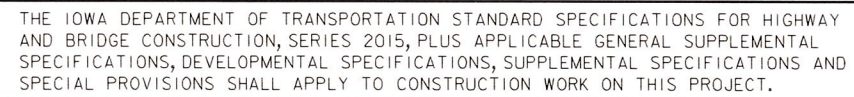
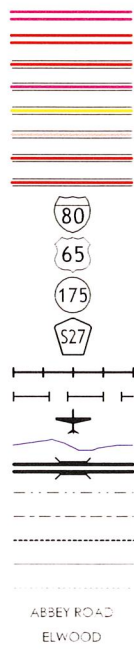


LINCOLN COUNTY
DESIGN

REPLACEMENT - CCS
BRF-151-3(162)-38-57

LINCOLN COUNTY
DESIGN

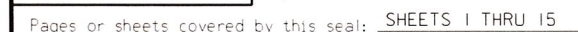
- INTERSTATE HIGHWAY
- UNITED STATES HIGHWAY
- STATE HIGHWAY
- COUNTY HIGHWAY
- RAILROAD
- PIPELINE
- AIRPORT
- HYDROLOGY
- BRIDGE
- STATE BOUNDARY
- COUNTY BOUNDARY
- CORPORATE BOUNDARY
- TOWNSHIP LINE
- SECTION LINE
- ROAD NAMES
- UNINCORPORATED PLACE



REVISIONS

NO.	DESCRIPTION
1	TITLE SHEET
2	ESTIMATE SHEET - DESIGN 0322
2-15	DESIGN 0322
PS.1-SPS.2	SOIL PROFILE SHEET
C.1	ESTIMATED ROADWAY QUANTITIES
A.1-L.1	ROADWAY SHEETS

THIS PROJECT IS COVERED BY THE IOWA DEPARTMENT OF NATURAL RESOURCES NPDS GENERAL PERMIT NO. 2. THE CONTRACTOR SHALL CARRY OUT THE TERMS AND CONDITIONS OF GENERAL PERMIT NO. 2 AND THE STORM WATER POLLUTION PREVENTION PLAN WHICH IS A PART OF THESE CONTRACT DOCUMENTS. REFER TO SECTION 2602 OF THE STANDARD SPECIFICATIONS FOR ADDITIONAL INFORMATION.



SHEET NUMBER 1

SUMMARY OF CONCRETE QUANTITIES

LOCATION	STRUCTURAL CONCRETE	HPC STRUCTURAL CONCRETE
WEST ABUTMENT FOOTING	17.0	-----
EAST ABUTMENT FOOTING	17.0	-----
SUPERSTRUCTURE (DECK + ABUT. WINGS)	275.3	-----
TOTAL (CU. YDS.)	309.3	-----

SUMMARY OF REINFORCING STEEL

LOCATION	NON-COATED REINFORCING STEEL	STAINLESS STEEL REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
WEST ABUTMENT FOOTING	-----	-----	2,380
EAST ABUTMENT FOOTING	-----	-----	2,380
SUPERSTRUCTURE (WITH BARRIER RAIL AND MONOLITHIC PIER CAP)	-----	2,490	70,994
TOTAL (LBS.)	-----	2,490	75,754

SUMMARY OF EXCAVATION

LOCATION	CLASS 20 EXCAVATION	CLASS 21 EXCAVATION
WEST ABUTMENT	68.3	-----
EAST ABUTMENT	68.3	-----
TOTAL (CU. YDS.)	136.6	-----

SUMMARY OF FOUNDATIONS

LOCATION	SUBSTRUCTURE TYPE	FOUNDATION TYPE	NUMBER	LENGTH (LIN. FT.)	TOTAL (LIN. FT.)
WEST ABUTMENT	INTEGRAL ABUTMENT	HP10x42	7	55	385
EAST ABUTMENT	INTEGRAL ABUTMENT	HP10x42	7	55	385
PIER #1	PILE BENT PIER	HP14x73	11	55	605
PIER #2	PILE BENT PIER	HP14x73	11	55	605
PILE ENCASEMENTS					
PIER #1	PIOL TYPE 3	HP14x73	11	Δ 17.95	197.5
PIER #2	PIOL TYPE 3	HP14x73	11	Δ 17.68	194.5

Δ AVERAGE LENGTH

DESIGN FOR 30° SKEW (R.A.)

100'-0 x 41'-0 CONTINUOUS
CONCRETE SLAB BRIDGE

30'-6 END SPANS 39'-0 INTERIOR SPAN

SUMMARY QUANTITIES

STA. 6267+72.00, 43.54' RT. (R) U.S. HWY 151 NOVEMBER, 2020

LINN COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2 OF 14 FILE NO. 31632 DESIGN NO. 322

GENERAL BRIDGE NOTES:

THIS DESIGN IS FOR THE REPLACEMENT OF THE EXISTING 60’ x 30’ CONTINUOUS CONCRETE SLAB BRIDGE ON N.B. U.S. HWY 151 OVER CRABAPPLE CREEK IN LINN COUNTY (DESIGN NO. 1059) WITH A YEAR OF CONSTRUCTION OF 1961. ELECTRONIC PLANS OF THE EXISTING STRUCTURE ARE AVAILABLE TO THE CONTRACTOR AS PART OF THE E-FILES SUPPLIED WITH THE CONTRACT DOCUMENTS.

THE LUMP SUM BID FOR “REMOVAL OF EXISTING BRIDGE” SHALL INCLUDE REMOVAL OF THE EXISTING 60’ x 30’ CONTINUOUS CONCRETE SLAB BRIDGE (DESIGN NO. 1059).

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

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.

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

IT SHALL BE THE BRIDGE CONTRACTOR’S RESPONSIBILITY TO PROVIDE SITES FOR EXCESS EXCAVATED MATERIAL. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED FOR MATERIAL HAULED TO THESE SITES.

ALL REINFORCING BARS AND BARS NOTED AS DOWELS SUPPLIED FOR THIS STRUCTURE SHALL BE DEFORMED REINFORCEMENT 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).

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2” 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 DEGRESS FROM VERTICAL.

SLAB FALSEWORK SHALL NOT BE REMOVED UNTIL THE FULL WIDTH SLAB HAS BEEN PLACED AND HAS ATTAINED THE AGE AND STRENGTH REQUIRED BY THE SPECIFICATION.

SLAB FALSEWORK SHALL BE REMOVED PRIOR TO CONSTRUCTION OF THE BARRIER RAILS.

THE FLOOR SLAB AS SHOWN INCLUDES ½” INTEGRAL WEARING SURFACE.

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 ROADWAY” ON DESIGN SHEET 5.

GUARDRAIL IS TO BE PLACED BY OTHERS.

THE APPROACH FILLS AS SHOWN ARE NOT A PART OF THIS CONTRACT, BUT ARE TO BE IN PLACE BEFORE ABUTMENT PILES ARE DRIVEN. THE BRIDGE CONTRACTOR IS TO LEVEL OFF AND SHAPE THE BERMS TO THE ELEVATIONS AND DIMENSIONS SHOWN. DRESSING OF SLOPES OUTSIDE THE BRIDGE AREA NOT DISTURBED BY THE BRIDGE CONTRACTOR SHALL BE PAID FOR AS EXTRA WORK.

DURING CONSTRUCTION OF THIS PROJECT THE BRIDGE CONTRACTOR WILL BE REQUIRED TO COORDINATE OPERATIONS WITH THOSE OF OTHER CONTRACTORS WORKING WITHIN THE SAME AREA. OTHER WORK IN PROGRESS DURING THE SAME PERIOD OF TIME WILL INCLUDE, BUT IS NOT LIMITED TO, CONSTRUCTION OF THE FOLLOWING PROJECTS:

NHSX-151-3(170)--3H-57

FOR SPECIFICATIONS AND
DESIGN STRESSES, REFER TO
J40-01-14.

THE CONTRACT LENGTH OF 55 FEET FOR THE WEST ABUTMENT PILES IS BASED ON A MIXED SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 88 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.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR WEST ABUTMENT PILES IS 66 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.

THE CONTRACT LENGTH OF 55 FEET FOR THE EAST ABUTMENT PILES IS BASED ON A NON-COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 88 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 FOOTING.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR EAST ABUTMENT PILES IS 70 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.

THE CONTRACT LENGTH OF 55 FEET FOR THE PIER 1 PILES IS BASED ON A MIXED SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 119 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 ENCASEMENT. DESIGN SCOUR (200-YEAR) WAS ASSUMED TO AFFECT THE UPPER 8 FEET OF EMBEDDED PILE LENGTH AND CAUSE 12 KIPS OF DRIVING RESISTANCE.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER 1 PILES IS 94 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.

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

I	DECK DRAINS

TRAFFIC CONTROL PLAN

THE ROADWAY WILL BE CLOSED TO THRU TRAFFIC. REFER TO THE TRAFFIC CONTROL PLAN INCLUDED IN THE TIED ROAD PLANS, PROJECT NO. NHSX-151-3(170)--3H-57.

404 PERMIT INFORMATION AND THE POLLUTION PREVENTION PLAN ARE INCLUDED IN THE TIED ROAD PLANS, PROJECT NO. NHSX-151-3(170)--3H-57.

THE CONTRACT LENGTH OF 55 FEET FOR THE PIER 2 PILES IS BASED ON A COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 119 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 ENCASEMENT. DESIGN SCOUR (200-YEAR) WAS ASSUMED TO AFFECT THE UPPER 8 FEET OF EMBEDDED PILE LENGTH AND CAUSE 11 KIPS OF DRIVING RESISTANCE.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER 2 PILES IS 94 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.

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

THE PIER PILE ENCASEMENTS ARE TO BE AS DETAILED AND NOTED ON IOWA D.O.T. STANDARD PIOL, AS SHOWN IN THESE PLANS. THE UNIT PRICE BID FOR ENCASEMENT SHALL BE FULL PAYMENT FOR FURNISHING AND PLACING ALL MATERIAL AND NECESSARY EXCAVATION. THE PILING ENCASEMENTS ARE TO EXTEND FROM THE BOTTOM OF PIER CAP TO ELEVATION SHOWN.

HAZARDOUS MATERIALS NOTES:

SCRAPE SAMPLES OF THIS BRIDGE WERE TAKEN TO GET AN INDICATION OF THE EXISTENCE OF ASBESTOS. THE ANALYSIS INDICATED THAT ASBESTOS IS NOT PRESENT IN THE EXISTING BRIDGE. SHOULD ASBESTOS BE FOUND DURING DEMOLITION, THE CONTRACTOR SHALL CEASE DEMOLITION ACTIVITIES IMMEDIATELY AND CONTACT THE PROJECT ENGINEER.

BRIDGE DECK DIMENSIONS TABLE

NO.	ITEM	UNIT	QUANTITY
1	DECK LENGTH	L.F.	100.96
2	MINIMUM DECK WIDTH	L.F.	44.17
3	MAXIMUM DECK WIDTH	L.F.	44.17
4	DECK AREA	S.F.	4,459

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 FOR 30° SKEW (R.A.)

100'-0 x 41'-0 CONTINUOUS
CONCRETE SLAB BRIDGE

30'-6 END SPANS39'-0 INTERIOR SPAN

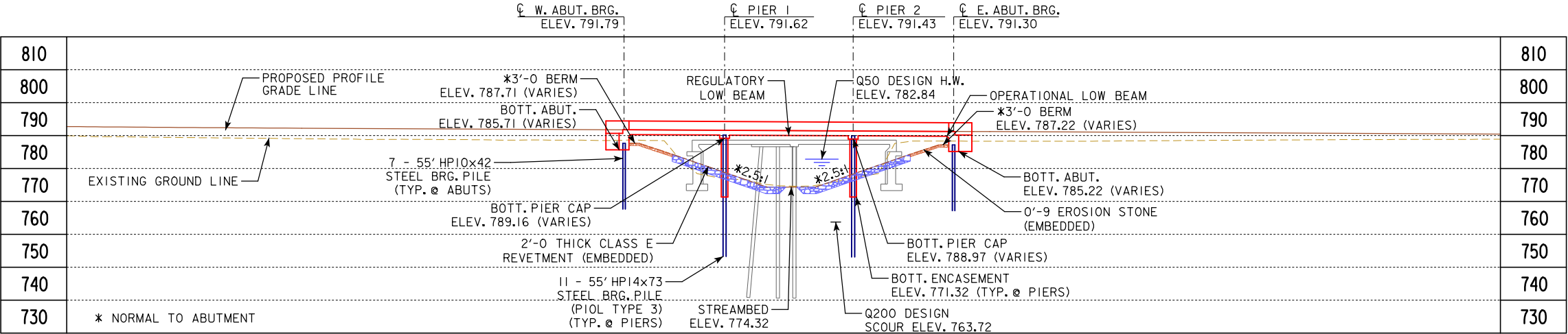
GENERAL NOTES

STA. 6267+72.00, 43.54' RT. (@ U.S. HWY 151)NOVEMBER, 2020

LINN COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

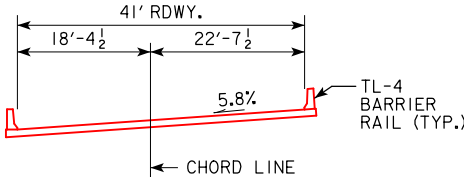
DESIGN SHEET NO. 3 OF 14FILE NO. 31632DESIGN NO. 322



- NOTES:
- 1) ALL SUBSTRUCTURE ELEMENTS ARE SKEWED 30° FROM A PERPENDICULAR TO THE CHORD LINE.
 - 2) ELEVATIONS SHOWN ARE ALONG CHORD LINE.
 - 3) EXISTING ARTICULATING BLOCK MAT UNDER EXISTING BRIDGE TO BE REMOVED. (DESIGN NO. 907)

LONGITUDINAL SECTION ALONG CHORD LINE

PROPOSED PROFILE GRADE



TYPICAL BRIDGE SECTION

CURVE DATA

PI STA. 6265+21.80
Δ = 16°54'26.55"
D = 02°08'51.06"
T = 396.5308
L = 787.2984
E = 29.3062
R = 2,668.0000
PC STA. 6261+25.27
PT STA. 6269+12.57
e = 5.8%

HYDRAULIC DATA

DRAINAGE AREA = 13.5 SQ. MI.
STREAM SLOPE = 12.01 FT./MI.
AVG. LOW WATER STAGE = 775.10
Q₅₀ = 2,840 CFS
STAGE = 782.84
REGULATORY LOW BEAM = 788.95
FREEBOARD = 6.11 FT.
AVG. BRIDGE VELOCITY = 8.94 FPS
Q₁₀₀ = 3,380 CFS
STAGE = 783.20
OPERATIONAL LOW BEAM = 788.73
BACKWATER = 2.33 FT.
AVG. BRIDGE VELOCITY = 9.95 FPS
Q₂₀₀ = 3,810 CFS
STAGE = 783.44
CALCULATED DESIGN SCOUR = 763.72
Q₅₀₀ = 4,450 CFS
STAGE = 783.76
AVG. BRIDGE VELOCITY = 11.81 FPS
CALCULATED CHECK SCOUR = 762.02

ROADWAY OVERTOP 789.21
STA. 6271+00.00

EXTREME HW STAGE = UNKNOWN
DATE = UNKNOWN

UTILITIES LEGEND

FO FIBER OPTIC
SPRINGVILLE COOP

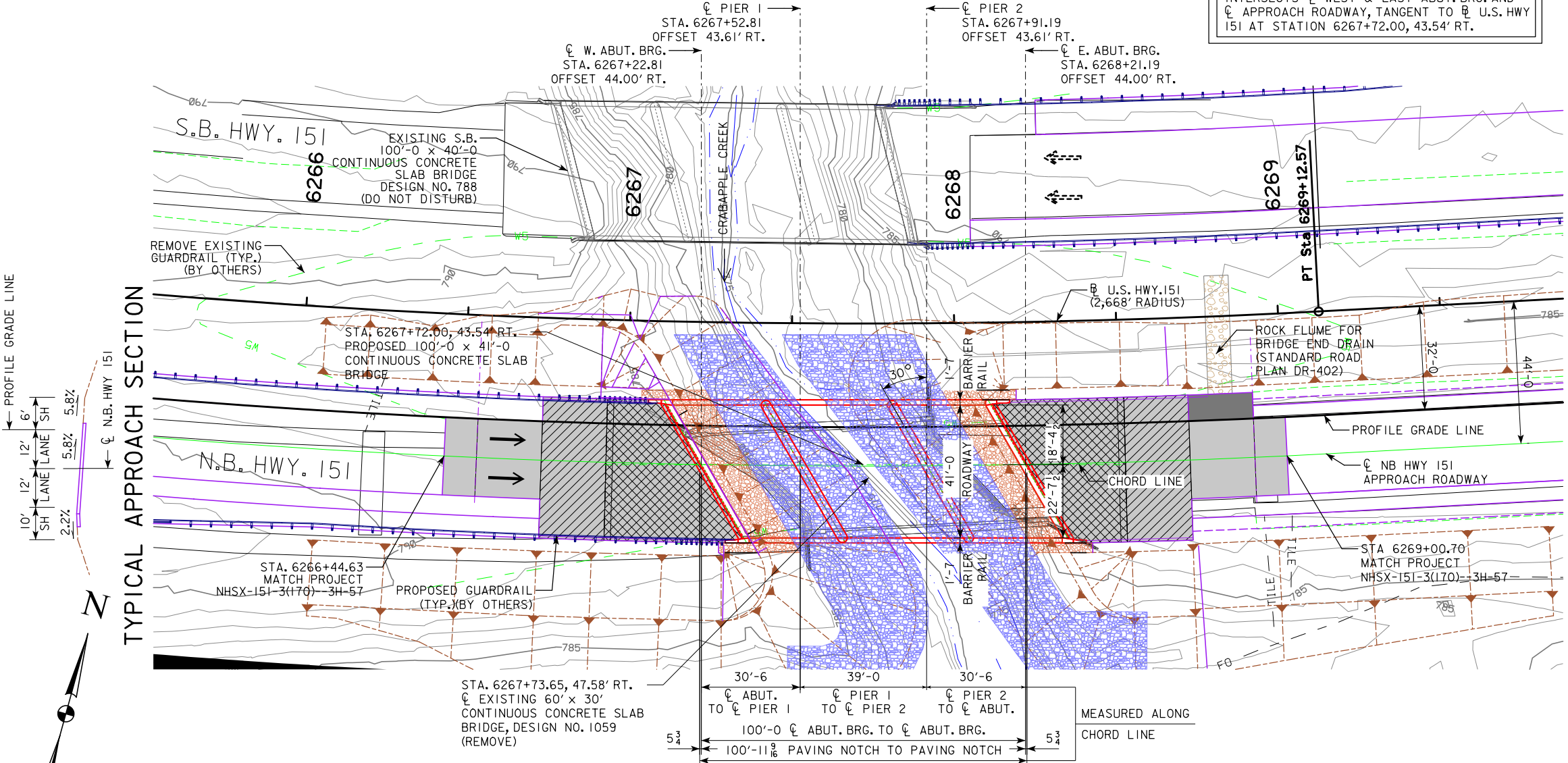
LOCATION

N.B. U.S. HWY. 151
OVER CRABAPPLE CREEK
T-84N R-6W
SECTION 36
MARION TOWNSHIP
LINN COUNTY
FHWA NO. 33541
BRIDGE MAINT. NO. 5740.8R151
LATITUDE 42.045683°
LONGITUDE -91.496389°

