

BRIDGE REPLACEMENT - PPCB  
NHSX-063-1(68)--3H-26  
03-16-2021

DAVIS COUNTY  
DAVIS COUNTY - DESIGN 113

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

DAVIS COUNTY

BRIDGE REPLACEMENT - PPCB

US 63 OVER SOAP CREEK  
2.5 MILES NORTH OF JCT. S.R. J15

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 & RC.1

DESIGN DATA RURAL

2019	AADT	5,100	V.P.D.
2039	AADT	5,900	V.P.D.
2035	DHV	850	V.P.H.
	TRUCKS	13	%
	Total Design ESALS	1,900,000	

INDEX OF SEALS

SHEET NO.	NAME	TYPE
I	CHAD S. PACKARD	STRUCTURAL DESIGN
I	DAVID J. MULHOLLAND	HYDRAULIC DESIGN
SPS.1	MARK DELL	GEOTECHNICAL DESIGN

HYDRAULIC DESIGN



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

Signature *David J. Mulholland* Date 01-05-2121  
Printed or Typed Name David J. Mulholland

My license renewal date is December 31, 2022

Pages or sheets covered by this seal: SHEETS 5 THRU 6 OF 227

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 *Chad S. Packard* Date 01-05-2121  
Printed or Typed Name Chad S. Packard

My license renewal date is December 31, 2022

Pages or sheets covered by this seal: SHEETS 1 THRU 33 OF 227

PROJECT DIRECTORY NAME: 2606301008

DESIGN TEAM CSP / TWE / Shuck-Britson, Inc.

ENGLISH

IOWA DOT \* BRIDGES AND STRUCTURES BUREAU

FILE NO. 31722

DAVIS COUNTY

PROJECT NUMBER NHSX-063-1(68)--3H-26

SHEET NUMBER I

ESTIMATED BRIDGE QUANTITIES					
ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
1	2301-0685550	BRIDGE APPROACH PAVEMENT, AS PER PLAN	SY	207.0	
2	2401-6745625	REMOVAL OF EXISTING BRIDGE	LS	1.00	
3	2402-2720000	EXCAVATION, CLASS 20	CY	1,115	
4	2402-2721000	EXCAVATION, CLASS 21	CY	522	
5	2403-0100010	STRUCTURAL CONCRETE (BRIDGE)	CY	405.2	
6	2403-7000210	HIGH PERFORMANCE STRUCTURAL CONCRETE	CY	585	
7	2404-7775000	REINFORCING STEEL	LB	55,232	
8	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB	156,661	
9	2404-7775009	REINFORCING STEEL, STAINLESS STEEL	LB	6,898	
10	2407-0564100	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTD100	EACH	12	
11	2407-0564135	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTD135	EACH	6	
12	2408-7800000	STRUCTURAL STEEL	LB	8,329	
13	2414-6424110	CONCRETE BARRIER RAILING	LF	732.0	
14	2501-0201517	PILES, STEEL, HP 14 X 117	LF	4,360	
15	2501-6335010	PREBORED HOLES	LF	360	
16	2507-2638650	BRIDGE WING ARMORING - EROSION STONE	SY	26.0	
17	2507-3250005	ENGINEERING FABRIC	SY	3,020.0	
18	2507-6800061	REVTMENT, CLASS E	TON	3,100.0	
19	2507-8029000	EROSION STONE	TON	16.0	
20	2526-8285000	CONSTRUCTION SURVEY	LS	1.00	
21	2533-4980005	MOBILIZATION	LS	1.00	
22	2599-9999010	DYNAMIC PILE TEST	LS	1.00	

ESTIMATE REFERENCE INFORMATION		
ITEM NO.	ITEM CODE	DESCRIPTION
1	2301-0685550	BRIDGE APPROACH PAVEMENT, AS PER PLAN PAYMENT IS FULL COMPENSATION FOR 14" DOUBLE REINFORCED APPROACH SLAB, AND OTHER MATERIAL AND LABOR TO CONSTRUCT THE BRIDGE APPROACH SECTION. INCLUDES ALL COSTS FOR FURNISHING AND INSTALLING CF-3 EXPANSION JOINTS AT THE GRADE BEAMS AND TYPE "B" JOINTS AT THE ABUTMENT PAVING NOTCHES SEE ROADWAY PLANS FOR POLYMER GRID AND MODIFIED SUB-BASE QUANTITIES. THE MATERIAL AND LABOR TO FURNISH AND INSTALL THE GRADE BEAM AND PILING IS NOT INCLUDED IN THIS BID ITEM.
2	2401-6745625	REMOVAL OF EXISTING BRIDGE INCLUDES ALL WORK FOR REMOVAL AND OFF-SITE DISPOSAL OF THE EXISTING CONTINUOUS STEEL GIRDER BRIDGE. REMOVAL SHALL BE IN ACCORDANCE WITH SECTION 2401 OF THE STANDARD SPECIFICATIONS.
3	2402-2720000	EXCAVATION, CLASS 20 INCLUDES EXCAVATION FOR BRIDGE ABUTMENTS, WINGS, PIERS, AND GRADE BEAMS. QUANTITY IS BASED ON THE ASSUMPTION THAT THE SITE GRADING AND SHAPING HAS BEEN COMPLETED TO THE "PROPOSED GROUNDLINE" PRIOR TO THE START OF CONSTRUCTION.
4	2402-2721000	EXCAVATION, CLASS 21 INCLUDES EXCAVATION FOR PIERS.
5	2403-0100010	STRUCTURAL CONCRETE (BRIDGE) INCLUDES CONCRETE FOR THE ABUTMENT FOOTING, THE PIER CAP, THE PIER COLUMN, AND THE PIER FOOTING.  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 FURNISH AND PLACING SUBDRAIN (INCLUDING EXCAVATION), FLOODABLE BACKFILL, POROUS BACKFILL, GEOTEXTILE FABRIC, WATER FLOODING, AND SUBDRAIN OUTLET AT ABUTMENTS  INCLUDES FURNISHING AND PLACING 3 INCH DIAMETER PVC PLASTIC PIPE AND EXPANDING FOAM IN THE ABUTMENT WINGS.
6	2403-7000210	HIGH PERFORMANCE STRUCTURAL CONCRETE THIS BID ITEM INCLUDES THE CONCRETE FOR THE BRIDGE DECK, ABUTMENT AND PIER DIAPHRAGMS, WINGWALLS, AND GRADE BEAMS. REFER TO THE DEVELOPMENTAL SPECIFICATION FOR HIGH PERFORMANCE CONCRETE FOR STRUCTURES FOR ADDITIONAL INFORMATION.
7	2404-7775000	REINFORCING STEEL - -
8	2404-7775005	REINFORCING STEEL, EPOXY COATED

9	2404-7775009	REINFORCING STEEL, STAINLESS STEEL - -
10	2407-0564100	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTD100 Includes pier and abutment bearing material.  Includes Contractor filling out beam numbers by location and beam seat elevations in "PPC Beam Data Spreadsheet" and forwarding electronic spreadsheet to the Engineer.
11	2407-0564135	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTD135 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.
12	2408-7800000	STRUCTURAL STEEL INCLUDES 18 DRAINS AT 120 LB EACH  INCLUDES INTERMEDIATE STEEL DIAPHRAGMS
13	2414-6424110	CONCRETE BARRIER RAILING INCLUDES CONCRETE BARRIERS ON BRIDGE DECK AND APPROACH SLAB. 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.
14	2501-0201517	PILES, STEEL, HP 14 X 117 INCLUDES FURNISHING AND INSTALLING STEEL PILE POINTS AT ALL GRADE BEAM ABUTMENT AND PIER PILE. REFER TO I.M. "PILE POINTS FOR STEEL H-PILES" AND I.M. "STRUCTURAL FIELD WELDING AND INSPECTION"
15	2501-6335010	PREBORED HOLES 15'-0 DEEP, 20" MINIMUM DIAMETER PREBORE REQUIRED AT EACH ABUTMENT PILE LOCATION.
16	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.
17	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.
18	2507-6800061	REVTMENT, CLASS E Estimated at 1.6 ton/cu yd.
19	2507-8029000	EROSION STONE Estimated at 1.6 ton/cu yd.
20	2526-8285000	CONSTRUCTION SURVEY - -
21	2533-4980005	MOBILIZATION - -
22	2599-9999010	DYNAMIC PILE TEST PDA TEST SHALL BE PERFORMED ON 2 PRODUCTION PILES AS INDICATED IN THESE PLANS. REFER TO "DYNAMIC PILE ANALYZER (PDA) TEST NOTE" FOR ADDITIONAL INFORMATION.

NOTE:  
ROADWAY QUANTITIES SHOWN  
ELSEWHERE IN THESE PLANS.

DESIGN FOR 0° SKEW  
339'-0 x 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE  
101'-0 END SPANS 137'-0 INTERIOR SPAN  
ESTIMATED QUANTITIES  
STA. 2496+41.15 (US 63) JANUARY, 2021  
DAVIS COUNTY  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 1 OF 32 FILE NO. 31722 DESIGN NO. 113

DESIGN TEAM CSP / TWE / Shuck-Britson, Inc.	DAVIS COUNTY	PROJECT NUMBER NHSX-063-1(68)--3H-26	SHEET NUMBER 2
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## SUMMARY OF CONCRETE QUANTITIES

LOCATION	STRUCTURAL CONCRETE	HPC STRUCTURAL CONCRETE
SOUTH ABUT.FTG.	24.6	_____
NORTH ABUT.FTG.	24.6	_____
BRIDGE DECK + ABUT. + PIER DIAPHRAGMS	_____	523.2
SOUTH ABUTMENT WINGS                  2 @ 3.3 C.Y.	_____	6.6
NORTH ABUTMENT WINGS                2 @ 3.3 C.Y.	_____	6.6
PIER NO. 1	178.0	_____
PIER NO. 2	178.0	_____
SOUTH GRADE BEAM	_____	24.3
NORTH GRADE BEAM	_____	24.3
TOTAL (CU. YDS.)	405.2	585.0

## SUMMARY OF REINFORCING STEEL

LOCATION	NON-COATED REINFORCING STEEL	STAINLESS STEEL REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
Δ BRIDGE DECK + ABUT. FTG.	_____	206	139,034
BARRIER RAIL - BOTH RAILS	_____	4426	11,337
BARRIER RAIL END SECTIONS	_____	4 @ 312 = 1,284	4 @ 125 = 500
ABUTMENT WINGS	_____	_____	4 @ 253 = 1,012
PIER NO. 1	27,612	_____	_____
PIER NO. 2	27,612	_____	_____
SOUTH GRADE BEAM	_____	509	2,389
NORTH GRADE BEAM	_____	509	2,389
TOTAL (LBS.)	55,232	6,898	156,661

Δ INCLUDES ABUT. & PIER DIAPHRAGMS

## SUMMARY OF EXCAVATION

LOCATION	CLASS 20 EXCAVATION	CLASS 21 EXCAVATION
SOUTH ABUTMENT	135	_____
NORTH ABUTMENT	135	_____
PIER NO. 1	337	255
PIER NO. 2	337	267
SOUTH GRADE BEAM	85	_____
NORTH GRADE BEAM	85	_____
TOTAL (CU. YDS.)	1,114	522

## SUMMARY OF FOUNDATIONS

[illegible]

## SUMMARY OF STRUCTURAL STEEL

LOCATION	TOTAL (LBS.)
BRIDGE DECK DRAINS 18 @ 120 C.Y.	2,160
INTERMEDIATE STEEL DIAPHRAGMS	6,169
TOTAL (LBS.)	8,329

## SUMMARY OF BEARINGS

[illegible]

DESIGN FOR 0° SKEW

**339'-0" x 44'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**

101'-0" END SPANS      137'-0" INTERIOR SPAN

**SUMMARY QUANTITIES SHEET**

STA. 2496+41.15 (US 63)      JANUARY, 2021

**DAVIS COUNTY**

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2 OF 32      FILE NO. 31722      DESIGN NO. 113

GENERAL NOTES

THIS DESIGN IS FOR REPLACEMENT OF THE EXISTING 280’ x 30’ CONTINUOUS WELDED GIRDER BRIDGE ON US.63 OVER SOAP CREEK WITH A 339’-0 x 44’ PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE, AT STATION: 2496+41.15. THE ORIGINAL BRIDGE WAS CONSTRUCTED IN 1962 UNDER DESIGN NO. 662. ELECTRONIC PLANS OF THE EXISTING STRUCTURE ARE AVAILABLE TO THE CONTRACTOR AS PART OF THE E-FILES SUPPLIED WITH THE CONTRACT DOCUMENTS.

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 BRIDGE CONTRACTOR OF THE CONSTRUCTION STARTING DATE.

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 ABUTMENT PILES. HOLES SHALL BE BORED TO THE ELEVATIONS SHOWN ON THE "LONGITUDINAL SECTION ALONG CENTERLINE APPROACH ROADWAY" ON THE SITUATION PLAN. PILES SHALL BE DRIVEN THROUGH THE HOLES TO AT LEAST THE SPECIFIED NOMINAL BEARING RESISTANCE.

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

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

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

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

THE LUMP SUM BID FOR "REMOVAL OF EXISTING BRIDGE" SHALL INCLUDE 280’-0 X 30’-0 CONTINUOUS WELDED GIRDER BRIDGE DESIGN NO. 662 DAVIS COUNTY.

REMOVALS SHALL BE IN ACCORDANCE WITH SECTION 2401 OF THE STANDARD SPECIFICATIONS.

FAINT LINES ON PLANS INDICATE THE EXISTING STRUCTURE.

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

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.

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 800 PARTS PER MILLION (PPM). ANALYSIS OF TOTAL CHROMIUM ON THIS SAMPLE WAS 836 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.

CAST IN-ONE-PIECE STEEL PILE POINTS ARE REQUIRED FOR THE GRADE BEAMS, ABUTMENTS AND PIERS PILES IN ACCORDANCE WITH ARTICLE 4167.02 OF THE CURRENT STANDARD SPECIFICATIONS AND MATERIALS I.M. 468.

THE BRIDGE CONTRACTOR IS TO CLEAR AND/OR SHAPE THE CHANNEL WITHIN THE APPROXIMATE LIMITS OF THE AREAS AS SHOWN ON THE "SITUATION PLAN" AND "SECTION A-A" ON DESIGN SHEET 30.

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

DYNAMIC PILE ANALYZER (PDA) TEST:

1. DYNAMIC PILE TESTING SHALL BE PERFORMED ON THE TWO PRODUCTION PILES AS SHOWN IN THESE PLANS. THE PRODUCTION PILE TESTING SHALL BE PERFORMED DURING INITIAL DRIVING AND RESTRIKES TO MONITOR HAMMER AND DRIVE SYSTEM PERFORMANCE, ASSESS PILE INSTALLATION STRESSES, AS WELL AS TO EVALUATE PILE CAPACITY. THE PDA TESTS WILL BE ONLY USED FOR THE POOL- FUNDED RESEARCH PROJECT WHICH STUDIES PILES TIPPING OUT IN SHALE OR IGM LAYERS. THE CONTRACTOR SHOULD CONTACT THE RESEARCH PERSONNEL FOR THE TEST INSTRUCTION AT LEAST 5 DAYS PRIOR TO THE PDA PILE DRIVING. THE RESEARCH PERSONNEL

CONTACT INFORMATION:  
Kam Ng  
1000 E. University Avenue  
University of Wyoming  
Laramie, WY 82071  
e-mail: kng1@uwyo.edu  
Office Phone: 307-766-4388

2. ALL EQUIPMENT NECESSARY FOR THE DYNAMIC MONITORING SUCH AS SENSORS, CABLES OR WIRELESS TRANSMITTERS, ETC., SHALL BE FURNISHED BY THE CONTRACTOR. THE EQUIPMENT SHALL CONFORM TO THE REQUIREMENTS OF ASTM D4945. THE CONTRACTOR WILL FURNISH THE PILE DRIVING ANALYZER, EQUIPMENT/INSTRUMENTS, MATERIAL, AND LABOR NECESSARY FOR DRILLING THE HOLES, MOUNTING THE INSTRUMENTS, OBTAINING THE DATA, AND PERFORMING THE CAPWAP ANALYSIS. AN ENGINEER WITH A MINIMUM 5 YEARS OF EXPERIENCE AND/OR WHO HAS ACHIEVED BASIC LEVEL OR BETTER ON THE FOUNDATION QA EXAMINATION FOR PROVIDERS OF PDA TESTING SERVICES SHALL BE IN CHARGE OF PILE DRIVING ANALYZER (PDA) OPERATION AND OF RESULT INTERPRETATION, EITHER ON SITE OR BY REMOTE CONNECTION.

3. CAPWAP ANALYSIS OF THE DYNAMIC PILE TESTING DATA SHALL BE PERFORMED ON DATA OBTAINED FROM: (1) AT THE INITIAL DRIVING WHEN THE PILE TIP PENETRATES INTO THE SHALE LAYER PRIOR TO END THE INITIAL DRIVING; (2) AT THE END OF INITIAL DRIVING; (3) AT THE BEGINNING OF THE 1-HOUR RESTRIKE; AND (4) AT THE BEGINNING OF THE 24-HOUR RESTRIKE. RESTRIKES SHOULD BE PERFORMED 1 HOUR AND 24 HOURS AFTER THE END OF INITIAL DRIVING. HAMMER BLOW COUNTS AND HAMMER STROKE HEIGHTS SHOULD BE RECORDED AT THE END OF INITIAL DRIVING AND ALL RESTRIKES. PILE DRIVING HAMMER SHOULD BE WARMED UP BEFORE PERFORMING THE RESTRIKES. CAPWAP ANALYSES SHALL BE PERFORMED BY AN ENGINEER WHO HAS ACHIEVED ADVANCED LEVEL OR BETTER ON THE FOUNDATION QA EXAMINATION FOR PROVIDERS OF PDA TESTING SERVICES. THE ENGINEER MAY REQUEST ADDITIONAL ANALYSES AT SELECTED PILE PENETRATION DEPTHS.

4. WITHIN ONE DAY OF PRODUCTION PILE TESTING, THE CONTRACTOR SHALL PREPARE A HAND WRITTEN DAILY FIELD REPORT SUMMARIZING THE DYNAMIC TESTING RESULTS. AS A MINIMUM, THE DAILY REPORTS SHALL INCLUDE THE CALCULATED DRIVING STRESSES, TRANSFERRED ENERGY, AND ESTIMATED ULTIMATE PILE CAPACITY AT THE TIME OF TESTING. VARIATIONS FROM PREVIOUS TRENDS IN THE DYNAMIC TEST DATA SHALL ALSO BE NOTED. DAILY FIELD REPORTS SHALL BE TRANSMITTED TO THE ENGINEER.

5. THE CONTRACTOR SHALL SEND THE DAILY FIELD REPORT, THE ELECTRONIC PDA TESTING FILES TOGETHER WITH THE CAPWAP ANALYSIS TO THE ABOVE RESEARCH PERSONNEL BY EMAILS NO LATER THAN TEN WORKING DAYS AFTER THE COMPLETION OF THE TESTING.

6. MEASUREMENT FOR THE DYNAMIC PILE TEST AND CAPWAP ANALYSIS WILL BE LUMP SUM. PAYMENT IS FULL COMPENSATION FOR ALL LABOR, MATERIALS, EQUIPMENT AND TIME ASSOCIATED WITH THE TESTS.

7. THE SELECTED PRODUCTION PILES FOR THE PDA TEST SHALL BE DRIVEN TO REACH THE BEARING CAPACITY PER PILE DESIGN NOTES IN THESE PLANS AND SHALL REMAIN AT LEAST 4’-0 OF PROJECTION ABOVE THE GROUND AT THE END OF DRIVING TO ALLOW THE PDA TEST INSTRUMENTATION REMOVAL. IF THE BEARING CAPACITY IS REACHED, THE TOP PROJECTION OF THE PILES SHALL BE CUT OFF TO PROVIDE THE REQUIRED PILE EMBEDMENT INTO ABUTMENT/PIER FOOTINGS.

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.

TRAFFIC CONTROL PLAN

TRAFFIC WILL BE MAINTAINED DURING CONSTRUCTION. SEE TRAFFIC CONTROL PLAN NOTE ON ROAD PLAN SHEETS.

SPECIFICATIONS:

DESIGN: AASHTO LRFD 8th Ed, SERIES OF 2017, EXCEPT AS NOTED IN THE CURRENT IOWA BRIDGE DESIGN MANUAL.  
CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT. INCLUDING THE DEVELOPMENTAL SPECIFICATION FOR HIGH PERFORMANCE CONCRETE FOR STRUCTURES.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8th Ed, SERIES OF 2017, EXCEPT AS NOTED IN THE CURRENT IOWA BRIDGE DESIGN MANUAL.  
REINFORCING STEEL IN ACCORDANCE WITH AASHTO LRFD SECTION 5, GRADE 60 FOR EPOXY COATED AND NON-COATED, AND GRADE 60 OR 75 FOR STAINLESS. CONCRETE IN ACCORDANCE WITH AASHTO LRFD SECTION 5, f'c = 4.0 KSI, EXCEPT PRESTRESSED BEAM CONCRETE AS NOTED.  
PRESTRESSED CONCRETE BEAMS, SEE DESIGN SHEETS 19, 20, 21 & 22.  
STRUCTURAL STEEL IN ACCORDANCE WITH AASHTO LRFD SECTION 6. ASTM A709 GRADE 36, GRADE 50, AND GRADE 50W ( AASHTO M270 GRADE 36, GRADE 50, AND GRADE 50W ).

POLLUTION PREVENTION PLAN SHOWN ELSEWHERE IN THESE PLANS.

SHOP DRAWING SUBMITTALS

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

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

SHOP DRAWINGS SHALL BE SUBMITTED WITH THE FOLLOWING NAMING CONVENTION:  
(Paren)\_County\_DesignNumber\_SubmittalDescription.pdf  
Example: (090)\_BlackHawk\_Design915\_DeckDrains.pdf

1	DECK DRAIN DETAILS
2	INTERMEDIATE STEEL DIAPHRAGM DETAILS

BRIDGE DECK DIMENSIONS TABLE

NO.	ITEM	UNIT	QUANTITY
1	DECK LENGTH	L.F.	342.0
2	MINIMUM DECK WIDTH	L.F.	47.2
3	MAXIMUM DECK WIDTH	L.F.	47.2
4	DECK AREA	S.F.	16142.0

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

DESIGN FOR 0° SKEW

339’-0 x 44’-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

101’-0 END SPANS137’-0 INTERIOR SPAN

GENERAL NOTES

STA. 2496+41.15 (US 63)JANUARY, 2021

DAVIS COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 3 OF 32 FILE NO. 31722 DESIGN NO. 113





## BERM SLOPE LOCATION TABLE

	SOUTH ABUTMENT			NORTH ABUTMENT		
	STATION	OFFSET	ELEV	STATION	OFFSET	ELEV
A1	2495+09.62	28.16' LT	676.00	2497+75.20	28.16' LT	676.00
A2	2495+09.62	0	676.00	2497+75.20	0	676.00
A3	2495+09.62	28.16' RT	676.00	2497+75.20	28.16' RT	676.00
A4	2495+60.65	28.16' LT	675.20	2496+96.55	28.16' LT	675.20
A5	2495+69.06	0	675.00	2496+96.26	0	675.00
A6	2495+71.83	28.16' RT	675.35	2496+94.66	28.16' RT	675.20
B1	2494+76.15	28.16' LT	689.39	2498+06.15	28.16' LT	688.38
B2	2494+76.15	0	689.39	2498+06.15	0	688.38
B3	2494+76.15	28.16' RT	689.39	2498+06.15	28.16' RT	688.38
G1	2494+33.66	125.27' LT	689.39	2498+48.64	125.27' LT	688.38
G2	2494+48.48	164.83' LT	677.50	2498+35.60	155.79' LT	678.50
G3	2494+71.23	224.13' LT	676.50	2498+12.32	143.34' LT	676.00
G4	2494+74.60	132.85' LT	677.00	2497+58.05	172.84' LT	675.50
G5	2495+64.58	165.15' LT	676.07	2497+00.00	173.10' LT	674.80
G6	2495+04.86	56.75' LT	676.00	2496+98.82	59.99' LT	675.10
G7	2495+73.01	79.73' LT	675.18	2497+77.22	46.38' LT	676.00
G9	2494+58.15	45.86' RT	689.39	2498+24.15	46.56' RT	688.38
G10	2494+58.15	77.76' RT	678.23	2498+24.15	78.54' RT	677.72
G11	2495+03.22	46.77' RT	676.00	2497+88.62	54.04' RT	677.80
G12	2495+65.15	54.88' RT	675.00	2496+94.95	56.27' RT	675.20
G13	2494+19.59	163.60' LT	676.80	2498+59.92	160.79' LT	676.95
G14	2493+95.52	135.49' LT	677.20	2498+84.36	136.93' LT	677.30
G15	2493+98.94	113.65' LT	683.20	2498+75.12	87.82' LT	685.50
G16	2493+92.49	77.37' LT	685.42	2498+92.55	100.08' LT	682.00
W1	2494+58.15	28.16' LT	695.53	2498+24.15	28.16' LT	694.47
W2	2494+58.15	28.16' RT	695.53	2498+24.15	28.16' RT	694.47

W - END WING / EROSION STONE  
BERM SLOPE TABLE ELEVATIONS REFLECT GRADING SURFACE

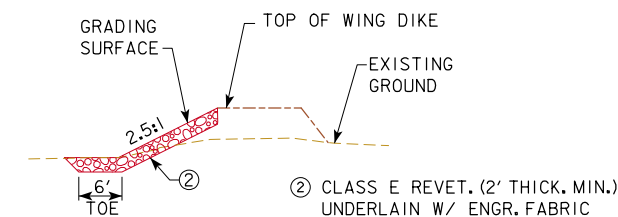
GRADING CONTROL-SOUTH:

POINTS A4, A5, A6, G5, G7 AND G12 ARE BANK GRADING CONTROL LINE

GRADING CONTROL-NORTH:

POINTS A4, A5, A6, G5, G6 AND G12 ARE BANK GRADING CONTROL LINE

NOTE: BANK GRADING CONTROL LINE LOCATED AT BASE OF 1% SLOPE



## TYPICAL SECTION AT WING DIKE

③ REFER TO IDOT STANDARD ROAD PLAN EW-210 FOR DETAILS.  
GRADING SHOWN FOR DIKES BASED ON 0° SKEWED BRIDGE DETAIL IN ROAD PLAN.  
SOUTH DIKE LOCATION STATION 2494+66.15  
NORTH DIKE LOCATION STATION 2498+16.15

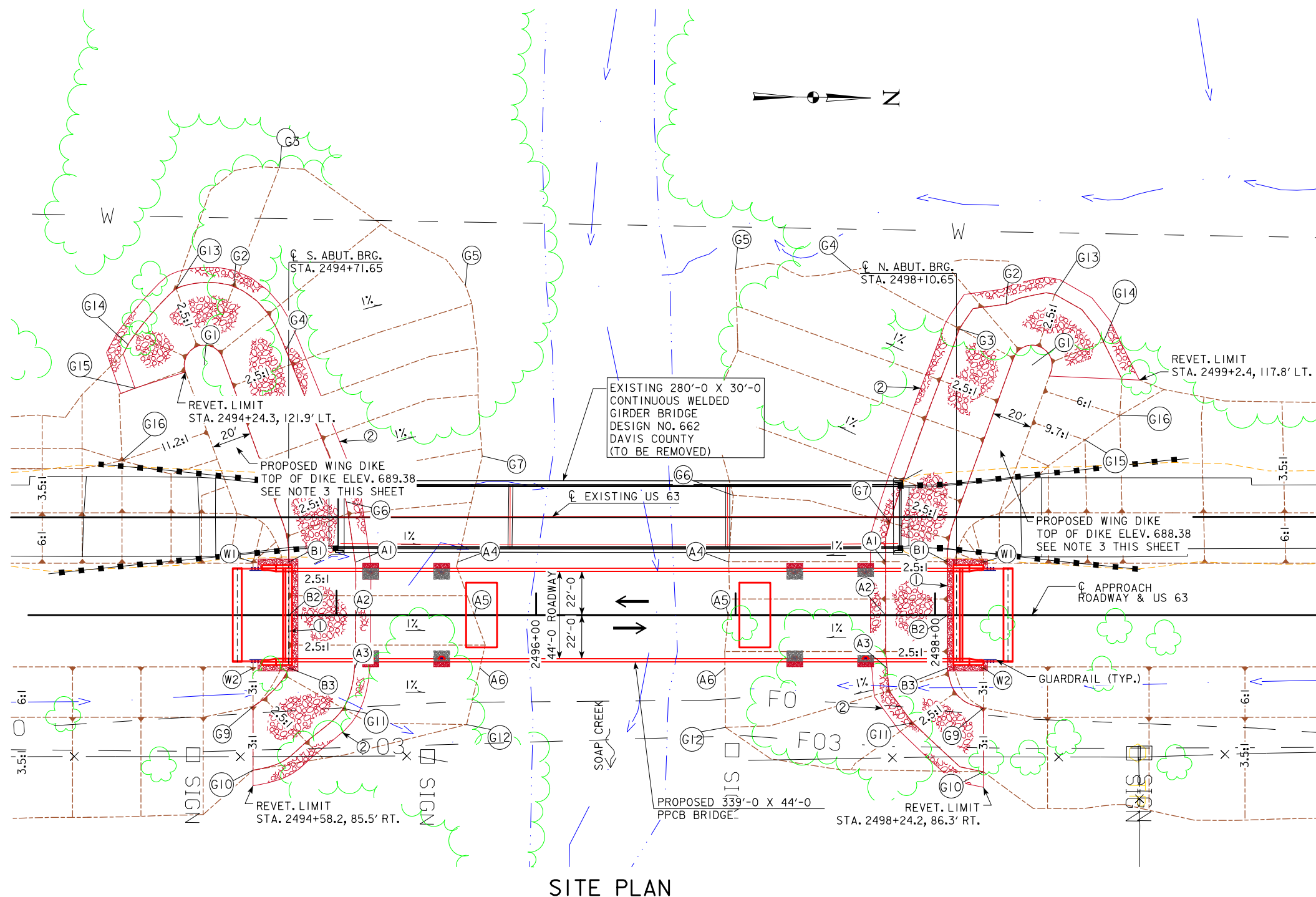
## ESTIMATED ARMORING QUANTITIES

LOCATION	REVTMENT CL. E (TON)	EROSION STONE (TON)	ENGINEERING FABRIC (SY)	EXCAVATION * (CY)
BERM AND WING DIKE LINING - SOUTH ABUTMENT	1,600	8	1,550	920
BERM AND WING DIKE LINING - NORTH ABUTMENT	1,500	8	1,470	860
TOTALS	3,100	16	3,020	1,780

EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE.

\* "EXCAVATION, CLASS 10, CHANNEL" QUANTITY IS INCLUDED IN THE ESTIMATED ROADWAY QUANTITIES SHOWN ELSEWHERE IN THESE PLANS.

