

BRIDGE REPLACEMENT - PPCB
BRF-003-5(77)--38-12
2-18-2020

BUTLER COUNTY
BUTLER COUNTY - DESIGN 118

LEGEND

INTERSTATE HIGHWAY	
PRIMARY HIGHWAY-DIVIDED	
PRIMARY HIGHWAY	
PORTLAND CEMENT CONCRETE ROAD	
ASPHALT ROAD	
BITUMINOUS ROAD	
GRAVEL ROAD	
EARTHEN ROAD	
INTERSTATE HIGHWAY	
UNITED STATES HIGHWAY	
STATE HIGHWAY	
COUNTY HIGHWAY	
RAILROAD	
PIPELINE	
AIRPORT	
HYDROLOGY	
BRIDGE	
STATE BOUNDARY	
COUNTY BOUNDARY	
CORPORATE BOUNDARY	
TOWNSHIP LINE	
SECTION LINE	
ROAD NAMES	
UNINCORPORATED PLACE	



PLANS OF PROPOSED IMPROVEMENTS ON THE
PRIMARY ROAD SYSTEM
BUTLER COUNTY
BRIDGE REPLACEMENT - PPCB
1A 3 OVER WEST FORK CEDAR RIVER
0.8 MI. E. OF CO. RD. T16

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

2019	AADT	2000	V.P.D.
2039	AADT	2100	V.P.D.
	DHV		V.P.H.
TRUCKS		19	%
Total			
Design	ESALs		

INDEX OF SEALS

SHEET NO.	NAME	TYPE
I	ROBERT D. MITCHELL	STRUCTURAL DESIGN
I	WILLIAM L. KAUFMAN	HYDRAULIC DESIGN
A.I	PAUL W. FLATTERY	ROADWAY DESIGN
SPS.I	DAVID J. HEER	GEOTECHNICAL DESIGN
CS.I	DAVID J. HEER	GEOTECHNICAL DESIGN
RC.I	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 William L. Kaufman Date 12-3-2019

Printed or Typed Name William L. Kaufman

My license renewal date is December 31, 2019

Pages or sheets covered by this seal: SHEETS 6 THRU 8

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.

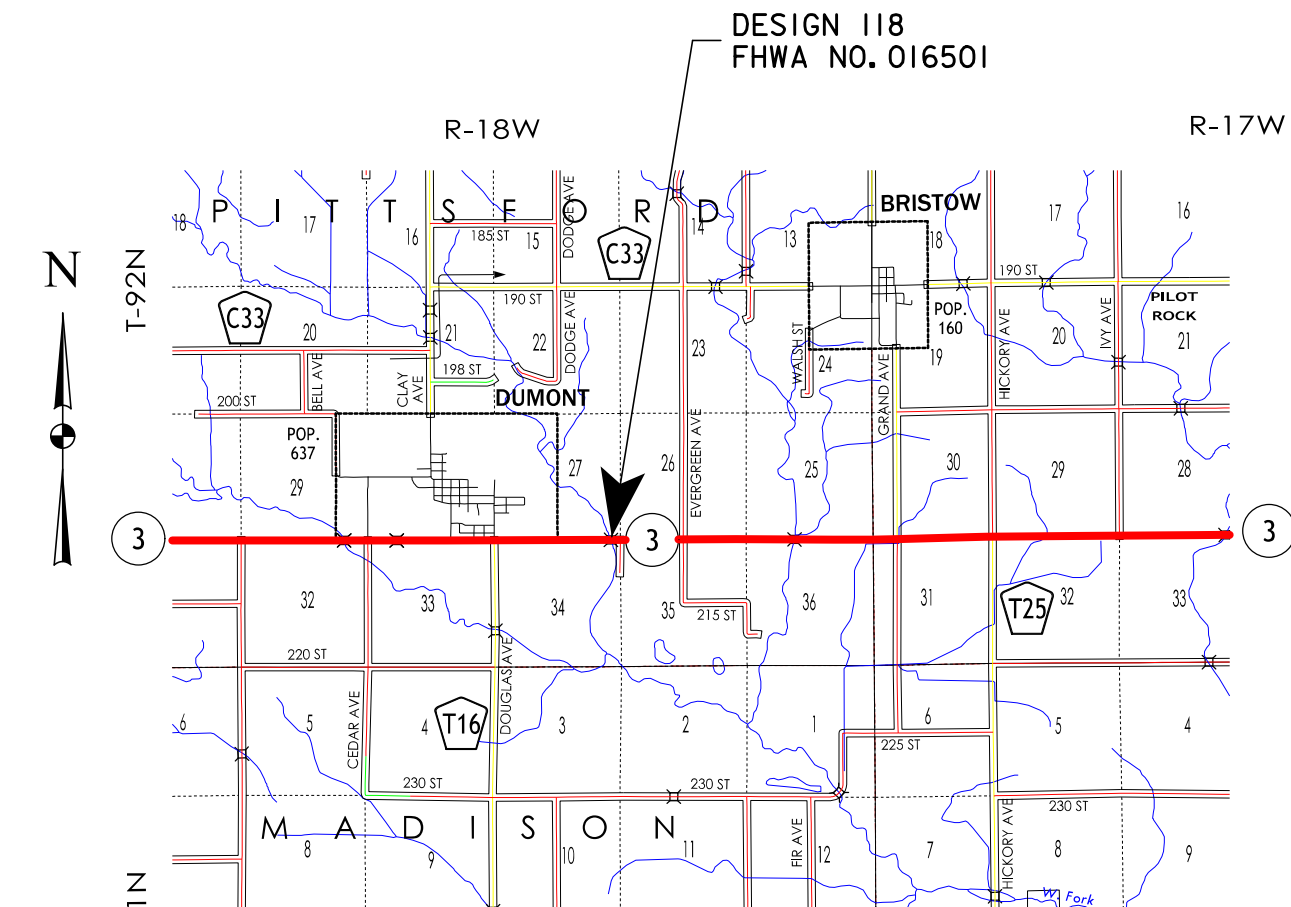
Signature Robert D. Mitchell Date 12-3-2019

Printed or Typed Name Robert D. Mitchell

My license renewal date is December 31, 2019

Pages or sheets covered by this seal: SHEETS 1 THRU 49 OF 143

LOCATION MAP



PROJECT DIRECTORY NAME: I200301014

DESIGN TEAM RDM / JDC / SHUCK-BRITSON

ENGLISH

IOWA DOT * OFFICE OF BRIDGES AND STRUCTURES

FILE NO. 31394

BUTLER COUNTY

PROJECT NUMBER BRF-003-5(77)--38-12

SHEET NUMBER 1

ESTIMATED BRIDGE QUANTITIES					
ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
1	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	CY	517.0	
2	2301-0685550	BRIDGE APPROACH PAVEMENT, AS PER PLAN	SY	188.9	
3	2401-6745625	REMOVAL OF EXISTING BRIDGE	LS	1.00	
4	2402-2720000	EXCAVATION, CLASS 20	CY	239	
5	2403-0100010	STRUCTURAL CONCRETE (BRIDGE)	CY	1,241.1	
6	2404-7775000	REINFORCING STEEL	LB	79,177	
7	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB	203,572	
8	2404-7775009	REINFORCING STEEL, STAINLESS STEEL	LB	7,195	
9	2405-2705000	EXCAVATE AND DEWATER	LS	1.00	
10	2407-0563085	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTC85	EACH	12	
11	2407-0563105	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTC105	EACH	12	
12	2407-0563110	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTC110	EACH	6	
13	2408-7800000	STRUCTURAL STEEL	LB	16,572	
14	2413-1300000	PREFORMED, PRE-COMPRESSED, SELF-EXPANDING, SEALANT SYSTEM WI TH SILICONE PRE-COATED SURFACE	LF	48	
15	2414-6424110	CONCRETE BARRIER RAILING	LF	1,056.7	
16	2501-0201057	PILES, STEEL, HP 10 X 57	LF	11,035	
17	2501-6335010	PREBORED HOLES	LF	120	
18	2507-2638650	BRIDGE WING ARMORING - EROSION STONE	SY	22.8	
19	2507-3250005	ENGINEERING FABRIC	SY	753.9	
20	2507-6800061	REVTMENT, CLASS E	TON	788.3	
21	2507-8029000	EROSION STONE	TON	39.2	
22	2533-4980005	MOBILIZATION	LS	1.00	

ESTIMATE REFERENCE INFORMATION		
ITEM NO.	ITEM CODE	DESCRIPTION
1	2104-2710020	EXCAVATION, CLASS 10, CHANNEL - -
2	2301-0685550	BRIDGE APPROACH PAVEMENT, AS PER PLAN INCLUDES EPOXY COATED REINFORCING STEEL AND STRUCTURAL CONCRETE FOR THE EAST APPROACH AND SLEEPER SLABS. SEE TABULATION 112-6 IN THE ROAD PLANS FOR QUANTITIES OF MODIFIED SUBBASE, POLYMER GRID, AND POLYETHYLENE SHEETING REQUIRED FOR THE EAST APPROACH SLABS.
3	2401-6745625	REMOVAL OF EXISTING BRIDGE - -
4	2402-2720000	EXCAVATION, CLASS 20 - -
5	2403-0100010	STRUCTURAL CONCRETE (BRIDGE) INCLUDES COST OF FURNISHING AND PLACING SPLASH BASINS (INCLUDING EXCAVATION, EROSION STONE OR CLASS E REVETMENT, AND ENGINEERING FABRIC). INCLUDES ALL RESILIENT JOINT FILLER REQUIRED. INCLUDES FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), FLOODABLE BACKFILL, POROUS BACKFILL, GEOTEXTILE FABRIC, WATER FLOODING, AND SUBDRAIN OUTLET AT ABUTMENTS. INCLUDES FURNISHING AND PLACING BUTYL RUBBER MEMBRANES, CAULK, AND WATERPROOF ADHESIVE AT THE EAST ABUTMENT. CARE SHALL BE TAKEN WHEN BACKFILLING WITH THE RUBBER MEMBRANES IN PLACE, ANY DAMAGED RUBBER MEMBRANES SHALL BE REPLACED AT NO ADDITIONAL COST TO THE STATE. INCLUDES FURNISHING AND PLACING 3 INCH DIAMETER PVC PLASTIC PIPE AND EXPANDING FOAM IN THE ABUTMENT WINGS. INCLUDES FURNISHING AND PLACING CONCRETE SEALER ON SIX BEAM ENDS AND EAST ABUTMENT SEATS AS NOTED IN THESE PLANS.
6	2404-7775000	REINFORCING STEEL - -
7	2404-7775005	REINFORCING STEEL, EPOXY COATED INCLUDES THE COST OF GRINDING ANY SHARP EDGES OF (37) 4b7 BARS SHOWN ON DESIGN SHEET 40.
8	2404-7775009	REINFORCING STEEL, STAINLESS STEEL - -

ESTIMATE REFERENCE INFORMATION		
ITEM NO.	ITEM CODE	DESCRIPTION
9	2405-2705000	EXCAVATE AND DEWATER FOR PIERS IN ACCORDANCE WITH SECTION 2405 OF THE STANDARD SPECIFICATIONS. THE MINIMUM SEAL COAT DIMENSIONS ARE 18' x 30' x 3' FOR PIER 1, AND 18' X 33' X 3' FOR PIERS 2,3,4.
10	2407-0563085	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTC85 INCLUDES PIER AND ABUTMENT BEARING MATERIAL. INCLUDES ANCHORED CURVED SOLE PLATES AT PIER 1. INCLUDES CONTRACTOR FILLING OUT BEAM NUMBERS BY LOCATION AND BEAM SEAT ELEVATIONS IN "PPC BEAM DATA SPREADSHEET" AND FORWARDING ELECTRONIC SPREADSHEET TO THE ENGINEER.
11	2407-0563105	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTC105 INCLUDES PIER AND ABUTMENT BEARING MATERIAL. INCLUDES ANCHORED CURVED SOLE PLATES AT EAST ABUTMENT. INCLUDES CONTRACTOR FILLING OUT BEAM NUMBERS BY LOCATION AND BEAM SEAT ELEVATIONS IN "PPC BEAM DATA SPREADSHEET" AND FORWARDING ELECTRONIC SPREADSHEET TO THE ENGINEER.
12	2407-0563110	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTC110 INCLUDES PIER BEARING MATERIAL. INCLUDES CONTRACTOR FILLING OUT BEAM NUMBERS BY LOCATION AND BEAM SEAT ELEVATIONS IN "PPC BEAM DATA SPREADSHEET" AND FORWARDING ELECTRONIC SPREADSHEET TO THE ENGINEER.
13	2408-7800000	STRUCTURAL STEEL - -
14	2413-1300000	PREFORMED, PRE-COMPRESSED, SELF-EXPANDING, SEALANT SYSTEM WI TH SILICONE PRE-COATED SURFACE PROVIDE AT EAST APPROACH SLEEPER SLAB JOINT IN ACCORDANCE WITH ARTICLE 4136.03,E OF THE STANDARD SPECIFICATIONS. INCLUDES COST OF DOUBLE STACKING AND TRIMMING TO FIT THE CURB FACE.
15	2414-6424110	CONCRETE BARRIER RAILING IF PLACEMENT OF CONCRETE IS DONE BY THE SLIPFORMING METHOD, CLASS BR CONCRETE IS REQUIRED. CAST-IN-PLACE BARRIER RAILS SHALL USE CLASS C MIX. PRICE BID FOR THIS ITEM SHALL INCLUDE THE COST OF CAST-IN-PLACE FORMS IF REQUIRED FOR PLACEMENT OF THE CONCRETE.
16	2501-0201057	PILES, STEEL, HP 10 X 57 - -
17	2501-6335010	PREBORED HOLES - -
18	2507-2638650	BRIDGE WING ARMORING - EROSION STONE INCLUDES FURNISHING AND PLACING ENGINEERING FABRIC, EROSION STONE, AND ALL REQUIRED EXCAVATING, SHAPING AND COMPACTING FOR WING ARMORING.
19	2507-3250005	ENGINEERING FABRIC ENGINEERING FABRIC SHALL BE MATERIAL AS SPECIFIED FOR EMBANKMENT EROSION CONTROL IN ACCORDANCE WITH ARTICLE 4196.01,B,3, OF THE STANDARD SPECIFICATIONS.
20	2507-6800061	REVTMENT, CLASS E ESTIMATED AT 1.6 TON/CY.
21	2507-8029000	EROSION STONE ESTIMATED AT 1.6 TON/CY.
22	2533-4980005	MOBILIZATION - -

NOTE:
ROADWAY QUANTITIES SHOWN
ELSEWHERE IN THESE PLANS.

DESIGN FOR 15° SKEW R.A.
498'-0 x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE
86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS
QUANTITIES
STA. 208+07.00 (IA 3) DECEMBER, 2019
BUTLER COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 1 OF 48 FILE NO. 31394 DESIGN NO. 118

DESIGN TEAM RDM / JDC / SHUCK-BRITTON	BUTLER COUNTY	PROJECT NUMBER BRF-003-5(77)--38-12	SHEET NUMBER 2
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GENERAL NOTES:

THIS DESIGN IS FOR THE REPLACEMENT OF THE EXISTING 345'-4 x 28'-0 PCBB AND STEEL I-BEAM BRIDGE,DESIGN NO.157 WITH A YEAR OF CONSTRUCTION OF 1957. ELECTRONIC PLANS OF THE EXISTING STRUCTURE ARE AVAILABLE TO THE CONTRACTOR AS PART OF THE E-FILES SUPPLIED WITH THE CONTRACT DOCUMENTS.

THE LUMP SUM BID FOR "REMOVAL OF EXISTING BRIDGE" SHALL INCLUDE 345'-4 x 28'-0 PCBB AND STEEL I-BEAM BEAM BRIDGE.

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

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

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

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.

CONCRETE BARRIER RAILS PLACED USING THE SLIPFORM METHOD WILL REQUIRE THE USE OF A CLASS BR CONCRETE IN ACCORDANCE WITH ARTICLE 25I3.03, A, 2, OF THE STANDARD SPECIFICATIONS. CAST-IN-PLACE BARRIER RAILS SHALL USE CLASS C MIX. CLASS D CONCRETE IS NOT PERMITTED FOR CONCRETE BARRIER RAILS (CAST-IN-PLACE OR SLIPFORMED METHOD).

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

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

THE BRIDGE CONTRACTOR SHALL PREBORE HOLES FOR THE WEST ABUTMENT PILES. HOLES SHALL BE BORED TO THE ELEVATIONS SHOWN ON THE "LONGITUDINAL SECTION ALONG CENTERLINE ROADWAY" ON DESIGN SHEET 5. PILES SHALL BE DRIVEN THROUGH THE HOLES TO AT LEAST THE SPECIFIED DESIGN BEARING.

FORMS FOR PIER CAPS MAY BE REMOVED WITH THE APPROVAL OF THE ENGINEER WHEN THE FOLLOWING TWO CONDITIONS HAVE BEEN MET:

- PIER CAP CONCRETE HAS BEEN IN PLACE FOR A MINIMUM OF 2 CALENDAR DAYS EXCLUDING DAYS THAT THE CONCRETE SURFACE IS SUBJECTED TO TEMPERATURES AT OR BELOW 40°F AND
- THE PIER CAP CONCRETE STRENGTH IS AT LEAST 2.5 KSI.

CONCRETE STRENGTH SHALL BE VERIFIED BY FLEXURAL STRENGTH ACCORDING TO MATERIALS I.M.316 WITH A MINIMUM FLEXURAL STRENGTH OF 0.34 KSI OR BY THE MATURITY METHOD ACCORDING TO MATERIALS I.M.383. CURING OF PIER CAP CONCRETE SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. PIER CAP CONCRETE SHALL ATTAIN A MINIMUM CONCRETE STRENGTH OF 4.0 KSI BEFORE BEING SUBJECTED TO EXTERIOR LOADS. PIER CAP CONCRETE SHALL BE SUBJECTED TO EXTERIOR LOADS IN ACCORDANCE WITH ARTICLE 2403.03, N, OF THE STANDARD SPECIFICATIONS.

A SCRAPE SAMPLE WAS TAKEN FROM AN AREA OF THIS BRIDGE TO GET AN INDICATION OF THE EXISTENCE OF AND LEVEL OF TOTAL LEAD AND TOTAL CHROMIUM. ANALYSIS OF TOTAL LEAD ON THIS SAMPLE WAS 4040 PARTS PER MILLION (PPM). ANALYSIS OF TOTAL CHROMIUM ON THIS SAMPLE WAS 622 PPM. THESE ANALYSES SHOW THE EXISTENCE OF THESE TWO TOXIC CONSTITUENTS. LEVELS INDICATED BY THESE TESTS COULD CREATE CONDITIONS ABOVE REGULATORY LIMITS FOR HEALTH AND SAFETY REQUIREMENTS. NO OTHER CONSTITUENTS WERE ANALYZED. THE BIDDER SHOULD NOT RELY ON THE IOWA DOT'S TESTING AND ANALYSIS FOR ANY PURPOSE OTHER THAN AS AN INDICATION OF THE EXISTENCE OF THESE TWO TOXIC CONSTITUENTS.

DESIGN HISTORY AT THIS SITE (INCLUDES THIS DESIGN)	
DES. NO.	TYPE OF WORK
I427	ORIGINAL PONY TRUSS
I31	STEEL BEAM APPROACHES
I57	PPCB WIDENING
I82	OVERLAY AND REPAIR
I18	THIS DESIGN

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

EAST ABUTMENT PILES SHALL NOT BE DRIVEN FOR A MINIMUM OF 70 DAYS FOLLOWING COMPLETION OF APPROACH FILLS. THE TIME PERIOD BETWEEN COMPLETION OF FILLS AND DRIVING PILES MAY BE CHANGED AS ORDERED BY THE ENGINEER BASED UPON REVIEW OF SETTLEMENT PLATES.

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (5G1 IS $\frac{5}{8}$ INCH DIAMETER BAR). ENGLISH REINFORCING STEEL RECEIVED IN THE FIELD MAY DISPLAY THE FOLLOWING "BAR DESIGNATION". THE "BAR DESIGNATION" IS THE STAMPED IMPRESSION ON THE REINFORCING BARS, AND IS EQUIVALENT TO THE BAR DIAMETER IN MILLIMETERS.

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

DETAILS FOR THE DOUBLE-REINFORCED SECTION AND SLEEPER SLAB AT THE EAST APPROACH ROADWAY ARE INCLUDED IN THE BRIDGE PLAN DESIGN SHEETS 38,39, AND 40. REFER TO THE ROAD PLANS FOR DETAILS OF THE WEST APPROACH ROADWAY. QUANTITIES OF MODIFIED SUBBASE, POLYMER GRID, AND POLYETHYLENE ARE INCLUDED IN THE ROAD PLANS FOR BOTH APPROACH ROADWAYS.

THE LUMP SUM BID ITEM,"EXCAVATE AND DEWATER" SHALL INCLUDE ALL COSTS ASSOCIATED WITH THE EXCAVATION AND DEWATERING REQUIRED TO CONSTRUCT THE PIER FOOTINGS IN THE DRY,IN ACCORDANCE WITH SECTION 2405,OF THE STANDARD SPECIFICATIONS. THE LENGTH AND WIDTH OF THE SEAL COAT WAS BASED ON THE REQUIRED ONE FOOT CLEARANCE BETWEEN THE TIP OF THE SHEET PILES AND THE BATTERED PILING. THE CONCRETE SEAL COAT, IF USED,SHALL BE 3 FEET THICK,BASED ON A Q=25 WATER ELEVATION OF 973.I. IF THE WATER ELEVATION IS HIGHER THAN 973.I AT THE TIME OF CONSTRUCTION,A LARGER SEAL COAT MAY BE REQUIRED TO MAINTAIN THE CLEARANCE BETWEEN THE SHEET PILES AND BATTERED PILING. THE BRIDGE ENGINEER SHALL BE NOTIFIED BEFORE USING A LARGER SEAL COAT.

NOTE:THE CONTRACTOR SHALL BE REQUIRED TO ACCOMMODATE ACCESS TO IOWA STATE UNIVERSITY RESEARCH PERSONNEL. RESEARCH PERSONNEL WILL BE INSTALLING GAGES ON THE DECK,GIRDERS AND EMBEDDED WITHIN ONE OR MORE APPROACH SLABS. THE APPROACH SLAB GAGES NEED TO BE INSTALLED PRIOR TO CONCRETE PLACEMENT. RESEARCH PERSONNEL SHALL BE NOTIFIED OF APPROACH SLAB CONCRETE PLACEMENT A MINIMUM OF 48 HOURS BEFORE EACH BEGINS. RESEARCH PERSONNEL ARE ANTICIPATED TO HAVE MINIMAL IMPACT ON THE CONTRACTOR'S OPERATIONS. THE CONTRACTOR SHALL TAKE EXTRA CARE TO ENSURE THAT RESEARCH INSTRUMENTATION IS NOT DAMAGED DURING CONSTRUCTION. IOWA STATE UNIVERSITY RESEARCH PERSONNEL CONTRACT INFORMATION: BRENT PHARES, PHONE: 515-294-5879.

SPECIFICATIONS:

DESIGN: AASHTO LRFD 7th Ed, SERIES OF 2014,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.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 7th Ed, SERIES OF 2014, EXCEPT AS NOTED IN THE 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, EXCEPT PRESTRESSED BEAM CONCRETE AS NOTED.
PRESTRESSED CONCRETE BEAMS, SEE BEAM DESIGN SHEET.
BRIDGE DECK CONCRETE f'c = 4.0
STRUCTURAL STEEL IN ACCORDANCE WITH AASHTO LRFD SECTION 6. ASTM A709 GRADE 50, AND GRADE 50W (AASHTO M270 GRADE 50, AND GRADE 50W).

SHOP DRAWING SUBMITTALS

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

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

SHOP DRAWINGS SHALL BE SUBMITTED WITH THE FOLLOWING NAMING CONVENTION:
(Paren)_County_DesignNumber_SubmittalDescription.pdf
Example: (090)_BlackHawk_Design915_DeckDrains.pdf

1	INTERMEDIATE DIAPHRAGMS
2	DECK DRAINS
3	PINTLE PLATES
4	CURVED SOLE PLATES

BRIDGE DECK DIMENSIONS TABLE

NO.	ITEM	UNIT	QUANTITY
1	DECK LENGTH	L.F.	499.6
2	MINIMUM DECK WIDTH	L.F.	47.2
3	MAXIMUM DECK WIDTH	L.F.	47.2
4	DECK AREA	S.F.	23,581

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

POLLUTION PREVENTION PLAN SHOWN ELSEWHERE IN THESE PLANS.

TRAFFIC CONTROL PLAN

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

DESIGN FOR 15° SKEW R.A.

498'-0 x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE

86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS

GENERAL NOTES

STA. 208+07.00 (1A 3) DECEMBER, 2019

BUTLER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2 OF 48 FILE NO. 31394 DESIGN NO. 118

PILE DIVING NOTES:

THE EAST ABUTMENT PILES SHALL NOT BE DRIVEN FOR A MINIMUM OF 70 DAYS FOLLOWING COMPLETION OF APPROACH FILLS. THE TIME PERIOD BETWEEN COMPLETION OF FILLS AND DRIVING PILES MAY BE CHANGED AS ORDERED BY THE ENGINEER BASED UPON REVIEW OF SETTLEMENT PLATES.

WEST ABUTMENT

THE CONTRACT LENGTH OF 85 FEET FOR THE WEST ABUTMENT PILES IS BASED ON A NON-COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 143 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.7 FOR ROCK END BEARING.

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

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR WEST ABUTMENT PILES IS 115 TONS AT END OF DRIVE. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

EAST ABUTMENT

THE CONTRACT LENGTH OF 85 FEET FOR THE EAST ABUTMENT PILES IS BASED ON A NON-COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 164 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.7 FOR ROCK END BEARING.

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

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR EAST ABUTMENT PILES IS 129 TONS AT END OF DRIVE. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

PIER 1

THE CONTRACT LENGTH OF 60 FEET FOR THE PIER 1 PILES IS BASED ON A NON-COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 151 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.7 FOR ROCK END BEARING.

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

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER 1 PILES IS 117 TONS AT END OF DRIVE. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

PIER 2

THE CONTRACT LENGTH OF 60 FEET FOR THE PIER 2 PILES IS BASED ON A NON-COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 151 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.7 FOR ROCK END BEARING.

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

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER 2 PILES IS 121 TONS AT END OF DRIVE. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

PIER 3

THE CONTRACT LENGTH OF 60 FEET FOR THE PIER 3 PILES IS BASED ON A NON-COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 141 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.7 FOR ROCK END BEARING.

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

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER 3 PILES IS 114 TONS AT END OF DRIVE. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

PIER 4

THE CONTRACT LENGTH OF 60 FEET FOR THE PIER 4 PILES IS BASED ON A NON-COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 150 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.7 FOR ROCK END BEARING.

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

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER 4 PILES IS 120 TONS AT END OF DRIVE. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

DESIGN FOR 15° SKEW R.A.

498'-0 x 44' PRETENSIONED

PRESTRESSED CONCRETE BEAM BRIDGE

86'-0, 106'-0 END SPANS87'-0, 112'-0, 107'-0 INTERIOR SPANS

PILE DRIVING NOTES

STA. 208+07.00 (1A 3)DECEMBER, 2019

BUTLER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 3 OF 48FILE NO. 31394DESIGN NO. 118

SUMMARY OF CONCRETE QUANTITIES

LOCATION	STRUCTURAL CONCRETE	
WEST ABUT. FTG.	24.1	
EAST ABUT. FTG.	51.4	
BRIDGE DECK + ABUTMENT AND PIER DIAPHRAGMS	726.5	
WEST ABUTMENT WINGS 2 @ 2.1 CY	4.2	
PIER NO. 1	100.0	
PIER NO. 2	105.2	
PIER NO. 3	105.1	
PIER NO. 4	105.1	
EAST ABUTMENT BACKWALL	6.1	
EAST ABUTMENT WINGWALL AND WINGS	13.4	
TOTAL (CU. YDS.)	1,241.1	

SUMMARY OF REINFORCING STEEL

LOCATION	NON-COATED REINFORCING STEEL	STAINLESS STEEL REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
WEST ABUT. FTG. + WEST ABUT. DIAPHG. + BRIDGE DECK + PIER DIAPHG.	123		177,286
EAST ABUT. FTG. + BKWL. + WINGWALLS + WINGS + ABUT. DIAPH.			8,249
WEST ABUTMENT WINGS 2 @ 241			482
BARRIER RAILS		6,481	16,541
WEST BARRIER RAIL END SECTIONS		384	532
EAST BARRIER RAIL END SECTIONS		330	482
PIER NO. 1	19,480		
PIER NO. 2	19,858		
PIER NO. 3	19,858		
PIER NO. 4	19,858		
TOTAL (LBS.)	79,177	7,195	203,572

SUMMARY OF EXCAVATION

LOCATION	CLASS 20 EXCAVATION	
WEST ABUTMENT	93	
EAST ABUTMENT	146	
TOTAL (CU. YDS.)	239	

SUMMARY OF FOUNDATIONS

[illegible]

SUMMARY OF STRUCTURAL STEEL

LOCATION		TOTAL (LBS.)
BRIDGE DECK DRAINS		2,544
INTERMEDIATE DIAPHRAGMS		8,148
EAST ABUTMENT BEARINGS	(6 PINTLE PLATES, RETAINER PLATES, SWEDGE ANCHORS, NUTS, AND WASHERS)	2,538
PIER #1 BEARINGS	(12 PINTLE PLATES)	3,342
TOTAL (LBS.)		16,572

SUMMARY OF BEARINGS

[illegible]

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

DESIGN FOR 15° SKEW R.A.

**498'-0" x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**

86'-0", 106'-0" END SPANS 87'-0", 112'-0", 107'-0" INTERIOR SPANS

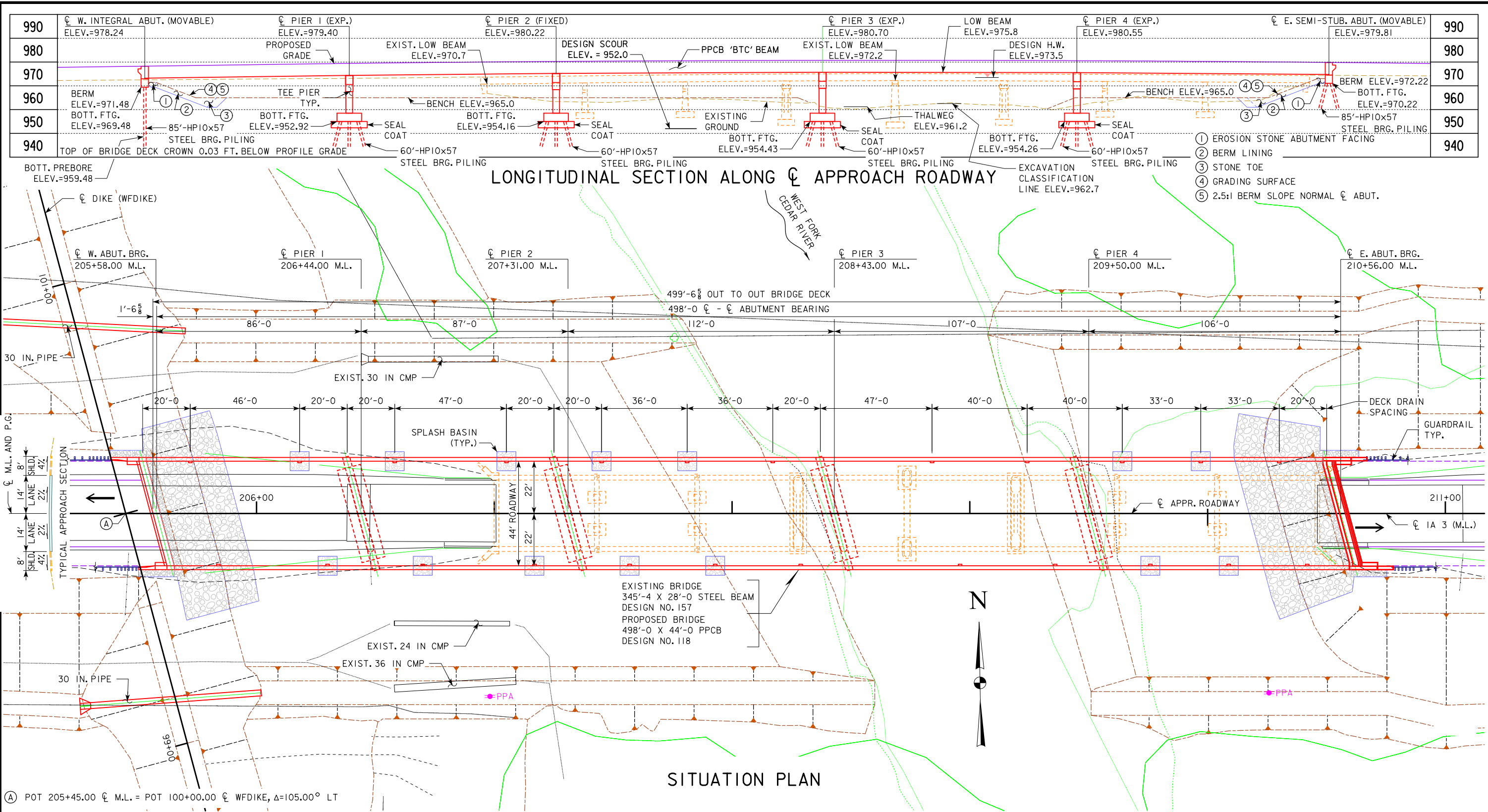
SUMMARY QUANTITIES SHEET

STA. 208+07.00 (IA 3) DECEMBER, 2019

BUTLER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 4 OF 48 FILE NO. 31394 DESIGN NO. 118

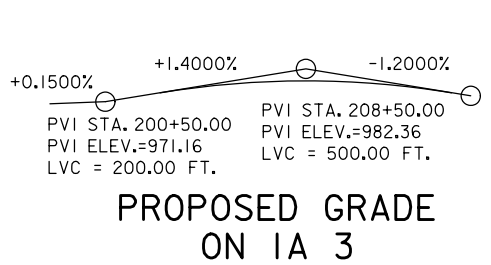


(A) POT 205+45.00 CL M.L. = POT 100+00.00 CL WFDIKE, Δ=105.00° LT

LOCATION
IA 3 OVER WEST FORK CEDAR RIVER
T-92 N R-18 W
SECTION 27/34
PITTSFORD TOWNSHIP
BUTLER COUNTY
BRIDGE MAINT. NO. 1295.7S003
FHWA NO. 016501
LATITUDE 42.744880°
LONGITUDE -92.948446°

UTILITIES LEGEND
FO - BURIED FIBER OPTIC DUMONT TEL. COMPANY
PPA - POLE ELECTRIC MID-AMERICAN ENERGY

TRAFFIC ESTIMATE
2019 AADT 2,000 V.P.D.
2039 AADT 2,100 V.P.D.
2039 DHV -- V.P.H.
TRUCKS 19%
TOTAL DESIGN ESALS --



DESIGN FOR 15° SKEW R.A.

**498'-0 x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**

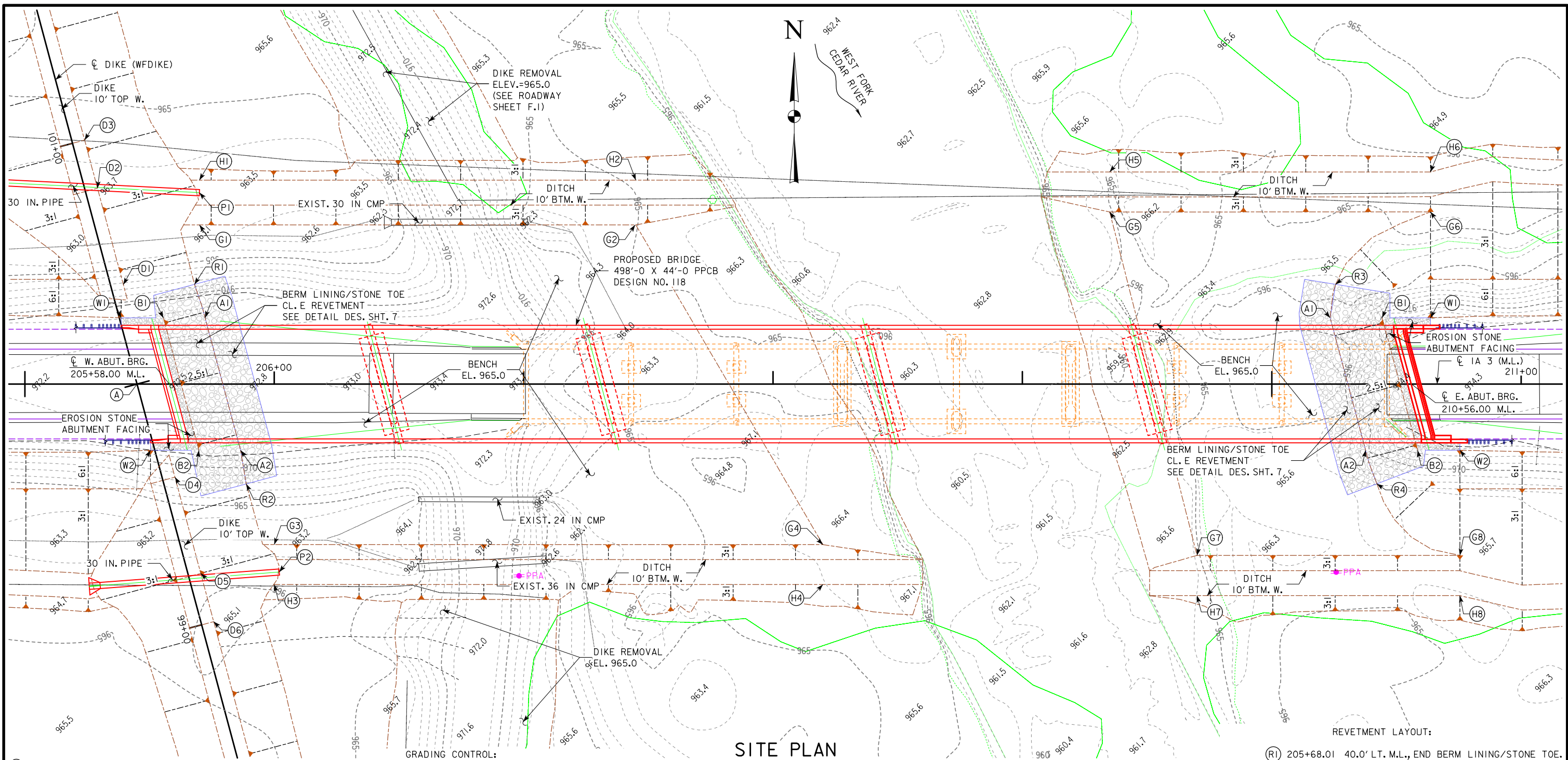
86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS

SITUATION PLAN

STA. 208+07.00 (IA 3) DECEMBER, 2019

BUTLER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 5 OF 48 FILE NO. 31394 DESIGN NO. 118



SITE PLAN

(A) POT 205+45.00 CL M.L. = POT 100+00.00 CL WFDIKE, Δ=105.00° LT
BENCH MARK/VERTICAL CONTROL POINT
NO. 12001 - SET FENO TYPE MONUMENT
NORTH 8935284.619 EAST 15313570.272
ELEV. = 978.795
IOWA RCS ZONE 5, SURVEY FEET
NAVD88/IARTN (GEOID 12A)

BERM SLOPE LOCATION TABLE					
W. ABUTMENT			E. ABUTMENT		
	STATION	OFFSET	STATION	OFFSET	ELEV
A1	205+72.26	26.58' LT	210+23.38	26.58' LT	965.00
A2	205+86.50	26.58' RT	210+37.62	26.58' RT	965.00
B1	205+55.54	26.58' LT	210+42.93	26.58' LT	972.22
B2	205+69.78	26.58' RT	210+57.17	26.58' RT	972.22
W1	205+38.61	26.58' LT	210+66.95	26.58' LT	979.14
W2	205+50.39	26.58' RT	210+78.74	26.58' RT	979.00

BERM SLOPE ELEVATIONS REFLECT GRADING SURFACE

- GRADING CONTROL:
- (D1) 100+40.0 WFDIKE, 5.0' RT., TOP/EDGE DIKE, EL. 975.0 = 205+39.5 M.L., 39.9' LT.
 - (D2) 100+80.0 WFDIKE, 5.0' RT., TOP/EDGE DIKE, EL. 975.0 = 205+29.1 M.L., 78.6' LT.
 - (D3) 101+00.0 WFDIKE, 5.0' RT., TOP/EDGE DIKE, EL. 973.9 = 205+24.0 M.L., 97.9' LT.
 - (D4) 99+60.0 WFDIKE, 5.0' RT., TOP/EDGE DIKE, EL. 974.0 = 205+60.2 M.L., 37.3' RT.
 - (D5) 99+20.0 WFDIKE, 5.0' RT., TOP/EDGE DIKE, EL. 974.0 = 205+70.5 M.L., 76.0' RT.
 - (D6) 99+00.0 WFDIKE, 5.0' RT., TOP/EDGE DIKE, EL. 971.5 = 205+75.7 M.L., 95.3' RT.
 - (G1) 205+70.0 M.L., 63.8' LT., EDGE BENCH, EL. 965.0

- (G2) 207+45.0 M.L., 63.8' LT., EDGE BENCH, EL. 965.0
- (G3) 206+00.0 M.L., 64.4' RT., EDGE BENCH, EL. 965.0
- (G4) 208+20.0 M.L., 64.4' RT., EDGE BENCH, EL. 965.0
- (G5) 209+35.0 M.L., 69.0' LT., EDGE BENCH, EL. 965.0
- (G6) 210+63.6 M.L., 69.1' LT., EDGE BENCH, EL. 965.0
- (G7) 209+70.0 M.L., 68.7' RT., EDGE BENCH, EL. 965.0
- (G8) 210+75.4 M.L., 68.7' RT., EDGE BENCH, EL. 965.0
- (H1) 205+70.0 M.L., 81.8' LT., BTM/EDGE DITCH, EL. 962.4
- (H2) 207+45.0 M.L., 81.8' LT., BTM/EDGE DITCH, EL. 962.4
- (H3) 206+00.0 M.L., 80.4' RT., BTM/EDGE DITCH, EL. 963.0

- (H4) 208+20.0 M.L., 80.4' RT., BTM/EDGE DITCH, EL. 963.0
- (H5) 209+35.0 M.L., 85.1' LT., BTM/EDGE DITCH, EL. 963.0
- (H6) 210+63.6 M.L., 85.1' LT., BTM/EDGE DITCH, EL. 963.0
- (H7) 209+70.0 M.L., 84.9' RT., BTM/EDGE DITCH, EL. 963.0
- (H8) 210+75.4 M.L., 84.9' RT., BTM/EDGE DITCH, EL. 963.0
- (P1) 205+70.0 M.L., 76.8' LT., CL 30" PIPE (UNCLASS.), 30" FLAP GATE, F.L. EL. 962.4
- (P2) 206+02.0 M.L., 75.4' RT., CL 30" PIPE (UNCLASS.), 30" FLAP GATE, F.L. EL. 963.0

CULVERTS:

REVETMENT LAYOUT:

- (R1) 205+68.01 40.0' LT. M.L., END BERM LINING/STONE TOE.
- (R2) 205+88.78 40.0' RT. M.L., END BERM LINING/STONE TOE.
- (R3) 210+25.57 40.0' LT. M.L., END BERM LINING/STONE TOE.
- (R4) 210+42.14 40.0' RT. M.L., END BERM LINING/STONE TOE.