TRAFFIC ESTIMATE

2021 AADT	16,800	V.P.D.
2041 AADT	23,100	V.P.D.
2021 DHV	-	V.P.H.
TRUCKS	13	%
TOTAL DESIGN ESALS	-	

DESIGN FOR 30° SKEW (R.A.)
100'-0 x 41'-0 CONTINUOUS CONCRETE SLAB BRIDGE
30'-6 END SPANS 39'-0 INTERIOR SPAN
SITUATION PLAN
STA. 6267+72.00, 43.54' RT. (U.S. HWY 151) NOVEMBER, 2020
LINN COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 4 OF 14 FILE NO. 31632 DESIGN NO. 322



SITUATION PLAN

BERM SLOPE LOCATION TABLE						
POINTS	WEST ABUTMENT			EAST ABUTMENT		
	STATION	OFFSET	ELEV.	STATION	OFFSET	ELEV.
A1	6267+46.80	20.68' RT.	774.32	6267+63.75	20.59' RT.	774.32
A2	6267+81.58	70.80' RT.	774.32	6268+01.25	70.91' RT.	774.32
B1	6267+16.56	21.16' RT.	786.63	6268+05.18	20.62' RT.	786.11
B2	6267+40.63	70.93' RT.	789.03	6268+27.62	71.18' RT.	788.50
W1	6267+06.18	21.40' RT.	790.71	6268+15.56	20.78' RT.	790.13
W2	6267+30.44	71.08' RT.	792.94	6268+39.00	71.60' RT.	792.43

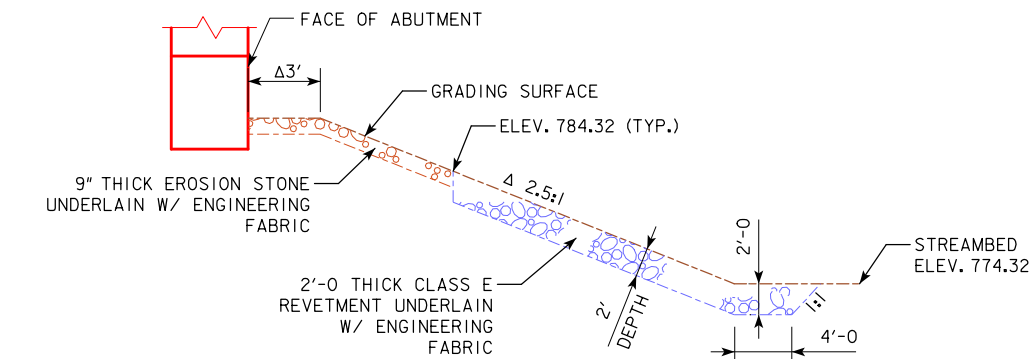
BERM SLOPE ELEVATIONS REFLECT THE GRADING SURFACE.
OFFSETS ARE GIVEN FROM THE U.S. HWY. 151 BASELINE.
ALL POINTS ARE 3'-0" FROM THE EDGE OF THE BRIDGE DECK.

ESTIMATED BERM ARMORING QUANTITIES				
LOCATION	REVTMENT CL. E (TON)	EROSION STONE (TON)	ENGINEERING FABRIC (SY)	CLASS 10 EX. (CY)
BERM LINING - WEST	450	35	530	295
BERM LINING - EAST	500	30	580	335
TOTALS	950	65	1110	630

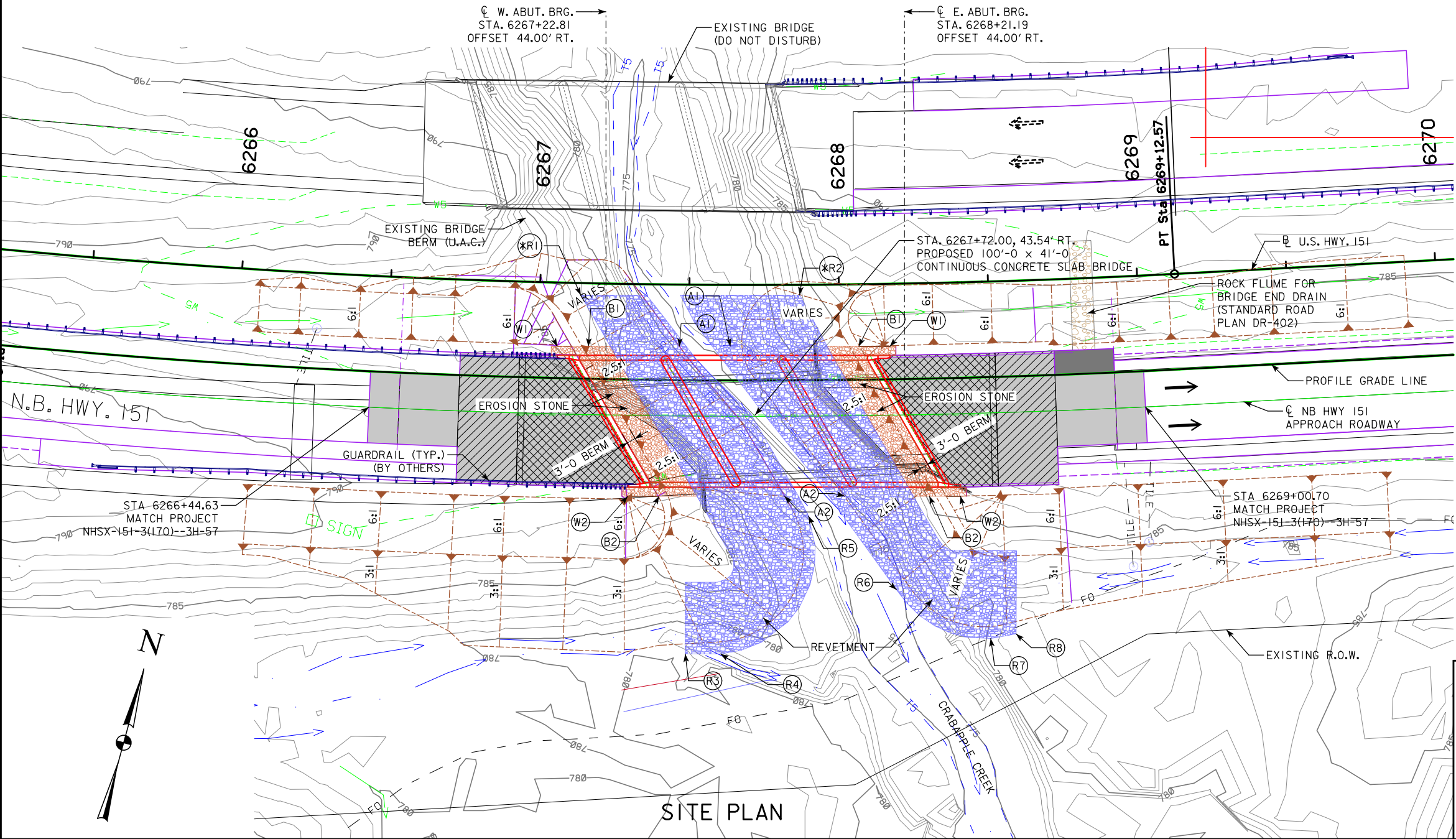
EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE AND INCLUDES ONLY THE EXCAVATION REQUIRED TO EMBED THE REVTMENT.

REVTMENT BASED ON DENSITY OF 1.6 TON/CY

EROSION STONE BASED ON A DENSITY OF 120 LB/CF.



SECTION THRU EMBEDDED REVTMENT BERM



REVTMENT LAYOUT:

- (R1) STA. 6267+14, 4' RT.
- (R2) STA. 6267+87, 4' RT.
- (R3) STA. 6267+50, 124' RT.
- (R4) STA. 6267+60, 124' RT.
- (R5) STA. 6267+89, 77' RT.
- (R6) STA. 6268+18, 103' RT.
- (R7) STA. 6268+48, 120' RT.
- (R8) STA. 6268+56, 120' RT.

* LIMITS SHALL EXTEND TO EXISTING REVTMENT LOCATED UNDER SB BRIDGE. CONTRACTOR TO FIELD VERIFY.

DESIGN FOR 30° SKEW (R.A.)

100'-0 x 41'-0 CONTINUOUS
CONCRETE SLAB BRIDGE

30'-6 END SPANS39'-0 INTERIOR SPAN

SITUATION PLAN - SITE

STA. 6267+72.00, 43.54' RT. (U.S. HWY 151)NOVEMBER, 2020

LINN COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 5 OF 14FILE NO. 31632DESIGN NO. 322

6267

6268

6269

PT Sta 6269+12.57

U.S. HWY. 151
(2,668' RADIUS)

PROFILE GRADE LINE

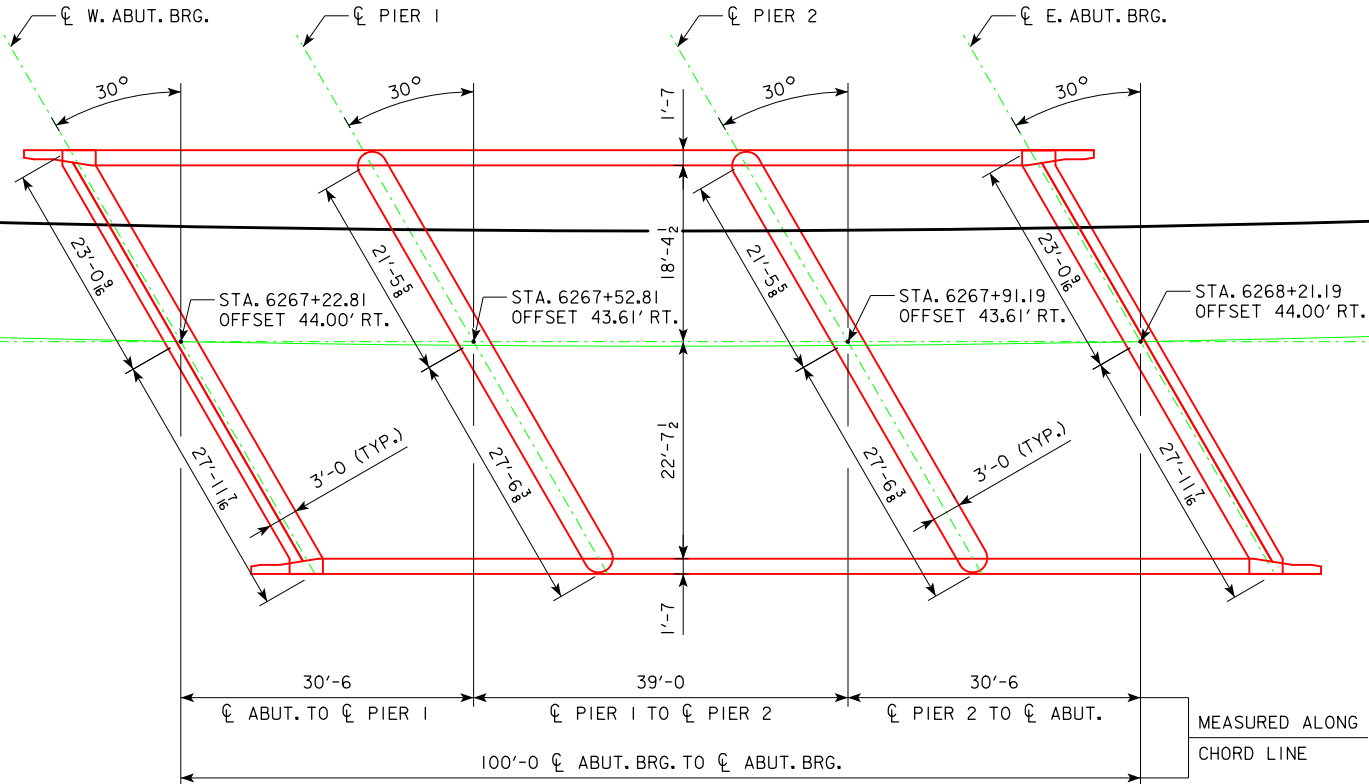
CHORD LINE
NB HWY 151
APPROACH ROADWAY

NOTE: PILES ARE NOT SHOWN FOR CLARITY

NOTE: STATION & OFFSET CALLOUTS ARE AT THE INTERSECTION OF THE CHORD LINE AND CL OF THE SUBSTRUCTURE BEARING.

NOTE: ALL SUBSTRUCTURE ELEMENTS ARE SKEWED 30° FROM A LINE PERPENDICULAR TO THE CHORD LINE.

NOTE: PROPOSED BRIDGE BUILT ON CHORD LINE THAT INTERSECTS CL WEST AND EAST ABUT. BRG. AND CL APPROACH ROADWAY, TANGENT TO U.S. HWY 151 AT STATION 6267+72.00, 43.54' RT.



STAKING DIAGRAM



BRIDGE COORDINATES

LOCATION	CL W. ABUT. BRG.	CL PIER 1	CL PIER 2	CL E. ABUT. BRG.
NORTH EDGE OF DECK	X=20546204.9707 Y=8077545.1707	X=20546234.3859 Y=8077553.2328	X=20546271.9987 Y=8077563.5417	X=20546301.4139 Y=8077571.6038
CL APPROACH ROADWAY	X=20546221.3594 Y=8077528.9682	X=20546251.0969 Y=8077536.7116	X=20546288.7071 Y=8077547.0232	X=20546317.8026 Y=8077555.4013
SOUTH EDGE OF DECK	X=20546241.2380 Y=8077509.3153	X=20546270.6532 Y=8077517.3774	X=20546308.2661 Y=8077527.6863	X=20546337.6812 Y=8077535.7484

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 30° SKEW (R.A.)

**100'-0" x 41'-0" CONTINUOUS
CONCRETE SLAB BRIDGE**

30'-6" END SPANS 39'-0" INTERIOR SPAN

STAKING DIAGRAM

STA. 6267+72.00, 43.54' RT. (CL U.S. HWY 151) NOVEMBER, 2020

LINN COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 6 OF 14 FILE NO. 31632 DESIGN NO. 322

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

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

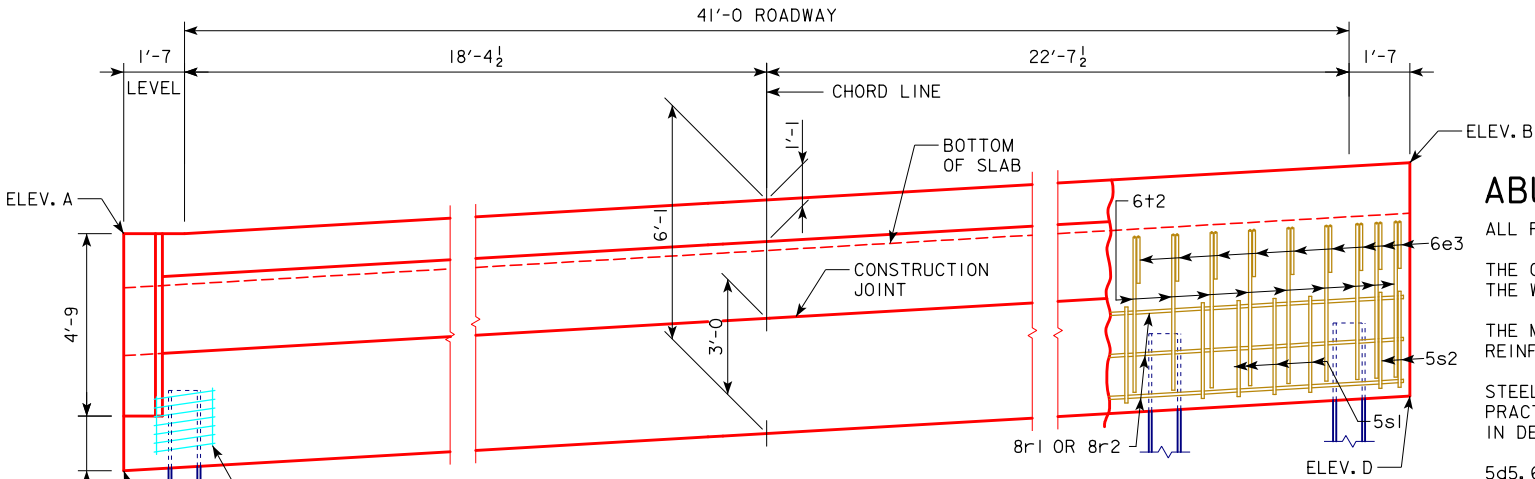
THE MINIMUM CLEAR DISTANCE FROM THE FACE OF THE CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

THE PIER PILES ARE TO BE DRIVEN TO FULL PENETRATION, IF PRACTICABLE, BUT IN NO CASE TO A BEARING VALUE LESS THAN THE PILE BEARING REQUIRED. ADDITIONAL DRIVING CAPACITY MAY BE REQUIRED THROUGH SCOURABLE LAYERS. REFER TO GENERAL PLAN NOTES FOR ADDITIONAL INFORMATION.

CAP STEEL AS DETAILED ON PIOL STANDARD PILE DRAWING IS REQUIRED FOR MONOLITHIC PIER CAPS.

SECTION BELOW SLAB

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 7 OF 14 FILE NO. 31632 DESIGN NO. 322



REAR ELEVATION

SPIRAL AT TOP OF EACH PILE.
7 TURNS OF #2 BAR 21" DIAMETER,
3" PITCH WITH 3-7/8" x 7/8" SPACERS
PUNCHED TO HOLD SPIRAL.

	W. ABUT.	E. ABUT.
ELEV. A	790.80	790.28
ELEV. B	793.11	792.66
ELEV. C	784.63	784.11
ELEV. D	787.03	786.58

ABUTMENT NOTES:

ALL PILING ARE HP 10 X 42.

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.

5d5, 6e3, 6e4 AND 8e INCLUDED WITH SUPERSTRUCTURE QUANTITIES.

