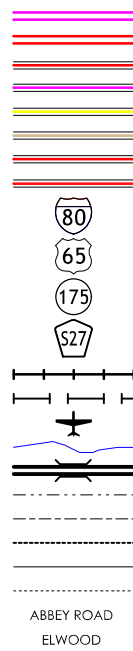


APPANOOSE COUNTY

REPLACEMENT - CCS LETTING DATE  
BRF-005-1(67)--38-04 11-17-2020

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

APPANOOSE COUNTY

BRIDGE REPLACEMENT - CCS  
1A 5 OVER DRAINAGE DITCH  
0.6 MI. SOUTH OF SECONDARY RD. T30

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.

STANDARD	ISSUED	REVISED
J44-01-14	07-2014	08-2020
J44-18-14	07-2014	08-2020
J44-19-14	07-2014	08-2020
J44-20-14	07-2014	08-2020
J44-22-14	07-2014	08-2020
J44-45-14	07-2014	08-2020
J44-46-14	07-2014	08-2020
J44-47-14	07-2014	08-2020
J44-50-14	07-2014	08-2020
J44-51-14	07-2014	08-2020
J44-53-14	07-2014	08-2020

## REVISIONS

SEE REVISION SHEET RA 02-01-2022

TOTAL SHEETS
96

PROJECT NUMBER

BRF-005-1(67)--38-04

R.O.W. PROJECT NUMBER

PROJECT IDENTIFICATION NUMBER

16-04-005-020

## INDEX OF SHEETS

[illegible]

STANDARD ROAD PLANS ARE LISTED  
ON SHEET NUMBER C.2 & RC.1

2016	AADT	<u>2,000</u>	V.P.D.
2036	AADT	<u>2,200</u>	V.P.D.
20??	DHV	<u>-</u>	V.P.H.
TRUCKS		<u>7</u>	%
Total			
Design	ESALs	<u>-</u>	

## INDEX OF SEALS

SHEET NO.	NAME	TYPE
1	HAROLD L. ADCOCK	STRUCTURAL DESIGN
7	DAVID J. MULHOLLAND	HYDRAULIC DESIGN
SPS.1 & CS.1	DAVID J. HEER	GEOTECHNICAL DESIGN
A.1	JASON M. HOLST	ROADWAY DESIGN
RC.1	SEANA K. GODBOLD	LANDSCAPE DESIGN

## STRUCTURAL DESIGN



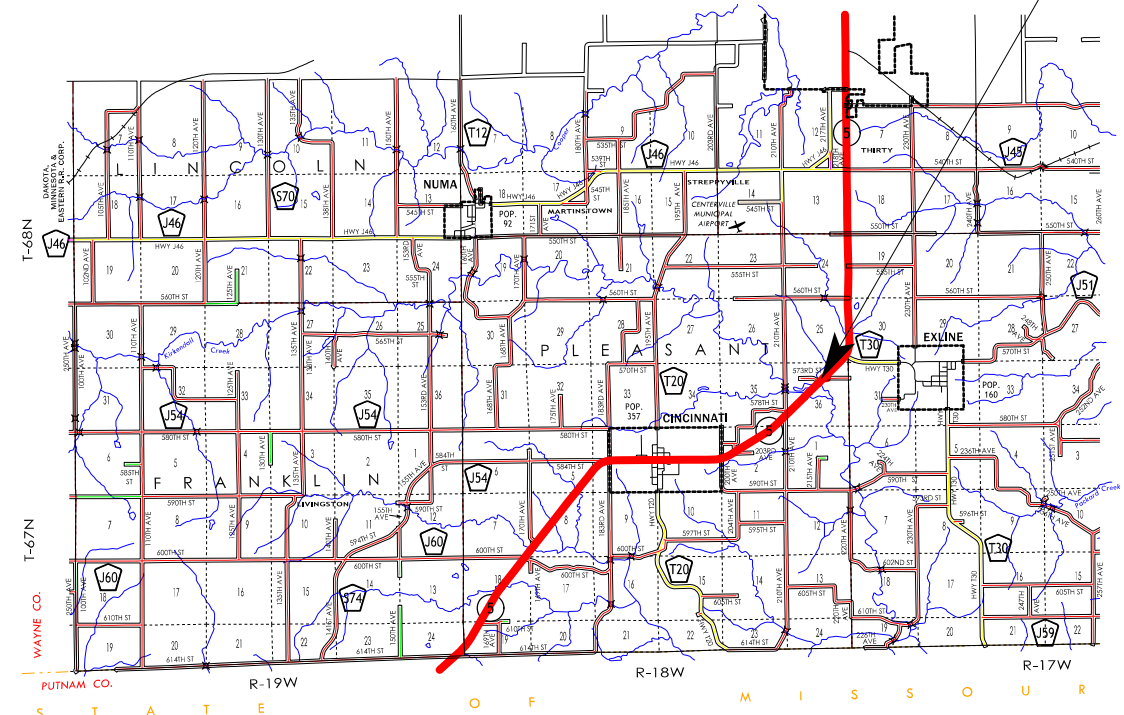
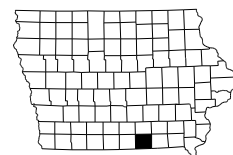
I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature James Underwood Date 8-31-2020

Printed or Typed Name Harold L. Adcock

My license renewal date is December 31, 2021

Pages or sheets covered by this seal: SHEETS 1 THRU 13 OF 96



## LOCATION MAP

PROJECT DIRECTORY NAME: 0400502016

DESIGN TEAM DKT / MRG / HLA

ENGLISH

IOWA DOT \* BRIDGES AND STRUCTURES BUREAU

FILE NO. 31644

APPANOOSE COUNTY

PROJECT NUMBER	BRF-005-1(67)--38-04
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SHEET NUMBER

2/1/2022 2:13:09 PM mgordy pw:\\NTPwintl.dot.int.lan:P\\Main\\Documents\\Projects\\0400502016\\BRF\\final\\BRG\_04005067.dgn 040120S000 11x17\_.pdf.pltcf

LISTING OF PROJECT REVISIONS							
DATE	SHEET NUMBER	REV. ITEM NUMBER	DESCRIPTION OF REVISIONS	DATE	SHEET NUMBER	REV. ITEM NUMBER	DESCRIPTION OF REVISIONS
02-01-2022	RA		REVISION SHEET ADDED.				
02-01-2022	2	I	REVISED: CHANGED STRUCTURAL CONCRETE (BRIDGE) QUANTITY AND REINFORCING STEEL QUANTITY. REASON: PIER 1 ENCASEMENT PLACED 8 INCHES TOO LOW.				
02-01-2022	5	I	REVISED: CHANGED STRUCTURAL CONCRETE (BRIDGE) QUANTITIES AND REINFORCING STEEL QUANTITIES. REASON: PIER 1 ENCASEMENT PLACED 8 INCHES TOO LOW.				
02-01-2022	8A	I	REVISED: PIER 1 ENCASEMENT SHEET ADDED. REASON: PIER 1 ENCASEMENT PLACED 8 INCHES TOO LOW.				
02-01-2022	9	I	REVISED: REMOVED INFORMATION SPECIFICALLY PERTAINING TO PIER 1 AS NEW PILE ENCASEMENT SHEET WAS ADDED FOR PIER 1. REASON: PIER 1 ENCASEMENT PLACED 8 INCHES TOO LOW.				
02-01-2022	10	I	REVISED: REMOVED REINFORCING BAR TABULATION INFORMATION SPECIFICALLY PERTAINING TO PIER 1 AS NEW ENCASEMENT SHEET WAS ADDED FOR PIER 1.CHANGED PIER 1 ENCASEMENT CONCRETE PLACEMENT QUANTITY. REASON: PIER 1 ENCASEMENT PLACED 8 INCHES TOO LOW.				
02-01-2022	10	I	REVISED: CHANGED PIER 2 ENCASEMENT CONCRETE PLACEMENT QUANTITY. REASON: PIER 2 ENCASEMENT CONCRETE PLACEMENT QUANTITY DID NOT MATCH QUANTITY SHOWN IN SUMMARY TABLE ON SHEET 5.				
<div><div><div>STRUCTURAL DESIGN</div><div><div><div>LICENSED PROFESSIONAL ENGINEER</div><div>Harold L. Adcock</div><div>14438</div><div>IOWA</div></div><div><div>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.</div><div>Signature<div>Harold L. Adcock</div></div><div>Date<div>02-01-2022</div></div><div>Printed or Typed Name</div><div>My license renewal date is December 31, 2023</div><div>Pages or sheets covered by this seal: SHEETS 1, RA, 2, 5, 8A, 9, 10</div></div></div></div></div>							
<div>APPANOOSE COUNTY DESIGN NO. 120 REVISION SHEET IOWA DEPARTMENT OF TRANSPORTATION</div>							
DESIGN TEAM DKT / MRG / HLA		FILE NO. 31644		APPANOOSE COUNTY		PROJECT NUMBER BRF-005-1(67)--38-04	
						SHEET NUMBER RA	

REVISED: FEBRUARY 1, 2022

ESTIMATED BRIDGE QUANTITIES						ESTIMATE REFERENCE INFORMATION		
ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.	ITEM NO.	ITEM CODE	DESCRIPTION
1	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	CY	779.0		13	2507-3250005	ENGINEERING FABRIC Engineering fabric shall be material as specified for embankment erosion control in accordance with Article 4196.01,B,3, of the Standard Specifications.
2	2401-6745625	REMOVAL OF EXISTING BRIDGE	LS	1.00		14	2507-6800061	REVTMENT, CLASS E Estimated at 1.6 ton/cu yd.
3	2402-2720000	EXCAVATION, CLASS 20	CY	275		15	2507-8029000	EROSION STONE Estimated at 1.6 ton/cu yd.
4	2402-2721000	EXCAVATION, CLASS 21	CY	136		16	2526-8285000	CONSTRUCTION SURVEY - -
5	2403-0100010	STRUCTURAL CONCRETE (BRIDGE)	CY	708.8711.3		17	2533-4980005	MOBILIZATION - -
6	2404-7775000	REINFORCING STEEL	LB	7,408-7,713				
7	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB	128,839				
8	2404-7775009	REINFORCING STEEL, STAINLESS STEEL	LB	3,611				
9	2414-6424110	CONCRETE BARRIER RAILING	LF	322.2				
10	2501-0201057	PILES, STEEL, HP 10 X 57	LF	1,080				
11	2501-0201473	PILES, STEEL, HP 14 X 73	LF	1,560				
12	2501-6335010	PREBORED HOLES	LF	270				
13	2507-3250005	ENGINEERING FABRIC	SY	1,338.0				
14	2507-6800061	REVTMENT, CLASS E	TON	1,248.0				
15	2507-8029000	EROSION STONE	TON	16.0				
16	2526-8285000	CONSTRUCTION SURVEY	LS	1.00				
17	2533-4980005	MOBILIZATION	LS	1.00				

ESTIMATE REFERENCE INFORMATION		
ITEM NO.	ITEM CODE	DESCRIPTION
1	2104-2710020	EXCAVATION, CLASS 10, CHANNEL --
2	2401-6745625	REMOVAL OF EXISTING BRIDGE Includes cost of complete removal of bridge substructure.
3	2402-2720000	EXCAVATION, CLASS 20 --
4	2402-2721000	EXCAVATION, CLASS 21 --
5	2403-0100010	STRUCTURAL CONCRETE (BRIDGE) Includes furnishing and placing subdrain (including excavation), floodable backfill, porous backfill, geotextile fabric, water flooding, and subdrain outlet at abutments and toe of berm.  Includes cost of 4 drains at 48 lbs steel per drain.  Includes cost of all material and labor to construct the wing armoring in the standards.  Includes costs of furnishing and placing 3" diameter PVC plastic pipe and expanding foam in the abutment wings.
6	2404-7775000	REINFORCING STEEL --
7	2404-7775005	REINFORCING STEEL, EPOXY COATED --
8	2404-7775009	REINFORCING STEEL, STAINLESS STEEL --
9	2414-6424110	CONCRETE BARRIER RAILING Class BR concrete is required if the rail is placed using the slipforming method. Cast-in-place barrier rails shall use Class C mix. Price bid for this item shall include the cost of cast-in-place forms if required for placement of the concrete.
10	2501-0201057	PILES, STEEL, HP 10 X 57 --
11	2501-0201473	PILES, STEEL, HP 14 X 73 --
12	2501-6335010	PREBORED HOLES All abutment piles shall be driven in 15-foot deep prebored holes.

