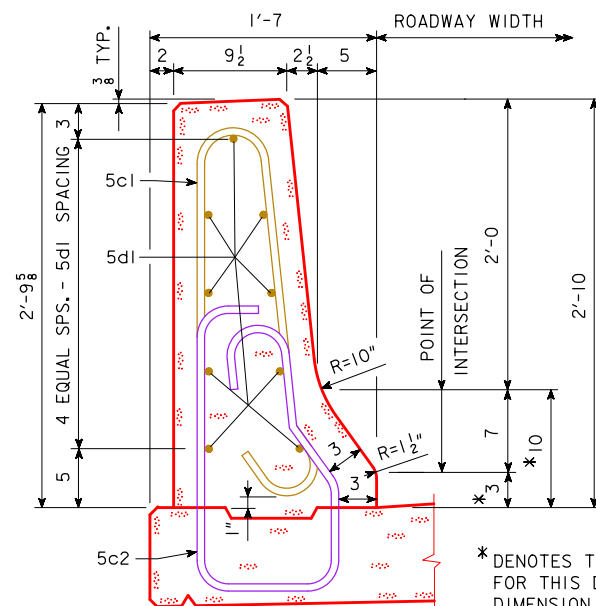
ALL BARRIER RAIL REINFORCING STEEL IS TO BE EITHER EPOXY COATED OR
STAINLESS STEEL AS SHOWN. THE STAINLESS STEEL REINFORCING STEEL SHALL BE
DEFORMED BAR GRADE 60 MEETING THE REQUIREMENTS OF MATERIALS I.M. 452.

THE CONCRETE BARRIER RAIL IS TO BE BID ON A LINEAL FOOT BASIS.
THE NUMBER OF LINEAL FEET OF BARRIER RAIL INSTALLED WILL BE PAID
FOR AT THE CONTRACT PRICE PER LINEAL FOOT BASED ON PLAN QUANTITIES.
PRICE BID FOR CONCRETE BARRIER RAILING 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.

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

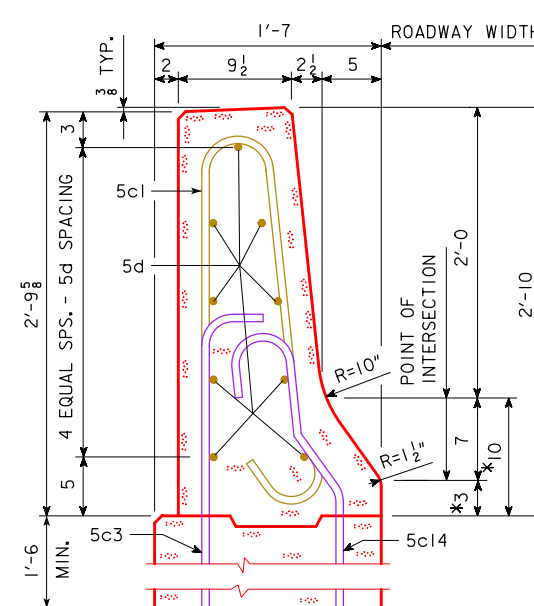
TOP OF THE BARRIER RAIL IS TO BE PARALLEL TO THE THEORETICAL \mathcal{C}
GRADE.

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








PART SECTION C-C

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






PART SECTION F-F

EPOXY COATED REINF. STEEL - TWO RAILS

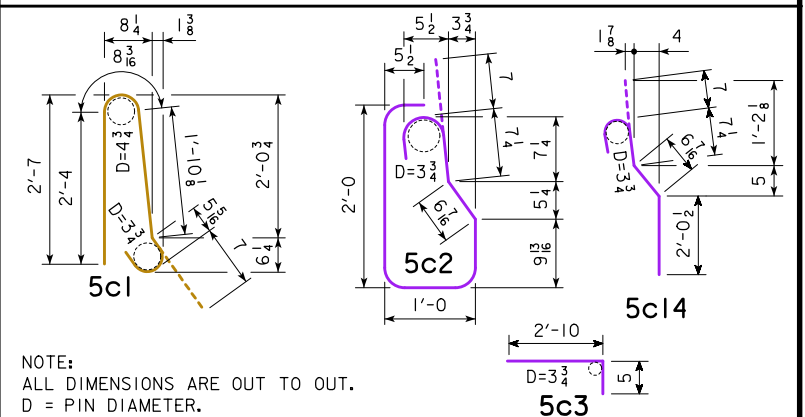
SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STANDARD SECTIONS	5c1	RAIL, VERTICAL		468	5'-11	2,880
	5d1	RAIL, LONGITUDINAL		126	35'-3	4,619
SPECIAL SECTION	5c1	RAIL, VERTICAL		24	5'-11	98
	5d4	RAIL, LONGITUDINAL		18	4'-8	87
	5d5	RAIL, LONGITUDINAL		18	4'-8	87
EPOXY STEEL TOTAL (LBS.)						7,771

STAINLESS STEEL REINF. STEEL - TWO RAILS

SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STD. SECT.	5c2	RAIL, VERTICAL		468	6'-0	2,920
SPEC. SECT.	5c3	RAIL, VERTICAL		24	3'-3	81
	5c14	RAIL, VERTICAL		24	3'-10	96
STAINLESS STEEL TOTAL (LBS.)						3,097

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

BENT BAR DETAILS



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

CONCRETE PLACEMENT SUMMARY

SECTION	TOTAL
STANDARD SECTION 468.00' @ 0.1052 CU.YD. PER FT.	49.2
SPECIAL SECTION A (TWO RAILS) 8.00' @ 0.1052 CU.YD. PER FT.	0.8
SPECIAL SECTION B (TWO RAILS) 8.00' @ 0.1052 CU.YD. PER FT.	0.8
UHPC CLOSURE POUR 4.00' @ 0.1052 CU.YD. PER FT.	0.4
TOTAL (CU. YD.)	51.2

CONCRETE BARRIER RAIL QUANTITIES

ITEM	UNIT	QUANTITY
CONCRETE BARRIER RAILING	L.F.	516.0

DESIGN FOR 0° SKEW
230'-0 X 44'-0 CONTINUOUS
WELDED GIRDER BRIDGE
115'-0 W. SPAN 115'-0 E. SPAN
BARRIER RAIL DETAILS
STA. 985+91.00 IA 92 (ML) OCTOBER, 2020
MAHASKA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 38 OF 42 FILE NO. 31191 DESIGN NO. 120

7'-0" END SECTION

1'-8" 8" 1" ϕ HOLES

2'-10" 2'-10" 7" 3"

1'-0" 2'-0" 4'-0"

TOP OF

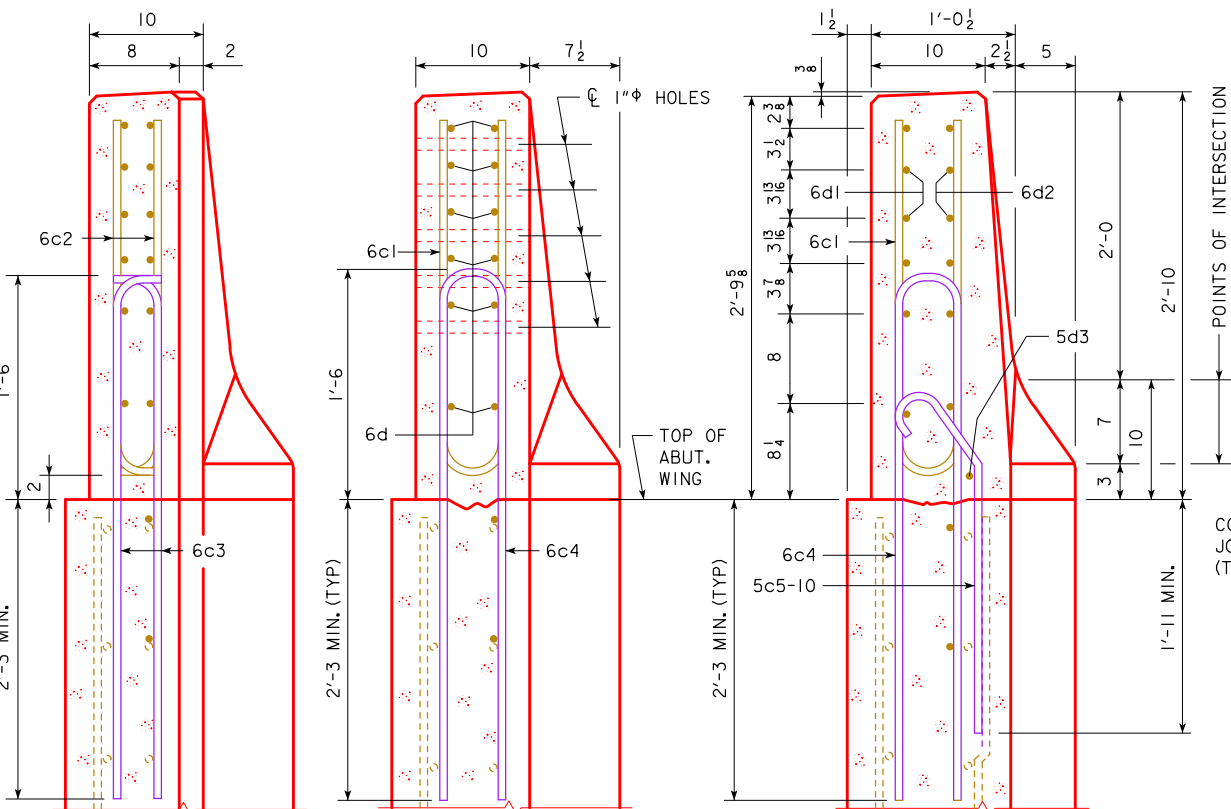
SLOPE FACE OF WALL 2 1/2" TO 24" VERTICALLY

LINES OF INTERSECTION

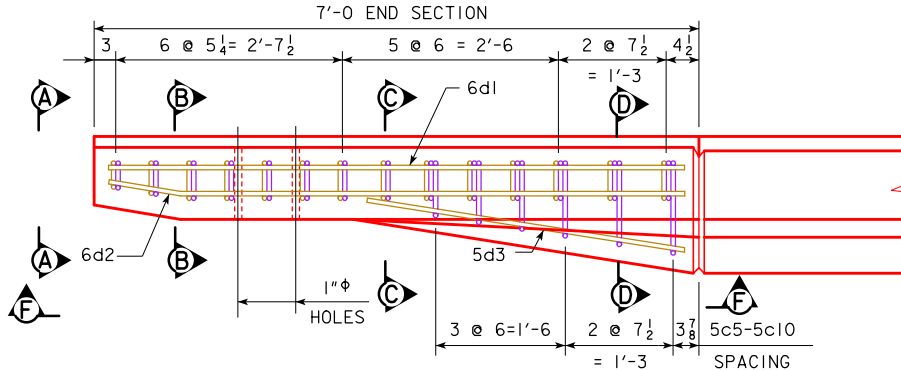
SLOPE 5 TO 7

VERTICAL

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



SECTION C-C

[illegible]

SECTION D-D

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

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

SECTION	TOTAL
BARRIER RAIL ONE END SECTION	0.65 CU. YD.