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

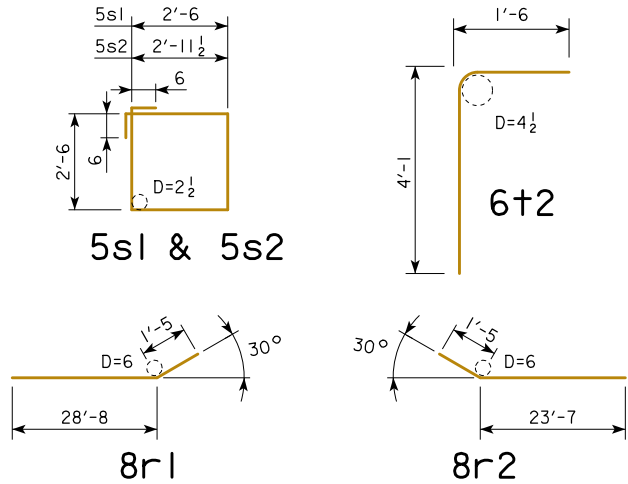
ESTIMATED QUANTITIES - ONE ABUT.

ITEM		QUANTITY
STRUCTURAL CONCRETE (BRIDGE)	C.Y.	17.0
REINF. STEEL EPOXY COATED	LBS.	2,380

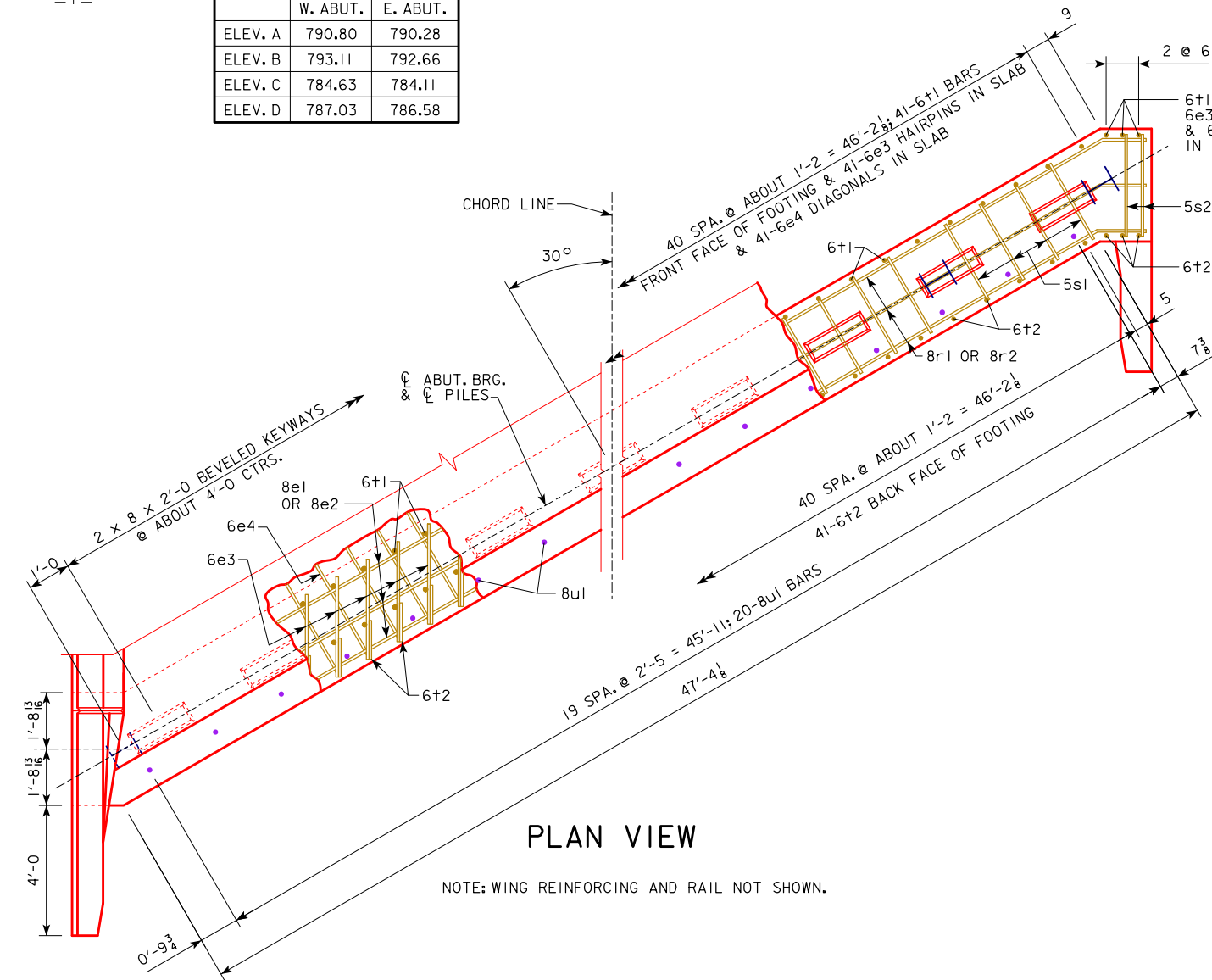
REINFORCING BAR LIST - ONE ABUT.

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
8r1	ABUTMENT FOOTING LONGITUDINAL		7	30'-1	562
8r2	ABUTMENT FOOTING LONGITUDINAL		7	25'-0	467
5s1	ABUTMENT FOOTING HOOPS		42	11'-0	482
5s2	ABUTMENT FOOTING HOOPS		4	11'-11	50
6+1	FOOTING TO SLAB DOWELS		47	5'-0	353
6+2	FOOTING TO SLAB DOWELS		47	5'-7	394
#2	PILE SPIRAL		7	38'-6	45
	SPIRAL SPACERS - L 7/8 x 7/8 x 1/8 x 0.70		21	1'-10	27
REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)					2,380

BENT BAR DETAILS

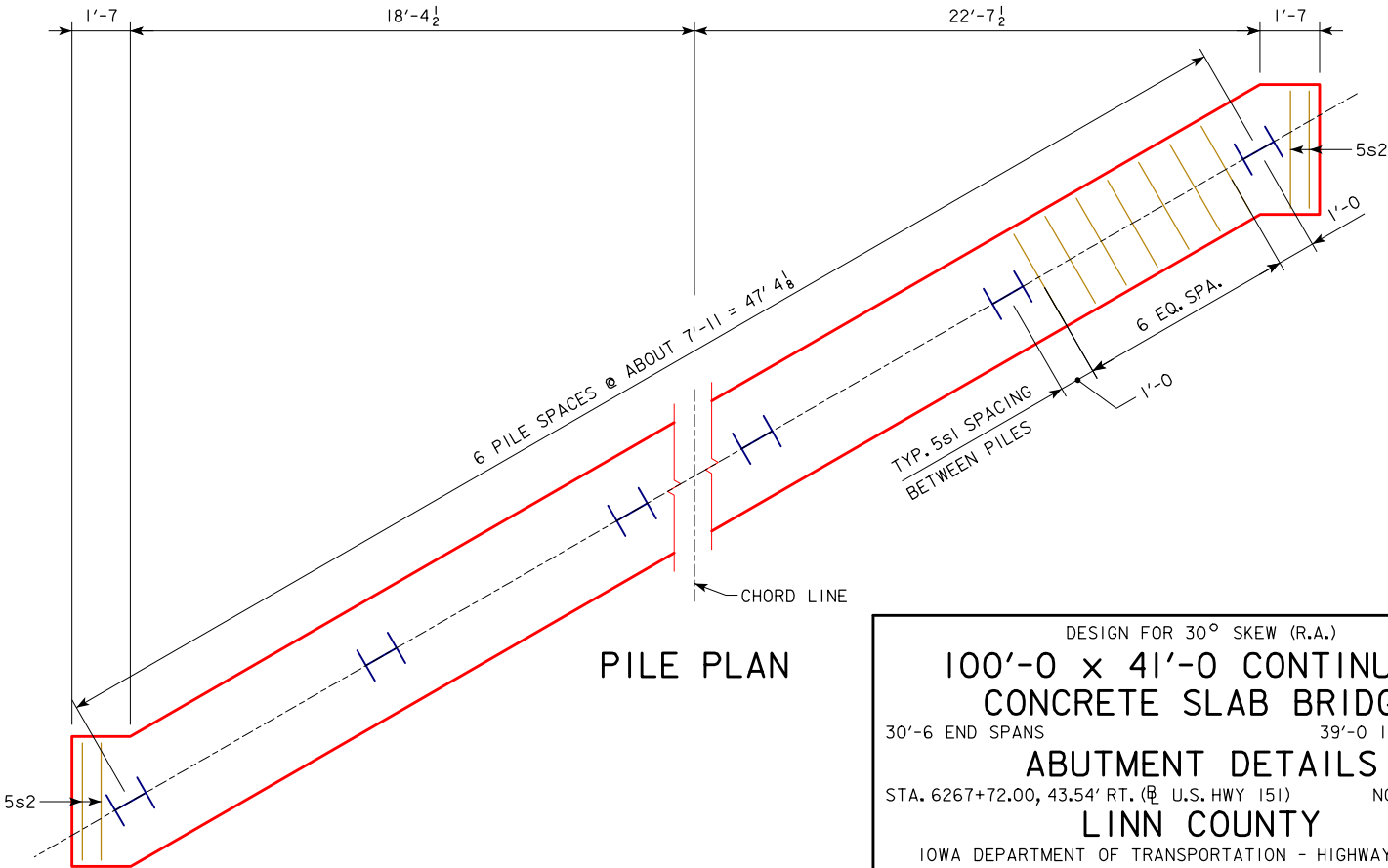


NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.



PLAN VIEW

NOTE: WING REINFORCING AND RAIL NOT SHOWN.



PILE PLAN

DESIGN FOR 30° SKEW (R.A.)	
100'-0 x 41'-0 CONTINUOUS CONCRETE SLAB BRIDGE	
30'-6 END SPANS	39'-0 INTERIOR SPAN
ABUTMENT DETAILS	
STA. 6267+72.00, 43.54' RT. (U.S. HWY 151)	
LINN COUNTY	
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION	
DESIGN SHEET NO. 8 OF 14	FILE NO. 31632
DESIGN NO. 322	

SUPERSTRUCTURE NOTES:
THIS BRIDGE IS DESIGNED FOR HL-93 LOADING PLUS AN ALLOWANCE OF 20 POUNDS PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.
THE SLAB AS SHOWN INCLUDES A 1/2 INCH INTEGRAL WEARING SURFACE.
THE MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR SHALL BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN. ALL REINFORCING STEEL IS TO BE SECURELY WIRED IN PLACE. SEE "BAR CHAIR NOTE".
ALL REINFORCING SHALL BE GRADE 60.

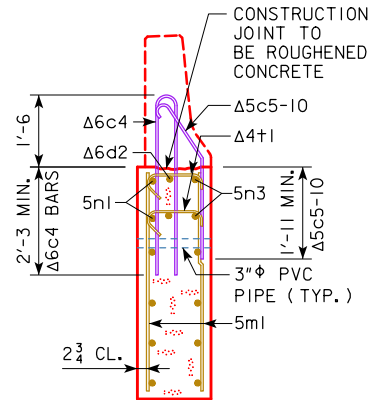
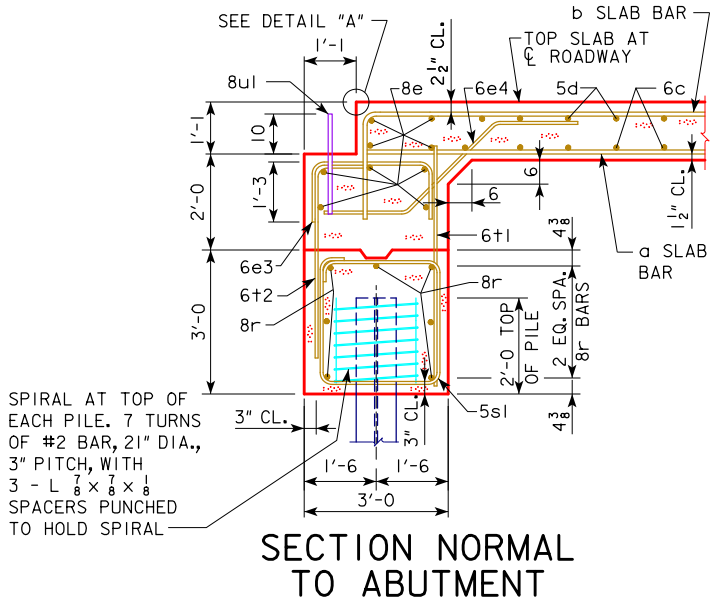
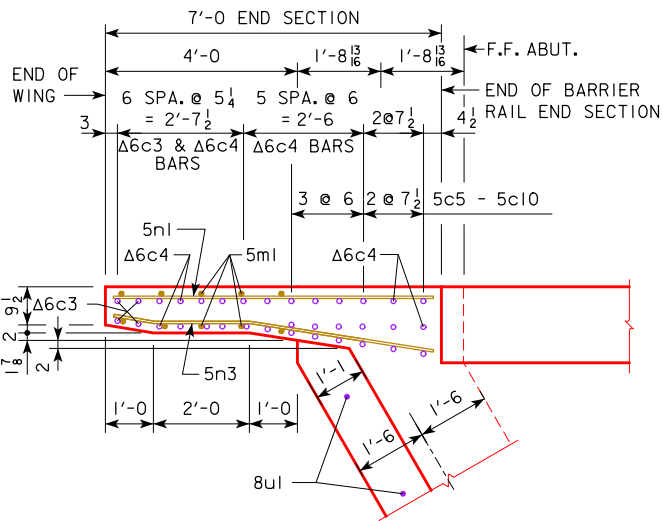
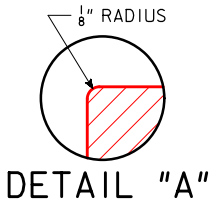
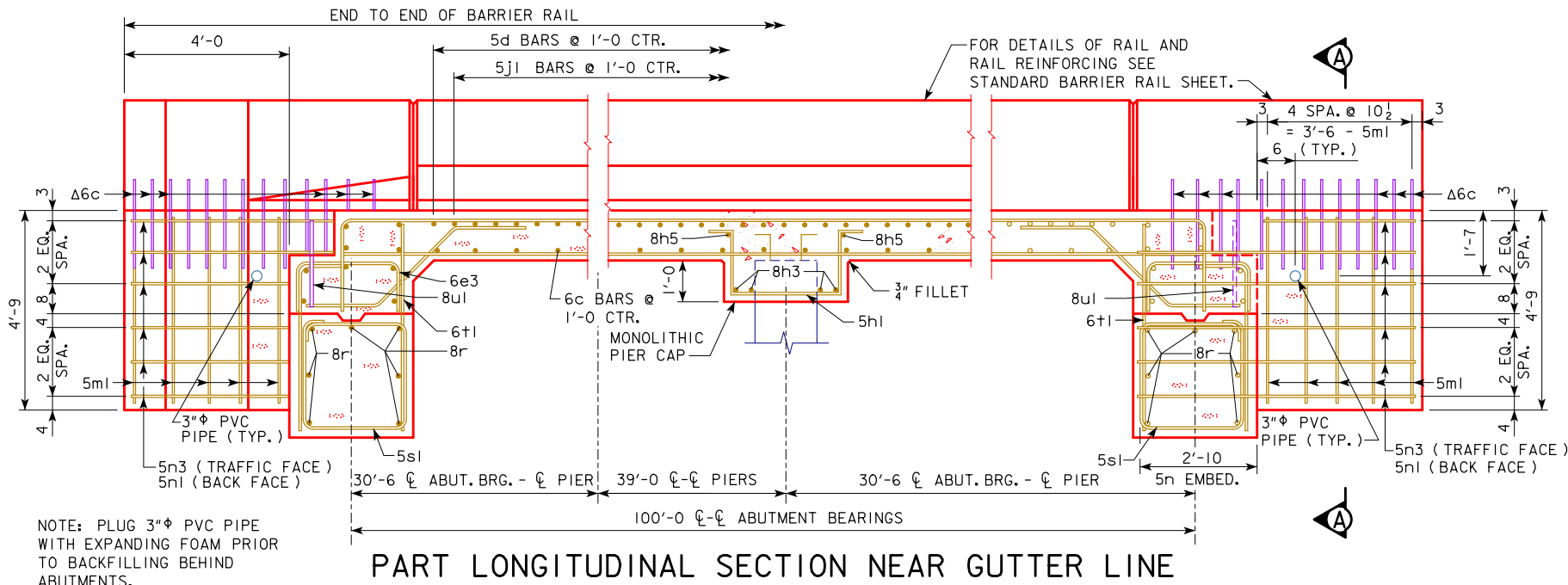
THE CONCRETE SLAB IS TO BE PLACED WITH A MINIMUM OF CONSTRUCTION JOINTS. PROCEDURES FOR PLACING SLAB CONCRETE SHALL BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF THE PROPOSED METHOD AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULT. SLAB FALSEWORK SHALL BE REMOVED PRIOR TO CONSTRUCTION OF THE BARRIER RAILS.

NOTE THAT WHEN PORTLAND CEMENT APPROACH PAVEMENT IS PLACED, COMPRESSIBLE JOINT MATERIAL MUST BE USED BETWEEN PAVEMENT AND END OF BRIDGE.