DESIGN FOR 15° SKEW R.A.

498'-0 x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE

86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS

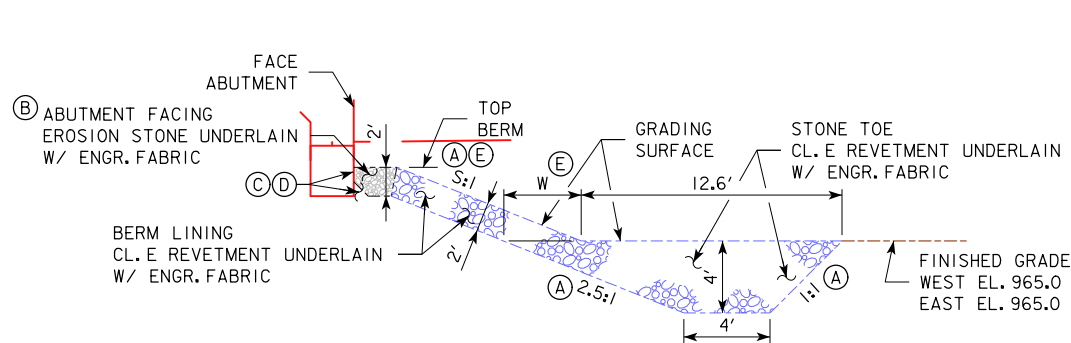
SITUATION PLAN - SITE

STA. 208+07.00 (IA 3) DECEMBER, 2019

BUTLER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

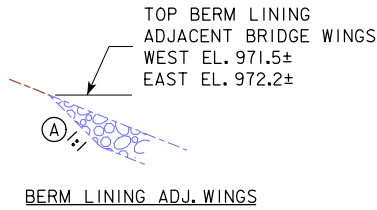
DESIGN SHEET NO. 6 OF 48 FILE NO. 31394 DESIGN NO. 118



SECTION THROUGH STONE TOE AND BERM LINING

(EMBEDDED REVETMENT AND BERMS)

- (A) SLOPE NORMAL ϕ ABUT. / GRADING CONTROL LINE (PT. A1-A2).
- (B) EXTEND FACING OUT TO LIMITS OF WING ARMORING.
- (C) 1' X 1' SOIL WEDGE AT FACE ABUTMENT.
- (D) CARRY ENGR. FABRIC UP SOIL WEDGE AND FACE ABUTMENT.
- (E) BERM/DIKE SLOPE S:1 S=2.5:1 W=5.4' S=3:1 W=6.3' S=3.5:1 W=7.2'



BENCH MARK NO.: REFER TO DESIGN SHEET 6

HYDRAULIC DATA

DRAINAGE AREA = 303.5 SQ. MI.
STREAM SLOPE = 2.27 FT./MI.
AVG. LOW WATER STAGE = EL. 962.7

Q₂₅ = 11,700 CFS (11,700 CFS)
STAGE = EL. 973.1

Q₅₀ = 14,000 CFS (14,000 CFS)
STAGE = EL. 973.5
REGULATORY LOW BEAM = EL. 975.8
BACKWATER = 0.23 FT./0.83 FT.
AVG. BRIDGE VELOCITY = 3.2 FPS

Q₁₀₀ = 15,969 CFS (16,300 CFS)
STAGE = EL. 973.9
OPERATIONAL LOW BEAM = 973.2
BACKWATER = 0.42 FT./1.06 FT.
AVG. BRIDGE VELOCITY = 3.5 FPS

Q₂₀₀ = 18,351 CFS (20,200 CFS)
STAGE = EL. 974.3
BACKWATER = 0.56 FT./ -
AVG. BRIDGE VELOCITY = 3.9 FPS
CALCULATED DESIGN SCOUR = EL. 952.0

Q₅₀₀ = 19,365 CFS (22,200 CFS)
STAGE = EL. 974.5
AVG. BRIDGE VELOCITY = 4.1 FPS
CALCULATED CHECK SCOUR = EL. 951.6

ROADWAY OVERTOP= 14,000 CFS
UPSTREAM DIKE LOW EL. 973.9
ROADWAY OVERTOP EL. 970.5
STA. 194+00

DISCHARGE IN PARANS. REPRESENTS
TOTAL STREAMFLOW.
BACKWATER REFERENCES CHANGE FROM
EXISTING/PRE-DEVELOPMENT CONDITION
NEAR FIRST HIGH-DAMAGE POTENTIAL
DEVELOPMENT UPSTREAM OF PROJECT
SITE (RESIDENCE N.E. OF BRIDGE).

ESTIMATED BERM ARMORING QUANTITIES

REVTMENT TYPE - LOCATION	REVTMENT CL. E (TON)	EROSION STONE (TON)	ENGINEERING FABRIC (SY)	EXCAVATION CL. 10 (CY)
BERM LINING\STONE TOE - WEST	381.2	19.6	363.2	250.4
BERM LINING\STONE TOE - EAST	407.1	19.6	390.7	266.6
TOTALS	788.3	39.2	753.9	517.0

EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE.

BRIDGE COORDINATES

LOCATION	ϕ W. ABUT. BRG.	ϕ PIER 1	ϕ PIER 2	ϕ PIER 3	ϕ PIER 4	ϕ E. ABUT. BRG.
NORTH EDGE OF DECK	X=15312119.7943 Y=8935383.3587	X=15312205.7827 Y=8935381.9446	X=15312292.7709 Y=8935380.5140	X=15312404.7558 Y=8935378.6723	X=15312511.7413 Y=8935376.9128	X=15312617.7270 Y=8935375.1698
ϕ APPROACH ROADWAY	X=15312125.7241 Y=8935359.6775	X=15312211.7124 Y=8935358.2633	X=15312298.7007 Y=8935356.8327	X=15312410.6855 Y=8935354.9910	X=15312517.6711 Y=8935353.2316	X=15312623.6567 Y=8935351.4885
SOUTH EDGE OF DECK	X=15312131.6538 Y=8935335.9963	X=15312217.6422 Y=8935334.5821	X=15312304.6305 Y=8935333.1515	X=15312416.6153 Y=8935331.3098	X=15312523.6008 Y=8935329.5504	X=15312629.5865 Y=8935327.8073

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 15° SKEW R.A.
**498'-0 x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**
86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS
SITUATION PLAN - MISCELLANEOUS
STA. 208+07.00 (1A 3) DECEMBER, 2019
BUTLER COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 7 OF 48 FILE NO. 31394 DESIGN NO. 118

[illegible]

SECTION B-B

◀ ELEVATION VIEW
(LOOKING EAST)

END ELEVATION

DESIGN FOR 15° SKEW R.A.

**498'-0 x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**
86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS

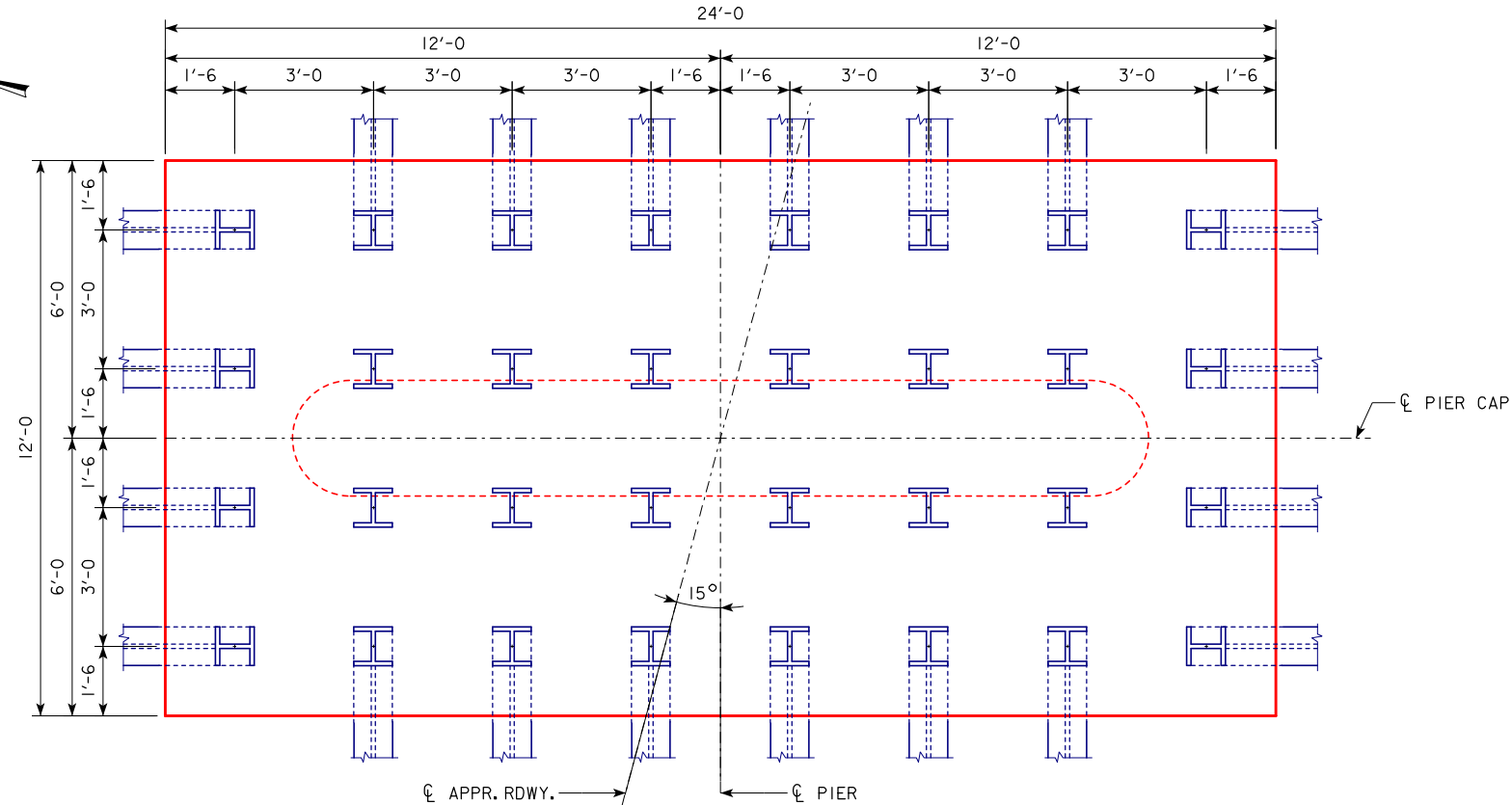
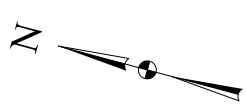
PIER 1 DETAILS

STA. 208+07.00 (IA 3)

DECEMBER, 2019

BUTLER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 8 OF 48 FILE NO. 31394 DESIGN NO. 118



PILE PLAN

NOTES:
DIMENSIONS SHOWN ARE AT BOTTOM OF FOOTING.
BATTER PILES 1:4 IN THE DIRECTION SHOWN.

32 - HP10x57 STEEL BEARING PILING REQUIRED
AT PIER NO. 1.

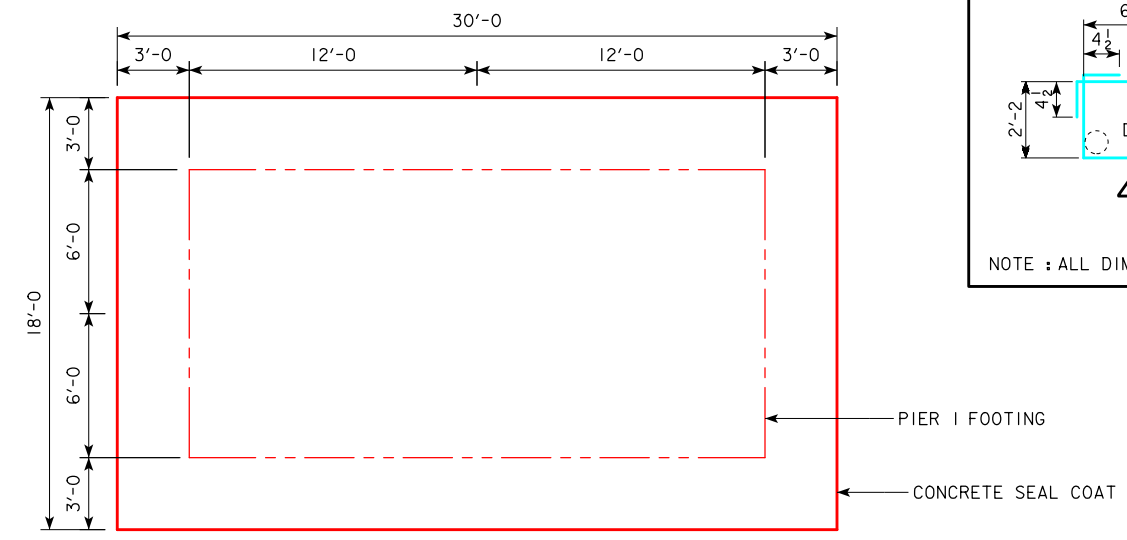
PIER NOTES:

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

CONSTRUCTION JOINTS ARE TO BE FORMED WITH A 3 x 10 x 14'-0 DRESSED AND BEVELED STRIP.

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

AN 18'-0 x 30'-0 x 3'-0 SEAL COAT IS REQUIRED BELOW THE PIER 1 FOOTING.

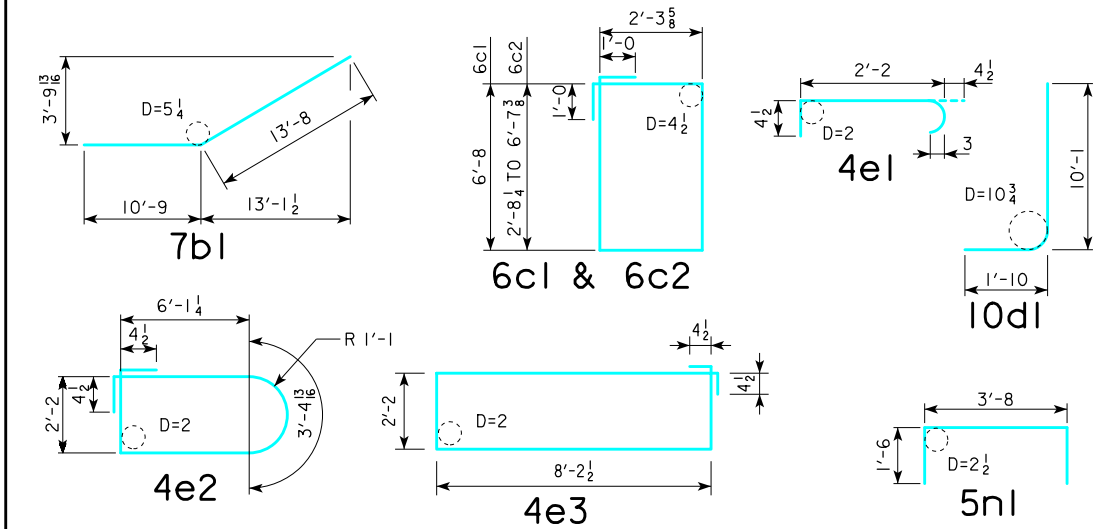


SEAL COAT DETAIL

REINFORCING BAR LIST - PIER 1

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
10a1	CAP, LONGIT., TOP		30	46'-2	5960
7a2	CAP, LONGIT., SIDES		2	46'-2	189
7a3	CAP, LONGIT., SIDES		2	46'-0	188
7a4	CAP, LONGIT., SIDES		2	39'-6	161
7a5	CAP, LONGIT., SIDES		2	33'-0	135
7a6	CAP, LONGIT., SIDES		2	26'-5	108
7b1	CAP, LONGIT., BOTTOM		12	24'-5	599
6c1	CAP HOOPS		38	20'-0	1142
6c2	CAP HOOPS, CANTILEVER		112	VARIES	2678
10d1	FOOTING TO STEM DOWELS		40	11'-11	2051
10d2	STEM, VERTICAL		40	13'-6	2324
4e1	STEM TIES		50	2'-11	97
4e2	STEM HOOPS AT ENDS		20	18'-7	248
4e3	STEM HOOPS		10	21'-6	144
5f1	FOOTING, TOP, TRANSV.		24	11'-6	288
5f2	FOOTING, TOP, LONGIT.		12	23'-6	294
10g1	FOOTING, BOTT., TRANSV.		29	11'-6	1435
10g2	FOOTING, BOTT., LONGIT.		12	23'-6	1213
5m1	CAP, STEPS, LONGIT.		16	3'-4	56
5n1	CAP, STEPS, TRANSV.		16	6'-8	111
4t1	CAP, TOP, TRANSV.		24	3'-8	59
REINFORCING STEEL TOTAL - (LBS.)					19,480

BENT BAR DETAILS



DESIGN FOR 15° SKEW R.A.

**498'-0 x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**

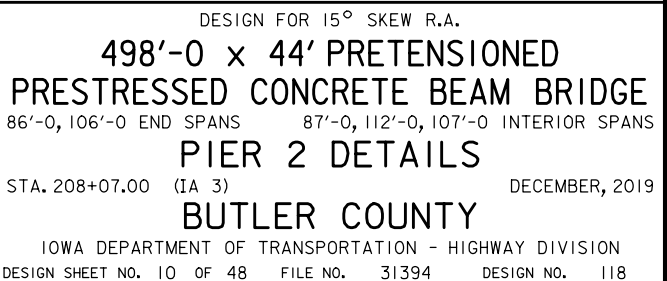
86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS

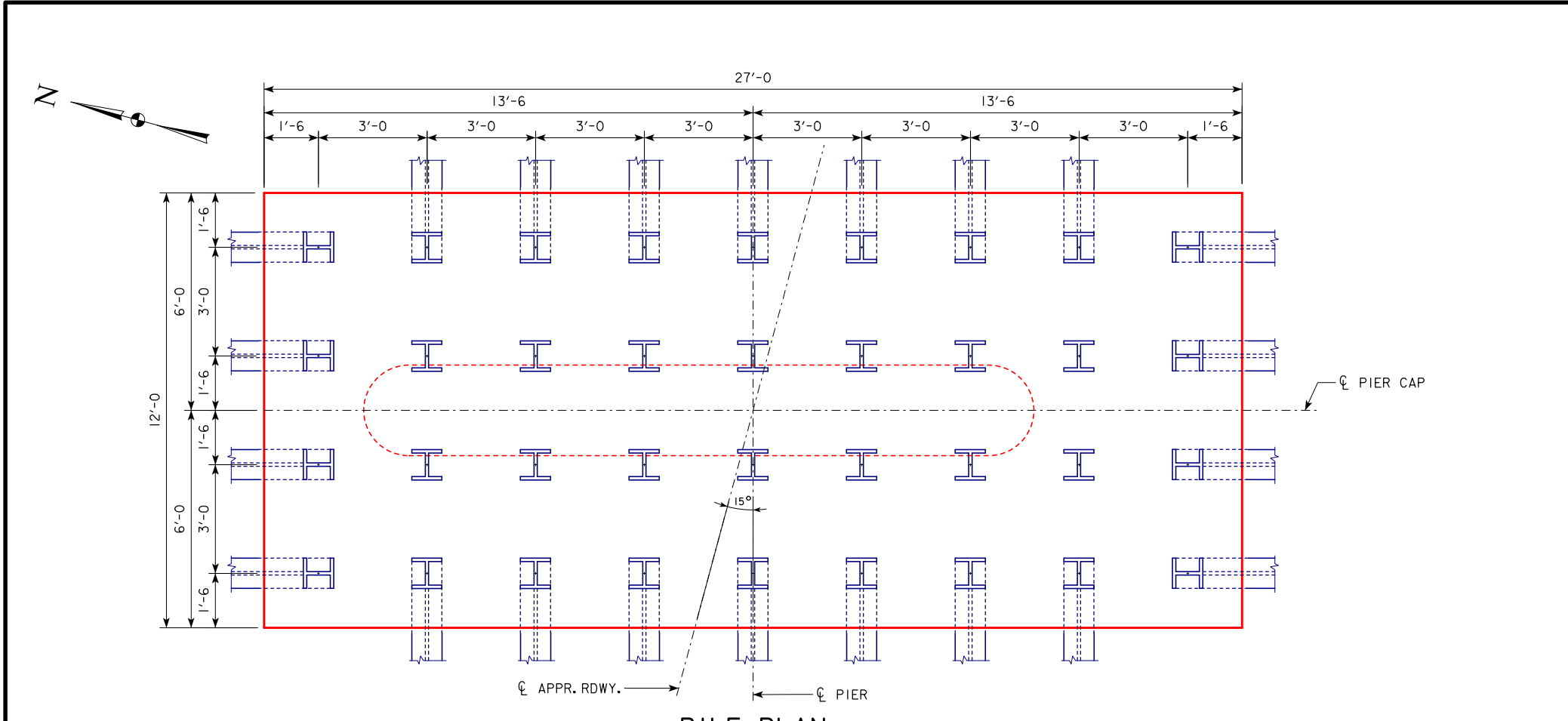
PIER 1 DETAILS

STA. 208+07.00 (1A 3) DECEMBER, 2019

BUTLER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 9 OF 48 FILE NO. 31394 DESIGN NO. 118





PILE PLAN

REINFORCING BAR LIST - PIER 2					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
10a1	CAP, LONGIT., TOP		30	46'-2	5960
7a2	CAP, LONGIT., SIDES		2	46'-2	189
7a3	CAP, LONGIT., SIDES		2	46'-0	188
7a4	CAP, LONGIT., SIDES		2	39'-6	161
7a5	CAP, LONGIT., SIDES		2	33'-0	135
7a6	CAP, LONGIT., SIDES		2	26'-5	108
7b1	CAP, LONGIT., BOTTOM		12	24'-5	599
6c1	CAP HOOPS		38	20'-0	1142
6c2	CAP HOOPS, CANTILEVER		112	VARIES	2678
10d1	FOOTING TO STEM DOWELS		40	11'-11	2051
10d2	STEM, VERTICAL		40	13'-6	2324
4e1	STEM TIES		50	2'-11	97
4e2	STEM HOOPS AT ENDS		20	18'-7	248
4e3	STEM HOOPS		10	21'-6	144
5f1	FOOTING, TOP, TRANSV.		27	11'-6	324
5f2	FOOTING, TOP, LONGIT.		12	26'-6	332
10g1	FOOTING, BOTT., TRANSV.		32	11'-6	1584
10g2	FOOTING, BOTT., LONGIT.		12	26'-6	1368
5m1	CAP, STEPS, LONGIT.		16	3'-4	56
5n1	CAP, STEPS, TRANSV.		16	6'-8	111
4t1	CAP, TOP, TRANSV.		24	3'-8	59
REINFORCING STEEL TOTAL - (LBS.)					19,858

NOTES:
DIMENSIONS SHOWN ARE AT BOTTOM OF FOOTING.
BATTER PILES 1:4 IN THE DIRECTION SHOWN.

36 - HP10x57 STEEL BEARING PILING REQUIRED
AT PIER NO. 2.

PIER NOTES:

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

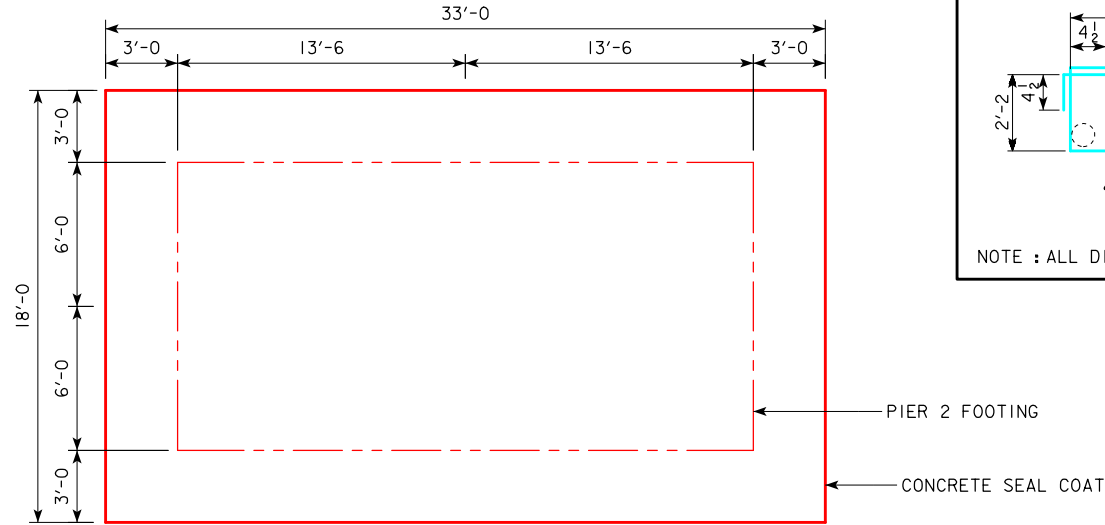
CONSTRUCTION JOINTS ARE TO BE FORMED WITH A 3 x 10 x 14'-0 DRESSED AND BEVELED STRIP.

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

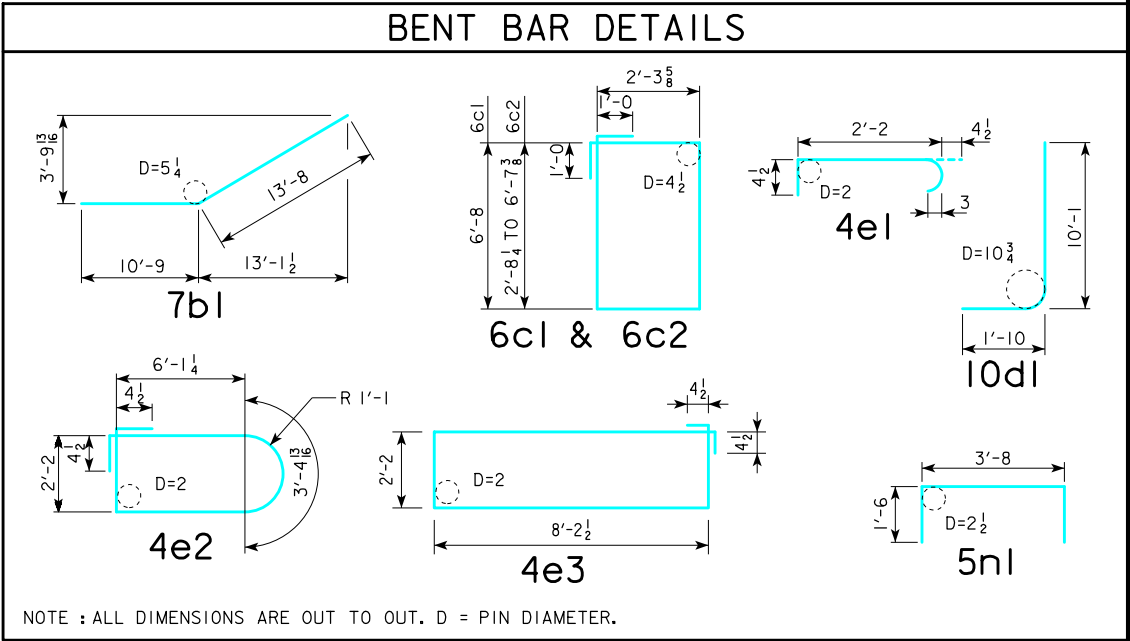
AN 18'-0 x 33'-0 x 3'-0 SEAL COAT IS REQUIRED BELOW THE PIER 2 FOOTING.

CONCRETE PLACEMENT QUANTITIES	
LOCATION	TOTAL
FOOTING	48.0
STEM	16.6
CAP & STEPS	40.6
TOTAL - CU.YDS.	105.2

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



SEAL COAT DETAIL



DESIGN FOR 15° SKEW R.A.

**498'-0 x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**

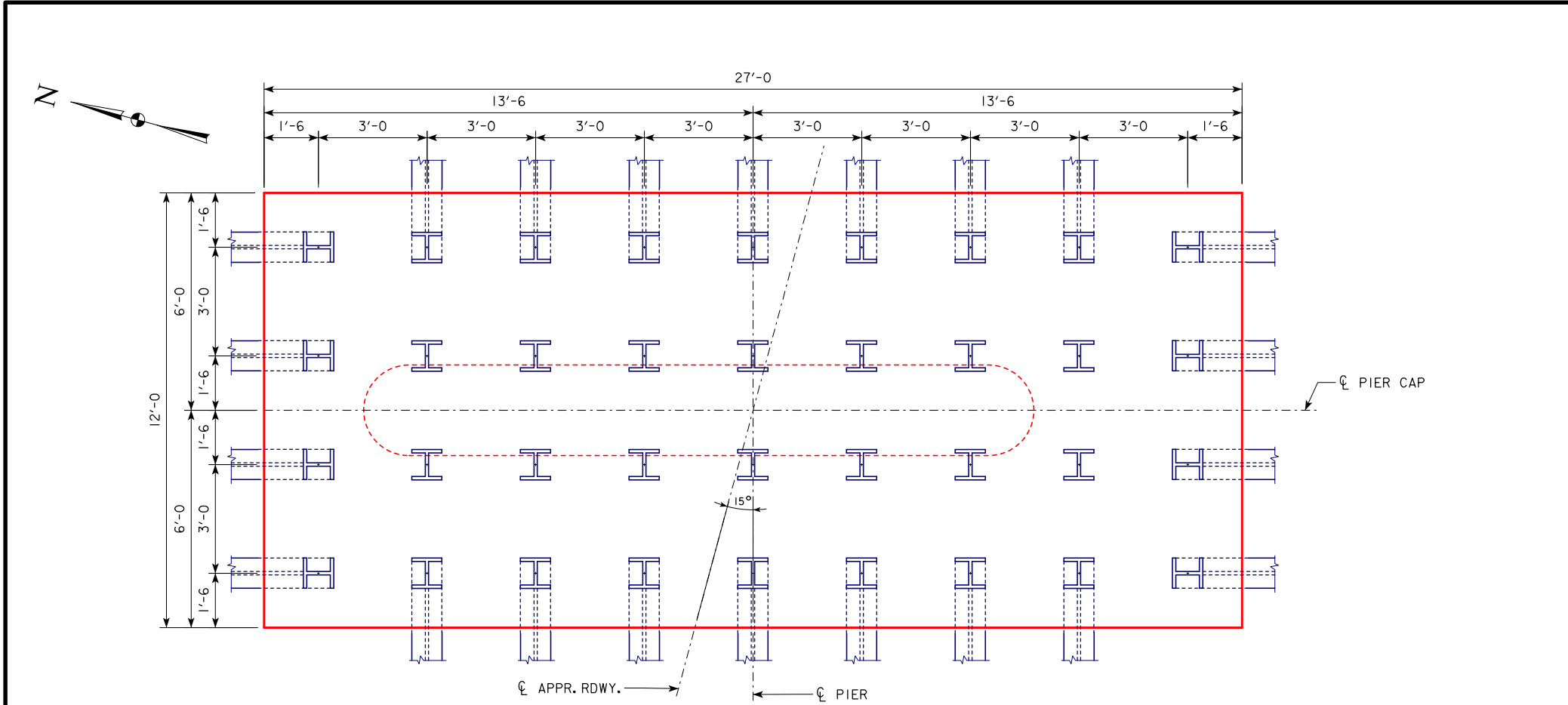
86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS

PIER 2 DETAILS

STA. 208+07.00 (1A 3) DECEMBER, 2019

BUTLER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 11 OF 48 FILE NO. 31394 DESIGN NO. 118



PILE PLAN

NOTE :
DIMENSIONS SHOWN ARE AT BOTTOM OF FOOTING.
BATTER PILES 1:4 IN THE DIRECTION SHOWN.

36 - HP10x57 STEEL BEARING PILING REQUIRED
AT PIER NO. 3.

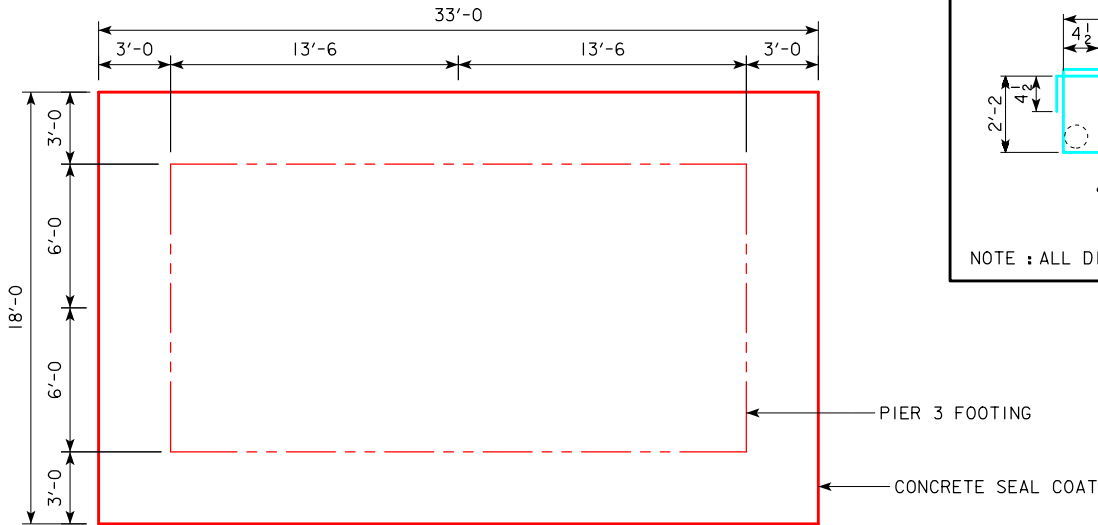
PIER NOTES:

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

CONSTRUCTION JOINTS ARE TO BE FORMED WITH A 3 x 10 x 14'-0 DRESSED AND BEVELED STRIP.

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

AN 18'-0 x 33'-0 x 3'-0 SEAL COAT IS REQUIRED BELOW THE PIER 3 FOOTING.

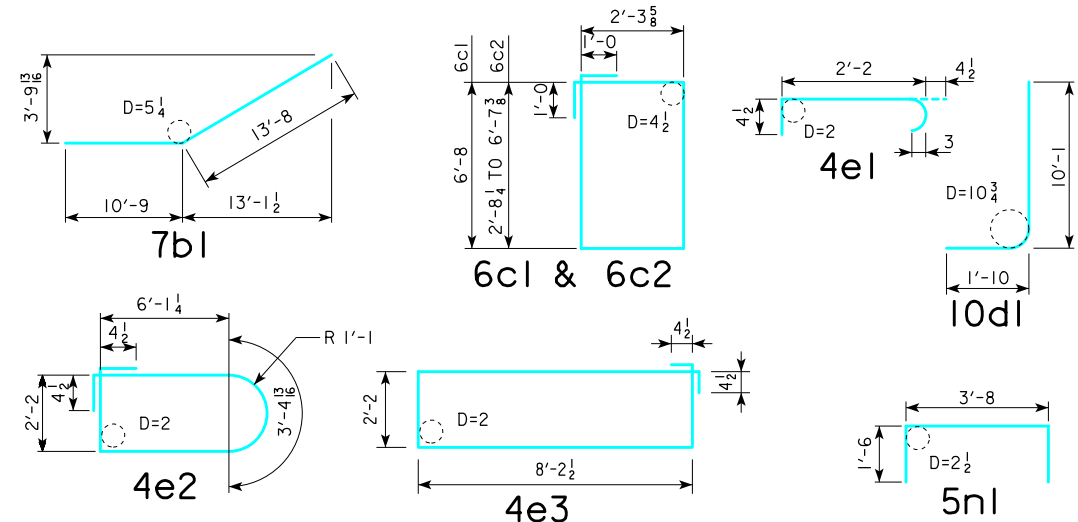


SEAL COAT DETAIL

REINFORCING BAR LIST - PIER 3

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
10a1	CAP, LONGIT., TOP		30	46'-2	5960
7a2	CAP, LONGIT., SIDES		2	46'-2	189
7a3	CAP, LONGIT., SIDES		2	46'-0	188
7a4	CAP, LONGIT., SIDES		2	39'-6	161
7a5	CAP, LONGIT., SIDES		2	33'-0	135
7a6	CAP, LONGIT., SIDES		2	26'-5	108
7b1	CAP, LONGIT., BOTTOM		12	24'-5	599
6c1	CAP HOOPS		38	20'-0	1142
6c2	CAP HOOPS, CANTILEVER		112	VARIES	2678
10d1	FOOTING TO STEM DOWELS		40	11'-11	2051
10d2	STEM, VERTICAL		40	13'-6	2324
4e1	STEM TIES		50	2'-11	97
4e2	STEM HOOPS AT ENDS		20	18'-7	248
4e3	STEM HOOPS		10	21'-6	144
5f1	FOOTING, TOP, TRANSV.		27	11'-6	324
5f2	FOOTING, TOP, LONGIT.		12	26'-6	332
10g1	FOOTING, BOTT., TRANSV.		32	11'-6	1584
10g2	FOOTING, BOTT., LONGIT.		12	26'-6	1368
5m1	CAP, STEPS, LONGIT.		16	3'-4	56
5n1	CAP, STEPS, TRANSV.		16	6'-8	111
4t1	CAP, TOP, TRANSV.		24	3'-8	59
REINFORCING STEEL TOTAL - (LBS.)					19,858

BENT BAR DETAILS



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

DESIGN FOR 15° SKEW R.A.