## TYPICAL SECTION AT BRIDGE BERM AND STREAMBANK



## SITE PLAN

DESIGN FOR 0° SKEW  
**339'-0 x 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
101'-0 END SPANS 137'-0 INTERIOR SPAN  
**SITUATION PLAN-SITE**  
STA. 2496+41.15 (US 63) JANUARY, 2021  
**DAVIS COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 5 OF 32 FILE NO. 31722 DESIGN NO. 113

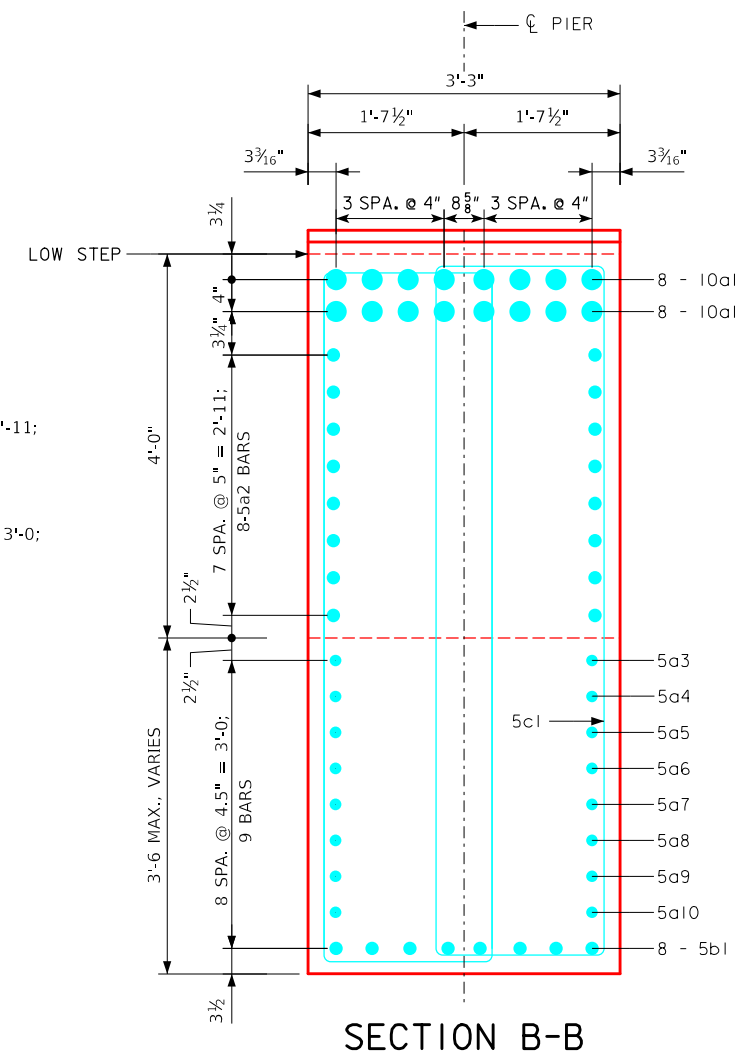
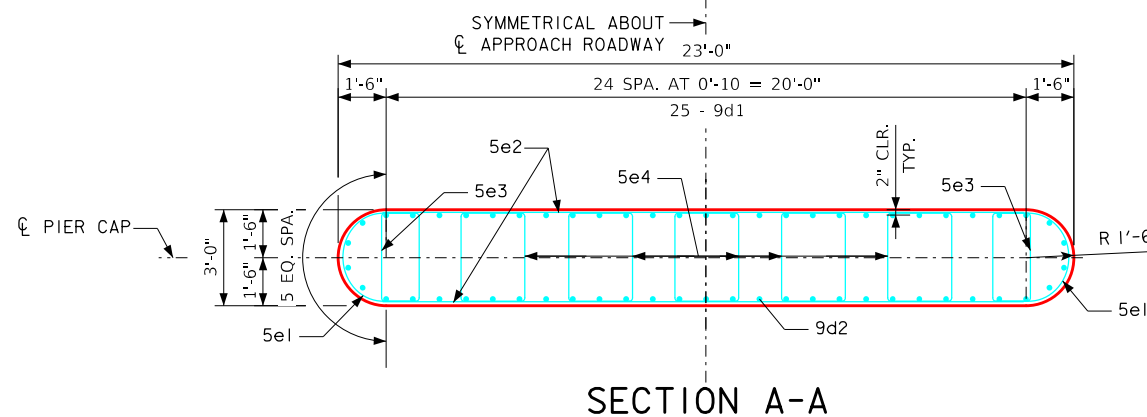
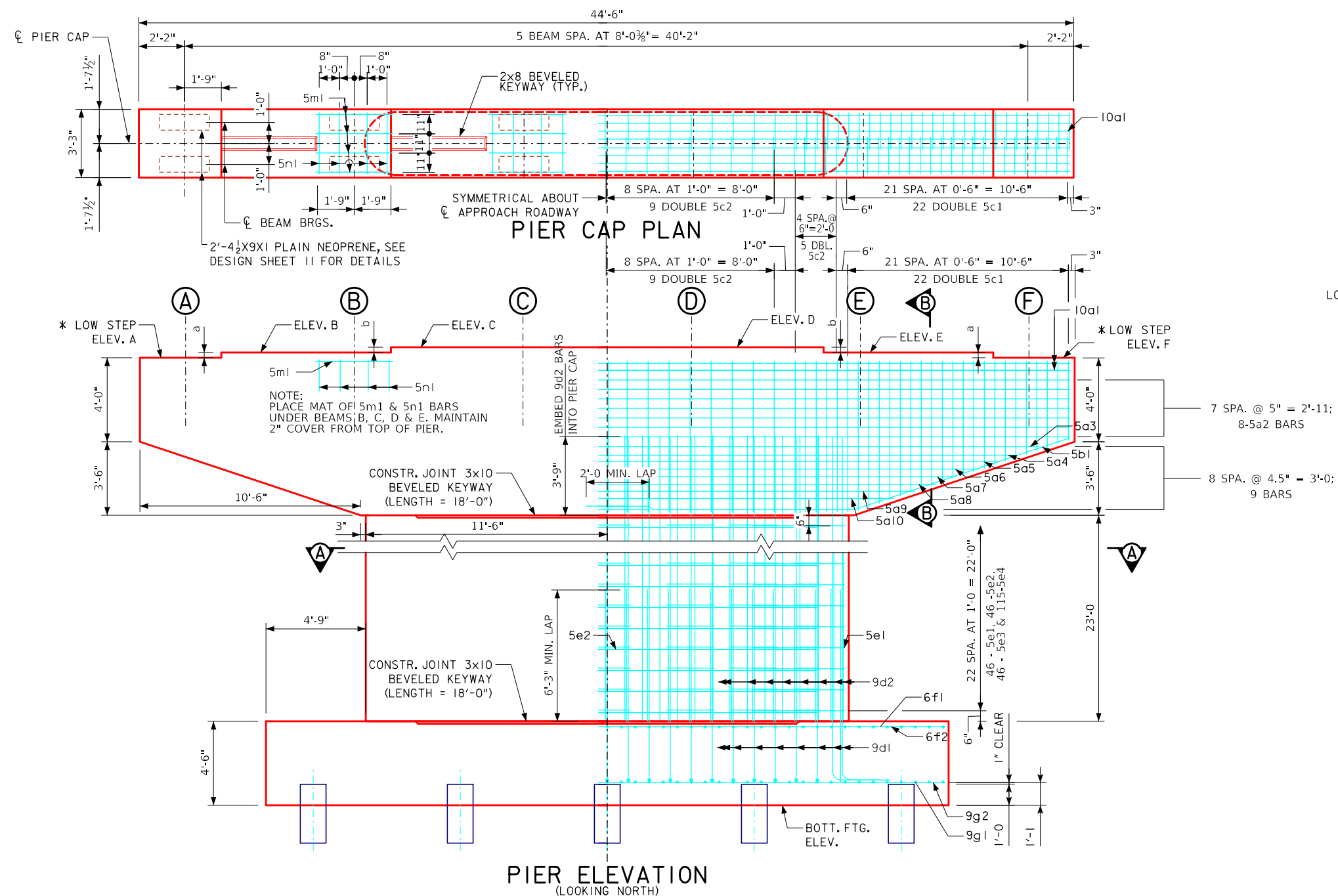


TABLE OF PIER STEPS AND ELEVATIONS					
STEP	PIER 1	PIER 2	ELEVATION	PIER 1	PIER 2
a	115 1/16	115 1/16	A	* 690.69	* 690.28
b	115 1/16	115 1/16	B	690.85	690.44
			C	691.01	690.60
			D	691.01	690.60
			E	690.85	690.44
			F	* 690.69	* 690.28
			BOTT. FTG.	655.69	655.28

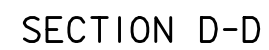
\* ELEVATION OF LOW STEP

NOTES:  
SEE DESIGN SHEET 8 FOR PIER NOTES.  
SEE DESIGN SHEET 7 FOR PIER FOOTING PLAN.

DESIGN FOR 0° SKEW  
339'-0" x 44'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE  
101'-0" END SPANS 137'-0" INTERIOR SPAN  
PIER DETAILS  
STA. 2496+41.15 (US 63) JANUARY, 2021  
DAVIS COUNTY  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 6 OF 32 FILE NO. 31722 DESIGN NO. 113



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



DESIGN FOR 0° SKEW  
339'-0" x 44'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE  
101'-0" END SPANS 137'-0" INTERIOR SPAN  
PIER DETAILS  
STA. 2496+41.15 (US 63) JANUARY, 2021  
DAVIS COUNTY  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 7 OF 32 FILE NO. 31722 DESIGN NO. 113



GENERAL PIER NOTES:

ALL REINFORCING STEEL IS TO BE SECURELY WIRED IN PLACE BEFORE CONCRETE IS PLACED.

ALL EXPOSED CORNERS 90° OR SHARPER ARE TO BE FILLETED WITH A 3/4" DRESSED AND BEVELED STRIP.

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

THE 9d1 FOOTING TO COLUMN DOWELS ARE TO BE IN PLACE BEFORE FOOTING CONCRETE IS PLACED.

I.M. 468 PILE POINTS FOR STEEL H-PILES AND I.M. 558 STRUCTURAL FIELD WELDING AND INSPECTION.

PILE DESIGN NOTES PIER 1:

THE CONTRACT LENGTH OF 30 FEET FOR THE PIER 1 PILES IS BASED ON A COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 269 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL AND 0.7 FOR ROCK END BEARING.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL AND 0.7 FOR ROCK END BEARING. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF FOOTING. DESIGN SCOUR (200-YEAR) WAS ASSUMED TO AFFECT THE UPPER 5'-3 OF EMBEDDING PILE LENGTH AND CAUSE 8 KIPS OF DRIVING RESISTANCE.

PILE DRIVING NOTE PIER 1:

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER 1 PILES IS 196 TONS AT END OF DRIVE OR RETAP. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. IN NO CASE SHALL A PILE BE EMBEDDED LESS THAN 19 FEET. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

PILE DESIGN NOTES PIER 2:


























THE CONTRACT LENGTH OF 50 FEET FOR THE PIER 2 PILES IS BASED ON A NON-COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 280 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.7 FOR ROCK END BEARING.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A NON-COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.7 FOR ROCK END BEARING. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF FOOTING. DESIGN SCOUR (200-YEAR) WAS ASSUMED TO AFFECT THE UPPER 6'-3 OF EMBEDDING PILE LENGTH AND CAUSE 11 KIPS OF DRIVING RESISTANCE.

PILE DRIVING NOTE PIER 2:

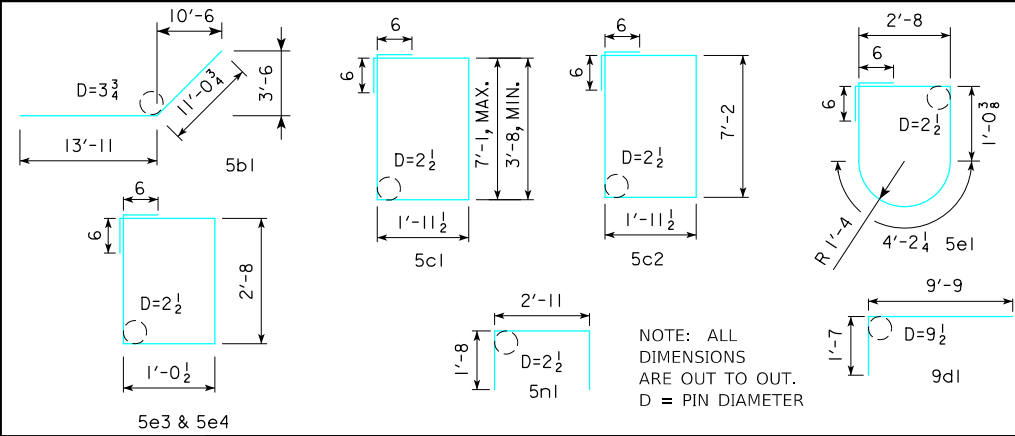
THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER 2 PILES IS 207 TONS AT END OF DRIVE OR RETAP. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. IN NO CASE SHALL A PILE BE EMBEDDED LESS THAN 42 FEET. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

REINFORCING BAR LIST - ONE PIER

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
10a1	CAP, TOP, LONGIT.		16	44'-2	3041
5a2	CAP, SIDES, LONGIT.,		16	44'-2	737
5a3	CAP, SIDES, LONGIT.,		4	22'-6	94
5a4	CAP, SIDES, LONGIT.,		4	21'-5	89
5a5	CAP, SIDES, LONGIT.,		4	20'-3	85
5a6	CAP, SIDES, LONGIT.,		4	19'-2	80
5a7	CAP, SIDES, LONGIT.,		4	18'-0	75
5a8	CAP, SIDES, LONGIT.,		4	16'-11	71
5a9	CAP, SIDES, LONGIT.,		4	15'-9	66
5a10	CAP, SIDES, LONGIT.,		4	14'-8	61
5b1	CAP, BOTTOM, LONGIT.		16	25'-0	417
5c1	CAP HOOPS, CANTILEVER		88	VARIES	1438
5c2	CAP HOOPS		54	19'-3	1084
9d1	FOOTING TO COLUMN DOWELS		58	11'-4	2235
9d2	COLUMN, VERTICAL		58	26'-10	5291
5e1	STEM, HOOPS ENDS		46	9'-11	476
5e2	STEM, TRANSVERSE		46	20'-0	960
5e3	STEM, TIES		46	8'-5	404
5e4	STEM, TIES		115	10'-1	1210
6f1	FOOTING, TOP, TRANSV.		49	15'-2	1116
6f2	FOOTING, TOP, LONGIT.		21	32'-2	1015
9g1	FOOTING, BOTTOM, TRANSV.		65	15'-2	3352
9g2	FOOTING, BOTTOM, LONGIT.		37	32'-2	4047
5m1	CAP, STEPS, LONGIT.		16	3'-10	64
5n1	CAP, STEPS, TRANSV.		16	6'-3	104
REINFORCING STEEL TOTAL - (LBS.)					27,612

REINFORCING STEEL

BENT BAR DETAILS



CONCRETE PLACEMENT QUANTITIES TWO PIERS

LOCATION			QUANTITY
	PIER 1	PIER 2	
CAP & STEPS	36.9	36.9	73.8
COLUMNS	57.1	57.1	114.2
FOOTINGS	84.0	84.0	168.0
TOTAL - C.Y.	178.0	178.0	356.0

DESIGN FOR 0° SKEW

339'-0 x 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

101'-0 END SPANS137'-0 INTERIOR SPAN

PIER NOTES & QUANTITIES

STA. 2496+41.15 (US 63)JANUARY, 2021

DAVIS COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 8 OF 32FILE NO. 31722DESIGN NO. 113

PILE DESIGN NOTES SOUTH ABUTMENT:

THE CONTRACT LENGTH OF 60 FEET FOR THE SOUTH ABUTMENT PILES IS BASED ON A NON-COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 225 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.70 FOR ROCK END BEARING. TO ACCOUNT FOR SOIL CONSOLIDATION UNDER THE NEW FILL, THE FACTORED AXIAL LOAD INCLUDES A FACTORED DOWNDRAG LOAD OF 65 KIPS.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A NON-COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.70 FOR ROCK END BEARING. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF PREBORE.

PILE DRIVING NOTE SOUTH ABUTMENT:

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR SOUTH ABUTMENT PILES IS 188 TONS AT END OF DRIVE. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. IN NO CASE SHALL A PILE BE EMBEDDED LESS THAN 35 FEET FROM BOTTOM OF PREBORE. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

PILE DESIGN NOTES NORTH ABUTMENT:

THE CONTRACT LENGTH OF 80 FEET FOR THE NORTH ABUTMENT PILES IS BASED ON A MIXED SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 240 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL AND 0.70 FOR ROCK END BEARING. TO ACCOUNT FOR CONSOLIDATION UNDER THE NEW FILL, THE FACTORED AXIAL LOAD INCLUDES A FACTORED DOWNDRAG LOAD OF 70 KIPS.

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

PILE DRIVING NOTE NORTH ABUTMENT:

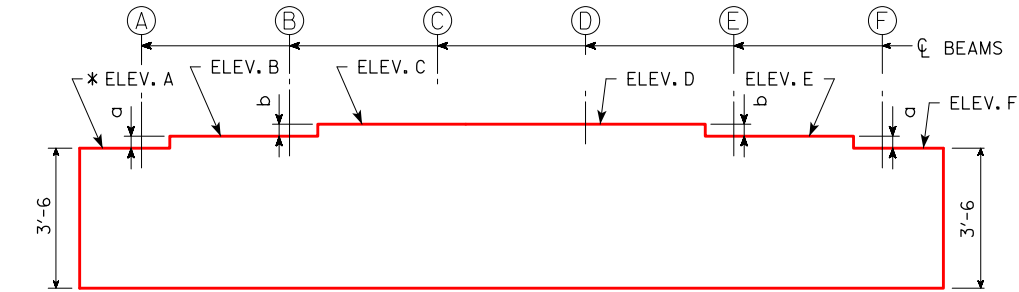
THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR NORTH ABUTMENT PILES IS 214 TONS AT END OF DRIVE. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. IN NO CASE SHALL A PILE BE EMBEDDED LESS THAN 60 FEET. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

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

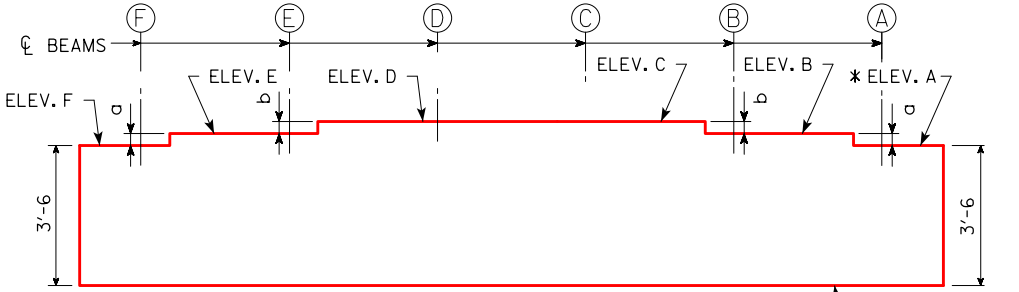
TABLE OF ABUTMENT STEPS		
STEP	SOUTH ABUT.	NORTH ABUT.
a	1 5/16	1 5/16
b	1 5/16	1 5/16

\* = LOW STEP ELEVATION

TABLE OF ABUTMENT ELEVATIONS		
POINT	SOUTH ABUT.	NORTH ABUT.
*ELEV. A	690.91	689.89
ELEV. B	691.07	690.06
ELEV. C	691.23	690.22
ELEV. D	691.23	690.22
ELEV. E	691.07	690.06
*ELEV. F	690.91	689.89
BOTT. FTG. ELEV.	687.41	686.39



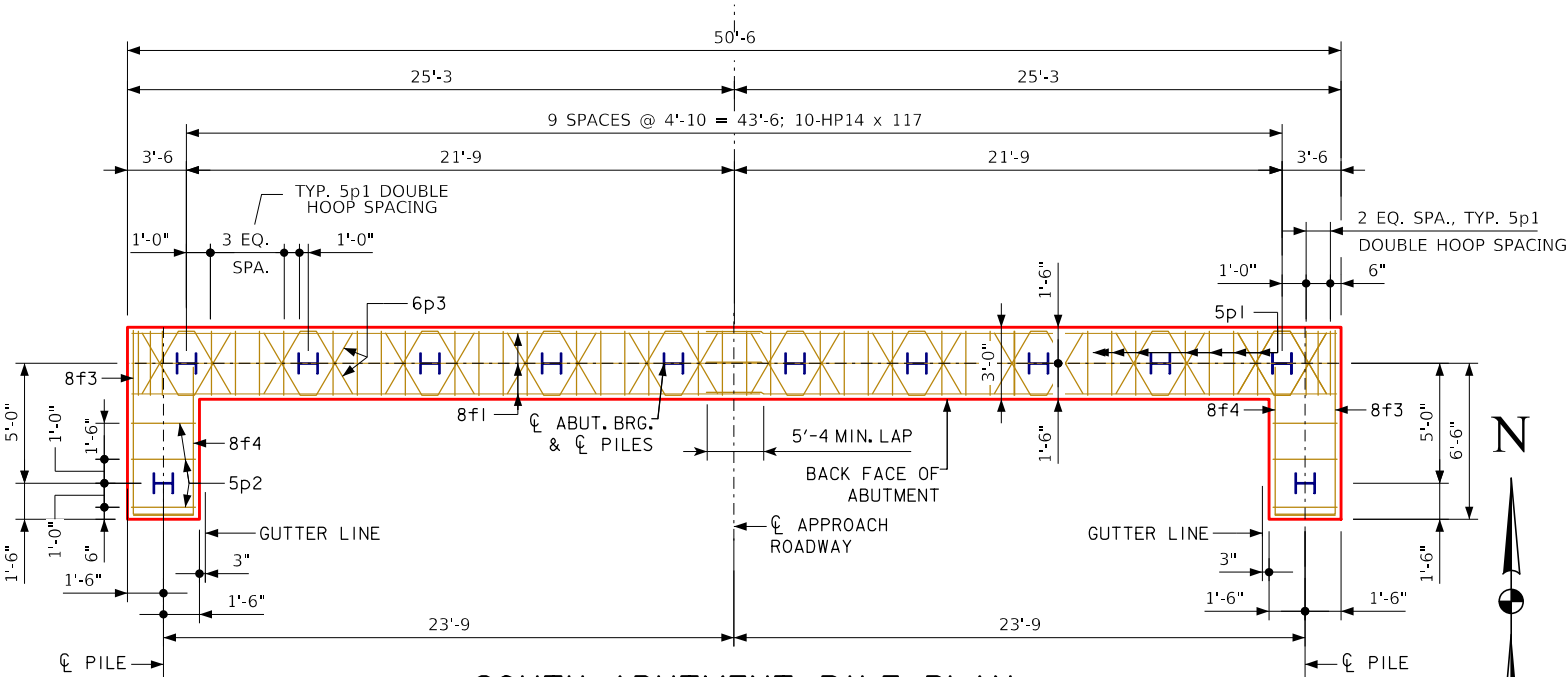
SOUTH ABUTMENT STEP DIAGRAM  
(REAR ELEVATION)



NORTH ABUTMENT STEP DIAGRAM  
(REAR ELEVATION)

\* LOW STEP ELEVATION

BOTTOM OF FOOTING ELEV.



SOUTH ABUTMENT PILE PLAN  
NOTE: HP 14 x 117 STEEL BEARING PILING  
REQUIRED AT EACH ABUTMENT.  
(NORTH ABUTMENT SIMILAR)

DESIGN FOR 0° SKEW

339'-0 x 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

101'-0 END SPANS 137'-0 INTERIOR SPAN

ABUTMENT FOOTING DETAILS

STA. 2496+41.15 (US 63) JANUARY, 2021

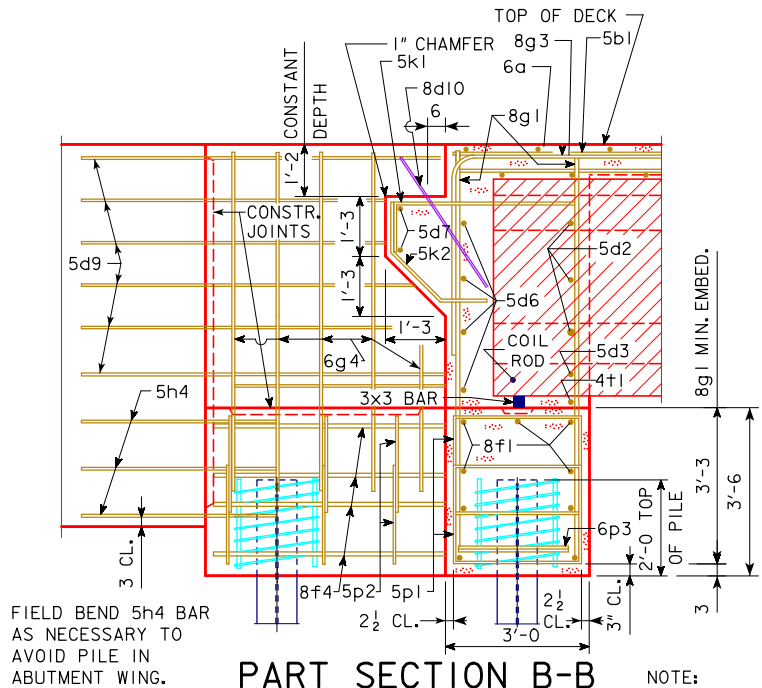
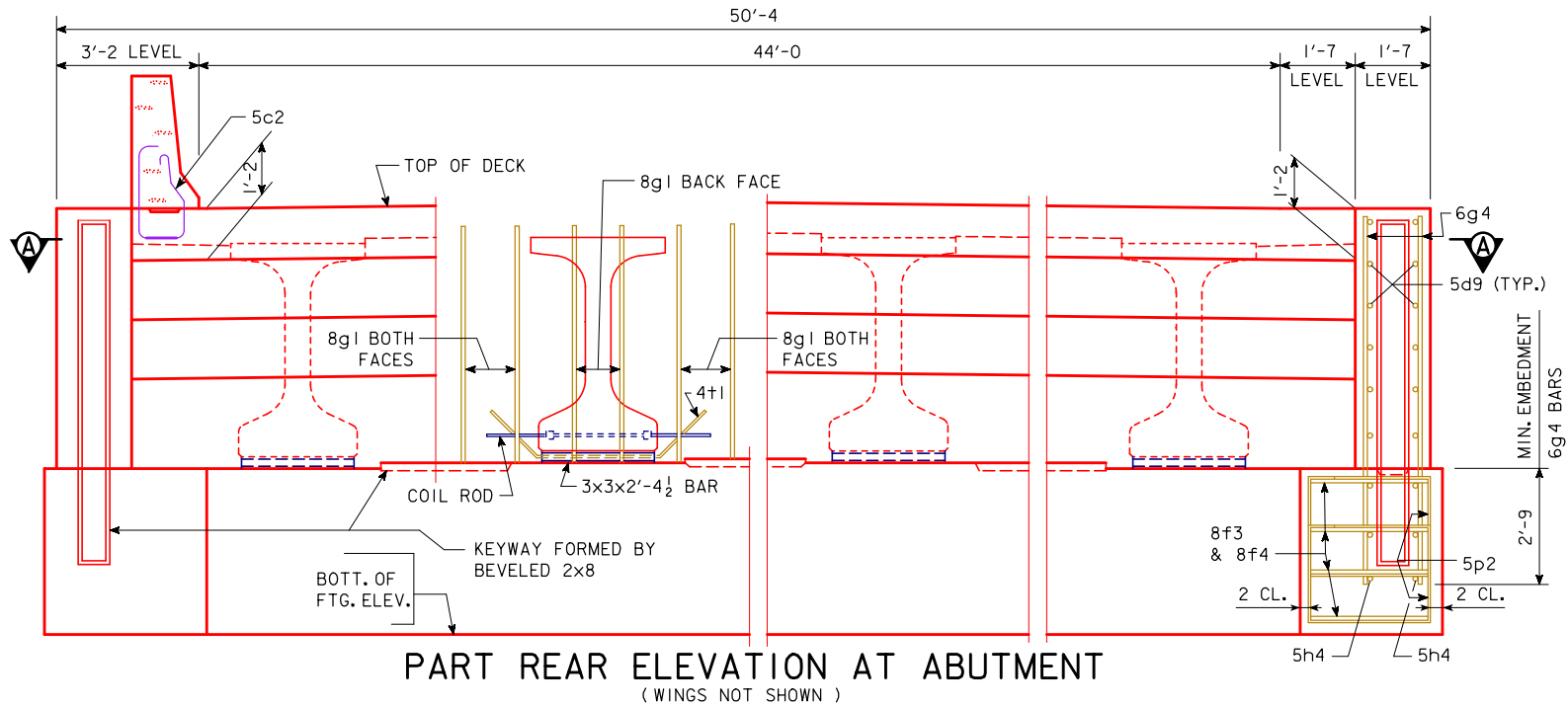
DAVIS COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

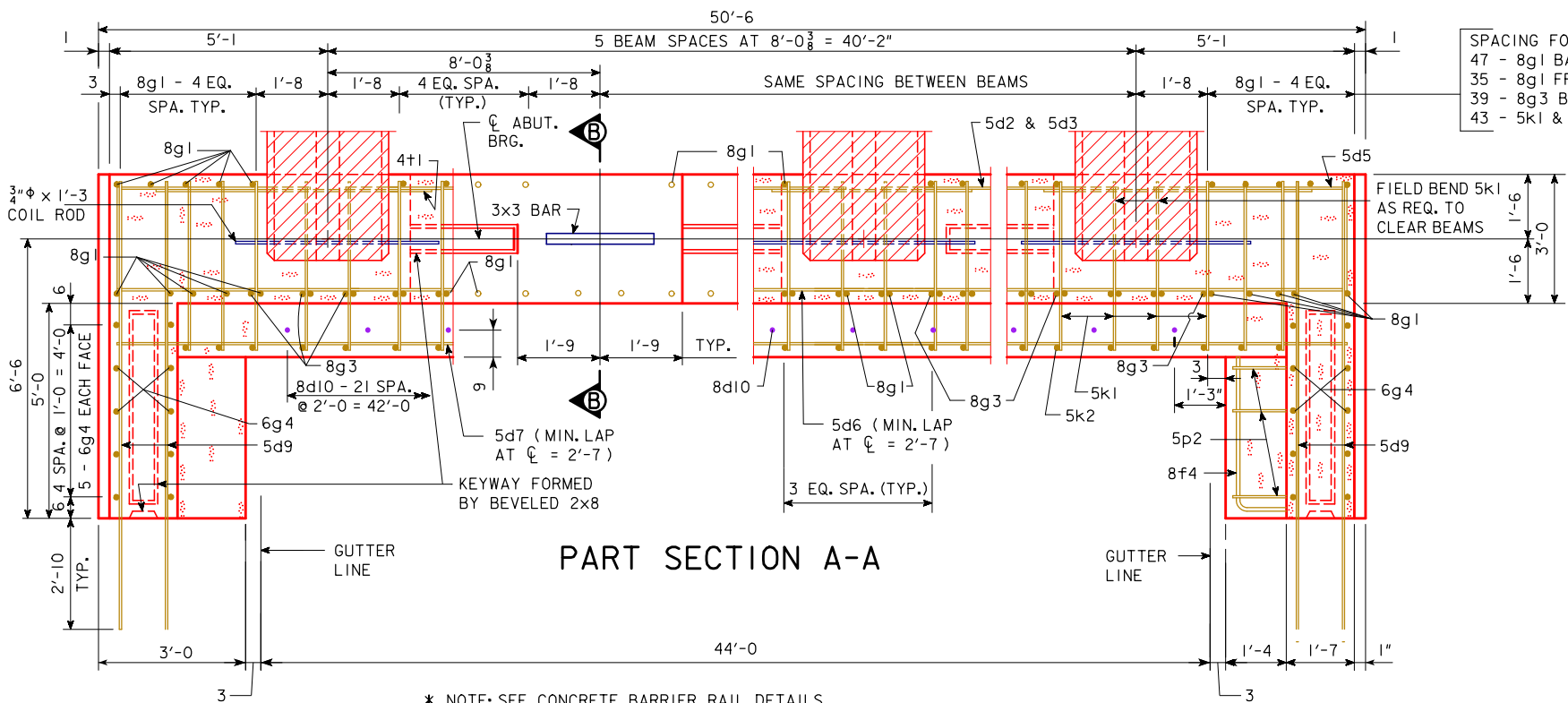
DESIGN SHEET NO. 9 OF 32 FILE NO. 31722 DESIGN NO. 113

CORRECTION 04-14 - ADDED CONCRETE QUANTITY TABLE & REFERRAL NOTE TO SUMMARY QUANTITY SHEET. REMOVED DESIGN BEARING NOTE FOR ABUT. PILING FROM ABUTMENT NOTES. ENGLISHBTRINTEGRALBRIDGES.DGN - 2085-BTCD - THIS SHEET ISSUED 02-08.

BENCH MARK NO.: POINT NO. 47, 6191178.76N, 22870667.79E, FND BRASS PLUG SW COR. BRIDGE, EL. 695.15



NOTE:  
THE SPIRAL AT THE TOP OF EACH PILE  
TO BE 7 TURNS OF No. 2 BAR, 21" DIAMETER,  
3" PITCH WITH 3 -  $L \frac{1}{8} \times \frac{1}{8} \times \frac{1}{8}$  SPACERS  
PUNCHED TO HOLD SPIRAL.