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

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

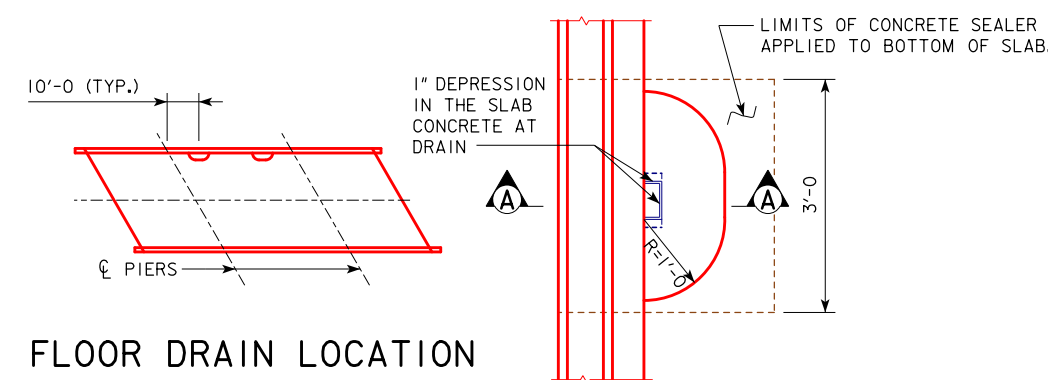
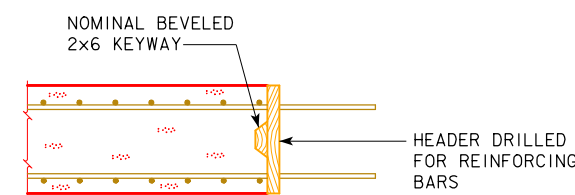
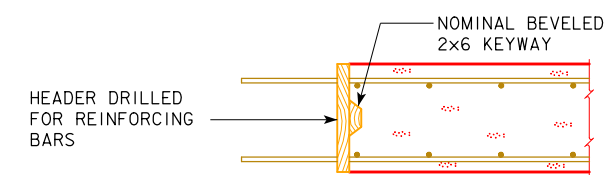
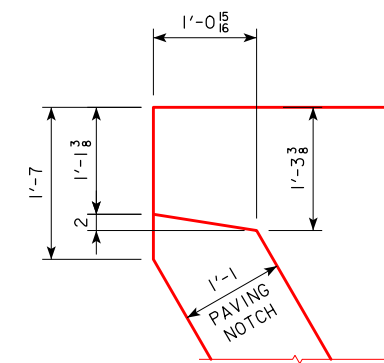
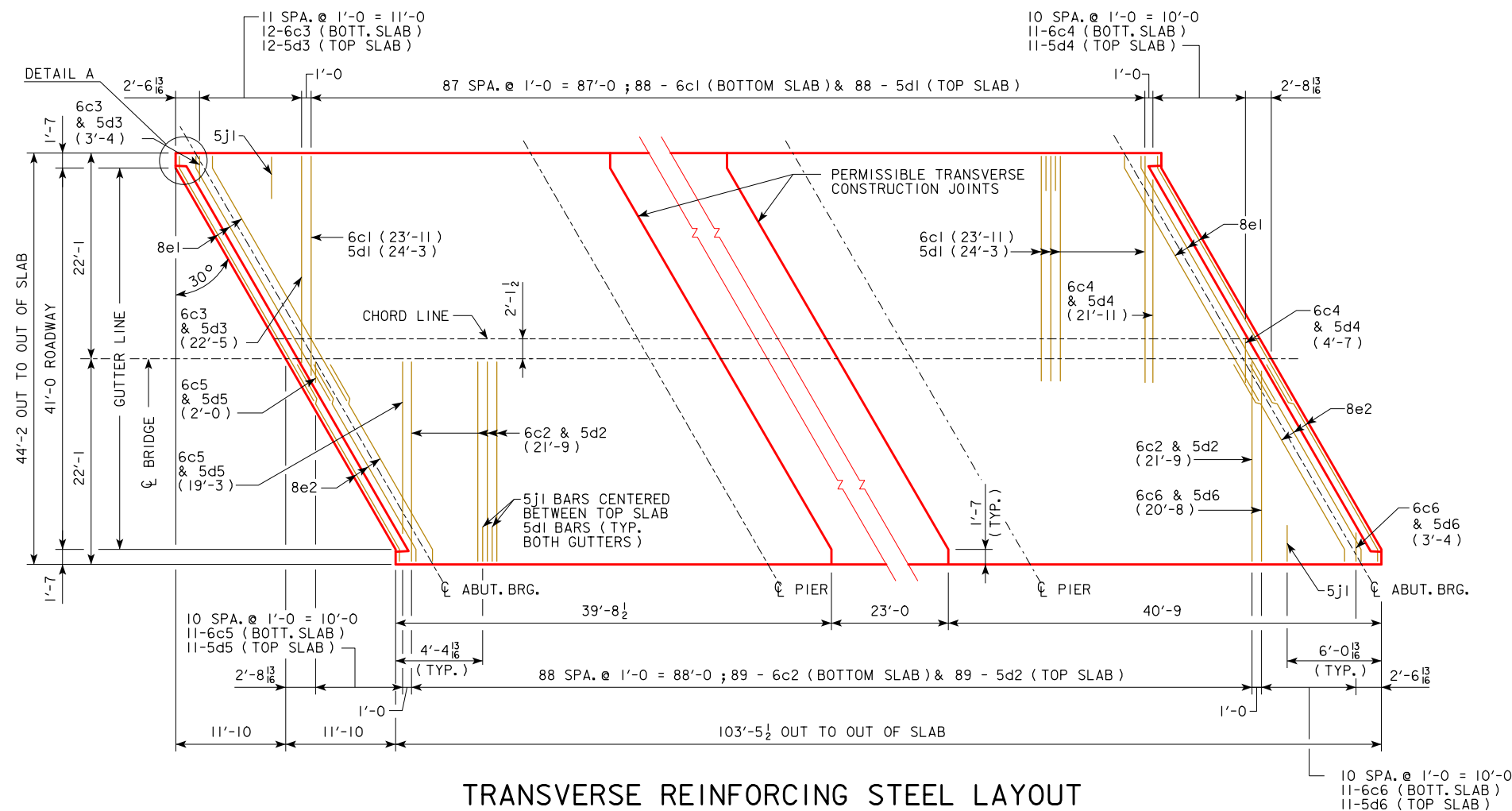
BAR CHAIR NOTE:
TOP MAT OF REINFORCING STEEL IS TO BE SUPPORTED BY INDIVIDUAL BAR CHAIRS SPACED AT NOT MORE THAN 3'-0 CENTERS LONGITUDINALLY AND TRANSVERSELY. THE BOTTOM MAT OF REINFORCING STEEL IS TO BE SUPPORTED BY INDIVIDUAL BAR CHAIRS SPACED AT NOT MORE THAN 3'-0 CENTERS LONGITUDINALLY AND TRANSVERSELY, 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.



SECTION A-A
Δ NOTE: SEE END SECTION DETAILS IN THESE PLANS FOR DETAILS OF BARRIER RAIL END SECTION. REINFORCING BARS 6c3, 6c4, 5c5-10, 6d2 & 4t1 ARE INCLUDED IN THE SUPERSTRUCTURE QUANTITIES.
NOTE: 5m1 & 5n1 BARS ARE INCLUDED IN SUPERSTRUCTURE BAR LIST. 5c, 6c, 6d & 4t1 BARS ARE INCLUDED IN BARRIER RAIL BAR LIST.

DESIGN FOR 30° SKEW (R.A.)
100'-0 x 41'-0 CONTINUOUS CONCRETE SLAB BRIDGE
30'-6 END SPANS 39'-0 INTERIOR SPAN
SUPERSTRUCTURE DETAILS
STA. 6267+72.00, 43.54' RT. (U.S. HWY 151) NOVEMBER, 2020
LINN COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 9 OF 14 FILE NO. 31632 DESIGN NO. 322



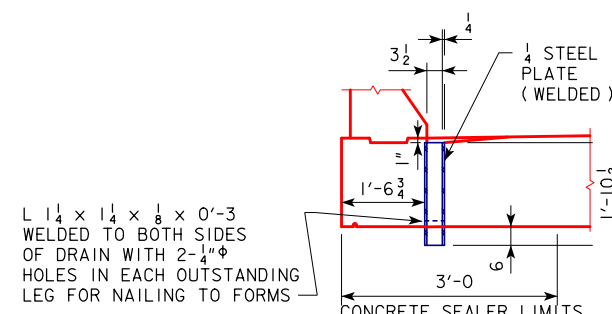


NOTE: 4" X 8" OUTSIDE DIMENSION ROLLED TUBE WITH 1/4" WALL THICKNESS MAY BE SUBSTITUTED FOR THE WELDED DRAIN SHOWN.

FLOOR DRAIN DETAILS

NOTE: DRAINS ARE TO BE GALVANIZED. INCLUDE COST OF DRAINS IN PRICE BID FOR "STRUCTURAL CONCRETE". 2 DRAINS REQUIRED.

PART PLAN



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

NOTE: WEIGHT OF ONE FLOOR DRAIN IS 37 LBS.

DESIGN FOR 30° SKEW (R.A.)
100'-0" x 41'-0" CONTINUOUS CONCRETE SLAB BRIDGE
30'-6" END SPANS 39'-0" INTERIOR SPAN
SUPERSTRUCTURE PLAN
STA. 6267+72.00, 43.54' RT. (U.S. HWY 151) NOVEMBER, 2020
LINN COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 11 OF 14 FILE NO. 31632 DESIGN NO. 322

REINFORCING BAR LIST- SUPERSTRUCTURE					
LOCATION	SHAPE	BAR	NO.	LENGTH	WEIGHT
SLAB LONGITUDINAL BOTTOM		8a1	54	22'-3	3208
SLAB LONGITUDINAL BOTTOM		8a2	54	33'-6	4830
SLAB LONGITUDINAL BOTTOM		8a3	54	31'-6	4542
SLAB LONGITUDINAL BOTTOM		9a4	54	28'-9	5279
SLAB LONGITUDINAL BOTTOM		9a5	27	32'-0	2938
SLAB LONGITUDINAL BOTTOM, AT RAIL		8a6	8	35'-9	764
SLAB LONGITUDINAL BOTTOM, AT RAIL		8a7	4	37'-4	399
SLAB LONGITUDINAL BOTTOM, AT RAIL		8a8	8	25'-0	534
SLAB LONGITUDINAL BOTTOM, AT RAIL		8a9	4	22'-6	240
SLAB LONGITUDINAL TOP		6b1	54	7'-0	568
SLAB LONGITUDINAL TOP		10b2	54	26'-9	6216
SLAB LONGITUDINAL TOP		10b3	54	27'-6	6390
SLAB LONGITUDINAL TOP		7b4	54	16'-6	1821
SLAB LONGITUDINAL TOP		6b5	54	13'-9	1115
SLAB LONGITUDINAL TOP		9b6	54	22'-9	4177
SLAB LONGITUDINAL TOP		6b7	27	26'-10	1088
SLAB LONGITUDINAL TOP, AT RAIL		6b8	8	25'-6	306
SLAB LONGITUDINAL TOP, AT RAIL		9b9	8	23'-6	639
SLAB LONGITUDINAL TOP, AT RAIL		6b10	4	21'-0	126
SLAB LONGITUDINAL TOP, AT RAIL		6b11	8	27'-6	330
SLAB LONGITUDINAL TOP, AT RAIL		10b12	8	19'-0	654
SLAB TRANSVERSE BOTTOM		6c1	88	23'-11	3161
SLAB TRANSVERSE BOTTOM		6c2	89	21'-9	2907
SLAB TRANSVERSE ENDS, BOTTOM		6c3	12	VARIES	232
SLAB TRANSVERSE ENDS, BOTTOM		6c4	11	VARIES	219
SLAB TRANSVERSE ENDS, BOTTOM		6c5	11	VARIES	176
SLAB TRANSVERSE ENDS, BOTTOM		6c6	11	VARIES	198
SLAB TRANSVERSE TOP		5d1	88	24'-3	2226
SLAB TRANSVERSE TOP		5d2	89	21'-9	2019
SLAB TRANSVERSE ENDS, TOP		5d3	12	VARIES	161
SLAB TRANSVERSE ENDS, TOP		5d4	11	VARIES	152
SLAB TRANSVERSE ENDS, TOP		5d5	11	VARIES	122
SLAB TRANSVERSE ENDS, TOP		5d6	11	VARIES	138
SLAB, TRANSVERSE AT ABUTMENT		8e1	18	30'-1	1446
SLAB, TRANSVERSE AT ABUTMENT		8e2	18	25'-0	1202
SLAB, HAIRPINS, AT ABUTMENT		6e3	94	5'-5	765
SLAB, DIAGONALS, AT ABUTMENT		6e4	94	5'-11	835
PIER CAP HOOPS		5h1	80	7'-5	619
PIER CAP ENDS		8h2	4	14'-5	154
PIER CAP, BOTTOM LONGITUDINAL		8h3	8	29'-11	639
PIER CAP, BOTTOM LONGITUDINAL		8h4	8	22'-9	486
PIER CAP, TOP LONGITUDINAL		8h5	4	30'-11	330
PIER CAP, TOP LONGITUDINAL		8h6	4	24'-6	262
TOP OF SLAB, TRANSVERSE, AT RAIL		5j1	188	8'-6	1667
WING, VERTICAL		5m1	40	4'-5	184
WING, HORIZONTAL BACK FACE		5n1	24	6'-8	167
WING, HORIZONTAL TRAFFIC FACE		5n3	24	6'-9	169
SUB EPOXY COATED TOTAL - LBS.					66,800
BARRIER RAIL - SEE LIST ON RAIL SHEET J40-46-14					4194
EPOXY COATED RAIL TOTAL - LBS.					70,994
STAINLESS STEEL RAIL TOTAL - LBS.					2267

ESTIMATED QUANTITIES - SUPERSTRUCTURE		
ITEM		QUANTITY
* STRUCTURAL CONCRETE (BRIDGE)	C.Y.	275.3
REINF. STEEL EPOXY COATED	LBS.	70,994
Δ REINF. STEEL STAINLESS STEEL	LBS.	2490
CONCRETE BARRIER	LIN. FT.	222.9

* INCLUDES 4 WINGS @ 0.68 C.Y. EACH; EXCLUDES RAIL CONCRETE.
Δ INCLUDES ABUTMENT PAVING NOTCH BAR WEIGHT.

BENT BAR DETAILS

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

STAINLESS STEEL REINFORCING FOR SUPERSTRUCTURE - BRIDGE				
LOCATION	SHAPE	BAR	NO.	LENGTH WEIGHT
ABUTMENT PAVING NOTCH BAR		8u1	40	2'-1 223
8u1 BARS SHALL BE PAID FOR UNDER THE BID ITEM "REINFORCING STEEL, STAINLESS STEEL".			WEIGHT = LBS.	

NOTES:
ALL BARRIER RAIL REINFORCING STEEL IS TO BE EITHER EPOXY COATED OR STAINLESS STEEL AS SHOWN OR NOTED. THE STAINLESS STEEL REINFORCING STEEL SHALL BE DEFORMED BAR GRADE 60 MEETING THE REQUIREMENTS OF MATERIALS I.M.452.

ALL OTHER REINFORCING STEEL IS TO BE EPOXY COATED.

THE TRANSVERSE REBARS ARE DETAILED WITH A SPLICE LAP. AT THE CONTRACTOR'S OPTION, THIS LAP MAY BE ELIMINATED BY FURNISHING FULL LENGTH BARS WITH NO REDUCTION IN PAY WEIGHT FOR SAME.

DESIGN FOR 30° SKEW (R.A.)

100'-0 x 41'-0 CONTINUOUS CONCRETE SLAB BRIDGE

30'-6 END SPANS39'-0 INTERIOR SPAN

SUPERSTRUCTURE DETAILS

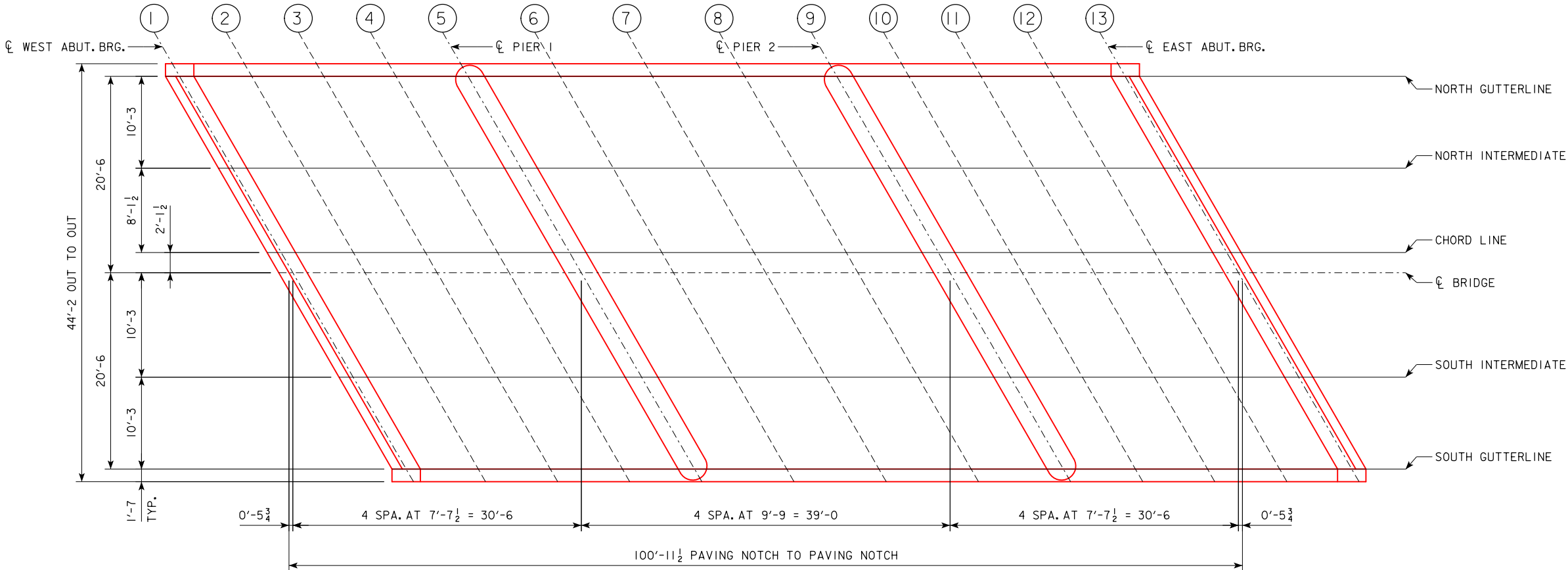
STA. 6267+72.00, 43.54' RT. (@ U.S. HWY 151)NOVEMBER, 2020

LINN COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. _12_ OF _14_ FILE NO. _31632_ DESIGN NO. _322_

TOP OF SLAB ELEVATIONS													
LOCATION	W. ABUT. BEARING				℄ PIER 1				℄ PIER 2				E. ABUT. BEARING
	1	2	3	4	5	6	7	8	9	10	11	12	13
NORTH GUTTERLINE	790.79	790.75	790.70	790.66	790.61	790.56	790.51	790.46	790.41	790.38	790.34	790.31	790.27
NORTH INTERMEDIATE	791.35	791.30	791.26	791.22	791.17	791.12	791.07	791.02	790.98	790.94	790.91	790.88	790.85
CHORD LINE	791.79	791.75	791.70	791.66	791.62	791.57	791.52	791.47	791.43	791.39	791.36	791.33	791.30
CENTERLINE BRIDGE	791.91	791.86	791.82	791.78	791.74	791.69	791.64	791.59	791.55	791.51	791.48	791.45	791.42
SOUTH INTERMEDIATE	792.47	792.42	792.38	792.34	792.30	792.25	792.20	792.16	792.11	792.08	792.05	792.02	791.99
SOUTH GUTTERLINE	793.03	792.98	792.94	792.90	792.86	792.82	792.77	792.73	792.68	792.65	792.62	792.59	792.57



DESIGN FOR 30° SKEW (R.A.)

