

LETTING DATE  
5/19/2020

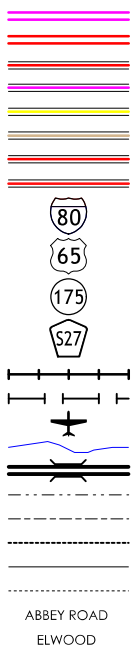
BRIDGE REPLACEMENT - PPCB  
BRF-034-9(224)--38-44

HENRY COUNTY - DESIGN 220/520

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

HENRY COUNTY

BRIDGE REPLACEMENT - PPCB

US 34 OVER SKUNK RIVER (E.B.)

3.8 MILES EAST OF JCT. SR W40

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

ENGLISH STANDARD  
BRIDGE PLANS

STANDARD ISSUED REVISED

TOTAL SHEETS  
97

PROJECT NUMBER

BRF-034-9(224)--38-44

R.O.W. PROJECT NUMBER

NHSN-034-9(225)--2R-44

PROJECT IDENTIFICATION NUMBER

I6-44-034-010

INDEX OF SHEETS

NO.	DESCRIPTION
1	TITLE SHEET
2	ESTIMATE BRIDGE QUANTITIES - DESIGN 220
2-40	DESIGN 220 - BRIDGE PLANS
<del>41</del>	<del>ESTIMATE BRIDGE QUANTITIES - DESIGN 520</del>
<del>41-49</del>	<del>DESIGN 520 - BRIDGE PLANS</del>
SPS.I-SPS.3	SOIL PROFILE SHEET
C.I	ESTIMATE ROADWAY QUANTITIES
A.I-U.I	ROADWAY SHEETS

REVISIONS



1-800-292-8989

www.iowaonecall.com



STANDARD ROAD  
PLANS

STANDARD ROAD PLANS ARE LISTED  
ON SHEET NUMBER C.2

DESIGN DATA RURAL

REFER TO INDIVIDUAL  
SITUATION PLANS FOR  
TRAFFIC DATA INFORMATION

INDEX OF SEALS

SHEET NO.	NAME	TYPE
1	ANTHONY J. BOWER	STRUCTURAL DESIGN
5	MARK D. WERNER	HYDRAULIC DESIGN
SPS.I	JUSTIN D. HUMKE	GEOTECHNICAL DESIGN
A.I	TAYLOR R. THEULEN	ROADWAY DESIGN
CS.I	MARK A. DELL	GEOTECHNICAL DESIGN

STRUCTURAL DESIGN

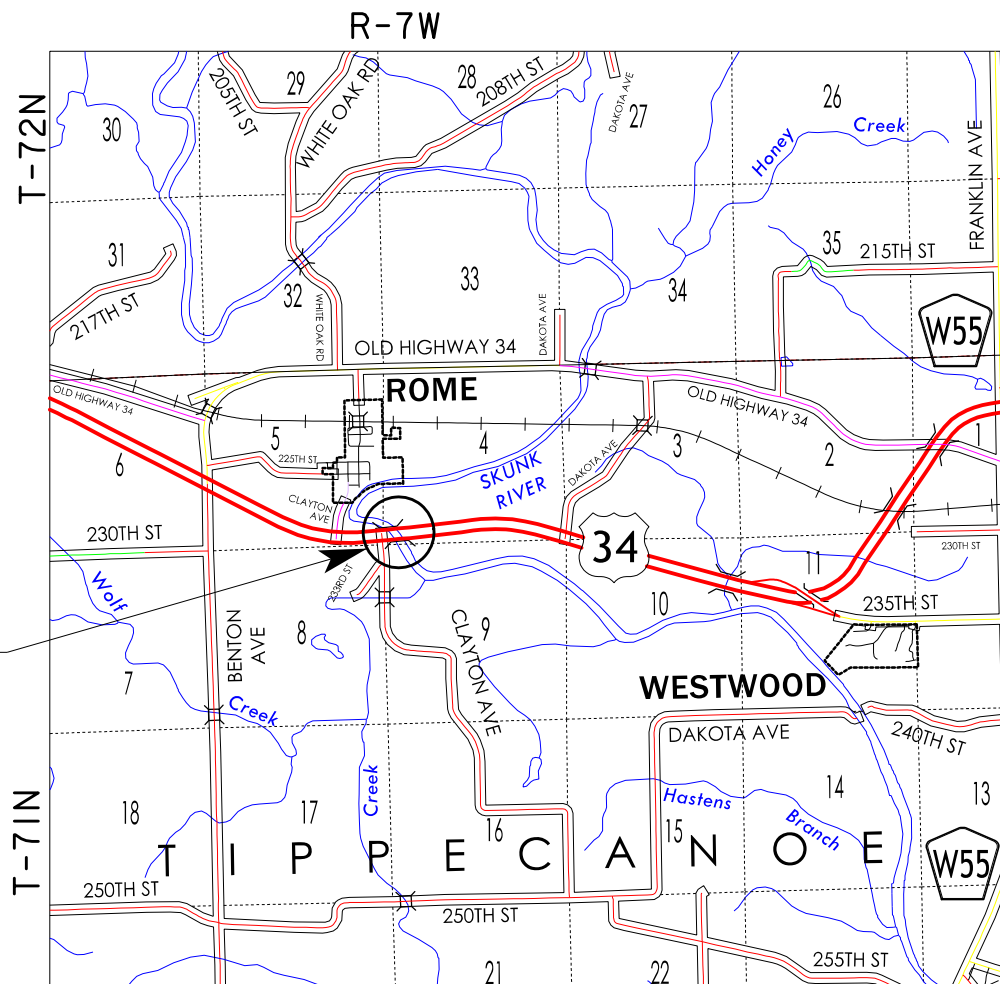


I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature Anthony J. Bower Date 2/28/2020  
Printed or Typed Name  
My license renewal date is December 31, 2020

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

LOCATION MAP



DESIGN 220  
FHWA 28431  
~~DESIGN 520~~  
~~FHWA 608390~~

PROJECT DIRECTORY NAME: 4403401016

DESIGN TEAM Stanley Consultants Inc.

ENGLISH IOWA DOT \* OFFICE OF BRIDGES AND STRUCTURES

FILE NO. 31636

HENRY COUNTY

PROJECT NUMBER BRF-034-9(224)--38-44

SHEET NUMBER 1

ESTIMATED BRIDGE QUANTITIES - DESIGN 220					
ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUANTITY
1.	2101-1001005	REMOVAL OF FLOOD DEBRIS	TON	100	
2.	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	CY	4370.0	
3.	2401-6745625	REMOVAL OF EXISTING BRIDGE	LS	1.00	
4.	2402-2720000	EXCAVATION, CLASS 20	CY	380	
5.	2402-2721000	EXCAVATION, CLASS 21	CY	648	
6.	2402-2722000	EXCAVATION, CLASS 22	CY	258	
7.	2403-0100010	STRUCTURAL CONCRETE (BRIDGE)	CY	669.1	
8.	2403-7000210	HIGH PERFORMANCE STRUCTURAL CONCRETE	CY	727.3	
9.	2404-7775000	REINFORCING STEEL	LB	86,641	
10.	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB	220,116	
11.	2404-7775009	REINFORCING STEEL, STAINLESS STEEL	LB	8,156	
12.	2407-0564330	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTE130	EACH	5	
13.	2407-0564340	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTE140	EACH	15	
14.	2408-7800000	STRUCTURAL STEEL	LB	33,167	
15.	2413-1200000	STEEL EXTRUSION JOINT WITH NEOPRENE	LF	88.2	
16.	2413-1200100	NEOPRENE GLAND INSTALLATION AND TESTING	LF	88.2	
17.	2414-6424110	CONCRETE BARRIER RAILING	LF	1,179.4	
18.	2501-0201057	PILES, STEEL, HP 10x57	LF	1,350	
19.	2507-2638650	BRIDGE WING ARMORING - EROSION STONE	SY	28.0	
20.	2507-3250005	ENGINEERING FABRIC	SY	5,970.0	
21.	2507-6800061	REVETMENT, CLASS E	TON	4,890.0	
22.	2507-8029000	EROSION STONE	TON	110.0	
23.	2526-8285000	CONSTRUCTION SURVEY	LS	1.00	
24.	2533-4980005	MOBILIZATION	LS	1.00	

ROADWAY QUANTITIES  
SHOWN ON SHEET C.1

ITEM NO.	DESCRIPTION
1.	INCLUDES ALL WORK FOR CUTTING, REMOVAL, AND OFF-SITE DISPOSAL OF FLOOD DEBRIS AGAINST THE UPSTREAM FACE OF EXISTING PIERS. REMOVAL OF SCHEDULED ITEMS SHALL BE IN ACCORDANCE WITH SECTION 2401 OF THE SPECIFICATIONS. THE CONTRACTOR WILL BE PAID THE CONTRACT UNIT PRICE FOR REMOVAL OF FLOOD DEBRIS. THE PAYMENT FOR REMOVAL OF FLOOD DEBRIS SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, EQUIPMENT, AND LABOR AND FOR PERFORMANCE OF ALL WORK NECESSARY FOR PROPER REMOVAL FROM THE PROJECT.
2.	INCLUDES EXCAVATION FOR REVETMENT FOR BERM LINING NEAR BOTH ABUTMENTS AND ALONG THE WEST BANK OF THE EXISTING CHANNEL AS SHOWN ON DESIGN SHEET 5.
3.	INCLUDES REMOVAL OF EXISTING SUBSTRUCTURES TO 1' BELOW THE NATURAL STREAM BOTTOM OR NATURAL GROUND SURFACE AND PLACEMENT OF BACKFILL MATERIAL.
4.	INCLUDES EXCAVATION FOR BRIDGE ABUTMENTS AND WINGS.
5.	INCLUDES EXCAVATION FOR BRIDGE PIERS.
6.	INCLUDES EXCAVATION FOR BRIDGE PIERS.
7.	INCLUDES THE CONCRETE FOR THE ABUTMENT FOOTINGS, BACKWALLS, PIERS, WING EXTENSIONS, AND MASKWALLS. INCLUDES FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), FLOODABLE BACKFILL, POROUS BACKFILL, GEOTEXTILE FABRIC, WATER FLOODING, AND SUBDRAIN OUTLETS AT ABUTMENTS. INCLUDES FURNISHING AND PLACING 3 INCH DIAMETER PVC PLASTIC PIPE AND EXPANDING FOAM IN THE ABUTMENT WINGS. INCLUDES FURNISHING AND APPLYING CONCRETE SEALER TO ABUTMENT BRIDGE SEATS AND ON BEAM ENDS AT ABUTMENTS. INCLUDES ALL RESILIENT JOINT FILLER REQUIRED.
8.	THIS BID ITEM INCLUDES THE CONCRETE FOR THE SLAB, ABUTMENT, PIER DIAPHRAGMS, AND WINGWALLS. REFER TO THE DEVELOPMENTAL SPECIFICATION FOR HIGH PERFORMANCE CONCRETE FOR STRUCTURES FOR ADDITIONAL INFORMATION.
12./13.	INCLUDES PIER AND ABUTMENT BEARING MATERIAL AND COIL TIES. INCLUDES ANCHORED CURVED SOLE PLATES AT PIERS AND ABUTMENTS. INCLUDES NEOPRENE PADS AND LAMINATED NEOPRENE BEARING PADS. NONSTANDARD STIRRUP LENGTHS ARE USED FOR BEAMS. INCLUDES CONTRACTOR FILLING OUT BEAM NUMBERS BY LOCATION AND BEAM SEAT ELEVATIONS IN "PCC BEAM DATA SPREADSHEET" AND FORWARDING ELECTRONIC SPREADSHEET TO THE ENGINEER.
14.	INCLUDES ALL COST FOR FURNISHING AND INSTALLING STEEL INTERMEDIATE DIAPHRAGMS. INCLUDES COST TO FURNISH AND INSTALL DECK DRAINS.
15.	INCLUDES ALL NECESSARY HARDWARE AND ACCESSORIES INCLUDING THE ANCHORAGE SYSTEM, TEMPORARY ERECTION MATERIAL AND THE 3/8" BARRIER PLATES WITH THEIR ANCHORAGE SYSTEM. EXCLUDES INSTALLATION OF NEOPRENE GLAND. EXPANSION CONDITIONS DO NOT ALLOW THE USE OF THE DS BROWN JOINT FOR THIS INSTALLATION.
16.	INCLUDES INSTALLATION OF NEOPRENE GLAND AND WATER TESTING OF JOINT.
17.	IF PLACEMENT OF CONCRETE IS DONE BY THE SLIPFORMING METHOD, CLASS BR CONCRETE IS REQUIRED. CAST-IN-PLACE BARRIER RAILS SHALL USE CLASS C MIX. PRICE BID FOR THIS ITEM SHALL INCLUDE THE COST OF CAST-IN-PLACE FORMS IF REQUIRED FOR PLACEMENT OF CONCRETE. INCLUDES 1,160 FEET OF 2 INCH DIAMETER RIGID STEEL CONDUIT. INCLUDES MATERIAL AND LABOR ASSOCIATED WITH PROVIDING AND INSTALLING RIGID STEEL CONDUIT, JUNCTION BOXES AND EXPANSION FITTINGS.
18.	INCLUDES FURNISHING AND INSTALLING STEEL PILE POINTS. PILING SHALL BE GRADE 50. SPLICES BETWEEN INDIVIDUAL LENGTHS OF PILE SHALL CONSIST OF FULL PENETRATION WELDS IN ACCORDANCE WITH SECTION 2501.03,P,2 OF THE STANDARD SPECIFICATIONS.
19.	INCLUDES FURNISHING AND PLACING ENGINEERING FABRIC, EROSION STONE, AND ALL REQUIRED EXCAVATING, SHAPING AND COMPACTING FOR WING ARMORING.
20.	ENGINEERING FABRIC SHALL BE MATERIAL AS SPECIFIED FOR REVETMENT, ARTICLE 4196.01,B,6 AND EMBANKMENT EROSION CONTROL, ARTICLE 4196.01,B,3 OF THE STANDARD SPECIFICATIONS.
21.	ESTIMATED AT 1.6 TON/CY. BROKEN CONCRETE WILL NOT BE ALLOWED AS A SUBSTITUTE FOR REVETMENT.
22.	ESTIMATED AT 1.6 TON/CY.

DESIGN FOR 20° SKEW (R.A.)

556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

141'-0 & 131'-0 END SPANS142'-0 INTERIOR SPANS

ESTIMATED QUANTITIES

STATION 960+00.06, RT. 89.00'MARCH 2020

HENRY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO.   1   OF   39   FILE NO.   31636   DESIGN NO.   220

## SUMMARY OF CONCRETE QUANTITIES

LOCATION	STRUCTURAL CONCRETE	HPC STRUCTURAL CONCRETE
WEST ABUT.FTG.+ BKWL.+ WING EXT.+ MASKWALL	65.6	_____
EAST ABUT.FTG.+ BKWL.+ WING EXT.+ MASKWALL	65.3	_____
BRIDGE DECK + ABUT.& PIER DIAPHRAGMS	_____	716.5
ABUTMENT WINGS 4 @ 2.7	_____	10.8
PIER #1	180.2	_____
PIER #2	176.0	_____
PIER #3	182.0	_____
TOTAL (CU. YDS.)	669.1	727.3

## SUMMARY OF REINFORCING STEEL

LOCATION	NON-COATED REINFORCING STEEL	STAINLESS STEEL REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
WEST ABUT.FTG. + BKWL. + WING EXT. + MASKWALL	_____	77	7,566
EAST ABUT.FTG. + BKWL. + WING EXT. + MASKWALL	_____	77	7,566
BRIDGE DECK **	_____	_____	183,927
ABUTMENT WINGS 4 @ 292	_____	_____	1,168
BARRIER RAIL - NORTH RAIL	_____	3,617	9,564
BARRIER RAIL - SOUTH RAIL	_____	3,617	9,261
BARRIER RAIL END SECTION	_____	4 AT 192	4 AT 266
PIER #1	28,982	_____	_____
PIER #2	28,429	_____	_____
PIER #3	29,230	_____	_____
** INCLUDES ABUTMENT & PIER DIAPHRAGMS FOR PCC	_____	_____	_____
TOTAL (LBS.)	86,641	8,156	220,116

## SUMMARY OF EXCAVATION

LOCATION	CLASS 20 EXCAVATION	CLASS 21 EXCAVATION	CLASS 22 EXCAVATION
WEST ABUTMENT	190	_____	_____
EAST ABUTMENT	190	_____	_____
PIER #1	_____	648	58
PIER #2	_____	_____	111
PIER #3	_____	_____	89
BERM LINING - WEST ABUT. #	_____	_____	_____
BERM LINING - EAST ABUT. #	_____	_____	_____
EX. CHANNEL - WEST BANK #	_____	_____	_____
TOTAL (CU. YDS.)	380	648	258

# SEE SITE PLAN SHEET FOR  
CLASS 10 EXCAVATION.

## SUMMARY OF FOUNDATIONS

[illegible]

## SUMMARY OF STRUCTURAL STEEL

LOCATION		TOTAL (LBS.)
BRIDGE DECK DRAINS	24 @ 136	3,264.0
DIAPHRAGMS		19,537.9
ABUTMENT BEARING STEEL ASSEMBLIES	10 @ 345.5	3,455.0
PIER BEARING STEEL ASSEMBLIES	20 @ 345.5	6,910.0
TOTAL (LBS.)		33,166.9

## SUMMARY OF BEARINGS

[illegible]

Δ CURVED SOLE PLATES ARE  
INCIDENTAL TO PPC BEAMS.

DESIGN FOR 20° SKEW (R.A.)

556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

141'-0 & 131'-0 END SPANS      142'-0 INTERIOR SPANS

SUMMARY QUANTITIES SHEET

STATION 960+00.06, RT. 89.00'      MARCH 2020

HENRY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2 OF 39      FILE NO. 31636      DESIGN NO. 220

GENERAL NOTES:

IT IS THE INTENT OF THIS DESIGN TO CONSTRUCT A NEW 4-SPAN 556'-0 X 40'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE ON EASTBOUND US 34 OVER THE SKUNK RIVER.

THIS DESIGN IS FOR THE REPLACEMENT OF THE EXISTING 520'-6 x 28'-0 CONTINUOUS I-BEAM BRIDGE, DESIGN NO. 2756 WITH A YEAR OF CONSTRUCTION OF 1957. ELECTRONIC PLANS OF THE EXISTING STRUCTURE ARE AVAILABLE TO THE CONTRACTOR AS PART OF THE E-FILES SUPPLIED WITH THE CONTRACT DOCUMENTS

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

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

CLASS 20 EXCAVATION MATERIAL UNSUITABLE FOR BACKFILLING SHALL BE DISPOSED OF IN A MANNER THAT WILL LEAVE THE SITE IN A NEAT CONDITION. 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.

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

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

SEE ROADWAY PLANS FOR GUARDRAIL BID ITEMS AND NOTES.

THE ROAD WILL BE CLOSED TO TRAFFIC DURING CONSTRUCTION. SEE TRAFFIC CONTROL PLAN NOTE ON THIS SHEET.

NO WAITING TIME REQUIRED BETWEEN COMPLETION OF ABUTMENT FILL AND DRIVING PILES.

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

CONCRETE FORMS ARE REQUIRED TO REMAIN IN PLACE 5 DAYS OR LONGER IN ACCORDANCE WITH ARTICLE 2403.03,M,2, OF THE STANDARD SPECIFICATIONS, EXCEPT THE MINIMUM CONCRETE FLEXURAL STRENGTH REQUIRED BEFORE REMOVAL OF FORMS SHALL BE 575 PSI.

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

THE BRIDGE CONTRACTOR IS TO INSTALL SUBDRAINS BEHIND THE ABUTMENTS AS DETAILED. THE SUBDRAINS SHALL BE 4" DIAMETER PERFORATED SUBDRAIN (POLYETHYLENE CORRUGATED TUBING). THE SUBDRAIN SHALL INCLUDE A METAL PIPE OUTLET SECTION WITH A REMOVABLE RODENT GUARD AS DETAILED IN THESE PLANS.

SEE ROADWAY PLANS FOR LONGITUDINAL GROOVING BID ITEMS AND NOTES.

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 348 PARTS PER MILLION (PPM). ANALYSIS OF TOTAL CHROMIUM ON THIS SAMPLE WAS 172 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.

FAINT LINES ON PLANS INDICATE THE EXISTING STRUCTURE.

THE LUMP SUM BID FOR "REMOVAL OF EXISTING BRIDGE" SHALL INCLUDE REMOVAL AND DISPOSAL OF THE EXISTING BRIDGE. ALL SALVAGEABLE MATERIAL AND UNSALVAGEABLE MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR. THE EXISTING STRUCTURE SHALL BE REMOVED TO AN ELEVATION AT LEAST 1 FOOT BELOW FINISHED GROUNDLINE AND TO THE EXTENT THAT IT WILL NOT INTERFERE WITH THE NEW CONSTRUCTION.

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

2" DIAMETER VENT HOLES TO BE PROVIDED IN ALL BTEI30 BEAMS IN SPAN #4. SEE DESIGN SHEET 22 FOR LOCATIONS AT BEAM THIRD POINTS.

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.

SUBDRAIN SLOPED DOWNWARD 2% PER FOOT FROM CENTERLINE APPROACH ROADWAY TO EXTEND THRU FILL (TYPICAL BOTH ABUTMENTS).

SOVEREIGN LANDS CONSTRUCTION PERMIT I6295 SHALL APPLY TO WORK ON THIS PROJECT. THE IOWA DNR CONSERVATION OFFICER FOR THE AREA SHALL BE CONTACTED. AT LEAST 48 HOURS PRIOR TO COMMENCING WORK CONTACT SETH MOORE AT 515-725-8464.

THIS STRUCTURE IS TO BE BUILT UNDER THE CONDITIONS OF DNR FLOOD PLAIN DEVELOPMENT PERMIT NUMBER 47653.

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

CONCRETE SEALER IS TO BE APPLIED TO THE EXPOSED BRIDGE SEAT AND WASH SURFACES AT THE ABUTMENTS.

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

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

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

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 SPECIFICATIONS FOR FLOOD DEBRIS REMOVAL  
DEVELOPMENTAL SPECIFICATIONS FOR HIGH PERFORMANCE CONCRETE

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 SHEET 21  
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 ).

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	STRUCTURAL STEEL - DIAPHRAGMS
2	DECK DRAINS
3	EXPANSION DEVICE
4	BARRIER PLATES
5	LAMINATED NEOPRENE PAD/ CURVE SOLE PLATE ASSEMBLY

BRIDGE DECK DIMENSIONS TABLE

NO.	ITEM	UNIT	QUANTITY
1	DECK LENGTH	L.F.	561.3
2	MINIMUM DECK WIDTH	L.F.	43.2
3	MAXIMUM DECK WIDTH	L.F.	43.2
4	DECK AREA	S.F.	24250

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

NOTE:  
ROADWAY QUANTITIES SHOWN  
ELSEWHERE IN THESE PLANS.

POLLUTION PREVENTION PLAN SHOWN  
ELSEWHERE IN THESE PLANS.

TRAFFIC CONTROL PLAN

NOTE: THE ROADWAY WILL BE CLOSED TO THRU TRAFFIC. TRAFFIC CONTROL WILL BE THE RESPONSIBILITY OF THE ROAD CONTRACTOR AS SHOWN ON THE ROAD PLANS.

DESIGN FOR 20° SKEW (R.A.)

556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

141'-0 & 131'-0 END SPANS142'-0 INTERIOR SPANS

GENERAL NOTES

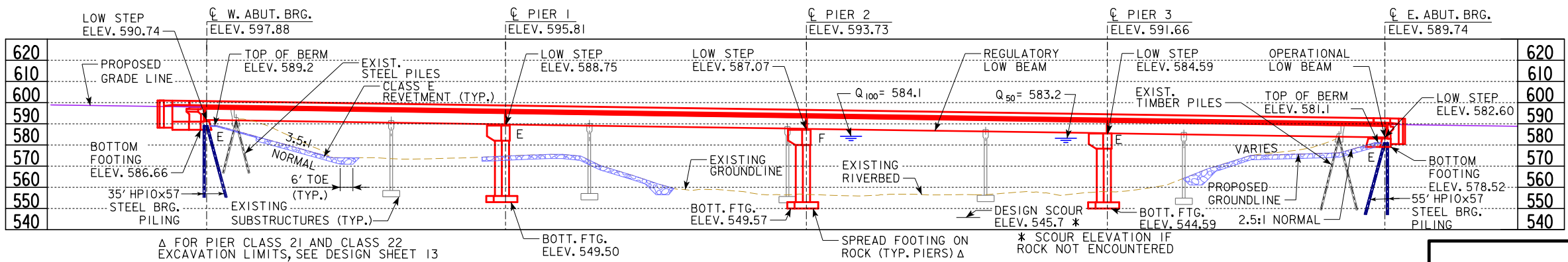
STATION 960+00.06, RT. 89.00'MARCH 2020

HENRY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO.   3   OF   39   FILE NO.   31636   DESIGN NO.   220





BENCH MARK NO. 322 - N:6469785.28 E:24370801.27 - BM 5" DIA. DRIVEN ALUMINUM ROD WITH 2.5" DIA. ALUMINUM CAP

VPI STA. 956+47.29  
VPI ELEV. 598.76

VPI STA. 963+54.29  
VPI ELEV. 588.41

## PROPOSED PROFILE GRADE US 34

**NOTES:**  
1. ALL UNITS ARE IN FEET UNLESS NOTED OTHERWISE.

### 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.

*Mark D. Werner* 10/1/2018  
Signature Date

**Mark D. Werner**  
Printed or Typed Name

My license renewal date is December 31, 2021

Pages or sheets covered by this seal: 5 & 6

### HYDRAULIC DATA

DRAINAGE AREA = 3430 SQ. MI.  
STREAM SLOPE = 1.056 FT./MI.  
AVG. LOW WATER STAGE = 565.0

$Q_{25} = 39,100$  CFS  
STAGE = 582.3

$Q_{50} = 43,850$  CFS  
STAGE = 583.2  
REGULATORY LOW BEAM = 586.5  
BACKWATER = 0.01 FT.

$Q_{100} = 48,300$  CFS  
STAGE = 584.1  
OPERATIONAL LOW BEAM = 583.4  
BACKWATER = 0.01 FT.  
AVG. BRIDGE VELOCITY = 5.8 FPS

$Q_{200} = 55,500$  CFS  
STAGE = 585.0  
CALCULATED DESIGN SCOUR = 545.7

$Q_{500} = 58,850$  CFS  
STAGE = 585.7  
AVG. BRIDGE VELOCITY = 6.5 FPS  
CALCULATED CHECK SCOUR = 545.7

ROADWAY OVERTOP ELEV STA. 587.2  
STA. 965+78.90

EXTREME HW STAGE = APPROX. 586.8  
DATE = APRIL 1973

### LOCATION

E.B. US 34 OVER SKUNK RIVER  
T-71N R-7W  
SECTION 4 & 5  
TIPPECANOE TOWNSHIP  
HENRY COUNTY  
FHWA NO. 28431  
BRIDGE MAINT. NO. 4426.7R034  
LATITUDE: 40.975053°  
LONGITUDE: -91.677947°

DESIGN FOR 20° SKEW (R.A.)

## 556'-0" X 40'-0" PRETENSIONED PRESTRESSED CONCRETE BEAM E.B. BRIDGE

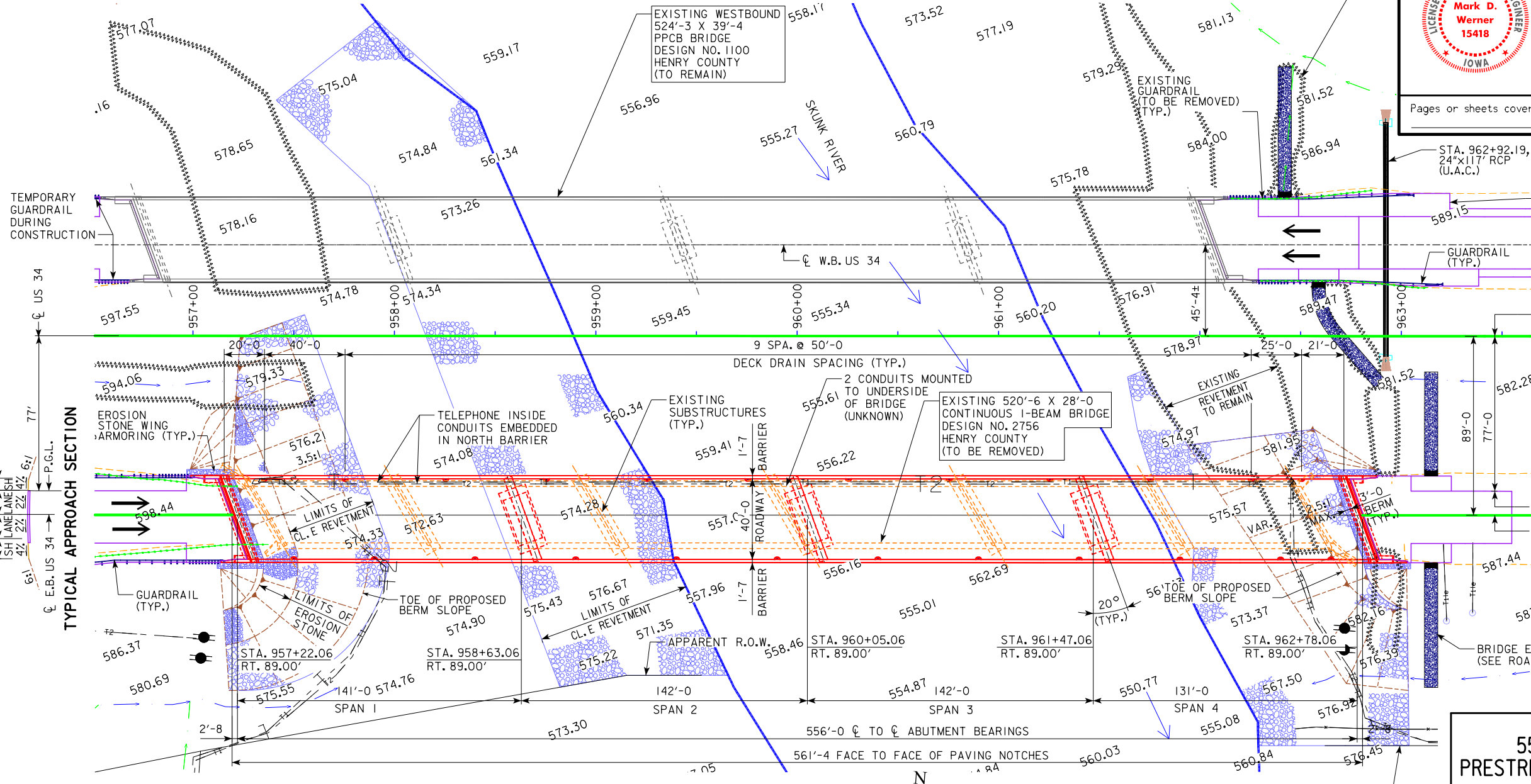
141'-0" & 131'-0" END SPANS 142'-0" INTERIOR SPANS

### SITUATION PLAN

STATION 960+00.06, RT. 89.00'

## HENRY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 4 OF 39 FILE NO. 31636 DESIGN NO. 220



### TRAFFIC ESTIMATE

2021 AADT	7900	V.P.D.
2041 AADT	11800	V.P.D.
TRUCKS	17	%

### SITUATION PLAN

### UTILITIES LEGEND:

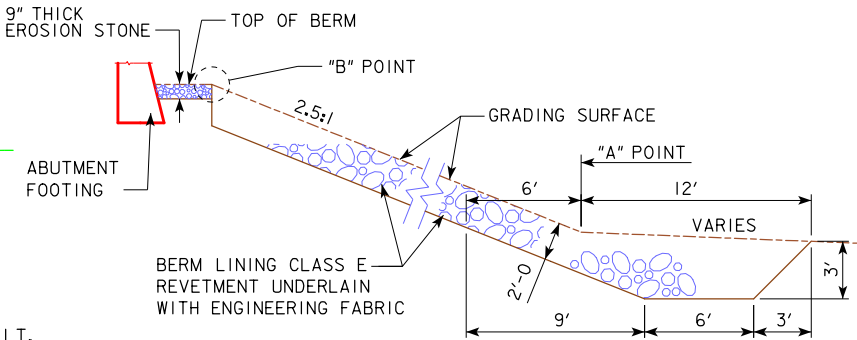
- T — TELEPHONE LINE - ICON
- T2 — TELEPHONE LINE - WINDSTREAM

BENCH MARK NO. 322 - N:6469785.28 E:24370801.27 -  
BM 8" DIA. DRIVEN ALUMINUM ROD WITH 2.5" DIA.  
ALUMINUM CAP

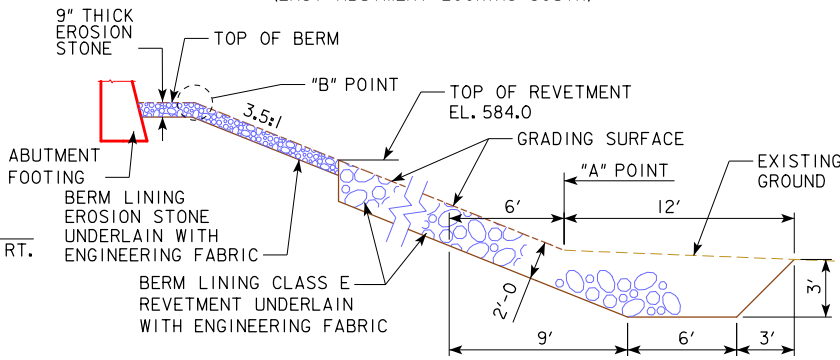
BERM SLOPE LOCATION TABLE

POINTS	WEST ABUTMENT			EAST ABUTMENT		
	STATION	OFFSET	ELEV.	STATION	OFFSET	ELEV.
A1	957+86.9	115.58' RT.	575.0	962+69.4	115.58' RT.	575.0
A2	957+70.7	66.42' RT.	575.0	962+41.6	66.42' RT.	575.0
B1	957+35.0	115.58' RT.	589.2	962+82.0	115.58' RT.	581.1
B2	957+20.5	66.42' RT.	589.2	962+64.8	66.42' RT.	581.1
W1	957+14.0	115.58' RT.	597.5	963+02.7	115.58' RT.	588.9
W2	956+98.9	66.42' RT.	597.8	962+87.6	66.42' RT.	589.2

BERM SLOPE ELEVATIONS REFLECT THE GRADING SURFACE



SECTION THRU EMBEDDED  
REVETMENT BERM  
(EAST ABUTMENT LOOKING SOUTH)



SECTION THRU EMBEDDED  
REVETMENT BERM  
(WEST ABUTMENT LOOKING NORTH)

UTILITIES LEGEND:

— T — TELEPHONE LINE - ICN  
— T2 — TELEPHONE LINE - WINDSTREAM  
— G-HP — GAS LINE - ANR PIPELINE CO.