SPACING FOR:  
47 - 8g1 BACK FACE  
35 - 8g1 FRONT FACE  
39 - 8g3 BACK FACE  
43 - 5k1 & 5k2 BACK FACE

\* NOTE: SEE CONCRETE BARRIER RAIL DETAILS  
SHEET FOR DETAILS OF BARRIER RAIL.  
REINFORCING BARS 5c2 ARE INCLUDED  
IN SUPERSTRUCTURE QUANTITIES.

CONSTRUCTION JOINT KEYWAYS ARE TO BE FORMED  
WITH BEVELED 2 x 8's, EXCEPT AS NOTED.

GENERAL ABUTMENT NOTES:

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR  
REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.  
IF NECESSARY TO PREVENT DAMAGE TO THE END OF THE BRIDGE  
DECK FROM CONSTRUCTION EQUIPMENT, AN APPROPRIATE  
METHOD OF PROTECTION APPROVED BY THE ENGINEER SHALL BE  
PROVIDED BY THE BRIDGE CONTRACTOR AT NO EXTRA COST TO THE STATE.

ABUTMENT CONCRETE QUANTITY

LOCATION	QUANTITY
SOUTH ABUTMENT FOOTING	24.6
NORTH ABUTMENT FOOTING	24.6
TOTAL (CU. YDS.)	49.2

NOTE: CONCRETE QUANTITIES ARE INCLUDED ON THE  
SUMMARY QUANTITIES SHEET.

NOTE: BARRIER RAIL NOT SHOWN IN DETAILS.

DESIGN FOR 0° SKEW

339'-0 x 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE  
101'-0 END SPANS 137'-0 INTERIOR SPAN

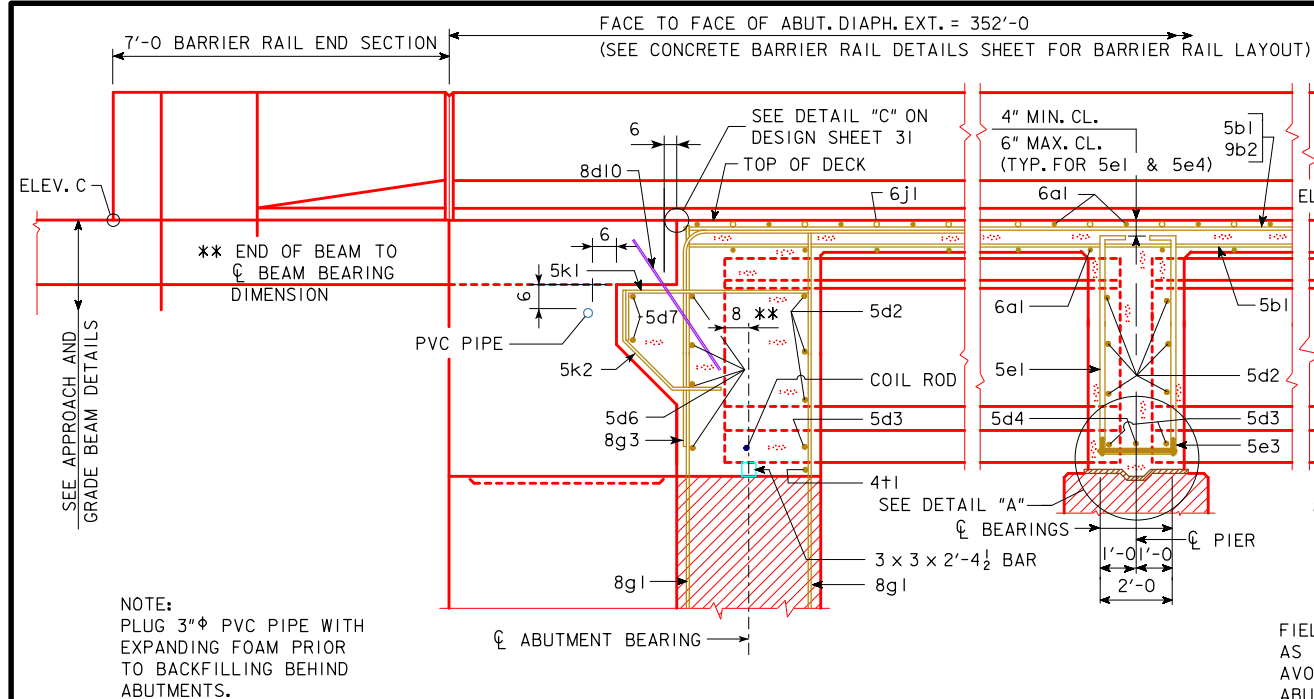
ABUTMENT FOOTING DETAILS

STA. 2496+41.15 (US 63) JANUARY, 2021

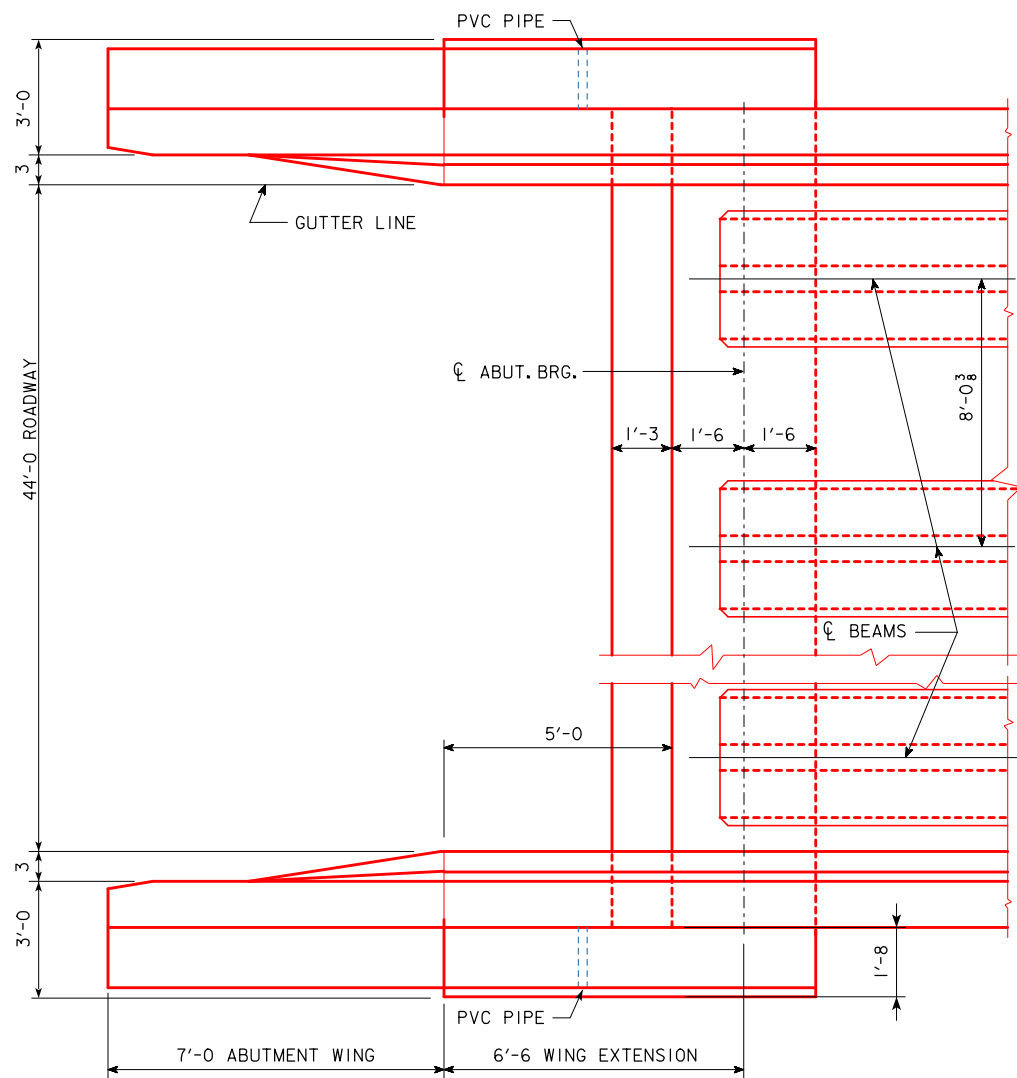
DAVIS COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 10 OF 32 FILE NO. 31722 DESIGN NO. 113

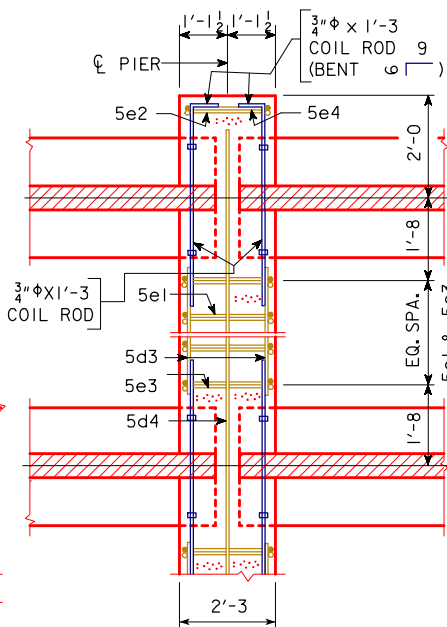
REVISED 01-12 - ADDED FIELD BEND 5h4 BAR TO AVOID PILE IN ABUTMENT WING NOTE.  
ENGLISHBRIEINGRIDS.DGN - 4507-BTCD - THIS SHEET ISSUED 02-08.



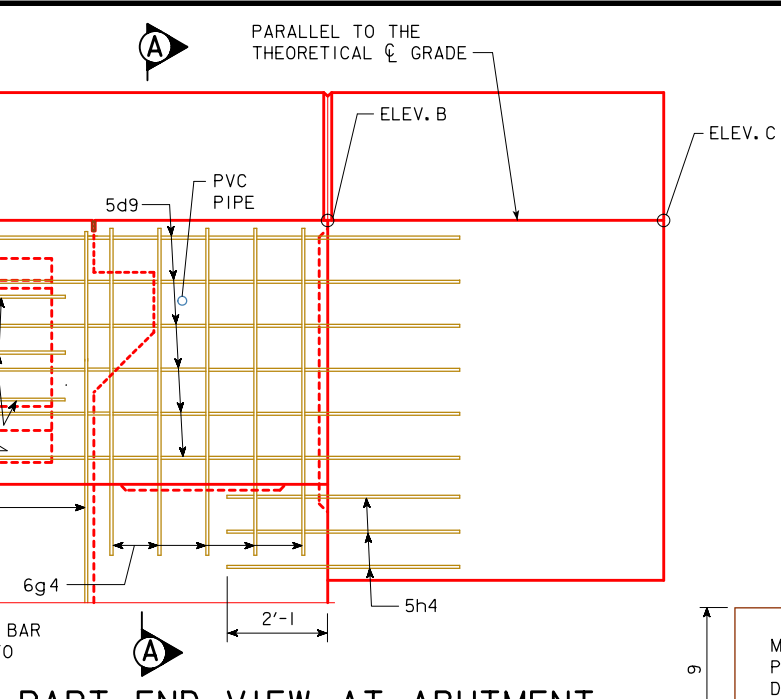
**PART LONGITUDINAL SECTION NEAR GUTTER**  
(FOR DETAILS OF INTERMEDIATE DIAPHRAGM SEE DESIGN SHT. 19)



**PART PLAN**

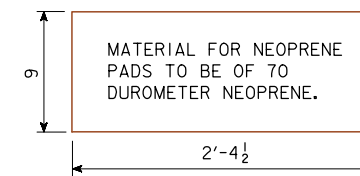


**PART SECTION AT PIER**  
(SEE CROSS SECTION THRU DECK FOR NUMBER  
OF DIAPHRAGM HOOP BARS BETWEEN BEAMS)



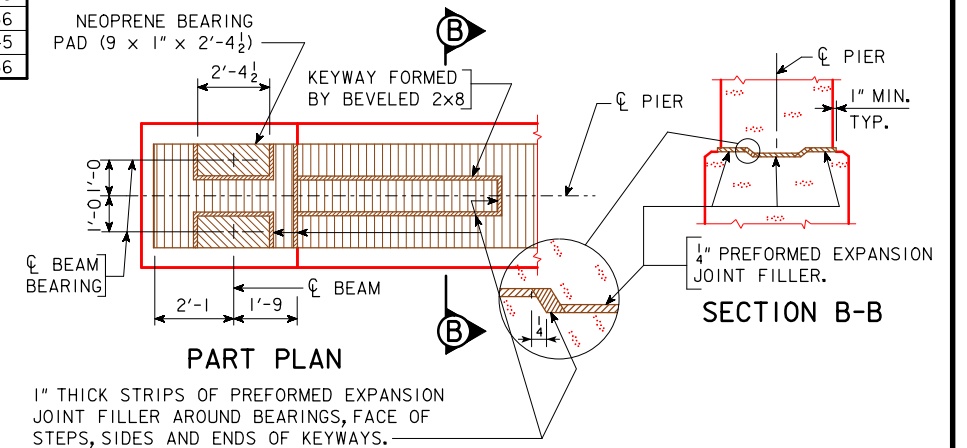
**PART END VIEW AT ABUTMENT**

TABLE OF WINGWALL ELEVATIONS				
LOCATION	DIM "C"	ELEV. A	ELEV. B	ELEV. C
S.W. CORNER	1'-0	696.41	696.43	696.45
N.W. CORNER	1'-0	695.41	695.38	695.36
S.E. CORNER	1'-0	696.41	696.43	696.45
N.E. CORNER	1'-0	695.41	695.38	695.36

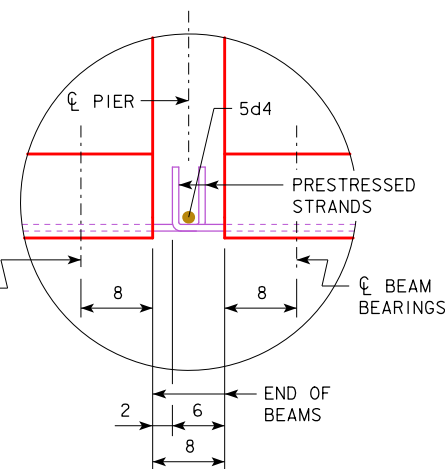


NOTE:  
COST OF NEOPRENE PADS SHALL BE INCLUDED IN THE PRICE BID FOR  
"PRETENSIONED PRESTRESSED CONCRETE BEAMS".

**FIXED PIER**



**TOP OF PIER DETAILS**



**DETAIL "A"**

DESIGN FOR 0° SKEW

**339'-0 x 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**

101'-0 END SPANS 137'-0 INTERIOR SPAN

**ABUT. & PIER DIAPHRAGM DETAILS**

STA. 2496+41.15 (US 63) JANUARY, 2021

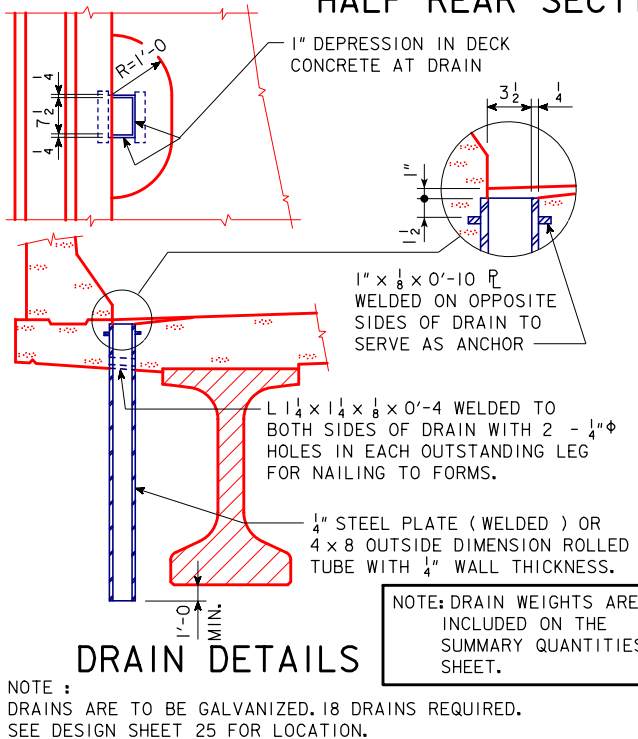
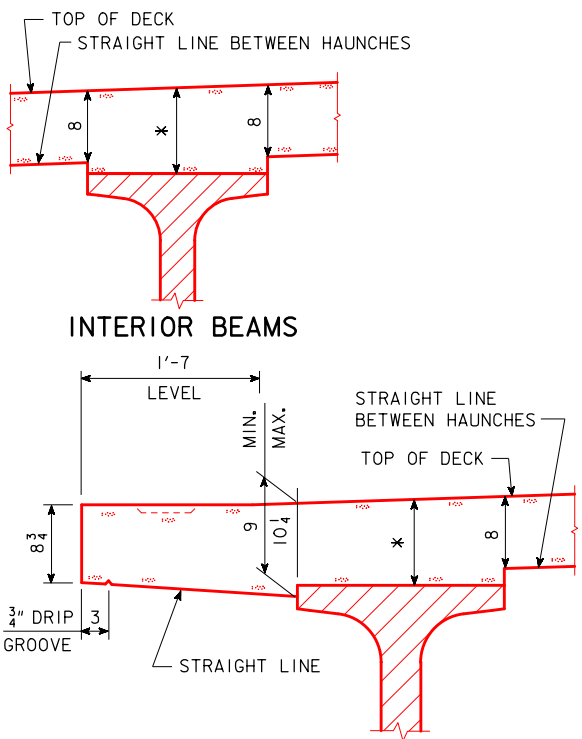
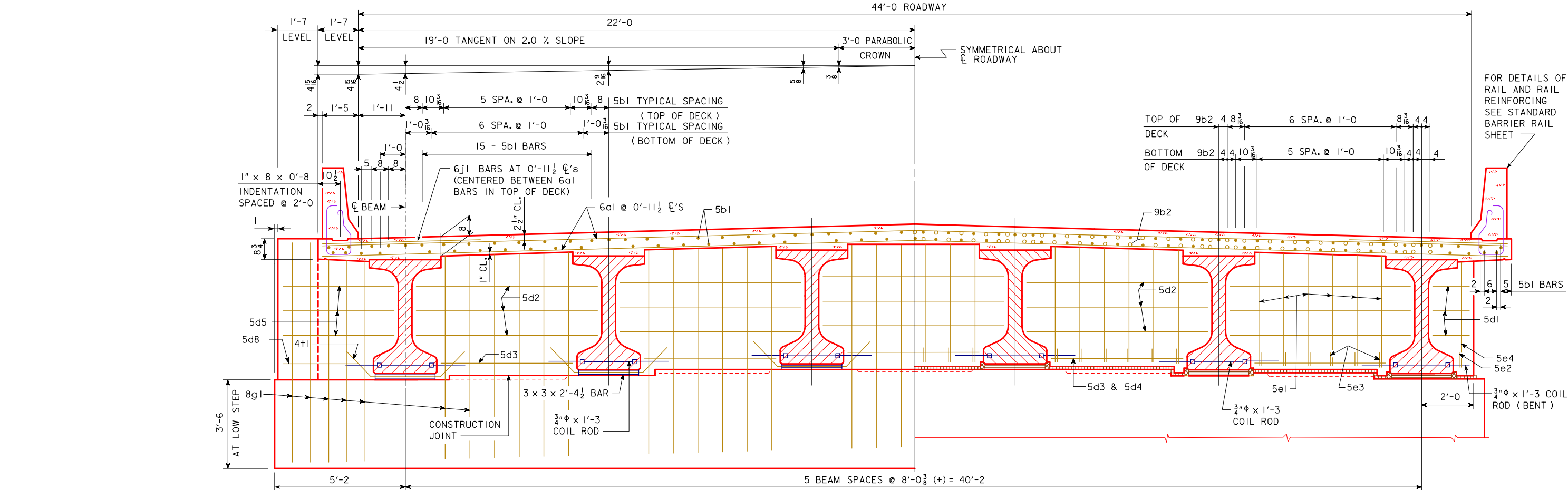
**DAVIS COUNTY**

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 11 OF 32 FILE NO. 31722 DESIGN NO. 113



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. ENGLISHBNTINTEGRALBRIDGES.DGN - 4384-BTD-6 - THIS SHEET ISSUED 02-08.



DATA FOR ONE DRAIN	
BEAM SIZE	BTD
DRAIN WEIGHT (LBS.)	120
DRAIN LENGTH (FT.)	6'-2 3/4

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

NOTE: FOR DETAILS OF INTERMEDIATE DIAPHRAGMS SEE DESIGN SHEET 19.

**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.

COST OF BEARING MATERIAL IS TO BE INCLUDED IN THE PRICE BID FOR "PRETENSIONED PRESTRESSED CONCRETE BEAMS".

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.

DESIGN FOR 0° SKEW

**339'-0 x 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**

101'-0 END SPANS 137'-0 INTERIOR SPAN

**BRIDGE DECK CROSS DETAILS**

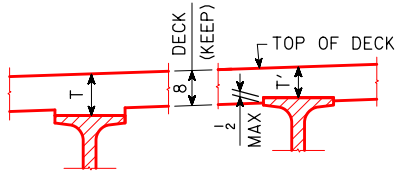
STA. 2496+41.15 (US 63) JANUARY, 2021

**DAVIS COUNTY**

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

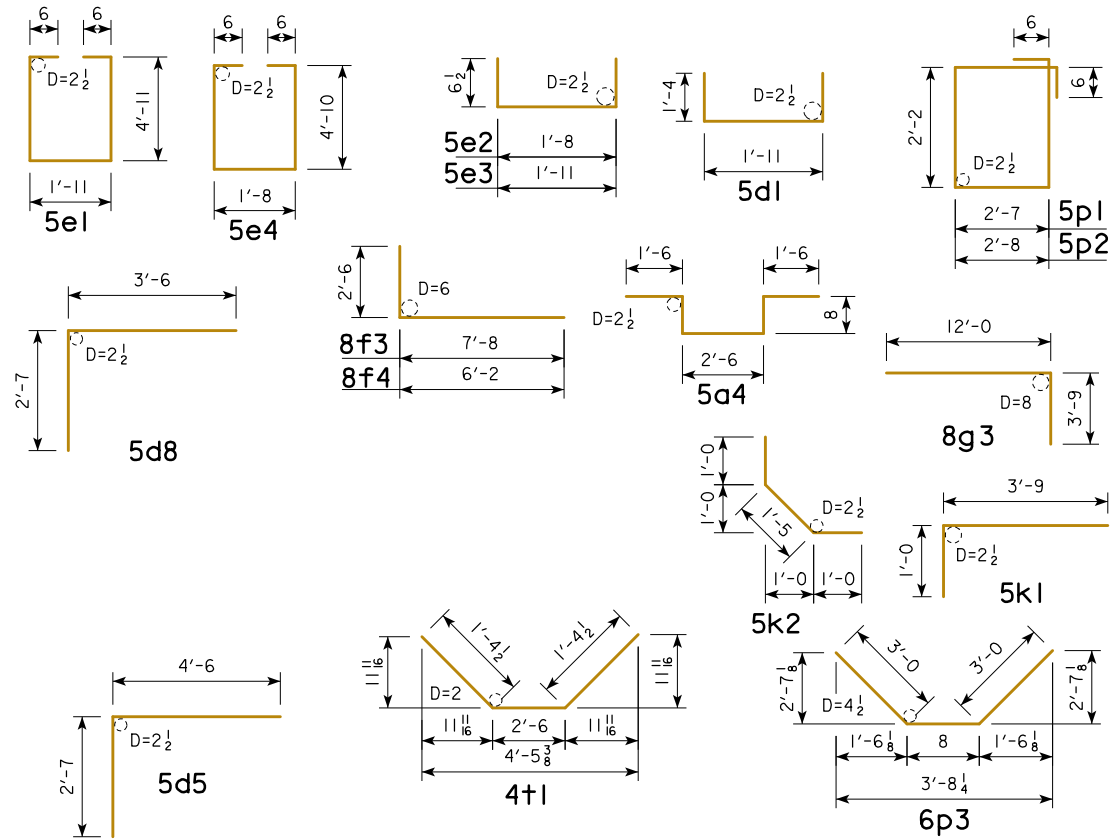
DESIGN SHEET NO. 12 OF 32 FILE NO. 31722 DESIGN NO. 113

REVISED 07-2015 - CHANGED CONCRETE PLACEMENT NOTE TO ACCOUNT FOR THE POSSIBLE ADDITION OF A RETARDING ADMIXTURE TO THE CONCRETE.  
ENGLISHBTRINTEGRALBRIDGES.DGN - 4518-BTCD - THIS SHEET ISSUED 02-08.



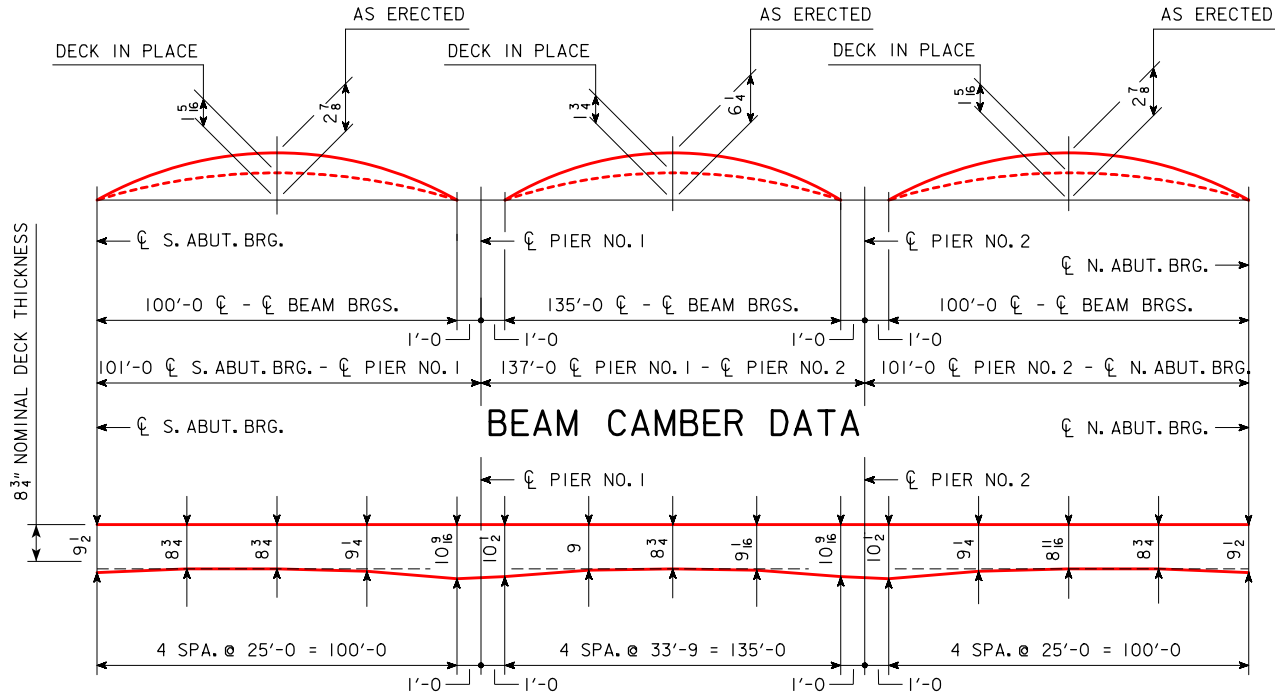
### DECK THICKNESS DETAILS

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.



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

### BENT BAR DETAILS



### BEAM CAMBER DATA

### DECK THICKNESS AT BEAMS (T)

### REINFORCING BAR LIST- SUPERSTRUCTURE AND TWO ABUTMENTS

	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
EPOXY COATED	6a1	DECK TRANSV. TOP & BOTT.		701	46'-10	49311
	6a2	DECK TRANSV. TOP & BOTT., ENDS		12	50'-0	901
	5a4	HAUNCH, TRANSV.		420	6'-10	2993
	5b1	DECK LONGIT. TOP & BOTT.		970	37'-2	37602
	9b2	DECK LONGIT. TOP AT PIERS		198	34'-2	23001
	5b4	HAUNCH, LONGIT.		24	22'-10	572
	5d1	PIER DIAPH. ENDS		12	4'-7	57
	5d2	PIER & ABUT. DIAPH. LONGIT.		90	7'-2	673
	5d3	PIER & ABUT. DIAPH. LONGIT.		30	5'-0	156
	5d4	PIER DIAPH. LONGIT.		2	43'-6	91
	5d5	ABUT. DIAPH. ENDS		12	7'-1	89
	5d6	ABUT. DIAPH., LONGIT., B.F.		16	27'-0	451
	5d7	PAVING NOTCH LONGIT.		8	27'-0	225
	5d8	ABUT. DIAPH. ENDS		4	6'-1	25
	5d9	ABUT. DIAPH. WING EXT. LONGIT.		48	10'-8	534
	5e1	PIER DIAPH. HOOPS		60	12'-9	798
	5e2	PIER DIAPH. TIES - ENDS		4	2'-9	11
	5e3	PIER DIAPH. TIES		60	3'-0	188
	5e4	PIER DIAPH. HOOPS - ENDS		4	12'-4	51
EPOXY COATED						
	8f1	ABUT. FOOTING LONGIT. BOTH FACES		36	27'-10	2675
	8f3	ABUT. EXTENSION LONGIT.		16	10'-2	434
	8f4	ABUT. EXTENSION LONGIT.		16	8'-8	370
	8g1	ABUT. VERT., BOTH FACES		164	8'-5	3685
	8g3	ABUT. DIAPH. VERT., BACK FACE		78	15'-9	3280
	6g4	ABUT. DIAPH. WING EXT., VERT.		40	8'-3	496
	5h4	ABUT. TO WING ANCHOR		24	5'-0	125
	6j1	TOP OF DECK TRANSV. (AT RAIL)		700	6'-3	6571
	6j2	TOP OF DECK TRANSV., ENDS (AT RAIL)		12	7'-10	141
	5k1	PAVING NOTCH		86	4'-9	426
	5k2	PAVING NOTCH		86	3'-5	306
	5p1	ABUT. HOOPS		168	10'-6	1840
	5p2	ABUT. EXTENSION HOOPS		24	10'-8	267
	6p3	ABUT. BOTT. AT PILES		40	6'-8	401
	4t1	UNDER BEAMS AT ABUTMENTS		12	5'-3	42
	*#2	PILE SPIRAL		24	38'-6	154
	*	PILE SPACERS, L 7/8 X 7/8 X 1/8 X 0.7		72	1'-10	92
	REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)					139,034

### REINFORCING BAR LIST

	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
S.S.	8d10	PAVING NOTCH DOWEL		22	3'-6	206
REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)						206

\* UNCOATED PILE SPIRALS AND SPACERS MAY BE SUBMITTED AT NO ADDITIONAL COST TO THE IOWA DOT.