100'-0 x 41'-0 CONTINUOUS
CONCRETE SLAB BRIDGE

30'-6 END SPANS 39'-0 INTERIOR SPAN

TOP OF SLAB ELEVATIONS

STA. 6267+72.00, 43.54' RT. (℄ U.S. HWY 151) NOVEMBER, 2020

LINN COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 13 OF 14 FILE NO. 31632 DESIGN NO. 322

SUBDRAIN NOTES :

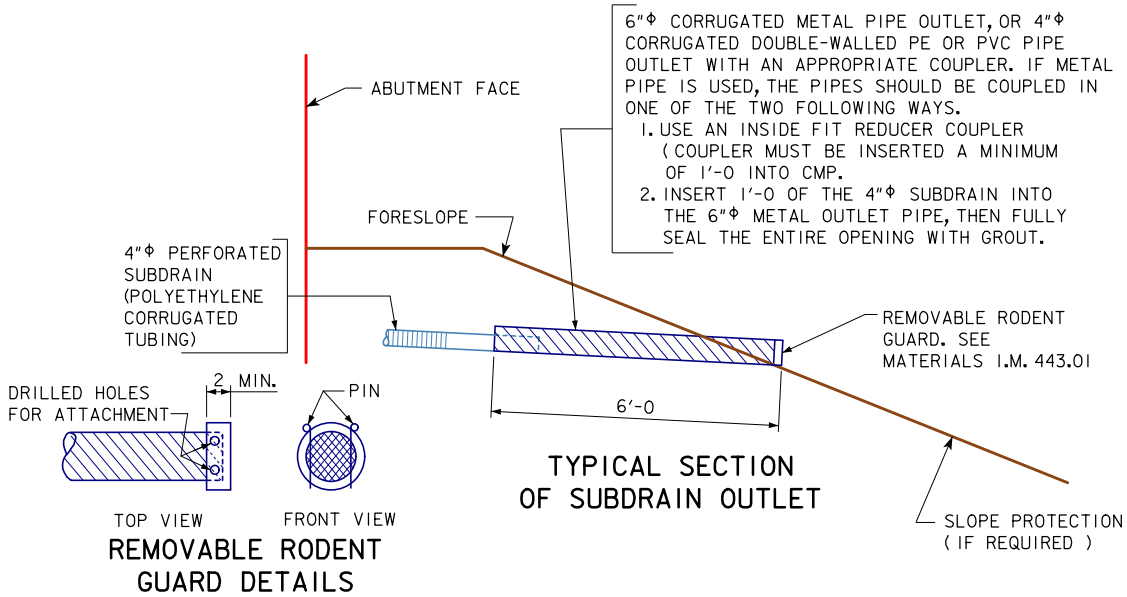
THE BRIDGE CONTRACTOR IS TO INSTALL SUBDRAINS BEHIND THE ABUTMENT. THE SUBDRAINS SHALL BE 4" IN DIAMETER AND BE IN ACCORDANCE WITH ARTICLE 4143.01, B, OF THE STANDARD SPECIFICATIONS. THE SUBDRAIN OUTLET SHALL CONSIST OF A 6'-0 LENGTH OF PIPE WITH A REMOVABLE RODENT GUARD.

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.

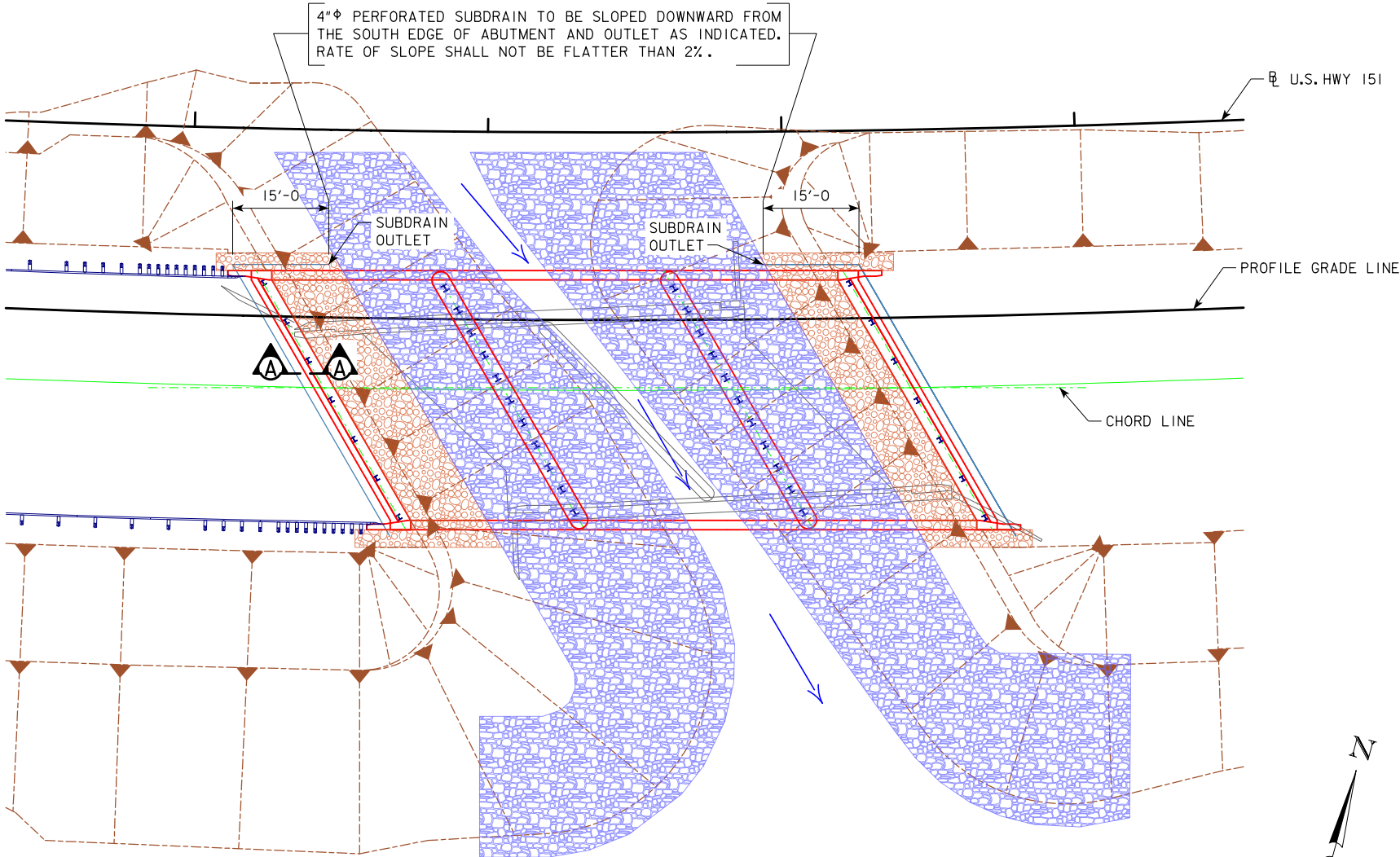
THE COST OF FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), GRANULAR BACKFILL, POROUS BACKFILL, AND SUBDRAIN OUTLET IS TO BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL CONCRETE (BRIDGE)". NO EXTRA PAYMENT WILL BE MADE.

SUBDRAIN OUTLET ELEVATIONS

LOCATION	ELEVATION
WEST ABUTMENT	±784.38
EAST ABUTMENT	±783.86



OUTLET DETAILS



NOTE:
SECTION A-A IS SHOWN ON ABUTMENT BACKFILL DETAILS SHEET, STANDARD J40-53-14.

SITUATION PLAN
SHOWING SUBDRAIN LOCATIONS



DESIGN FOR 30° SKEW (R.A.)
100'-0 x 41'-0 CONTINUOUS CONCRETE SLAB BRIDGE
30'-6 END SPANS 39'-0 INTERIOR SPAN
SUBDRAIN DETAILS
STA. 6267+72.00, 43.54' RT. (U.S. HWY 151) NOVEMBER, 2020
LINN COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 14 OF 14 FILE NO. 31632 DESIGN NO. 322

INDEX FOR J40-14 STANDARDS:

J40-1-14	INDEX, GENERAL NOTES & GENERAL INFORMATION
J40-2-14	SUPERSTRUCTURE DETAILS 70'-0 BRIDGE
J40-3-14	SUPERSTRUCTURE DETAILS 70'-0 BRIDGE
J40-4-14	SUPERSTRUCTURE DETAILS 80'-0 BRIDGE
J40-5-14	SUPERSTRUCTURE DETAILS 80'-0 BRIDGE
J40-6-14	SUPERSTRUCTURE DETAILS 90'-0 BRIDGE
J40-7-14	SUPERSTRUCTURE DETAILS 90'-0 BRIDGE
J40-8-14	SUPERSTRUCTURE DETAILS 100'-0 BRIDGE
J40-9-14	SUPERSTRUCTURE DETAILS 100'-0 BRIDGE
J40-10-14	SUPERSTRUCTURE DETAILS 110'-0 BRIDGE
J40-11-14	SUPERSTRUCTURE DETAILS 110'-0 BRIDGE
J40-12-14	SUPERSTRUCTURE DETAILS 120'-0 BRIDGE
J40-13-14	SUPERSTRUCTURE DETAILS 120'-0 BRIDGE
J40-14-14	SUPERSTRUCTURE DETAILS 130'-0 BRIDGE
J40-15-14	SUPERSTRUCTURE DETAILS 130'-0 BRIDGE
J40-16-14	SUPERSTRUCTURE DETAILS 140'-0 BRIDGE
J40-17-14	SUPERSTRUCTURE DETAILS 140'-0 BRIDGE
J40-18-14	SUPERSTRUCTURE DETAILS 150'-0 BRIDGE
J40-19-14	SUPERSTRUCTURE DETAILS 150'-0 BRIDGE
J40-20-14	SUPERSTRUCTURE DETAILS ALL BRIDGES
J40-21-14	SUPERSTRUCTURE DETAILS ALL BRIDGES 0° SKEW
J40-22-14	SUPERSTRUCTURE DETAILS ALL BRIDGES 15° SKEW
J40-23-14	SUPERSTRUCTURE DETAILS ALL BRIDGES 30° SKEW
J40-24-14	SUPERSTRUCTURE DETAILS ALL BRIDGES 45° SKEW
J40-25-14	MONOLITHIC PIER CAP DETAILS ALL BRIDGES
J40-26-14	MONOLITHIC PIER CAP DETAILS ALL BRIDGES
J40-27-14	NON-MONOLITHIC PIER CAP DETAILS ALL BRIDGES
J40-28-14	NON-MONOLITHIC PIER CAP DETAILS ALL BRIDGES
J40-29-14	NON-MONOLITHIC PIER CAP DETAILS ALL BRIDGES
J40-30-14	ABUTMENT DETAILS 0° SKEW - TIMBER PILING
J40-31-14	ABUTMENT DETAILS 0° SKEW - TIMBER PILING
J40-32-14	ABUTMENT DETAILS 15° SKEW - TIMBER PILING
J40-33-14	ABUTMENT DETAILS 15° SKEW - TIMBER PILING
J40-34-14	ABUTMENT DETAILS 30° SKEW - TIMBER PILING
J40-35-14	ABUTMENT DETAILS 30° SKEW - TIMBER PILING
J40-36-14	ABUTMENT DETAILS 45° SKEW - TIMBER PILING
J40-37-14	ABUTMENT DETAILS 45° SKEW - TIMBER PILING
J40-38-14	ABUTMENT DETAILS - TIMBER PILING
J40-39-14	ABUTMENT DETAILS 0° SKEW - STEEL PILING
J40-40-14	ABUTMENT DETAILS 15° SKEW - STEEL PILING
J40-41-14	ABUTMENT DETAILS 30° SKEW - STEEL PILING
J40-42-14	ABUTMENT DETAILS 45° SKEW - STEEL PILING
J40-43-14	ABUTMENT DETAILS 45° SKEW - STEEL PILING
J40-44-14	ABUTMENT DETAILS - STEEL PILING
J40-45-14	BARRIER RAIL DETAILS
J40-46-14	BARRIER RAIL DETAILS
J40-47-14	BARRIER RAIL END SECTION
J40-48-14	OPEN BARRIER RAIL DETAILS
J40-49-14	OPEN BARRIER RAIL DETAILS
J40-50-14	SUBDRAIN DETAILS
J40-51-14	WING ARMORING & MACADAM STONE DETAILS
J40-52-14	ABUTMENT BACKFILL DETAILS - 0° SKEWS
J40-53-14	ABUTMENT BACKFILL DETAILS - 15°, 30°, & 45° SKEWS

GENERAL NOTES:

THE J40-14 BRIDGE STANDARDS, IF PROPERLY USED, PROVIDE THE STRUCTURAL PLANS NECESSARY TO CONSTRUCT THREE SPAN 40' ROADWAY CONTINUOUS CONCRETE SLAB BRIDGES WITH LENGTHS OF 70'-0, 80'-0, 90'-0, 100'-0, 110'-0, 120'-0, 130'-0, 140'-0 AND 150'-0.

THESE BRIDGES MAY BE BUILT ON A 0°, 15°, 30° OR 45° SKEW. THESE PLANS SHOW THE BRIDGES SKEWED IN ONE DIRECTION, BUT ALL DIMENSIONS AND DETAILS WOULD BE THE SAME FOR THE OPPOSITE SKEW.

THESE STANDARDS GIVE MOST OF THE INFORMATION NECESSARY TO BUILD THESE BRIDGES. HOWEVER, THE FOLLOWING ADDITIONAL INFORMATION IS REQUIRED FOR USE ON PRIMARY ROUTES. FOR SECONDARY ROUTES THE ENGINEER MAY NOT REQUIRE ALL SHEETS TO BE PROVIDED:

1. TITLE SHEET WITH ENGINEERS SEAL

2. ESTIMATION QUANTITIES TOTALS INCLUDING CLASS 20 EXCAVATION FOR BRIDGE

3. SITUATION PLAN LAYOUT OF BRIDGE

4. TOP OF SLAB ELEVATIONS LAYOUT

5. BOTTOM OF ABUTMENT FOOTING ELEVATIONS

6. BOTTOM OF PIER CAP ELEVATIONS

7. PILING DESIGN INFORMATION

8. SLOPE PROTECTION LAYOUT IF NEEDED

9. CONDUIT LAYOUT

10. LIGHTING LAYOUT IF NEEDED

FOR CLARITY, MOST SECTIONS SHOWN ON THE FOLLOWING SHEETS ARE DRAWN WITH BARRIER RAIL ONLY. THESE SECTIONS WILL BE IDENTICAL FOR OPEN RAIL DESIGN WITH ANY MODIFICATIONS SHOWN ON SHEET J40-48-14 AND J40-49-14.

THESE BRIDGES ARE DESIGNED FOR HL93 LOADING PLUS 20 LBS. PER SQ. FT. OF ROADWAY FOR FUTURE WEARING SURFACE. CONTROL OF CRACKING BY DISTRIBUTION OF REINFORCEMENT FOR SLAB DESIGN BASED ON PRE LRFD 2005 INTERIMS.

NOTE THAT WHEN APPROACH PAVEMENT IS TO BE PLACED, THE TEMPORARY PAVING BLOCKS SHALL BE REMOVED AND A PROPER JOINT FOR EXPANSION SHALL BE PROVIDED BETWEEN THE BRIDGE AND THE APPROACH PAVING.

THE FLOOR SLAB AS SHOWN INCLUDES ½" INTEGRAL WEARING SURFACE.

THE ABUTMENTS FOR THESE BRIDGES ARE BUILT INTEGRAL WITH THE SUPERSTRUCTURE. THEREFORE, IT IS IMPORTANT THAT A PROPER JOINT FOR EXPANSION BE PROVIDED BETWEEN THE BRIDGE AND APPROACH PAVING, WHEN APPROACH PAVING IS NEEDED.

THE ABUTMENT DESIGN UTILIZED ON THESE BRIDGES RESTRICTS THEIR USE IN THE FOLLOWING MANNER:

(1) THESE BRIDGES ARE NOT TO BE USED WHEN POINT BEARING FOR THE ABUTMENT STEEL PILING WOULD BE OBTAINED ON ROCK AT A DISTANCE LESS THAN 15 FEET FROM THE BOTTOM OF FOOTING.

(2) FOR THE 140 FOOT AND 150 FOOT LONG BRIDGES THE ABUTMENT PILING ARE TO BE DRIVEN THROUGH OVERSIZED HOLES PREBORED TO A MINIMUM OF 10 FEET BELOW THE BELOW THE BOTTOM OF FOOTING. THE PREBORED HOLES SHALL BE IN ACCORDANCE WITH SECTION 2501.03, Q OF THE STANDARD SPECIFICATIONS. THE ELEVATION OF THE BOTTOM OF THE PREBORED HOLE SHALL BE SHOWN ON THE PLANS.

(3) IF ROCK IS ENCOUNTERED LESS THAN 5 FOOT BELOW THE PREBORED HOLES, A SPECIAL ANALYSIS WILL BE REQUIRED. WHEN PREBORING IS NOT REQUIRED FOR THE ABUTMENT FOOTING AND ROCK IS ENCOUNTERED LESS THAN 10 FOOT BELOW THE BOTTOM OF ABUTMENT FOOTING, A SPECIAL ANALYSIS WILL BE REQUIRED.

THE PIERS AND ABUTMENTS FOR THESE STANDARDS HAVE BEEN DESIGNED FOR THE USE OF BOTH FRICTION AND POINT BEARING PILES. IT IS NECESSARY THAT THE TYPE AND LENGTH FOR BOTH THE ABUTMENT AND PIER PILES BE DESIGNATED ON THE FRONT SHEET OF THE PLANS.

THE INTEGRAL ABUTMENTS AND PILE BENTS FOR THESE J40 STANDARDS HAVE BEEN DESIGNED FOR THE USE OF VARIOUS TYPES OF PILE FOOTINGS AS FOLLOWS.