I

REVISED: 02-01-2022

CHANGED STRUCTURAL CONCRETE (BRIDGE) QUANTITY AND REINFORCING STEEL QUANTITY.

REASON: PIER 1 ENCASEMENT PLACED 8 INCHES TOO LOW.

DESIGN FOR 15° SKEW L.A.

150'-0 X 44'-0

CONTINUOUS CONCRETE SLAB BRIDGE

45'-6 END SPANS59'-0 INTERIOR SPAN

ESTIMATED QUANTITIES

STA. 545+86.96 (1A 5)SEPTEMBER, 2020

APPANOOSE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION

DESIGN SHEET NO. 1 OF 12FILE NO. 31644DESIGN NO. 120

REVISED: FEBRUARY 1, 2022

GENERAL NOTES:

THIS DESIGN IS FOR THE REPLACEMENT OF THE EXISTING 50'-0 x 30'-0 STEEL I-BEAM BRIDGE DESIGN NO. 247 WITH A 150'-0 x 44'-0 CONTINUOUS CONCRETE SLAB BRIDGE. ELECTRONIC PLANS OF THE EXISTING STRUCTURE ARE AVAILABLE TO THE CONTRACTOR AS PART OF THE E-FILES SUPPLIED WITH THE CONTRACT DOCUMENTS.

THE LUMP SUM BID FOR "REMOVAL OF EXISTING BRIDGE" SHALL INCLUDE REMOVING THE EXISTING 50'-0 x 30'-0 STEEL I-BEAM BRIDGE.

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

IT WILL BE NECESSARY TO COMPLETELY REMOVE THE ABUTMENT PILES OF THE EXISTING BRIDGE DUE TO INTERFERENCE WITH THE NEW PIERS PER SECTION 240I.03.C.1 OF THE STANDARD SPECIFICATIONS.

ALL COSTS ASSOCIATED WITH PROVIDING PILE LOCATION INFORMATION TO THE ENGINEER AND ALL LABOR AND EQUIPMENT TO EXTRACT ANY EXISTING PILES SHALL BE INCLUDED IN THE PRICE BID FOR "REMOVAL OF EXISTING BRIDGE".

THE CONTRACTOR SHALL FURNISH AND PLACE GRANULAR MATERIAL IN THE HOLES OF ANY EXTRACTED STEEL MONOTUBE PILES. THIS WORK SHALL BE INCIDENTAL TO CONSTRUCTION.

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.

FAINT LINES ON PLANS INDICATE THE EXISTING STRUCTURE.

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

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).

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 RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE SITES FOR EXCESS EXCAVATED MATERIAL. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED FOR MATERIAL HAULED TO THESE SITES.

THE BRIDGE CONTRACTOR SHALL PREBORE HOLES FOR ABUTMENT PILES. HOLES SHALL BE BORED TO THE ELEVATIONS SHOWN ON THE "LONGITUDINAL SECTION ALONG CENTERLINE APPROACH ROADWAY" ON DESIGN SHEET 5. PILES SHALL BE DRIVEN THROUGH THE HOLES TO AT LEAST THE SPECIFIED DESIGN BEARING.

SCRAPE SAMPLES HAVE BEEN TAKEN FROM DIFFERENT AREAS OF THIS BRIDGE TO TEST FOR THE EXISTENCE OF AND LEVEL OF TOTAL LEAD AND TOTAL CHROMIUM. ANALYSIS RESULTS ARE REPORTED IN THE FOLLOWING TABLE:

ANALYSIS OF LEAD AND CHROMIUM PARTS PER MILLION (PPM)					
LOCATION	YEAR SAMPLED	LEAD		CHROMIUM	
		TOTAL	LEACHABLE	TOTAL	LEACHABLE
RAILING	1997 (TOTAL)/ 2010 (LEACHABLE)	114	0.078	14	< 0.030
STRINGER	1998	4,475	---	2,400	---
PILE	2010	3,090	0.107	542	< 0.030
SKIRT	1997	36,300	---	2,500	---

THESE ANALYSES SHOW THE EXISTENCE OF THESE TWO TOXIC CONSTITUENTS. LEVELS INDICATED BY THESE TESTS COULD CREATE CONDITIONS ABOVE REGULATORY LIMITS FOR HEALTH AND SAFETY REQUIREMENTS. NO OTHER CONSTITUENTS WERE ANALYZED. THE BIDDER SHOULD NOT RELY ON THE IOWA DOT'S TESTING AND ANALYSIS FOR ANY PURPOSE OTHER THAN AS AN INDICATION OF THE EXISTENCE OF THESE TWO TOXIC CONSTITUENTS.

THE CONTRACTOR SHALL CONDUCT THEIR OPERATIONS IN SUCH A MANNER THAT ANY PAINT REMOVED DURING DEMOLITION IS CONTAINED, COLLECTED, AND DISPOSED OF IN ACCORDANCE WITH SECTION 250B, OF THE STANDARD SPECIFICATIONS. BEFORE DELIVERY OF ANY SCRAP STEEL THE CONTRACTOR SHALL PROVIDE A WRITTEN NOTICE TO THE RECEIVING FACILITY. THIS NOTICE SHALL AT A MINIMUM INCLUDE:

1. A NOTICE THAT THE SCRAP STEEL IS COATED WITH PAINT THAT HAS REGULATED MATERIALS AT LEVELS WHICH COULD BE HAZARDOUS TO EMPLOYEES OR THE ENVIRONMENT.

2. A COPY OF THE SCRAPE SAMPLE PROVIDED IN THE CONTRACT DOCUMENTS.

3. A SIGNATURE BLOCK FOR THE RECEIVING FACILITY TO CONFIRM THEIR RECEIPT OF THIS INFORMATION.

A COPY OF THIS NOTICE, SIGNED BY THE RECEIVING FACILITY, SHALL BE RETURNED TO THE ENGINEER BEFORE ANY SCRAP STEEL IS REMOVED FROM THE PROJECT. THE COST OF HANDLING AND DISPOSAL OF PAINTED STEEL IS INCIDENTAL TO THE REMOVAL BID ITEM.

BRIDGE DECK DIMENSIONS TABLE			
NO.	ITEM	UNIT	QUANTITY
1	DECK LENGTH	L.F.	150.9
2	MINIMUM DECK WIDTH	L.F.	47.2
3	MAXIMUM DECK WIDTH	L.F.	47.2
4	DECK AREA	S.F.	7,122

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.

DESIGN HISTORY AT THIS SITE (INCLUDES THIS DESIGN)	
DES. NO.	TYPE OF WORK
247	ORIGINAL DESIGN
187	OVERLAY AND BRIDGE REPAIR
211	COUNTERMEASURE REPAIR
116	RETROFIT END SECTION
120	REPLACEMENT

TRAFFIC CONTROL PLAN
TRAFFIC SHALL BE MAINTAINED ON AN ONSITE TEMPORARY RUNAROUND. REFER TO THE TRAFFIC CONTROL PLAN SHOWN ELSEWHERE IN THESE PLANS.

POLLUTION PREVENTION PLAN SHOWN ELSEWHERE IN THESE PLANS.
---

SHOP DRAWING SUBMITTALS

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

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

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

1	DECK DRAINS
2	FALSE WORK FOR SLAB BRIDGE

SPECIFICATIONS:

DESIGN: AASHTO LRFD, SERIES OF 2004 WITH INTERIM 2005.

CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2012, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 3RD EDITION, SERIES OF 2004:

REINFORCING STEEL IN ACCORDANCE WITH AASHTO LRFD SECTION 5, GRADE 60.

CONCRETE IN ACCORDANCE WITH AASHTO LRFD SECTION 5, f'c = 3,500 PSI.

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

n = 9 FOR TENSION REINFORCING STEEL. 2n = 18 FOR COMPRESSION REINFORCING STEEL.

HL-93 LIVE LOAD PLUS 20 LBS. PER SQ. FT. FOR FUTURE WEARING SURFACE.

END SPAN LENGTH IS USED TO CALCULATE EQUIVALENT WIDTH IN LIVE LOAD DISTRIBUTION.

SIX FOOT OF APPROACH SLAB DEAD LOAD AND LIVE LOAD INCLUDED IN ABUTMENT LOADS.

CONTROL OF CRACKING BY DISTRIBUTION OF REINFORCEMENT FOR SLAB DESIGN BASED ON PRE-2005 LRFD INTERIMS.

DESIGN FOR 15° SKEW L.A.

150'-0 X 44'-0

CONTINUOUS CONCRETE SLAB BRIDGE

45'-6 END SPANS59'-0 INTERIOR SPAN

GENERAL NOTES

STA. 545+86.96 (1A 5)SEPTEMBER, 2020

APPANOOSE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION

DESIGN SHEET NO. 2 OF 12FILE NO. 31644DESIGN NO. 120

PILE DRIVING NOTES:

SOUTH ABUTMENT PILES:

THE CONTRACT LENGTH OF 60 FEET FOR THE SOUTH ABUTMENT PILES IS BASED ON A MIXED SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 103 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL AND 0.70 FOR ROCK END BEARING.

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

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR THE SOUTH ABUTMENT PILES IS 75 TONS AT END OF DRIVE OR RETAP. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

NORTH ABUTMENT PILES:

THE CONTRACT LENGTH OF 60 FEET FOR THE NORTH ABUTMENT PILES IS BASED ON A MIXED SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 138 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL AND 0.7 FOR ROCK END BEARING. TO ACCOUNT FOR SOIL CONSOLIDATION UNDER THE NEW FILL, THE FACTORED AXIAL LOAD INCLUDES A FACTORED DOWNDRAG LOAD OF 35 KIPS.

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

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR NORTH ABUTMENT PILES IS 117 TONS AT END OF DRIVE OR RETAP. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

PIER NO. 1 PILES:

THE CONTRACT LENGTH OF 65 FEET FOR THE PIER NO. 1 PILES IS BASED ON A COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 182 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL AND 0.7 FOR ROCK END BEARING.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL AND 0.7 FOR ROCK END BEARING. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF FOOTING. DESIGN SCOUR (200-YEAR) WAS ASSUMED TO AFFECT THE UPPER 12 FEET OF EMBEDDED PILE LENGTH AND CAUSE 14 KIPS OF DRIVING RESISTANCE.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER NO. 1 PILES IS 139 TONS AT END OF DRIVE OR RETAP. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

PIER NO. 2 PILES:

THE CONTRACT LENGTH OF 65 FEET FOR THE PIER NO. 2 PILES IS BASED ON A MIXED SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 182 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL AND 0.7 FOR ROCK END BEARING.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A MIXED SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL AND 0.7 FOR ROCK END BEARING. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF FOOTING. DESIGN SCOUR (200-YEAR) WAS ASSUMED TO AFFECT THE UPPER 12 FEET OF EMBEDDED PILE LENGTH AND CAUSE 9 KIPS OF DRIVING RESISTANCE.