BAR	"X"
5c5	0'-6 ¹ / ₂
5c6	0'-8 ¹ / ₂
5c7	0'-10 ¹ / ₄
5c8	1'-0 ¹ / ₄
5c9	1'-2
5c10	1'-4

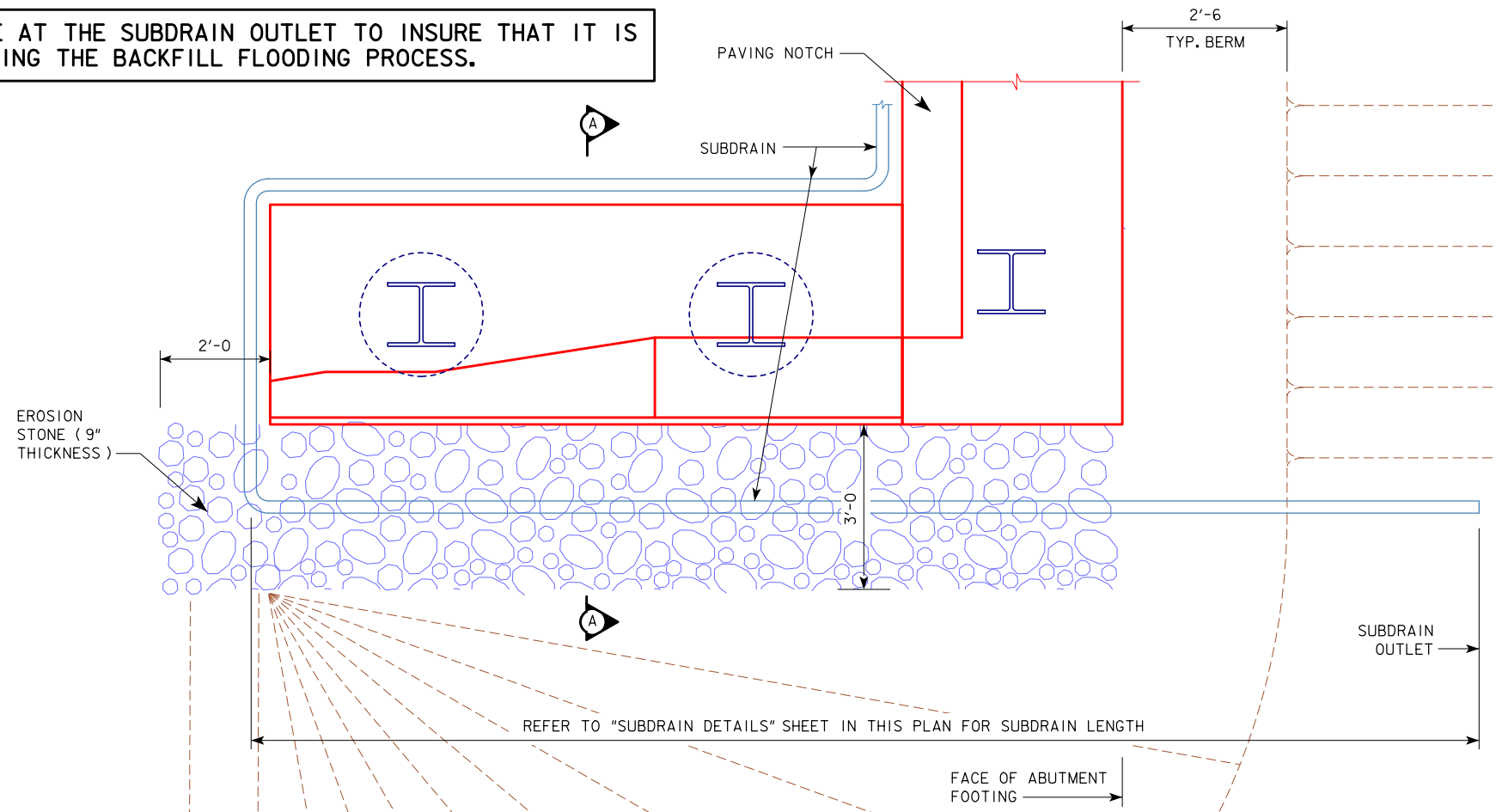
NOTE: ALL DIMENSIONS ARE OUT TO OUT.
D = PIN DIAMETER.

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D = PIN DIAMETER.

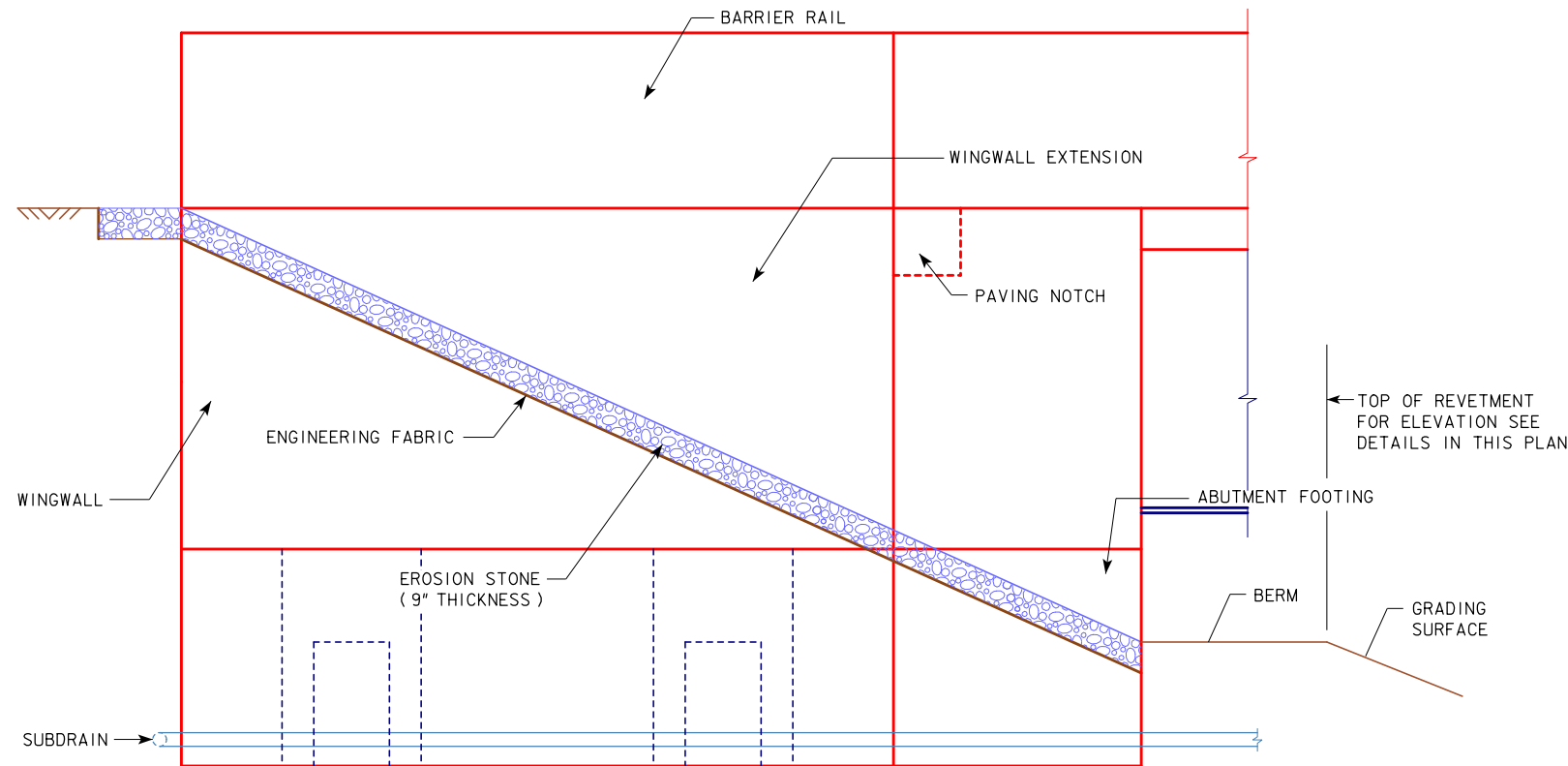
DESIGN FOR 0° SKEW
230'-0 X 44'-0 CONTINUOUS
WELDED GIRDER BRIDGE
115'-0 W. SPAN 115'-0 E. SPAN
END SECTION DETAILS
STA. 985+91.00 IA 92 (ML) OCTOBER, 2020
MAHASKA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 39 OF 42 FILE NO. 31191 DESIGN NO. 120

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

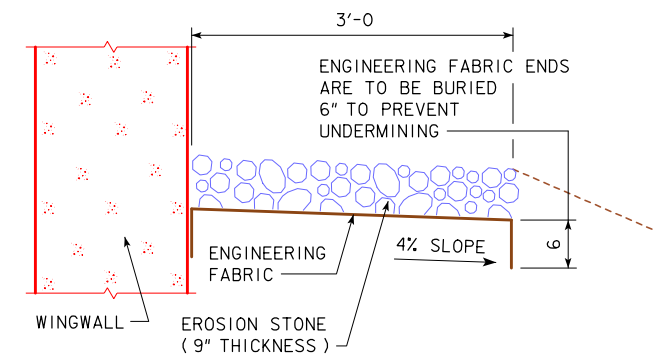
A CHECK SHALL BE MADE AT THE SUBDRAIN OUTLET TO INSURE THAT IT IS DRAINING PROPERLY DURING THE BACKFILL FLOODING PROCESS.