• INTEGRAL ABUTMENTS: TIMBER PILES OR HP 10x42 PILES AT BRIDGE DESIGN MANUAL(BDM) ARTICLE 6.2.6.1 STRUCTURAL RESISTANCE LEVEL-1 (SRL-1)

• PILE BENTS: STANDARD CONCRETE-FILLED STEEL PIPE PILES (PIOL), STANDARD PRESTRESSED CONCRETE PILES (PIOL), OR STANDARD H-PILES (PIOL AND SRL-1)

BECAUSE THESE BRIDGE STANDARDS HAVE BEEN REVISED FOR LRFD BASED ON 2012-COMPLETED IOWA STATE UNIVERSITY RESEARCH, FOR PILE FOUNDATIONS THE DESIGNER WILL NEED TO DETERMINE THE CONSTRUCTION CONTROL METHOD, CONTRACT LENGTH, AND DRIVING TARGET AND GIVE THAT INFORMATION ON THE FRONT SHEET OF THE PLANS. BRIDGE DESIGN MANUAL CADD NOTES E177, E718, E719, E818, AND E819 ARE APPROPRIATE FOR THAT PURPOSE. THE NOTES, AS WELL AS THE BRIDGE DESIGN MANUAL AND DESIGN EXAMPLES, ARE AVAILABLE ON THE OFFICE OF BRIDGES AND STRUCTURES WEB SITE: HTTP://WWW.IOWADOT.GOV/BRIDGE/INDEX.HTM.

STRUCTURAL RESISTANCE LEVEL-1 (SRL-1) REPLACES THE 50 TON STEEL PILE DESIGNATION.

FOR MORE INFORMATION ON SRL-1, SEE THE BRIDGE DESIGN MANUAL, LOCATED ON THE IOWA DEPARTMENT OF TRANSPORTATION, OFFICE OF BRIDGES AND STRUCTURES WEB SITE.

FOR PIERS SUBJECT TO SCOUR THE DESIGN BEARING SHALL BE OBTAINED BELOW SCOUR ELEVATION. SCOUR ELEVATION SHALL BE SHOWN ON THE FRONT SHEET.

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.

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

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

THE BR-205 DOUBLE REINFORCED 12" APPROACH STANDARD ROAD PLAN SHALL BE USED WITH THE J40 STANDARDS. THIS STANDARD TIES THE APPROACHES TO THE INTEGRAL (MOVABLE) ABUTMENT, AND PROVIDES EXPANSION MOVEMENT (CF JOINT) AT THE END OF THE FIRST APPROACH SLAB PANEL.

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

SPECIFICATIONS:

DESIGN: AASHTO LRFD, 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 Ed, SERIES OF 2004. REINFORCING STEEL IN ACCORDANCE WITH LRFD AASHTO SECTION 5, GRADE 60. CONCRETE IN ACCORDANCE WITH LRFD AASHTO SECTION 5, f'c = 3,500 PSI,

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

n = 9 FOR TENSION STEEL

2n = 18 FOR COMPRESSION 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 & LIVE LOAD INCLUDED IN ABUTMENT LOADS.

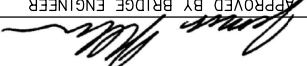
CONTROL OF CRACKING BY DISTRIBUTION OF REINFORCEMENT FOR SLAB


DESIGN BASED ON PRE 2005 LRFD INTERMS.

LATEST REVISION DATE

08-2020

APPROVED BY BRIDGE ENGINEER



 Highway Division

STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES

CONTINUOUS CONCRETE SLAB BRIDGES

JULY, 2014

INDEX AND GENERAL NOTES

J40-01-14

TABLE OF BARRIER RAIL DIMENSIONS AND NUMBERS

[illegible]

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.

THE CONCRETE BARRIER RAIL IS TO BE BID ON A LINEAL FOOT BASIS. THE NUMBER OF LINEAL FEET OF BARRIER RAIL INSTALLED WILL BE PAID FOR AT THE CONTRACT PRICE PER LINEAL FOOT BASED ON PLAN QUANTITIES. PRICE BID FOR "CONCRETE BARRIER RAILING" SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, EXCLUDING REINFORCING STEEL, AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO ERECT THE RAIL IN ACCORDANCE WITH THESE PLANS AND CURRENT SPECIFICATIONS.

IF CONDUIT IS REQUIRED IN THIS PLAN THE RIGID STEEL CONDUIT, JUNCTION BOXES AND FITTINGS INCLUDING LABOR AND ANY ADDITIONAL WORK TO DO THE INSTALLATION IS CONSIDERED INCIDENTAL TO THE COST OF THE RAILING.

THE JOINT SEALER SHALL BE LIGHT GRAY NONSAG LATEX CAULKING SEALER MARKETED FOR OUTDOOR USE. NO TESTING OR CERTIFICATION IS REQUIRED.

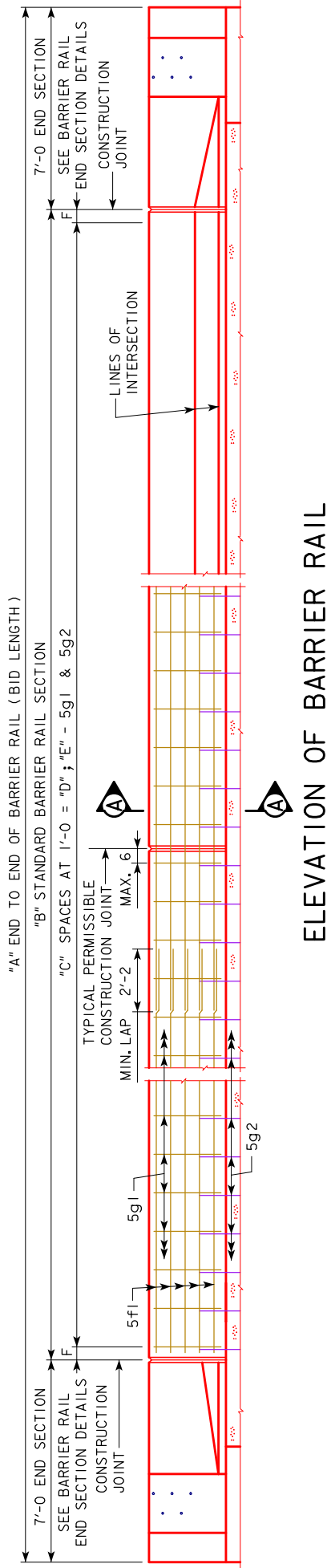
TOP OF THE BARRIER RAIL IS TO BE PARALLEL TO THE THEORETICAL ∇ GRADE.

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

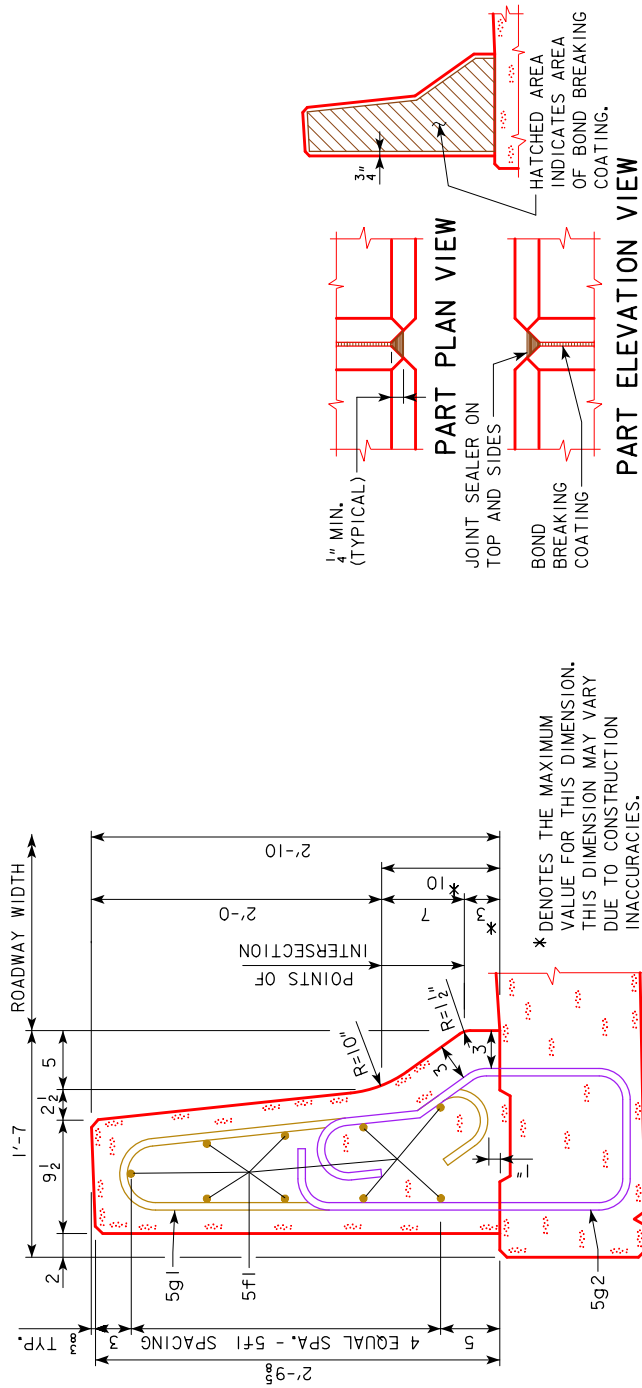
ALL BARRIER RAIL REINFORCING STEEL IS TO BE EITHER EPOXY COATED OR STAINLESS STEEL AS SHOWN OR NOTED. THE STAINLESS STEEL REINFORCING STEEL SHALL BE DEFORMED BAR GRADE 60 MEETING THE REQUIREMENTS OF MATERIALS 1.M.452.

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 SPECIFICATION. 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).

	Highway Division
	STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES CONTINUOUS CONCRETE SLAB BRIDGES JUL Y, 2014
APPROVED BY BRIDGE ENGINEER 	BARRIER RAIL DETAILS
LATEST REVISION DATE 08-2020	J40-45-14





ELEVATION OF BARRIER RAIL



PART SECTION A-A


BARRIER RAIL JOINT DETAILS

EPOXY REINFORCING STEEL-TWO BARRIER RAILS

BRIDGE LENGTH				70'-0			80'-0			90'-0			100'-0			110'-0			120'-0			130'-0			140'-0			150'-0											
SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT									
STANDARD SECTION	5g1	VERTICAL		136	5'-11	839	156	5'-11	963	176	5'-11	1086	196	5'-11	1210	216	5'-11	1333	236	5'-11	1456	256	5'-11	1580	276	5'-11	1703	296	5'-11	1827									
	5f1	LONGITUDINAL		36	35'-1	1317	54	27'-5	1544	54	30'-9	1732	54	34'-1	1920	54	37'-5	2107	72	31'-2	2340	72	33'-8	2528	72	36'-2	2716	72	38'-8	2904									
	4 END SECTIONS @ 266 LBS.						1064						1064						1064												1064								
(INCLUDE WITH SUPERSTRUCTURE REINFORCING)				TOTAL (LBS.)			3220	TOTAL (LBS.)			3571	TOTAL (LBS.)			3882	TOTAL (LBS.)			4194	TOTAL (LBS.)			4504	TOTAL (LBS.)			4860	TOTAL (LBS.)			5172	TOTAL (LBS.)			5483	TOTAL (LBS.)			5795

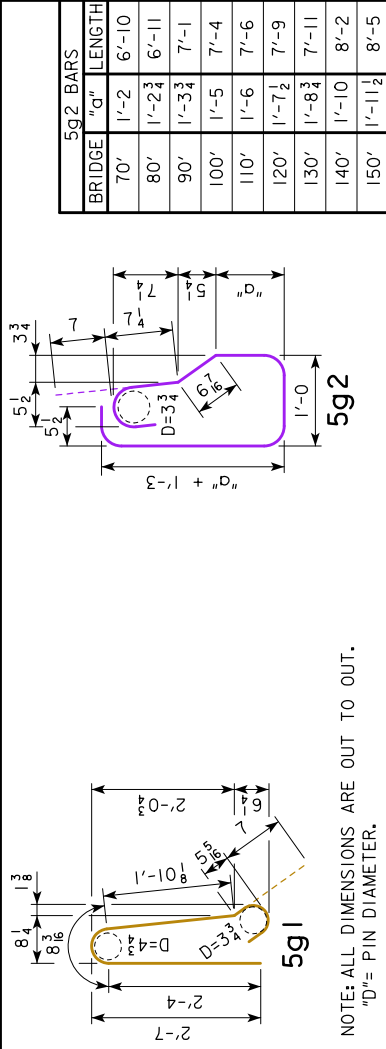
REINFORCING QUANTITIES SHOWN ARE BASED ON 45° SKEW BID LENGTHS.

STAINLESS STEEL REINFORCING STEEL-TWO BARRIER RAILS

BRIDGE LENGTH				70'-0			80'-0			90'-0			100'-0			110'-0			120'-0			130'-0			140'-0			150'-0		
SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT
STANDARD SECTION	5g2	VERTICAL		136	6'-10	969	156	6'-11	1125	176	7'-1	1300	196	7'-4	1499	216	7'-6	1690	236	7'-9	1908	256	7'-11	2114	276	8'-2	2351	296	8'-5	2598
	4 END SECTIONS @ 192 LBS.						768								768			768			768									768
(INCLUDE WITH SUPERSTRUCTURE REINFORCING)				TOTAL (LBS.)		1737	TOTAL (LBS.)		1893	TOTAL (LBS.)		2068	TOTAL (LBS.)		2267	TOTAL (LBS.)		2458	TOTAL (LBS.)		2676	TOTAL (LBS.)		2882	TOTAL (LBS.)		3119	TOTAL (LBS.)		3366

REINFORCING QUANTITIES SHOWN ARE BASED ON 45° SKEW BID LENGTHS.

BENT BAR DETAILS




CONCRETE PLACEMENT SUMMARY

BRIDGE LENGTH		70'-0		80'-0		90'-0		100'-0		110'-0		120'-0		130'-0		140'-0		150'-0	
STANDARD SECTION	* 2 x "B" @ 0.1052 CU. YDS. PER FT.	14.4	16.5	18.6	20.7	22.8	24.9	27.0	29.1	31.2	33.3	35.4	37.5	39.6	41.7	43.8	45.9	48.0	50.1
END SECTION	4 @ 0.65 CU. YDS.	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
TOTAL (CU. YDS.)		17.0	19.1	21.2	23.3	25.4	27.5	29.6	31.7	33.8	35.9	38.0	40.1	42.2	44.3	46.4	48.5	50.6	52.7

* SEE J40-45-14 FOR DIMENSION "B".
CONCRETE QUANTITIES SHOWN ARE
BASED ON 45° SKEW BID LENGTHS.

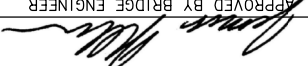
CONCRETE BARRIER RAIL QUANTITIES

BRIDGE LENGTH		70'-0		80'-0		90'-0		100'-0		110'-0		120'-0		130'-0		140'-0		150'-0	
CONCRETE BARRIER RAILING	0° SKEW	L.F.	162.0	182.0	202.0	222.0	242.0	262.0	282.0	302.0	322.0	342.0	362.0	382.0	402.0	422.0	442.0	462.0	482.0
CONCRETE BARRIER RAILING	15° SKEW	L.F.	162.2	182.2	202.2	222.2	242.2	262.2	282.2	302.2	322.2	342.2	362.2	382.2	402.2	422.2	442.2	462.2	482.2
CONCRETE BARRIER RAILING	30° SKEW	L.F.	162.9	182.9	202.9	222.9	242.9	262.9	282.9	302.9	322.9	342.9	362.9	382.9	402.9	422.9	442.9	462.9	482.9
CONCRETE BARRIER RAILING	45° SKEW	L.F.	164.5	184.5	204.5	224.5	244.5	264.5	284.5	304.5	324.5	344.5	364.5	384.5	404.5	424.5	444.5	464.5	484.5



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08-2020

LATEST REVISION DATE

STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES

CONTINUOUS CONCRETE







SLAB BRIDGES

JULY, 2014

BARRIER RAIL DETAILS

J40-46-14

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
4t1	RAIL, ABUTMENT WING TIE BARS		4	VARIES	5
EPOXY REINF. TOTAL WEIGHT (LBS.)					266

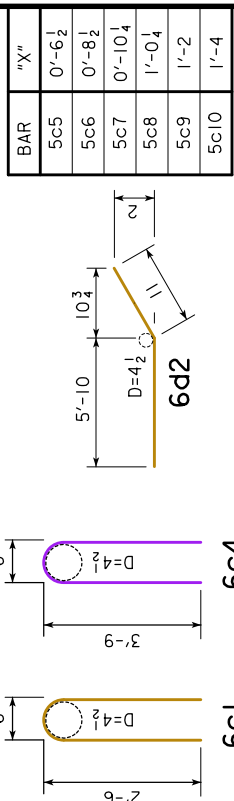
STAINLESS STEEL REINF. STEEL - ONE END SECT.