**498'-0 x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**

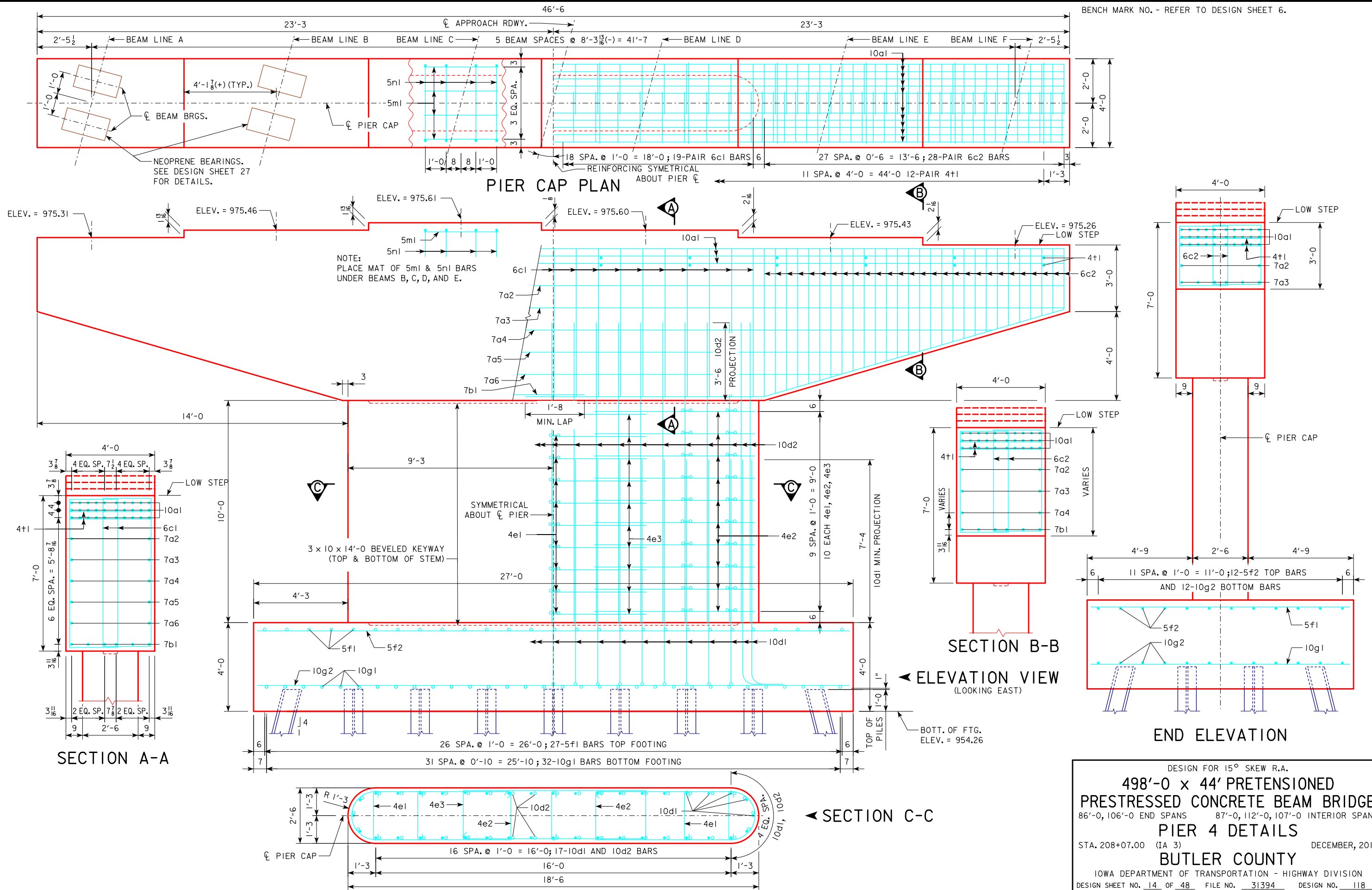
86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS

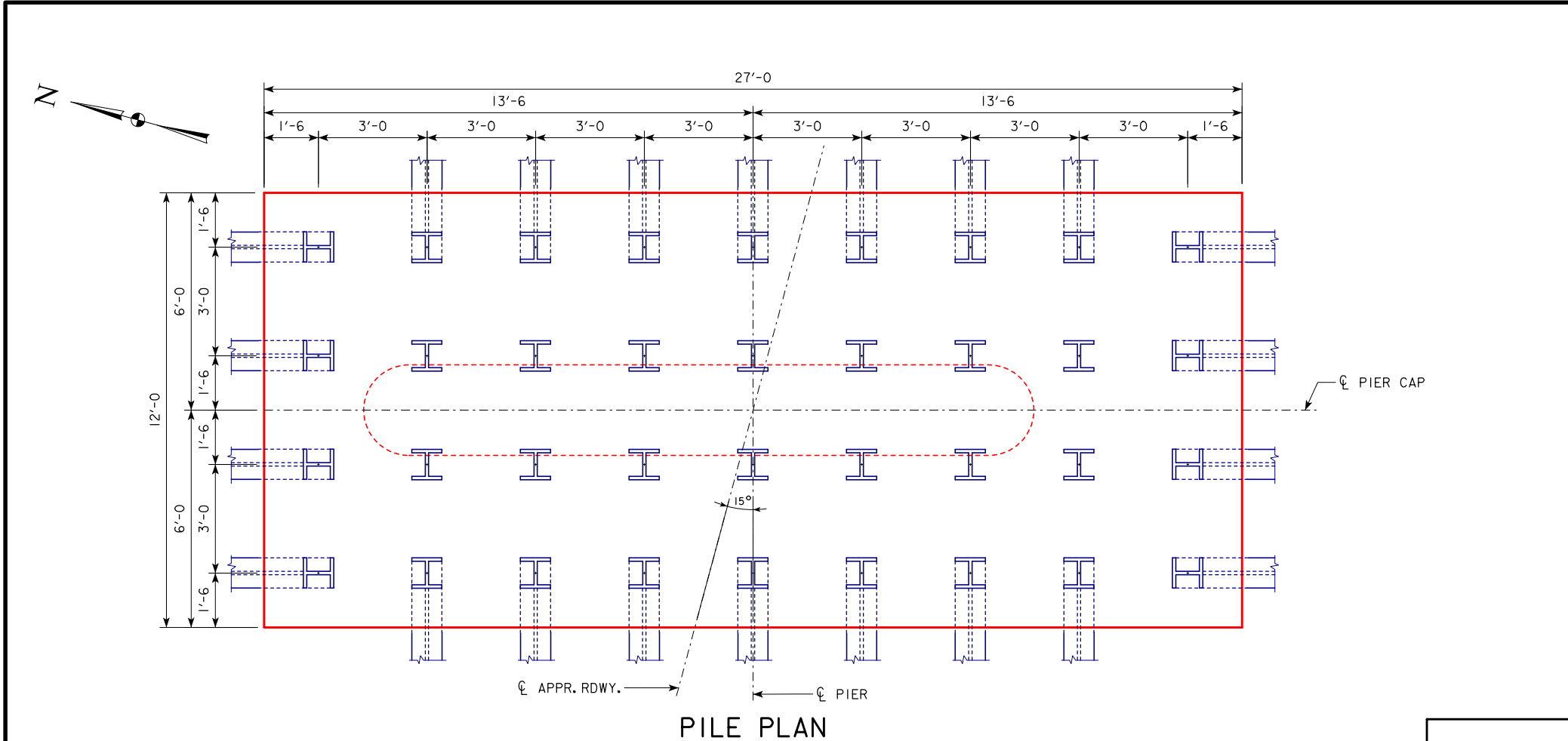
PIER 3 DETAILS

STA. 208+07.00 (1A 3) DECEMBER, 2019

BUTLER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 13 OF 48 FILE NO. 31394 DESIGN NO. 118





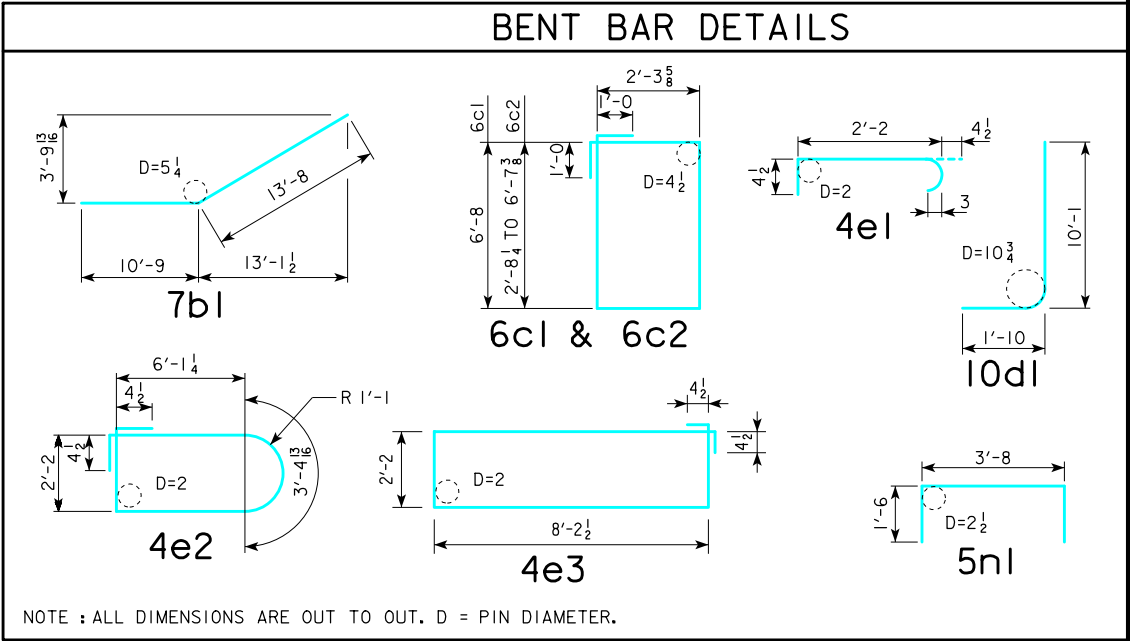
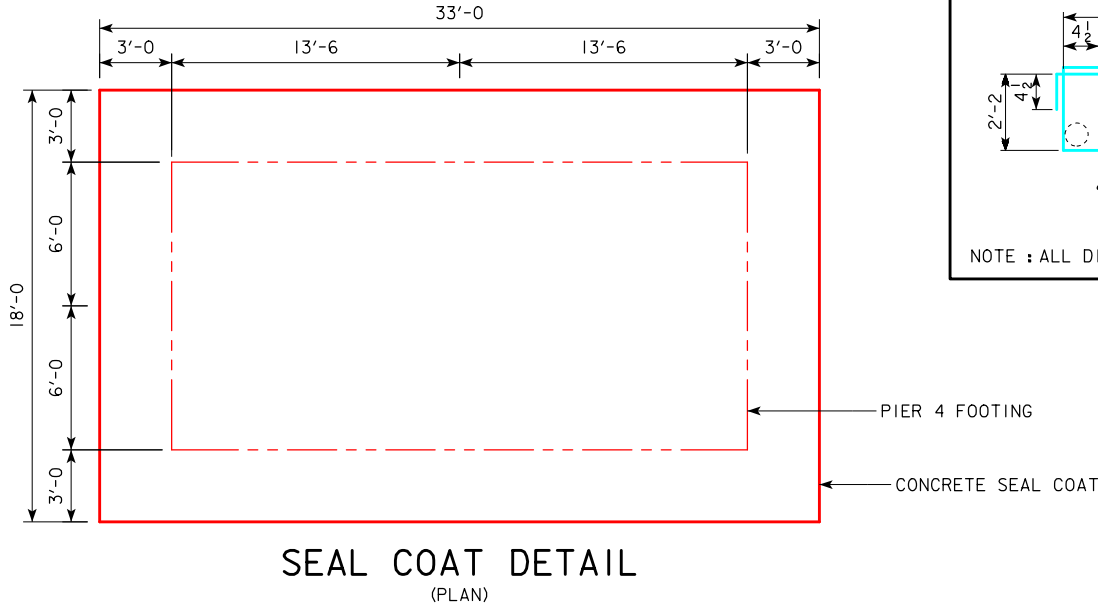
REINFORCING BAR LIST - PIER 4					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
10a1	CAP, LONGIT., TOP		30	46'-2	5960
7a2	CAP, LONGIT., SIDES		2	46'-2	189
7a3	CAP, LONGIT., SIDES		2	46'-0	188
7a4	CAP, LONGIT., SIDES		2	39'-6	161
7a5	CAP, LONGIT., SIDES		2	33'-0	135
7a6	CAP, LONGIT., SIDES		2	26'-5	108
7b1	CAP, LONGIT., BOTTOM		12	24'-5	599
6c1	CAP HOOPS		38	20'-0	1142
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10d1	FOOTING TO STEM DOWELS		40	11'-11	2051
10d2	STEM, VERTICAL		40	13'-6	2324
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5f1	FOOTING, TOP, TRANSV.		27	11'-6	324
5f2	FOOTING, TOP, LONGIT.		12	26'-6	332
10g1	FOOTING, BOTT., TRANSV.		32	11'-6	1584
10g2	FOOTING, BOTT., LONGIT.		12	26'-6	1368
5m1	CAP, STEPS, LONGIT.		16	3'-4	56
5n1	CAP, STEPS, TRANSV.		16	6'-8	111
4t1	CAP, TOP, TRANSV.		24	3'-8	59
REINFORCING STEEL TOTAL - (LBS.)					19,858

NOTES:
DIMENSIONS SHOWN ARE AT BOTTOM OF FOOTING.
BATTER PILES 1:4 IN THE DIRECTION SHOWN.
36 - HPI0x57 STEEL BEARING PILING REQUIRED
AT PIER NO. 4.

PIER NOTES:
MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2 INCHES
UNLESS OTHERWISE NOTED OR SHOWN
CONSTRUCTION JOINTS ARE TO BE FORMED WITH A 3 x 10 x 14'-0 DRESSED AND BEVELED STRIP.
ALL BATTERED PILE SHALL BE TRIMMED TO A HORIZONTAL LINE TO AID IN THE PLACEMENT OF
REINFORCING.
AN 18'-0 x 33'-0 x 3'-0 SEAL COAT IS REQUIRED BELOW THE PIER 4 FOOTING.

CONCRETE PLACEMENT QUANTITIES	
LOCATION	TOTAL
FOOTING	48.0
STEM	16.6
CAP & STEPS	40.5
TOTAL - CU.YDS.	105.1

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



DESIGN FOR 15° SKEW R.A.
498'-0 x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE
86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS
PIER 4 DETAILS
STA. 208+07.00 (1A 3) DECEMBER, 2019
BUTLER COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 15 OF 48 FILE NO. 31394 DESIGN NO. 118

47'-2"

44'-0" ROADWAY

1'-7" LEVEL

1'-7" LEVEL

TOP OF DECK

8g1 BOTH FACES

4+1

COIL ROD

3x3x2'-4 1/2" BAR

KEYWAY FORMED BY BEVELED 2x8

BOTT. OF FTG. ELEV. (SEE TABLE)

6g4

5d9

5d8

MIN. EMBEDMENT

6g4 BARS

1'-9"

8f3

8f5

2 CL.

5p2

2 CL.

TABLE OF ABUTMENT ELEVATIONS		
POINT	WEST ABUT.	
ELEV. A	972.98	
ELEV. B	973.17	
ELEV. C	973.36	
ELEV. D	973.39	
ELEV. E	973.26	
ELEV. F	973.13	
BOTT. FTG. ELEV.	969.48	

[illegible]

DESIGN FOR 15° SKEW R.A.

498'-0" x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE

86'-0", 106'-0" END SPANS 87'-0", 112'-0", 107'-0" INTERIOR SPANS

WEST ABUTMENT FOOTING DETAILS

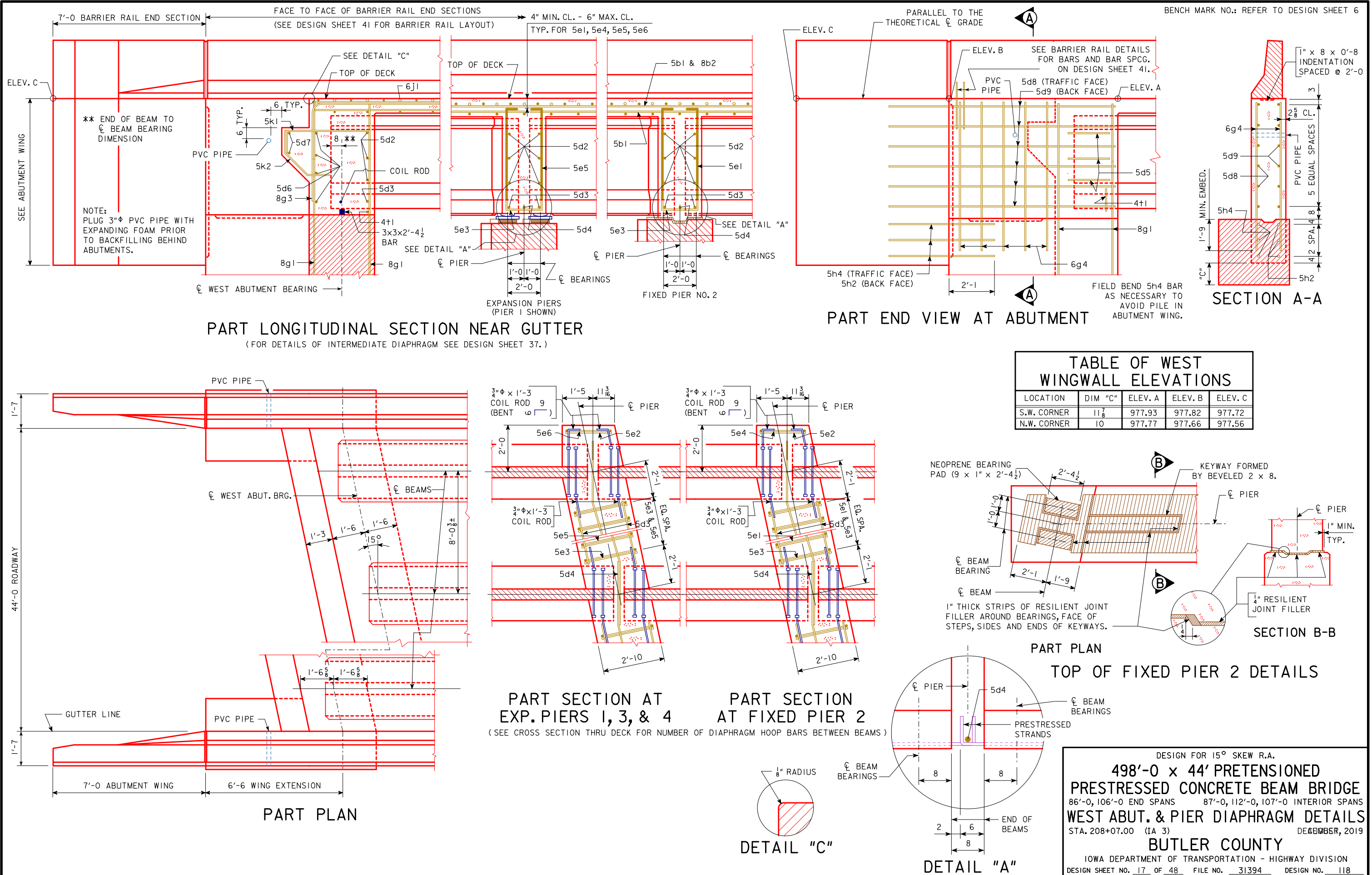
STA. 208+07.00 (IA 3) DECEMBER, 2011

BUTLER COUNTRY

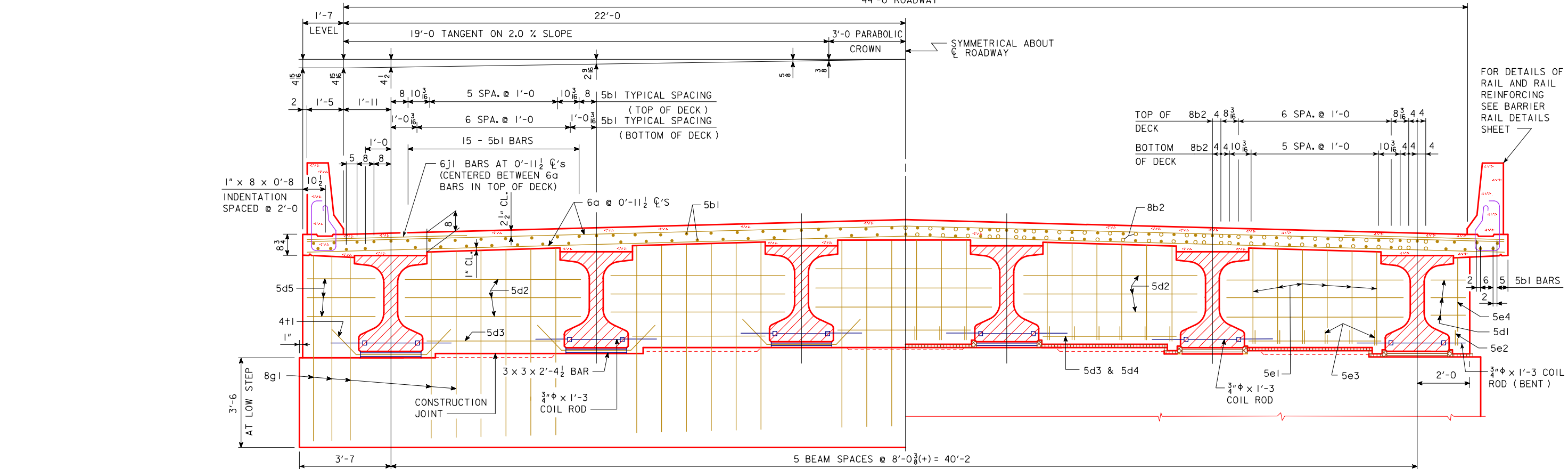
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 16 OF 48 FILE NO. 31394 DESIGN NO. 118

REVISED 01-12 - ADDED FIELD BEND 5h4 BAR TO AVOID PILE IN ABUTMENT WING NOTE.
ENGLISHBRIEINGALBRIDGE.DGN - 4512-BTCD - THIS SHEET ISSUED 02-08.



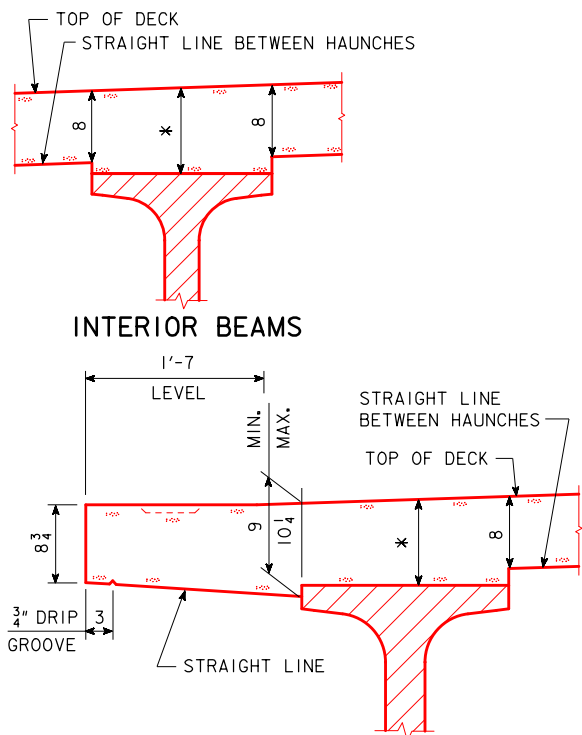
CORRECTION 04-14 - ADDED REFERRAL NOTE TO SUMMARY QUANTITIES SHEET FOR THE DRAIN WEIGHT. NOTE ABOUT CHOICE OF EPOXY OR STAINLESS STEEL DECK TO BARRIER RAIL BARS. ENGLISHBTINTEGRALBRIDGES.DGN - 4384-BTC-6 - THIS SHEET ISSUED 02-08.



HALF SECTION NEAR WEST ABUTMENT

HALF SECTION NEAR FIXED PIER 2

DECK AREA = 31.93 SQ. FT.
DECK AREA DOES NOT
INCLUDE THE HAUNCH.

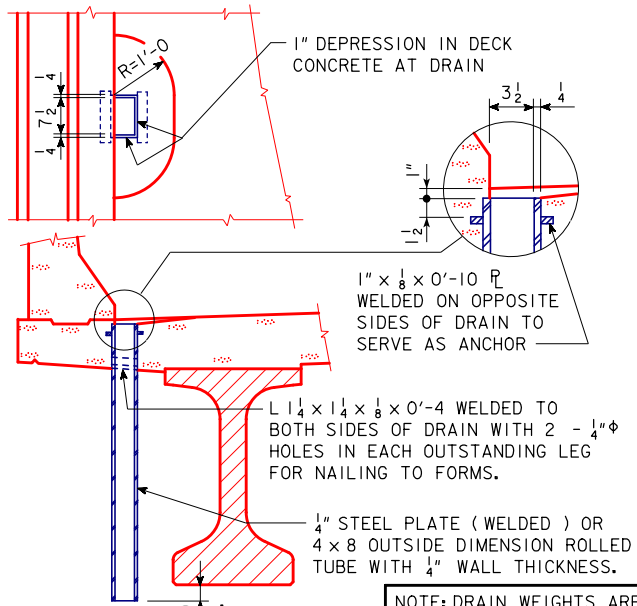


INTERIOR BEAMS

EXTERIOR BEAMS

TYPICAL DECK AND
HAUNCH DETAIL

* FOR DECK THICKNESS OVER BEAMS SEE
HAUNCH AND CAMBER DETAILS ON
DESIGN SHEET 32.



DRAIN DETAILS

NOTE :
DRAINS ARE TO BE GALVANIZED. 24 DRAINS REQUIRED.
SEE "SITUATION PLAN" FOR LOCATION. WEIGHT OF DRAINS IS
INCLUDED IN THE QUANTITY FOR "STRUCTURAL STEEL".
WEIGHT IS BASED ON ROLLED TUBE.

DATA FOR ONE DRAIN

BEAM SIZE	BTC
DRAIN WEIGHT (LBS.)	106
DRAIN LENGTH (FT.)	5'-5 3/4

NOTE: FOR DETAILS OF INTERMEDIATE DIAPHRAGMS SEE DESIGN SHEET 37.

SUPERSTRUCTURE NOTES:

THE BRIDGE DECK AS SHOWN INCLUDES 1/2" INTEGRAL WEARING SURFACE.

THE PIER AND ABUTMENT DIAPHRAGM CONCRETE IS TO BE PLACED MONOLITHICALLY WITH THE BRIDGE DECK.

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

ALL BEAMS ARE TO BE SET VERTICAL.

FORMS FOR THE DECK AND BARRIER RAIL ARE TO BE SUPPORTED BY THE PRESTRESSED CONCRETE BEAMS.

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

ALL DECK AND DIAPHRAGM REINFORCING IS TO BE WIRED IN PLACE AND ADEQUATELY SUPPORTED BEFORE CONCRETE IS PLACED.

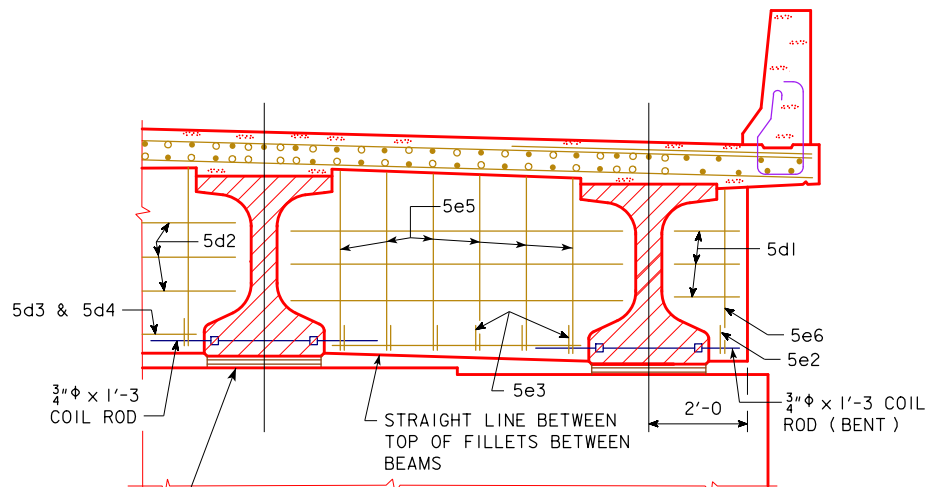
TOP TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 2 1/2" CLEAR BELOW TOP OF DECK. BOTTOM TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 1" CLEAR ABOVE BOTTOM OF DECK. TOP AND BOTTOM REINFORCING STEEL IS TO BE SUPPORTED BY INDIVIDUAL BAR CHAIRS SPACED AT NOT MORE THAN 3'-0" CENTERS LONGITUDINALLY AND TRANSVERSELY, OR BY CONTINUOUS ROWS OF BAR HIGH CHAIRS OR DECK BOLSTERS SPACED 4'-0" APART. I.M. 451.01 REQUIREMENTS SHALL APPLY FOR BAR CHAIRS, BAR HIGH CHAIRS, AND DECK BOLSTERS.

TRANSVERSE DECK REINFORCING MAY BE SPLICED WITH ONE LAP LOCATED AS FOLLOWS:

TOP BAR - LAP MIDWAY BETWEEN BEAMS (MIN. LAP = 1'-10").

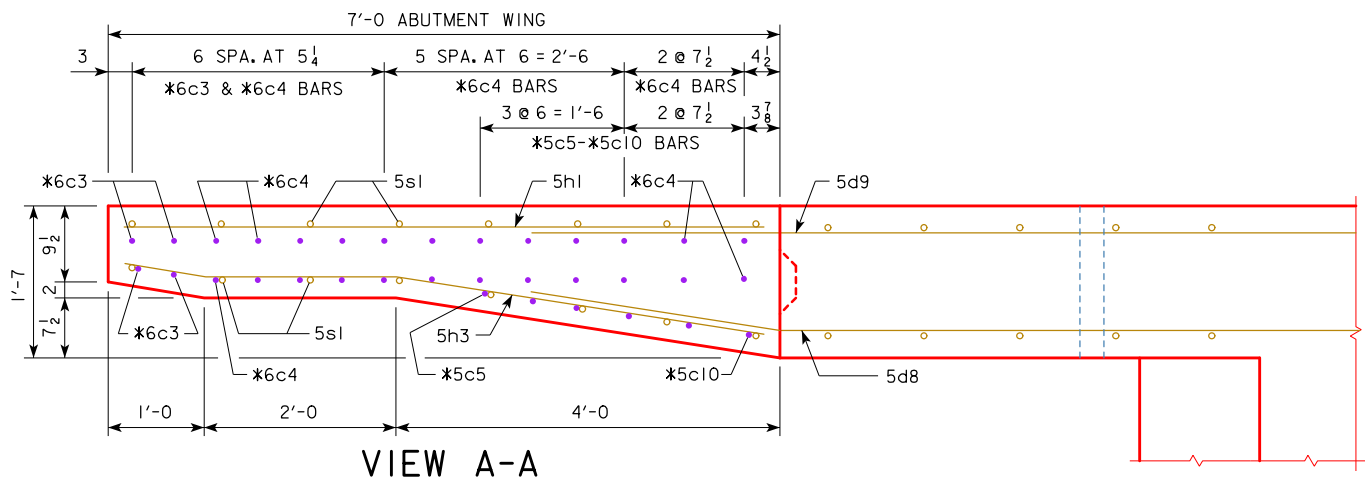
BOTTOM BARS - LAP OVER BEAMS (MIN. LAP = 1'-10").

PAYMENT FOR REINFORCING BARS SHALL BE BASED ON NO SPLICES, AND NO ALLOWANCE SHALL BE MADE FOR THE ADDITIONAL LENGTH OF BAR REQUIRED FOR THE USE OF SPLICES.

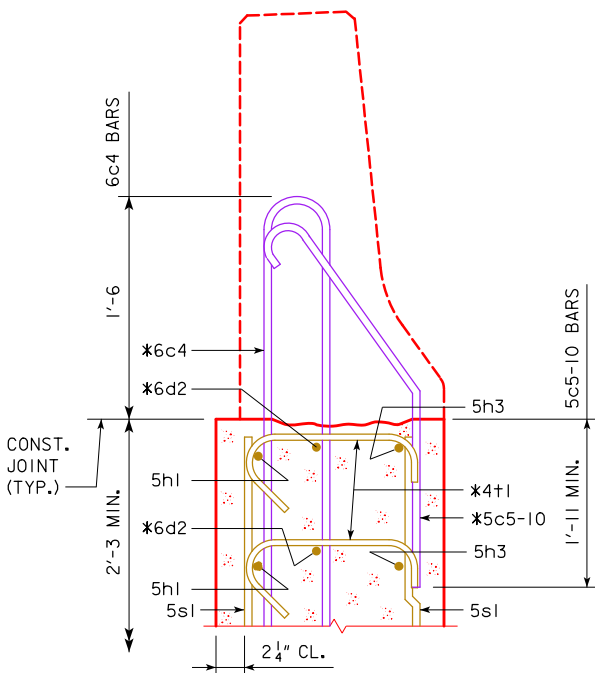


HALF SECTION NEAR
EXPANSION PIERS 1, 3, AND 4

DESIGN FOR 15° SKEW R.A.
**498'-0" x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**
86'-0", 106'-0" END SPANS 87'-0", 112'-0", 107'-0" INTERIOR SPANS
BRIDGE DECK CROSS SECTION
STA. 208+07.00 (IA 3) DESIGNER, 2019
BUTLER COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 18 OF 48 FILE NO. 31394 DESIGN NO. 118



VIEW A-A



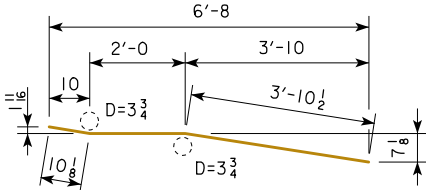
SECTION B-B

* BARRIER RAIL END SECTION BARS TO BE PLACED WITH ABUTMENT WING.
SEE BARRIER RAIL END SECTION SHEET IN THESE PLANS FOR DETAILS OF REINFORCING BARS 6c3, 6c4, 5c5-10, 6d2 & 4+1.

REINFORCING BAR LIST - ONE ABUT. WING

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5h1	HORIZONTAL BACK FACE		9	6'-8	63
5h3	HORIZONTAL TRAFFIC FACE		9	6'-9	63
5s1	VERTICAL BOTH FACES		16	6'-11	115

REINFORCING STEEL EPOXY COATED - TOTAL (LBS.) 241

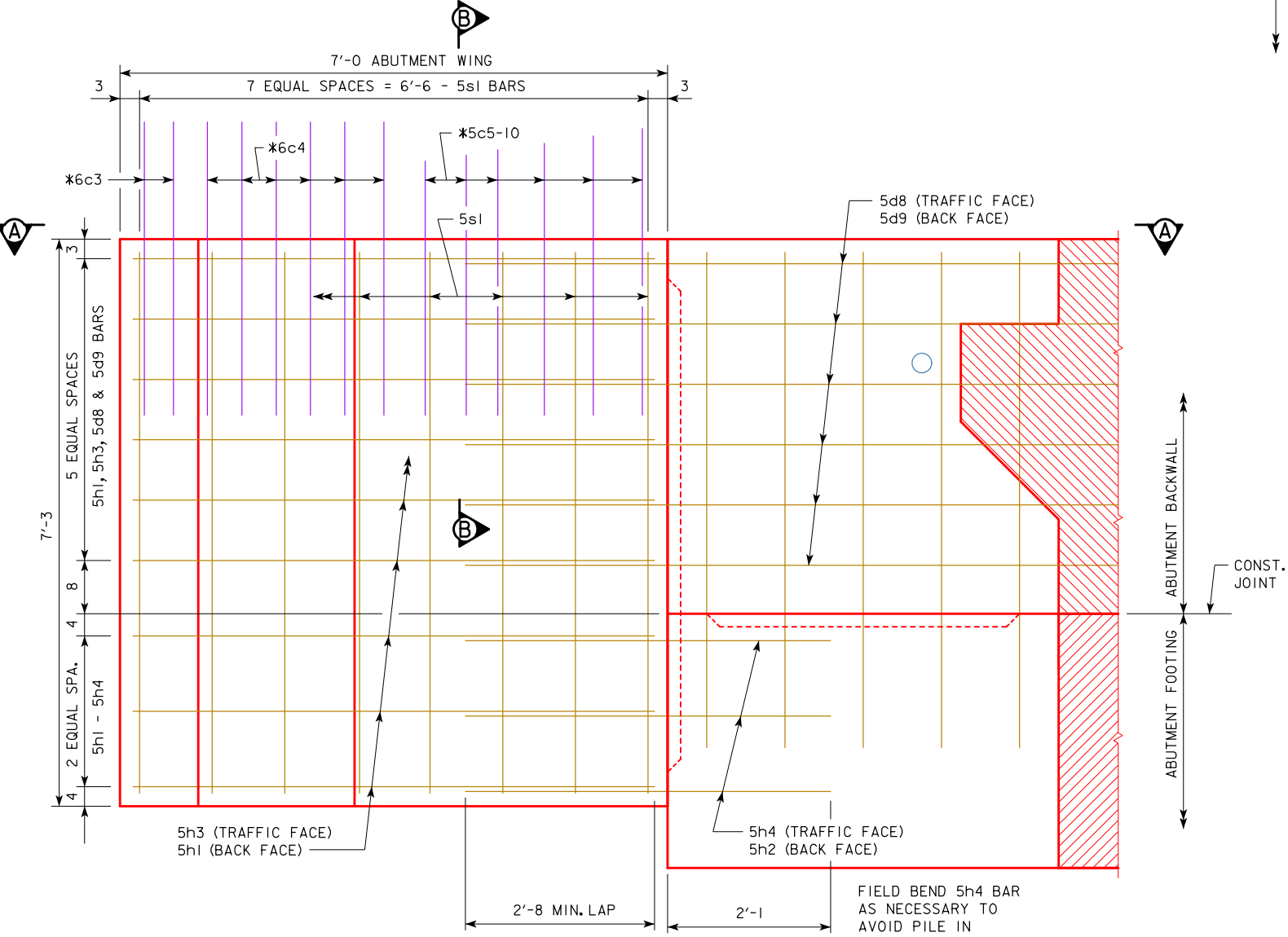


5h3
NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.
BENT BAR DETAILS

CONCRETE PLACEMENT SUMMARY

CONCRETE	TOTAL
ONE ABUTMENT WING	2.1
TOTAL (CU. YDS.)	2.1

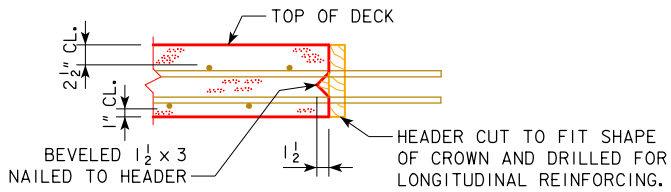
NOTE:
CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED ON THE SUMMARY QUANTITIES SHEET.



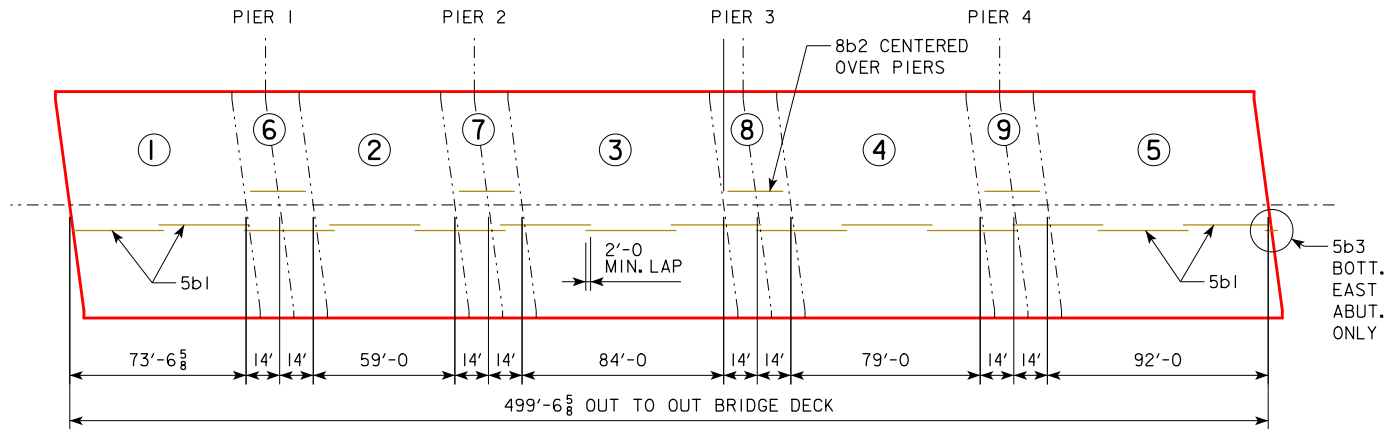
ABUTMENT WING - ELEVATION VIEW

DESIGN FOR 15° SKEW R.A.
498'-0 x 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
 86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS
WEST ABUTMENT WING DETAILS
 STA. 208+07.00 (1A 3) DECEMBER, 2019
BUTLER COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 19 OF 48 FILE NO. 31394 DESIGN NO. 118

REVISED 07-2015 - CHANGED CONCRETE PLACEMENT NOTE TO ACCOUNT FOR THE POSSIBLE ADDITION OF A RETARDING ADMIXTURE TO THE CONCRETE.
ENGLISHBTINTEGRALBRIDGES.DGN - 4520-BTCD - THIS SHEET ISSUED 02-08.



PERMISSIBLE TRANSVERSE DECK CONSTRUCTION JOINT

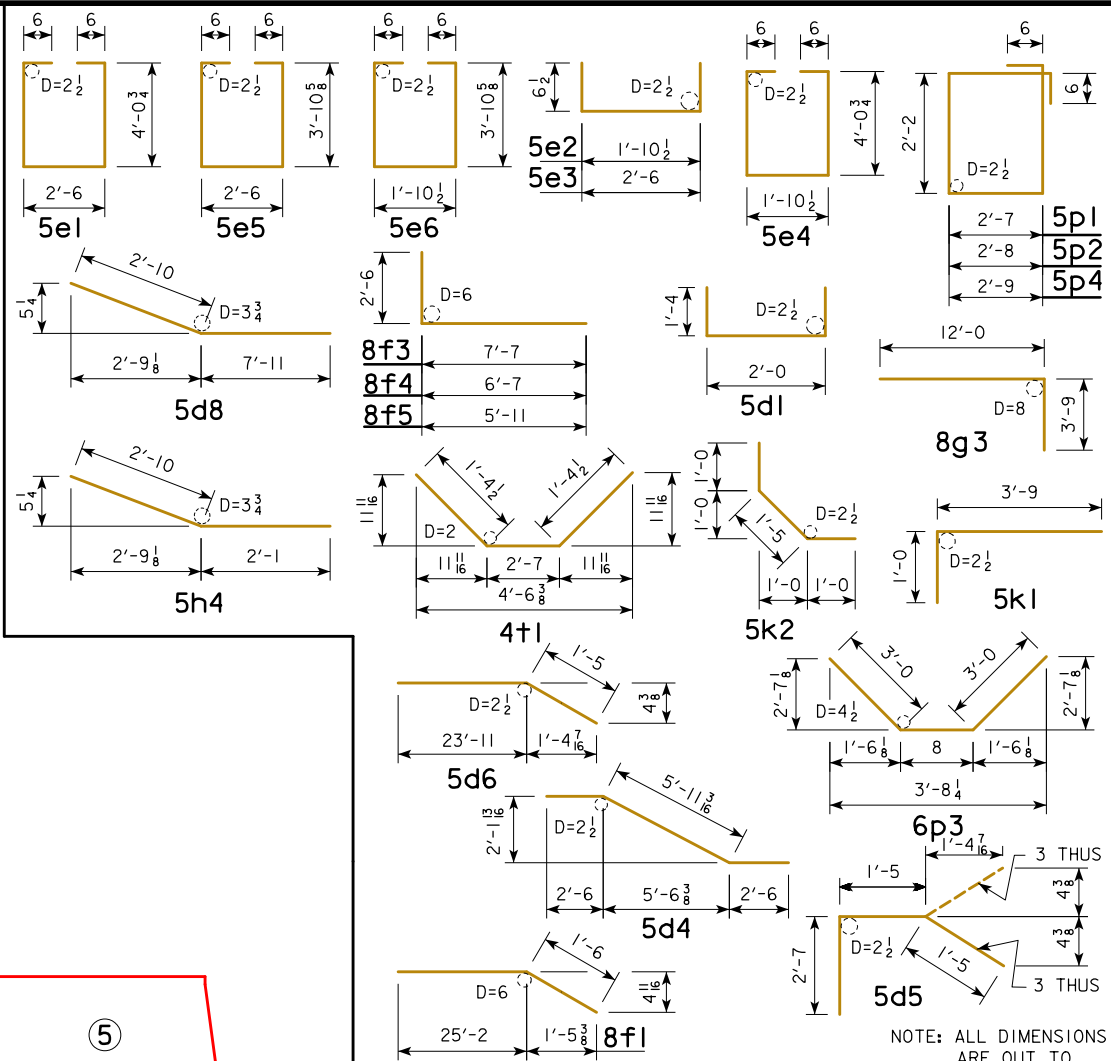


CONCRETE PLACEMENT AND LONGITUDINAL REINFORCING DIAGRAM

(NOT TO SCALE)

CONCRETE PLACEMENT DIAGRAM

NOTE: CONCRETE DECK SHALL BE PLACED IN SECTIONS AND SEQUENCES INDICATED. ALTERNATE PROCEDURES FOR PLACING DECK CONCRETE MAY BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF THE PROPOSED METHOD AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULTS. FOR APPROVED ALTERNATE PROCEDURES THE ENGINEER SHALL DETERMINE IF A RETARDING ADMIXTURE IS REQUIRED TO MAINTAIN PLASTICITY OF THE CONCRETE DECK DURING PLACEMENT.



BENT BAR DETAILS

CONCRETE PLACEMENT QUANTITIES

LOCATION	QUANTITY
SECTION 1, DECK & WEST ABUT. DIAPH. & WING EXT.	117.0
SECTION 2, DECK	73.5
SECTION 3, DECK	106.8
SECTION 4, DECK	99.6
SECTION 5, DECK & EAST ABUT. DIAPH.	122.6
SECTION 6, DECK & PIER 1 DIAPH.	50.9
SECTION 7, DECK & PIER 2 DIAPH.	52.3
SECTION 8, DECK & PIER 3 DIAPH.	51.9
SECTION 9, DECK & PIER 4 DIAPH.	51.9
TOTAL (CU. YDS.)	726.5

NOTES:
CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED ON THE SUMMARY QUANTITIES SHEET.
EAST ABUTMENT REINFORCING BARS ARE NOT INCLUDED IN THIS BAR LIST.