TOP VIEW OF WING ARMORING WITH WING EXTENSION



PROFILE VIEW OF WING ARMORING WITH WING EXTENSION



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 CHOKO 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			
230'-0 X 44'-0 CONTINUOUS			
WELDED GIRDER BRIDGE			
115'-0 W. SPAN			115'-0 E. SPAN
BRIDGE WING ARMORING			
STA. 985+91.00	IA 92 (ML)		OCTOBER, 2020
MAHASKA COUNTY			
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION			
DESIGN SHEET NO. 40 OF 42	FILE NO. 31191		DESIGN NO. 120

BRIDGE

APPROACH PAVEMENT

2'-2

1'-6

ABUTMENT WING

TOP SLOPE OF GEOTEXTILE FABRIC

2'-2 (TYP.)

CL ABUT. BRG.

TOP SLOPE OF GEOTEXTILE FABRIC

4" ϕ SUBDRAIN

NOTE:
SHADED AREA SHOWS LIMITS
OF GEOTEXTILE FABRIC

CL APPROACH ROADWAY

A

TOE OF SLOPE & LIMIT OF BOTTOM OF TRENCH FOR EXCAVATION

BACK FACE OF ABUTMENT

2'-2 (TYP.)

2'-2 (TYP.)

1'-6

ABUTMENT WING

2'-2

TOP SLOPE OF GEOTEXTILE FABRIC

LIMITS OF TOP SLOPE OF GEOTEXTILE FABRIC ALONG ABUTMENT WING EXTENSION FOOTINGS

LIMITS OF BOTTOM OF TRENCH ALONG WING EXTENSION FOOTINGS

INSIDE FACE TO INSIDE FACE OF ABUTMENT WINGS

DESIGN TEAM IOWA DOT \ HR GREEN, INC.

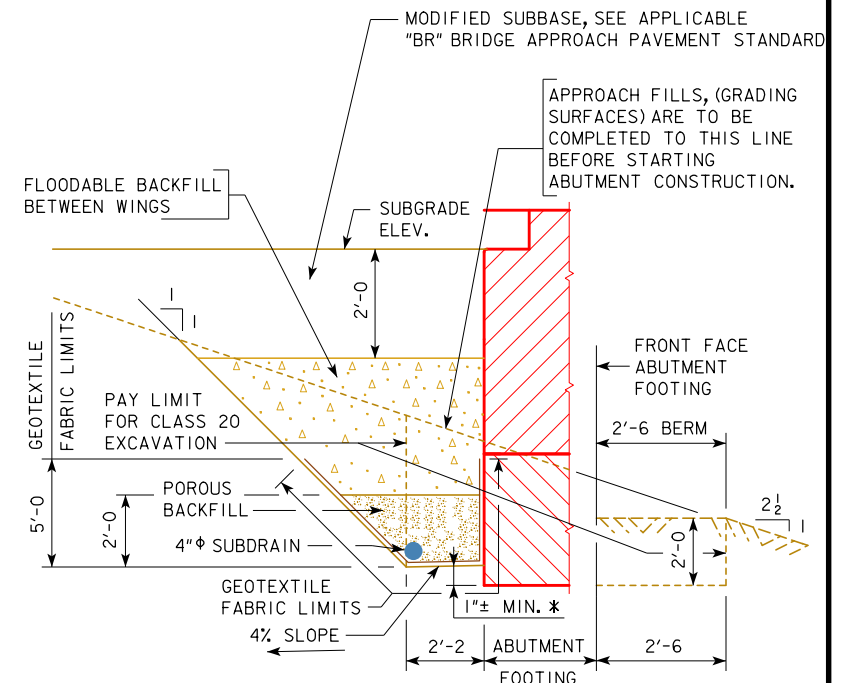
STANDARD SHEET 1007E - MODIFIED

PROJECT NUMBER BRF-092-7(45)--38-62

SHEET NUMBER 42

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

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



* DIMENSION VARIES DUE
TO 2% SUBDRAIN SLOPE.

DESIGN FOR 0° SKEW
230'-0 X 44'-0 CONTINUOUS
WELDED GIRDER BRIDGE
115'-0 W. SPAN 115'-0 E. SPAN
ABUTMENT BACKFILL DETAILS
STA. 985+91.00 IA 92 (ML) OCTOBER, 2020
MAHASKA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 41 OF 42 FILE NO. 31191 DESIGN NO. 120

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 BRIDGES.DGN 1007C - THIS SHEET ISSUED 06-02 FOR WATER CROSSINGS.

BENCH MARK: FENO3, FENO MONUMENT IDOT MAINT. GAR. - X=19,535,805.4 Y=7,580,007.9
IOWA RCS ZONE 9 (NEWTON), ELEVATION 757.71 NAVD88/1ARTN (GEOID12B)

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.

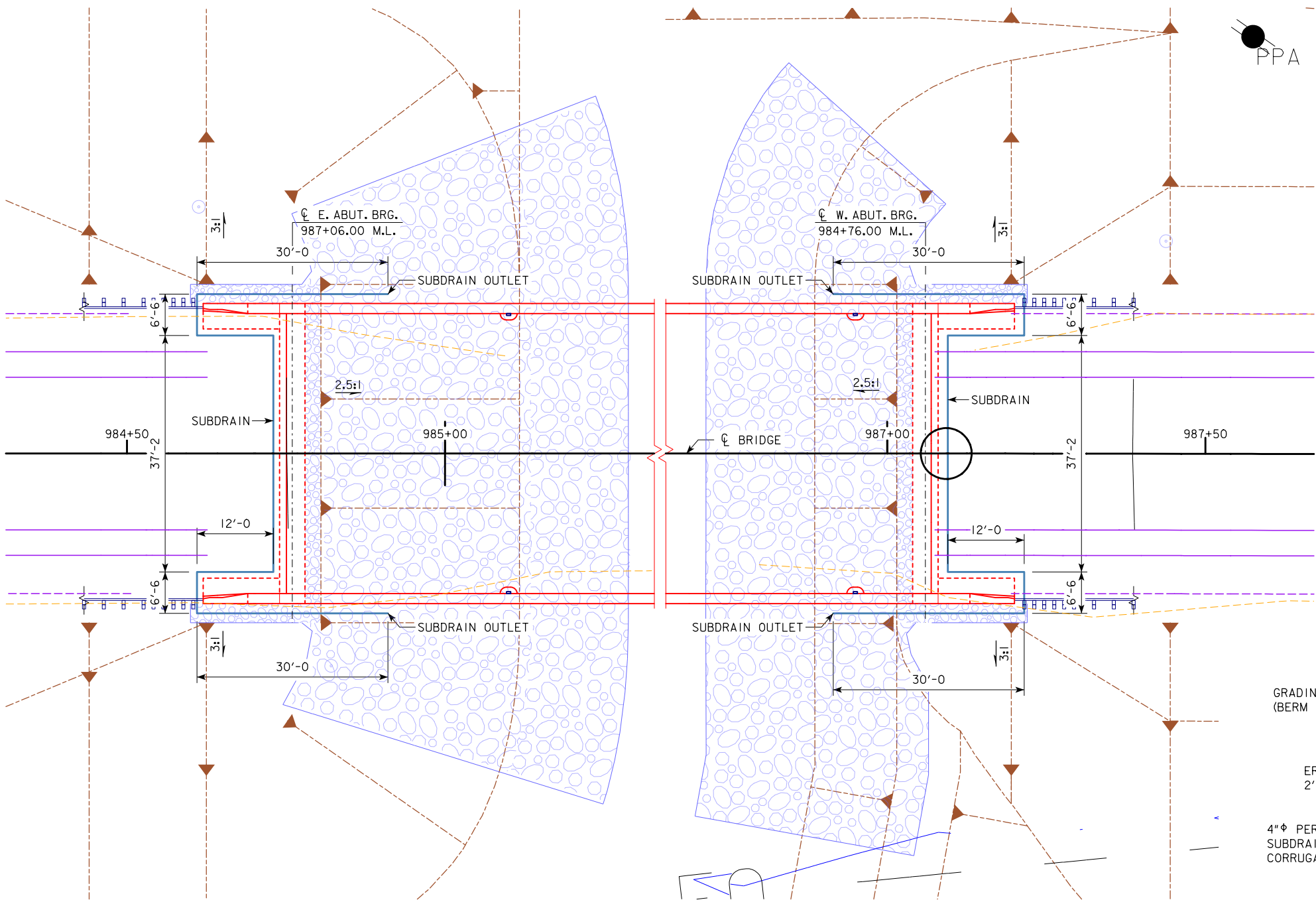
1. USE AN INSIDE FIT REDUCER COUPLER (COUPLER MUST BE INSERTED A MINIMUM OF 1'-0 INTO THE METAL OUTLET PIPE).
2. INSERT 1'-0 OF THE 4" SUBDRAIN INTO THE 6" METAL OUTLET PIPE, THEN FULLY SEAL THE ENTIRE OPENING WITH GROUT.

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.

