

BRIDGE NEW - CCS
ER-002-I(135)--28-36

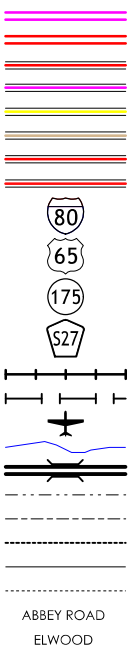
LETTING DATE
7/21/2020

FREMONT COUNTY - DESIGN 420 & 520

LEGEND

INTERSTATE HIGHWAY
PRIMARY HIGHWAY-DIVIDED
PRIMARY HIGHWAY
PORTLAND CEMENT CONCRETE ROAD
ASPHALT ROAD
BITUMINOUS ROAD
GRAVEL ROAD
EARTHEN ROAD

INTERSTATE HIGHWAY
UNITED STATES HIGHWAY
STATE HIGHWAY
COUNTY HIGHWAY
RAILROAD
PIPELINE
AIRPORT
HYDROLOGY
BRIDGE
STATE BOUNDARY
COUNTY BOUNDARY
CORPORATE BOUNDARY
TOWNSHIP LINE
SECTION LINE
ROAD NAMES
UNINCORPORATED PLACE



PLANS OF PROPOSED IMPROVEMENTS ON THE

PRIMARY ROAD SYSTEM

FREMONT COUNTY

BRIDGE NEW - CCS

1A 2 EB/WB OVER MISSOURI RIVER OVERFLOW
2.2 MILES WEST OF I-29

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
62

PROJECT NUMBER

ER-002-I(135)--28-36

R.O.W. PROJECT NUMBER

PROJECT IDENTIFICATION NUMBER

19-36-002-070-01

INDEX OF SHEETS

NO.	DESCRIPTION
1	TITLE SHEET
2	ESTIMATE SHEET - DESIGN 420
2-26	DESIGN 420
27	ESTIMATE SHEET - DESIGN 520
27-51	DESIGN 520
SPS.1-SPS.4	SOIL PROFILE SHEET
C.1	ESTIMATED ROADWAY QUANTITIES
C.1-U.5	ROADWAY PLANS

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
5 & 30	ANDREW W. McCOY	HYDRAULIC DESIGN
SPS.1	JUSTIN D. HUMKE	GEOTECHNICAL DESIGN
C.1	KELLY C. BELL	ROADWAY DESIGN

STRUCTURAL DESIGN



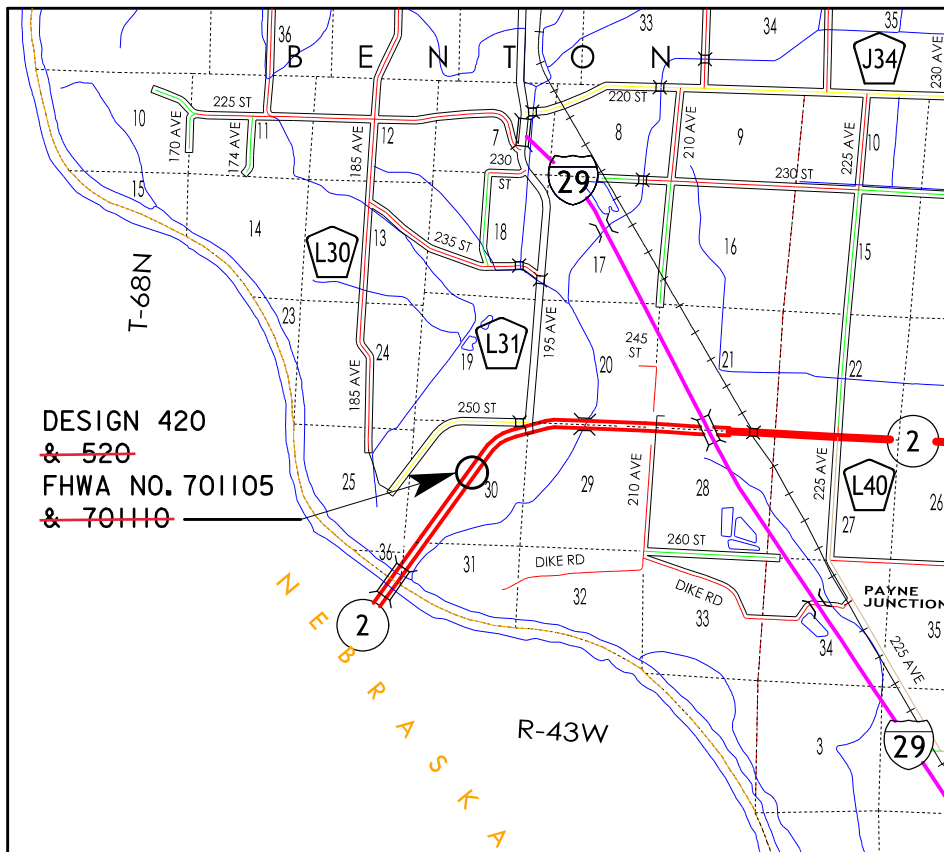
I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature: Anthony J. Bower Date: 5/14/2020
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 51

LOCATION MAP



PROJECT DIRECTORY NAME: 3600207019

DESIGN TEAM Stanley Consultants Inc.

ENGLISH IOWA DOT * OFFICE OF BRIDGES AND STRUCTURES

FILE NO. 31911

FREMONT COUNTY

PROJECT NUMBER ER-002-I(135)--28-36

SHEET NUMBER 1

ESTIMATED BRIDGE QUANTITIES - DESIGN 420					
ITEM NO.	ITEM CODE	ITEM	UNIT	QUANTITY	AS BUILT QUANTITY
1.	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	CY	13200.0	
2.	2402-2720000	EXCAVATION, CLASS 20	CY	2496	
3.	2403-0100010	STRUCTURAL CONCRETE (BRIDGE)	CY	437.3	
4.	2403-7000210	HIGH PERFORMANCE STRUCTURAL CONCRETE	CY	1088.1	
5.	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB	294347	
6.	2404-7775009	REINFORCING STEEL, STAINLESS STEEL	LB	6679	
7.	2405-2705000	EXCAVATE AND DEWATER	LS	1.00	
8.	2414-6424110	CONCRETE BARRIER RAILING	LF	676.0	
9.	2501-0201057	PILES, STEEL, HP 10x57	LF	8295	
10.	2501-6335010	PREBORED HOLES	LF	180	
11.	2507-2638650	BRIDGE WING ARMORING - EROSION STONE	SY	12.0	
12.	2507-3250005	ENGINEERING FABRIC	SY	3840.0	
13.	2507-6800061	REVETMENT, CLASS E	TON	3440.0	
14.	2507-8029000	EROSION STONE	TON	13.2	
15.	2526-8285000	CONSTRUCTION SURVEY	LS	1.00	
16.	2533-4980005	MOBILIZATION	LS	1.00	

ITEM NO.	DESCRIPTION
11.	INCLUDES FURNISHING AND PLACING ENGINEERING FABRIC, EROSION STONE, AND ALL REQUIRED EXCAVATING, SHAPING AND COMPACTING FOR WING ARMORING.
12.	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.
13.	ESTIMATED AT 1.6 TON/CY. BROKEN CONCRETE WILL NOT BE ALLOWED AS A SUBSTITUTE FOR REVETMENT.
14.	ESTIMATED AT 1.6 TON/CY.

ESTIMATE REFERENCE INFORMATION

ROADWAY QUANTITIES
SHOWN ON SHEET C.1

ITEM NO.	DESCRIPTION
1.	INCLUDES EXCAVATION FOR CHANNEL WITHIN THE APPROXIMATE LIMITS OF THE AREAS AS SHOWN ON THE "SITUATION PLAN" SOUTH OF C 1A 2.
2.	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.
3.	INCLUDES THE CONCRETE FOR THE ABUTMENT FOOTINGS AND PIER ENCASEMENTS. 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.
4.	THIS BID ITEM INCLUDES THE CONCRETE FOR THE SLAB, ABUTMENTS END DIAPHRAGMS, ABUTMENT WINGS, AND MONOLITHIC PIER CAPS. REFER TO THE DEVELOPMENTAL SPECIFICATION FOR HIGH PERFORMANCE CONCRETE FOR STRUCTURES FOR ADDITIONAL INFORMATION. INCLUDES COST OF 16 DRAINS AT 48 LBS STEEL PER DRAIN.
7.	FOR PIERS IN ACCORDANCE WITH ARTICLE 2405 OF THE STANDARD SPECIFICATIONS. PAYMENT IS FOR FULL COMPENSATION FOR CLASS 20 AND CLASS 21 EXCAVATION, COFFERDAMS, SEAL COATS, AND 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.
8.	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 676 FEET OF 2 INCH DIAMETER RIGID STEEL CONDUIT. INCLUDES MATERIAL AND LABOR ASSOCIATED WITH PROVIDING AND INSTALLING RIGID STEEL CONDUIT, JUNCTION BOXES AND FITTINGS.
9.	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.

DESIGN FOR 0° SKEW

327'-0 x 40'-0 CONTINUOUS
CONCRETE SLAB E.B. BRIDGE

45'-6 END SPANS59'-0 INTERIOR SPANS

ESTIMATED QUANTITIES

1A 2 STA. 1423+63.50, RT. 32.00' MAY 2020

FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 25FILE NO. 31911DESIGN NO. 420

GENERAL NOTES:

THIS DESIGN IS TO CONSTRUCT A NEW 6-SPAN 327'-0 x 40'-0 CONCRETE SLAB 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 OR FUTURE WEARING SURFACE.

FAINT LINES ON PLANS INDICATE THE EXISTING STRUCTURE.

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.

THE BRIDGE CONTRACTOR SHALL PREBORE HOLES FOR ABUTMENT PILES. HOLES SHALL BE BORED TO THE ELEVATIONS SHOWN ON THE "LONGITUDINAL SECTION ALONG CENTERLINE E.B. IA 2" ON SITUATION PLAN SHEET. PILES SHALL BE DRIVEN THROUGH THE HOLES TO AT LEAST THE SPECIFIED DESIGN BEARING.

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.

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

CONCRETE BARRIER RAILS PLACED USING THE SLIP FORM METHOD WILL REQUIRE THE USE OF A CLASS BR CONCRETE IN ACCORDANCE WITH ARTICLE 2513.03A,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 SIPHONED METHOD).

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (5G1 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.

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.

LONGITUDINAL GROOVING WILL BE INCLUDED WITH THE ROADWAY PLANS.

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

GUARDRAIL IS TO BE PLACED BY OTHERS.

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

IA 2 WILL BE OPEN TO TRAFFIC DURING CONSTRUCTION. SEE TRAFFIC CONTROL PLAN THIS SHEET.

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

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

THE BRIDGE CONTRACTOR IS TO CLEAR AND/OR SHAPE THE CHANNEL WITHIN THE APPROXIMATE LIMITS OF THE AREAS AS SHOWN ON THE "SITUATION PLAN" AND "LONGITUDINAL SECTION ALONG CENTERLINE E.B. IA 2" ON DESIGN SHEET 4.

SPECIFICATIONS:

DESIGN: AASHTO LRFD 8th Ed, SERIES OF 2017, EXCEPT AS NOTED IN THE CURRENT IOWA BRIDGE DESIGN MANUAL.

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

DEVELOPMENTAL SPECIFICATIONS FOR HIGH PERFORMANCE CONCRETE

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8th Ed, SERIES OF 2017, EXCEPT AS NOTED IN THE CURRENT IOWA BRIDGE DESIGN MANUAL.

REINFORCING STEEL IN ACCORDANCE WITH AASHTO LRFD SECTION 5, GRADE 60 FOR EPOXY COATED AND NON-COATED, AND GRADE 60 OR 75 FOR STAINLESS.

CONCRETE IN ACCORDANCE WITH AASHTO LRFD SECTION 5, f'c = 4.0 KSI. BRIDGE SLAB CONCRETE f'c = 4.0 KSI

STRUCTURAL STEEL IN ACCORDANCE WITH AASHTO LRFD SECTION 6. ASTM A709 GRADE 36, GRADE 50, AND GRADE 50W (AASHTO M270 GRADE 36, GRADE 50, AND GRADE 50W).

BRIDGE SLAB DIMENSIONS TABLE

NO.	ITEM	UNIT	QUANTITY
1	SLAB LENGTH	L.F.	327.8
2	MINIMUM SLAB WIDTH	L.F.	43.2
3	MAXIMUM SLAB WIDTH	L.F.	43.2
4	SLAB AREA	S.F.	14151

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

SHOP DRAWING SUBMITTALS

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

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

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

1	FLOOR DRAINS
2	FALSEWORK

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. ER-002-1(130)-28-36.

NOTE:
ROAD PLANS FOR THE PROJECT HAVE BEEN TIED TO THE BRIDGE PLANS THROUGH THE CONTRACT LETTING PROCESS. THE TIED ROAD PLANS, PROJECT NO. ER-002-1(130)-28-36, CONTAIN 404 PERMIT INFORMATION AND THE POLLUTION PREVENTION PLAN.

DESIGN FOR 0° SKEW

327'-0 x 40'-0 CONTINUOUS
CONCRETE SLAB E.B. BRIDGE

45'-6 END SPANS59'-0 INTERIOR SPANS

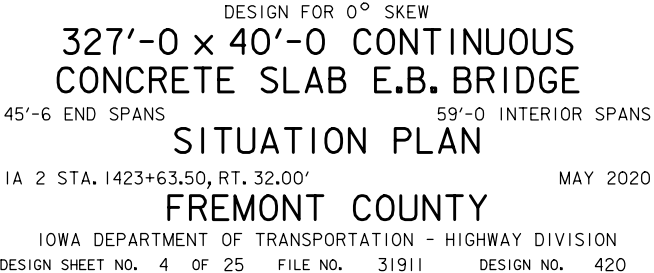
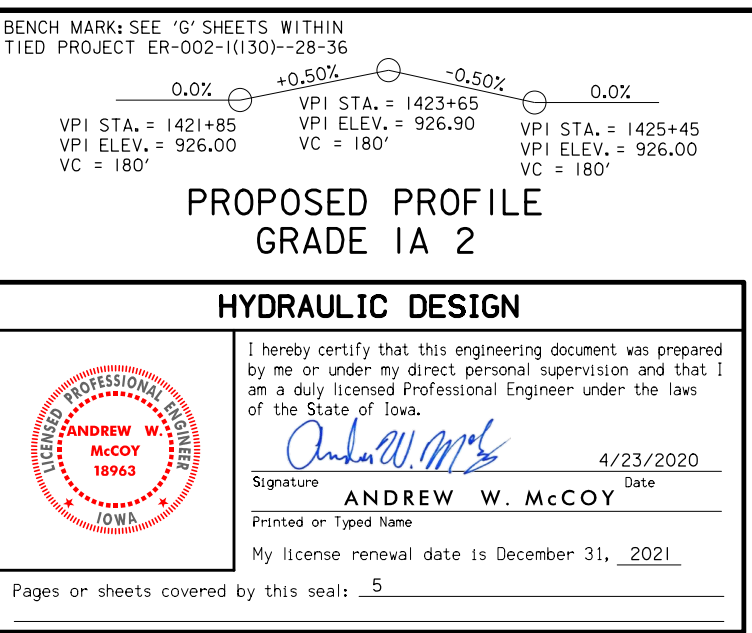
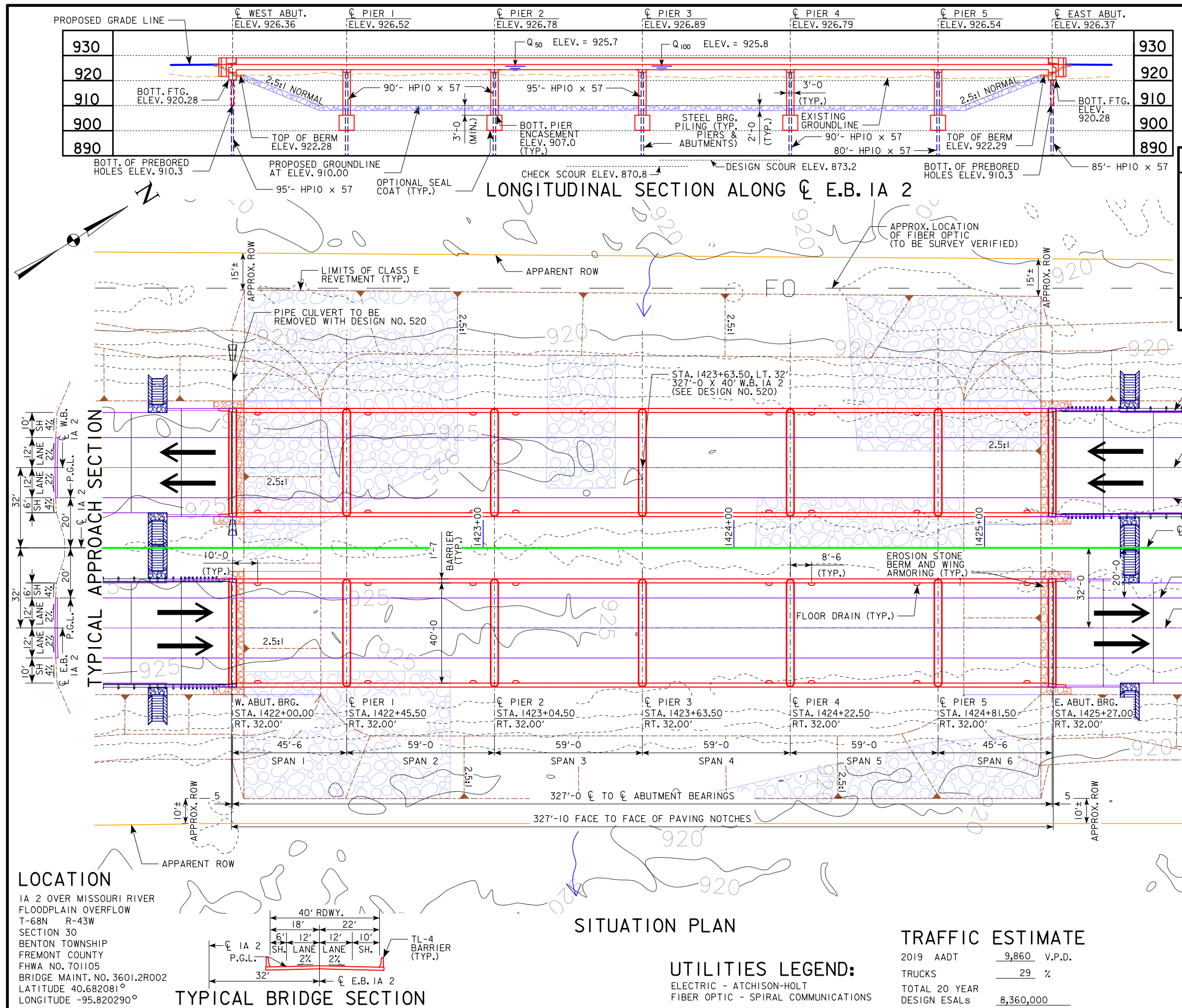
GENERAL NOTES

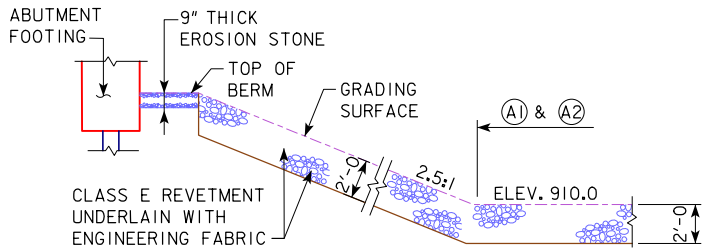
IA 2 STA. 1423+63.50, RT. 32.00' MAY 2020

FREMONT COUNTY

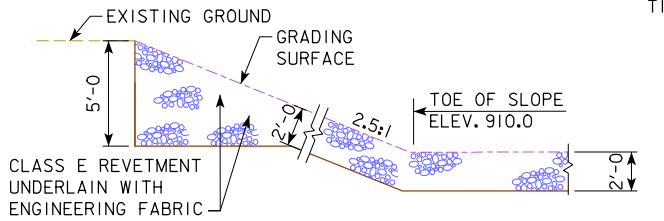
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 3 OF 25 FILE NO. 31911 DESIGN NO. 420