REINFORCING BAR LIST

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6a1	DECK TRANSV. TOP & BOTT.		1017	46'-10	71,540
6a2	DECK TRANSV. TOP ENDS		26	VARIES	906
6a3	DECK TRANSV. BOTT. ENDS		24	VARIES	838
5b1	DECK LONGIT. TOP & BOTT.		1358	37'-7	53,233
8b2	DECK LONGIT. TOP & BOTT. AT PIERS		396	27'-8	29,253
5b3	DECK LONGIT. BOTT. EAST ABUT.		43	5'-0	224
5d1	PIER DIAPH. ENDS		24	4'-8	117
5d2	PIER & WEST ABUT. DIAPH. LONGIT.		135	7'-5	1,044
5d3	PIER & WEST ABUT. DIAPH. LONGIT.		45	5'-5	254
5d4	PIER DIAPH. LONGIT.		20	11'-0	229
5d5	WEST ABUT. DIAPH. ENDS		6	5'-5	34
5d6	WEST ABUT. DIAPH. LONGIT. B.F.		8	25'-4	211
5d7	PAVING NOTCH LONGIT.		4	25'-4	106
5d8	WEST ABUT. DIAPH. WING EXT. LONGIT.		12	10'-9	135
5d9	WEST ABUT. DIAPH. WING EXT. LONGIT.		12	10'-8	134
5e1	FIXED PIER DIAPH. HOOPS		30	11'-8	365
5e2	PIER DIAPH. TIES ENDS		8	3'-0	25
5e3	PIER DIAPH. TIES		120	3'-7	448
5e4	FIXED PIER DIAPH. HOOPS ENDS		2	11'-0	23
5e5	EXPANSION PIER DIAPH. HOOPS		90	11'-4	1,064
5e6	EXPANSION PIER DIAPH. HOOPS ENDS		6	10'-8	67
8f1	WEST ABUT. FOOTING LONGIT. BOTH F.		18	26'-8	1,282
8f3	WEST ABUT. EXTENSION LONGIT.		8	10'-1	215
8f4	WEST ABUT. EXTENSION LONGIT.		4	9'-1	97
8f5	WEST ABUT. EXTENSION LONGIT.		4	8'-5	90
8g1	WEST ABUT. VERT. BOTH F.		83	7'-9	1,717
8g3	WEST ABUT. DIAPH. VERT. B.F.		43	15'-9	1,808
6g4	WEST ABUT. DIAPH. WING EXT. VERT.		20	6'-4	190
5h2	WEST ABUT. TO WING ANCHOR		6	4'-11	31
5h4	WEST ABUT. TO WING ANCHOR		6	4'-11	31
6j1	TOP OF DECK TRANSV. (AT RAIL)		1040	6'-3	9,763
5k1	WEST PAVING NOTCH		45	4'-9	223
5k2	WEST PAVING NOTCH		45	3'-5	160
5p1	WEST ABUT. HOOPS		94	10'-6	1,029
5p2	WEST ABUT. EXTENSION HOOPS		12	10'-8	134
6p3	WEST ABUT. BOTT. AT PILES		20	6'-8	200
5p4	WEST ABUT. HOOPS AT ENDS		4	10'-10	45
4+1	UNDER BEAMS AT WEST ABUTMENT		6	5'-4	21
REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)				177,286	
#2	PILE SPIRAL		12	38'-6	77
	SPIRAL SPACERS, L/8 x 7/8 x 1/8 x 0.70		36	1'-10	46
REINFORCING STEEL - TOTAL (LBS.)				123	

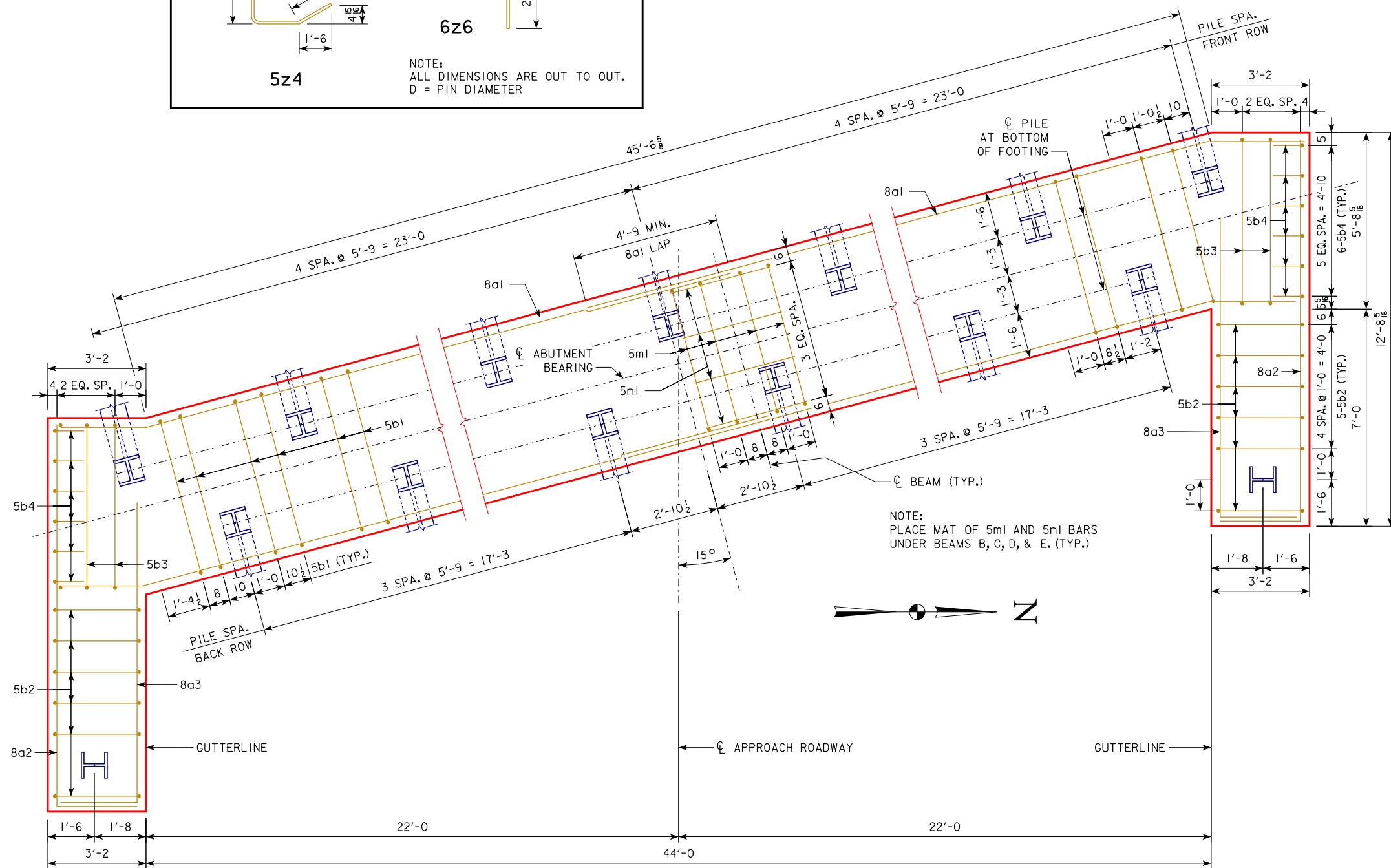
EPOXY COATED REINFORCING

NON-COATED

DESIGN FOR 15° SKEW R.A.
**498'-0 x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**
86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS
DECK, WEST ABUT. & DIAPH. QUANTITIES
STA. 208+07.00 (1A 3) DECEMBER, 2019
BUTLER COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 21 OF 48 FILE NO. 31394 DESIGN NO. 118

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

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



REINFORCING BAR LIST - EAST ABUTMENT

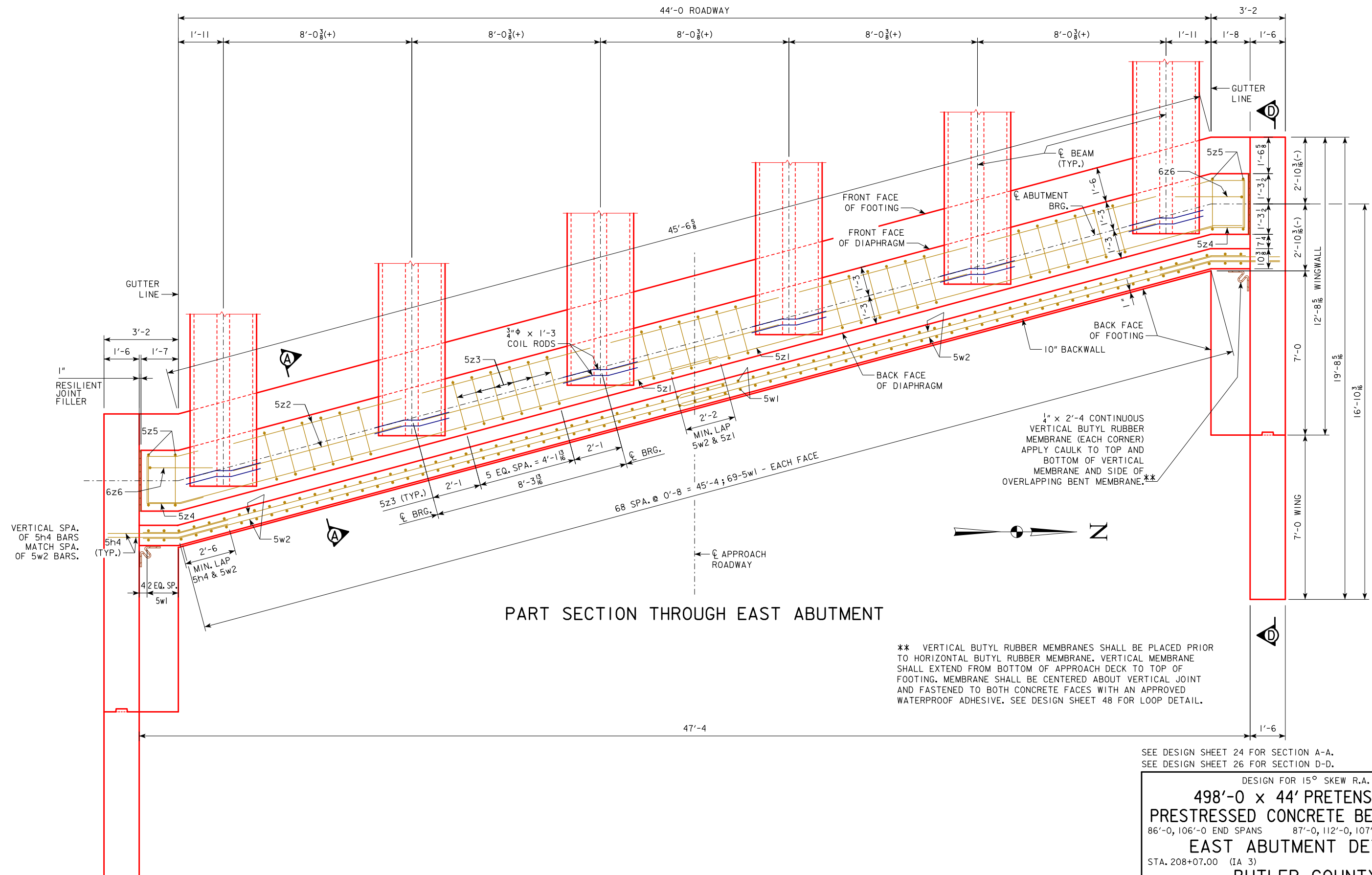
[illegible]

5z BARS TO BE PLACED WITH DECK REINFORCING STEEL.

LOCATION	EAST ABUT.	
FOOTING	51.4	
BACKWALL	6.1	
12.7' LONG WINGWALLS (2 @ 3.6)	7.2	
7.0' LONG WINGS (2 @ 3.1)	6.2	
TOTAL (C.Y.)	70.9	

NOTES:
CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED
ON THE SUMMARY QUANTITIES SHEET.
THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE LOCATION
OF ANCHOR BOLTS WITH THE FOOTING REINFORCING STEEL.
REINFORCING STEEL MAY BE SHIFTED SLIGHTLY TO PREVENT
INTERFERENCE WITH THE ANCHOR BOLTS. SEE DESIGN SHEET 28
FOR ANCHOR BOLT DETAILS.
DIMENSIONS SHOWN ON PILING LAYOUT ARE AT BOTTOM OF
FOOTING. BATTER PILES IN THE DIRECTION SHOWN.
19 - HPI0x57x85' STEEL BEARING PILING REQUIRED AT EAST
ABUTMENT.
SEE DESIGN SHEET 3 FOR PILE DRIVING NOTES.

DESIGN FOR 15° SKEW R.A.
498'-0" x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE
86'-0", 106'-0" END SPANS 87'-0", 112'-0", 107'-0" INTERIOR SPANS
EAST ABUTMENT FOOTING DETAILS
STA. 208+07.00 (IA 3) DECEMBER, 2019
BUTLER COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 22 OF 48 FILE NO. 31394 DESIGN NO. 118



** VERTICAL BUTYL RUBBER MEMBRANES SHALL BE PLACED PRIOR TO HORIZONTAL BUTYL RUBBER MEMBRANE. VERTICAL MEMBRANE SHALL EXTEND FROM BOTTOM OF APPROACH DECK TO TOP OF FOOTING. MEMBRANE SHALL BE CENTERED ABOUT VERTICAL JOINT AND FASTENED TO BOTH CONCRETE FACES WITH AN APPROVED WATERPROOF ADHESIVE. SEE DESIGN SHEET 48 FOR LOOP DETAIL.

SEE DESIGN SHEET 24 FOR SECTION A-A.
SEE DESIGN SHEET 26 FOR SECTION D-D.

DESIGN FOR 15° SKEW R.A.

**498'-0 x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**

86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS

EAST ABUTMENT DETAILS

STA. 208+07.00 (1A 3) DECEMBER, 2019

BUTLER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 23 OF 48 FILE NO. 31394 DESIGN NO. 118

44'-0" ROADWAY

1'-6" 1'-8" GUTTER LINE

CL APPROACH ROADWAY

TOP OF PAVING NOTCH - BOTTOM OF APPROACH SLAB

1'-1" 2"

TOP OF BACKWALL

PARALLEL

4'-0 3/4"

4'-0" LOW STEP

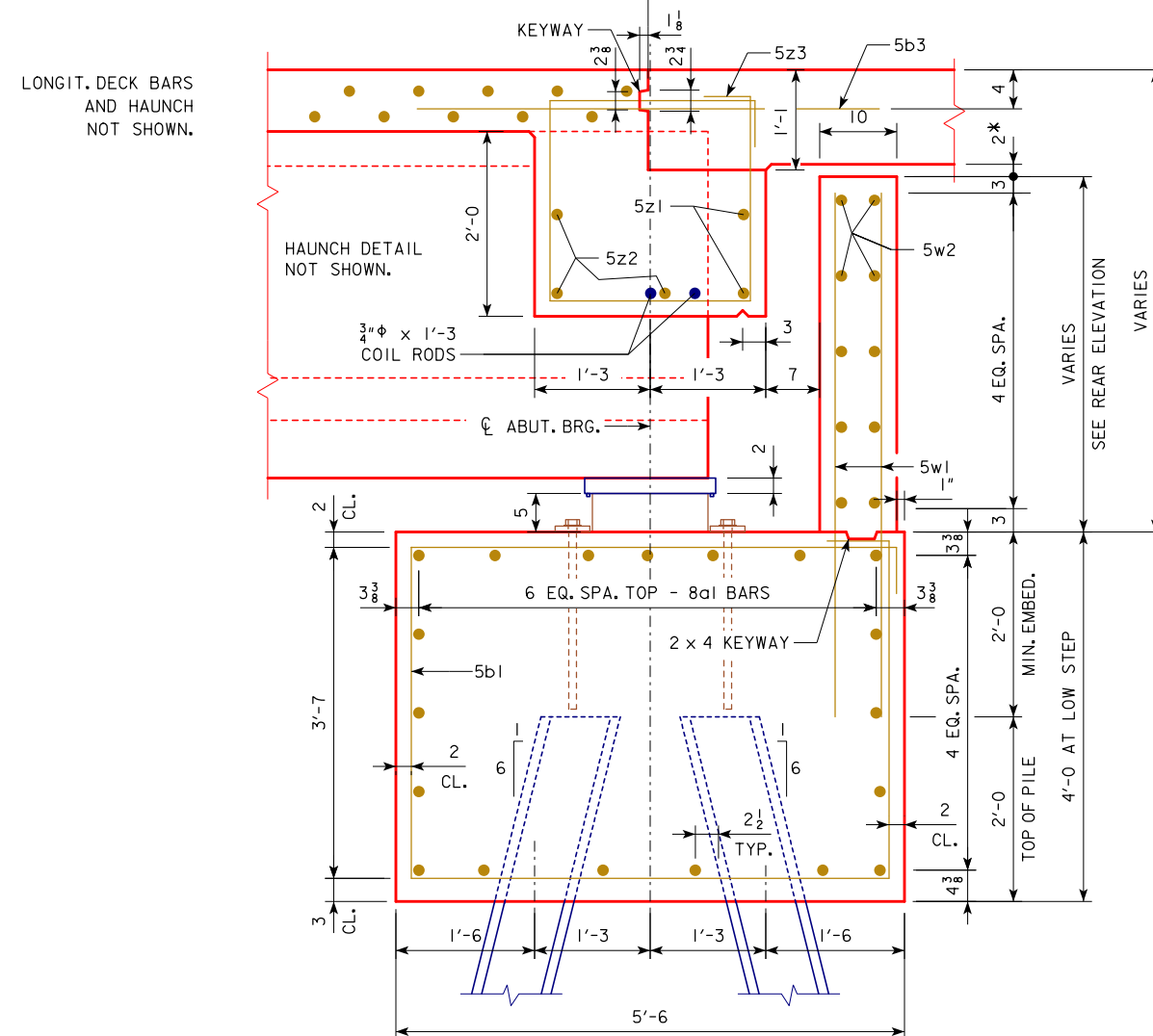
BOTT. OF FOOTING ELEV. (SEE TABLE)

3'-2"

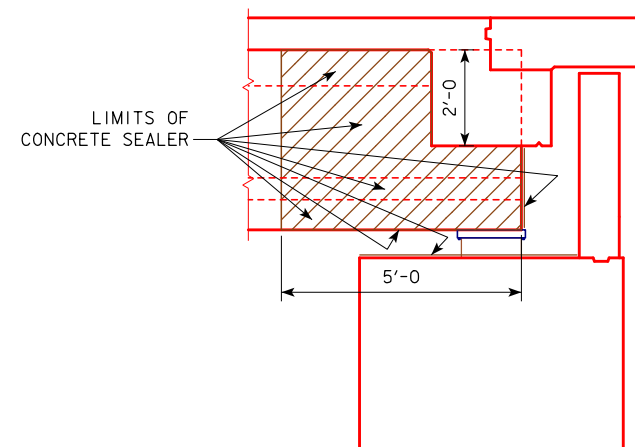
REAR ELEVATION

(NOT TO SCALE)

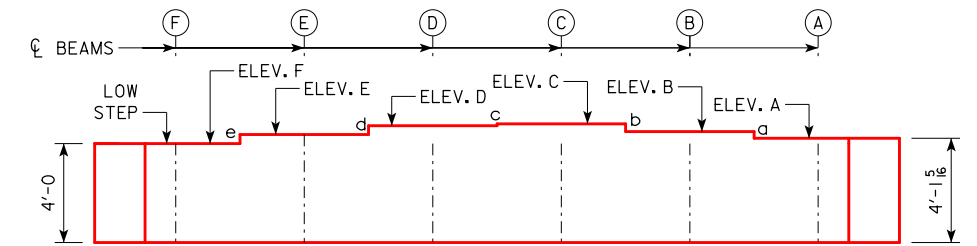
← BRIDGE DECK | APPROACH SLAB →



* - THE 2" GAP MAY INCREASE SLIGHTLY TO ACCOMODATE APPROACH SLAB FORMS.



CONCRETE SEALER LIMITS FOR PRESTRESSED BEAM



(REAR ELEVATION)

POINT	EAST ABUTMENT	
ELEV. A	974.33	
ELEV. B	974.47	
ELEV. C	974.61	
ELEV. D	974.59	
ELEV. E	974.41	
ELEV. F	974.22	
BOTT. FTG. ELEV.	970.22	

STEP	EAST ABUTMENT	
a	$1 \frac{11}{16}$	
b	$1 \frac{11}{16}$	
c	$\frac{1}{4}$	
d	$2 \frac{3}{16}$	
e	$2 \frac{3}{16}$	

DESIGN FOR 15° SKEW R.A.

**498'-0" x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**

86'-0", 106'-0" END SPANS 87'-0", 112'-0", 107'-0" INTERIOR SPANS

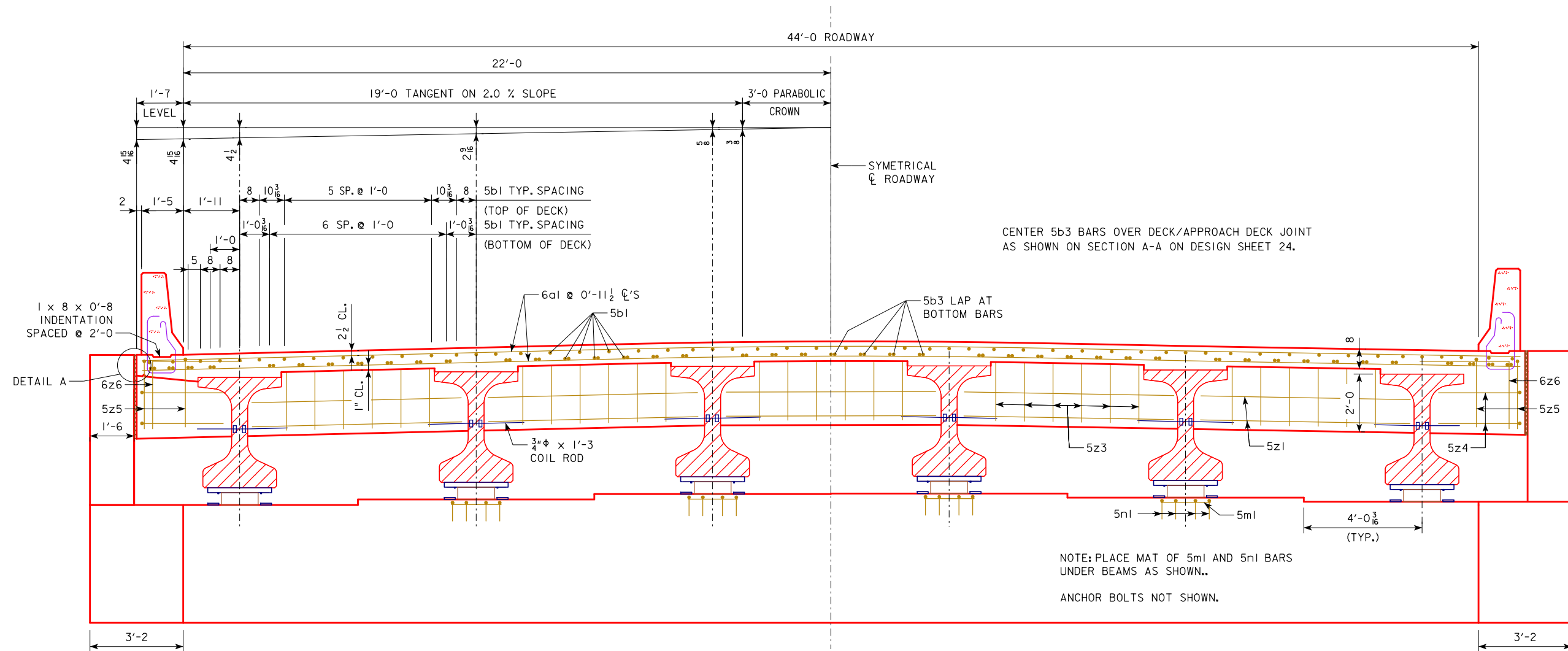
EAST ABUTMENT DETAILS

STA. 208+07.00 (IA 3) DECEMBER, 2019

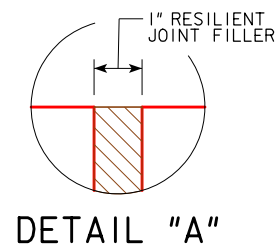
BUTLER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 24 OF 48 FILE NO. 31394 DESIGN NO. 118



EAST ABUTMENT SECTION
(FRONT FACE)



DESIGN FOR 15° SKEW R.A.

**498'-0 x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**

86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS

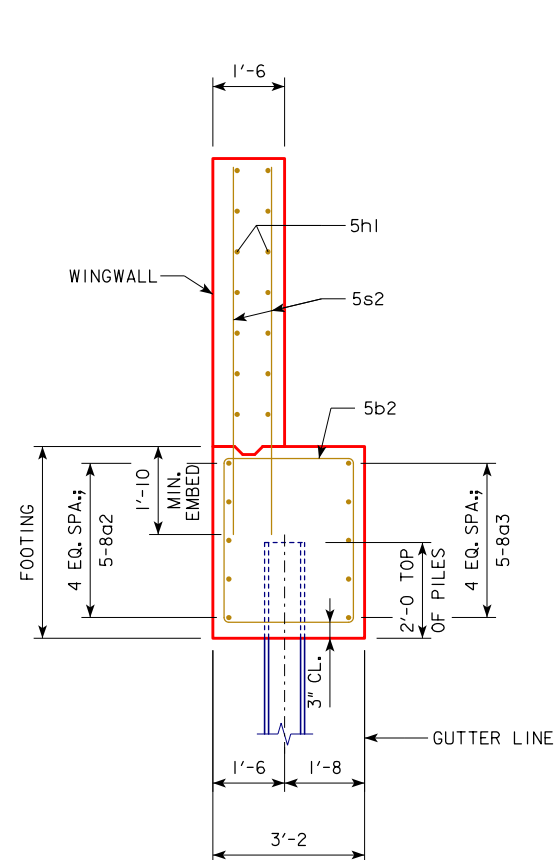
BRIDGE DECK CROSS SECTION

STA. 208+07.00 (IA 3) DECEMBER, 2019

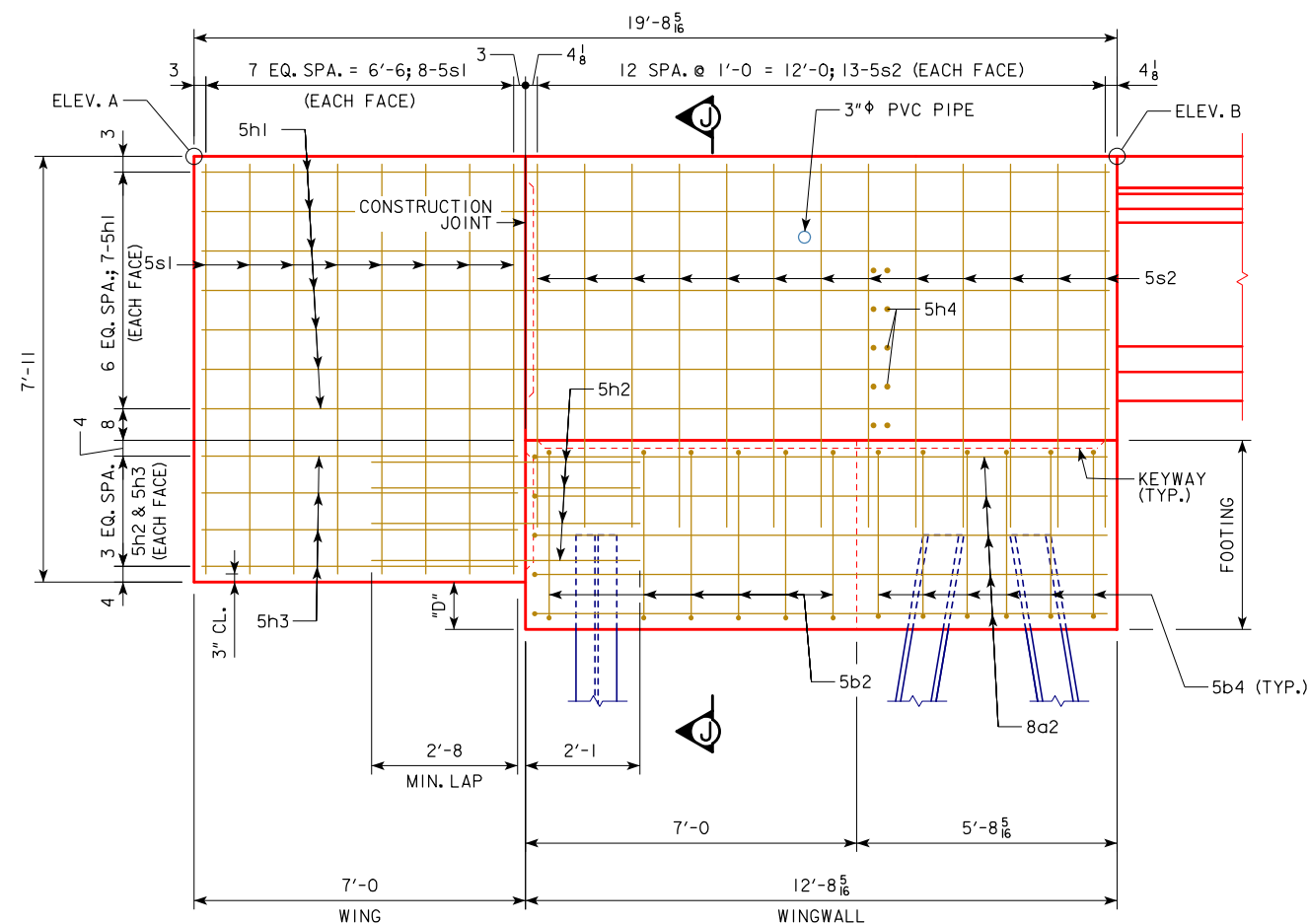
BUTLER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 25 OF 48 FILE NO. 31394 DESIGN NO. 118



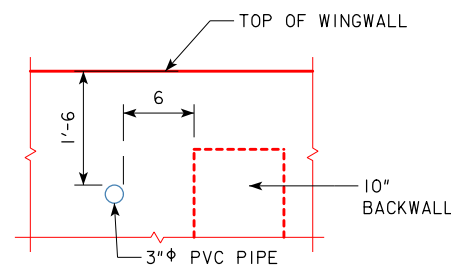
SECTION J-J



SECTION D-D

(FOOTING BARS 8a1 AND 5b1 NOT SHOWN FOR CLARITY.)

TABLE OF ELEVATIONS				
LOCATION	DIM. "D"	ELEV. A	ELEV. B	
NORTHEAST	1'-1 13/16	979.29	979.48	
SOUTHEAST	1'-0 1/4	979.16	979.37	



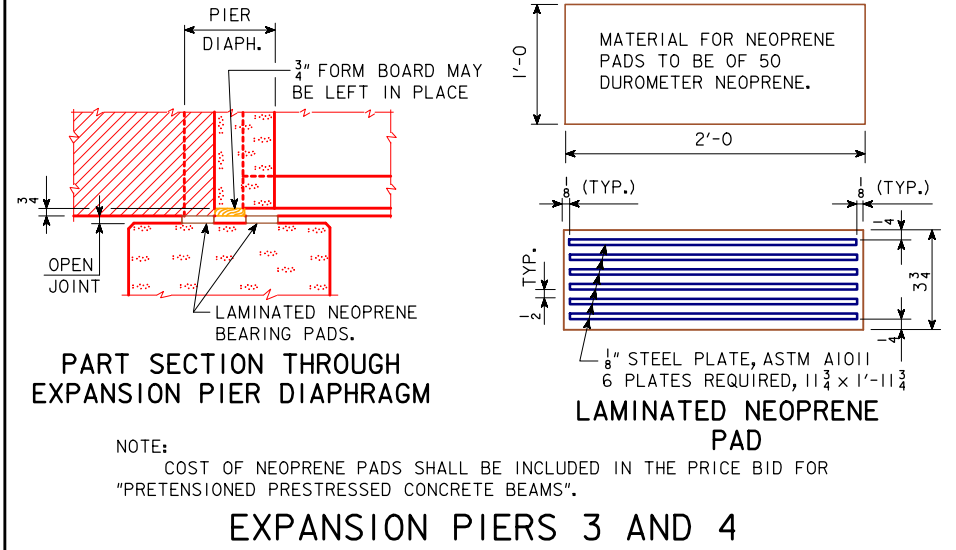
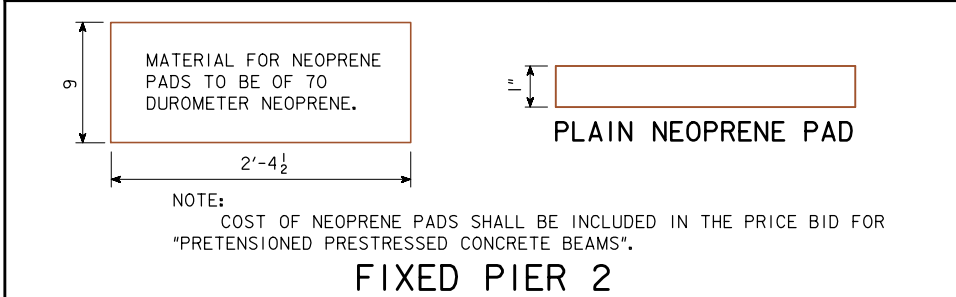
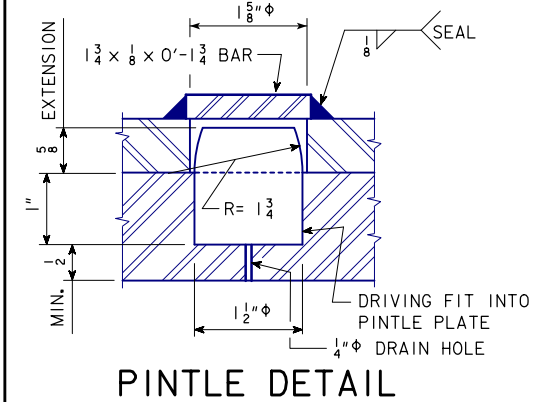
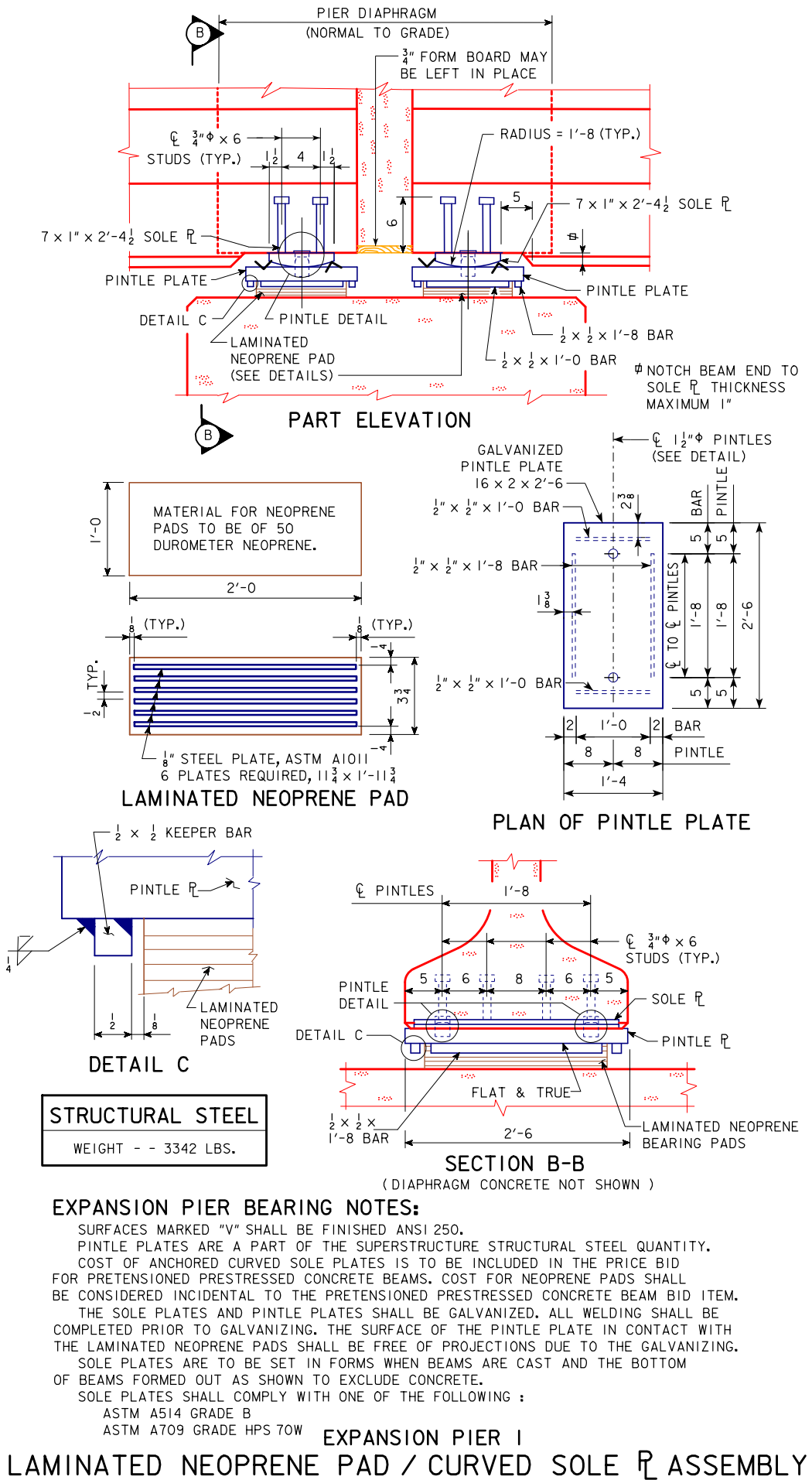
PVC PIPE LOCATION

NOTE:
PLUG 3" ϕ PVC PIPE WITH EXPANDING FOAM
PRIOR TO BACKFILLING BEHIND ABUTMENTS.

SEE DESIGN SHEET 23 FOR LOCATION OF SECTION D-D,
SEE DESIGN SHEETS 23 AND 24 FOR 5h4 BAR LOCATION.

DESIGN FOR 15° SKEW R.A.
**498'-0 x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**
86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS
EAST ABUTMENT DETAILS
STA. 208+07.00 (1A 3) DECEMBER, 2019
BUTLER COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 26 OF 48 FILE NO. 31394 DESIGN NO. 118

CORRECTION 04-14 - ADDED WEIGHT TABLE & TITLES/DESCRIPTIONS TO AGREE WITH SUMMARY QUANTITY SHEET. ADDED NOTE REFERRING TO SUMMARY QUANTITIES SHEET.
ENGLISHBEAMS.DGN - 4541H - THIS SHEET ISSUED 03-08.



NOTE: STRUCTURAL STEEL WEIGHT
IS INCLUDED ON THE
SUMMARY QUANTITIES SHEET.

DESIGN FOR 15° SKEW R.A.

498'-0 x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE

86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS

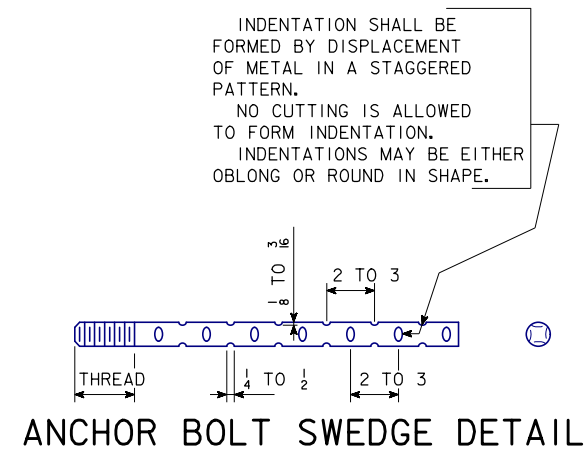
PIER BEARING DETAILS

STA. 208+07.00 (IA 3) DECEMBER, 2019

BUTLER COUNTY

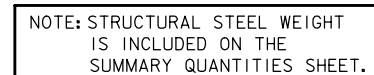
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 27 OF 48 FILE NO. 31394 DESIGN NO. 118



SURFACES MARKED "V" SHALL BE FINISHED ANSI 250.
PINTLE PLATES, RETAINER PLATES, SWEDGE ANCHOR BOLTS, NUTS AND WASHERS ARE A PART OF THE SUPERSTRUCTURE STRUCTURAL STEEL QUANTITY.
COST OF ANCHORED CURVED SOLE PLATES IS TO BE INCLUDED IN THE PRICE BID FOR PRETENSIONED PRESTRESSED CONCRETE BEAMS.
COST OF NEOPRENE BEARING PADS SHALL BE CONSIDERED INCIDENTAL TO THE BID ITEM FOR PRETENSIONED PRESTRESSED CONCRETE BEAMS.
SOLE PLATES ARE TO BE SET IN FORMS WHEN BEAMS ARE CAST AND THE BOTTOM OF BEAMS FORMED OUT AS SHOWN TO EXCLUDE CONCRETE.
SOLE PLATES SHALL COMPLY WITH ONE OF THE FOLLOWING:
ASTM A514 GRADE B
ASTM A709 GRADE HPS 70W
THE SOLE PLATES, PINTLE PLATES, KEEPER BARS, AND RETAINER PLATES SHALL BE GALVANIZED. WELDING SHALL BE COMPLETED PRIOR TO GALVANIZING. THE SURFACES OF THE PINTLE PLATE IN CONTACT WITH THE CURVED SOLE PLATE AND THE LAMINATED NEOPRENE PAD SHALL BE FREE OF PROJECTIONS DUE TO GALVANIZING.
KEEPER BARS, PINTLE PLATES AND RETAINER PLATES SHALL COMPLY WITH ASTM A709 GRADE 50.
SWEDGE ANCHOR BOLTS, NUTS AND WASHERS SHALL MEET THE REQUIREMENTS OF I.M. 453.08.
THE RETAINER PLATES SHALL BE FREE OF SHARP EDGES.
THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE LOCATION OF ANCHOR BOLTS WITH THE FOOTING REINFORCING STEEL. REINFORCING STEEL MAY BE SHIFTED SLIGHTLY TO PREVENT INTERFERENCE WITH THE ANCHOR BOLTS.

LAMINATED NEOPRENE PAD / CURVED SOLE PLATE ASSEMBLY



DESIGN FOR 15° SKEW R.A.

