

BRIDGE REPLACEMENT - PPCB  
BRF-030-7(182)--38-57

LETTING DATE  
5-18-2021

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

LINN COUNTY

BRIDGE REPLACEMENT - PPCB  
E.B. US 30 OVER CEDAR RIVER  
0.5 MI.W. OF THE E. JCT. OF US 151

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.3

DESIGN DATA RURAL

REFER TO INDIVIDUAL  
SITUATION PLANS FOR  
TRAFFIC DATA INFORMATION

INDEX OF SEALS

SHEET NO.	NAME	TYPE
I	MATTHEW K. RASMUSSEN	STRUCTURAL DESIGN
* 8	AARON D. MOORE	HYDRAULIC DESIGN
SPS.I-SPS.IO	STEVEN J. MEGIVERN	GEOTECHNICAL DESIGN
A.I	ROBERT J. MILLER	ROADWAY DESIGN
RC.I	AARON D. MOORE	LANDSCAPE DESIGN

\* PROVIDED BY TRANSYSTEMS

STRUCTURAL DESIGN

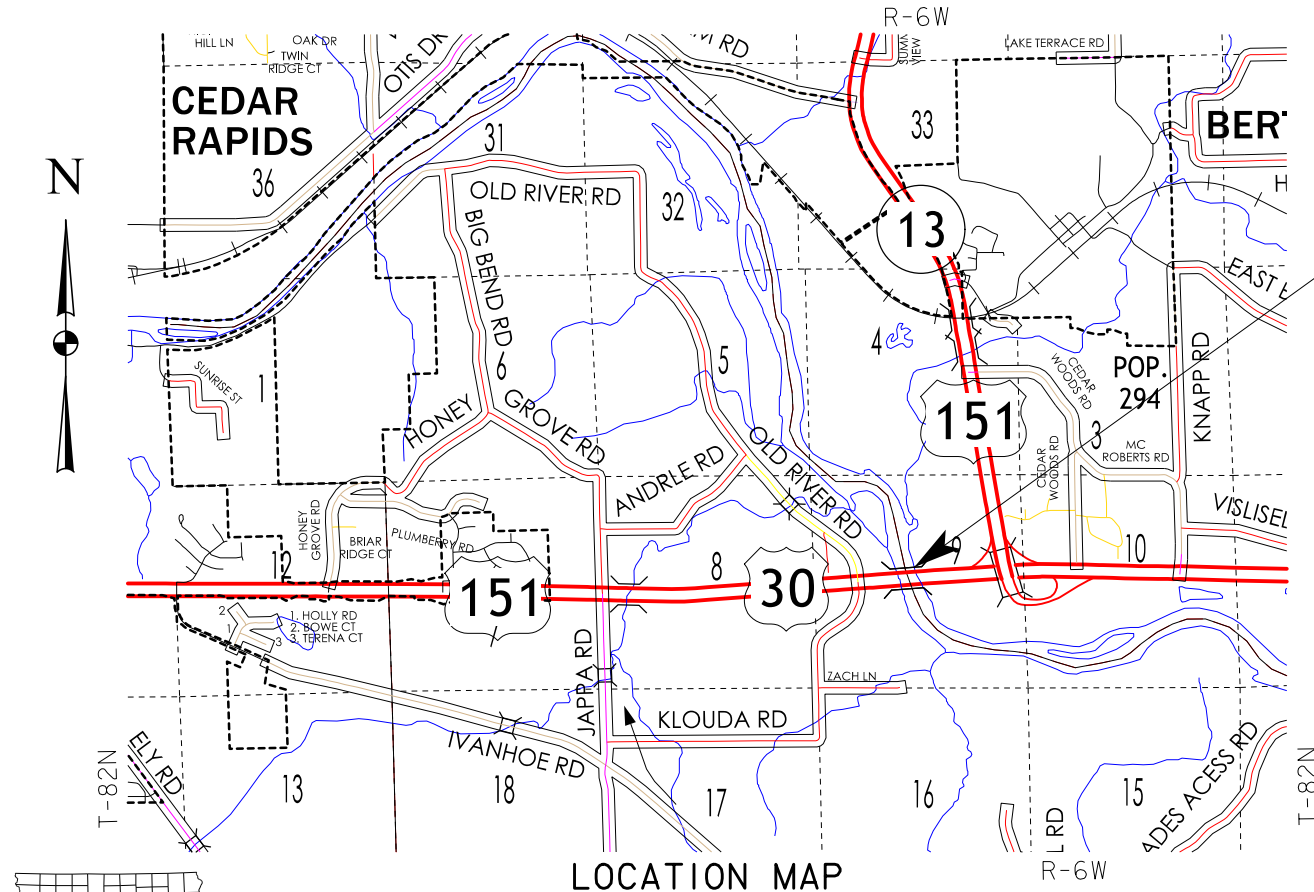


I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature: Matthew K. Rasmussen Date: 2/19/2021  
Printed or Typed Name: Matthew K. Rasmussen

My license renewal date is December 31, 2022

Pages or sheets covered by this seal: SHEETS I THRU 57 OF 175



DESIGN NOS. 220 & 521  
FHWA NOS. 33471 & 33472

PROJECT DIRECTORY NAME: 5703002014

DESIGN TEAM: SCHEMMER

ENGLISH

IOWA DOT \* BRIDGES AND STRUCTURES BUREAU

FILE NO. 31598

LINN COUNTY

PROJECT NUMBER BRF-030-7(182)--38-57

SHEET NUMBER I

ESTIMATED BRIDGE QUANTITIES - DESIGN 220					
ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUANTITY
1	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	CY	142.7	
2	2401-6745625	REMOVAL OF EXISTING BRIDGE	LS	1	
3	2402-2720000	EXCAVATION, CLASS 20	CY	165.6	
4	2403-0100010	STRUCTURAL CONCRETE (BRIDGE)	CY	238.4	
5	2403-7000210	HIGH PERFORMANCE STRUCTURAL CONCRETE	CY	2,037.1	
6	2404-7775000	REINFORCING STEEL	LB	287,144	
7	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB	703,304	
8	2404-7775009	REINFORCING STEEL, STAINLESS STEEL	LB	15,412	
9	2407-0564310	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTE110	EACH	10	
10	2407-0564350	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTE150	EACH	30	
11	2408-7800000	STRUCTURAL STEEL	LB	58,889	
12	2414-6424110	CONCRETE BARRIER RAILING	LF	2,335	
13	2433-0001072	CONCRETE DRILLED SHAFT, 72 IN. DIAMETER	LF	980	
14	2433-0003000	DEMONSTRATION SHAFT	LF	67	
15	2499-2300001	DECK DRAINS	LS	1	
16	2501-0201057	PILES, STEEL, HP 10 X 57	LF	2,700	
17	2507-2638650	BRIDGE WING ARMORING - EROSION STONE	SY	56.8	
18	2507-3250005	ENGINEERING FABRIC	SY	214	
19	2507-6800061	REVETMENT, CLASS E	TON	233	
20	2526-8285000	CONSTRUCTION SURVEY	LS	1	
21	2533-4980005	MOBILIZATION	LS	1	
22	2599-9999009	CONCRETE DRILLED SHAFT, 84 IN. DIAMETER	LF	138	
23	2599-9999009	EXPANSION DEVICE (FINGER JOINT)	LF	80.3	

ESTIMATE REFERENCE INFORMATION		
ITEM NO.	ITEM CODE	DESCRIPTION
2	2401-6745625	REMOVAL OF EXISTING BRIDGE INCLUDES ALL WORK FOR REMOVAL AND DISPOSAL OF EXISTING CONTINUOUS WELDED PLATE GIRDER BRIDGE (DESIGN NO.151).
3	2402-2720000	EXCAVATION, CLASS 20 INCLUDES EXCAVATION FOR BRIDGE ABUTMENTS AND WINGS.
4	2403-0100010	STRUCTURAL CONCRETE (BRIDGE) INCLUDES ALL RESILIENT JOINT FILLER REQUIRED.  INCLUDES FURNISHING AND PLACING ANY SHEET PILE NECESSARY TO RETAIN EMBANKMENT DURING CONSTRUCTION OF THE BRIDGE.  CONCRETE SEALER IS TO BE APPLIED TO THE EXPOSED BRIDGE SEAT AND WASH SURFACES AT THE ABUTMENTS.
5	2403-7000210	HIGH PERFORMANCE STRUCTURAL CONCRETE INCLUDES THE CONCRETE FOR THE SLAB, ABUTMENTS ABOVE THE FOOTINGS, WINGWALLS, DIAPHRAGMS, AND PIER CAPS. REFER TO DEVELOPMENTAL SPECIFICATION FOR "HIGH PERFORMANCE CONCRETE FOR STRUCTURES," DS-15073 FOR ADDITIONAL INFORMATION.  INCLUDES ALL RESILIENT EXPANSION JOINT FILLER REQUIRED.  INCLUDES FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), FLOODABLE BACKFILL, POROUS BACKFILL, GEOTEXTILE FABRIC, WATER FLOODING, AND SUBDRAIN OUTLET AT ABUTMENTS AND TOE OF BERM.  INCLUDES FURNISHING AND PLACING 3 INCH DIAMETER PVC PLASTIC PIPE AND EXPANDING FOAM IN THE ABUTMENT WINGS.  INCLUDES FURNISHING AND APPLYING CONCRETE SEALER TO THE PIER CAPS.
9	2407-0564310	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTE110 INCLUDES PIER BEARING MATERIAL.  INCLUDES CONTRACTOR FILLING OUT BEAM NUMBERS BY LOCATION AND BEAM SEAT ELEVATIONS IN "PPC BEAM DATA SPREADSHEET" AND FORWARDING ELECTRONIC FILES TO THE ENGINEER.
10	2407-0564350	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTE150 INCLUDES PIER BEARING MATERIAL.  INCLUDES CONTRACTOR FILLING OUT BEAM NUMBERS BY LOCATION AND BEAM SEAT ELEVATIONS IN "PPC BEAM DATA SPREADSHEET" AND FORWARDING ELECTRONIC FILES TO THE ENGINEER.
11	2408-7800000	STRUCTURAL STEEL INCLUDES ALL COSTS FOR FURNISHING AND INSTALLING STEEL INTERMEDIATE DIAPHRAGMS.  INCLUDES STEEL FOR BEARING ASSEMBLY AT W. ABUT., PIER NO. 1, PIER NO. 2, PIER NO. 3, PIER NO. 5, PIER NO. 6, PIER NO. 7, AND E. ABUT.

ESTIMATE REFERENCE INFORMATION		
ITEM NO.	ITEM CODE	DESCRIPTION
12	2414-6424110	CONCRETE BARRIER RAILING INCLUDES MATERIAL AND LABOR ASSOCIATED WITH PROVIDING AND INSTALLING THE RIGID STEEL CONDUIT, JUNCTION BOXES AND FITTINGS. INCLUDES 1,166.0 FT. OF 2" DIA. RIGID STEEL CONDUIT.  CAST-IN-PLACE RAILS SHALL USE HIGH PERFORMANCE CONCRETE.
13	2433-0001072	CONCRETE DRILLED SHAFT, 72 IN. DIAMETER INCLUDES ALL COSTS ASSOCIATED WITH ANY ELECTIVE REMOVALS OF THE EXISTING BRIDGE DECK OVERHANG FOR THE PURPOSE OF DRILLED SHAFT INSTALLATION.  SEE DESIGN SHEET 13 FOR ADDITIONAL NOTES.
14	2433-0003000	DEMONSTRATION SHAFT SEE DESIGN SHEET 13 FOR ADDITIONAL NOTES.
15	2499-2300001	DECK DRAINS INCLUDES 50 NEW DECK DRAINS. REFER TO DESIGN SHEETS 4 THRU 6 FOR LOCATION, AND DESIGN SHEET 25 FOR MATERIALS AND THE DETAILS OF THEIR CONSTRUCTION. THE PAYMENT SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, EQUIPMENT AND LABOR, AND FOR PERFORMANCE OF ALL WORK NECESSARY FOR FABRICATING AND INSTALLING THE DECK DRAINS AS PER PLAN.  INCLUDES FURNISHING AND PLACING SPLASH BASINS, INCLUDING EXCAVATION, CLASS E REVETMENT, AND ENGINEERING FABRIC.
16	2501-0201057	PILES, STEEL, HP 10 X 57 INCLUDES DRIVING PILE INTO COMPETENT SHALE. SEE DESIGN SHEET 21 FOR PILE DRIVING REQUIREMENTS.
17	2507-2638650	BRIDGE WING ARMORING - EROSION STONE INCLUDES FURNISHING AND PLACING EROSION STONE, ENGINEERING FABRIC, AND ALL REQUIRED EXCAVATING, SHAPING AND COMPACTING FOR WING AND BERM ARMORING.
18	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.
19	2507-6800061	REVETMENT, CLASS E ESTIMATED AT 1.6 TON/CU YD.  AS THIS PROJECT REQUIRES A SOVEREIGN LAND PERMIT, NO BROKEN CONCRETE IS ALLOWED AS A SUBSTITUTE.
22	2599-9999009	CONCRETE DRILLED SHAFT, 84 IN. DIAMETER INCLUDES ALL COSTS ASSOCIATED WITH ANY ELECTIVE REMOVALS OF THE EXISTING BRIDGE DECK OVERHANG FOR THE PURPOSE OF DRILLED SHAFT INSTALLATION.  SEE DESIGN SHEET 13 FOR ADDITIONAL NOTES.
23	2599-9999009	EXPANSION DEVICE (FINGER JOINT) INCLUDES ALL COSTS FOR FURNISHING AND INSTALLING STEEL EXPANSION JOINT SYSTEM (FINGER TYPE) AT WEST ABUTMENT AND EAST ABUTMENT. INCLUDES FABRICATION AND INSTALLATION OF NEOPRENE TROUGH AND CURTAINS, AND TROUGH STEEL, AND ASSOCIATED HARDWARE. INCLUDES FABRICATION AND INSTALLATION OF BARRIER COVER PLATES.

INDEX OF SHEETS		INDEX OF SHEETS		INDEX OF SHEETS	
SHEET DESCRIPTION	NO.	SHEET DESCRIPTION	NO.	SHEET DESCRIPTION	NO.
TITLE SHEET	1	TOP OF SLAB ELEVATIONS	30	STEEL INTERM. DIAPHRAGM DETAILS	45
BRIDGE QUANTITIES	2	SLAB HAUNCH DATA DETAILS	32	PIER BEARING DETAILS	47
SUMMARY QUANTITIES SHEET	3	ROADWAY EXPANSION DEVICE DETAILS	35	ABUT. & PIER BEARING DETAILS	48
GENERAL NOTES	4	BARRIER COVER PLATE DETAILS	36	BARRIER RAIL END SECTION	49
SITUATION PLAN	5	FINGER JOINT DETAILS	37	BARRIER RAIL DETAILS	50
SITE PLAN	8	TROUGH STEEL DETAILS	38	CONDUIT DETAILS	51
STAKING DIAGRAM	9	NEOPRENE TROUGH DETAILS	39	SUBDRAIN DETAILS	53
EXPANSION PIER DETAILS	10	DRAIN BLOCK DETAILS	40	ABUTMENT BACKFILL DETAILS	54
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PIER DETAILS & NOTES	14	BTE110 BEAM DETAILS	43	BARRIER RAIL RETROFIT DETAILS	56
PIER DETAILS	15	BTE150 BEAM DETAILS	44	BACKWALL REPAIR DETAILS	57
ABUTMENT FOOTING DETAILS	19				
ABUTMENT WING DETAILS	20				
ABUTMENT QUANTITIES	22				
SUPERSTRUCTURE DETAILS	23				
DECK, ABUT. & DIAPH. QUANTITIES	26				
TOP OF SLAB ELEVATION LOCATIONS	27				
SLAB THICKNESS DETAILS	29				

NOTE:  
ROADWAY QUANTITIES SHOWN  
ELSEWHERE IN THESE PLANS.

DESIGN FOR 0° SKEW

1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

111' END SPANS152' INTERIOR SPANS

BRIDGE QUANTITES

STA. 389+39.66MARCH, 2021

LINN COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 54 FILE NO. 31598 DESIGN NO. 220

## SUMMARY OF CONCRETE QUANTITIES

LOCATION	STRUCTURAL CONCRETE	HPC STRUCTURAL CONCRETE
WEST ABUTMENT BKWL. + WING + MASKWALL	_____	23.4
EAST ABUTMENT BKWL. + WING + MASKWALL	_____	23.2
WEST ABUTMENT FTG. AND STEPS	42.8	_____
EAST ABUTMENT FTG. AND STEPS	42.8	_____
BRIDGE DECK **	_____	1,412.3
PIER NO. 1 COL.	11.8	_____
PIER NO. 2 COL.	27.1	_____
PIER NO. 3 COL.	28.0	_____
PIER NO. 4 COL.	42.9	_____
PIER NO. 5 COL.	18.6	_____
PIER NO. 6 COL.	12.4	_____
PIER NO. 7 COL.	11.2	_____
PIER NO. 1 CAP & STEPS	_____	82.6
PIER NO. 2 CAP & STEPS	_____	82.6
PIER NO. 3 CAP & STEPS	_____	82.6
PIER NO. 4 CAP & STEPS	_____	82.6
PIER NO. 5 CAP & STEPS	_____	82.6
PIER NO. 6 CAP & STEPS	_____	82.6
PIER NO. 7 CAP & STEPS	_____	82.6
WEST ABUTMENT DRAIN BLOCK	0.4	_____
EAST ABUTMENT DRAIN BLOCK	0.4	_____
** INCLUDES ABUTMENT & PIER DIAPHRAGMS		
TOTAL (CU. YDS.)	238.4	2037.1

## SUMMARY OF REINFORCING STEEL

LOCATION	NON-COATED REINFORCING STEEL	STAINLESS STEEL REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
WEST ABUT. FTG. + BKWL. + WING EXT. + MASKWALL	_____	73	7,171
EAST ABUT. FTG. + BKWL. + WING EXT. + MASKWALL	_____	73	7,171
BRIDGE DECK **	_____	_____	391,486
ABUTMENT WINGS	_____	_____	4 AT 292
BARRIER RAIL - NORTH RAIL	_____	7,249	18,596
BARRIER RAIL - SOUTH RAIL	_____	7,249	18,596
BARRIER RAIL END SECTION	_____	4 AT 192	4 AT 266
PIER NO. 1	40,499	_____	34,868
PIER NO. 2	35,222	_____	37,609
PIER NO. 3	35,222	_____	37,767
PIER NO. 4	39,511	_____	41,803
PIER NO. 5	38,740	_____	36,081
PIER NO. 6	40,939	_____	34,973
PIER NO. 7	40,939	_____	34,763
DEMONSTRATION SHAFT	16,072	_____	_____
WEST ABUTMENT DRAIN BLOCK	_____	_____	94
EAST ABUTMENT DRAIN BLOCK	_____	_____	94
** INCLUDES ABUTMENT & PIER DIAPHRAGMS			
TOTAL (LBS.)	287,144	15,412	703,304

## SUMMARY OF EXCAVATION

LOCATION	CLASS 20 EXCAVATION	CLASS 21 EXCAVATION
WEST ABUTMENT	82.8	_____
EAST ABUTMENT	82.8	_____
TOTAL (CU. YDS.)	165.6	

NOTE: SEE DESIGN SHEET 7 FOR CLASS 10 EXCAVATION QUANTITIES.

## SUMMARY OF FOUNDATIONS

LOCATION	SUBSTRUCTURE TYPE	FOUNDATION TYPE	NUMBER	LENGTH (LIN. FT.)	TOTAL (LIN. FT.)
WEST ABUTMENT	STUB ABUTMENT	HP10x57	15	90	1,350
EAST ABUTMENT	STUB ABUTMENT	HP10x57	15	90	1,350
PIER NO. 1	FRAME PIER	72 INCH DRILLED SHAFT	2	86	172
PIER NO. 2	FRAME PIER	72 INCH DRILLED SHAFT	2	74	148
PIER NO. 3	FRAME PIER	72 INCH DRILLED SHAFT	2	74	148
PIER NO. 4	FRAME PIER	84 INCH DRILLED SHAFT	2	69	138
PIER NO. 5	FRAME PIER	72 INCH DRILLED SHAFT	2	82	164
PIER NO. 6	FRAME PIER	72 INCH DRILLED SHAFT	2	87	174
PIER NO. 7	FRAME PIER	72 INCH DRILLED SHAFT	2	87	174
DEMONSTRATION SHAFT		72 INCH DRILLED SHAFT	1	67	67
		TOTAL 72 INCH DRILLED SHAFT (LIN. FT.)			980
		TOTAL 84 INCH DRILLED SHAFT (LIN. FT.)			138
		TOTAL DEMONSTRATION SHAFT (LIN. FT.)			67
		TOTAL HP 10x57 (LIN. FT.)			2,700

## SUMMARY OF STRUCTURAL STEEL

LOCATION	TOTAL (LBS.)
INTERMEDIATE DIAPHRAGMS	32,847
WEST ABUTMENT BEARING ASSEMBLY	2,075
EAST ABUTMENT BEARING ASSEMBLY	2,075
PIER NO. 1 BEARING ASSEMBLY	3,742
PIER NO. 2 BEARING ASSEMBLY	3,602
PIER NO. 3 BEARING ASSEMBLY	3,602
PIER NO. 5 BEARING ASSEMBLY	3,602
PIER NO. 6 BEARING ASSEMBLY	3,602
PIER NO. 7 BEARING ASSEMBLY	3,742
TOTAL (LBS.)	58,889

## SUMMARY OF BEARINGS

[illegible]

Δ CURVED SOLE PLATES ARE  
INCIDENTAL TO PPC BEAMS

DESIGN FOR 0° SKEW  
1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE  
111' END SPANS 152' INTERIOR SPANS  
SUMMARY QUANTITIES SHEET  
STA. 389+39.66 MARCH, 2021  
LINN COUNTY  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 2 OF 54 FILE NO. 31598 DESIGN NO. 220

GENERAL NOTES:

THIS DESIGN IS FOR THE REPLACEMENT OF THE EXISTING 8 SPAN 1,134'-0 x 29' PLATE GIRDER BRIDGE DESIGN NO. 151 WITH A YEAR OF CONSTRUCTION OF 1953. ELECTRONIC PLANS OF THE EXISTING STRUCTURE ARE AVAILABLE TO THE CONTRACTOR AS PART OF THE E-FILES SUPPLIED WITH THE CONTRACT DOCUMENTS.

THE LUMP SUM BID FOR "REMOVAL OF EXISTING BRIDGE" SHALL INCLUDE REMOVAL OF EXISTING REVETMENT.

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

THIS PLAN SET ALSO INCLUDES A BARRIER RAIL RETROFIT, BACKWALL REPAIR, AND FINGER JOINT GRINDING TO THE EXISTING W.B. US 30 BRIDGE DESIGN NO. 570 WITH A YEAR OF CONSTRUCTION OF 1973. 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.

ALL PLAN DIMENSIONS ARE HORIZONTAL UNLESS NOTED OTHERWISE

FAINT LINES ON PLANS INDICATE THE EXISTING STRUCTURE.

US 30 WILL REMAIN OPEN TO THROUGH TRAFFIC DURING THE INSTALLATION OF DRILLED SHAFTS. FOLLOWING DRILLED SHAFT INSTALLATION, EASTBOUND TRAFFIC WILL BE SWITCHED TO THE WESTBOUND LANES FOR TWO LANE TWO WAY OPERATIONS VIA THE USE OF MEDIAN CROSSTOPS.

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

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.

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.

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

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

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (501 IS 3/8 INCH DIAMETER BAR ). ENGLISH REINFORCING STEEL RECEIVED IN THE FIELD MAY DISPLAY THE FOLLOWING "BAR DESIGNATION". THE "BAR DESIGNATION" IS THE STAMPED IMPRESSION ON THE REINFORCING BARS, AND IS EQUIVALENT TO THE BAR DIAMETER IN MILLIMETERS.

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

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.

LONGITUDINAL GROOVING OF THE BRIDGE DECK WILL BE REQUIRED IN ACCORDANCE WITH ARTICLE 2412.03, D OF THE STANDARD SPECIFICATIONS. LONGITUDINAL GROOVING QUANTITIES FOR THIS PROJECT ARE INCLUDED IN THE ROADWAY PLANS.

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 120000 PARTS PER MILLION (PPM). ANALYSIS OF TOTAL CHROMIUM ON THIS SAMPLE WAS 700 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.

CRANES WILL NOT BE ALLOWED ON THE EXISTING BRIDGE WHILE IT IS IN SERVICE. INSTALLATION OF DRILLED SHAFTS SHALL BE FROM BELOW THE DECK OF THE EXISTING BRIDGE.

THE CONTRACTOR SHALL ADHERE TO ARTICLE 4151.03, D OF THE STANDARD SPECIFICATIONS FOR STORAGE, HANDLING, AND PLACEMENT OF REINFORCING ON THE JOB SITE. NOTE THAT ARTICLE 4151.03, D, 2 REQUIRES COVERING OF COATED BARS IF THEY ARE EXPOSED FOR 2 MONTHS OR MORE. THIS ALSO APPLIES TO ANY PLACED STEEL, LEFT EXPOSED, TO BE INCORPORATED INTO FUTURE CONSTRUCTION.

LABORATORY ANALYSIS HAS IDENTIFIED ASBESTOS AT THIS SITE. ASBESTOS SHALL BE REMOVED PRIOR TO BRIDGE DEMOLITION OPERATIONS. REMOVAL, TRANSPORT, AND DISPOSAL SHALL BE IN ACCORDANCE WITH SECTION 2536, OF THE STANDARD SPECIFICATIONS.

REQUIRED DNR INFORMATION INCLUDES:  
YEAR CONSTRUCTED - 1953  
ASBESTOS LOCATION - IN THE GRAY CAULK IN THE JOINTS OF THE CONCRETE BRIDGE RAILINGS  
FHWA NUMBER - INFORMATION PROVIDED ELSEWHERE IN PLAN  
ROAD/ROUTE (CITY) - INFORMATION PROVIDED ELSEWHERE IN PLAN  
COUNTY - INFORMATION PROVIDED ELSEWHERE IN PLAN  
DIRECTION TO BRIDGE - INFORMATION PROVIDED ELSEWHERE IN PLAN  
BRIDGE SIZE - INFORMATION PROVIDED ELSEWHERE IN PLAN  
NUMBER OF DECKS - 1 (TYP.)  
ASBESTOS INSPECTOR/AMOUNTS - BRAD AZELTINE/2 SQ. FT. (ESTIMATED)

SOVEREIGN LANDS CONSTRUCTION PERMIT 18-107 SHALL APPLY TO WORK ON THIS PROJECT. THE IOWA DNR CONSERVATION OFFICERS FOR THE AREA SHALL BE CONTACTED AT LEAST 48 HOURS PRIOR TO COMMENCING WORK. CONTACT PAUL SLEEPER AT (319)350-8399 AND STEVE WOODRUFF AT (614)489-2574.

WITH RESPECT TO WORKING DAYS, WATERWAY ELEVATIONS OF 691.00 FEET OR BELOW WILL NOT BE CONSIDERED A CONDITION BEYOND THE CONTROL OF THE CONTRACTOR.

- NOTES FOR PADDLING ROUTE COORDINATION:
- USE IOWA DNR'S WARNING SIGNAGE REQUIREMENTS AS STATED AND DEFINED ON ROADWAY PLAN SHEET J.11 TO HELP THE PADDLING PUBLIC AVOID INJURY DURING REMOVAL AND RECONSTRUCTION OF THE E.B. US 30 BRIDGE. SEE CHAPTER SIX ON SIGNAGE IN "DEVELOPING WATER TRAILS IN IOWA" FOUND AT THIS LINK: <https://www.iowadnr.gov/things-to-do/canoeing-kayaking/water-trail-development> [iowadnr.gov]
  - WHEN THE CHANNEL OBSTRUCTION IS PLACED, A NOTIFICATION SHALL BE SENT TO JOHN WENCK VIA E-MAIL AT JOHN.WENCK@DNR.IOWA.GOV SO THAT A TEMPORARY HAZARD SYMBOL CAN BE ADDED TO THE DNR'S INTERACTIVE RIVER MAPPING SYSTEM.
  - WHEN THE CHANNEL OBSTRUCTION IS REMOVED, A NOTIFICATION SHALL BE SENT TO JOHN WENCK VIA E-MAIL AT JOHN.WENCK@DNR.IOWA.GOV SO THAT THE TEMPORARY HAZARD SYMBOL CAN BE REMOVED FROM THE DNR'S INTERACTIVE RIVER MAPPING SYSTEM.
  - ALL CONSTRUCTION DEBRIS SHALL BE REMOVED FROM THE RIVER CHANNEL WHEN THE TEMPORARY CONSTRUCTION PLATFORM IS REMOVED.

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.

DEVELOPMENTAL SPECIFICATION FOR MASS CONCRETE - CONTROL OF HEAT OF HYDRATION. THE FOLLOWING ELEMENTS QUALIFY AS MASS CONCRETE ON THIS PROJECT:  
PIER CAPS  
PIER COLUMNS  
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 40 THRU 43.  
BRIDGE DECK CONCRETE f'c = 4.0 KSI  
STRUCTURAL STEEL IN ACCORDANCE WITH AASHTO LRFD SECTION 6. ASTM A709 GRADE 36, GRADE 50, AND GRADE 50W (AASHTO M270 GRADE 36, GRADE 50, AND GRADE 50W ).

BRIDGE DECK DIMENSIONS TABLE

NO.	ITEM	UNIT	QUANTITY
1	DECK LENGTH	L.F.	1140.0
2	MINIMUM DECK WIDTH	L.F.	43.2
3	MAXIMUM DECK WIDTH	L.F.	43.2
4	DECK AREA	S.F.	49,248

- 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.

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	STEEL INTERMEDIATE DIAPHRAGMS
2	DECK DRAINS
3	FINGER EXPANSION JOINT
4	BARRIER COVER PLATES
5	LAMINATED NEOPRENE PAD/CURVED SOLE PLATE ASSEMBLY
6	MASONRY PLATE/BRONZE BEARING - ASSEMBLY

OTHER SUBMITTALS -

THE CONTRACTOR SHALL PROVIDE SUBMITTALS FOR THE FOLLOWING ITEMS SHOWN IN THE TABLE BELOW.

REQUIREMENTS FOR THE FOLLOWING SUBMITTALS SHALL BE IN ACCORDANCE WITH THE DESIGN PLANS.

1	DRILLED SHAFT CONFIRMATION BORING LOGS
2	DRILLED SHAFT INSTALLATION PLAN

TRAFFIC CONTROL PLAN

NOTE: REFER TO THE TRAFFIC CONTROL PLAN ON ROAD PLANS IN THESE PLANS

NOTE: POLLUTION PREVENTION PLAN IS SHOWN ELSEWHERE IN THESE PLANS

NOTE: ROADWAY QUANTITIES SHOWN ELSEWHERE IN THESE PLANS.

DESIGN FOR 0° SKEW

1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

111' END SPANS152' INTERIOR SPANS

GENERAL NOTES

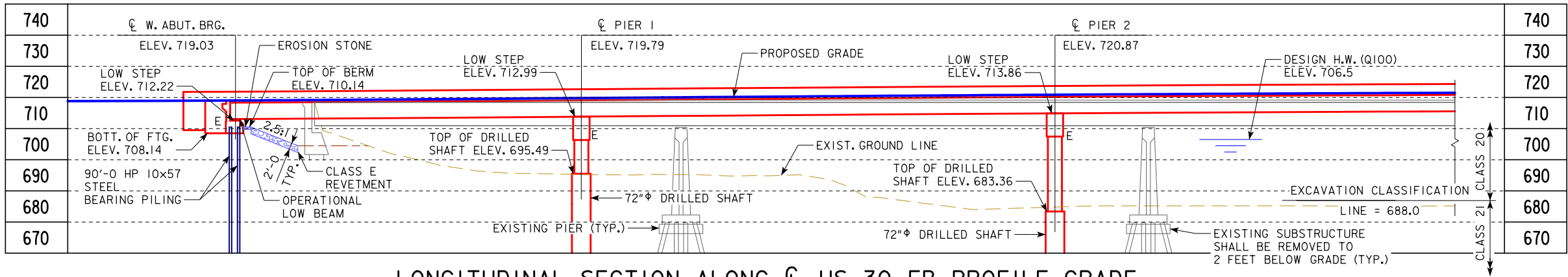
STA. 389+39.66MARCH, 2021

LINN COUNTY

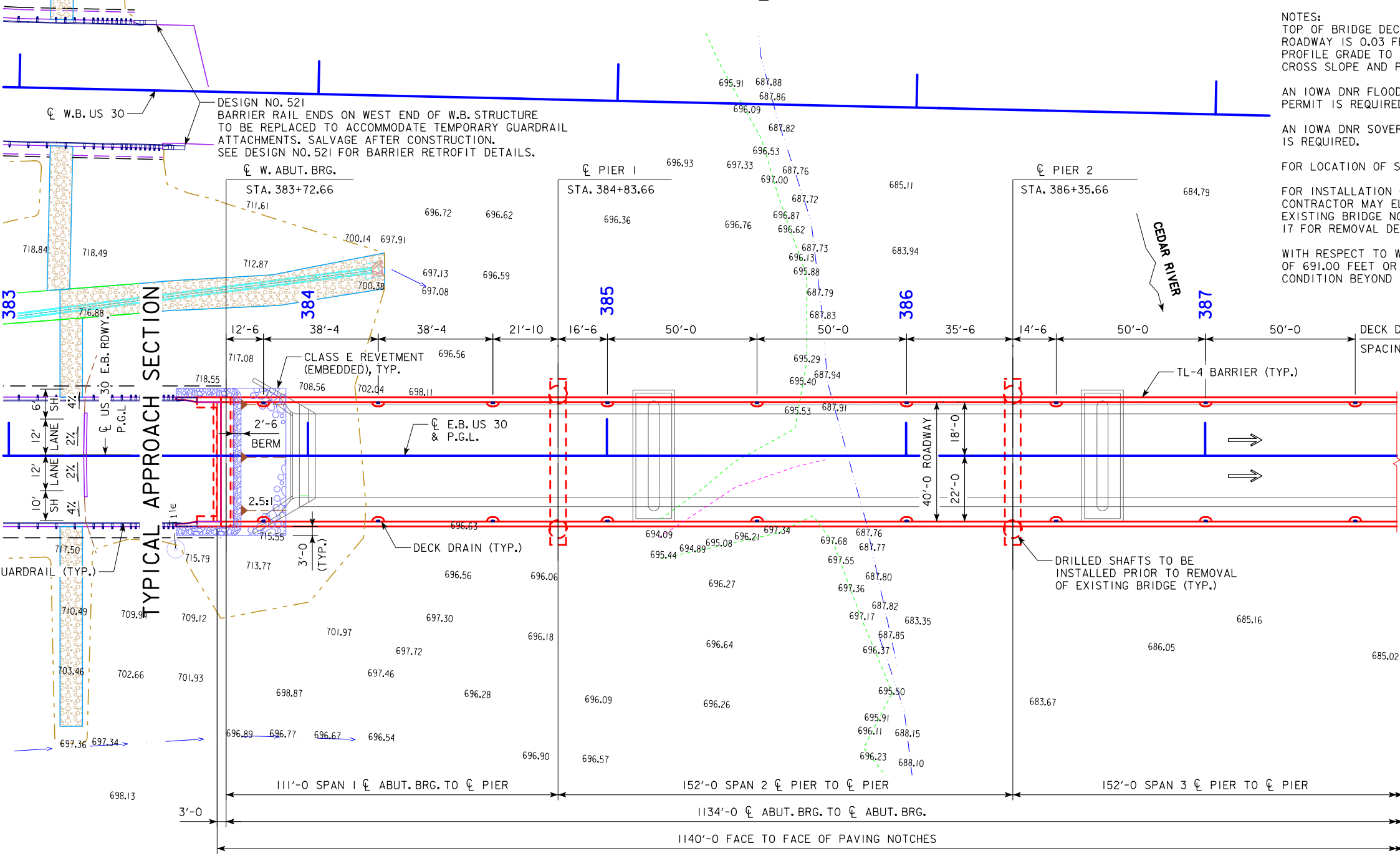
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 3 OF 54FILE NO. 31598DESIGN NO. 220





LONGITUDINAL SECTION ALONG  $\phi$  US 30 EB PROFILE GRADE



TYPICAL APPROACH SECTION

NOTES:  
TOP OF BRIDGE DECK AT CENTERLINE  
ROADWAY IS 0.03 FEET BELOW THE  
PROFILE GRADE TO ACCOUNT FOR DECK  
CROSS SLOPE AND PARABOLIC CROWN.

AN IOWA DNR FLOOD PLAIN CONSTRUCTION  
PERMIT IS REQUIRED.

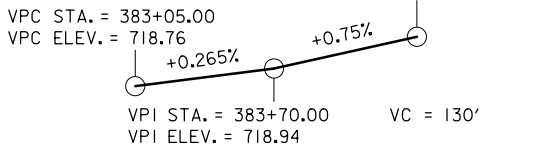
AN IOWA DNR SOVEREIGN LANDS PERMIT  
IS REQUIRED.

FOR LOCATION OF SPASH BASINS, SEE DESIGN SHEET 25.

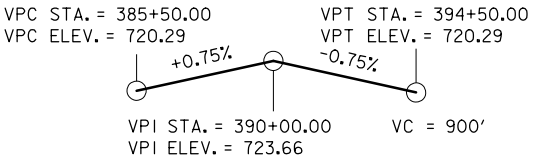
FOR INSTALLATION OF THE NORTH DRILLED SHAFTS, THE  
CONTRACTOR MAY ELECT TO REMOVE A PORTION OF THE  
EXISTING BRIDGE NORTH OVERHANG. SEE DESIGN SHEET  
17 FOR REMOVAL DETAILS AND NOTES.

WITH RESPECT TO WORKING DAYS, WATERWAY ELEVATIONS  
OF 691.00 FEET OR BELOW WILL NOT BE CONSIDERED A  
CONDITION BEYOND THE CONTROL OF THE CONTRACTOR.

BENCH MARK NO. 1: 8033630.679N, 20530416.940E  
CP-321 SET FENO MONUMENT  
ELEV. 722.66  
BENCH MARK NO. 2: 8034138.474N, 20533527.240E  
CP-322 SET FENO MONUMENT  
ELEV. 726.92



PROPOSED PROFILE  
GRADE PART 1



PROPOSED PROFILE  
GRADE PART 2

HYDRAULIC DATA

DRAINAGE AREA = 6951.0 SQ. MI.  
STREAM SLOPE = 2.2 FT./MI.  
AVG. LOW WATER STAGE = 688.0

$Q_{50}$  = 87,908 CFS  
STAGE = 704.8  
REGULATORY LOW BEAM = 715.4  
BACKWATER = 0.3 FT.  
AVG. BRIDGE VELOCITY = 5.9 FPS

$Q_{100}$  = 100,408 CFS  
STAGE = 706.5  
OPERATIONAL LOW BEAM = 712.6  
BACKWATER = 0.4 FT.  
AVG. BRIDGE VELOCITY = 6.0 FPS

$Q_{200}$  = 112,918 CFS  
STAGE = 708.2  
CALCULATED DESIGN SCOUR = 655.1

$Q_{500}$  = 129,241 CFS  
STAGE = 709.4  
AVG. BRIDGE VELOCITY = 6.5 FPS  
CALCULATED CHECK SCOUR = 652.9

ROADWAY OVERTOP 713.4  
STA. 404+13

UTILITIES LEGEND:  
NO KNOWN UTILITIES NEAR BRIDGE

LOCATION

EB US 30 OVER THE CEDAR RIVER  
T-82N R-6W  
SECTION 9  
PUTNAM TOWNSHIP  
LINN COUNTY  
FHWA NO. 33471  
BRIDGE MAINT. NO. 5758.9R030  
LATITUDE 41.926005°  
LONGITUDE -91.550627°

TRAFFIC ESTIMATE  
(EASTBOUND ONLY)

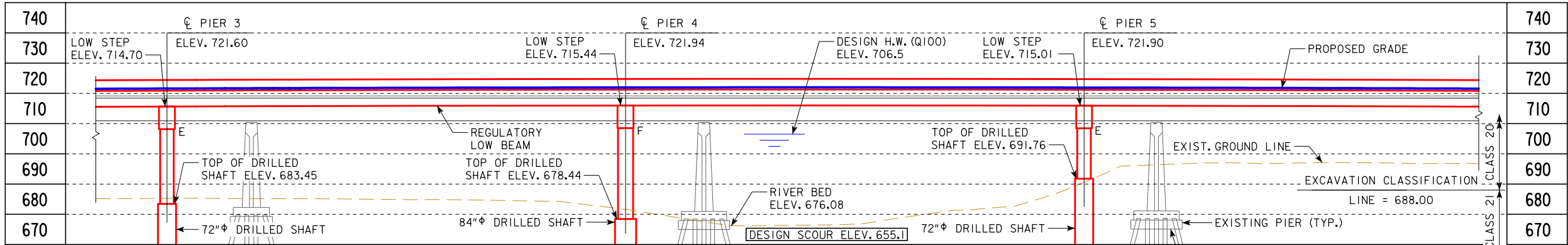
2020 AADT	27,700	V.P.D.
2040 AADT	39,800	V.P.D.
2040 DHV	-	V.P.H.
TRUCKS	16	%
TOTAL DESIGN ESALs	-	

DESIGN FOR 0° SKEW  
1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE  
111' END SPANS 152' INTERIOR SPANS

SITUATION PLAN

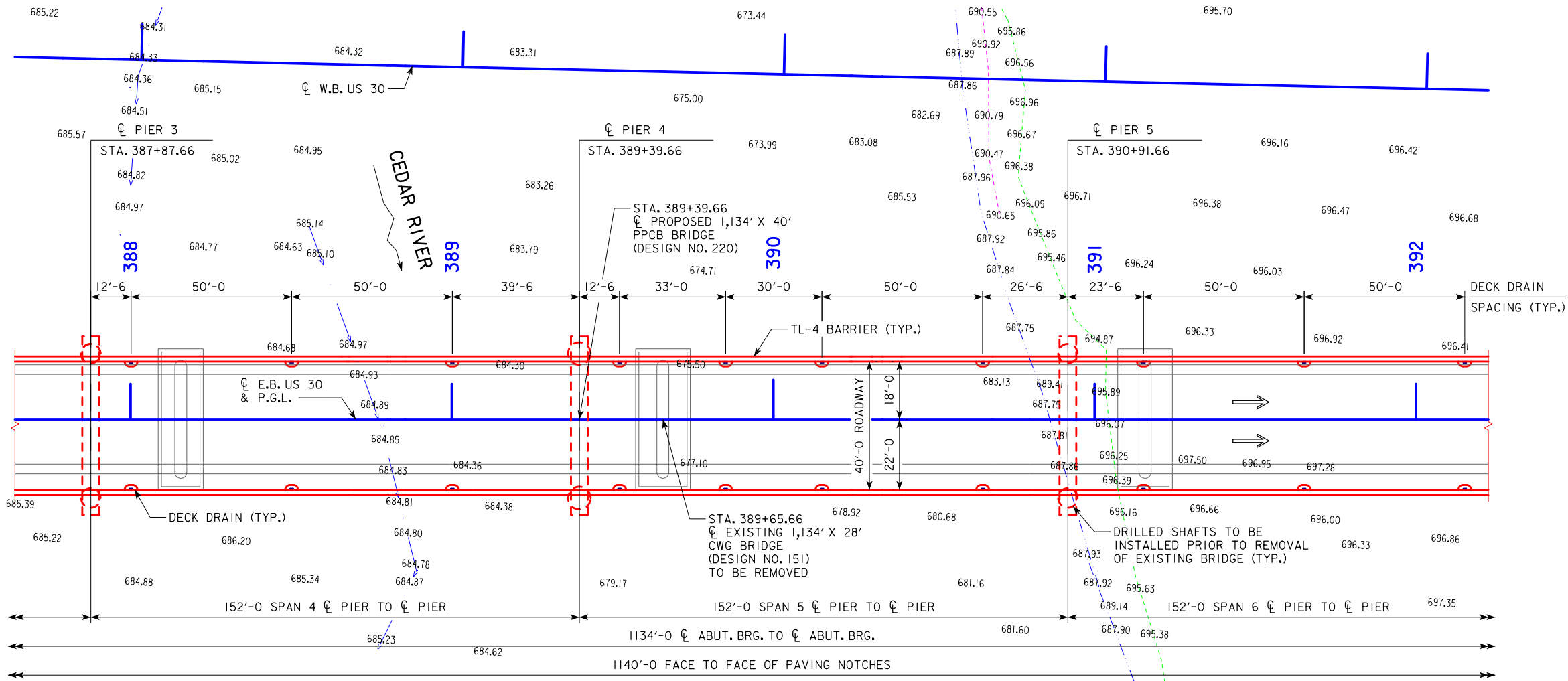
STA. 389+39.66 MARCH, 2021  
LINN COUNTY  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 4 OF 54 FILE NO. 31598 DESIGN NO. 220

SITUATION PLAN



BENCH MARK NO. 1: 8033630.679N, 20530416.940E  
CP-321 SET FENO MONUMENT  
ELEV. 722.66  
BENCH MARK NO. 2: 8034138.474N, 20533527.240E  
CP-322 SET FENO MONUMENT  
ELEV. 726.92

LONGITUDINAL SECTION ALONG CL US 30 EB PROFILE GRADE



UTILITIES LEGEND:  
NO KNOWN UTILITIES NEAR BRIDGE

SITUATION PLAN

BRIDGE COORDINATES									
LOCATION	CL W. ABUT. BRG.	CL PIER 1	CL PIER 2	CL PIER 3	CL PIER 4	CL PIER 5	CL PIER 6	CL PIER 7	CL E. ABUT. BRG.
NORTH EDGE OF DECK	E=20531041.608 N=8033720.351	E=20531152.430 N=8033726.630	E=20531304.187 N=8033735.227	E=20531455.944 N=8033743.824	E=20531607.700 N=8033752.422	E=20531759.457 N=8033761.019	E=20531911.214 N=8033769.617	E=20532062.970 N=8033778.214	E=20532173.793 N=8033784.492
CL APPROACH ROADWAY	E=20531042.716 N=8033700.799	E=20531153.538 N=8033707.078	E=20531305.295 N=8033715.675	E=20531457.051 N=8033724.272	E=20531608.808 N=8033732.870	E=20531760.565 N=8033741.467	E=20531912.321 N=8033750.065	E=20532064.078 N=8033758.662	E=20532174.900 N=8033764.940
SOUTH EDGE OF DECK	E=20531044.050 N=8033677.254	E=20531154.872 N=8033683.532	E=20531306.629 N=8033692.130	E=20531458.385 N=8033700.727	E=20531610.142 N=8033709.324	E=20531761.899 N=8033717.922	E=20531913.655 N=8033726.519	E=20532065.412 N=8033735.116	E=20532176.234 N=8033741.395

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

DESIGN FOR 0° SKEW

1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

111' END SPANS152' INTERIOR SPANS

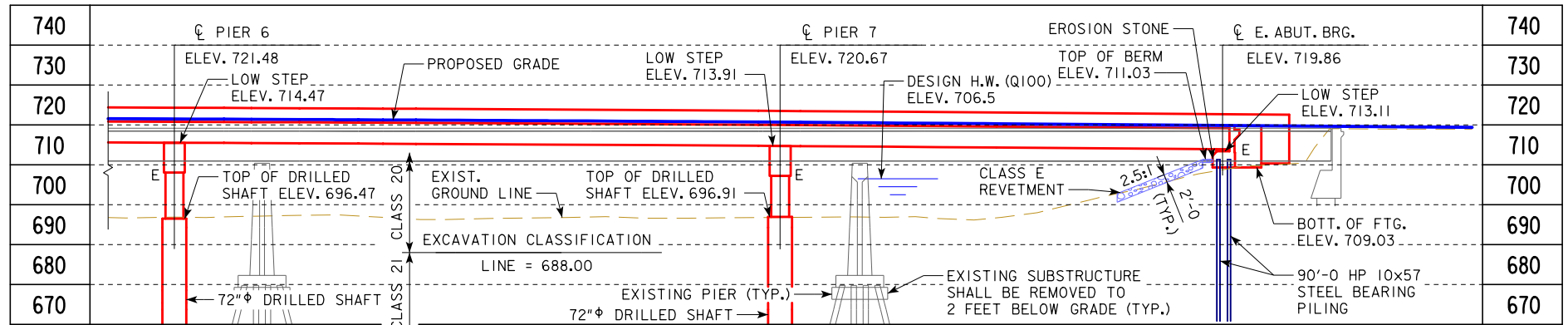
SITUATION PLAN

STA. 389+39.66MARCH, 2021

LINN COUNTY

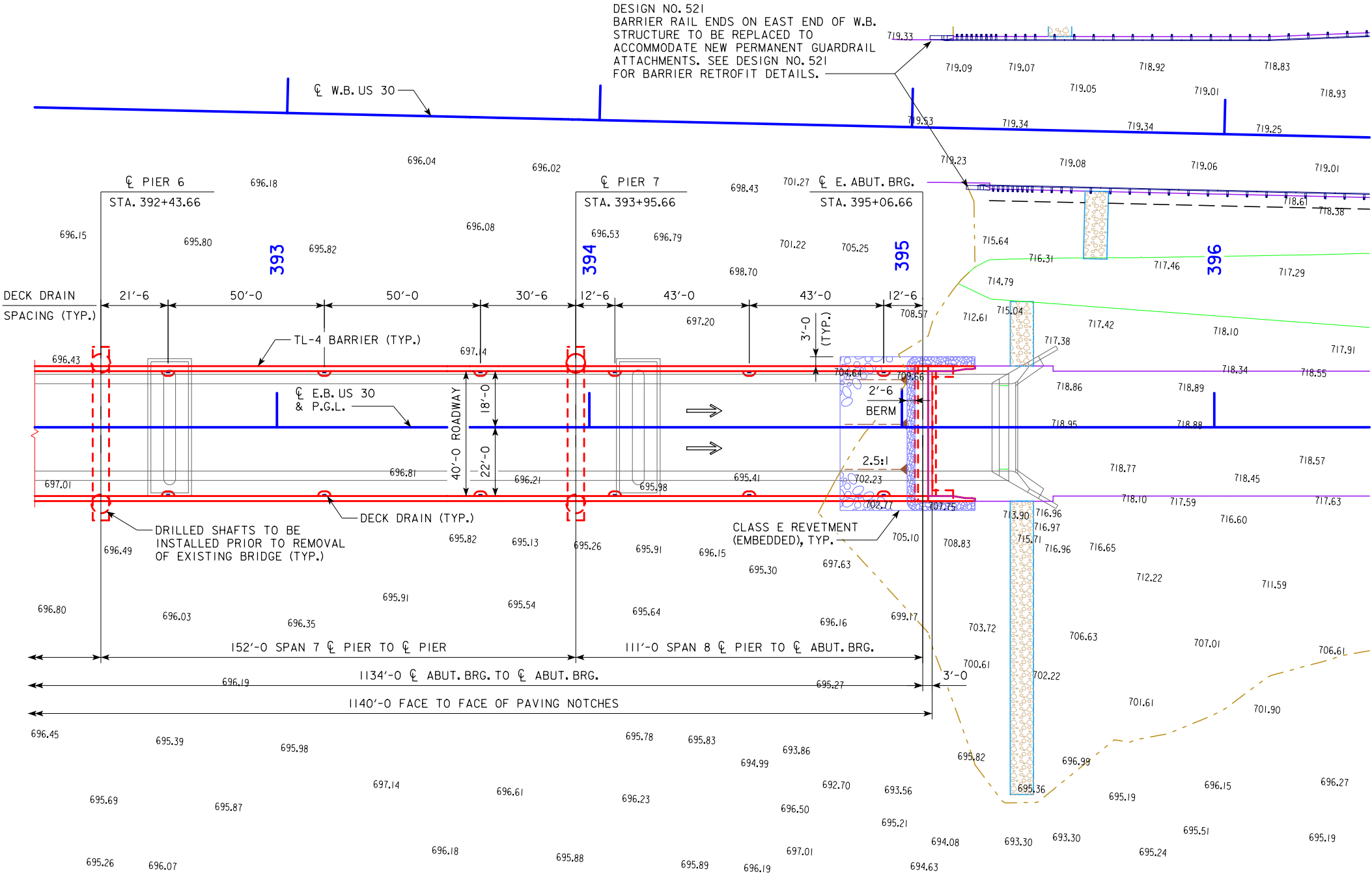
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 5 OF 54FILE NO. 31598DESIGN NO. 220



LONGITUDINAL SECTION ALONG CL US 30 EB PROFILE GRADE

BENCH MARK NO. 1: 8033630.679N, 20530416.940E  
CP-321 SET FENO MONUMENT  
ELEV 722.66  
BENCH MARK NO. 2: 8034138.474N, 20533527.240E  
CP-322 SET FENO MONUMENT  
ELEV 726.92

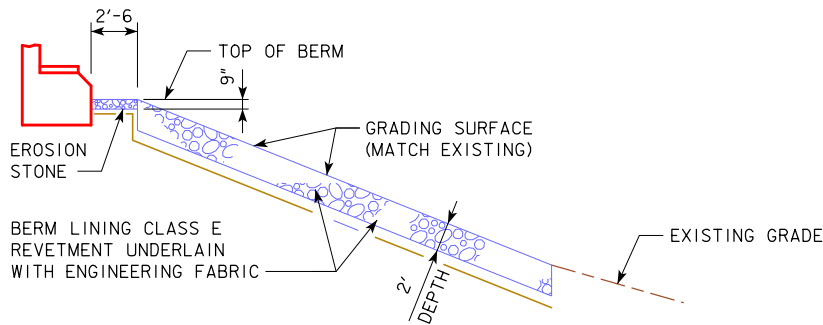


SITUATION PLAN

TYPICAL APPROACH SECTION

UTILITIES LEGEND:  
NO KNOWN UTILITIES NEAR BRIDGE

DESIGN FOR 0° SKEW  
**1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
111' END SPANS 152' INTERIOR SPANS  
**SITUATION PLAN**  
STA. 389+39.66 MARCH, 2021  
**LINN COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 6 OF 54 FILE NO. 31598 DESIGN NO. 220



SECTION THRU EMBEDDED REVETMENT BERM

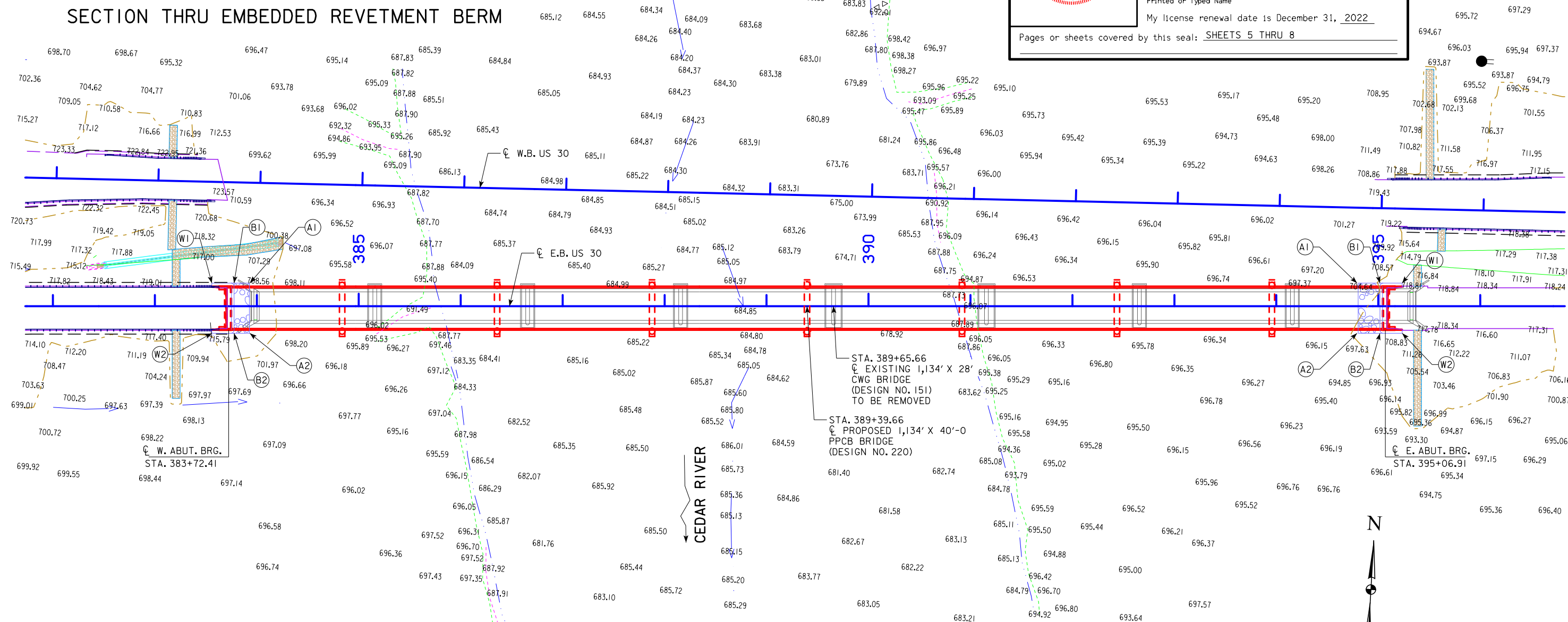
HYDRAULIC DESIGN



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 Aaron D. Moore Date 2/18/2021  
Printed or Typed Name Aaron D. Moore  
My license renewal date is December 31, 2022

Pages or sheets covered by this seal: SHEETS 5 THRU 8



BERM SLOPE LOCATION TABLE

POINTS	W. ABUTMENT			E. ABUTMENT		
	STATION	OFFSET	ELEV.	STATION	OFFSET	ELEV.
A1	383+92.42	22.58' LT	704.20	394+80.54	22.58' LT	702.48
A2	383+92.42	26.58' RT	704.20	394+80.54	26.58' RT	702.48
B1	383+77.66	22.58' LT	710.14	395+01.66	22.58' LT	711.03
B2	383+77.66	26.58' RT	710.14	395+01.66	26.58' RT	711.03
W1	383+55.91	22.58' LT	718.56	395+23.41	22.58' LT	719.34
W2	383+55.91	26.58' RT	718.48	395+23.41	26.58' RT	719.26

BERM SLOPE ELEVATIONS REFLECT THE GRADING SURFACE

ESTIMATED BERM ARMORING QUANTITIES

LOCATION	REVTMENT CL. E (TON)	EROSION STONE (TON)	ENGINEERING FABRIC (SY)	EXCAVATION CLASS 10 (CY)
BERM LINING - WEST ABUTMENT	96.1	12.4	88.3	58.9
BERM LINING - EAST ABUTMENT	136.7	12.4	125.8	83.8
TOTALS	232.8	24.8	214.0	142.7

EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE.