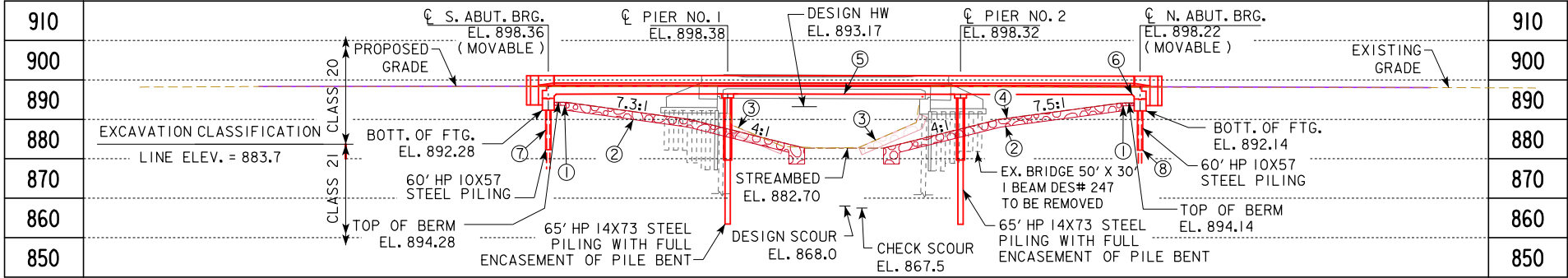
THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER NO. 2 PILES IS 136 TONS AT END OF DRIVE OR RETAP. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

DESIGN FOR 15° SKEW L.A.  
150'-0 X 44'-0  
CONTINUOUS CONCRETE SLAB BRIDGE  
45'-6 END SPANS59'-0 INTERIOR SPAN  
PILE DRIVING NOTES  
STA. 545+86.96 (1A 5)SEPTEMBER, 2020  
APPANOOSE COUNTY  
IOWA DEPARTMENT OF TRANSPORTATION  
DESIGN SHEET NO. 3 OF 12FILE NO. 31644DESIGN NO. 120

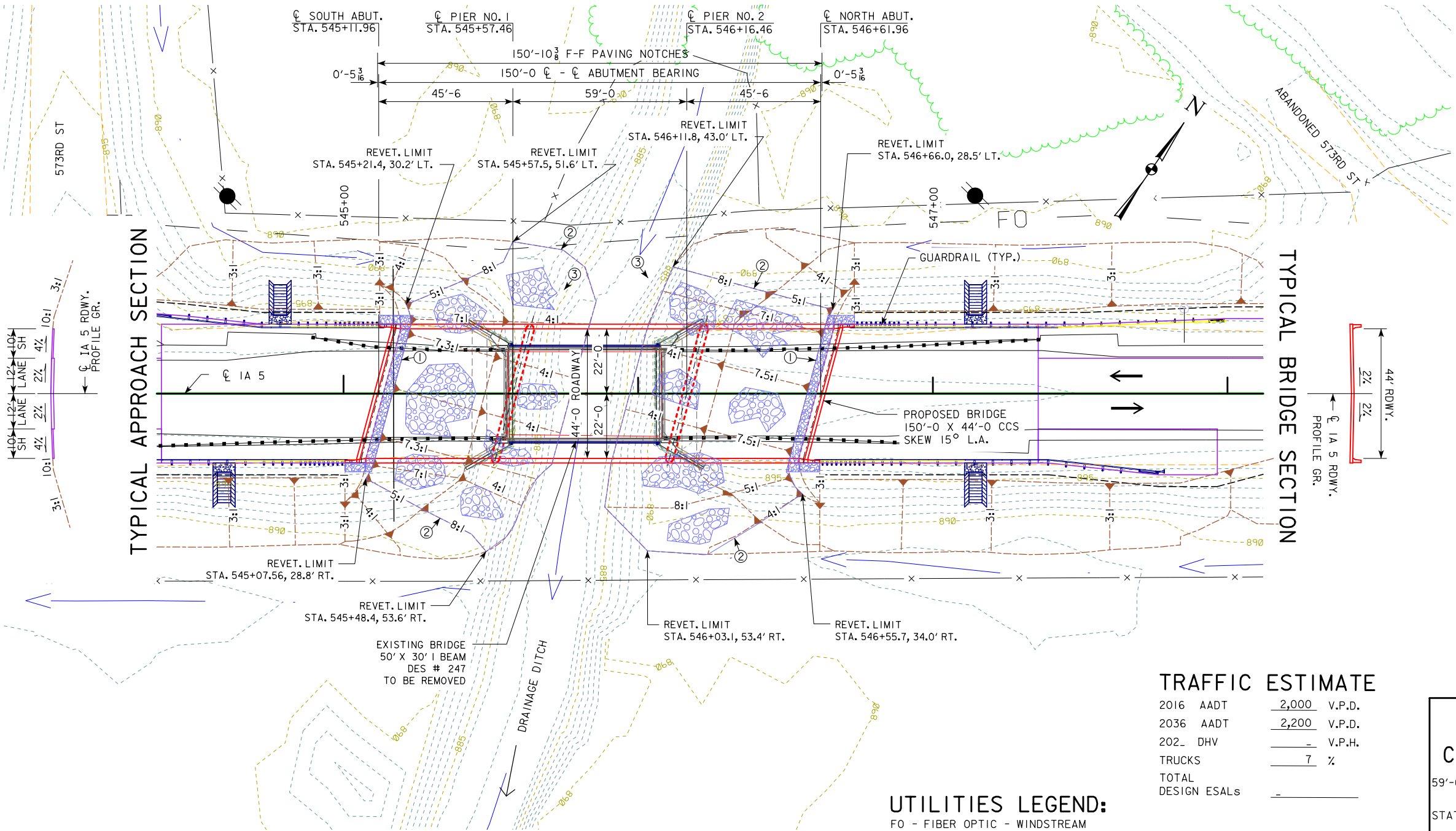
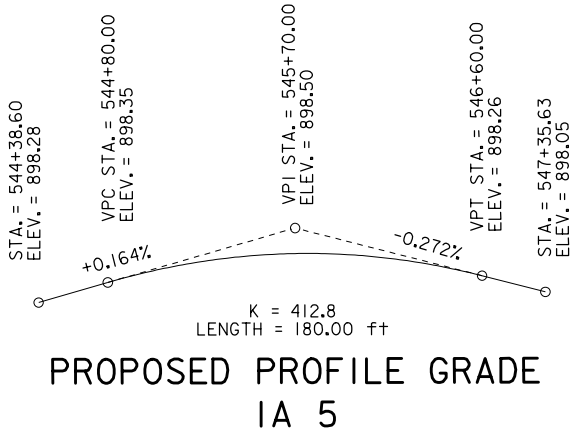




BENCH MARK NO. 501, 6103495.595N, 22742484.407E, FND IDOT BUTTON SW WING BRIDGE, EL. 898.600



- BERM PROTECTION EROSION STONE (0-9 THICK. MIN.) UNDERLAIN W/ ENGR. FABRIC
- BERM PROTECTION CLASS E REVET. (2' THICK. MIN.) UNDERLAIN W/ ENGR. FABRIC
- EXISTING CLASS E REVETMENT
- GRADING SURFACE
- REGULATORY LOW BEAM
- OPERATIONAL LOW BEAM
- PRE BORE HOLES, 1'-4 DIA., BOTTOM EL. 877.28
- PRE BORE HOLES, 1'-4 DIA., BOTTOM EL. 877.14



### HYDRAULIC DATA

DRAINAGE AREA = 6.2 SQ. MI.  
STREAM SLOPE = 10.6 FT./MI.  
AVG. LOW WATER STAGE = 883.7

Q<sub>50</sub> = 4,510 CFS  
STAGE = 893.17  
REGULATORY LOW BEAM = 895.98  
BACKWATER = 1.36 FT.  
AVG. BRIDGE VELOCITY = 6.9 FPS

Q<sub>100</sub> = 5,550 CFS  
STAGE = 893.70  
OPERATIONAL LOW BEAM = 895.83  
BACKWATER = 1.79 FT.  
AVG. BRIDGE VELOCITY = 7.7 FPS

Q<sub>200</sub> = 6,680 CFS  
STAGE = 894.23  
CALCULATED DESIGN SCOUR = 868.0

Q<sub>500</sub> = 8,040 CFS  
STAGE = 894.79  
AVG. BRIDGE VELOCITY = 9.2 FPS  
CALCULATED CHECK SCOUR = 867.5

ROADWAY OVERTOP 896.0  
STA. 537+88

EXTREME HW STAGE = UNKNOWN  
DATE = UNKNOWN

### LOCATION

IA 5 OVER DRAINAGE DITCH  
T-68N R-18W  
SECTION 36  
PLEASANT TOWNSHIP  
APPANOOSE COUNTY  
FHWA NO. 013901  
BRIDGE MAINT. NO. 0407.6S005  
LATITUDE 40.648507°  
LONGITUDE 92.876049°

### TRAFFIC ESTIMATE

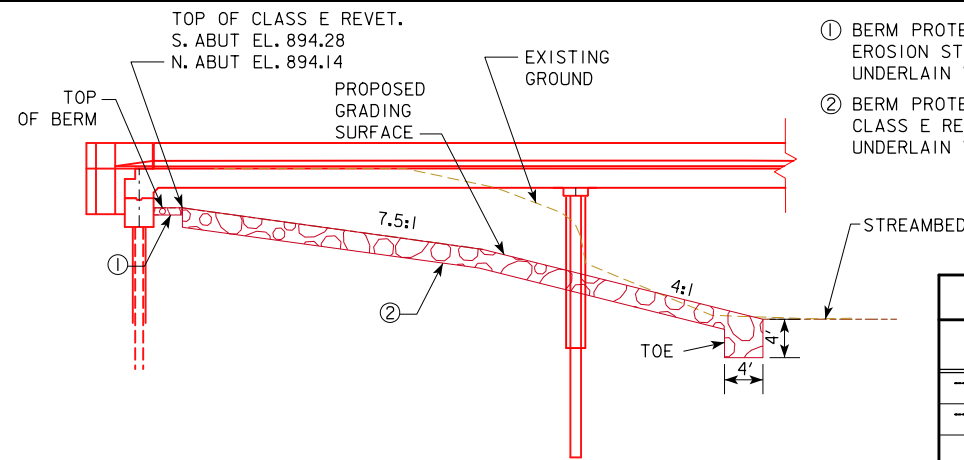
2016 AADT	2,000	V.P.D.
2036 AADT	2,200	V.P.D.
2022 DHV	-	V.P.H.
TRUCKS	7	%
TOTAL DESIGN ESALS	-	

### UTILITIES LEGEND:

FO - FIBER OPTIC - WINDSTREAM  
W - WATER - RATHBUN REGIONAL WATER

### SITUATION PLAN

DESIGN FOR 15° SKEW L.A.  
**150'-0 X 44'-0**  
**CONTINUOUS CONCRETE SLAB BRIDGE**  
59'-0 CENTER SPAN 45'-6 END SPANS  
STATION 545+86.96  
SEPTEMBER 2018  
**SITUATION PLAN**  
**APPANOOSE COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION  
DESIGN SHEET NO. 5 OF 12 FILE NO. 31644 DESIGN NO. 120