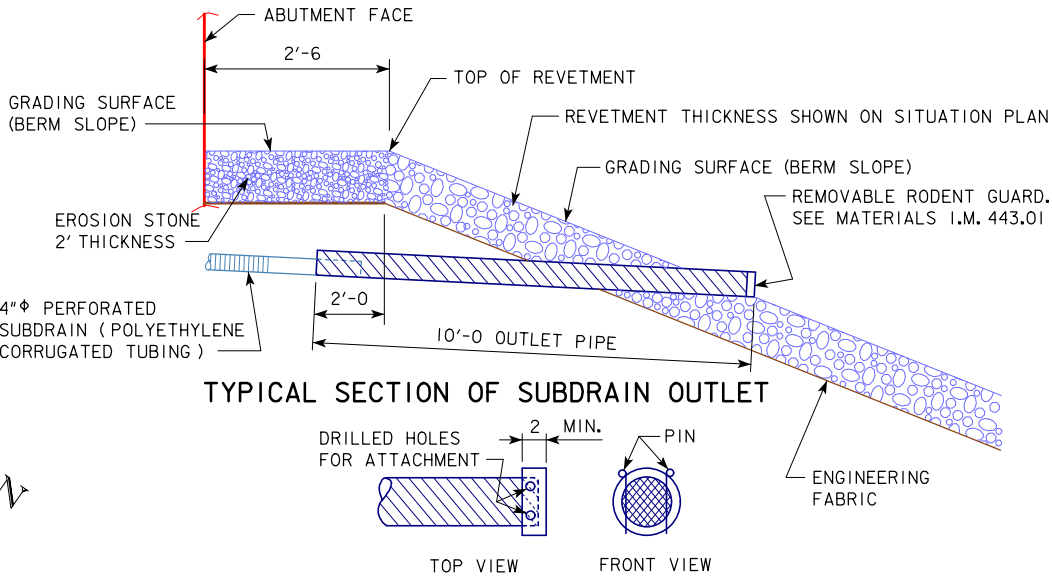
THE DIMENSIONS SHOWN FOR THE PROPOSED SUBDRAINS ARE BASED ON THE PROPOSED GRADING LAYOUT OF BRIDGE BERMS. THE DIMENSIONS SHOWN ARE FOR ESTIMATING ONLY. REQUIRED LENGTHS AND GENERAL LOCATIONS OF SUBDRAINS ARE SUBJECT TO CHANGE DUE TO FIELD ADJUSTMENTS OF THE GRADING LAYOUT.

SUBDRAIN OUTLET ELEVATIONS

LOCATION	ELEVATION
WEST ABUTMENT	729.30
EAST ABUTMENT	721.95



SITUATION PLAN
SHOWING SUBDRAIN LOCATIONS

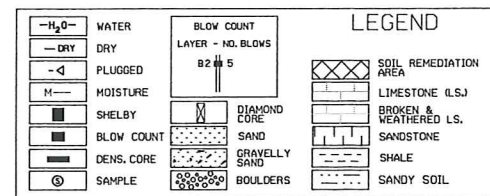


REMOVABLE RODENT GUARD DETAILS
REVETMENT STONE (EMBEDDED) OUTLET DETAILS

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

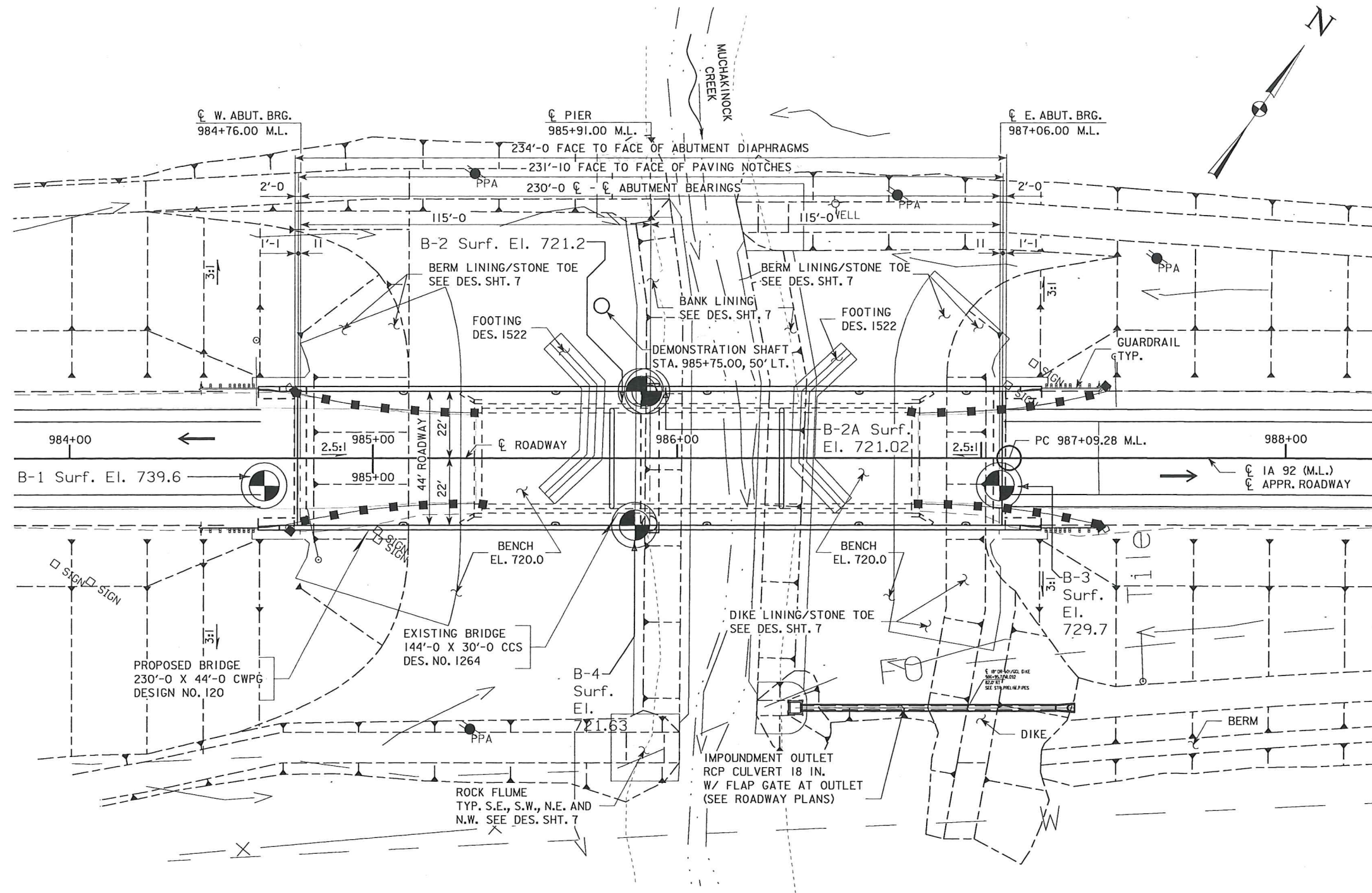
DESIGN FOR 0° SKEW
**230'-0 X 44'-0 CONTINUOUS
WELDED GIRDER BRIDGE**
115'-0 W. SPAN 115'-0 E. SPAN
SUBDRAIN DETAILS
STA. 985+91.00 1A 92 (ML) OCTOBER, 2020
MAHASKA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 42 OF 42 FILE NO. 31191 DESIGN NO. 120

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



LOCATION

IA 92 OVER MUCHAKINOCK CK.
1.3 MI. W. OF JCT. IA 163
T 75 N R 16 W
SECTION 22
GARFIELD TOWNSHIP
MAHASKA COUNTY
FHWA NO. 34981
BRIDGE MAINT. NO. 6278.0S092
LATITUDE 41.288295°
LONGITUDE 92.696725°



Water Level Observations (Ft.)

Boring No.	Date Drilled	While Drilling	Immediately after Drilling	After Drilling
B-1	12/17/2018	21.0'	21.0'	--
B-2	12/24/2018	18.5'	10.0'	--
B-2A	04/20/2020	Water levels precluded due to drilling methods.		3.5' on 4/21/2020
B-3	12/17/2018	19.0'	11.0'	WCI @ 18.5'
B-4	04/21/2020	Water levels precluded due to drilling methods.		7.0' approximately 6 Hrs. after drilling.

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.