SITE PLAN

DESIGN FOR 0° SKEW  
**1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
111' END SPANS 152' INTERIOR SPANS

SITE PLAN

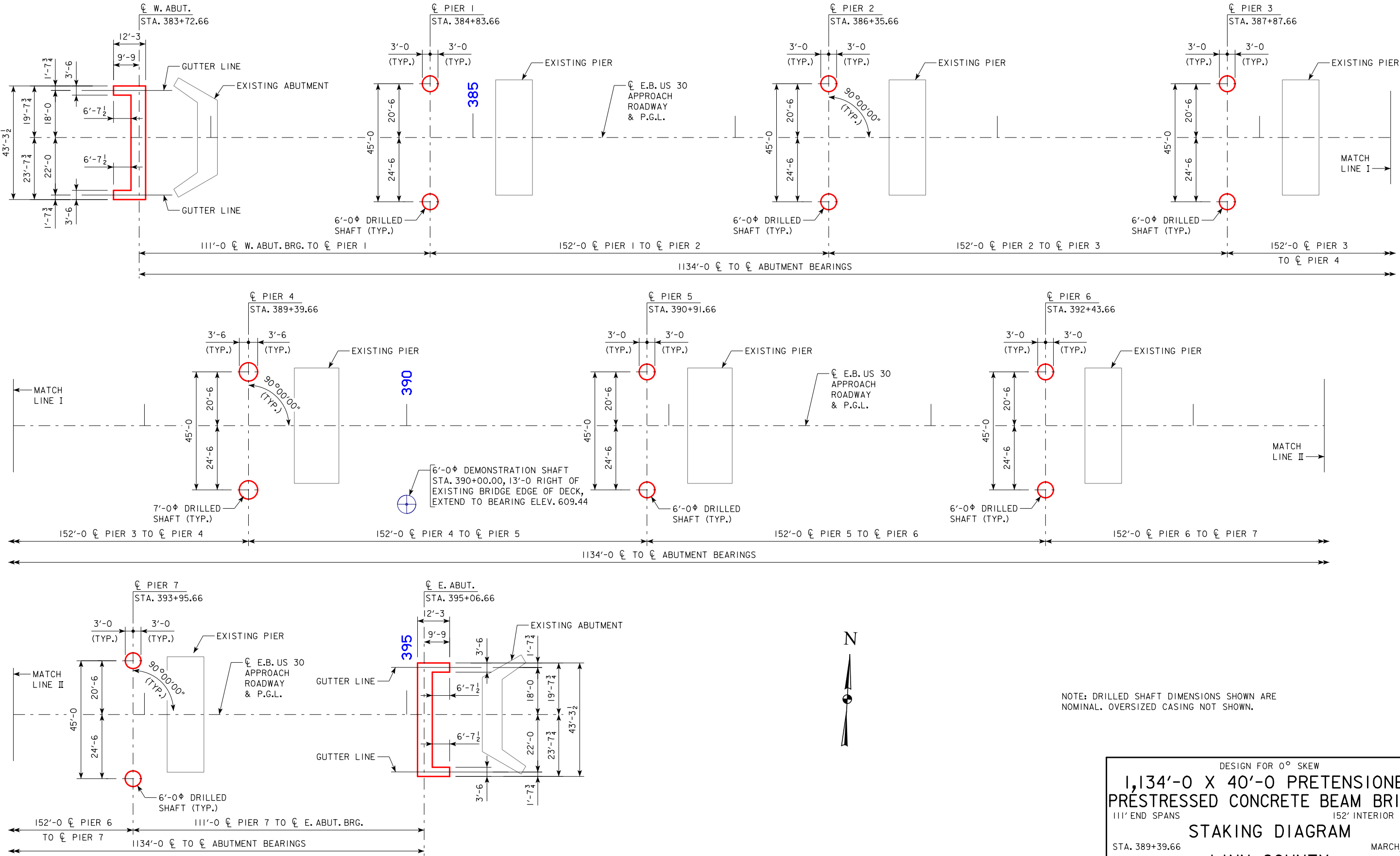
STA. 389+39.66 MARCH, 2021

LINN COUNTY

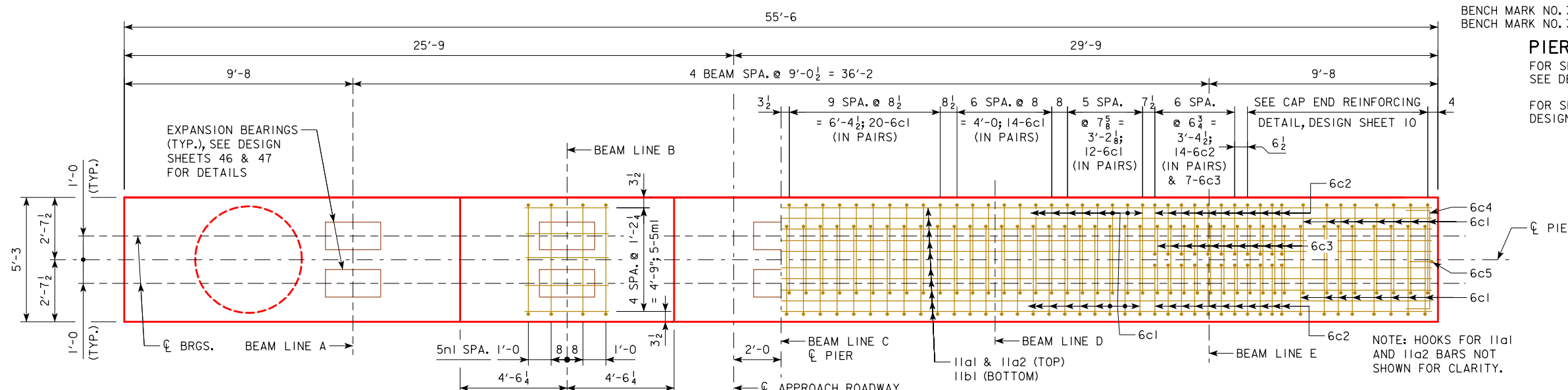
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 7 OF 54 FILE NO. 31598 DESIGN NO. 220



BENCH MARK NO. 321: STA. 373+43.92, 34.60' RT. SET FENO MON, ELEV 722.66  
BENCH MARK NO. 322: STA. 408+77.97, 276.45' LT. SET FENO MON, ELEV 726.92



STAKING DIAGRAM



BENCH MARK NO. 321: STA. 373+43.92, 34.60' RT. SET FENO MON, ELEV 722.66  
 BENCH MARK NO. 322: STA. 408+77.97, 276.45' LT. SET FENO MON, ELEV 726.92

**PIER NOTES:**  
 FOR SECTION A-A, SECTION B-B, AND END VIEW REINFORCING, SEE DESIGN SHEET 10.  
 FOR SECTIONS OF 54" COLUMN AND 72" DRILLED SHAFT, SEE DESIGN SHEET 10.

PIER CAP PLAN (PIER NOS. 1 THRU 3 & 5 THRU 7)

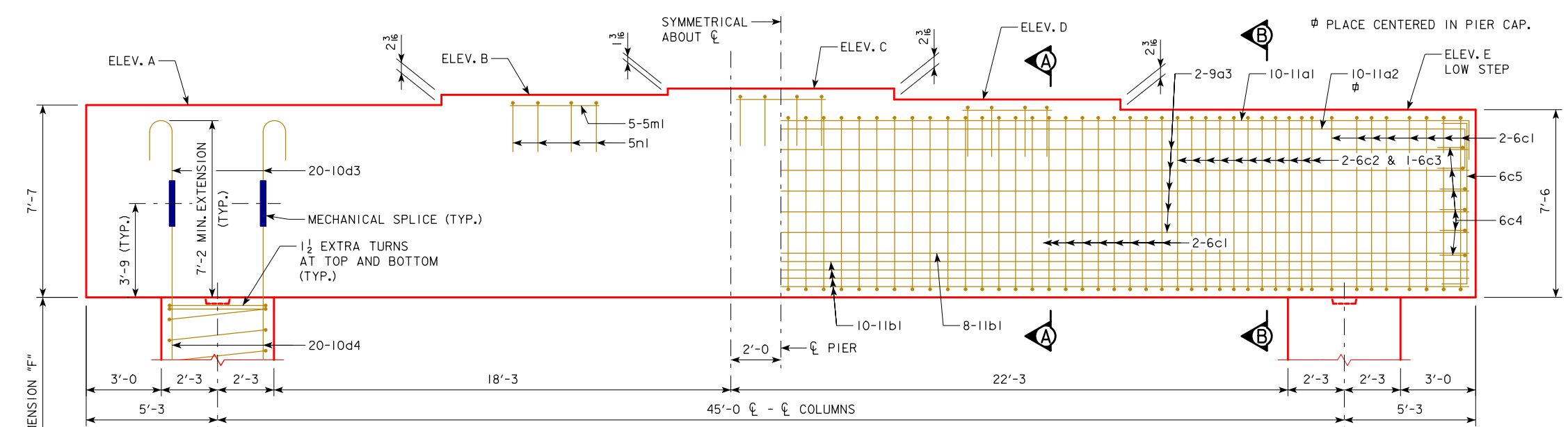
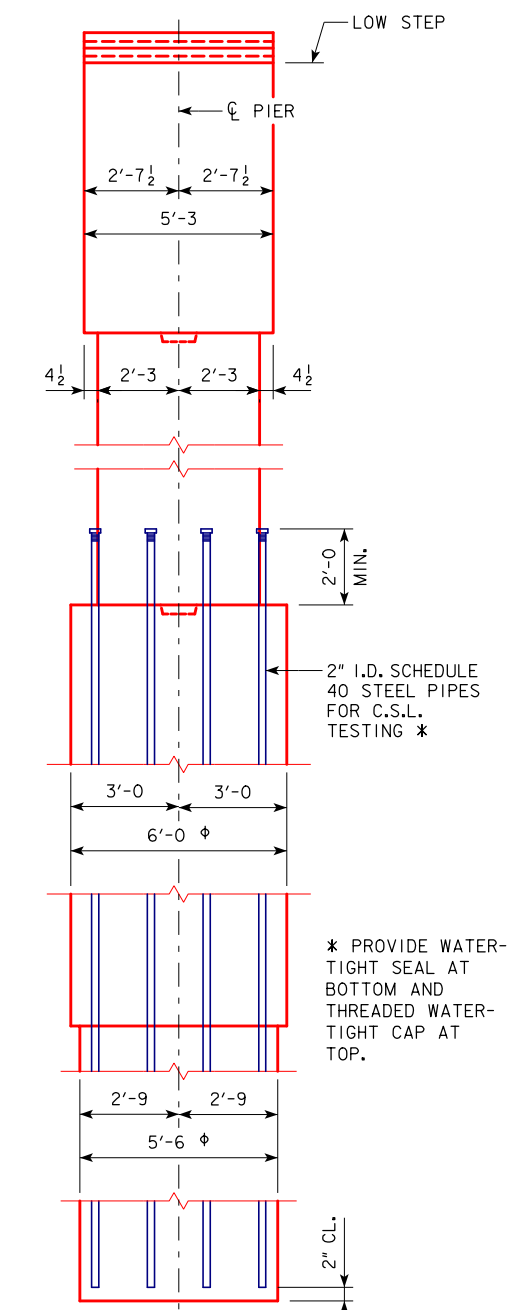
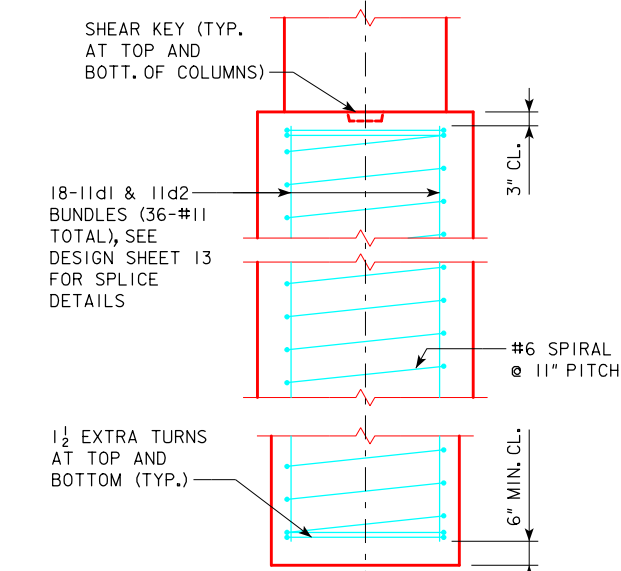


TABLE OF PIER ELEVATIONS & DIMENSIONS						
POINT	PIER NO. 1	PIER NO. 2	PIER NO. 3	PIER NO. 5	PIER NO. 6	PIER NO. 7
ELEV. A	713.07	713.94	714.79	715.09	714.55	713.99
ELEV. B	713.25	714.12	714.97	715.27	714.73	714.17
ELEV. C	713.35	714.22	715.07	715.37	714.83	714.27
ELEV. D	713.17	714.04	714.89	715.19	714.65	714.09
ELEV. E	712.99	713.86	714.70	715.01	714.47	713.91
BOTT. OF CAP	705.49	706.36	707.20	707.51	706.97	706.41
TOP OF SHAFT	695.49	683.36	683.45	691.76	696.47	696.91
BOTT. OF SHAFT	609.49	609.36	609.45	609.76	609.47	609.91
DIMENSION "F"	10'-0	23'-0	23'-9	15'-9	10'-6	9'-6
DIMENSION "G"	86'-0	74'-0	74'-0	82'-0	87'-0	87'-0

PIER ELEVATION (PIER NOS. 1 THRU 3 & 5 THRU 7)  
 (LOOKING EAST)

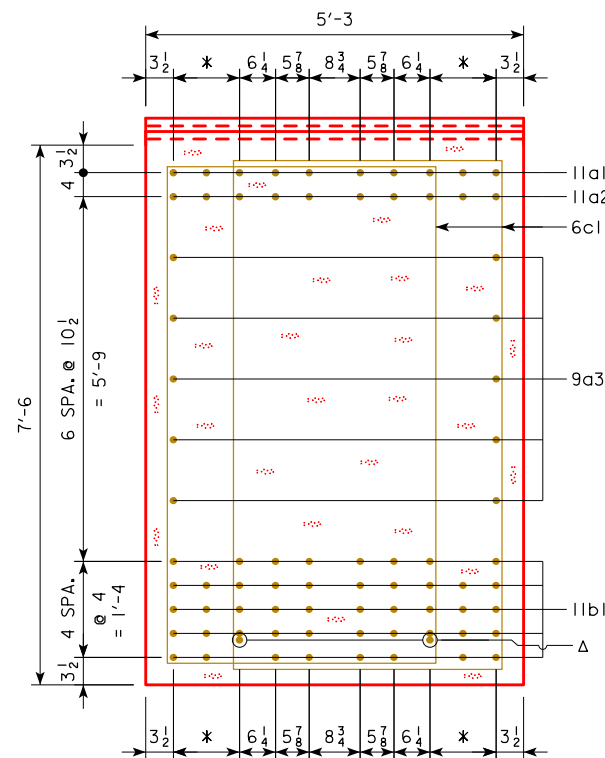


END ELEVATION

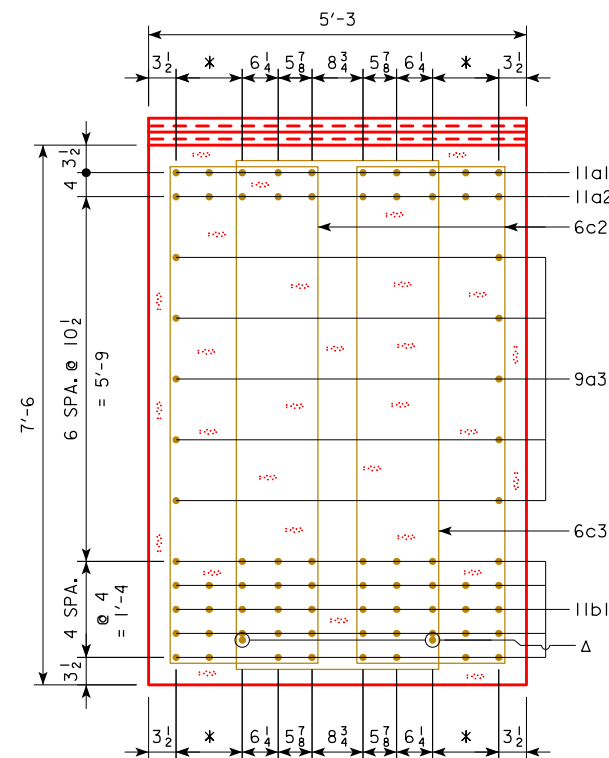


DESIGN FOR 0° SKEW  
**1,134'-0 X 40'-0 PRETENSIONED  
 PRESTRESSED CONCRETE BEAM BRIDGE**  
 111' END SPANS 152' INTERIOR SPANS  
**EXPANSION PIER DETAILS**  
 STA. 389+39.66 MARCH, 2021  
**LINN COUNTY**  
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
 DESIGN SHEET NO. 9 OF 54 FILE NO. 31598 DESIGN NO. 220

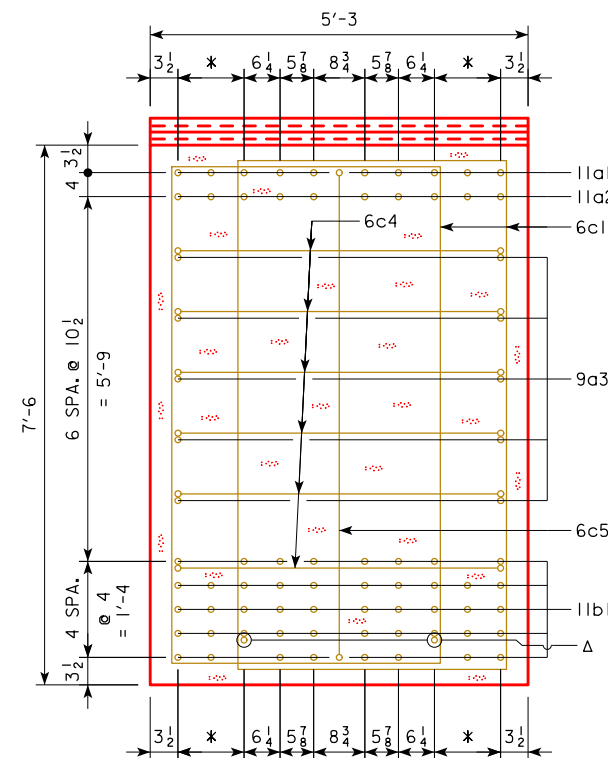




SECTION A-A

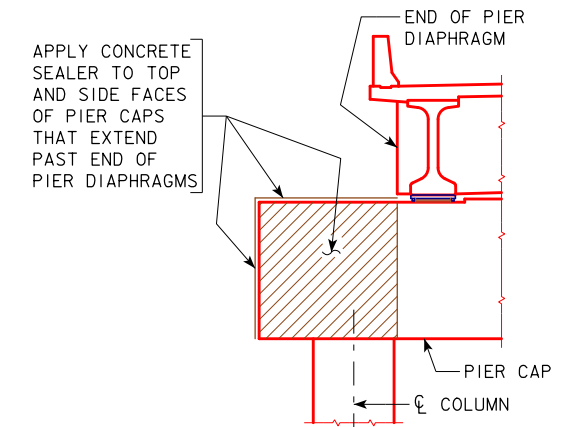


SECTION B-B

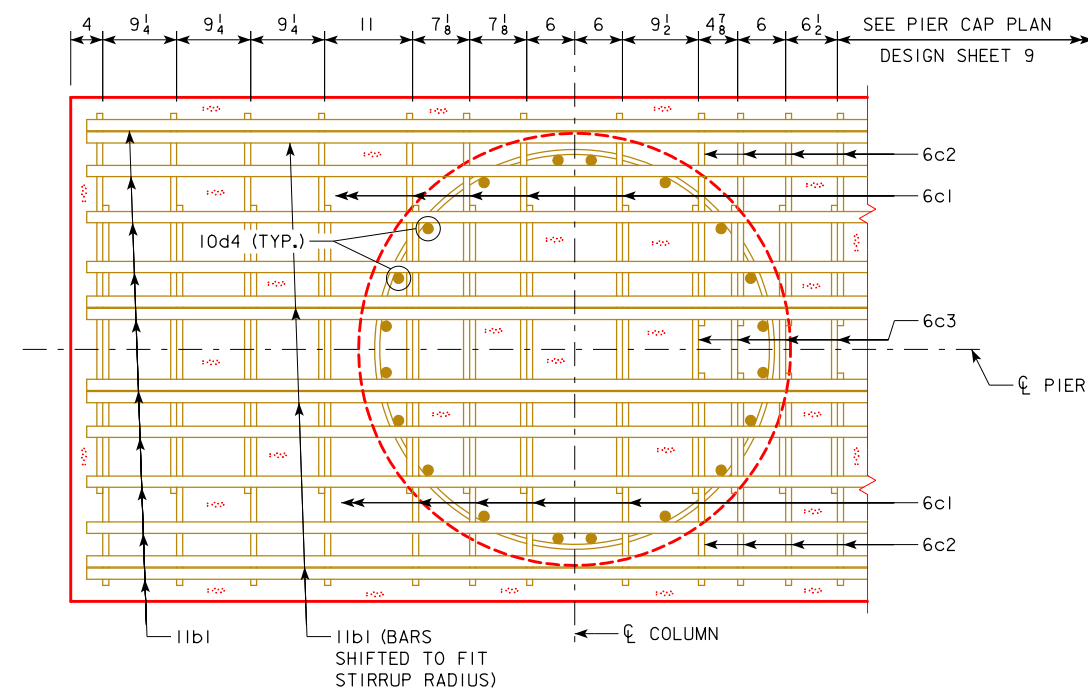


CAP END VIEW

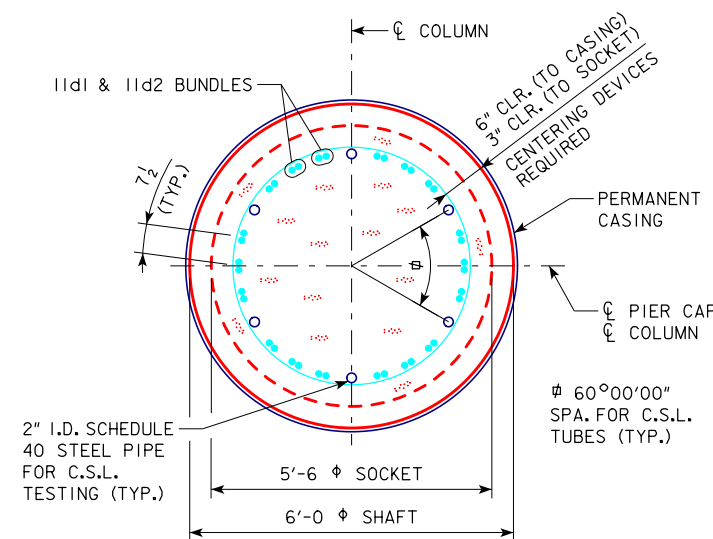
NOTES:  
 \* 2 SPA. @ 5 3/4" = 11 1/2"  
 Δ 11b1 BARS FROM OUTER LAYER BUNDLED WITH SECOND LAYER 11b1 BARS AS SHOWN TO AID IN CONSTRUCTABILITY.  
 CONTRACTOR TO PROVIDE SUPPORT BARS FOR 11a2 AND INNER ROW 11b1 BARS AT 4'-0" MAX. INTERVALS. COST OF SUPPORT BARS SHALL BE INCIDENTAL TO BID ITEM FOR "REINFORCING STEEL, EPOXY COATED."



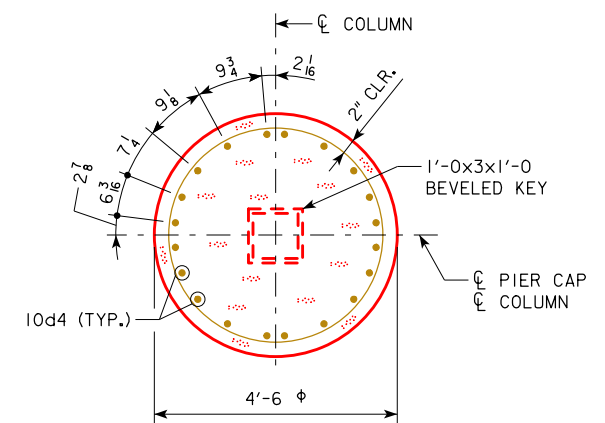
PIER CAP CONCRETE SEALER DETAIL



CAP END REINFORCING DETAIL  
(SHOWING BOTTOM LAYER OF LONGITUDINAL REINFORCING)

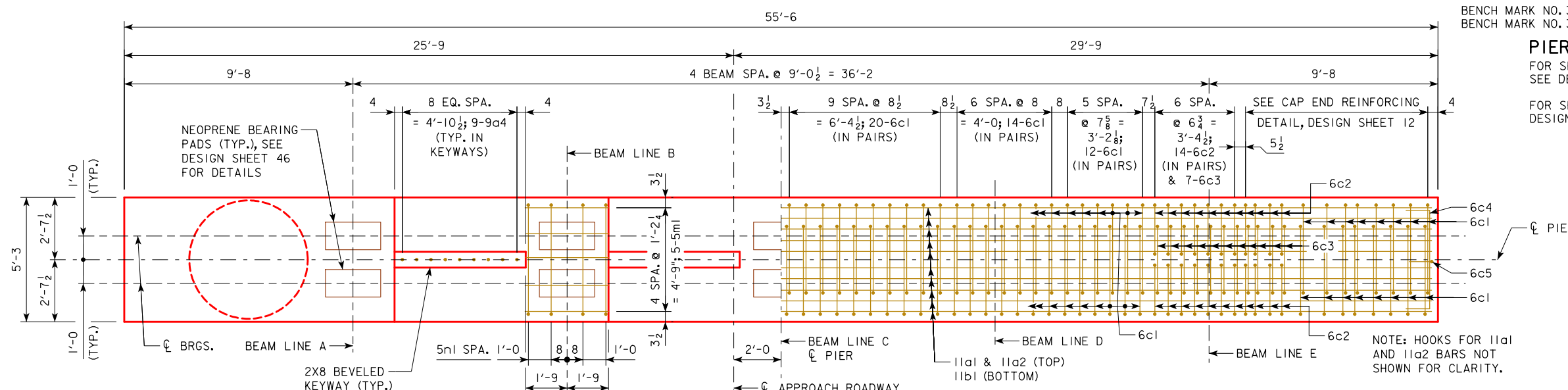


SECTION THROUGH 72" DRILLED SHAFT

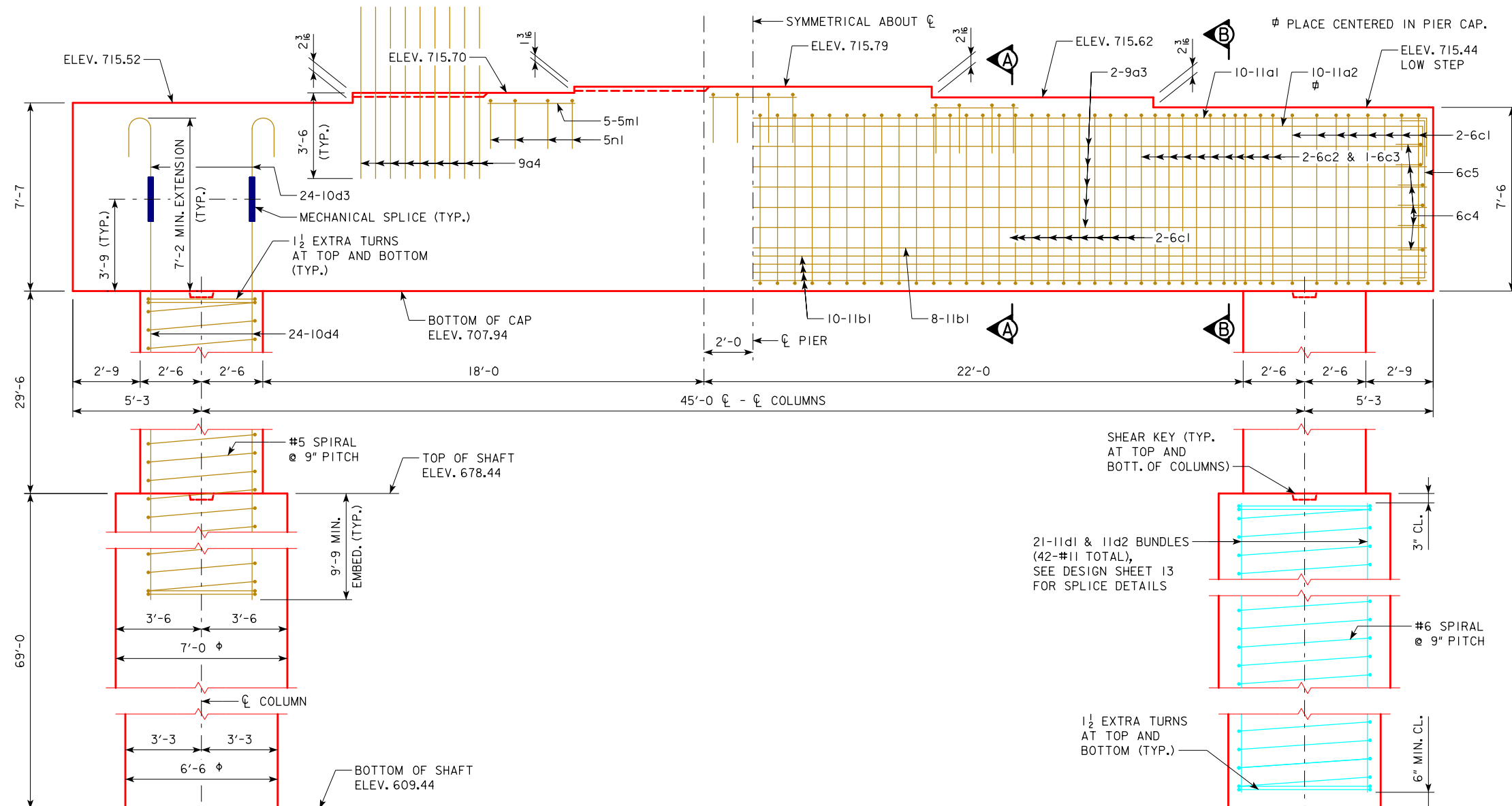


SECTION THROUGH 54" PIER COLUMN

DESIGN FOR 0° SKEW  
**1,134'-0" X 40'-0" PRETENSIONED  
 PRESTRESSED CONCRETE BEAM BRIDGE**  
 111' END SPANS 152' INTERIOR SPANS  
**EXPANSION PIER DETAILS**  
 STA. 389+39.66 MARCH, 2021  
**LINN COUNTY**  
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
 DESIGN SHEET NO. 10 OF 54 FILE NO. 31598 DESIGN NO. 220



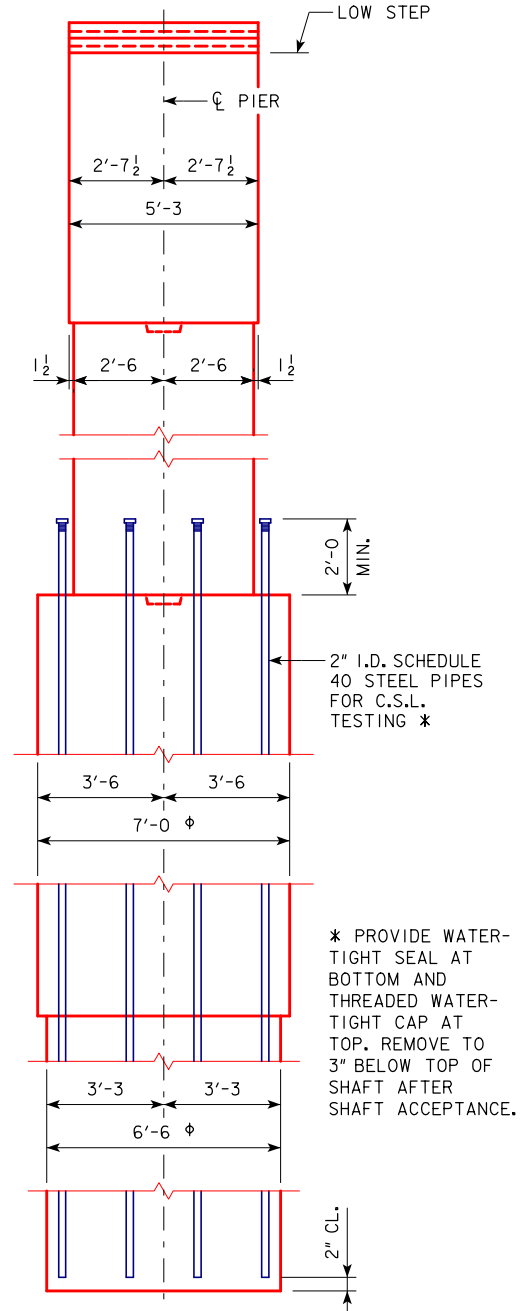
PIER CAP PLAN (PIER NO. 4)



PIER ELEVATION (PIER NO. 4)  
(LOOKING EAST)

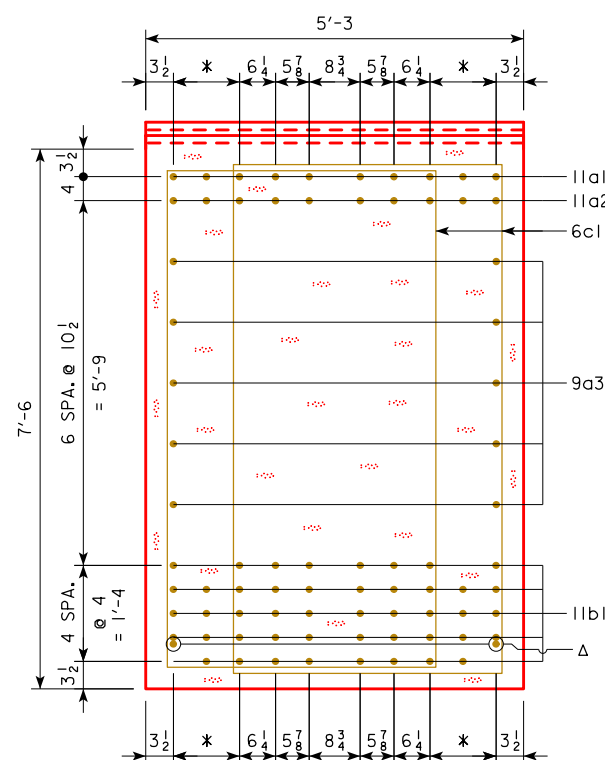
BENCH MARK NO. 321: STA. 373+43.92, 34.60' RT. SET FENO MON, ELEV 722.66  
BENCH MARK NO. 322: STA. 408+77.97, 276.45' LT. SET FENO MON, ELEV 726.92

**PIER NOTES:**  
FOR SECTION A-A, SECTION B-B, AND END VIEW REINFORCING, SEE DESIGN SHEET 12.  
FOR SECTIONS OF 60" COLUMN AND 84" DRILLED SHAFT, SEE DESIGN SHEET 12.

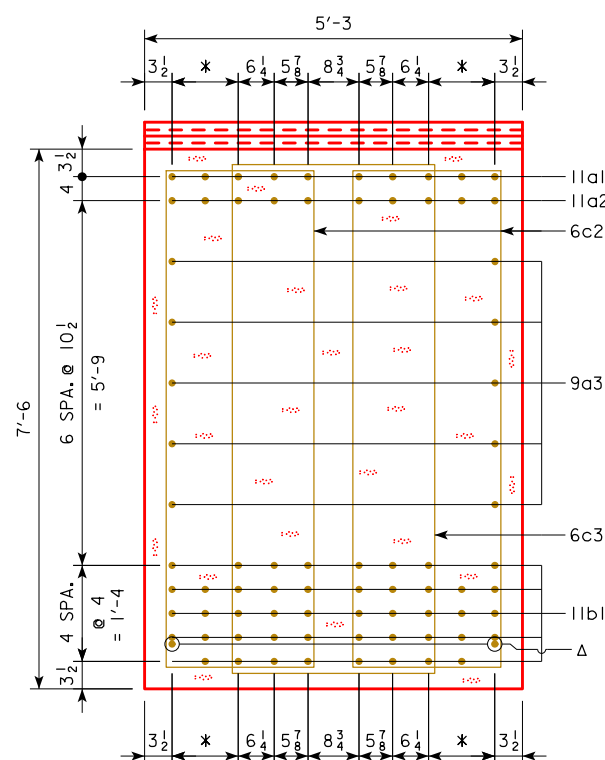


END ELEVATION

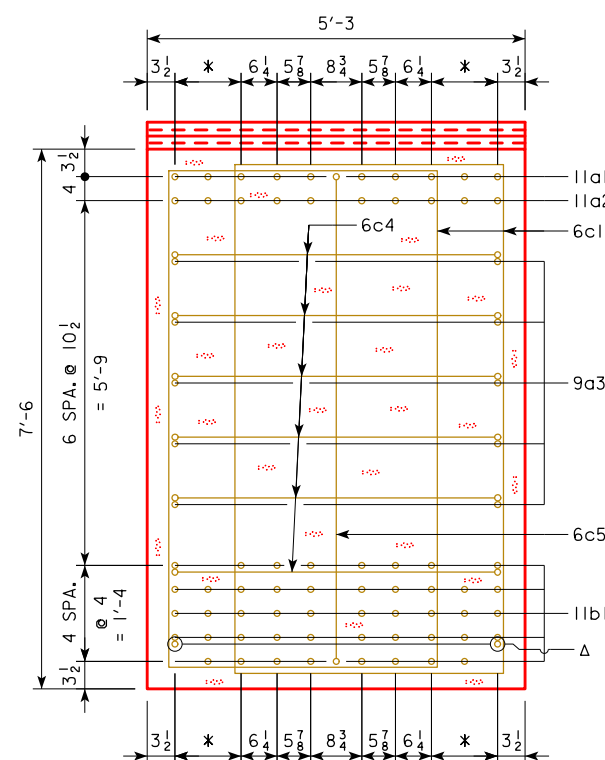
DESIGN FOR 0° SKEW  
**1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
111' END SPANS 152' INTERIOR SPANS  
**FIXED PIER DETAILS**  
STA. 389+39.66 MARCH, 2021  
**LINN COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 11 OF 54 FILE NO. 31598 DESIGN NO. 220



SECTION A-A

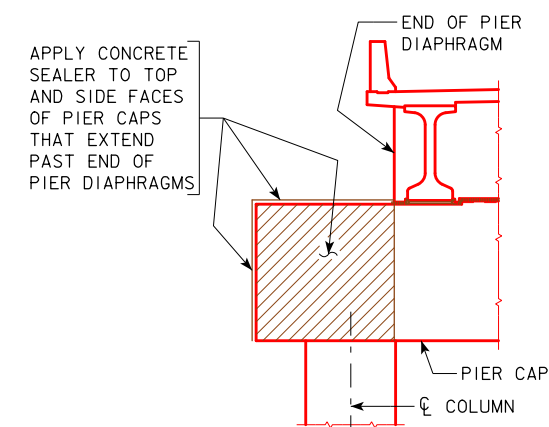


SECTION B-B

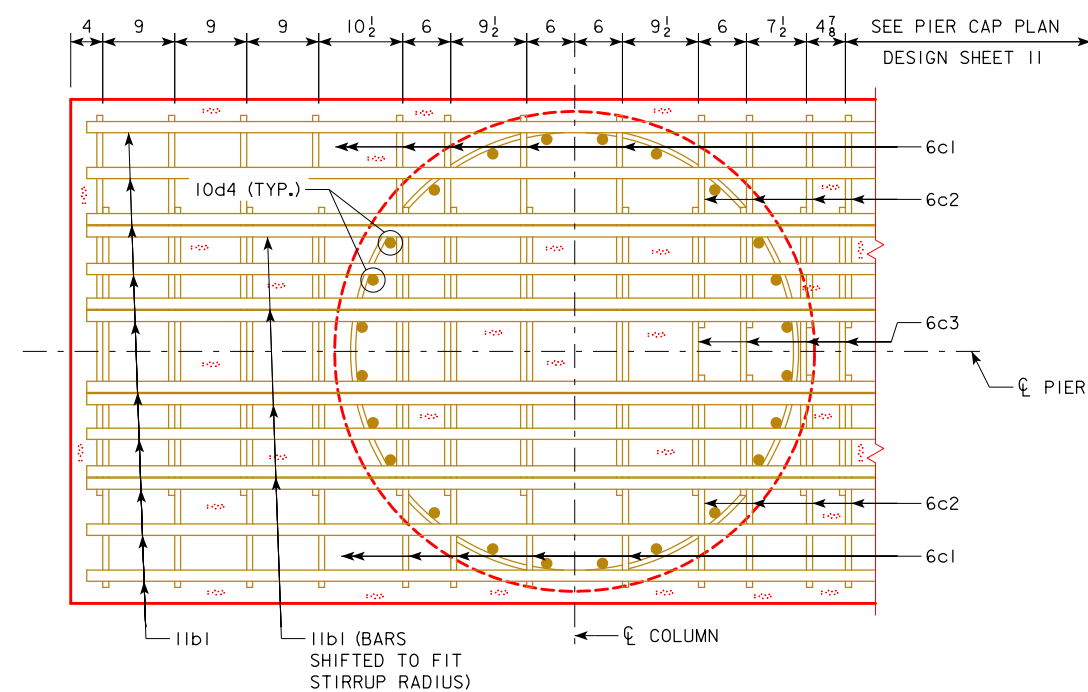


CAP END VIEW

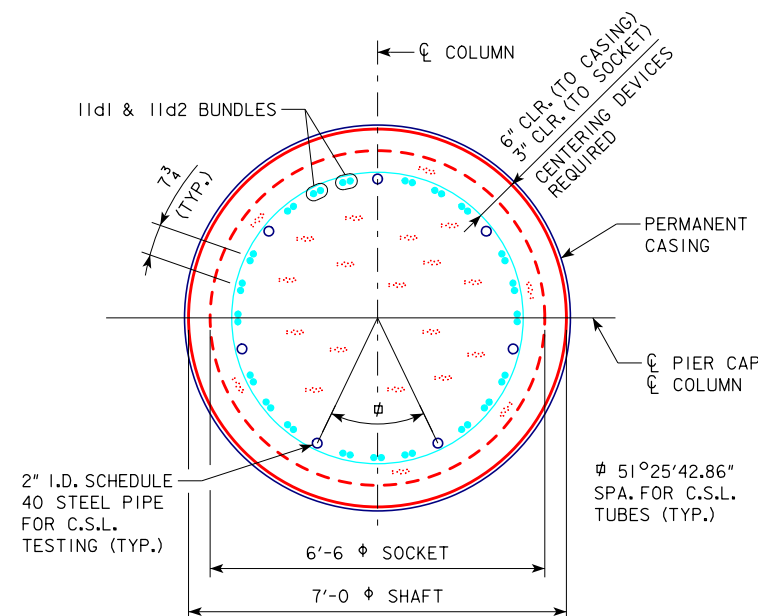
NOTES:  
 \* 2 SPA. @ 5 3/4" = 11 1/2"  
 Δ 11b1 BARS FROM OUTER LAYER BUNDLED WITH SECOND LAYER 11b1 BARS AS SHOWN TO AID IN CONSTRUCTABILITY.  
 CONTRACTOR TO PROVIDE SUPPORT BARS FOR 11a2 AND INNER ROW 11b1 BARS AT 4'-0" MAX. INTERVALS. COST OF SUPPORT BARS SHALL BE INCIDENTAL TO BID ITEM FOR "REINFORCING STEEL, EPOXY COATED."



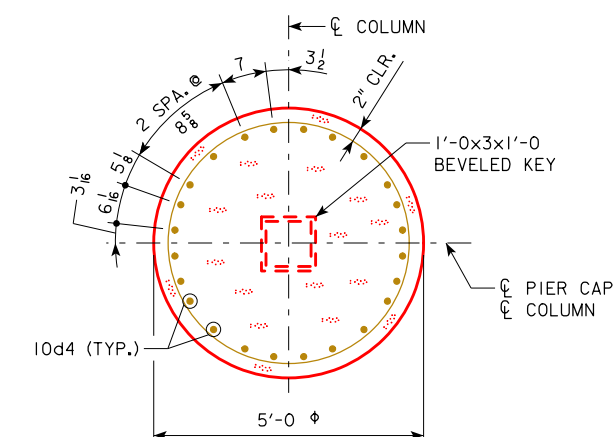
PIER CAP CONCRETE SEALER DETAIL



CAP END REINFORCING DETAIL  
 (SHOWING BOTTOM LAYER OF LONGITUDINAL REINFORCING)



SECTION THROUGH 84" DRILLED SHAFT



NOTE: REINFORCING LAYOUT SYMMETRICAL ABOUT COLUMNS.

SECTION THROUGH 60" PIER COLUMN

DESIGN FOR 0° SKEW  
**1,134'-0" X 40'-0" PRETENSIONED  
 PRESTRESSED CONCRETE BEAM BRIDGE**  
 111' END SPANS 152' INTERIOR SPANS  
**FIXED PIER DETAILS**  
 STA. 389+39.66 MARCH, 2021  
**LINN COUNTY**  
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
 DESIGN SHEET NO. 12 OF 54 FILE NO. 31598 DESIGN NO. 220

PIER NOTES:

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 INCHES UNLESS OTHERWISE NOTED OR SHOWN.

REINFORCING SHALL BE SECURELY WIRED IN PLACE BEFORE CONCRETE IS PLACED. NO EXCEPTIONS TO THIS REQUIREMENT SHALL BE PERMITTED.

SPIRAL REINFORCING IS TO BE NO. #5 BAR (COLUMNS) AND #6 BAR (SHAFTS), WITH 0.625" AND 0.750" DIAMETERS, RESPECTIVELY, WITH PITCHES AS SHOWN IN THESE PLANS. PLACE 4 EQUALLY SPACED  $1 \times 1 \times \frac{1}{8}$  SPACERS PUNCHED TO HOLD SPIRALS. SPIRALS ARE TO HAVE  $1\frac{1}{2}$  EXTRA TURNS AT TOP AND BOTTOM COLUMNS AND SHAFTS.

THE SPIRAL REINFORCING FOR THE COLUMNS AND DRILLED SHAFTS MAY BE SPLICED BY LAPPING 3'-1 (#5 BAR) OR 3'-8 (#6 BAR). THE LENGTH OF THE SPIRAL SHOWN DOES NOT INCLUDE THE LAPPED LENGTH OF THE SPLICES. THE COST OF THE LAPS AT SPLICES IS TO BE INCLUDED IN THE PRICE BID FOR THE OTHER REINFORCEMENT.

THE SPIRAL REINFORCING MAY BE SUBSTITUTED WITH CIRCULAR TIES SPACED AT THE SAME INTERVALS AS THE SPIRAL REINFORCING NOTED IN THESE PLANS. PAYMENT WILL BE BASED ON THE WEIGHT OF THE SPIRAL REINFORCEMENT. NO ADJUSTMENTS IN REINFORCING STEEL PAY WEIGHT WILL BE ALLOWED. SEE BENT BAR DETAILS FOR BAR SIZE AND SPLICE LAP LENGTH.

ARTICLE 415I.03, A, 2, OF THE STANDARD SPECIFICATIONS SHALL NOT BE PERMITTED FOR SPIRAL REINFORCEMENT.

THE 10d3 AND 10d4 BARS IN THE PIER CAPS SHALL BE SPLICED AT THE LOCATIONS SHOWN USING MECHANICAL SPLICE ASSEMBLIES. MECHANICAL SPLICE ASSEMBLIES CONSIST OF MECHANICAL SPLICERS AND REINFORCING SPLICE BARS AS REQUIRED TO FACILITATE THE USE OF THE MECHANICAL SPLICER. THE MECHANICAL SPLICE ASSEMBLY USED SHALL MEET THE REQUIREMENTS OF MATERIALS I.M. 45I APPENDIX E. REINFORCING SPLICE BARS SHALL BE A MINIMUM OF 1.270 INCH DIAMETERS FOR 10d BARS.

ALL MECHANICAL SPLICE ASSEMBLIES TO BE USED IN SPLICING 10d BARS IN THE PIER CAPS SHALL BE EPOXY COATED.

THE COST OF ALL SPLICE ASSEMBLIES IS TO BE INCLUDED IN THE PRICE BID FOR "REINFORCING STEEL, EPOXY COATED" AND NO SEPARATE PAYMENT WILL BE MADE. THE WEIGHT OF MECHANICAL SPLICE ASSEMBLIES IS NOT INCLUDED IN THE QUANTITY SHOWN FOR "REINFORCING STEEL, EPOXY COATED." A TOTAL OF 288 SPLICE ASSEMBLIES WILL BE REQUIRED.

CONCRETE SEALER IS TO BE APPLIED TO THE PIER CAPS AS SHOWN ON THIS SHEET AND IN ACCORDANCE WITH THE CURRENT IOWA D.O.T. STANDARD SPECIFICATIONS.

THE COST OF FURNISHING AND PLACING CONCRETE SEALER IS TO BE INCLUDED IN THE PRICE BID FOR "HIGH PERFORMANCE STRUCTURAL CONCRETE."

DRILLED SHAFT NOTES:

THE DRILLED SHAFTS ARE DESIGNED TO SUPPORT A MAXIMUM FACTORED AXIAL LOAD OF 2560 KIPS AT THE TOP OF THE SHAFT. AXIAL RESISTANCE IS INTENDED TO BE DEVELOPED THROUGH SKIN FRICTION BETWEEN THE SHAFT AND THE DOLOSTONE AND LIMESTONE MATERIALS INDICATED IN THE SOIL BORING LOGS. MINIMUM ROCK SOCKET DEPTH INTO COMPETENT DOLOSTONE AND/OR LIMESTONE MATERIALS SHALL BE AS SHOWN ON DESIGN SHEET 14. IF DIFFERING SITE CONDITIONS ARE ENCOUNTERED, ADJUSTMENT TO THE CONTRACT LENGTH MAY BE REQUIRED.

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

A CONSTRUCTION JOINT IS PERMITTED NEAR THE TOP OF THE SHAFT TO FACILITATE ACCURATE PLACEMENT OF THE 10d4 COLUMN BARS. ANY CONTAMINATED AND/OR UNSOUND CONCRETE RESULTING FROM THE FIRST CONCRETE PLACEMENT SHALL BE REMOVED TO ESTABLISH A SOUND INTERFACE AT THE CONSTRUCTION JOINT. THE CONSTRUCTION JOINT INTERFACE AND PROJECTING REINFORCING BARS AND CSL TUBES SHALL BE CLEANED TO THE EXTENT PRACTICABLE PRIOR TO PLACEMENT OF CONCRETE ABOVE THE JOINT.

THE PRICE BID FOR "CONCRETE DRILLED SHAFT, 72 IN. DIAMETER" AND "CONCRETE DRILLED SHAFT, 84 IN. DIAMETER" SHALL INCLUDE ALL COSTS OF MATERIALS AND LABOR FOR EXCAVATION AND CONCRETE PLACEMENT (INCLUDING THE COST OF ADDITIONAL EXCAVATION AND CONCRETE PLACEMENT FOR THE OVERSIZED, CASIED PORTION OF THE SHAFT), AND ALL COSTS FOR C.S.L. TESTING.

DRILLED SHAFTS SHALL BE CONSTRUCTED WITH OVERSIZED PERMANENT CASING (NOMINAL DIAMETERS OF 72 IN. FOR EXPANSION PIERS AND 84 IN. FOR THE FIXED PIER), TO THE TOP OF DESIGN ROCK SOCKET. CASING SHALL BE DESIGNED BY THE CONTRACTOR AND SHALL HAVE A MINIMUM WALL THICKNESS OF  $\frac{1}{2}$ ". THE PRICE FOR "DRILLED SHAFT, 72 IN. DIAMETER" AND "DRILLED SHAFT, 84 IN. DIAMETER" SHALL INCLUDE THE COST OF ALL MATERIAL AND LABOR FOR THE INSTALLATION OF THE PERMANENT CASING.

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

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

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

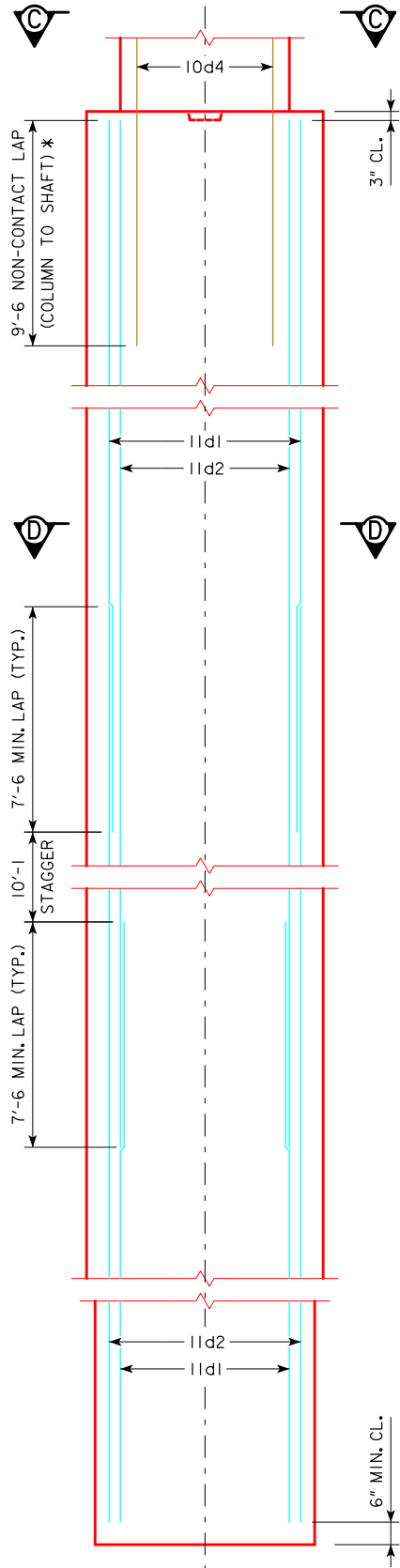
CONTRACTOR MAY ELECT TO REMOVE A PORTION OF THE EXISTING DECK OVERHANG TO FACILITATE SHAFT INSTALLATION. SEE DESIGN SHEET 17 FOR DETAILS.

DEMONSTRATION SHAFT NOTES:

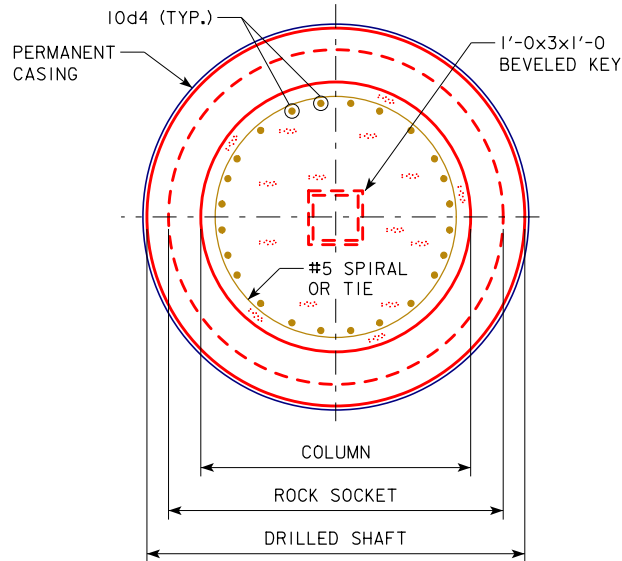
DEMONSTRATION SHAFT SHALL CONFORM TO DETAILS FOR THE 72 INCH DIAMETER DRILLED SHAFT ON DESIGNS SHEETS 9, 10, & 13. DEMONSTRATION SHAFT SHALL BE CONSTRUCTED AT THE LOCATION SHOWN ON DESIGN SHEET 8, AND TO THE ELEVATIONS SHOWN ON DESIGN SHEET 14. LENGTH OF ROCK SOCKET SHALL BE DETERMINED BY A BORING AT THE LOCATION OF THE DEMONSTRATION SHAFT.

THE PORTION OF THE DEMONSTRATION SHAFT BELOW ELEV. 676.44 MAY REMAIN IN PLACE.

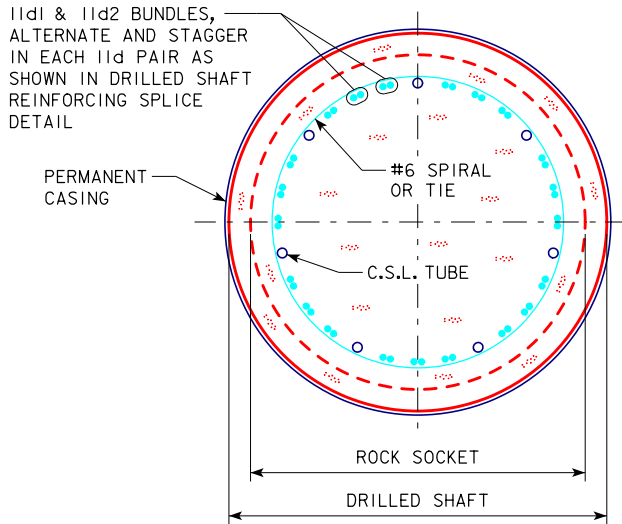
ALL COSTS NOTED AS SUBSIDIARY TO "CONCRETE DRILLED SHAFT, 72 IN. DIAMETER" SHALL ALSO BE SUBSIDIARY TO THE BID ITEM "DEMONSTRATION SHAFT."



\* NON-CONTACT LAP SPLICE NOTE:  
MINIMUM LENGTH OF COLUMN-TO-SHAFT  
REINFORCING LAP IS 9'-6. COLUMN CAGE  
MUST BE SUPPORTED AND TIED TO SHAFT  
CAGE OR POSITIVELY SECURED BY OTHER  
MEANS TO PREVENT SHIFTING OF COLUMN  
CAGE DURING CONCRETE PLACEMENT.