DESIGN FOR 0° SKEW

339'-0 x 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

101'-0 END SPANS137'-0 INTERIOR SPAN

DECK, ABUT. & DIAPH. QUANTITIES

STA. 2496+41.15 (US 63)JANUARY, 2021

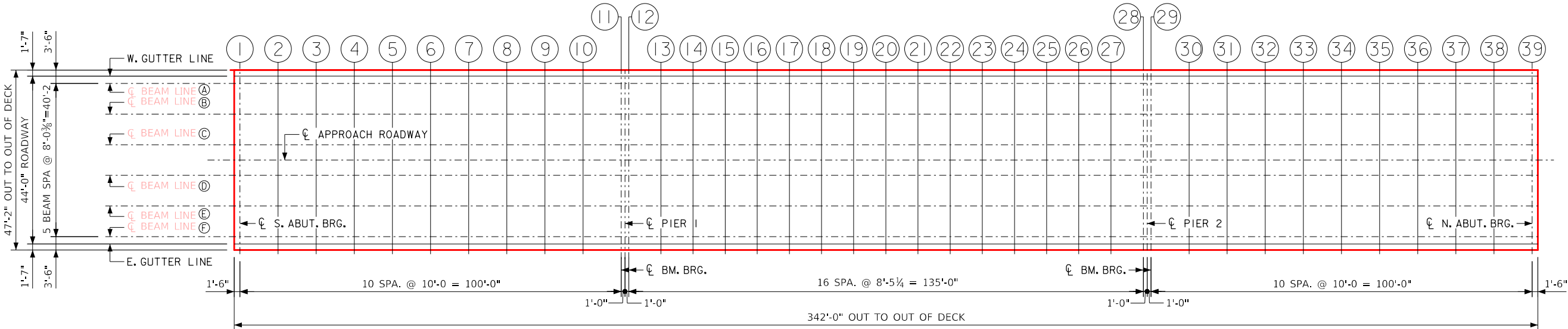
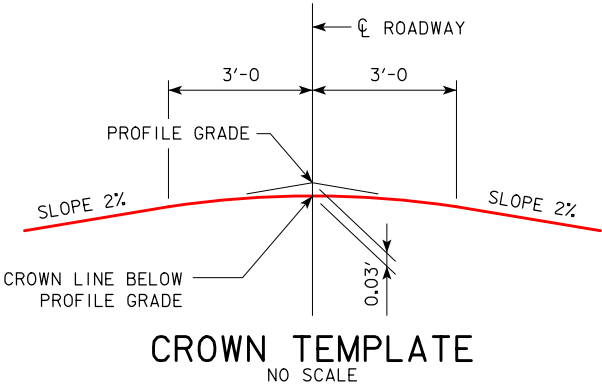
DAVIS COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 13 OF 32FILE NO. 31722DESIGN NO. 113

TOP OF DECK ELEVATIONS																											
LOCATION	℄ S. ABUT. BEARING										℄ PIER NO. 1 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
WEST GUTTER LINE	696.42	696.39	696.36	696.33	696.30	696.27	696.24	696.21	696.18	696.15	696.12	696.11	696.08	696.06	696.03	696.01	695.98	695.96	695.93	695.91	695.88	695.86	695.83	695.81	695.78	695.75	695.73
BEAM LINE "A"	696.45	696.42	696.39	696.36	696.33	696.30	696.27	696.24	696.21	696.18	696.15	696.15	696.12	696.10	696.07	696.05	696.02	696.00	695.97	695.94	695.92	695.89	695.87	695.84	695.82	695.79	695.77
BEAM LINE "B"	696.61	696.58	696.55	696.52	696.49	696.46	696.43	696.40	696.37	696.34	696.31	696.31	696.28	696.26	696.23	696.21	696.18	696.16	696.13	696.11	696.08	696.05	696.03	696.00	695.98	695.95	695.93
BEAM LINE "C"	696.77	696.74	696.71	696.68	696.65	696.62	696.59	696.56	696.53	696.50	696.47	696.47	696.44	696.42	696.39	696.37	696.34	696.32	696.29	696.27	696.24	696.22	696.19	696.16	696.14	696.11	696.09
CROWN LINE	696.83	696.80	696.77	696.74	696.71	696.68	696.65	696.62	696.59	696.56	696.53	696.52	696.49	696.47	696.44	696.42	696.39	696.37	696.34	696.32	696.29	696.27	696.24	696.22	696.19	696.16	696.14
BEAM LINE "D"	696.77	696.74	696.71	696.68	696.65	696.62	696.59	696.56	696.53	696.50	696.47	696.47	696.44	696.42	696.39	696.37	696.34	696.32	696.29	696.27	696.24	696.22	696.19	696.16	696.14	696.11	696.09
BEAM LINE "E"	696.61	696.58	696.55	696.52	696.49	696.46	696.43	696.40	696.37	696.34	696.31	696.31	696.28	696.26	696.23	696.21	696.18	696.16	696.13	696.11	696.08	696.06	696.03	696.00	695.98	695.95	695.93
BEAM LINE "F"	696.45	696.42	696.39	696.36	696.33	696.30	696.27	696.24	696.21	696.18	696.15	696.15	696.12	696.10	696.07	696.05	696.02	696.00	695.97	695.94	695.92	695.89	695.87	695.84	695.82	695.79	695.77
EAST GUTTER LINE	696.42	696.39	696.36	696.33	696.30	696.27	696.24	696.21	696.18	696.15	696.12	696.11	696.08	696.06	696.03	696.01	695.98	695.96	695.93	695.91	695.88	695.86	695.83	695.81	695.78	695.75	695.73

TOP OF DECK ELEVATIONS													
LOCATION	℄ PIER NO. 2 BEARINGS											℄ N. ABUT. BEARING	
	LINE 28	LINE 29	LINE 30	LINE 31	LINE 32	LINE 33	LINE 34	LINE 35	LINE 36	LINE 37	LINE 38	LINE 39	
WEST GUTTER LINE	695.70	695.70	695.67	695.64	695.61	695.58	695.55	695.52	695.49	695.46	695.43	695.40	
BEAM LINE "A"	695.74	695.74	695.71	695.68	695.65	695.62	695.59	695.56	695.53	695.50	695.47	695.44	
BEAM LINE "B"	695.90	695.90	695.87	695.84	695.81	695.78	695.75	695.72	695.69	695.66	695.63	695.60	
BEAM LINE "C"	696.06	696.06	696.03	696.00	695.97	695.94	695.91	695.88	695.85	695.82	695.79	695.76	
CROWN LINE	696.11	696.11	696.08	696.05	696.02	695.99	695.96	695.93	695.90	695.87	695.84	695.81	
BEAM LINE "D"	696.06	696.06	696.03	696.00	695.97	695.94	695.91	695.88	695.85	695.82	695.79	695.76	
BEAM LINE "E"	695.90	695.90	695.87	695.84	695.81	695.78	695.75	695.72	695.69	695.66	695.63	695.60	
BEAM LINE "F"	695.74	695.74	695.71	695.68	695.65	695.62	695.59	695.56	695.53	695.50	695.47	695.44	
EAST GUTTER LINE	695.70	695.70	695.67	695.64	695.61	695.58	695.55	695.52	695.49	695.46	695.43	695.40	



TOP OF DECK ELEVATIONS LAYOUT



DESIGN FOR 0° SKEW

339'-0 x 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

101'-0 END SPANS137'-0 INTERIOR SPAN

TOP OF DECK ELEVATIONS

STA. 2496+41.15 (US 63)JANUARY, 2021

DAVIS COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 14 OF 32FILE NO. 31722DESIGN NO. 113

TABLE OF BEAM LINE DECK HAUNCH ELEVATIONS																											
LOCATION	℄ S. ABUT. BEARING											℄ PIER NO. 1 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
BEAM LINE "A"	695.79	695.80	695.80	695.80	695.79	695.77	695.73	695.68	695.62	695.56	695.49	695.48	695.53	695.58	695.62	695.65	695.67	695.68	695.67	695.65	695.62	695.58	695.52	695.44	695.36	695.27	695.18
BEAM LINE "B"	695.95	695.96	695.97	695.96	695.95	695.93	695.89	695.84	695.79	695.72	695.65	695.64	695.69	695.74	695.78	695.81	695.83	695.84	695.83	695.81	695.78	695.74	695.68	695.61	695.52	695.43	695.34
BEAM LINE "C"	696.11	696.12	696.13	696.12	696.11	696.09	696.05	696.00	695.95	695.88	695.81	695.80	695.85	695.90	695.94	695.97	695.99	696.00	695.99	695.98	695.94	695.90	695.84	695.77	695.68	695.59	695.50
BEAM LINE "D"	696.11	696.12	696.13	696.12	696.11	696.09	696.05	696.00	695.95	695.88	695.81	695.80	695.85	695.90	695.94	695.97	695.99	696.00	695.99	695.98	695.94	695.90	695.84	695.77	695.68	695.59	695.50
BEAM LINE "E"	695.95	695.96	695.97	695.96	695.95	695.93	695.89	695.84	695.79	695.72	695.65	695.64	695.69	695.74	695.78	695.81	695.83	695.84	695.83	695.81	695.78	695.74	695.68	695.61	695.52	695.43	695.34
BEAM LINE "F"	695.79	695.80	695.80	695.80	695.79	695.77	695.73	695.68	695.62	695.56	695.49	695.48	695.53	695.58	695.62	695.65	695.67	695.68	695.67	695.65	695.62	695.58	695.52	695.44	695.36	695.27	695.18

TABLE OF BEAM LINE DECK HAUNCH ELEVATIONS												
LOCATION	℄ PIER NO. 2 BEARINGS											℄ N. ABUT. BEARING
	LINE 28	LINE 29	LINE 30	LINE 31	LINE 32	LINE 33	LINE 34	LINE 35	LINE 36	LINE 37	LINE 38	LINE 39
BEAM LINE "A"	695.08	695.07	695.08	695.09	695.09	695.07	695.05	695.01	694.97	694.91	694.84	694.77
BEAM LINE "B"	695.24	695.23	695.24	695.25	695.25	695.24	695.21	695.18	695.13	695.07	695.00	694.93
BEAM LINE "C"	695.40	695.39	695.40	695.41	695.41	695.40	695.37	695.34	695.29	695.23	695.16	695.09
BEAM LINE "D"	695.40	695.39	695.40	695.41	695.41	695.40	695.37	695.34	695.29	695.23	695.16	695.09
BEAM LINE "E"	695.24	695.23	695.24	695.25	695.25	695.24	695.21	695.18	695.13	695.07	695.00	694.93
BEAM LINE "F"	695.08	695.07	695.08	695.09	695.09	695.07	695.05	695.01	694.97	694.91	694.84	694.77

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

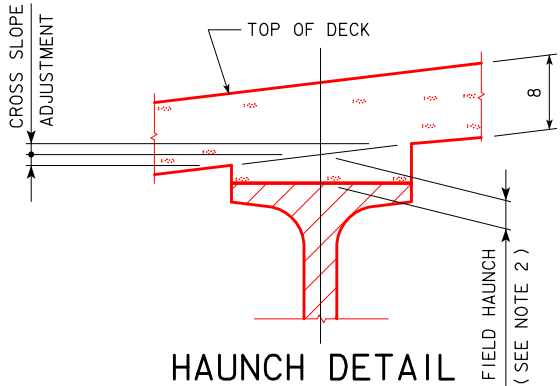
NOTE 1:  
BRIDGE SEAT ELEVATIONS ARE SET BASED ON THEORETICAL CAMBER AND BEAM DEFLECTIONS. THESE BRIDGE SEATS WILL PROVIDE A THEORETICAL BEAM HAUNCH WITHIN DESIGN PARAMETERS. FIELD HAUNCHES ARE DETERMINED USING SURVEYED TOP OF BEAM ELEVATIONS AND "BEAM LINE DECK HAUNCH ELEVATION" DATA. ALLOWABLE MAXIMUM 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 2:  
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 DECK HAUNCH ELEVATION". THIS VALUE WILL BE THE HAUNCH NEEDED (SEE "FIELD HAUNCH" IN HAUNCH DETAIL). THE "BEAM LINE DECK 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.

MISCELLANEOUS DATA TABLE																													
	BEAM LINE		℄ S. ABUT. BEARING									℄ PIER NO. 1 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
ANTICIPATED DEFLECTION DUE TO DECK (IN.)	ALL		0	$\frac{1}{2}$	$\frac{15}{16}$	$1\frac{5}{16}$	$1\frac{1}{2}$	$1\frac{9}{16}$	$1\frac{1}{2}$	$1\frac{5}{16}$	$\frac{15}{16}$	$\frac{1}{2}$	0	0	$\frac{7}{8}$	$1\frac{3}{4}$	$2\frac{9}{16}$	$3\frac{3}{16}$	$3\frac{3}{4}$	$4\frac{3}{16}$	$4\frac{7}{16}$	$4\frac{1}{2}$	$4\frac{7}{16}$	$4\frac{3}{16}$	$3\frac{3}{4}$	$3\frac{3}{16}$	$2\frac{9}{16}$	$1\frac{3}{4}$	$\frac{7}{8}$
CROSS SLOPE ADJUSTMENTS (IN.)	ALL		$\pm \frac{5}{16}$																										
ALLOWABLE FIELD HAUNCH (IN. & FT.)	MAX.	ALL	$2\frac{1}{2}$ (0.208)									$3\frac{1}{2}$ (0.292)						$2\frac{1}{2}$ (0.208)									$3\frac{1}{2}$ (0.292)		
	MIN.	ALL	$-\frac{3}{16}$ (-0.013)									$\frac{1}{2}$ (0.042)						$-\frac{3}{16}$ (-0.013)									$\frac{1}{2}$ (0.042)		



MISCELLANEOUS DATA TABLE														
	BEAM LINE		C PIER NO. 2 BEARINGS											C N. ABUT. BEARING
			LINE 28	LINE 29	LINE 30	LINE 31	LINE 32	LINE 33	LINE 34	LINE 35	LINE 36	LINE 37	LINE 38	LINE 39
ANTICIPATED DEFLECTION DUE TO DECK (IN.)	ALL		0	0	$\frac{1}{2}$	$\frac{15}{16}$	$1\frac{5}{16}$	$1\frac{1}{2}$	$1\frac{9}{16}$	$1\frac{1}{2}$	$1\frac{5}{16}$	$\frac{15}{16}$	$\frac{1}{2}$	0
CROSS SLOPE ADJUSTMENTS (IN.)	ALL		$\pm \frac{5}{16}$											
ALLOWABLE FIELD HAUNCH (IN. & FT.)	MAX.	ALL	$3\frac{1}{2}$ (0.292)				$2\frac{1}{2}$ (0.208)							
	MIN.	ALL	$\frac{1}{2}$ (0.042)				$-\frac{3}{16}$ (-0.013)							



DESIGN FOR 0° SKEW

339'-0 x 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

101'-0 END SPANS 137'-0 INTERIOR SPAN

DECK HAUNCH DATA DETAILS

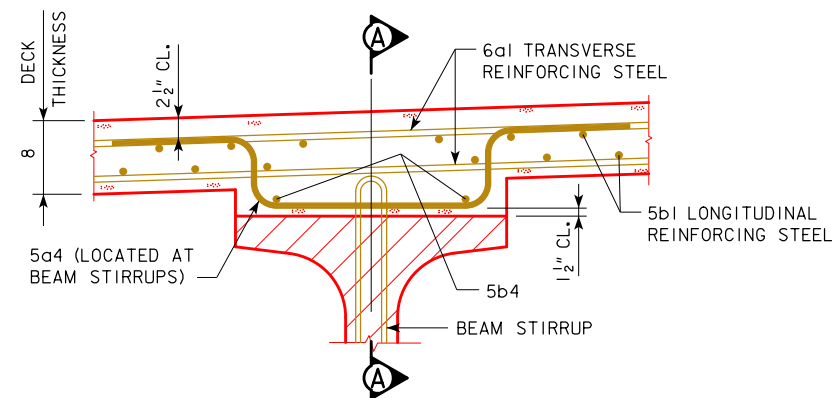
STA. 2496+41.15 (US 63) JANUARY, 2021

DAVIS COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

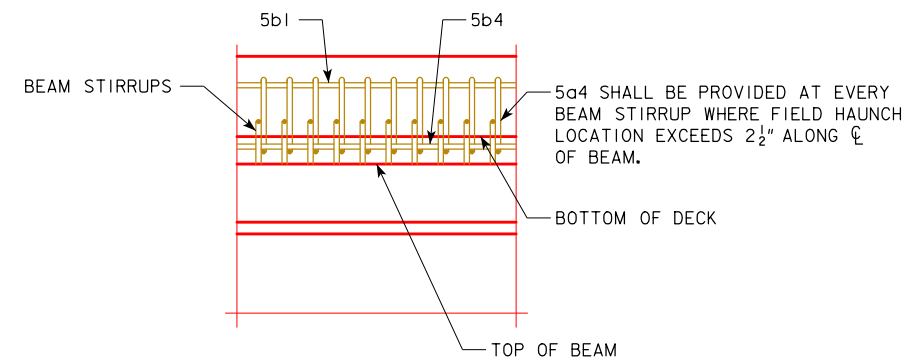
DESIGN SHEET NO. 15 OF 32 FILE NO. 31722 DESIGN NO. 113





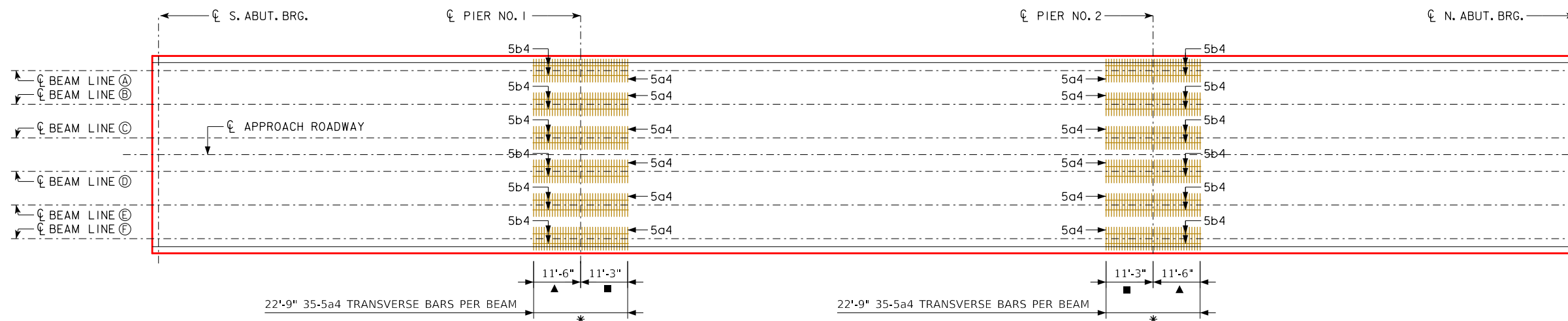
HAUNCH SECTION

NOTE: AS HAUNCH DECREASES, 5a4 BARS CAN BE ANGLED TO ENSURE PROPER CLEARANCES. PLACE 5a4 NEXT TO AND MATCH SPACING WITH BEAM STIRRUPS.



SECTION A-A

THE TOP AND BOTTOM 6a1 AND 5b1 BOTTOM BARS NOT SHOWN FOR CLARITY.

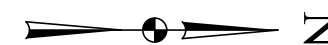


\* 5a4 STIRRUP EXTENSION BARS ARE ANTICIPATED WITHIN THESE LIMITS

■ 18-5a4 TO MATCH BEAM STIRRUPS IN SPAN 2

▲ 17-5a4 TO MATCH BEAM STIRRUPS IN SPANS 1 & 3

HAUNCH REINFORCING LAYOUT



DESIGN FOR 0° SKEW

**339'-0 x 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**

101'-0 END SPANS 137'-0 INTERIOR SPAN

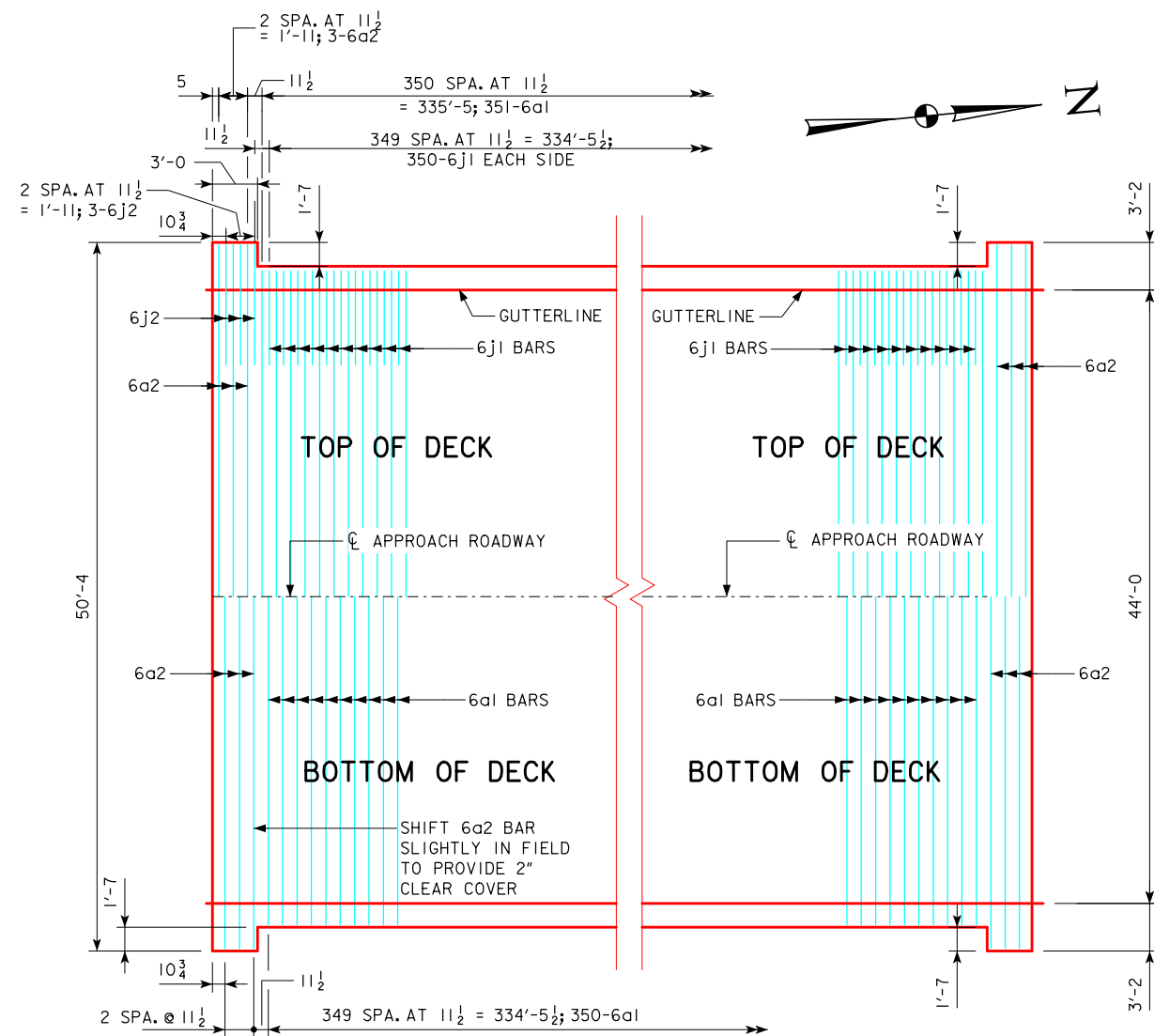
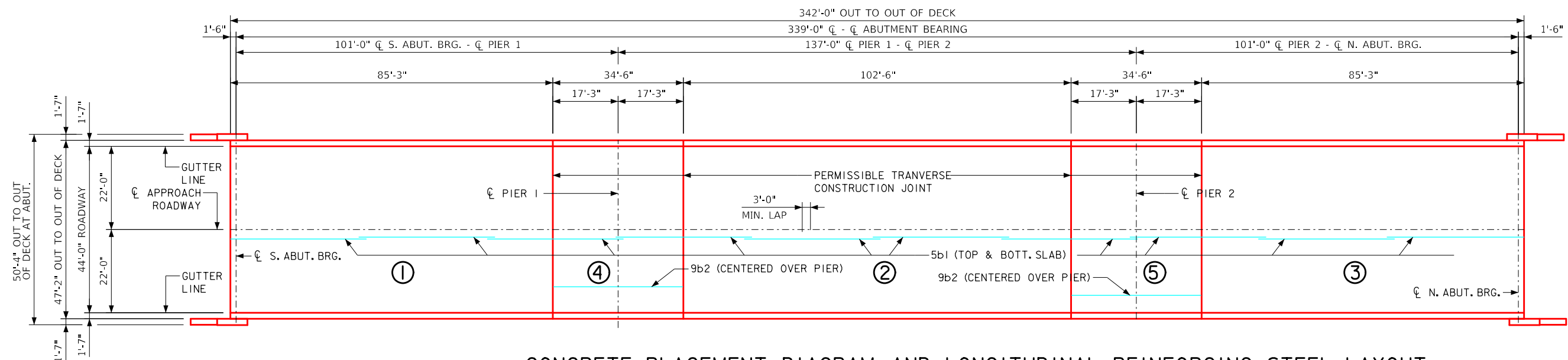
**HAUNCH REINFORCING LAYOUT**

STA. 2496+41.15 (US 63) JANUARY, 2021

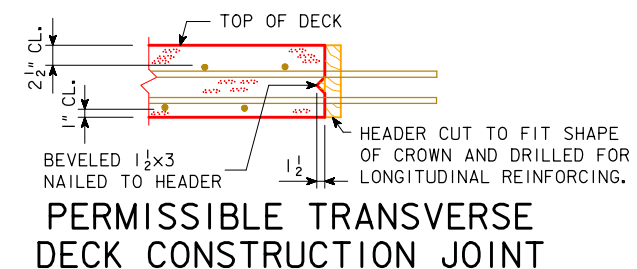
**DAVIS COUNTY**

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 16 OF 32 FILE NO. 31722 DESIGN NO. 113



NOTE: CONCRETE DECK SHALL BE PLACED IN SECTIONS AND SEQUENCES INDICATED. AN APPROVED ALTERNATE PROCEDURE IS TO PLACE THE CONCRETE DECK IN ONE CONTINUOUS POUR BEGINNING AT ONE END OF THE BRIDGE. ALTERNATE PROCEDURES FOR PLACING DECK CONCRETE MAY BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF THE PROPOSED METHOD AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULTS. THE BRIDGE ENGINEER SHALL REVIEW ANY PROCEDURES. THE COST OF ANY ADDITIONAL ANALYSIS AND PLAN MODIFICATIONS SHALL BE PAID FOR BY THE CONTRACTOR. THE ENGINEER SHALL DETERMINE IF A RETARDING ADMIXTURE IS REQUIRED TO MAINTAIN PLASTICITY OF THE CONCRETE DECK DURING PLACEMENT. DECK CONCRETE SECTIONS SHALL CURE FOR A MINIMUM OF 48 HOURS AND SHALL ACHIEVE A MINIMUM STRENGTH OF 75% OF THE 28 DAY DECK CONCRETE STRENGTH PRIOR TO REMOVING DECK HEADERS AND BEGINNING AN ADJACENT POUR.

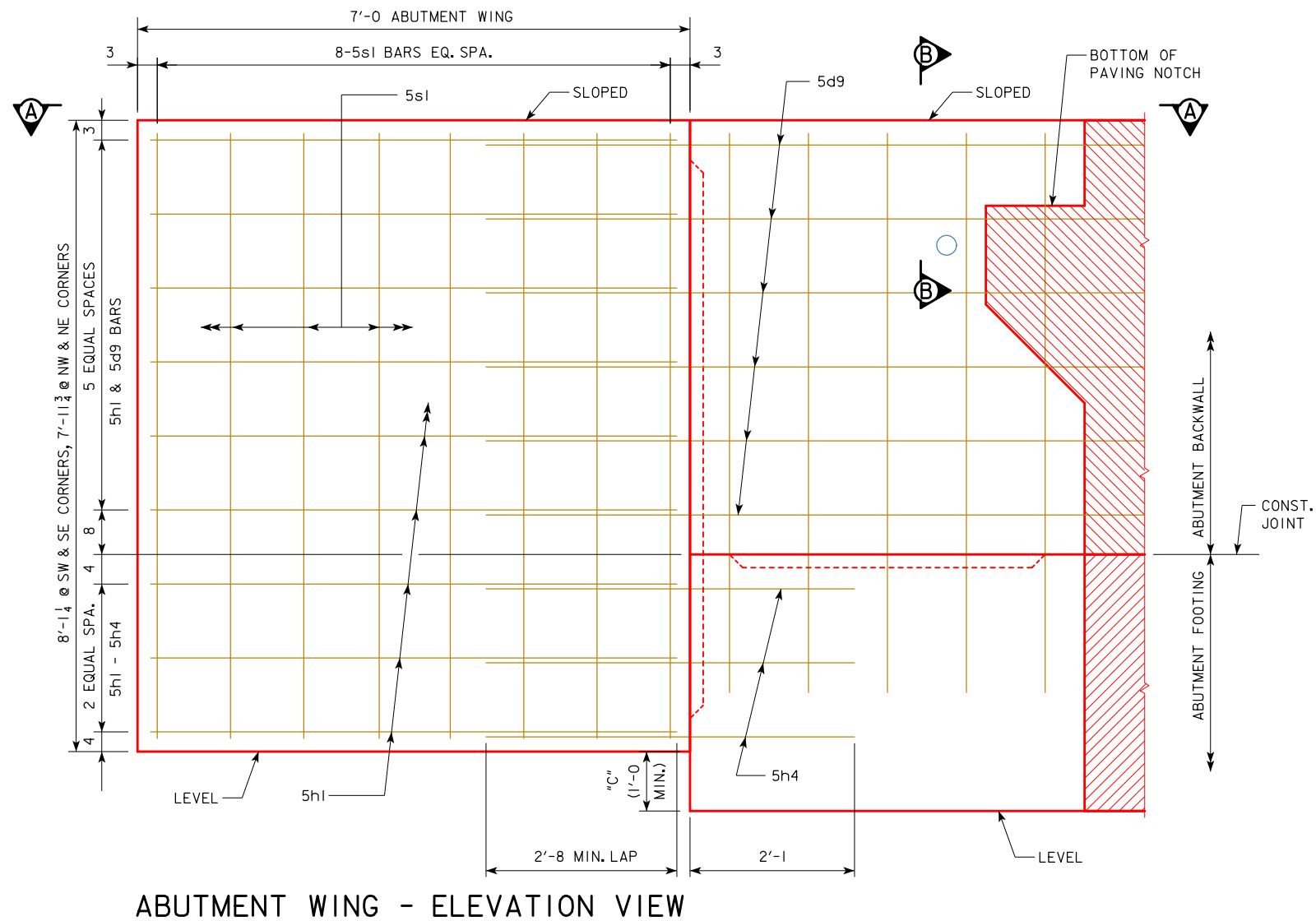
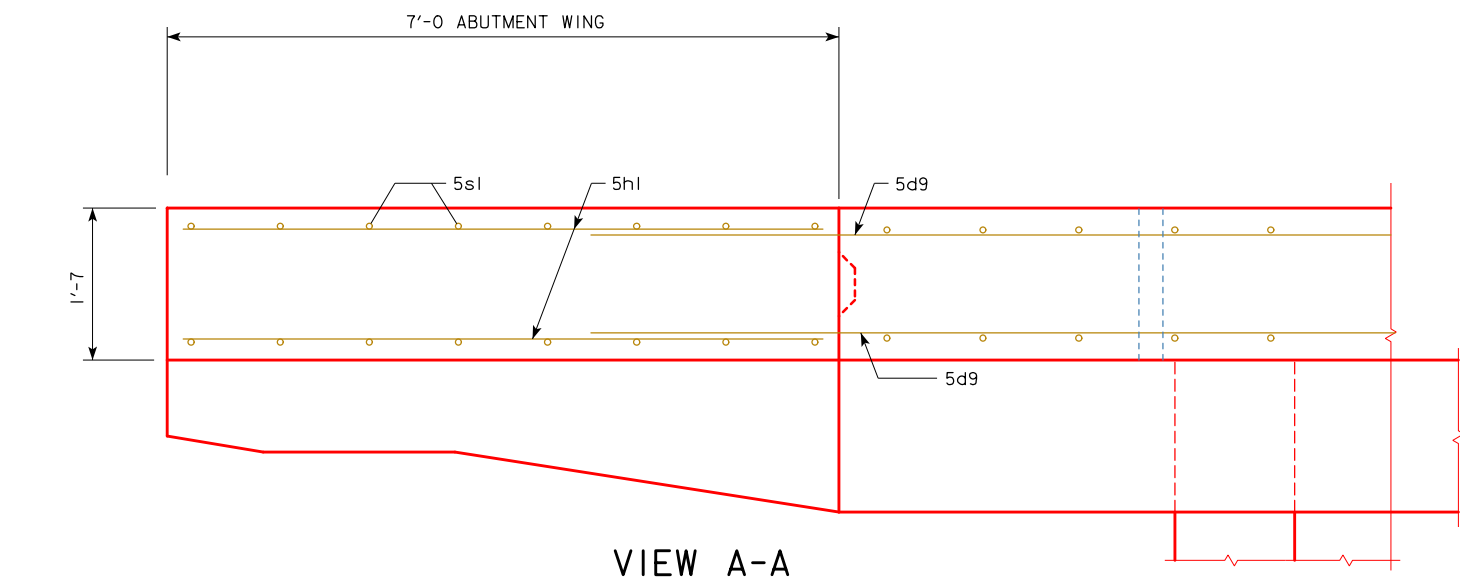




CONCRETE PLACEMENT QUANTITIES	
LOCATION	QUANTITY
SECTION 1, DECK & ABUT. DIAPH.	137.4
SECTION 2, DECK	127.0
SECTION 3, DECK & ABUT. DIAPH.	137.4
SECTION 4, DECK & PIER DIAPHRAGM	60.7
SECTION 5, DECK & PIER DIAPHRAGM	60.7
TOTAL (CU. YDS.)	523.2

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

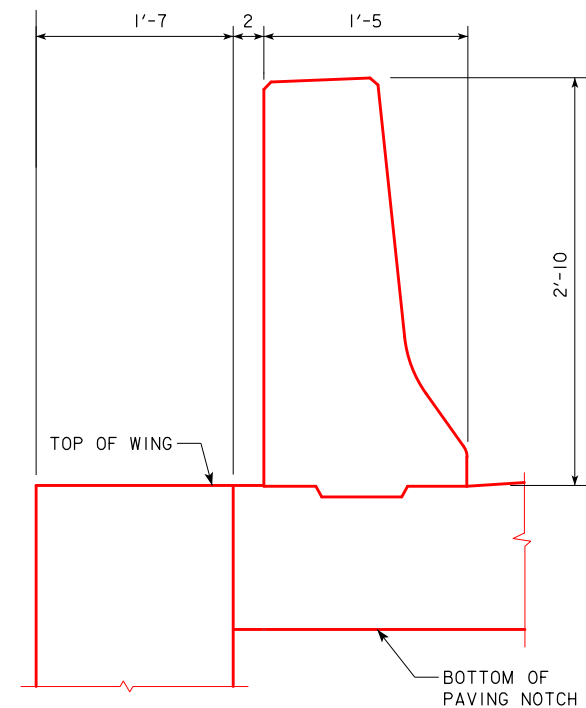
DESIGN FOR 0° SKEW  
339'-0" x 44'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE  
101'-0" END SPANS 137'-0" INTERIOR SPAN  
SUPERSTRUCTURE DETAILS  
STA. 2496+41.15 (US 63) JANUARY, 2021  
DAVIS COUNTY  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 17 OF 32 FILE NO. 31722 DESIGN NO. 113

CORRECTION 04-14 - ADDED REFERRAL NOTE TO SUMMARY QUANTITIES SHEET.  
ENGLISHMISCELLANEOUSBRIDGES.DGN - 2113 - THIS SHEET ISSUED 02-08.