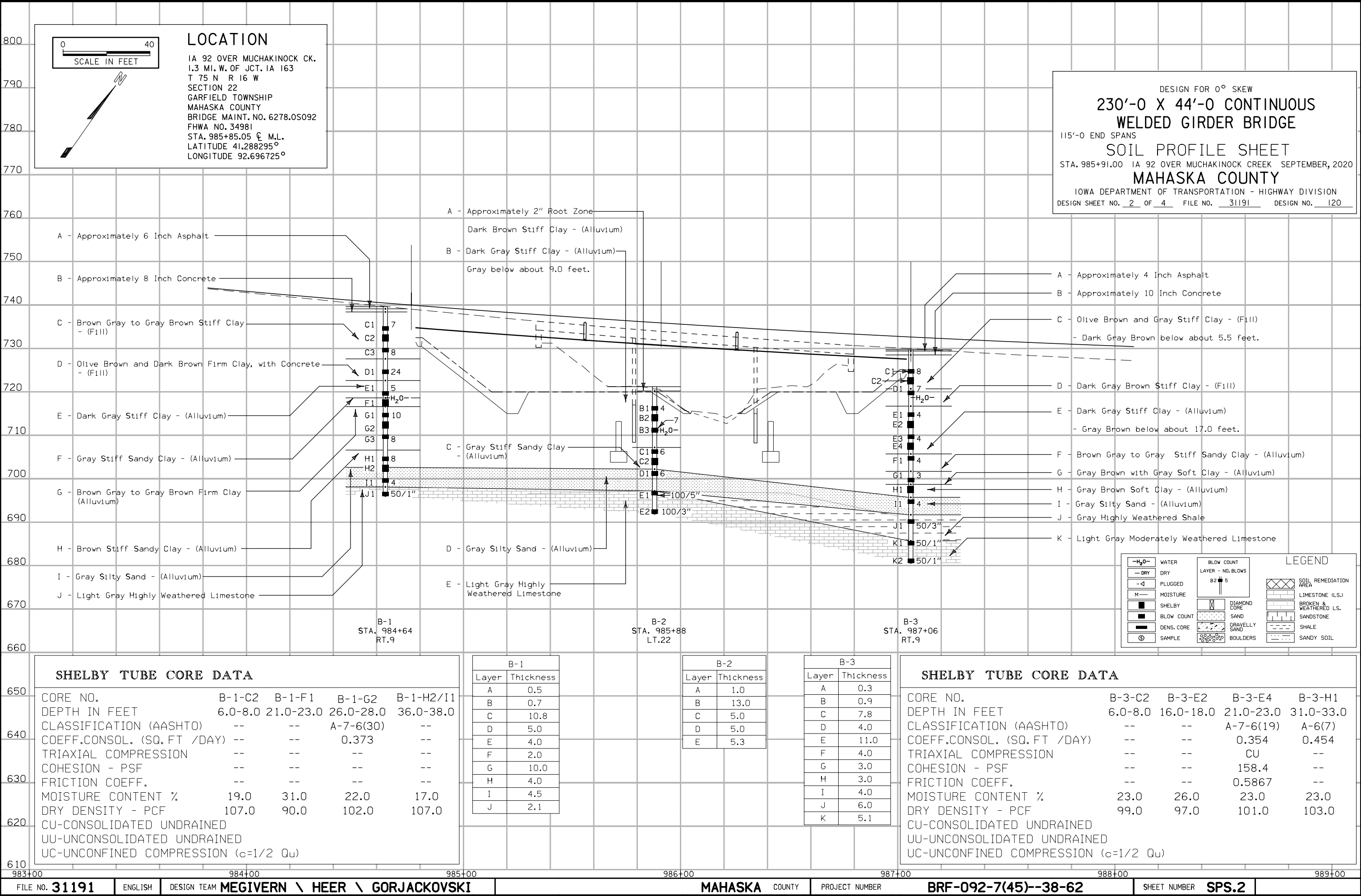
David Heer 8-4-2020
Signature Date

David J. Heer
Printed or Typed Name

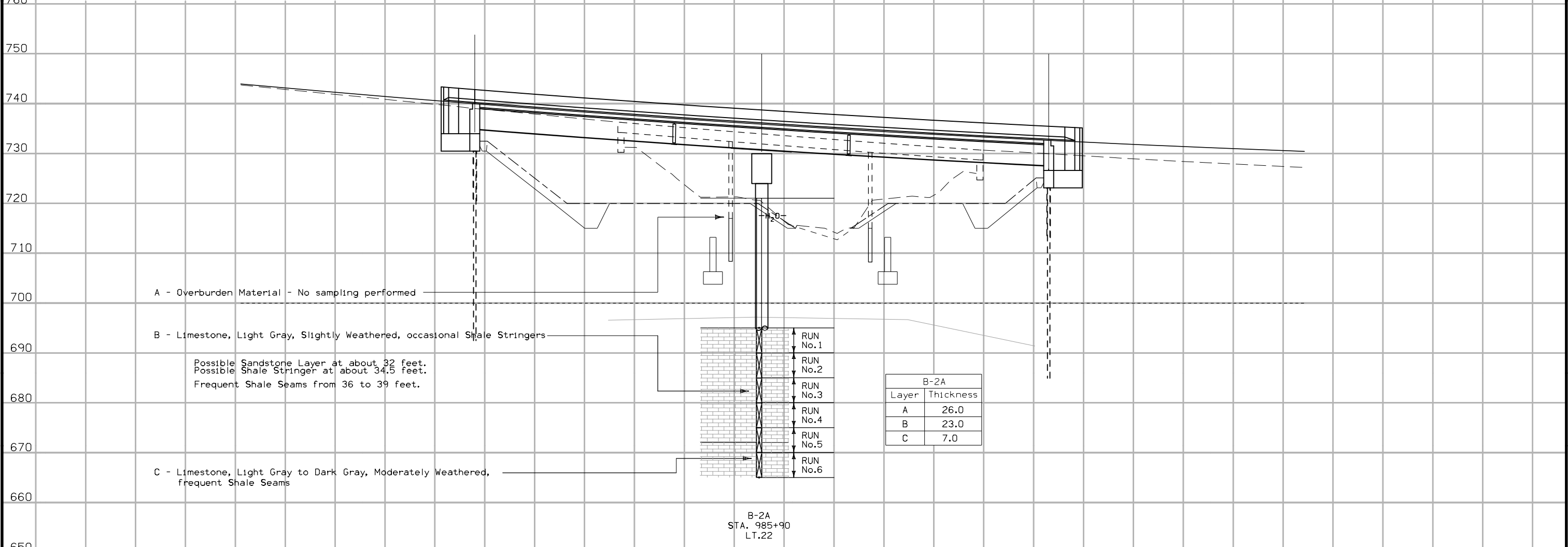
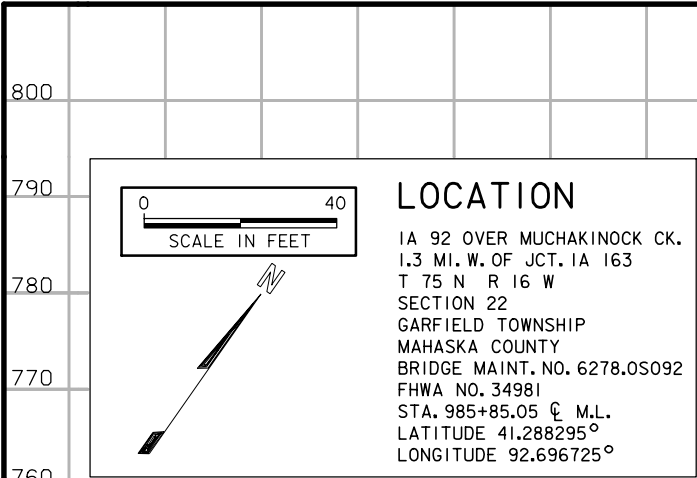
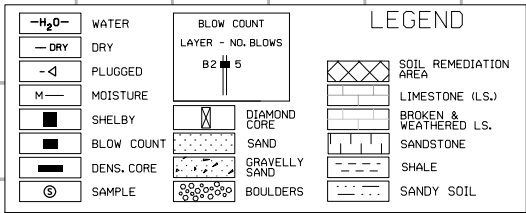
My license renewal date is December 31, 2020.

Pages or sheets covered by this seal: SPS.1, SPS.2, SPS.3, and SPS.4

DESIGN FOR 0° SKEW
**230'-0 X 44'-0 CONTINUOUS
WELDED GIRDER BRIDGE**
115'-0 END SPANS
SOIL PLAN SHEET
STA. 985+91.00 IA 92 OVER MUCHAKINOCK CREEK SEPTEMBER, 2020
MAHASKA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 1 OF 4 FILE NO. 31191 DESIGN NO. 120



DESIGN FOR 0° SKEW
230'-0 X 44'-0 CONTINUOUS
WELDED GIRDER BRIDGE
115'-0 END SPANS
SOIL PROFILE SHEET
STA. 985+91.00 1A 92 OVER MUCHAKINOCK CREEK SEPTEMBER, 2020
MAHASKA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 3 OF 4 FILE NO. 31191 DESIGN NO. 120



630	ROCK CORE INFORMATION						
640	Boring	Approx. Surf. El.(ft)	Bottom El.(ft)	Run No.	Interval(ft)	Recovery(%)	RQD(%)
630	B-2A	721.02	690.0	RUN No.1	26.0 - 31.0	100	68
			685.0	RUN No.2	31.0 - 36.0	100	78
680.0			RUN No.3	36.0 - 41.0	100	78	
675.0			RUN No.4	41.0 - 46.0	100	58	
670.0			RUN No.5	46.0 - 51.0	100	89	
665.0			RUN No.6	51.0 - 56.0	100	98	

Rock Core Compressive Strength Testing Report					
Sample Number	Elevation	Material Description	Compressive Strength (psi)	Moisture (%)	Dry Density (pcf)
B-2A-Run1-B1	690.3	Limestone, Light Gray, Slightly Weathered, occasional Shale Stringers	995	3	144
B-2A-Run2-B2	686.5	Possible Sandstone Layer at about 32 feet. Possible Shale Stringer at about 34.5 feet. Frequent Shale Seams from 36 to 39 feet.	4340	2	156
B-2A-Run3-B3	682.0		3455	2	152
B-2A-Run4-B4	676.5	Limestone, Light Gray, Slightly Weathered, occasional Shale Stringers	4975	1	159
B-2A-Run5-B5	672.8	Limestone, Light Gray, Slightly Weathered, occasional Shale Stringers	1135	1	159
B-2A-Run5-C1	670.7	Limestone, Light Gray to Dark Gray, Moderately Weathered, Frequent Shale Seams	1165	4	143