SECTION C-C

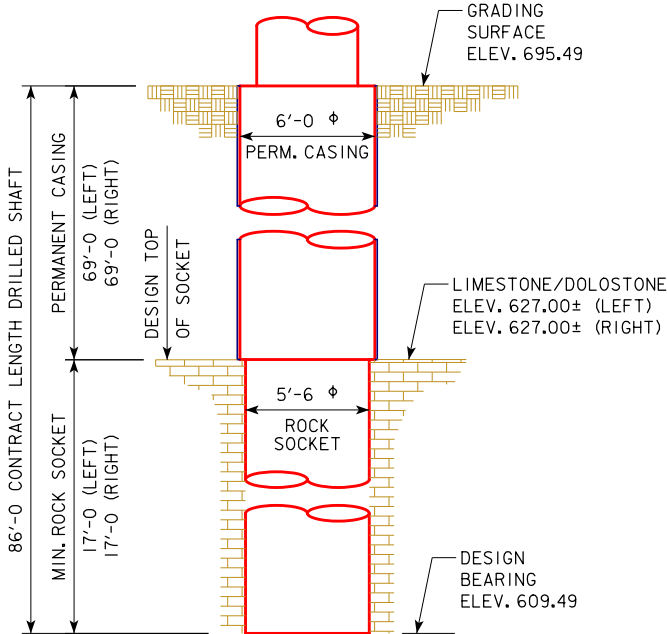


SECTION D-D

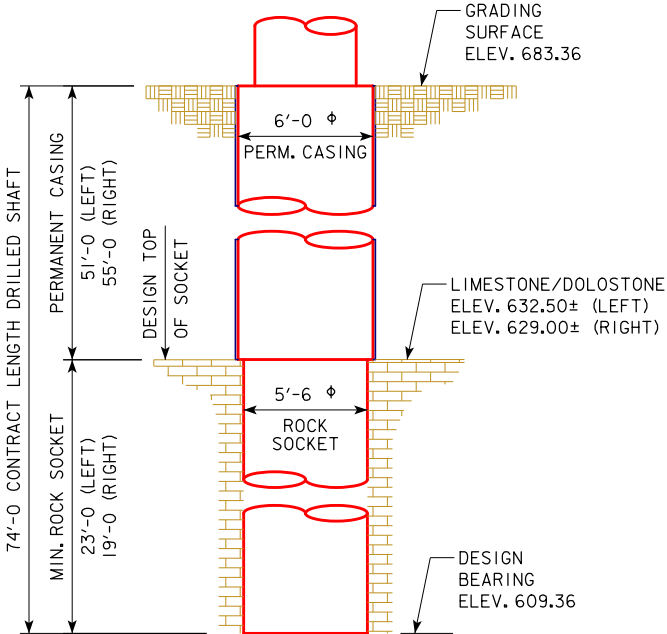
DRILLED SHAFT REINFORCING  
SPLICE DETAIL

DESIGN FOR 0° SKEW  
**1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
111' END SPANS 152' INTERIOR SPANS  
**PIER DETAILS & NOTES**  
STA. 389+39.66 MARCH, 2021  
**LINN COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 13 OF 54 FILE NO. 31598 DESIGN NO. 220

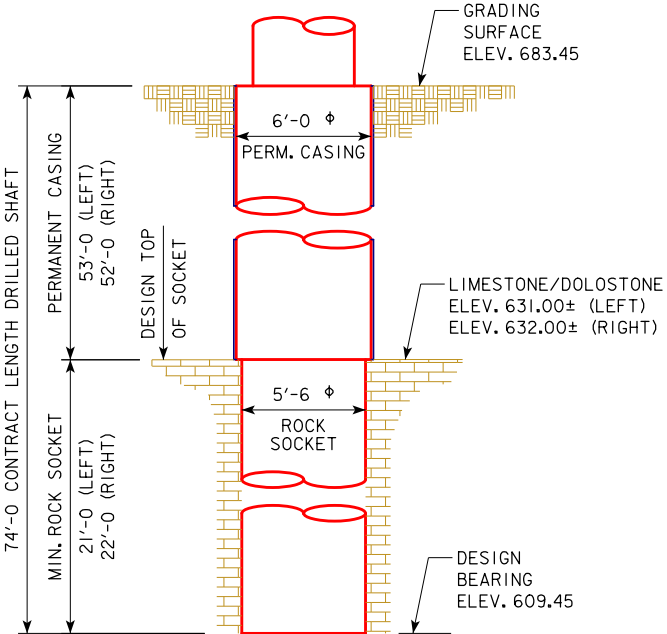
BENCH MARK NO. 321: STA. 373+43.92, 34.60' RT. SET FENO MON, ELEV 722.66  
BENCH MARK NO. 322: STA. 408+77.97, 276.45' LT. SET FENO MON, ELEV 726.92



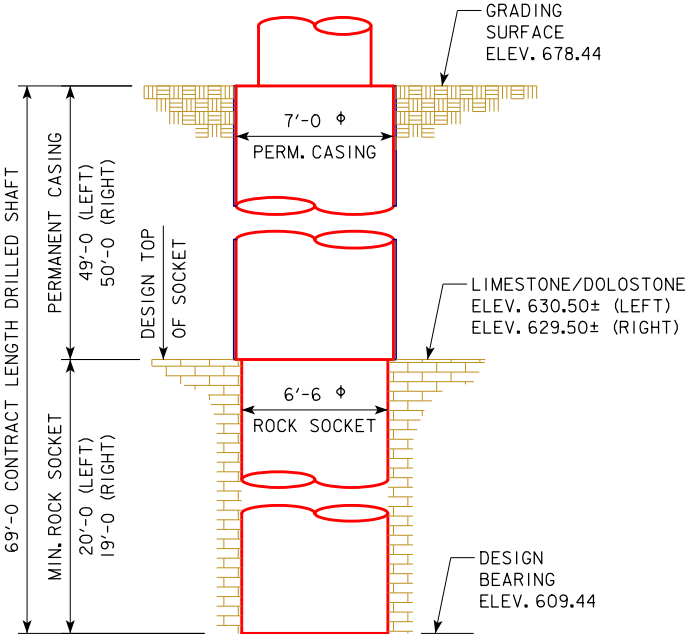
PIER 1



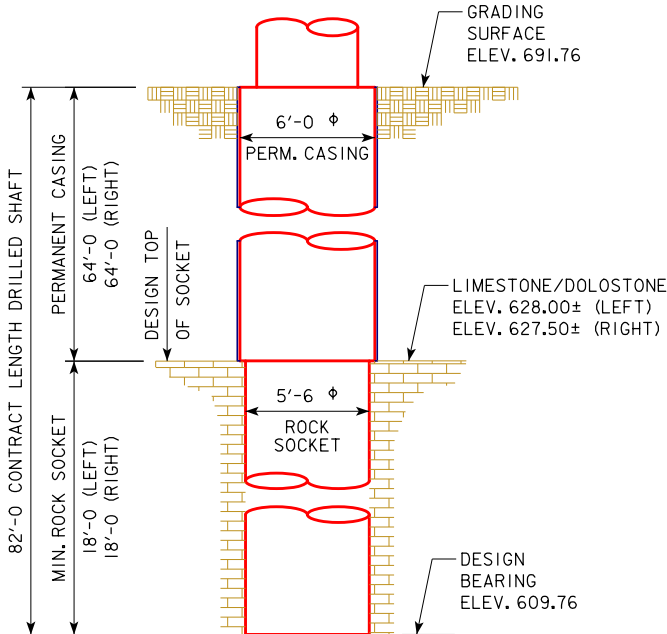
PIER 2



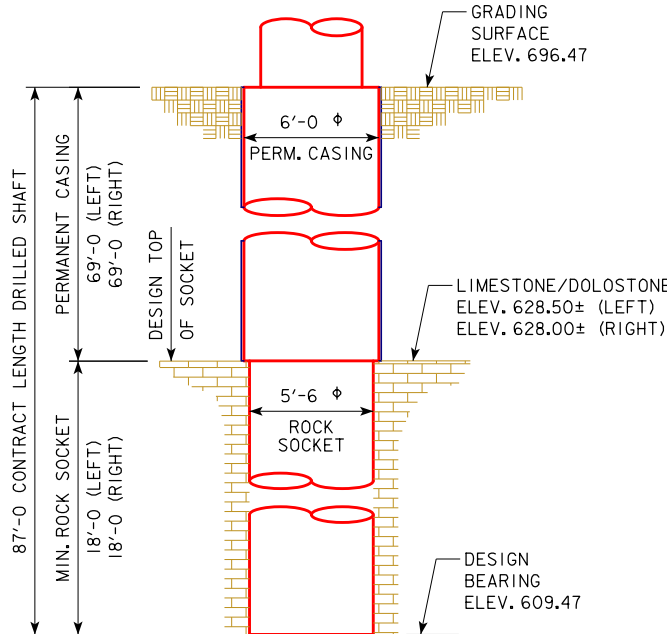
PIER 3



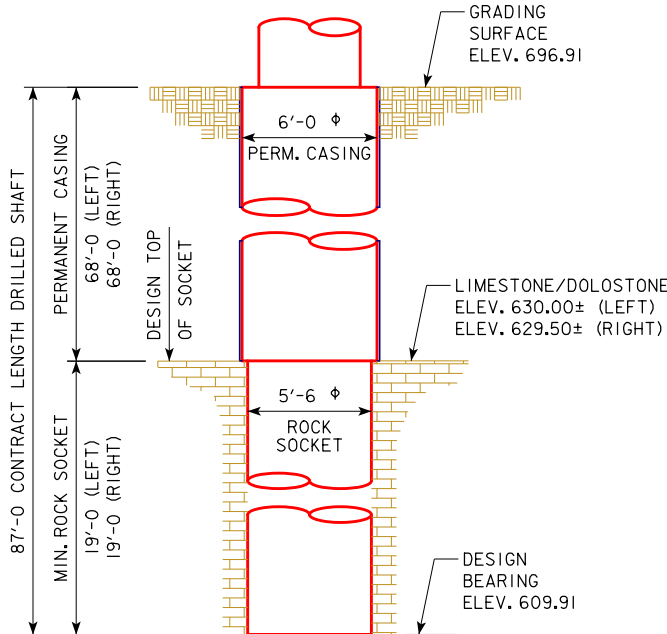
PIER 4



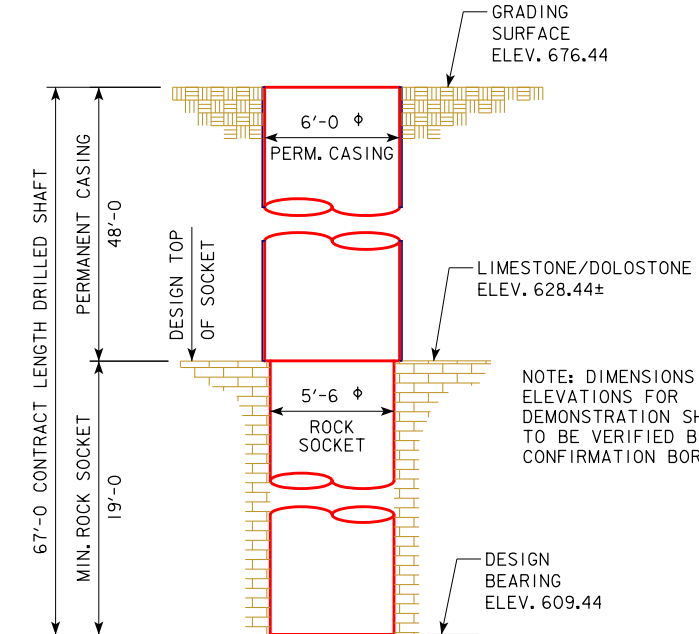
PIER 5



PIER 6



PIER 7



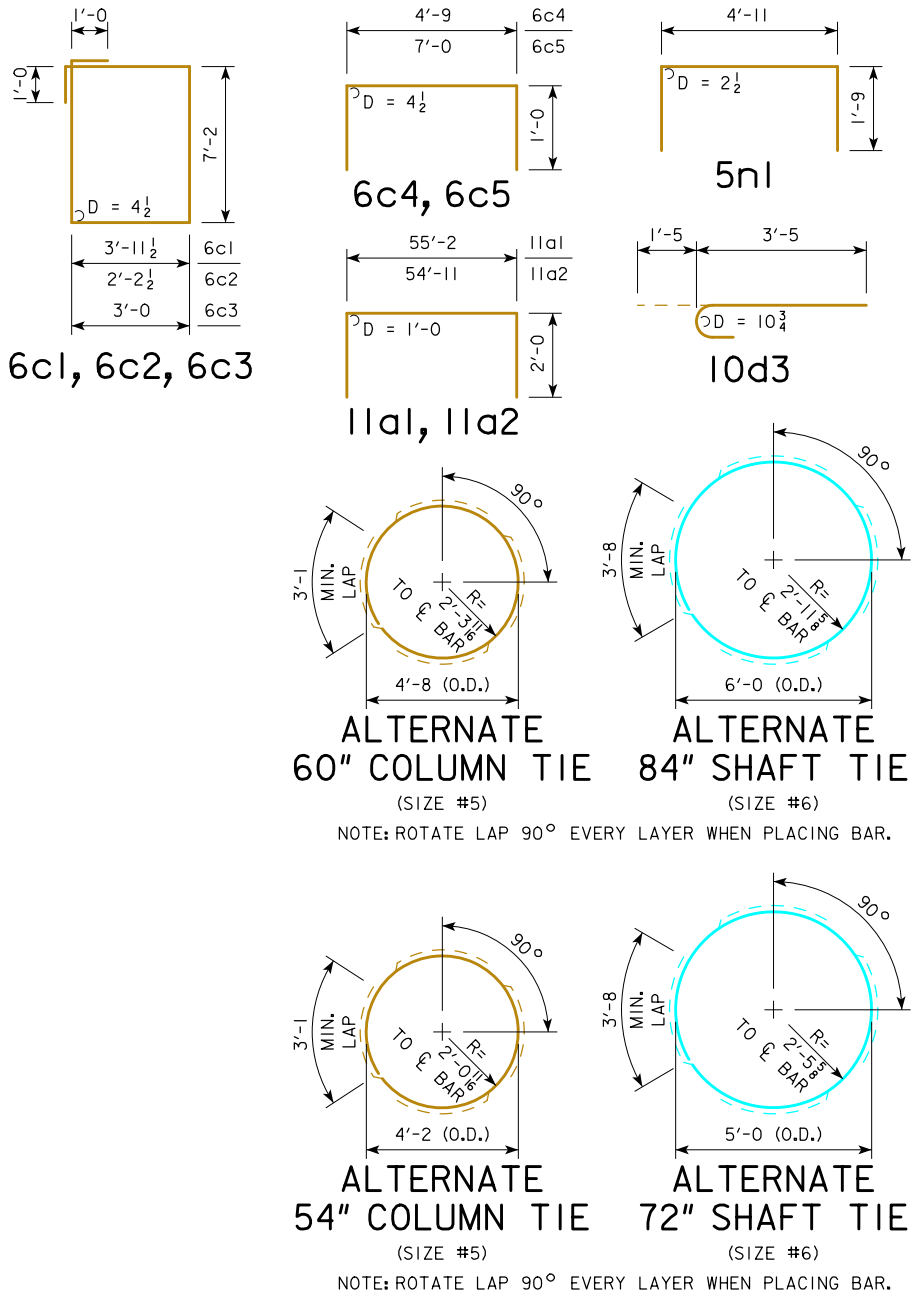
DEMONSTRATION SHAFT

NOTE: LEFT AND RIGHT NOTE THE SHAFT FOR  
A GIVEN PIER WHEN VIEWED LOOKING UPSTATION.

DESIGN FOR 0° SKEW  
**1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
111' END SPANS 152' INTERIOR SPANS  
**PIER DETAILS**  
STA. 389+39.66 MARCH, 2021  
**LINN COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 14 OF 54 FILE NO. 31598 DESIGN NO. 220



BENT BAR DETAILS



REINFORCING BAR LIST - PIER NO.1

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
11a1	CAP, TOP, LONGIT.		10	59'-2	3144
11a2	CAP, TOP, LONGIT.		10	58'-11	3130
9a3	CAP, SIDES, LONGIT.		10	55'-2	1876
11b1	CAP, BOTTOM, LONGIT.		48	55'-2	14069
6c1	CAP, HOOPS		124	24'-3	4517
6c2	CAP, HOOPS		44	20'-9	1371
6c3	CAP, HOOPS		22	22'-4	738
6c4	CAP, ENDS, HORIZ.		12	6'-9	122
6c5	CAP, ENDS, VERTICAL		2	9'-0	27
10d3	COLUMN, VERTICAL, IN CAP		40	4'-10	832
10d4	COLUMN, VERTICAL		40	23'-6	4045
5m1	CAP STEP, LONGIT.		15	3'-6	55
5n1	CAP STEP, TRANSV.		12	8'-5	105
#5	COLUMN SPIRAL		2	341'-4	712
	SPIRAL SPACERS 11x11x1/8 (0.80 LB./FT.)		8	19'-6	125
REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)					34,868
11d1	SHAFT, VERTICAL		72	37'-7	14377
11d2	SHAFT, VERTICAL		72	55'-2	21103
#6	SHAFT SPIRAL		2	1489'-2	4473
	SPIRAL SPACERS 11x11x1/8 (0.80 LB./FT.)		8	85'-3	546
REINFORCING STEEL NON-EPOXY COATED - TOTAL (LBS.)					40,499
CONCRETE PLACEMENT SUMMARY					
CONCRETE					TOTAL (CY)
CAP AND STEPS - HIGH PERFORMANCE STRUCTURAL CONCRETE					82.6
COLUMNS - STRUCTURAL CONCRETE (BRIDGE)					11.8

NOTE:

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

REINFORCING BAR LIST - PIER NO.2

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
11a1	CAP, TOP, LONGIT.		10	59'-2	3144
11a2	CAP, TOP, LONGIT.		10	58'-11	3130
9a3	CAP, SIDES, LONGIT.		10	55'-2	1876
11b1	CAP, BOTTOM, LONGIT.		48	55'-2	14069
6c1	CAP, HOOPS		124	24'-3	4517
6c2	CAP, HOOPS		44	20'-9	1371
6c3	CAP, HOOPS		22	22'-4	738
6c4	CAP, ENDS, HORIZ.		12	6'-9	122
6c5	CAP, ENDS, VERTICAL		2	9'-0	27
10d3	COLUMN, VERTICAL, IN CAP		40	4'-10	832
10d4	COLUMN, VERTICAL		40	36'-6	6282
5m1	CAP STEP, LONGIT.		15	3'-6	55
5n1	CAP STEP, TRANSV.		12	8'-5	105
#5	COLUMN SPIRAL		2	542'-11	1133
	SPIRAL SPACERS 11x11x1/8 (0.80 LB./FT.)		8	32'-6	208
REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)					37,609
11d1	SHAFT, VERTICAL		72	31'-7	12082
11d2	SHAFT, VERTICAL		72	49'-2	18808
#6	SHAFT SPIRAL		2	1286'-1	3863
	SPIRAL SPACERS 11x11x1/8 (0.80 LB./FT.)		8	73'-3	469
REINFORCING STEEL NON-EPOXY COATED - TOTAL (LBS.)					35,222
CONCRETE PLACEMENT SUMMARY					
CONCRETE					TOTAL (CY)
CAP AND STEPS - HIGH PERFORMANCE STRUCTURAL CONCRETE					82.6
COLUMNS - STRUCTURAL CONCRETE (BRIDGE)					27.1

DESIGN FOR 0° SKEW

1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

111' END SPANS152' INTERIOR SPANS

PIER DETAILS




















STA. 389+39.66MARCH, 2021

LINN COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION





















DESIGN SHEET NO. 15 OF 54FILE NO. 31598DESIGN NO. 220






















REINFORCING BAR LIST - PIER NO. 3						
EPOXY COATED	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
	11a1	CAP, TOP, LONGIT.		10	59'-2	3144
	11a2	CAP, TOP, LONGIT.		10	58'-11	3130
	9a3	CAP, SIDES, LONGIT.		10	55'-2	1876
	11b1	CAP, BOTTOM, LONGIT.		48	55'-2	14069
	6c1	CAP, HOOPS		124	24'-3	4517
	6c2	CAP, HOOPS		44	20'-9	1371
	6c3	CAP, HOOPS		22	22'-4	738
	6c4	CAP, ENDS, HORIZ.		12	6'-9	122
	6c5	CAP, ENDS, VERTICAL		2	9'-0	27
	10d3	COLUMN, VERTICAL, IN CAP		40	4'-10	832
	10d4	COLUMN, VERTICAL		40	37'-3	6411
	5m1	CAP STEP, LONGIT.		15	3'-6	55
	5n1	CAP STEP, TRANSV.		12	8'-5	105
#5	COLUMN SPIRAL		2	554'-7	1157	
	SPIRAL SPACERS 11x1x1/8 (0.80 LB./FT.)		8	33'-3	213	
REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)						37,767
NON-EPOXY						
	11d1	SHAFT, VERTICAL		72	31'-7	12082
	11d2	SHAFT, VERTICAL		72	49'-2	18808
	#6	SHAFT SPIRAL		2	1286'-1	3863
		SPIRAL SPACERS 11x1x1/8 (0.80 LB./FT.)		8	73'-3	469
REINFORCING STEEL NON-EPOXY COATED - TOTAL (LBS.)						35,222
CONCRETE PLACEMENT SUMMARY						
CONCRETE					TOTAL (CY)	
CAP AND STEPS - HIGH PERFORMANCE STRUCTURAL CONCRETE					82.6	
COLUMNS - STRUCTURAL CONCRETE (BRIDGE)					28.0	

NOTE:

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

REINFORCING BAR LIST - PIER NO. 4						
EPOXY COATED	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
	11a1	CAP, TOP, LONGIT.		10	59'-2	3144
	11a2	CAP, TOP, LONGIT.		10	58'-11	3130
	9a3	CAP, SIDES, LONGIT.		10	55'-2	1876
	9a4	CAP, TOP, DOWELS INTO DIAPHRAGM		36	7'-0	857
	11b1	CAP, BOTTOM, LONGIT.		48	55'-2	14069
	6c1	CAP, HOOPS		124	24'-3	4517
	6c2	CAP, HOOPS		44	20'-9	1371
	6c3	CAP, HOOPS		22	22'-4	738
	6c4	CAP, ENDS, HORIZ.		12	6'-9	122
	6c5	CAP, ENDS, VERTICAL		2	9'-0	27
	10d3	COLUMN, VERTICAL, IN CAP		48	4'-10	998
	10d4	COLUMN, VERTICAL		48	43'-0	8881
	5m1	CAP STEP, LONGIT.		15	3'-6	55
5n1	CAP STEP, TRANSV.		12	8'-5	105	
#5	COLUMN SPIRAL		2	797'-5	1663	
	SPIRAL SPACERS 11x1x1/8 (0.80 LB./FT.)		8	39'-0	250	
REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)						41,803
NON-EPOXY						
	11d1	SHAFT, VERTICAL		84	29'-1	12980
	11d2	SHAFT, VERTICAL		84	46'-8	20827
	#6	SHAFT SPIRAL		2	1753'-5	5267
		SPIRAL SPACERS 11x1x1/8 (0.80 LB./FT.)		8	68'-3	437
REINFORCING STEEL NON-EPOXY COATED - TOTAL (LBS.)						39,511
CONCRETE PLACEMENT SUMMARY						
CONCRETE					TOTAL (CY)	
CAP AND STEPS - HIGH PERFORMANCE STRUCTURAL CONCRETE					82.6	
COLUMNS - STRUCTURAL CONCRETE (BRIDGE)					42.9	

REINFORCING BAR LIST - PIER NO. 5						
EPOXY COATED	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
	11a1	CAP, TOP, LONGIT.		10	59'-2	3144
	11a2	CAP, TOP, LONGIT.		10	58'-11	3130
	9a3	CAP, SIDES, LONGIT.		10	55'-2	1876
	11b1	CAP, BOTTOM, LONGIT.		48	55'-2	14069
	6c1	CAP, HOOPS		124	24'-3	4517
	6c2	CAP, HOOPS		44	20'-9	1371
	6c3	CAP, HOOPS		22	22'-4	738
	6c4	CAP, ENDS, HORIZ.		12	6'-9	122
	6c5	CAP, ENDS, VERTICAL		2	9'-0	27
	10d3	COLUMN, VERTICAL, IN CAP		40	4'-10	832
	10d4	COLUMN, VERTICAL		40	29'-3	5035
	5m1	CAP STEP, LONGIT.		15	3'-6	55
	5n1	CAP STEP, TRANSV.		12	8'-5	105
#5	COLUMN SPIRAL		2	430'-6	898	
	SPIRAL SPACERS 11x1x1/8 (0.80 LB./FT.)		8	25'-3	162	
REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)						36,081
NON-EPOXY						
	11d1	SHAFT, VERTICAL		72	35'-7	13612
	11d2	SHAFT, VERTICAL		72	53'-2	20338
	#6	SHAFT SPIRAL		2	1421'-6	4270
		SPIRAL SPACERS 11x1x1/8 (0.80 LB./FT.)		8	81'-3	520
REINFORCING STEEL NON-EPOXY COATED - TOTAL (LBS.)						38,740
CONCRETE PLACEMENT SUMMARY						
CONCRETE					TOTAL (CY)	
CAP AND STEPS - HIGH PERFORMANCE STRUCTURAL CONCRETE					82.6	
COLUMNS - STRUCTURAL CONCRETE (BRIDGE)					18.6	

DESIGN FOR 0° SKEW

1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

111' END SPANS152' INTERIOR SPANS




















PIER DETAILS

STA. 389+39.66MARCH, 2021




















LINN COUNTY





IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

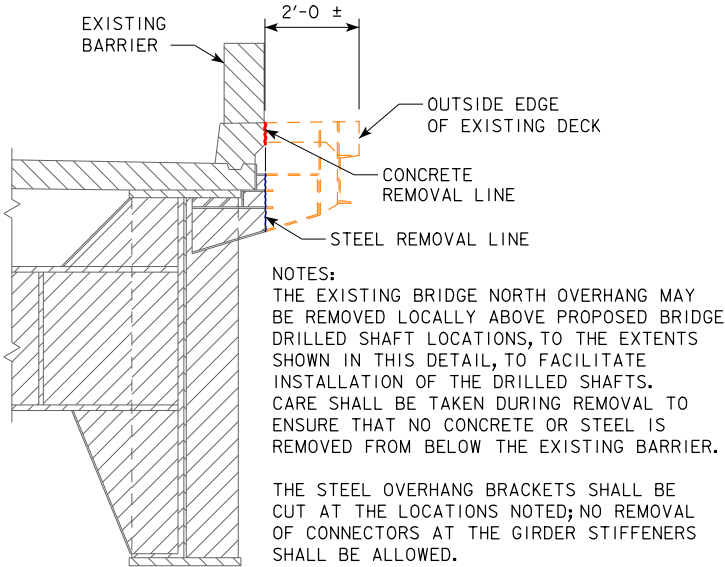
DESIGN SHEET NO. 16 OF 54FILE NO. 31598DESIGN NO. 220

REINFORCING BAR LIST - PIER NO. 6						
EPOXY COATED	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
	11a1	CAP, TOP, LONGIT.		10	59'-2	3144
	11a2	CAP, TOP, LONGIT.		10	58'-11	3130
	9a3	CAP, SIDES, LONGIT.		10	55'-2	1876
	11b1	CAP, BOTTOM, LONGIT.		48	55'-2	14069
	6c1	CAP, HOOPS		124	24'-3	4517
	6c2	CAP, HOOPS		44	20'-9	1371
	6c3	CAP, HOOPS		22	22'-4	738
	6c4	CAP, ENDS, HORIZ.		12	6'-9	122
	6c5	CAP, ENDS, VERTICAL		2	9'-0	27
	10d3	COLUMN, VERTICAL, IN CAP		40	4'-10	832
	10d4	COLUMN, VERTICAL		40	24'-0	4131
	5m1	CAP STEP, LONGIT.		15	3'-6	55
	5n1	CAP STEP, TRANSV.		12	8'-5	105
	#5	COLUMN SPIRAL		2	349'-1	728
		SPIRAL SPACERS 11x11x1/8 (0.80 LB./FT.)		8	20'-0	128
REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)						34,973
NON-EPOXY	11d1	SHAFT, VERTICAL		72	38'-1	14568
	11d2	SHAFT, VERTICAL		72	55'-8	21295
	#6	SHAFT SPIRAL		2	1506'-1	4524
		SPIRAL SPACERS 11x11x1/8 (0.80 LB./FT.)		8	86'-3	552
REINFORCING STEEL NON-EPOXY COATED - TOTAL (LBS.)						40,939
CONCRETE PLACEMENT SUMMARY						
CONCRETE					TOTAL (CY)	
CAP AND STEPS - HIGH PERFORMANCE STRUCTURAL CONCRETE					82.6	
COLUMNS - STRUCTURAL CONCRETE (BRIDGE)					12.4	

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

REINFORCING BAR LIST - PIER NO. 7						
EPOXY COATED	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
	11a1	CAP, TOP, LONGIT.		10	59'-2	3144
	11a2	CAP, TOP, LONGIT.		10	58'-11	3130
	9a3	CAP, SIDES, LONGIT.		10	55'-2	1876
	11b1	CAP, BOTTOM, LONGIT.		48	55'-2	14069
	6c1	CAP, HOOPS		124	24'-3	4517
	6c2	CAP, HOOPS		44	20'-9	1371
	6c3	CAP, HOOPS		22	22'-4	738
	6c4	CAP, ENDS, HORIZ.		12	6'-9	122
	6c5	CAP, ENDS, VERTICAL		2	9'-0	27
	10d3	COLUMN, VERTICAL, IN CAP		40	4'-10	832
	10d4	COLUMN, VERTICAL		40	23'-0	3959
	5m1	CAP STEP, LONGIT.		15	3'-6	55
	5n1	CAP STEP, TRANSV.		12	8'-5	105
	#5	COLUMN SPIRAL		2	333'-6	696
		SPIRAL SPACERS 11x11x1/8 (0.80 LB./FT.)		8	19'-0	122
REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)						34,763
NON-EPOXY	11d1	SHAFT, VERTICAL		72	38'-1	14568
	11d2	SHAFT, VERTICAL		72	55'-8	21295
	#6	SHAFT SPIRAL		2	1506'-1	4524
		SPIRAL SPACERS 11x11x1/8 (0.80 LB./FT.)		8	86'-3	552
REINFORCING STEEL NON-EPOXY COATED - TOTAL (LBS.)						40,939
CONCRETE PLACEMENT SUMMARY						
CONCRETE					TOTAL (CY)	
CAP AND STEPS - HIGH PERFORMANCE STRUCTURAL CONCRETE					82.6	
COLUMNS - STRUCTURAL CONCRETE (BRIDGE)					11.2	

REINFORCING BAR LIST - DEMONSTRATION SHAFT						
NON-EPOXY	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
	11d1	SHAFT, VERTICAL		36	28'-1	5371
	11d2	SHAFT, VERTICAL		36	45'-8	8735
	#6	SHAFT SPIRAL		1	1167'-8	1754
		SPIRAL SPACERS 11x11x1/8 (0.80 LB./FT.)		4	66'-3	212
REINFORCING STEEL NON-EPOXY COATED - TOTAL (LBS.)						16,072



DESIGN FOR 0° SKEW

1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

111' END SPANS152' INTERIOR SPANS

PIER DETAILS

STA. 389+39.66MARCH, 2021

LINN COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 17 OF 54FILE NO. 31598DESIGN NO. 220

ENGLISHBTSTUBABOUTMENTBRIDGES.DGN - 2092-BTE - THIS SHEET ISSUED 07-08.



**PART PLAN VIEW**  
(WEST ABUTMENT SHOWN;  
EAST ABUTMENT SIMILAR)

Dimensions and Reinforcement Details:

- Overall Width: 40'-0"
- Roadway Width: 22'-0"
- Abutment Width: 18'-0"
- Beam Spaces: 5 BEAM SPACES @ 9'-0 $\frac{1}{2}$ " = 36'-2"
- Typical Beam Space: 1'-9"
- Reinforcement Bars: 5g1, 5d1, 5d2, 5d3, 5d4, 5d5, 5m1, 5m2, 5m3, 5m4, 5m5, 5m6, 5m7, 5m8, 5m9, 5m10, 5m11, 5m12, 5m13, 5m14, 5m15, 5m16, 5m17, 5m18, 5m19, 5m20, 5m21, 5m22, 5m23, 5m24, 5m25, 5m26, 5m27, 5m28, 5m29, 5m30, 5m31, 5m32, 5m33, 5m34, 5m35, 5m36, 5m37, 5m38, 5m39, 5m40, 5m41, 5m42, 5m43, 5m44, 5m45, 5m46, 5m47, 5m48, 5m49, 5m50, 5m51, 5m52, 5m53, 5m54, 5m55, 5m56, 5m57, 5m58, 5m59, 5m60, 5m61, 5m62, 5m63, 5m64, 5m65, 5m66, 5m67, 5m68, 5m69, 5m70, 5m71, 5m72, 5m73, 5m74, 5m75, 5m76, 5m77, 5m78, 5m79, 5m80, 5m81, 5m82, 5m83, 5m84, 5m85, 5m86, 5m87, 5m88, 5m89, 5m90, 5m91, 5m92, 5m93, 5m94, 5m95, 5m96, 5m97, 5m98, 5m99, 5m100.
- Minimum Lap at CL = 2'-2"
- Approach Roadway CL
- Abutment Bearing CL
- Wash: 1" WASH
- Note: SEE DESIGN SHEET 20 FOR VIEWS A-A & B-B.

PART PLAN VIEW  
(WEST ABUTMENT SHOWN;  
EAST ABUTMENT SIMILAR)



TABLE OF ABUTMENT ELEVATIONS		
POINT	WEST ABUTMENT	EAST ABUTMENT
ELEV. A	712.30	713.19
ELEV. B	712.49	713.38
ELEV. C	712.58	713.47
ELEV. D	712.41	713.30
ELEV. E	712.22	713.11
BOTT. BACKWALL ELEV.	711.97	712.86
BOTT. FTG. ELEV.	708.14	709.03

### TABLE OF ABUTMENT STEPS

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

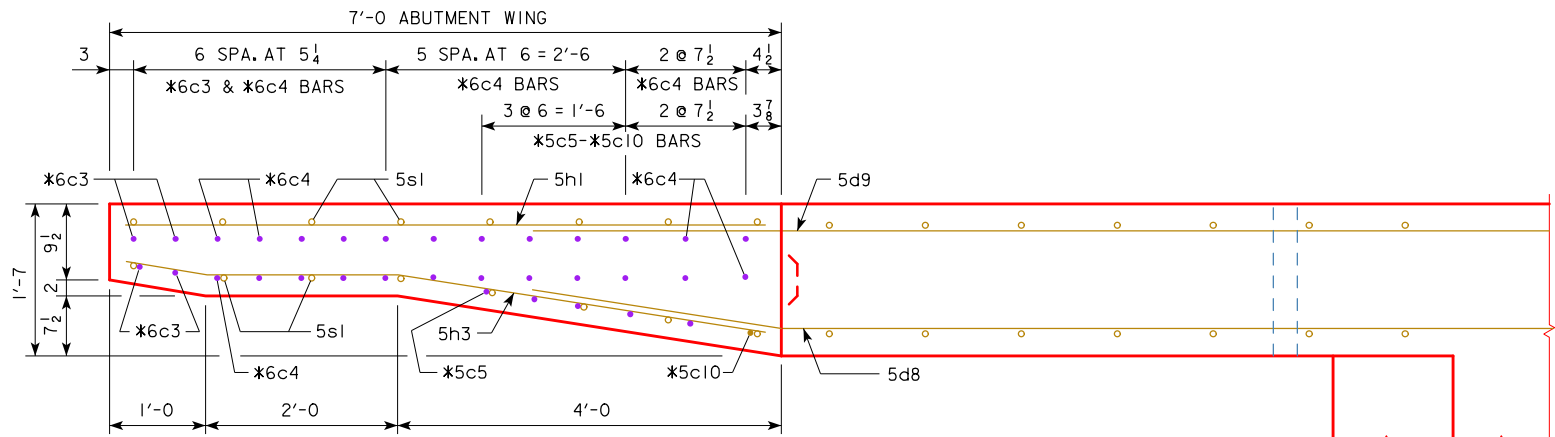


NOTES:  
DIMENSIONS SHOWN ON PILING LAYOUT ARE AT BOTTOM OF FOOTING.  
15 - HPI0x57 STEEL BEARING PILING REQUIRED AT EACH ABUTMENT.

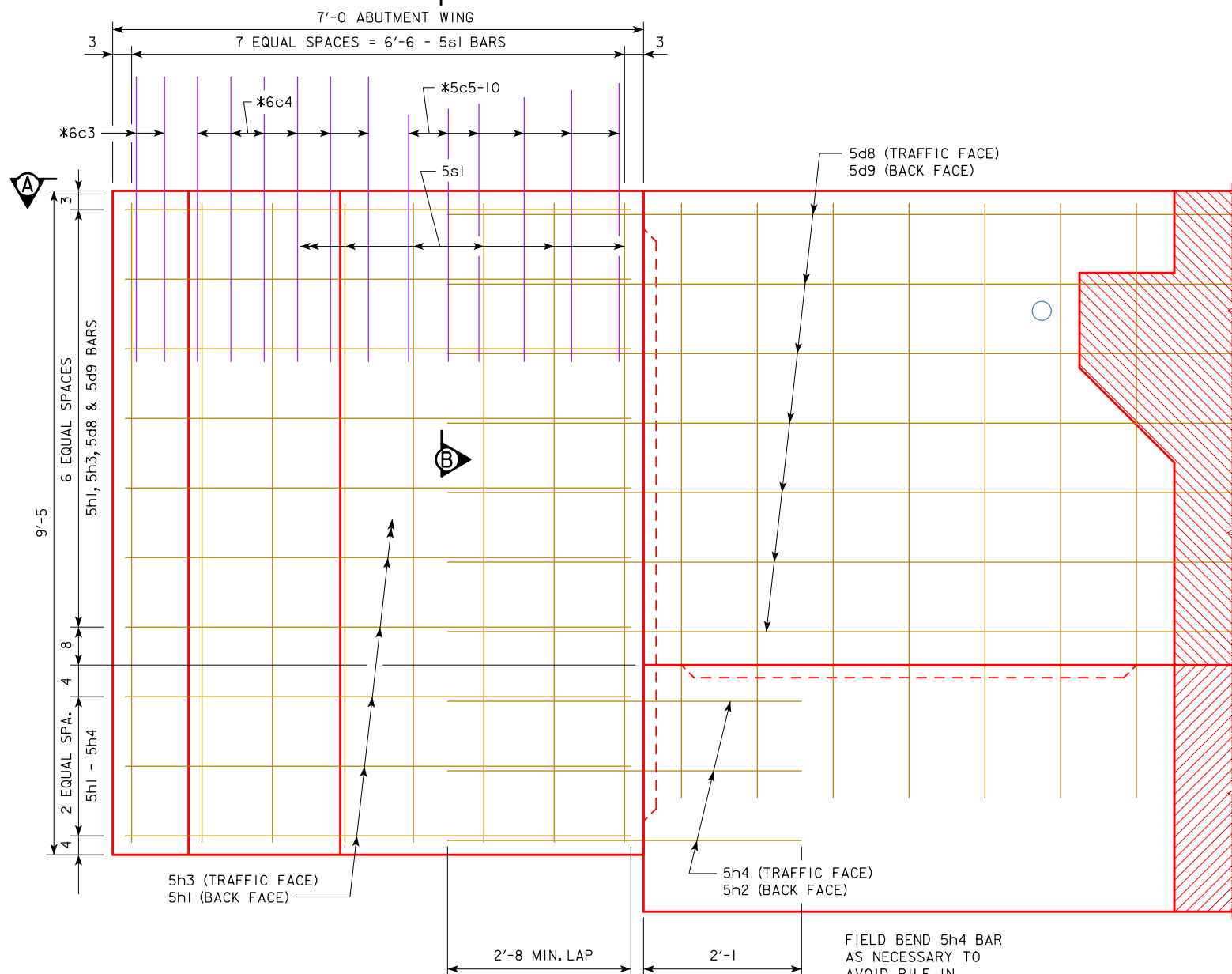
THE PORTION OF THE BACKWALL CONTAINING THE ABUTMENT ANCHORAGE OF THE  
EXPANSION DEVICE IS TO BE PLACED AFTER THE BRIDGE DECK IS PLACED.

DESIGN FOR 0° SKEW  
1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE  
111' END SPANS 152' INTERIOR SPANS  
ABUTMENT FOOTING DETAILS  
STA. 389+39.66 MARCH, 2021  
LINN COUNTY  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 18 OF 54 FILE NO. 31598 DESIGN NO. 220

CORRECTION 04-14 - ADDED REFERRAL NOTE TO SUMMARY QUANTITIES SHEET.  
ENGLISH\MISCELLANEOUS\BRIDGES.DGN - 2114-S - THIS SHEET ISSUED 02-08.

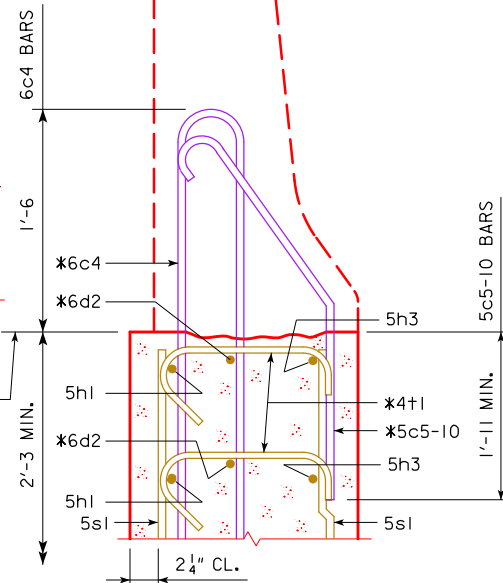


VIEW A-A



ABUTMENT WING - ELEVATION VIEW

CONST.  
JOINT  
(TYP.)



SECTION B-B

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

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

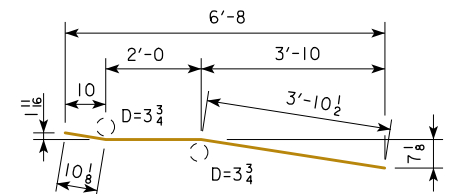
ABUTMENT BACKWALL  
CONST. JOINT  
ABUTMENT FOOTING

FIELD BEND 5h4 BAR  
AS NECESSARY TO  
AVOID PILE IN  
ABUTMENT WING.

REINFORCING BAR LIST - ONE ABUT. WING

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5h1	HORIZONTAL BACK FACE		10	6'-8	70
5h3	HORIZONTAL TRAFFIC FACE		10	6'-9	70
5s1	VERTICAL BOTH FACES		16	9'-1	152

REINFORCING STEEL EPOXY COATED - TOTAL (LBS.) 292



5h3

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

BENT BAR DETAILS

CONCRETE PLACEMENT SUMMARY

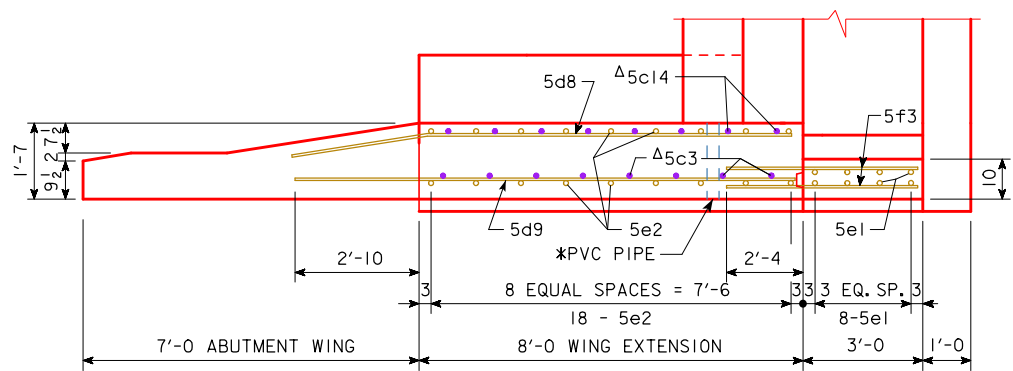
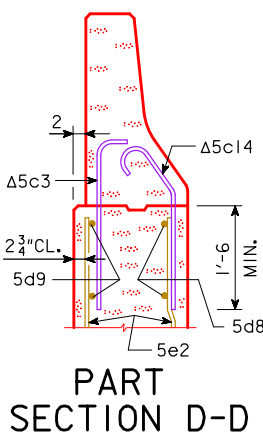
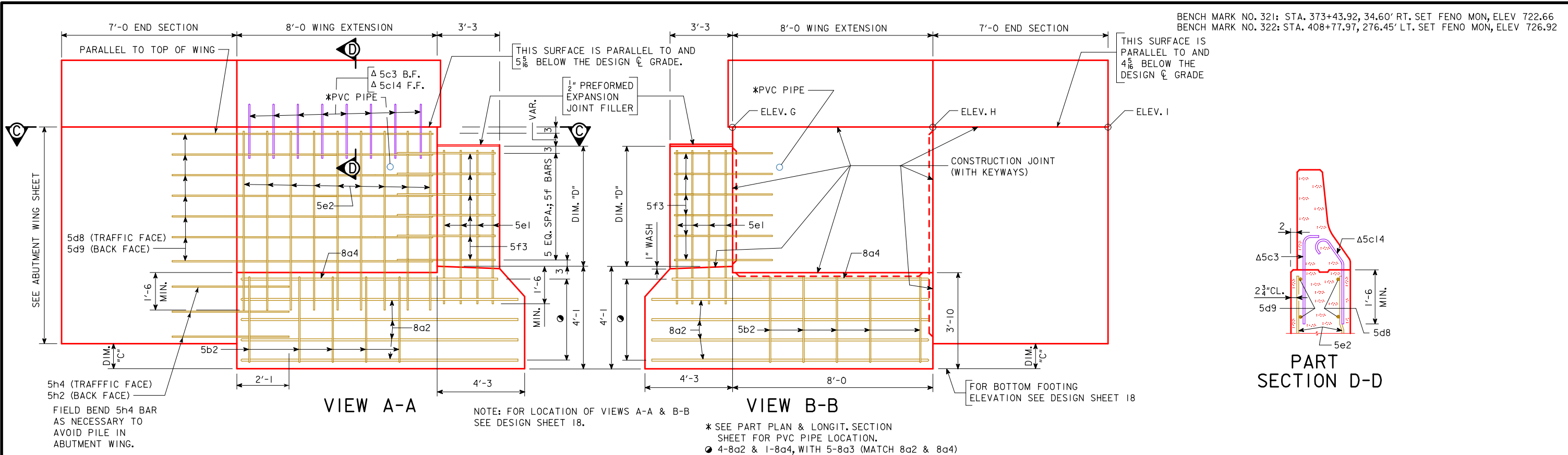
CONCRETE	TOTAL
ONE ABUTMENT WING	2.7
TOTAL (CU. YDS.)	2.7

NOTE:

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

DESIGN FOR 0° SKEW  
**1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
111' END SPANS 152' INTERIOR SPANS  
**ABUTMENT WING DETAILS**  
STA. 389+39.66 MARCH, 2021  
**LINN COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 19 OF 54 FILE NO. 31598 DESIGN NO. 220

CORRECTION 04-14 - CHANGED NOTE ABOUT BARRIER RAIL BARS 5c3 & 5c14 TO BARRIER RAIL QTYS. INSTEAD OF BRIDGE DECK QTYS.  
ENGLISHBTSTUBABUTMENTBRIDGES.DGN - 2099-BTE - THIS SHEET ISSUED 07-08.



SECTION C-C

NOTE: BARRIER RAIL NOT SHOWN IN SECTION C-C.

Δ NOTE: SEE DESIGN SHEET 49 IN THESE PLANS FOR DETAILS OF BARRIER RAIL WING EXTENSIONS. REINFORCING BARS 5c3 AND 5c14 ARE INCLUDED IN THE BARRIER RAIL QUANTITIES.

TABLE OF WINGWALL ELEVATIONS					
LOCATION	ELEV. G	ELEV. H	ELEV. I	DIM. "C"	DIM. "D"
N.W. CORNER	718.66	718.62	718.59	1'-0 3/8	5'-8
S.W. CORNER	718.58	718.54	718.51	11 7/16	5'-7 1/16
N.E. CORNER	719.49	719.43	719.37	11 1/8	5'-7 3/16
S.E. CORNER	719.41	719.35	719.29	10 1/8	5'-6 1/4

DESIGN FOR 0° SKEW

1,134'-0" X 40'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

111' END SPANS      152' INTERIOR SPANS

ABUTMENT WING DETAILS

STA. 389+39.66      MARCH, 2021

LINN COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 20 OF 54      FILE NO. 31598      DESIGN NO. 220



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

CONCRETE RUBBLE IN THE CLAY FILL SHALL BE EXCAVATED PRIOR TO PILE DRIVING.

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

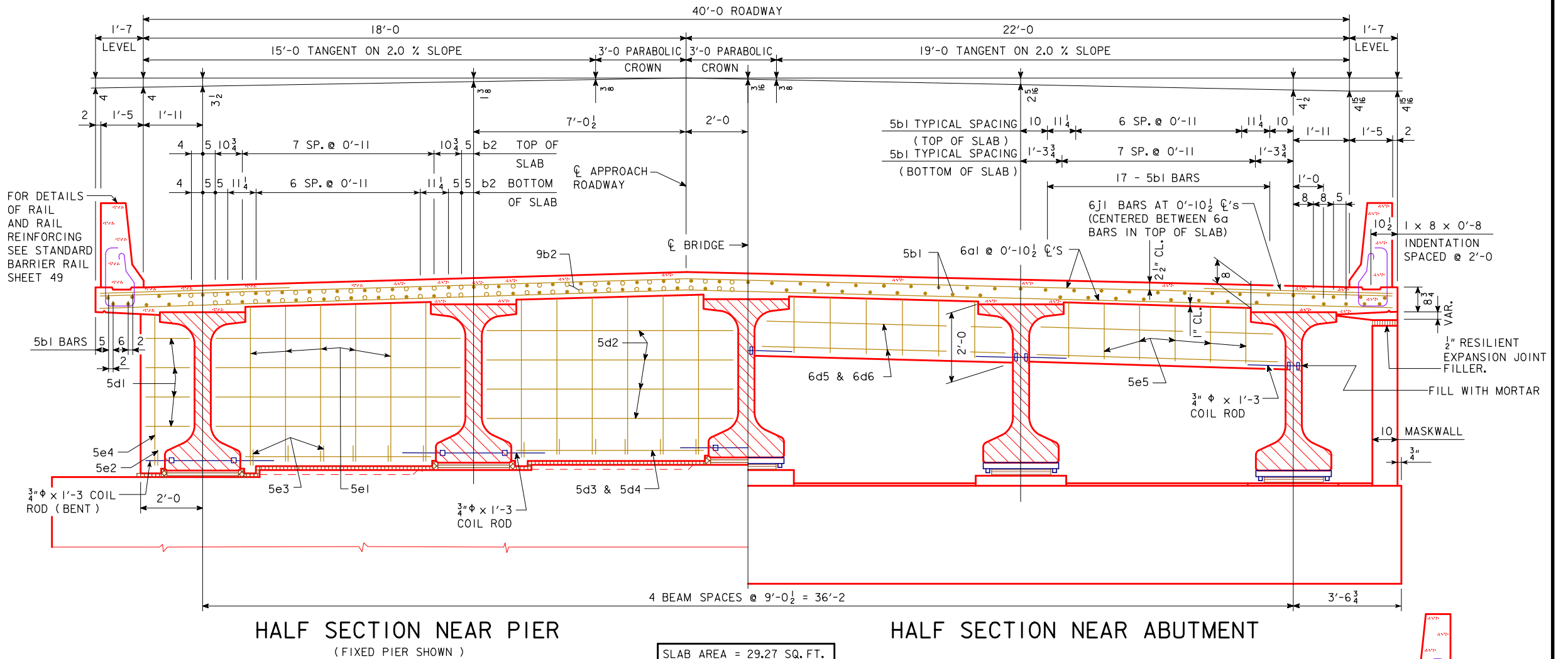
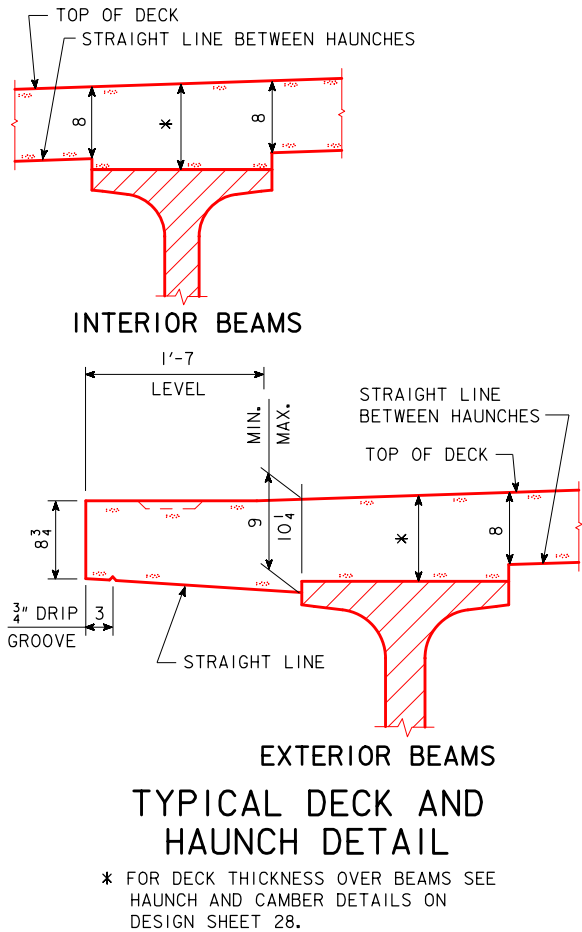
NOTE:  
CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED  
ON THE SUMMARY QUANTITIES SHEET.

	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
<b>EPOXY COATED BARS</b>	8a1	FOOTING LONGITUDINAL	—	14	43'-0	1607
	8a2	WING FOOTING	]]]	8	15'-10	338
	8a3	WING FOOTING	]]]	10	12'-5	332
	8a4	WING FOOTING	]]]	2	15'-1	81
	5b1	FOOTING HOOPS	⌒	56	17'-11	1046
	5b2	WING FOOTING HOOPS	⌒	10	14'-0	146
	6d1	BACKWALL VERTICAL B.F.	—	79	7'-2	850
	5d2	BACKWALL VERTICAL F.F.	—	39	6'-6	264
	5d3	PAVING NOTCH	]]]	39	4'-2	169
	5d4	PAVING NOTCH	]]]	39	3'-5	139
	4d6	BACKWALL VERTICAL HOOP	]]]	39	7'-9	202
	5d8	WING EXTENSION FF HORIZONTAL	/	14	10'-8	156
	5d9	WING EXTENSION BF HORIZONTAL	—	14	10'-8	156
	5e1	MASKWALL VERTICAL	—	16	7'-1	118
	5e2	WING EXTENSION VERTICAL	—	36	7'-11	297
	5f3	MASKWALL HORIZONTAL	—	24	5'-1	127
	5g1	BACKWALL LONGITUDINAL	—	16	39'-8	662
	5g2	BACKWALL DOWELS	—	32	4'-5	147
	5g3	PAVING NOTCH LONGITUDINAL	—	2	39'-8	83
	5h2	WING EXTENSION BF HORIZONTAL	—	6	4'-11	31
5h4	WING EXTENSION FF HORIZONTAL	/	6	4'-11	31	
5m1	BEAM STEPS TRANSVERSE	]]]	20	5'-11	123	
5n1	BEAM STEPS LONGITUDINAL	—	20	3'-2	66	
	REINFORCING STEEL - EPOXY COATED - TOTAL (LBS.)					7,171
<b>S.S. BARS</b>	5d5	PAVING NOTCH DOWELS (STAINLESS STEEL)	—	20	3'-6	73
	STAINLESS STEEL - TOTAL (LBS.)					73

DESIGN FOR 0° SKEW  
1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE  
111' END SPANS 152' INTERIOR SPANS  
ABUTMENT QUANTITIES  
STA. 389+39.66 MARCH, 2021  
LINN COUNTY  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 21 OF 54 FILE NO. 31598 DESIGN NO. 220



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. ENGLISHB1STUBABUTMENTBRIDGES.DGN - 4559-BTE-5 - THIS SHEET ISSUED 07-08.



NOTE: FOR DETAILS OF INTERMEDIATE DIAPHRAGMS SEE DESIGN SHEETS 44 & 45.

### 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 RESILIENT 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 BRIDGE DECK AND BARRIER RAIL ARE TO BE SUPPORTED BY THE PRESTRESSED CONCRETE BEAMS.

