



**RS40-14 THREE SPAN
ROLLED STEEL BEAM
BRIDGE STANDARDS**

REVISED 02-2017 - UPDATED SPECIFICATIONS DESIGN: AASHTO LRFD (WAS 4TH ED., SERIES OF 2007 UP TO 2008 INTERIM) CONSTRUCTION, SERIES 2012. UPDATED DESIGN STRESSES: AASHTO LRFD (WAS 4TH ED., SERIES OF 2007 UP TO 2008 INTERIM), REMOVED REFERENCE TO BRIDGE DESIGN MANUAL CADD NOTE E177. REMOVED REFERENCE TO "PIERS" IN STEEL "H" PILE NOTES. ADDED WEATHERING STEEL NOTE STATING BEAM FABRICATED FOR DEAD LOAD FIT. REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

GENERAL NOTES:

THE RS40-14 BRIDGE STANDARDS, IF PROPERLY USED, PROVIDE THE STRUCTURAL PLANS NECESSARY TO CONSTRUCT CONTINUOUS 40'-0 ROADWAY STEEL ROLLED BEAM BRIDGES WITH LENGTHS OF 160'-0, 180'-0, 200'-0, 220'-0, 240'-0, 260'-0, 280'-0, 300'-0, 320'-0 AND 340'-0.

ALL BRIDGES MAY BE BUILT ON A 0°, 10°, 20°, 30° OR 45° SKEW. WHERE A SINGLE SKEW IS SHOWN, IT IS USUALLY SHOWN AS RIGHT AHEAD. UNLESS NOTED OTHERWISE, ALL DIMENSIONS AND DETAILS SHOWN FOR A GIVEN SKEW APPLY TO THE OPPOSITE SKEW.

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

- (1) STEEL H PILES SHALL BE USED AT THE ABUTMENTS. H PILES MAY BE DRIVEN AS FRICTION OR POINT BEARING PILES.
- (2) 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 12 FEET FROM THE BOTTOM OF FOOTING.
- (3) THE ABUTMENT PILING FOR ALL BRIDGES ARE TO BE DRIVEN THROUGH OVERSIZE HOLES PREBORED TO A MINIMUM OF 10 FEET 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.

CLASS 20 EXCAVATION WILL BE REQUIRED TO CONSTRUCT THE INTEGRAL ABUTMENTS AND CLASS 20 & 21 EXCAVATION WILL BE REQUIRED TO CONSTRUCT TEE PIERS. THE QUANTITIES FOR CLASS 20 AND 21 ARE NOT INCLUDED ON THESE SHEETS, BUT SHALL BE CALCULATED AND INCLUDED IN THE FINAL PLANS.

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

ABUTMENT STEP HEIGHTS DEPEND ON PROFILE GRADE FOR BRIDGES AND SHALL BE SET BY FINAL DESIGNER.

FOR THE NON-SYMMETRICAL CROSS-SECTION OPTION THE DESIGNER SHALL PROVIDE A STAKING DIAGRAM.

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.

3" WING PVC PIPE IS INCIDENTAL TO STRUCTURAL CONCRETE.

THE INTEGRAL ABUTMENTS, PILE BENTS, AND TEE PIERS FOR THESE RS40 STANDARDS HAVE BEEN DESIGNED FOR THE USE OF VARIOUS TYPES OF PILE FOOTINGS OR SPREAD FOOTINGS AS FOLLOWS.

- INTEGRAL ABUTMENTS: HP10x57 PILES REFER TO 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).
- TEE PIERS: HP10x57 PILES AT BRIDGE DESIGN MANUAL (BDM) ARTICLE 6.2.6.1 STRUCTURAL RESISTANCE LEVEL-1 OR 2 (SRL-1 OR SRL-2) OR SPREAD FOOTINGS.

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

STRUCTURAL RESISTANCE LEVEL 2 (SRL-2) REPLACES THE 75 TON STEEL PILE DESIGNATION.

FOR MORE INFORMATION ON SRL-1 AND SRL-2, SEE THE BRIDGE DESIGN MANUAL, LOCATED ON THE IOWA DEPARTMENT OF TRANSPORTATION, OFFICE OF BRIDGES AND STRUCTURES WEB SITE.

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 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](http://www.iowadot.gov/bridge/index.htm).

THESE STANDARDS ARE USING NON-COATED, EPOXY COATED AND STAINLESS STEEL REINFORCING BARS. THE DESIGNER SHOULD NOTE WHERE THESE DIFFERENT TYPES OF BARS ARE USED THROUGHOUT THESE STANDARDS.

STRUCTURAL STEEL NOTES:

THE DESIGN OF THE STRUCTURAL STEEL MEMBERS HAS BEEN BASED ON THE FOLLOWING:

- (1) DESIGN VEHICLE: HL-93.
- (2) DEAD LOAD 2: 20 PSF FUTURE WEARING SURFACE AND BARRIER RAILS EQUALLY DISTRIBUTED TO ALL BEAMS.
- (3) PRIMARY MEMBER FLEXURAL CAPACITY IS BASED UPON ELASTIC SECTION PROPERTIES (S), NOT PLASTIC SECTION PROPERTIES (Z).
- (4) LIVE LOAD DEFLECTION LIMIT: L/800.
- (5) LIVE LOAD DISTRIBUTION FACTOR FOR DEFLECTION: EQUALLY DISTRIBUTED TO ALL BEAMS.

THE FINAL DESIGNER SHALL COMPUTE STRUCTURAL STEEL CAMBER AND THEORETICAL CONCRETE HAUNCH DIAGRAMS IN ACCORDANCE WITH IOWA DOT POLICIES TO MATCH THE SPECIFIC GRADE AND SITE APPLICATIONS. ROLLED BEAMS MAY BE CAMBERED AT THE MILL BY COLD CAMBERING OR BY THE FABRICATOR BY HEAT CAMBERING OR COLD CAMBERING. THIS INFORMATION SHALL BE IN ACCORDANCE WITH ARTICLE 2408.02, K OF THE STANDARD SPECIFICATIONS.

STEEL H PILE SECTION HP10x57 SHALL BE USED FOR ALL ABUTMENTS. PILE SPACING AND NUMBER OF PILES ARE BASED ON A MAXIMUM CAPACITY OF 6 KSI (100 K = 50 TONS). IMPACT IS INCLUDED IN INTEGRAL ABUTMENT PILE DESIGN. IMPACT IS NOT INCLUDED IN T-PIER DESIGN. THE ACTUAL PILE LOADS REQUIRED FOR A GIVEN BRIDGE LENGTH AND SKEW ARE TABULATED ON APPROPRIATE STANDARD SHEETS.

SHEAR STUD HEIGHTS SHALL BE DETERMINED BY THE FINAL DESIGNER, BASED ON THE SITE SPECIFIC GRADE AND THE THEORETICAL CONCRETE HAUNCH DIAGRAM.

MAGNETIC PARTICLE INSPECTION OF WELDS SHALL BE DONE PER AWS SPECIFICATIONS.

SUBSTRUCTURE - CONSTRUCTION

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

SPECIFICATIONS:

DESIGN: AASHTO LRFD 7TH EDITION, SERIES OF 2014.
 CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

WELDING: AASHTO/AWS D1.5 AS SPECIFIED AND MODIFIED BY THE STANDARD SPECIFICATIONS AND CURRENT SUPPLEMENTAL SPECIFICATIONS.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO LRFD 7TH EDITION, SERIES OF 2014 INTERIM.

REINFORCING STEEL IN ACCORDANCE WITH SECTION 5, GRADE 60.

CONCRETE IN ACCORDANCE WITH SECTION 5, f'c = 4000 psi.

STRUCTURAL STEEL IN ACCORDANCE WITH SECTION 6, ASTM A709, GRADE 50W AND GRADE 36.

FATIGUE CYCLES BASED ON INFINITE FATIGUE. FATIGUE INVESTIGATION WITH REFINED ANALYSIS WAS CONSIDERED FOR BRIDGE LENGTHS 180'-0, 200'-0, 220'-0, 260'-0, & 320'-0.

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. ESTIMATED QUANTITIES TOTALS
3. SUMMARY QUANTITIES SHEET
4. SITUATION PLAN LAYOUT OF BRIDGE
5. GENERAL INFORMATION SHEET (WORKING STANDARD 5251)
6. SLAB ELEVATIONS SHEET (WORKING STANDARDS 5262, 5263, 5265, 5266, 5268, 5269, 5271, 5272, 5274, 5275, 5277, 5278, 5280, 5281, 5283, 5284, 5286, 5287, 5289, 5290)
7. BEAM LINE HAUNCH DATA SHEET (WORKING STANDARDS 5264, 5267, 5270, 5273, 5276, 5279, 5282, 5285, 5288, 5291)
8. MISCELLANEOUS DETAIL SHEET (WORKING STANDARDS 5252 TO 5261)
9. PILING DESIGN INFORMATION
10. SLOPE PROTECTION LAYOUT IF NEEDED
11. CONDUIT LAYOUT
12. LIGHTING LAYOUT IF NEEDED

WEATHERING STEEL NOTES:

ALL STRUCTURAL STEEL, EXCEPT AS NOTED, SHALL CONFORM TO ASTM A709 GRADE 50W. THE MINIMUM YIELD POINT FOR GRADE 50W STRUCTURAL STEEL IS 50 ksi FOR PLATES 4" AND UNDER IN THICKNESS, AND ALL STRUCTURAL SHAPES. THE GRADE 50W STEEL IS A WEATHERING STEEL AND IS TO REMAIN UNPAINTED, EXCEPT AS NOTED. CVN TESTING IS REQUIRED FOR MAIN BEAMS AND ALL SPLICE PLATES.

FLANGE DEFLECTORS ARE TO BE ASTM A709 GRADE 50W OR 36. S3 x 7.5 BEAM ERECTION SEATS ARE TO BE ASTM A709 GRADE 50W OR 36.

ALL STRUCTURAL STEEL PIECES COMPRISING THE ABUTMENT AND PIER BEARINGS SHALL COMPLY WITH THE REQUIREMENTS AS STATED IN THE NOTES IN THIS SECTION.

SHEAR STUDS ARE TO BE OF AN APPROVED TYPE LISTED IN MATERIALS I.M. 453.10, APPENDIX A.

THE PAINTED FINISH ON BEARINGS, FLANGE DEFLECTORS AND WEATHERING STEEL SHALL BE IN ACCORDANCE WITH THE PLAN NOTES AND ARTICLE 2408.02, Q, OF THE STANDARD SPECIFICATIONS. ALL WEATHERING STEEL EMBEDDED INTO AN INTEGRAL ABUTMENT SHALL BE PAINTED TO A DISTANCE OF 2'-9 FROM THE PLANE THROUGH THE ABUTMENT BEARINGS AND SEALED BY CAULKING AT THE ABUTMENT CONCRETE AND STEEL INTERFACE.

THE STEEL FOR THE EXTERIOR BEAMS OF THE BRIDGE SHALL BE OF THE SAME TYPE AND FROM THE SAME SOURCE.

BOLTS FOR USE WITH WEATHERING STEEL SHALL BE A325 TYPE III WITH A563 GRADE DH3 NUTS AND F436 TYPE III WASHERS.

BOLTS USED TO SPLICE BEAM SECTIONS ARE TO BE INSTALLED SUCH THAT NUTS ARE ON THE INSIDE FACE OF THE BEAM WEBS FOR THE EXTERIOR BEAMS, AND ON THE TOP OF BOTH TOP AND BOTTOM FLANGES OF ALL THE BEAMS.

THE STEEL SHALL BE KEPT FREE OF OIL, GREASE, DIRT, CRAYON OR CHALK MARKS, CONCRETE SPATTER AND ANY OTHER FOREIGN MATTER THAT MAY AFFECT THE NATURAL OXIDATION OF THE STEEL. ANY FOREIGN MATTER REMAINING ON THE STEEL AFTER COMPLETION OF BRIDGE CONSTRUCTION SHALL BE REMOVED BY THE BRIDGE CONTRACTOR AS DIRECTED BY THE ENGINEER. THE RESULTANT SURFACE SHALL BE FREE OF ALL VISIBLE RESIDUES. ALL COSTS ASSOCIATED WITH CLEANING STEEL SURFACES SHALL BE BORNE BY THE BRIDGE CONTRACTOR.



SEAL MATERIAL FOR CAULKING SHALL BE NEUTRAL CURE AND NON SAG SILICONE. TWO PRODUCTS MEETING THESE CRITERIA ARE DOW 888, CSL342 JOINT SEALANT AND CRAFCO ROAD SAVER SILICONE.

ALL FIELD CONNECTIONS ARE TO BE BOLTED USING "HIGH TENSILE STRENGTH BOLTS". UNLESS OTHERWISE NOTED, ALL OPEN HOLES ARE TO BE $\frac{1}{16}$ " ϕ AND ALL BOLTS ARE TO BE $\frac{1}{8}$ " ϕ .

FILL \bar{r} THICKNESSES SHOWN ON PLANS ARE BASED ON NOMINAL BEAM DIMENSIONS. THESE THICKNESSES ARE TO BE VERIFIED OR ADJUSTED DURING FABRICATION TO SECURE A CLOSE FIT. EACH FILL PLATE SHALL FIT TO THE NEAREST $\frac{1}{16}$ " IN THICKNESS AND SINGLE PLATES ARE REQUIRED AT EACH FILL LOCATION.

THE DESIGN DRAWINGS INDICATE AWS PREQUALIFIED WELDED JOINTS, AND UNLESS OTHERWISE NOTED THE DESIGN JOINT DETAILS ARE FOR MANUAL SHIELDED METAL-ARC WELDING. ALTERNATE JOINT DETAILS MAY BE SUBMITTED FOR APPROVAL.

THE BEAMS ARE TO BE FABRICATED FOR A STEEL DEAD LOAD FIT CONDITION.

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER 		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES	
		OCTOBER, 2014	
		GENERAL NOTES	RS40-002-14

TEE PIER NOTES:

THE TEE PIERS SHOWN IN THESE PLANS ARE DESIGNED FOR USE WITH THE RS40-14 ROLLED STEEL BEAM BRIDGE STANDARDS. THE PIER MAY BE USED FOR EITHER GRADE SEPARATION OR STREAM CROSSING STRUCTURES. THE PIERS WERE DESIGNED FOR THE FOLLOWING STREAM FORCE AND ICE LOADING CONDITIONS, AND SHOULD NOT BE USED WHERE THESE LOADING CONDITIONS ARE EXCEEDED.

ICE FORCE:
ICE FORCES WERE APPLIED AT A HEIGHT OF $H/2 + 1'-6"$ ABOVE THE BOTTOM OF THE PIER FOOTING, WHERE H IS THE OVERALL HEIGHT OF PIER. THE EFFECTIVE ICE STRENGTH WAS 24 KSF FOR 1'-7" OF ICE DEPTH. A PRIMARY ICE FORCE (F) WAS CALCULATED ACCORDING TO THE LRFD SPECIFICATIONS AND APPLIED TO THE PIER STEM AS FOLLOWS:

- CASE 1: 100% OF F APPLIED PARALLEL TO THE PIER'S LONG AXIS AND 15% OF F APPLIED PERPENDICULAR TO THE PIER'S LONG AXIS.
- CASE 2: 50% OF F APPLIED PARALLEL TO THE PIER'S LONG AXIS AND 34% OF F APPLIED PERPENDICULAR TO THE PIER'S LONG AXIS.

STREAM FLOW:
THE STREAM VELOCITY USED WAS 5 FT/SEC WITH THE C_D COEFFICIENT EQUAL TO 1.4. THE RESULTING STREAM FORCE WAS ASSUMED TO ACT PARALLEL TO THE PIER'S LONG AXIS. IT WAS ASSUMED THAT SUPERSTRUCTURE ELEMENTS WILL CLEAR HIGH WATER BY APPROXIMATELY 3'-0".

FOOTING GEOMETRY:
IT WAS ASSUMED THAT THE PIER FOOTING WILL BE SET APPROXIMATELY 6'-0" BELOW THE ADJACENT STREAMBED OR GROUND SURFACE. IT WAS ALSO ASSUMED THAT THERE ARE NO SIGNIFICANT UNBALANCED EARTH PRESSURES APPLIED TO THE PIER.

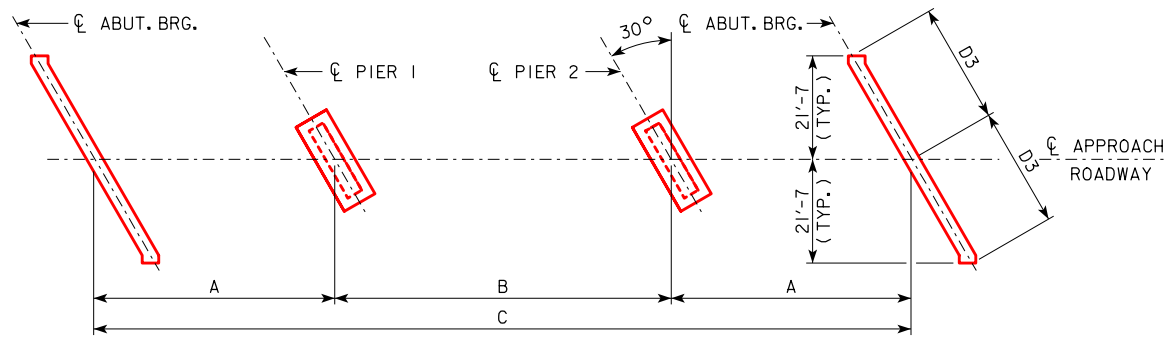
ALL BRIDGES WITH TEE PIERS DETAILED ON THESE STANDARDS ARE INTENDED TO HAVE ONE FIXED PIER AND ONE EXPANSION PIER. THE PILE LAYOUT AND REINFORCEMENT SHOWN ARE THE SAME FOR EITHER FIXED OR EXPANSION PIER. THE ONLY DISTINCTION BETWEEN FIXED PIER AND EXPANSION PIER LIES IN THE SELECTION OF BEARINGS AND INSTALLATION OF ANCHOR BOLTS IN THE TOP OF THE CAP. EACH BRIDGE SHALL HAVE ONE SET OF FIXED BEARINGS AND ONE SET OF EXPANSION BEARINGS, WHICH MAY BE USED ON EITHER PIER 1 OR PIER 2. THE ANCHOR BOLTS IN THE TOP OF THE CAP SHOULD BE ELIMINATED FROM THE EXPANSION PIER.

HP10x57 STEEL PILE SHALL BE USED IN THE PILE FOOTINGS OF THE PIERS FOR EITHER FRICTION OR POINT BEARING PILE CONDITIONS. FRICTION BEARING INCLUDES SIDE FRICTION AND END BEARING IN SOIL. POINT BEARING INCLUDES SIDE FRICTION AND POINT BEARING IN ROCK. NOMINAL STRUCTURAL RESISTANCE WAS TAKEN AS 243 KIPS FOR 50 TON FRICTION BEARING PILES AND 365 KIPS FOR 75 TON POINT BEARING PILES. A NOMINAL UPLIFT RESISTANCE OF 42 KIPS PER PILE WAS USED IN THE DESIGN OF THE PIER FOOTINGS. THE PIER SHALL NOT BE USED AT SITES WHERE THIS UPLIFT FORCE CANNOT BE ACHIEVED DUE TO SPECIFIC CONDITIONS SUCH AS NEAR SURFACE ROCK LAYERS.

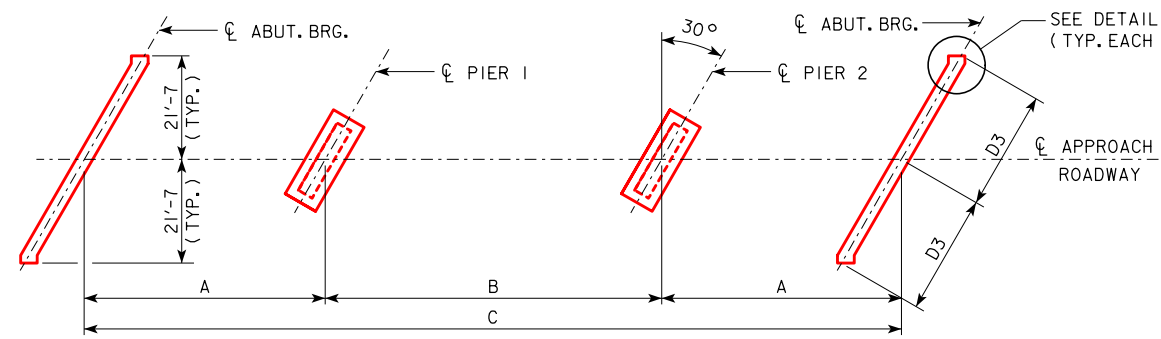
WHEN PIERS ARE USED IN GRADE SEPARATION STRUCTURES, EPOXY COATED REINFORCEMENT MAY BE REQUIRED FOR PIER COLUMNS. CONSULT CURRENT POLICY FOR GUIDANCE ON THE USE OF EPOXY COATED REINFORCEMENT IN SUCH CASES. ADJUST THE d_1 COLUMN BAR PROJECTION INTO THE CAP AND d_1/d_2 LAP DISTANCE ACCORDINGLY.

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

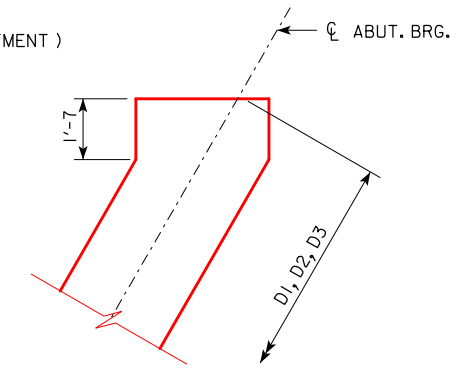
08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
		<div style="width: 60%; text-align: center;">TEE PIER NOTES</div> <div style="width: 35%; text-align: center;">RS40-003-14</div>



30° SKEW (R.A.)

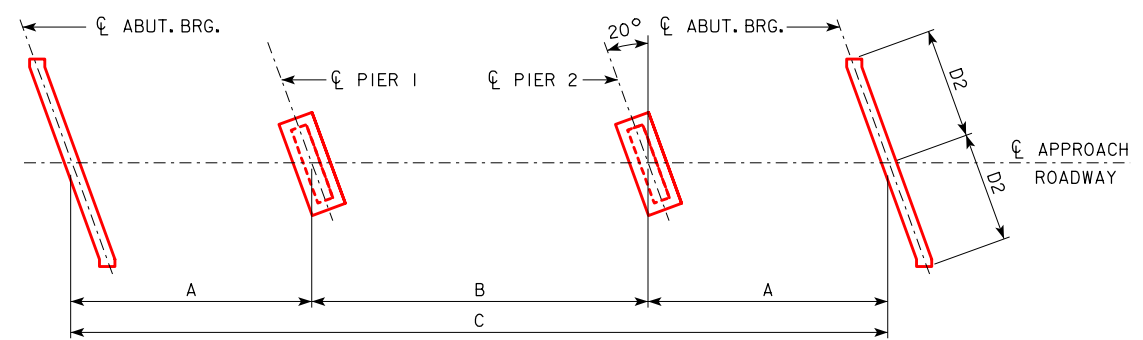


30° SKEW (L.A.)

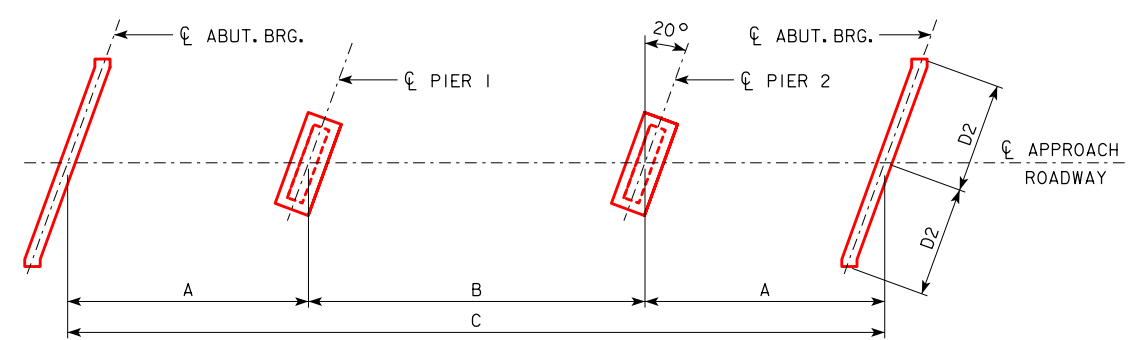


DETAIL A

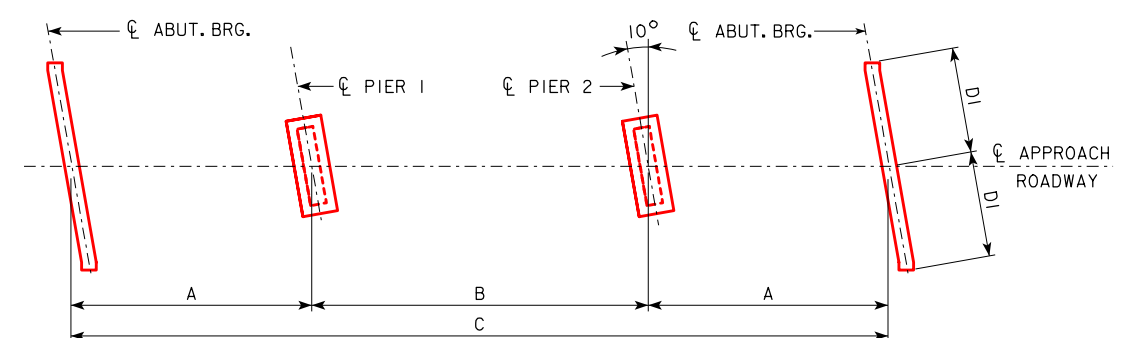
DIMENSION D1, D2, D3 APPLIES AT LOCATION SHOWN ALONG THE CL ABUTMENT BEARING (TYP.)



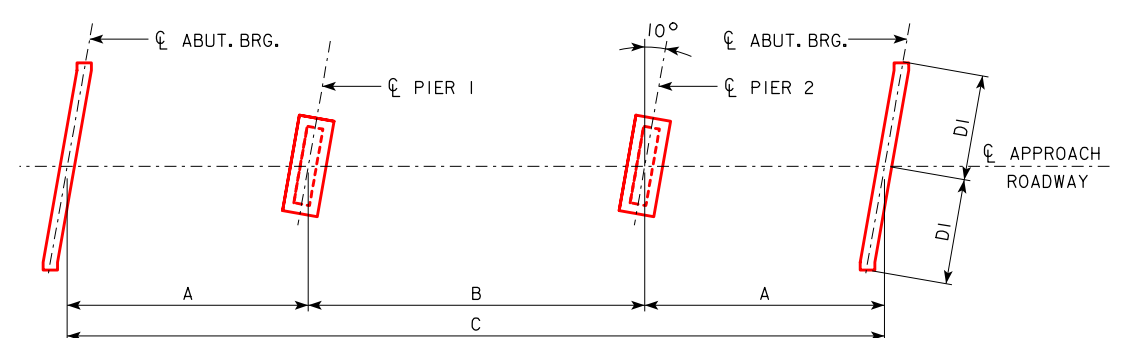
20° SKEW (R.A.)



20° SKEW (L.A.)

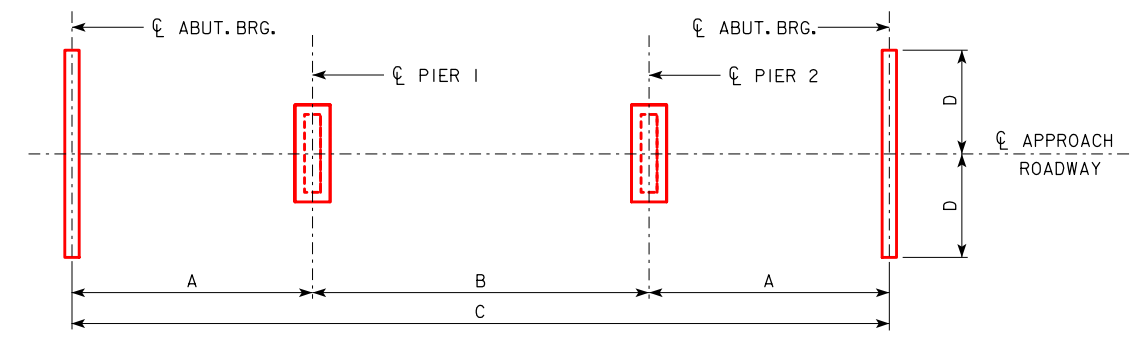


10° SKEW (R.A.)



10° SKEW (L.A.)

- NOTES:
 1. ALL SUBSTRUCTURE UNITS ARE CONSTRUCTED PARALLEL TO THE SKEW INDICATED FOR EACH BRIDGE.
 2. R.A. = RIGHT AHEAD
 L.A. = LEFT AHEAD

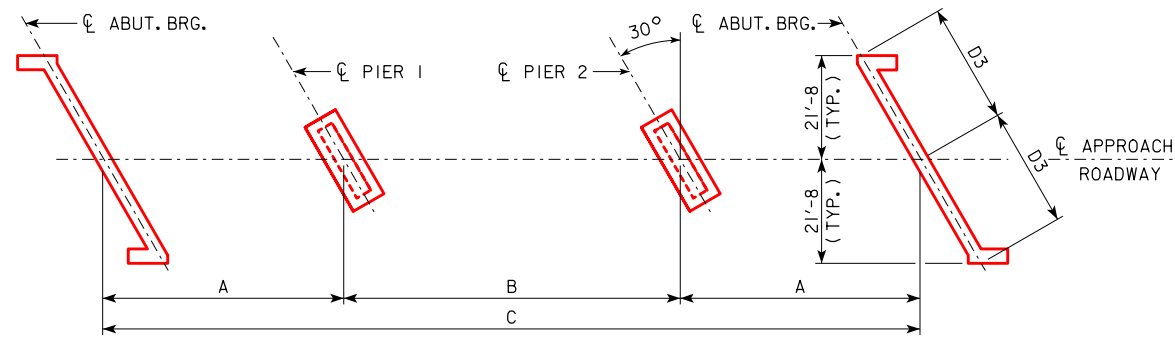


0° SKEW

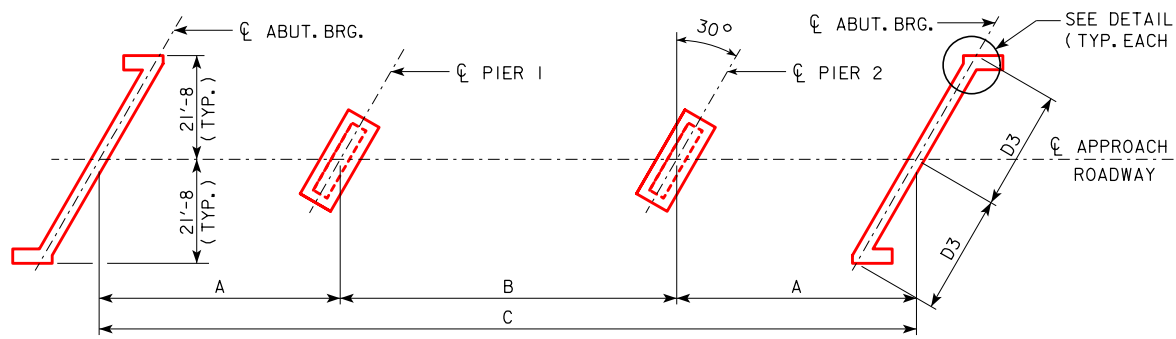
BEAM BRIDGE STANDARDS							
LENGTH	A	B	C	0°SKEW D	10°SKEW D1	20°SKEW D2	30°SKEW D3
160'-0	48'-0	64'-0	160'-0	21'-7	21'-11	22'-11 5/8	24'-11 1/16
180'-0	54'-0	72'-0	180'-0	21'-7	21'-11	22'-11 5/8	24'-11 1/16
200'-0	60'-0	80'-0	200'-0	21'-7	21'-11	22'-11 5/8	24'-11 1/16
220'-0	66'-0	88'-0	220'-0	21'-7	21'-11	22'-11 5/8	24'-11 1/16
240'-0	72'-0	96'-0	240'-0	21'-7	21'-11	22'-11 5/8	24'-11 1/16
260'-0	78'-0	104'-0	260'-0	21'-7	21'-11	22'-11 5/8	24'-11 1/16
280'-0	84'-0	112'-0	280'-0	21'-7	21'-11	22'-11 5/8	24'-11 1/16
300'-0	90'-0	120'-0	300'-0	21'-7	21'-11	22'-11 5/8	24'-11 1/16
320'-0	96'-0	128'-0	320'-0	21'-7	21'-11	22'-11 5/8	24'-11 1/16

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

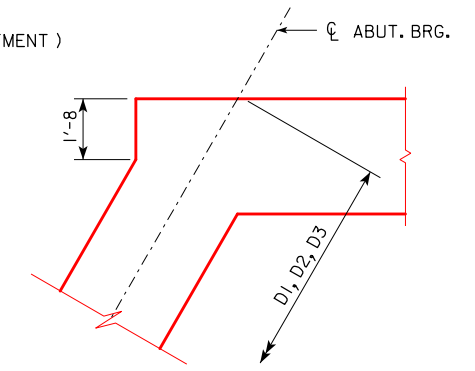
08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
		SUBSTRUCTURE LAYOUTS	RS40-004-14



30° SKEW (R.A.)

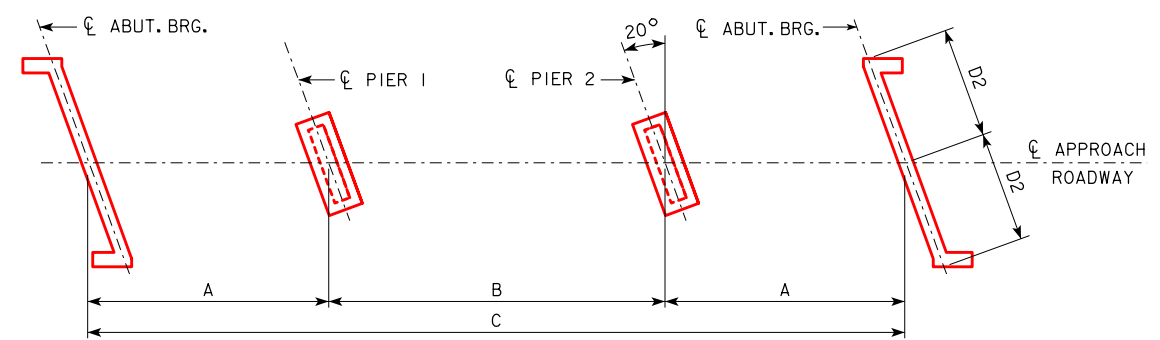


30° SKEW (L.A.)

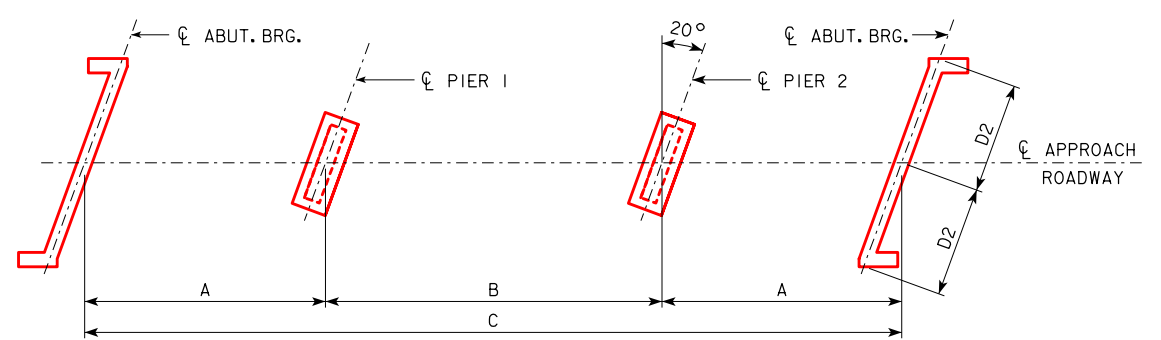


DETAIL A

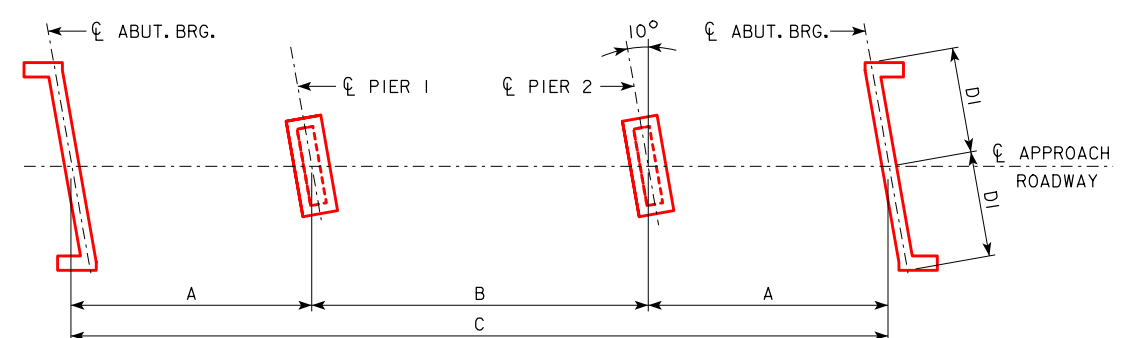
DIMENSION D1, D2, D3 APPLIES AT LOCATION SHOWN ALONG THE CL ABUTMENT BEARING (TYP.)



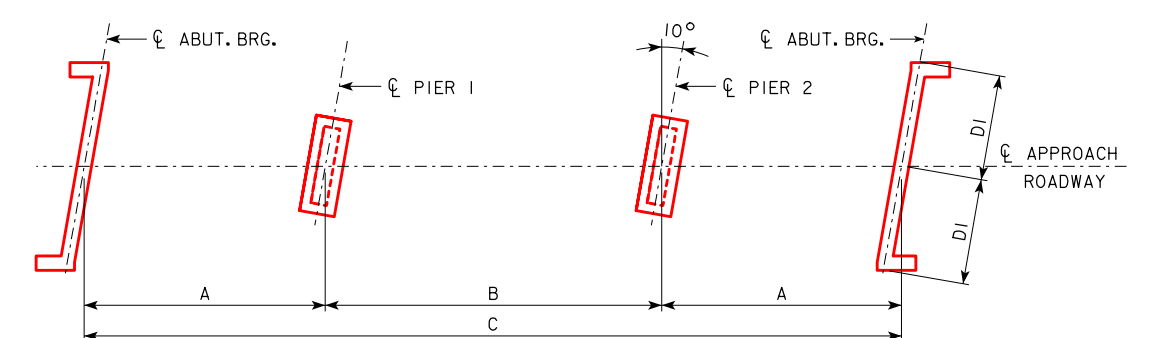
20° SKEW (R.A.)



20° SKEW (L.A.)

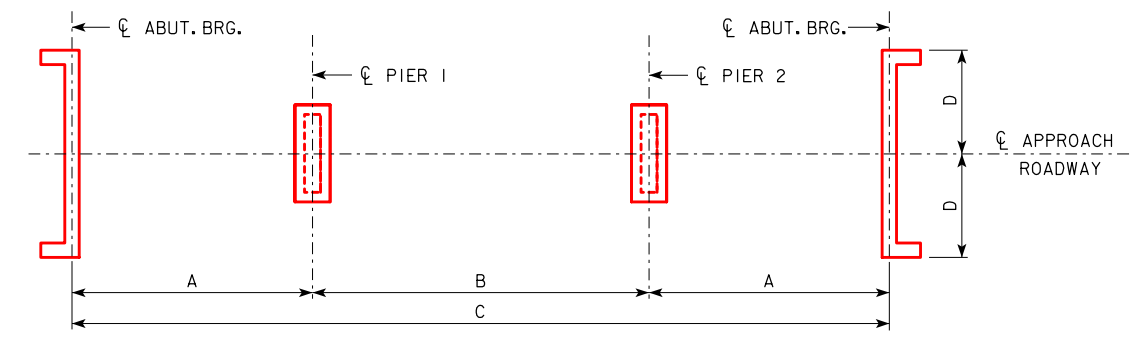


10° SKEW (R.A.)



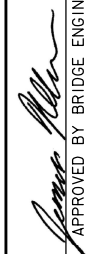

10° SKEW (L.A.)

- NOTES:
1. ALL SUBSTRUCTURE UNITS ARE CONSTRUCTED PARALLEL TO THE SKEW INDICATED FOR EACH BRIDGE.
 2. R.A. = RIGHT AHEAD
L.A. = LEFT AHEAD

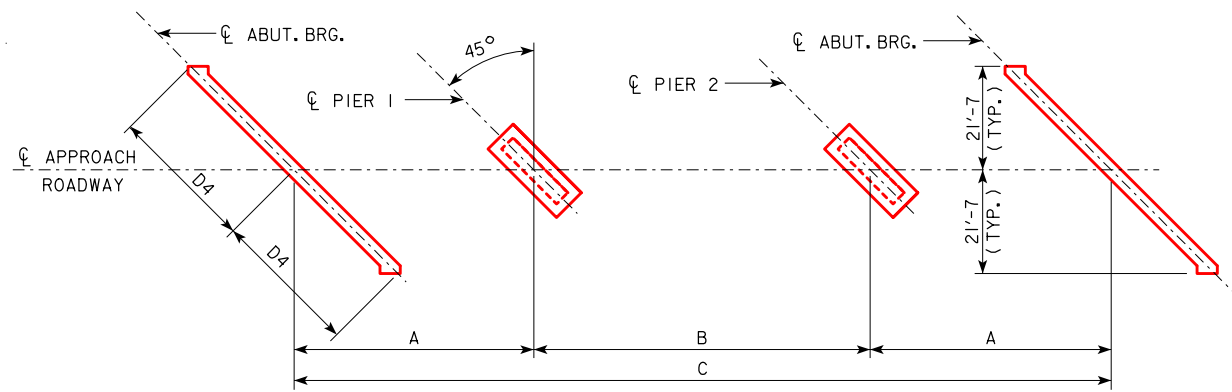


0° SKEW

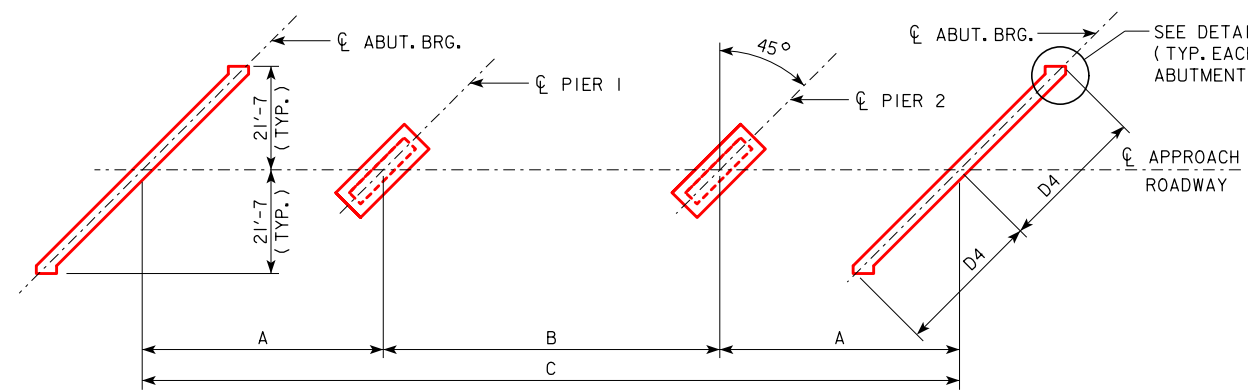
BEAM BRIDGE STANDARDS							
LENGTH	A	B	C	0°SKEW D	10°SKEW D1	20°SKEW D2	30°SKEW D3
340'-0	102'-0	136'-0	340'-0	21'-8	22'-0	23'-0 1/8	25'-0 1/4

08-2018 LATEST REVISION DATE  APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	SUBSTRUCTURE LAYOUTS
	RS40-005-14

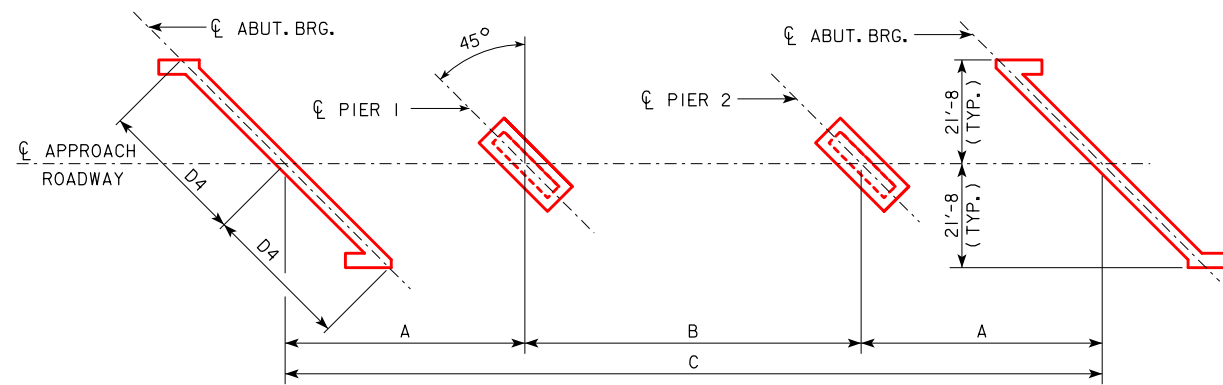
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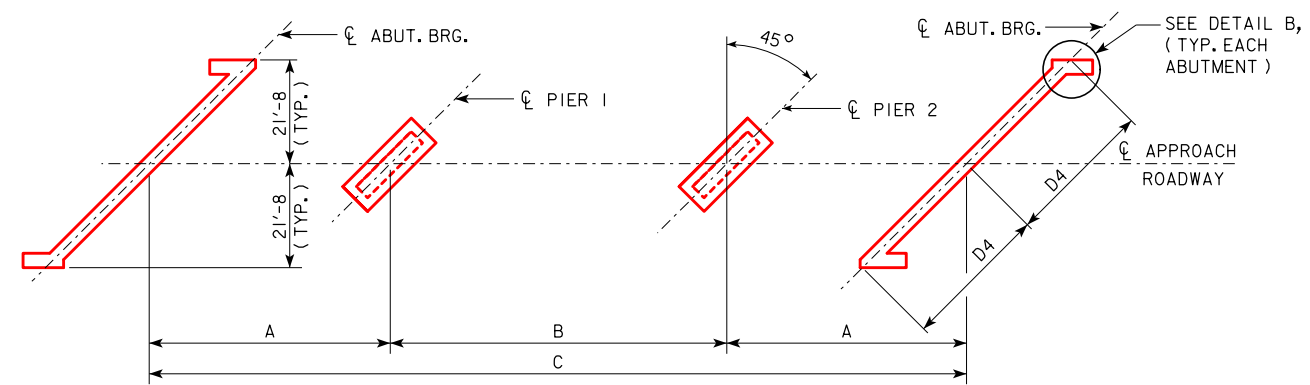
45° SKEW (R.A.)
(BRIDGES 160'-0 TO 320'-0)



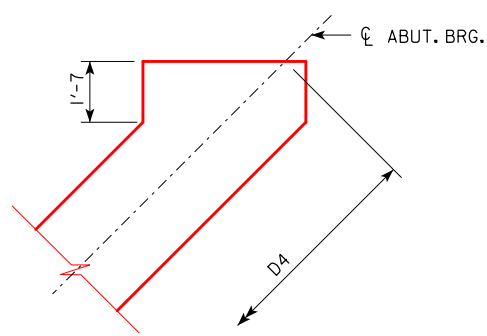
45° SKEW (L.A.)
(BRIDGES 160'-0 TO 320'-0)



45° SKEW (R.A.)
(340'-0 BRIDGE)

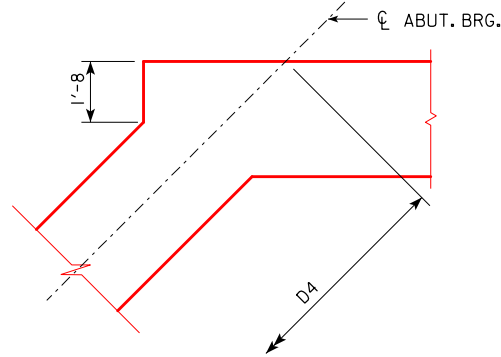


45° SKEW (L.A.)
(340'-0 BRIDGE)



DETAIL A

DIMENSION D4 APPLIES AT LOCATION SHOWN ALONG THE ϕ ABUTMENT BEARING (TYP.)



DETAIL B

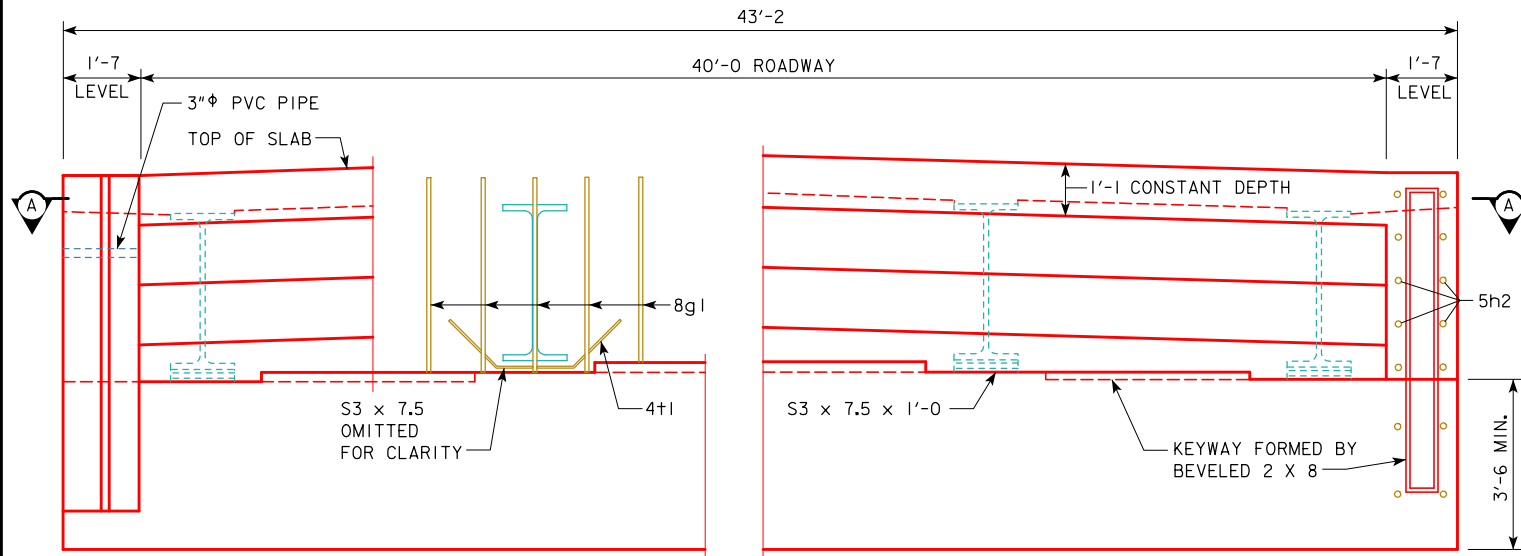
DIMENSION D4 APPLIES AT LOCATION SHOWN ALONG THE ϕ ABUTMENT BEARING (TYP.)

- NOTES:
1. ALL SUBSTRUCTURE UNITS ARE CONSTRUCTED PARALLEL TO THE SKEW INDICATED FOR EACH BRIDGE.
2. R.A. = RIGHT AHEAD
L.A. = LEFT AHEAD

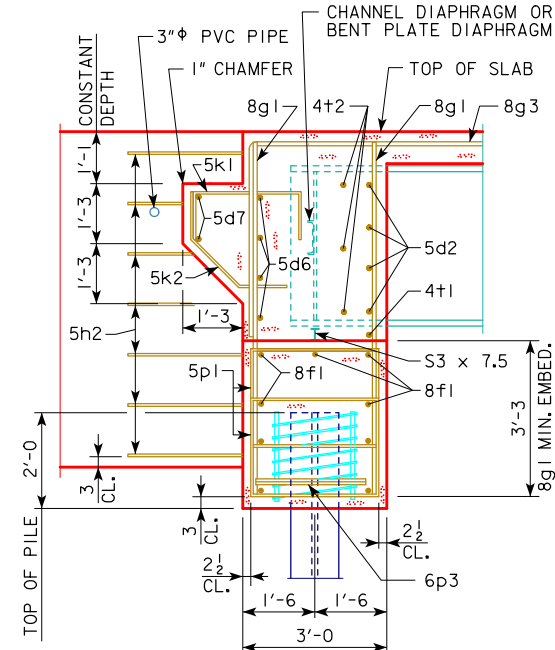
BEAM BRIDGE STANDARDS				
LENGTH	A	B	C	45° SKEW D4
160'-0	48'-0	64'-0	160'-0	30'-6 ⁵ / ₁₆
180'-0	54'-0	72'-0	180'-0	30'-6 ⁵ / ₁₆
200'-0	60'-0	80'-0	200'-0	30'-6 ⁵ / ₁₆
220'-0	66'-0	88'-0	220'-0	30'-6 ⁵ / ₁₆
240'-0	72'-0	96'-0	240'-0	30'-6 ⁵ / ₁₆
260'-0	78'-0	104'-0	260'-0	30'-6 ⁵ / ₁₆
280'-0	84'-0	112'-0	280'-0	30'-6 ⁵ / ₁₆
300'-0	90'-0	120'-0	300'-0	30'-6 ⁵ / ₁₆
320'-0	96'-0	128'-0	320'-0	30'-6 ⁵ / ₁₆
340'-0	102'-0	136'-0	340'-0	30'-7 ¹¹ / ₁₆

08-2018 LATEST REVISION DATE	<i>[Signature]</i> APPROVED BY BRIDGE ENGINEER	IOWADOT Highway Division	
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
		SUBSTRUCTURE LAYOUTS	RS40-006-14

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

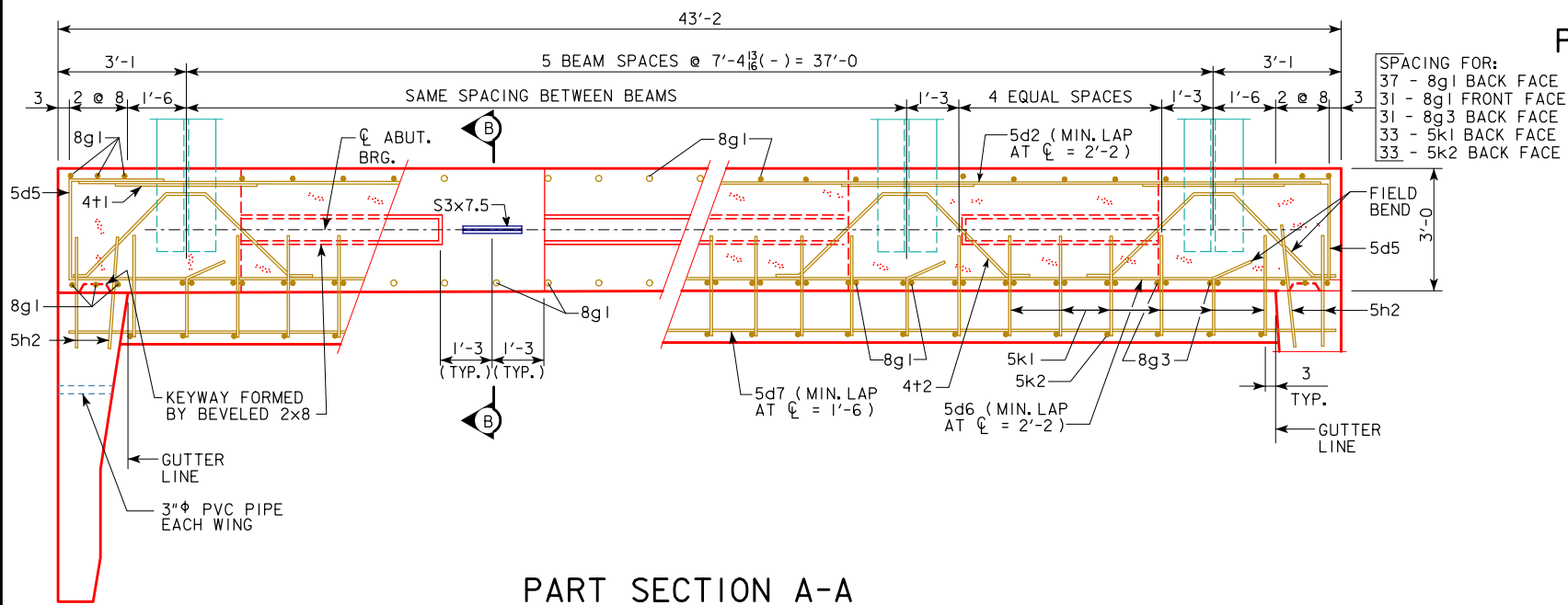


PART REAR ELEVATION AT ABUTMENT

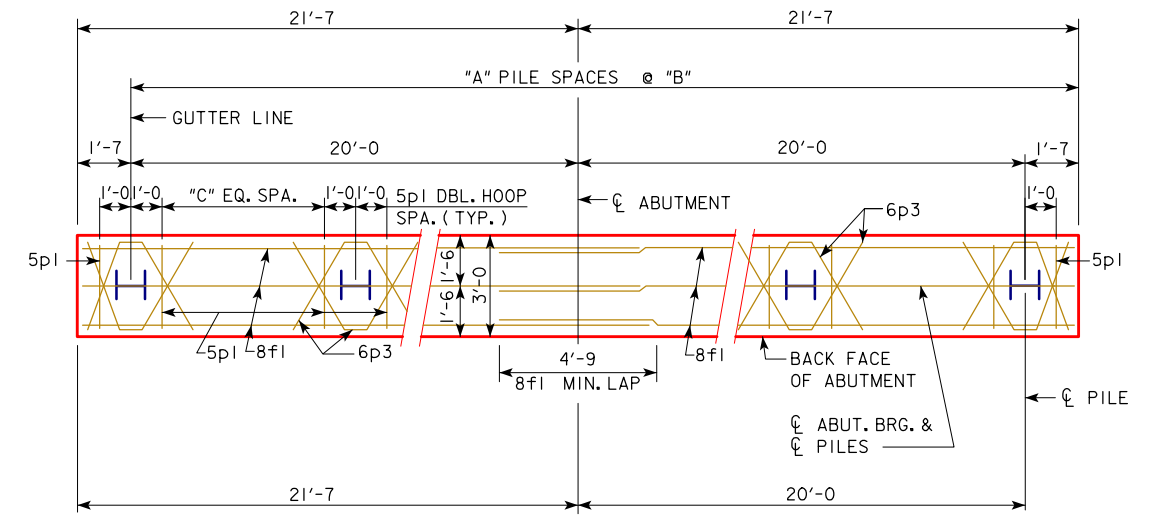


PART SECTION B-B

- NOTES:
1. HOLES DRILLED THROUGH BEAM WEB FOR 5d2 AND 4+2 BARS.
 2. THE SPIRAL AT THE TOP OF EACH PILE TO BE 7 TURNS OF No. 2 BAR, 2 1/2\"/>



PART SECTION A-A



ABUTMENT PILE PLAN

ABUTMENT NOTES:

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2\"/>

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 COUNTY OR STATE. ABUTMENT PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

PLACE 5h2 BAR AT 1:6 SLOPE TO MATCH TRAFFIC SIDE OF ABUTMENT WING FACE. (BOTH SIDES TYPICAL)

BARRIER RAIL NOT SHOWN IN DETAILS.

IF ROCK IS CLOSER THAN 15' BELOW ABUTMENT FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.

ABUTMENT PILE SPACING

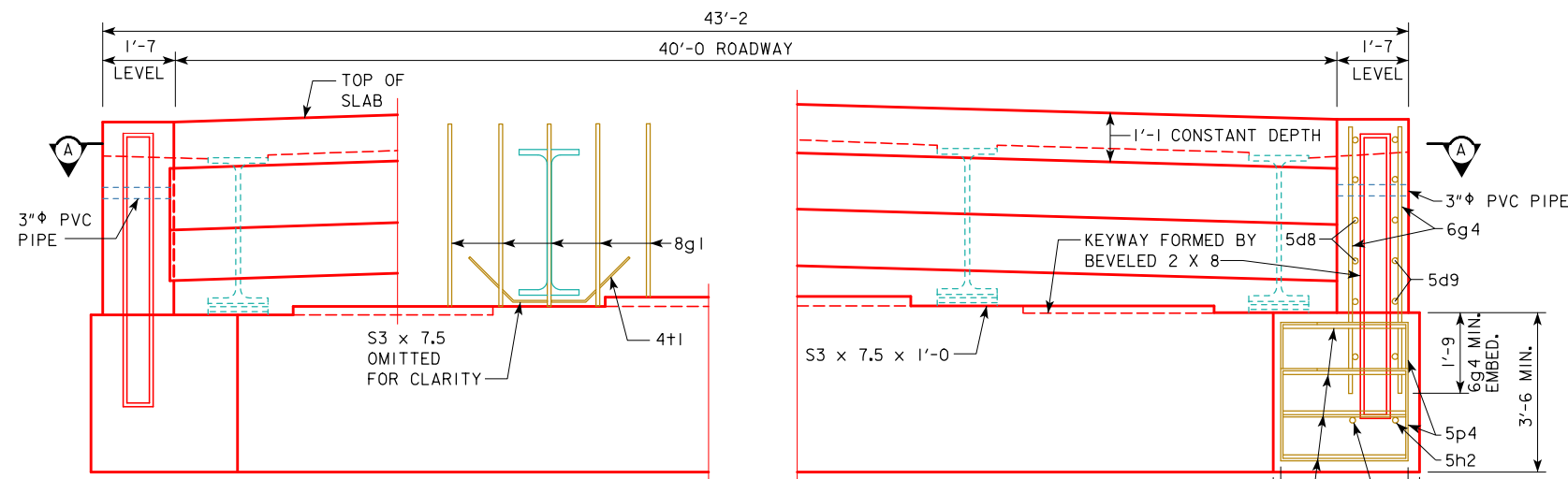
DIMENSION OR NO.	CL TO CL ABUTMENT BEARING								
	160'-0	180'-0	200'-0	220'-0	240'-0	260'-0	280'-0	300'-0	320'-0
"A"	7	7	7	8	8	8	9	9	9
"B" (FT-IN)	5'-8 3/16	5'-8 9/16	5'-8 3/8	5'-0	5'-0	5'-0	4'-5 5/16	4'-5 5/16	4'-5 5/16
"C" EQUAL SPACES	4	4	4	3	3	3	3	3	3
NO. OF PILES PER ABUT.	8	8	8	9	9	9	10	10	10
PU, STRENGTH I DESIGN LOAD (KIPS)	131	137	144	132	137	143	131	136	137

NOTE: HP 10 x 57 STEEL BEARING PILING REQUIRED.
NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

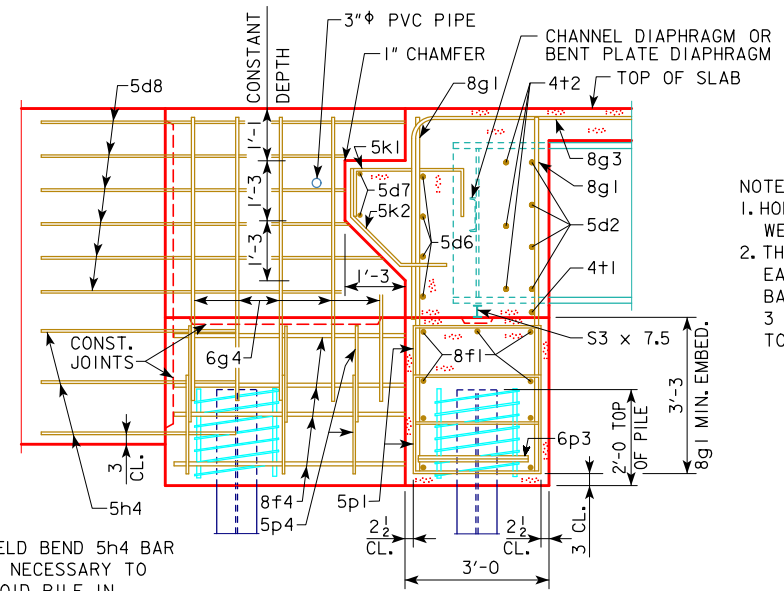
NOTE:
ABUTMENT STEP DIAGRAM PROVIDED BY DESIGNER, SEE "GENERAL INFORMATION" SHEET (WORKING STANDARD 5251).

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	ABUTMENT DETAILS 0° SKEW
	RS40-007-14

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

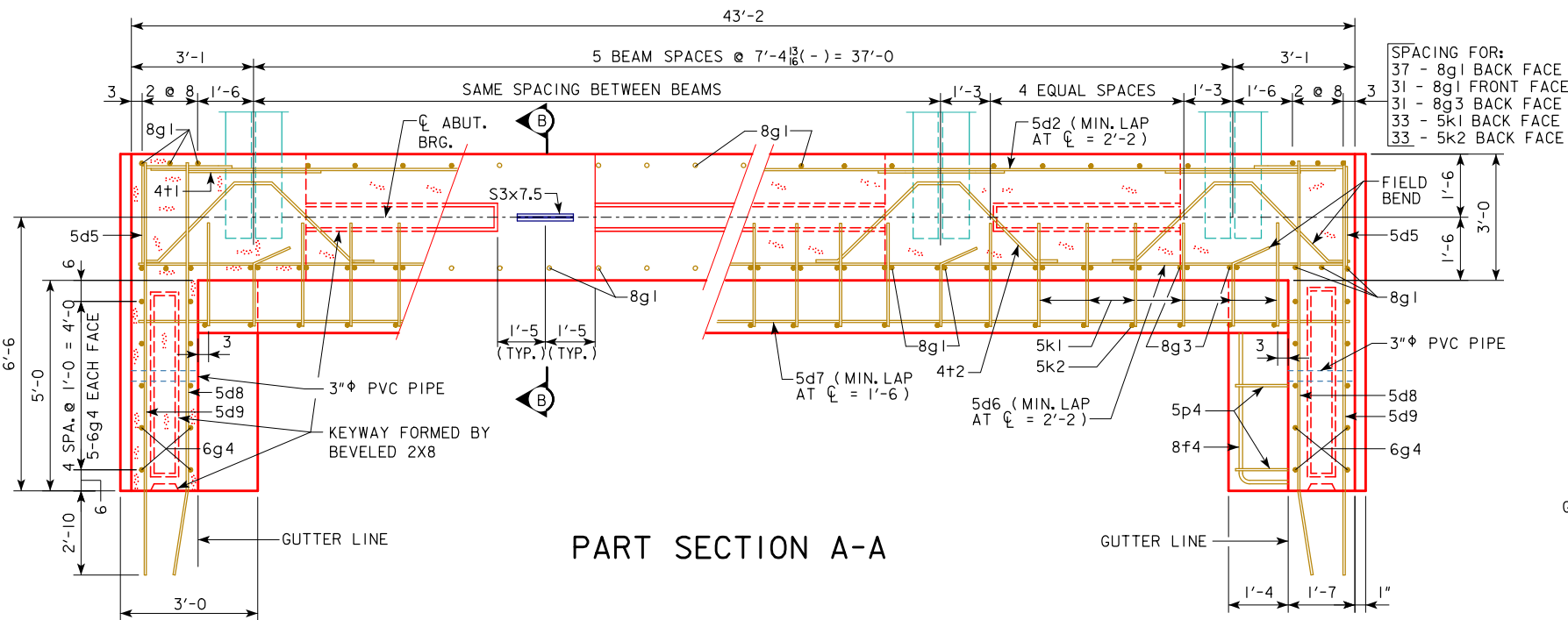


PART REAR ELEVATION AT ABUTMENT
(WINGS NOT SHOWN)

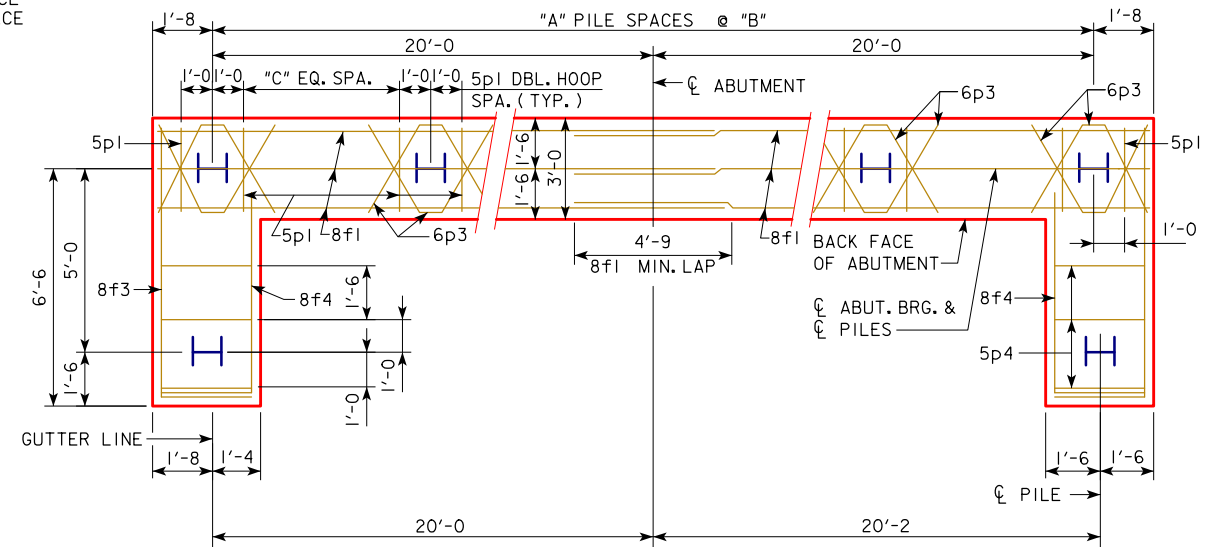


PART SECTION B-B

- NOTES:**
- HOLES DRILLED THROUGH BEAM WEB FOR 5d2 AND 4+2 BARS.
 - THE SPIRAL AT THE TOP OF EACH PILE TO BE 7 TURNS OF No. 2 BAR, 2 1/8\"/>



PART SECTION A-A



ABUTMENT PILE PLAN

ABUTMENT NOTES:

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2\"/>

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 COUNTY OR STATE. ABUTMENT PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

BARRIER RAIL NOT SHOWN IN DETAILS.

IF ROCK IS CLOSER THAN 15' BELOW ABUTMENT FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.

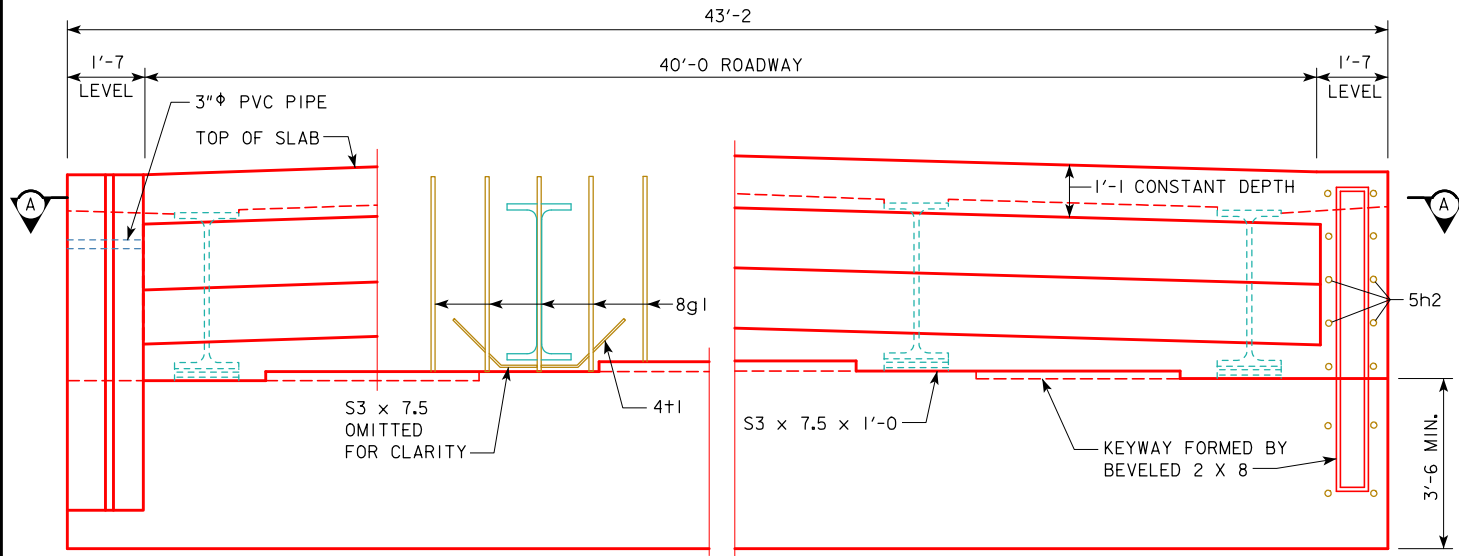
ABUTMENT PILE SPACING

DIMENSION OR NO.	CL TO CL ABUTMENT BEARING
"A"	340'-0
"B" (FT-IN)	9
"C" EQUAL SPACES	4'-5 1/8
NO. OF PILES PER ABUT.	12
PU, STRENGTH I DESIGN LOAD (KIPS)	143

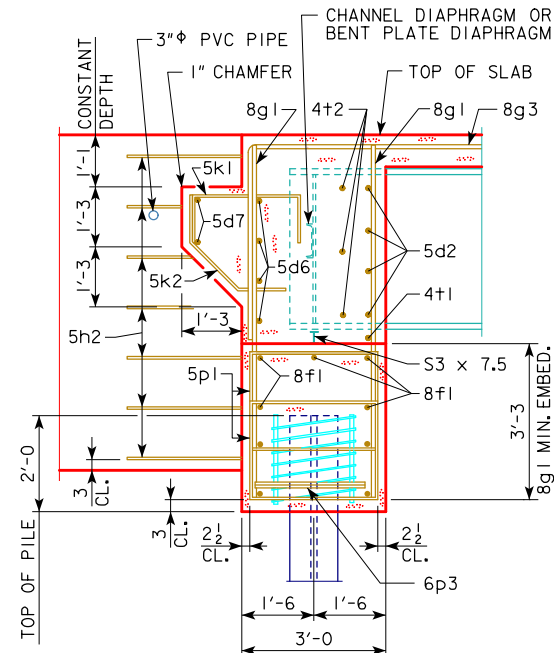
NOTE: HP 10 x 57 STEEL BEARING PILING REQUIRED.
NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

NOTE:
ABUTMENT STEP DIAGRAM PROVIDED BY DESIGNER, SEE "GENERAL INFORMATION" SHEET (WORKING STANDARD 5251).

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	ABUTMENT DETAILS 0° SKEW
	RS40-008-14

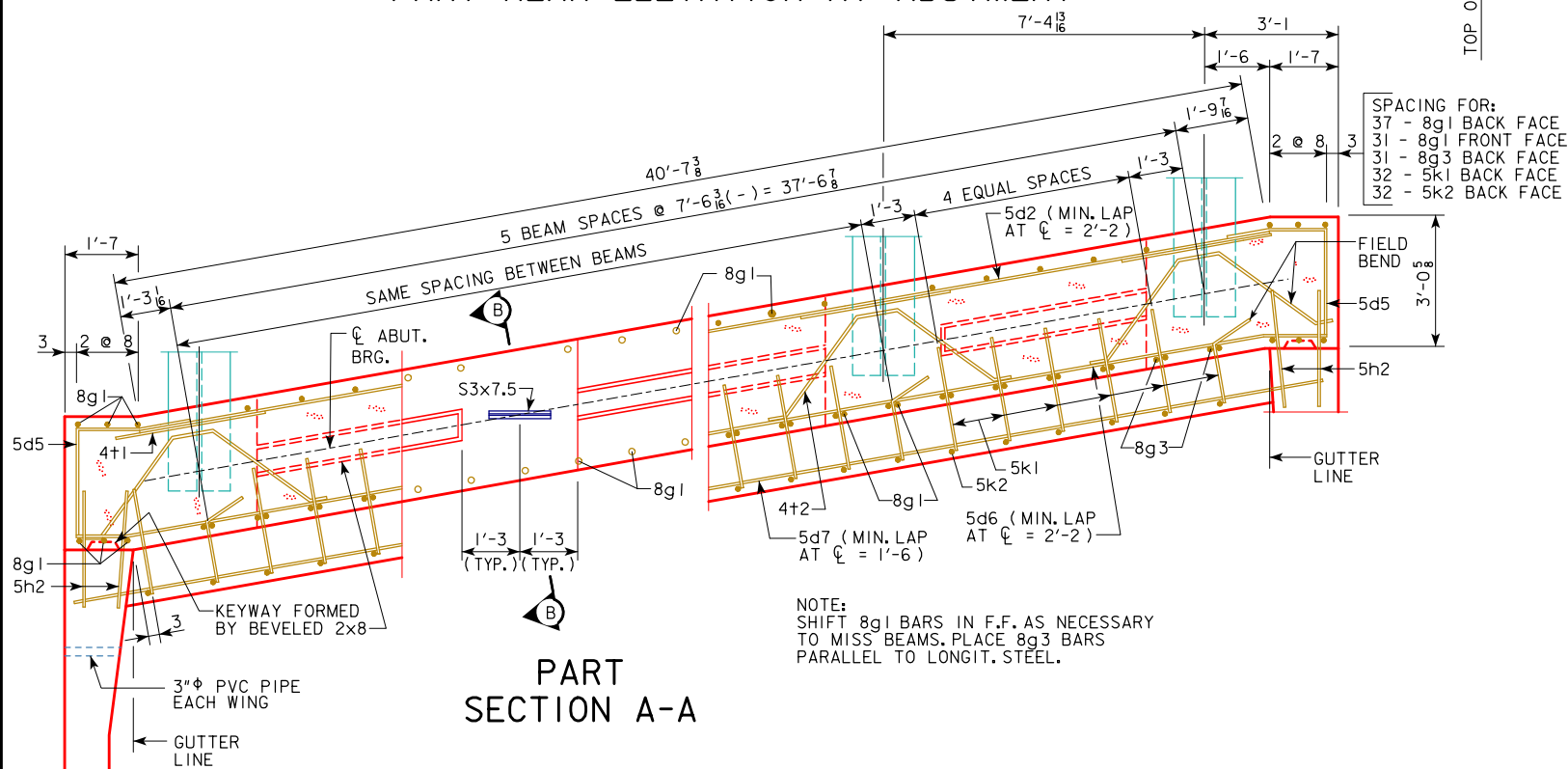


PART REAR ELEVATION AT ABUTMENT

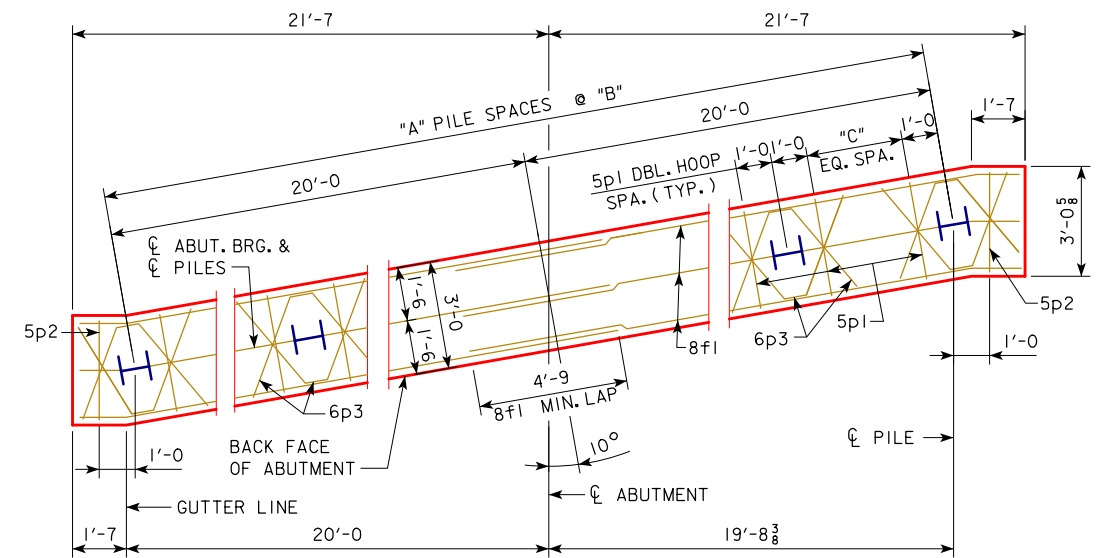


PART SECTION B-B

- NOTES:
- HOLES DRILLED THROUGH BEAM WEB FOR 5d2 AND 4+2 BARS.
 - THE SPIRAL AT THE TOP OF EACH PILE TO BE 7 TURNS OF No. 2 BAR, 21" DIAMETER, 3" PITCH WITH 3 - L₈ x 7/8 x 1/8 SPACERS PUNCHED TO HOLD SPIRAL.



PART SECTION A-A



ABUTMENT PILE PLAN

ABUTMENT NOTES:

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

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 COUNTY OR STATE. ABUTMENT PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

PLACE 5h2 BAR AT 1:6 SLOPE TO MATCH TRAFFIC SIDE OF ABUTMENT WING FACE. (BOTH SIDES TYPICAL)

BARRIER RAIL NOT SHOWN IN DETAILS.

IF ROCK IS CLOSER THAN 15' BELOW ABUTMENT FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.

ABUTMENT PILE SPACING

DIMENSION OR NO.	CL TO CL ABUTMENT BEARING								
	160'-0"	180'-0"	200'-0"	220'-0"	240'-0"	260'-0"	280'-0"	300'-0"	320'-0"
"A"	7	7	7	8	8	8	9	9	9
"B" (FT-IN)	5'-8 9/16"	5'-8"	5'-8 9/16"	5'-0"	5'-0"	5'-0"	4'-5 5/16"	4'-5 5/16"	4'-5 5/16"
"C" EQUAL SPACES	4	4	4	3	3	3	3	3	3
NO. OF PILES PER ABUT.	8	8	8	9	9	9	10	10	10
PU, STRENGTH I DESIGN LOAD (KIPS)	131	138	144	132	137	143	132	136	138

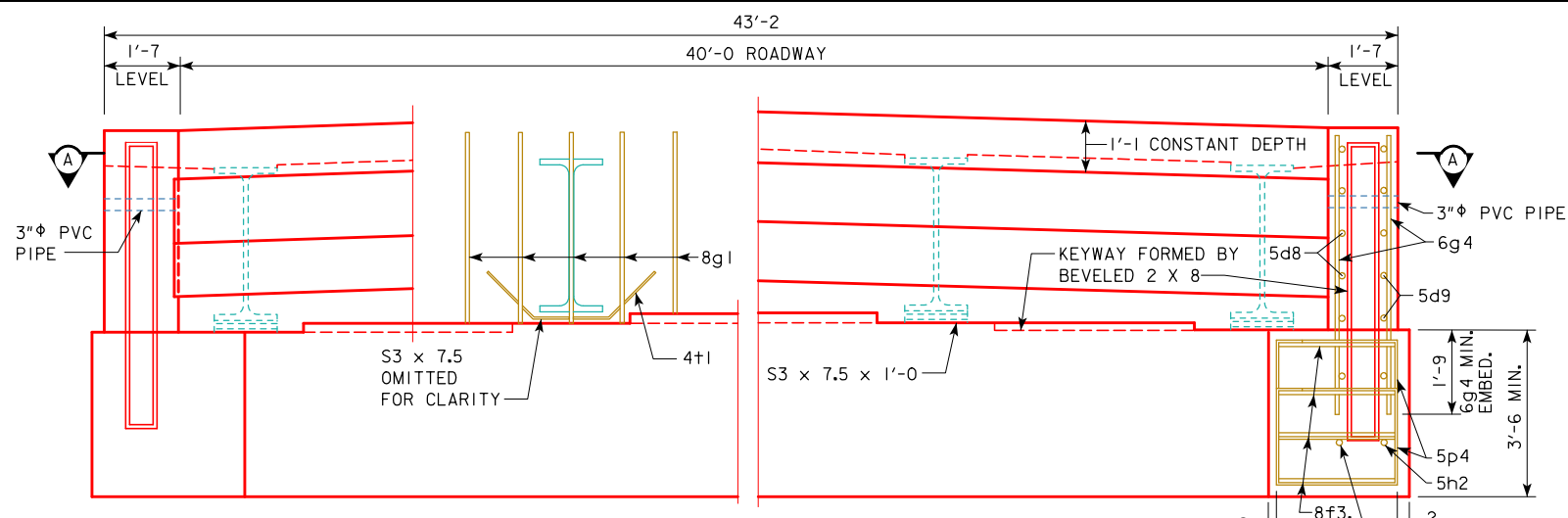
NOTE: HP 10 x 57 STEEL BEARING PILING REQUIRED.

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

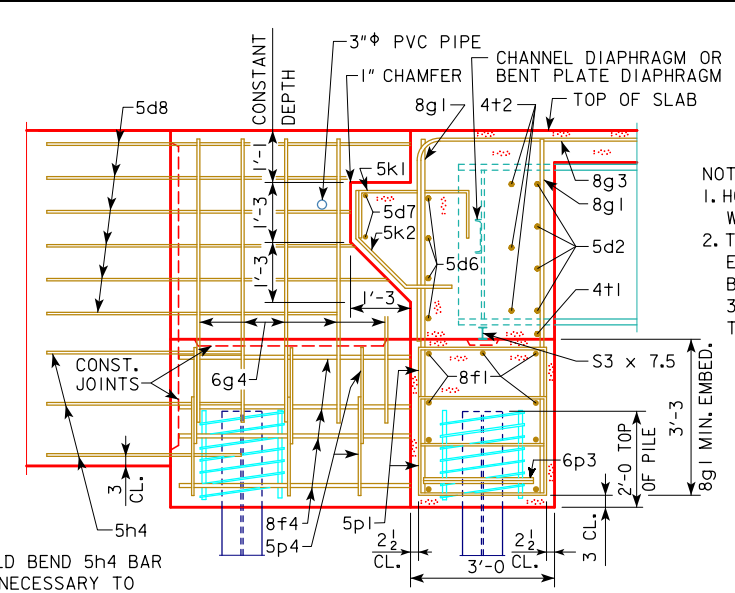
NOTE:
ABUTMENT STEP DIAGRAM PROVIDED BY DESIGNER,
SEE "GENERAL INFORMATION" SHEET (WORKING
STANDARD 5251).

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	ABUTMENT DETAILS 10° SKEW
	RS40-009-14

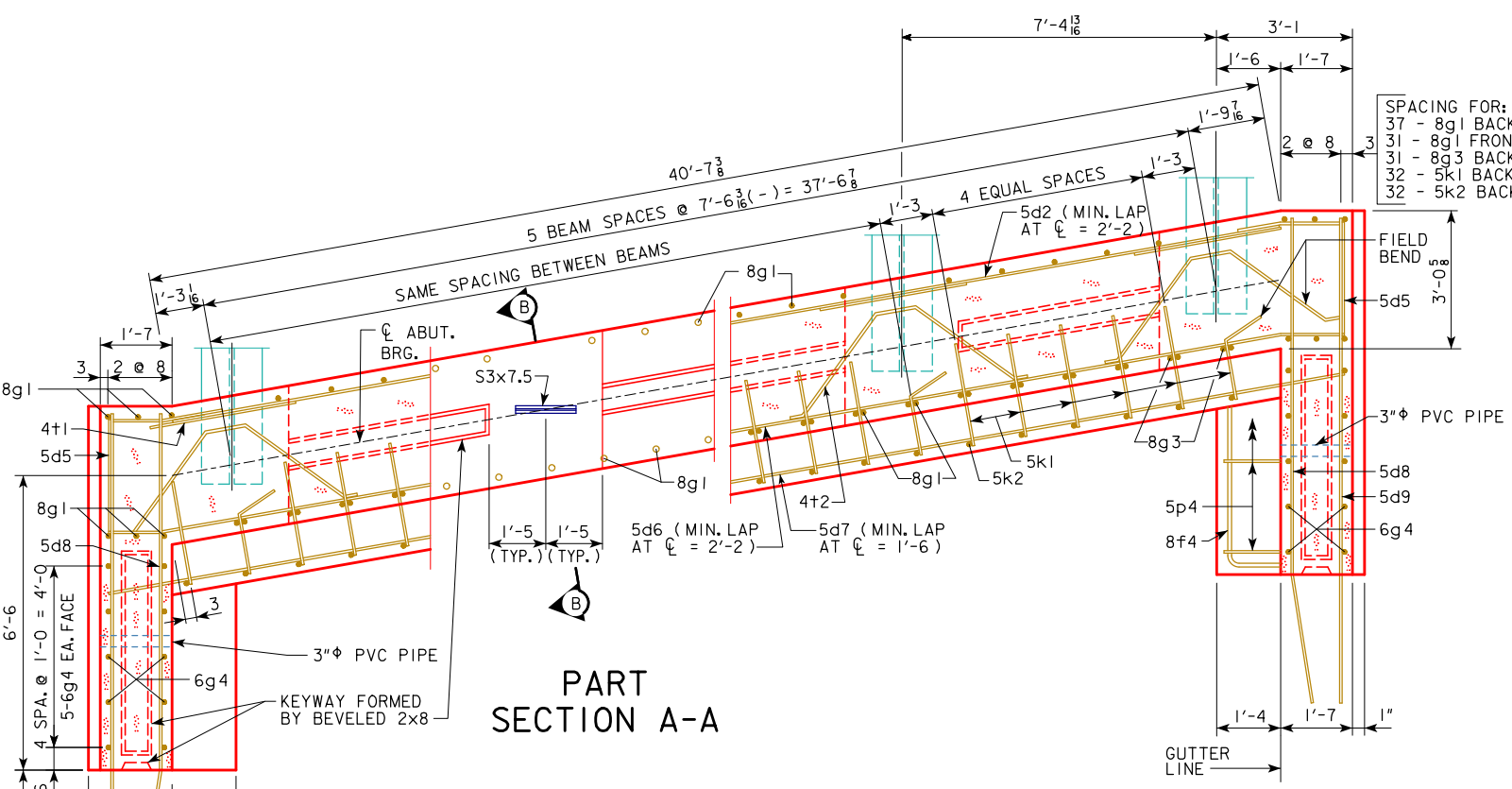


PART REAR ELEVATION AT ABUTMENT
(WINGS NOT SHOWN)



PART SECTION B-B

- NOTES:**
- HOLES DRILLED THROUGH BEAM WEB FOR 5d2 AND 4t2 BARS.
 - THE SPIRAL AT THE TOP OF EACH PILE TO BE 7 TURNS OF No. 2 BAR, 2 1/2\"/>



PART SECTION A-A

NOTE:
SHIFT 8g1 BARS IN F.F. AS NECESSARY TO MISS BEAMS. PLACE 8g3 BARS PARALLEL TO LONGITUDINAL STEEL.

ABUTMENT NOTES:

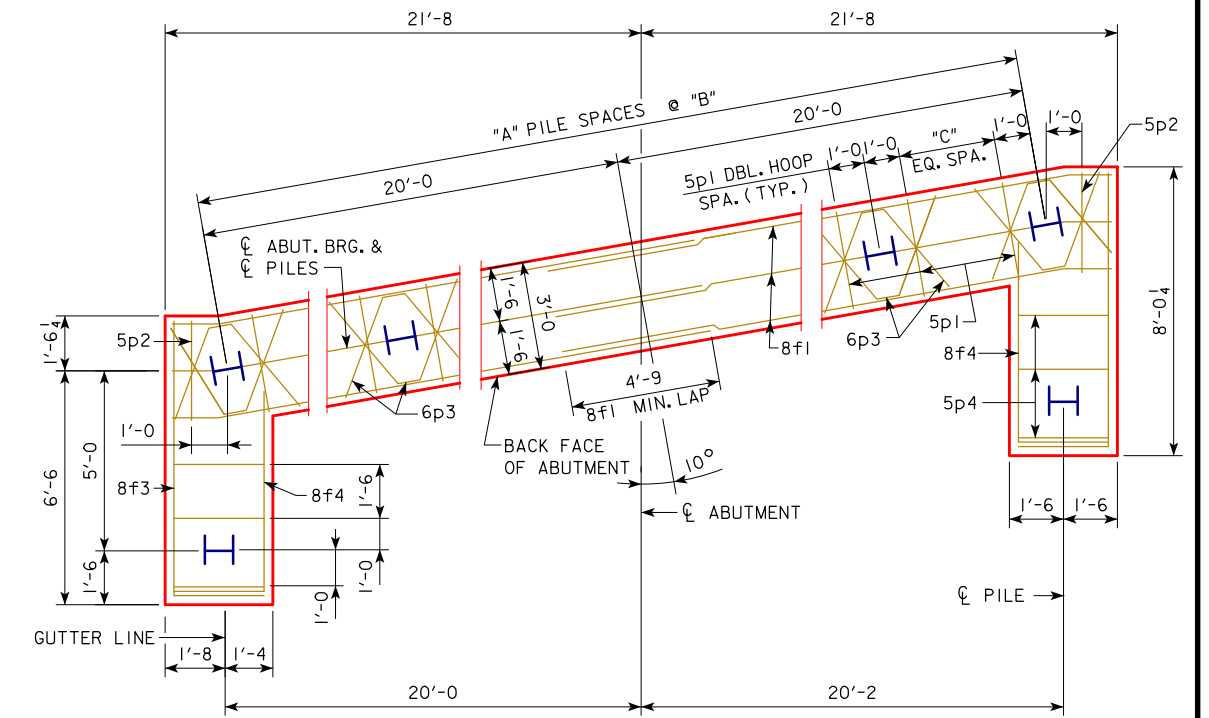
MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2\"/>

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 COUNTY OR STATE. ABUTMENT PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

BARRIER RAIL NOT SHOWN IN DETAILS.

IF ROCK IS CLOSER THAN 15' BELOW ABUTMENT FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.

- SPACING FOR:**
- 37 - 8g1 BACK FACE
 - 31 - 8g1 FRONT FACE
 - 31 - 8g3 BACK FACE
 - 32 - 5k1 BACK FACE
 - 32 - 5k2 BACK FACE



ABUTMENT PILE PLAN

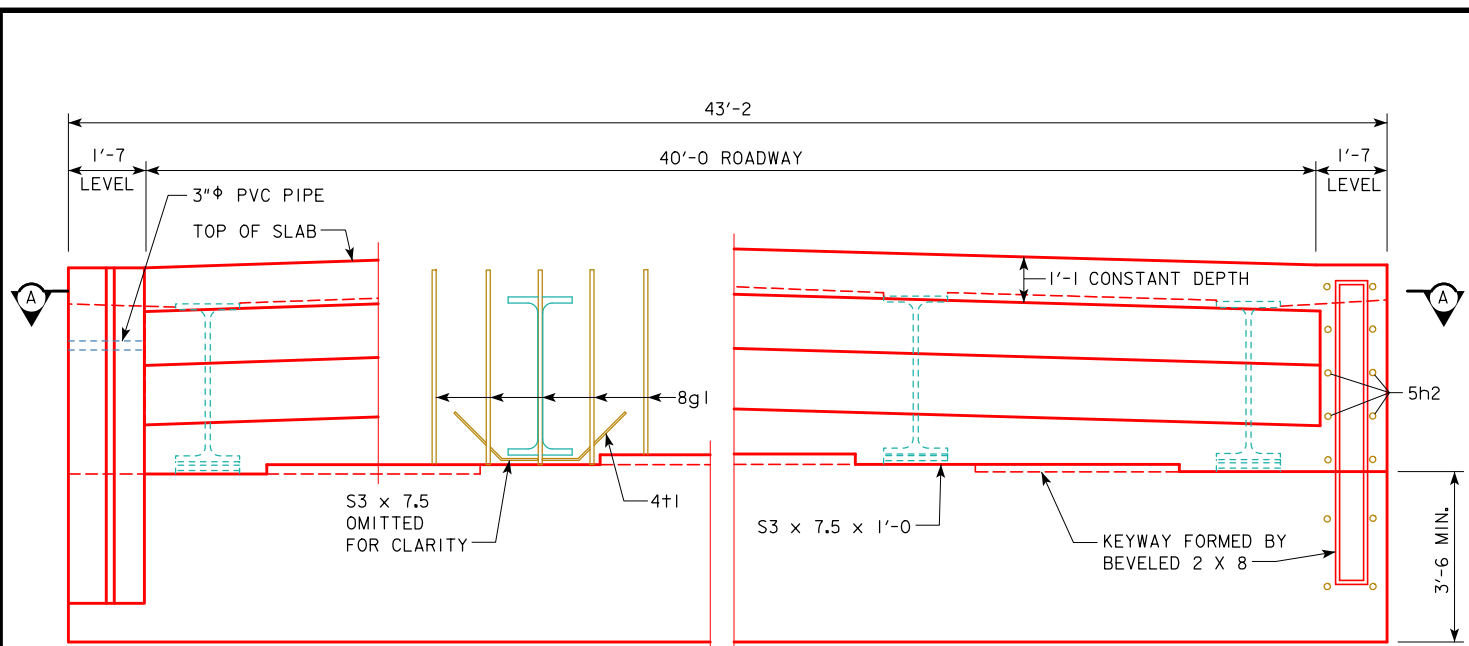
NOTE:
ABUTMENT STEP DIAGRAM PROVIDED BY DESIGNER, SEE "GENERAL INFORMATION" SHEET (WORKING STANDARD 5251).

ABUTMENT PILE SPACING	
DIMENSION OR NO.	CL TO CL ABUTMENT BEARING
"A"	340'-0
"B" (FT-IN)	9
"C" EQUAL SPACES	4'-5 5/8
NO. OF PILES PER ABUT.	3
PU, STRENGTH I DESIGN LOAD (KIPS)	143

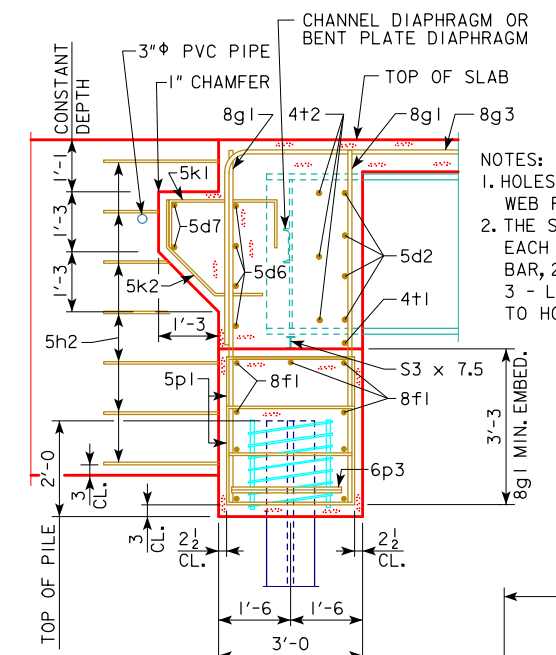
NOTE: HP 10 x 57 STEEL BEARING PILING REQUIRED.
NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	ABUTMENT DETAILS 10° SKEW
	RS40-010-14

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



PART REAR ELEVATION AT ABUTMENT



PART SECTION B-B

- NOTES:
- HOLES DRILLED THROUGH BEAM WEB FOR 5d2 AND 4+2 BARS.
 - THE SPIRAL AT THE TOP OF EACH PILE TO BE 7 TURNS OF No. 2 BAR, 2 1/2\"/>

ABUTMENT NOTES:

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2\"/>

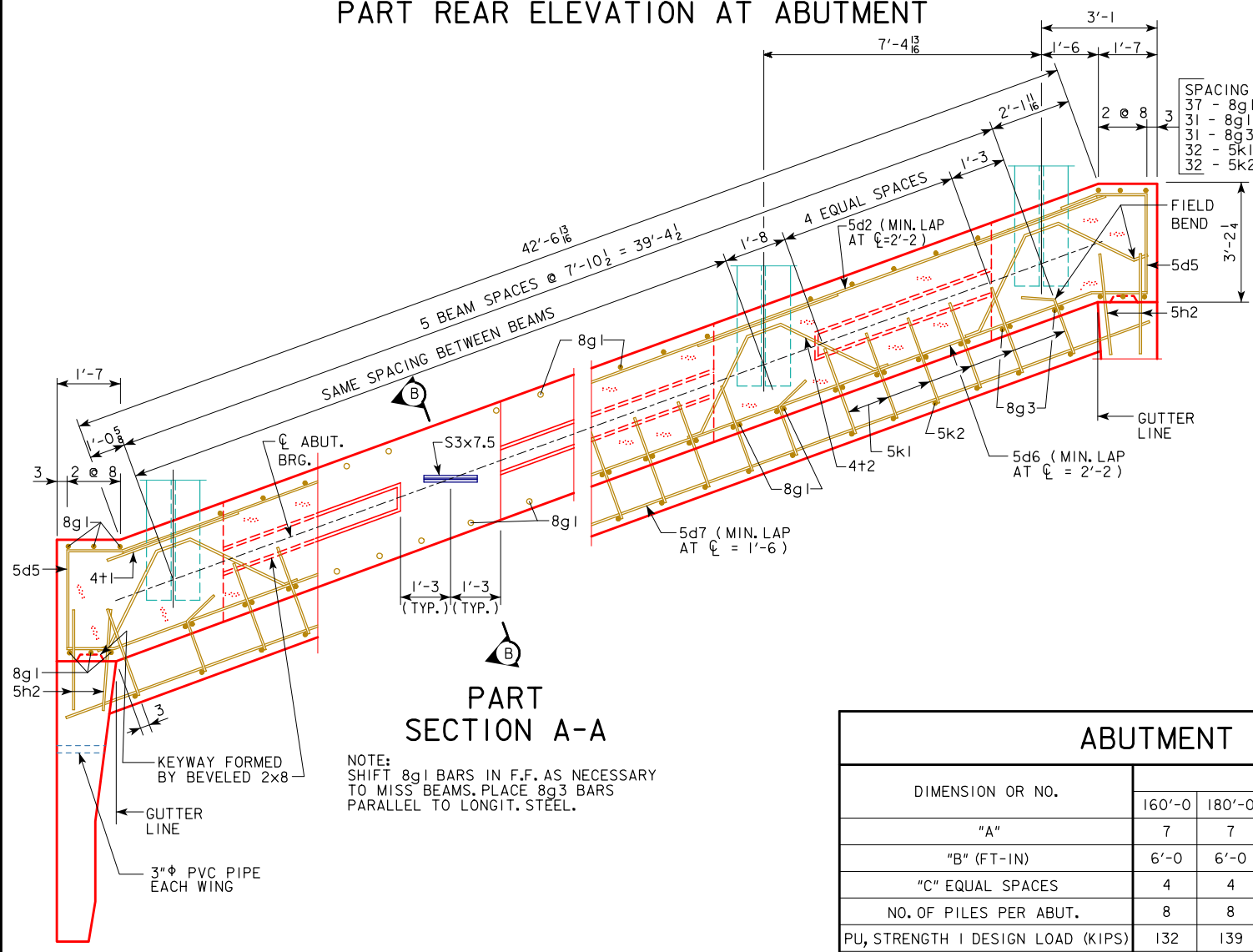
IF NECESSARY TO PREVENT DAMAGE TO THE END OF THE BRIDGE DECK OR BACKWALL FROM CONSTRUCTION EQUIPMENT, AN APPROPRIATE METHOD OF PROTECTION APPROVED BY THE ENGINEER SHALL BE PROVIDED BY THE BRIDGE CONTRACTOR AT NO EXTRA COST TO THE COUNTY OR STATE.

ABUTMENT PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

PLACE 5h2 BAR AT 1:6 SLOPE TO MATCH TRAFFIC SIDE OF ABUTMENT WING FACE. (BOTH SIDES TYPICAL)

BARRIER RAIL NOT SHOWN IN DETAILS.

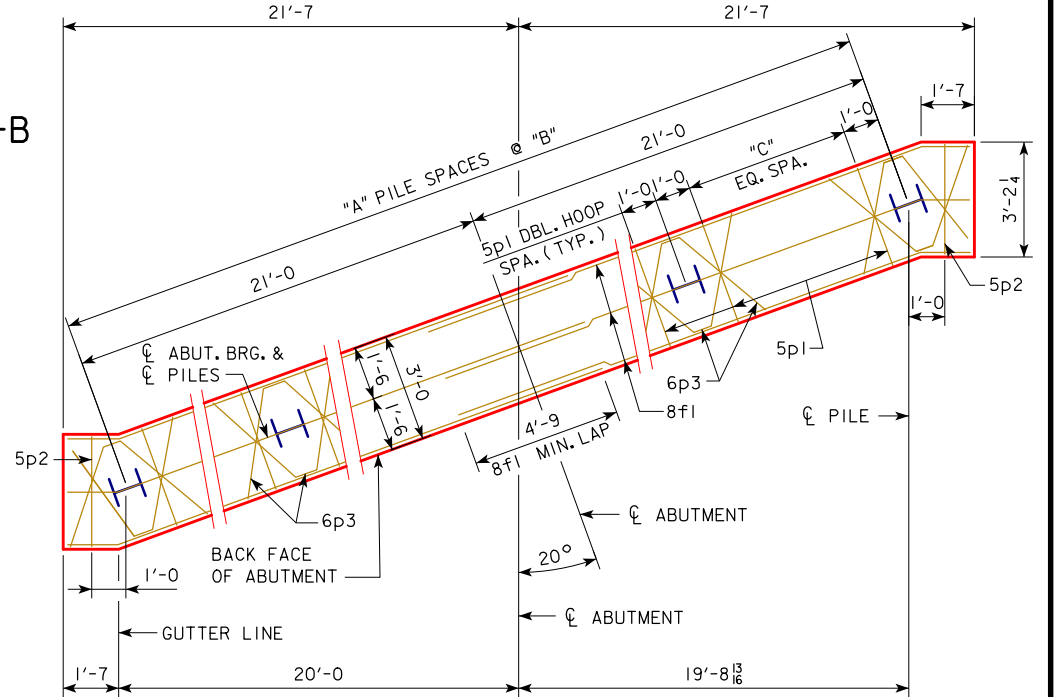
IF ROCK IS CLOSER THAN 15' BELOW ABUTMENT FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.



PART SECTION A-A

NOTE:
SHIFT 8g1 BARS IN F.F. AS NECESSARY TO MISS BEAMS. PLACE 8g3 BARS PARALLEL TO LONGIT. STEEL.

- SPACING FOR:
- 37 - 8g1 BACK FACE
 - 31 - 8g1 FRONT FACE
 - 31 - 8g3 BACK FACE
 - 32 - 5k1 BACK FACE
 - 32 - 5k2 BACK FACE



ABUTMENT PILE PLAN

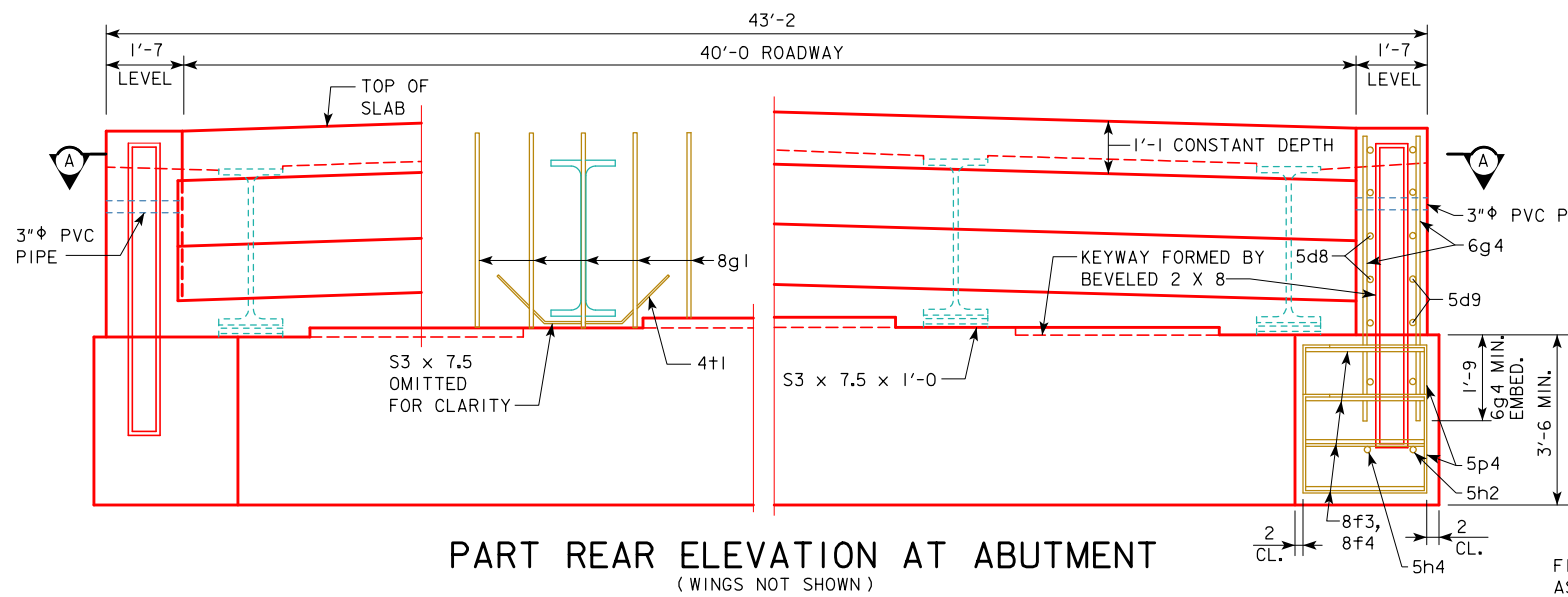
NOTE:
ABUTMENT STEP DIAGRAM PROVIDED BY DESIGNER, SEE "GENERAL INFORMATION" SHEET (WORKING STANDARD 525I).

DIMENSION OR NO.	CL TO CL ABUTMENT BEARING								
	160'-0	180'-0	200'-0	220'-0	240'-0	260'-0	280'-0	300'-0	320'-0
"A"	7	7	7	8	8	8	9	9	9
"B" (FT-IN)	6'-0	6'-0	6'-0	5'-3	5'-3	5'-3	4'-8	4'-8	4'-8
"C" EQUAL SPACES	4	4	4	3	3	3	3	3	3
NO. OF PILES PER ABUT.	8	8	8	9	9	9	10	10	10
PU, STRENGTH I DESIGN LOAD (KIPS)	132	139	145	133	138	144	132	137	139

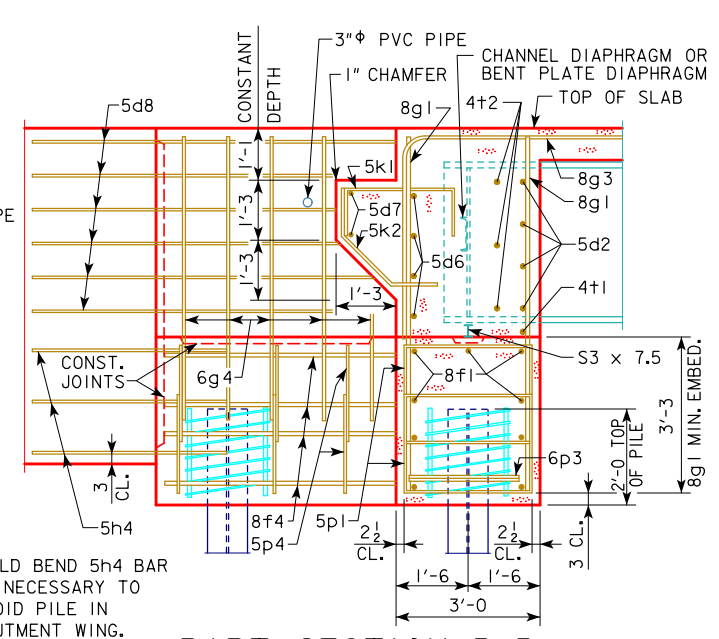
NOTE: HP 10 x 57 STEEL BEARING PILING REQUIRED.
NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	ABUTMENT DETAILS 20° SKEW
	RS40-011-14



PART REAR ELEVATION AT ABUTMENT
(WINGS NOT SHOWN)



PART SECTION B-B

ABUTMENT NOTES:

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

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 COUNTY OR STATE.

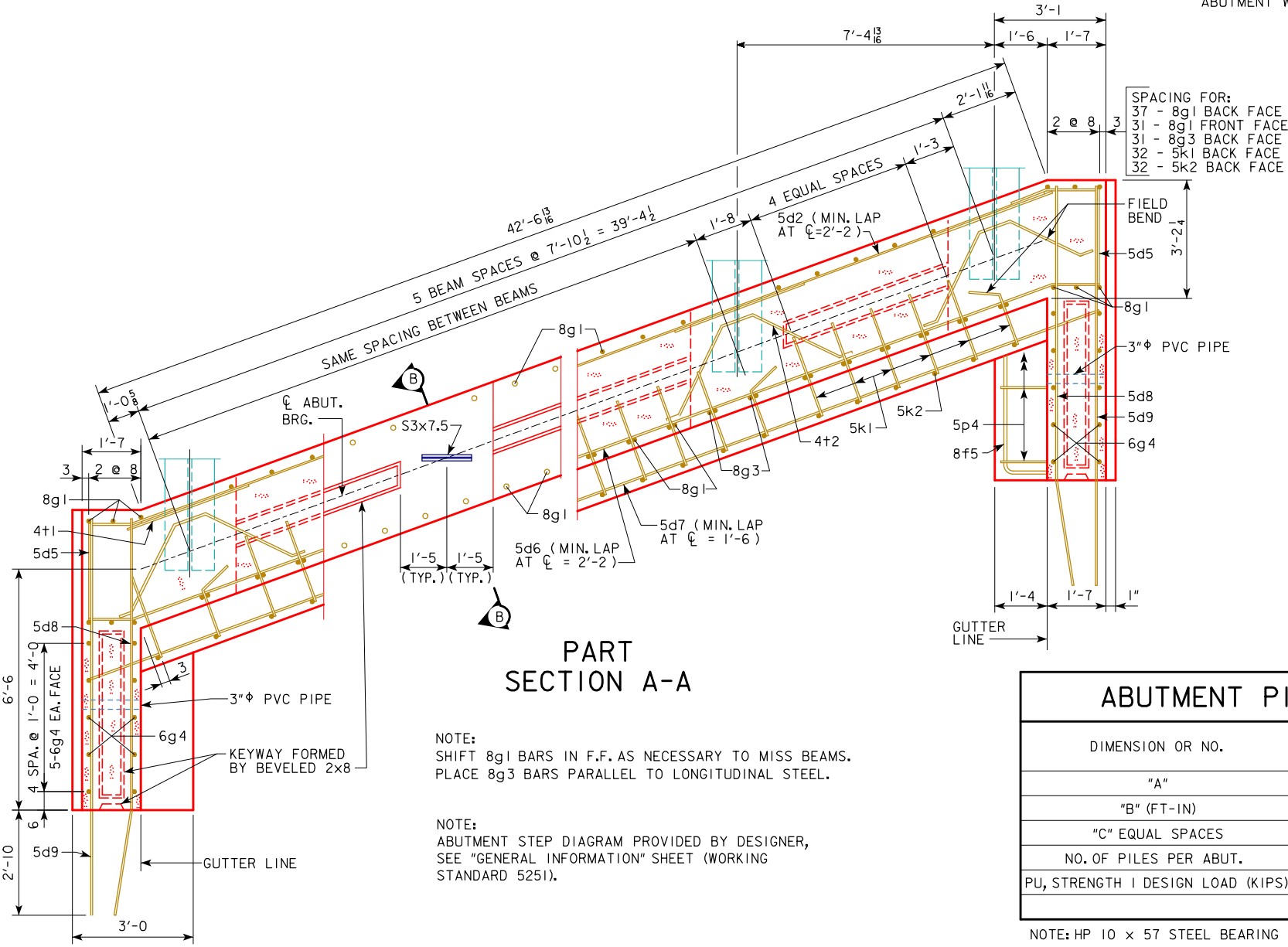
ABUTMENT PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

BARRIER RAIL NOT SHOWN IN DETAILS.

IF ROCK IS CLOSER THAN 15' BELOW ABUTMENT FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.

NOTES:

- HOLES DRILLED THROUGH BEAM WEB FOR 5d2 AND 4+2 BARS.
- THE SPIRAL AT THE TOP OF EACH PILE TO BE 7 TURNS OF No. 2 BAR, 21" DIAMETER, 3" PITCH WITH 3 - L₇ x 7/8 x 1/8 SPACERS PUNCHED TO HOLD SPIRAL.



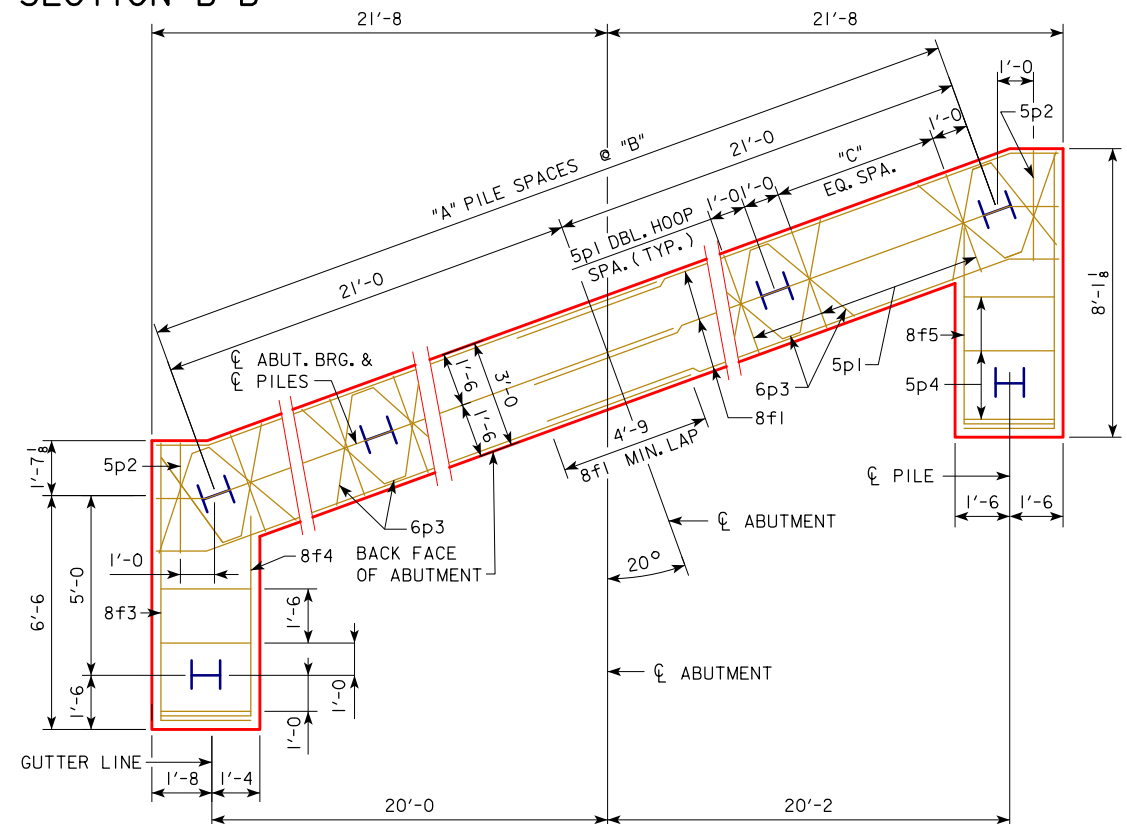
PART SECTION A-A

NOTE:
SHIFT 8g1 BARS IN F.F. AS NECESSARY TO MISS BEAMS. PLACE 8g3 BARS PARALLEL TO LONGITUDINAL STEEL.

NOTE:
ABUTMENT STEP DIAGRAM PROVIDED BY DESIGNER, SEE "GENERAL INFORMATION" SHEET (WORKING STANDARD 525I).

ABUTMENT PILE SPACING	
DIMENSION OR NO.	CL TO CL ABUTMENT BEARING
	340'-0
"A"	9
"B" (FT-IN)	4'-8
"C" EQUAL SPACES	3
NO. OF PILES PER ABUT.	12
PU, STRENGTH I DESIGN LOAD (KIPS)	144

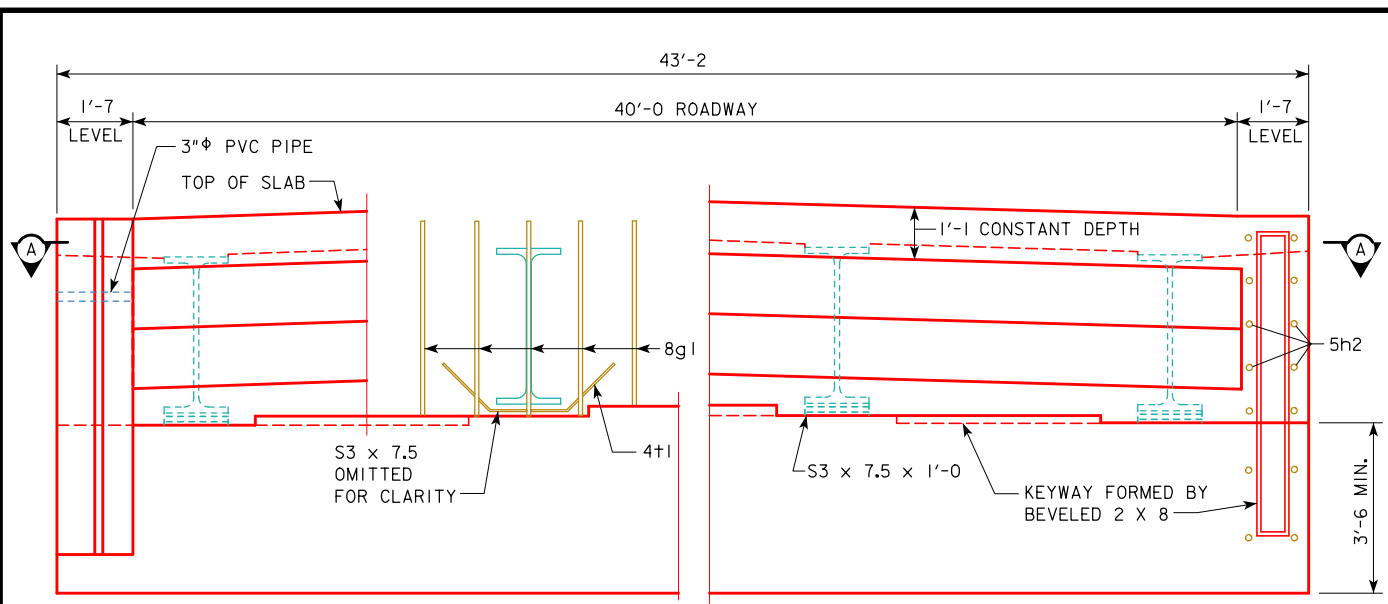
NOTE: HP 10 x 57 STEEL BEARING PILING REQUIRED.
NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



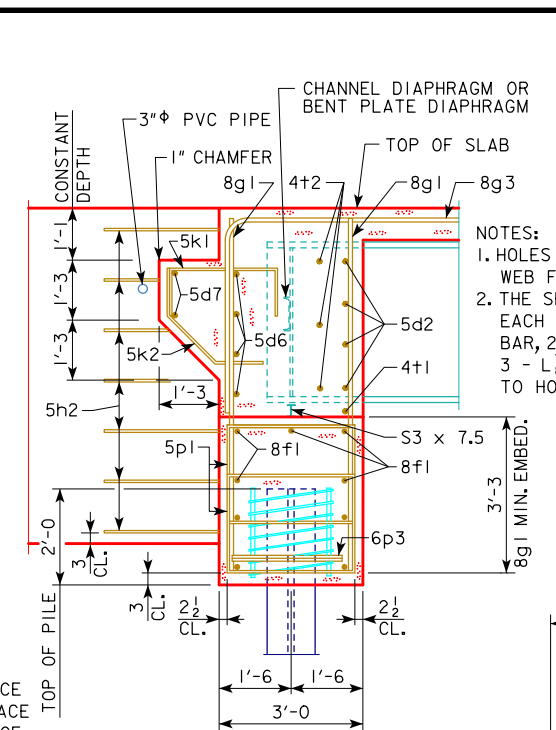
ABUTMENT PILE PLAN

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER 	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	ABUTMENT DETAILS 20° SKEW
	RS40-012-14

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



PART REAR ELEVATION AT ABUTMENT



PART SECTION B-B

- NOTES:
- HOLES DRILLED THROUGH BEAM WEB FOR 5d2 AND 4+2 BARS.
 - THE SPIRAL AT THE TOP OF EACH PILE TO BE 7 TURNS OF No. 2 BAR, 2 1/2" DIAMETER, 3" PITCH WITH 3 - L 3/8 x 7/8 x 1/8 SPACERS PUNCHED TO HOLD SPIRAL.