**498'-0 x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**

86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS

EAST ABUT. BEARING DETAILS

STA. 208+07.00 (IA 3) DECEMBER, 2019

BUTLER COUNTY

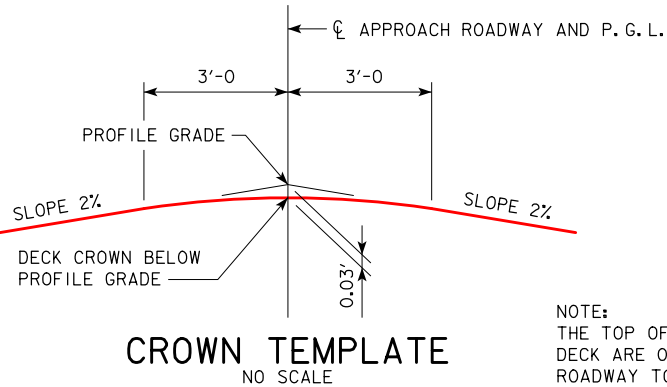
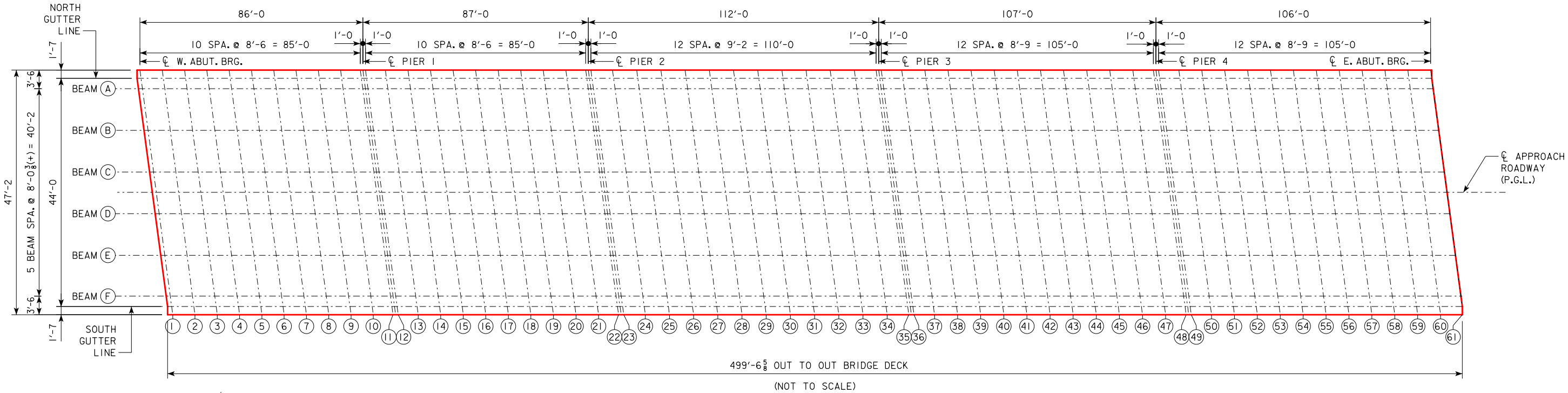
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 28 OF 48 FILE NO. 31394 DESIGN NO. 118

TOP OF DECK ELEVATIONS

LOCATION	C.L. W. ABUT. BRG.											C.L. PIER #1 BEARINGS												C.L. PIER #2 BEARINGS											
	LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6	LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12	LINE 13	LINE 14	LINE 15	LINE 16	LINE 17	LINE 18	LINE 19	LINE 20	LINE 21	LINE 22	LINE 23	LINE 24	LINE 25	LINE 26	LINE 27	LINE 28	LINE 29	LINE 30	LINE 31				
NORTH GUTTER LINE	977.75	977.87	977.99	978.11	978.22	978.34	978.46	978.58	978.69	978.80	978.90	978.93	979.03	979.12	979.21	979.30	979.39	979.47	979.55	979.62	979.69	979.76	979.77	979.84	979.90	979.96	980.01	980.06	980.10	980.14	980.18				
BEAM LINE A	977.79	977.91	978.03	978.15	978.27	978.39	978.51	978.62	978.73	978.84	978.94	978.97	979.07	979.16	979.26	979.34	979.43	979.51	979.59	979.66	979.73	979.80	979.81	979.88	979.94	980.00	980.05	980.10	980.14	980.18	980.21				
BEAM LINE B	977.98	978.10	978.22	978.34	978.46	978.58	978.70	978.81	978.92	979.03	979.13	979.16	979.25	979.35	979.44	979.53	979.61	979.69	979.77	979.84	979.91	979.97	979.99	980.05	980.11	980.17	980.22	980.27	980.31	980.35	980.38				
BEAM LINE C	978.17	978.29	978.41	978.53	978.65	978.77	978.89	979.00	979.11	979.22	979.32	979.34	979.44	979.53	979.62	979.71	979.79	979.87	979.95	980.02	980.09	980.15	980.17	980.23	980.29	980.34	980.39	980.44	980.48	980.52	980.55				
CL APPROACH RDWY (CROWN)	978.24	978.36	978.48	978.60	978.72	978.84	978.95	979.07	979.18	979.28	979.38	979.41	979.50	979.60	979.69	979.77	979.86	979.93	980.01	980.08	980.15	980.21	980.22	980.29	980.35	980.40	980.45	980.50	980.54	980.58	980.61				
BEAM LINE D	978.20	978.32	978.44	978.56	978.68	978.80	978.92	979.03	979.14	979.24	979.34	979.37	979.46	979.56	979.65	979.73	979.81	979.89	979.97	980.04	980.10	980.17	980.18	980.24	980.30	980.36	980.41	980.45	980.49	980.53	980.56				
BEAM LINE E	978.07	978.19	978.31	978.43	978.55	978.67	978.78	978.90	979.00	979.11	979.21	979.23	979.33	979.42	979.51	979.59	979.67	979.75	979.82	979.89	979.96	980.02	980.03	980.10	980.15	980.21	980.25	980.30	980.34	980.37	980.41				
BEAM LINE F	977.94	978.06	978.18	978.30	978.42	978.54	978.65	978.76	978.87	978.97	979.07	979.09	979.19	979.28	979.37	979.45	979.53	979.61	979.68	979.75	979.81	979.87	979.89	979.95	980.00	980.06	980.10	980.15	980.19	980.22	980.25				
SOUTH GUTTER LINE	977.91	978.03	978.15	978.27	978.39	978.51	978.62	978.73	978.84	978.94	979.04	979.06	979.16	979.25	979.34	979.42	979.50	979.58	979.65	979.72	979.78	979.84	979.85	979.92	979.97	980.02	980.07	980.11	980.15	980.19	980.22				

LOCATION				C.L. PIER #3 BEARINGS													C.L. PIER #4 BEARINGS													C.L. E. ABUT. BRG.
	LINE 32	LINE 33	LINE 34	LINE 35	LINE 36	LINE 37	LINE 38	LINE 39	LINE 40	LINE 41	LINE 42	LINE 43	LINE 44	LINE 45	LINE 46	LINE 47	LINE 48	LINE 49	LINE 50	LINE 51	LINE 52	LINE 53	LINE 54	LINE 55	LINE 56	LINE 57	LINE 58	LINE 59	LINE 60	LINE 61
NORTH GUTTER LINE	980.21	980.23	980.26	980.27	980.28	980.29	980.30	980.30	980.30	980.30	980.29	980.28	980.26	980.24	980.22	980.19	980.16	980.15	980.12	980.08	980.03	979.98	979.93	979.87	979.81	979.75	979.68	979.61	979.53	979.45
BEAM LINE A	980.25	980.27	980.29	980.31	980.32	980.33	980.34	980.34	980.34	980.34	980.33	980.32	980.30	980.28	980.26	980.23	980.20	980.19	980.15	980.11	980.07	980.02	979.96	979.91	979.85	979.78	979.71	979.64	979.56	979.48
BEAM LINE B	980.41	980.44	980.46	980.48	980.48	980.49	980.50	980.50	980.50	980.49	980.49	980.47	980.46	980.44	980.41	980.38	980.35	980.34	980.30	980.26	980.22	980.17	980.11	980.05	979.99	979.93	979.86	979.78	979.71	979.63
BEAM LINE C	980.58	980.61	980.63	980.64	980.64	980.65	980.66	980.66	980.66	980.65	980.64	980.63	980.61	980.59	980.57	980.54	980.50	980.49	980.45	980.41	980.37	980.31	980.26	980.20	980.14	980.07	980.00	979.93	979.85	979.77
CL APPROACH RDWY (CROWN)	980.64	980.66	980.68	980.70	980.70	980.71	980.71	980.71	980.71	980.71	980.70	980.68	980.66	980.64	980.61	980.58	980.55	980.54	980.50	980.46	980.41	980.36	980.30	980.25	980.18	980.12	980.04	979.97	979.89	979.81
BEAM LINE D	980.59	980.61	980.63	980.64	980.65	980.66	980.66	980.66	980.66	980.65	980.64	980.63	980.61	980.59	980.56	980.53	980.49	980.48	980.44	980.40	980.35	980.30	980.25	980.19	980.12	980.06	979.98	979.91	979.83	979.75
BEAM LINE E	980.43	980.45	980.47	980.49	980.49	980.50	980.50	980.50	980.50	980.49	980.48	980.46	980.44	980.42	980.39	980.36	980.32	980.31	980.27	980.23	980.18	980.13	980.07	980.01	979.94	979.88	979.80	979.73	979.65	979.56
BEAM LINE F	980.28	980.30	980.31	980.33	980.33	980.34	980.34	980.34	980.33	980.32	980.31	980.30	980.27	980.25	980.22	980.19	980.15	980.14	980.10	980.05	980.01	979.95	979.89	979.83	979.77	979.70	979.62	979.55	979.47	979.38
SOUTH GUTTER LINE	980.24	980.26	980.28	980.29	980.29	980.30	980.30	980.30	980.30	980.29	980.27	980.26	980.24	980.21	980.18	980.15	980.11	980.10	980.06	980.02	979.97	979.91	979.85	979.79	979.73	979.66	979.58	979.51	979.42	979.34



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

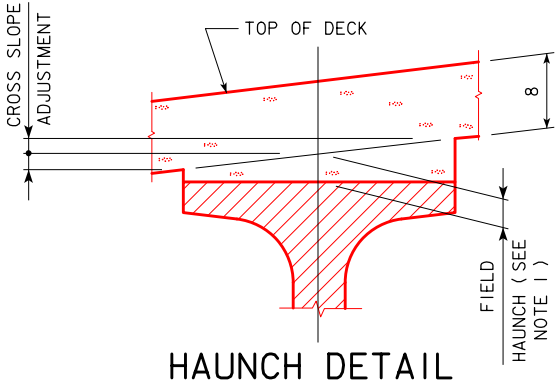


DESIGN FOR 15° SKEW R.A.
**498'-0" x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**
86'-0", 106'-0" END SPANS 87'-0", 112'-0", 107'-0" INTERIOR SPANS
TOP OF DECK ELEVATIONS
STA. 208+07.00 (IA 3) DECEMBER, 2019
BUTLER COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 29 OF 48 FILE NO. 31394 DESIGN NO. 118

TABLE OF BEAM LINE HAUNCH ELEVATIONS																																
LOCATION	C.L. W. ABUT. BRG.										C.L. PIER #1 BEARINGS											C.L. PIER #2 BEARINGS										
	LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6	LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12	LINE 13	LINE 14	LINE 15	LINE 16	LINE 17	LINE 18	LINE 19	LINE 20	LINE 21	LINE 22	LINE 23	LINE 24	LINE 25	LINE 26	LINE 27	LINE 28	LINE 29	LINE 30	LINE 31	
BEAM LINE A	977.12	977.28	977.43	977.57	977.71	977.83	977.94	978.04	978.13	978.21	978.28	978.30	978.43	978.56	978.67	978.78	978.87	978.94	979.01	979.06	979.10	979.13	979.14	979.28	979.40	979.51	979.61	979.68	979.74	979.77	979.78	
BEAM LINE B	977.32	977.47	977.62	977.76	977.90	978.02	978.13	978.23	978.32	978.40	978.47	978.49	978.62	978.74	978.86	978.96	979.05	979.12	979.19	979.24	979.27	979.31	979.32	979.46	979.58	979.69	979.78	979.85	979.91	979.94	979.94	
BEAM LINE C	977.51	977.66	977.81	977.95	978.09	978.21	978.33	978.42	978.51	978.58	978.65	978.68	978.81	978.93	979.04	979.14	979.23	979.31	979.37	979.41	979.45	979.48	979.50	979.63	979.75	979.86	979.95	980.03	980.08	980.11	980.11	
BEAM LINE D	977.54	977.69	977.84	977.98	978.12	978.24	978.35	978.45	978.54	978.61	978.68	978.70	978.83	978.95	979.06	979.16	979.25	979.32	979.38	979.43	979.47	979.50	979.51	979.65	979.77	979.88	979.97	980.04	980.09	980.11	980.12	
BEAM LINE E	977.41	977.56	977.71	977.85	977.99	978.11	978.22	978.32	978.40	978.48	978.54	978.56	978.69	978.81	978.93	979.02	979.11	979.18	979.24	979.29	979.32	979.35	979.37	979.50	979.62	979.73	979.82	979.89	979.93	979.96	979.97	
BEAM LINE F	977.28	977.43	977.58	977.72	977.86	977.98	978.09	978.18	978.27	978.34	978.40	978.43	978.56	978.68	978.79	978.88	978.97	979.04	979.10	979.14	979.18	979.21	979.22	979.35	979.47	979.58	979.66	979.73	979.78	979.81	979.81	

MISCELLANEOUS DATA TABLE

		BEAM LINE	℄ W. ABUT. BRG.									℄ PIER NO. 1 BEARINGS												℄ PIER NO. 2 BEARINGS										
			LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6	LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12	LINE 13	LINE 14	LINE 15	LINE 16	LINE 17	LINE 18	LINE 19	LINE 20	LINE 21	LINE 22	LINE 23	LINE 24	LINE 25	LINE 26	LINE 27	LINE 28	LINE 29	LINE 30	LINE 31	
ANTICIPATED DEFLECTION DUE TO DECK (IN.)		ALL	0	$\frac{7}{16}$	$\frac{13}{16}$	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{1}{4}$	$\frac{1}{16}$	$\frac{13}{16}$	$\frac{7}{16}$	0	0	$\frac{3}{8}$	$\frac{3}{4}$	1	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{1}{16}$	1	$\frac{3}{4}$	$\frac{3}{8}$	0	0	$\frac{13}{16}$	$\frac{9}{16}$	$2\frac{1}{4}$	$2\frac{3}{4}$	$3\frac{1}{16}$	$3\frac{1}{8}$	$3\frac{1}{16}$	$2\frac{3}{4}$	
CROSS SLOPE ADJUSTMENTS (IN.)		ALL	$\frac{3}{8}$																															
ALLOWABLE FIELD HAUNCH (IN. & FT.)	MAX.	ALL	$2\frac{1}{2}$ (0.208)																															
	MIN.	ALL	$-\frac{1}{8}$ (-0.01)																															



HAUNCH DETAIL

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

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

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

SHEET 1 OF 2

DESIGN FOR 15° SKEW R.A.

498'-0 x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE

86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS

DECK HAUNCH DATA DETAILS

STA. 208+07.00 (1A 3) DECEMBER, 2019

BUTLER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 30 OF 48 FILE NO. 31394 DESIGN NO. 118

TABLE OF BEAM LINE HAUNCH ELEVATIONS																														
LOCATION				C.L. PIER #3 BEARINGS														C.L. PIER #4 BEARINGS												C.L. E. ABUT. BRG.
	LINE 32	LINE 33	LINE 34	LINE 35	LINE 36	LINE 37	LINE 38	LINE 39	LINE 40	LINE 41	LINE 42	LINE 43	LINE 44	LINE 45	LINE 46	LINE 47	LINE 48	LINE 49	LINE 50	LINE 51	LINE 52	LINE 53	LINE 54	LINE 55	LINE 56	LINE 57	LINE 58	LINE 59	LINE 60	LINE 61
BEAM LINE A	979.77	979.74	979.70	979.65	979.65	979.72	979.78	979.83	979.87	979.89	979.89	979.87	979.83	979.77	979.70	979.62	979.53	979.52	979.55	979.56	979.57	979.56	979.53	979.48	979.41	979.32	979.22	979.10	978.96	978.82
BEAM LINE B	979.93	979.90	979.86	979.81	979.81	979.88	979.95	980.00	980.03	980.05	980.05	980.03	979.99	979.93	979.86	979.77	979.68	979.67	979.70	979.72	979.72	979.71	979.68	979.63	979.56	979.47	979.36	979.24	979.10	978.96
BEAM LINE C	980.10	980.07	980.03	979.98	979.98	980.05	980.11	980.16	980.19	980.21	980.20	980.18	980.14	980.09	980.01	979.93	979.83	979.83	979.85	979.87	979.87	979.86	979.82	979.77	979.70	979.61	979.51	979.38	979.24	979.10
BEAM LINE D	980.11	980.08	980.03	979.98	979.98	980.05	980.11	980.16	980.19	980.20	980.20	980.18	980.14	980.08	980.01	979.92	979.83	979.82	979.84	979.86	979.86	979.84	979.81	979.76	979.69	979.60	979.49	979.36	979.22	979.08
BEAM LINE E	979.95	979.92	979.87	979.82	979.82	979.89	979.95	980.00	980.03	980.04	980.04	980.01	979.97	979.91	979.84	979.75	979.66	979.65	979.67	979.68	979.68	979.67	979.63	979.58	979.51	979.42	979.31	979.18	979.04	978.90
BEAM LINE F	979.80	979.76	979.72	979.66	979.66	979.73	979.79	979.83	979.86	979.88	979.87	979.85	979.80	979.74	979.67	979.58	979.48	979.48	979.50	979.51	979.51	979.49	979.46	979.41	979.33	979.24	979.13	979.00	978.86	978.71

MISCELLANEOUS DATA TABLE																															
	BEAM LINE				℄ PIER NO. 3 BEARINGS													℄ PIER NO. 4 BEARINGS													℄ E. ABUT. BRG.
		LINE 32	LINE 33	LINE 34	LINE 35	LINE 36	LINE 37	LINE 38	LINE 39	LINE 40	LINE 41	LINE 42	LINE 43	LINE 44	LINE 45	LINE 46	LINE 47	LINE 48	LINE 49	LINE 50	LINE 51	LINE 52	LINE 53	LINE 54	LINE 55	LINE 56	LINE 57	LINE 58	LINE 59	LINE 60	LINE 61
ANTICIPATED DEFLECTION DUE TO DECK (IN.)	ALL	2 ¹ ₄	1 ⁹ ₁₆	1 ³ ₁₆	0	0	1 ¹ ₁₆	1 ³ ₈	1 ¹⁵ ₁₆	2 ³ ₈	2 ⁵ ₈	2 ¹¹ ₁₆	2 ⁵ ₈	2 ³ ₈	1 ¹⁵ ₁₆	1 ³ ₈	1 ¹ ₁₆	0	0	3 ³ ₄	1 ⁷ ₁₆	2 ¹ ₁₆	2 ¹ ₂	2 ³ ₄	2 ⁷ ₈	2 ³ ₄	2 ¹ ₂	2 ¹ ₁₆	1 ⁷ ₁₆	3 ³ ₄	0
CROSS SLOPE ADJUSTMENTS (IN.)	ALL	3 ³ ₈																													
ALLOWABLE FIELD HAUNCH (IN. & FT.)	MAX.	ALL	2 ¹ ₂ (0.208)																												
	MIN.	ALL	-1 ¹ ₈ (-0.01)																												

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

DESIGN FOR 15° SKEW R.A.

498'-0 x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE

86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS

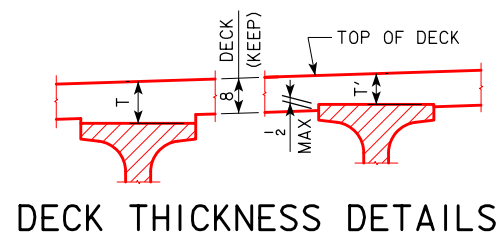
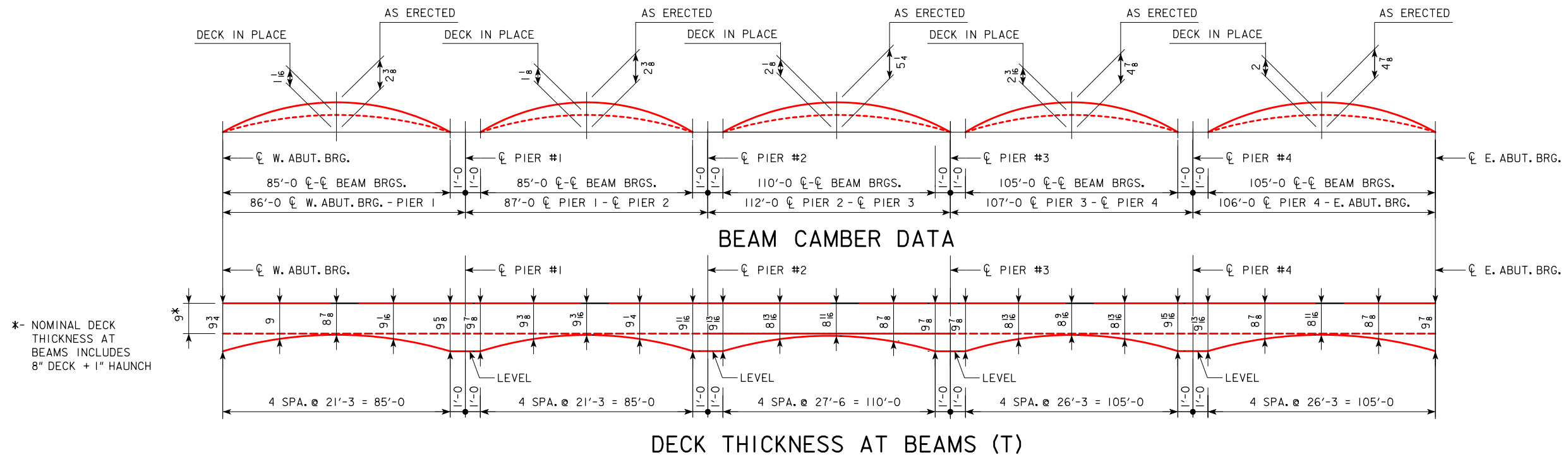
DECK HAUNCH DATA DETAILS

STA. 208+07.00 (1A 3) DECEMBER, 2019

BUTLER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 31 OF 48 FILE NO. 31394 DESIGN NO. 118



NOTE: THE DECK THICKNESS (T) AT BEAMS IS BASED ON THE ANTICIPATED BEAM CAMBER AND DEFLECTIONS. THESE VALUES ARE USED BY THE DESIGNER TO SET BEAM ELEVATIONS AND ESTIMATE CONCRETE QUANTITIES. REFER TO THE HAUNCH DATA DETAILS SHEET FOR ADDITIONAL INFORMATION TO AID THE CONTRACTOR IN SETTING THE FIELD HAUNCHES REQUIRED FOR CONSTRUCTION.

DESIGN FOR 15° SKEW R.A.

**498'-0 x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**

86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS

DECK THICKNESS DETAILS

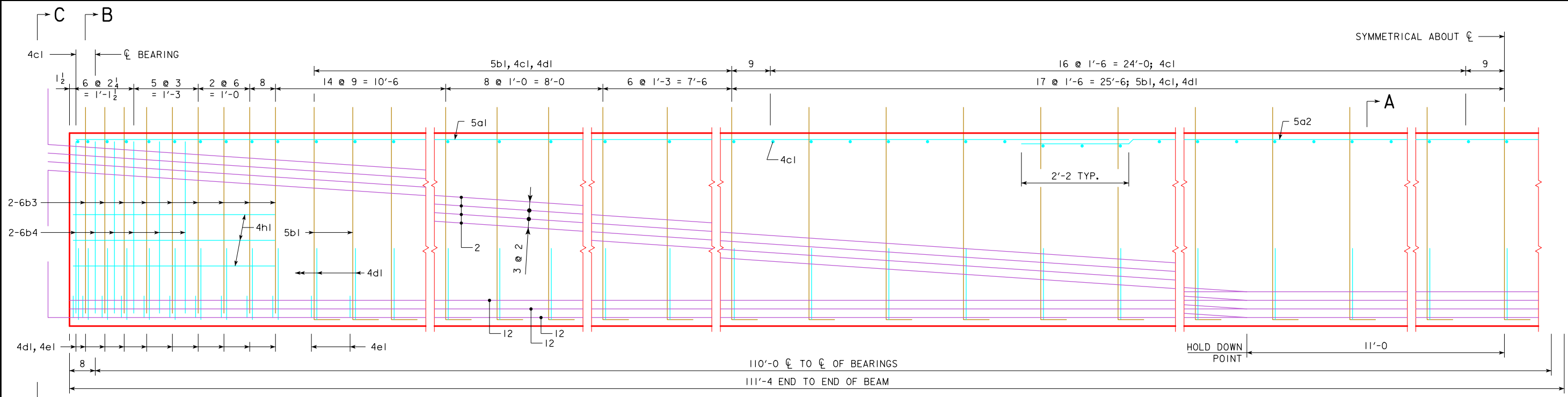
STA. 208+07.00 (1A 3) DECEMBER, 2019

BUTLER COUNTY

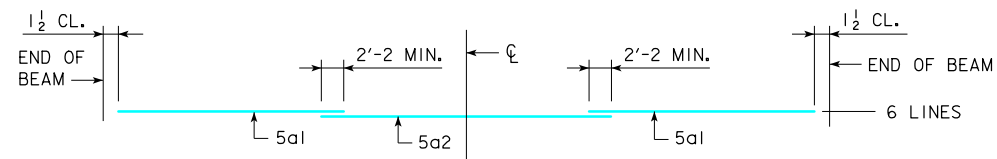
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 32 OF 48 FILE NO. 31394 DESIGN NO. 118

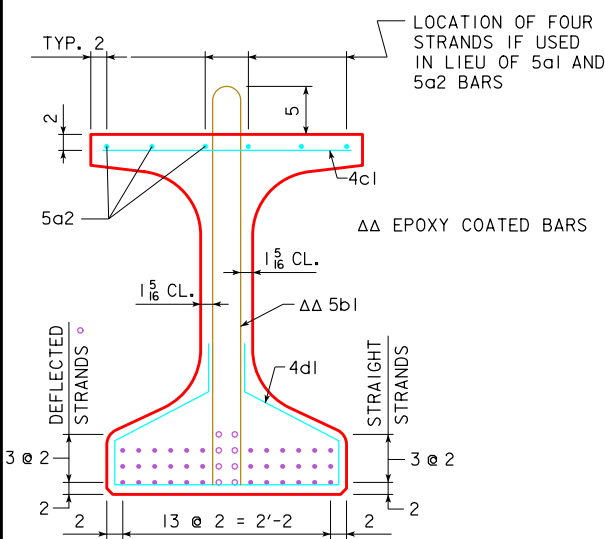
REVISED 10-07 - 5b2 BAR DELETED. 5b1 BAR LENGTHENED TO EXTEND 5 INCHES ABOVE BEAM TOP. ALTERNATE SECTION A-A ADDED.
ENGLISHBEAMS.DGN 4717 - THIS SHEET ISSUED 05-04.



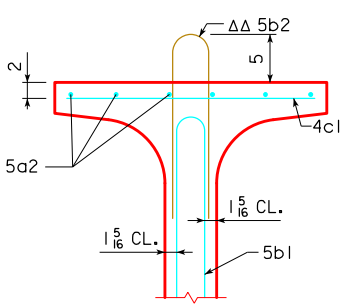
BTC110



TOP FLANGE LONGITUDINAL BAR LAYOUT

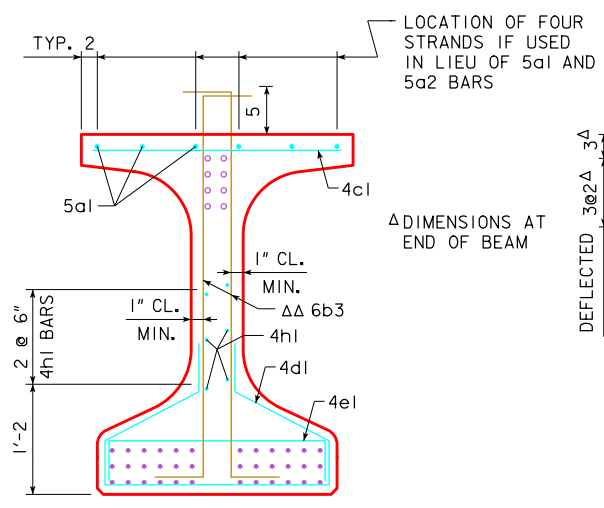


SECTION A-A

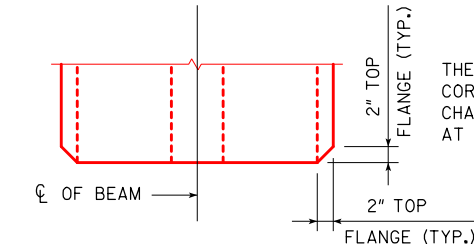


SECTION A-A
(ALTERNATE)

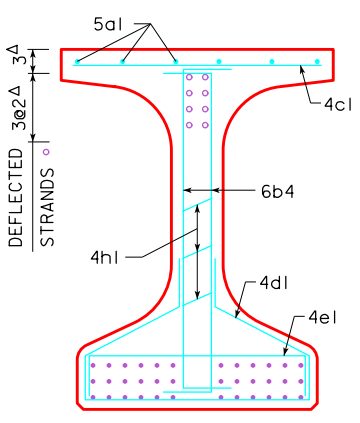
SEE ALTERNATE BAR NOTE ON
DESIGN SHEET 33.



SECTION B-B

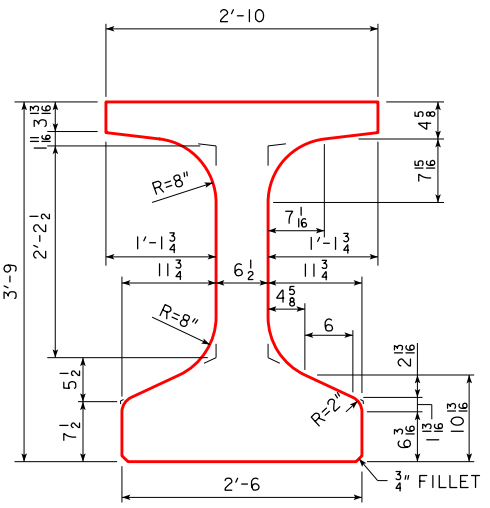


TOP VIEW



SECTION C-C

THE TOP FLANGE BEAM
CORNERS ARE TO BE
CHAMFERED 2" AS SHOWN
AT BOTH ENDS OF THE BEAM



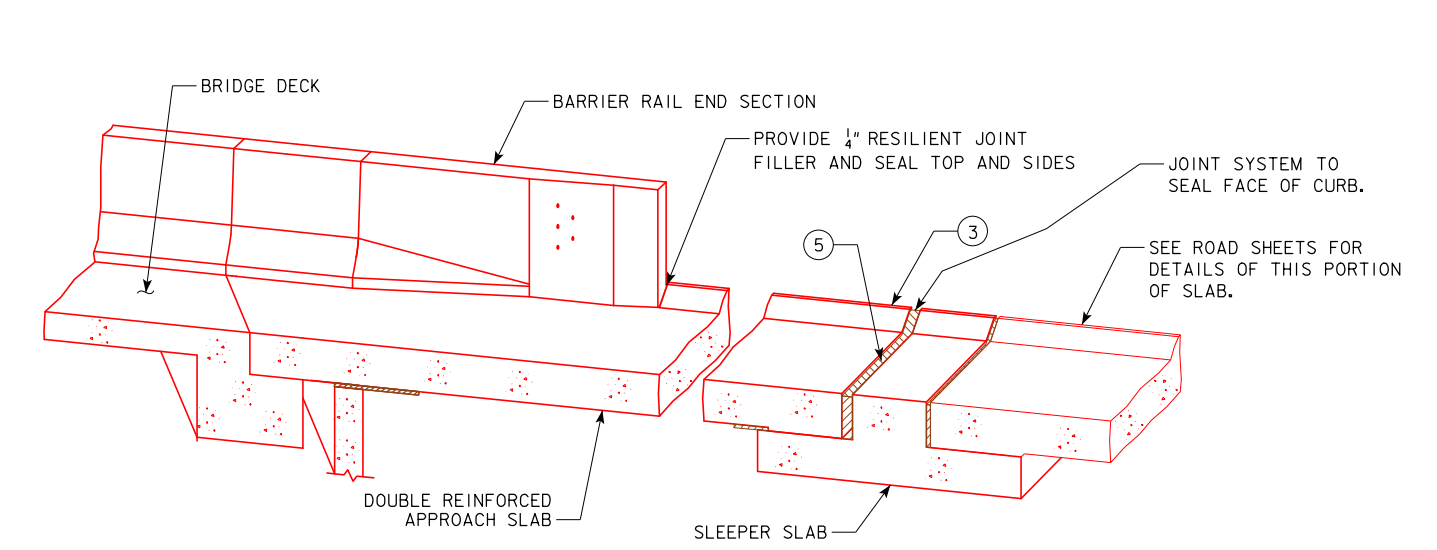
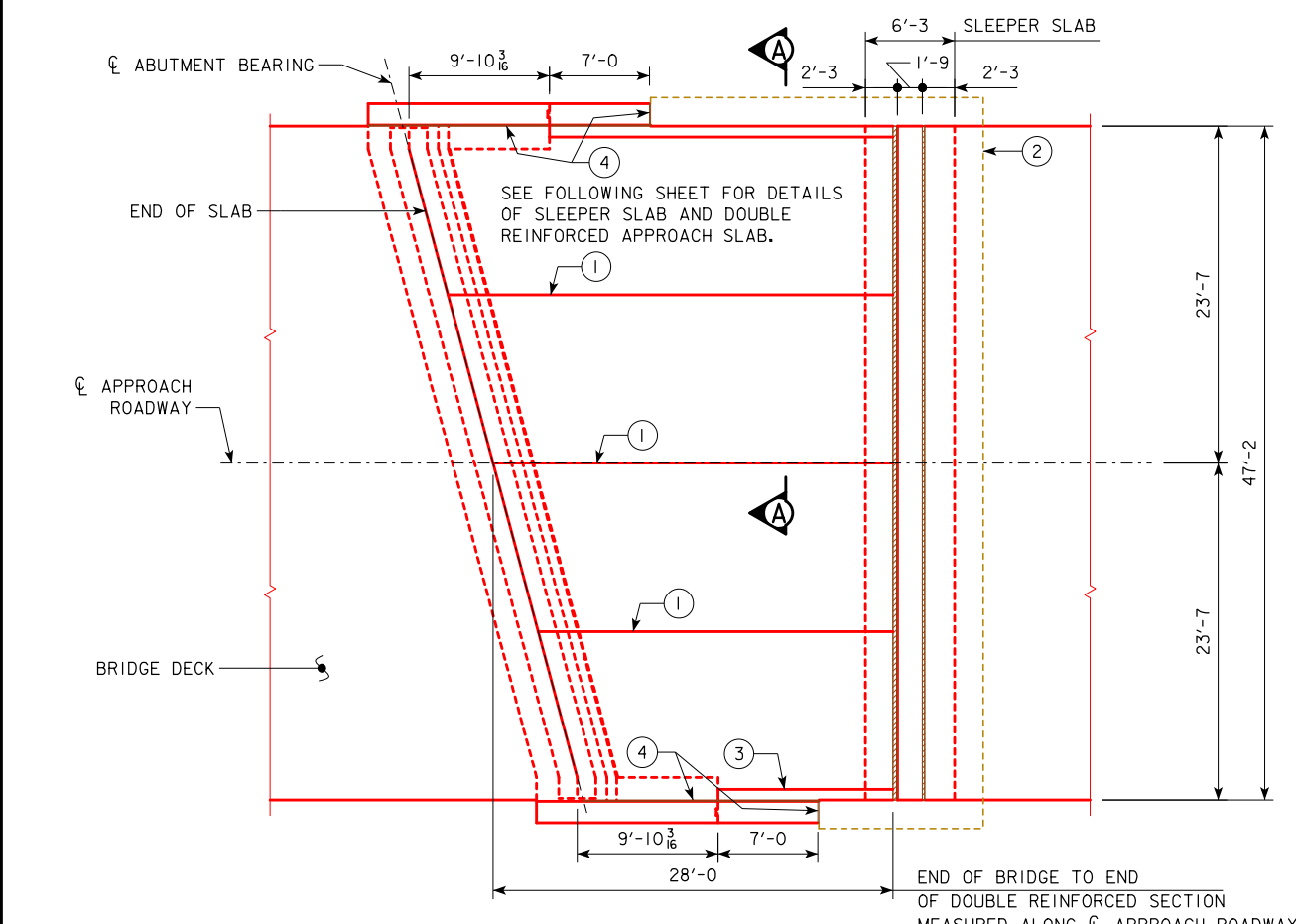
BEAM SECTION
PROPERTIES

BTC BEAM CROSS
SECTION

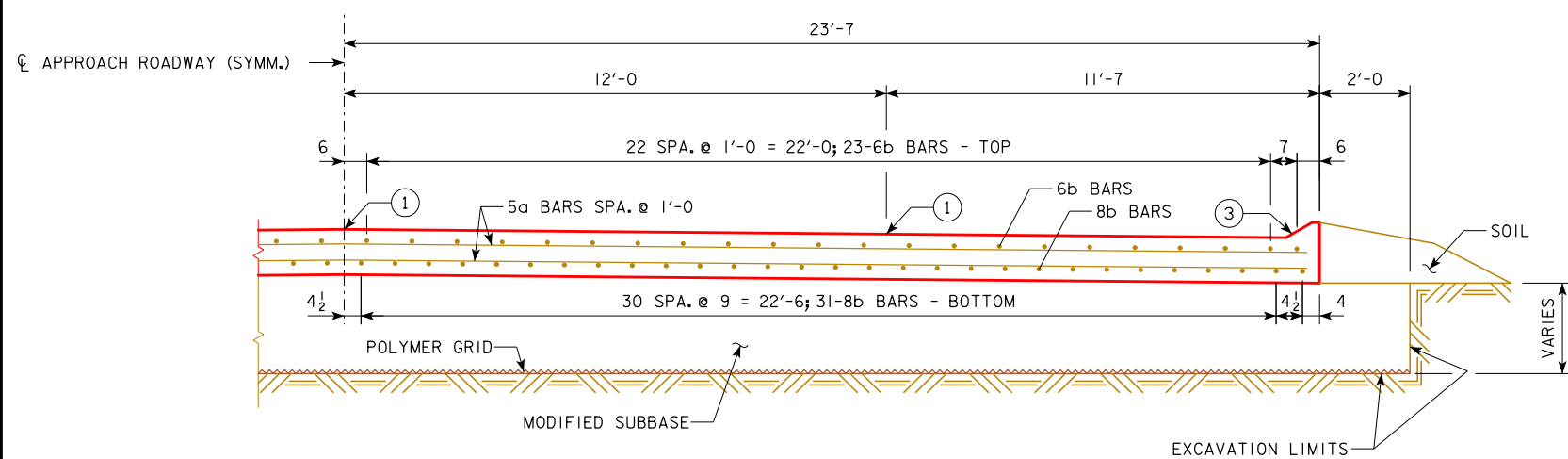
AREA = 691.8 in²
 $\bar{y}_b = 20.74$ in.
I = 178,971 in⁴

DESIGN FOR 15° SKEW R.A.
**498'-0 x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**
86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS
BTC110 BEAM DETAILS
STA. 208+07.00 (1A 3) DECEMBER, 2019
BUTLER COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 36 OF 48 FILE NO. 31394 DESIGN NO. 118

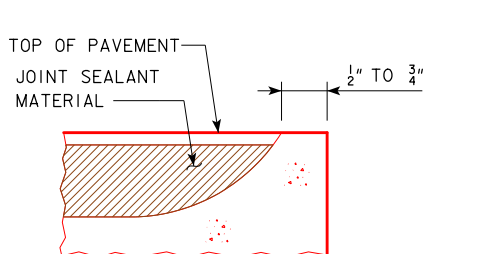
BULB TEE "C" BEAM INTERMEDIATE DIAPHRAGM STRUCTURAL STEEL			
ONE BEAM CONNECTION (DETAIL "F")			WEIGHT
		NO. OF BEAM CONNECTIONS	
2 - $\frac{7}{8}" \phi \times 9\frac{1}{4}"$ H.S. BOLTS WITH NUTS & WASHERS = 4.8 LBS.		50	240
ONE DETAIL "F"	1 - BACKING PL $6 \times \frac{3}{8} \times 1'-1\frac{3}{8}"$ = 8.5 LBS.	50	425
	1 - BENT PL $9 \times 6 \times \frac{1}{2} \times 1'-1\frac{3}{8}"$ = 28.5 LBS.	50	1425
ONE DIAPHRAGM			
		NUMBER OF DIAPHRAGMS	
8 - $\frac{7}{8}" \phi \times 2\frac{3}{4}"$ H.S.BOLTS WITH NUTS & WASHERS = 10.3 LBS.		25	258
	LENGTH OF MEMBER		
1 - C15 x 33.9 = 33.9 LBS./FT.	6'-10 $\frac{1}{8}"$	25	5800
INTERMEDIATE DIAPHRAGM STRUCTURAL STEEL - TOTAL (LBS.)			8148



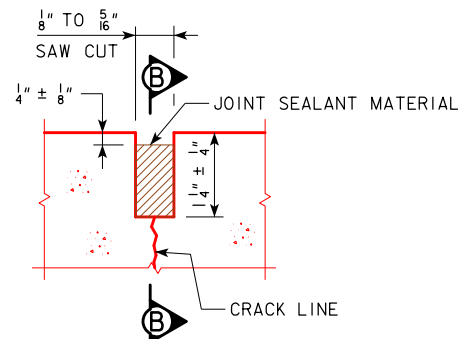
ISOMETRIC VIEW OF EAST APPROACH SLAB
NOT TO SCALE



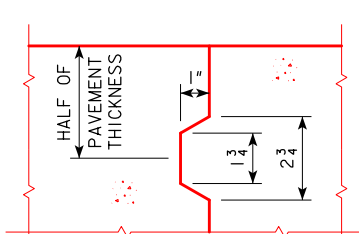
SECTION A-A



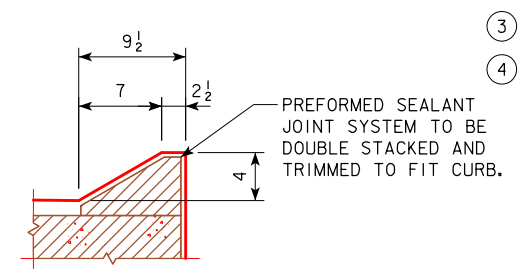
SECTION B-B
(DETAIL AT EDGE OF PAVEMENT)



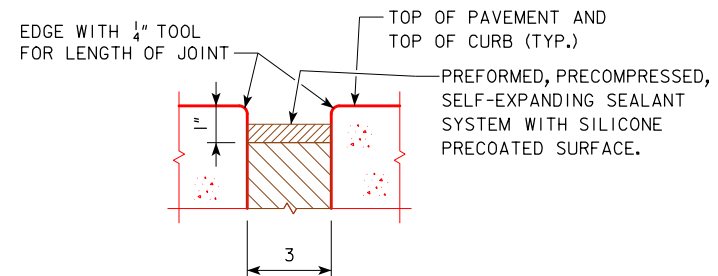
DETAIL "B"



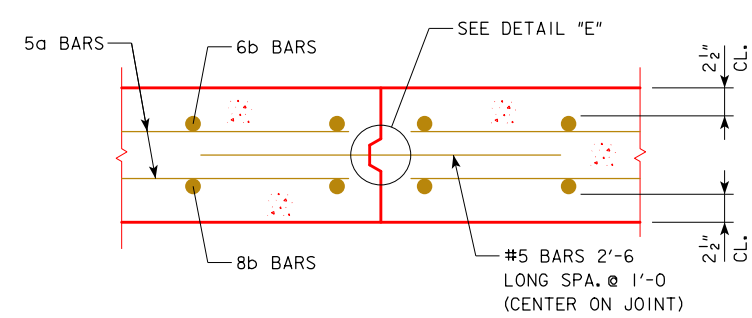
DETAIL "E"



CURB DETAIL



⑤ JOINT DETAIL



"KS-2" JOINT DETAIL

- ① LONGITUDINAL JOINT:
SINGLE POUR - SAW CUT JOINT PER DETAIL "B"
TWO POURS - USE "KS-2" JOINT
- ② POLYMER GRID AND EXCAVATION LIMITS OF MODIFIED SUBBASE 2' OUTSIDE OF PAVEMENT EDGE.
- ③ 4" SLOPED CURB, SEE "CURB DETAIL".
- ④ 1" RESILIENT JOINT FILLER REQUIRED BETWEEN THE DOUBLE REINFORCED APPROACH SLAB AND WING.

APPROACH SLAB NOTES:

PAYMENT FOR "BRIDGE APPROACH PAVEMENT, AS PER PLAN" WILL BE MADE ON A SQUARE YARD BASIS FOR BRIDGE APPROACH PAVEMENT CONSTRUCTED. THE AREA OF BRIDGE APPROACH PAVEMENT INCLUDED FOR MEASUREMENT IS THE 1'-9" WIDE SECTION OF SLEEPER SLAB AND THE 6'-3" WIDE SECTION BELOW THE PAVEMENT.

THE UNIT PRICE BID PER SQUARE YARD FOR BRIDGE APPROACH PAVEMENT SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO CONSTRUCT THE DOUBLE REINFORCED APPROACH PAVEMENT AND SLEEPER SLAB IN ACCORDANCE WITH THESE PLANS AND CURRENT SPECIFICATIONS.

REBAR AND CONCRETE QUANTITIES ARE PROVIDED FOR INFORMATION ONLY.

DESIGN FOR 15° SKEW R.A.