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

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

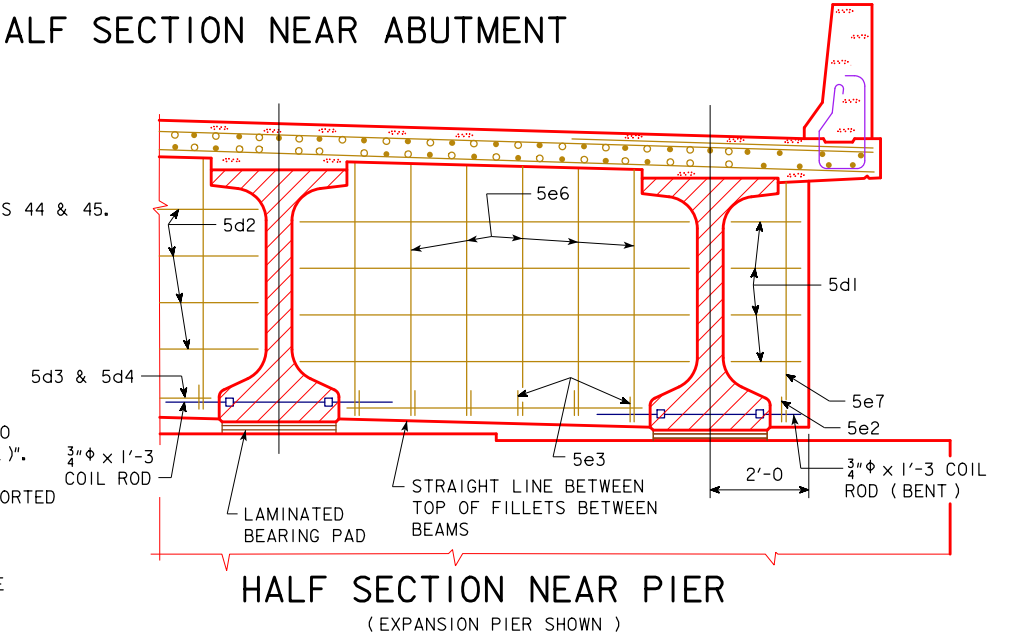
TOP TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 2 1/2" CLEAR BELOW TOP OF DECK. BOTTOM TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 1" CLEAR ABOVE BOTTOM OF DECK. TOP AND BOTTOM REINFORCING STEEL IS TO BE SUPPORTED BY INDIVIDUAL BAR CHAIRS SPACED AT NOT MORE THAN 3'-0 CENTERS LONGITUDINALLY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

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

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

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

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



DESIGN FOR 0° SKEW

1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

111' END SPANS

152' INTERIOR SPANS

SUPERSTRUCTURE DETAILS

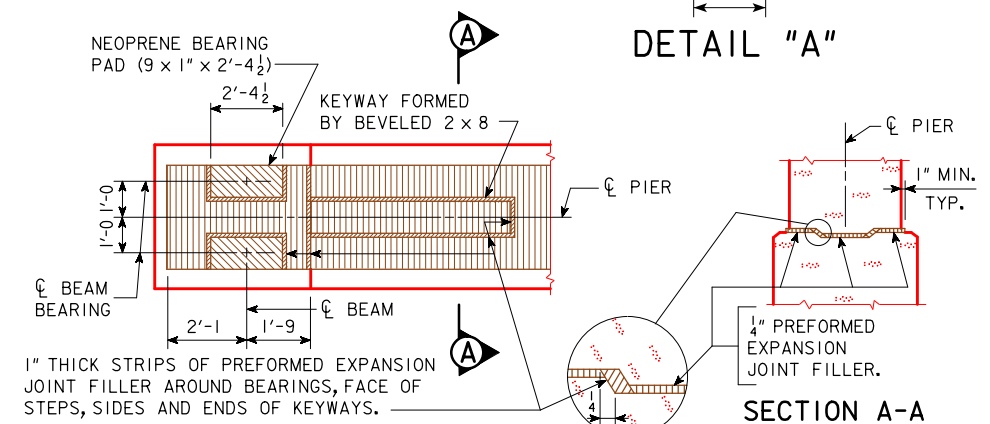
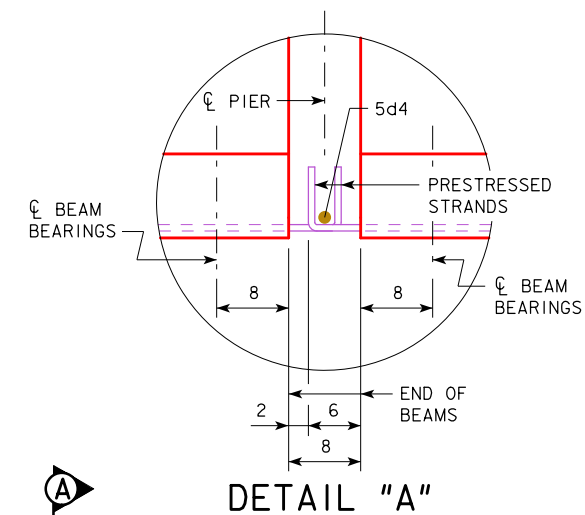
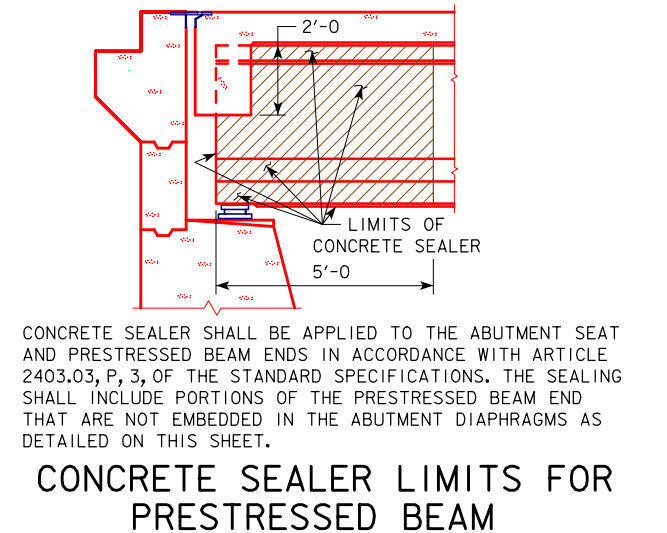
STA. 389+39.66

MARCH, 2021

LINN COUNTY

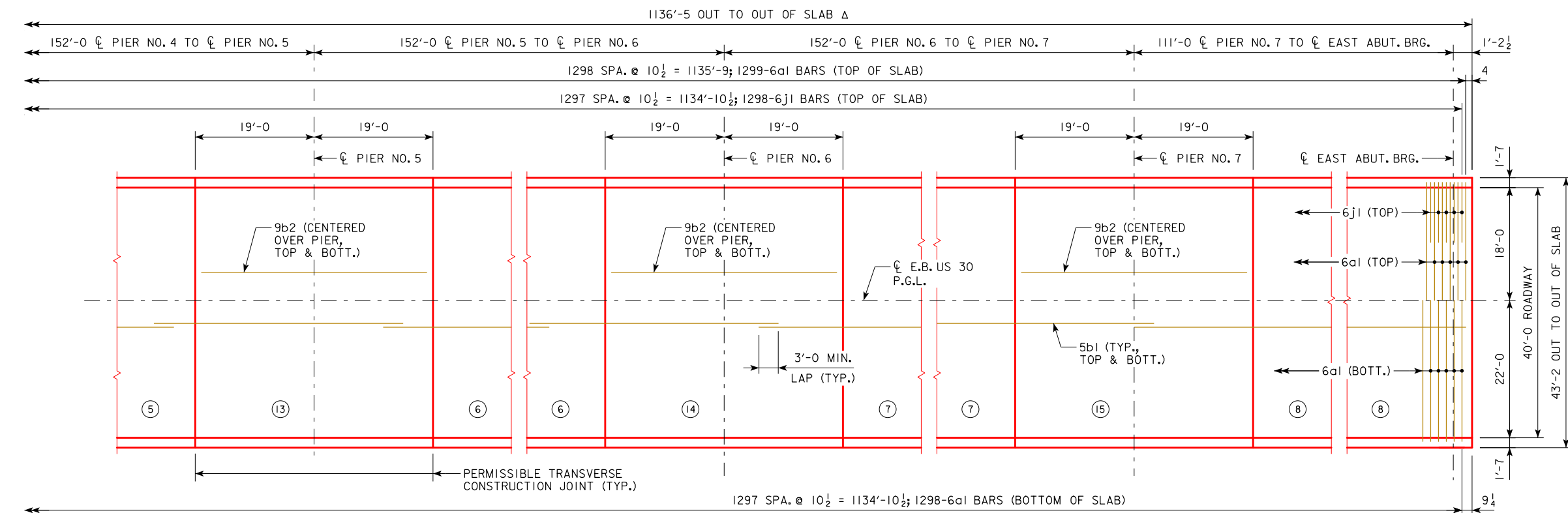
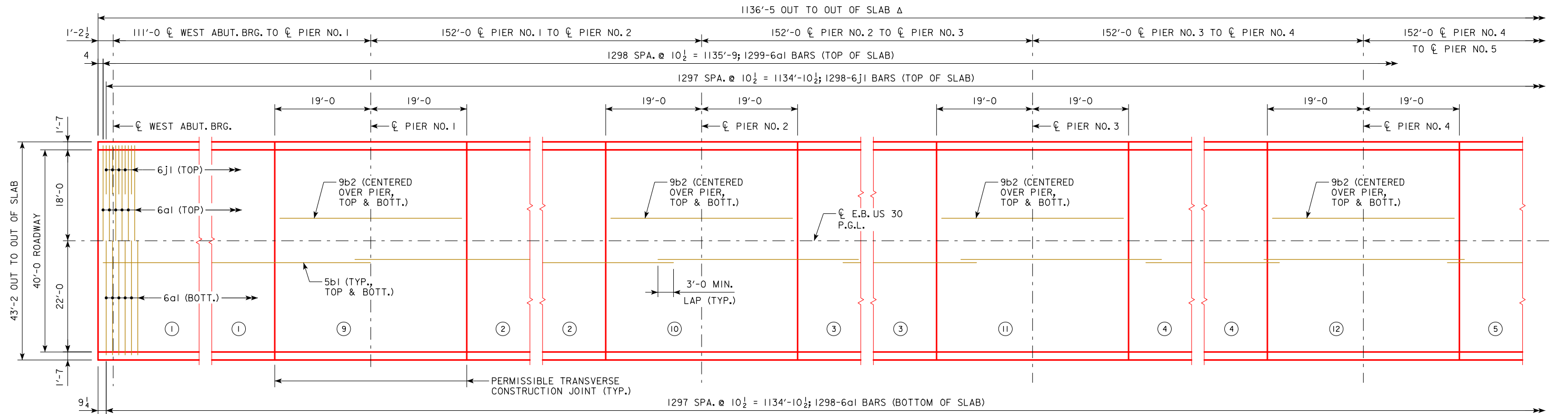
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 22 OF 54 FILE NO. 31598 DESIGN NO. 220



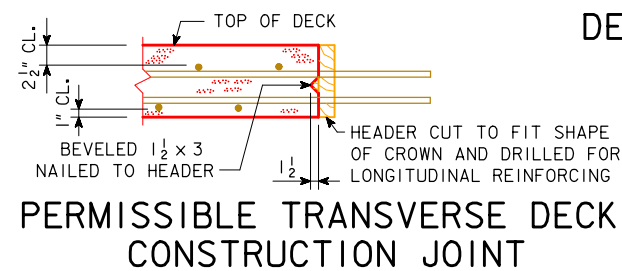
PART PLAN  
TOP OF FIXED PIER DETAILS

DESIGN FOR 0° SKEW  
1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE  
111' END SPANS 152' INTERIOR SPANS  
SUPERSTRUCTURE DETAILS  
STA. 389+39.66 MARCH, 2021  
LINN COUNTY  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 23 OF 54 FILE NO. 31598 DESIGN NO. 220



Δ DIMENSION AT 50°F. SEE DESIGN SHEET 34 FOR JOINT SETTINGS AT OTHER TEMPERATURES.

NOTE: SEE DESIGN SHEET 25 FOR POUR SEQUENCE NOTES.



## DECK REINFORCEMENT LAYOUT AND CONCRETE PLACEMENT PLAN

DESIGN FOR 0° SKEW

**1,134'-0" X 40'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**

111' END SPANS 152' INTERIOR SPANS

**SUPERSTRUCTURE DETAILS**

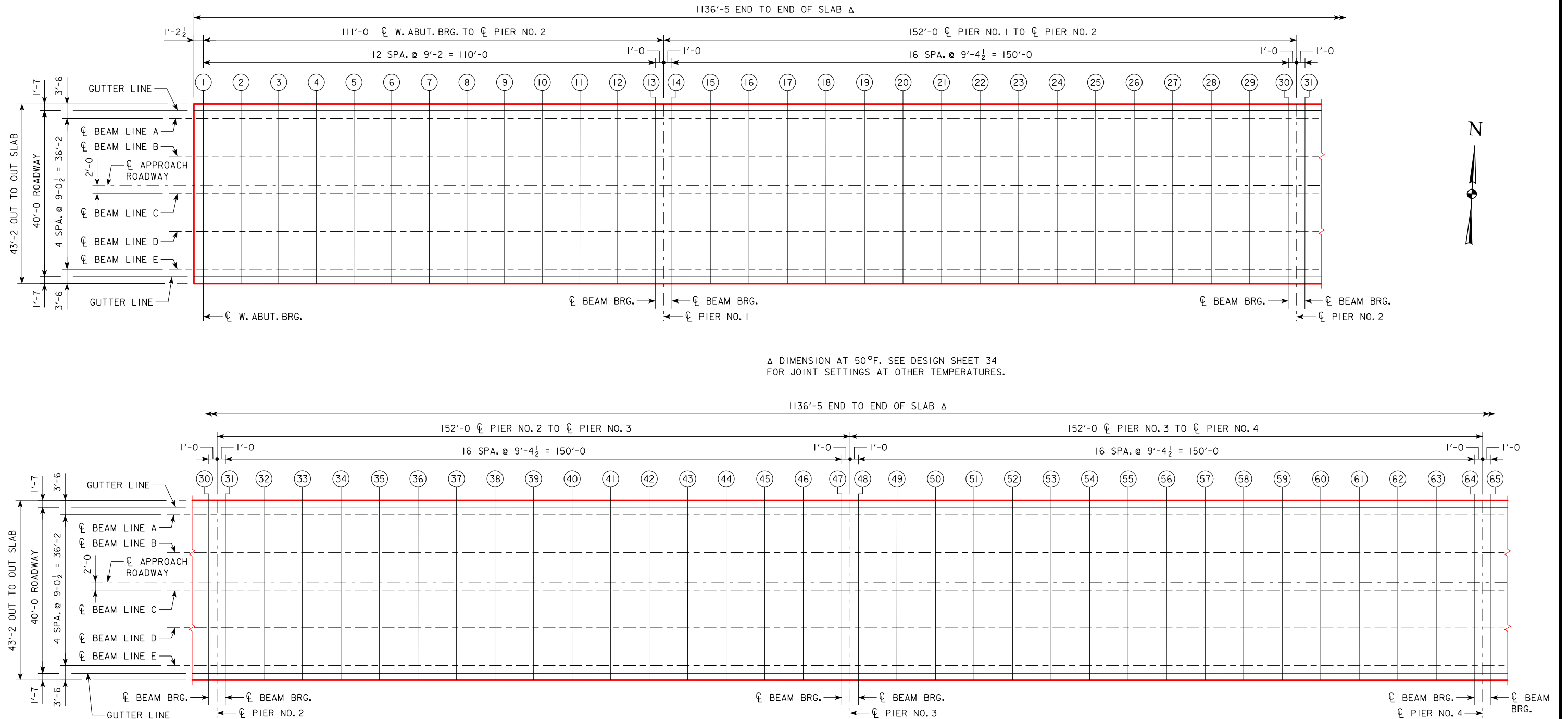
STA. 389+39.66 MARCH, 2021

**LINN COUNTY**

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 24 OF 54 FILE NO. 31598 DESIGN NO. 220





LOCATION OF TOP OF SLAB ELEVATIONS

DESIGN FOR 0° SKEW

**1,134'-0" X 40'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**

111' END SPANS 152' INTERIOR SPANS

**TOP OF SLAB ELEV. LOCATIONS**

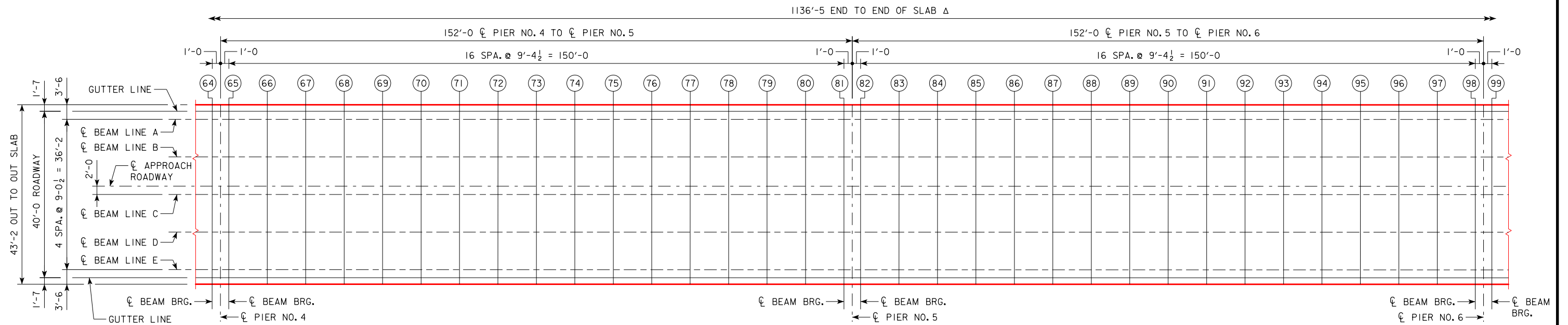
STA. 389+39.66 MARCH, 2021

**LINN COUNTY**

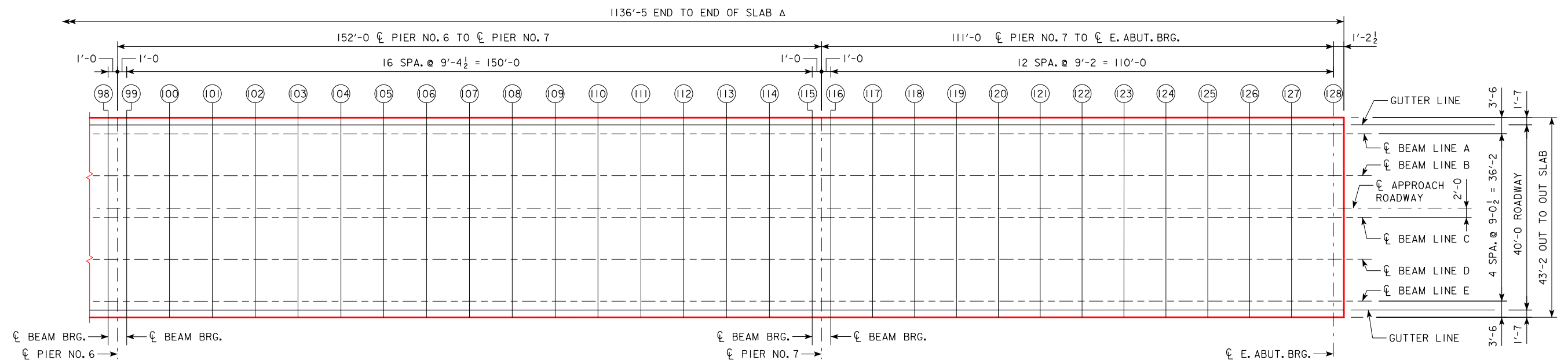
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 26 OF 54 FILE NO. 31598 DESIGN NO. 220





Δ DIMENSION AT 50°F. SEE DESIGN SHEET 34  
FOR JOINT SETTINGS AT OTHER TEMPERATURES.



## LOCATION OF TOP OF SLAB ELEVATIONS

DESIGN FOR 0° SKEW

**1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**

111' END SPANS 152' INTERIOR SPANS

**TOP OF SLAB ELEV. LOCATIONS**

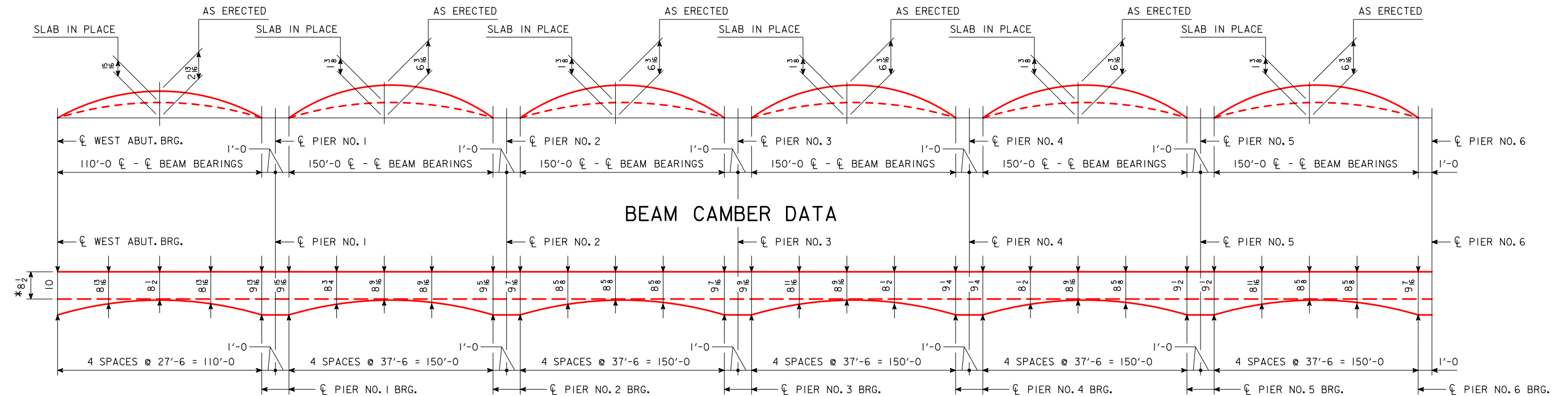
STA. 389+39.66 MARCH, 2021

**LINN COUNTY**

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

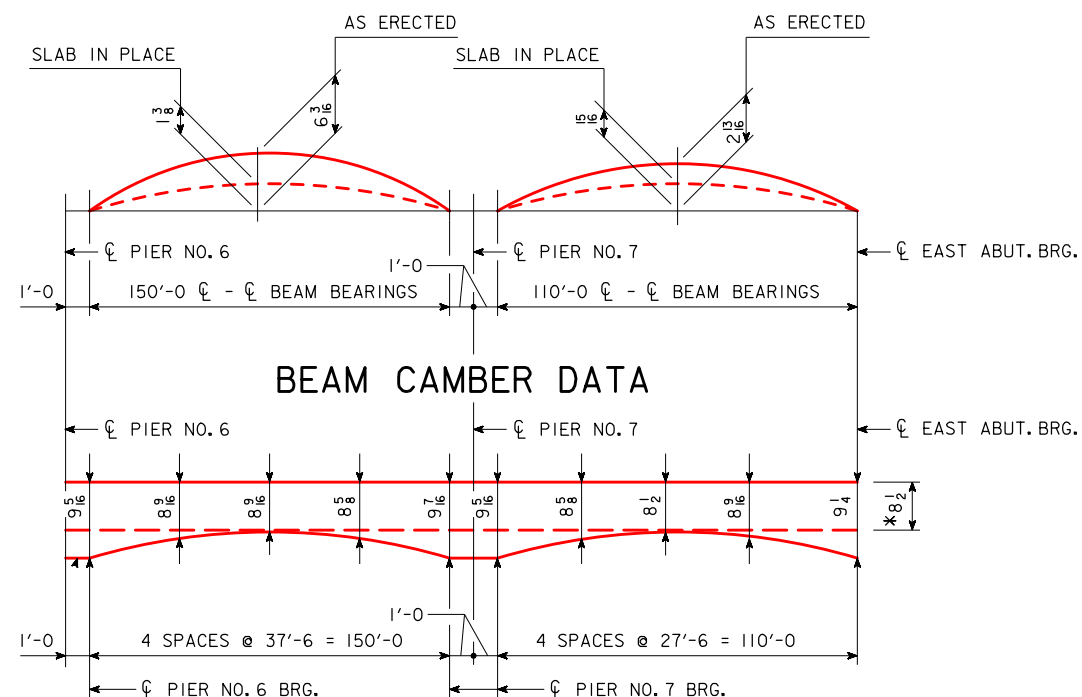
DESIGN SHEET NO. 27 OF 54 FILE NO. 31598 DESIGN NO. 220



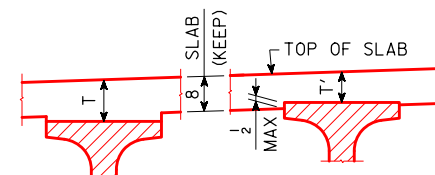


SLAB THICKNESS AT BEAMS (T)

\* NOMINAL SLAB THICKNESS AT BEAMS INCLUDES 8" SLAB + 1/2" HAUNCH



SLAB THICKNESS AT BEAMS (T)



SLAB THICKNESS DETAILS

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

DESIGN FOR 0° SKEW  
**1,134'-0" X 40'-0" PRETENSIONED  
 PRESTRESSED CONCRETE BEAM BRIDGE**  
 111' END SPANS 152' INTERIOR SPANS  
**SLAB THICKNESS DETAILS**  
 STA. 389+39.66 MARCH, 2021  
**LINN COUNTY**  
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
 DESIGN SHEET NO. 28 OF 54 FILE NO. 31598 DESIGN NO. 220

TOP OF SLAB ELEVATIONS																											
BEAM LINE	℄ W. 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	
NORTH GUTTER LINE	718.67	718.72	718.77	718.83	718.89	718.95	719.01	719.08	719.15	719.22	719.29	719.36	719.42	719.44	719.51	719.58	719.65	719.72	719.79	719.86	719.93	720.00	720.06	720.13	720.20	720.26	
GIRDER A	718.71	718.76	718.81	718.87	718.93	718.99	719.05	719.12	719.19	719.26	719.33	719.39	719.46	719.48	719.55	719.62	719.69	719.76	719.83	719.90	719.97	720.04	720.10	720.17	720.23	720.30	
GIRDER B	718.89	718.94	718.99	719.05	719.11	719.17	719.23	719.30	719.37	719.44	719.51	719.58	719.64	719.66	719.73	719.80	719.87	719.94	720.01	720.08	720.15	720.22	720.28	720.35	720.42	720.48	
℄ APPROACH RDWY. & P.G.L.	719.00	719.05	719.10	719.16	719.22	719.28	719.34	719.41	719.48	719.55	719.62	719.69	719.75	719.77	719.84	719.91	719.98	720.05	720.12	720.19	720.26	720.33	720.39	720.46	720.53	720.59	
GIRDER C	718.99	719.04	719.09	719.15	719.20	719.27	719.33	719.40	719.47	719.54	719.60	719.67	719.74	719.76	719.83	719.90	719.97	720.04	720.11	720.18	720.24	720.31	720.38	720.45	720.51	720.58	
GIRDER D	718.81	718.86	718.91	718.97	719.03	719.09	719.15	719.22	719.29	719.36	719.43	719.50	719.56	719.58	719.65	719.72	719.79	719.86	719.93	720.00	720.07	720.14	720.20	720.27	720.34	720.40	
GIRDER E	718.63	718.68	718.73	718.79	718.85	718.91	718.97	719.04	719.11	719.18	719.25	719.31	719.38	719.40	719.47	719.54	719.61	719.68	719.75	719.82	719.89	719.96	720.02	720.09	720.15	720.22	
SOUTH GUTTER LINE	718.59	718.64	718.69	718.75	718.81	718.87	718.93	719.00	719.07	719.14	719.21	719.28	719.34	719.36	719.43	719.50	719.57	719.64	719.71	719.78	719.85	719.92	719.98	720.05	720.12	720.18	
				℄ PIER NO. 2 BEARINGS																	℄ PIER NO. 3 BEARINGS						
	LINE 27	LINE 28	LINE 29	LINE 30	LINE 31	LINE 32	LINE 33	LINE 34	LINE 35	LINE 36	LINE 37	LINE 38	LINE 39	LINE 40	LINE 41	LINE 42	LINE 43	LINE 44	LINE 45	LINE 46	LINE 47	LINE 48	LINE 49	LINE 50	LINE 51	LINE 52	
NORTH GUTTER LINE	720.32	720.38	720.44	720.50	720.51	720.57	720.62	720.68	720.73	720.78	720.83	720.87	720.92	720.96	721.01	721.05	721.09	721.13	721.16	721.20	721.23	721.24	721.27	721.30	721.33	721.36	
GIRDER A	720.36	720.42	720.48	720.54	720.55	720.61	720.66	720.71	720.77	720.82	720.86	720.91	720.96	721.00	721.05	721.09	721.13	721.16	721.20	721.24	721.27	721.28	721.31	721.34	721.37	721.40	
GIRDER B	720.54	720.60	720.66	720.72	720.73	720.79	720.84	720.90	720.95	721.00	721.05	721.09	721.14	721.18	721.23	721.27	721.31	721.35	721.38	721.42	721.45	721.46	721.49	721.52	721.55	721.58	
℄ APPROACH RDWY. & P.G.L.	720.65	720.71	720.77	720.83	720.84	720.90	720.95	721.01	721.06	721.11	721.16	721.20	721.25	721.29	721.34	721.38	721.42	721.46	721.49	721.53	721.56	721.57	721.60	721.63	721.66	721.69	
GIRDER C	720.64	720.70	720.76	720.82	720.83	720.89	720.94	720.99	721.04	721.09	721.14	721.19	721.24	721.28	721.32	721.36	721.40	721.44	721.48	721.52	721.55	721.56	721.59	721.62	721.65	721.68	
GIRDER D	720.46	720.52	720.58	720.64	720.65	720.71	720.76	720.82	720.87	720.92	720.97	721.01	721.06	721.10	721.15	721.19	721.23	721.27	721.30	721.34	721.37	721.38	721.41	721.44	721.47	721.50	
GIRDER E	720.28	720.34	720.40	720.46	720.47	720.53	720.58	720.63	720.69	720.74	720.78	720.83	720.88	720.92	720.97	721.01	721.05	721.08	721.12	721.16	721.19	721.20	721.23	721.26	721.29	721.32	
SOUTH GUTTER LINE	720.24	720.30	720.36	720.42	720.43	720.49	720.54	720.60	720.65	720.70	720.75	720.79	720.84	720.88	720.93	720.97	721.01	721.05	721.08	721.12	721.15	721.16	721.19	721.22	721.25	721.28	
												℄ PIER NO. 4 BEARINGS															
	LINE 53	LINE 54	LINE 55	LINE 56	LINE 57	LINE 58	LINE 59	LINE 60	LINE 61	LINE 62	LINE 63	LINE 64	LINE 65	LINE 66	LINE 67	LINE 68	LINE 69	LINE 70	LINE 71	LINE 72	LINE 73	LINE 74	LINE 75	LINE 76	LINE 77	LINE 78	
NORTH GUTTER LINE	721.39	721.41	721.44	721.46	721.48	721.50	721.51	721.53	721.55	721.56	721.57	721.58	721.58	721.59	721.60	721.60	721.61	721.61	721.61	721.61	721.61	721.61	721.60	721.60	721.59	721.58	
GIRDER A	721.43	721.45	721.47	721.50	721.52	721.54	721.55	721.57	721.58	721.60	721.61	721.62	721.62	721.63	721.64	721.64	721.65	721.65	721.65	721.65	721.65	721.65	721.64	721.63	721.63	721.62	
GIRDER B	721.61	721.63	721.65	721.68	721.70	721.72	721.73	721.75	721.76	721.78	721.79	721.80	721.80	721.81	721.82	721.82	721.83	721.83	721.83	721.83	721.83	721.83	721.82	721.82	721.81	721.80	
℄ APPROACH RDWY. & P.G.L.	721.72	721.74	721.77	721.79	721.81	721.83	721.84	721.86	721.88	721.89	721.90	721.91	721.91	721.92	721.93	721.93	721.94	721.94	721.94	721.94	721.94	721.94	721.93	721.93	721.92	721.91	
GIRDER C	721.70	721.73	721.75	721.77	721.79	721.81	721.83	721.85	721.86	721.88	721.89	721.90	721.90	721.91	721.92	721.92	721.93	721.93	721.93	721.93	721.93	721.92	721.92	721.91	721.91	721.90	
GIRDER D	721.53	721.55	721.57	721.60	721.62	721.64	721.65	721.67	721.68	721.70	721.71	721.72	721.72	721.73	721.74	721.74	721.75	721.75	721.75	721.75	721.75	721.75	721.74	721.74	721.73	721.72	
GIRDER E	721.35	721.37	721.39	721.42	721.44	721.46	721.47	721.49	721.50	721.52	721.53	721.54	721.54	721.55	721.56	721.56	721.57	721.57	721.57	721.57	721.57	721.57	721.56	721.55	721.55	721.54	
SOUTH GUTTER LINE	721.31	721.33	721.36	721.38	721.40	721.42	721.43	721.45	721.47	721.48	721.49	721.50	721.50	721.51	721.52	721.52	721.53	721.53	721.53	721.53	721.53	721.53	721.52	721.52	721.51	721.50	

NOTE:  
SLAB LOCATIONS ARE THE SAME  
LOCATIONS AS THE ENCIRCLED  
NUMBERS SHOWN ON THE TOP OF  
SLAB ELEV. LOCATIONS SHEETS.

DESIGN FOR 0° SKEW

1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

111' END SPANS152' INTERIOR SPANS

TOP OF SLAB ELEVATIONS

STA. 389+39.66MARCH, 2021

LINN COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 29 OF 54FILE NO. 31598DESIGN NO. 220

TOP OF SLAB ELEVATIONS																												
BEAM LINE			⌀ PIER NO. 5 BEARINGS																	⌀ PIER NO. 6 BEARINGS								
	LINE 79	LINE 80	LINE 81	LINE 82	LINE 83	LINE 84	LINE 85	LINE 86	LINE 87	LINE 88	LINE 89	LINE 90	LINE 91	LINE 92	LINE 93	LINE 94	LINE 95	LINE 96	LINE 97	LINE 98	LINE 99	LINE 100	LINE 101	LINE 102	LINE 103	LINE 104		
NORTH GUTTER LINE	721.57	721.56	721.54	721.54	721.53	721.51	721.49	721.47	721.45	721.43	721.40	721.38	721.35	721.32	721.29	721.26	721.23	721.19	721.16	721.12	721.11	721.07	721.03	720.99	720.95	720.90		
GIRDER A	721.61	721.60	721.58	721.58	721.56	721.55	721.53	721.51	721.49	721.47	721.44	721.42	721.39	721.36	721.33	721.30	721.27	721.23	721.20	721.16	721.15	721.11	721.07	721.03	720.99	720.94		
GIRDER B	721.79	721.78	721.76	721.76	721.74	721.73	721.71	721.69	721.67	721.65	721.62	721.60	721.57	721.54	721.51	721.48	721.45	721.41	721.38	721.34	721.33	721.29	721.25	721.21	721.17	721.12		
⌀ APPROACH RDWY. & P.G.L.	721.90	721.89	721.87	721.87	721.86	721.84	721.82	721.80	721.78	721.76	721.73	721.71	721.68	721.65	721.62	721.59	721.56	721.52	721.49	721.45	721.44	721.40	721.36	721.32	721.28	721.23		
GIRDER C	721.89	721.87	721.86	721.86	721.84	721.83	721.81	721.79	721.77	721.74	721.72	721.69	721.67	721.64	721.61	721.58	721.55	721.51	721.48	721.44	721.43	721.39	721.35	721.31	721.27	721.22		
GIRDER D	721.71	721.70	721.68	721.68	721.66	721.65	721.63	721.61	721.59	721.57	721.54	721.52	721.49	721.46	721.43	721.40	721.37	721.33	721.30	721.26	721.25	721.21	721.17	721.13	721.09	721.04		
GIRDER E	721.53	721.52	721.50	721.50	721.48	721.47	721.45	721.43	721.41	721.39	721.36	721.34	721.31	721.28	721.25	721.22	721.19	721.15	721.12	721.08	721.07	721.03	720.99	720.95	720.91	720.86		
SOUTH GUTTER LINE	721.49	721.48	721.46	721.46	721.45	721.43	721.41	721.39	721.37	721.35	721.32	721.30	721.27	721.24	721.21	721.18	721.15	721.11	721.08	721.04	721.03	720.99	720.95	720.91	720.87	720.82		
											⌀ PIER NO. 7 BEARINGS																⌀ E. ABUT. BEARINGS	
	LINE 105	LINE 106	LINE 107	LINE 108	LINE 109	LINE 110	LINE 111	LINE 112	LINE 113	LINE 114	LINE 115	LINE 116	LINE 117	LINE 118	LINE 119	LINE 120	LINE 121	LINE 122	LINE 123	LINE 124	LINE 125	LINE 126	LINE 127	LINE 128				
NORTH GUTTER LINE	720.86	720.81	720.76	720.71	720.66	720.60	720.55	720.49	720.43	720.38	720.31	720.30	720.24	720.18	720.11	720.05	719.98	719.91	719.84	719.78	719.71	719.64	719.57	719.50				
GIRDER A	720.90	720.85	720.80	720.75	720.70	720.64	720.59	720.53	720.47	720.41	720.35	720.34	720.28	720.22	720.15	720.09	720.02	719.95	719.88	719.81	719.74	719.68	719.61	719.54				
GIRDER B	721.08	721.03	720.98	720.93	720.88	720.82	720.77	720.71	720.65	720.59	720.53	720.52	720.46	720.40	720.33	720.27	720.20	720.13	720.06	719.99	719.93	719.86	719.79	719.72				
⌀ APPROACH RDWY. & P.G.L.	721.19	721.14	721.09	721.04	720.99	720.93	720.88	720.82	720.76	720.71	720.64	720.63	720.57	720.51	720.44	720.38	720.31	720.24	720.17	720.11	720.04	719.97	719.90	719.83				
GIRDER C	721.17	721.13	721.08	721.03	720.97	720.92	720.87	720.81	720.75	720.69	720.63	720.62	720.56	720.49	720.43	720.36	720.30	720.23	720.16	720.09	720.02	719.95	719.89	719.82				
GIRDER D	721.00	720.95	720.90	720.85	720.80	720.74	720.69	720.63	720.57	720.51	720.45	720.44	720.38	720.32	720.25	720.19	720.12	720.05	719.98	719.91	719.85	719.78	719.71	719.64				
GIRDER E	720.82	720.77	720.72	720.67	720.62	720.56	720.51	720.45	720.39	720.33	720.27	720.26	720.20	720.14	720.07	720.01	719.94	719.87	719.80	719.73	719.66	719.60	719.53	719.46				
SOUTH GUTTER LINE	720.78	720.73	720.68	720.63	720.58	720.52	720.47	720.41	720.35	720.30	720.23	720.22	720.16	720.10	720.03	719.97	719.90	719.83	719.76	719.70	719.63	719.56	719.49	719.42				

NOTE:  
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SLAB ELEV. LOCATIONS SHEETS.

DESIGN FOR 0° SKEW

1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

111' END SPANS152' INTERIOR SPANS

TOP OF SLAB ELEVATIONS

STA. 389+39.66MARCH, 2021

LINN COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

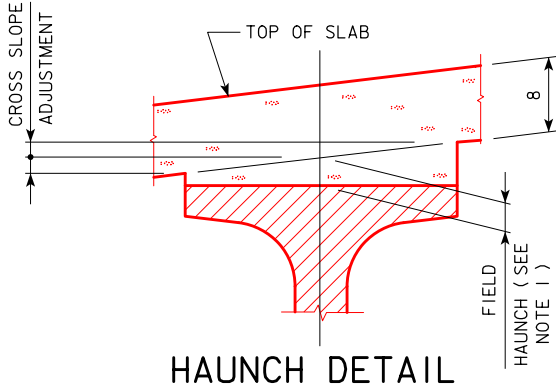
DESIGN SHEET NO. 30 OF 54FILE NO. 31598DESIGN NO. 220

REVISED 06-12 - THE ALLOWABLE FIELD HAUNCH MAX. & MIN. WAS CHANGED TO INCHES & DECIMALS OF FEET. NOTE & NOTE 1 WERE CHANGED. THE SLAB HAUNCH LOCATIONS EXAMPLE WAS REPLACED WITH A NOTE.  
ENGLISH\MISCELLANEOUS\BRIDGES.DGN - 1066 - THIS SHEET ISSUED 02-08.

BENCH MARK NO. 321: STA. 373+43.92, 34.60' RT. SET FENO MON, ELEV 722.66  
BENCH MARK NO. 322: STA. 408+77.97, 276.45' LT. SET FENO MON, ELEV 726.92

TABLE OF BEAM LINE SLAB HAUNCH ELEVATIONS																						
BEAM LINE	℄ W. 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
A	718.04	718.13	718.22	718.31	718.40	718.47	718.54	718.60	718.66	718.70	718.74	718.77	718.80	718.81	718.96	719.11	719.25	719.38	719.50	719.60	719.69	719.77
B	718.22	718.32	718.41	718.49	718.58	718.65	718.72	718.79	718.84	718.88	718.92	718.95	718.98	718.99	719.14	719.29	719.43	719.56	719.68	719.78	719.87	719.95
C	718.32	718.41	718.50	718.59	718.67	718.75	718.82	718.88	718.94	718.98	719.02	719.05	719.07	719.09	719.24	719.39	719.52	719.65	719.77	719.88	719.97	720.04
D	718.14	718.24	718.33	718.41	718.50	718.57	718.64	718.71	718.76	718.80	718.84	718.87	718.90	718.91	719.06	719.21	719.35	719.48	719.60	719.70	719.79	719.87
E	717.96	718.05	718.14	718.23	718.32	718.39	718.46	718.52	718.58	718.62	718.66	718.69	718.72	718.73	718.88	719.03	719.17	719.30	719.42	719.52	719.61	719.69
BEAM LINE								℄ PIER NO. 2 BEARINGS														
	LINE 23	LINE 24	LINE 25	LINE 26	LINE 27	LINE 28	LINE 29	LINE 30	LINE 31	LINE 32	LINE 33	LINE 34	LINE 35	LINE 36	LINE 37	LINE 38	LINE 39	LINE 40	LINE 41	LINE 42	LINE 43	LINE 44
A	719.83	719.87	719.90	719.92	719.92	719.91	719.89	719.87	719.88	720.02	720.15	720.27	720.38	720.48	720.57	720.64	720.69	720.73	720.75	720.75	720.74	720.72
B	720.01	720.05	720.08	720.10	720.10	720.09	720.07	720.05	720.06	720.20	720.33	720.45	720.56	720.66	720.75	720.82	720.87	720.91	720.93	720.93	720.92	720.90
C	720.11	720.15	720.18	720.19	720.20	720.19	720.17	720.15	720.16	720.30	720.43	720.55	720.66	720.76	720.85	720.91	720.97	721.00	721.03	721.03	721.02	721.00
D	719.93	719.97	720.00	720.02	720.02	720.01	719.99	719.97	719.98	720.12	720.25	720.37	720.48	720.58	720.67	720.74	720.79	720.83	720.85	720.85	720.84	720.82
E	719.75	719.79	719.82	719.84	719.84	719.83	719.81	719.79	719.80	719.94	720.07	720.19	720.30	720.40	720.49	720.56	720.61	720.65	720.67	720.67	720.66	720.64

MISCELLANEOUS DATA TABLE																							
	BEAM LINE	℄ W. 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
ANTICIPATED DEFLECTION DUE TO SLAB (IN.)	ALL	0	$\frac{1}{2}$	$\frac{15}{16}$	$\frac{1}{5}{16}$	$\frac{1}{5}{8}$	$\frac{1}{13}{16}$	$\frac{1}{7}{8}$	$\frac{1}{13}{16}$	$\frac{1}{5}{8}$	$\frac{1}{5}{16}$	$\frac{15}{16}$	$\frac{1}{2}$	0	0	$\frac{15}{16}$	$\frac{1}{7}{8}$	$\frac{2}{11}{16}$	$\frac{3}{8}$	4	$\frac{4}{7}{16}$	$\frac{4}{11}{16}$	$\frac{4}{3}{4}$
CROSS SLOPE ADJUSTMENTS (IN.)	A, B, D, & E	$\frac{5}{16}$																					
	C	$\frac{5}{16}$																					
ALLOWABLE FIELD HAUNCH (IN. & FT.)	MAX.	ALL	$2\frac{1}{2}$ (0.208)																				
	MIN.	ALL	$-\frac{3}{16}$ (-0.013)																				
	BEAM LINE								℄ PIER NO. 2 BEARINGS														
		LINE 23	LINE 24	LINE 25	LINE 26	LINE 27	LINE 28	LINE 29	LINE 30	LINE 31	LINE 32	LINE 33	LINE 34	LINE 35	LINE 36	LINE 37	LINE 38	LINE 39	LINE 40	LINE 41	LINE 42	LINE 43	LINE 44
ANTICIPATED DEFLECTION DUE TO SLAB (IN.)	ALL	$\frac{4}{11}{16}$	$\frac{4}{7}{16}$	4	$\frac{3}{8}$	$\frac{2}{11}{16}$	$\frac{1}{7}{8}$	$\frac{15}{16}$	0	0	$\frac{15}{16}$	$\frac{1}{7}{8}$	$\frac{2}{11}{16}$	$\frac{3}{8}$	4	$\frac{4}{7}{16}$	$\frac{4}{11}{16}$	$\frac{4}{3}{4}$	$\frac{4}{11}{16}$	$\frac{4}{7}{16}$	4	$\frac{3}{8}$	$\frac{2}{11}{16}$
CROSS SLOPE ADJUSTMENTS (IN.)	A, B, D, & E	$\frac{5}{16}$																					
	C	$\frac{5}{16}$																					
ALLOWABLE FIELD HAUNCH (IN. & FT.)	MAX.	ALL	$2\frac{1}{2}$ (0.208)																				
	MIN.	ALL	$-\frac{3}{16}$ (-0.013)																				



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

NOTE:  
HAUNCH LOCATIONS ARE AT THE SAME LOCATION AS THE ENCIRCLED NUMBERS SHOWN ON TOP OF SLAB ELEV. LOCATIONS SHEETS.

NOTE 1:  
TO CALCULATE FIELD HAUNCH REQUIRED AT EACH LOCATION, SURVEY THE BEAM TOPS CONSISTENT WITH THE SPACINGS SHOWN ON THE "TOP OF SLAB ELEVATIONS LAYOUT". SUBTRACT THE SURVEYED BEAM SHOT FROM THE "BEAM LINE HAUNCH ELEVATION". THIS VALUE WILL BE THE HAUNCH NEEDED (SEE "FIELD HAUNCH" IN HAUNCH DETAIL). THE "BEAM LINE HAUNCH ELEVATION" INCLUDES ADJUSTMENTS FOR SLAB 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.

DESIGN FOR 0° SKEW

1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

111' END SPANS152' INTERIOR SPANS

SLAB HAUNCH DATA DETAILS

STA. 389+39.66MARCH, 2021

LINN COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 31 OF 54FILE NO. 31598DESIGN NO. 220

REVISED 06-12 - THE ALLOWABLE FIELD HAUNCH MAX. & MIN. WAS CHANGED TO INCHES & DECIMALS OF FEET. NOTE & NOTE 1 WERE CHANGED. THE SLAB HAUNCH LOCATIONS EXAMPLE WAS REPLACED WITH A NOTE.  
ENGLISH\MISCELLANEOUS\BRIDGES.DGN - 1066 - THIS SHEET ISSUED 02-08.

BENCH MARK NO. 321: STA. 373+43.92, 34.60' RT. SET FENO MON, ELEV 722.66  
BENCH MARK NO. 322: STA. 408+77.97, 276.45' LT. SET FENO MON, ELEV 726.92

TABLE OF BEAM LINE SLAB HAUNCH ELEVATIONS																						
BEAM LINE			℄ PIER NO. 3 BEARINGS																℄ PIER NO. 4 BEARINGS			
	LINE 45	LINE 46	LINE 47	LINE 48	LINE 49	LINE 50	LINE 51	LINE 52	LINE 53	LINE 54	LINE 55	LINE 56	LINE 57	LINE 58	LINE 59	LINE 60	LINE 61	LINE 62	LINE 63	LINE 64	LINE 65	LINE 66
A	720.69	720.65	720.60	720.61	720.72	720.83	720.93	721.02	721.09	721.15	721.20	721.23	721.24	721.24	721.22	721.19	721.14	721.09	721.02	720.95	720.95	721.04
B	720.87	720.83	720.79	720.79	720.90	721.01	721.11	721.20	721.27	721.33	721.38	721.41	721.42	721.42	721.40	721.37	721.32	721.27	721.20	721.13	721.14	721.22
C	720.97	720.93	720.88	720.89	721.00	721.11	721.21	721.29	721.37	721.43	721.48	721.51	721.52	721.52	721.50	721.46	721.42	721.36	721.30	721.23	721.23	721.32
D	720.79	720.75	720.71	720.71	720.82	720.93	721.03	721.12	721.19	721.25	721.30	721.33	721.34	721.34	721.32	721.29	721.24	721.19	721.12	721.05	721.06	721.14
E	720.61	720.57	720.52	720.53	720.64	720.75	720.85	720.94	721.01	721.07	721.12	721.15	721.16	721.16	721.14	721.11	721.06	721.01	720.94	720.87	720.87	720.96
BEAM LINE															℄ PIER NO. 5 BEARINGS							
	LINE 67	LINE 68	LINE 69	LINE 70	LINE 71	LINE 72	LINE 73	LINE 74	LINE 75	LINE 76	LINE 77	LINE 78	LINE 79	LINE 80	LINE 81	LINE 82	LINE 83	LINE 84	LINE 85	LINE 86	LINE 87	LINE 88
A	721.12	721.20	721.26	721.32	721.35	721.37	721.38	721.37	721.34	721.30	721.24	721.18	721.10	721.01	720.92	720.91	720.98	721.04	721.09	721.13	721.15	721.17
B	721.31	721.38	721.44	721.50	721.53	721.56	721.56	721.55	721.52	721.48	721.42	721.36	721.28	721.19	721.10	721.09	721.16	721.22	721.27	721.31	721.34	721.35
C	721.40	721.48	721.54	721.59	721.63	721.65	721.66	721.65	721.62	721.58	721.52	721.45	721.37	721.29	721.19	721.19	721.25	721.31	721.36	721.40	721.43	721.45
D	721.23	721.30	721.36	721.42	721.45	721.48	721.48	721.47	721.44	721.40	721.34	721.28	721.20	721.11	721.02	721.01	721.08	721.14	721.19	721.23	721.26	721.27
E	721.04	721.12	721.18	721.24	721.27	721.29	721.30	721.29	721.26	721.22	721.16	721.10	721.02	720.93	720.84	720.83	720.90	720.96	721.01	721.05	721.07	721.09

MISCELLANEOUS DATA TABLE																								
	BEAM LINE				℄ PIER NO. 3 BEARINGS																℄ PIER NO. 4 BEARINGS			
			LINE 45	LINE 46	LINE 47	LINE 48	LINE 49	LINE 50	LINE 51	LINE 52	LINE 53	LINE 54	LINE 55	LINE 56	LINE 57	LINE 58	LINE 59	LINE 60	LINE 61	LINE 62	LINE 63	LINE 64	LINE 65	LINE 66
ANTICIPATED DEFLECTION DUE TO SLAB (IN.)	ALL		1 <sup>7</sup> <sub>8</sub>	1 <sup>5</sup> <sub>16</sub>	0	0	1 <sup>5</sup> <sub>16</sub>	1 <sup>7</sup> <sub>8</sub>	2 <sup>11</sup> <sub>16</sub>	3 <sup>3</sup> <sub>8</sub>	4	4 <sup>7</sup> <sub>16</sub>	4 <sup>11</sup> <sub>16</sub>	4 <sup>3</sup> <sub>4</sub>	4 <sup>11</sup> <sub>16</sub>	4 <sup>7</sup> <sub>16</sub>	4	3 <sup>3</sup> <sub>8</sub>	2 <sup>11</sup> <sub>16</sub>	1 <sup>7</sup> <sub>8</sub>	1 <sup>5</sup> <sub>16</sub>	0	0	1 <sup>5</sup> <sub>16</sub>
CROSS SLOPE ADJUSTMENTS (IN.)	A, B, D, & E		5 <sub>16</sub>																					
	C		5 <sub>16</sub>																					
ALLOWABLE FIELD HAUNCH (IN. & FT.)	MAX.	ALL	2 <sup>1</sup> <sub>2</sub> (0.208)																					
	MIN.	ALL	-3 <sub>16</sub> (-0.013)																					
	BEAM LINE														℄ PIER NO. 5 BEARINGS									
			LINE 67	LINE 68	LINE 69	LINE 70	LINE 71	LINE 72	LINE 73	LINE 74	LINE 75	LINE 76	LINE 77	LINE 78	LINE 79	LINE 80	LINE 81	LINE 82	LINE 83	LINE 84	LINE 85	LINE 86	LINE 87	LINE 88
ANTICIPATED DEFLECTION DUE TO SLAB (IN.)	ALL		1 <sup>7</sup> <sub>8</sub>	2 <sup>11</sup> <sub>16</sub>	3 <sup>3</sup> <sub>8</sub>	4	4 <sup>7</sup> <sub>16</sub>	4 <sup>11</sup> <sub>16</sub>	4 <sup>3</sup> <sub>4</sub>	4 <sup>11</sup> <sub>16</sub>	4 <sup>7</sup> <sub>16</sub>	4	3 <sup>3</sup> <sub>8</sub>	2 <sup>11</sup> <sub>16</sub>	1 <sup>7</sup> <sub>8</sub>	1 <sup>5</sup> <sub>16</sub>	0	0	1 <sup>5</sup> <sub>16</sub>	1 <sup>7</sup> <sub>8</sub>	2 <sup>11</sup> <sub>16</sub>	3 <sup>3</sup> <sub>8</sub>	4	4 <sup>7</sup> <sub>16</sub>
CROSS SLOPE ADJUSTMENTS (IN.)	A, B, D, & E		5 <sub>16</sub>																					
	C		5 <sub>16</sub>																					
ALLOWABLE FIELD HAUNCH (IN. & FT.)	MAX.	ALL	2 <sup>1</sup> <sub>2</sub> (0.208)																					
	MIN.	ALL	-3 <sub>16</sub> (-0.013)																					

NOTE:  
HAUNCH LOCATIONS ARE AT THE SAME  
LOCATION AS THE ENCIRCLED NUMBERS  
SHOWN ON TOP OF SLAB ELEV.  
LOCATIONS SHEETS.

DESIGN FOR 0° SKEW

1,134'-0 X 40'-0 PRETENSIONED  
PRÉSTRESSED CONCRETE BEAM BRIDGE

111' END SPANS152' INTERIOR SPANS

SLAB HAUNCH DATA DETAILS

STA. 389+39.66MARCH, 2021

LINN COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 32 OF 54FILE NO. 31598DESIGN NO. 220



REVISED 06-12 - THE ALLOWABLE FIELD HAUNCH MAX. & MIN. WAS CHANGED TO INCHES & DECIMALS OF FEET. NOTE & NOTE 1 WERE CHANGED. THE SLAB HAUNCH LOCATIONS EXAMPLE WAS REPLACED WITH A NOTE.  
ENGLISH\MISCELLANEOUS\BRIDGES.DGN - 1066 - THIS SHEET ISSUED 02-08.

BENCH MARK NO. 321: STA. 373+43.92, 34.60' RT. SET FENO MON, ELEV 722.66  
BENCH MARK NO. 322: STA. 408+77.97, 276.45' LT. SET FENO MON, ELEV 726.92

TABLE OF BEAM LINE SLAB HAUNCH ELEVATIONS																						
BEAM LINE										℄ PIER NO. 6 BEARINGS												
	LINE 89	LINE 90	LINE 91	LINE 92	LINE 93	LINE 94	LINE 95	LINE 96	LINE 97	LINE 98	LINE 99	LINE 100	LINE 101	LINE 102	LINE 103	LINE 104	LINE 105	LINE 106	LINE 107	LINE 108	LINE 109	LINE 110
A	721.17	721.15	721.11	721.06	721.00	720.92	720.82	720.72	720.61	720.49	720.49	720.53	720.56	720.59	720.60	720.61	720.60	720.57	720.53	720.47	720.40	720.31
B	721.35	721.33	721.29	721.24	721.18	721.10	721.00	720.90	720.79	720.67	720.67	720.71	720.74	720.77	720.79	720.79	720.78	720.75	720.71	720.65	720.58	720.49
C	721.44	721.43	721.39	721.34	721.28	721.20	721.10	721.00	720.89	720.77	720.76	720.80	720.84	720.87	720.88	720.89	720.88	720.85	720.81	720.75	720.68	720.59
D	721.27	721.25	721.21	721.16	721.10	721.02	720.92	720.82	720.71	720.59	720.59	720.63	720.66	720.69	720.71	720.71	720.70	720.67	720.63	720.57	720.50	720.41
E	721.09	721.07	721.03	720.98	720.92	720.84	720.74	720.64	720.53	720.41	720.41	720.45	720.48	720.51	720.52	720.53	720.52	720.49	720.45	720.39	720.32	720.23
BEAM LINE					℄ PIER NO. 7 BEARINGS													℄ E. ABUT. BEARING				
	LINE 111	LINE 112	LINE 113	LINE 114	LINE 115	LINE 116	LINE 117	LINE 118	LINE 119	LINE 120	LINE 121	LINE 122	LINE 123	LINE 124	LINE 125	LINE 126	LINE 127	LINE 128				
A	720.20	720.09	719.96	719.83	719.69	719.67	719.65	719.63	719.60	719.56	719.50	719.44	719.37	719.28	719.19	719.09	718.98	718.87				
B	720.39	720.27	720.14	720.01	719.87	719.85	719.83	719.81	719.78	719.74	719.69	719.62	719.55	719.46	719.37	719.27	719.16	719.05				
C	720.48	720.37	720.24	720.10	719.96	719.95	719.93	719.91	719.88	719.83	719.78	719.72	719.65	719.56	719.47	719.37	719.26	719.15				
D	720.31	720.19	720.06	719.93	719.79	719.77	719.75	719.73	719.70	719.66	719.61	719.54	719.47	719.38	719.29	719.19	719.08	718.97				
E	720.12	720.01	719.88	719.75	719.61	719.59	719.57	719.55	719.52	719.48	719.42	719.36	719.29	719.20	719.11	719.01	718.90	718.79				

MISCELLANEOUS DATA TABLE																										
	BEAM LINE											℄ PIER NO. 6 BEARINGS														
			LINE 89	LINE 90	LINE 91	LINE 92	LINE 93	LINE 94	LINE 95	LINE 96	LINE 97	LINE 98	LINE 99	LINE 100	LINE 101	LINE 102	LINE 103	LINE 104	LINE 105	LINE 106	LINE 107	LINE 108	LINE 109	LINE 110		
ANTICIPATED DEFLECTION DUE TO SLAB (IN.)	ALL		4 <sup>11</sup> <sub>16</sub>	4 <sup>3</sup> <sub>4</sub>	4 <sup>11</sup> <sub>16</sub>	4 <sup>7</sup> <sub>16</sub>	4	3 <sup>3</sup> <sub>8</sub>	2 <sup>11</sup> <sub>16</sub>	1 <sup>7</sup> <sub>8</sub>	1 <sup>5</sup> <sub>16</sub>	0	0	1 <sup>5</sup> <sub>16</sub>	1 <sup>7</sup> <sub>8</sub>	2 <sup>11</sup> <sub>16</sub>	3 <sup>3</sup> <sub>8</sub>	4	4 <sup>7</sup> <sub>16</sub>	4 <sup>11</sup> <sub>16</sub>	4 <sup>3</sup> <sub>4</sub>	4 <sup>11</sup> <sub>16</sub>	4 <sup>7</sup> <sub>16</sub>	4		
CROSS SLOPE ADJUSTMENTS (IN.)	A, B, D, & E		5 <sub>16</sub>																							
	C		5 <sub>16</sub>																							
ALLOWABLE FIELD HAUNCH (IN. & FT.)	MAX.	ALL	2 <sup>1</sup> <sub>2</sub> (0.208)																							
	MIN.	ALL	-3 <sub>16</sub> (-0.013)																							
	BEAM LINE						℄ PIER NO. 7 BEARINGS												℄ E. ABUT. BEARING							
			LINE 111	LINE 112	LINE 113	LINE 114	LINE 115	LINE 116	LINE 117	LINE 118	LINE 119	LINE 120	LINE 121	LINE 122	LINE 123	LINE 124	LINE 125	LINE 126	LINE 127	LINE 128						
ANTICIPATED DEFLECTION DUE TO SLAB (IN.)	ALL		3 <sup>3</sup> <sub>8</sub>	2 <sup>11</sup> <sub>16</sub>	1 <sup>7</sup> <sub>8</sub>	1 <sup>5</sup> <sub>16</sub>	0	0	1 <sub>2</sub>	1 <sup>5</sup> <sub>16</sub>	1 <sup>5</sup> <sub>16</sub>	1 <sup>13</sup> <sub>16</sub>	1 <sup>7</sup> <sub>8</sub>	1 <sup>13</sup> <sub>16</sub>	1 <sup>5</sup> <sub>8</sub>	1 <sup>5</sup> <sub>16</sub>	1 <sup>5</sup> <sub>16</sub>	1 <sub>2</sub>	0							
CROSS SLOPE ADJUSTMENTS (IN.)	A, B, D, & E		5 <sub>16</sub>																							
	C		5 <sub>16</sub>																							
ALLOWABLE FIELD HAUNCH (IN. & FT.)	MAX.	ALL	2 <sup>1</sup> <sub>2</sub> (0.208)																							
	MIN.	ALL	-3 <sub>16</sub> (-0.013)																							

NOTE:  
HAUNCH LOCATIONS ARE AT THE SAME LOCATION AS THE ENCIRCLED NUMBERS SHOWN ON TOP OF SLAB ELEV. LOCATIONS SHEETS.

DESIGN FOR 0° SKEW

1,134'-0 X 40'-0 PRETENSIONED  
PRÉSTRESSED CONCRETE BEAM BRIDGE

111' END SPANS152' INTERIOR SPANS

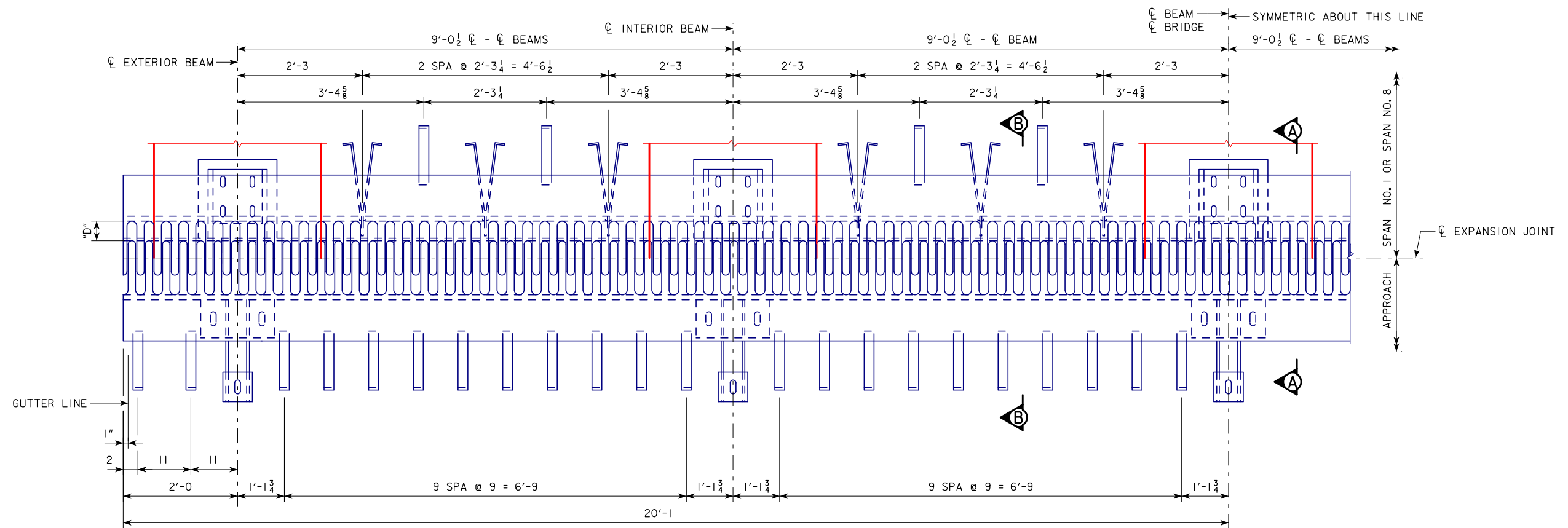
SLAB HAUNCH DATA DETAILS

STA. 389+39.66MARCH, 2021

LINN COUNTY

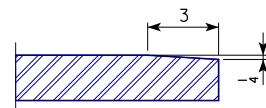
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 33 OF 54FILE NO. 31598DESIGN NO. 220



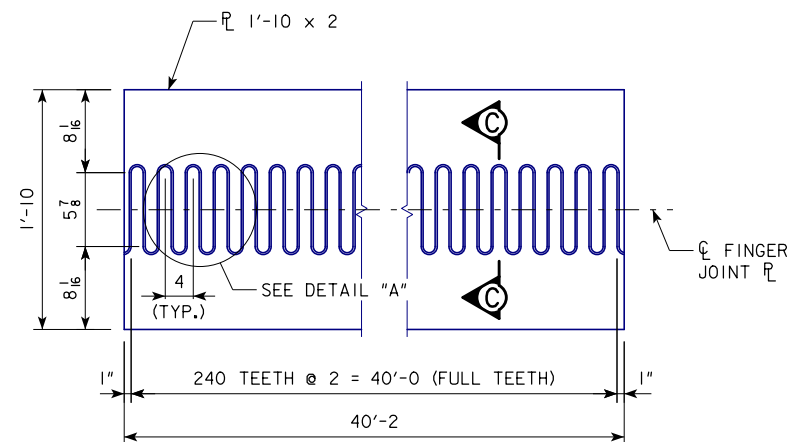
## PLAN VIEW

NOTE: SEE DESIGN SHEET 36 FOR SECTIONS "A-A" AND "B-B".

