

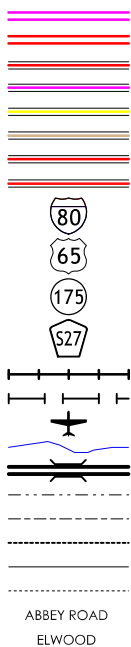
BRIDGE NEW - PPCB
NHSN-002-1(123)--2R-36
LETTING DATE
7/2/2019

FREMONT COUNTY - DESIGN 119 & 219
FREMONT COUNTY

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

FREMONT COUNTY

BRIDGE NEW - PPCB

1A 2 OVER MISSOURI RIVER OVERFLOW

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
122

PROJECT NUMBER

NHSN-002-1(123)--2R-36

R.O.W. PROJECT NUMBER

PROJECT IDENTIFICATION NUMBER

19-36-002-070

INDEX OF SHEETS

NO.	DESCRIPTION
1	TITLE SHEET
2	ESTIMATE SHEET - DESIGN 119
2-60	DESIGN 119
~~61~~	~~ESTIMATE SHEET DESIGN 219~~
~~61-109~~	~~DESIGN 219~~
SPS.1-SPS.6	SOIL PROFILE SHEET
C.1	ESTIMATE SHEET FOR ROADWAY
C.1-U.5	ROADWAY SHEETS

REVISIONS



1-800-292-8989

www.iowaonecall.com



STANDARD ROAD
PLANS

STANDARD ROAD PLANS ARE LISTED
ON SHEET NUMBER C.1

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
4 & 64	MARK D. WERNER	HYDRAULIC DESIGN
SPS.1	JUSTIN D. HUMKE	GEOTECHNICAL DESIGN
C.1	PAUL W. FLATTERY	ROADWAY 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 7/15/2019
Printed or Typed Name Anthony J. Bower

My license renewal date is December 31, 2020

Pages or sheets covered by this seal: SHEETS 1 THRU 109

PROJECT DIRECTORY NAME: 3600207019

DESIGN TEAM Stanley Consultants Inc.

ENGLISH

IOWA DOT * OFFICE OF BRIDGES AND STRUCTURES

FILE NO. 31719

FREMONT COUNTY

PROJECT NUMBER NHSN-002-1(123)--2R-36

SHEET NUMBER

1

ESTIMATED BRIDGE QUANTITIES - DESIGN 119

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL			AS BUILT QUANTITY
				1	2	3	
					ALTERNATE OPTION 1	ALTERNATE OPTION 2	
1.	2402-2720000	EXCAVATION, CLASS 20	CY	5,128			
2.	2403-0100010	STRUCTURAL CONCRETE (BRIDGE)	CY	1488.5	829.2	1845.6	
3.	2404-7775000	REINFORCING STEEL	LB		164,100	109,398	
4.	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB	369,005			
5.	2404-7775009	REINFORCING STEEL, STAINLESS STEEL	LB	14,766			
6.	2405-2705000	EXCAVATE AND DEWATER	LS		1.0	1.0	
7.	2407-0550000	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, SBTE155	EACH	12			
8.	2407-0564355	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTE155	EACH	30			
9.	2408-7800000	STRUCTURAL STEEL	LB	62,265		1,284	
10.	2414-6424110	CONCRETE BARRIER RAILING	LF	2,261			
11.	2501-0201473	PILES, STEEL, HP 14x73	LF	4,080			
12.	2501-0201517	PILES, STEEL, HP 14x117	LF		24,000	19,500	
13.	2507-2638650	BRIDGE WING ARMORING - EROSION STONE	SY	28.0			
14.	2507-3250005	ENGINEERING FABRIC	SY	5,542			
15.	2507-6800061	REVTMENT, CLASS E	TON	5,338			
16.	2507-8029000	EROSION STONE	TON	13.5			
17.	2526-8285000	CONSTRUCTION SURVEY	LS	1.0			
18.	2533-4980005	MOBILIZATION	LS	1.0			
19.	2599-9999005	EXPANSION JOINT (DRAINAGE SYSTEM)	EACH	2.0			
20.	2599-9999009	EXPANSION JOINT (FINGER PLATES)	LF	80.7			
21.	2599-9999010	CONCRETE DEADMAN ANCHOR	LS	1.0			
22.	2599-9999010	TEMPORARY DETOUR BRIDGE SUPERSTRUCTURE	LS	1.0			

ESTIMATE REFERENCE INFORMATION

ROADWAY QUANTITIES
SHOWN ON SHEET C.

ITEM NO.	DESCRIPTION
1.	INCLUDES EXCAVATION FOR BRIDGE ABUTMENTS, WINGS, AND REVETMENT. QUANTITY FOR "EXCAVATION, CLASS 20" IS BASED ON THE ASSUMPTION THAT SITE GRADING AND SHAPING HAS BEEN COMPLETED TO THE "PROPOSED GROUND LINE" PRIOR TO THE START OF CONSTRUCTION OF THE ABUTMENT, WINGS, AND REVETMENT. DOES NOT INCLUDE EXCAVATION AT PIERS.
2.	INCLUDES THE CONCRETE FOR THE ABUTMENT FOOTINGS, BACKWALLS, WING EXTENSIONS, MASKWALLS, DECK, ABUTMENT AND PIER DIAPHRAGMS, ABUTMENT WINGS, DRAIN BLOCKS, AND BERM BLOCKS. 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.
	FOR OPTION 1, INCLUDES THE CONCRETE FOR THE PIERS.
	FOR OPTION 2, INCLUDES THE CONCRETE FOR THE PIERS. THE MASS CONCRETE REQUIREMENTS SHALL BE WAIVED FOR THE PILE BENT PIER CAP ONLY.
4.	INCLUDES MECHANICAL SPLICERS IN THE ABUTMENT BACKWALLS. INCLUDES WELDED WIRE FABRIC IN THE DRAIN BLOCKS AT THE ABUTMENTS AS SHOWN ON DESIGN SHEET 47.
6.	FOR OPTION 1: FOR PIERS IN ACCORDANCE WITH ARTICLE 2405 OF THE STANDARD SPECIFICATIONS. THE DESIGN IS BASED ON SEAL COAT DIMENSIONS AS SHOWN ON DESIGN SHEET 18. PAYMENT IS FOR FULL COMPENSATION FOR CLASS 20 AND CLASS 21 EXCAVATION, COFFERDAMS AND TREMIE CONCRETE SEALS (IF USED), COSTS OF OTHER PROCEDURES REQUIRED TO DEWATER THE EXCAVATIONS, PUMPING, BAILING AND DRAINAGE, AND MATERIALS, WORK, LABOR, AND EQUIPMENT REQUIRED TO PLACE THE FOOTINGS AND PIERS IN THE DRY.
	FOR OPTION 2: FOR PIERS IN ACCORDANCE WITH ARTICLE 2405 OF THE STANDARD SPECIFICATIONS. PAYMENT IS FOR FULL COMPENSATION FOR CLASS 20 AND CLASS 21 EXCAVATION, COFFERDAMS, COSTS OF OTHER PROCEDURES REQUIRED TO DEWATER THE EXCAVATIONS, PUMPING, BAILING AND DRAINAGE, AND MATERIALS, WORK, LABOR, AND EQUIPMENT REQUIRED TO PLACE THE PIERS IN THE DRY.
7.	INCLUDES PIER AND ABUTMENT BEARING MATERIAL AND COIL TIES. INCLUDES ANCHORED CURVED SOLE PLATES AT ABUTMENTS AND PIERS. INCLUDES TOP FLANGE WELD PLATES AT ABUTMENTS. INCLUDES LAMINATED NEOPRENE BEARING PADS. NONSTANDARD STIRRUP LENGTHS ARE USED FOR THIS BEAM. INCLUDES CONTRACTOR FILLING OUT BEAM NUMBERS BY LOCATION AND BEAM SEAT ELEVATIONS IN "PPC BEAM DATA SPREADSHEET" AND FORWARDING ELECTRONIC SPREADSHEET TO THE ENGINEER.
8.	INCLUDES PIER BEARING MATERIAL AND COIL TIES. INCLUDES ANCHORED CURVED SOLE PLATES AT PIERS. INCLUDES NEOPRENE PADS, AND LAMINATED NEOPRENE BEARING PADS. NONSTANDARD STIRRUP LENGTHS ARE USED FOR THIS BEAM. INCLUDES CONTRACTOR FILLING OUT BEAM NUMBERS BY LOCATION AND BEAM SEAT ELEVATIONS IN "PPC BEAM DATA SPREADSHEET" AND FORWARDING ELECTRONIC SPREADSHEET TO THE ENGINEER.

ITEM NO.	DESCRIPTION
9.	INCLUDES ALL COSTS FOR FURNISHING AND INSTALLING STEEL INTERMEDIATE DIAPHRAGMS. INCLUDES 1/8 INCH NEOPRENE SHEETS FOR ABUTMENT BEARINGS. INCLUDES COST TO FURNISH AND INSTALL DECK DRAINS. INCLUDES AN ALLOWANCE FOR BRONZE PLATES AT ABUTMENT BEARINGS. FOR OPTION 2, INCLUDES FURNISHING AND INSTALLING SHEAR KEY WELD PLATES AT PIER CAPS.
10.	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 2,261 FEET OF 2 INCH DIAMETER RIGID STEEL CONDUIT. INCLUDES MATERIAL AND LABOR ASSOCIATED WITH PROVIDING AND INSTALLING RIGID STEEL CONDUIT, JUNCTION BOXES AND FITTINGS.
11.	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.
12.	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. FOR OPTION 2, INCLUDES FURNISHING AND INSTALLING PILE BRACE INCLUDING WELDS AS SHOWN ON DESIGN SHEET 20.
13.	INCLUDES FURNISHING AND PLACING ENGINEERING FABRIC, EROSION STONE, AND ALL REQUIRED EXCAVATING, SHAPING AND COMPACTING FOR WING ARMORING.
14.	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.
15.	ESTIMATED AT 1.6 TON/CY. BROKEN CONCRETE WILL NOT BE ALLOWED AS A SUBSTITUTE FOR REVETMENT.
16.	ESTIMATED AT 1.6 TON/CY.
19.	INCLUDES FULL COMPENSATION FOR THE FURNISHING, INSTALLING AND TESTING THE DRAINAGE SYSTEM UNDER THE FINGER JOINT AT THE ABUTMENTS AS DETAILED AND NOTED IN THESE PLANS. INCLUDES ALL NECESSARY HARDWARE AND ACCESSORIES NOT INCLUDED IN THE PRICE BID FOR "EXPANSION JOINT (FINGER PLATES)". INCLUDES ALL COSTS ASSOCIATED WITH FABRICATING, FURNISHING, AND INSTALLING NEOPRENE CURTAINS, NEOPRENE TROUGHS, CONCRETE ANCHORS, HANGER PLATES, ANGLES, AND ALL ASSOCIATED HARDWARE.
20.	INCLUDES FULL COMPENSATION FOR FURNISHING AND INSTALLING THE FINGER EXPANSION JOINT ASSEMBLY AT THE ABUTMENTS. THIS INCLUDES ALL NECESSARY HARDWARE AND ACCESSORIES INCLUDING THE FINGER PLATES, SUPPORT BRACKETS, ANCHOR PLATES, SHEAR STUDS, BOLTS, BARRIER RAIL PLATES, BENT PLATES, SHIM PLATES, CAP SCREWS, ASSOCIATED HARDWARE AND ALL TEMPORARY ERECTION MATERIAL. ALSO INCLUDES ALL MISCELLANEOUS MATERIALS REQUIRED FOR CONSTRUCTION OF THE FINGER JOINTS INCLUDING FIELD WELDS.
21.	INCLUDES ALL COSTS OF FURNISHING AND INSTALLING DEADMAN ANCHORS, INCLUDING ANCHOR TEES, RODS, CLEVIS, TURNBUCKLES, GALVANIZING, CONCRETE, REINFORCING STEEL, AND ALL WORK NECESSARY TO COMPLETE THE INSTALLATION OF DEADMAN ANCHORS. SEE DESIGN SHEET II FOR DETAILS AND NOTES.
22.	PAYMENT FOR "TEMPORARY DETOUR BRIDGE SUPERSTRUCTURE" WILL BE THE LUMP SUM CONTRACT PRICE. PAYMENT WILL BE FULL COMPENSATION FOR RENT, DELIVERY, ASSEMBLING, ERECTING, DISASSEMBLING, INSPECTING, MAINTAINING AND RETURNING THE TEMPORARY DETOUR BRIDGE SUPERSTRUCTURE. ALL COSTS FOR EQUIPMENT, LABOR AND MATERIALS NEEDED TO COMPLETE, MAKE USE OF AND REMOVE THE TEMPORARY DETOUR BRIDGE SUPERSTRUCTURE SHALL BE INCLUDED IN THE CONTRACT PRICE. INCLUDES COST TO FURNISH AND INSTALL REINFORCING AND CONCRETE TO BE UTILIZED FOR TEMPORARY BACKWALL AT BOTH ABUTMENTS. INCLUDES COST TO REMOVE TEMPORARY BACKWALL AND DISPOSE OF REMOVED MATERIALS IN ACCORDANCE WITH SPECIFICATIONS.

DIVISIONS:

- 1 BID ITEMS THAT ARE COMMON TO ALL CONTRACTOR CHOICES
2 BID ALTERNATE OPTION 1 IF SELECTING FRAME PIER
3 BID ALTERNATE OPTION 2 IF SELECTING ENCASED PILE BENT

DESIGN FOR 0° SKEW
1097'-0" X 40'-0" PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE
156'-0" END SPANS 157'-0" INTERIOR SPAN
ESTIMATED QUANTITIES
IA 2 STA. 400+85.00, RT. 32.00' JULY 2019
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 1 OF 59 FILE NO. 31719 DESIGN NO. 119

GENERAL NOTES:

IT IS THE INTENT OF THIS DESIGN TO CONSTRUCT A NEW 7-SPAN 1097'-0 X 40'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE ON EASTBOUND IA 2 OVER THE MISSOURI RIVER OVERFLOW.

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.

GUARDRAIL IS TO BE PLACED BY OTHERS.

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

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 PILES 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.

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

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

THE APPROACH FILLS AS SHOWN ARE TO BE IN PLACE BEFORE ABUTMENT PILES ARE DRIVEN. THE BRIDGE CONTRACTOR IS TO LEVEL OFF AND SHAPE THE BERMS TO THE ELEVATIONS AND DIMENSIONS SHOWN.

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).

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 CONTRACTOR IS NOT REQUIRED TO USE SAME PIER TYPE OPTION AS DESIGN NO. 219.

SEE ROADWAY PLANS FOR LONGITUDINAL GROOVING BID ITEMS AND NOTES.

404 PERMIT INFORMATION AND THE POLLUTION PREVENTION PLAN ARE INCLUDED IN THE TIED ROAD PLANS, PROJECT NO. NHSN-002-1(I122)--2R-36.

THE 7d3 BARS FOR THE PILE BENT OPTION SHALL BE SET AS DOWELS IN DRILLED HOLES. HOLES ARE TO BE 10" DEEP. THE DOWELS SHALL BE INSTALLED IN ACCORDANCE WITH THE GROUT MANUFACTURER'S RECOMMENDATIONS. EITHER OF THE FOLLOWING SYSTEMS MAY BE USED AS A BONDING AGENT FOR VERTICAL DOWELS, BUT ONLY SYSTEM "A" MAY BE USED FOR HORIZONTAL DOWELS:

- A. POLYMER GROUT SYSTEM IN ACCORDANCE WITH ARTICLE 2301.03, E, OF THE STANDARD SPECIFICATIONS.
- B. HYDRAULIC CEMENT GROUT SYSTEMS. DRILLED HOLES ARE TO BE 2½ TIMES THE DOWEL DIAMETER AND ARE TO BE BLOWN CLEAN WITH COMPRESSED AIR IMMEDIATELY PRIOR TO PLACING GROUT. THE HYDRAULIC CEMENT GROUT SHALL BE ONE OF THOSE APPROVED IN MATERIALS I.M. 491.13 AND SHALL BE USED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

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).

THIS STRUCTURE IS TO BE BUILT UNDER THE CONDITIONS OF DNR FLOOD PLAIN DEVELOPMENT PERMIT. PERMIT NUMBER TO BE PROVIDED BY THE OWNER WHEN AVAILABLE.

SOVEREIGN LANDS CONSTRUCTION PERMIT 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 SHALL BE PROVIDED BY OWNER WHEN AVAILABLE.

THIS PROJECT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF U.S. ARMY CORPS OF ENGINEERS PERMIT WHEN PERMIT NO. TO BE PROVIDED BY THE OWNER WHEN AVAILABLE. A COPY OF THIS PERMIT WILL BE AVAILABLE FROM THE IOWA DOT OFFICE OF CONTRACTS UPON REQUEST. THE U.S. ARMY CORPS OF ENGINEERS RESERVES THE RIGHT TO VISIT THE SITE WITHOUT PRIOR NOTICE.

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

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

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.
SPECIAL PROVISION - TEMPORARY DETOUR BRIDGE
SPECIAL PROVISION - MASS 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 30.
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	FINGER JOINT DETAILS
3	DECK DRAINAGE SYSTEM
4	TEMPORARY BRIDGE SUPERSTRUCTURE

BRIDGE DECK DIMENSIONS TABLE

NO.	ITEM	UNIT	QUANTITY
1	DECK LENGTH	L.F.	1103.0
2	MINIMUM DECK WIDTH	L.F.	43.2
3	MAXIMUM DECK WIDTH	L.F.	43.2
4	DECK AREA	S.F.	47650

- 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.

TRAFFIC CONTROL PLAN

NOTE: THE ROADWAY WILL BE OPEN TO THRU TRAFFIC. REFER TO THE TRAFFIC CONTROL PLAN INCLUDED IN THE TIED ROAD PLANS, PROJECT NO. NHSN-002-1(I122)-2R-36.

NOTE:
ROAD PLANS FOR THE PROJECT HAVE BEEN TIED TO THE BRIDGE PLANS THROUGH THE CONTRACT LETTING PROCESS. THE TIED ROAD PLANS, PROJECT NO. NHSN-002-1(I122)--2R-36, CONTAIN 404 PERMIT INFORMATION AND THE POLLUTION PREVENTION PLAN.

DESIGN FOR 0° SKEW

1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

156'-0 END SPANS157'-0 INTERIOR SPAN

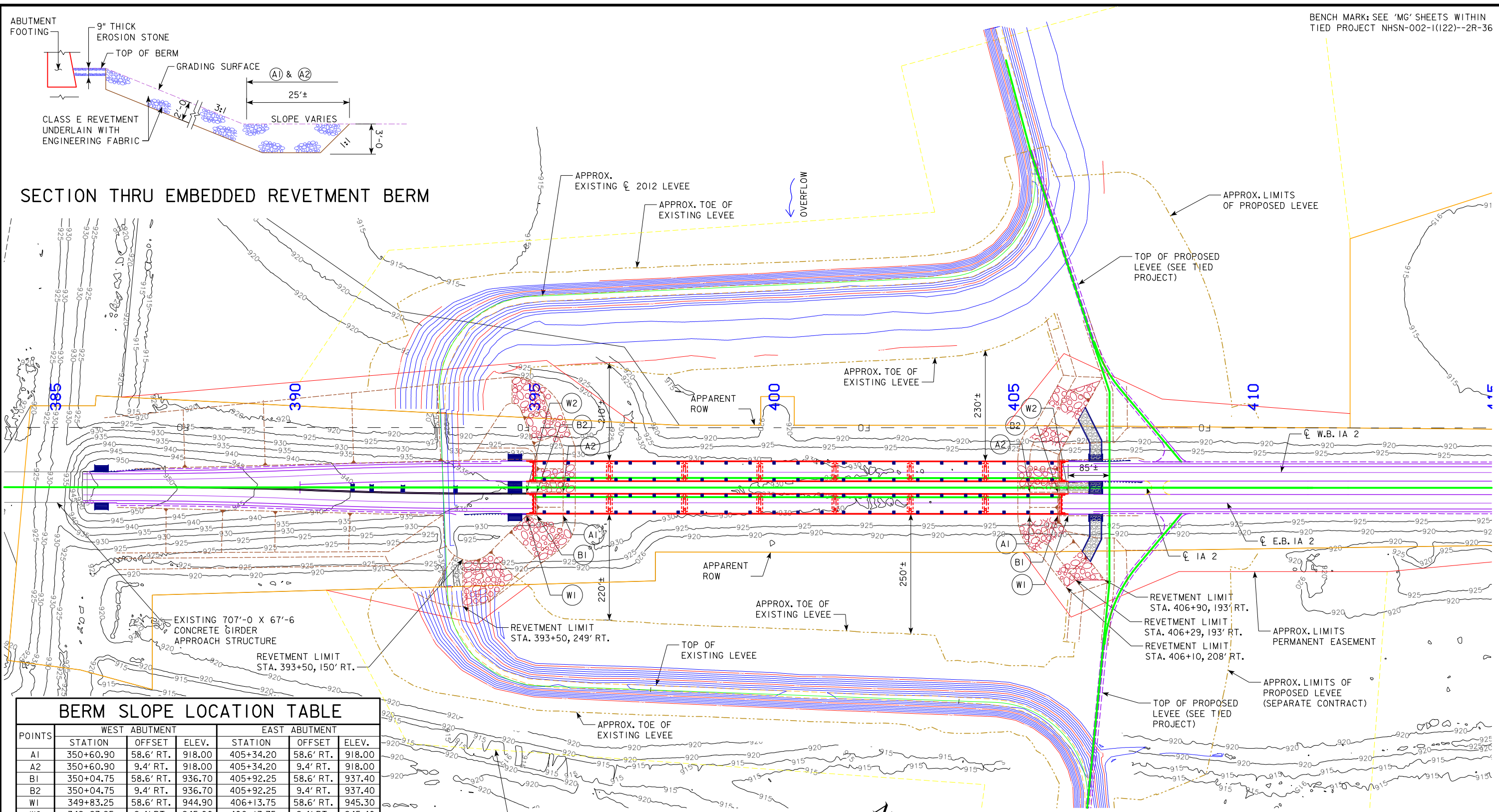
GENERAL NOTES

IA 2 STA. 400+85.00, RT. 32.00'JULY 2019

FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 3 OF 59FILE NO. 31719DESIGN NO. 119



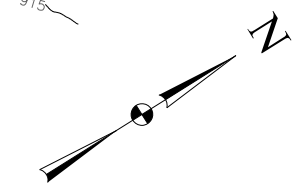
BERM SLOPE LOCATION TABLE						
POINTS	WEST ABUTMENT			EAST ABUTMENT		
	STATION	OFFSET	ELEV.	STATION	OFFSET	ELEV.
A1	350+60.90	58.6' RT.	918.00	405+34.20	58.6' RT.	918.00
A2	350+60.90	9.4' RT.	918.00	405+34.20	9.4' RT.	918.00
B1	350+04.75	58.6' RT.	936.70	405+92.25	58.6' RT.	937.40
B2	350+04.75	9.4' RT.	936.70	405+92.25	9.4' RT.	937.40
W1	349+83.25	58.6' RT.	944.90	406+13.75	58.6' RT.	945.30
W2	349+83.25	9.4' RT.	945.00	406+13.75	9.4' RT.	945.40

BERM SLOPE ELEVATIONS REFLECT THE GRADING SURFACE

ESTIMATED BERM ARMORING QUANTITIES				
LOCATION	REVTMENT CL. E (TON)	EROSION STONE (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
BERM LINING - WEST ABUTMENT	3,215	6.75	3,334	3,019
BERM LINING - EAST ABUTMENT	2,123	6.75	2,208	1,995
TOTALS	5,338	13.5	5,542	5,014

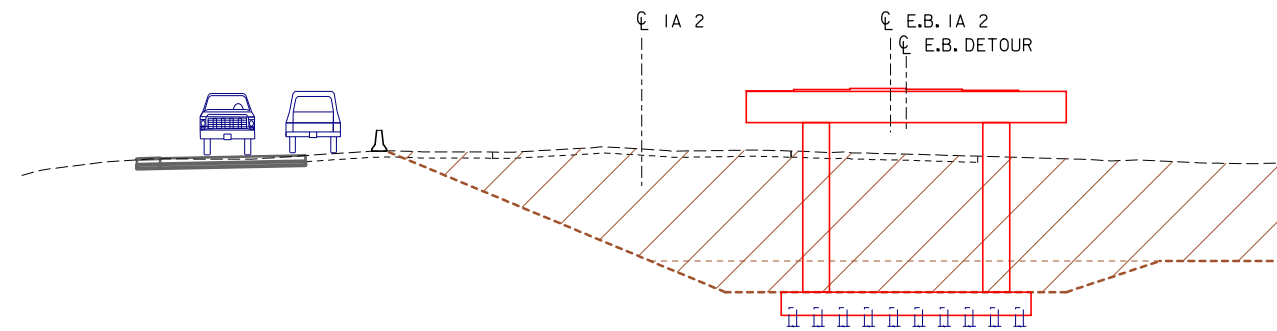
EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE.

SITE PLAN

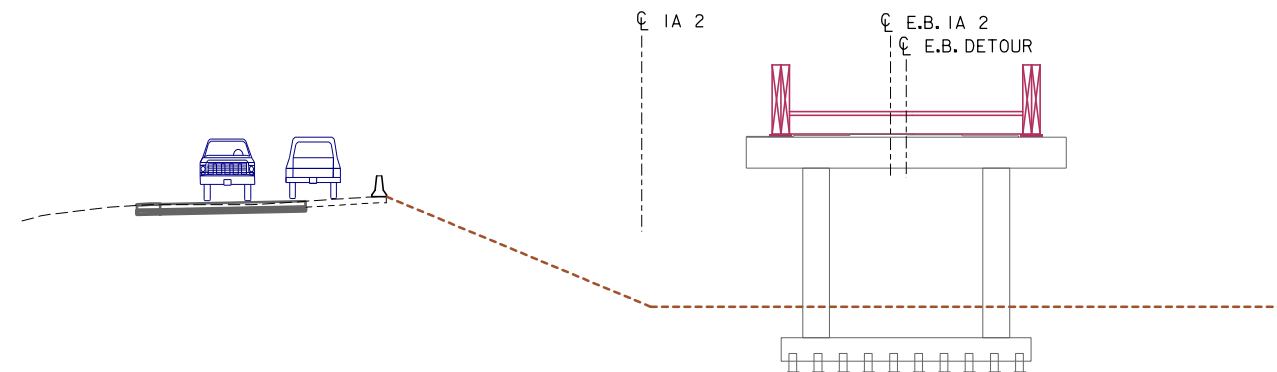


- NOTES:
- EXISTING 2012 LEEVE SHOWN WAS OBTAINED FROM ADDITIONAL SURVEY FROM MAY 2019.
 - PROPOSED LEEVE CONSTRUCTION SHALL BE PART OF TIED PROJECT.

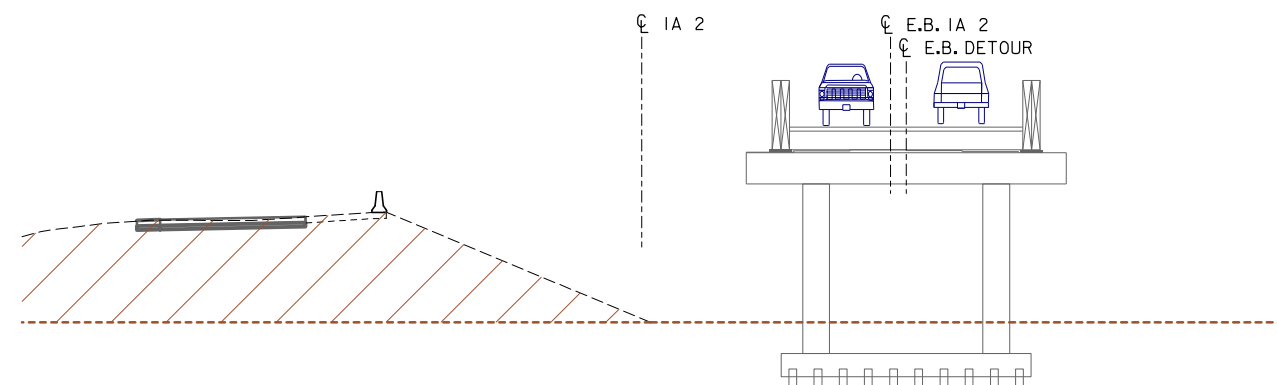
DESIGN FOR 0° SKEW
1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE
156'-0 END SPANS 157'-0 INTERIOR SPAN
SITUATION PLAN - SITE
IA 2 STA. 400+85.00, RT. 32.00'
JULY 2019
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 5 OF 59 FILE NO. 31719 DESIGN NO. 119



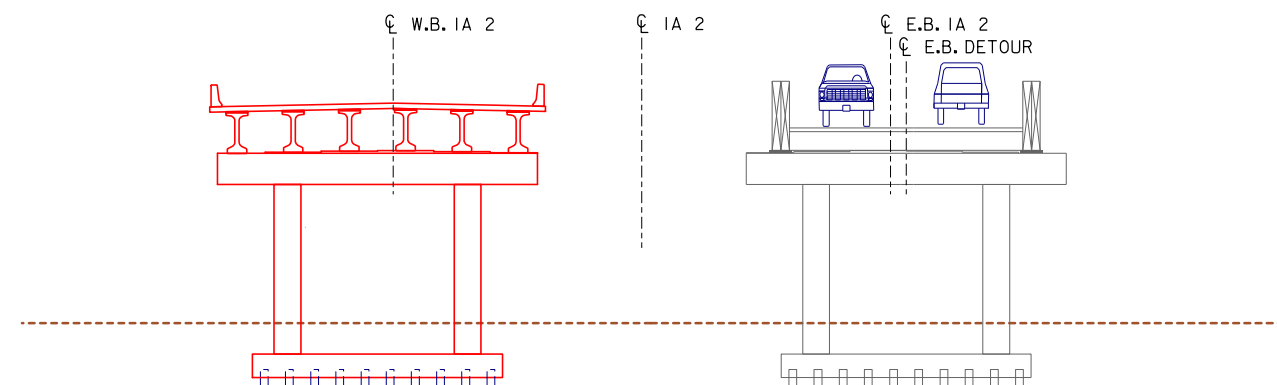
STAGE 2 - CONSTRUCT E.B. SUBSTRUCTURE



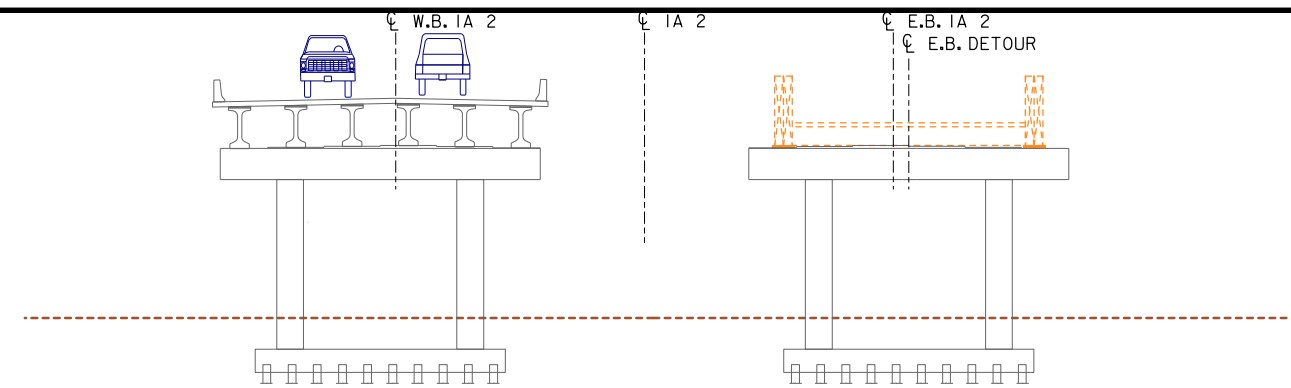
STAGE 2 - INSTALL TEMPORARY BRIDGE SUPERSTRUCTURE



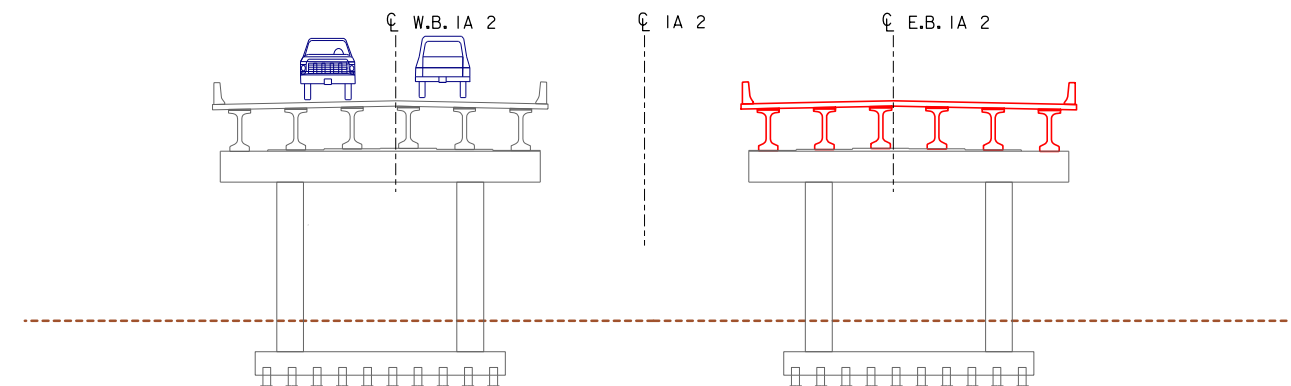
STAGE 3A - SHIFT TRAFFIC



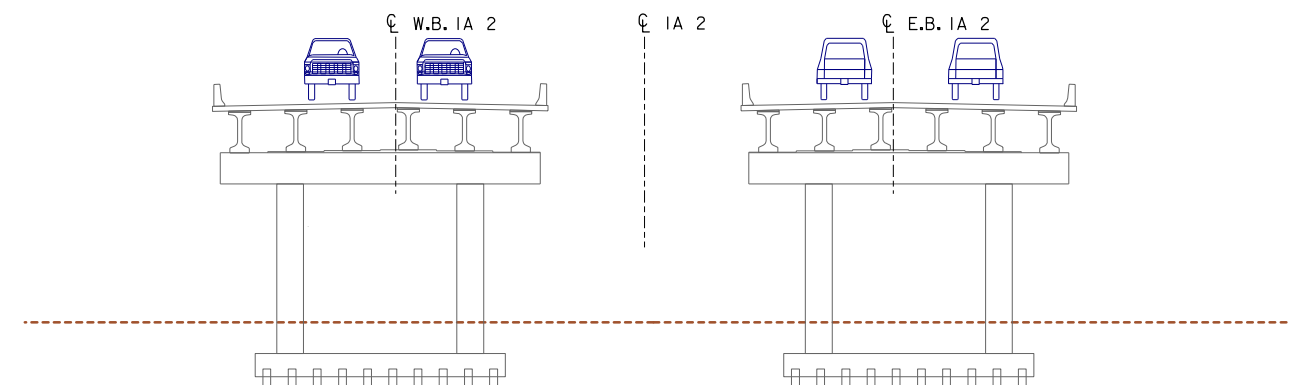
STAGE 3B - CONSTRUCT W.B. BRIDGE



STAGE 4A - REMOVE TEMPORARY BRIDGE SUPERSTRUCTURE



STAGE 4B - CONSTRUCT E.B. SUPERSTRUCTURE



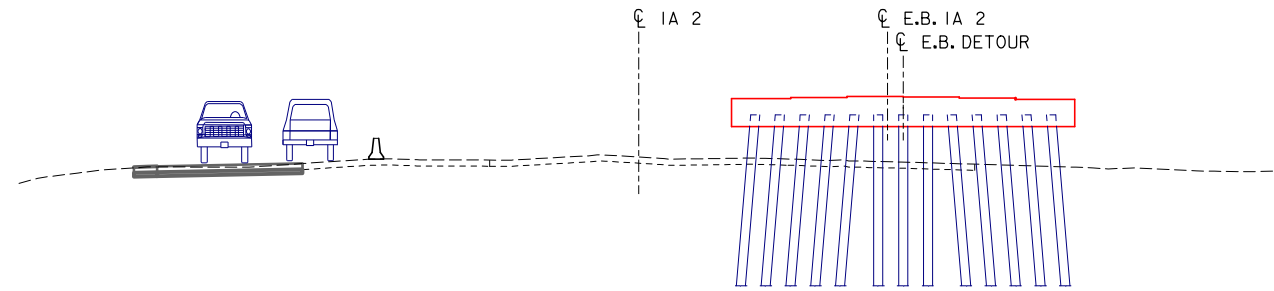
COMPLETED PROJECT

FRAME PIER OPTION STAGING NOTES:

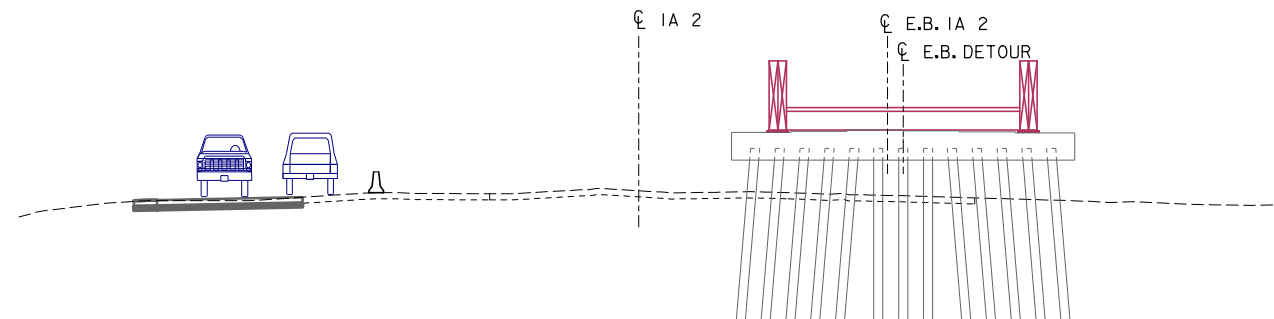
- STAGE 1
1. NO BRIDGE WORK DURING STAGE 1.
2. HEAD-TO-HEAD TRAFFIC ON EXISTING E.B. IA 2 ROADWAY.
- STAGE 2
1. HEAD-TO-HEAD TRAFFIC SHIFTED TO W.B. ROADWAY.
2. EXCAVATE ONLY AS NECESSARY TO BUILD E.B. PERMANENT SUBSTRUCTURE.
INSTALL COFFERDAMS AND SEAL COATS AS REQUIRED.
3. CONSTRUCT E.B. PERMANENT SUBSTRUCTURE.
4. INSTALL TEMPORARY BRIDGE SUPERSTRUCTURE ON PERMANENT E.B. SUBSTRUCTURE.
- STAGE 3
1. HEAD-TO-HEAD TRAFFIC SHIFTED TO E.B. TEMPORARY DETOUR/BRIDGE.
2. CONSTRUCT LEVEE AND EXCAVATE DOWN TO ELEV. 918'± TO OPEN OVERFLOW CHANNEL (OVERFLOW TO BE OPEN BY MARCH 1, 2020).
3. CONSTRUCT ENTIRE W.B. BRIDGE.
- STAGE 4
1. HEAD-TO-HEAD TRAFFIC SHIFTED TO W.B. PERMANENT BRIDGE.
2. REMOVE TEMPORARY DETOUR BRIDGE.
3. CONSTRUCT PERMANENT E.B. SUPERSTRUCTURE.

- COMPLETED PROJECT
1. TRAFFIC SHIFTED TO BOTH PERMANENT BRIDGES.

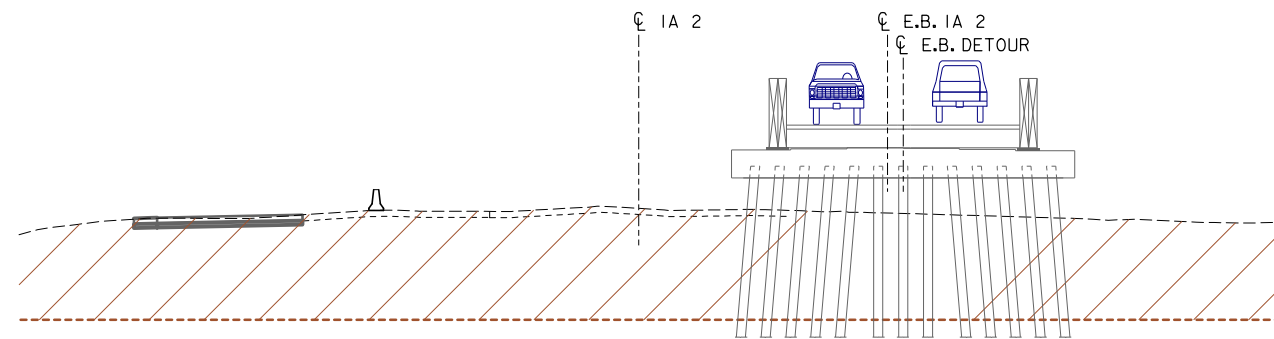
DESIGN FOR 0° SKEW
1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE
156'-0 END SPANS 157'-0 INTERIOR SPAN
STAGING DETAILS - FRAME PIER OPTION
IA 2 STA. 400+85.00, RT. 32.00' JULY 2019
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 6 OF 59 FILE NO. 31719 DESIGN NO. 119



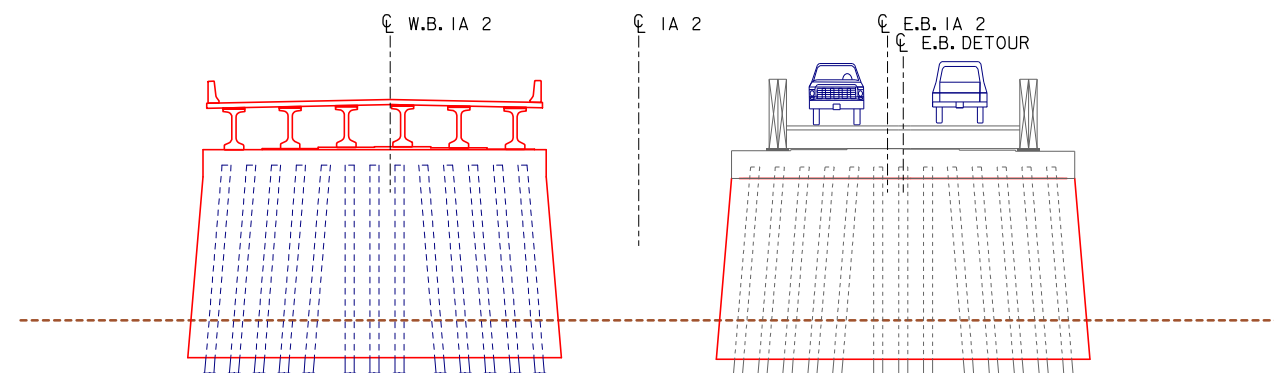
STAGE 2A - CONSTRUCT E.B. SUBSTRUCTURE



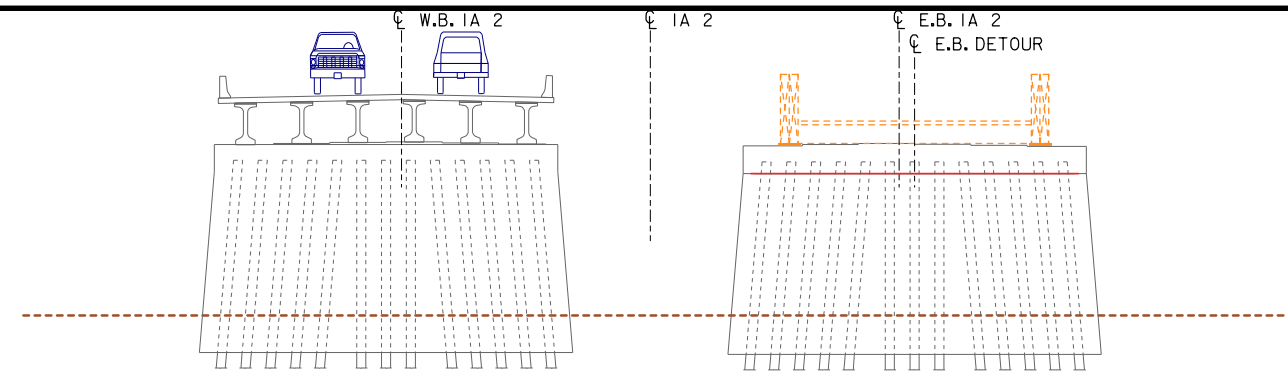
STAGE 2B - INSTALL TEMPORARY BRIDGE SUPERSTRUCTURE



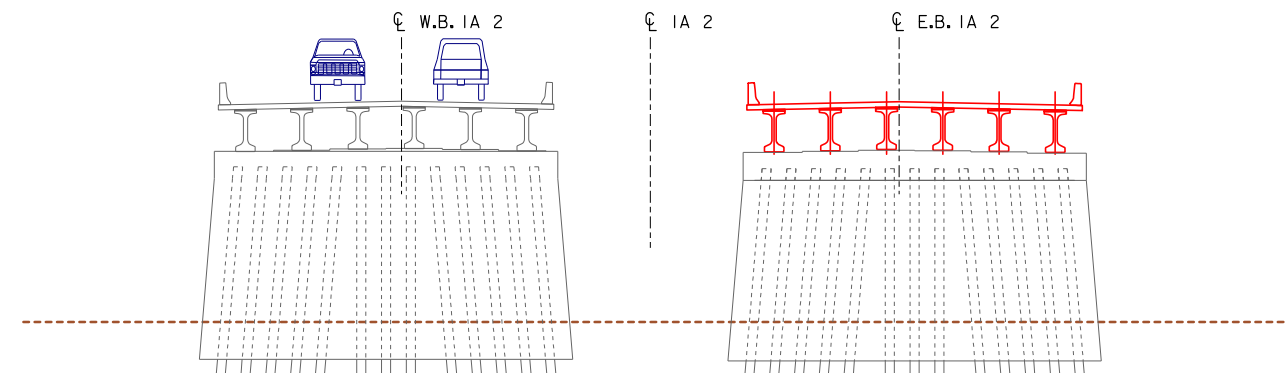
STAGE 3A - EXCAVATE W.B. ROADWAY



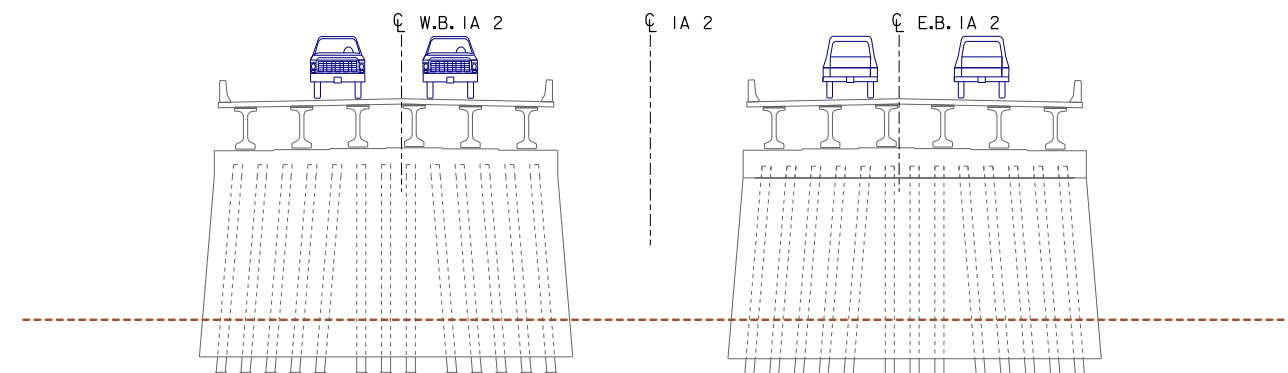
STAGE 3B - CONSTRUCT W.B. BRIDGE, ENCASE E.B. SUBSTRUCTURE



STAGE 4A - REMOVE TEMPORARY BRIDGE SUPERSTRUCTURE



STAGE 4B - CONSTRUCT E.B. SUPERSTRUCTURE



COMPLETED PROJECT

PILE BENT OPTION STAGING NOTES:

- STAGE 1
1. NO BRIDGE WORK DURING STAGE 1.
2. HEAD-TO-HEAD TRAFFIC ON EXISTING E.B. IA 2 ROADWAY.

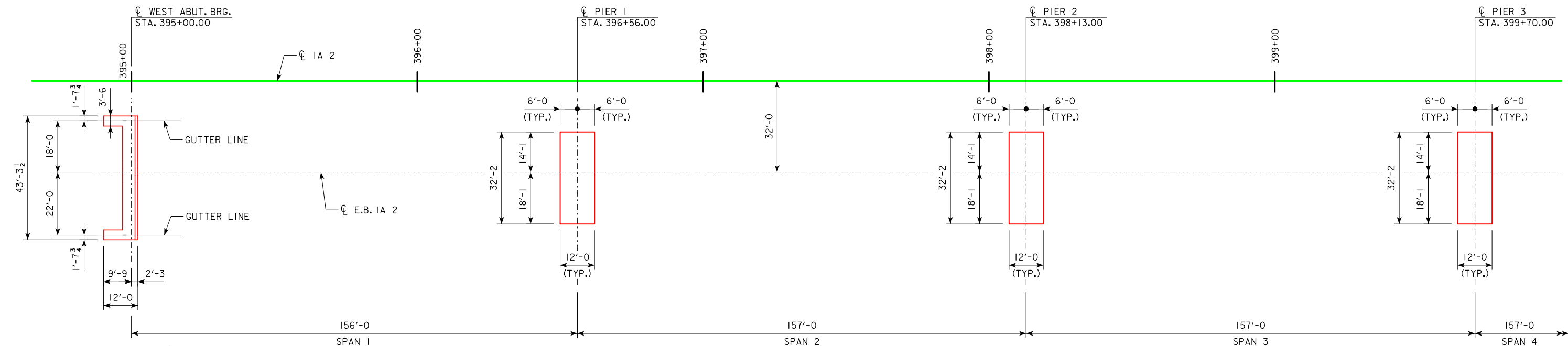
- STAGE 2
1. HEAD-TO-HEAD TRAFFIC SHIFTED TO W.B. IA 2 DETOUR ROADWAY.
2. CONSTRUCT E.B. SUBSTRUCTURE
3. INSTALL TEMPORARY BRIDGE SUPERSTRUCTURE ON PERMANENT E.B. SUBSTRUCTURE.