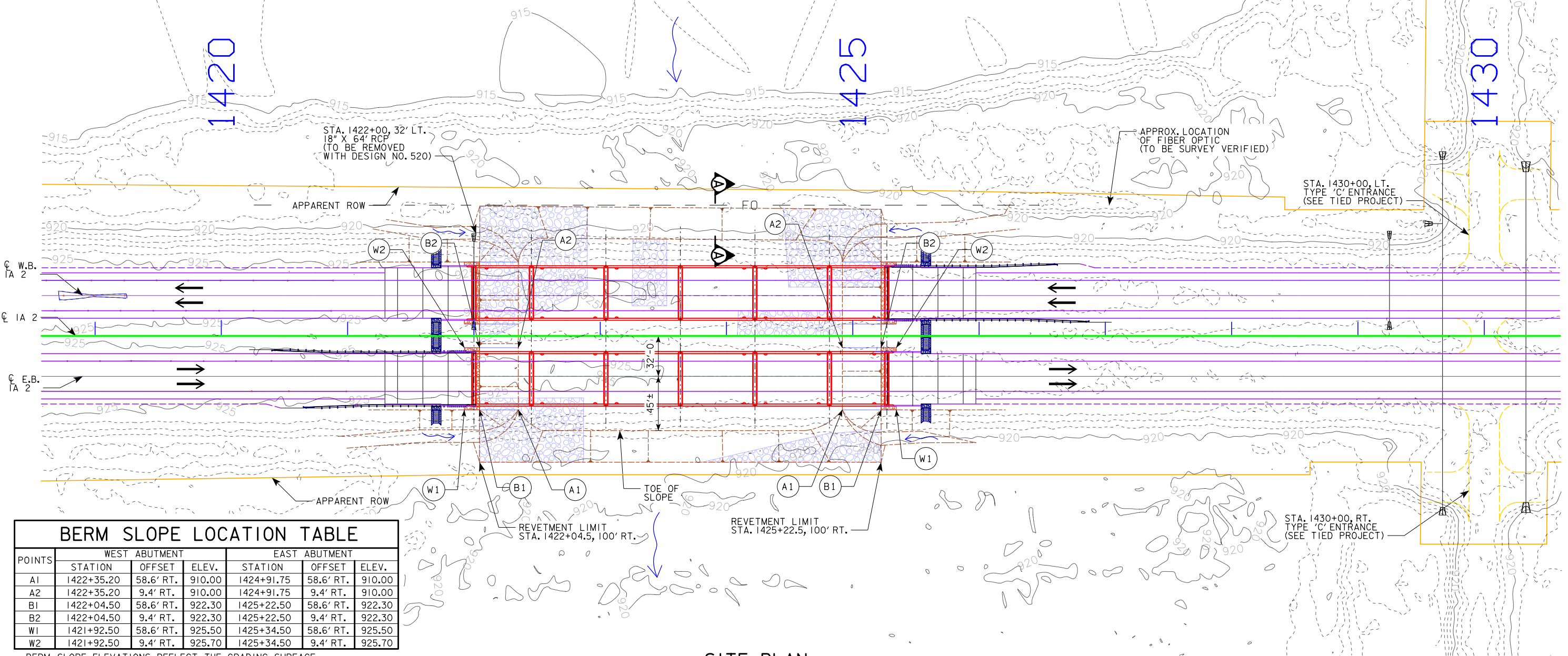




SECTION THRU EMBEDDED REVETMENT BERM



SECTION A-A THRU SIDE SLOPES



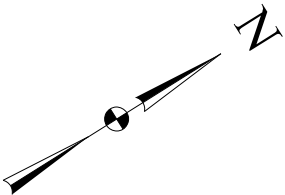
BERM SLOPE LOCATION TABLE						
POINTS	WEST ABUTMENT			EAST ABUTMENT		
	STATION	OFFSET	ELEV.	STATION	OFFSET	ELEV.
A1	1422+35.20	58.6' RT.	910.00	1424+91.75	58.6' RT.	910.00
A2	1422+35.20	9.4' RT.	910.00	1424+91.75	9.4' RT.	910.00
B1	1422+04.50	58.6' RT.	922.30	1425+22.50	58.6' RT.	922.30
B2	1422+04.50	9.4' RT.	922.30	1425+22.50	9.4' RT.	922.30
W1	1421+92.50	58.6' RT.	925.50	1425+34.50	58.6' RT.	925.50
W2	1421+92.50	9.4' RT.	925.70	1425+34.50	9.4' RT.	925.70

BERM SLOPE ELEVATIONS REFLECT THE GRADING SURFACE

ESTIMATED BERM ARMORING QUANTITIES					
LOCATION	REVTMENT CL. E (TON)	EROSION STONE (TON)	ENGINEERING FABRIC (SY)	EXCAVATION CL. 10 (CY)	EXCAVATION CL. 20 (CY)
BERM LINING - WEST ABUTMENT	1720	6.6	1920	6600	1200
BERM LINING - EAST ABUTMENT	1720	6.6	1920	6600	1200
TOTALS	3440	13.2	3840	13200	2400

EXCAVATION QUANTITY CALCULATED FROM EXISTING GROUND.
QUANTITIES INCLUDED WITH BRIDGE PLANS.

SITE PLAN



DESIGN FOR 0° SKEW

327'-0 x 40'-0 CONTINUOUS
CONCRETE SLAB E.B. BRIDGE

45'-6 END SPANS59'-0 INTERIOR SPANS

SITUATION PLAN - SITE

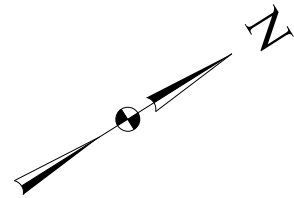
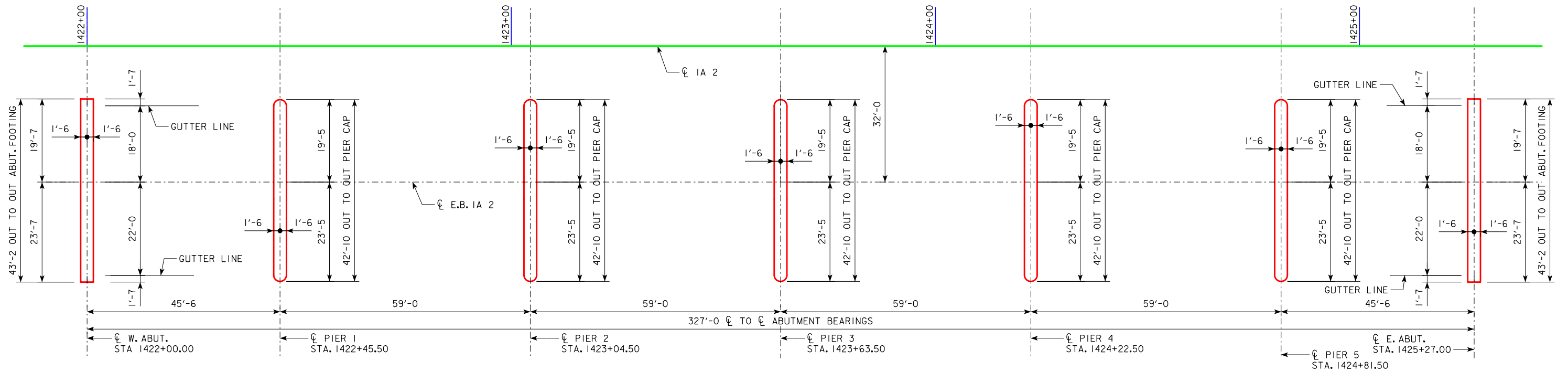
IA 2 STA. 1423+63.50, RT. 32.00'

MAY 2020

FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 5 OF 25FILE NO. 31911DESIGN NO. 420



STAKING DIAGRAM

BRIDGE COORDINATES

LOCATION	CL W. ABUT. BRG.	CL PIER 1	CL PIER 2	CL PIER 3	CL PIER 4	CL PIER 5	CL E. ABUT. BRG.
NORTH EDGE OF SLAB	N=6757308.615 E=16475774.577	N=6757346.165 E=16475800.273	N=6757394.855 E=16475833.593	N=6757443.546 E=16475866.913	N=6757492.237 E=16475900.233	N=6757540.927 E=16475933.553	N=6757578.477 E=16475959.249
CL APPROACH ROADWAY	N=6757297.556 E=16475790.738	N=6757335.105 E=16475816.434	N=6757383.796 E=16475849.754	N=6757432.487 E=16475883.074	N=6757481.177 E=16475916.394	N=6757529.868 E=16475949.714	N=6757567.417 E=16475975.410
SOUTH EDGE OF SLAB	N=6757284.237 E=16475810.201	N=6757321.787 E=16475835.897	N=6757370.477 E=16475869.217	N=6757419.168 E=16475902.537	N=6757467.859 E=16475935.857	N=6757516.549 E=16475969.177	N=6757554.099 E=16475994.873

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

327'-0 x 40'-0 CONTINUOUS
CONCRETE SLAB E.B. BRIDGE

45'-6 END SPANS59'-0 INTERIOR SPANS

STAKING DIAGRAM

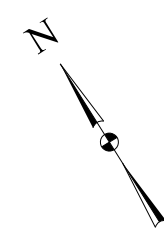
IA 2 STA. 1423+63.50, RT. 32.00'







FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

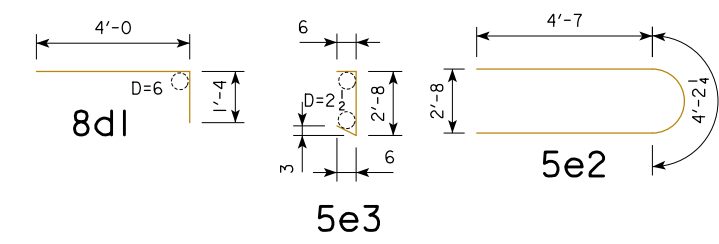
DESIGN SHEET NO. 6 OF 25FILE NO. 31911DESIGN NO. 420

MAY 2020



EPOXY COATED REINF. STEEL - ONE ENCASEMENT					
MARK	LOCATION	SHAPE	LENGTH	NO.	WEIGHT
8d1	ENCASEMENT TO CAP DOWELS		5'-4	60	854
5d2	ENCASEMENT, VERTICAL		16'-8	84	1460
5d3	ENCASEMENT, VERTICAL ENDS		16'-9	14	245
5e1	ENCASEMENT LONGITUDINAL		39'-6	36	1483
5e2	ENCASEMENT LONGITUDINAL, ENDS		13'-5	36	504
5e3	ENCASEMENT, TRANSVERSE TIES		3'-8	270	1033
REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)					5579

BENT BAR DETAILS



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

ESTIMATED QUANTITIES - ONE ENCASEMENT

LOCATION	UNIT	
STRUCTURAL CONCRETE (BRIDGE)	C.Y.	81.7
REINFORCING STEEL EPOXY COATED	LBS.	5579
STEEL PILING HP 10 X 57	NO.	15

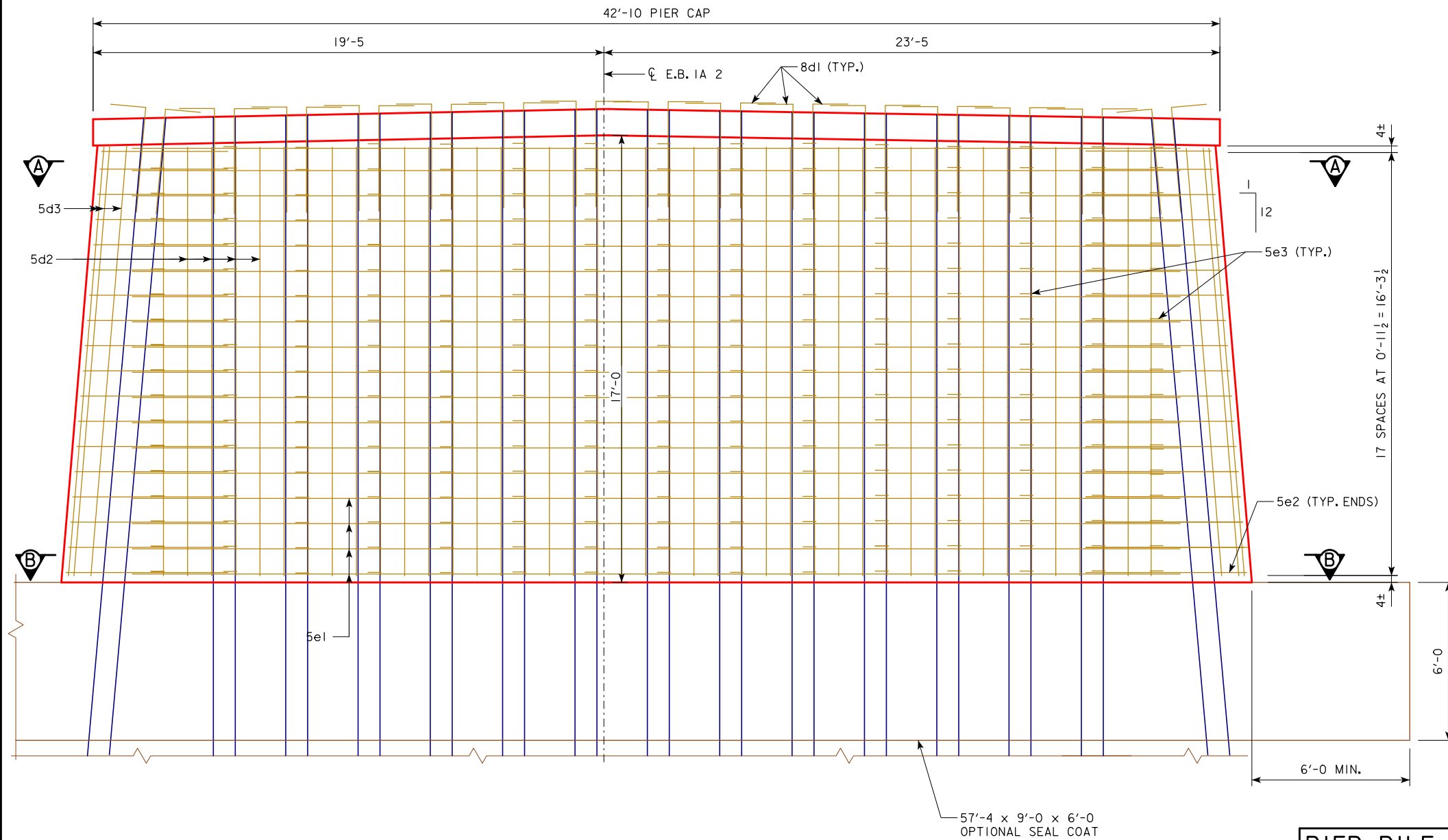
NOTE: CONCRETE AND REINFORCING QUANTITIES ARE INCLUDED ON THE SUMMARY QUANTITIES SHEET.

PILING NOTES:

15 - HP 10 X 57 STEEL PILING REQUIRED PER PIER.
PILE DIMENSIONS ARE TO TOP AND BOTTOM OF PILE ENCASEMENT.
BATTER PILING WHERE INDICATED 1:12 IN THE DIRECTION SHOWN.
ALL PILES LEVEL FOR 1'-0" EMBEDMENT INTO THE CAP.

NOTES:

1. SEE DESIGN SHEET 9 FOR VIEW B-B.
2. THE LUMP SUM BID ITEM, "EXCAVATE AND DEWATER" SHALL INCLUDE ALL COSTS ASSOCIATED WITH THE EXCAVATION AND DEWATERING REQUIRED TO CONSTRUCT THE PIER ENCASEMENTS IN THE DRY, IN ACCORDANCE WITH SECTION 2405, OF THE STANDARD SPECIFICATIONS. THE LENGTH AND WIDTH OF THE SEAL COAT WAS BASED ON THE REQUIRED ONE FOOT CLEARANCE BETWEEN THE TIP OF THE SHEET PILES AND THE BATTERED PILING. THE CONCRETE SEAL COAT, IF USED, SHALL BE 6.0 FEET THICK, BASED ON A WATER ELEVATION OF 920.0. IF THE WATER ELEVATION IS HIGHER THAN 920.0 AT THE TIME OF CONSTRUCTION, A LARGER SEAL COAT MAY BE REQUIRED TO MAINTAIN THE CLEARANCE BETWEEN THE SHEET PILES AND BATTERED PILING. THE BRIDGE ENGINEER SHALL BE NOTIFIED BEFORE USING A LARGER SEAL COAT.



PIER ELEVATION
(LOOKING EAST)

PIER PILE LENGTHS	
	(LIN. FT.)
PIER 1	90
PIER 2	90
PIER 3	95
PIER 4	90
PIER 5	80

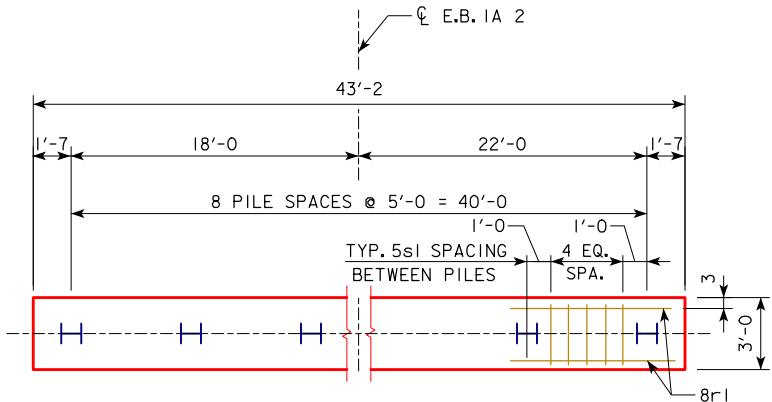
DESIGN FOR 0° SKEW
327'-0" x 40'-0" CONTINUOUS
CONCRETE SLAB E.B. BRIDGE
45'-6" END SPANS 59'-0" INTERIOR SPANS
PIER ENCASEMENT DETAILS
1A 2 STA. 1423+63.50, RT. 32.00' MAY 2020
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 7 OF 25 FILE NO. 31911 DESIGN NO. 420

ABUTMENT PILE DRIVING NOTES:

THE CONTRACT LENGTH OF 95 FEET (WEST ABUTMENT) AND 85 FEET (EAST ABUTMENT) PILES IS BASED ON A NON-COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 128 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.7 FOR ROCK END BEARING.

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

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR ABUTMENT PILES IS 110 TONS AT END OF DRIVE. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

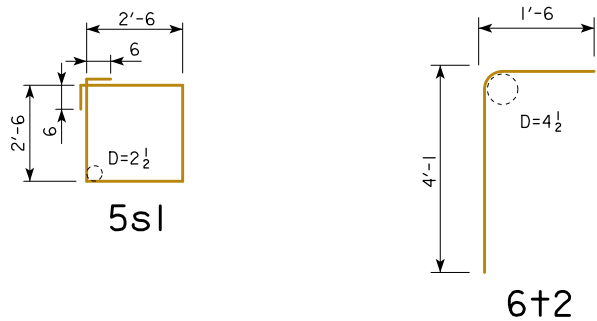


ABUTMENT PILING LAYOUT
(WEST ABUTMENT SHOWN, EAST ABUTMENT SIMILAR)

REINFORCING STEEL - ONE ABUT. FTG.

MARK	LOCATION	SHAPE	LENGTH	NO.	WEIGHT
8r1	ABUTMENT FOOTING LONGITUDINAL		42'-10"	7	801
5s1	ABUTMENT FOOTING HOOPS		11'-0"	44	505
6+1	FOOTING TO SLAB DOWELS		5'-0"	46	345
6+2	FOOTING TO SLAB DOWELS		5'-7"	46	386
#2	PILE SPIRAL		38'-6"	9	58
	SPIRAL SPACERS - L 7/8 X 7/8 X 1/8 X 0.70		1'-10"	27	35
REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)					2130

BENT BAR DETAILS

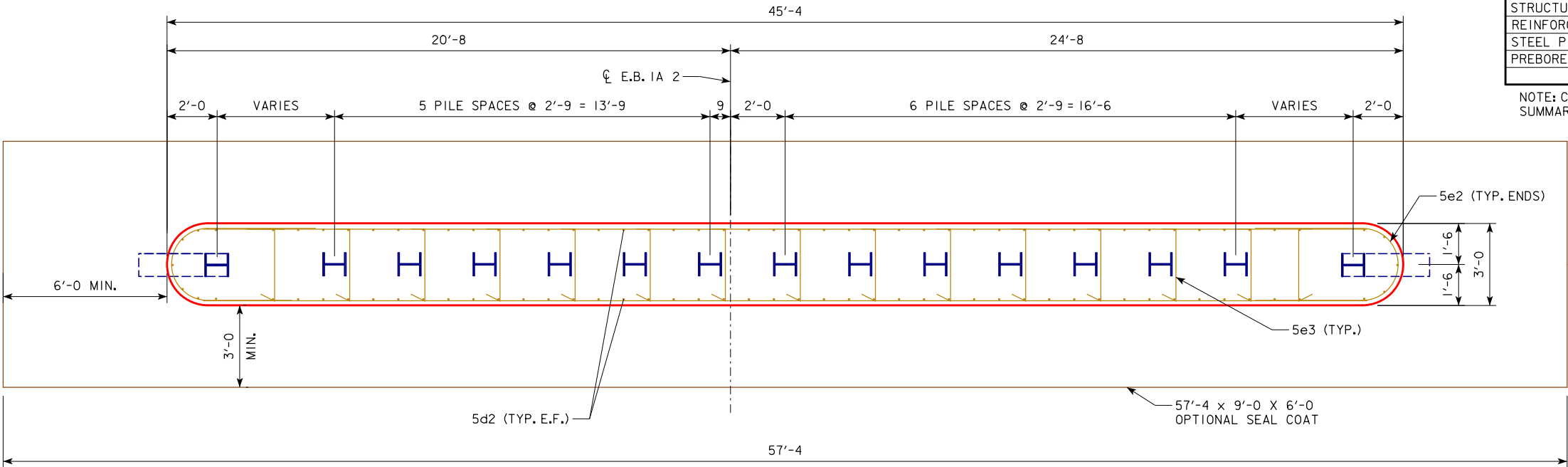


NOTE: DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

ESTIMATED QUANTITIES - ONE ABUT. FTG.