**498'-0" x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**

86'-0", 106'-0" END SPANS 87'-0", 112'-0", 107'-0" INTERIOR SPANS

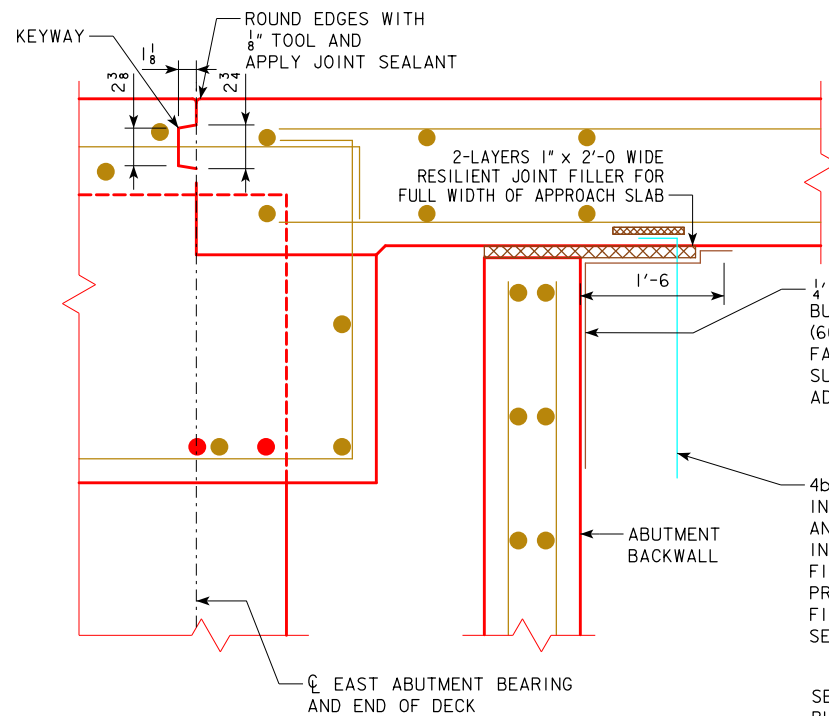
EAST APPROACH SLAB DETAILS

STA. 208+07.00 (1A 3) DECEMBER, 2019

BUTLER COUNTY

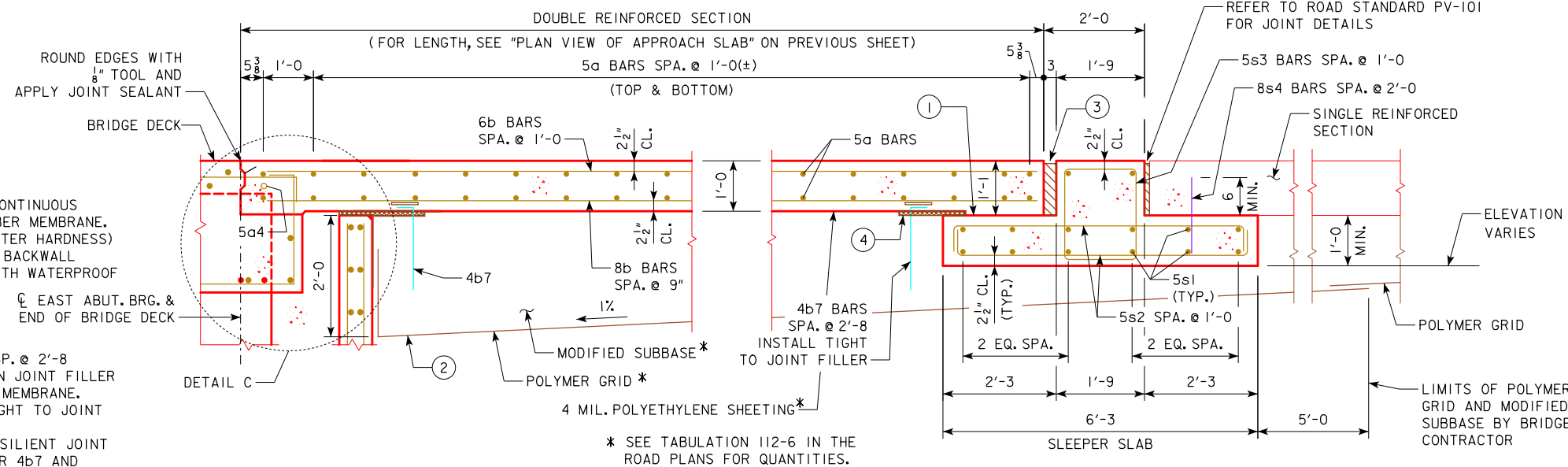
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 38 OF 48 FILE NO. 31394 DESIGN NO. 118



DETAIL C

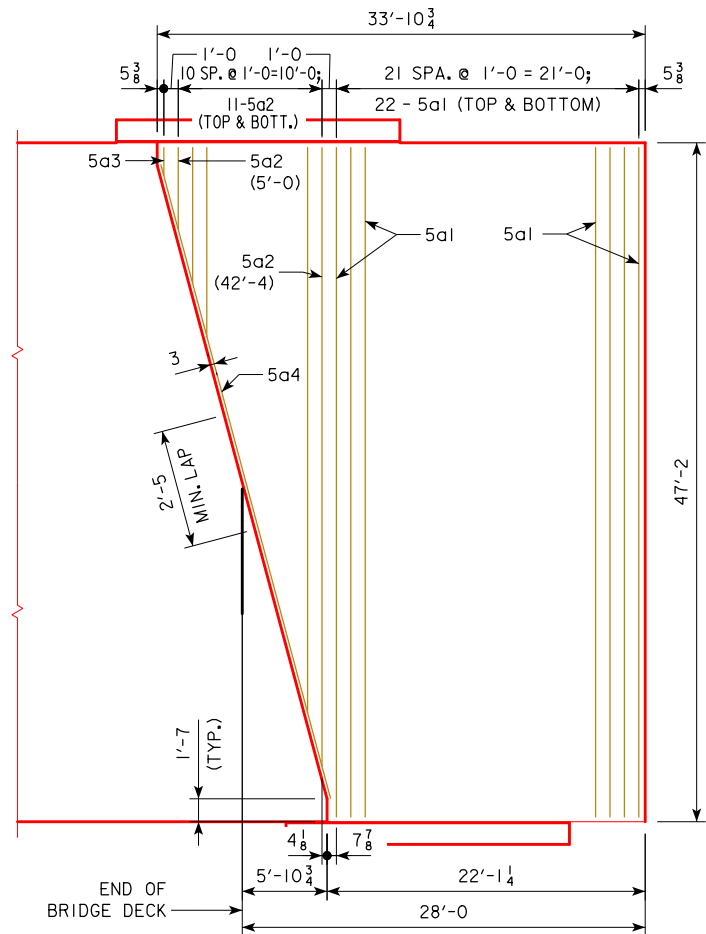
SEE MATERIALS I.M. 495.03 FOR BUTYL RUBBER MEMBRANE.



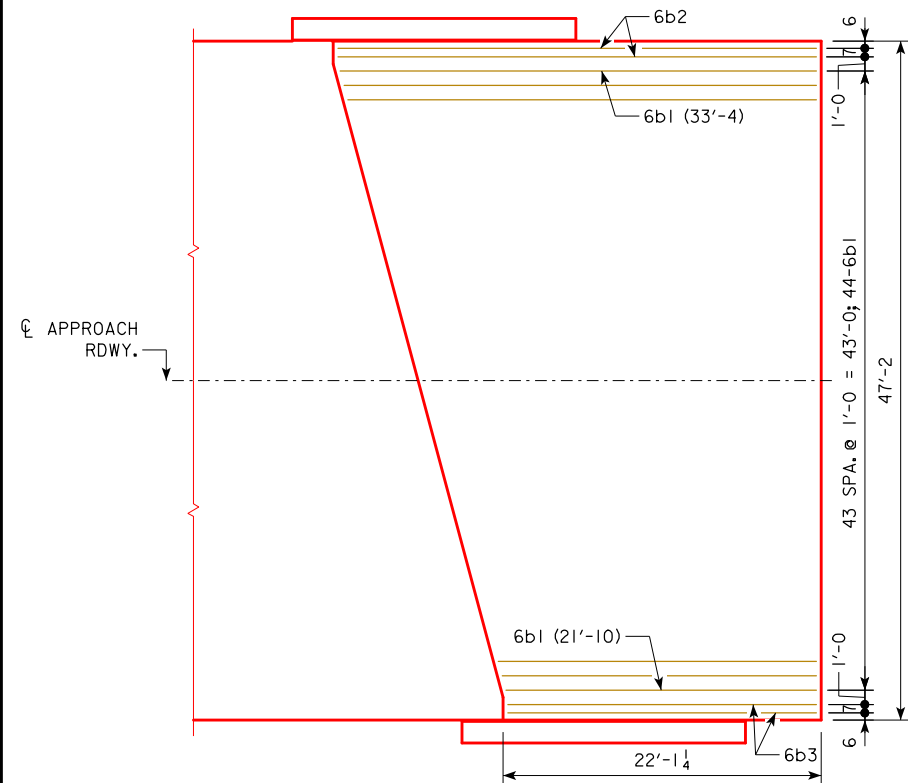
LONGITUDINAL SECTION OF APPROACH SLAB

- ① DEBOND WITH 2 LAYERS OF 30# ASPHALTIC FELT PAPER FULL LENGTH.
- ② EXCAVATE TO EXISTING GRANULAR BACKFILL LINE.
- ③ PREFORMED, PRECOMPRESSED, SELF-EXPANDING SEALANT SYSTEM WITH SILICONE PRECOATED SURFACE.
- ④ $\frac{3}{4}$ " x 1'-4" WIDE RESILIENT JOINT FILLER FOR FULL WIDTH OF APPROACH SLAB.

DESIGN FOR 15° SKEW R.A.
**498'-0 x 44' PRETENSIONED
 PRESTRESSED CONCRETE BEAM BRIDGE**
 86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS
EAST APPROACH SLAB DETAILS
 STA. 208+07.00 (1A 3) DECEMBER, 2019
BUTLER COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 39 OF 48 FILE NO. 31394 DESIGN NO. 118

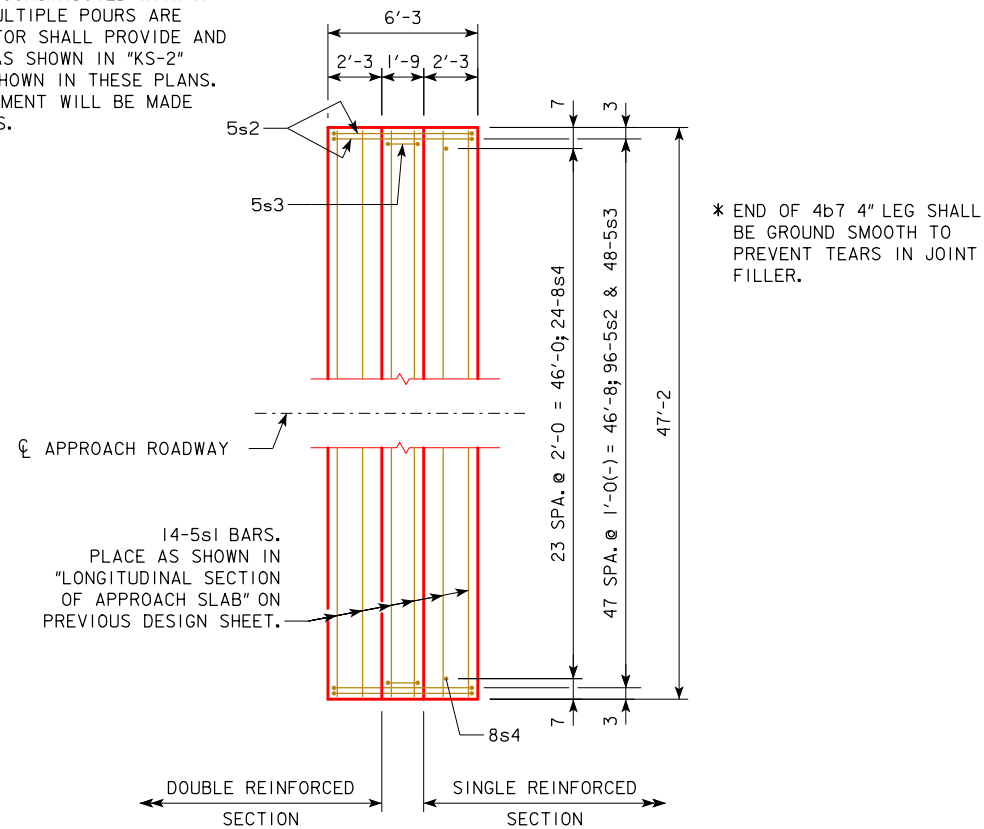


TOP & BOTTOM TRANSVERSE REINFORCING LAYOUT

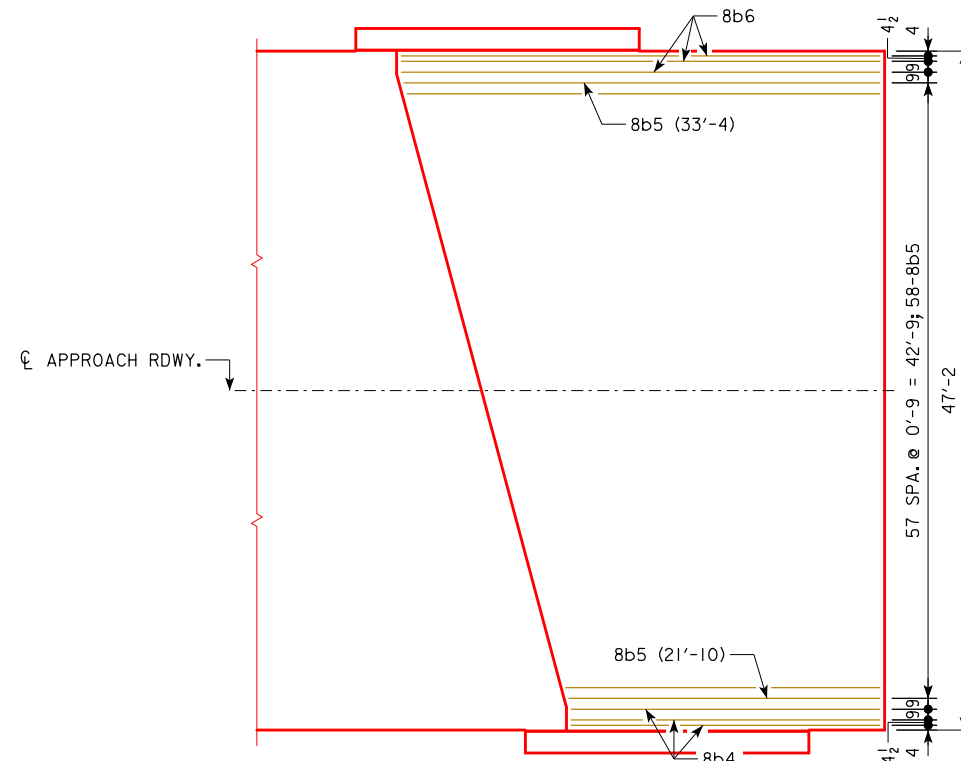


TOP LONGITUDINAL REINFORCING LAYOUT

NOTE:
REINFORCING STEEL QUANTITIES ASSUME APPROACH SLAB IS CONSTRUCTED WITH A SINGLE POUR. IF MULTIPLE POURS ARE REQUIRED, CONTRACTOR SHALL PROVIDE AND INSTALL #5 BARS AS SHOWN IN "KS-2" JOINT DETAIL AS SHOWN IN THESE PLANS. NO ADDITIONAL PAYMENT WILL BE MADE FOR #5 DOWEL BARS.



PLAN VIEW OF SLEEPER SLAB

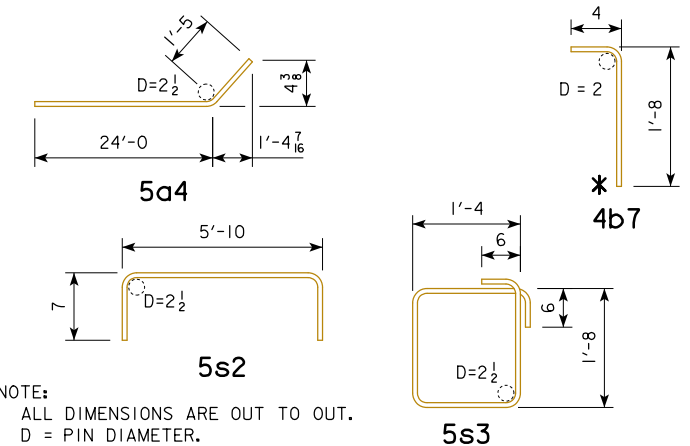


BOTTOM LONGITUDINAL REINFORCING LAYOUT

REINFORCING BAR LIST-EAST APPROACH SLAB

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5a1	APPROACH SLAB TRANSV. TOP AND BOTT.		44	46'-10	2149
5a2	APPROACH SLAB TRANSV. TOP AND BOTT.		22	VARIES	543
5a3	APPROACH SLAB TRANSV. TOP AND BOTT.		2	1'-4	3
5a4	APPROACH SLAB TRANSV. TOP AND BOTT.		2	25'-5	53
6b1	APPROACH SLAB LONGIT. TOP		44	VARIES	1823
6b2	APPROACH SLAB LONGIT. TOP		2	33'-6	101
6b3	APPROACH SLAB LONGIT. TOP		2	21'-8	65
8b4	APPROACH SLAB LONGIT. BOTT.		3	21'-8	174
8b5	APPROACH SLAB LONGIT. BOTT.		58	VARIES	4272
8b6	APPROACH SLAB LONGIT. BOTT.		3	33'-6	268
4b7*	APPROACH SLAB		37	2'-0	49
5s1	SLEEPER SLAB LONGIT.		14	46'-10	684
5s2	SLEEPER SLAB STIRRUPS		96	7'-0	701
5s3	SLEEPER SLAB STIRRUPS		48	7'-0	350
8s4	SLEEPER SLAB VERTICAL DOWELS		24	1'-6	96
REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)					11,331

BENT BAR DETAILS



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

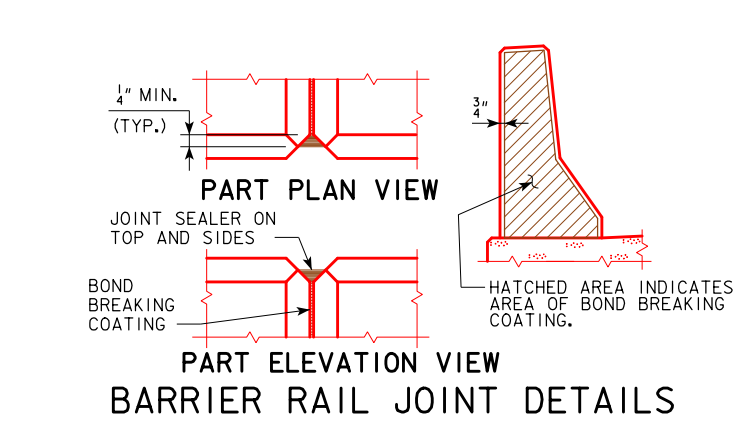
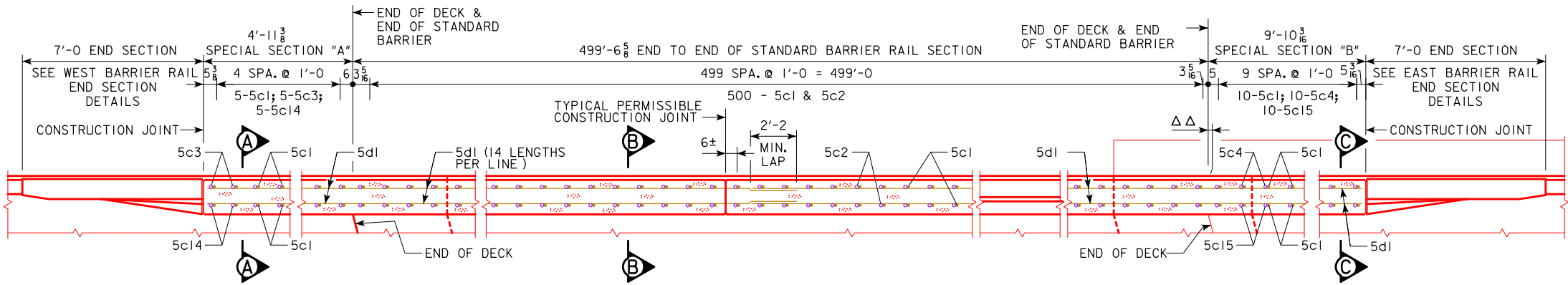
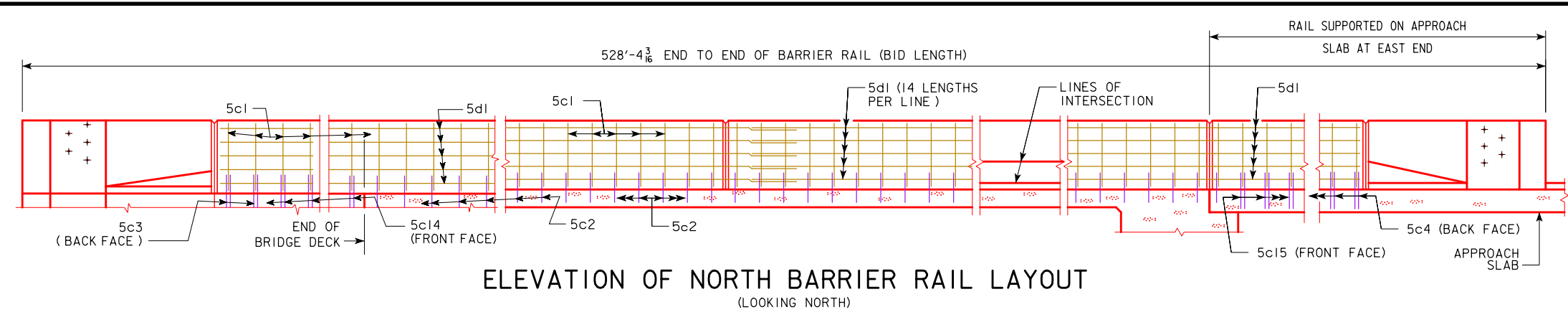
CONCRETE PLACEMENT SUMMARY

ITEM	QUANTITY
EAST APPROACH SLAB	48.9
EAST SLEEPER SLAB	14.2
TOTAL (CU. YDS.)	63.1

EAST APPROACH SLAB QUANTITIES

LOCATION	QUANTITY
EAST APPROACH SLAB & SLEEPER SLAB	188.9
TOTAL (SQ. YDS.)	188.9

DESIGN FOR 15° SKEW R.A.
**498'-0 x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**
86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS
EAST APPROACH SLAB DETAILS
STA. 208+07.00 (1A 3) DECEMBER, 2019
BUTLER COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 40 OF 48 FILE NO. 31394 DESIGN NO. 118



BARRIER RAIL NOTES:

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

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

COST OF THE RESILIENT JOINT FILLER, 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 MARKETING FOR OUTDOOR USE. NO TESTING OR CERTIFICATION IS REQUIRED.

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

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

CONCRETE PLACEMENT SUMMARY		
SECTION		TOTAL
STANDARD SECTION	999.10 @ 0.1052 CU. YD. PER FT.	105.1
SPECIAL SECTION "A"	9.90 @ 0.1052 CU. YD. PER FT.	1.0
SPECIAL SECTION "B"	19.70 @ 0.1052 CU. YD. PER FT.	2.1
TOTAL (CU. YD.)		108.2
CONCRETE BARRIER RAIL QUANTITIES		
ITEM	UNIT	QUANTITY
CONCRETE BARRIER RAILING	L.F.	1056.7

EPOXY COATED REINF. STEEL - TWO RAILS						
	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
	5c1	RAIL, VERTICAL		1030	5'-11"	6356
	5d1	RAIL, LONGITUDINAL		252	38'-9"	10185
EPOXY STEEL TOTAL (LBS.)						16541

STAINLESS STEEL REINF. STEEL - TWO RAILS							
SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	
STANDARD SECTIONS	5c2	RAIL, VERTICAL		1000	6'-0	6258	
SPECIAL SECTIONS	"A"	5c3	RAIL, VERTICAL		10	3'-3	34
		5c14	RAIL, VERTICAL		10	3'-10	40
	"B"						
		5c4	RAIL, VERTICAL		20	3'-6	73
		5c15	RAIL, VERTICAL		20	3'-8	76
STAINLESS STEEL TOTAL (LBS.)						6481	

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

DESIGN FOR 15° SKEW R.A.

498'-0 x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE

86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS

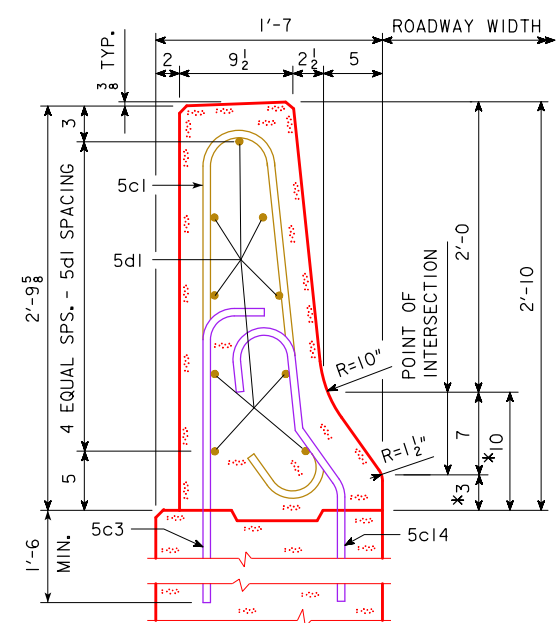
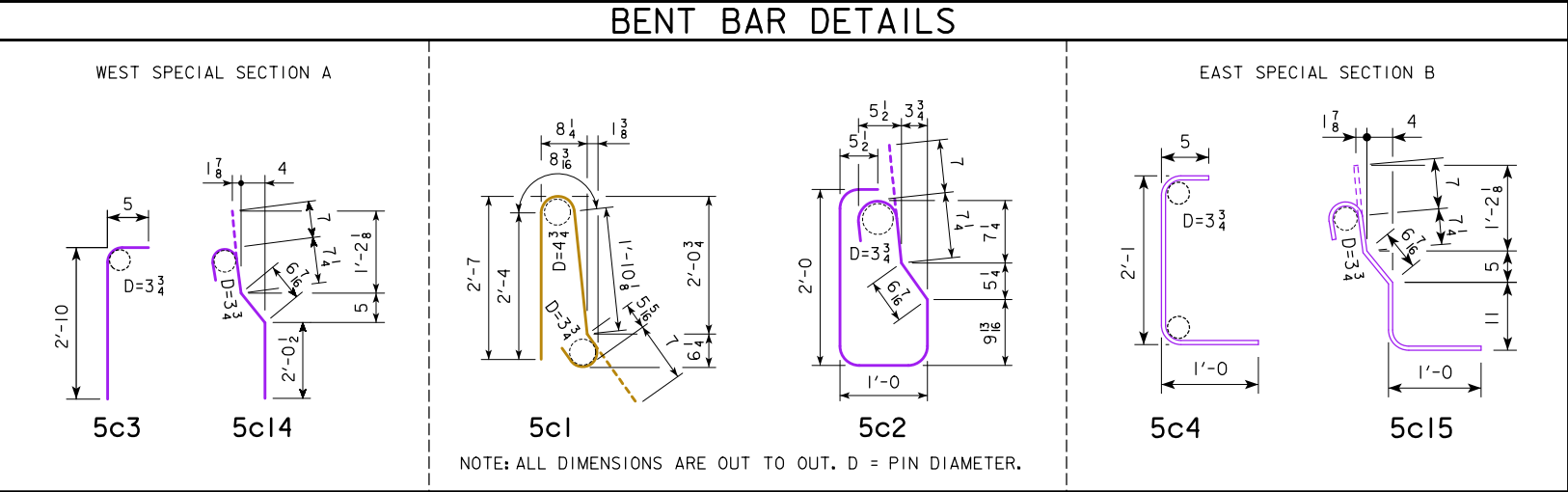
BARRIER RAIL DETAILS

STA. 208+07.00 (1A 3) DECEMBER, 2019

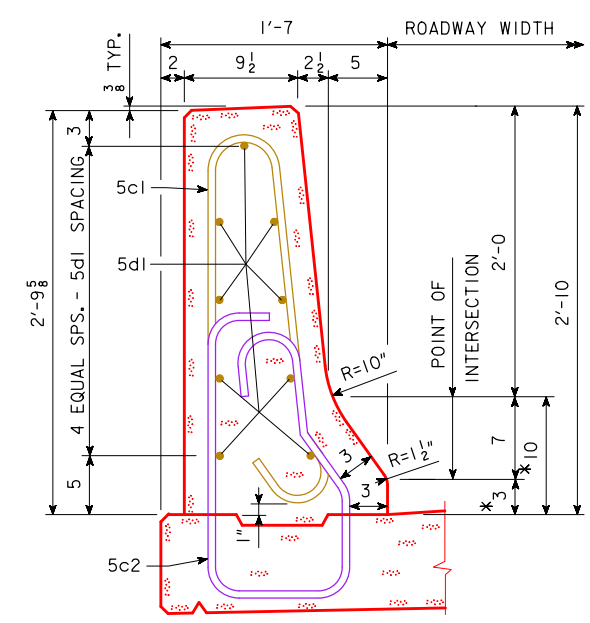
BUTLER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

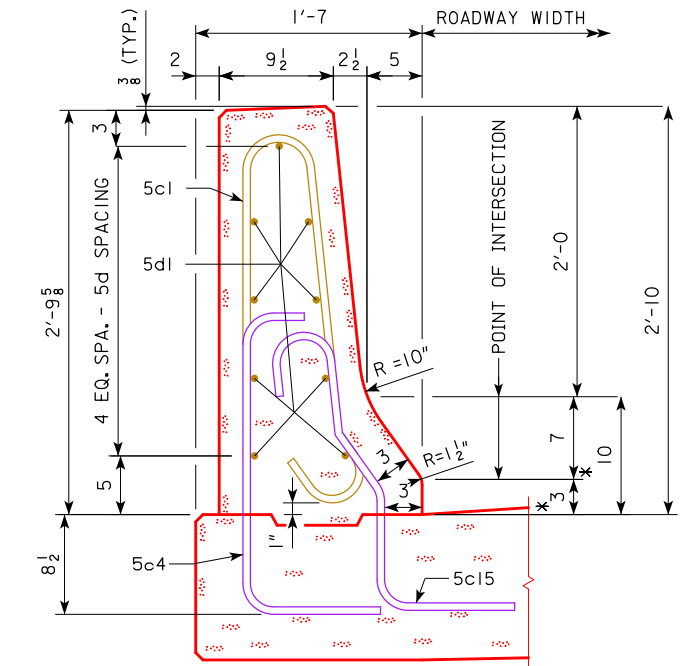
DESIGN SHEET NO. 41 OF 48 FILE NO. 31394 DESIGN NO. 118



SECTION A-A
(WEST SPECIAL SECTION A)



SECTION B-B
(STANDARD SECTION)



SECTION C-C
(EAST SPECIAL SECTION B)

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

SEE PREVIOUS DESIGN SHEET FOR LOCATIONS OF SECTIONS AND BENT BARS.

DESIGN FOR 15° SKEW R.A.

**498'-0 x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**

86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS

BARRIER RAIL DETAILS

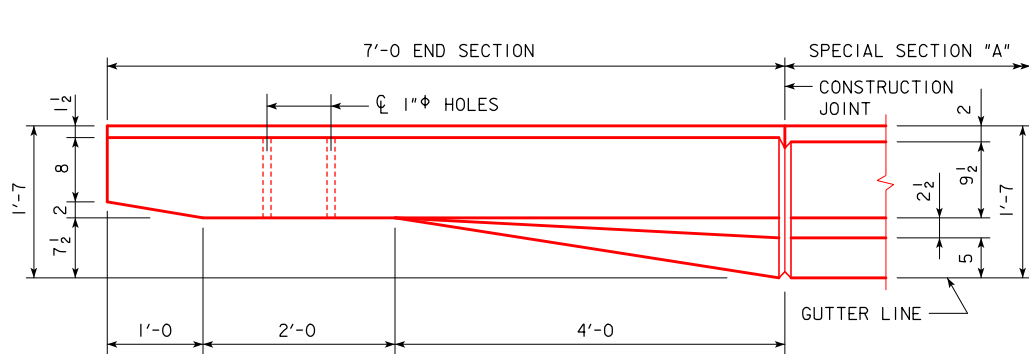
STA. 208+07.00 (IA 3) DECEMBER, 2019

BUTLER COUNTY

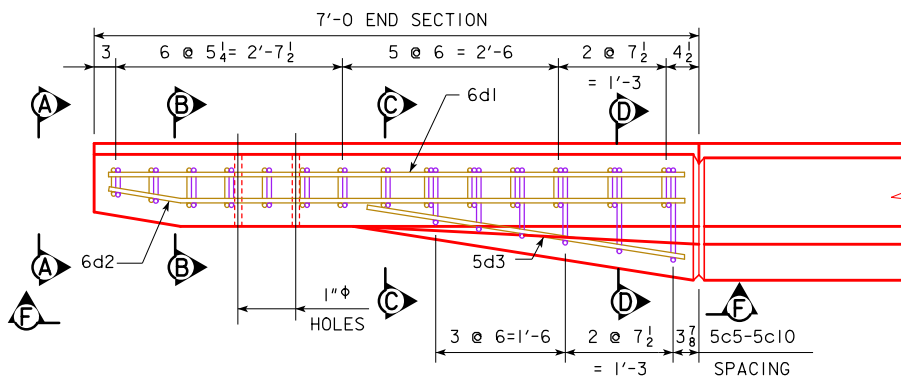
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 42 OF 48 FILE NO. 31394 DESIGN NO. 118

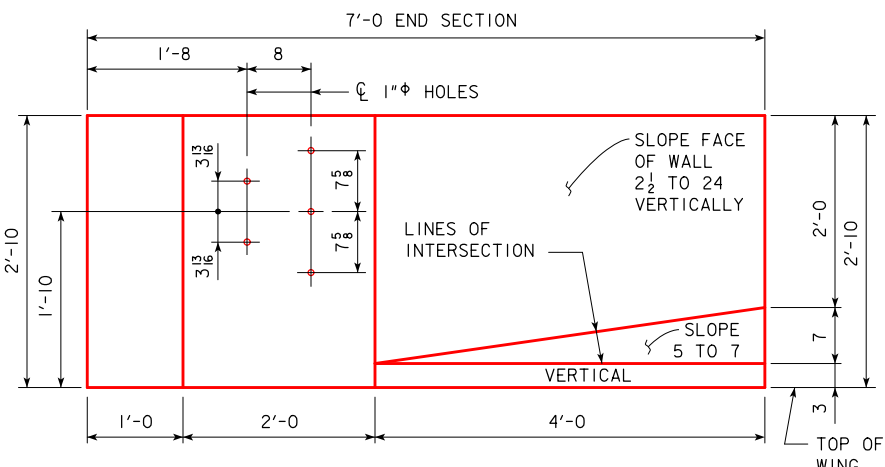
ENGLISHDECKRAILBRIDGES.DGN 10/17S - THIS SHEET ISSUED 04-14 - ADDED STAINLESS STEEL REINFORCING BAR LIST AND CHANGED 6c3, 6c4 & 5c5-10 BARS TO STAINLESS STEEL.



PART PLAN VIEW

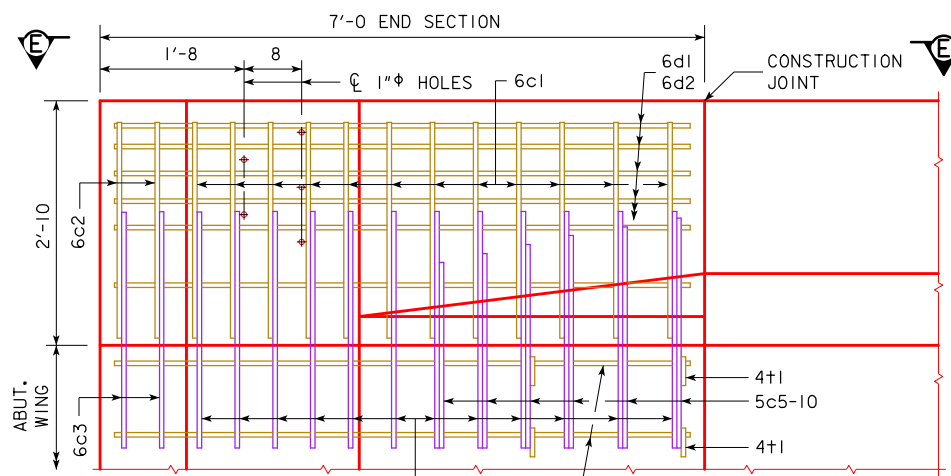


PART VIEW E-E

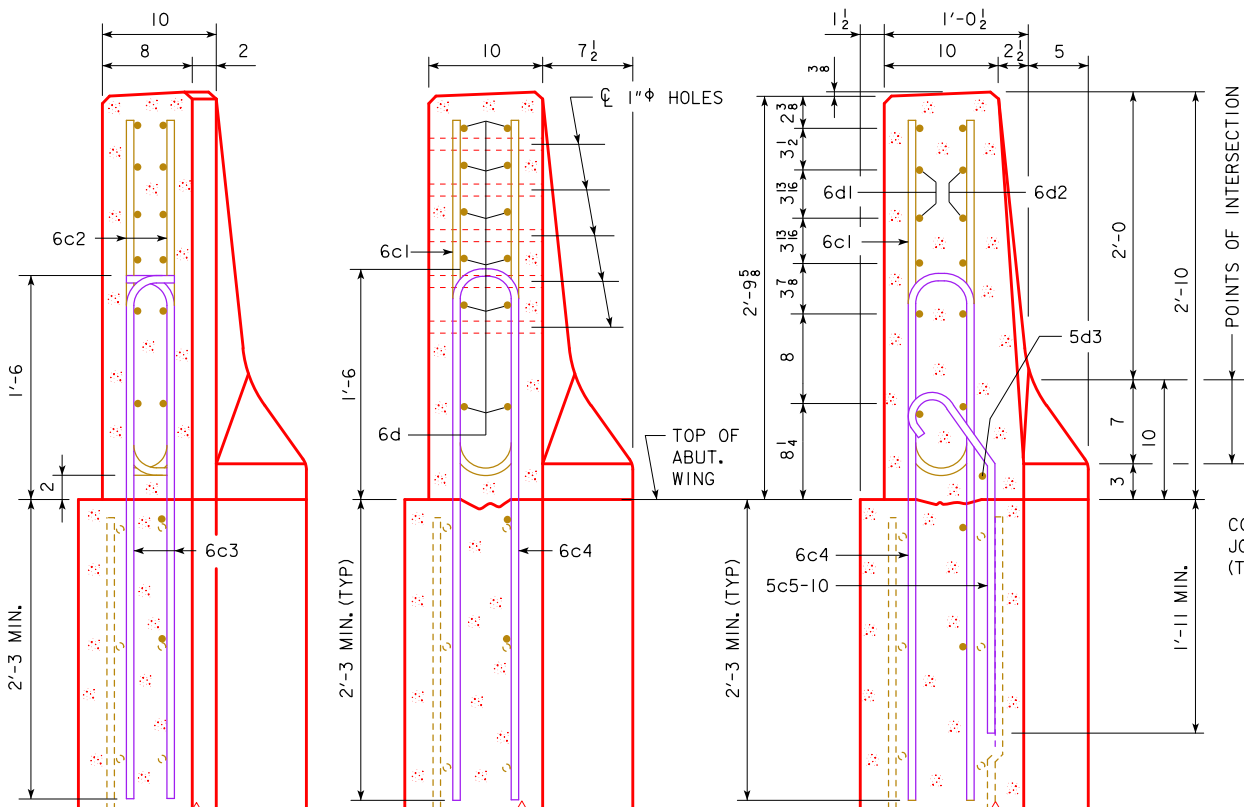


PART ELEVATION VIEW

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



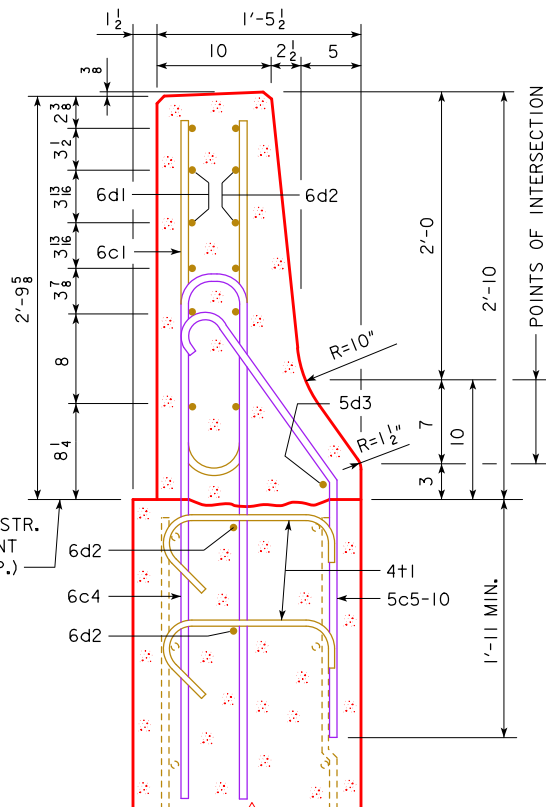
PART VIEW F-F



VIEW A-A

SECTION B-B

SECTION C-C



SECTION D-D

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

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

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

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

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

EPOXY COATED REINF. STEEL - ONE END SECT.

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6c1	RAIL, VERTICAL		12	5'-6"	99
6c2	RAIL, VERTICAL		4	2'-10"	17
6d1	RAIL, HORIZONTAL		6	6'-8"	60
6d2	RAIL, HORIZONTAL		8	6'-9"	81
5d3	RAIL, HORIZONTAL		1	3'-9"	4
4+1	RAIL, ABUTMENT WING TIE BARS		4	VARIES	5
EPOXY REINF. TOTAL WEIGHT (LBS.)					266

STAINLESS STEEL REINF. STEEL - ONE END SECT.