REINFORCING BAR LIST - ONE ABUT.WING					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5hI	HORIZONTAL		18	6'-8	125
5sI	VERTICAL BOTH FACES		16	7'-8	128
REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)					253

CONCRETE PLACEMENT SUMMARY	
CONCRETE	TOTAL
ONE ABUTMENT WING	3.3
TOTAL (CU. YDS.)	3.3



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

SECTION B-B

SEE BARRIER RAIL END SECTION  
SHEET IN THESE PLANS FOR  
DETAILS OF REINFORCING BARS.

DESIGN FOR 0° SKEW

339'-0" x 44'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

101'-0" END SPANS                      137'-0" INTERIOR SPAN

ABUTMENT WING DETAILS

STA. 2496+41.15 (US 63)                      JANUARY, 2021

DAVIS COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 18 OF 32      FILE NO. 31722      DESIGN NO. 113

ALL DIAPHRAGM MATERIALS, INCLUDING BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED.

SHOP DRAWINGS OF THE STEEL DIAPHRAGMS SHOWING LAYOUT AND DETAILS OF THE DIAPHRAGMS SHALL BE SUBMITTED FOR APPROVAL.

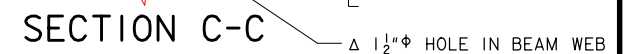
ALL COSTS FOR FURNISHING AND INSTALLING STEEL INTERMEDIATE DIAPHRAGMS SHALL BE INCLUDED IN THE PRICE BID FOR STRUCTURAL STEEL.

THE  $1\frac{1}{2}$ "  $\phi$  HOLES FOR THE  $\frac{7}{8}$ "  $\phi$  H.S. BOLTS SHALL BE CAST INTO THE WEB. DRILLING IS NOT ALLOWED.

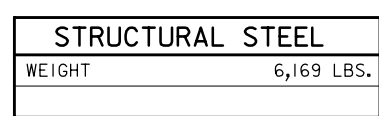
THE  $\frac{7}{8}$ "  $\phi$  H.S. BOLTS THROUGH THE WEB SHALL HAVE A THREAD LENGTH OF 3 INCH MIN. AND 4 INCH MAX. AND SHALL MEET THE REQUIREMENTS OF ASTM A449.

ALL BOLTS ARE TO BE TIGHTENED PRIOR TO PLACING BRIDGE CONCRETE DECK.

ONE BEAM CONNECTION ( DETAIL "F" AND/OR DETAIL "G" )			WEIGHT
		NO. OF BEAM CONNECTIONS	
2 - $\frac{7}{8}" \phi \times 9\frac{1}{4}"$ H.S. BOLTS WITH NUTS & WASHERS = 4.8 LBS.		24	115
ONE DETAIL "G"	2 - BENT $\bar{C} 9 \times 6 \times \frac{1}{2} \times 1'-1\frac{3}{8}" = 57.0$ LBS.	16	912
ONE DETAIL "F"	1 - BACKING $\bar{C} 6 \times \frac{3}{4} \times 1'-1\frac{3}{8}" = 8.5$ LBS.	8	68
	1 - BENT $\bar{C} 9 \times 6 \times \frac{1}{2} \times 1'-1\frac{3}{8}" = 28.5$ LBS.	8	228
ONE DIAPHRAGM			
		NUMBER OF DIAPHRAGMS	
8 - $\frac{7}{8}" \phi \times 2\frac{3}{4}"$ H.S.BOLTS WITH NUTS & WASHERS = 10.3 LBS.		20	206
	LENGTH OF MEMBER		
1 - $C15 \times 33.9 = 33.9$ LBS./FT.	6'-10 $\frac{1}{8}"$	20	4,640
INTERMEDIATE DIAPHRAGM STRUCTURAL STEEL - TOTAL (LBS.)			6,169



INTEGRAL ABUT. FIXED PIER  
BEAM COIL TIE LOCATIONS



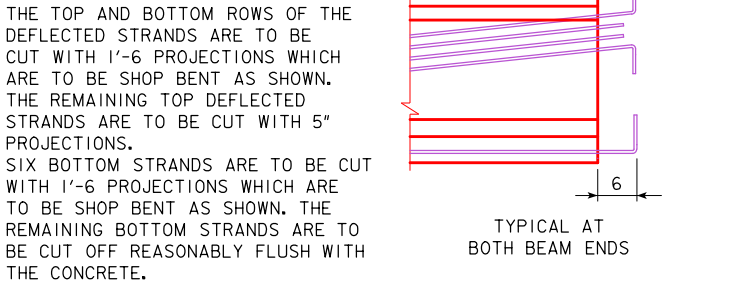
NOTE: STRUCTURAL STEEL WEIGHT  
IS INCLUDED ON THE  
SUMMARY QUANTITIES SHEET.



DETAIL G

4 - 1" x 2" SLOTTED  
HOLES IN 9" LEG  
OF BENT  $\overline{P}_L$  AND  
1" x 1 $\frac{1}{2}$ " SLOTTED  
HOLES IN C15x33.9  
7 $\frac{7}{8}$ "  $\Phi$  H.S. BOLTS  
W/HEAVY HEX NUT.  
2 - 1 $\frac{1}{8}$ " x 2"  $\Phi$  O.D. PLAIN  
WASHERS AND ONE  
HARDENED WASHER  
(TYP.). SEE SLOTTED  
HOLE DETAILS.





## DESIGN STRESSES:

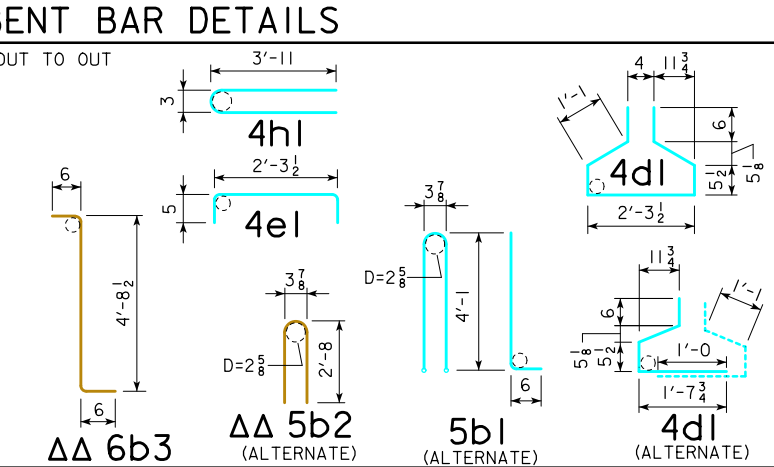
DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE TO BE  
IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN  
SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 2007.  
REINFORCING STEEL IN ACCORDANCE WITH SECTION 5, GRADE 60.  
CONCRETE IN ACCORDANCE WITH SECTION 5.  
PRESTRESSING STEEL IN ACCORDANCE WITH SECTION 5, GRADE 270.

## SPECIFICATIONS:










CONSTRUCTION: STANDARD SPECIFICATIONS OF THE IOWA  
DEPARTMENT OF TRANSPORTATION, CURRENT SERIES, WITH  
CURRENT APPLICABLE SPECIAL PROVISIONS AND SUPPLE-  
MENTAL SPECIFICATIONS.  
DESIGN: A.A.S.H.T.O. LRFD, SERIES OF 2007, WITH MINOR MODIFICATIONS.

ALTERNATE BAR NOTES:

ALTERNATE BARS SHOWN IN BENT BAR DETAILS MAY BE USED IN LIEU OF REINFORCING BARS SHOWN IN BAR LIST. NO ADDITIONAL PAYMENT SHALL BE MADE FOR USE OF ALTERNATE BARS.



## REINFORCING BAR LIST

REINFORCING BAR LIST						
BEAM				BTD100		
BAR	SHAPE			NO.	LENGTH	BAR
5a1				12	32'-9	5a1
5a2				6	40'-0	5a2
5b1				75	10'-8	5b1
6b3				32	5'-9	6b3
6b4				16	5'-1	6b4
4c1				127	2'-7	4c1
4d1				95	6'-5	4d1
4e1				26	3'-2	4e1
4h1				6	8'-0	4h1

# BTD BEAM DATA

[illegible]

① DEFLECTIONS A MID-SPAN DUE TO WEIGHT OF DECK AND DIAPHRAGM. THE DEFLECTIONS SHOWN ARE FOR A DECK (8 in) AND HAUNCH (1.5 in) WEIGHT OF:

0.98 kips/ft FOR 9'-3 BEAM SPACING AND ONE STEEL DIAPHRAGM (0.500 kips) AT  $\frac{1}{4}$  OF SPAN FOR BTD50 TO BTD120, AND TWO STEEL DIAPHRAGMS (0.500 kips) PLACED 20'-0, ON EITHER SIDE, OF THE BEAM CENTERLINE FOR BTD125 TO BTD130. FOR DIFFERENT DECK AND DIAPHRAGM WEIGHTS, DEFLECTIONS WILL BE DIRECTLY PROPORTIONAL.

② DEFLECTIONS DUE TO THE COMBINED EFFECT OF CREEP DUE TO WEIGHT OF DECK AND SHRINKAGE OF DECK.

TOTAL BEAM DEFLECTIONS AT  $\frac{1}{4}$  OF SPAN,  $\Delta_0$ , DUE TO WEIGHT OF DECK AND DIAPHRAGMS FOR DETAILING PURPOSE:

(A)  $\Delta_0 = \Delta_1 + \Delta_T$  FOR SIMPLE SPAN.

(B)  $\Delta_0 = \Delta_1 + \frac{3}{4} \Delta_T$  FOR END SPANS OF CONTINUOUS BRIDGE.

(C)  $\Delta_0 = \Delta_1 + \frac{1}{2} \Delta_T$  FOR INTERIOR SPANS OF CONTINUOUS BRIDGE.

③ TOTAL INITIAL PRESTRESS IS BASED ON 72.6%  $f's$ ,  $f's = 270$  ksi. AND  $A_s = 0.217$  in<sup>2</sup>.

CALCULATED DESIGN CAMBERS HAVE BEEN REDUCED FROM THEIR THEORETICAL VALUES BY 15% TO AID CONSTRUCTABILITY.

BEAM NOTES:

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

ALL PPC BEAMS SHALL USE HIGH PERFORMANCE CONCRETE (HPC) IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

ALL PRESTRESSING STRANDS EXCEPT LIFTING LOOP STRANDS SHALL BE 0.60 in. NOMINAL DIAMETER (NOMINAL STEEL AREA = 0.217 in<sup>2</sup>) AND CONFORM TO ASTM A416 GRADE 270 LOW RELAXATION STRANDS. MINIMUM STRAND BREAKING STRENGTH SHALL BE 58.6 kips.

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

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

THE PORTIONS OF THE PRESTRESSED BEAMS THAT ARE TO BE EMBEDDED IN THE ABUTMENT AND PIER DIAPHRAGMS SHALL BE ROUGHENED FOR A DISTANCE OF 10" FROM THE BEAM END BY SANDBLASTING OR OTHER APPROVED METHODS TO PROVIDE SUITABLE BOND BETWEEN THE BEAM AND THE DIAPHRAGM IN ACCORDANCE WITH ARTICLE 2403.03, 1, OF THE STANDARD SPECIFICATIONS.

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

FOR TRANSPORTING, THE ALLOWABLE OVERHANG IS SHOWN IN THE "LIFTING LOOP AND OVERHANG TABLE".

THE CONTRACTOR SHALL ASSURE THE LATERAL STABILITY OF THE BTD110 TO BTD130 BEAMS DURING HANDLING, TRANSPORTING AND ERECTION BY PROVIDING TEMPORARY BRACING AS NEEDED.

HOLES MUST BE CAST IN THE WEB TO ACCOMMODATE THE STEEL  
DIAPHRAGM ATTACHMENTS AS DETAILED ON THE STEEL DIAPHRAGM  
DETAIL SHEET.

MINIMUM CONCRETE  $f'_c$  (AT 28 DAYS) AND MINIMUM  $f'_c$  AT RELEASE ARE LOCATED IN THE BTB BEAM DATA TABLE ABOVE.

FOUR 0.60 IN. DIAMETER STRANDS STRESSED TO NOT MORE  
THAN 5000 lbs. EACH MAY BE USED IN LIEU OF BARS 5a1 AND 5a  
IN THE TOP FLANGE.

## DESIGN FOR 0° SKEW

339'-0" x 44'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE  
01'-0" END SPANS 137'-0" INTERIOR SPAN

BTD 100 BEAM DATA

STA. 2496+41.15 (US 63)

JANUARY, 2021

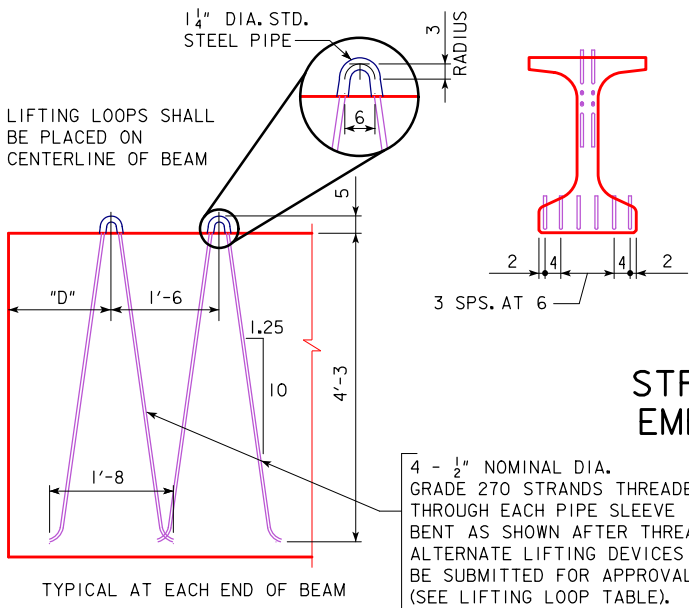
DAVIS COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 20 OF 32 FILE NO. 31722 DESIGN NO. 113



CORRECTION 12-13 - COIL TIE DETAIL WAS CHANGED TO REFLECT THE DISTANCE BETWEEN COIL TIE ANCHORS EMBEDDED ¼ INCH. ENGLISHBEAMS.DGN 4748SI - THIS SHEET ISSUED 05-04.



TYPICAL AT EACH END OF BEAM

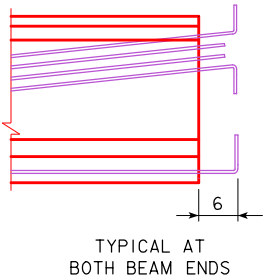
## LIFTING LOOP DETAIL

### LIFTING LOOP AND OVERHANG TABLE

BEAM	LIFTING LOOPS EACH END	# OF STRANDS PER LOOP	D	BEAM OVERHANG (FT)
BTDI35	2	4	9'-3	16

LIFTING LOOPS SHALL CARRY LOADS EQUALLY.

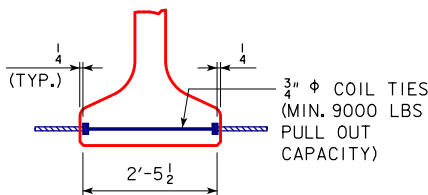
THE TOP AND BOTTOM ROWS OF THE DEFLECTED STRANDS ARE TO BE CUT WITH 1'-6 PROJECTIONS WHICH ARE TO BE SHOP BENT AS SHOWN. THE REMAINING TOP DEFLECTED STRANDS ARE TO BE CUT WITH 5" PROJECTIONS. SIX BOTTOM STRANDS ARE TO BE CUT WITH 1'-6 PROJECTIONS WHICH ARE TO BE SHOP BENT AS SHOWN. THE REMAINING BOTTOM STRANDS ARE TO BE CUT OFF REASONABLY FLUSH WITH THE CONCRETE.



TYPICAL AT BOTH BEAM ENDS

## STRAND PROJECTION AT BEAM ENDS WHEN EMBEDDED IN CONCRETE END DIAPHRAGMS

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



## COIL TIE DETAIL

ΔΔ 5b1 AND 6b3 BARS TO BE EPOXY COATED  
\* 6b3 AND 6b4 BARS TO BE USED IN PAIRS

## DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE TO BE IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 2007. REINFORCING STEEL IN ACCORDANCE WITH SECTION 5, GRADE 60. CONCRETE IN ACCORDANCE WITH SECTION 5. PRESTRESSING STEEL IN ACCORDANCE WITH SECTION 5, GRADE 270.

## SPECIFICATIONS:

CONSTRUCTION: STANDARD SPECIFICATIONS OF THE IOWA DEPARTMENT OF TRANSPORTATION, CURRENT SERIES, WITH CURRENT APPLICABLE SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS.  
DESIGN: A.A.S.H.T.O. LRFD, SERIES OF 2007, WITH MINOR MODIFICATIONS.

## ALTERNATE BAR NOTES:

ALTERNATE BARS SHOWN IN BENT BAR DETAILS MAY BE USED IN LIEU OF REINFORCING BARS SHOWN IN BAR LIST. NO ADDITIONAL PAYMENT SHALL BE MADE FOR USE OF ALTERNATE BARS.

## BTDI35 BEAM DATA

BTD BEAM	SPAN LENGTH ℄-℄ BEARING	OVERALL BEAM LENGTH (L)	CONCRETE STRENGTH		STRAND SIZE DIA. (in)	NO. OF STRAND		TOTAL INITIAL PRESTRESS kips ③	HOLD DOWN FORCE-kips	CAMBER (in)		DEFLECTION (in) Δ <sub>0</sub>		PERMISSIBLE MAXIMUM SPACING	WEIGHT (TONS)	CONCRETE (CU YD.)	REINFORCING STEEL (WEIGHT-LBS)				
												IMMEDIATE① (ELASTIC) Δ <sub>i</sub>	TIME ② (PLASTIC) Δ <sub>T</sub>								
			f'ci (ksi)	f'c (ksi)		STRAIGHT	DEFLECTED			AT RELEASE	AFTER LOSSES			STEEL DIAPHRAGM				STEEL DIAPHRAGM	HL-93 LOADING		
																					STEEL DIAPHRAGM
			BTDI35	135'-0		136'-4	8.00			9.00	0.60	42	12	2297				29.5	3.57	6.27	4.51

## BEAM NOTES:

THIS BEAM IS DESIGNED FOR AASHTO LIVE LOADS AS INDICATED IN ABOVE TABLE WITH AN ALLOWANCE OF 20 LBS PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.

ALL PPC BEAMS SHALL USE HIGH PERFORMANCE CONCRETE (HPC) IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

ALL PRESTRESSING STRANDS EXCEPT LIFTING LOOP STRANDS SHALL BE 0.60 in. NOMINAL DIAMETER (NOMINAL STEEL AREA = 0.217 in<sup>2</sup>) AND CONFORM TO ASTM A416 GRADE 270 LOW RELAXATION STRANDS. MINIMUM STRAND BREAKING STRENGTH SHALL BE 58.6 kips.

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

BEARINGS SHALL BE AS DETAILED ON OTHER DESIGN SHEETS.

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

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

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

FOR TRANSPORTING, THE ALLOWABLE OVERHANG IS SHOWN IN THE "LIFTING LOOP AND OVERHANG TABLE".










THE CONTRACTOR SHALL ASSURE THE LATERAL STABILITY OF THE BEAM DURING HANDLING, TRANSPORTING AND ERECTION BY PROVIDING TEMPORARY BRACING AS NEEDED.

HOLES MUST BE CAST IN THE WEB TO ACCOMMODATE THE STEEL DIAPHRAGM ATTACHMENTS AS DETAILED ON THE STEEL DIAPHRAGM DETAIL SHEET.

MINIMUM CONCRETE f'c (AT 28 DAYS) AND MINIMUM f'ci AT RELEASE ARE LOCATED IN THE BTDI35 BEAM DATA TABLE ABOVE.

FOUR 0.60 IN. DIAMETER STRANDS STRESSED TO NOT MORE THAN 5000 lbs. EACH MAY BE USED IN LIEU OF BARS 5a1 AND 5a2 IN THE TOP FLANGE.

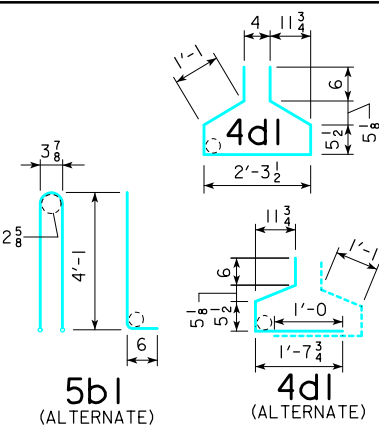
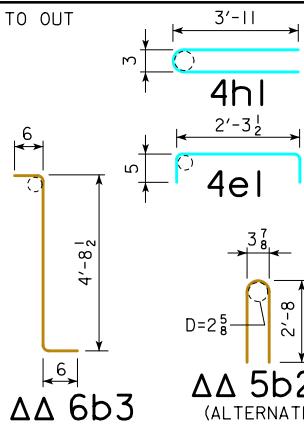
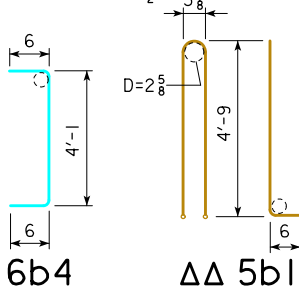
## REINFORCING BAR LIST

		BEAM		BTDI35	
		BAR	SHAPE	NO.	LENGTH
ΔΔ ΔΔ * *		5a1		12	31'-4
		5a2		12	40'-0
		5b1		111	10'-8
		6b3		36	5'-9
		6b4		24	5'-1
		4c1		175	2'-7
4d1		131	6'-5		
4e1		26	3'-2		
4h1		6	8'-0		

## BENT BAR DETAILS

NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT  
D = PIN DIAMETER FOR BENDING  
(UNLESS OTHERWISE SHOWN)

#4 BAR D= 2"  
#5 BAR D= 2 1/2"  
#6 BAR D= 4 1/2"



DESIGN FOR 0° SKEW

**339'-0 x 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**

101'-0 END SPANS 137'-0 INTERIOR SPAN

**BTDI35 BEAM DATA**

STA. 2496+41.15 (US 63) JANUARY, 2021

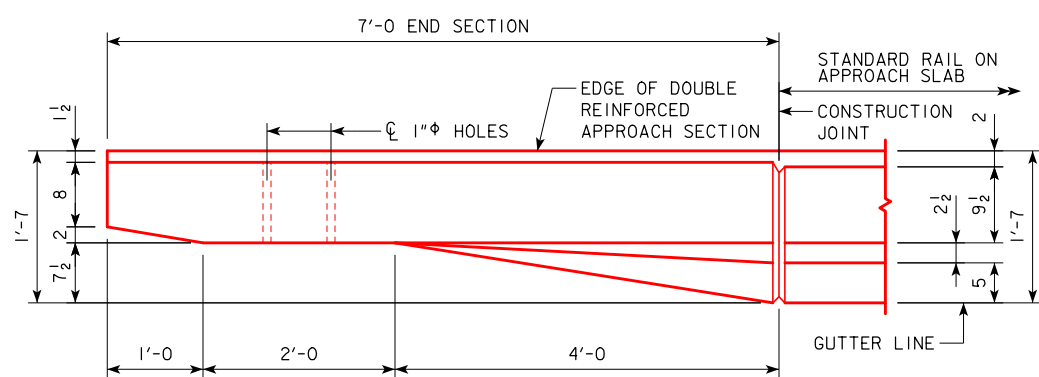
**DAVIS COUNTY**

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 22 OF 32 FILE NO. 31722 DESIGN NO. 113

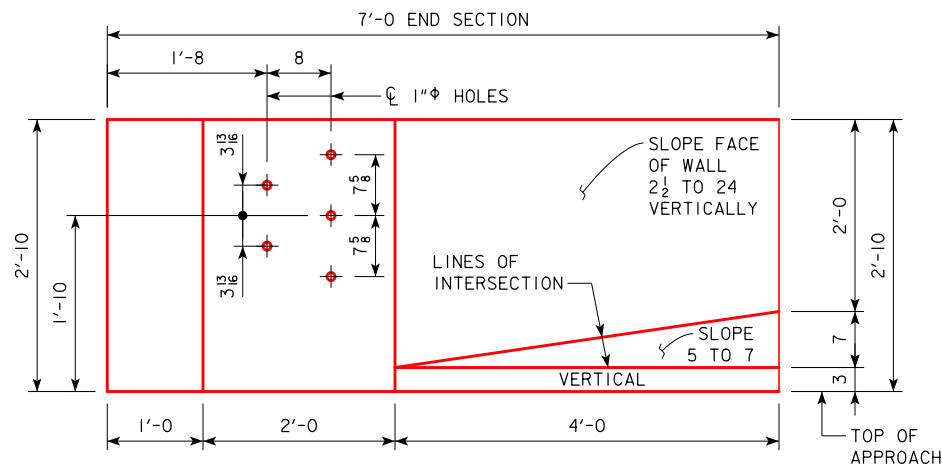








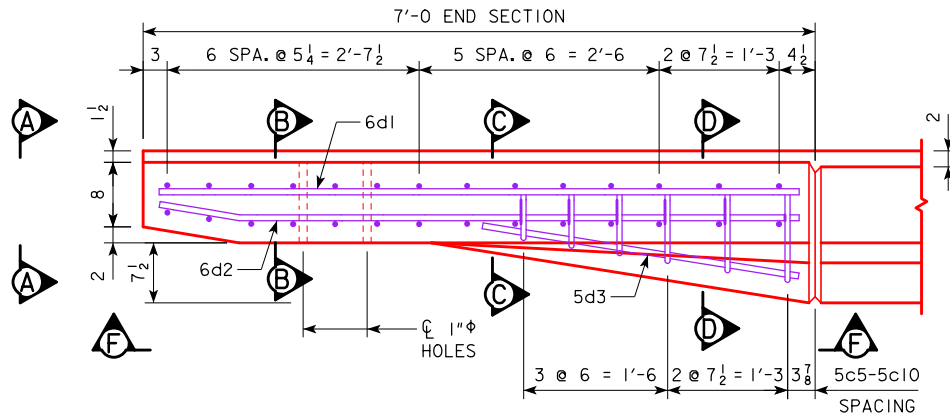
PART PLAN VIEW



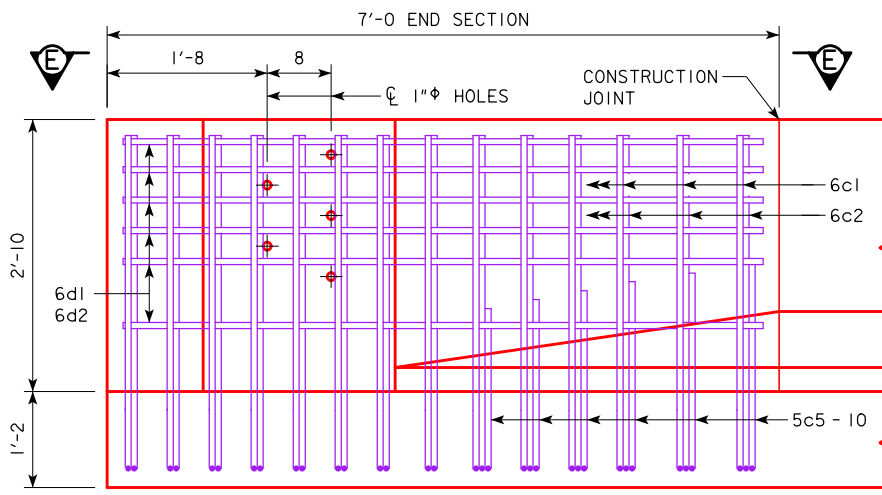
PART ELEVATION VIEW

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

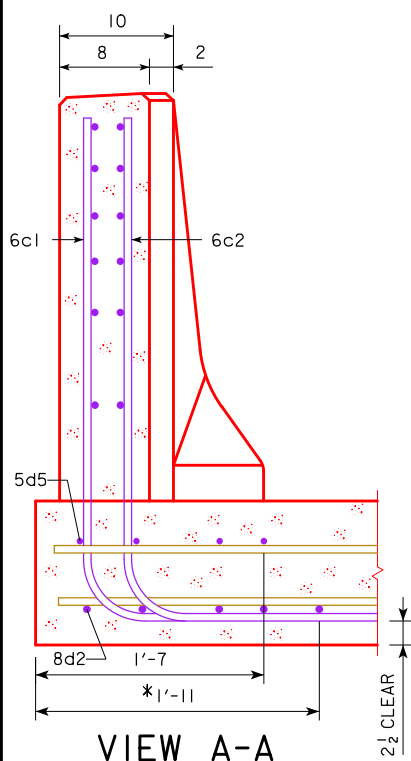
\* 8d2 BARS SPACED AT 5" MAX. SEE DESIGN SHEET 29 FOR APPROACH SLAB REINFORCING DETAILS.