- STAGE 3
1. HEAD-TO-HEAD TRAFFIC SHIFTED TO E.B. IA 2 DETOUR/TEMPORARY BRIDGE.
2. CONSTRUCT LEVEE AND EXCAVATE DOWN TO ELEV. 918'± TO OPEN OVERFLOW CHANNEL (OVERFLOW TO BE OPEN BY MARCH 1, 2020).
3. CONSTRUCT W.B. BRIDGE, ENCASE PILE BENT PRIOR TO SETTING BEAMS.
4. ENCASE E.B. PILE BENT.

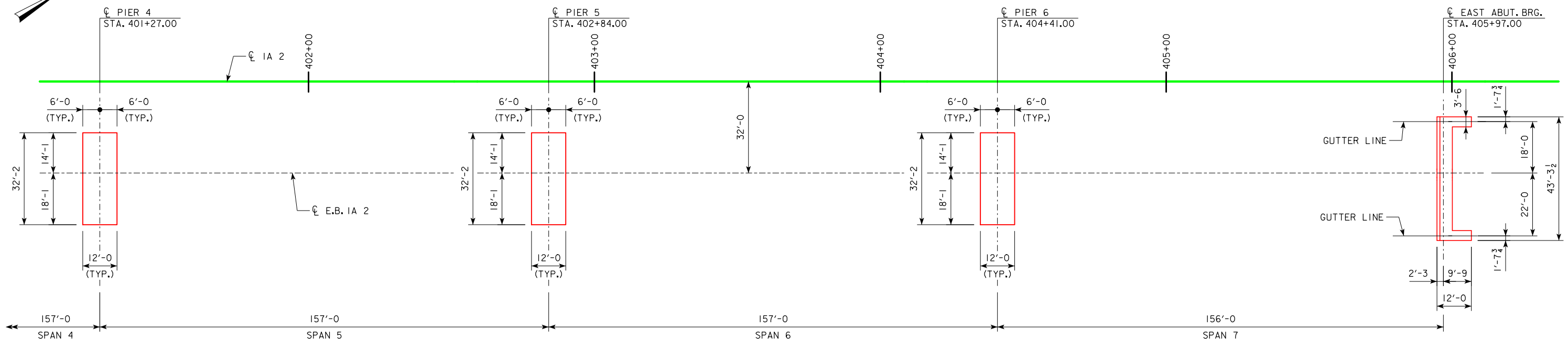
- STAGE 4
1. HEAD-TO-HEAD TRAFFIC SHIFTED TO W.B. BRIDGE.
2. REMOVE TEMPORARY BRIDGE SUPERSTRUCTURE.
3. CONSTRUCT PERMANENT E.B. SUPERSTRUCTURE.

- COMPLETED PROJECT
1. TRAFFIC SHIFTED TO BOTH COMPLETED BRIDGES.

DESIGN FOR 0° SKEW
1097'-0" X 40'-0" PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE
156'-0" END SPANS 157'-0" INTERIOR SPAN
STAGING DETAILS - PILE BENT OPTION
IA 2 STA. 400+85.00, RT. 32.00'
JULY 2019
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 7 OF 59 FILE NO. 31719 DESIGN NO. 119



STAKING DIAGRAM - FRAME PIER OPTION
(SPANS 1-4 SHOWN)



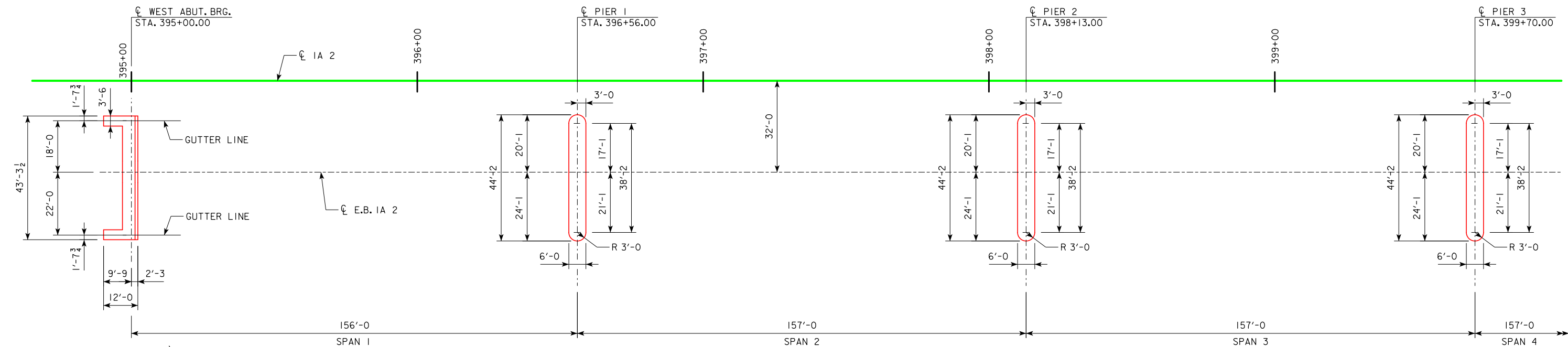
STAKING DIAGRAM - FRAME PIER OPTION
(SPANS 4-7 SHOWN)

BRIDGE COORDINATES

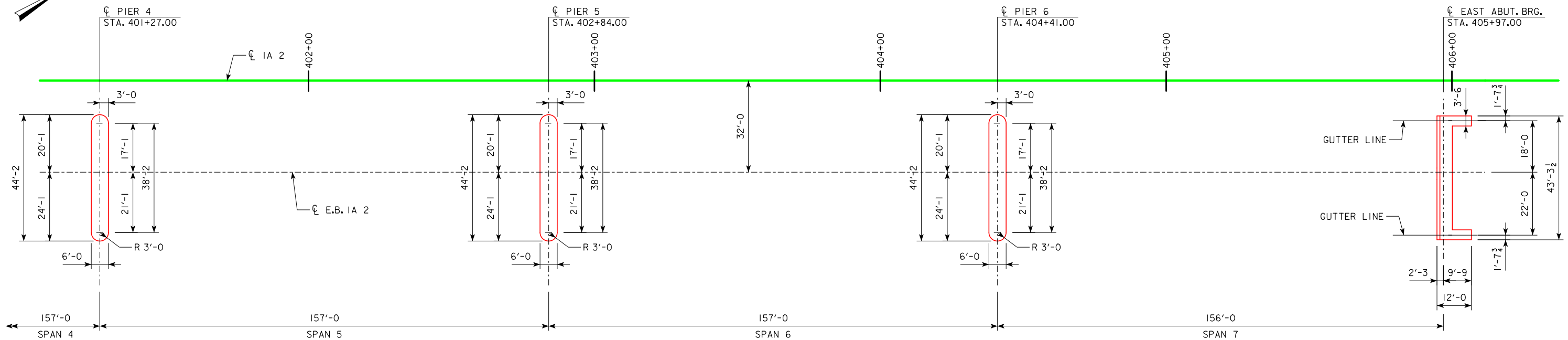
LOCATION	CL W. ABUT. BRG.	CL PIER 1	CL PIER 2	CL PIER 3	CL PIER 4	CL PIER 5	CL PIER 6	CL E. ABUT. BRG.
LEFT EDGE OF DECK	N=6755080.398 E=16474249.770	N=6755209.140 E=16474337.870	N=6755338.707 E=16474426.530	N=6755468.273 E=16474515.200	N=6755597.840 E=16474603.860	N=6755727.407 E=16474692.530	N=6755856.973 E=16474781.190	N=6755985.715 E=16474869.290
CL APPROACH ROADWAY	N=6755069.339 E=16474265.930	N=6755198.080 E=16474354.030	N=6755327.647 E=16474442.690	N=6755457.214 E=16474531.360	N=6755586.780 E=16474620.020	N=6755716.347 E=16474708.690	N=6755845.914 E=16474797.350	N=6755974.655 E=16474885.450
RIGHT EDGE OF DECK	N=6755056.021 E=16474285.390	N=6755184.762 E=16474373.490	N=6755314.329 E=16474462.150	N=6755443.895 E=16474550.820	N=6755573.462 E=16474639.48	N=6755703.029 E=16474728.150	N=6755832.595 E=16474816.810	N=6755961.337 E=16474904.910

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

DESIGN FOR 0° SKEW
**1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE**
156'-0 END SPANS 157'-0 INTERIOR SPAN
STAKING DIAGRAM - FRAME PIER OPTION
IA 2 STA. 400+85.00, RT. 32.00'
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 8 OF 59 FILE NO. 31719 DESIGN NO. 119



STAKING DIAGRAM - PILE BENT OPTION
(SPANS 1-4 SHOWN)



STAKING DIAGRAM - PILE BENT OPTION
(SPANS 4-7 SHOWN)

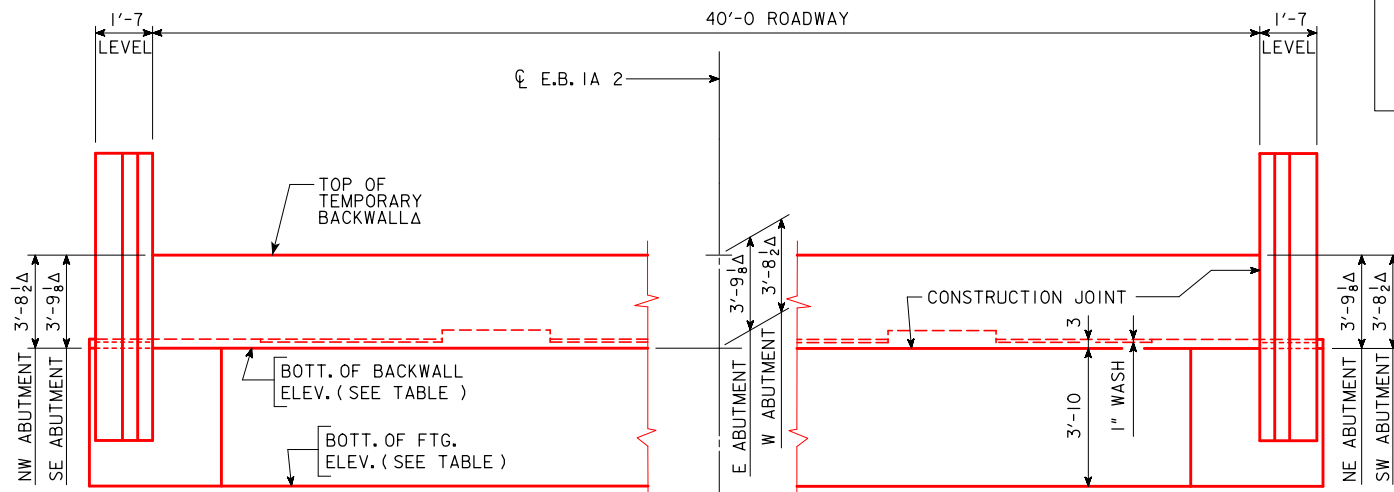
BRIDGE COORDINATES								
LOCATION	CL W. ABUT. BRG.	CL PIER 1	CL PIER 2	CL PIER 3	CL PIER 4	CL PIER 5	CL PIER 6	CL E. ABUT. BRG.
LEFT EDGE OF DECK	N=6755080.398 E=16474249.770	N=6755209.140 E=16474337.870	N=6755338.707 E=16474426.530	N=6755468.273 E=16474515.200	N=6755597.840 E=16474603.860	N=6755727.407 E=16474692.530	N=6755856.973 E=16474781.190	N=6755985.715 E=16474869.290
CL APPROACH ROADWAY	N=6755069.339 E=16474265.930	N=6755198.080 E=16474354.030	N=6755327.647 E=16474442.690	N=6755457.214 E=16474531.360	N=6755586.780 E=16474620.020	N=6755716.347 E=16474708.690	N=6755845.914 E=16474797.350	N=6755974.655 E=16474885.450
RIGHT EDGE OF DECK	N=6755056.021 E=16474285.390	N=6755184.762 E=16474373.490	N=6755314.329 E=16474462.150	N=6755443.895 E=16474550.820	N=6755573.462 E=16474639.48	N=6755703.029 E=16474728.150	N=6755832.595 E=16474816.810	N=6755961.337 E=16474904.910

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.

NOTE:
PILE BENT AS SHOWN MATCHES
PILE CAP WHICH IS ASSUMED TO BE
CONSTRUCTED FIRST.

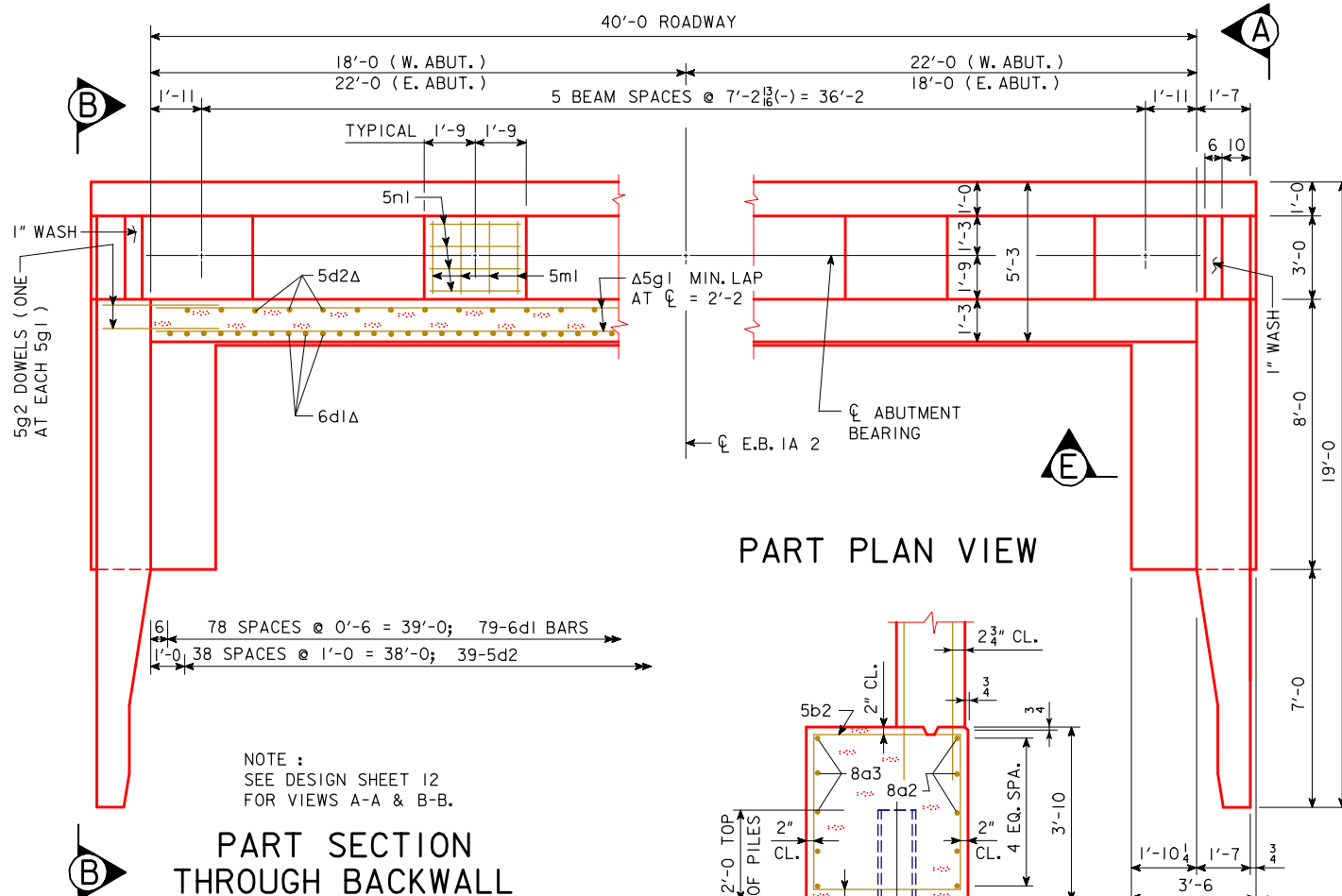
DESIGN FOR 0° SKEW
**1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE**
156'-0 END SPANS 157'-0 INTERIOR SPAN
STAKING DIAGRAM - PILE BENT OPTION
IA 2 STA. 400+85.00, RT. 32.00'
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 9 OF 59 FILE NO. 31719 DESIGN NO. 119

BENCH MARK: SEE 'MG' SHEETS WITHIN
TIED PROJECT NHSN-002-1(122)-2R-36



REAR ELEVATION

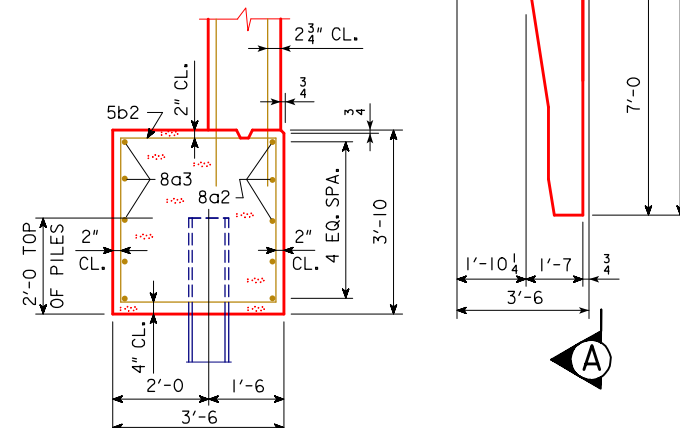
NOTE :
PLACE 5mI AND 5nI BARS
UNDER EACH BEAM.



PART SECTION
THROUGH BACKWALL

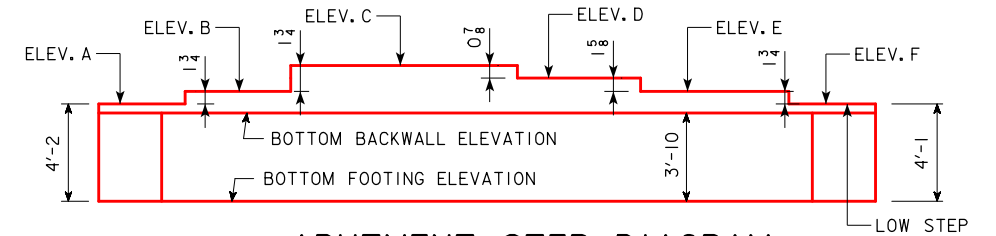
NOTE :
SEE DESIGN SHEET 12
FOR VIEWS A-A & B-B.

PART PLAN VIEW



SECTION E-E

Δ HEIGHT OF TEMPORARY BACKWALL CAN BE MODIFIED
AS REQUIRED TO MATCH SUPERSTRUCTURE OF
TEMPORARY BRIDGE SUPERSTRUCTURE WITH WRITTEN
APPROVAL BY THE ENGINEER. COST TO FURNISH
AND INSTALL TEMPORARY BACKWALL CONCRETE AND
REINFORCING SHALL BE INCIDENTAL TO PRICE BID
FOR "TEMPORARY DETOUR BRIDGE SUPERSTRUCTURE".



ABUTMENT STEP DIAGRAM

(REAR ELEVATION, WEST ABUTMENT)
(FRONT ELEVATION, EAST ABUTMENT)

TABLE OF ABUTMENT
ELEVATIONS

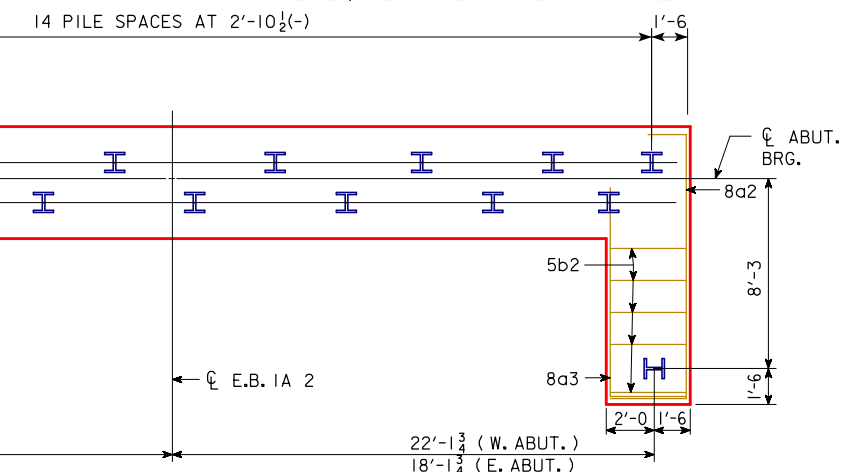
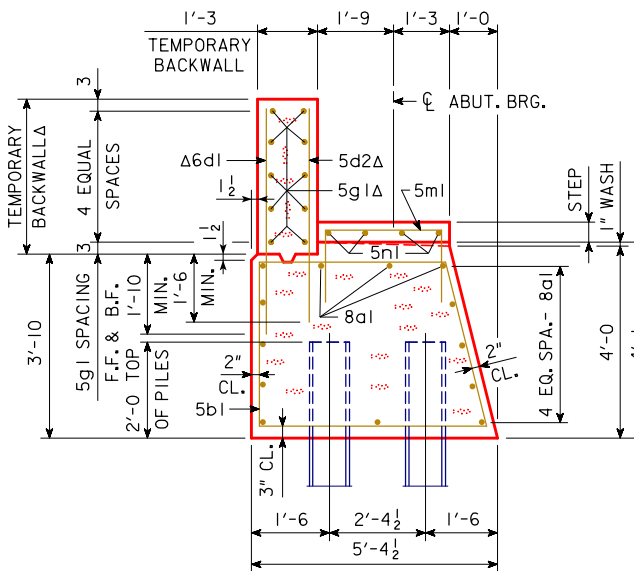
POINT	WEST ABUTMENT	EAST ABUTMENT
ELEV. A	938.81	939.52
ELEV. B	938.95	939.66
ELEV. C	939.09	939.80
ELEV. D	939.02	939.73
ELEV. E	938.87	939.58
ELEV. F	938.73	939.44
BOTT. BACKWALL ELEV.	938.48	939.19
BOTT. FTG. ELEV.	934.65	935.36

THE CONTRACT LENGTH OF 125 FEET (WEST ABUTMENT) AND 115 FEET (EAST ABUTMENT) FOR THE ABUTMENT PILES IS BASED ON A NON-COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 265 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.70 FOR ROCK END BEARING. TO ACCOUNT FOR SOIL CONSOLIDATION UNDER THE NEW FILL, THE FACTORED AXIAL LOAD INCLUDES A FACTORED DOWNDRAG LOAD OF 75 KIPS AT THE WEST ABUTMENT AND 65 KIPS AT THE EAST ABUTMENT.

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

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR ABUTMENT PILES IS 280 TONS (WEST ABUT.) AND 275 TONS (EAST ABUT.) AT END OF DRIVE. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. IN NO CASE SHALL A PILE BE EMBEDDED LESS THAN 100 FEET. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

SECTION THROUGH ABUTMENT

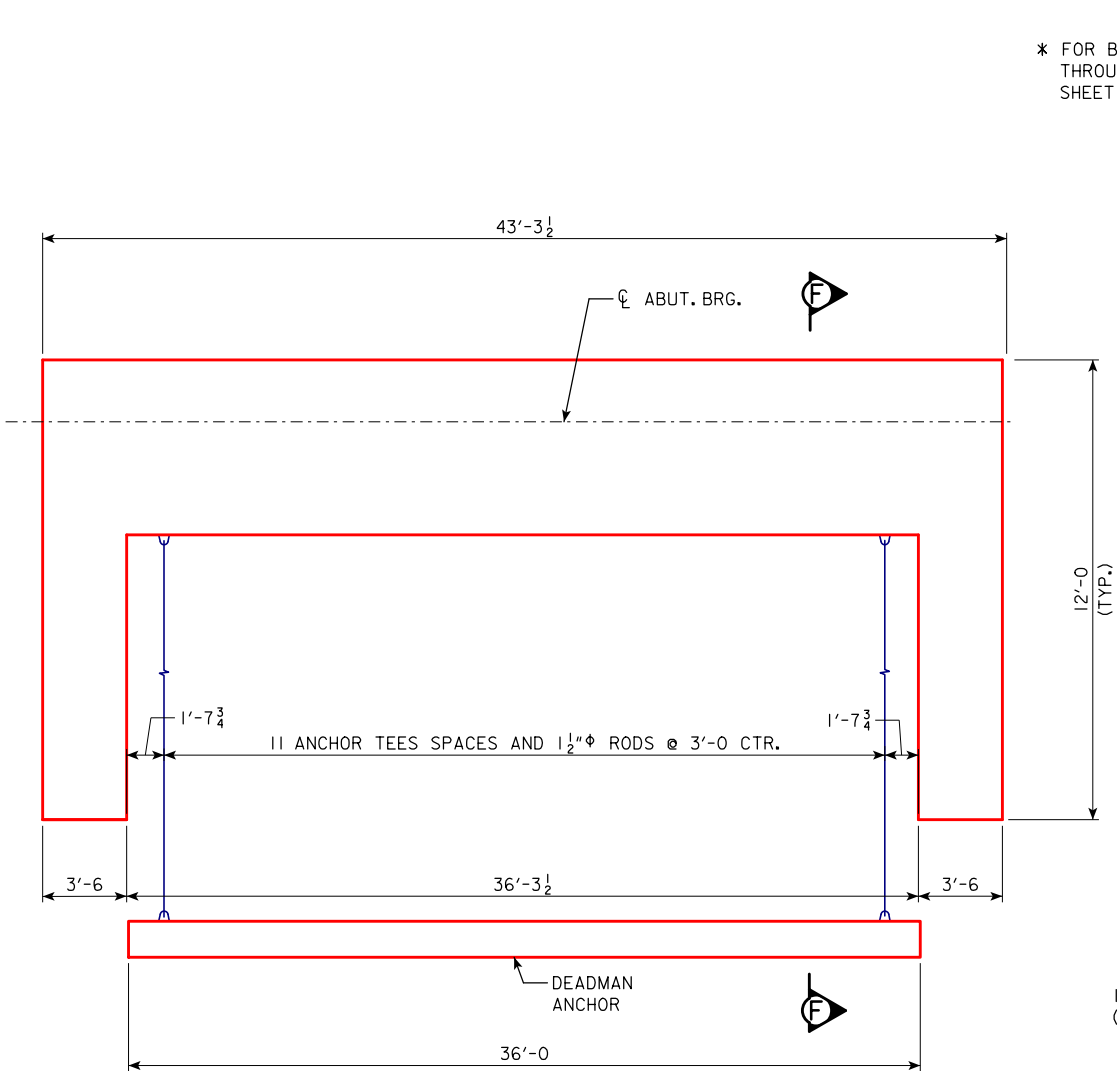


PILING LAYOUT

NOTE :
DIMENSIONS SHOWN ON PILING LAYOUT ARE AT BOTTOM OF
FOOTING. 17 - HP14X73 STEEL BEARING PILING REQUIRED
AT EACH ABUTMENT.

NOTE: BARRIER RAIL NOT SHOWN IN DETAILS.

DESIGN FOR 0° SKEW
1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE
156'-0 END SPANS 157'-0 INTERIOR SPAN
ABUTMENT FOOTING DETAILS
IA 2 STA. 400+85.00, RT. 32.00'
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 10 OF 59 FILE NO. 31719 DESIGN NO. 119



ABUTMENT LAYOUT

DEADMAN ANCHOR NOTES:

REINFORCING STEEL LENGTHS ARE BASED ON NOMINAL LENGTHS OUT TO OUT.

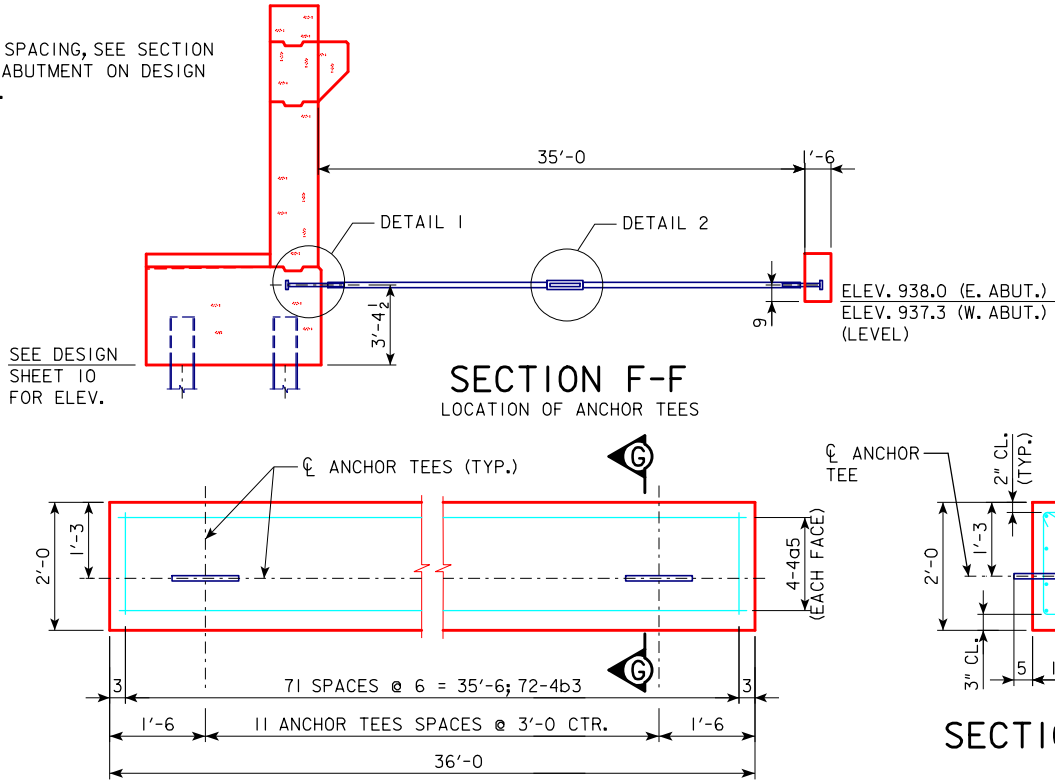
ALL ANCHOR TEES, RODS, CLEVISSES, TURNBUCKLES, ETC. SHALL BE FABRICATED FROM ASTM A709 GRADE 36, ASTM A668 CLASS F OR EQUIVALENT STEEL AND GALVANIZED IN ACCORDANCE WITH ASTM A123. SHOP DRAWINGS WILL NOT BE REQUIRED. ALL CONCRETE SHALL BE CLASS C. ALL REINFORCING STEEL SHALL BE GRADE 60.

ALL METAL MEMBERS OF THE ANCHORAGE SYSTEM NOT EMBEDDED IN CONCRETE SHALL BE CLEANED AND RECEIVE A HEAVY COATING OF AN APPROVED BITUMINOUS PAINT.

FINE AGGREGATE SHALL BE IN ACCORDANCE WITH ARTICLE 4133.04, A OF THE STANDARD SPECIFICATIONS AND SHALL BE PLACED BELOW AND ABOVE THE ROD AND TURNBUCKLES.

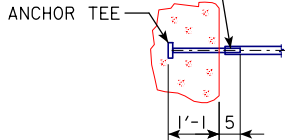
PAYMENT FOR ALL MATERIALS, BACKFILL AND ANY OTHER INCIDENTAL WORK NECESSARY TO COMPLETE THE DEADMAN ANCHORAGE ASSEMBLY WILL BE PAID FOR AT THE LUMP SUM PRICE FOR "CONCRETE DEADMAN ANCHOR".

* FOR BAR SPACING, SEE SECTION THROUGH ABUTMENT ON DESIGN SHEET 10.

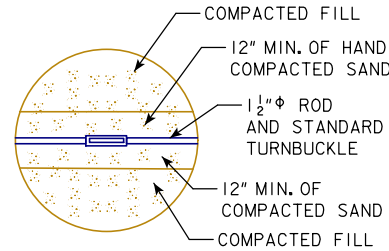


ELEVATION OF DEADMAN

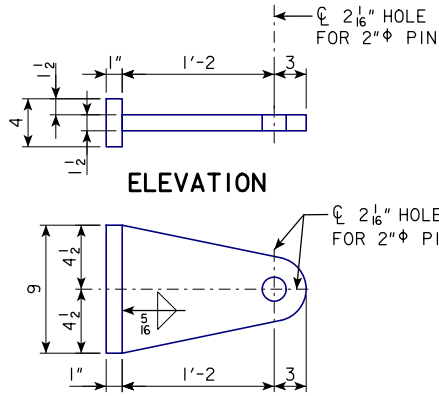
1 1/2" ϕ ROD AND STANDARD CLEVIS
(USE CLEVIS AT ALL ANCHOR TEES)



DETAIL 1



DETAIL 2



DETAIL OF ANCHOR TEE

DEADMAN ANCHOR CONCRETE PLACEMENT SUMMARY

ITEM	QUANTITY
** CLASS C CONCRETE (C.Y.)	2 @ 4.0
	8.0

DEADMAN ANCHOR REINFORCING BAR LIST
(TWO DEADMAN ANCHORS)

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
4a5	DEADMAN LONGIT.		16	35'-8	381
4b3	DEADMAN HOOP		144	6'-2	593
** REINFORCING STEEL - TOTAL (LBS)					974

** COST OF CONCRETE AND REINFORCING STEEL TO BE INCLUDED IN THE PRICE BID FOR "CONCRETE DEADMAN ANCHOR".

DEADMAN ANCHOR CONSTRUCTION SEQUENCE:

CONSTRUCT ABUTMENT WITH ANCHOR TEES IN PLACE.

CONSTRUCT DEADMAN WITH ANCHOR TEES IN PLACE.

MACHINE COMPACT FILL UP TO ELEVATION OF 1 1/2" ϕ ROD AND TURNBUCKLE.

INSTALL 1 1/2" ϕ ROD, CLEVIS AND TURNBUCKLE ASSEMBLY.

TIGHTEN TURNBUCKLE UNTIL SNUG.

HAND COMPACT FILL FOR 12" (MIN.) OVER 1 1/2" ϕ ROD AND TURNBUCKLE.

MACHINE COMPACT REMAINING FILL.

DESIGN FOR 0° SKEW
1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE
156'-0 END SPANS 157'-0 INTERIOR SPAN
ABUTMENT DEADMAN DETAILS
IA 2 STA. 400+85.00, RT. 32.00' JULY 2019
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 11 OF 59 FILE NO. 31719 DESIGN NO. 119

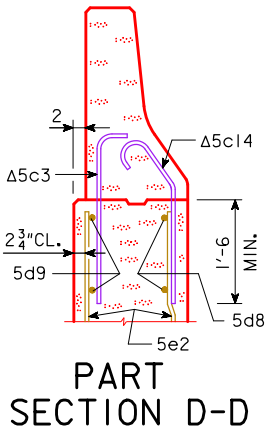
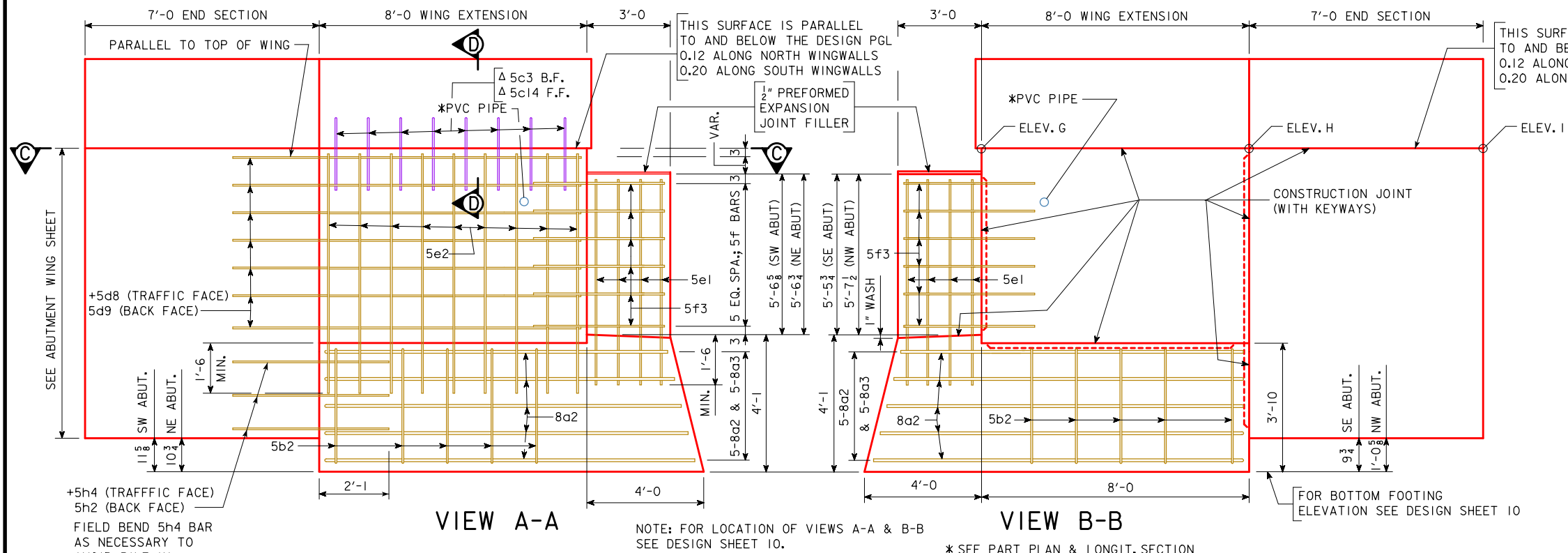
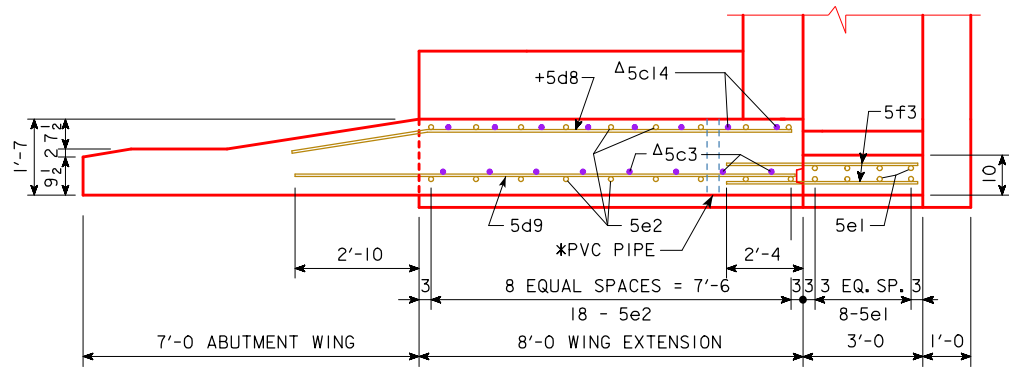


TABLE OF WINGWALL ELEVATIONS			
LOCATION	ELEV. G	ELEV. H	ELEV. I
NORTHWEST WING	945.20	945.16	945.12
SOUTHWEST WING	945.12	945.08	945.04
NORTHEAST WING	945.84	945.75	945.67
SOUTHEAST WING	945.76	945.67	945.59



SECTION C-C
NOTE: BARRIER RAIL NOT SHOWN IN SECTION C-C.
Δ NOTE: SEE DESIGN SHEETS 49 AND 50
IN THESE PLANS FOR DETAILS OF
BARRIER RAIL WING EXTENSIONS.
REINFORCING BARS 5c3 AND 5c14
ARE INCLUDED IN THE BARRIER RAIL
QUANTITIES.

DESIGN FOR 0° SKEW

1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

156'-0 END SPANS157'-0 INTERIOR SPAN

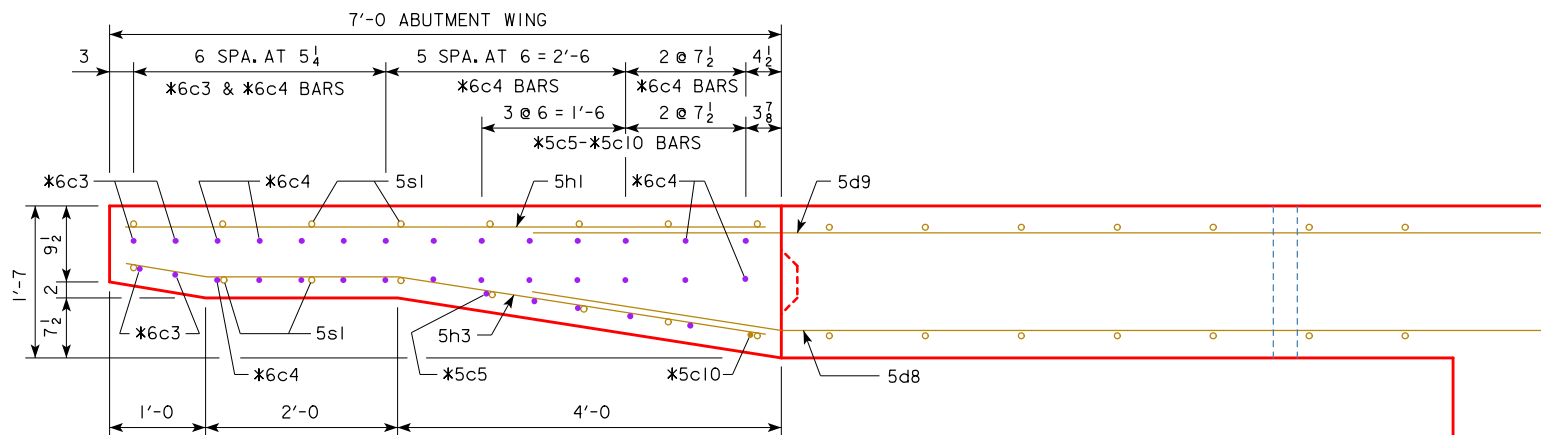
ABUTMENT WING EXT. DETAILS

IA 2 STA. 400+85.00, RT. 32.00'JULY 2019

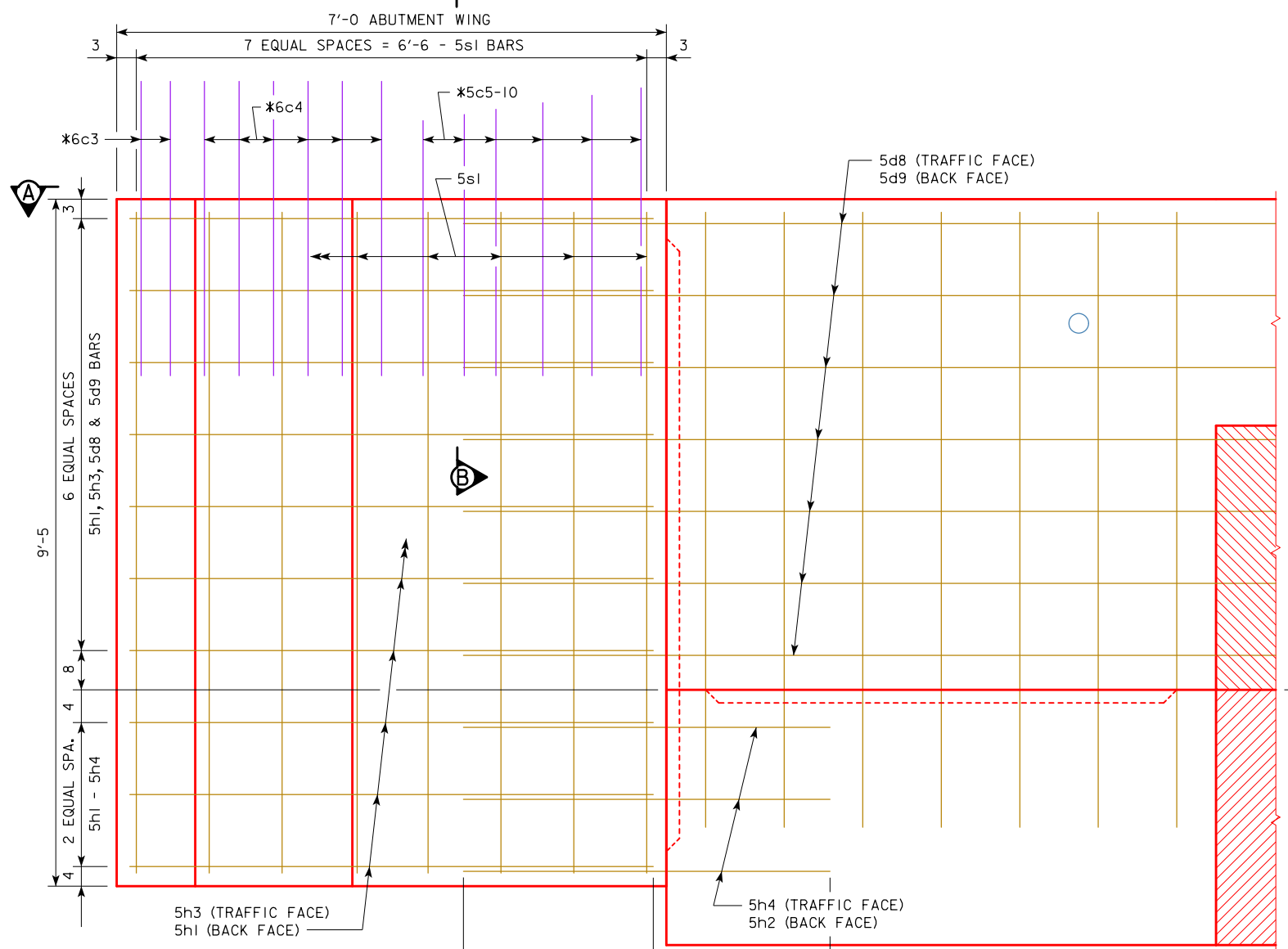
FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

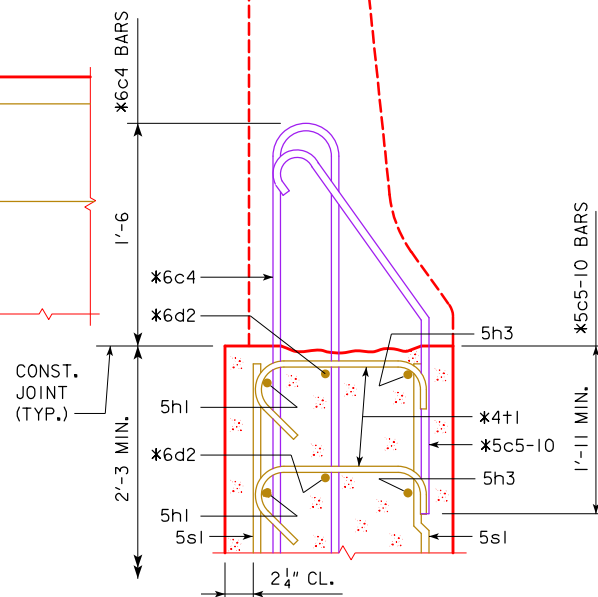
DESIGN SHEET NO. 12 OF 59FILE NO. 31719DESIGN NO. 119



VIEW A-A



ABUTMENT WING - ELEVATION VIEW



SECTION B-B

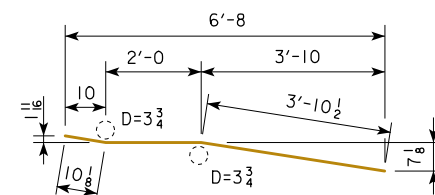
* BARRIER RAIL END SECTION BARS TO BE PLACED WITH ABUTMENT WING.

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

REINFORCING BAR LIST - ONE ABUT. WING

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

REINFORCING STEEL EPOXY COATED - TOTAL (LBS.) 292



5h3

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

BENT BAR DETAILS

CONCRETE PLACEMENT SUMMARY

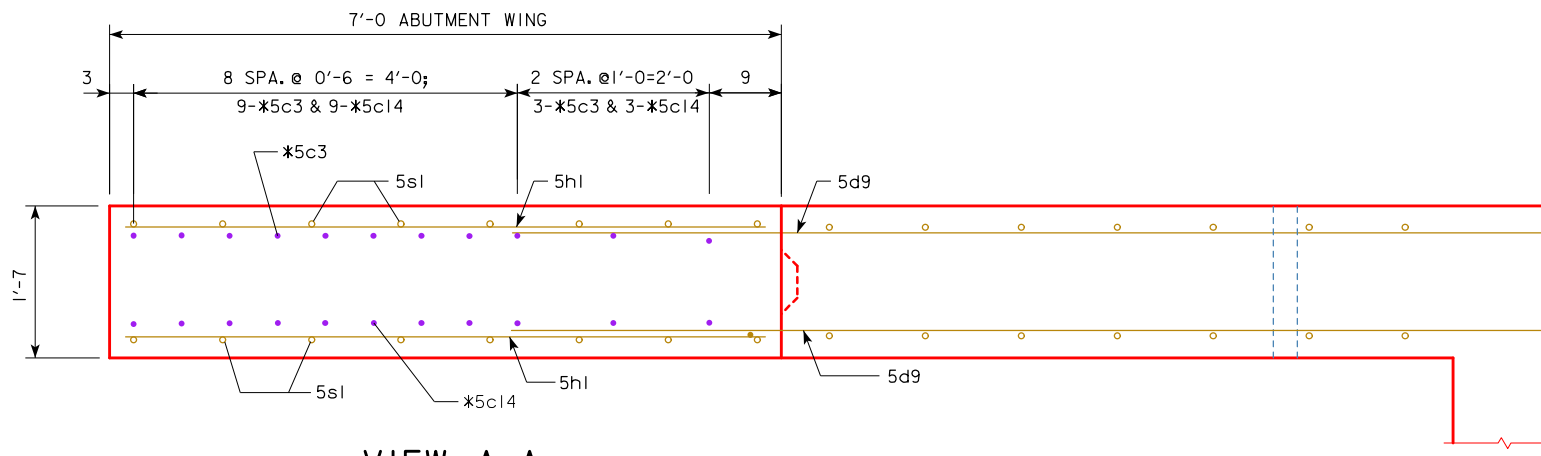
CONCRETE	TOTAL
ONE ABUTMENT WING	2.7
TOTAL (CU. YDS.)	2.7

NOTE:

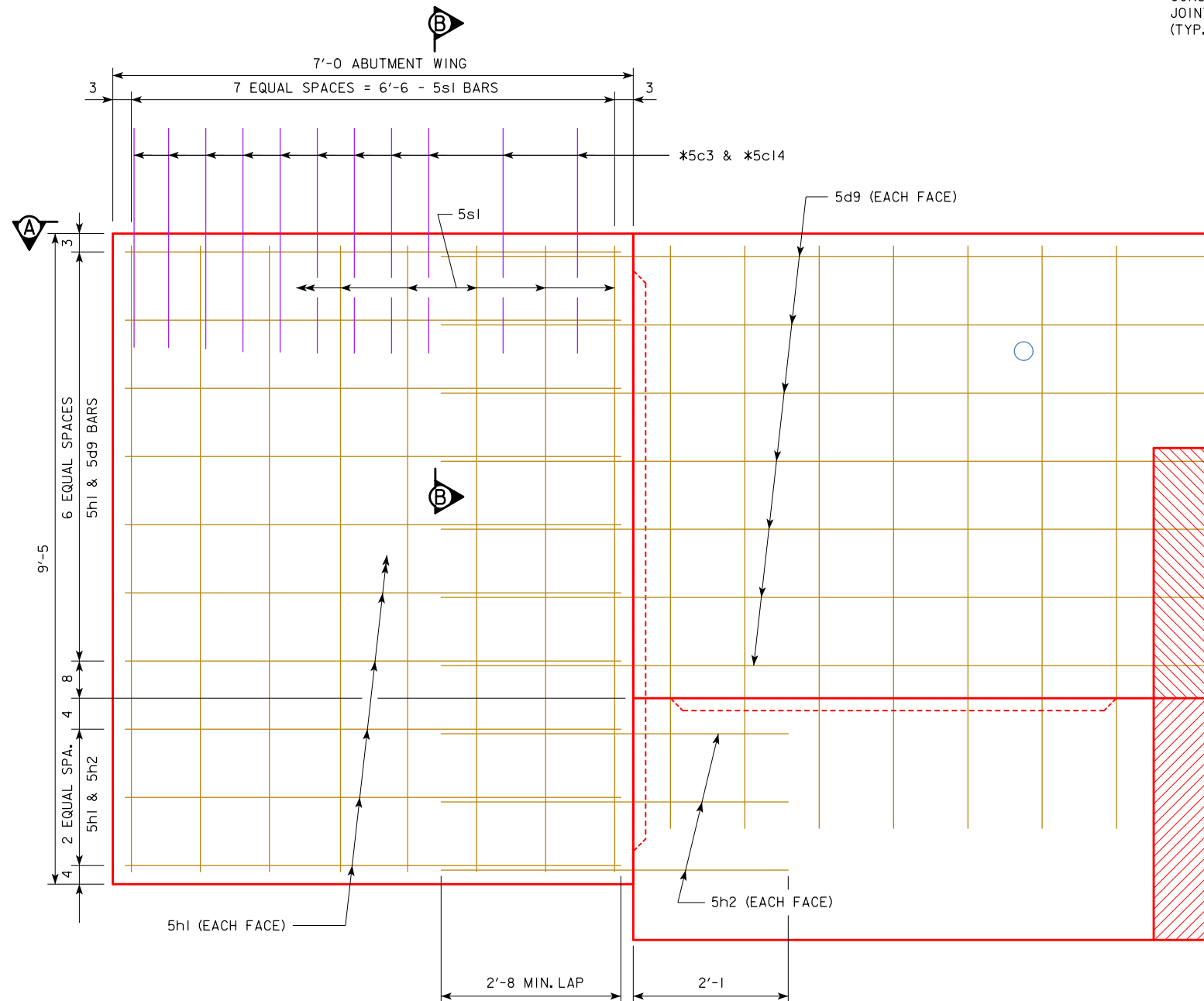
CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED ON THE SUMMARY QUANTITIES SHEET.