ESTIMATED BERM ARMORING QUANTITIES

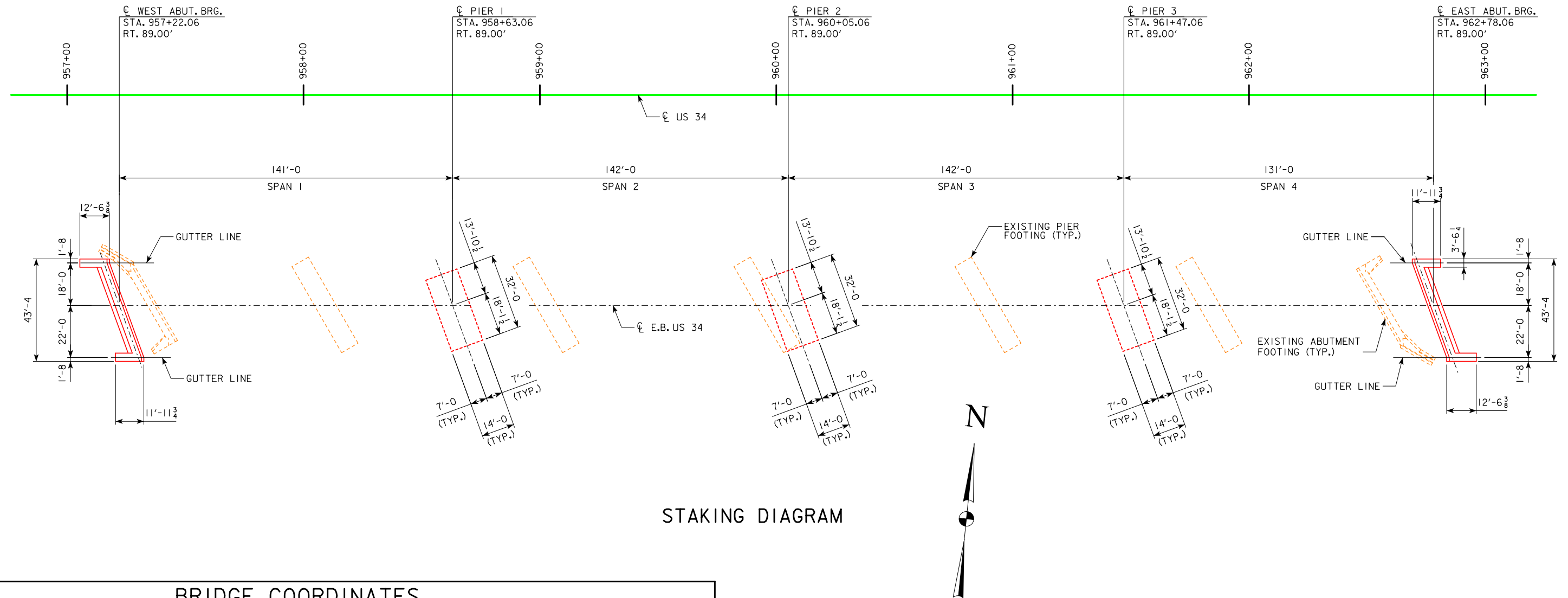
LOCATION	REVETMENT CL. E (TON)	EROSION STONE (TON)	ENGINEERING FABRIC (SY)	EXCAVATION CL. 10 (CY)
BERM LINING - WEST ABUT.	860	100	1260	815
BERM LINING - EAST ABUT.	1460	10	1720	1295
EX. CHANNEL - WEST BANK	2570	0	2990	2260
TOTALS	4890	110	5970	4370

EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE.

SITE PLAN



DESIGN FOR 20° SKEW (R.A.)  
**556'-0" X 40'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE**  
141'-0" & 131'-0" END SPANS 142'-0" INTERIOR SPANS  
**SITUATION PLAN - SITE**  
STATION 960+00.06, RT. 89.00' MARCH 2020  
**HENRY COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 5 OF 39 FILE NO. 31636 DESIGN NO. 220



STAKING DIAGRAM

BRIDGE COORDINATES					
LOCATION	CL W. ABUT. BRG.	CL PIER 1	CL PIER 2	CL PIER 3	CL E. ABUT. BRG.
NORTH EDGE OF DECK	N=6464439.312 E=24381475.762	N=6464450.685 E=24381616.300	N=6464462.140 E=24381757.837	N=6464473.594 E=24381899.375	N=6464484.161 E=24382029.950
CL APPROACH ROADWAY	N=6464420.368 E=24381484.446	N=6464431.741 E=24381624.984	N=6464443.195 E=24381766.521	N=6464454.649 E=24381908.059	N=6464465.217 E=24382038.634
SOUTH EDGE OF DECK	N=6464397.553 E=24381494.904	N=6464408.927 E=24381635.442	N=6464420.381 E=24381776.979	N=6464431.835 E=24381918.517	N=6464442.402 E=24382049.092

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 20° SKEW (R.A.)

556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

141'-0 & 131'-0 END SPANS142'-0 INTERIOR SPANS

STAKING DIAGRAM

STATION 960+00.06, RT. 89.00'MARCH 2020

HENRY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 6 OF 39FILE NO. 31636DESIGN NO. 220







CORRECTION 04-14 - CHANGED NOTE ABOUT BARRIER RAIL BARS 5c3 & 5c14 TO BARRIER RAIL QTY'S. INSTEAD OF BRIDGE DECK QTY'S.  
ENGLISHBTSTUBABUTMENTBRIDGE.DGN - 2102-BTE - THIS SHEET ISSUED 07-08.

BENCH MARK NO. 322 - N:6469785.28 E:24370801.27  
BM 5/8" DIA. DRIVEN ALUMINUM ROD WITH 2.5" DIA. ALUMINUM CAP.

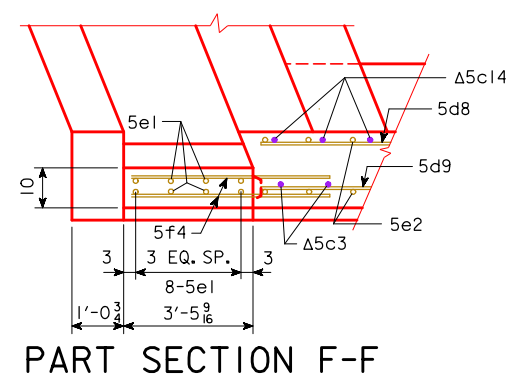
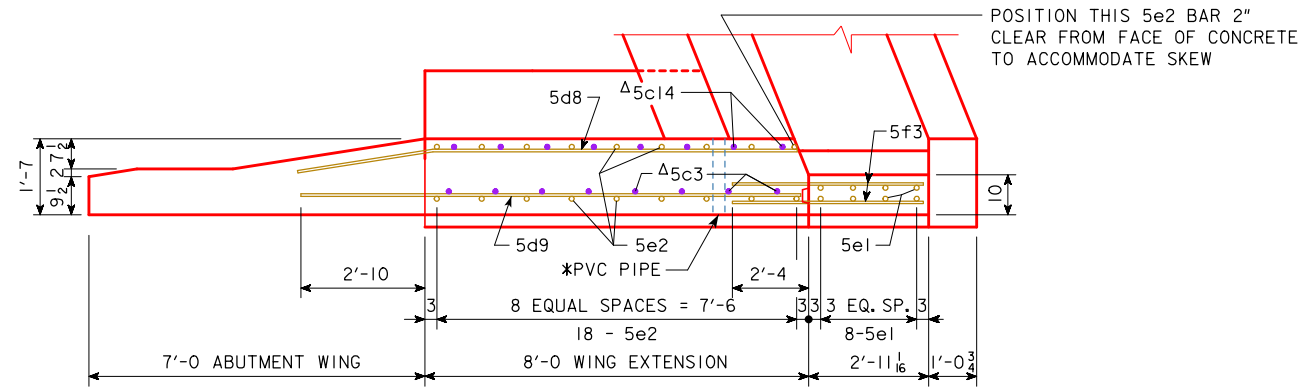
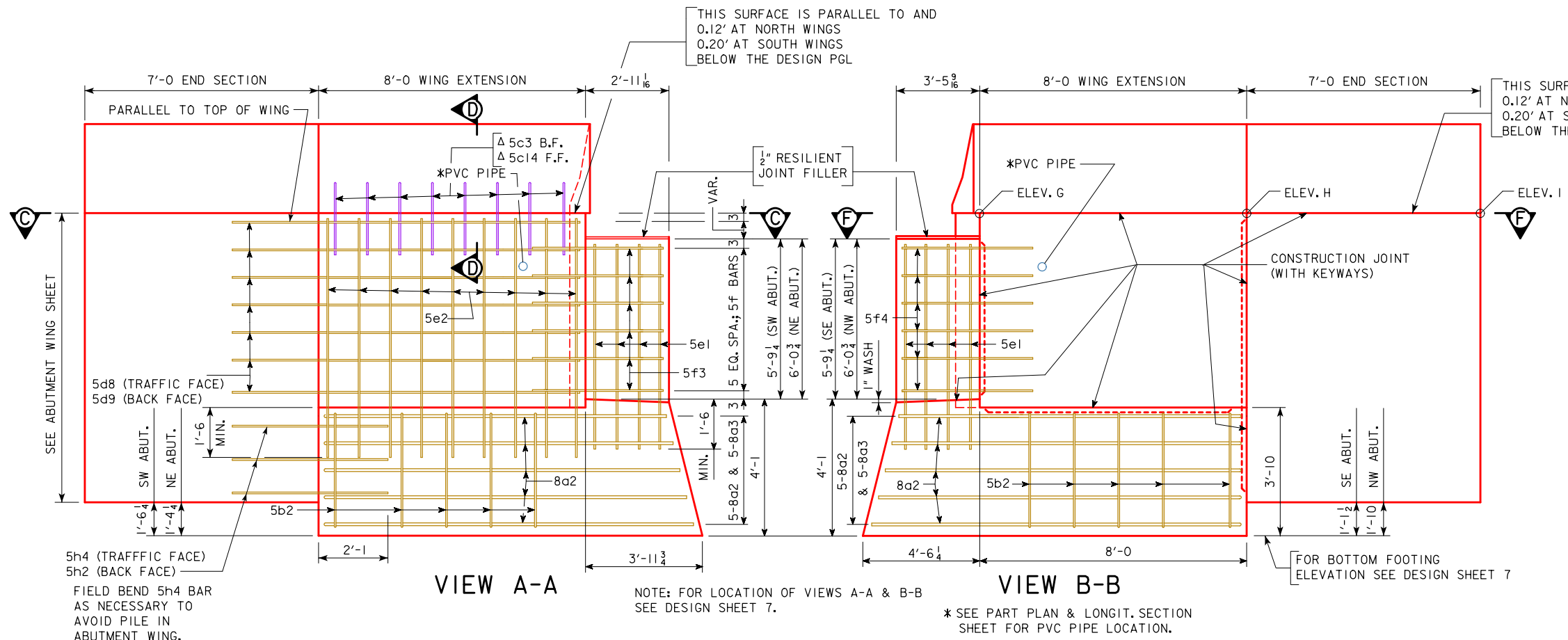


TABLE OF WINGWALL ELEVATIONS			
LOCATION	ELEV. G	ELEV. H	ELEV. I
NORTHWEST WING	597.69	597.80	597.91
SOUTHWEST WING	597.39	597.50	597.60
NORTHEAST WING	589.50	589.38	589.28
SOUTHEAST WING	589.28	589.16	589.06

DESIGN FOR 20° SKEW (R.A.)

**556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE**

141'-0 & 131'-0 END SPANS      142'-0 INTERIOR SPANS

**ABUTMENT WING EXT. DETAILS**

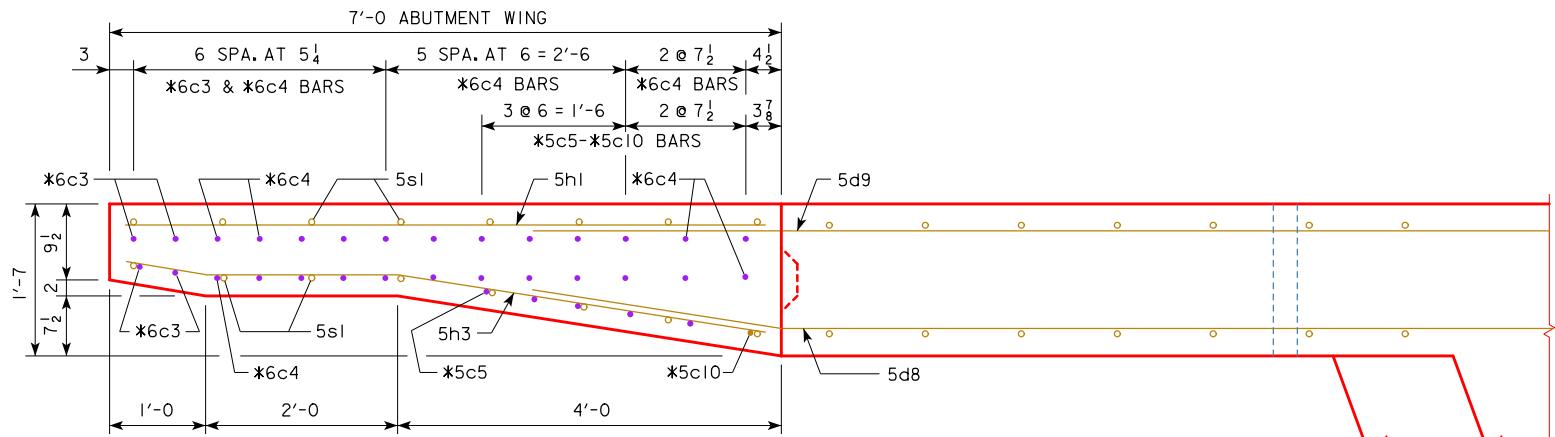
STATION 960+00.06, RT. 89.00'      MARCH 2020

**HENRY COUNTY**

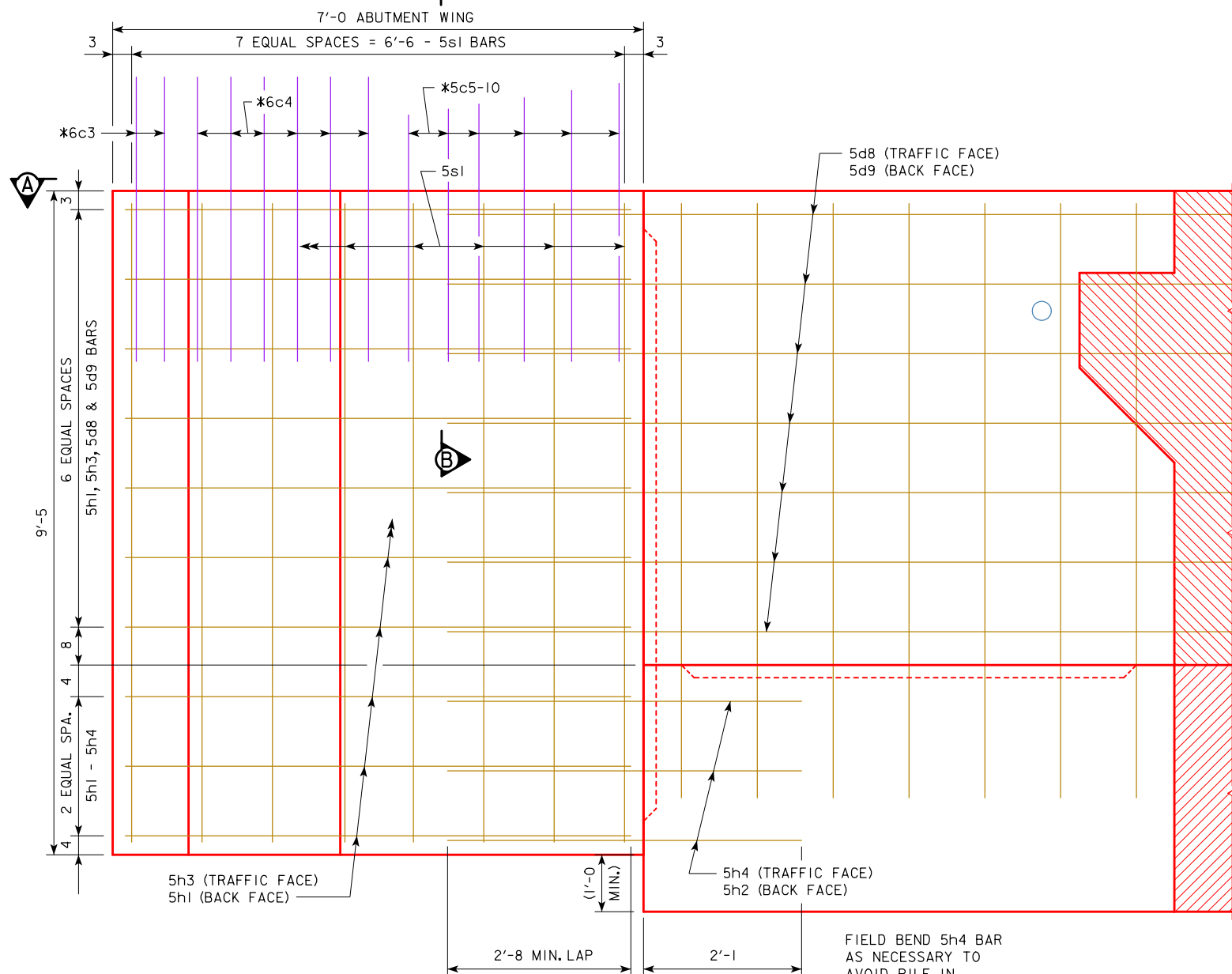
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 8 OF 39      FILE NO. 31636      DESIGN NO. 220

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

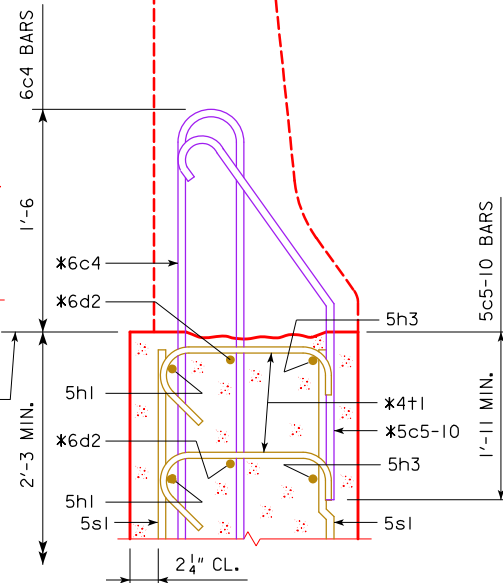


VIEW A-A



ABUTMENT WING - ELEVATION VIEW

CONST.  
JOINT  
(TYP.)



SECTION B-B

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

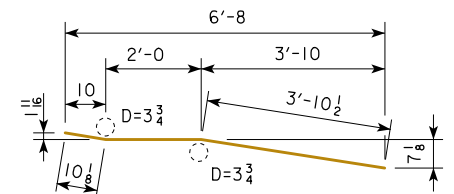
SEE BARRIER RAIL END SECTION  
SHEET IN THESE PLANS FOR  
DETAILS OF REINFORCING BARS  
6c3, 6c4, 5c5-10, 6d2 & 4t1.

ABUTMENT BACKWALL  
CONST. JOINT  
ABUTMENT FOOTING

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

HIGH PERFORMANCE  
CONCRETE PLACEMENT SUMMARY

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

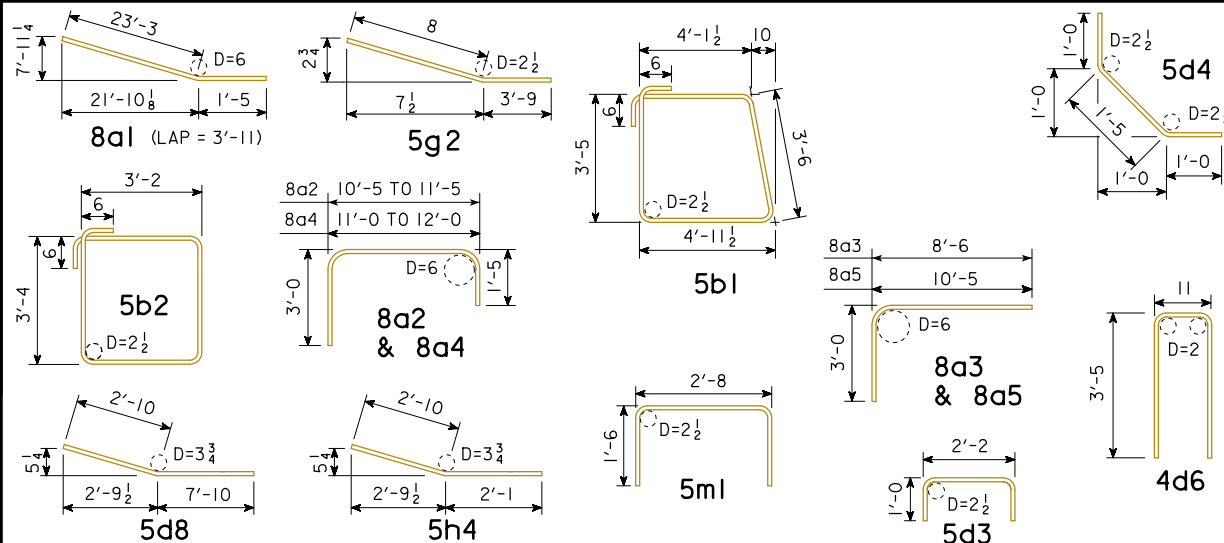
NOTE:

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

DESIGN FOR 20° SKEW (R.A.)  
**556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE**  
141'-0 & 131'-0 END SPANS 142'-0 INTERIOR SPANS  
**ABUTMENT WING DETAILS**  
STATION 960+00.06, RT. 89.00' MARCH 2020  
**HENRY COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 9 OF 39 FILE NO. 31636 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.



























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



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

LOCATION	WEST ABUT.	EAST ABUT.
FOOTING AND STEPS	39.7	39.7
BACKWALL BELOW CONSTR. JOINT	7.2	7.1
BACKWALL ABOVE CONSTR. JOINT	10.8	10.8
NORTH WING EXTENSION	3.4	3.3
SOUTH WING EXTENSION	3.3	3.2
NORTH WING MASKWALL	0.7	0.6
SOUTH WING MASKWALL	0.5	0.6
TOTAL (C.Y.)	65.6	65.3

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

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
8a1	FOOTING LONGITUDINAL		26	24'-8	1712
8a2	WING FOOTING		5	VARIES	205
8a3	WING FOOTING		5	11'-6	154
8a4	WING FOOTING		5	VARIES	212
8a5	WING FOOTING		5	13'-5	179
5b1	FOOTING HOOPS		60	17'-0	1064
5b2	WING FOOTING HOOPS		10	14'-0	146
6d1	BACKWALL VERTICAL B.F.		85	7'-10	1000
5d2	BACKWALL VERTICAL F.F.		42	7'-0	307
5d3	PAVING NOTCH		42	4'-2	183
5d4	PAVING NOTCH		42	3'-5	150
4d6	BACKWALL VERTICAL HOOP		42	7'-9	217
5d8	WING EXTENSION FF HORIZONTAL		14	10'-8	156
5d9	WING EXTENSION BF HORIZONTAL		14	10'-8	156
5e1	MASKWALL VERTICAL		16	7'-4	122
5e2	WING EXTENSION VERTICAL		28	8'-5	316
5f3	MASKWALL HORIZONTAL		12	5'-0	63
5f4	MASKWALL HORIZONTAL		12	5'-6	69
5g1	BACKWALL LONGITUDINAL		32	22'-5	748
5g2	BACKWALL DOWELS		32	4'-5	147
5g3	PAVING NOTCH LONGITUDINAL		4	22'-5	94
5h2	WING EXTENSION BF HORIZONTAL		6	4'-11	31
5h4	WING EXTENSION FF HORIZONTAL		6	4'-11	31
5m1	BEAM STEPS TRANSVERSE		12	5'-8	71
5n1	BEAM STEPS LONGITUDINAL		12	2'-8	33
REINFORCING STEEL - EPOXY COATED - TOTAL (LBS.)					7566
5d5	PAVING NOTCH DOWELS (STAINLESS STEEL)		21	3'-6	77
STAINLESS STEEL - TOTAL (LBS.)					77

REVISED 07-14 - CHANGED THE 5m HORIZONTAL BAR LENGTH TO 2'-8" TO ACCOMMODATE THE 3'-0" TRANSVERSE DISTANCE OF THE BEAM STEPS.  
ENGLISHBTSTUBAUTMENTBRIDGES.DGN - 2109-BTE - THIS SHEET ISSUED 07-08.

DESIGN FOR 20° SKEW (R.A.)

556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

141'-0 & 131'-0 END SPANS                      142'-0 INTERIOR SPANS

ABUTMENT QUANTITIES

STATION 960+00.06, RT. 89.00'                      MARCH 2020

HENRY COUNTY

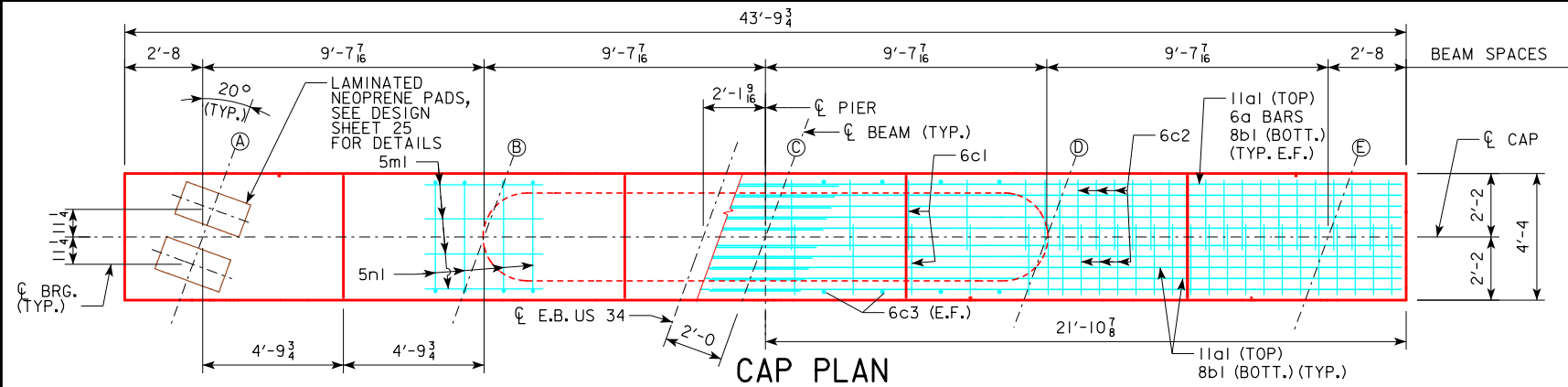
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 10 OF 39      FILE NO. 31636      DESIGN NO. 220

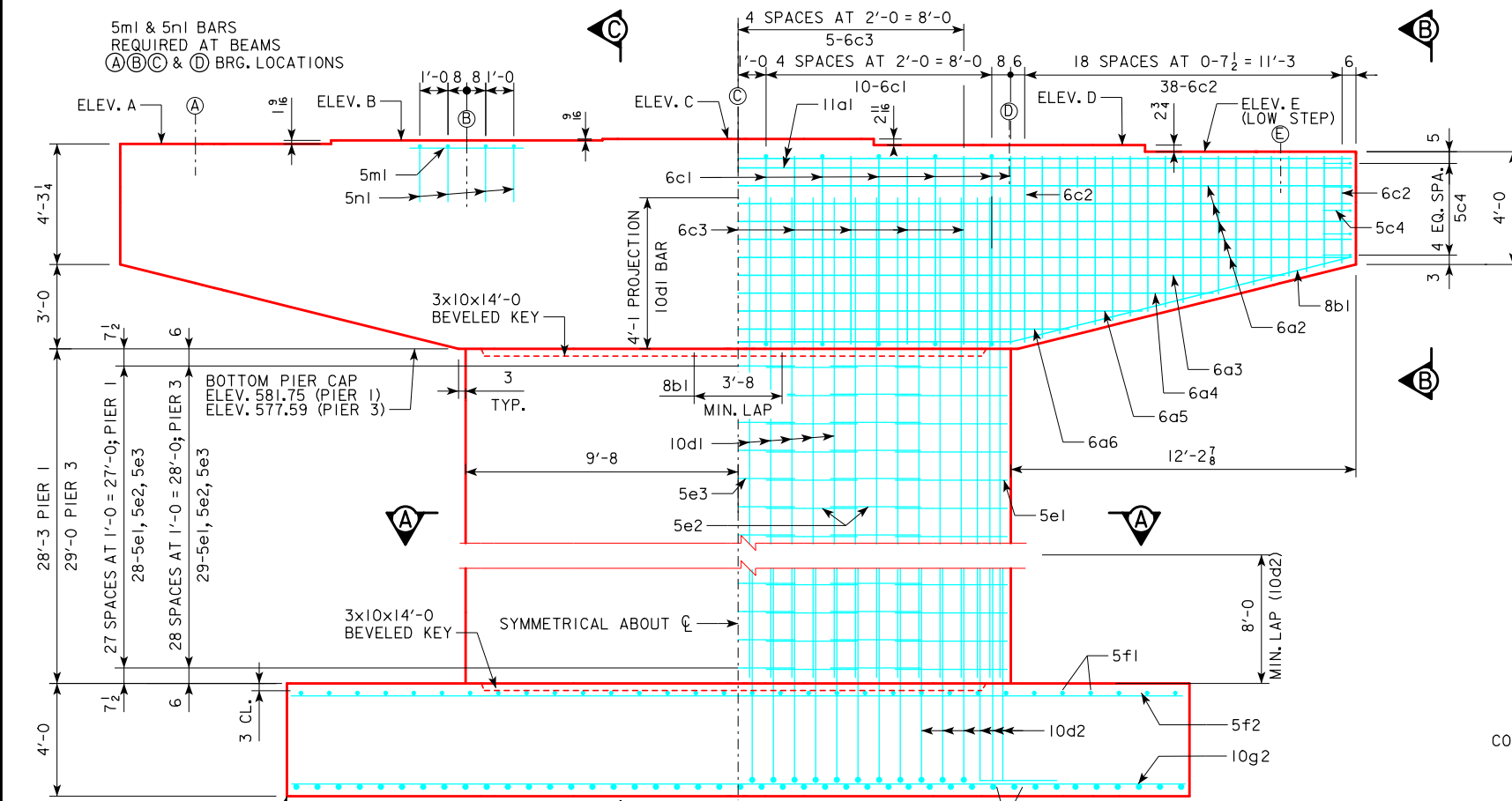
BENCH MARK NO. 322 - N:6469785.28 E:24370801.27  
BM 5/8" DIA. DRIVEN ALUMINUM ROD WITH 2.5" DIA. ALUMINUM CAP.