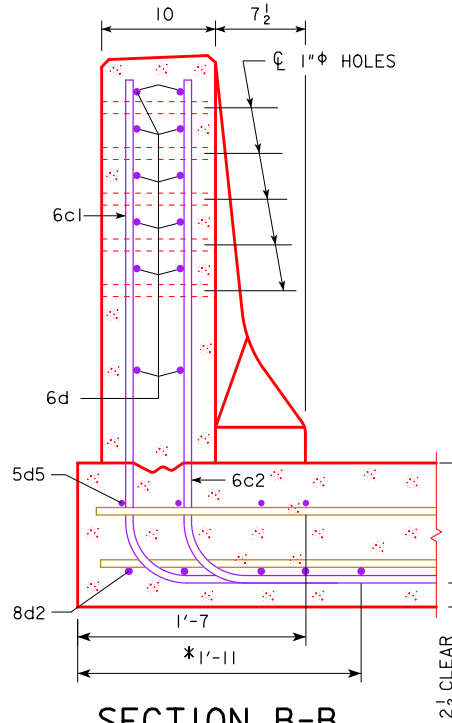
PART VIEW E-E



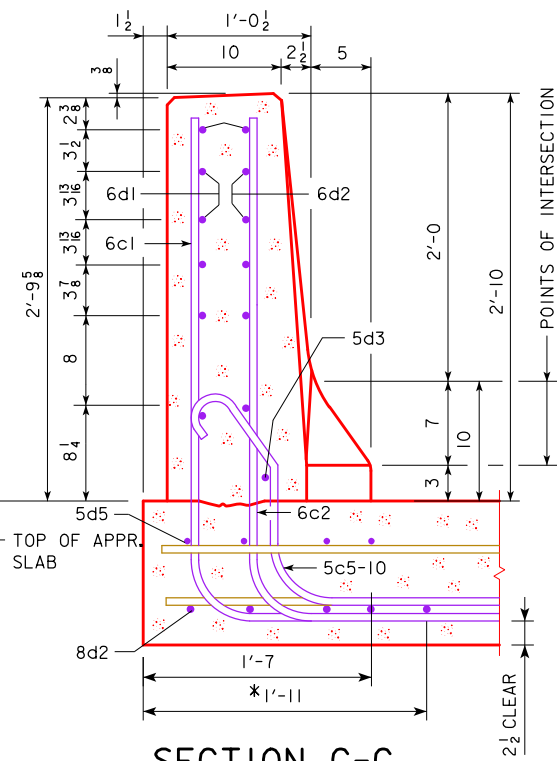
PART VIEW F-F



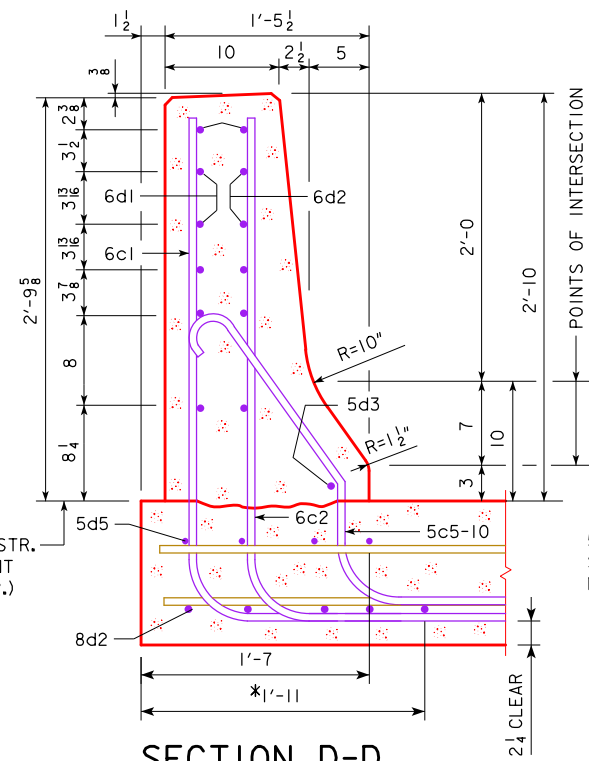
VIEW A-A



SECTION B-B



SECTION C-C



SECTION D-D

5d3 APPROACH SLAB REINFORCING NOT SHOWN.

## STAINLESS STEEL REINF. STEEL - ONE END SECT.

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6c1	RAIL, VERTICAL		14	6'-6	137
6c2	RAIL, VERTICAL		14	7'-0	147
5c5-10	RAIL, VERTICAL		6	VARIES	28
STAINLESS STEEL TOTAL WEIGHT (LBS.)					312

## EPOXY REINF. STEEL - ONE END SECT.

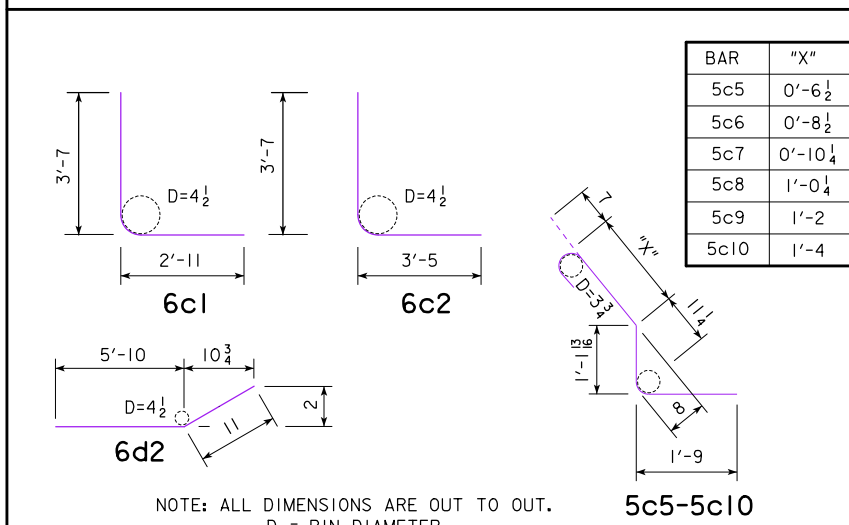
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6d1	RAIL, HORIZONTAL		6	6'-8	60
6d2	RAIL, HORIZONTAL		6	6'-9	61
5d3	RAIL, HORIZONTAL		1	3'-9	4
EPOXY STEEL TOTAL WEIGHT (LBS.)					125

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



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

NOTE: CONSTRUCTION JOINT BETWEEN TOP OF APPROACH 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: 6c1, 6c2 AND 5c5-10 BARS ARE TO BE PLACED WITH THE APPROACH.

DESIGN FOR 0° SKEW

**339'-0 x 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE**

101'-0 END SPANS 137'-0 INTERIOR SPAN

**BARRIER RAIL END SECTION DETAILS**

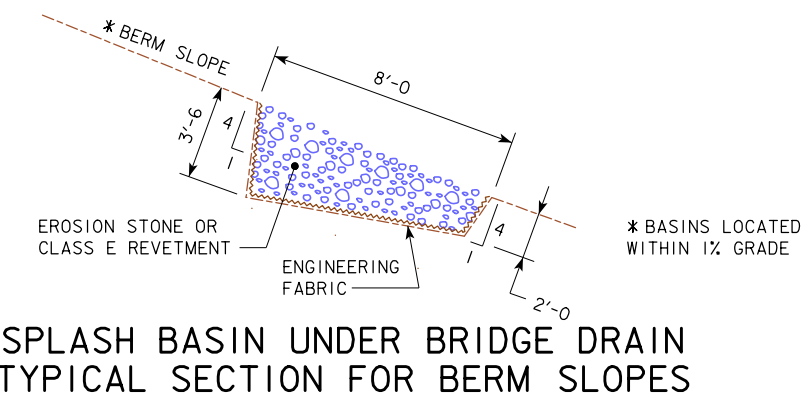
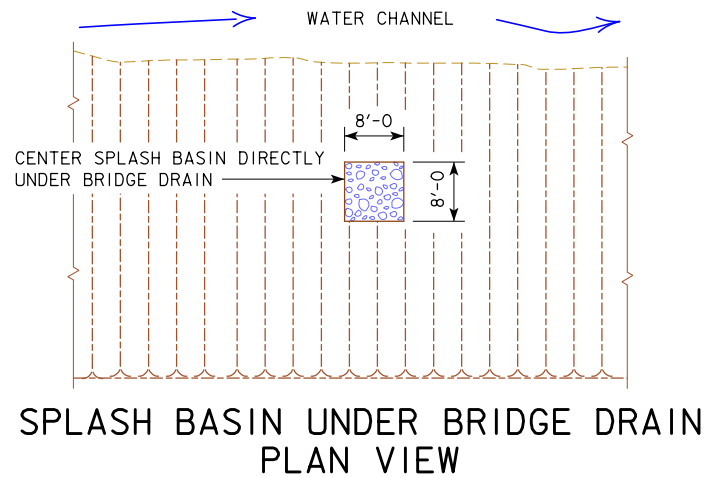
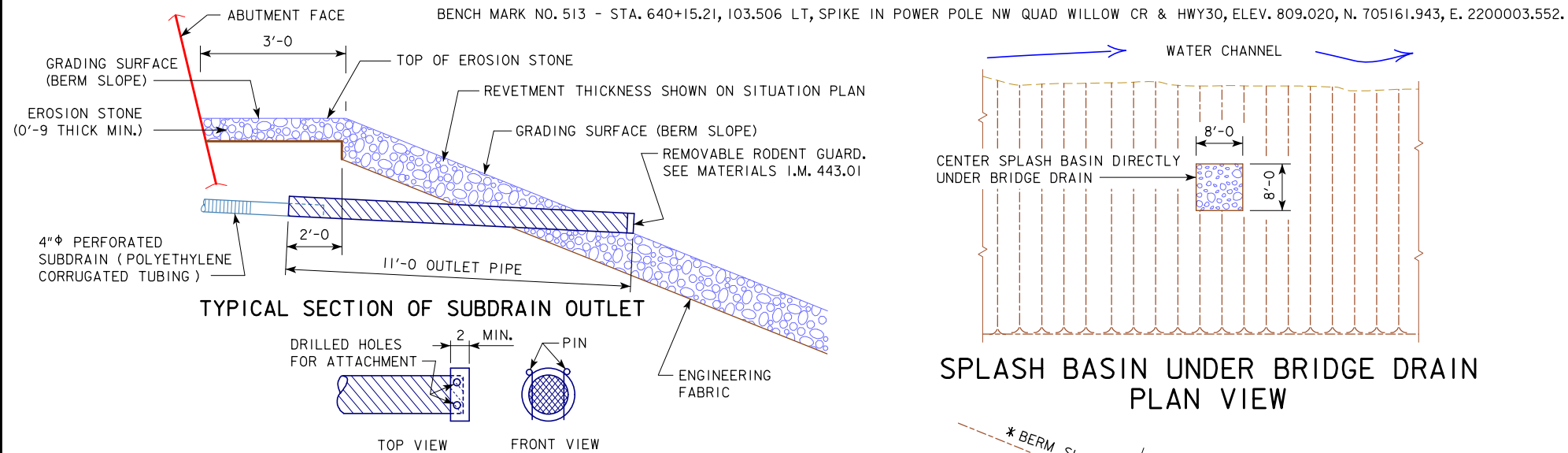
STA. 2496+41.15 (US 63) JANUARY, 2021

**DAVIS COUNTY**

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 25 OF 32 FILE NO. 31722 DESIGN NO. 113

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



## 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 REVTMENT AND IT'S PLACEMENT LOCATION. THE CONTRACTOR IS TO INSURE THE OUTLET PIPE IS ADEQUATELY STRONG ENOUGH AND WILL NOT BE DAMAGED WHEN REVTMENT 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.

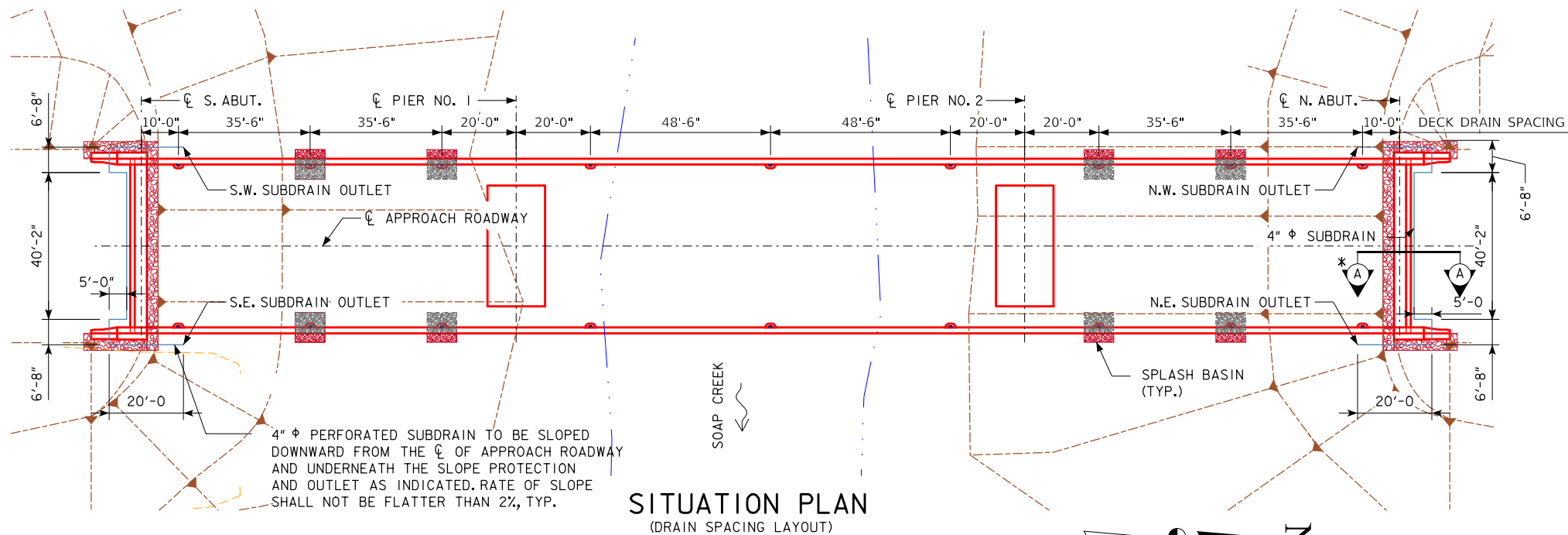
1. USE AN INSIDE FIT REDUCER COUPLER (COUPLER MUST BE INSERTED A MINIMUM OF 1'-0" INTO THE METAL OUTLET PIPE).
2. INSERT 1'-0" OF THE 4"  $\Phi$  SUBDRAIN INTO THE 6"  $\Phi$  METAL OUTLET PIPE, THEN FULLY SEAL THE ENTIRE OPENING WITH GROUT.

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

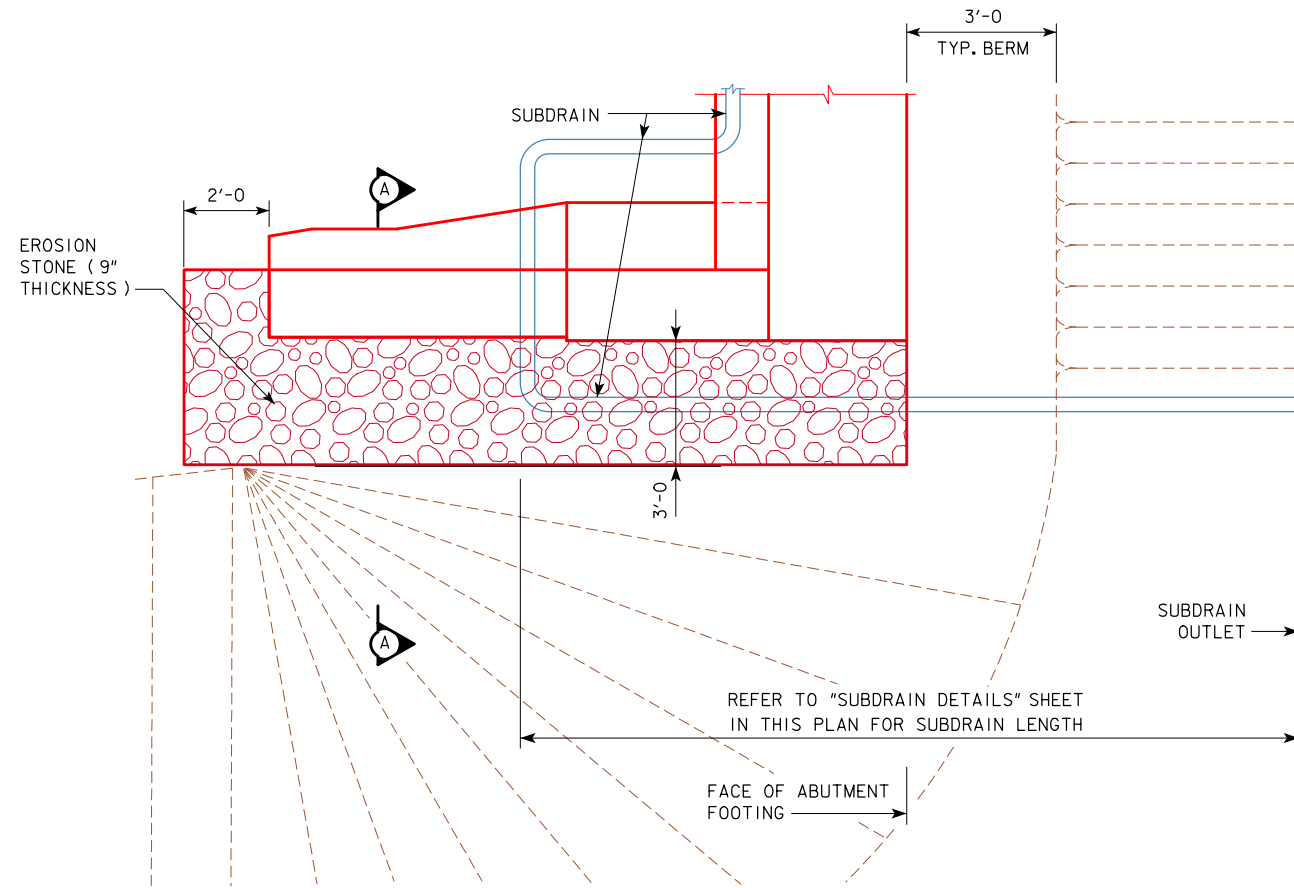
THE DIMENSIONS SHOWN FOR THE PROPOSED SUBDRAINS ARE BASED ON THE PROPOSED GRADING LAYOUT OF BRIDGE BERMS. THE DIMENSIONS SHOWN ARE FOR ESTIMATING ONLY. REQUIRED LENGTHS AND GENERAL LOCATIONS OF SUBDRAINS ARE SUBJECT TO CHANGE DUE TO FIELD ADJUSTMENTS OF THE GRADING LAYOUT.

## SUBDRAIN OUTLET ELEVATIONS

LOCATION	ELEVATION
SOUTH ABUTMENT - S.W. OUTLET	687.09
SOUTH ABUTMENT - S.E. OUTLET	687.09
NORTH ABUTMENT - N.W. OUTLET	686.07
NORTH ABUTMENT - N.E. OUTLET	686.07

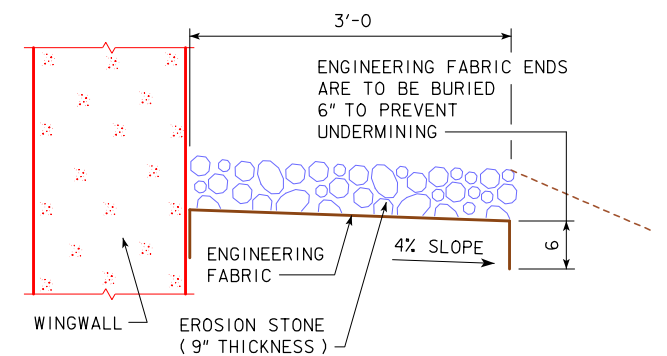


DESIGN FOR 0° SKEW  
339'-0" x 44'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE  
101'-0" END SPANS 137'-0" INTERIOR SPAN  
SUBDRAIN DETAILS  
STA. 2496+41.15 (US 63) JANUARY, 2021  
DAVIS COUNTY  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 26 OF 32 FILE NO. 31722 DESIGN NO. 113



TOP VIEW OF WING ARMORING WITH WING EXTENSION

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



SECTION A-A

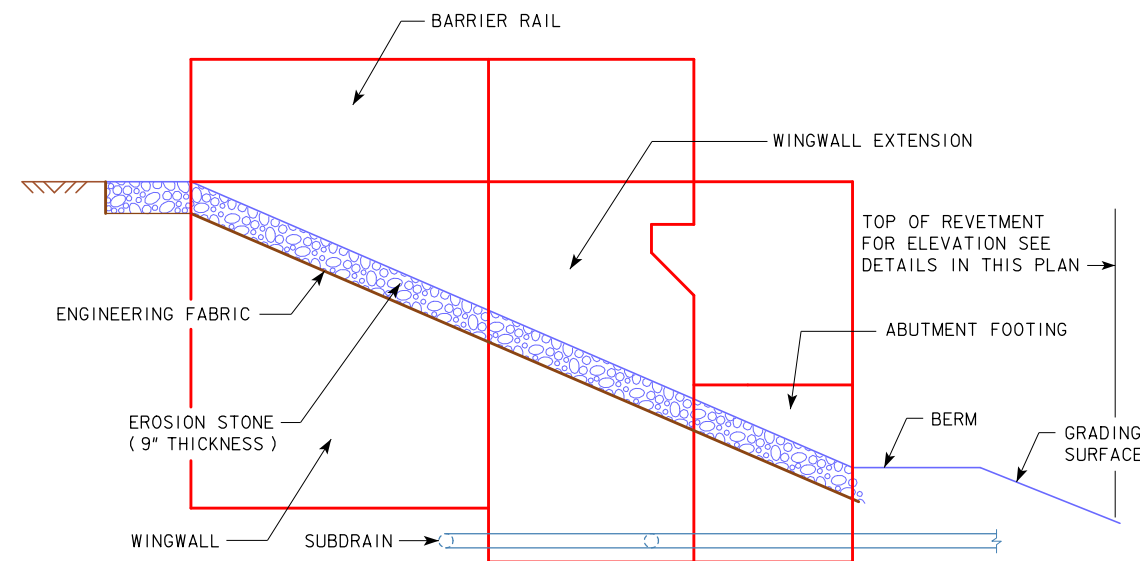
### GENERAL NOTES:

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

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

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

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

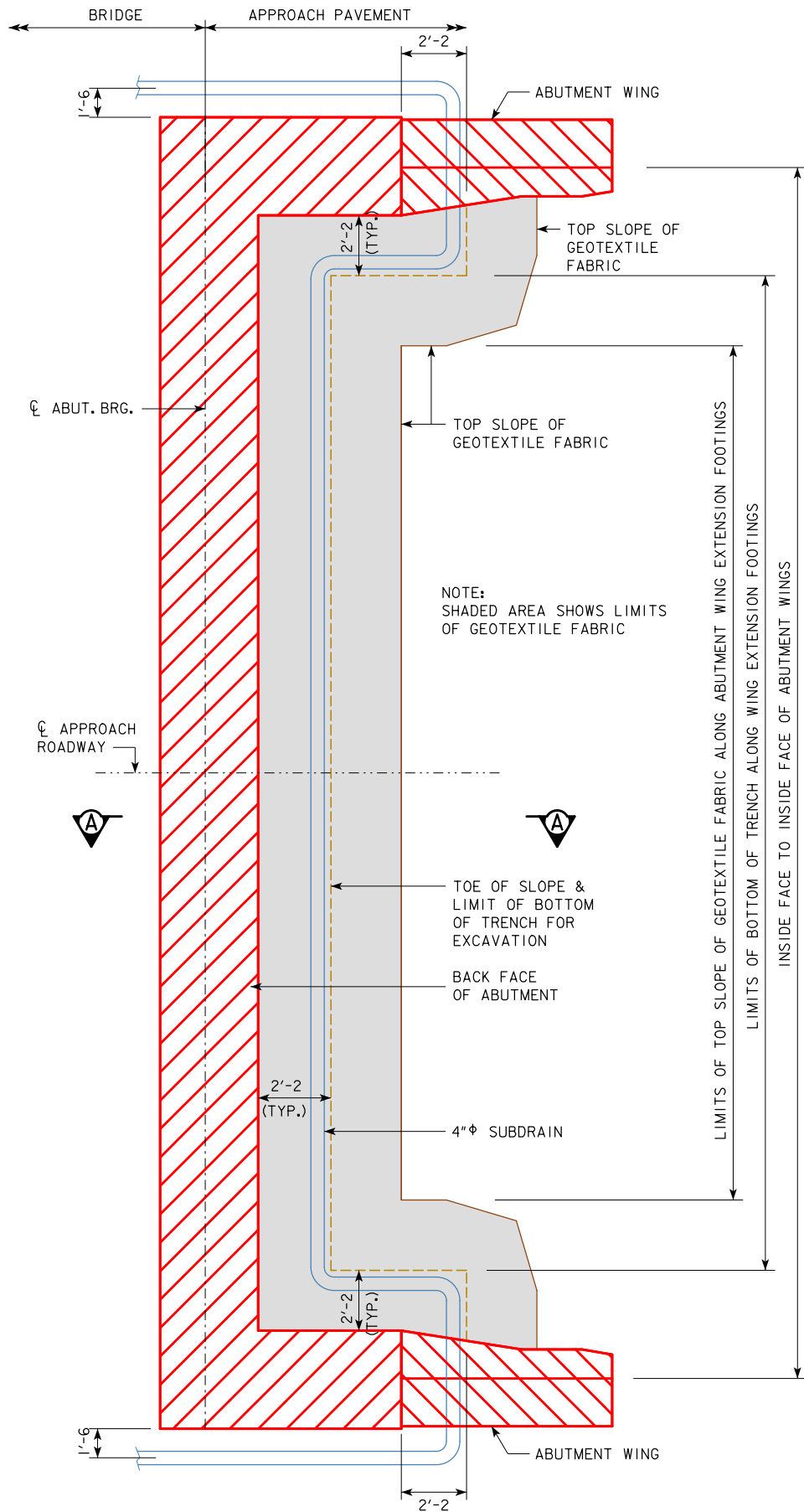


PROFILE VIEW OF WING ARMORING WITH WING EXTENSION  
( INTEGRAL ABUTMENT WITH WING EXTENSIONS )

DESIGN FOR 0° SKEW	
<b>339'-0 x 44'-0 PRETENSIONED</b>	
<b>PRESTRESSED CONCRETE BEAM BRIDGE</b>	
101'-0 END SPANS	137'-0 INTERIOR SPAN
<b>BRIDGE WING ARMORING</b>	
STA. 2496+41.15 (US 63)	JANUARY, 2021
<b>DAVIS COUNTY</b>	
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION	
DESIGN SHEET NO. <u>27</u> OF <u>32</u>	FILE NO. <u>31722</u> DESIGN NO. <u>113</u>



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.



ABUTMENT PLAN WITH WING EXTENSIONS  
(NORTH ABUTMENT SHOWN, SOUTH ABUTMENT SIMILAR)

## ABUTMENT BACKFILL PROCESS:

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

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

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

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

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

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

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

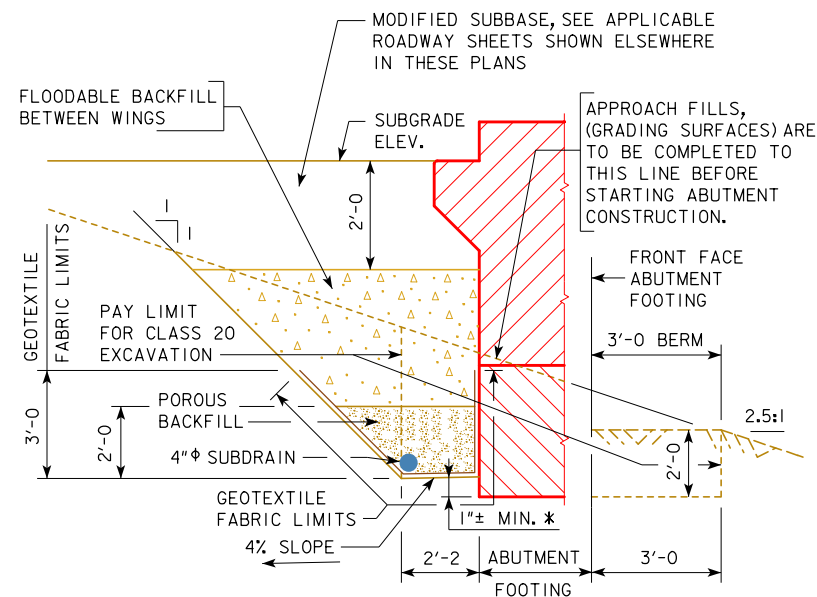
WATER REQUIRED FOR FLOODING, SUBDRAINS, POROUS BACKFILL, FLOODABLE BACKFILL, AND GEOTEXTILE FABRIC FURNISHED AT THE BRIDGE ABUTMENTS WILL NOT BE MEASURED SEPARATELY FOR PAYMENT.

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

## NOTE:

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

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



SECTION A-A  
BACKFILL DETAILS

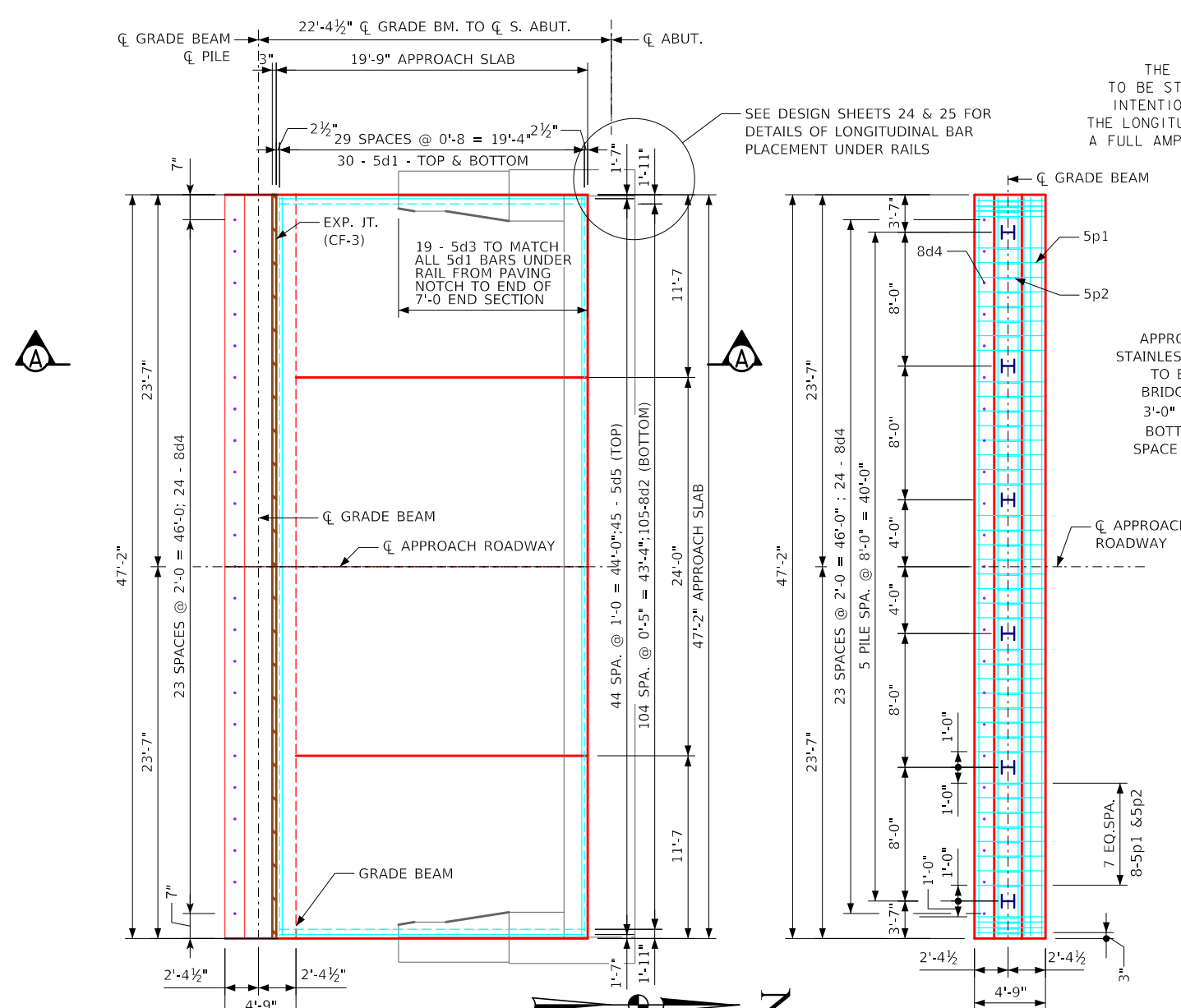
NOTE: GEOTEXTILE FABRIC WILL BE ATTACHED TO FACE OF ABUTMENT FOOTING AND WINGS.