THIS SHEET IS FOR THE SOUTHWEST, NORTHEAST, AND SOUTHEAST WINGS.

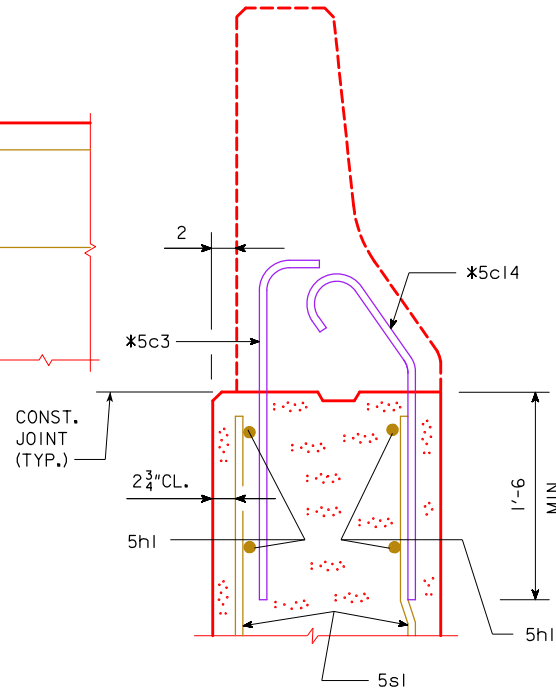
DESIGN FOR 0° SKEW
**1097'-0 X 40'-0 PRETENSIONED
 PRESTRESSED CONCRETE BEAM E.B. BRIDGE**
 156'-0 END SPANS 157'-0 INTERIOR SPAN
ABUTMENT WING DETAILS
 1A 2 STA. 400+85.00, RT. 32.00' JULY 2019
FREMONT COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 13 OF 59 FILE NO. 31719 DESIGN NO. 119



VIEW A-A



ABUTMENT WING - ELEVATION VIEW



SECTION B-B

* BARRIER RAIL SPECIAL END SECTION B BARS TO BE PLACED WITH ABUTMENT WING.
SEE NORTH BARRIER RAIL DETAILS SHEET IN THESE PLANS FOR DETAILS OF REINFORCING BARS 5c3 & 5c14.

REINFORCING BAR LIST - N.W. ABUT. WING

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5hl	HORIZONTAL BACK FACE		20	6'-8	139
5sl	VERTICAL BOTH FACES		16	9'-1	152
REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)					291

CONCRETE PLACEMENT SUMMARY

CONCRETE	TOTAL
ONE ABUTMENT WING	3.9
TOTAL (CU. YDS.)	3.9

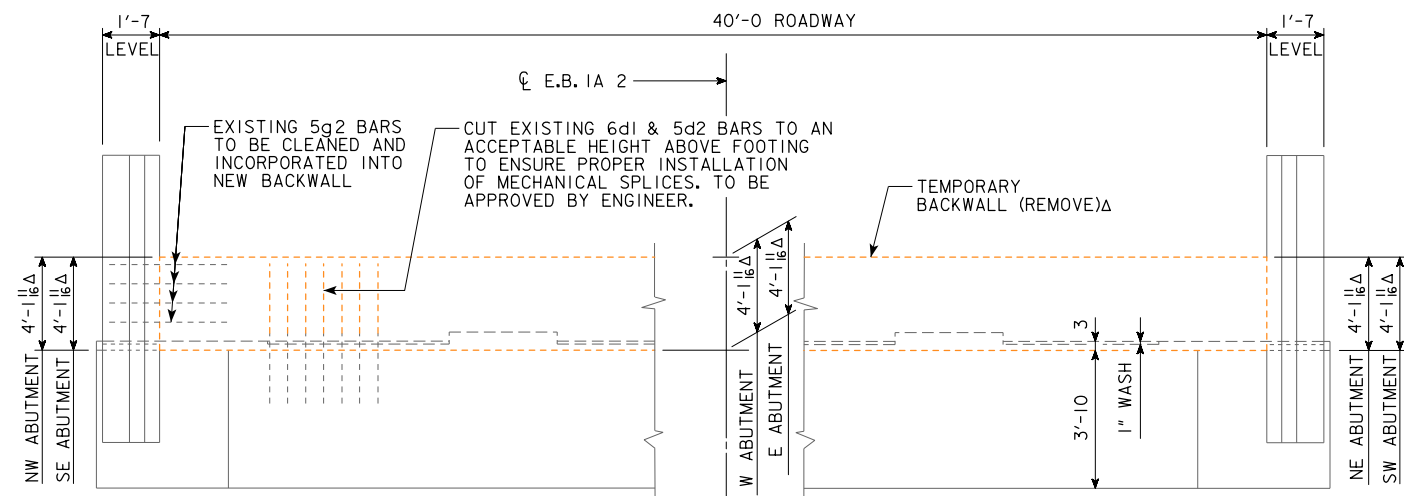
NOTE:

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

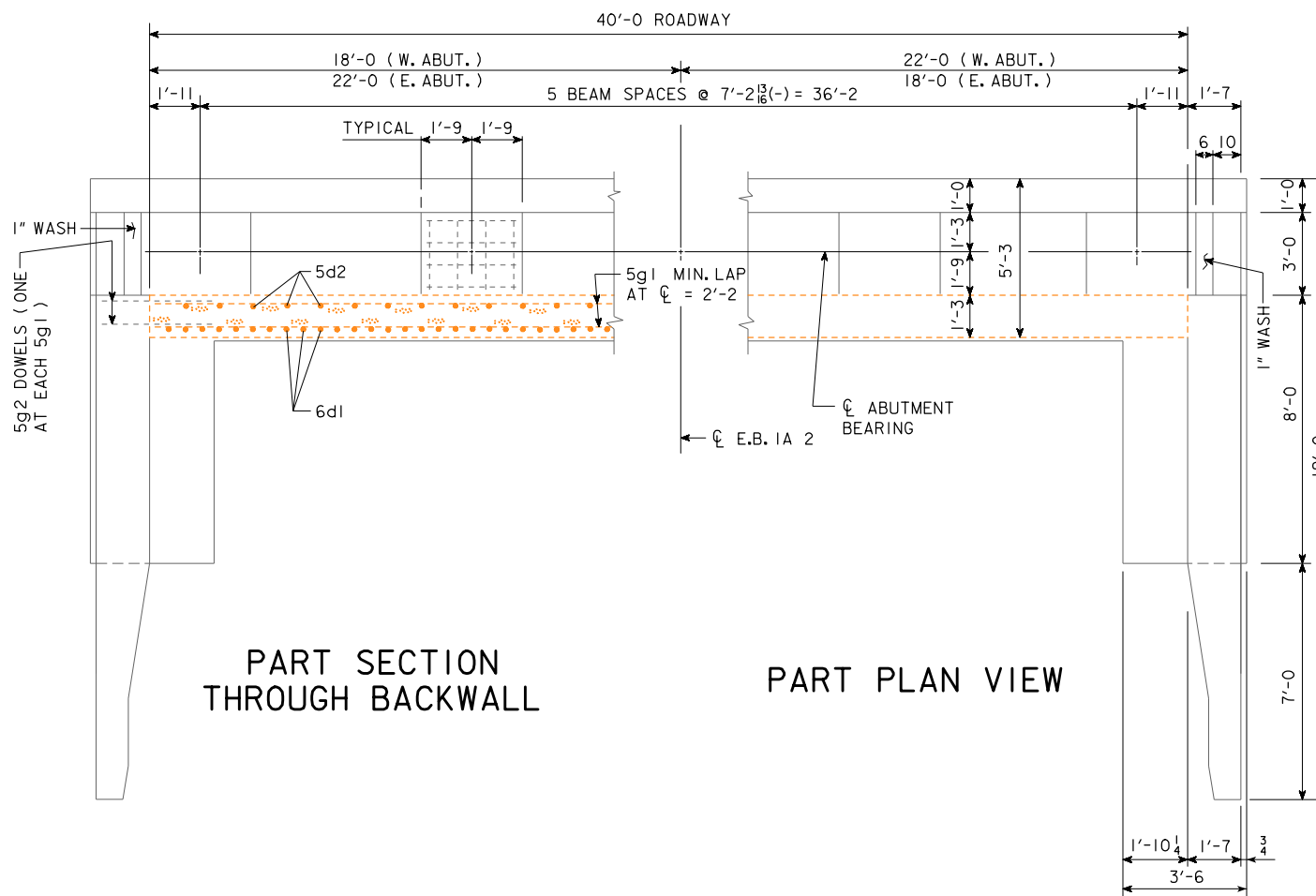
THIS SHEET IS FOR THE NORTH WING ON THE WEST ABUTMENT ONLY.

DESIGN FOR 0° SKEW
1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE
156'-0 END SPANS 157'-0 INTERIOR SPAN
N.W. ABUTMENT WING DETAILS
IA 2 STA. 400+85.00, RT. 32.00' JULY 2019
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 14 OF 59 FILE NO. 31719 DESIGN NO. 119

Δ HEIGHT OF TEMPORARY BACKWALL MAY BE MODIFIED AS REQUIRED TO MATCH SUPERSTRUCTURE OF TEMPORARY BRIDGE SUPERSTRUCTURE WITH WRITTEN APPROVAL BY THE ENGINEER.

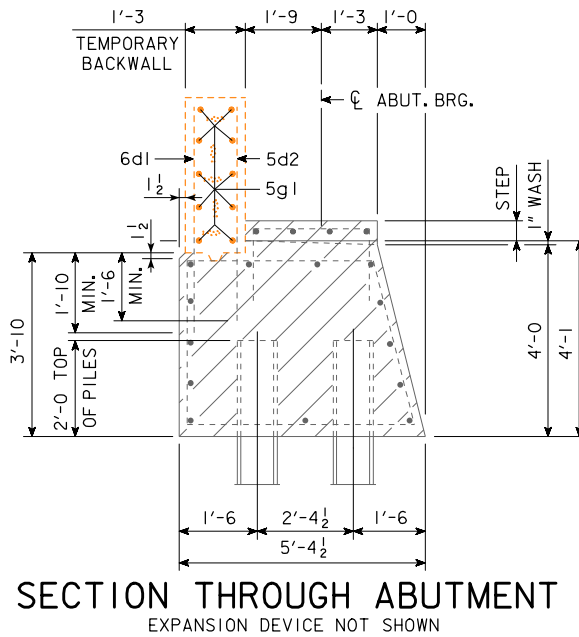


REAR ELEVATION



PART SECTION THROUGH BACKWALL

PART PLAN VIEW

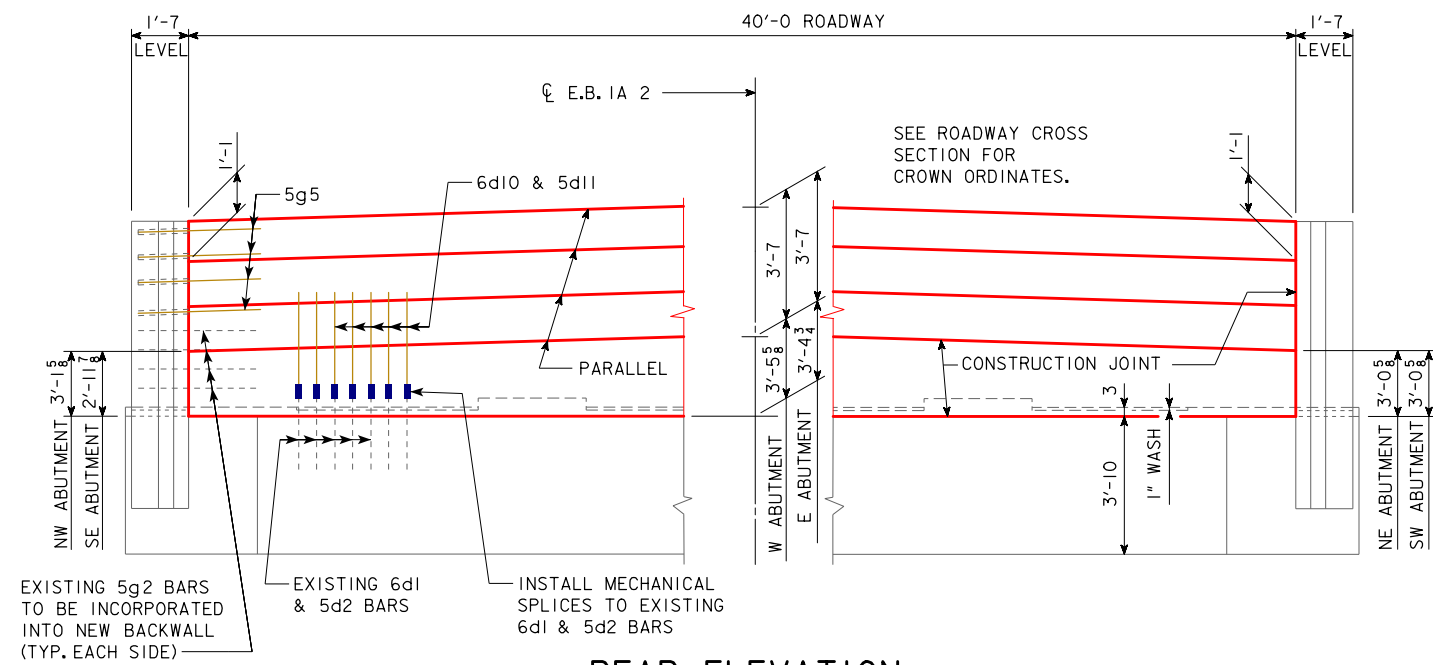


SECTION THROUGH ABUTMENT
EXPANSION DEVICE NOT SHOWN

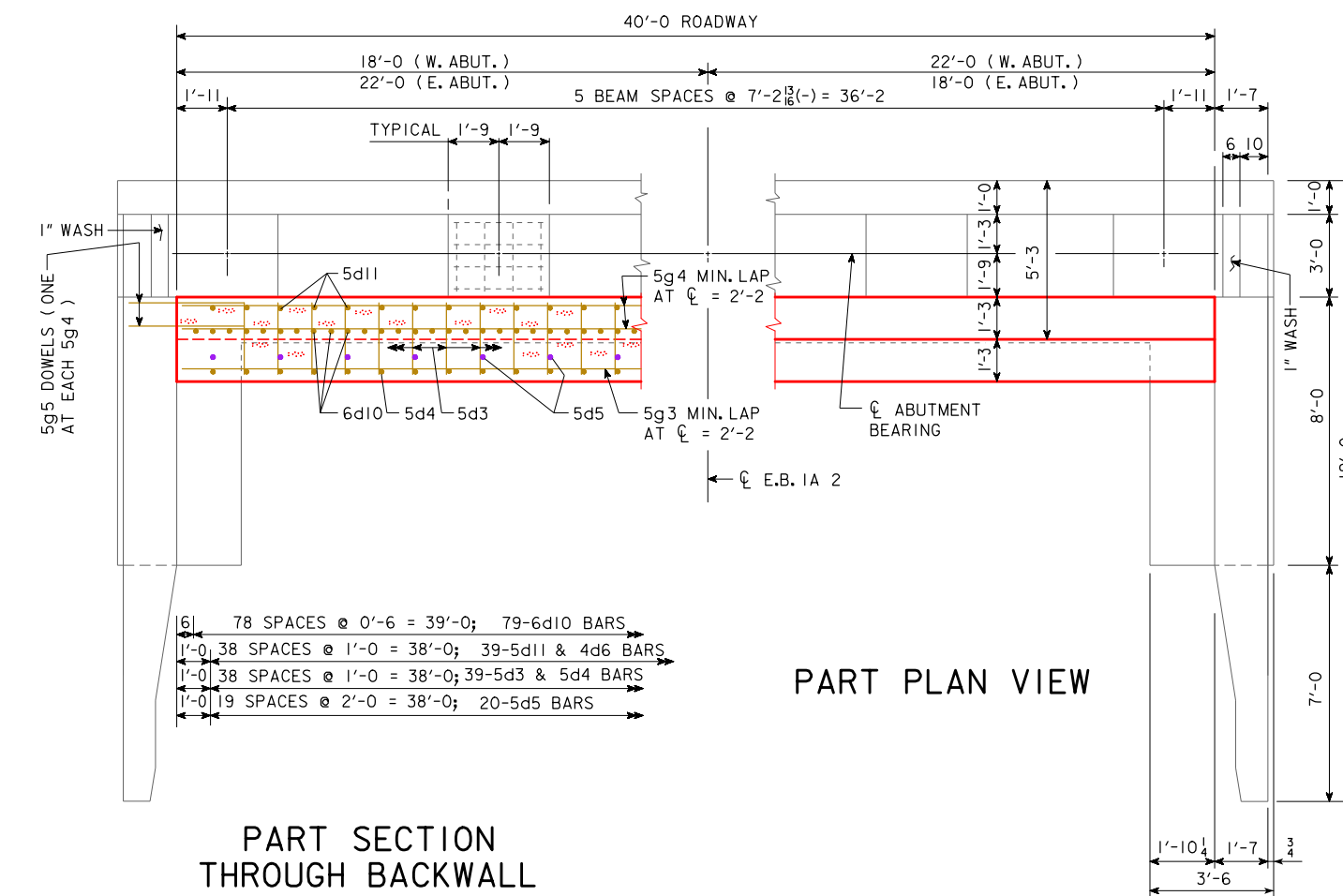
NOTE:

1. TEMPORARY BACKWALL REMOVAL SHALL OCCUR WHEN EXISTING TRAFFIC IS SHIFTED TO W.B. BRIDGE AND THE TEMPORARY BRIDGE HAS BEEN REMOVED. SEE DESIGN SHEETS 57 TO 59 FOR TEMPORARY BRIDGE DETAILS.
2. BARRIER RAIL NOT SHOWN IN DETAILS.

DESIGN FOR 0° SKEW
**1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE**
156'-0 END SPANS 157'-0 INTERIOR SPAN
ABUTMENT REMOVAL DETAILS
IA 2 STA. 400+85.00, RT. 32.00' JULY 2019
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 15 OF 59 FILE NO. 31719 DESIGN NO. 119

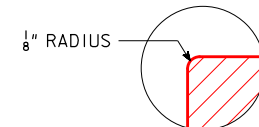


REAR ELEVATION

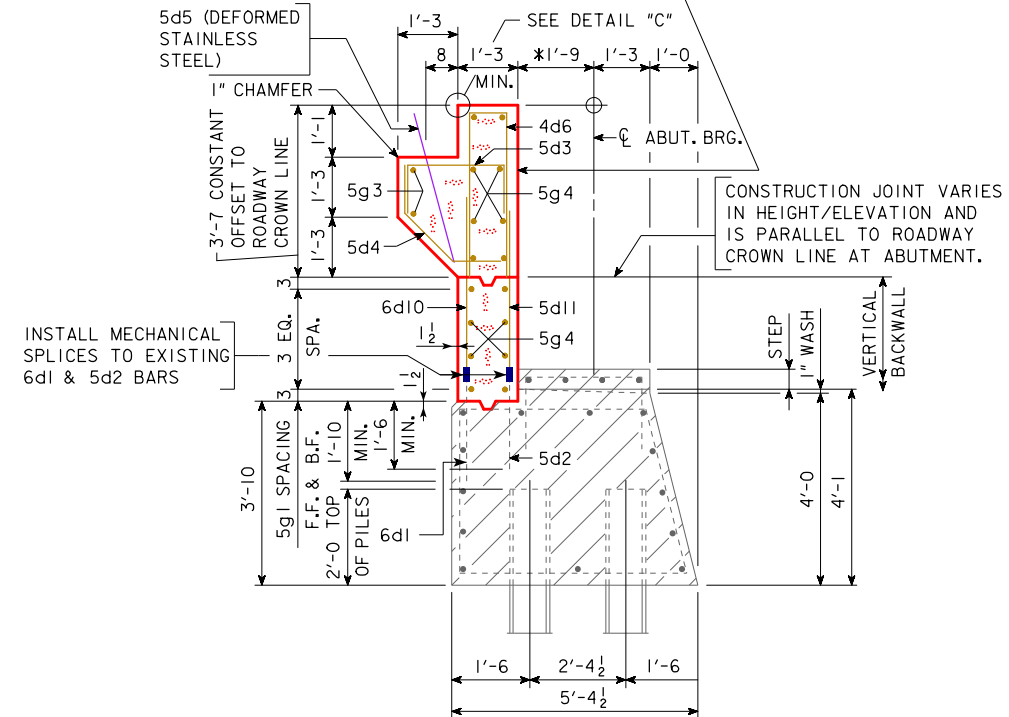


PART PLAN VIEW

PART SECTION THROUGH BACKWALL



DETAIL "C"



SECTION THROUGH ABUTMENT
EXPANSION DEVICE NOT SHOWN

NOTE:
COST TO FURNISH AND INSTALL MECHANICAL
SPICES SHALL BE INCIDENTAL TO PRICE
BID FOR "REINFORCING STEEL, EPOXY COATED".

DESIGN FOR 0° SKEW
**1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE**
156'-0 END SPANS 157'-0 INTERIOR SPAN
ABUTMENT DETAILS - ULTIMATE BUILD
IA 2 STA. 400+85.00, RT. 32.00'
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 16 OF 59 FILE NO. 31719 DESIGN NO. 119

NOTE: BARRIER RAIL NOT SHOWN IN DETAILS.

ABUTMENT NOTES:

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

THE MASKWALL IS TO BE POURED BEFORE THE SUPERSTRUCTURE DECK IS POURED. CONSTRUCTION JOINT KEYWAYS ARE TO BE FORMED WITH BEVELED 2x6's.

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

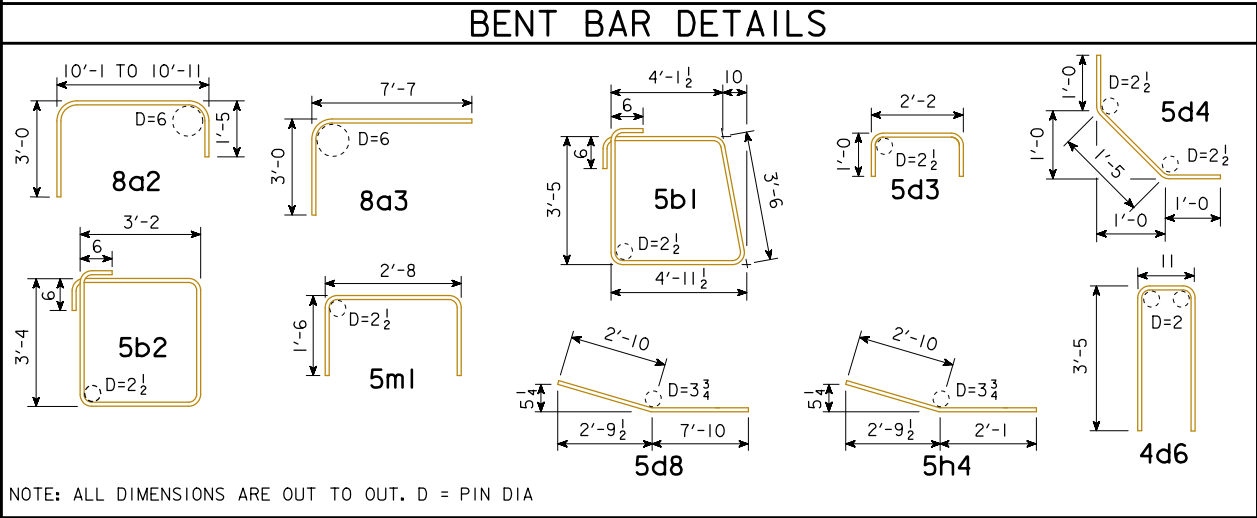
CONCRETE SEALER IS TO BE APPLIED TO THE ABUTMENT BRIDGE SEAT AND WASH SURFACES IN ACCORDANCE WITH THE CURRENT IOWA D.O.T. STANDARD SPECIFICATIONS.

THE COST OF PREFORMED EXPANSION JOINT FILLER, AND COST OF FURNISHING AND PLACING CONCRETE SEALER IS TO BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL CONCRETE (BRIDGE)".

PAVING NOTCH DOWELS SHALL BE STAINLESS STEEL DEFORMED BAR GRADE 60, MEETING THE REQUIREMENTS OF MATERIALS I.M. 452.

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. BEAMS AND MASONRY PLATES ARE TO BE SET BEFORE BACKWALL IS PLACED.



REINFORCING BAR LIST - ONE TEMP. BACKWALL							
EPOXY COATED BARS	BAR	LOCATION		SHAPE	NO.	LENGTH	WEIGHT
	5g1	BACKWALL LONGITUDINAL		—	20	20'-11	436
	REINF. STEEL - EPOXY COATED - TEMP. BACKWALL - TOTAL (LBS.)						436
NOTE: 5g1 BARS NOT INCLUDED IN REINFORCING QUANTITY. TOTAL SHOWN IS APPROXIMATE WEIGHT BASED ON TEMPORARY BACKWALL HEIGHT SHOWN, WHICH IS SUBJECT TO CHANGE. TEMPORARY BACKWALL REINFORCING SHALL BE INCIDENTAL TO PRICE BID FOR "TEMPORARY DETOUR BRIDGE SUPERSTRUCTURE".							

REINFORCING BAR LIST - WEST ABUTMENT							REINFORCING BAR LIST - EAST ABUTMENT						
EPOXY COATED BARS	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	EPOXY COATED BARS	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
	8a1	FOOTING LONGITUDINAL		13	42'-11	1490		8a1	FOOTING LONGITUDINAL		13	42'-11	1490
	8a2	WING FOOTING		10	VARIES	398		8a2	WING FOOTING		10	VARIES	398
	8a3	WING FOOTING		10	10'-7	283		8a3	WING FOOTING		10	10'-7	283
	5b1	FOOTING HOOPS		60	17'-0	1064		5b1	FOOTING HOOPS		60	17'-0	1064
	5b2	WING FOOTING HOOPS		10	14'-0	146		5b2	WING FOOTING HOOPS		10	14'-0	146
	Δ 6d1	BACKWALL VERTICAL B.F.		79	5'-4	633		Δ 6d1	BACKWALL VERTICAL B.F.		79	5'-4	633
	Δ 5d2	BACKWALL VERTICAL F.F.		39	5'-0	203		Δ 5d2	BACKWALL VERTICAL F.F.		39	5'-0	203
	5d3	PAVING NOTCH		39	4'-2	169		5d3	PAVING NOTCH		39	4'-2	169
	5d4	PAVING NOTCH		39	3'-5	139		5d4	PAVING NOTCH		39	3'-5	139
	4d6	BACKWALL VERTICAL HOOP		39	7'-9	202		4d6	BACKWALL VERTICAL HOOP		39	7'-9	202
	5d8	WING EXTENSION F.F. HORIZONTAL		7	10'-8	78		5d8	WING EXTENSION F.F. HORIZONTAL		14	10'-8	156
	5d9	WING EXTENSION B.F. HORIZONTAL		21	10'-8	234		5d9	WING EXTENSION B.F. HORIZONTAL		14	10'-8	156
	6d10	BACKWALL VERTICAL B.F.		79	5'-6	653		6d10	BACKWALL VERTICAL B.F.		79	5'-6	653
	5d11	BACKWALL VERTICAL F.F.		39	5'-4	217		5d11	BACKWALL VERTICAL F.F.		39	5'-4	217
	5e1	MASKWALL VERTICAL		16	7'-0	117		5e1	MASKWALL VERTICAL		16	7'-0	117
	5e2	WING EXTENSION VERTICAL		36	8'-0	300		5e2	WING EXTENSION VERTICAL		36	8'-0	300
S.S. BARS	5f3	MASKWALL HORIZONTAL		24	4'-10	121	S.S. BARS	5f3	MASKWALL HORIZONTAL		24	4'-10	121
	5g2	BACKWALL DOWELS		20	4'-5	92		5g2	BACKWALL DOWELS		20	4'-5	92
	5g3	PAVING NOTCH LONGITUDINAL		4	20'-11	87		5g3	PAVING NOTCH LONGITUDINAL		4	20'-11	87
	5g4	BACKWALL LONGITUDINAL		32	20'-11	698		5g4	BACKWALL LONGITUDINAL		32	20'-11	698
	5g5	BACKWALL DOWELS		16	4'-5	74		5g5	BACKWALL DOWELS		16	4'-5	74
	5h2	WING EXTENSION HORIZONTAL		9	4'-11	46		5h2	WING EXTENSION B.F. HORIZONTAL		6	4'-11	31
	5h4	WING EXTENSION HORIZONTAL		3	4'-11	15		5h4	WING EXTENSION F.F. HORIZONTAL		6	4'-11	31
S.S. BARS	5m1	BEAM STEPS TRANSVERSE		24	5'-8	142	S.S. BARS	5m1	BEAM STEPS TRANSVERSE		24	5'-8	142
	5n1	BEAM STEPS LONGITUDINAL		24	3'-2	79		5n1	BEAM STEPS LONGITUDINAL		24	3'-2	79
	REINFORCING STEEL - EPOXY COATED - TOTAL (LBS.)					7680		REINFORCING STEEL - EPOXY COATED - TOTAL (LBS.)					7681
5d5	PAVING NOTCH DOWELS (STAINLESS STEEL)		20	3'-6	73		5d5	PAVING NOTCH DOWELS (STAINLESS STEEL)		20	3'-6	73	
	STAINLESS STEEL - TOTAL (LBS.)					73		STAINLESS STEEL - TOTAL (LBS.)					73

Δ LENGTH TO BE MODIFIED AS REQUIRED. ANY MODIFICATION TO BAR LENGTH SHALL BE CONSIDERED INCIDENTAL TO "TEMPORARY DETOUR BRIDGE SUPERSTRUCTURE"

CONCRETE PLACEMENT QUANTITIES		
LOCATION	WEST ABUT.	EAST ABUT.
FOOTING AND STEPS	38.3	38.3
BACKWALL BELOW CONSTR. JOINT	6.0	6.0
BACKWALL ABOVE CONSTR. JOINT	10.1	10.1
NORTH WING EXTENSION	3.2	3.2
SOUTH WING EXTENSION	3.2	3.2
NORTH WING MASKWALL	0.5	0.5
SOUTH WING MASKWALL	0.5	0.5
TOTAL (C.Y.)	61.8	61.8

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

DESIGN FOR 0° SKEW

1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

156'-0 END SPANS157'-0 INTERIOR SPAN

ABUTMENT QUANTITIES

IA 2 STA. 400+85.00, RT. 32.00'

JULY 2019

FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 17 OF 59FILE NO. 31719DESIGN NO. 119

PIER NOTES - FRAME PIER OPTION:

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

SPIRAL REINFORCING IS TO BE NO.5 BAR WITH 5/8" DIAMETER, 12" PITCH WITH 4 EQUALLY SPACED L 7/8 x 7/8 x 1/8 SPACERS PUNCHED TO HOLD SPIRALS. SPIRALS ARE TO HAVE 1 1/2 EXTRA TURNS AT TOP AND BOTTOM COLUMNS.

THE SPIRAL REINFORCING MAY BE SPLICED BY LAPPING 2'-6. THE LENGTH OF THE SPIRAL SHOWN DOES NOT INCLUDE THE LAPPED LENGTH OF THE SPLICES. THE COST OF THE LAPS AT SPLICES IS TO BE INCLUDED IN THE PRICE BID FOR OTHER REINFORCEMENT.

COLUMN TIES SPACED AT 12" CENTERS MAY BE SUBSTITUTED FOR THE SPIRAL REINFORCEMENT. PAYMENT WILL BE BASED ON THE WEIGHT OF SPIRAL REINFORCEMENT. NO ADJUSTMENTS IN REINFORCING STEEL PAY WEIGHT WILL BE ALLOWED. SEE BENT BAR DETAILS FOR SPLICE LAP LENGTH.

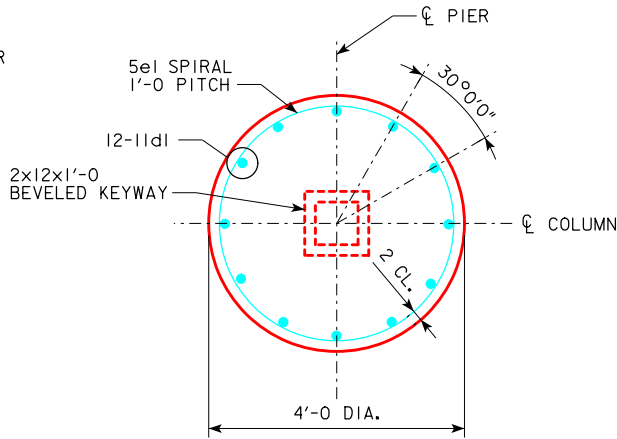
ARTICLE 415I.03, A, 2, OF THE STANDARD SPECIFICATIONS SHALL NOT BE PERMITTED FOR SPIRAL REINFORCEMENT.

THE CONTRACT LENGTH OF 100 FEET FOR THE PIER PILES IS BASED ON A NON-COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 220 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.70 FOR ROCK END BEARING.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A NON-COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.7 FOR ROCK END BEARING. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF PILE CAP FOOTING. DESIGN SCOUR (200-YEAR) WAS ASSUMED TO AFFECT THE UPPER 30 FEET OF EMBEDDED PILE LENGTH AND CAUSE 90 KIPS OF DRIVING RESISTANCE.

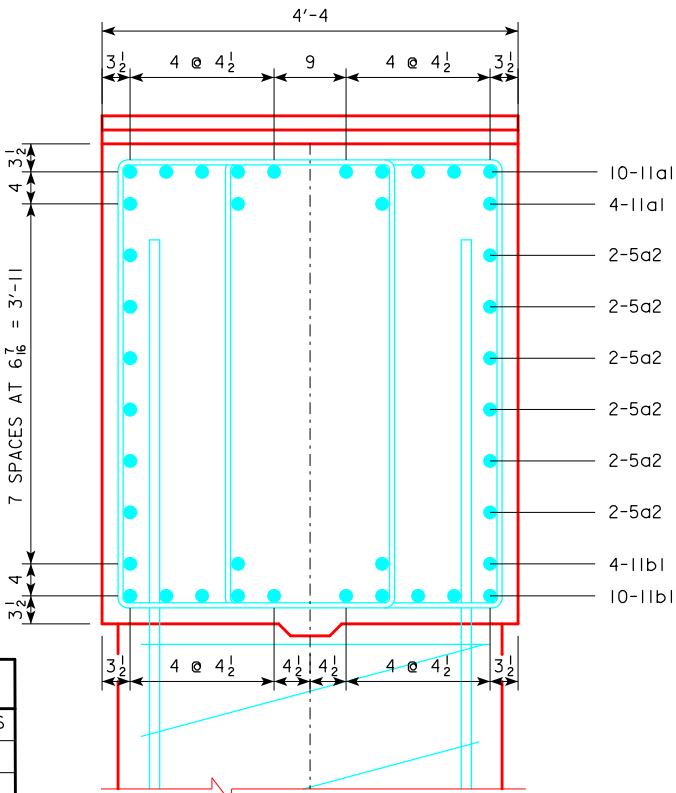
THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER PILES IS 245 TONS AT END OF DRIVE. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. IN NO CASE SHALL A PILE BE EMBEDDED LESS THAN 90 FEET. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

BENCH MARK: SEE 'MG' SHEETS WITHIN
TIED PROJECT NHSN-002-1(I122)--2R-36

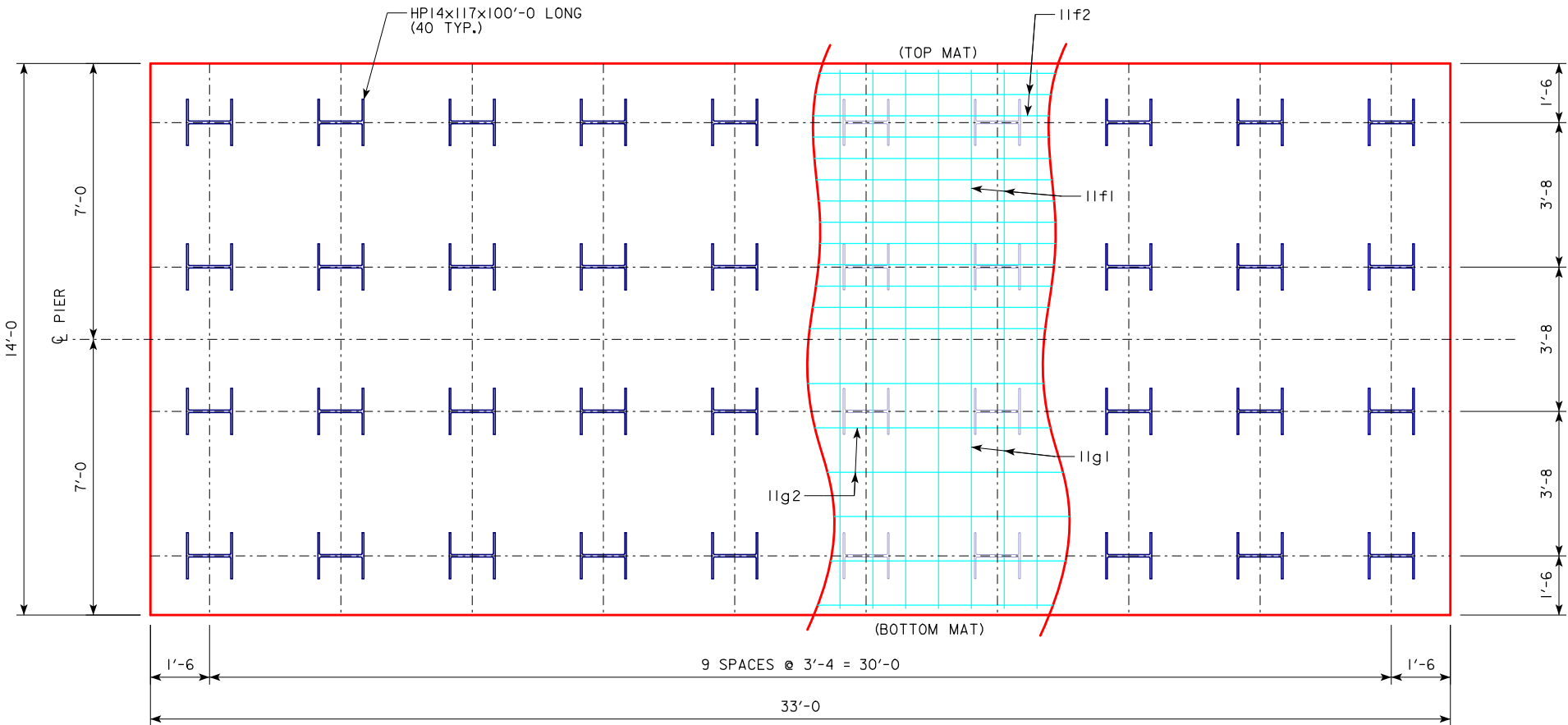


SECTION A-A

PIER CAP ELEVATIONS						
	PIER #1	PIER #2	PIER #3	PIER #4	PIER #5	PIER #6
ELEV. A	939.27	940.05	941.39	941.94	941.28	940.55
ELEV. B	939.42	940.19	941.53	942.09	941.43	940.69
ELEV. C	939.56	940.33	941.67	942.23	941.56	940.83
ELEV. D	939.48	940.26	941.59	942.15	941.49	940.76
ELEV. E	939.34	940.11	941.45	942.01	941.35	940.61
ELEV. F	939.19	939.97	941.31	941.86	941.20	940.47



SECTION B-B



FOOTING PLAN

REINFORCING BAR LIST - PIER

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
11a1	PIER CAP, LONGITUDINAL, TOP		14	40'-10	3037
5a2	PIER CAP, LONGITUDINAL, SIDES		12	40'-10	511
11b1	PIER CAP, LONGITUDINAL, BOTTOM		14	40'-10	3037
5c1	PIER CAP, HOOPS		126	16'-0	2103
5n1	PIER CAP, UNDER BEAM		12	7'-0	88
5m1	PIER CAP, UNDER BEAM		12	4'-0	50
11d1	PIER COLUMN, VERTICALS		24	24'-6	3124
11d2	PIER FOOTING TO COLUMN DOWELS		24	12'-6	1594
5e1	PIER COLUMN, SPIRAL		2	280'-0	584
11f1	PIER FOOTING, LONGIT., TOP		38	13'-6	2726
11f2	PIER FOOTING, TRANSVERSE, TOP		26	37'-6	5180
11g1	PIER FOOTING, LONGIT., BOTTOM		38	13'-6	2726
11g2	PIER FOOTING, TRANSVERSE, BOTTOM		13	37'-6	2590

REINFORCING STEEL - TOTAL (LBS.) 27,350

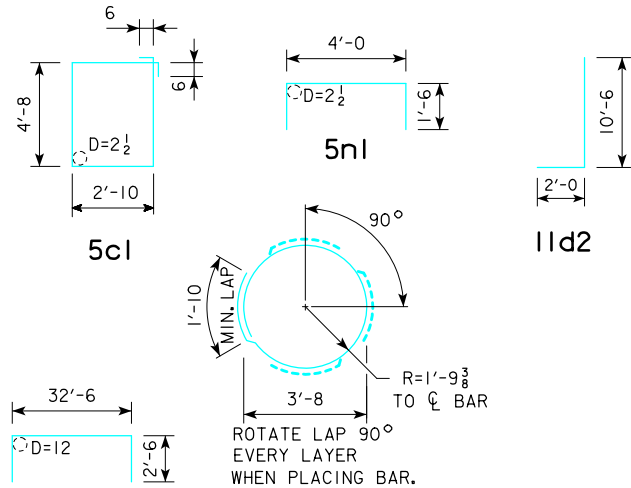
CONCRETE PLACEMENT QUANT. PIER

LOCATION	QUANTITY
CAP	34.0
COLUMNS	2 @ 9.3
PILE CAP FOOTING	85.6
TOTAL (CU. YDS.)	138.2

ESTIMATED QUANTITIES PIER

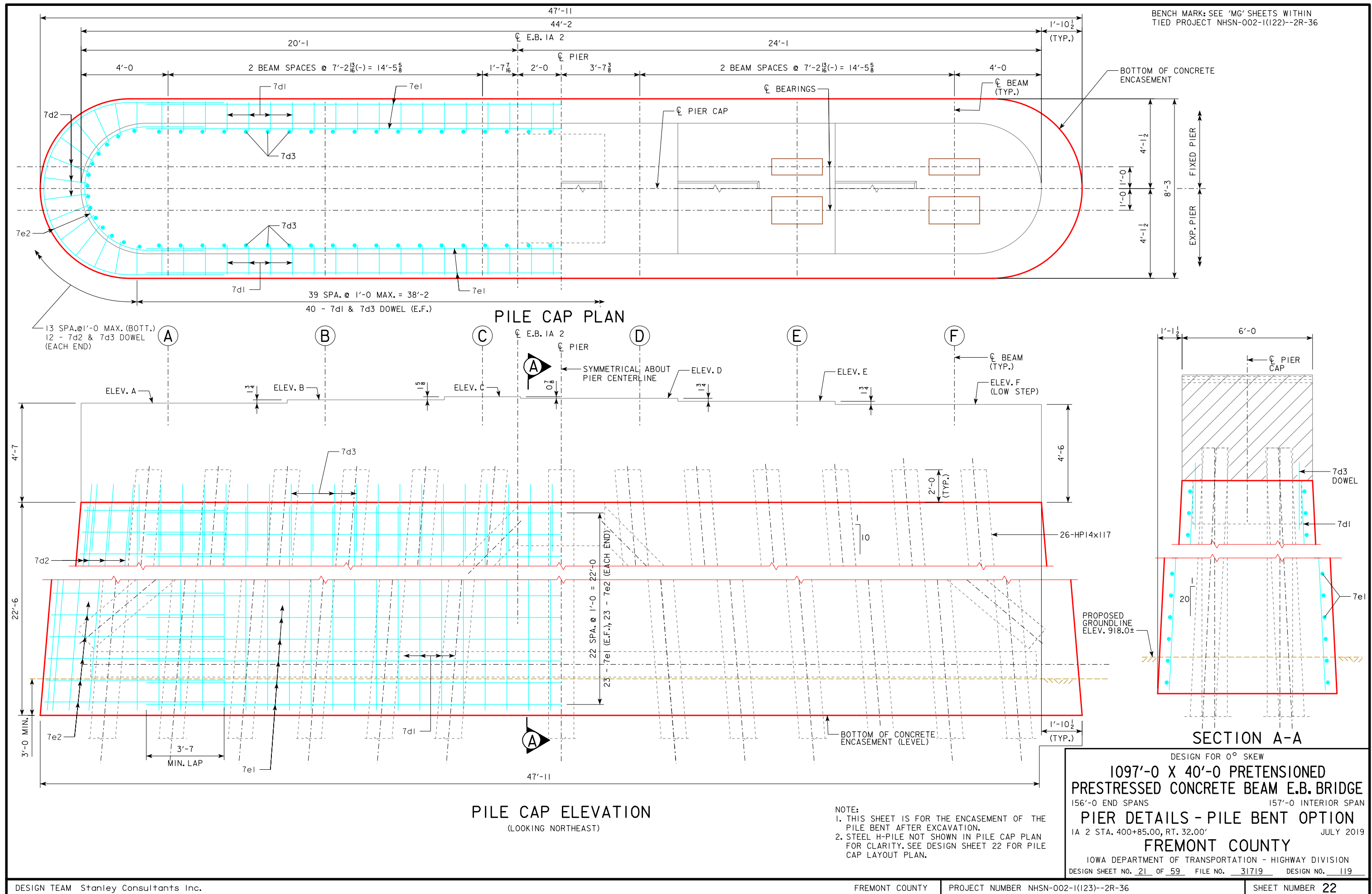
ITEM	UNIT	QUANTITY
STRUCTURAL CONCRETE (BRIDGE)	6 @ 138.2	CY 829.2
REINFORCING STEEL	6 @ 27,350	LBS 164,100
HP 14 x 117 PILES	6 @ 4,000	LF 24,000
EXCAVATE AND DEWATER	LS	1.0

BENT BAR DETAILS



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

DESIGN FOR 0° SKEW
1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE
156'-0 END SPANS 157'-0 INTERIOR SPAN
PIER DETAILS - FRAME PIER OPTION
IA 2 STA. 400+85.00, RT. 32.00'
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 19 OF 59 FILE NO. 31719 DESIGN NO. 119



REINFORCING BAR LIST - PIER CAP					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
10a1	PIER CAP, LONGITUDINAL, TOP		11	28'-1	1329
10a2	PIER CAP, LONGITUDINAL, TOP		11	21'-0	994
7a3	PIER CAP, LONGITUDINAL, SIDES		8	38'-2	624
7a4	PIER CAP, LONGITUDINAL, ENDS		12	16'-0	392
10b1	PIER CAP, LONGITUDINAL, BOTTOM		8	28'-1	967
10b2	PIER CAP, LONGITUDINAL, BOTTOM		8	21'-0	723
7b3	SHEAR BLOCK		2	15'-8	64
7b4	SHEAR BLOCK		4	14'-8	120
5b5	SHEAR BLOCK		4	3'-6	15
5b6	SHEAR BLOCK		2	4'-6	9
5c1	PIER CAP, HOOPS		104	16'-8	1808
5n1	PIER CAP, UNDER BEAM		12	8'-8	108
5m1	PIER CAP, UNDER BEAM		18	4'-0	75
REINFORCING STEEL - TOTAL (LBS.)					7228

BENT BAR DETAILS - PIER CAP

The image contains four technical drawings of bent bar details for a pier cap:

- 5c1:** A rectangular cross-section with a height of 4'-2" and a width of 3'-8". It shows a bent bar with a pin diameter $D = 2\frac{1}{2}$ ". The bar is bent 90 degrees, with a vertical segment of 6" and a horizontal segment of 6".
- 7a4:** A U-shaped bent bar with a total height of 5'-8" and a total width of 3'-7". The bar is bent 180 degrees, with a vertical segment of 8'-10" and a horizontal segment of 3'-7". The radius of the bend is $R = 2'-9\frac{1}{2}"$ TO ϕ BAR.
- 7b3 & 7b4:** A rectangular cross-section with a height of 5'-6" and a width of 4'-8". It shows a bent bar with a pin diameter $D = 2\frac{1}{2}"$ ". The bar is bent 90 degrees, with a vertical segment of 7b3 and a horizontal segment of 7b4.