STEP ELEVATIONS

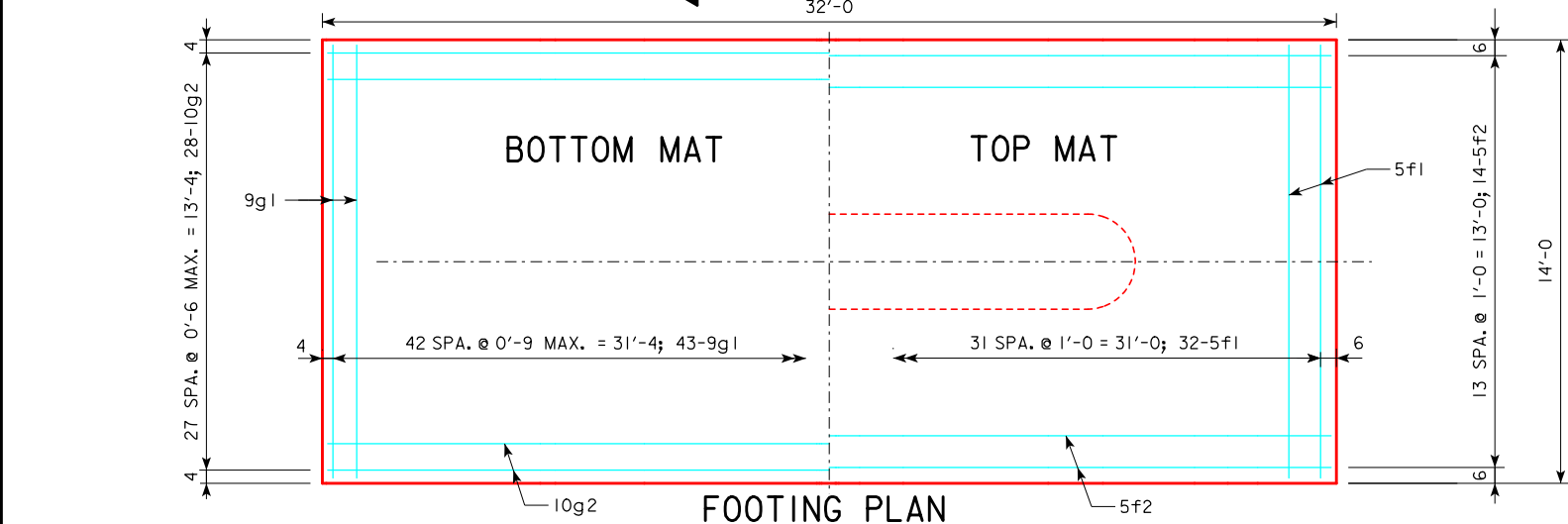
	BEAM A	BEAM B	BEAM C	BEAM D	BEAM E
PIER 1	589.02	589.15	589.20	588.98	588.75
PIER 3	584.86	585.00	585.04	584.82	584.59



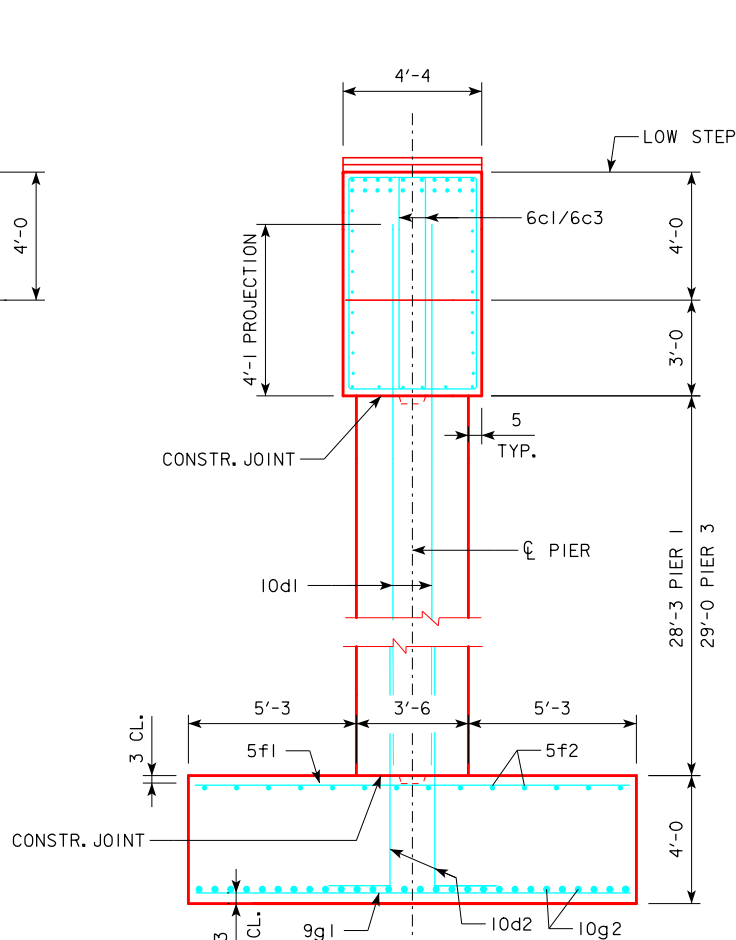
CAP PLAN



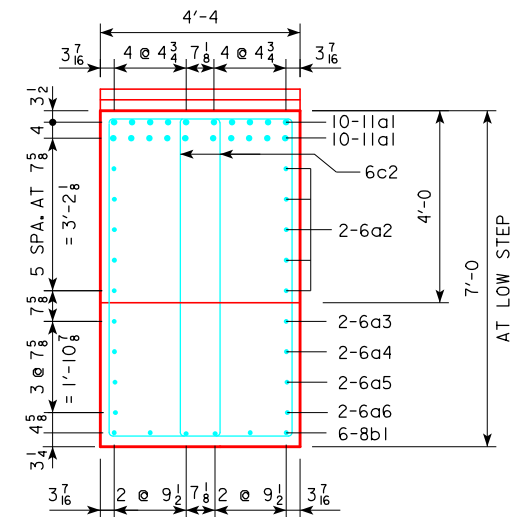
ELEVATION



FOOTING PLAN



SECTION C-C



VIEW B-B

NOTES:  
SEE DESIGN SHEET 12 FOR FIXED PIER #2 DETAILS.  
SEE DESIGN SHEET 13 FOR SECTION A-A, PIER NOTES,  
BAR LISTS, AND BENT BAR DETAILS.

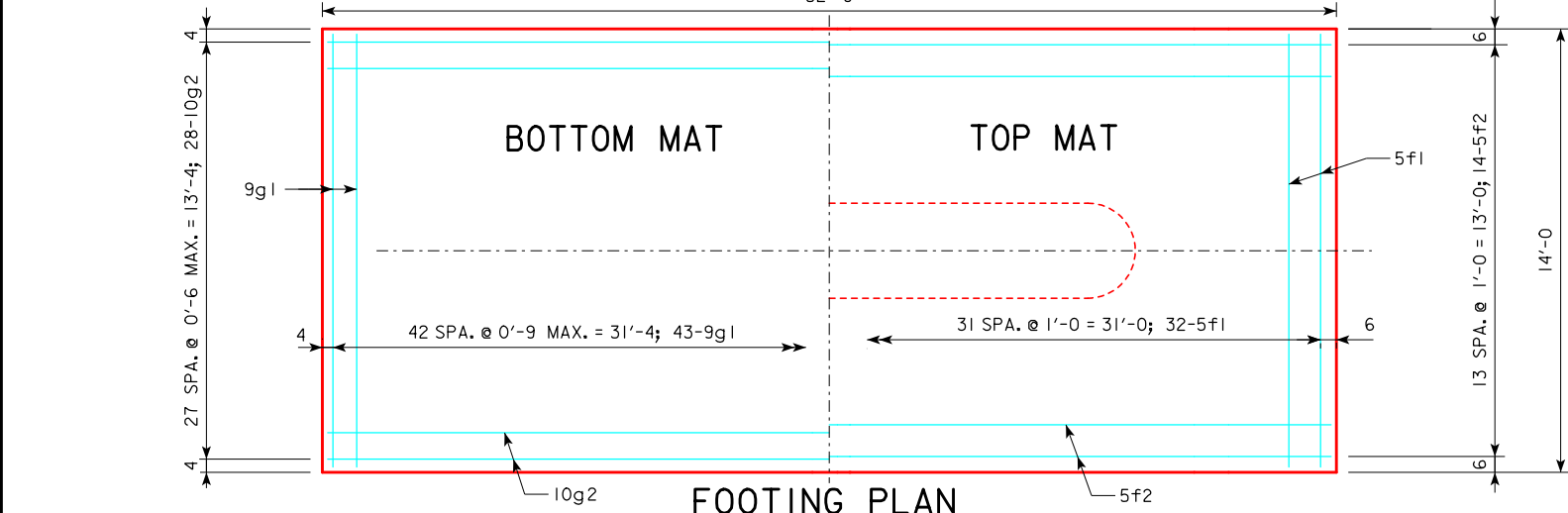
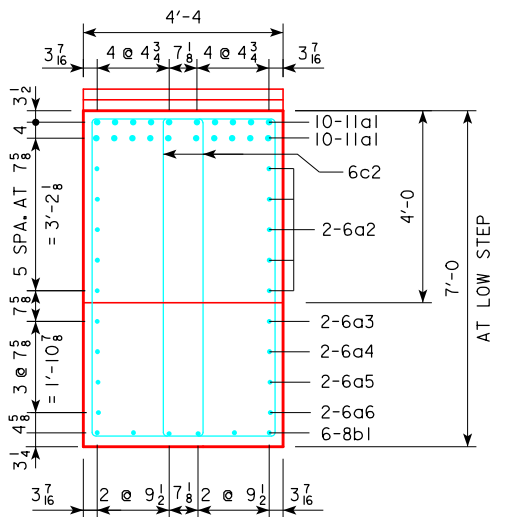
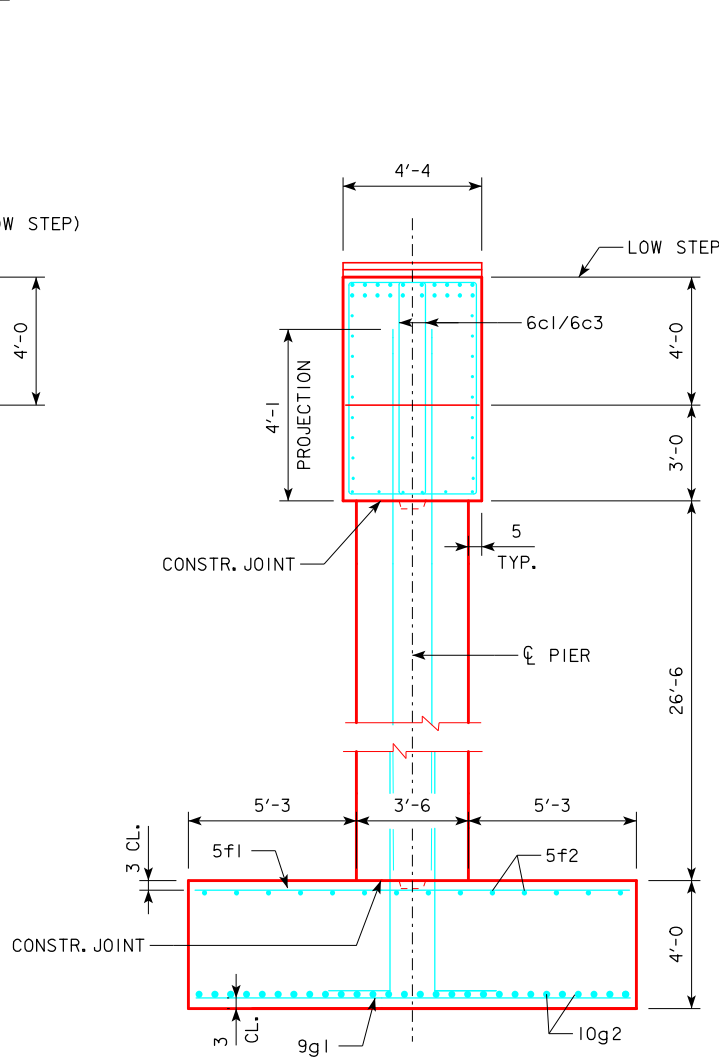
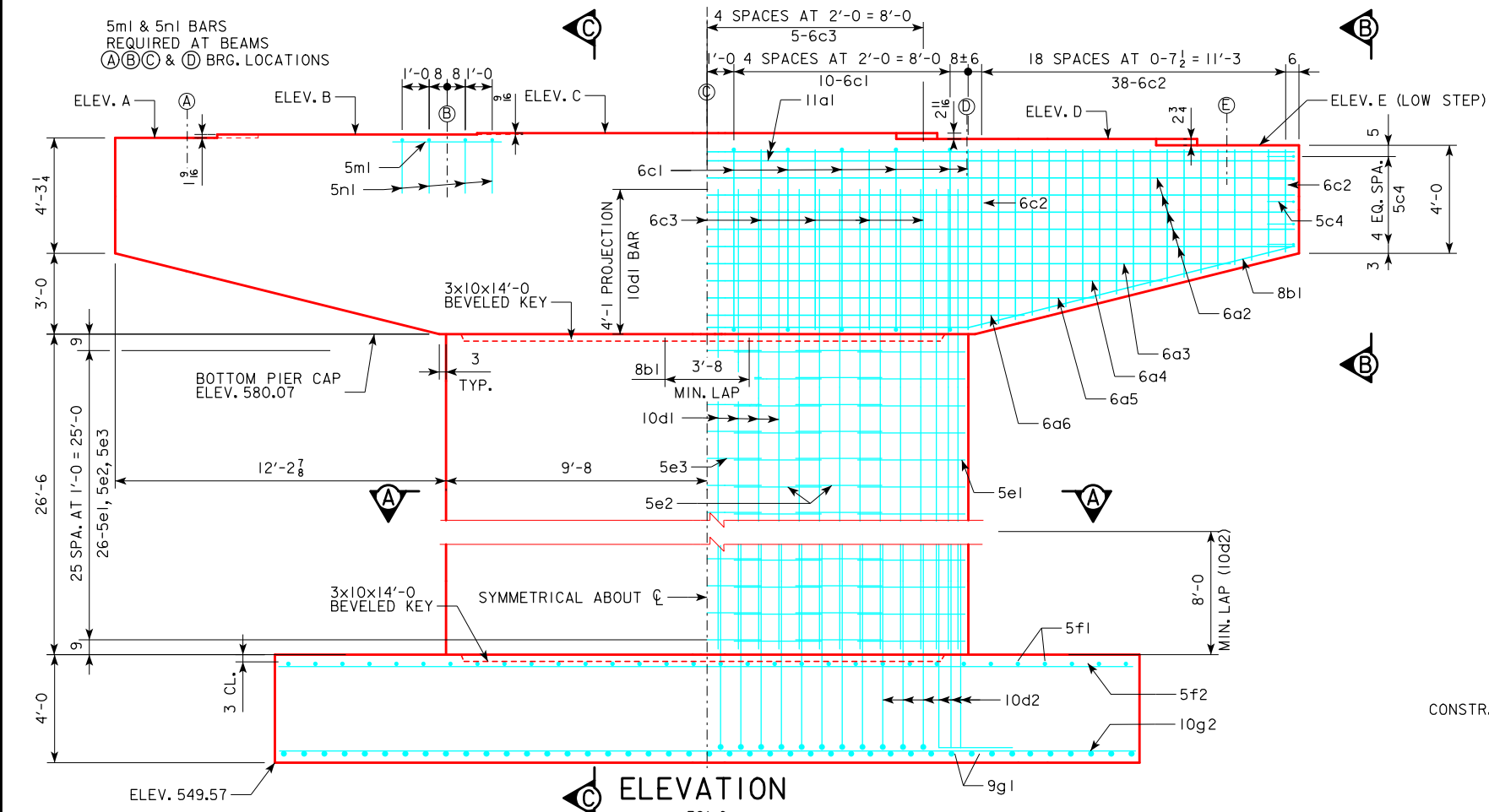
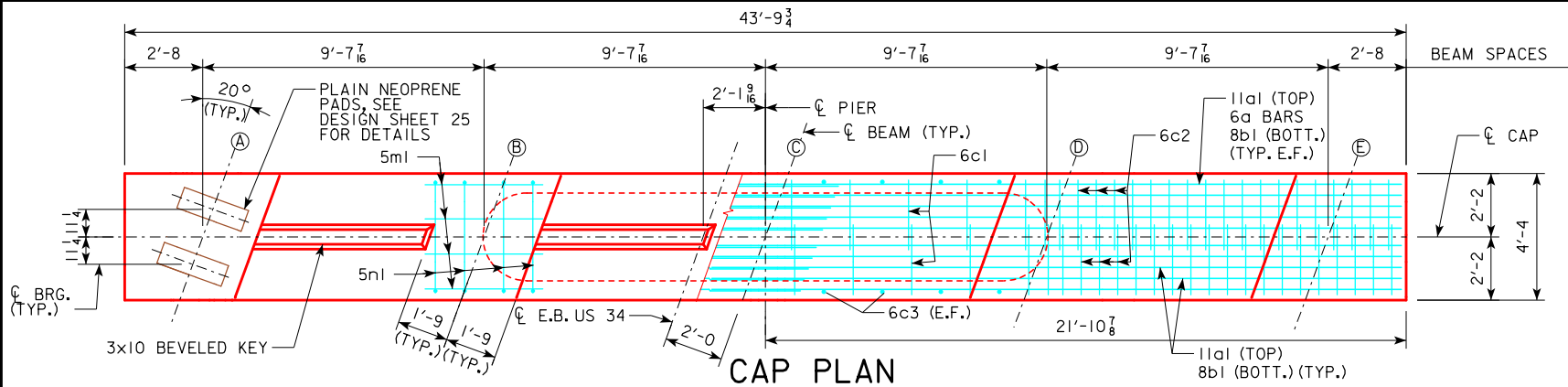
DESIGN FOR 20° SKEW (R.A.)  
**556'-0" X 40'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE**  
141'-0" & 131'-0" END SPANS 142'-0" INTERIOR SPANS  
**PIERS 1 & 3 DETAILS**  
STATION 960+00.06, RT. 89.00' MARCH 2020  
**HENRY COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 11 OF 39 FILE NO. 31636 DESIGN NO. 220



BENCH MARK NO. 322 - N:6469785.28 E:24370801.27  
BM 5/8" DIA. DRIVEN ALUMINUM ROD WITH 2.5" DIA.  
ALUMINUM CAP.

STEP ELEVATIONS

	BEAM A	BEAM B	BEAM C	BEAM D	BEAM E
PIER 2	587.34	587.47	587.52	587.30	587.07



NOTES:  
SEE DESIGN SHEET 11 FOR EXPANSION PIERS #1 AND #3.  
SEE DESIGN SHEET 13 FOR SECTION A-A, PIER NOTES,  
BAR LISTS, AND BENT BAR DETAILS.

DESIGN FOR 20° SKEW (R.A.)  
**556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE**  
141'-0 & 131'-0 END SPANS 142'-0 INTERIOR SPANS  
**PIER 2 DETAILS**  
STATION 960+00.06, RT. 89.00' MARCH 2020  
**HENRY COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 12 OF 39 FILE NO. 31636 DESIGN NO. 220

BENCH MARK NO. 322 - N:6469785.28 E:24370801.27  
BM 5/8" DIA. DRIVEN ALUMINUM ROD WITH 2.5" DIA.  
ALUMINUM CAP.

PIER NOTES:

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

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

REINFORCING IS TO BE SECURELY WIRED IN PLACE BEFORE  
CONCRETE IS POURED.

FOOTING MUST BE SEATED IN ROCK AS SHOWN IN "PIER  
EXCAVATION LIMITS" DETAIL.

THE DESIGN BEARING PRESSURE FOR THE PIER SPREAD  
FOOTINGS ARE BASED ON A NOMINAL BEARING RESISTANCE  
VALUE OF 18.0 KSF (SERVICE LIMIT STATE) AND 8.0 KSF  
(FACTORED LRFD STRENGTH I LIMIT STATE).

CONC. ESTIMATED QUANTITIES

LOCATION	PIER 1	PIER 2	PIER 3
CAP	45.8	45.8	45.8
COLUMN	68.0	63.8	69.8
FOOTING	66.4	66.4	66.4
TOTAL (CY)	180.2	176.0	182.0

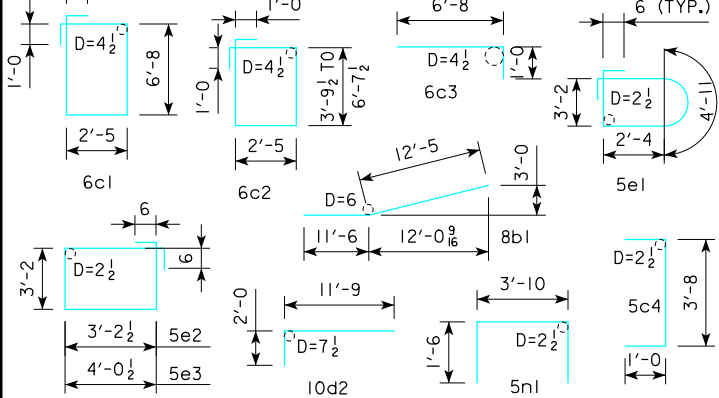
GROUND LINE ELEVATIONS

LOCATION	PIER 1	PIER 2	PIER 3
TOP OF GROUND	574.9	553.9	548.1
TOP OF ROCK	551.9	553.9	548.1

REINFORCING BAR LIST - PIER ONE

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
11a1	CAP TOP & 2nd ROW, LONGITUDINAL		20	43'-5"	4613
6a2	CAP, SIDES, LONGITUDINAL		10	43'-5"	652
6a3	CAP, SIDES, LONGITUDINAL		2	38'-8"	116
6a4	CAP, SIDES, LONGITUDINAL		2	33'-7"	101
6a5	CAP, SIDES, LONGITUDINAL		2	28'-6"	86
6a6	CAP, SIDES, LONGITUDINAL		2	23'-5"	70
8b1	CAP, LONGITUDINAL, BOTTOM		12	23'-11"	766
6c1	CAP, HOOPS		24	20'-2"	727
6c2	CAP, HOOPS		76	VARIES	1969
6c3	CAP, STIRRUPS		18	7'-8"	207
5c4	CAP END, TRANSVERSE		10	5'-8"	59
10d1	PIER COLUMN, VERTICAL		54	32'-4"	7513
10d2	PIER COLUMN, DOWEL		54	13'-9"	3195
5e1	COLUMN, TIES END		56	13'-9"	803
5e2	COLUMN, TIES		56	13'-9"	803
5e3	COLUMN, TIES		28	15'-5"	450
5f1	FOOTING, TRANSVERSE, TOP		32	13'-6"	451
5f2	FOOTING, LONGITUDINAL, TOP		14	31'-6"	460
9g1	FOOTING, TRANSVERSE, BOTTOM		43	13'-6"	1974
10g2	FOOTING, LONGITUDINAL, BOTTOM		28	31'-6"	3795
5m1	CAP, STEPS, LONGITUDINAL		16	3'-6"	58
5n1	CAP, STEPS, TRANSVERSE		16	6'-10"	114
REINFORCING STEEL - TOTAL (LBS.)				28,982	

BENT BAR DETAILS

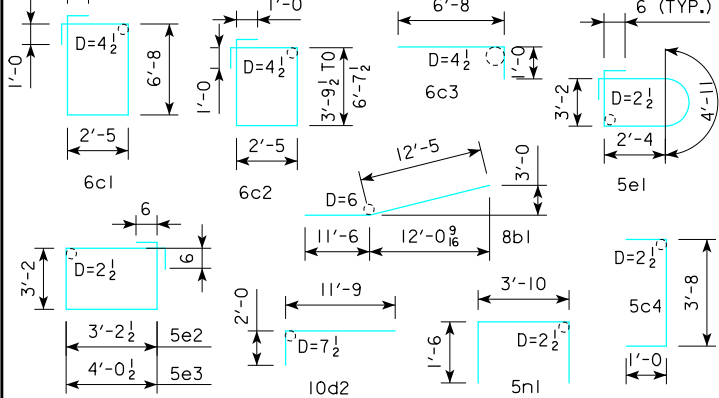


NOTE: ALL DIMENSIONS ARE OUT TO OUT. D= PIN DIAMETER.

REINFORCING BAR LIST - PIER TWO

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
11a1	CAP TOP & 2nd ROW, LONGITUDINAL		20	43'-5"	4613
6a2	CAP, SIDES, LONGITUDINAL		10	43'-5"	652
6a3	CAP, SIDES, LONGITUDINAL		2	38'-8"	116
6a4	CAP, SIDES, LONGITUDINAL		2	33'-7"	101
6a5	CAP, SIDES, LONGITUDINAL		2	28'-6"	86
6a6	CAP, SIDES, LONGITUDINAL		2	23'-5"	70
8b1	CAP, LONGITUDINAL, BOTTOM		12	23'-11"	766
6c1	CAP, HOOPS		24	20'-2"	727
6c2	CAP, HOOPS		76	VARIES	1969
6c3	CAP, STIRRUPS		18	7'-8"	207
5c4	CAP END, TRANSVERSE		10	5'-8"	59
10d1	PIER COLUMN, VERTICAL		54	30'-7"	7106
10d2	PIER COLUMN, DOWEL		54	13'-9"	3195
5e1	COLUMN, TIES END		52	13'-9"	746
5e2	COLUMN, TIES		52	13'-9"	746
5e3	COLUMN, TIES		26	15'-5"	418
5f1	FOOTING, TRANSVERSE, TOP		32	13'-6"	451
5f2	FOOTING, LONGITUDINAL, TOP		14	31'-6"	460
9g1	FOOTING, TRANSVERSE, BOTTOM		43	13'-6"	1974
10g2	FOOTING, LONGITUDINAL, BOTTOM		28	31'-6"	3795
5m1	CAP, STEPS, LONGITUDINAL		16	3'-6"	58
5n1	CAP, STEPS, TRANSVERSE		16	6'-10"	114
REINFORCING STEEL - TOTAL (LBS.)				28,429	

BENT BAR DETAILS

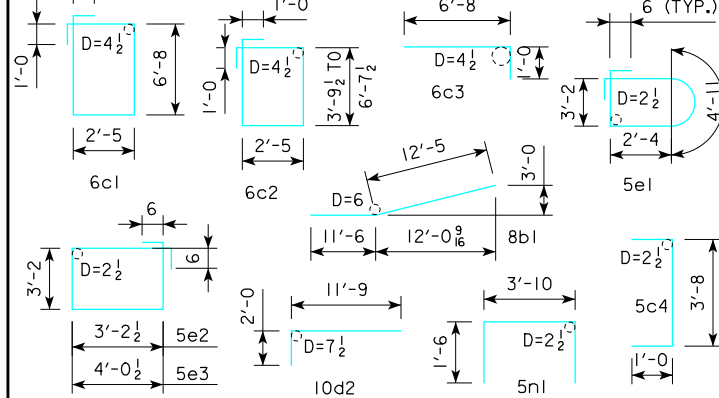


NOTE: ALL DIMENSIONS ARE OUT TO OUT. D= PIN DIAMETER.

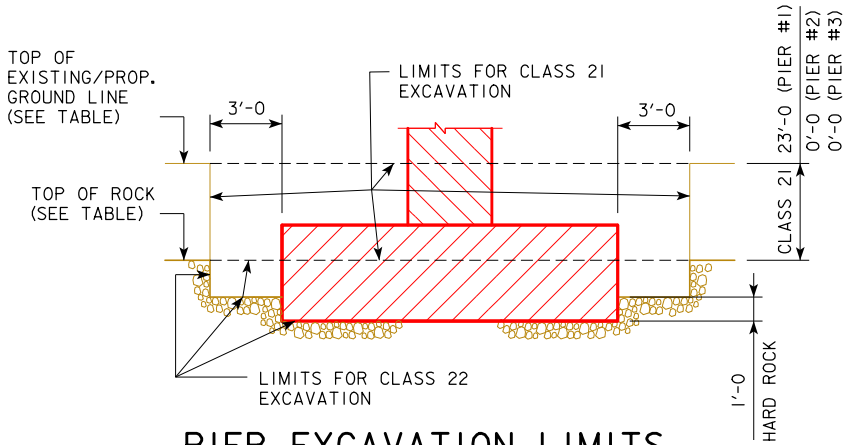
REINFORCING BAR LIST - PIER THREE

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
11a1	CAP TOP & 2nd ROW, LONGITUDINAL		20	43'-5"	4613
6a2	CAP, SIDES, LONGITUDINAL		10	43'-5"	652
6a3	CAP, SIDES, LONGITUDINAL		2	38'-8"	116
6a4	CAP, SIDES, LONGITUDINAL		2	33'-7"	101
6a5	CAP, SIDES, LONGITUDINAL		2	28'-6"	86
6a6	CAP, SIDES, LONGITUDINAL		2	23'-5"	70
8b1	CAP, LONGITUDINAL, BOTTOM		12	23'-11"	766
6c1	CAP, HOOPS		24	20'-2"	727
6c2	CAP, HOOPS		76	VARIES	1969
6c3	CAP, STIRRUPS		18	7'-8"	207
5c4	CAP END, TRANSVERSE		10	5'-8"	59
10d1	PIER COLUMN, VERTICAL		54	33'-1"	7687
10d2	PIER COLUMN, DOWEL		54	13'-9"	3195
5e1	COLUMN, TIES END		58	13'-9"	832
5e2	COLUMN, TIES		58	13'-9"	832
5e3	COLUMN, TIES		29	15'-5"	466
5f1	FOOTING, TRANSVERSE, TOP		32	13'-6"	451
5f2	FOOTING, LONGITUDINAL, TOP		14	31'-6"	460
9g1	FOOTING, TRANSVERSE, BOTTOM		43	13'-6"	1974
10g2	FOOTING, LONGITUDINAL, BOTTOM		28	31'-6"	3795
5m1	CAP, STEPS, LONGITUDINAL		16	3'-6"	58
5n1	CAP, STEPS, TRANSVERSE		16	6'-10"	114
REINFORCING STEEL - TOTAL (LBS.)				29,230	

BENT BAR DETAILS



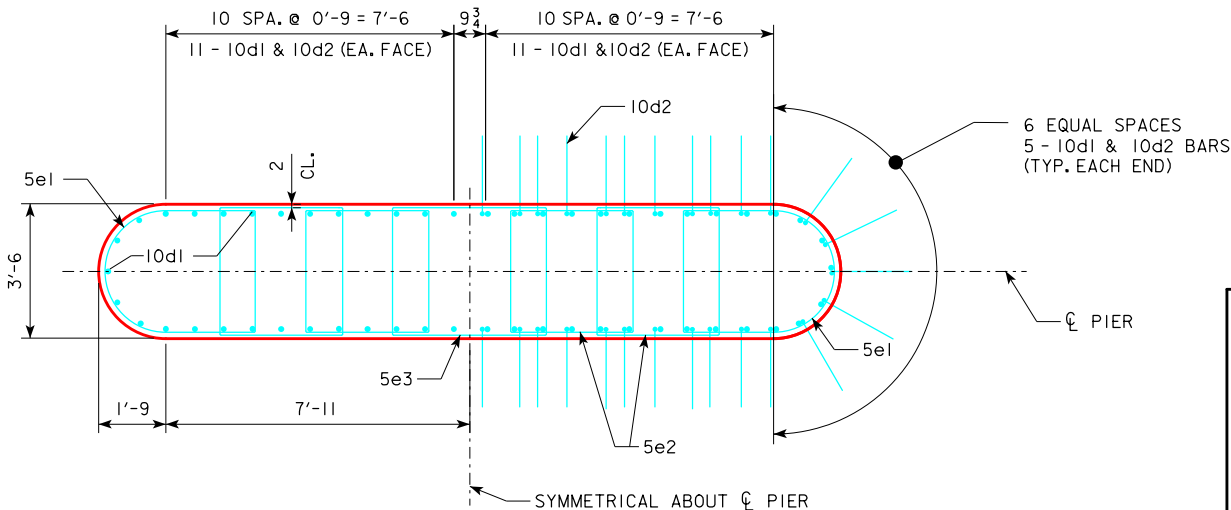
NOTE: ALL DIMENSIONS ARE OUT TO OUT. D= PIN DIAMETER.