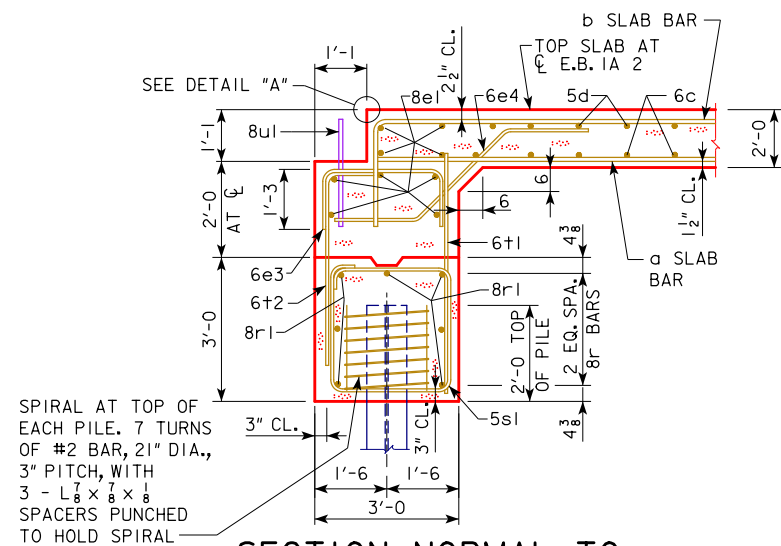
LOCATION	UNIT	
STRUCTURAL CONCRETE (BRIDGE)	C.Y.	14.4
REINFORCING STEEL EPOXY COATED	LBS.	2130
STEEL PILING HP 10 X 57	NO.	9
PREBORE HOLES	FT.	90

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

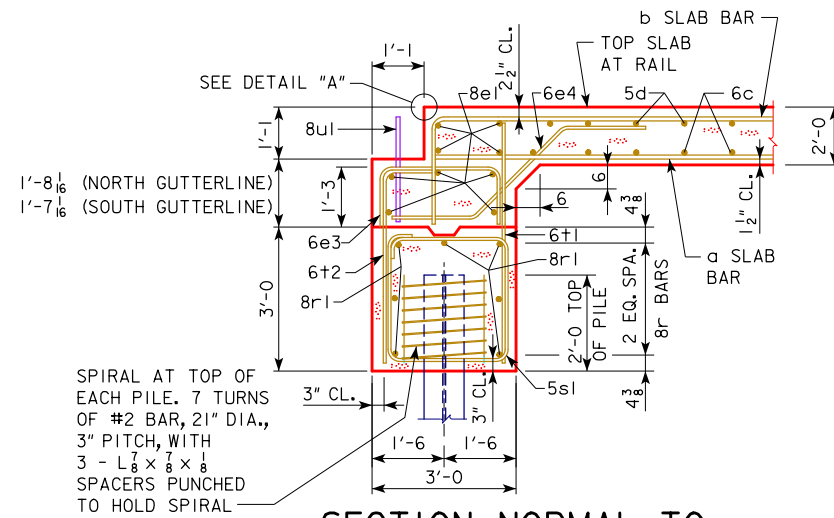


PIER ENCASEMENT
VIEW B-B

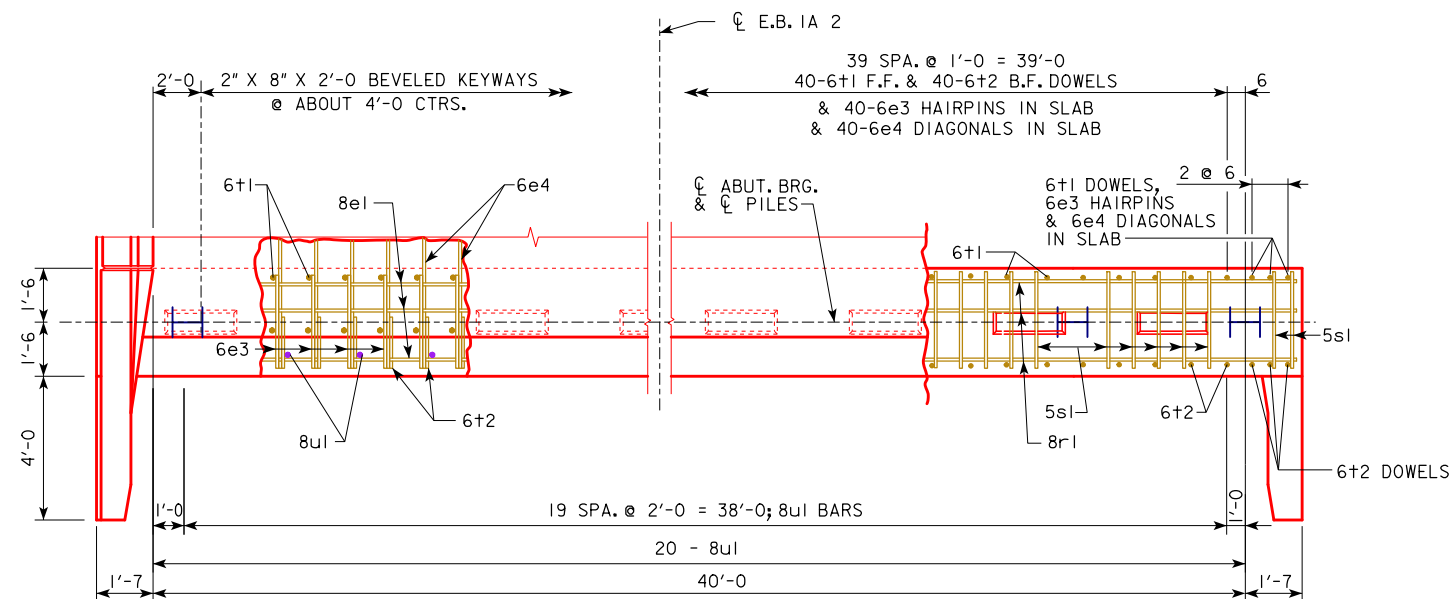
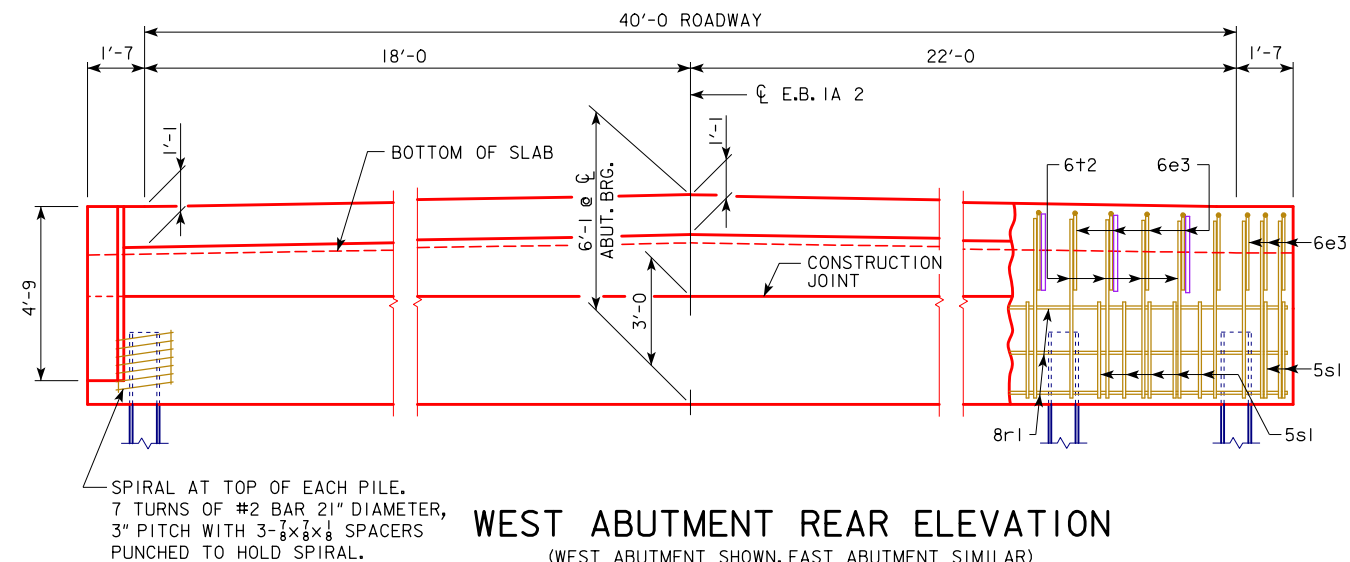
DESIGN FOR 0° SKEW
**327'-0 x 40'-0 CONTINUOUS
CONCRETE SLAB E.B. BRIDGE**
45'-6 END SPANS 59'-0 INTERIOR SPANS
SUBSTRUCTURE DETAILS
1A 2 STA. 1423+63.50, RT. 32.00' MAY 2020
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 9 OF 25 FILE NO. 31911 DESIGN NO. 420



SECTION NORMAL TO ABUTMENT AT CL E.B. 1A 2



SECTION NORMAL TO ABUTMENT AT GUTTERLINE



NOTE: WING REINFORCING AND RAIL NOT SHOWN.
8e1, 6e3, 6e4 AND 8u1 ARE INCLUDED WITH SUPERSTRUCTURE QUANTITIES.

ABUTMENT NOTES:

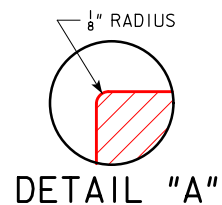
ALL PILING ARE HP 10 X 57.

THE CONCRETE AND REINFORCING STEEL FOR THE WINGS IS INCLUDED WITH THE SUPERSTRUCTURE.

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

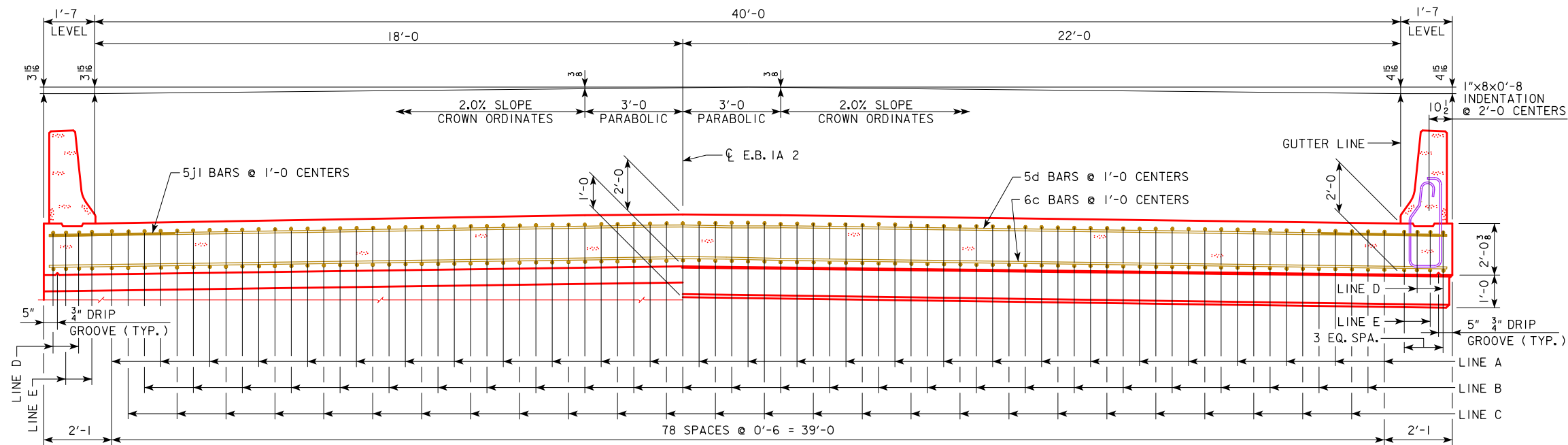
STEEL ABUTMENT PILES SHALL BE DRIVEN TO FULL PENETRATION IF PRACTICABLE BUT IN NO CASE TO A BEARING VALUE LESS THAN SHOWN IN DESIGN PLANS.

ABUTMENT PILING WAS DESIGNED FOR HL-93 LOADING WITH AN ALLOWANCE FOR 20 LBS. PER SQ. FT. FUTURE WEARING SURFACE.



DESIGN FOR 0° SKEW	
327'-0 x 40'-0 CONTINUOUS CONCRETE SLAB E.B. BRIDGE	
45'-6 END SPANS	59'-0 INTERIOR SPANS
ABUTMENT DETAILS	
1A 2 STA. 1423+63.50, RT. 32.00'	
FREMONT COUNTY	
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION	
DESIGN SHEET NO. 10 OF 25	FILE NO. 31911
MAY 2020	
DESIGN NO. 420	

REVISED 07-16 DATE ON SHEET CHANGED TO CORRECT CLERICAL ERROR.



HALF SECTION NEAR ABUTMENT

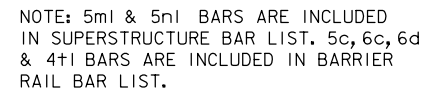
NOTE: TOP LONGITUDINAL REINFORCING STEEL IS TO BE PARALLEL TO AND $2\frac{1}{2}$ " CLEAR BELOW TOP OF SLAB. BOTTOM LONGITUDINAL REINFORCING STEEL IS TO BE PARALLEL TO AND $1\frac{1}{2}$ " CLEAR ABOVE BOTTOM OF SLAB. REINFORCING STEEL IS TO BE SECURELY WIRED IN PLACE AND ADEQUATELY SUPPORTED ON BAR CHAIRS BEFORE CONCRETE IS POURED. I.M. 451.01 REQUIREMENTS SHALL APPLY FOR BAR CHAIRS.

HALF SECTION NEAR PIER

SLAB CROSS-SECTIONAL AREA
= 86.38 SQ. FT.

- NOTES:
1. SEE DESIGN SHEET 13 FOR TRANSVERSE REINFORCING LAYOUT.
 2. SEE DESIGN SHEET 14 FOR PLACEMENT FOR LONGITUDINAL REINFORCING.
 3. SEE DESIGN SHEET 15 FOR BAR LIST AND BENT BAR DETAILS.
 4. SEE DESIGN SHEET 18 FOR CAMBER DIAGRAM.

DESIGN FOR 0° SKEW
**327'-0 x 40'-0 CONTINUOUS
CONCRETE SLAB E.B. BRIDGE**
45'-6 END SPANS 59'-0 INTERIOR SPANS
SUPERSTRUCTURE DETAILS
1A 2 STA. 1423+63.50, RT. 32.00' MAY 2020
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 11 OF 25 FILE NO. 31911 DESIGN NO. 420



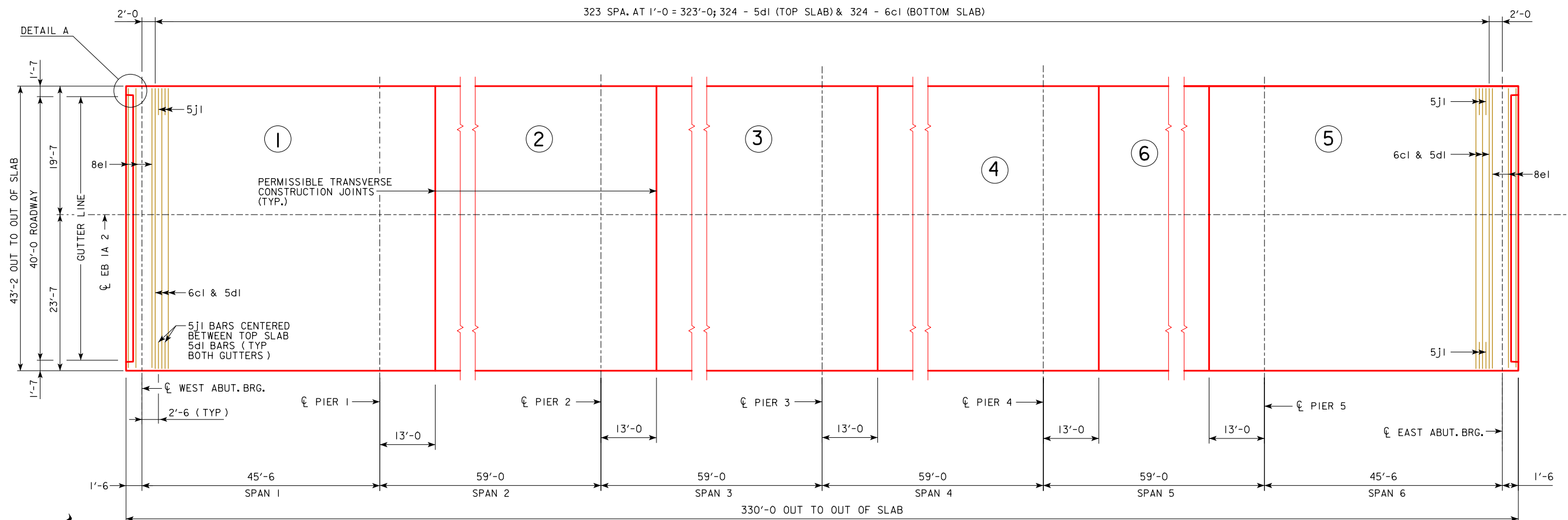
COST OF FURNISHING AND PLACING 3" ϕ PVC PIPE IN EACH WING IS INCLUDED IN THE PRICE BID FOR STRUCTURAL CONCRETE.

TOP MAT OF REINFORCING STEEL IS TO BE SUPPORTED BY INDIVIDUAL BAR CHAIRS SPACED AT NOT MORE THAN 3'-0" CENTERS LONGITUDINALLY AND TRANSVERSELY. THE BOTTOM MAT OF 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 SLAB BOLSTERS SPACED 4'-0" APART. I.M. 451.01 REQUIREMENTS SHALL APPLY FOR BAR CHAIRS, BAR HIGH CHAIRS, AND SLAB BOLSTERS.



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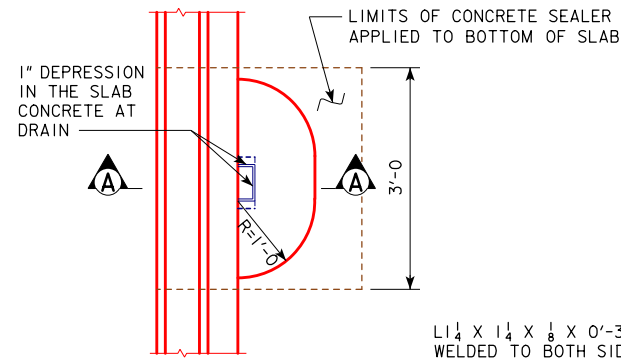
REVISED 07-09 - CHANGED THE DRAIN ANGLES DETAILS ON SECTION A-A.



TRANSVERSE REINFORCING STEEL LAYOUT

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

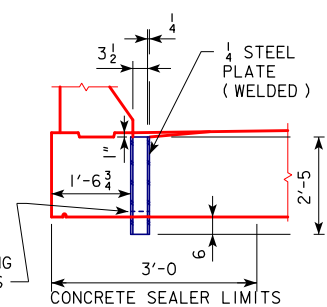
NOTE:
TRANSVERSE SLAB REINFORCING MAY BE SPLICED WITH ONE LAP LOCATED AT CENTERLINE OF ROADWAY. PAYMENT FOR REINFORCING BARS SHALL BE BASED ON NO SPLICES, AND NO ALLOWANCE SHALL BE MADE FOR THE ADDITIONAL LENGTH OF BAR REQUIRED FOR THE USE OF SPLICES. MINIMUM LAP LENGTH FOR 6cl BARS IS 1'-8, AND MINIMUM LAP LENGTH FOR 5dl BARS IS 2'-0.