7b3 & 7b4

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

[illegible]

BENT BAR DETAILS - PIER ENCASEMENT

The diagram illustrates the reinforcement details for a bent bar in a pier encasement. It shows a U-shaped reinforcement layout with the following dimensions and specifications:

- Horizontal Dimensions:**
 - Top horizontal segment: 3'-7" TO 5'-6"
 - Radius: $R = 2'-9\frac{1}{2}"$ TO 3'-11 $\frac{1}{2}"$ TO $\varnothing$ BAR
- Vertical Dimensions:**
 - Left vertical segment: 8'-10" TO 12'-4"
 - Right vertical segment: 5'-8" TO 7'-10"
- Label:** 7e2

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

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

THE CONTRACT LENGTH OF 125 FEET FOR THE PIER PILES IS BASED ON A NON-COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 235 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.70 FOR ROCK END BEARING.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A NON-COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.7 FOR ROCK END BEARING. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF PIER CAP. DESIGN SCOUR (200-YEAR) WAS ASSUMED TO AFFECT THE UPPER 50 FEET OF EMBEDDED PILE LENGTH AND CAUSE 150 KIPS OF DRIVING RESISTANCE.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER PILES IS 290 TONS AT END OF DRIVE. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. IN NO CASE SHALL A PILE BE EMBEDDED LESS THAN 100 FEET BELOW FINISHED GROUND LINE ELEVATION 918. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

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

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

THE MASS CONCRETE REQUIREMENTS SHALL BE WAIVED FOR THE PIER CAPS ONLY.



BENCH MARK: SEE 'MG' SHEETS WITHIN
TIED PROJECT NHSN-002-1(122)--2R-36

NOTE:
PILE BRACE HALF SECTION CONSIDERED INCIDENTAL TO
"HP 14x17 PILES".

PIER CAP ELEVATIONS						
	PIER #1	PIER #2	PIER #3	PIER #4	PIER #5	PIER #6
ELEV. A	939.27	940.05	941.39	941.94	941.28	940.55
ELEV. B	939.42	940.19	941.53	942.09	941.43	940.69
ELEV. C	939.56	940.33	941.67	942.23	941.56	940.83
ELEV. D	939.48	940.26	941.59	942.15	941.49	940.76
ELEV. E	939.34	940.11	941.45	942.01	941.35	940.61
ELEV. F	939.19	939.97	941.31	941.86	941.20	940.47

CONCRETE PLACEMENT QUANT. - ONE PIER	
LOCATION	QUANTITY
PIER CAP	46.0
PIER ENCASEMENT	261.6
TOTAL (CU. YDS.)	307.6

ESTIMATED QUANTITIES PIER			
ITEM		UNIT	QUANTITY
STRUCTURAL CONCRETE (BRIDGE)	6 @ 307.6	CY	1845.6
REINFORCING STEEL, EPOXY-COATED	6 @ 18233	LBS	109398
HP 14 x 117 PILES	6 @ 3250	LF	19500
STRUCTURAL STEEL	6 @ 214	LBS	1284
EXCAVATE AND DEWATER		LS	1.0

DESIGN FOR 0° SKEW

1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

156'-0 END SPANS 157'-0 INTERIOR SPAN

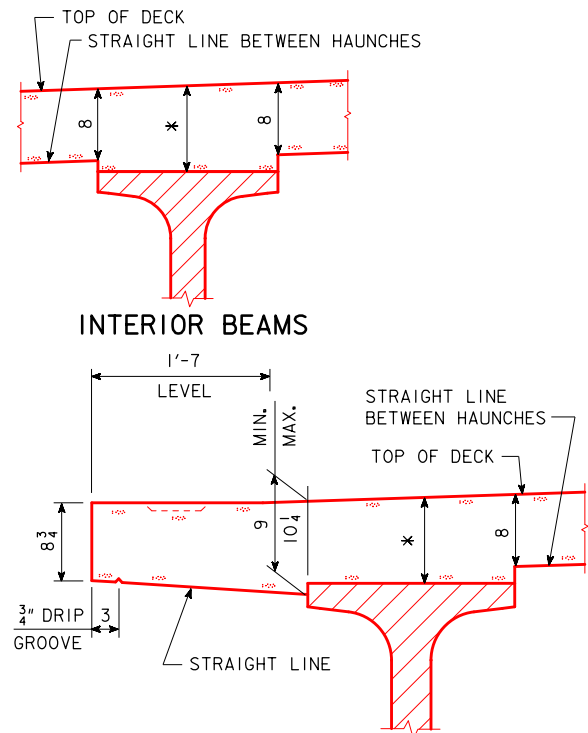
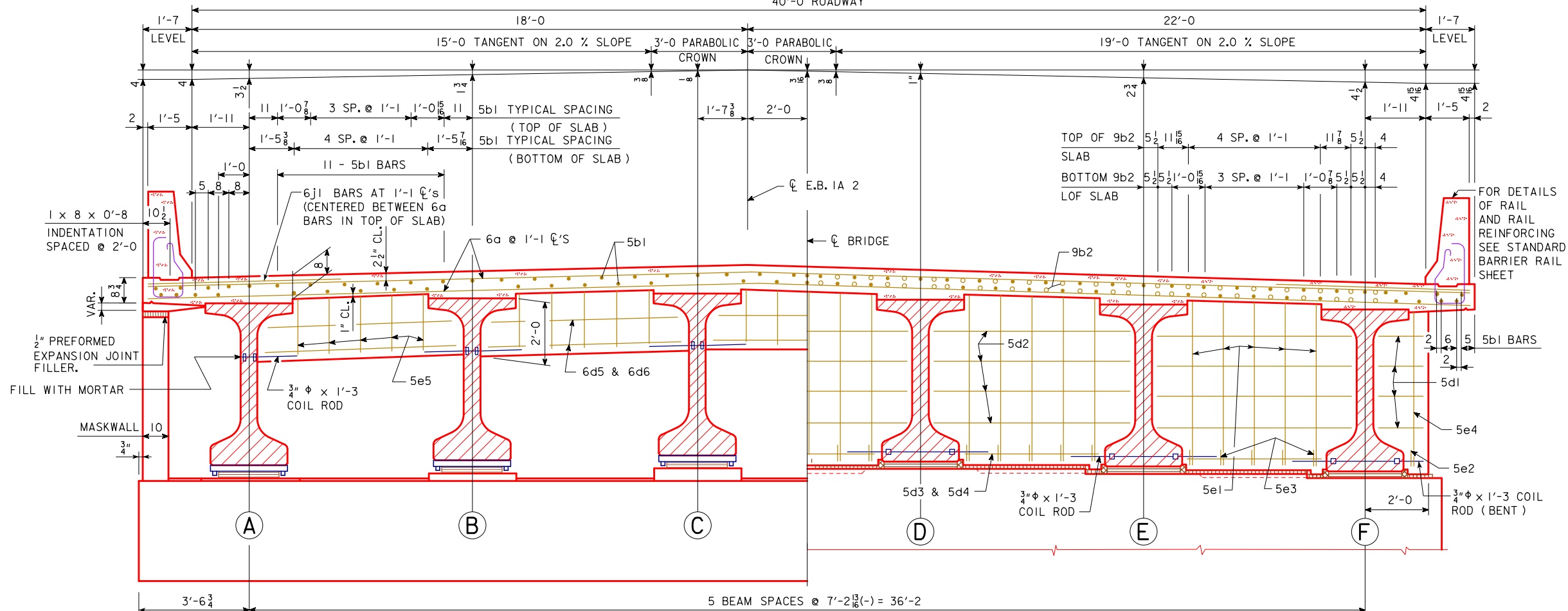
PIER DETAILS - PILE BENT OPTION

1A 2 STA. 400+85.00, RT. 32.00' JULY 2019

FREMONT COUNTY

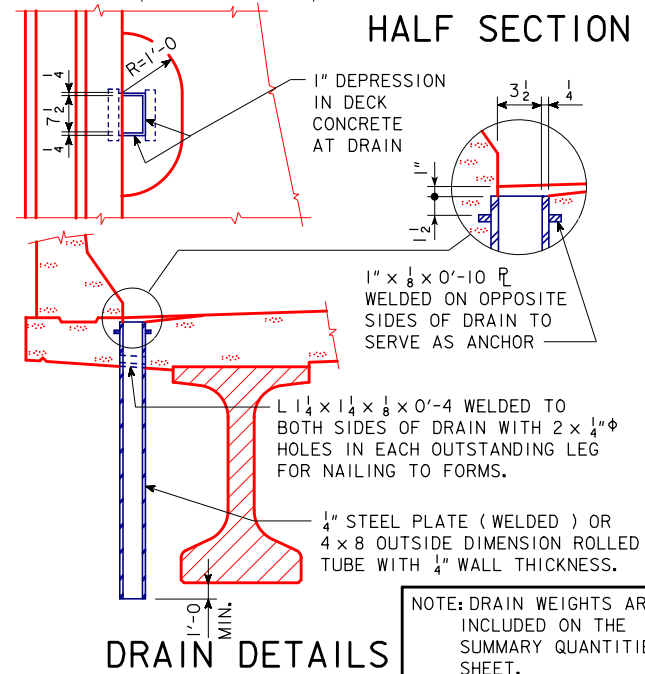
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 22 OF 59 FILE NO. 31719 DESIGN NO. 119



EXTERIOR BEAMS
TYPICAL DECK AND
HAUNCH DETAIL

* FOR DECK THICKNESS OVER BEAMS SEE HAUNCH AND CAMBER DETAILS ON DESIGN SHEETS 42.



NOTE :
DRAINS ARE TO BE GALVANIZED. 46 DRAINS REQUIRED.
SEE " SITUATION PLAN " FOR LOCATION. WEIGHT OF DRAINS IS
INCLUDED IN THE QUANTITY FOR "STRUCTURAL STEEL".
WEIGHT IS BASED ON ROLLED TUBE.

DATA FOR ONE DRAIN	
BEAM SIZE	BTE
DRAIN WEIGHT (LBS.)	136
DRAIN LENGTH (FT.)	6'-11 ³ / ₄

SLAB AREA = 29.24 SQ. FT.
SLAB AREA DOES NOT
INCLUDE THE HAUNCH.

NOTE: FOR DETAILS OF INTERMEDIATE DIAPHRAGMS SEE DESIGN SHEETS 28 AND 29.

SUPERSTRUCTURE NOTES:

THE BRIDGE DECK AS SHOWN INCLUDES $\frac{1}{2}$ " INTEGRAL WEARING SURFACE.

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

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

ALL BEAMS ARE TO BE SET VERTICAL.

FORMS FOR THE 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.

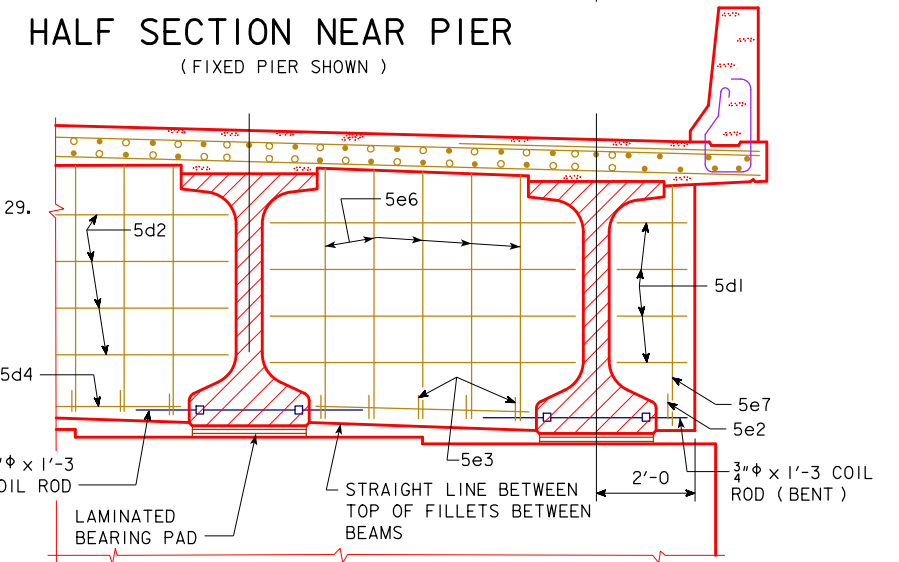
TOP TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND $2\frac{1}{2}$ " CLEAR BELOW TOP OF DECK. BOTTOM TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 1" CLEAR ABOVE BOTTOM OF DECK. TOP AND BOTTOM REINFORCING STEEL IS TO BE SUPPORTED BY INDIVIDUAL BAR CHAIRS SPACED AT NOT MORE THAN 3'-0" CENTERS 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").

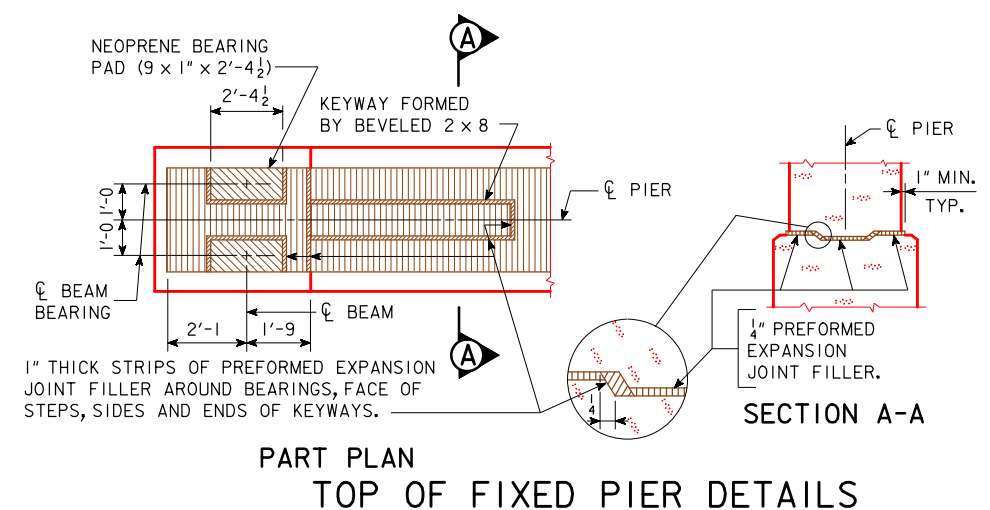
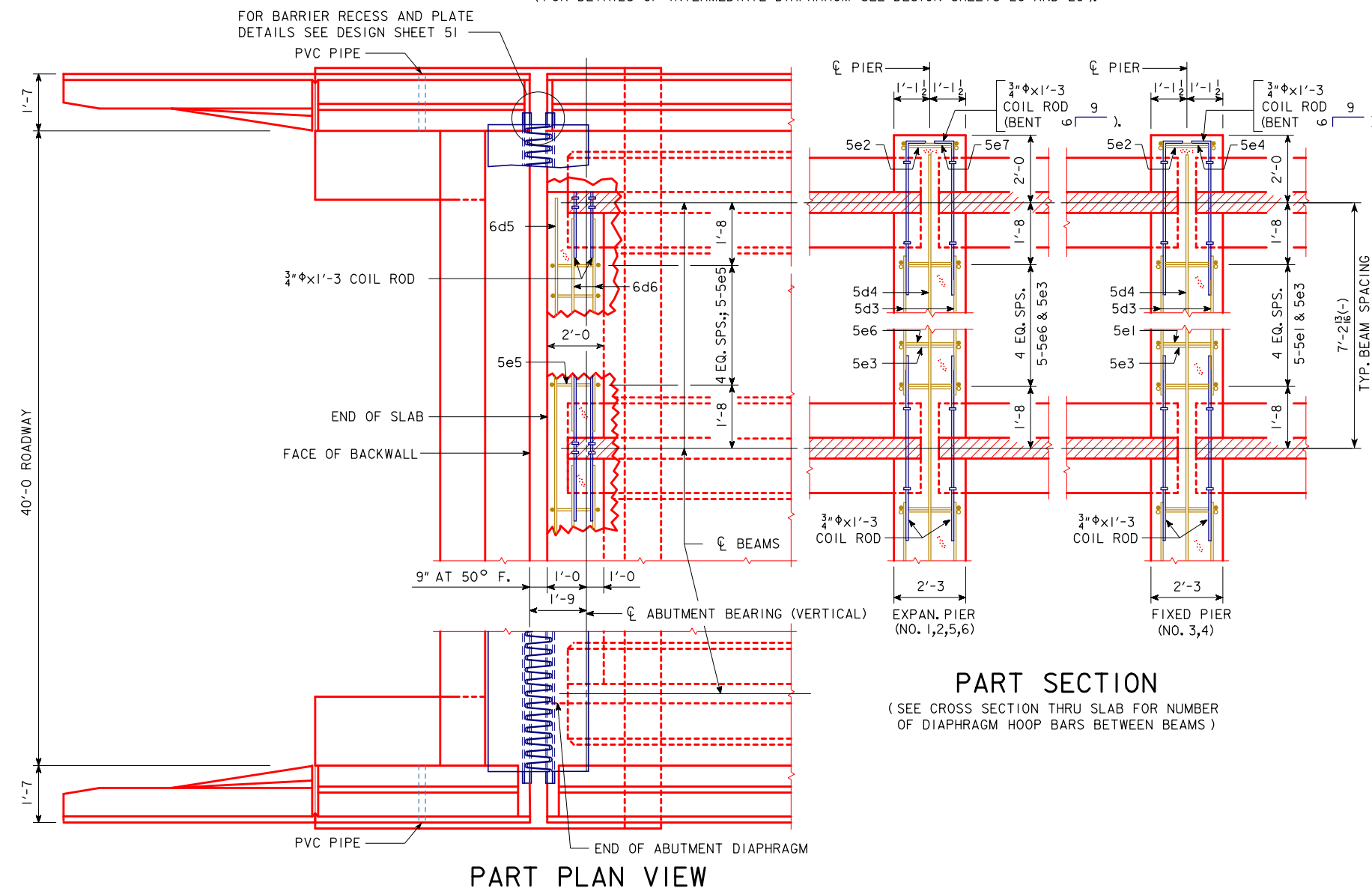
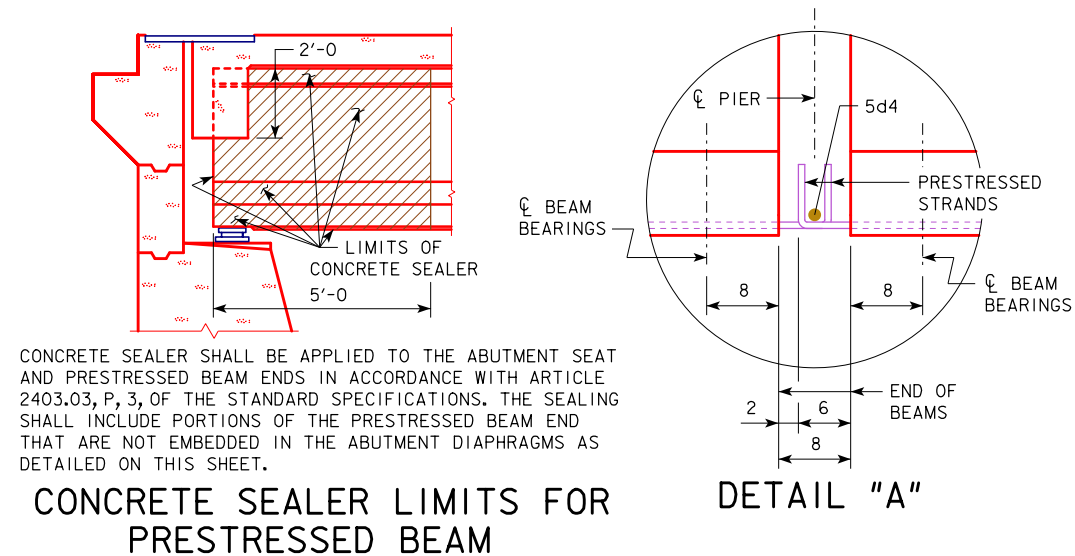
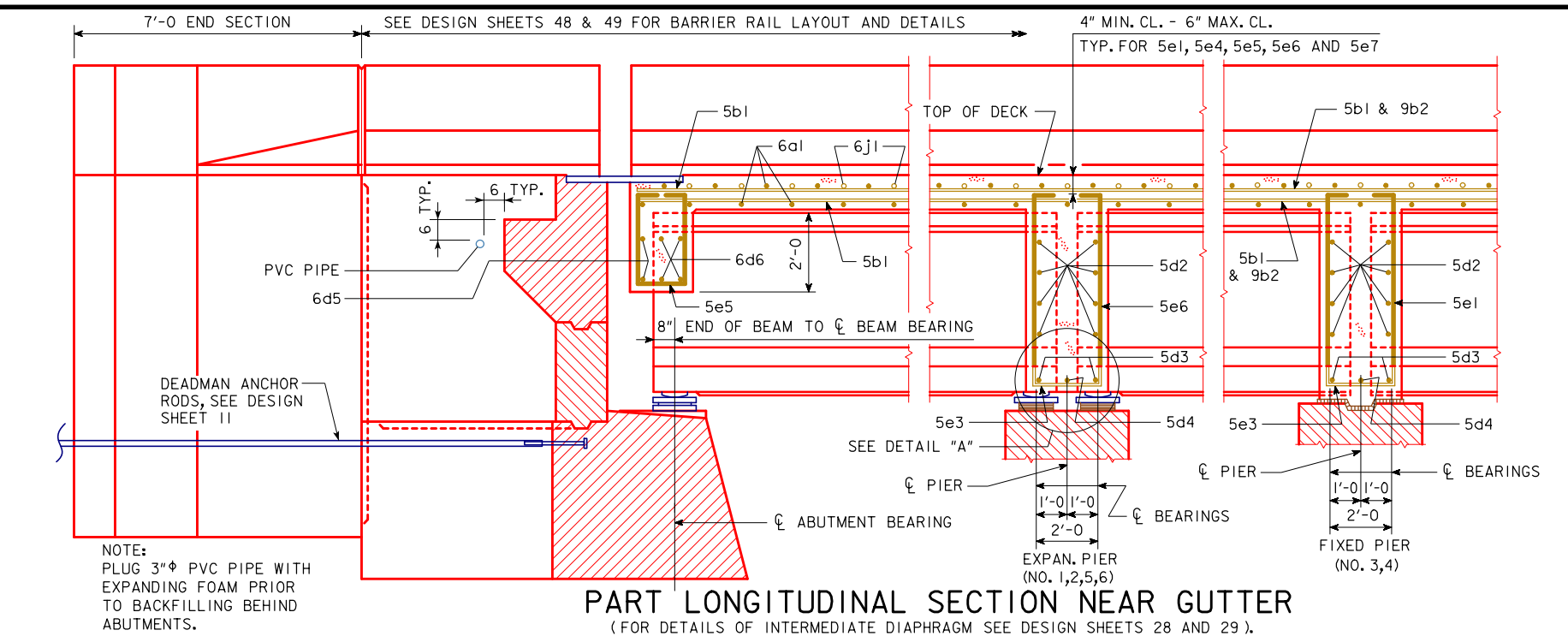
BOTTOM BARS - LAP OVER BEAMS (MIN. LAP = 1'-10").

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
(EXPANSION PIER SHOWN)

DESIGN FOR 0° SKEW
1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE
156'-0 END SPANS 157'-0 INTERIOR SPAN
TRANSVERSE SECTION
IA 2 STA. 400+85.00, RT. 32.00' JULY 2019
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 23 OF 59 FILE NO. 31719 DESIGN NO. 119



DESIGN FOR 0° SKEW

1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

156'-0 END SPANS 157'-0 INTERIOR SPAN

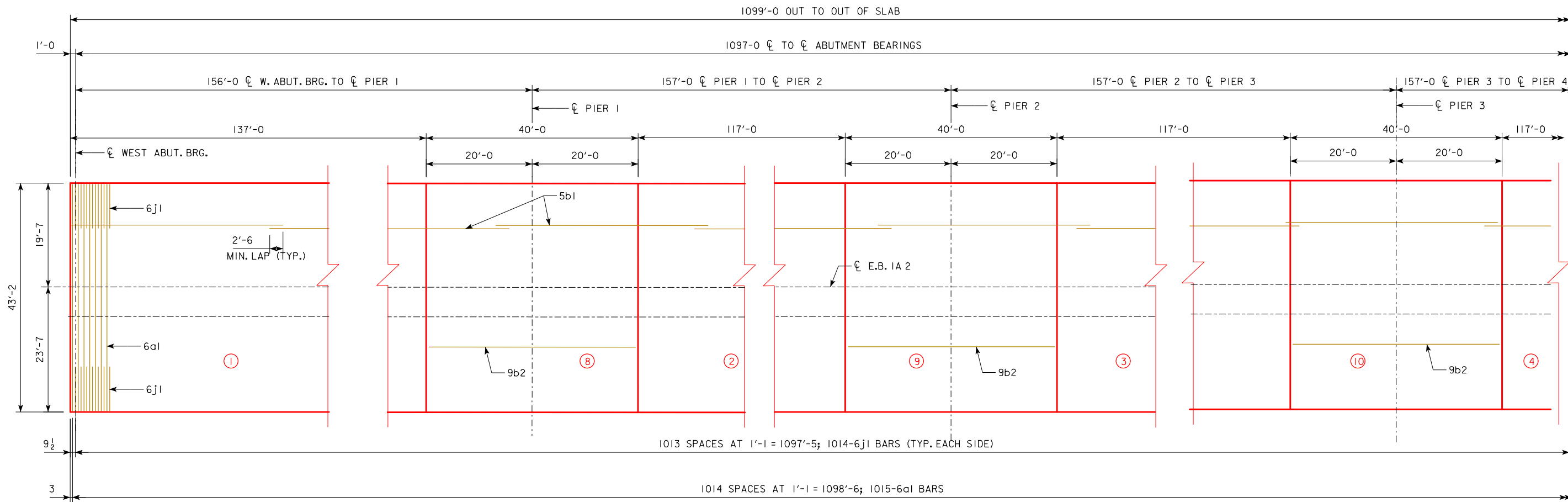
PART PLAN AND LONGITUDINAL SECTION

1A 2 STA. 400+85.00, RT. 32.00' JULY 2019

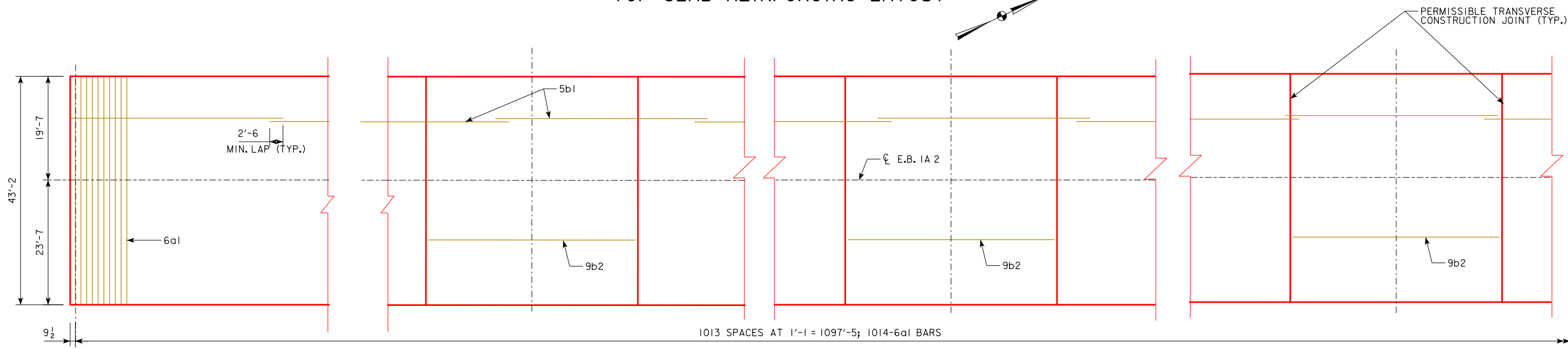
FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 24 OF 59 FILE NO. 31719 DESIGN NO. 119



TOP SLAB REINFORCING LAYOUT



BOTTOM SLAB REINFORCING LAYOUT

NOTE: CONCRETE DECK SHALL BE PLACED IN SECTIONS AND SEQUENCES INDICATED. ALTERNATE PROCEDURES FOR PLACING DECK CONCRETE MAY BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF 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 MODIFICATION 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 0° SKEW

**1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE**

156'-0 END SPANS 157'-0 INTERIOR SPAN

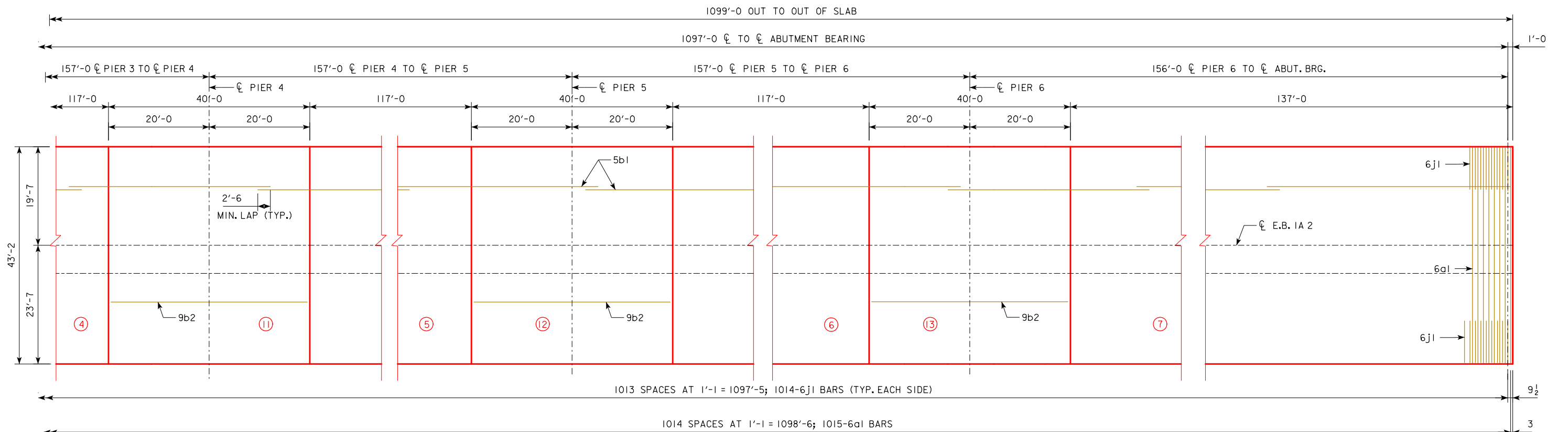
SUPERSTRUCTURE DETAILS

IA 2 STA. 400+85.00, RT. 32.00' JULY 2019

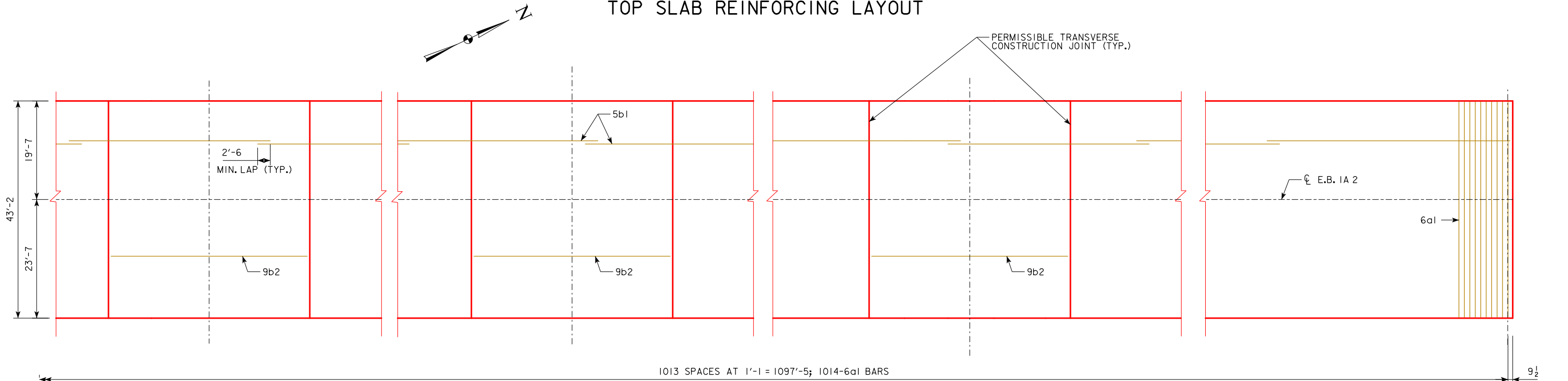
FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 25 OF 59 FILE NO. 31719 DESIGN NO. 119



TOP SLAB REINFORCING LAYOUT



BOTTOM SLAB REINFORCING LAYOUT

NOTE: CONCRETE DECK SHALL BE PLACED IN SECTIONS AND SEQUENCES INDICATED. ALTERNATE PROCEDURES FOR PLACING DECK CONCRETE MAY BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF 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 MODIFICATION 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 0° SKEW

1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

156'-0 END SPANS 157'-0 INTERIOR SPAN

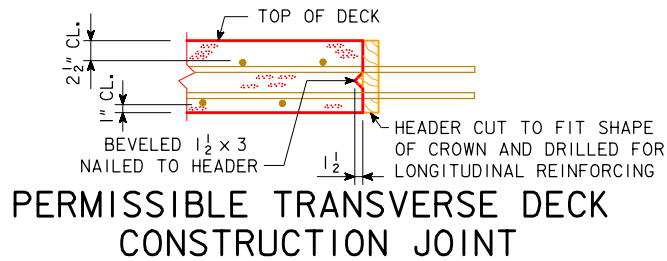
SUPERSTRUCTURE DETAILS

1A 2 STA. 400+85.00, RT. 32.00' JULY 2019

FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 26 OF 59 FILE NO. 31719 DESIGN NO. 119

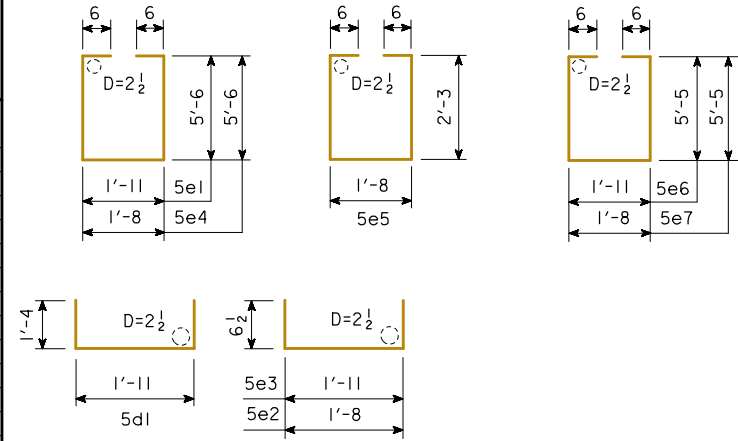


PERMISSIBLE TRANSVERSE DECK
CONSTRUCTION JOINT

CONCRETE PLACEMENT QUANTITIES	
LOCATION	QUANTITY
SECTION 1, DECK & ABUT. DIAPH.	159.8
SECTION 2, DECK	132.5
SECTION 3, DECK	132.5
SECTION 4, DECK	132.5
SECTION 5, DECK	132.5
SECTION 6, DECK	132.5
SECTION 7, DECK & ABUT. DIAPH.	159.8
SECTION 8, DECK & PIER DIAPH.	61.2
SECTION 9, DECK & PIER DIAPH.	61.2
SECTION 10, DECK & PIER DIAPH.	61.2
SECTION 11, DECK & PIER DIAPH.	61.2
SECTION 12, DECK & PIER DIAPH.	61.2
SECTION 13, DECK & PIER DIAPH.	61.2
TOTAL (CU. YDS.)	1349.3

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

REINFORCING BAR LIST - DECK						
EPOXY COATED REINFORCING	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
	6a1	DECK TRANSV.		2029	42'-10	130537
	5b1	DECK LONGIT.		2280	39'-6	95169
	9b2	DECK LONGIT. OVER PIERS		474	39'-6	63658
	5d1	PIER DIAPH. ENDS		48	4'-7	229
	5d2	PIER DIAPH. LONGIT.		240	6'-4	1585
	5d3	PIER DIAPH. LONGIT.		60	4'-4	271
	5d4	PIER DIAPH. LONGIT.		6	39'-10	249
	6d5	ABUT. DIAPH.		4	36'-4	218
	6d6	ABUT. DIAPH. LONGIT.		40	6'-4	381
	5e1	PIER DIAPH. HOOPS		50	13'-11	726
	5e2	PIER DIAPH. TIES ENDS		12	2'-9	34
	5e3	PIER DIAPH. TIES		150	3'-0	469
	5e4	PIER DIAPH. HOOPS ENDS		4	13'-8	57
	5e5	ABUT. DIAPH. HOOPS		50	7'-5	387
	5e6	EXPAN. PIER DIAPH. HOOPS		100	13'-9	1434
	5e7	EXPAN. PIER DIAPH. HOOPS ENDS		8	13'-6	113
	6j1	DECK TRANSV. TOP (AT RAIL)		2028	6'-3	19038
	REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)					314555



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

BENT BAR DETAILS

DESIGN FOR 0° SKEW

1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

156'-0 END SPANS157'-0 INTERIOR SPAN

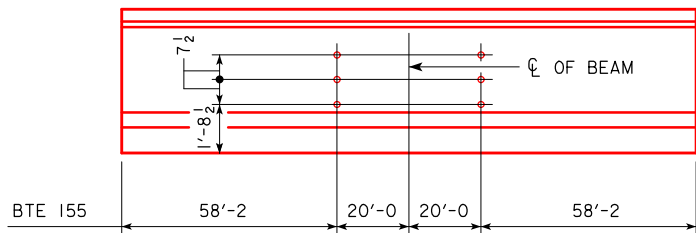
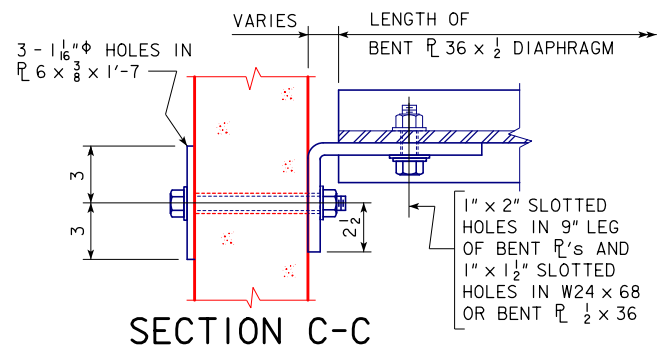
SUPERSTRUCTURE QUANTITIES & BAR LIST

IA 2 STA. 400+85.00, RT. 32.00'JULY 2019

FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

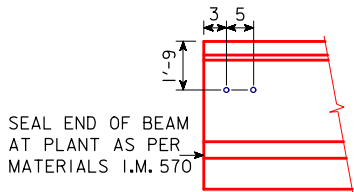
DESIGN SHEET NO. 27 OF 59FILE NO. 31719DESIGN NO. 119



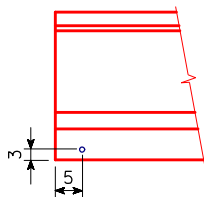
INTERMEDIATE DIAPHRAGM
BOLT HOLE LOCATIONS

NOTES:

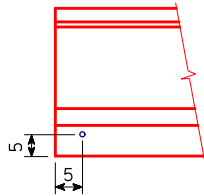
ALL DIAPHRAGM MATERIALS, INCLUDING BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED.
SHOP DRAWINGS OF THE STEEL DIAPHRAGMS SHOWING LAYOUT AND DETAILS OF THE DIAPHRAGMS SHALL BE SUBMITTED FOR APPROVAL.
ALL COSTS FOR FURNISHING AND INSTALLING STEEL INTERMEDIATE DIAPHRAGMS SHALL BE INCLUDED IN THE PRICE BID FOR STRUCTURAL STEEL.
THE 1 1/2" ϕ HOLES FOR THE 7/8" ϕ H.S. BOLTS SHALL BE CAST INTO THE WEB. DRILLING IS NOT ALLOWED.
THE 7/8" ϕ 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.



ALL SKEWS
STUB ABUT.



FIXED PIER

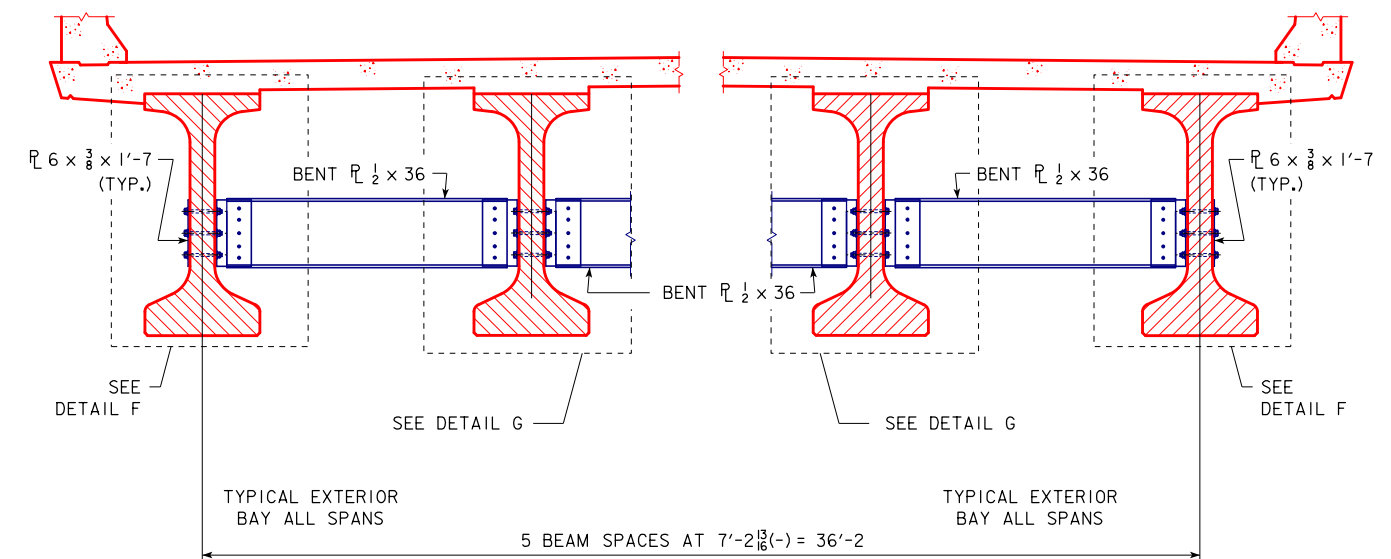


EXPANSION PIER
BEAM COIL TIE LOCATIONS

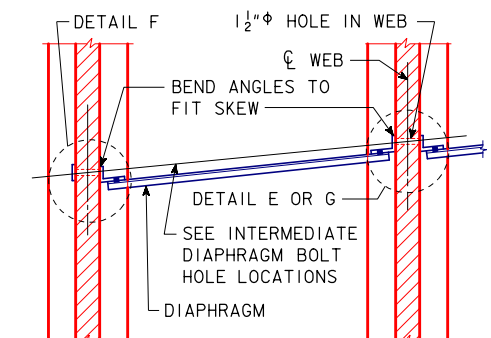
DESIGN FOR 0° SKEW
1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE
156'-0 END SPANS 157'-0 INTERIOR SPAN
INTERMEDIATE DIAPHRAGMS
IA 2 STA. 400+85.00, RT. 32.00' JULY 2019
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 28 OF 59 FILE NO. 31719 DESIGN NO. 119

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

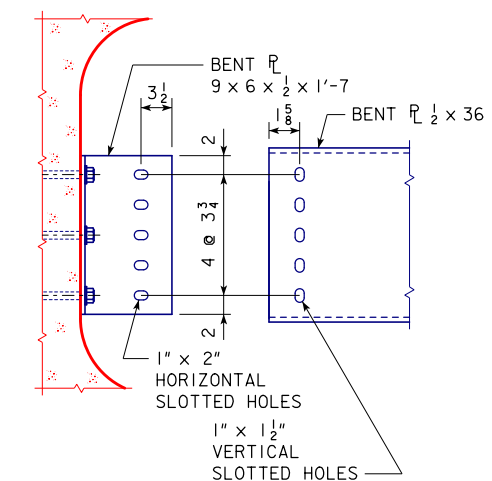
BULB TEE "E" BEAM INTERMEDIATE DIAPHRAGM STRUCTURAL STEEL			
ONE BEAM CONNECTION (DETAIL "F" AND/OR DETAIL "G")			WEIGHT
		NO. OF BEAM CONNECTIONS	
3 - 7/8" ϕ x 9 1/4" H.S. BOLTS WITH NUTS & WASHERS = 7.2 LBS.		84	605.0
ONE DETAIL "G"	2 - BENT PL 9 x 6 x 1/2 x 1'-7 = 80.8 LBS.	56	4,524.8
ONE DETAIL "F"	1 - BACKING PL 6 x 3/8 x 1'-7 = 12.1 LBS.	28	338.8
	1 - BENT PL 9 x 6 x 1/2 x 1'-7 = 40.4 LBS.	28	1,131.2
ONE DIAPHRAGM			
		NUMBER OF DIAPHRAGMS	
10 - 7/8" ϕ x 2 1/4" H.S. BOLTS WITH NUTS & WASHERS = 9.7 LBS.		70	679.0
1 - BENT PL 36 x 1/2 = 61.3 LBS./FT.	LENGTH OF MEMBER 6'-0 3/16	70	25,947.1
INTERMEDIATE DIAPHRAGM STRUCTURAL STEEL - TOTAL (LBS.)			33,225.9



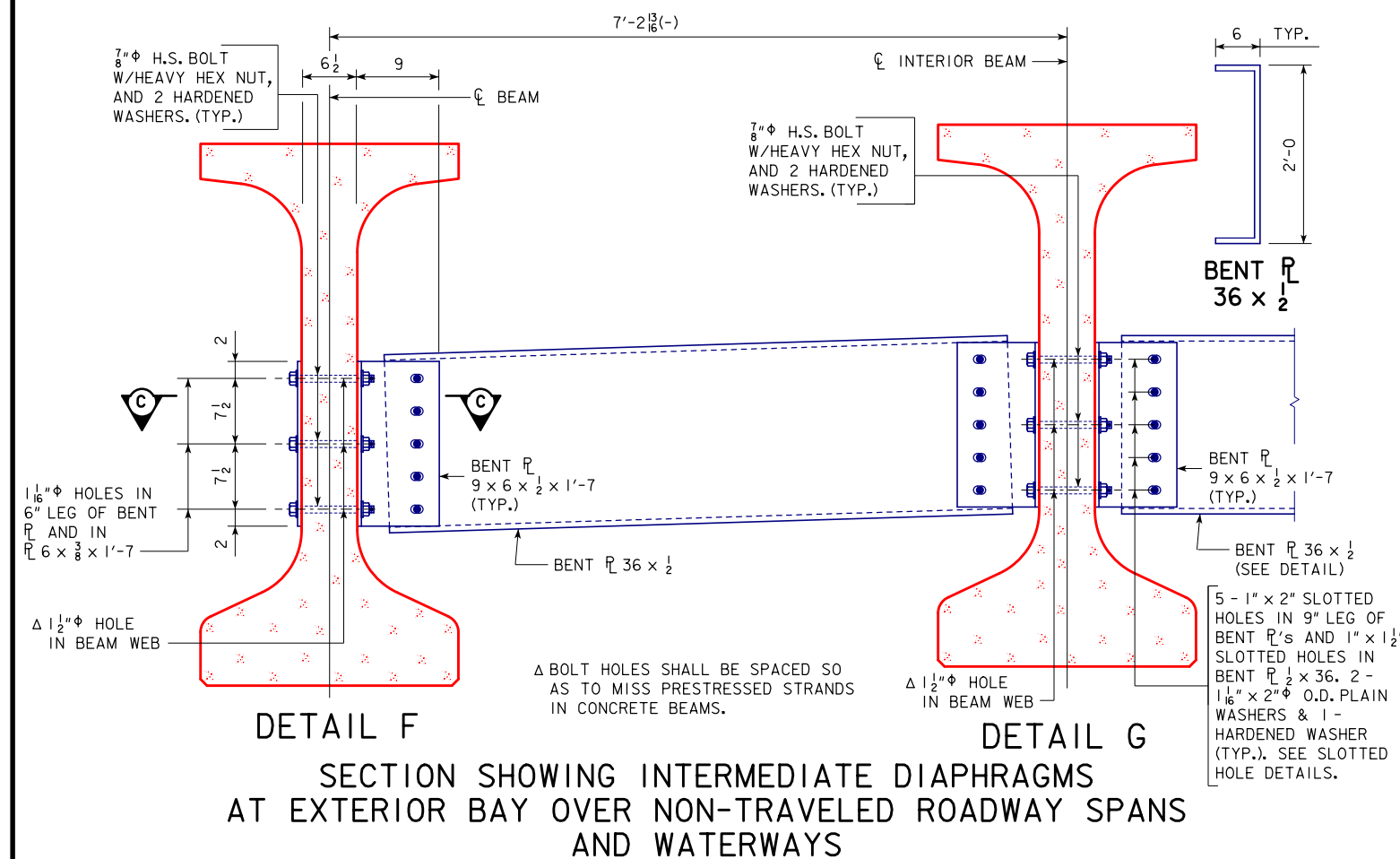
SECTION SHOWING INTERMEDIATE DIAPHRAGM



PART SECTION A-A

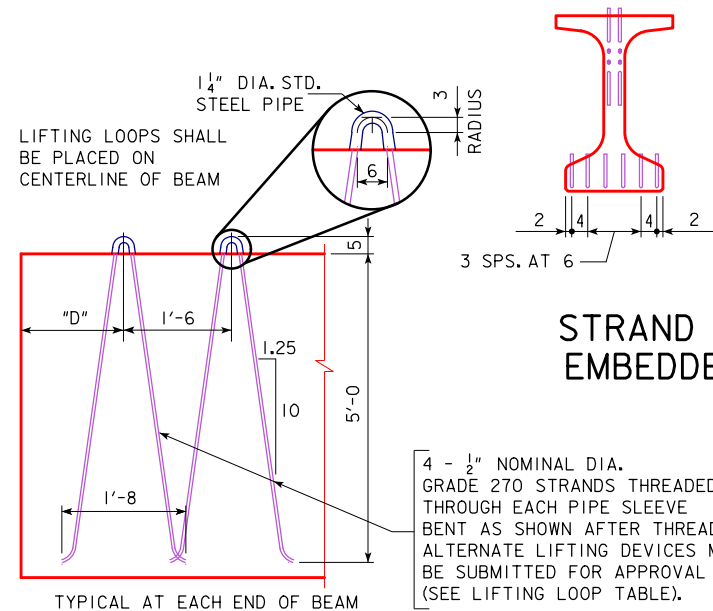


SLOTTED HOLE DETAILS



DETAIL F
SECTION SHOWING INTERMEDIATE DIAPHRAGMS
AT EXTERIOR BAY OVER NON-TRAVELED ROADWAY SPANS
AND WATERWAYS

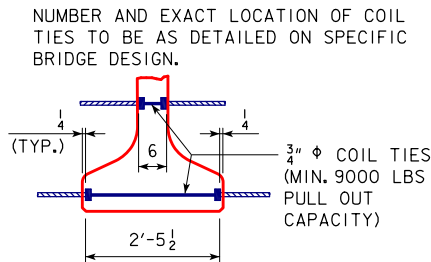
DESIGN FOR 0° SKEW
**1097'-0 X 40'-0 PRETENSIONED
 PRESTRESSED CONCRETE BEAM E.B. BRIDGE**
 156'-0 END SPANS 157'-0 INTERIOR SPAN
INTERMEDIATE DIAPHRAGMS
 IA 2 STA. 400+85.00, RT. 32.00' JULY 2019
FREMONT COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 29 OF 59 FILE NO. 31719 DESIGN NO. 119



LIFTING LOOP DETAIL

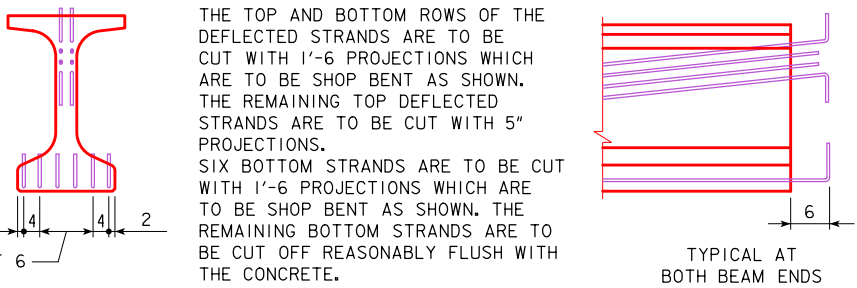
LIFTING LOOP AND OVERHANG TABLE				
BEAMS	LIFTING LOOPS EACH END	# OF STRANDS PER LOOP	D	BEAM OVERHANG (FT)
BTEI55	2	4	13'-6	16

LIFTING LOOPS SHALL CARRY LOADS EQUALLY.