TYPICAL SECTION AT BRIDGE BERM  
REVTMENT PROTECTION

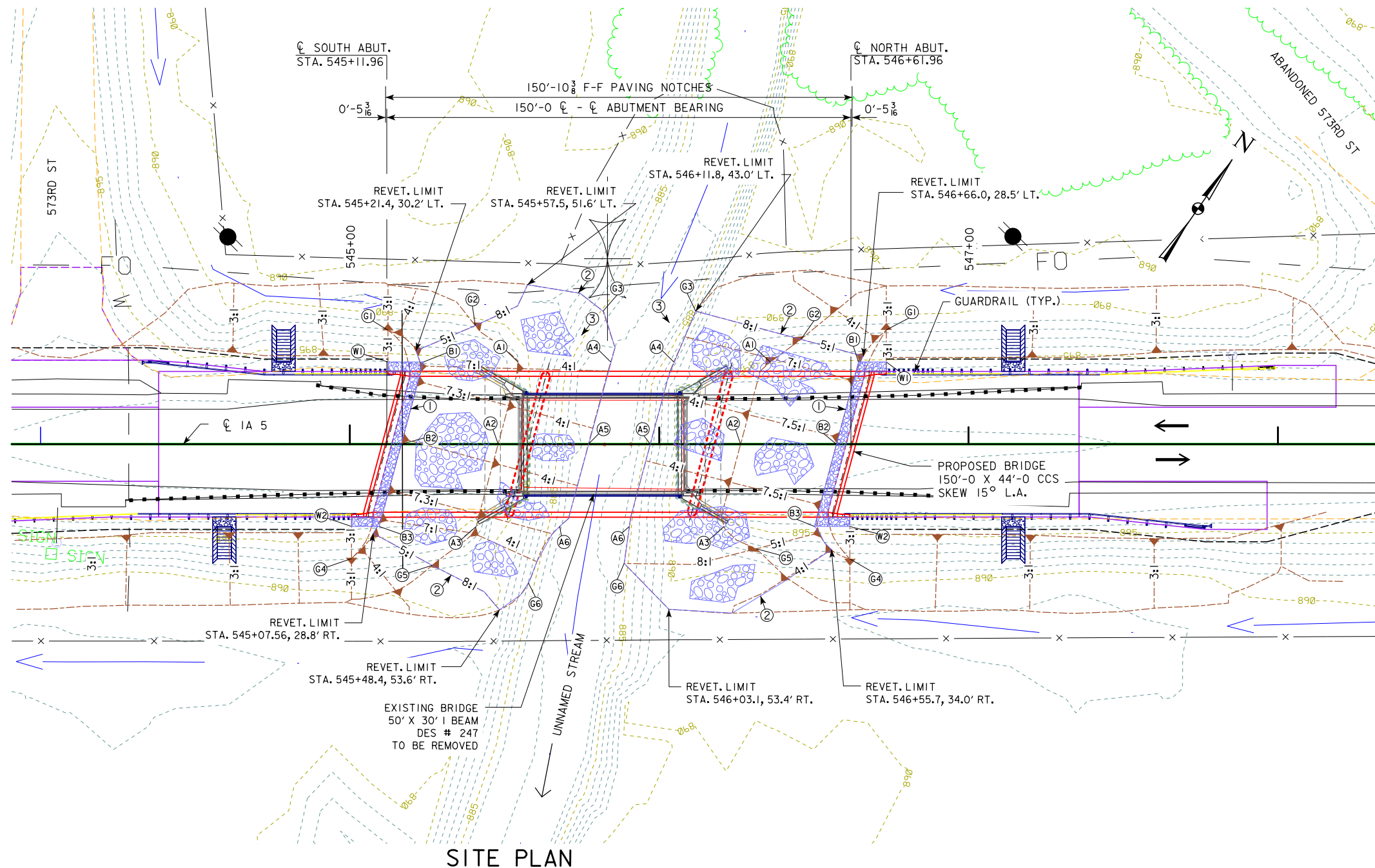
ESTIMATED BERM ARMORING QUANTITIES				
LOCATION	REVTMENT CL. E (TON)	EROSION STONE (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
---	620	8	665	387
---	628	8	673	392
TOTALS	1,248	16	1,338	779

EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE.

BRIDGE COORDINATES

LOCATION	CL. S. ABUT. BRG.	CL. PIER NO. 1	CL. PIER NO. 2	CL. N. ABUT. BRG.
WEST EDGE OF DECK	X=22742458.7307 Y=6103475.2719	X=22742491.3332 Y=6103507.6157	X=22742533.2183 Y=6103549.1685	X=22742565.2184 Y=6103580.9146
CL. APPROACH ROADWAY	X=22742471.1553 Y=6103454.3780	X=22742503.4565 Y=6103486.4230	X=22742545.3416 Y=6103527.9758	X=22742577.6429 Y=6103560.0207
EAST EDGE OF DECK	X=22742483.5798 Y=6103433.4841	X=22742515.5798 Y=6103465.2303	X=22742557.4649 Y=6103506.7831	X=22742590.0674 Y=6103539.1268

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.



SITE PLAN

BERM SLOPE LOCATION TABLE

	STATION	OFFSET	ELEV	STATION	OFFSET	ELEV
A1	545+54.31	26.8' LT	890.00	546+35.94	26.58' LT	890.00
A2	545+47.92	0	890.00	546+26.32	0	890.00
A3	545+40.83	26.58' RT	890.00	546+21.01	26.58' RT	890.00
A4	545+84.33	26.58' LT	882.70	546+04.74	26.58' LT	882.70
A5	545+77.12	0	882.70	545+97.12	0	882.70
A6	545+67.82	26.58' RT	882.70	545+90.37	26.58' RT	882.70
B1	545+23.74	26.58' LT	894.28	546+64.43	26.58' LT	894.14
B2	545+16.64	0	894.28	545+57.30	0	894.14
B3	545+09.50	26.58' RT	894.28	546+50.19	26.58' RT	894.14
G1	545+12.31	36.88' LT	894.28	546+73.41	36.98' LT	894.14
G2	545+40.58	38.36' LT	890.00	546+45.78	33.92' LT	890.00
G3	545+81.86	43.03' LT	884.80	546+11.78	43.05' LT	886.00
G4	545+00.52	36.98' RT	894.28	546+61.62	37.08' RT	894.14
G5	545+26.61	39.16' RT	890.00	546+31.40	33.80' RT	890.00
G6	545+57.75	44.88' RT	885.90	545+88.66	38.56' RT	884.50
W1	545+12.31	26.58' LT	897.74	546+73.41	26.58' LT	897.64
W2	545+00.52	26.58' RT	897.79	546+61.62	26.58' RT	897.67

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

GRADING CONTROL-WEST AND EAST:  
POINTS A4, A5 AND A6 ARE BERM GRADING CONTROL LINE

HYDRAULIC DESIGN

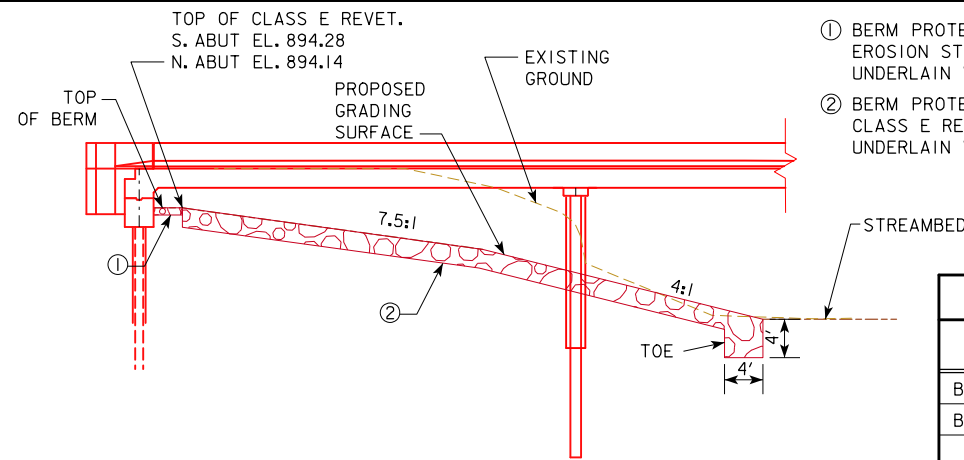
I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

*David J. Mulholland* 9/11/2020  
Signature Date  
Printed or Typed Name **David J. Mulholland**  
My license renewal date is December 31, 2020

Pages or sheets covered by this seal: SHEETS 6, 7, AND 8

DESIGN FOR 15° SKEW L.A.  
**150'-0" X 44'-0"**  
**CONTINUOUS CONCRETE SLAB BRIDGE**  
59'-0" CENTER SPAN 45'-6" END SPANS  
**SITUATION PLAN-SITE**  
STATION 545+86.96 SEPTEMBER 2020  
**APPANOOSE COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION  
DESIGN SHEET NO. 6 OF 12 FILE NO. 31644 DESIGN NO. 120





TYPICAL SECTION AT BRIDGE BERM  
REVTMENT PROTECTION

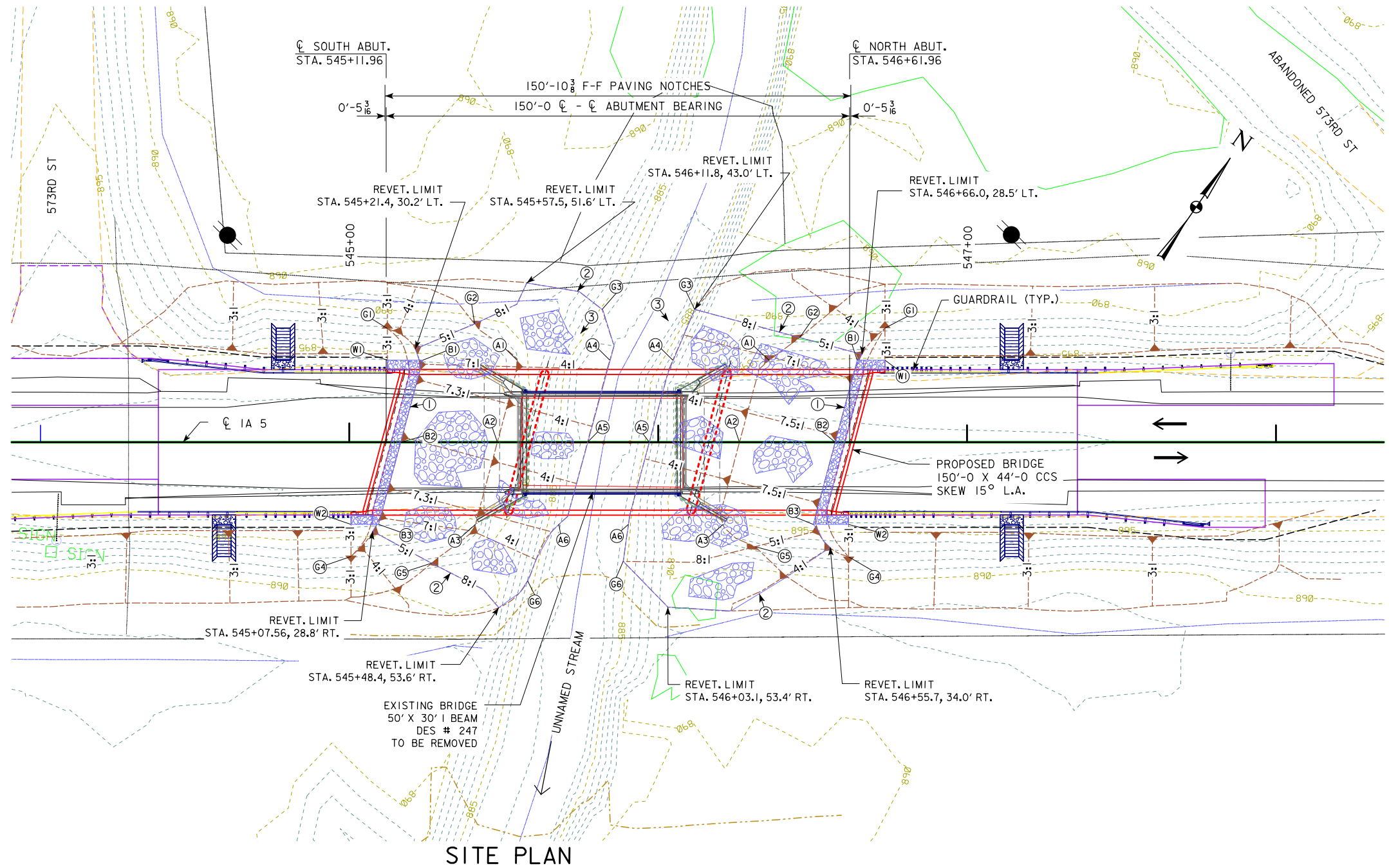
ESTIMATED BERM ARMORING QUANTITIES				
LOCATION	REVTMENT CL. E (TON)	EROSION STONE (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
BERM LINING - SOUTH ABUTMENT	620	8	665	387
BERM LINING - NORTH ABUTMENT	628	8	673	392
TOTALS	1,248	16	1,338	779

EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE.