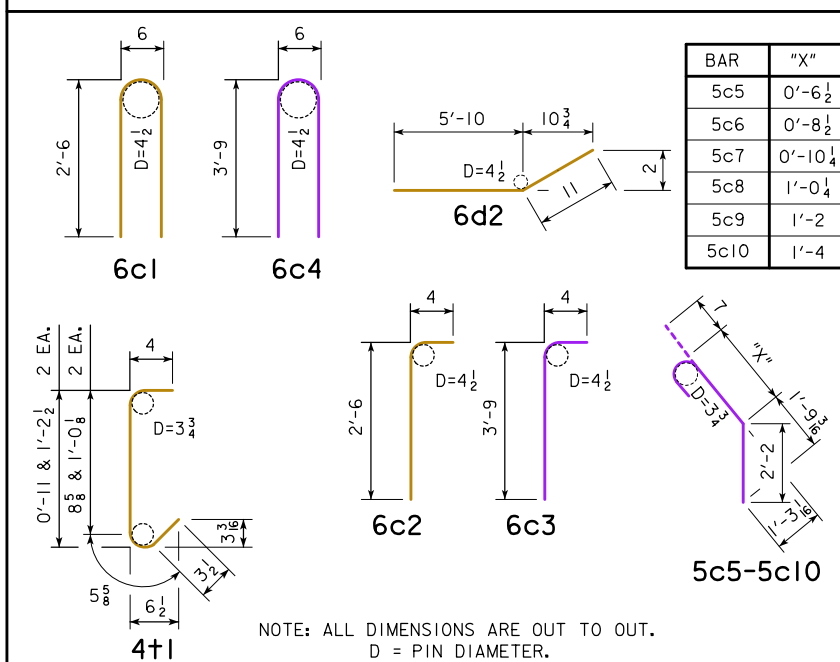
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6c3	RAIL, VERTICAL		4	4'-1"	25
6c4	RAIL, VERTICAL		12	8'-0"	144
5c5-10	RAIL, VERTICAL		6	VARIES	23
STAINLESS STEEL TOTAL WEIGHT (LBS.)					192

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

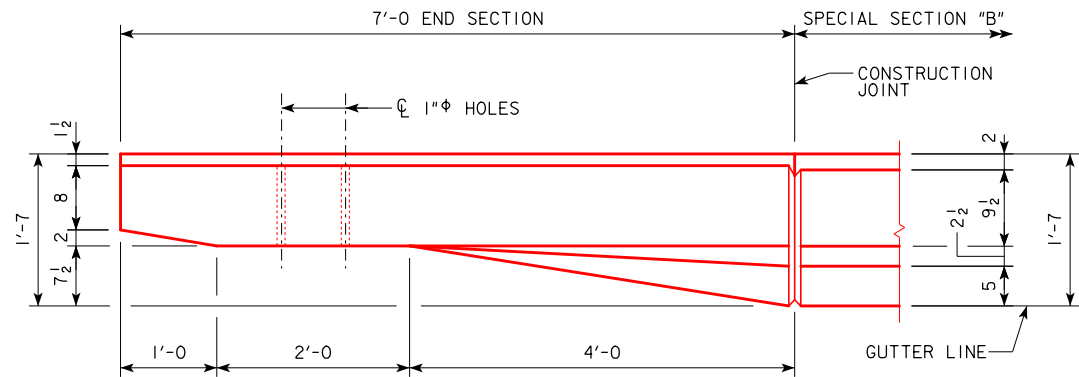
CONCRETE PLACEMENT SUMMARY

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

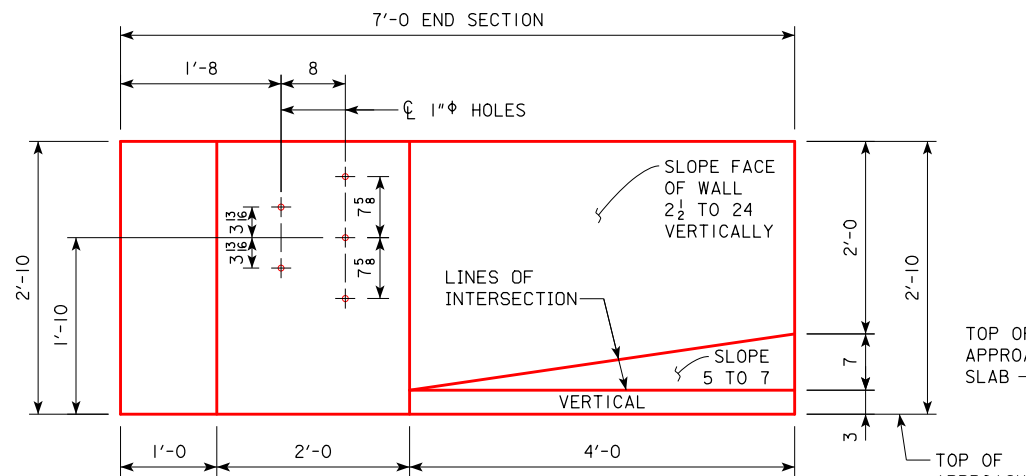
BENT BAR DETAILS



DESIGN FOR 15° SKEW R.A.
**498'-0" x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**
86'-0", 106'-0" END SPANS 87'-0", 112'-0", 107'-0" INTERIOR SPANS
WEST END SECTION DETAILS
STA. 208+07.00 (1A 3) DECEMBER, 2019
BUTLER COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 43 OF 48 FILE NO. 31394 DESIGN NO. 118

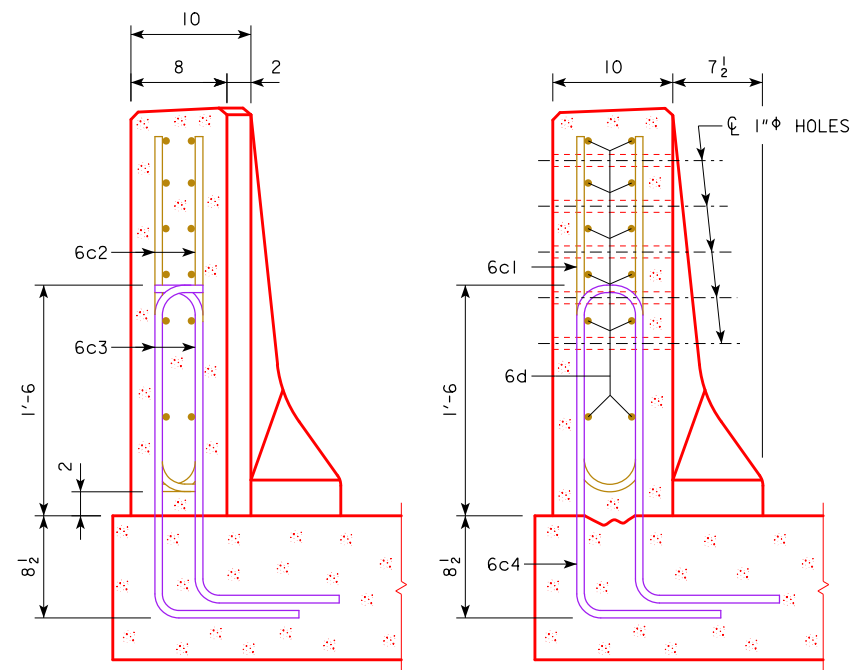


PART PLAN VIEW

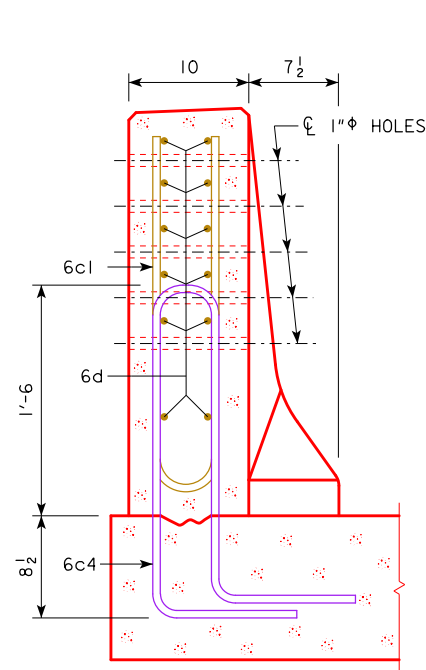


PART ELEVATION VIEW

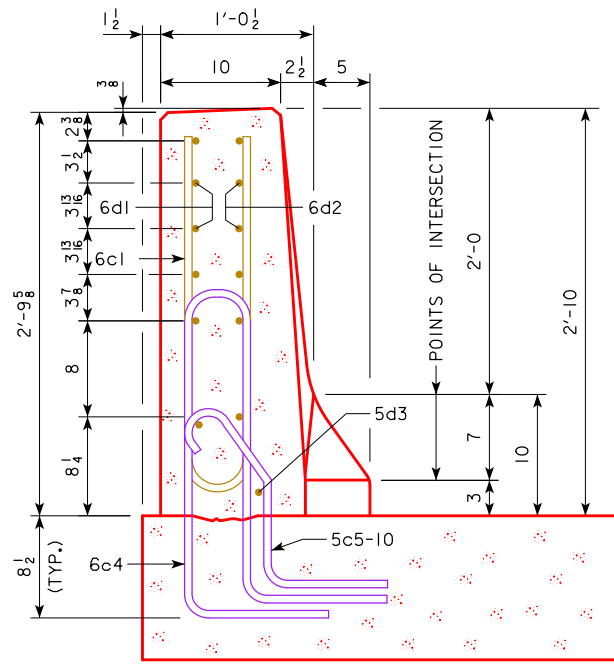
PROVIDE 5 HOLES FORMED WITH 1" PLASTIC CONDUIT. COST TO BE INCLUDED IN PRICE BID FOR CONCRETE BARRIER RAILING.



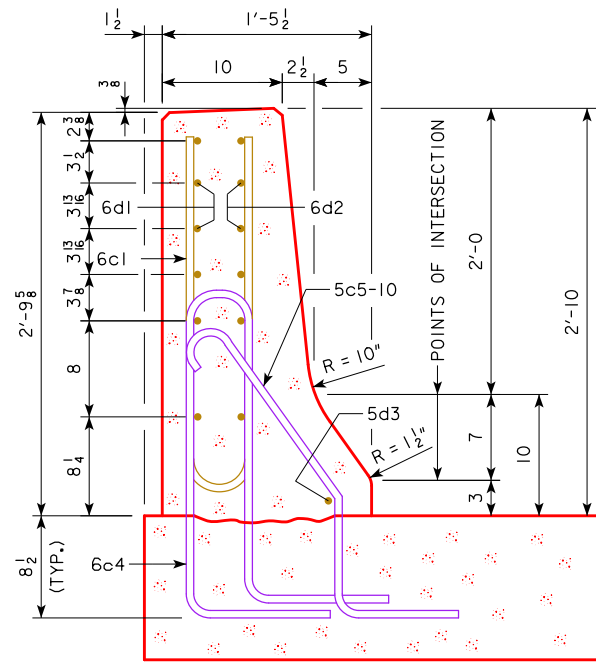
VIEW A-A



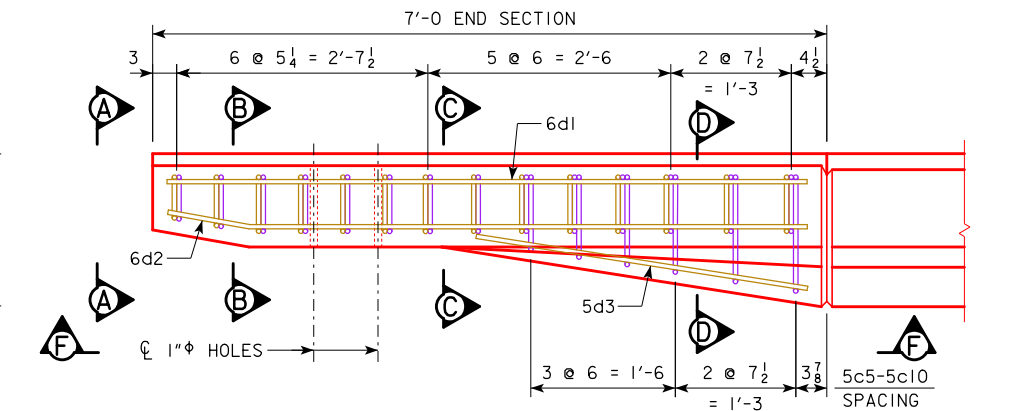
SECTION B-B



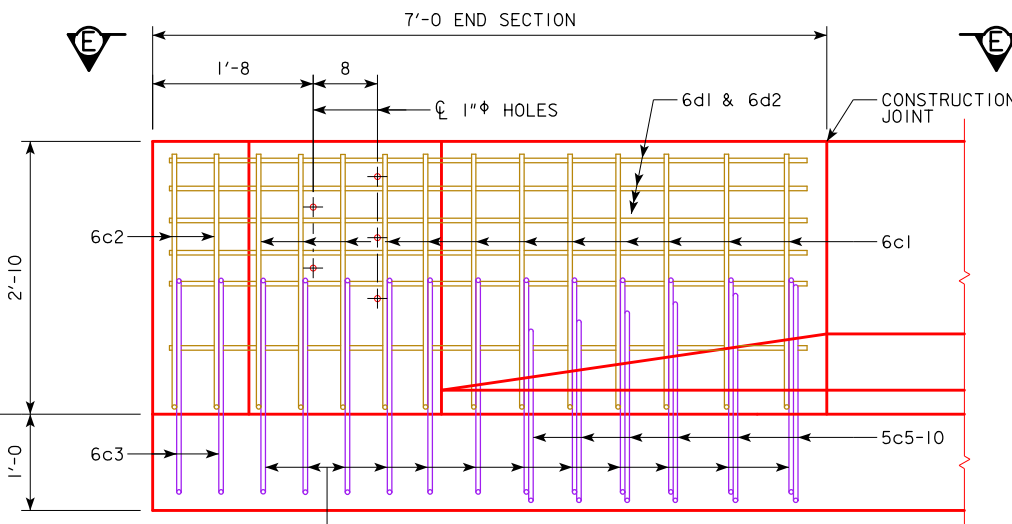
SECTION C-C



SECTION D-D



PART VIEW E-E



PART VIEW F-F

EPOXY COATED REINF. STEEL - ONE END SECT.

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6c1	RAIL, VERTICAL		12	5'-6	99
6c2	RAIL, VERTICAL		4	2'-10	17
6d1	RAIL, HORIZONTAL		6	6'-8	60
6d2	RAIL, HORIZONTAL		6	6'-9	61
5d3	RAIL, HORIZONTAL		1	3'-9	4
EPOXY REINF. TOTAL WEIGHT (LBS.)					241

STAINLESS STEEL REINF. STEEL - ONE END SECT.

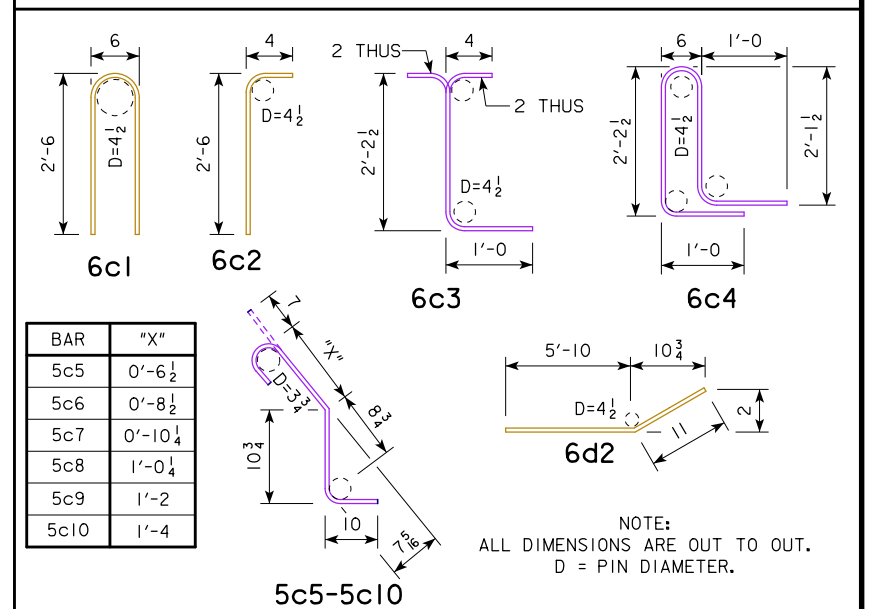
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6c3	RAIL, VERTICAL		4	3'-7	22
6c4	RAIL, VERTICAL		12	6'-10	123
5c5-10	RAIL, VERTICAL		6	VARIES	20
STAINLESS STEEL TOTAL WEIGHT (LBS.)					165

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

CONCRETE PLACEMENT SUMMARY

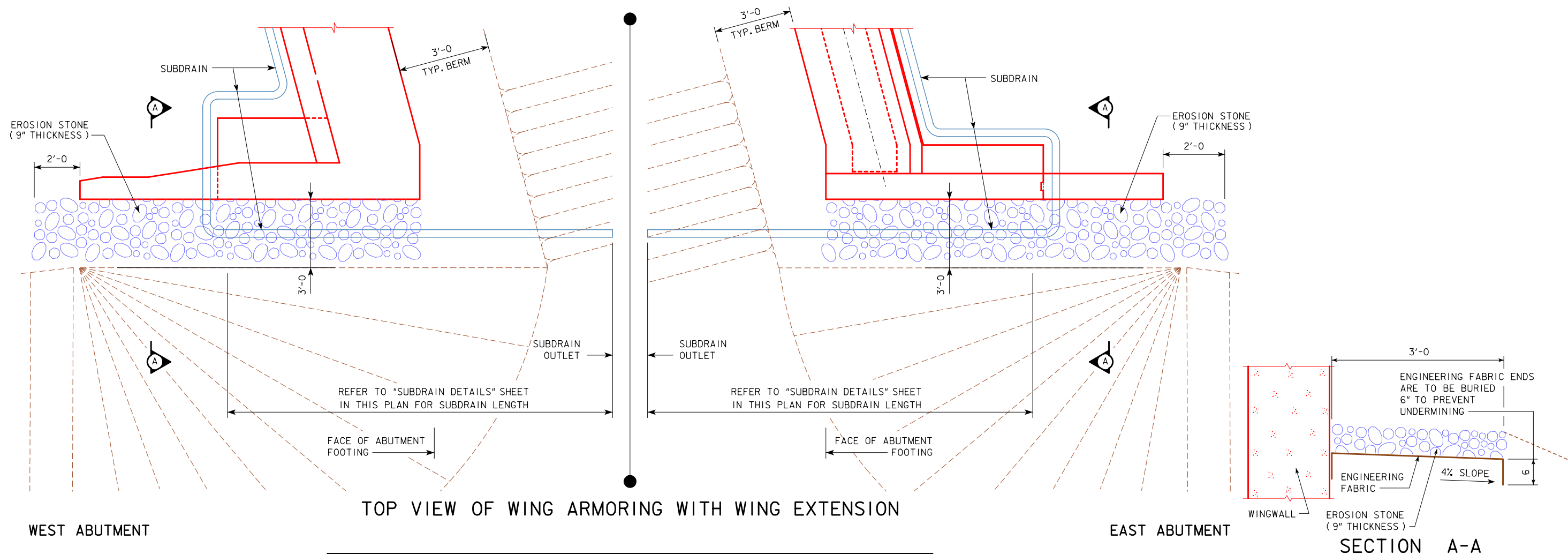
SECTION	TOTAL
BARRIER RAIL ONE END SECTION	0.65 CU. YD.

BENT BAR DETAILS



NOTES:
CONSTRUCTION JOINT BETWEEN TOP OF APPROACH SLAB AND BARRIER RAIL IS ROUGHENED CONCRETE.
THE 10" RADIUS AND 1 1/2" RADIUS ARE TYPICAL AND SHALL BE USED WHEN CONSTRUCTING THE CORNERS FOR VIEW A-A, SECTION B-B, SECTION C-C AND SECTION D-D.
THE 6c3, 6c4 AND 5c5-10 BARS ARE TO BE PLACED WITH THE APPROACH SLAB.

DESIGN FOR 15° SKEW R.A.
**498'-0 x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**
86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS
EAST END SECTION DETAILS
STA. 208+07.00 (IA 3) BUTLER COUNTY DECEMBER, 2019
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 44 OF 48 FILE NO. 31394 DESIGN NO. 118



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

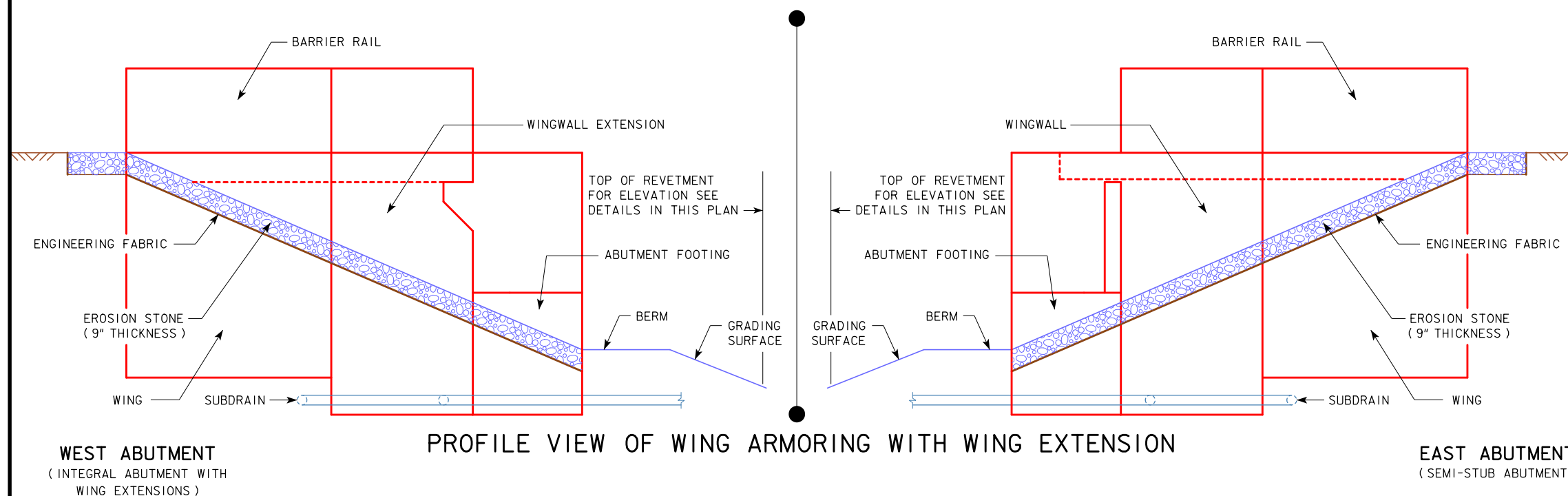
GENERAL NOTES:

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 CHOKER 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 15° SKEW R.A.

**498'-0" x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**

86'-0", 106'-0" END SPANS 87'-0", 112'-0", 107'-0" INTERIOR SPANS

BRIDGE WING ARMORING

STA. 208+07.00 (1A 3) DECEMBER, 2019

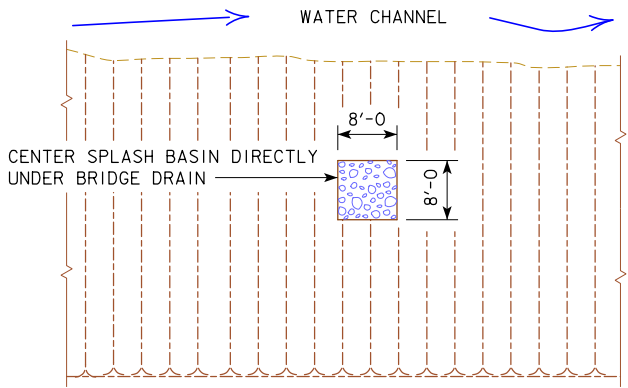
BUTLER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

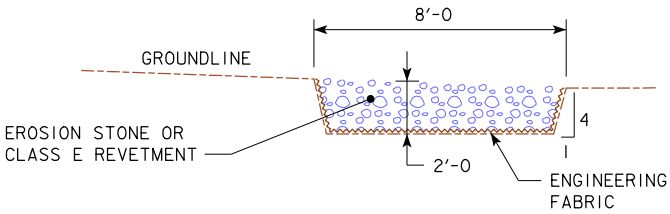
DESIGN SHEET NO. 45 OF 48 FILE NO. 31394 DESIGN NO. 118

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

BENCH MARK - REFER TO DESIGN SHEET 6.



SPLASH BASIN UNDER BRIDGE DRAIN
PLAN VIEW



SPLASH BASIN UNDER BRIDGE DRAIN
TYPICAL SECTION FOR EXISTING GRADES

SPLASH BASIN NOTES :

THE COST OF FURNISHING AND PLACING SPLASH BASINS (INCLUDING EXCAVATION, EROSION STONE OR CLASS E REVETMENT, AND ENGINEERING FABRIC) IS TO BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL CONCRETE (BRIDGE)". NO EXTRA PAYMENT WILL BE MADE. TOTAL NUMBER OF SPLASH BASINS = 14. SEE SITUATION PLAN FOR LOCATIONS.

SUBDRAIN NOTES :

THIS PLAN SHEET SHOWS DETAILS FOR PLACING ALL SUBDRAINS AND SUBDRAIN OUTLETS REQUIRED FOR THIS STRUCTURE.

THE SUBDRAINS SHALL BE 4" IN DIAMETER AND SHALL BE IN ACCORDANCE WITH ARTICLE 4143.01, B, OF THE STANDARD SPECIFICATIONS.

THE SUBDRAIN OUTLET SHALL CONSIST OF A LENGTH OF PIPE WITH A REMOVABLE RODENT GUARD AS DETAILED ON THIS SHEET. THE LENGTH OF THE OUTLET PIPE SHALL BE DETERMINED BY THE REVETMENT AND IT'S PLACEMENT LOCATION. THE CONTRACTOR IS TO INSURE THE OUTLET PIPE IS ADEQUATELY STRONG ENOUGH AND WILL NOT BE DAMAGED WHEN REVETMENT IS PLACED. A CHECK WILL BE MADE AT THE SUBDRAIN OUTLET TO INSURE THAT THE SUBDRAIN IS NOT DAMAGED AND IS DRAINING PROPERLY DURING THE BACKFILL FLOODING PROCESS. IF A METAL OUTLET PIPE IS USED, IT SHALL BE 6 INCHES IN DIAMETER AND COUPLED TO THE 4 INCH DIAMETER SUBDRAIN IN ONE OF THE TWO FOLLOWING WAYS.

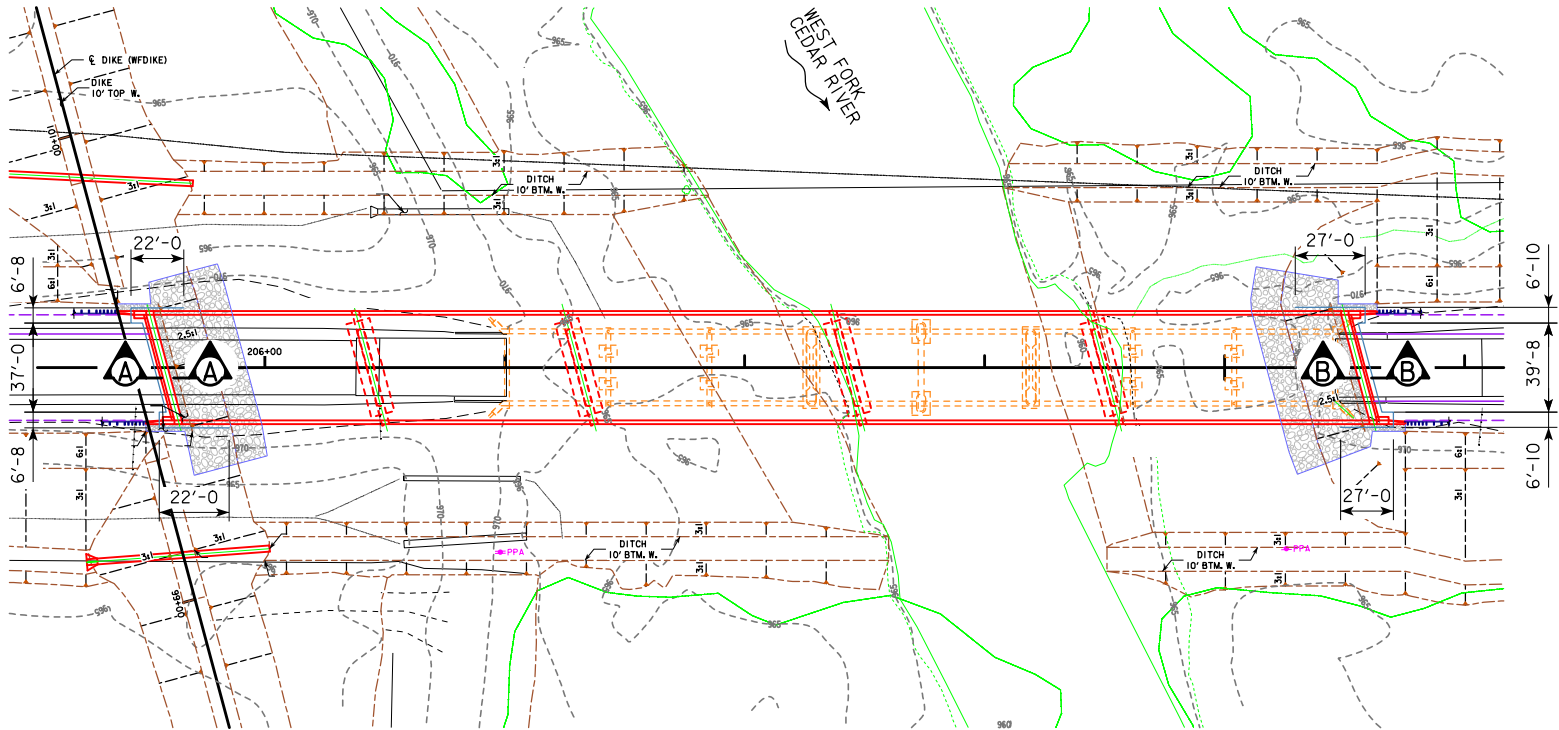
1. USE AN INSIDE FIT REDUCER COUPLER (COUPLER MUST BE INSERTED A MINIMUM OF 1'-0 INTO THE METAL OUTLET PIPE).
2. INSERT 1'-0 OF THE 4" SUBDRAIN INTO THE 6" METAL OUTLET PIPE, THEN FULLY SEAL THE ENTIRE OPENING WITH GROUT.

THE COST OF FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), GRANULAR BACKFILL, POROUS BACKFILL, AND SUBDRAIN OUTLET IS TO BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL CONCRETE (BRIDGE)". NO EXTRA PAYMENT WILL BE MADE.

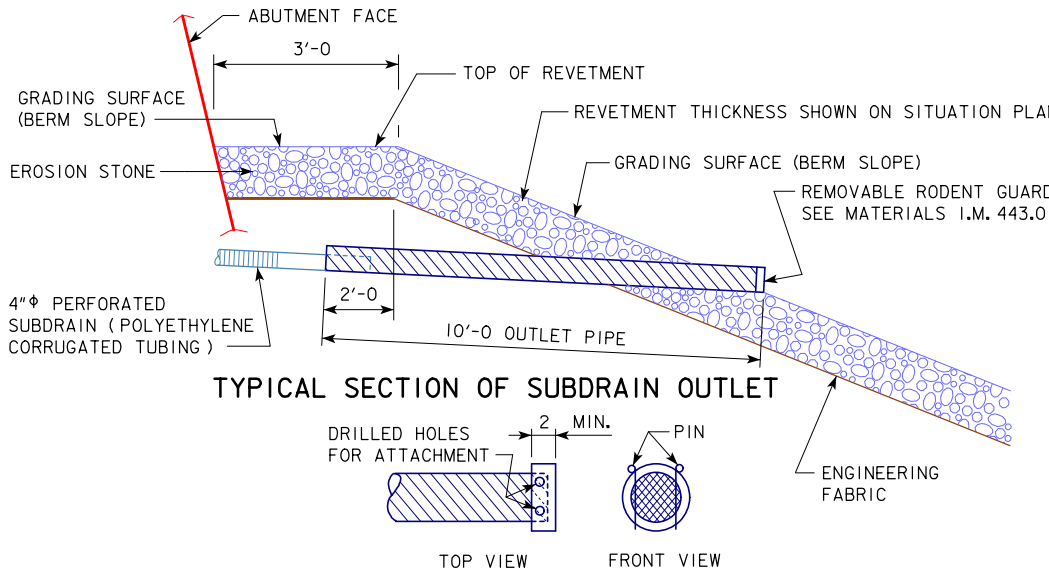
THE DIMENSIONS SHOWN FOR THE PROPOSED SUBDRAINS ARE BASED ON THE PROPOSED GRADING LAYOUT OF BRIDGE BERMS. THE DIMENSIONS SHOWN ARE FOR ESTIMATING ONLY. REQUIRED LENGTHS AND GENERAL LOCATIONS OF SUBDRAINS ARE SUBJECT TO CHANGE DUE TO FIELD ADJUSTMENTS OF THE GRADING LAYOUT.

SUBDRAIN OUTLET ELEVATIONS

LOCATION	ELEVATION
WEST ABUTMENT	968.8
EAST ABUTMENT	969.5



SITUATION PLAN
SHOWING SUBDRAIN LOCATIONS

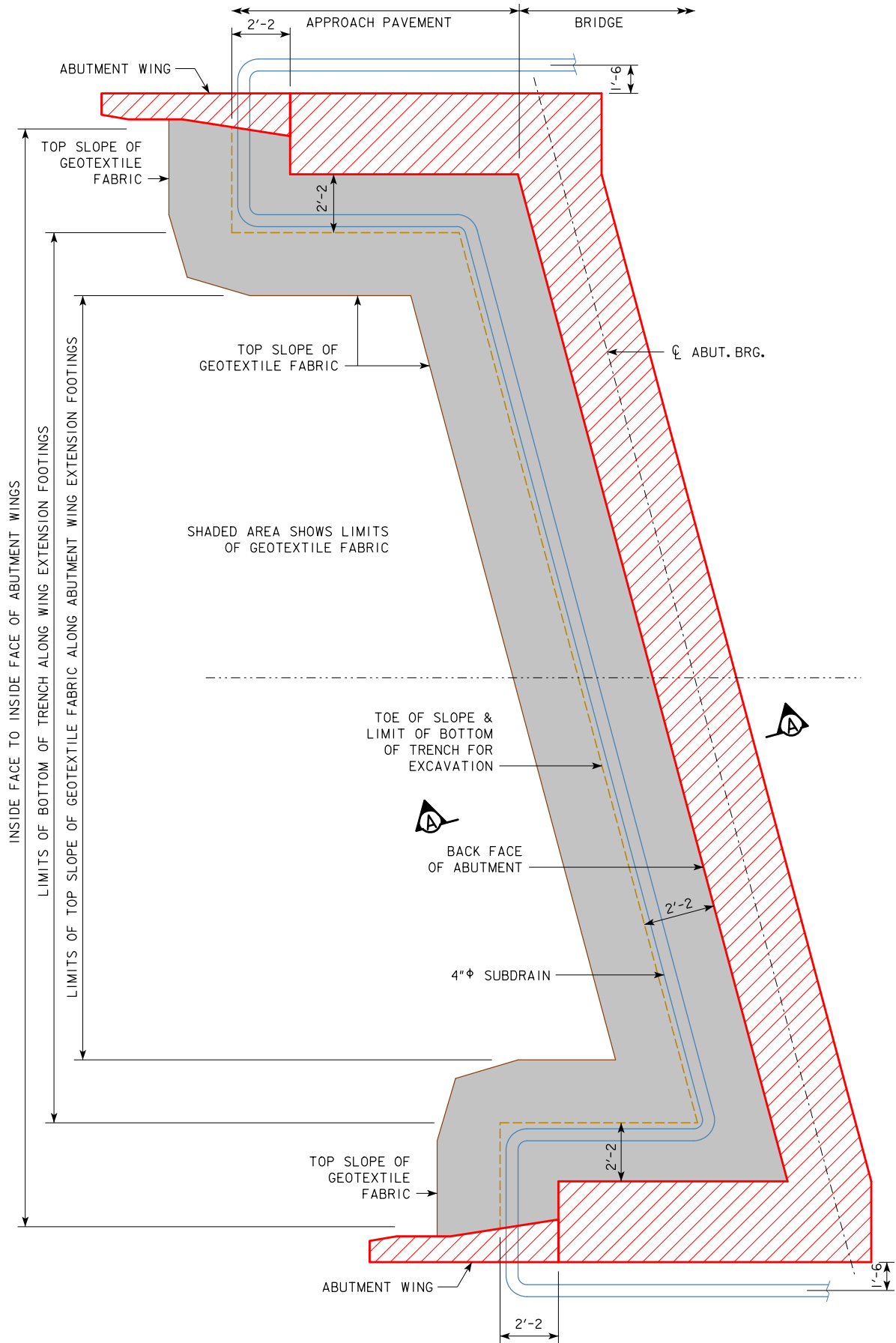


TYPICAL SECTION OF SUBDRAIN OUTLET
REMOVABLE RODENT GUARD DETAILS
REKETMENT STONE (EMBEDDED) OUTLET DETAILS

NOTE:
SECTIONS A-A AND B-B ARE SHOWN ON
ABUTMENT BACKFILL DETAILS SHEETS.

DESIGN FOR 15° SKEW R.A.
**498'-0 x 44' PRETENSIONED
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SUBDRAIN DETAILS
STA. 208+07.00 (IA 3) DECEMBER, 2019
BUTLER COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 46 OF 48 FILE NO. 31394 DESIGN NO. 118

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



WEST ABUTMENT PLAN WITH WING EXTENSIONS

ABUTMENT BACKFILL PROCESS:

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

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

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

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

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

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

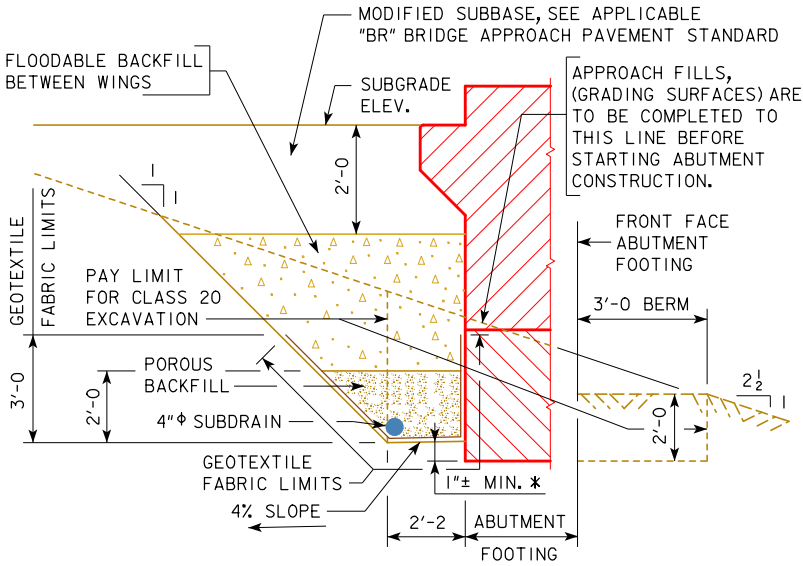
FLOODABLE BACKFILL LIFT PLACEMENT, FLOODING, AND COMPACTION SHALL PROGRESS UNTIL THE REQUIRED FULL THICKNESS OF THE ABUTMENT BACKFILL HAS BEEN COMPLETED.

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

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

SUBDRAIN SHALL SLOPE DOWNWARD 2% FROM C APPROACH ROADWAY.

THE GEOTEXTILE FABRIC SHALL BE IN ACCORDANCE WITH ARTICLE 4196.01, B, 6 OF THE STANDARD SPECIFICATIONS. IF THE ENGINEERING FABRIC IS LAPPED, THE LAPS SHALL BE A MINIMUM OF ONE FOOT IN LENGTH, SHINGLE FASHION WITH UP SLOPE LAP PIECE ON TOP AND STAPLED FOR CONTINUITY.



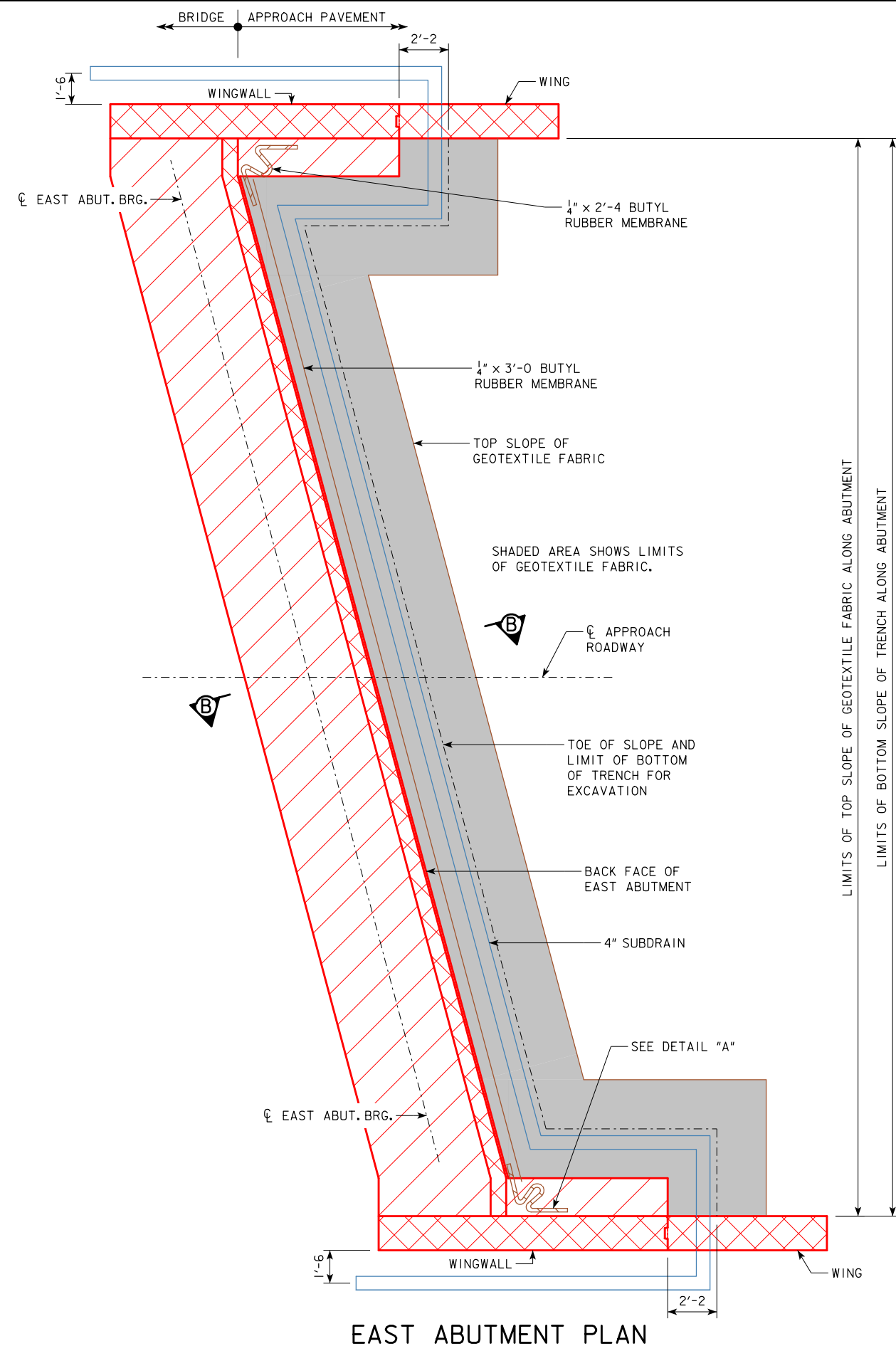
SECTION A-A
WEST ABUT. BACKFILL DETAILS

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

* DIMENSION VARIES DUE TO 2% SUBDRAIN SLOPE.

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

DESIGN FOR 15° SKEW R.A.
**498'-0 x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**
86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS
WEST ABUTMENT BACKFILL DETAILS
STA. 208+07.00 (IA 3) DECEMBER, 2019
BUTLER COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 47 OF 48 FILE NO. 31394 DESIGN NO. 118



ABUTMENT BACKFILL PROCESS:

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

AFTER THE SUBGRADE HAS BEEN SHAPED, THE GEOTEXTILE FABRIC SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAILS SHOWN. THE FABRIC IS INTENDED TO BE INSTALLED IN THE BASE OF THE EXCAVATION AND EXTENDED VERTICALLY UP THE ABUTMENT BACKWALL, ABUTMENT WINGS AND WINGWALLS, AND EXCAVATION FACE TO A HEIGHT THAT WILL BE APPROXIMATELY 3 FOOT HIGHER THAN THE HEIGHT OF THE POROUS BACKFILL AT THE EAST ABUTMENT, AS SHOWN IN THE "BACKFILL DETAILS" ON THIS SHEET. THE STRIPS OF THE FABRIC PLACED SHALL OVERLAP APPROXIMATELY 1 FOOT AND SHALL BE PINNED IN PLACE. THE FABRIC SHALL BE ATTACHED TO THE ABUTMENT BY USING LATH FOLDED IN THE FABRIC AND SECURED TO THE CONCRETE WITH SHALLOW CONCRETE NAILS. THE FABRIC PLACED AGAINST THE EXCAVATION FACE SHALL BE PINNED.