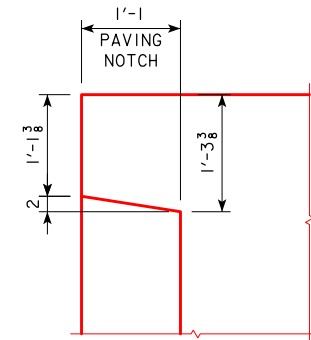
PART PLAN

NOTE: 4" X 8" OUTSIDE DIMENSION ROLLED TUBE WITH 1/4" WALL THICKNESS MAY BE SUBSTITUTED FOR THE WELDED DRAIN SHOWN.

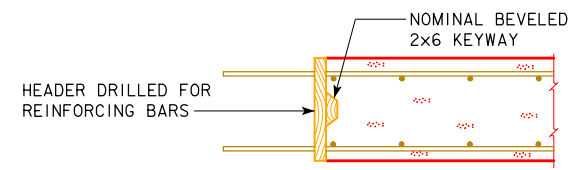
1 1/2" X 1 1/4" X 1/8" X 0'-3"
WELDED TO BOTH SIDES
OF DRAIN WITH 2-1/4" Ø
HOLES IN EACH OUTSTANDING
LEG FOR NAILING TO FORMS



SECTION A-A



DETAIL A



TRANSVERSE CONSTR. JOINT

NOTE:
SEE DESIGN SHEET 14 FOR PLACEMENT OF LONGITUDINAL REINFORCING

FLOOR DRAIN DETAILS

SEE SITUATION PLAN FOR DRAIN LAYOUT
(DRAIN WEIGHT = 48 LBS EACH)

NOTE: DRAINS ARE TO BE GALVANIZED. INCLUDE COST OF DRAINS
IN PRICE BID FOR "HIGH PERFORMANCE STRUCTURAL CONCRETE". 16 DRAINS REQUIRED.

DESIGN FOR 0° SKEW
**327'-0" x 40'-0" CONTINUOUS
CONCRETE SLAB E.B. BRIDGE**
45'-6" END SPANS 59'-0" INTERIOR SPANS
SUPERSTRUCTURE DETAILS
1A 2 STA. 1423+63.50, RT. 32.00' MAY 2020
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 13 OF 25 FILE NO. 31911 DESIGN NO. 420

EPOXY COATED REINFORCING

[illegible]


NOTE:
CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED
ON THE SUMMARY QUANTITIES SHEET.
INCLUDES 4 ABUTMENT WINGS @ 0.68 C.Y. EACH, EXCLUDES RAIL CONCRETE.

LOCATION	QUANTITY
SECTION 1, SLAB, ABUT. DIAPH., ABUT. WINGS, & PIER CAP	200.7
SECTION 2, SLAB & PIER CAP	193.7
SECTION 3, SLAB & PIER CAP	193.7
SECTION 4, SLAB & PIER CAP	193.7
SECTION 5, SLAB, ABUT. DIAPH., ABUT. WINGS, & PIER CAP	200.7
SECTION 6, SLAB	105.6
TOTAL (CU. YDS.)	1088.1

Figure 1 displays five diagrams illustrating various pipe configurations and dimensions:

- 8h2:** A U-shaped pipe with a vertical offset of $3'-10\frac{3}{4}"$, a horizontal offset of $5'-3"$, and a vertical dimension of $2'-6\frac{3}{4}"$. The horizontal distance is $8h2$.
- 6e3:** A pipe with a vertical offset of $2'-6"$, a horizontal offset of $1'-3"$, and a vertical dimension of $1'-3"$. The horizontal distance is $6e3$.
- 5h1:** A pipe with a vertical offset of $2'-6"$, a horizontal offset of $2'-8"$, and a vertical dimension of $2'-5"$. The horizontal distance is $5h1$.
- 8b2, 7b7, 6b8, & 6b9:** A pipe with a vertical offset of $2'-3"$, a horizontal offset of $2'-3"$, and a vertical dimension of $2'-3"$. The horizontal distance is $8b2, 7b7, 6b8, \& 6b9$.
- 5n3:** A pipe with a vertical offset of $10\frac{3}{4}"$, a horizontal offset of $10\frac{5}{8}"$, a vertical dimension of $2'-0"$, and a horizontal distance of $3'-9\frac{1}{2}"$. The horizontal distance is $5n3$.
- 6e4:** A pipe with a vertical offset of $1'-6"$, a horizontal offset of $2'-0\frac{3}{4}"$, and a vertical dimension of $2'-0\frac{3}{4}"$. The horizontal distance is $6e4$.

STAINLESS STEEL REINFORCING FOR SUPERSTRUCTURE

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
8u1	ABUTMENT PAVING NOTCH BAR		40	2'-1	223
REINFORCING STEEL STAINLESS STEEL - TOTAL (LBS.)					223

REVISED 07-09 - OPEN RAIL REINF. QTYS. CHANGED WHICH CHANGED TOTAL REINF. QTYS.

DESIGN TEAM Stanley Consultants Inc.

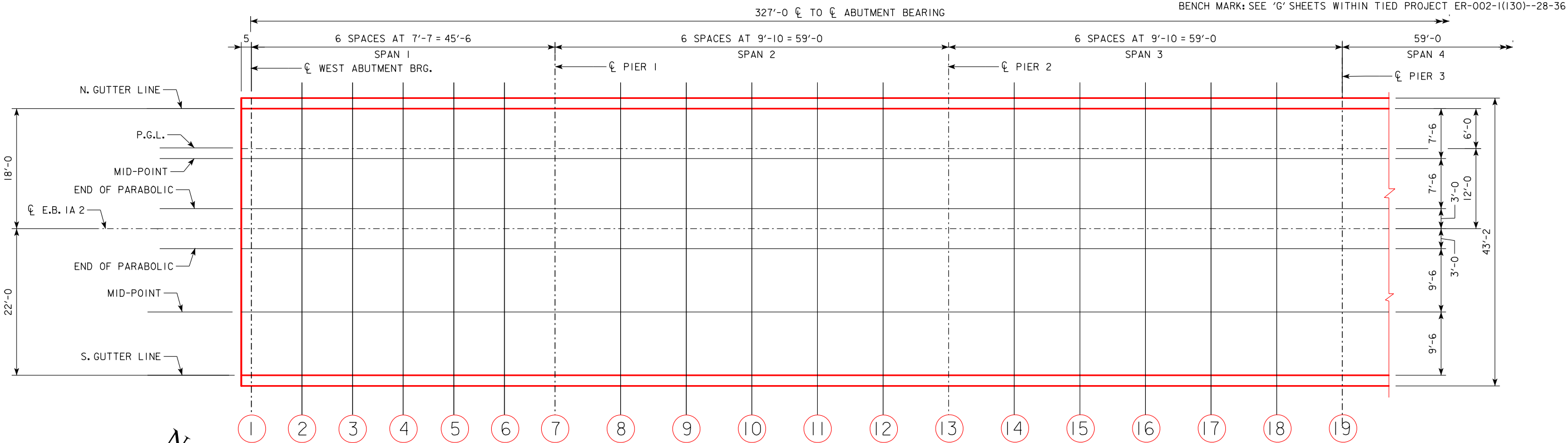
FREMONT COUNTY

PROJECT NUMBER ER-002-1(135)--28-36

SHEET NUMBER 16

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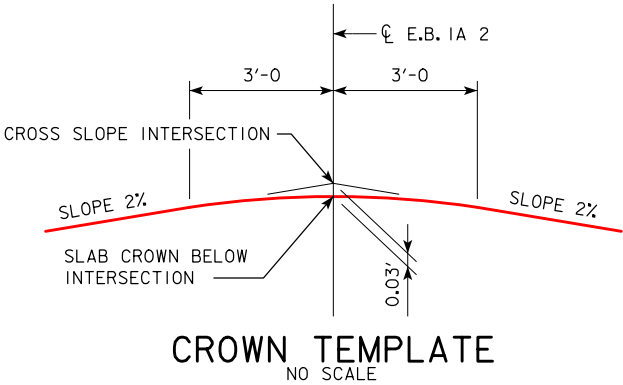
DESIGN FOR 0° SKEW
327'-0" x 40'-0" CONTINUOUS
CONCRETE SLAB E.B. BRIDGE
45'-6" END SPANS 59'-0" INTERIOR SPANS
SUPERSTRUCTURE QUANTITIES
IA 2 STA. 1423+63.50, RT. 32.00' MAY 2020
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 15 OF 25 FILE NO. 31911 DESIGN NO. 420



TOP OF SLAB PLAN (SPAN 1, SPAN 2 & SPAN 3)

TOP OF SLAB ELEVATIONS

	CL WEST ABUT.BRG.						CL PIER 1 BEARING						CL PIER 2 BEARING						CL PIER 3 BEARING
LOCATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
N. GUTTER LINE	926.03	926.06	926.08	926.11	926.13	926.16	926.19	926.24	926.28	926.33	926.38	926.42	926.45	926.48	926.51	926.53	926.54	926.55	926.55
MID-POINT	926.18	926.21	926.23	926.26	926.28	926.31	926.34	926.39	926.43	926.48	926.53	926.57	926.60	926.63	926.66	926.68	926.69	926.70	926.70
END OF PARABOLIC	926.33	926.36	926.38	926.41	926.43	926.46	926.49	926.54	926.58	926.63	926.68	926.72	926.75	926.78	926.81	926.83	926.84	926.85	926.85
CL E.B. 1A 2	926.36	926.38	926.41	926.44	926.46	926.49	926.52	926.57	926.61	926.66	926.71	926.75	926.78	926.81	926.84	926.86	926.87	926.88	926.88
END OF PARABOLIC	926.33	926.36	926.38	926.41	926.43	926.46	926.49	926.54	926.58	926.63	926.68	926.72	926.75	926.78	926.81	926.83	926.84	926.85	926.85
MID-POINT	926.14	926.17	926.19	926.22	926.24	926.27	926.30	926.35	926.39	926.44	926.49	926.53	926.56	926.59	926.62	926.64	926.65	926.66	926.66
S. GUTTER LINE	925.95	925.98	926.00	926.03	926.05	926.08	926.11	926.16	926.20	926.25	926.30	926.34	926.37	926.40	926.43	926.45	926.46	926.47	926.47



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

DESIGN FOR 0° SKEW

**327'-0" x 40'-0" CONTINUOUS
CONCRETE SLAB E.B. BRIDGE**

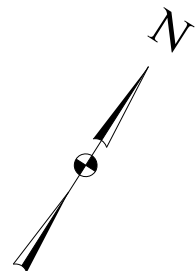
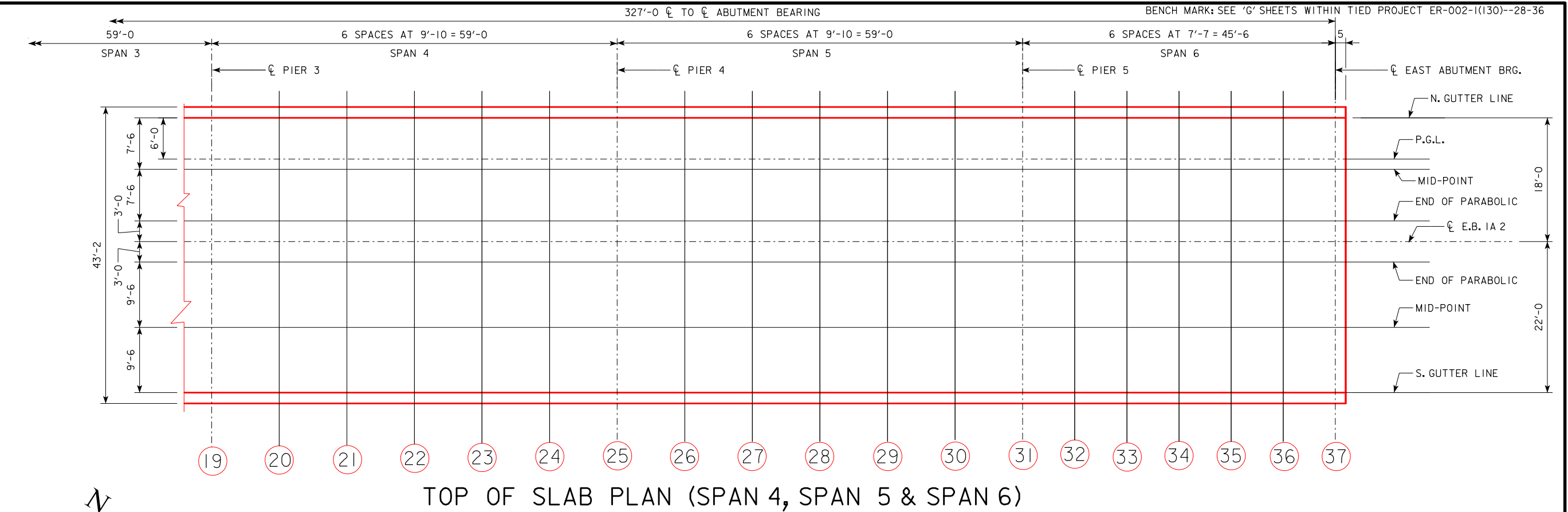
45'-6" END SPANS 59'-0" INTERIOR SPANS

TOP OF SLAB ELEVATIONS

1A 2 STA. 1423+63.50, RT. 32.00' MAY 2020

FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 16 OF 25 FILE NO. 31911 DESIGN NO. 420



TOP OF SLAB ELEVATIONS																			
LOCATION	ϕ PIER 3 BEARING						ϕ PIER 4 BEARING						ϕ PIER 5 BEARING						ϕ EAST ABUT.BRG.
N. GUTTER LINE	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
MID-POINT	926.55	926.55	926.55	926.53	926.52	926.49	926.46	926.43	926.39	926.34	926.30	926.25	926.21	926.18	926.15	926.12	926.09	926.07	926.04
END OF PARABOLIC	926.70	926.70	926.70	926.68	926.67	926.64	926.61	926.58	926.54	926.49	926.45	926.40	926.36	926.33	926.30	926.27	926.24	926.22	926.19
ϕ E.B. 1A 2	926.85	926.85	926.85	926.83	926.82	926.79	926.76	926.73	926.69	926.64	926.60	926.55	926.51	926.48	926.45	926.42	926.39	926.37	926.34
END OF PARABOLIC	926.88	926.88	926.87	926.86	926.84	926.82	926.79	926.76	926.72	926.67	926.63	926.58	926.54	926.50	926.47	926.45	926.42	926.39	926.37
MID-POINT	926.85	926.85	926.85	926.83	926.82	926.79	926.76	926.73	926.69	926.64	926.60	926.55	926.51	926.48	926.45	926.42	926.39	926.37	926.34
S. GUTTER LINE	926.66	926.66	926.66	926.64	926.63	926.60	926.57	926.54	926.50	926.45	926.41	926.36	926.32	926.29	926.26	926.23	926.20	926.18	926.15
	926.47	926.47	926.47	926.45	926.44	926.41	926.38	926.35	926.31	926.26	926.22	926.17	926.13	926.10	926.07	926.04	926.01	925.99	925.96

NOTE:
SEE DESIGN SHEET 16 FOR CROWN TEMPLATE DETAIL.

DESIGN FOR 0° SKEW

327'-0" x 40'-0" CONTINUOUS
CONCRETE SLAB E.B. BRIDGE

45'-6" END SPANS59'-0" INTERIOR SPANS

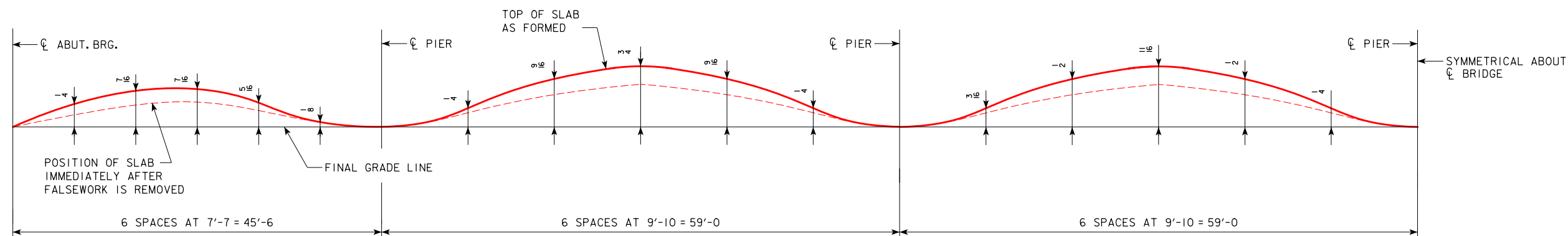
TOP OF SLAB ELEVATIONS

1A 2 STA. 1423+63.50, RT. 32.00' MAY 2020

FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 17 OF 25FILE NO. 31911DESIGN NO. 420



FORM CAMBER DIAGRAM

THIS DIAGRAM SHOWS THE FORM CAMBER REQUIRED TO COMPENSATE FOR THE ANTICIPATED ULTIMATE DEAD LOAD DEFLECTION. THE ABOVE DIMENSIONS DO NOT INCLUDE ANY ALLOWANCE FOR FORM DEFLECTION OR FALSEWORK SETTLEMENT.

DESIGN FOR 0° SKEW

**327'-0 x 40'-0 CONTINUOUS
CONCRETE SLAB E.B. BRIDGE**

45'-6 END SPANS 59'-0 INTERIOR SPANS

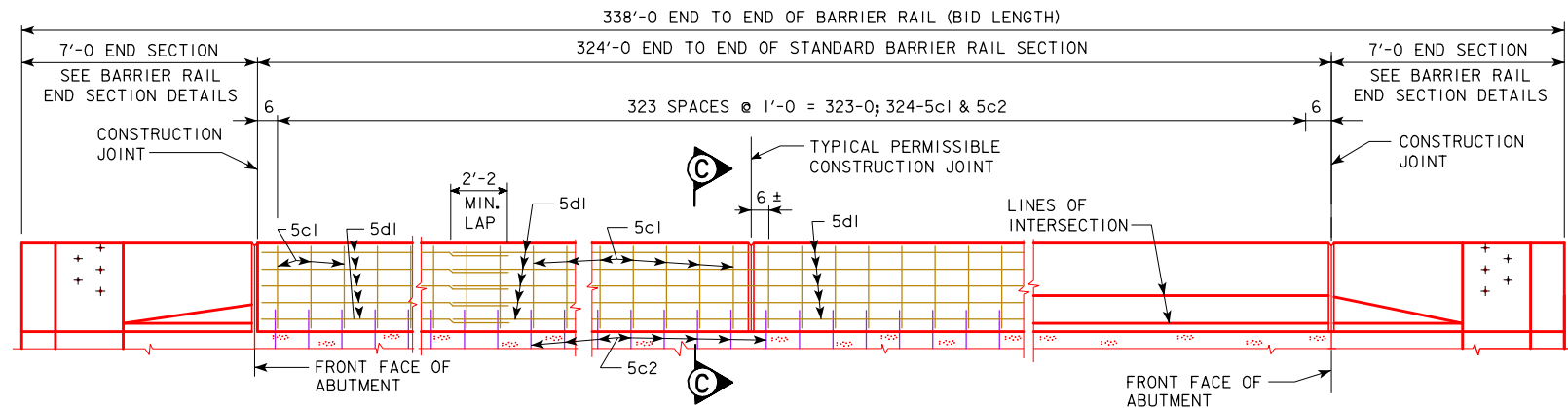
CAMBER DIAGRAM

IA 2 STA. 1423+63.50, RT. 32.00' MAY 2020

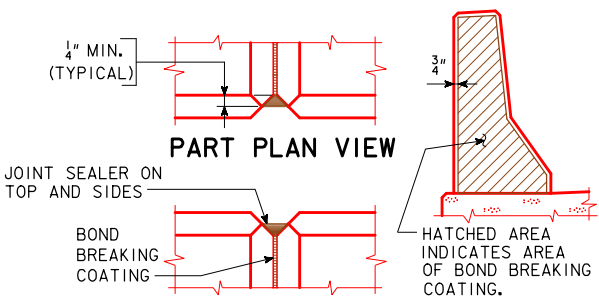
FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 18 OF 25 FILE NO. 31911 DESIGN NO. 420