BRIDGE COORDINATES

LOCATION	CL. S. ABUT. BRG.	CL. PIER NO. 1	CL. PIER NO. 2	CL. N. ABUT. BRG.
WEST EDGE OF DECK	X=22742458.7307 Y=6103475.2719	X=22742491.3332 Y=6103507.6157	X=22742533.2183 Y=6103549.1685	X=22742565.2184 Y=6103580.9146
CL. APPROACH ROADWAY	X=22742471.1553 Y=6103454.3780	X=22742503.4565 Y=6103486.4230	X=22742545.3416 Y=6103527.9758	X=22742577.6429 Y=6103560.0207
EAST EDGE OF DECK	X=22742483.5798 Y=6103433.4841	X=22742515.5798 Y=6103465.2303	X=22742557.4649 Y=6103506.7831	X=22742590.0674 Y=6103539.1268

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.



SITE PLAN

BERM SLOPE LOCATION TABLE

SOUTH ABUTMENT						NORTH ABUTMENT					
	STATION	OFFSET	ELEV				STATION	OFFSET	ELEV		
A1	545+54.31	26.8' LT	890.00			546+35.94	26.58' LT		890.00		
A2	545+47.92	0	890.00			546+26.32	0		890.00		
A3	545+40.83	26.58' RT	890.00			546+21.01	26.58' RT		890.00		
A4	545+84.33	26.58' LT	882.70			546+04.74	26.58' LT		882.70		
A5	545+77.12	0	882.70			545+97.12	0		882.70		
A6	545+67.82	26.58' RT	882.70			545+90.37	26.58' RT		882.70		
B1	545+23.74	26.58' LT	894.28			546+64.43	26.58' LT		894.14		
B2	545+16.64	0	894.28			545+57.30	0		894.14		
B3	545+09.50	26.58' RT	894.28			546+50.19	26.58' RT		894.14		
G1	545+12.31	36.88' LT	894.28			546+73.41	36.98' LT		894.14		
G2	545+40.58	38.36' LT	890.00			546+45.78	33.92' LT		890.00		
G3	545+81.86	43.03' LT	884.80			546+11.78	43.05' LT		886.00		
G4	545+00.52	36.98' RT	894.28			546+61.62	37.08' RT		894.14		
G5	545+26.61	39.16' RT	890.00			546+31.40	33.80' RT		890.00		
G6	545+57.75	44.88' RT	885.90			545+88.66	38.56' RT		884.50		
W1	545+12.31	26.58' LT	897.74			546+73.41	26.58' LT		897.64		
W2	545+00.52	26.58' RT	897.79			546+61.62	26.58' RT		897.67		

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

GRADING CONTROL-WEST AND EAST:  
POINTS A4, A5 AND A6 ARE BERM GRADING CONTROL LINE

**HYDRAULIC DESIGN**

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

Signature: *David J. Mulholland* Date: 9/1/2020

Printed or Typed Name: David J. Mulholland

My license renewal date is December 31, 2020

Pages or sheets covered by this seal: SHEETS 6, 7, AND 8

DESIGN FOR 15° SKEW L.A.

**150'-0 X 44'-0**

**CONTINUOUS CONCRETE SLAB BRIDGE**

59'-0 CENTER SPAN 45'-6 END SPANS

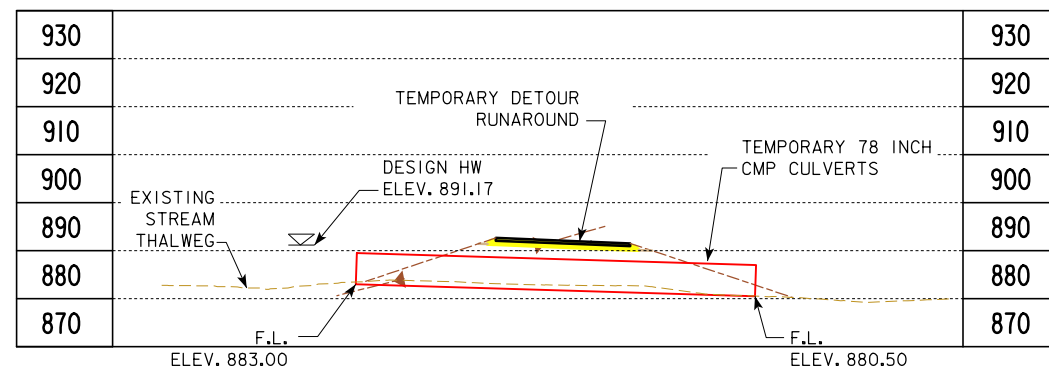
**SITUATION PLAN-SITE**

STATION 545+86.96 SEPTEMBER 2020

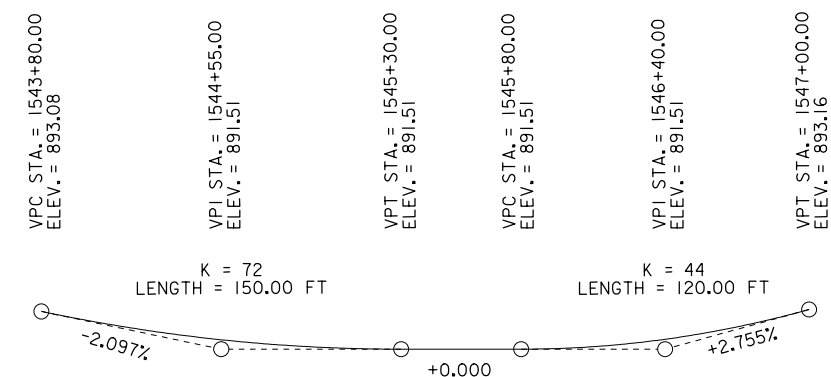
**APPANOOSE COUNTY**

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 6 OF 12 FILE NO. 31644 DESIGN NO. 120



LONGITUDINAL SECTION ALONG CULVERTS



## PROPOSED PROFILE DETOUR RUNAROUND

## LOCATION

IA 5 DETOUR RUNAROUND  
OVER DRAINAGE DITCH  
T-68N R-18W  
SECTION 36  
PLEASANT TOWNSHIP  
APPANOOSE COUNTY  
LATITUDE 40.648255°  
LONGITUDE 92.875868°

## HYDRAULIC DATA

DRAINAGE AREA = 6.2 SQ. MI.  
Q<sub>5</sub> = 1,000 CFS  
HW ELEV. = 891.17  
STREAM SLOPE = 10.6 FT./MI.

## TRAFFIC ESTIMATE-1A 5

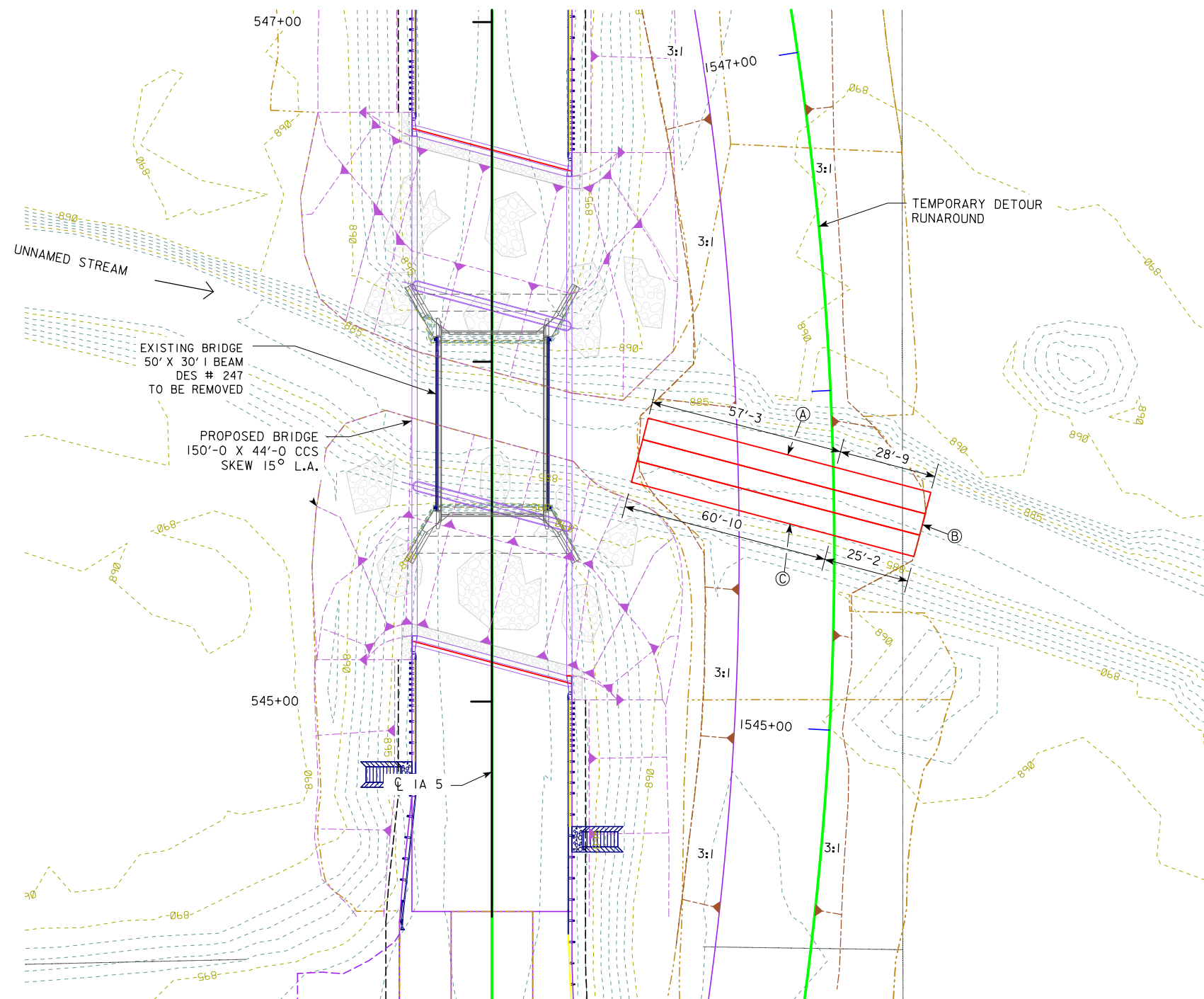
2016	AADT	<u>2,000</u>	V.P.D.
2036	AADT	<u>2,200</u>	V.P.D.
202_	DHV	<u>-</u>	V.P.H.
TRUCKS		<u>7</u>	%
TOTAL DESIGN	ESALs	-	

UTILITIES LEGEND:

FO - FIBER OPTIC - WINDSTREAM  
W - WATER - RATHBUN REGIONAL WATER

THIS DRAWING SHOWS INTERIM CONDITION DURING CONSTRUCTION.  
SEE DESIGN SHEETS 5 AND 6 FOR FINAL GRADING AND BRIDGE PLAN.