COIL TIE DETAIL

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



STRAND PROJECTION AT BEAM ENDS WHEN EMBEDDED IN CONCRETE END DIAPHRAGMS

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.

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 ₀		PERMISSIBLE MAXIMUM SPACING	WEIGHT (TONS)	CONCRETE (CU YD.)	REINFORCING STEEL (WEIGHT-LBS)	
			f'ci (ksi)	f'c (ksi)		STRAIGHT	DEFLECTED			AT RELEASE	AFTER LOSSES	IMMEDIATE ^① (ELASTIC) Δ _i	TIME ^② (PLASTIC) Δ _T	HL-93 LOADING				
												STEEL DIAPHRAGM	STEEL DIAPHRAGM					STEEL DIAPHRAGM
BTEI55	155'-0	156'-4	8.00	9.00	0.60	46	12	2468	32.6	3.72	6.50	4.36	1.09	8'-0 ¹ / ₂	65.8	32.5	4318	

- 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:
0.85 kips/ft FOR 8'-0 BEAM SPACING AND TWO STEEL DIAPHRAGMS (0.500 kips) PLACED 20'-0, ON EITHER SIDE, OF THE BEAM CENTERLINE. FOR DIFFERENT SLAB AND DIAPHRAGM WEIGHTS, DEFLECTIONS WILL BE DIRECTLY PROPORTIONAL.
- ② DEFLECTIONS DUE TO THE COMBINED EFFECT OF CREEP DUE TO WEIGHT OF SLAB AND SHRINKAGE OF SLAB.
TOTAL BEAM DEFLECTIONS AT 1/2 OF SPAN, Δ₀, DUE TO WEIGHT OF SLAB AND DIAPHRAGMS FOR DETAILING PURPOSE:
(A) Δ₀ = Δ_i + Δ_T FOR SIMPLE SPAN.
(B) Δ₀ = Δ_i + 3/4 Δ_T FOR END SPANS OF CONTINUOUS BRIDGE.
(C) Δ₀ = Δ_i + 1/2 Δ_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 in².
- ④ REQUIRES A 4000 psi, 28 DAY COMPRESSIVE STRENGTH FOR CAST-IN-PLACE SLAB CONCRETE.

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

DESIGN STRESSES:

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

NOTES:
MODIFIED STIRRUP EXTENSIONS FOR 6b3 BARS

BEAM NOTES:

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

ALL PPC BEAMS SHALL USE HIGH PERFORMANCE CONCRETE (HPC) IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. HOLD DOWN POINTS FOR DEFLECTED STRANDS MAY BE MOVED TOWARD ENDS OF BEAM A DISTANCE OF 0.05 L MAXIMUM AT PRODUCER'S OPTION.

ALL PRESTRESSING STRANDS EXCEPT LIFTING LOOP STRANDS SHALL BE 0.60 in. NOMINAL DIAMETER (NOMINAL STEEL AREA = 0.217 in²) 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.

REINFORCING BAR LIST				BENT BAR DETAILS			
BEAM		BTEI55		NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT D = PIN DIAMETER FOR BENDING (UNLESS OTHERWISE SHOWN)			
BAR	SHAPE	NO.	LENGTH	#4 BAR D= 2" #5 BAR D= 2 1/2" #6 BAR D= 4 1/2"			
ΔΔ 5b1		119	12'-2				
ΔΔ * 6b3		52	6'-7				
* 6b4		20	5'-10				
4c1		189	2'-7				
4d1		151	6'-5				
4e1		36	3'-2				
4h1		8	8'-0				
				6b4			
				ΔΔ 5b1			
				ΔΔ 6b3			
				ΔΔ 5b2 (ALTERNATE)			
				5b1 (ALTERNATE)			
				4d1 (ALTERNATE)			

DESIGN FOR 0° SKEW
1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE
156'-0 END SPANS 157'-0 INTERIOR SPAN
BTEI55 BEAM DETAILS
IA 2 STA. 400+85.00, RT. 32.00' JULY 2019
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 30 OF 59 FILE NO. 31719 DESIGN NO. 119



CL OF BEAM

2" TOP FLANGE (TYP.)

2" TOP FLANGE (TYP.)

THE CHORD AT

TOP VIEW



BTE BEAM CROSS
SECTION



SEE ALTERNATE BAR NOTE ON
STANDARD SHEET 4790 (SHEET 1).

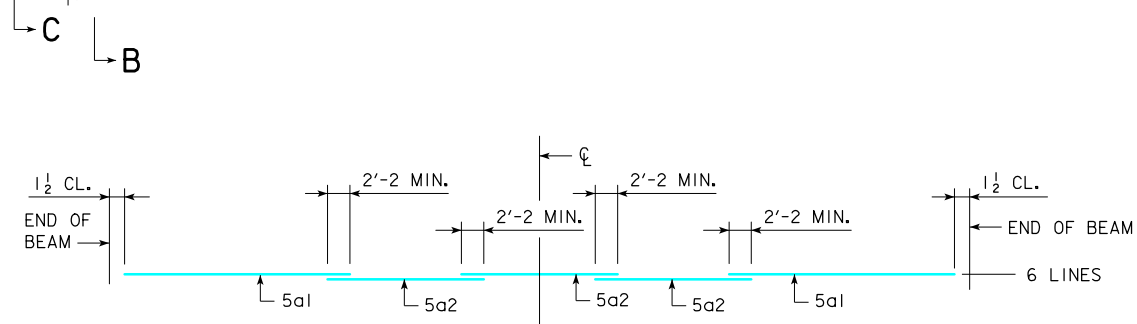
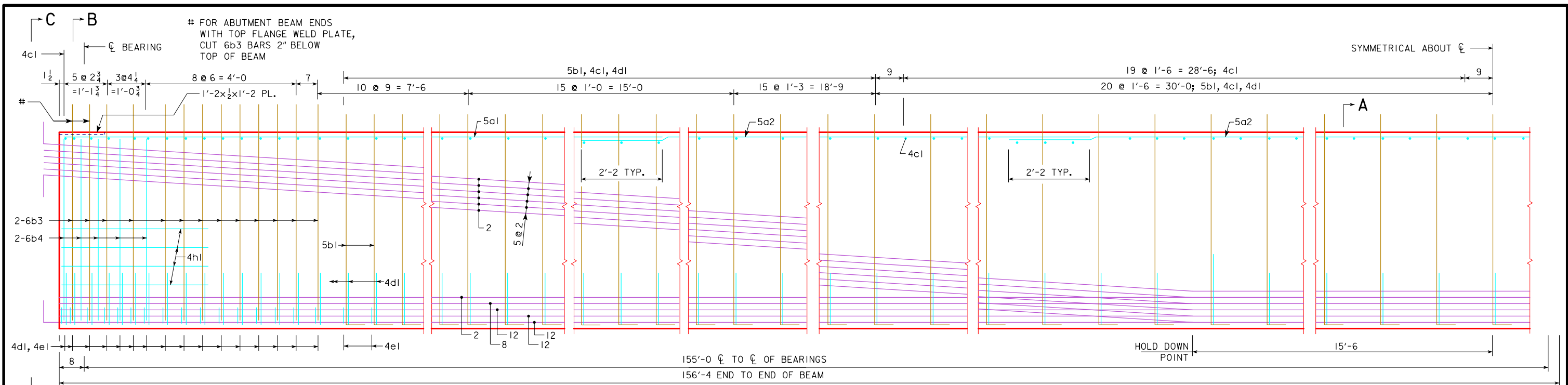


MODIFIED STANDARD SHEET 4790

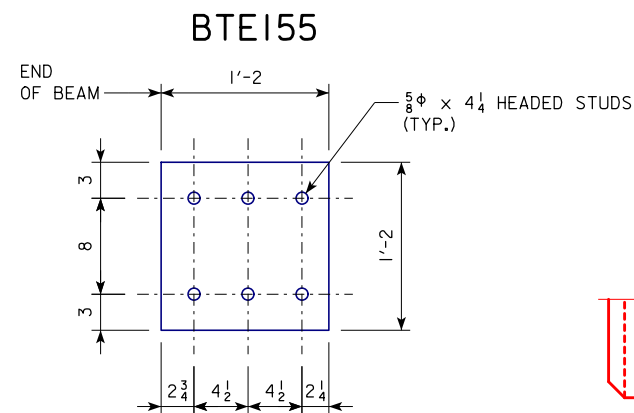
FREMONT COUNTY

PROJECT NUMBER	NHSN-002-1(123)--2R-36
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SHEET NUMBER 32



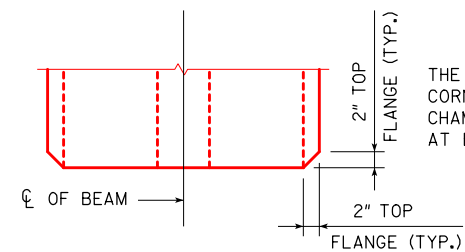
TOP FLANGE LONGITUDINAL BAR LAYOUT



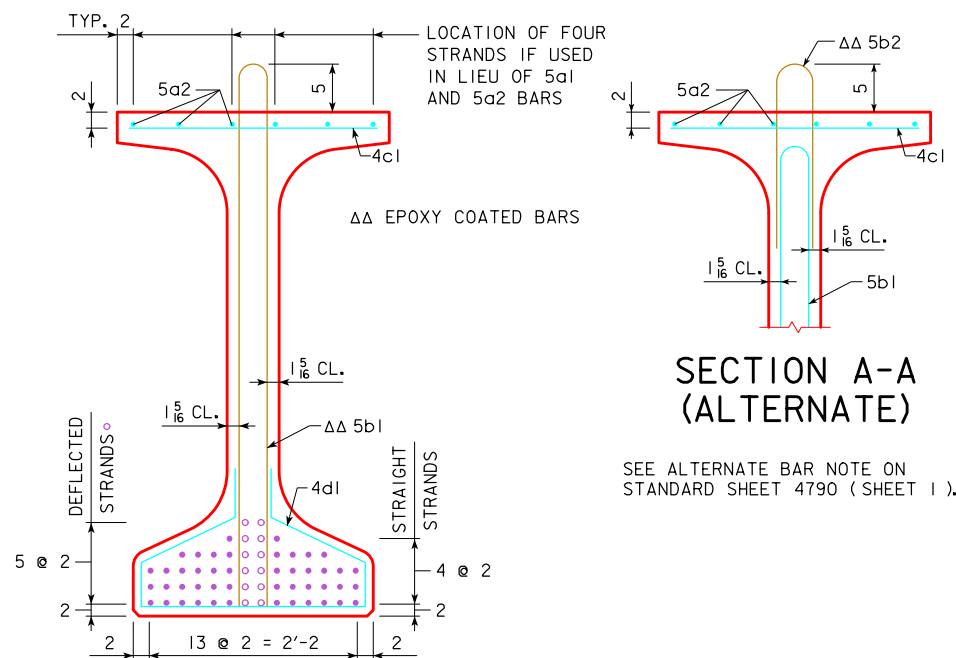
TOP FLANGE WELD PLATE DETAIL
(12 LOCATIONS)

NOTE:
MODIFIED STIRRUP
EXTENSIONS FOR 6b3 BARS.

NOTE:
TOP FLANGE WELD PLATES
FOR ABUTMENT BEAM ENDS
SHALL BE SET IN FORMS
WHEN BEAM IS CAST.



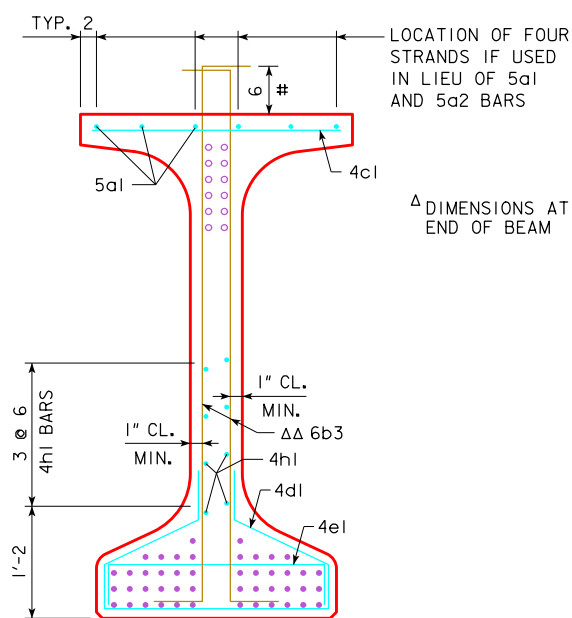
TOP VIEW



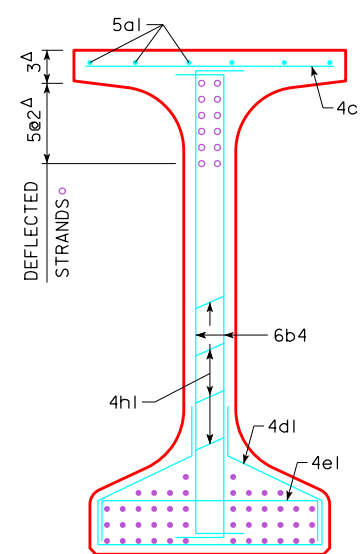
SECTION A-A

SECTION A-A
(ALTERNATE)

SEE ALTERNATE BAR NOTE ON
STANDARD SHEET 4790 (SHEET 1).



SECTION B-B

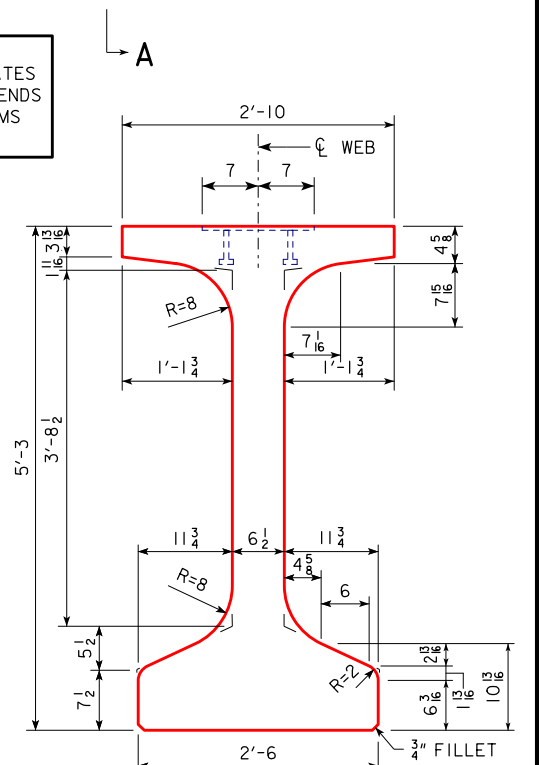


SECTION C-C

BEAM SECTION
PROPERTIES

AREA = 807.4 in²
 $\bar{y}_b$ = 28.75 in
I = 422,790 in⁴

BTE BEAM CROSS
SECTION



DESIGN FOR 0° SKEW

1097'-0" X 40'-0" PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

156'-0" END SPANS 157'-0" INTERIOR SPAN

SPECIAL BTE155 BEAM DETAILS

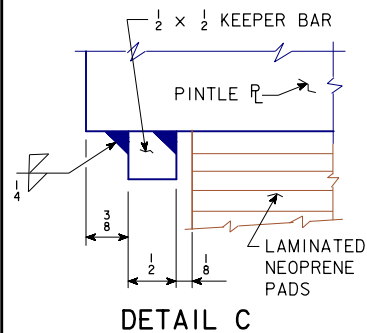
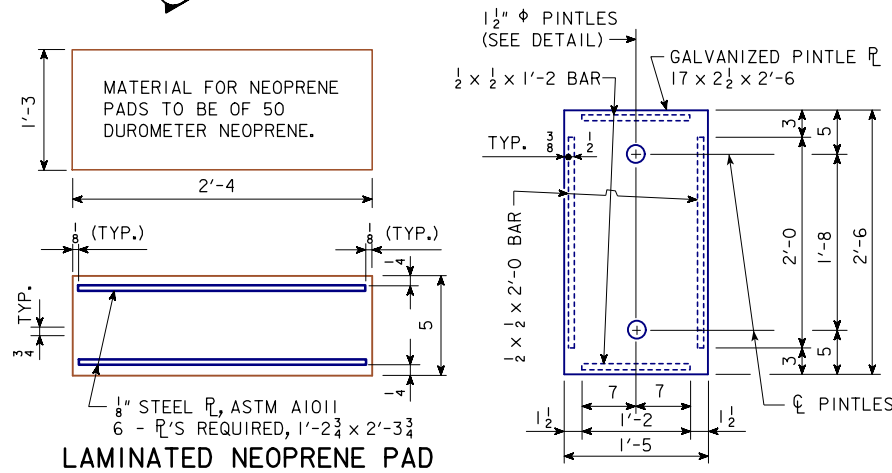
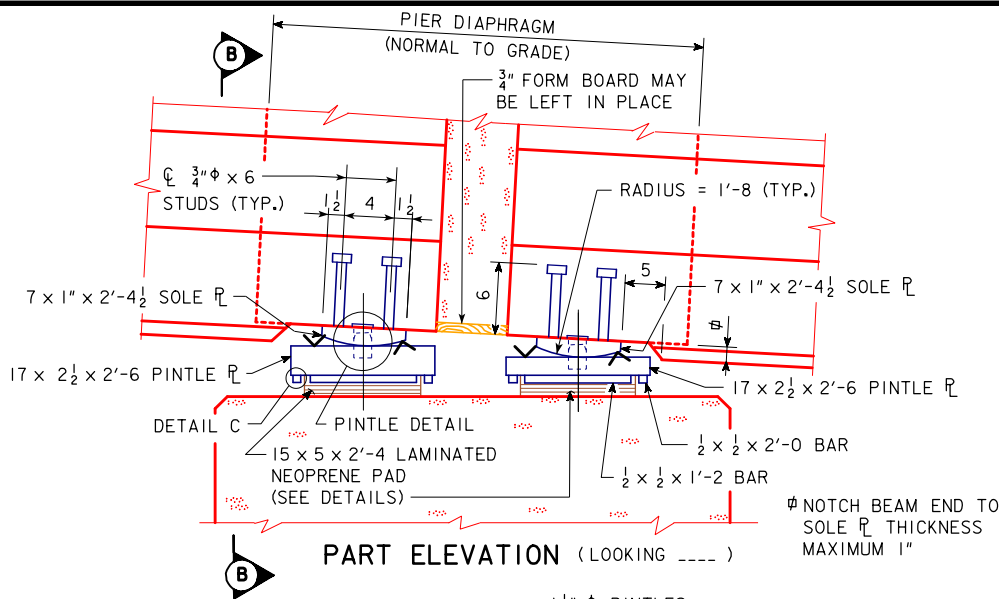
1A 2 STA. 400+85.00, RT. 32.00'

JULY 2019

FREMONT COUNTY

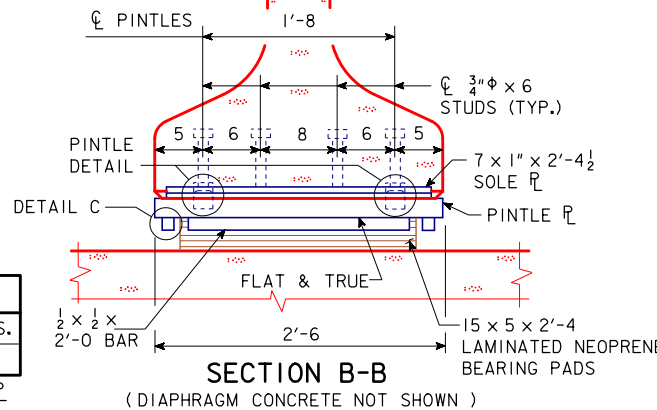
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 32 OF 59 FILE NO. 31719 DESIGN NO. 119



STRUCTURAL STEEL	
WEIGHT	17,611 LBS.

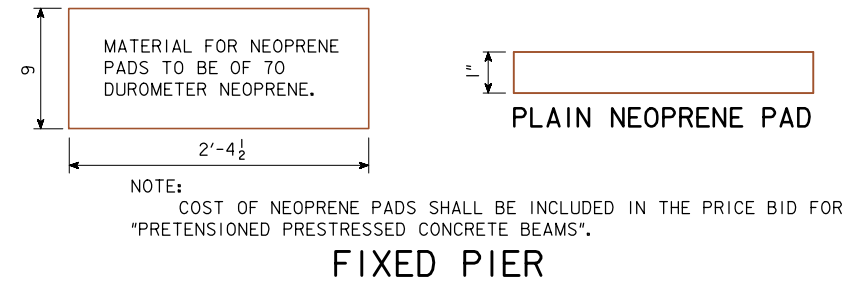
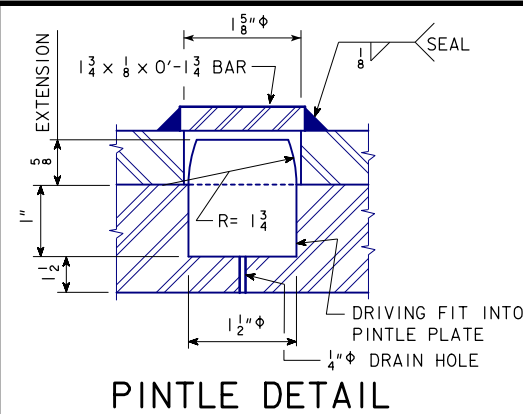
DOES NOT INCLUDE CURVED SOLE PLATE



EXPANSION PIER BEARING NOTES:

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

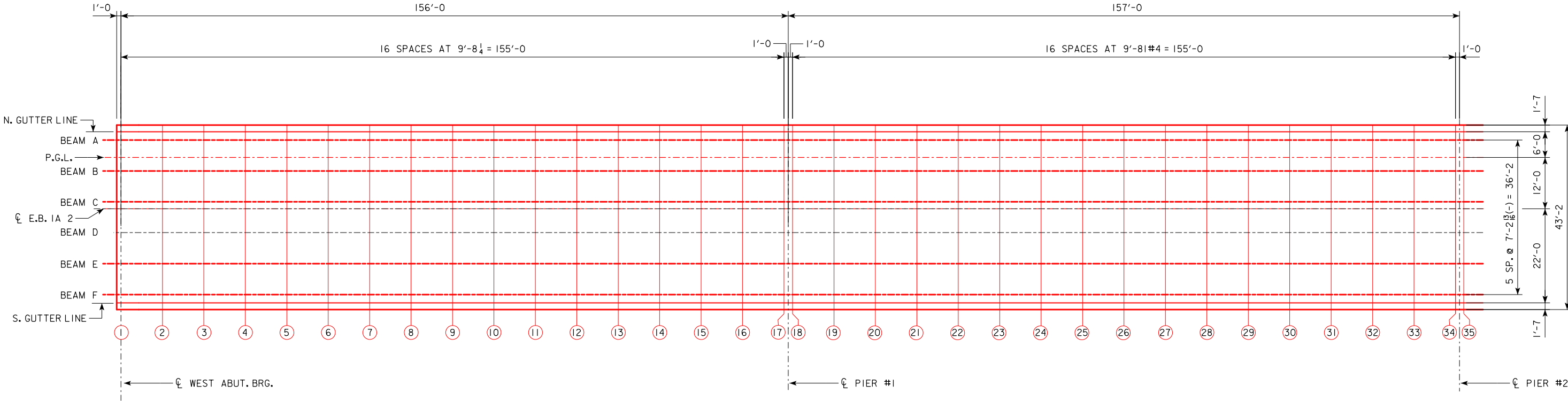
EXPANSION PIER LAMINATED NEOPRENE PAD / CURVED SOLE PLATE ASSEMBLY



* THE 1/8 INCH NEOPRENE SHEETS ARE TO BE 50, 60, OR 70 DUROMETER HARDNESS AND SHALL BE 1 INCH GREATER IN LENGTH THAN THE BOTTOM SURFACE OF THE MASONRY PLATES OR STEEL BEARINGS.

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

DESIGN FOR 0° SKEW
**1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE**
156'-0 END SPANS 157'-0 INTERIOR SPAN
PIER BEARING DETAILS
IA 2 STA. 400+85.00, RT. 32.00' JULY 2019
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 34 OF 59 FILE NO. 31719 DESIGN NO. 119



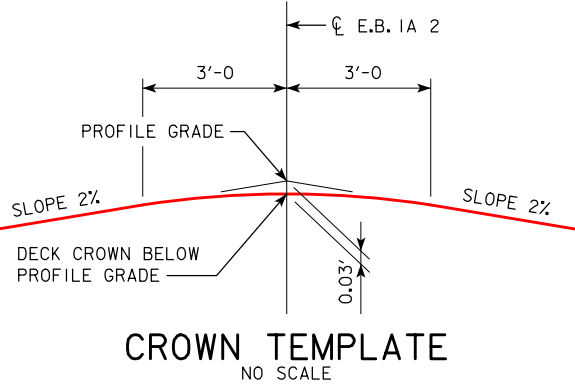
TOP OF SLAB PLAN (SPAN 1 & SPAN 2)

TOP OF SLAB ELEVATIONS

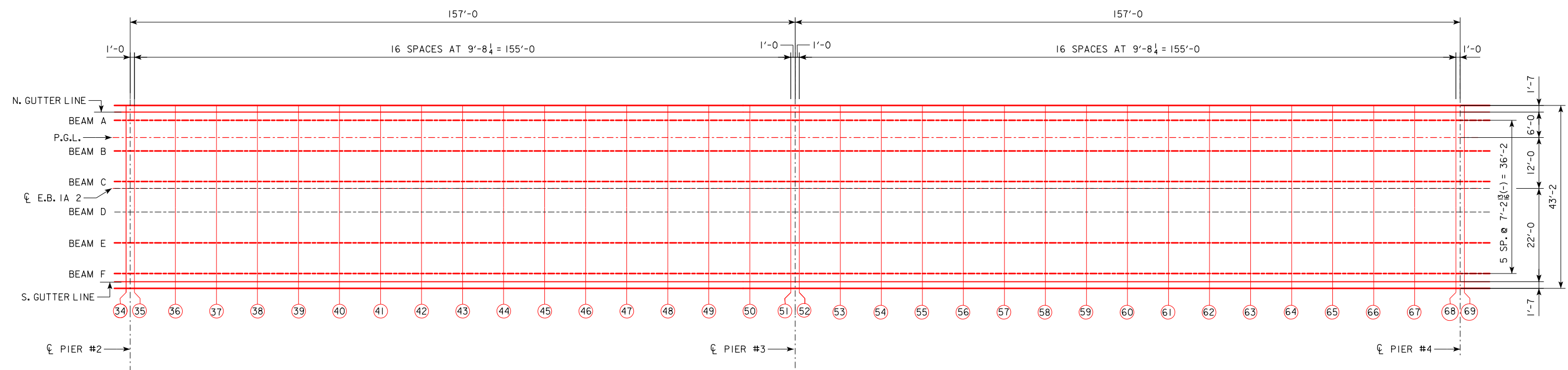
	CL WEST ABUT.BRG.																CL PIER #1 BEARING										
LOCATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
NORTH GUTTER LINE	945.21	945.25	945.30	945.35	945.40	945.45	945.50	945.54	945.59	945.64	945.69	945.74	945.79	945.83	945.88	945.93	945.98	945.99	946.04	946.09	946.14	946.18	946.23	946.28	946.33	946.38	946.43
BEAM A	945.24	945.29	945.34	945.39	945.44	945.49	945.53	945.58	945.63	945.68	945.73	945.78	945.82	945.87	945.92	945.97	946.02	946.03	946.08	946.13	946.17	946.22	946.27	946.32	946.37	946.42	946.46
BEAM B	945.39	945.44	945.48	945.53	945.58	945.63	945.68	945.73	945.78	945.82	945.87	945.92	945.97	946.02	946.07	946.11	946.16	946.17	946.22	946.27	946.32	946.37	946.42	946.46	946.51	946.56	946.61
BEAM C	945.53	945.57	945.62	945.67	945.72	945.77	945.82	945.86	945.91	945.96	946.01	946.06	946.11	946.16	946.20	946.25	946.30	946.31	946.36	946.41	946.46	946.50	946.55	946.60	946.65	946.70	946.75
CL E.B. 1A 2	945.54	945.58	945.63	945.68	945.73	945.78	945.83	945.88	945.92	945.97	946.02	946.07	946.12	946.17	946.21	946.26	946.31	946.32	946.37	946.42	946.47	946.52	946.56	946.61	946.66	946.71	946.76
BEAM D	945.45	945.50	945.55	945.60	945.65	945.69	945.74	945.79	945.84	945.89	945.94	945.99	946.03	946.08	946.13	946.18	946.23	946.24	946.29	946.33	946.38	946.43	946.48	946.53	946.58	946.63	946.67
BEAM E	945.31	945.36	945.40	945.45	945.50	945.55	945.60	945.65	945.70	945.74	945.79	945.84	945.89	945.94	945.99	946.03	946.08	946.09	946.14	946.19	946.24	946.29	946.34	946.38	946.43	946.48	946.53
BEAM F	945.16	945.21	945.26	945.31	945.36	945.41	945.45	945.50	945.55	945.60	945.65	945.70	945.74	945.79	945.84	945.89	945.94	945.95	946.00	946.05	946.09	946.14	946.19	946.24	946.29	946.34	946.38
SOUTH GUTTER LINE	945.12	945.17	945.22	945.27	945.32	945.37	945.42	945.46	945.51	945.56	945.61	945.66	945.71	945.75	945.80	945.85	945.90	945.91	945.96	946.01	946.06	946.10	946.15	946.20	946.25	946.30	946.35

TOP OF SLAB ELEVATIONS

							CL PIER #2 BEARING
LOCATION	28	29	30	31	32	33	34
NORTH GUTTER LINE	946.47	946.52	946.57	946.62	946.67	946.72	946.77
BEAM A	946.51	946.56	946.61	946.66	946.71	946.75	946.80
BEAM B	946.66	946.71	946.75	946.80	946.85	946.90	946.95
BEAM C	946.80	946.84	946.89	946.94	946.99	947.04	947.09
CL E.B. 1A 2	946.81	946.85	946.90	946.95	947.00	947.05	947.10
BEAM D	946.72	946.77	946.82	946.87	946.92	946.96	947.01
BEAM E	946.58	946.63	946.67	946.72	946.77	946.82	946.87
BEAM F	946.43	946.48	946.53	946.58	946.63	946.67	946.72
SOUTH GUTTER LINE	946.39	946.44	946.49	946.54	946.59	946.64	946.68



DESIGN FOR 0° SKEW
**1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE**
156'-0 END SPANS 157'-0 INTERIOR SPAN
TOP OF SLAB ELEVATIONS
1A 2 STA. 400+85.00, RT. 32.00' JULY 2019
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 35 OF 59 FILE NO. 31719 DESIGN NO. 119



TOP OF SLAB PLAN (SPAN 3 & SPAN 4)

TOP OF SLAB ELEVATIONS

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	946.78	946.82	946.87	946.92	946.97	947.02	947.07	947.11	947.16	947.21	947.26	947.31	947.36	947.40	947.45	947.50	947.55	947.56	947.61	947.65	947.70	947.74	947.78	947.81	947.85	947.88	947.91
BEAM A	946.81	946.86	946.91	946.96	947.01	947.06	947.10	947.15	947.20	947.25	947.30	947.35	947.39	947.44	947.49	947.54	947.59	947.60	947.65	947.69	947.74	947.78	947.82	947.85	947.89	947.92	947.95
BEAM B	946.96	947.01	947.05	947.10	947.15	947.20	947.25	947.30	947.35	947.39	947.44	947.49	947.54	947.59	947.64	947.68	947.73	947.74	947.79	947.84	947.88	947.92	947.96	948.00	948.03	948.06	948.09
BEAM C	947.10	947.14	947.19	947.24	947.29	947.34	947.39	947.43	947.48	947.53	947.58	947.63	947.68	947.73	947.77	947.82	947.87	947.88	947.93	947.97	948.02	948.06	948.10	948.13	948.17	948.20	948.23
CL E.B. 1A 2	947.11	947.15	947.20	947.25	947.30	947.35	947.40	947.45	947.49	947.54	947.59	947.64	947.69	947.74	947.78	947.83	947.88	947.89	947.94	947.99	948.03	948.07	948.11	948.15	948.18	948.21	948.24
BEAM D	947.02	947.07	947.12	947.17	947.22	947.26	947.31	947.36	947.41	947.46	947.51	947.56	947.60	947.65	947.70	947.75	947.80	947.81	947.86	947.90	947.95	947.99	948.03	948.06	948.10	948.13	948.16
BEAM E	946.88	946.93	946.97	947.02	947.07	947.12	947.17	947.22	947.27	947.31	947.36	947.41	947.46	947.51	947.56	947.60	947.65	947.66	947.71	947.76	947.80	947.84	947.88	947.92	947.95	947.98	948.01
BEAM F	946.73	946.78	946.83	946.88	946.93	946.98	947.02	947.07	947.12	947.17	947.22	947.27	947.31	947.36	947.41	947.46	947.51	947.52	947.57	947.61	947.66	947.70	947.74	947.77	947.81	947.84	947.87
SOUTH GUTTER LINE	946.69	946.74	946.79	946.84	946.89	946.94	946.99	947.03	947.08	947.13	947.18	947.23	947.28	947.32	947.37	947.42	947.47	947.48	947.53	947.57	947.62	947.66	947.70	947.73	947.77	947.80	947.83

TOP OF SLAB ELEVATIONS

LOCATION							CL PIER #4 BEARING
	62	63	64	65	66	67	
NORTH GUTTER LINE	947.94	947.96	947.98	948.00	948.02	948.04	948.05
BEAM A	947.97	948.00	948.02	948.04	948.06	948.08	948.09
BEAM B	948.12	948.14	948.17	948.19	948.20	948.22	948.23
BEAM C	948.26	948.28	948.30	948.32	948.34	948.36	948.37
CL E.B. IA 2	948.27	948.29	948.31	948.34	948.35	948.37	948.38
BEAM D	948.18	948.21	948.23	948.25	948.27	948.28	948.30
BEAM E	948.04	948.06	948.09	948.11	948.12	948.14	948.15
BEAM F	947.89	947.92	947.94	947.96	947.98	948.00	948.01
SOUTH GUTTER LINE	947.86	947.88	947.90	947.92	947.94	947.96	947.97

DESIGN FOR 0° SKEW

1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

156'-0 END SPANS157'-0 INTERIOR SPAN

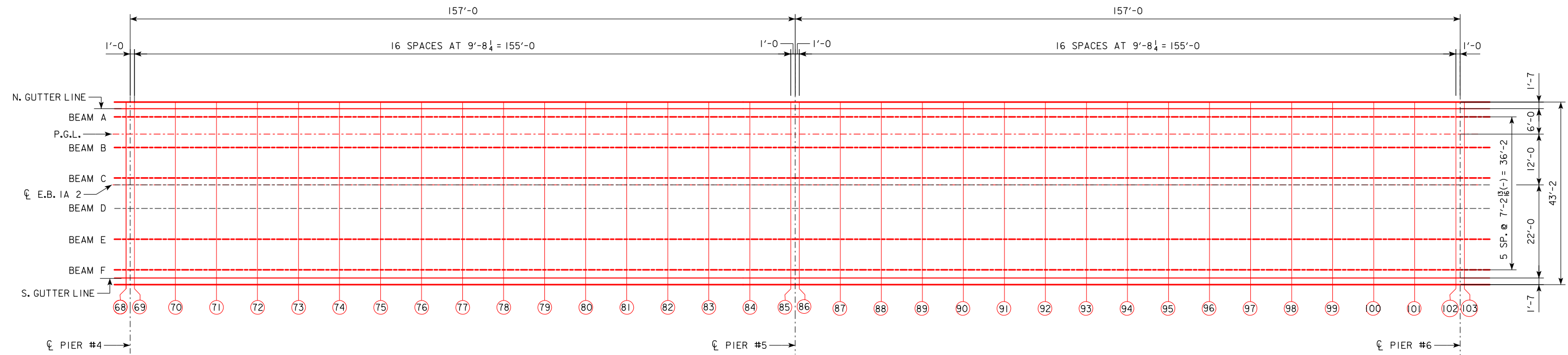
TOP OF SLAB ELEVATIONS

IA 2 STA. 400+85.00, RT. 32.00'JULY 2019

FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 36 OF 59FILE NO. 31719DESIGN NO. 119



TOP OF SLAB PLAN (SPAN 5 & SPAN 6)

TOP OF SLAB ELEVATIONS

	CL PIER #4 BEARING															CL PIER #5 BEARING											
LOCATION	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
NORTH GUTTER LINE	948.05	948.06	948.07	948.08	948.08	948.08	948.08	948.07	948.07	948.06	948.05	948.04	948.02	948.00	947.98	947.96	947.93	947.93	947.90	947.87	947.84	947.80	947.77	947.73	947.68	947.64	947.59
BEAM A	948.09	948.10	948.11	948.11	948.12	948.12	948.12	948.11	948.11	948.10	948.09	948.07	948.06	948.04	948.02	948.00	947.97	947.97	947.94	947.91	947.88	947.84	947.80	947.77	947.72	947.68	947.63
BEAM B	948.24	948.25	948.25	948.26	948.26	948.26	948.26	948.26	948.25	948.24	948.23	948.22	948.20	948.19	948.16	948.14	948.12	948.11	948.08	948.05	948.02	947.99	947.95	947.91	947.87	947.82	947.78
BEAM C	948.37	948.38	948.39	948.40	948.40	948.40	948.40	948.40	948.39	948.38	948.37	948.36	948.34	948.32	948.30	948.28	948.26	948.25	948.22	948.19	948.16	948.12	948.09	948.05	948.01	947.96	947.91
CL E.B. 1A 2	948.38	948.39	948.40	948.41	948.41	948.41	948.41	948.41	948.40	948.39	948.38	948.37	948.35	948.33	948.31	948.29	948.27	948.26	948.23	948.20	948.17	948.13	948.10	948.06	948.02	947.97	947.93
BEAM D	948.30	948.31	948.32	948.32	948.33	948.33	948.33	948.32	948.32	948.31	948.30	948.28	948.27	948.25	948.23	948.21	948.18	948.18	948.15	948.12	948.09	948.05	948.01	947.97	947.93	947.89	947.84
BEAM E	948.16	948.17	948.17	948.18	948.18	948.18	948.18	948.18	948.17	948.16	948.15	948.14	948.12	948.11	948.08	948.06	948.04	948.03	948.00	947.97	947.94	947.91	947.87	947.83	947.79	947.74	947.70
BEAM F	948.01	948.02	948.03	948.03	948.04	948.04	948.04	948.04	948.03	948.03	948.02	948.01	947.99	947.98	947.96	947.94	947.92	947.89	947.89	947.86	947.83	947.80	947.76	947.72	947.68	947.60	947.55
SOUTH GUTTER LINE	947.97	947.98	947.99	948.00	948.00	948.00	948.00	947.99	947.99	947.98	947.97	947.96	947.94	947.92	947.90	947.88	947.85	947.85	947.82	947.79	947.76	947.72	947.69	947.65	947.60	947.56	947.51

TOP OF SLAB ELEVATIONS

							CL PIER #6 BEARING
LOCATION	96	97	98	99	100	101	102
NORTH GUTTER LINE	947.55	947.49	947.44	947.38	947.33	947.27	947.20
BEAM A	947.58	947.53	947.48	947.42	947.36	947.30	947.24
BEAM B	947.73	947.68	947.62	947.57	947.51	947.45	947.39
BEAM C	947.87	947.81	947.76	947.71	947.65	947.59	947.52
CL E.B. 1A 2	947.88	947.83	947.77	947.72	947.66	947.60	947.53
BEAM D	947.79	947.74	947.69	947.63	947.57	947.51	947.45
BEAM E	947.65	947.60	947.54	947.49	947.43	947.37	947.31
BEAM F	947.50	947.45	947.40	947.34	947.28	947.22	947.16
SOUTH GUTTER LINE	947.46	947.41	947.36	947.30	947.25	947.19	947.12

DESIGN FOR 0° SKEW

1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

156'-0 END SPANS157'-0 INTERIOR SPAN

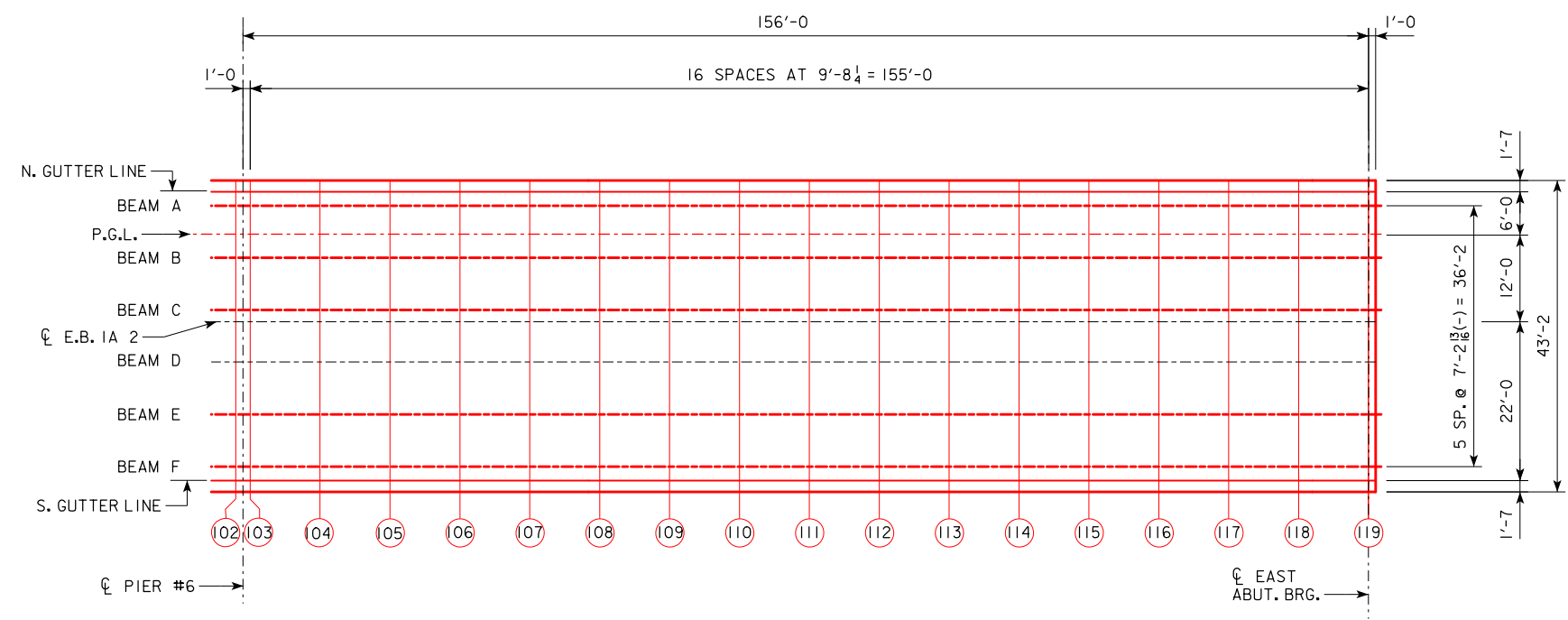
TOP OF SLAB ELEVATIONS

1A 2 STA. 400+85.00, RT. 32.00'JULY 2019

FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 37 OF 59FILE NO. 31719DESIGN NO. 119



TOP OF SLAB PLAN (SPAN 7)

TOP OF SLAB ELEVATIONS

	CL PIER #6 BEARING																CL EAST ABUT. BRG.
LOCATION	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119
NORTH GUTTER LINE	947.19	947.12	947.05	946.98	946.91	946.84	946.76	946.68	946.60	946.51	946.42	946.34	946.24	946.15	946.05	945.95	945.85
BEAM A	947.23	947.16	947.09	947.02	946.95	946.87	946.80	946.72	946.63	946.55	946.46	946.37	946.28	946.19	946.09	945.99	945.89
BEAM B	947.37	947.31	947.24	947.17	947.09	947.02	946.94	946.86	946.78	946.69	946.61	946.52	946.43	946.33	946.24	946.14	946.04
BEAM C	947.51	947.44	947.38	947.31	947.23	947.16	947.08	947.00	946.92	946.83	946.75	946.66	946.56	946.47	946.37	946.28	946.17
CL E.B. 1A 2	947.52	947.45	947.39	947.32	947.24	947.17	947.09	947.01	946.93	946.84	946.76	946.67	946.58	946.48	946.38	946.29	946.19
BEAM D	947.44	947.37	947.30	947.23	947.16	947.08	947.01	946.93	946.84	946.76	946.67	946.58	946.49	946.40	946.30	946.20	946.10
BEAM E	947.29	947.23	947.16	947.09	947.01	946.94	946.86	946.78	946.70	946.61	946.53	946.44	946.35	946.25	946.16	946.06	945.96
BEAM F	947.15	947.08	947.01	946.94	946.87	946.79	946.72	946.64	946.55	946.47	946.38	946.29	946.20	946.11	946.01	945.91	945.81
SOUTH GUTTER LINE	947.11	947.04	946.97	946.90	946.83	946.76	946.68	946.60	946.52	946.43	946.34	946.26	946.16	946.07	945.97	945.87	945.77

DESIGN FOR 0° SKEW

1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

156'-0 END SPANS157'-0 INTERIOR SPAN

TOP OF SLAB ELEVATIONS

1A 2 STA. 400+85.00, RT. 32.00'JULY 2019

FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 38 OF 59FILE NO. 31719DESIGN NO. 119

TABLE OF BEAM LINE HAUNCH ELEVATIONS																											
	☐ WEST ABUT.BRG.																☐ PIER #1 BEARING										
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	944.58	944.70	944.82	944.94	945.05	945.14	945.23	945.30	945.35	945.39	945.42	945.43	945.43	945.42	945.41	945.38	945.35	945.36	945.48	945.60	945.71	945.82	945.91	945.99	946.06	946.12	946.16
BEAM B	944.72	944.85	944.97	945.08	945.19	945.29	945.37	945.44	945.50	945.54	945.57	945.58	945.58	945.57	945.55	945.52	945.50	945.51	945.63	945.75	945.86	945.96	946.06	946.14	946.21	946.26	946.30
BEAM C	944.86	944.98	945.11	945.22	945.33	945.43	945.51	945.58	945.63	945.68	945.70	945.72	945.72	945.71	945.69	945.66	945.63	945.64	945.77	945.88	946.00	946.10	946.19	946.28	946.34	946.40	946.44
BEAM D	944.79	944.91	945.03	945.15	945.26	945.35	945.44	945.51	945.56	945.60	945.63	945.64	945.64	945.63	945.61	945.59	945.56	945.57	945.69	945.81	945.92	946.03	946.12	946.20	946.27	946.33	946.37
BEAM E	944.64	944.77	944.89	945.00	945.11	945.21	945.29	945.36	945.42	945.46	945.48	945.50	945.50	945.49	945.47	945.44	945.42	945.43	945.55	945.67	945.78	945.88	945.98	946.06	946.13	946.18	946.22
BEAM F	944.50	944.62	944.74	944.86	944.97	945.06	945.15	945.22	945.27	945.31	945.34	945.35	945.35	945.34	945.33	945.30	945.27	945.28	945.40	945.52	945.63	945.74	945.83	945.91	945.98	946.04	946.08

TABLE OF BEAM LINE HAUNCH ELEVATIONS							
						☐ PIER #2 BEARING	
LINE 28	LINE 29	LINE 30	LINE 31	LINE 32	LINE 33	LINE 34	LOCATION
946.19	946.20	946.20	946.20	946.18	946.16	946.14	BEAM A
946.33	946.35	946.35	946.34	946.33	946.31	946.28	BEAM B
946.47	946.48	946.49	946.48	946.47	946.44	946.42	BEAM C
946.40	946.41	946.41	946.41	946.39	946.37	946.35	BEAM D
946.25	946.27	946.27	946.26	946.25	946.23	946.20	BEAM E
946.11	946.12	946.12	946.12	946.10	946.08	946.06	BEAM F

MISCELLANEOUS DATA TABLE																											
	BEAM LINE	☐ WEST ABUT.BRG.																☐ 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	15/16	1 13/16	2 5/8	3 5/16	3 7/8	4 5/16	4 9/16	4 11/16	4 9/16	4 5/16	3 7/8	3 5/16	2 5/8	1 13/16	15/16	0	0	7/8	1 11/16	2 1/2	3 1/8	3 11/16	4 1/16	4 5/16	4 7/16
CROSS SLOPE ADJUSTMENTS (IN.)	A,B,D,E,F	5/16																									
	C	1/4																									
ALLOWABLE FIELD HAUNCH (IN. & FT.)	MIN.	ALL	1/4	1/4	-3/16													1/4	1/4	1/4	1/4	-3/16					
	MAX.	ALL	3 1/4	3 1/4	2 1/2													3 1/4	3 1/4	3 1/4	3 1/4	2 1/2					

MISCELLANEOUS DATA TABLE									
							☐ PIER #2 BEARING	BEAM LINE	
LINE 27	LINE 28	LINE 29	LINE 30	LINE 31	LINE 32	LINE 33	LINE 34		
4 5/16	4 1/16	3 11/16	3 1/8	2 1/2	1 11/16	7/8	0	ALL	ANTICIPATED DEFLECTION DUE TO SLAB (IN.)
5/16								A,B,D,E,F	CROSS SLOPE ADJUSTMENTS (IN.)
1/4								C	
-3/16						1/4	1/4	MIN. ALL	ALLOWABLE FIELD HAUNCH (IN. & FT.)
2 1/2						3 1/4	3 1/4	MAX. ALL	

HAUNCH LOCATIONS ARE THE SAME
LOCATION AS THE ENCIRCLED LETTERS
SHOWN ON SLAB ELEVATIONS SHEETS.