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

230'-0 X 44'-0 CONTINUOUS
WELDED GIRDER BRIDGE

115'-0 END SPANS

SOIL PROFILE SHEET

STA. 985+91.00 IA 92 OVER MUCHAKINOCK CREEK SEPTEMBER, 2020

MAHASKA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

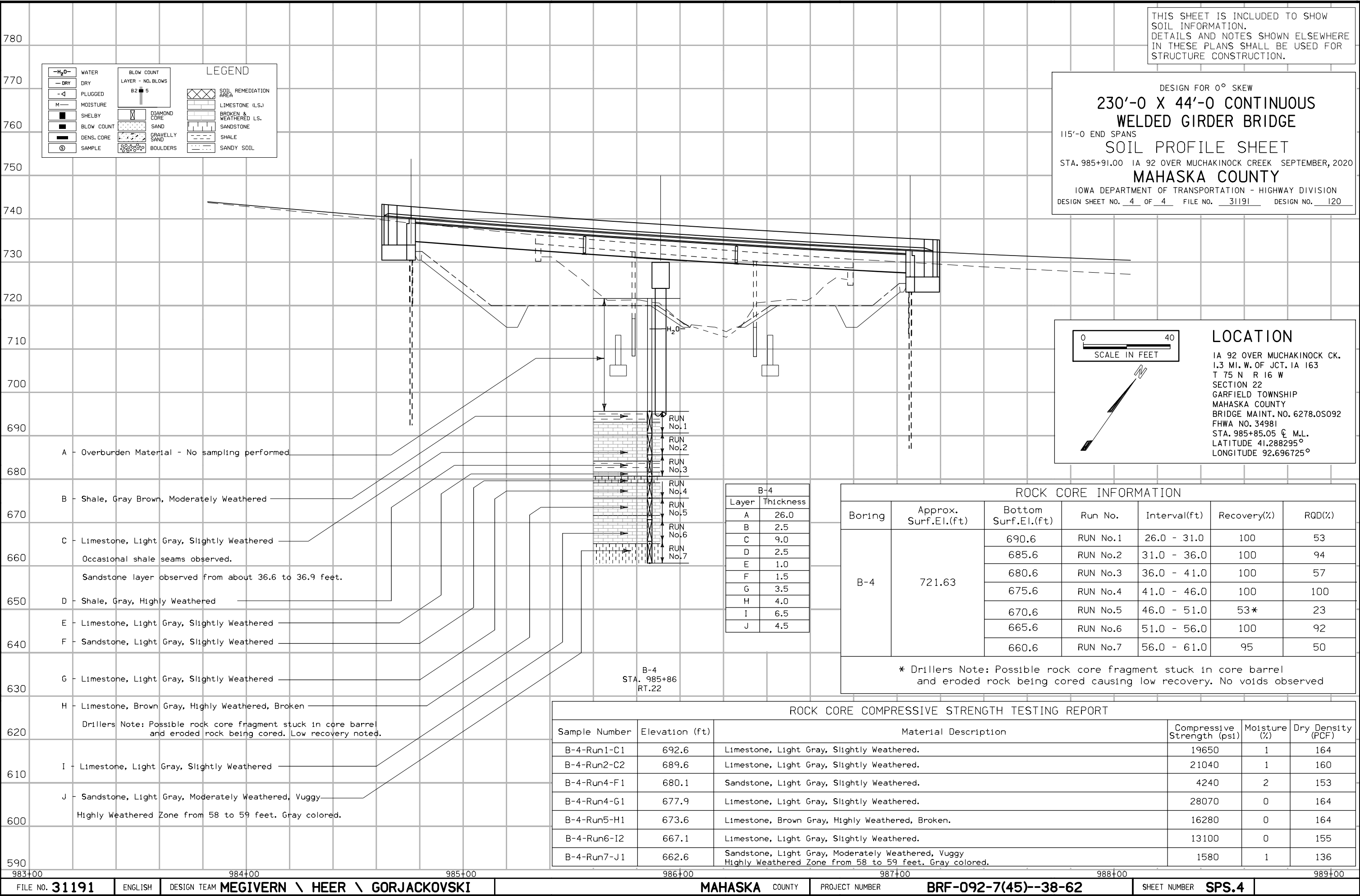
DESIGN SHEET NO. 4 OF 4 FILE NO. 31191 DESIGN NO. 120

040

SCALE IN FEET

LOCATION

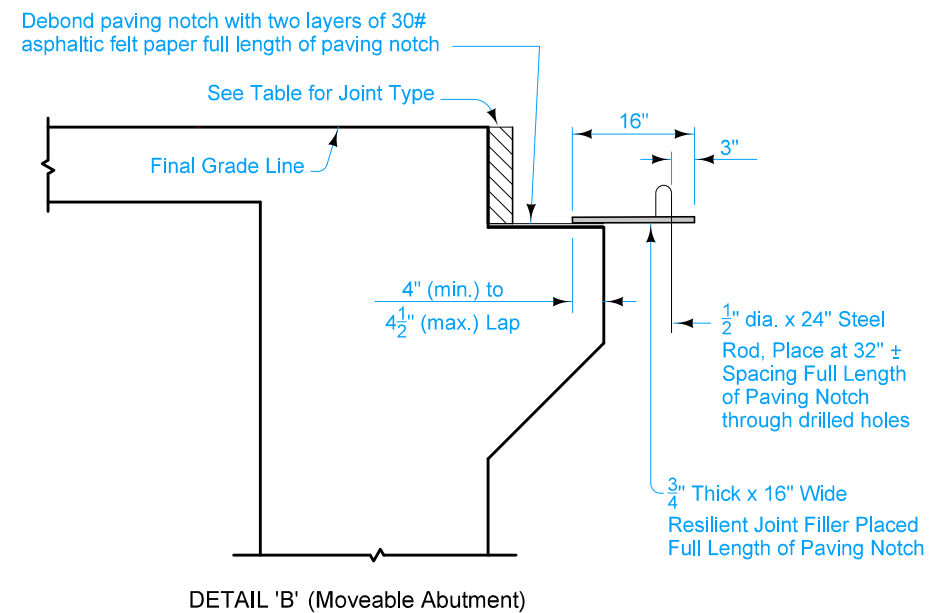
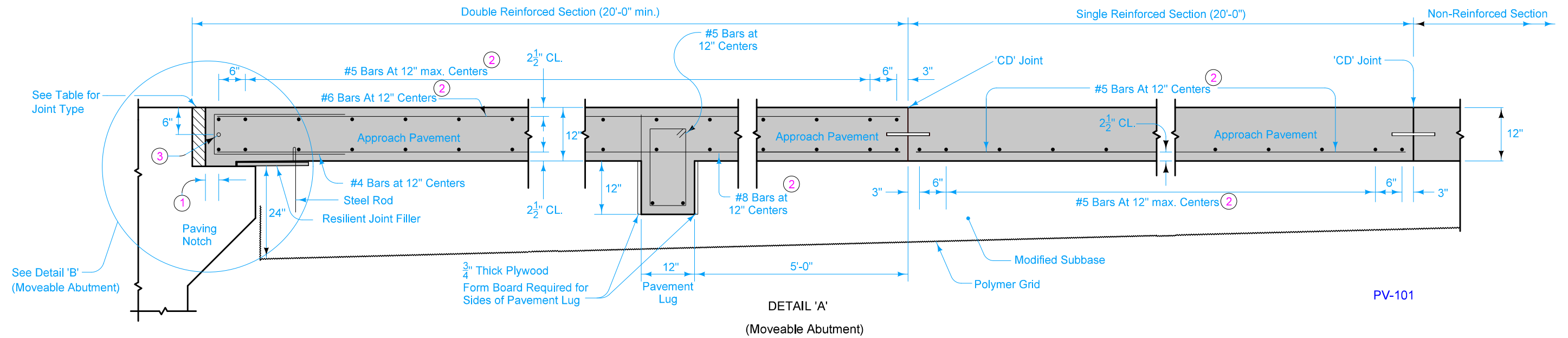
IA 92 OVER MUCHAKINOCK CK.
1.3 MI. W. OF JCT. IA 163
T 75 N R 16 W
SECTION 22
GARFIELD TOWNSHIP
MAHASKA COUNTY
BRIDGE MAINT. NO. 6278.0S092
FHWA NO. 34981
STA. 985+85.05 C M.L.
LATITUDE 41.288295°
LONGITUDE 92.696725°



		100-1D 10-18-05
<h2 style="text-align: center;">PROJECT DESCRIPTION</h2>		
<p>This project involves the bridge replacement over Muchakinock Creek, as well as new bridge approaches and some pavement replacement on IA 92.</p>		

[illegible][illegible]

FILE NO. 31191	ENGLISH	DESIGN TEAM Flattery\Johnson	MAHASKA COUNTY	PROJECT NUMBER BRF-092-7(45)- -38-62	SHEET NUMBER C.1	
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JOINT TYPE FOR MOVEABLE ABUTMENT BRIDGES		
Joint	Maximum Bridge Length	
	Concrete Beam or Slab	Steel Girder
CF-1	370'	250'
CF-2	465'	320'
CF-3	575'	400'

- ① 2" min. to 2 1/2" max. clear to bent bar.
- ② Minimum lap length: #5 Bars - 18"
#6 Bars - 27"
#8 Bars - 48"
- ③ If bridge is skewed, place additional #5 bar parallel to skewed face.

For joint details, refer to PV-101.

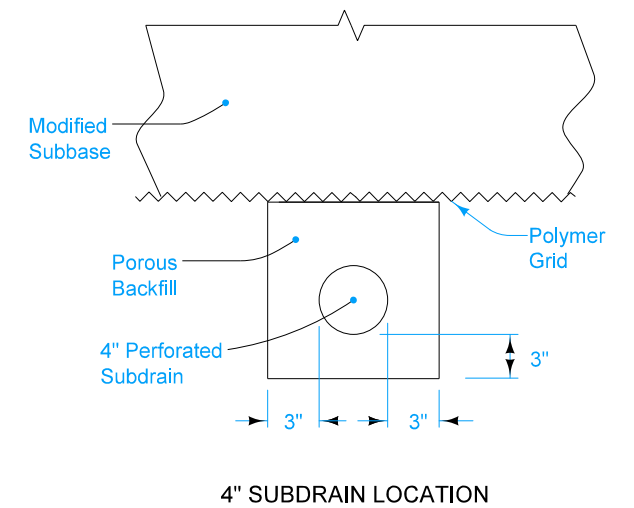
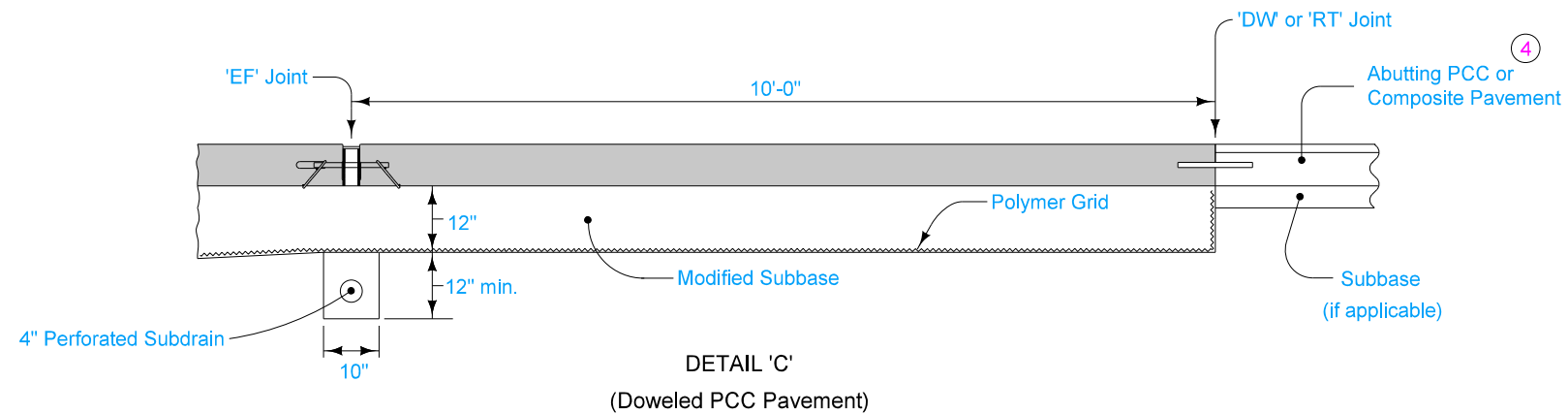
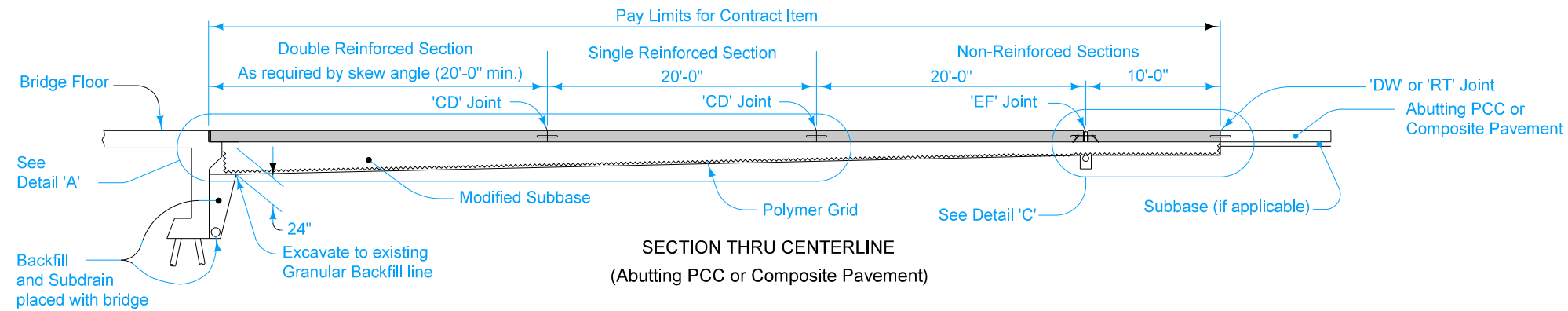
For curb details, see Detail 'G'.