\* VARIES DUE TO 2% SUBDRAIN SLOPE

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

DESIGN FOR 0° SKEW  
**339'-0 x 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
101'-0 END SPANS 137'-0 INTERIOR SPAN  
**ABUTMENT BACKFILL DETAILS**  
STA. 2496+41.15 (US 63) JANUARY, 2021  
**DAVIS COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
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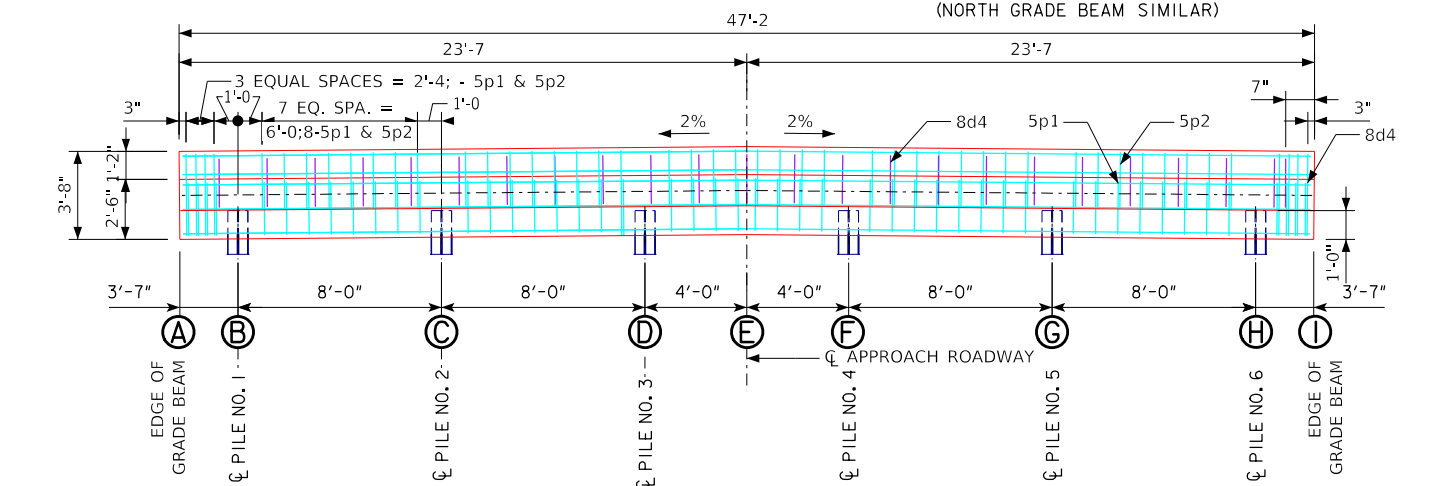




GENERAL PLAN OF APPROACH SLABS  
SHOWING REINFORCING

GRADE BEAM PLAN  
SHOWING REINFORCING

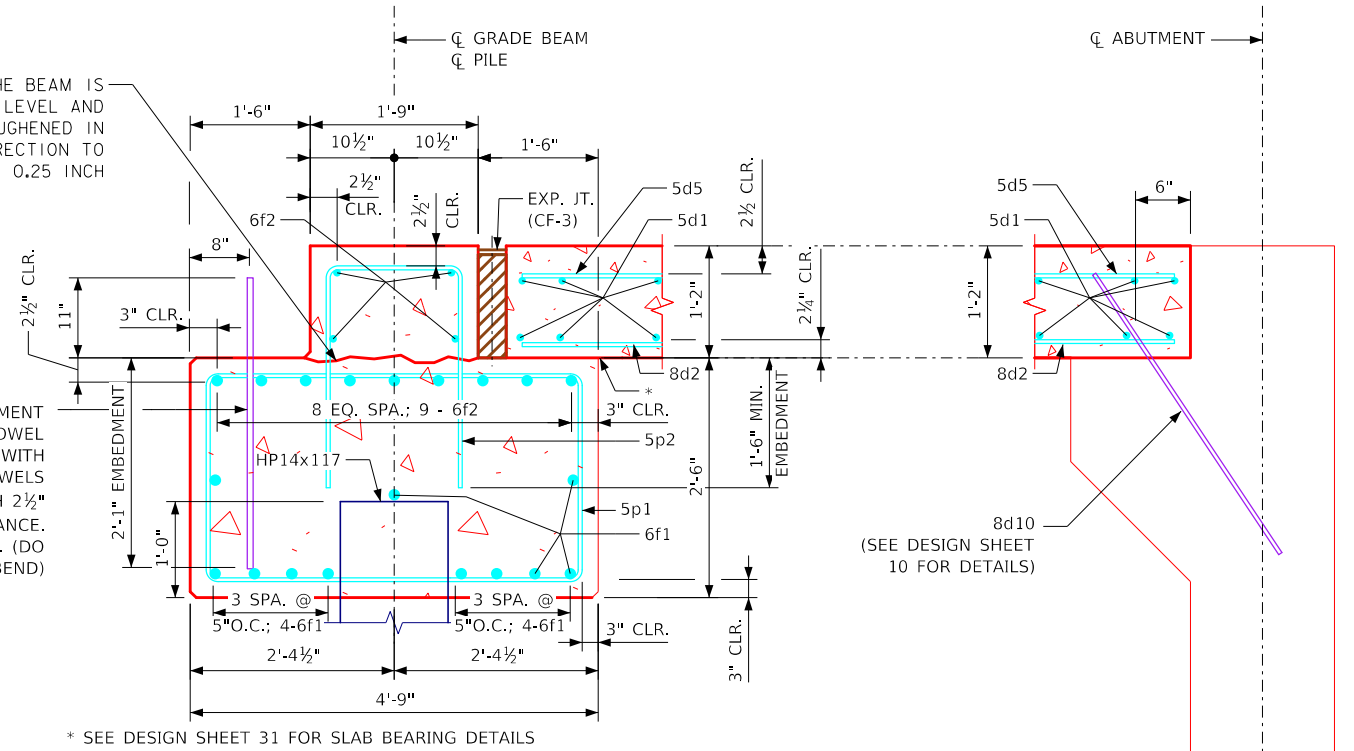
NOTE: HP 14 x 117 STEEL BEARING PILING  
REQUIRED AT EACH GRADE BEAM.  
(NORTH GRADE BEAM SIMILAR)



GRADE BEAM ELEVATION

THE TOP OF THE BEAM IS  
TO BE STRUCK OFF LEVEL AND  
INTENTIONALLY ROUGHENED IN  
THE LONGITUDINAL DIRECTION TO  
A FULL AMPLITUDE OF 0.25 INCH

APPROACH PAVEMENT  
STAINLESS STEEL DOWEL  
TO BE PLACED WITH  
BRIDGE. 8d4 DOWELS  
3'-0" LONG WITH 2 1/2"  
BOTTOM CLEARANCE.  
SPACE @ 24" O.C. (DO  
NOT BEND)



SECTION A-A

PILE DESIGN NOTES SOUTH GRADE BEAM:

THE CONTRACT LENGTH OF 60 FEET FOR THE SOUTH GRADE BEAM PILES IS BASED ON A NON-COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 232 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.70 FOR ROCK END BEARING. TO ACCOUNT FOR SOIL CONSOLIDATION UNDER THE NEW FILL, THE FACTORED AXIAL LOAD INCLUDES A FACTORED DOWNDRAW LOAD OF 118 KIPS.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A NON-COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.70 FOR ROCK END BEARING. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF GRADE BEAM.

PILE DRIVING NOTE SOUTH GRADE BEAM:

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR SOUTH GRADE BEAM PILES IS 201 TONS AT END OF DRIVE. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. IN NO CASE SHALL A PILE BE EMBEDDED LESS THAN 45 FEET. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

PILE DESIGN NOTES NORTH GRADE BEAM:

THE CONTRACT LENGTH OF 80 FEET FOR THE NORTH GRADE BEAM PILES IS BASED ON A MIXED SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 256 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL AND 0.70 FOR ROCK END BEARING. TO ACCOUNT FOR SOIL CONSOLIDATION UNDER THE NEW FILL, THE FACTORED AXIAL LOAD INCLUDES A FACTORED DOWNDRAW LOAD OF 142 KIPS.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A MIXED SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL AND 0.70 FOR ROCK END BEARING. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF GRADE BEAM.

PILE DRIVING NOTE NORTH GRADE BEAM:

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR NORTH GRADE BEAM PILES IS 227 TONS AT END OF DRIVE. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. IN NO CASE SHALL A PILE BE EMBEDDED LESS THAN 68 FEET. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

TABLE OF BOTTOM OF  
GRADE BEAM ELEVATIONS

POINT	SOUTH BEAM	NORTH BEAM
ELEV. A	692.78	691.64
ELEV. B	692.85	691.71
ELEV. C	693.01	691.87
ELEV. D	693.17	692.03
ELEV. E	693.25	692.11
ELEV. F	693.17	692.03
ELEV. G	693.01	691.87
ELEV. H	692.85	691.71
ELEV. I	692.78	691.64

DESIGN FOR 0° SKEW

**339'-0 x 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**

101'-0 END SPANS 137'-0 INTERIOR SPAN

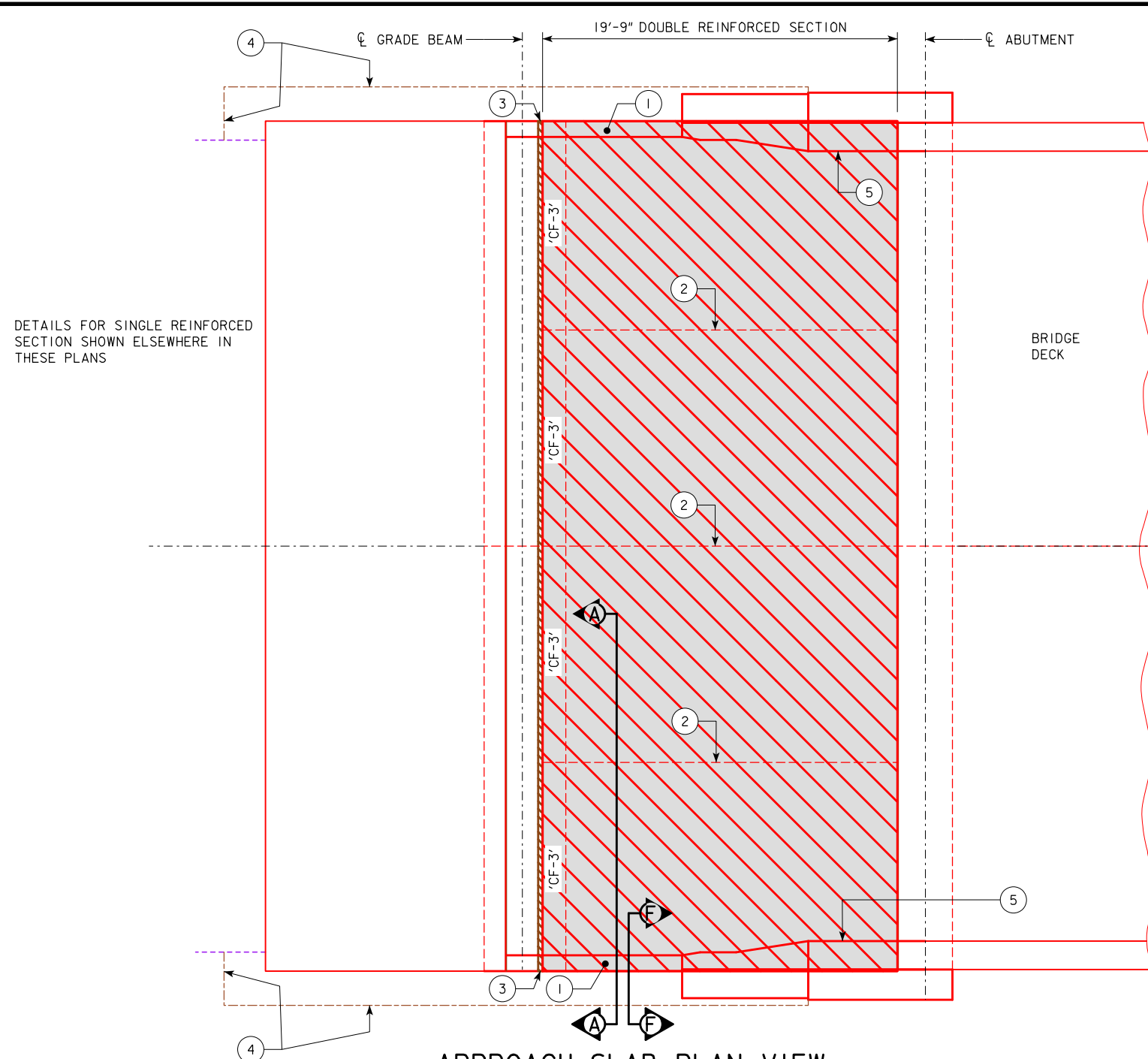
**APPROACH AND GRADE BEAM DETAILS**

STA. 2496+41.15 (US 63) JANUARY, 2021

**DAVIS COUNTY**

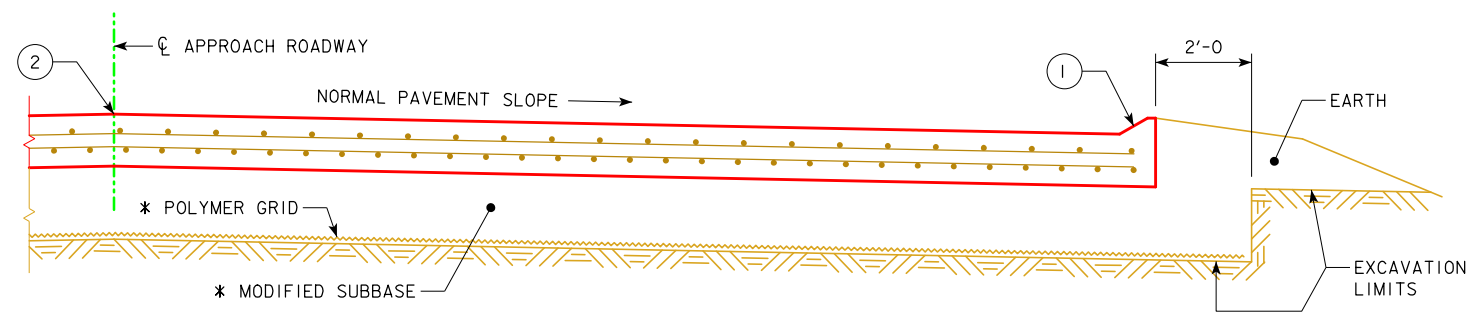
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 29 OF 32 FILE NO. 31722 DESIGN NO. 113



### APPROACH SLAB PLAN VIEW

(SOUTH APPROACH SLAB SHOWN, NORTH APPROACH SLAB SIMILAR OPPOSITE HAND)

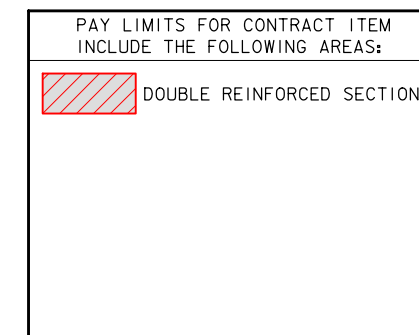


### SECTION A-A

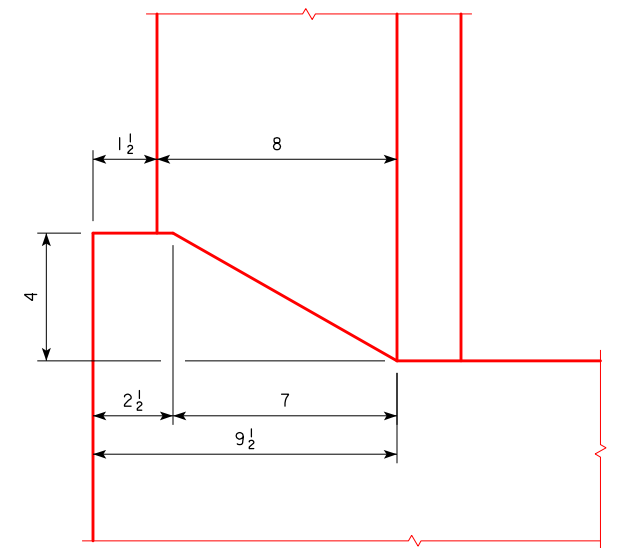
\* SEE ROADWAY QUANTITIES SHOWN ELSEWHERE IN THESE PLANS

FOR JOINT DETAILS, SEE PV-101.

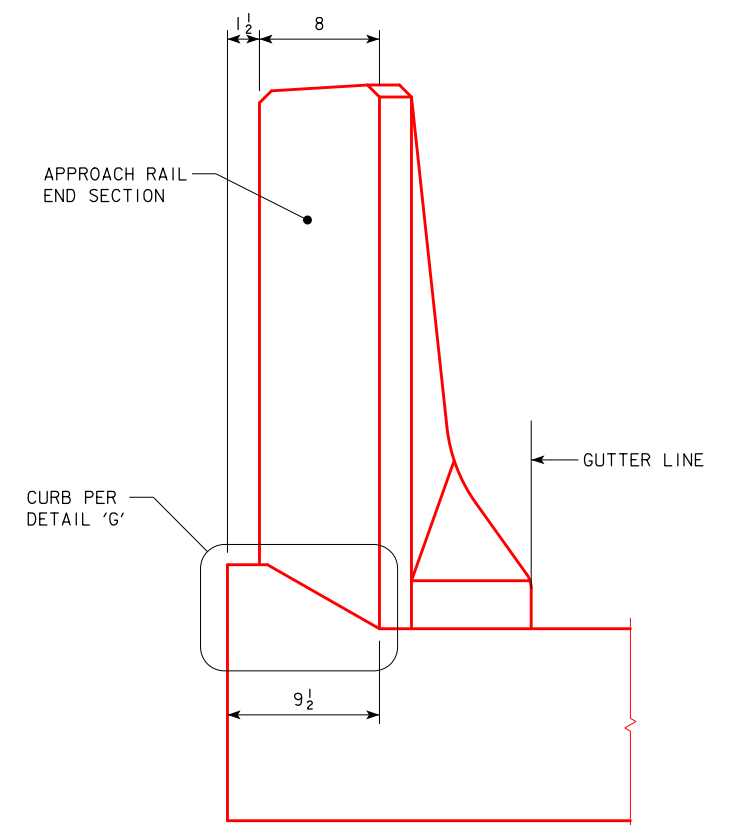
- 1 BUILD 4 INCH SLOPED CURB TO END OF REINFORCED SECTIONS. FOR CURB DETAILS, SEE DETAIL 'G'.
- 2 LONGITUDINAL JOINT (PV-101):  
SINGLE POUR - SAW CUT JOINT PER DETAIL B.  
TWO POURS - USE 'KS-1' JOINT (SINGLE REINFORCED SECTION). USE 'KS-2' JOINT (DOUBLE REINFORCED SECTION).
- 3 SEE END ELEV. VIEW OF GRADE BEAM ON DESIGN SHEET 31.
- 4 POLYMER GRID AND EXCAVATION LIMITS OF MODIFIED SUBBASE 2 FEET OUTSIDE OF PAVEMENT EDGE. TRIM TO CLEAR PILES AS NECESSARY
- 5 REINFORCING BARS IN THE RAIL WILL NEED TO BE PLACED DURING THE APPROACH SLAB POUR. FOR APPROACH SLAB BARRIER DETAILS SEE CONCRETE BARRIER RAIL DETAILS SHEET & BARRIER RAIL END SECTION DETAILS SHEET.



SEE DESIGN SHEET 29 FOR REINFORCING DETAILS.



### DETAIL 'G'



### VIEW F-F

DESIGN FOR 0° SKEW

**339'-0" x 44'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**

101'-0" END SPANS 137'-0" INTERIOR SPAN

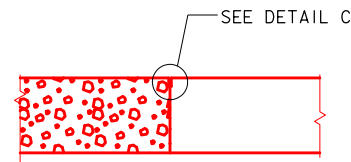
**APPROACH PLAN**

STA. 2496+41.15 (US 63) JANUARY, 2021

**DAVIS COUNTY**

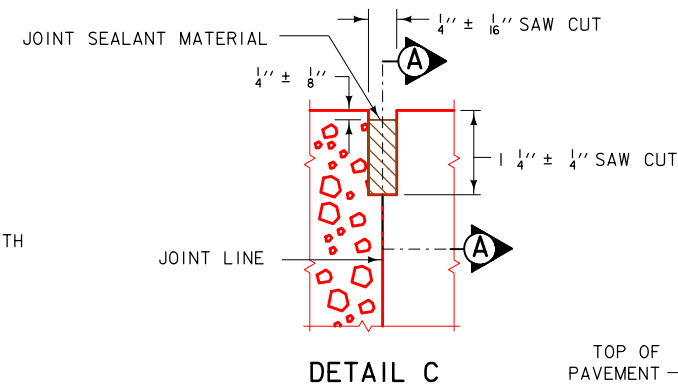
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 30 OF 32 FILE NO. 31722 DESIGN NO. 113

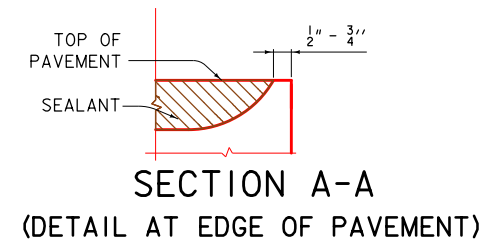


'B'  
PLAIN JOINT

NOTE: EDGE WITH  $\frac{1}{8}$  INCH TOOL FOR LENGTH OF JOINT.

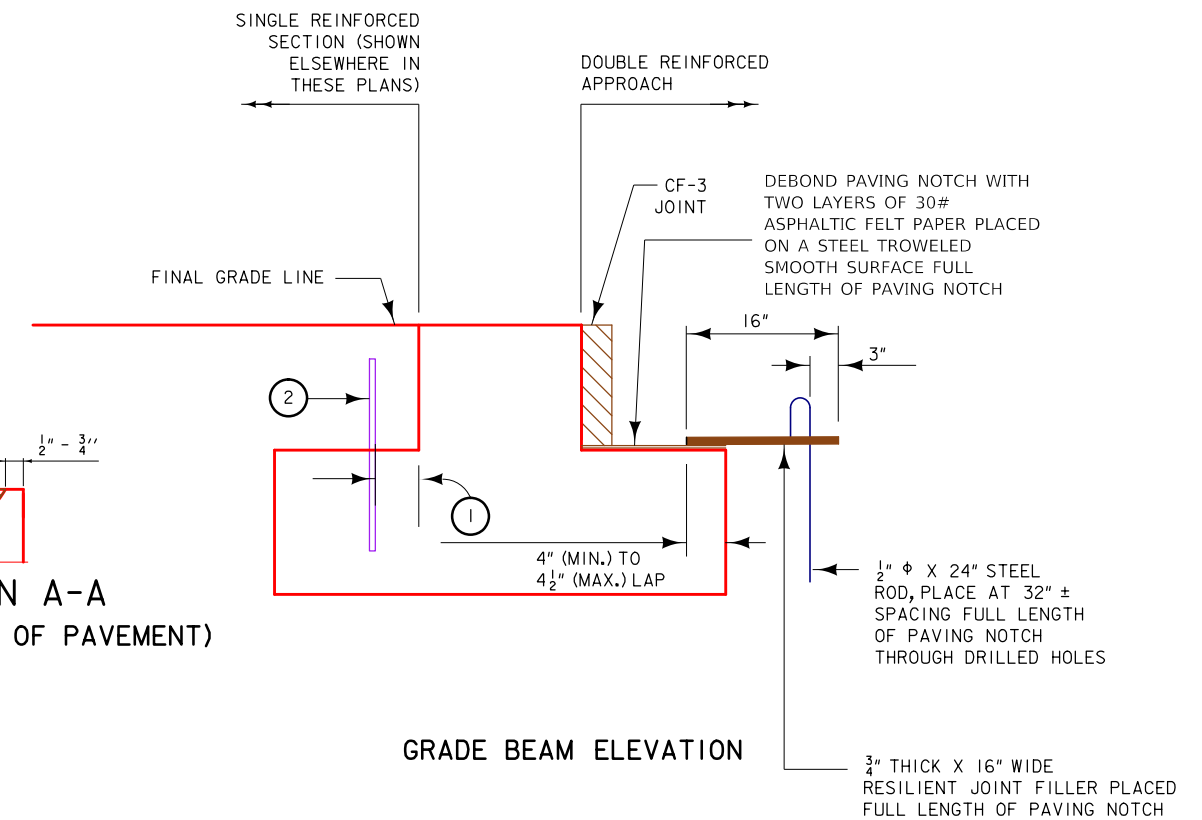


DETAIL C

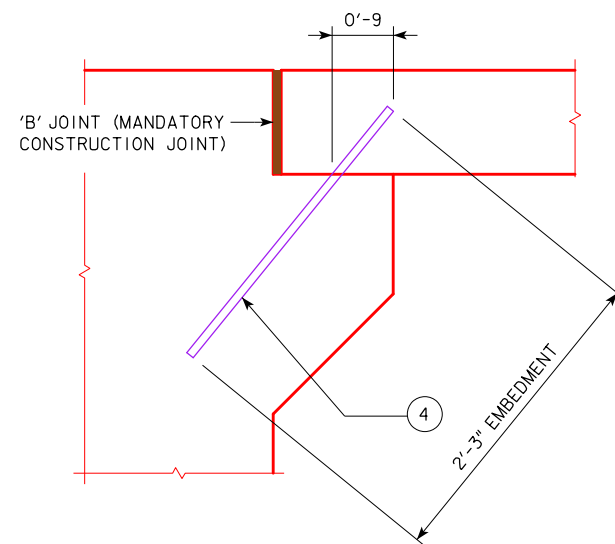


SECTION A-A

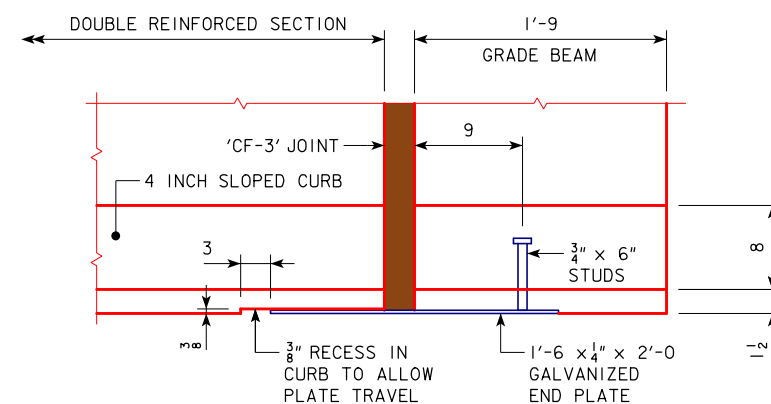
(DETAIL AT EDGE OF PAVEMENT)



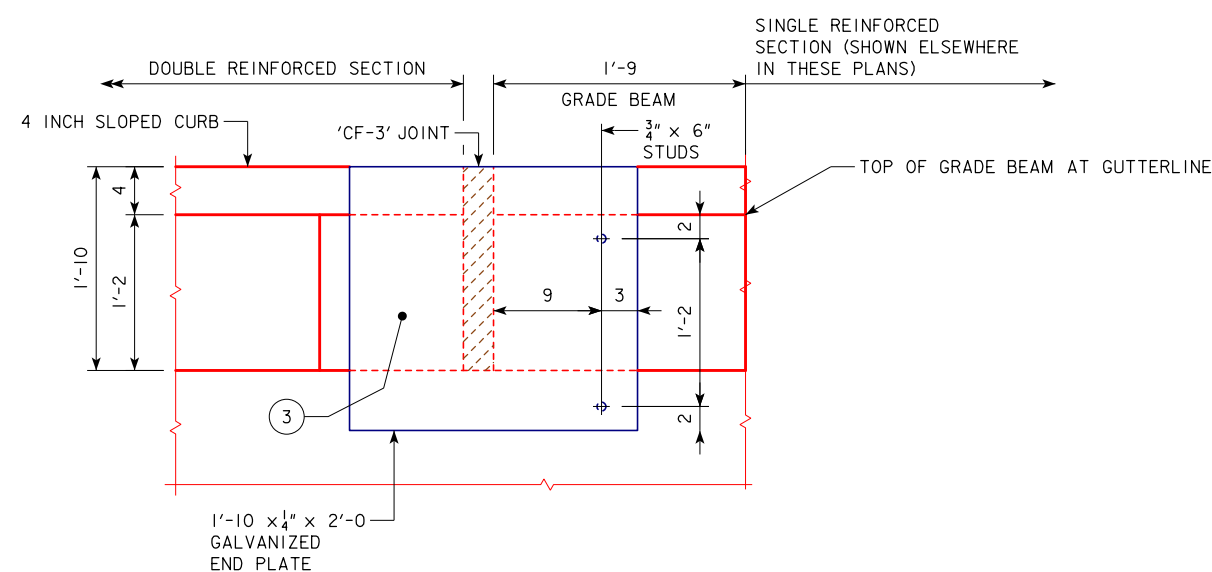
GRADE BEAM ELEVATION



DETAIL 'B'



PARTIAL PLAN VIEW



END ELEVATION VIEW OF GRADE BEAM

- ① 8" CLEAR.
- ② 8d4 STAINLESS STEEL DOWELS 3'-0" LONG WITH 2'-1" EMBEDMENT. SPACE AT 24 INCHES O.C. TO BE PLACED WITH BRIDGE. DO NOT BEND.
- ③ DEBOND PAVING NOTCH WITH 2 LAYERS OF 30# ASPHALTIC FELT PAPER FULL LENGTH.
- ④ 8d10 STAINLESS STEEL DOWELS 3'-6" LONG PLACED AS SHOWN. SPACE AT 24 INCHES O.C.. TO BE PLACED WITH BRIDGE. DO NOT BEND.

DESIGN FOR 0° SKEW

**339'-0 x 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**

101'-0 END SPANS 137'-0 INTERIOR SPAN

**APPROACH SLAB DETAILS**

STA. 2496+41.15 (US 63) JANUARY, 2021

**DAVIS COUNTY**

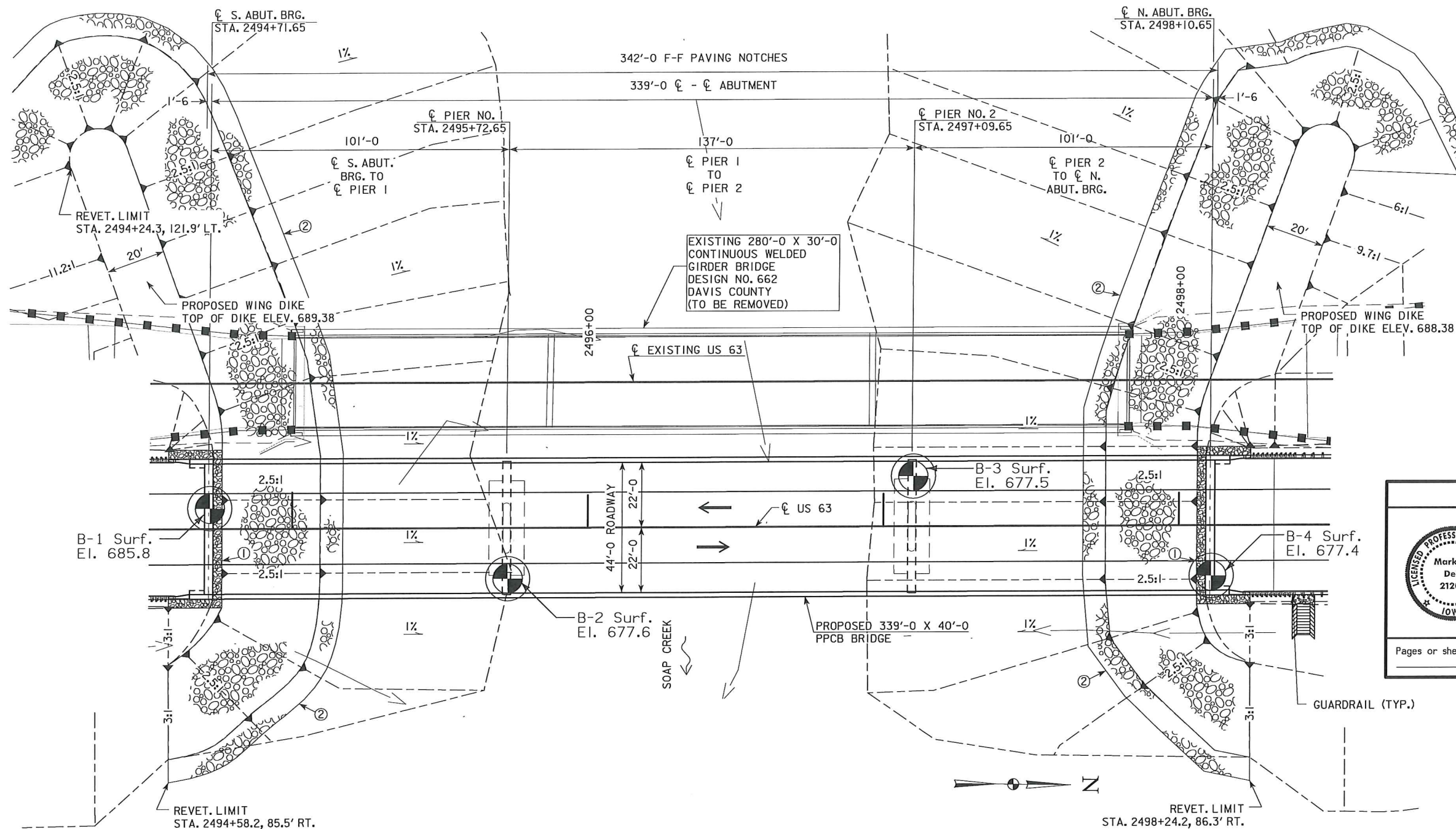
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 31 OF 32 FILE NO. 31722 DESIGN NO. 113





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



#### GEOTECHNICAL DESIGN



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

Signature: Mark A. Dell Date: 9/28/20

Printed or Typed Name

My license renewal date is December 31, 2021

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

Water Level Observations (Ft.)