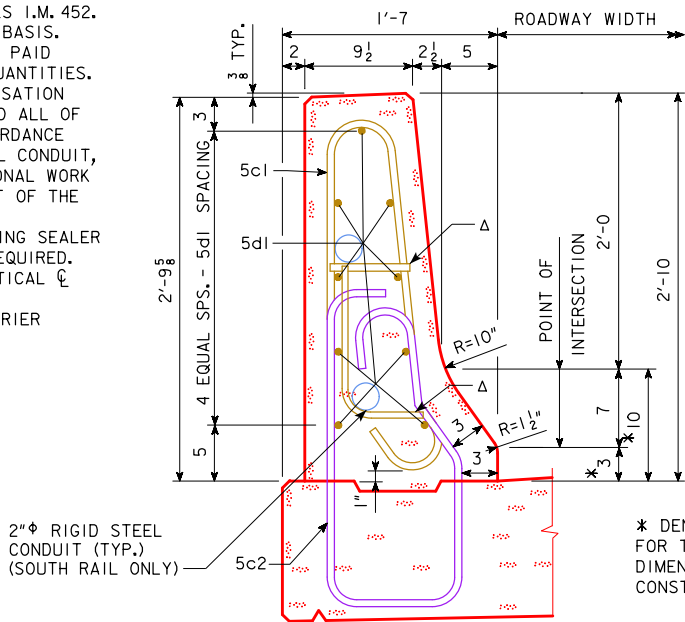
ELEVATION OF BARRIER RAIL LAYOUT



PART ELEVATION VIEW
BARRIER RAIL JOINT DETAILS

BARRIER RAIL NOTES:

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



PART SECTION C-C

Δ NOTE: CONDUIT SUPPORT BAR DETAILS AND QUANTITIES ARE ON DESIGN SHEET 21 (SOUTH BARRIER RAIL ONLY)

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

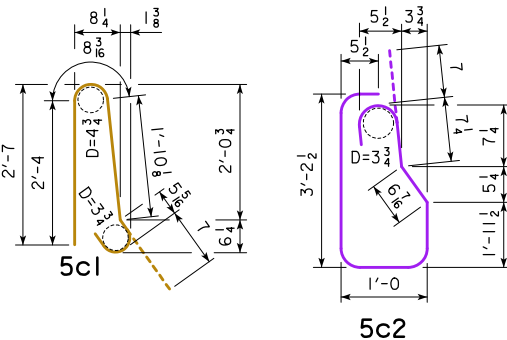
EPOXY COATED REINF. STEEL - TWO RAILS

SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STANDARD SECTIONS	5c1	RAIL, VERTICAL	⏏	648	5'-11"	3998
	5dl	RAIL, LONGITUDINAL	—	162	38'-2"	6448
EPOXY STEEL TOTAL (LBS.)						10446

STAINLESS STEEL REINF. STEEL - TWO RAILS

SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STD. SECTS.	5c2	RAIL, VERTICAL	⏏	648	8'-5"	5688
STAINLESS STEEL TOTAL (LBS.)						5688

BENT BAR DETAILS



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

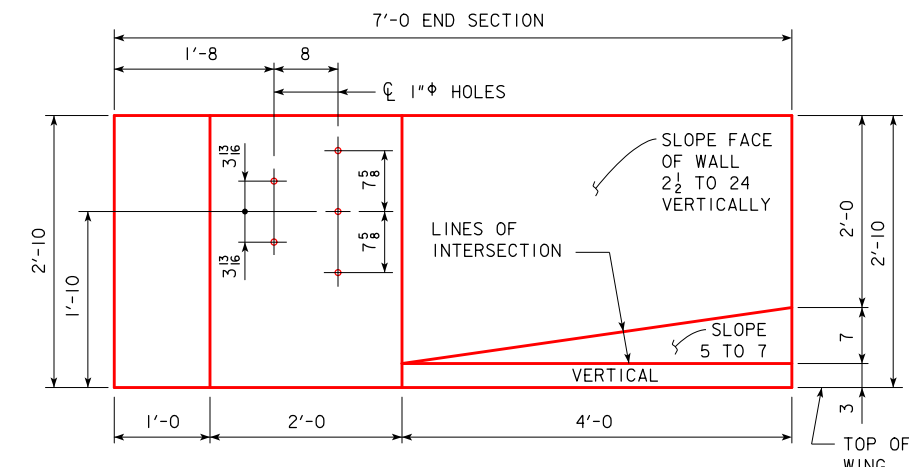
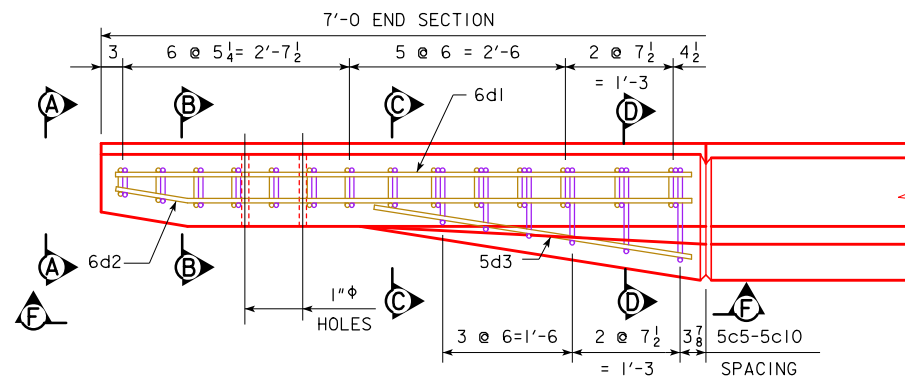
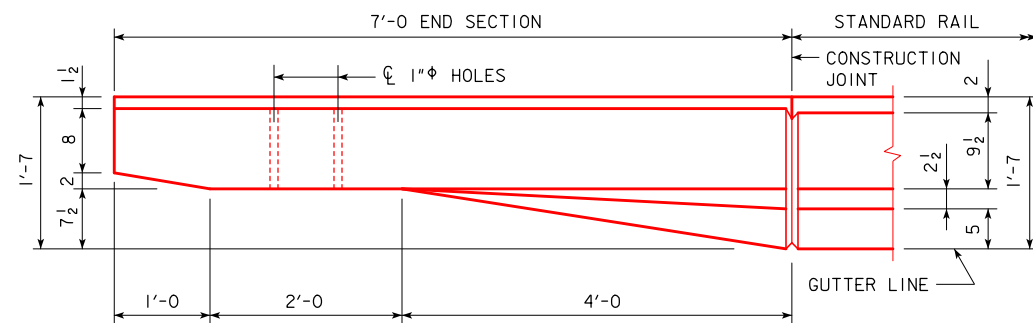
CONCRETE PLACEMENT SUMMARY

SECTION	TOTAL
NORTH RAIL STANDARD SECTION 324'-0" @ 0.1052 CU. YD. PER FT.	34.1
SOUTH RAIL STANDARD SECTION 324'-0" @ 0.1052 CU. YD. PER FT.	34.1
TOTAL (CU. YD.)	68.2

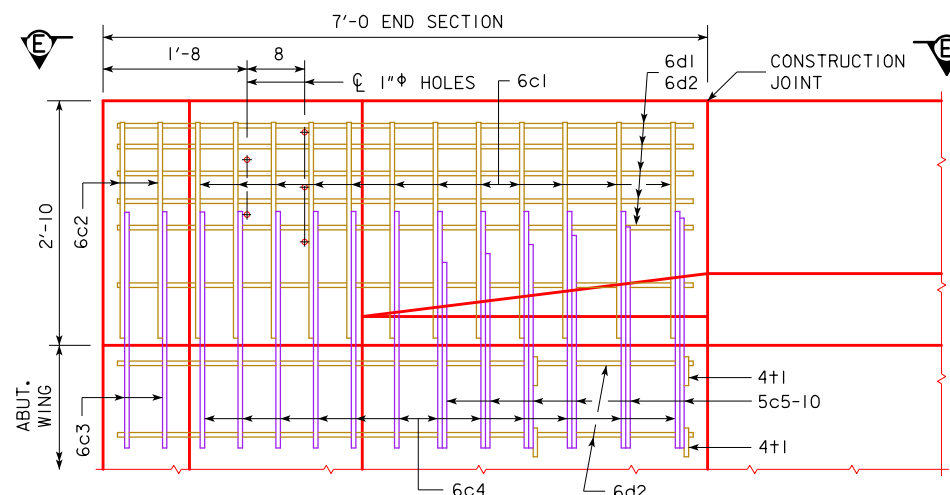
CONCRETE BARRIER RAIL QUANTITIES

ITEM	UNIT	QUANTITY
CONCRETE BARRIER RAILING 2 @ 338'-0"	L.F.	676.0

DESIGN FOR 0° SKEW
327'-0" x 40'-0" CONTINUOUS
CONCRETE SLAB E.B. BRIDGE
45'-6" END SPANS 59'-0" INTERIOR SPANS
BARRIER RAIL DETAILS
IA 2 STA. 1423+63.50, RT. 32.00'
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 19 OF 25 FILE NO. 31911 DESIGN NO. 420



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



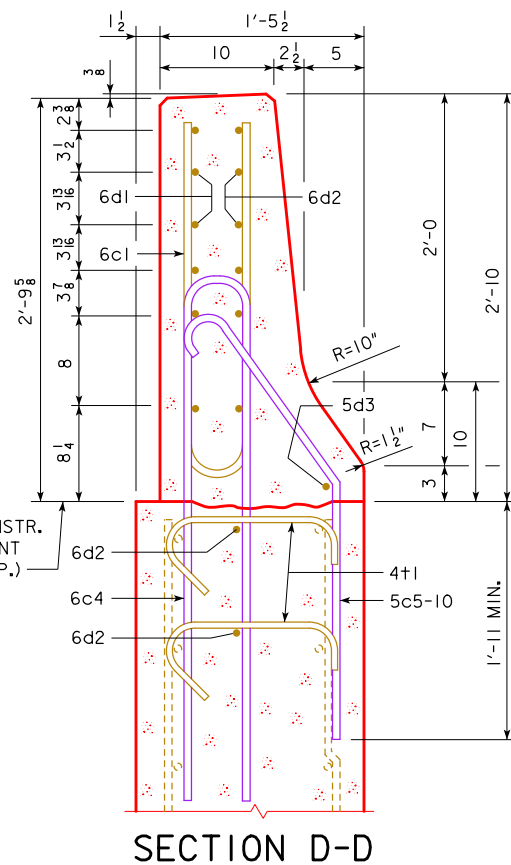
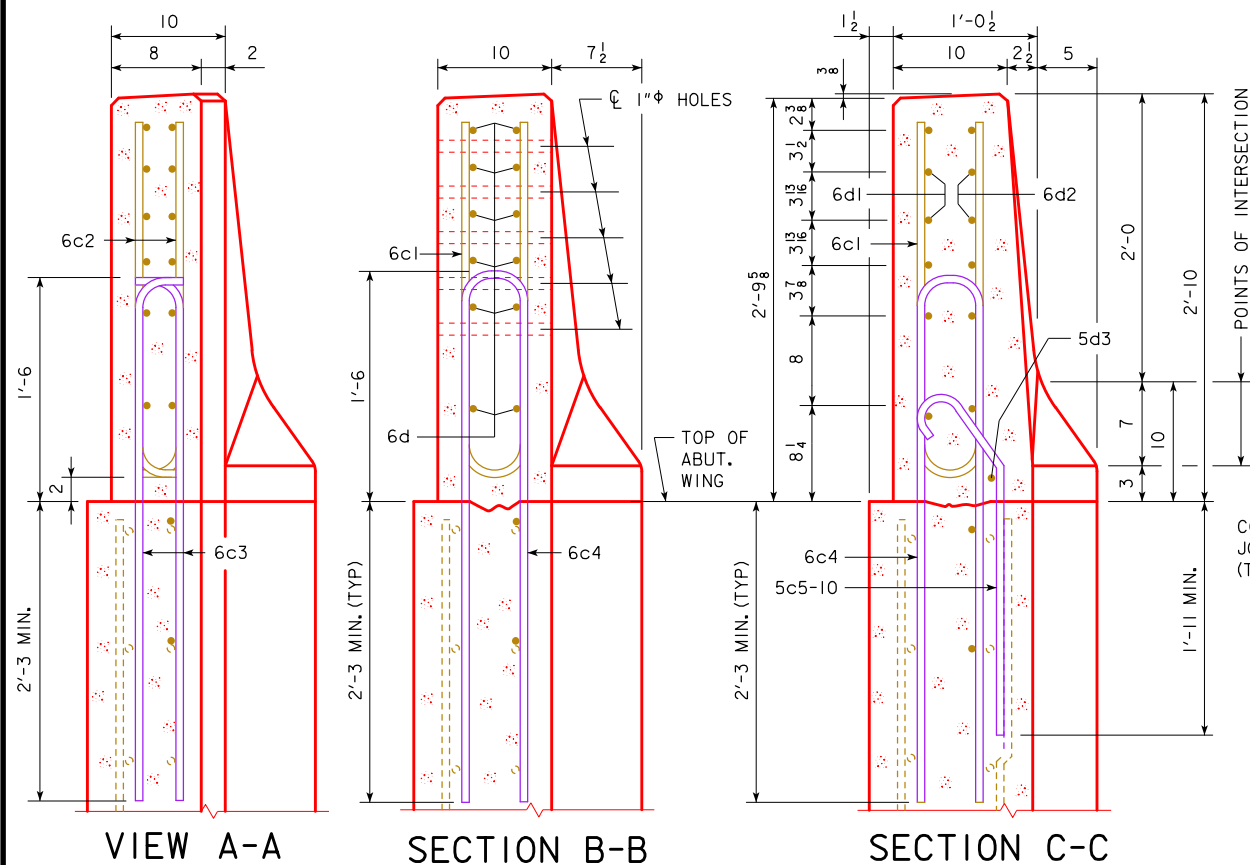
NOTE:
4+1 PLACEMENT- 2 BARS EACH
LEVEL OF 6d2 IN WING FOOTING.

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







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

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



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



EPOXY COATED REINF. STEEL - ONE END SECT.

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

STAINLESS STEEL REINF. STEEL - ONE END SECT.

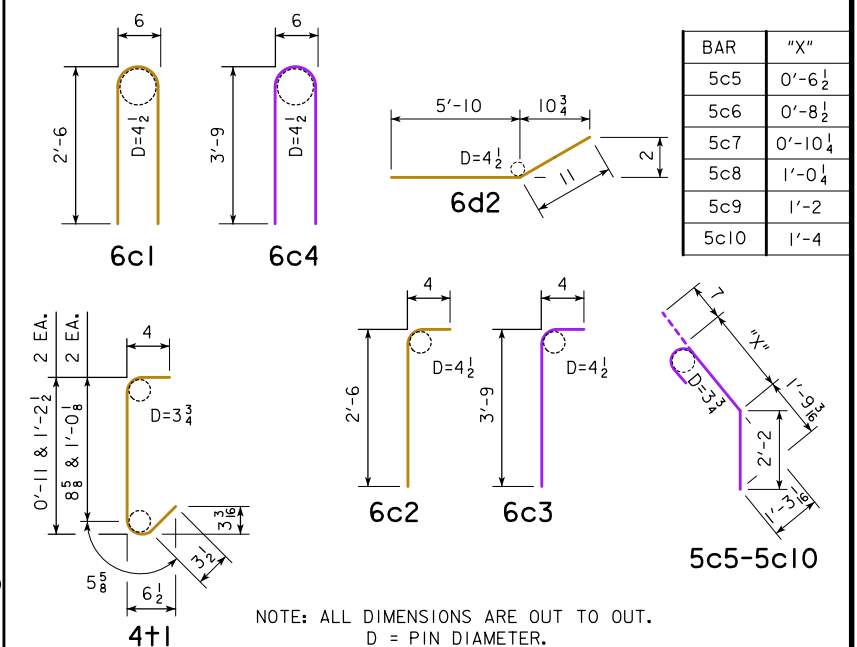
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6c3	RAIL, VERTICAL		4	4'-1	25
6c4	RAIL, VERTICAL		12	8'-0	144
5c5-10	RAIL, VERTICAL		6	VARIES	23
STAINLESS STEEL TOTAL WEIGHT (LBS.)					192

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

CONCRETE PLACEMENT SUMMARY

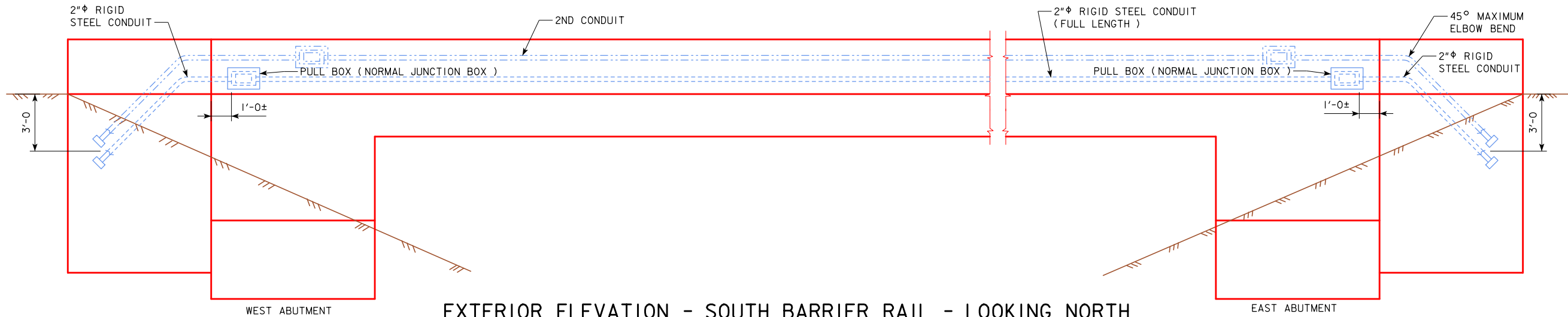
SECTION	TOTAL
BARRIER RAIL ONE END SECTION	0.65 CU. YD.

BENT BAR DETAILS



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

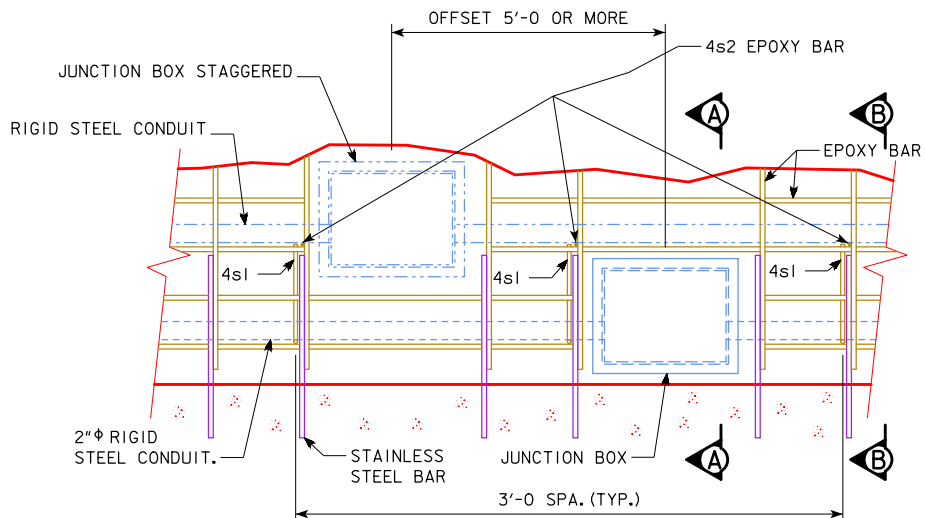
DESIGN FOR 0° SKEW
327'-0" x 40'-0" CONTINUOUS
CONCRETE SLAB E.B. BRIDGE
45'-6" END SPANS 59'-0" INTERIOR SPANS
BARRIER RAIL END SECTION DETAILS
1A 2 STA. 1423+63.50, RT. 32.00' MAY 2020
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 20 OF 25 FILE NO. 31911 DESIGN NO. 420



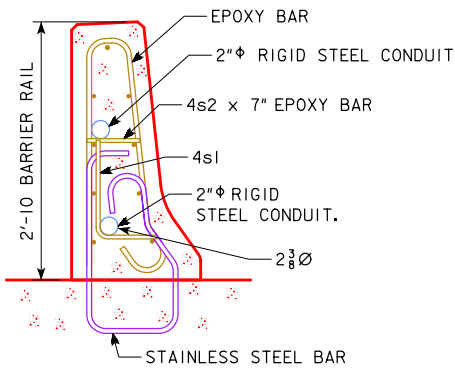
EXTERIOR ELEVATION - SOUTH BARRIER RAIL - LOOKING NORTH

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.