All transverse bars are #5.

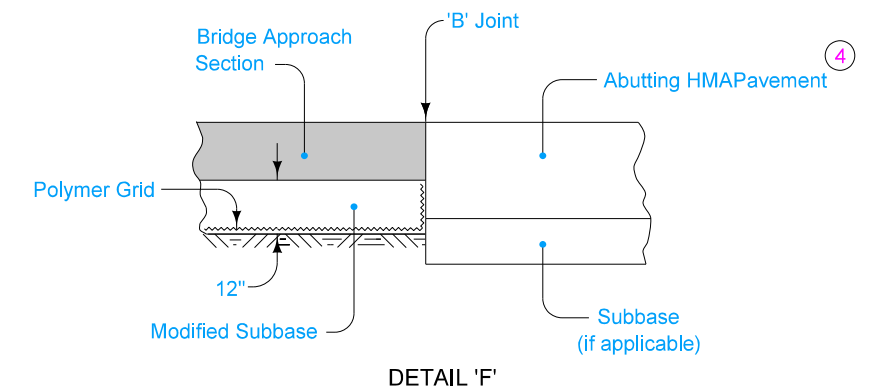
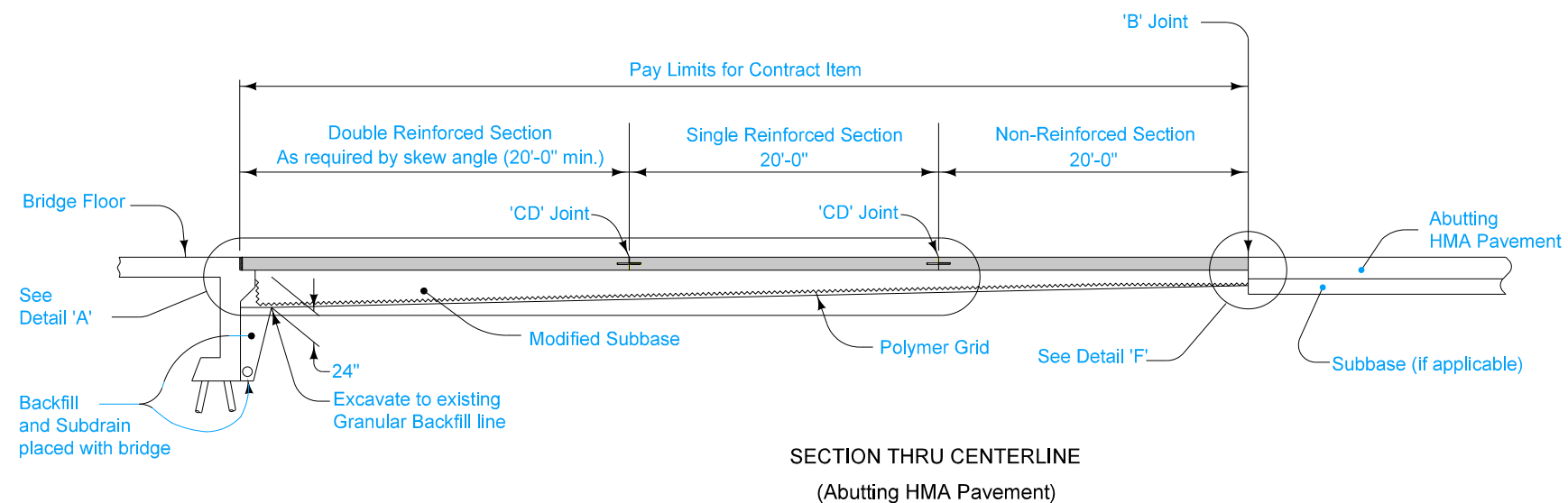
Possible Contract Item:
Bridge Approach, BR-203

Possible Tabulation:
112-6

MODIFIED STANDARD ROAD PLAN	BR-203M
	SHEET 1 of 3
DOUBLE REINFORCED 12" APPROACH	



④ If abutting pavement (PCC or HMA) is not in place, refer to BR-213.