ABUTMENT NOTES:

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

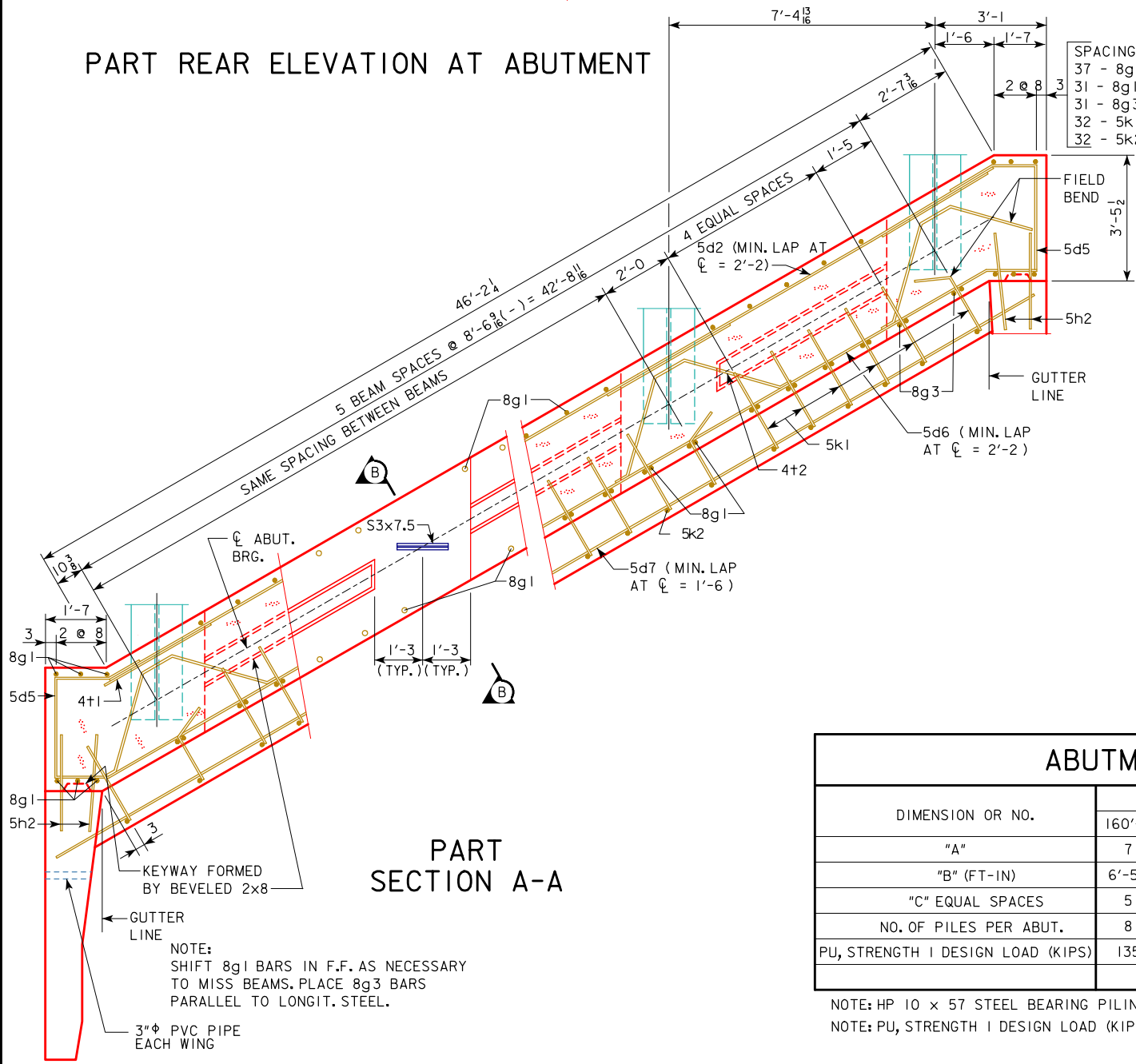
IF NECESSARY TO PREVENT DAMAGE TO THE END OF THE BRIDGE DECK OR BACKWALL FROM CONSTRUCTION EQUIPMENT, AN APPROPRIATE METHOD OF PROTECTION APPROVED BY THE ENGINEER SHALL BE PROVIDED BY THE BRIDGE CONTRACTOR AT NO EXTRA COST TO THE COUNTY OR STATE.

ABUTMENT PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

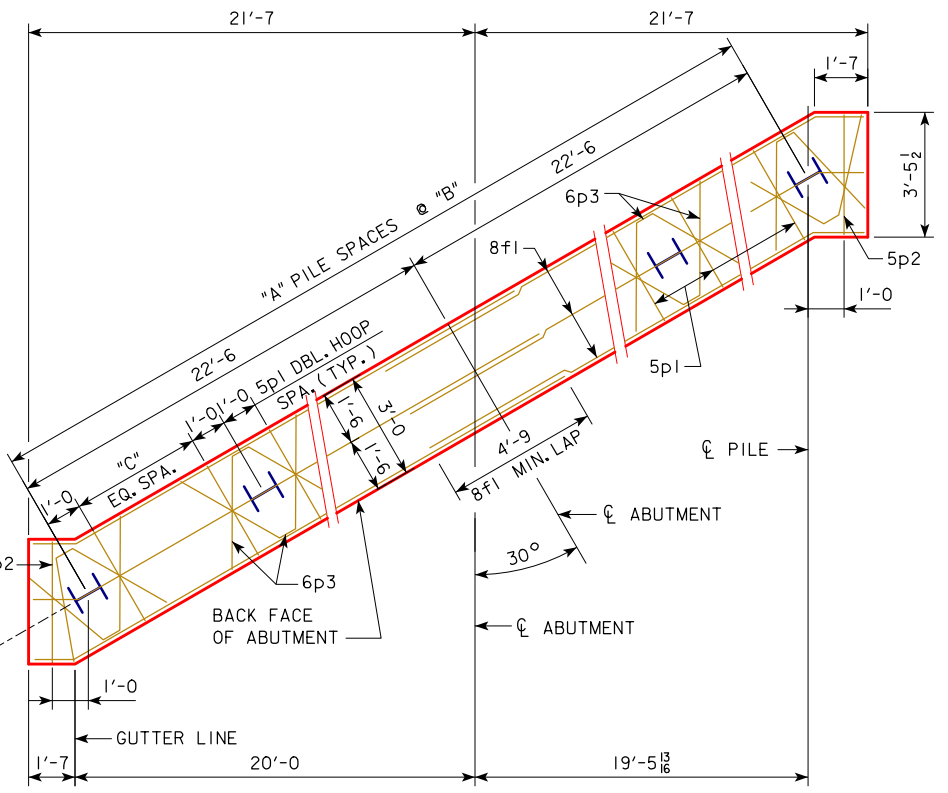
PLACE 5h2 BAR AT 1:6 SLOPE TO MATCH TRAFFIC SIDE OF ABUTMENT WING FACE. (BOTH SIDES TYPICAL)

BARRIER RAIL NOT SHOWN IN DETAILS.

IF ROCK IS CLOSER THAN 15' BELOW ABUTMENT FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.



PART SECTION A-A



ABUTMENT PILE PLAN

NOTE:
ABUTMENT STEP DIAGRAM PROVIDED BY DESIGNER, SEE "GENERAL INFORMATION" SHEET (WORKING STANDARD 5251).

ABUTMENT PILE SPACING

DIMENSION OR NO.	CL TO CL ABUTMENT BEARING								
	160'-0"	180'-0"	200'-0"	220'-0"	240'-0"	260'-0"	280'-0"	300'-0"	320'-0"
"A"	7	7	8	8	8	9	9	9	9
"B" (FT-IN)	6'-5 1/8"	6'-5 1/8"	5'-7 1/2"	5'-7 1/2"	5'-7 1/2"	5'-0"	5'-0"	5'-0"	5'-0"
"C" EQUAL SPACES	5	5	4	4	4	3	3	3	3
NO. OF PILES PER ABUT.	8	8	9	9	9	10	10	10	10
PU, STRENGTH I DESIGN LOAD (KIPS)	135	141	129	135	140	130	134	139	141

NOTE: HP 10 x 57 STEEL BEARING PILING REQUIRED.
NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018
LATEST REVISION DATE

IOWADOT Highway Division

STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES

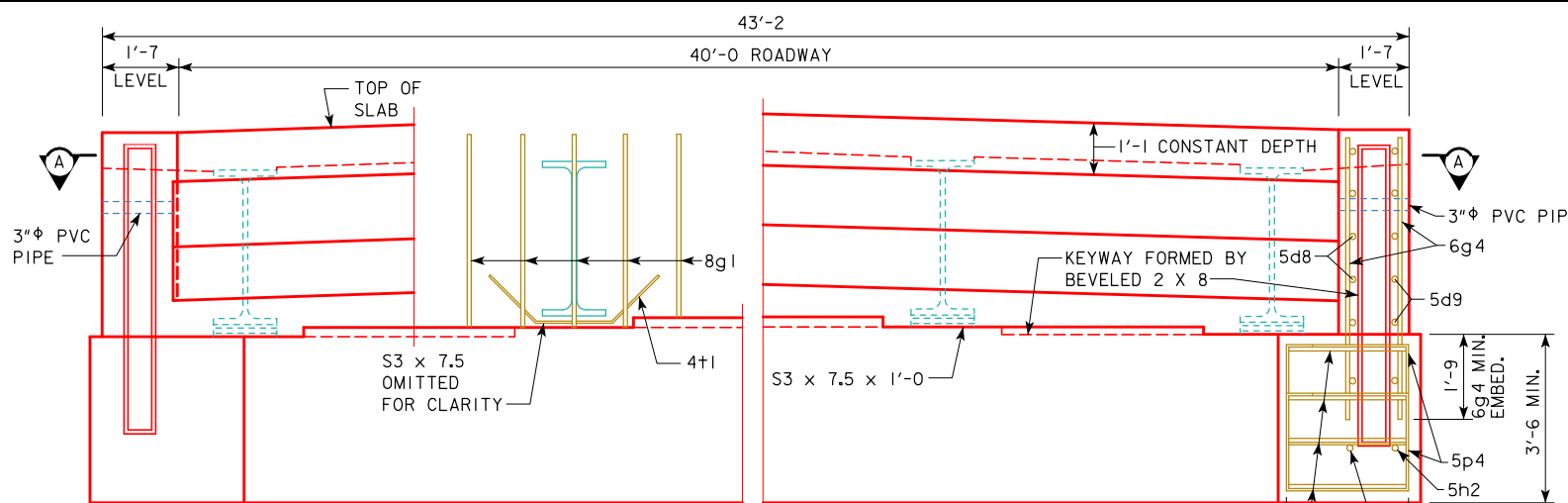
ROLLED STEEL BEAM BRIDGES

OCTOBER, 2014

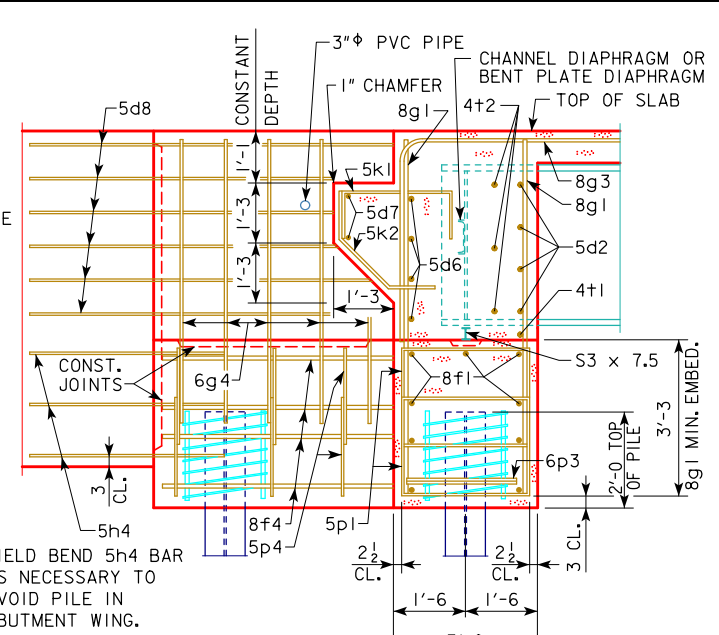
APPROVED BY BRIDGE ENGINEER

ABUTMENT DETAILS
30° SKEW

RS40-013-14

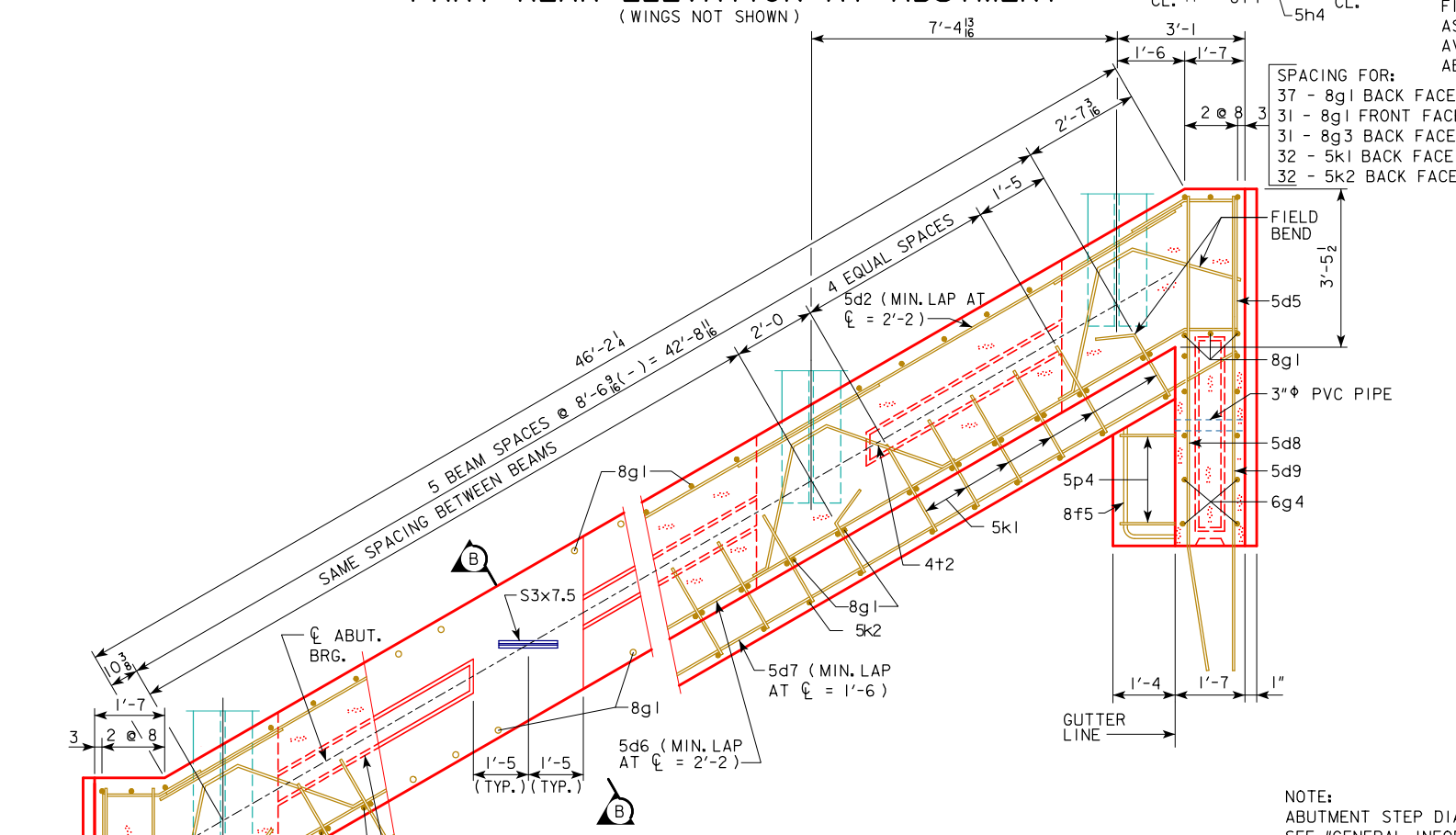


PART REAR ELEVATION AT ABUTMENT
(WINGS NOT SHOWN)



PART SECTION B-B

ABUTMENT NOTES:
 MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.
 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 COUNTY OR STATE.
 ABUTMENT PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.
 PLACE 5h2 BAR AT 1:6 SLOPE TO MATCH TRAFFIC SIDE OF ABUTMENT WING FACE. (BOTH SIDES TYPICAL)
 BARRIER RAIL NOT SHOWN IN DETAILS.
 IF ROCK IS CLOSER THAN 15' BELOW ABUTMENT FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.

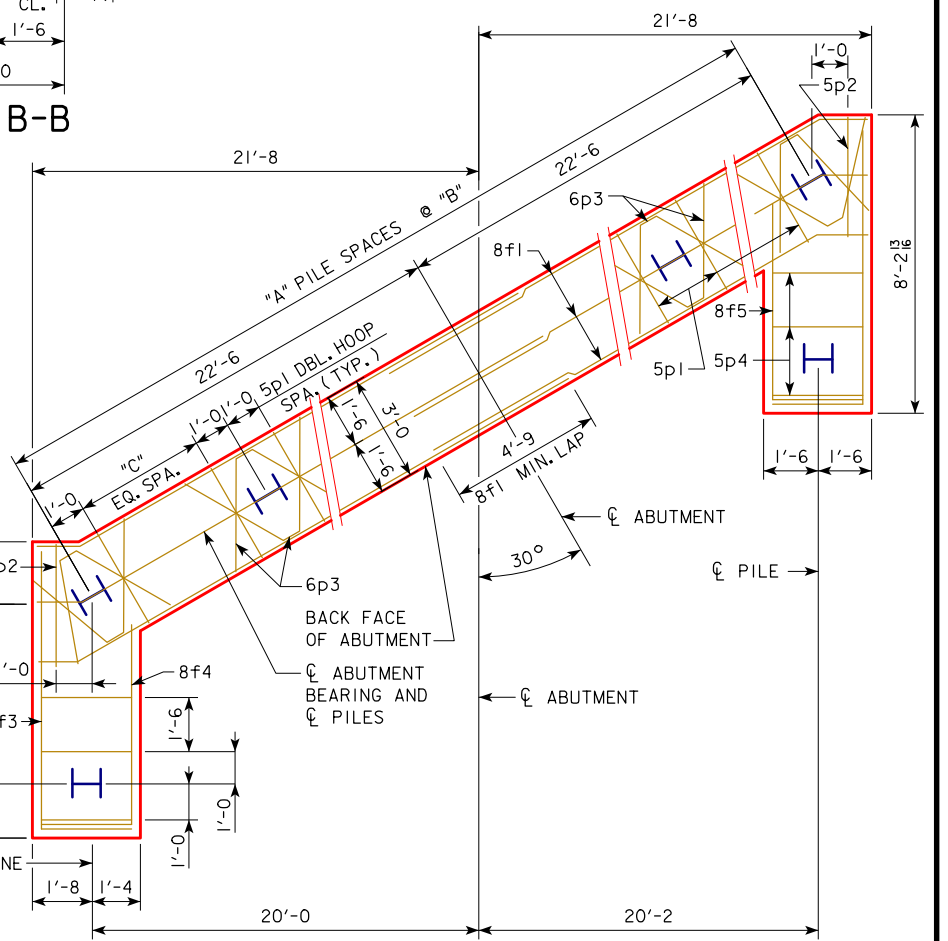


PART SECTION A-A

- NOTES:**
 1. HOLES DRILLED THROUGH BEAM WEB FOR 5d2 AND 4t2 BARS.
 2. THE SPIRAL AT THE TOP OF EACH PILE TO BE 7 TURNS OF No. 2 BAR, 2 1/8" DIAMETER, 3" PITCH WITH 3 - L 7/8 x 7/8 x 1/8 SPACERS PUNCHED TO HOLD SPIRAL.

- SPACING FOR:**
 37 - 8g1 BACK FACE
 31 - 8g1 FRONT FACE
 31 - 8g3 BACK FACE
 32 - 5k1 BACK FACE
 32 - 5k2 BACK FACE

NOTE:
 ABUTMENT STEP DIAGRAM PROVIDED BY DESIGNER, SEE "GENERAL INFORMATION" SHEET (WORKING STANDARD 5251).



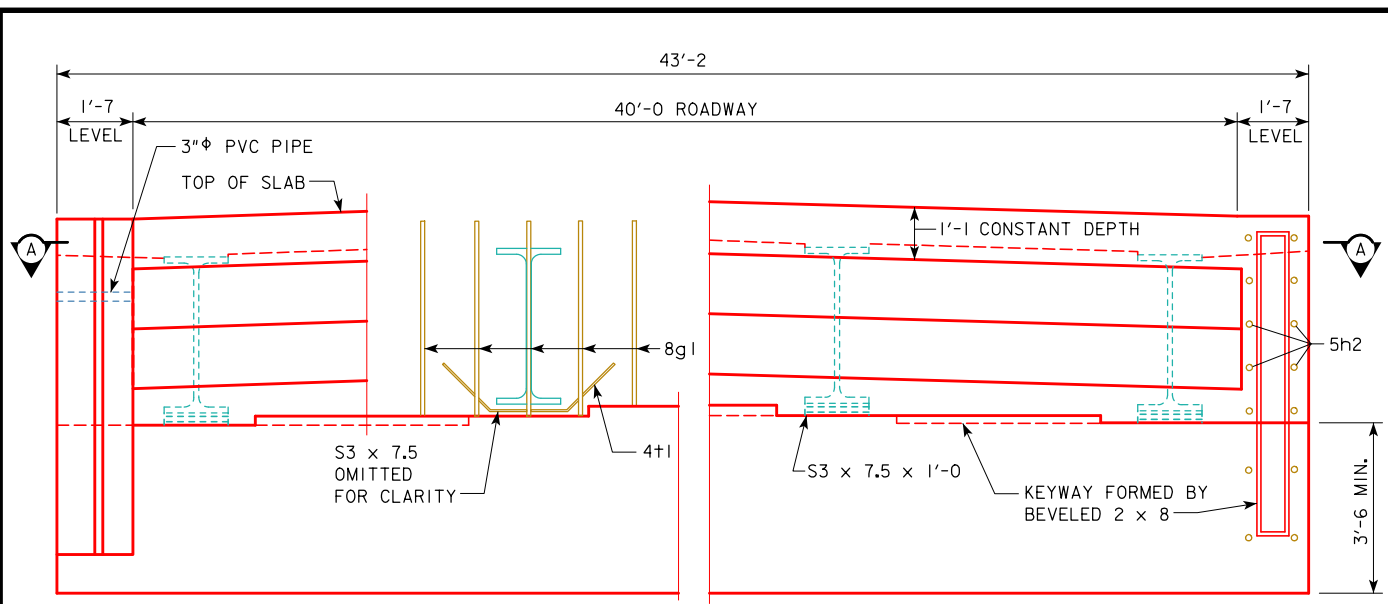
ABUTMENT PILE PLAN

ABUTMENT PILE SPACING	
DIMENSION OR NO.	CL TO CL ABUTMENT BEARING
	340'-0
"A"	10
"B" (FT-IN)	4'-6
"C" EQUAL SPACES	3
NO. OF PILES PER ABUT.	13
PU, STRENGTH I DESIGN LOAD (KIPS)	132

NOTE: HP 10 x 57 STEEL BEARING PILING REQUIRED.
NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER <i>[Signature]</i>		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
ABUTMENT DETAILS 30° SKEW		RS40-014-14	

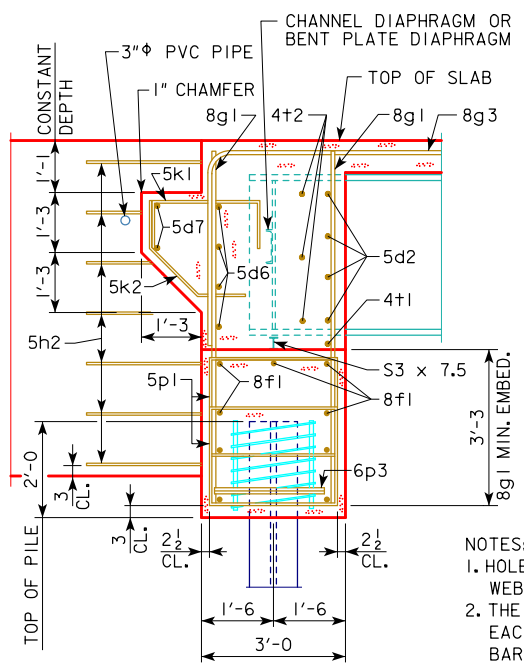
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



PART REAR ELEVATION AT ABUTMENT

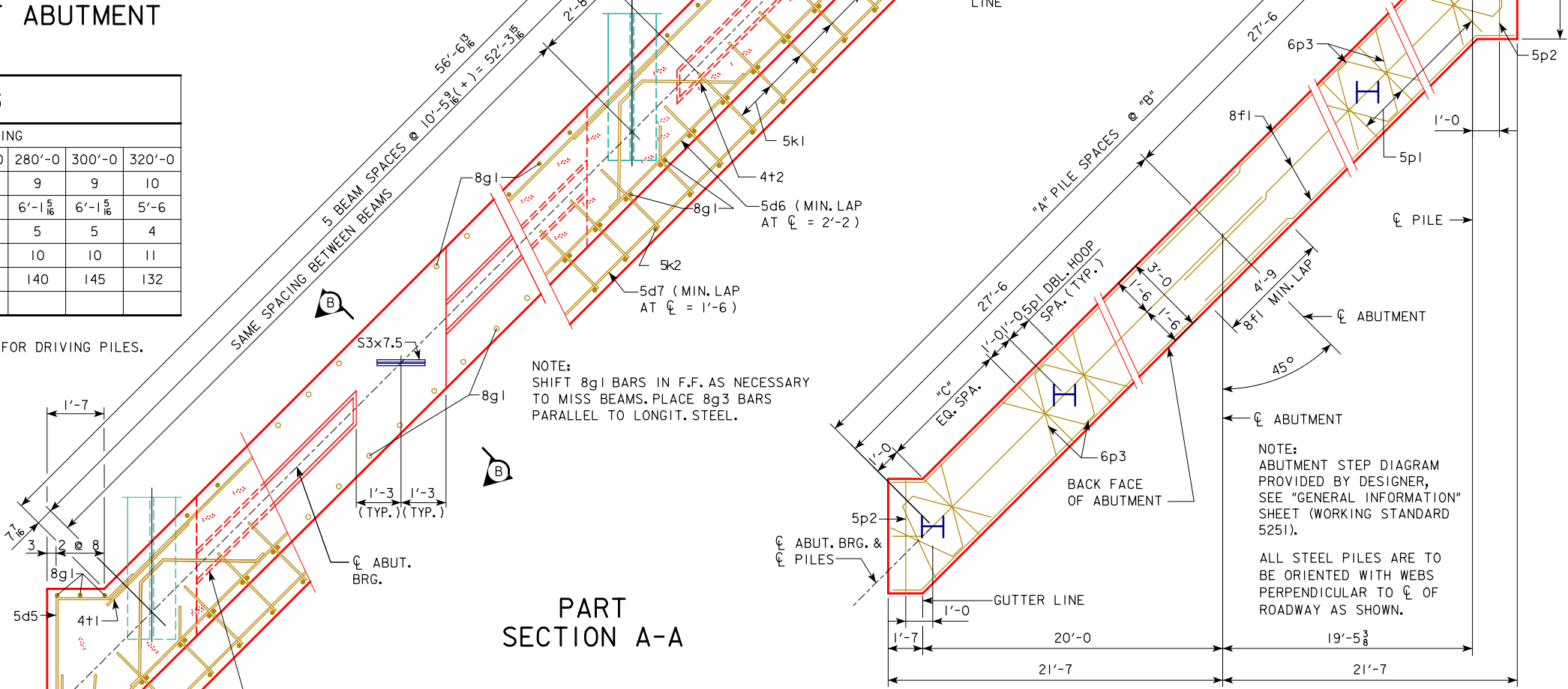
DIMENSION OR NO.	CL TO CL ABUTMENT BEARING								
	160'-0	180'-0	200'-0	220'-0	240'-0	260'-0	280'-0	300'-0	320'-0
"A"	8	8	8	8	9	9	9	9	10
"B" (FT-IN)	6'-10 1/2	6'-10 1/2	6'-10 1/2	6'-10 1/2	6'-1 5/16	6'-1 5/16	6'-1 5/16	6'-1 5/16	5'-6
"C" EQUAL SPACES	5	5	5	5	5	5	5	5	4
NO. OF PILES PER ABUT.	9	9	9	9	10	10	10	10	11
PU, STRENGTH I DESIGN LOAD (KIPS)	124	129	135	141	130	136	140	145	132

NOTE: HP 10 x 57 STEEL BEARING PILING REQUIRED.
 NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



PART SECTION B-B

- NOTES:
- Holes drilled through beam web for 5d2 and 4t2 bars.
 - The spiral at the top of each pile to be 7 turns of No. 2 bar, 2 1/8" diameter, 3" pitch with 3 - 1 1/8" x 7/8" x 1/8" spacers punched to hold spiral.



PART SECTION A-A

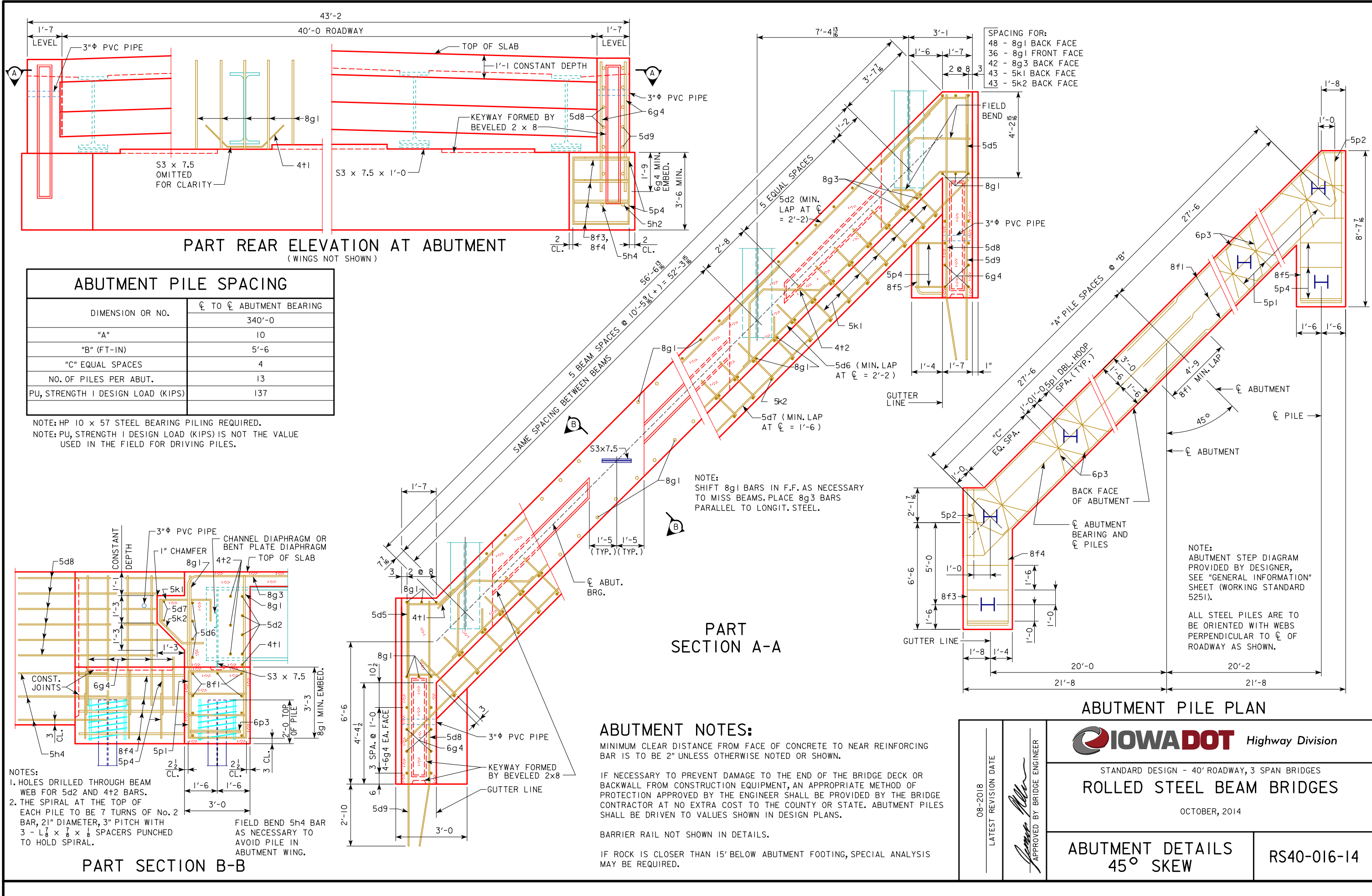
ABUTMENT PILE PLAN

ABUTMENT NOTES:

- MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.
- 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 COUNTY OR STATE. ABUTMENT PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.
- PLACE 5h2 BAR AT 1:6 SLOPE TO MATCH TRAFFIC SIDE OF ABUTMENT WING FACE. (BOTH SIDES TYPICAL)
- BARRIER RAIL NOT SHOWN IN DETAILS.
- IF ROCK IS CLOSER THAN 15' BELOW ABUTMENT FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER <i>[Signature]</i>		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
		ABUTMENT DETAILS 45° SKEW	RS40-015-14

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



PART REAR ELEVATION AT ABUTMENT
(WINGS NOT SHOWN)

ABUTMENT PILE SPACING

DIMENSION OR NO.	CL TO CL ABUTMENT BEARING
"A"	340'-0"
"B" (FT-IN)	5'-6"
"C" EQUAL SPACES	4'
NO. OF PILES PER ABUT.	13
PU, STRENGTH I DESIGN LOAD (KIPS)	137

NOTE: HP 10 x 57 STEEL BEARING PILING REQUIRED.
NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

PART SECTION A-A

ABUTMENT NOTES:

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

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BARRIER RAIL NOT SHOWN IN DETAILS.

IF ROCK IS CLOSER THAN 15' BELOW ABUTMENT FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.

ABUTMENT PILE PLAN



STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES

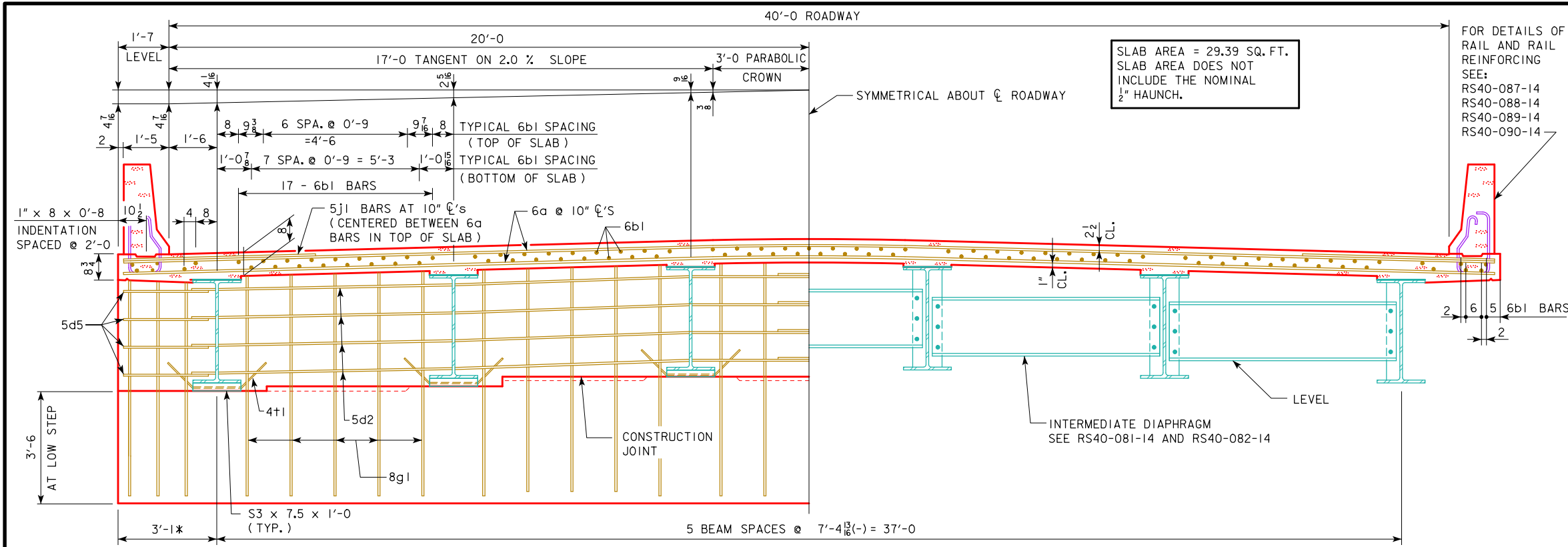
ROLLED STEEL BEAM BRIDGES

OCTOBER, 2014

ABUTMENT DETAILS
45° SKEW

RS40-016-14

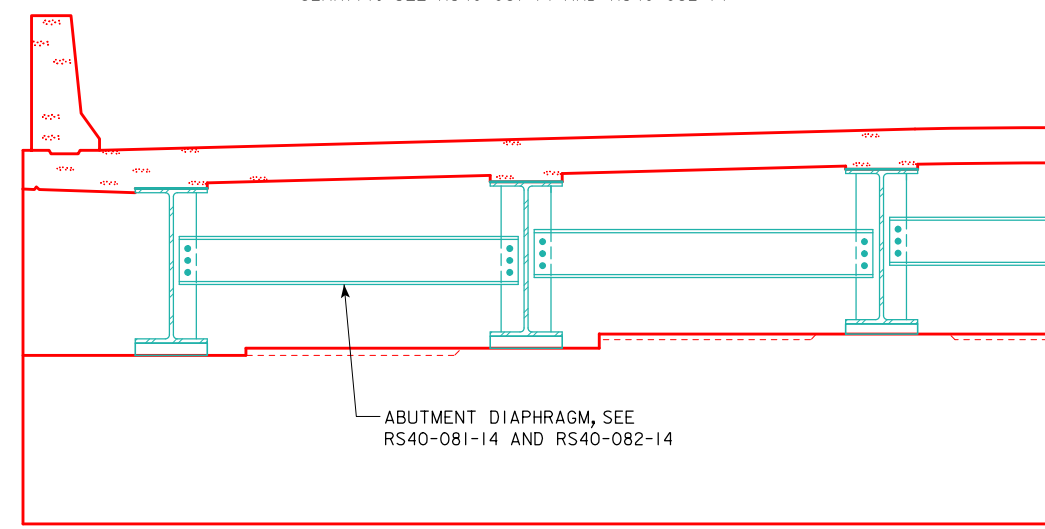
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



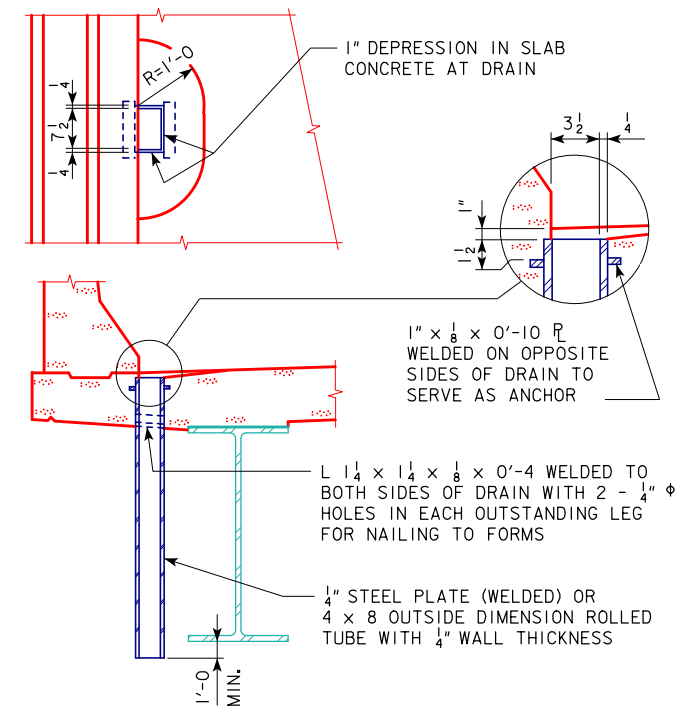
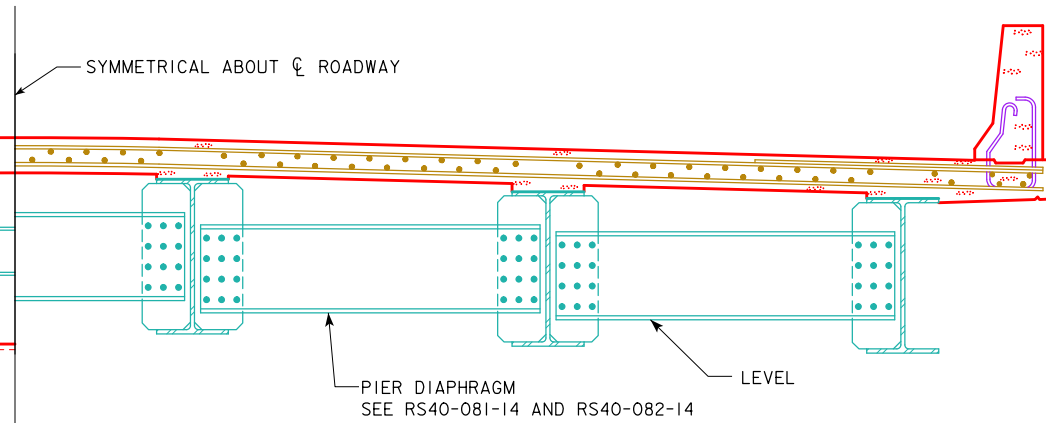
SUPERSTRUCTURE NOTES:
 THE FLOOR SLAB AS SHOWN INCLUDES 1/2" INTEGRAL WEARING SURFACE.
 FORMS FOR THE SLAB AND BARRIER RAIL ARE TO BE SUPPORTED BY THE BEAMS.
 CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR SHALL BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.
 TOP TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 2 1/2" CLEAR BELOW TOP OF SLAB. BOTTOM TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 1" CLEAR ABOVE BOTTOM OF SLAB. TOP AND BOTTOM REINFORCING STEEL IS TO BE SUPPORTED BY INDIVIDUAL BAR CHAIRS SPACED AT NOT MORE THAN 3'-0 CENTERS LONGITUDINALLY AND TRANSVERSELY, OR BY CONTINUOUS ROWS OF BAR HIGH CHAIRS OR SLAB BOLSTERS SPACED 4'-0 APART. I.M. 451.01 REQUIREMENTS SHALL APPLY FOR BAR CHAIRS, BAR HIGH CHAIRS, AND SLAB BOLSTERS.
 TRANSVERSE SLAB REINFORCING MAY BE SPLICED WITH ONE LAP LOCATED AS FOLLOWS: TOP BARS - LAP MIDWAY BETWEEN BEAMS (MIN. LAP = 1'-10). BOTTOM BARS - LAP OVER GIRDERS (MIN. LAP = 1'-10). PAYMENT FOR REINFORCING BARS SHALL BE BASED ON NO SPLICES, AND NO ALLOWANCE SHALL BE MADE FOR THE ADDITIONAL LENGTH OF BAR REQUIRED FOR THE USE OF SPLICES.
 THE ABUTMENT DIAPHRAGM CONCRETE IS TO BE PLACED MONOLITHICALLY WITH THE FLOOR SLAB.

3'-2 FOR 340'-0 BRIDGE **HALF SECTION NEAR ABUTMENT**

NOTE:
 STEEL ABUTMENT DIAPHRAGMS OMITTED FOR CLARITY. SEE RS40-081-14 AND RS40-082-14



HALF SECTION NEAR INTERMEDIATE DIAPHRAGM



HALF SECTION NEAR ABUTMENT

NOTE:
 REINFORCING OMITTED FOR CLARITY. FOR BEAM CAMBER AND THEORETICAL CONCRETE HAUNCH DIAGRAM, SEE MISC. DETAILS WORK SHEET FOR APPROPRIATE LENGTH BRIDGE.

DRAIN DETAIL NOTE:
 DRAINS ARE TO BE GALVANIZED. FOR NUMBER OF DRAINS REQUIRED AND LOCATION SEE "GENERAL INFORMATION SHEET" (WORKING STANDARD 5251). WEIGHT OF DRAINS IS SHOWN ON THE SUMMARY QUANTITIES SHEET IN THE BRIDGE PLANS

DATA FOR ONE DRAIN					
BEAM SIZE	W30	W33	W36	W40	W44
WT. LBS.	82	87	92	96	105
LENGTH FT.	4'-3	4'-7	4'-9	5'-0	5'-5

08-2018
 LATEST REVISION DATE
 APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES

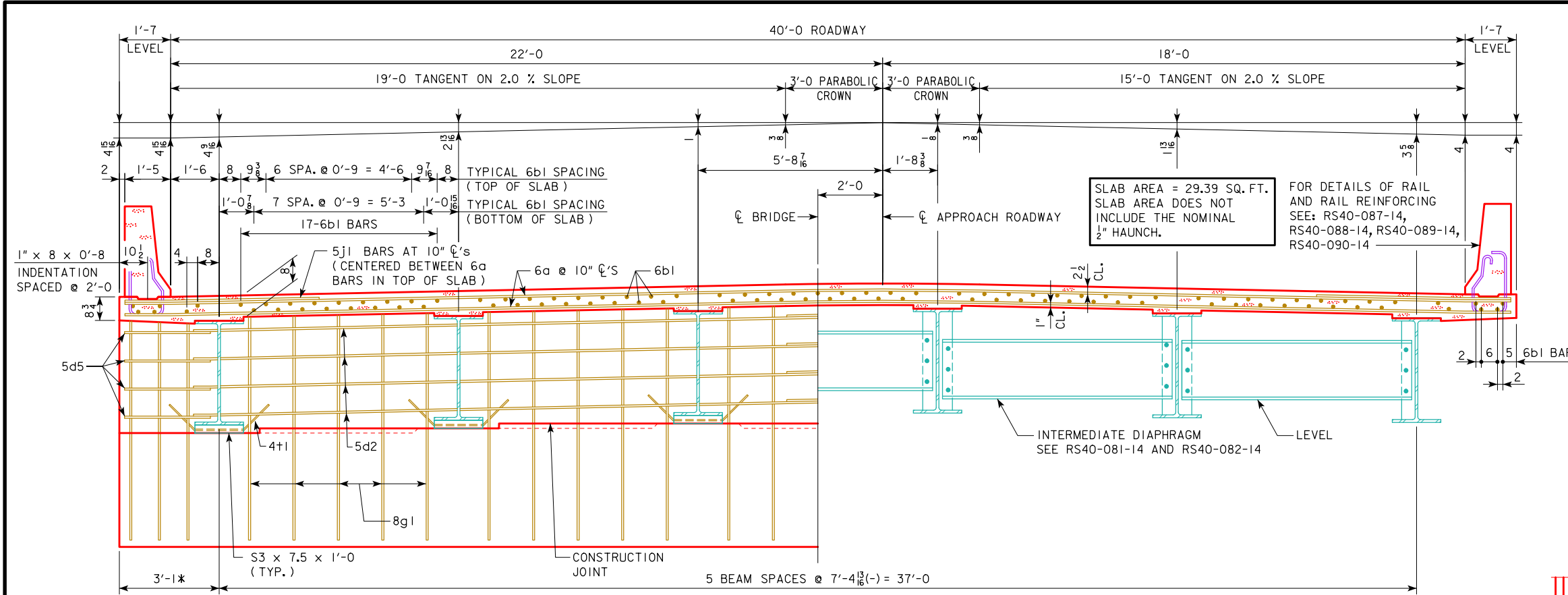
ROLLED STEEL BEAM BRIDGES

OCTOBER, 2014

SYMMETRICAL CROSS SECTIONS
 160'-0-340'-0 SPANS

RS40-017-14

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



SUPERSTRUCTURE NOTES:

THE FLOOR SLAB AS SHOWN INCLUDES 1/2" INTEGRAL WEARING SURFACE.
 FORMS FOR THE SLAB AND BARRIER RAIL ARE TO BE SUPPORTED BY THE BEAMS.

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

TOP TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 2 1/2" CLEAR BELOW TOP OF SLAB. BOTTOM TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 1" CLEAR ABOVE BOTTOM OF SLAB. TOP AND BOTTOM REINFORCING STEEL IS TO BE SUPPORTED BY INDIVIDUAL BAR CHAIRS SPACED AT NOT MORE THAN 3'-0" CENTERS LONGITUDINALLY AND TRANSVERSELY, OR BY CONTINUOUS ROWS OF BAR HIGH CHAIRS OR SLAB BOLSTERS SPACED 4'-0" APART. I.M. 451.01 REQUIREMENTS SHALL APPLY FOR BAR CHAIRS, BAR HIGH CHAIRS, AND SLAB BOLSTERS.

TRANSVERSE SLAB REINFORCING MAY BE SPLICED WITH ONE LAP LOCATED AS FOLLOWS: TOP BARS - LAP MIDWAY BETWEEN BEAMS (MIN. LAP = 1'-10"). BOTTOM BARS - LAP OVER GIRDERS (MIN. LAP = 1'-10"). PAYMENT FOR REINFORCING BARS SHALL BE BASED ON NO SPLICES, AND NO ALLOWANCE SHALL BE MADE FOR THE ADDITIONAL LENGTH OF BAR REQUIRED FOR THE USE OF SPLICES.

THE ABUTMENT DIAPHRAGM CONCRETE IS TO BE PLACED MONOLITHICALLY WITH THE FLOOR SLAB.

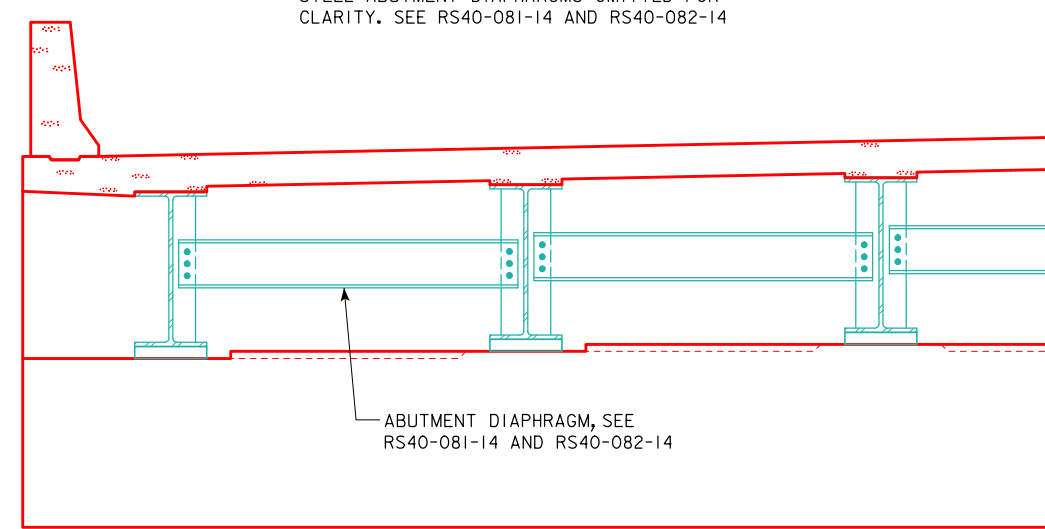
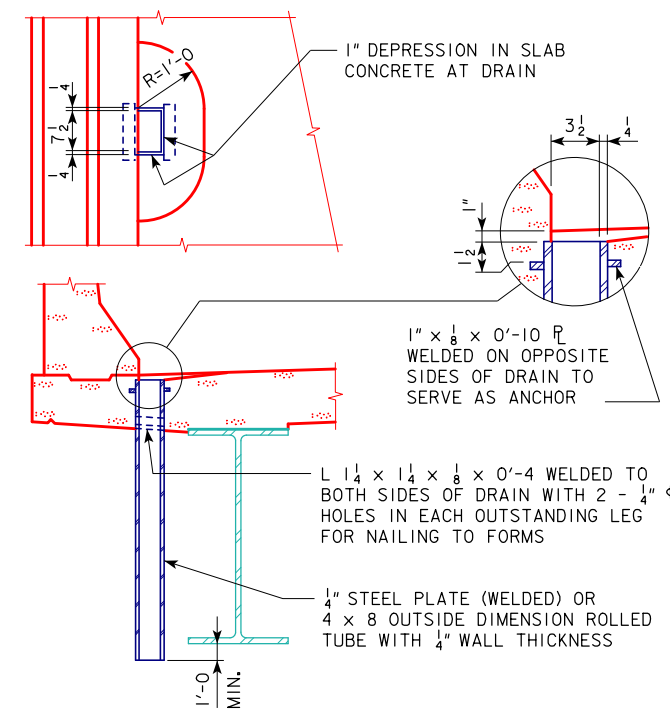
SLAB AREA = 29.39 SQ. FT.
 SLAB AREA DOES NOT INCLUDE THE NOMINAL 1/2" HAUNCH.
 FOR DETAILS OF RAIL AND RAIL REINFORCING SEE: RS40-087-14, RS40-088-14, RS40-089-14, RS40-090-14

3'-2 FOR 340'-0 BRIDGE **HALF SECTION NEAR ABUTMENT**

NOTE:
 STEEL ABUTMENT DIAPHRAGMS OMITTED FOR CLARITY. SEE RS40-081-14 AND RS40-082-14

HALF SECTION NEAR INTERMEDIATE DIAPHRAGM

SYMMETRICAL ABOUT CL BRIDGE - REINFORCING ONLY



HALF SECTION NEAR ABUTMENT

NOTE:
 REINFORCING OMITTED FOR CLARITY. FOR BEAM CAMBER AND THEORETICAL CONCRETE HAUNCH DIAGRAM, SEE MISC. DETAILS WORK SHEET FOR APPROPRIATE LENGTH BRIDGE.

HALF SECTION NEAR PIER

DRAIN DETAIL NOTE:
 DRAINS ARE TO BE GALVANIZED. FOR NUMBER OF DRAINS REQUIRED AND LOCATION SEE "GENERAL INFORMATION SHEET" (WORKING STANDARD 5251). WEIGHT OF DRAINS IS SHOWN ON THE SUMMARY QUANTITIES SHEET IN THE BRIDGE PLANS

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WT. LBS.	82	87	92	96	105
LENGTH FT.	4'-3	4'-7	4'-9	5'-0	5'-5

08-2018
 LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES

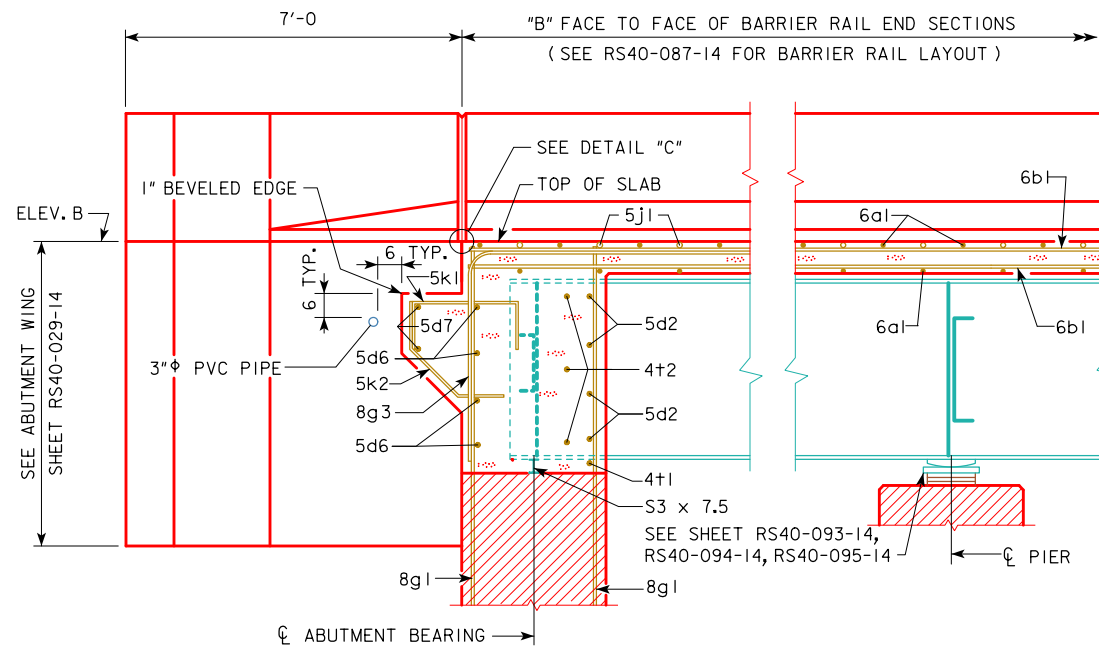
ROLLED STEEL BEAM BRIDGES

OCTOBER, 2014

UNSYMMETRICAL CROSS SECTIONS
 160'-0-340'-0 SPANS

RS40-018-14

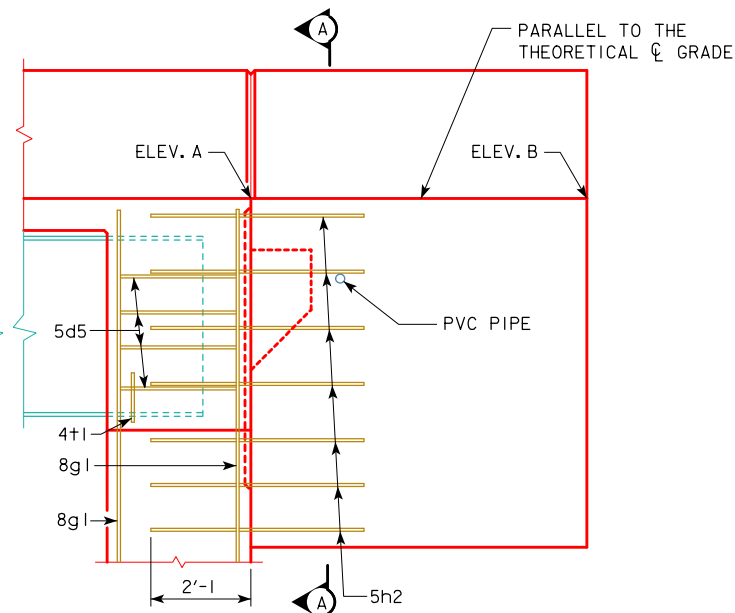
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



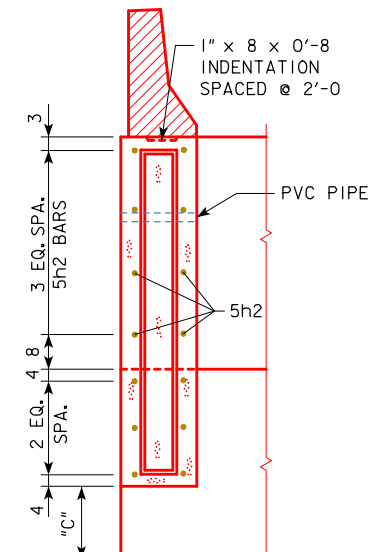
PART LONGITUDINAL SECTION NEAR GUTTER

NOTE:
PLUG 3"Ø PVC PIPE WITH EXPANDING
FOAM PRIOR TO BACKFILLING BEHIND
ABUTMENTS.

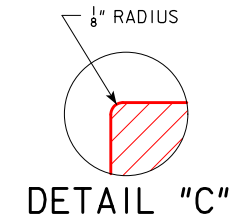
NOTE:
FOR ELEVATION A, ELEVATION B AND
DIMENSION C SEE "MISCELLANEOUS DETAILS"
FOR THE APPROPRIATE LENGTH BRIDGE.



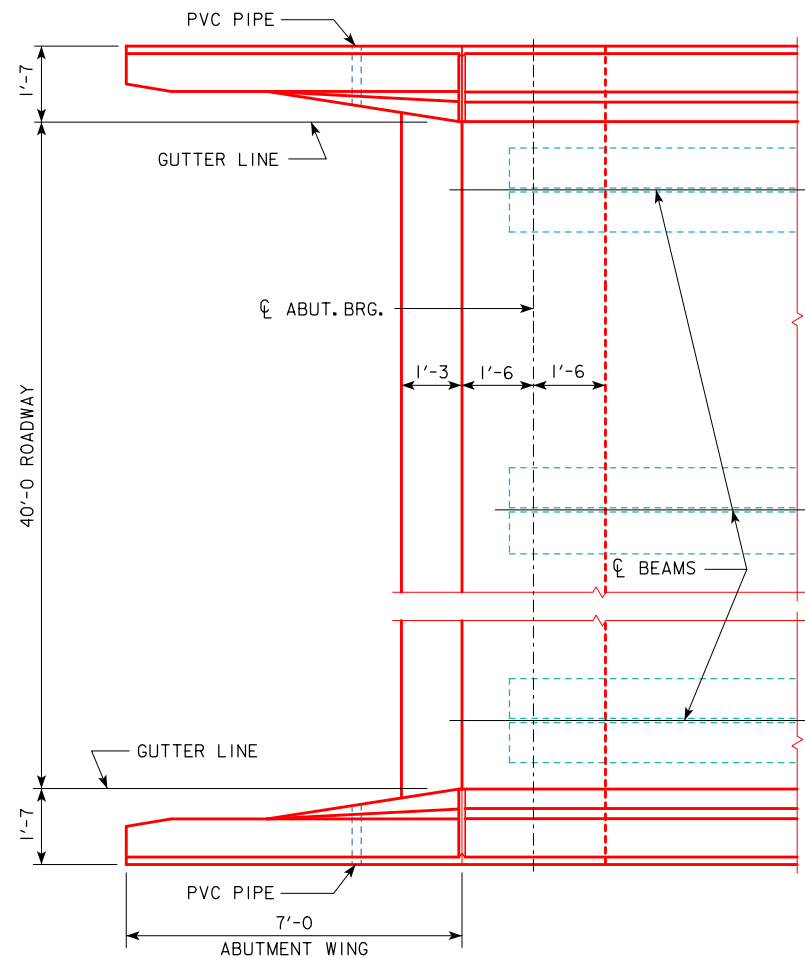
PART END VIEW AT ABUTMENT



SECTION A-A



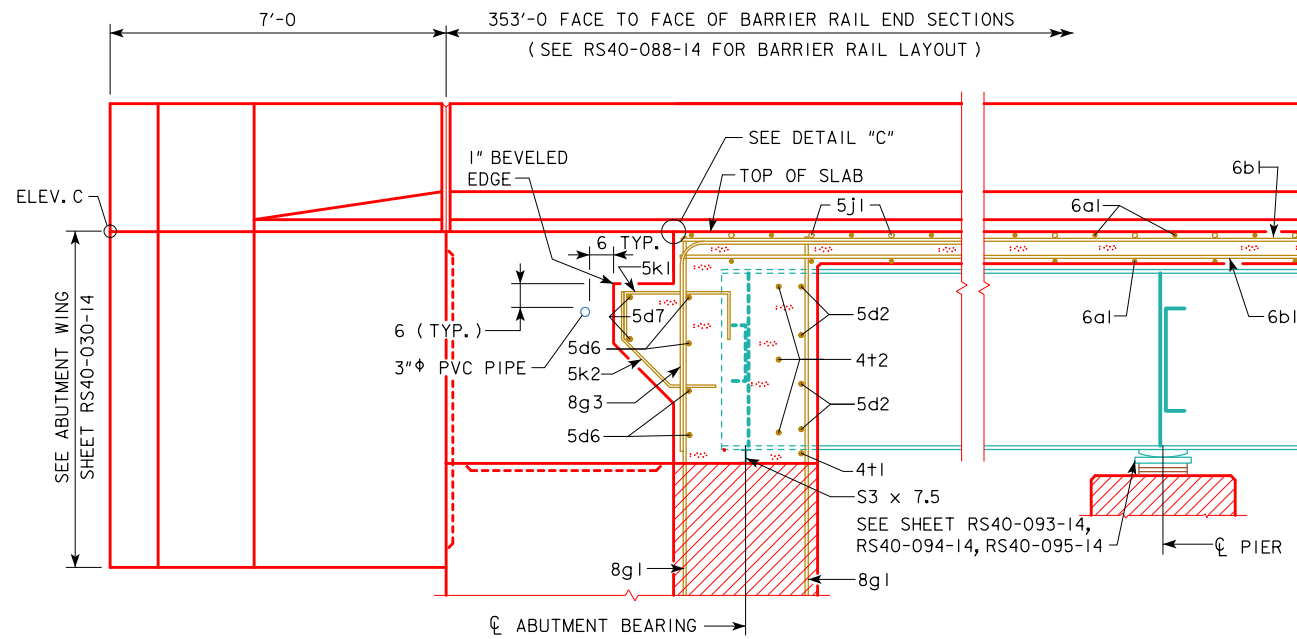
DETAIL "C"



PART PLAN
(STEEL DIAPHRAGMS NOT SHOWN)

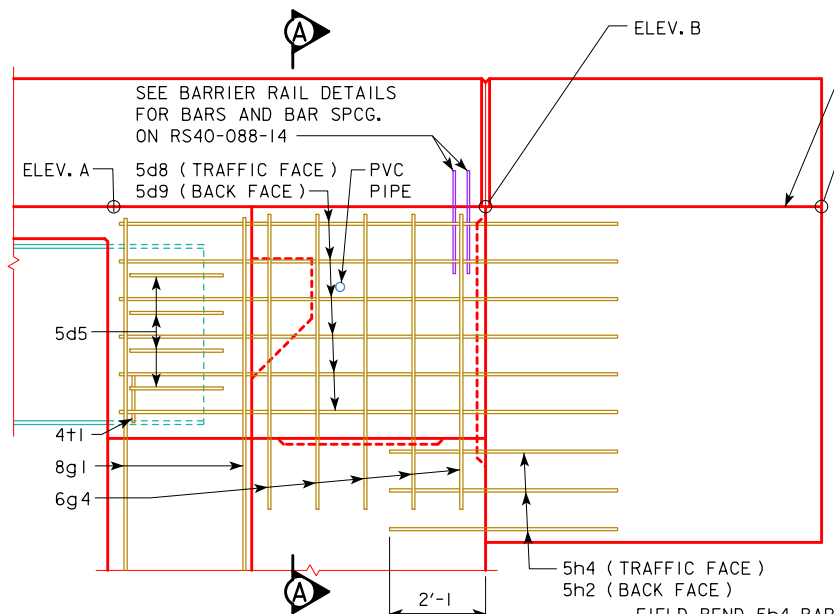
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER		
	STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
	LONGITUDINAL SECTION 0° SKEW	RS40-019-14



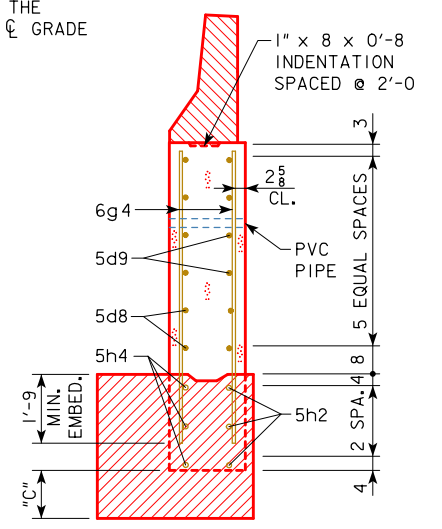
PART LONGITUDINAL SECTION NEAR GUTTER

NOTE:
PLUG 3" PVC PIPE WITH EXPANDING FOAM PRIOR TO BACKFILLING BEHIND ABUTMENTS.

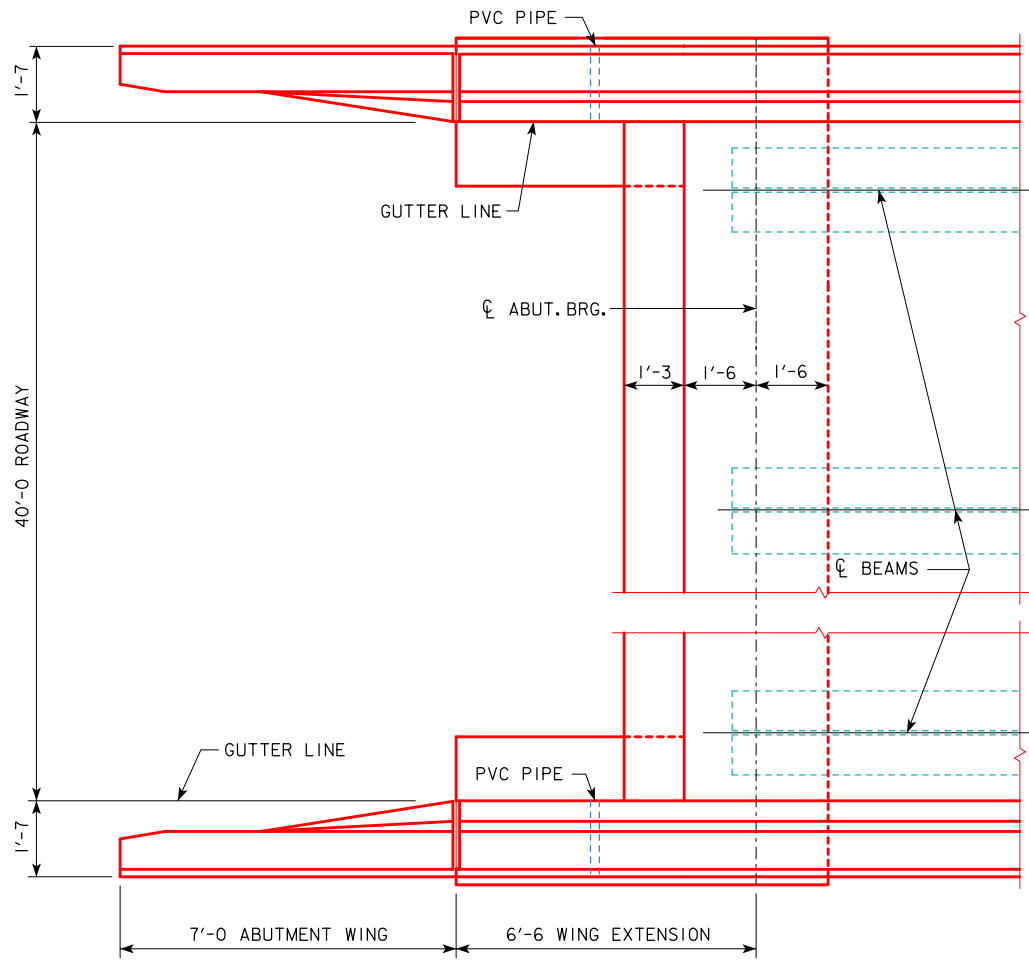


PART END VIEW AT ABUTMENT

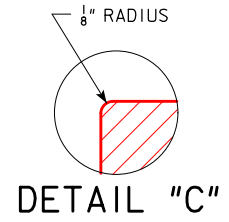
NOTE:
FOR ELEVATION A, ELEVATION B, ELEVATION C AND DIMENSION C SEE "MISCELLANEOUS DETAILS" FOR THE APPROPRIATE LENGTH BRIDGE.





SECTION A-A



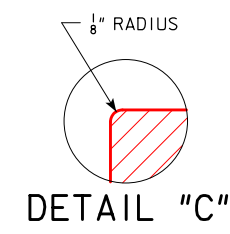
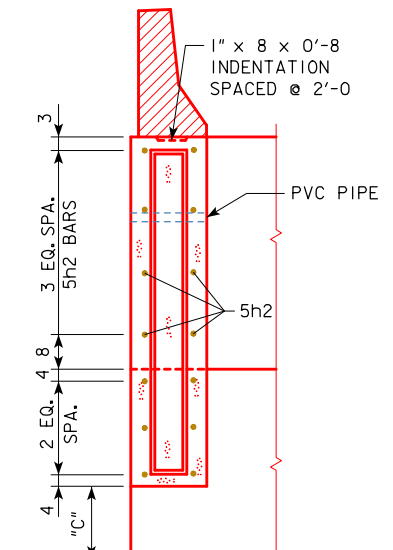
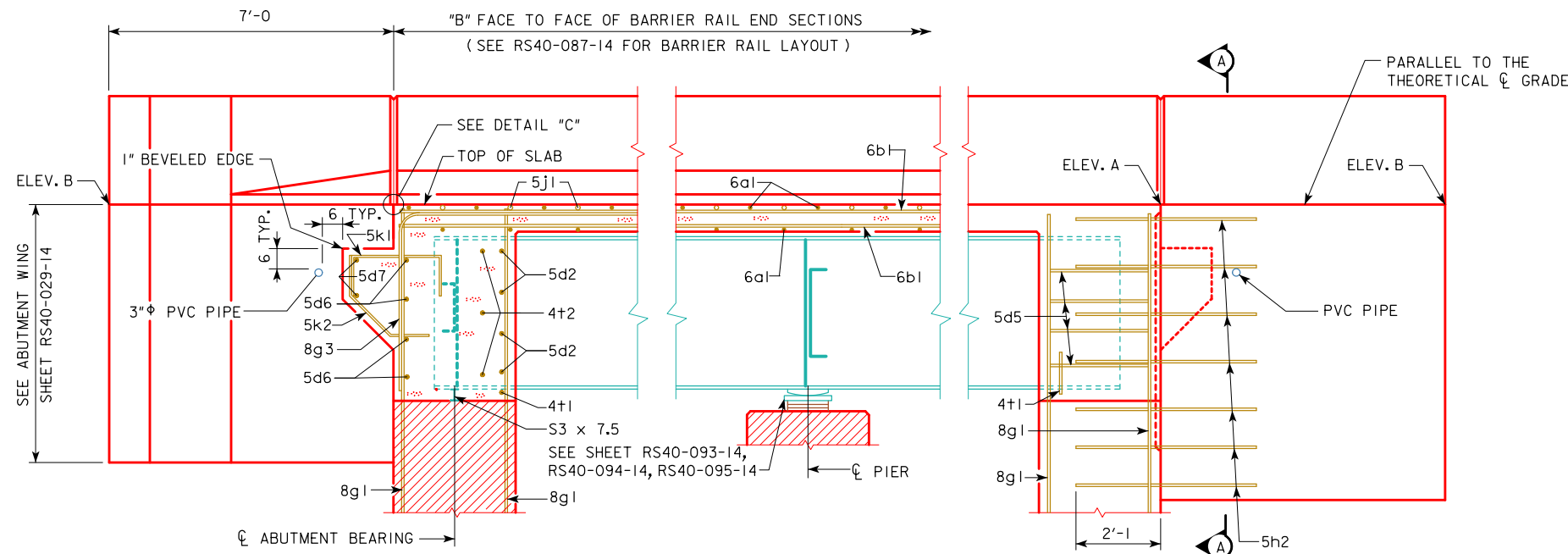
PART PLAN
(STEEL DIAPHRAGMS NOT SHOWN)



DETAIL "C"

08-2018 LATEST REVISION DATE  APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	LONGITUDINAL SECTION 0° SKEW RS40-020-14	
	OCTOBER, 2014		
	LONGITUDINAL SECTION 0° SKEW RS40-020-14		

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



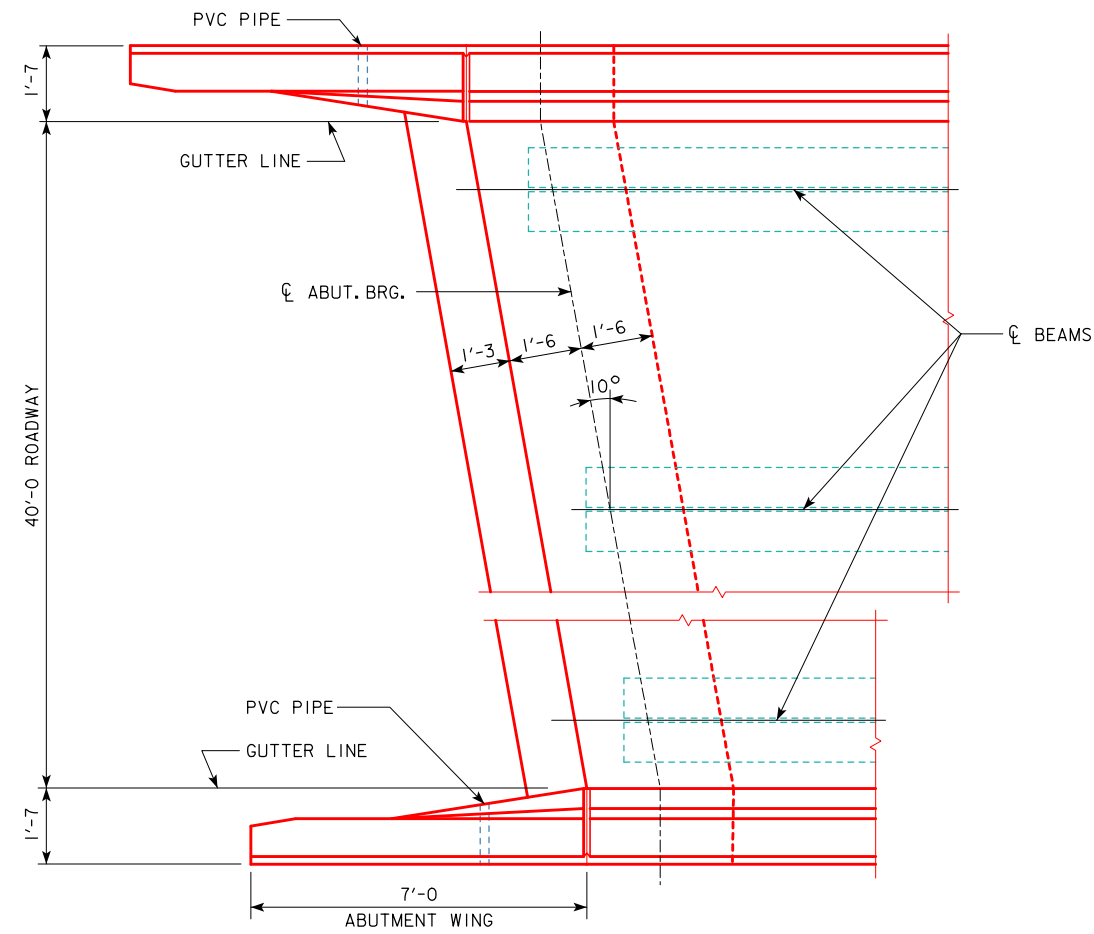
PART LONGITUDINAL SECTION NEAR GUTTER

PART END VIEW AT ABUTMENT

SECTION A-A

NOTE:
PLUG 3" PVC PIPE WITH EXPANDING
FOAM PRIOR TO BACKFILLING BEHIND
ABUTMENTS.

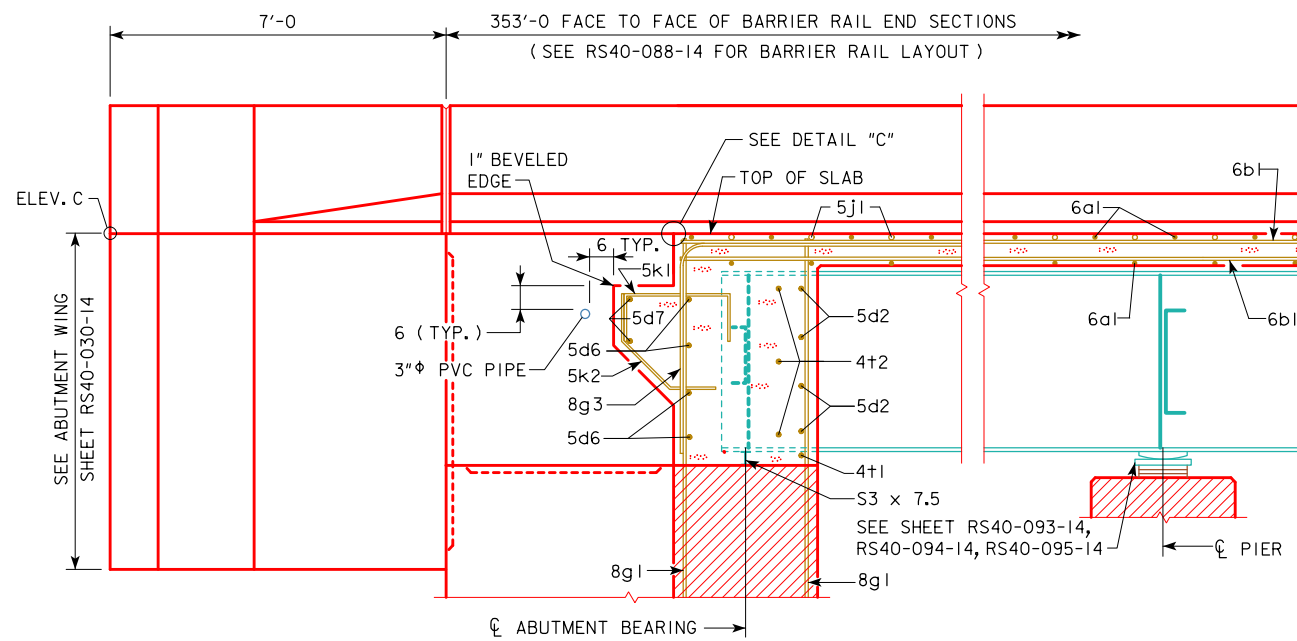
NOTE:
FOR ELEVATION A, ELEVATION B AND
DIMENSION C SEE "MISCELLANEOUS DETAILS"
FOR THE APPROPRIATE LENGTH BRIDGE.



PART PLAN
(STEEL DIAPHRAGMS NOT SHOWN)

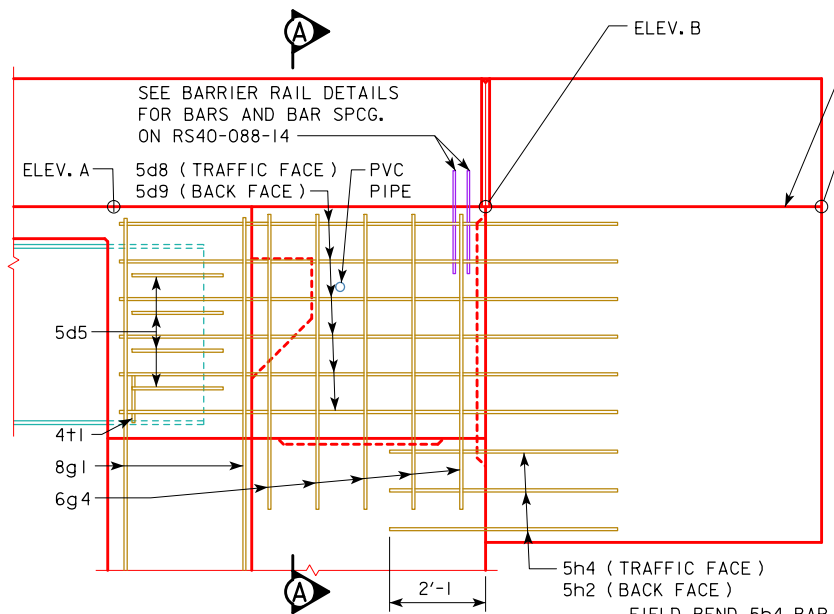
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
		LONGITUDINAL SECTION 10° SKEW	RS40-021-14



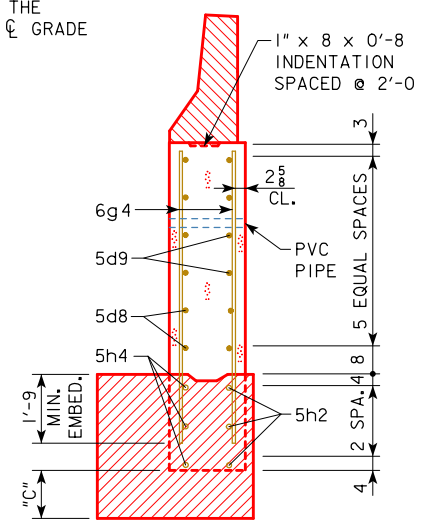
PART LONGITUDINAL SECTION NEAR GUTTER

NOTE:
PLUG 3" ϕ PVC PIPE WITH EXPANDING FOAM PRIOR TO BACKFILLING BEHIND ABUTMENTS.

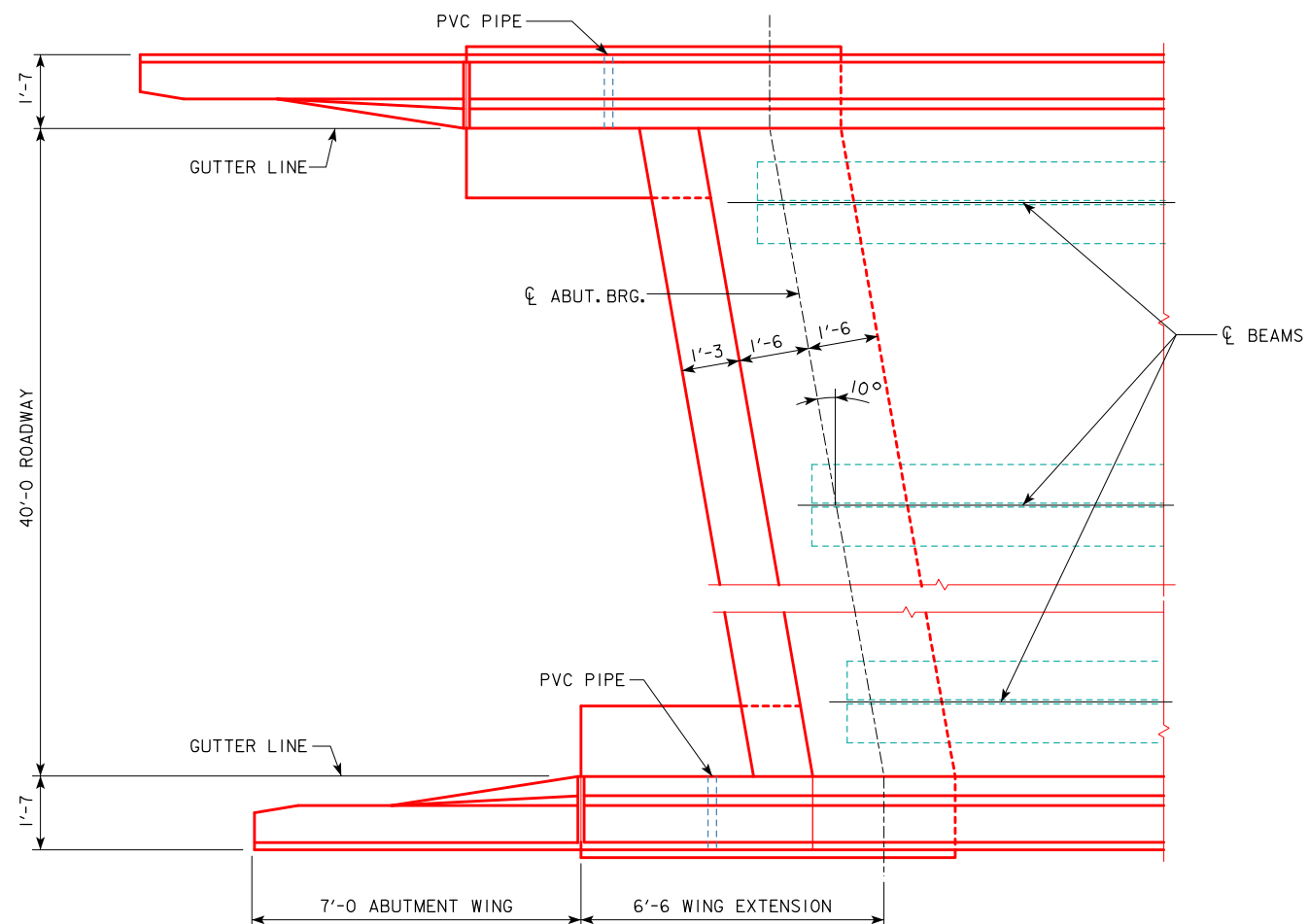


PART END VIEW AT ABUTMENT

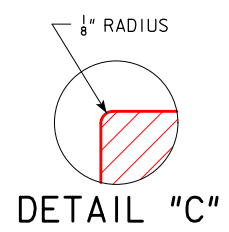
NOTE:
FOR ELEVATION A, ELEVATION B, ELEVATION C AND DIMENSION C SEE "MISCELLANEOUS DETAILS" FOR THE APPROPRIATE LENGTH BRIDGE.



SECTION A-A

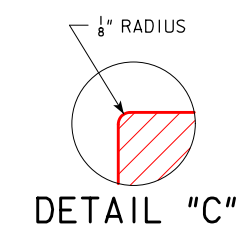
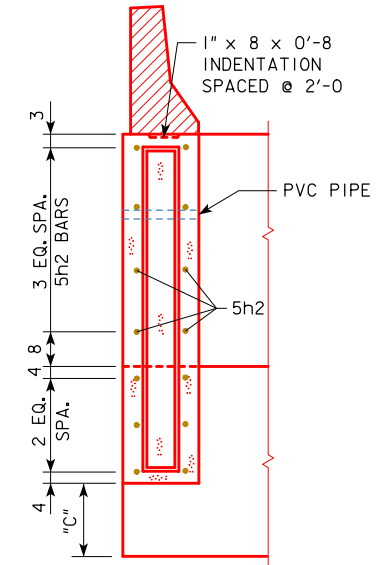
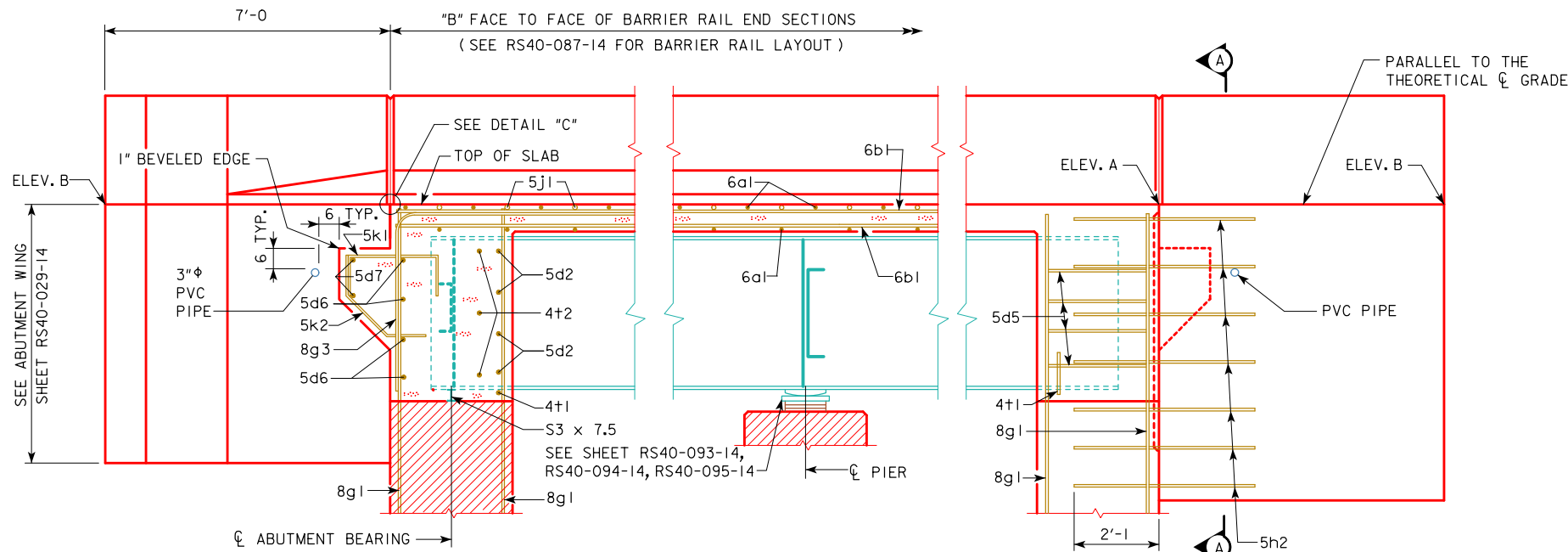


PART PLAN
(STEEL DIAPHRAGMS NOT SHOWN)



REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	LONGITUDINAL SECTION 10° SKEW RS40-022-14	
	OCTOBER, 2014		
	LONGITUDINAL SECTION 10° SKEW RS40-022-14		



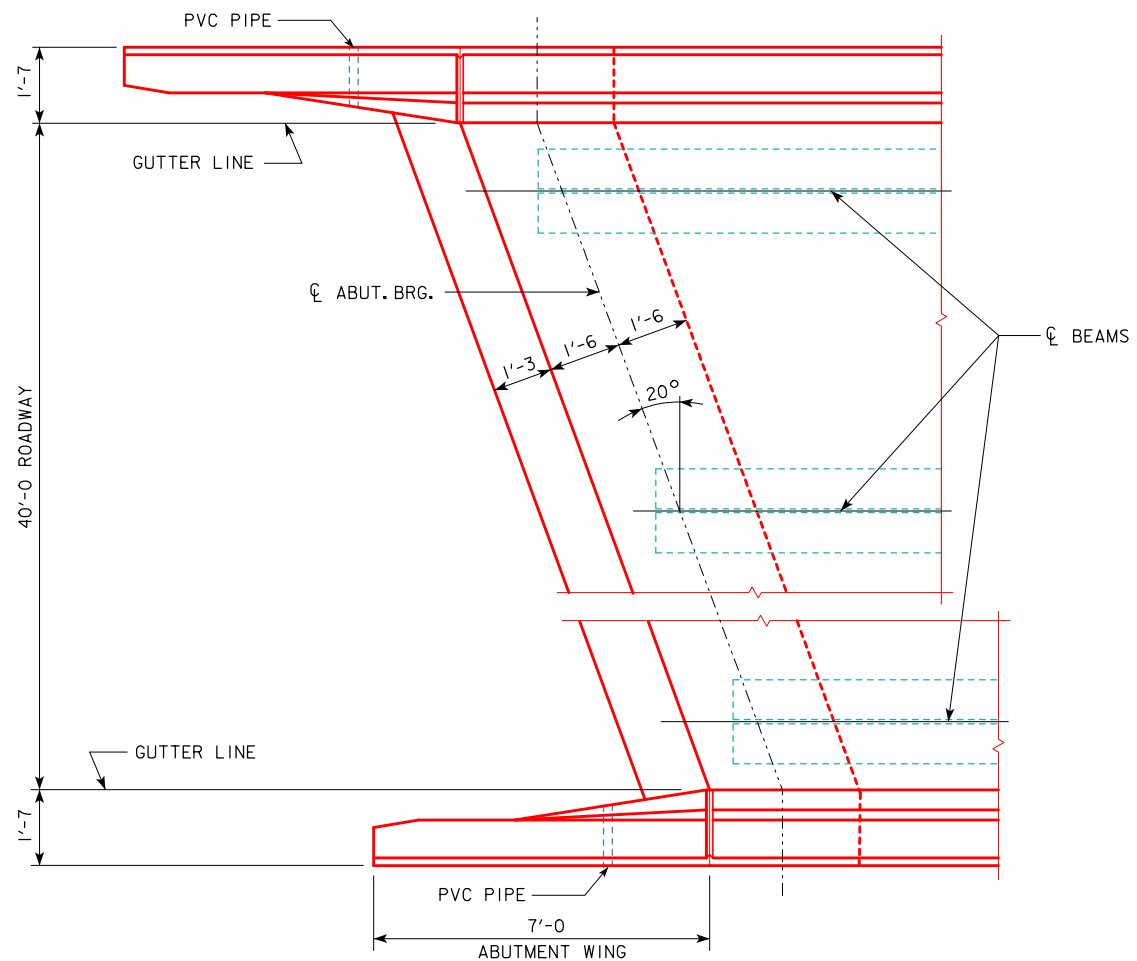
PART LONGITUDINAL SECTION NEAR GUTTER

PART END VIEW AT ABUTMENT

SECTION A-A

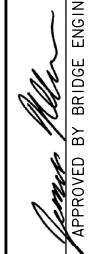

NOTE:
 PLUG 3" PVC PIPE WITH EXPANDING
 FOAM PRIOR TO BACKFILLING BEHIND
 ABUTMENTS.

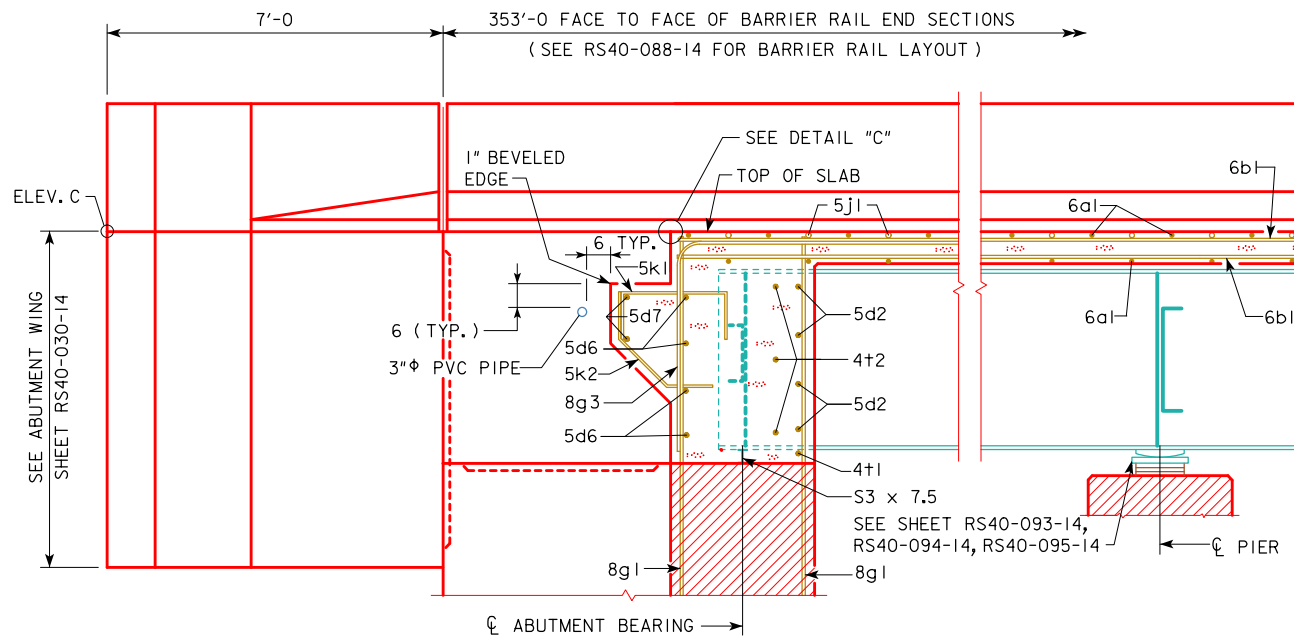
NOTE:
 FOR ELEVATION A, ELEVATION B AND
 DIMENSION C SEE "MISCELLANEOUS DETAILS"
 FOR THE APPROPRIATE LENGTH BRIDGE.



PART PLAN
 (STEEL DIAPHRAGMS NOT SHOWN)

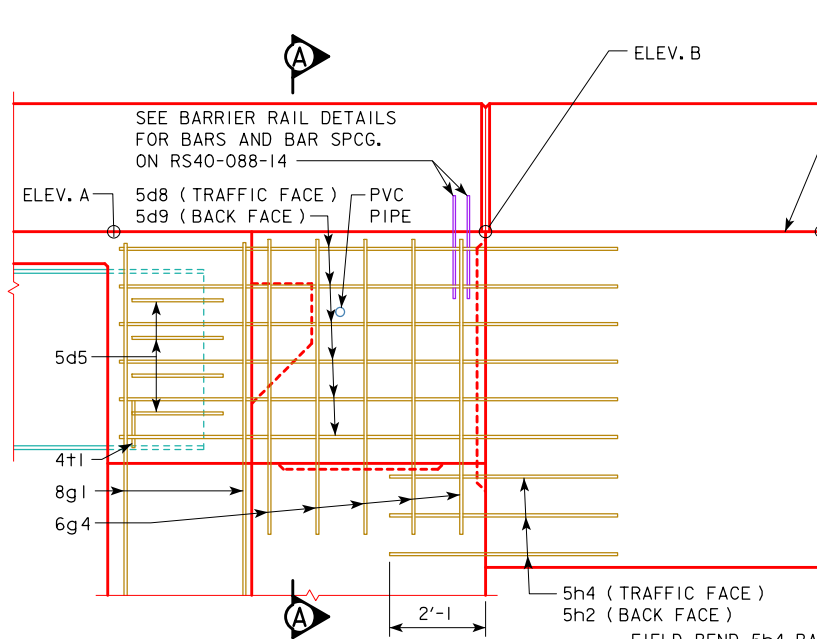
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE  APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	LONGITUDINAL SECTION 20° SKEW



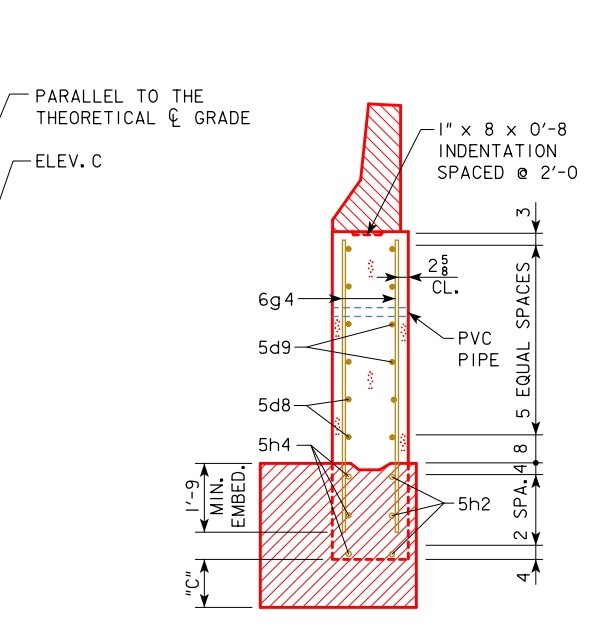
PART LONGITUDINAL SECTION NEAR GUTTER

NOTE:
PLUG 3" PVC PIPE WITH EXPANDING FOAM PRIOR TO BACKFILLING BEHIND ABUTMENTS.

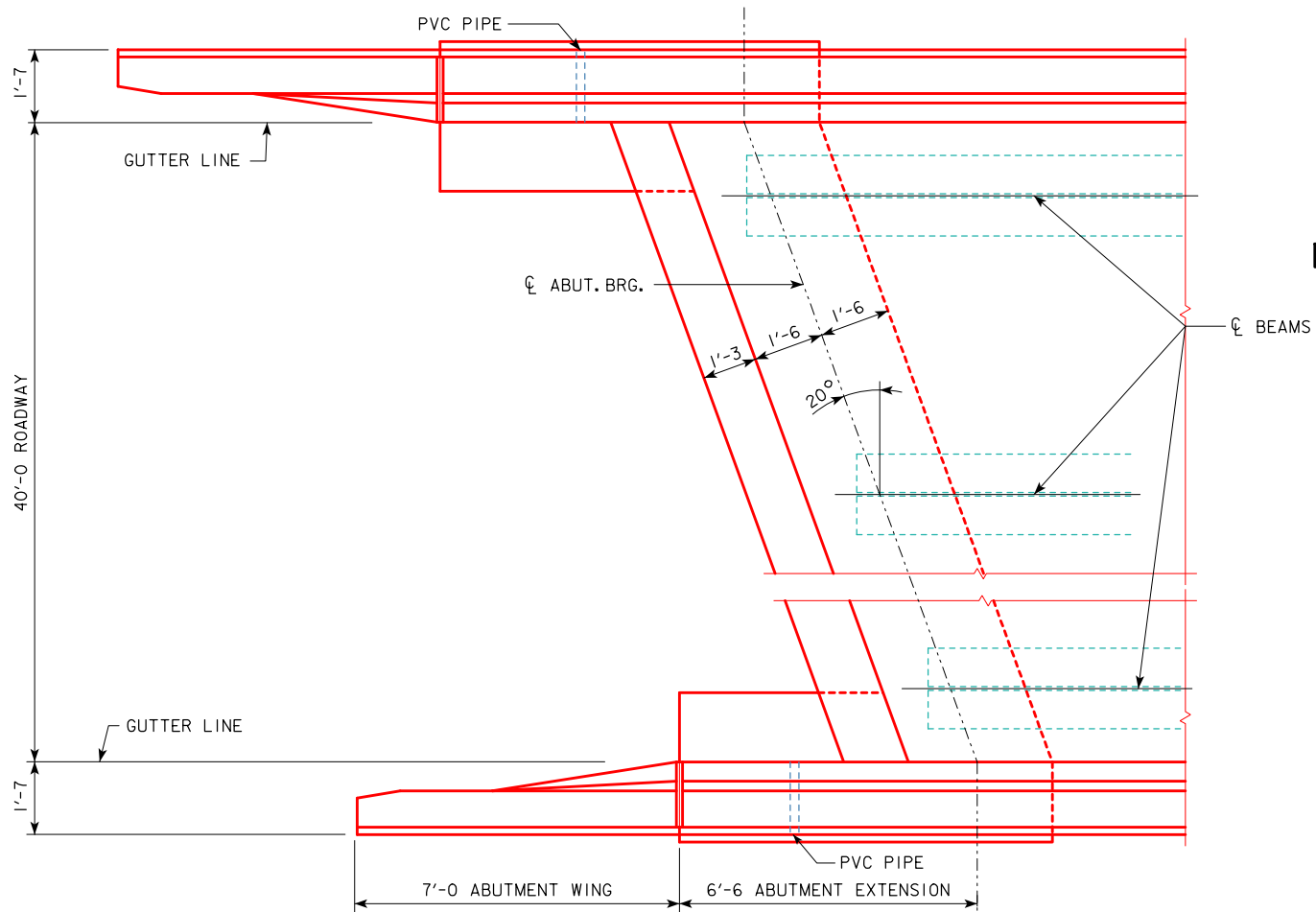


PART END VIEW AT ABUTMENT

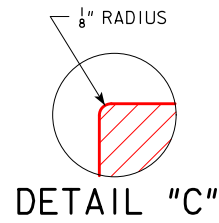
NOTE:
FOR ELEVATION A, ELEVATION B, ELEVATION C AND DIMENSION C SEE "MISCELLANEOUS DETAILS" FOR THE APPROPRIATE LENGTH BRIDGE.



SECTION A-A

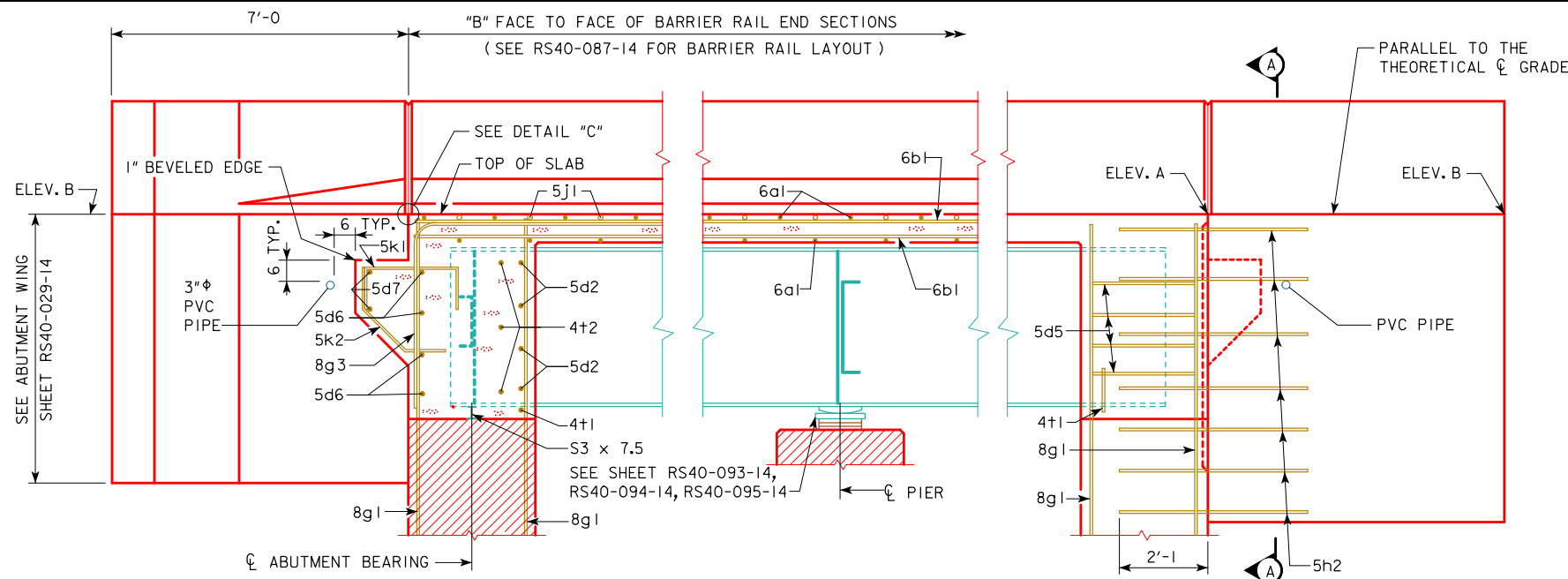


PART PLAN
(STEEL DIAPHRAGMS NOT SHOWN)



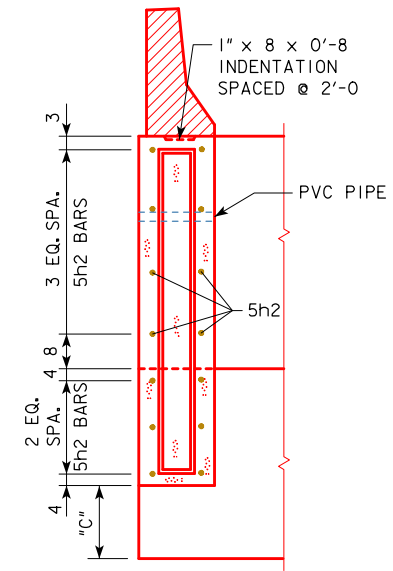
08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	LONGITUDINAL SECTION 20° SKEW RS40-024-14	
	OCTOBER, 2014		
	LONGITUDINAL SECTION 20° SKEW RS40-024-14		

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

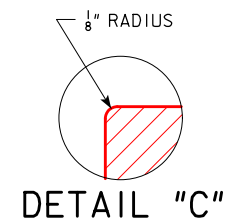


PART LONGITUDINAL SECTION NEAR GUTTER

PART END VIEW AT ABUTMENT



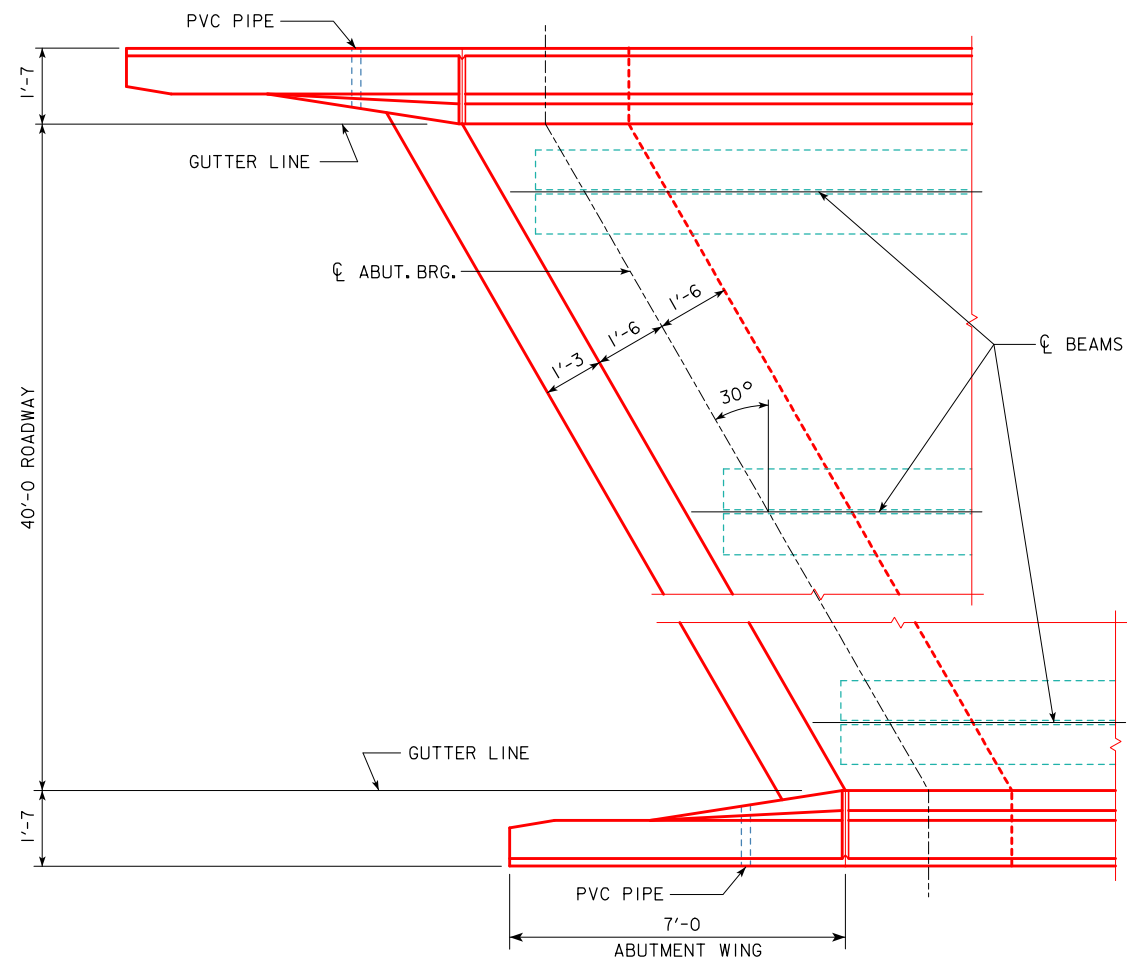
SECTION A-A



DETAIL "C"

NOTE:
PLUG 3" PVC PIPE WITH EXPANDING
FOAM PRIOR TO BACKFILLING BEHIND
ABUTMENTS.

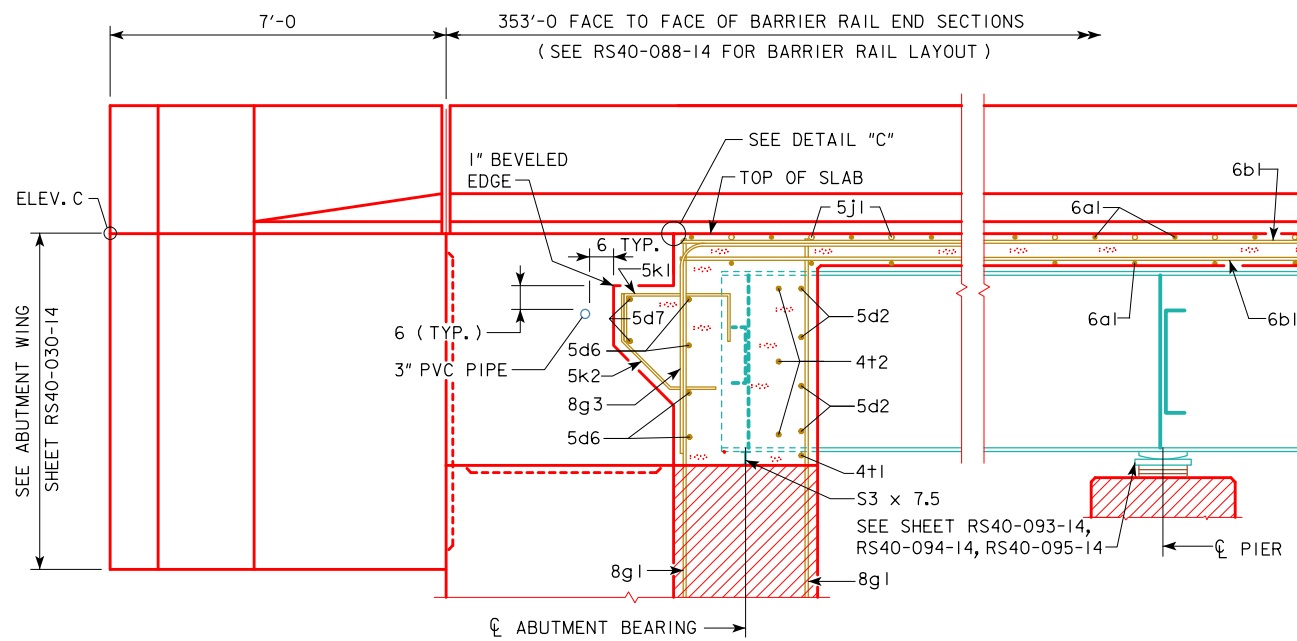
NOTE:
FOR ELEVATION A, ELEVATION B AND
DIMENSION C SEE "MISCELLANEOUS DETAILS"
FOR THE APPROPRIATE LENGTH BRIDGE.



PART PLAN
(STEEL DIAPHRAGMS NOT SHOWN)

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	LONGITUDINAL SECTION 30° SKEW	RS40-025-14	
	OCTOBER, 2014			
	LONGITUDINAL SECTION 30° SKEW			

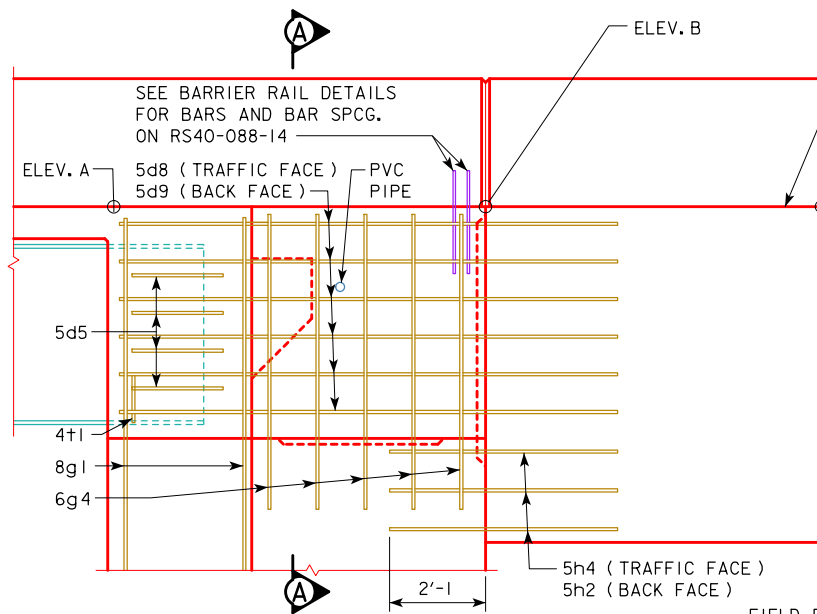
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



PART LONGITUDINAL SECTION NEAR GUTTER

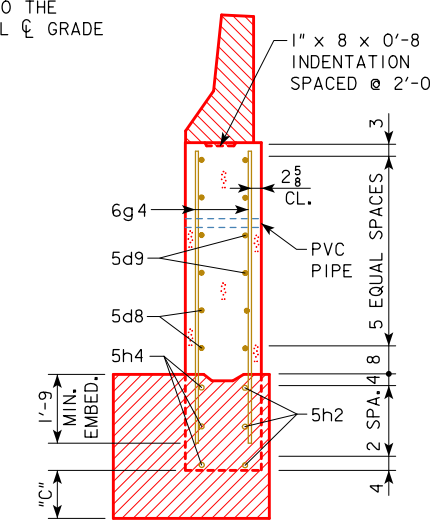
NOTE:
PLUG 3" ϕ PVC PIPE WITH
EXPANDING FOAM PRIOR
TO BACKFILLING BEHIND
ABUTMENTS.

NOTE:
FOR ELEVATION A, ELEVATION B, ELEVATION C AND
DIMENSION C SEE "MISCELLANEOUS DETAILS"
FOR THE APPROPRIATE LENGTH BRIDGE.