PIER EXCAVATION LIMITS

(CLASS 21 AND CLASS 22 LIMITS SHOWN)

NOTE: TOP OF ROCK LOCATED AT TOP OF GROUND LINE AT PIER #2 & PIER #3



SECTION A-A

DESIGN FOR 20° SKEW (R.A.)  
**556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE**  
141'-0 & 131'-0 END SPANS 142'-0 INTERIOR SPANS  
**PIER QUANTITIES**  
STATION 960+00.06, RT. 89.00' MARCH 2020  
**HENRY COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 13 OF 39 FILE NO. 31636 DESIGN NO. 220

CORRECTION 04-14 - ADDED REFERRAL NOTE TO SUMMARY QUANTITIES SHEET FOR ENGLISHBTSTUBABUTMENTBRIDGES.DGN - 4559-BTE-5 - THIS SHEET ISSUED 07-08.



\* FOR DECK THICKNESS OVER BEAMS SEE  
HAUNCH AND CAMBER DETAILS ON  
DESIGN SHEET 30.



SLAB AREA = 29.27 SQ. FT.  
SLAB AREA DOES NOT  
INCLUDE THE HAUNCH.

NOTE: FOR DETAILS OF INTERMEDIATE DIAPHRAGMS SEE DESIGN SHEETS 19 AND 20.

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 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.



HALF SECTION NEAR PIER

DESIGN FOR 20° SKEW (R.A.)

556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

141'-0 & 131'-0 END SPANS 142'-0 INTERIOR SPANS

TRANSVERSE SECTION

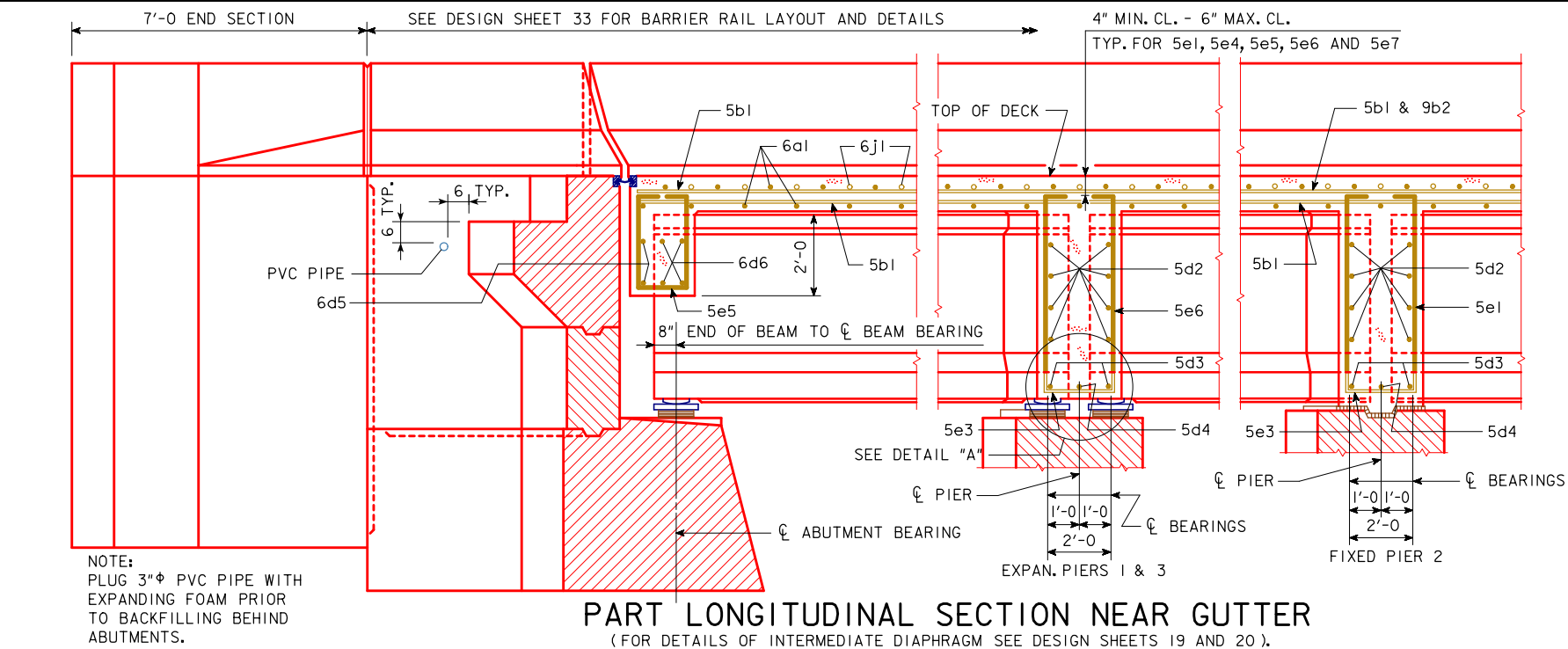
STATION 960+00.06, RT. 89.00' MARCH 2020

HENRY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

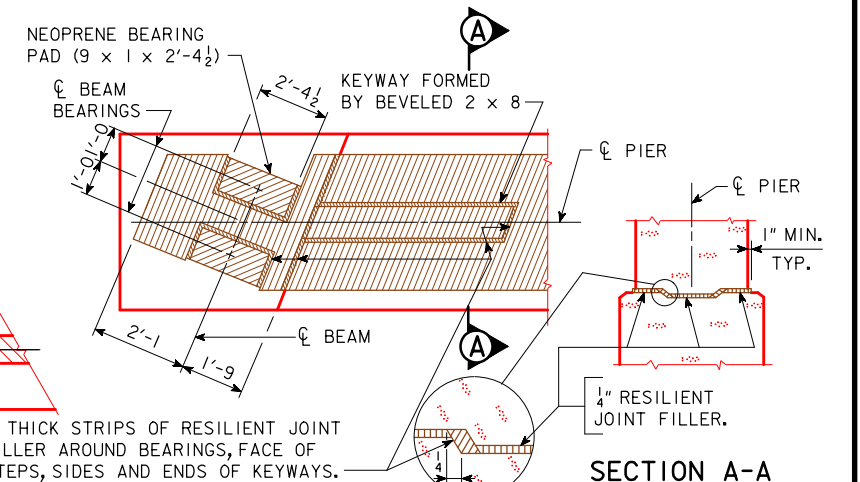
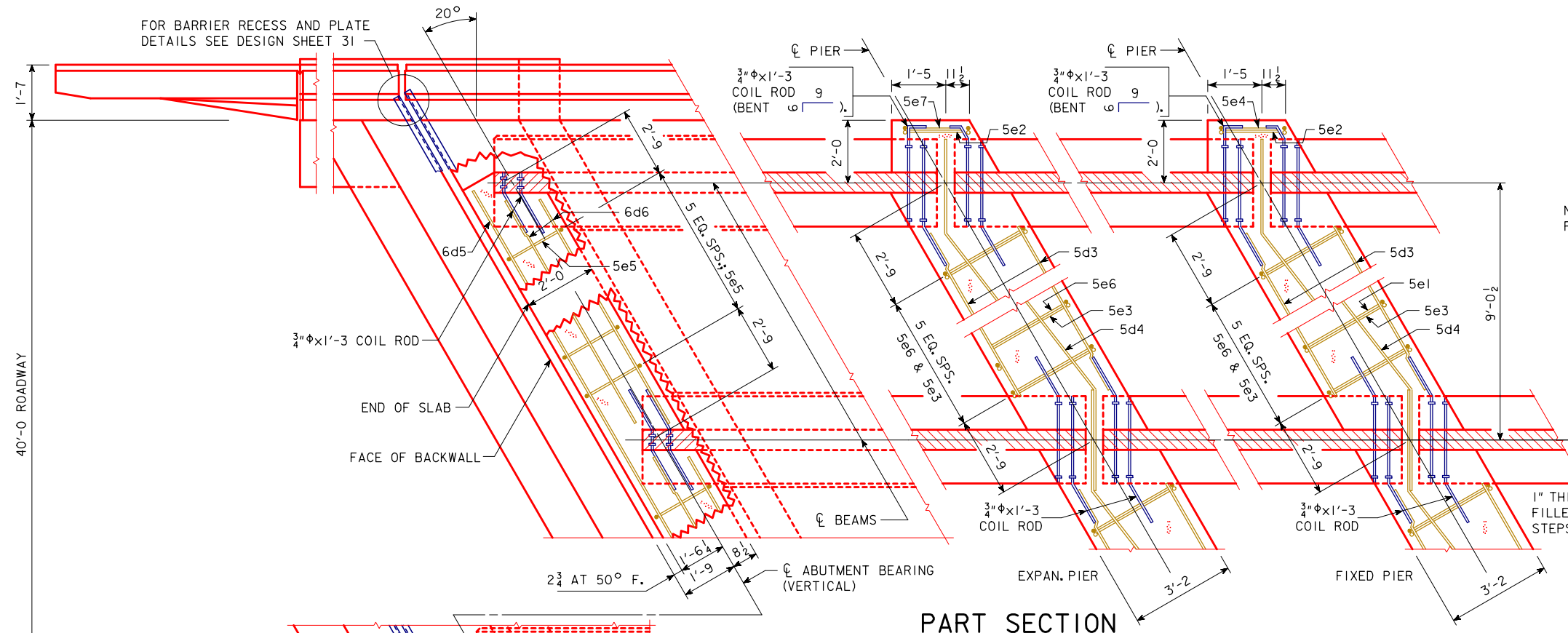
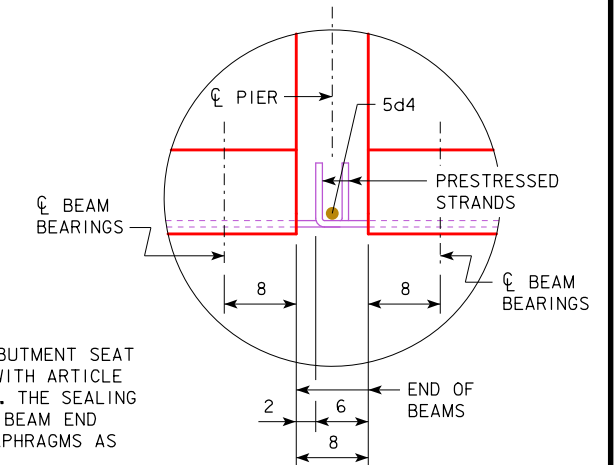
DESIGN SHEET NO. 14 OF 39 FILE NO. 31636 DESIGN NO. 220

CORRECTION 10-10 - CONCRETE SEALER ARTICLE 2403.21 D CHANGED TO ARTICLE 2403.03, P. 3.  
ENGLISHBTSTUBABUTMENTBRIDGES.DGN - 4548-BTCDE - THIS SHEET ISSUED 07-08.

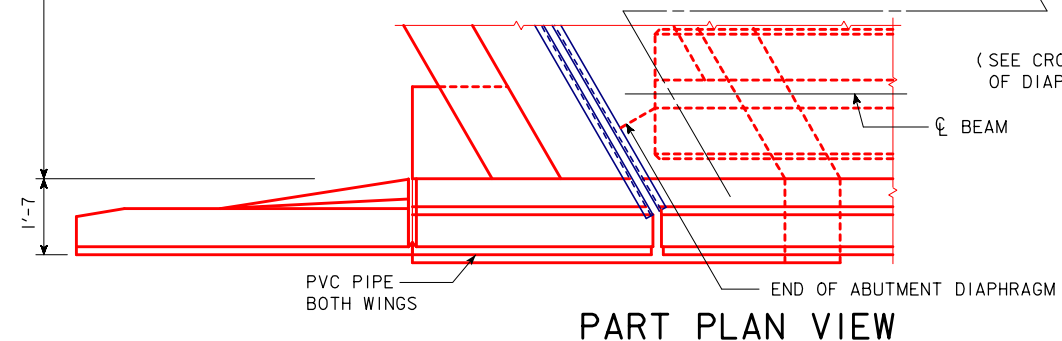


CONCRETE SEALER SHALL BE APPLIED TO THE ABUTMENT SEAT AND PRESTRESSED BEAM ENDS IN ACCORDANCE WITH ARTICLE 2403.03, P. 3, OF THE STANDARD SPECIFICATIONS. THE SEALING SHALL INCLUDE PORTIONS OF THE PRESTRESSED BEAM END THAT ARE NOT EMBEDDED IN THE ABUTMENT DIAPHRAGMS AS DETAILED ON THIS SHEET.

### CONCRETE SEALER LIMITS FOR PRESTRESSED BEAM



### PART PLAN TOP OF FIXED PIER DETAILS



DESIGN FOR 20° SKEW (R.A.)

**556'-0 X 40'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM E.B. BRIDGE**

141'-0 & 131'-0 END SPANS 142'-0 INTERIOR SPANS

**PART PLAN AND LONGITUDINAL SECTION**

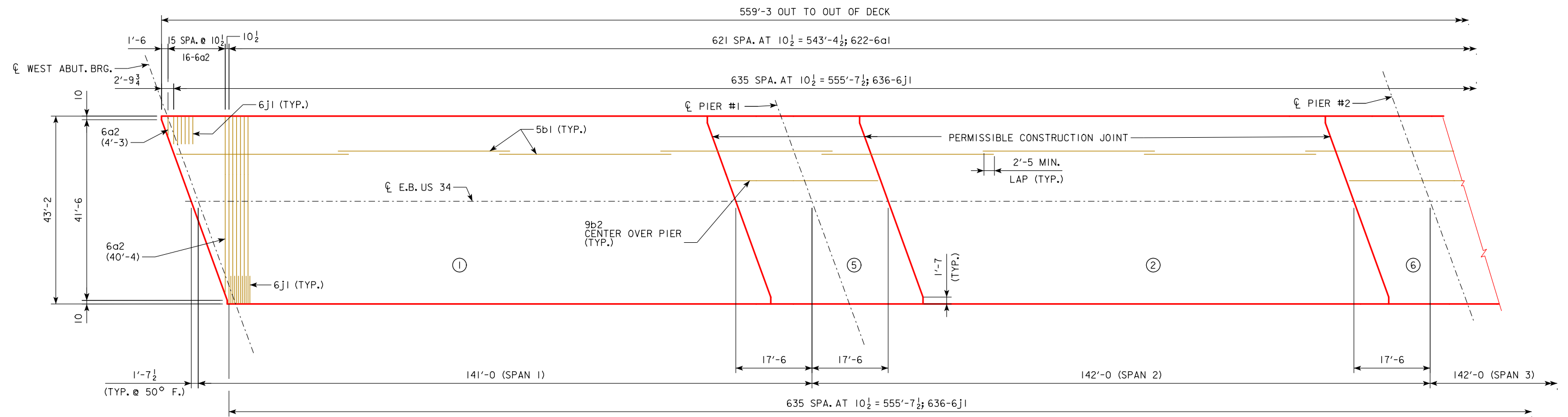
STATION 960+00.06, RT. 89.00' MARCH 2020

**HENRY COUNTY**

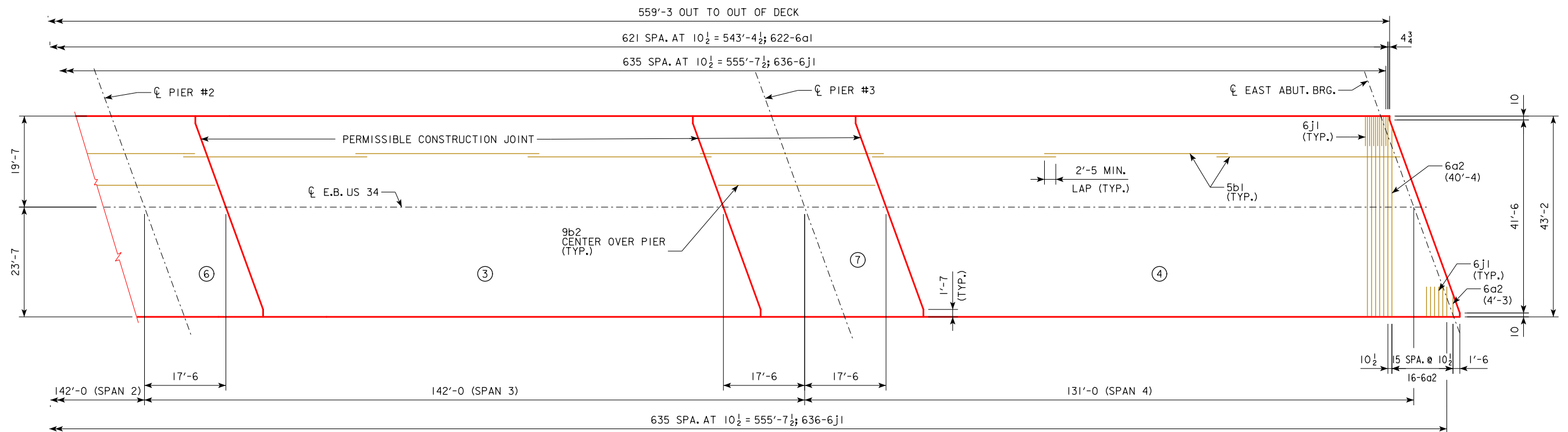
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 15 OF 39 FILE NO. 31636 DESIGN NO. 220





TOP DECK REINFORCING LAYOUT (SPAN 1 & SPAN 2)



TOP DECK REINFORCING LAYOUT (SPAN 3 & SPAN 4)

NOTE: CONCRETE DECK SHALL BE PLACED IN SECTIONS AND SEQUENCES INDICATED. PLACING THE CONCRETE DECK IN ONE CONTINUOUS POUR IS PROHIBITED AND WILL NOT BE CONSIDERED FOR APPROVAL AS AN ALTERNATE PROCEDURE. ALTERNATE PROCEDURES FOR PLACING DECK CONCRETE MAY BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF THE PROPOSED METHOD AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULTS. THE BRIDGE ENGINEER SHALL REVIEW ANY ALTERNATE PROCEDURES. THE COST OF ANY ADDITIONAL ANALYSIS AND PLAN MODIFICATIONS SHALL BE PAID FOR BY THE CONTRACTOR. THE ENGINEER SHALL DETERMINE IF A RETARDING ADMIXTURE IS REQUIRED TO MAINTAIN PLASTICITY OF THE CONCRETE DECK DURING PLACEMENT.

DESIGN FOR 20° SKEW (R.A.)

**556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE**

141'-0 & 131'-0 END SPANS 142'-0 INTERIOR SPANS

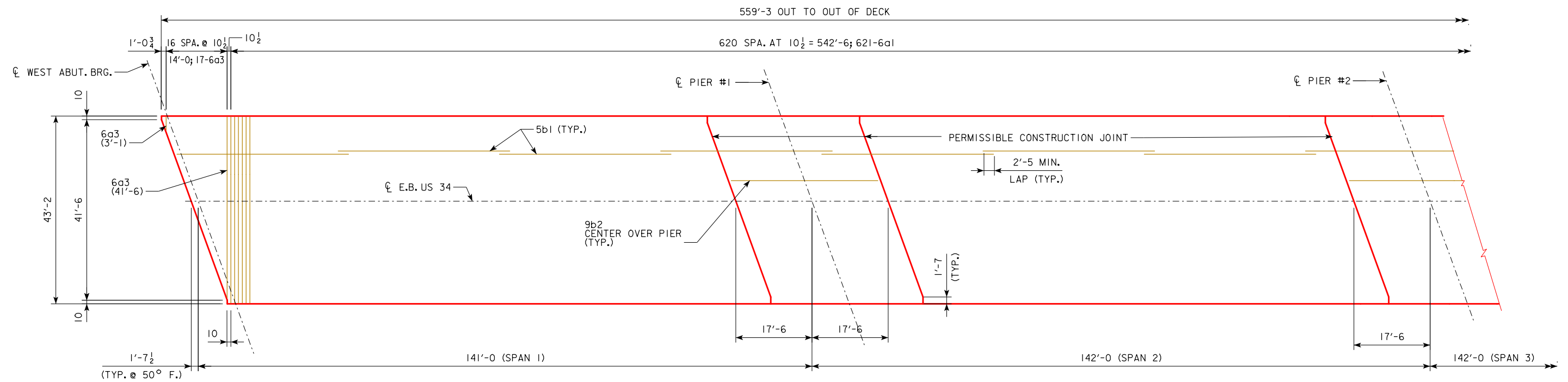
**SUPERSTRUCTURE DETAILS**

STATION 960+00.06, RT. 89.00' MARCH 2020

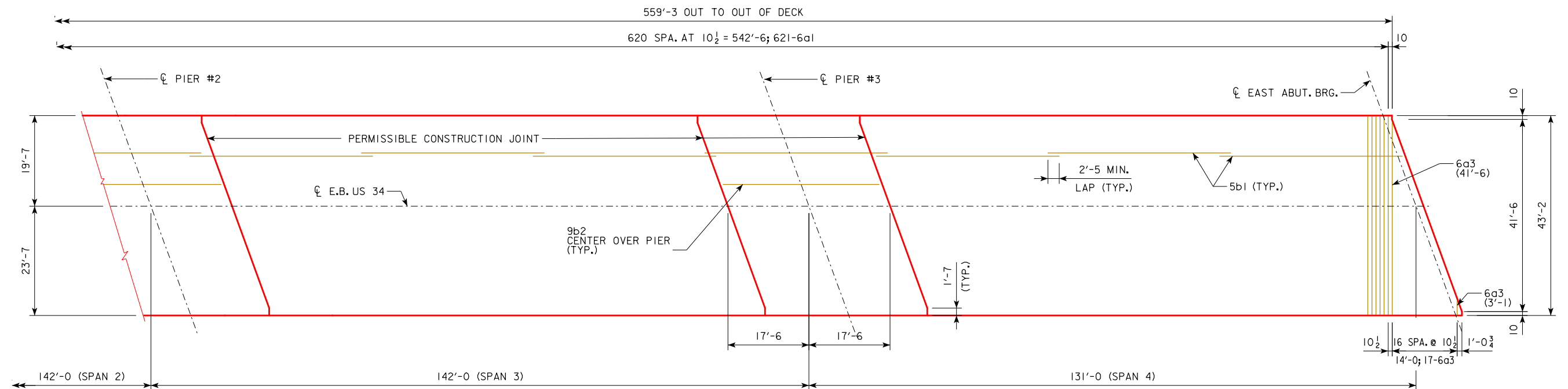
**HENRY COUNTY**

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 16 OF 39 FILE NO. 31636 DESIGN NO. 220



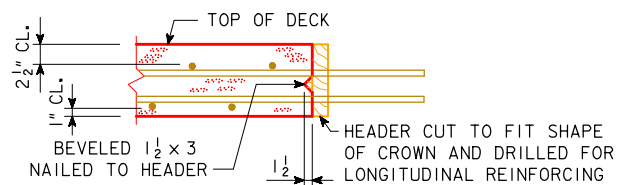
BOTTOM DECK REINFORCING LAYOUT (SPAN 1 & SPAN 2)



BOTTOM DECK REINFORCING LAYOUT (SPAN 3 & SPAN 4)

DESIGN FOR 20° SKEW (R.A.)  
556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE  
141'-0 & 131'-0 END SPANS 142'-0 INTERIOR SPANS  
SUPERSTRUCTURE DETAILS  
STATION 960+00.06, RT. 89.00' MARCH 2020  
HENRY COUNTY  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 17 OF 39 FILE NO. 31636 DESIGN NO. 220

REVISED 07-2015 - CHANGED CONCRETE PLACEMENT NOTE TO ACCOUNT FOR THE POSSIBLE ADDITION OF A RETARDING ADMIXTURE TO THE CONCRETE.  
ENGLISHBTSTUBAUTMENTBRIDGES.DGN - 4552-BTCODE - THIS SHEET ISSUED 07-08.



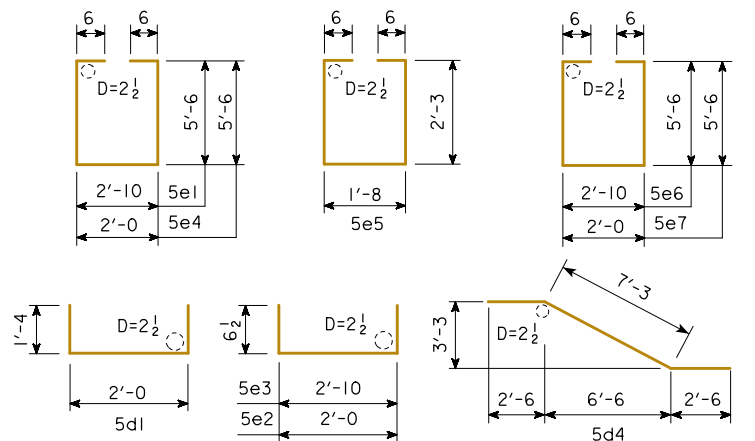
# PERMISSIBLE TRANSVERSE DECK CONSTRUCTION JOINT

## HIGH PERFORMANCE CONCRETE PLACEMENT QUANTITIES

LOCATION	QUANTITY
SECTION 1, DECK & ABUT. DIAPH.	146.3
SECTION 2, DECK	120.7
SECTION 3, DECK	120.7
SECTION 4, DECK & ABUT. DIAPH.	135.0
SECTION 5, DECK & PIER DIAPH.	64.6
SECTION 6, DECK & PIER DIAPH.	64.6
SECTION 7, DECK & PIER DIAPH.	64.6
TOTAL (CU. YDS.)	716.5

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

## REINFORCING BAR LIST - BRIDGE DECK

[illegible]

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

## BENT BAR DETAILS

DESIGN FOR 20° SKEW (R.A.)

556'-0" X 40'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

141'-0" & 131'-0" END SPANS      142'-0" INTERIOR SPANS

DECK, ABUT. & DIAPH. QUANTITIES

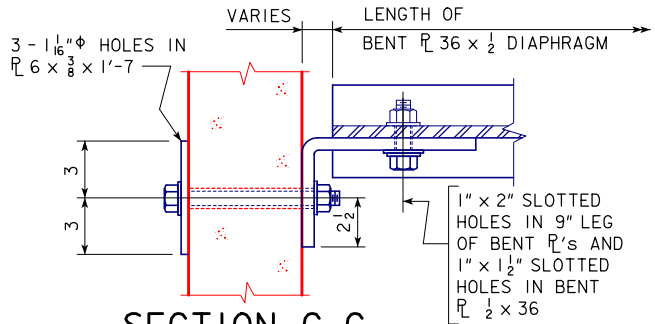
STATION 960+00.06, RT. 89.00'      MARCH 2020

HENRY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

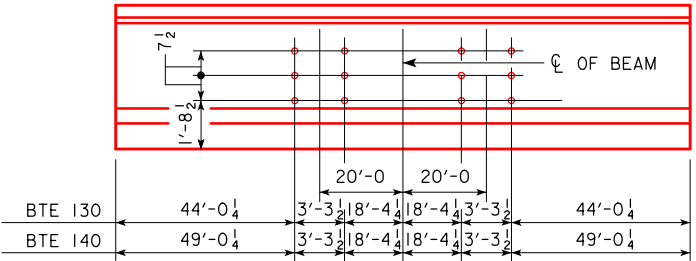
DESIGN SHEET NO. 18 OF 39      FILE NO. 31636      DESIGN NO. 220

ENGLISHBEAMS.DGN - I036-I-BTE - THIS SHEET ISSUED 06-14, SHEET 1 OF 2.



SECTION C-C

NOTE: SEE DESIGN SHEET 20 FOR LOCATION OF SECTION C-C.



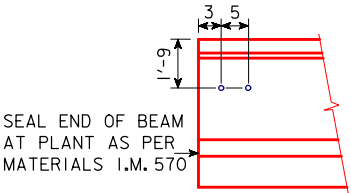
INTERMEDIATE DIAPHRAGM  
BOLT HOLE LOCATIONS

NOTES:

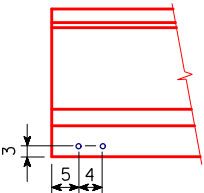
ALL DIAPHRAGM MATERIALS, INCLUDING BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED.  
SHOP DRAWINGS OF THE STEEL DIAPHRAGMS SHOWING LAYOUT AND DETAILS OF THE DIAPHRAGMS SHALL BE SUBMITTED FOR APPROVAL.  
ALL COSTS FOR FURNISHING AND INSTALLING STEEL INTERMEDIATE DIAPHRAGMS SHALL BE INCLUDED IN THE PRICE 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.

STRUCTURAL STEEL		
WEIGHT	19,537.9	LBS.

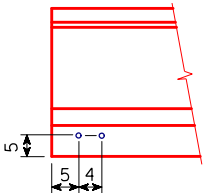
NOTE: STRUCTURAL STEEL WEIGHT IS INCLUDED ON THE SUMMARY QUANTITIES SHEET.



STUB ABUT.



FIXED PIER



EXPANSION PIER  
BEAM COIL TIE LOCATIONS

DESIGN FOR 20° SKEW (R.A.)