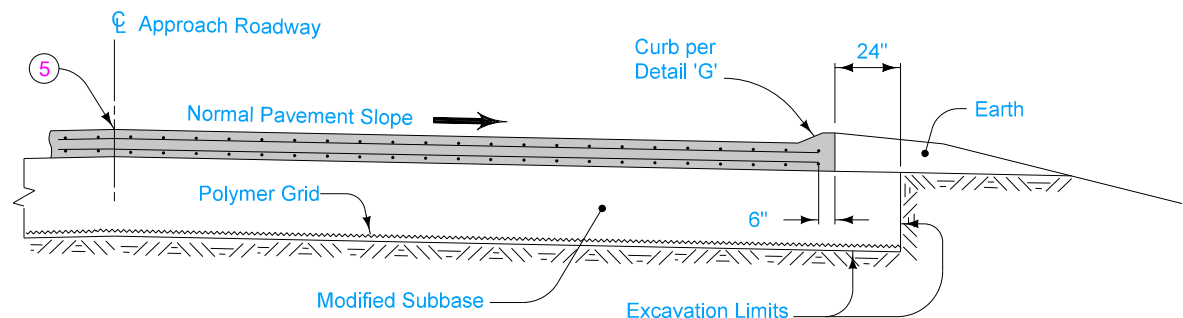


**MODIFIED
STANDARD ROAD PLAN**

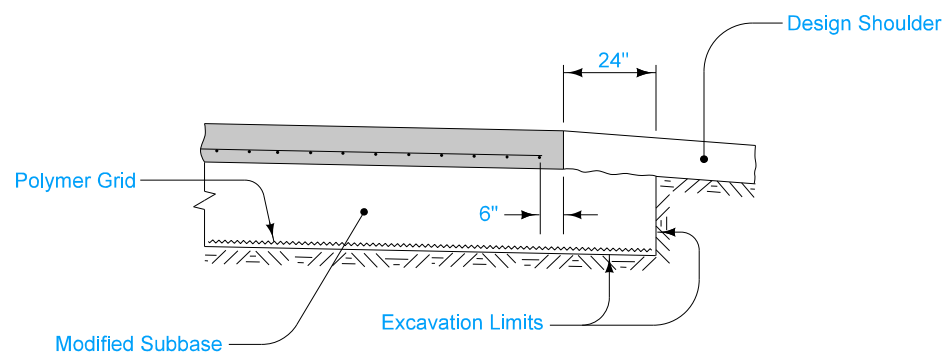
BR-203M

SHEET 2 of 3

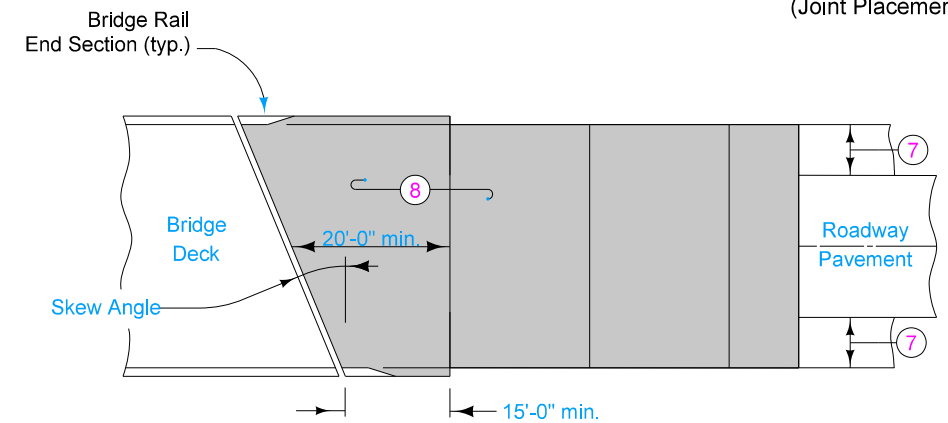
DOUBLE REINFORCED 12" APPROACH



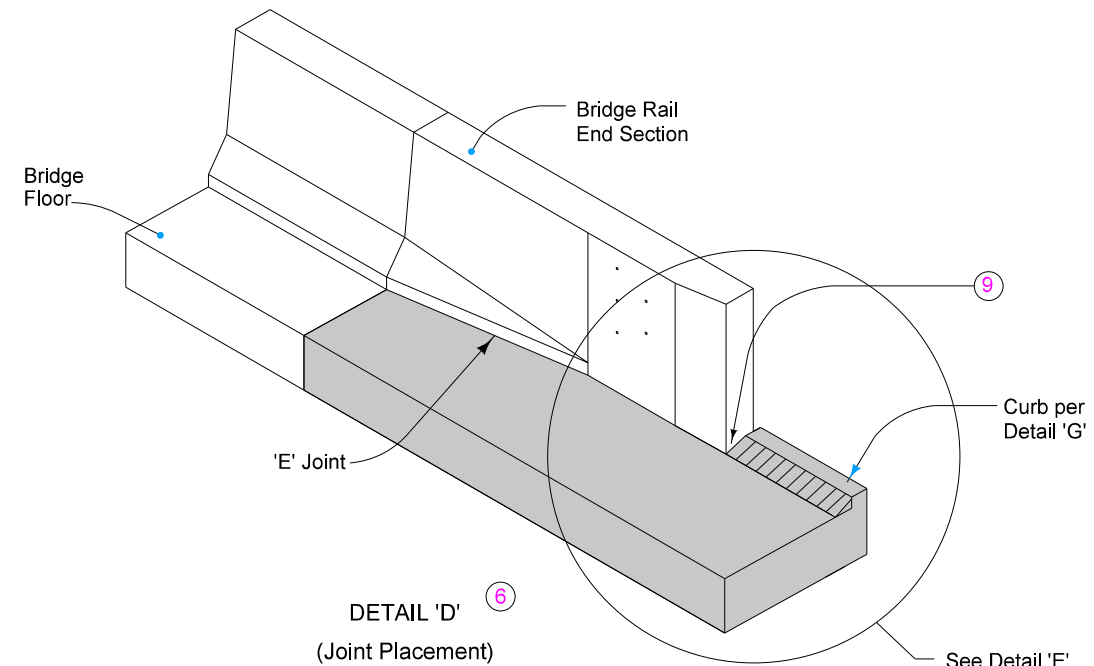
SECTION A-A ⑤



SECTION B-B ⑥

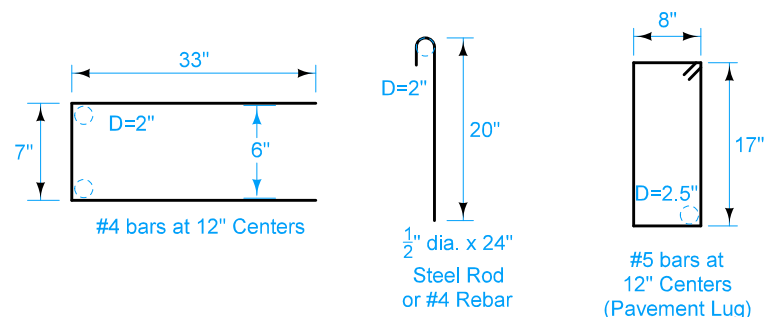


APPROACH PAVEMENT LAYOUT AT A SKEW

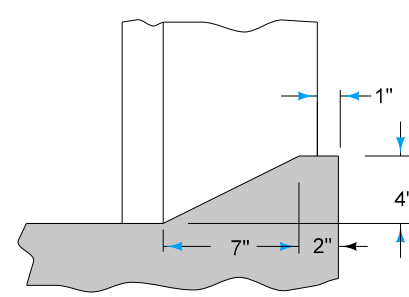


DETAIL 'D' ⑥
(Joint Placement)

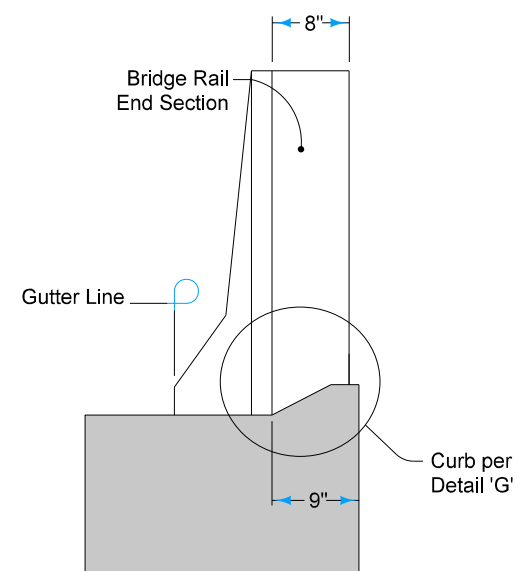
- ⑤ Longitudinal Joint (PV-101):
Single pour - Saw cut joint per Detail B.
Two pours - Use 'KS-2' joint.
 - ⑥ Refer to BR-211M.
 - ⑦ Design shoulder width.
 - ⑧ Reinforced bridge approach section.
 - ⑨ Expansion joint at end of Bridge Rail End Section: Place joint filler the full depth of the bridge approach pavement. In areas with curb, place full depth of pavement plus curb and shape material to fit the shape of the curb per Section B-B of PV-101. Seal joint per Detail F of PV-101.
- Moveable Abutment Bridges: Flexible Foam Expansion Joint Filler complying with Section 4136 of the Standard Specifications. Minimum filler width is the abutment 'CF' joint width. Joint length as required to completely fill from back side of curb to front face of bridge wing.



BENT BAR SHAPES



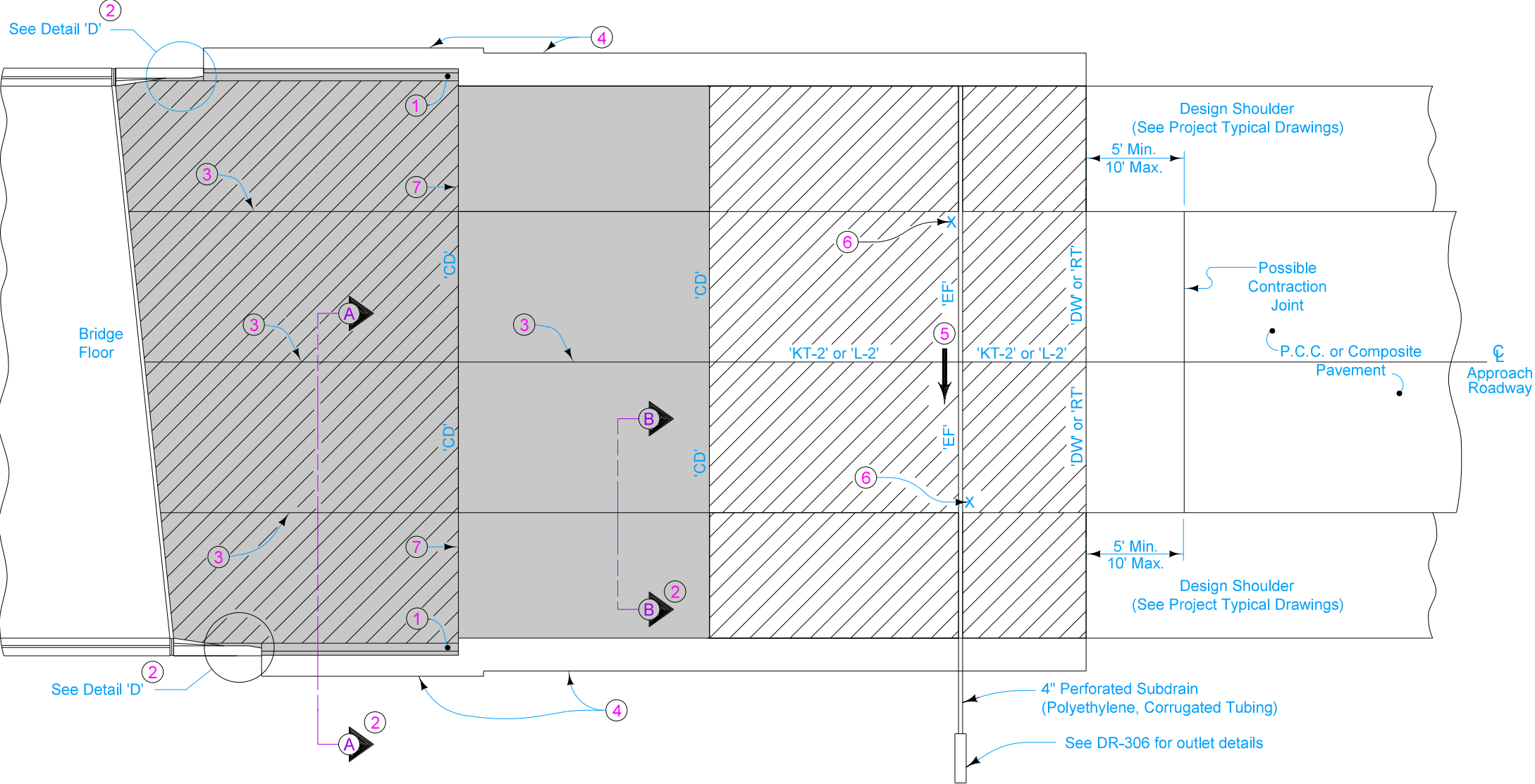
DETAIL 'G'



DETAIL 'E'
(Back of Curb Placement)

MODIFIED STANDARD ROAD PLAN	BR-203M
	SHEET 3 of 3
DOUBLE REINFORCED 12" APPROACH	

For joint details, see PV-101.



PLAN VIEW

Pay limits for contract item include the following areas:

- Double Reinforced Section
- Single Reinforced Section
- Non-Reinforced Section

MODIFIED STANDARD ROAD PLAN	BR-211M
	SHEET 1 of 1
BRIDGE APPROACH (ABUTTING PCC OR COMPOSITE PAVEMENT)	