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

CONCRETE PLACEMENT SUMMARY

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

BENT BAR DETAILS



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



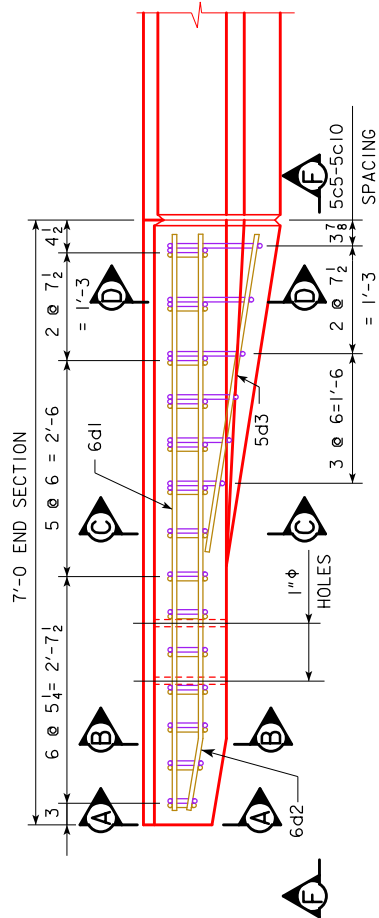
Highway Division

STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES CONTINUOUS CONCRETE SLAB BRIDGES

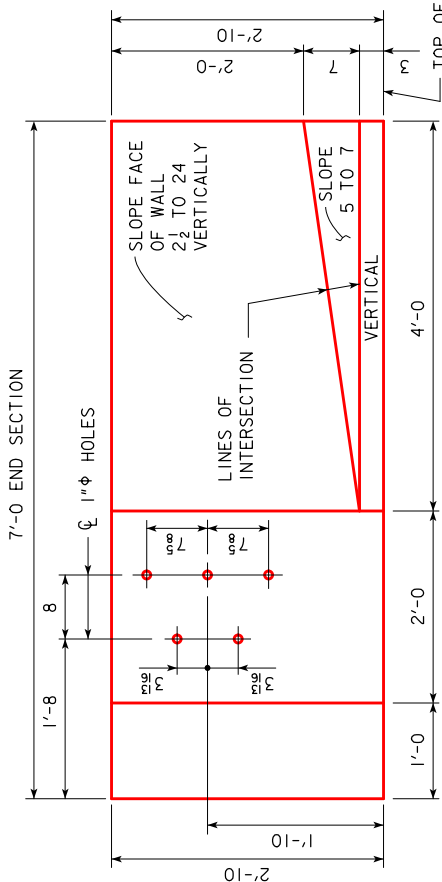
JULY, 2014

BARRIER RAIL END SECTION

J40-47-14

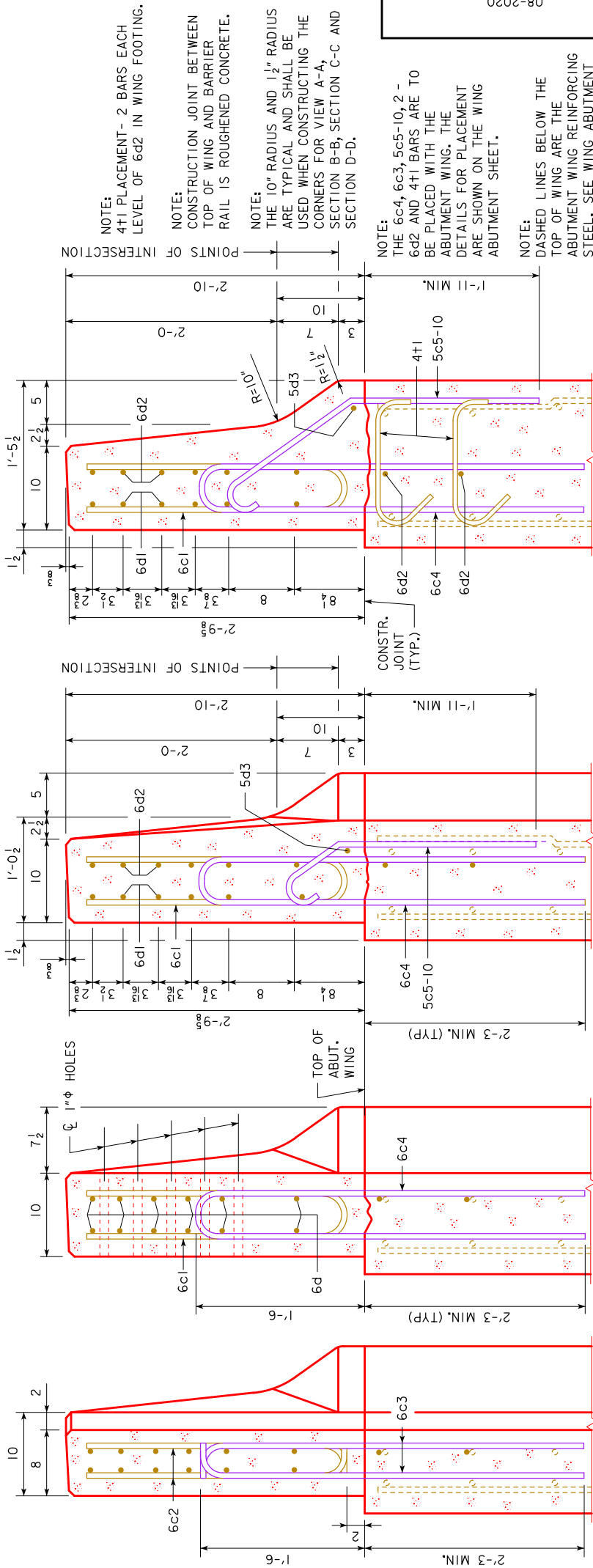


PART PLAN VIEW



PART ELEVATION VIEW

PROVIDE 5 HOLES FORMED WITH 1"Ø PVC PIPE. 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 1/2" 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.

08-2020
REVISION DATE

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"W" DIMENSION	SKREW	DIMENSION
	15°	2'-2 7/8
	30°	2'-6
	45°	3'-0 3/4

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 FEET 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.

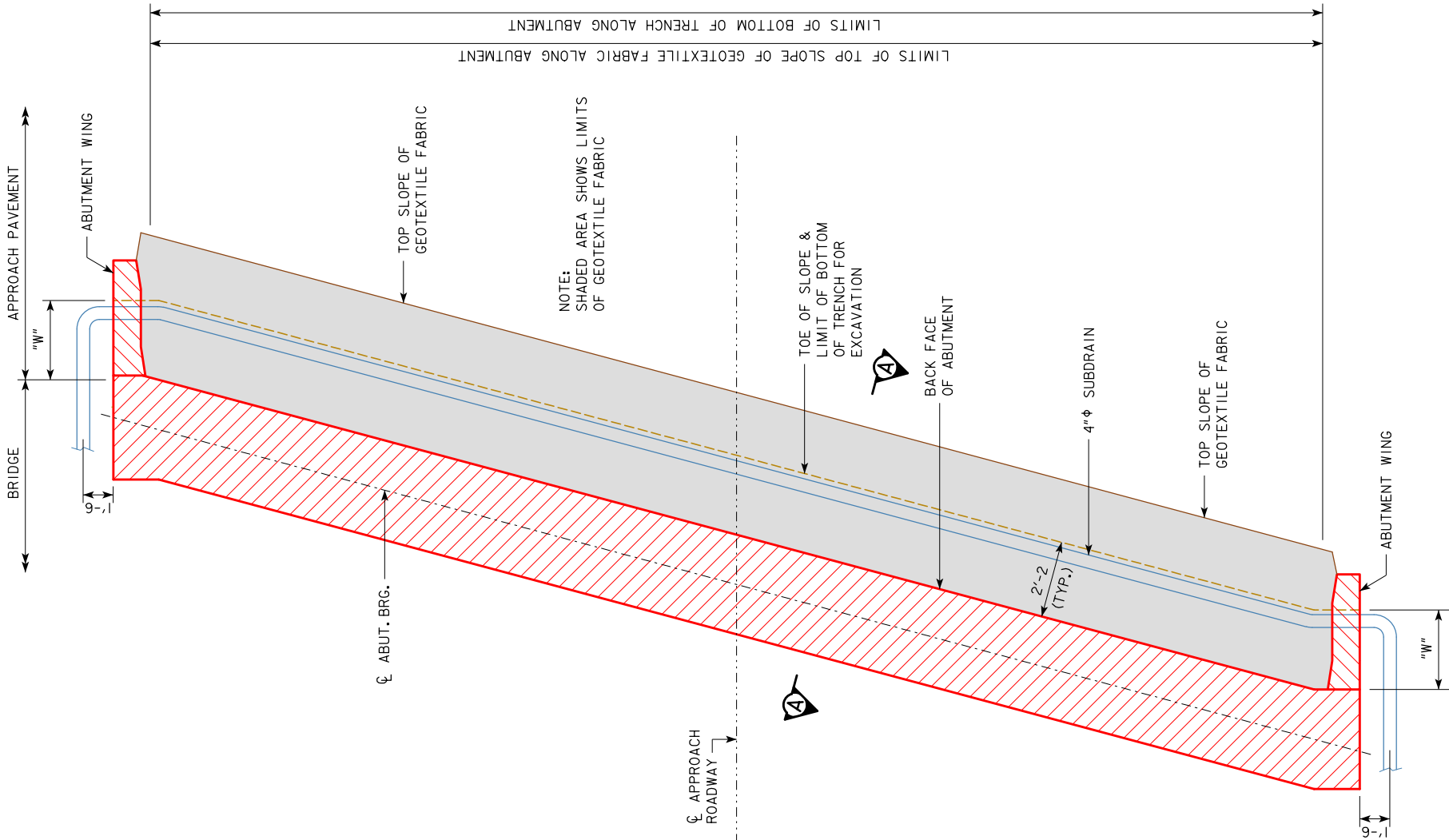
THE REMAINING WORK INVOLVES BACKFILLING WITH FLOODABLE BACKFILL, SURFACE FLOODING, AND VIBRATORY COMPACTION. THE FLOODABLE BACKFILL MATERIAL SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. THE FLOODABLE BACKFILL SHALL BE PLACED IN INDIVIDUAL LIFTS, SURFACE FLOODED, AND COMPACTED WITH VIBRATORY 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 SUBRAIN AND PROGRESS TO THE LOW POINT WHERE THE SUBRAIN 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 3 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.



ABUTMENT PLAN WITHOUT WING EXTENSIONS

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

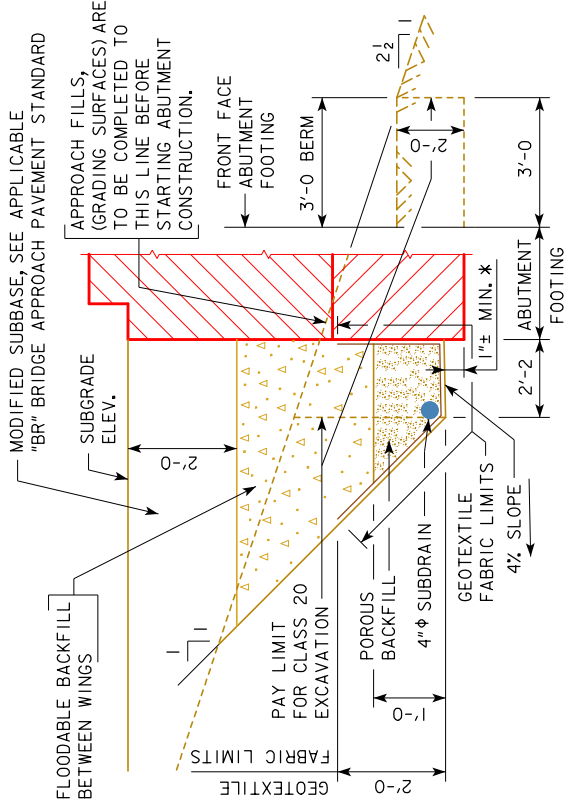
	Highway Division
STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES CONTINUOUS CONCRETE SLAB BRIDGES	JULY, 2014
ABUTMENT BACKFILL DETAILS FOR 15°, 30°, & 45° SKEWS	J40-53-14

NOTE:

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

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

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



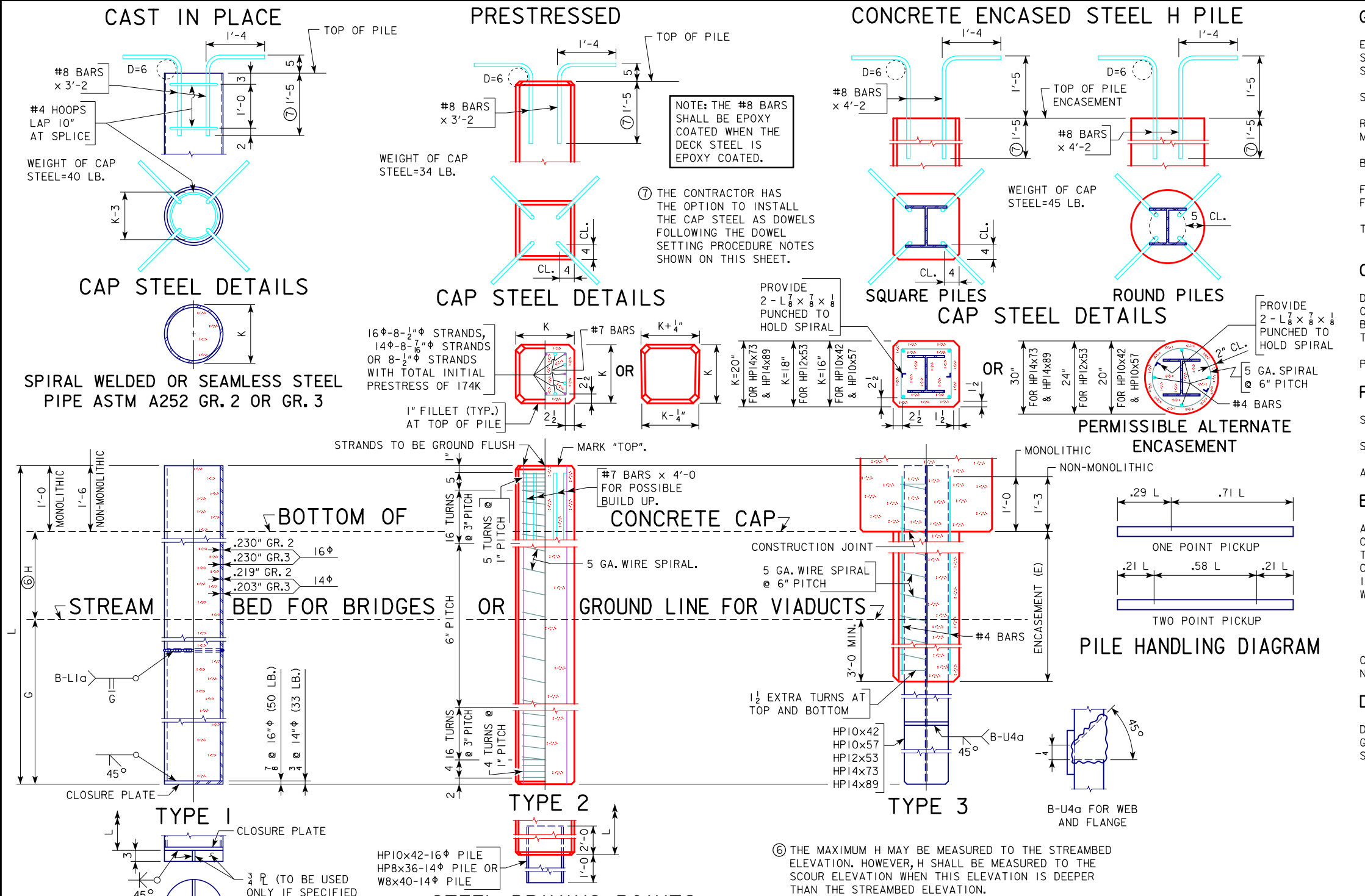
SECTION A-A

BACKFILL DETAILS

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

* DIMENSION VARIES DUE TO 2% SUBDRAIN SLOPE.

REVISION 07-2019: CHANGED ALL REFERENCES OF "LINEAL" TO "LINEAL". TYPE 3 FOR "ROUND HP14x73 PILE" CHANGED "CONCRETE (E=18') QTY. TO 3.17 (WAS 2.75). CHANGED "CONCRETE 1' CHANGE" TO 0.176 (WAS 0.153). CHANGED "REINFORCING (E=18') QTY. TO 110 LB. (WAS 107). CHANGED "REINFORCING 1' CHANGE" TO 5.62 LB. (WAS 5.50). TYPE 3 FOR "ROUND HP14x89 PILE" CHANGED "CONCRETE (E=18') QTY. TO 3.15 (WAS 2.73). CHANGED "CONCRETE 1' CHANGE" TO 0.175 (WAS 0.152). CHANGED "REINFORCING (E=18') QTY. TO 110 LB. (WAS 107). CHANGED "REINFORCING 1' CHANGE" WEIGHT TO 5.62 LB. (WAS 5.50). ENGLISH\MISCELLANEOUS\BRIDGES.DGN - PIOL - THIS SHEET ISSUED 01-09.



GENERAL NOTES:

EXCEPT AS NOTED ELSEWHERE, MATERIAL, CONSTRUCTION, DRIVING AND EXTENSIONS OR BUILD UPS WHEN NECESSARY SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS OF THE IOWA D.O.T. AND CURRENT SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS APPLICABLE.

CAP STEEL SHALL BE AS DETAILED ON THIS SHEET (D=PIN DIAMETER). IT SHALL BE USED IF PILE EMBEDMENT IS LESS THAN 1'-6.

"NOMINAL RESISTANCE P_n", "G", AND "H" AS GIVEN IN TABLES ARE RECOMMENDED DESIGN VALUES FOR ORDINARY CONDITIONS, BUT MAY BE MODIFIED FOR SPECIAL CONDITIONS ON ANY GIVEN JOB.

NOMINAL RESISTANCE P_n AND PILE SIZE REQUIRED SHALL IN ALL CASES BE AS SPECIFIED ON THE PLANS.

NOMINAL RESISTANCE P_n SHOWN ARE FOR FRICTION RESISTANCE EXCEPT FOR TYPE 3 PILING WHERE THE RESISTANCE VALUES SHOWN COULD BE EITHER FRICTION OR POINT RESISTANCE.

COST OF ALL DRIVING POINTS AND CAP STEEL IS TO BE INCLUDED IN THE PRICE BID PER LINEAL FOOT FOR PILING.

WIRE SPIRAL SHALL CONFORM TO ASTM A82.

CAST IN PLACE PILE NOTES:

SHELL THICKNESSES SHOWN ARE MINIMUM REQUIREMENTS. THE METHOD OF DRIVING STEEL SHELL PILES SHALL BE ADAPTED TO THE TYPE AND THICKNESS OF SHELL SPECIFIED. ANY SHELLS WHICH HAVE BEEN IMPROPERLY DRIVEN, BROKEN OR ARE OTHERWISE DEFECTIVE SHALL BE REMOVED AND REPLACED BY THE BRIDGE CONTRACTOR.

ALL CAST IN PLACE PILES SHALL HAVE A CLOSURE PLATE. DRIVING POINTS SHALL BE USED IF SPECIFIED ON THE PLANS.

PRESTRESSED PILE NOTES:

EXCEPT AS OTHERWISE NOTED ALL EXPOSED CORNERS 90° OR SHARPER SHALL BE FILLETED 3/4".

DRIVING POINTS FOR PRESTRESSED PILES, IF CALLED FOR ON THE PLANS, SHALL BE AS DETAILED.

HEADS OF PRESTRESSED PILES TO BE FINISHED SMOOTH AND NORMAL TO AXIS OF PILE.

BIDDING NOTES:

THE PLANS SHALL DESIGNATE THE SIZE OF PILE TO BE USED. THEY SHALL ALSO SPECIFY THE TYPE, EITHER TYPE 1, TYPE 2, OR TYPE 3. IF THE OPTION OF TYPE 1 OR 2 IS GIVEN ON THE PLANS, THE CONTRACTOR SHALL CHOOSE THE TYPE TO BE USED. IF TYPE 3 IS SPECIFIED, TYPE 3 SHALL BE USED, BUT THE CONTRACTOR MAY CHOOSE THE SHAPE OF THE ENCASEMENT. IT SHOULD BE KEPT IN MIND THAT FOR A GIVEN SIZE AND RESISTANCE VALUE, LENGTH MAY VARY WITH THE SHAPE (SQUARE OR ROUND).

PILES SHALL BE BID DESIGNATING THE SIZE, TYPE AND LENGTH.

TYPE 1 PILING WILL BE BID PER LINEAL FOOT OF PILE.

TYPE 2 PILING WILL BE BID PER LINEAL FOOT OF PILE.