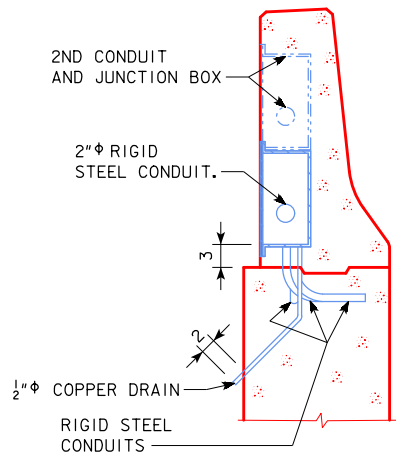
CONDUIT SUPPORT - RAIL ELEV. DETAIL
TWO JUNCTION BOX DETAIL - ADJUST REINFORCING TO CLEAR JUNCTION BOX. JUNCTION BOXES ARE TO BE PLACED NO FURTHER THAN 300'-0" APART.



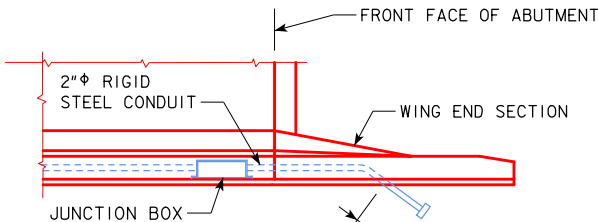
SECTION B-B - CONDUIT SUPPORT

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.

(110 REQUIRED)



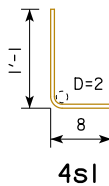
SECTION A-A
THRU JUNCTION BOX



PART PLAN AT WING

EPOXY REINFORCING STEEL-SOUTH RAIL

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
4s1	RAIL CONDUIT		110	1'-9"	129
4s2	RAIL CONDUIT		110	7"	43
TOTAL WEIGHT (LBS.)					172



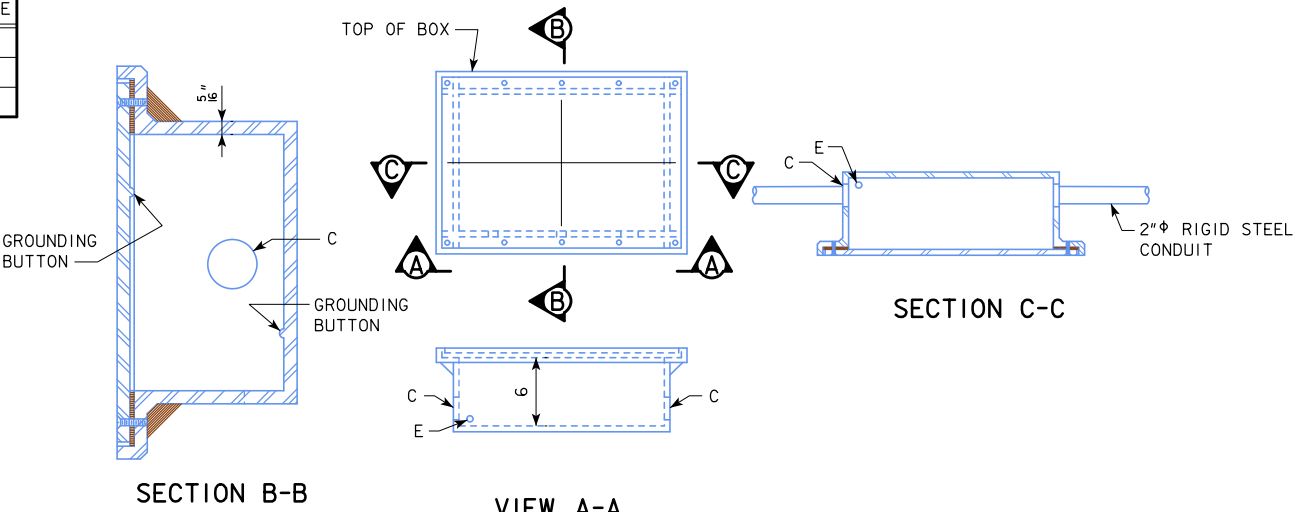
NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

DESIGN FOR 0° SKEW
**327'-0" x 40'-0" CONTINUOUS
CONCRETE SLAB E.B. BRIDGE**
45'-6" END SPANS 59'-0" INTERIOR SPANS
CONDUIT DETAILS
IA 2 STA. 1423+63.50, RT. 32.00' MAY 2020
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 21 OF 25 FILE NO. 31911 DESIGN NO. 420

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

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.



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

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

327'-0 x 40'-0 CONTINUOUS CONCRETE SLAB E.B. BRIDGE

45'-6 END SPANS

59'-0 INTERIOR SPANS

CONDUIT DETAILS

IA 2 STA. 1423+63.50, RT. 32.00'

FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 22 OF 25 FILE NO. 31911 DESIGN NO. 420

MAY 2020

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 ITS 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.

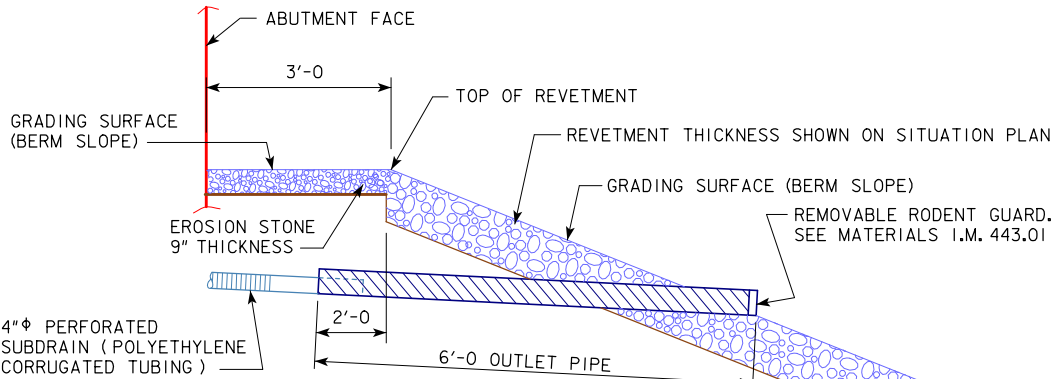
1. USE AN INSIDE FIT REDUCER COUPLER (COUPLER MUST BE INSERTED A MINIMUM OF 1'-0 INTO THE METAL OUTLET PIPE).
2. INSERT 1'-0 OF THE 4"Φ SUBDRAIN INTO THE 6"Φ METAL OUTLET PIPE, THEN FULLY SEAL THE ENTIRE OPENING WITH GROUT.

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.

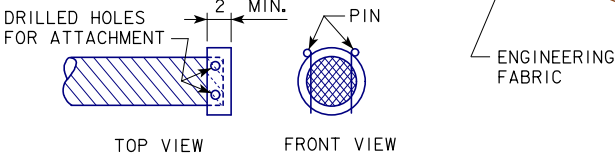
THE DIMENSIONS SHOWN FOR THE PROPOSED SUBDRAINS ARE BASED ON THE PROPOSED GRADING LAYOUT OF BRIDGE BERMS. THE DIMENSIONS SHOWN ARE FOR ESTIMATING ONLY. REQUIRED LENGTHS AND GENERAL LOCATIONS OF SUBDRAINS ARE SUBJECT TO CHANGE DUE TO FIELD ADJUSTMENTS OF THE GRADING LAYOUT.

SUBDRAIN OUTLET ELEVATIONS

LOCATION	ELEVATION
EAST ABUTMENT	919.8±
WEST ABUTMENT	919.8±



TYPICAL SECTION OF SUBDRAIN OUTLET



REMOVABLE RODENT GUARD DETAILS

REVTMENT STONE (EMBEDDED) OUTLET DETAILS

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

DESIGN FOR 0° SKEW

**327'-0 x 40'-0 CONTINUOUS
CONCRETE SLAB E.B. BRIDGE**

45'-6 END SPANS 59'-0 INTERIOR SPANS

SUBDRAIN DETAILS

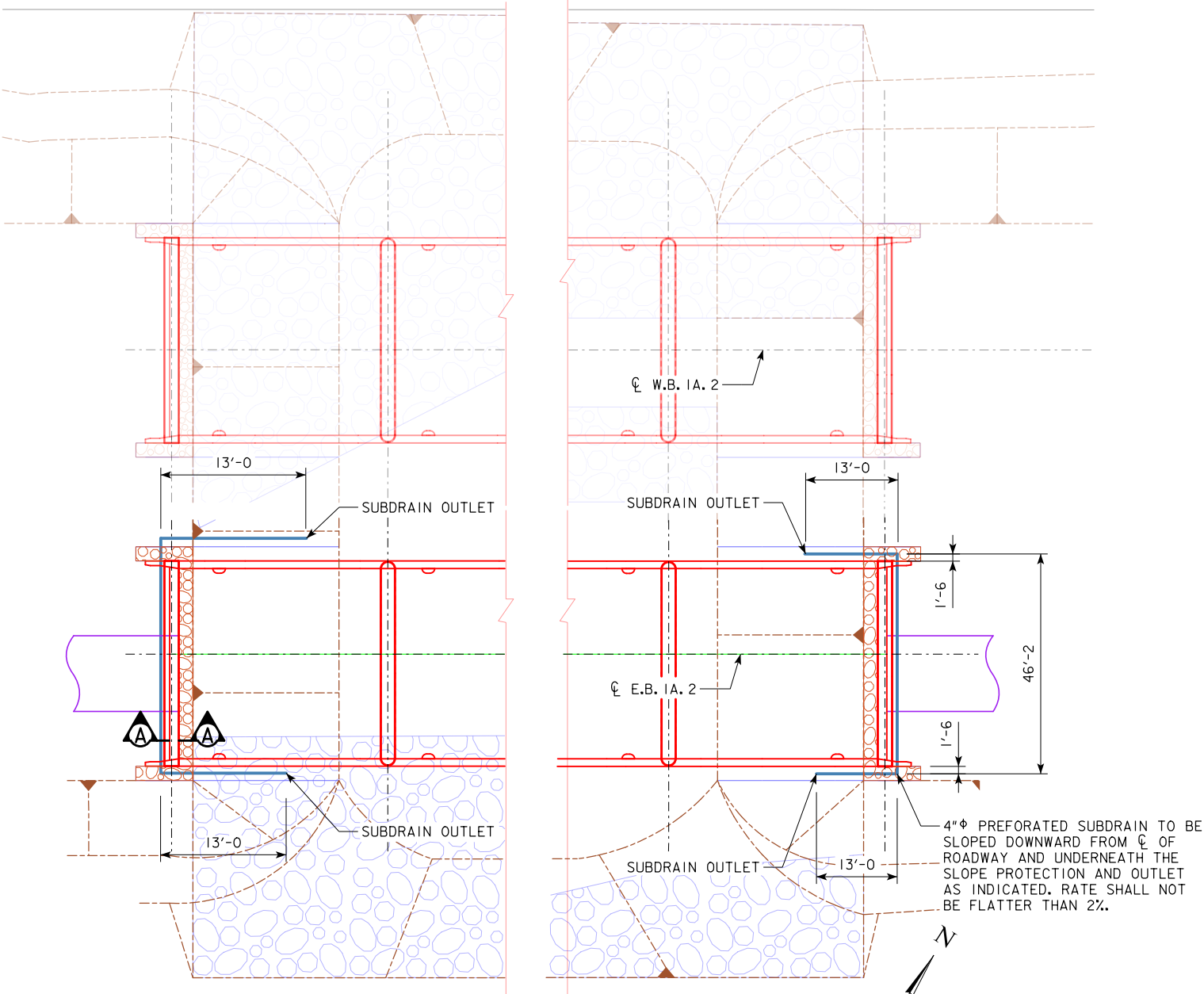
IA 2 STA. 1423+63.50, RT. 32.00' MAY 2020

FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

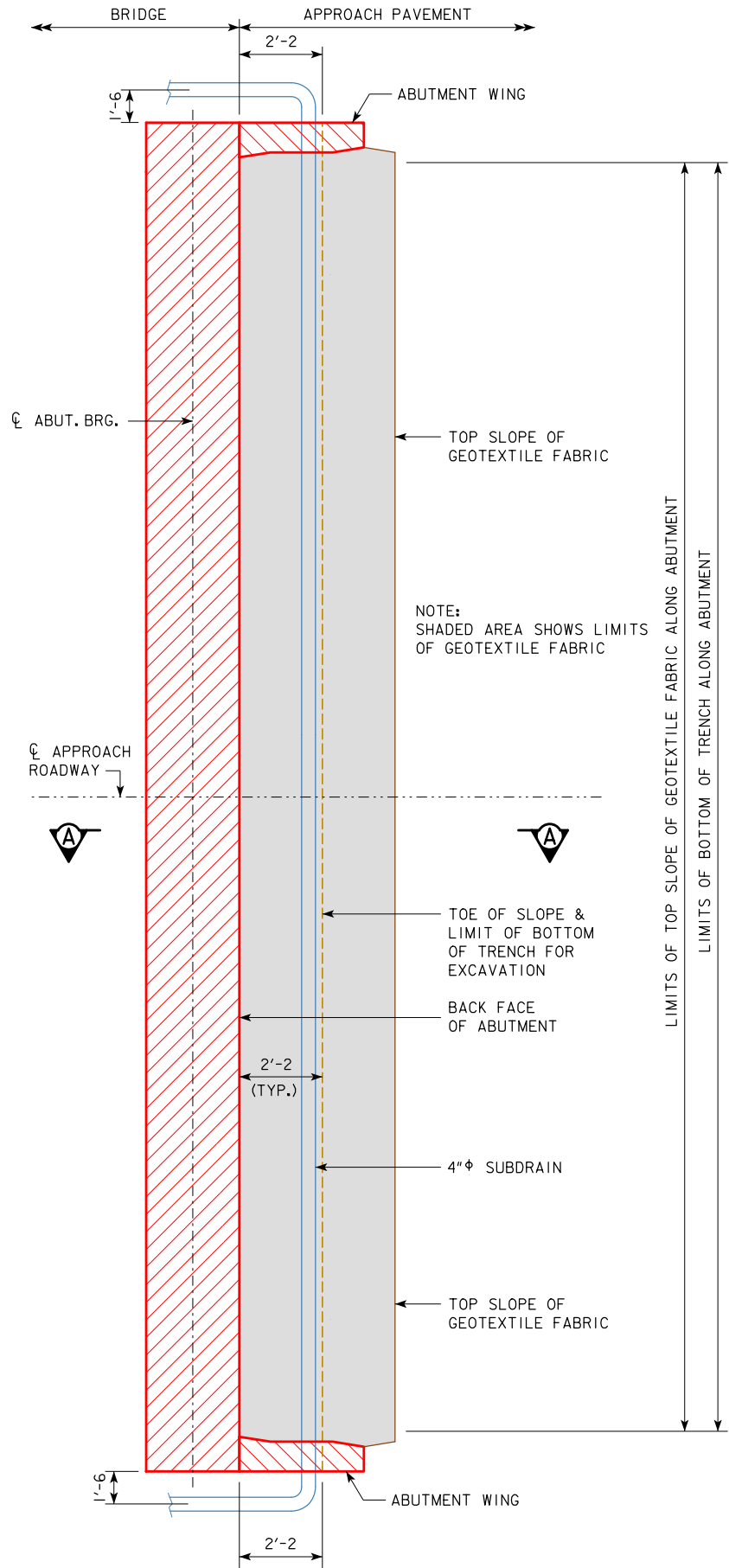
DESIGN SHEET NO. 23 OF 25 FILE NO. 31911 DESIGN NO. 420

REVISED 07-11 - THE BERM SLOPE IS IDENTIFIED AS THE GRADING SURFACE.
ENGLISH FORESLOPE PROTECT ION BRIDGES.DGN 1007A - THIS SHEET ISSUED 06-02.



SITUATION PLAN
SHOWING SUBDRAIN LOCATIONS

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



ABUTMENT PLAN

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.

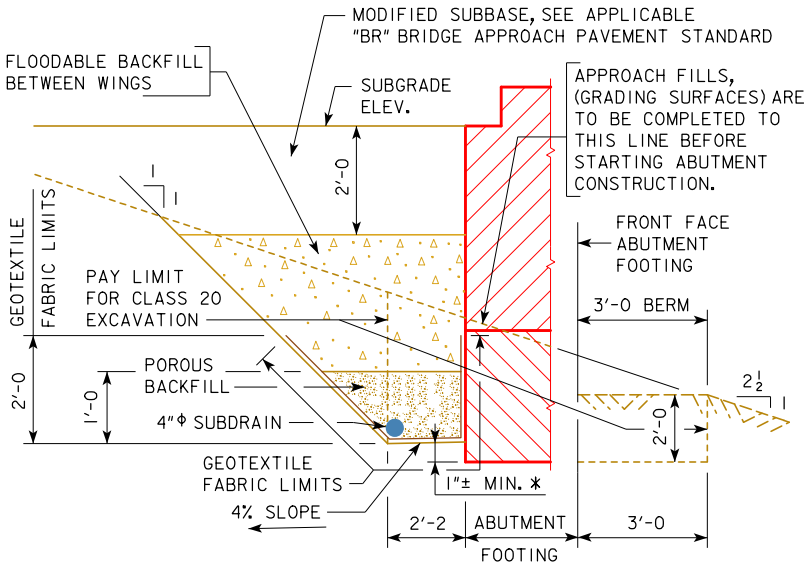
THE COST OF WATER REQUIRED FOR FLOODING, SUBDRAINS, POROUS BACKFILL, FLOODABLE BACKFILL, AND GEOTEXTILE FABRIC FURNISHED AT THE BRIDGE ABUTMENTS SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR STRUCTURAL CONCRETE.

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

NOTE:

SUBDRAIN SHALL SLOPE DOWNWARD 2% FROM ϕ 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.

DESIGN FOR 0° SKEW

327'-0 x 40'-0 CONTINUOUS
CONCRETE SLAB E.B. BRIDGE

45'-6 END SPANS59'-0 INTERIOR SPANS

ABUTMENT BACKFILL DETAILS

IA 2 STA. 1423+63.50, RT. 32.00'MAY 2020

FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 24 OF 25FILE NO. 31911DESIGN NO. 420

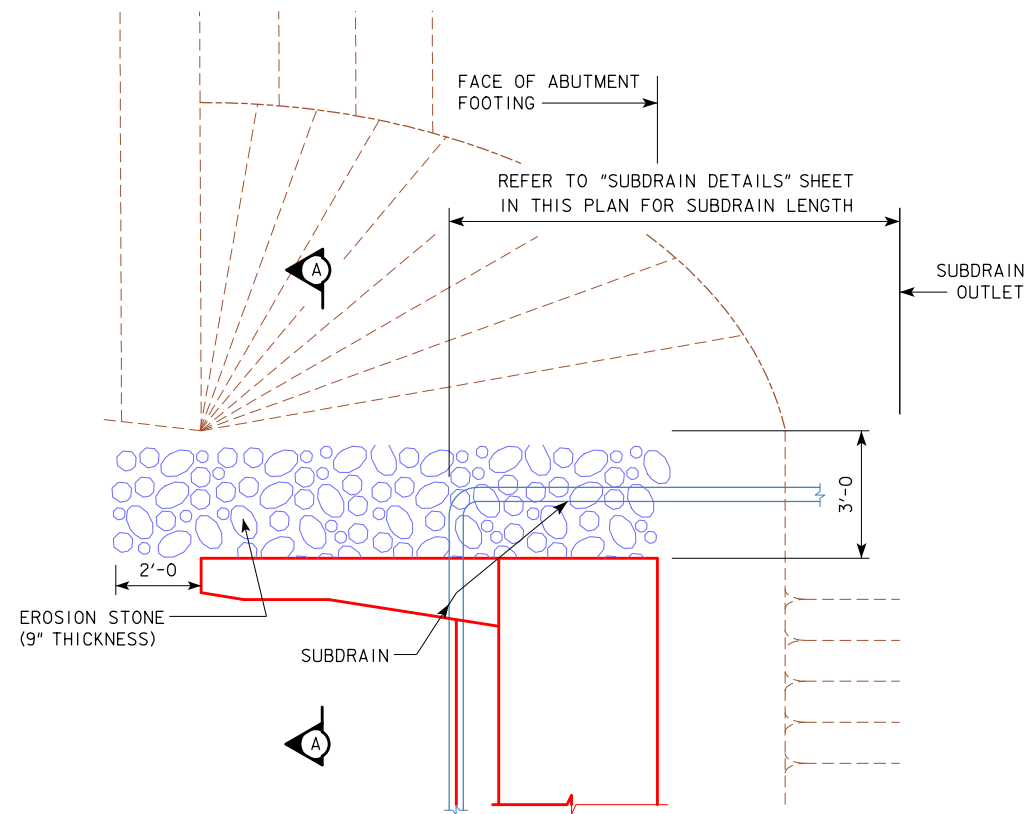
BRIDGE WING ARMORING NOTES:

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.