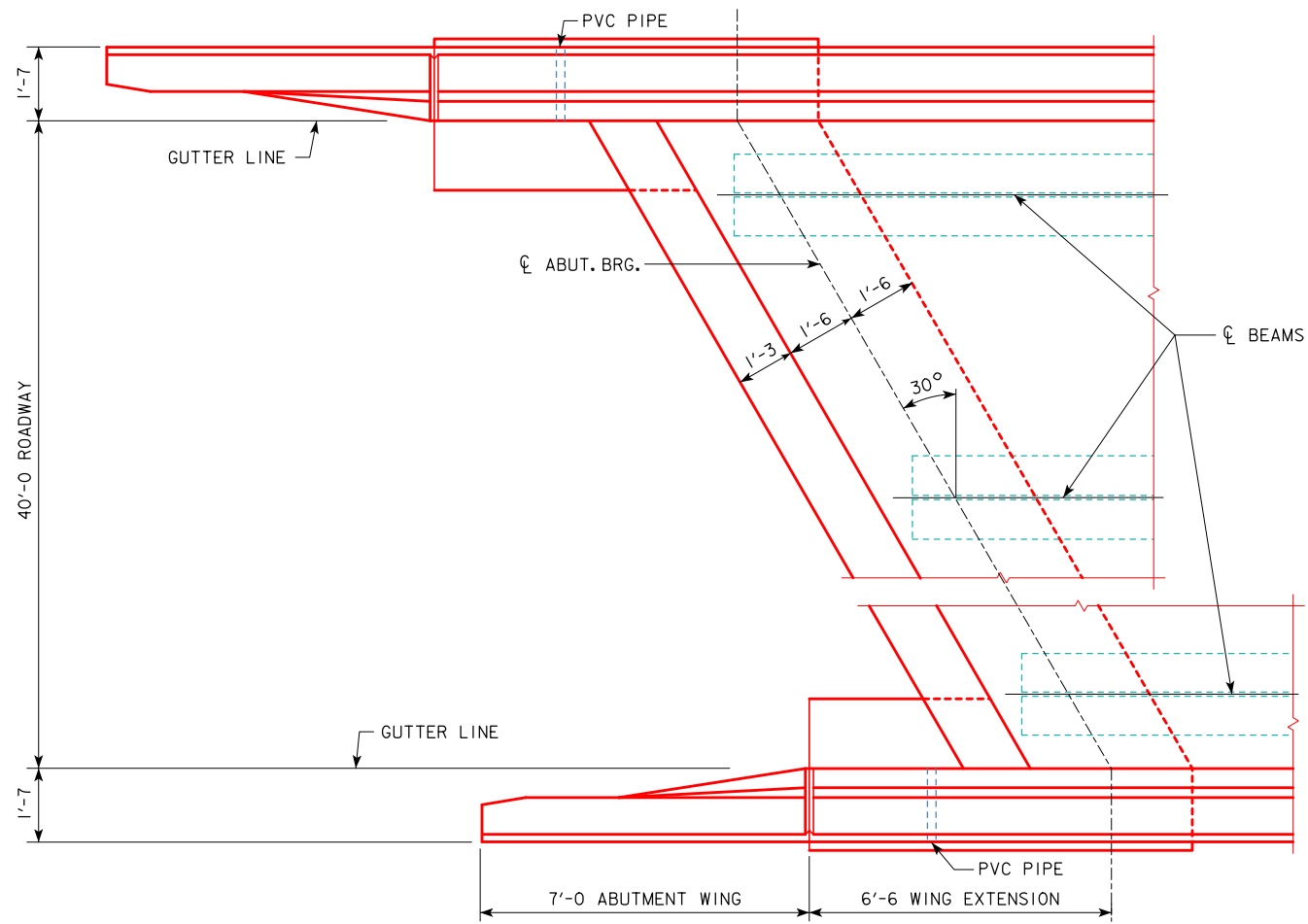


PART END VIEW AT ABUTMENT

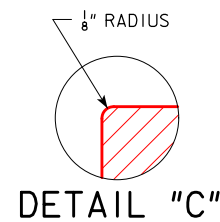
FIELD BEND 5h4 BAR
AS NECESSARY TO
AVOID PILE IN
ABUTMENT WING.



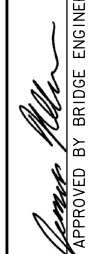

SECTION A-A



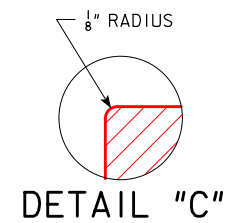
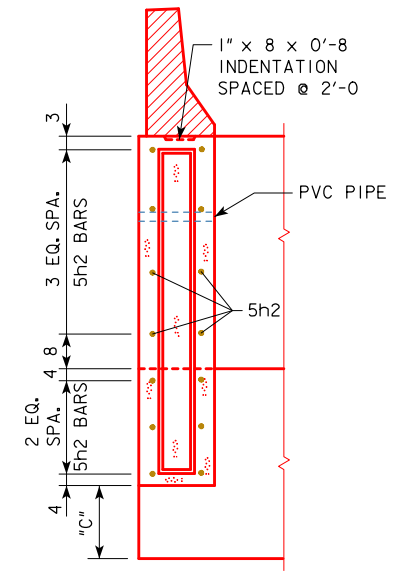
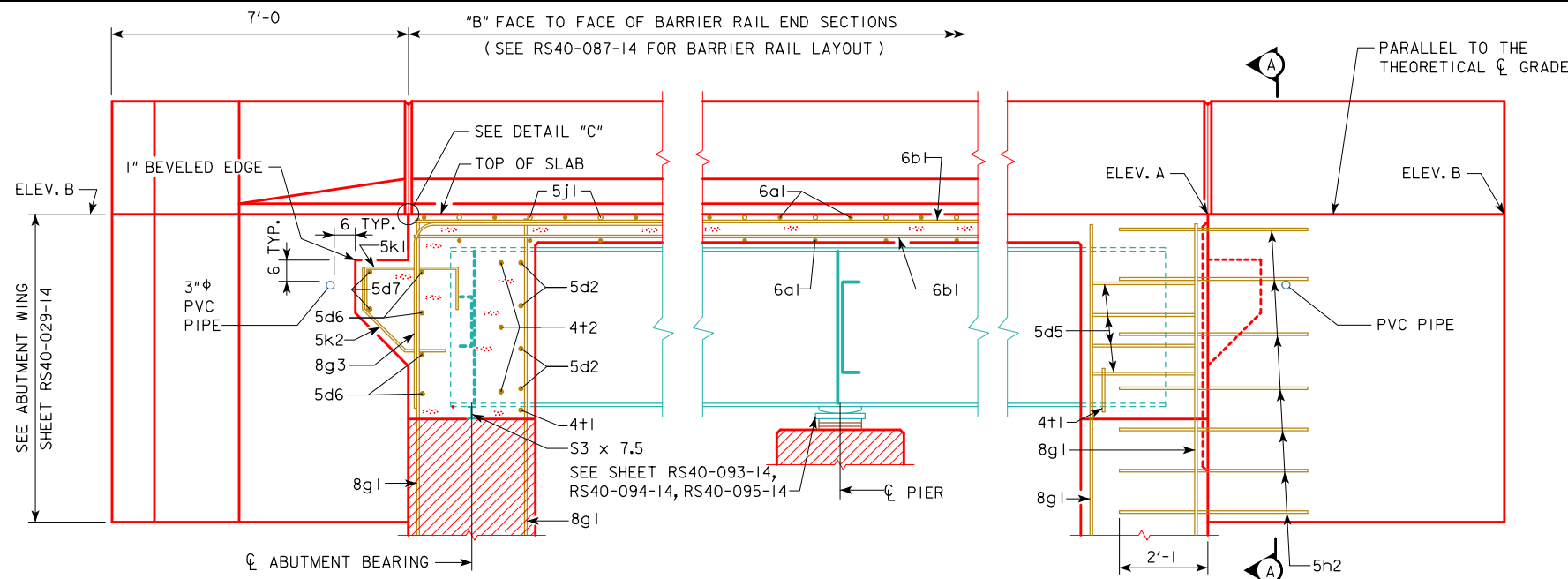
PART PLAN
(STEEL DIAPHRAGMS NOT SHOWN)



DETAIL "C"

08-2018 LATEST REVISION DATE  APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	LONGITUDINAL SECTION 30° SKEW RS40-026-14	
	LONGITUDINAL SECTION 30° SKEW		
	RS40-026-14		

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



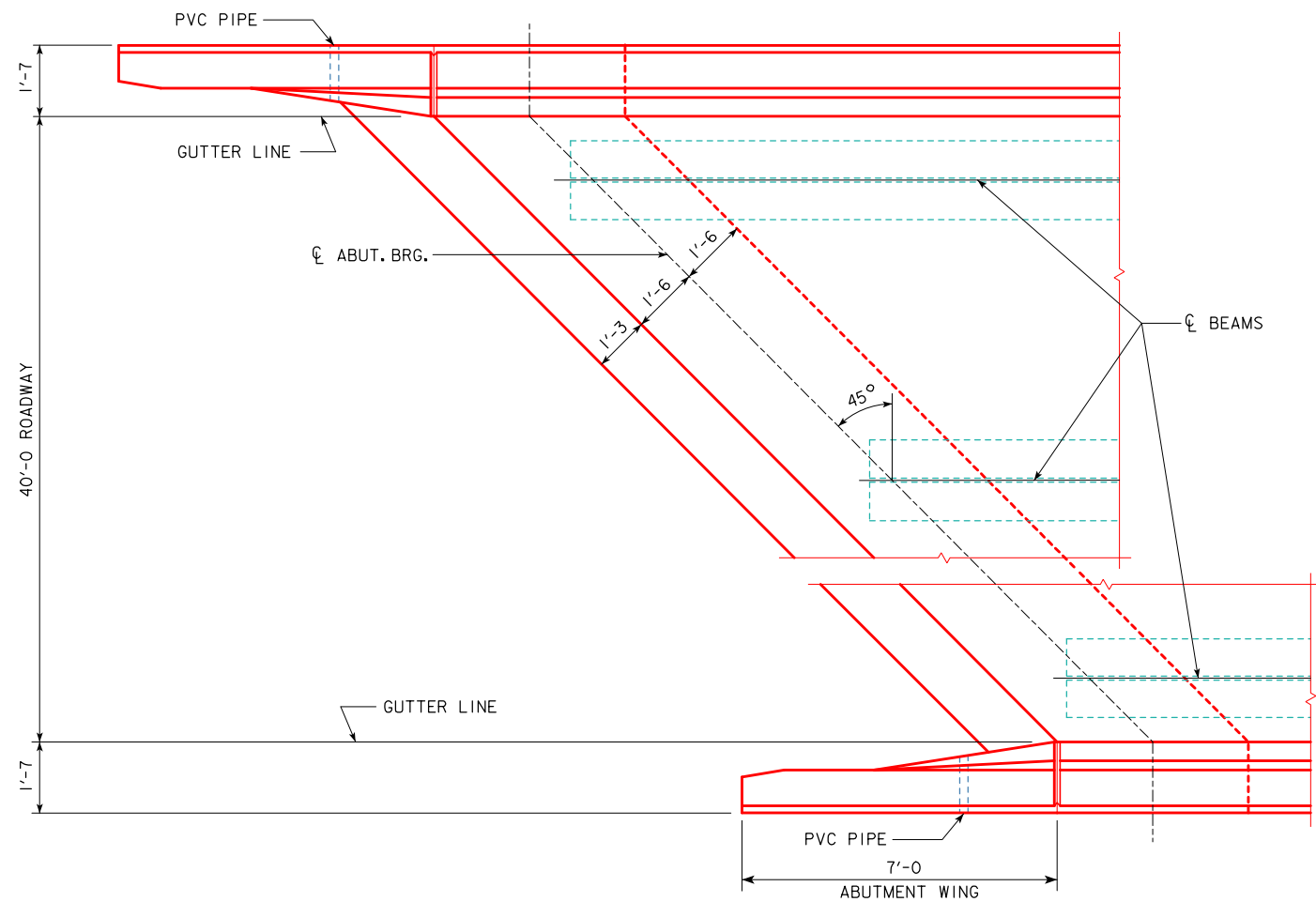
PART LONGITUDINAL SECTION NEAR GUTTER

PART END VIEW AT ABUTMENT



SECTION A-A

NOTE:
PLUG 3" PVC PIPE WITH EXPANDING
FOAM PRIOR TO BACKFILLING BEHIND
ABUTMENTS.

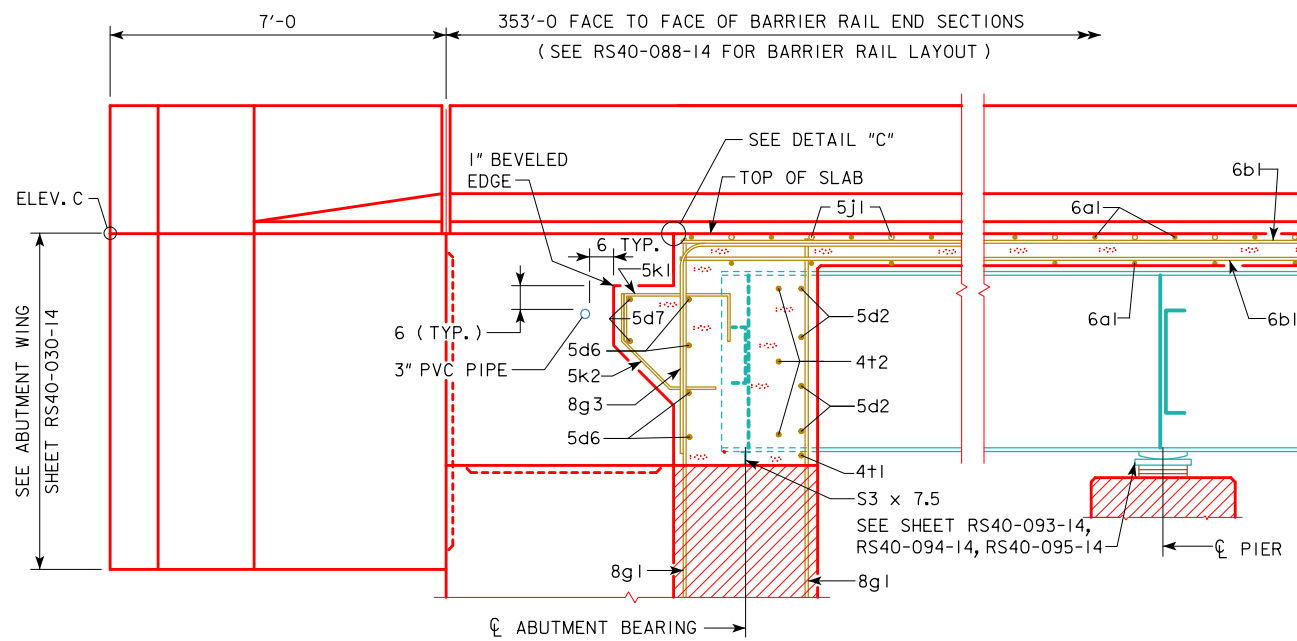
NOTE:
FOR ELEVATION A, ELEVATION B AND
DIMENSION C SEE "MISCELLANEOUS DETAILS"
FOR THE APPROPRIATE LENGTH BRIDGE.



PART PLAN
(STEEL DIAPHRAGMS NOT SHOWN)

08-2018 LATEST REVISION DATE  APPROVED BY BRIDGE ENGINEER	
	STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	LONGITUDINAL SECTION 45° SKEW

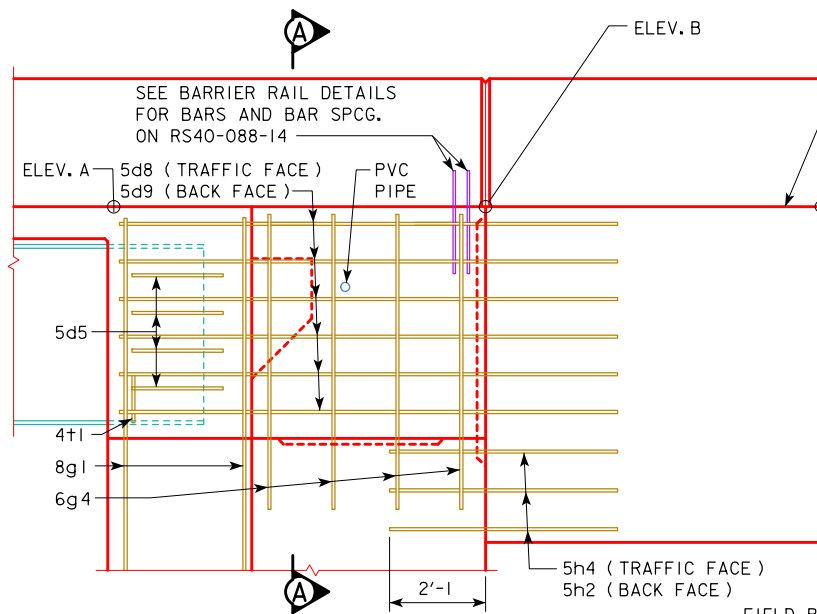
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



PART LONGITUDINAL SECTION NEAR GUTTER

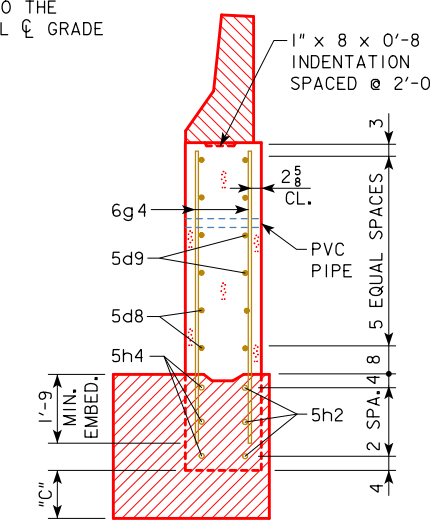
NOTE:
PLUG 3" ϕ PVC PIPE WITH EXPANDING FOAM PRIOR TO BACKFILLING BEHIND ABUTMENTS.

NOTE:
FOR ELEVATION A, ELEVATION B, ELEVATION C AND DIMENSION C SEE "MISCELLANEOUS DETAILS" FOR THE APPROPRIATE LENGTH BRIDGE.

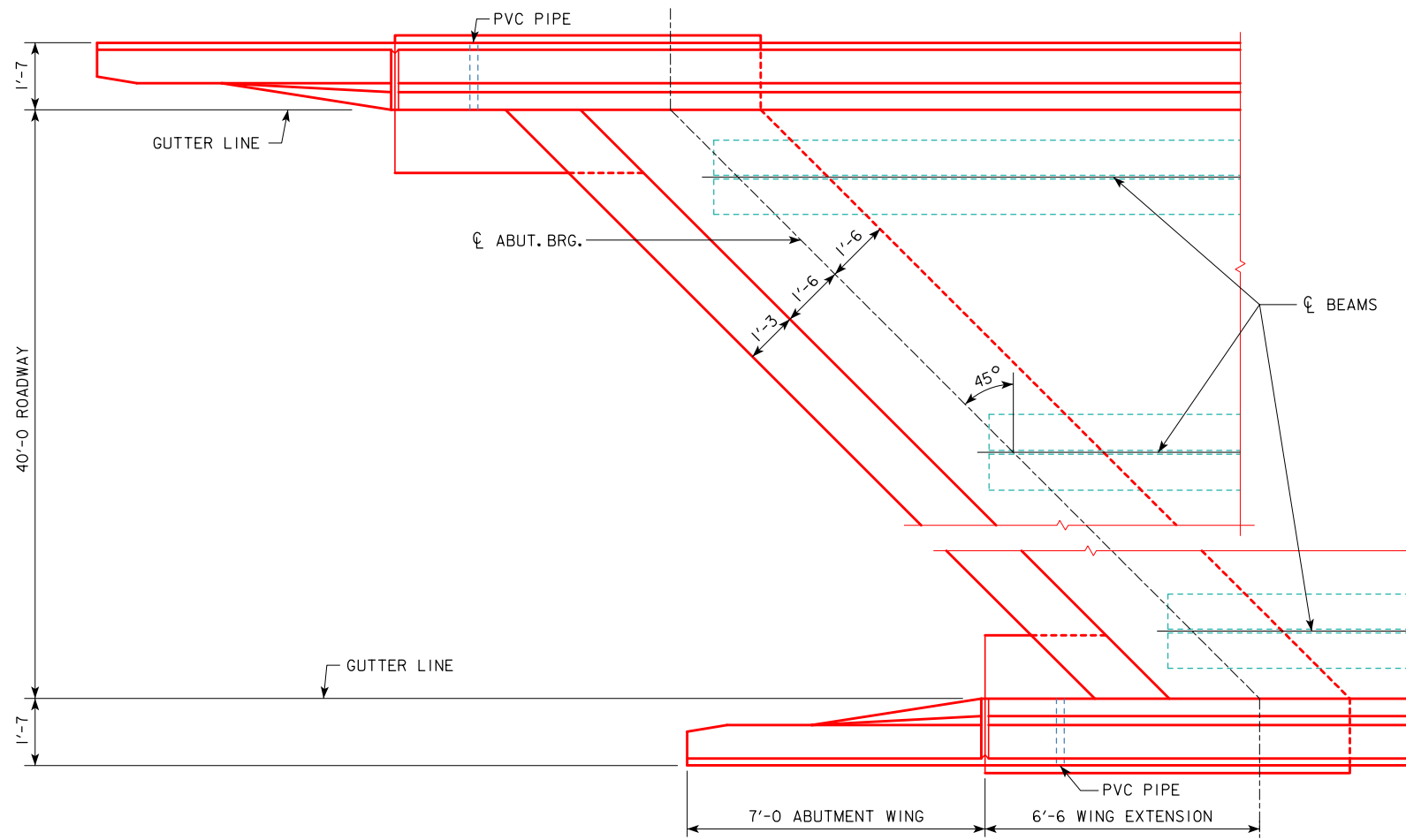


PART END VIEW AT ABUTMENT

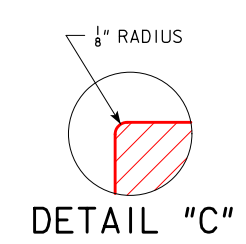
FIELD BEND 5h4 BAR AS NECESSARY TO AVOID PILE IN ABUTMENT WING.



SECTION A-A



PART PLAN
(STEEL DIAPHRAGMS NOT SHOWN)

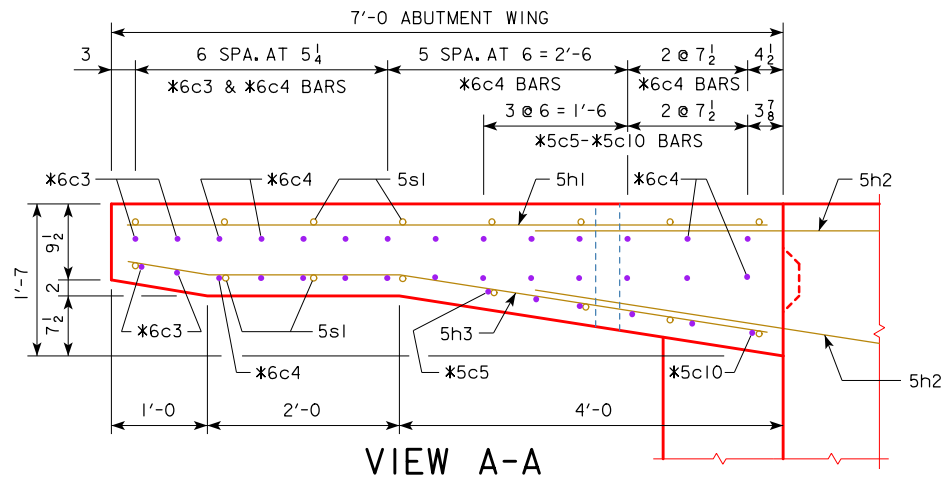


DETAIL "C"

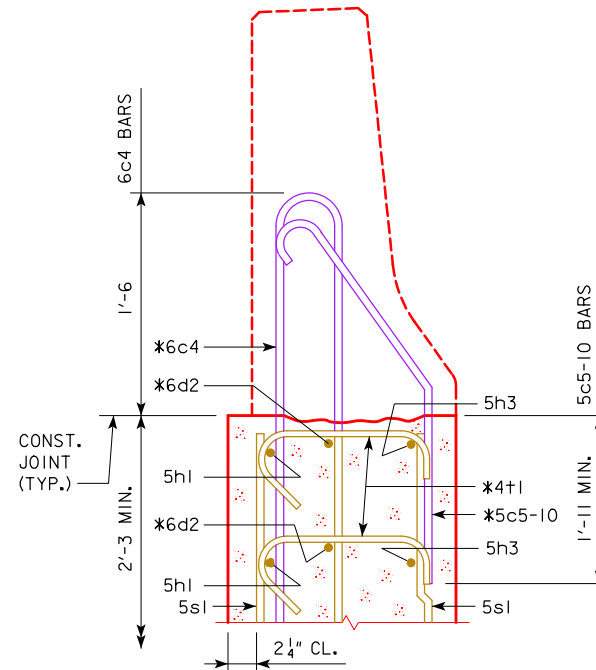
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
	LONGITUDINAL SECTION 45° SKEW	RS40-028-14

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



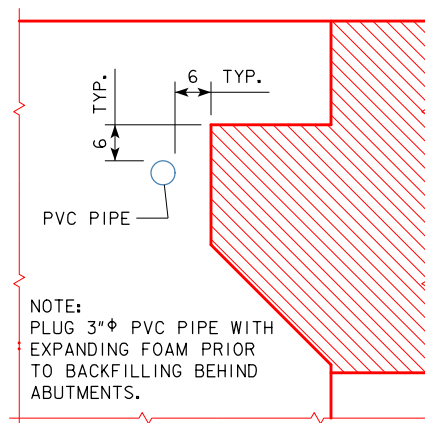
NOTE:
PLUG 3" ϕ PVC PIPE WITH
EXPANDING FOAM PRIOR
TO BACKFILLING BEHIND
ABUTMENTS.



SECTION B-B

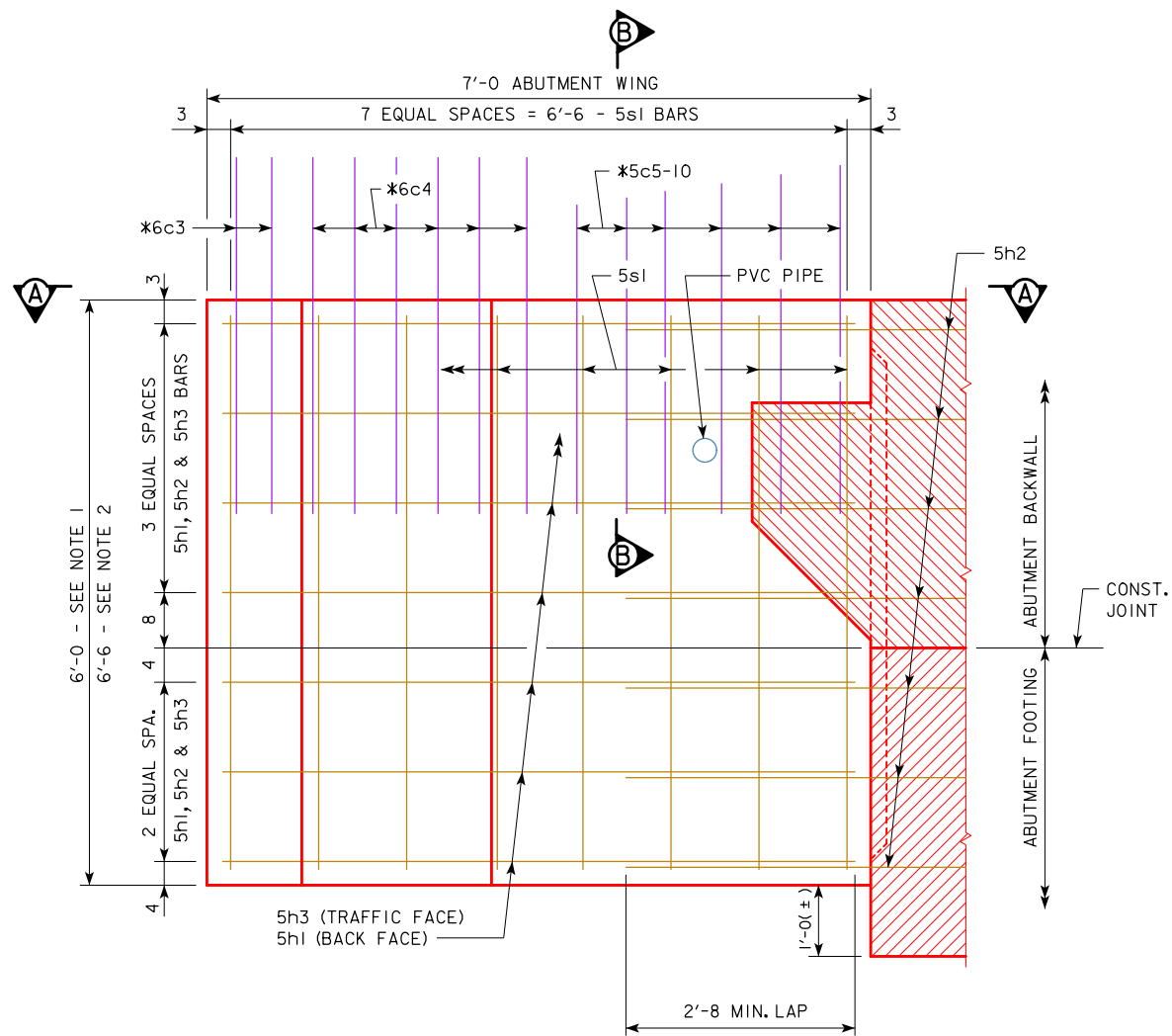
* BARRIER RAIL END SECTION
BARS TO BE PLACED WITH
ABUTMENT WING.

SEE END SECTION DETAILS ON
SHEET RS40-089-14 FOR DETAILS
OF BARRIER RAIL END SECTION.
REINFORCING BARS 6c3, 6c4,
5c5-10, 6d2 & 4+1 ARE
INCLUDED IN THE BARRIER
RAIL QUANTITIES.



NOTE:
PLUG 3" ϕ PVC PIPE WITH
EXPANDING FOAM PRIOR
TO BACKFILLING BEHIND
ABUTMENTS.

PVC PIPE LOCATION



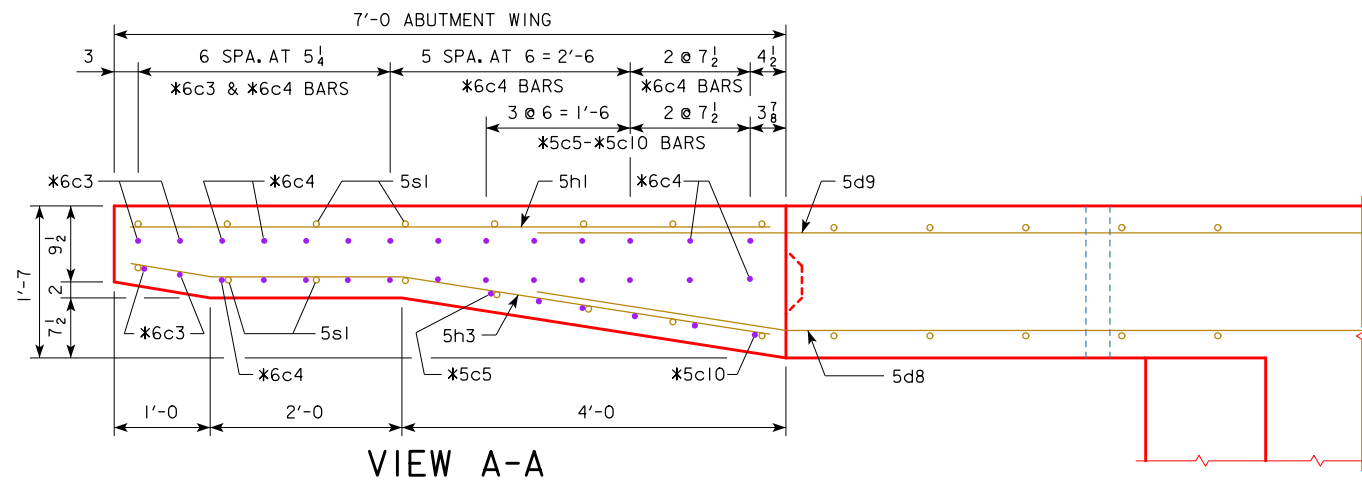
ABUTMENT WING - ELEVATION VIEW

NOTE:

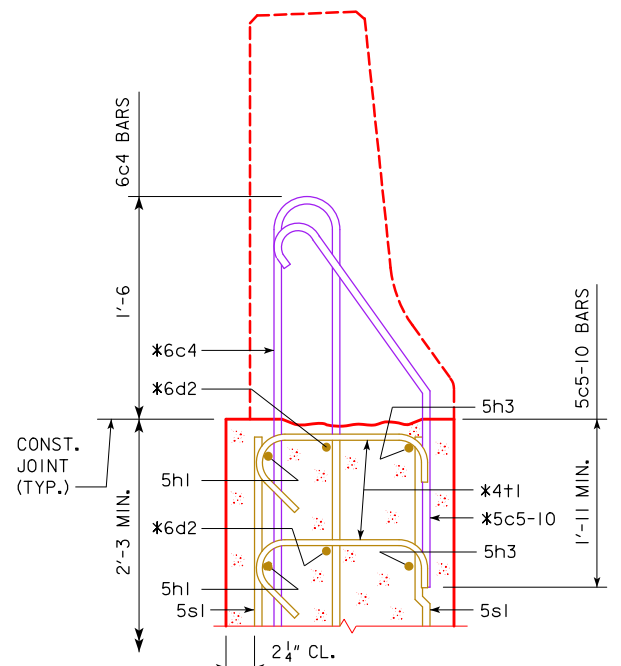
1. USE FOR BRIDGES 160'-0" THRU 200'-0."
2. USE FOR BRIDGES 220'-0" THRU 320'-0."
3. REINFORCING STEEL QUANTITY IS INCLUDED IN THE DECK AND ABUTMENT REINFORCEMENT QUANTITIES.
4. SEE CONCRETE PLACEMENT QUANTITIES TABLE FOR VALUES.

08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
ABUTMENT WING DETAILS BRIDGES 160'-0" - 320'-0"		RS40-029-14

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



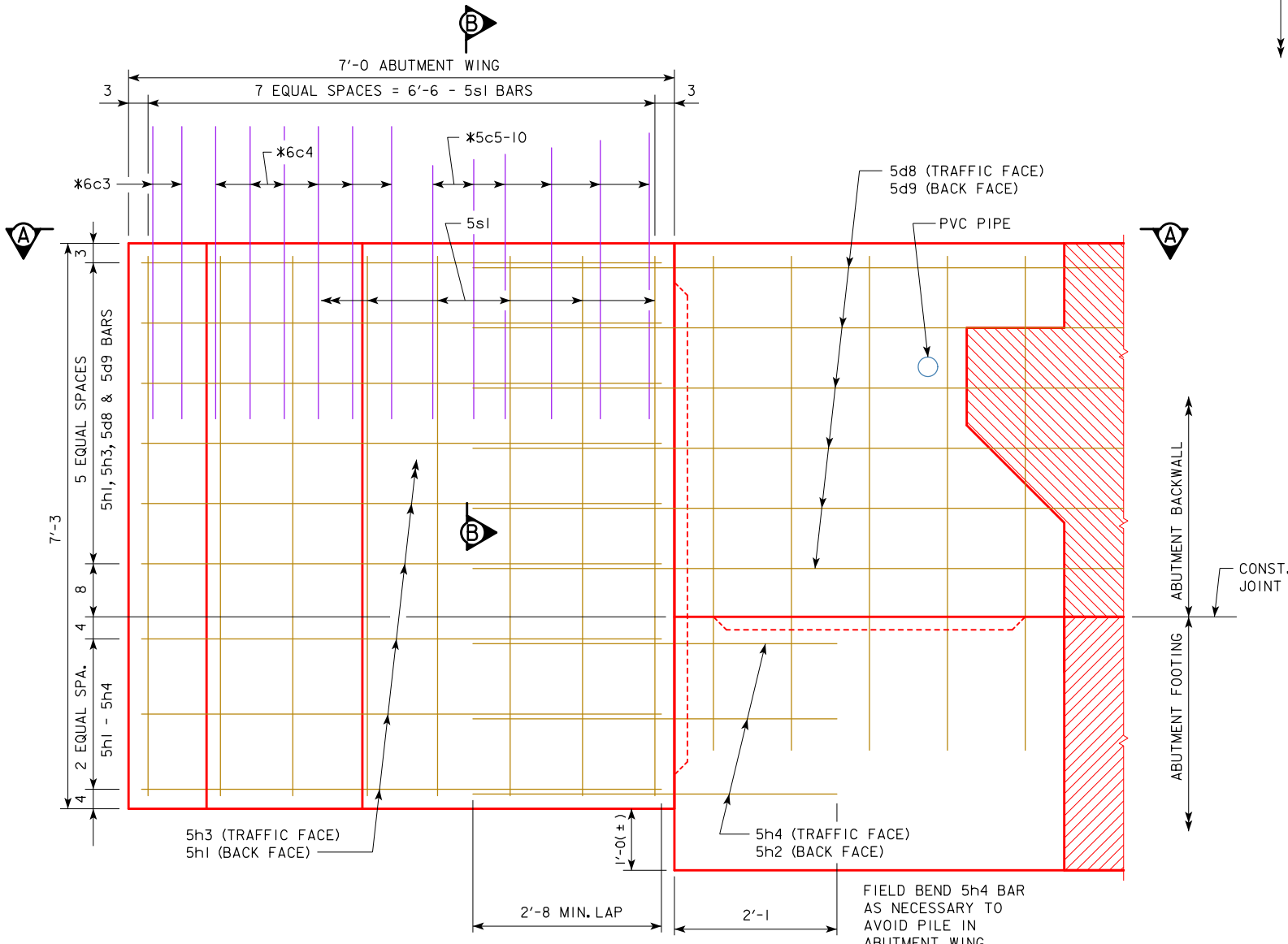
VIEW A-A



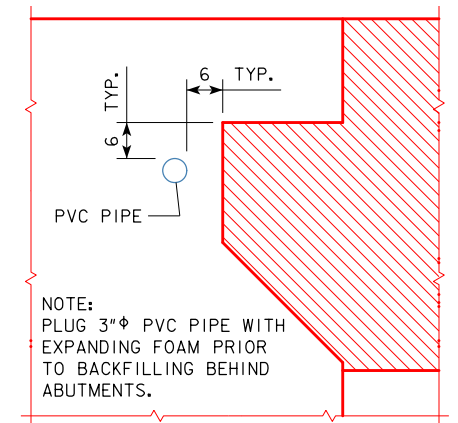
SECTION B-B

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

SEE END SECTION DETAILS ON SHEET RS40-089-14 FOR DETAILS OF BARRIER RAIL END SECTION. REINFORCING BARS 6c3, 6c4, 5c5-10, 6d2 & 4+1 ARE INCLUDED IN THE BARRIER RAIL QUANTITIES.



ABUTMENT WING - ELEVATION VIEW



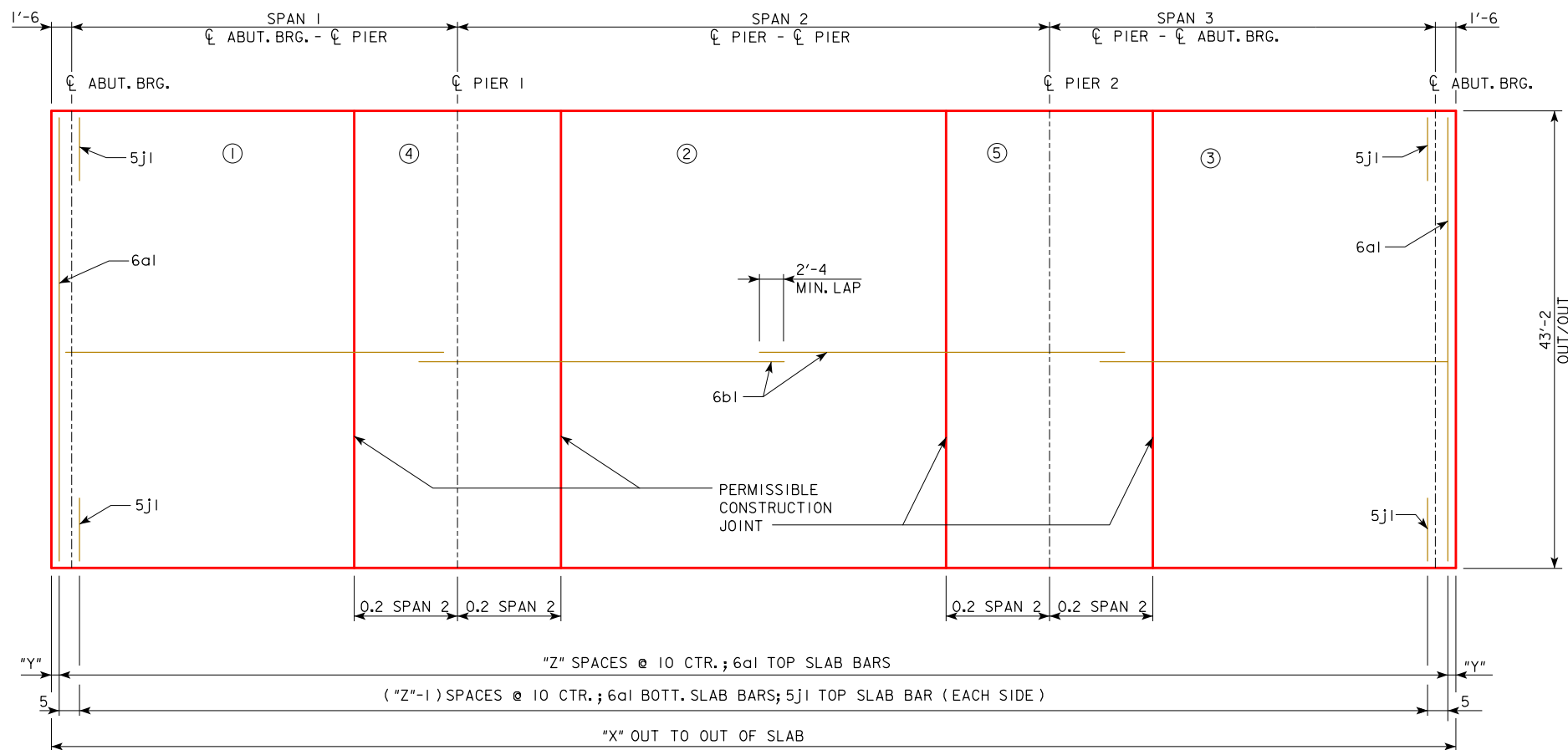
PVC PIPE LOCATION

NOTE:

1. USE FOR 340'-0 BRIDGES.
2. REINFORCING STEEL QUANTITY IS INCLUDED IN THE DECK AND ABUTMENT REINFORCEMENT QUANTITIES.
3. SEE CONCRETE PLACEMENT QUANTITIES TABLE FOR VALUES.

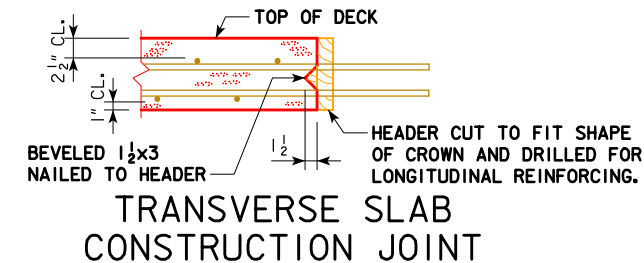
<p>08-2018 LATEST REVISION DATE</p>	<p>APPROVED BY BRIDGE ENGINEER</p>	<p>IOWADOT Highway Division</p> <p>STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES</p> <p>ROLLED STEEL BEAM BRIDGES</p> <p>OCTOBER, 2014</p>
<p>ABUTMENT WING DETAILS BRIDGE 340'-0</p>		<p>RS40-030-14</p>

REVISED 07-2015 - CHANGED NOTE 1, CONCRETE PLACEMENT NOTE TO ACCOUNT FOR THE POSSIBLE ADDITION OF A RETARDING ADMIXTURE TO THE CONCRETE.
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



CONCRETE PLACEMENT DIAGRAM SHOWING SLAB REINFORCING

SPAN LENGTHS			
BRIDGE LENGTH	SPAN 1	SPAN 2	SPAN 3
160'-0	48'-0	64'-0	48'-0
180'-0	54'-0	72'-0	54'-0
200'-0	60'-0	80'-0	60'-0
220'-0	66'-0	88'-0	66'-0
240'-0	72'-0	96'-0	72'-0
260'-0	78'-0	104'-0	78'-0
280'-0	84'-0	112'-0	84'-0
300'-0	90'-0	120'-0	90'-0
320'-0	96'-0	128'-0	96'-0
340'-0	102'-0	136'-0	102'-0



NOTES:

- CONCRETE DECK SHALL BE PLACED IN SECTIONS AND SEQUENCES INDICATED. ALTERNATE PROCEDURES FOR PLACING DECK CONCRETE MAY BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF THE PROPOSED METHOD AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULTS. FOR APPROVED ALTERNATE PROCEDURES THE ENGINEER SHALL DETERMINE IF A RETARDING ADMIXTURE IS REQUIRED TO MAINTAIN PLASTICITY OF THE CONCRETE DECK DURING PLACEMENT.

REINFORCEMENT DIMENSIONS CL-CL ABUTMENT BEARINGS	160'-0	180'-0	200'-0	220'-0	240'-0	260'-0	280'-0	300'-0	320'-0	340'-0
X (F.T-IN.)	163'-0	183'-0	203'-0	223'-0	243'-0	263'-0	283'-0	303'-0	323'-0	343'-0
Y (IN.)	3	3	3	3	3	3	3	3	3	3
Z (SPACES)	195	219	243	267	291	315	339	363	387	411

Δ NOTE:
CONCRETE QUANTITIES SHALL BE LISTED ON THE SUMMARY QUANTITIES SHEET.

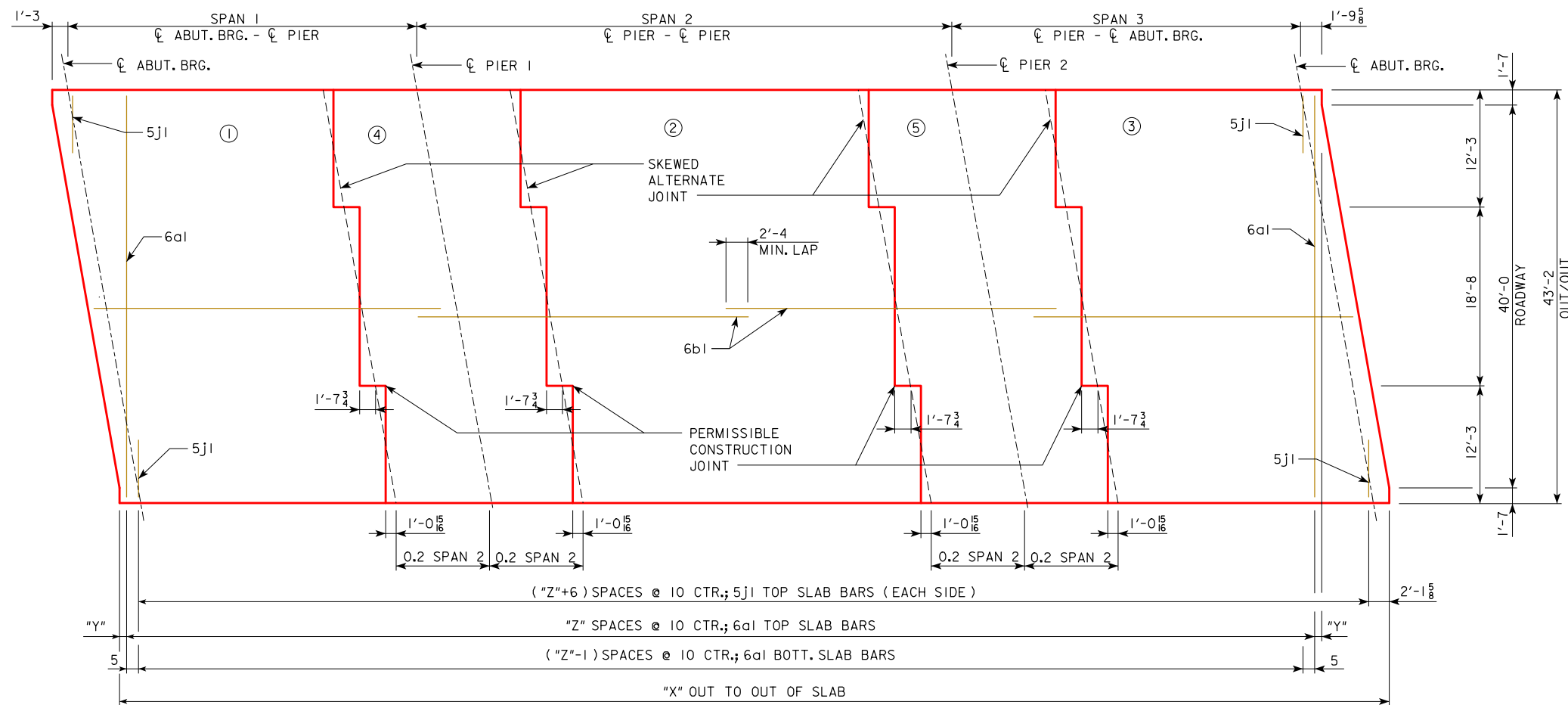
Δ CONCRETE PLACEMENT QTYS. (SUPERSTRUCTURE PLUS INTEGRAL ABUTMENTS)		160'-0	180'-0	200'-0	220'-0	240'-0	260'-0	280'-0	300'-0	320'-0	340'-0
SLAB, AND ABUT DIAPHRAGM, SECTION 1 & 3	CY	113.8	123.8	136.0	147.9	157.8	169.7	179.6	189.6	199.7	212.4
SLAB, SECTION 2	CY	42.1	47.4	52.7	58.0	63.2	68.7	74.0	79.2	84.5	89.8
SLAB, SECTION 4 & 5	CY	56.1	63.2	70.2	77.3	84.3	91.6	98.6	105.7	112.7	119.8
ABUTMENT WINGS	CY	7.2	7.2	7.2	7.6	7.6	7.6	7.6	7.6	7.6	13.9
TWO ABUTMENT FOOTINGS	CY	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	42.8
TOTAL	CY	254.2	276.6	301.1	325.8	347.9	372.6	394.8	417.1	439.5	478.7

ESTIMATED QTYS. (SUPERSTRUCTURE PLUS INTEGRAL ABUTMENTS)		160'-0	180'-0	200'-0	220'-0	240'-0	260'-0	280'-0	300'-0	320'-0	340'-0
NO. OF STEEL H-PILES FOR TWO ABUTMENTS (HP 10 X 57)	NO.	16	16	16	18	18	18	20	20	20	24
BARRIER RAILS	LF	354.0	394.0	434.0	474.0	514.0	554.0	594.0	634.0	674.0	734.0
WING ARMORING - MACADAM STONE	SY	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	5.7
PREBORED HOLES	LF	160	160	160	180	180	180	200	200	200	240

NOTE:
FOR QUANTITIES OF STRUCTURAL CONCRETE, REINFORCING STEEL AND STRUCTURAL STEEL REFER TO THE SUMMARY QUANTITIES SHEET IN THE BRIDGE PLANS.

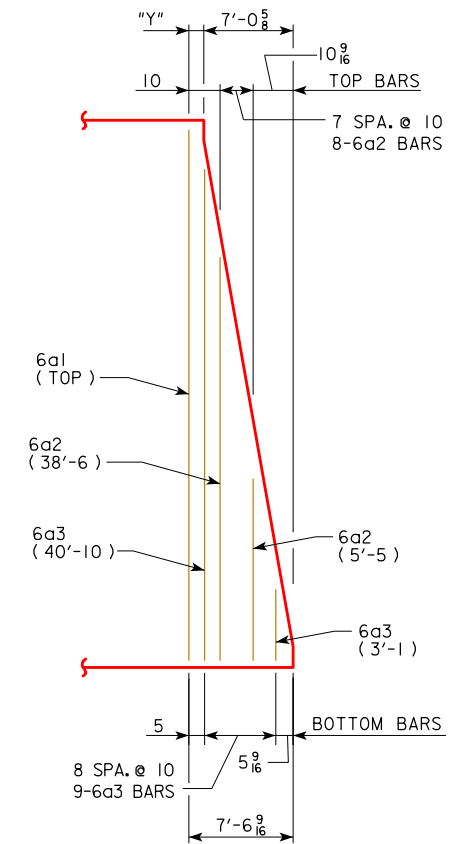
08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER <i>[Signature]</i>	IOWADOT Highway Division	
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
		SUPERSTRUCTURE QUANTITIES 0° SKEW	RS40-031-14

REVISED 07-2015 - CHANGED NOTE 1, CONCRETE PLACEMENT NOTE TO ACCOUNT FOR THE POSSIBLE ADDITION OF A RETARDING ADMIXTURE TO THE CONCRETE.
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



CONCRETE PLACEMENT DIAGRAM SHOWING SLAB REINFORCING (RIGHT AHEAD SKEW SHOWN, LEFT AHEAD SKEW SIMILAR)

END OF SLAB REINFORCING
(TYPICAL EACH END OF DECK)



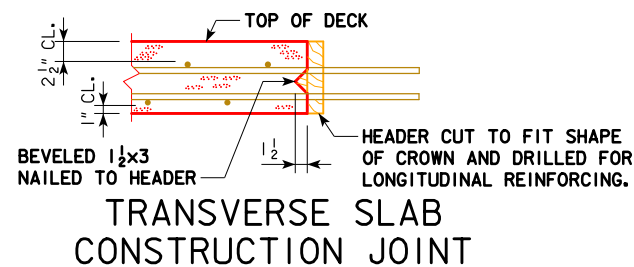
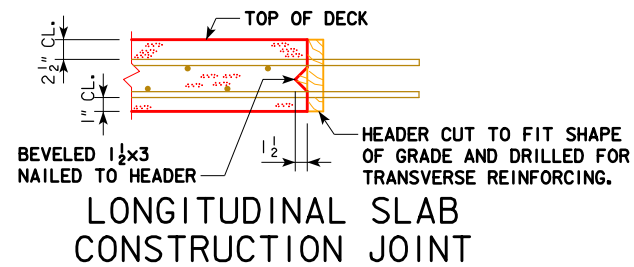
REINFORCEMENT DIMENSIONS CL-CL ABUTMENT BEARINGS	160'-0	180'-0	200'-0	220'-0	240'-0	260'-0	280'-0	300'-0	320'-0	340'-0
X (FT.-IN.)	163'-0 ⁵ / ₈	183'-0 ⁵ / ₈	203'-0 ⁵ / ₈	223'-0 ⁵ / ₈	243'-0 ⁵ / ₈	263'-0 ⁵ / ₈	283'-0 ⁵ / ₈	303'-0 ⁵ / ₈	323'-0 ⁵ / ₈	343'-0 ⁵ / ₈
Y (IN.)	5 ¹⁵ / ₁₆	5 ¹⁵ / ₁₆	5 ¹⁵ / ₁₆	5 ¹⁵ / ₁₆	5 ¹⁵ / ₁₆	5 ¹⁵ / ₁₆	5 ¹⁵ / ₁₆	5 ¹⁵ / ₁₆	5 ¹⁵ / ₁₆	5 ¹⁵ / ₁₆
Z (SPACES)	186	210	234	258	282	306	330	354	378	402

Δ NOTE:
CONCRETE QUANTITIES SHALL BE LISTED ON THE SUMMARY QUANTITIES SHEET.

Δ CONCRETE PLACEMENT QTYS. (SUPERSTRUCTURE PLUS INTEGRAL ABUTMENTS)	160'-0	180'-0	200'-0	220'-0	240'-0	260'-0	280'-0	300'-0	320'-0	340'-0
SLAB, AND ABUT DIAPHRAGM, SECTION 1 & 3	CY 114.4	124.4	136.7	148.5	158.5	170.3	180.3	190.3	200.4	213.1
SLAB, SECTION 2	CY 42.1	47.4	52.7	58.0	63.2	68.7	74.0	79.2	84.5	89.8
SLAB, SECTION 4 & 5	CY 56.1	63.2	70.2	77.3	84.3	91.6	98.6	105.7	112.7	119.8
ABUTMENT WINGS	CY 7.2	7.2	7.2	7.6	7.6	7.6	7.6	7.6	7.6	13.9
TWO ABUTMENT FOOTINGS	CY 35.5	35.5	35.5	35.5	35.5	35.5	35.5	35.5	35.5	43.3
TOTAL	CY 255.3	277.7	302.3	326.9	349.1	373.7	396.0	418.3	440.7	479.9

ESTIMATED QTYS. (SUPERSTRUCTURE PLUS INTEGRAL ABUTMENTS)	160'-0	180'-0	200'-0	220'-0	240'-0	260'-0	280'-0	300'-0	320'-0	340'-0
NO. OF STEEL H-PILES FOR TWO ABUTMENTS (HP 10 X 57) AND DESIGN BEARING REQUIRED PER PILE	NO. 16	16	16	18	18	18	20	20	20	24
BARRIER RAILS	LF 354.1	394.1	434.1	474.1	514.1	554.1	594.1	634.1	674.1	734.0
WING ARMORING - MACADAM STONE	SY 3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	5.7
PREBORED HOLES	LF 160	160	160	180	180	180	200	200	200	240

NOTE:
FOR QUANTITIES OF STRUCTURAL CONCRETE, REINFORCING STEEL AND STRUCTURAL STEEL REFER TO THE SUMMARY QUANTITIES SHEET IN THE BRIDGE PLANS.



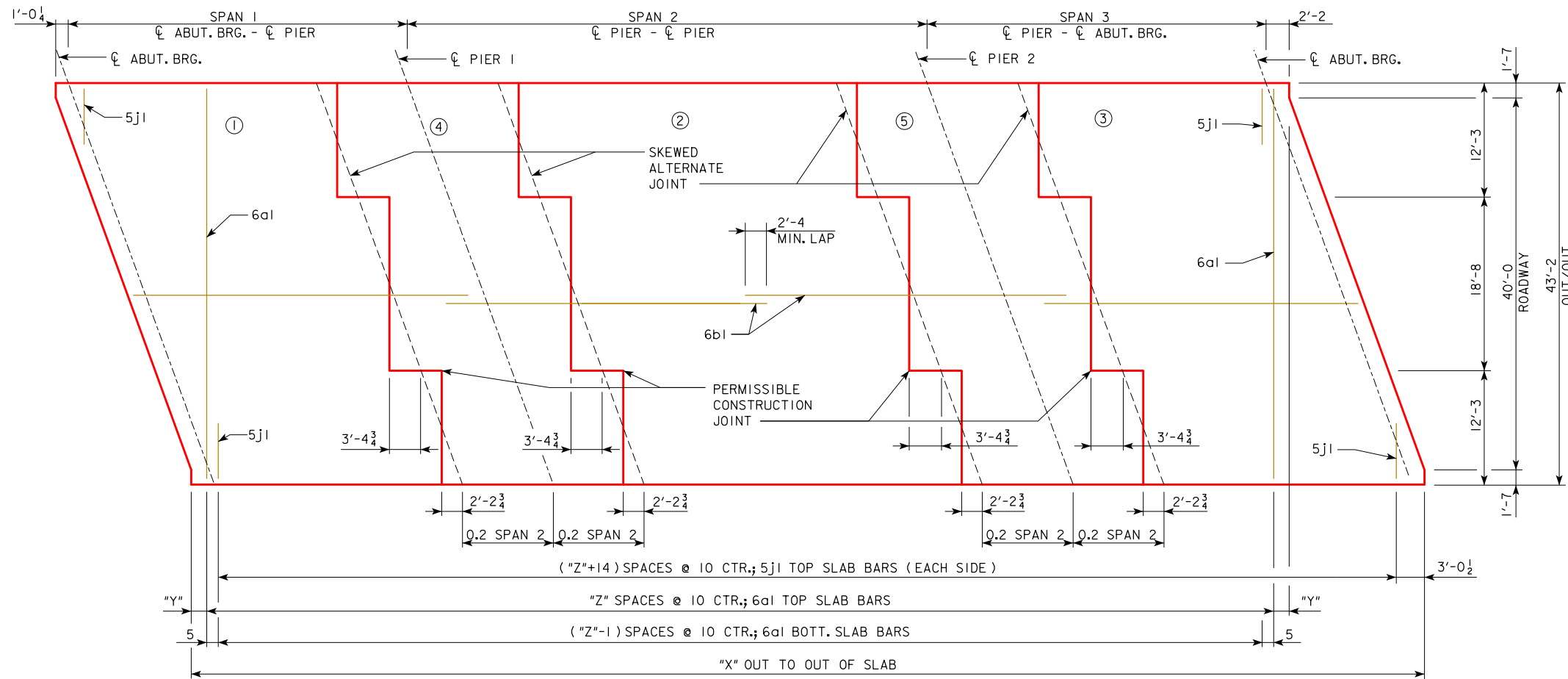
NOTES:

- CONCRETE DECK SHALL BE PLACED IN SECTIONS AND SEQUENCES INDICATED. ALTERNATE PROCEDURES FOR PLACING DECK CONCRETE MAY BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF THE PROPOSED METHOD AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULTS. FOR APPROVED ALTERNATE PROCEDURES THE ENGINEER SHALL DETERMINE IF A RETARDING ADMIXTURE IS REQUIRED TO MAINTAIN PLASTICITY OF THE CONCRETE DECK DURING PLACEMENT.

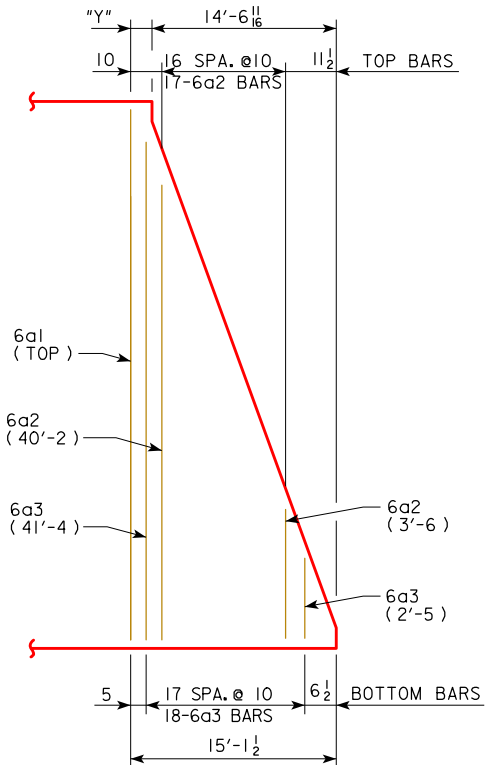
BRIDGE LENGTH	SPAN LENGTHS		
	SPAN 1	SPAN 2	SPAN 3
160'-0	48'-0	64'-0	48'-0
180'-0	54'-0	72'-0	54'-0
200'-0	60'-0	80'-0	60'-0
220'-0	66'-0	88'-0	66'-0
240'-0	72'-0	96'-0	72'-0
260'-0	78'-0	104'-0	78'-0
280'-0	84'-0	112'-0	84'-0
300'-0	90'-0	120'-0	90'-0
320'-0	96'-0	128'-0	96'-0
340'-0	102'-0	136'-0	102'-0

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER <i>[Signature]</i>	IOWA DOT Highway Division	
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES	
		ROLLED STEEL BEAM BRIDGES	
		OCTOBER, 2014	
		SUPERSTRUCTURE QUANTITIES 10° SKEW	RS40-032-14

REVISED 07-2015 - CHANGED NOTE 1, CONCRETE PLACEMENT NOTE TO ACCOUNT FOR THE POSSIBLE ADDITION OF A RETARDING ADMIXTURE TO THE CONCRETE.
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



CONCRETE PLACEMENT DIAGRAM SHOWING SLAB REINFORCING (RIGHT AHEAD SKEW SHOWN, LEFT AHEAD SKEW SIMILAR)



END OF SLAB REINFORCING
(TYPICAL EACH END OF DECK)

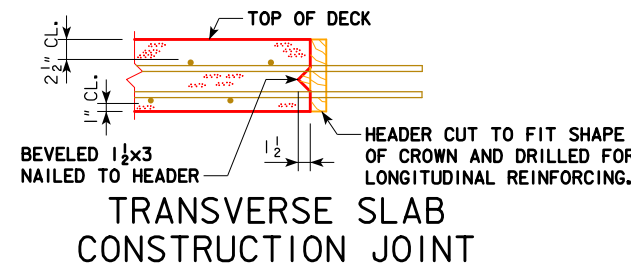
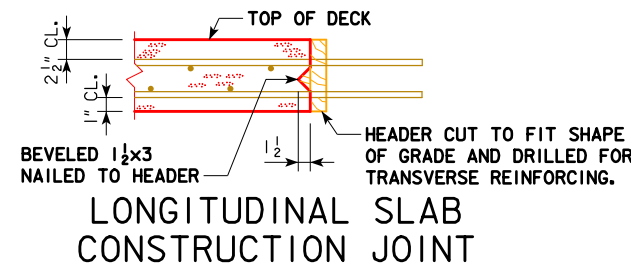
REINFORCEMENT DIMENSIONS CL-CL ABUTMENT BEARINGS	160'-0	180'-0	200'-0	220'-0	240'-0	260'-0	280'-0	300'-0	320'-0	340'-0
X (FT.-IN.)	163'-2 1/4	183'-2 1/4	203'-2 1/4	223'-2 1/4	243'-2 1/4	263'-2 1/4	283'-2 1/4	303'-2 1/4	323'-2 1/4	343'-2 1/4
Y (IN.)	6 13/16	6 13/16	6 13/16	6 13/16	6 13/16	6 13/16	6 13/16	6 13/16	6 13/16	6 13/16
Z (SPACES)	177	201	225	249	273	297	321	345	369	393

Δ NOTE:
CONCRETE QUANTITIES SHALL BE LISTED ON THE SUMMARY QUANTITIES SHEET.

Δ CONCRETE PLACEMENT QTYS. (SUPERSTRUCTURE PLUS INTEGRAL ABUTMENTS)	160'-0	180'-0	200'-0	220'-0	240'-0	260'-0	280'-0	300'-0	320'-0	340'-0
SLAB, AND ABUT DIAPHRAGM, SECTION 1 & 3	CY 116.2	126.2	138.6	150.6	160.6	172.5	182.5	192.5	202.6	215.4
SLAB, SECTION 2	CY 42.1	47.4	52.7	58.0	63.2	68.7	74.0	79.2	84.5	89.8
SLAB, SECTION 4 & 5	CY 56.1	63.2	70.2	77.3	84.3	91.6	98.6	105.7	112.7	119.8
ABUTMENT WINGS	CY 7.2	7.2	7.2	7.6	7.6	7.6	7.6	7.6	7.6	13.9
TWO ABUTMENT FOOTINGS	CY 37.2	37.2	37.2	37.2	37.2	37.2	37.2	37.2	37.2	45.0
TOTAL	CY 258.8	281.2	305.9	330.7	352.9	377.6	399.9	422.2	444.6	483.9

ESTIMATED QTYS. (SUPERSTRUCTURE PLUS INTEGRAL ABUTMENTS)	160'-0	180'-0	200'-0	220'-0	240'-0	260'-0	280'-0	300'-0	320'-0	340'-0
NO. OF STEEL H-PILES FOR TWO ABUTMENTS (HP 10 X 57)	NO. 16	16	16	18	18	18	20	20	20	24
BARRIER RAILS	LF 354.4	394.4	434.4	474.4	514.4	554.4	594.4	634.4	674.4	734.0
WING ARMORING - MACADAM STONE	SY 3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	5.7
PREBORED HOLES	LF 160	160	160	180	180	180	200	200	200	240

NOTE:
FOR QUANTITIES OF STRUCTURAL CONCRETE, REINFORCING STEEL AND STRUCTURAL STEEL REFER TO THE SUMMARY QUANTITIES SHEET IN THE BRIDGE PLANS.



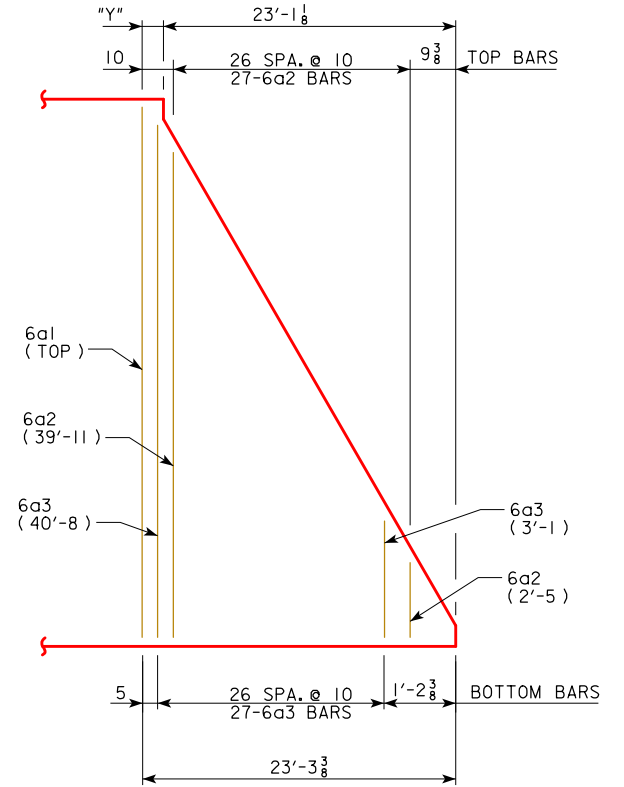
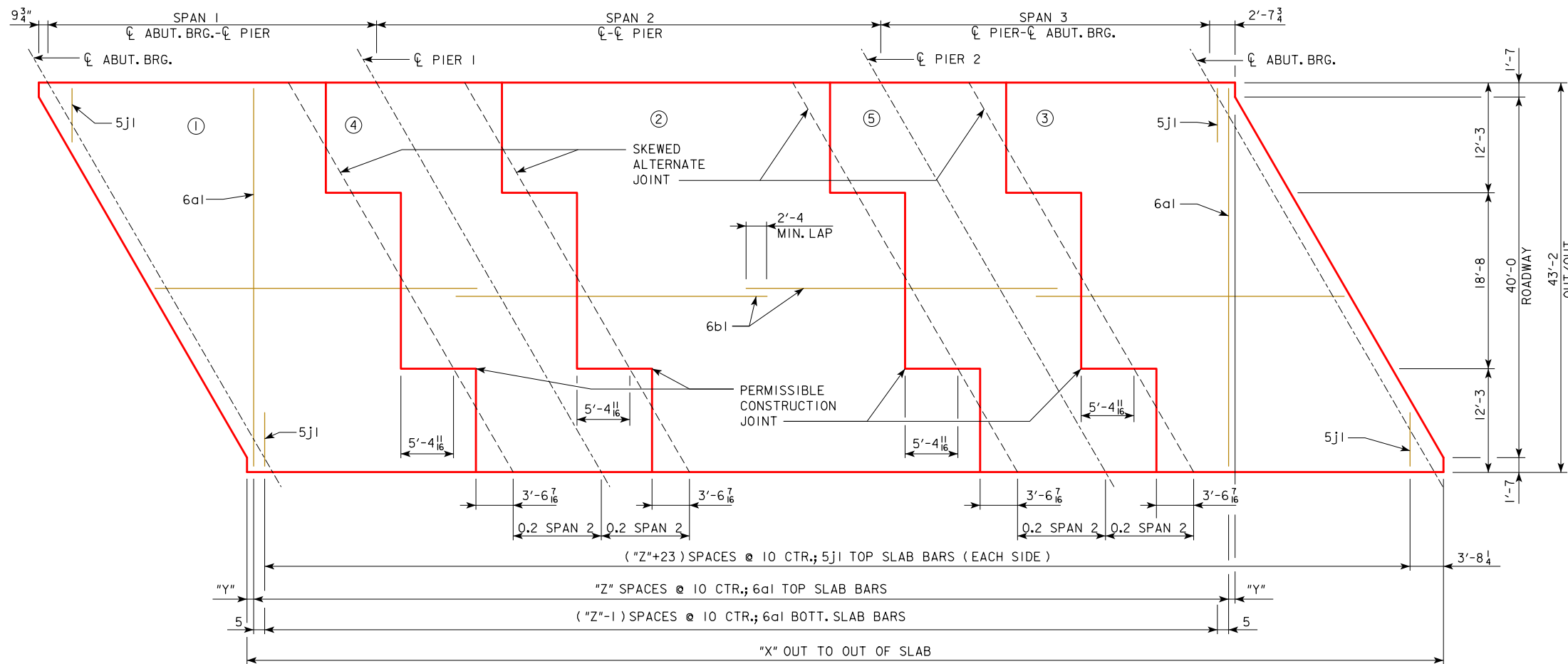
NOTES:

1. CONCRETE DECK SHALL BE PLACED IN SECTIONS AND SEQUENCES INDICATED. ALTERNATE PROCEDURES FOR PLACING DECK CONCRETE MAY BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF THE PROPOSED METHOD AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULTS. FOR APPROVED ALTERNATE PROCEDURES THE ENGINEER SHALL DETERMINE IF A RETARDING ADMIXTURE IS REQUIRED TO MAINTAIN PLASTICITY OF THE CONCRETE DECK DURING PLACEMENT.

SPAN LENGTHS			
BRIDGE LENGTH	SPAN 1	SPAN 2	SPAN 3
160'-0	48'-0	64'-0	48'-0
180'-0	54'-0	72'-0	54'-0
200'-0	60'-0	80'-0	60'-0
220'-0	66'-0	88'-0	66'-0
240'-0	72'-0	96'-0	72'-0
260'-0	78'-0	104'-0	78'-0
280'-0	84'-0	112'-0	84'-0
300'-0	90'-0	120'-0	90'-0
320'-0	96'-0	128'-0	96'-0
340'-0	102'-0	136'-0	102'-0

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER <i>[Signature]</i>	IOWADOT Highway Division	
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
SUPERSTRUCTURE QUANTITIES 20° SKEW		RS40-033-14	

REVISED 07-2015 - CHANGED NOTE 1, CONCRETE PLACEMENT NOTE TO ACCOUNT FOR THE POSSIBLE ADDITION OF A RETARDING ADMIXTURE TO THE CONCRETE.
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



CONCRETE PLACEMENT DIAGRAM SHOWING SLAB REINFORCING (RIGHT AHEAD SKEW SHOWN, LEFT AHEAD SKEW SIMILAR)

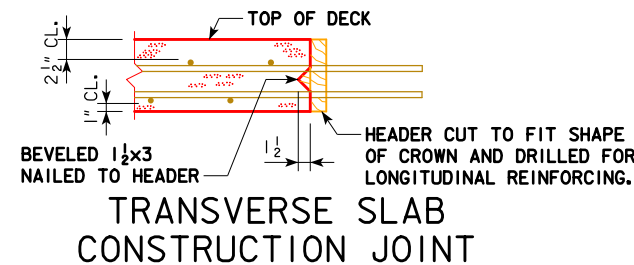
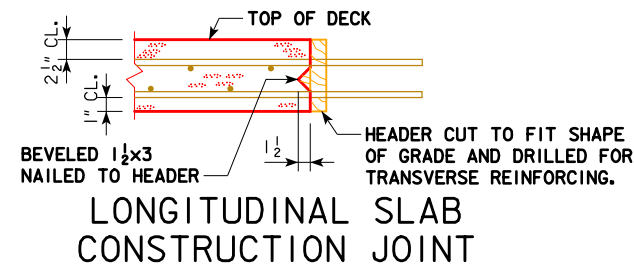
REINFORCEMENT DIMENSIONS CL-CL ABUTMENT BEARINGS	160'-0	180'-0	200'-0	220'-0	240'-0	260'-0	280'-0	300'-0	320'-0	340'-0
X (FT.-IN.)	163'-5 1/2	183'-5 1/2	203'-5 1/2	223'-5 1/2	243'-5 1/2	263'-5 1/2	283'-5 1/2	303'-5 1/2	323'-5 1/2	343'-5 1/2
Y (IN.)	24	24	24	24	24	24	24	24	24	24
Z (SPACES)	168	192	216	240	264	288	312	336	360	384

Δ NOTE:
CONCRETE QUANTITIES SHALL BE LISTED ON THE SUMMARY QUANTITIES SHEET.

Δ CONCRETE PLACEMENT QTYS. (SUPERSTRUCTURE PLUS INTEGRAL ABUTMENTS)	160'-0	180'-0	200'-0	220'-0	240'-0	260'-0	280'-0	300'-0	320'-0	340'-0
SLAB, AND ABUT DIAPHRAGM, SECTION 1 & 3	CY 119.4	CY 129.5	CY 142.2	CY 154.3	CY 164.3	CY 176.5	CY 186.4	CY 196.5	CY 206.6	CY 219.8
SLAB, SECTION 2	CY 42.1	CY 47.4	CY 52.7	CY 58.0	CY 63.2	CY 68.7	CY 74.0	CY 79.2	CY 84.5	CY 89.8
SLAB, SECTION 4 & 5	CY 56.1	CY 63.2	CY 70.2	CY 77.3	CY 84.3	CY 91.6	CY 98.6	CY 105.7	CY 112.7	CY 119.8
ABUTMENT WINGS	CY 7.2	CY 7.2	CY 7.2	CY 7.6	CY 7.6	CY 7.6	CY 7.6	CY 7.6	CY 7.6	CY 13.9
TWO ABUTMENT FOOTINGS	CY 40.4	CY 40.4	CY 40.4	CY 40.4	CY 40.4	CY 40.4	CY 40.4	CY 40.4	CY 40.4	CY 48.2
TOTAL	CY 265.2	CY 287.7	CY 312.7	CY 337.6	CY 359.8	CY 384.8	CY 407.0	CY 429.4	CY 451.8	CY 491.5

ESTIMATED QTYS. (SUPERSTRUCTURE PLUS INTEGRAL ABUTMENTS)	160'-0	180'-0	200'-0	220'-0	240'-0	260'-0	280'-0	300'-0	320'-0	340'-0
NO. OF STEEL H-PILES FOR TWO ABUTMENTS (HP 10 X 57)	NO. 16	16	18	18	18	20	20	20	20	26
BARRIER RAILS	LF 354.9	LF 394.9	LF 434.9	LF 474.9	LF 514.9	LF 554.9	LF 594.9	LF 634.9	LF 674.9	LF 734.0
WING ARMORING - MACADAM STONE	SY 3.6	SY 3.6	SY 3.6	SY 3.6	SY 3.6	SY 3.6	SY 3.6	SY 3.6	SY 3.6	SY 5.7
PREBORED HOLES	LF 160	LF 160	LF 180	LF 180	LF 180	LF 200	LF 200	LF 200	LF 200	LF 260

NOTE:
FOR QUANTITIES OF STRUCTURAL CONCRETE, REINFORCING STEEL AND STRUCTURAL STEEL REFER TO THE SUMMARY QUANTITIES SHEET IN THE BRIDGE PLANS.



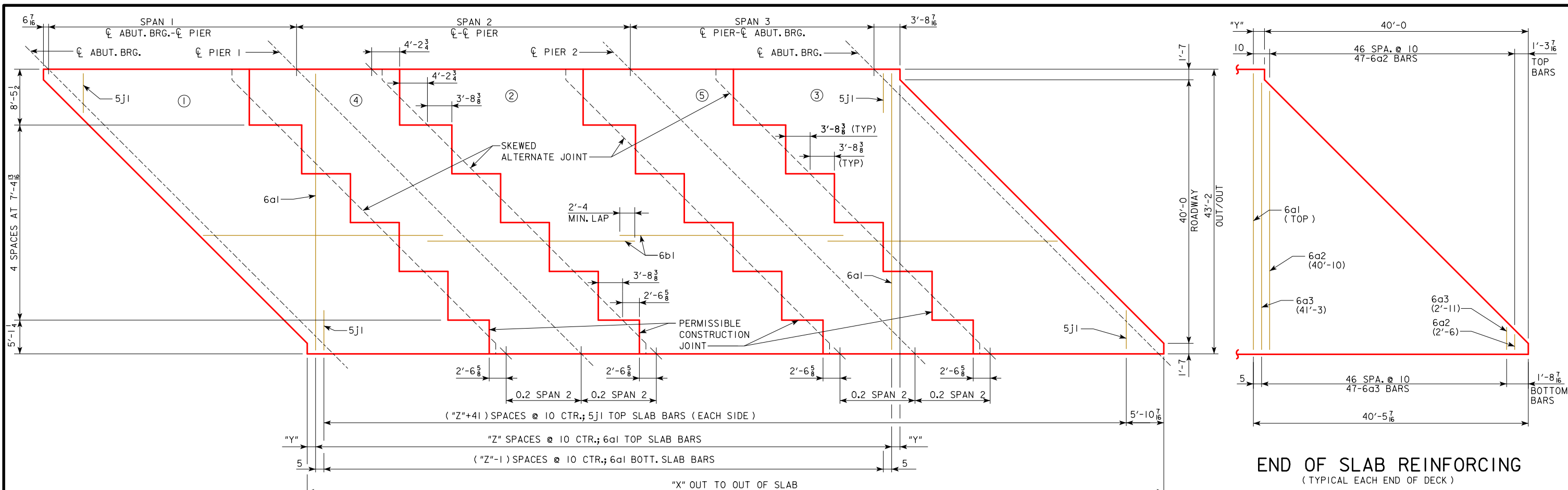
NOTES:

1. CONCRETE DECK SHALL BE PLACED IN SECTIONS AND SEQUENCES INDICATED. ALTERNATE PROCEDURES FOR PLACING DECK CONCRETE MAY BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF THE PROPOSED METHOD AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULTS. FOR APPROVED ALTERNATE PROCEDURES THE ENGINEER SHALL DETERMINE IF A RETARDING ADMIXTURE IS REQUIRED TO MAINTAIN PLASTICITY OF THE CONCRETE DECK DURING PLACEMENT.

SPAN LENGTHS			
BRIDGE LENGTH	SPAN 1	SPAN 2	SPAN 3
160'-0	48'-0	64'-0	48'-0
180'-0	54'-0	72'-0	54'-0
200'-0	60'-0	80'-0	60'-0
220'-0	66'-0	88'-0	66'-0
240'-0	72'-0	96'-0	72'-0
260'-0	78'-0	104'-0	78'-0
280'-0	84'-0	112'-0	84'-0
300'-0	90'-0	120'-0	90'-0
320'-0	96'-0	128'-0	96'-0
340'-0	102'-0	136'-0	102'-0

08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	IOWADOT Highway Division	
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES	
		ROLLED STEEL BEAM BRIDGES	
		OCTOBER, 2014	
		SUPERSTRUCTURE QUANTITIES 30° SKEW	RS40-034-14

REVISED 07-2015 - CHANGED NOTE 1, CONCRETE PLACEMENT NOTE TO ACCOUNT FOR THE POSSIBLE ADDITION OF A RETARDING ADMIXTURE TO THE CONCRETE.
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



CONCRETE PLACEMENT DIAGRAM SHOWING SLAB REINFORCING (RIGHT AHEAD SKEW SHOWN, LEFT AHEAD SKEW SIMILAR)

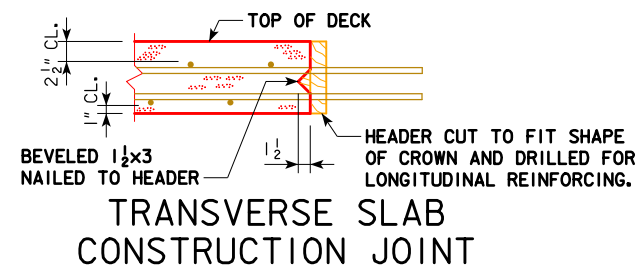
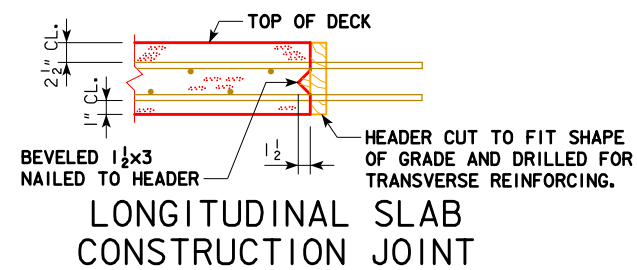
REINFORCEMENT DIMENSIONS CL-CL ABUTMENT BEARINGS	160'-0"	180'-0"	200'-0"	220'-0"	240'-0"	260'-0"	280'-0"	300'-0"	320'-0"	340'-0"
X (FT.-IN.)	164'-2 7/8"	184'-2 7/8"	204'-2 7/8"	224'-2 7/8"	244'-2 7/8"	264'-2 7/8"	284'-2 7/8"	304'-2 7/8"	324'-2 7/8"	344'-2 7/8"
Y (IN.)	5 7/16"	5 7/16"	5 7/16"	5 7/16"	5 7/16"	5 7/16"	5 7/16"	5 7/16"	5 7/16"	5 7/16"
Z (SPACES)	148	172	196	220	244	268	292	316	340	364

Δ NOTE:
CONCRETE QUANTITIES SHALL BE LISTED ON THE SUMMARY QUANTITIES SHEET.

Δ CONCRETE PLACEMENT QTYS. (SUPERSTRUCTURE PLUS INTEGRAL ABUTMENTS)	160'-0"	180'-0"	200'-0"	220'-0"	240'-0"	260'-0"	280'-0"	300'-0"	320'-0"	340'-0"
SLAB, AND ABUT DIAPHRAGM, SECTION 1 & 3	CY 129.1	CY 139.4	CY 152.6	CY 165.4	CY 175.4	CY 188.0	CY 198.1	CY 208.2	CY 218.4	CY 232.4
SLAB, SECTION 2	CY 42.1	CY 47.4	CY 52.7	CY 58.0	CY 63.2	CY 68.7	CY 74.0	CY 79.2	CY 84.5	CY 89.8
SLAB, SECTION 4 & 5	CY 56.1	CY 63.2	CY 70.2	CY 77.3	CY 84.3	CY 91.6	CY 98.6	CY 105.7	CY 112.7	CY 119.8
ABUTMENT WINGS	CY 7.2	CY 7.2	CY 7.2	CY 7.6	CY 7.6	CY 7.6	CY 7.6	CY 7.6	CY 7.6	CY 13.9
TWO ABUTMENT FOOTINGS	CY 49.5	CY 49.5	CY 49.5	CY 49.5	CY 49.5	CY 49.5	CY 49.5	CY 49.5	CY 49.5	CY 57.2
TOTAL	CY 284.0	CY 306.7	CY 332.2	CY 357.8	CY 380.0	CY 405.4	CY 427.8	CY 450.2	CY 472.7	CY 513.1

ESTIMATED QTYS. (SUPERSTRUCTURE PLUS INTEGRAL ABUTMENTS)	160'-0"	180'-0"	200'-0"	220'-0"	240'-0"	260'-0"	280'-0"	300'-0"	320'-0"	340'-0"
NO. OF STEEL H-PILES FOR TWO ABUTMENTS (HP 10 x 57)	NO. 18	18	18	18	20	20	20	20	22	26
BARRIER RAILS	LF 356.5	LF 396.5	LF 436.5	LF 476.5	LF 516.5	LF 556.5	LF 596.5	LF 636.5	LF 676.5	LF 734.0
WING ARMORING - MACADAM STONE	SY 3.7	SY 3.7	SY 3.7	SY 3.7	SY 3.7	SY 3.7	SY 3.7	SY 3.7	SY 3.7	SY 5.9
PREBORED HOLES	LF 180	LF 180	LF 180	LF 180	LF 200	LF 200	LF 200	LF 200	LF 220	LF 260

NOTE:
FOR QUANTITIES OF STRUCTURAL CONCRETE, REINFORCING STEEL AND STRUCTURAL STEEL REFER TO THE SUMMARY QUANTITIES SHEET IN THE BRIDGE PLANS.



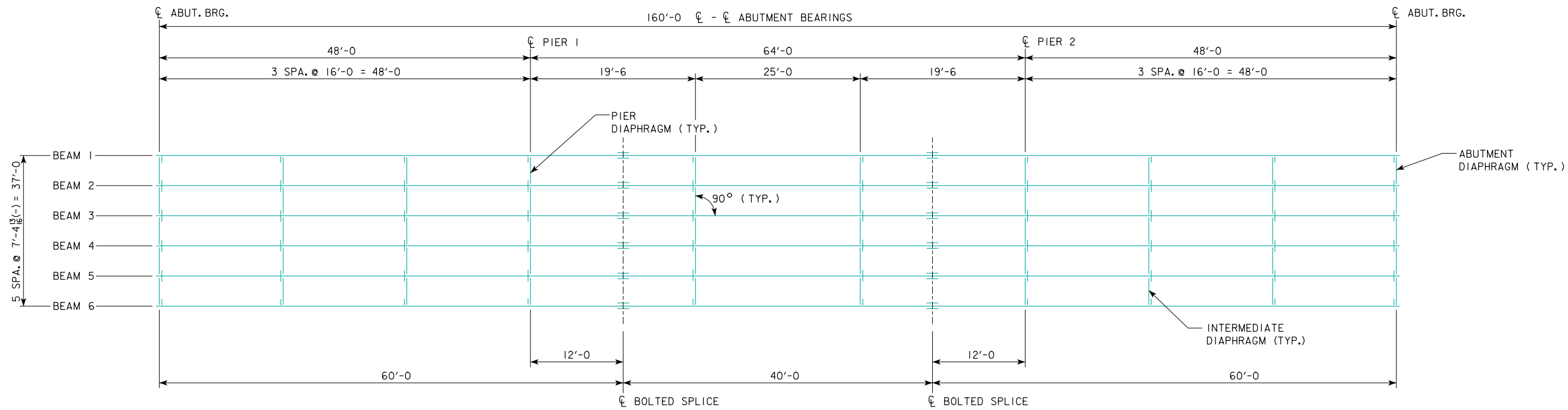
NOTES:

- CONCRETE DECK SHALL BE PLACED IN SECTIONS AND SEQUENCES INDICATED. ALTERNATE PROCEDURES FOR PLACING DECK CONCRETE MAY BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF THE PROPOSED METHOD AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULTS. FOR APPROVED ALTERNATE PROCEDURES THE ENGINEER SHALL DETERMINE IF A RETARDING ADMIXTURE IS REQUIRED TO MAINTAIN PLASTICITY OF THE CONCRETE DECK DURING PLACEMENT.

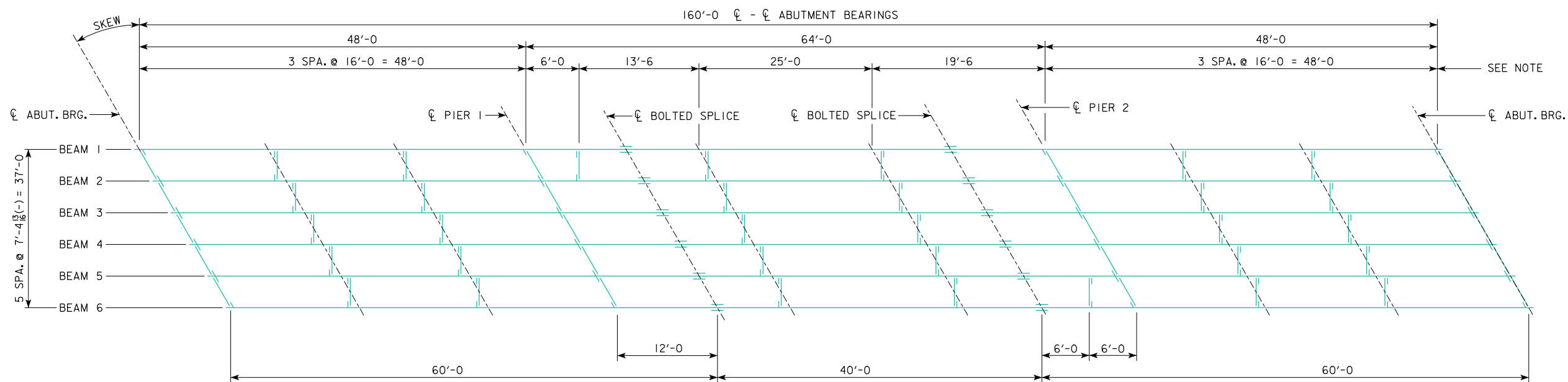
BRIDGE LENGTH	SPAN LENGTHS		
	SPAN 1	SPAN 2	SPAN 3
160'-0"	48'-0"	64'-0"	48'-0"
180'-0"	54'-0"	72'-0"	54'-0"
200'-0"	60'-0"	80'-0"	60'-0"
220'-0"	66'-0"	88'-0"	66'-0"
240'-0"	72'-0"	96'-0"	72'-0"
260'-0"	78'-0"	104'-0"	78'-0"
280'-0"	84'-0"	112'-0"	84'-0"
300'-0"	90'-0"	120'-0"	90'-0"
320'-0"	96'-0"	128'-0"	96'-0"
340'-0"	102'-0"	136'-0"	102'-0"

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER <i>[Signature]</i>	IOWADOT Highway Division	
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES	
		ROLLED STEEL BEAM BRIDGES	
		OCTOBER, 2014	
		SUPERSTRUCTURE QUANTITIES 45° SKEW	RS40-035-14

REVISED 02-2017 - ADDED DIAPHRAGMS TO SKEWED FRAMING PLAN IN OUTER BAYS, BETWEEN BEAMS 1 & 2 AND 5 & 6 OF 64'-0" CENTER SPAN, 6'-0" FROM PIER CENTERLINES.
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

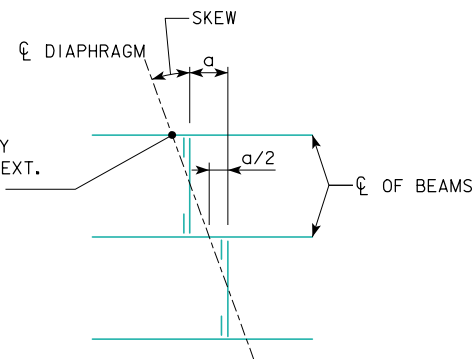


0° SKEW FRAMING PLAN



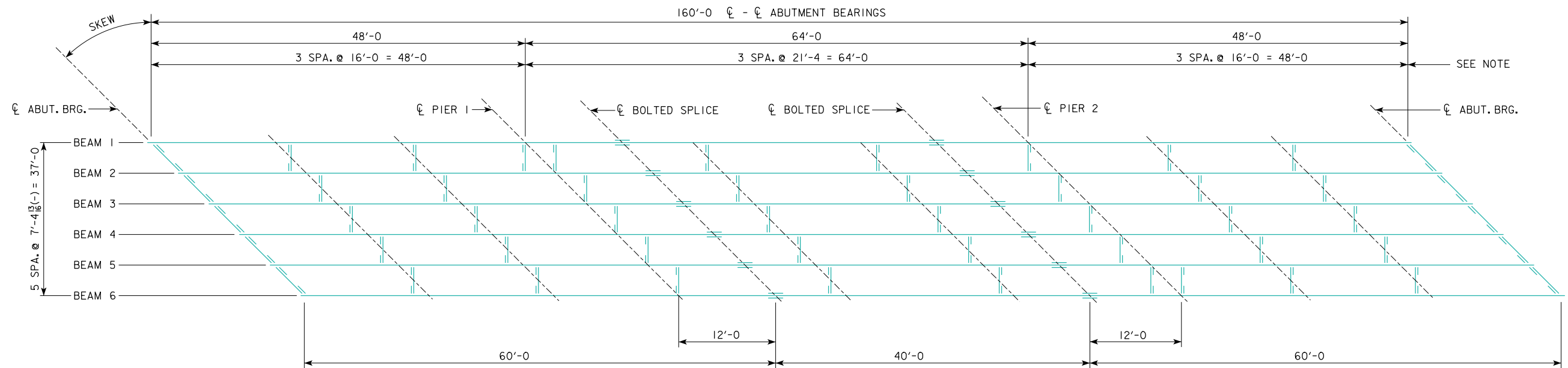
SKEWED FRAMING PLAN
(R.A. SHOWN, L.A. SIMILAR)

NOTE:
DIMENSIONS SHOWN APPLY
AT INTERSECTION OF ϕ EXT.
BEAM AND ϕ DIAPHRAGM



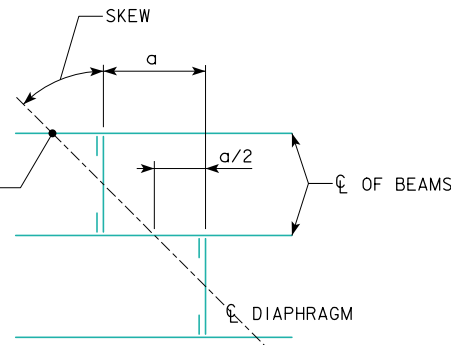
SKEW	a (FT.-IN.)
10°	1'-3 $\frac{1}{8}$ "
20°	2'-8 $\frac{5}{8}$ "
30°	4'-3 $\frac{1}{4}$ "

08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	IOWADOT Highway Division	
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
FRAMING PLAN 160'-0" BRIDGE		RS40-041-14	



45° SKEWED FRAMING PLAN
(R.A. SHOWN, L.A. SIMILAR)

NOTE:
DIMENSIONS SHOWN APPLY
AT INTERSECTION OF ϕ EXT.
BEAM AND ϕ DIAPHRAGM

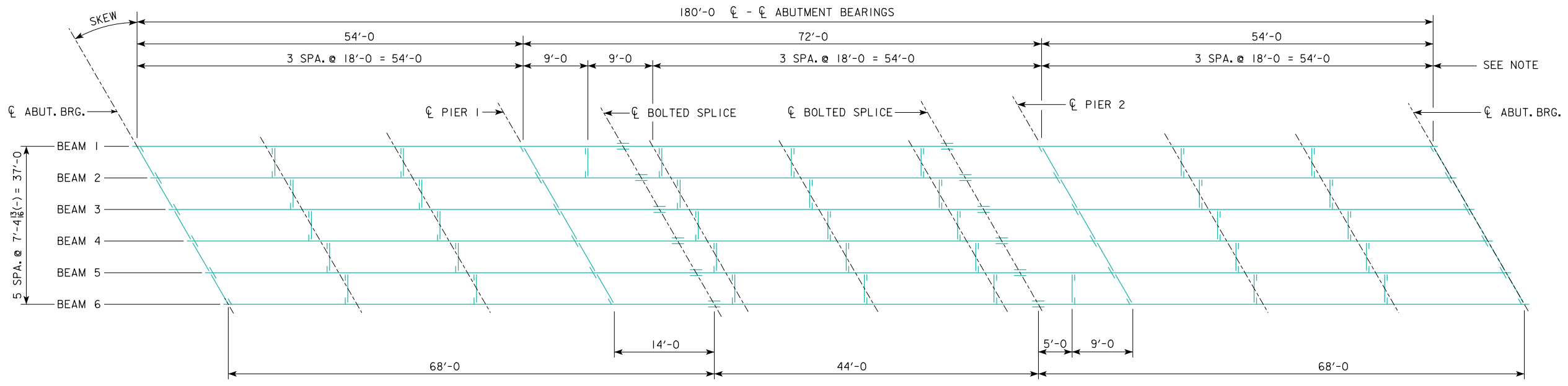
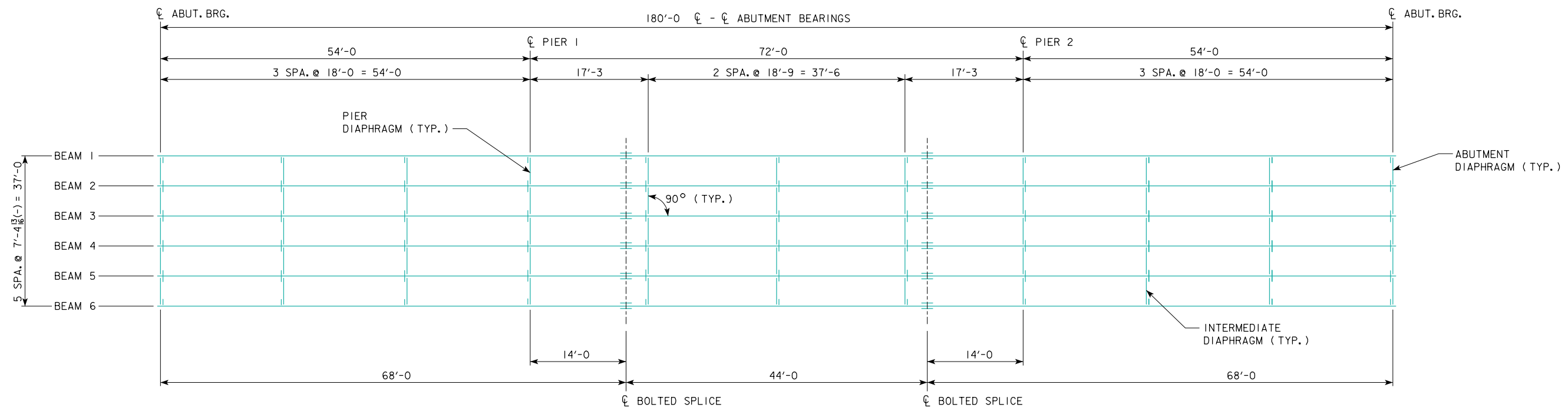


SKEW	a (FT.-IN.)
45°	7'-4 $\frac{13}{16}$ "

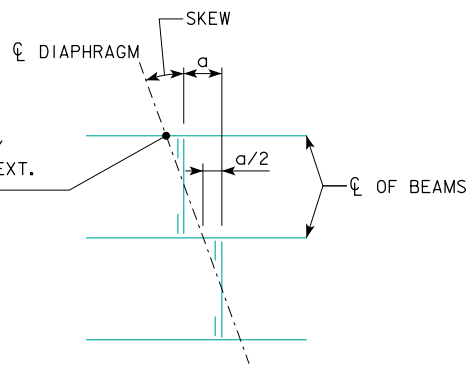
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	
	STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	FRAMING PLAN 160'-0 BRIDGE
RS40-042-14	

REVISED 02-2017 - CHANGED DIAPHRAGM SPACING IN ZERO SKEW FRAMING PLAN (WAS 4 SPACED AT 18'-0" IN 72'-0" CENTER SPAN, CHANGED DIAPHRAGM SPACING IN SKEWED FRAMING PLAN (WAS 4 SPACED AT 18'-0" IN 72'-0" CENTER SPAN, ADDED DIAPHRAGMS TO SKEWED FRAMING PLAN IN OUTER BAYS, BETWEEN BEAMS 1 & 2 AND 5 & 6 OF 72'-0" CENTER SPAN, 9'-0" FROM PIER CENTERLINES, REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

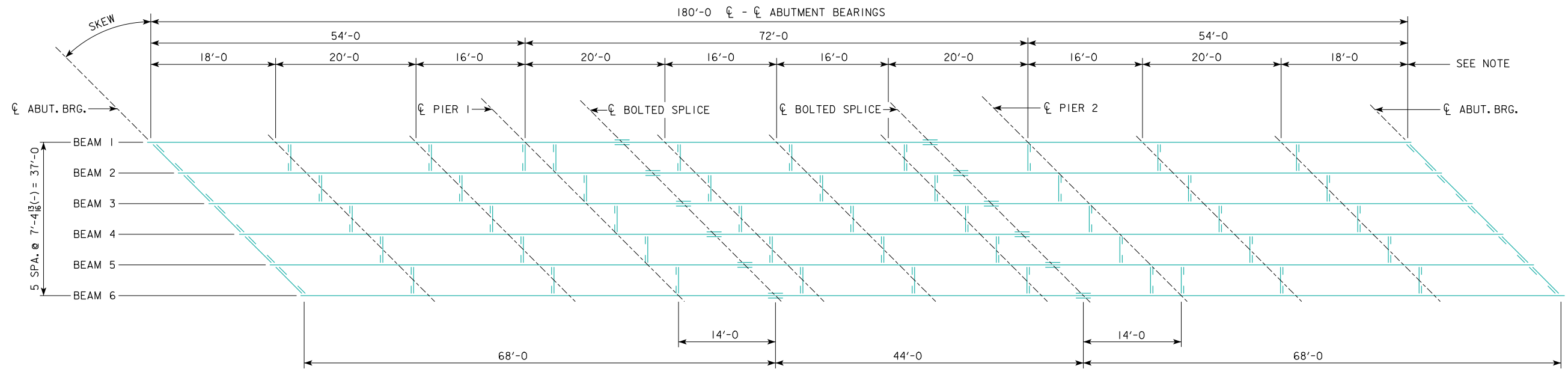


NOTE:
DIMENSIONS SHOWN APPLY
AT INTERSECTION OF ϕ EXT.
BEAM AND ϕ DIAPHRAGM

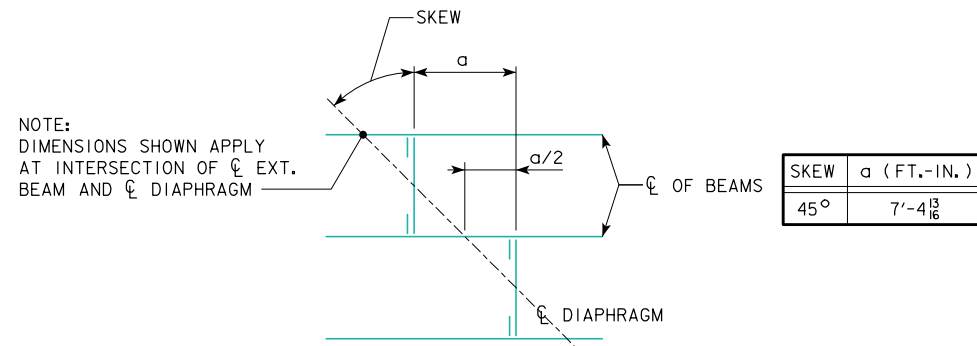


SKEW	a (FT.-IN.)
10°	1'-3 $\frac{11}{16}$
20°	2'-8 $\frac{5}{16}$
30°	4'-3 $\frac{1}{4}$

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER <i>[Signature]</i>		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
FRAMING PLAN 180'-0 BRIDGE		RS40-043-14	



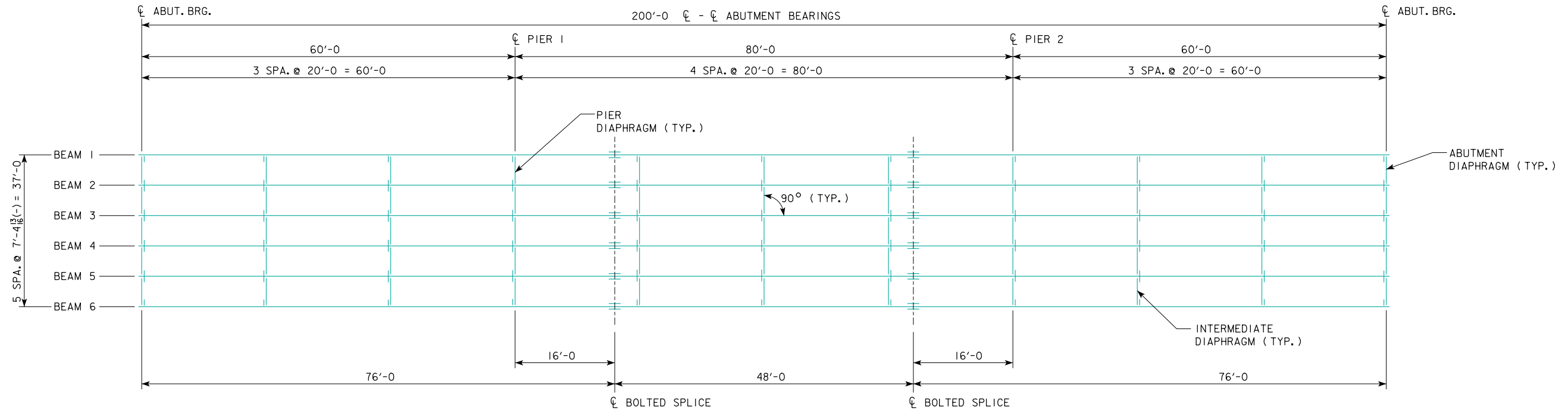
45° SKEWED FRAMING PLAN
(R.A. SHOWN, L.A. SIMILAR)



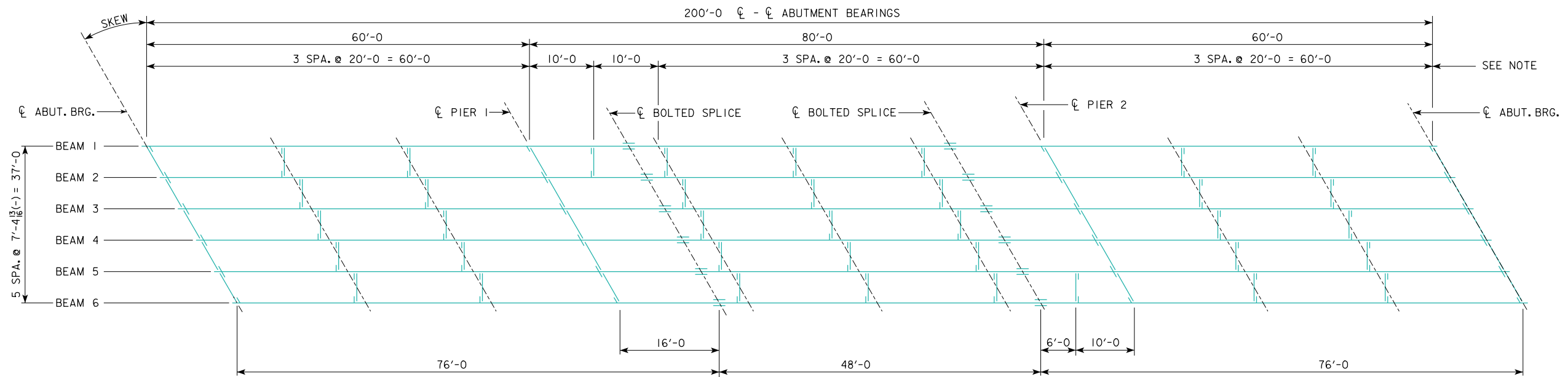
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
		FRAMING PLAN 180'-0 BRIDGE	RS40-044-14

REVISED 02-2017 - CHANGED DIAPHRAGM SPACING IN SKEWED FRAMING PLAN (WAS 4 SPACED AT 20'-0" IN 80'-0" CENTER SPAN. ADDED DIAPHRAGMS TO SKEWED FRAMING PLAN IN OUTER BAYS, BETWEEN BEAMS 1 & 2 AND 5 & 6 OF 80'-0" CENTER SPAN, 10'-0" FROM PIER CENTERLINES.
 REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

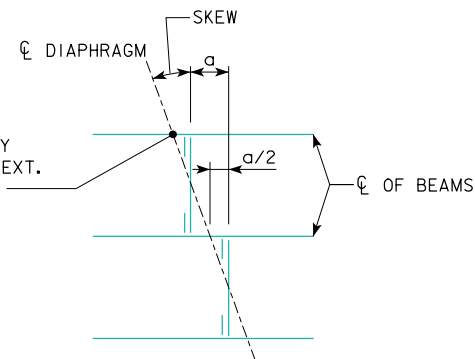


0° SKEW FRAMING PLAN



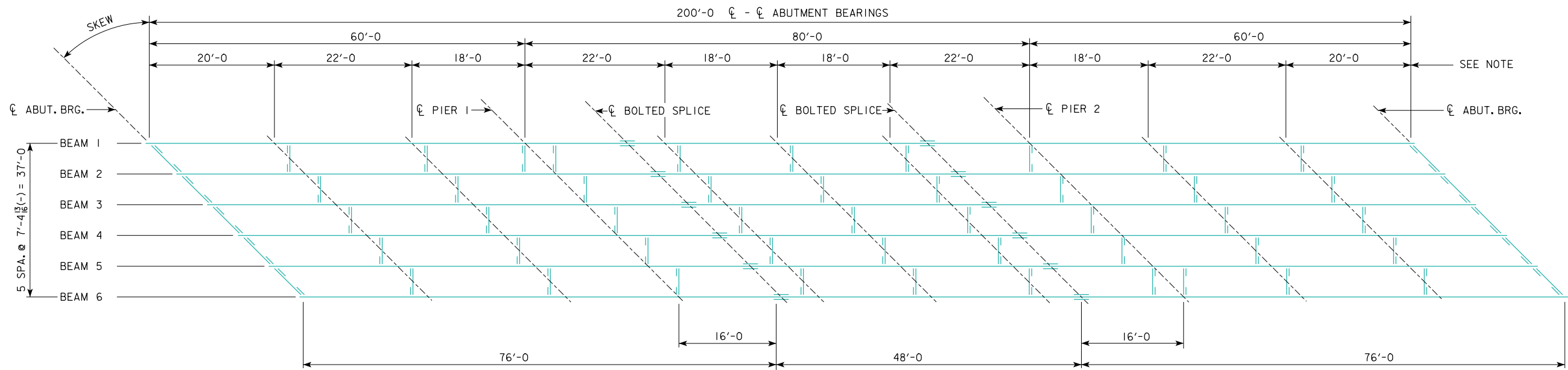
SKEWED FRAMING PLAN
(R.A. SHOWN, L.A. SIMILAR)

NOTE:
 DIMENSIONS SHOWN APPLY
 AT INTERSECTION OF ϕ EXT.
 BEAM AND ϕ DIAPHRAGM

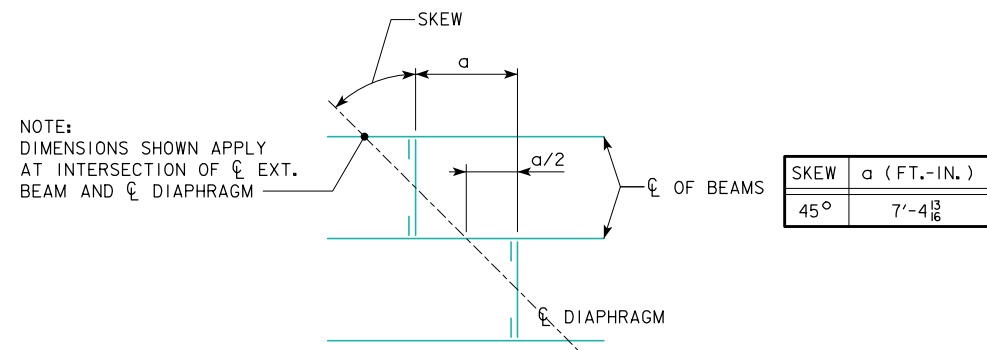


SKEW	a (FT.-IN.)
10°	1'-3 $\frac{11}{16}$ "
20°	2'-8 $\frac{5}{16}$ "
30°	4'-3 $\frac{1}{4}$ "

08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	RS40-045-14
		FRAMING PLAN 200'-0 BRIDGE	



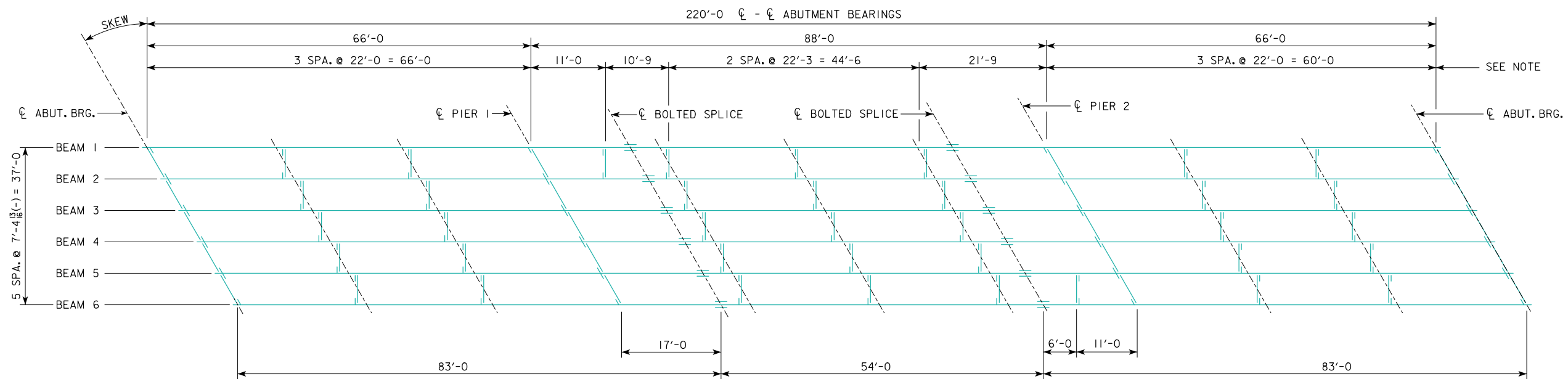
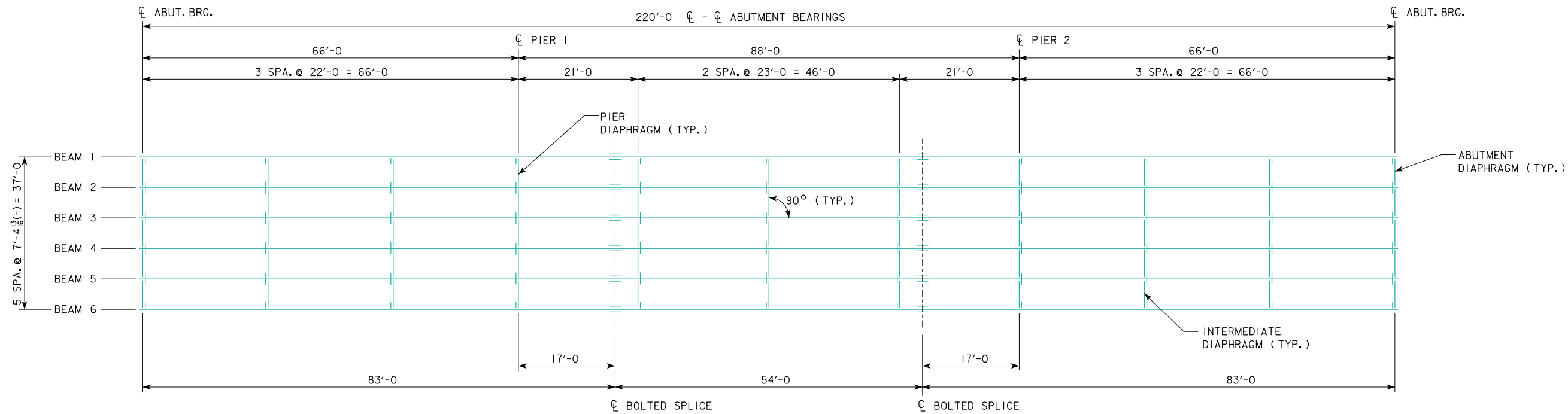
45° SKEWED FRAMING PLAN
(R.A. SHOWN, L.A. SIMILAR)



REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

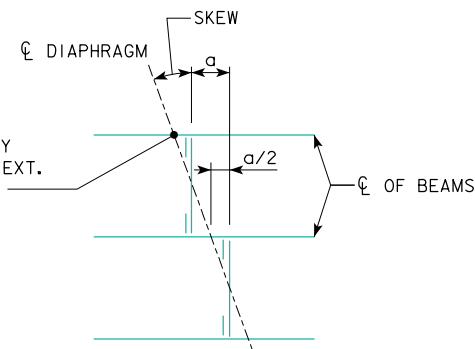
08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
	FRAMING PLAN 200'-0 BRIDGE	RS40-046-14

REVISED 02-2017 - CHANGED DIAPHRAGM SPACING IN ZERO SKEW FRAMING PLAN (WAS 4 SPACED AT 22'-0" IN 88'-0" CENTER SPAN. CHANGED DIAPHRAGM SPACING IN SKEWED FRAMING PLAN (WAS 4 SPACED AT 22'-0" IN 88'-0" CENTER SPAN. ADDED DIAPHRAGMS TO SKEWED FRAMING PLAN IN OUTER BAYS, BETWEEN BEAMS 1 & 2 AND 5 & 6 OF 88'-0" CENTER SPAN, 11'-0" FROM PIER CENTERLINES.
 REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



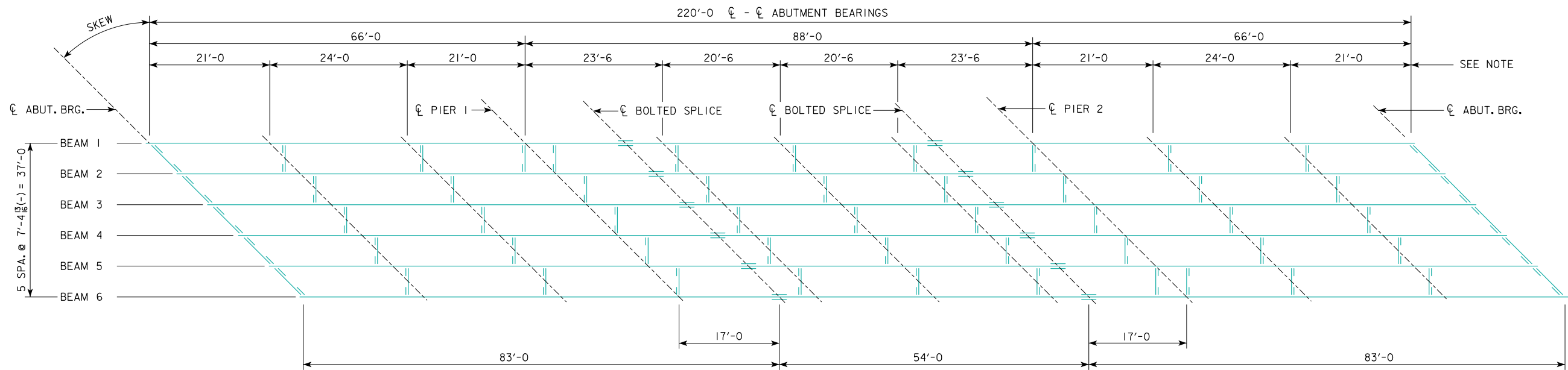
SKEWED FRAMING PLAN
 (R.A. SHOWN, L.A. SIMILAR)

NOTE:
 DIMENSIONS SHOWN APPLY
 AT INTERSECTION OF ϕ EXT.
 BEAM AND ϕ DIAPHRAGM



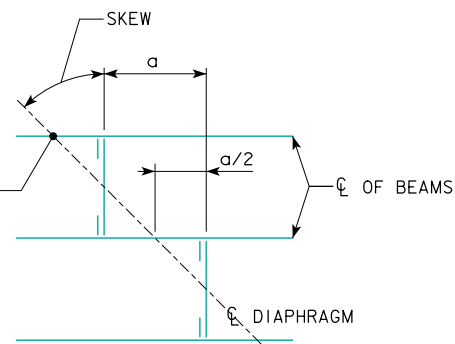
SKEW	a (FT.-IN.)
10°	1'-3 $\frac{11}{16}$ "
20°	2'-8 $\frac{5}{16}$ "
30°	4'-3 $\frac{1}{4}$ "

08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
		FRAMING PLAN 220'-0" BRIDGE	RS40-047-14



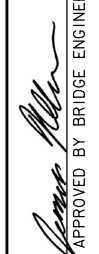

45° SKEWED FRAMING PLAN
(R.A. SHOWN, L.A. SIMILAR)

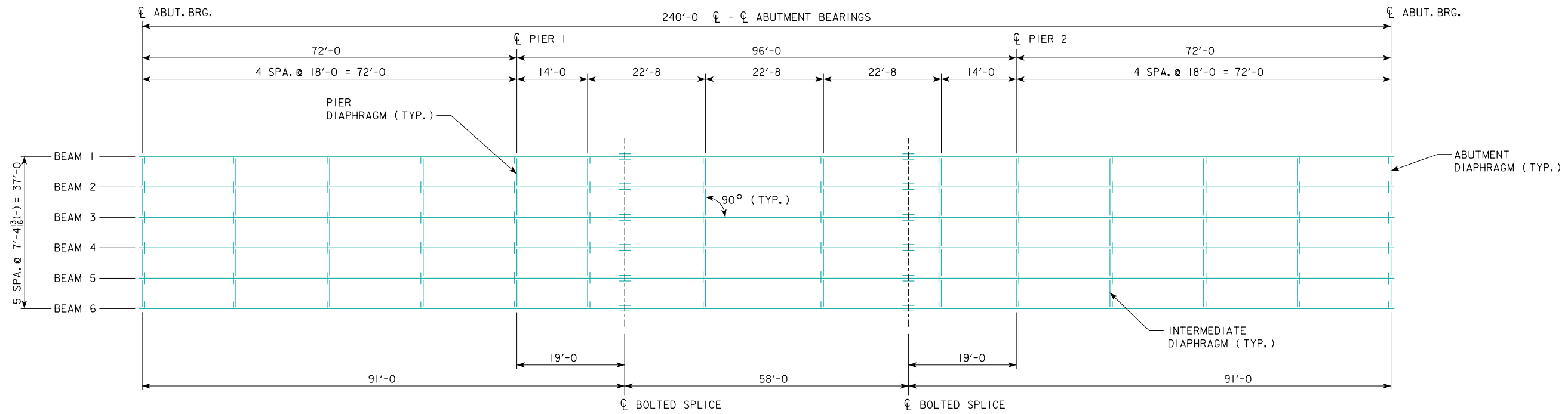
NOTE:
DIMENSIONS SHOWN APPLY
AT INTERSECTION OF ϕ EXT.
BEAM AND ϕ DIAPHRAGM