DESIGN FOR 0° SKEW

1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

156'-0 END SPANS157'-0 INTERIOR SPAN

HAUNCH DETAILS

1A 2 STA. 400+85.00, RT. 32.00'JULY 2019

FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 39 OF 59FILE NO. 31719DESIGN NO. 119

TABLE OF BEAM LINE HAUNCH ELEVATIONS

	☐ PIER #2 BEARING																☐ 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	946.15	946.27	946.39	946.50	946.60	946.70	946.78	946.85	946.90	946.94	946.97	946.99	946.99	946.98	946.97	946.95	946.92	946.93	947.05	947.17	947.28	947.37	947.46	947.53	947.58	947.62	947.64
BEAM B	946.29	946.41	946.53	946.64	946.75	946.84	946.92	946.99	947.05	947.09	947.12	947.13	947.13	947.13	947.11	947.09	947.07	947.08	947.20	947.31	947.42	947.52	947.60	947.67	947.73	947.76	947.79
BEAM C	946.43	946.55	946.67	946.78	946.88	946.98	947.06	947.13	947.18	947.23	947.25	947.27	947.27	947.27	947.25	947.23	947.20	947.21	947.34	947.45	947.56	947.65	947.74	947.81	947.86	947.90	947.92
BEAM D	946.36	946.48	946.60	946.71	946.81	946.91	946.99	947.06	947.11	947.15	947.18	947.20	947.20	947.19	947.18	947.16	947.13	947.14	947.26	947.38	947.48	947.58	947.67	947.74	947.79	947.83	947.85
BEAM E	946.21	946.33	946.45	946.56	946.67	946.76	946.84	946.91	946.97	947.01	947.04	947.05	947.05	947.05	947.03	947.01	946.99	947.00	947.12	947.23	947.34	947.44	947.52	947.59	947.65	947.68	947.71
BEAM F	946.07	946.19	946.31	946.42	946.52	946.62	946.70	946.77	946.82	946.86	946.89	946.91	946.91	946.90	946.89	946.87	946.84	946.85	946.97	947.09	947.20	947.29	947.38	947.45	947.50	947.54	947.56

TABLE OF BEAM LINE HAUNCH ELEVATIONS

						☐ PIER #4 BEARING	
LINE 62	LINE 63	LINE 64	LINE 65	LINE 66	LINE 67	LINE 68	LOCATION
947.65	947.64	947.62	947.58	947.54	947.48	947.42	BEAM A
947.79	947.78	947.76	947.73	947.68	947.63	947.57	BEAM B
947.93	947.92	947.90	947.86	947.82	947.76	947.70	BEAM C
947.86	947.85	947.83	947.79	947.75	947.69	947.63	BEAM D
947.71	947.70	947.68	947.65	947.60	947.55	947.49	BEAM E
947.57	947.56	947.54	947.50	947.46	947.40	947.34	BEAM F

MISCELLANEOUS DATA TABLE

	BEAM LINE		☐ PIER #2 BEARING															☐ PIER #3 BRG.												
			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	7/8	1 11/16	2 1/2	3 1/8	3 11/16	4 1/16	4 5/16	4 7/16	4 5/16	4 1/16	3 11/16	3 1/8	2 1/2	1 11/16	7/8	0	0	7/8	1 11/16	2 1/2	3 1/8	3 11/16	4 1/16	4 5/16	4 7/16		
CROSS SLOPE ADJUSTMENTS (IN.)	A,B,D,E,F		5/16																											
	C		1/4																											
ALLOWABLE FIELD HAUNCH (IN. & FT.)	MIN.	ALL	1/4	1/4	-3/16												1/4	1/4	1/4	1/4	-3/16									
	MAX.	ALL	3 1/4	3 1/4	2 1/2												3 1/4	3 1/4	3 1/4	3 1/4	2 1/2									

MISCELLANEOUS DATA TABLE

							☐ PIER #4 BRG.	BEAM LINE		
LINE 61	LINE 62	LINE 63	LINE 64	LINE 65	LINE 66	LINE 67	LINE 68			
4 5/16	4 1/16	3 11/16	3 1/8	2 1/2	1 11/16	7/8	0	ALL		ANTICIPATED DEFLECTION DUE TO SLAB (IN.)
5/16								A,B,D,E,F		CROSS SLOPE ADJUSTMENTS (IN.)
1/4								C		
-3/16						1/4	1/4	MIN.	ALL	ALLOWABLE FIELD HAUNCH (IN. & FT.)
2 1/2						3 1/4	3 1/4	MAX.	ALL	

DESIGN FOR 0° SKEW

1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

156'-0 END SPANS157'-0 INTERIOR SPAN

HAUNCH DETAILS

IA 2 STA. 400+85.00, RT. 32.00'JULY 2019

FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 40 OF 59FILE NO. 31719DESIGN NO. 119

TABLE OF BEAM LINE HAUNCH ELEVATIONS																											
	℄ PIER #4 BRG.															℄ PIER #5 BRG.											
LOCATION	LINE 69	LINE 70	LINE 71	LINE 72	LINE 73	LINE 74	LINE 75	LINE 76	LINE 77	LINE 78	LINE 79	LINE 80	LINE 81	LINE 82	LINE 83	LINE 84	LINE 85	LINE 86	LINE 87	LINE 88	LINE 89	LINE 90	LINE 91	LINE 92	LINE 93	LINE 94	LINE 95
BEAM A	947.42	947.51	947.58	947.65	947.71	947.76	947.79	947.81	947.81	947.79	947.76	947.71	947.65	947.58	947.50	947.40	947.31	947.30	947.35	947.39	947.42	947.44	947.42	947.38	947.33		
BEAM B	947.57	947.65	947.73	947.80	947.86	947.90	947.94	947.95	947.95	947.94	947.91	947.86	947.80	947.73	947.64	947.55	947.45	947.45	947.49	947.53	947.56	947.58	947.59	947.58	947.56	947.52	947.47
BEAM C	947.71	947.79	947.87	947.94	948.00	948.04	948.07	948.09	948.09	948.07	948.04	948.00	947.94	947.86	947.78	947.69	947.59	947.58	947.63	947.67	947.70	947.72	947.73	947.72	947.70	947.66	947.61
BEAM D	947.63	947.72	947.79	947.86	947.92	947.97	948.00	948.02	948.02	948.00	947.97	947.92	947.86	947.79	947.71	947.61	947.52	947.51	947.55	947.59	947.63	947.65	947.65	947.65	947.63	947.59	947.54
BEAM E	947.49	947.57	947.65	947.72	947.78	947.82	947.86	947.87	947.87	947.86	947.83	947.78	947.72	947.64	947.56	947.47	947.37	947.37	947.41	947.45	947.48	947.50	947.51	947.50	947.48	947.44	947.39
BEAM F	947.34	947.43	947.50	947.57	947.63	947.68	947.71	947.73	947.73	947.71	947.68	947.63	947.57	947.50	947.42	947.32	947.23	947.22	947.27	947.31	947.34	947.36	947.36	947.36	947.34	947.30	947.25

TABLE OF BEAM LINE HAUNCH ELEVATIONS																								
						℄ PIER #6 BRG.																℄ EAST ABUT. BRG.		
LINE 96	LINE 97	LINE 98	LINE 99	LINE 100	LINE 101	LINE 102	LINE 103	LINE 104	LINE 105	LINE 106	LINE 107	LINE 108	LINE 109	LINE 110	LINE 111	LINE 112	LINE 113	LINE 114	LINE 115	LINE 116	LINE 117	LINE 118	LINE 119	LOCATION
947.26	947.17	947.07	946.96	946.84	946.71	946.57	946.56	946.57	946.58	946.57	946.56	946.53	946.49	946.43	946.36	946.26	946.16	946.03	945.89	945.74	945.58	945.40	945.23	BEAM A
947.40	947.32	947.22	947.11	946.98	946.85	946.72	946.71	946.72	946.72	946.72	946.70	946.68	946.63	946.58	946.50	946.41	946.30	946.18	946.04	945.88	945.72	945.55	945.37	BEAM B
947.54	947.45	947.36	947.24	947.12	946.99	946.86	946.84	946.85	946.86	946.86	946.84	946.81	946.77	946.71	946.64	946.55	946.44	946.31	946.17	946.02	945.86	945.69	945.51	BEAM C
947.47	947.38	947.28	947.17	947.05	946.92	946.78	946.77	946.78	946.79	946.78	946.77	946.74	946.70	946.64	946.57	946.47	946.37	946.24	946.10	945.95	945.79	945.61	945.43	BEAM D
947.32	947.24	947.14	947.03	946.90	946.77	946.64	946.63	946.64	946.64	946.64	946.62	946.60	946.55	946.50	946.42	946.33	946.22	946.10	945.96	945.80	945.64	945.47	945.29	BEAM E
947.18	947.09	946.99	946.88	946.76	946.63	946.49	946.48	946.49	946.50	946.49	946.48	946.45	946.41	946.35	946.28	946.18	946.08	945.95	945.81	945.66	945.50	945.32	945.15	BEAM F

MISCELLANEOUS DATA TABLE																											
	BEAM LINE	℄ PIER #4 BRG.																℄ PIER #5 BRG.									
		LINE 69	LINE 70	LINE 71	LINE 72	LINE 73	LINE 74	LINE 75	LINE 76	LINE 77	LINE 78	LINE 79	LINE 80	LINE 81	LINE 82	LINE 83	LINE 84	LINE 85	LINE 86	LINE 87	LINE 88	LINE 89	LINE 90	LINE 91	LINE 92	LINE 93	LINE 94
ANTICIPATED DEFLECTION DUE TO SLAB (IN.)	ALL	0	7/8	1 11/16	2 1/2	3 1/8	3 11/16	4 1/16	4 5/16	4 7/16	4 5/16	4 1/16	3 11/16	3 1/8	2 1/2	1 11/16	7/8	0	0	7/8	1 11/16	2 1/2	3 1/8	3 11/16	4 1/16	4 5/16	4 7/16
CROSS SLOPE ADJUSTMENTS (IN.)	A,B,D,E,F	5/16																									
	C	1/4																									
ALLOWABLE FIELD HAUNCH (IN. & FT.)	MIN.	ALL	1/4	1/4	-3/16													1/4	1/4	1/4	1/4	-3/16					
	MAX.	ALL	3 1/4	3 1/4	2 1/2													3 1/4	3 1/4	3 1/4	3 1/4	2 1/2					

MISCELLANEOUS DATA TABLE																											
							C PIER #6 BRG.																C EAST ABUT.BRG.	BEAM LINE			
LINE 95	LINE 96	LINE 97	LINE 98	LINE 99	LINE 100	LINE 101	LINE 102	LINE 103	LINE 104	LINE 105	LINE 106	LINE 107	LINE 108	LINE 109	LINE 110	LINE 111	LINE 112	LINE 113	LINE 114	LINE 115	LINE 116	LINE 117	LINE 118	LINE 119			
4 5/16	4 1/16	3 11/16	3 1/8	2 1/2	1 11/16	7/8	0	0	15/16	1 13/16	2 5/8	3 5/16	3 7/8	4 5/16	4 9/16	4 11/16	4 9/16	4 5/16	3 7/8	3 5/16	2 5/8	1 13/16	15/16	0	ALL	ANTICIPATED DEFLECTION DUE TO SLAB (IN.)	
5/16																							A,B,D,E,F		CROSS SLOPE ADJUSTMENTS (IN.)		
1/4																							C				
-3/16						1/4	1/4	1/4	1/4	-3/16												1/4	1/4	MIN.	ALL	ALLOWABLE FIELD HAUNCH (IN. & FT.)	
2 1/2						3 1/4	3 1/4	3 1/4	3 1/4	2 1/2												3 1/4	3 1/4	MAX.	ALL		

DESIGN FOR 0° SKEW

1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

156'-0 END SPANS157'-0 INTERIOR SPAN

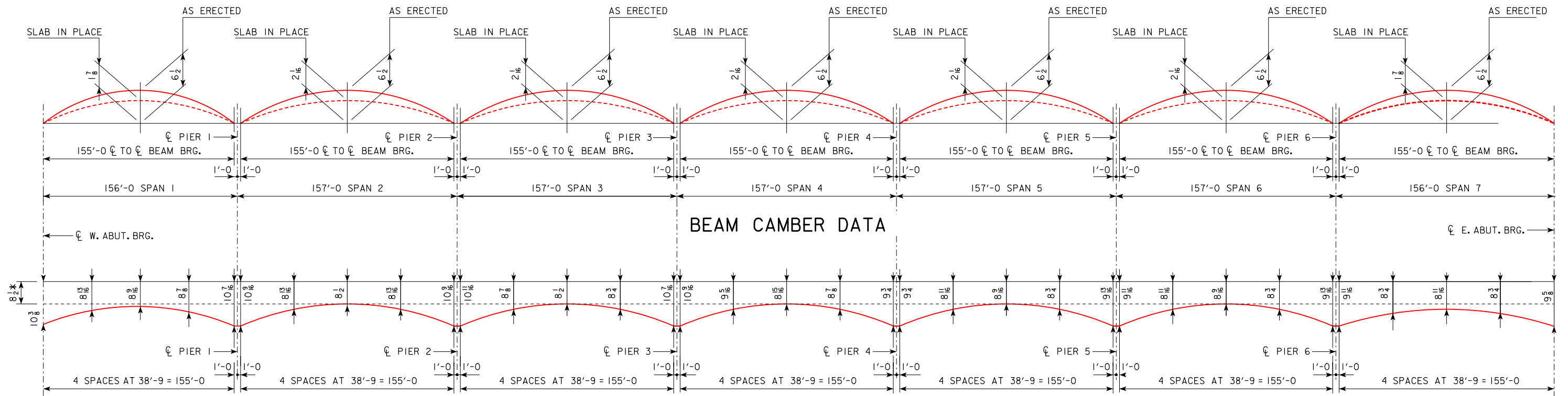
HAUNCH DETAILS

IA 2 STA. 400+85.00, RT. 32.00'JULY 2019

FREMONT COUNTY

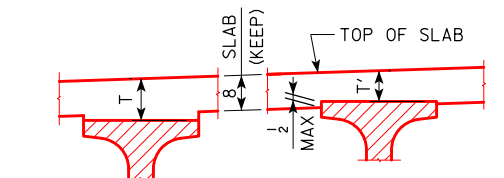
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 41 OF 59FILE NO. 31719DESIGN NO. 119



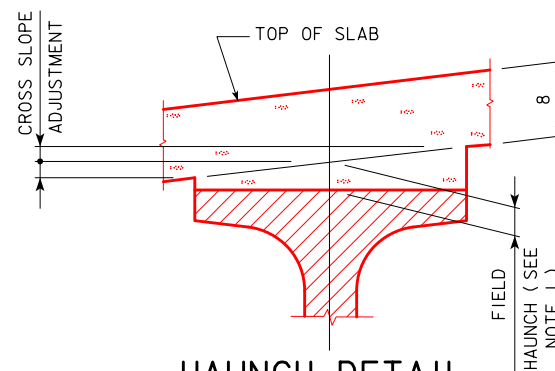
SLAB THICKNESS AT BEAMS (T)

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



SLAB THICKNESS DETAILS

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

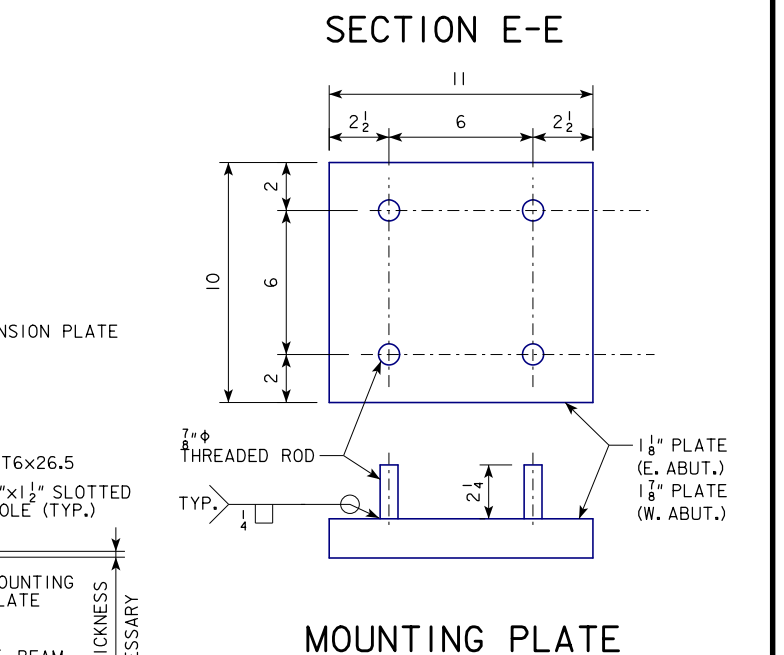
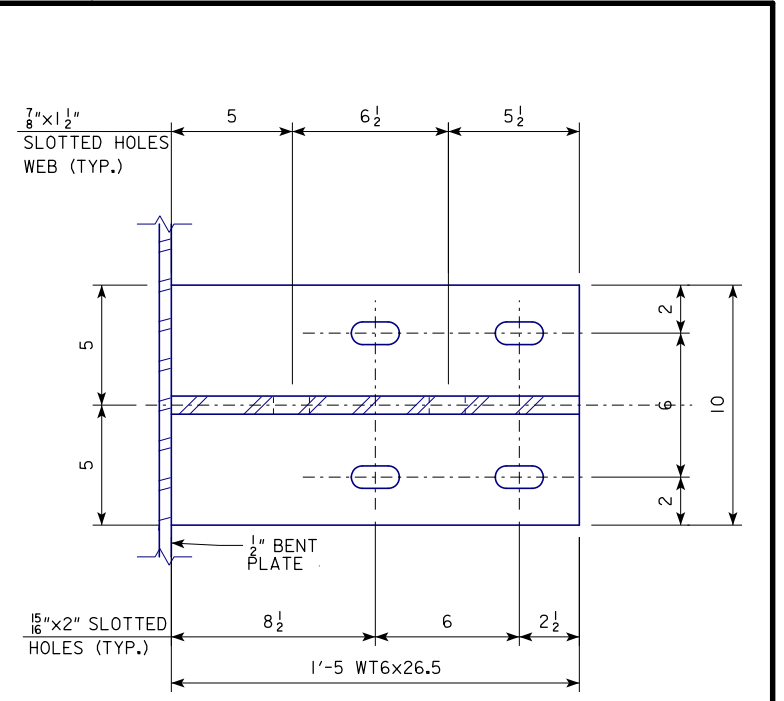
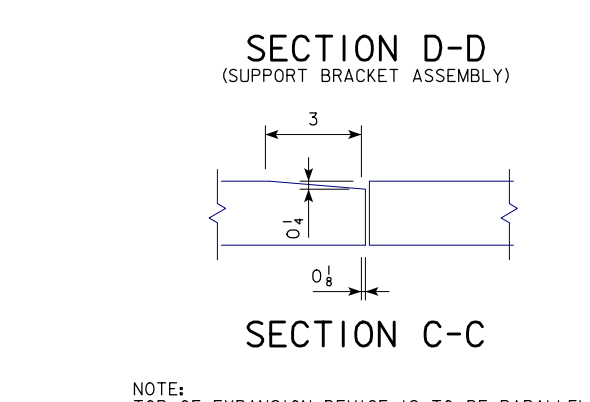
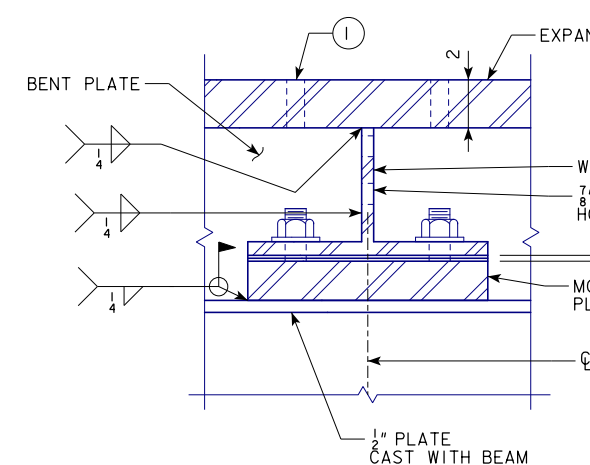
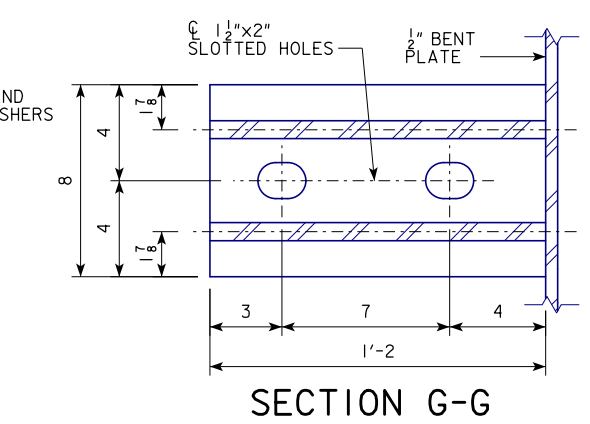
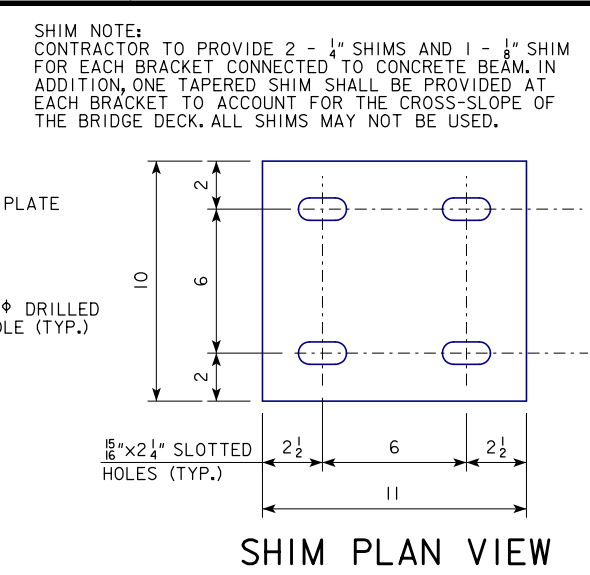
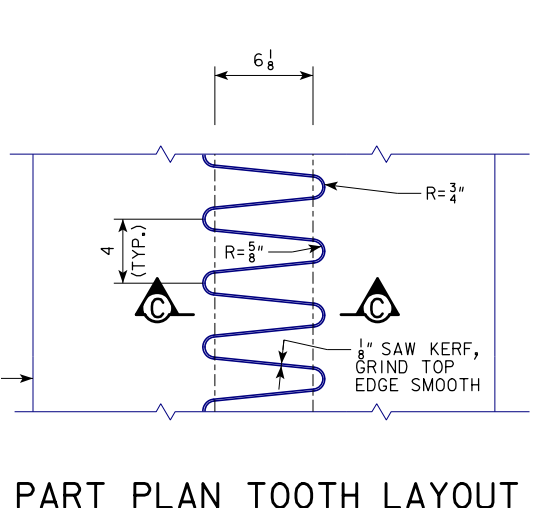
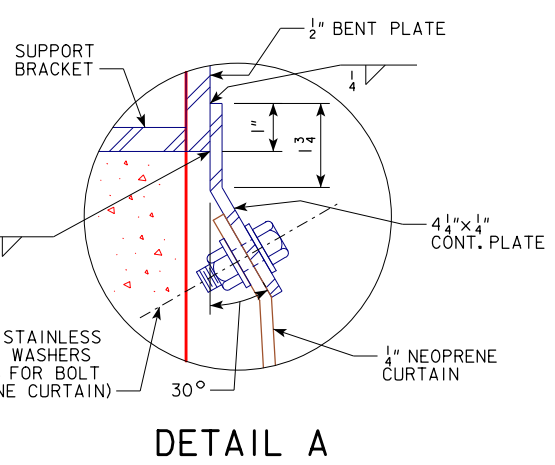
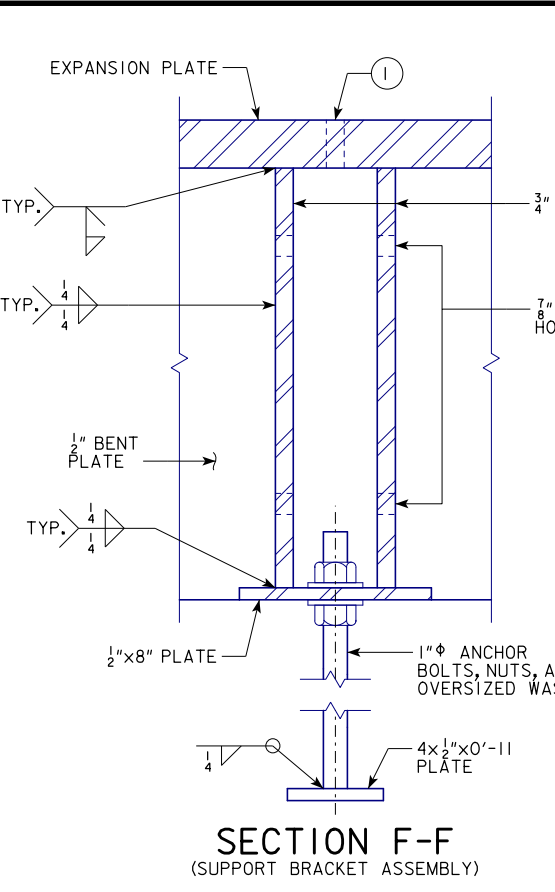
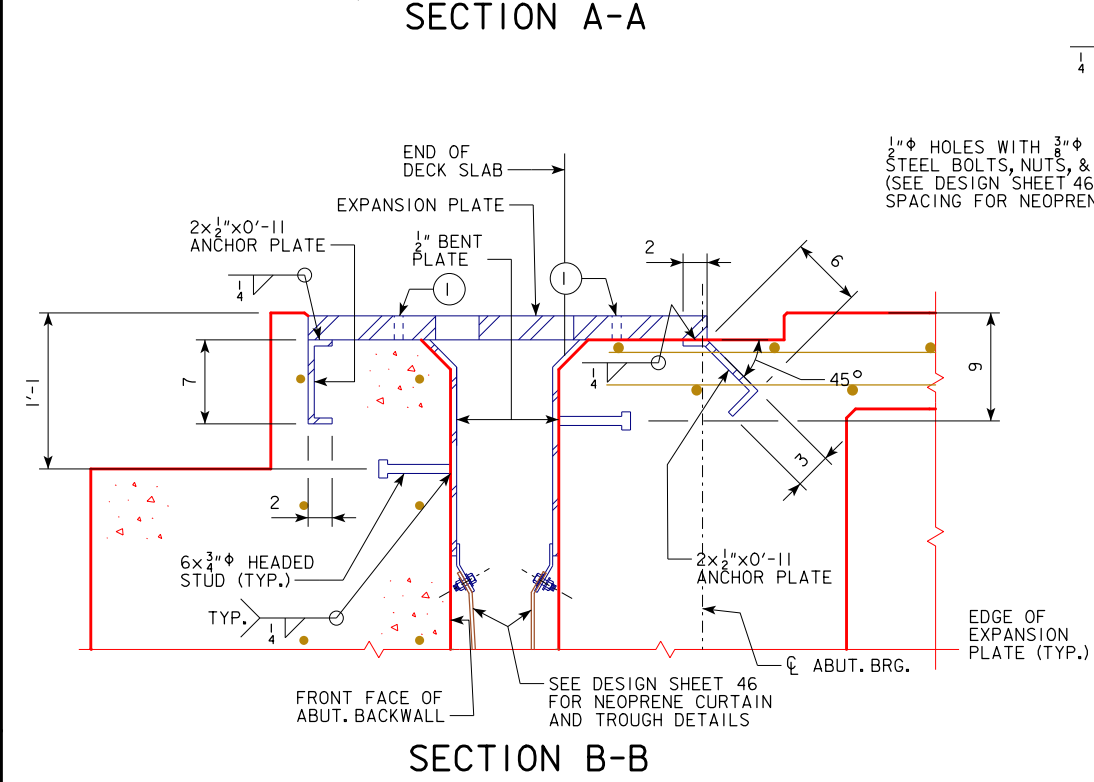
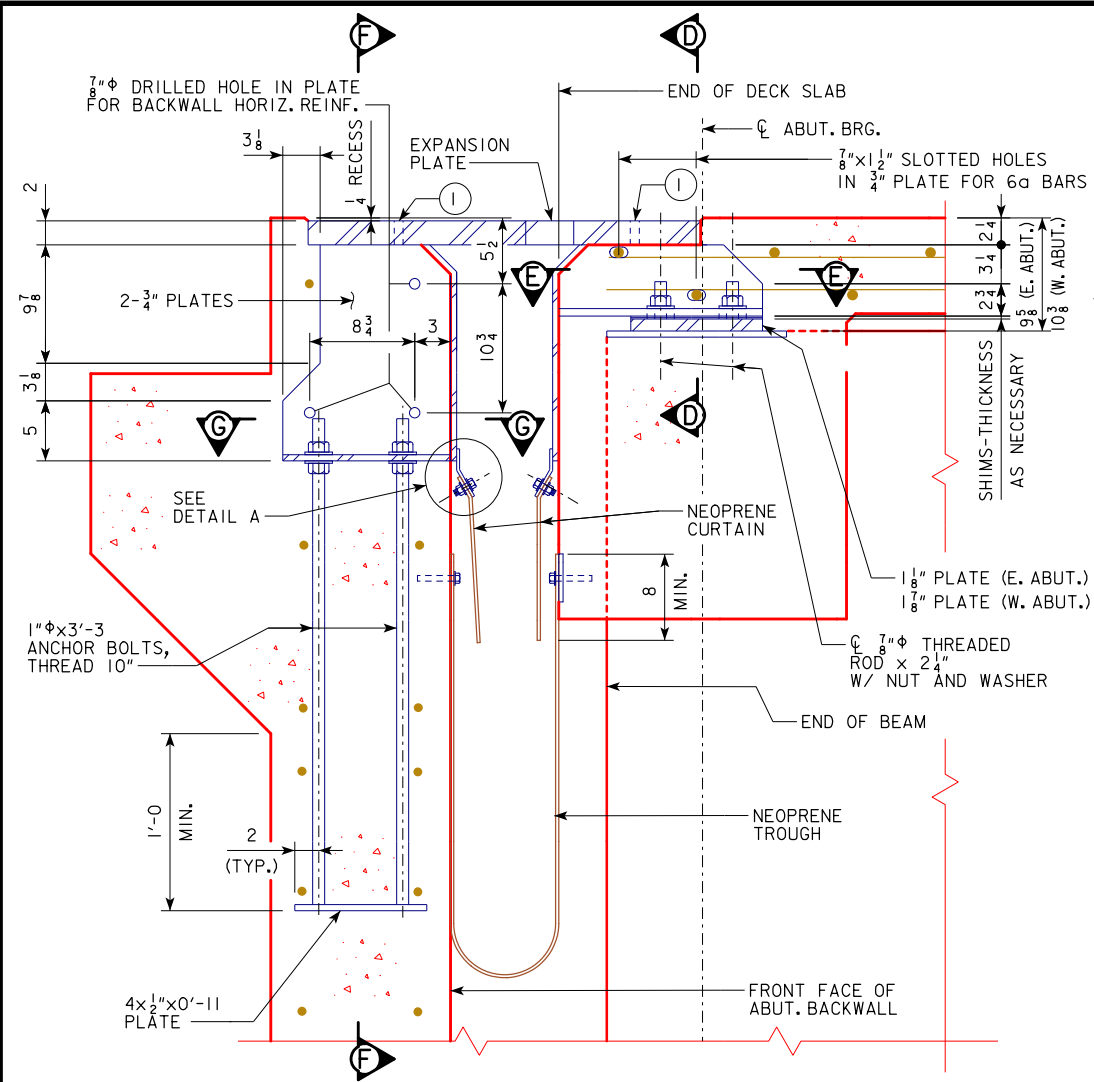


HAUNCH DETAIL

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.

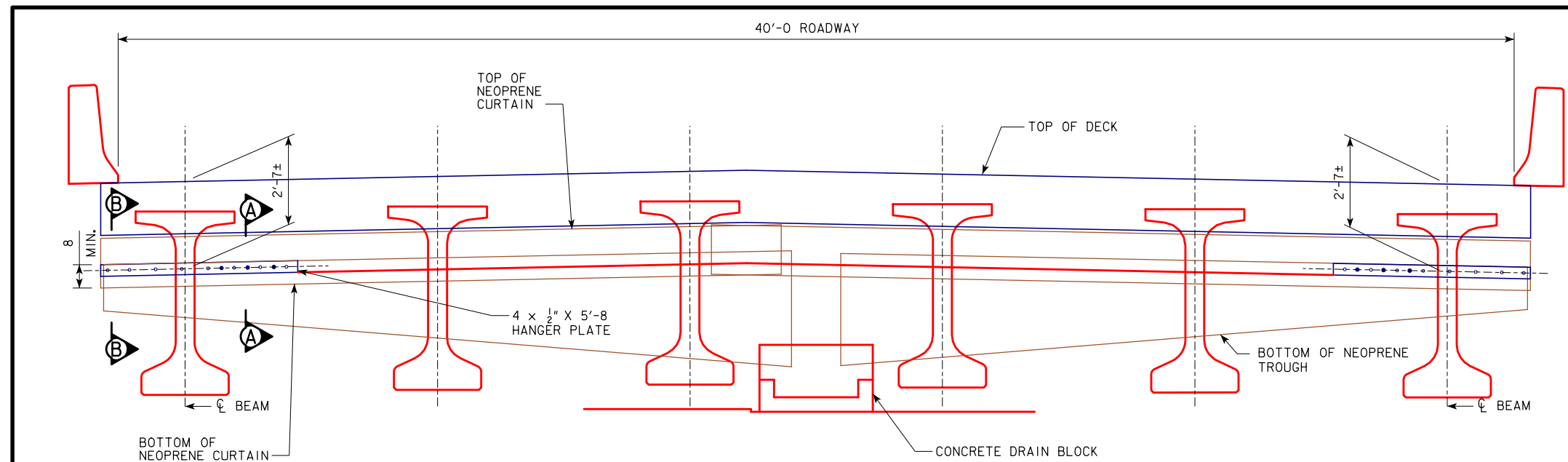
DESIGN FOR 0° SKEW
**1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE**
156'-0 END SPANS 157'-0 INTERIOR SPAN
SLAB THICKNESS DIAGRAM & DETAILS
IA 2 STA. 400+85.00, RT. 32.00' JULY 2019
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 42 OF 59 FILE NO. 31719 DESIGN NO. 119



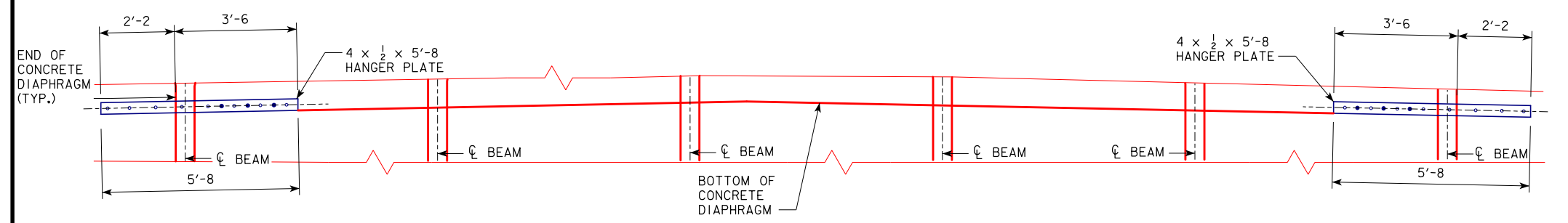
NOTE:
CONCRETE SHALL BE FORCED UNDER AND AROUND FINGER PLATE SUPPORTING HARDWARE, STUDS AND BARS. PROPER CONSOLIDATION SHALL BE ACHIEVED BY LOCALIZED INTERNAL VIBRATION.

NOTE:
TOP OF EXPANSION DEVICE IS TO BE PARALLEL TO GRADE. FLAME CUT FROM 2'-6x2" PLATE. BEVEL EACH TOOTH 1/4"x3".

DESIGN FOR 0° SKEW
1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE
156'-0 END SPANS 157'-0 INTERIOR SPAN
EXPANSION DEVICE DETAILS
IA 2 STA. 400+85.00, RT. 32.00'
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 44 OF 59 FILE NO. 31719 DESIGN NO. 119

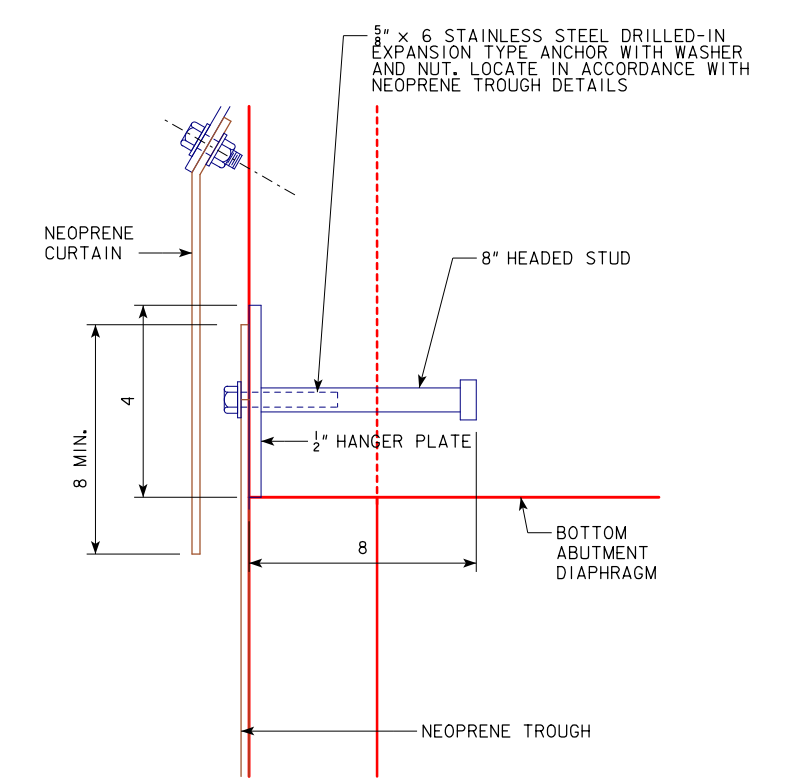


ELEVATION AT ABUTMENT JOINT
(LOOKING NORTHEAST)

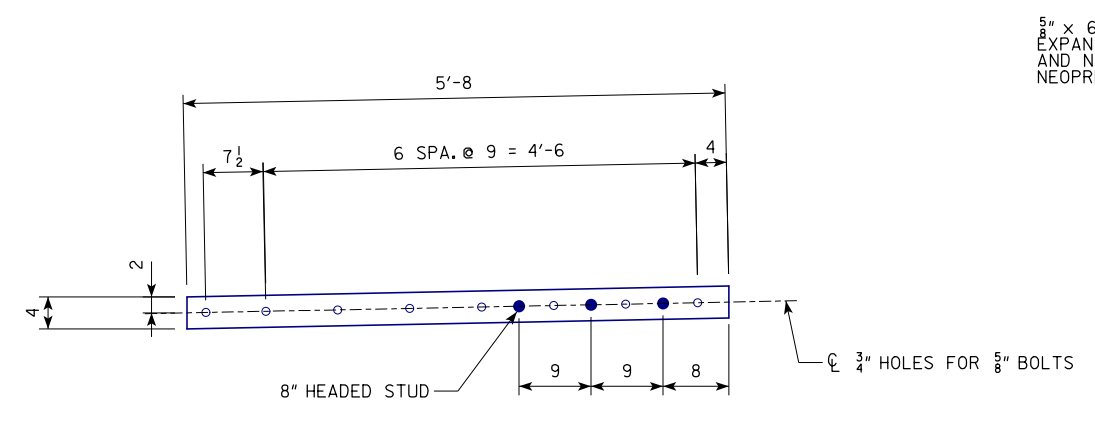


TROUGH HANGER PLATE DETAIL
(NEOPRENE NOT SHOWN FOR CLARITY)

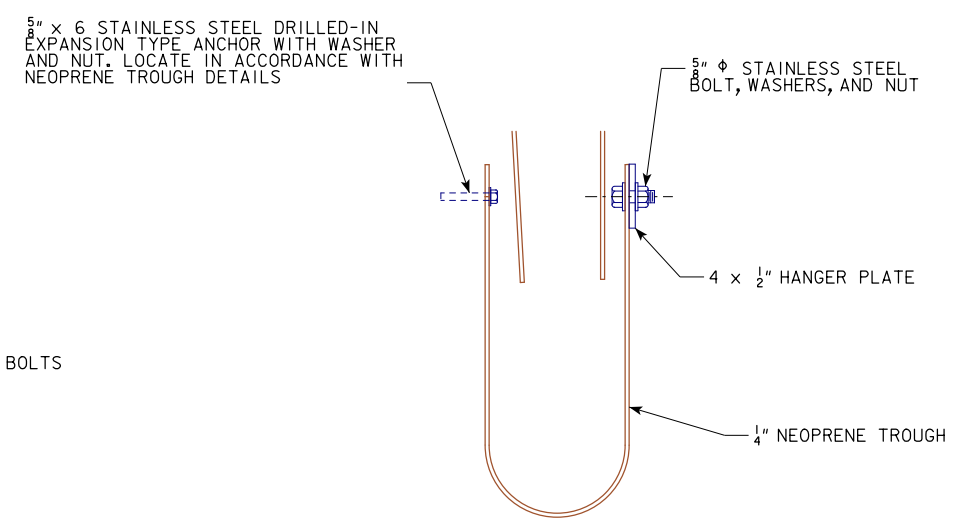
- NOTES:
1. SEE DESIGN SHEET 46 FOR NEOPRENE CURTAIN AND TROUGH DETAILS.
 2. UPON COMPLETION OF FINGER JOINT AND DRAINAGE TROUGH INSTALLATION, THE CONTRACTOR SHALL FLUSH THE SYSTEM WITH WATER TO TEST THAT WATER IS PROPERLY DIRECTED INTO THE DRAIN BLOCK AND BERM BLOCK WITHOUT LEAKING ONTO THE ABUTMENT SURFACES.
 3. SEE DESIGN SHEET 47 FOR DRAIN BLOCK AND BERM BLOCK DETAILS.



SECTION A-A



HANGER PLATE



SECTION B-B

DESIGN FOR 0° SKEW

1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

156'-0 END SPANS 157'-0 INTERIOR SPAN

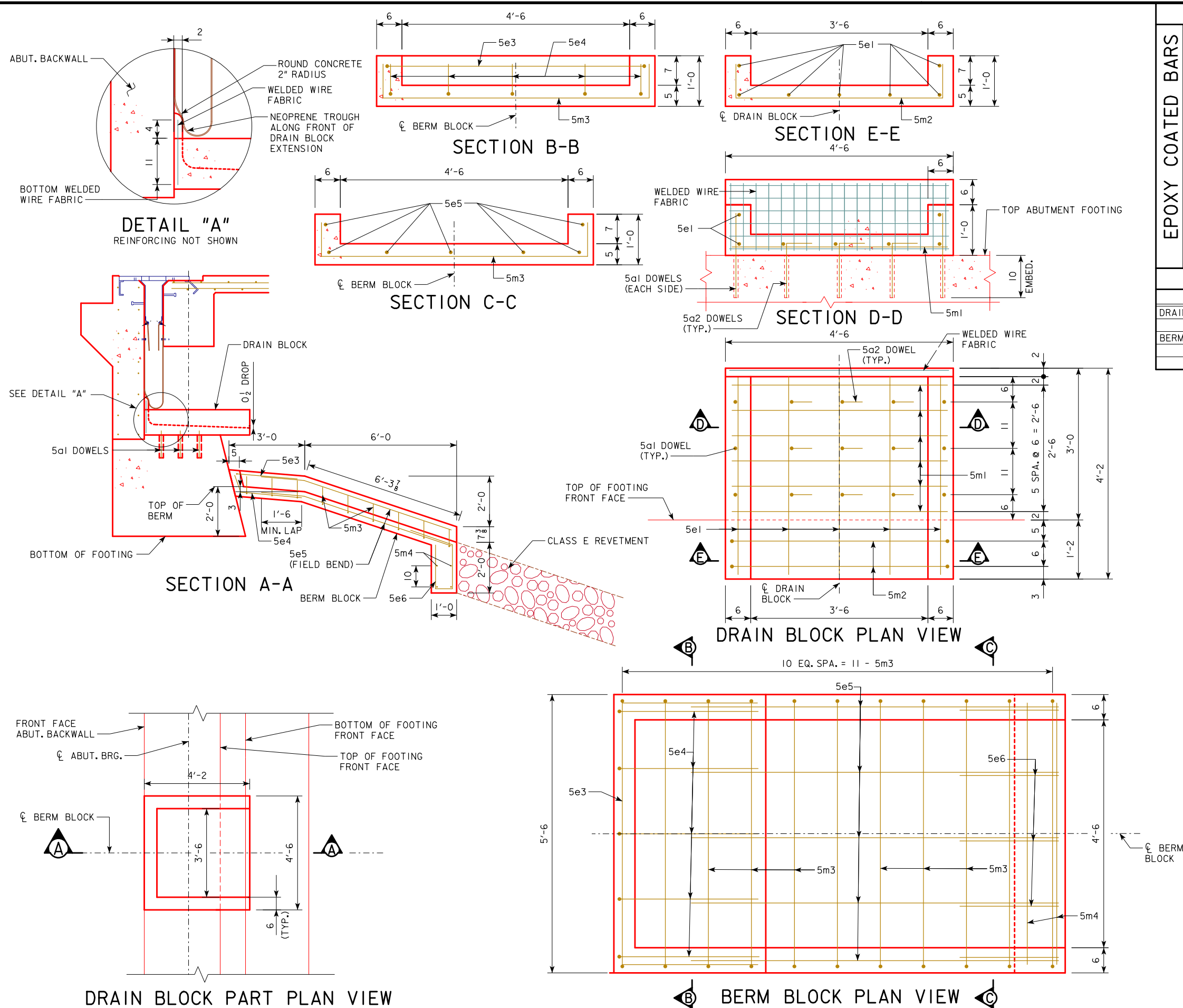
EXPANSION JOINT DRAINAGE TROUGH DETAILS

1A 2 STA. 400+85.00, RT. 32.00' JULY 2019

FREMONT COUNTY

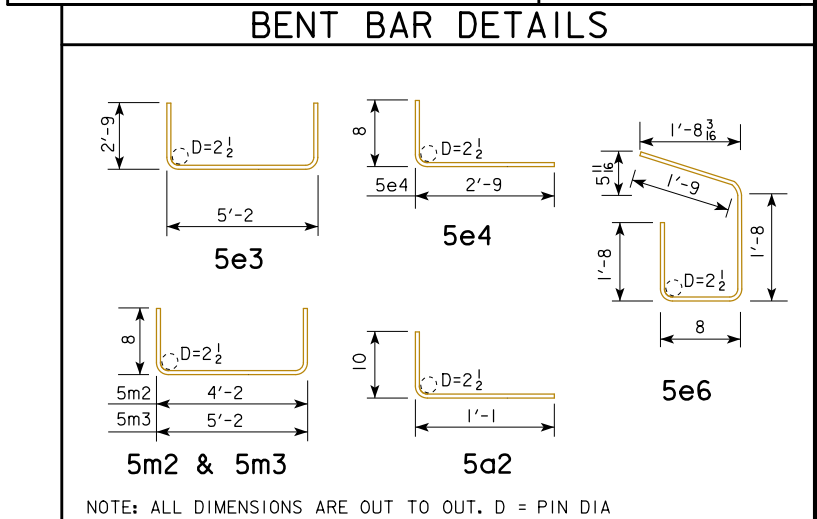
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 45 OF 59 FILE NO. 31719 DESIGN NO. 119



REINFORCING BAR LIST - ONE ABUTMENT DRAIN AND ONE BERM BLOCK				
BAR	LOCATION	SHAPE	NO.	WEIGHT
5a1	DRAIN BLOCK, VERTICAL DOWELS		6	1'-8
5a2	DRAIN BLOCK, VERTICAL DOWELS		9	1'-11
5e1	DRAIN BLOCK, LONGITUDINAL		7	3'-10
5e3	BERM BLOCK, LONGITUDINAL		1	9'-8
5e4	BERM BLOCK, LONGITUDINAL		5	3'-5
5e5	BERM BLOCK, LONGITUDINAL		7	7'-7
5e6	BERM BLOCK, CURTAIN VERTICAL		5	5'-9
5m1	DRAIN BLOCK, TRANSVERSE		6	4'-2
5m2	DRAIN BLOCK, TRANSVERSE		2	5'-6
5m3	BERM BLOCK, TRANSVERSE		11	6'-6
5m4	BERM BLOCK, TRANSVERSE		4	5'-2
REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)			303	

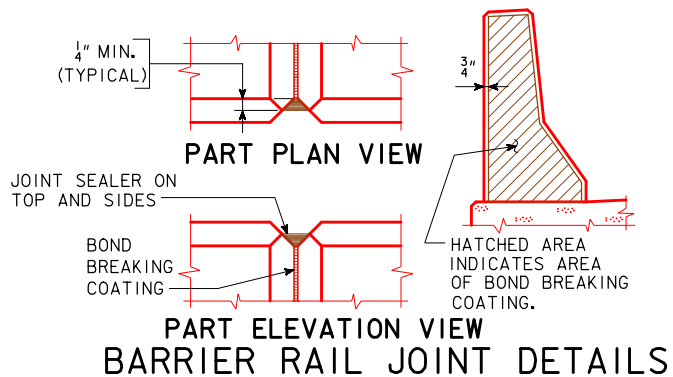
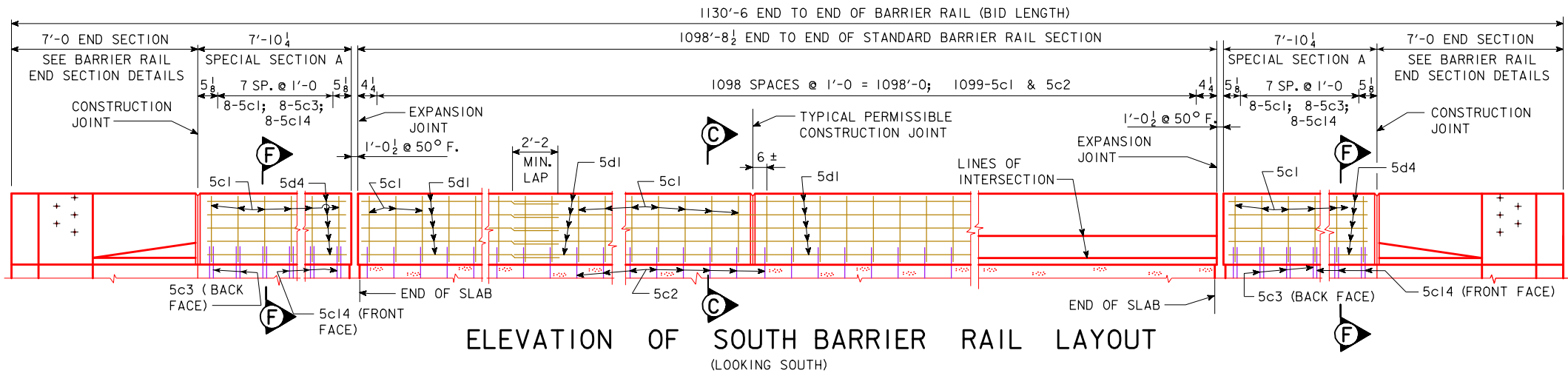
CONCRETE PLACEMENT QUANTITIES	
LOCATION	ONE ABUT.
DRAIN BLOCK	0.4
BERM BLOCK AND CURTAINS	1.4
TOTAL (C.Y.)	1.8



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

- NOTES:
1. DRAIN BLOCK AND BERM BLOCK TO BE INSTALLED PRIOR TO NEOPRENE CURTAIN AND TROUGH.
 2. WELDED WIRE FABRIC IS INCIDENTAL TO "REINFORCING STEEL, EPOXY COATED".