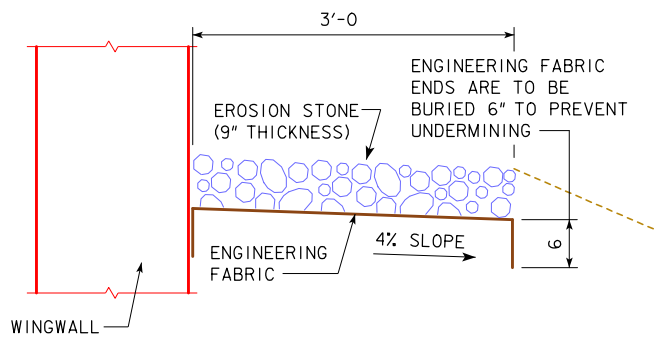
THE EROSION STONE SHALL BE IN ACCORDANCE WITH SECTION 4130, OF THE STANDARD SPECIFICATIONS. MATERIAL PASSING THE 3 INCH SCREEN BUT 100% RETAINED ON A 1 INCH SCREEN MAY BE USED AS CHOKE STONE.

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.

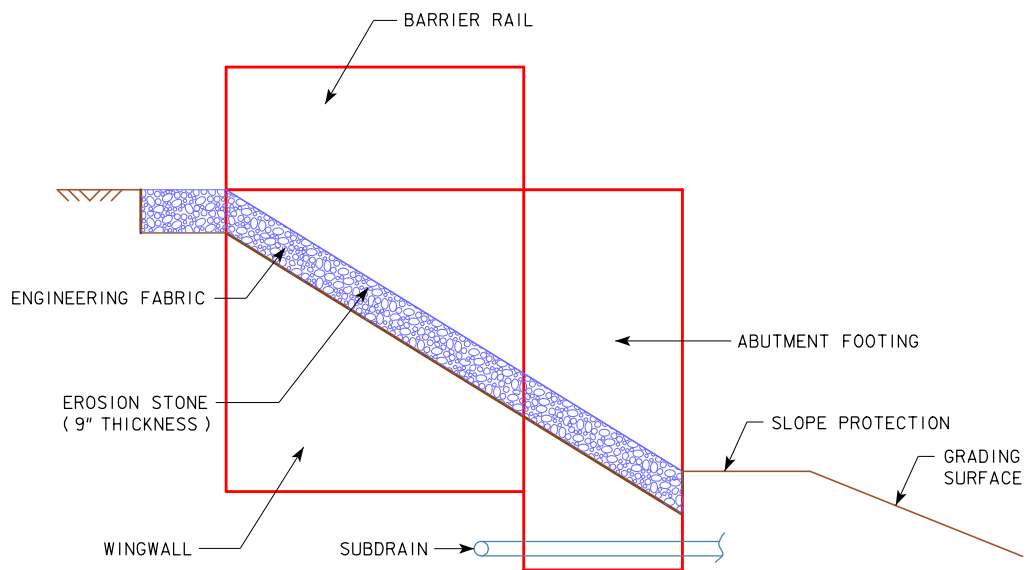
PAYMENT FOR THE BRIDGE WING ARMORING WILL BE BID PER SQUARE YARD. COST WILL INCLUDE ENGINEERING FABRIC, EROSION STONE, EXCAVATION, SHAPING, AND COMPACTION TO DIMENSIONS SHOWN IN THESE PLANS. BID ITEM SHALL BE "BRIDGE WING ARMORING - EROSION STONE".



TOP VIEW OF WING ARMORING



SECTION A-A



PROFILE VIEW OF WING ARMORING

DESIGN FOR 0° SKEW

327'-0 x 40'-0 CONTINUOUS CONCRETE SLAB E.B. BRIDGE

45'-6 END SPANS 59'-0 INTERIOR SPANS

BRIDGE WING ARMORING

1A 2 STA. 1423+63.50, RT. 32.00' MAY 2020

FREMONT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 25 OF 25 FILE NO. 31911 DESIGN NO. 420

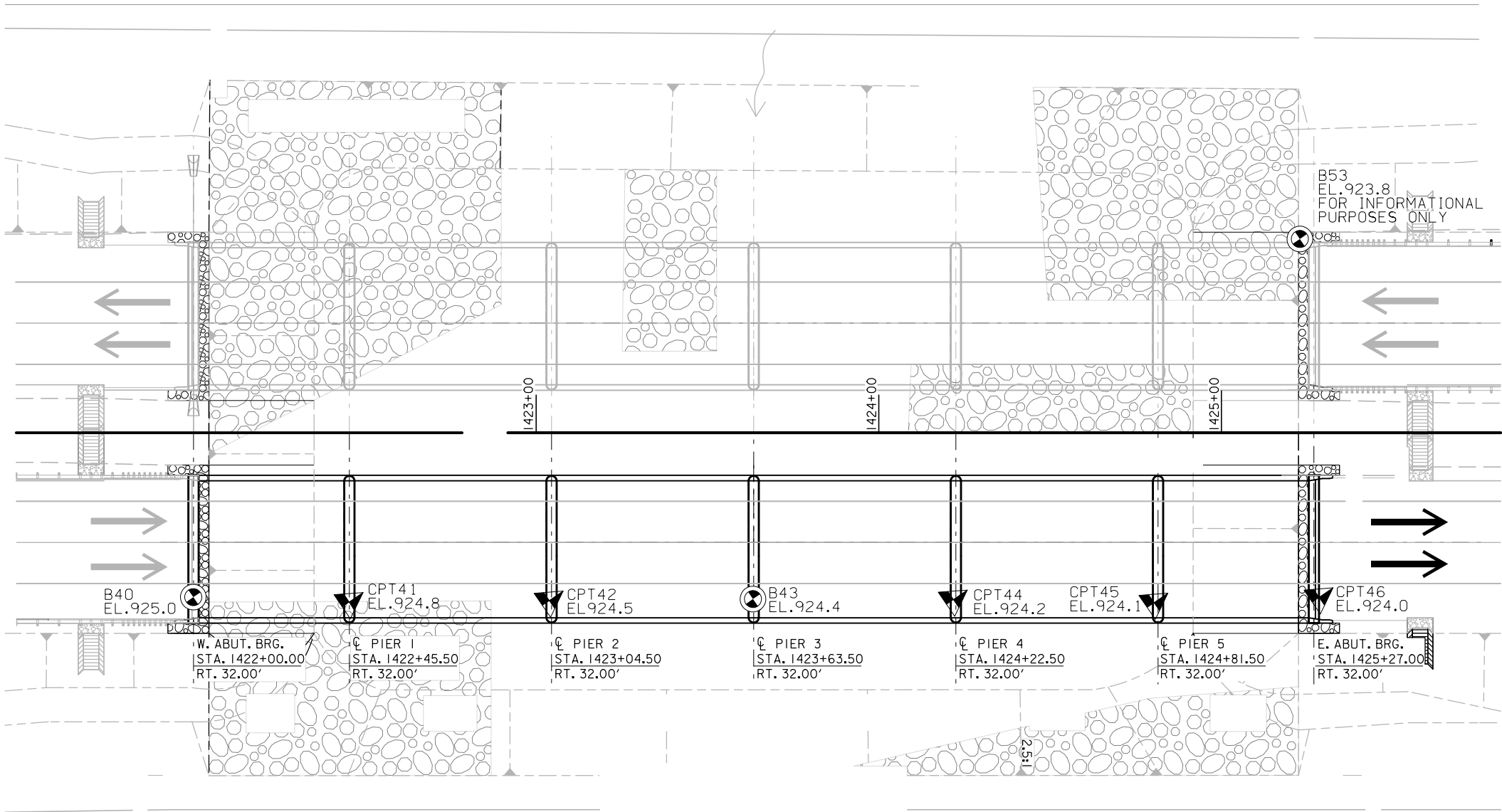
GEOTECHNICAL DESIGN



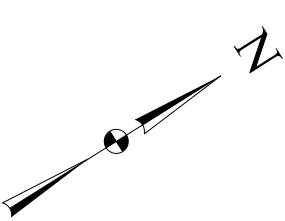
I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature: Justin D. Humke
Printed or Typed Name: Justin D. Humke
Date: 4-17-2020

My license renewal date is December 31, 2021
Pages or sheets covered by this seal: SPS.1 thru SPS.4



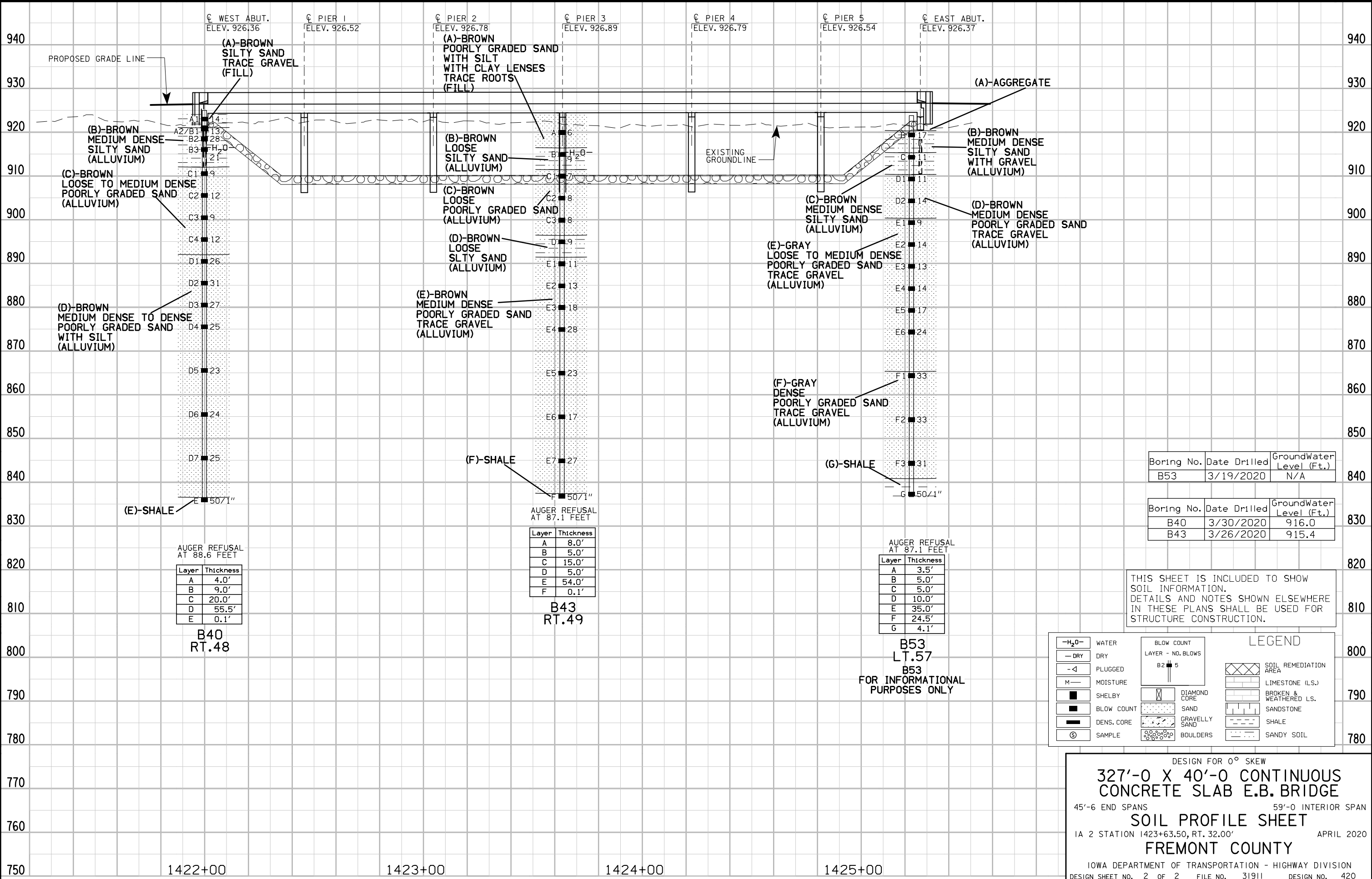
THIS SHEET IS INCLUDED TO SHOW SOIL INFORMATION. DETAILS AND NOTES SHOWN ELSEWHERE IN THESE PLANS SHALL BE USED FOR STRUCTURE CONSTRUCTION.



LOCATION
1A 2 OVERFLOW
T-68N R-43W
SECTION 30
BENTON TOWNSHIP
FREMONT COUNTY
FHWA NO. 701105
BRIDGE MAINT. NO. 3601.2R002
LATITUDE 40.682081°
LONGITUDE -95.820290°



DESIGN FOR 0° SKEW
327'-0 X 40'-0 CONTINUOUS CONCRETE SLAB E.B. BRIDGE
45'-6 END SPANS 59'-0 INTERIOR SPAN
SOIL PROFILE SHEET
1A 2 STATION 1423+63.50, RT. 32.00' APRIL 2020
FREMONT COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 1 OF 2 FILE NO. 31911 DESIGN NO. 420



100-1A
07-15-97

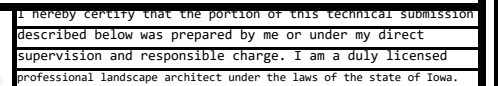
[illegible]

105-4
10-18-11

[illegible]

111-25
10-18-11

ROADWAY DESIGN



Kelly C. Bell
Printed or Typed Name
My license renewal date is December 31, 2021

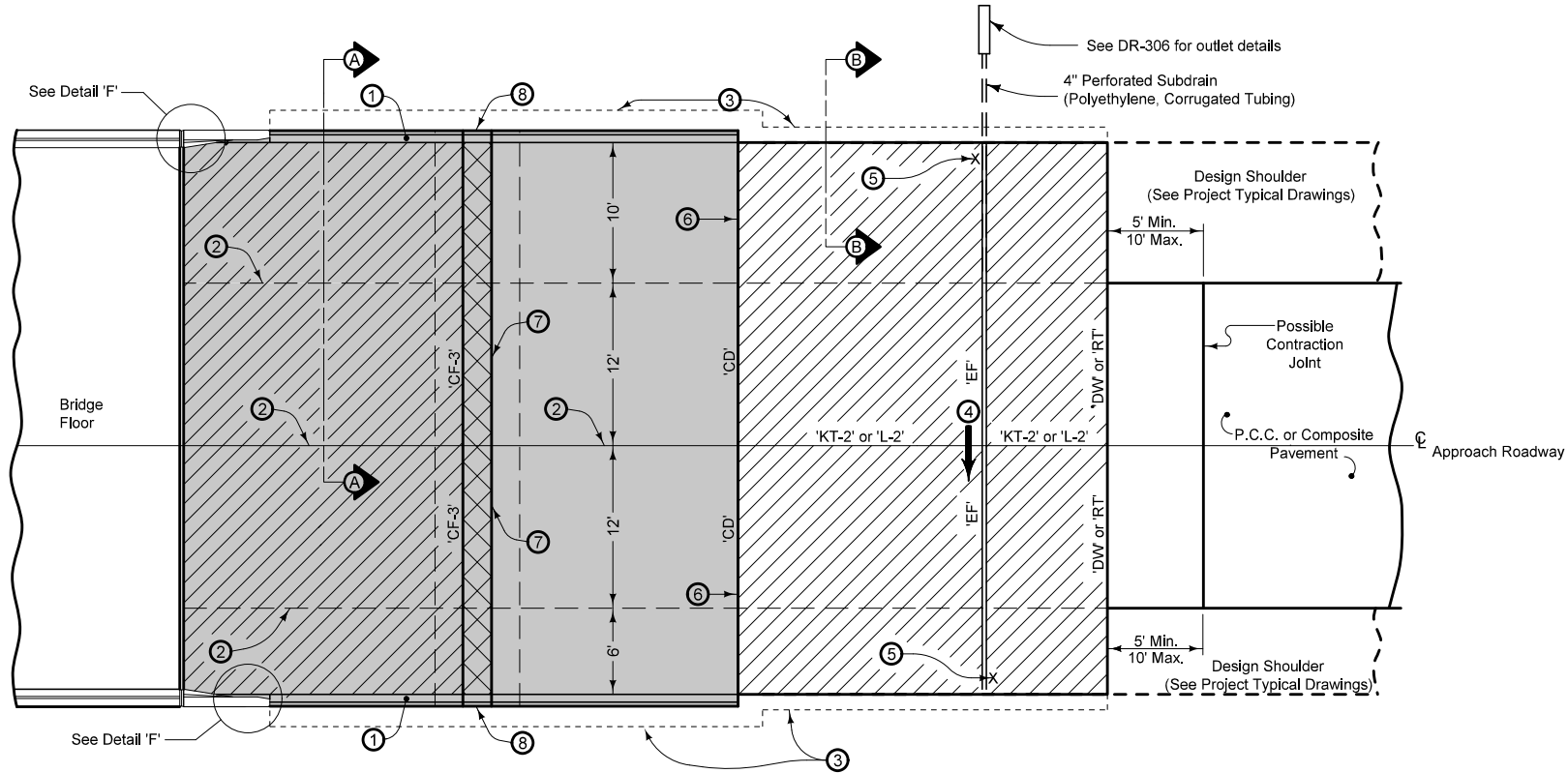
5/18/2020 4:53:11 PM kbell c:\pw work\pwmain\kbell\d1038770\36002135 C01.xlsm

* Not a bid item

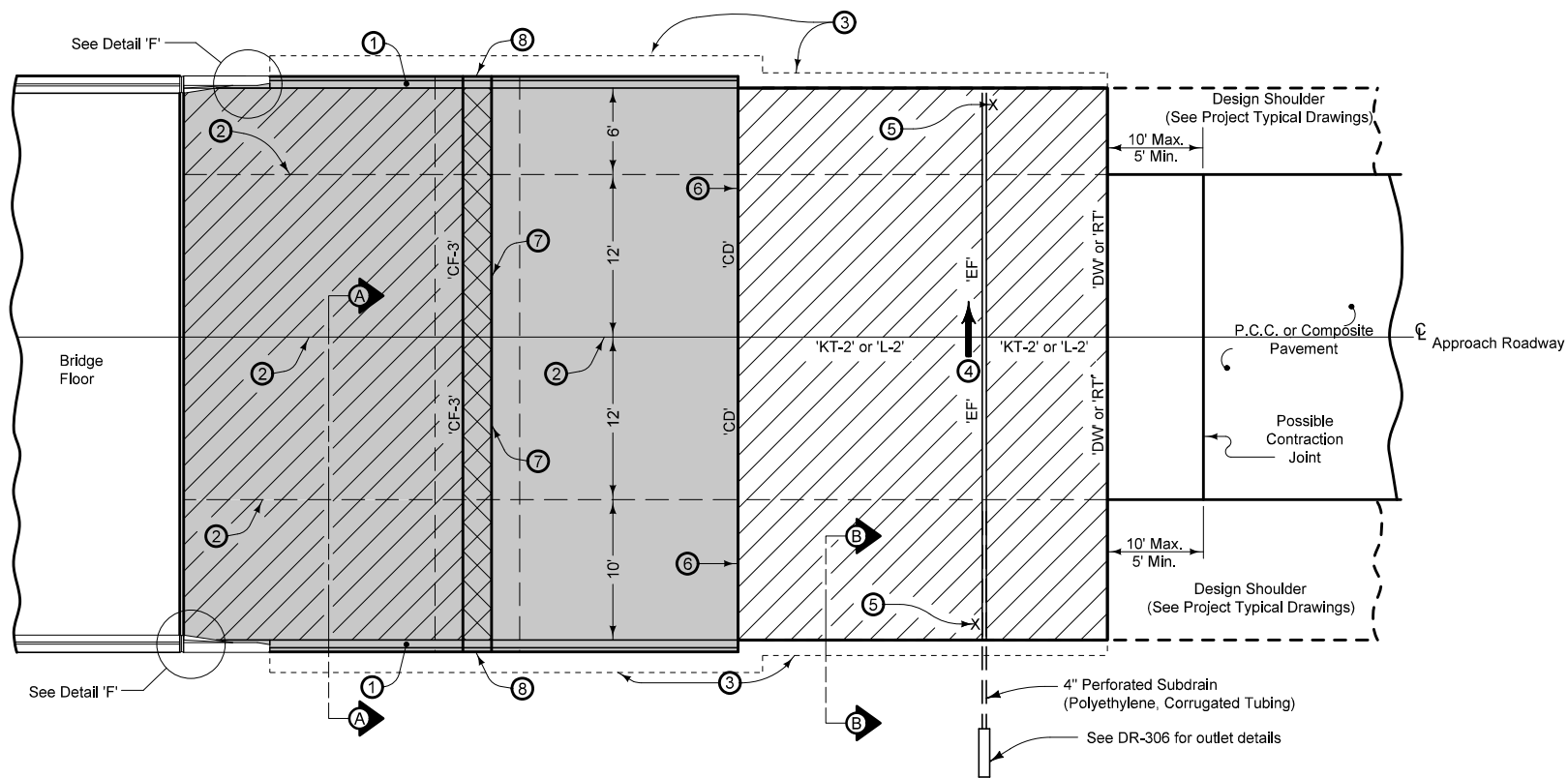
LONGITUDINAL GROOVING

FILE NO. 31911	ENGLISH	DESIGN TEAM Flattery\Bell\Jack	FREMONT COUNTY	PROJECT NUMBER ER-002-1(135)--28-36	SHEET NUMBER C.2
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PLAN VIEW



IA 2



Pay limits for contract item include the following areas:

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

For joint details, see PV-101.