Boring No.	Date Drilled	While Drilling	After Drilling	
B-1	07/08/2019	11.0	17.0 on 7/9/2019	WCI @ 17.0
B-2	08/12/2019	13.0	12.5 After Boring Completion	--
B-3	07/08/2019	8.5	12.5 on 7/9/2019	WCI @ 12.5
B-4	07/09/2019	8.0	9.0 After Boring Completion	WCI @ 9.0

#### LOCATION

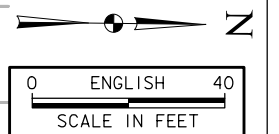
US 63 OVER SOAP CREEK  
T-70 N R-13 W  
SECTION 7  
LICK CREEK TOWNSHIP  
DAVIS COUNTY  
MAINT. NO. 2625.8S063  
FHWA NO. 22561  
LATITUDE: 40.885054°  
LONGITUDE: 92.409248°

DESIGN FOR 0° SKEW  
**339'-0 X 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
101'-0 END SPANS 137'-0 CENTER SPAN  
**SOIL PROFILE SHEET**  
STATION 2496+41.15  
**DAVIS COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 1 OF 3 FILE NO. 31722 DESIGN NO. 113

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

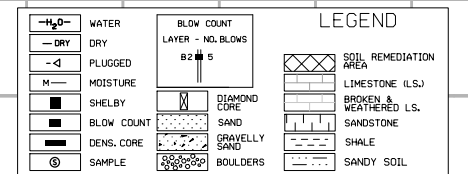


THIS SHEET IS INCLUDED TO SHOW SOIL INFORMATION. DETAILS AND NOTES SHOWN ELSEWHERE IN THESE PLANS SHALL BE USED FOR STRUCTURE CONSTRUCTION.



### LOCATION

US 63 OVER SOAP CREEK  
T-70 N R-13 W  
SECTION 7  
LICK CREEK TOWNSHIP  
DAVIS COUNTY  
MAINT. NO. 2625.8S063  
FHWA NO. 22561  
LATITUDE: 40.885054°  
LONGITUDE: 92.409248°



B-4	
Layer	Thickness
A	1.0
B	6.5
C	9.5
D	14.5
E	4.5
F	4.0
G	23.0
H	2.7

### SHELBY TUBE CORE DATA

CORE NO.	B-1-B2	B-2-E2	B-4-E1
DEPTH IN FEET	6.5-8.5	26.0-28.0	32.0-34.0
CLASSIFICATION (AASHTO)	--	--	--
COEFF. CONSOL. (SQ. FT / DAY)	--	--	--
TRIAXIAL COMPRESSION	--	--	--
COHESION - PSF	--	--	--
FRICTION COEFF.	--	--	--
MOISTURE CONTENT %	22.0	23.0	25.0
DRY DENSITY - PCF	--	--	--
CU-CONSOLIDATED UNDRAINED	--	--	--
UU-UNCONSOLIDATED UNDRAINED	--	--	--
UC-UNCONFINED COMPRESSION (c=1/2 Qu)	--	--	--

NOTE: NOT ALL SAMPLES ORIGINATED FROM SHELBY TUBE SAMPLING WERE TESTED IN THE LABORATORY,

DESIGN FOR 0° SKEW  
**339'-0 X 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
101'-0 END SPANS 137'-0 CENTER SPAN  
**SOIL PROFILE SHEET**  
STATION 2496+41.15  
**DAVIS COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 2 OF 3 FILE NO. 31722 DESIGN NO. 113

ROCK CORE INFORMATION					
Boring	Approx. Surf. El. (ft)	Run No.	Interval (ft)	Recovery (%)	RQD (%)
B-2	677.6	1	49.5-50.5	100	33
		2	50.5-55.5	100	100
		3	55.5-60.5	100	100
		4	60.5-65.5	100	97
		5	65.5-70.5	100	97
B-3	677.5	1	55.0-60.0	75	43
		2	60.0-61.0	0	0
		3	61.0-65.0	74	58

Driller's Note:  
Run 2 damaged by  
bit during coring.

B-2	
Layer	Thickness
A	2.0
B	10.0
C	7.5
D	2.5
E	13.0
F	6.5
G	8.2
H	2.8
I	2.0
J	8.5
K	1.1
L	6.4

B-3	
Layer	Thickness
A	1.0
B	7.5
C	11.0
D	9.0
E	9.5
F	0.5
G	26.5

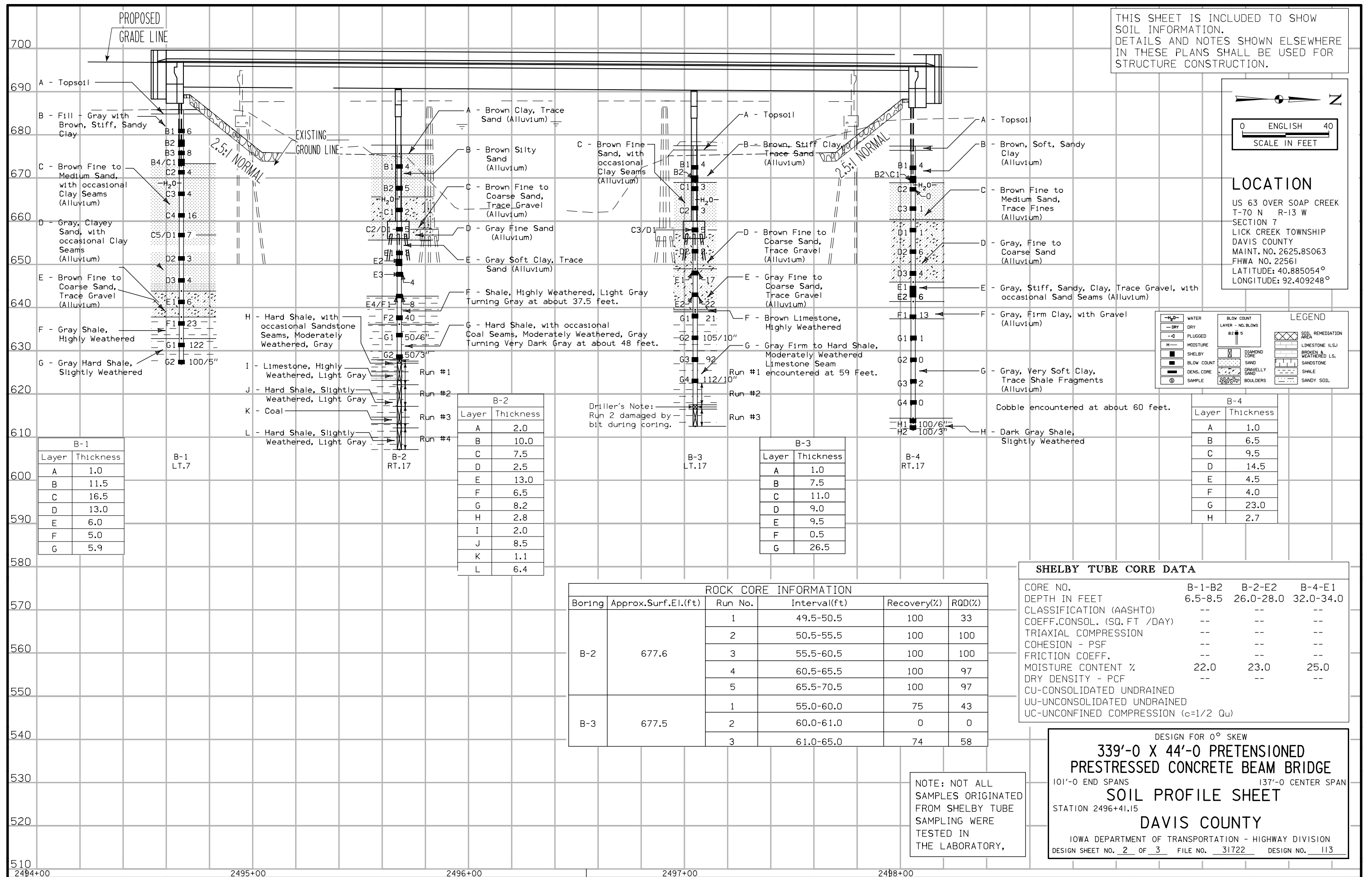
B-1	
Layer	Thickness
A	1.0
B	11.5
C	16.5
D	13.0
E	6.0
F	5.0
G	5.9

B-1  
LT.7

B-2  
RT.17

B-3  
LT.17

B-4  
RT.17



ROCK CORE COMPRESSIVE STRENGTH TESTING REPORT					
Sample Number	Elevation	Material Description	Compressive Strength (psi)	Moisture (%)	Dry Density (PCF)
B-2-H2/I1/J1	626.1	Hard Shale, with occasional sandstone seams, moderately weathered, gray	125	13	123
B-2-H2/I1/J1	624.6	Limestone, highly weathered, light gray	225	10	134
B-2-H2/I1/J1	624.4	Limestone, highly weathered, light gray	11,125	1	161
B-2-J2	621.1	Hard Shale, slightly weathered, light gray	65	11	135
B-2-J2	619.9	Hard Shale, slightly weathered, light gray	15	17	117
B-2-J2	619.0	Hard Shale, slightly weathered, light gray	65	16	117
B-2-J3/K1/L1	615.7	Hard Shale, slightly weathered, light gray	200	11	130
B-2-J3/K1/L1	613.2	Hard Shale, slightly weathered, light gray	65	13	123
B-2-L2	610.1	Hard Shale, slightly weathered, light gray	150	14	122
B-3-G5	621.8	Firm to Hard Shale, moderately weathered, gray	200	14	120
B-3-G5	619.8	Firm to Hard Shale, moderately weathered, gray	110	15	120
B-3-G7	613.1	Firm to Hard Shale, moderately weathered, gray	90	16	113

DESIGN FOR 0° SKEW

339'-0 X 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

101'-0 END SPANS137'-0 CENTER SPAN

SOIL PROFILE SHEET

STATION 2496+41.15

DAVIS COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 3 OF 3FILE NO. 31722DESIGN NO. 113

[illegible]

100-4A  
10-29-02

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
1	2102-0425070	<b>SPECIAL BACKFILL</b> See Tab. 100-24 and Tab. 112-9M in the C Sheets for locations and details.
-	-	-
2	2102-2625001	<b>EMBANKMENT-IN-PLACE, CONTRACTOR FURNISHED</b> See T Sheets and cross sections.  See T sheets for approximate available Topsoil for Earth Shoulder Construction.  Provide Borrow material according to Section 2102 of the Standard Specifications.
-	-	-
3	2102-2710070	<b>EXCAVATION, CLASS 10, ROADWAY AND BORROW</b> See T Sheets and cross sections.  Overhaul is incidental to roadway excavation on this project and will not be paid for separately.  Includes Settlement plates. See Tab. 103-5 in the CS Sheets and the Q Sheets for details.
-	-	-
4	2102-2710090	<b>EXCAVATION, CLASS 10, WASTE</b> See T Sheets and cross sections.
-	-	-
5	2102-2712015	<b>EXCAVATION, CLASS 12, BOULDERS OR ROCK FRAGMENTS</b> See Tab. 103-7 in the CS Sheets.  Dispose of excess material according to Section 1106.07 of the current specification.
-	-	-
6	2102-4560000	<b>LOCATING TILE LINES</b> Estimated at twice the length of the project.
-	-	-
7	2105-8425015	<b>TOPSOIL, STRIP, SALVAGE AND SPREAD</b> Refer to Tab. 103-10 in the CS Sheets and the T Sheets for locations and details.
-	-	-
8	2107-0875000	<b>COMPACTION WITH MOISTURE AND DENSITY CONTROL</b> See Tab. 103-10 in the CS Sheets and the T Sheets for locations and details.
-	-	-
9	2107-3825025	<b>GRANULAR MATERIAL FOR BLANKET AND SUBDRAIN</b>
10	2112-0000100	<b>WICK DRAIN</b> See Tab. 104-6 in the CS Sheets for locations and details.
-	-	-
11	2115-0100000	<b>MODIFIED SUBBASE</b> See Tab. 100-24 in the C Sheets for locations and details.
-	-	-
12	2121-7425010	<b>GRANULAR SHOULDERS, TYPE A</b> See Tab. 112-9M in the C Sheets for locations and details.
-	-	-
13	2122-5190006	<b>PAVED SHOULDER, P.C. CONCRETE, 6 IN.</b> See Detail 7156M in the B Sheets and Tab. 112-9M in the C Sheets for locations and details.
-	-	-
14	2122-5190010	<b>PAVED SHOULDER, P.C. CONCRETE, 10 IN.</b>
15	2123-7450000	<b>SHOULDER CONSTRUCTION, EARTH</b> See Tab. 112-9M in the C Sheets for locations and details.
-	-	-
16	2301-0690205	<b>BRIDGE APPROACH, BR-205</b> See Tab. 112-M in the C Sheets and Modified BR-205 in the U Sheets for locations and details.
-	-	-
17	2301-1003100	<b>STANDARD OR SLIP-FORM PORTLAND CEMENT CONCRETE PAVEMENT, QM- C, CLASS 3 DURABILITY, 10 IN.</b> See Tab. 100-24 in the C Sheets for locations and details.
-	-	-
18	2301-6911722	<b>PORTLAND CEMENT CONCRETE PAVEMENT SAMPLES</b> - -
-	-	-
19	2304-0100000	<b>DETOUR PAVEMENT</b> See Tab. 100-24 in the C Sheets for locations and details.
-	-	-
20	2315-8275025	<b>SURFACING, DRIVEWAY, CLASS A CRUSHED STONE</b> See Tab. 102-3 in the C Sheets for locations and details.
-	-	-
21	2412-0000100	<b>LONGITUDINAL GROOVING IN CONCRETE</b> See Tab. 100-28 in the C Sheets for locations and details.
-	-	-
22	2422-0360024	<b>APRONS, UNCLASSIFIED, 24 IN. DIA.</b>
23	2422-1722024	<b>CULVERT, UNCLASSIFIED ENTRANCE PIPE, 24 IN. DIA.</b> See Tab. 102-3 in the C Sheets for locations and details.
-	-	-

[illegible]

<h2 style="margin: 0;">UTILITIES</h2> <h3 style="margin: 0;">(POINT 25 PROJECT)</h3>	262-5 10-18-05
This is a POINT 25 project and is subject to the provisions of IAC 761-115.25.	

FILE NO.	<b>31722</b>	ENGLISH	DESIGN TEAM	<b>Flattery\Bell</b>		<b>DAVIS</b>	COUNTY	PROJECT NUMBER	<b>NHSX-063-1(68) -- 3H-26</b>	SHEET NUMBER	<b>C.2</b>	
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STANDARD ROAD PLANS		
The following Standard Road Plans apply to construction work on this project.		
Number	Date	Title
BA-200	04-16-19	Steel Beam Guardrail Components
BA-201	04-18-17	Steel Beam Guardrail Barrier Transition Section (MASH TL-3)
BA-202	10-20-15	Steel Beam Guardrail Bolted End Anchor
BA-205	04-19-16	Steel Beam Guardrail Tangent End Terminal (MASH TL-3)
BA-206	10-15-19	Steel Beam Guardrail Flared End Terminal For Cable Connection
BA-250	10-18-16	Steel Beam Guardrail Installation at Concrete Barrier or Bridge End Post (MASH TL-3)
BA-401	10-15-19	Temporary Barrier Rail (Precast Concrete)
BA-500	04-19-16	Temporary Crash Cushions Sand Barrel
DR-101	04-18-17	Pipe Culvert (Bedding and Backfill)
DR-102	04-21-15	Pipe Culvert (Cover and Camber)
DR-103	04-21-15	Pipe Culvert (Installation Details)
DR-104	04-19-16	Depth of Cover Tables for Concrete and Corrugated Pipe
DR-121	10-17-17	Connected Pipe Joints
DR-201	10-16-18	Concrete Aprons
DR-203	04-21-15	Metal Pipe Aprons and Beveled Ends
DR-303	10-17-17	Subdrains (Longitudinal)
DR-306	10-16-18	Precast Concrete Headwall for Subdrain Outlets
DR-402	10-15-19	Rock Flume for Bridge End Drain
DR-651	04-18-17	Unclassified Pipe Culvert
EW-101	10-17-17	Embankment and Rebuilding Embankments
EW-102	10-20-15	Allowable Placement of Unsuitable Soil in Embankments
EW-103	10-20-15	Embankment Subgrade Treatment, Moisture Density Control and Special Compaction
EW-201	04-19-16	Bridge Berm Grading without Recoverable Slope (Barnroof Section)
EW-210	10-20-15	Standard Wing Dikes
EW-212	10-20-15	Settlement Plate
EW-301	10-20-15	Guardrail Grading
EW-501	10-20-15	Rural Entrance
PM-110	10-16-18	Line Types
PM-221	10-18-16	Climbing Lane
PV-12	04-19-16	Milled Shoulder Rumble Strips
PV-101	04-16-19	Joints
PV-102	10-18-16	PCC Curb Details
PV-301	04-19-11	Superelevation Details Two Lane Roadway
SI-173	04-19-16	Object Markers
SI-211	10-18-16	Object Marker and Delineator Placement with Guardrail
TC-1	10-15-19	Work Not Affecting Traffic (Two-Lane or Multi-Lane)
TC-202	04-21-15	Work Within 15 ft of Traveled Way
TC-213	10-15-19	Lane Closure with Flaggers
TC-217	10-18-16	Lane Closure with Signals and TBR

<div>111-25</div> <div>10-18-11</div> <div>INDEX OF TABULATIONS</div>		
Tabulation	Tabulation Title	Sheet No.
C Sheets		
100-0A	ESTIMATED ROADWAY QUANTITIES (1 DIVISION PROJECT)	C.1
100-1D	PROJECT DESCRIPTION	C.1
100-4A	ESTIMATE REFERENCE INFORMATION	C.1 - C.2
100-24	PCC PAVEMENT	C.5
100-27	PROPOSED POSTED SPEED LIMIT	C.5
100-28	LONGITUDINAL GROOVING	C.8
102-3	ACCESS POINTS AND SAFETY RAMPS	C.4
102-5	EXISTING PAVEMENT	C.3
104-8A	SCOUR PROTECTION OR ROCK FLUME FOR BRIDGE END DRAIN	C.8
105-4	STANDARD ROAD PLANS	C.2
107-23	GRADING FOR GUARDRAIL INSTALLATIONS	C.9
108-8A	STEEL BEAM GUARDRAIL AT CONCRETE BARRIER OR BRIDGE RAIL END SECTION	C.9
108-13A	SAFETY CLOSURES	C.4
108-22	PAVEMENT MARKING LINE TYPES	C.11
108-28	TEMPORARY TRAFFIC SIGNALS	C.10
108-30	CRASH CUSHIONS	C.10
108-33	TEMPORARY BARRIER RAIL	C.10
110-1	REMOVAL OF PAVEMENT	C.3
110-7A	REMOVAL OF STEEL BEAM GUARDRAIL	C.3
111-25	INDEX OF TABULATIONS	C.2
112-6	BRIDGE APPROACH SECTION	C.8
112-9M	SHOULDERS	C.6
112-10	MILLED RUMBLE STRIPS	C.7

## BRIDGE APPROACH SECTION

Refer to the U Sheets.

* Not a bid item
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[illegible]

<p style="text-align: center;"><b>SCOUR PROTECTION OR ROCK FLUME FOR BRIDGE END DRAIN</b></p> <p style="text-align: center;">Refer to Standard Road Plan DR-401 and DR-402</p>		<p>104-8A 10-17-17</p>
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Location	Bid Items	PCC Paved Shoulder	Scour Protection (DR-401)	Rock Flume (DR-402)
----------	-----------	--------------------	---------------------------	---------------------

[illegible]

<div style="text-align: right;">100-28 10-19-10</div> <div style="text-align: center;">LONGITUDINAL GROOVING</div>		
	Total	

[illegible]



For joint details, see PV-101.

For curb details, see Detail 'G'.

All transverse bars are #5.

Use epoxy coated bars for all reinforcement.

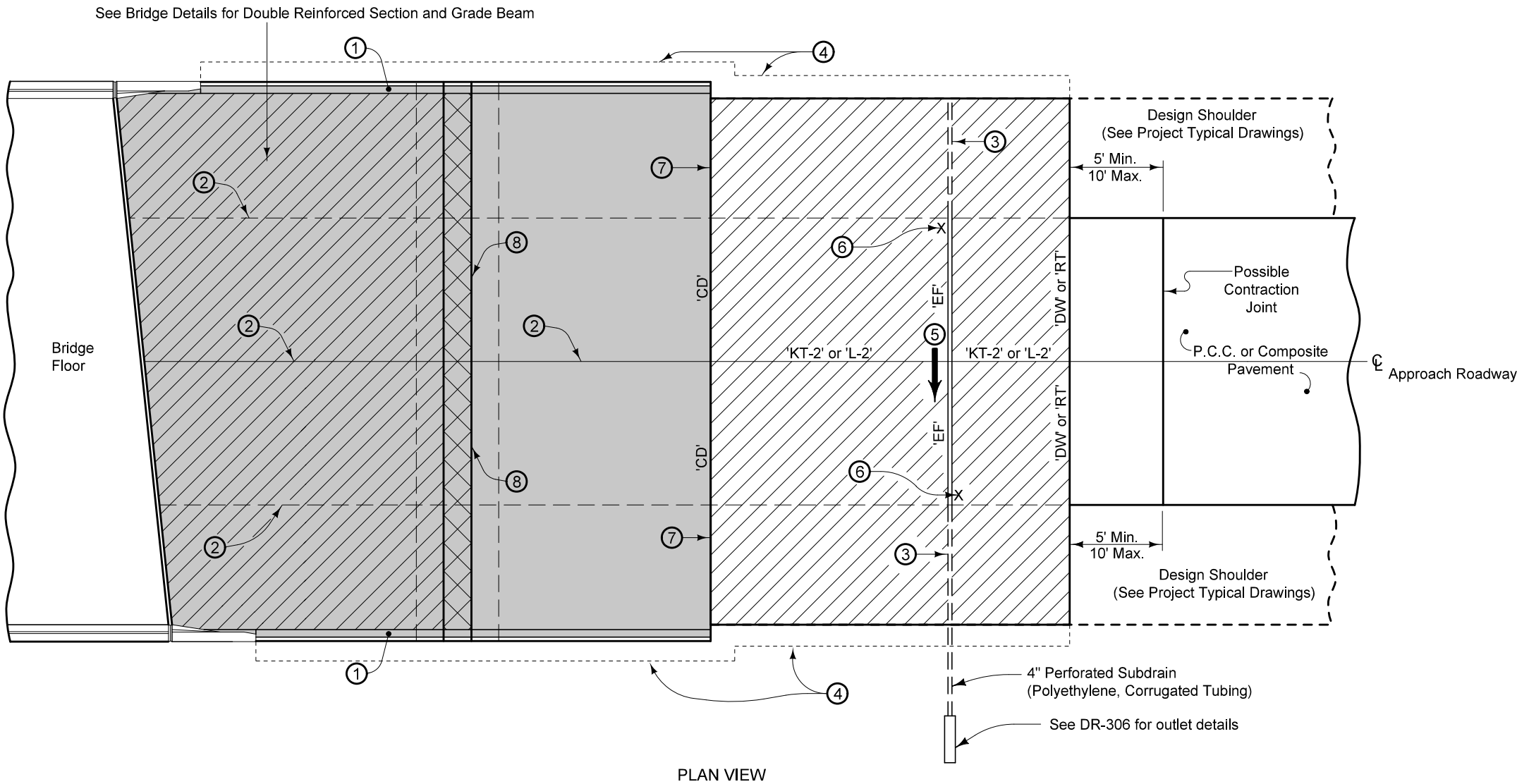
Quantities for both the top part of the grade beam and the bottom portion under the approach pavement have been included in the double reinforced section quantities.

- 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

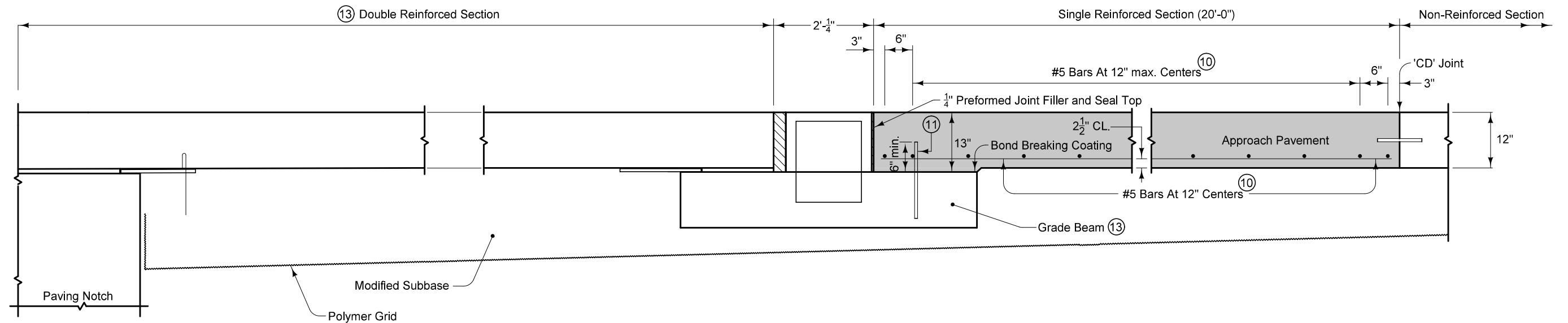
Possible Tabulation:  
112-6

<b>MODIFIED</b>		
<b>STANDARD ROAD PLAN</b>	<b>BR-205M</b>	
	SHEET 1 of 2	
<b>SINGLE AND NON-REINFORCED 12" APPROACH</b>		

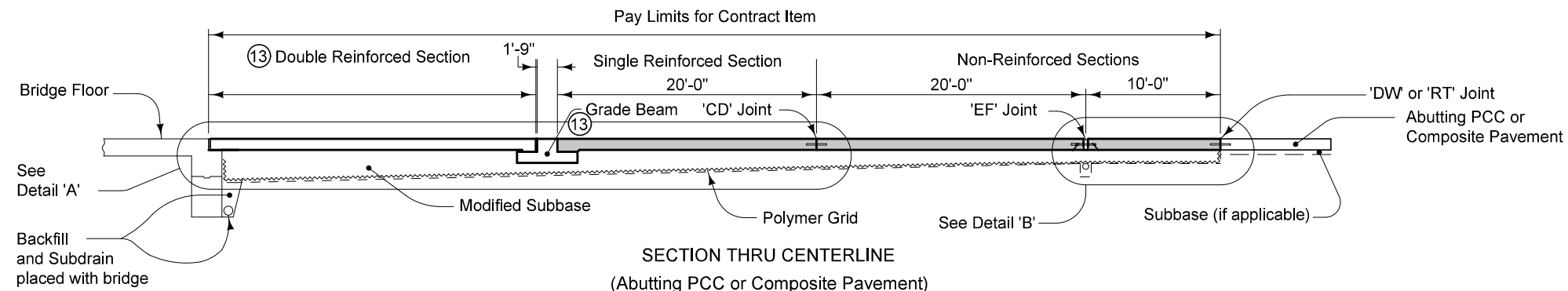


Pay limits for contract item include the following areas:

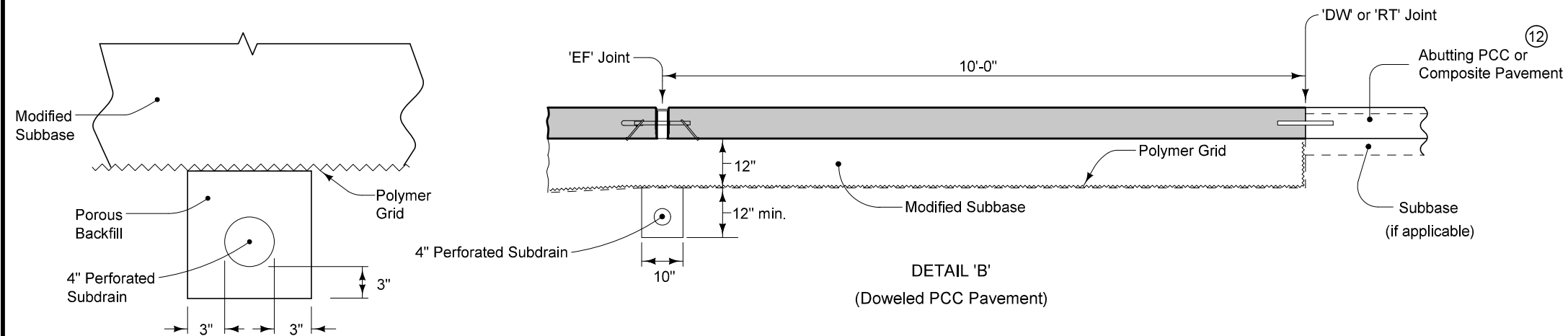
- Double Reinforced Section
- Grade Beam Section
- Single Reinforced Section
- Non-Reinforced Section



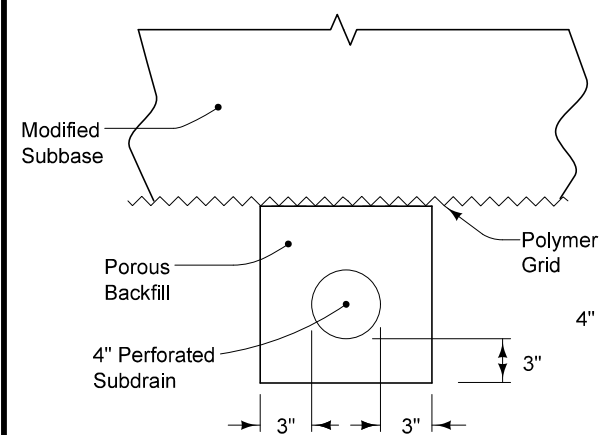
DETAIL 'A'



SECTION THRU CENTERLINE  
(Abutting PCC or Composite Pavement)



DETAIL 'B'  
(Doweled PCC Pavement)



4" SUBDRAIN LOCATION

- ⑩ Minimum lap length: #5 Bars - 18"  
#6 Bars - 27"  
#8 Bars - 48"
- ⑪ See Bridge Details for dowel information.
- ⑫ If abutting pavement (PCC or HMA) is not in place, refer to BR-213.
- ⑬ See Bridge Details for double reinforced section and Grade Beam. Not included in contract item.

<b>MODIFIED</b>	
	<b>BR-205M</b>
<b>STANDARD ROAD PLAN</b>	SHEET 2 of 2

**SINGLE AND NON-REINFORCED  
12" APPROACH**