556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

141'-0 & 131'-0 END SPANS142'-0 INTERIOR SPANS

INTERMEDIATE DIAPHRAGMS

STATION 960+00.06, RT. 89.00'MARCH 2020

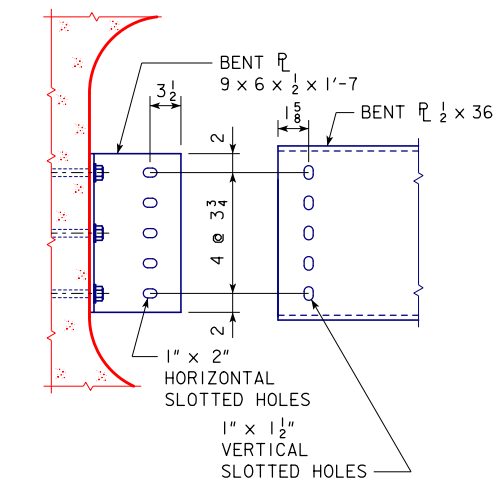
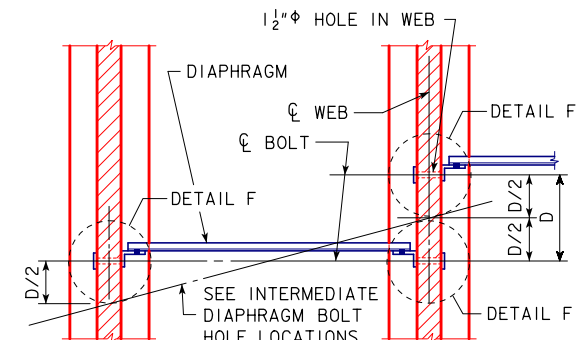
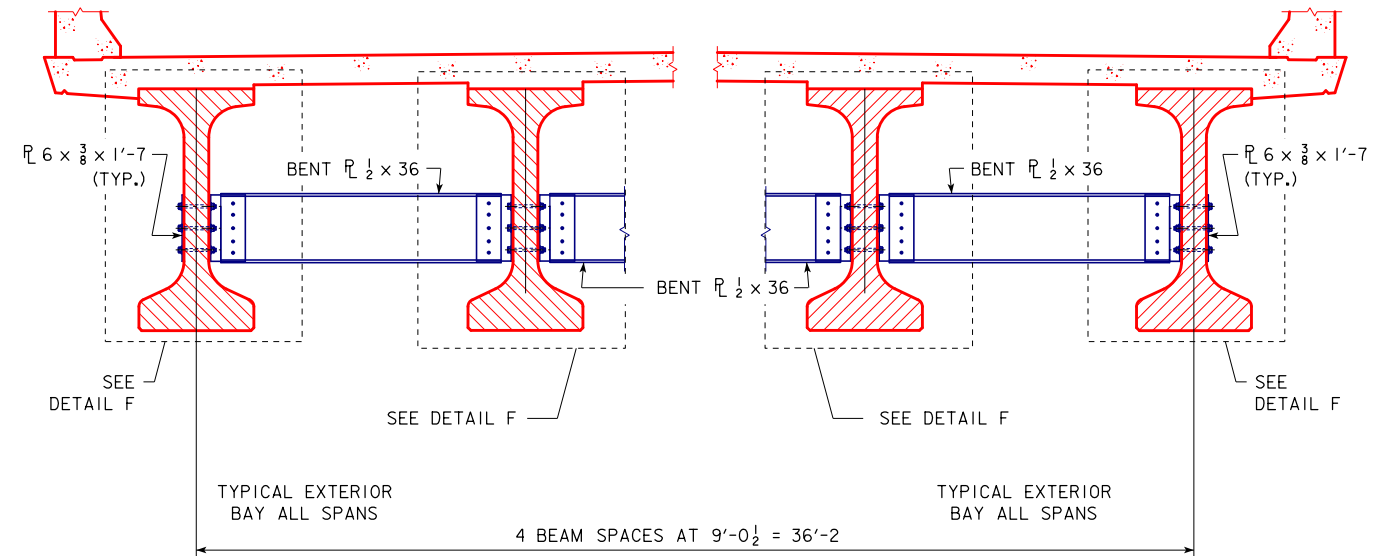
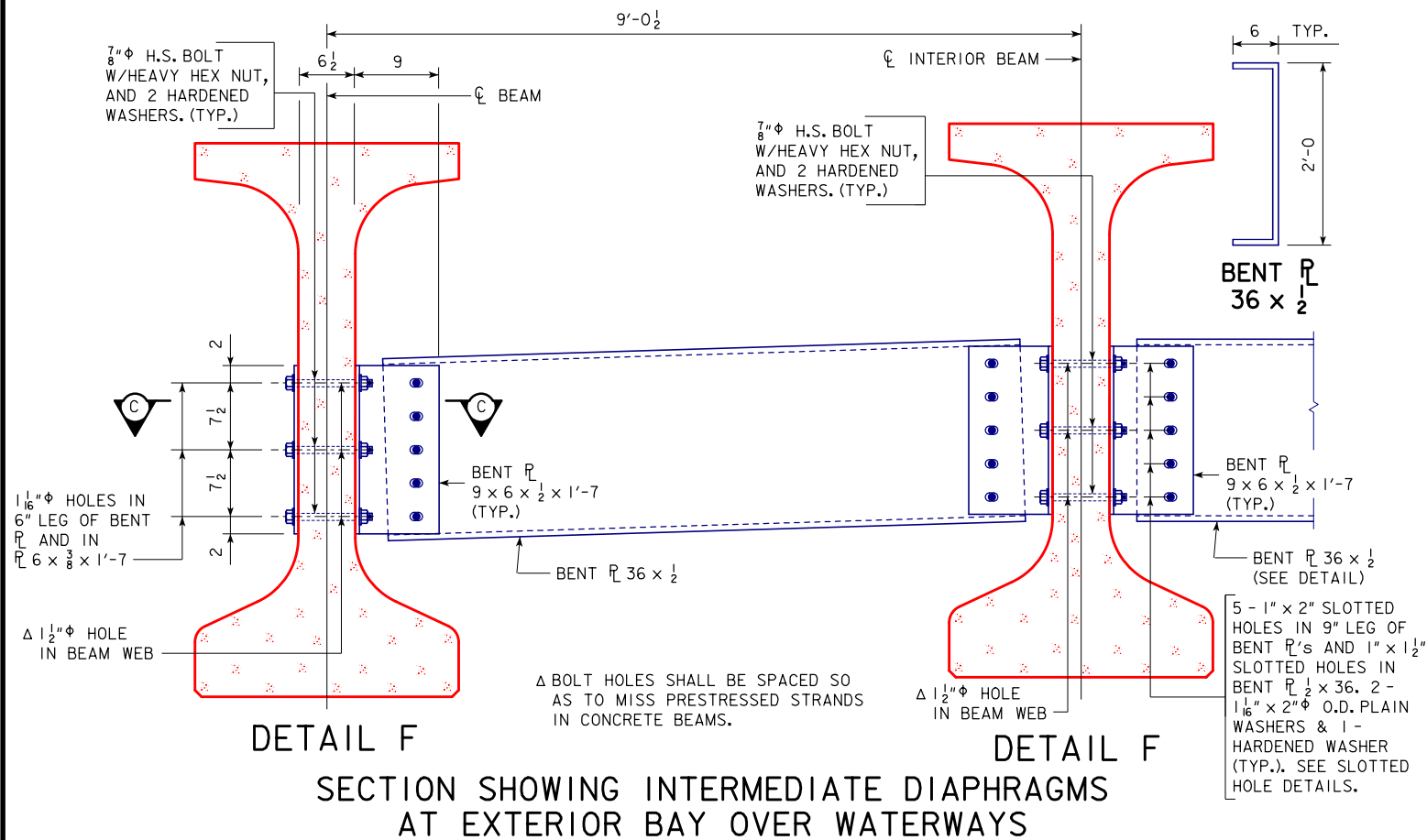
HENRY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 19 OF 39FILE NO. 31636DESIGN NO. 220



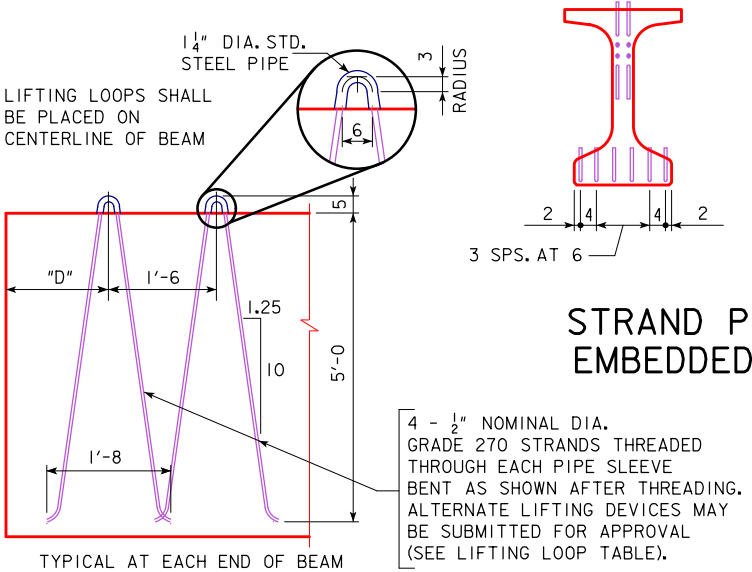
ENGLISHBEAMS.DGN - I036-2-BTE - THIS SHEET ISSUED 06-14. SHEET 2 OF 2.



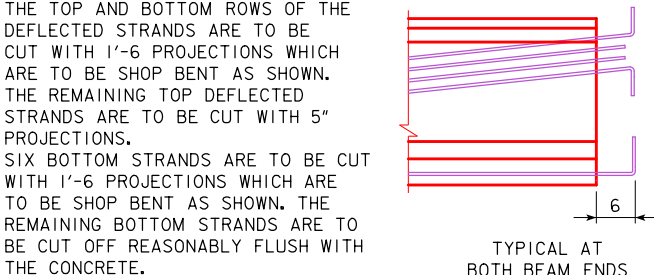
NOTE: SEE DESIGN SHEET 19 FOR SECTION C-C.

DESIGN FOR 20° SKEW (R.A.)  
**556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE**  
141'-0 & 131'-0 END SPANS 142'-0 INTERIOR SPANS  
**INTERMEDIATE DIAPHRAGMS**  
STATION 960+00.06, RT. 89.00' MARCH 2020  
**HENRY COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 20 OF 39 FILE NO. 31636 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.



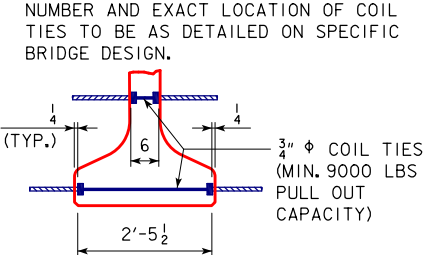
STRAND PROJECTION AT BEAM ENDS WHEN EMBEDDED IN CONCRETE END DIAPHRAGMS



LIFTING LOOP DETAIL

LIFTING LOOP AND OVERHANG TABLE				
BEAMS	LIFTING LOOPS EACH END	# OF STRANDS PER LOOP	D	BEAM OVERHANG (FT)
BTEI30	2	4	9'-3	16
BTEI40	2	4	9'-3	16

LIFTING LOOPS SHALL CARRY LOADS EQUALLY.



COIL TIE DETAIL

BTE BEAM DATA																		
BTE BEAM	SPAN LENGTH ℄ BEARING	OVERALL BEAM LENGTH (L)	CONCRETE STRENGTH		STRAND SIZE DIA. (in)	NO. OF STRAND		TOTAL INITIAL PRESTRESS kips ③	HOLD DOWN FORCE-kips	CAMBER (in)		DEFLECTION (in) Δ <sub>0</sub>		PERMISSIBLE MAXIMUM SPACING	WEIGHT (TONS)	CONCRETE (CU YD.)	REINFORCING STEEL (WEIGHT-LBS)	
			f'ci (ksi)	f'c (ksi)		STRAIGHT	DEFLECTED					AT RELEASE	AFTER LOSSES					IMMEDIATE① (ELASTIC) Δ <sub>i</sub>
										STEEL DIAPHRAGM	STEEL DIAPHRAGM							
														HL-93 LOADING				
													STEEL DIAPHRAGM					
BTEI30	130'-0	131'-4	6.50	7.50	0.60	36	6	1788	21.8	2.59	4.55	2.71	0.68	9'-3	55.2	27.3	3647	
BTEI40	140'-0	141'-4	7.50	8.50	0.60	40	8	2042	26.0	2.97	5.21	3.42	0.85	9'-3	59.4	29.3	3897	

- 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  $\frac{L}{4}$  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  $\frac{L}{4}$  OF SPAN,  $\Delta_0$ , DUE TO WEIGHT OF SLAB AND DIAPHRAGMS FOR DETAILING PURPOSE:
- (A)  $\Delta_0 = \Delta_i + \Delta_T$  FOR SIMPLE SPAN.
- (B)  $\Delta_0 = \Delta_i + \frac{3}{4}\Delta_T$  FOR END SPANS OF CONTINUOUS BRIDGE.
- (C)  $\Delta_0 = \Delta_i + \frac{1}{2}\Delta_T$  FOR INTERIOR SPANS OF CONTINUOUS BRIDGE.
- ③ TOTAL INITIAL PRESTRESS IS BASED ON 72.6%  $f'_s$ ,  $f'_s = 270$  ksi. AND  $A_s = 0.217$  in<sup>2</sup>.

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.

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.
- IF SOLE PLATE IS REQUIRED FOR BEARING, SOLE PLATE IS TO BE SET IN FORMS WHEN BEAM IS CAST AND FORMED OUT BELOW TO EXCLUDE CONCRETE AS DETAILED ON THE BEARING SHEET.
- IF STUB ABUTMENTS ARE USED, ALL STRANDS AT THE ENDS OF BEAMS AT STUB ABUTMENTS SHALL BE CUT OFF REASONABLY FLUSH WITH THE CONCRETE.
- WHEN EXPANSION JOINTS ARE USED, CONCRETE SEALER SHALL BE APPLIED TO THE PRESTRESSED BEAM END SECTIONS. 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.

ALTERNATE BAR NOTES:

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

REINF. BAR LIST						BENT BAR DETAILS	
BEAM		BTEI30		BTEI40		NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT D = PIN DIAMETER FOR BENDING (UNLESS OTHERWISE SHOWN) #4 BAR D= 2" #5 BAR D= 2 1/8" #6 BAR D= 4 1/2"	
BAR	SHAPE	NO.	LENGTH	NO.	LENGTH		
5a1		12	28'-10	12	33'-10		4h1
5a2		12	40'-0	12	40'-0		4e1
5b1		95	12'-2	105	12'-2		5b2 (ALTERNATE)
6b3		56	6'-6	56	6'-6		5b1 (ALTERNATE)
6b4		12	5'-10	12	5'-10		4d1 (ALTERNATE)
4c1		161	2'-7	171	2'-7		
4d1		125	6'-5	135	6'-5		
4e1		34	3'-2	34	3'-2		
4h1		8	8'-0	8	8'-0		

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

NOTE:  
MODIFIED STIRRUP  
EXTENSIONS FOR  
6b3 BARS.

DESIGN FOR 20° SKEW (R.A.)

556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

141'-0 & 131'-0 END SPANS 142'-0 INTERIOR SPANS

BTE BEAM DETAILS

STATION 960+00.06, RT. 89.00' MARCH 2020

HENRY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 21 OF 39 FILE NO. 31636 DESIGN NO. 220

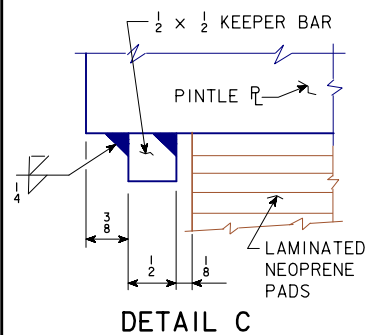
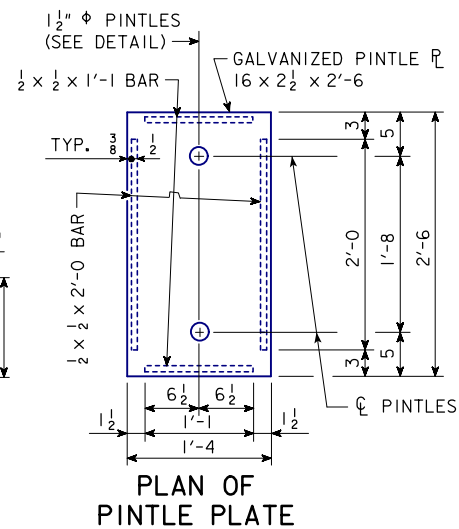
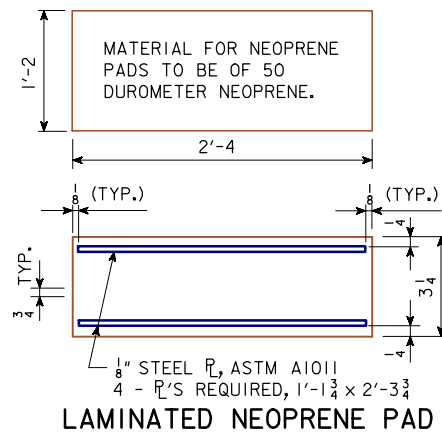
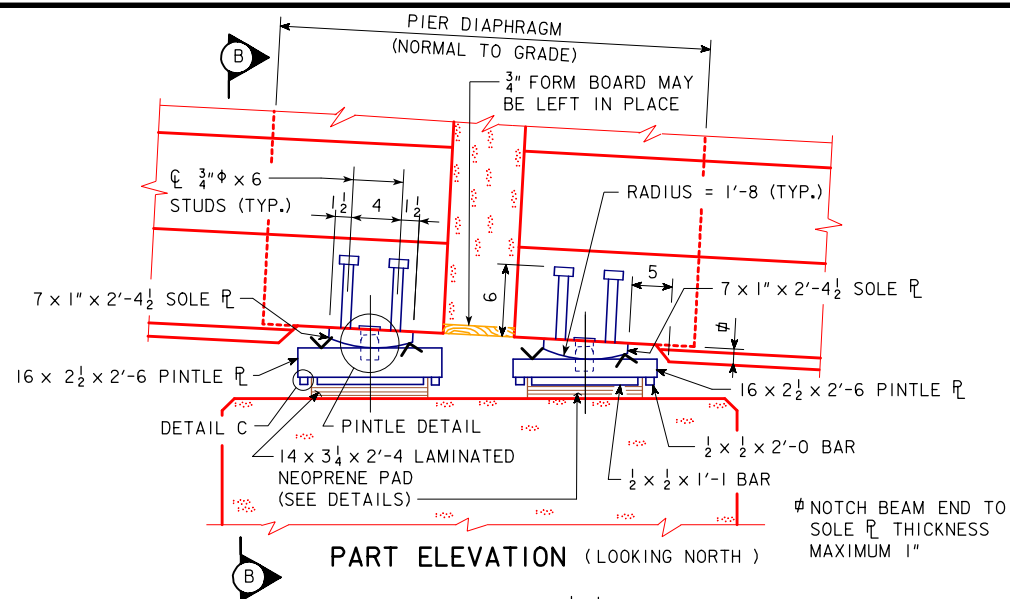






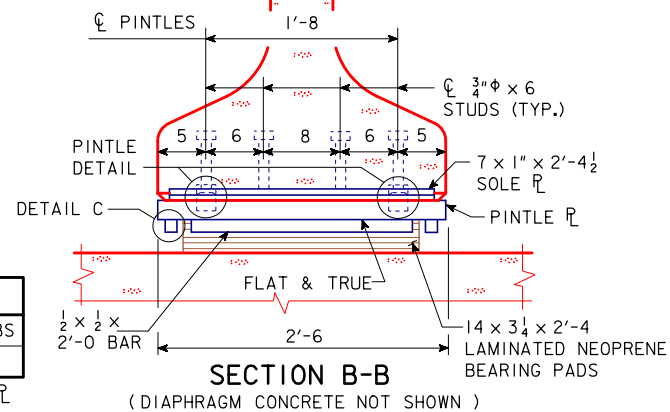


CORRECTION 04-14 - ADDED WEIGHT TABLE & TITLES/DESCRIPTIONS TO AGREE WITH SUMMARY QUANTITY SHEET. ADDED NOTE REFERRING TO SUMMARY QUANTITIES SHEET.  
ENGLISHBEAMS.DGN - 4541H - THIS SHEET ISSUED 03-08.



STRUCTURAL STEEL	
WEIGHT	6,910.0 LBS

DOES NOT INCLUDE CURVED SOLE R



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

COMPLETED PRIOR TO GALVANIZING. THE SURFACE OF THE PINTLE PLATE IN CONTACT WITH THE LAMINATED NEOPRENE PAD SHALL BE FREE OF PROJECTIONS DUE TO THE GALVANIZING

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

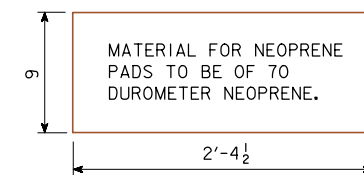
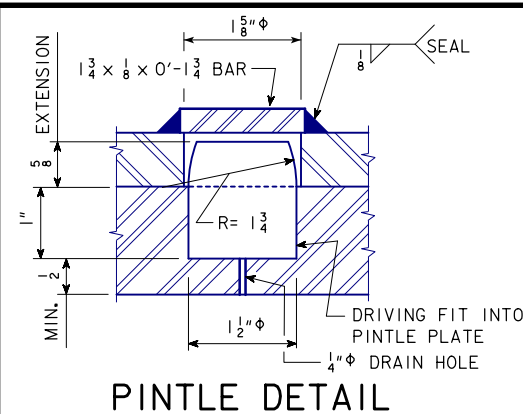
SOLE PLATES ARE TO BE SET IN FORMS WHEN BEAMS ARE CAST AND THE BOTTOM OF BEAMS FORMED OUT AS SHOWN TO EXCLUDE CONCRETE

SELF PLATES SHALL COMPLY WITH ONE OF THE FOLLOWING:

SOLE PLATES SHALL COMPLY WITH  
ASTM A514 GRADE B

ASTM A709 GRADE HPS 70W

ASTM A709 GRADE HPS 70W EXPANSION PIER  
LAMINATED NEOPRENE PAD / CURVED SOLE PLATE ASSEMBLY



NOTE:

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

FIXED PIER

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

DESIGN FOR 20° SKEW (R.A.)

556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

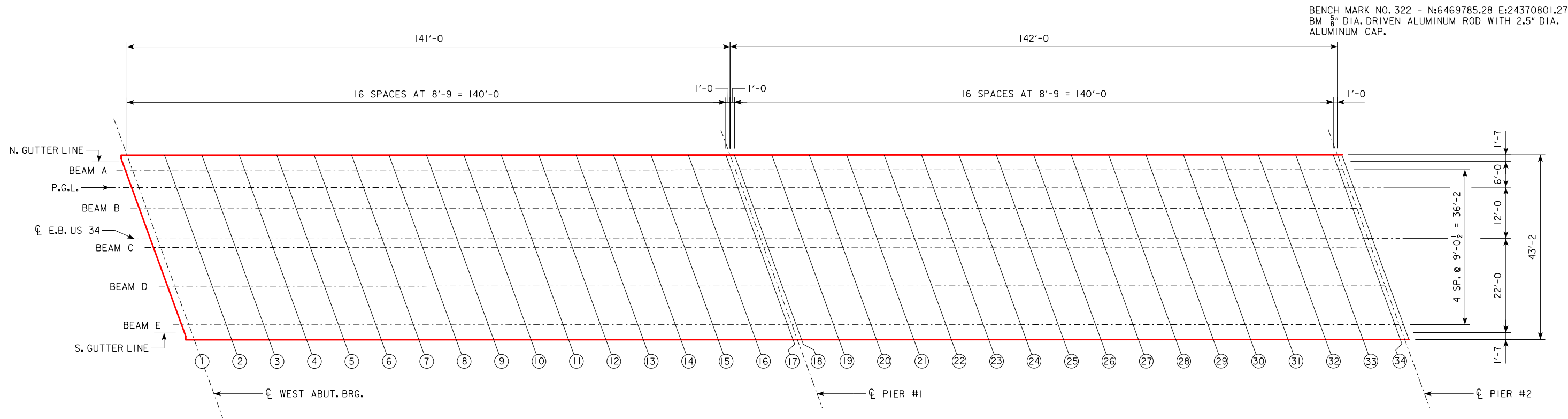
14'-0" & 13'-0" END SPANS                      142'-0" INTERIOR SPANS

## PIER BEARING DETAILS

STATION 960+00.06, RT. 89.00' MARCH 2020

HENRY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION



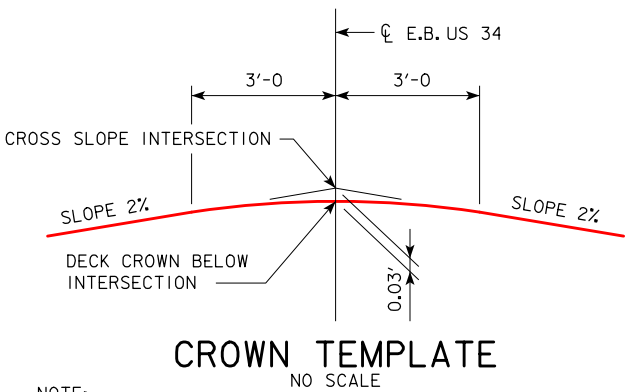
TOP OF SLAB PLAN (SPAN 1 & SPAN 2)

TOP OF SLAB ELEVATIONS

	CL WEST ABUT.BRG.																CL PIER #1 BEARING										
LOCATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
NORTH GUTTER LINE	597.64	597.51	597.39	597.26	597.13	597.00	596.87	596.75	596.62	596.49	596.36	596.23	596.11	595.98	595.85	595.72	595.59	595.56	595.44	595.31	595.18	595.05	594.92	594.80	594.67	594.54	594.41
BEAM A	597.67	597.54	597.41	597.29	597.16	597.03	596.90	596.77	596.65	596.52	596.39	596.26	596.13	596.01	595.88	595.75	595.62	595.59	595.46	595.34	595.21	595.08	594.95	594.82	594.70	594.57	594.44
BEAM B	597.80	597.68	597.55	597.42	597.29	597.16	597.04	596.91	596.78	596.65	596.52	596.39	596.27	596.14	596.01	595.88	595.75	595.72	595.60	595.47	595.34	595.21	595.08	594.96	594.83	594.70	594.57
CL E.B. US 34	597.88	597.75	597.62	597.49	597.37	597.24	597.11	596.98	596.85	596.73	596.60	596.47	596.34	596.21	596.08	595.96	595.83	595.80	595.67	595.54	595.41	595.29	595.16	595.03	594.90	594.77	594.65
BEAM C	597.85	597.72	597.60	597.47	597.34	597.21	597.08	596.96	596.83	596.70	596.57	596.44	596.31	596.19	596.06	595.93	595.80	595.77	595.64	595.52	595.39	595.26	595.13	595.00	594.88	594.75	594.62
BEAM D	597.63	597.50	597.37	597.24	597.11	596.99	596.86	596.73	596.60	596.47	596.35	596.22	596.09	595.96	595.83	595.71	595.58	595.55	595.42	595.29	595.16	595.04	594.91	594.78	594.65	594.52	594.40
BEAM E	597.40	597.27	597.14	597.01	596.89	596.76	596.63	596.50	596.37	596.25	596.12	595.99	595.86	595.73	595.60	595.48	595.35	595.32	595.19	595.06	594.93	594.81	594.68	594.55	594.42	594.29	594.17
SOUTH GUTTER LINE	597.35	597.22	597.09	596.97	596.84	596.71	596.58	596.45	596.32	596.20	596.07	595.94	595.81	595.68	595.56	595.43	595.30	595.27	595.14	595.01	594.89	594.76	594.63	594.50	594.37	594.25	594.12

TOP OF SLAB ELEVATIONS

							CL PIER #2 BEARING	LOCATION
28	29	30	31	32	33	34		
594.28	594.15	594.03	593.90	593.77	593.64	593.51		NORTH GUTTER LINE
594.31	594.18	594.05	593.93	593.80	593.67	593.54		BEAM A
594.44	594.32	594.19	594.06	593.93	593.80	593.67		BEAM B
594.52	594.39	594.26	594.13	594.01	593.88	593.75		CL E.B. US 34
594.49	594.36	594.24	594.11	593.98	593.85	593.72		BEAM C
594.27	594.14	594.01	593.88	593.75	593.63	593.50		BEAM D
594.04	593.91	593.78	593.65	593.53	593.40	593.27		BEAM E
593.99	593.86	593.73	593.61	593.48	593.35	593.22		SOUTH GUTTER LINE



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

DESIGN FOR 20° SKEW (R.A.)

**556'-0" X 40'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE**

141'-0" & 131'-0" END SPANS 142'-0" INTERIOR SPANS

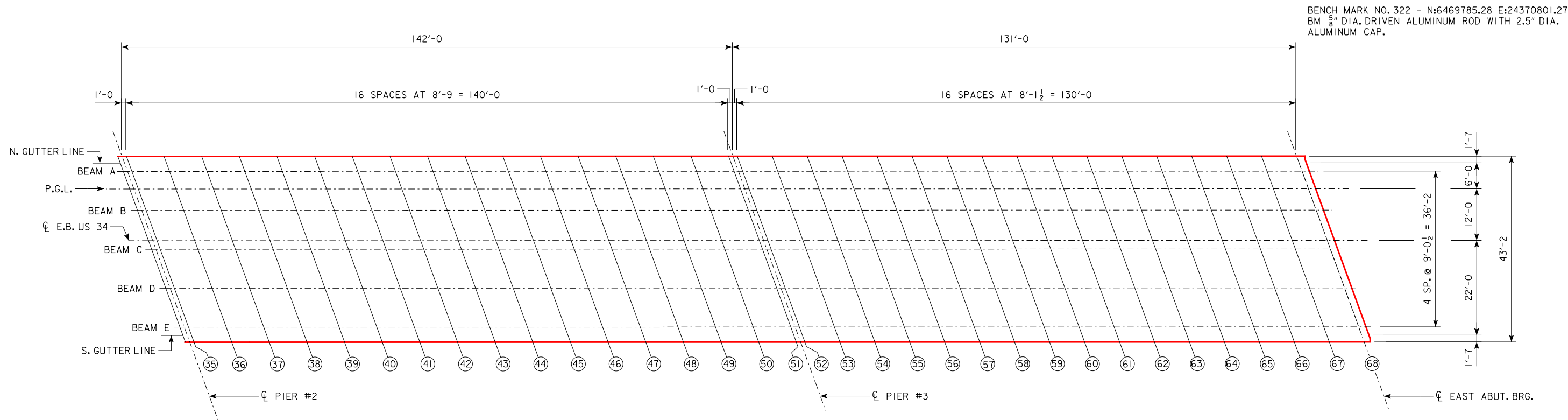
**TOP OF SLAB ELEVATIONS**

STATION 960+00.06, RT. 89.00' MARCH 2020

**HENRY COUNTY**

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 26 OF 39 FILE NO. 31636 DESIGN NO. 220



TOP OF SLAB PLAN (SPAN 3 & SPAN 4)

TOP OF SLAB ELEVATIONS

	CL PIER #2 BEARING															CL PIER #3 BEARING											
LOCATION	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61
NORTH GUTTER LINE	593.48	593.36	593.23	593.10	592.97	592.84	592.72	592.59	592.46	592.33	592.20	592.08	591.95	591.82	591.69	591.56	591.43	591.41	591.29	591.17	591.05	590.93	590.81	590.69	590.57	590.45	590.33
BEAM A	593.51	593.38	593.26	593.13	593.00	592.87	592.74	592.62	592.49	592.36	592.23	592.10	591.98	591.85	591.72	591.59	591.46	591.43	591.31	591.20	591.08	590.96	590.84	590.72	590.60	590.48	590.36
BEAM B	593.65	593.52	593.39	593.26	593.13	593.00	592.88	592.75	592.62	592.49	592.36	592.24	592.11	591.98	591.85	591.72	591.60	591.57	591.45	591.33	591.21	591.09	590.97	590.85	590.73	590.61	590.50
CL E.B. US 34	593.72	593.59	593.46	593.34	593.21	593.08	592.95	592.82	592.70	592.57	592.44	592.31	592.18	592.05	591.93	591.80	591.67	591.64	591.52	591.40	591.28	591.17	591.05	590.93	590.81	590.69	590.57
BEAM C	593.69	593.57	593.44	593.31	593.18	593.05	592.93	592.80	592.67	592.54	592.41	592.28	592.16	592.03	591.90	591.77	591.64	591.61	591.50	591.38	591.26	591.14	591.02	590.90	590.78	590.66	590.54
BEAM D	593.47	593.34	593.21	593.08	592.96	592.83	592.70	592.57	592.44	592.32	592.19	592.06	591.93	591.80	591.68	591.55	591.42	591.39	591.27	591.15	591.03	590.91	590.80	590.68	590.56	590.44	590.32
BEAM E	593.24	593.11	592.98	592.86	592.73	592.60	592.47	592.34	592.22	592.09	591.96	591.83	591.70	591.57	591.45	591.32	591.19	591.16	591.04	590.92	590.80	590.69	590.57	590.45	590.33	590.21	590.09
SOUTH GUTTER LINE	593.19	593.06	592.94	592.81	592.68	592.55	592.42	592.29	592.17	592.04	591.91	591.78	591.65	591.53	591.40	591.27	591.14	591.11	590.99	590.87	590.76	590.64	590.52	590.40	590.28	590.16	590.04

TOP OF SLAB ELEVATIONS

						CL EAST ABUT. BRG.	LOCATION
62	63	64	65	66	67	68	
590.22	590.10	589.98	589.86	589.74	589.62	589.50	NORTH GUTTER LINE
590.24	590.13	590.01	589.89	589.77	589.65	589.53	BEAM A
590.38	590.26	590.14	590.02	589.90	589.78	589.66	BEAM B
590.45	590.33	590.21	590.09	589.98	589.86	589.74	CL E.B. US 34
590.42	590.31	590.19	590.07	589.95	589.83	589.71	BEAM C
590.20	590.08	589.96	589.84	589.72	589.61	589.49	BEAM D
589.97	589.85	589.73	589.61	589.50	589.38	589.26	BEAM E
589.92	589.80	589.68	589.57	589.45	589.33	589.21	SOUTH GUTTER LINE

NOTE:  
SEE DESIGN SHEET 26 FOR CROWN TEMPLATE DETAIL.

DESIGN FOR 20° SKEW (R.A.)  
**556'-0" X 40'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE**  
141'-0" & 131'-0" END SPANS 142'-0" INTERIOR SPANS  
**TOP OF SLAB ELEVATIONS**  
STATION 960+00.06, RT. 89.00' MARCH 2020  
**HENRY COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 27 OF 39 FILE NO. 31636 DESIGN NO. 220

BENCH MARK NO. 322 - N:6469785.28 E:24370801.27  
BM 5/8" DIA. DRIVEN ALUMINUM ROD WITH 2.5" DIA.  
ALUMINUM CAP.