For curb details, see Detail 'G'.

All transverse bars are #5.

Use epoxy coated bars for all reinforcement.

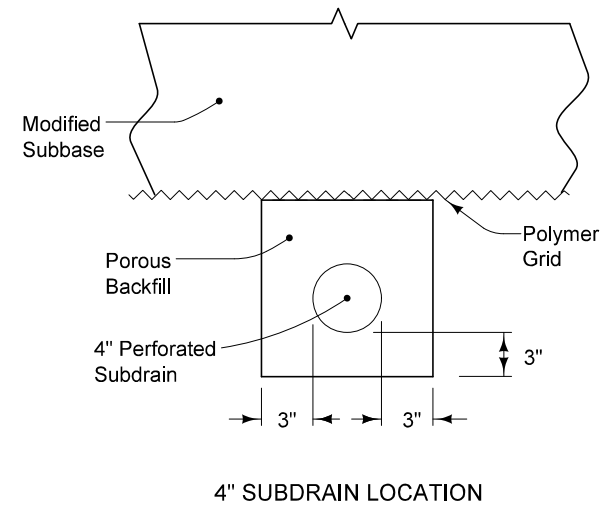
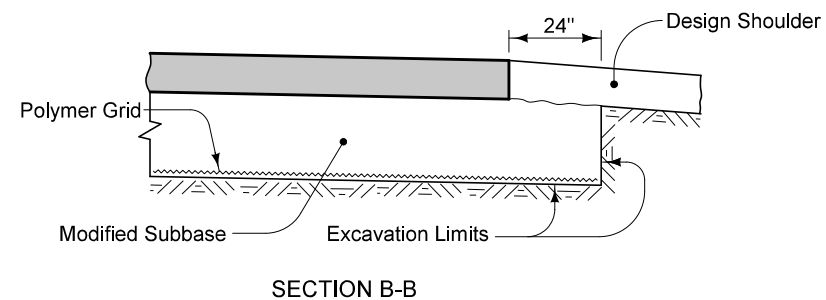
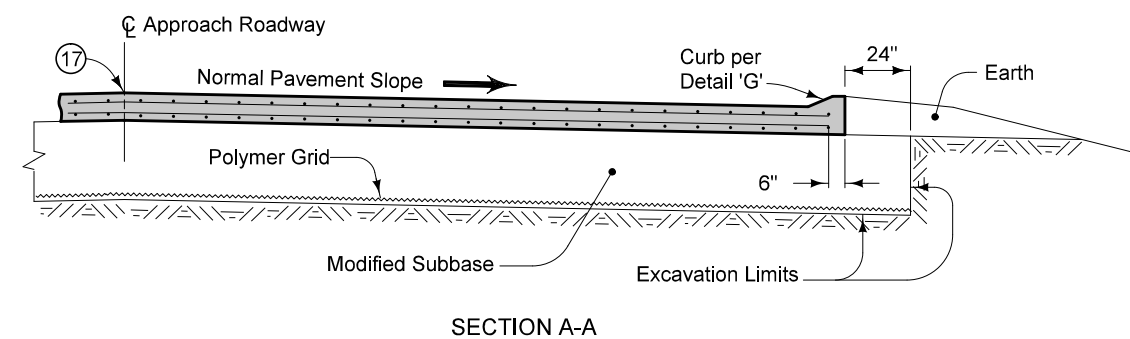
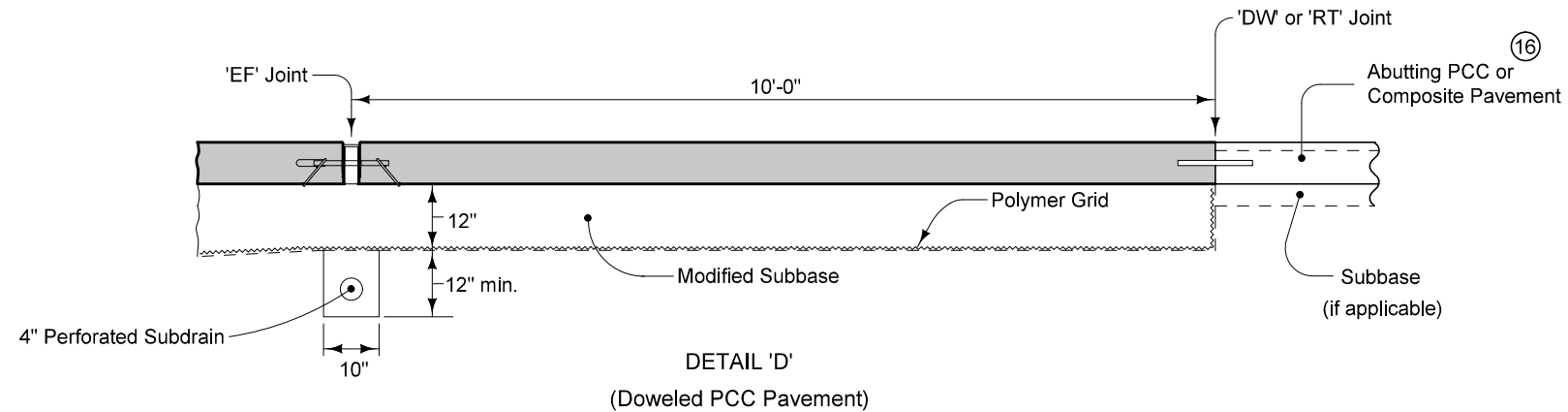
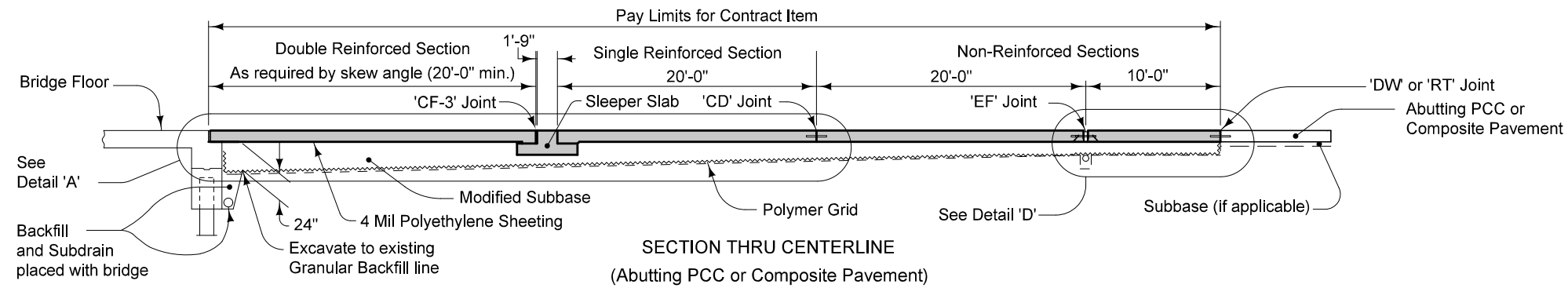
Quantities for both the 1'-9" top part of the sleeper slab and the 6'-3" portion under the approach pavement have been included in the double reinforced section quantities.

- Build 4 inch Sloped Curb to end of Reinforced Sections.
- 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).
- Polymer Grid and excavation limits of Modified Subbase 2 feet outside of pavement edge.
- Slope subdrain to drain.
- Place an "X" in the plastic concrete near the 'EF' joint at the outside edge of pavement.
- Place 'RD' Joint where PCC shoulder. Place 'B' joint otherwise.
- $\frac{1}{4}$ inch Preformed Joint Filler and seal top.
- See Detail 'C'.

Possible Contract Item:
Bridge Approach, BR-205

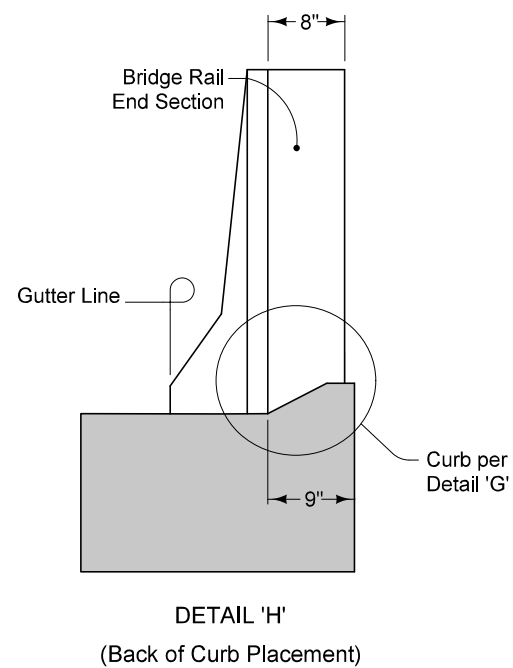
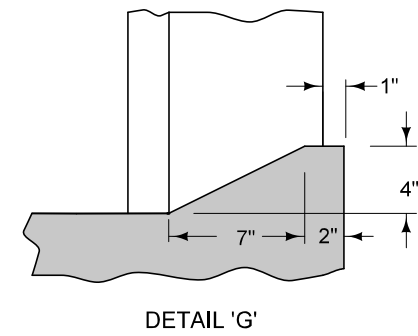
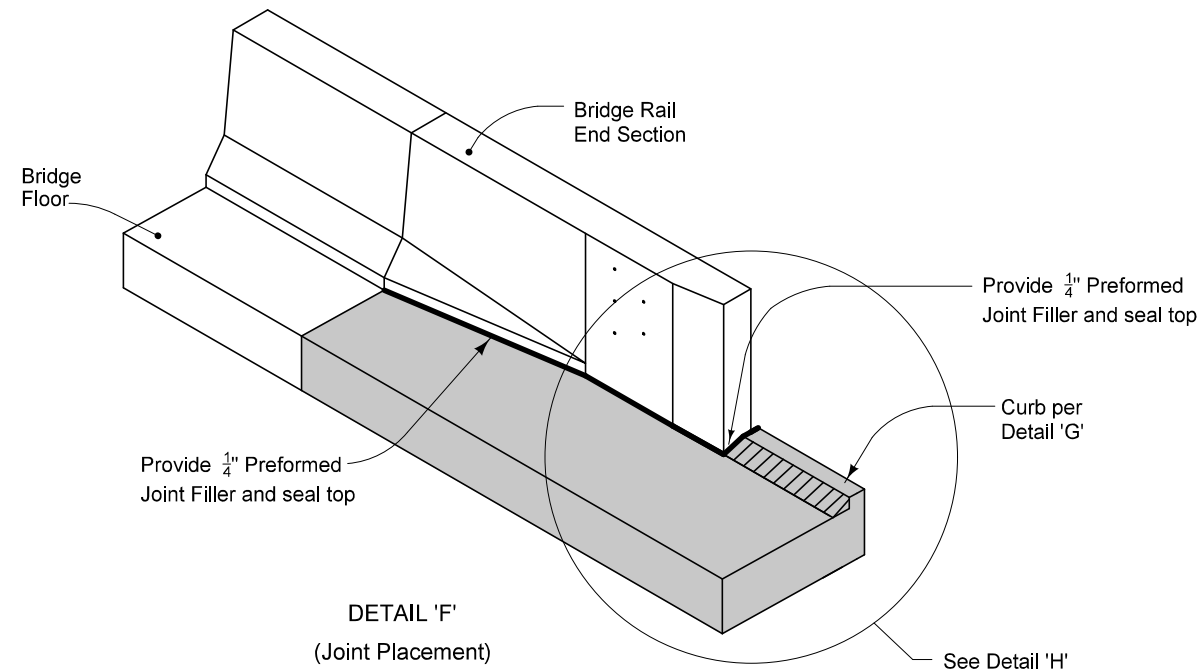
Possible Tabulation:
112-6

MODIFIED STANDARD ROAD PLAN	BR-205M
	SHEET 1 of 4
DOUBLE REINFORCED 12" APPROACH (SLAB BRIDGE ABUTTING PCC NO SKEW)	

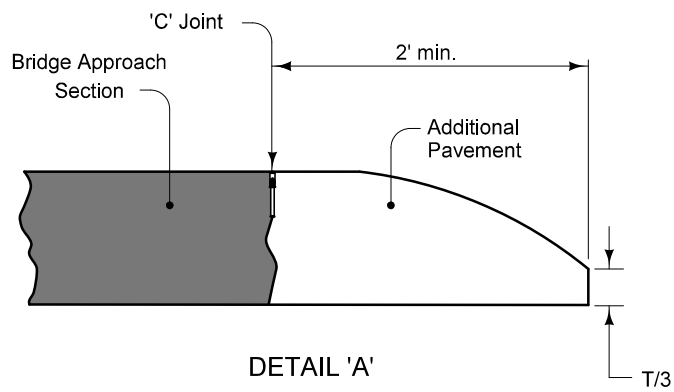


- ①⑥ If abutting pavement (PCC) is not in place, refer to BR-213M.
- ①⑦ Longitudinal Joint (PV-101):
Single Pour - Saw cut joint per Detail B.
Two Pours - Use 'KS-1' joint (Single Reinforced Section).
Use 'KS-2' joint (Double Reinforced Section).
- ①⑧ See Detail 'C'.

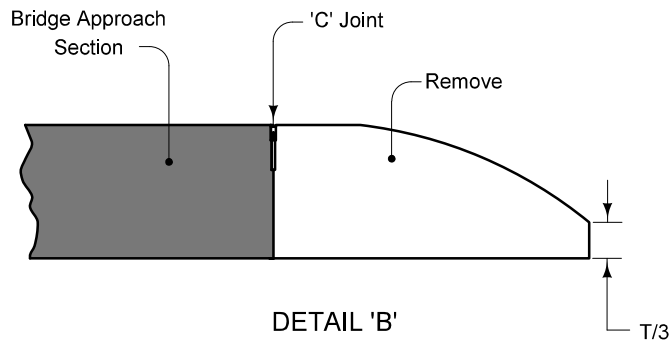
MODIFIED STANDARD ROAD PLAN	
	BR-205M
	SHEET 3 of 4
DOUBLE REINFORCED 12" APPROACH (SLAB BRIDGE)	



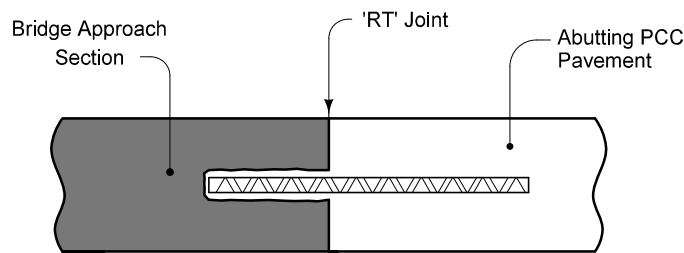
MODIFIED		
	BR-205M	
STANDARD ROAD PLAN	SHEET 4 of 4	
DOUBLE REINFORCED 12" APPROACH (SLAB BRIDGE)		



DETAIL 'A'
SECTION A-A

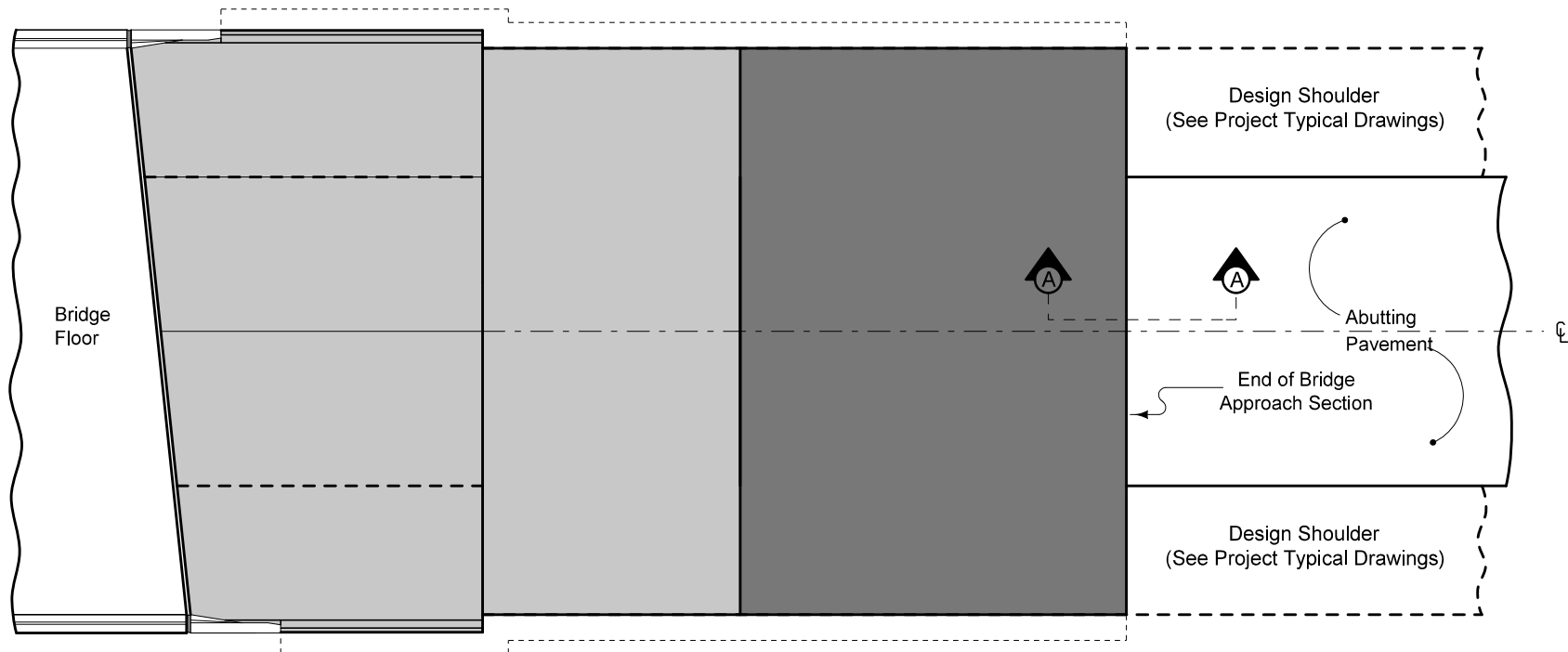


DETAIL 'B'
SECTION A-A



(For Abutting PCC Pavement)

DETAIL 'C'
SECTION A-A



PLAN VIEW

For Jointing Details, see PV-101.

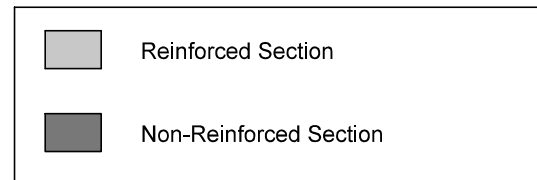
If abutting pavement (PCC or HMA) is not in place when bridge approach pavement is constructed, the following procedure applies:

1. The paving contractor of bridge the approach pavement paves Additional Pavement (as shown in Detail 'A'), constructs 'C' joint at end of bridge approach section, and leaves in this state.
2. The paving contractor of the abutting pavement saw cuts full depth at 'C' joint and removes Additional Pavement (see Detail 'B'), then
3. The paving contractor of the abutting pavement constructs 'RT' joint or 'B' joint, accordingly (see Detail 'C').

This work is incidental to other work as follows:

Detail 'A': Bridge Approach, BR-203.

Details 'B' and 'C': Standard or Slip Form PCC Pavement, or Hot Mix Asphalt Mixture.



**MODIFIED
STANDARD ROAD PLAN**

BR-213M

SHEET 1 of 1

**BRIDGE APPROACH
(ABUTTING PAVEMENT)**