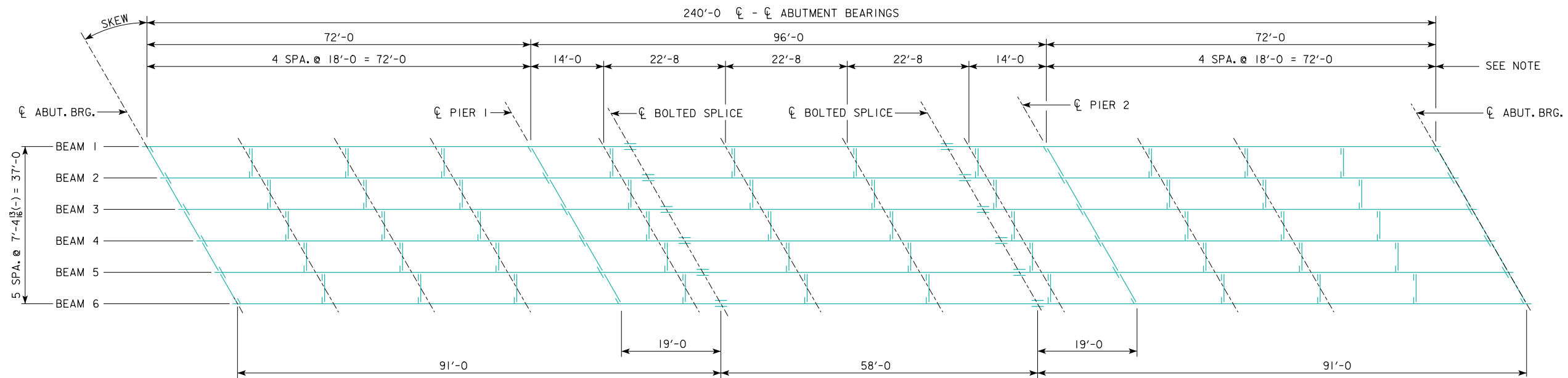
SKEW	a (FT.-IN.)
45°	7'-4 $\frac{13}{16}$ "

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE  APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	FRAMING PLAN 220'-0 BRIDGE
	RS40-048-14

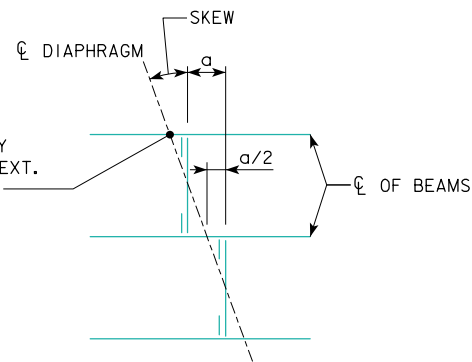


0° SKEW FRAMING PLAN

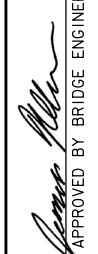



SKEWED FRAMING PLAN
(R.A. SHOWN, L.A. SIMILAR)

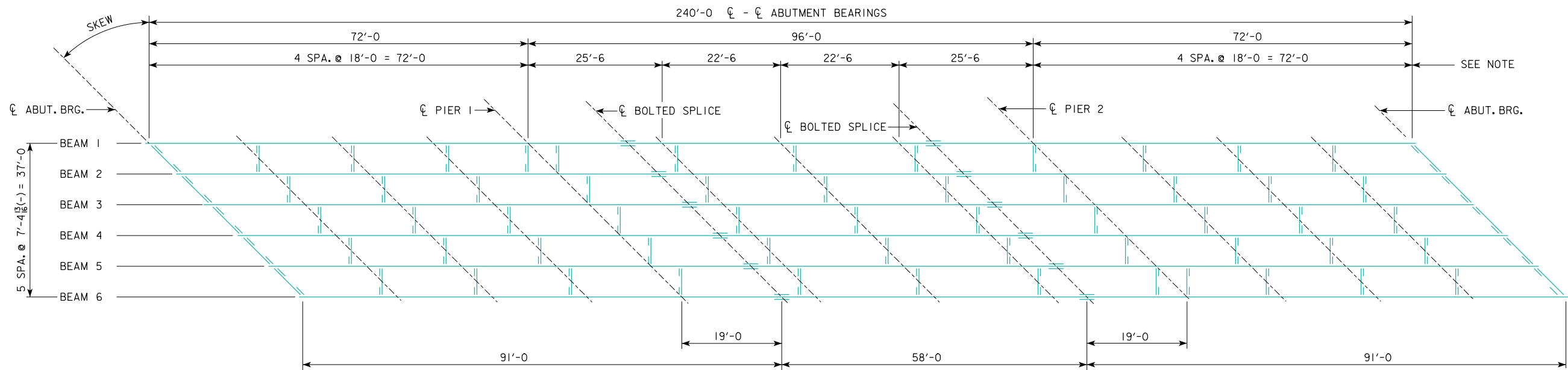
NOTE:
DIMENSIONS SHOWN APPLY
AT INTERSECTION OF ϕ EXT.
BEAM AND ϕ DIAPHRAGM



SKEW	a (FT.-IN.)
10°	1'-3 ¹¹ / ₁₆
20°	2'-8 ⁵ / ₁₆
30°	4'-3 ¹ / ₄

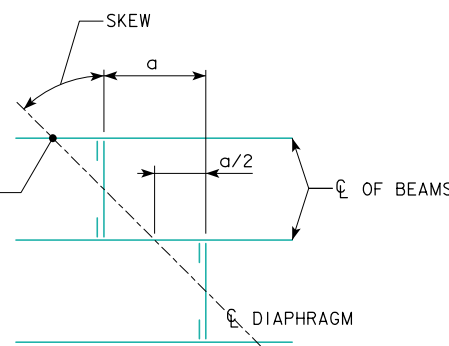
08-2018 LATEST REVISION DATE  APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	FRAMING PLAN 240'-0 BRIDGE
	RS40-049-14

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



45° SKEWED FRAMING PLAN
(R.A. SHOWN, L.A. SIMILAR)

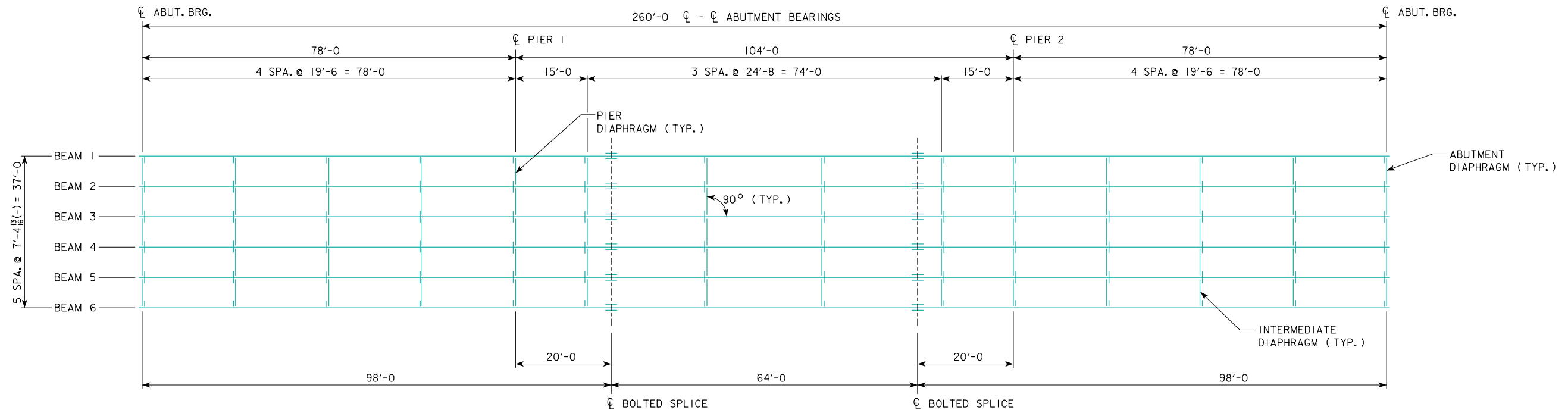
NOTE:
DIMENSIONS SHOWN APPLY
AT INTERSECTION OF ϕ EXT.
BEAM AND ϕ DIAPHRAGM



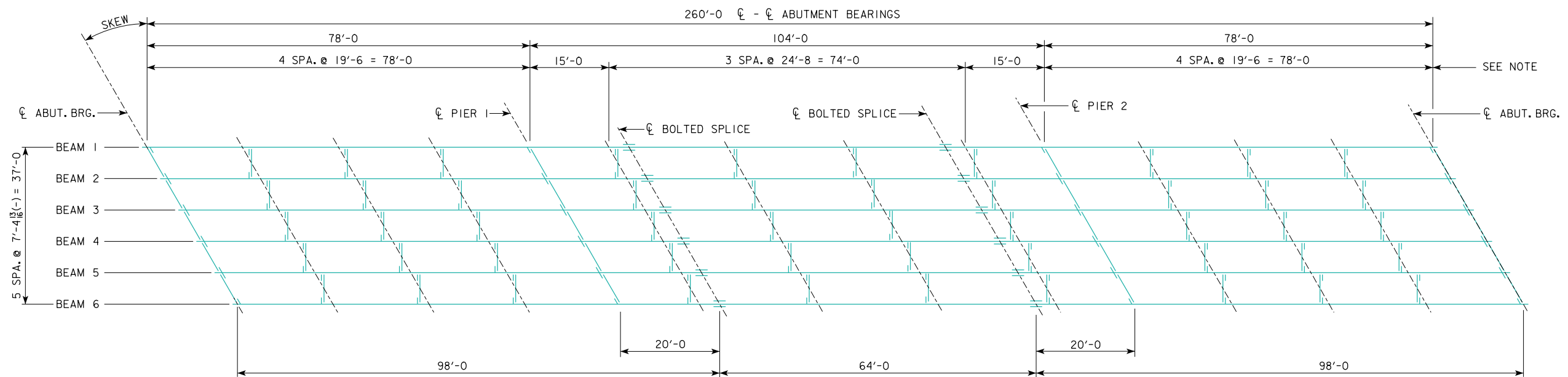
SKEW	a (FT.-IN.)
45°	7'-4 $\frac{13}{16}$ "

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	FRAMING PLAN 240'-0 BRIDGE
	RS40-050-14

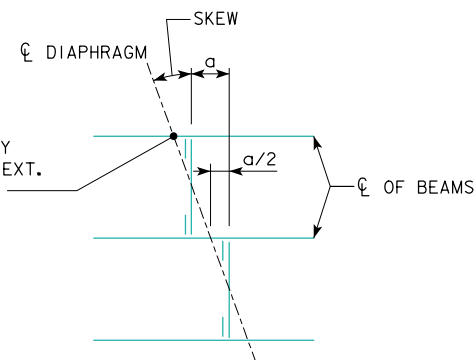


0° SKEW FRAMING PLAN



SKEWED FRAMING PLAN
(R.A. SHOWN, L.A. SIMILAR)

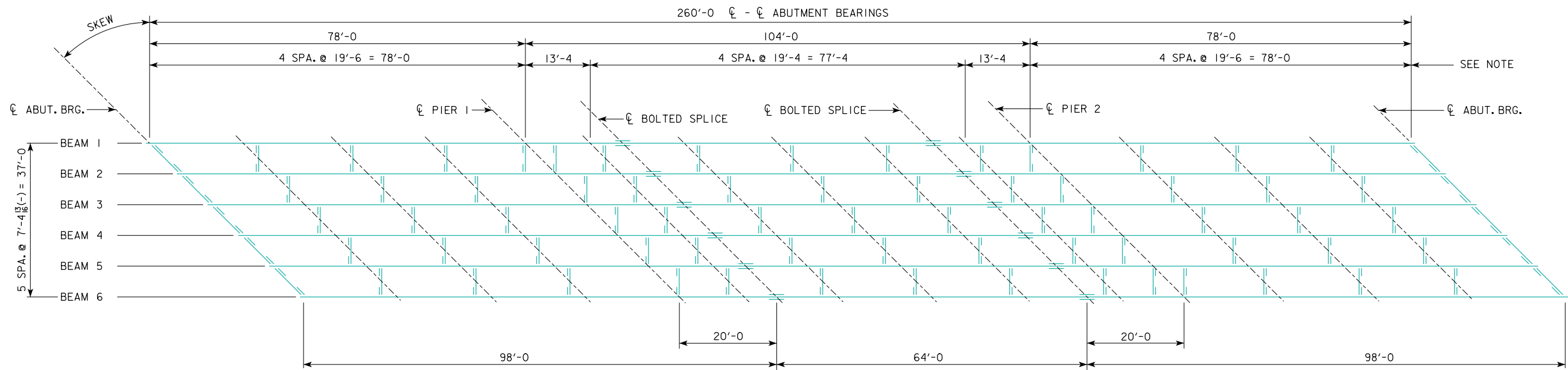
NOTE:
DIMENSIONS SHOWN APPLY
AT INTERSECTION OF ϕ EXT.
BEAM AND ϕ DIAPHRAGM



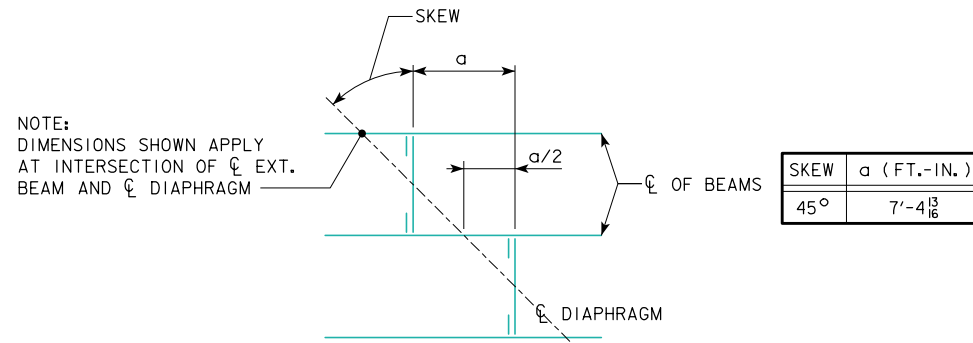
SKEW	a (FT.-IN.)
10°	1'-3 $\frac{11}{16}$ "
20°	2'-8 $\frac{5}{16}$ "
30°	4'-3 $\frac{1}{4}$ "

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER <i>[Signature]</i>		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
FRAMING PLAN 260'-0 BRIDGE		RS40-051-14	

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

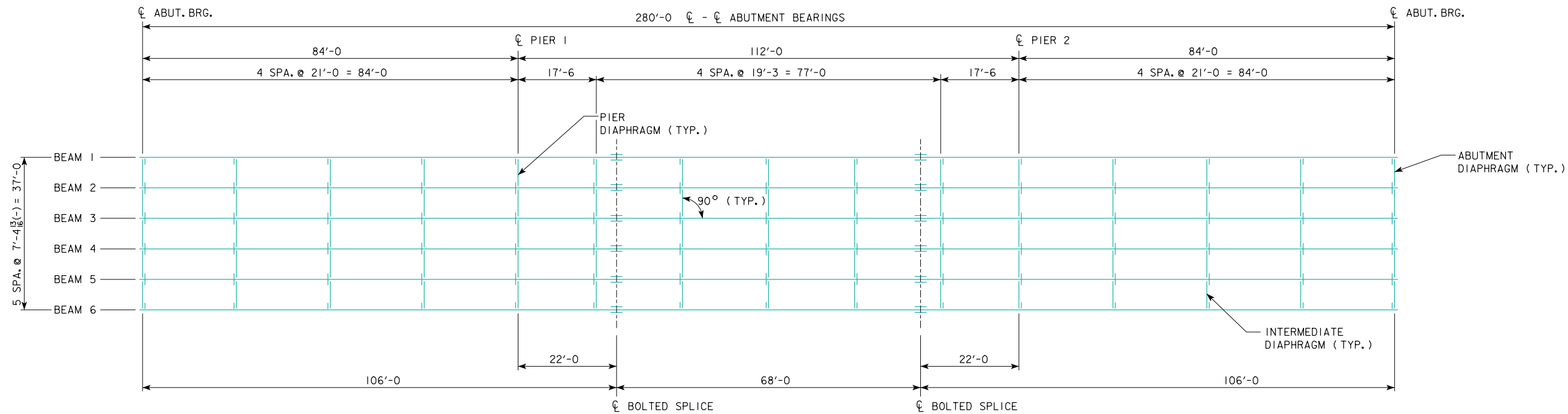


45° SKEWED FRAMING PLAN
(R.A. SHOWN, L.A. SIMILAR)

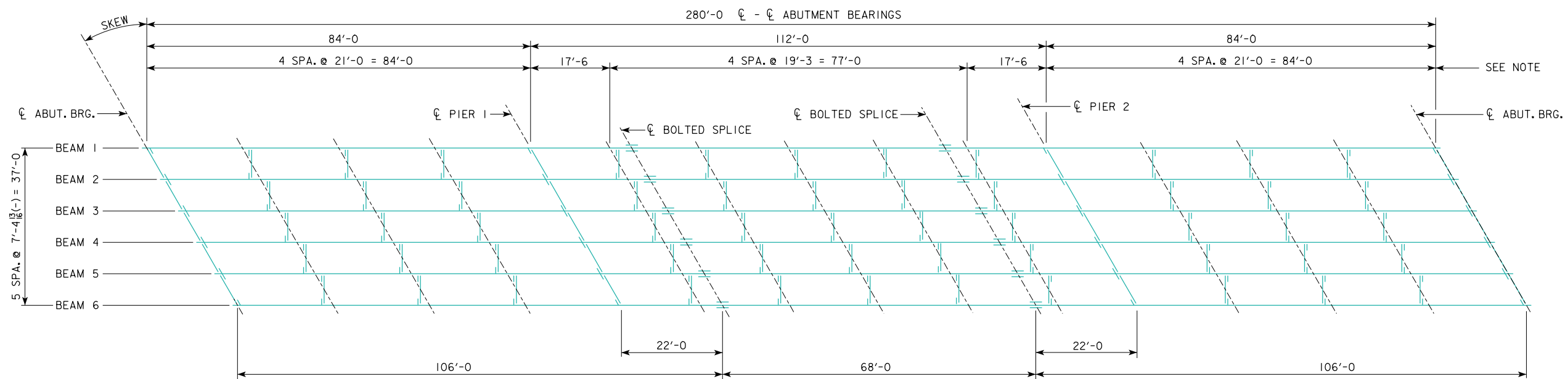


REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	FRAMING PLAN 260'-0 BRIDGE
	RS40-052-14



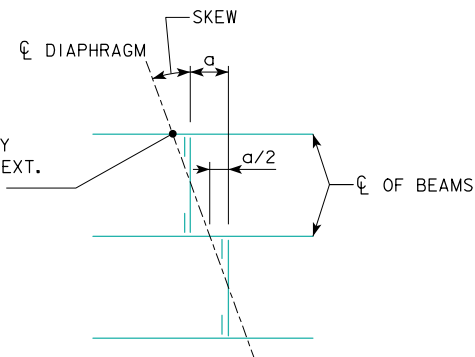
0° SKEW FRAMING PLAN



SKEWED FRAMING PLAN

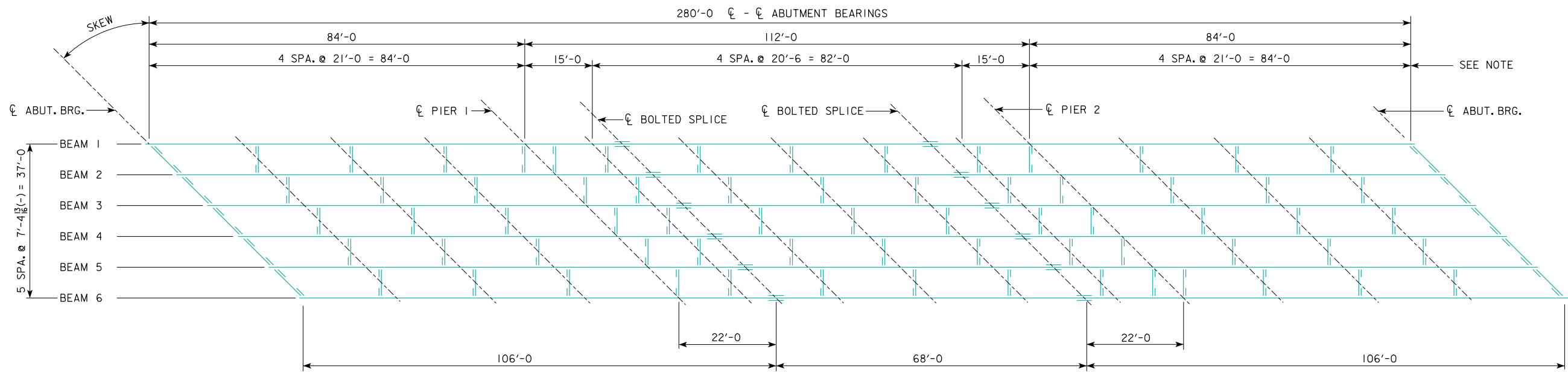
(R.A. SHOWN, L.A. SIMILAR)

NOTE:
DIMENSIONS SHOWN APPLY
AT INTERSECTION OF ϕ EXT.
BEAM AND ϕ DIAPHRAGM

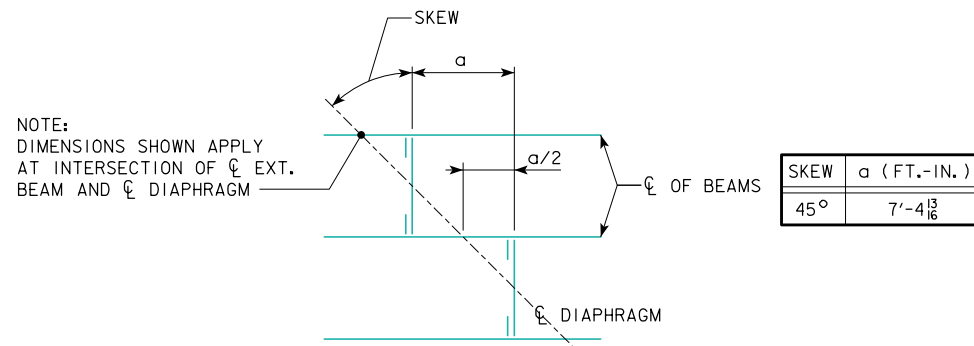


SKEW	a (FT.-IN.)
10°	1'-3 $\frac{1}{8}$ "
20°	2'-8 $\frac{5}{8}$ "
30°	4'-3 $\frac{1}{4}$ "

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER <i>[Signature]</i>		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
FRAMING PLAN 280'-0 BRIDGE		RS40-053-14	

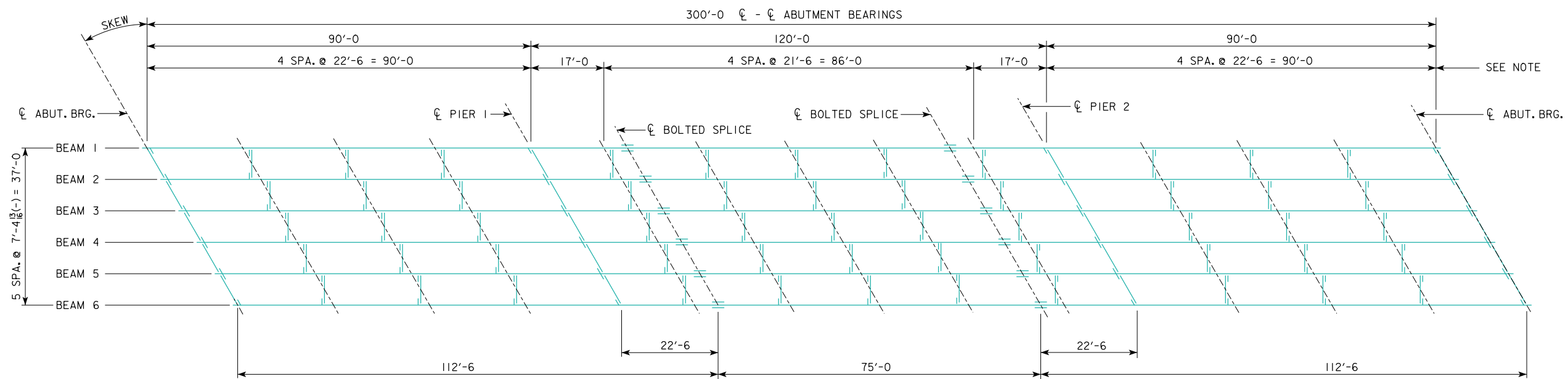
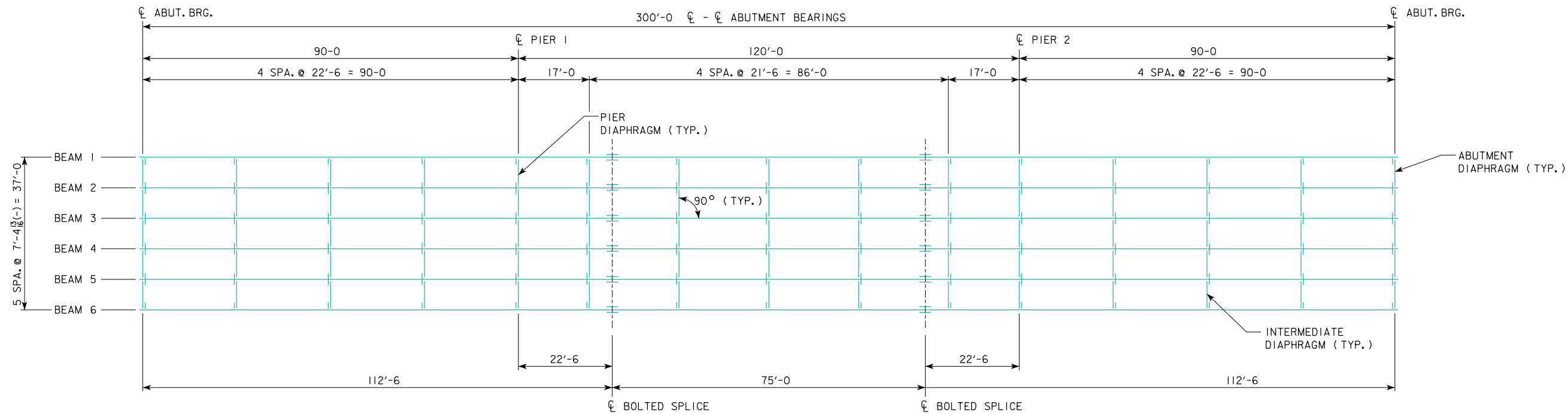


45° SKEWED FRAMING PLAN
(R.A. SHOWN, L.A. SIMILAR)

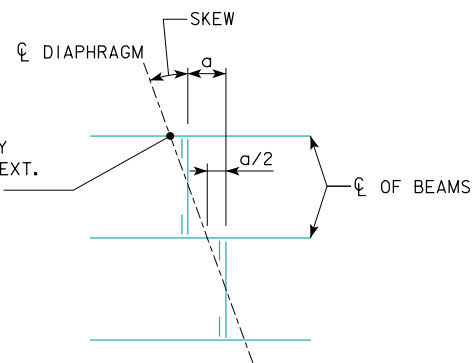


REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER		
	STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
	<table border="1" style="width: 100%;"> <tr> <td style="width: 50%;">FRAMING PLAN 280'-0 BRIDGE</td> <td style="width: 50%;">RS40-054-14</td> </tr> </table>	FRAMING PLAN 280'-0 BRIDGE
FRAMING PLAN 280'-0 BRIDGE	RS40-054-14	



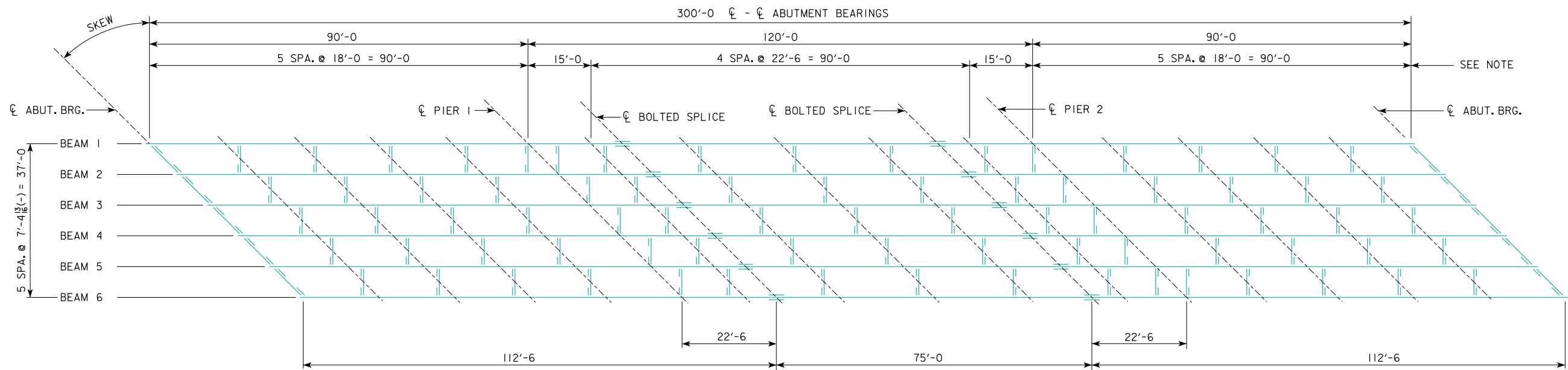
NOTE:
DIMENSIONS SHOWN APPLY
AT INTERSECTION OF ϕ EXT.
BEAM AND ϕ DIAPHRAGM



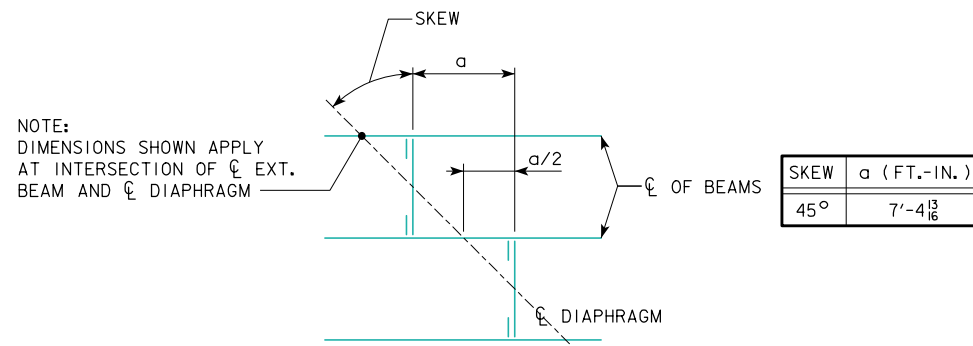
SKEW	a (FT.-IN.)
10°	1'-3 $\frac{1}{8}$ "
20°	2'-8 $\frac{5}{8}$ "
30°	4'-3 $\frac{1}{4}$ "

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER <i>[Signature]</i>		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
FRAMING PLAN 300'-0 BRIDGE		RS40-055-14	

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

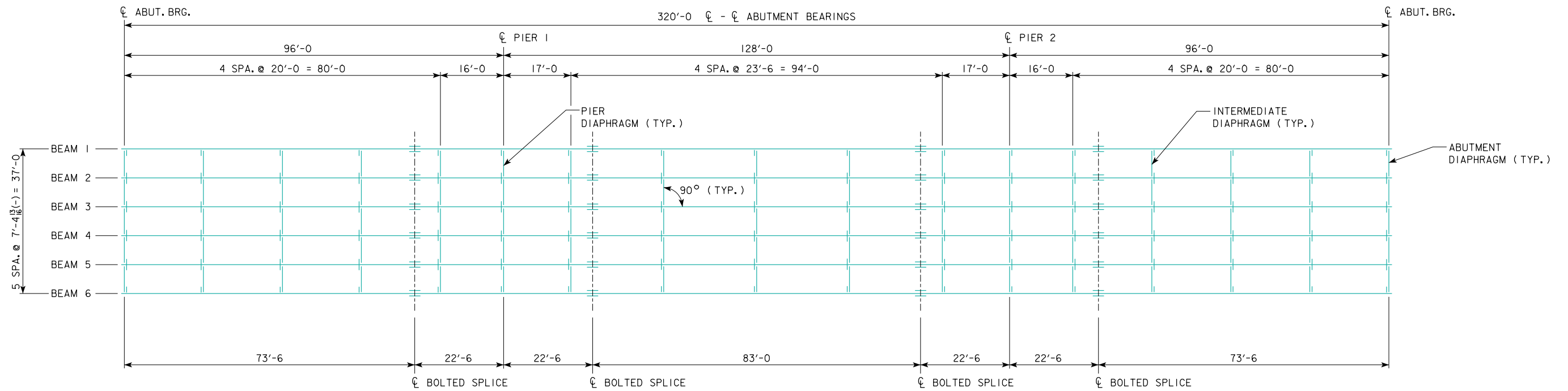


45° SKEWED FRAMING PLAN
(R.A. SHOWN, L.A. SIMILAR)

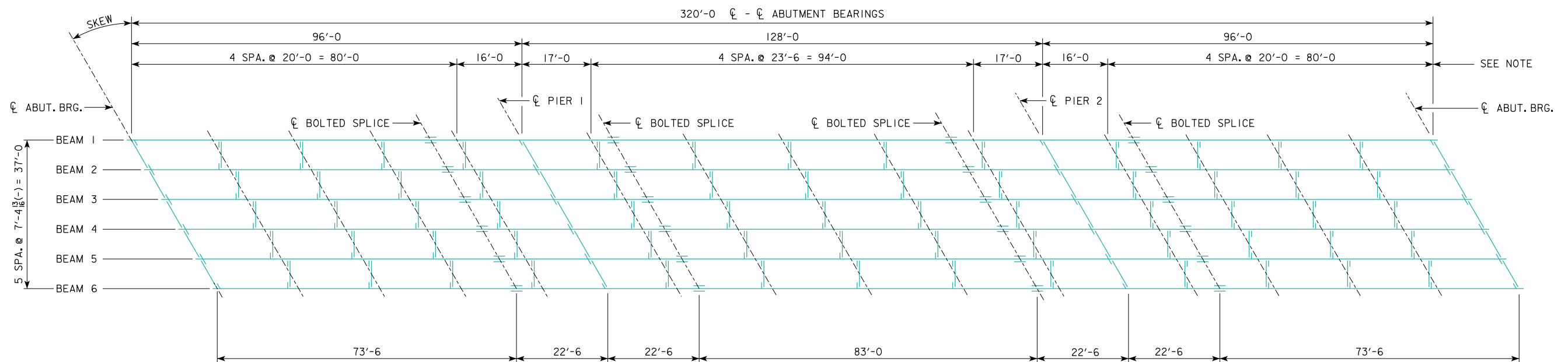


REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
	FRAMING PLAN 300'-0 BRIDGE	RS40-056-14

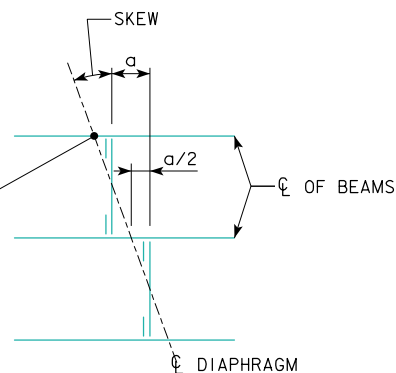


0° SKEW FRAMING PLAN



SKEWED FRAMING PLAN
(R.A. SHOWN, L.A. SIMILAR)

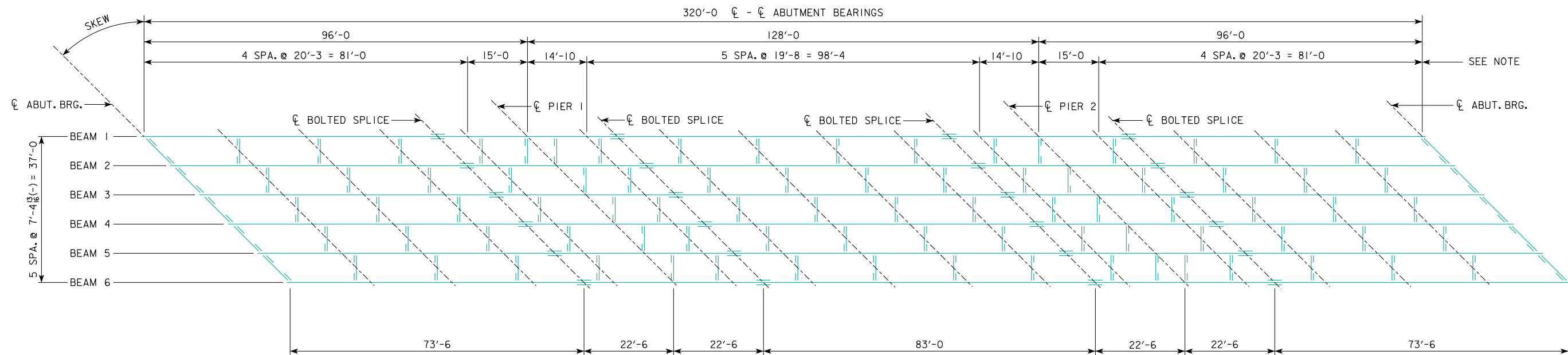
NOTE:
DIMENSIONS SHOWN APPLY
AT INTERSECTION OF EXT.
BEAM AND CL DIAPHRAGM



SKEW	a (FT.-IN.)
10°	1'-3 ¹¹ / ₁₆
20°	2'-8 ⁵ / ₁₆
30°	4'-3 ¹ / ₄

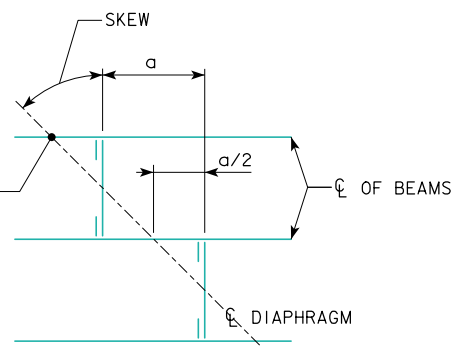
08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER 	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	FRAMING PLAN 320'-0 BRIDGE
	RS40-057-14

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



45° SKEWED FRAMING PLAN
(R.A. SHOWN, L.A. SIMILAR)

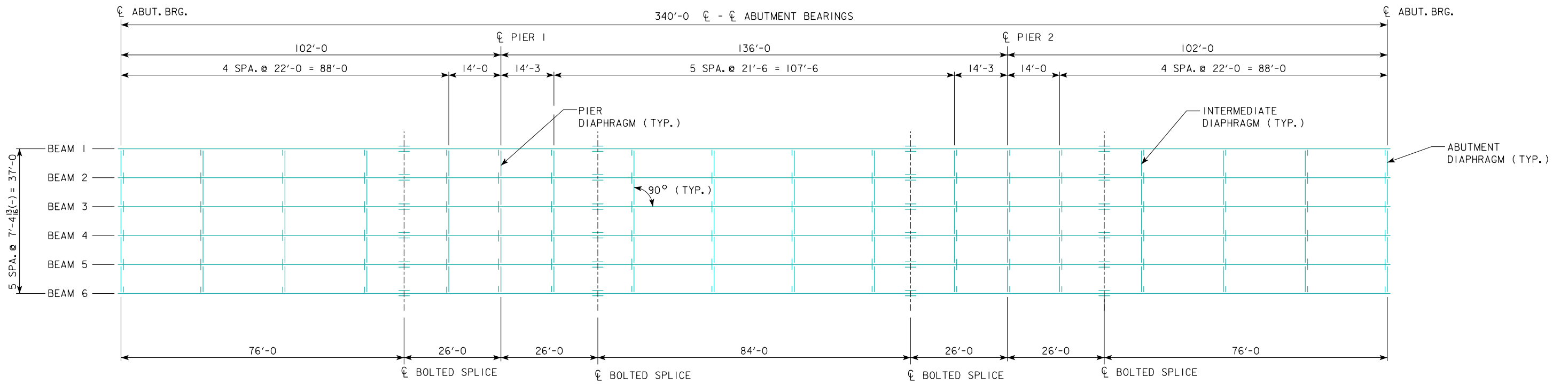
NOTE:
DIMENSIONS SHOWN APPLY
AT INTERSECTION OF ϕ EXT.
BEAM AND ϕ DIAPHRAGM



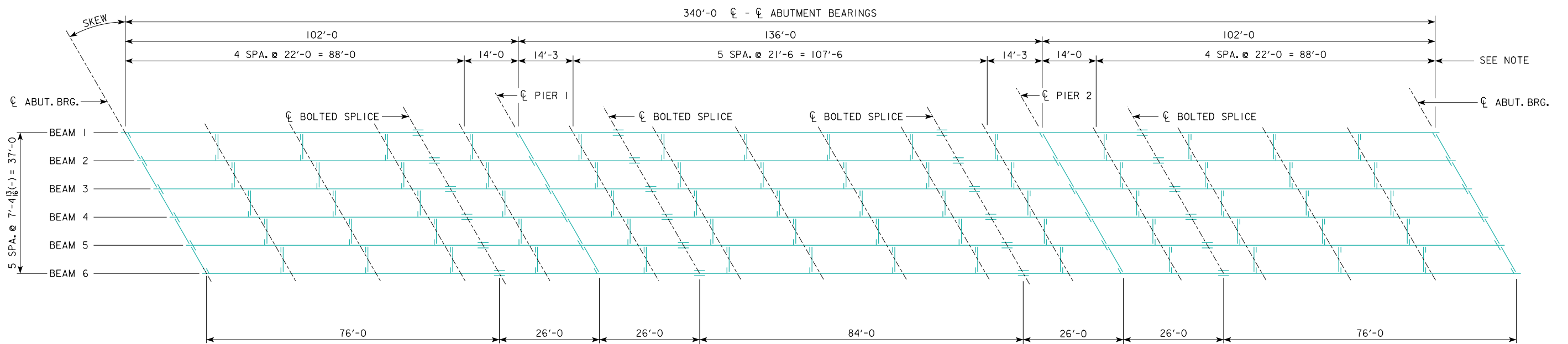
SKEW	a (FT.-IN.)
45°	7'-4 $\frac{13}{16}$

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	FRAMING PLAN 320'-0 BRIDGE
	RS40-058-14

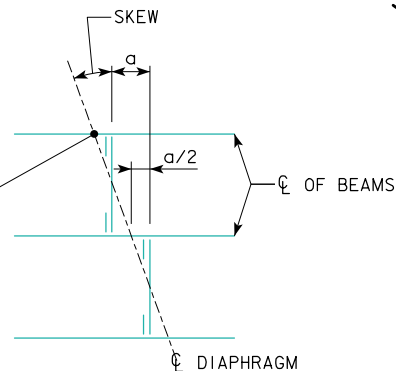


0° SKEW FRAMING PLAN





SKEWED FRAMING PLAN
(R.A. SHOWN, L.A. SIMILAR)

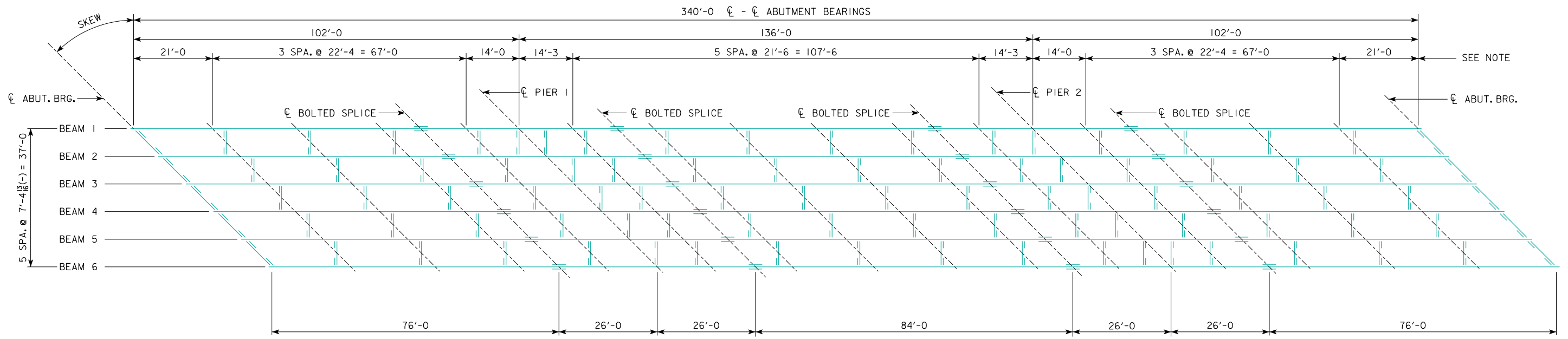
NOTE:
DIMENSIONS SHOWN APPLY
AT INTERSECTION OF EXT.
BEAM AND CL DIAPHRAGM



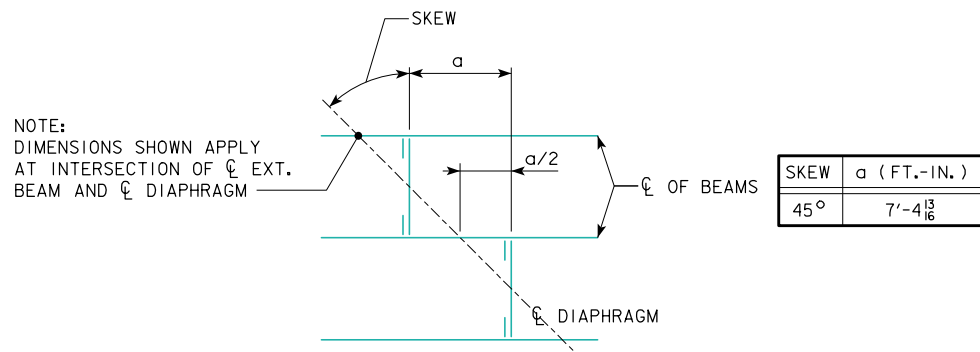
SKEW	a (FT.-IN.)
10°	1'-3 ¹¹ / ₁₆
20°	2'-8 ⁵ / ₁₆
30°	4'-3 ¹ / ₄

08-2018 LATEST REVISION DATE  APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	FRAMING PLAN 340'-0 BRIDGE
	RS40-059-14

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

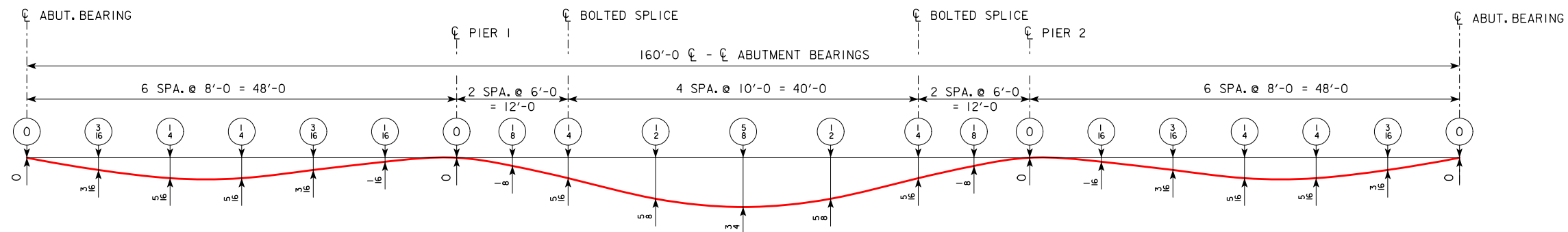


45° SKEWED FRAMING PLAN
(R.A. SHOWN, L.A. SIMILAR)



REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	FRAMING PLAN 340'-0 BRIDGE
	RS40-060-14



DEAD LOAD DEFLECTION DIAGRAM

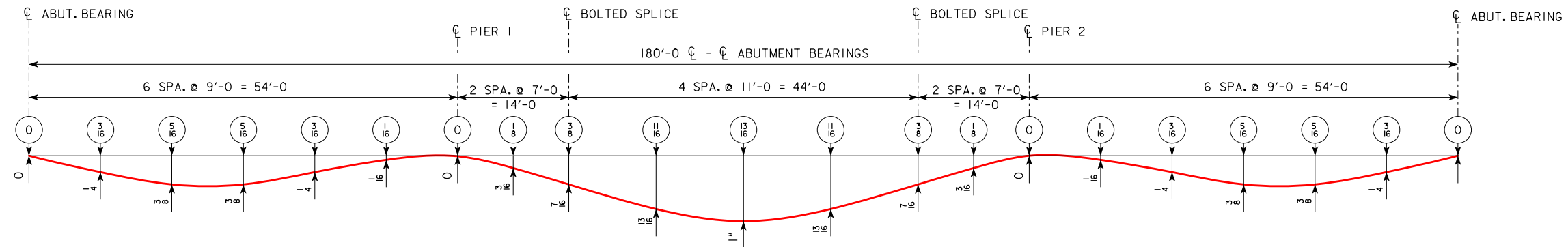
- NOTES:
 1. ENCIRCLED NUMBERS INDICATE ANTICIPATED DEFLECTION DUE TO CONCRETE ONLY.
 2. DEFLECTIONS ARE IN INCHES.

		MOMENT - foot-kips						REACTION - kips					
LOAD NAME	LOAD - k/ft†	POSITIVE MOMENT				NEGATIVE MOMENT		REACTION					
		0.4 PT. END SPAN		0.5 PT. CENTER SPAN		PIER	PIER	ABUTMENT	ABUTMENT	PIER	PIER		
		INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR		
DC1	0.74*	0.72*	129	120	167	155	279	259	16	15	55	51	
DC2	0.14	0.14	24	24	35	35	38	38	3	3	9	9	
DW	0.15	0.15	25	25	37	36	39	39	3	3	9	9	
LIVE LOAD + IMPACT HL-93	DISTRIBUTION FACTOR	MOMENT	MOMENT	538	577	606	699	339	380	-	-	-	-
		0.635	0.681										
	REACTION	REACTION	-	-	-	-	-	-	69	61	101	89	
TOTAL			-	-	-	-	-	-	91	82	174	158	

* LOAD VALUES DO NOT INCLUDE GIRDER WEIGHT.
 MOMENT AND REACTION VALUES DO INCLUDE GIRDER WEIGHT.
 MOMENTS AND REACTIONS SHOWN ARE UNFACTORED.

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER 		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
		BEAM DEFLECTIONS 160'-0 BRIDGE	RS40-061-14

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



DEAD LOAD DEFLECTION DIAGRAM

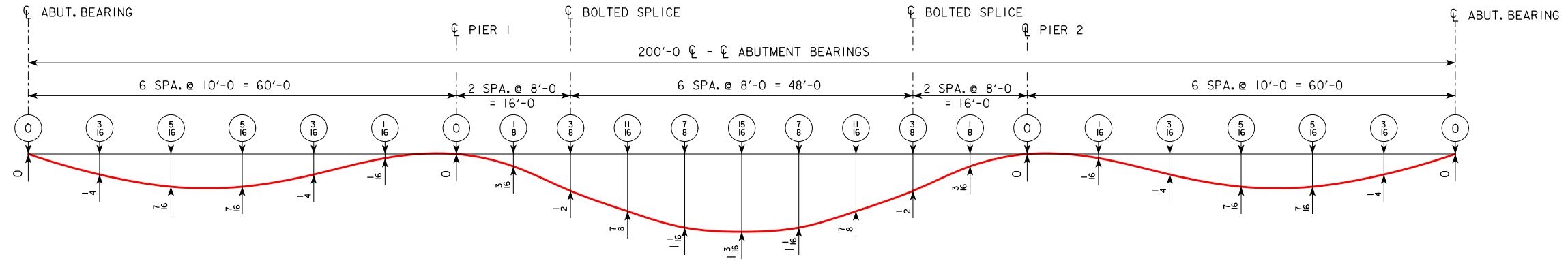
- NOTES:
 1. ENCIRCLED NUMBERS INDICATE ANTICIPATED DEFLECTION DUE TO CONCRETE ONLY.
 2. DEFLECTIONS ARE IN INCHES.

		MOMENT - foot-kips						REACTION - kips					
LOAD NAME	LOAD - k/ft	POSITIVE MOMENT				NEGATIVE MOMENT		REACTION					
		0.4 PT. END SPAN		0.5 PT. CENTER SPAN		PIER	PIER	ABUTMENT	ABUTMENT	PIER	PIER		
		INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR		
DC1	0.74*	0.72*	166	155	202	187	370	344	18	17	63	59	
DC2	0.14	0.14	30	30	42	42	50	50	3	3	10	10	
DW	0.15	0.15	31	31	44	44	52	52	3	3	10	10	
LIVE LOAD + IMPACT HL-93	DISTRIBUTION FACTOR	MOMENT	MOMENT	639	690	691	812	429	485	-	-	-	-
		0.630	0.681										
		REACTION	REACTION	-	-	-	-	-	-	72	64	106	94
TOTAL			-	-	-	-	901	931	96	87	189	173	

* LOAD VALUES DO NOT INCLUDE GIRDER WEIGHT.
 MOMENT AND REACTION VALUES DO INCLUDE GIRDER WEIGHT.
 MOMENTS AND REACTIONS SHOWN ARE UNFACTORED.

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER 		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
		BEAM DEFLECTIONS 180'-0 BRIDGE	RS40-062-14

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



DEAD LOAD DEFLECTION DIAGRAM

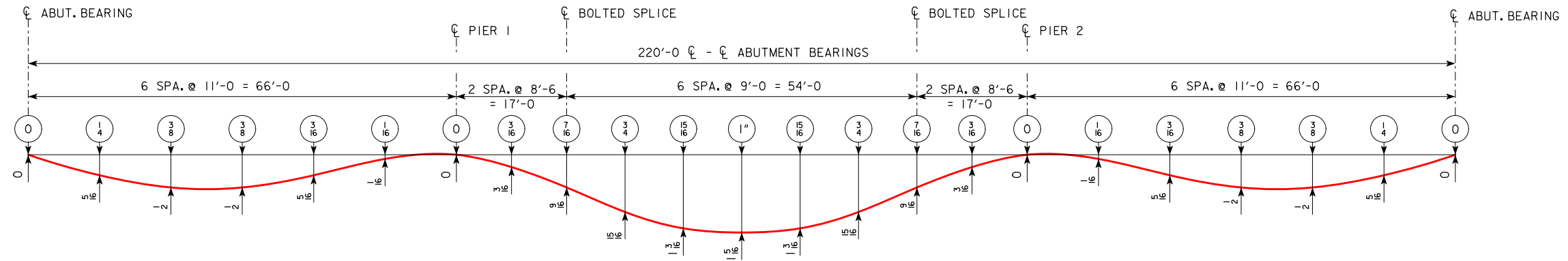
- NOTES:
 1. ENCIRCLED NUMBERS INDICATE ANTICIPATED DEFLECTION DUE TO CONCRETE ONLY.
 2. DEFLECTIONS ARE IN INCHES.

		MOMENT - foot-kips		MOMENT AND REACTION TABLE						REACTION - kips			
LOAD NAME	LOAD - k/ft	POSITIVE MOMENT				NEGATIVE MOMENT		REACTION					
		0.4 PT. END SPAN		0.5 PT. CENTER SPAN		PIER	PIER	ABUTMENT	ABUTMENT	PIER	PIER		
		INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR		
DC1	0.74*	0.72*		209	196	249	231	470	438	21	20	72	67
DC2	0.14	0.14		36	36	51	51	63	63	3	3	11	11
DW	0.15	0.15		38	38	53	53	65	66	3	3	11	11
LIVE LOAD + IMPACT HL-93	DISTRIBUTION FACTOR	MOMENT	MOMENT	745	806	792	935	549	623	-	-	-	-
		0.629	0.681										
		REACTION	REACTION	-	-	-	-	-	-	75	66	111	98
TOTAL				-	-	-	-	1147	1190	102	92	205	187

* LOAD VALUES DO NOT INCLUDE GIRDER WEIGHT.
 MOMENT AND REACTION VALUES DO INCLUDE GIRDER WEIGHT.
 MOMENTS AND REACTIONS SHOWN ARE UNFACTORED.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER 	
	STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	BEAM DEFLECTIONS 200'-0 BRIDGE
RS40-063-14	

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



DEAD LOAD DEFLECTION DIAGRAM

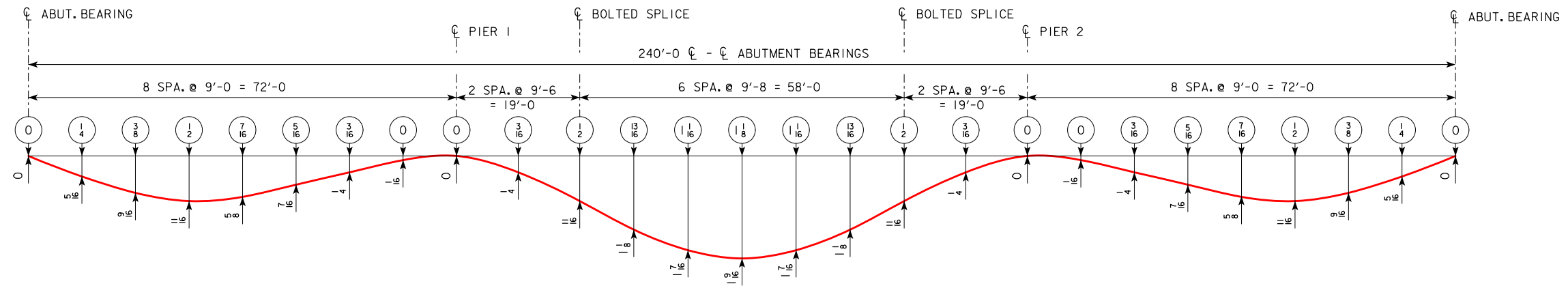
- NOTES:
 1. ENCIRCLED NUMBERS INDICATE ANTICIPATED DEFLECTION DUE TO CONCRETE ONLY.
 2. DEFLECTIONS ARE IN INCHES.

		MOMENT - foot-kips						REACTION - kips					
LOAD NAME	LOAD - k/ft	POSITIVE MOMENT				NEGATIVE MOMENT		REACTION					
		0.4 PT. END SPAN		0.5 PT. CENTER SPAN		PIER	PIER	ABUTMENT	ABUTMENT	PIER	PIER		
		INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR		
DC1	0.74*	0.72*	260	243	307	286	579	541	23	22	80	75	
DC2	0.14	0.14	44	44	62	62	75	76	4	4	12	12	
DW	0.15	0.15	46	46	65	64	79	79	4	4	13	13	
LIVE LOAD + IMPACT HL-93	DISTRIBUTION FACTOR	MOMENT	MOMENT	841	913	943	1115	648	738	-	-	-	-
		0.626	0.681										
	REACTION	REACTION	-	-	-	-	-	-	77	68	118	104	
TOTAL			-	-	-	-	1381	1434	108	98	223	204	

* LOAD VALUES DO NOT INCLUDE GIRDER WEIGHT.
 MOMENT AND REACTION VALUES DO INCLUDE GIRDER WEIGHT.
 MOMENTS AND REACTIONS SHOWN ARE UNFACTORED.

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER 		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
		BEAM DEFLECTIONS 220'-0 BRIDGE	RS40-064-14

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



DEAD LOAD DEFLECTION DIAGRAM

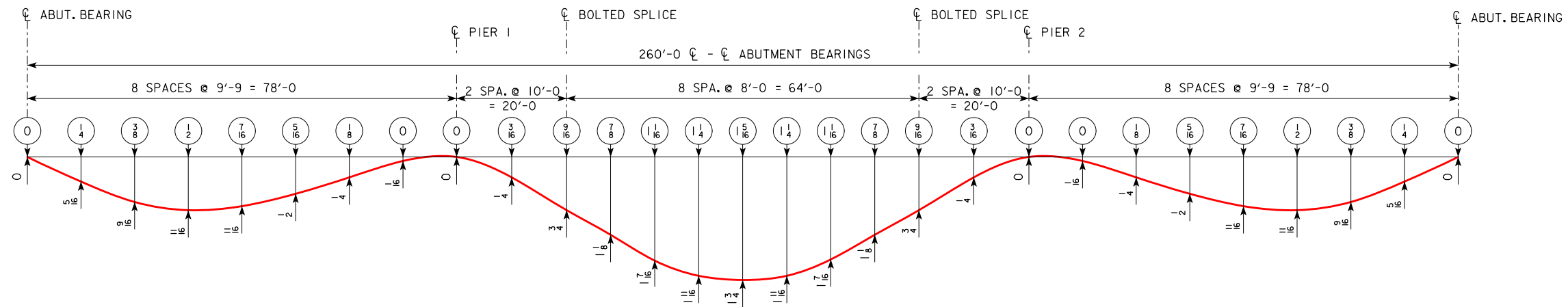
- NOTES:
 1. ENCIRCLED NUMBERS INDICATE ANTICIPATED DEFLECTION DUE TO CONCRETE ONLY.
 2. DEFLECTIONS ARE IN INCHES.

		MOMENT - foot-kips						REACTION - kips					
LOAD NAME	LOAD - k/ft		POSITIVE MOMENT				NEGATIVE MOMENT		REACTION				
			0.4 PT. END SPAN		0.5 PT. CENTER SPAN		PIER	PIER	ABUTMENT	ABUTMENT	PIER	PIER	
	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	
DC1	0.74*	0.72*	322	301	401	374	698	653	26	24	90	85	
DC2	0.14	0.14	53	52	75	74	89	90	4	4	13	13	
DW	0.15	0.15	55	55	78	77	93	93	4	4	14	14	
LIVE LOAD + IMPACT HL-93	DISTRIBUTION FACTOR	MOMENT	MOMENT	943	1035	1077	1277	735	847	-	-	-	-
		0.620	0.681										
		REACTION	REACTION	-	-	-	-	-	-	79	70	128	113
TOTAL			-	-	-	-	1615	1683	113	102	245	225	

* LOAD VALUES DO NOT INCLUDE GIRDER WEIGHT.
 MOMENT AND REACTION VALUES DO INCLUDE GIRDER WEIGHT.
 MOMENTS AND REACTIONS SHOWN ARE UNFACTORED.

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER 	IOWA DOT Highway Division	
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES	
		OCTOBER, 2014	
		BEAM DEFLECTIONS 240'-0 BRIDGE	RS40-065-14

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



DEAD LOAD DEFLECTION DIAGRAM

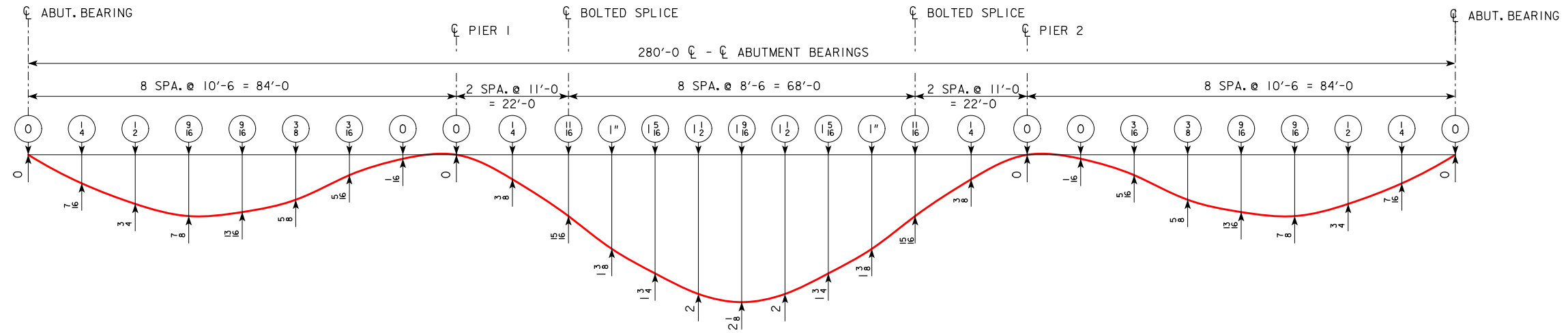
- NOTES:
 1. ENCIRCLED NUMBERS INDICATE ANTICIPATED DEFLECTION DUE TO CONCRETE ONLY.
 2. DEFLECTIONS ARE IN INCHES.

		MOMENT - foot-kips						REACTION - kips					
LOAD NAME	LOAD - k/ft	POSITIVE MOMENT				NEGATIVE MOMENT		REACTION					
		0.4 PT. END SPAN		0.5 PT. CENTER SPAN		PIER	PIER	ABUTMENT	ABUTMENT	PIER	PIER		
		INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR		
DC1	0.74*	0.72*	385	362	440	411	848	794	29	27	100	94	
DC2	0.14	0.14	60	60	83	83	109	109	4	4	14	14	
DW	0.15	0.15	63	62	87	86	113	114	4	4	15	15	
LIVE LOAD + IMPACT HL-93	DISTRIBUTION FACTOR	MOMENT	MOMENT	1053	1159	1163	1391	870	1004	-	-	-	-
		0.618	0.681										
	REACTION	REACTION	-	-	-	-	-	-	82	72	138	122	
TOTAL			-	-	-	-	1940	2021	119	107	267	245	

* LOAD VALUES DO NOT INCLUDE GIRDER WEIGHT.
 MOMENT AND REACTION VALUES DO INCLUDE GIRDER WEIGHT.
 MOMENTS AND REACTIONS SHOWN ARE UNFACTORED.

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER <i>[Signature]</i>		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
		BEAM DEFLECTIONS 260'-0 BRIDGE	RS40-066-14

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



DEAD LOAD DEFLECTION DIAGRAM

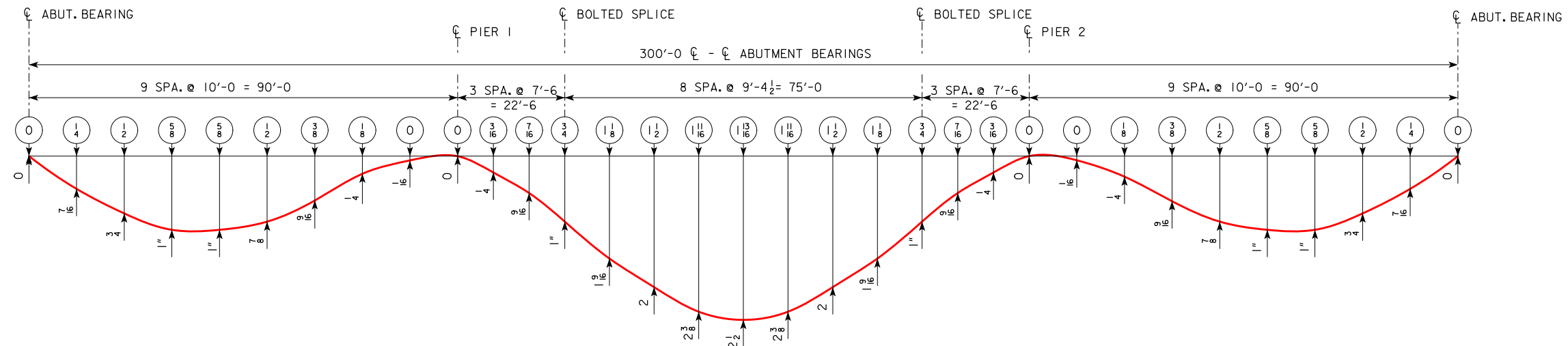
- NOTES:
 1. ENCIRCLED NUMBERS INDICATE ANTICIPATED DEFLECTION DUE TO CONCRETE ONLY.
 2. DEFLECTIONS ARE IN INCHES.

		MOMENT - foot-kips						REACTION - kips					
LOAD NAME	LOAD - k/ft	POSITIVE MOMENT				NEGATIVE MOMENT		REACTION					
		0.4 PT. END SPAN		0.5 PT. CENTER SPAN		PIER	PIER	ABUTMENT	ABUTMENT	PIER	PIER		
		INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR		
DC1	0.74*	0.72*	456	429	523	489	998	935	31	30	109	103	
DC2	0.14	0.14	70	69	96	95	127	127	4	4	15	15	
DW	0.15	0.15	73	72	100	99	132	133	5	5	16	16	
LIVE LOAD + IMPACT HL-93	DISTRIBUTION FACTOR	MOMENT	MOMENT	1159	1288	1273	1538	962	1122	-	-	-	-
		0.612	0.681										
		REACTION	REACTION	-	-	-	-	-	-	84	74	146	129
TOTAL			-	-	-	-	2219	2317	124	113	286	263	

* LOAD VALUES DO NOT INCLUDE GIRDER WEIGHT.
 MOMENT AND REACTION VALUES DO INCLUDE GIRDER WEIGHT.
 MOMENTS AND REACTIONS SHOWN ARE UNFACTORED.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER 	
	STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	BEAM DEFLECTIONS 280'-0 BRIDGE
RS40-067-14	

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



DEAD LOAD DEFLECTION DIAGRAM

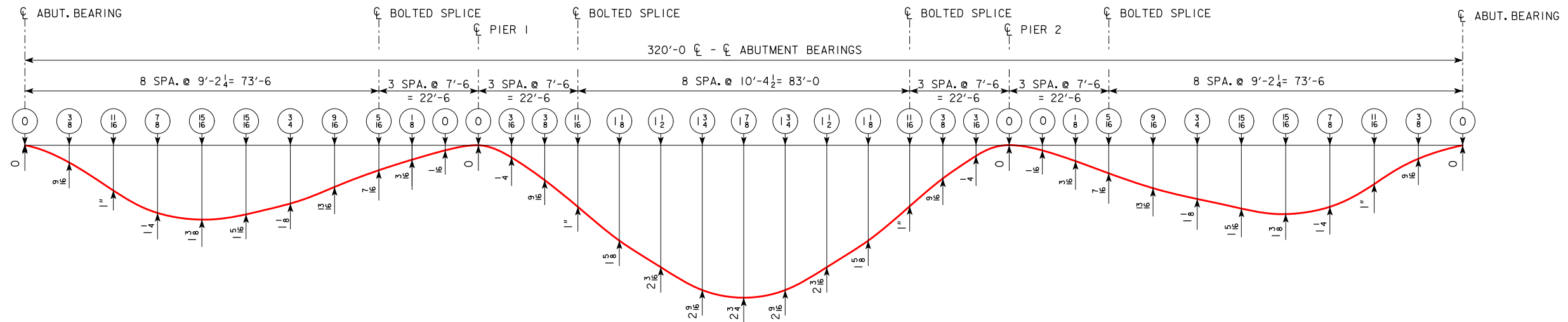
- NOTES:
 1. ENCIRCLED NUMBERS INDICATE ANTICIPATED DEFLECTION DUE TO CONCRETE ONLY.
 2. DEFLECTIONS ARE IN INCHES.

		MOMENT - foot-kips						REACTION - kips					
LOAD NAME	LOAD - k/ft	POSITIVE MOMENT				NEGATIVE MOMENT		REACTION					
		0.4 PT. END SPAN		0.5 PT. CENTER SPAN		PIER	PIER	ABUTMENT	ABUTMENT	PIER	PIER		
		INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR		
DC1	0.74*	0.72*	542	511	606	567	1189	1117	35	33	121	114	
DC2	0.14	0.14	79	78	107	106	148	149	5	5	17	17	
DW	0.15	0.15	82	82	112	111	155	156	5	5	17	17	
LIVE LOAD + IMPACT HL-93	DISTRIBUTION FACTOR	MOMENT	MOMENT	1272	1420	1370	1669	1083	1269	-	-	-	-
		0.609	0.681										
		REACTION	REACTION	-	-	-	-	-	-	86	76	154	135
TOTAL			-	-	-	-	2575	2691	131	119	309	283	

* LOAD VALUES DO NOT INCLUDE GIRDER WEIGHT.
 MOMENT AND REACTION VALUES DO INCLUDE GIRDER WEIGHT.
 MOMENTS AND REACTIONS SHOWN ARE UNFACTORED.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER 	
	STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	BEAM DEFLECTIONS 300'-0 BRIDGE
RS40-068-14	

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



DEAD LOAD DEFLECTION DIAGRAM

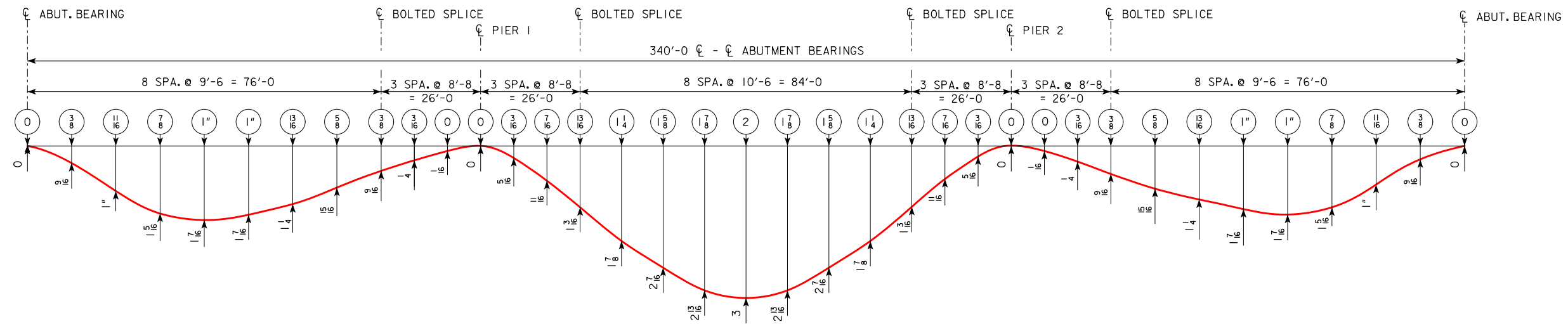
- NOTES:
 1. ENCIRCLED NUMBERS INDICATE ANTICIPATED DEFLECTION DUE TO CONCRETE ONLY.
 2. DEFLECTIONS ARE IN INCHES.

		MOMENT - foot-kips						REACTION - kips					
LOAD NAME	LOAD - k/ft	POSITIVE MOMENT				NEGATIVE MOMENT		REACTION					
		0.4 PT. END SPAN		0.5 PT. CENTER SPAN		PIER	PIER	ABUTMENT	ABUTMENT	PIER	PIER		
		INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR		
DC1	0.74*	0.72*		565	531	680	639	1406	1321	35	33	132	124
DC2	0.14	0.14		87	86	115	114	175	176	5	5	18	18
DW	0.15	0.15		91	90	120	119	183	184	5	5	18	18
LIVE LOAD + IMPACT HL-93	DISTRIBUTION FACTOR	MOMENT	MOMENT										
		0.591	0.681	1302	1500	1511	1869	1260	1488	-	-	-	-
		REACTION	REACTION								87	77	163
TOTAL													

* LOAD VALUES DO NOT INCLUDE GIRDER WEIGHT.
 MOMENT AND REACTION VALUES DO INCLUDE GIRDER WEIGHT.
 MOMENTS AND REACTIONS SHOWN ARE UNFACTORED.

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER <i>[Signature]</i>		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES	
		ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
BEAM DEFLECTIONS 320'-0 BRIDGE		RS40-069-14	

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



DEAD LOAD DEFLECTION DIAGRAM

- NOTES:
 1. ENCIRCLED NUMBERS INDICATE ANTICIPATED DEFLECTION DUE TO CONCRETE ONLY.
 2. DEFLECTIONS ARE IN INCHES.

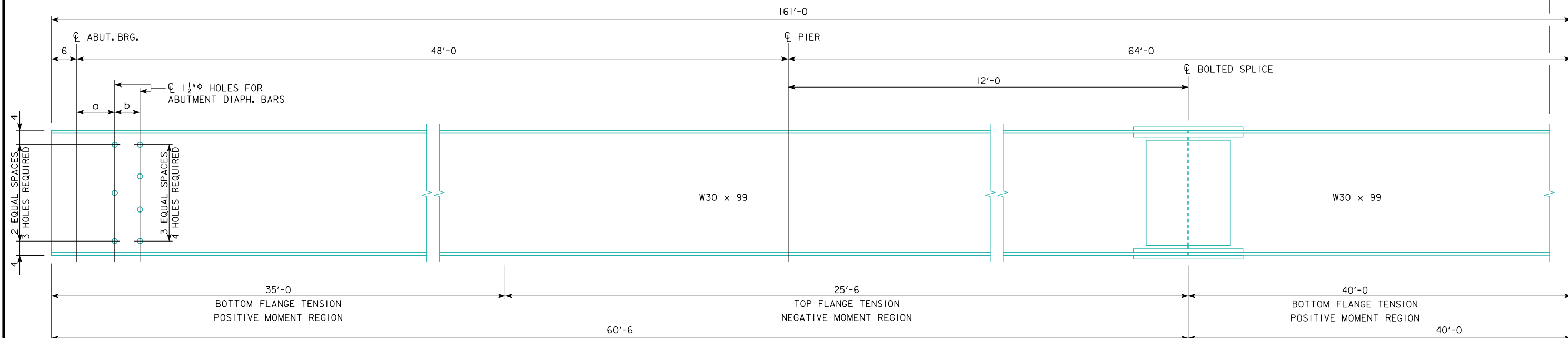
		MOMENT - foot-kips						REACTION - kips					
LOAD NAME	LOAD - k/ft	POSITIVE MOMENT				NEGATIVE MOMENT		REACTION					
		0.4 PT. END SPAN		0.5 PT. CENTER SPAN		PIER	PIER	ABUTMENT	ABUTMENT	PIER	PIER		
		INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR		
DC1	0.74*	0.72*	655	615	798	750	1589	1494	38	36	141	132	
DC2	0.14	0.14	99	99	133	132	195	197	5	5	19	19	
DW	0.15	0.15	103	103	139	137	204	205	6	6	20	20	
LIVE LOAD + IMPACT HL-93	DISTRIBUTION FACTOR	MOMENT	MOMENT	1459	1675	1611	1988	1316	1560	-	-	-	-
		0.592	0.681										
		REACTION	REACTION	-	-	-	-	-	-	89	79	167	148
TOTAL			-	-	-	-	3304	3456	138	126	347	319	

* LOAD VALUES DO NOT INCLUDE GIRDER WEIGHT.
 MOMENT AND REACTION VALUES DO INCLUDE GIRDER WEIGHT.
 MOMENTS AND REACTIONS SHOWN ARE UNFACTORED.

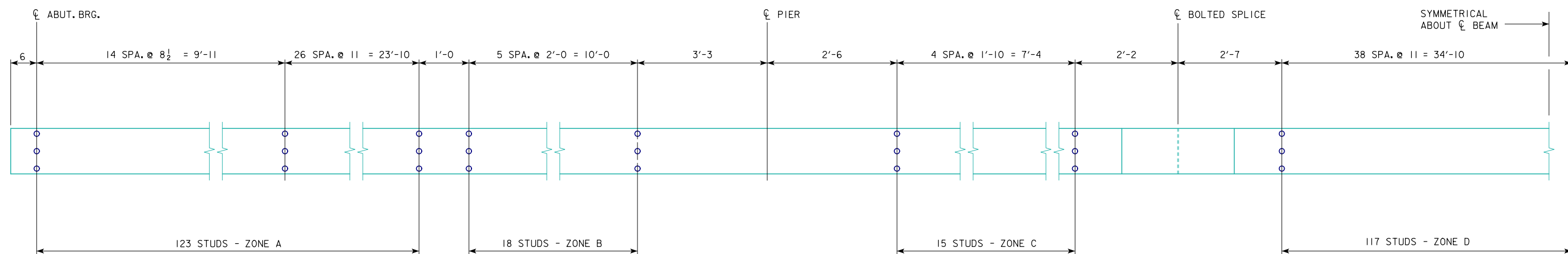
08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
		BEAM DEFLECTIONS 340'-0 BRIDGE
		RS40-070-14

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

SYMMETRICAL ABOUT ϕ BEAM



BEAM ELEVATION



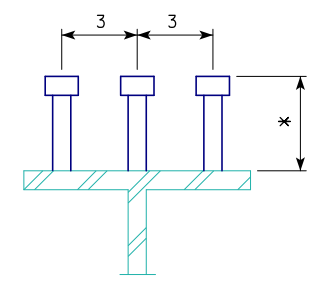
SHEAR STUD SPACING

* NOTE: STUD HEIGHTS (3 1/2", 4" OR 5") FOR THE LOCATIONS SHOWN SHALL BE DETERMINED BY THE DESIGNER. ON "MISCELLANEOUS DETAILS 160'-0 BRIDGE" SHEET, STUD HEIGHTS CAN BE IDENTIFIED BY THE DESIGNER IN A TABLE CORRESPONDING TO THE ZONES LISTED ON THIS SHEET.

Δ WEIGHT OF SHEAR STUDS ARE NOT INCLUDED, SEE MISC. DETAILS - STANDARDS 5252 TO 5261.

STRUCTURAL STEEL	
Δ BEAM WEIGHT	15,939 LBS.

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



SHEAR STUD DETAILS

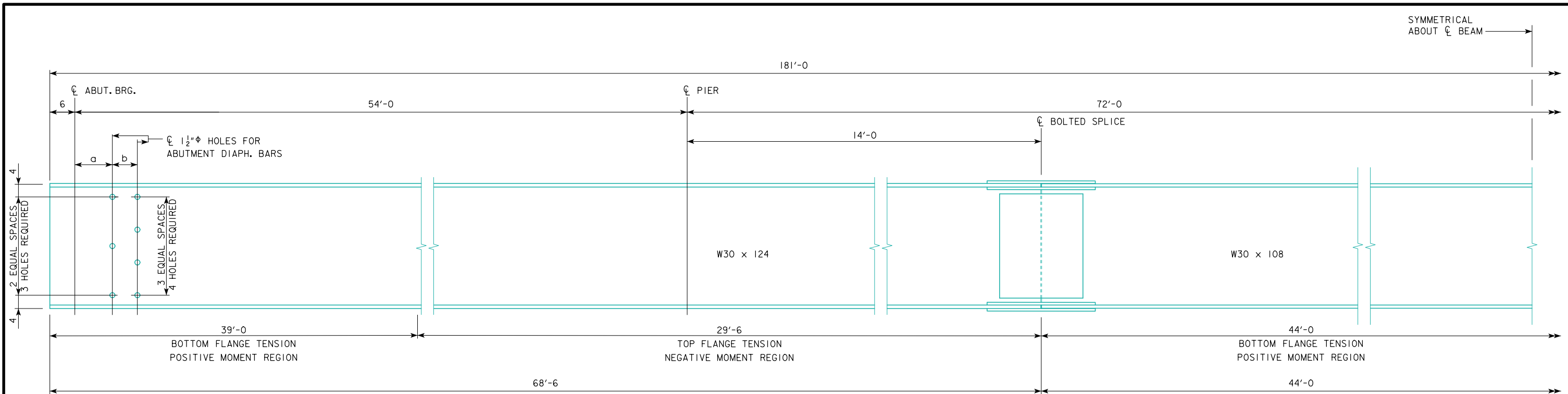
NOTE: ALL STUDS TO BE 7/8" ϕ

SKEW	a (IN)	b (IN)
0°	9	6
10°	9 1/8	6 1/8
20°	9 5/8	6 3/8
30°	10 3/8	6 7/8
45°	12 3/4	8 1/2

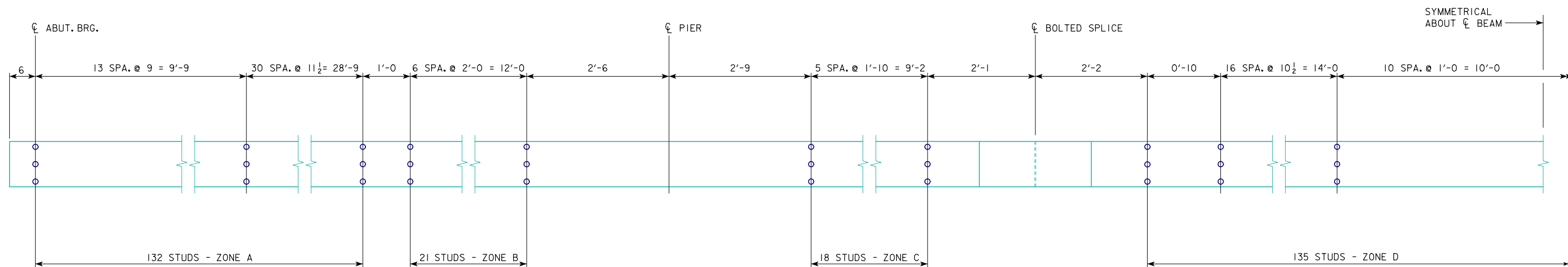
08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER	
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
		BEAM PLAN AND ELEVATION 160'-0 BRIDGE
		RS40-071-14

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

REVISED 02-2017 - CHANGED NOTE STATING "MISCELLANEOUS DETAILS 180'-0 BRIDGE" (WAS 160'-0 IN ERROR).
 REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



BEAM ELEVATION



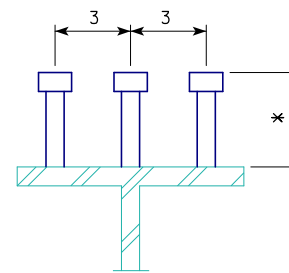
SHEAR STUD SPACING

* NOTE: STUD HEIGHTS (3 1/2", 4" OR 5") FOR THE LOCATIONS SHOWN SHALL BE DETERMINED BY THE DESIGNER. ON "MISCELLANEOUS DETAILS 180'-0 BRIDGE" SHEET, STUD HEIGHTS CAN BE IDENTIFIED BY THE DESIGNER IN A TABLE CORRESPONDING TO THE ZONES LISTED ON THIS SHEET.

Δ WEIGHT OF SHEAR STUDS ARE NOT INCLUDED, SEE MISC. DETAILS - STANDARDS 5252 TO 5261.

STRUCTURAL STEEL	
Δ BEAM WEIGHT	21,740 LBS.

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



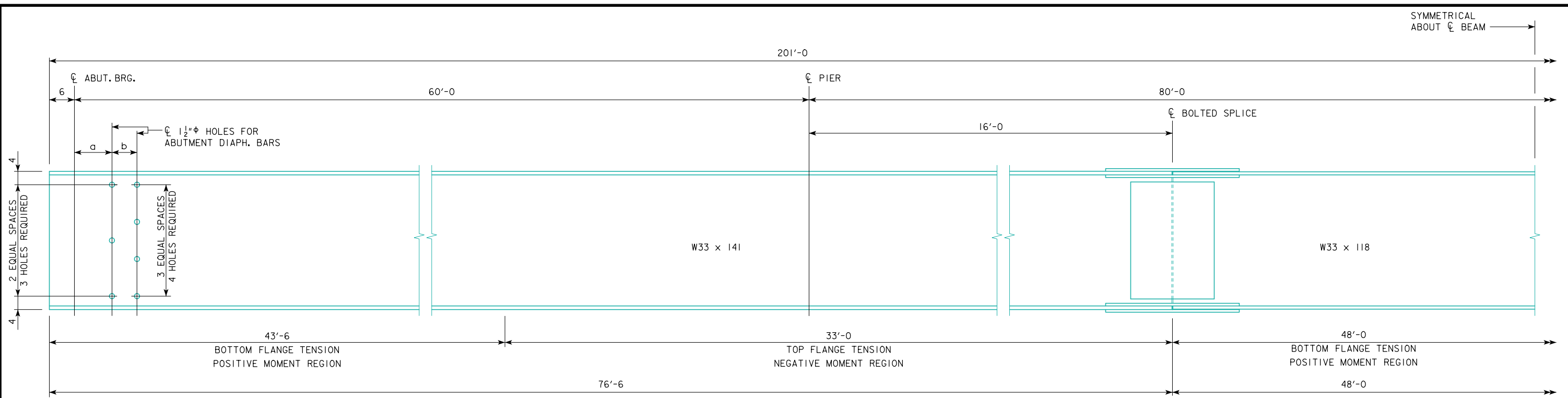
SHEAR STUD DETAILS

NOTE: ALL STUDS TO BE 7/8" φ

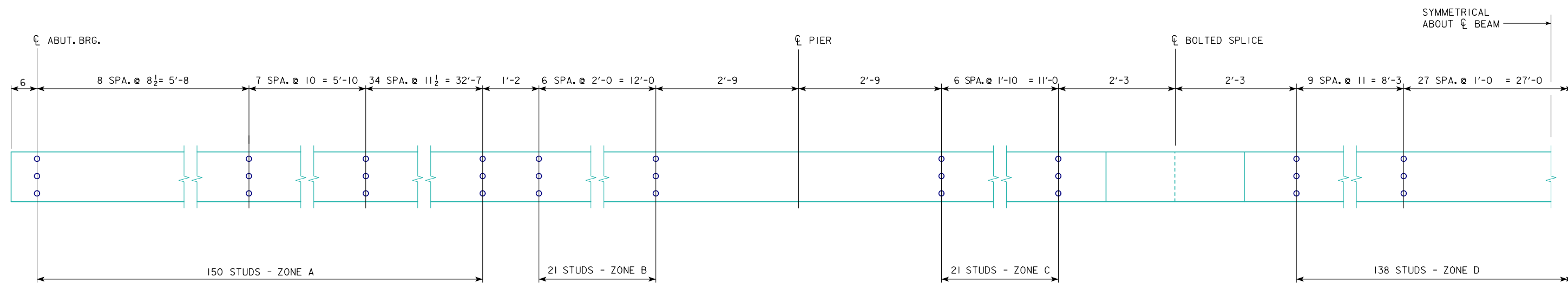
SKEW	a (IN)	b (IN)
0°	9	6
10°	9 1/8	6 1/8
20°	9 5/8	6 3/8
30°	10 3/8	6 7/8
45°	12 3/4	8 1/2

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER <i>[Signature]</i>		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
		BEAM PLAN AND ELEVATION 180'-0 BRIDGE	RS40-072-14

REVISED 02-2017 - CHANGED NOTE STATING "MISCELLANEOUS DETAILS 200'-0 BRIDGE" (WAS 160'-0 IN ERROR).
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



BEAM ELEVATION



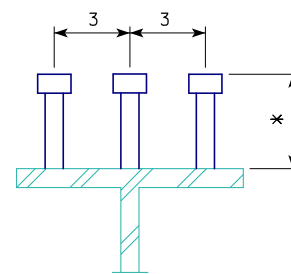
SHEAR STUD SPACING

* NOTE: STUD HEIGHTS (3 1/2", 4" OR 5") FOR THE LOCATIONS SHOWN SHALL BE DETERMINED BY THE DESIGNER. ON "MISCELLANEOUS DETAILS 200'-0 BRIDGE" SHEET, STUD HEIGHTS CAN BE IDENTIFIED BY THE DESIGNER IN A TABLE CORRESPONDING TO THE ZONES LISTED ON THIS SHEET.

Δ WEIGHT OF SHEAR STUDS ARE NOT INCLUDED, SEE MISC. DETAILS - STANDARDS 5252 TO 5261.

STRUCTURAL STEEL	
Δ BEAM WEIGHT	27,237 LBS.

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



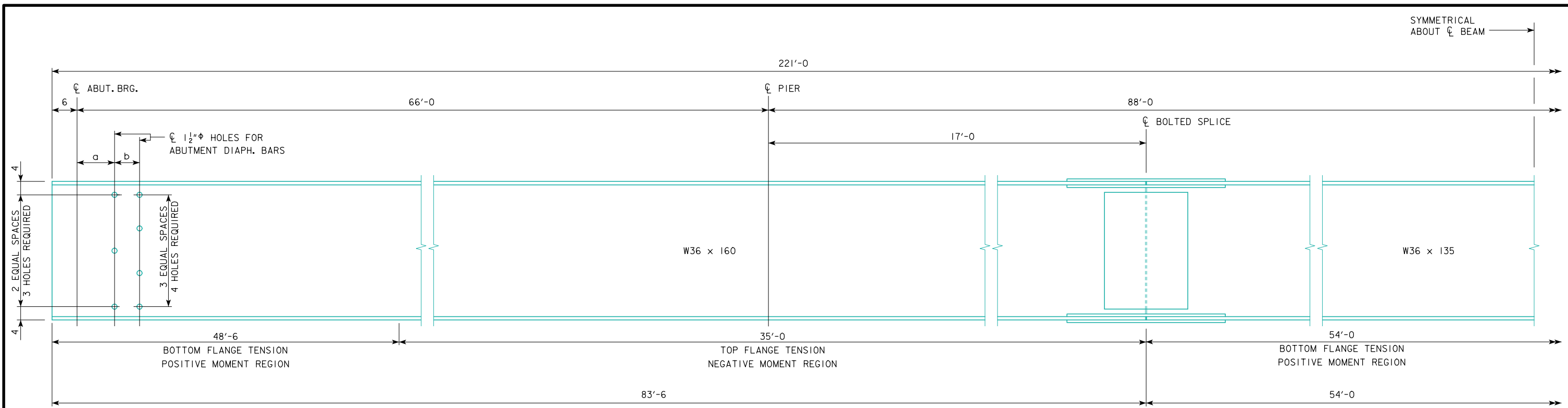
3 STUDS PER ROW
SHEAR STUD DETAILS

NOTE: ALL STUDS TO BE 7/8" Φ

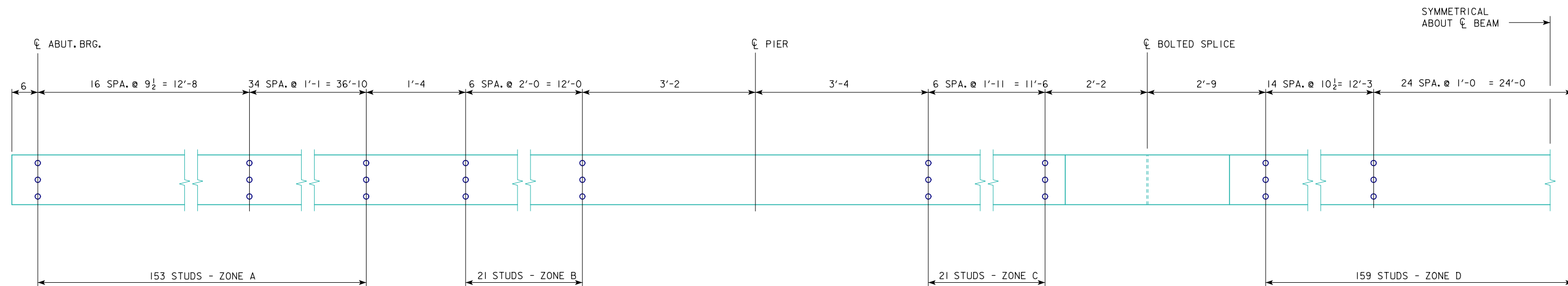
SKEW	a (IN)	b (IN)
0°	9	6
10°	9 1/8	6 1/8
20°	9 5/8	6 3/8
30°	10 3/8	6 7/8
45°	12 3/4	8 1/2

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER 	IOWADOT Highway Division	
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES	
		ROLLED STEEL BEAM BRIDGES	
		OCTOBER, 2014	
BEAM PLAN AND ELEVATION 200'-0 BRIDGE		RS40-073-14	

REVISED 02-2017 - CHANGED NOTE STATING "MISCELLANEOUS DETAILS 220'-0 BRIDGE" (WAS 160'-0 IN ERROR).
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



BEAM ELEVATION



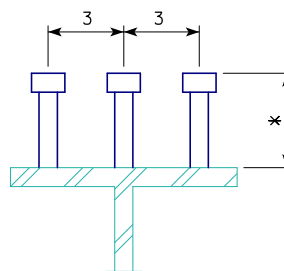
SHEAR STUD SPACING

* NOTE: STUD HEIGHTS (3 1/2\", 4\" OR 5\") FOR THE LOCATIONS SHOWN SHALL BE DETERMINED BY THE DESIGNER. ON "MISCELLANEOUS DETAILS 220'-0 BRIDGE" SHEET, STUD HEIGHTS CAN BE IDENTIFIED BY THE DESIGNER IN A TABLE CORRESPONDING TO THE ZONES LISTED ON THIS SHEET.

Δ WEIGHT OF SHEAR STUDS ARE NOT INCLUDED, SEE MISC. DETAILS - STANDARDS 5252 TO 5261.

STRUCTURAL STEEL	
Δ BEAM WEIGHT	34,010 LBS.

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

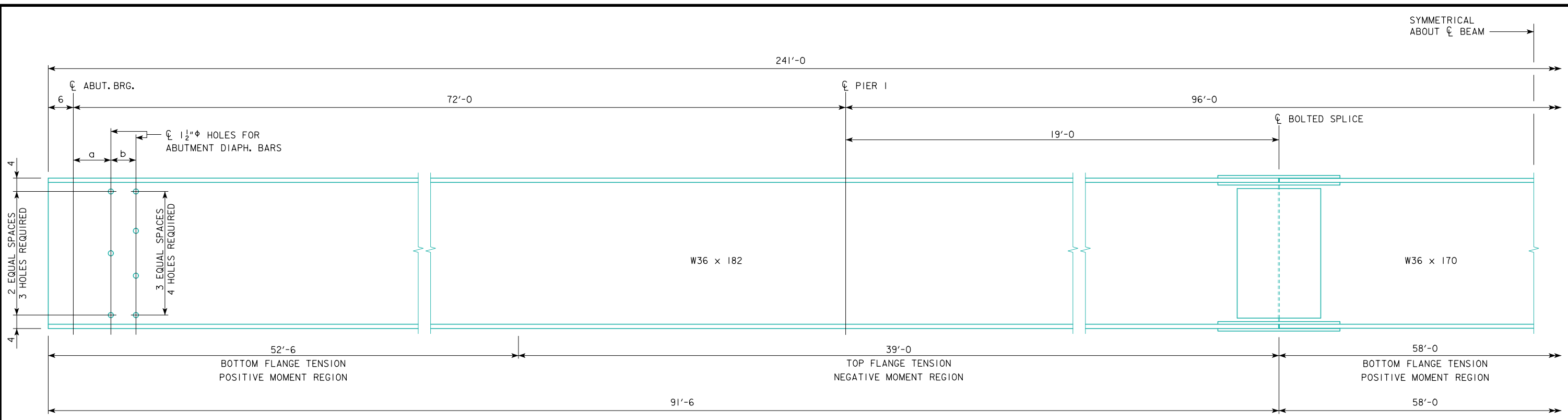


3 STUDS PER ROW
SHEAR STUD DETAILS
NOTE : ALL STUDS TO BE 7/8\"/>

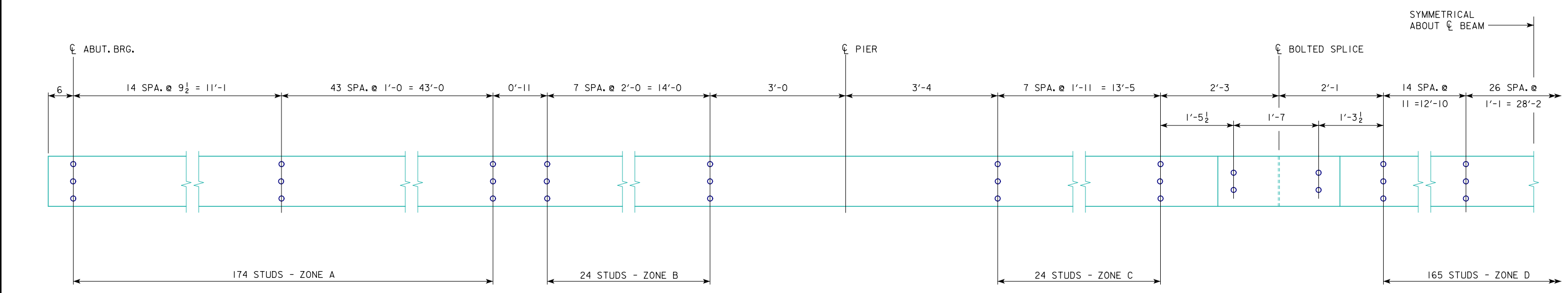
SKEW	a (IN)	b (IN)
0°	9	6
10°	9 1/8	6 1/8
20°	9 5/8	6 3/8
30°	10 3/8	6 7/8
45°	12 3/4	8 1/2

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER <i>[Signature]</i>	IOWADOT Highway Division	
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES	
		ROLLED STEEL BEAM BRIDGES	
		OCTOBER, 2014	
		BEAM PLAN AND ELEVATION 220'-0 BRIDGE	RS40-074-14

REVISED 02-2017 - ADDED 4 SHEAR STUDS AT "CENTERLINE OF BOLTED SPLICE" LOCATION BETWEEN "ZONE C & D". ADDED "SHEAR STUD ON SPLICE PLATE DETAILS" SHOWING 2 STUDS PER ROW.
 CHANGED NOTE STATING "MISCELLANEOUS DETAILS 240'-0 BRIDGE" (WAS 160'-0 IN ERROR).
 REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

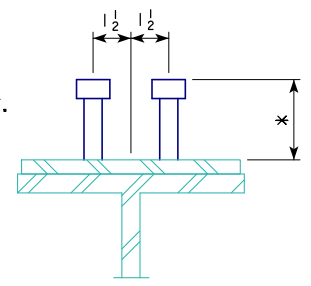


BEAM ELEVATION

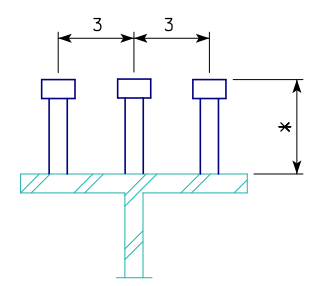


SHEAR STUD SPACING

* NOTE: STUD HEIGHTS (3 1/2", 4" OR 5") FOR THE LOCATIONS SHOWN SHALL BE DETERMINED BY THE DESIGNER. ON "MISCELLANEOUS DETAILS 240'-0 BRIDGE" SHEET, STUD HEIGHTS CAN BE IDENTIFIED BY THE DESIGNER IN A TABLE CORRESPONDING TO THE ZONES LISTED ON THIS SHEET.



SHEAR STUD ON SPLICE PLATE DETAILS
NOTE: ALL STUDS TO BE 7/8"φ



SHEAR STUD DETAILS
NOTE: ALL STUDS TO BE 7/8"φ

Δ WEIGHT OF SHEAR STUDS ARE NOT INCLUDED, SEE MISC. DETAILS - STANDARDS 5252 TO 5261.

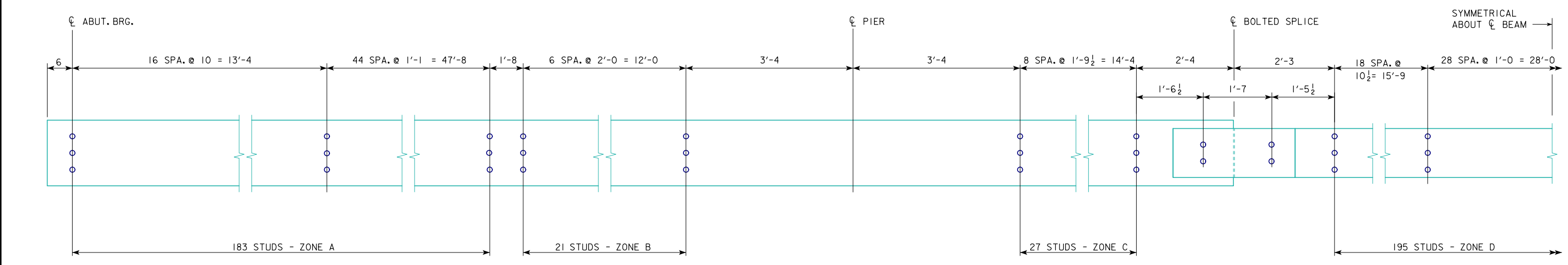
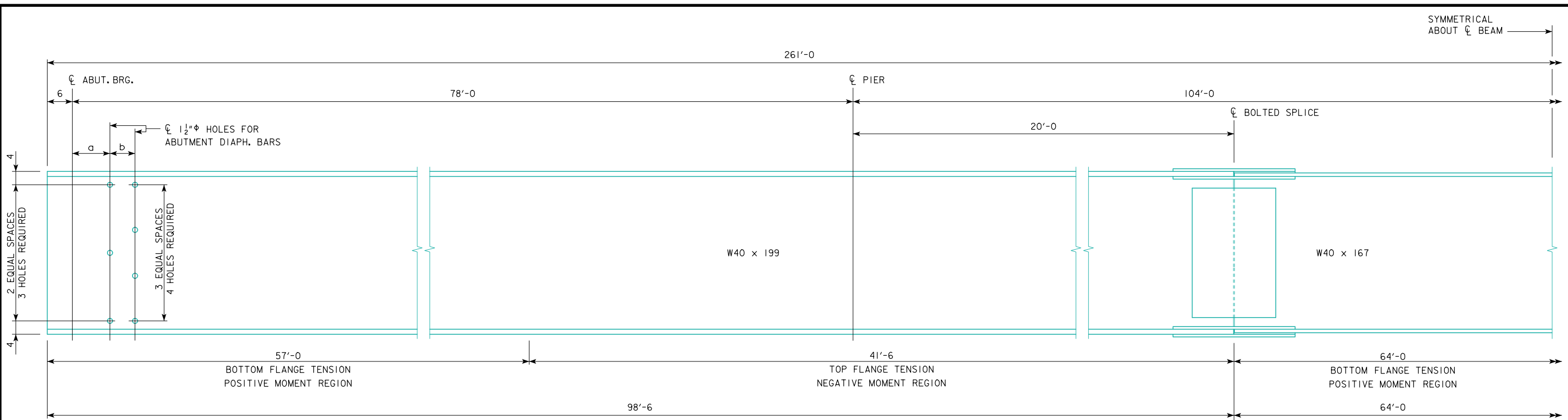
STRUCTURAL STEEL	
Δ BEAM WEIGHT	
	43,166 LBS.

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

SKIEW	a (IN)	b (IN)
0°	9	6
10°	9 1/8	6 1/8
20°	9 5/8	6 3/8
30°	10 3/8	6 7/8
45°	12 3/4	8 1/2

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER <i>[Signature]</i>		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
BEAM PLAN AND ELEVATION 240'-0 BRIDGE		RS40-075-14	

REVISED 02-2017 - ADDED 4 SHEAR STUDS AT "CENTERLINE OF BOLTED SPLICE" LOCATION BETWEEN "ZONE C & D". ADDED "SHEAR STUD ON SPLICE PLATE DETAILS" SHOWING 2 STUDS PER ROW.
 CHANGED NOTE STATING "MISCELLANEOUS DETAILS 260'-0 BRIDGE" (WAS 160'-0 IN ERROR).
 REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

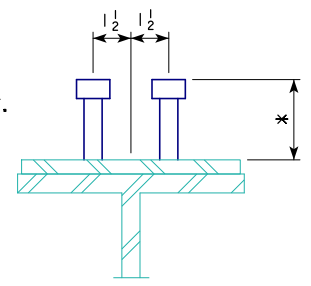


* NOTE: STUD HEIGHTS (3 1/2", 4" OR 5") FOR THE LOCATIONS SHOWN SHALL BE DETERMINED BY THE DESIGNER. ON "MISCELLANEOUS DETAILS 260'-0 BRIDGE" SHEET, STUD HEIGHTS CAN BE IDENTIFIED BY THE DESIGNER IN A TABLE CORRESPONDING TO THE ZONES LISTED ON THIS SHEET.

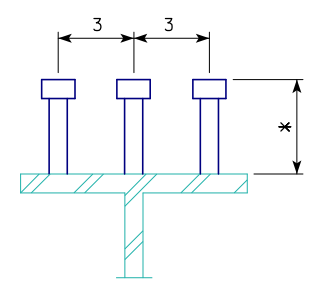
Δ WEIGHT OF SHEAR STUDS ARE NOT INCLUDED, SEE MISC. DETAILS - STANDARDS 5252 TO 5261.

STRUCTURAL STEEL	
Δ BEAM WEIGHT	
49,891 LBS.	

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



SHEAR STUD ON SPLICE PLATE DETAILS
NOTE : ALL STUDS TO BE 7/8"φ

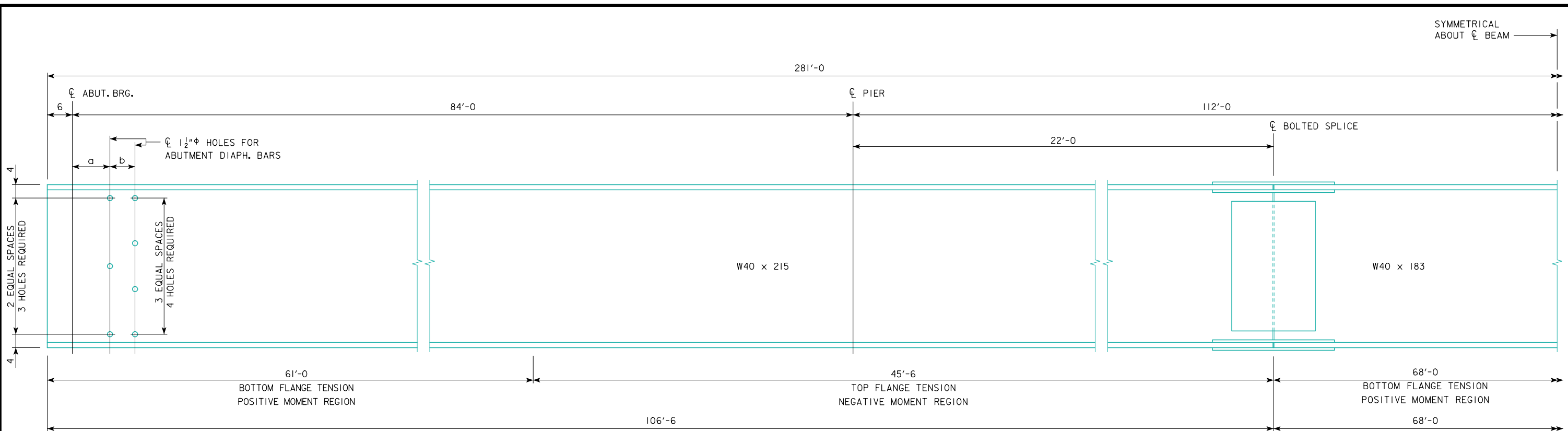


SHEAR STUD DETAILS
NOTE : ALL STUDS TO BE 7/8"φ

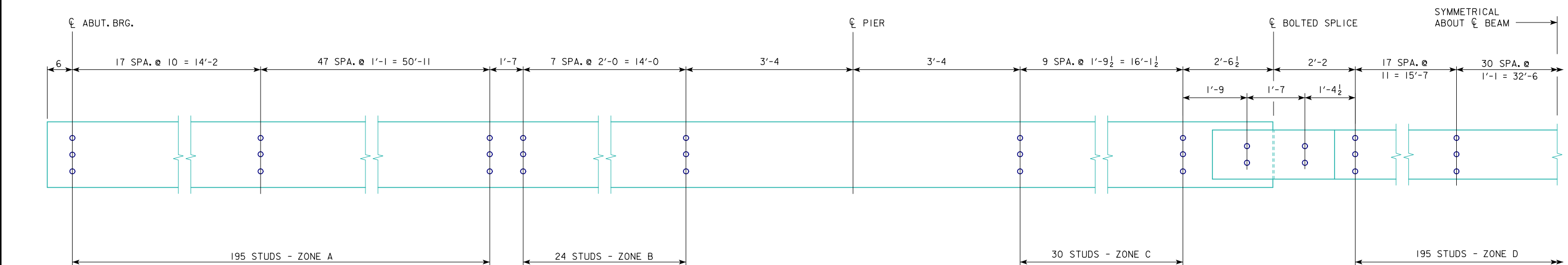
SKEW	a (IN)	b (IN)
0°	9	6
10°	9 5/8	6 1/8
20°	9 5/8	6 3/8
30°	10 3/8	6 7/8
45°	12 3/4	8 1/2

08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	RS40-076-14	
		BEAM PLAN AND ELEVATION 260'-0 BRIDGE		

REVISED 02-2017 - ADDED 4 SHEAR STUDS AT "CENTERLINE OF BOLTED SPLICE" LOCATION BETWEEN "ZONE C & D". ADDED "SHEAR STUD ON SPLICE PLATE DETAILS" SHOWING 2 STUDS PER ROW.
 CHANGED NOTE STATING "MISCELLANEOUS DETAILS 280'-0 BRIDGE" (WAS 160'-0 IN ERROR).
 REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

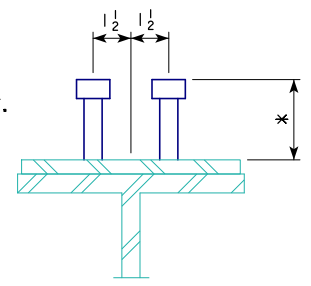


BEAM ELEVATION

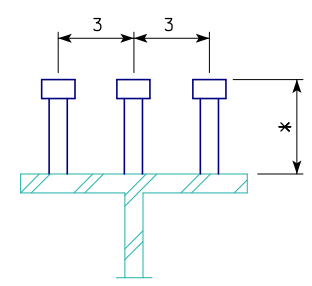


SHEAR STUD SPACING

* NOTE: STUD HEIGHTS (3 1/2", 4" OR 5") FOR THE LOCATIONS SHOWN SHALL BE DETERMINED BY THE DESIGNER. ON "MISCELLANEOUS DETAILS 280'-0 BRIDGE" SHEET, STUD HEIGHTS CAN BE IDENTIFIED BY THE DESIGNER IN A TABLE CORRESPONDING TO THE ZONES LISTED ON THIS SHEET.



SHEAR STUD ON SPLICE PLATE DETAILS
NOTE: ALL STUDS TO BE 7/8" ϕ



SHEAR STUD DETAILS
NOTE: ALL STUDS TO BE 7/8" ϕ

Δ WEIGHT OF SHEAR STUDS ARE NOT INCLUDED, SEE MISC. DETAILS - STANDARDS 5252 TO 5261.

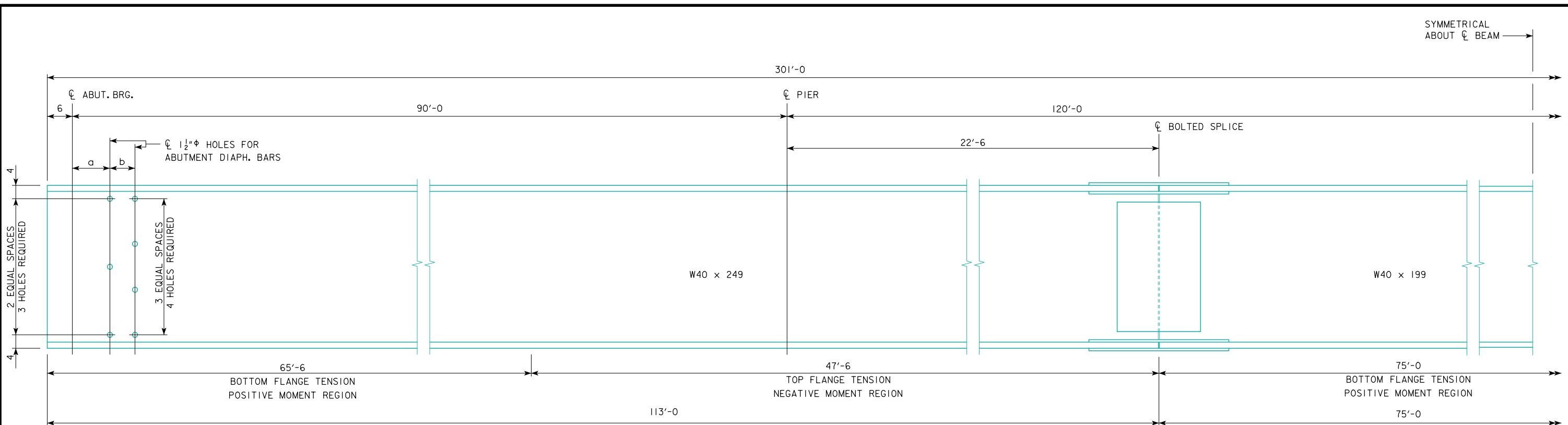
STRUCTURAL STEEL	
Δ BEAM WEIGHT	58,239 LBS.

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

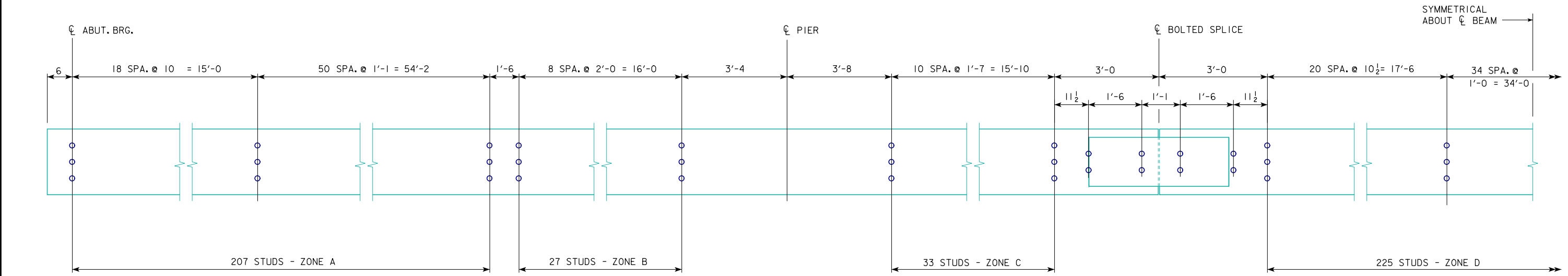
SKEW	a (IN)	b (IN)
0°	9	6
10°	9 1/8	6 1/8
20°	9 5/8	6 3/8
30°	10 3/8	6 7/8
45°	12 3/4	8 1/2

08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	RS40-077-14	
		BEAM PLAN AND ELEVATION 280'-0 BRIDGE		

REVISED 02-2017 - ADDED 8 SHEAR STUDS AT "CENTERLINE OF BOLTED SPLICE" LOCATION BETWEEN "ZONE C & D". ADDED "SHEAR STUD ON SPLICE PLATE DETAILS" SHOWING 2 STUDS PER ROW.
 CHANGED NOTE STATING "MISCELLANEOUS DETAILS 300'-0 BRIDGE" (WAS 160'-0 IN ERROR).
 REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



BEAM ELEVATION



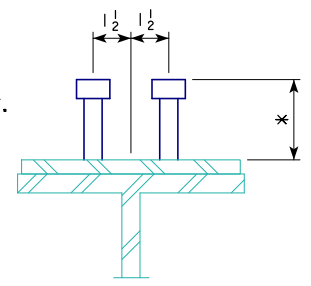
SHEAR STUD SPACING

* NOTE: STUD HEIGHTS (3 1/2", 4" OR 5") FOR THE LOCATIONS SHOWN SHALL BE DETERMINED BY THE DESIGNER. ON "MISCELLANEOUS DETAILS 300'-0 BRIDGE" SHEET, STUD HEIGHTS CAN BE IDENTIFIED BY THE DESIGNER IN A TABLE CORRESPONDING TO THE ZONES LISTED ON THIS SHEET.

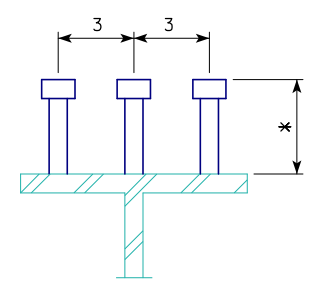
Δ WEIGHT OF SHEAR STUDS ARE NOT INCLUDED, SEE MISC. DETAILS - STANDARDS 5252 TO 5261.

STRUCTURAL STEEL	
Δ BEAM WEIGHT	
	71,199 LBS.

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



SHEAR STUD ON SPLICE PLATE DETAILS
NOTE: ALL STUDS TO BE 7/8" φ

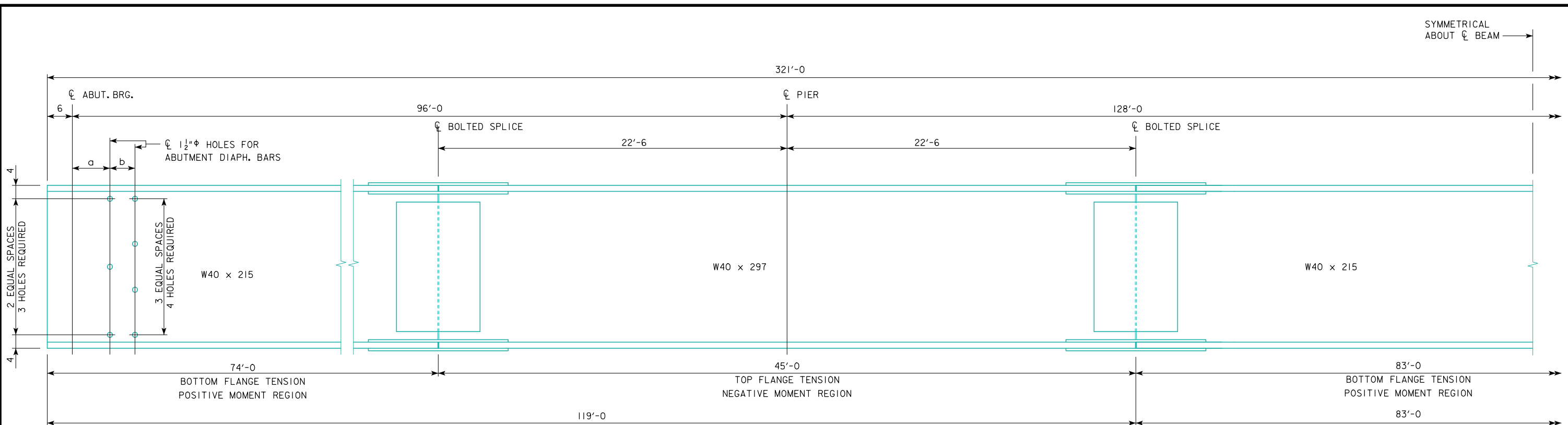


SHEAR STUD DETAILS
NOTE: ALL STUDS TO BE 7/8" φ

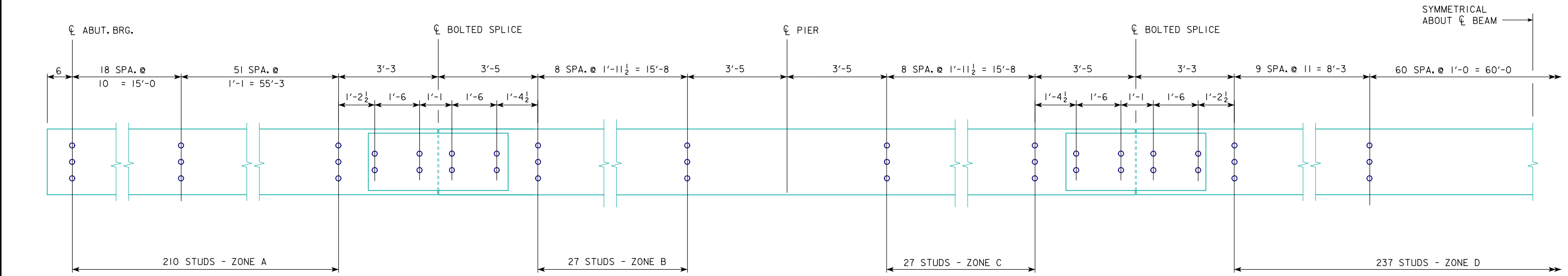
SKEW	a (IN)	b (IN)
0°	9	6
10°	9 1/8	6 1/8
20°	9 3/8	6 3/8
30°	10 3/8	6 7/8
45°	12 3/4	8 1/2

08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
		BEAM PLAN AND ELEVATION 300'-0 BRIDGE
		RS40-078-14

REVISED 02-2017 - ADDED 8 SHEAR STUDS AT EACH "CENTERLINE OF BOLTED SPLICE" LOCATION BETWEEN "ZONE A & B" AND "ZONE C & D". ADDED "SHEAR STUD ON SPLICE PLATE DETAILS" SHOWING 2 STUDS PER ROW. CHANGED NOTE STATING "MISCELLANEOUS DETAILS 320'-0 BRIDGE" (WAS 160'-0 IN ERROR).
 REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



BEAM ELEVATION

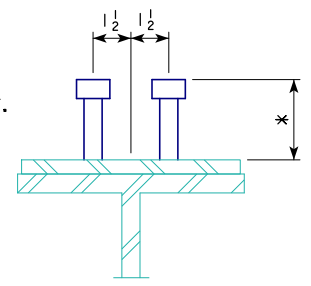


SHEAR STUD SPACING

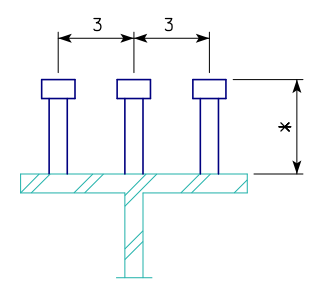
* NOTE: STUD HEIGHTS (3 1/2", 4" OR 5") FOR THE LOCATIONS SHOWN SHALL BE DETERMINED BY THE DESIGNER. ON "MISCELLANEOUS DETAILS 320'-0 BRIDGE" SHEET, STUD HEIGHTS CAN BE IDENTIFIED BY THE DESIGNER IN A TABLE CORRESPONDING TO THE ZONES LISTED ON THIS SHEET.