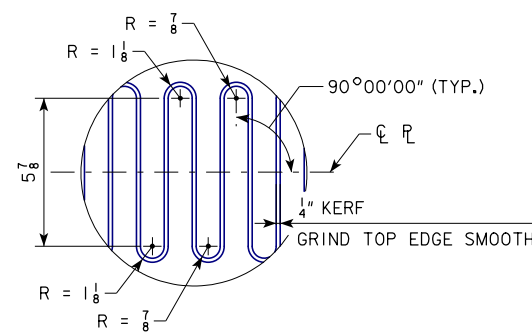


## SECTION C-C

NOTE: TOP OF EXPANSION DEVICE IS TO BE PARALLEL TO GRADE.  
FLAME CUT FROM 1'-10 x 2 PL. BEVEL EACH TOOTH 1/4 x 3.



EXPANSION DEVICE PLAN VIEW SHOWING  
TOOTH LAYOUT



DETAIL "A"

## NOTES:

THE CONTRACTOR SHALL SUBMIT FOR APPROVAL SHOP DRAWINGS OF THE EXPANSION JOINT SHOWING LAYOUT AND MATERIAL TO BE USED.

THE EXPANSION DEVICE AND ALL ASSOCIATED ATTACHMENT PLATES SHALL BE GALVANIZED AFTER WELDING, INCLUDING THE SHIMS. THE WELD PLATES EMBEDDED IN THE GIRDER SHALL HAVE GALVANIZED PAINT APPLIED AFTER WELDING IN THE FIELD IS COMPLETED.

THE EXPANSION DEVICE IS TO BE PARALLEL TO GRADE.

CAP SCREWS SHALL BE COUNTERSUNK 1/16" BELOW TOP OF THE PLATE.

THE MINIMUM GRADE OF STRUCTURAL STEEL FOR THE EXPANSION DEVICE SHALL BE ASTM-A709, GRADE 50.

THE BID ITEM "EXPANSION DEVICE (FINGER JOINT)" SHALL INCLUDE THE COST FOR FURNISHING AND INSTALLING THE ABUTMENT EXPANSION DEVICE, INCLUDING THE ANCHORAGE SYSTEM, NEOPRENE TROUGH ANGLES, ABUTMENT ANCHOR BOLTS, STAINLESS STEEL CONCRETE ANCHORS, STAINLESS STEEL BOLTS WITH STAINLESS STEEL WASHERS AND STAINLESS STEEL NUTS, GALVANIZED BOLTS WITH WASHERS AND NUTS, PLATE WASHERS, SHIMS, NEOPRENE TROUGH CONNECTION PLATES, AND BARRIER RAIL COVER PLATES.

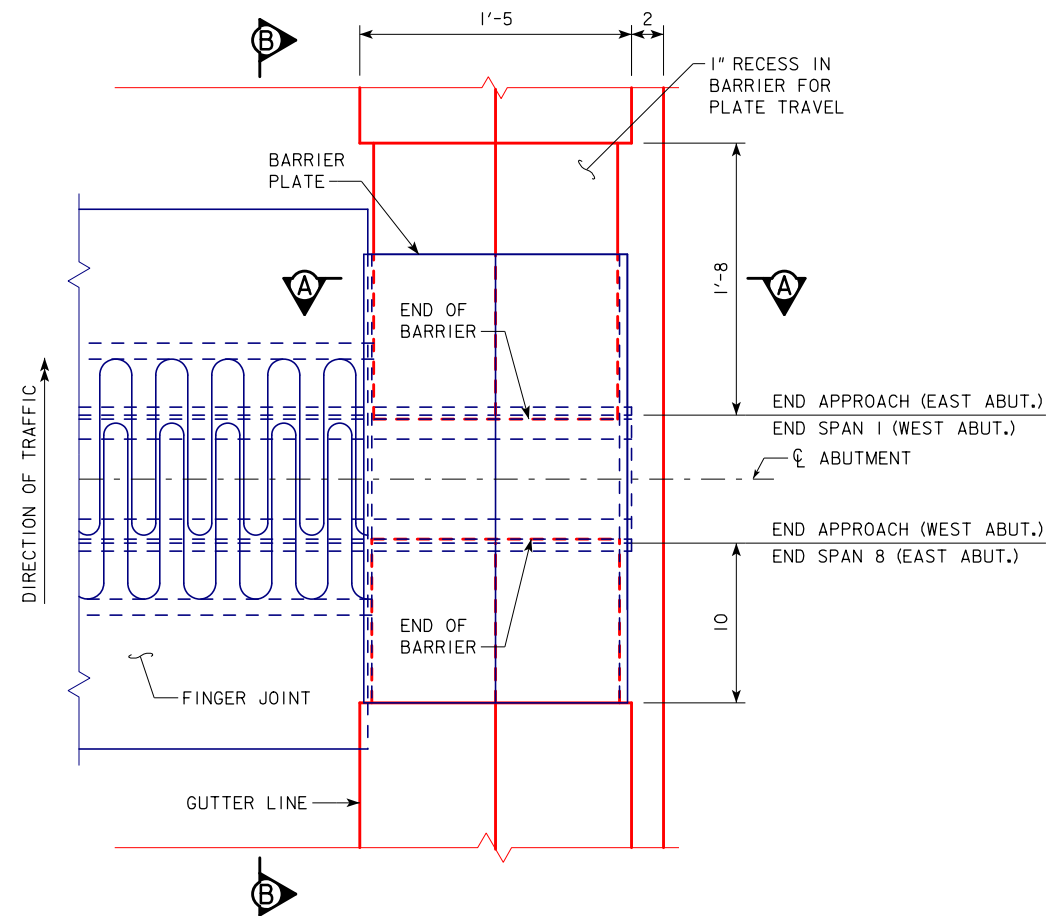
CONTRACTOR TO NOTE THAT THE CAP SCREW ANCHORAGE SYSTEM FOR THE 1/2" BARRIER PLATES ARE ALWAYS TO BE PLACED ON THE ONCOMING TRAFFIC SIDE.

CONCRETE SHALL BE FORCED UNDER AND AROUND FINGER PLATE SUPPORTING HARDWARE, STUDS AND BARS. PROPER CONSOLIDATION SHALL BE ACHIEVED BY LOCALIZED INTERNAL VIBRATION.

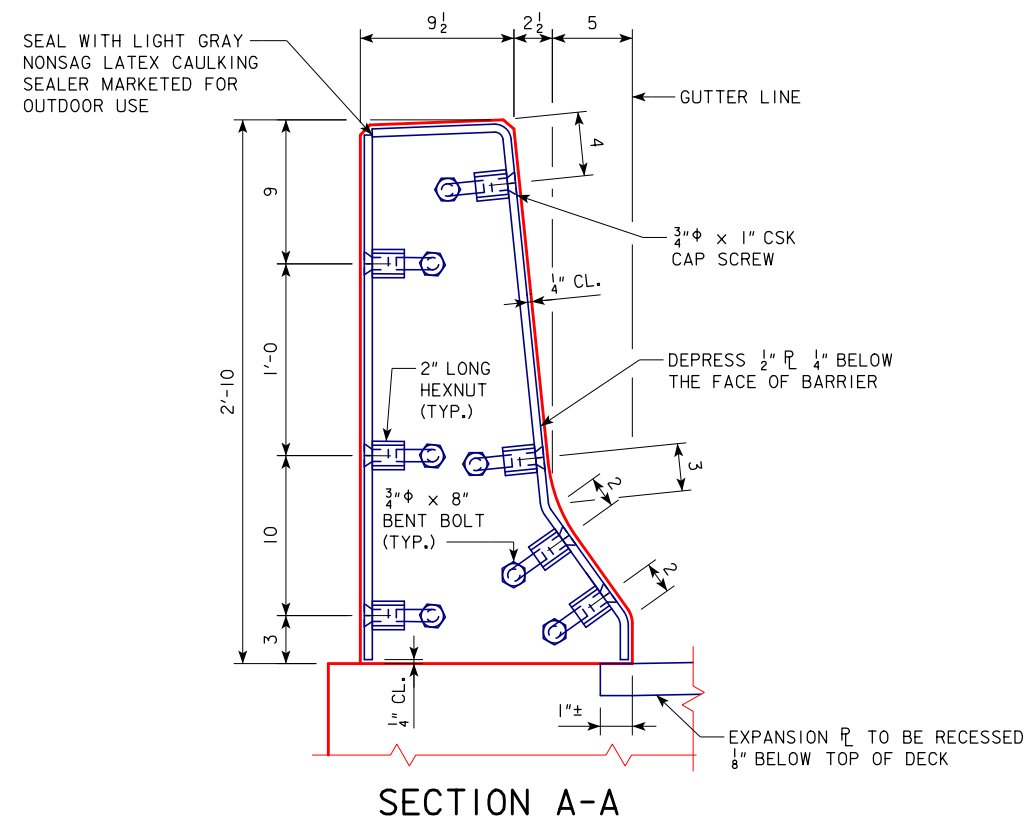
## FINGER JOINT SETTINGS

TEMPERATURE	DIMENSION "D"	
	W. ABUT.	E. ABUT.
10°F	4 1/4	4 1/4
50°F	2 5/8	2 5/8
90°F	1"	1"

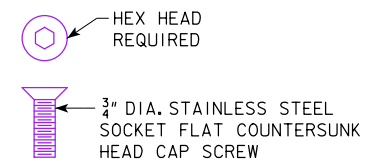
DESIGN FOR 0° SKEW  
1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE  
111' END SPANS 152' INTERIOR SPANS  
ROADWAY EXP. DEVICE DETAILS  
STA. 389+39.66 MARCH, 2021  
LINN COUNTY  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 34 OF 54 FILE NO. 31598 DESIGN NO. 220



**EXPANSION DEVICE PLAN  
SHOWING BARRIER**  
(DIMENSIONED AT BASE OF BARRIER)

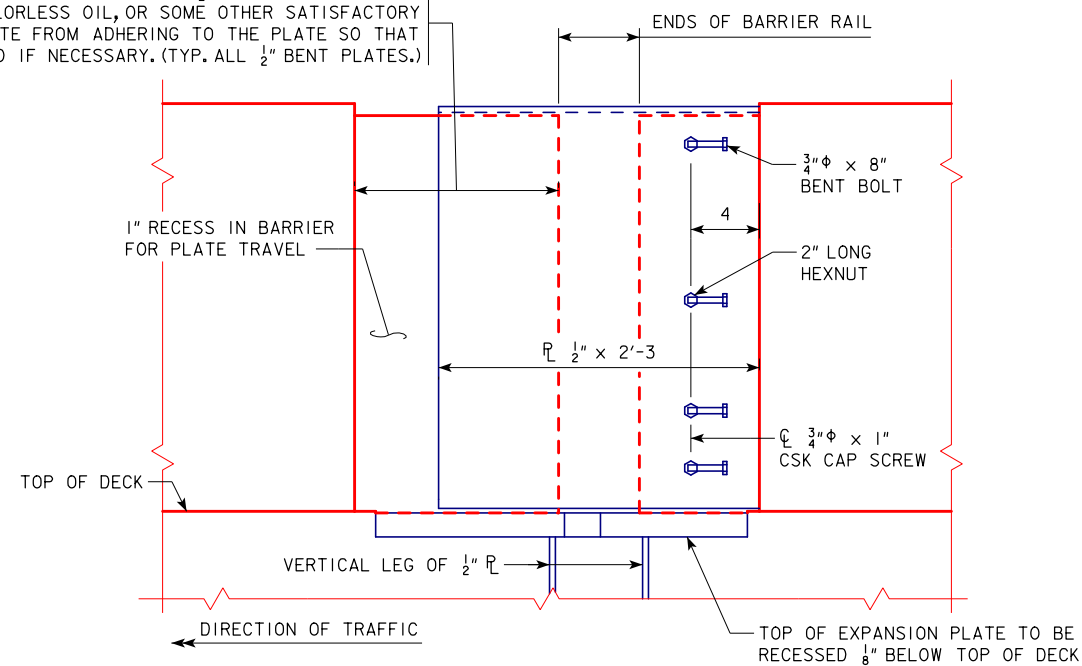


**SECTION A-A**

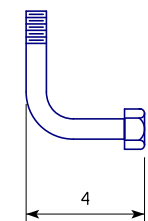


**SOCKET FLAT COUNTERSUNK  
HEAD CAP SCREW DETAIL**

THE INSIDE SURFACE OF THIS PORTION OF THE 1/2" BENT PLATE IS TO BE PAINTED WITH A COLORLESS OIL, OR SOME OTHER SATISFACTORY MEANS TO PREVENT CONCRETE FROM ADHERING TO THE PLATE SO THAT THE PLATE CAN BE REMOVED IF NECESSARY. (TYP. ALL 1/2" BENT PLATES.)



**SECTION B-B**



**BENT BOLT DETAIL**

DESIGN FOR 0° SKEW  
**1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
111' END SPANS 152' INTERIOR SPANS  
**BARRIER COVER PLATE DETAILS**  
STA. 389+39.66 MARCH, 2021  
**LINN COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 35 OF 54 FILE NO. 31598 DESIGN NO. 220



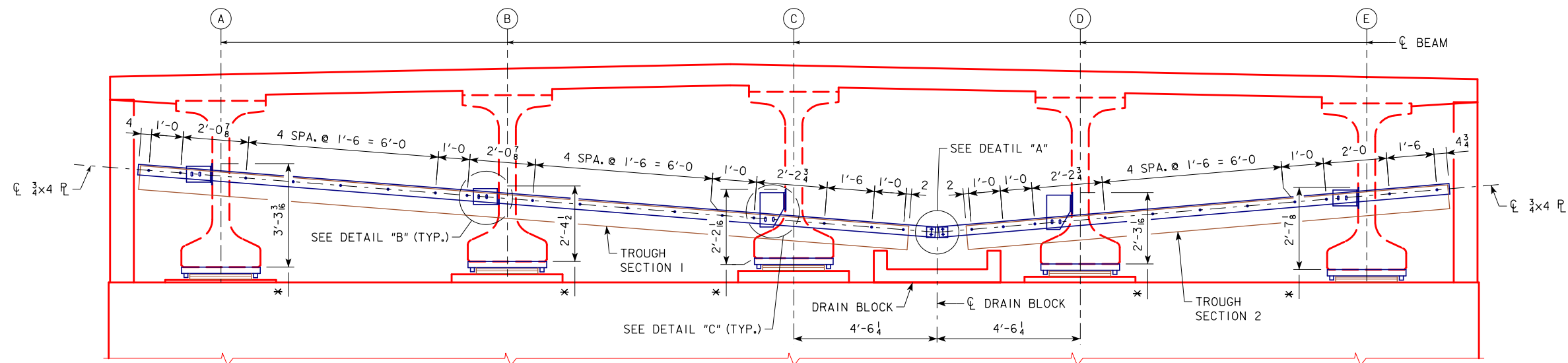
PLAN VIEW OF SHIMS



### PLAN

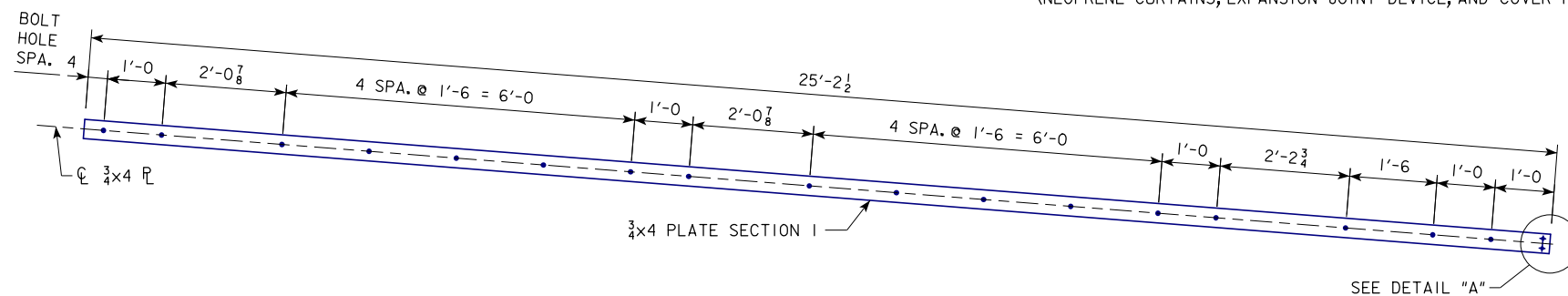
ELEVATION  
MOUNTING P DETAIL

DESIGN FOR 0° SKEW  
1,134'-0" X 40'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE  
111' END SPANS 152' INTERIOR SPANS  
FINGER JOINT DETAILS  
STA. 389+39.66 MARCH, 2021  
LINN COUNTY  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 36 OF 54 FILE NO. 31598 DESIGN NO. 220

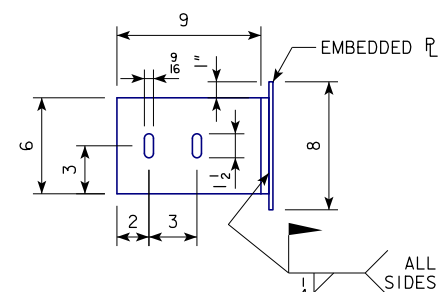
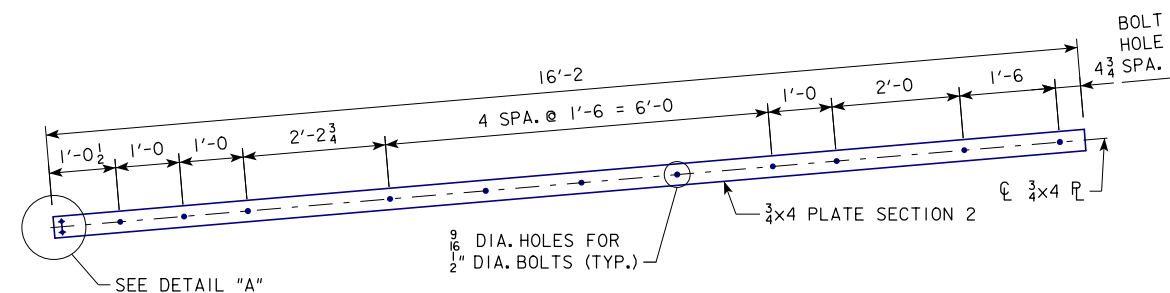


### ELEVATION NEAR ABUTMENT

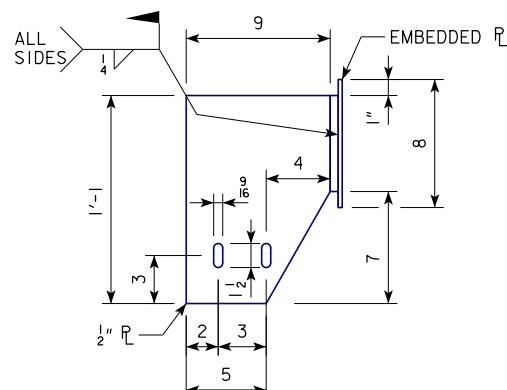
(LOOKING UPSTATION AT EAST ABUTMENT; WEST ABUTMENT SIMILAR)  
(NEOPRENE CURTAINS, EXPANSION JOINT DEVICE, AND COVER PLATES NOT SHOWN)



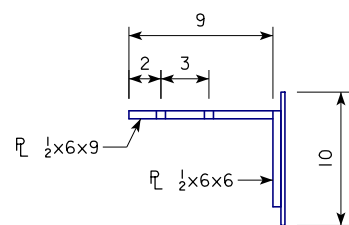
### 3/4 x 4 PLATE DETAIL



### ELEVATION

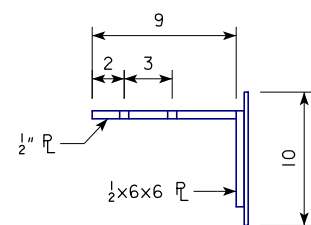


### ELEVATION



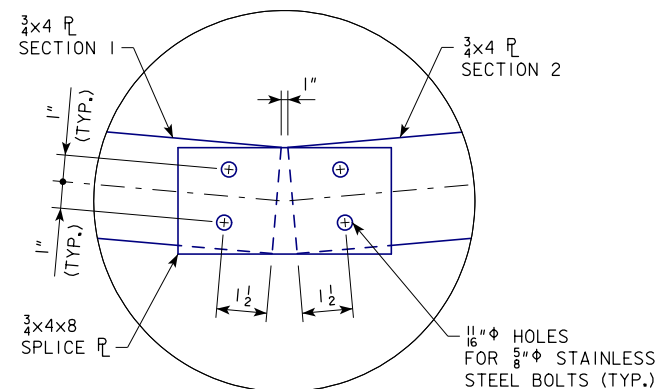
### PLAN

### DETAIL "B"



### PLAN

### DETAIL "C"

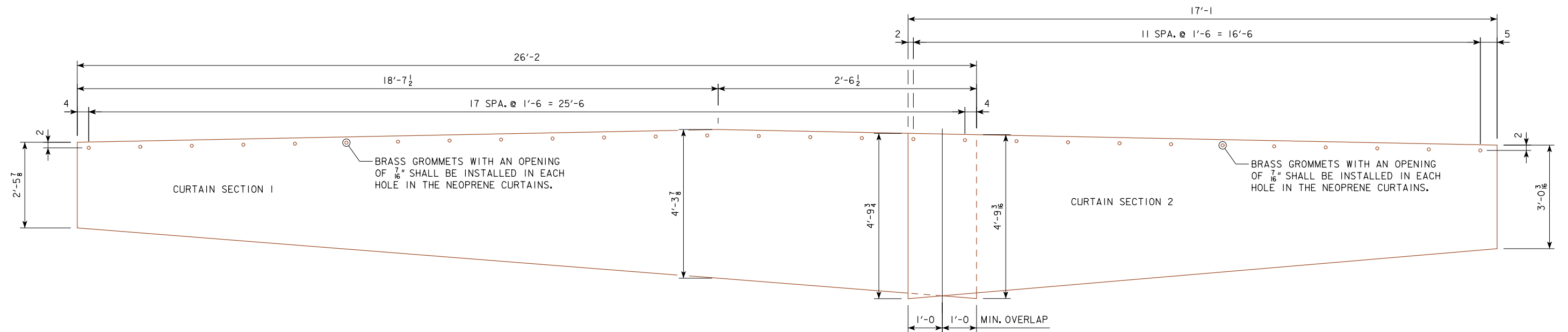


### DETAIL "A"

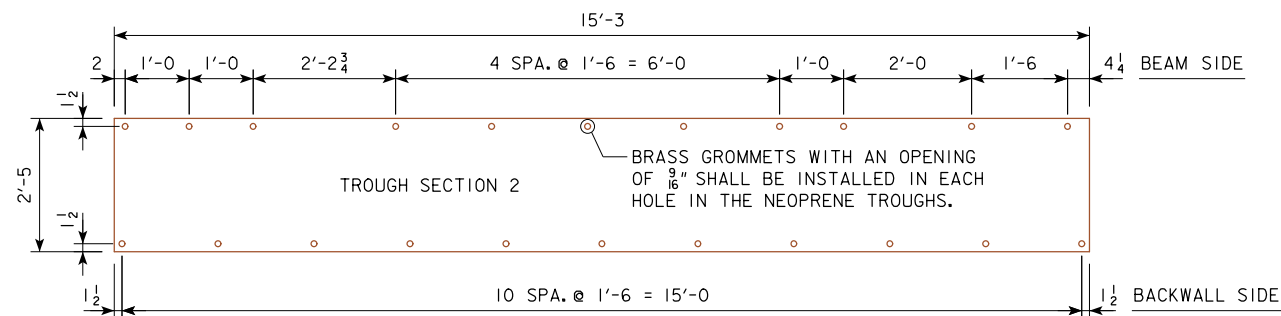
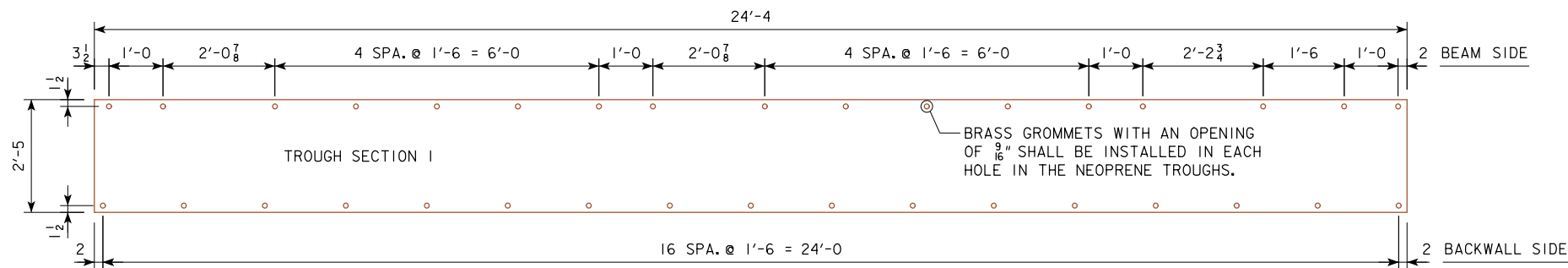
NOTES:  
FOR DRAIN BLOCK DETAILS, SEE DESIGN SHEET 39.  
FOR NEOPRENE TROUGH AND CURTAIN DETAILS, SEE DESIGN SHEET 38.  
\* DIMENSIONS ARE TO TOP OF EMBEDDED PLATE IN BEAM FROM  
BOTTOM OF BOTTOM FLANGE. SEE DESIGN SHEET 42 FOR  
EMBEDDED PLATE DETAILS.

DESIGN FOR 0° SKEW  
**1,134'-0" X 40'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
111' END SPANS 152' INTERIOR SPANS  
**TROUGH STEEL DETAILS**  
STA. 389+39.66 MARCH, 2021  
**LINN COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 37 OF 54 FILE NO. 31598 DESIGN NO. 220

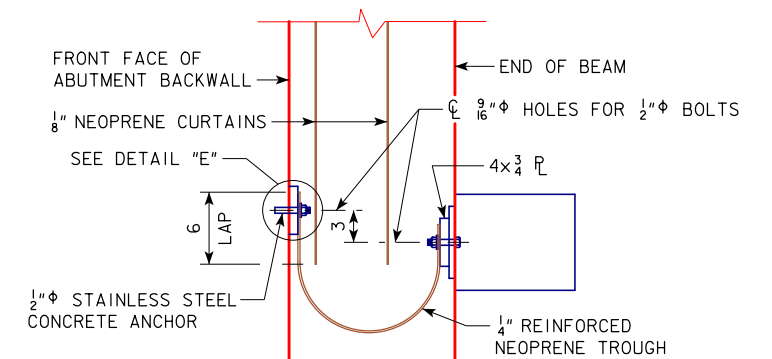




ELEVATION -  $\frac{1}{8}$ " REINFORCED NEOPRENE CURTAIN DETAILS



PLAN VIEW -  $\frac{1}{4}$ " REINFORCED NEOPRENE TROUGH DETAILS



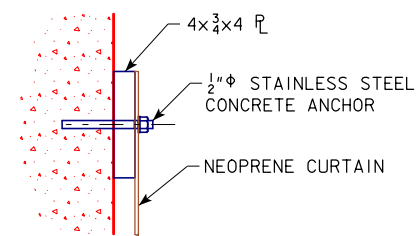
TYPICAL SECTION THROUGH TROUGH

### REINFORCED NEOPRENE NOTES:

THE ELASTOMER COMPOUND FOR TROUGHS AND CURTAINS SHALL BE IN ACCORDANCE WITH TABLE B OF ARTICLE 4195.02 OF THE STANDARD SPECIFICATIONS EXCEPT THE TENSILE STRENGTH SHALL BE 1500 PSI MINIMUM OR IT SHALL BE (EPDM) ETHYLENE PROPYLENE DIENE MONOMER (ASTM D 200, LINE CALL-OUTS 3BA, 515, A14, B13, F17, C12, K21).

STAINLESS STEEL BOLTS, WASHERS, NUTS AND CONCRETE ANCHORS SHALL MEET THE REQUIREMENTS OF ASTM A 193.

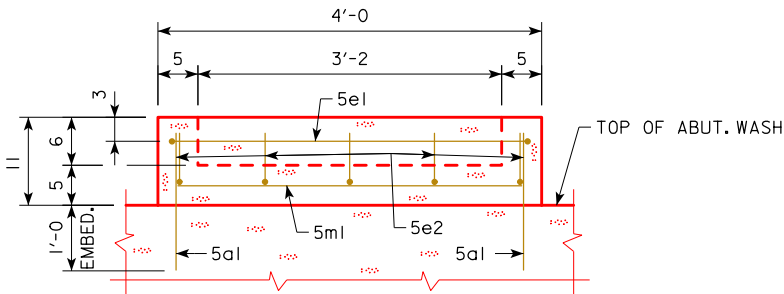
THE BID ITEM "EXPANSION DEVICE (FINGER JOINT)" SHALL INCLUDE ALL COSTS FOR FURNISHING AND INSTALLING THE  $\frac{1}{8}$ " REINFORCED NEOPRENE CURTAINS, THE  $\frac{1}{4}$ " REINFORCED NEOPRENE TROUGH, AND ASSOCIATED CONNECTION PLATES AND HARDWARE.



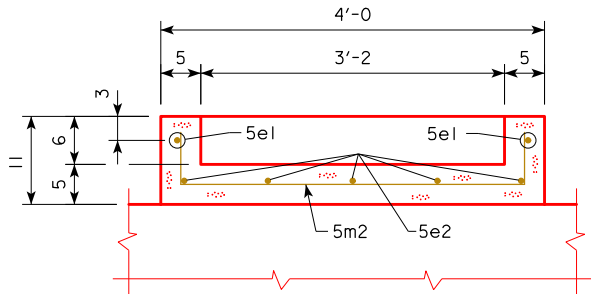
DETAIL E

NOTE:  
HOLES IN  $\frac{3}{4}$  x 4 PLATE SHALL  
MATCH HOLE LOCATIONS AS SHOWN  
ABOVE.

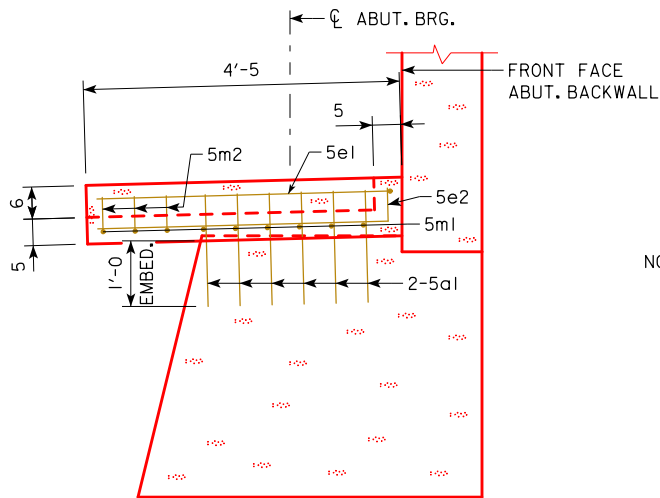
DESIGN FOR 0° SKEW	
1,134'-0 X 40'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE	
111' END SPANS	152' INTERIOR SPANS
NEOPRENE TROUGH DETAILS	
STA. 389+39.66	MARCH, 2021
LINN COUNTY	
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION	
DESIGN SHEET NO. 38 OF 54	FILE NO. 31598
DESIGN NO. 220	



SECTION F-F

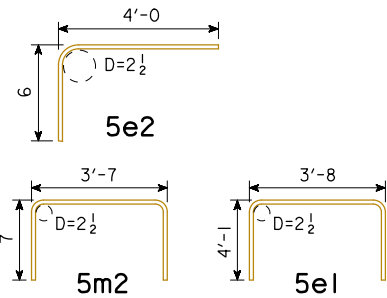


SECTION E-E



SECTION G-G

BENT BAR DETAILS



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

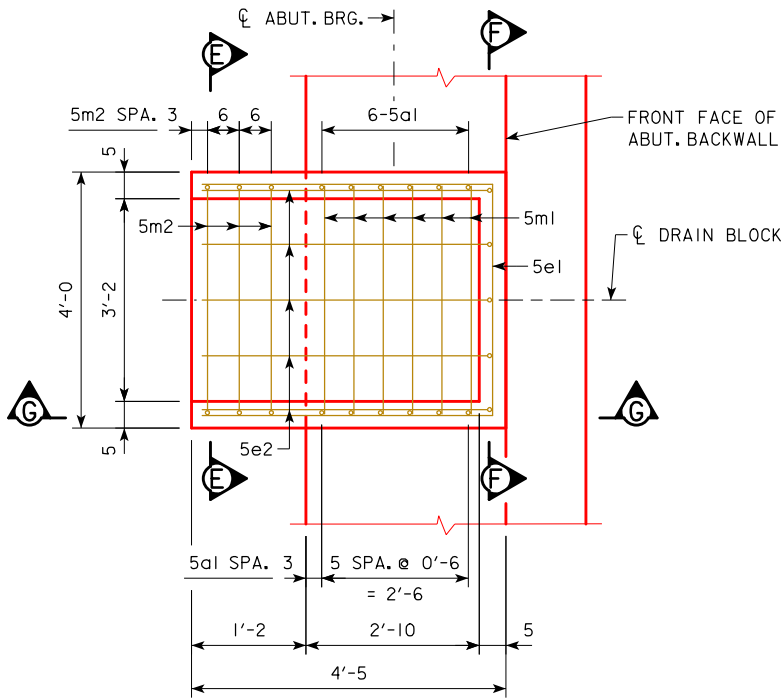
REINFORCING BAR LIST  
ONE DRAIN BLOCK

EPOXY COATED BARS	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
	5a1	DOWEL INTO ABUTMENT, VERTICAL		12	1'-9	22
	5e1	SIDE & BACK, HORIZ.		1	11'-10	12
	5e2	BOTT. & BACK, LONGIT.		5	4'-6	23
	5m1	ABOVE ABUTMENT, TRANSV.		6	3'-7	22
	5m2	OVERHANG, TRANSV.		3	4'-9	15
REINFORCING STEEL - EPOXY COATED - TOTAL (LBS.)						94

CONCRETE PLACEMENT QUANTITIES

LOCATION	WEST ABUT.	EAST ABUT.
DRAIN BLOCK	0.4	0.4
TOTAL (C.Y.)	0.4	0.4

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



DRAIN BLOCK PLAN VIEW

NOTE: FOR LOCATION OF DRAIN BLOCK ON ABUTMENTS, SEE DESIGN SHEET 37.

DESIGN FOR 0° SKEW  
1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE  
111' END SPANS 152' INTERIOR SPANS  
DRAIN BLOCK DETAILS  
STA. 389+39.66 MARCH, 2021  
LINN COUNTY  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 39 OF 54 FILE NO. 31598 DESIGN NO. 220

REVISION 08-12 - I.M. REFERENCE NOTE FOR SEALING BEAM ENDS DISTINGUISHES BETWEEN THE FABRICATOR AND CONTRACTOR. DECK PANEL OPTION NOTE WAS DELETED.  
ENGLISHBEAMS.DGN - 4770s1 - THIS SHEET ISSUED 02-08.

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, 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 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.

SOLE PLATE IS TO BE SET IN FORMS WHEN BEAM IS CAST AND FORMED OUT BELOW TO EXCLUDE CONCRETE AS DETAILED ON THE BEARING SHEETS.

ALL STRANDS AT THE ENDS OF BEAMS AT STUB ABUTMENTS SHALL BE CUT OFF REASONABLY FLUSH WITH THE CONCRETE.

CONCRETE SEALER SHALL BE APPLIED TO THE PRESTRESSED BEAM END SECTIONS AT THE ABUTMENTS. THE SEALING SHALL BE IN ACCORDANCE WITH MATERIALS I.M. 570 (FABRICATOR APPLICATION) AND I.M. 491.12 (CONTRACTOR APPLICATION).

MINIMUM CONCRETE f'c (AT 28 DAYS) AND MINIMUM f'ci AT RELEASE ARE LOCATED IN THE BTE 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.

BTE BEAM DATA																	
BTE BEAM	SPAN LENGTH C-C 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>D</sub>		PERMISSIBLE MAXIMUM SPACING	WEIGHT (TONS)	CONCRETE (CU YD.)	REINFORCING STEEL (WEIGHT-LBS)
												IMMEDIATE ① (ELASTIC) Δ <sub>i</sub>	TIME ② (PLASTIC) Δ <sub>T</sub>				
			f'ci (ksi)	f'c (ksi)		AT RELEASE	AFTER LOSSES			STEEL DIAPHRAGM	STEEL DIAPHRAGM	HL-93 LOADING					
												STEEL DIAPHRAGM					
BTEI10	110'-0	111'-4	5.00	6.00	0.60	26	4	1276	17.7	1.61	2.83	1.62	0.41	9'-3	46.8	23.1	3125
④ BTEI50	150'-0	151'-4	8.00	9.00	0.60	44	12	2383	33.7	3.52	6.17	4.34	1.09	9'-3	63.6	31.4	4194

① DEFLECTIONS AT MID-SPAN DUE TO WEIGHT OF SLAB AND DIAPHRAGM. THE DEFLECTIONS SHOWN ARE FOR A SLAB (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 1/4 OF SPAN FOR BTE60 TO BTE120, AND TWO STEEL DIAPHRAGMS (0.500 kips) PLACED 20'-0, ON EITHER SIDE, OF THE BEAM CENTERLINE FOR BTE125 TO BTE150. FOR DIFFERENT SLAB AND DIAPHRAGM WEIGHTS, DEFLECTIONS WILL BE DIRECTLY PROPORTIONAL.

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

TOTAL BEAM DEFLECTIONS AT 1/4 OF SPAN, Δ<sub>D</sub>, DUE TO WEIGHT OF SLAB AND DIAPHRAGMS FOR DETAILING PURPOSE:

(A) Δ<sub>D</sub>=Δ<sub>i</sub>+Δ<sub>T</sub> FOR SIMPLE SPAN.  
(B) Δ<sub>D</sub>=Δ<sub>i</sub>+3/4Δ<sub>T</sub> FOR END SPANS OF CONTINUOUS BRIDGE.  
(C) Δ<sub>D</sub>=Δ<sub>i</sub>+1/2Δ<sub>T</sub> FOR INTERIOR SPANS OF CONTINUOUS BRIDGE.

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

④ REQUIRES A 4000 psi, 28 DAY COMPRESSIVE STRENGTH FOR CAST-IN-PLACE SLAB CONCRETE.

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

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.

DESIGN FOR 0° SKEW

1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

111' END SPANS152' INTERIOR SPANS

BTE BEAM DETAILS

STA. 389+39.66MARCH, 2021

LINN COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

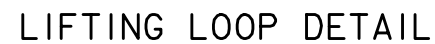
DESIGN SHEET NO. 40 OF 54FILE NO. 31598DESIGN NO. 220

ENGLISHBEAMS.DGN - 4770s2 - THIS SHEET ISSUED 02-08.

$$\begin{array}{c} \Delta \Delta \\ \Delta \Delta * \\ * \end{array}$$

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△△＊  
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LIFTING LOOPS SHALL CARRY LOADS EQUALLY.



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"

6b4

ΔΔ 5b1

ΔΔ 6b3

4h1

4e1

ΔΔ 5b2 (ALTERNATE)

5b1 (ALTERNATE)

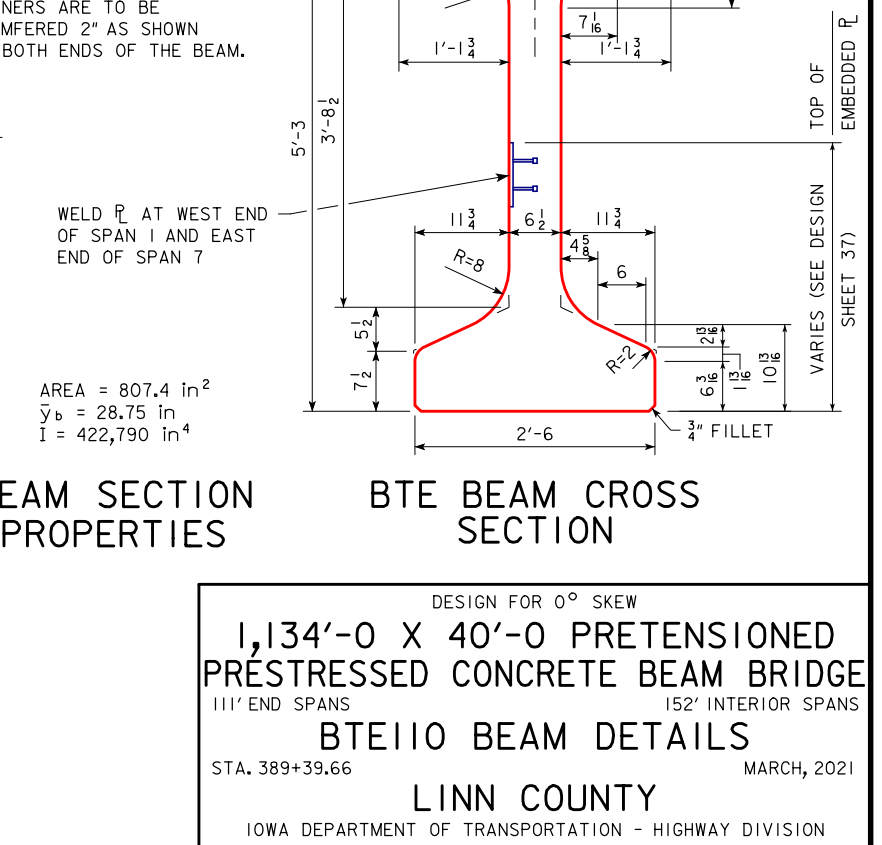
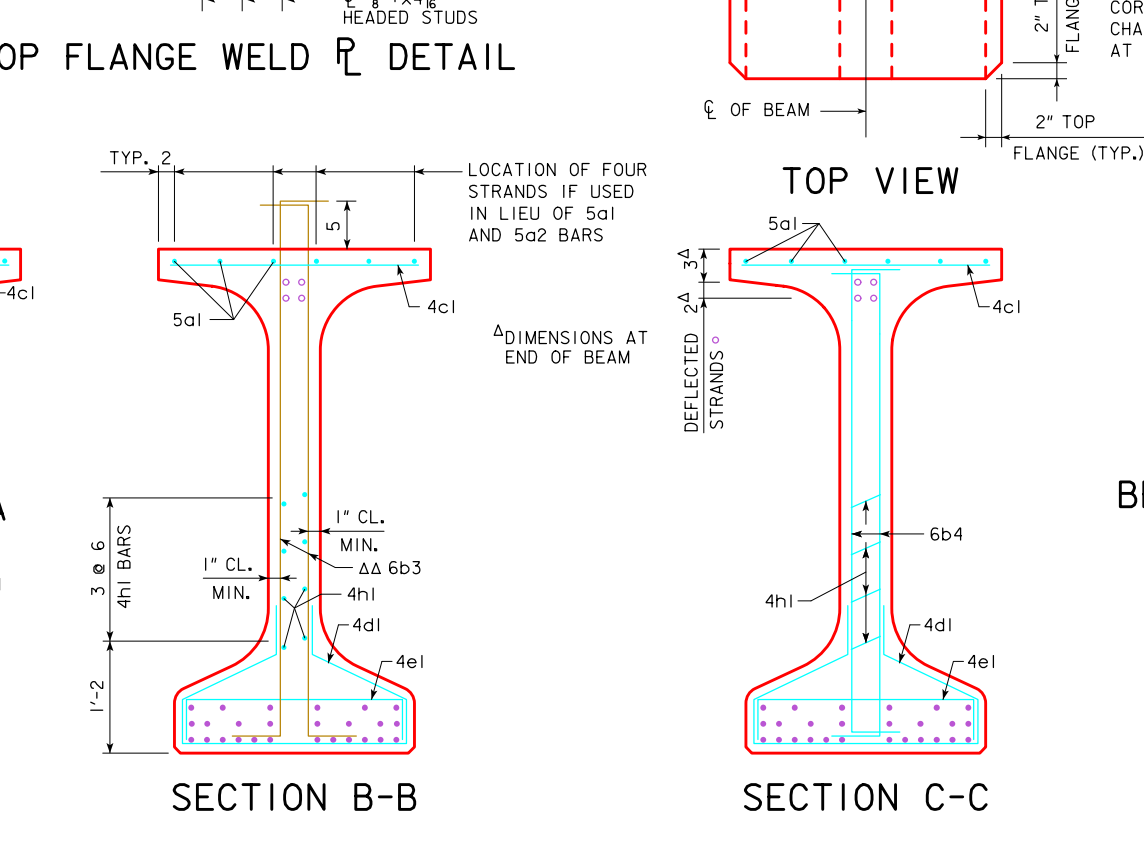
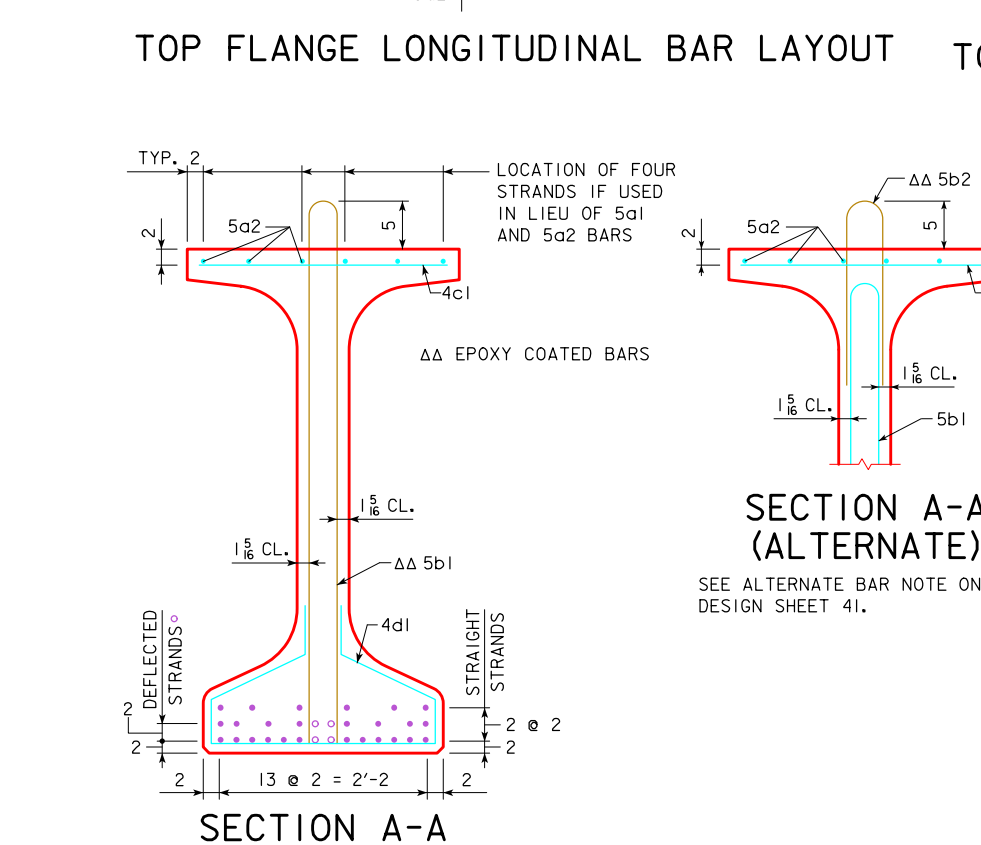
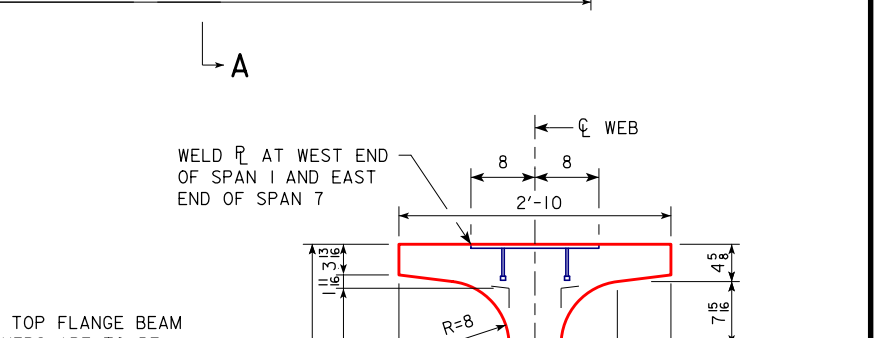
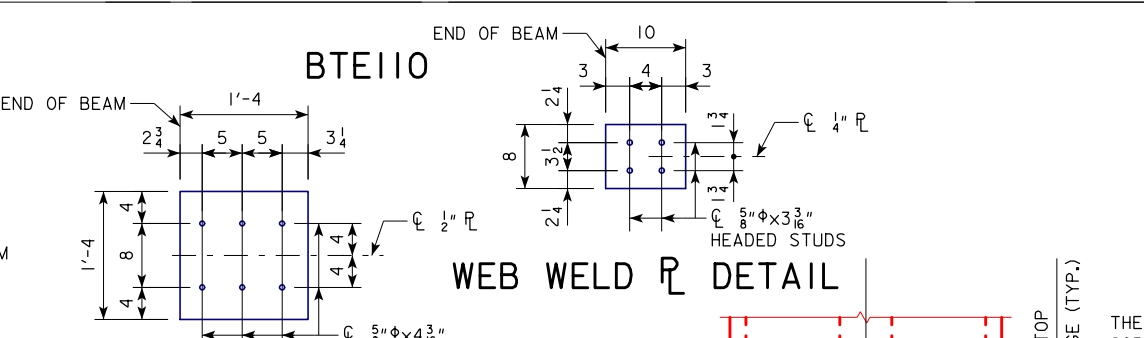
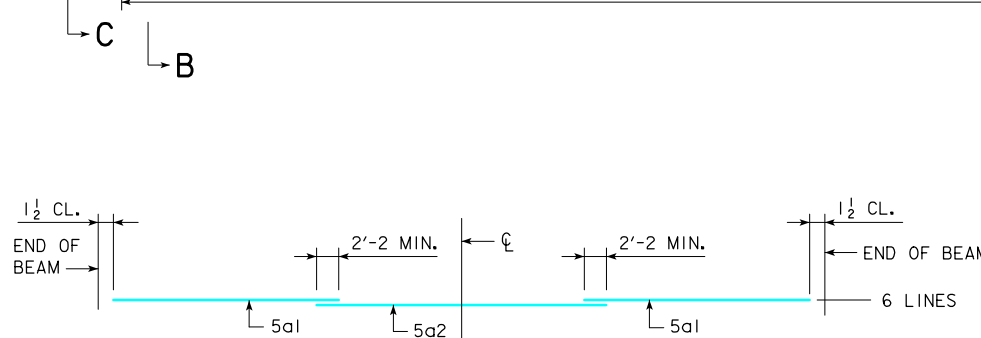
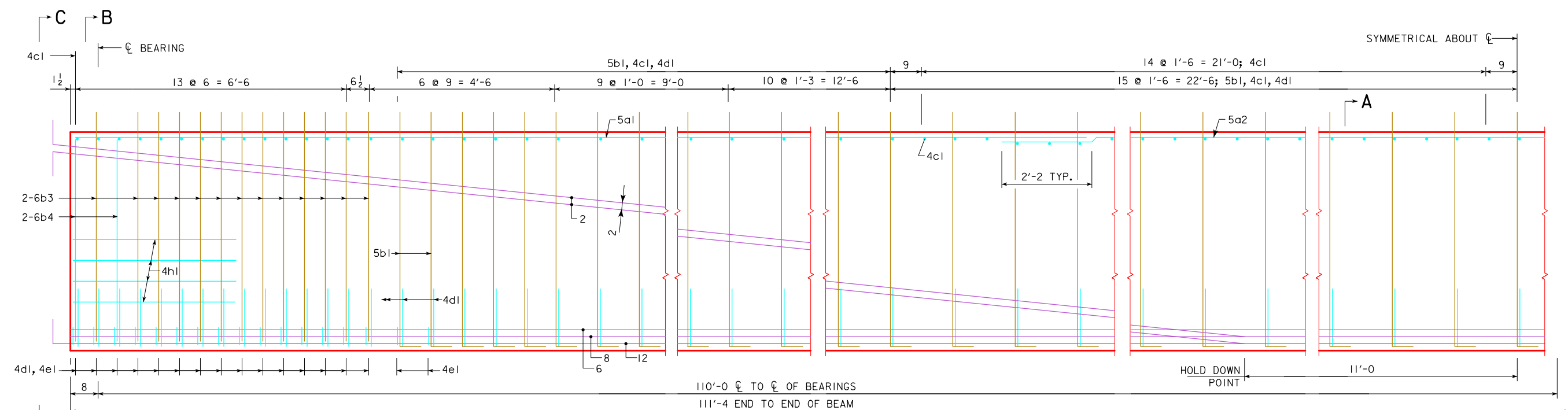
4d1 (ALTERNATE)

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.



DESIGN TEAM: SCHEMMER	BULB TEE "E" BEAMS - SHEET 2 OF 2	STANDARD SHEET 4770	LINN COUNTY	PROJECT NUMBER BRF-030-7(182)--38-57	SHEET NUMBER 42
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REVISED 05-12 - ALTERNATE SECTION A-A 5a1 BAR CHANGED TO 5a2.  
ENGLISHBEAMS.DGN - 4781 - THIS SHEET ISSUED 02-08.



AREA = 807.4 in<sup>2</sup>  
y<sub>b</sub> = 28.75 in  
I = 422,790 in<sup>4</sup>

BEAM SECTION PROPERTIES

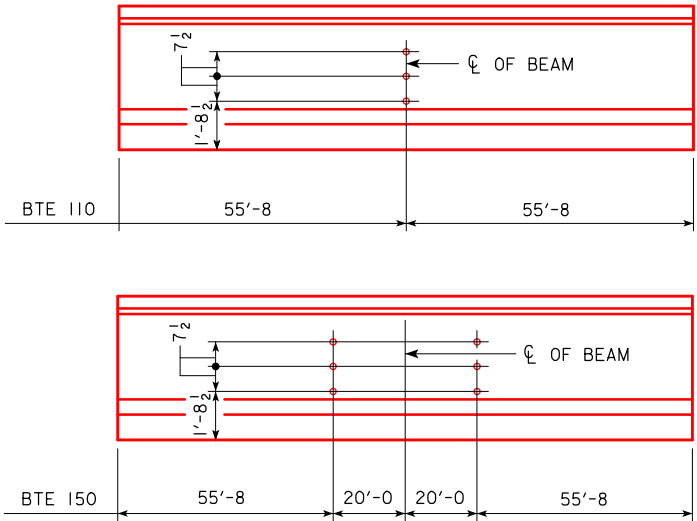
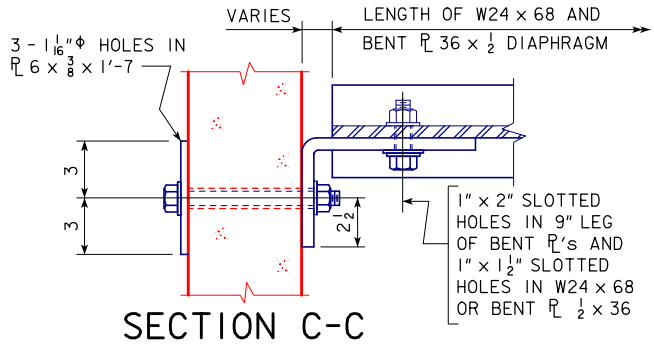
BTE BEAM CROSS SECTION

DESIGN FOR 0° SKEW  
**1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
111' END SPANS 152' INTERIOR SPANS  
**BTE110 BEAM DETAILS**  
STA. 389+39.66 MARCH, 2021  
**LINN COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 42 OF 54 FILE NO. 31598 DESIGN NO. 220

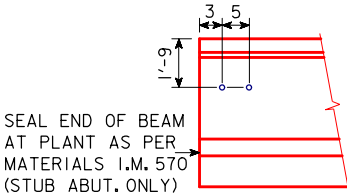




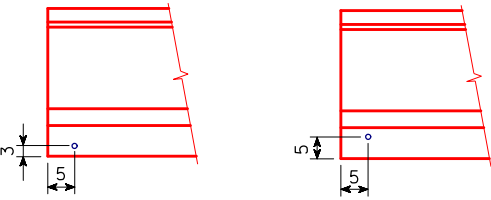
ENGLISHBEAMS.DGN - 1036-I-BTE - THIS SHEET ISSUED 06-14. SHEET 1 OF 2.



INTERMEDIATE DIAPHRAGM  
BOLT HOLE LOCATIONS



STUB ABUT.



FIXED PIER      EXPANSION PIER  
BEAM COIL TIE LOCATIONS

STRUCTURAL STEEL		
WEIGHT	32,847	LBS.