NOTE: REFER TO ROADWAY SHEETS FOR 78" CMP CULVERT BID ITEMS.



## SITUATION PLAN

- (A) 78" X 86'-0" CMP CULVERT  
STA. 1545+74.16  
SKEW 15° LT AHEAD  
F.L. LT. 883.00  
F.L. RT. 880.50
- (B) 78" X 86'-0" CMP CULVERT  
STA. 1545+67.41  
SKEW 15° LT AHEAD  
F.L. LT. 883.00  
F.L. RT. 880.50
- (C) 78" X 86'-0" CMP CULVERT  
STA. 1545+60.67  
SKEW 15° LT AHEAD  
F.L. LT. 883.00  
F.L. RT. 880.50

DESIGN FOR 15° SKEW L.A.

150'-0 X 44'-0  
CONTINUOUS CONCRETE SLAB BRIDGE

59'-0 CENTER SPAN                      45'-6 END SPANS





TEMPORARY 78-INCH CMP CULVERTS

STATION 1545+67.41 SEPTEMBER 2018

APPANOOSE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION

DESIGN SHEET NO. 7 OF 12 FILE NO. 31644 DESIGN NO. 120

REINFORCING BAR LIST - PIER I ENCASEMENT					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5a1	ENCASEMENT, VERTICAL		70	14'-10"	1,083
4b1	ENCASEMENT, TRANSVERSE, TIES		374	2'-10"	708
5c1	ENCASEMENT, HORIZ.		68	25'-3"	1,791
5c2	ENCASEMENT, ENDS		34	8'-1"	287
5d2	ENCASEMENT, DOWELS		70	1'-11"	140
REINFORCING STEEL - TOTAL - (LBS.)					4,009

EPOXY COATED REINF. BAR LIST - PIER I ENCASEMENT					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
8d1	ENCASEMENT TO SLAB DOWELS		48	4'-2"	534
5h1	PIER CAP HOOPS		10	8'-6"	89
REINFORCING STEEL EPOXY COATED - TOTAL - (LBS.)					623

PIER NOTES:

ALL MONOLITHIC PIER CAP REINFORCING AND CONCRETE IS INCLUDED IN SUPERSTRUCTURE ESTIMATE OF QUANTITIES.

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

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

FOR PILING DRIVING NOTES REFER TO GENERAL NOTES SHEET.

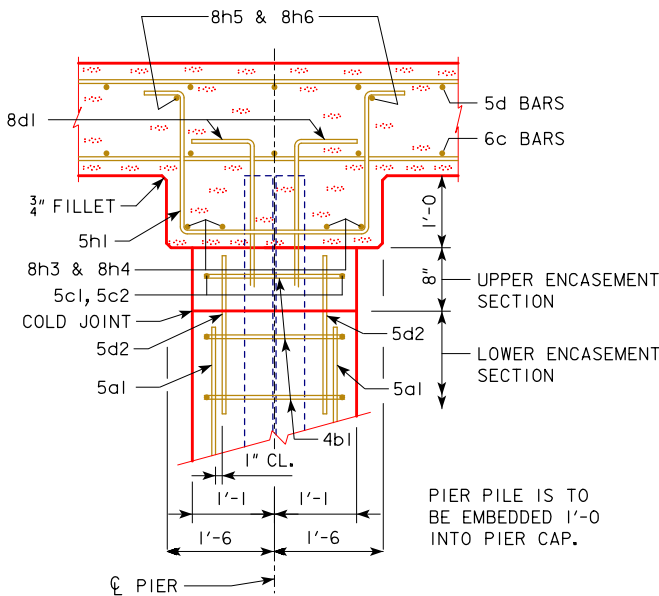
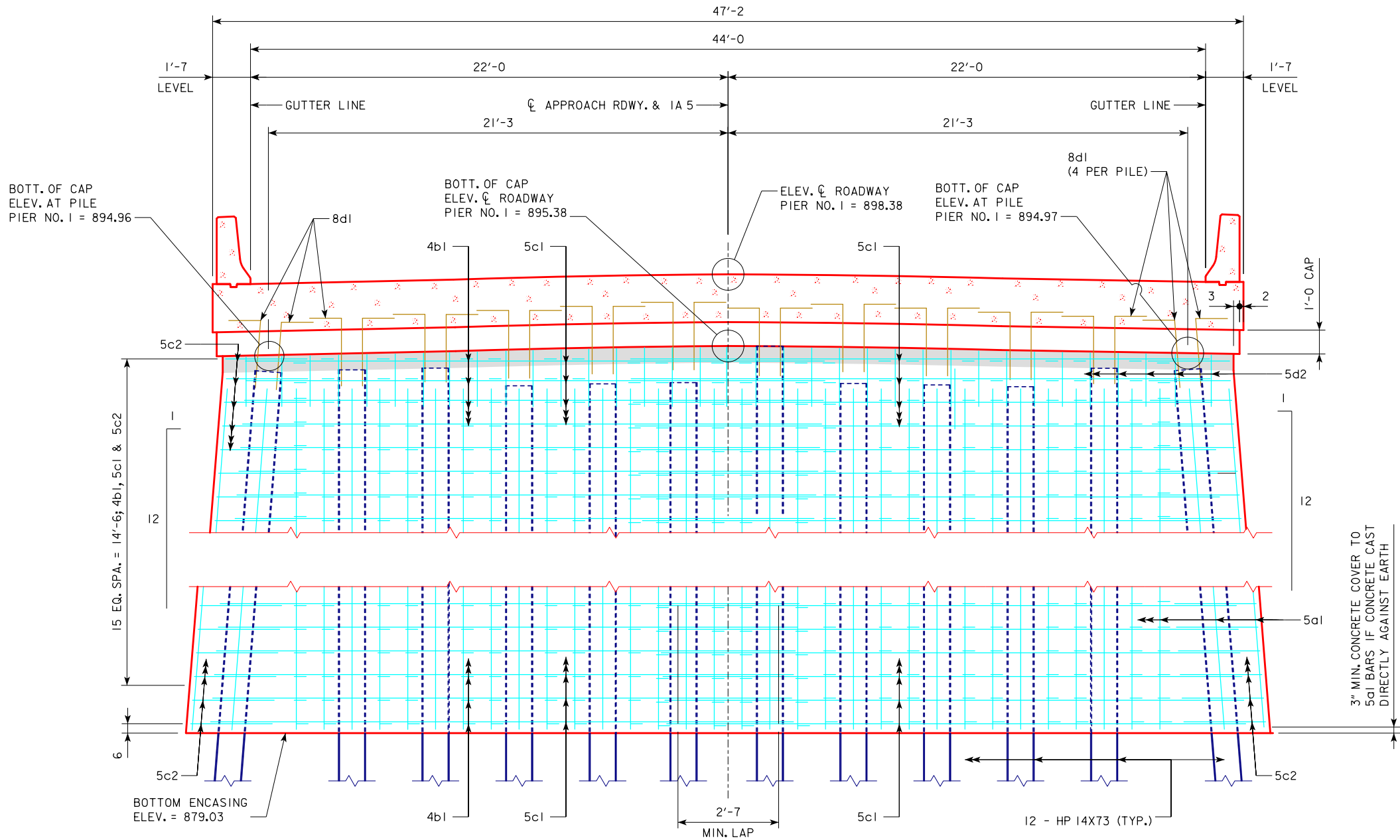
DOWEL SETTING NOTES:

THE 5d2 VERTICAL REINFORCING BARS SHALL BE SET AS DOWELS IN DRILLED HOLES WITH DEPTH OF 1'-5."

FOR A BONDING AGENT, USE A POLYMER GROUT SYSTEM IN ACCORDANCE WITH ARTICLE 2301.03, E OF THE STANDARD SPECIFICATIONS.

THE DOWELS SHALL BE INSTALLED IN ACCORDANCE WITH THE POLYMER GROUT MANUFACTURER'S RECOMMENDATIONS.

INTENTIONALLY ROUGHEN COLD JOINT AT TOP OF LOWER ENCASEMENT SECTION BEFORE INSTALLING DOWELS. PREPARE COLD JOINT WITH BONDING AGENT BETWEEN UPPER ENCASEMENT SECTION AND LOWER ENCASEMENT SECTION PER STANDARD SPECIFICATIONS ARTICLE 2403.03, I.



PIER I CAP SECTION  
(ENCASEMENT SHOWN)

ELEVATION VIEW - PIER I SECTION  
LOOKING NORTHEAST (ALONG ROUTE)

REVISOR: 02-01-2022 THIS SHEET ADDED.  
REASON: PIER I ENCASEMENT PLACED 8 INCHES TOO LOW.

DESIGN FOR 15° SKEW L.A.  
**150'-0 X 44'-0**  
**CONTINUOUS CONCRETE SLAB BRIDGE**  
45'-6 END SPANS 59'-0 INTERIOR SPAN  
**PILE ENCASEMENT DETAILS**  
STA. 545+86.96 (IA 5) SEPTEMBER, 2020  
**APPANOOSE COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION  
DESIGN SHEET NO. 7A OF 12 FILE NO. 31644 DESIGN NO. 120

REVISED: FEBRUARY 1, 2022



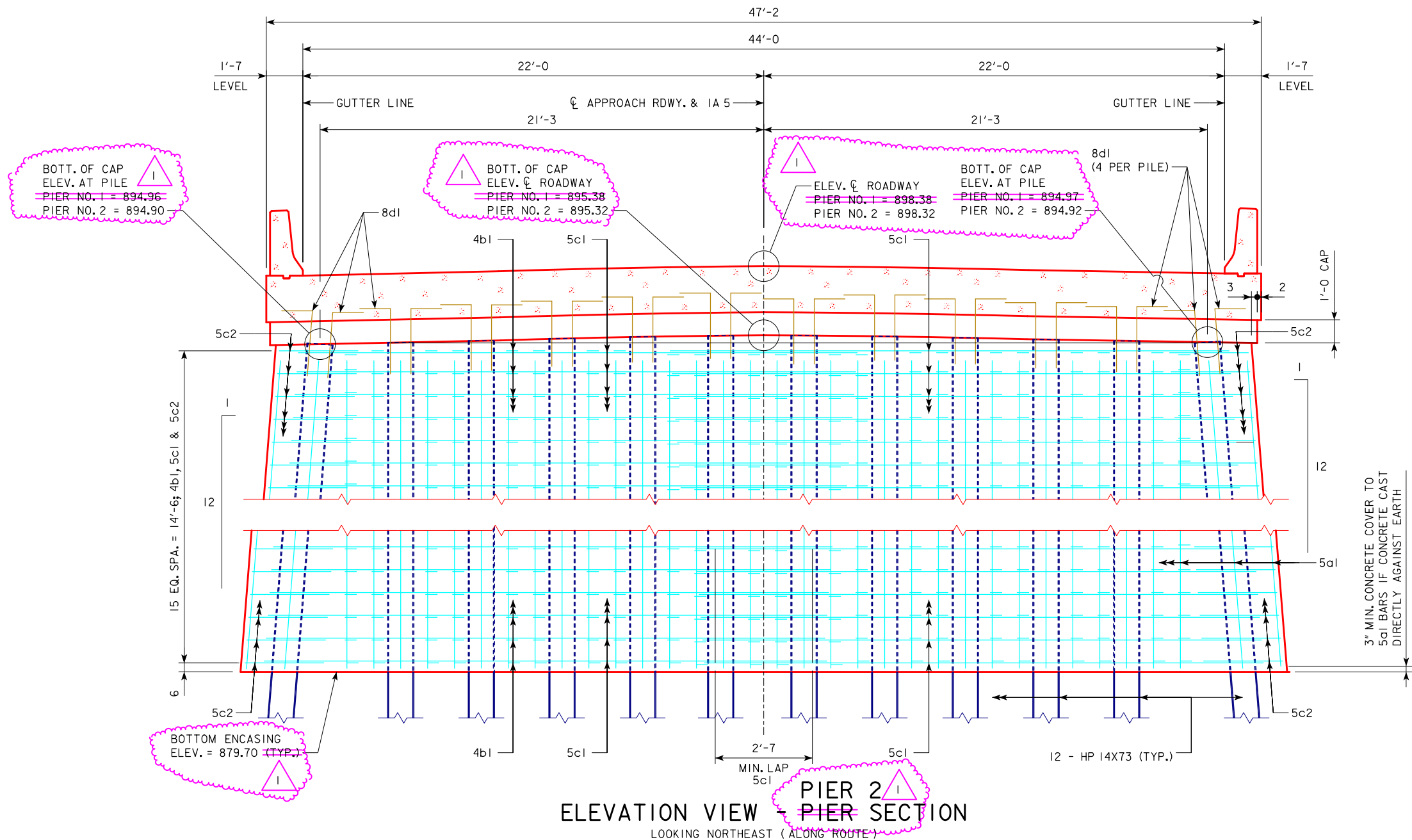
PIER NOTES:

ALL MONOLITHIC PIER CAP REINFORCING AND CONCRETE IS INCLUDED IN SUPERSTRUCTURE ESTIMATE OF QUANTITIES.

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

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

FOR PILING DRIVING NOTES REFER TO GENERAL NOTES SHEET.



REVIS: 02-01-2022 REMOVED INFORMATION SPECIFICALLY PERTAINING TO PIER 1 AS NEW PILE ENCASEMENT SHEET WAS ADDED FOR PIER 1.  
REASON: PIER 1 ENCASEMENT PLACED 8 INCHES TOO LOW.

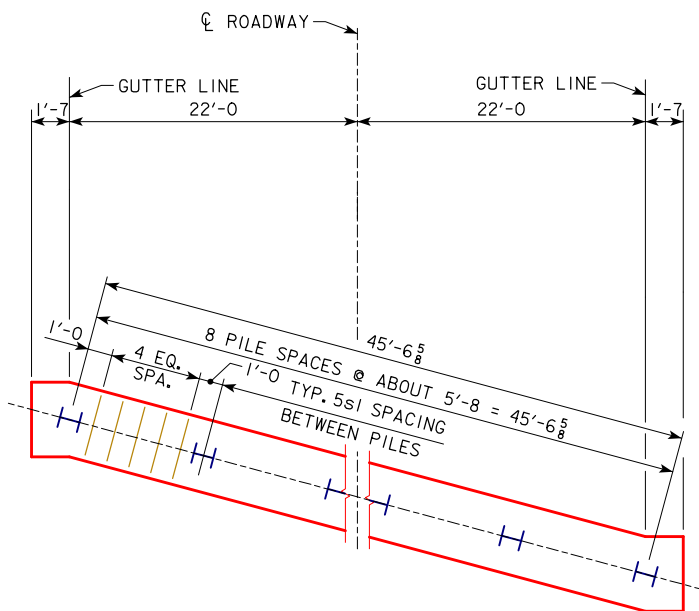
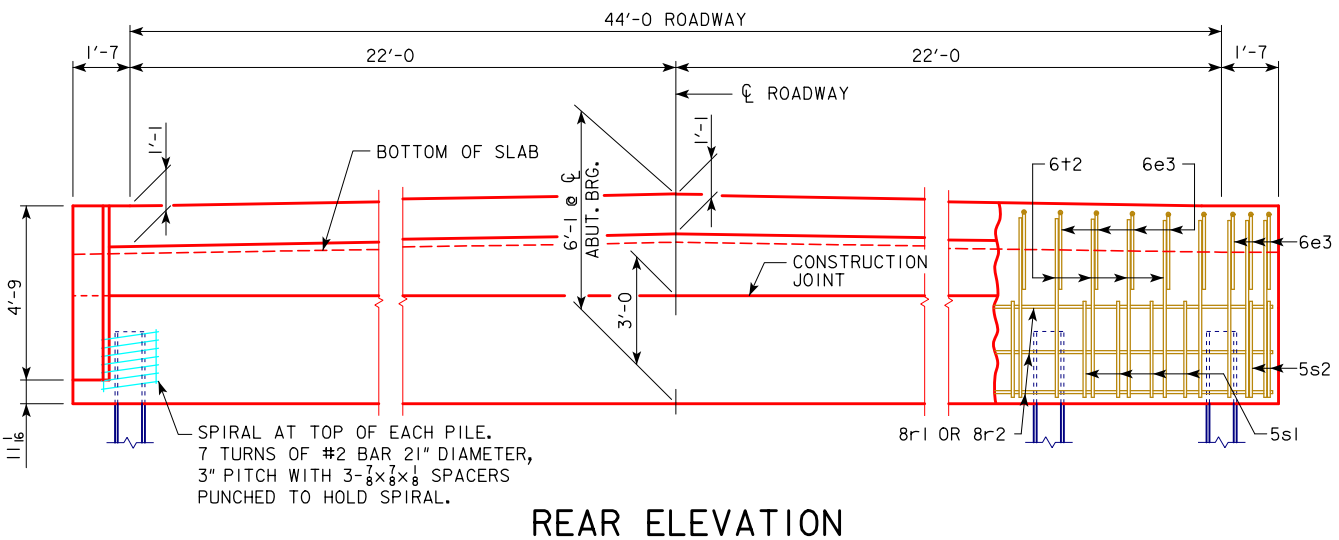
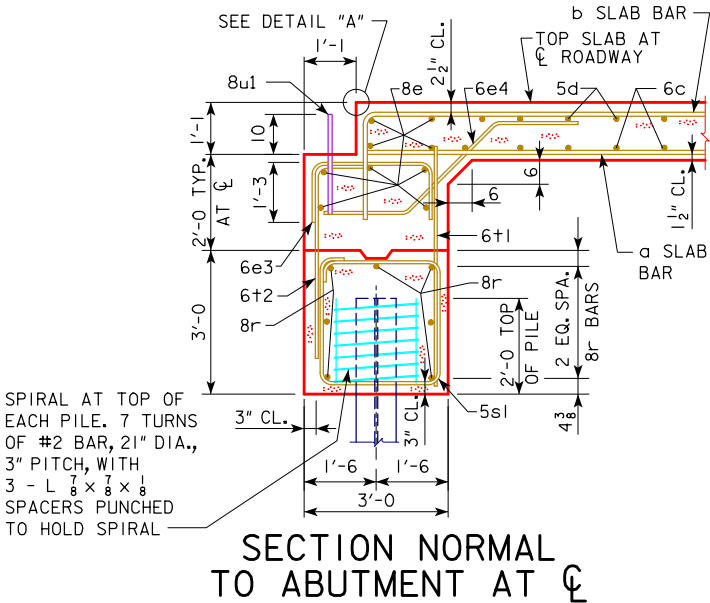
DESIGN FOR 15° SKEW L.A.  
150'-0 X 44'-0  
CONTINUOUS CONCRETE SLAB BRIDGE  
45'-6 END SPANS 59'-0 INTERIOR SPAN  
PILE ENCASEMENT DETAILS  
STA. 545+86.96 (IA 5) SEPTEMBER, 2020  
APPANOOSE COUNTY  
IOWA DEPARTMENT OF TRANSPORTATION  
DESIGN SHEET NO. 8 OF 12 FILE NO. 31644 DESIGN NO. 120

REVISED: FEBRUARY 1, 2022



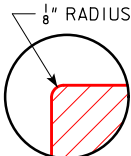


THIS DESIGN SHEET IS A MODIFICATION OF STANDARD SHEET J44-40-14. NOTE THAT ALL PILES ARE HP 10X57.

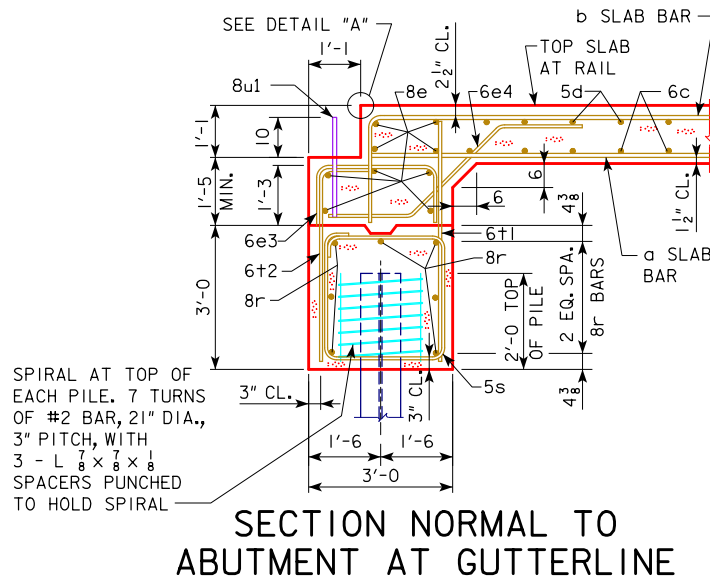


150'-0 BRIDGE

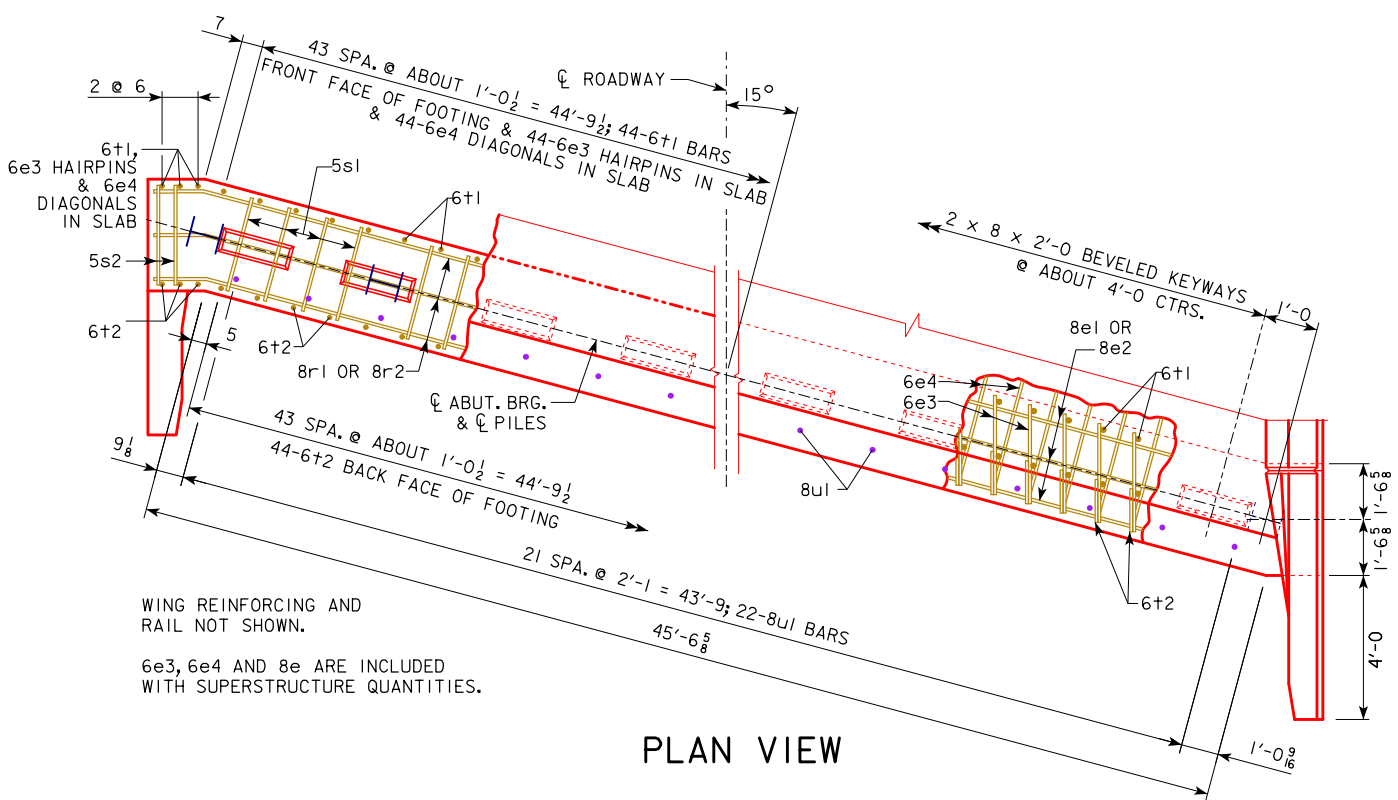
PILE PLAN - 15° SKEW  
STEEL PILING



DETAIL "A"