TABLE OF BEAM LINE HAUNCH ELEVATIONS

	CL WEST ABUT.BRG.																CL PIER #1 BEARINGS										
LOCATION	LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6	LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12	LINE 13	LINE 14	LINE 15	LINE 16	LINE 17	LINE 18	LINE 19	LINE 20	LINE 21	LINE 22	LINE 23	LINE 24	LINE 25	LINE 26	LINE 27
BEAM A	597.00	596.94	596.88	596.81	596.73	596.64	596.54	596.43	596.31	596.18	596.03	595.87	595.70	595.52	595.34	595.15	594.95	594.93	594.86	594.79	594.72	594.64	594.55	594.45	594.34	594.21	594.08
BEAM B	597.14	597.07	597.01	596.94	596.86	596.77	596.67	596.56	596.44	596.31	596.16	596.00	595.84	595.66	595.47	595.28	595.09	595.06	594.99	594.92	594.85	594.77	594.68	594.58	594.47	594.35	594.21
BEAM C	597.19	597.12	597.06	596.99	596.91	596.82	596.72	596.61	596.49	596.36	596.21	596.05	595.88	595.71	595.52	595.33	595.14	595.11	595.04	594.97	594.90	594.82	594.73	594.63	594.52	594.39	594.26
BEAM D	596.96	596.90	596.83	596.76	596.68	596.60	596.50	596.39	596.27	596.13	595.99	595.83	595.66	595.48	595.30	595.10	594.91	594.88	594.82	594.75	594.67	594.59	594.50	594.40	594.29	594.17	594.04
BEAM E	596.73	596.67	596.60	596.53	596.45	596.37	596.27	596.16	596.04	595.90	595.76	595.60	595.43	595.25	595.07	594.88	594.68	594.65	594.59	594.52	594.44	594.36	594.27	594.17	594.06	593.94	593.81

TABLE OF BEAM LINE HAUNCH ELEVATIONS

						CL PIER #2 BEARING	
LINE 28	LINE 29	LINE 30	LINE 31	LINE 32	LINE 33	LINE 34	LOCATION
593.93	593.78	593.61	593.44	593.25	593.07	592.88	BEAM A
594.07	593.91	593.74	593.57	593.39	593.20	593.01	BEAM B
594.12	593.96	593.79	593.62	593.43	593.25	593.06	BEAM C
593.89	593.73	593.57	593.39	593.21	593.02	592.83	BEAM D
593.66	593.50	593.34	593.16	592.98	592.79	592.60	BEAM E

MISCELLANEOUS DATA TABLE

	BEAM LINE	CL WEST ABUT.BRG.																	CL PIER #1 BEARING											
		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			
ANTICIPATED DEFLECTION DUE TO SLAB (IN.)	ALL	0	$\frac{13}{16}$	$1\frac{9}{16}$	$2\frac{1}{4}$	$2\frac{13}{16}$	$3\frac{5}{16}$	$3\frac{11}{16}$	$3\frac{7}{8}$	$3\frac{15}{16}$	$3\frac{7}{8}$	$3\frac{11}{16}$	$3\frac{5}{16}$	$2\frac{13}{16}$	$2\frac{1}{4}$	$1\frac{9}{16}$	$\frac{13}{16}$	0	0	$\frac{3}{4}$	$1\frac{7}{16}$	$2\frac{1}{8}$	$2\frac{11}{16}$	$3\frac{1}{8}$	$3\frac{1}{2}$	$3\frac{11}{16}$	$3\frac{3}{4}$			
CROSS SLOPE ADJUSTMENTS (IN.)	ALL	$\frac{5}{16}$																												
ALLOWABLE FIELD HAUNCH IN. & (FT.)	MIN.	ALL	$\frac{1}{4}$ (0.021)	$\frac{1}{4}$ (0.021)	$-\frac{3}{16}$ (-0.016)											$\frac{1}{4}$ (0.021)	$\frac{1}{4}$ (0.021)	$\frac{1}{4}$ (0.021)	$\frac{1}{4}$ (0.021)	$-\frac{3}{16}$ (-0.016)										
	MAX.	ALL	$3\frac{1}{4}$ (0.271)	$3\frac{1}{4}$ (0.271)	$2\frac{1}{2}$ (0.208)											$3\frac{1}{4}$ (0.271)	$3\frac{1}{4}$ (0.271)	$3\frac{1}{4}$ (0.271)	$3\frac{1}{4}$ (0.271)	$2\frac{1}{2}$ (0.208)										

MISCELLANEOUS DATA TABLE

							CL PIER #2 BEARING	BEAM LINE	
LINE 27	LINE 28	LINE 29	LINE 30	LINE 31	LINE 32	LINE 33	LINE 34		
3 11/16	3 1/2	3 1/8	2 11/16	2 1/8	1 7/16	3/4	0	ALL	ANTICIPATED DEFLECTION DUE TO SLAB (IN.)
5/16								ALL	CROSS SLOPE ADJUSTMENTS (IN.)
-3/16 (-0.016)						1/4 (0.021)	1/4 (0.021)	MIN.	ALL
2 1/2 (0.208)						3 1/4 (0.271)	3 1/4 (0.271)	MAX.	ALL

DESIGN FOR 20° SKEW (R.A.)

556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

141'-0 & 131'-0 END SPANS142'-0 INTERIOR SPANS

HAUNCH DETAILS

STATION 960+00.06, RT. 89.00'MARCH 2020

HENRY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 28 OF 39FILE NO. 31636DESIGN NO. 220



BENCH MARK NO. 322 - N:6469785.28 E:24370801.27  
BM 5/8" DIA. DRIVEN ALUMINUM ROD WITH 2.5" DIA.  
ALUMINUM CAP.

TABLE OF BEAM LINE HAUNCH ELEVATIONS																											
	CL PIER #2 BEARING															CL PIER #3 BEARING											
LOCATION	LINE 35	LINE 36	LINE 37	LINE 38	LINE 39	LINE 40	LINE 41	LINE 42	LINE 43	LINE 44	LINE 45	LINE 46	LINE 47	LINE 48	LINE 49	LINE 50	LINE 51	LINE 52	LINE 53	LINE 54	LINE 55	LINE 56	LINE 57	LINE 58	LINE 59	LINE 60	LINE 61
BEAM A	592.85	592.78	592.71	592.64	592.56	592.47	592.37	592.26	592.13	592.00	591.85	591.70	591.53	591.36	591.17	590.99	590.80	590.77	590.70	590.63	590.56	590.48	590.39	590.30	590.19	590.08	589.95
BEAM B	592.98	592.91	592.84	592.77	592.69	592.60	592.50	592.39	592.27	592.13	591.99	591.83	591.66	591.49	591.31	591.12	590.93	590.90	590.83	590.76	590.69	590.61	590.52	590.43	590.32	590.21	590.09
BEAM C	593.03	592.96	592.89	592.82	592.74	592.65	592.55	592.44	592.32	592.18	592.04	591.88	591.71	591.54	591.36	591.17	590.98	590.95	590.88	590.81	590.74	590.66	590.57	590.48	590.37	590.26	590.13
BEAM D	592.80	592.74	592.67	592.59	592.51	592.42	592.32	592.21	592.09	591.96	591.81	591.65	591.49	591.31	591.13	590.94	590.75	590.72	590.66	590.59	590.51	590.43	590.35	590.25	590.15	590.03	589.91
BEAM E	592.57	592.51	592.44	592.37	592.28	592.19	592.09	591.98	591.86	591.73	591.58	591.43	591.26	591.08	590.90	590.71	590.52	590.49	590.43	590.36	590.28	590.21	590.12	590.02	589.92	589.80	589.68

TABLE OF BEAM LINE HAUNCH ELEVATIONS							
						CL EAST ABUT. BEARING	
LINE 62	LINE 63	LINE 64	LINE 65	LINE 66	LINE 67	LINE 68	LOCATION
589.82	589.68	589.53	589.37	589.20	589.03	588.86	BEAM A
589.95	589.81	589.66	589.50	589.34	589.17	589.00	BEAM B
590.00	589.86	589.71	589.55	589.38	589.22	589.04	BEAM C
589.78	589.63	589.48	589.32	589.16	588.99	588.82	BEAM D
589.55	589.40	589.25	589.10	588.93	588.76	588.59	BEAM E

MISCELLANEOUS DATA TABLE																												
	BEAM LINE		CL PIER #2 BEARING															CL PIER #3 BEARING										
			LINE 35	LINE 36	LINE 37	LINE 38	LINE 39	LINE 40	LINE 41	LINE 42	LINE 43	LINE 44	LINE 45	LINE 46	LINE 47	LINE 48	LINE 49	LINE 50	LINE 51	LINE 52	LINE 53	LINE 54	LINE 55	LINE 56	LINE 57	LINE 58	LINE 59	LINE 60
ANTICIPATED DEFLECTION DUE TO SLAB (IN.)	ALL		0	$\frac{3}{4}$	$1\frac{7}{16}$	$2\frac{1}{8}$	$2\frac{11}{16}$	$3\frac{1}{8}$	$3\frac{1}{2}$	$3\frac{11}{16}$	$3\frac{3}{4}$	$3\frac{11}{16}$	$3\frac{1}{2}$	$3\frac{1}{8}$	$2\frac{11}{16}$	$2\frac{1}{8}$	$1\frac{7}{16}$	$\frac{3}{4}$	0	0	$\frac{5}{8}$	$1\frac{1}{4}$	$1\frac{3}{4}$	$2\frac{1}{4}$	$2\frac{5}{8}$	$2\frac{15}{16}$	$3\frac{1}{16}$	$3\frac{1}{8}$
CROSS SLOPE ADJUSTMENTS (IN.)	ALL		$\frac{5}{16}$																									
ALLOWABLE FIELD HAUNCH IN. & (FT.)	MIN.	ALL	$\frac{1}{4}$ (0.021)	$\frac{1}{4}$ (0.021)	$-\frac{3}{16}$ (-0.016)												$\frac{1}{4}$ (0.021)	$\frac{1}{4}$ (0.021)	$\frac{1}{4}$ (0.021)	$\frac{1}{4}$ (0.021)	$-\frac{3}{16}$ (-0.016)							
	MAX.	ALL	$3\frac{1}{4}$ (0.271)	$3\frac{1}{4}$ (0.271)	$2\frac{1}{2}$ (0.208)												$3\frac{1}{4}$ (0.271)	$3\frac{1}{4}$ (0.271)	$3\frac{1}{4}$ (0.271)	$3\frac{1}{4}$ (0.271)	$2\frac{1}{2}$ (0.208)							

MISCELLANEOUS DATA TABLE									
							CL EAST ABUT.BRG.	BEAM LINE	
LINE 61	LINE 62	LINE 63	LINE 64	LINE 65	LINE 66	LINE 67	LINE 68		
3 1/16	2 15/16	2 5/8	2 1/4	1 3/4	1 1/4	5/8	0	ALL	ANTICIPATED DEFLECTION DUE TO SLAB (IN.)
5/16								ALL	CROSS SLOPE ADJUSTMENTS (IN.)
- 3/16 (-0.016)						1/4 (0.021)	1/4 (0.021)	MIN.	ALLOWABLE FIELD HAUNCH IN. & (FT.)
2 1/2 (0.208)						3/4 (0.271)	3/4 (0.271)	MAX.	

DESIGN FOR 20° SKEW (R.A.)

556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

141'-0 & 131'-0 END SPANS142'-0 INTERIOR SPANS

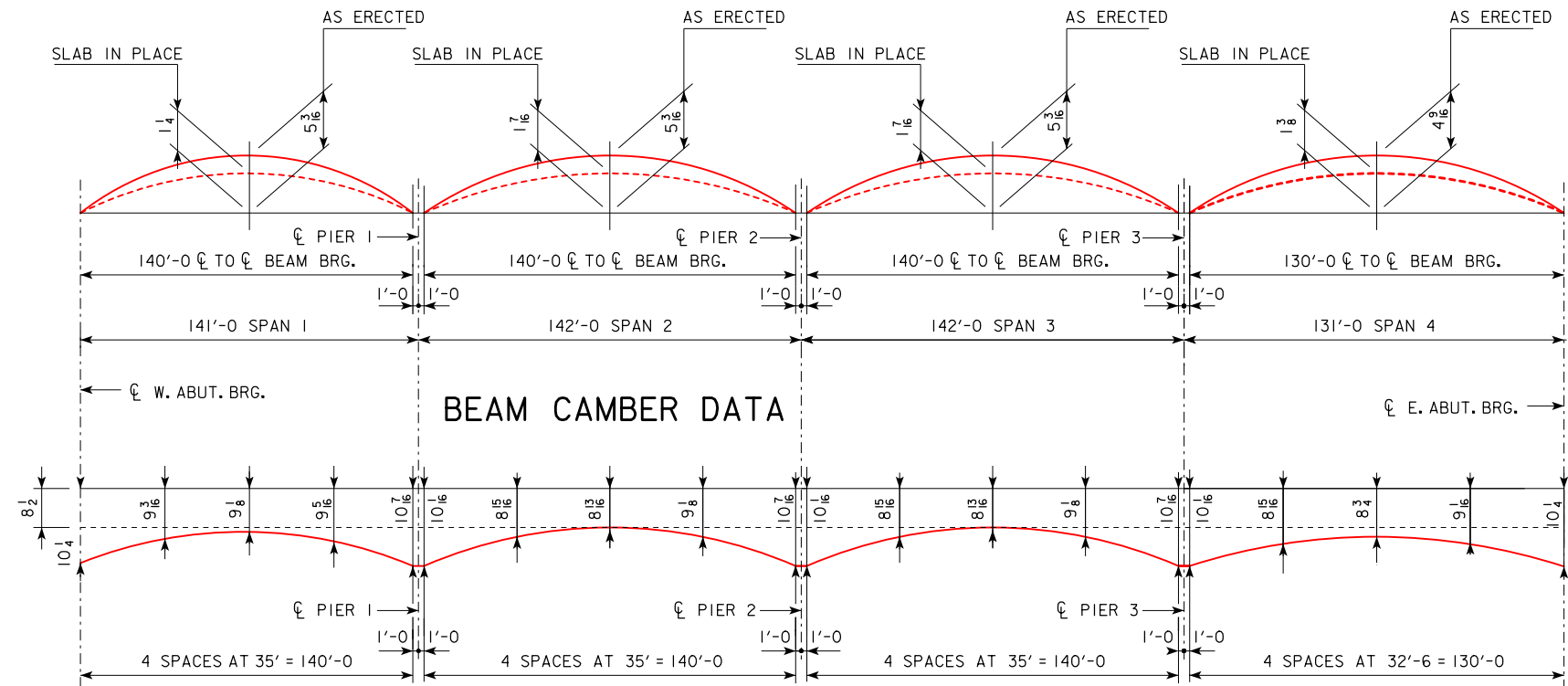
HAUNCH DETAILS

STATION 960+00.06, RT. 89.00'MARCH 2020

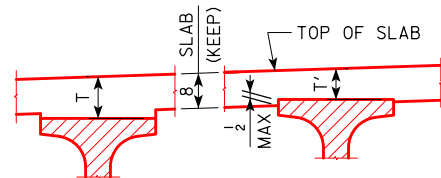
HENRY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

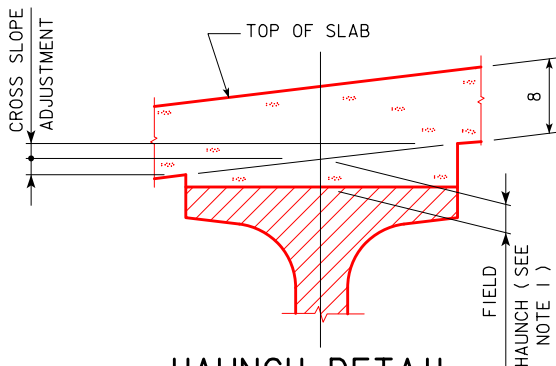
DESIGN SHEET NO. 29 OF 39FILE NO. 31636DESIGN NO. 220



DECK THICKNESS AT BEAMS (T)



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.

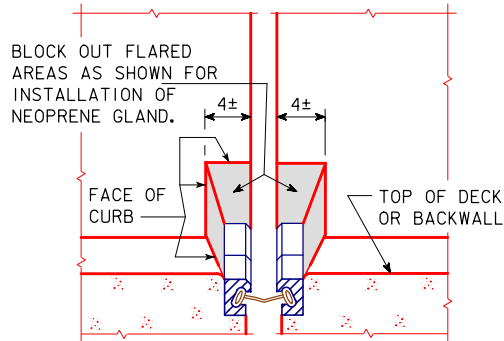


NOTE 1:  
TO CALCULATE FIELD HAUNCH REQUIRED AT EACH LOCATION, SURVEY THE BEAM TOPS CONSISTENT WITH THE SPACINGS SHOWN ON THE "TOP OF SLAB ELEVATIONS LAYOUT". SUBTRACT THE SURVEYED BEAM SHOT FROM THE "BEAM LINE HAUNCH ELEVATION". THIS VALUE WILL BE THE HAUNCH NEEDED (SEE "FIELD HAUNCH" IN HAUNCH DETAIL).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

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.

DESIGN FOR 20° SKEW (R.A.)  
**556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE**  
141'-0 & 131'-0 END SPANS      142'-0 INTERIOR SPANS  
**SLAB THICKNESS DIAGRAM & DETAILS**  
STATION 960+00.06, RT. 89.00'      MARCH 2020  
**HENRY COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 30 OF 39    FILE NO. 31636    DESIGN NO. 220

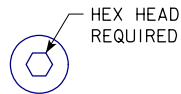
REVISION 08-13 - ADDED A CORRESPONDING MAXIMUM DECK TEMPERATURE COLUMN TO EXPANSION DEVICE TABLE. ADDED A SPLICE DETAIL TO THE PART PLAN VIEWS.  
ENGLISHDECKRAILBRIDGES.DGN 1026 - THIS SHEET ISSUED 03-02.



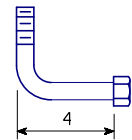
### BLOCKOUT DETAIL

(DRAWN FOR 0° SKEW FOR ILLUSTRATIVE PURPOSES)

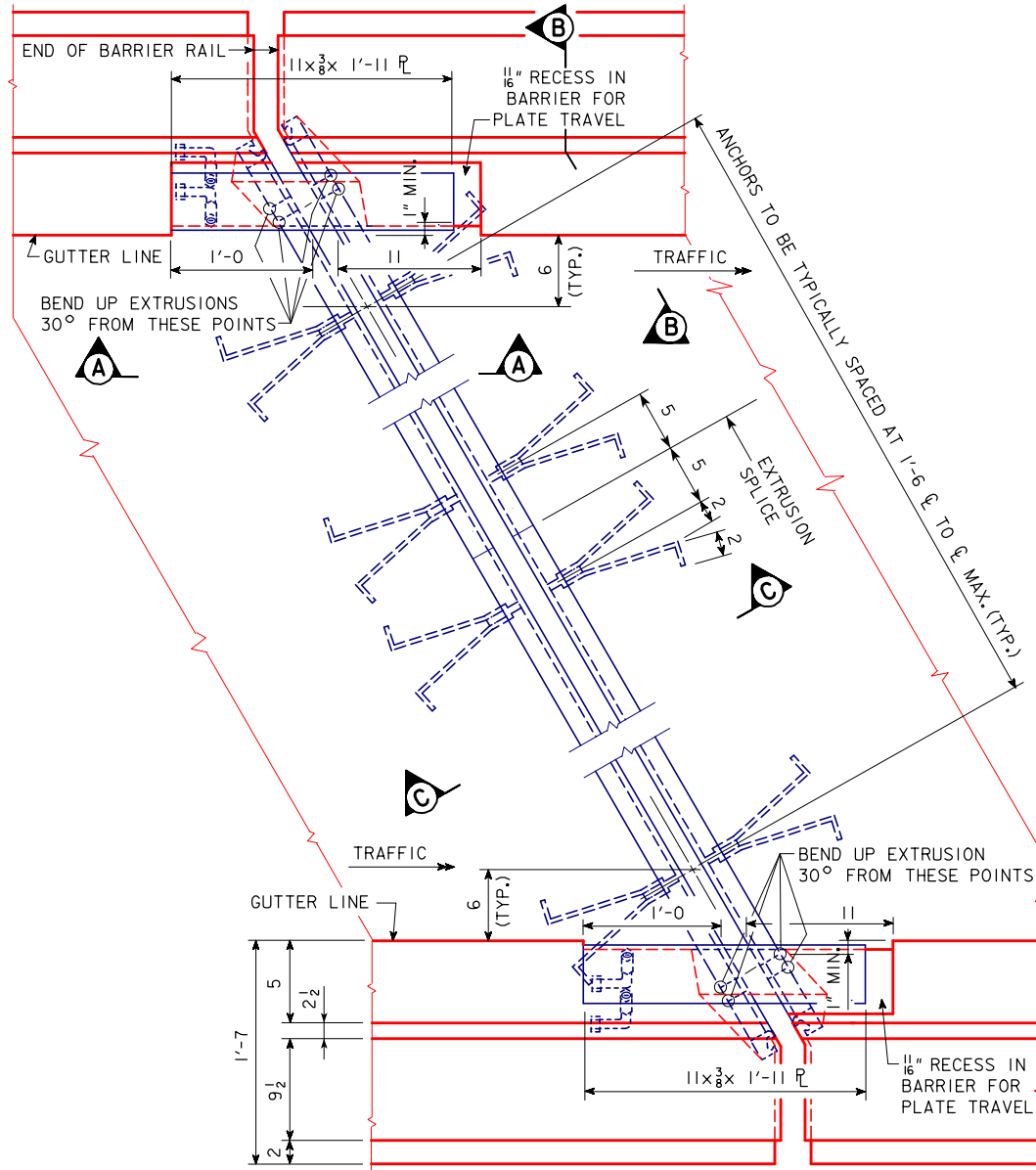
CONTRACTOR TO NOTE THAT THE CAP SCREW ANCHORAGE SYSTEM FOR THE 3/8" BARRIER PLATES ARE ALWAYS TO BE PLACED ON THE ONCOMING TRAFFIC SIDE.



### CAP SCREW DETAIL

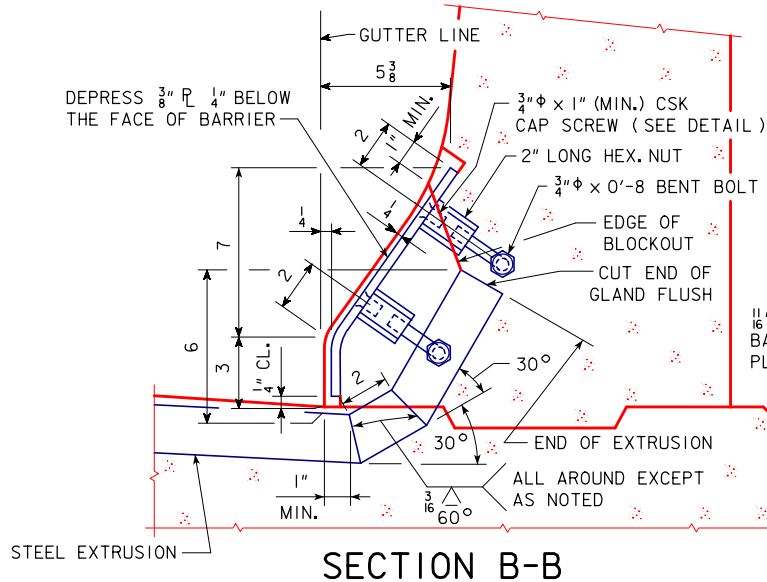


### BENT BOLT DETAIL

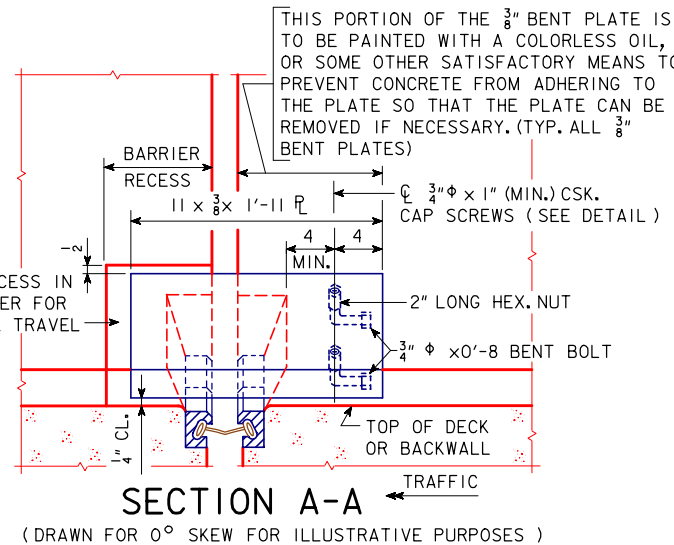


### PART PLAN VIEW OF EXPANSION DEVICE R.A. SKEW

NOTE: IT IS INTENDED THAT THE 1/2 INCH RECESSED AREA BE FORMED SO THAT WHEN THE 3/8" BENT PLATE IS INSTALLED THE PLATE WILL BE ABLE TO MOVE FREELY IN THIS RECESSED AREA.



### SECTION B-B



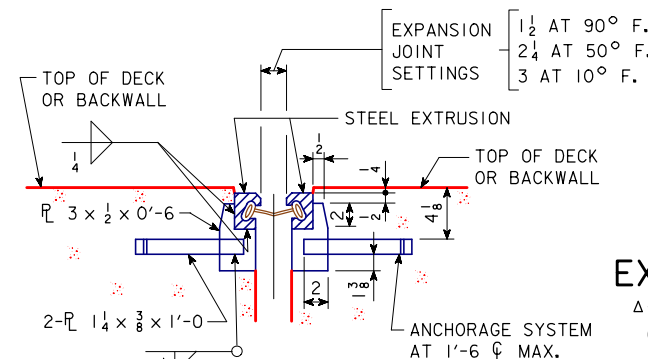
### SECTION A-A

(DRAWN FOR 0° SKEW FOR ILLUSTRATIVE PURPOSES)

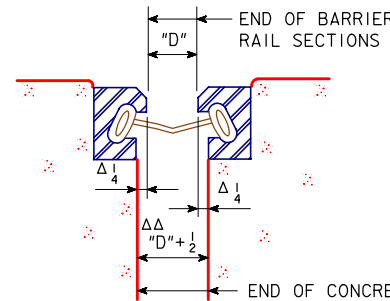
### BARRIER PLATE NOTE:

THE MATERIAL USED FOR THE BARRIER PLATES IS TO BE ASTM A36 STEEL. THE BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A307. THE PLATES, BOLTS, NUTS AND CAP SCREWS ARE TO BE GALVANIZED IN ACCORDANCE WITH ARTICLE 4100.07 OF THE STANDARD SPECIFICATIONS.

NOTE: JOINT SETTINGS FOR OTHER TEMPERATURES ARE PROPORTIONAL. TEMPERATURES SHOWN ARE CONCRETE DECK TEMPERATURES ON THE UNDERSIDE OR SHADED PORTION OF THE DECK.



### SECTION C-C



### EXPANSION OPENING DETAIL

THIS DIMENSION MAY VARY SLIGHTLY DEPENDING ON MANUFACTURER FURNISHING THE JOINT.

USED FOR ALL OUT TO OUT DIMENSIONS OF SLAB. THE DIMENSION MAY VARY SLIGHTLY DEPENDING ON MANUFACTURER FURNISHING THE JOINT.

### TABLE OF APPROVED EXPANSION DEVICES

MANUFACTURER	TYPE OF STEEL EXTRUSION	NEOPRENE GLAND	MINIMUM OPENING FOR GLAND INSTALLATION	CORRESPONDING MAXIMUM DECK TEMPERATURE
WATSON-BOWMAN & ACME CORP.	A	SE-400	1 1/2"	90° F.
APPROVED EQUAL				

NOTE:  
SEE DESIGN SHEET 32 FOR EXPANSION DEVICE NOTES CONTAINING THE STEEL EXTRUSION NOTES, NEOPRENE GLAND NOTES, AND WATERTIGHT INTEGRITY TESTING AND REPAIR NOTES.

DESIGN FOR 20° SKEW (R.A.)  
**556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE**  
141'-0 & 131'-0 END SPANS 142'-0 INTERIOR SPANS  
**EXPANSION DEVICE DETAILS**  
STATION 960+00.06, RT. 89.00' MARCH 2020  
**HENRY COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 31 OF 39 FILE NO. 31636 DESIGN NO. 220

REVISION 08-13 - STEEL EXTRUSION NOTE WAS ADDED TO SHOW A WELD DETAIL ON THE SHOP DRAWINGS FOR SPLICES.  
AN ADDITIONAL NEOPRENE GLAND NOTE ABOUT THE CORRESPONDING MAXIMUM DECK TEMPERATURE WAS ADDED.  
ENGLISHDECKRAILBRIDGES.DGN - 1026s2 - THIS SHEET ISSUED 11-08.

STEEL EXTRUSION NOTES:

THE CONTRACTOR SHALL SUBMIT FOR APPROVAL SHOP DRAWINGS OF THE EXPANSION DEVICES SHOWING LAYOUT, MATERIAL TO BE USED, AND PROVISIONS FOR THE HOLDING DEVICE DURING PLACEMENT OF CONCRETE.

THE EXPANSION DEVICE SHALL BE GALVANIZED AFTER WELDING. ALL CURB PLATES INCLUDING THEIR ANCHORAGES SHALL BE GALVANIZED.

THE EXPANSION DEVICE IS TO BE PARALLEL TO GRADE.

CAP SCREWS SHALL BE COUNTERSUNK  $\frac{1}{8}$ " BELOW TOP OF THE PLATE. THE MINIMUM GRADE OF STRUCTURAL STEEL FOR THE EXPANSION DEVICE SHALL BE ASTM A36.

BLOCKOUT DETAILS MAY BE ALTERED FROM THOSE SHOWN PROVIDED THE GLAND MAY BE INSTALLED AND REMOVED IF NECESSARY AND THE CURB AREA REMAINS WATERTIGHT.

SHOP SPLICES OF THE STEEL EXTRUSION WILL BE PERMITTED. PRIOR TO MAKING SHOP SPLICES STEEL EXTRUSION PIECES SHALL HAVE A MINIMUM LENGTH OF 15 FEET. THE INDIVIDUAL LENGTH OF PIECES SHALL BE CHOSEN SO THAT A MINIMUM NUMBER OF SPLICES IS REQUIRED. ALL PIECES SHALL BE JOINED WITH A PREQUALIFIED PARTIAL PENETRATION SINGLE GROOVE WELD DETAILED ON THE SHOP DRAWING. ALL SURFACES NOT IN CONTACT WITH CONCRETE ARE TO BE GROUND FLUSH. NO WELD SHALL BE PERMITTED IN THE INTERNAL SECTION OF THE EXTRUSION WHERE THE NEOPRENE GLAND IS TO BE INSTALLED.

THE NUMBER OF FEET OF STEEL EXTRUSION INSTALLED SHALL BE PAID FOR AT THE CONTRACT PRICE PER FOOT BASED ON PLAN QUANTITIES. THE PRICE BID FOR "STEEL EXTRUSION JOINT W/NEOPRENE" SHALL INCLUDE THE COST OF FURNISHING BUT NOT THE COST OF INSTALLING THE NEOPRENE GLAND. THE CONTRACT PRICE BID FOR "STEEL EXTRUSION JOINT W/NEOPRENE" SHALL BE FULL COMPENSATION FOR FURNISHING AND INSTALLING STEEL EXTRUSIONS. THIS WORK WILL CONSIST OF FURNISHING ALL REQUIRED MATERIALS, (INCLUDING THE  $\frac{3}{8}$ " PLATES AT THE CURBS AND THEIR ANCHORAGE SYSTEMS), AND THE INSTALLATION AND ADJUSTMENT OF THE EXPANSION JOINTS IN ACCORDANCE WITH THE DETAILS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER. THE FURNISHING AND INSTALLATION OF ALL NECESSARY HARDWARE AND ACCESSORIES AS SUPPLIED BY THE EXPANSION JOINT MANUFACTURER ARE TO BE INCLUDED IN THIS WORK, INCLUDING THE ANCHORAGE SYSTEM AND ANY TEMPORARY ERECTION MATERIAL. ALL WORK AND MATERIALS FOR THE INSTALLATION OF THE EXPANSION JOINTS ARE TO COMPLY WITH THE WRITTEN RECOMMENDATIONS OF THE EXPANSION JOINT MANUFACTURER.

FIELD CONSTRUCTION NOTES:

IF THE STEEL EXTRUSION IS SPLICED IN THE FIELD, THE SPLICE LOCATION SHALL BE DETAILED ON THE SHOP DRAWINGS. THE CONNECTION DETAILS SHALL INCLUDE TAB PLATES AND PREPARED ENDS TO ACCOMMODATE THE NECESSARY WELDING. SEE DETAILS IN THESE PLANS.

GALVANIZED COATING DAMAGE BY FIELD WELDING SHALL BE REPAIRED IN ACCORDANCE WITH MATERIALS I.M. 410.

NEOPRENE GLAND NOTES:

THE NEOPRENE GLAND IS TO BE PLACED AS ONE CONTINUOUS PIECE FROM END TO END OF THE STEEL EXTRUSION.

THE NEOPRENE GLAND SHALL CONFORM TO ASTM-2628 MODIFIED TO EXCLUDE RECOVER TEST AND COMPRESSION SET.

THE CONTRACTOR SHALL INSTALL THE GLAND ABOVE THE MINIMUM TEMPERATURE OF 45° AND THE MINIMUM JOINT OPENING AND CORRESPONDING MAXIMUM DECK TEMPERATURE SHOWN IN THESE PLANS. THE DECK TEMPERATURE SHALL BE MEASURED BY RECORDING THE SURFACE TEMPERATURES ON THE UNDERSIDE OF THE DECK ADJACENT TO THE JOINTS. IF THE DECK TEMPERATURE DOES NOT FALL WITHIN THE SPECIFIED TEMPERATURE RANGE BEFORE THE CONTRACTOR HAS COMPLETED ALL OTHER REQUIRED WORK, IT WILL BE NECESSARY FOR THE CONTRACTOR TO RETURN TO THE PROJECT SITE TO COMPLETE INSTALLATION AND TESTING OF THE NEOPRENE GLAND. IF THE CONTRACTOR IS REQUIRED TO RETURN TO THE PROJECT SITE AFTER ALL OTHER REQUIRED WORK HAS BEEN COMPLETED, THE CONTRACTOR SHALL COMPLETE INSTALLATION AND TESTING OF NEOPRENE GLAND AT NO EXTRA CHARGE TO THE STATE.