STRUCTURAL STEEL	
Δ BEAM WEIGHT	76,395 LBS.

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



SHEAR STUD ON SPLICE PLATE DETAILS
NOTE: ALL STUDS TO BE 7/8" ϕ



SHEAR STUD DETAILS
NOTE: ALL STUDS TO BE 7/8" ϕ

SKEW	a (IN)	b (IN)
0°	9	6
10°	9 1/8	6 1/8
20°	9 5/8	6 3/8
30°	10 3/8	6 7/8
45°	12 3/4	8 1/2

08-2018 LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

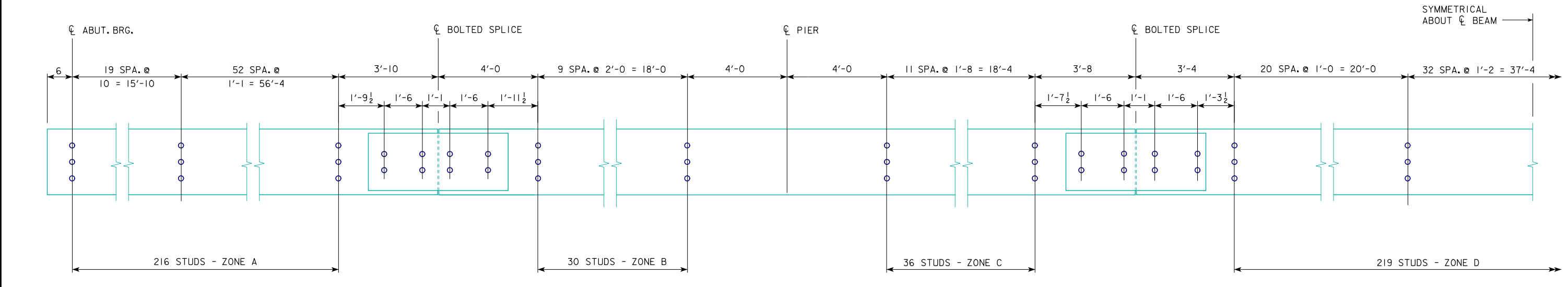
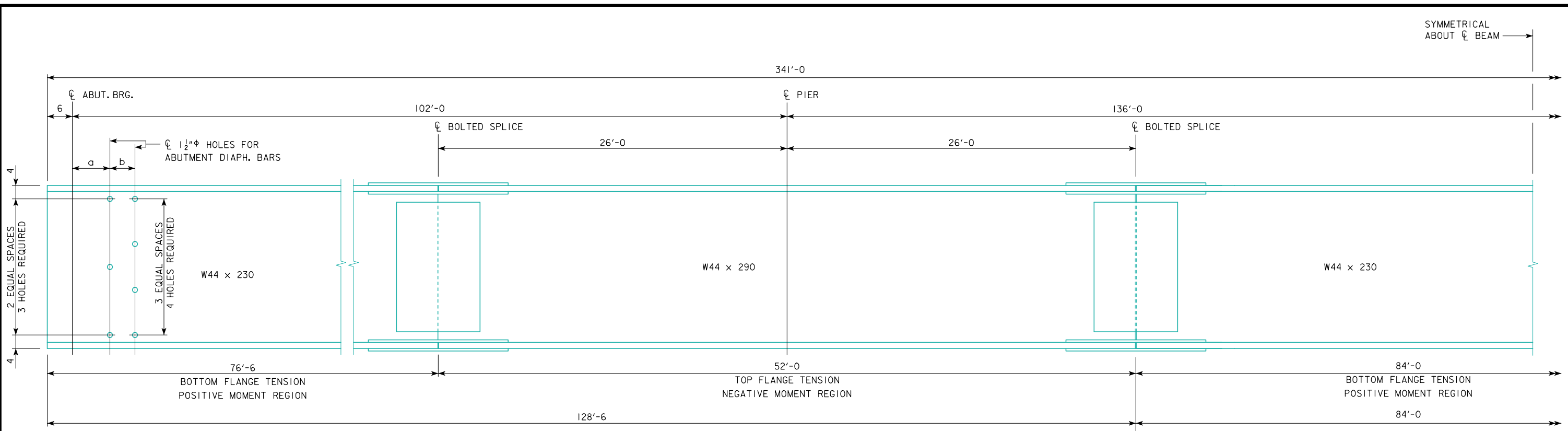


STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES
ROLLED STEEL BEAM BRIDGES
 OCTOBER, 2014

BEAM PLAN AND ELEVATION
320'-0 BRIDGE

RS40-079-14

REVISED 02-2017 - ADDED 8 SHEAR STUDS AT EACH "CENTERLINE OF BOLTED SPLICE" LOCATION BETWEEN "ZONE A & B" AND "ZONE C & D". ADDED "SHEAR STUD ON SPLICE PLATE DETAILS" SHOWING 2 STUDS PER ROW. CHANGED NOTE STATING "MISCELLANEOUS DETAILS 340'-0 BRIDGE" (WAS 160'-0 IN ERROR).
 REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

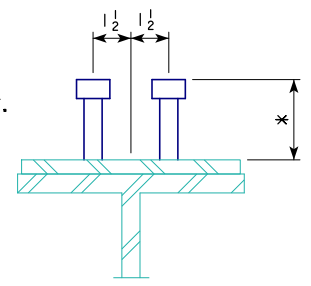


* NOTE: STUD HEIGHTS (3 1/2", 4" OR 5") FOR THE LOCATIONS SHOWN SHALL BE DETERMINED BY THE DESIGNER. ON "MISCELLANEOUS DETAILS 340'-0 BRIDGE" SHEET, STUD HEIGHTS CAN BE IDENTIFIED BY THE DESIGNER IN A TABLE CORRESPONDING TO THE ZONES LISTED ON THIS SHEET.

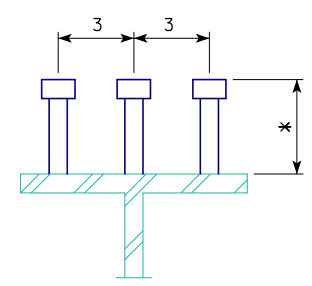
Δ WEIGHT OF SHEAR STUDS ARE NOT INCLUDED, SEE MISC. DETAILS - STANDARDS 5252 TO 5261.

STRUCTURAL STEEL	
Δ BEAM WEIGHT	
84,670 LBS.	

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



SHEAR STUD ON SPLICE PLATE DETAILS
NOTE: ALL STUDS TO BE 7/8"φ



SHEAR STUD DETAILS
NOTE: ALL STUDS TO BE 7/8"φ

SKEW	a (IN)	b (IN)
0°	9	6
10°	9 1/8	6 1/8
20°	9 5/8	6 3/8
30°	10 3/8	6 7/8
45°	12 3/4	8 1/2

08-2018 LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

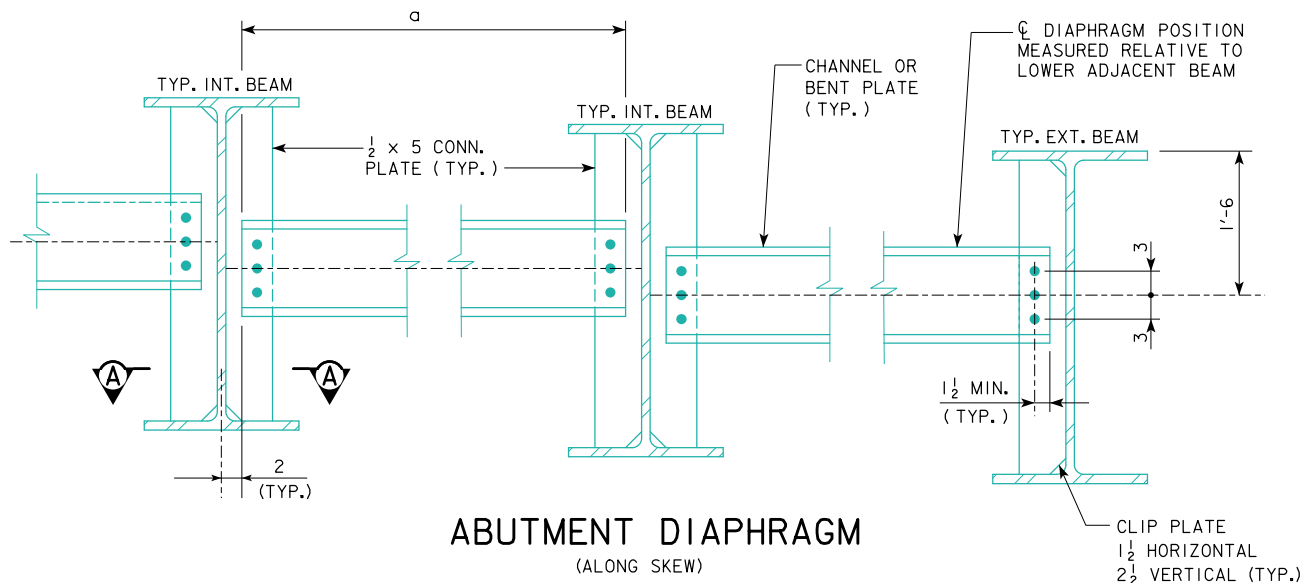


STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES
ROLLED STEEL BEAM BRIDGES
 OCTOBER, 2014

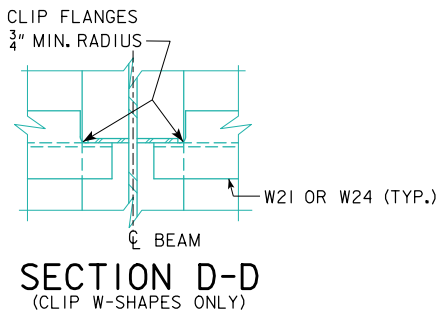
BEAM PLAN AND ELEVATION
340'-0 BRIDGE

RS40-080-14

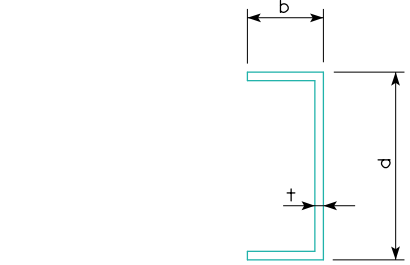
REVISED 08-2018 - REVISED INTERMEDIATE & PIER DIAPHRAGM SIZES & BOLTED CONNECTION DTLS. FOR BRIDGE LENGTHS 200'-0 TO 340'-0, ADDED SECTION D-D. UPDATED BRIDGE ENGINEER SIGNATURE.



ABUTMENT DIAPHRAGM
(ALONG SKEW)



SECTION D-D
(CLIP W-SHAPES ONLY)

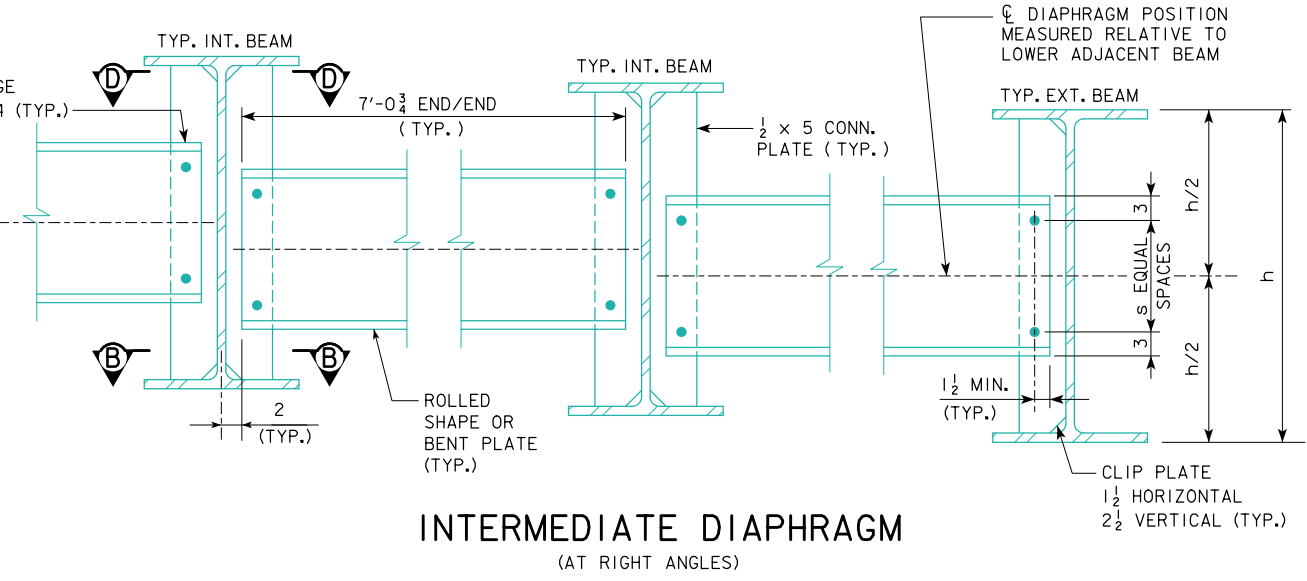


BENT PLATE DIAPHRAGM OPTION

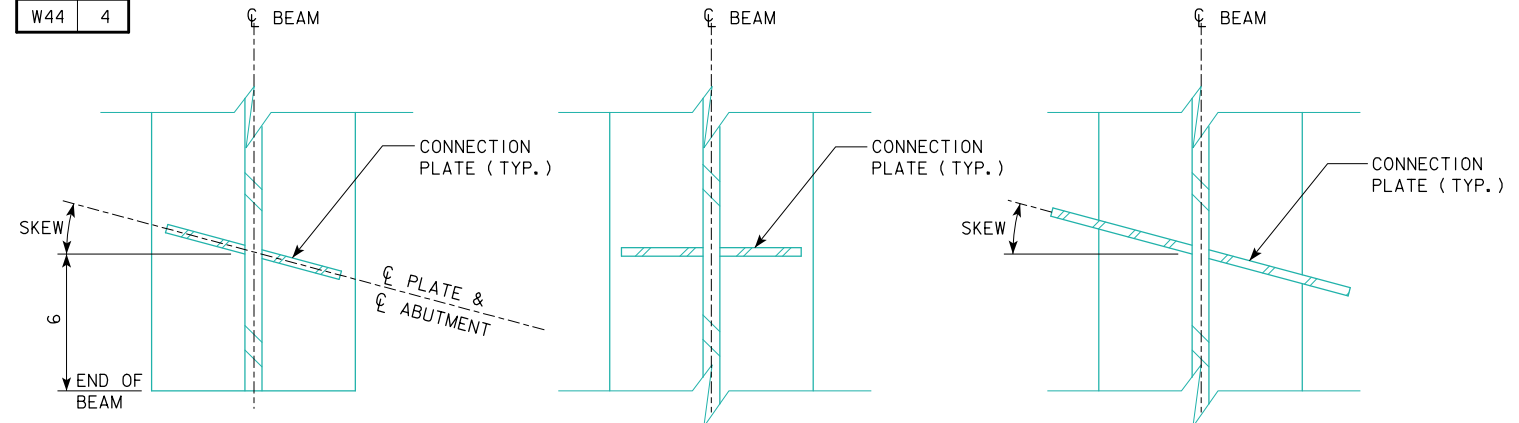
SKEW	a (FT-IN)
0°	7'-0 ³ / ₄
10°	7'-2 ¹ / ₁₆
20°	7'-6 ³ / ₁₆
30°	8'-1 ⁷ / ₈
45°	9'-11 ⁷ / ₈

DIAPHRAGM LOCATION	BEAM SIZE	ROLLED SHAPE OPTION		BENT PLATE OPTION			
		DESIGNATION	CONN. BOLTS	d (IN)	b (IN)	t (IN)	CONN. BOLTS
INTERMEDIATE	W30	C15x33.9	3 - 7/8"φ	15	4	3/8	3 - 7/8"φ
INTERMEDIATE	W33 & W36	MC18x42.7	4 - 7/8"φ	18	4	3/8	4 - 7/8"φ
INTERMEDIATE	W40	W21x50	4 - 7/8"φ	21	4	3/8	4 - 7/8"φ
INTERMEDIATE	W44	W24x62	5 - 7/8"φ	24	4	1/2	5 - 7/8"φ
ABUTMENT	ALL	C12x20.7	3 - 7/8"φ	12	4	3/8	3 - 7/8"φ
PIER	W30	C15x33.9	12 - 7/8"φ	15	4	3/8	12 - 7/8"φ
PIER	W33 & W36	MC18x42.7	12 - 7/8"φ	18	4	3/8	12 - 7/8"φ
PIER	W40	W21x50	12 - 7/8"φ	21	4	3/8	12 - 7/8"φ
PIER	W44	W24x62	12 - 7/8"φ	24	4	1/2	12 - 7/8"φ

BEAM SIZE	s
W30	2
W33	3
W36	3
W40	3
W44	4



INTERMEDIATE DIAPHRAGM
(AT RIGHT ANGLES)



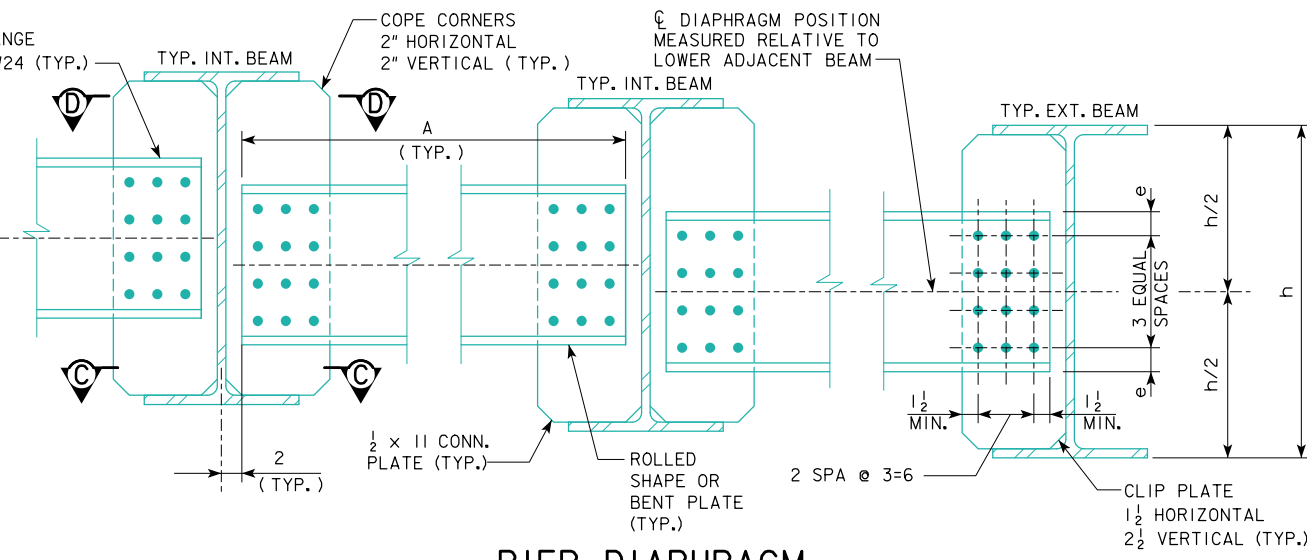
SECTION A-A

SECTION B-B

SECTION C-C

FOR 45° SKEW, CONNECTION PLATES ARE AT RIGHT ANGLES

- NOTES:
- EITHER ROLLED SHAPE OR BENT PLATE DIAPHRAGM OPTION MAY BE SELECTED AT CONTRACTOR'S OPTION.
 - CLIP FLANGES OF W21 AND W24 DIAPHRAGMS AT CONNECTION PLATES. WEB OF W-SHAPE DIAPHRAGM SHALL BE IN CONTACT WITH CONNECTION PLATE FOR FULL HEIGHT OF DIAPHRAGM.



PIER DIAPHRAGM
(ALONG SKEW FOR 0°, 10°, 20° AND 30° SKEW)
(AT RIGHT ANGLES FOR 45° SKEW)

SKEW	A (FT-IN)
0°	7'-0 ³ / ₄
10°	7'-2 ¹ / ₁₆
20°	7'-6 ³ / ₁₆
30°	8'-1 ⁷ / ₈
45°	7'-0 ³ / ₄

BEAM SIZE	e (IN)
W30	3
W33	3
W36	3
W40	3
W44	3 ¹ / ₂

08-2018
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER



STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES

ROLLED STEEL BEAM BRIDGES

OCTOBER, 2014

DIAPHRAGM DETAILS
SHEET I

RS40-081-14

REVISED 10-2016 - UPDATED DIAPHRAGM WEIGHTS FOR BRIDGE LENGTHS 160'-0 TO 220'-0 WITH 10, 20 AND 30 DEGREE SKEWS.
REVISED 08-2018 - UPDATED DIAPHRAGM WEIGHTS FOR BRIDGE LENGTHS 200'-0 TO 340'-0 FOR ALL SKEWS. UPDATED BRIDGE ENGINEER SIGNATURE.

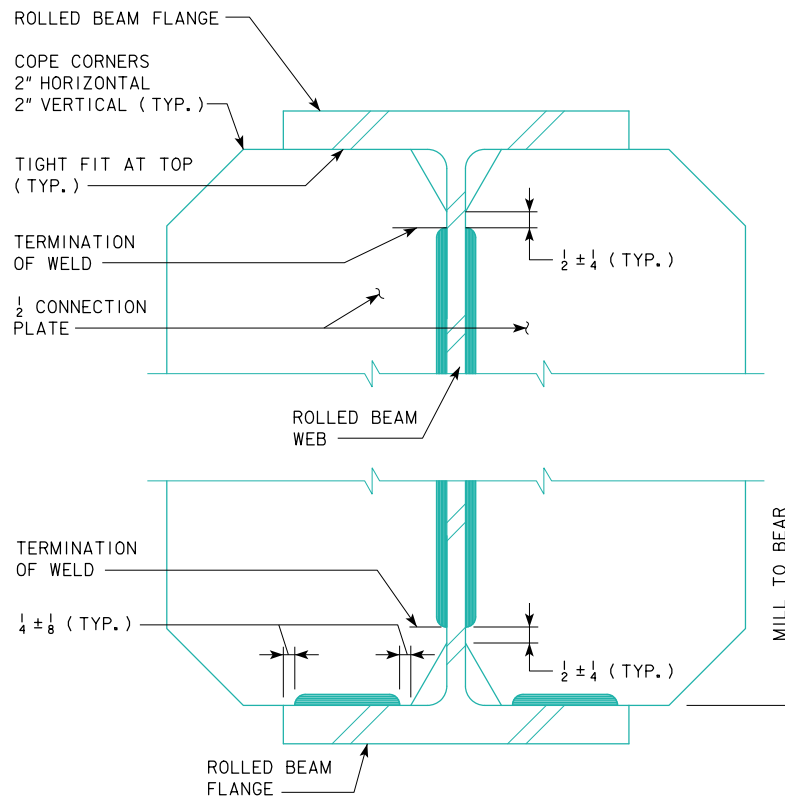
0 SKEW		DIAPHRAGM WEIGHTS									
(WEIGHT IN LBS. INCLUDES DIAPHRAGM, NUTS, BOLTS, CONNECTION PLATES AND WELDS)											
DIAPHRAGM	BRIDGE LENGTH										
	160'-0	180'-0	200'-0	220'-0	240'-0	260'-0	280'-0	300'-0	320'-0	340'-0	
ROLLED SHAPE	13,980	15,407	18,580	18,833	24,197	27,607	29,673	29,675	33,799	43,370	
BENT PLATE	12,697	13,929	15,522	15,775	20,029	21,968	23,541	23,543	26,682	38,412	

10 SKEW		DIAPHRAGM WEIGHTS									
(WEIGHT IN LBS. INCLUDES DIAPHRAGM, NUTS, BOLTS, CONNECTION PLATES AND WELDS)											
DIAPHRAGM	BRIDGE LENGTH										
	160'-0	180'-0	200'-0	220'-0	240'-0	260'-0	280'-0	300'-0	320'-0	340'-0	
ROLLED SHAPE	14,611	16,038	19,357	19,618	24,266	27,684	29,751	29,752	33,876	43,460	
BENT PLATE	13,248	14,480	16,144	16,405	20,091	22,034	23,608	23,609	26,748	38,497	

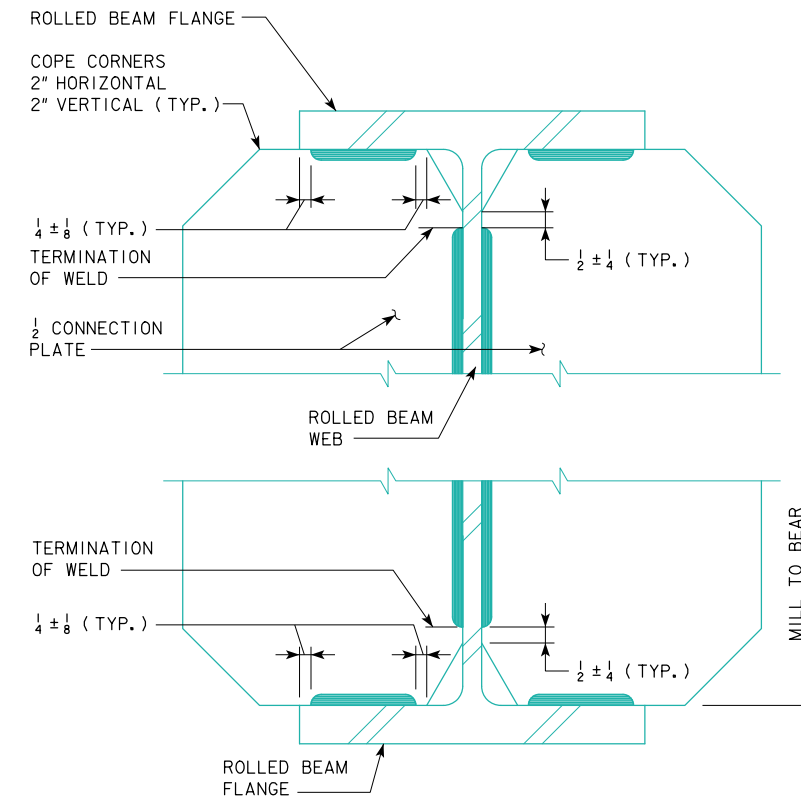
20 SKEW		DIAPHRAGM WEIGHTS									
(WEIGHT IN LBS. INCLUDES DIAPHRAGM, NUTS, BOLTS, CONNECTION PLATES AND WELDS)											
DIAPHRAGM	BRIDGE LENGTH										
	160'-0	180'-0	200'-0	220'-0	240'-0	260'-0	280'-0	300'-0	320'-0	340'-0	
ROLLED SHAPE	14,799	16,226	19,575	19,836	24,484	27,928	29,994	29,996	34,120	43,745	
BENT PLATE	13,430	14,663	16,339	16,600	20,286	22,243	23,817	23,818	26,957	38,763	

30 SKEW		DIAPHRAGM WEIGHTS									
(WEIGHT IN LBS. INCLUDES DIAPHRAGM, NUTS, BOLTS, CONNECTION PLATES AND WELDS)											
DIAPHRAGM	BRIDGE LENGTH										
	160'-0	180'-0	200'-0	220'-0	240'-0	260'-0	280'-0	300'-0	320'-0	340'-0	
ROLLED SHAPE	15,149	16,576	19,982	20,243	24,891	24,891	30,448	30,449	34,573	44,276	
BENT PLATE	13,770	15,002	16,704	16,965	20,651	22,632	24,206	24,207	27,346	39,259	

45 SKEW		DIAPHRAGM WEIGHTS									
(WEIGHT IN LBS. INCLUDES DIAPHRAGM, NUTS, BOLTS, CONNECTION PLATES AND WELDS)											
DIAPHRAGM	BRIDGE LENGTH										
	160'-0	180'-0	200'-0	220'-0	240'-0	260'-0	280'-0	300'-0	320'-0	340'-0	
ROLLED SHAPE	15,284	16,711	20,028	20,297	23,873	31,256	31,258	35,390	37,448	45,148	
BENT PLATE	14,036	15,269	16,935	17,205	20,040	25,040	25,042	28,189	29,754	40,173	



CONNECTION PLATE WELD TERMINATION DETAIL (PIER DIAPHRAGM, 0° TO 30° SKEW)

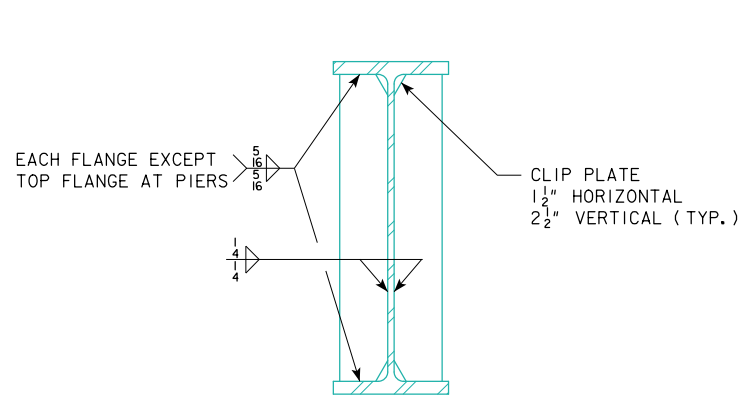


CONNECTION PLATE WELD TERMINATION DETAIL (PIER DIAPHRAGM, 45° SKEW)

NOTE: THE STRUCTURAL STEEL QUANTITY REQUIRED FOR THE APPROPRIATE BRIDGE LENGTH AND SKEW ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE BRIDGE PLAN.

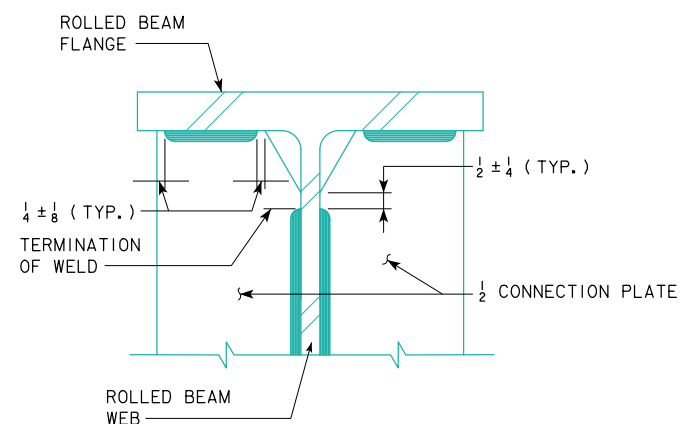
THE BENT PLATE OPTION SHOULD BE SHOWN ON THE SUMMARY QUANTITIES SHEET.

THE CONTRACTOR MAY CHOOSE TO PROVIDE ROLLED SHAPE DIAPHRAGMS AT NO ADDITIONAL COST.



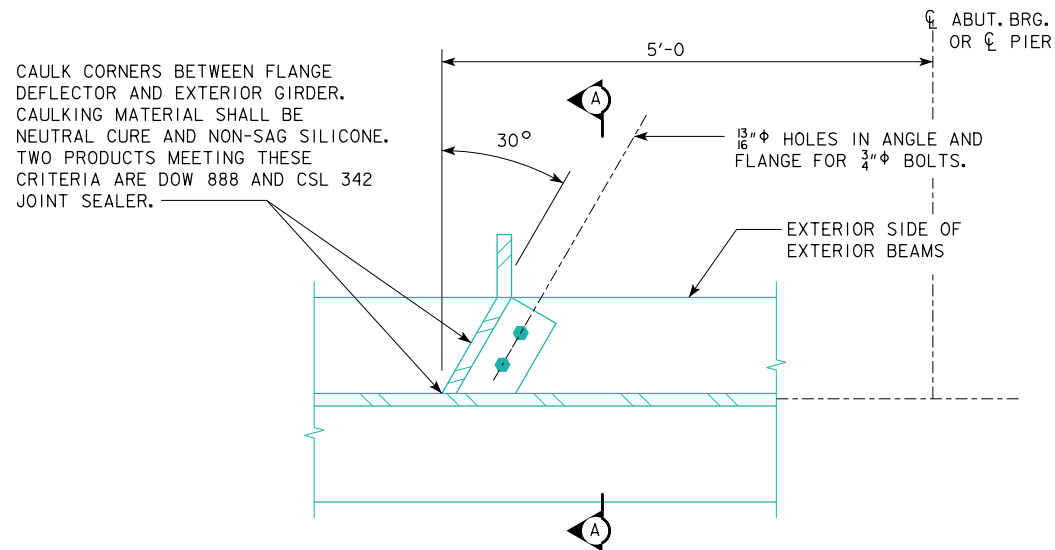
CONNECTION PLATE DETAIL

NOTE: EXTERIOR BEAMS REQUIRE A CONNECTION PLATE ON THE INTERIOR SIDE OF THE WEB ONLY.

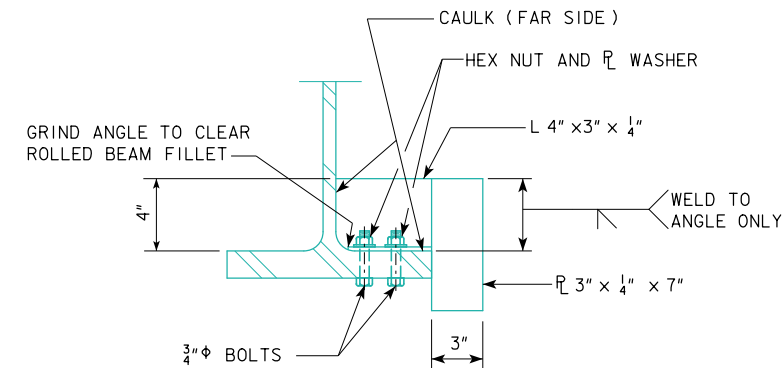


CONNECTION PLATE WELD TERMINATION DETAIL (ABUTMENT & INTERMEDIATE DIAPHRAGM)

08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	IOWADOT Highway Division	
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES	
		ROLLED STEEL BEAM BRIDGES	
		OCTOBER, 2014	
		DIAPHRAGM DETAILS SHEET 2	RS40-082-14



FLANGE DEFLECTOR DETAILS



SECTION A-A

BRIDGE LENGTH	WEIGHT(lb.) PER FLANGE DEFLECTOR
160'-0	6.0
180'-0	6.0
200'-0	6.2
220'-0	6.4
240'-0	6.4
260'-0	7.5
280'-0	7.5
300'-0	7.5
320'-0	7.5
340'-0	7.6

INCLUDES WEIGHT OF PLATES, ANGLES, BOLTS, NUTS AND WASHERS.

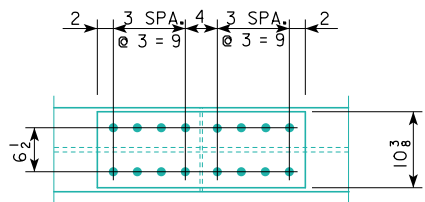
NOTE: THE STRUCTURAL STEEL QUANTITY FOR THE FLANGE DEFLECTOR PLUS THE TOTAL NUMBER OF FLANGE DEFLECTORES REQUIRED IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE BRIDGE PLAN.

NOTES:

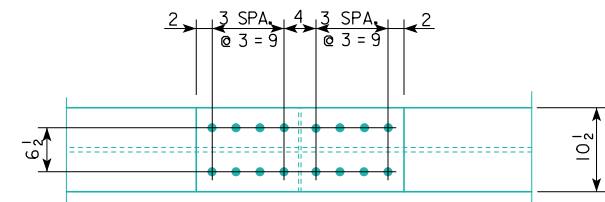
1. FLANGE DEFLECTORS ARE REQUIRED ON THE OUTSIDE OF THE EXTERIOR BEAM. LOCATION AND NUMBER OF FLANGE DEFLECTORS DETERMINED BY FINAL DESIGNER.
2. FLANGE DEFLECTOR LAYOUT IS SHOWN ON THE "GENERAL INFORMATION SHEET (WORKING STANDARD 5251) IN THE BRIDGE PLANS.

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

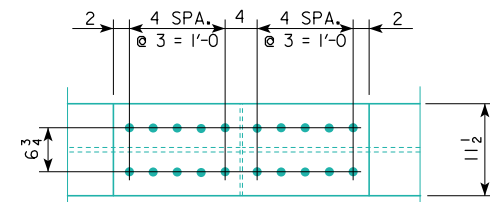
08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
	FLANGE DEFLECTOR DETAILS	RS40-083-14



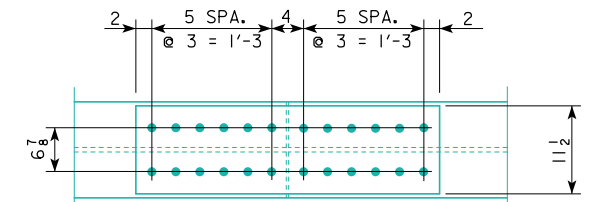
TOP AND BOTTOM FLANGE



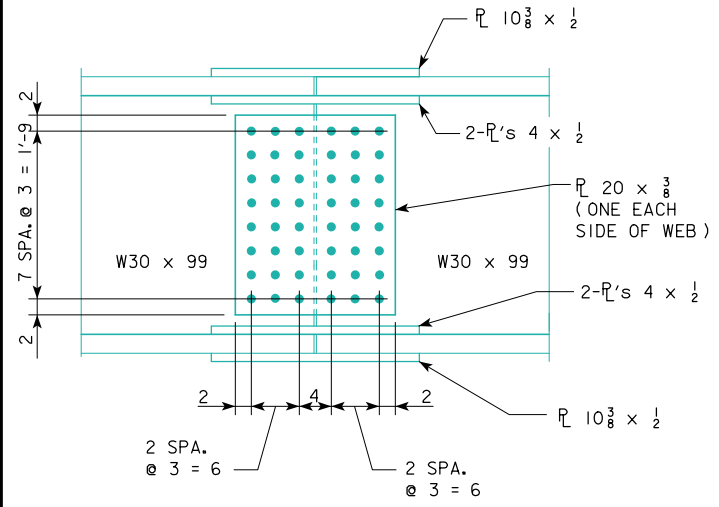
TOP AND BOTTOM FLANGE



TOP AND BOTTOM FLANGE



TOP AND BOTTOM FLANGE

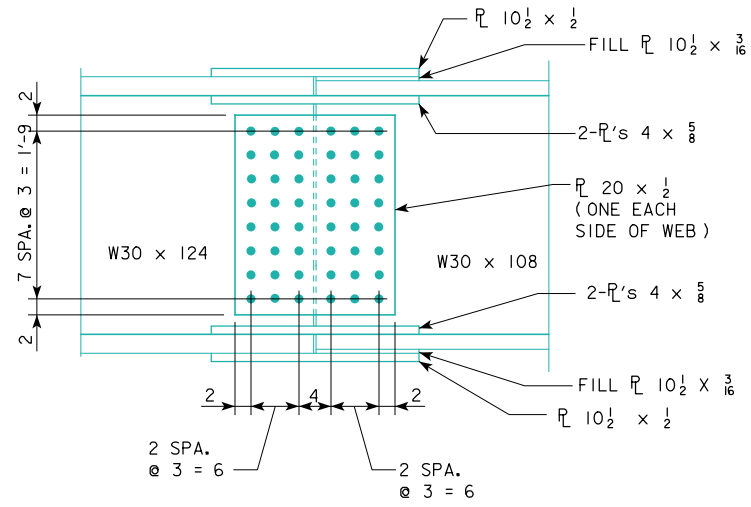


BOLTED SPLICE DETAILS

160' BEAM SPLICE

NOTE: ALL BOLTS 7/8"φ

STRUCTURAL STEEL
ONE SPLICE
329 (LBS.)

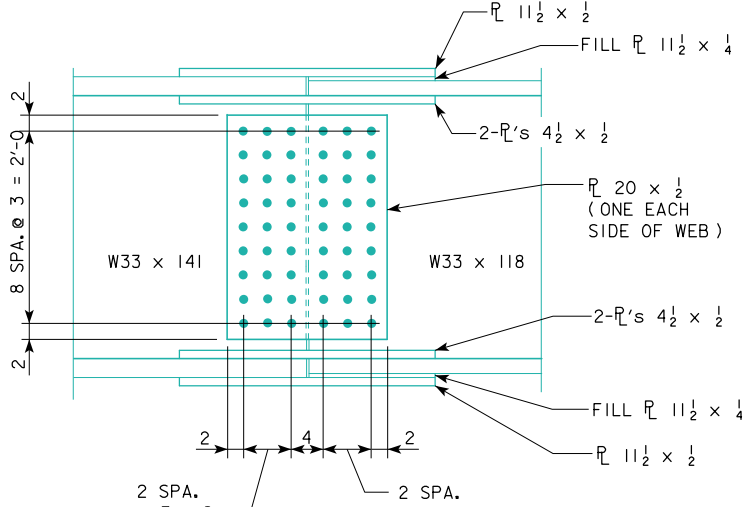


BOLTED SPLICE DETAILS

180' BEAM SPLICE

NOTE: ALL BOLTS 7/8"φ

STRUCTURAL STEEL
ONE SPLICE
396 (LBS.)

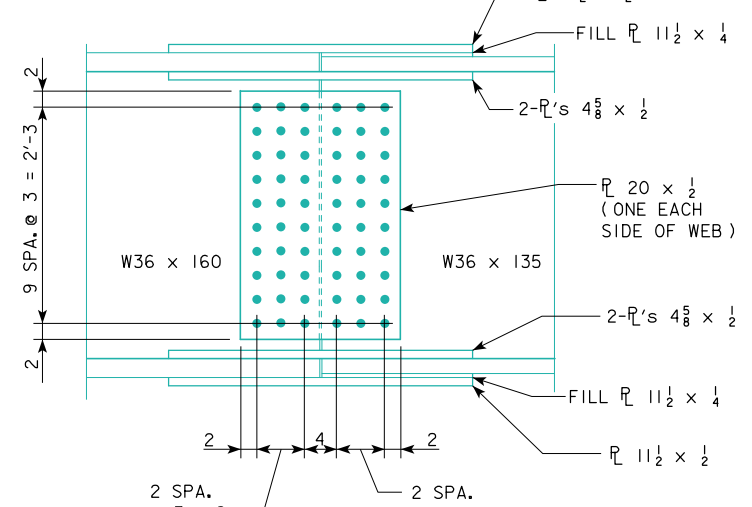


BOLTED SPLICE DETAILS

200' BEAM SPLICE

NOTE: ALL BOLTS 7/8"φ

STRUCTURAL STEEL
ONE SPLICE
476 (LBS.)



BOLTED SPLICE DETAILS

220' BEAM SPLICE

NOTE: ALL BOLTS 7/8"φ

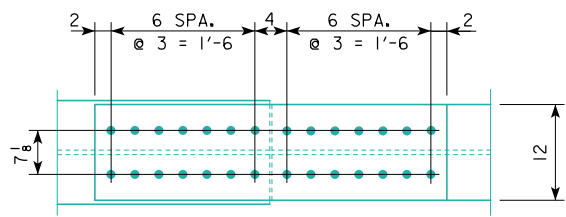
STRUCTURAL STEEL
ONE SPLICE
553 (LBS.)

NOTE: STRUCTURAL STEEL WEIGHT INCLUDES WEIGHT OF SPLICE PLATES, FILL PLATES, BOLTS, NUTS AND WASHERS.

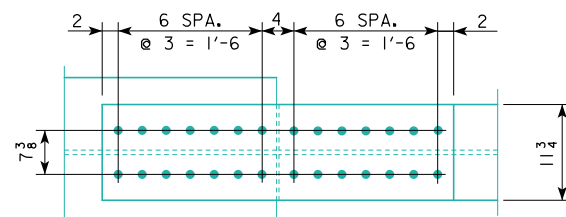
NOTE: STRUCTURAL STEEL WEIGHT IS INCLUDED ON THE SUMMARY QUANTITIES SHEET.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	
	STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	BOLTED FIELD SPLICE DETAILS SHEET I
RS40-084-14	

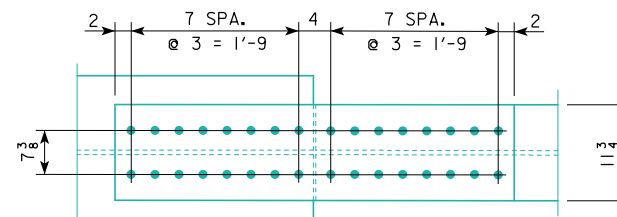
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



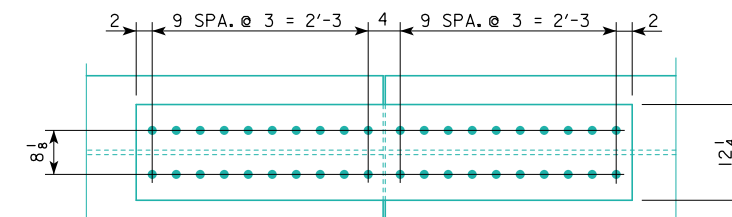
TOP AND BOTTOM FLANGE



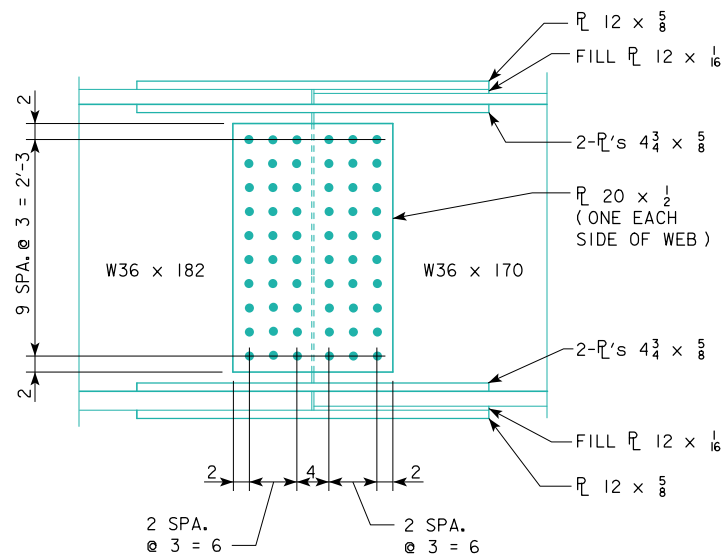
TOP AND BOTTOM FLANGE



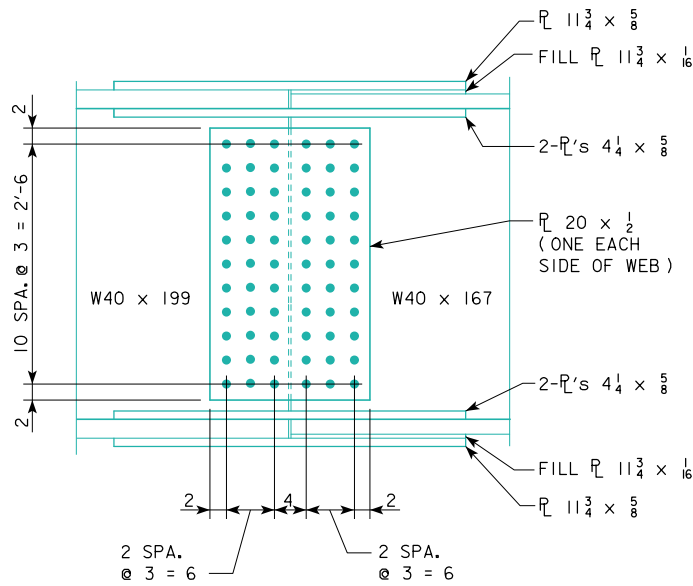
TOP AND BOTTOM FLANGE



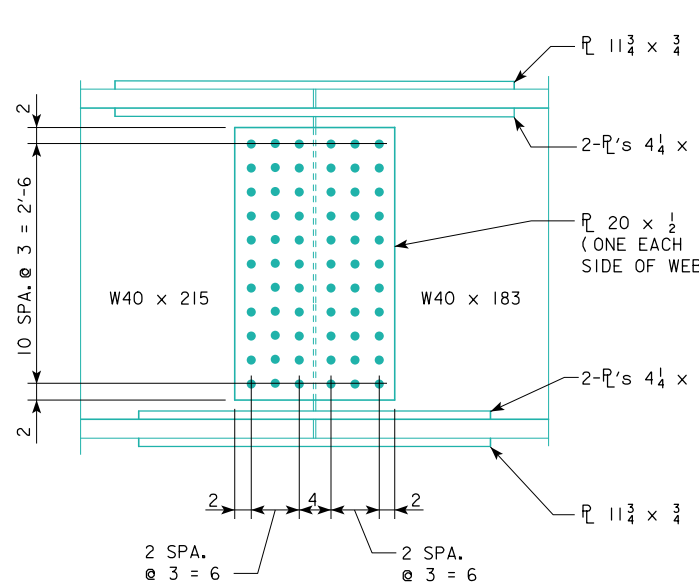
TOP AND BOTTOM FLANGE



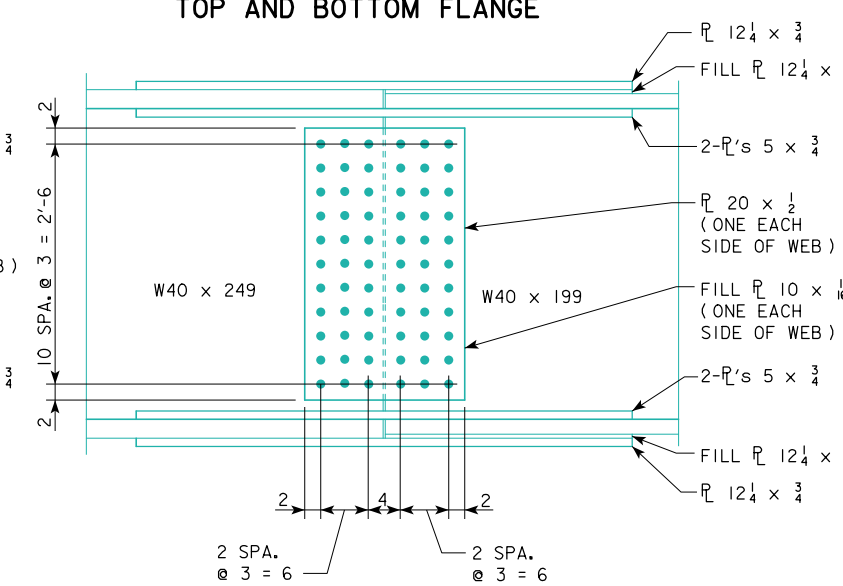
BOLTED SPLICE DETAILS



BOLTED SPLICE DETAILS



BOLTED SPLICE DETAILS



BOLTED SPLICE DETAILS

240' BEAM SPLICE

NOTE: ALL BOLTS 7/8"φ

STRUCTURAL STEEL
ONE SPLICE
658 (LBS.)

260' BEAM SPLICE

NOTE: ALL BOLTS 7/8"φ

STRUCTURAL STEEL
ONE SPLICE
659 (LBS.)

280' BEAM SPLICE

NOTE: ALL BOLTS 7/8"φ

STRUCTURAL STEEL
ONE SPLICE
781 (LBS.)

300' BEAM SPLICE

NOTE: ALL BOLTS 7/8"φ

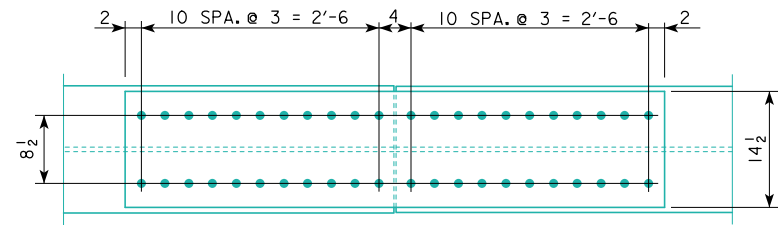
STRUCTURAL STEEL
ONE SPLICE
1,054 (LBS.)

NOTE: STRUCTURAL STEEL WEIGHT INCLUDES WEIGHT OF SPLICE PLATES, FILL PLATES, BOLTS, NUTS AND WASHERS.

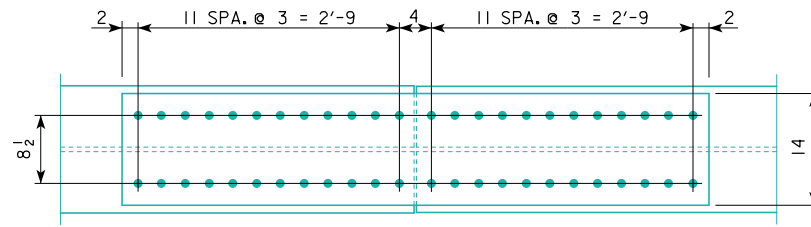
NOTE: STRUCTURAL STEEL WEIGHT IS INCLUDED ON THE SUMMARY QUANTITIES SHEET.

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

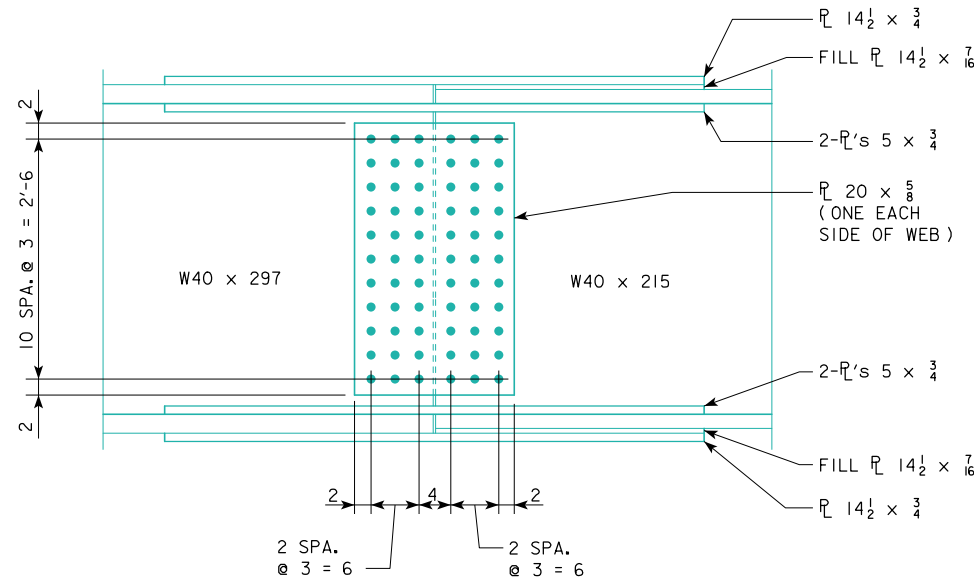
08-2018 LATEST REVISION DATE	<i>[Signature]</i> APPROVED BY BRIDGE ENGINEER		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
BOLTED FIELD SPLICE DETAILS SHEET 2		RS40-085-14	



TOP AND BOTTOM FLANGE



TOP AND BOTTOM FLANGE

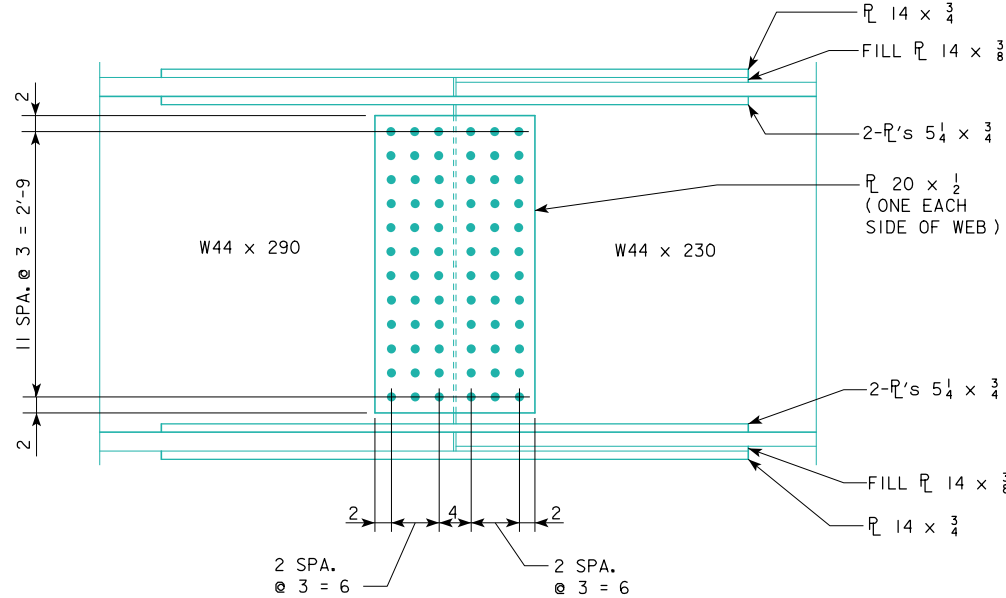


BOLTED SPLICE DETAILS

320' BEAM SPLICE

NOTE: ALL BOLTS 7/8"φ

STRUCTURAL STEEL
ONE SPLICE
1,270 (LBS.)



BOLTED SPLICE DETAILS

340' BEAM SPLICE

NOTE: ALL BOLTS 7/8"φ

STRUCTURAL STEEL
ONE SPLICE
1,304 (LBS.)

NOTE: STRUCTURAL STEEL WEIGHT INCLUDES WEIGHT OF SPLICE PLATES, FILL PLATES, BOLTS, NUTS AND WASHERS.

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

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

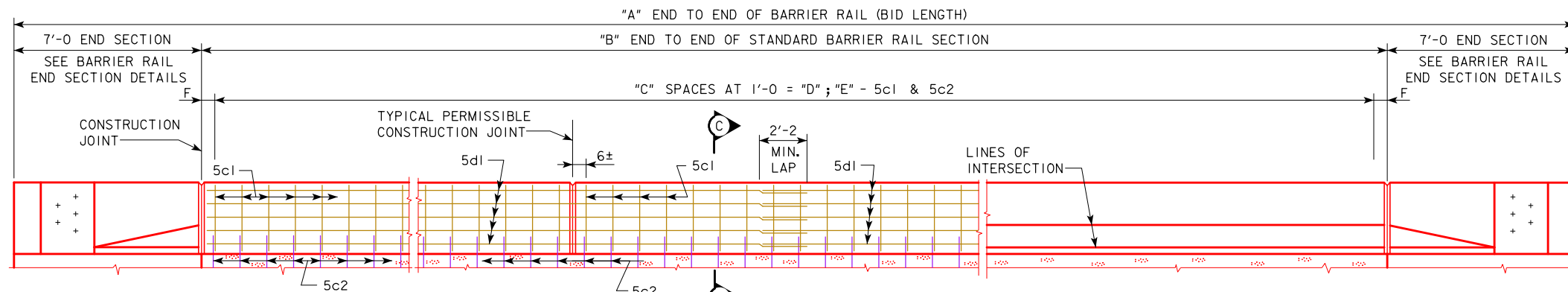
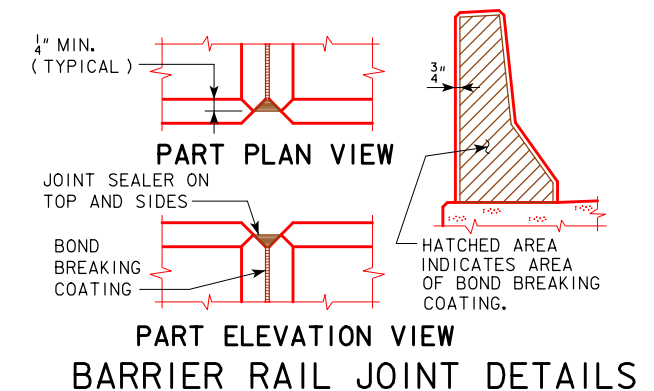
08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	
	STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	BOLTED FIELD SPLICE DETAILS SHEET 3
RS40-086-14	

TABLE OF BARRIER RAIL DIMENSIONS AND NUMBERS

BRIDGE LENGTH		160'-0					180'-0					200'-0					220'-0					240'-0					260'-0				
SKEW		0°	10°	20°	30°	45°	0°	10°	20°	30°	45°	0°	10°	20°	30°	45°	0°	10°	20°	30°	45°	0°	10°	20°	30°	45°	0°	10°	20°	30°	45°
DIMENSION OR NUMBER	A (FT-IN)	177'-0	177'-0 ⁵ / ₈	177'-2 ¹ / ₄	177'-5 ¹ / ₂	178'-2 ⁷ / ₈	197'-0	197'-0 ⁵ / ₈	197'-2 ¹ / ₄	197'-5 ¹ / ₂	198'-2 ⁷ / ₈	217'-0	217'-0 ⁵ / ₈	217'-2 ¹ / ₄	217'-5 ¹ / ₂	218'-2 ⁷ / ₈	237'-0	237'-0 ⁵ / ₈	237'-2 ¹ / ₄	237'-5 ¹ / ₂	238'-2 ⁷ / ₈	257'-0	257'-0 ⁵ / ₈	257'-2 ¹ / ₄	257'-5 ¹ / ₂	258'-2 ⁷ / ₈	277'-0	277'-0 ⁵ / ₈	277'-2 ¹ / ₄	277'-5 ¹ / ₂	278'-2 ⁷ / ₈
	B (FT-IN)	163'-0	163'-0 ⁵ / ₈	163'-2 ¹ / ₄	163'-5 ¹ / ₂	164'-2 ⁷ / ₈	183'-0	183'-0 ⁵ / ₈	183'-2 ¹ / ₄	183'-5 ¹ / ₂	184'-2 ⁷ / ₈	203'-0	203'-0 ⁵ / ₈	203'-2 ¹ / ₄	203'-5 ¹ / ₂	204'-2 ⁷ / ₈	223'-0	223'-0 ⁵ / ₈	223'-2 ¹ / ₄	223'-5 ¹ / ₂	224'-2 ⁷ / ₈	243'-0	243'-0 ⁵ / ₈	243'-2 ¹ / ₄	243'-5 ¹ / ₂	244'-2 ⁷ / ₈	263'-0	263'-0 ⁵ / ₈	263'-2 ¹ / ₄	263'-5 ¹ / ₂	264'-2 ⁷ / ₈
	C	162	162	162	162	163	182	182	182	182	183	202	202	202	202	203	222	222	222	222	223	242	242	242	242	243	262	262	262	262	263
	D (FT-IN)	162'-0	162'-0	162'-0	162'-0	163'-0	182'-0	182'-0	182'-0	182'-0	183'-0	202'-0	202'-0	202'-0	202'-0	203'-0	222'-0	222'-0	222'-0	222'-0	223'-0	242'-0	242'-0	242'-0	242'-0	243'-0	262'-0	262'-0	262'-0	262'-0	263'-0
	E	163	163	163	163	164	183	183	183	183	184	203	203	203	203	204	223	223	223	223	224	243	243	243	243	244	263	263	263	263	264
	F (IN)	6	6 ⁵ / ₁₆	7 ¹ / ₈	8 ³ / ₄	7 ⁷ / ₁₆	6	6 ⁵ / ₁₆	7 ¹ / ₈	8 ³ / ₄	7 ⁷ / ₁₆	6	6 ⁵ / ₁₆	7 ¹ / ₈	8 ³ / ₄	7 ⁷ / ₁₆	6	6 ⁵ / ₁₆	7 ¹ / ₈	8 ³ / ₄	7 ⁷ / ₁₆	6	6 ⁵ / ₁₆	7 ¹ / ₈	8 ³ / ₄	7 ⁷ / ₁₆	6	6 ⁵ / ₁₆	7 ¹ / ₈	8 ³ / ₄	7 ⁷ / ₁₆

TABLE OF BARRIER RAIL DIMENSIONS AND NUMBERS - CONT.

BRIDGE LENGTH		280'-0					300'-0					320'-0				
SKEW		0°	10°	20°	30°	45°	0°	10°	20°	30°	45°	0°	10°	20°	30°	45°
DIMENSION OR NUMBER	A (FT-IN)	297'-0	297'-0 ⁵ / ₈	297'-2 ¹ / ₄	297'-5 ¹ / ₂	298'-2 ⁷ / ₈	317'-0	317'-0 ⁵ / ₈	317'-2 ¹ / ₄	317'-5 ¹ / ₂	318'-2 ⁷ / ₈	337'-0	337'-0 ⁵ / ₈	337'-2 ¹ / ₄	337'-5 ¹ / ₂	338'-2 ⁷ / ₈
	B (FT-IN)	283'-0	283'-0 ⁵ / ₈	283'-2 ¹ / ₄	283'-5 ¹ / ₂	284'-2 ⁷ / ₈	303'-0	303'-0 ⁵ / ₈	303'-2 ¹ / ₄	303'-5 ¹ / ₂	304'-2 ⁷ / ₈	323'-0	323'-0 ⁵ / ₈	323'-2 ¹ / ₄	323'-5 ¹ / ₂	324'-2 ⁷ / ₈
	C	282	282	282	282	283	302	302	302	302	303	322	322	322	322	323
	D (FT-IN)	282'-0	282'-0	282'-0	282'-0	283'-0	302'-0	302'-0	302'-0	302'-0	303'-0	322'-0	322'-0	322'-0	322'-0	323'-0
	E	283	283	283	283	284	303	303	303	303	304	323	323	323	323	324
	F (IN)	6	6 ⁵ / ₁₆	7 ¹ / ₈	8 ³ / ₄	7 ⁷ / ₁₆	6	6 ⁵ / ₁₆	7 ¹ / ₈	8 ³ / ₄	7 ⁷ / ₁₆	6	6 ⁵ / ₁₆	7 ¹ / ₈	8 ³ / ₄	7 ⁷ / ₁₆



BARRIER RAIL NOTES:

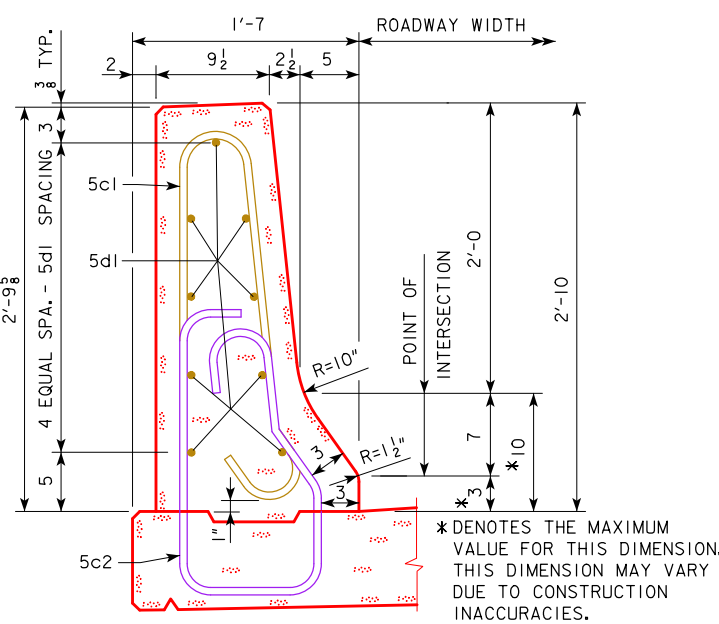
1. MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.
2. THE PERMISSIBLE CONSTRUCTION JOINTS ARE TO BE PLACED BETWEEN VERTICAL BARS AT A MINIMUM SPACING OF 20 FEET. CONSTRUCTION JOINT CONTACT SURFACES ARE TO BE COATED WITH AN APPROVED BOND BREAKER.
3. COST OF THE JOINT SEALER AND BOND BREAKER SHALL BE CONSIDERED INCIDENTAL TO OTHER CONSTRUCTION.
4. ALL BARRIER RAIL REINFORCING STEEL IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

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.
5. 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.

ELEVATION OF BARRIER RAIL LAYOUT

BARRIER RAIL NOTES - CONT.:

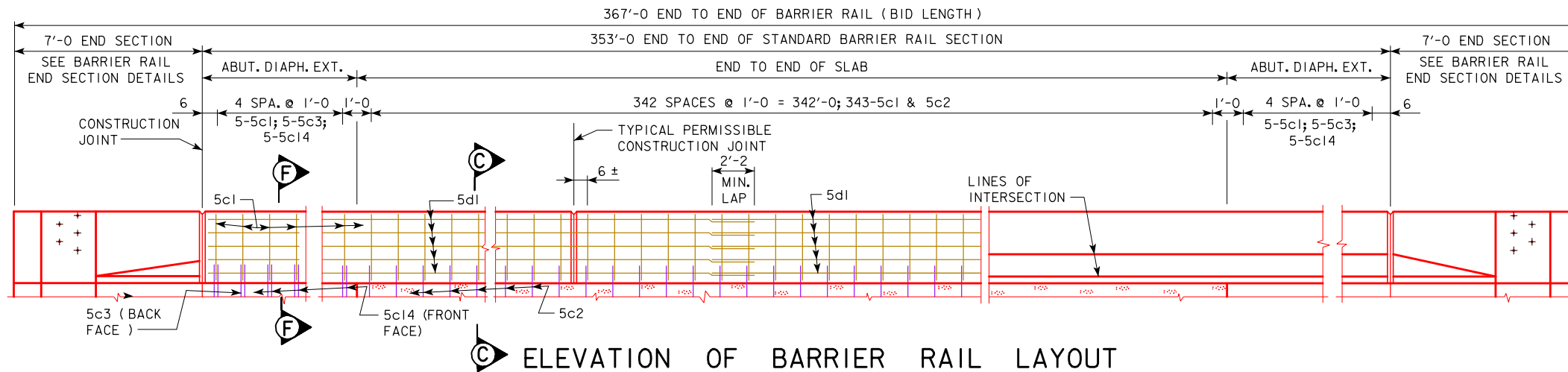
6. THE JOINT SEALER SHALL BE LIGHT GRAY NONSAG LATEX CAULKING SEALER MARKETED FOR OUTDOOR USE. NO TESTING OR CERTIFICATION IS REQUIRED.
7. TOP OF THE BARRIER RAIL IS TO BE PARALLEL TO THE THEORETICAL \bar{C} GRADE.
8. CROSS SECTIONAL AREA OF THE STANDARD SECTION OF THE BARRIER RAIL = 2.84 SQUARE FEET.
9. CONCRETE BARRIER RAILS PLACED USING THE SLIPFORM METHOD WILL REQUIRE THE USE OF A CLASS BR CONCRETE IN ACCORDANCE WITH ARTICLE 2513.03A 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).



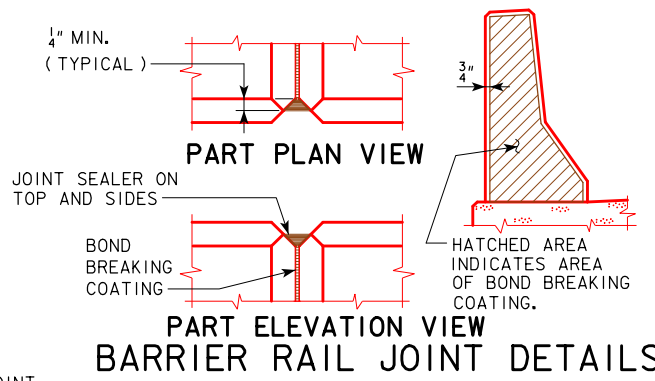
PART SECTION C-C

08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
		BARRIER RAIL DETAILS 160' TO 320' BRIDGES
		RS40-087-14

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



ELEVATION OF BARRIER RAIL LAYOUT

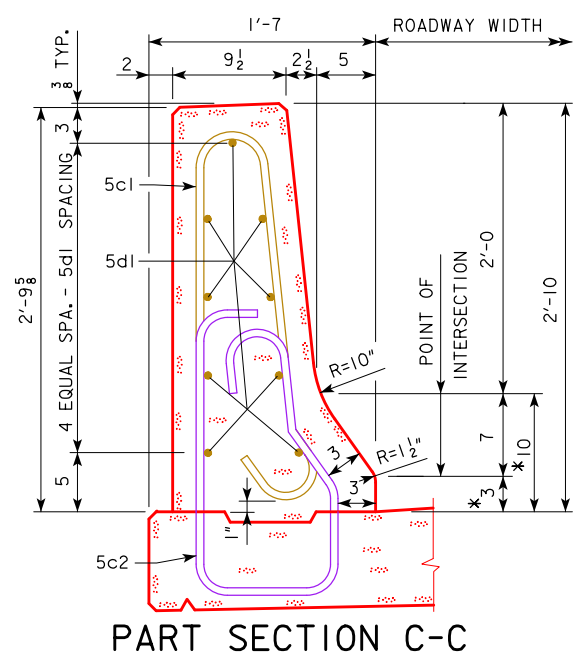


BARRIER RAIL JOINT DETAILS

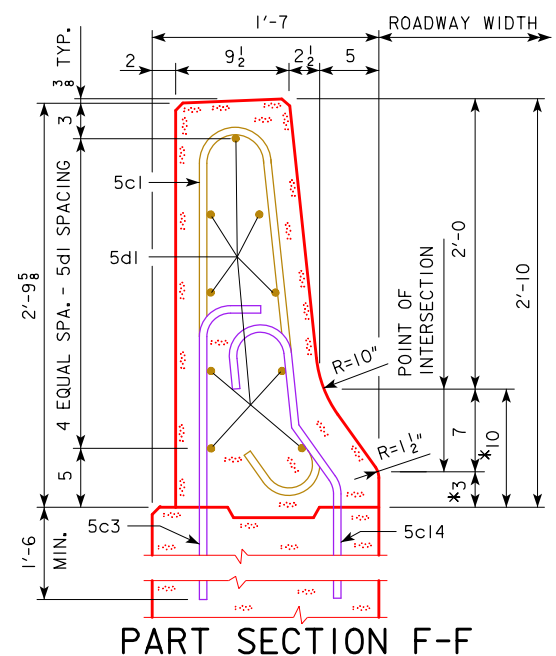
BARRIER RAIL NOTES:

1. MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.
2. 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.
3. COST OF THE JOINT SEALER AND BOND BREAKER SHALL BE CONSIDERED INCIDENTAL TO OTHER CONSTRUCTION.
4. ALL BARRIER RAIL REINFORCING STEEL IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

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.
5. 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.
6. THE JOINT SEALER SHALL BE LIGHT GRAY NONSAG LATEX CAULKING SEALER MARKETED FOR OUTDOOR USE. NO TESTING OR CERTIFICATION IS REQUIRED.
7. TOP OF THE BARRIER RAIL IS TO BE PARALLEL TO THE THEORETICAL \bar{C} GRADE.
8. CROSS SECTIONAL AREA OF THE STANDARD SECTION OF THE BARRIER RAIL = 2.84 SQUARE FEET.
9. CONCRETE BARRIER RAILS PLACED USING THE SLIPFORM METHOD WILL REQUIRE THE USE OF A CLASS BR CONCRETE IN ACCORDANCE WITH ARTICLE 2513.03A 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 METHODS).



PART SECTION C-C



PART SECTION F-F

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

EPOXY REINF. STEEL-TWO BARRIER RAILS

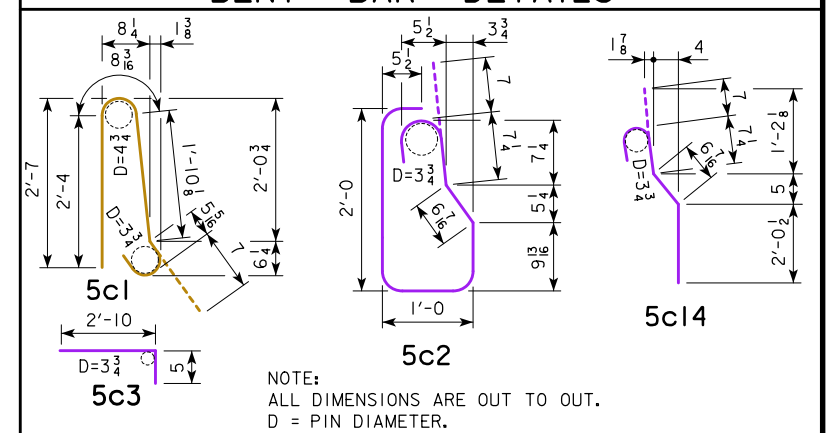
SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STANDARD SECTION	5c1	VERTICAL		706	5'-11"	4357
	5d1	LONGITUDINAL		180	37'-6"	7041
EPOXY COATED REINFORCING STEEL TOTAL LBS.						11,398

STAINLESS REINF. STEEL-TWO BARRIER RAILS

SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STANDARD SECTION	5c2	VERTICAL		686	6'-0"	4293
	5c3	VERTICAL		20	3'-3"	68
	5c14	VERTICAL		20	3'-10"	80
STAINLESS STEEL REINFORCING STEEL TOTAL LBS.						4,441

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

BENT BAR DETAILS



CONCRETE PLACEMENT SUMMARY

SECTION	TOTAL
STANDARD SECTION 2 @ 353.0 @ 0.1052 CU. YD. PER FT.	74.3
BARRIER RAIL END SECTION 4 @ 0.65 CU. YD.	2.6
TOTAL (CU. YD.)	76.9

CONCRETE BARRIER RAIL QUANTITIES

ITEM	UNIT	QUANTITY
CONCRETE BARRIER RAILING	L.F.	734.0

08-2018 LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES

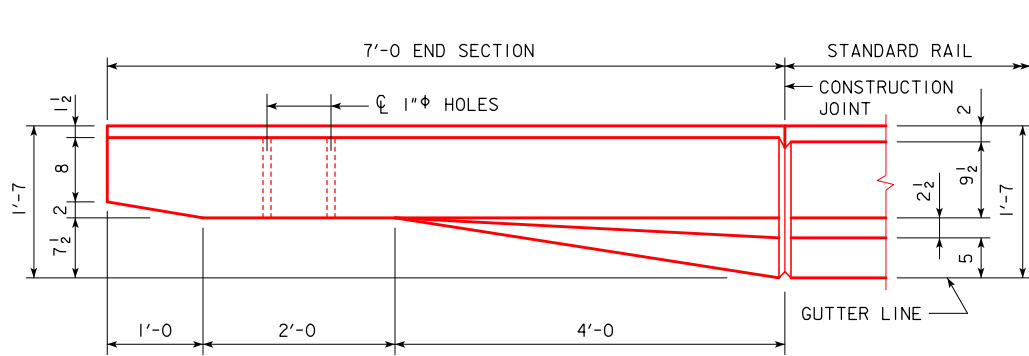
ROLLED STEEL BEAM BRIDGES

OCTOBER, 2014

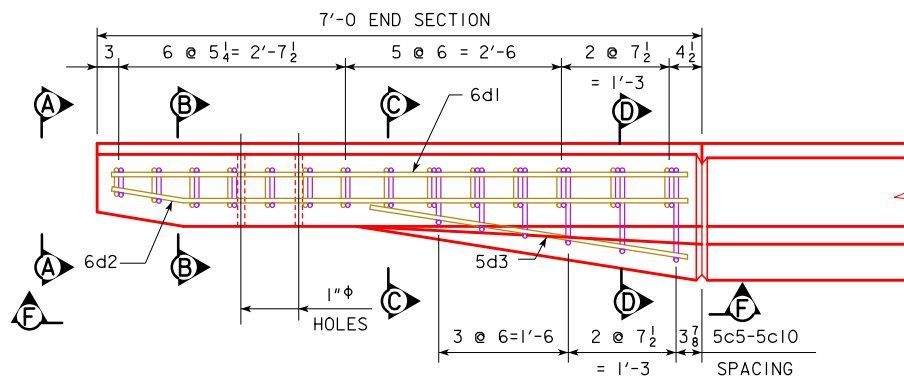
BARRIER RAIL DETAILS
340'-0 BRIDGE

RS40-088-14

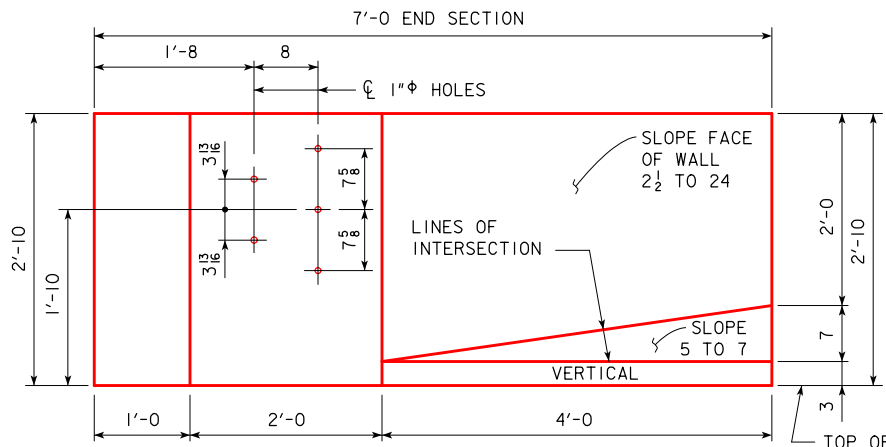
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



PART PLAN VIEW

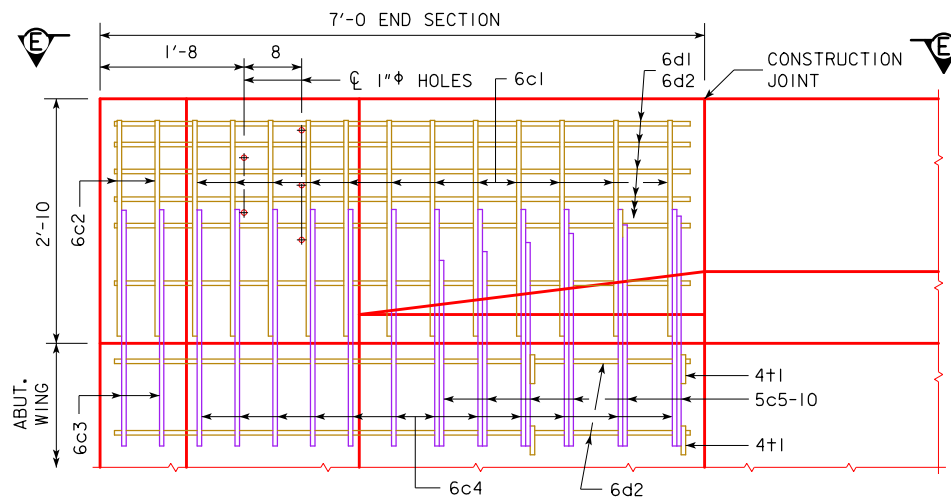


PART VIEW E-E



PART ELEVATION VIEW

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



PART VIEW F-F

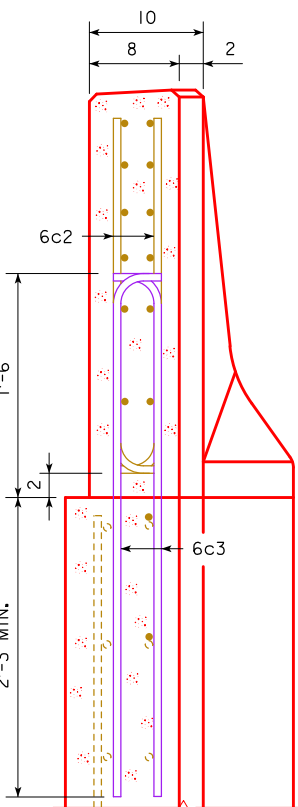
NOTE:
4+1 PLACEMENT- 2 BARS EACH LEVEL OF 6d2 IN WING FOOTING.

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

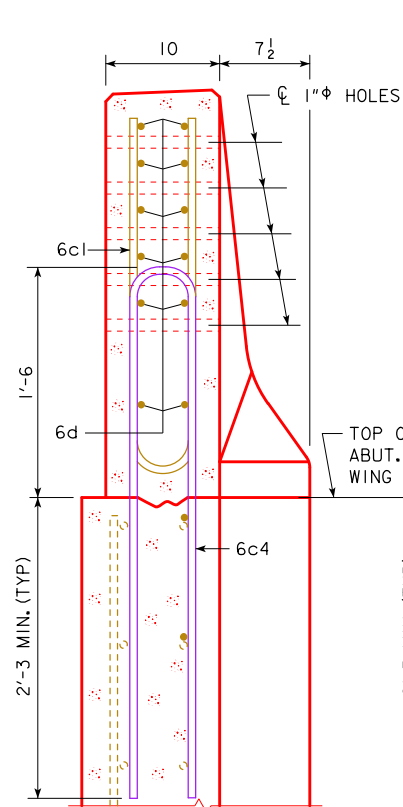
NOTE:
THE 10" RADIUS AND 1 1/2" RADIUS ARE TYPICAL AND SHALL BE USED WHEN CONSTRUCTING THE CORNERS FOR VIEW A-A, SECTION B-B, SECTION C-C AND SECTION D-D.

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

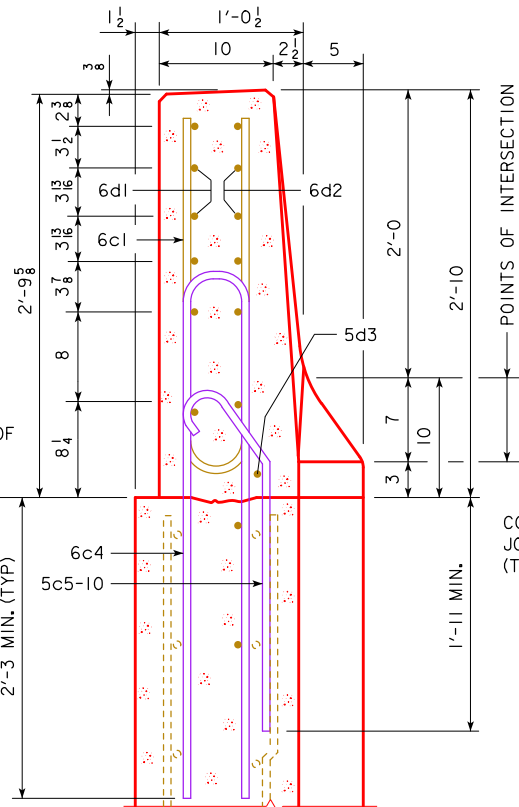
NOTE:
DASHED LINES BELOW THE TOP OF WING ARE THE ABUTMENT WING REINFORCING STEEL. SEE WING ABUTMENT SHEET FOR PLACEMENT.



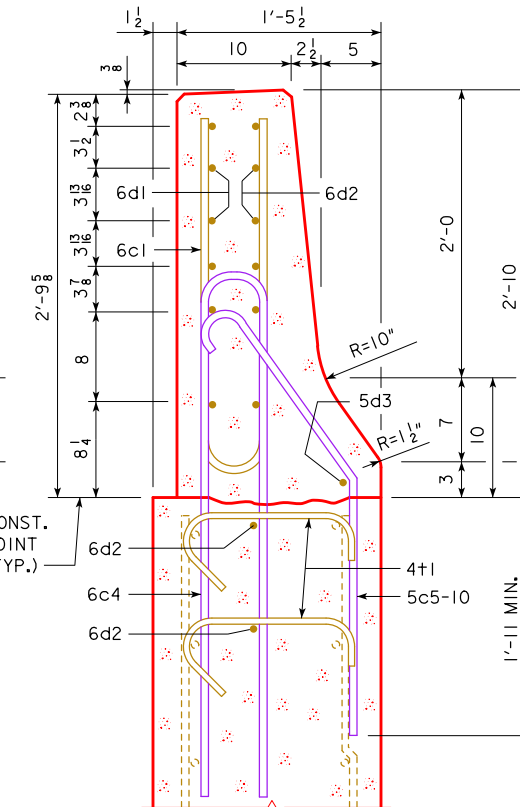
VIEW A-A



SECTION B-B



SECTION C-C



SECTION D-D

EPOXY REINFORCING STEEL - ONE END SECTION

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

STAINLESS REINFORCING STEEL - ONE END SECTION

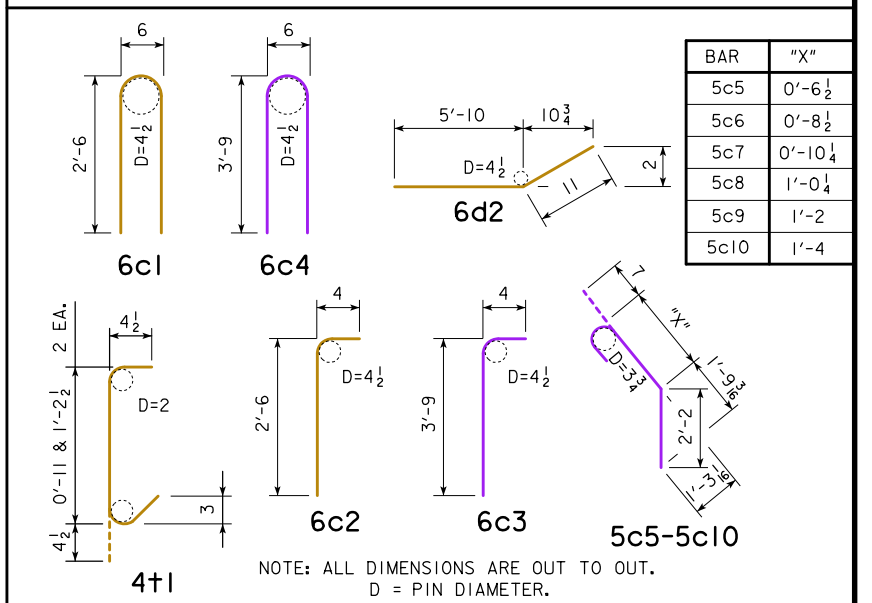
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6c3	VERTICAL	U	4	4'-1	25
6c4	VERTICAL	U	12	8'-0	144
5c5-10	VERTICAL	U	6	VARIABLES	23
STAINLESS STEEL TOTAL WEIGHT (LBS.)					192

NOTE: REINFORCING STEEL QUANTITIES ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

CONCRETE PLACEMENT SUMMARY

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

BENT BAR DETAILS



REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER



STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES

ROLLED STEEL BEAM BRIDGES

OCTOBER, 2014

BARRIER RAIL DETAILS
END SECTION

RS40-089-14

EPOXY REINF. STEEL-TWO BARRIER RAILS - 0°, 10°, 20° AND 30° SKEW

BRIDGE LENGTH				160'-0			180'-0			200'-0			220'-0			240'-0			260'-0			280'-0			300'-0			320'-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			
STANDARD SECTION	5c1	VERTICAL	⏏	326	5'-11	2012	366	5'-11	2259	406	5'-11	2506	446	5'-11	2752	486	5'-11	2999	526	5'-11	3246	566	5'-11	3493	606	5'-11	3740	646	5'-11	3987
	5d1	LONGITUDINAL	—	90	34'-5	3231	108	32'-4	3642	108	35'-8	4018	126	33'-9	4435	126	36'-8	4819	144	34'-10	5232	144	37'-4	5607	162	35'-8	6026	162	38'-0	6421
	EPOXY COATED REINFORCING STEEL TOTAL LBS.						5,243		5,901		6,524		7,187		7,818		8,478		9,100		9,766		10,408							

STAINLESS STEEL REINF. STEEL-TWO BARRIER RAILS - 0°, 10°, 20° AND 30° SKEW

BRIDGE LENGTH				160'-0			180'-0			200'-0			220'-0			240'-0			260'-0			280'-0			300'-0			320'-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			
STANDARD SECTION	5c2	VERTICAL	⏏	326	6'-0	2040	366	6'-0	2290	406	6'-0	2541	446	6'-0	2791	486	6'-0	3041	526	6'-0	3292	566	6'-0	3542	606	6'-0	3792	646	6'-0	4043
	STAINLESS STEEL REINFORCING STEEL TOTAL LBS.						2,040		2,290		2,541		2,791		3,041		3,292		3,542		3,792		4,043							

EPOXY REINF. STEEL-TWO BARRIER RAILS - 45° SKEW

BRIDGE LENGTH				160'-0			180'-0			200'-0			220'-0			240'-0			260'-0			280'-0			300'-0			320'-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			
STANDARD SECTION	5c1	VERTICAL	⏏	328	5'-11	2024	368	5'-11	2271	408	5'-11	2518	448	5'-11	2765	488	5'-11	3011	528	5'-11	3258	568	5'-11	3505	608	5'-11	3752	648	5'-11	3999
	5d1	LONGITUDINAL	—	90	34'-7	3246	108	32'-7	3671	108	35'-11	4046	126	34'-0	4469	126	36'-10	4841	144	35'-0	5257	144	37'-6	5633	162	35'-10	6055	162	38'-1	6435
	EPOXY COATED REINFORCING STEEL TOTAL LBS.						5,270		5,942		6,564		7,234		7,852		8,515		9,138		9,807		10,434							

STAINLESS STEEL REINF. STEEL-TWO BARRIER RAILS - 45° SKEW

BRIDGE LENGTH				160'-0			180'-0			200'-0			220'-0			240'-0			260'-0			280'-0			300'-0			320'-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			
STANDARD SECTION	5c2	VERTICAL	⏏	328	6'-0	2053	368	6'-0	2303	408	6'-0	2553	448	6'-0	2804	488	6'-0	3054	528	6'-0	3304	568	6'-0	3555	608	6'-0	3805	648	6'-0	4055
	STAINLESS STEEL REINFORCING STEEL TOTAL LBS.						2,053		2,303		2,553		2,804		3,054		3,304		3,555		3,805		4,055							

NOTE: THE REINFORCING STEEL QUANTITIES ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

CONCRETE PLACEMENT SUMMARY

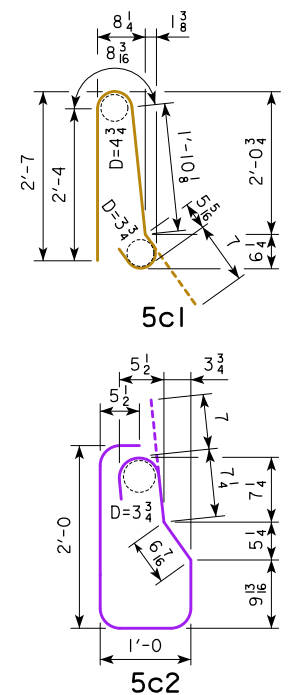
BRIDGE LENGTH		160'-0	180'-0	200'-0	220'-0	240'-0	260'-0	280'-0	300'-0	320'-0
STANDARD SECTION *	2 X B @ 0.1052 CU.YD. PER FT.	34.6	38.8	43.0	47.2	51.4	55.6	59.8	64.0	68.2
END SECTION	4 @ 0.65 CU.YD.	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
TOTAL (CU. YD.)		37.2	41.4	45.6	49.8	54.0	58.2	62.4	66.6	70.8

* SEE RS40-087-14 FOR DIMENSION "B". CONCRETE QUANTITIES SHOWN ARE BASED ON 45° SKEW BID LENGTHS.

CONCRETE BARRIER RAIL QUANTITIES

BRIDGE LENGTH		UNIT	160'-0	180'-0	200'-0	220'-0	240'-0	260'-0	280'-0	300'-0	320'-0
CONCRETE BARRIER RAILING	0° SKEW	L.F.	354.0	394.0	434.0	474.0	514.0	554.0	594.0	634.0	674.0
CONCRETE BARRIER RAILING	10° SKEW	L.F.	354.1	394.1	434.1	474.1	514.1	554.1	594.1	634.1	674.1
CONCRETE BARRIER RAILING	20° SKEW	L.F.	354.4	394.4	434.4	474.4	514.4	554.4	594.4	634.4	674.4
CONCRETE BARRIER RAILING	30° SKEW	L.F.	354.9	394.9	434.9	474.9	514.9	554.9	594.9	634.9	674.9
CONCRETE BARRIER RAILING	45° SKEW	L.F.	356.5	396.5	436.5	476.5	516.5	556.5	596.5	636.5	676.5

BENT BAR DETAILS



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

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

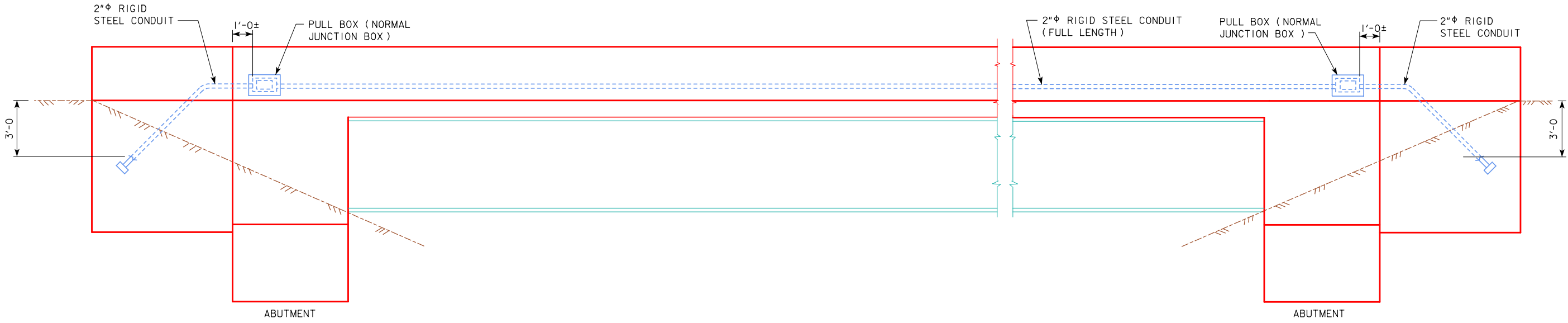
08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	
	STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	BARRIER RAIL DETAILS QUANTITIES

RS40-090-14

LIGHTING NOTES:

NOTE: SEE STANDARD SHEET 1030As1 FOR LI-104 JUNCTION BOX DETAILS AND LIGHTING NOTES.

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



EXTERIOR ELEVATION

NOTE: SEE STANDARD SHEET 1030As2 FOR REINFORCING AND DETAILS REGARDING THE PLACEMENT OF CONDUIT AND JUNCTION BOXES IN BARRIER RAILS WITH STAINLESS STEEL REINFORCING. (SECTION THRU BARRIER RAIL, JUNCTION BOX AND PART PLAN AT WING).

REVISED 02-2017 - REMOVED ALL CONDUIT, JUNCTION BOX DETAILS AND LIGHTING NOTES. ADDED NOTES AND LIGHTING NOTES. SEE STANDARD SHEET 1030As1 AND 1030As2 FOR JUNCTION BOX DETAILS AND LIGHTING NOTES, REINFORCING AND DETAILS REGARDING REINFORCING AND THE PLACEMENT OF CONDUIT AND JUNCTION BOXES IN BARRIER RAILS WITH STAINLESS STEEL REINFORCING.
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
		JUNCTION BOX AND CONDUIT DETAILS SHEET 1	RS40-091-14
		(Empty space for additional notes or signatures)	

LIGHTING NOTES:



NOTE: SEE STANDARD SHEET 1030As1 FOR LI-104 JUNCTION BOX DETAILS AND LIGHTING NOTES.

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



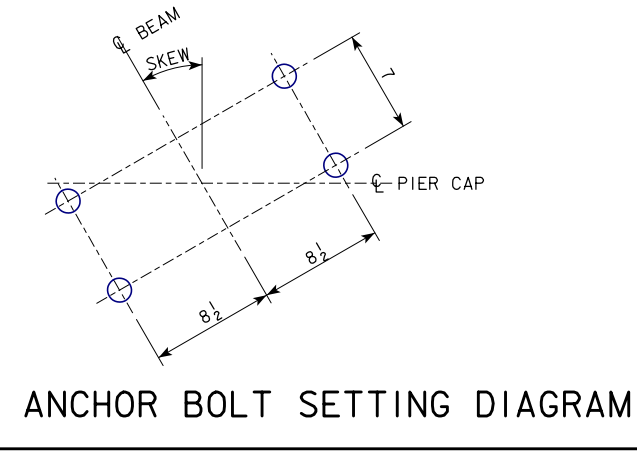
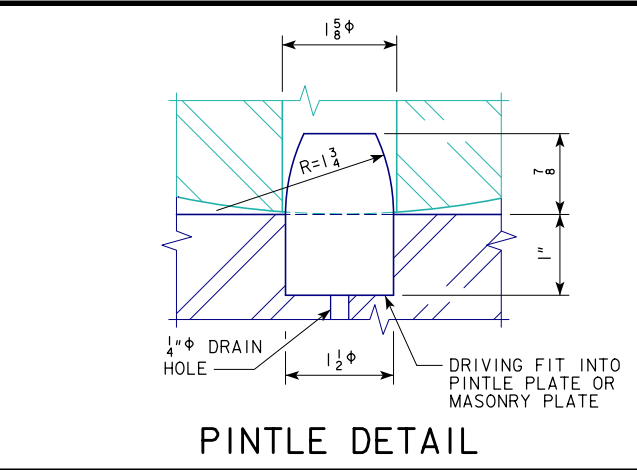
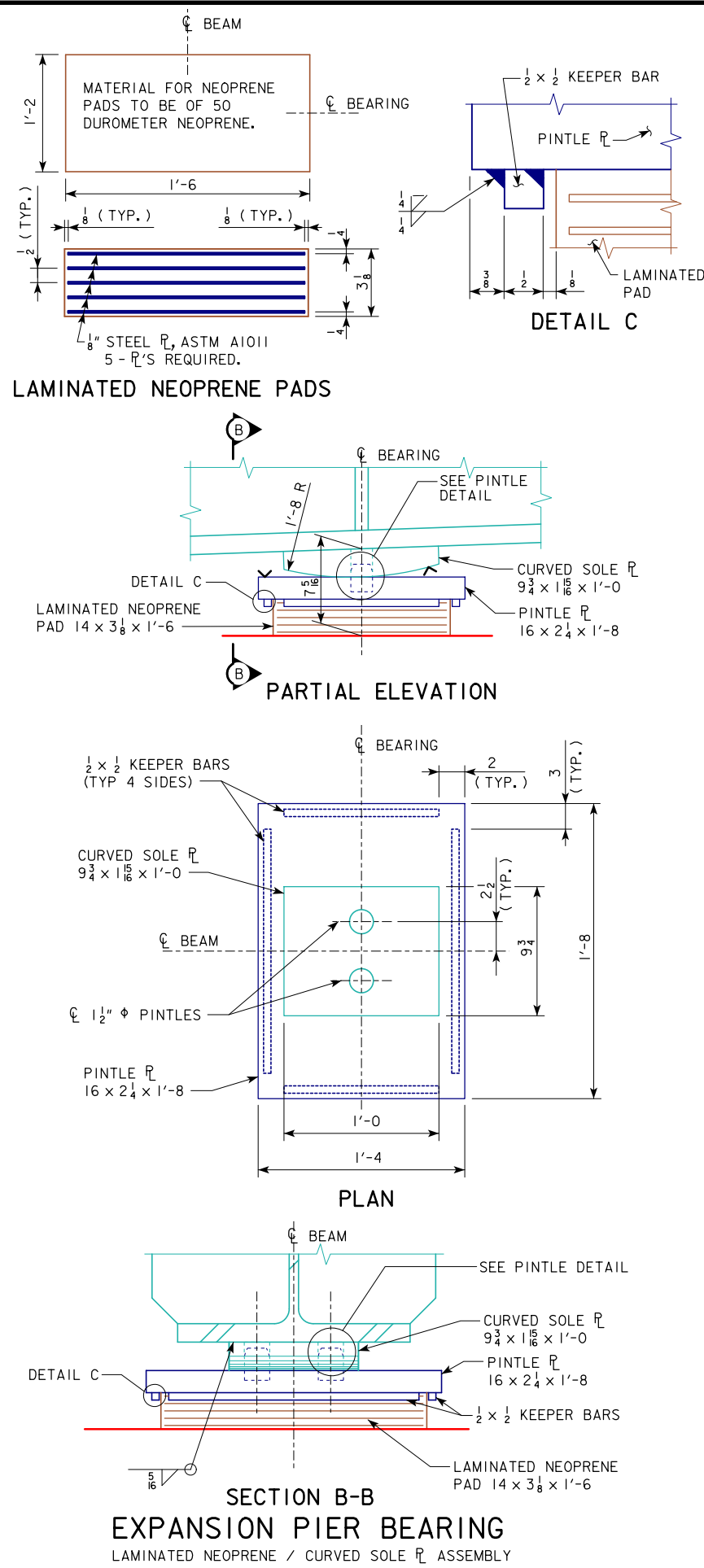
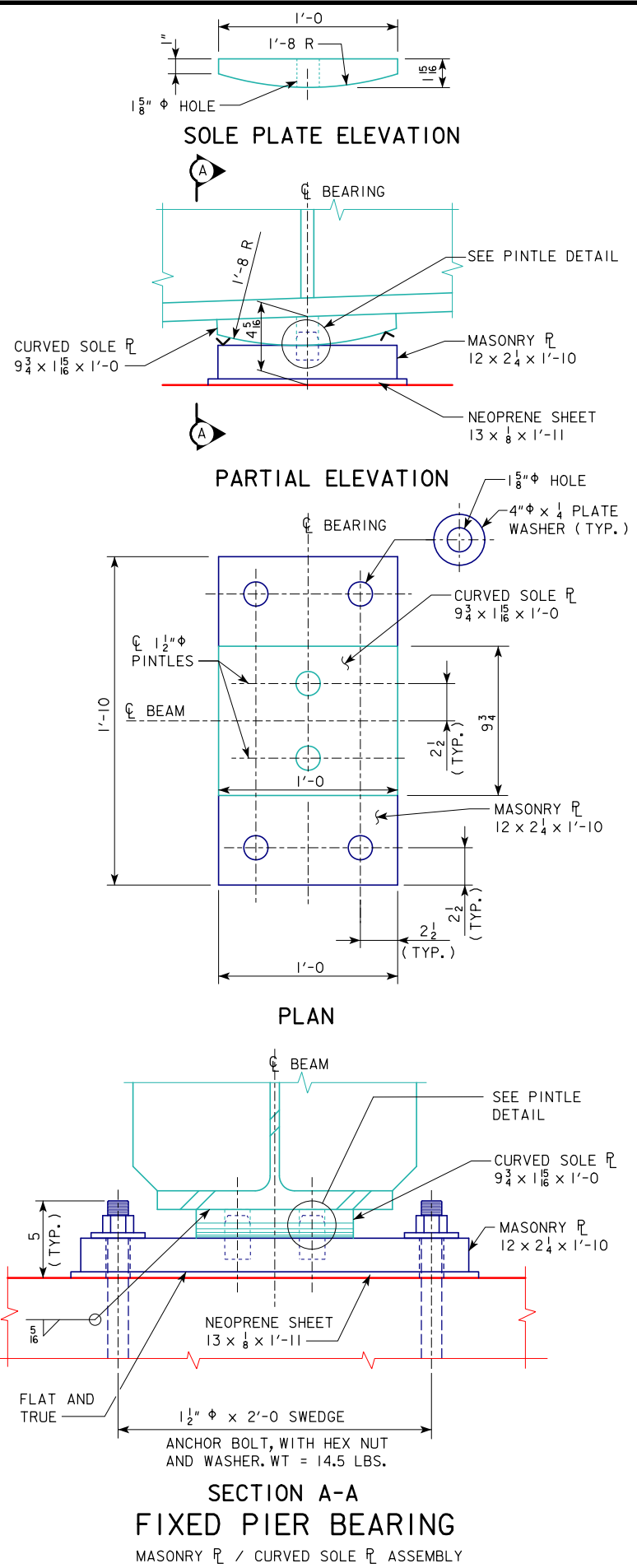
EXTERIOR ELEVATION

NOTE: SEE STANDARD SHEET 1030As2 FOR REINFORCING AND DETAILS REGARDING THE PLACEMENT OF CONDUIT AND JUNCTION BOXES IN BARRIER RAILS WITH STAINLESS STEEL REINFORCING. (SECTION THRU BARRIER RAIL, JUNCTION BOX AND PART PLAN AT WING).

08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES	
		ROLLED STEEL BEAM BRIDGES	
		OCTOBER, 2014	
JUNCTION BOX AND CONDUIT DETAILS SHEET 2		RS40-092-14	

REVISED 02-2017 - REMOVED ALL CONDUIT, JUNCTION BOX DETAILS AND LIGHTING NOTES. ADDED NOTES AND LIGHTING NOTES. SEE STANDARD SHEET 1030As1 AND 1030As2 FOR JUNCTION BOX DETAILS AND LIGHTING NOTES, REINFORCING AND DETAILS REGARDING REINFORCING AND THE PLACEMENT OF CONDUIT AND JUNCTION BOXES IN BARRIER RAILS WITH STAINLESS STEEL REINFORCING.
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

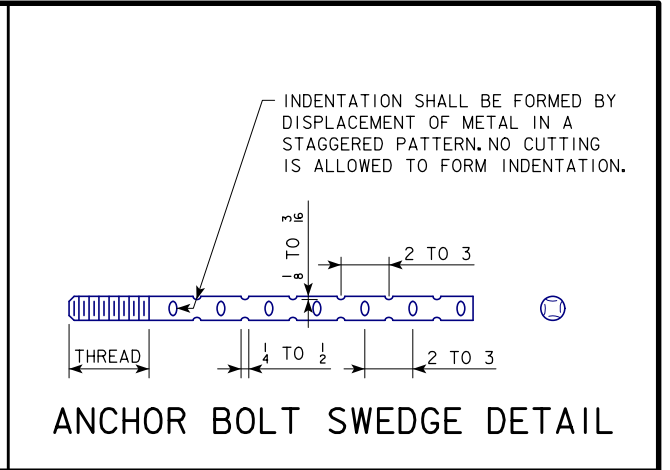
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



STRUCTURAL STEEL		
DATA FOR ONE BEARING		
BEAM SIZE	FIXED BRG.	EXP. BRG.
WEIGHT (LBS.)	277	259

WEIGHT INCLUDES SOLE PLATE, PINTLE PLATE, MASONRY PLATE, ANCHOR BOLTS, NUTS, WASHERS AND WELDS.

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



- BEARING NOTES:**
1. SURFACES MARKED "V" SHALL MEET ANSI 250 SURFACE FINISH.
 2. MASONRY PLATES ARE TO BE SET ON A 1/8 INCH NEOPRENE SHEET.
 3. PINTLE PLATES, SOLE PLATES, ANCHOR BOLTS, AND MASONRY PLATES, ARE A PART OF THE STRUCTURAL STEEL QUANTITY. UNIT PRICE BID FOR STRUCTURAL STEEL SHALL INCLUDE ALLOWANCE FOR COST OF THE 1/8" NEOPRENE SHEETS AND NEOPRENE BEARING PADS.
 4. THE PINTLE PLATES, KEEPER BARS AND MASONRY PLATES SHALL BE GALVANIZED. ALL WELDING SHALL BE COMPLETED PRIOR TO GALVANIZING.
 5. THE SURFACE OF THE PINTLE PLATE IN CONTACT WITH THE LAMINATED NEOPRENE PADS AND CURVED SOLE PLATE SHALL BE FREE OF PROJECTIONS DUE TO THE GALVANIZING.
 6. CURVED SOLE PLATES SHALL COMPLY WITH ASTM A709 GRADE 50W AND SHALL BE PAINTED PER STANDARD SPECIFICATIONS. KEEPER BARS, PINTLE PLATES AND MASONRY PLATES, WHICH ARE TO BE GALVANIZED, SHALL COMPLY WITH ASTM A709 GRADE 50.
 7. ANCHOR BOLTS, NUTS AND WASHERS SHALL MEET THE REQUIREMENTS OF I.M. 453.08.
 8. BEARINGS SHOWN ON THIS DRAWING MAY BE USED FOR APPLICATIONS WITH LOCAL BEAM SLOPES BETWEEN 0% - 6%±. FOR SITUATIONS OUTSIDE OF THIS SLOPE RANGE, THE DESIGNER SHALL EVALUATE THE BEARING'S APPLICABILITY IN ACCORDANCE WITH CURRENT IOWA DEPARTMENT OF TRANSPORTATION AND AASHTO SPECIFICATIONS ON BEARING DESIGN.
 9. THE 1/8 INCH NEOPRENE SHEETS ARE TO BE 50, 60, OR 70 DUROMETER HARDNESS AND SHALL BE 1 INCH GREATER IN LENGTH AND WIDTH THAN THE BOTTOM SURFACES OF THE MASONRY PLATES OR STEEL BEARINGS.

08-2018
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES

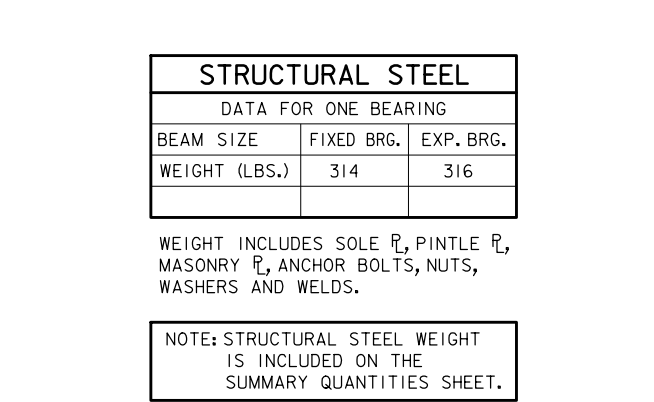
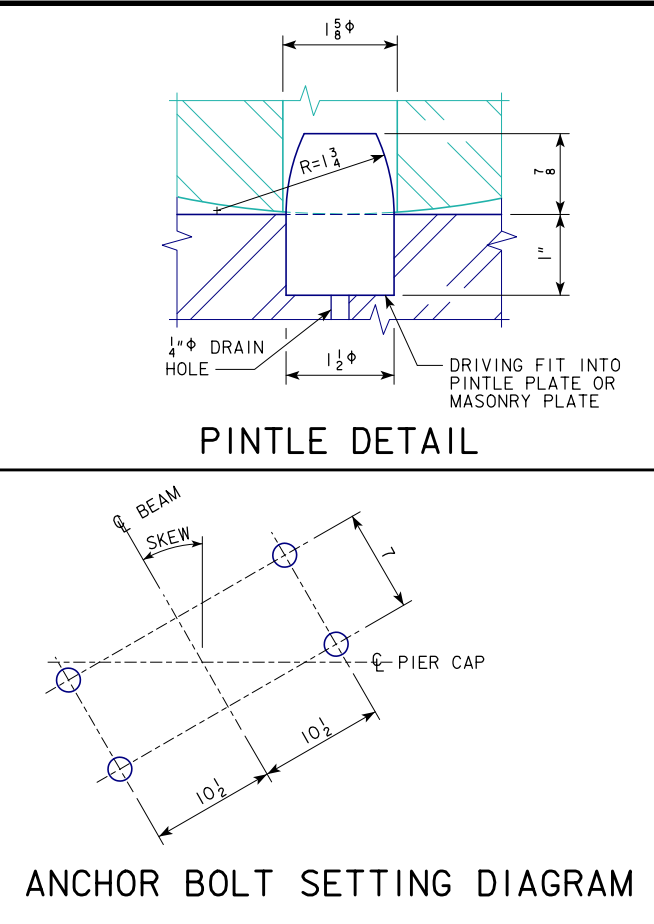
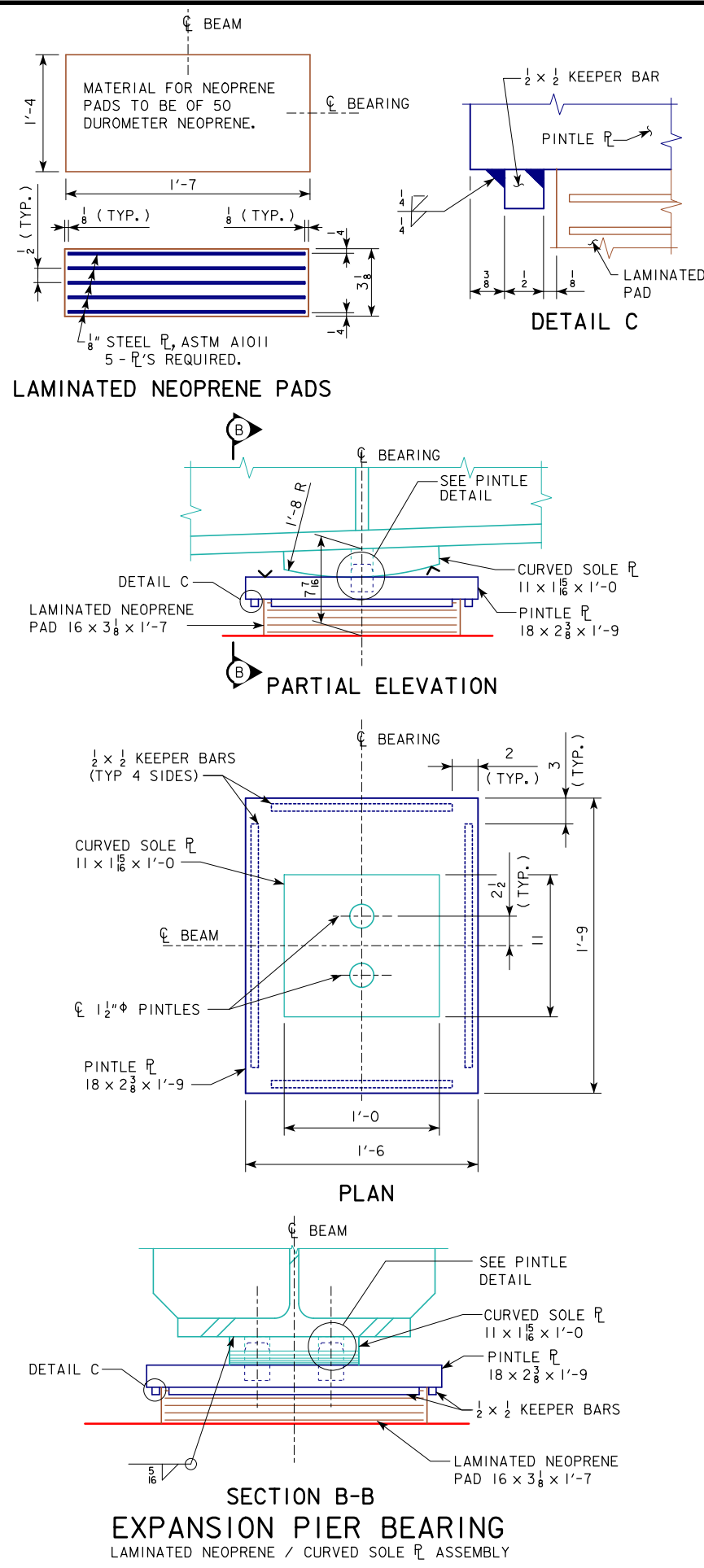
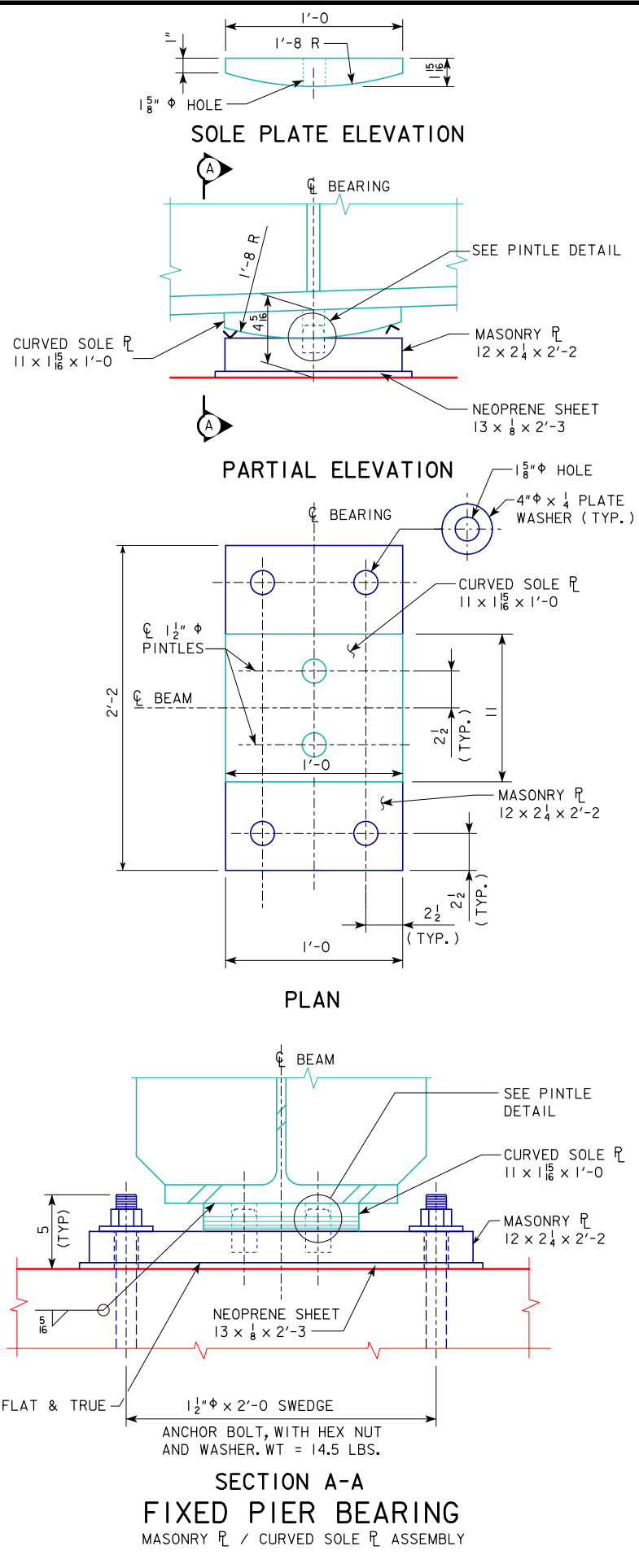
ROLLED STEEL BEAM BRIDGES

OCTOBER, 2014

**PIER BEARING DETAILS
160'-0 TO 200'-0 SPAN**

RS40-093-14

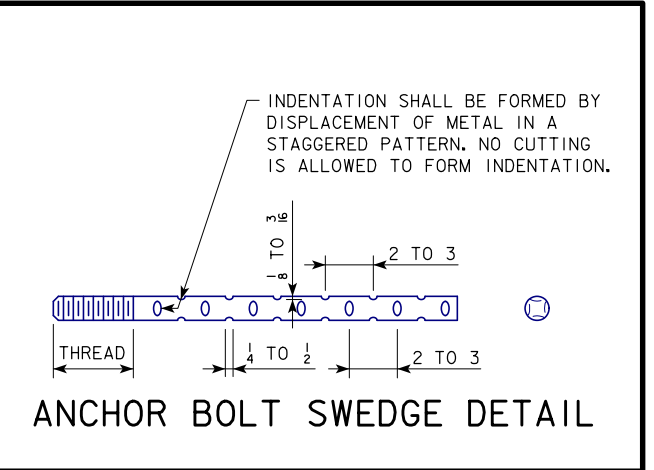
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



STRUCTURAL STEEL		
DATA FOR ONE BEARING		
BEAM SIZE	FIXED BRG.	EXP. BRG.
WEIGHT (LBS.)	314	316

WEIGHT INCLUDES SOLE PLATE, PINTLE PLATE, MASONRY PLATE, ANCHOR BOLTS, NUTS, WASHERS AND WELDS.