SECTION NORMAL TO  
ABUTMENT AT GUTTERLINE



### PLAN VIEW

ABUTMENT NOTES:

ALL PILING HP 10X57.

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.

ALL REINFORCING STEEL IS TO BE GRADE 60.

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

NUMBER OF PILES AND ABUTMENT DESIGN LOADS								
BRIDGE LENGTH	150'-0"							
PILING - NUMBER	9							
PU, STRENGTH   DESIGN LOAD - KIPS	Δ 927							

Δ INCLUDES DYNAMIC LOAD ALLOWANCE

NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

DESIGN FOR 15° SKEW L.A.  
150'-0 X 44'-0  
CONTINUOUS CONCRETE SLAB BRIDGE  
45'-6 END SPANS 59'-0 INTERIOR SPAN  
ABUTMENT DETAILS- STEEL PILING  
STA. 545+86.96 (1A 5) SEPTEMBER, 2020  
APPANOOSE COUNTY  
IOWA DEPARTMENT OF TRANSPORTATION  
DESIGN SHEET NO. 10 OF 12 FILE NO. 31644 DESIGN NO. 120

THIS DESIGN SHEET IS A MODIFICATION OF STANDARD SHEET J44-44-14. NOTE THAT ALL PILES ARE HP 10X57 WITH A 15-FT PREBORE.

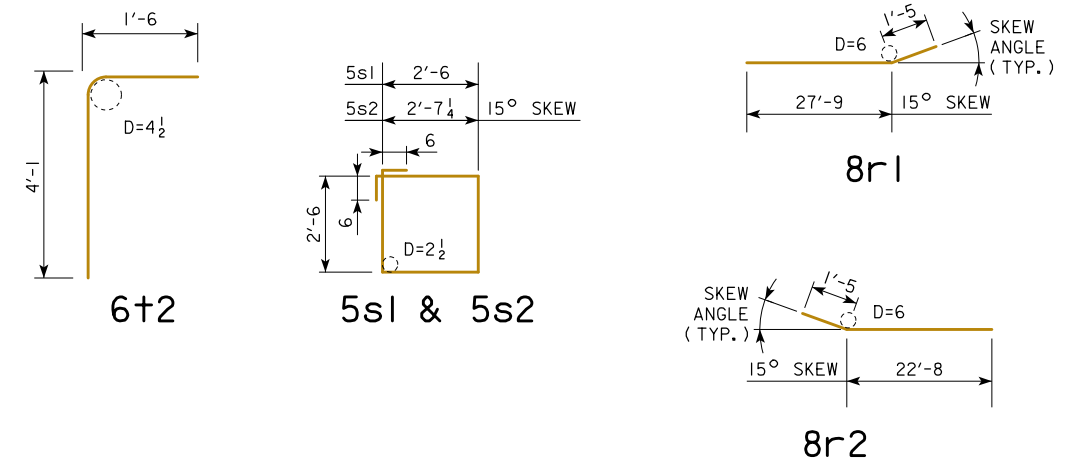
BILL OF REINFORCING STEEL - ONE ABUTMENT - 15° SKEW

BRIDGE LENGTH				150'-0"	
MARK	LOCATION	SHAPE	LENGTH	NO.	WEIGHT
8r1	ABUTMENT FOOTING LONGITUDINAL		29'-2"	7	545
8r2	ABUTMENT FOOTING LONGITUDINAL		24'-1"	7	450
5sl	ABUTMENT FOOTING HOOPS		11'-0"	40	459
5s2	ABUTMENT FOOTING HOOPS		11'-3"	4	47
6+1	FOOTING TO SLAB BARS		5'-0"	50	376
6+2	FOOTING TO SLAB BARS		5'-7"	50	419
#2	PILE SPIRAL		38'-6"	9	58
	SPIRAL SPACERS, L $\frac{7}{8} \times \frac{1}{8} \times \frac{1}{8}$ x 0.70		1'-10"	27	35
REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)				2,389	

## ESTIMATED QUANTITIES - ONE ABUT. - 15° SKEW

LOCATION	UNIT	QUANTITY							
BRIDGE LENGTH		150'-0							
STRUCTURAL CONCRETE ( BRIDGE )	C.Y.	16.3							
REINFORCING STEEL EPOXY COATED	LBS.	2,389							
STEEL PILING HP 10X57	NO.	9							
PREBORE HOLES @ 15' EACH	FT.	135							

## BENT BAR DETAILS

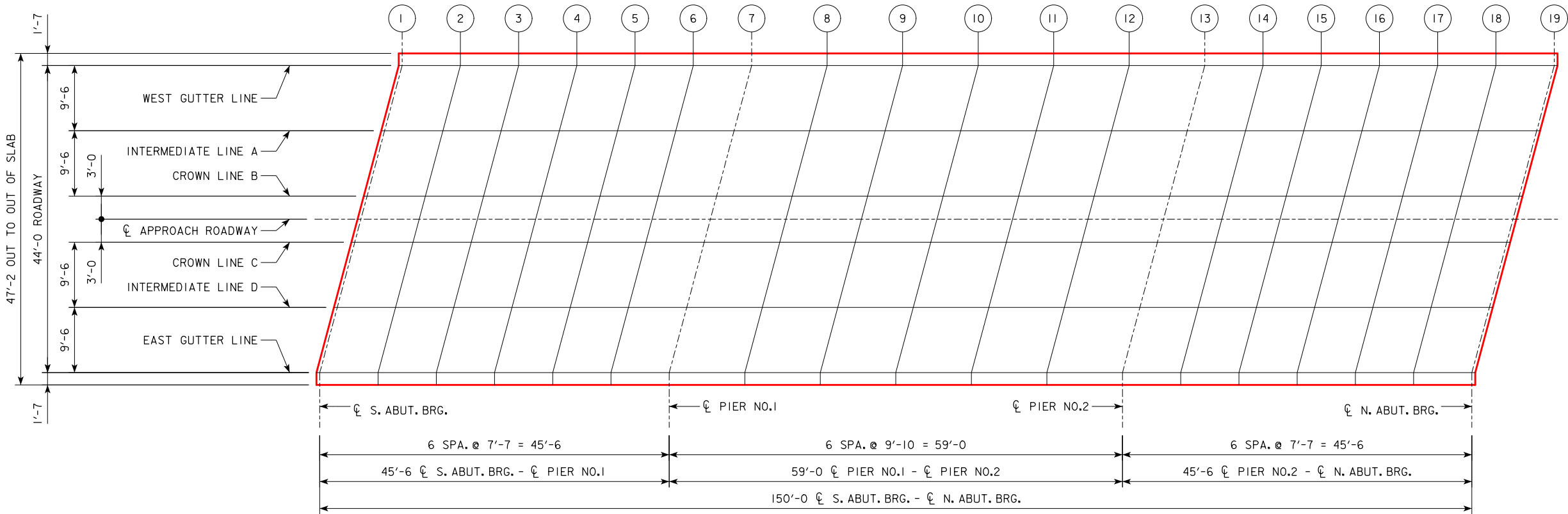


NOTE: DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

NOTE: THE PILE SPIRALS AND SPIRAL SPACERS ARE TO BE NON-COATED REINFORCING BUT MAY BE EPOXY COATED AT THE CONTRACTORS OPTION AND EXPENSE.

DESIGN FOR 15° SKEW L.A.  
150'-0 X 44'-0  
CONTINUOUS CONCRETE SLAB BRIDGE  
45'-6 END SPANS 59'-0 INTERIOR SPAN  
ABUTMENT DETAILS- STEEL PILING  
STA. 545+86.96 (1A 5) SEPTEMBER, 2020  
APPANOOSE COUNTY  
IOWA DEPARTMENT OF TRANSPORTATION  
DESIGN SHEET NO. 11 OF 12 FILE NO. 31644 DESIGN NO. 120

TOP OF BRIDGE SLAB ELEVATIONS																			
LOCATION	C.L. S. ABUT. BRG.						C.L. PIER NO.1						C.L. PIER NO.2						C.L. N. ABUT. BRG.
	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
WEST GUTTER LINE	897.96	897.96	897.96	897.97	897.97	897.97	897.96	897.96	897.95	897.94	897.93	897.92	897.90	897.88	897.87	897.85	897.83	897.81	897.79
INTERMEDIATE LINE A	898.14	898.15	898.15	898.16	898.16	898.16	898.15	898.15	898.14	898.13	898.12	898.11	898.09	898.08	898.06	898.05	898.03	898.01	897.99
CROWN LINE B	898.33	898.34	898.34	898.34	898.35	898.35	898.35	898.34	898.34	898.33	898.32	898.30	898.29	898.27	898.26	898.24	898.23	898.21	898.19
C.L. APPROACH ROADWAY	898.36	898.37	898.37	898.38	898.38	898.38	898.38	898.37	898.37	898.36	898.35	898.34	898.32	898.31	898.29	898.28	898.26	898.24	898.22
CROWN LINE C	898.33	898.34	898.34	898.34	898.35	898.35	898.35	898.34	898.34	898.33	898.32	898.31	898.29	898.28	898.26	898.25	898.23	898.21	898.19
INTERMEDIATE LINE D	898.14	898.14	898.15	898.15	898.16	898.16	898.16	898.15	898.15	898.14	898.13	898.12	898.10	898.09	898.08	898.06	898.05	898.03	898.01
EAST GUTTER LINE	897.95	897.95	897.96	897.96	897.96	897.97	897.97	897.96	897.96	897.95	897.94	897.93	897.92	897.91	897.89	897.88	897.86	897.84	897.82



TOP OF DECK ELEVATION LAYOUT

DESIGN FOR 15° SKEW L.A.

150'-0 X 44'-0

CONTINUOUS CONCRETE SLAB BRIDGE

45'-6 END SPANS59'-0 INTERIOR SPAN

TOP OF SLAB ELEVATIONS

STA. 545+86.96 (1A 5)SEPTEMBER, 2020

APPANOOSE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION

DESIGN SHEET NO. 12 OF 12FILE NO. 31644DESIGN NO. 120