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

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

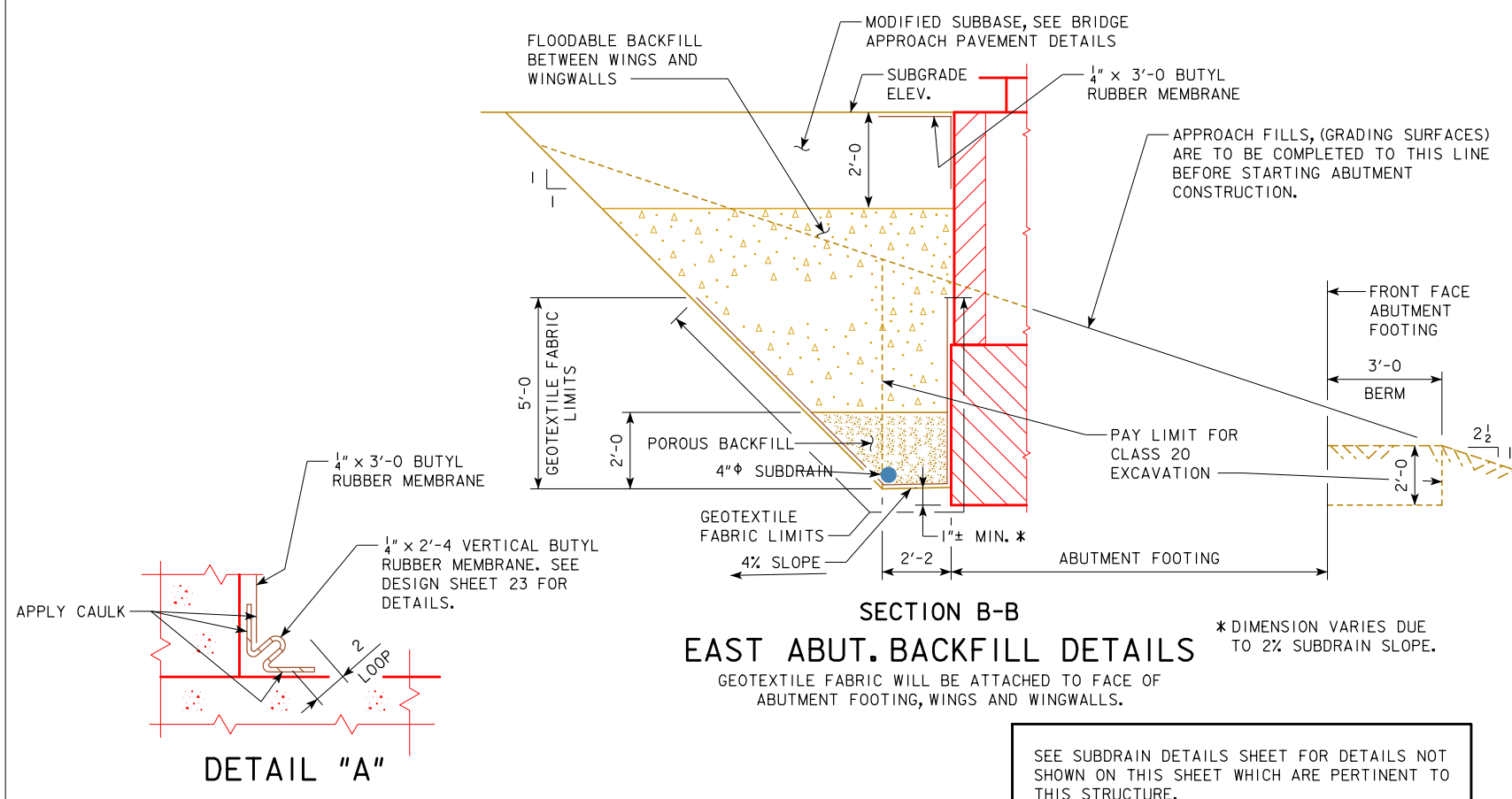
THE REMAINING WORK INVOLVES BACKFILLING WITH FLOODABLE BACKFILL, SURFACE FLOODING, AND VIBRATORY COMPACTION. THE FLOODABLE BACKFILL MATERIAL SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. THE FLOODABLE BACKFILL SHALL BE PLACED IN INDIVIDUAL LIFTS, SURFACE FLOODED, AND COMPACTED WITH VIBRATORY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

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

THE COST OF WATER REQUIRED FOR FLOODING, SUBDRAINS, POROUS BACKFILL, FLOODABLE BACKFILL, BUTYL RUBBER MEMBRANES, WATERPROOF ADHESIVE, CAULK, AND GEOTEXTILE FABRIC FURNISHED AT THE BRIDGE ABUTMENTS SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR "STRUCTURAL CONCRETE (BRIDGE)".



SUBDRAIN SHALL SLOPE DOWNWARD 2% FROM CL APPROACH ROADWAY.

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DESIGN FOR 15° SKEW R.A.

**498'-0 x 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**

86'-0, 106'-0 END SPANS 87'-0, 112'-0, 107'-0 INTERIOR SPANS

EAST ABUTMENT BACKFILL DETAILS

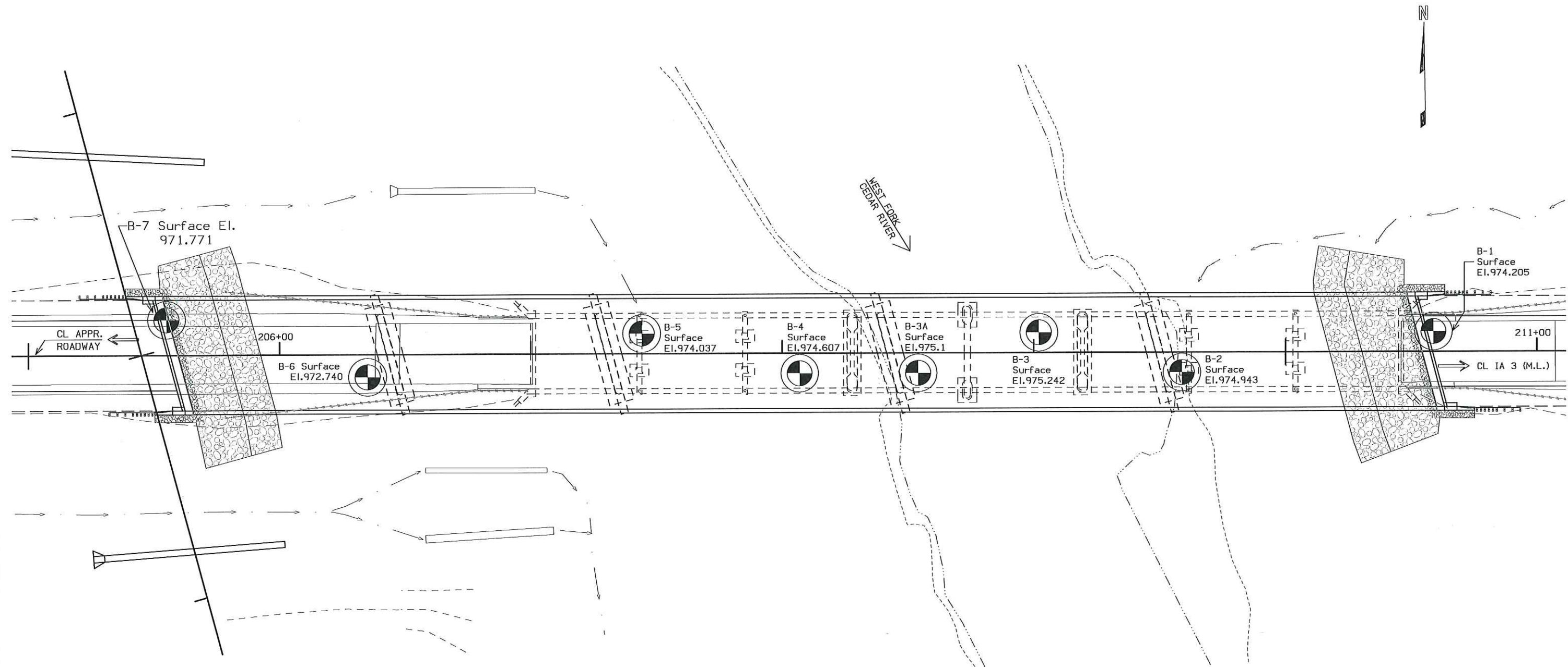
STA. 208+07.00 (IA 3) DECEMBER, 2019

BUTLER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 48 OF 48 FILE NO. 31394 DESIGN NO. 118

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



LOCATION

IA 3 OVER WEST FORK CEDAR RIVER
T 92 N R 18 W
SECTION 34
PITTSFORD TOWNSHIP
BUTLER COUNTY
BRIDGE MAINT. NO. 1295.7S003
FHWA NO. 016501
STA. 208+07.00 @ M.L.
LATITUDE 42.744880°
LONGITUDE -92.948446°

Note:
Streambed Elevation,
Thalweg = 961.2

0 ENGLISH 40
SCALE IN FEET

LEGEND	
	WATER
	DRY
	PLUGGED
	MOISTURE
	SHELBY
	BLOW COUNT
	DENS. CORE
	SAMPLE
	LAYER - NO. BLOWS
	DIAMOND CORE
	SAND
	GRAVELLY SAND
	BOULDERS
	SOIL REMEDIATION AREA
	LIMESTONE (L.S.)
	BROKEN & WEATHERED L.S.
	SANDSTONE
	SHALE
	SANDY SOIL

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 J. Heer 10-26-18
Signature Date
David J. Heer
Printed or Typed Name
My license renewal date is December 31, 2018.

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

DESIGN FOR 15° SKEW (R.A.)

**498'-0 X 44'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**

86', 106' END SPANS BTC BEAMS 87', 112', 107' INT. SPANS

BORING LOCATION

STATION: 208+07.00 IA 3

BUTLER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 3 FILE NO. 31394 DESIGN NO. 118

LOCATION

IA 3 OVER WEST FORK CEDAR RIVER
T 92 N R 18 W
SECTION 34
PITTSFORD TOWNSHIP
BUTLER COUNTY
BRIDGE MAINT. NO. I295.7S003
FHWA NO. 016501
STA. 208+07.00 @ M.L.
LATITUDE 42.744880°
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WATER

DRY

PLUGGED

MOISTURE

SHELBY

BLOW COUNT

DENS. CORE

SAMPLE

BLow COUNT

LAYER - NO. BLOWS

DIAMOND CORE

SAND

GRAVELLY SAND

BOULDERS

SOIL REMEDIATION AREA

LIMESTONE (L.S.)

BROKEN & WEATHERED L.S.

SANDSTONE

SHALE

SANDY SOIL

LEGEND

990

EXISTING GROUND

ROCK CORE COMPRESSIVE STRENGTH TESTING REPORT

Sample Number	Elevation	Material Description	Compressive Strength (psi)	Moisture (%)	Dry Density (PCF)
B-3-R1	894.83-895.16	Moderately Weathered Limestone, Fine-Grained, Massive Bedded, Highly Fractured, Moderately Hard Auger Refusal at 78'	11,700	2	165
	887.74-888.07		15,200	2	161
B-5-R1	893.79-894.12	Moderately Weather Limestone, Fine-Grained, Massive Bedded, Highly Fractured, Moderately Hard Auger Refusal at 77'	11,000	4	158
	888.21-888.54		14,900	1	170

Water Level Observations (Ft.)

Boring No.	Date Drilled	While Drilling	After Drilling
B-1	03/03/2017	13.0	Backfilled
B-3	03/08/2017	10.0 RIVER	
B-5	03/09/2017	10.0	Backfilled
B-7	06/21/2017	Water level obscured due to Mud Rotary drilling.	Backfilled

ROCK CORE INFORMATION

Boring	Approx.Surf.El.(ft)	Run No.	Interval(ft)	Recovery(%)	RQD(%)
B-3	975.2	1	78'-88'	100	88
B-5	974.0	1	77'-87'	100	54

SHELBY TUBE CORE DATA

CORE NO.	B-1-C2
DEPTH IN FEET	8.0-10.0
CLASSIFICATION (AASHTO)	--
COEFF.CONSO. (SQ. FT. /DAY)	1.525
TRIAXIAL COMPRESSION	CU
COHESION - PSF	400
FRICTION COEFF.	0.27
MOISTURE CONTENT %	33.1
DRY DENSITY - PCF	85.8
CU-CONSOLIDATED UNDRAINED	
UU-UNCONSOLIDATED UNDRAINED	
UC-UNCONFINED COMPRESSION (c=1/2 Qu)	



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

WEST BOUND LINE PROFILE

DESIGN FOR 15° SKEW (R.A.)

498'-0" X 44'-0" PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE

86', 106' END SPANS BTC BEAMS 87', 112', 107' INT. SPANS

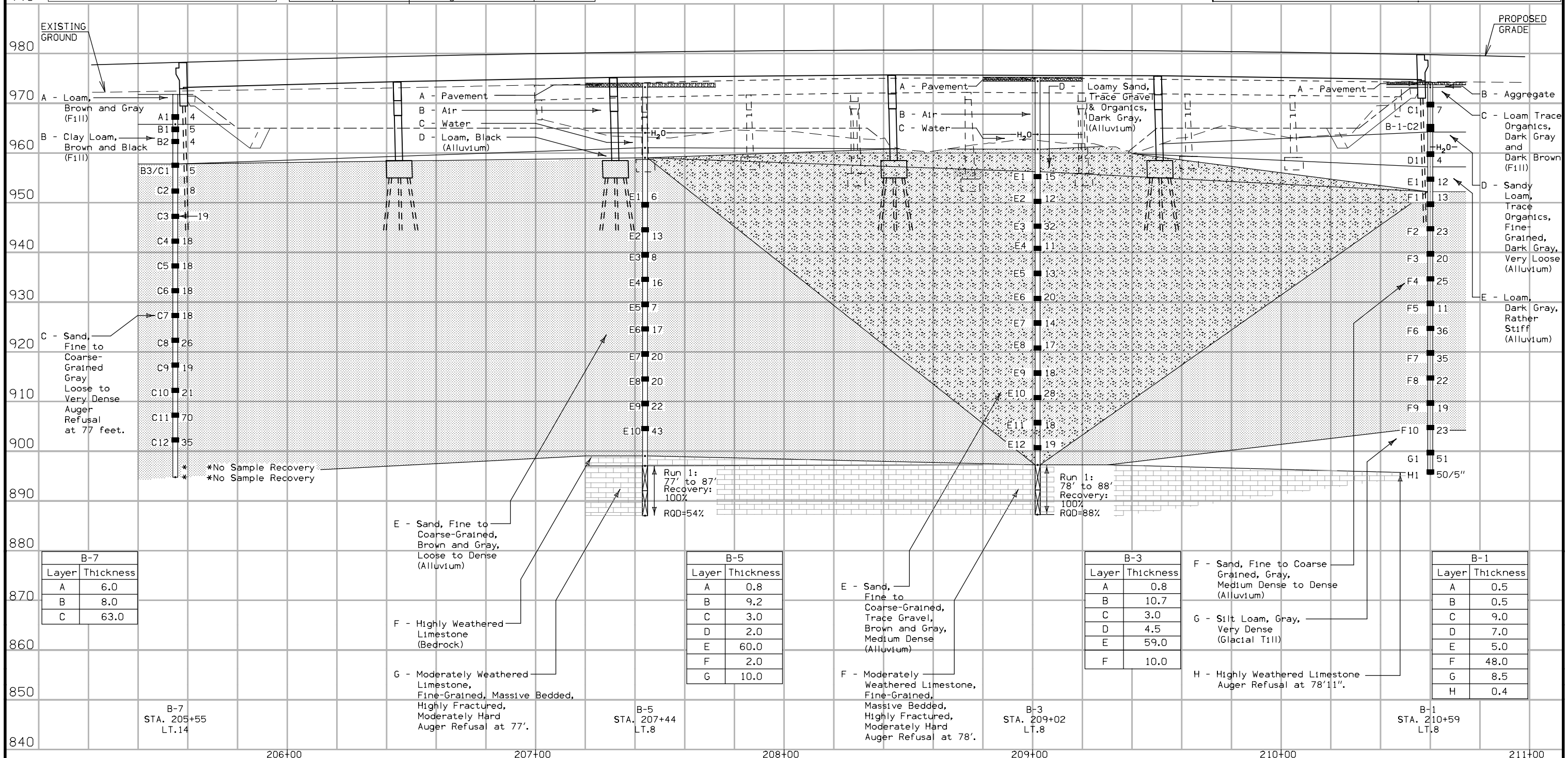
SOIL PROFILE SHEET

STATION: 208+07.00 IA 3 NOV. 2019

BUTLER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2 OF 3 FILE NO. 31394 DESIGN NO. 118



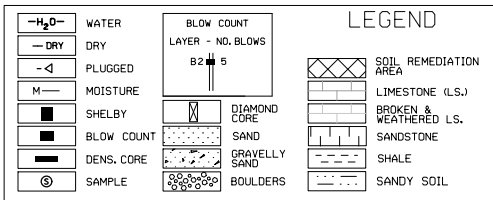
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LOCATION

IA 3 OVER WEST FORK CEDAR RIVER
T 92 N R 18 W
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BRIDGE MAINT. NO. 1295.7S003
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LATITUDE 42.744880°
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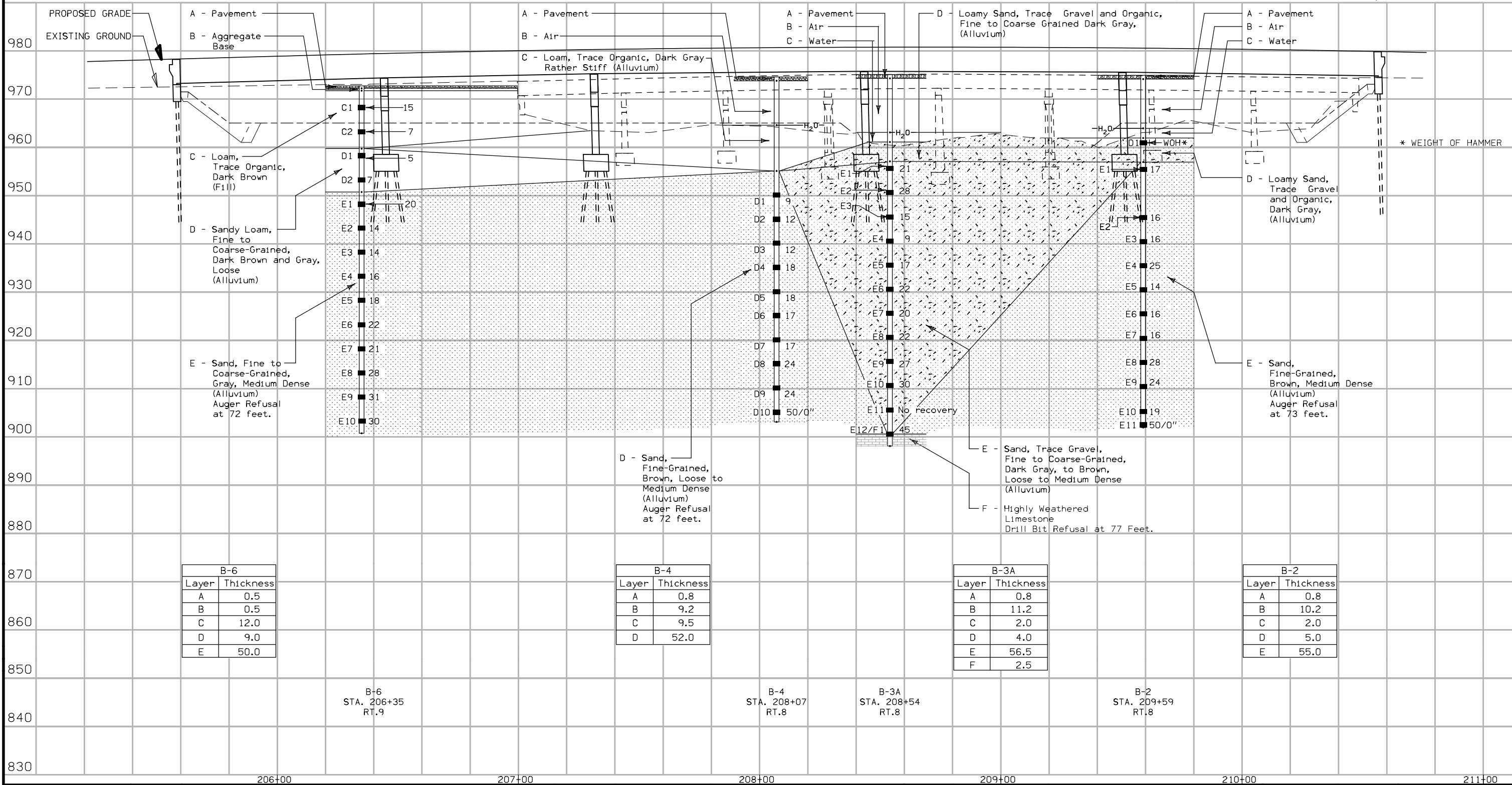


Water Level Observations (Ft.)			
Boring No.	Date Drilled	While Drilling	After Drilling
B-2	03/07/2017	11.0 RIVER	--
B-3A	07/23/2018	12.0 RIVER	--
B-4	08/07/2018	14.0	--
B-6	03/08/2017	Water level obscured due to mud rotary drilling method.	Boring backfilled



EAST
BOUND
LINE
PROFILE

DESIGN FOR 15° SKEW (R.A.)
**498'-0 X 44'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**
86', 106' END SPANS BTC BEAMS 87', 112', 107' INT. SPANS
SOIL PROFILE SHEET
STATION: 208+07.00 IA 3 NOV. 2019
BUTLER COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 3 OF 3 FILE NO. 31394 DESIGN NO. 118



B-6	
Layer	Thickness
A	0.5
B	0.5
C	12.0
D	9.0
E	50.0

B-6
STA. 206+35
RT.9

B-4	
Layer	Thickness
A	0.8
B	9.2
C	9.5
D	52.0

B-4
STA. 208+07
RT.8

B-3A	
Layer	Thickness
A	0.8
B	11.2
C	2.0
D	4.0
E	56.5
F	2.5

B-3A
STA. 208+54
RT.8

B-2	
Layer	Thickness
A	0.8
B	10.2
C	2.0
D	5.0
E	55.0

B-2
STA. 209+59
RT.8

BRIDGE APPROACH SECTION

Refer to the BR Series.

* Not a bid item

[illegible]

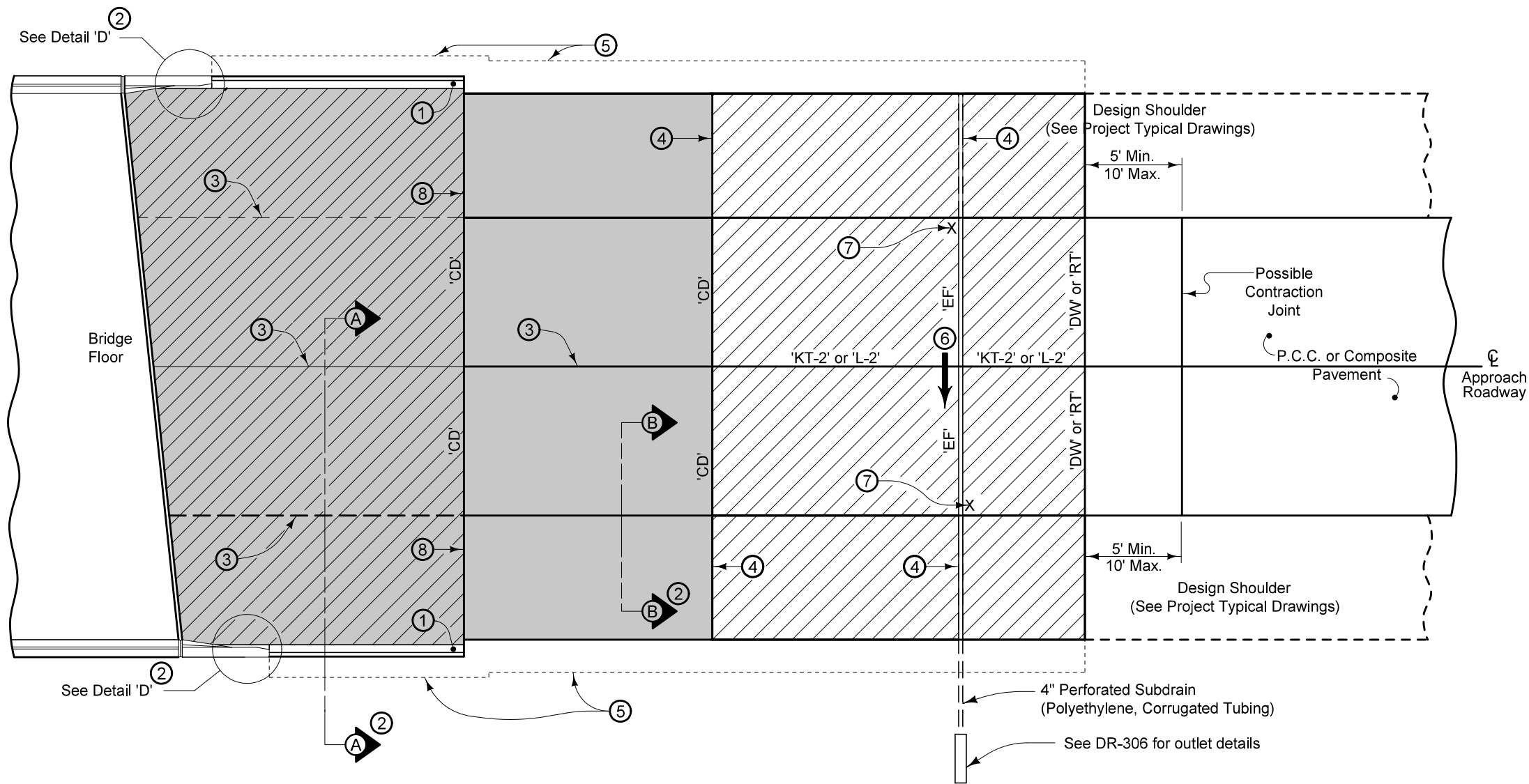
SCOUR PROTECTION OR ROCK FLUME FOR BRIDGE END DRAIN

Refer to Standard Road Plan DR-401 and DR-402

[illegible]

For joint details, see PV-101.

- ① Build 4 inch Sloped Curb to end of Double Reinforced Section.
- ② See BR-201, BR-202, BR-203, or BR-204.
- ③ Longitudinal Joint (PV-101):
Single Pour - Saw cut joint per Detail B .
Two Pours - Use 'KS-1' joint (Single Reinforced Section).
Use 'KS-2' joint (Double Reinforced Section).
- ④ Extend 'CD' and 'EF' joints where PCC Shoulder.
- ⑤ Polymer Grid and excavation limits of Modified Subbase 2 feet outside of pavement edge. See BR-201, BR-202, BR-203, or BR-204.
- ⑥ Slope subdrain to drain.
- ⑦ Place an "X" in the plastic concrete near the 'EF' joint at the outside edge of pavement.
- ⑧ Place 'RD' Joint where PCC shoulder. Place 'B' joint otherwise.

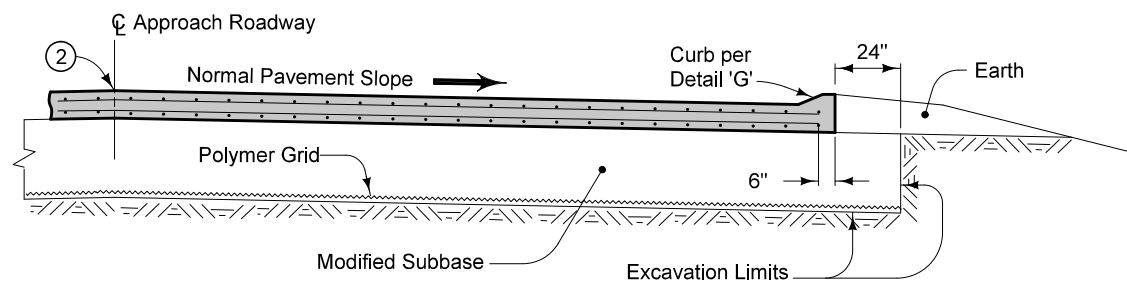
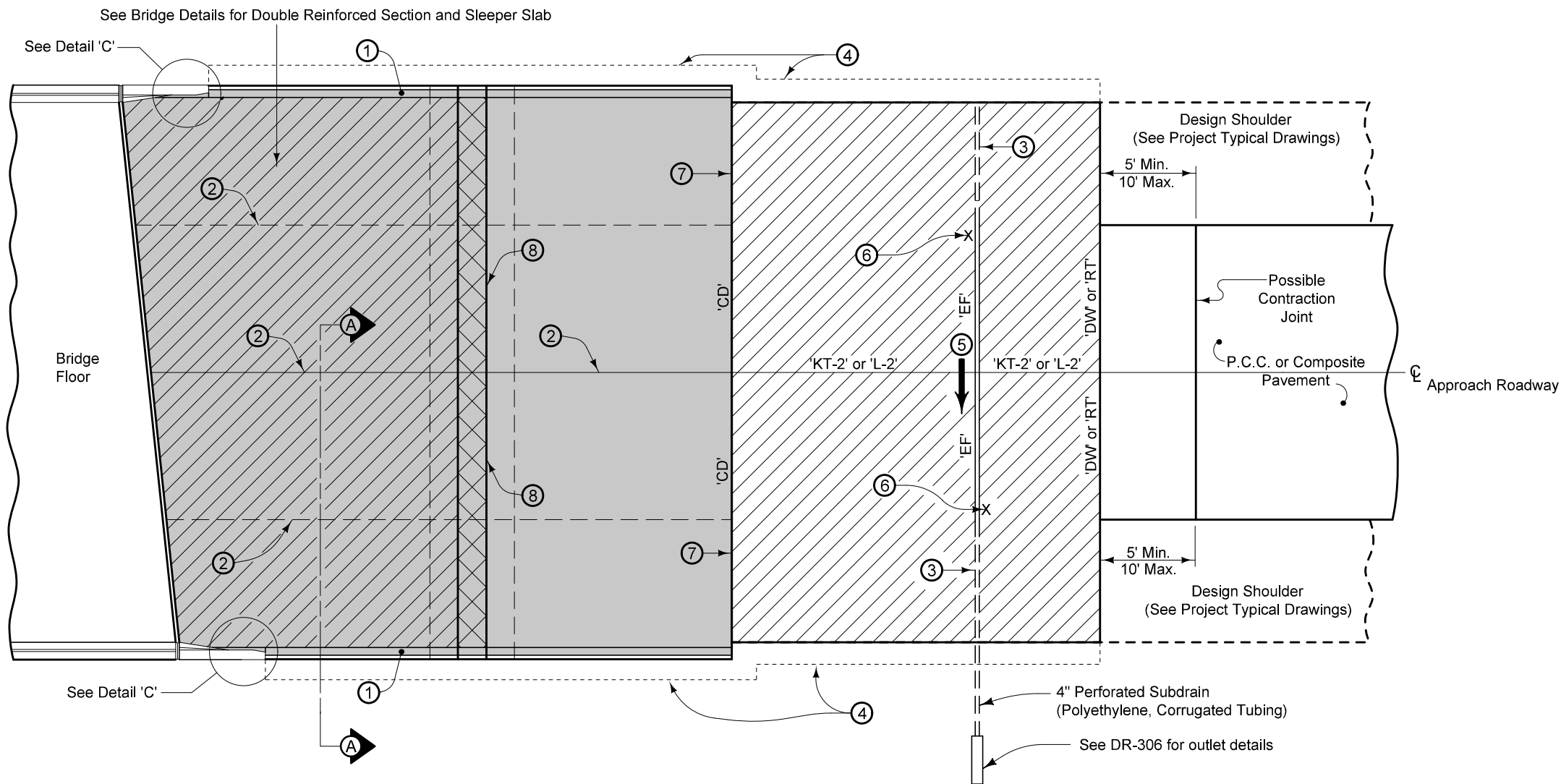


PLAN VIEW





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)		



Pay limits for contract item include the following areas:

-  Double Reinforced Section
-  Sleeper Beam Section
-  Single Reinforced Section
-  Non-Reinforced Section

For joint details, see PV-101.

For curb details, see Detail 'G'.

All transverse bars are #5.

Use epoxy coated bars for all reinforcement.

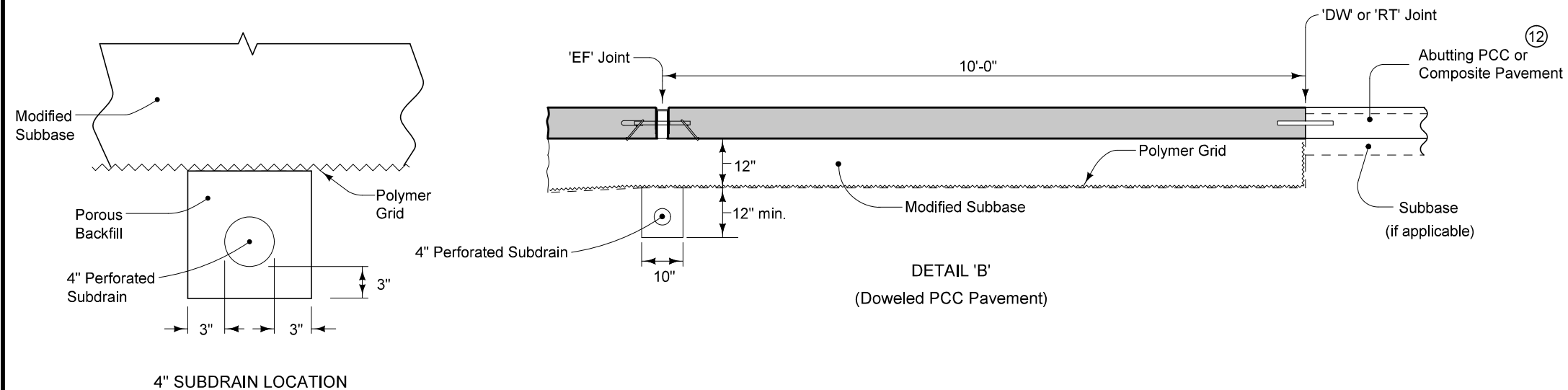
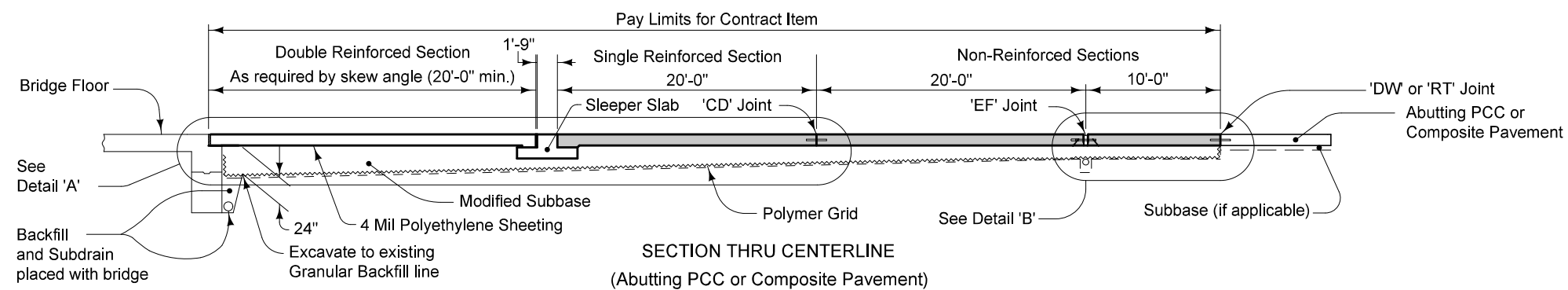
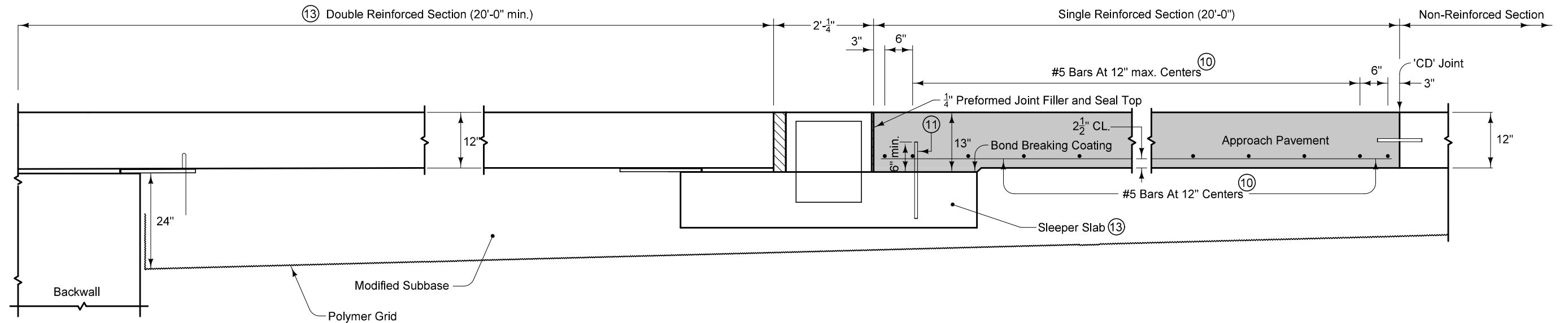
Quantities for both the 1'-9" top part of the sleeper slab and the 6'-3" portion under the approach pavement have been included in the double reinforced section quantities.

- ① Build 4 inch Sloped Curb to end of Reinforced Sections.
- ② Longitudinal Joint (PV-101):
Single Pour - Saw cut joint per Detail B.
Two Pours - Use 'KS-1' joint (Single Reinforced Section).
Use 'KS-2' joint (Double Reinforced Section).
- ③ Extend 'CD' and 'EF' joints where PCC Shoulder.
- ④ Polymer Grid and excavation limits of Modified Subbase 2 feet outside of pavement edge.
- ⑤ Slope subdrain to drain.
- ⑥ Place an "X" in the plastic concrete near the 'EF' joint at the outside edge of pavement.
- ⑦ Place 'RD' Joint where PCC shoulder. Place 'B' joint otherwise.
- ⑧ $\frac{1}{4}$ inch Preformed Joint Filler and seal top.

Possible Contract Item:
Bridge Approach, BR-205

Possible Tabulation:
112-6

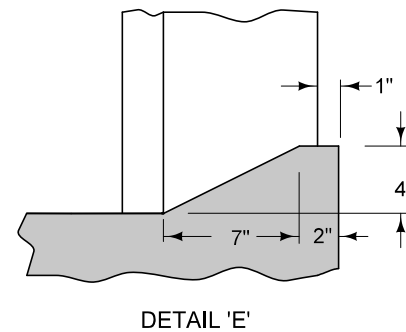
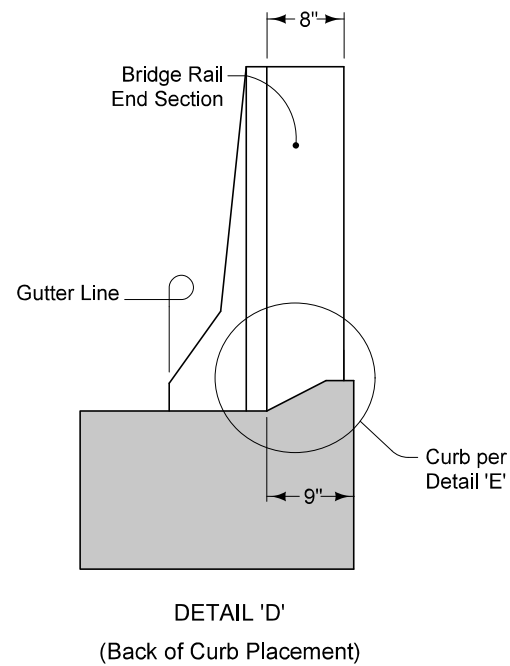
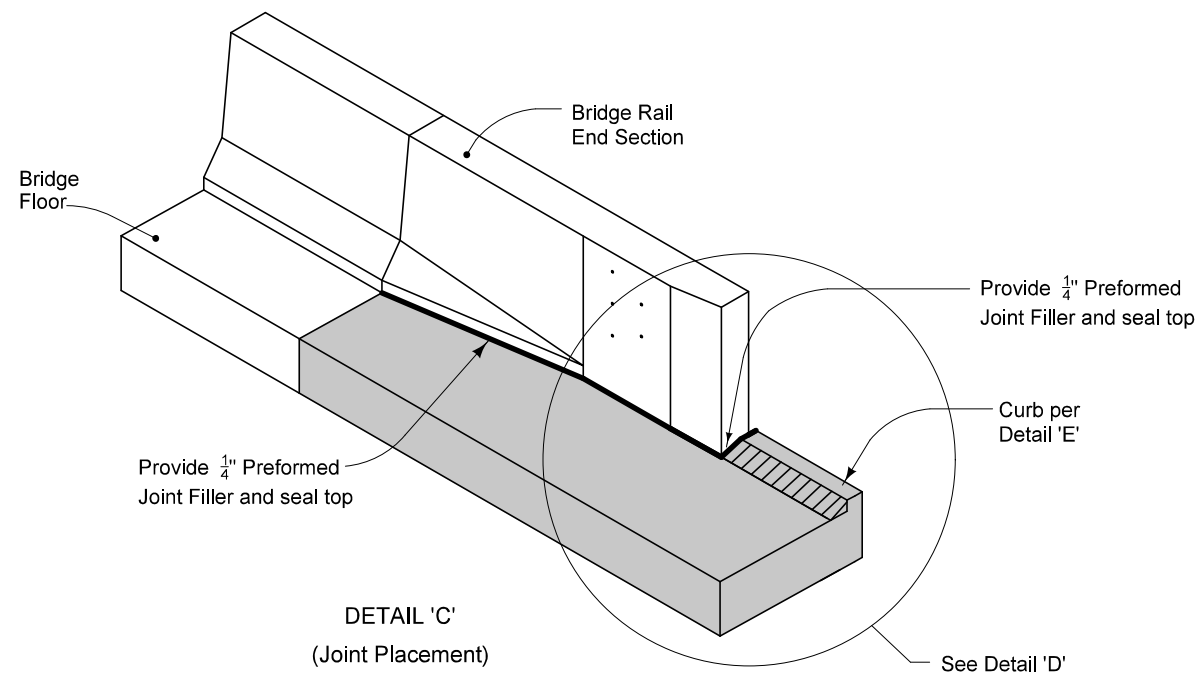
MODIFIED	
	BR-205M
STANDARD ROAD PLAN	SHEET 1 of 3
DOUBLE REINFORCED 12" APPROACH	



- ⑩ Minimum lap length: #5 Bars - 18"
#6 Bars - 27"
#8 Bars - 48"
- ⑪ #8 dowels 1'-6" long with 2½ inch bottom end clearance.
Space at 24 inches O.C.
- ⑫ If abutting pavement (PCC or HMA) is not in place, refer to BR-213.
- ⑬ See Bridge Details for double reinforced section and sleeper slab.

MODIFIED
STANDARD ROAD PLAN
BR-205M
SHEET 2 of 3

DOUBLE REINFORCED 12" APPROACH



MODIFIED	
	BR-205M
STANDARD ROAD PLAN	SHEET 3 of 3
DOUBLE REINFORCED 12" APPROACH	