THE NUMBER OF FEET OF NEOPRENE GLAND INSTALLED SHALL BE PAID FOR AT THE CONTRACT PRICE PER FOOT BASED ON PLAN QUANTITIES. THE PRICE FOR "NEOPRENE GLAND INSTALLATION AND TESTING" SHALL BE FULL COMPENSATION FOR INSTALLING AND TESTING OF THE NEW NEOPRENE GLAND. THIS WORK WILL CONSIST OF CLEANING THE EXTRUSION, INSTALLATION OF THE NEOPRENE GLAND AND WATER TIGHT TESTING OF THE EXPANSION JOINT SYSTEM. ALL WORK AND MATERIALS NECESSARY FOR THE INSTALLATION OF THE NEOPRENE GLAND SHALL COMPLY WITH THE RECOMMENDATIONS OF THE EXPANSION JOINT MANUFACTURER. THE PRICE BID FOR "NEOPRENE GLAND INSTALLATION AND TESTING" SHALL INCLUDE ALL WATERTIGHT INTEGRITY TESTING, LEAK REPAIRS AS DIRECTED BY THE ENGINEER, AND SUBSEQUENT WATERTIGHT TESTING UNTIL A LEAK FREE INSTALLATION IS ACHIEVED.

WATERTIGHT INTEGRITY TESTING AND REPAIR NOTES:

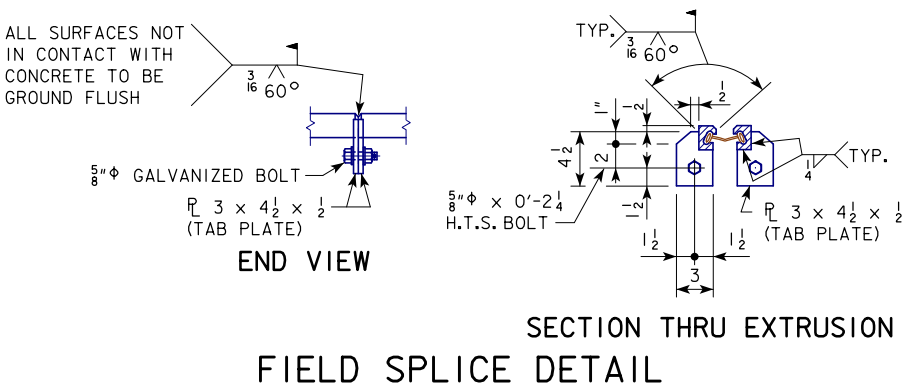
AFTER INSTALLATION OF EACH NEOPRENE GLAND, THE CONTRACTOR SHALL PERFORM WATERTIGHT INTEGRITY TESTS AT THE DECK LEVEL TO DETECT ANY LEAKAGE. THE TESTS ARE TO CHECK FOR LEAKAGE AT THE UPTURNED ENDS OF THE EXPANSION DEVICE AND FOR LEAKAGE ALONG THE EXPANSION DEVICE ACROSS THE DECK AND ANY MEDIANS OR SIDEWALKS. THE CONTRACTOR MAY CONDUCT A SINGLE TEST OF THE ENTIRE DEVICE INCLUDING UPTURNED ENDS OR MAY CONDUCT SEPARATE TESTS OF UPTURNED ENDS AND ONE OR MORE TESTS OF OVERLAPPING LENGTHS BETWEEN THE UPTURNED ENDS.

AT EACH UPTURNED END OF THE EXPANSION DEVICE, THE CONTRACTOR SHALL BLOCK OUT ON THE DECK AT LEAST 3 FEET OF THE EXPANSION DEVICE LEADING TO THE UPTURNED END AND FLOOD THE AREA. A MINIMUM WATER DEPTH OF 3" SHALL BE MAINTAINED AT THE GUTTERLINE FOR AT LEAST 30 MINUTES. DURING THE TEST, THE INSPECTOR SHALL OBSERVE FOR ANY OVERFLOW AT THE UPTURNED END. AT THE CONCLUSION OF THE TEST THE INSPECTOR WILL EXAMINE THE UNDERSIDE OF THE JOINT FOR LEAKAGE. THE EXPANSION DEVICE IS CONSIDERED WATERTIGHT IF THE INSPECTOR OBSERVES NO OVERFLOW DURING THE TEST AND IF NO DRIPPING WATER OR WATER DROPLETS ARE VISIBLE IN THE UNDERDECK AREAS NEAR THE UPTURNED END.

THE CONTRACTOR SHALL TEST THE EXPANSION DEVICE BETWEEN UPTURNED ENDS BY BLOCKING OUT AND COVERING THE DEVICE WITH PONDED OR FLOWING WATER TO A DEPTH OF AT LEAST 1" AT ALL POINTS, FOR AT LEAST 30 MINUTES. VERTICAL CURB SURFACES MAY BE TESTED WITH AN UNNOZZLED HOSE DELIVERING APPROXIMATELY ONE GALLON PER MINUTE DIRECTED TO FLOW OVER THE ENTIRE CURB HEIGHT FOR 30 MINUTES. AT THE CONCLUSION OF THE TEST, THE INSPECTOR WILL EXAMINE THE UNDERSIDE OF THE JOINT FOR LEAKAGE. THE EXPANSION DEVICE IS CONSIDERED WATERTIGHT IF NO DRIPPING WATER OR WATER DROPLETS ARE VISIBLE IN THE UNDERDECK AREAS ALONG THE FULL LENGTH OF THE EXPANSION JOINT. DAMP CONCRETE THAT DOES NOT SHOW DRIPPING WATER OR WATER DROPLETS IS NOT CONSIDERED A SIGN OF LEAKAGE.

IF THE EXPANSION DEVICE LEAKS AT AN UPTURNED END OR ALONG ITS LENGTH, THE CONTRACTOR SHALL LOCATE THE LEAK(S) AND TAKE REPAIR MEASURES TO STOP THE LEAKAGE. THE REPAIR MEASURES SHALL BE AS RECOMMENDED BY THE MANUFACTURER AND APPROVED BY THE ENGINEER PRIOR TO BEGINNING CORRECTIVE WORK.

IF MEASURES TO ELIMINATE LEAKAGE ARE TAKEN, THE CONTRACTOR SHALL PERFORM SUBSEQUENT WATERTIGHT INTEGRITY TESTS SUBJECT TO THE SAME CONDITIONS AS THE ORIGINAL TEST.



DESIGN FOR 20° SKEW (R.A.)

556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

141'-0 & 131'-0 END SPANS142'-0 INTERIOR SPANS

EXPANSION DEVICE NOTES

STATION 960+00.06, RT. 89.00'MARCH 2020

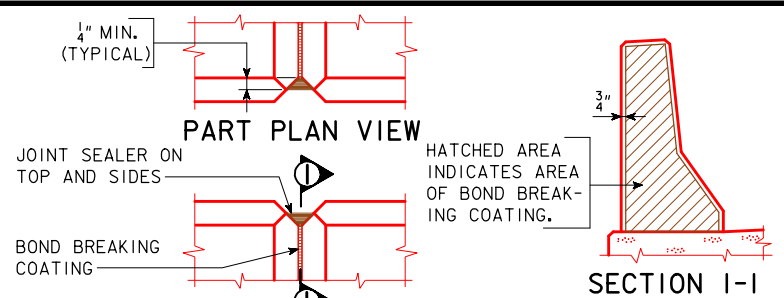
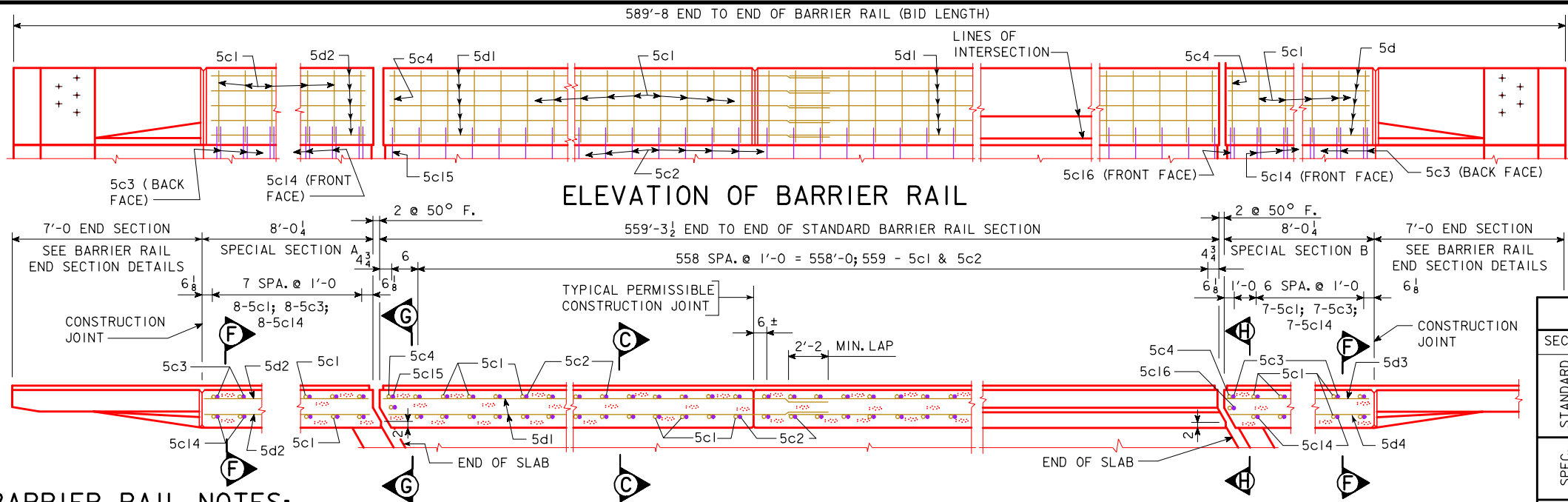
HENRY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 32 OF 39FILE NO. 31636DESIGN NO. 220



ENGLISHDECKRAILBRIDGES.DGN - 1018SA - THIS SHEET ISSUED 04-14 - ADDED STAINLESS STEEL REINFORCING BAR LIST AND CHANGED 5c2, 5c3, 5c14-16 BARS TO STAINLESS STEEL.



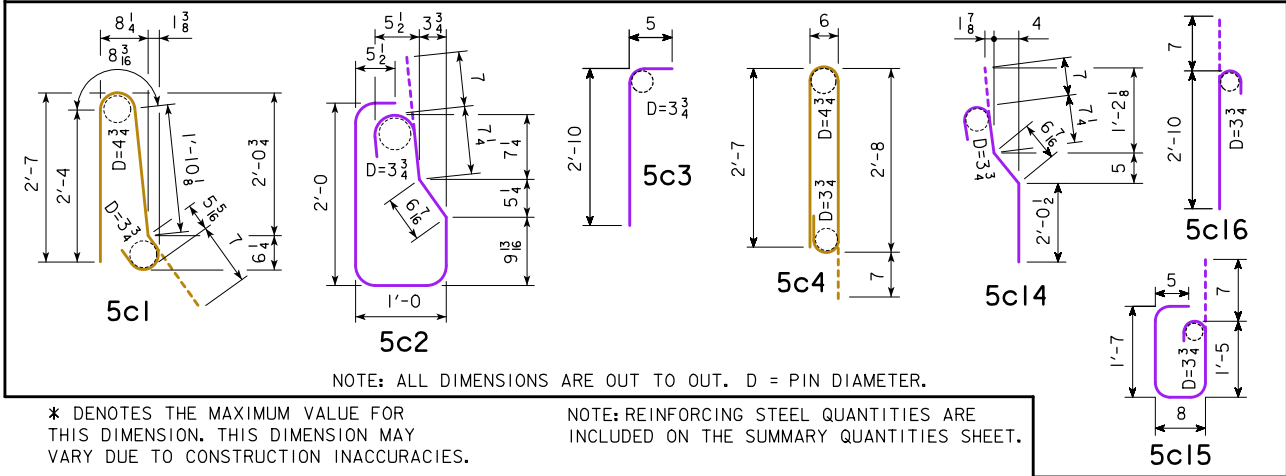
PART ELEVATION VIEW  
BARRIER RAIL JOINT DETAILS

**BARRIER RAIL NOTES:**

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.  
THE PERMISSIBLE CONSTRUCTION JOINTS ARE TO BE PLACED BETWEEN VERTICAL BARS AT A MINIMUM SPACING OF 20 FEET. CONSTRUCTION JOINT CONTACT SURFACES ARE TO BE COATED WITH AN APPROVED BOND BREAKER.  
COST OF THE JOINT SEALER AND BOND BREAKER SHALL BE CONSIDERED INCIDENTAL TO OTHER CONSTRUCTION.  
ALL BARRIER RAIL REINFORCING STEEL IS TO BE EITHER EPOXY COATED OR STAINLESS STEEL AS SHOWN. THE STAINLESS STEEL REINFORCING STEEL SHALL BE DEFORMED BAR GRADE 60 MEETING THE REQUIREMENTS OF MATERIALS I.M. 452.  
THE CONCRETE BARRIER RAIL IS TO BE BID ON A LINEAL FOOT BASIS. THE NUMBER OF LINEAL FEET OF BARRIER RAIL INSTALLED WILL BE PAID FOR AT THE CONTRACT PRICE PER LINEAL FOOT BASED ON PLAN QUANTITIES. PRICE BID FOR CONCRETE BARRIER RAILING SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, EXCLUDING REINFORCING STEEL, AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO ERECT THE RAIL IN ACCORDANCE WITH THESE PLANS AND CURRENT SPECIFICATIONS. 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. SEE DESIGN SHEET 36 FOR CONDUIT AND CONDUIT SUPPORT REINFORCING.  
THE JOINT SEALER SHALL BE LIGHT GRAY NONSAG LATEX CAULKING SEALER MARKETING FOR OUTDOOR USE. NO TESTING OR CERTIFICATION IS REQUIRED.  
TOP OF THE BARRIER RAIL IS TO BE PARALLEL TO THE THEORETICAL C GRADE.  
CROSS SECTIONAL AREA OF THE STANDARD AND SPECIAL SECTIONS OF THE BARRIER RAIL = 2.84 SQUARE FEET.

PART SECTION OF BARRIER RAIL

**BENT BAR DETAILS**



**EPOXY COATED REINF. STEEL - TWO RAILS**

SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STANDARD SECTIONS	5c1	RAIL, VERTICAL	1	1118	5'-11	6899
	5c4	RAIL, VERTICAL	2	2	6'-4	13
	5d1	RAIL, LONGITUDINAL	3	270	39'-6	11124
SPEC. SECT. A	5c1	RAIL, VERTICAL	1	16	5'-11	99
	5d2	RAIL, LONGITUDINAL	4	18	7'-8	144
SPECIAL SECTION B	5c1	RAIL, VERTICAL	1	14	5'-11	86
	5c4	RAIL, VERTICAL	2	2	6'-4	13
	5d3	RAIL, LONGITUDINAL	5	16	7'-8	128
	5d4	RAIL, LONGITUDINAL	6	2	7'-6	16
EPOXY REINF. TOTAL WEIGHT (LBS.)						18522

**STAINLESS STEEL REINF. STEEL - TWO RAILS**

SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STD. SECTS.	5c2	RAIL, VERTICAL	7	1118	6'-0	6996
	5c15	RAIL, VERTICAL	8	2	4'-8	10
SPEC. SECT. A	5c3	RAIL, VERTICAL	9	16	3'-3	54
	5c14	RAIL, VERTICAL	10	16	3'-10	64
SPECIAL SECTION B	5c3	RAIL, VERTICAL	11	14	3'-3	47
	5c14	RAIL, VERTICAL	12	14	3'-10	56
	5c16	RAIL, VERTICAL	13	2	3'-5	7
STAINLESS STEEL TOTAL WEIGHT (LBS.)						7234

**CONCRETE PLACEMENT SUMMARY**

SECTION		TOTAL
STANDARD SECTION	1118.6 AT 0.1052 CU. YDS. PER FT.	117.7
SPECIAL SECTION A	16.0 AT 0.1052 CU. YDS. PER FT.	1.7
SPECIAL SECTION B	16.0 AT 0.1052 CU. YDS. PER FT.	1.7
TOTAL ( CU. YD. )		121.1

**CONCRETE BARRIER RAIL QUANTITIES**

ITEM	UNIT	QUANTITY
CONCRETE BARRIER RAILING	2 @ 589.7 LIN. FT.	1,179.4

DESIGN FOR 20° SKEW (R.A.)  
**556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE**  
141'-0 & 131'-0 END SPANS 142'-0 INTERIOR SPANS  
**BARRIER RAIL DETAILS**  
STATION 960+00.06, RT. 89.00' MARCH 2020  
**HENRY COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 33 OF 39 FILE NO. 31636 DESIGN NO. 220

PART SECTION C-C

PART SECTION G-G

PART SECTION H-H

PART SECTION F-F





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









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



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

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

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

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

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
4t1	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

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

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

Technical drawings of 10 different bar shapes (6c1, 6c2, 6c3, 6c4, 6d2, 4+1, 5c5-5c10) with dimensions and a table of bar types and dimensions.

**6c1**: U-shaped bar, overall height 2'-6", pin diameter  $D=4\frac{1}{2}$ ", pin width 6".

**6c2**: L-shaped bar, overall height 2'-6", pin diameter  $D=4\frac{1}{2}$ ", pin width 4".

**6c3**: L-shaped bar, overall height 3'-9", pin diameter  $D=4\frac{1}{2}$ ", pin width 4".

**6c4**: U-shaped bar, overall height 3'-9", pin diameter  $D=4\frac{1}{2}$ ", pin width 6".

**6d2**: Z-shaped bar, overall height 2'-6", pin diameter  $D=4\frac{1}{2}$ ", pin width 6".

**4+1**: L-shaped bar, overall height 8'-0", pin diameter  $D=3\frac{3}{4}$ ", pin width 4".

**5c5-5c10**: Z-shaped bar, overall height 8'-0", pin diameter  $D=3\frac{3}{4}$ ", pin width 4".

BAR	"X"
5c5	0'-6 $\frac{1}{2}$
5c6	0'-8 $\frac{1}{2}$
5c7	0'-10 $\frac{1}{4}$
5c8	1'-0 $\frac{1}{4}$
5c9	1'-2
5c10	1'-4

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

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D = PIN DIAMETER.

DESIGN FOR 20° SKEW (R.A.)

556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

141'-0 & 131'-0 END SPANS 142'-0 INTERIOR SPANS

BARRIER RAIL END SECTION DETAILS

STATION 960+00.06, RT. 89.00' MARCH 2020

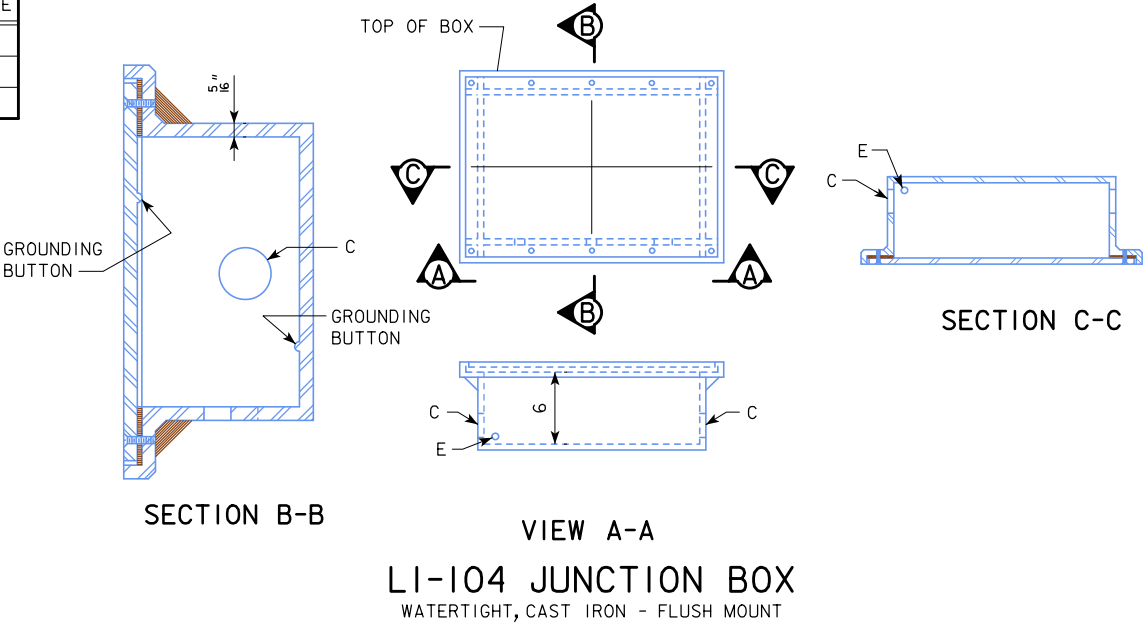
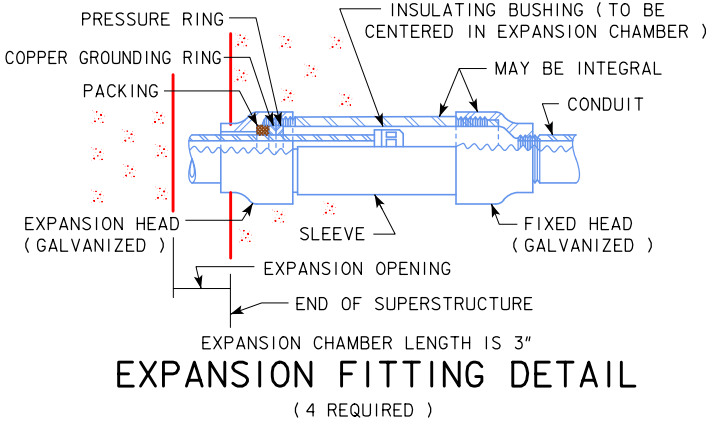
HENRY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 34 OF 39 FILE NO. 31636 DESIGN NO. 220

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

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



CONDUIT 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 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 20° SKEW (R.A.)

556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

141'-0 & 131'-0 END SPANS142'-0 INTERIOR SPANS

CONDUIT DETAILS

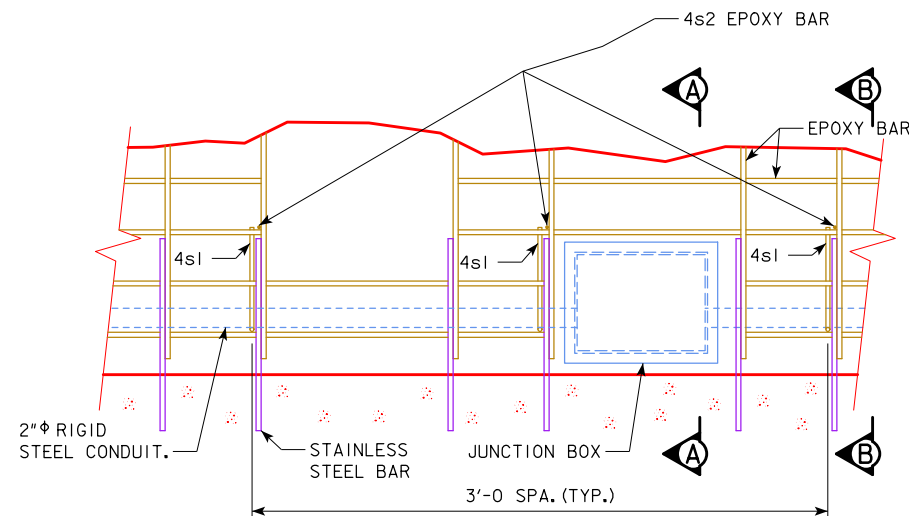
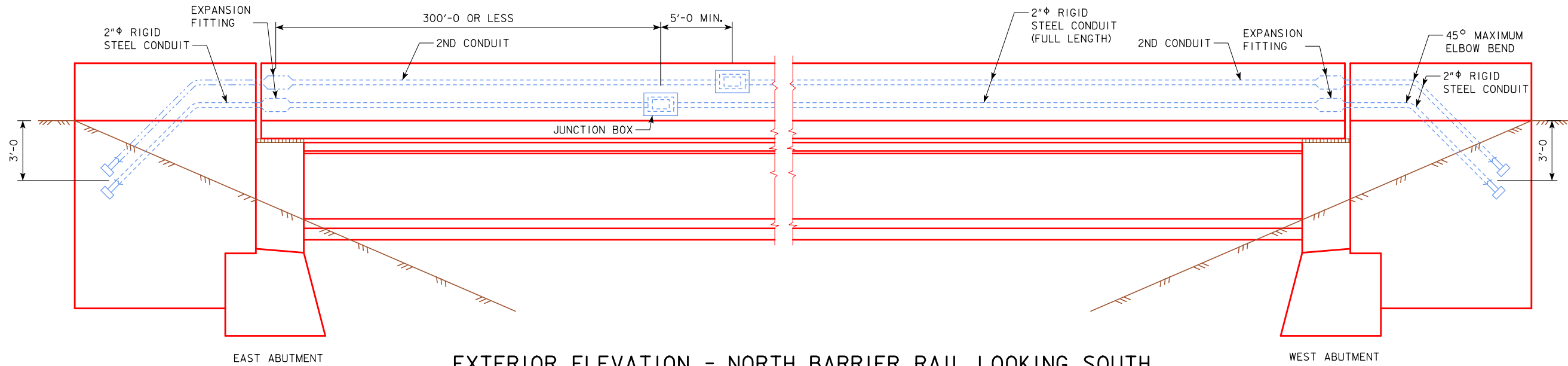
STATION 960+00.06, RT. 89.00'MARCH 2020

HENRY COUNTY

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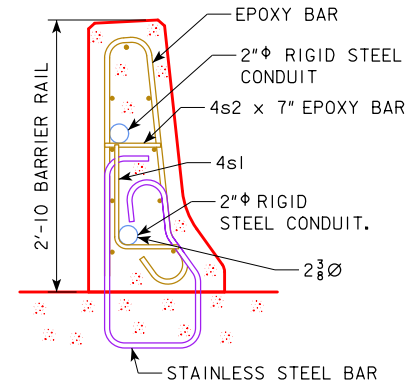
DESIGN SHEET NO. 35 OF 39FILE NO. 31636DESIGN NO. 220

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.



#### CONDUIT SUPPORT - RAIL ELEV. DETAIL

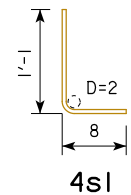
TWO JUNCTION BOX DETAIL - ADJUST REINFORCING TO CLEAR JUNCTION BOX.  
JUNCTION BOXES ARE TO BE PLACED NO FURTHER THAN 300'-0" APART.



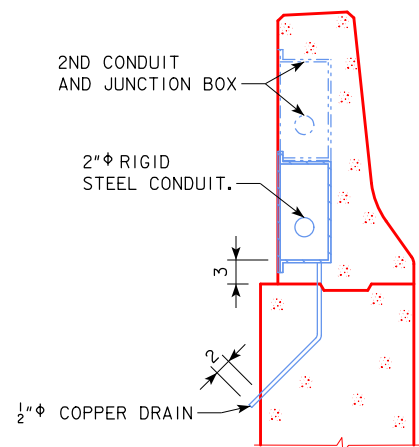
#### SECTION B-B - CONDUIT SUPPORT

ONLY USED IN RAIL WITH CONDUIT, USE 3'-0" SPACING. GALVANIZED CONDUIT SHALL NOT COME INTO CONTACT WITH THE STAINLESS STEEL REINFORCING.  
(194 REQUIRED)

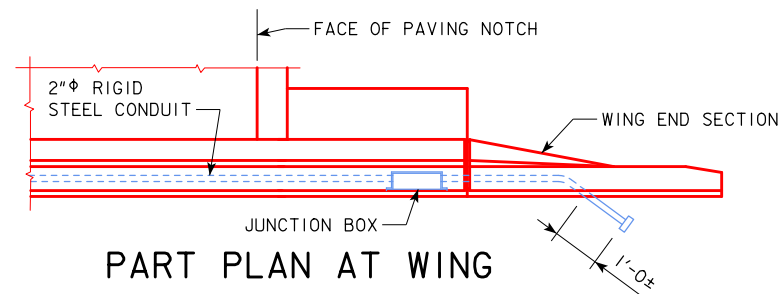
EPOXY REINFORCING STEEL-ONE RAIL					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
4s1	RAIL CONDUIT		194	1'-9"	227
4s2	RAIL CONDUIT		194	0'-7"	76
TOTAL WEIGHT (LBS.)					303



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



#### SECTION A-A THRU JUNCTION BOX



#### PART PLAN AT WING

DESIGN FOR 20° SKEW (R.A.)  
**556'-0" X 40'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE**  
141'-0" & 131'-0" END SPANS 142'-0" INTERIOR SPANS  
**CONDUIT DETAILS**  
STATION 960+00.06, RT. 89.00' MARCH 2020  
**HENRY COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
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SUBDRAIN NOTES :

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

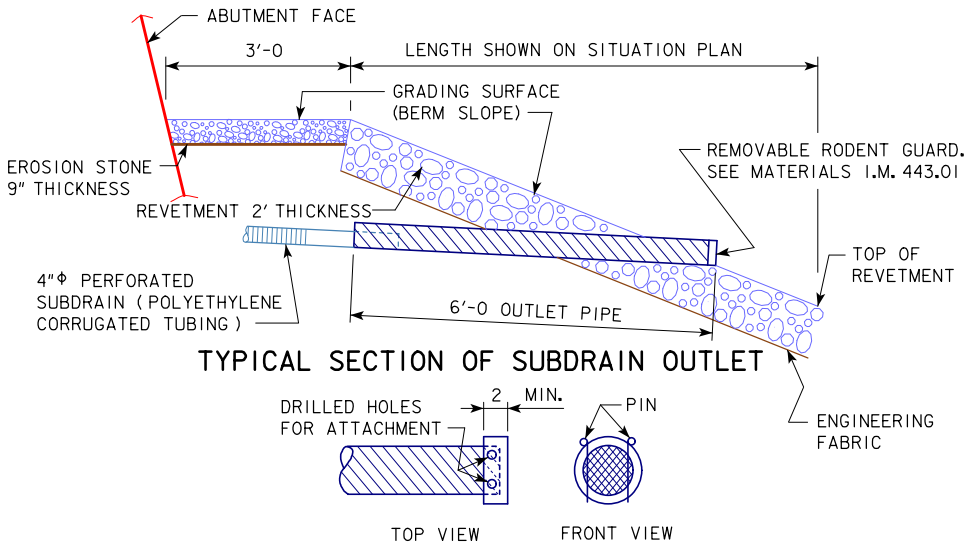
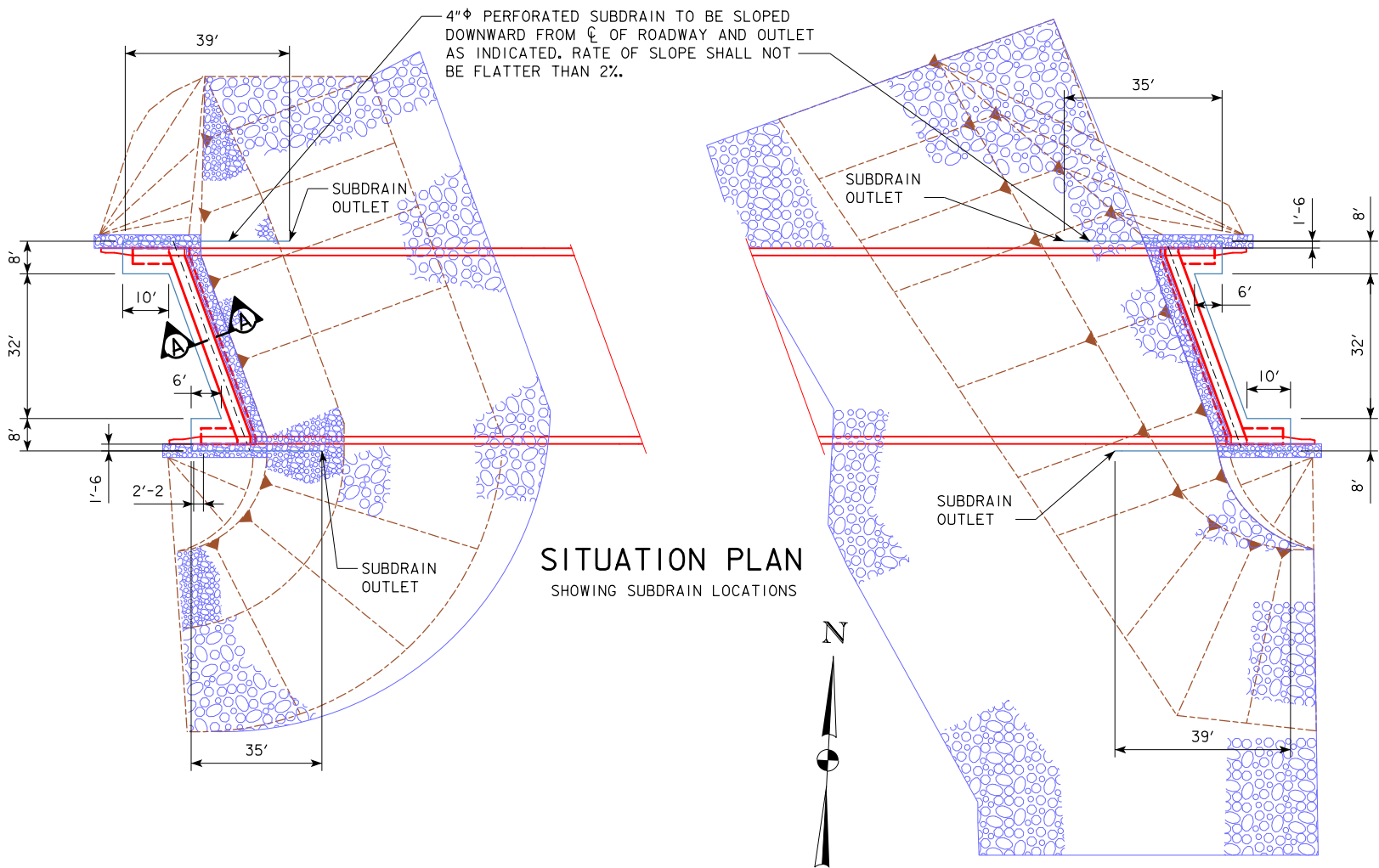
THE SUBDRAINS SHALL BE 4" IN DIAMETER AND SHALL BE IN ACCORDANCE WITH ARTICLE 4143.01, B, OF THE STANDARD SPECIFICATIONS.