DESIGN FOR 0° SKEW
**1097'-0 X 40'-0 PRETENSIONED
 PRESTRESSED CONCRETE BEAM E.B. BRIDGE**
 156'-0 END SPANS 157'-0 INTERIOR SPAN
DRAIN BLOCK DETAILS
 IA 2 STA. 400+85.00, RT. 32.00'
FREMONT COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 47 OF 59 FILE NO. 31719 DESIGN NO. 119



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

Δ NOTE: CONDUIT SUPPORT BAR DETAILS AND QUANTITIES ARE ON DESIGN SHEET 53

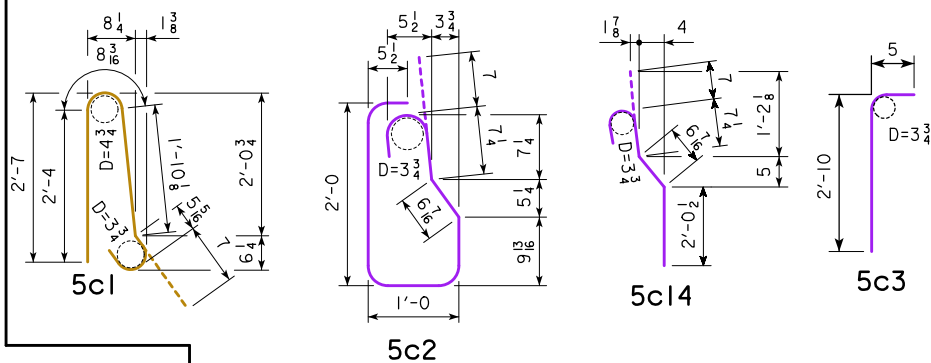
EPOXY COATED REINF. STEEL - SOUTH RAIL

SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STANDARD SECTIONS	5c1	RAIL, VERTICAL		1099	5'-11"	6782
	5d1	RAIL, LONGITUDINAL		261	40'-0"	10889
SPECIAL SECTIONS	5c1	RAIL, VERTICAL		16	5'-11"	99
	5d4	RAIL, LONGIT.		18	7'-6"	141
EPOXY STEEL TOTAL (LBS.)						17911

STAINLESS STEEL REINF. STEEL - SOUTH RAIL

SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STD. SECTS.	5c2	RAIL, VERTICAL		1099	6'-0"	6878
SPECIAL SECTIONS	5c3	RAIL, VERTICAL		16	3'-3"	54
	5c14	RAIL, VERTICAL		16	3'-10"	64
STAINLESS STEEL TOTAL (LBS.)						6996

BENT BAR DETAILS



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

CONCRETE PLACEMENT SUMMARY

SECTION		TOTAL
STANDARD SECTION	1098'-8½ @ 0.1052 CU. YD. PER FT.	115.6
SPECIAL SECTION A	15'-8½ @ 0.1052 CU. YD. PER FT.	1.7
TOTAL (CU. YD.)		117.3

CONCRETE BARRIER RAIL QUANTITIES

ITEM	UNIT	QUANTITY
CONCRETE BARRIER RAILING	L.F.	1130.5

BARRIER RAIL NOTES:

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

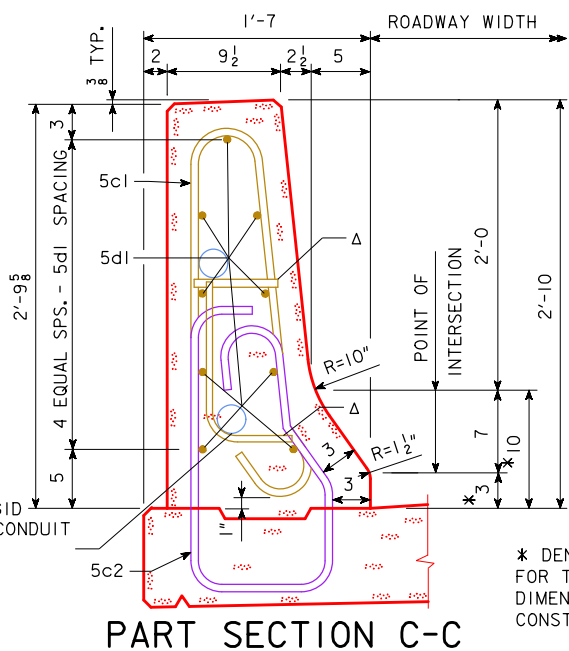
THE PERMISSIBLE CONSTRUCTION JOINTS ARE TO BE PLACED BETWEEN VERTICAL BARS AT A MINIMUM SPACING OF 20 FEET. CONSTRUCTION JOINT CONTACT SURFACES ARE TO BE COATED WITH AN APPROVED BOND BREAKER. COST OF THE JOINT SEALER AND BOND BREAKER SHALL BE CONSIDERED INCIDENTAL TO OTHER CONSTRUCTION.

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.

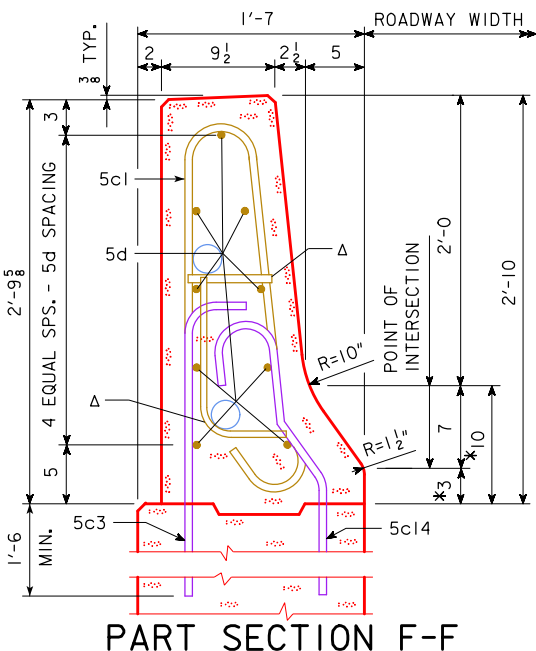
THE CONCRETE BARRIER RAIL IS TO BE BID ON A LINEAL FOOT BASIS. THE NUMBER OF LINEAL FEET OF BARRIER RAIL INSTALLED WILL BE PAID FOR AT THE CONTRACT PRICE PER LINEAL FOOT BASED ON PLAN QUANTITIES. PRICE BID FOR CONCRETE BARRIER RAILING SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, EXCLUDING REINFORCING STEEL, AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO ERECT THE RAIL IN ACCORDANCE WITH THESE PLANS AND CURRENT SPECIFICATIONS. IF CONDUIT IS REQUIRED IN THIS PLAN THE RIGID STEEL CONDUIT, JUNCTION BOXES AND FITTINGS INCLUDING LABOR AND ANY ADDITIONAL WORK TO DO THE INSTALLATION IS CONSIDERED INCIDENTAL TO THE COST OF THE RAILING.

THE JOINT SEALER SHALL BE LIGHT GRAY NONSAG LATEX CAULKING SEALER MARKETED FOR OUTDOOR USE. NO TESTING OR CERTIFICATION IS REQUIRED. TOP OF THE BARRIER RAIL IS TO BE PARALLEL TO THE THEORETICAL GRADE.

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



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



DESIGN FOR 0° SKEW
1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE
156'-0 END SPANS 157'-0 INTERIOR SPAN
SOUTH BARRIER RAIL DETAILS
IA 2 STA. 400+85.00, RT. 32.00'
JULY 2019
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 48 OF 59 FILE NO. 31719 DESIGN NO. 119



PART VIEW F-F

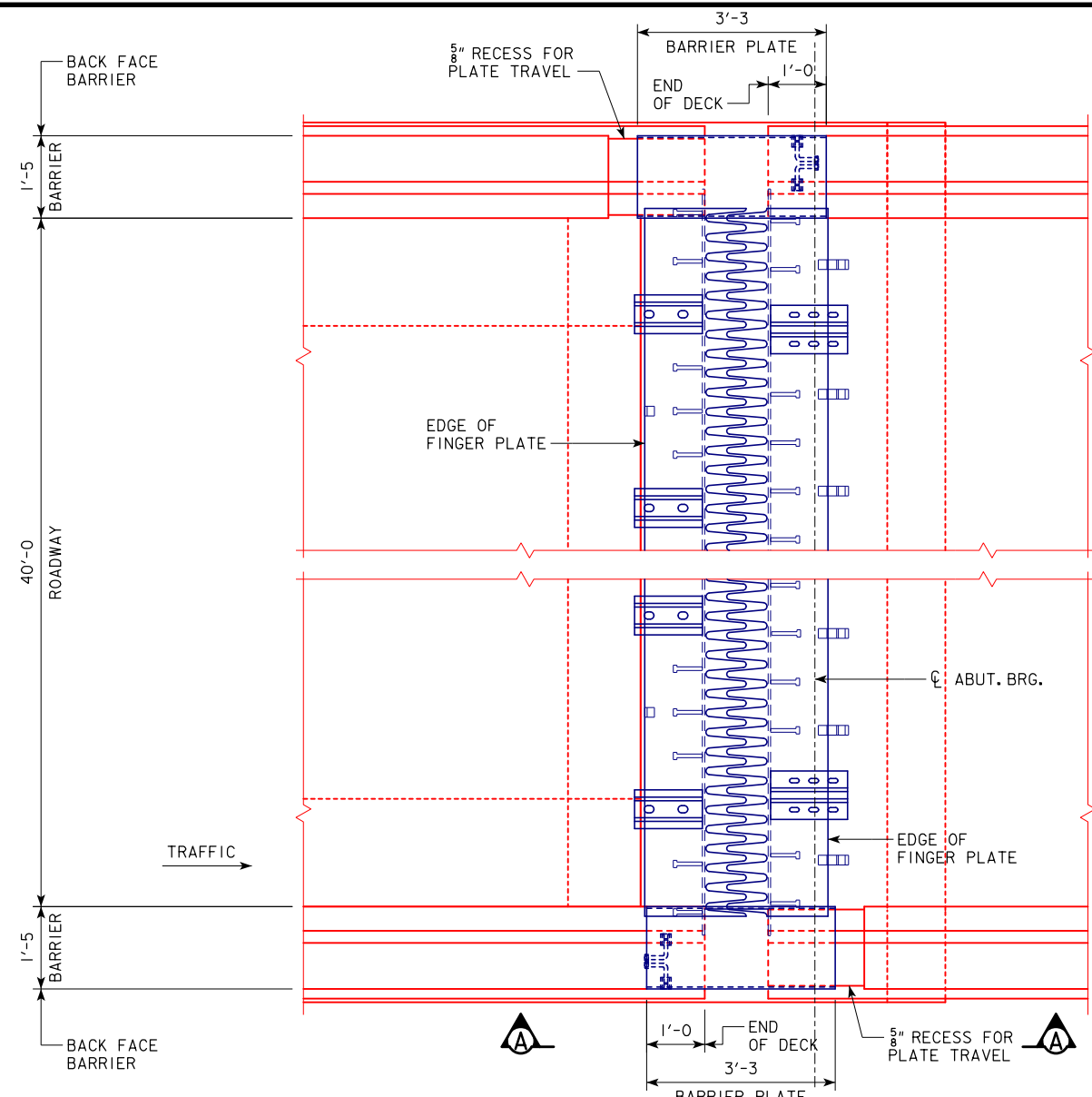


SECTION B-B

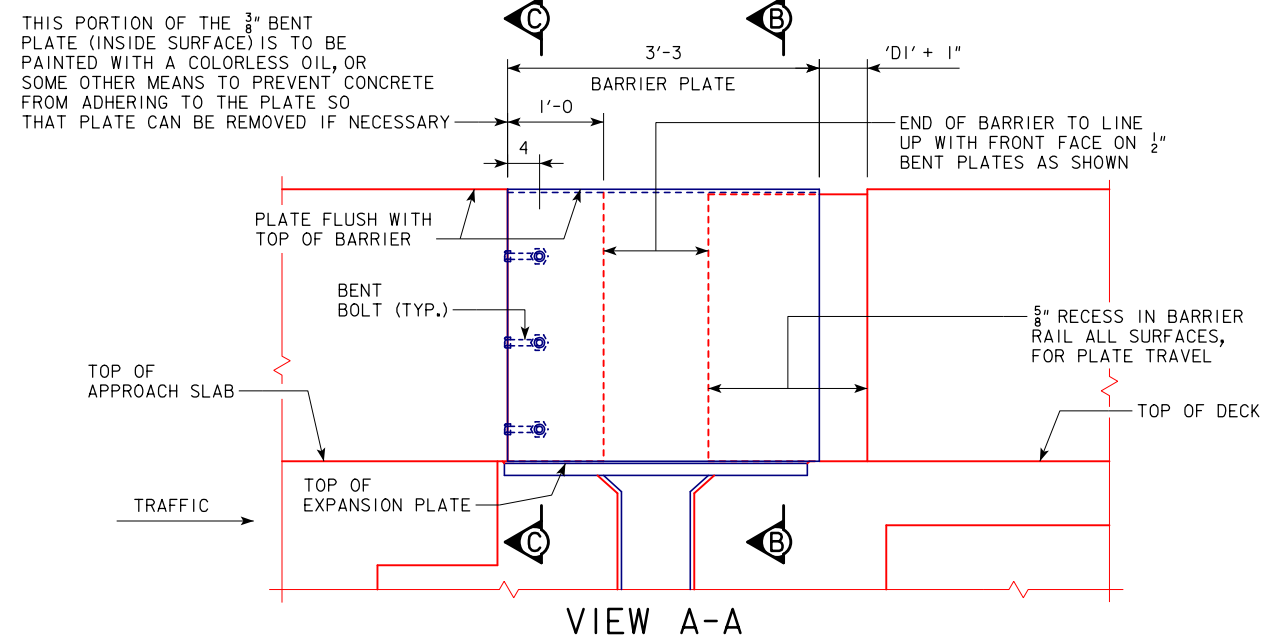
SECTION C-C



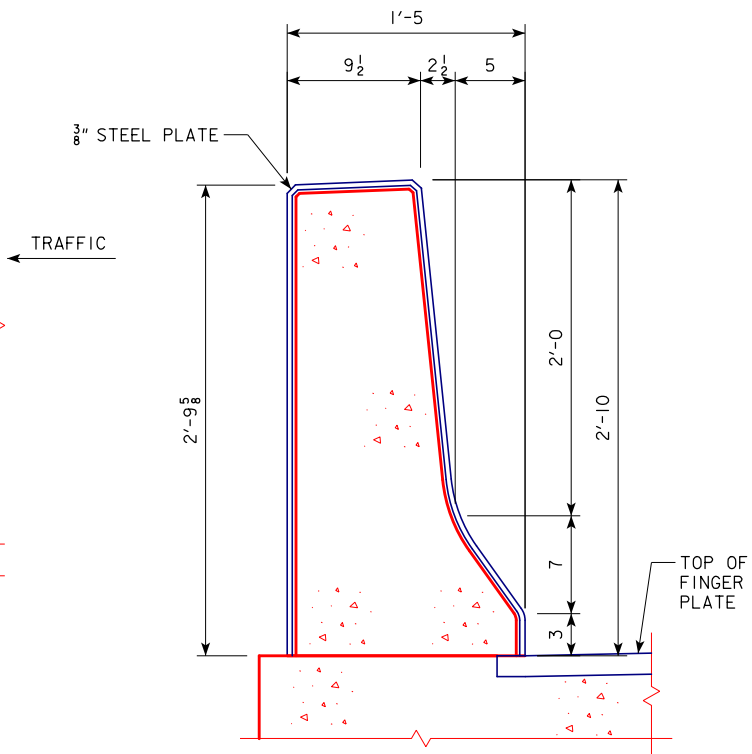
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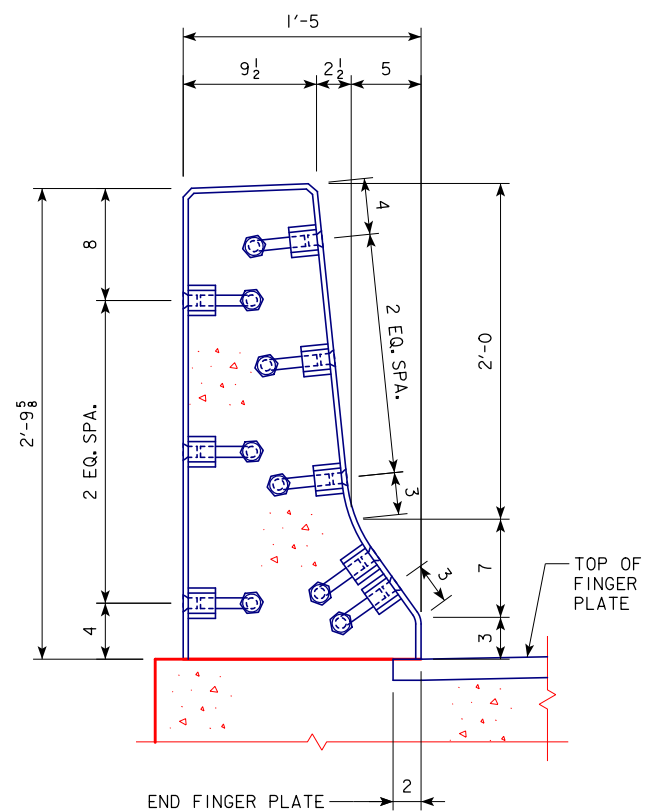
PART PLAN VIEW EXPANSION DEVICE



VIEW A-A



SECTION B-B



SECTION C-C

FINGER JOINT NOTES:

THE CONTRACTOR SHALL SUBMIT FOR APPROVAL SHOP DRAWINGS OF THE ENTIRE FINGER JOINT ASSEMBLY, BARRIER PLATES, NEOPRENE TROUGH AND CURTAIN SHOWING LAYOUT, MATERIAL TO BE USED, AND PROVISIONS FOR SECURELY HOLDING THE JOINT IN PLACE DURING PLACING OF CONCRETE. SHOP DRAWINGS SHALL INCLUDE PROVISIONS FOR STAGING CONSTRUCTION AS SHOWN IN THESE PLANS.

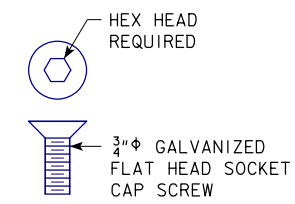
THE ENTIRE EXPANSION DEVICE SHALL BE GALVANIZED AFTER WELDING, EXCEPT HARDWARE DESIGNATED AS STAINLESS STEEL. THE ANCHORAGES, SHIMS, BOLTS, WASHERS, AND NUTS SHALL BE GALVANIZED.

THE TOP OF THE EXPANSION DEVICE SHALL BE RECESSED $\frac{1}{4}$ " BELOW THE TOP OF DECK, PARALLEL TO GRADE, AND MATCH THE ROADWAY CROSS-SLOPE.

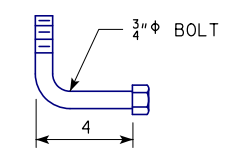
CAP SCREWS SHALL BE COUNTERSUNK $\frac{1}{16}$ " INCH BELOW TOP OF PLATE.

THE MATERIAL USED FOR THE 2 x 2'-6" FINGER JOINT PLATES IS TO BE ASTM A572, GRADE 50 STEEL. ALL OTHER STRUCTURAL STEEL IS TO BE ASTM A709 GRADE 36 STEEL.

THE $\frac{3}{8}$ " ϕ BOLTS AND WASHERS ATTACHING THE NEOPRENE CURTAIN TO THE $4\frac{1}{4}$ x $\frac{1}{4}$ BENT PLATE AND THE $\frac{5}{8}$ " ϕ BOLTS, NUTS AND WASHERS ATTACHING THE NEOPRENE TROUGH TO THE TROUGH HANGERS ARE TO BE ASTM A193 STAINLESS STEEL. ALL OTHER BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A-307. THE PLATES, BOLTS, NUTS AND CAP SCREWS ARE TO BE GALVANIZED IN ACCORDANCE WITH ARTICLE 4100.07 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED.



CAP SCREW DETAIL



BENT BOLT DETAIL

NOTES:

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

IT IS INTENDED THAT THE $\frac{5}{8}$ " RECESSED AREA BE FORMED SO THAT WHEN THE $\frac{3}{8}$ " PLATE IS IN INSTALLED, THE PLATE WILL BE ABLE TO MOVE FREELY IN THIS RECESSED AREA.

SEE DESIGN SHEETS 48 AND 49 FOR BARRIER RAIL REINFORCING DETAILS.

* SEE DESIGN SHEET 43 FOR 'D1' VALUE.

DESIGN FOR 0° SKEW

**1097'-0" X 40'-0" PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE**

156'-0" END SPANS 157'-0" INTERIOR SPAN

BARRIER RAIL EXPANSION PLATES

IA 2 STA. 400+85.00, RT. 32.00'

JULY 2019

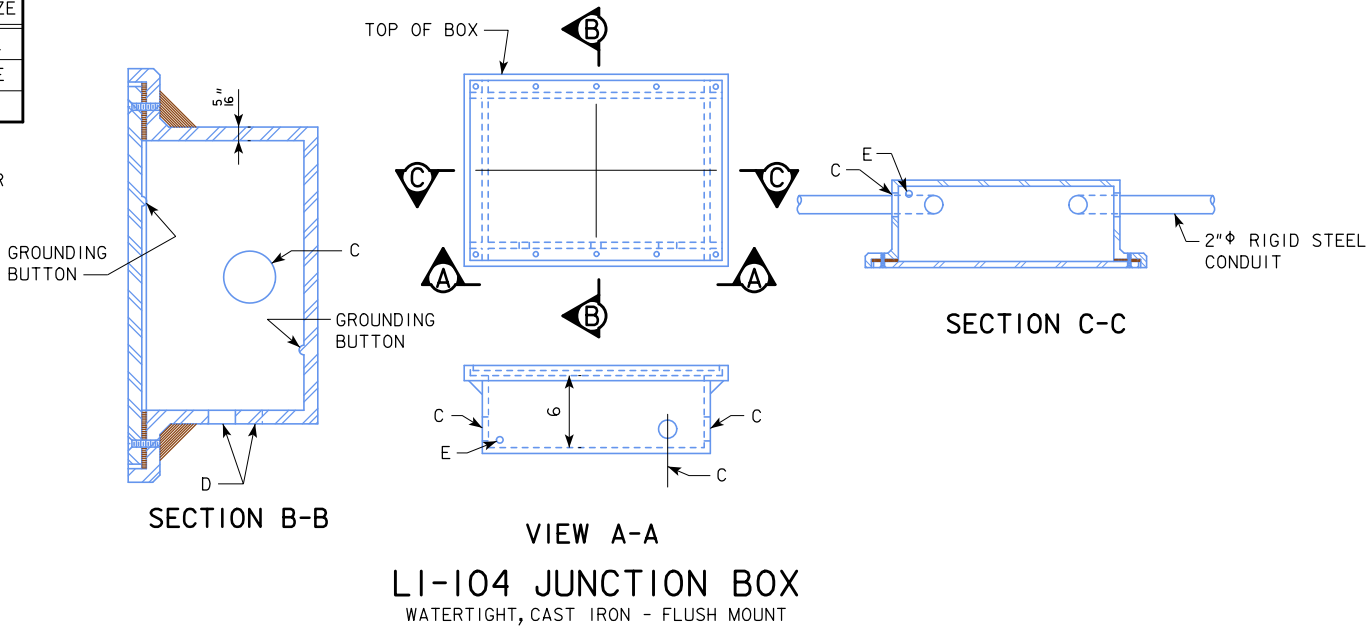
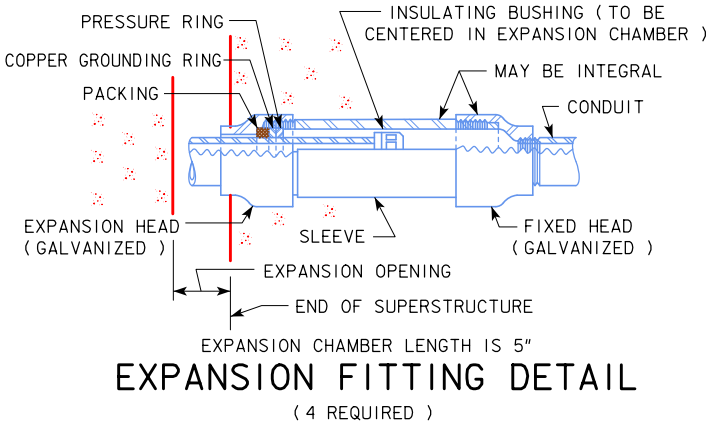
FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 51 OF 59 FILE NO. 31719 DESIGN NO. 119

BOSSED FOR	HOLE	FOR CONDUIT SIZE
5 THREADS	C	2" ϕ RIGID STEEL
NONE	E	1/2" ϕ COPPER PIPE

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



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 0° SKEW

1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

156'-0 END SPANS157'-0 INTERIOR SPAN

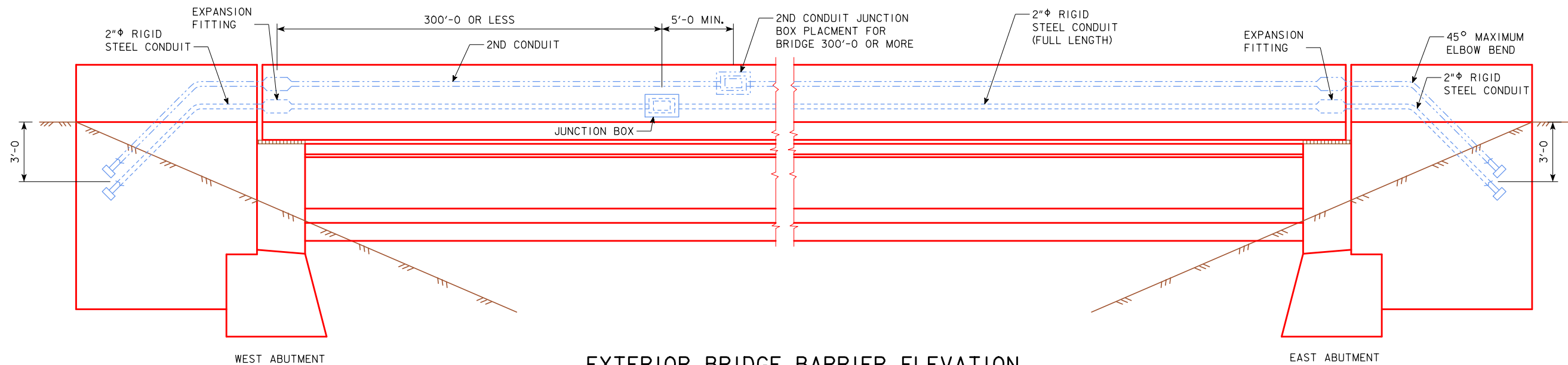
CONDUIT DETAILS

IA 2 STA. 400+85.00, RT. 32.00'JULY 2019

FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 52 OF 59FILE NO. 31719DESIGN NO. 119



EXTERIOR BRIDGE BARRIER ELEVATION
SOUTH BARRIER RAIL, LOOKING NORTH

I.T.S CONDUIT NOTES:

I.T.S. CONDUIT SHALL BE LIMITED TO SIX 45° ELBOW BENDS FOR A CABLE PULL FROM HANDHOLE TO HANDHOLE.

RIGID STEEL CONDUIT FOR I.T.S. APPLICATIONS SHALL BE INSTALLED AND PREPARED TO FACILITATE INSTALLATION OF FIBER OPTIC CABLE.

THE MINIMUM INSIDE BEND RADIUS FOR RIGID STEEL CONDUIT USED FOR I.T.S. APPLICATIONS SHALL BE 18".

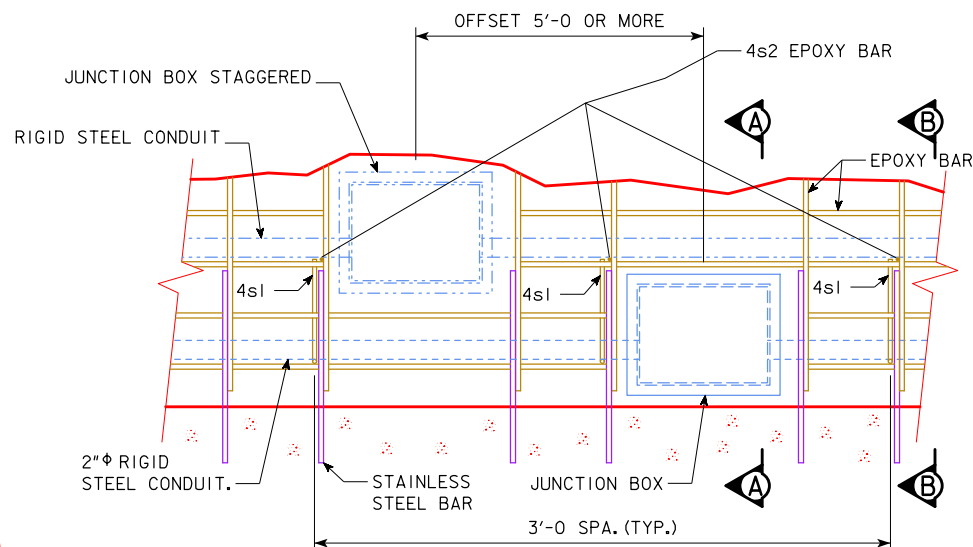
RIGID STEEL CONDUIT FOR I.T.S. APPLICATIONS SHALL BE CUT AND THREADED TO ELIMINATE EXPOSED THREADS AFTER COMPLETING THE CONNECTIONS; ALL COUPLINGS SHALL BE TIGHTENED UNTIL THE CONDUIT ENDS MEET TO ALLOW A CONTINUOUS INNER SURFACE THROUGHOUT THE ENTIRE LENGTH OF THE CONDUIT RUN. NIPPLES SHOULD BE USED TO ELIMINATE CUTTING AND THREADING SHORT LENGTHS OF CONDUIT.

ALL BURRS AND ROUGHENED SURFACES SHALL BE REMOVED FROM CONDUITS AND FITTINGS. ALL CONDUIT RUNS SHALL BE REAMED, CLEANED AND SWABBED FOR INSTALLATION OF FIBER OPTIC CABLE.

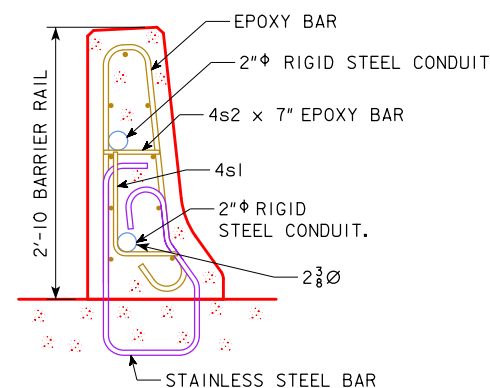
ONLY GALVANIZED FITTINGS SHALL BE USED WITH RIGID STEEL CONDUIT. DAMAGED GALVANIZED SURFACES OF RIGID STEEL CONDUIT OR FITTINGS SHALL BE PAINTED WITH AN ACCEPTABLE ZINC-RICH PAINT.

I.T.S. CONDUIT SHALL INCLUDE A POLYPROPYLENE PULL ROPE BETWEEN HANDHOLES WITH A MINIMUM 600 POUND TENSILE STRENGTH.

I.T.S. RIGID STEEL CONDUIT, PULL ROPES AND FITTINGS, INCLUDING LABOR AND ANY ADDITIONAL WORK FOR INSTALLATION IS CONSIDERED INCIDENTAL TO THE COST OF THE RAILING.



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



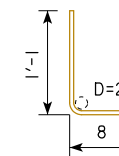
SECTION B-B - CONDUIT SUPPORT

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

(377 REQUIRED)

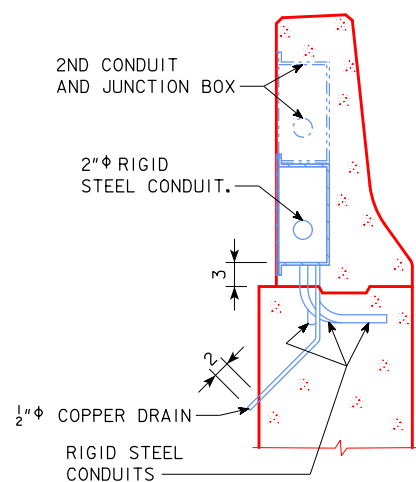
EPOXY REINFORING STEEL-SOUTH RAIL

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
4s1	RAIL CONDUIT		377	1'-9	441
4s2	RAIL CONDUIT (OPTIONAL)		377	7	147
TOTAL WEIGHT (LBS.)					588

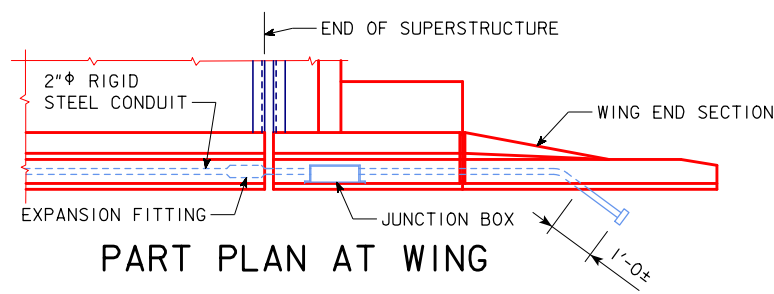


4s1

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



**SECTION A-A
THRU JUNCTION BOX**



PART PLAN AT WING

DESIGN FOR 0° SKEW

**1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE**

156'-0 END SPANS 157'-0 INTERIOR SPAN

CONDUIT DETAILS

IA 2 STA. 400+85.00, RT. 32.00' JULY 2019

FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 53 OF 59 FILE NO. 31719 DESIGN NO. 119

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).

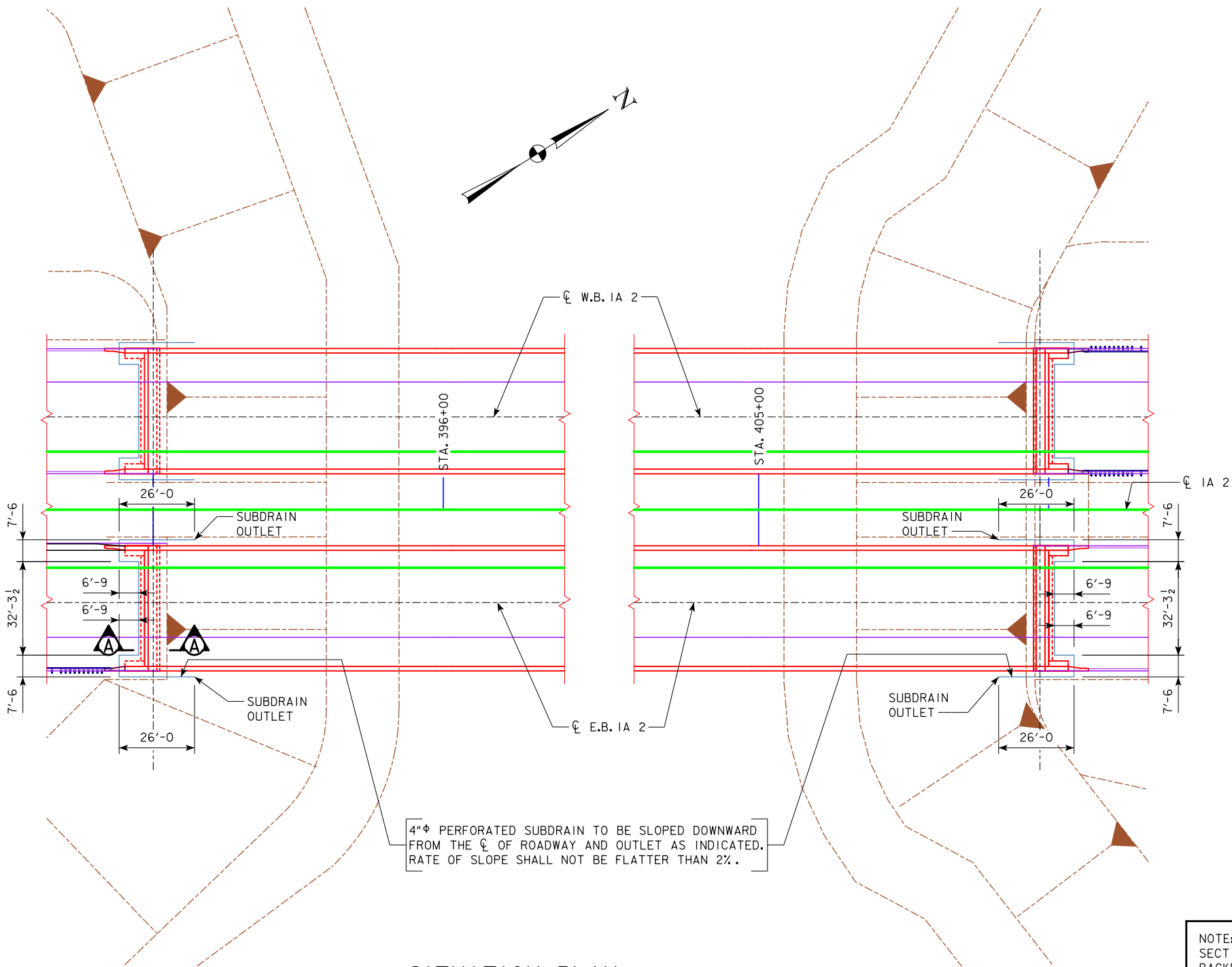
2. INSERT 1'-0 OF THE 4"Φ SUBDRAIN INTO THE 6"Φ METAL OUTLET PIPE, THEN FULLY SEAL THE ENTIRE OPENING WITH GROUT.

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.

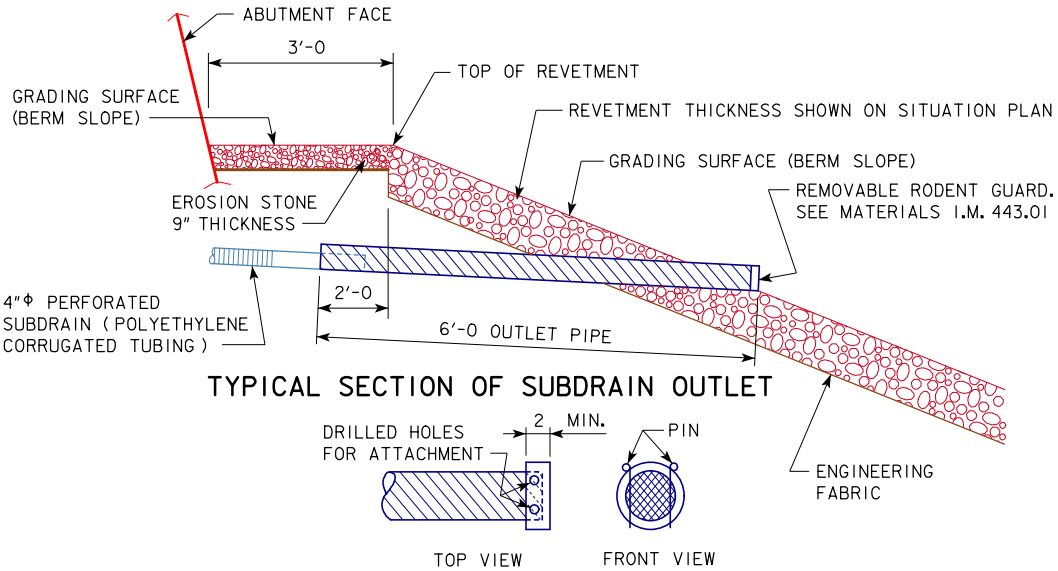
THE DIMENSIONS SHOWN FOR THE PROPOSED SUBDRAINS ARE BASED ON THE PROPOSED GRADING LAYOUT OF BRIDGE BERMS. THE DIMENSIONS SHOWN ARE FOR ESTIMATING ONLY. REQUIRED LENGTHS AND GENERAL LOCATIONS OF SUBDRAINS ARE SUBJECT TO CHANGE DUE TO FIELD ADJUSTMENTS OF THE GRADING LAYOUT.

SUBDRAIN OUTLET ELEVATIONS

LOCATION	ELEVATION
WEST ABUTMENT	933.2±
EAST ABUTMENT	933.9±



SITUATION PLAN
SHOWING SUBDRAIN LOCATIONS



REMOVABLE RODENT GUARD DETAILS
REVETMENT STONE (EMBEDDED) OUTLET DETAILS

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

DESIGN FOR 0° SKEW

1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

156'-0 END SPANS157'-0 INTERIOR SPAN

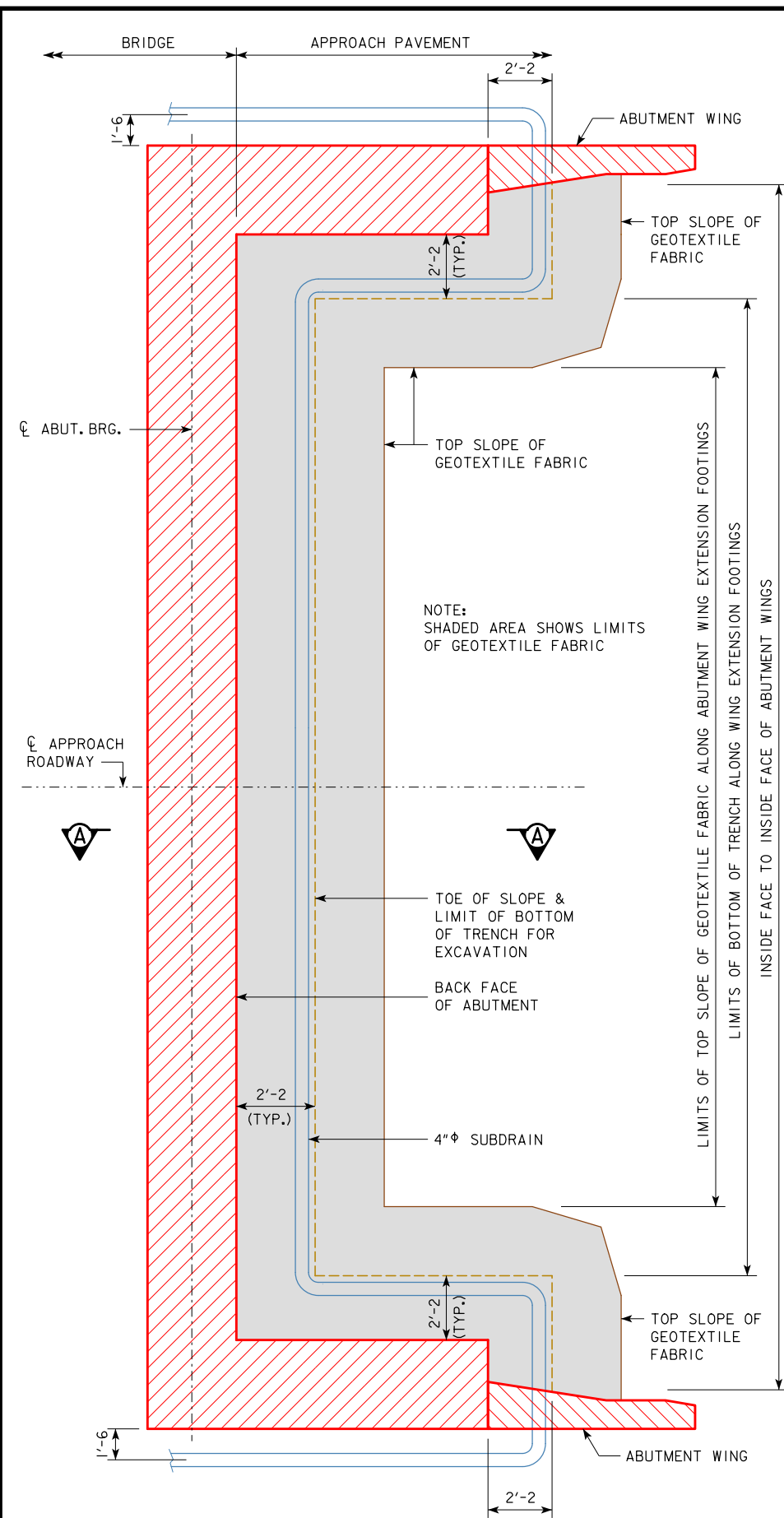
SUBDRAIN DETAILS

IA 2 STA. 400+85.00, RT. 32.00'JULY 2019

FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 54 OF 59FILE NO. 31719DESIGN NO. 119



ABUTMENT PLAN WITH WING EXTENSIONS

ABUTMENT BACKFILL PROCESS:

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

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

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

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

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

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

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

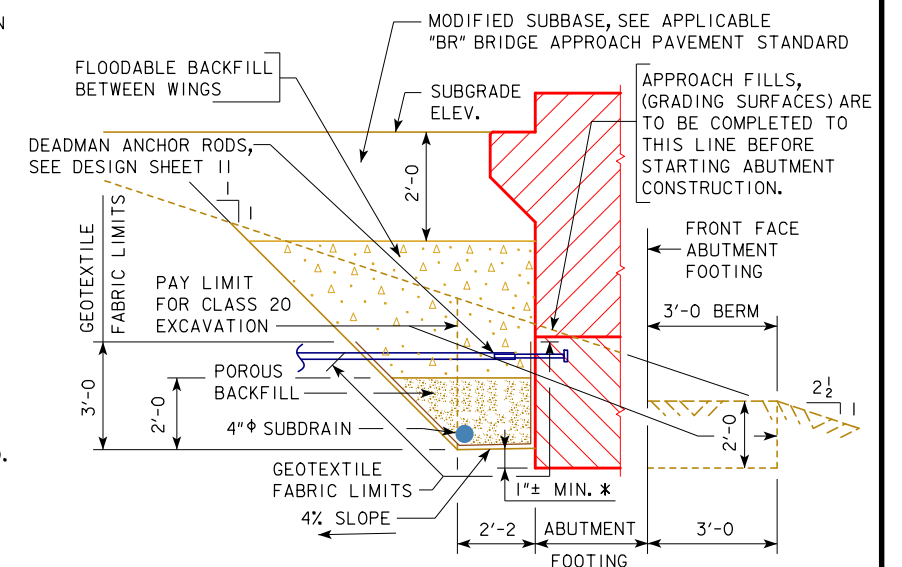
WATER REQUIRED FOR FLOODING, SUBDRAINS, POROUS BACKFILL, FLOODABLE BACKFILL, AND GEOTEXTILE FABRIC FURNISHED AT THE BRIDGE ABUTMENTS WILL NOT BE MEASURED SEPARATELY FOR PAYMENT.