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

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

BULB TEE "E" BEAM INTERMEDIATE DIAPHRAGM STRUCTURAL STEEL				
ONE BEAM CONNECTION (DETAIL "F" AND/OR DETAIL "G")				WEIGHT
3 - 7/8" $\phi$ x 9 1/4" H.S. BOLTS WITH NUTS & WASHERS = 7.2 LBS.		NO. OF BEAM CONNECTIONS	70	504
ONE DETAIL "G"		2 - BENT PL 9 x 6 x 1/2 x 1'-7 = 80.8 LBS.	42	3,368
ONE DETAIL "F"		1 - BACKING PL 6 x 3/8 x 1'-7 = 12.1 LBS.	28	339
		1 - BENT PL 9 x 6 x 1/2 x 1'-7 = 40.4 LBS.	28	1,131
ONE DIAPHRAGM				
		NUMBER OF DIAPHRAGMS		
10 - 7/8" $\phi$ x 2 1/4" H.S. BOLTS WITH NUTS & WASHERS = 9.7 LBS.		56		543
1 - BENT PL 36 x 1/2 = 61.3 LBS./FT.	LENGTH OF MEMBER	7'-10 1/4	56	26,962
INTERMEDIATE DIAPHRAGM STRUCTURAL STEEL - TOTAL (LBS.)				32,847

DESIGN FOR 0° SKEW

1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

111' END SPANS152' INTERIOR SPANS

STEEL INTERM. DIAPH. DETAILS

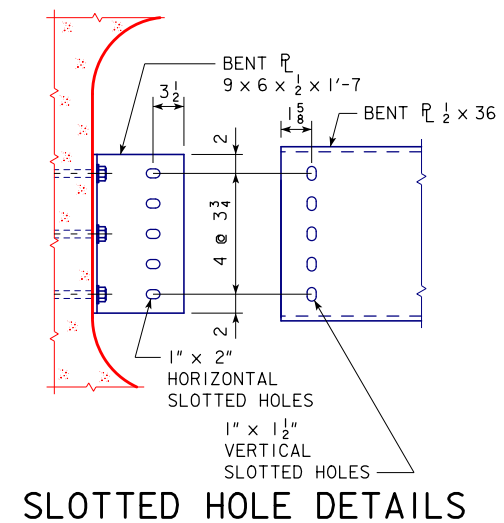
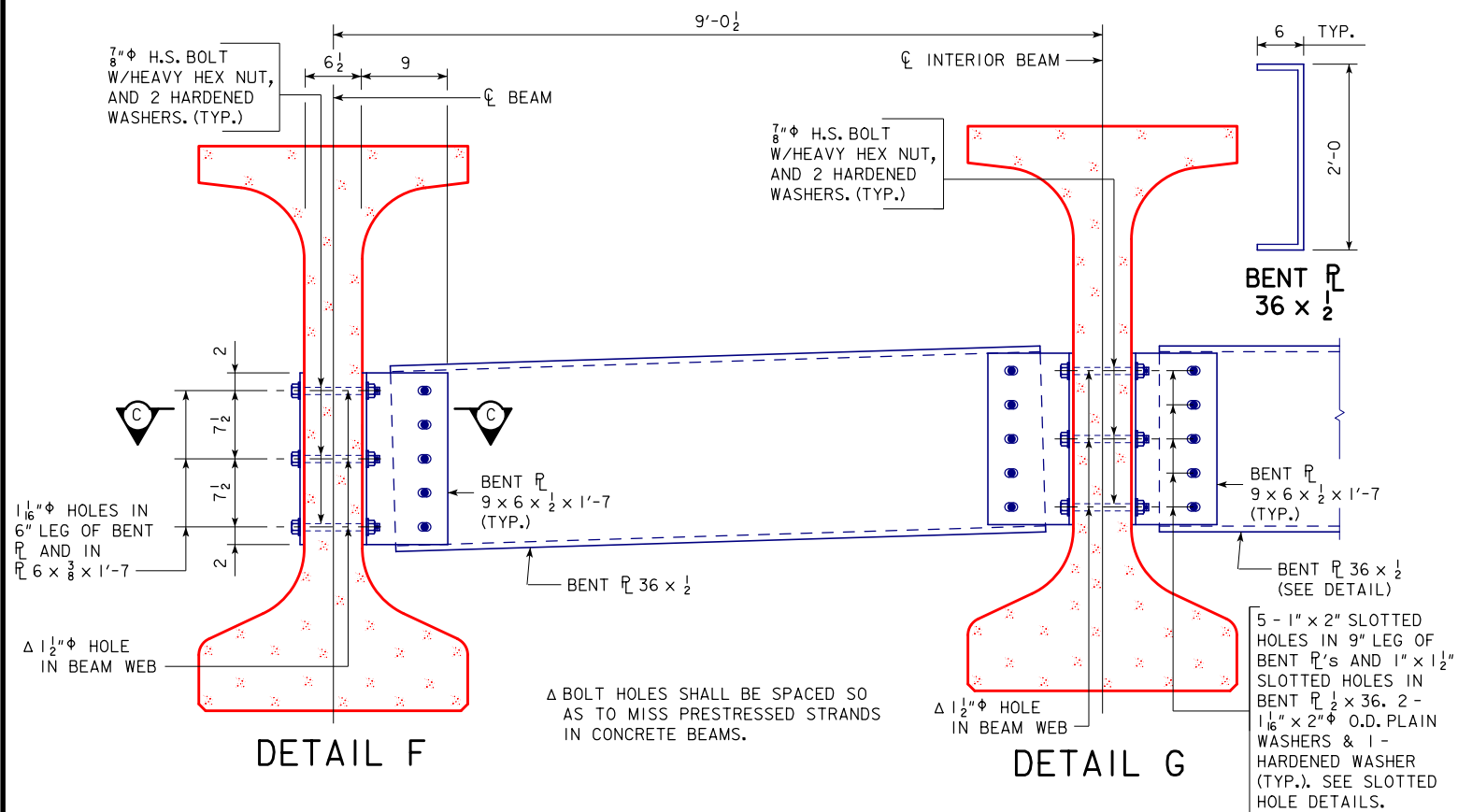
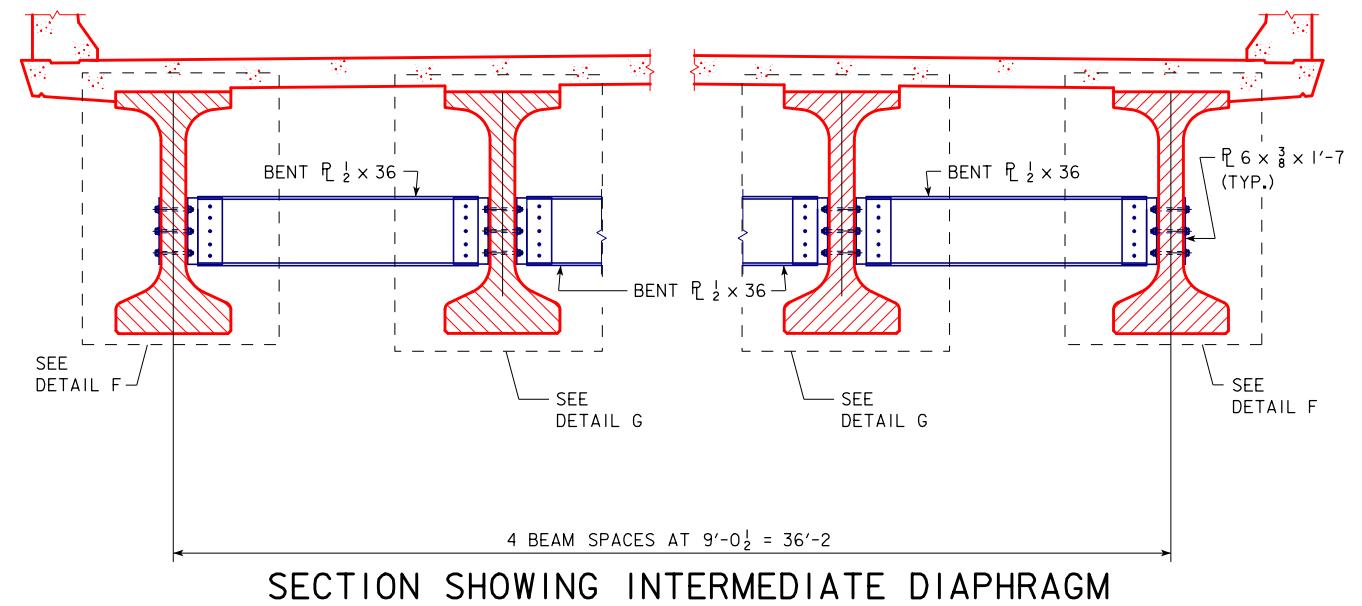
STA. 389+39.66MARCH, 2021

LINN COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 44 OF 54FILE NO. 31598DESIGN NO. 220

ENGLISHBEAMS.DGN - 1036-2-BTE - THIS SHEET ISSUED 06-14. SHEET 2 OF 2.



DESIGN FOR 0° SKEW

1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

111' END SPANS 152' INTERIOR SPANS

STEEL INTERM. DIAPH. DETAILS

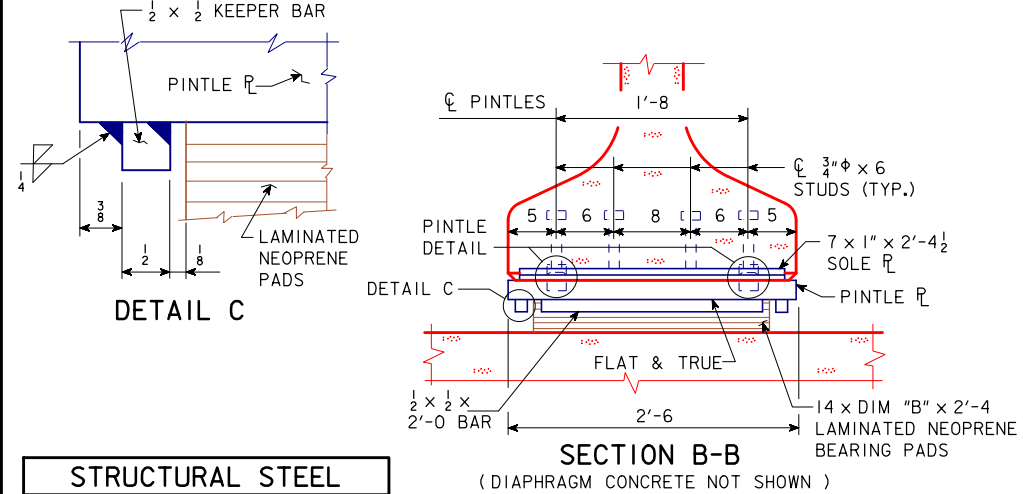
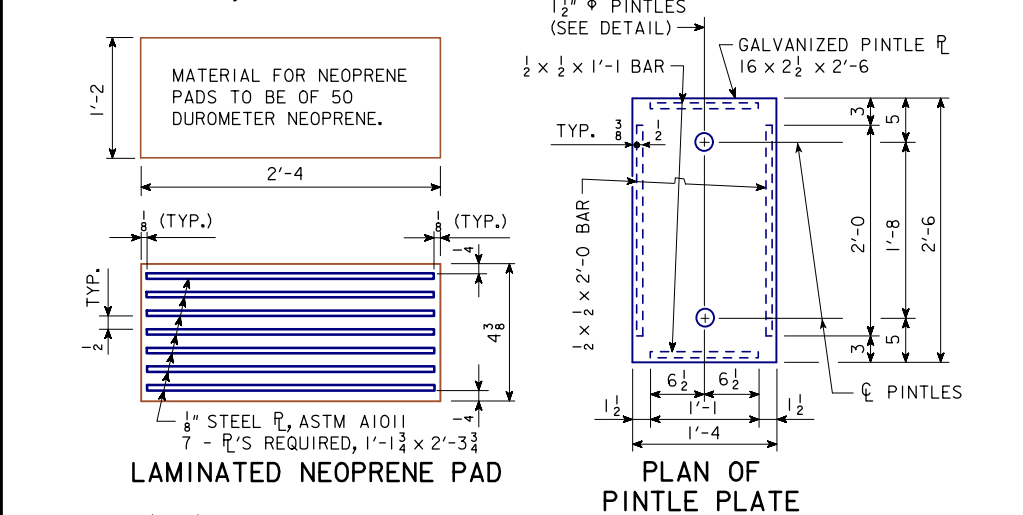
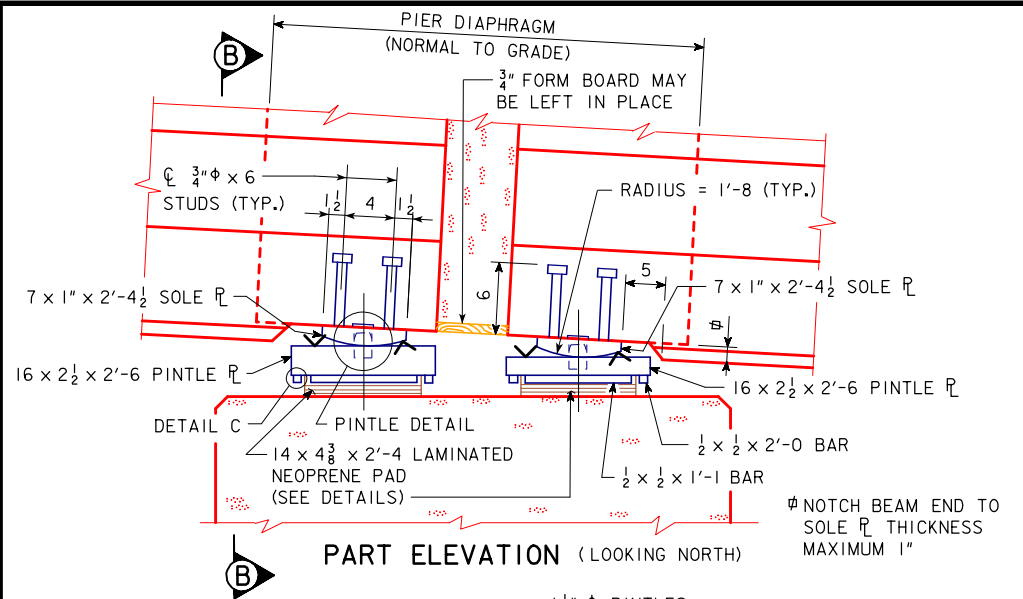
STA. 389+39.66 MARCH, 2021

LINN COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

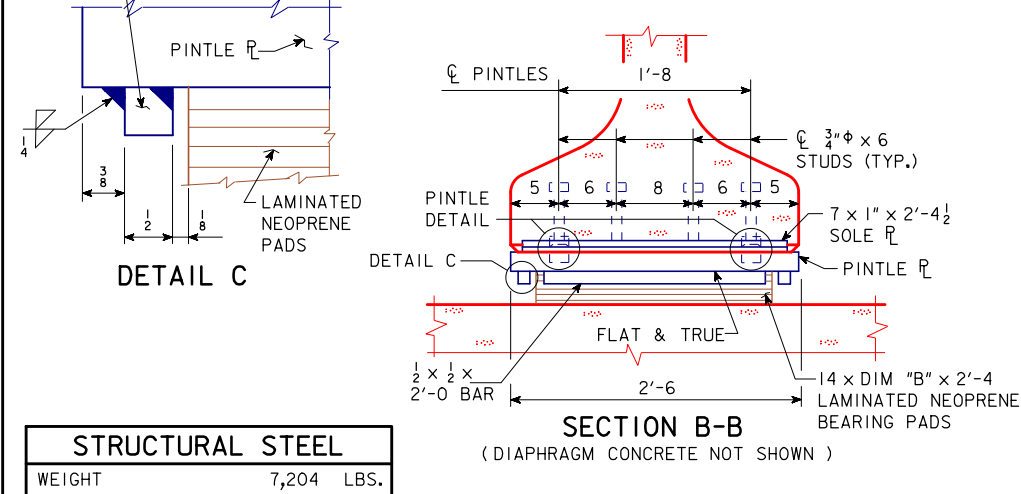
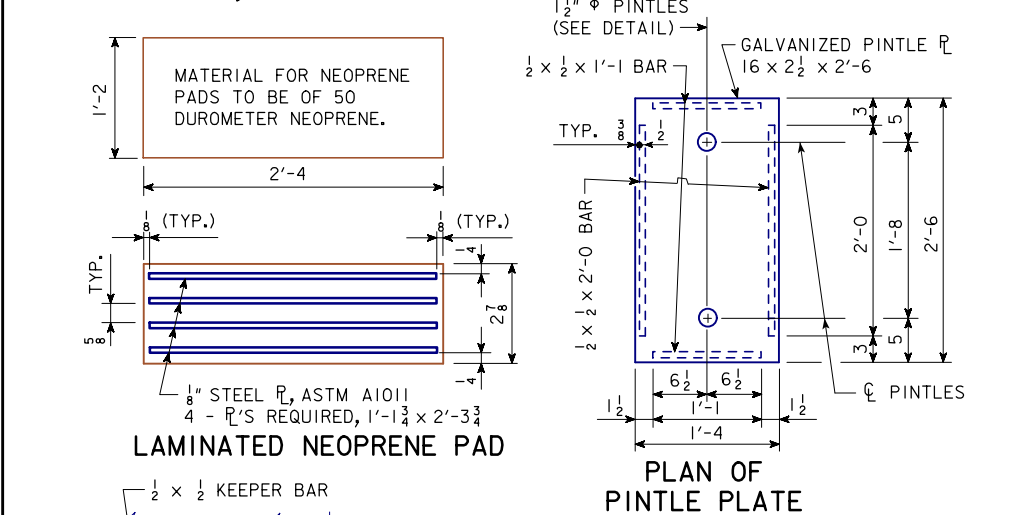
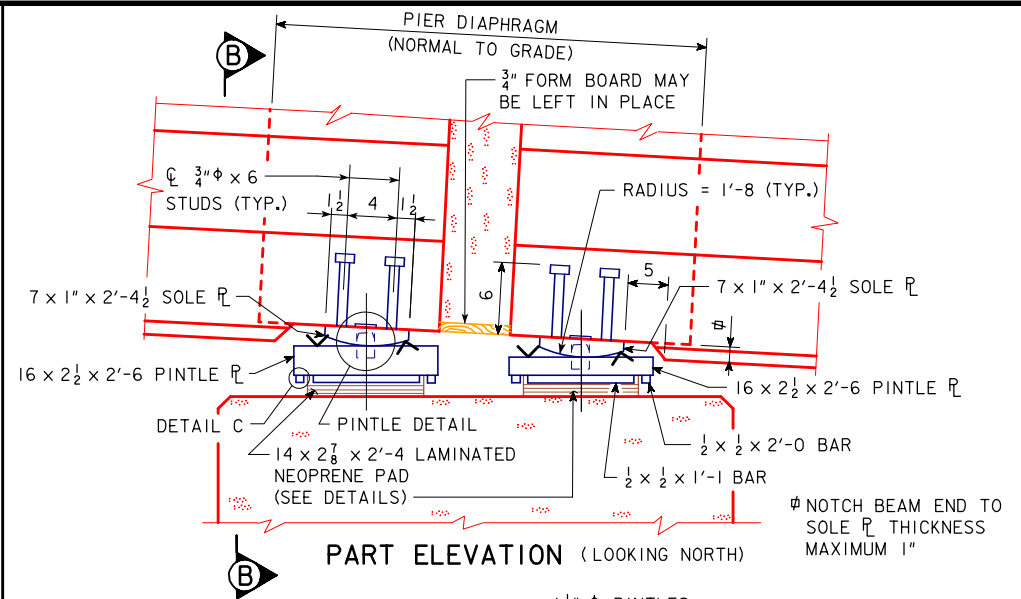
DESIGN SHEET NO. 45 OF 54 FILE NO. 31598 DESIGN NO. 220

CORRECTION 04-14 - ADDED WEIGHT TABLE & TITLES/DESCRIPTIONS TO AGREE WITH SUMMARY QUANTITY SHEET. ADDED NOTE REFERRING TO SUMMARY QUANTITIES SHEET.  
ENGLISHBEAMS.DGN - 454IH - THIS SHEET ISSUED 03-08.



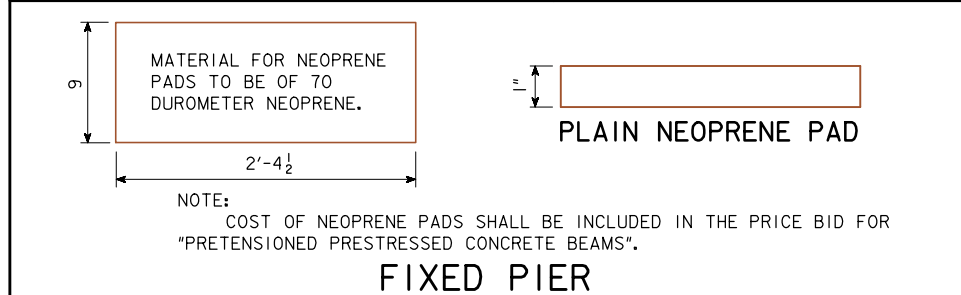
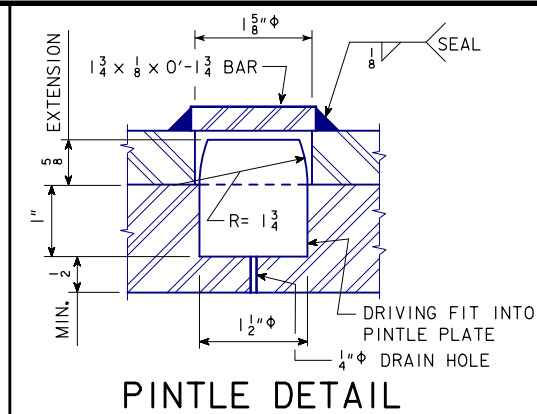
STRUCTURAL STEEL	
WEIGHT	7,204 LBS.
DOES NOT INCLUDE CURVED SOLE PLATE	

EXPANSION PIER  
PIERS 2 & 6 LAMINATED NEOPRENE  
PAD / CURVED SOLE PLATE ASSEMBLY



STRUCTURAL STEEL	
WEIGHT	7,204 LBS.
DOES NOT INCLUDE CURVED SOLE PLATE	

EXPANSION PIER  
PIERS 3 & 5 LAMINATED NEOPRENE  
PAD / CURVED SOLE PLATE ASSEMBLY

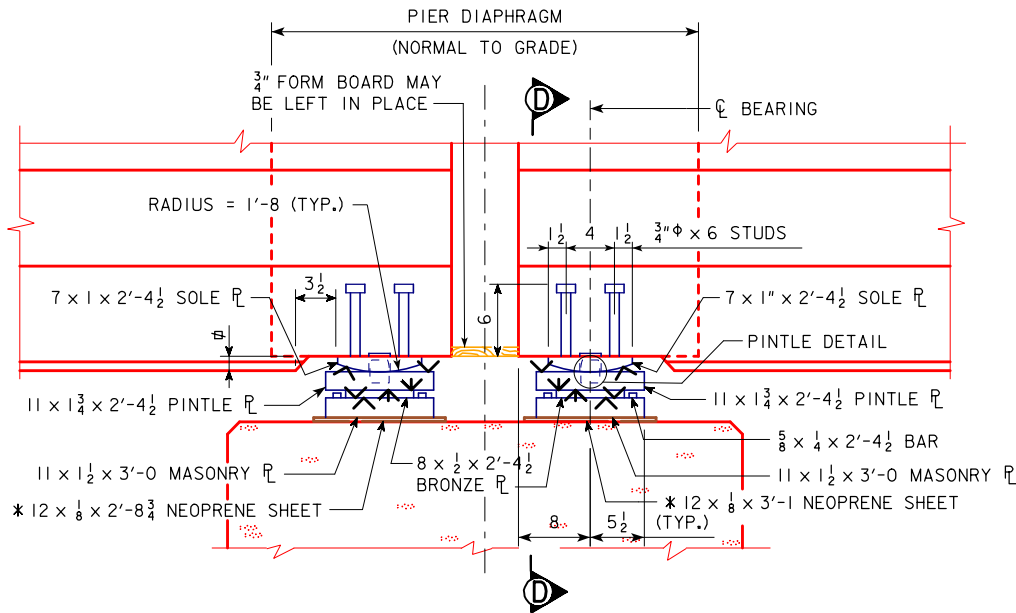


**EXPANSION PIER BEARING NOTES:**  
SURFACES MARKED "V" SHALL BE FINISHED ANSI 250.  
PINTLE PLATES ARE A PART OF THE SUPERSTRUCTURE STRUCTURAL STEEL QUANTITY. COST OF ANCHORED CURVED SOLE PLATES IS TO BE INCLUDED IN THE PRICE BID FOR PRETENSIONED PRESTRESSED CONCRETE BEAMS. COST FOR NEOPRENE PADS SHALL BE CONSIDERED INCIDENTAL TO THE PRETENSIONED PRESTRESSED CONCRETE BEAM BID ITEM. THE SOLE PLATES AND PINTLE PLATES SHALL BE GALVANIZED. ALL WELDING SHALL BE COMPLETED PRIOR TO GALVANIZING. THE SURFACE OF THE PINTLE PLATE IN CONTACT WITH THE LAMINATED NEOPRENE PADS SHALL BE FREE OF PROJECTIONS DUE TO THE GALVANIZING. SOLE PLATES ARE TO BE SET IN FORMS WHEN BEAMS ARE CAST AND THE BOTTOM OF BEAMS FORMED OUT AS SHOWN TO EXCLUDE CONCRETE. SOLE PLATES SHALL COMPLY WITH ONE OF THE FOLLOWING :  
ASTM A514 GRADE B  
ASTM A709 GRADE HPS 70W

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

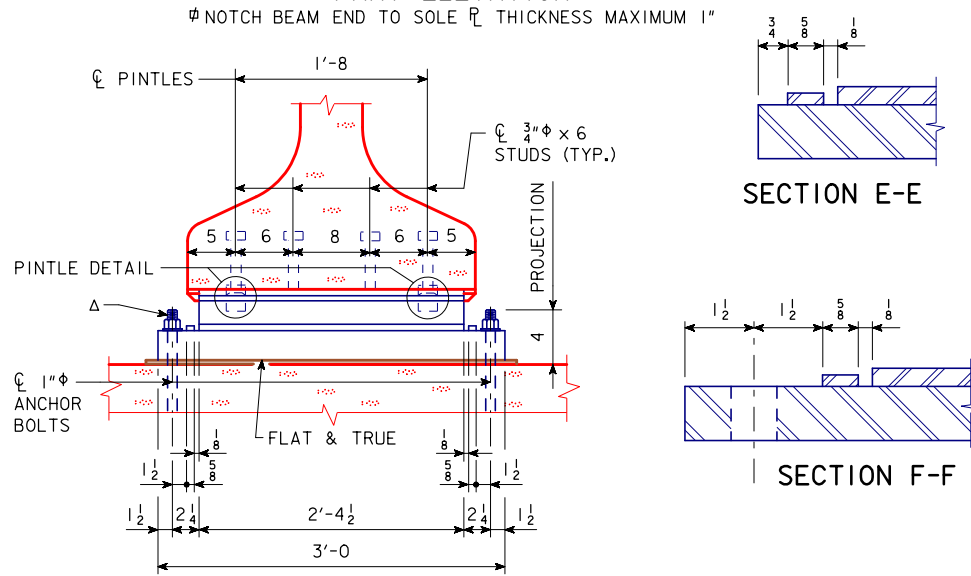
DESIGN FOR 0° SKEW  
1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE  
111' END SPANS 152' INTERIOR SPANS  
PIER BEARING DETAILS  
STA. 389+39.66 MARCH, 2021  
LINN COUNTY  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 46 OF 54 FILE NO. 31598 DESIGN NO. 220

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

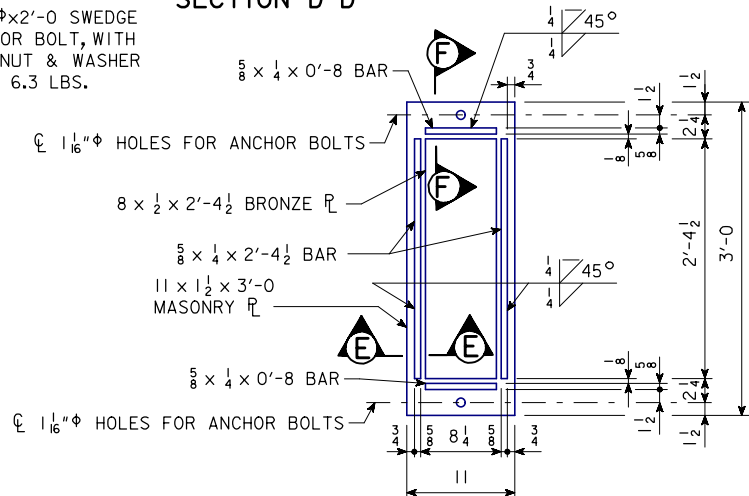


PART ELEVATION

Ø NOTCH BEAM END TO SOLE PLATE THICKNESS MAXIMUM 1"

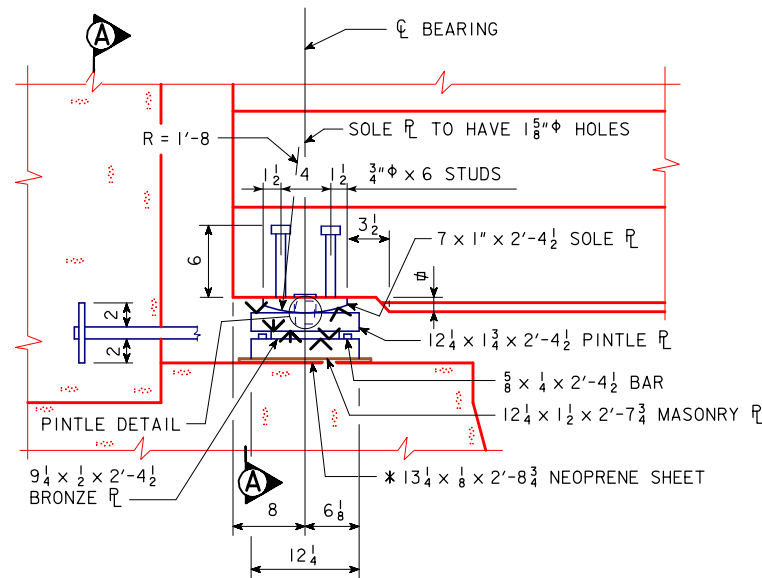


Δ 1" x 2'-0" SWEDGE ANCHOR BOLT, WITH HEX. NUT & WASHER WT. = 6.3 LBS.



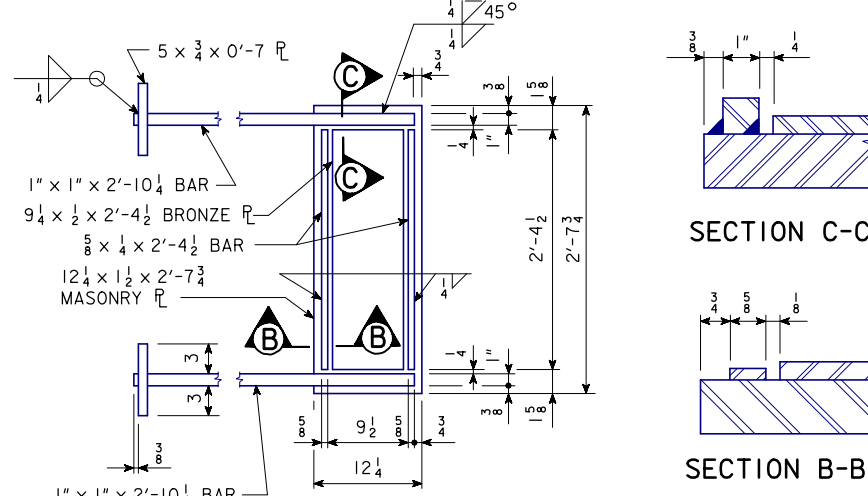
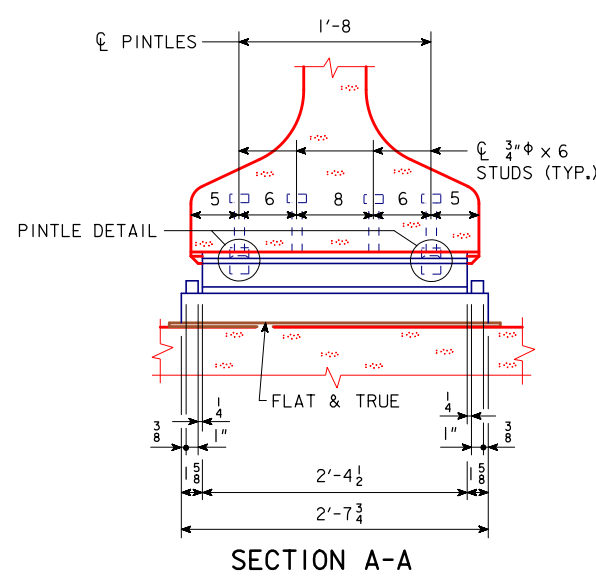
PLAN OF MASONRY PLATE AND BRONZE PLATE

PIERS 1 & 7 MASONRY PLATE / BRONZE BEARING ASSEMBLY



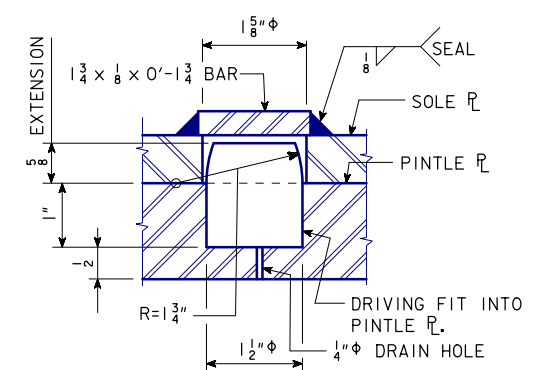
PART ELEVATION

Ø NOTCH BEAM END TO SOLE PLATE THICKNESS MAXIMUM 1"



PLAN OF MASONRY PLATE AND BRONZE PLATE

ABUTMENT MASONRY PLATE / BRONZE BEARING ASSEMBLY



PINTLE DETAIL

BEARING NOTES:

THE SLIDING SURFACE OF THE BRONZE PLATE SHALL BE LUBRICATED IN ACCORDANCE WITH ARTICLE 4190.03, OF THE STANDARD SPECIFICATIONS, AND THE BRONZE METAL SHALL BE CAST BRONZE IN ACCORDANCE WITH ARTICLE 4190.03, OF THE STANDARD SPECIFICATIONS. TOP EDGES OF BRONZE PLATE SHALL BE BEVELED 1/8".

SURFACES MARKED "V" SHALL BE FINISHED ANSI 250 AND SURFACES MARKED "V" SHALL BE FINISHED ANSI 125.

MASONRY PLATES ARE TO BE SET ON A 1/8" NEOPRENE SHEET.

PINTLE PLATES, MASONRY PLATES, AND LUBRICATED BRONZE PLATES ARE A PART OF THE SUPERSTRUCTURE STRUCTURAL STEEL QUANTITY. UNIT PRICE BID FOR STRUCTURAL STEEL SHALL INCLUDE ALLOWANCE FOR COST OF BRONZE PLATES. COST OF NEOPRENE SHEETS SHALL BE CONSIDERED INCIDENTAL TO THE STRUCTURAL STEEL BID ITEM. COST OF THE ANCHORED CURVED SOLE PLATES IS TO BE INCLUDED IN THE PRICE BID FOR PRETENSIONED PRESTRESSED CONCRETE BEAMS.

THE SOLE PLATE, PINTLE PLATE AND THE MASONRY PLATE SHALL BE GALVANIZED. THE SOLE PLATE AND MASONRY PLATE SHALL BE FITTED UP AND WELDED PRIOR TO GALVANIZING. THE SURFACE OF PINTLE PLATE IN CONTACT WITH BRONZE BEARING PLATE SHALL BE SMOOTH AND FREE OF PROJECTIONS DUE TO GALVANIZING.

SOLE PLATES ARE TO BE SET IN FORMS WHEN BEAMS ARE CAST AND THE BOTTOM OF BEAMS FORMED OUT AS SHOWN TO EXCLUDE CONCRETE.

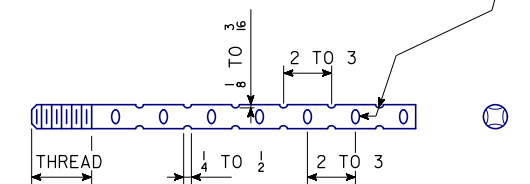
SOLE PLATES SHALL COMPLY WITH ONE OF THE FOLLOWING SPECIFICATIONS :

ASTM A514 GRADE B

ASTM A709 GRADE HPS 70W

ANCHOR BOLTS, NUTS AND WASHERS SHALL MEET THE REQUIREMENTS OF I.M. 453.08.

INDENTATION SHALL BE FORMED BY DISPLACEMENT OF METAL IN A STAGGERED PATTERN. NO CUTTING IS ALLOWED TO FORM INDENTATION. INDENTATIONS MAY BE EITHER OBLONG OR ROUND IN SHAPE.



STRUCTURAL STEEL

WEIGHT 11,634 LBS.

DOES NOT INCLUDE CURVED SOLE PLATE

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

DESIGN FOR 0° SKEW

1,134'-0" X 40'-0" PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

111' END SPANS 152' INTERIOR SPANS

ABUT. & PIER BEARING DETAILS

STA. 389+39.66 MARCH, 2021

LINN COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 47 OF 54 FILE NO. 31598 DESIGN NO. 220

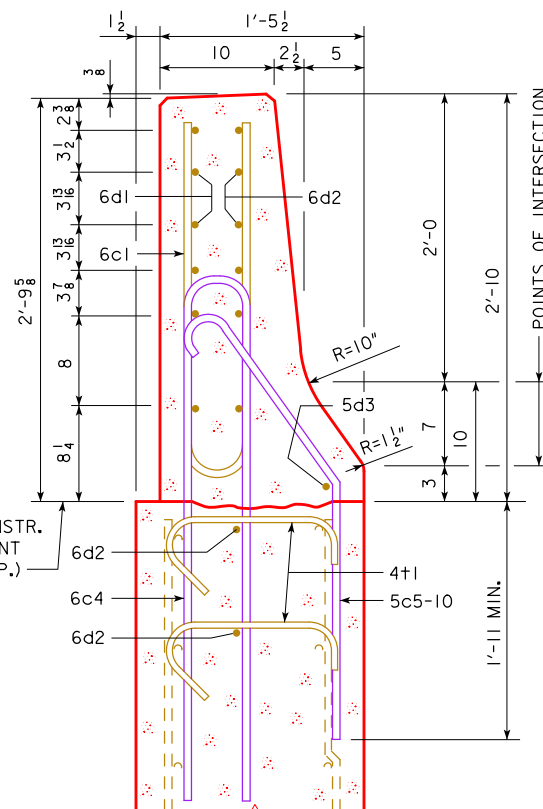




VIEW A-A







SECTION B-B




SECTION C-C



SECTION D-D

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

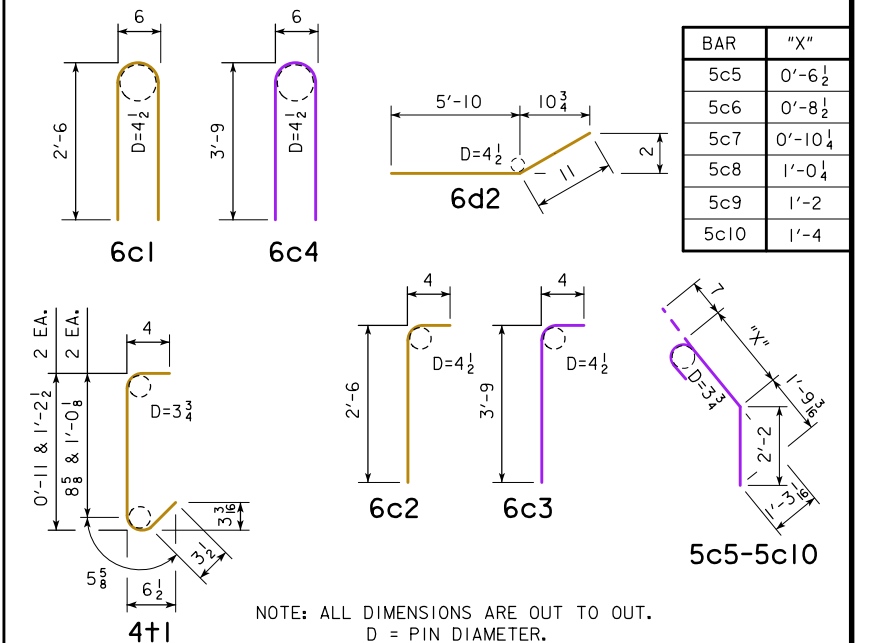
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6c1	RAIL, VERTICAL		12	5'-6	99
6c2	RAIL, VERTICAL		4	2'-10	17
6d1	RAIL, HORIZONTAL		6	6'-8	60
6d2	RAIL, HORIZONTAL		8	6'-9	81
5d3	RAIL, HORIZONTAL		1	3'-9	4
4+1	RAIL, ABUTMENT WING TIE BARS		4	VARIES	5
EPOXY REINF. TOTAL WEIGHT (LBS.)					266

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

## 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.

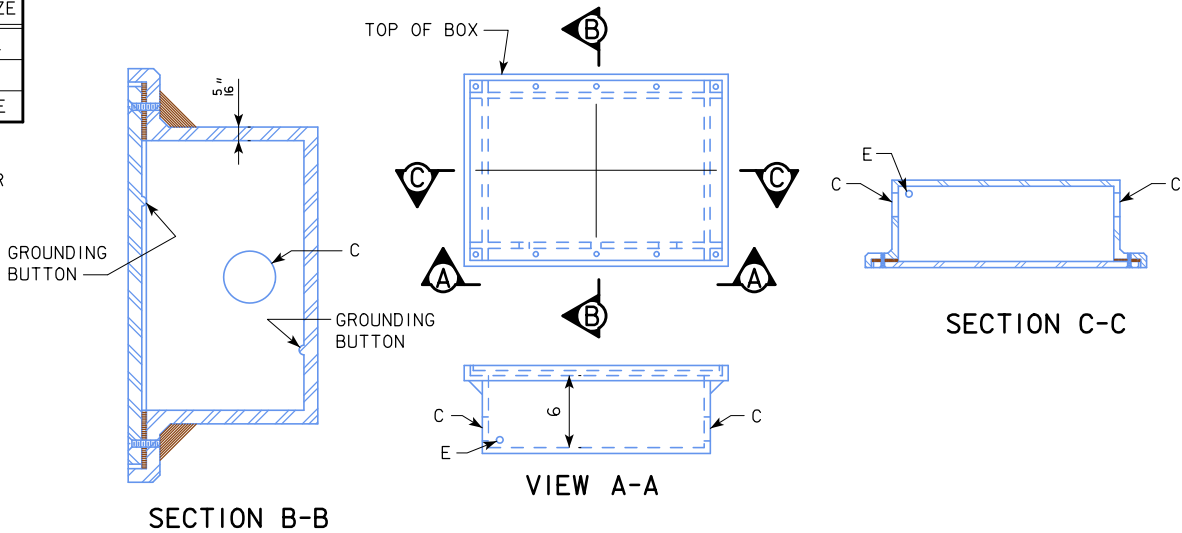
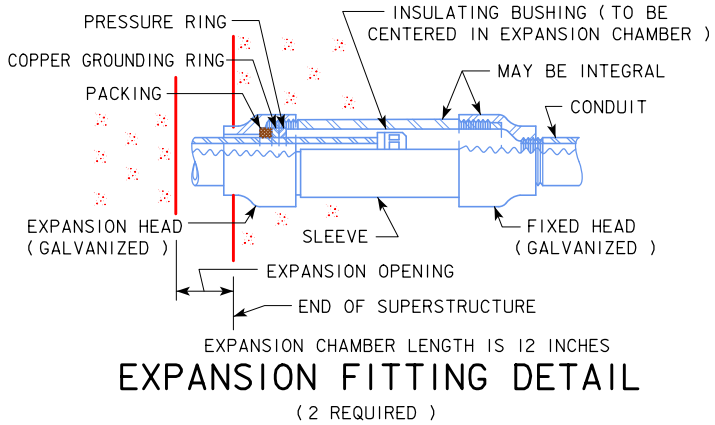
DESIGN FOR 0° SKEW  
1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE  
111' END SPANS 152' INTERIOR SPANS  
BARRIER RAIL END SECTION  
STA. 389+39.66 MARCH, 2021  
LINN COUNTY  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 48 OF 54 FILE NO. 31598 DESIGN NO. 220



REVISED 09-14 - ADD STAINLESS STEEL NOTE TO THE LIGHTING NOTES.  
REVISED 09-2016 - ADDED STANDARD SPECIFICATIONS 4185.02.B.2 IN LIGHTING NOTES. CHANGED BAR MARK FROM "x" to "p".  
ENGLISHDECKRAILBRIDGES.DGN 1030ASI - THIS SHEET REDRAWN 9-8-88

BOSSSED FOR	HOLE	FOR CONDUIT SIZE
5 THREADS	C	2" $\phi$ RIGID STEEL
NONE	E	$\frac{1}{2}$ " $\phi$ COPPER PIPE

NOTE:  
THE GROUNDING BUTTONS ARE TO BE BLIND DRILLED AND TAPPED FOR  $\frac{3}{8}$ "  $\phi$   $\times$  0'-0  $\frac{3}{4}$  BOLTS.



LI-104 JUNCTION BOX  
WATERTIGHT, CAST IRON - FLUSH MOUNT

**LIGHTING NOTES:**  
SEE LI-104 STANDARD ROAD PLAN FOR ADDITIONAL INFORMATION ON JUNCTION BOXES.  
CONSTRUCTION SHALL CONFORM TO THE CURRENT IOWA D.O.T. STANDARD AND SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS.  
CONDUIT INSTALLATION SHALL BE IN ACCORDANCE WITH ARTICLE 2523.03, N, OF THE STANDARD SPECIFICATIONS.  
ALL "C" ENTRANCE HOLES IN JUNCTION BOXES SHALL BE DRILLED AND TAPPED FOR THE SPECIFIED CONDUIT SIZE. ALL OTHER HOLES SHALL HAVE A CONCRETE - TIGHT SLIP FIT. CONDUIT ENDS SHALL NOT PROTRUDE INTO JUNCTION BOX MORE THAN  $\frac{1}{4}$ ". DRAIN PIPE END SHALL BE FLUSH WITH INSIDE SURFACE OF BOX. GROUNDING BUTTONS SHALL BE LOCATED APPROXIMATELY 3" FROM THE INSIDE SURFACE OF THE BOX WALL, AND NOT CLOSER THAN 3" TO THE EDGE OF ANY HOLE IN THE BOX FLOOR. HOLES FOR DRAIN PIPE SHALL BE PLACED IN THE LOW CORNER OF THE BOX, WITH A MINIMUM CLEARANCE OF 1" BETWEEN THE EDGE OF THE HOLE AND THE INSIDE SURFACE OF THE BOX WALL. TYPICAL DETAILS ARE SHOWN ON THIS SHEET.  
THE RIGID STEEL CONDUIT, JUNCTION BOXES AND FITTINGS INCLUDING LABOR AND ANY ADDITIONAL WORK TO DO THE INSTALLATION IS CONSIDERED INCIDENTAL TO THE COST OF THE RAILING.  
EXPANSION FITTING SHALL BE AS SPECIFIED OR AS APPROVED BY THE ENGINEER. TYPICAL DETAILS ARE SHOWN ON THIS SHEET.  
STAINLESS-STEEL REINFORCEMENT SHALL NOT BE ALLOWED TO BE IN CONTACT WITH THE UNCOATED REINFORCEMENT, BARE METAL FORMING HARDWARE, OR TO GALVANIZED ATTACHMENTS OR GALVANIZED CONDUIT.

DESIGN FOR 0° SKEW

1,134'-0 X 40'-0 PRETENSIONED  
PRÉSTRESSED CONCRETE BEAM BRIDGE

111' END SPANS152' INTERIOR SPANS

CONDUIT DETAILS

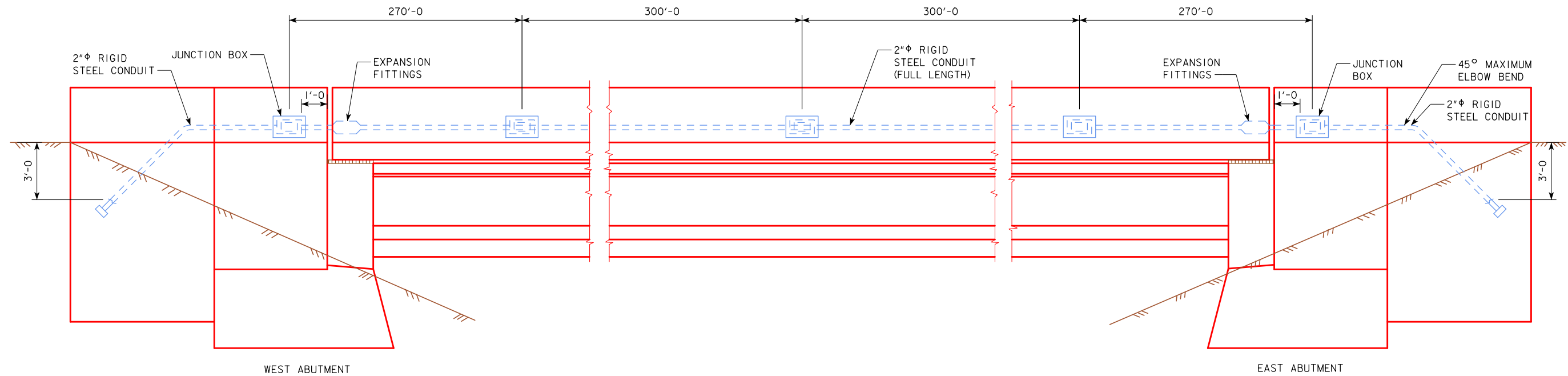
STA. 389+39.66MARCH, 2021

LINN COUNTY

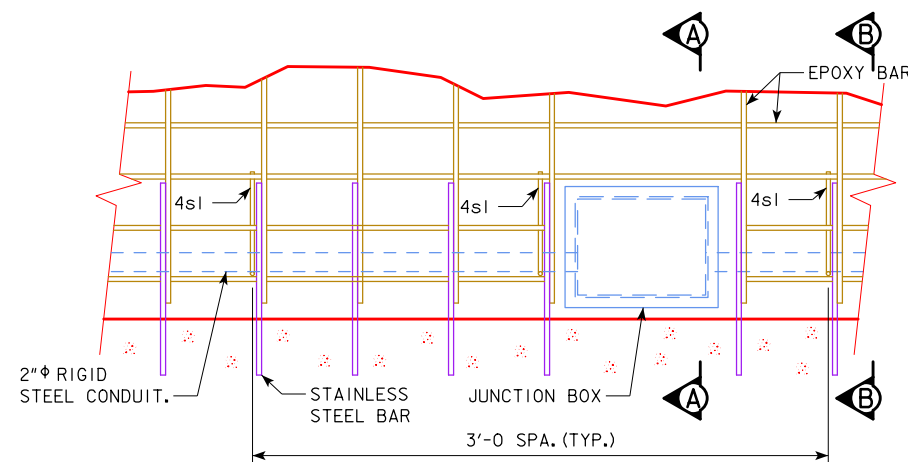
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 50 OF 54FILE NO. 31598DESIGN NO. 220

REVISION 05-11 - ADDED THE WORD 'MINIMUM' TO THE 3 1/2 INCH DIMENSION FOR THE LOCATION OF THE 2 INCH CONDUIT IN THE BARRIER RAIL.  
REVISED 09-2016 - ADDED CONDUIT SUPPORT RAIL DETAIL TO KEEP CONDUIT ISOLATED FROM THE STAINLESS STEEL REINFORCING.  
ENGLISHDECKRAILBRIDGES.DGN 1030AS2 - THIS SHEET ISSUED 09-03.

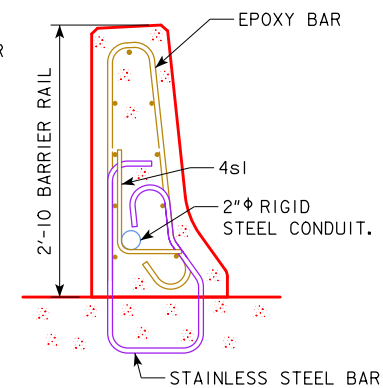


EXTERIOR ELEVATION - SOUTH BARRIER RAIL - LOOKING NORTH



CONDUIT SUPPORT - RAIL ELEV. DETAIL

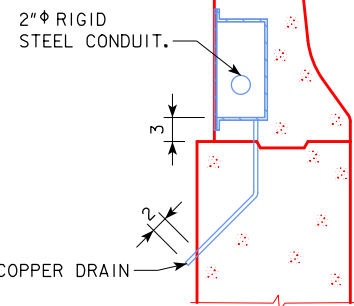
TWO JUNCTION BOX DETAIL - ADJUST REINFORCING TO CLEAR JUNCTION BOX.  
JUNCTION BOXES ARE TO BE PLACED NO FURTHER THAN 300'-0" APART.



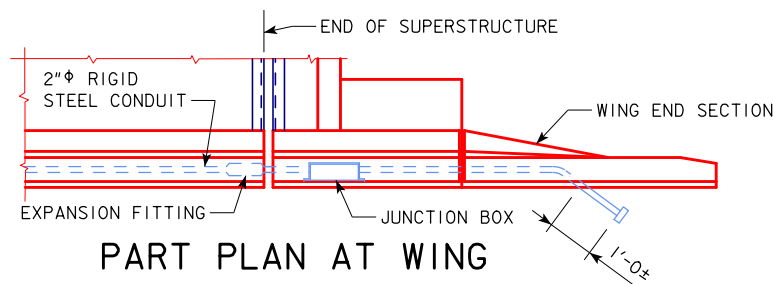
SECTION B-B - CONDUIT SUPPORT

ONLY USED IN RAIL WITH CONDUIT, USE 3'-0" SPACING. GALVANIZED CONDUIT  
SHALL NOT COME INTO CONTACT WITH THE STAINLESS STEEL REINFORCING.  
LOWER CONDUIT CAN ONLY BE 2" DIAMETER.

( 768 REQUIRED )



SECTION A-A  
THRU JUNCTION BOX



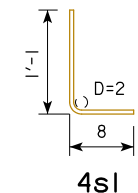
PART PLAN AT WING

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

FOR JUNCTION BOX AND EXPANSION FITTING  
DETAILS, SEE DESIGN SHEET 50.

EPOXY REINFORCING STEEL-ONE RAIL

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
4s1	RAIL CONDUIT		384	1'-9	449
TOTAL WEIGHT (LBS.)					449

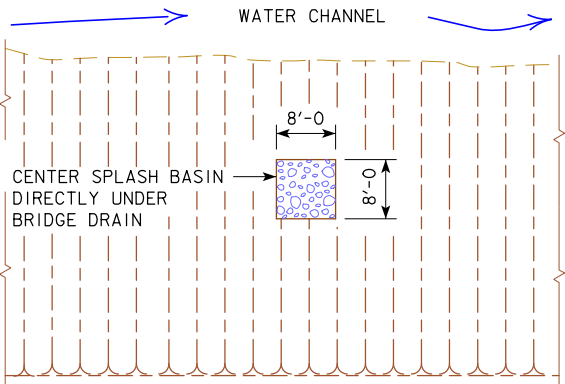


NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

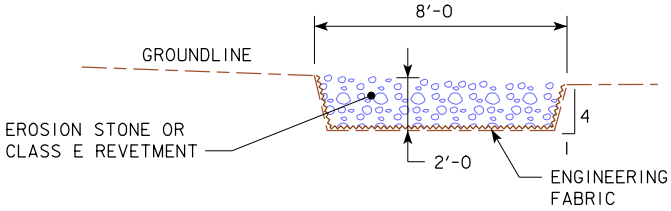
DESIGN FOR 0° SKEW  
**1,134'-0" X 40'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
111' END SPANS 152' INTERIOR SPANS  
**CONDUIT DETAILS**  
STA. 389+39.66 MARCH, 2021  
**LINN COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 51 OF 54 FILE NO. 31598 DESIGN NO. 220



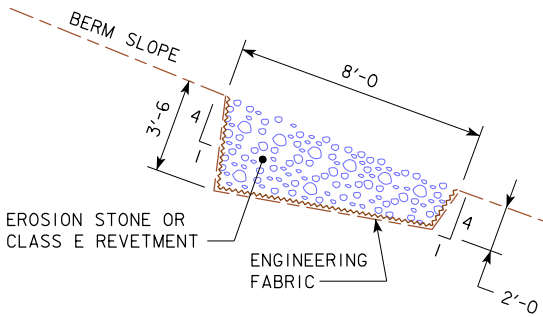
BENCH MARK NO. 321: STA. 373+43.92, 34.60' RT. SET FENO MON, ELEV 722.66  
BENCH MARK NO. 322: STA. 408+77.97, 276.45' LT. SET FENO MON, ELEV 726.92



SPLASH BASIN UNDER BRIDGE DRAIN  
PLAN VIEW



SPLASH BASIN UNDER BRIDGE DRAIN  
TYPICAL SECTION FOR EXISTING GRADES



SPLASH BASIN UNDER BRIDGE DRAIN  
TYPICAL SECTION FOR BERM SLOPES

SUBDRAIN NOTES :

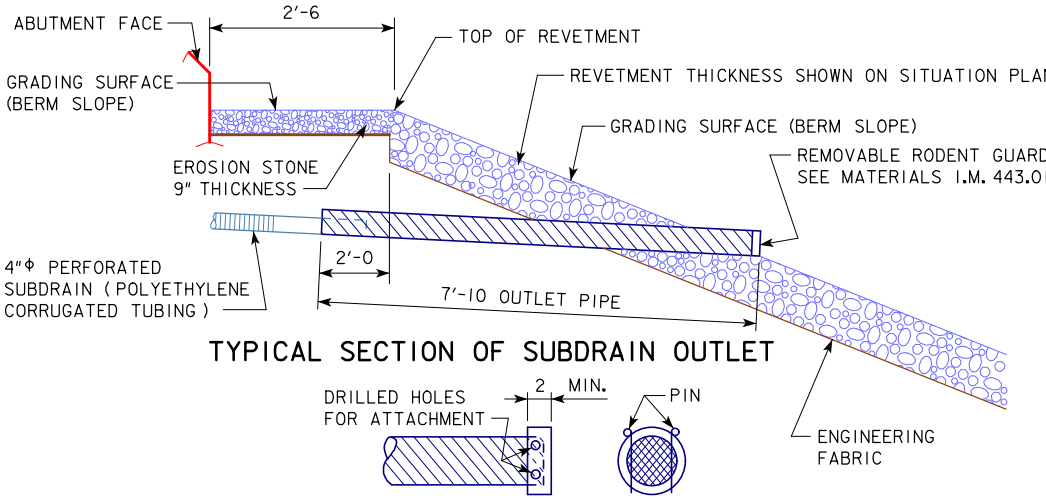
THIS PLAN SHEET SHOWS DETAILS FOR PLACING ALL SUBDRAINS AND SUBDRAIN OUTLETS REQUIRED FOR THIS STRUCTURE.  
THE SUBDRAINS SHALL BE 4" IN DIAMETER AND SHALL BE IN ACCORDANCE WITH ARTICLE 4143.01, B, OF THE STANDARD SPECIFICATIONS.  
THE SUBDRAIN OUTLET SHALL CONSIST OF A LENGTH OF PIPE WITH A REMOVABLE RODENT GUARD AS DETAILED ON THIS SHEET. THE LENGTH OF THE OUTLET PIPE SHALL BE DETERMINED BY THE REVETMENT AND IT'S PLACEMENT LOCATION. THE CONTRACTOR IS TO INSURE THE OUTLET PIPE IS ADEQUATELY STRONG ENOUGH AND WILL NOT BE DAMAGED WHEN REVETMENT IS PLACED. A CHECK WILL BE MADE AT THE SUBDRAIN OUTLET TO INSURE THAT THE SUBDRAIN IS NOT DAMAGED AND IS DRAINING PROPERLY DURING THE BACKFILL FLOODING PROCESS. IF A METAL OUTLET PIPE IS USED, IT SHALL BE 6 INCHES IN DIAMETER AND COUPLED TO THE 4 INCH DIAMETER SUBDRAIN IN ONE OF THE TWO FOLLOWING WAYS.  
1. USE AN INSIDE FIT REDUCER COUPLER (COUPLER MUST BE INSERTED A MINIMUM OF 1'-0 INTO THE METAL OUTLET PIPE).  
2. INSERT 1'-0 OF THE 4"Φ SUBDRAIN INTO THE 6"Φ 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.

SPLASH BASIN NOTES :

THE COST OF FURNISHING AND PLACING SPLASH BASINS (INCLUDING EXCAVATION, EROSION STONE OR CLASS E REVETMENT, AND ENGINEERING FABRIC) IS TO BE INCLUDED IN THE PRICE BID FOR "DECK DRAINS". NO EXTRA PAYMENT WILL BE MADE. TOTAL NUMBER OF SPLASH BASINS = 24.