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



- BEARING NOTES:**
1. SURFACES MARKED "V" SHALL MEET ANSI 250 SURFACE FINISH.
 2. MASONRY PLATES ARE TO BE SET ON A 1/8 INCH NEOPRENE SHEET.
 3. PINTLE PLATES, SOLE PLATES, ANCHOR BOLTS, AND MASONRY PLATES, ARE A PART OF THE STRUCTURAL STEEL QUANTITY. UNIT PRICE BID FOR STRUCTURAL STEEL SHALL INCLUDE ALLOWANCE FOR COST OF THE 1/8" NEOPRENE SHEETS AND NEOPRENE BEARING PADS.
 4. THE PINTLE PLATES, KEEPER BARS AND MASONRY PLATES SHALL BE GALVANIZED. ALL WELDING SHALL BE COMPLETED PRIOR TO GALVANIZING.
 5. THE SURFACE OF THE PINTLE PLATE IN CONTACT WITH THE LAMINATED NEOPRENE PADS AND CURVED SOLE PLATE SHALL BE FREE OF PROJECTIONS DUE TO THE GALVANIZING.
 6. CURVED SOLE PLATES SHALL COMPLY WITH ASTM A709 GRADE 50W AND SHALL BE PAINTED PER STANDARD SPECIFICATIONS. KEEPER BARS, PINTLE PLATES AND MASONRY PLATES, WHICH ARE TO BE GALVANIZED, SHALL COMPLY WITH ASTM A709 GRADE 50.
 7. ANCHOR BOLTS, NUTS AND WASHERS SHALL MEET THE REQUIREMENTS OF I.M. 453.08.
 8. BEARINGS SHOWN ON THIS DRAWING MAY BE USED FOR APPLICATIONS WITH LOCAL BEAM SLOPES BETWEEN 0% - 6%±. FOR SITUATIONS OUTSIDE OF THIS SLOPE RANGE, THE DESIGNER SHALL EVALUATE THE BEARING'S APPLICABILITY IN ACCORDANCE WITH CURRENT IOWA DEPARTMENT OF TRANSPORTATION AND AASHTO SPECIFICATIONS ON BEARING DESIGN.
 9. THE 1/8 INCH NEOPRENE SHEETS ARE TO BE 50, 60, OR 70 DUROMETER HARDNESS AND SHALL BE 1 INCH GREATER IN LENGTH AND WIDTH THAN THE BOTTOM SURFACES OF THE MASONRY PLATES OR STEEL BEARINGS.

08-2018
LATEST REVISION DATE

[Signature]
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES

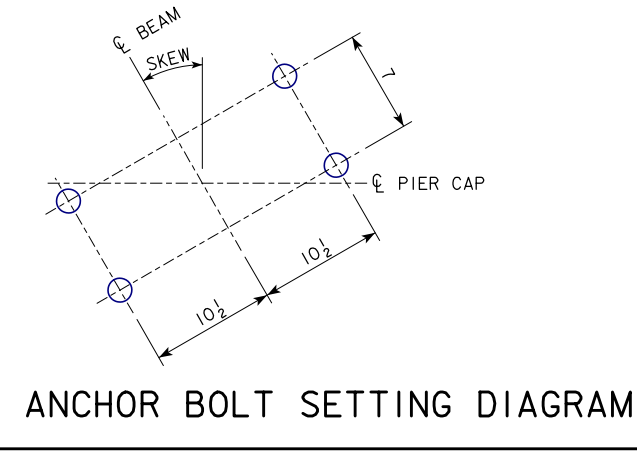
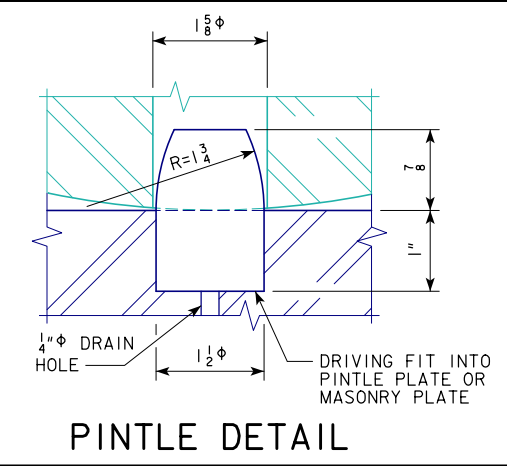
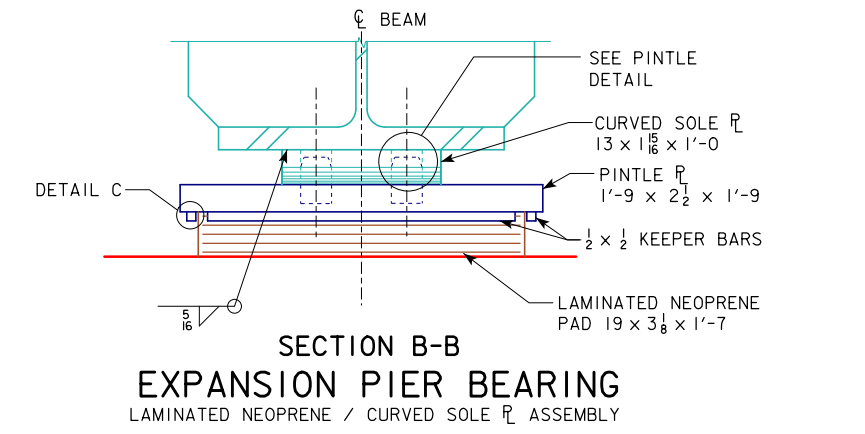
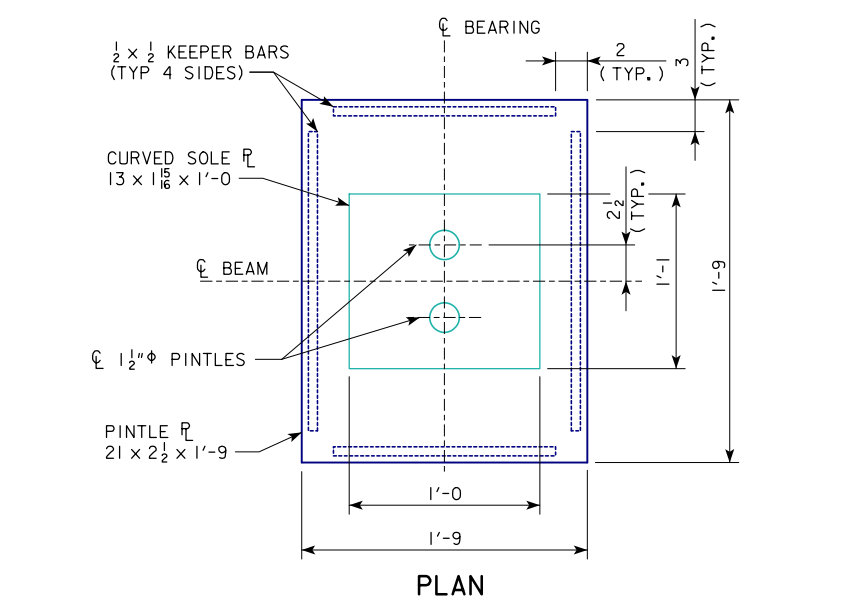
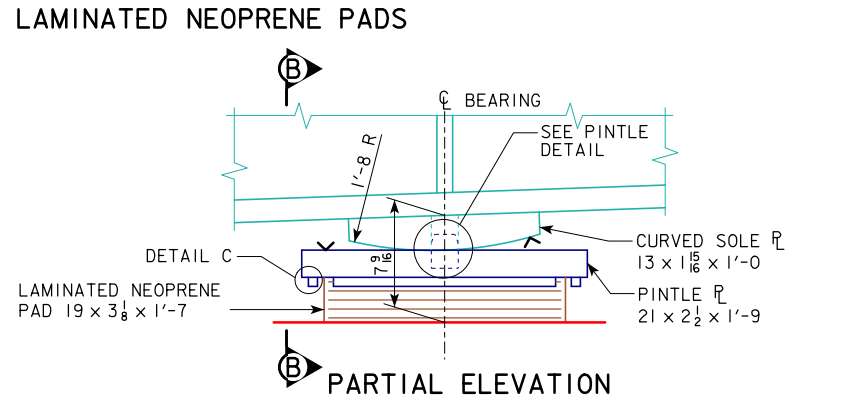
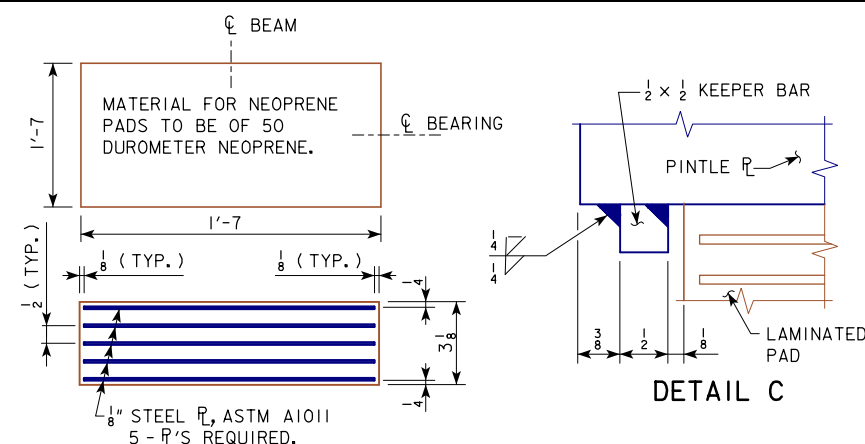
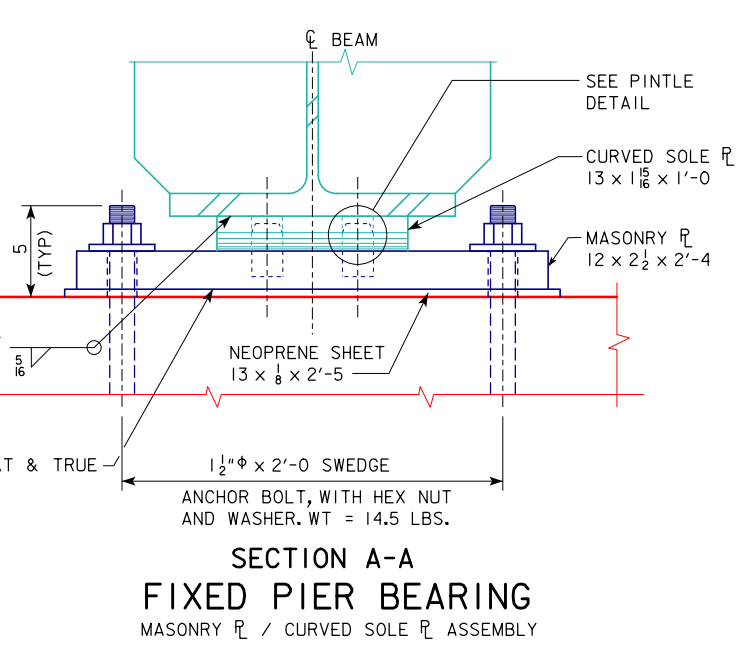
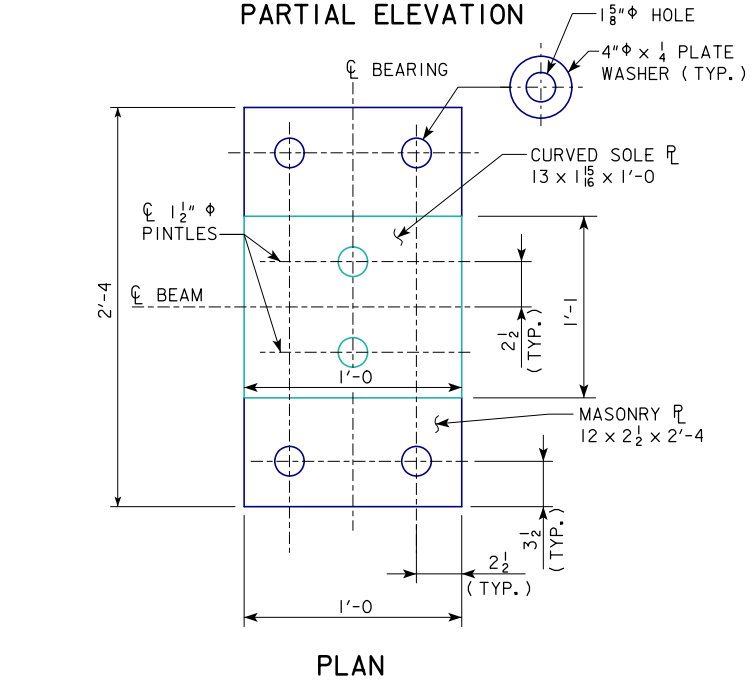
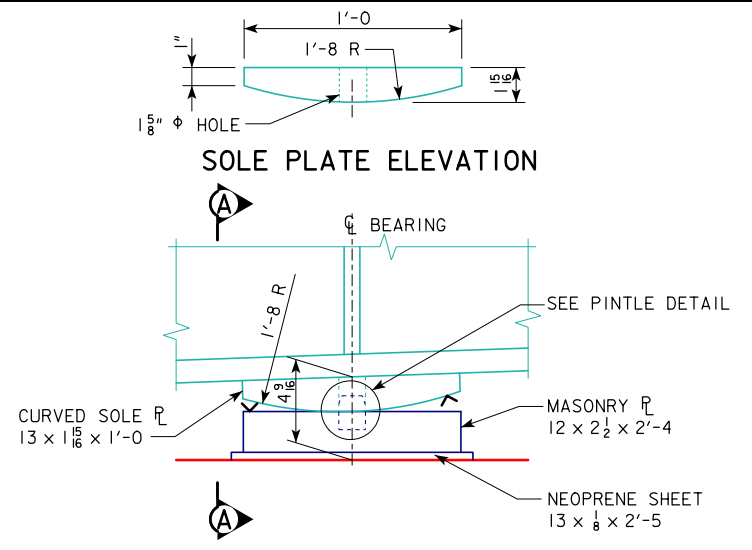
ROLLED STEEL BEAM BRIDGES

OCTOBER, 2014

**PIER BEARING DETAILS
220'-0 TO 260'-0 SPAN**

RS40-094-14

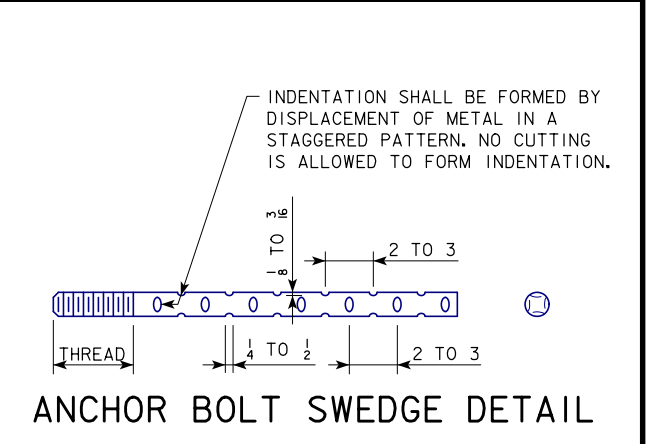
REVISED 08-2018 - CHANGED FIXED PIER BEARING ASSEMBLY THICKNESS IN "PARTIAL ELEVATION" DETAIL TO 4 9/16" (WAS 4 1/4"). UPDATED BRIDGE ENGINEER SIGNATURE.



STRUCTURAL STEEL		
DATA FOR ONE BEARING		
BEAM SIZE	FIXED BRG.	EXP. BRG.
WEIGHT (LBS.)	362	384

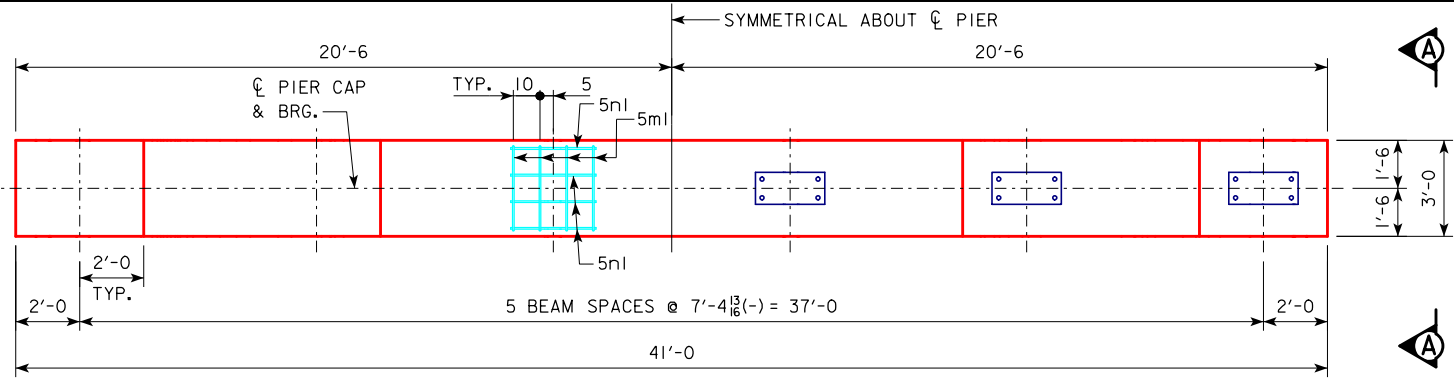
WEIGHT INCLUDES SOLE PLATE, PINTLE PLATE, MASONRY PLATE, ANCHOR BOLTS, NUTS, WASHERS AND WELDS.

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



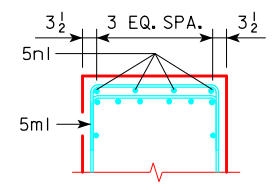
- BEARING NOTES:**
- SURFACES MARKED "V" SHALL MEET ANSI 250 SURFACE FINISH.
 - MASONRY PLATES ARE TO BE SET ON A 1/8 INCH NEOPRENE SHEET.
 - PINTLE PLATES, SOLE PLATES, ANCHOR BOLTS, AND MASONRY PLATES, ARE A PART OF THE STRUCTURAL STEEL QUANTITY. UNIT PRICE BID FOR STRUCTURAL STEEL SHALL INCLUDE ALLOWANCE FOR COST OF THE 1/8" NEOPRENE SHEETS AND NEOPRENE BEARING PADS.
 - THE PINTLE PLATES, KEEPER BARS AND MASONRY PLATES SHALL BE GALVANIZED. ALL WELDING SHALL BE COMPLETED PRIOR TO GALVANIZING.
 - THE SURFACE OF THE PINTLE PLATE IN CONTACT WITH THE LAMINATED NEOPRENE PADS AND CURVED SOLE PLATE SHALL BE FREE OF PROJECTIONS DUE TO THE GALVANIZING.
 - CURVED SOLE PLATES SHALL COMPLY WITH ASTM A709 GRADE 50W AND SHALL BE PAINTED PER STANDARD SPECIFICATIONS. KEEPER BARS, PINTLE PLATES AND MASONRY PLATES, WHICH ARE TO BE GALVANIZED, SHALL COMPLY WITH ASTM A709 GRADE 50.
 - ANCHOR BOLTS, NUTS AND WASHERS SHALL MEET THE REQUIREMENTS OF I.M. 453.08.
 - BEARINGS SHOWN ON THIS DRAWING MAY BE USED FOR APPLICATIONS WITH LOCAL BEAM SLOPES BETWEEN 0% - 6%±. FOR SITUATIONS OUTSIDE OF THIS SLOPE RANGE, THE DESIGNER SHALL EVALUATE THE BEARING'S APPLICABILITY IN ACCORDANCE WITH CURRENT IOWA DEPARTMENT OF TRANSPORTATION AND AASHTO SPECIFICATIONS ON BEARING DESIGN.
 - THE 1/8 INCH NEOPRENE SHEETS ARE TO BE 50, 60, OR 70 DUROMETER HARDNESS AND SHALL BE 1 INCH GREATER IN LENGTH AND WIDTH THAN THE BOTTOM SURFACES OF THE MASONRY PLATES OR STEEL BEARINGS.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	PIER BEARING DETAILS 280'-0 TO 340'-0 SPAN
	RS40-095-14

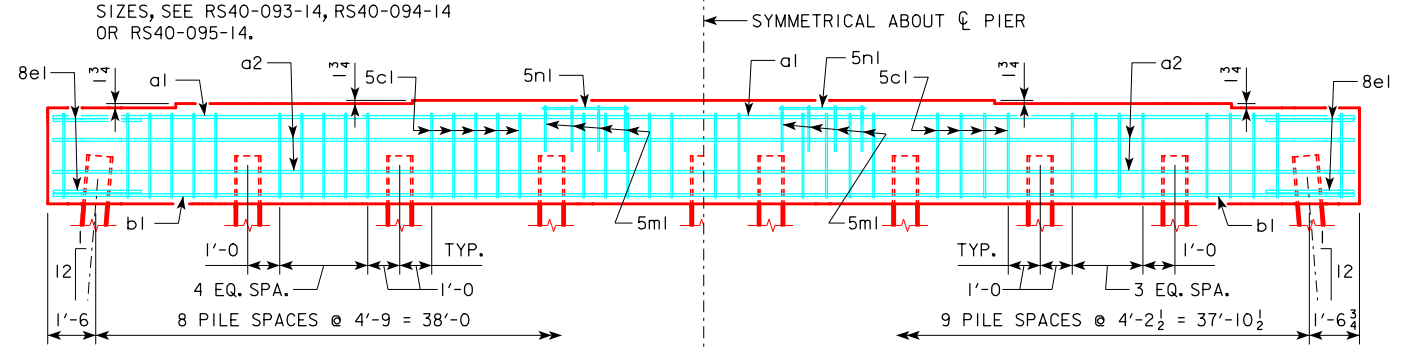


TYPICAL PLAN

NOTE:
ANCHOR BOLTS REQUIRED FOR FIXED PIER BEARINGS ONLY. FOR BOLT AND BEARING SIZES, SEE RS40-093-14, RS40-094-14 OR RS40-095-14.

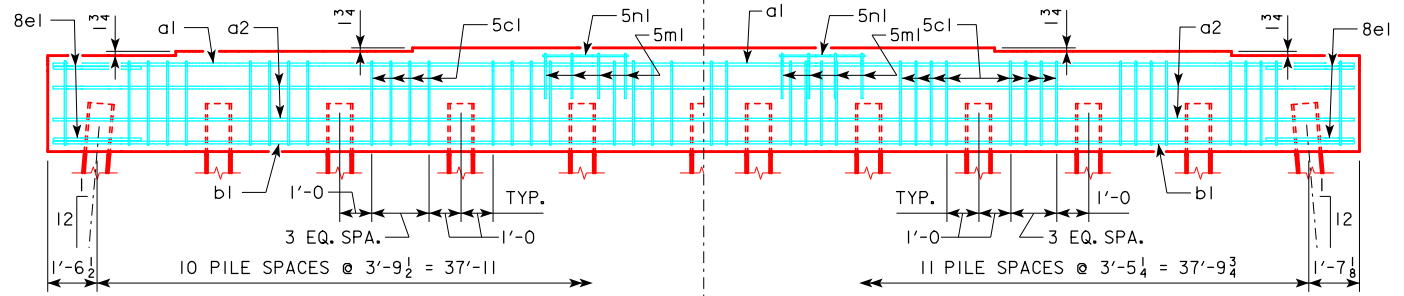


5ml & 5n1 BAR LAYOUT



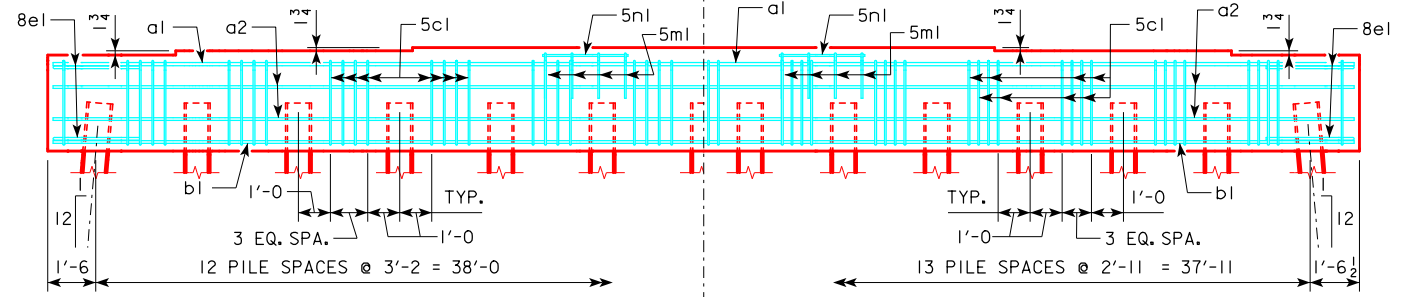
9 PILE BENT

10 PILE BENT



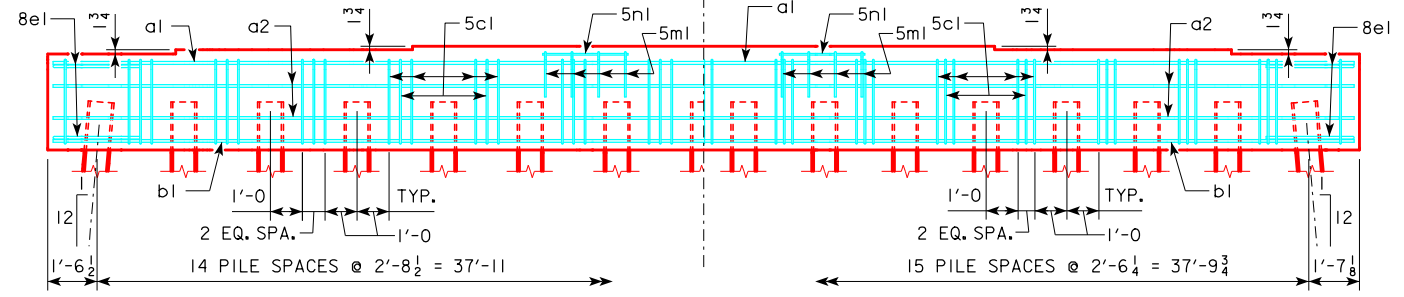
11 PILE BENT

12 PILE BENT



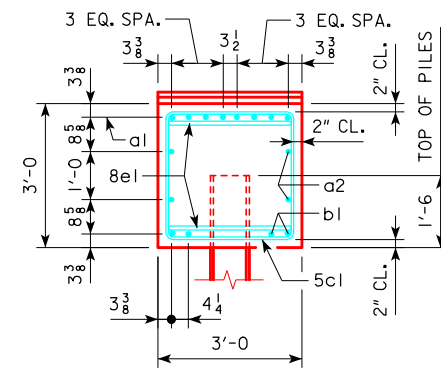
13 PILE BENT

14 PILE BENT

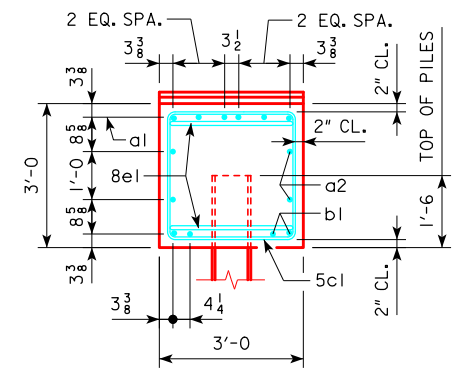


15 PILE BENT

16 PILE BENT



VIEW A-A FOR 9 & 10 PILE BENTS



VIEW A-A FOR 11, 12, 13, 14, 15 & 16 PILE BENTS

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
	PILE BENT PIERS 0° SKEW	RS40-096-14

REINFORCING BAR LIST AND ESTIMATED QUANTITIES - PER PILE BENT

BAR	LENGTH	SHAPE	9 PILE BENT			10 PILE BENT			11 PILE BENT			12 PILE BENT			13 PILE BENT			14 PILE BENT			15 PILE BENT			16 PILE BENT		
			NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
a1	40'-8"		8	9	1106	8	9	1106	6	9	830	6	9	830	6	9	830	6	9	830	6	9	830	6	9	830
a2	40'-8"		4	8	434	4	8	434	4	8	434	4	8	434	4	8	434	4	8	434	4	8	434	4	8	434
b1	40'-8"		4	9	553	4	9	553	4	9	553	4	9	553	4	9	553	4	9	553	4	9	553	4	9	553
5c1	11'-8"		42	5	511	38	5	462	42	5	511	46	5	560	50	5	608	54	5	657	44	5	535	47	5	572
8e1	8'-1"		4	8	86	4	8	86	4	8	86	4	8	86	4	8	86	4	8	86	4	8	86	4	8	86
5m1	5'-8"		8	5	47	8	5	47	8	5	47	8	5	47	8	5	47	8	5	47	8	5	47	8	5	47
5n1	2'-10"		8	5	24	8	5	24	8	5	24	8	5	24	8	5	24	8	5	24	8	5	24	8	5	24
REINFORCING STEEL (LB.)			2761			2712			2485			2534			2582			2631			2509			2546		
STRUCTURAL CONCRETE (CY)	① PILE TYPE																									
	1, 2		-----			-----			14.0			14.0			13.9			13.9			13.8			13.8		
	3		14.5			14.5			14.5			14.5			14.5			14.5			14.5			14.5		

PILE BENT NOTES:

THESE PIER BENTS ARE DESIGNED FOR USE IN LOCATIONS WHERE ICE AND DRIFT CONDITIONS ARE NOT SEVERE.

FOR DETAILS OF TRESTLE PILES, TYPES 1, 2 AND 3, SEE STANDARD PIOL.

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

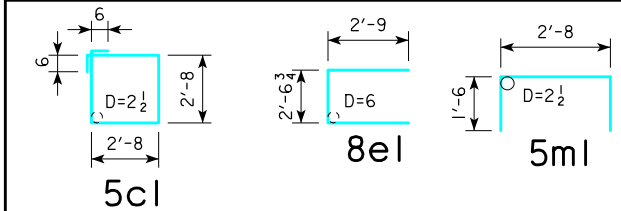
PIER PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

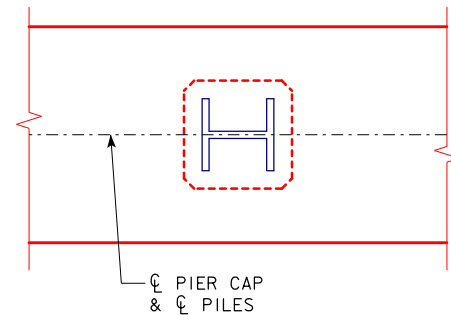
NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

BENT BAR DETAILS



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



PILE ORIENTATION DETAIL FOR
TYPE 3 TRESTLE BENT PILES

℄-℄ ABUTMENT BEARING	FRICTION BEARING PILING			FRICTION OR POINT BEARING PILING		
	PIOL TYPE 1 OR 2			PIOL TYPE 3		
	NUMBER OF TRESTLE PILES	② "K" (INCHES)	③ LRFD P _u , STRENGTH I, DES. LOAD (KIPS)	NUMBER OF TRESTLE PILES	PILE SIZE	③ LRFD P _u , STRENGTH I, DES. LOAD (KIPS)
160'-0"	13	14	92	9	HP10x57	133
	11	16	109	9	HP12x53	133
180'-0"	14	14	93	9	HP10x57	145
	12	16	109	10	HP12x53	131
200'-0"	--	--	--	10	HP10x57	142
	--	--	--	11	HP12x53	129
220'-0"	--	--	--	11	HP10x57	141
	--	--	--	12	HP12x53	129
240'-0"	--	--	--	12	HP10x57	141
	--	--	--	13	HP12x53	130
260'-0"	--	--	--	13	HP10x57	141
	--	--	--	14	HP12x53	131
280'-0"	--	--	--	14	HP10x57	141
	--	--	--	15	HP12x53	131
300'-0"	--	--	--	15	HP10x57	141
	--	--	--	16	HP12x53	132
320'-0"	--	--	--	16	HP10x57	141
340'-0"	--	--	--	--	--	--

① CONCRETE QUANTITIES SHOWN HAVE HAD THE VOLUME OF EMBEDDED PILES DEDUCTED FOR TYPES 1 AND 2 BASED ON 0.8 FT³ PER FOOT OF EMBEDMENT. THE CONCRETE QUANTITIES FOR TYPE 3 PILES DO NOT REQUIRE REDUCTION FOR PILE EMBEDMENT.

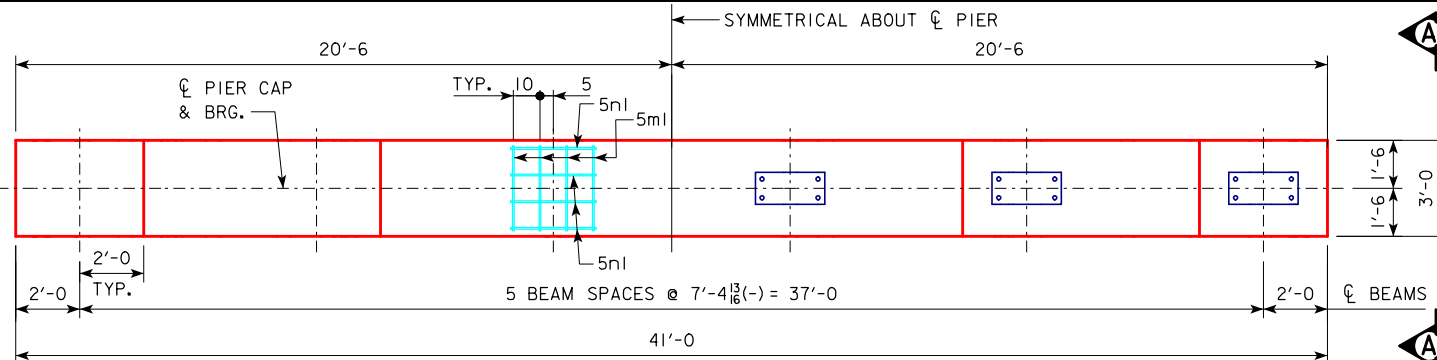
② SEE STANDARD PIOL FOR "K" DIMENSION.

③ NOTE: P_u, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

NOTE: FRICTION BEARING INCLUDES SIDE FRICTION AND END BEARING IN SOIL.
POINT BEARING INCLUDES SIDE FRICTION AND POINT BEARING IN ROCK.

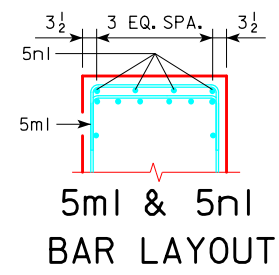
08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
PILE BENT PIERS 0° SKEW		RS40-097-14

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

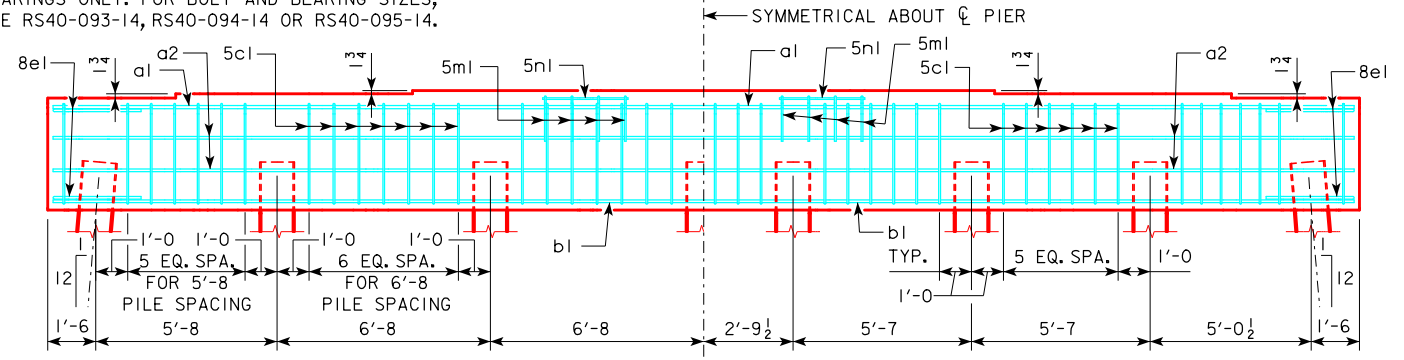


TYPICAL PLAN

NOTE:
ANCHOR BOLTS REQUIRED FOR FIXED PIER BEARINGS ONLY. FOR BOLT AND BEARING SIZES, SEE RS40-093-14, RS40-094-14 OR RS40-095-14.

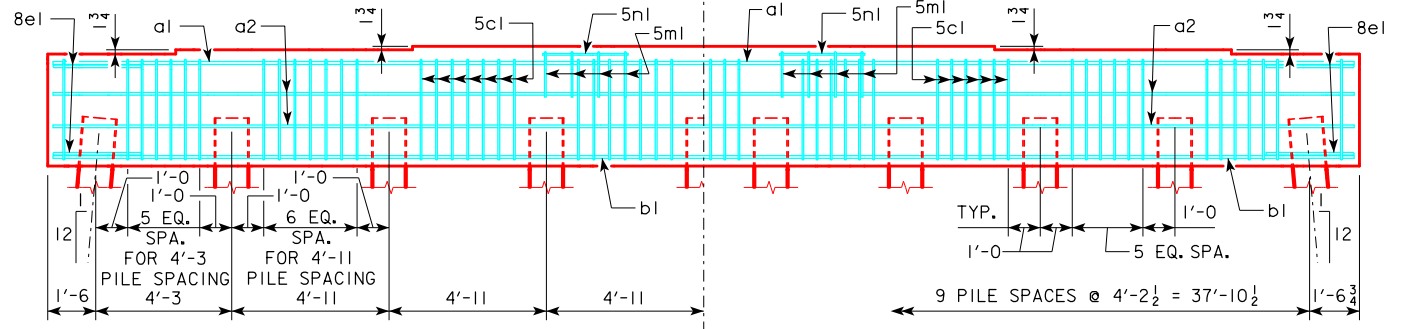


5ml & 5nl BAR LAYOUT



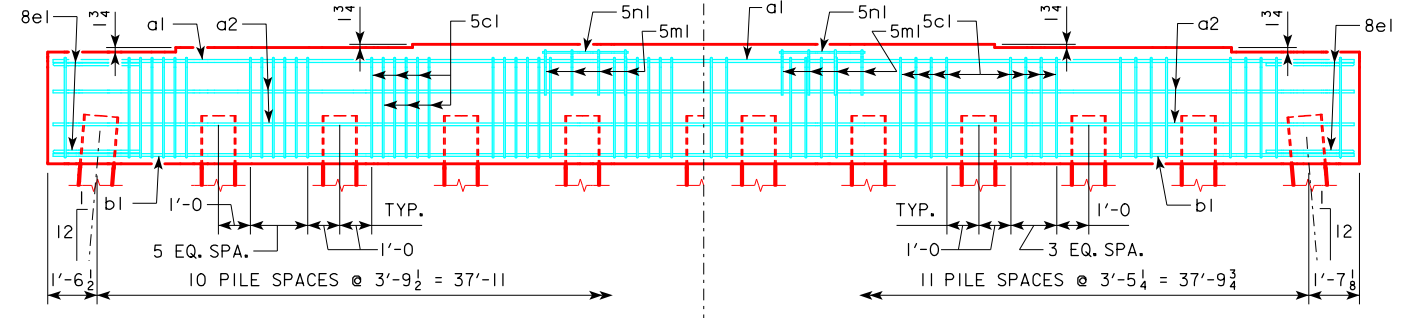
7 PILE BENT

8 PILE BENT



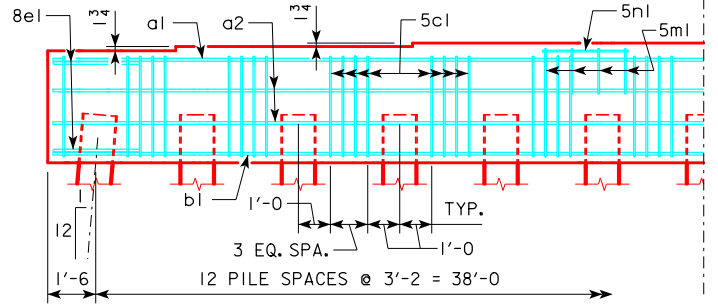
9 PILE BENT

10 PILE BENT

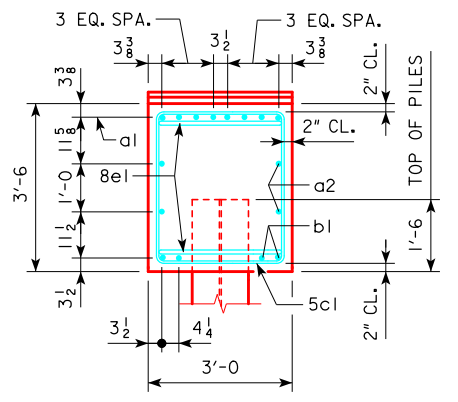


11 PILE BENT

12 PILE BENT



13 PILE BENT



VIEW A-A
FOR 7, 8, 9, 10, 11, 12 & 13 PILE BENTS

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
	PILE BENT PIERS HPI4 PILES 0° SKEW	RS40-098-14

PILE BENT NOTES:

THESE PIER BENTS ARE DESIGNED FOR USE IN LOCATIONS WHERE ICE AND DRIFT CONDITIONS ARE NOT SEVERE.

FOR DETAILS OF TRESTLE PILES, SEE STANDARD PIOL.

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

PIER PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

REINFORCING BAR LIST AND ESTIMATED QUANTITIES - PER PILE BENT

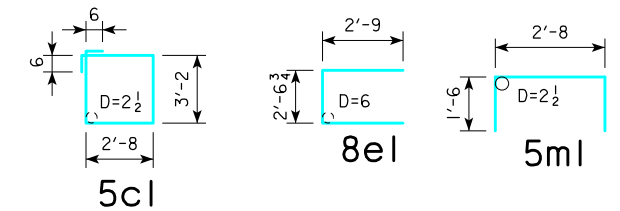
BAR	LENGTH	SHAPE	7 PILE BENT			8 PILE BENT			9 PILE BENT			10 PILE BENT			11 PILE BENT			12 PILE BENT			13 PILE BENT		
			NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
a1	40'-8"		8	9	1106	8	9	1106	8	9	1106	8	9	1106	8	9	1106	8	9	1106	8	9	1106
a2	40'-8"		4	8	434	4	8	434	4	8	434	4	8	434	4	8	434	4	8	434	4	8	434
b1	40'-8"		4	9	553	4	9	553	4	9	553	4	9	553	4	10	700	4	9	553	4	9	553
5c1	12'-8"		42	5	555	44	5	581	56	5	740	56	5	740	62	5	819	46	5	608	50	5	661
8e1	8'-1"		4	8	86	4	8	86	4	8	86	4	8	86	4	8	86	4	8	86	4	8	86
5m1	5'-8"		8	5	47	8	5	47	8	5	47	8	5	47	8	5	47	8	5	47	8	5	47
5n1	2'-10"		8	5	24	8	5	24	8	5	24	8	5	24	8	5	24	8	5	24	8	5	24
REINFORCING STEEL (LB.)			2805			2831			2990			2990			3216			2858			2911		
STRUCTURAL PILE TYPE																							
CONCRETE (CY)			3			16.8			16.8			16.8			16.8			16.8			16.8		

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

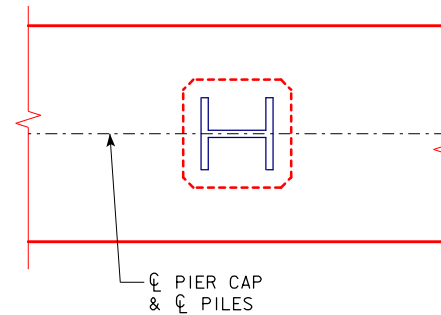
NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

BENT BAR DETAILS



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



PILE ORIENTATION DETAIL FOR TYPE 3 TRESTLE BENT PILES

FRICTION OR POINT BEARING PILING

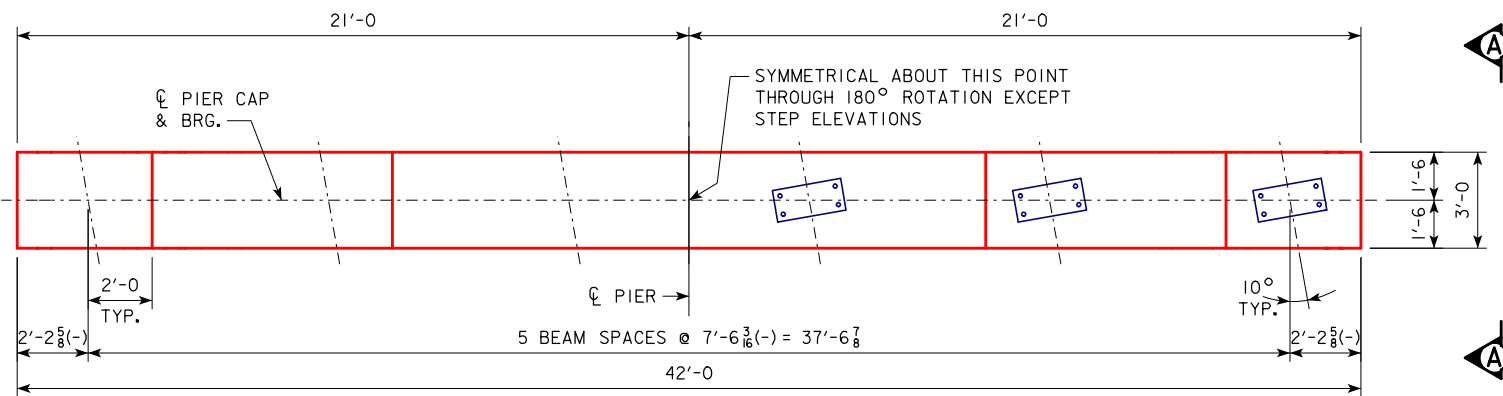
ABUTMENT BEARING	PIOL TYPE 3		
	NUMBER OF TRESTLE PILES	PILE SIZE	① LRFD P _u , STRENGTH I, DES. LOAD (KIPS)
160'-0"	7	HP14x73	173
	7	HP14x89	173
180'-0"	8	HP14x73	165
	7	HP14x89	189
200'-0"	8	HP14x73	178
	7	HP14x89	204
220'-0"	9	HP14x73	173
	7	HP14x89	223
240'-0"	10	HP14x73	171
	8	HP14x89	213
260'-0"	10	HP14x73	185
	9	HP14x89	205
280'-0"	11	HP14x73	180
	9	HP14x89	220
300'-0"	12	HP14x73	178
	10	HP14x89	213
320'-0"	13	HP14x73	175
	11	HP14x89	206
340'-0"	13	HP14x73	184
	11	HP14x89	217

① NOTE: P_u, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

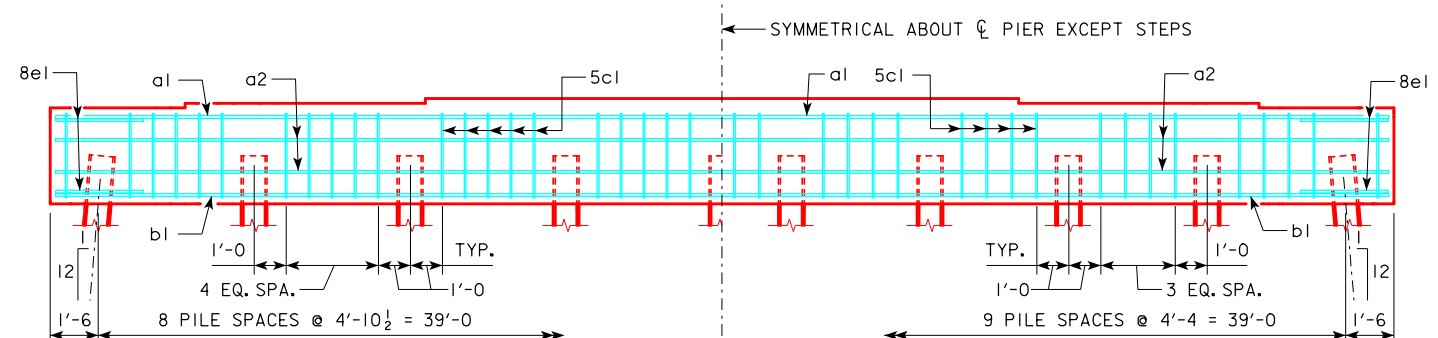
NOTE: FRICTION BEARING INCLUDES SIDE FRICTION AND END BEARING IN SOIL. POINT BEARING INCLUDES SIDE FRICTION AND POINT BEARING IN ROCK.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	PILE BENT PIERS HP14 PILES 0° SKEW
	RS40-099-14

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

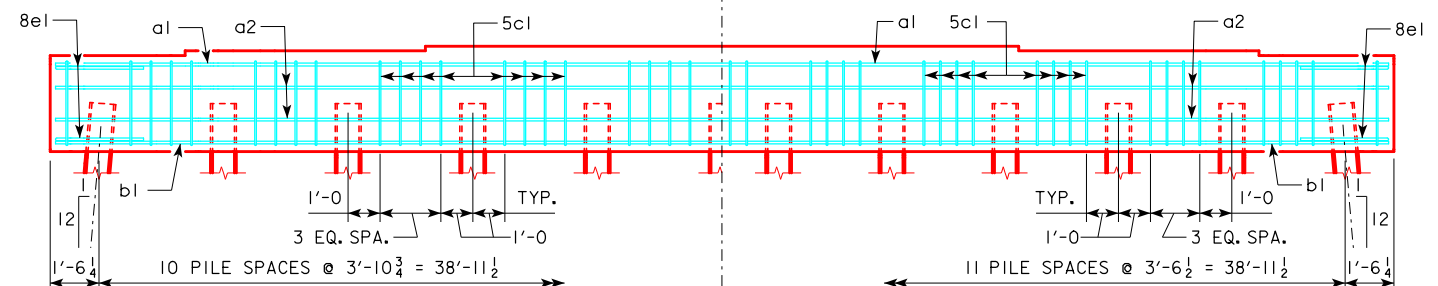


TYPICAL PLAN



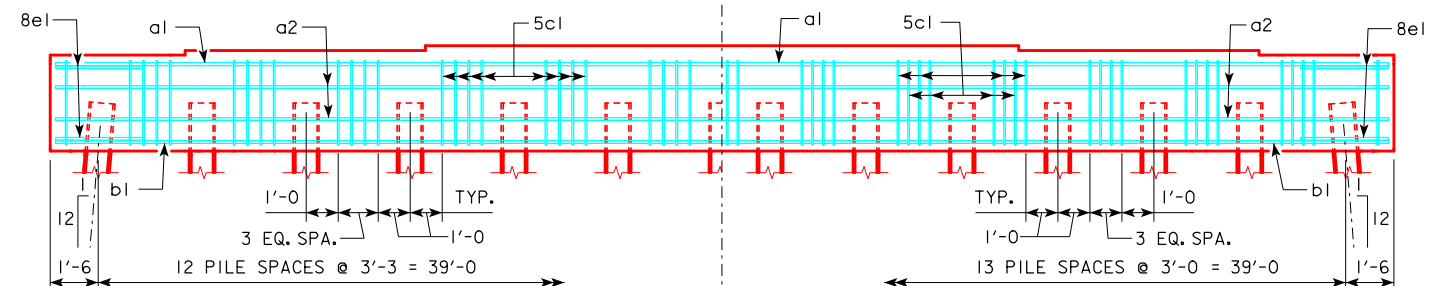
9 PILE BENT

10 PILE BENT



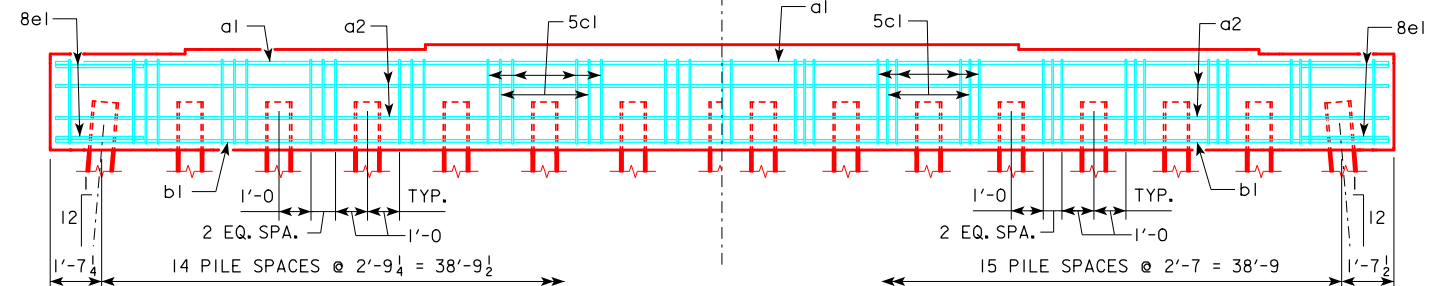
11 PILE BENT

12 PILE BENT



13 PILE BENT

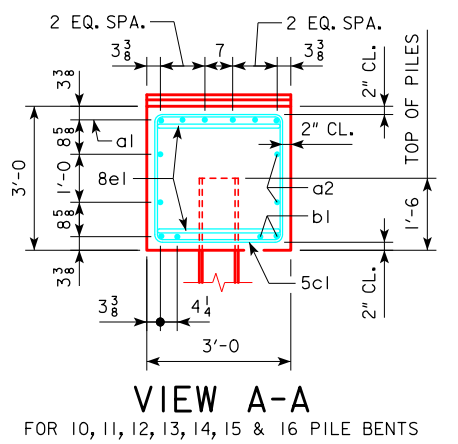
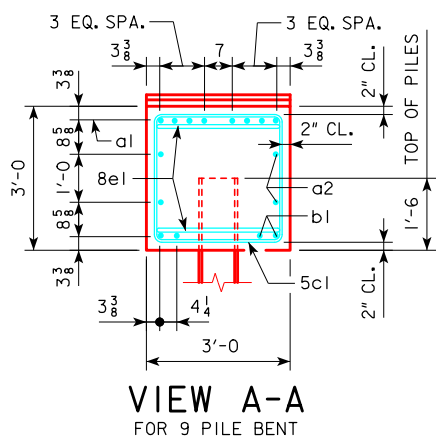
14 PILE BENT



15 PILE BENT

16 PILE BENT

NOTE:
 THE HEIGHT OF THE STEPS ON THE BRIDGE SEAT IS EQUAL TO THE DIFFERENCE IN ELEVATIONS OF THE TOP OF SLAB AT ADJACENT BEAMS ALONG CL PIER.
 ANCHOR BOLTS REQUIRED FOR FIXED PIER BEARINGS ONLY. FOR BOLT AND BEARING SIZES, SEE RS40-093-14, RS40-094-14 OR RS40-095-14.



REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
	PILE BENT PIERS 10° SKEW	RS40-100-14

PILE BENT NOTES:

THESE PIER BENTS ARE DESIGNED FOR USE IN LOCATIONS WHERE ICE AND DRIFT CONDITIONS ARE NOT SEVERE.

FOR DETAILS OF TRESTLE PILES, TYPES 1, 2 AND 3, SEE STANDARD PIOL.

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

PIER PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

REINFORCING BAR LIST AND ESTIMATED QUANTITIES - PER PILE BENT

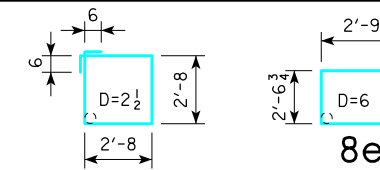
BAR	LENGTH	SHAPE	9 PILE BENT			10 PILE BENT			11 PILE BENT			12 PILE BENT			13 PILE BENT			14 PILE BENT			15 PILE BENT			16 PILE BENT		
			NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
a1	41'-8"		8	9	1133	6	9	850	6	9	850	6	9	850	6	9	850	6	9	850	6	9	850	6	9	850
a2	41'-8"		4	8	445	4	8	445	4	8	445	4	8	445	4	8	445	4	8	445	4	8	445	4	8	445
b1	41'-8"		4	9	567	4	9	567	4	9	567	4	9	567	4	9	567	4	9	567	4	9	567	4	9	567
5c1	11'-8"		42	5	511	38	5	462	42	5	511	46	5	560	50	5	608	54	5	657	44	5	535	47	5	572
8e1	8'-1"		4	8	86	4	8	86	4	8	86	4	8	86	4	8	86	4	8	86	4	8	86	4	8	86
① REINFORCING STEEL (LB.)			2742			2410			2459			2508			2556			2605			2483			2520		
STRUCTURAL CONCRETE (CY)	② PILE TYPE																									
	1, 2		-----			-----			14.4			14.4			14.3			14.3			14.2			14.2		
3		14.9			14.9			14.9			14.9			14.9			14.9			14.9			14.9			

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

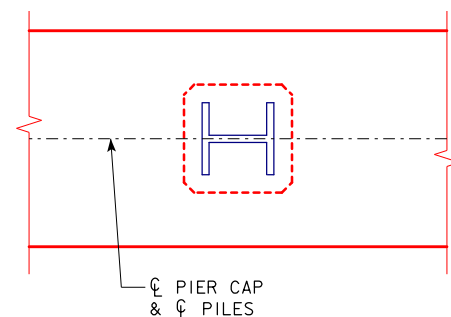
NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

BENT BAR DETAILS



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



PILE ORIENTATION DETAIL FOR TYPE 3 TRESTLE BENT PILES

℄-℄ ABUTMENT BEARING	FRICTION BEARING PILING			FRICTION OR POINT BEARING PILING		
	PIOL TYPE 1 OR 2			PIOL TYPE 3		
	NUMBER OF TRESTLE PILES	③ "K" (INCHES)	③ LRFD P _u , STRENGTH I, DES. LOAD (KIPS)	NUMBER OF TRESTLE PILES	PILE SIZE	④ LRFD P _u , STRENGTH I, DES. LOAD (KIPS)
160'-0"	13	14	92	9	HP10x57	133
	11	16	109	9	HP12x53	133
180'-0"	14	14	94	9	HP10x57	146
	12	16	109	10	HP12x53	131
200'-0"	--	--	--	10	HP10x57	142
	--	--	--	11	HP12x53	129
220'-0"	--	--	--	11	HP10x57	141
	--	--	--	12	HP12x53	129
240'-0"	--	--	--	12	HP10x57	142
	--	--	--	13	HP12x53	131
260'-0"	--	--	--	13	HP10x57	141
	--	--	--	14	HP12x53	131
280'-0"	--	--	--	14	HP10x57	141
	--	--	--	15	HP12x53	132
300'-0"	--	--	--	15	HP10x57	141
	--	--	--	16	HP12x53	133
320'-0"	--	--	--	16	HP10x57	141
340'-0"	--	--	--	--	--	--

- ① SEE SHEET RS40-166-14 FOR STEP REINFORCING STEEL QUANTITIES AND DETAILS.
- ② CONCRETE QUANTITIES SHOWN HAVE HAD THE VOLUME OF EMBEDDED PILES DEDUCTED FOR TYPES 1 AND 2 BASED ON 0.8 FT³ PER FOOT OF EMBEDMENT. THE CONCRETE QUANTITIES FOR TYPE 3 PILES DO NOT REQUIRE REDUCTION FOR PILE EMBEDMENT.
- ③ SEE STANDARD PIOL FOR "K" DIMENSION.
- ④ NOTE: P_u, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

NOTE: FRICTION BEARING INCLUDES SIDE FRICTION AND END BEARING IN SOIL. POINT BEARING INCLUDES SIDE FRICTION AND POINT BEARING IN ROCK.

IOWADOT Highway Division

STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES

ROLLED STEEL BEAM BRIDGES

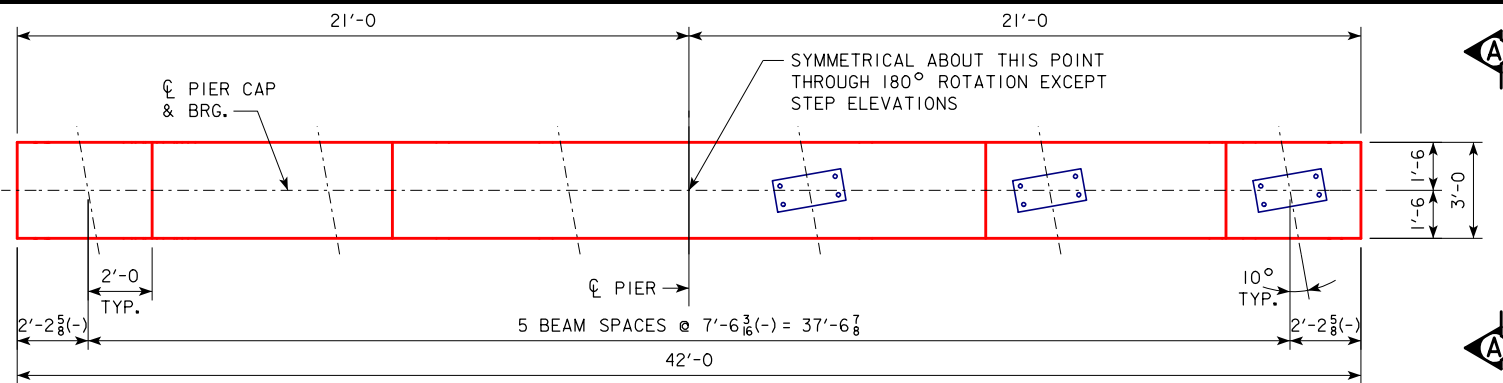
OCTOBER, 2014

PILE BENT PIERS

10° SKEW

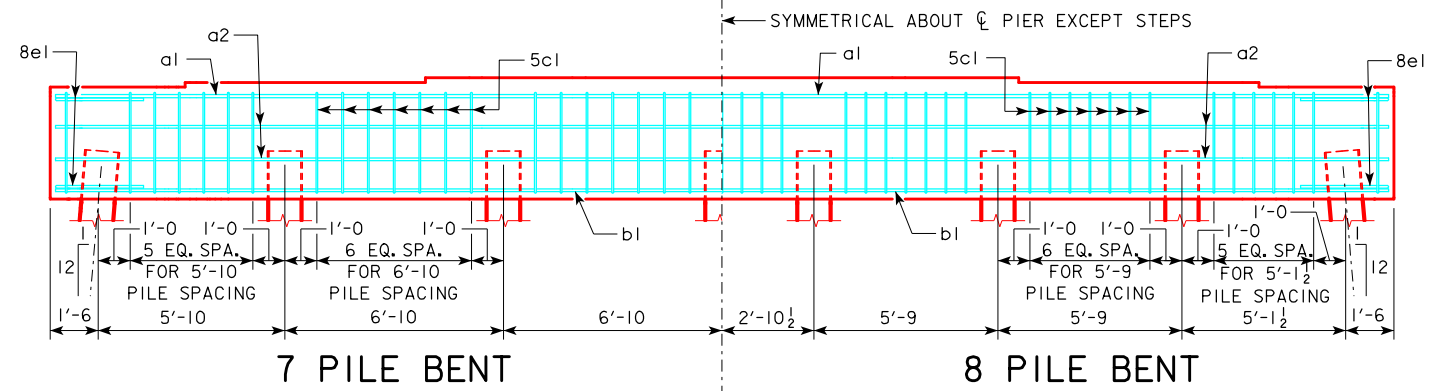
RS40-101-14

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



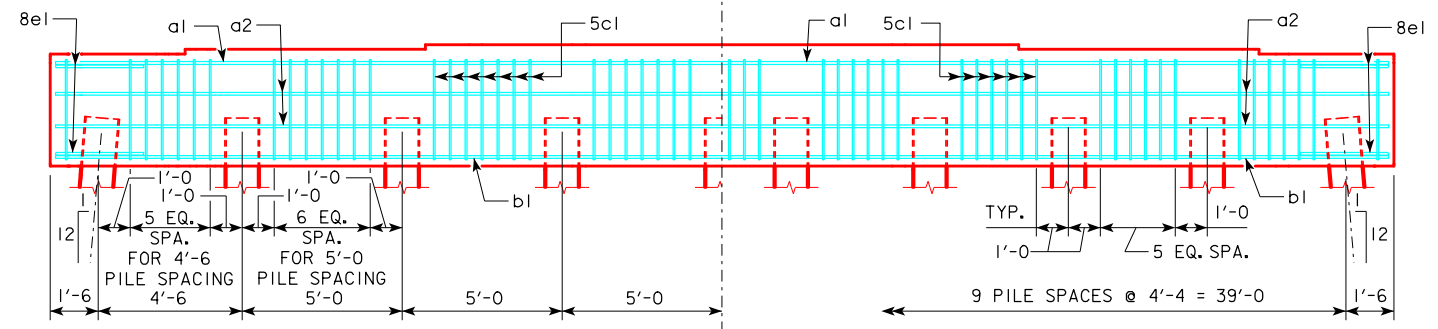
TYPICAL PLAN

NOTE:
 THE HEIGHT OF THE STEPS ON THE BRIDGE SEAT IS EQUAL TO THE DIFFERENCE IN ELEVATIONS OF THE TOP OF SLAB AT ADJACENT BEAMS ALONG CL PIER.
 ANCHOR BOLTS REQUIRED FOR FIXED PIER BEARINGS ONLY. FOR BOLT AND BEARING SIZES, SEE RS40-093-14, RS40-094-14 OR RS40-095-14.



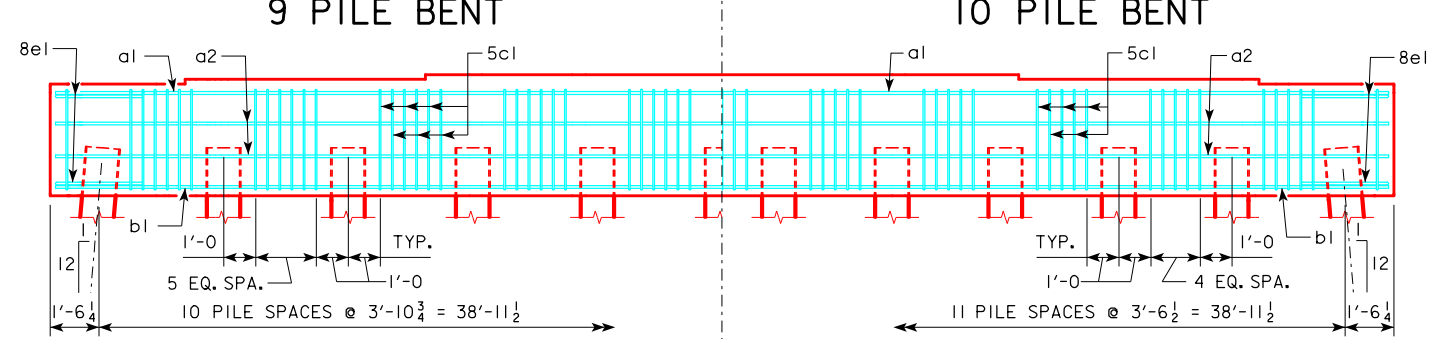
7 PILE BENT

8 PILE BENT



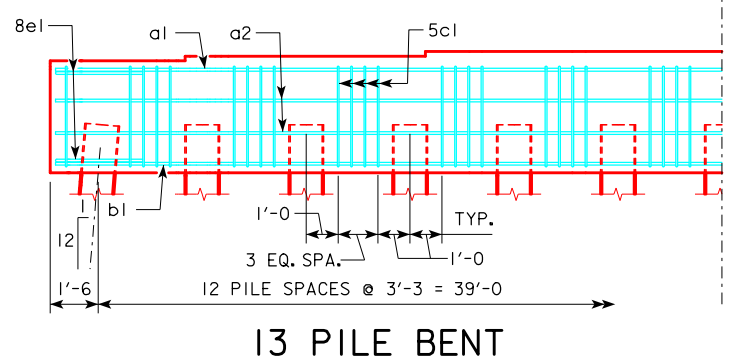
9 PILE BENT

10 PILE BENT

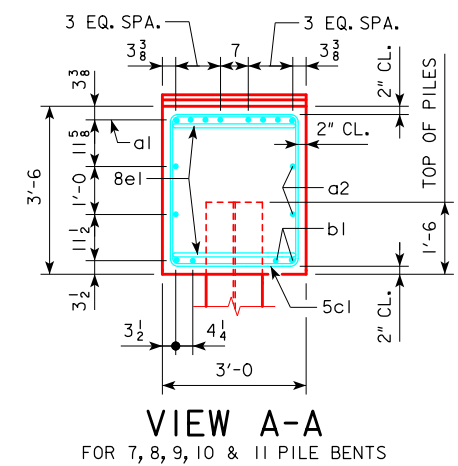


11 PILE BENT

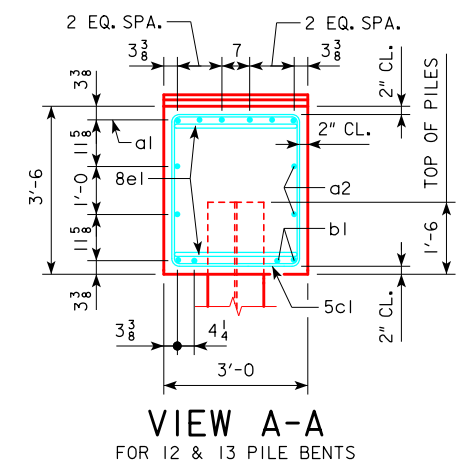
12 PILE BENT



13 PILE BENT



VIEW A-A
FOR 7, 8, 9, 10 & 11 PILE BENTS



VIEW A-A
FOR 12 & 13 PILE BENTS

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018
 LATEST REVISION DATE
 APPROVED BY BRIDGE ENGINEER

STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
PILE BENT PIERS HPI4 PILES 10° SKEW	RS40-102-14

PILE BENT NOTES:

THESE PIER BENTS ARE DESIGNED FOR USE IN LOCATIONS WHERE ICE AND DRIFT CONDITIONS ARE NOT SEVERE.

FOR DETAILS OF TRESTLE PILES, SEE STANDARD PIOL.

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

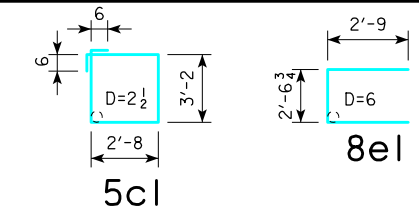
PIER PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

REINFORCING BAR LIST AND ESTIMATED QUANTITIES - PER PILE BENT

BAR	LENGTH	SHAPE	7 PILE BENT			8 PILE BENT			9 PILE BENT			10 PILE BENT			11 PILE BENT			12 PILE BENT			13 PILE BENT		
			NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
a1	41'-8"		8	9	1133	8	9	1133	8	9	1133	8	9	1133	8	9	1133	6	9	850	6	9	850
a2	41'-8"		4	8	445	4	8	445	4	8	445	4	8	445	4	8	445	4	8	445	4	8	445
b1	41'-8"		4	9	567	4	10	717	4	9	567	4	9	567	4	10	717	4	9	567	4	9	567
5c1	12'-8"		42	5	555	49	5	647	56	5	740	56	5	740	62	5	819	57	5	753	50	5	661
8e1	8'-1"		4	8	86	4	8	86	4	8	86	4	8	86	4	8	86	4	8	86	4	8	86
REINFORCING STEEL (LB.)			2786			3028			2971			2971			3200			2701			2609		
STRUCTURAL PILE TYPE																							
CONCRETE (CY)			3			17.2			17.2			17.2			17.2			17.2			17.2		

- NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.
- NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.
- NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

BENT BAR DETAILS

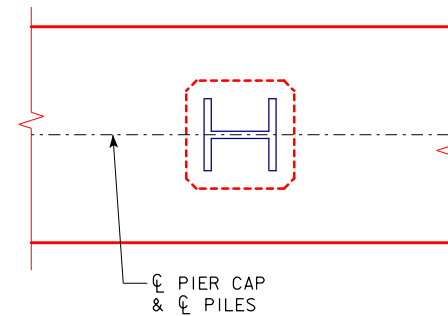


NOTE: ALL DIMENSIONS ARE OUT TO OUT. D=PIN DIAMETER.

FRICION OR POINT BEARING PILING

ABUTMENT BEARING	PIOL TYPE 3		
	NUMBER OF TRESTLE PILES	PILE SIZE	LRFD Pu, STRENGTH I, DES. LOAD (KIPS)
160'-0"	7	HPI4x73	173
	7	HPI4x89	173
180'-0"	8	HPI4x73	165
	7	HPI4x89	189
200'-0"	8	HPI4x73	179
	7	HPI4x89	204
220'-0"	9	HPI4x73	174
	7	HPI4x89	223
240'-0"	10	HPI4x73	171
	8	HPI4x89	214
260'-0"	10	HPI4x73	185
	9	HPI4x89	205
280'-0"	11	HPI4x73	180
	9	HPI4x89	221
300'-0"	12	HPI4x73	178
	10	HPI4x89	213
320'-0"	13	HPI4x73	175
	11	HPI4x89	207
340'-0"	13	HPI4x73	184
	11	HPI4x89	218

- SEE SHEET RS40-166-14 FOR STEP REINFORCING STEEL QUANTITIES AND DETAILS.
- NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

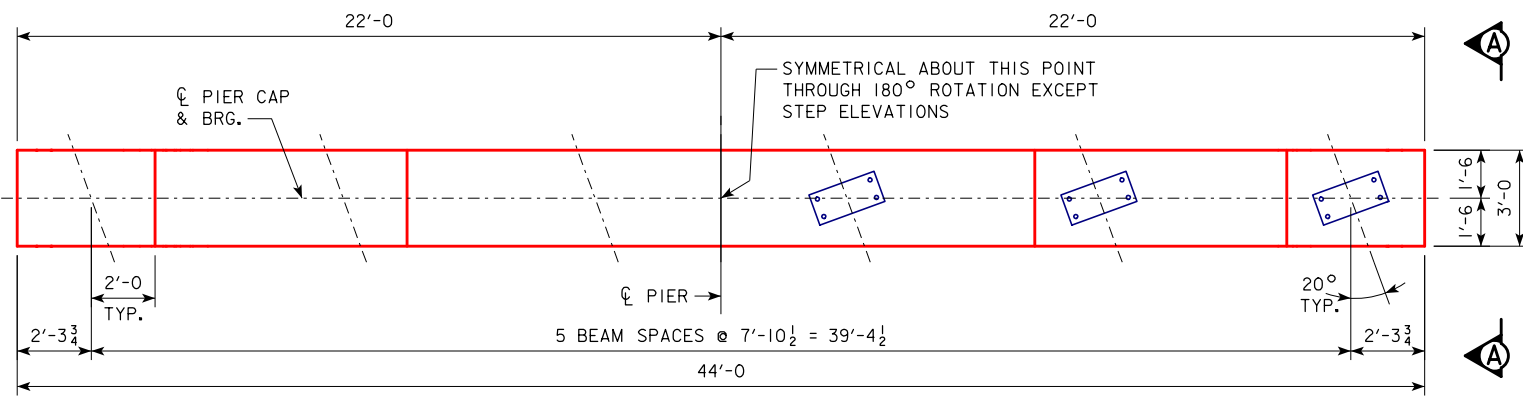


PILE ORIENTATION DETAIL FOR TYPE 3 TRESTLE BENT PILES

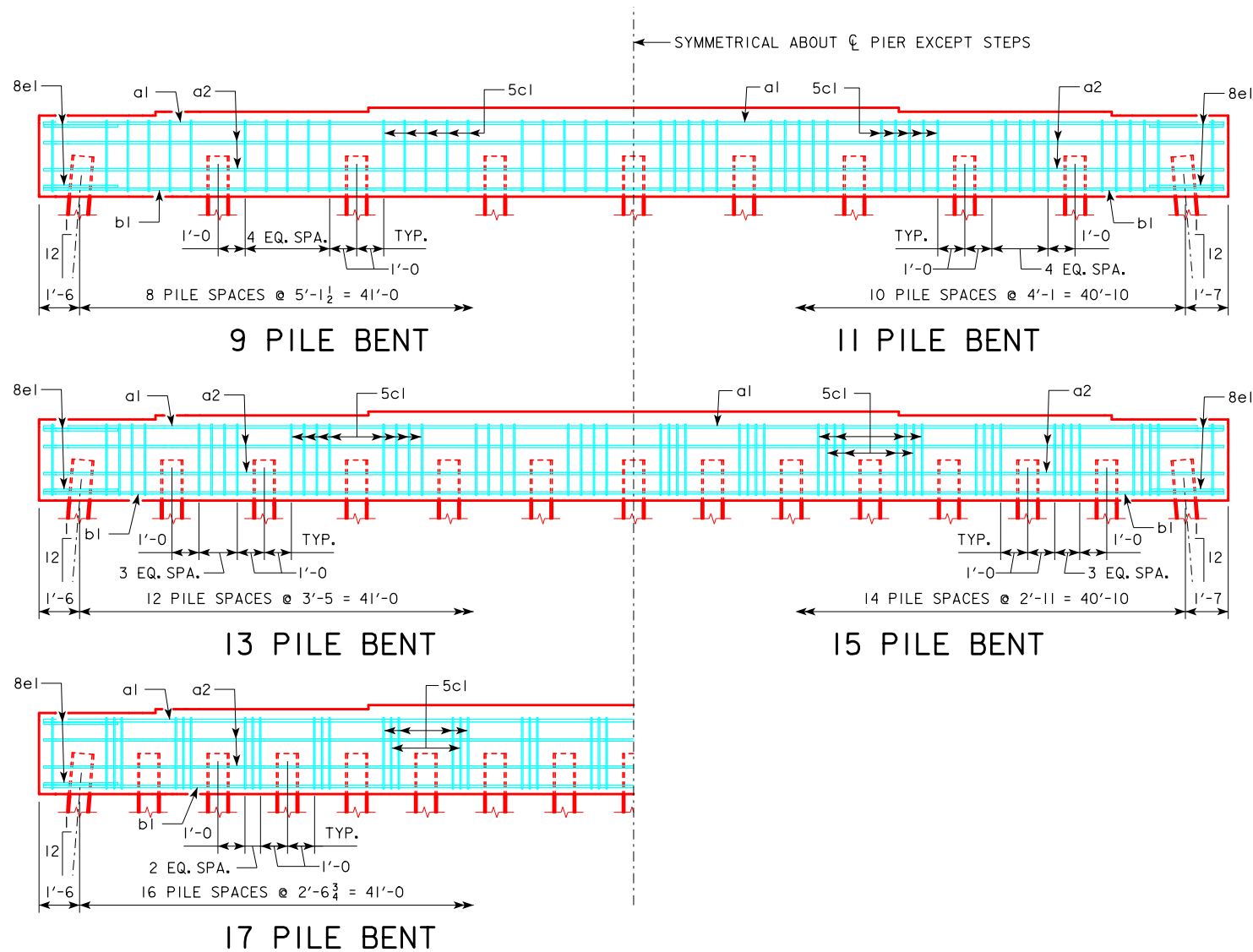
NOTE: FRICTION BEARING INCLUDES SIDE FRICTION AND END BEARING IN SOIL. POINT BEARING INCLUDES SIDE FRICTION AND POINT BEARING IN ROCK.

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

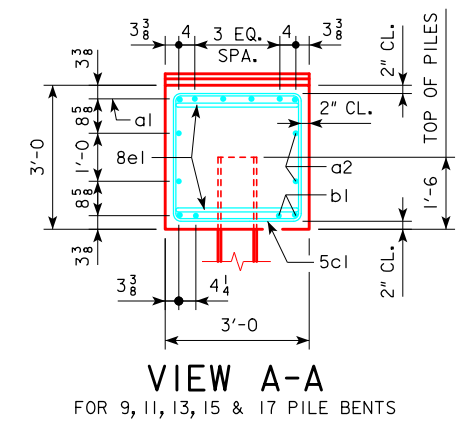
08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
PILE BENT PIERS HPI4 PILES 10° SKEW		RS40-103-14	



TYPICAL PLAN



NOTE:
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 ANCHOR BOLTS REQUIRED FOR FIXED PIER BEARINGS ONLY. FOR BOLT AND BEARING SIZES, SEE RS40-093-14, RS40-094-14 OR RS40-095-14.



REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
PILE BENT PIERS 20° SKEW		RS40-104-14	

PILE BENT NOTES:

THESE PIER BENTS ARE DESIGNED FOR USE IN LOCATIONS WHERE ICE AND DRIFT CONDITIONS ARE NOT SEVERE.

FOR DETAILS OF TRESTLE PILES, TYPES 1, 2 AND 3, SEE STANDARD PIOL.

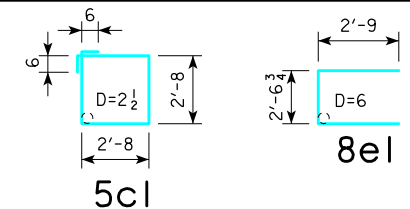
MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR SHALL BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.

PIER PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

REINFORCING BAR LIST AND ESTIMATED QUANTITIES - PER PILE BENT

BAR	LENGTH	SHAPE	9 PILE BENT			11 PILE BENT			13 PILE BENT			15 PILE BENT			17 PILE BENT					
			NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT			
a1	43'-8		6	9	891	6	9	891	6	9	891	6	9	891	6	9	891			
a2	43'-8		4	8	466	4	8	466	4	8	466	4	8	466	4	8	466			
b1	43'-8		4	9	594	4	9	594	4	9	594	4	9	594	4	9	594			
5c1	11'-8		42	5	511	52	5	633	50	5	608	58	5	706	50	5	608			
8e1	8'-1		4	8	86	4	8	86	4	8	86	4	8	86	4	8	86			
① REINFORCING STEEL (LB.)			2548			2670			2645			2743			2645					
STRUCTURAL ②			PILE TYPE																	
CONCRETE (CY)			1, 2			-----			15.2			15.1			15.0			14.9		
			3			15.7			15.7			15.7			15.7			15.7		

BENT BAR DETAILS



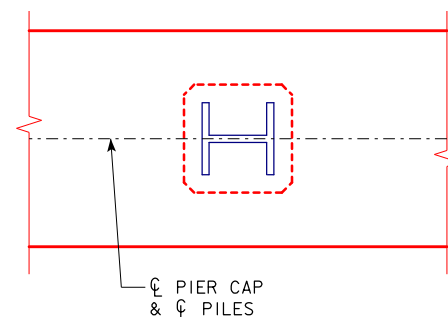
NOTE: ALL DIMENSIONS ARE OUT TO OUT. D=PIN DIAMETER.

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

℄-℄ ABUTMENT BEARING	FRICTION BEARING PILING			FRICTION OR POINT BEARING PILING		
	PIOL TYPE 1 OR 2			PIOL TYPE 3		
	NUMBER OF TRESTLE PILES	③ "K" (INCHES)	④ LRFD P _u , STRENGTH I, DES. LOAD (KIPS)	NUMBER OF TRESTLE PILES	PILE SIZE	④ LRFD P _u , STRENGTH I, DES. LOAD (KIPS)
160'-0	13	14	93	9	HP10x57	134
	11	16	109	9	HP12x53	134
180'-0	15	14	88	11	HP10x57	119
	13	16	101	11	HP12x53	119
200'-0	15	14	95	11	HP10x57	129
	13	16	109	11	HP12x53	129
220'-0	--	--	--	11	HP10x57	141
	--	--	--	13	HP12x53	120
240'-0	--	--	--	13	HP10x57	131
	--	--	--	13	HP12x53	131
260'-0	--	--	--	13	HP10x57	142
	--	--	--	15	HP12x53	123
280'-0	--	--	--	15	HP10x57	132
	--	--	--	15	HP12x53	132
300'-0	--	--	--	15	HP10x57	142
	--	--	--	17	HP12x53	125
320'-0	--	--	--	17	HP10x57	133
	--	--	--	17	HP12x53	133
340'-0	--	--	--	17	HP10x57	140



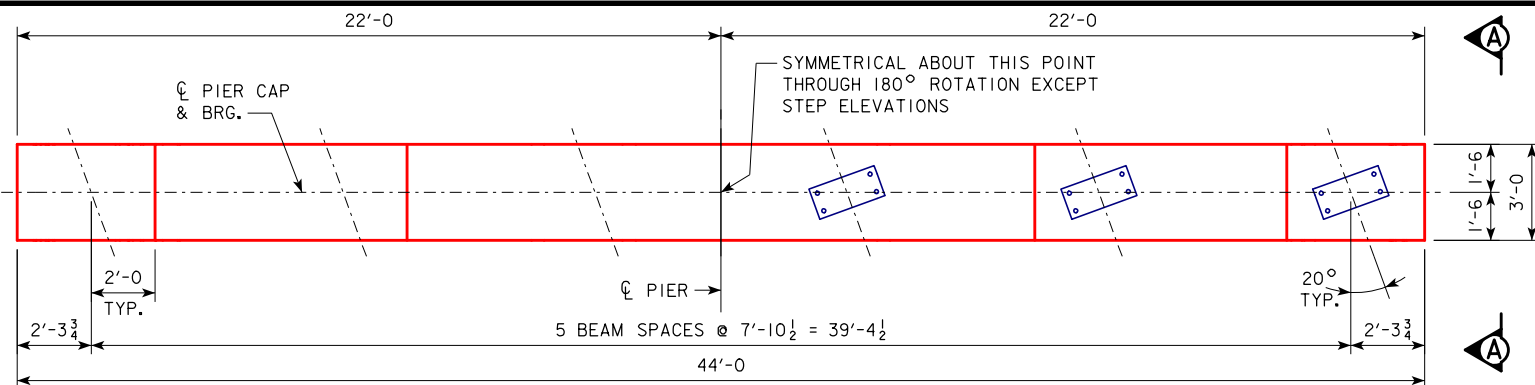
PILE ORIENTATION DETAIL FOR TYPE 3 TRESTLE BENT PILES

- ① SEE SHEET RS40-167-14 FOR STEP REINFORCING STEEL QUANTITIES AND DETAILS.
- ② CONCRETE QUANTITIES SHOWN HAVE HAD THE VOLUME OF EMBEDDED PILES DEDUCTED FOR TYPES 1 AND 2 BASED ON 0.8 FT³ PER FOOT OF EMBEDMENT. THE CONCRETE QUANTITIES FOR TYPE 3 PILES DO NOT REQUIRE REDUCTION FOR PILE EMBEDMENT.
- ③ SEE STANDARD PIOL FOR "K" DIMENSION.
- ④ NOTE: P_u, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

NOTE: FRICTION BEARING INCLUDES SIDE FRICTION AND END BEARING IN SOIL. POINT BEARING INCLUDES SIDE FRICTION AND POINT BEARING IN ROCK.

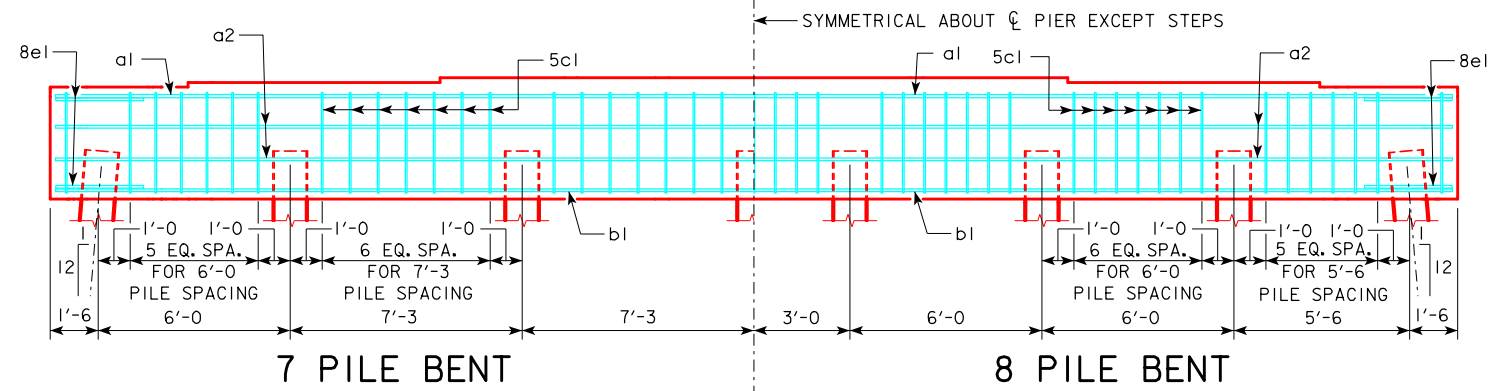
08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	PILE BENT PIERS 20° SKEW
	RS40-105-14

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



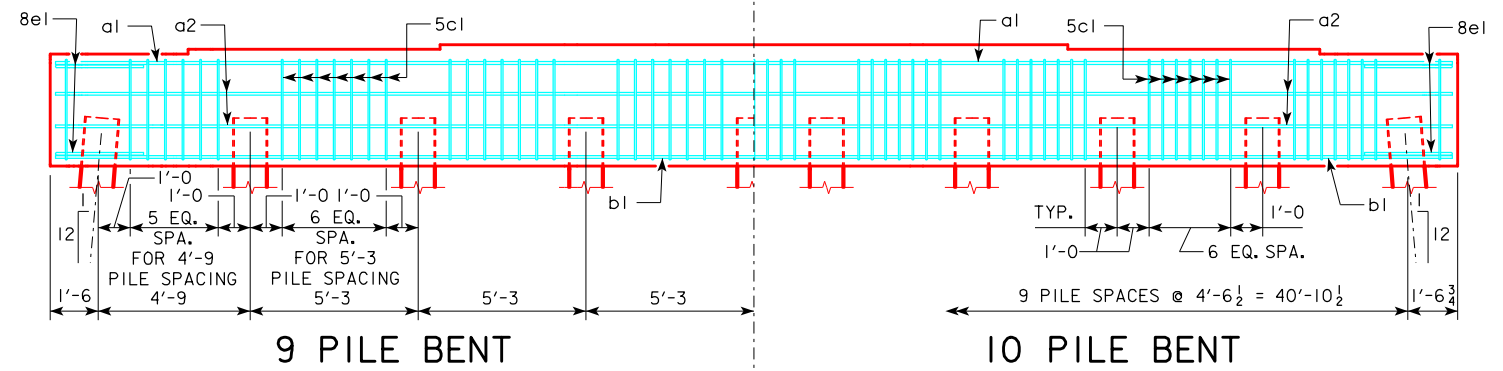
TYPICAL PLAN

NOTE:
 THE HEIGHT OF THE STEPS ON THE BRIDGE SEAT IS EQUAL TO THE DIFFERENCE IN ELEVATIONS OF THE TOP OF SLAB AT ADJACENT BEAMS ALONG CL PIER.
 ANCHOR BOLTS REQUIRED FOR FIXED PIER BEARINGS ONLY. FOR BOLT AND BEARING SIZES, SEE RS40-093-14, RS40-094-14 OR RS40-095-14.



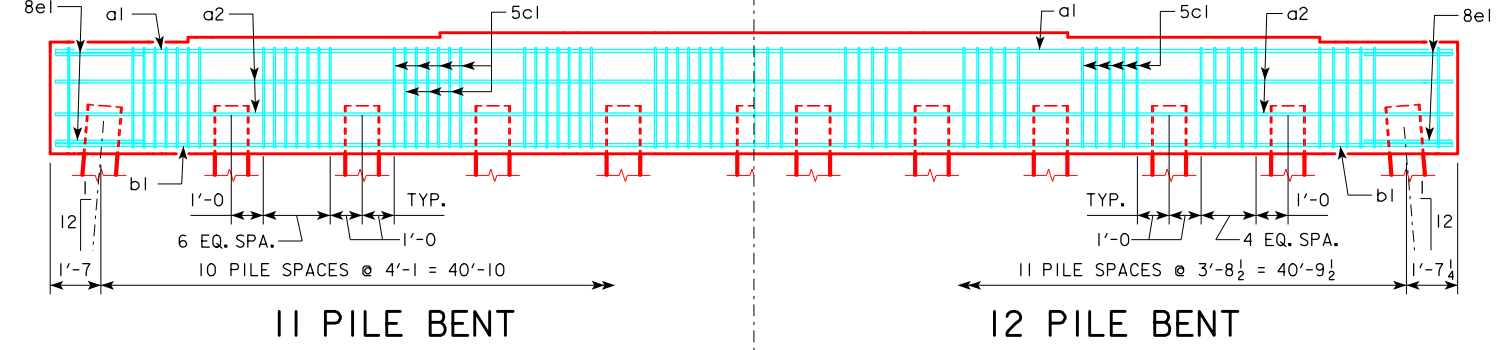
7 PILE BENT

8 PILE BENT



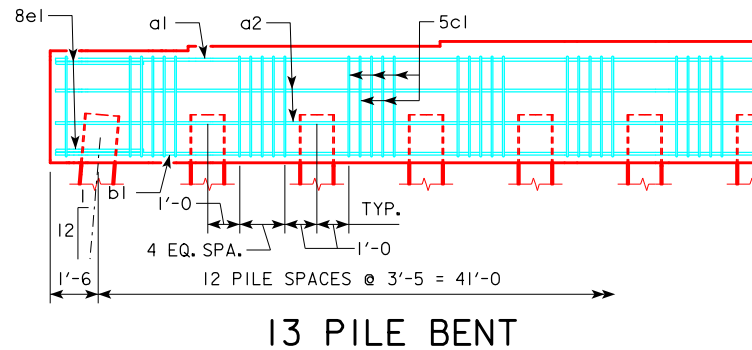
9 PILE BENT

10 PILE BENT

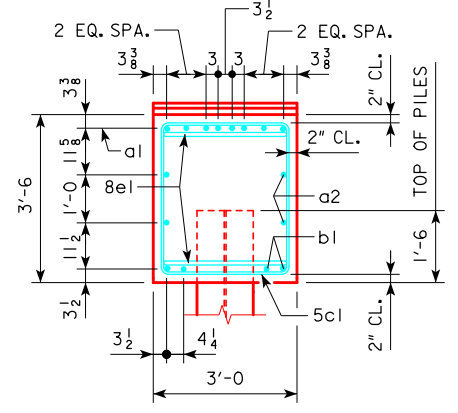


11 PILE BENT

12 PILE BENT



13 PILE BENT



VIEW A-A

FOR 7, 8, 9, 10, 11, 12 & 13 PILE BENTS

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
		PILE BENT PIERS HPI4 PILES 20° SKEW	RS40-106-14

PILE BENT NOTES:

THESE PIER BENTS ARE DESIGNED FOR USE IN LOCATIONS WHERE ICE AND DRIFT CONDITIONS ARE NOT SEVERE.

FOR DETAILS OF TRESTLE PILES, SEE STANDARD PIOL.

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

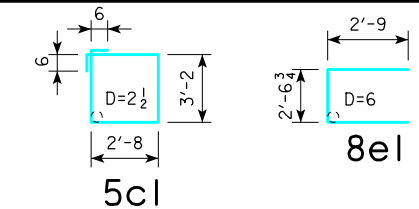
PIER PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

REINFORCING BAR LIST AND ESTIMATED QUANTITIES - PER PILE BENT

BAR	LENGTH	SHAPE	7 PILE BENT			8 PILE BENT			9 PILE BENT			10 PILE BENT			11 PILE BENT			12 PILE BENT			13 PILE BENT		
			NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
a1	43'-8"		8	9	1188	8	9	1188	8	9	1188	8	9	1188	8	9	1188	8	9	1188	8	9	1188
a2	43'-8"		4	8	466	4	8	466	4	8	466	4	8	466	4	8	466	4	8	466	4	8	466
b1	43'-8"		4	10	752	4	10	752	4	10	752	4	10	752	4	10	752	4	9	594	4	9	594
5c1	12'-8"		42	5	555	49	5	647	56	5	740	65	5	859	72	5	951	57	5	753	62	5	819
8e1	8'-1"		4	8	86	4	8	86	4	8	86	4	8	86	4	8	86	4	8	86	4	8	86
REINFORCING STEEL (LB.)			3047			3139			3232			3351			3443			3087			3153		
STRUCTURAL	PILE TYPE																						
CONCRETE (CY)	3		18.1			18.1			18.1			18.1			18.1			18.1					

- NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.
- NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.
- NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

BENT BAR DETAILS

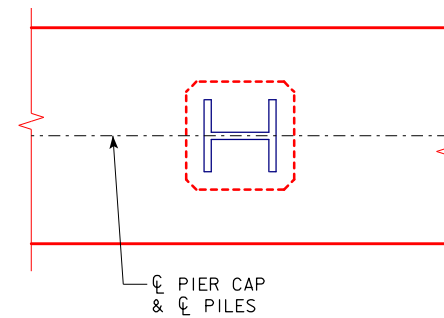


NOTE: ALL DIMENSIONS ARE OUT TO OUT. D=PIN DIAMETER.

FRICION OR POINT BEARING PILING

CL-CL ABUTMENT BEARING	PIOL TYPE 3		
	NUMBER OF TRESTLE PILES	PILE SIZE	LRFD Pu, STRENGTH I, DES. LOAD (KIPS)
160'-0"	7	HPI4x73	174
	7	HPI4x89	174
180'-0"	8	HPI4x73	166
	7	HPI4x89	189
200'-0"	8	HPI4x73	179
	7	HPI4x89	205
220'-0"	9	HPI4x73	174
	7	HPI4x89	224
240'-0"	10	HPI4x73	171
	8	HPI4x89	214
260'-0"	10	HPI4x73	185
	9	HPI4x89	206
280'-0"	11	HPI4x73	181
	9	HPI4x89	221
300'-0"	12	HPI4x73	178
	10	HPI4x89	214
320'-0"	13	HPI4x73	175
	11	HPI4x89	207
340'-0"	13	HPI4x73	184
	11	HPI4x89	218

- SEE SHEET RS40-167-14 FOR STEP REINFORCING STEEL QUANTITIES AND DETAILS.
- NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

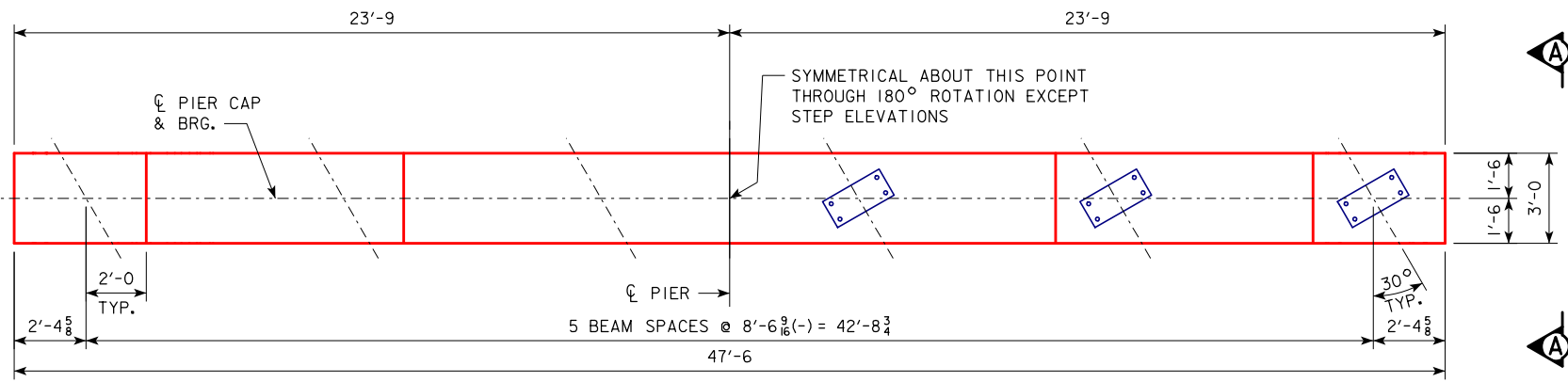


PILE ORIENTATION DETAIL FOR TYPE 3 TRESTLE BENT PILES

NOTE: FRICTION BEARING INCLUDES SIDE FRICTION AND END BEARING IN SOIL. POINT BEARING INCLUDES SIDE FRICTION AND POINT BEARING IN ROCK.

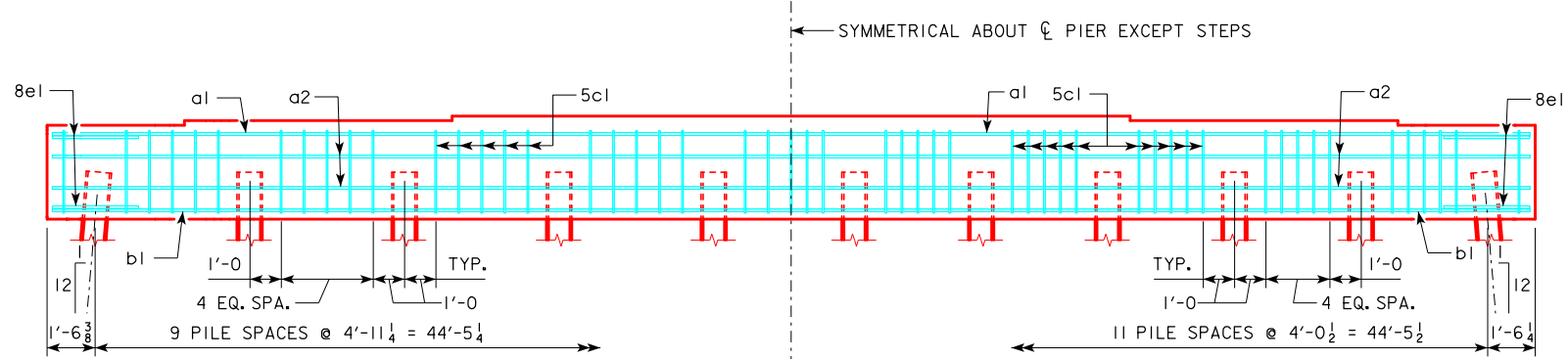
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
	PILE BENT PIERS HPI4 PILES 20° SKEW	RS40-107-14



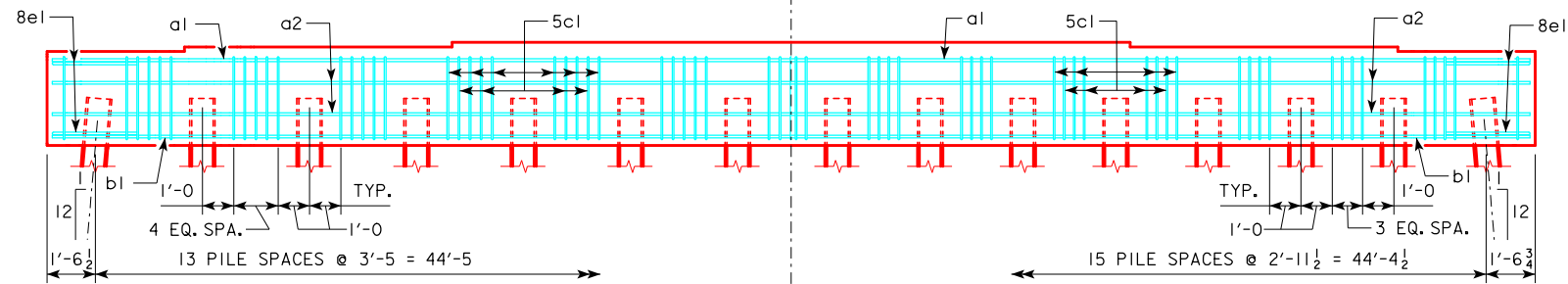
TYPICAL PLAN

NOTE:
 THE HEIGHT OF THE STEPS ON THE BRIDGE SEAT IS EQUAL TO THE DIFFERENCE IN ELEVATIONS OF THE TOP OF SLAB AT ADJACENT BEAMS ALONG \bar{C} PIER.
 ANCHOR BOLTS REQUIRED FOR FIXED PIER BEARINGS ONLY. FOR BOLT AND BEARING SIZES, SEE RS40-093-14, RS40-094-14 OR RS40-095-14.



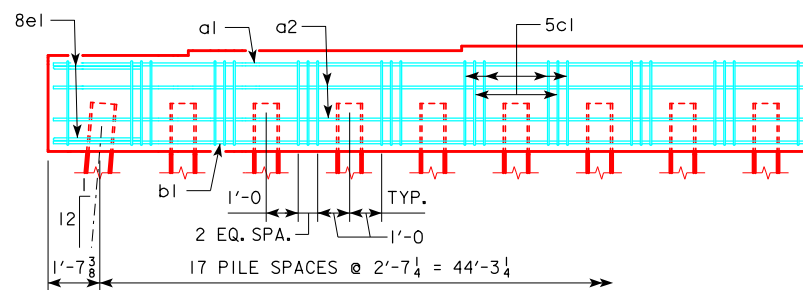
10 PILE BENT

12 PILE BENT

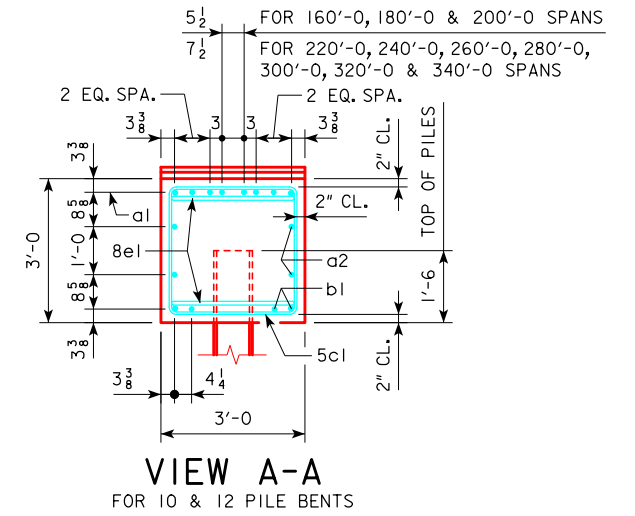


14 PILE BENT

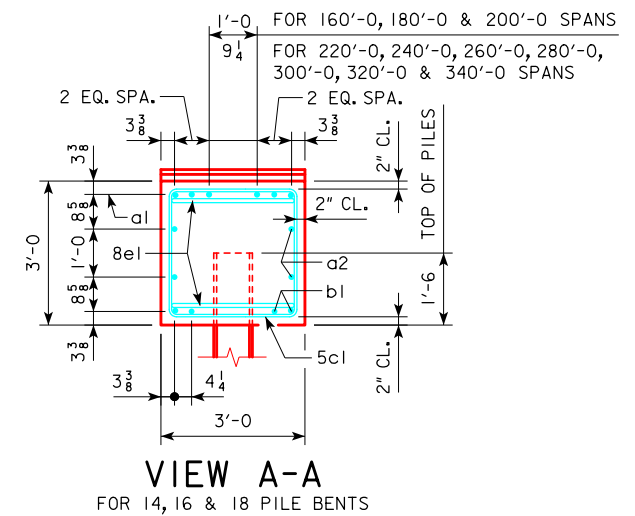
16 PILE BENT



18 PILE BENT



VIEW A-A
FOR 10 & 12 PILE BENTS



VIEW A-A
FOR 14, 16 & 18 PILE BENTS

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
PILE BENT PIERS 30° SKEW		RS40-108-14	

PILE BENT NOTES:

THESE PIER BENTS ARE DESIGNED FOR USE IN LOCATIONS WHERE ICE AND DRIFT CONDITIONS ARE NOT SEVERE.

FOR DETAILS OF TRESTLE PILES, TYPES 1, 2 AND 3, SEE STANDARD PIOL.

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

PIER PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

REINFORCING BAR LIST AND ESTIMATED QUANTITIES - PER PILE BENT

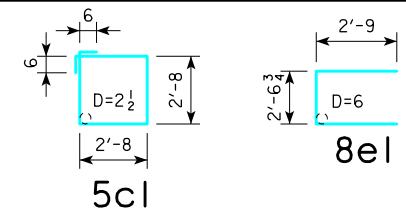
BAR	LENGTH	SHAPE	10 PILE BENT			12 PILE BENT			14 PILE BENT			16 PILE BENT			18 PILE BENT		
			NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
a1	47'-2		8	9	1283	8	9	1283	6	9	962	6	9	962	6	9	962
a2	47'-2		4	8	504	4	8	504	4	8	504	4	8	504	4	8	504
b1	47'-2		4	9	641	4	9	641	4	9	641	4	9	641	4	9	641
5c1	11'-8		47	5	572	57	5	694	67	5	815	62	5	754	53	5	645
8e1	8'-1		4	8	86	4	8	86	4	8	86	4	8	86	4	8	86
① REINFORCING STEEL (LB.)			3086			3208			3008			2947			2838		
STRUCTURAL CONCRETE (CY)			② PILE TYPE														
			1, 2			-----			16.5			16.4			16.3		
			3			17.0			17.0			17.0			17.0		

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

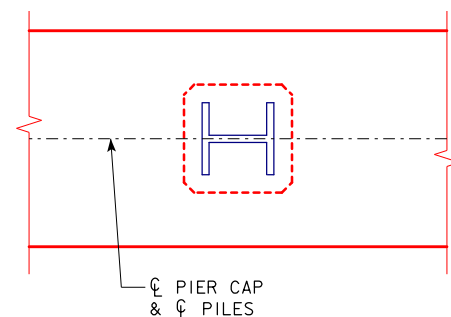
NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

BENT BAR DETAILS



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



PILE ORIENTATION DETAIL FOR TYPE 3 TRESTLE BENT PILES

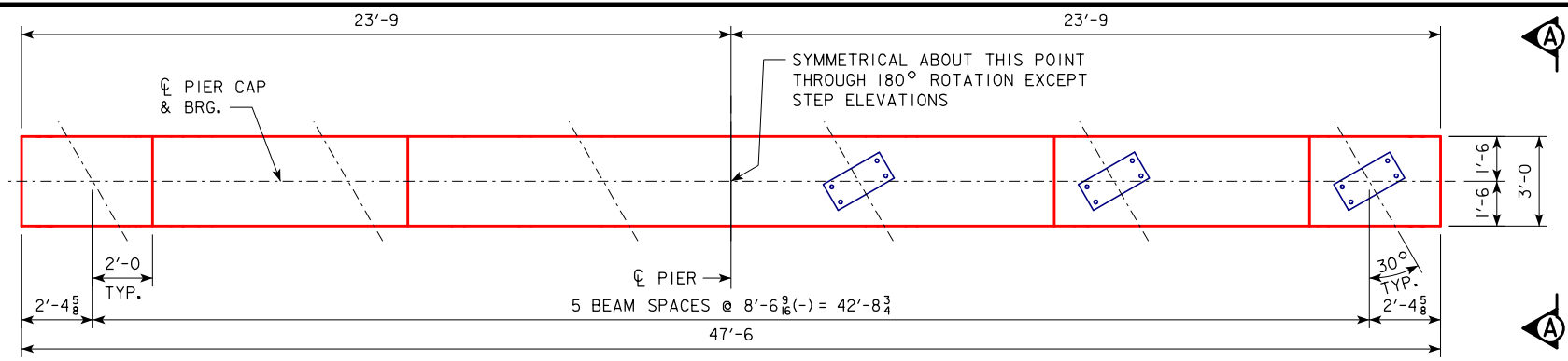
℄-℄ ABUTMENT BEARING	FRICTION BEARING PILING			FRICTION OR POINT BEARING PILING		
	PIOL TYPE 1 OR 2			PIOL TYPE 3		
	NUMBER OF TRESTLE PILES	③ "K" (INCHES)	③ LRFD P _u , STRENGTH I, DES. LOAD (KIPS)	NUMBER OF TRESTLE PILES	PILE SIZE	③ LRFD P _u , STRENGTH I, DES. LOAD (KIPS)
160'-0	14	14	86	10	HP10x57	121
	12	16	101	10	HP12x53	121
180'-0	14	14	94	10	HP10x57	132
	14	16	94	10	HP12x53	132
200'-0	16	14	89	10	HP10x57	143
	14	16	102	12	HP12x53	119
220'-0	--	--	--	12	HP10x57	130
	--	--	--	12	HP12x53	130
240'-0	--	--	--	14	HP10x57	142
	--	--	--	14	HP12x53	122
260'-0	--	--	--	14	HP10x57	132
	--	--	--	14	HP12x53	132
280'-0	--	--	--	14	HP10x57	142
	--	--	--	16	HP12x53	124
300'-0	--	--	--	16	HP10x57	133
	--	--	--	16	HP12x53	133
320'-0	--	--	--	16	HP10x57	142
	--	--	--	18	HP12x53	126
340'-0	--	--	--	18	HP10x57	133
	--	--	--	18	HP12x53	133

- ① SEE SHEET RS40-168-14 FOR STEP REINFORCING STEEL QUANTITIES AND DETAILS.
- ② CONCRETE QUANTITIES SHOWN HAVE HAD THE VOLUME OF EMBEDDED PILES DEDUCTED FOR TYPES 1 AND 2 BASED ON 0.8 FT³ PER FOOT OF EMBEDMENT. THE CONCRETE QUANTITIES FOR TYPE 3 PILES DO NOT REQUIRE REDUCTION FOR PILE EMBEDMENT.
- ③ SEE STANDARD PIOL FOR "K" DIMENSION.
- ④ NOTE: P_u, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

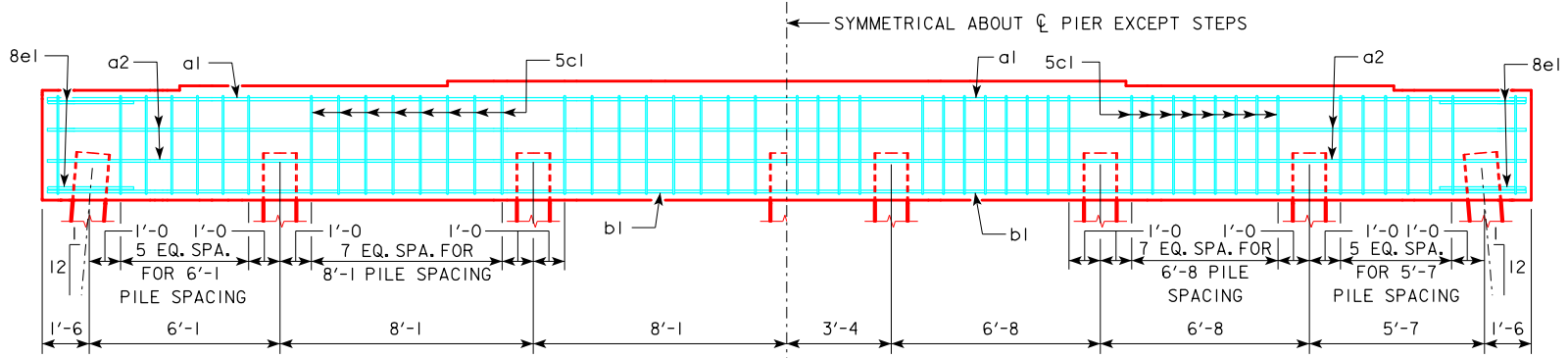
NOTE: FRICTION BEARING INCLUDES SIDE FRICTION AND END BEARING IN SOIL. POINT BEARING INCLUDES SIDE FRICTION AND POINT BEARING IN ROCK.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	PILE BENT PIERS 30° SKEW
	RS40-109-14

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

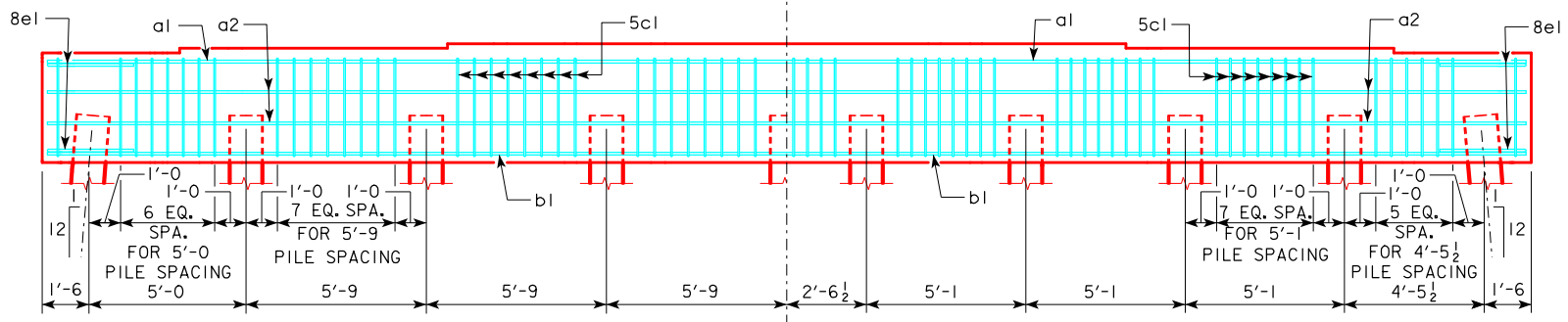


TYPICAL PLAN



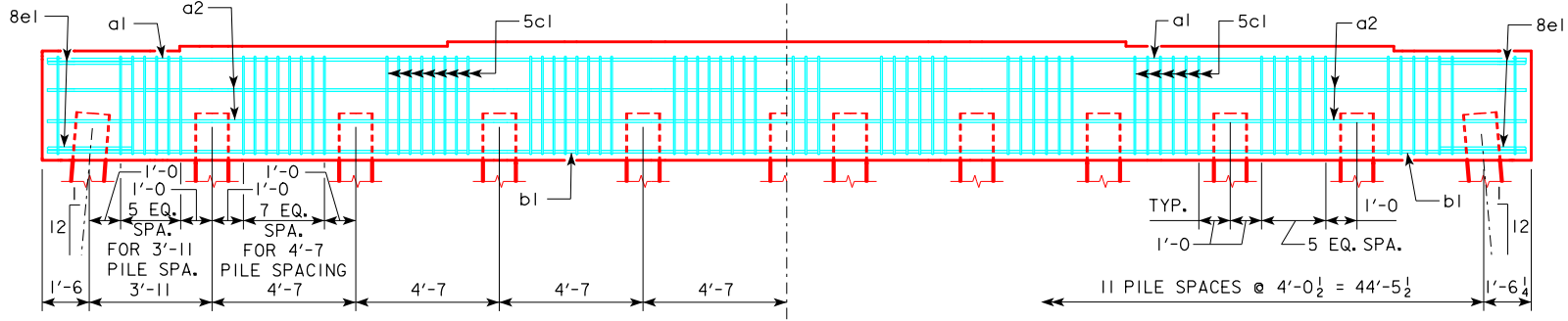
7 PILE BENT

8 PILE BENT



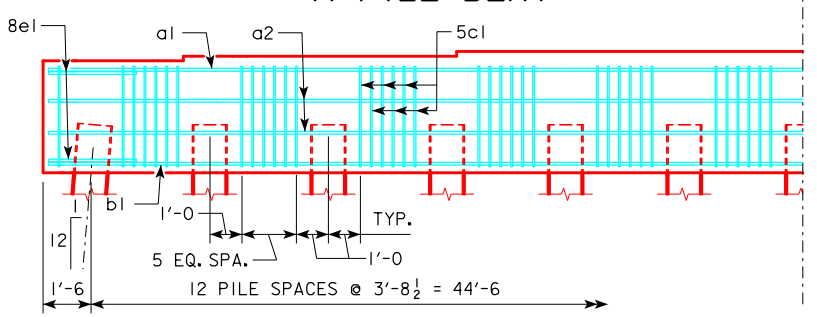
9 PILE BENT

10 PILE BENT



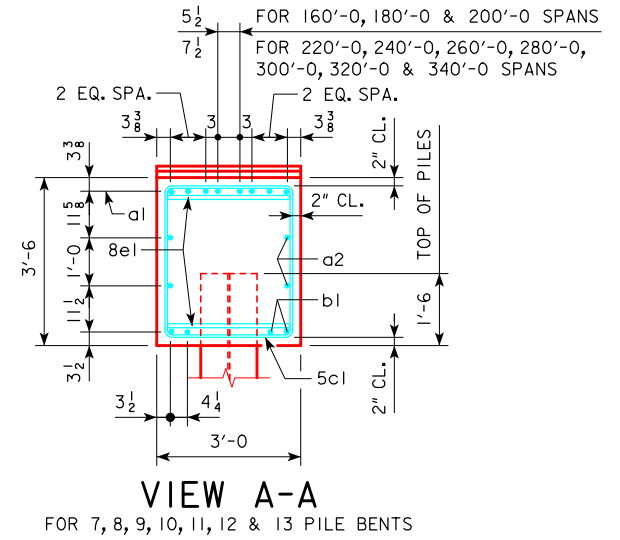
11 PILE BENT

12 PILE BENT



13 PILE BENT

NOTE:
 THE HEIGHT OF THE STEPS ON THE BRIDGE SEAT IS EQUAL TO THE DIFFERENCE IN ELEVATIONS OF THE TOP OF SLAB AT ADJACENT BEAMS ALONG CL PIER.
 ANCHOR BOLTS REQUIRED FOR FIXED PIER BEARINGS ONLY. FOR BOLT AND BEARING SIZES, SEE RS40-093-14, RS40-094-14 OR RS40-095-14.



VIEW A-A

FOR 7, 8, 9, 10, 11, 12 & 13 PILE BENTS

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	IOWADOT Highway Division STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
		PILE BENT PIERS HPI4 PILES 30° SKEW	RS40-110-14

PILE BENT NOTES:

THESE PIER BENTS ARE DESIGNED FOR USE IN LOCATIONS WHERE ICE AND DRIFT CONDITIONS ARE NOT SEVERE.

FOR DETAILS OF TRESTLE PILES, SEE STANDARD PIOL.