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

NOTE:

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

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



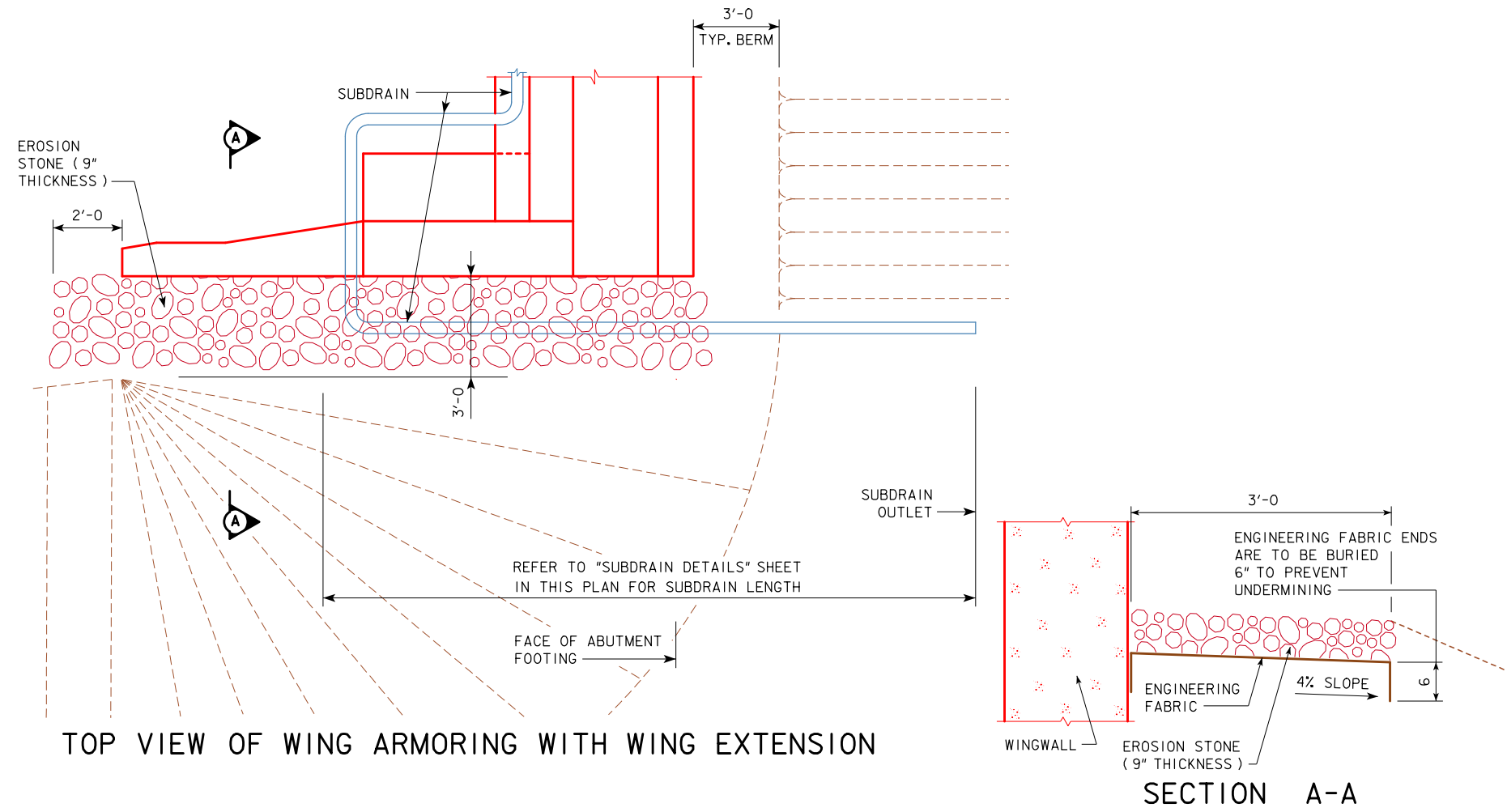
SECTION A-A
BACKFILL DETAILS

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

* DIMENSION VARIES DUE TO 2% SUBDRAIN SLOPE.

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

DESIGN FOR 0° SKEW
**1097'-0 X 40'-0 PRETENSIONED
 PRESTRESSED CONCRETE BEAM E.B. BRIDGE**
 156'-0 END SPANS 157'-0 INTERIOR SPAN
ABUTMENT BACKFILL DETAILS
 IA 2 STA. 400+85.00, RT. 32.00' JULY 2019
FREMONT COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 55 OF 59 FILE NO. 31719 DESIGN NO. 119



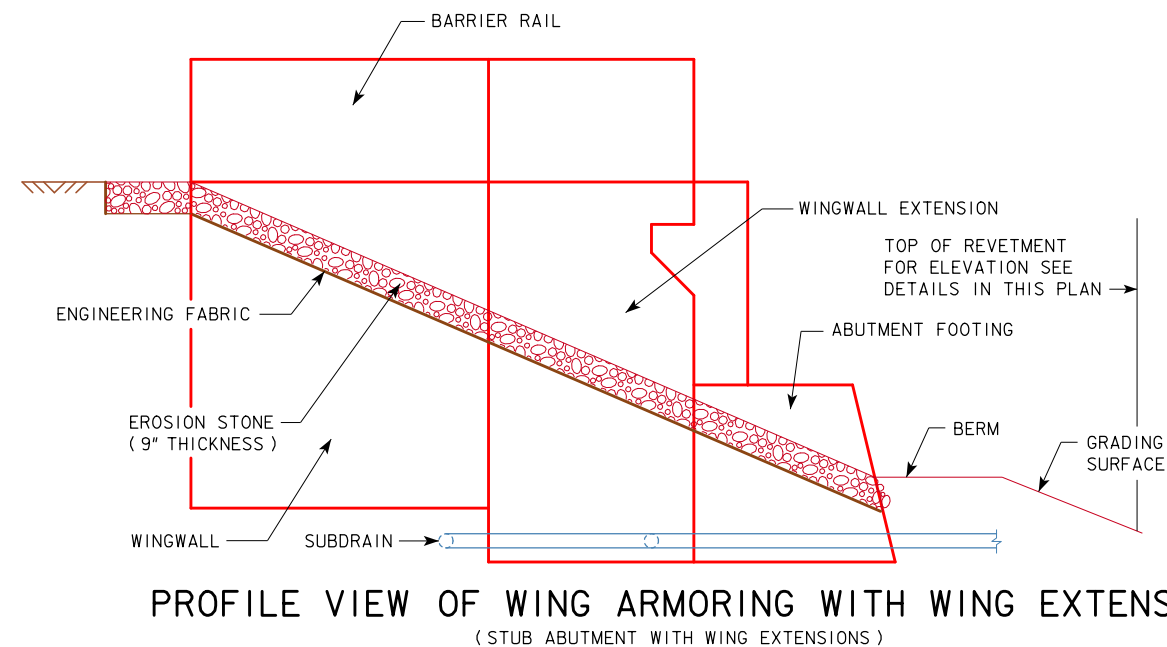
GENERAL NOTES:

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

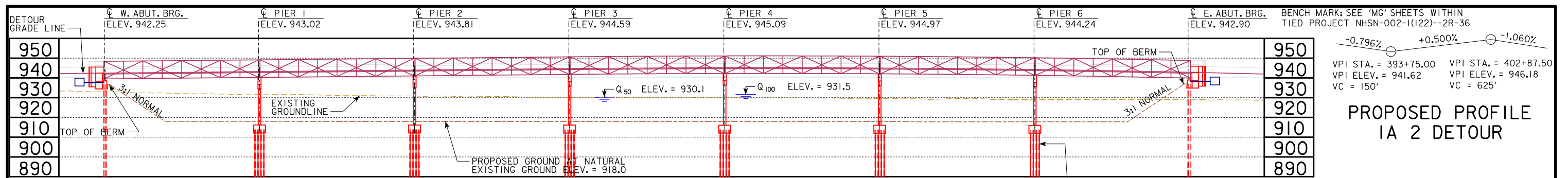
THE EROSION STONE SHALL BE IN ACCORDANCE WITH SECTION 4130, OF THE STANDARD SPECIFICATIONS. MATERIAL PASSING THE 3 INCH SCREEN BUT 100% RETAINED ON A 1 INCH SCREEN MAY BE USED AS CHOKE STONE.

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

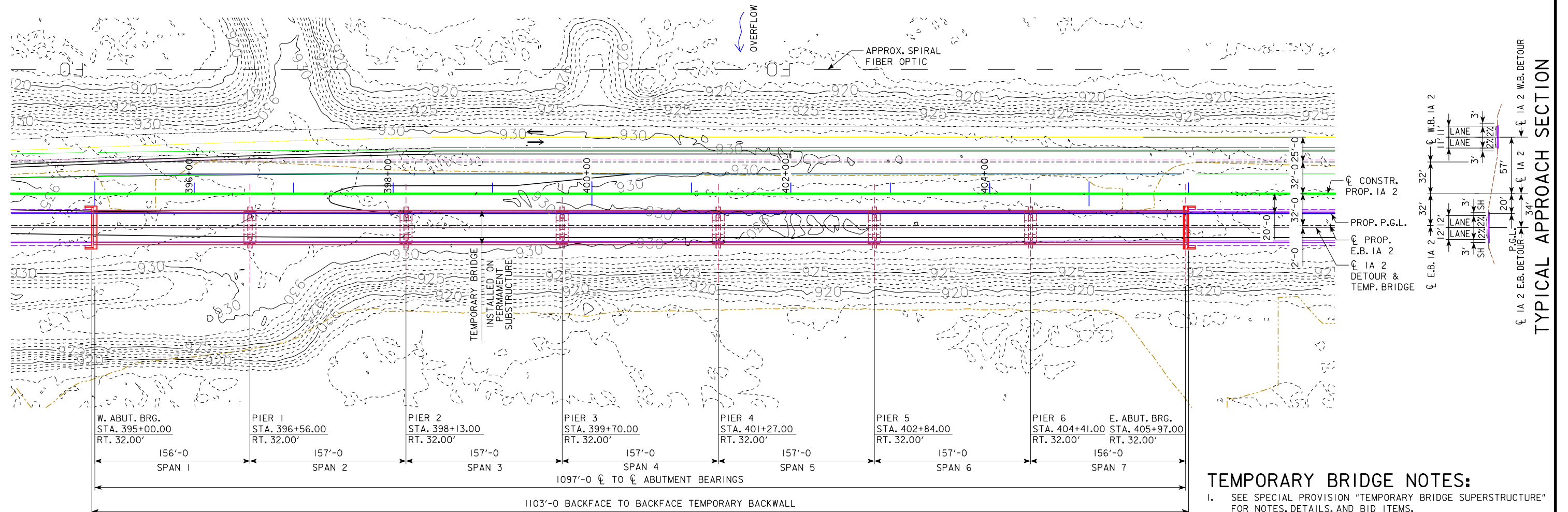
PAYMENT FOR THE BRIDGE WING ARMORING WILL BE BID PER SQUARE YARD. COST WILL INCLUDE ENGINEERING FABRIC, EROSION STONE, EXCAVATION, SHAPING, AND COMPACTION TO DIMENSIONS SHOWN IN THESE PLANS. BID ITEM SHALL BE "BRIDGE WING ARMORING - EROSION STONE".



DESIGN FOR 0° SKEW	
1097'-0 X 40'-0 PRETENSIONED	
PRESTRESSED CONCRETE BEAM E.B. BRIDGE	
156'-0 END SPANS	157'-0 INTERIOR SPAN
BRIDGE WING ARMORING	
IA 2 STA. 400+85.00, RT. 32.00'	
FREMONT COUNTY	
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION	
DESIGN SHEET NO. 56 OF 59	FILE NO. 31719
JULY 2019	
DESIGN NO. 119	

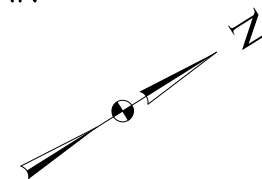


LONGITUDINAL SECTION ALONG CL TEMPORARY BRIDGE
(VERTICAL SCALE 2:1)



TEMPORARY BRIDGE SITUATION PLAN

UTILITIES LEGEND:
— FO — SPIRAL FIBER OPTIC



TEMPORARY BRIDGE NOTES:

1. SEE SPECIAL PROVISION "TEMPORARY BRIDGE SUPERSTRUCTURE" FOR NOTES, DETAILS, AND BID ITEMS.
2. ALL UNITS ARE IN FEET UNLESS OTHERWISE NOTED.
3. TL-4 BRIDGE RAILING PROPOSED.
4. PIER TYPE - 2 COLUMN FRAME PIERS SHOWN, PILE BENT OPTION NOT SHOWN.
5. FOR DETAILS NOT SHOWN, SEE SITUATION PLAN ON DESIGN SHEET 4.

DESIGN FOR 0° SKEW

1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

156'-0 END SPANS 157'-0 INTERIOR SPAN

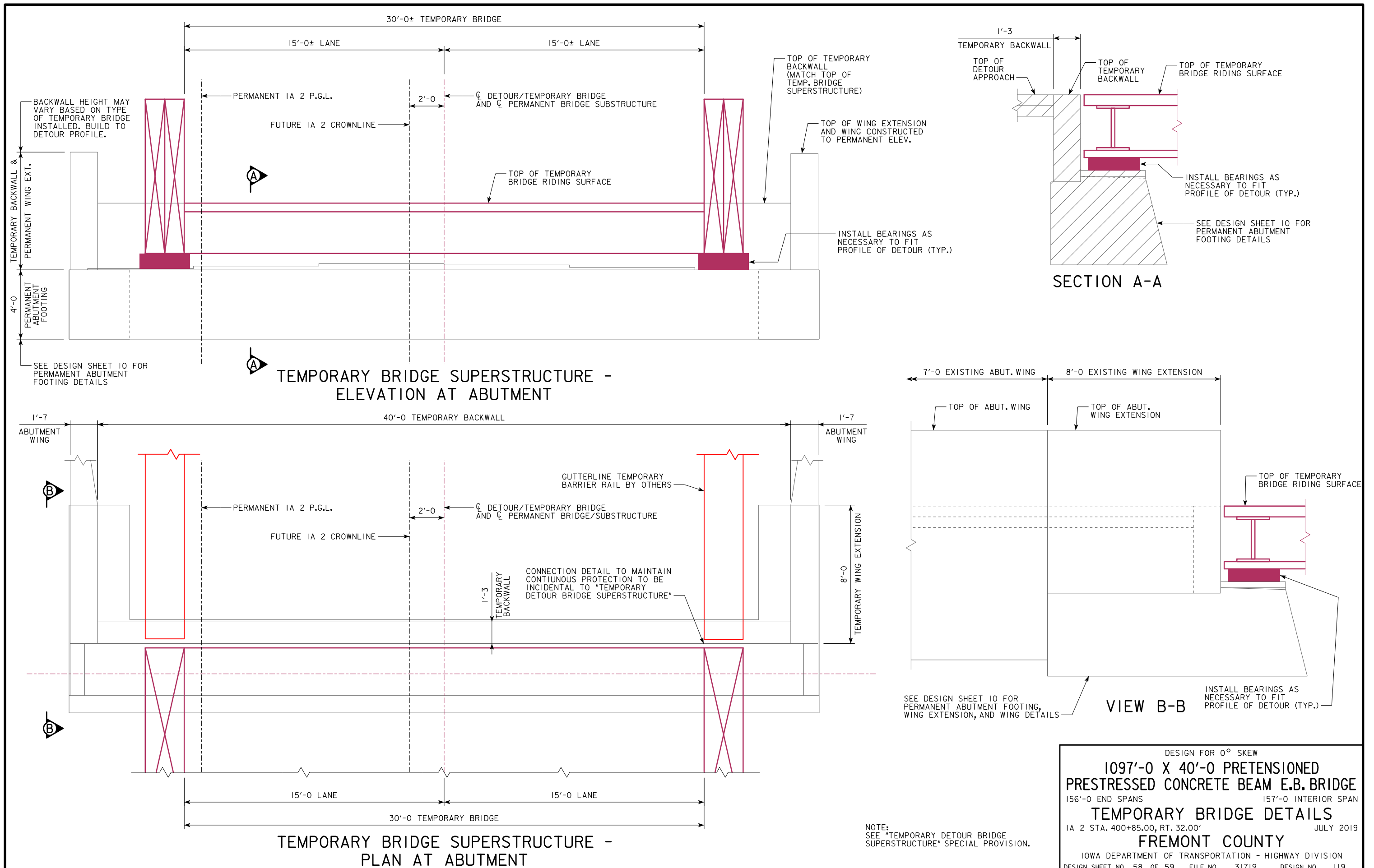
TEMPORARY BRIDGE DETAILS

1A 2 STA. 400+85.00, RT. 32.00' JULY 2019

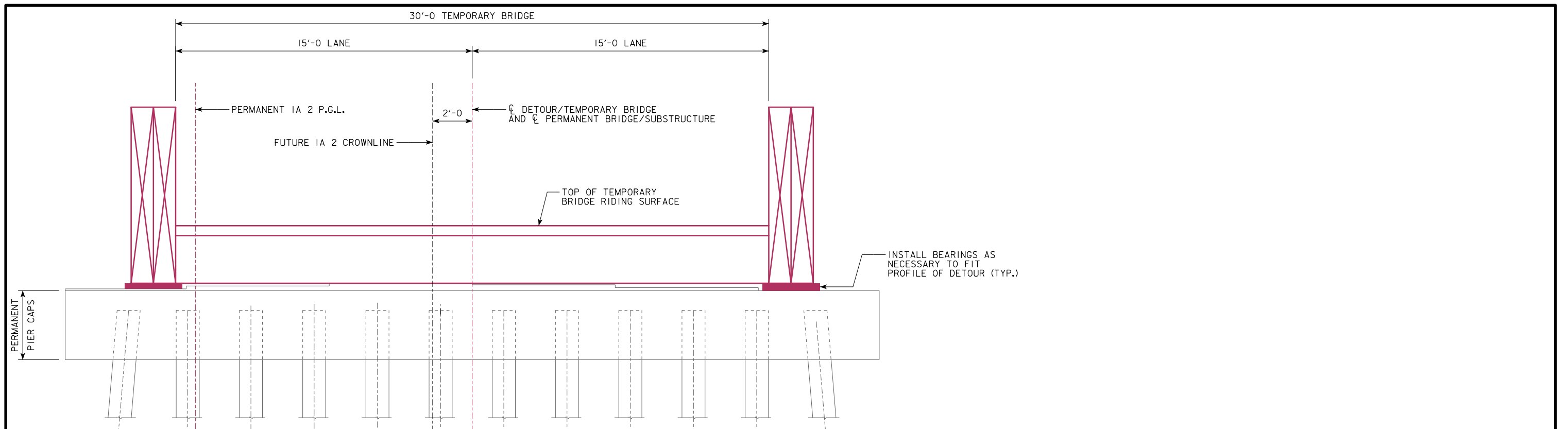
FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 57 OF 59 FILE NO. 31719 DESIGN NO. 119



DESIGN FOR 0° SKEW
1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE
156'-0 END SPANS 157'-0 INTERIOR SPAN
TEMPORARY BRIDGE DETAILS
IA 2 STA. 400+85.00, RT. 32.00'
JULY 2019
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 58 OF 59 FILE NO. 31719 DESIGN NO. 119



TEMPORARY BRIDGE SUPDERSTRUCTURE
- ELEVATION AT PIERS
(PILE BENT OPTION, FRAME PIER OPTION SIMILAR)

DESIGN FOR 0° SKEW

1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE

156'-0 END SPANS 157'-0 INTERIOR SPAN

TEMPORARY BRIDGE DETAILS

IA 2 STA. 400+85.00, RT. 32.00' JULY 2019

FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 59 OF 59 FILE NO. 31719 DESIGN NO. 119

NOTE: All Cone Penetration Test (CPT) data will be provided with the electronic files.

GEOTECHNICAL DESIGN



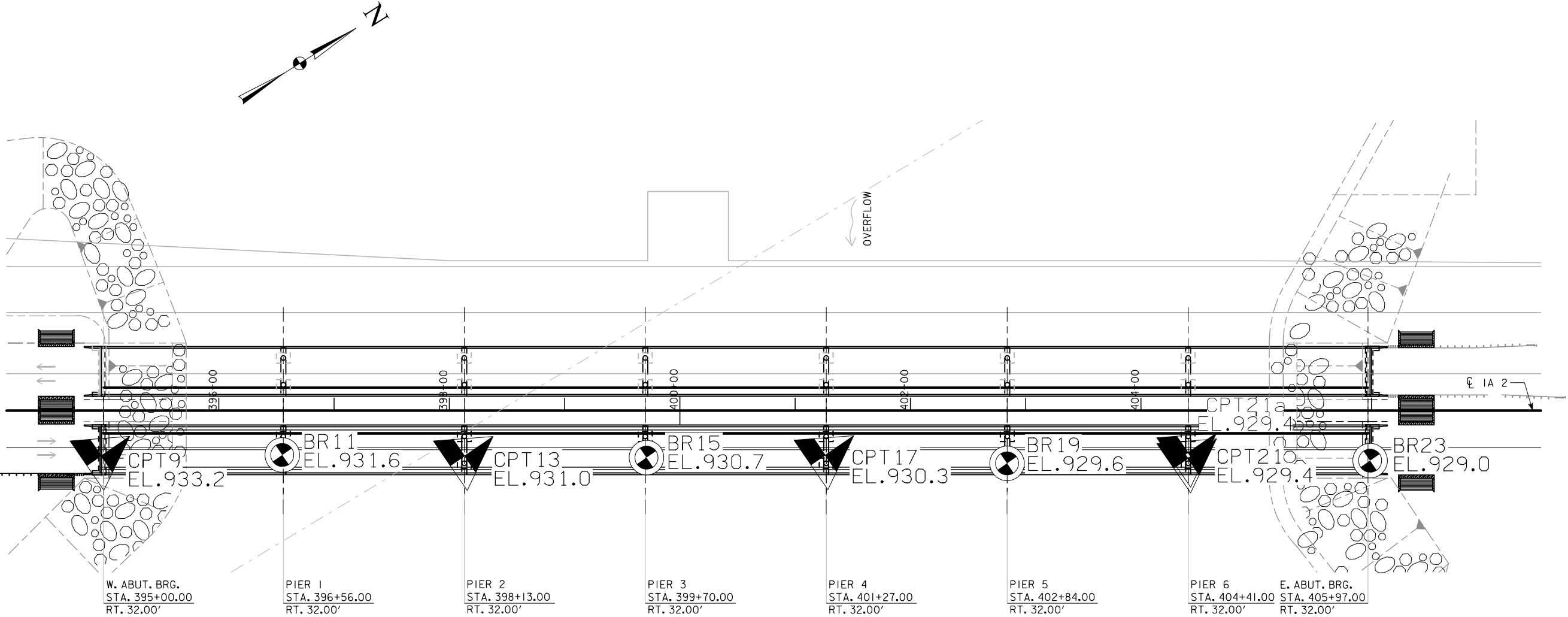
I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature: *Justin D. Humke* Date: 6-14-2019

Printed or Typed Name: Justin D. Humke

My license renewal date is December 31, 2019

Pages or sheets covered by this seal: SPS.1 thru SPS.6



LOCATION

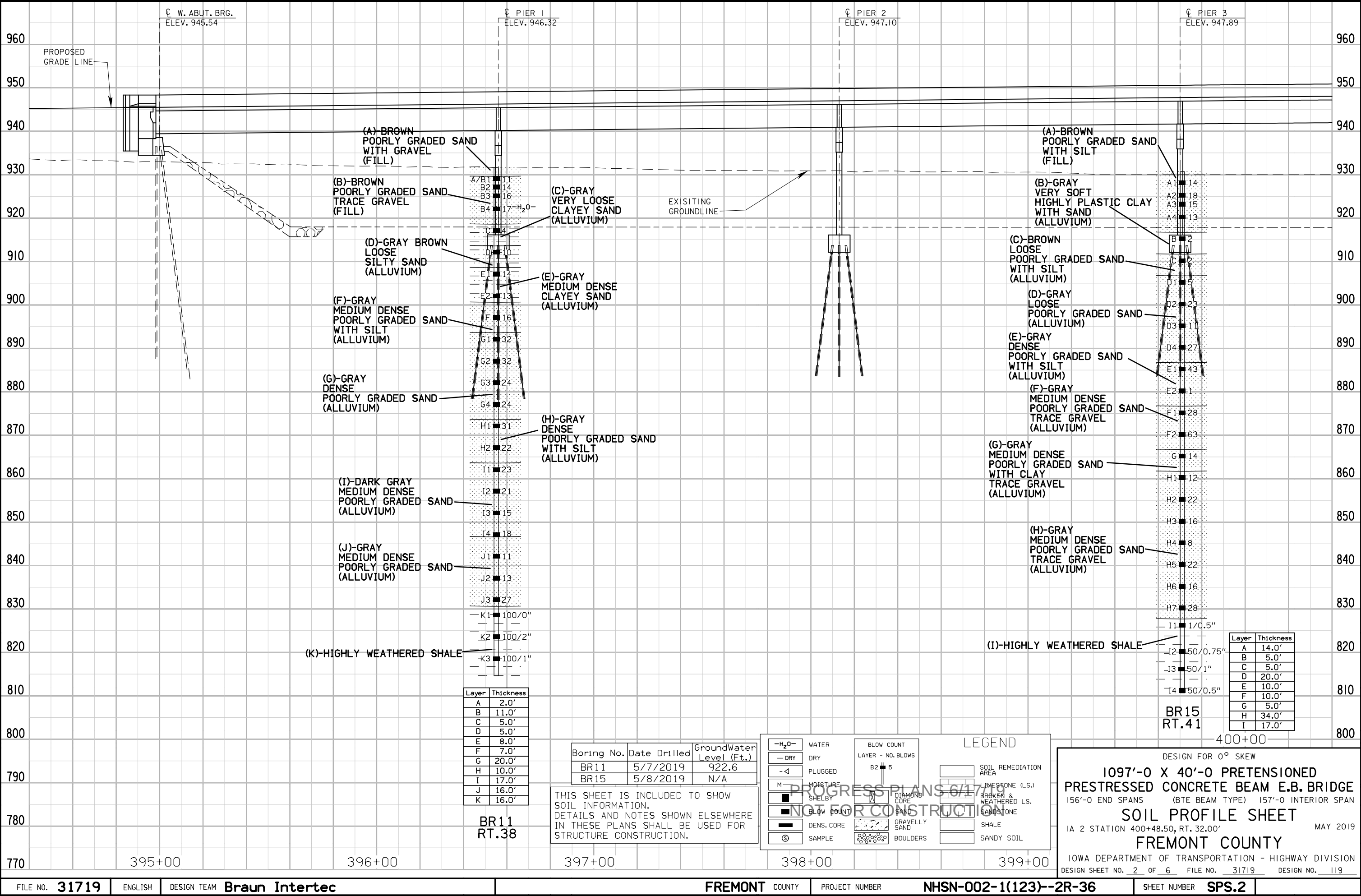
E.B. IA 2 OVERFLOW
T-68N R-43W
SECTION 30/31
BENTON TOWNSHIP
FREMONT COUNTY
FHWA NO. 701075
BRIDGE MAINT. NO. 3600.5R002
LATITUDE 40.676833°
LONGITUDE -95.824989°

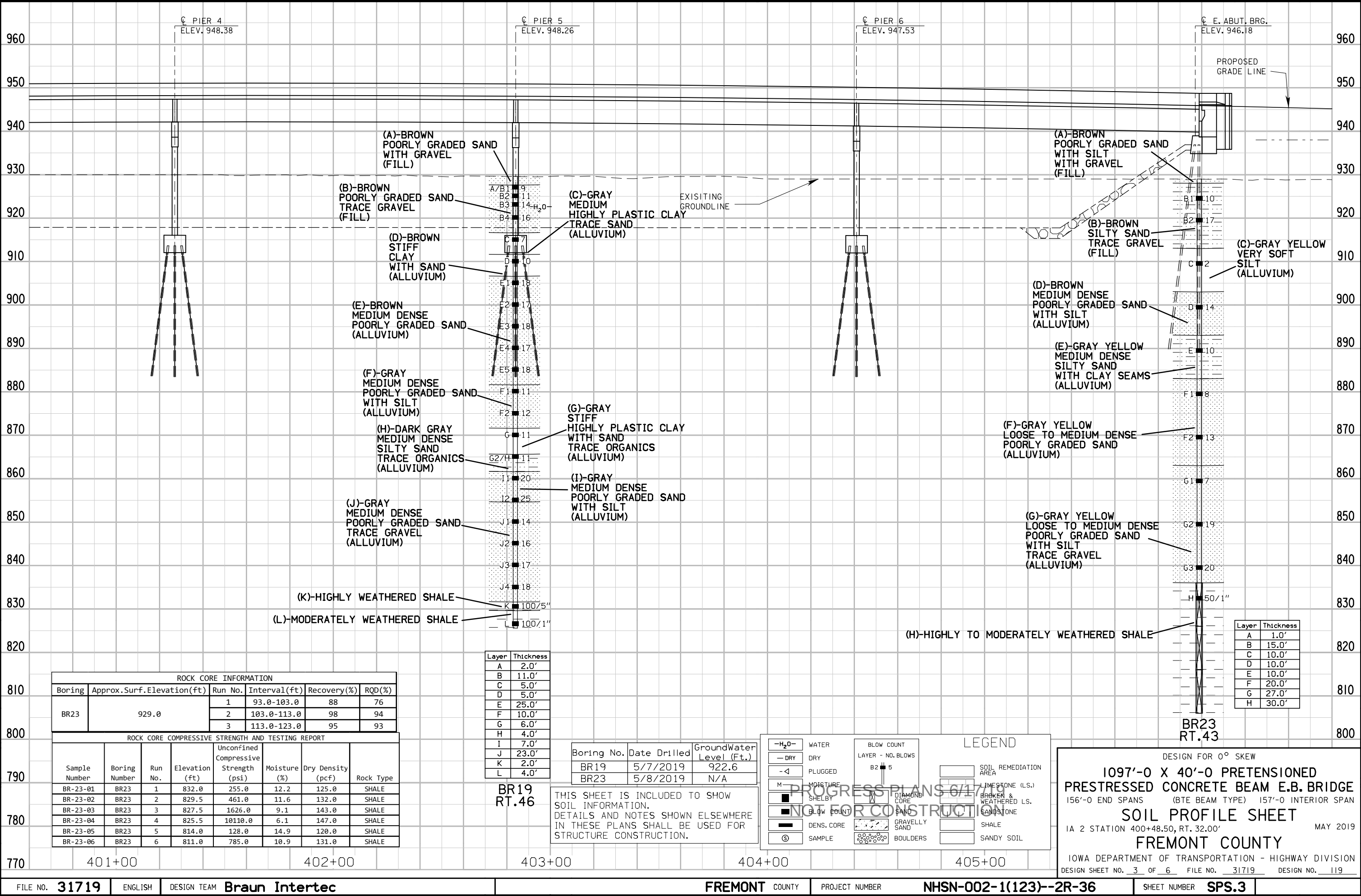


THIS SHEET IS INCLUDED TO SHOW SOIL INFORMATION. DETAILS AND NOTES SHOWN ELSEWHERE IN THESE PLANS SHALL BE USED FOR STRUCTURE CONSTRUCTION.

PROGRESS PLANS 6/17/19
NOT FOR CONSTRUCTION

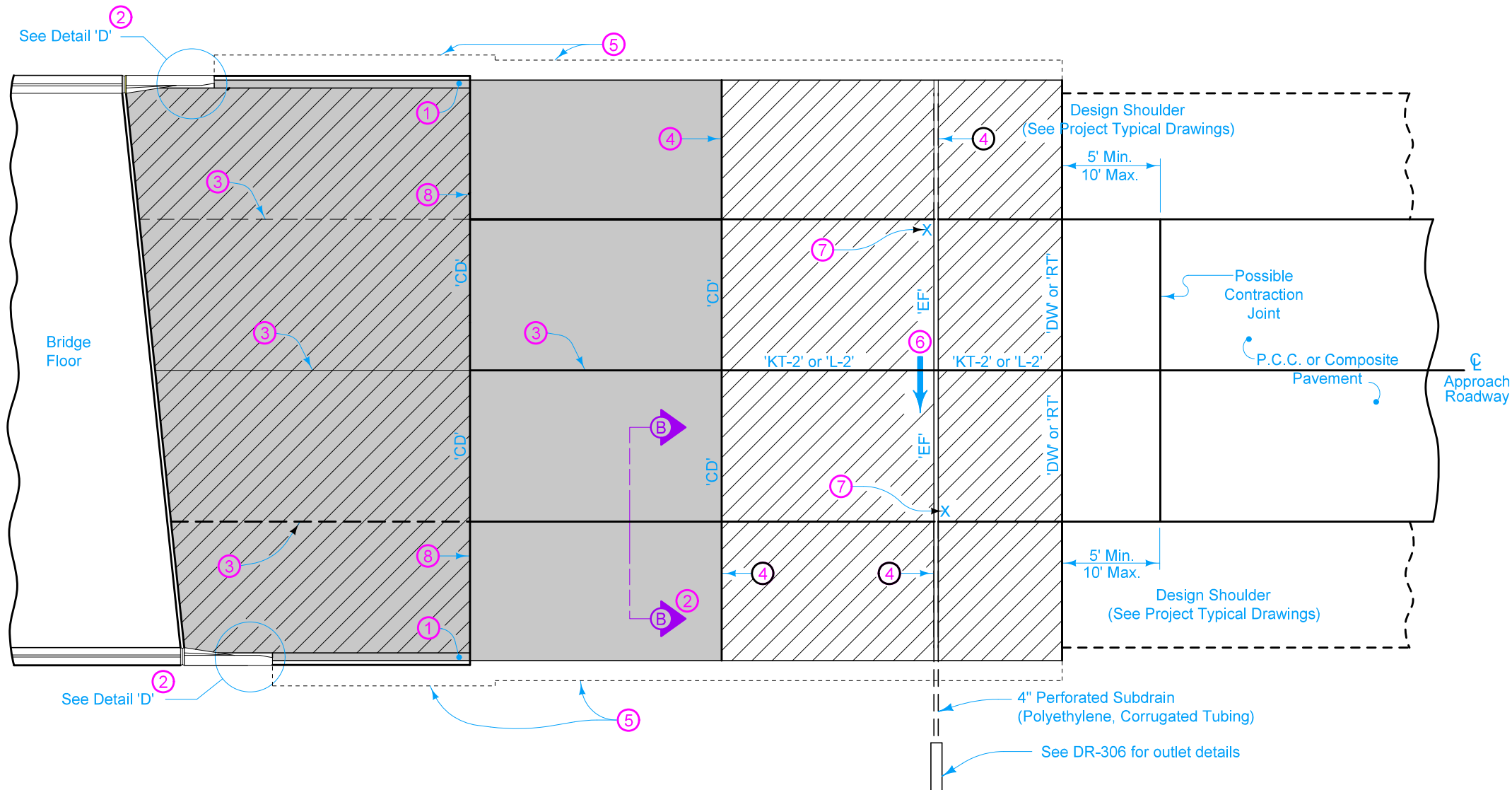
DESIGN FOR 0° SKEW
1097'-0 X 40'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM E.B. BRIDGE
156'-0 END SPANS (BTE BEAM TYPE) 157'-0 INTERIOR SPAN
SOIL PROFILE SHEET
IA 2 STATION 400+48.50, RT. 32.00' MAY 2019
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 1 OF 6 FILE NO. 31719 DESIGN NO. 119





For joint details, see PV-101.

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



PLAN VIEW

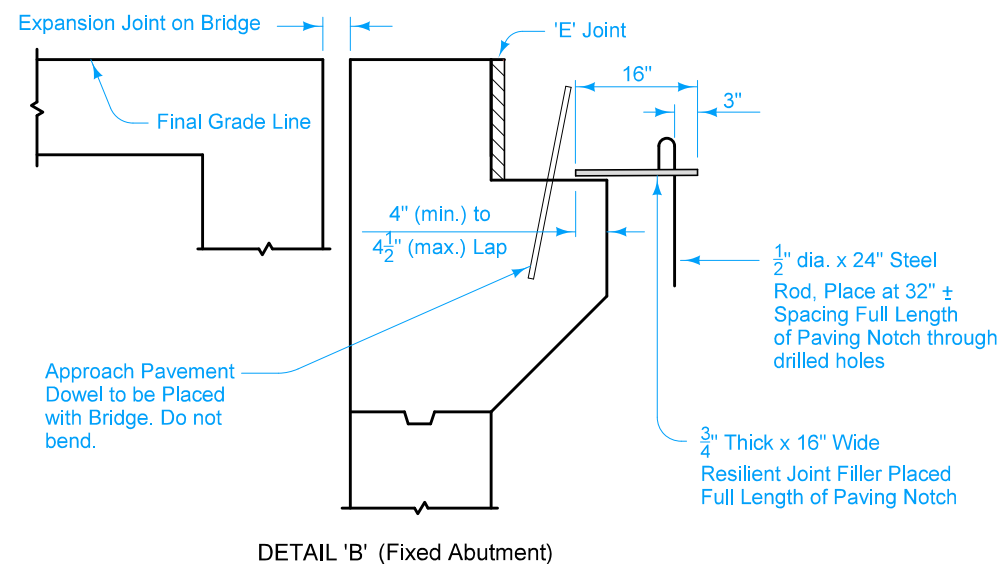
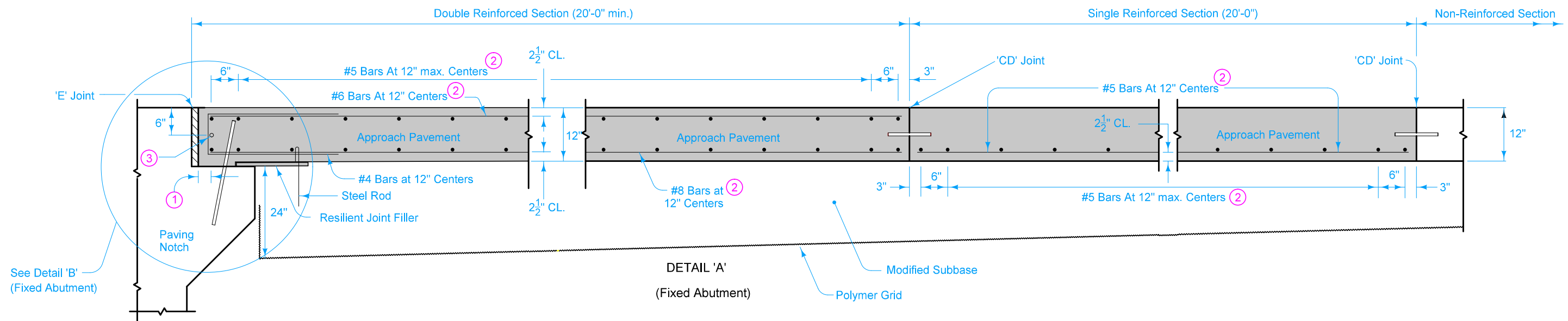
Pay limits for contract item
include the following areas:

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

MODIFIED STANDARD ROAD PLAN	BR-211M SHEET 1 of 1
BRIDGE APPROACH IA 2 OVERFLOW BRIDGES	

⑨ 'DW' or 'RT' joint.





For joint details, refer to [PV-101](#).

For curb details, see Detail 'G'.

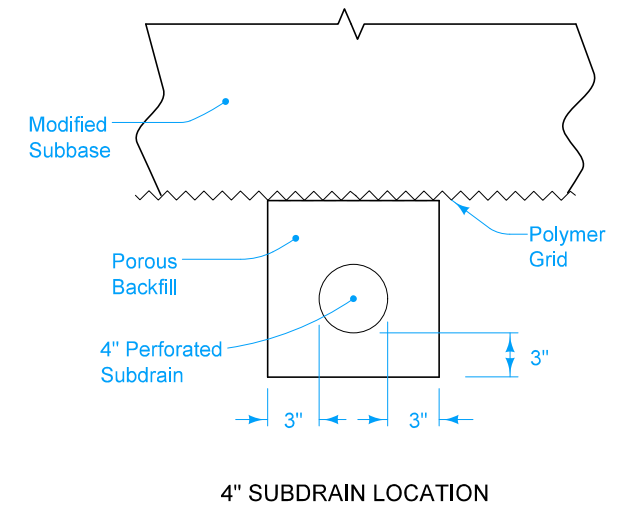
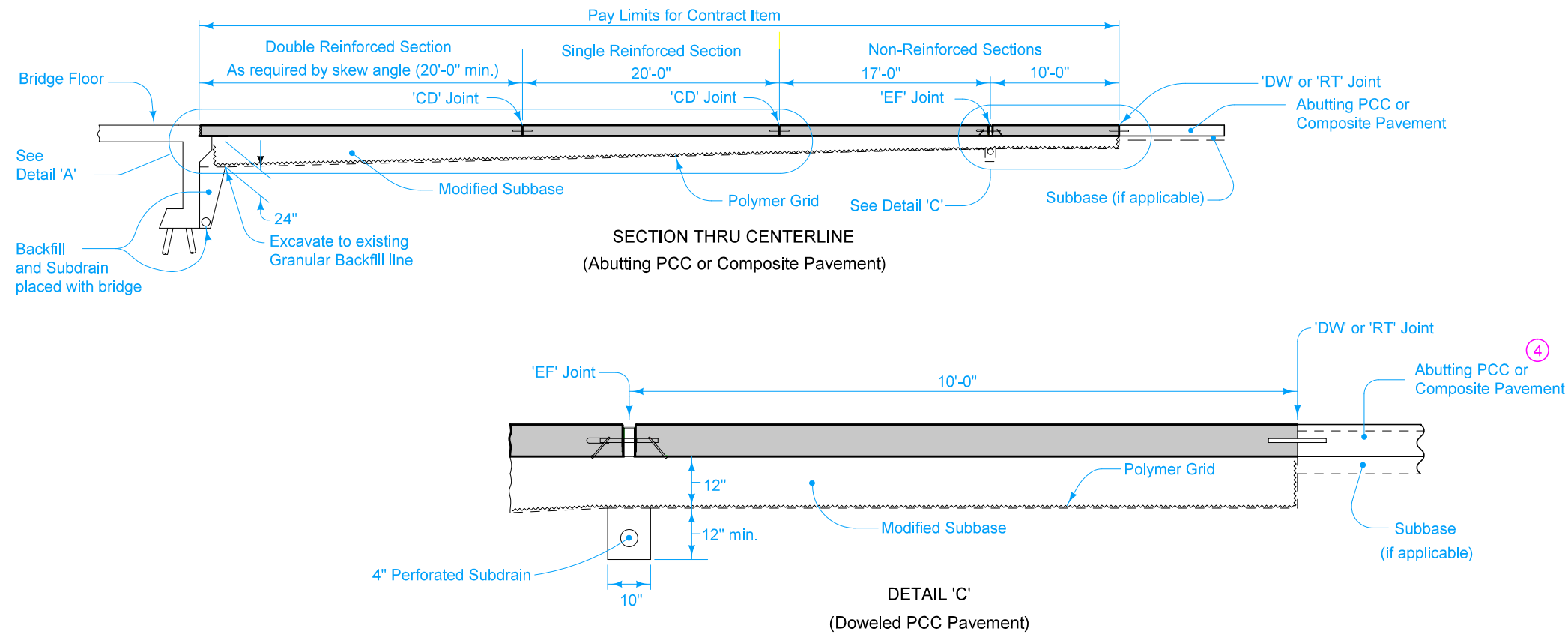
All transverse bars are #5.

Possible Contract Item:
Bridge Approach, BR-203

Possible Tabulation:
112-6

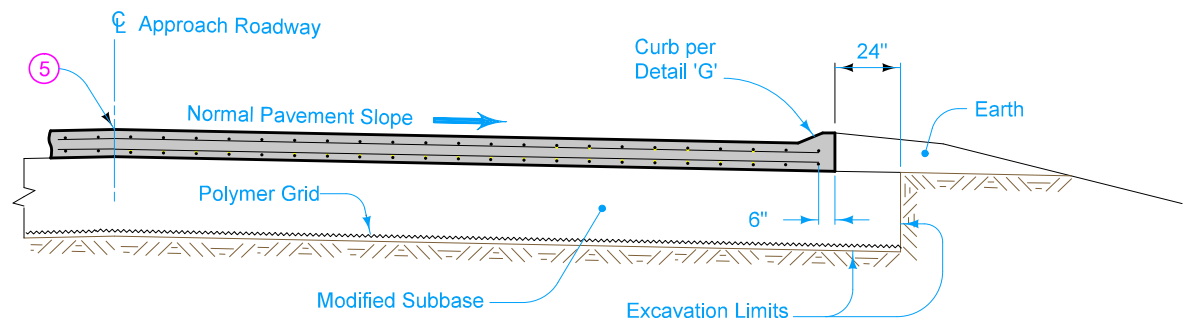
MODIFIED		
	BR-203M	
STANDARD ROAD PLAN	SHEET 1 of 3	
DOUBLE REINFORCED 12" APPROACH		
IA 2 OVERFLOW BRIDGES		

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

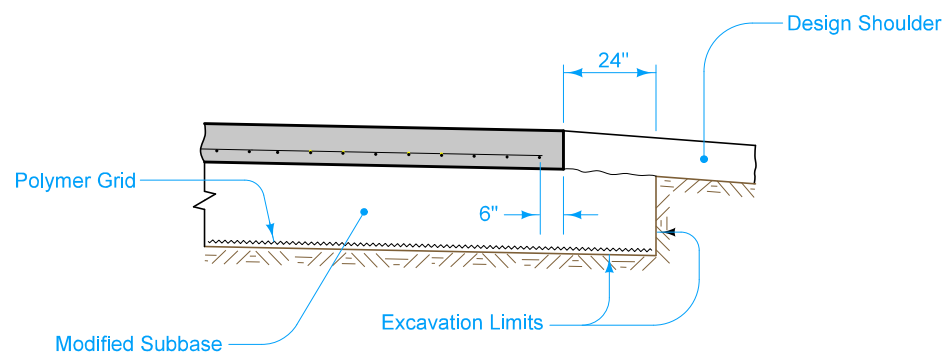


④ If abutting pavement (PCC or HMA) is not in place, refer to **BR-213**.

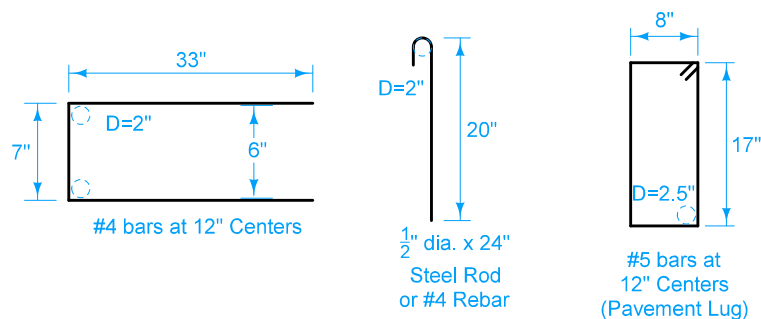
MODIFIED	
	BR-203M
STANDARD ROAD PLAN	SHEET 2 of 3
DOUBLE REINFORCED 12" APPROACH	
IA 2 OVERFLOW BRIDGES	



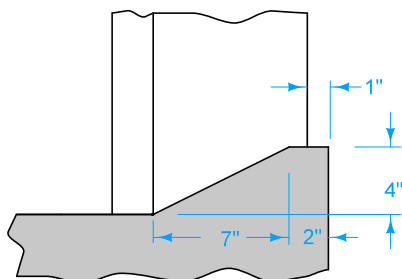
SECTION A-A



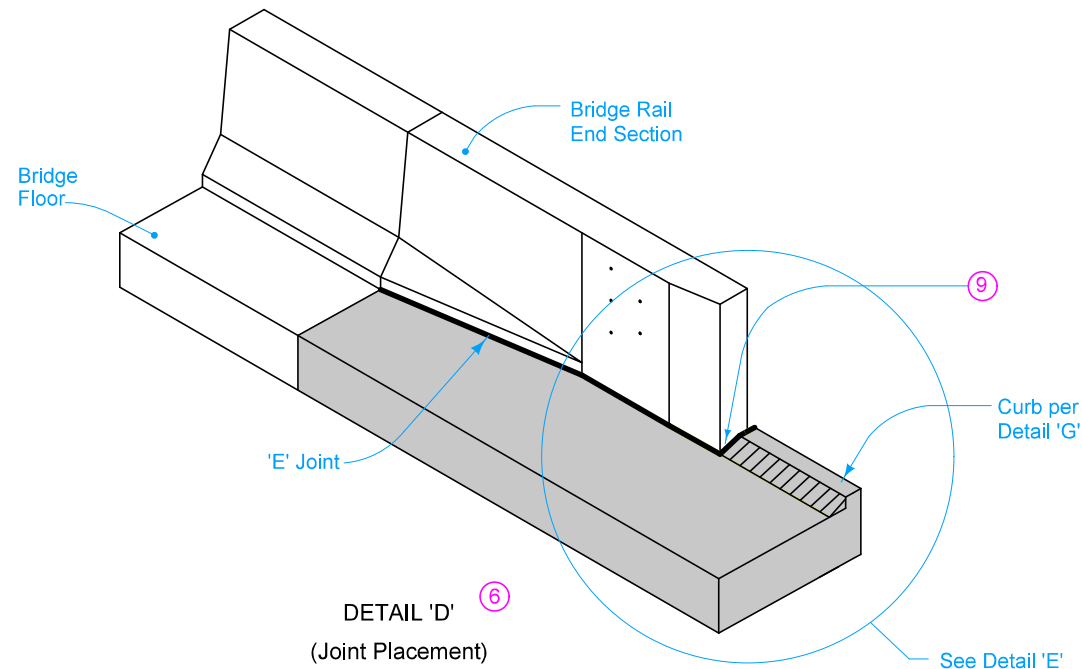
SECTION B-B



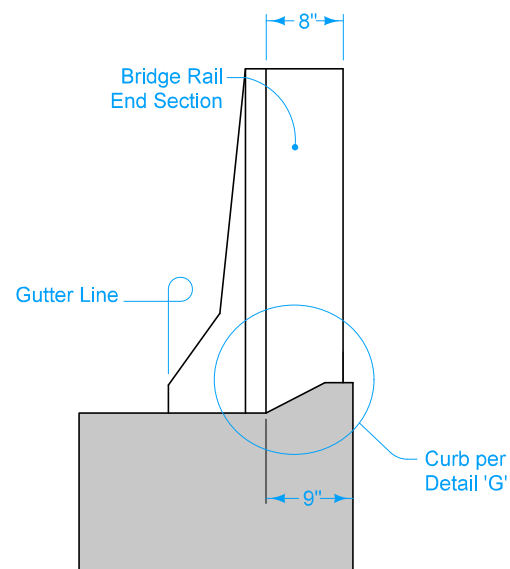
BENT BAR SHAPES



DETAIL 'G'



DETAIL 'D'
(Joint Placement)



DETAIL 'E'
(Back of Curb Placement)

- ⑤ Longitudinal Joint (PV-101):
Single pour - Saw cut joint per Detail B.
Two pours - Use 'KS-2' joint.
- ⑥ Refer to BR-211M, BR-212, or BR-231.
- ⑦ Design shoulder width.
- ⑧ Reinforced bridge approach section.
- ⑨ Expansion joint at end of Bridge Rail End Section: Place joint filler the full depth of the bridge approach pavement. In areas with curb, place full depth of pavement plus curb and shape material to fit the shape of the curb per Section B-B of PV-101. Seal joint per Detail F of PV-101.

- Fixed Abutment Bridges: Type 'E' joint.

MODIFIED	REVISION	
	1	
	BR-203M	
	SHEET 3 of 3	
STANDARD ROAD PLAN		
REVISIONS:		
APPROVED BY DESIGN METHODS ENGINEER		
DOUBLE REINFORCED 12" APPROACH IA 2 OVERFLOW BRIDGES		