SUBDRAIN OUTLET ELEVATIONS

LOCATION	ELEVATION
NW ABUTMENT	707.67
SW ABUTMENT	707.67
NE ABUTMENT	708.54
SE ABUTMENT	708.54



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

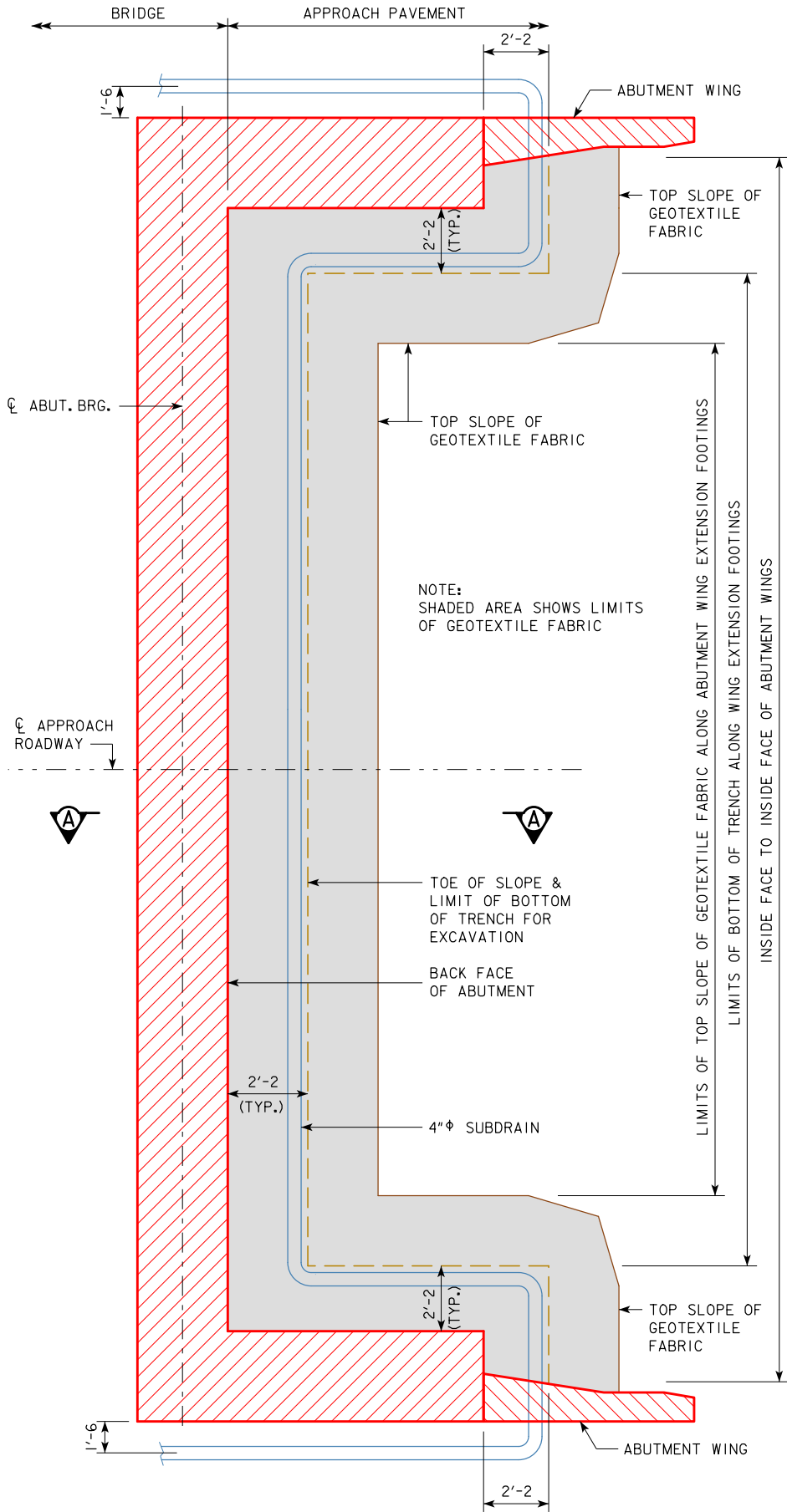
NOTE:  
SECTION A-A IS SHOWN ON ABUTMENT  
BACKFILL DETAILS SHEET.

DESIGN FOR 0° SKEW  
1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE  
111' END SPANS 152' INTERIOR SPANS  
SUBDRAIN DETAILS  
STA. 389+39.66 MARCH, 2021  
LINN COUNTY  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 52 OF 54 FILE NO. 31598 DESIGN NO. 220

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



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

ABUTMENT BACKFILL PROCESS:

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

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

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

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

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

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

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

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

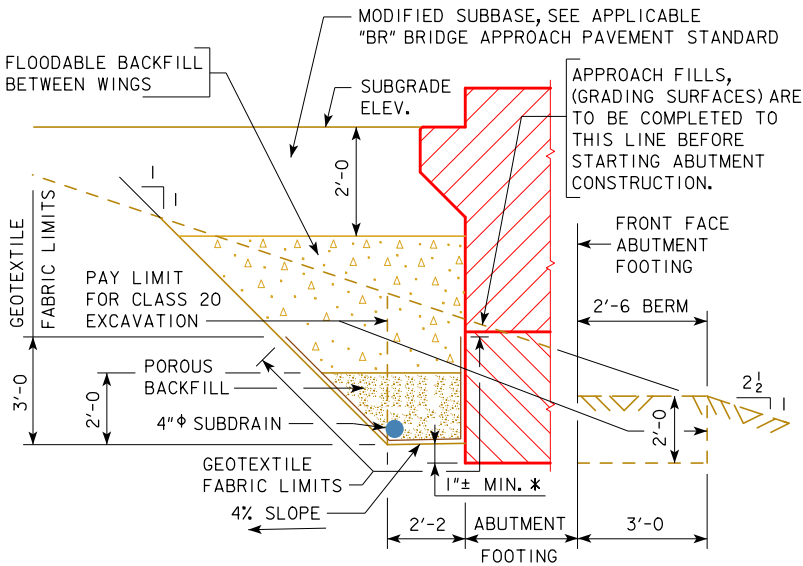
THE COST OF WATER REQUIRED FOR FLOODING, SUBDRAINS, POROUS BACKFILL, FLOODABLE BACKFILL, AND GEOTEXTILE FABRIC FURNISHED AT THE BRIDGE ABUTMENTS SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR STRUCTURAL CONCRETE.

NOTE:

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

SUBDRAIN SHALL SLOPE DOWNWARD 2% FROM HIGH END WHEN OUTLETTING AT ONE END OF THE ABUTMENT.

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



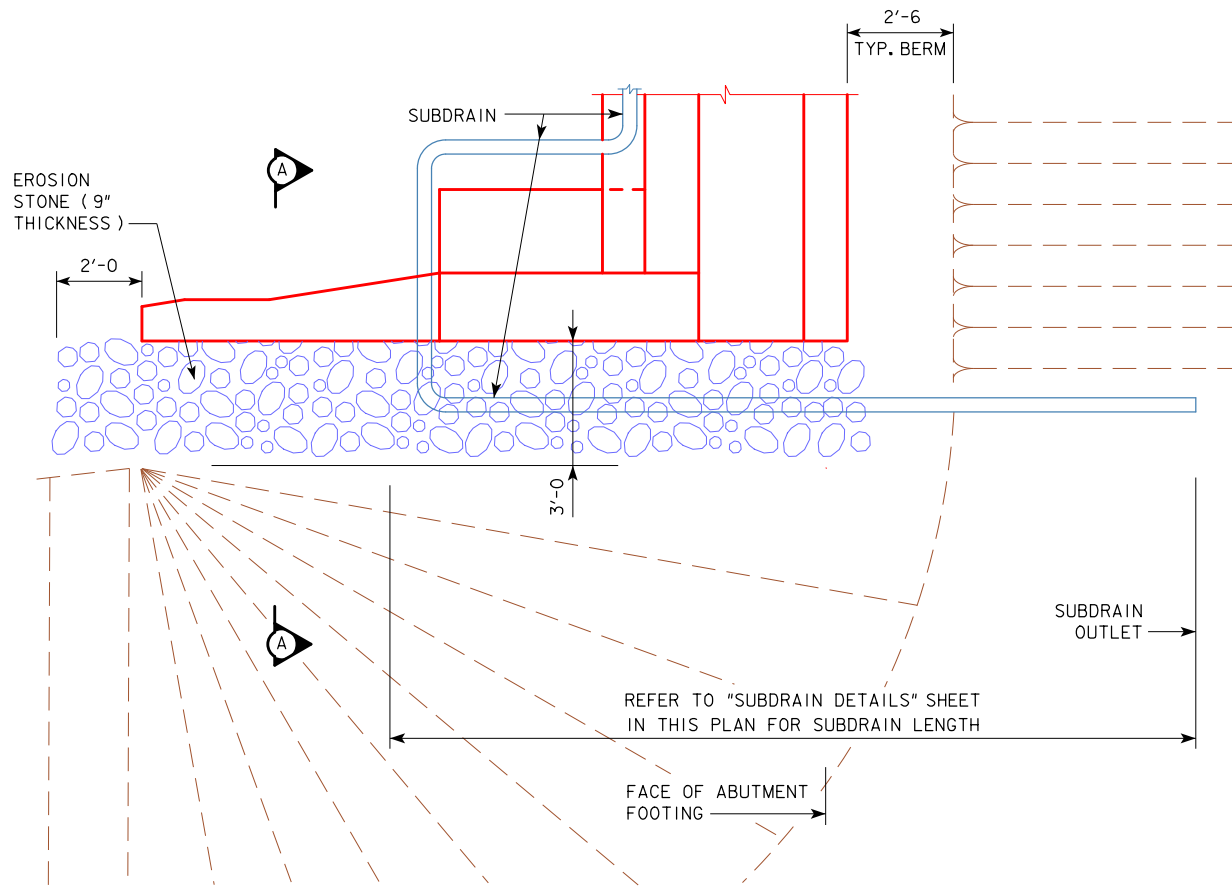
SECTION A-A  
BACKFILL DETAILS

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

\* DIMENSION VARIES DUE TO 2% SUBDRAIN SLOPE.

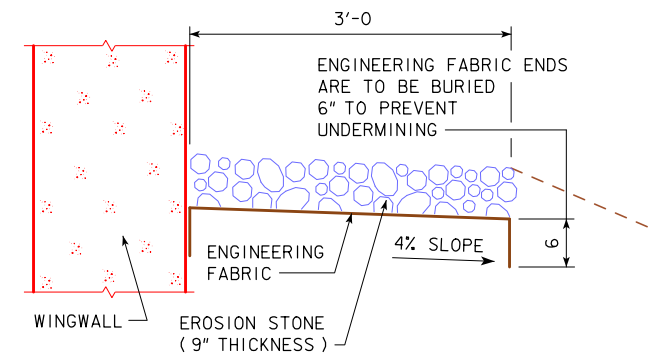
NOTE:  
SEE SUBDRAIN DETAILS SHEET FOR DETAILS NOT SHOWN ON THIS SHEET WHICH ARE PERTINENT TO THIS STRUCTURE.

DESIGN FOR 0° SKEW  
**1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
111' END SPANS 152' INTERIOR SPANS  
**ABUTMENT BACKFILL DETAILS**  
STA. 389+39.66 AT BACKFACE OF ABUTMENTS MARCH, 2021  
**LINN COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 53 OF 54 FILE NO. 31598 DESIGN NO. 220



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

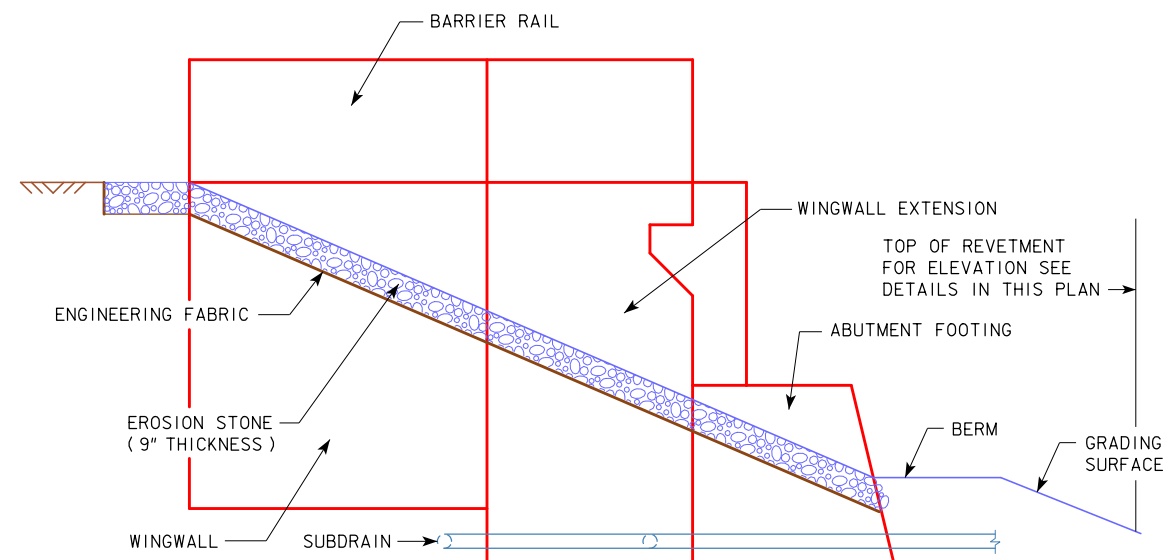
### GENERAL NOTES:

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 CHOKER STONE.

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

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



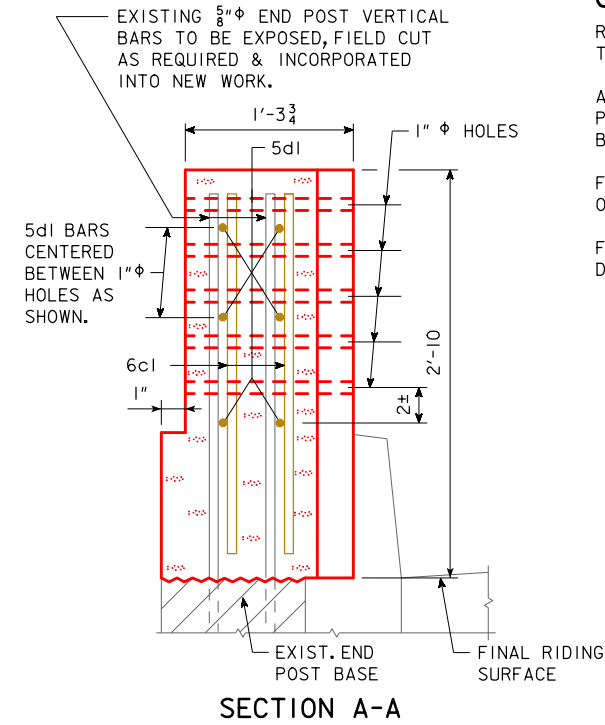
PROFILE VIEW OF WING ARMORING WITH WING EXTENSION

DESIGN FOR 0° SKEW	
1,134'-0 X 40'-0 PRETENSIONED	
PRESTRESSED CONCRETE BEAM BRIDGE	
111' END SPANS	152' INTERIOR SPANS
BRIDGE WING ARMORING	
STA. 389+39.66	MARCH, 2021
LINN COUNTY	
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION	
DESIGN SHEET NO. 54 OF 54	FILE NO. 31598
DESIGN NO. 220	

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

ESTIMATED BRIDGE QUANTITIES - DESIGN 521					
ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUANTITY
1	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB	416	
2	2414-6424110	CONCRETE BARRIER RAILING	LF	28	
3	2426-6772016	CONCRETE REPAIR	SF	24	

ESTIMATE REFERENCE INFORMATION		
ITEM NO.	ITEM CODE	DESCRIPTION
2	2414-6424110	CONCRETE BARRIER RAILING INCLUDES ALL MATERIALS (ASIDE FROM REINFORCING STEEL), LABOR, EQUIPMENT, AND ASSOCIATED COSTS FOR BRIDGE BARRIER RAIL END REMOVAL AND RETROFIT.  CAST-IN-PLACE RAILS SHALL USE HIGH PERFORMANCE CONCRETE.
3	2426-6772016	CONCRETE REPAIR INCLUDES GRINDING THE STEEL FINGER JOINT AT THE EAST ABUTMENT, SOUTH SIDE, AND WEST ABUTMENT, NORTH SIDE, TO BE FLUSH WITH OPPOSING STEEL BASE PLATE.



### GENERAL NOTES:

RETROFIT TO BARRIER RAIL IS INTENDED FOR ALL 4 BARRIER ENDS OF THE US 30 W.B. BRIDGE.

ALL OTHER MATERIALS, LABOR, EQUIPMENT, AND ASSOCIATED COSTS TO PERFORM THE W.B. BARRIER RAIL END REMOVAL AND RETROFIT SHALL BE CONSIDERED SUBSIDIARY TO THE BID ITEM "CONCRETE BARRIER RAILING".

FOR LOCATIONS OF BARRIER END REPAIR, SEE DESIGN SHEETS 4 AND 6 OF DESIGN 220.

FOR ADDITIONAL APPLICABLE GENERAL NOTES, SEE DESIGN SHEET 3 OF DESIGN 220.

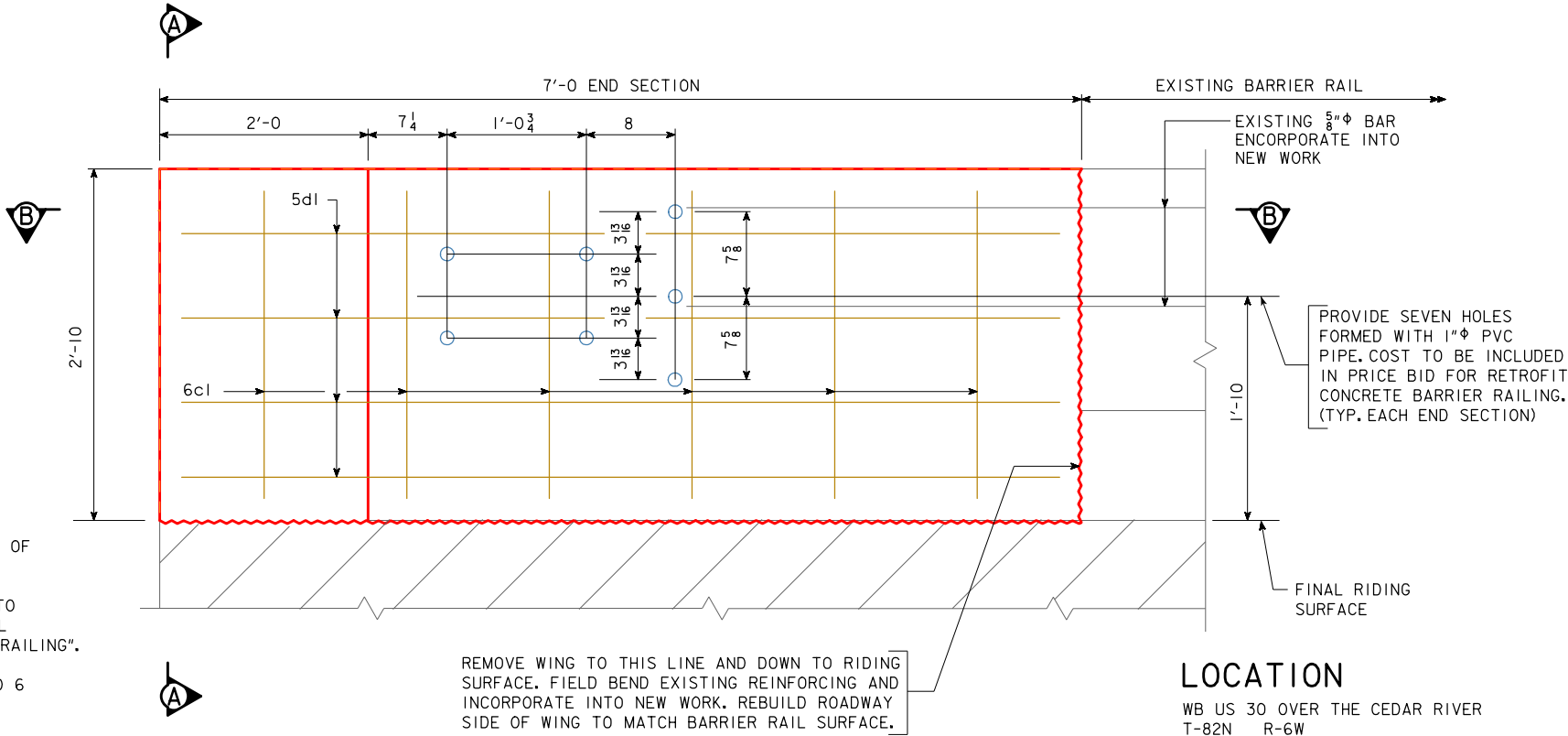
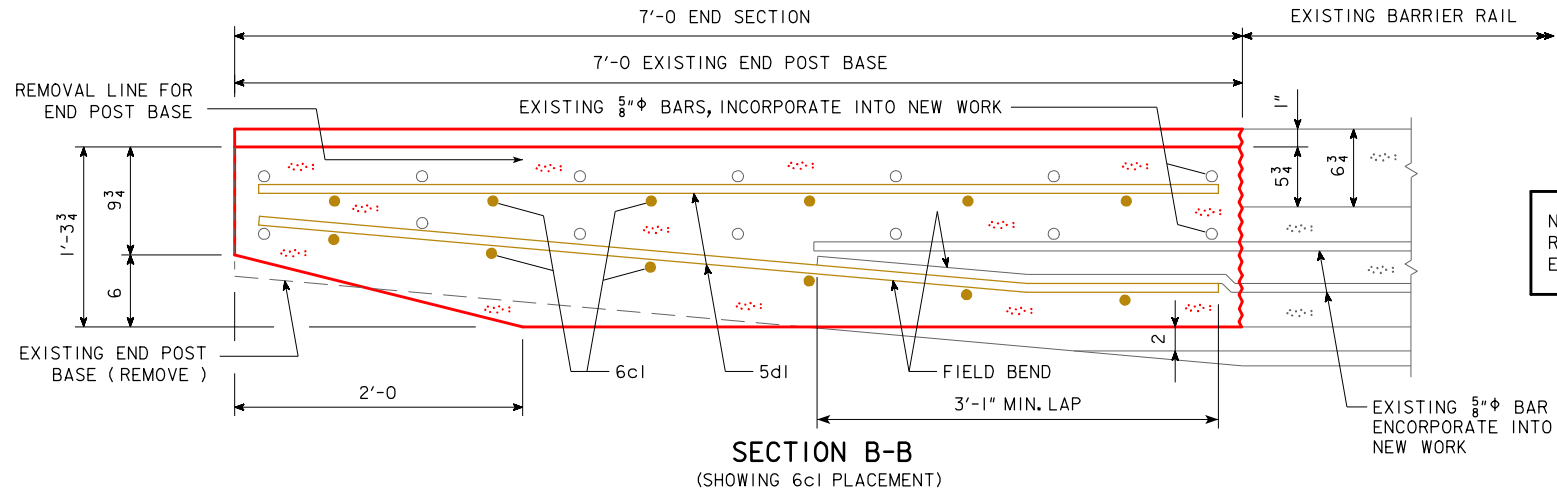
### SPECIFICATIONS:

DESIGN: AASHTO SERIES OF 2002.  
CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

DEVELOPMENTAL SPECIFICATION FOR HIGH PERFORMANCE CONCRETE FOR STRUCTURES

### DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 2002.  
REINFORCING STEEL IN ACCORDANCE WITH SECTION 8, GRADE 60.  
CONCRETE IN ACCORDANCE WITH SECTION 8,  $f'c = 4.0$  KSI.  
STRUCTURAL STEEL IN ACCORDANCE WITH SECTION 10 ASTM A709 GRADE 36, GRADE 50, AND GRADE 50W (AASHTO M270 GRADE 36, GRADE 50, AND GRADE 50W).



### LOCATION

WB US 30 OVER THE CEDAR RIVER  
T-82N R-6W  
SECTION 9  
PUTNAM TOWNSHIP  
LINN COUNTY  
FHWA NO. 33472  
BRIDGE MAINT. NO. 5758.9L030  
LATITUDE 41.926205°  
LONGITUDE -91.548535°

DESIGN HISTORY AT THIS SITE (INCLUDES THIS DESIGN)	
DES. NO.	TYPE OF WORK
570	ORIGINAL DESIGN
521	RETROFIT BARRIER

### TRAFFIC ESTIMATE (WESTBOUND ONLY)

2020	AADT	27,700	V.P.D.
2040	AADT	39,800	V.P.D.
2040	DHV	-	V.P.H.
TRUCKS		16	%
TOTAL DESIGN ESALs		12,900,000	

NOTE:  
ROADWAY QUANTITIES SHOWN ELSEWHERE IN THESE PLANS.

### TRAFFIC CONTROL PLAN

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

NOTE:  
POLLUTION PREVENTION PLAN IS SHOWN ELSEWHERE IN THESE PLANS

### EPOXY REINFORCING STEEL- ONE RAIL END

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6cl	END SECTION, VERTICAL		12	2'-7"	47
5dl	END SECTION, LONGIT.		8	6'-9"	57
TOTAL (LBS.)					104

### CONCRETE PLACEMENT SUMMARY

SECTION	TOTAL
ONE BARRIER RAIL END SECTION	0.8 CU. YD.

### CONCRETE BARRIER RAIL QUANTITIES

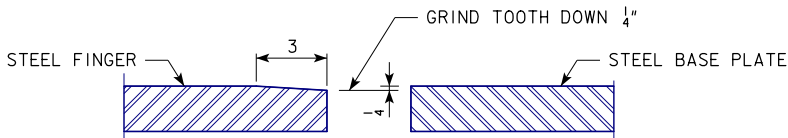
ITEM	UNIT	QUANTITY
ONE BARRIER RAIL END SECTION	L.F.	7'-0"

DESIGN FOR 15° SKEW (R.A.)  
1,134'-0" X 40'-0" CONTINUOUS  
WELDED GIRDER BRIDGE

117'-0" END SPANS 150'-0" INTERIOR SPANS  
BARRIER RAIL RETROFIT DETAILS  
STA. 387+82.00 MARCH, 2021

### LINN COUNTY

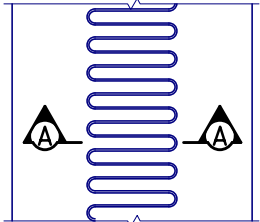
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 1 OF 2 FILE NO. 31598 DESIGN NO. 521



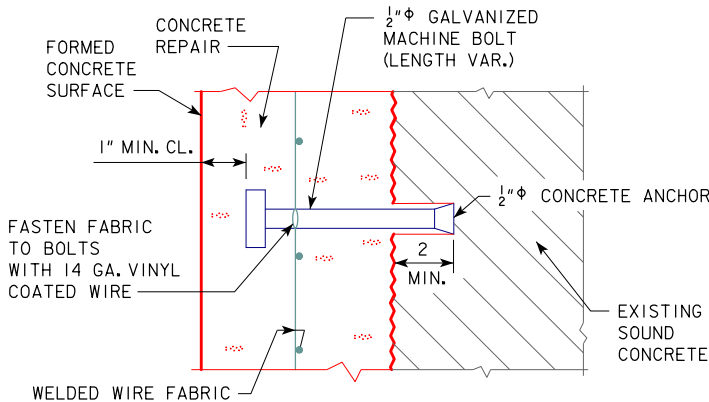
SECTION A-A

NOTES:  
GRIND STEEL FINGERS ON FINGER JOINT AT:  
EAST ABUTMENT, SOUTH LANE, OF THE W.B. US 30 BRIDGE, AS SHOWN IN SECTION A-A. THE LIMITS OF GRINDING SHALL BE THE FULL WIDTH OF THE SOUTH LANE, PLUS 2'-0" PAST THE CENTERLINE AND 2'-0" PAST THE EDGE OF LANE LINE, FOR 16'-0" TOTAL. THE LENGTH OF GRINDING NECESSARY SHALL BE APPROVED BY THE ENGINEER IN THE FIELD PRIOR TO BEGINNING WORK.

WEST ABUTMENT, NORTH SHOULDER, OF THE W.B. US 30 BRIDGE, AS SHOWN IN SECTION A-A. THE LIMITS OF GRINDING SHALL BE THE FULL WIDTH OF THE NORTH SHOULDER, FOR 10'-0" TOTAL. THE LENGTH OF GRINDING NECESSARY SHALL BE APPROVED BY THE ENGINEER IN THE FIELD PRIOR TO BEGINNING WORK.

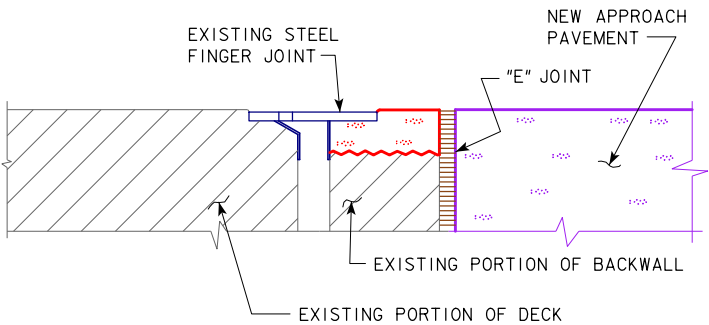


PART PLAN TOOTH LAYOUT

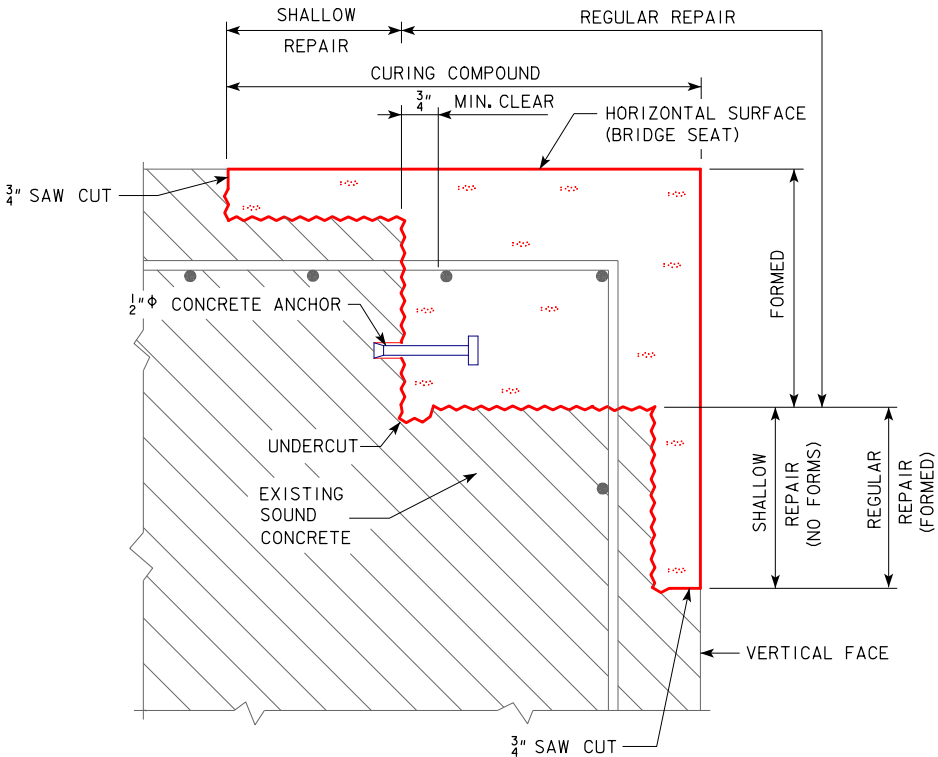


ANCHOR DETAIL

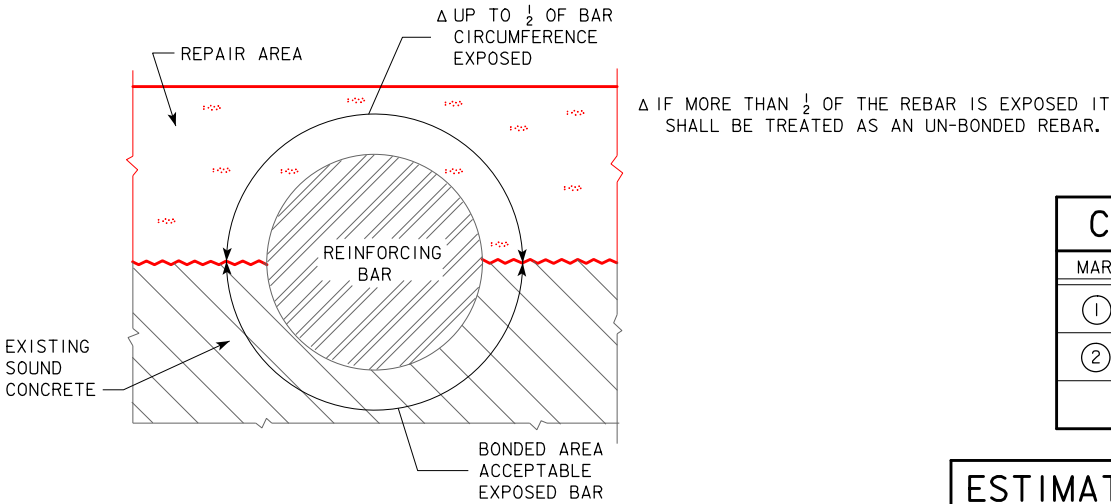
FOR SPACING AND USE OF CONCRETE ANCHORS AND WWF SEE THE REPAIR NOTES.



PART LONGITUDINAL SECTION ALONG ROADWAY  
(WEST ABUTMENT, LOOKING SOUTH)



CORNER REPAIR



CONCRETE REMOVAL  
ADJACENT TO REINFORCING

REPAIR NOTES:

DETAILS ON THIS SHEET FOR REPAIR OF THE BACKWALL APPLY TO THE WEST ABUTMENT OF THE W.B. US 30 BRIDGE ONLY.

THE SPALLED AND HOLLOW AREAS OF THIS BRIDGE AS NOTED AND SHOWN IN THESE PLANS SHALL BE REPAIRED AS FOLLOWS:

ALL THE COSTS OF EQUIPMENT AND MATERIALS REQUIRED TO REPAIR THE SPALLED AND HOLLOW AREAS OF THIS BRIDGE SHALL BE INCLUDED IN THE PRICE BID FOR "CONCRETE REPAIR".

THE PRICE BID FOR "CONCRETE REPAIR" SHALL INCLUDE THE COST OF ALL CONCRETE ANCHORS AND WELDED WIRE FABRIC REQUIRED BY THE PLANS.

THE ENGINEER SHALL DETERMINE AND OUTLINE BY VISUAL AND AUDIBLE INSPECTION THE ACTUAL AREAS OF THE CONCRETE REPAIRS. THE CONTRACTOR SHALL BE PAID FOR THE ACTUAL AMOUNT OF REPAIRS MADE ON A SQUARE FOOT BASIS BASED ON THE PRICE BID PER SQUARE FOOT.

ALL EXISTING REINFORCING BARS THAT ARE EXPOSED BY CONCRETE REMOVAL SHALL BE CLEANED AND CAREFULLY INCORPORATED INTO THE NEW WORK, EXCEPT BADLY DETERIORATED EXISTING REINFORCING WHICH SHALL BE REPLACED AS DIRECTED BY THE ENGINEER.

THE CONCRETE ANCHORS REQUIRED SHALL HAVE A MINIMUM PULL OUT OF 5000 LBS. BASED ON 4000 PSI CONCRETE. AN ANCHOR MEETING THE REQUIREMENTS OF IOWA D.O.T. MATERIALS I.M. 453.09 AND THE PULL OUT LOAD ABOVE IS REQUIRED. THE ANCHORS SHALL BE GALVANIZED AND SHALL BE INSTALLED ACCORDING TO RECOMMENDATIONS OF THE MANUFACTURER. THE COST OF FURNISHING AND INSTALLING THE CONCRETE ANCHORS SHALL BE INCLUDED IN THE PRICE BID FOR "CONCRETE REPAIR".

THE WELDED WIRE FABRIC SHALL BE ASTM A185 AND GALVANIZED AS PER ASTM A-641. THE WWF WIRES SHALL BE SPACED 3 x 3 OR 4 x 4 AND THE WIRES SHALL HAVE A NOMINAL AREA OF 0.014 TO 0.029 SQUARE INCHES INCLUSIVE, EXAMPLE "WWF 3 x 3 - W1.4 x W2.9".

WHERE REINFORCEMENT HAS BEEN EXPOSED AND CLEARANCE AROUND THE PERIPHERY OF THE EXISTING BAR IS PROVIDED NO SUPPLEMENTAL REINFORCING IS REQUIRED, EXCEPT WHERE EXISTING REINFORCEMENT DENSITY AND PATTERN ARE SUCH THAT INDIVIDUAL OPEN SPACES BETWEEN BARS ARE OF 1.5 SQUARE FOOT OR LARGER. FOR THIS CONDITION 1/2" CONCRETE ANCHORS AND WELDED WIRE FABRIC SHALL BE INSTALLED AT THE RATE OF ONE CONCRETE ANCHOR WITH WWF PER EACH 1.5 SQUARE FEET OF AREA WITHIN EACH OPEN SPACE.

REPAIRING THE STRUCTURAL CONCRETE SHALL BE IN ACCORDANCE WITH SECTION 2426, OF THE STANDARD SPECIFICATIONS.

CONCRETE PLACEMENT QUANTITIES

MARK	TYPE	UNITS	QUANTITY
①	SHALLOW REPAIR	SQ. FT.	0
②	REGULAR REPAIR	SQ. FT.	24
TOTAL (SQ. FT.)			24

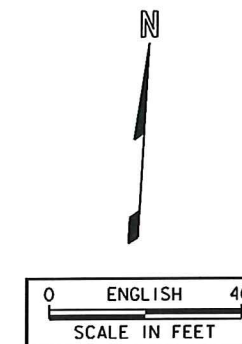
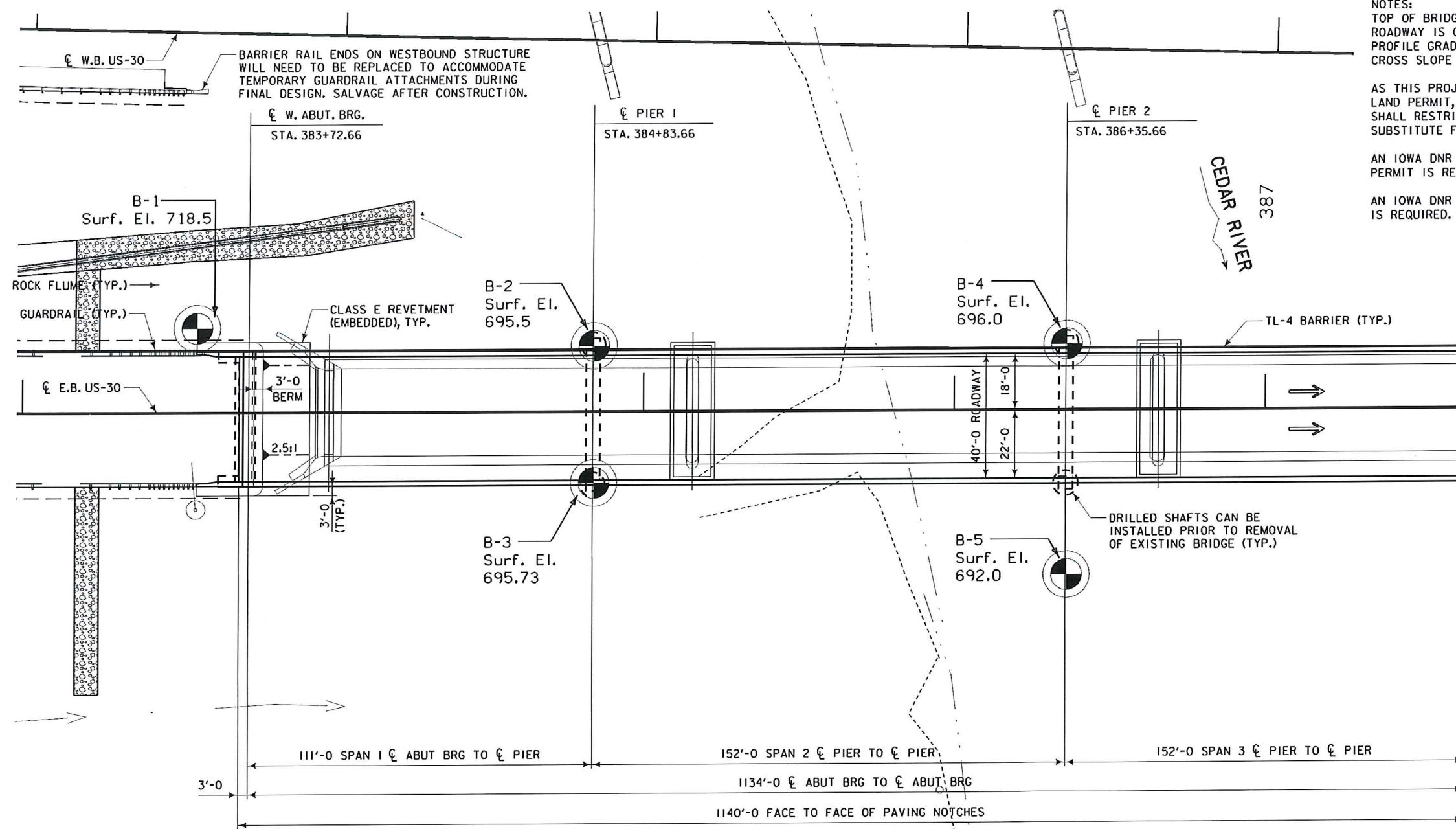
ESTIMATED CONCRETE REPAIR QUANTITIES

DESCRIPTION	UNITS	AMOUNT
CONCRETE REPAIR	SQ. FT.	24

DESIGN FOR 15° SKEW (R.A.)  
**1,134'-0 X 40'-0 CONTINUOUS  
WELDED GIRDER BRIDGE**  
117'-0 END SPANS 150'-0 INTERIOR SPANS  
**BACKWALL REPAIR DETAILS**  
STA. 387+82.00 MARCH, 2021  
**LINN COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 2 OF 2 FILE NO. 31598 DESIGN NO. 521



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



## LOCATION

EB US 30 OVER THE CEDAR RIVER  
T-82N R-6W  
SECTION 9  
PUTNAM TOWNSHIP  
LINN COUNTY  
FHWA NO. 33471  
BRIDGE MAINT. NO. 5758.9R030  
LATITUDE 41.926005°  
LONGITUDE -91.550627°

## 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: Stephen J. Megivern Date: 1/16/2020

Printed or Typed Name

My license renewal date is December 31, 2020.

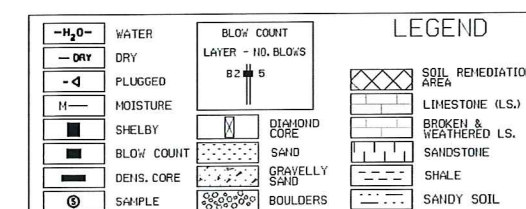
Pages or sheets covered by this seal: SPS.1, SPS.2, SPS.3, SPS.4,  
SPS.5, SPS.6, SPS.7, SPS.8, SPS.9 and SPS.10

Water Level Observations (Ft.)				
Boring No.	Date Drilled	While Drilling	Immediately after Drilling	After Drilling
B-1	09/24/2018	32.5'	--	--
B-2	09/21/2018	0.0'	--	--
B-3	09/21/2018	7.5'	--	--
B-4	10/02/2018	0.0'	--	--
B-5	09/19/2018	0.0'	--	--

### Note:

Borings B-1, B-2 and  
B-4 are shown on SPS.4.

Borings B-3 and B-5  
are shown on SPS.5.



DESIGN FOR 0° SKEW  
**1,134'-0" X 40'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
111' END SPANS (BTE BEAM TYPE) 152' INTERIOR SPAN  
**SITUATION PLAN**  
STA. 389+39.66  
**LINN COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 1 OF 10 FILE NO. 31598 DESIGN NO. 220

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

DESIGN FOR 0° SKEW

1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

111' END SPANS (BTE BEAM TYPE) 152' INTERIOR SPAN

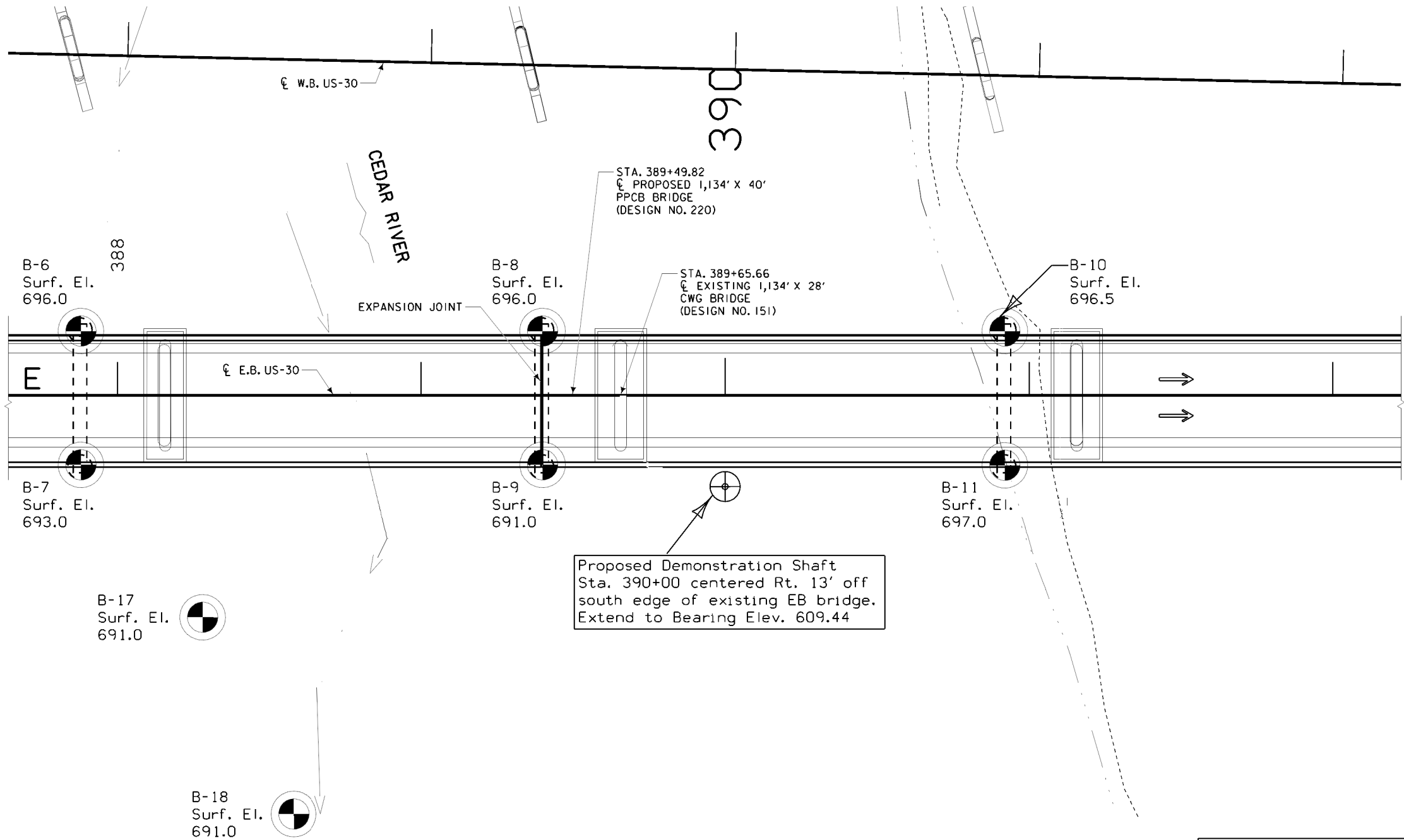
SITUATION PLAN

STA. 389+39.66 FEBRUARY, 2018

LINN COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2 OF 10 FILE NO. 31598 DESIGN NO. 220



-H<sub>2</sub>O-

DRY

PLUGGED

MOISTURE

SHELBY

BLOW COUNT

DENS. CORE

SAMPLE

WATER

DRY

PLUGGED

MOISTURE

SHELBY

BLOW COUNT

DENS. CORE

SAMPLE

BLOW COUNT

LAYER - NO. BLOWS

B2 5

DIAMOND CORE

SAND

GRAVELLY SAND

BOULDERS

LEGEND

SOIL REMEDIATION AREA

LIMESTONE (LS.)

BROKEN & WEATHERED LS.

SANDSTONE

SHALE

SANDY SOIL

Note:

Borings B-6, B-8 and B-10 are shown on SPS.6.

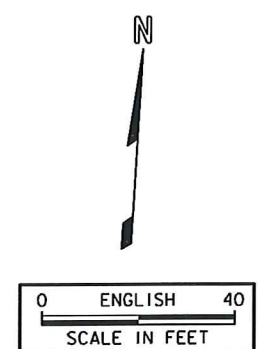
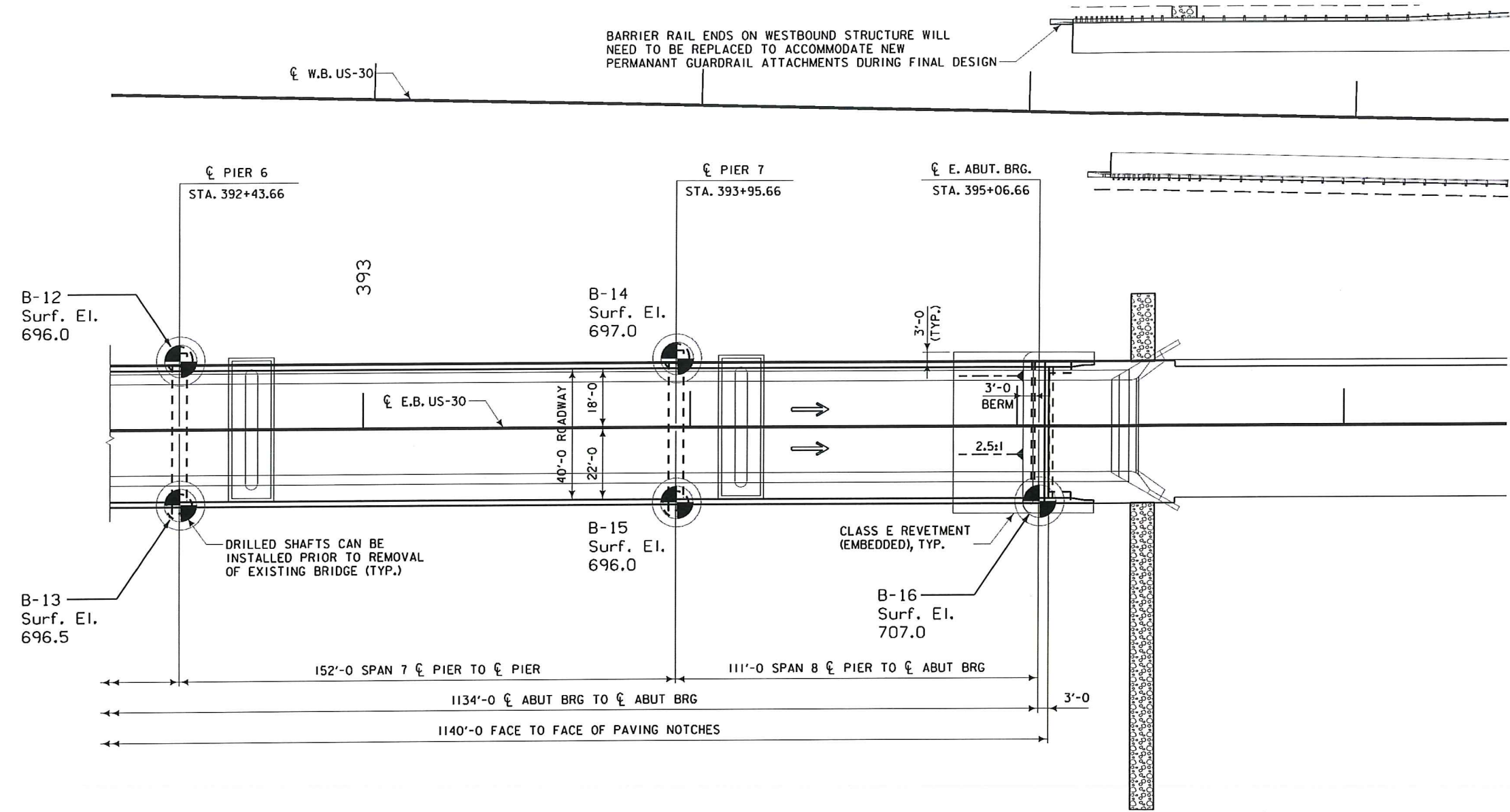
Borings B-7, B-9 and B-11 are shown on SPS.7.

Borings B-17 and B-18 are shown on SPS.8.

Water Level Observations (Ft.)				
Boring No.	Date Drilled	While Drilling	Immediately after Drilling	After Drilling
B-6	10/01/2018	--	--	--
B-7	09/20/2018	0.0'	--	--
B-8	10/02/2018	0.0'	--	--
B-9	09/18/2018	0.0'	--	--
B-10	09/19/2018	6.0'	--	4.5' on 09/20/2018
B-11	09/20/2018	6.0'	--	--
B-17	09/21/2018	0.0'	--	--
B-18	09/21/2018	0.0'	--	--



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



Water Level Observations (Ft.)				
Boring No.	Date Drilled	While Drilling	Immediately after Drilling	After Drilling
B-12	10/01/2018	7.0'	--	4.5'
B-13	09/19/2018	8.0'	--	4.0' on 03/20/2018
B-14	09/18/2018	8.5'	--	7.5' on 09/20/2018
B-15	09/20/2018	5.5'	--	--
B-16	09/21/2018	16.5'	--	13.0' on 9/21/2018

Note:

Borings B-12 and B-14 are shown on SPS.9.

Borings B-13, B-15 and B-16 are shown on SPS.10.

~H<sub>2</sub>O~

WATER

— DRY

DRY

— <4

PLUGGED

— H—

MOISTURE

■

SHELBY

■

BLOW COUNT

■

DENS. CORE

⊕

SAMPLE

BLOW COUNT

LAYER - NO. BLOWS

B2 5

■

DIAMOND CORE

■

SAND

■

GRAVELLY SAND

■

BOULDERS

■

SOIL REMEDIATION AREA

■

LIMESTONE (LS.)

■

BROKEN & WEATHERED LS.