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.



REMOVABLE RODENT GUARD DETAILS  
EROSION STONE (EMBEDDED) OUTLET DETAILS

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

DESIGN FOR 20° SKEW (R.A.)

**556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE**

141'-0 & 131'-0 END SPANS      142'-0 INTERIOR SPANS

**SUBDRAIN DETAILS**

STATION 960+00.06, RT. 89.00'      MARCH 2020

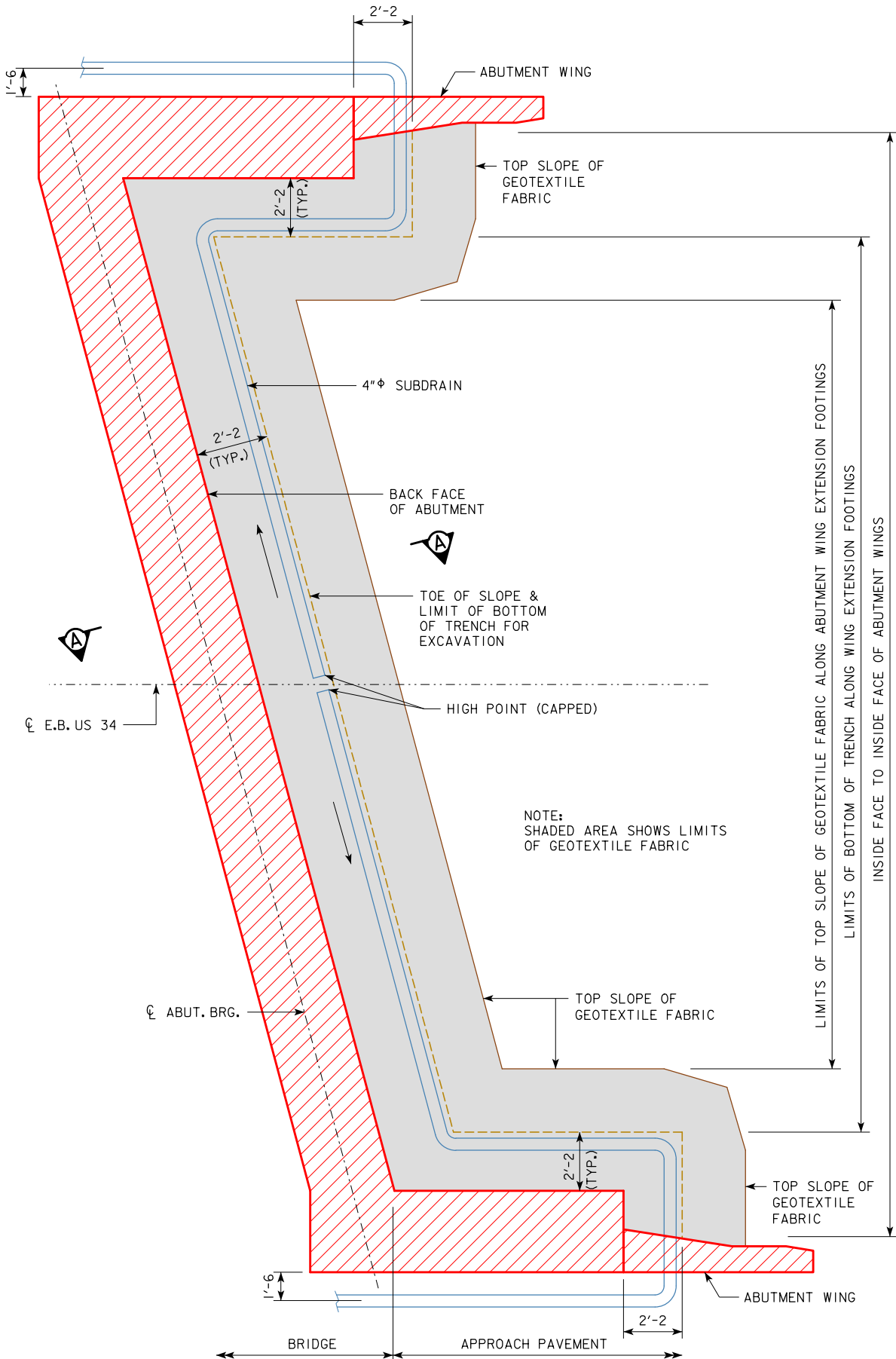
**HENRY COUNTY**

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

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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.

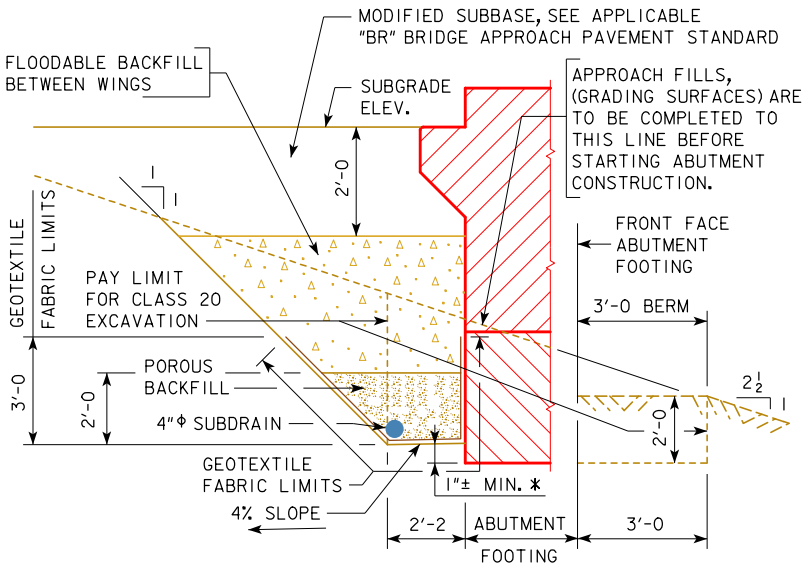
WATER REQUIRED FOR FLOODING, SUBDRAINS, POROUS BACKFILL, FLOODABLE BACKFILL, AND GEOTEXTILE FABRIC FURNISHED AT THE BRIDGE ABUTMENTS WILL NOT BE MEASURED SEPARATELY FOR PAYMENT.

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 C APPROACH ROADWAY WHEN OUTLETTING BOTH SIDES OF THE ABUTMENT.

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



SECTION A-A  
BACKFILL DETAILS

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

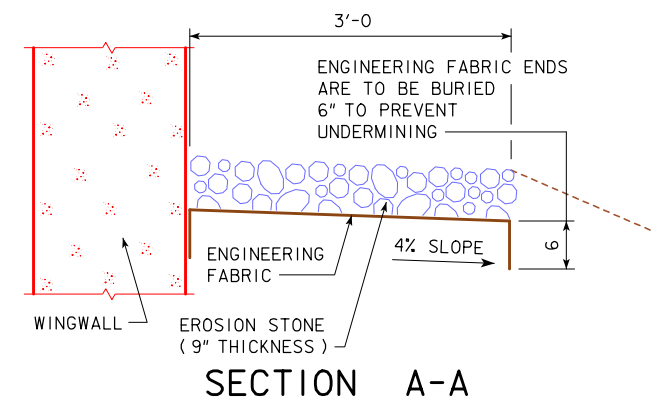
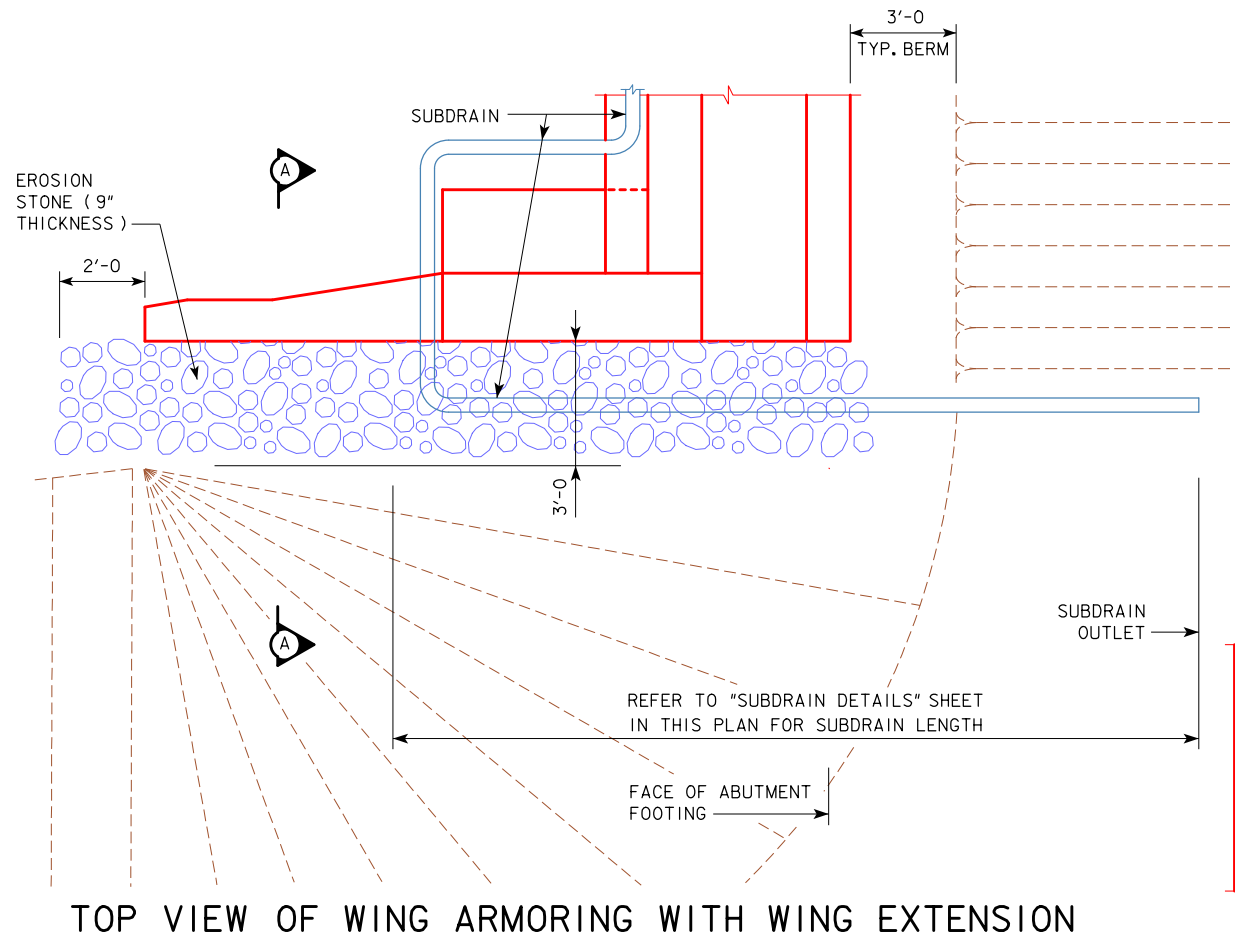
\* DIMENSION VARIES DUE TO 2% SUBDRAIN SLOPE.

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

DESIGN FOR 20° SKEW (R.A.)  
**556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE**  
141'-0 & 131'-0 END SPANS 142'-0 INTERIOR SPANS  
**ABUTMENT BACKFILL DETAILS**  
STATION 960+00.06, RT. 89.00' MARCH 2020  
**HENRY COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
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REVISED 06-14 - ADDED 2 FEET OF LENGTH OF EROSION STONE IN FRONT OF THE BRIDGE WING.  
ENGLISHFORSLOPEPROTECTIONBRIDGES.DGN 1005A - THIS SHEET ISSUED 06-02.



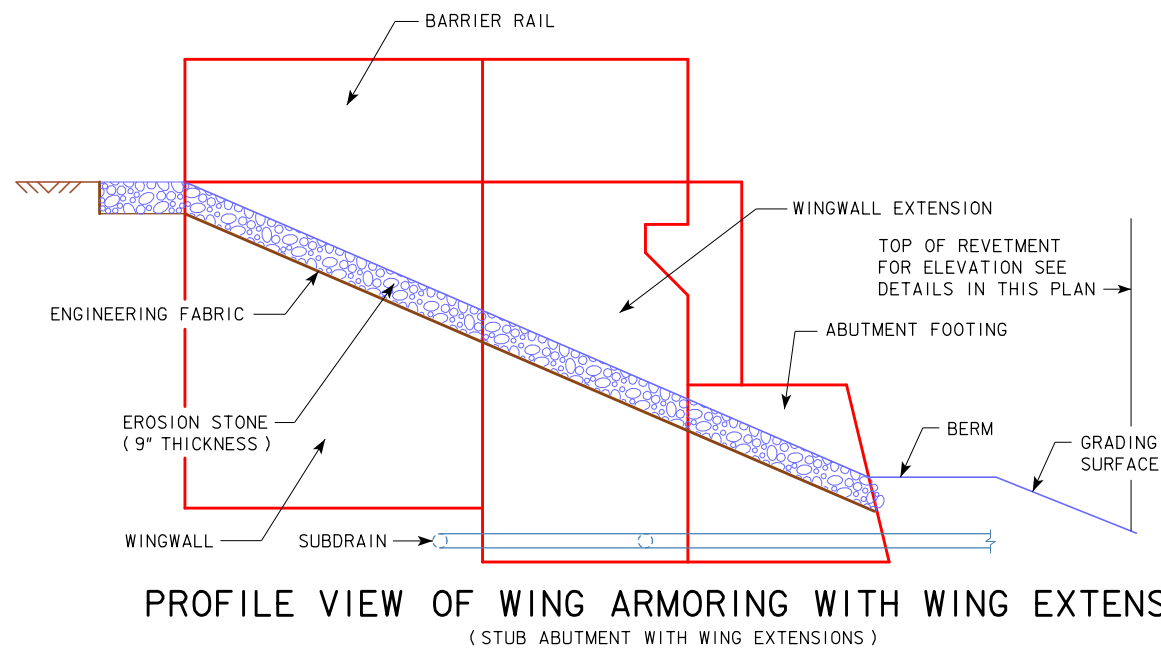
**GENERAL NOTES:**

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

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

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

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



DESIGN FOR 20° SKEW (R.A.)	
<b>556'-0 X 40'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM E.B. BRIDGE</b>	
141'-0 & 131'-0 END SPANS	142'-0 INTERIOR SPANS
<b>BRIDGE WING ARMORING</b>	
STATION 960+00.06, RT. 89.00'	MARCH 2020
<b>HENRY COUNTY</b>	
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION	
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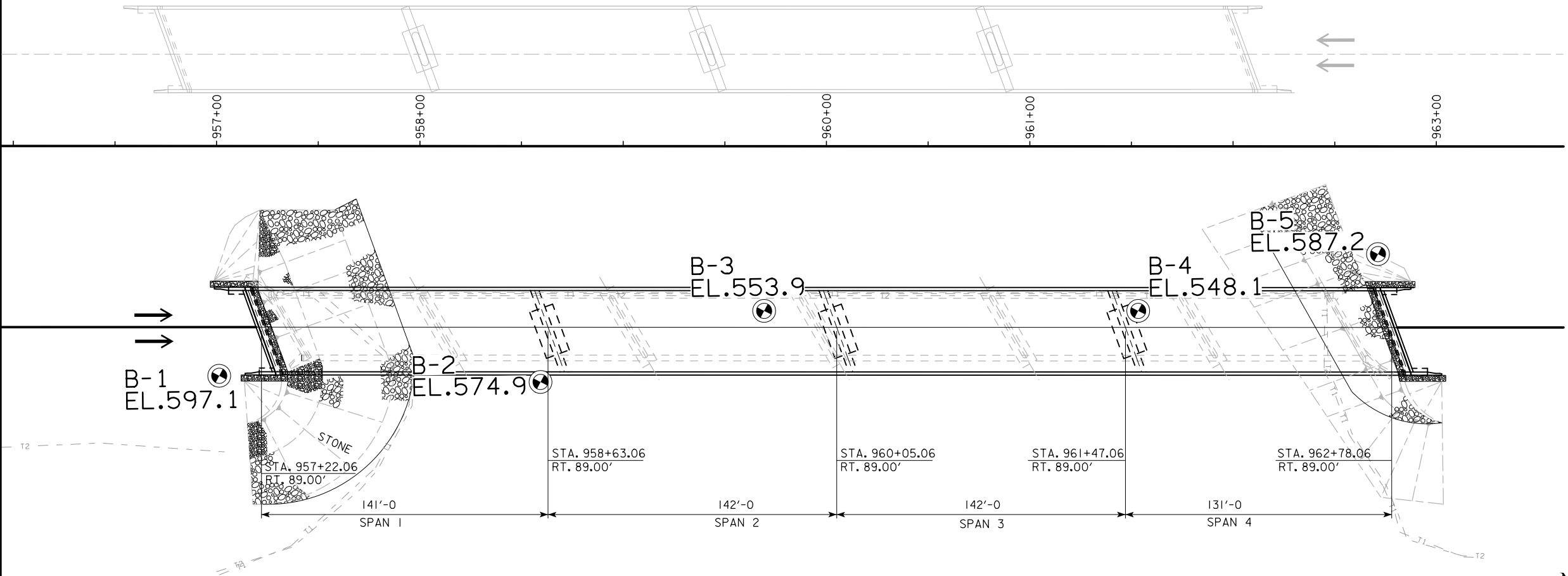
GEOTECHNICAL DESIGN



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: *Justin D. Humke* Date: 3-12-2020  
Printed or Typed Name: Justin D. Humke  
My license renewal date is December 31, 2021

Pages or sheets covered by this seal: SPS.1 thru SPS.3



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

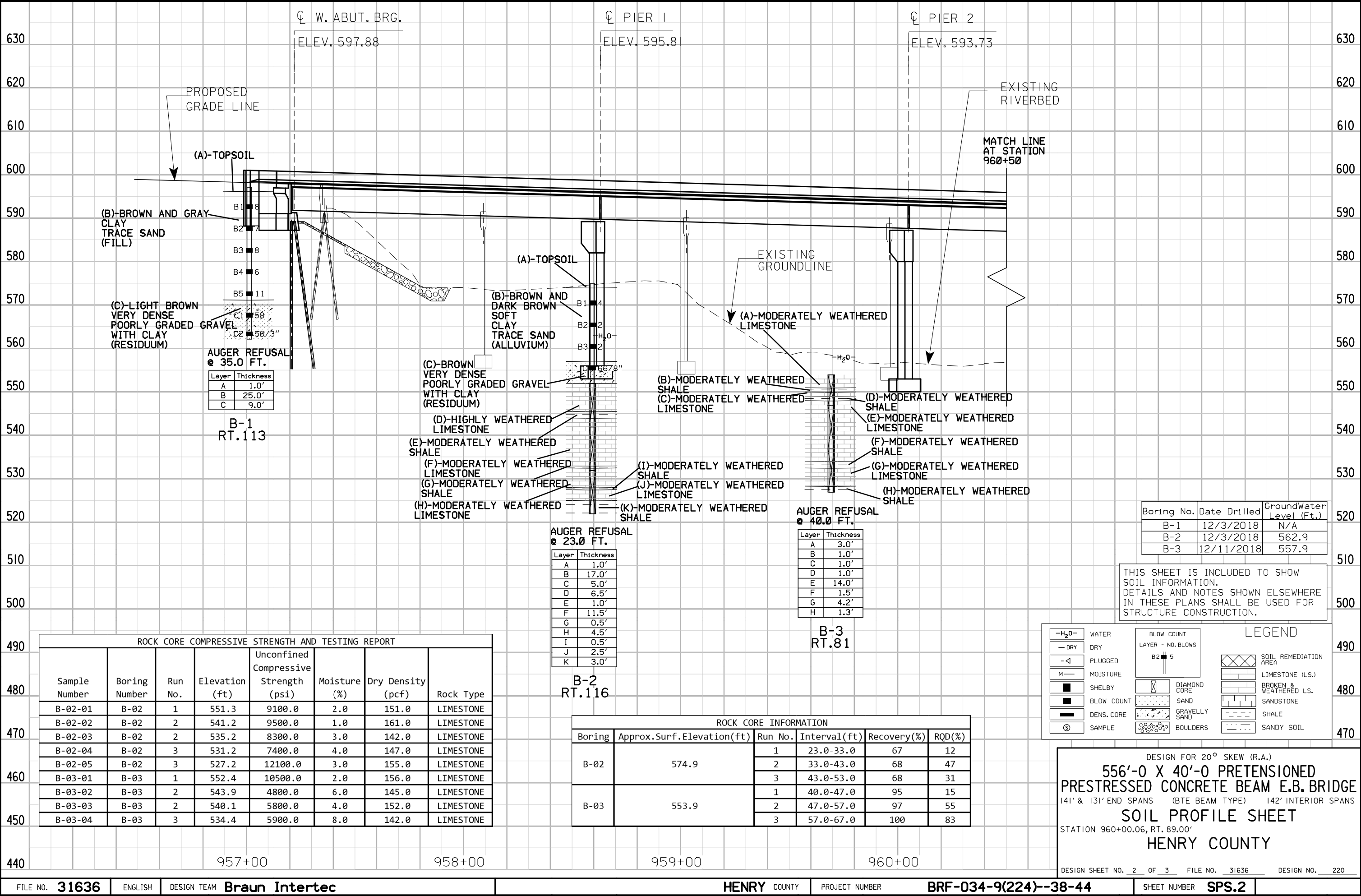


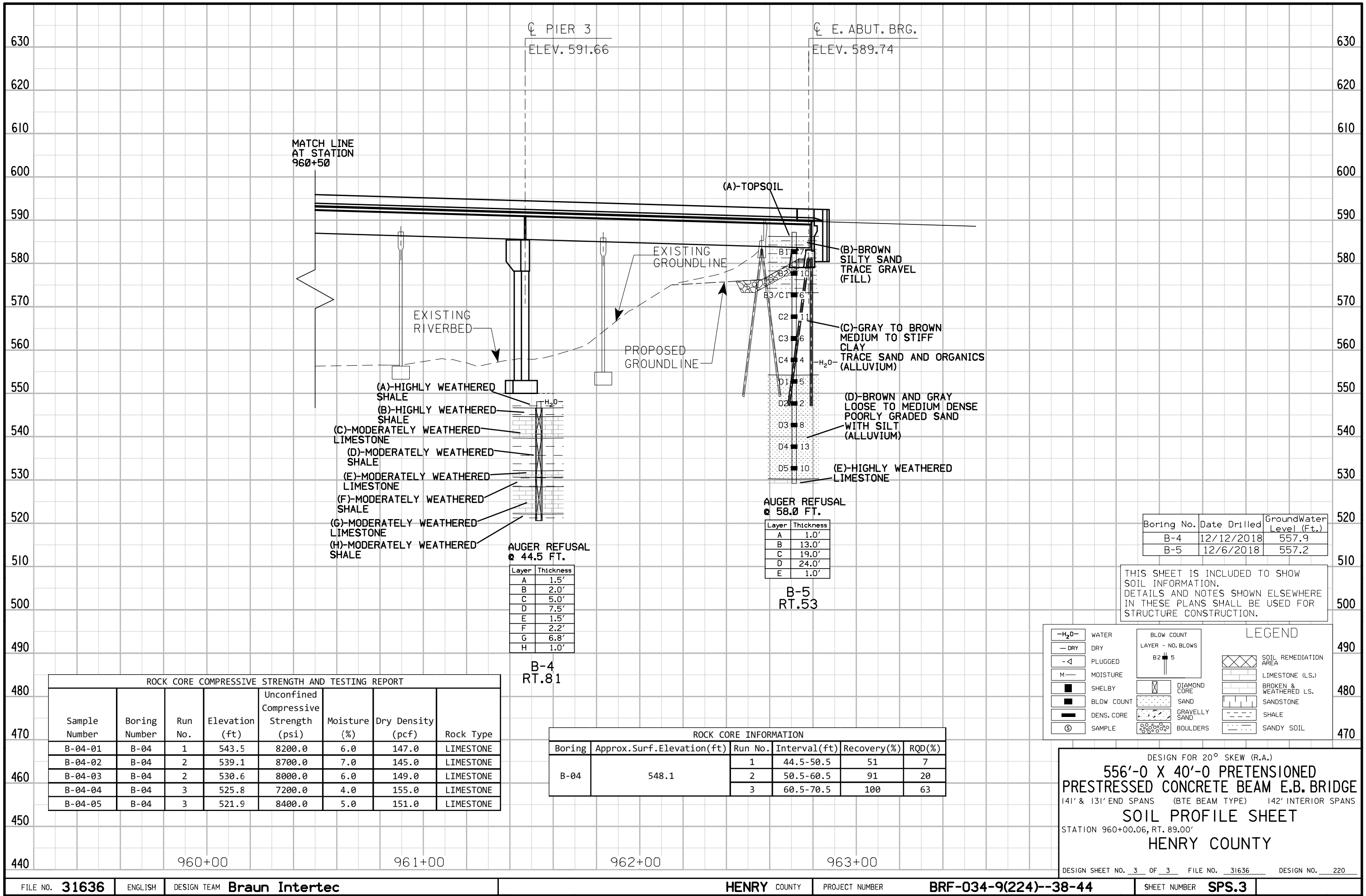
LOCATION

E.B. US 34 OVER SKUNK RIVER  
T-7IN R-7W  
SECTION 4 & 5  
TIPPECANOE TOWNSHIP  
HENRY COUNTY  
FHWA NO. 2843I  
BRIDGE MAINT. NO. 4426.7R034  
LATITUDE: 40.975053°  
LONGITUDE: -91.677947°

DESIGN FOR 20° SKEW (R.A.)  
556'-0 X 40'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM E.B. BRIDGE  
141' & 131' END SPANS (BTE BEAM TYPE) 142' INTERIOR SPANS  
SOIL PROFILE SHEET  
STATION 960+00.06, RT. 89.00'  
HENRY COUNTY

DESIGN SHEET NO. 1 OF 3 FILE NO. 31636 DESIGN NO. 220





ROCK CORE COMPRESSION STRENGTH AND TESTING REPORT							
Sample Number	Boring Number	Run No.	Elevation (ft)	Unconfined Compressive Strength (psi)	Moisture (%)	Dry Density (pcf)	Rock Type
B-04-01	B-04	1	543.5	8200.0	6.0	147.0	LIMESTONE
B-04-02	B-04	2	539.1	8700.0	7.0	145.0	LIMESTONE
B-04-03	B-04	2	530.6	8000.0	6.0	149.0	LIMESTONE
B-04-04	B-04	3	525.8	7200.0	4.0	155.0	LIMESTONE
B-04-05	B-04	3	521.9	8400.0	5.0	151.0	LIMESTONE

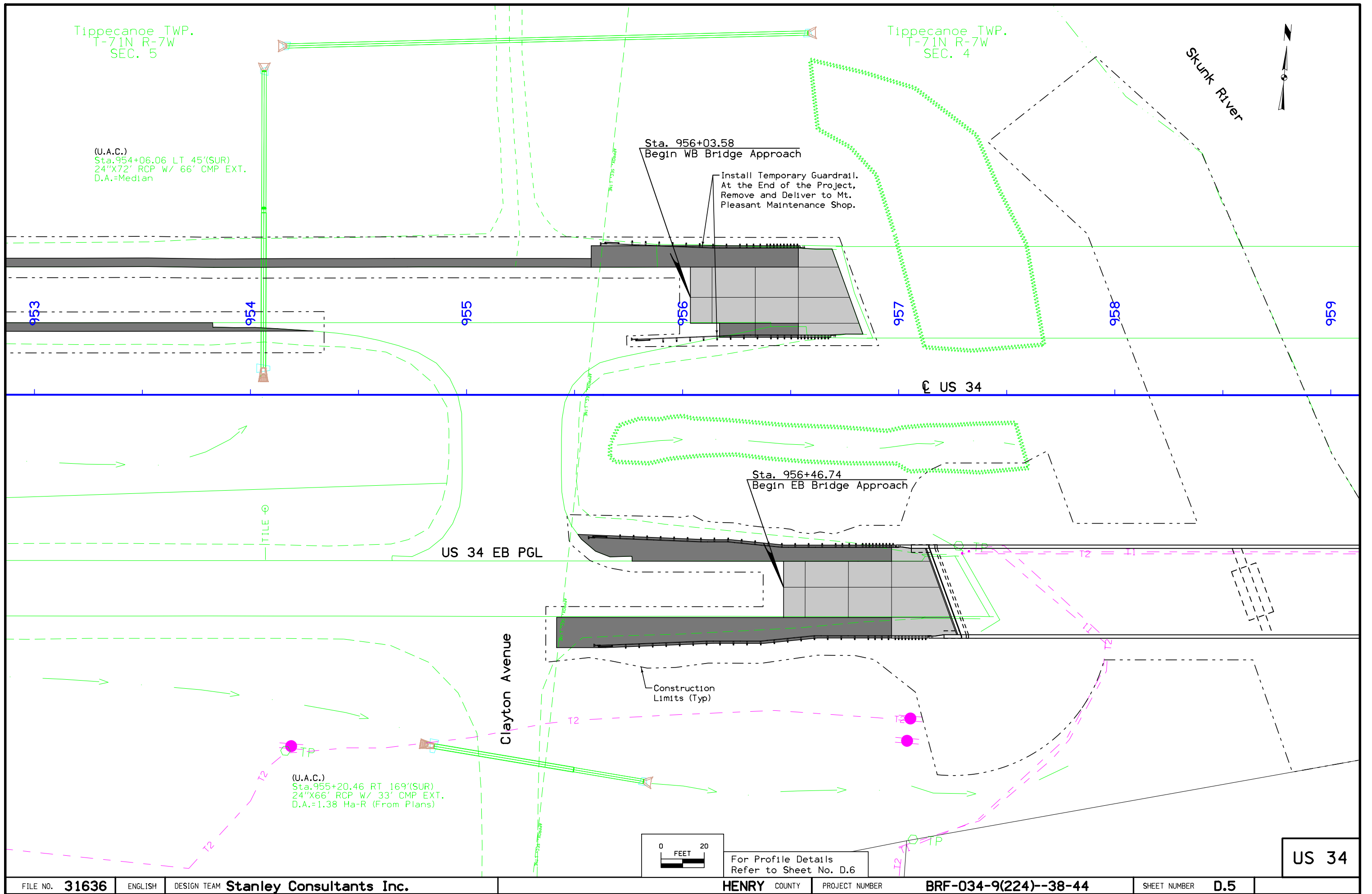
ROCK CORE INFORMATION					
Boring	Approx. Surf. Elevation (ft)	Run No.	Interval (ft)	Recovery (%)	RQD (%)
B-04	548.1	1	44.5-50.5	51	7
		2	50.5-60.5	91	20
		3	60.5-70.5	100	63











Tippecanoe TWP.  
T-71N R-7W  
SEC. 4

Sta. 959+42 LT 46.17' (SUR)  
BRG 2 524'X39' Prestressed Concrete Beam Bridge  
Design No. 1100

Sta. 959+97 RT 88.36' (SUR)  
BRG 1 520'X28' Continuous I Beam Bridge  
Design No. 1397

(U.A.C.)  
Sta. 962+92.19 LT 46'(SUR)  
24"X117" RCP  
D.A.=Median

Sta. 962+78.93  
End WB Bridge Approach

Sta. 963+54.84  
End EB Bridge Approach

Construction  
Limits (Typ)

US 34 EB PGL

US 34

0 20  
FEET

For Profile Details  
Refer to Sheet No. D.8

FILE NO. 31636

ENGLISH

DESIGN TEAM Stanley Consultants Inc.

HENRY COUNTY

PROJECT NUMBER

BRF-034-9(224)--38-44

SHEET NUMBER D.7

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