TYPE 3 PILING WILL BE BID PER LINEAL FOOT OF PILE AND LINEAL FOOT OF ENCASEMENT. PRICE BID FOR ENCASEMENT SHALL BE FULL PAYMENT FOR NECESSARY EXCAVATION AND FOR FURNISHING AND PLACING ALL MATERIAL.

DOWEL SETTING PROCEDURE:

IF CAP STEEL IS REQUIRED FOR THE PRESTRESSED PILES THE #8 DEFORMED BARS ARE TO BE SET AS DOWELS INTO THE PILES WITH POLYMER GROUT IN ACCORDANCE WITH ARTICLE 2301.03, E, OF THE STANDARD SPECIFICATIONS OR BY THE FOLLOWING PROCEDURE.

-A.) DRILL HOLE APPROXIMATELY TWICE THE DIAMETER OF THE DOWEL BAR AND TO THE DEPTH INDICATED.

-B.) FILL HOLE WITH WATER AND ALLOW TO STAND LONG ENOUGH TO THOROUGHLY SATURATE THE SURROUNDING CONCRETE (ABOUT FOUR HOURS).

-C.) BLOW OUT ALL FREE WATER AND FILL HOLE 2/3 FULL OF MORTAR.

-D.) INSERT DOWEL BY DRIVING, IF NECESSARY, AND MANIPULATE OR TAP WITH A HAMMER TO CONSOLIDATE MORTAR AND SECURE COMPLETE EMBEDMENT.

-E.) ADD MORE MORTAR, IF NECESSARY, TO FILL HOLE.

-F.) MORTAR SHALL CONSIST OF EQUAL PARTS PORTLAND CEMENT AND SAND WITH JUST ENOUGH WATER TO MAKE A WORKABLE MIX.

APPROVED BY:  BRIDGE ENGINEER

STEEL DRIVING POINTS

ASTM A36

K DIMENSION	IN.	14 ϕ	16 ϕ
G MIN. BELOW GROUND	FT.	24	27
6 H MAX. ABOVE GROUND	FT.	18	22
SHELL ASTM A-252		GR. 2	GR. 2
CONCRETE (L=40')	C.Y.	1.49	1.95
CONCRETE 1' CHANGE	C.Y.	0.0372	0.0488
1 WT. OF SHELL (L=40')	LB.	1325	1600
WT. OF SHELL 1' CHANGE	LB.	32.26	38.77
f'c	KSI	4.0	4.0
5 NOMINAL RESISTANCE P _n	KIPS	119	137

1 INCLUDES WEIGHT OF CLOSURE PLATE.

STEEL DRIVING POINTS

ASTM A36

STRAND STRENGTH	IN.	14 ϕ	16 ϕ
K DIMENSION	IN.	14 ϕ	16 ϕ
G MIN. BELOW GROUND	FT.	24	27
6 H MAX. ABOVE GROUND	FT.	18	22
CONCRETE (L=40')	C.Y.	2.01	2.62
CONCRETE 1' CHANGE	C.Y.	0.050	0.066
2 REINFORCING (L=40')	LB.	232	280
REINFORCING 1' CHANGE	LB.	3.93	5.10
MAX. L 1 PT. PICK-UP	FT.	57	60
MAX. L 2 PT. PICK-UP	FT.	82	86
f'c	KSI	5.0	5.0
5 NOMINAL RESISTANCE P _n	KIPS	127	146
3 INITIAL PRESTRESS	KIPS	174	231

2 INCLUDES PRESTRESSING STRANDS.

3 INCREASE 5% FOR ARTIFICIAL CURING.

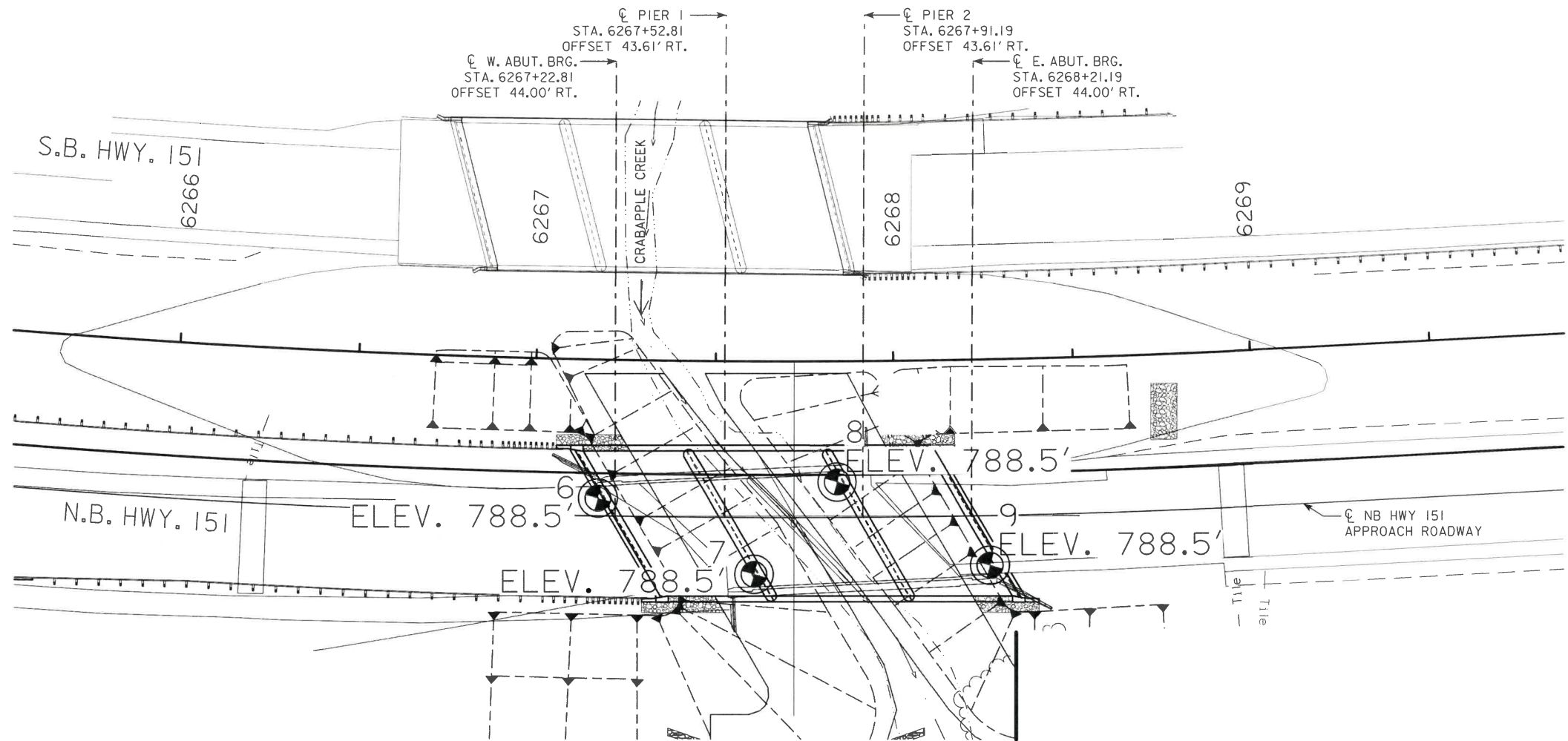
STEEL H PILE		HP10x42	HP10x57	HP12x53	HP14x73	HP14x89	
G MINIMUM BELOW GROUND		FT.	18	18	21	24	24
⑥ H MAX. ABOVE GROUND W/MONOLITHIC		FT.	19	19	23	28	29
⑥ H MAX. ABOVE GROUND W/NON-MONOLITHIC		FT.	15	16	20	25	26
SQUARE	CONCRETE (E=18')	C.Y.	1.12	1.10	1.41	1.74	1.72
	CONCRETE 1' CHANGE	C.Y.	0.062	0.061	0.078	0.097	0.096
	④ REINFORCING (E=18')	LB.	96	96	99	103	103
	④ REINFORCING 1' CHANGE	LB.	4.98	4.98	5.13	5.28	5.28
ROUND	CONCRETE (E=18')	C.Y.	1.40	1.38	2.02	3.17	3.15
	CONCRETE 1' CHANGE	C.Y.	0.078	0.076	0.112	0.176	0.175
	④ REINFORCING (E=18')	LB.	97	97	102	110	110
	④ REINFORCING 1' CHANGE	LB.	5.02	5.02	5.26	5.62	5.62
⑤ NOMINAL RESISTANCE P _n		KIPS	154	208	192	265	324
f'c = 4.0 KSI							

④ INCLUDES WEIGHT OF PUNCHED L $\frac{7}{8} \times \frac{7}{8} \times \frac{1}{8}$

⑤ SEE BRIDGE DESIGN MANUAL 6.6.4.2 FOR ADDITIONAL INFORMATION

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

NOTE: SOILS MAY VARY BETWEEN BORINGS. SEE STANDARD SPECIFICATION 1104.01



GEOTECHNICAL DESIGN



I hereby certify that this engineering document was prepared under my supervision and that engineering decisions with regard to the design were made by me or by other duly licensed Professional Engineers under the laws of the State of Iowa.

Signature: *Zachary A. Bonzer* Date: *9-21-2020*
ZACHARY A. BONZER
Printed or Typed Name

My license renewal date is December 31, 2020

Pages or sheets covered by this seal: SPS.1 & SPS.2

LOCATION

N.B. U.S. HWY. 151
OVER CRABAPPLE CREEK
T-84N R-6W
SECTION 36
MARION TOWNSHIP
LINN COUNTY
FHWA NO. 33541
BRIDGE MAINT. NO. 5740.8R151
LATITUDE 42.045683°
LONGITUDE -91.496389°

DESIGN FOR 30° SKEW (R.A.)

100'-0 x 41'-0 CONTINUOUS
CONCRETE SLAB BRIDGE

30'-6 END SPANS 39'-0 INTERIOR SPAN

SOIL PROFILE SHEET

STA. 6267+72.00, 43.54' RT.

LINN COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 1 OF 2 FILE NO. 31632 DESIGN NO. 322

FILE NO. 31632

ENGLISH

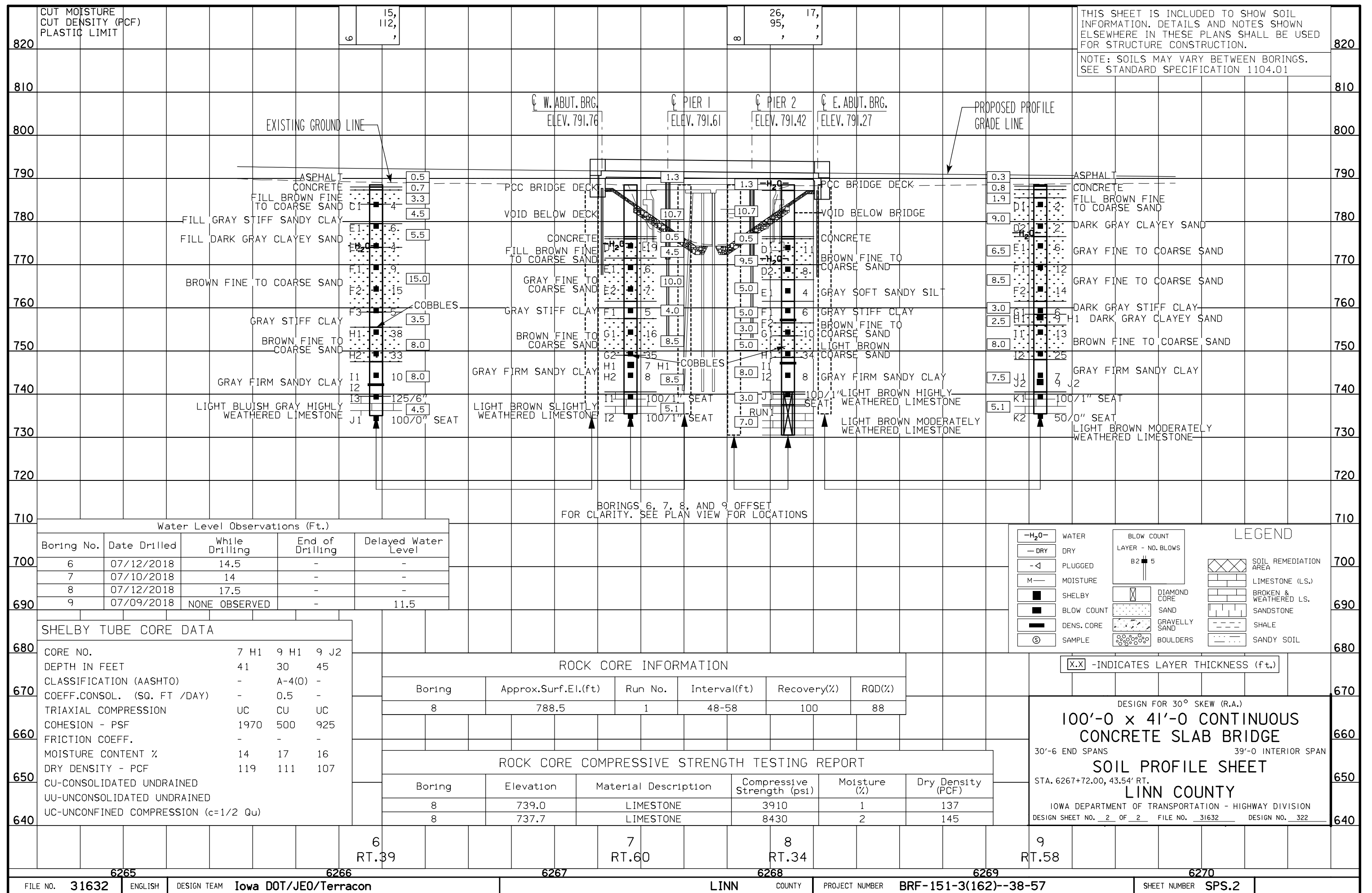
DESIGN TEAM Iowa DOT/JEO/Terracon

LINN

COUNTY

PROJECT NUMBER BRF-151-3(162)--38-57

SHEET NUMBER SPS.1



100-0A
10-28-97

[illegible]

105-4
10-18-11

[illegible]

281-1
10-18-16

282-3
04-17-18

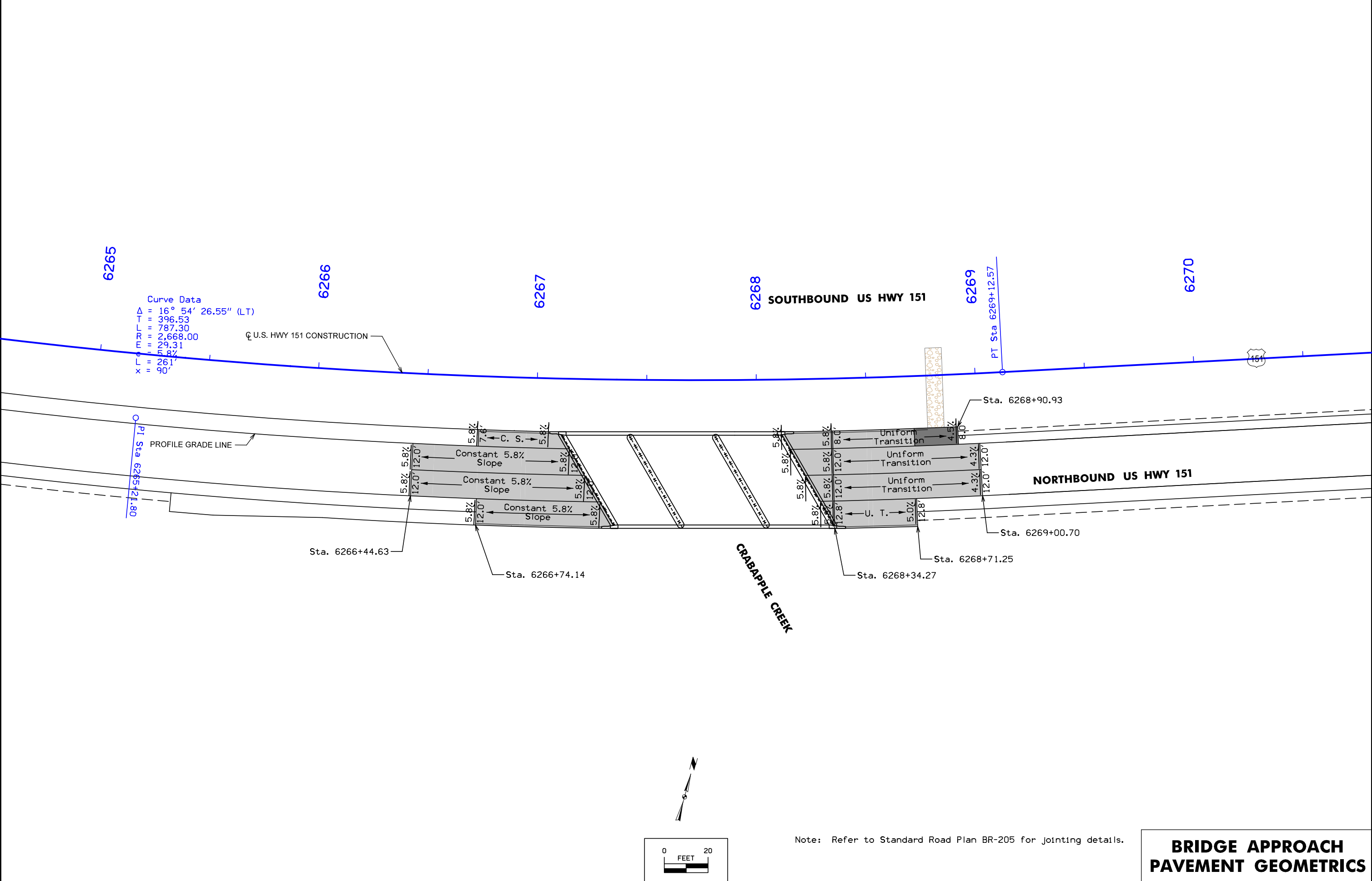
262-5
10-18-05

112-6
04-18-17

* Not a bid item

[illegible]

SHEET NUMBER	C.1
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Curve Data
Δ = 16° 54' 26.55" (LT)
T = 396.53
L = 787.30
R = 2,668.00
E = 29.31
F = 5.8%
L = 261'
X = 90'

U.S. HWY 151 CONSTRUCTION

PROFILE GRADE LINE

PI Sta 6265+21.80

Sta. 6266+44.63

Sta. 6266+74.14

CRABAPPLE CREEK

Sta. 6268+34.27

Sta. 6268+71.25

Sta. 6269+00.70

Sta. 6268+90.93

SOUTHBOUND US HWY 151

NORTHBOUND US HWY 151

Note: Refer to Standard Road Plan BR-205 for jointing details.

**BRIDGE APPROACH
PAVEMENT GEOMETRICS**