■

SANDSTONE

■

SHALE

■

SANDY SOIL

DESIGN FOR 0° SKEW

1,134'-0" X 40'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

111' END SPANS (BTE BEAM TYPE) 152' INTERIOR SPAN

SITUATION PLAN

STA. 389+39.66 FEBRUARY, 2018

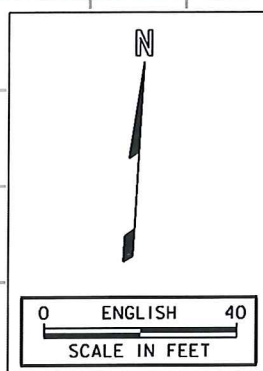
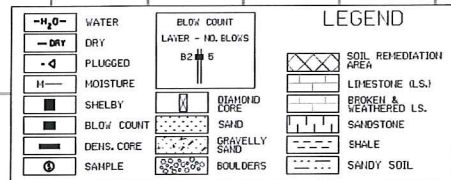
LINN COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 3 OF 10 FILE NO. 31598 DESIGN NO. 220



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



### LOCATION

EB US 30 OVER THE CEDAR RIVER  
T-82N R-6W  
SECTION 9  
PUTNAM TOWNSHIP  
LINN COUNTY  
FHWA NO. 33471  
BRIDGE MAINT. NO. 5758.9R030  
LATITUDE 41.926005°  
LONGITUDE -91.550627°

DESIGN FOR 0° SKEW  
1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE  
111' END SPANS (BTE BEAM TYPE) 152' INTERIOR SPAN  
SOIL PROFILE SHEET  
STA. 389+39.66  
LINN COUNTY  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 4 OF 10 FILE NO. 31598 DESIGN NO. 220

### NORTH LINE PROFILE EB US 30

B-1		B-2	
Layer	Thickness	Layer	Thickness
A	29.0	A	4.0
B	1.0	B	4.5
C	2.5	C	21.5
D	4.5	D	38.5
E	23.0	E	16.0
F	22.0	F	3.0
G	10.5	G	3.5
H	5.1	H	23.0
		I	5.0

ROCK CORE INFORMATION					
Boring	Approx. Surf. El. (ft)	Run No.	Interval (ft)	Recovery (%)	RQD (%)
B-2	695.5	Run No.1	69.0-79.0	95	67
		Run No.2	79.0-89.0	96	84
		Run No.3	89.0-99.0	100	89
		Run No.4	99.0-109.0	100	26
		Run No.5	109.0-119.0	92	44

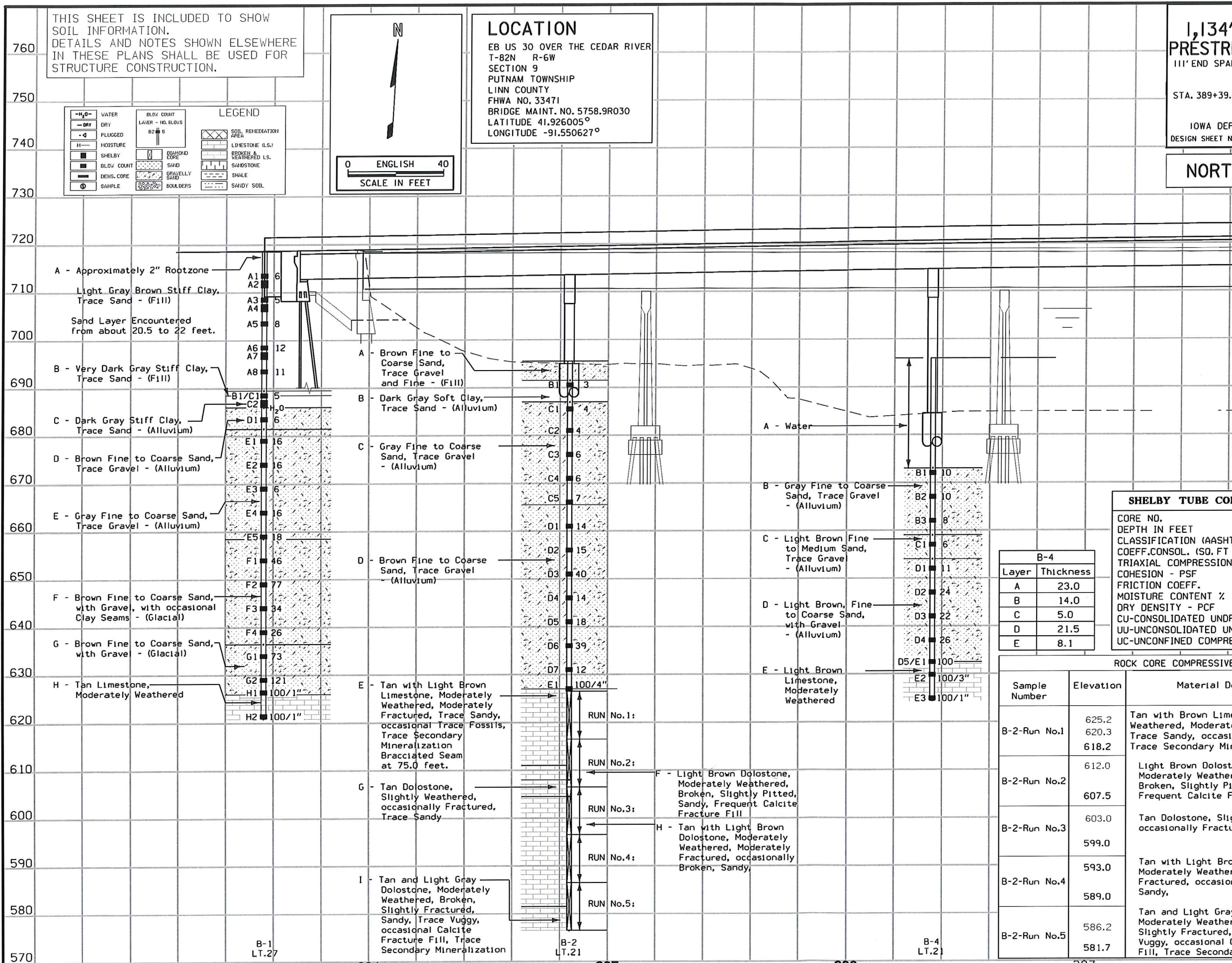
### SHELBY TUBE CORE DATA

CORE NO.	B-1-A2	B-1-A4	B-1-A7	B-1-C2
DEPTH IN FEET	5.5-7.5	10.5-12.5	20.5-22.5	30.5-32.5
CLASSIFICATION (AASHTO)	--	--	--	A-6(17)
COEFF. CONSOL. (SQ. FT / DAY)	--	--	--	--
TRIAxIAL COMPRESSION	--	--	--	CU
COHESION - PSF	--	--	--	176
FRICTION COEFF.	--	--	--	0.27
MOISTURE CONTENT %	--	--	--	38
DRY DENSITY - PCF	18	18	20	38
CU-CONSOLIDATED UNDRAINED	109	105	105	80
UU-UNCONSOLIDATED UNDRAINED				
UC-UNCONFINED COMPRESSION (c=1/2 Qu)				

### ROCK CORE COMPRESSIVE STRENGTH TESTING REPORT

Sample Number	Elevation	Material Description	Compressive Strength (psi)	Moisture (%)	Dry Density (PCF)
B-2-Run No.1	625.2	Tan with Brown Limestone, Moderately Weathered, Moderately Fractured, Trace Sandy, occasional Trace Fossils, Trace Secondary Mineralization	6351	2	154
	620.3		2658	10	125
	618.2		7852	3	150
B-2-Run No.2	612.0	Light Brown Dolostone, Moderately Weathered, Broken, Slightly Pitted, Sandy, Frequent Calcite Fracture Fill	2053	16	117
	607.5		2230	12	121
B-2-Run No.3	603.0	Tan Dolostone, Slightly Weathered, occasionally Fractured, Trace Sandy	2724	13	116
	599.0		5453	6	140
B-2-Run No.4	593.0	Tan with Light Brown Dolostone, Moderately Weathered, Moderately Fractured, occasionally Broken, Sandy,	3124	12	124
	589.0		2339	12	127
B-2-Run No.5	586.2	Tan and Light Gray Dolostone, Moderately Weathered, Broken, Slightly Fractured, Sandy, Trace Vuggy, occasional Calcite Fracture Fill, Trace Secondary Mineralization	7151	8	134
	581.7		5557	8	132

B-4	
Layer	Thickness
A	23.0
B	14.0
C	5.0
D	21.5
E	8.1



FILE NO. 31598

ENGLISH

DESIGN TEAM

MEGIVERN \ DELL \ GORJACKOVSKI

LINN COUNTY

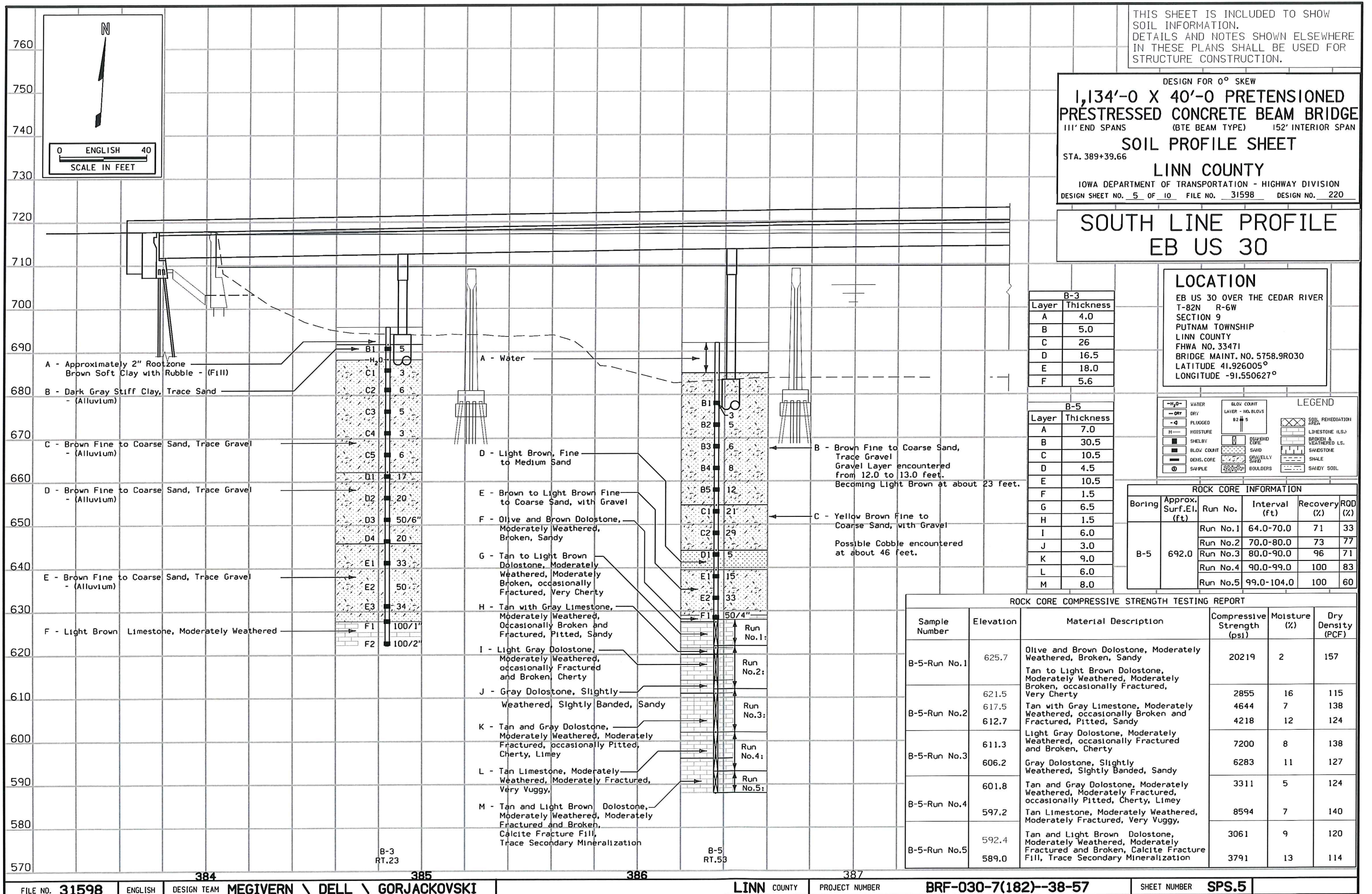
PROJECT NUMBER

BRF-030-7(182)--38-57

SHEET NUMBER

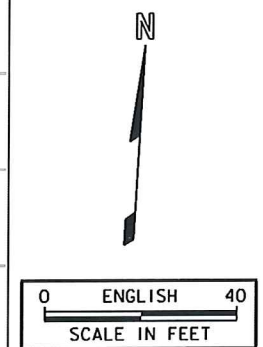
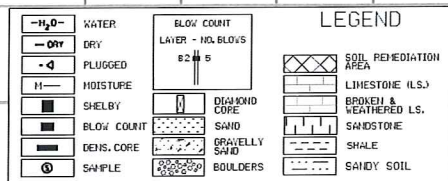
SPS.4







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LOCATION

EB US 30 OVER THE CEDAR RIVER  
T-82N R-6W  
SECTION 9  
PUTNAM TOWNSHIP  
LINN COUNTY  
FHWA NO. 33471  
BRIDGE MAINT. NO. 5758.9R030  
LATITUDE 41.926005°  
LONGITUDE -91.550627°

NORTH LINE  
PROFILE  
EB US 30

DESIGN FOR 0° SKEW

1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

111' END SPANS (BTE BEAM TYPE) 152' INTERIOR SPAN

SOIL PROFILE SHEET

STA. 389+39.66

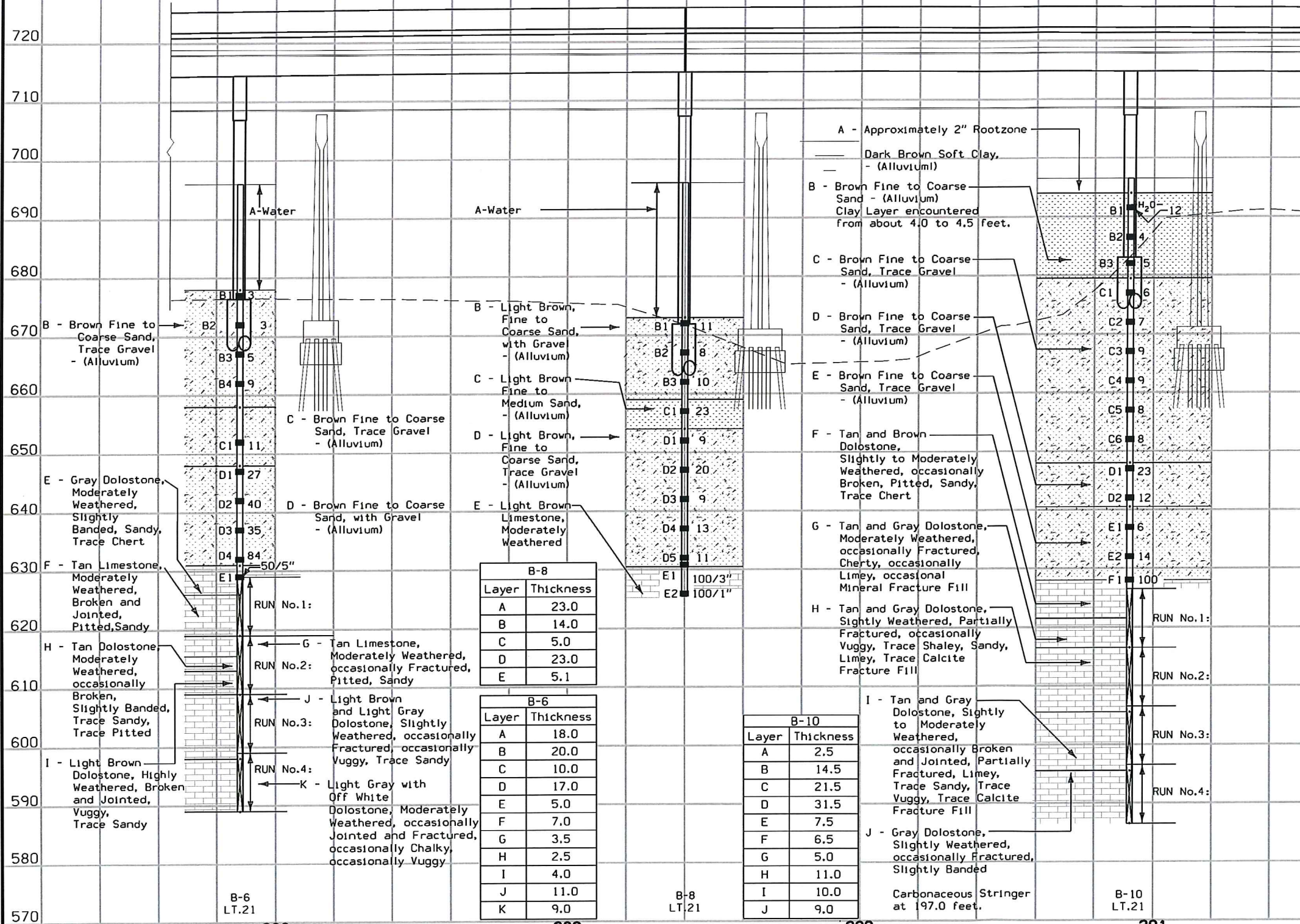
LINN COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 6 OF 10 FILE NO. 31598 DESIGN NO. 220

ROCK CORE INFORMATION					
Boring	Approx. Surf. El. (ft)	Run No.	Interval (ft)	Recovery (%)	RQD (%)
B-6	696.0	Run No.1	67.0-77.0	100	63
		Run No.2	77.0-87.0	98	53
		Run No.3	87.0-97.0	98	76
		Run No.4	97.0-107.0	99	67
B-10	696.5	Run No.1	70.0-80.0	95	67
		Run No.2	77.0-87.0	98	53
		Run No.3	87.0-97.0	98	76
		Run No.4	97.0-107.0	99	67

ROCK CORE COMPRESSIVE STRENGTH TESTING REPORT					
Sample Number	Elevation	Material Description	Compressive Strength (psi)	Moisture (%)	Dry Density (pcf)
B-6 Run No.1	625.2	Gray Dolostone, Moderately Weathered, Slightly Banded, Sandy, Trace Chert	15506	4	149
	622.2	Tan Limestone, Highly to Moderately Weathered, Broken and Jointed, Pitted, Sandy, occasionally Fractured	17196	5	153
B-6 Run No.2	618.6	Tan and Light Brown Dolostone, Moderately to Highly Weathered, occasionally Broken to Broken Slightly Banded, Trace Sandy to Sandy, Trace Pitted, Vuggy, and jointed	4386	13	125
	613.3		3932	12	123
B-6 Run No.3	609.4		4015	13	120
	606.3	Light Brown and Light Gray Dolostone, Slightly Weathered, occasionally Fractured, occasionally Vuggy, Trace Sandy	5127	12	125
B-6 Run No.4	601.5		7443	7	142
	598.5	Light Gray with Off White Dolostone, Moderately Weathered, occasionally Jointed and Fractured, occasionally Chalky, occasionally Vuggy	4360	13	118
B-6 Run No.4	593.7		6835	9	135
	590.0		6545	8	138
B-10 Run No.1	625.6	Tan and Gray Dolostone, Moderately Weathered, occasionally Fractured, Cherty, occasionally Limey, occasional Mineral Fracture Fill	2681	10	119
	620.9		3852	10	128
B-10 Run No.2	617.7		2502	14	142
	614.1	Tan and Gray Dolostone, Slightly Weathered, Partially Fractured, occasionally Vuggy, Trace Shale, Sandy, Limey, Trace Calcite Fracture Fill	3100	13	118
B-10 Run No.2	607.8		9980	7	142
B-10 Run No.3	601.0	Tan and Gray Dolostone, Slightly to Moderately Weathered, occasionally Broken and Jointed, Partially Fractured, Limey, Trace Sandy, Trace Vuggy, Trace Calcite Fracture Fill	5233	7	131
	597.5		6844	7	138
B-10 Run No.4	596.0	Gray Dolostone, Slightly Weathered, occasionally Fractured, Slightly Banded Carbonaceous Stringer at 197.0 feet.	4752	6	133
	591.1		6805	7	135



FILE NO. 31598

ENGLISH

DESIGN TEAM MEGIVERN \ DELL \ GORJACKOVSKI

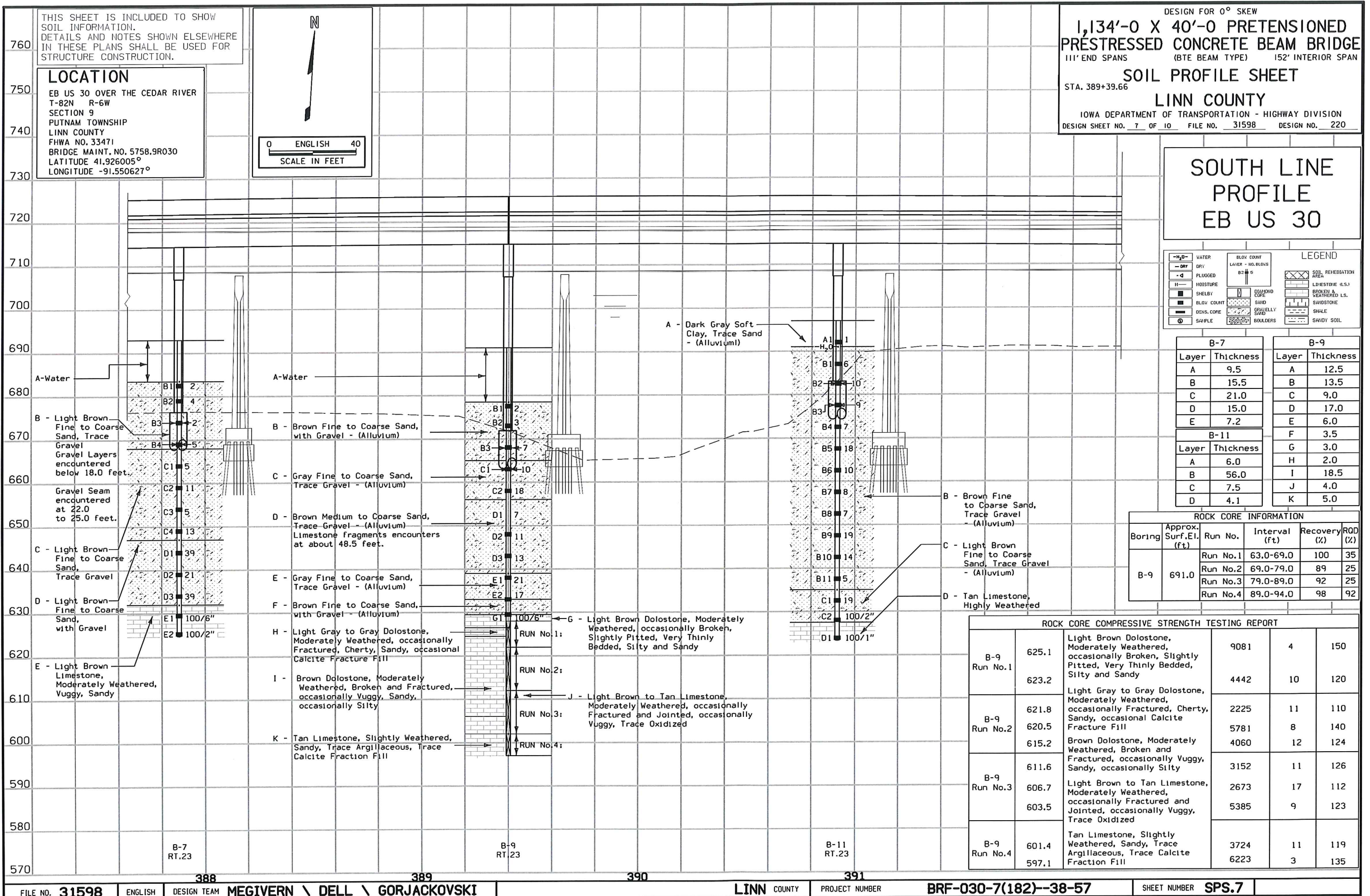
LINN COUNTY

PROJECT NUMBER

BRF-030-7(182)--38-57

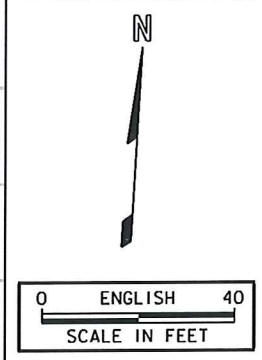
SHEET NUMBER SPS.6





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**LOCATION**  
EB US 30 OVER THE CEDAR RIVER  
T-82N R-6W  
SECTION 9  
PUTNAM TOWNSHIP  
LINN COUNTY  
FHWA NO. 33471  
BRIDGE MAINT. NO. 5758.9R030  
LATITUDE 41.926005°  
LONGITUDE -91.550627°



DESIGN FOR 0° SKEW  
**1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
111' END SPANS (BTE BEAM TYPE) 152' INTERIOR SPAN  
**SOIL PROFILE SHEET**  
STA. 389+39.66  
**LINN COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 7 OF 10 FILE NO. 31598 DESIGN NO. 220

**SOUTH LINE  
PROFILE  
EB US 30**

LEGEND

WATER	WATER	WATER	WATER
DRY	DRY	DRY	DRY
PLUGGED	PLUGGED	PLUGGED	PLUGGED
MOISTURE	MOISTURE	MOISTURE	MOISTURE
SHELBY	SHELBY	SHELBY	SHELBY
BLOX COUNT	BLOX COUNT	BLOX COUNT	BLOX COUNT
DENS. CORE	DENS. CORE	DENS. CORE	DENS. CORE
SAMPLE	SAMPLE	SAMPLE	SAMPLE
SOIL REFORMATION	SOIL REFORMATION	SOIL REFORMATION	SOIL REFORMATION
DIAMOND CURE	DIAMOND CURE	DIAMOND CURE	DIAMOND CURE
GRAVELLY SAND	GRAVELLY SAND	GRAVELLY SAND	GRAVELLY SAND
BOULDERS	BOULDERS	BOULDERS	BOULDERS
SHALE	SHALE	SHALE	SHALE
SAIDY SOIL	SAIDY SOIL	SAIDY SOIL	SAIDY SOIL

B-7		B-9	
Layer	Thickness	Layer	Thickness
A	9.5	A	12.5
B	15.5	B	13.5
C	21.0	C	9.0
D	15.0	D	17.0
E	7.2	E	6.0
		F	3.5
B-11		G	3.0
Layer	Thickness	H	2.0
A	6.0	I	18.5
B	56.0	J	4.0
C	7.5	K	5.0
D	4.1		

ROCK CORE INFORMATION

Boring	Approx. Surf. El. (ft)	Run No.	Interval (ft)	Recovery (%)	RQD (%)
B-9	691.0	Run No.1	63.0-69.0	100	35
		Run No.2	69.0-79.0	89	25
		Run No.3	79.0-89.0	92	25
		Run No.4	89.0-94.0	98	92

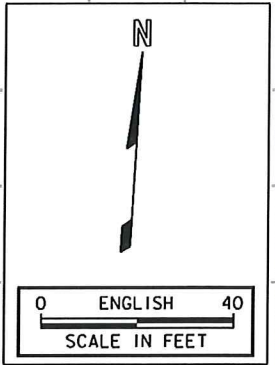
ROCK CORE COMPRESSIVE STRENGTH TESTING REPORT

Boring	Run No.	Depth (ft)	Strength (psi)	Notes
B-9 Run No.1	625.1	9081	4	Light Brown Dolostone, Moderately Weathered, occasionally Broken, Slightly Pitted, Very Thinly Bedded, Silty and Sandy
	623.2	4442	10	
B-9 Run No.2	621.8	2225	11	Light Gray to Gray Dolostone, Moderately Weathered, occasionally Fractured, Cherty, Sandy, occasional Calcite Fracture Fill
	620.5	5781	8	
B-9 Run No.3	615.2	4060	12	Brown Dolostone, Moderately Weathered, Broken and Fractured, occasionally Vuggy, Sandy, occasionally Silty
	611.6	3152	11	
B-9 Run No.4	606.7	2673	17	Light Brown to Tan Limestone, Moderately Weathered, occasionally Fractured and Jointed, occasionally Vuggy, Trace Oxidized
	603.5	5385	9	
B-9 Run No.4	601.4	3724	11	Tan Limestone, Slightly Weathered, Sandy, Trace Argillaceous, Trace Calcite Fracture Fill
	597.1	6223	3	



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SAND BAR BORINGS PROFILE EB US 30



**LOCATION**  
EB US 30 OVER THE CEDAR RIVER  
T-82N R-6W  
SECTION 9  
PUTNAM TOWNSHIP  
LINN COUNTY  
FHWA NO. 33471  
BRIDGE MAINT. NO. 5758.9R030  
LATITUDE 41.926005°  
LONGITUDE -91.550627°

B - Brown to Light Brown  
Fine to Coarse Sand,  
Trace Gravel

B - Light Brown Fine  
to Coarse Sand,  
Trace Gravel

B-17	
Layer	Thickness
A	9.5
B	20.0

B-18	
Layer	Thickness
A	9.5
B	20.0

B-17  
RT. 73

B-18  
RT. 138

WATER

DRY

PLUGGED

MOISTURE

SHELBY

BLOW COUNT

DENS. CORE

SAMPLE

BLOW COUNT

LAYER - NO. BLOWS

82# 5

DIAMOND CORE

SAND

GRAVELLY SAND

BOULDERS

SOIL REMEDIATION

LIMESTONE (L.S.)

BROKEN & WEATHERED L.S.

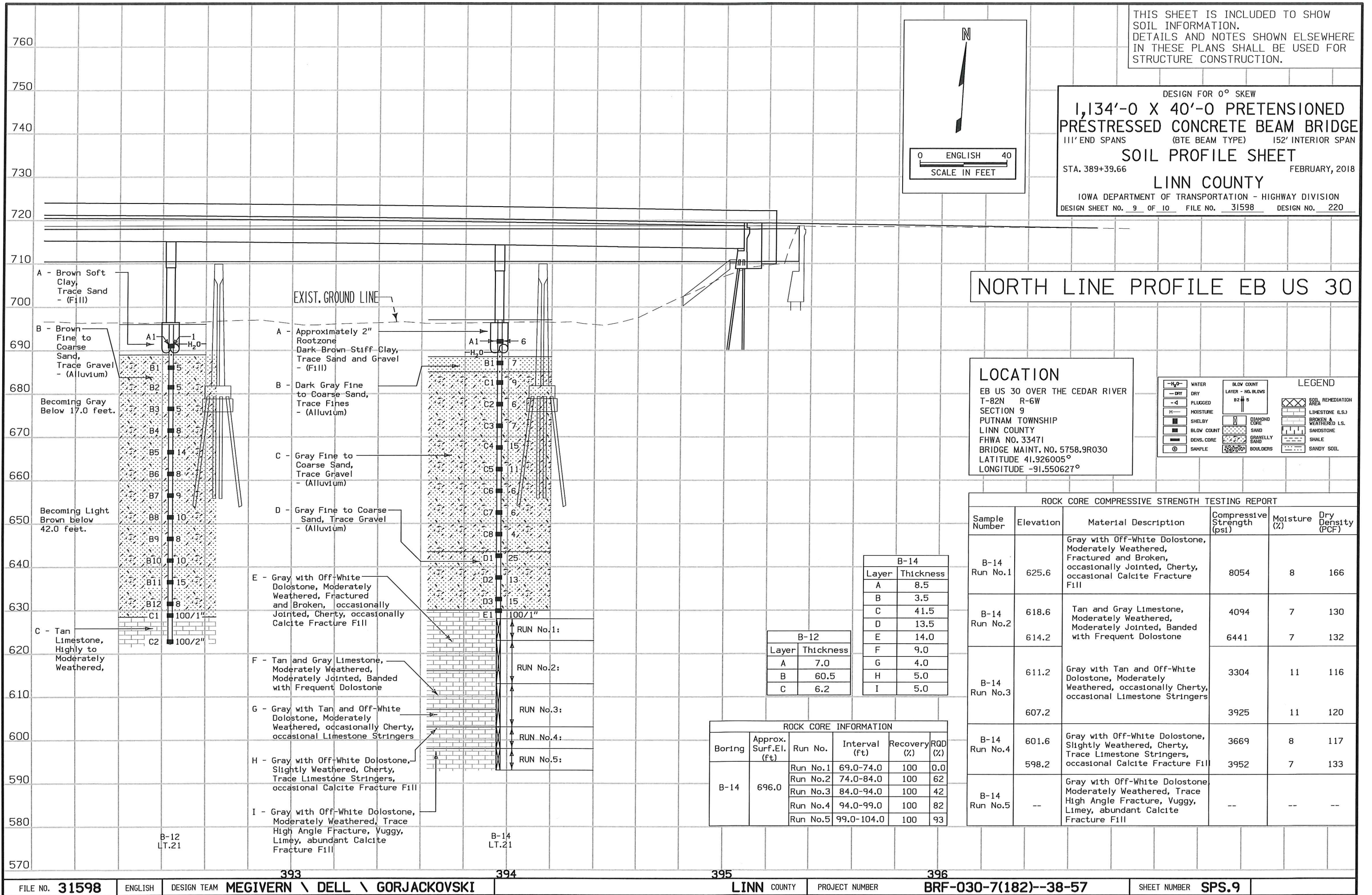
SANDSTONE

SHALE

SANDY SOIL

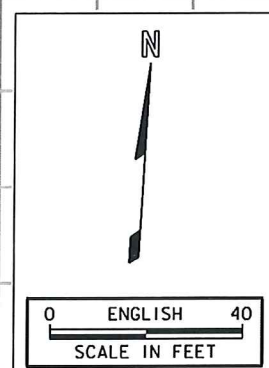
DESIGN FOR 0° SKEW  
**1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
111' END SPANS (BTE BEAM TYPE) 152' INTERIOR SPAN  
**SOIL PROFILE SHEET**  
STA. 389+39.66  
**LINN COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 8 OF 10 FILE NO. 31598 DESIGN NO. 220







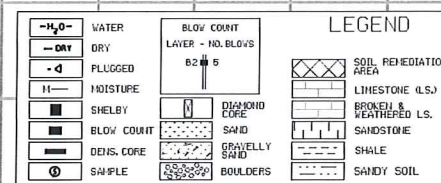
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### LOCATION

EB US 30 OVER THE CEDAR RIVER  
T-82N R-6W  
SECTION 9  
PUTNAM TOWNSHIP  
LINN COUNTY  
FHWA NO. 33471  
BRIDGE MAINT. NO. 5758.9R030  
LATITUDE 41.926005°  
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### SOUTH LINE PROFILE EB US 30



DESIGN FOR 0° SKEW  
**1,134'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
111' END SPANS (BTE BEAM TYPE) 152' INTERIOR SPAN  
**SOIL PROFILE SHEET**  
STA. 389+39.66  
**LINN COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 10 OF 10 FILE NO. 31598 DESIGN NO. 220

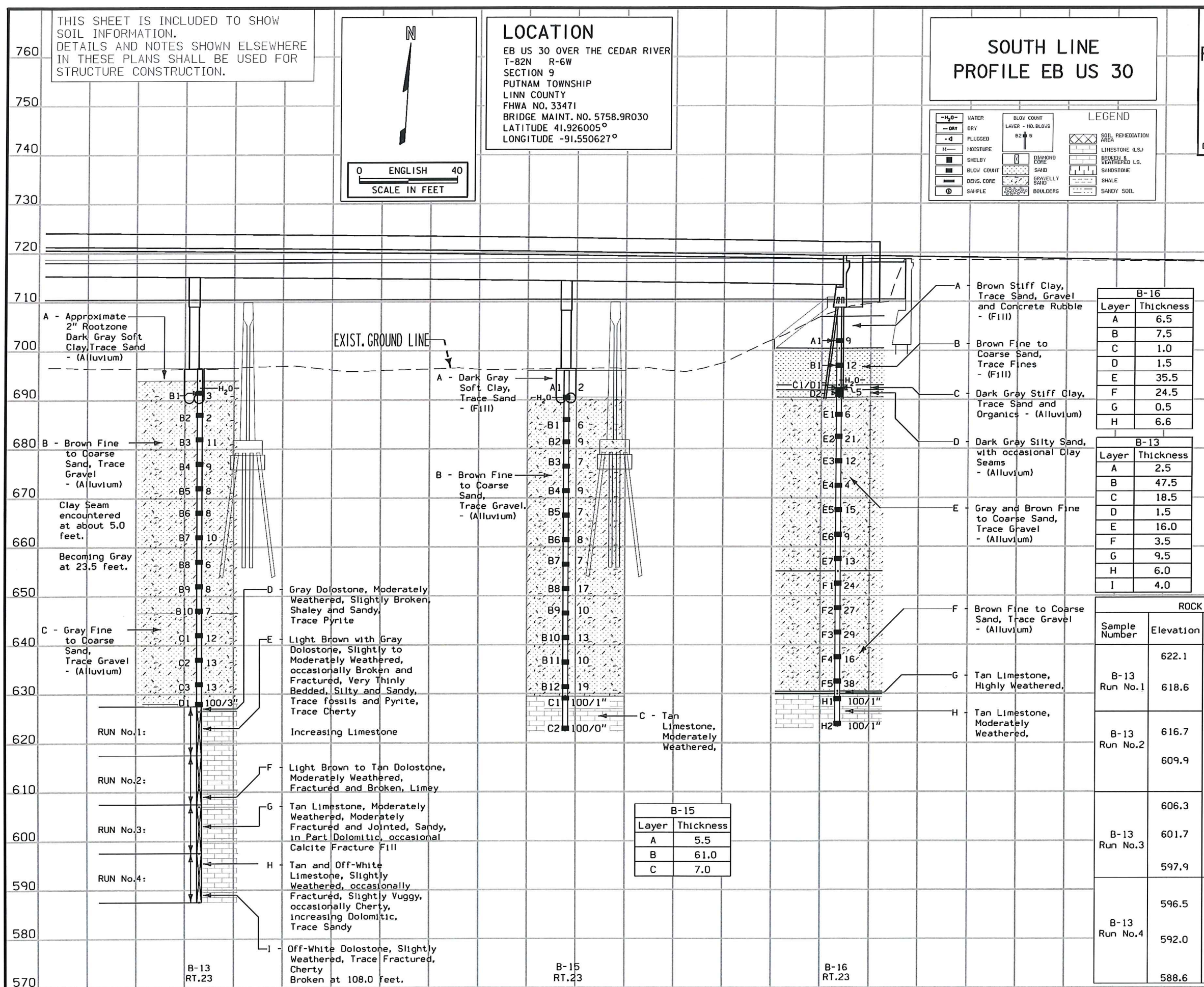
### SHELBY TUBE CORE DATA

CORE NO. B-16-D2  
DEPTH IN FEET 15.5-16.5  
CLASSIFICATION (AASHTO) --  
COEFF. CONSOL. (SQ. FT / DAY) --  
TRIAXIAL COMPRESSION --  
COHESION - PSF --  
FRICTION COEFF. --  
MOISTURE CONTENT % 22.0  
DRY DENSITY - PCF 96.0  
CU-CONSOLIDATED UNDRAINED  
UU-UNCONSOLIDATED UNDRAINED  
UC-UNCONFINED COMPRESSION ( $c=1/2 Q_u$ )

ROCK CORE INFORMATION					
Boring	Approx. Surf. El. (ft)	Run No.	Interval (ft)	Recovery (%)	RQD (%)
B-13	696.5	Run No.1	69.0-79.0	100	55
		Run No.2	79.0-89.0	100	62
		Run No.3	89.0-99.0	100	46
		Run No.4	99.0-109.0	100	90

### ROCK CORE COMPRESSION TESTING REPORT

Sample Number	Elevation	Material Description	Compressive Strength (psi)	Moisture (%)	Dry Density (PCF)
B-13 Run No.1	622.1	Gray Dolostone, Moderately Weathered, Slightly Broken, Shaley and Sandy, Trace Pyrite	3006	10	128
	618.6		6493	7	135
B-13 Run No.2	616.7	Light Brown with Gray Dolostone, Slightly to Moderately Weathered, occasionally Broken and Fractured, Very Thinly Bedded, Silty and Sandy, Trace fossils and Pyrite, Trace Cherty	4678	12	121
	609.9		4154	10	129
B-13 Run No.3	606.3	Light Brown to Tan Dolostone, Moderately Weathered, Fractured and Broken, Limey	4127	7	121
	601.7	Tan Limestone, Moderately Weathered, Moderately Fractured and Jointed, Sandy in Part, Dolomitic, occasional Calcite Fracture Fill	4658	8	123
	597.9		6887	6	133
B-13 Run No.4	596.5	Tan and Off-White Limestone, Slightly Weathered, occasionally Fractured, Slightly Vuggy, occasionally Cherty, increasing Dolomitic, Sandy	6020	4	129
	592.0	Off-White Dolostone, Slightly Weathered, Trace Fractured, Cherty Broken at 108.0 feet.	4231	7	135
	588.6		6435	7	132



B-15	
Layer	Thickness
A	5.5
B	61.0
C	7.0



<div>100-1D 10-18-05</div> <div>PROJECT DESCRIPTION</div> <div>This project involves the replacement of the U.S. 30, eastbound bridge over the Cedar River (Maint No.5758.9R030) 0.5 miles west of the east junction of U.S. 151. The project also includes bridge approach replacment and pavement widening in the westbound lanes.</div>	
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<div>ESTIMATED PROJECT QUANTITIES (UP TO A 5 DIVISION PROJECT)</div>														100-1C 04-17-12
<div>Division 1: Participating Division 2: Non-Participating</div>														

Item No.	Item Code	Item	Unit	Quantities									
				Estimated					As Built				
				Division 1	Division 2	0	0	0	Total	Division 1	Division 2	0	0
1	2102-0425070	SPECIAL BACKFILL	TON	4450.8					4450.8				
2	2102-2625001	EMBANKMENT IN PLACE, CONTRACTOR FURNISHED	CY	1232					1232				
3	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	15126					15126				
4	2102-2710090	EXCAVATION, CLASS 10, WASTE	CY	1348					1348				
5	2105-8425005	TOPSOIL, FURNISH AND SPREAD	CY	1643					1643				
6	2105-8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD	CY	5667					5667				
7	2113-0001100	SUBGRADE STABILIZATION MATERIAL, POLYMER GRID	SY	212.3					212.3				
8	2121-7425010	GRANULAR SHOULDERS, TYPE A	TON	1034					1034				
9	2122-5190010	PAVED SHOULDER, P.C. CONCRETE, 10 IN.	SY	300.3					300.3				
10	2122-5190501	PAVED SHOULDER, PCC (PAVED SHOULDER PANEL FOR BRIDGE END DRAIN)	SY	334.3					334.3				
11	2122-5500090	PAVED SHOULDER, HOT MIX ASPHALT MIXTURE, 9 IN.	SY	1088.1					1088.1				
12	2123-7450000	SHOULDER CONSTRUCTION, EARTH	STA	31.8					31.8				
13	2210-0475290	MACADAM STONE BASE	TONS	62.1					62.1				
14	2213-2713300	EXCAVATION, CLASS 13, FOR WIDENING	CY	69.4					69.4				
15	2301-0690202	BRIDGE APPROACH, BR-202	SY	220.1					220.1				
16	2301-0690203	BRIDGE APPROACH, BR-203	SY	449.8					449.8				
17	2301-1004100	STANDARD OR SLIP FORM PCC PAVEMENT, 10 IN.	SY	3027.2					3027.2				
18	2301-4875006	MEDIAN, P.C. CONCRETE, 6"	SY	12					12				
19	2304-0100000	DETOUR PAVEMENT	SY	3420					3420				
20	2312-8260051	GRANULAR SURFACING ON ROAD, CLASS A CRUSHED STONE	TONS	44.1					44.1				
21	2401-6745065	REMOVAL OF BRIDGE END DRAIN	EACH	1					1				
22	2401-6745650	REMOVAL OF EXISTING STRUCTURES	LS	1					1				
23	2412-0000100	LONGITUDINAL GROOVING IN CONCRETE	SY	5599.5					5599.5				
24	2416-0101036	REMOVE AND REINSTALL CONC. PIPE APRONS LESS THAN OR EQUAL TO 36 IN.	EACH	2					2				
25	2416-1180024	CULVERT, CONCRETE ROADWAY PIPE, 24 IN. DIA.	LF	9					9				
26	2417-5895018	BEVELED PIPE AND GUARD, 18 IN.	EACH	3					3				
27	2422-1722018	CULVERT, UNCLASSIFIED ENTRANCE PIPE, 18 IN. DIA.	LF	516					516				
28	2435-0140160	MANHOLE, STORM SEWER, SW-401, 60 IN.	EACH	1					1				
29	2503-0500402	BRIDGE END DRAIN, DR-402	EACH	8					8				
30	2505-4008120	REMOVAL OF STEEL BEAM GUARDRAIL	LF	1076					1076				
31	2505-4008300	STEEL BEAM GUARDRAIL	LF	650					650				
32	2505-4008410	STEEL BEAM GUARDRAIL BARRIER TRANSITION SECTION, BA-201	EACH	6					6				
33	2505-4021010	STEEL BEAM GUARDRAIL END ANCHOR, BOLTED	EACH	6					6				
34	2505-4021720	STEEL BEAM GUARDRAIL TANGENT END TERMINAL, BA-205	EACH	6					6				
35	2506-4984000	FLOWABLE MORTAR	CY	187.4					187.4				
36	2507-3250005	ENGINEERING FABRIC	SY	242.2					242.2				
37	2507-8029000	EROSION STONE	TON	1.7					1.7				
38	2510-6745850	REMOVAL OF PAVEMENT	SY	6908.8					6908.8				
39	2512-1725156	CURB AND GUTTER, P.C. CONCRETE, 1.5 FT	LF	47					47				
40	2524-6765210	REMOVAL OF TYPE A SIGN ASSEMBLY	EACH	6					6				
41	2524-6765220	REMOVAL OF TYPE B SIGN ASSEMBLY	EACH	2					2				
42	2524-9275222	WOOD POSTS FOR TYPE A OR B SIGNS, 4 IN. X 6 IN.	LF	138					138				
43	2524-9325001	TYPE A SIGN, SHEET ALUMINUM	SF	55.1					55.1				
44	2524-9325150	INSTALL TYPE A SIGN	EACH	10					10				
45	2524-9680002	TYPE B SIGNS, FORMED STEEL PANEL	SF	12					12				
46	2524-9680250	INSTALL TYPE B SIGN	EACH	2					2				
47	2527-9263109	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED	STA	129.6					129.6				
48	2527-9263131	WET RETROREFLECTIVE REMOVABLE TAPE MARKINGS	STA	378.94					378.94				
49	2527-9263146	PAINTED SYMBOLS AND LEGENDS	EACH	3					3				
50	2527-9263180	PAVEMENT MARKINGS REMOVED	STA	85.95					85.95				
51	2527-9263190	SYMBOLS AND LEGENDS REMOVED	EACH	3					3				
52	2528-2518000	SAFETY CLOSURE	EACH	6					6				
53	2528-8400048	TEMPORARY BARRIER RAIL, CONCRETE	LF	1314					1314				
54	2528-8445110	TRAFFIC CONTROL	LS	1					1				
55	2528-9109020	TEMPORARY LANE SEPARATOR SYSTEM	LF	4080					4080				
56	2528-9290050	PORTABLE DYNAMIC MESSAGE SIGN (PDMS)	CDAY	See Proposal					See Proposal				
57	2529-5070110	PATCHES, FULL-DEPTH FINISH, BY AREA	SY	15.3					15.3				
58	2529-5070120	PATCHES, FULL-DEPTH FINISH, BY COUNT	EACH	1					1				
59	2551-0000130	TEMP CRASH CUSHION, SEVERE USE (SU)	EACH	2					2				
60	2555-0000010	DELIVER AND STOCKPILE SALVAGED MATERIALS	LS		1				1				

ESTIMATE REFERENCE INFORMATION			100-4A 10-29-02
Item No.	Item Code	Description	
1	2102-0425070	SPECIAL BACKFILL Refer to Tab. 100-24 on Sheet C.2, Tab. 112-9 on Sheet C.5, and Tab. 112-8 on Sheet C.8	
2	2102-2625001	EMBANKMENT IN PLACE, CONTRACTOR FURNISHED 1.3 swell factor applied	
3	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	
4	2102-2710090	EXCAVATION, CLASS 10, WASTE	
5	2105-8425005	TOPSOIL, FURNISH AND SPREAD	
6	2105-8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD Refer to Tab. 107-28 on Sheet T.9 for Earthwork Quantities	
7	2113-0001100	SUBGRADE STABILIZATION MATERIAL, POLYMER GRID Refer to Detail 8101 on Sheet B.8 details.	
8	2121-7425010	GRANULAR SHOULDERS, TYPE A Refer to Tab. 112-9 on Sheet C.5, Tab. 112-8 on Sheet C.8 and Sheet B.1-B.2 for details.	
9	2122-5190010	PAVED SHOULDER, P.C. CONCRETE, 10 IN. Refer to Tab. 112-9 on Sheet C.5 and Sheets B.1-B.4 for details.	
10	2122-5190501	PAVED SHOULDER, PCC (PAVED SHOULDER PANEL FOR BRIDGE END DRAIN) Refer to Tab. 104-8A on Sheet C.7	
11	2122-5500090	PAVED SHOULDER, HOT MIX ASPHALT MIXTURE, 9 IN.	
12	2123-7450000	SHOULDER CONSTRUCTION, EARTH Refer to Tab. 112-9 on Sheet C.5 and Sheets B.1-B.4 for details.	
13	2210-0475290	MACADAM STONE BASE Refer to Detail 8101 on Sheet B.8 details.	
14	2213-2713300	EXCAVATION, CLASS 13, FOR WIDENING Refer to Tab. 112-9 on Sheet C.5 and Sheets B.1-B.4 for details.	
15	2301-0690202	BRIDGE APPROACH, BR-202	
16	2301-0690203	BRIDGE APPROACH, BR-203 Refer to Tab. 112-6 on Sheet C.5	
17	2301-1004100	STANDARD OR SLIP FORM PCC PAVEMENT, 10 IN. Refer to Tab. 100-24 on Sheet C.4	
18	2301-4875006	MEDIAN, P.C. CONCRETE, 6" Refer to Tab. 112-4 on Sheet C.4	
19	2304-0100000	DETOUR PAVEMENT Refer to Tab. 112-8 on Sheet C.8	
20	2312-8260051	GRANULAR SURFACING ON ROAD, CLASS A CRUSHED STONE Refer to Detail 8101 on Sheet B.8 details.	
21	2401-6745065	REMOVAL OF BRIDGE END DRAIN Includes 1 Bridge End Drain removal on northeast corner of WB US-30 bridge. Remove drain structure and grate, plug pipe outlet with earth berm, and fill remaining pipe with flowable mortar.	
22	2401-6745650	REMOVAL OF EXISTING STRUCTURES Refer to Tab. 110-2 on Sheet C.9	
23	2412-0000100	LONGITUDINAL GROOVING IN CONCRETE Refer to Tab. 100-28 on Sheet C.6	
24	2416-0101036	REMOVE AND REINSTALL CONC. PIPE APRONS LESS THAN OR EQUAL TO 36 IN. Refer to Tab. 104-3 and Tab. 112-8 on Sheet C.8	
25	2416-1180024	CULVERT, CONCRETE ROADWAY PIPE, 24 IN. DIA. Refer to Tab. 104-3 on Sheet C.8	
26	2417-5895018	BEVELED PIPE AND GUARD, 18 IN.	
27	2422-1722018	CULVERT, UNCLASSIFIED ENTRANCE PIPE, 18 IN. DIA. Refer to Tab. 112-8 on Sheet C.8	
28	2435-0140160	MANHOLE, STORM SEWER, SW-401, 60 IN. Includes manhole A1 for use in extending of 24" culvert at east cross over. Remove manhole when cross over is removed.	
29	2503-0500402	BRIDGE END DRAIN, DR-402 Refer to Tab. 104-8A on Sheet C.7	
30	2505-4008120	REMOVAL OF STEEL BEAM GUARDRAIL Refer to Tab. 110-7A on Sheet C.7	
ESTIMATE REFERENCE INFORMATION			100-4A 10-29-02
Item No.	Item Code	Description	
31	2505-4008300	STEEL BEAM GUARDRAIL	
32	2505-4008410	STEEL BEAM GUARDRAIL BARRIER TRANSITION SECTION, BA-201	
33	2505-4021010	STEEL BEAM GUARDRAIL END ANCHOR, BOLTED	
34	2505-4021720	STEEL BEAM GUARDRAIL TANGENT END TERMINAL, BA-205 Refer to Tab. 108-8A on Sheet C.7 and Typical 7156 on Sheet B.5 for details.	
35	2506-4984000	FLOWABLE MORTAR Refer to Tab. 110-9 on Sheet C.8	
36	2507-3250005	ENGINEERING FABRIC	
37	2507-8029000	EROSION STONE Refer to Tab. 100-23 on Sheet C.8	
38	2510-6745850	REMOVAL OF PAVEMENT Refer to Tab. 110-1 on Sheet C.9 and Tab 112-8 on Sheet C.8	
39	2512-1725156	CURB AND GUTTER, P.C. CONCRETE, 1.5 FT Refer to Tab. 112-4 on Sheet C.4	
40	2524-6765210	REMOVAL OF TYPE A SIGN ASSEMBLY	
41	2524-6765220	REMOVAL OF TYPE B SIGN ASSEMBLY Refer to Tab. 190-62 on Sheet C.12	
42	2524-9275222	WOOD POSTS FOR TYPE A OR B SIGNS, 4 IN. X 6 IN. Refer to Tab. 190-50 and Tab. 190-51 on Sheet C.11	
43	2524-9325001	TYPE A SIGN, SHEET ALUMINUM	
44	2524-9325150	INSTALL TYPE A SIGN	
45	2524-9680002	TYPE B SIGNS, FORMED STEEL PANEL	
46	2524-9680250	INSTALL TYPE B SIGN Refer to Tab. 190-50 and Tab. 190-51 on on Sheet C.11 and Tab. 190-66 on Sheet C.12	
47	2527-9263109	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED	
48	2527-9263131	WET RETROREFLECTIVE REMOVABLE TAPE MARKINGS Refer to Tab. 108-22 on Sheet C.10	
49	2527-9263146	PAINTED SYMBOLS AND LEGENDS Refer to Tab. 108-29 on Sheet C.11	
50	2527-9263180	PAVEMENT MARKINGS REMOVED Refer to Tab. 108-22 on Sheet C.10	
51	2527-9263190	SYMBOLS AND LEGENDS REMOVED Refer to Tab. 108-29 on Sheet C.11	
52	2528-2518000	SAFETY CLOSURE Refer to Tab. 108-13A on Sheet C.8	
53	2528-8400048	TEMPORARY BARRIER RAIL, CONCRETE Refer to Tab. 108-33 on Sheet C.12	
54	2528-8445110	TRAFFIC CONTROL Refer to Tab. 108-23A and Tab. 108-26A On Sheet J.1	
55	2528-9109020	TEMPORARY LANE SEPARATOR SYSTEM Refer to Tab. 108-35 on Sheet C.9	
56	2528-9290050	PORTABLE DYNAMIC MESSAGE SIGN (PDMS) Refer to Sheet J.11 for details.	
57	2529-5070110	PATCHES, FULL-DEPTH FINISH, BY AREA Refer to Tab. 102-6C on Sheet C.6	
58	2529-5070120	PATCHES, FULL-DEPTH FINISH, BY COUNT Refer to Tab. 102-6C on Sheet C.6	
59	2555-0000010	TEMP CRASH CUSHION, SEVERE USE (SU) Refer to Tab. 108-30 on Sheet C.12	
60	2555-0000010	DELIVER AND STOCKPILE SALVAGED MATERIALS Refer to Tab. 110-13 on Sheet C.7	
FILE NO. 31598			
ENGLISH			
DESIGN TEAM IOWA DOT\TRANSYSTEMS			
LINN COUNTY			
PROJECT NUMBER BRF-030-7(182)--38-57			
SHEET NUMBER C.2			
2/23/2021 8:11:36 AM AAMEYER c:\pw_work\pwm\main\anthony.meyer\d0856282\57030182_C1.xlsm			

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100-4A	ESTIMATE REFERENCE INFORMATION	C.2	
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STANDARD ROAD PLANS			105-4 10-18-11
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-401	10-15-19	Temporary Barrier Rail (Precast Concrete)	
BR-202	10-17-17	Double Reinforced 10" Approach with Variable Depth Paving Notch	
BR-203	10-17-17	Double Reinforced 12" Approach	
BR-211	10-17-17	Bridge Approach (Abutting PCC or Composite Pavement)	
DR-102	04-21-15	Pipe Culvert (Cover and Camber)	
DR-205	04-21-20	Concrete Apron with End Wall	
DR-212	04-21-20	Beveled Pipe and Guard	
DR-402	10-15-19	Rock Flume for Bridge End Drain	
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-301	10-20-15	Guardrail Grading	
PM-110	04-21-20	Line Types	
PM-111	04-21-20	Symbols and Legends	
PM-120	10-21-14	Stop Lines and Islands	
PM-310	04-21-20	Entrance and Exit Ramps	
PM-562	10-15-19	Divided Multi-Lane Roadway with Left Turn Lanes	
PV-20	10-21-14	Paved Islands	
PV-101	04-21-20	Joints	
PV-102	04-21-20	PCC Curb Details	
PV-105	10-21-14	PCC Pavement Widening	
PV-121	04-21-15	Jointing PCC Pavement Widening	
PV-512	04-21-15	Median Crossover (100' Median)	
PV-513	04-21-20	Median Crossover (100' Median) 16' Wide 1 Lane	
SI-101	04-19-16	Locations - Type 'A' Signs	
SI-102	04-19-16	Locations - Type 'B' Signs	
SI-111	04-19-16	Support Structures - Wood Posts	
SI-121	10-16-18	Fabrication - Sign Legend Components	
SI-131	10-18-16	Installation - Type 'A' Signs	
SI-132	04-17-18	Installation - Type 'B' Signs	
SI-171	04-18-17	Reference Location Sign Posts	
SI-173	04-19-16	Object Markers	
SI-211	10-18-16	Object Marker and Delineator Placement with Guardrail	
SI-881	04-16-19	Special Signs for Workzones	
SW-401	04-21-20	Circular Storm Sewer Manhole	
TC-1	10-15-19	Work Not Affecting Traffic (Two-Lane or Multi-Lane)	
TC-61	04-21-20	Two-Lane, Two-way Operation	
TC-402	04-21-15	Work Within 15 ft of Traveled Way	
TC-418	04-21-20	Lane Closure on Divided Highway	
TC-420	10-16-18	Lane Closure at Ramps	
TC-421	04-21-20	Lane Closure with TBR	
TC-433	10-17-17	Pavement Marking Operations	

112-9  
10-15-13

SHOULDERS

① Lane(s) to which the shoulder is adjacent.  
② Bid Item  
③ Applies only for Paved Shoulders constructed on project with existing granular shoulders.  
④ Does not include shrink.

Calculations assume a HMA unit weight (lbs/cf) of 145, a Special Backfill unit weight (lbs/cf) of 140, and a Granular Shoulder unit weight (lbs/cf) of 140.

Location		Quantities																			Remarks			
Road Identification	① Direction Of Traffic	Station to Station	Side	<div>P</div>	<div>G</div>	<div>L</div>	Class 13 Excavation ③	Hot Mix Asphalt		Binder	Paved Shoulder	Reinforced Paved Shoulder	Special Backfill				Modified Subbase	Granular Shoulder		Earth Shoulder Construction Alternates				
				Width	Width	Length		TON	TON/STA	TONS	SY ②	SY ②	HMA Alternate		PCC Alternate			TON ②	TON/STA	STA ②		HMA	PCC	
				FT	FT	FT		CY ②	TON	TON/STA	TONS	SY ②	SY ②	TON ②	TON/STA	TON ②		TON/STA	CY ②	TON ②		TON/STA	STA ②	CY ④
Division 1																								
WB US-30	WB	367+76.63	374+70.81	RT		3.0	694.2											131.929	19.005	6.9		78.9		
WB US-30	WB	375+65.66	382+29.06	LT		3.0	663.4											126.079	19.005	6.6		28.7		
WB US-30	WB	379+06.80	381+39.73	RT		3.0	232.9											44.268	19.005	2.3		26.4		
WB US-30	WB	381+39.73	381+64.73	RT	2.3 to 3.3	3.0	25.0		4.316	17.264	0.259	7.8		2.100	8.400			3.449	13.797	0.3	3.3			
WB US-30	WB	381+64.73	382+09.78	RT	3.3 to 1.5	3.0	45.0		6.798	15.089	0.408	12.0		3.153	7.000			6.216	13.797	0.5	5.6			
WB US-30	WB	382+09.78	382+84.69	RT	1.5	3.0	74.9		7.637	10.195	0.458	12.5		4.719	6.300			10.335	13.797	0.7	11.6			
WB US-30	WB	382+84.69	383+03.59	RT	1.5 to 1.3	3.0	18.9		1.824	9.652	0.109	2.9		1.558	8.246			2.608	13.797	0.2	5.8			
WB US-30	WB	382+29.06	382+59.13	LT	2.6	3.0	30.1		4.864	16.177	0.292	8.7		3.157	10.500			4.027	13.391	0.3	2.1			
WB US-30	WB	382+59.13	382+99.23	LT	3.3 to 1	3.0	40.1		5.506	13.730	0.330	9.6		3.368	8.400			5.370	13.391	0.4	2.4			
WB US-30	WB	382+99.23	383+03.59	LT	1.0	3.0	4.4		0.326	7.477	0.020	0.5		0.409	9.387			0.584	13.391	0.0	0.3			
EB US-30	EB	380+43.72	380+70.99	LT	6.0		27.3		9.453	34.664	0.567	18.2		3.724	13.657					0.3				
EB US-30	EB	380+70.99	381+01.05	LT	9.2		30.1		15.650	52.064	0.939	30.8		5.126	17.052					0.3	1.6			
EB US-30	EB	381+01.05	381+40.90	LT	9.2 to 7.6		39.8		19.014	47.714	1.141	37.2		6.497	16.303					0.4	2.7			
EB US-30	EB	381+40.90	383+10.91	LT	7.6		170.0		73.723	43.364	4.423	144.0		26.443	15.554					1.7	23.8			
EB US-30	EB	380+81.07	381+08.48	RT	10.0		27.4		15.463	56.414	0.928	30.5		4.712	17.192					0.3	4.4			
EB US-30	EB	381+08.48	381+38.29	RT	13.2		29.8		22.004	73.814	1.320	43.8		5.774	19.369					0.3	3.9			
EB US-30	EB	381+38.29	381+78.40	RT	13.2 to 11.6		40.1		27.862	69.464	1.672	55.3		7.668	19.117					0.4	5.2			
EB US-30	EB	381+78.40	383+10.91	RT	11.6		132.5		86.283	65.114	5.177	170.8		24.710	18.648					1.3	13.3			
WB US-30	WB	395+56.71	396+13.64	LT	10.9 to 10.7		56.9					68.3				49.017	86.100			0.6		20.3		
EB US-30	EB	395+48.41	396+71.70	LT	6.0		123.3		42.737	34.664	2.564	82.2		16.786	13.615					1.2	15.3			
EB US-30	EB	395+48.41	396+71.70	RT	10.0		123.3		69.553	56.414	4.173	137.0		21.774	17.661					1.2	10.6			
WB US-30	WB	396+13.64	396+52.79	LT	10.9 to 12		39.2					49.8				35.352	90.300			0.4		13.2		
WB US-30	WB	396+52.79	396+83.80	LT	12.0		31.0					41.3				29.304	94.500			0.3		9.9		
WB US-30	WB	395+69.56	397+38.85	RT	2.9 to 6		169.3					83.7				70.509	41.650			1.7		40.4		
WB US-30	WB	397+38.85	397+79.03	RT	6 to 7.8		40.2					30.8				23.626	58.800			0.4		9.7		
WB US-30	WB	397+79.03	398+10.24	RT	7.8 to 7.4		31.2					26.4				19.365	62.048			0.3		7.7		
WB US-30	WB	250' WofKnapp	Knapp Rd.	LT	10.0	3.0	250.0	69.4	141.035	56.414	8.462	277.8						59.500	23.800	2.5			Note 1	
	Notes:						Total	69.4			Total HMA	1088.1		141.800		227.200			394.300		31.8			
1.	Begin shoulder at west return of Knapp Rd. and end shoulder 250' west of west return of Knapp Rd.																							
Division 2	None																							