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PIER PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

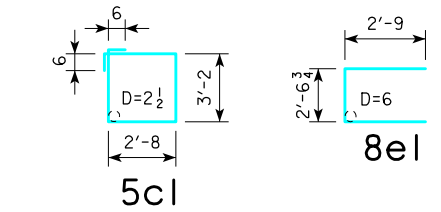
REINFORCING BAR LIST AND ESTIMATED QUANTITIES - PER PILE BENT

BAR	LENGTH	SHAPE	7 PILE BENT			8 PILE BENT			9 PILE BENT			10 PILE BENT			11 PILE BENT			12 PILE BENT			13 PILE BENT		
			NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
a1	47'-2		8	9	1283	8	9	1283	8	9	1283	8	9	1283	8	9	1283	8	9	1283	8	9	1283
a2	47'-2		4	8	504	4	8	504	4	8	504	4	8	504	4	8	504	4	8	504	4	8	504
b1	47'-2		4	10	812	4	10	812	4	10	812	4	10	812	4	10	812	4	9	641	4	10	812
5c1	12'-8		46	5	608	54	5	713	64	5	846	70	5	925	78	5	1030	68	5	898	74	5	978
8e1	8'-1		4	8	86	4	8	86	4	8	86	4	8	86	4	8	86	4	8	86	4	8	86
REINFORCING STEEL (LB.)			3293			3398			3531			3610			3715			3412			3663		
STRUCTURAL																							
CONCRETE (CY)			3			19.6			19.6			19.6			19.6			19.6			19.6		

①

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.
NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.
NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

BENT BAR DETAILS

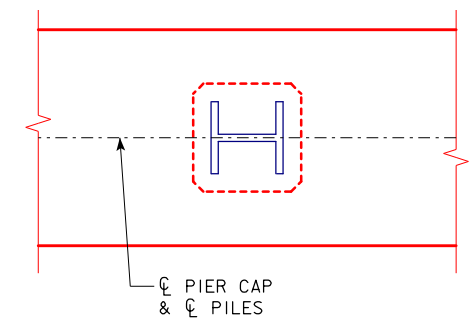


NOTE: ALL DIMENSIONS ARE OUT TO OUT. D=PIN DIAMETER.

FRICION OR POINT BEARING PILING

CL-CL ABUTMENT BEARING	PIOL TYPE 3		
	NUMBER OF TRESTLE PILES	PILE SIZE	① LRFD P _u , STRENGTH I, DES. LOAD (KIPS)
160'-0	7	HP14x73	175
	7	HP14x89	175
180'-0	8	HP14x73	167
	7	HP14x89	190
200'-0	8	HP14x73	180
	7	HP14x89	206
220'-0	9	HP14x73	175
	7	HP14x89	225
240'-0	10	HP14x73	172
	8	HP14x89	215
260'-0	11	HP14x73	169
	9	HP14x89	207
280'-0	11	HP14x73	181
	9	HP14x89	222
300'-0	12	HP14x73	179
	10	HP14x89	214
320'-0	13	HP14x73	176
	11	HP14x89	208
340'-0	13	HP14x73	185
	11	HP14x89	218

① SEE SHEET RS40-168-14 FOR STEP REINFORCING STEEL QUANTITIES AND DETAILS.
② NOTE: P_u, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

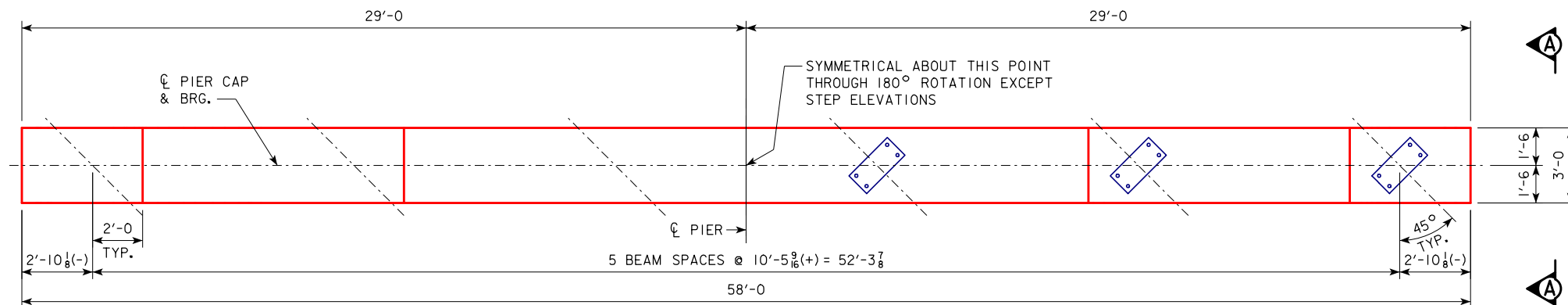


PILE ORIENTATION DETAIL FOR TYPE 3 TRESTLE BENT PILES

NOTE: FRICTION BEARING INCLUDES SIDE FRICTION AND END BEARING IN SOIL.
POINT BEARING INCLUDES SIDE FRICTION AND POINT BEARING IN ROCK.

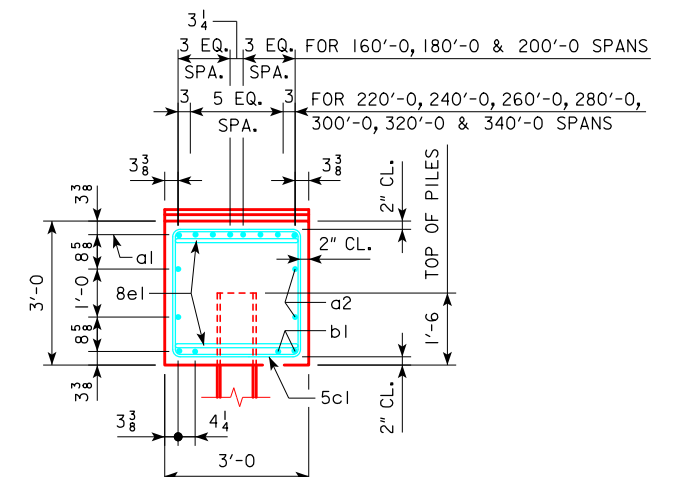
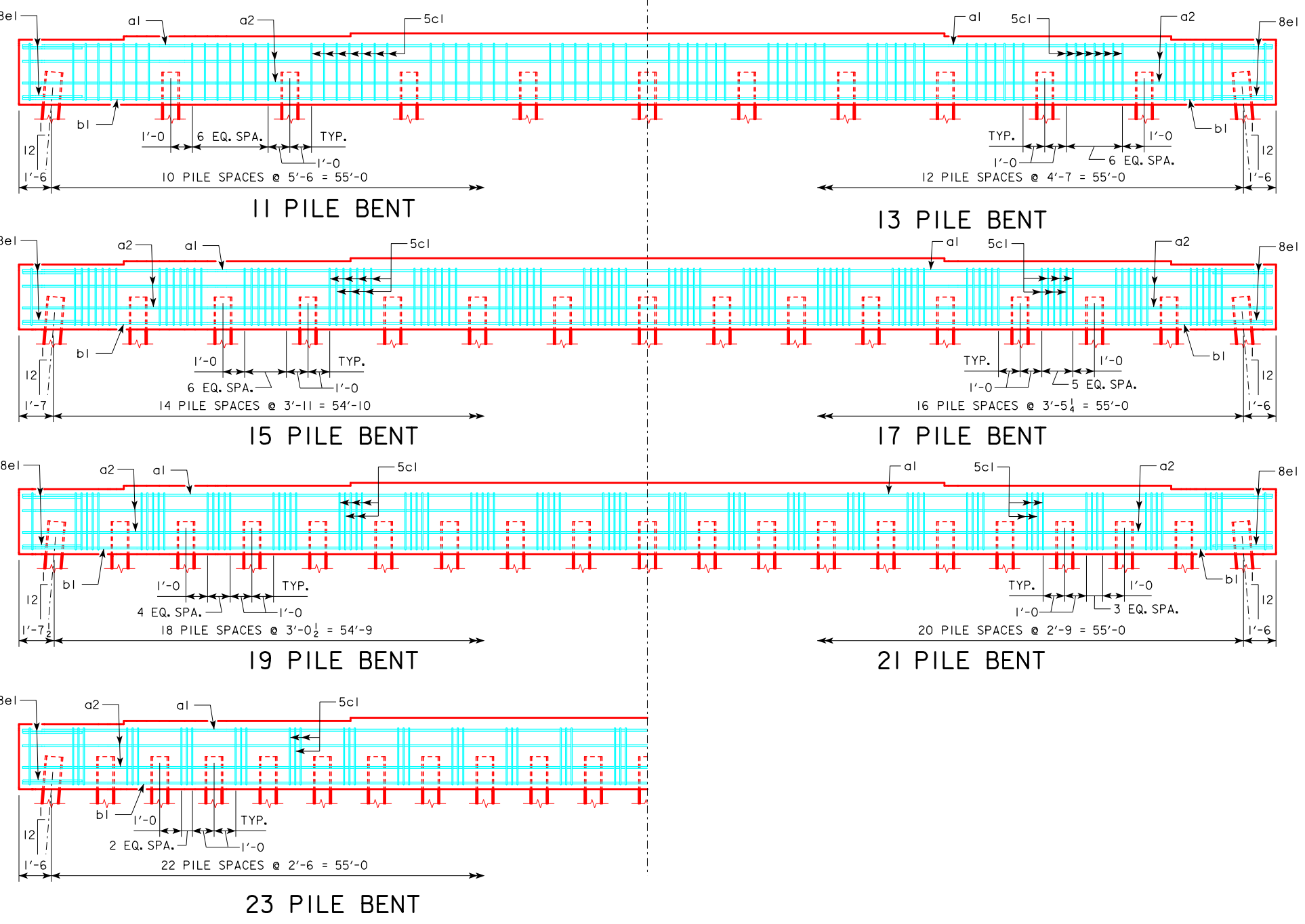
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	PILE BENT PIERS HP14 PILES 30° SKEW
	RS40-111-14

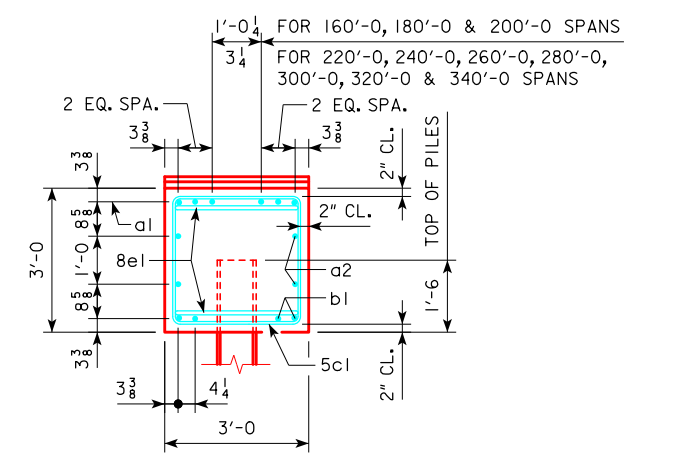


NOTE:
 THE HEIGHT OF THE STEPS ON THE BRIDGE SEAT IS EQUAL TO THE DIFFERENCE IN ELEVATIONS OF THE TOP OF SLAB AT ADJACENT BEAMS ALONG ϕ PIER.
 ANCHOR BOLTS REQUIRED FOR FIXED PIER BEARINGS ONLY.
 FOR BOLT AND BEARING SIZES, SEE RS40-093-14, RS40-094-14 OR RS40-095-14.

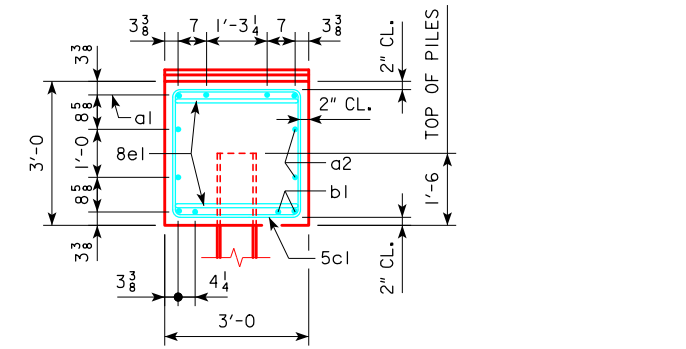
TYPICAL PLAN



VIEW A-A
FOR 11, 13 & 15 PILE BENTS



VIEW A-A
FOR 17 & 19 PILE BENTS



VIEW A-A
FOR 21 & 23 PILE BENTS

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
	PILE BENT PIERS 45° SKEW	RS40-112-14

PILE BENT NOTES:

THESE PIER BENTS ARE DESIGNED FOR USE IN LOCATIONS WHERE ICE AND DRIFT CONDITIONS ARE NOT SEVERE.

FOR DETAILS OF TRESTLE PILES, TYPES 1, 2 AND 3, SEE STANDARD PIOL.

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

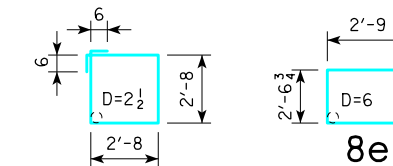
PIER PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

REINFORCING BAR LIST AND ESTIMATED QUANTITIES - PER PILE BENT

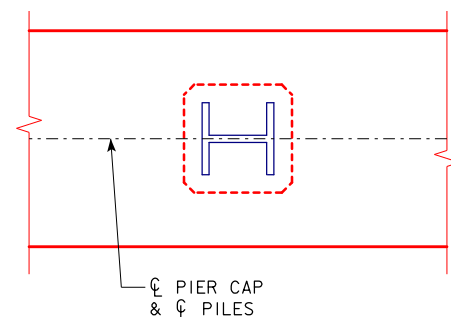
BAR	LENGTH	SHAPE	11 PILE BENT			13 PILE BENT			15 PILE BENT			17 PILE BENT			19 PILE BENT			21 PILE BENT			23 PILE BENT					
			NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT			
a1	57'-8"		8	9	1569	8	9	1569	8	9	1569	6	9	1176	6	9	1176	4	9	784	4	9	784			
a2	57'-8"		4	8	616	4	8	616	4	8	616	4	8	616	4	8	616	4	8	616	4	8	616			
b1	57'-8"		4	9	784	4	9	784	4	9	784	4	9	784	4	9	784	4	9	784	4	9	784			
5c1	11'-8"		72	5	876	86	5	1046	100	5	1217	98	5	1192	92	5	1119	82	5	998	68	5	827			
8e1	8'-1"		4	8	86	4	8	86	4	8	86	4	8	86	4	8	86	4	8	86	4	8	86			
① REINFORCING STEEL (LB.)			3931			4101			4272			3854			3781			3268			3097					
② STRUCTURAL CONCRETE (CY)			PILE TYPE																							
			1, 2			-----			20.4			20.3			20.2			20.1			20.0			19.9		
			3			20.9			20.9			20.9			20.9			20.9			-----			-----		

- NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.
- NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.
- NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

BENT BAR DETAILS



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



PILE ORIENTATION DETAIL FOR TYPE 3 TRESTLE BENT PILES

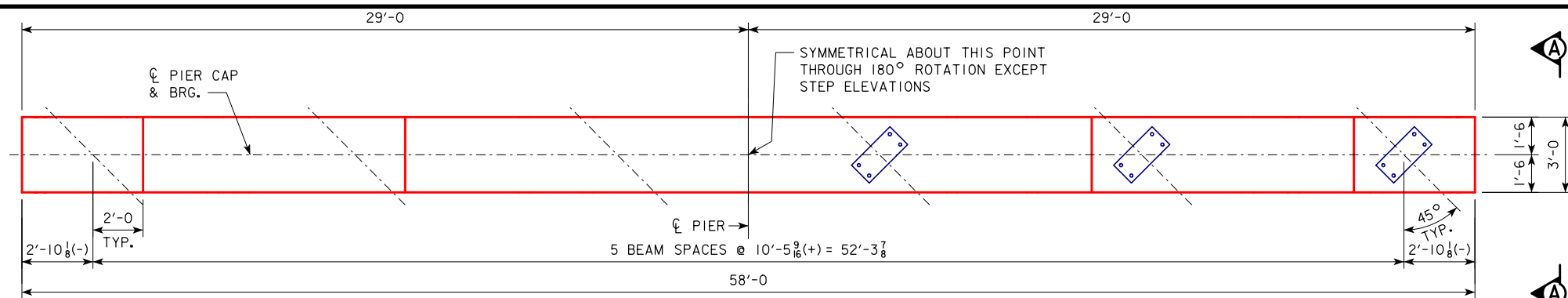
℄-℄ ABUTMENT BEARING	FRICTION BEARING PILING			FRICTION OR POINT BEARING PILING		
	PIOL TYPE 1 OR 2			PIOL TYPE 3		
	NUMBER OF TRESTLE PILES	③ "K" (INCHES)	③ LRFD P _u , STRENGTH I, DES. LOAD (KIPS)	NUMBER OF TRESTLE PILES	PILE SIZE	④ LRFD P _u , STRENGTH I, DES. LOAD (KIPS)
160'-0"	13	14	94	11	HP10x57	112
	13	16	94	11	HP12x53	112
180'-0"	15	14	89	11	HP10x57	122
	13	16	103	11	HP12x53	122
200'-0"	17	14	85	11	HP10x57	131
	15	16	96	11	HP12x53	131
220'-0"	17	14	93	11	HP10x57	143
	15	16	105	13	HP12x53	121
240'-0"	19	14	91	13	HP10x57	133
	17	16	101	13	HP12x53	133
260'-0"	--	--	--	13	HP10x57	143
	--	--	--	15	HP12x53	124
280'-0"	--	--	--	15	HP10x57	133
	--	--	--	15	HP12x53	133
300'-0"	--	--	--	15	HP10x57	143
	--	--	--	17	HP12x53	126
320'-0"	--	--	--	17	HP10x57	135
	--	--	--	19	HP12x53	120
340'-0"	--	--	--	17	HP10x57	142
	--	--	--	19	HP12x53	127

- ① SEE SHEET RS40-169-14 FOR STEP REINFORCING STEEL QUANTITIES AND DETAILS.
- ② CONCRETE QUANTITIES SHOWN HAVE HAD THE VOLUME OF EMBEDDED PILES DEDUCTED FOR TYPES 1 AND 2 BASED ON 0.8 FT³ PER FOOT OF EMBEDMENT. THE CONCRETE QUANTITIES FOR TYPE 3 PILES DO NOT REQUIRE REDUCTION FOR PILE EMBEDMENT.
- ③ SEE STANDARD PIOL FOR "K" DIMENSION.
- ④ NOTE: P_u, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

NOTE: FRICTION BEARING INCLUDES SIDE FRICTION AND END BEARING IN SOIL. POINT BEARING INCLUDES SIDE FRICTION AND POINT BEARING IN ROCK.

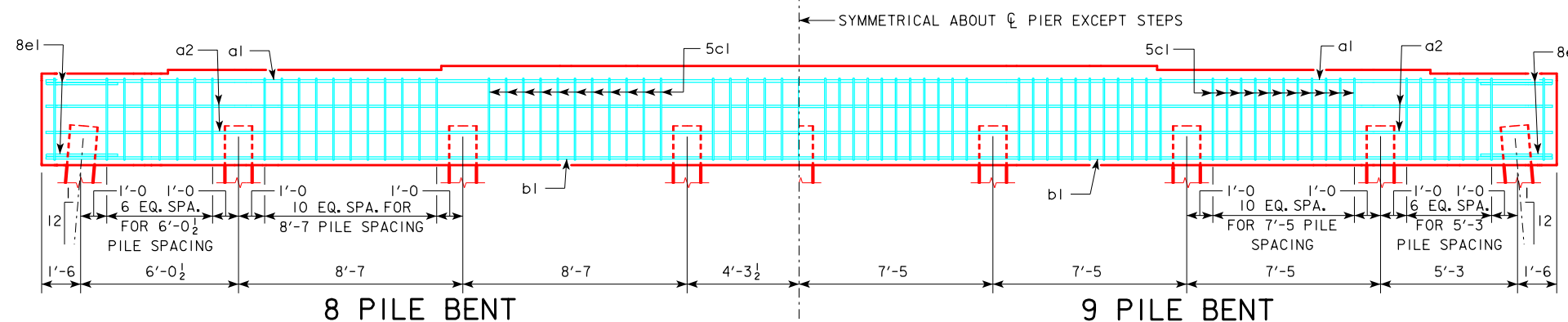
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	PILE BENT PIERS 45° SKEW
	RS40-113-14



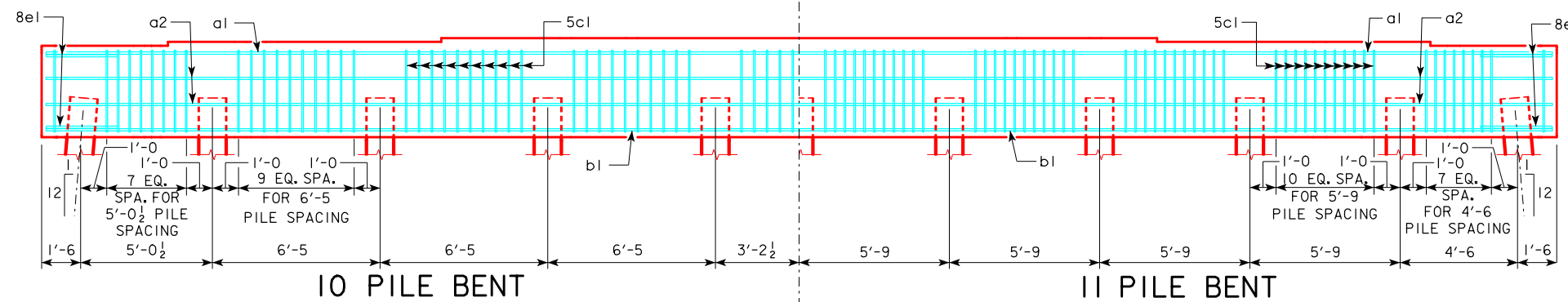
TYPICAL PLAN

NOTE:
 THE HEIGHT OF THE STEPS ON THE BRIDGE SEAT IS EQUAL TO THE DIFFERENCE IN ELEVATIONS OF THE TOP OF SLAB AT ADJACENT BEAMS ALONG \varnothing PIER.
 ANCHOR BOLTS REQUIRED FOR FIXED PIER BEARINGS ONLY.
 FOR BOLT AND BEARING SIZES, SEE RS40-093-14, RS40-094-14 OR RS40-095-14.



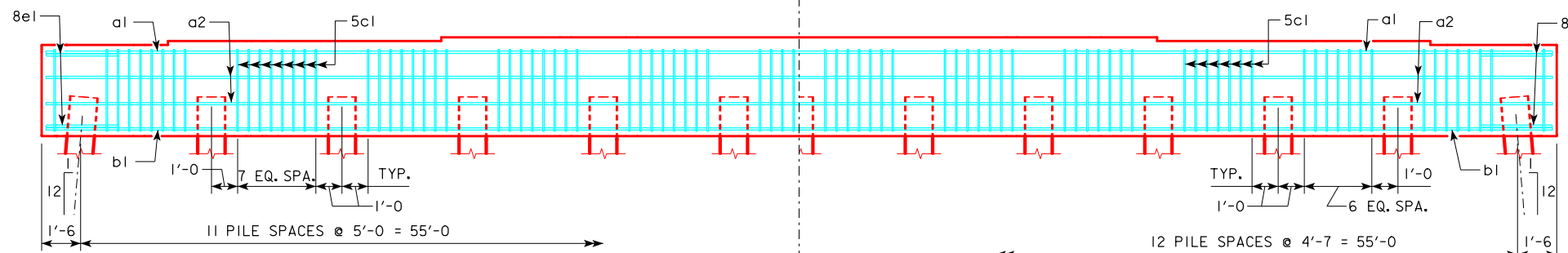
8 PILE BENT

9 PILE BENT



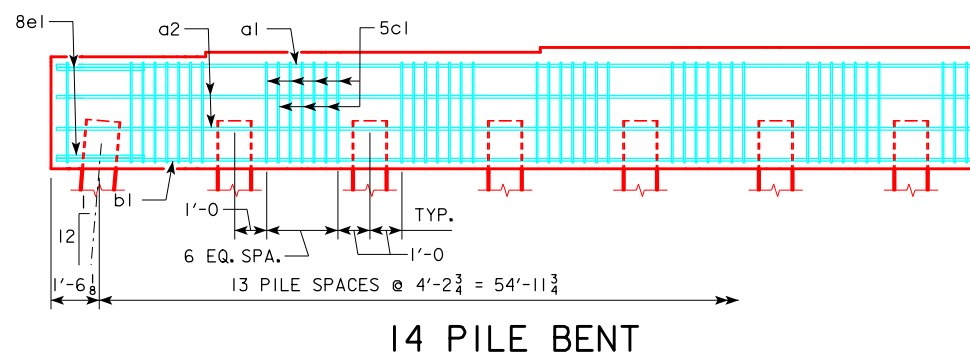
10 PILE BENT

11 PILE BENT

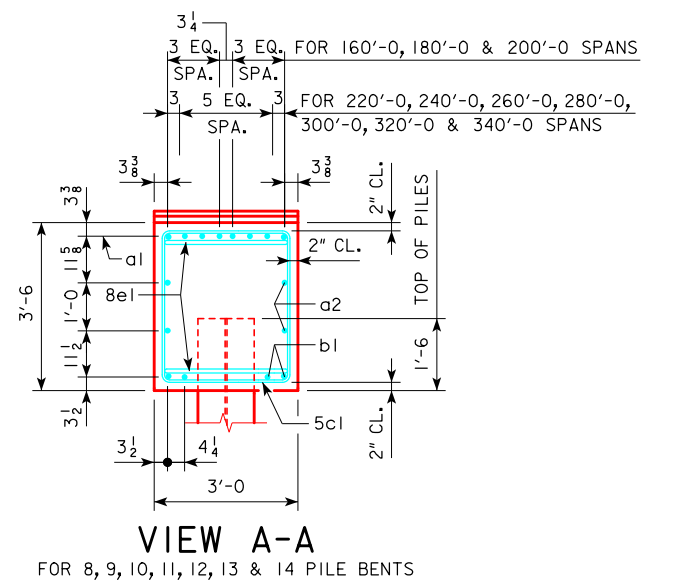


12 PILE BENT

13 PILE BENT



14 PILE BENT



VIEW A-A
 FOR 8, 9, 10, 11, 12, 13 & 14 PILE BENTS

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES	
		OCTOBER, 2014	
PILE BENT PIERS HPI4 PILES 45° SKEW		RS40-114-14	

PILE BENT NOTES:

THESE PIER BENTS ARE DESIGNED FOR USE IN LOCATIONS WHERE ICE AND DRIFT CONDITIONS ARE NOT SEVERE.

FOR DETAILS OF TRESTLE PILES, SEE STANDARD PIOL.

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

PIER PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

REINFORCING BAR LIST AND ESTIMATED QUANTITIES - PER PILE BENT

BAR	LENGTH	SHAPE	8 PILE BENT			9 PILE BENT			10 PILE BENT			11 PILE BENT			12 PILE BENT			13 PILE BENT			14 PILE BENT		
			NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
a1	57'-8"		8	9	1569	8	9	1569	8	9	1569	8	9	1569	8	9	1569	8	9	1569	8	9	1569
a2	57'-8"		4	8	616	4	8	616	4	8	616	4	8	616	4	8	616	4	8	616	4	8	616
b1	57'-8"		4	10	993	4	10	993	4	10	993	4	10	993	4	10	993	4	10	993	4	10	993
5c1	12'-8"		71	5	938	82	5	1083	88	5	1163	106	5	1400	90	5	1189	86	5	1136	93	5	1229
8e1	8'-1"		4	8	86	4	8	86	4	8	86	4	8	86	4	8	86	4	8	86	4	8	86
REINFORCING STEEL (LB.)			4202			4347			4427			4664			4453			4400			4493		
STRUCTURAL																							
CONCRETE (CY)			3			24.2			24.2			24.2			24.2			24.2			24.2		

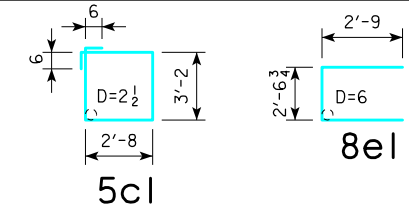
①

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

BENT BAR DETAILS



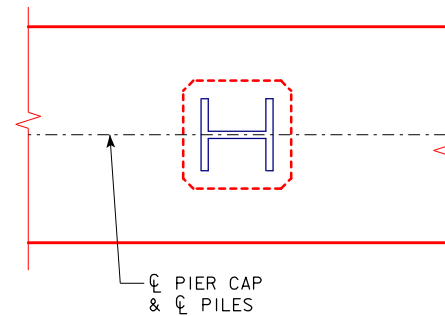
NOTE: ALL DIMENSIONS ARE OUT TO OUT. D=PIN DIAMETER.

FRICION OR POINT BEARING PILING

C-C ABUTMENT BEARING	PIOL TYPE 3		
	NUMBER OF TRESTLE PILES	PILE SIZE	② LRFD P _u , STRENGTH I, DES. LOAD (KIPS)
160'-0"	8	HPI4x73	155
	8	HPI4x89	155
180'-0"	8	HPI4x73	169
	8	HPI4x89	169
200'-0"	8	HPI4x73	183
	8	HPI4x89	183
220'-0"	9	HPI4x73	177
	8	HPI4x89	199
240'-0"	10	HPI4x73	174
	8	HPI4x89	218
260'-0"	11	HPI4x73	171
	9	HPI4x89	209
280'-0"	11	HPI4x73	183
	9	HPI4x89	224
300'-0"	12	HPI4x73	180
	10	HPI4x89	216
320'-0"	13	HPI4x73	177
	11	HPI4x89	209
340'-0"	14	HPI4x73	173
	11	HPI4x89	220

① SEE SHEET RS40-169-14 FOR STEP REINFORCING STEEL QUANTITIES AND DETAILS.

② NOTE: P_u, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



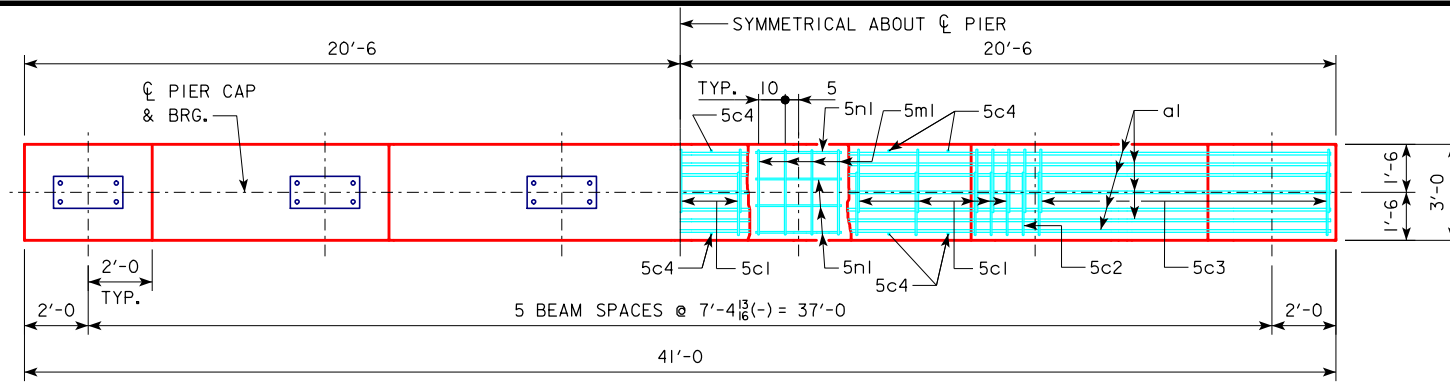
PILE ORIENTATION DETAIL FOR TYPE 3 TRESTLE BENT PILES

NOTE: FRICTION BEARING INCLUDES SIDE FRICTION AND END BEARING IN SOIL.
POINT BEARING INCLUDES SIDE FRICTION AND POINT BEARING IN ROCK.

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

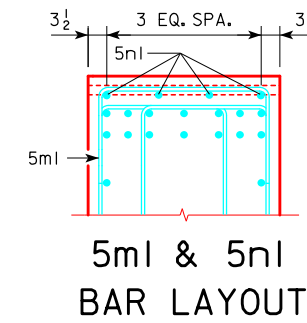
08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
	PILE BENT PIERS HPI4 PILES 45° SKEW	RS40-115-14

REVISED 02-2017 - CHANGED BEVELED KEYWAY ON PIER COLUMN CAP AND FOOTING TO 3"x10"x15'-0 (WAS 2"x8"x17'-0). KEYWAY LENGTH CHANGED TO BE 5'-0 LESS THAN WIDTH OF PIER COLUMN.
 REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



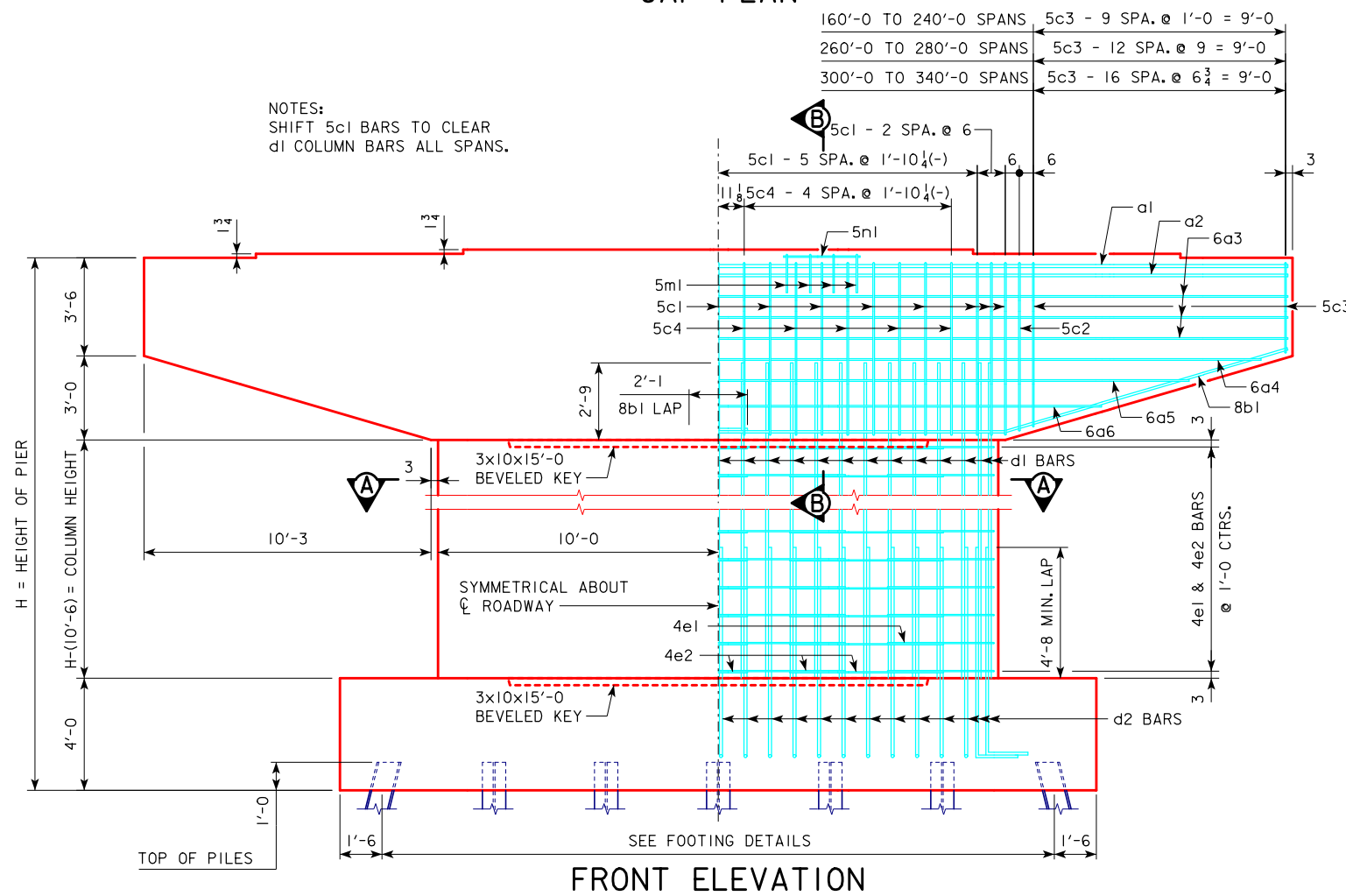
CAP PLAN

NOTE:
 ANCHOR BOLTS REQUIRED FOR FIXED
 PIER BEARINGS ONLY. FOR BOLT AND
 BEARING SIZES, SEE RS40-093-14,
 RS40-094-14 OR RS40-095-14.

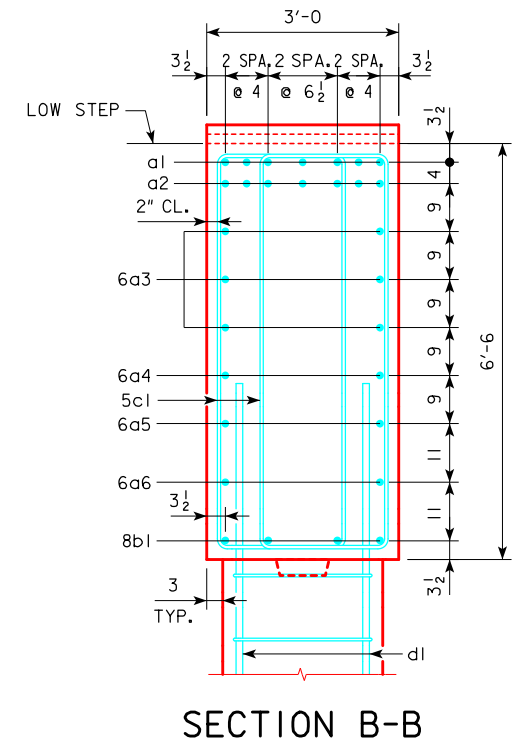


5ml & 5nl
 BAR LAYOUT

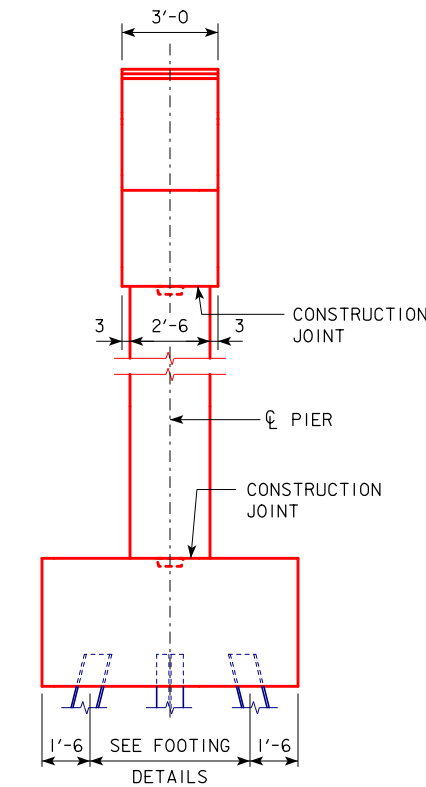
NOTES:
 SHIFT 5c1 BARS TO CLEAR
 d1 COLUMN BARS ALL SPANS.



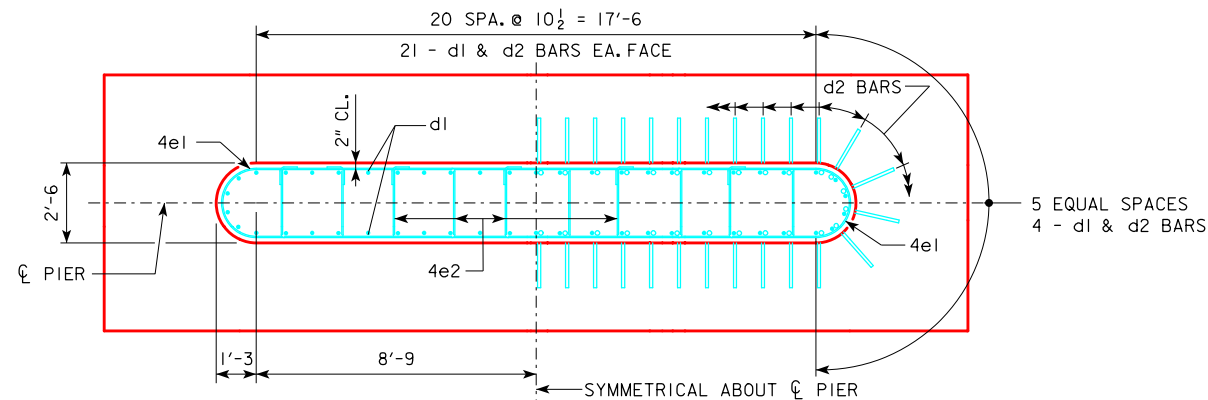
FRONT ELEVATION



SECTION B-B



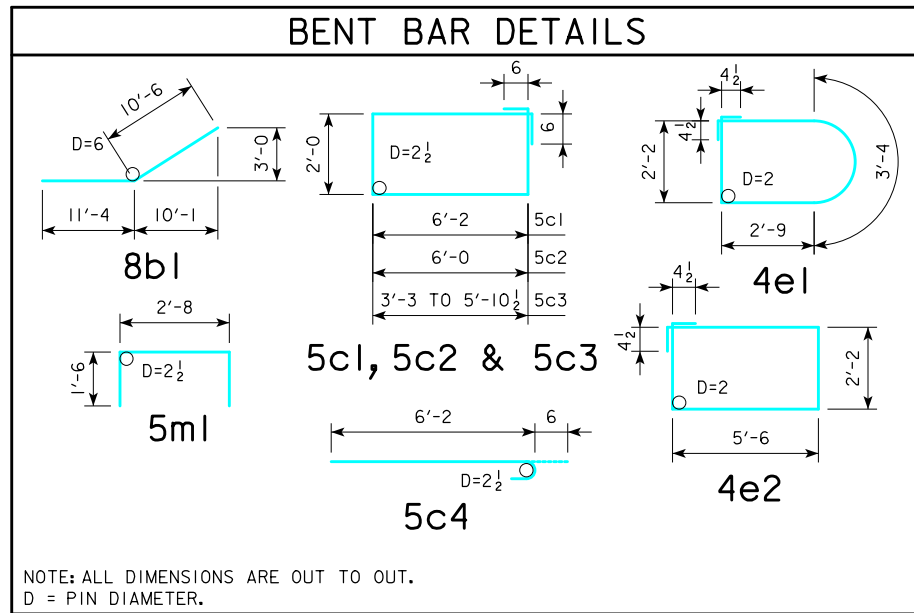
END ELEVATION



SECTION A-A

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER 		
	STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
	TEE PIER CAP & COLUMN DETAILS 0° SKEW	RS40-116-14

		CAP																															
		CL - CL ABUT. BEARINGS		160'-0"			180'-0"			200'-0"			220'-0"			240'-0"			260'-0"			280'-0"			300'-0"			320'-0"			340'-0"		
REINFORCING STEEL	BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT			
		a1	40'-8"		7	8	760	7	8	760	7	8	760	7	9	968	7	9	968	7	10	1225	7	10	1225	7	10	1225	7	11	1512	7	11
	a2	40'-8"		7	7	582	7	8	760	7	8	760	7	8	760	7	9	968	7	9	968	7	10	1225	7	10	1225	7	10	1225	7	10	1225
	6a3	40'-8"		6	6	366	6	6	366	6	6	366	6	6	366	6	6	366	6	6	366	6	6	366	6	6	366	6	6	366	6	6	366
	6a4	38'-8"		2	6	116	2	6	116	2	6	116	2	6	116	2	6	116	2	6	116	2	6	116	2	6	116	2	6	116	2	6	116
	6a5	33'-7"		2	6	101	2	6	101	2	6	101	2	6	101	2	6	101	2	6	101	2	6	101	2	6	101	2	6	101	2	6	101
	6a6	27'-4"		2	6	82	2	6	82	2	6	82	2	6	82	2	6	82	2	6	82	2	6	82	2	6	82	2	6	82	2	6	82
	8b1	21'-10"		8	8	466	8	8	466	8	8	466	8	8	466	8	8	466	8	8	466	8	8	466	8	8	466	8	8	466	8	8	466
	5c1	17'-4"		30	5	542	30	5	542	30	5	542	30	5	542	30	5	542	30	5	542	30	5	542	30	5	542	30	5	542	30	5	542
	5c2	17'-0"		4	5	71	4	5	71	4	5	71	4	5	71	4	5	71	4	5	71	4	5	71	4	5	71	4	5	71	4	5	71
	5c3	VARIABLES		40	5	589	40	5	589	40	5	589	40	5	589	40	5	589	40	5	589	40	5	589	40	5	589	40	5	589	40	5	589
	5c4	6'-8"		20	5	139	20	5	139	20	5	139	20	5	139	20	5	139	20	5	139	20	5	139	20	5	139	20	5	139	20	5	139
	5ml	5'-8"		8	5	47	8	5	47	8	5	47	8	5	47	8	5	47	8	5	47	8	5	47	8	5	47	8	5	47	8	5	47
	5nl	2'-10"		8	5	24	8	5	24	8	5	24	8	5	24	8	5	24	8	5	24	8	5	24	8	5	24	8	5	24	8	5	24
TOTAL (LB.)				3885			4063			4063			4271			4479			4913			5170			5406			5693			5693		
STRUCTURAL CONCRETE (CY)				27.0			27.0			27.0			27.0			27.0			27.0			27.0			27.0			27.0			27.0		



NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

		COLUMN																															
		CL - CL ABUT. BEARINGS		160'-0"			180'-0"			200'-0"			220'-0"			240'-0"			260'-0"			280'-0"			300'-0"			320'-0"			340'-0"		
H IN FEET	COLUMN HEIGHT	STRUCTURAL CONCRETE (CY)	REINFORCING STEEL												TOTAL WEIGHT (LB.)																		
			d1 BAR				4e1 BAR				4e2 BAR																						
		NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT				
16	5'-6"	9.9	50	9	8'-3"	1403	12	4	11'-9"	94	24	4	16'-1"	258	1755																		
17	6'-6"	11.7	50	9	9'-3"	1573	14	4	11'-9"	110	28	4	16'-1"	301	1984																		
18	7'-6"	13.5	50	9	10'-3"	1743	16	4	11'-9"	126	32	4	16'-1"	344	2213																		
19	8'-6"	15.3	50	9	11'-3"	1913	18	4	11'-9"	141	36	4	16'-1"	387	2441																		
20	9'-6"	17.1	50	9	12'-3"	2083	20	4	11'-9"	157	40	4	16'-1"	430	2670																		
21	10'-6"	18.9	50	9	13'-3"	2253	22	4	11'-9"	173	44	4	16'-1"	473	2899																		
22	11'-6"	20.7	50	9	14'-3"	2423	24	4	11'-9"	188	48	4	16'-1"	516	3127																		
23	12'-6"	22.5	50	9	15'-3"	2593	26	4	11'-9"	204	52	4	16'-1"	559	3356																		
24	13'-6"	24.3	50	9	16'-3"	2763	28	4	11'-9"	220	56	4	16'-1"	602	3585																		
25	14'-6"	26.1	50	9	17'-3"	2933	30	4	11'-9"	235	60	4	16'-1"	645	3813																		
26	15'-6"	27.9	50	9	18'-3"	3103	32	4	11'-9"	251	64	4	16'-1"	688	4042																		
27	16'-6"	29.7	50	9	19'-3"	3273	34	4	11'-9"	267	68	4	16'-1"	731	4271																		
28	17'-6"	31.5	50	9	20'-3"	3443	36	4	11'-9"	283	72	4	16'-1"	774	4500																		
29	18'-6"	33.3	50	9	21'-3"	3613	38	4	11'-9"	298	76	4	16'-1"	817	4728																		
30	19'-6"	35.1	50	9	22'-3"	3783	40	4	11'-9"	314	80	4	16'-1"	859	4956																		
31	20'-6"	36.9	50	9	23'-3"	3953	42	4	11'-9"	330	84	4	16'-1"	902	5185																		
32	21'-6"	38.7	50	9	24'-3"	4123	44	4	11'-9"	345	88	4	16'-1"	945	5413																		
33	22'-6"	40.5	50	9	25'-3"	4293	46	4	11'-9"	361	92	4	16'-1"	988	5642																		
34	23'-6"	42.4	50	9	26'-3"	4463	48	4	11'-9"	377	96	4	16'-1"	1031	5871																		
35	24'-6"	44.2	50	9	27'-3"	4633	50	4	11'-9"	392	100	4	16'-1"	1074	6099																		
36	25'-6"	46.0	50	9	28'-3"	4803	52	4	11'-9"	408	104	4	16'-1"	1117	6328																		
37	26'-6"	47.8	50	9	29'-3"	4973	54	4	11'-9"	424	108	4	16'-1"	1160	6557																		
38	27'-6"	49.6	50	9	30'-3"	5143	56	4	11'-9"	440	112	4	16'-1"	1203	6786																		
39	28'-6"	51.4	50	9	31'-3"	5313	58	4	11'-9"	455	116	4	16'-1"	1246	7014																		
40	29'-6"	53.2	50	9	32'-3"	5483	60	4	11'-9"	471	120	4	16'-1"	1289	7243																		

PIER NOTES:

SEE "TEE PIER NOTES" ON RS40-003-14 FOR NOTES REGARDING APPLICATION OF THESE PIER STANDARDS.

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

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER 		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
		TEE PIER CAP & COLUMN DETAILS 0° SKEW	RS40-117-14

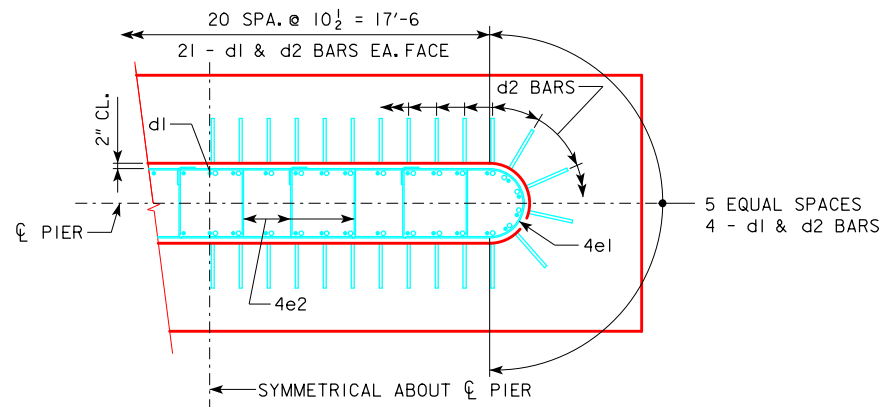
REVISED 02-2017 - CHANGED VERTICAL CLEARANCE OF REBAR "f2" TO TOP OF PIER FOOTING TO 3" (WAS 2").
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

H IN FT.	CL - CL ABUT. BRG.	PILING (HP10x57)		FOOTING SIZE	
		NO. & LAYOUT	① LRFD P _u , STRENGTH I, DES. LOAD (KIPS)		
16 TO 18	160'-0"	15A	146	4' x 9' x 24'	
	180'-0"	16A	146		
	200'-0"	18A	145		
	220'-0"	18E	142		
	240'-0"	20A	142		
	260'-0"	20B	145		
	280'-0"	22A	144		
	300'-0"	23B	144		
	320'-0"	24B	146	4' x 12' x 32'	
	340'-0"	26A	144		
19 TO 21	160'-0"	16A	141		4' x 9' x 24'
	180'-0"	17A	145		
	200'-0"	18D	143		
	220'-0"	18E	145		
	240'-0"	20A	145		
	260'-0"	21B	143		
	280'-0"	23A	143		
	300'-0"	23B	146		
	320'-0"	25A	144	4' x 12' x 32'	
	340'-0"	26A	147		
22 TO 24	160'-0"	16B	143		4' x 10' x 24'
	180'-0"	18B	142		
	200'-0"	18D	146		
	220'-0"	19A	144		
	240'-0"	20B	141		
	260'-0"	21B	146		
	280'-0"	23A	145		
	300'-0"	24B	143		
	320'-0"	25A	147	4' x 12' x 32'	
	340'-0"	26B	142		
25 TO 27	160'-0"	16C	144		4' x 10' x 26'
	180'-0"	18C	142		
	200'-0"	18E	141		
	220'-0"	19A	146		
	240'-0"	20B	144		
	260'-0"	22A	142		
	280'-0"	24A	143		
	300'-0"	24B	145		
	320'-0"	26A	144	4' x 12' x 32'	
	340'-0"	26B	144		
28 TO 30	160'-0"	17B	142		4' x 10' x 26'
	180'-0"	18C	145		
	200'-0"	18E	144		
	220'-0"	20A	143		
	240'-0"	20B	146		
	260'-0"	22A	144		
	280'-0"	24A	145		
	300'-0"	25A	143		
	320'-0"	26A	146	4' x 12' x 32'	
	340'-0"	26B	145		
31 TO 33	160'-0"	17C	143		4' x 11' x 26'
	180'-0"	18D	146		
	200'-0"	18E	146		
	220'-0"	20A	145		
	240'-0"	21B	143		
	260'-0"	22A	146		
	280'-0"	24B	140		
	300'-0"	25A	144		
	320'-0"	26B	141	4' x 12' x 32'	
	340'-0"	27A	143		
34 TO 36	160'-0"	17D	141		4' x 11' x 28'
	180'-0"	18E	141		
	200'-0"	19A	144		
	220'-0"	21A	143		
	240'-0"	21B	145		
	260'-0"	23A	144		
	280'-0"	24B	142		
	300'-0"	25A	146		
	320'-0"	26B	142	4' x 12' x 32'	
	340'-0"	27A	144		

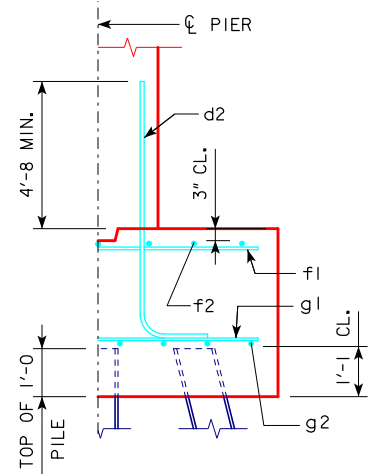
H IN FT.	CL - CL ABUT. BRG.	PILING (HP10x57)		FOOTING SIZE
		NO. & LAYOUT	① LRFD P _u , STRENGTH I, DES. LOAD (KIPS)	
37 TO 40	160'-0"	18E	136	4' x 11' x 28'
	180'-0"	18E	144	
	200'-0"	20A	141	
	220'-0"	21A	146	
	240'-0"	22A	142	
	260'-0"	23A	146	
	280'-0"	24B	144	
	300'-0"	26A	143	
	320'-0"	26B	144	4' x 12' x 32'
	340'-0"	27A	146	

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)				STRUCTURAL CONCRETE (CY)	
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)		
4' x 9' x 24'	d2	50 - #9 AS SHOWN	9'-1	1544	2694	32.0
	f1	24 - #5 @ 1'-0"	8'-8	217		
	f2	9 - #5 @ 1'-0"	23'-8	222		
	g1	30 - #6 @ 0'-9 1/2"	8'-8	391		
	g2	9 - #6 @ 1'-0"	23'-8	320		
	d2	50 - #9 AS SHOWN	9'-1	1544		
f1	24 - #5 @ 1'-0"	9'-8	242			
f2	10 - #5 @ 1'-0"	23'-8	247			
g1	28 - #7 @ 0'-10"	9'-8	553			
g2	10 - #6 @ 1'-0"	23'-8	355			
d2	50 - #9 AS SHOWN	9'-1	1544	3309	38.5	
f1	26 - #5 @ 1'-0"	9'-8	262			
f2	10 - #5 @ 1'-0"	25'-8	268			
g1	28 - #7 @ 0'-11"	9'-8	553			
g2	13 - #7 @ 0'-9 1/2"	25'-8	682			
d2	50 - #9 AS SHOWN	9'-1	1544			3578
f1	26 - #5 @ 1'-0"	10'-8	289			
f2	11 - #5 @ 1'-0"	25'-8	294			
g1	27 - #8 @ 0'-11 1/2"	10'-8	769			
g2	13 - #7 @ 0'-10 1/2"	25'-8	682			
d2	50 - #9 AS SHOWN	9'-1	1544	4164	45.6	
f1	28 - #5 @ 1'-0"	10'-8	312			
f2	11 - #5 @ 1'-0"	27'-8	317			
g1	31 - #8 @ 0'-11"	10'-8	883			
g2	15 - #8 @ 0'-9"	27'-8	1108			
d2	50 - #9 AS SHOWN	9'-1	1544			5142
f1	30 - #5 @ 1'-0"	11'-8	365			
f2	12 - #5 @ 1'-0"	29'-8	371			
g1	34 - #9 @ 0'-10 1/2"	11'-8	1349			
g2	15 - #9 @ 0'-9 1/2"	29'-8	1513			
d2	50 - #9 AS SHOWN	9'-1	1544	5880	56.9	
f1	32 - #5 @ 1'-0"	11'-8	389			
f2	12 - #5 @ 1'-0"	31'-8	396			
g1	38 - #9 @ 0'-10"	11'-8	1507			
g2	15 - #10 @ 0'-9 1/2"	31'-8	2044			
d2	50 - #9 AS SHOWN	9'-1	1544			6681
f1	32 - #5 @ 1'-0"	13'-8	456			
f2	14 - #5 @ 1'-0"	31'-8	462			
g1	38 - #9 @ 0'-10"	13'-8	1766			
g2	18 - #10 @ 0'-9 1/2"	31'-8	2453			

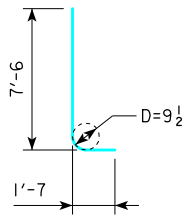
① NOTE: P_u, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET RS40-116-14.)



TYPICAL SECTION



d2

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

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

FOOTING NOTES:

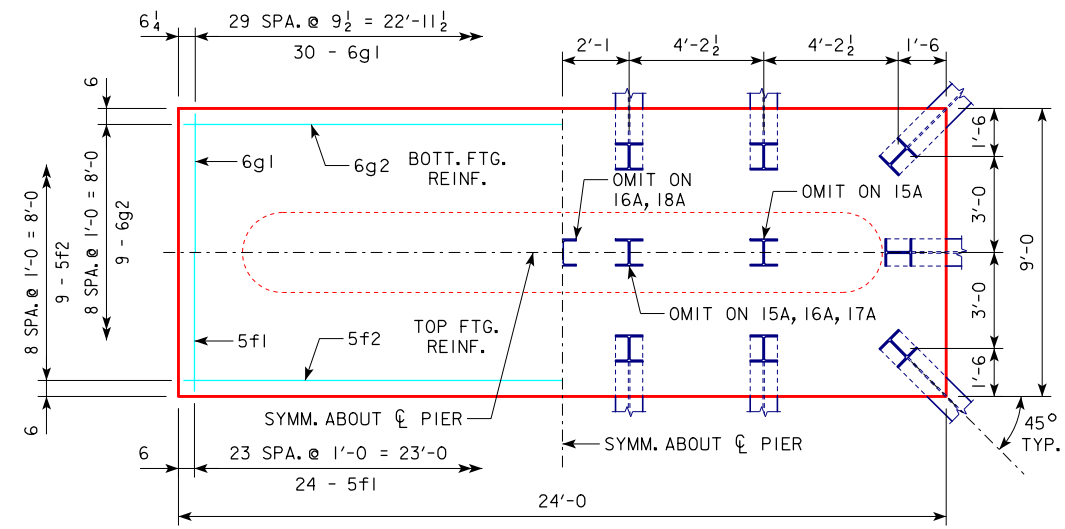
THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET RS40-116-14.

BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.

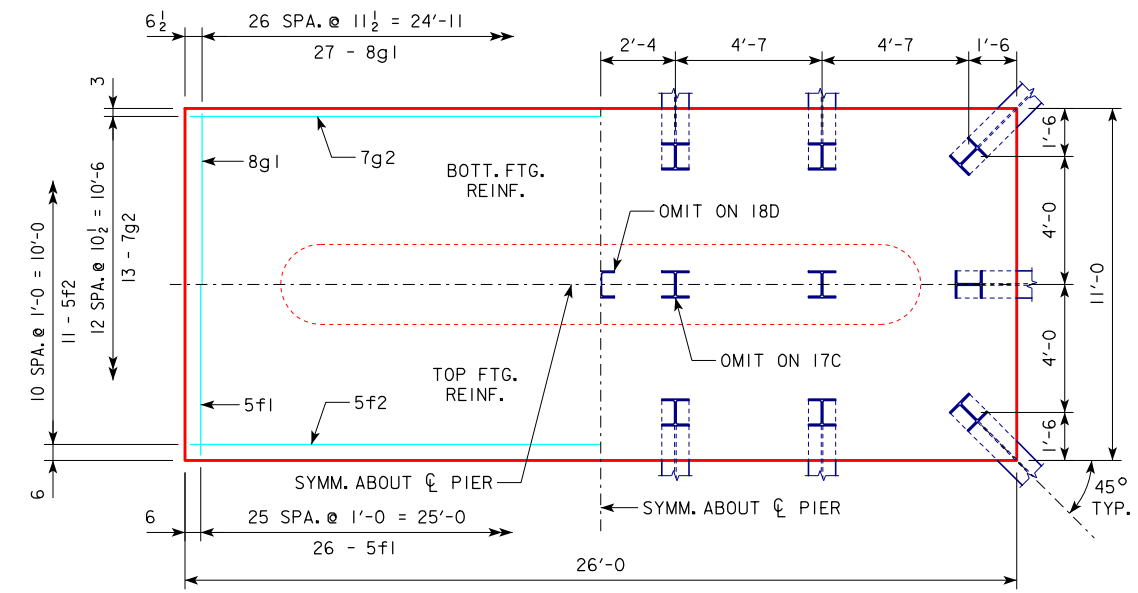
STEEL PILING USED AS POINT BEARING SHALL HAVE A MINIMUM DISTANCE OF APPROXIMATELY 10 FEET FROM BOTTOM OF FOOTING TO TOP OF BEARING ROCK. THE PILE LAYOUTS ARE SUCH THAT THE DISTANCE CENTER TO CENTER OF ADJACENT PILING SHALL NOT EXCEED 8'-0".

PIER PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

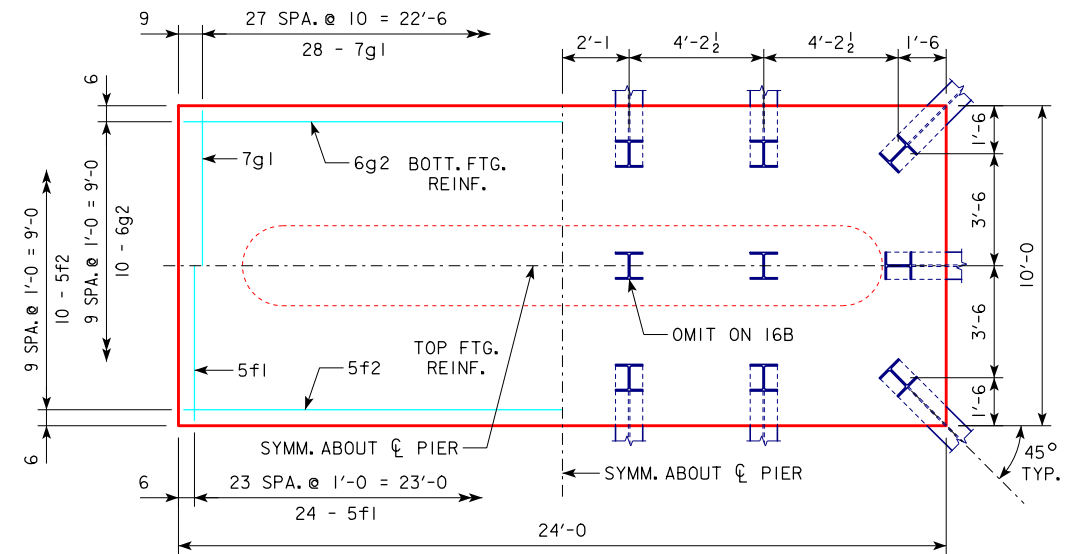
08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	IOWA DOT Highway Division
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES
		ROLLED STEEL BEAM BRIDGES
		OCTOBER, 2014
TEE PIER-HP10x57 SRL-I STEEL PILE FOOTINGS		RS40-118-14
		0° SKEW - SHEET 1



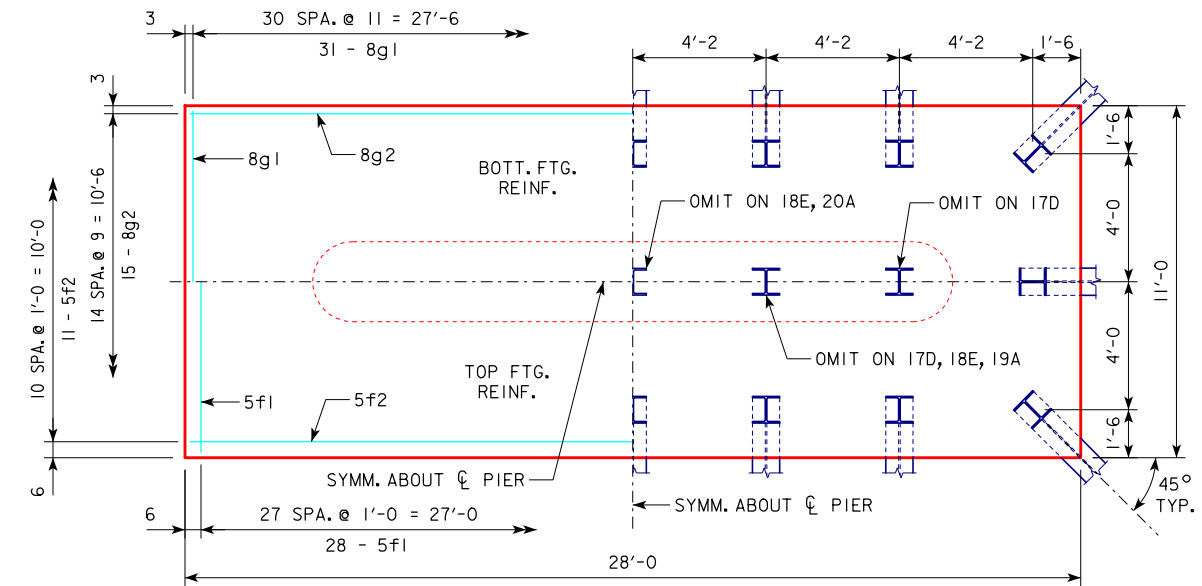
4'-0 x 9'-0 x 24'-0 FOR 15A, 16A, 17A & 18A



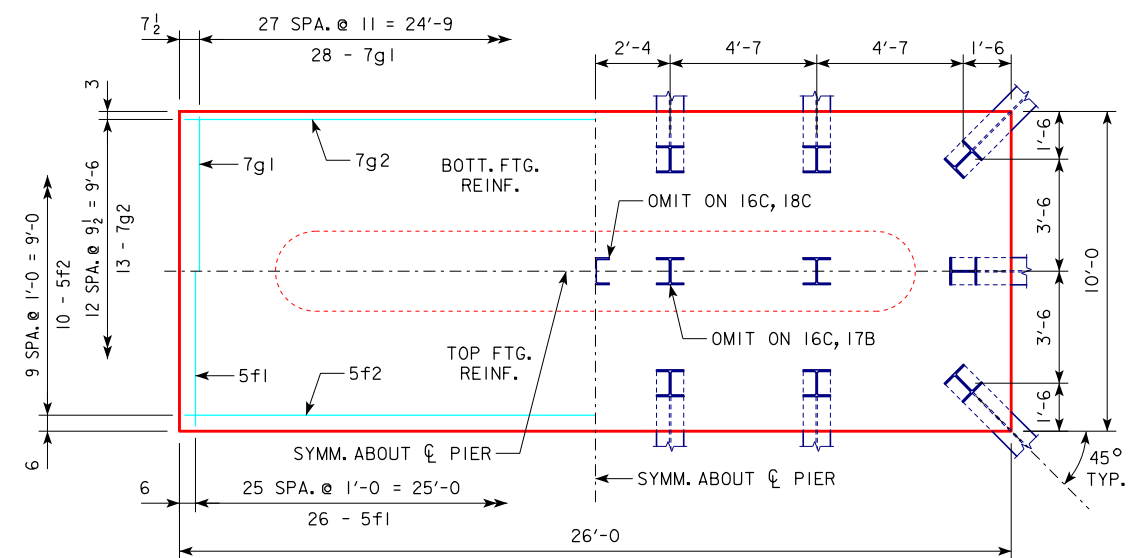
4'-0 x 11'-0 x 26'-0 FOR 17C & 18D



4'-0 x 10'-0 x 24'-0 FOR 16B & 18B



4'-0 x 11'-0 x 28'-0 FOR 17D, 18E, 19A, 20A & 21A

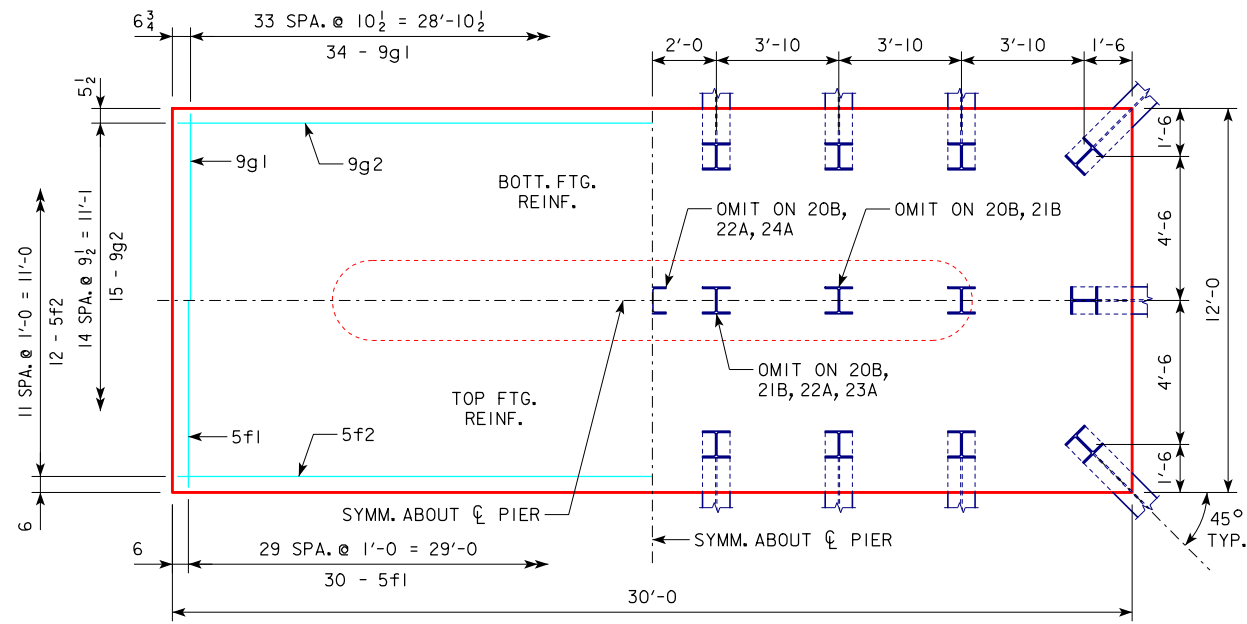


4'-0 x 10'-0 x 26'-0 FOR 16C, 17B & 18C

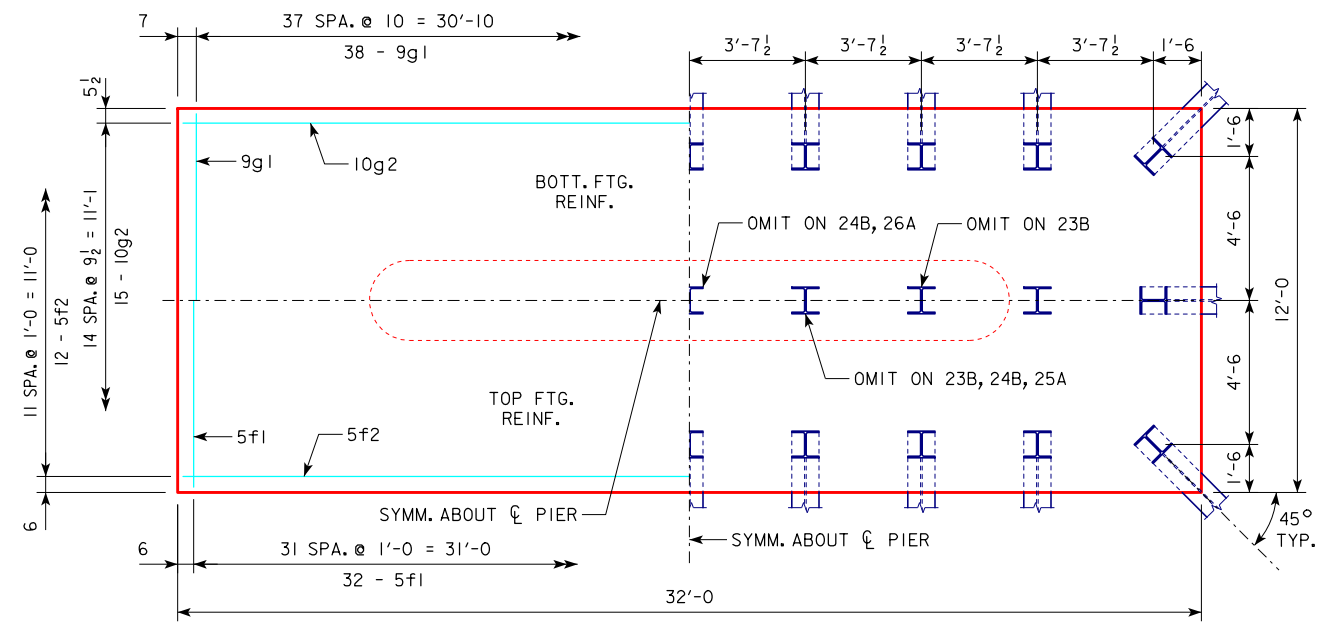
NOTE:
SEE SHEET RS40-118-14 FOR FOOTING NOTES.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	TEE PIER-HP10x57 SRL-1 STEEL PILE FOOTINGS 0° SKEW - SHEET 2
	RS40-119-14

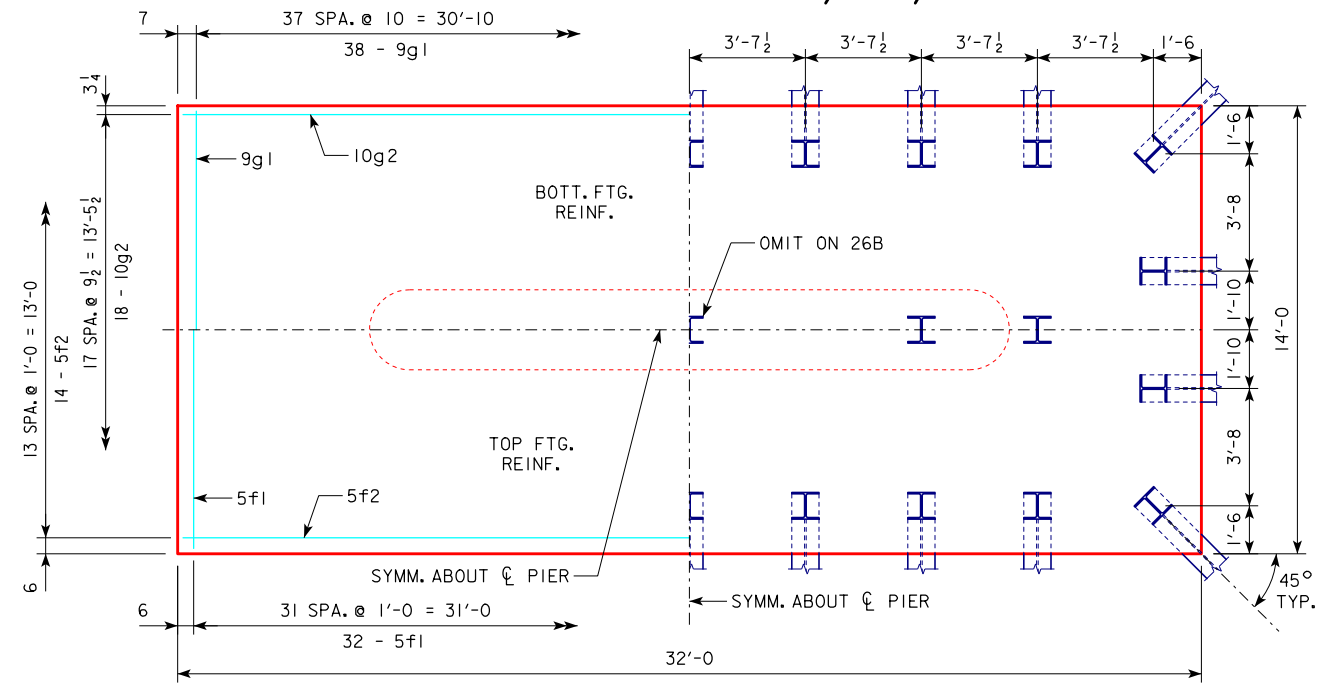
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



4'-0 x 12'-0 x 30'-0 FOR 20B, 21B, 22A, 23A & 24A



4'-0 x 12'-0 x 32'-0 FOR 23B, 24B, 25A & 26A



4'-0 x 14'-0 x 32'-0 FOR 26B & 27A

NOTE:
SEE SHEET RS40-118-14 FOR FOOTING NOTES.

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	TEE PIER-HP10x57 SRL-1 STEEL PILE FOOTINGS 0° SKEW - SHEET 3

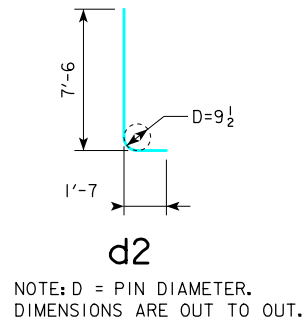
RS40-120-14

REVISED 02-2017 - ADDED "LRFD P_u, STRENGTH I, DES. LOAD (KIPS)" TO "PILING (HP10x57)" COLUMN HEADING IN THE TABLE ON THE LEFT SIDE OF THE SHEET.
 CHANGED VERTICAL CLEARANCE OF REBAR "f2" TO TOP OF PIER FOOTING TO 3" (WAS 2").
 REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

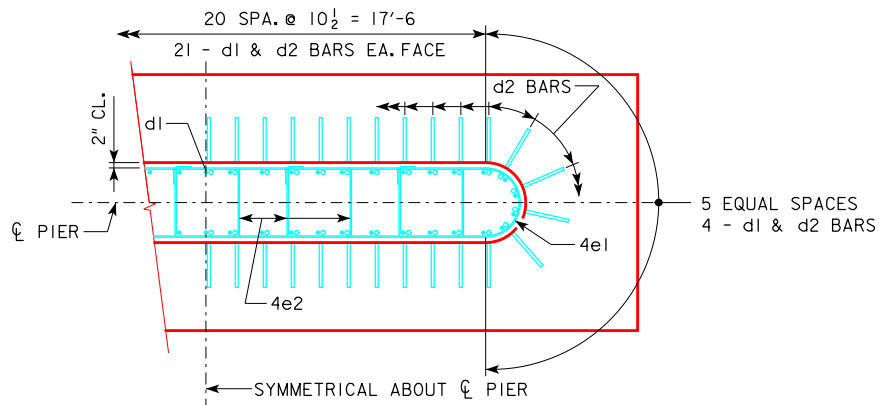
H IN FT.	CL - CL ABUT. BRG.	PILING (HP10x57)		FOOTING SIZE
		NO. & LAYOUT	LRFD P _u , STRENGTH I, DES. LOAD (KIPS)	
16 TO 18	160'-0"	10A	206	4' x 8' x 25'
	180'-0"	11A	208	
	200'-0"	12A	204	
	220'-0"	13A	205	
	240'-0"	14A	204	
	260'-0"	14A	218	
	280'-0"	16A	213	
	300'-0"	16C	218	
	320'-0"	17A	215	
	340'-0"	17B	213	
19 TO 21	160'-0"	10A	213	4' x 8' x 25'
	180'-0"	11A	215	
	200'-0"	12A	211	
	220'-0"	13A	211	
	240'-0"	14A	210	
	260'-0"	15A	215	
	280'-0"	16B	214	
	300'-0"	16D	220	
	320'-0"	17B	208	
	340'-0"	17B	217	
22 TO 24	160'-0"	10B	215	4' x 9' x 25'
	180'-0"	11B	216	
	200'-0"	12B	212	
	220'-0"	13B	212	
	240'-0"	14B	210	
	260'-0"	15B	215	
	280'-0"	16B	218	
	300'-0"	16F	209	
	320'-0"	17B	212	
	340'-0"	18A	211	
25 TO 27	160'-0"	10C	218	4' x 10' x 25'
	180'-0"	11C	218	
	200'-0"	12C	213	
	220'-0"	13C	213	
	240'-0"	14C	211	
	260'-0"	15C	215	
	280'-0"	16C	217	
	300'-0"	16F	212	
	320'-0"	17B	215	
	340'-0"	18A	214	
28 TO 30	160'-0"	11C	210	4' x 10' x 25'
	180'-0"	12C	206	
	200'-0"	12C	218	
	220'-0"	13C	217	
	240'-0"	14C	214	
	260'-0"	15C	218	
	280'-0"	16D	217	
	300'-0"	16F	215	
	320'-0"	17B	217	
	340'-0"	18A	216	
31 TO 33	160'-0"	11D	212	4' x 11' x 25'
	180'-0"	12D	207	
	200'-0"	12D	219	
	220'-0"	13D	218	
	240'-0"	14D	215	
	260'-0"	15D	218	
	280'-0"	16E	216	
	300'-0"	16F	217	
	320'-0"	17B	219	
	340'-0"	18A	218	
34 TO 36	160'-0"	11E	213	4' x 11' x 27'
	180'-0"	12E	209	
	200'-0"	13E	204	
	220'-0"	13E	218	
	240'-0"	14E	215	
	260'-0"	15E	218	
	280'-0"	16F	208	
	300'-0"	16F	220	
	320'-0"	18A	211	
	340'-0"	19A	213	

H IN FT.	CL - CL ABUT. BRG.	PILING (HP10x57)		FOOTING SIZE
		NO. & LAYOUT	LRFD P _u , STRENGTH I, DES. LOAD (KIPS)	
37 TO 40	160'-0"	12F	200	4' x 12' x 27'
	180'-0"	12F	211	
	200'-0"	13F	212	
	220'-0"	14F	214	
	240'-0"	15F	201	
	260'-0"	15F	213	
	280'-0"	16F	211	
	300'-0"	17B	214	
	320'-0"	18A	215	
	340'-0"	19A	218	

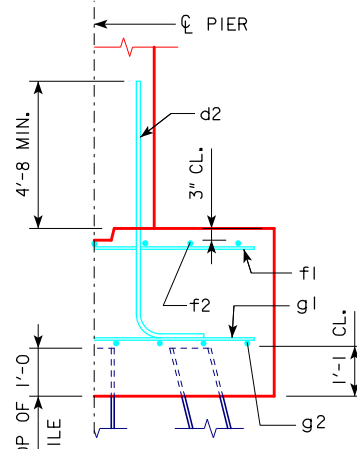
FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)					STRUCTURAL CONCRETE (CY)
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	
4' x 8' x 25'	d2	50 - #9 AS SHOWN	9'-1"	1544	3017	29.6
	f1	25 - #5 @ 1'-0"	7'-8"	200		
	f2	8 - #5 @ 1'-0"	24'-8"	206		
	g1	27 - #6 @ 0'-11"	7'-8"	311		
	g2	15 - #7 @ 0'-6"	24'-8"	756		
	d2	50 - #9 AS SHOWN	9'-1"	1544		
f1	25 - #5 @ 1'-0"	8'-8"	226			
f2	9 - #5 @ 1'-0"	24'-8"	232			
g1	28 - #7 @ 0'-10 1/2"	8'-8"	496			
g2	15 - #7 @ 0'-7"	24'-8"	756			
d2	50 - #9 AS SHOWN	9'-1"	1544	3532	37.0	
f1	25 - #5 @ 1'-0"	9'-8"	252			
f2	10 - #5 @ 1'-0"	24'-8"	257			
g1	28 - #8 @ 0'-10 1/2"	9'-8"	723			
g2	15 - #7 @ 0'-8"	24'-8"	756			
d2	50 - #9 AS SHOWN	9'-1"	1544			3874
f1	25 - #5 @ 1'-0"	10'-8"	278			
f2	11 - #5 @ 1'-0"	24'-8"	283			
g1	27 - #9 @ 0'-11"	10'-8"	979			
g2	12 - #8 @ 0'-11"	24'-8"	790			
d2	50 - #9 AS SHOWN	9'-1"	1544	4387	44.0	
f1	27 - #5 @ 1'-0"	10'-8"	300			
f2	11 - #5 @ 1'-0"	26'-8"	306			
g1	34 - #8 @ 0'-9 1/2"	10'-8"	968			
g2	14 - #9 @ 0'-9 1/2"	26'-8"	1269			
d2	50 - #9 AS SHOWN	9'-1"	1544			4876
f1	27 - #5 @ 1'-0"	11'-8"	329			
f2	12 - #5 @ 1'-0"	26'-8"	334			
g1	33 - #9 @ 0'-9 1/2"	11'-8"	1309			
g2	15 - #9 @ 0'-9 1/2"	26'-8"	1360			



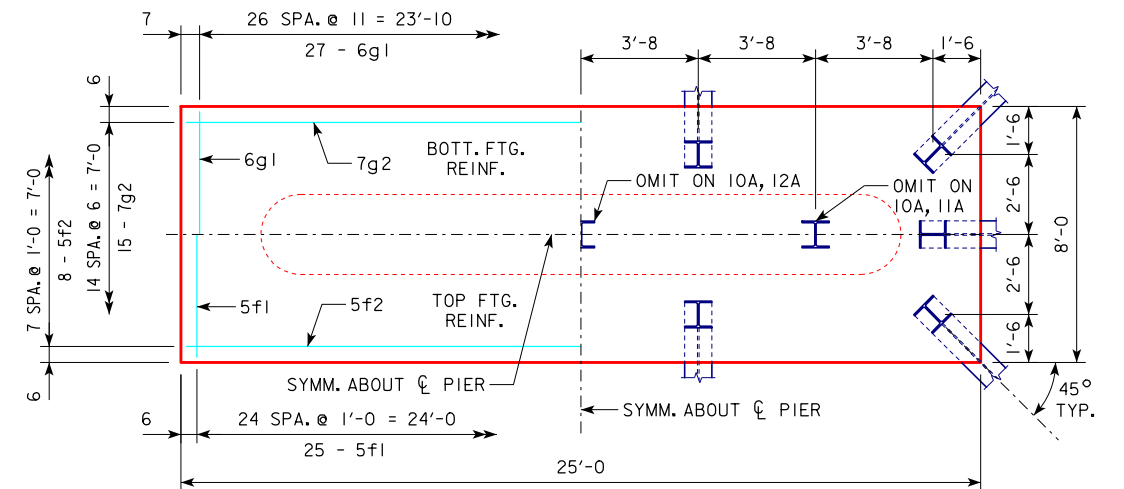
NOTE: P_u, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



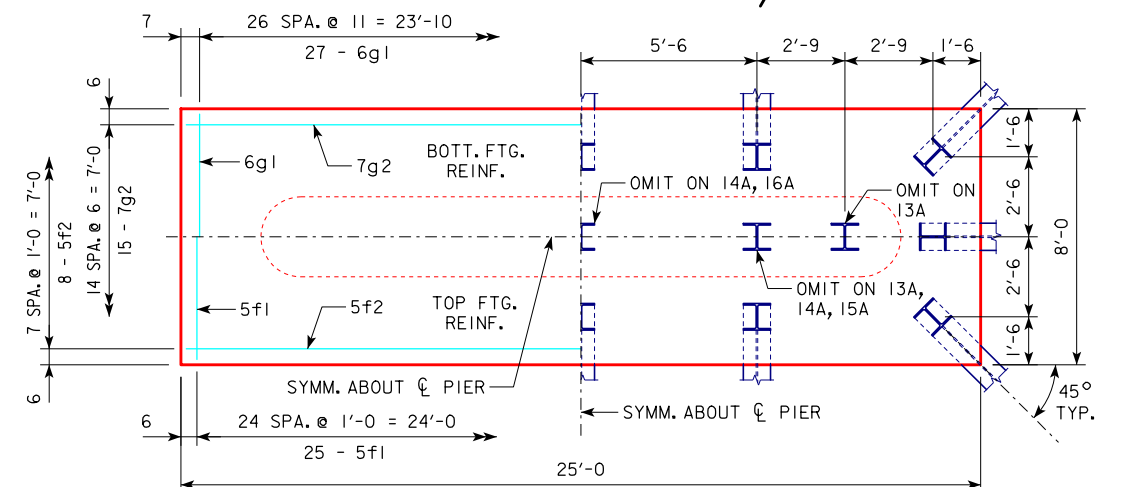
d2 BAR LAYOUT
 (SEE SECTION A-A ON SHEET RS40-116-14.)



TYPICAL SECTION



4'-0 x 8'-0 x 25'-0 FOR 10A, 11A & 12A

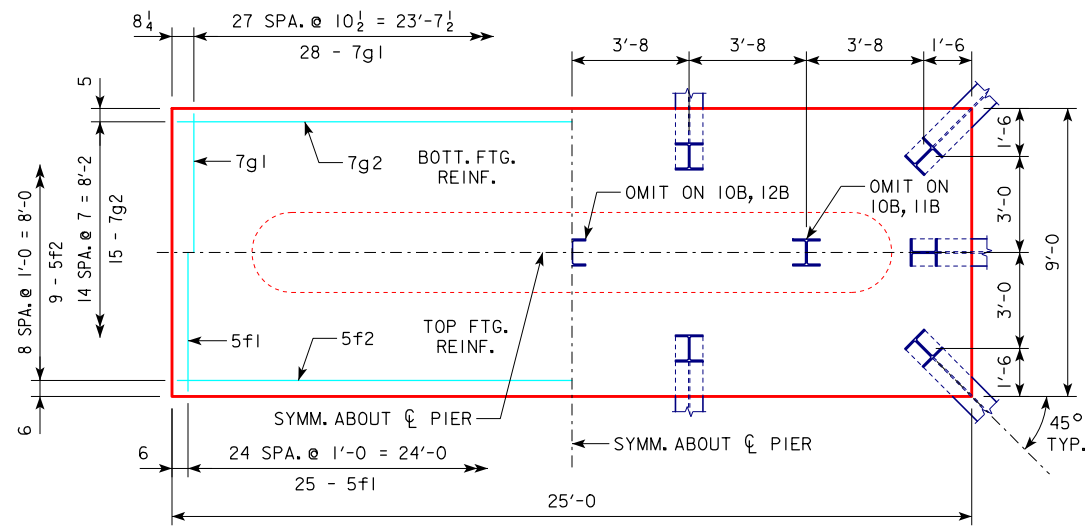


4'-0 x 8'-0 x 25'-0 FOR 13A, 14A, 15A & 16A

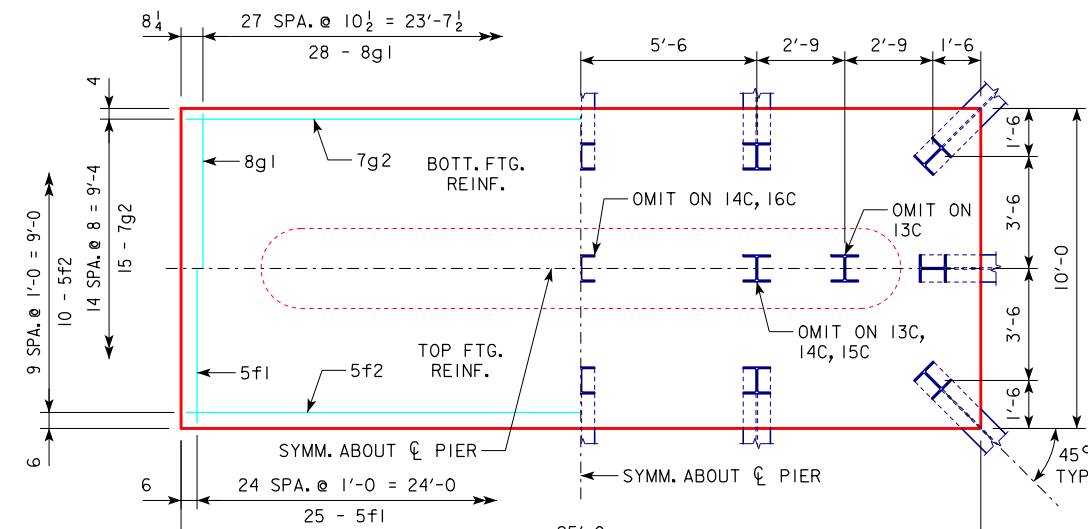
NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.
 NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.
 NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

FOOTING NOTES:
 THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET RS40-116-14.
 BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.
 STEEL PILING USED AS POINT BEARING SHALL HAVE A MINIMUM DISTANCE OF APPROXIMATELY 10 FEET FROM BOTTOM OF FOOTING TO TOP OF BEARING ROCK. THE PILE LAYOUTS ARE SUCH THAT THE DISTANCE CENTER TO CENTER OF ADJACENT PILING SHALL NOT EXCEED 8'-0".
 PIER PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

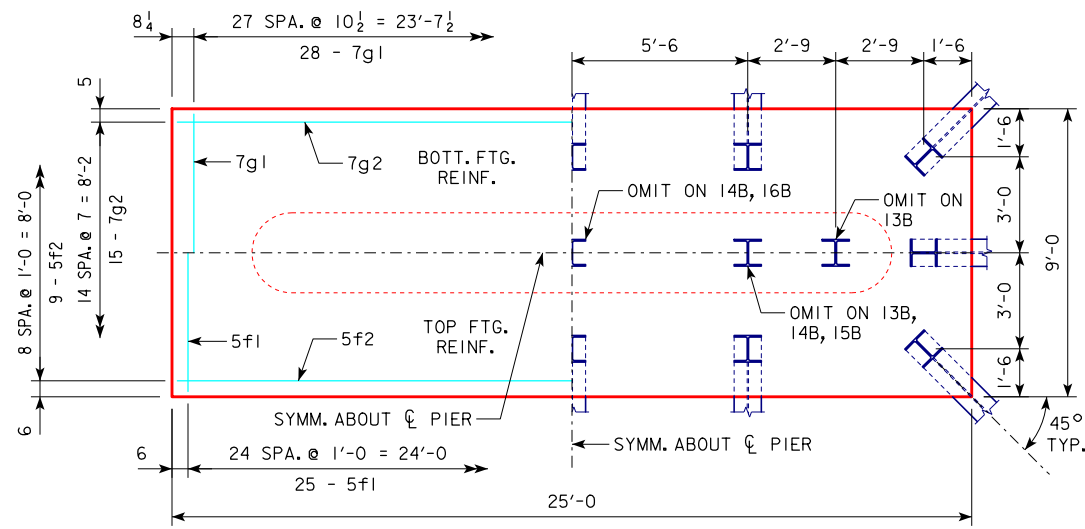
08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES
			ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
TEE PIER-HP10x57 SRL-2 STEEL PILE FOOTINGS 0° SKEW - SHEET 1		RS40-121-14	



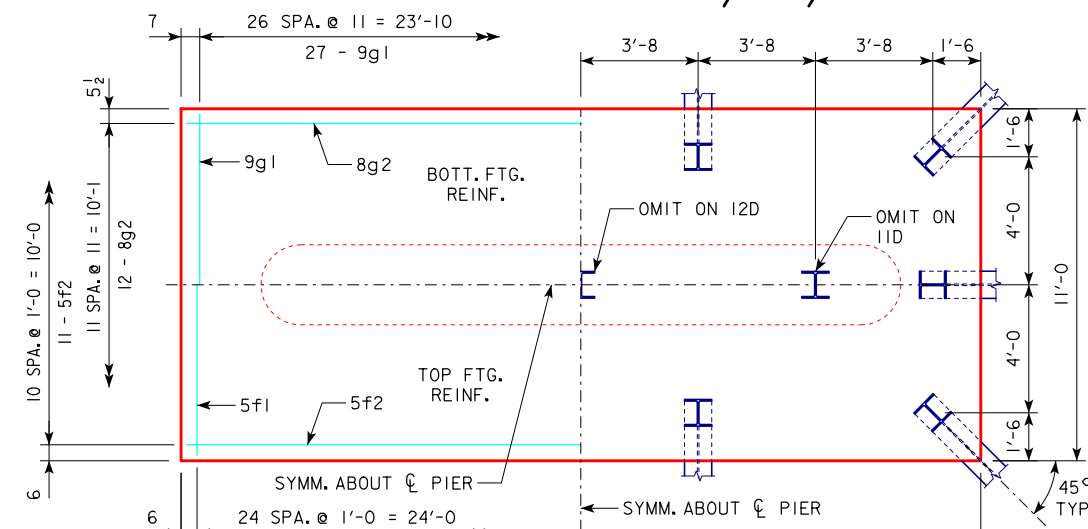
4'-0 x 9'-0 x 25'-0 FOR 10B, 11B & 12B



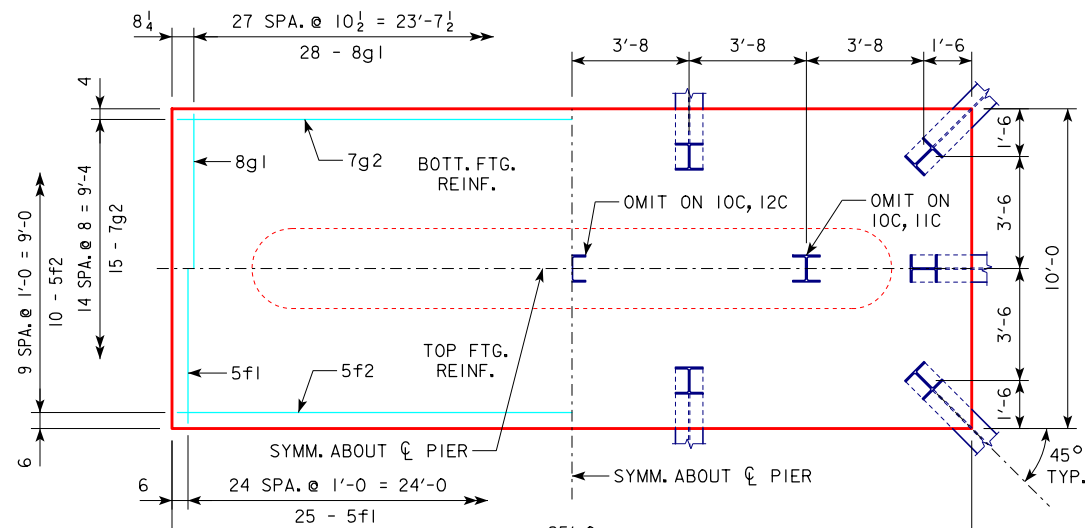
4'-0 x 10'-0 x 25'-0 FOR 13C, 14C, 15C & 16C



4'-0 x 9'-0 x 25'-0 FOR 13B, 14B, 15B & 16B



4'-0 x 11'-0 x 25'-0 FOR 11D & 12D



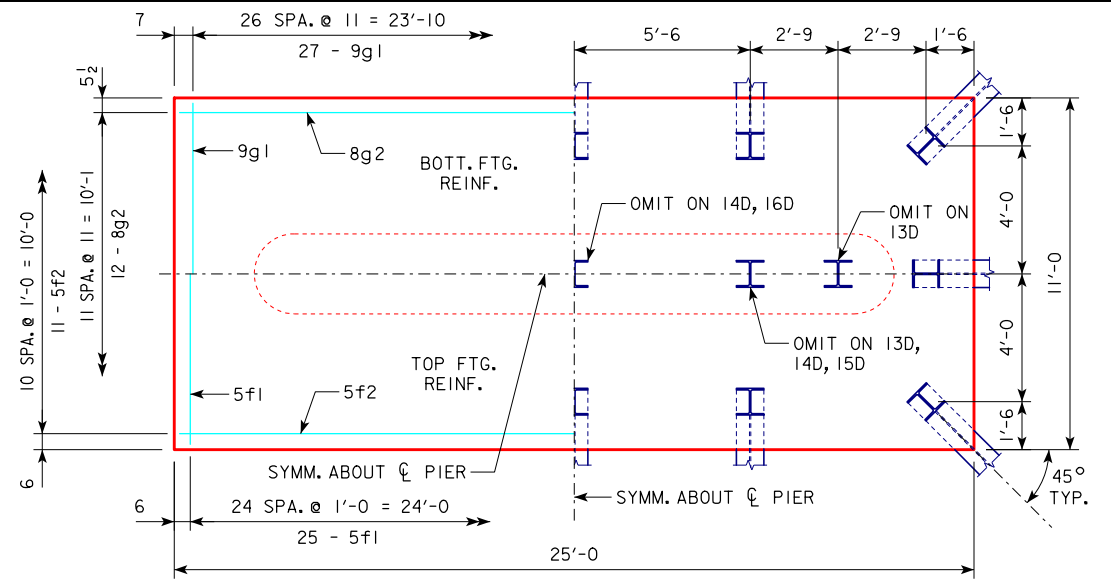
4'-0 x 10'-0 x 25'-0 FOR 10C, 11C & 12C

NOTE:
SEE SHEET RS40-121-14 FOR FOOTING NOTES.

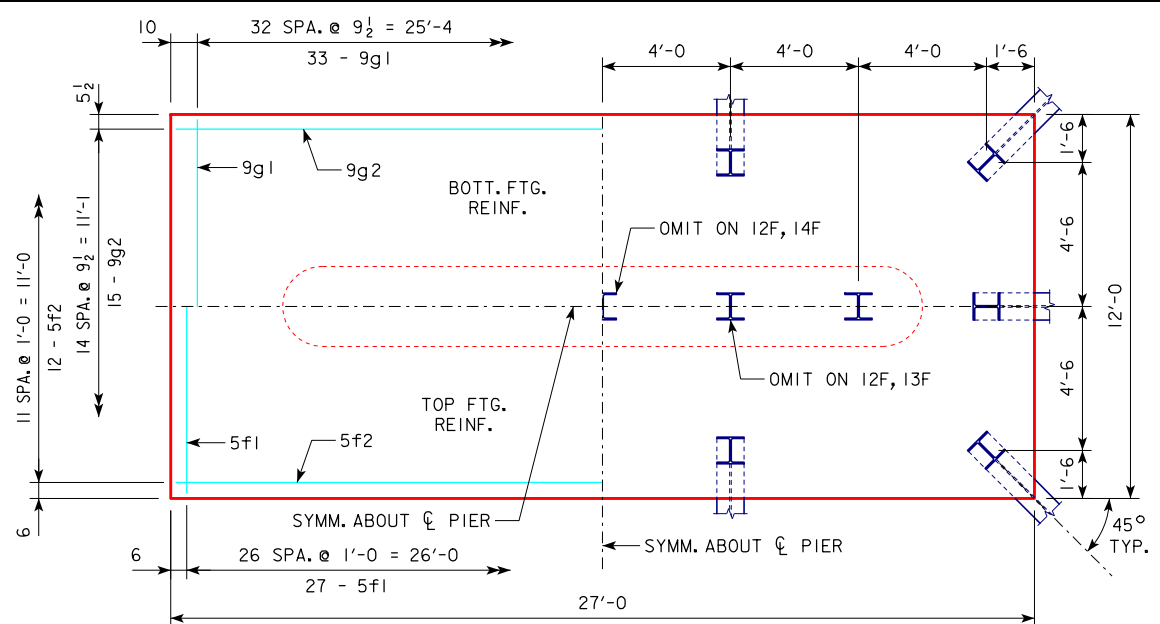
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	TEE PIER-HPI0x57 SRL-2 STEEL PILE FOOTINGS 0° SKEW - SHEET 2

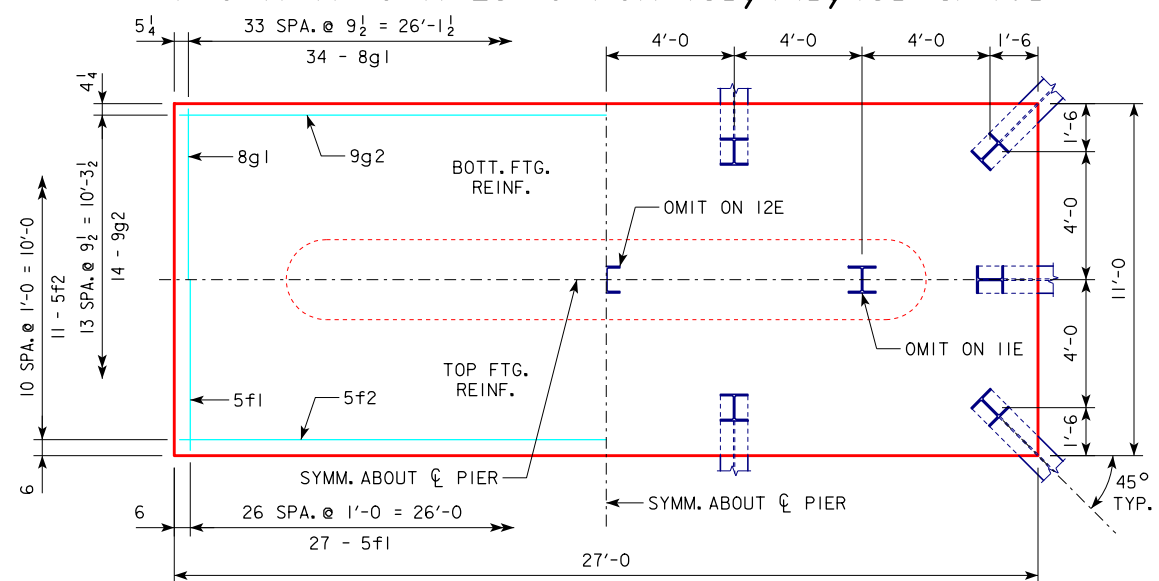
RS40-122-14



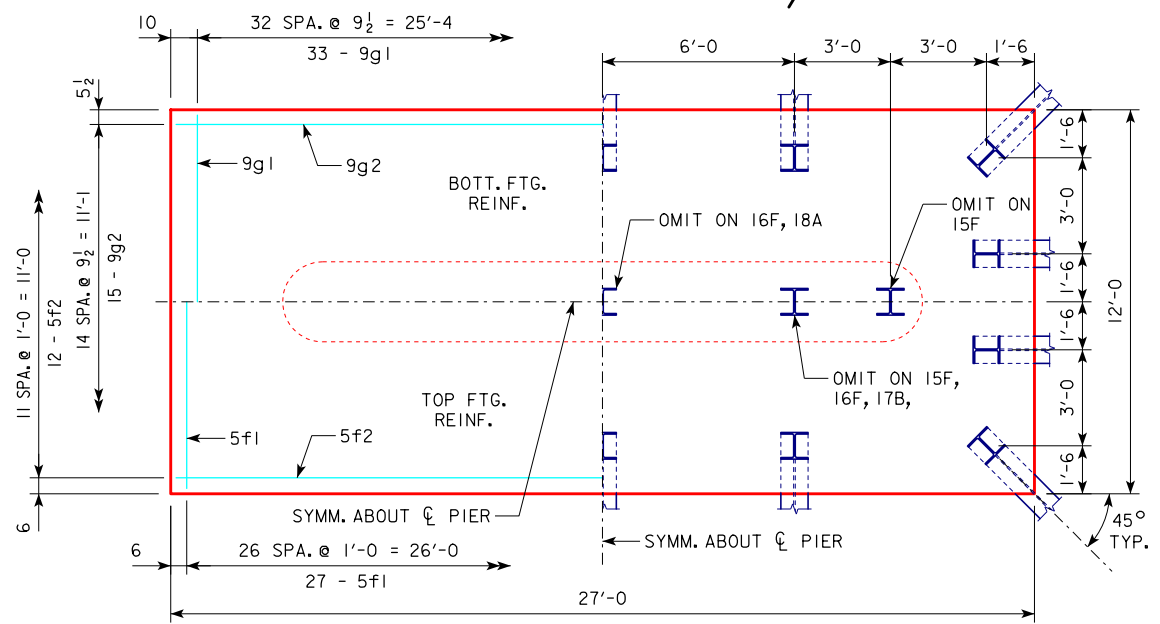
4'-0 x 11'-0 x 25'-0 FOR 13D, 14D, 15D & 16D



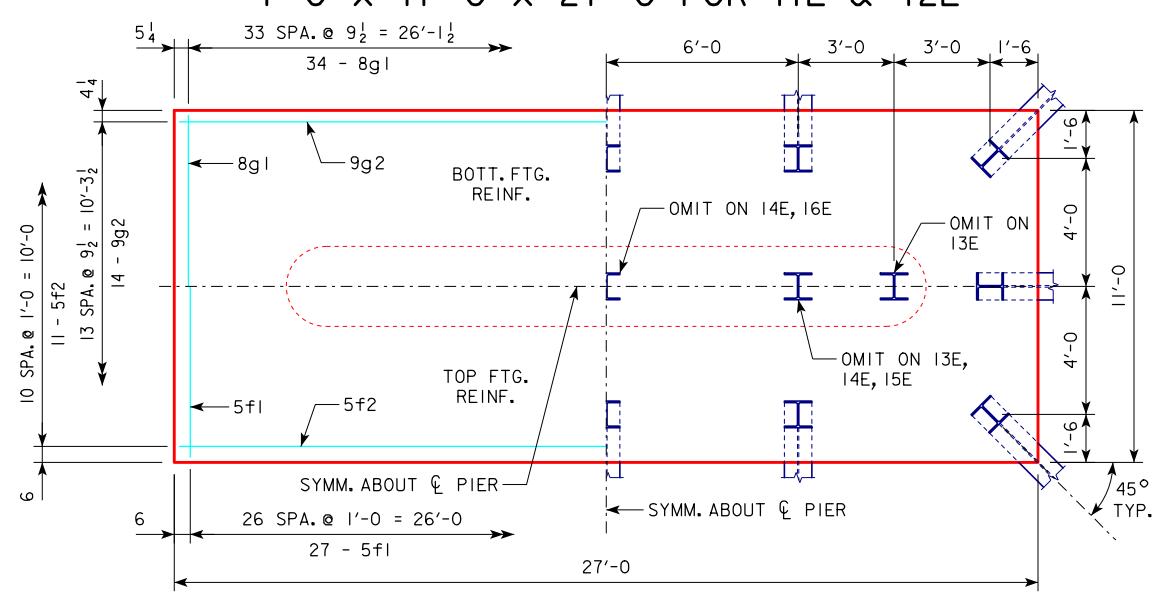
4'-0 x 12'-0 x 27'-0 FOR 12F, 13F & 14F



4'-0 x 11'-0 x 27'-0 FOR 11E & 12E



4'-0 x 12'-0 x 27'-0 FOR 15F, 16F, 17B, 18A & 19A



4'-0 x 11'-0 x 27'-0 FOR 13E, 14E, 15E, 16E & 17A

NOTE:
SEE SHEET RS40-121-14 FOR FOOTING NOTES.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	TEE PIER-HPI0x57 SRL-2 STEEL PILE FOOTINGS 0° SKEW - SHEET 3
	RS40-123-14

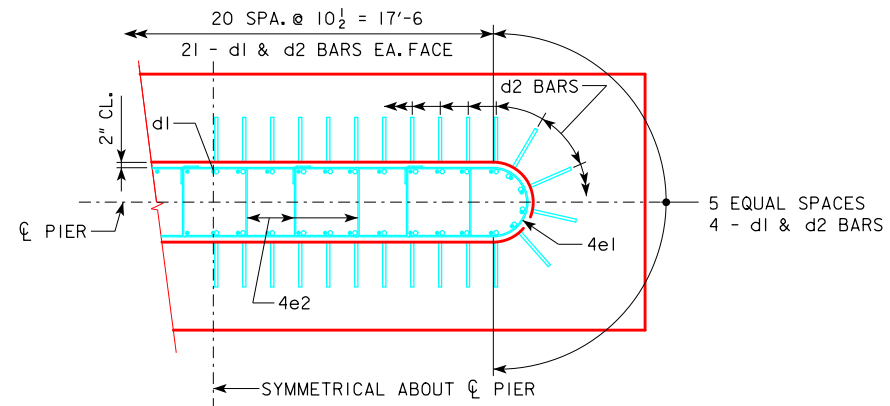
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

REVISED 02-2017 - CHANGED VERTICAL CLEARANCE OF REBAR "f2" TO TOP OF PIER FOOTING TO 3" (WAS 2").
 REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

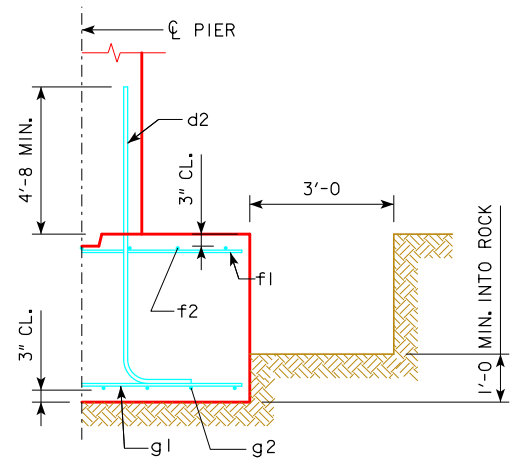
H IN FT.	CL - CL ABUT. BRG.	FOOTING SIZE	
16 TO 18	160'-0"	4' x 8' x 26'	
	180'-0"	4' x 8' x 28'	
	200'-0"	4' x 8' x 28'	
	220'-0"	4' x 9' x 28'	
	240'-0"	4' x 9' x 28'	
	260'-0"	4' x 9' x 30'	
19 TO 21	280'-0"	4' x 10' x 30'	
	300'-0"	4' x 10' x 30'	
	320'-0"	4' x 10' x 32'	
	340'-0"	4' x 10' x 32'	
	22 TO 24	160'-0"	4' x 8' x 26'
		180'-0"	4' x 8' x 28'
200'-0"		4' x 8' x 28'	
220'-0"		4' x 9' x 28'	
240'-0"		4' x 9' x 30'	
260'-0"		4' x 9' x 30'	
25 TO 27	280'-0"	4' x 10' x 30'	
	300'-0"	4' x 10' x 30'	
	320'-0"	4' x 10' x 32'	
	340'-0"	4' x 10' x 32'	
	28 TO 30	160'-0"	4' x 8' x 28'
		180'-0"	4' x 8' x 28'
200'-0"		4' x 9' x 28'	
220'-0"		4' x 9' x 28'	
240'-0"		4' x 9' x 30'	
260'-0"		4' x 10' x 30'	
31 TO 33	280'-0"	4' x 10' x 30'	
	300'-0"	4' x 10' x 32'	
	320'-0"	4' x 11' x 32'	
	340'-0"	4' x 11' x 32'	
	34 TO 36	160'-0"	4' x 8' x 28'
		180'-0"	4' x 8' x 28'
200'-0"		4' x 9' x 28'	
220'-0"		4' x 9' x 30'	
240'-0"		4' x 10' x 30'	
260'-0"		4' x 10' x 30'	
37 TO 40	280'-0"	4' x 10' x 32'	
	300'-0"	4' x 10' x 32'	
	320'-0"	4' x 11' x 32'	
	340'-0"	4' x 11' x 32'	

H IN FT.	CL - CL ABUT. BRG.	FOOTING SIZE
37 TO 40	160'-0"	4' x 9' x 28'
	180'-0"	4' x 9' x 30'
	200'-0"	4' x 9' x 30'
	220'-0"	4' x 10' x 30'
	240'-0"	4' x 10' x 32'
	260'-0"	4' x 11' x 32'

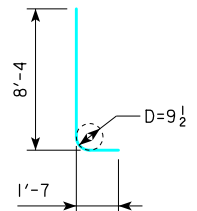
FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)				TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)		
4' x 8' x 26'	d2	50 - #9 AS SHOWN	9'-11"	1686	2793	30.8
	f1	26 - #5 @ 1'-0"	7'-8"	208		
	f2	8 - #5 @ 1'-0"	25'-8"	214		
	g1	26 - #6 @ 1'-0"	7'-8"	299		
4' x 8' x 28'	g2	10 - #6 @ 0'-10"	25'-8"	386	3202	33.2
	d2	50 - #9 AS SHOWN	9'-11"	1686		
	f1	28 - #5 @ 1'-0"	7'-8"	224		
	f2	8 - #5 @ 1'-0"	27'-8"	231		
4' x 9' x 28'	g1	28 - #6 @ 1'-0"	7'-8"	322	3455	37.3
	g2	10 - #8 @ 0'-10"	27'-8"	739		
	d2	50 - #9 AS SHOWN	9'-11"	1686		
	f1	28 - #5 @ 1'-0"	8'-8"	253		
4' x 9' x 30'	f2	9 - #5 @ 1'-0"	27'-8"	260	4028	40.0
	g1	34 - #6 @ 0'-10"	8'-8"	443		
	g2	11 - #8 @ 0'-10"	27'-8"	813		
	d2	50 - #9 AS SHOWN	9'-11"	1686		
4' x 10' x 30'	f1	30 - #5 @ 1'-0"	8'-8"	271	4362	44.4
	f2	10 - #5 @ 1'-0"	29'-8"	309		
	g1	45 - #6 @ 0'-8"	9'-8"	653		
	g2	14 - #9 @ 0'-8 1/2"	29'-8"	1412		
4' x 10' x 32'	d2	50 - #9 AS SHOWN	9'-11"	1686	4866	47.4
	f1	32 - #5 @ 1'-0"	9'-8"	323		
	f2	10 - #5 @ 1'-0"	31'-8"	330		
	g1	48 - #6 @ 0'-8"	9'-8"	697		
4' x 11' x 32'	g2	17 - #9 @ 0'-7"	31'-8"	1830	5452	52.1
	d2	50 - #9 AS SHOWN	9'-11"	1686		
	f1	32 - #5 @ 1'-0"	10'-8"	356		
	f2	11 - #5 @ 1'-0"	31'-8"	363		
4' x 8' x 28'	g1	46 - #7 @ 0'-8"	10'-8"	1003		
	g2	15 - #10 @ 0'-9"	31'-8"	2044		



d2 BAR LAYOUT
 (SEE SECTION A-A ON SHEET RS40-116-14.)



TYPICAL SECTION



d2
 NOTE: D = PIN DIAMETER.
 DIMENSIONS ARE OUT TO OUT.

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

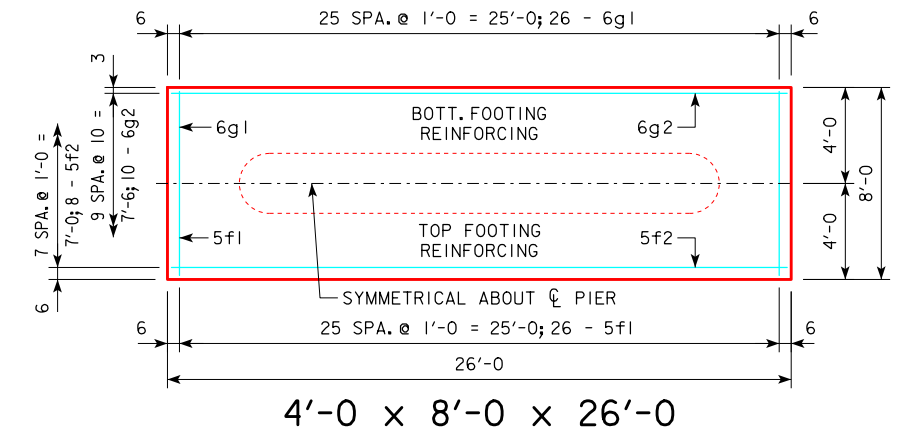
NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

FOOTING NOTES:

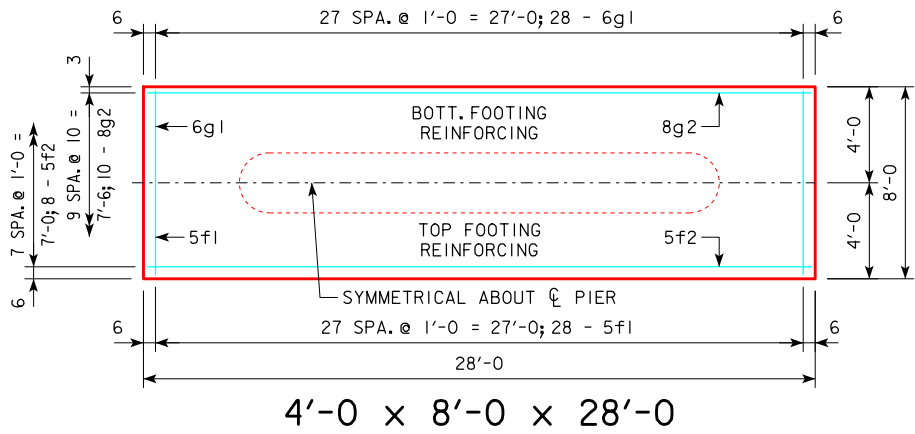
THESE SPREAD FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET RS40-116-14.

THESE SPREAD FOOTINGS SHALL EXTEND AT LEAST 12 INCHES INTO SUITABLE FOUNDATION ROCK AND THE LAST 12 INCHES OF ROCK EXCAVATION SHALL BE TO NEAT LINES OF MASONRY. THE FOUNDATION ROCK SHALL HAVE A MINIMUM LRFD NOMINAL BEARING RESISTANCE OF 30 KIPS PER SQUARE FOOT (ALLOWABLE BEARING VALUE OF AT LEAST 10 KIPS PER SQUARE FOOT).

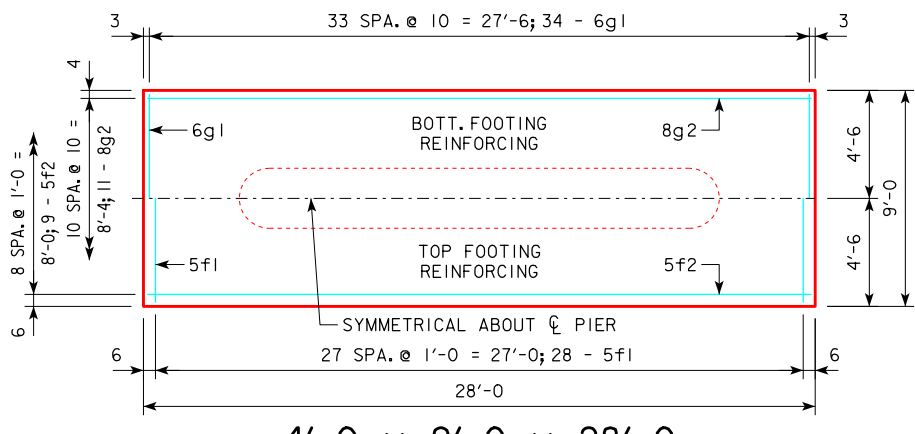
08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER	
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
TEE PIER - SPREAD FOOTINGS 0° SKEW - SHEET 1		RS40-124-14



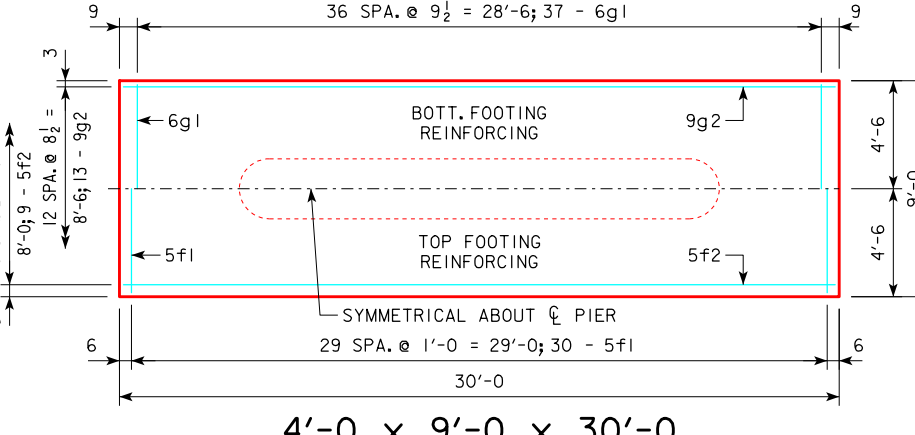
4'-0 x 8'-0 x 26'-0



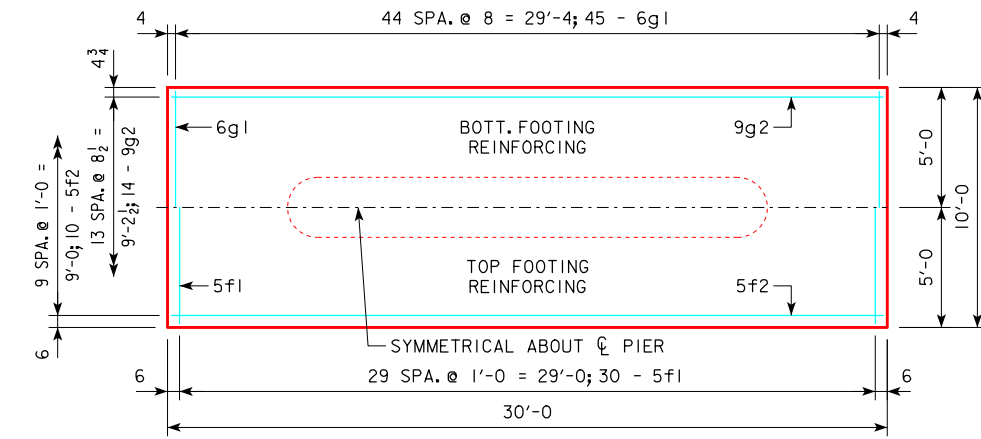
4'-0 x 8'-0 x 28'-0



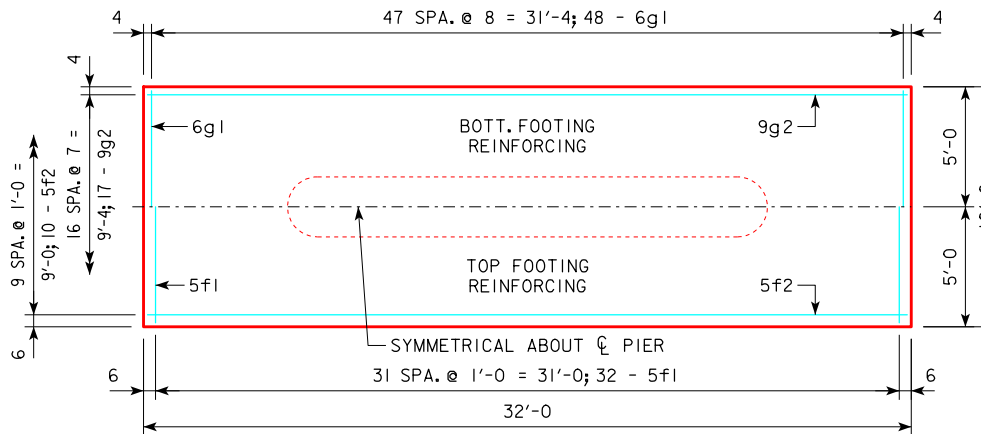
4'-0 x 9'-0 x 28'-0



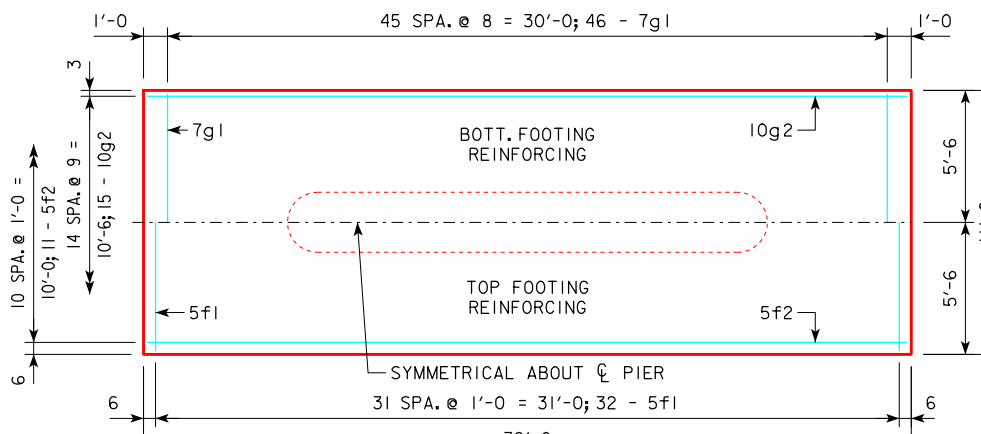
4'-0 x 9'-0 x 30'-0



4'-0 x 10'-0 x 30'-0



4'-0 x 10'-0 x 32'-0



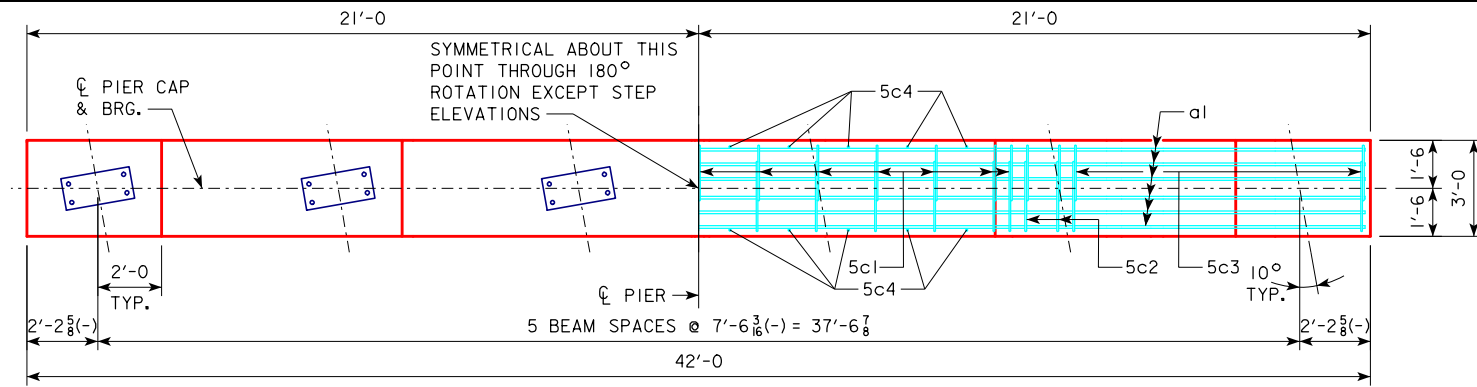
4'-0 x 11'-0 x 32'-0

NOTE:
SEE SHEET RS40-124-14 FOR FOOTING NOTES.

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
	TEE PIER - SPREAD FOOTINGS 0° SKEW - SHEET 2	
	RS40-125-14	

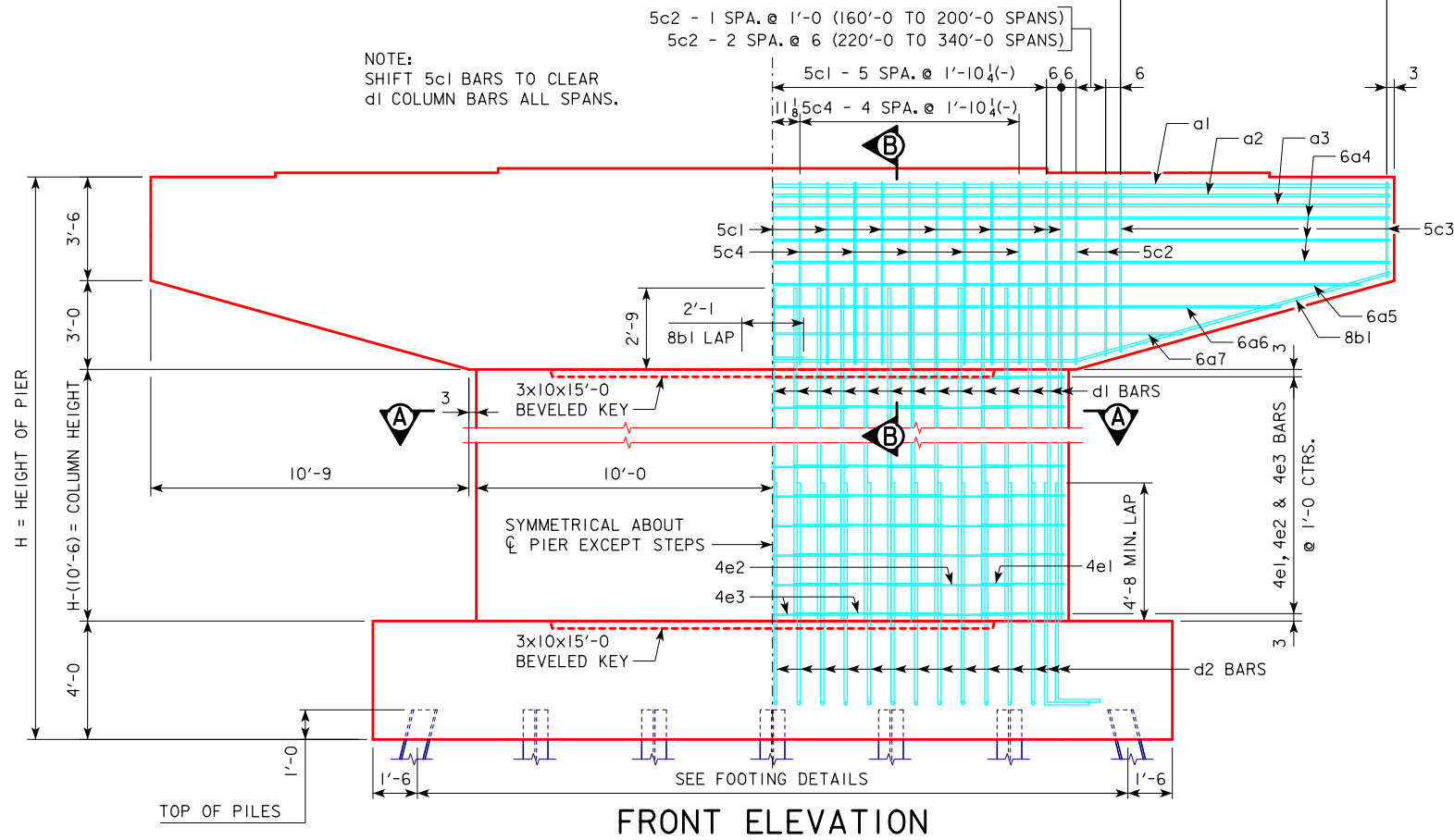
REVISED 02-2017 - CHANGED BEVELED KEYWAY ON PIER COLUMN CAP AND FOOTING TO 3"x10"x15'-0 (WAS 2"x8"x17'-0). KEYWAY LENGTH CHANGED TO BE 5'-0 LESS THAN WIDTH OF PIER COLUMN.
 REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



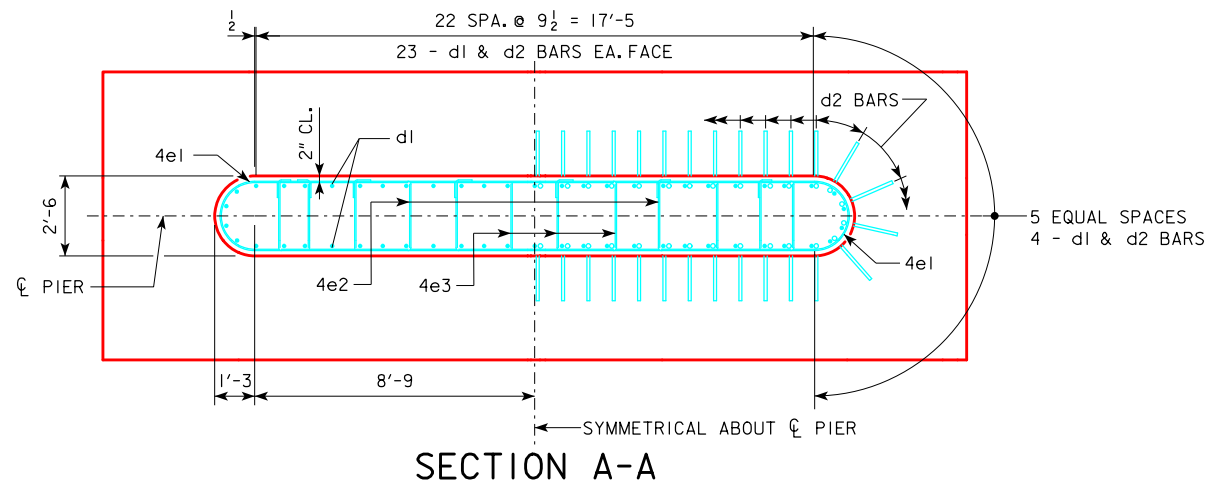
CAP PLAN

160'-0 TO 240'-0 SPANS 5c3 - 9 SPA. @ 1'-0 = 9'-0
 260'-0 TO 280'-0 SPANS 5c3 - 12 SPA. @ 9 = 9'-0
 300'-0 TO 340'-0 SPANS 5c3 - 16 SPA. @ 6 3/4 = 9'-0

NOTE:
 SHIFT 5c1 BARS TO CLEAR
 d1 COLUMN BARS ALL SPANS.

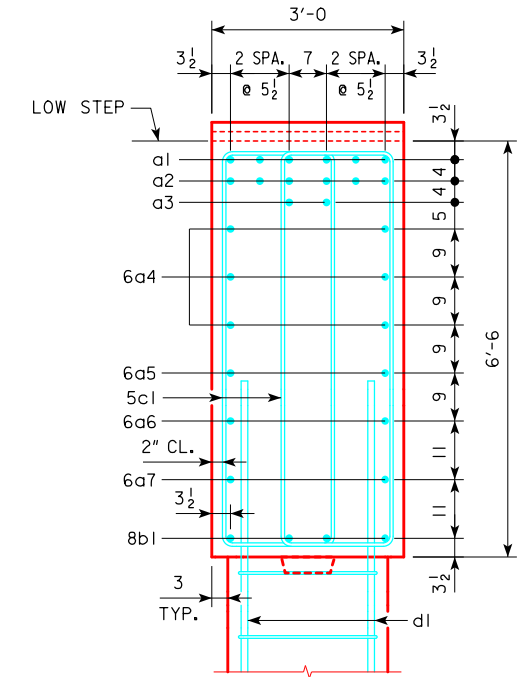


FRONT ELEVATION

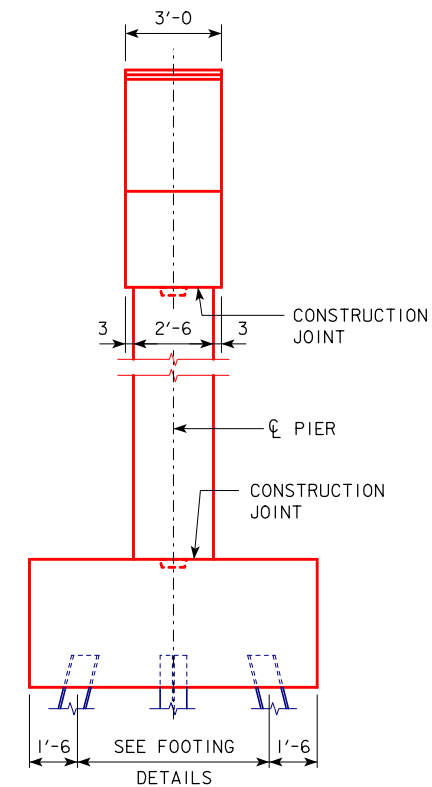


SECTION A-A

NOTE:
 ANCHOR BOLTS REQUIRED FOR FIXED
 PIER BEARINGS ONLY. FOR BOLT AND
 BEARING SIZES, SEE RS40-093-14,
 RS40-094-14 OR RS40-095-14.



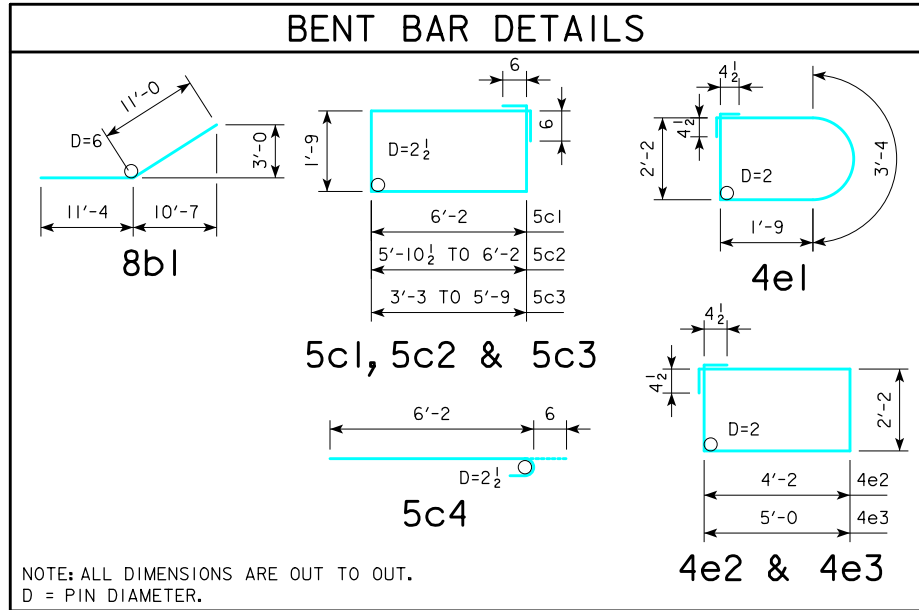
SECTION B-B



END ELEVATION

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER <i>[Signature]</i>		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
TEE PIER CAP & COLUMN DETAILS 10° SKEW		RS40-126-14	

		CAP																														
CL - CL ABUT. BEARINGS		160'-0			180'-0			200'-0			220'-0			240'-0			260'-0			280'-0			300'-0			320'-0			340'-0			
BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
a1	41'-8		6	9	850	6	9	850	6	9	850	6	10	1076	6	10	1076	6	10	1076	6	11	1328	6	11	1328	6	11	1328	6	11	1328
a2	41'-8		6	8	668	6	8	668	6	9	850	6	9	850	6	10	1076	6	10	1076	6	10	1076	6	11	1328	6	11	1328	6	11	1328
a3	41'-8		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
6a4	41'-8		6	6	376	6	6	376	6	6	376	6	6	376	6	6	376	6	6	376	6	6	376	6	6	376	6	6	376	6	6	376
6a5	39'-7		2	6	119	2	6	119	2	6	119	2	6	119	2	6	119	2	6	119	2	6	119	2	6	119	2	6	119	2	6	119
6a6	34'-3		2	6	103	2	6	103	2	6	103	2	6	103	2	6	103	2	6	103	2	6	103	2	6	103	2	6	103	2	6	103
6a7	27'-8		2	6	83	2	6	83	2	6	83	2	6	83	2	6	83	2	6	83	2	6	83	2	6	83	2	6	83	2	6	83
8b1	22'-4		8	8	477	8	8	477	8	8	477	8	8	477	8	8	477	8	8	477	8	8	477	8	8	477	8	8	477	8	8	477
5c1	16'-10		26	5	456	26	5	456	26	5	456	26	5	456	26	5	456	26	5	456	26	5	456	26	5	456	26	5	456	26	5	456
5c2	VARIABLES		8	5	138	8	5	138	8	5	138	12	5	207	12	5	207	12	5	207	12	5	207	12	5	207	12	5	207	12	5	207
5c3	VARIABLES		40	5	563	40	5	563	40	5	563	40	5	563	40	5	563	52	5	732	52	5	732	68	5	957	68	5	957	68	5	957
5c4	6'-8		20	5	139	20	5	139	20	5	139	20	5	139	20	5	139	20	5	139	20	5	139	20	5	139	20	5	139	20	5	139
① TOTAL (LB.)			3972			3972			4154			4449			4675			4844			5096			5573			5698			5856		
STRUCTURAL CONCRETE (CY)			27.7			27.7			27.7			27.7			27.7			27.7			27.7			27.7			27.7			27.7		



NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

		COLUMN																													
H IN FEET	COLUMN HEIGHT	STRUCTURAL CONCRETE (CY)	REINFORCING STEEL												TOTAL WEIGHT (LB.)																
			4d1 BAR		4e1 BAR		4e2 BAR		4e3 BAR		4e3 BAR		4e3 BAR																		
NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT
16	5'-6	9.9	54	9	8'-3	1515	12	4	9'-9	78	12	4	13'-5	108	18	4	15'-1	181	18	4	15'-1	181	18	4	15'-1	181	18	4	15'-1	181	1882
17	6'-6	11.7	54	9	9'-3	1698	14	4	9'-9	91	14	4	13'-5	125	21	4	15'-1	212	21	4	15'-1	212	21	4	15'-1	212	21	4	15'-1	212	2126
18	7'-6	13.5	54	9	10'-3	1882	16	4	9'-9	104	16	4	13'-5	143	24	4	15'-1	242	24	4	15'-1	242	24	4	15'-1	242	24	4	15'-1	242	2371
19	8'-6	15.3	54	9	11'-3	2066	18	4	9'-9	117	18	4	13'-5	161	27	4	15'-1	272	27	4	15'-1	272	27	4	15'-1	272	27	4	15'-1	272	2616
20	9'-6	17.1	54	9	12'-3	2249	20	4	9'-9	130	20	4	13'-5	179	30	4	15'-1	302	30	4	15'-1	302	30	4	15'-1	302	30	4	15'-1	302	2860
21	10'-6	18.9	54	9	13'-3	2433	22	4	9'-9	143	22	4	13'-5	197	33	4	15'-1	332	33	4	15'-1	332	33	4	15'-1	332	33	4	15'-1	332	3105
22	11'-6	20.7	54	9	14'-3	2616	24	4	9'-9	156	24	4	13'-5	215	36	4	15'-1	363	36	4	15'-1	363	36	4	15'-1	363	36	4	15'-1	363	3350
23	12'-6	22.5	54	9	15'-3	2800	26	4	9'-9	169	26	4	13'-5	233	39	4	15'-1	393	39	4	15'-1	393	39	4	15'-1	393	39	4	15'-1	393	3595
24	13'-6	24.3	54	9	16'-3	2984	28	4	9'-9	182	28	4	13'-5	251	42	4	15'-1	423	42	4	15'-1	423	42	4	15'-1	423	42	4	15'-1	423	3840
25	14'-6	26.1	54	9	17'-3	3167	30	4	9'-9	195	30	4	13'-5	269	45	4	15'-1	453	45	4	15'-1	453	45	4	15'-1	453	45	4	15'-1	453	4084
26	15'-6	27.9	54	9	18'-3	3351	32	4	9'-9	208	32	4	13'-5	287	48	4	15'-1	484	48	4	15'-1	484	48	4	15'-1	484	48	4	15'-1	484	4330
27	16'-6	29.7	54	9	19'-3	3534	34	4	9'-9	221	34	4	13'-5	305	51	4	15'-1	514	51	4	15'-1	514	51	4	15'-1	514	51	4	15'-1	514	4574
28	17'-6	31.5	54	9	20'-3	3718	36	4	9'-9	234	36	4	13'-5	323	54	4	15'-1	544	54	4	15'-1	544	54	4	15'-1	544	54	4	15'-1	544	4819
29	18'-6	33.3	54	9	21'-3	3902	38	4	9'-9	247	38	4	13'-5	341	57	4	15'-1	574	57	4	15'-1	574	57	4	15'-1	574	57	4	15'-1	574	5064
30	19'-6	35.1	54	9	22'-3	4085	40	4	9'-9	261	40	4	13'-5	358	60	4	15'-1	605	60	4	15'-1	605	60	4	15'-1	605	60	4	15'-1	605	5309
31	20'-6	36.9	54	9	23'-3	4269	42	4	9'-9	274	42	4	13'-5	376	63	4	15'-1	635	63	4	15'-1	635	63	4	15'-1	635	63	4	15'-1	635	5554
32	21'-6	38.7	54	9	24'-3	4452	44	4	9'-9	287	44	4	13'-5	394	66	4	15'-1	665	66	4	15'-1	665	66	4	15'-1	665	66	4	15'-1	665	5798
33	22'-6	40.5	54	9	25'-3	4636	46	4	9'-9	300	46	4	13'-5	412	69	4	15'-1	695	69	4	15'-1	695	69	4	15'-1	695	69	4	15'-1	695	6043
34	23'-6	42.4	54	9	26'-3	4820	48	4	9'-9	313	48	4	13'-5	430	72	4	15'-1	725	72	4	15'-1	725	72	4	15'-1	725	72	4	15'-1	725	6288
35	24'-6	44.2	54	9	27'-3	5003	50	4	9'-9	326	50	4	13'-5	448	75	4	15'-1	756	75	4	15'-1	756	75	4	15'-1	756	75	4	15'-1	756	6533
36	25'-6	46.0	54	9	28'-3	5187	52	4	9'-9	339	52	4	13'-5	466	78	4	15'-1	786	78	4	15'-1	786	78	4	15'-1	786	78	4	15'-1	786	6778
37	26'-6	47.8	54	9	29'-3	5370	54	4	9'-9	352	54	4	13'-5	484	81	4	15'-1	816	81	4	15'-1	816	81	4	15'-1	816	81	4	15'-1	816	7022
38	27'-6	49.6	54	9	30'-3	5554	56	4	9'-9	365	56	4	13'-5	502	84	4	15'-1	846	84	4	15'-1	846	84	4	15'-1	846	84	4	15'-1	846	7267
39	28'-6	51.4	54	9	31'-3	5738	58	4	9'-9	378	58	4	13'-5	520	87	4	15'-1	877	87	4	15'-1	877	87	4	15'-1	877	87	4	15'-1	877	7513
40	29'-6	53.2	54	9	32'-3	5921	60	4	9'-9	391	60	4	13'-5	538	90	4	15'-1	907	90	4	15'-1	907	90	4	15'-1	907	90	4	15'-1	907	7757

PIER NOTES:

SEE "TEE PIER NOTES" ON RS40-003-14 FOR NOTES REGARDING APPLICATION OF THESE PIER STANDARDS.

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

① SEE SHEET RS40-166-14 FOR STEP REINFORCING STEEL QUANTITIES AND DETAILS.

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	
	STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	TEE PIER CAP & COLUMN DETAILS 10° SKEW
	RS40-127-14

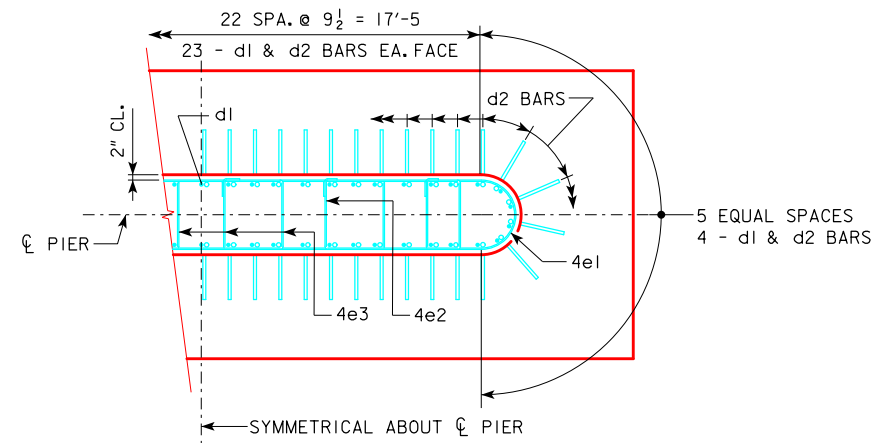
REVISED 02-2017 - CHANGED VERTICAL CLEARANCE OF REBAR "f2" TO TOP OF PIER FOOTING TO 3" (WAS 2").
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

H IN FT.	CL - CL ABUT. BRG.	PILING (HP10x57)		FOOTING SIZE	
		NO. & LAYOUT	① LRFD Pu, STRENGTH I, DES. LOAD (KIPS)		
16 TO 18	160'-0	16A	139	4' x 9' x 24'	
	180'-0	17A	144		
	200'-0	18A	145		
	220'-0	18D	144		
	19 TO 21	240'-0	20A	144	4' x 11' x 28'
		260'-0	21B	143	
		280'-0	23A	143	4' x 12' x 32'
		300'-0	23B	146	
320'-0		25A	144		
340'-0		26A	146		
22 TO 24	160'-0	16B	142	4' x 10' x 24'	
	180'-0	17B	146		
	200'-0	18B	146	4' x 10' x 26'	
	220'-0	19A	143		
	240'-0	21A	143	4' x 11' x 28'	
	260'-0	21B	146		
	280'-0	23A	146	4' x 12' x 32'	
	300'-0	24B	143		
320'-0	25A	147			
340'-0	26B	142			
25 TO 27	160'-0	16C	143	4' x 10' x 26'	
	180'-0	17C	147		
	200'-0	18D	140	4' x 11' x 28'	
	220'-0	19A	146		
	240'-0	21A	146	4' x 11' x 30'	
	260'-0	22A	143		
	280'-0	23B	143	4' x 12' x 32'	
	300'-0	24B	145		
320'-0	25B	143			
340'-0	26B	144			
28 TO 30	160'-0	16D	145	4' x 11' x 26'	
	180'-0	18C	143		
	200'-0	18D	143	4' x 11' x 28'	
	220'-0	18D	146		
	240'-0	20A	146	4' x 11' x 30'	
	260'-0	21B	145		
	280'-0	23A	144	4' x 12' x 32'	
	300'-0	24B	141		
320'-0	26B	142			
340'-0	27A	144			
31 TO 33	160'-0	17D	146	4' x 11' x 26'	
	180'-0	18D	141		
	200'-0	19A	144	4' x 11' x 28'	
	220'-0	21A	144		
	240'-0	22A	141	4' x 11' x 30'	
	260'-0	23A	146		
	280'-0	24B	143	4' x 12' x 32'	
	300'-0	26A	143		
320'-0	26B	143			
340'-0	27A	146			
34 TO 36	160'-0	17E	144	4' x 11' x 28'	
	180'-0	18D	144		
	200'-0	19A	147	4' x 11' x 30'	
	220'-0	21A	146		
	240'-0	22A	144	4' x 11' x 30'	
	260'-0	24A	144		
	280'-0	24B	145	4' x 12' x 32'	
	300'-0	26A	145		
320'-0	26B	145			
340'-0	28A	143			

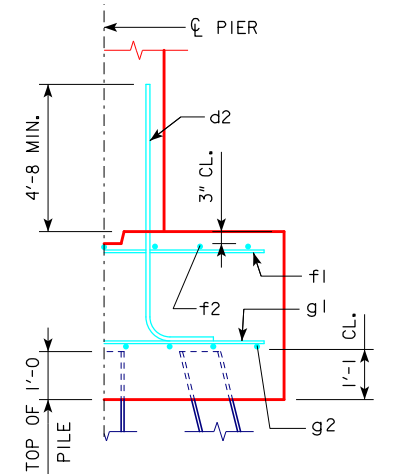
H IN FT.	CL - CL ABUT. BRG.	PILING (HP10x57)		FOOTING SIZE	
		NO. & LAYOUT	① LRFD Pu, STRENGTH I, DES. LOAD (KIPS)		
37 TO 40	160'-0	18D	139	4' x 11' x 28'	
	180'-0	19A	142		
	200'-0	20A	144		
	220'-0	21B	142		
	37 TO 40	240'-0	22A	146	4' x 11' x 30'
		260'-0	24A	147	
		280'-0	25A	143	4' x 12' x 32'
		300'-0	26A	147	
320'-0		26B	147		
340'-0		28A	145		

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)				STRUCTURAL CONCRETE (CY)	
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)		
4' x 9' x 24'	d2	54 - #9 AS SHOWN	9'-1	1668	2818	32.0
	f1	24 - #5 @ 1'-0	8'-8	217		
	f2	9 - #5 @ 1'-0	23'-8	222		
	g1	30 - #6 @ 0'-9 1/2	8'-8	391		
	g2	9 - #6 @ 1'-0	23'-8	320		
	4' x 10' x 24'	d2	54 - #9 AS SHOWN	9'-1		
f1		24 - #5 @ 1'-0	9'-8	242		
f2		10 - #5 @ 1'-0	23'-8	247		
g1		29 - #7 @ 0'-10	9'-8	573		
g2		10 - #6 @ 1'-0	23'-8	355		
4' x 10' x 26'		d2	54 - #9 AS SHOWN	9'-1	1668	3453
	f1	26 - #5 @ 1'-0	9'-8	262		
	f2	10 - #5 @ 1'-0	25'-8	268		
	g1	29 - #7 @ 0'-10 1/2	9'-8	573		
	g2	13 - #7 @ 0'-9 1/2	25'-8	682		
	4' x 11' x 26'	d2	54 - #9 AS SHOWN	9'-1	1668	
f1		26 - #5 @ 1'-0	10'-8	289		
f2		11 - #5 @ 1'-0	25'-8	294		
g1		27 - #8 @ 0'-11 1/2	10'-8	769		
g2		13 - #7 @ 0'-10 1/2	25'-8	682		
4' x 11' x 28'		d2	54 - #9 AS SHOWN	9'-1	1668	4288
	f1	28 - #5 @ 1'-0	10'-8	312		
	f2	11 - #5 @ 1'-0	27'-8	317		
	g1	31 - #8 @ 0'-11	10'-8	883		
	g2	15 - #8 @ 0'-9	27'-8	1108		
	4' x 11' x 30'	d2	54 - #9 AS SHOWN	9'-1	1668	
f1		30 - #5 @ 1'-0	10'-8	334		
f2		11 - #5 @ 1'-0	29'-8	340		
g1		30 - #9 @ 1'-0	10'-8	1088		
g2		14 - #9 @ 0'-9 1/2	29'-8	1412		
4' x 12' x 32'		d2	54 - #9 AS SHOWN	9'-1	1668	6004
	f1	32 - #5 @ 1'-0	11'-8	389		
	f2	12 - #5 @ 1'-0	31'-8	396		
	g1	38 - #9 @ 0'-10	11'-8	1507		
	g2	15 - #10 @ 0'-9 1/2	31'-8	2044		
	4' x 14' x 32'	d2	54 - #9 AS SHOWN	9'-1	1668	
f1		32 - #5 @ 1'-0	13'-8	456		
f2		14 - #5 @ 1'-0	31'-8	462		
g1		39 - #9 @ 0'-9 1/2	13'-8	1812		
g2		19 - #10 @ 0'-9	31'-8	2589		

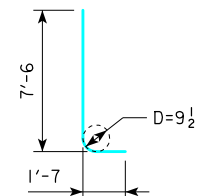
① NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET RS40-126-14.)



TYPICAL SECTION



d2
NOTE: D = PIN DIAMETER.
DIMENSIONS ARE OUT TO OUT.

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

FOOTING NOTES:

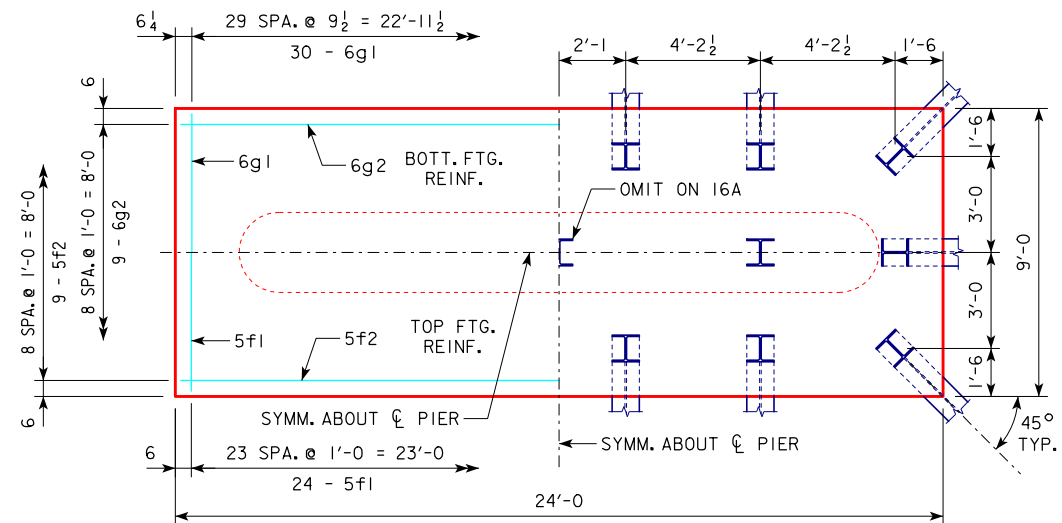
THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET RS40-126-14.

BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.

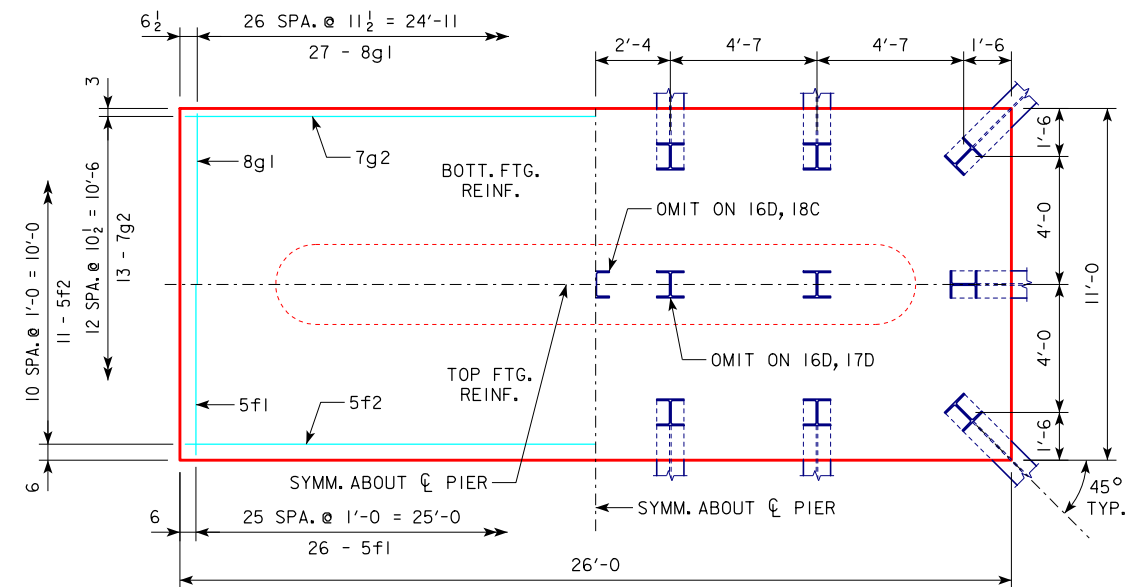
STEEL PILING USED AS POINT BEARING SHALL HAVE A MINIMUM DISTANCE OF APPROXIMATELY 10 FEET FROM BOTTOM OF FOOTING TO TOP OF BEARING ROCK. THE PILE LAYOUTS ARE SUCH THAT THE DISTANCE CENTER TO CENTER OF ADJACENT PILING SHALL NOT EXCEED 8'-0.

PIER PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

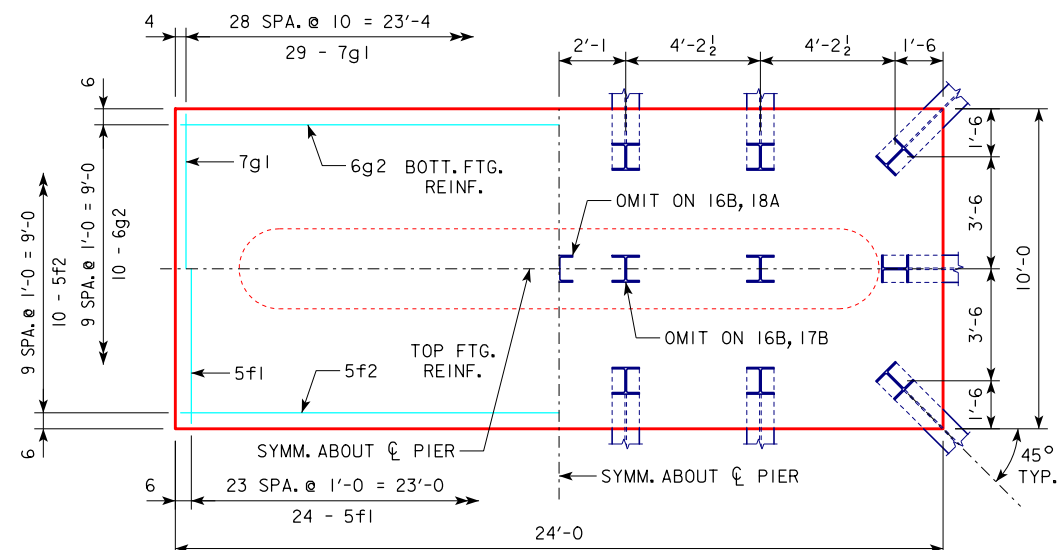
08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES
			ROLLED STEEL BEAM BRIDGES
		OCTOBER, 2014	
		TEE PIER-HP10x57 SRL-1 STEEL PILE FOOTINGS	RS40-128-14
		10° SKEW - SHEET 1	



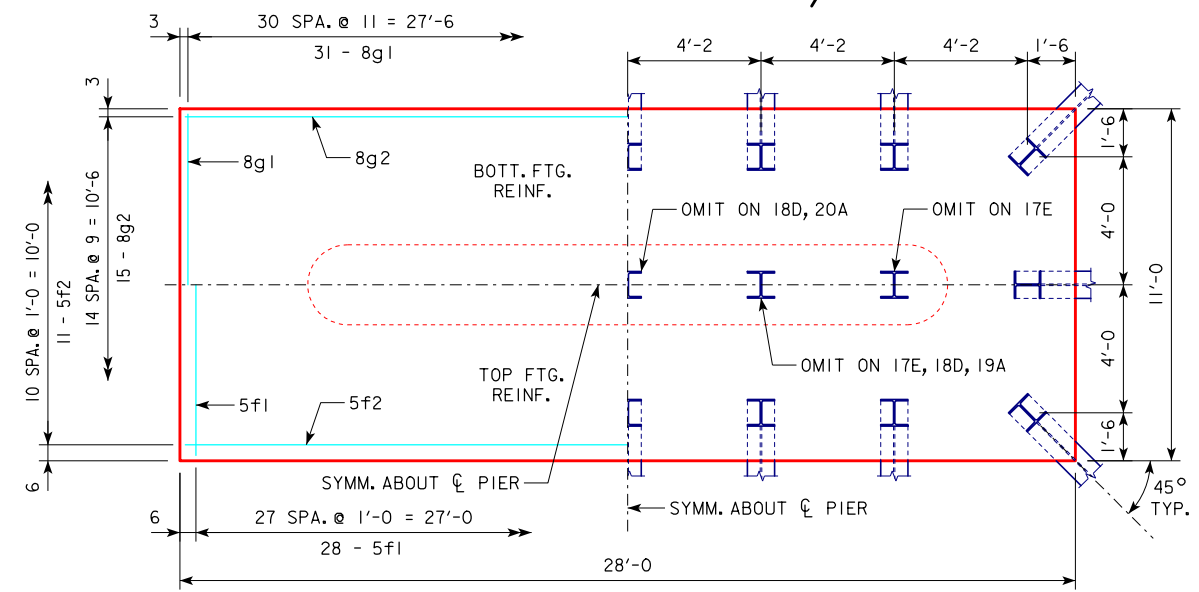
4'-0 x 9'-0 x 24'-0 FOR 16A & 17A



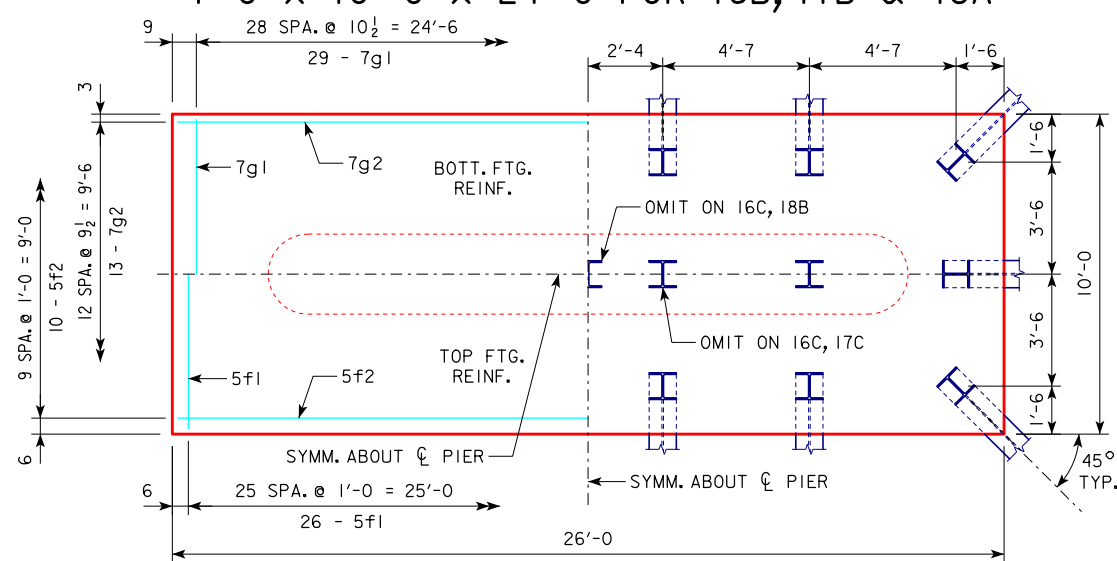
4'-0 x 11'-0 x 26'-0 FOR 16D, 17D & 18C



4'-0 x 10'-0 x 24'-0 FOR 16B, 17B & 18A



4'-0 x 11'-0 x 28'-0 FOR 17E, 18D, 19A, 20A & 21A

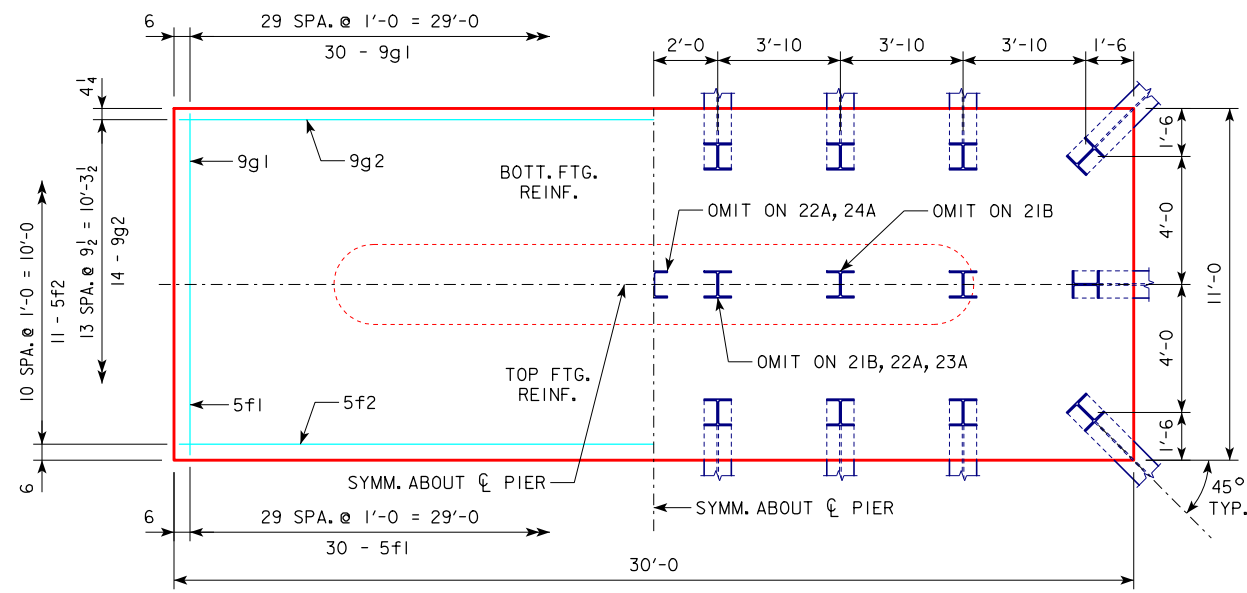


4'-0 x 10'-0 x 26'-0 FOR 16C, 17C & 18B

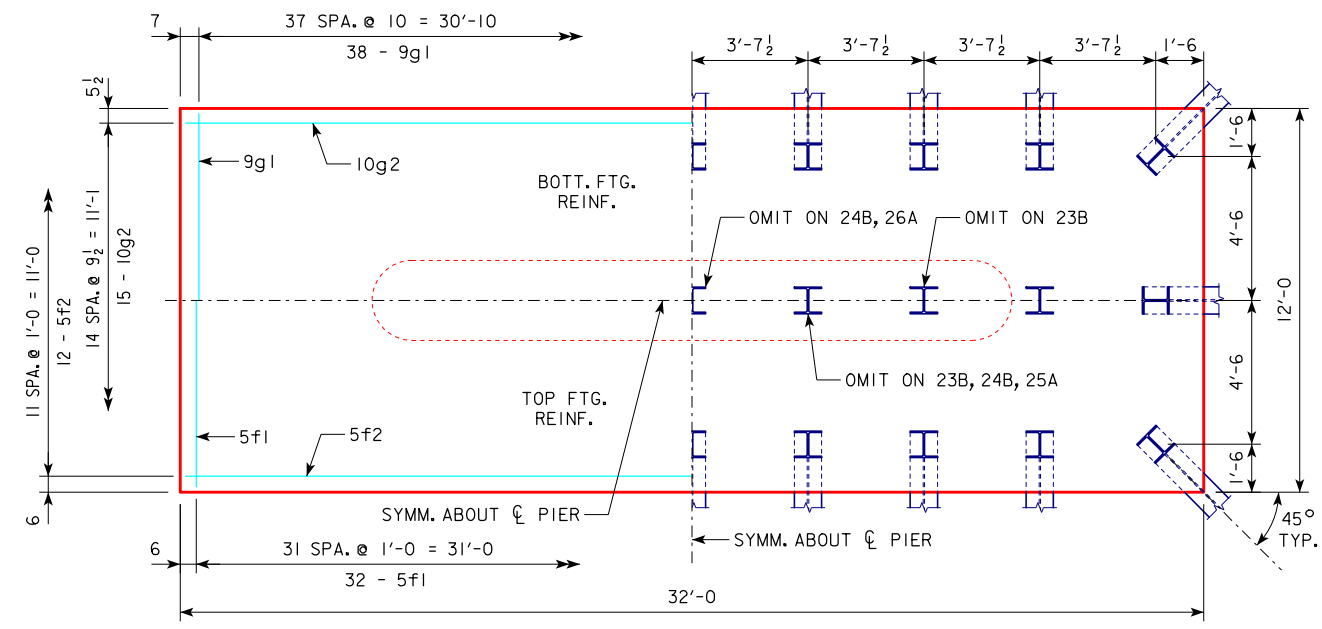
NOTE:
SEE SHEET RS40-128-14 FOR FOOTING NOTES.

08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	RS40-129-14 TEE PIER-HPI0x57 SRL-1 STEEL PILE FOOTINGS 10° SKEW - SHEET 2

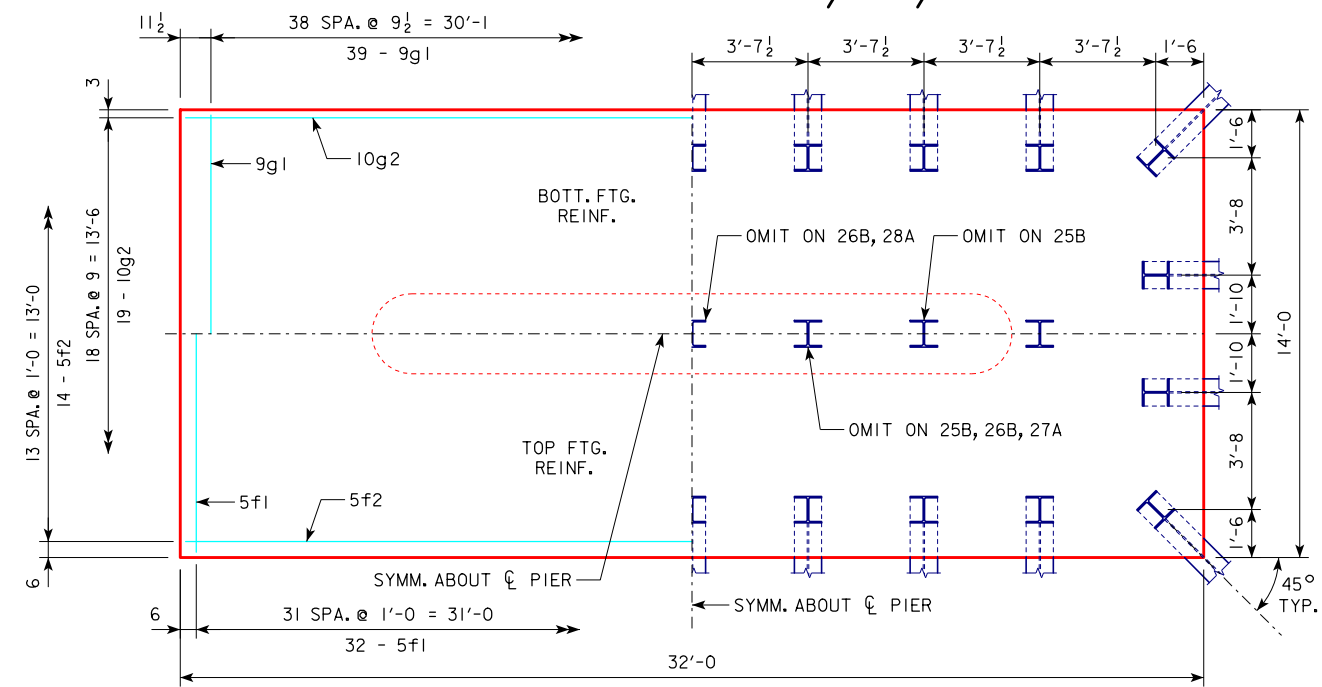
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



4'-0 x 11'-0 x 30'-0 FOR 21B, 22A, 23A & 24A



4'-0 x 12'-0 x 32'-0 FOR 23B, 24B, 25A & 26A



4'-0 x 14'-0 x 32'-0 FOR 25B, 26B, 27A & 28A

NOTE:
SEE SHEET RS40-128-14 FOR FOOTING NOTES.

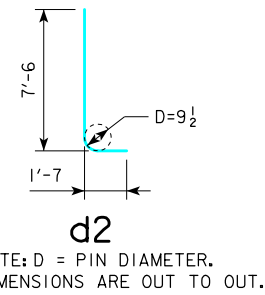
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	RS40-130-14
	TEE PIER-HPI0x57 SRL-I STEEL PILE FOOTINGS <small>10° SKEW - SHEET 3</small>	

REVISED 02-2017 - CHANGED VERTICAL CLEARANCE OF REBAR "f2" TO TOP OF PIER FOOTING TO 3" (WAS 2").
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

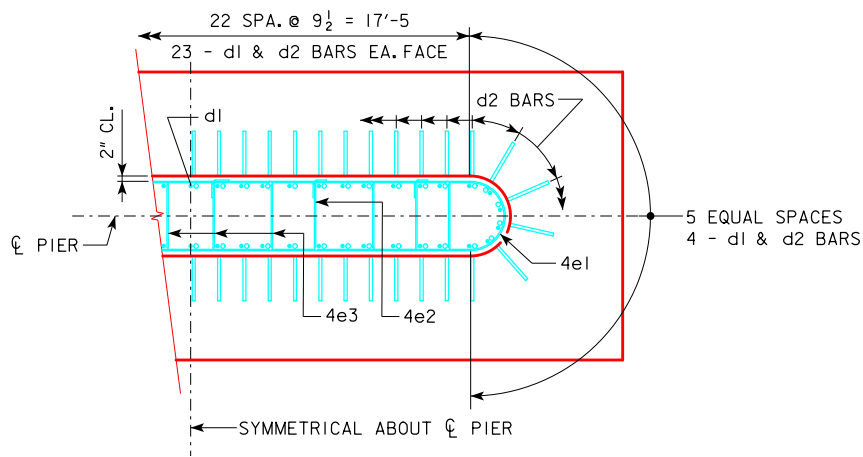
H IN FT.	CL - CL ABUT. BRG.	PILING (HP10x57)		FOOTING SIZE	
		NO. & LAYOUT	LRFD P _u , STRENGTH I, DES. LOAD (KIPS)		
16 TO 18	160'-0	10A	209	4' x 8' x 25'	
	180'-0	11A	211		
	200'-0	12A	206		
	220'-0	13A	208		
	240'-0	14A	206		
	260'-0	14B	216		
	280'-0	16A	211		
19 TO 21	300'-0	16D	214	4' x 9' x 25'	
	320'-0	16E	215		
	340'-0	17B	218		
	160'-0	10A	216		4' x 8' x 25'
	180'-0	11A	218		
	200'-0	12A	213		
	220'-0	13A	214		
240'-0	14A	212			
260'-0	15A	213			
280'-0	16A	217			
22 TO 24	300'-0	16D	219	4' x 9' x 25'	
	320'-0	16E	219		
	340'-0	18A	210		
	160'-0	10B	218		4' x 10' x 25'
	180'-0	12B	202		
	200'-0	12B	214		
	220'-0	13B	216		
240'-0	14B	213			
260'-0	15A	218			
280'-0	16B	217			
25 TO 27	300'-0	16E	212	4' x 10' x 25'	
	320'-0	17B	215		
	340'-0	18A	214		
	160'-0	11C	209		4' x 11' x 25'
	180'-0	12C	204		
	200'-0	12C	216		
	220'-0	13C	217		
240'-0	14C	214			
260'-0	15B	218			
280'-0	16C	218			
28 TO 30	300'-0	16E	215	4' x 11' x 25'	
	320'-0	17B	218		
	340'-0	18A	217		
	160'-0	11C	214		4' x 10' x 25'
	180'-0	12C	209		
	200'-0	13C	206		
	220'-0	14C	204		
240'-0	14C	218			
260'-0	15C	216			
280'-0	16D	218			
31 TO 33	300'-0	16E	218	4' x 11' x 25'	
	320'-0	18A	210		
	340'-0	19A	219		
	160'-0	12D	198		4' x 11' x 25'
	180'-0	12D	211		
	200'-0	13D	208		
	220'-0	14D	205		
240'-0	14D	219			
260'-0	15C	219			
280'-0	16E	209			
34 TO 36	300'-0	17B	212	4' x 12' x 27'	
	320'-0	18A	213		
	340'-0	19A	214		
	160'-0	12E	200		4' x 11' x 27'
	180'-0	12E	212		
	200'-0	13E	208		
	220'-0	14E	205		
240'-0	14E	219			
260'-0	15D	214			
280'-0	16E	212			
37 TO 40	300'-0	17B	215	4' x 12' x 27'	
	320'-0	18A	215		
	340'-0	19A	216		
	160'-0	12F	203		4' x 12' x 27'
	180'-0	12F	215		
	200'-0	13F	215		
	220'-0	14F	217		
240'-0	15D	205			
260'-0	15D	217			
280'-0	16E	215			

H IN FT.	CL - CL ABUT. BRG.	PILING (HP10x57)		FOOTING SIZE
		NO. & LAYOUT	LRFD P _u , STRENGTH I, DES. LOAD (KIPS)	
37 TO 40	160'-0	12F	203	4' x 12' x 27'
	180'-0	12F	215	
	200'-0	13F	215	
	220'-0	14F	217	
	240'-0	15D	205	
	260'-0	15D	217	
	280'-0	16E	215	
	300'-0	17B	218	4' x 12' x 27'
	320'-0	18A	218	
	340'-0	19A	219	

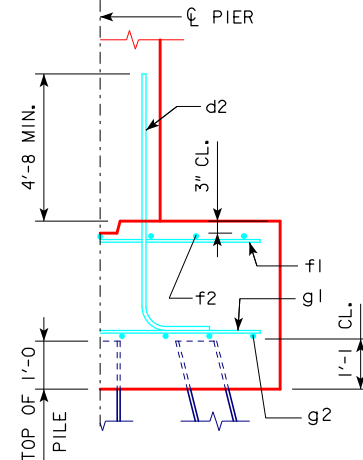


FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)				STRUCTURAL CONCRETE (CY)
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	
4' x 8' x 25'	d2	54 - #9 AS SHOWN	9'-1	1668	3141
	f1	25 - #5 @ 1'-0	7'-8	200	
	f2	8 - #5 @ 1'-0	24'-8	206	
	g1	27 - #6 @ 0'-11	7'-8	311	
	g2	15 - #7 @ 0'-6	24'-8	756	
4' x 9' x 25'	d2	54 - #9 AS SHOWN	9'-1	1668	3378
	f1	25 - #5 @ 1'-0	8'-8	226	
	f2	9 - #5 @ 1'-0	24'-8	232	
	g1	28 - #7 @ 0'-10 1/2	8'-8	496	
	g2	15 - #7 @ 0'-7	24'-8	756	
4' x 10' x 25'	d2	54 - #9 AS SHOWN	9'-1	1668	3656
	f1	25 - #5 @ 1'-0	9'-8	252	
	f2	10 - #5 @ 1'-0	24'-8	257	
	g1	28 - #8 @ 0'-10 1/2	9'-8	723	
	g2	15 - #7 @ 0'-8	24'-8	756	
4' x 11' x 25'	d2	54 - #9 AS SHOWN	9'-1	1668	3998
	f1	25 - #5 @ 1'-0	10'-8	278	
	f2	11 - #5 @ 1'-0	24'-8	283	
	g1	27 - #9 @ 0'-11	10'-8	979	
	g2	12 - #8 @ 0'-11	24'-8	790	
4' x 11' x 27'	d2	54 - #9 AS SHOWN	9'-1	1668	4511
	f1	27 - #5 @ 1'-0	10'-8	300	
	f2	11 - #5 @ 1'-0	26'-8	306	
	g1	34 - #8 @ 0'-9 1/2	10'-8	968	
	g2	14 - #9 @ 0'-9 1/2	26'-8	1269	
4' x 12' x 27'	d2	54 - #9 AS SHOWN	9'-1	1668	5000
	f1	27 - #5 @ 1'-0	11'-8	329	
	f2	12 - #5 @ 1'-0	26'-8	334	
	g1	33 - #9 @ 0'-9 1/2	11'-8	1309	
	g2	15 - #9 @ 0'-9 1/2	26'-8	1360	

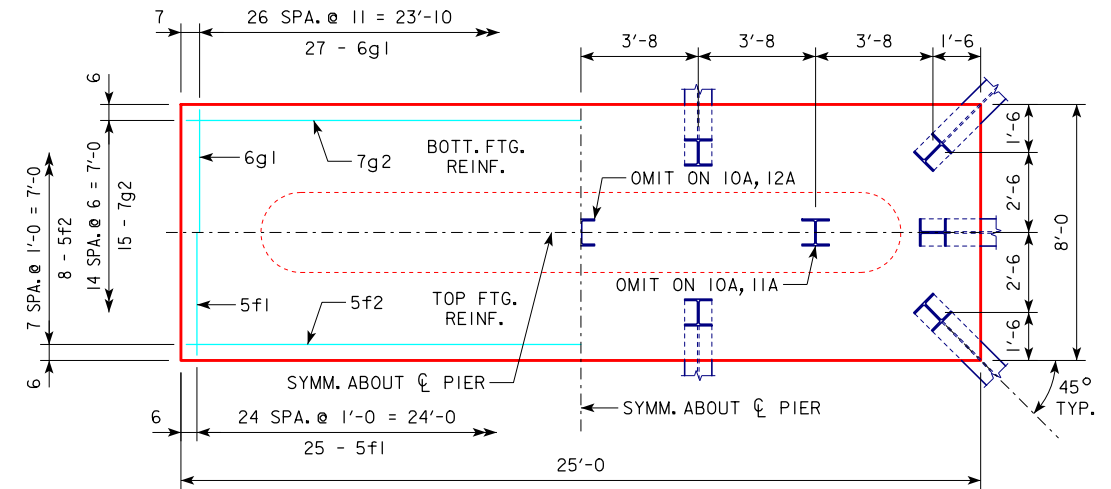
NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



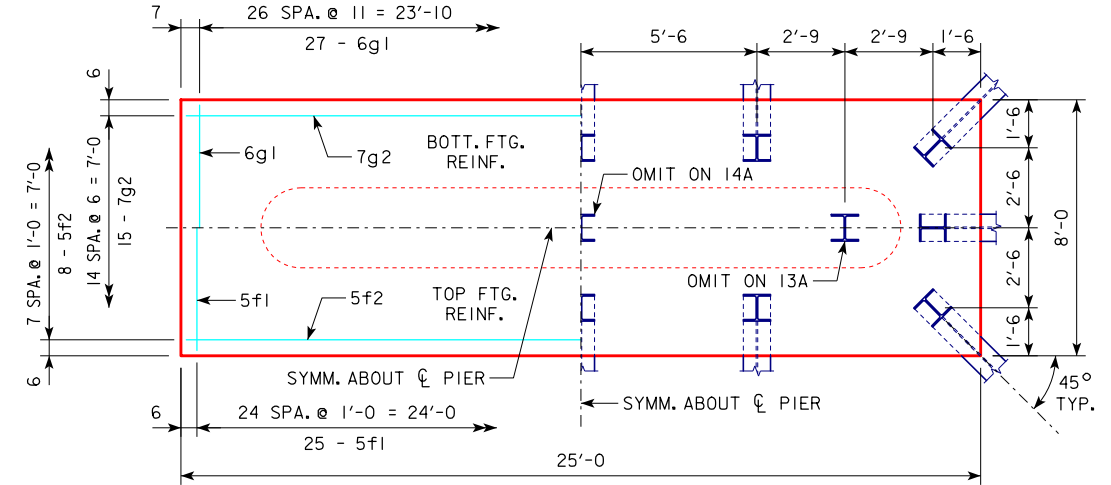
d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET RS40-126-14.)



TYPICAL SECTION



4'-0 x 8'-0 x 25'-0 FOR 10A, 11A & 12A



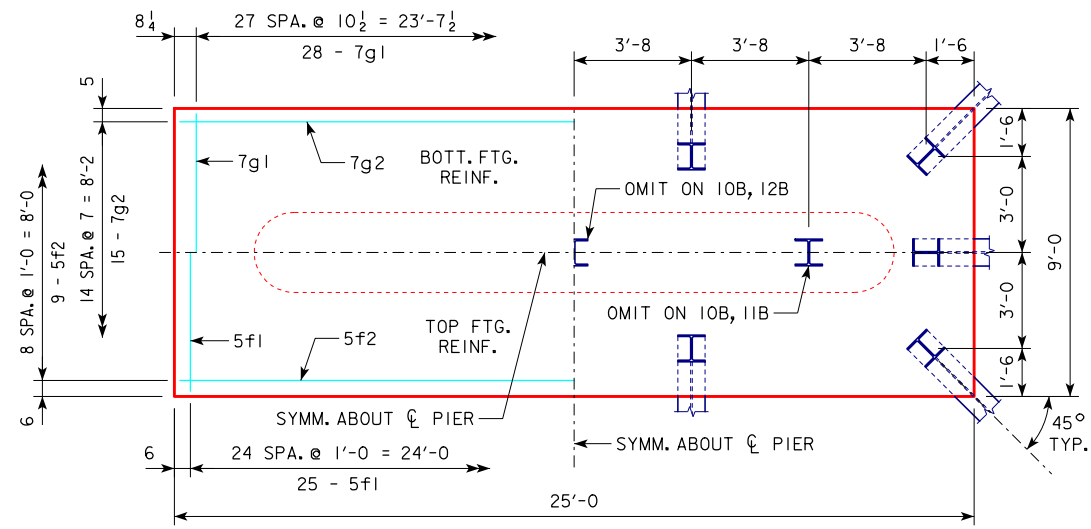
4'-0 x 8'-0 x 25'-0 FOR 13A & 14A

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.
NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.
NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

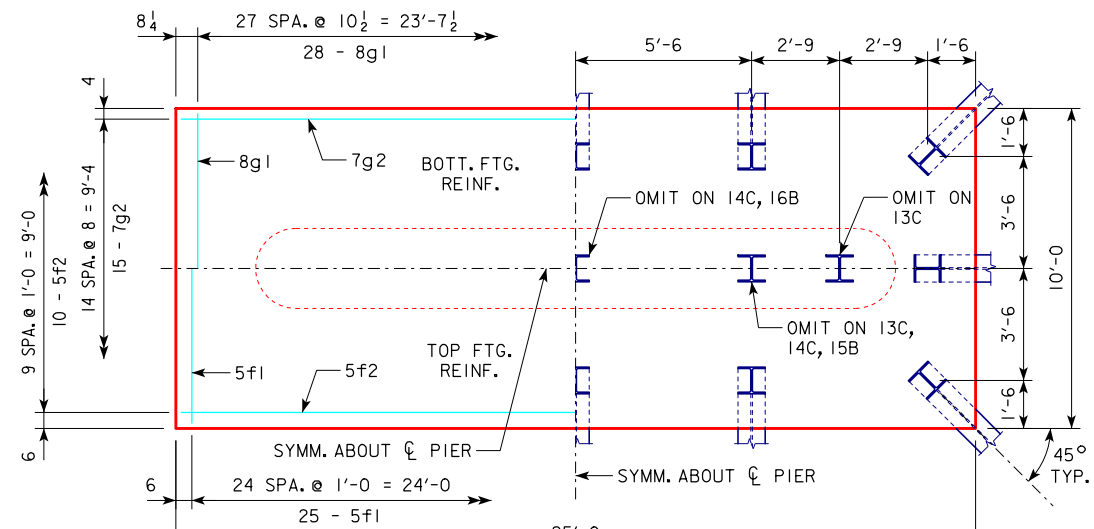
FOOTING NOTES:

THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET RS40-126-14.
BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.
STEEL PILING USED AS POINT BEARING SHALL HAVE A MINIMUM DISTANCE OF APPROXIMATELY 10 FEET FROM BOTTOM OF FOOTING TO TOP OF BEARING ROCK. THE PILE LAYOUTS ARE SUCH THAT THE DISTANCE CENTER TO CENTER OF ADJACENT PILING SHALL NOT EXCEED 8'-0.
PIER PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

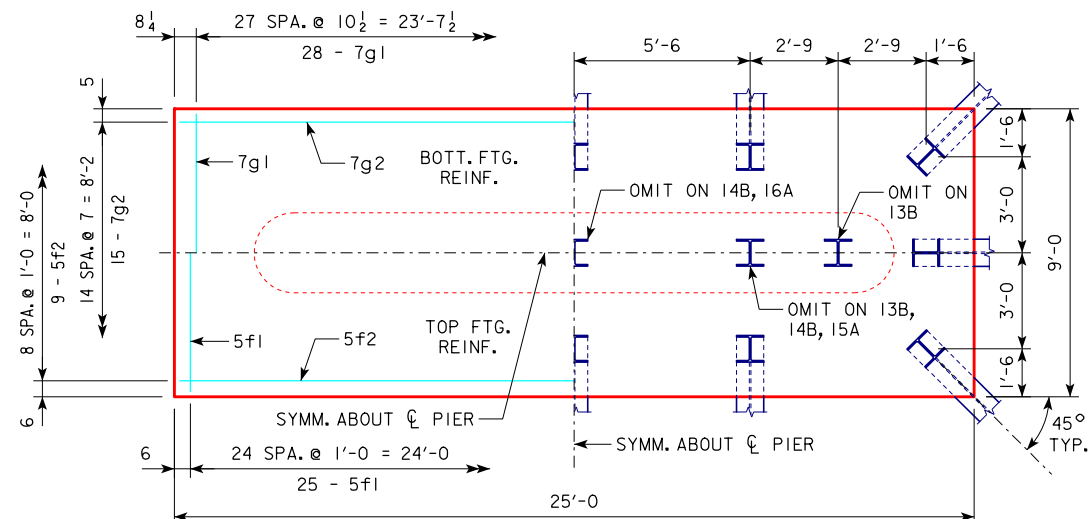
08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	RS40-131-14 10° SKEW - SHEET 1
		TEE PIER-HP10x57 SRL-2 STEEL PILE FOOTINGS	



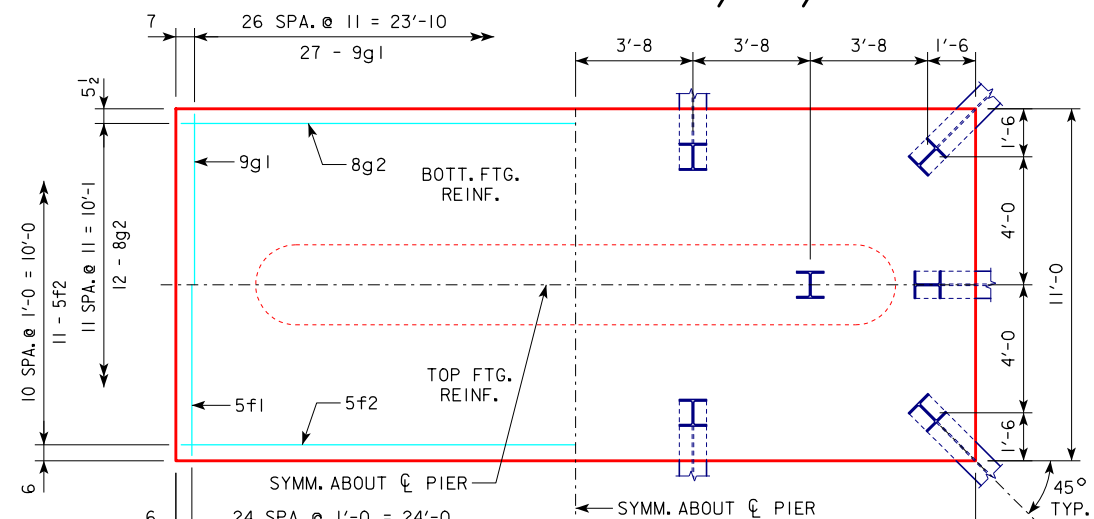
4'-0 x 9'-0 x 25'-0 FOR 10B, 11B & 12B



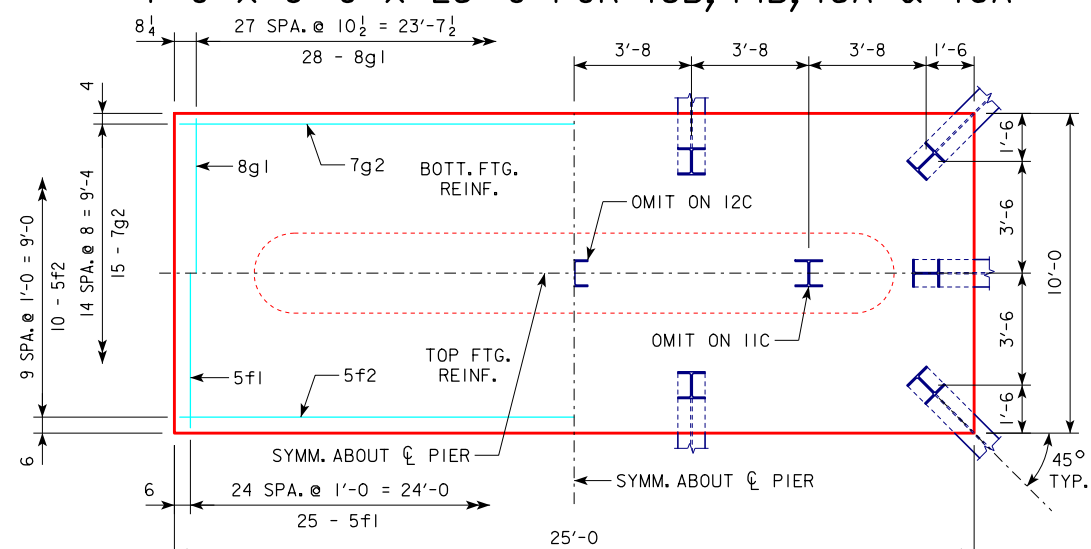
4'-0 x 10'-0 x 25'-0 FOR 13C, 14C, 15B & 16B



4'-0 x 9'-0 x 25'-0 FOR 13B, 14B, 15A & 16A



4'-0 x 11'-0 x 25'-0 FOR 12D

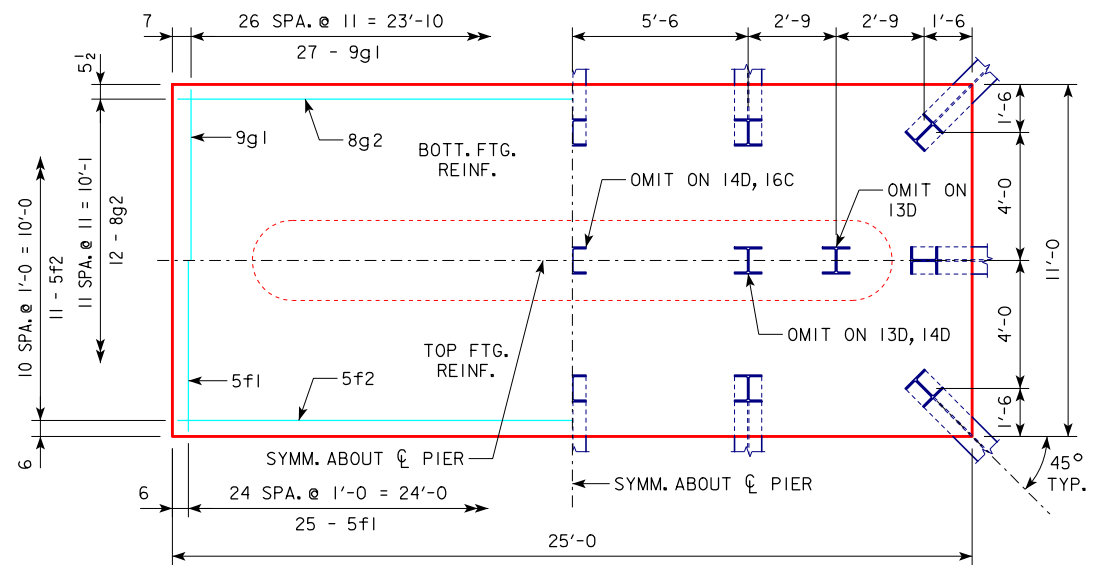


4'-0 x 10'-0 x 25'-0 FOR 11C & 12C

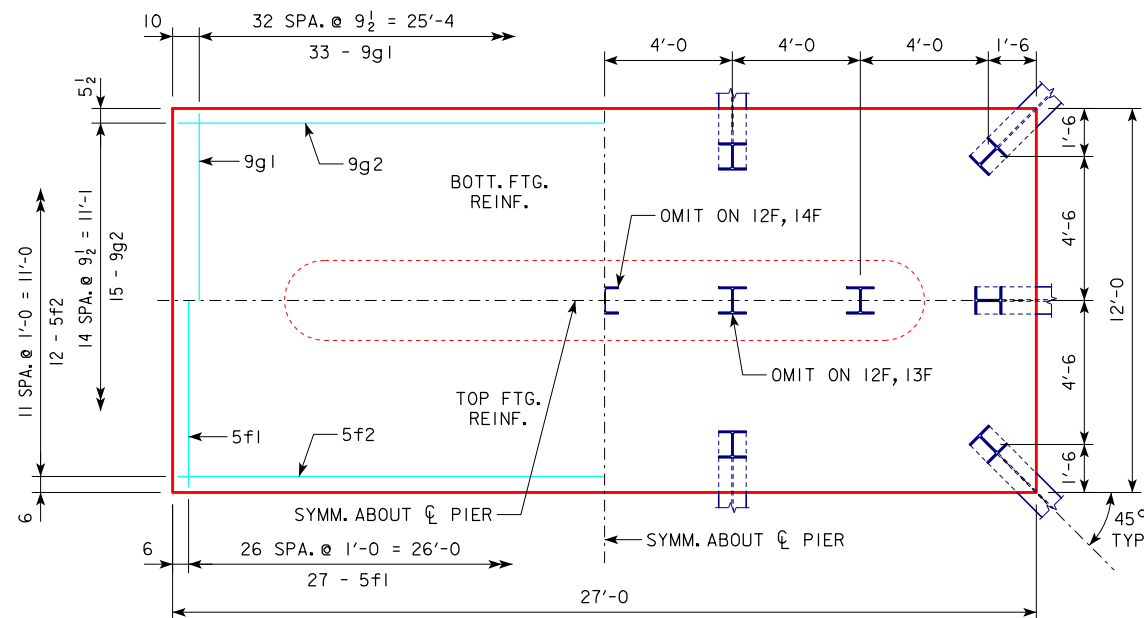
NOTE:
SEE SHEET RS40-131-14 FOR FOOTING NOTES.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	RS40-132-14
	TEE PIER-HPI0x57 SRL-2 STEEL PILE FOOTINGS 10° SKEW - SHEET 2	

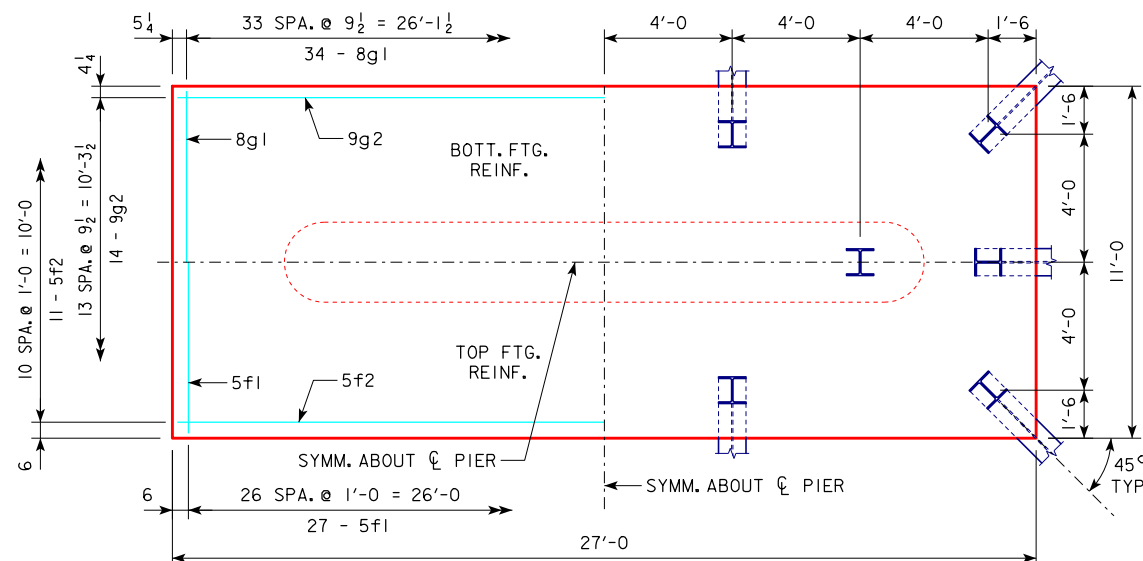
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



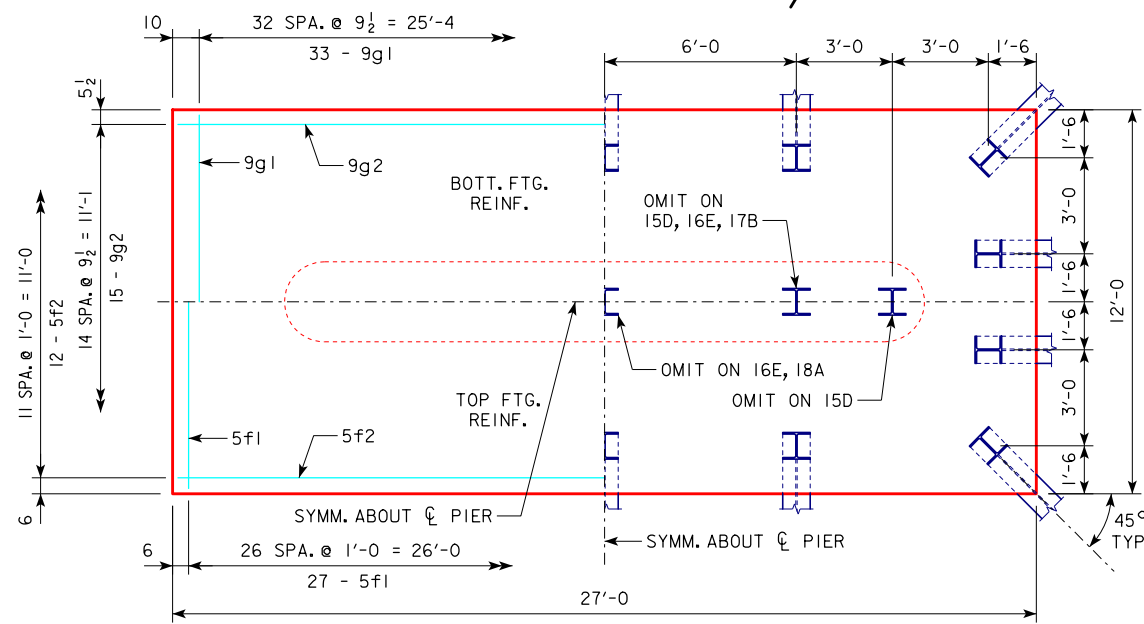
4'-0 x 11'-0 x 25'-0 FOR 13D, 14D & 16C



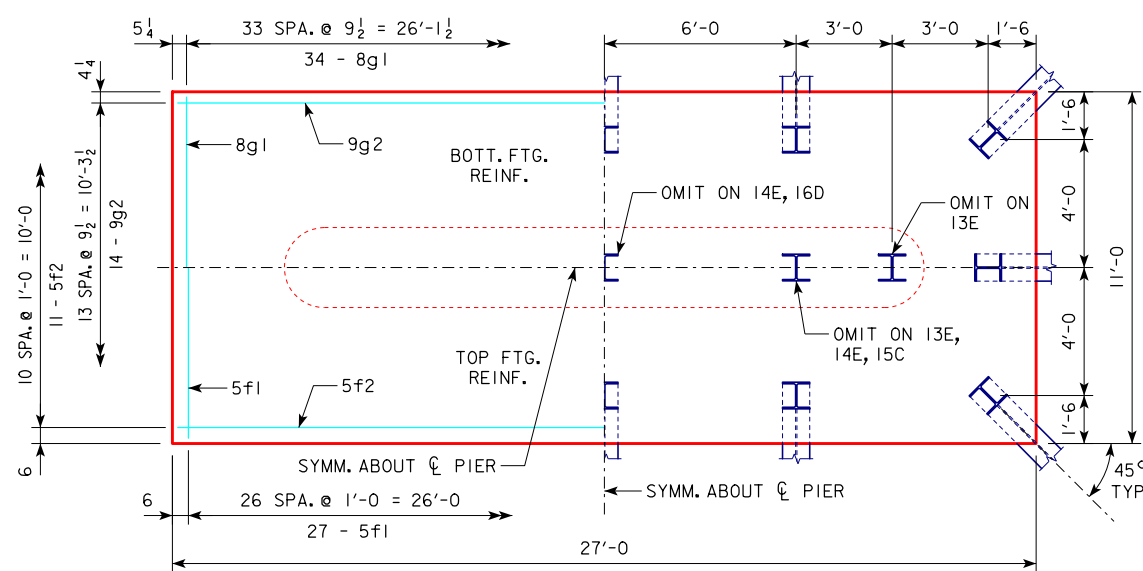
4'-0 x 12'-0 x 27'-0 FOR 12F, 13F & 14F



4'-0 x 11'-0 x 27'-0 FOR 12E



4'-0 x 12'-0 x 27'-0 FOR 15D, 16E, 17B, 18A & 19A



4'-0 x 11'-0 x 27'-0 FOR 13E, 14E, 15C & 16D

NOTE:
SEE SHEET RS40-131-14 FOR FOOTING NOTES.

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

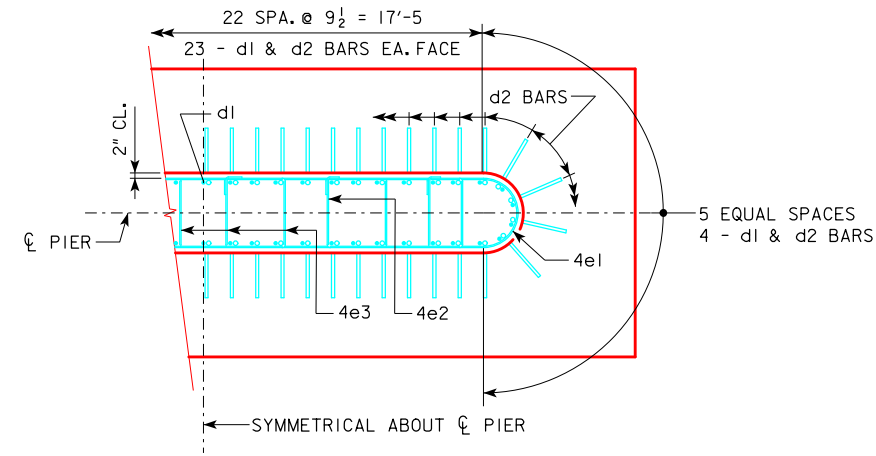
08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER <i>[Signature]</i>		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
TEE PIER-HPI0x57 SRL-2 STEEL PILE FOOTINGS 10° SKEW - SHEET 3		RS40-133-14	

REVISED 02-2017 - CHANGED VERTICAL CLEARANCE OF REBAR "f2" TO TOP OF PIER FOOTING TO 3" (WAS 2").
 REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

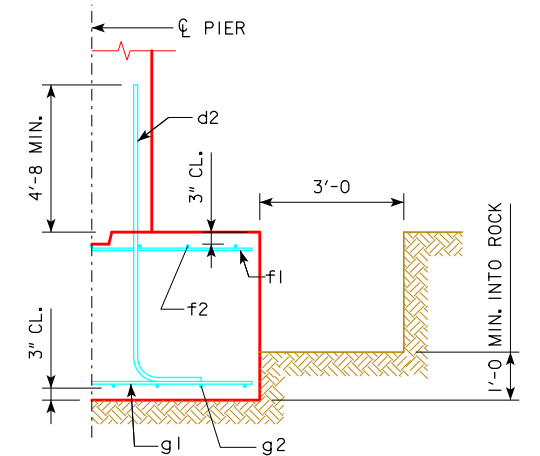
H IN FT.	CL - CL ABUT. BRG.	FOOTING SIZE
16 TO 18	160'-0"	4' x 8' x 26'
	180'-0"	4' x 9' x 26'
	200'-0"	4' x 9' x 28'
	220'-0"	4' x 10' x 28'
	240'-0"	4' x 9' x 28'
	260'-0"	4' x 10' x 28'
	280'-0"	4' x 10' x 28'
	300'-0"	4' x 10' x 30'
	320'-0"	4' x 11' x 30'
	340'-0"	4' x 11' x 30'
19 TO 21	160'-0"	4' x 8' x 26'
	180'-0"	4' x 9' x 26'
	200'-0"	4' x 9' x 28'
	220'-0"	4' x 9' x 28'
	240'-0"	4' x 10' x 28'
	260'-0"	4' x 10' x 28'
	280'-0"	4' x 10' x 30'
	300'-0"	4' x 10' x 30'
	320'-0"	4' x 11' x 30'
	340'-0"	4' x 11' x 30'
22 TO 24	160'-0"	4' x 8' x 26'
	180'-0"	4' x 9' x 26'
	200'-0"	4' x 9' x 28'
	220'-0"	4' x 9' x 28'
	240'-0"	4' x 10' x 28'
	260'-0"	4' x 10' x 28'
	280'-0"	4' x 10' x 30'
	300'-0"	4' x 10' x 30'
	320'-0"	4' x 11' x 30'
	340'-0"	4' x 11' x 30'
25 TO 27	160'-0"	4' x 9' x 26'
	180'-0"	4' x 9' x 26'
	200'-0"	4' x 9' x 28'
	220'-0"	4' x 9' x 28'
	240'-0"	4' x 10' x 28'
	260'-0"	4' x 10' x 28'
	280'-0"	4' x 10' x 30'
	300'-0"	4' x 11' x 30'
	320'-0"	4' x 11' x 30'
	340'-0"	4' x 11' x 32'
28 TO 30	160'-0"	4' x 9' x 26'
	180'-0"	4' x 9' x 26'
	200'-0"	4' x 9' x 28'
	220'-0"	4' x 10' x 28'
	240'-0"	4' x 10' x 28'
	260'-0"	4' x 10' x 30'
	280'-0"	4' x 10' x 30'
	300'-0"	4' x 11' x 30'
	320'-0"	4' x 11' x 30'
	340'-0"	4' x 11' x 32'
31 TO 33	160'-0"	4' x 9' x 26'
	180'-0"	4' x 9' x 26'
	200'-0"	4' x 9' x 28'
	220'-0"	4' x 10' x 28'
	240'-0"	4' x 10' x 28'
	260'-0"	4' x 10' x 30'
	280'-0"	4' x 10' x 30'
	300'-0"	4' x 11' x 30'
	320'-0"	4' x 11' x 30'
	340'-0"	4' x 11' x 32'
34 TO 36	160'-0"	4' x 9' x 26'
	180'-0"	4' x 9' x 26'
	200'-0"	4' x 9' x 28'
	220'-0"	4' x 10' x 28'
	240'-0"	4' x 10' x 28'
	260'-0"	4' x 10' x 30'
	280'-0"	4' x 10' x 30'
	300'-0"	4' x 11' x 30'
	320'-0"	4' x 11' x 30'
	340'-0"	4' x 11' x 32'

H IN FT.	CL - CL ABUT. BRG.	FOOTING SIZE
37 TO 40	160'-0"	4' x 9' x 26'
	180'-0"	4' x 9' x 28'
	200'-0"	4' x 9' x 28'
	220'-0"	4' x 10' x 28'
	240'-0"	4' x 10' x 28'
	260'-0"	4' x 10' x 30'
	280'-0"	4' x 10' x 30'
	300'-0"	4' x 11' x 30'
	320'-0"	4' x 11' x 30'
	340'-0"	4' x 11' x 32'

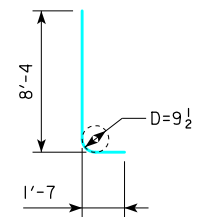
FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)				TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)		
4' x 8' x 26'	d2	54 - #9 AS SHOWN	9'-11"	1821	2962	30.8
	f1	26 - #5 @ 1'-0"	7'-8"	208		
	f2	8 - #5 @ 1'-0"	25'-8"	214		
	g1	26 - #6 @ 1'-0"	7'-8"	299		
4' x 9' x 26'	d2	54 - #9 AS SHOWN	9'-11"	1821	3160	34.7
	f1	26 - #5 @ 1'-0"	8'-8"	235		
	f2	9 - #5 @ 1'-0"	25'-8"	241		
	g1	30 - #6 @ 0'-10 1/2"	8'-8"	391		
4' x 9' x 28'	d2	54 - #9 AS SHOWN	9'-11"	1821	3577	37.3
	f1	28 - #5 @ 1'-0"	8'-8"	253		
	f2	9 - #5 @ 1'-0"	27'-8"	260		
	g1	33 - #6 @ 0'-10"	8'-8"	430		
4' x 10' x 28'	d2	54 - #9 AS SHOWN	9'-11"	1821	3950	41.5
	f1	28 - #5 @ 1'-0"	9'-8"	282		
	f2	10 - #5 @ 1'-0"	27'-8"	289		
	g1	34 - #7 @ 0'-10"	9'-8"	672		
4' x 10' x 30'	d2	54 - #9 AS SHOWN	9'-11"	1821	4575	44.4
	f1	30 - #5 @ 1'-0"	9'-8"	302		
	f2	10 - #5 @ 1'-0"	29'-8"	309		
	g1	37 - #7 @ 0'-9 1/2"	9'-8"	731		
4' x 11' x 30'	d2	54 - #9 AS SHOWN	9'-11"	1821	5062	48.9
	f1	30 - #5 @ 1'-0"	10'-8"	334		
	f2	11 - #5 @ 1'-0"	29'-8"	340		
	g1	37 - #8 @ 0'-9 1/2"	10'-8"	1054		
4' x 11' x 32'	d2	54 - #9 AS SHOWN	9'-11"	1821	5831	52.1
	f1	32 - #5 @ 1'-0"	10'-8"	356		
	f2	11 - #5 @ 1'-0"	31'-8"	363		
	g1	39 - #8 @ 0'-9 1/2"	10'-8"	1111		
4' x 11' x 32'	d2	54 - #9 AS SHOWN	9'-11"	1821	2180	
	f1	32 - #5 @ 1'-0"	31'-8"	363		
	f2	11 - #5 @ 1'-0"	31'-8"	363		
	g1	16 - #10 @ 0'-8"	31'-8"	2180		



d2 BAR LAYOUT
 (SEE SECTION A-A ON SHEET RS40-126-14.)



TYPICAL SECTION



d2

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

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

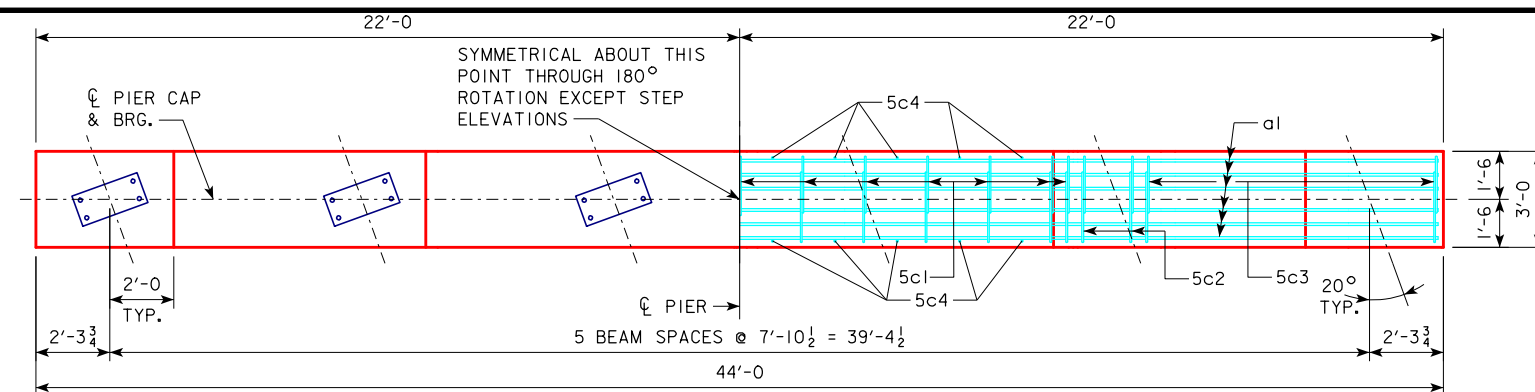
FOOTING NOTES:

THESE SPREAD FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET RS40-126-14.

THESE SPREAD FOOTINGS SHALL EXTEND AT LEAST 12 INCHES INTO SUITABLE FOUNDATION ROCK AND THE LAST 12 INCHES OF ROCK EXCAVATION SHALL BE TO NEAT LINES OF MASONRY. THE FOUNDATION ROCK SHALL HAVE A MINIMUM LRFD NOMINAL BEARING RESISTANCE OF 30 KIPS PER SQUARE FOOT (ALLOWABLE BEARING VALUE OF AT LEAST 10 KIPS PER SQUARE FOOT).

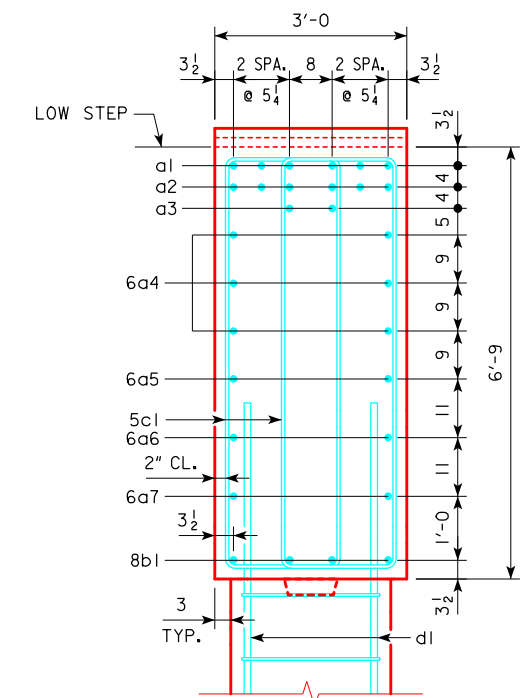
08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	TEE PIER - SPREAD FOOTINGS 10° SKEW - SHEET 1	RS40-134-14

REVISED 02-2017 - CHANGED BEVELED KEYWAY ON PIER COLUMN CAP AND FOOTING TO 3"x10"x16'-0 (WAS 2"x8"x18'-0). KEYWAY LENGTH CHANGED TO BE 5'-0 LESS THAN WIDTH OF PIER COLUMN.
 REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

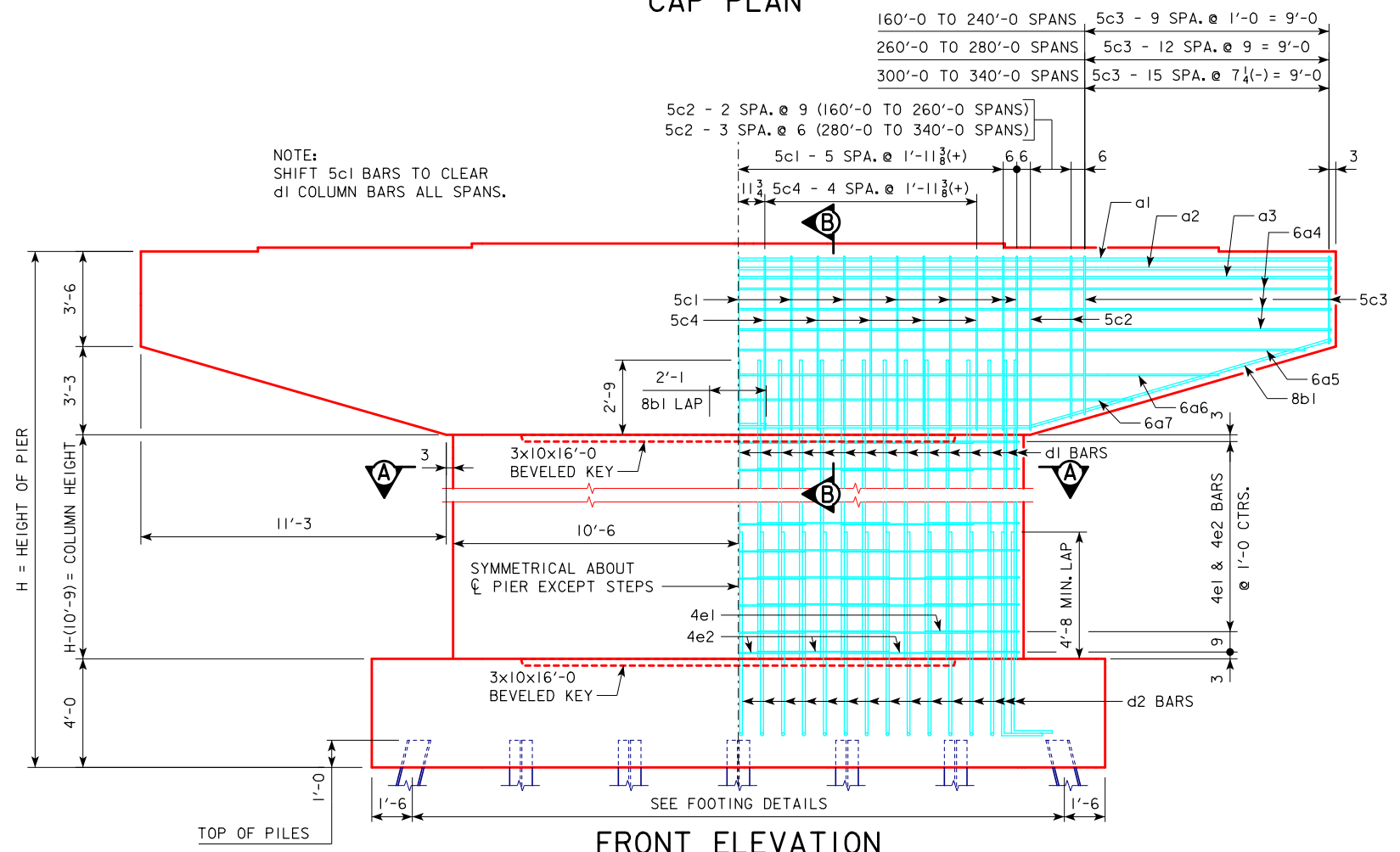


CAP PLAN

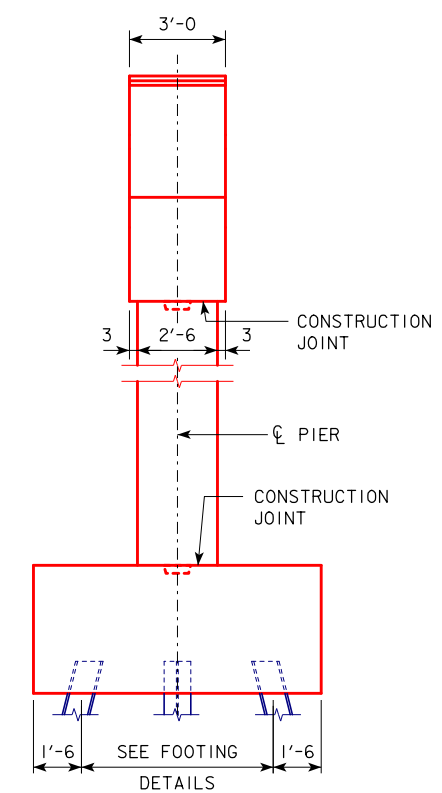
NOTE:
 ANCHOR BOLTS REQUIRED FOR FIXED
 PIER BEARINGS ONLY. FOR BOLT AND
 BEARING SIZES, SEE RS40-093-14,
 RS40-094-14 OR RS40-095-14.



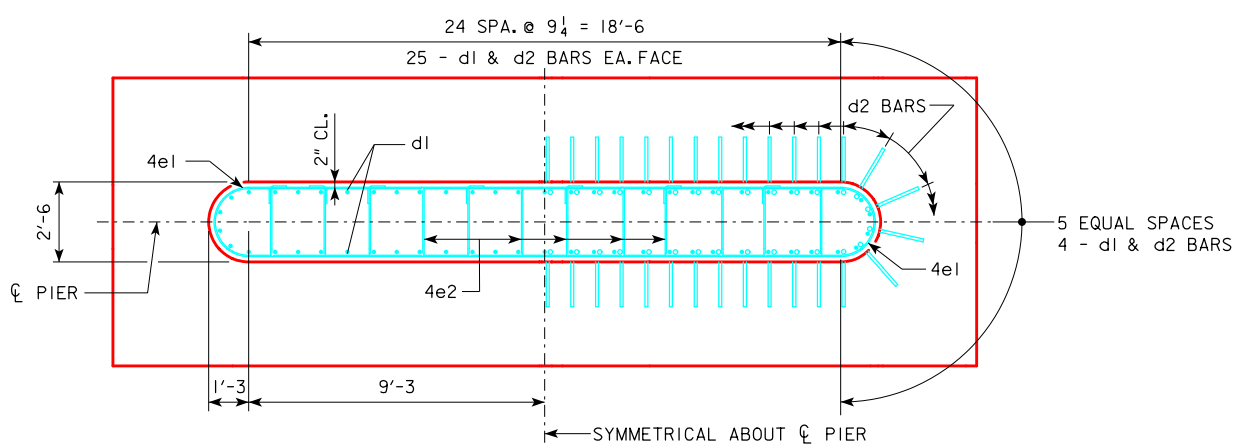
SECTION B-B



FRONT ELEVATION



END ELEVATION

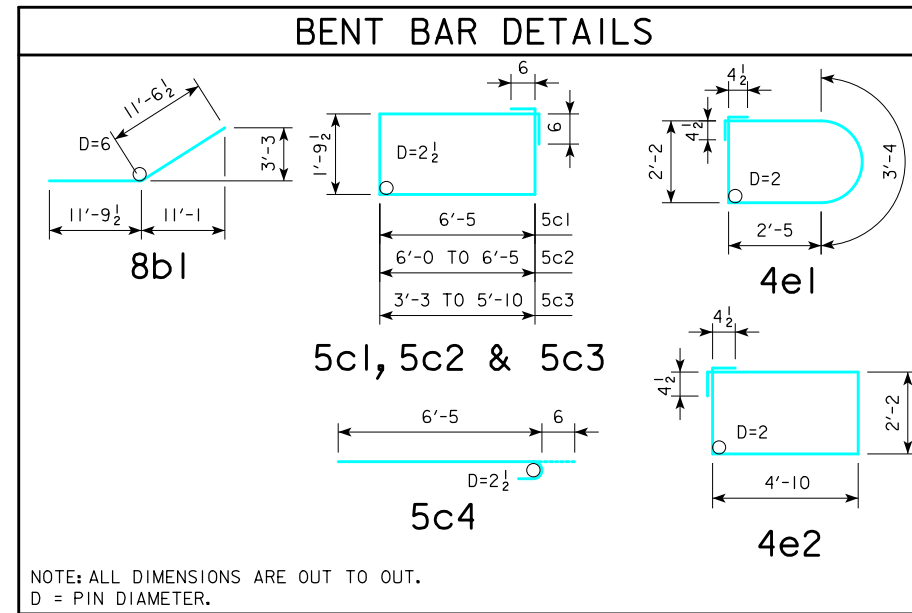


SECTION A-A

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER 	
	STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	TEE PIER CAP & COLUMN DETAILS 20° SKEW
RS40-136-14	

CAP		160'-0		180'-0		200'-0		220'-0		240'-0		260'-0		280'-0		300'-0		320'-0		340'-0							
CL - CL ABUT. BEARINGS	REINFORCING STEEL	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT					
a1	43'-8	6	9	891	6	9	891	6	9	891	6	10	1127	6	10	1127	6	11	1392	6	11	1392	6	11	1392		
a2	43'-8	6	8	700	6	8	700	6	9	891	6	9	891	6	10	1127	6	10	1127	6	11	1392	6	11	1392		
a3	43'-8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2	6	131	2	9	297
6a4	43'-8	6	6	394	6	6	394	6	6	394	6	6	394	6	6	394	6	6	394	6	6	394	6	6	394		
6a5	41'-8	2	6	125	2	6	125	2	6	125	2	6	125	2	6	125	2	6	125	2	6	125	2	6	125		
6a6	35'-4	2	6	106	2	6	106	2	6	106	2	6	106	2	6	106	2	6	106	2	6	106	2	6	106		
6a7	29'-0	2	6	87	2	6	87	2	6	87	2	6	87	2	6	87	2	6	87	2	6	87	2	6	87		
8b1	23'-4	8	8	498	8	8	498	8	8	498	8	8	498	8	8	498	8	8	498	8	8	498	8	8	498		
5c1	17'-5	26	5	472	26	5	472	26	5	472	26	5	472	26	5	472	26	5	472	26	5	472	26	5	472		
5c2	VARIES	12	5	213	12	5	213	12	5	213	12	5	213	12	5	284	16	5	284	16	5	284	16	5	284		
5c3	VARIES	40	5	570	40	5	570	40	5	570	40	5	570	52	5	741	52	5	741	64	5	912	64	5	912		
5c4	6'-11	20	5	144	20	5	144	20	5	144	20	5	144	20	5	144	20	5	144	20	5	144	20	5	144		
① TOTAL (LB.)		4200		4200		4391		4627		4863		5034		5370		5806		5937		6103							
STRUCTURAL CONCRETE (CY)		29.9		29.9		29.9		29.9		29.9		29.9		29.9		29.9		29.9		29.9							

COLUMN		STRUCTURAL CONCRETE (CY)		REINFORCING STEEL												TOTAL WEIGHT (LB.)		
H IN FEET	COLUMN HEIGHT	NO.	SIZE	LENGTH	WEIGHT	d1 BAR				4e1 BAR				4e2 BAR				
						NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	
16	5'-3	9.9	58	9	8'-0	1578	12	4	11'-1	89	30	4	14'-9	296	1963			
17	6'-3	11.8	58	9	9'-0	1775	14	4	11'-1	104	35	4	14'-9	345	2224			
18	7'-3	13.7	58	9	10'-0	1972	16	4	11'-1	118	40	4	14'-9	394	2484			
19	8'-3	15.6	58	9	11'-0	2169	18	4	11'-1	133	45	4	14'-9	443	2745			
20	9'-3	17.5	58	9	12'-0	2366	20	4	11'-1	148	50	4	14'-9	493	3007			
21	10'-3	19.4	58	9	13'-0	2564	22	4	11'-1	163	55	4	14'-9	542	3269			
22	11'-3	21.3	58	9	14'-0	2761	24	4	11'-1	178	60	4	14'-9	591	3530			
23	12'-3	23.2	58	9	15'-0	2958	26	4	11'-1	192	65	4	14'-9	640	3790			
24	13'-3	25.1	58	9	16'-0	3155	28	4	11'-1	207	70	4	14'-9	690	4052			
25	14'-3	27.0	58	9	17'-0	3352	30	4	11'-1	222	75	4	14'-9	739	4313			
26	15'-3	28.9	58	9	18'-0	3550	32	4	11'-1	237	80	4	14'-9	788	4575			
27	16'-3	30.8	58	9	19'-0	3747	34	4	11'-1	252	85	4	14'-9	838	4837			
28	17'-3	32.7	58	9	20'-0	3944	36	4	11'-1	267	90	4	14'-9	887	5098			
29	18'-3	34.6	58	9	21'-0	4141	38	4	11'-1	281	95	4	14'-9	936	5358			
30	19'-3	36.5	58	9	22'-0	4338	40	4	11'-1	296	100	4	14'-9	985	5619			
31	20'-3	38.4	58	9	23'-0	4536	42	4	11'-1	311	105	4	14'-9	1035	5882			
32	21'-3	40.3	58	9	24'-0	4733	44	4	11'-1	326	110	4	14'-9	1084	6143			
33	22'-3	42.2	58	9	25'-0	4930	46	4	11'-1	341	115	4	14'-9	1133	6404			
34	23'-3	44.1	58	9	26'-0	5127	48	4	11'-1	355	120	4	14'-9	1182	6664			
35	24'-3	45.9	58	9	27'-0	5324	50	4	11'-1	370	125	4	14'-9	1232	6926			
36	25'-3	47.8	58	9	28'-0	5522	52	4	11'-1	385	130	4	14'-9	1281	7188			
37	26'-3	49.7	58	9	29'-0	5719	54	4	11'-1	400	135	4	14'-9	1330	7449			
38	27'-3	51.6	58	9	30'-0	5916	56	4	11'-1	415	140	4	14'-9	1379	7710			
39	28'-3	53.5	58	9	31'-0	6113	58	4	11'-1	429	145	4	14'-9	1429	7971			
40	29'-3	55.4	58	9	32'-0	6310	60	4	11'-1	444	150	4	14'-9	1478	8232			



NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

PIER NOTES:

SEE "TEE PIER NOTES" ON RS40-003-14 FOR NOTES REGARDING APPLICATION OF THESE PIER STANDARDS.

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

① SEE SHEET RS40-167-14 FOR STEP REINFORCING STEEL QUANTITIES AND DETAILS.

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE <i>[Signature]</i> APPROVED BY BRIDGE ENGINEER	
	STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	TEE PIER CAP & COLUMN DETAILS 20° SKEW
RS40-137-14	

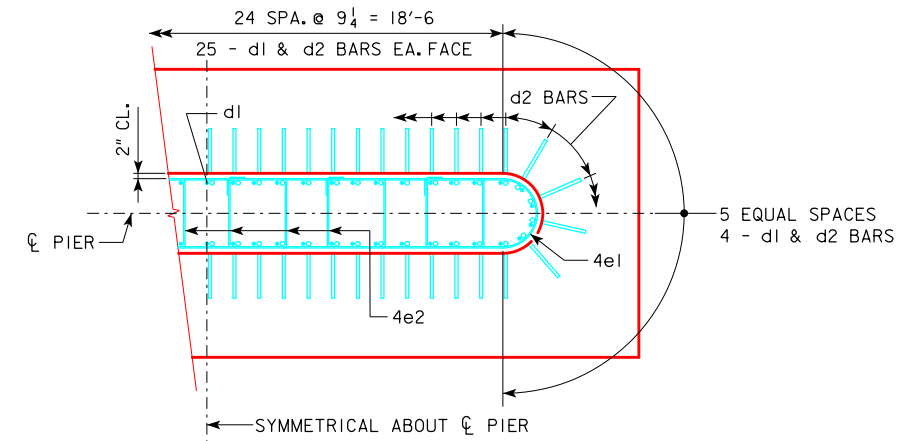
REVISED 02-2017 - ADDED "LRFD P_u, STRENGTH I, DES. LOAD (KIPS)" TO "PILING (HP10x57)" COLUMN HEADING IN THE TABLE ON THE LEFT SIDE OF THE SHEET.
 CHANGED VERTICAL CLEARANCE OF REBAR "f2" TO TOP OF PIER FOOTING TO 3" (WAS 2").
 REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

H IN FT.	CL - CL ABUT. BRG.	PILING (HP10x57)		FOOTING SIZE
		NO. & LAYOUT	LRFD P _u , STRENGTH I, DES. LOAD (KIPS)	
16 TO 18	160'-0	17A	134	4' x 8' x 26'
	180'-0	17A	144	
	200'-0	18A	143	
	220'-0	20A	145	
	240'-0	21C	146	4' x 11' x 26'
	260'-0	21F	142	4' x 14' x 30'
	280'-0	22A	146	
	300'-0	24A	138	4' x 14' x 32'
320'-0	24A	146		
340'-0	26A	143		
19 TO 21	160'-0	17A	139	4' x 8' x 26'
	180'-0	18A	139	
	200'-0	19A	143	
	220'-0	21A	146	
	240'-0	21D	144	4' x 11' x 30'
	260'-0	21F	145	4' x 14' x 30'
	280'-0	23A	145	
	300'-0	24A	141	4' x 14' x 32'
320'-0	25A	144		
340'-0	26A	146		
22 TO 24	160'-0	17A	143	4' x 8' x 26'
	180'-0	18A	143	
	200'-0	20A	142	
	220'-0	21B	146	
	240'-0	21E	143	4' x 9' x 26'
	260'-0	22A	143	4' x 12' x 30'
	280'-0	24A	136	4' x 14' x 30'
	300'-0	24A	143	
320'-0	26A	142	4' x 14' x 32'	
340'-0	27A	144		
25 TO 27	160'-0	17B	144	4' x 9' x 26'
	180'-0	18B	144	
	200'-0	20B	143	
	220'-0	21C	146	
	240'-0	21E	145	4' x 11' x 26'
	260'-0	22A	145	4' x 12' x 30'
	280'-0	24A	138	4' x 14' x 30'
	300'-0	24A	146	
320'-0	26A	144	4' x 14' x 32'	
340'-0	27A	147		
28 TO 30	160'-0	17C	146	4' x 10' x 26'
	180'-0	18C	146	
	200'-0	20C	144	
	220'-0	21D	144	
	240'-0	21F	144	4' x 11' x 30'
	260'-0	23A	144	4' x 14' x 30'
	280'-0	24A	140	
	300'-0	25A	144	4' x 14' x 32'
320'-0	26A	146		
340'-0	28A	145		
31 TO 33	160'-0	18D	139	4' x 11' x 26'
	180'-0	19B	143	
	200'-0	20D	145	
	220'-0	21D	146	
	240'-0	21F	147	4' x 11' x 30'
	260'-0	23A	146	4' x 14' x 30'
	280'-0	24A	142	
	300'-0	25A	146	4' x 14' x 32'
320'-0	27A	144		
340'-0	28A	147		
34 TO 36	160'-0	18D	142	4' x 11' x 26'
	180'-0	19B	146	
	200'-0	20E	143	
	220'-0	21E	143	
	240'-0	22A	144	4' x 12' x 30'
	260'-0	24A	136	4' x 14' x 30'
	280'-0	24A	144	
	300'-0	26A	143	4' x 14' x 32'
320'-0	27A	146		
340'-0	29A	144		

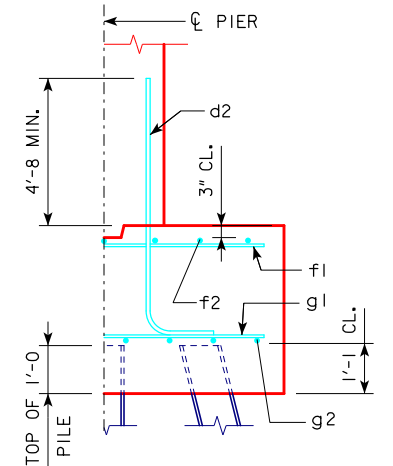
H IN FT.	CL - CL ABUT. BRG.	PILING (HP10x57)		FOOTING SIZE
		NO. & LAYOUT	LRFD P _u , STRENGTH I, DES. LOAD (KIPS)	
37 TO 40	160'-0	18E	142	4' x 11' x 30'
	180'-0	19C	145	
	200'-0	21D	143	
	220'-0	21E	146	
	240'-0	22A	146	4' x 12' x 30'
	260'-0	24A	138	4' x 14' x 30'
	280'-0	24A	146	
	300'-0	26A	145	4' x 14' x 32'
320'-0	28A	144		
340'-0	29A	145		

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)				TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)		
4' x 8' x 26'	d2	58 - #9 AS SHOWN	9'-1	1791	3037	30.8
	f1	26 - #5 @ 1'-0	7'-8	208		
	f2	8 - #5 @ 1'-0	25'-8	214		
	g1	26 - #6 @ 1'-0	7'-8	299		
	g2	10 - #7 @ 0'-10	25'-8	525		
4' x 9' x 26'	d2	58 - #9 AS SHOWN	9'-1	1791	3253	34.7
	f1	26 - #5 @ 1'-0	8'-8	235		
	f2	9 - #5 @ 1'-0	25'-8	241		
	g1	26 - #7 @ 1'-0	8'-8	461		
	g2	10 - #7 @ 0'-11	25'-8	525		
4' x 10' x 26'	d2	58 - #9 AS SHOWN	9'-1	1791	3646	38.5
	f1	26 - #5 @ 1'-0	9'-8	262		
	f2	10 - #5 @ 1'-0	25'-8	268		
	g1	31 - #8 @ 0'-10	9'-8	800		
	g2	10 - #7 @ 1'-0	25'-8	525		
4' x 11' x 26'	d2	58 - #9 AS SHOWN	9'-1	1791	3758	42.4
	f1	26 - #5 @ 1'-0	10'-8	289		
	f2	11 - #5 @ 1'-0	25'-8	294		
	g1	31 - #8 @ 0'-10	10'-8	883		
	g2	13 - #6 @ 0'-10 1/2	25'-8	501		
4' x 11' x 30'	d2	58 - #9 AS SHOWN	9'-1	1791	4760	48.9
	f1	30 - #5 @ 1'-0	10'-8	334		
	f2	11 - #5 @ 1'-0	29'-8	340		
	g1	31 - #8 @ 0'-11 1/2	10'-8	883		
	g2	14 - #9 @ 0'-9 1/2	29'-8	1412		
4' x 12' x 30'	d2	58 - #9 AS SHOWN	9'-1	1791	5187	53.3
	f1	30 - #5 @ 1'-0	11'-8	365		
	f2	12 - #5 @ 1'-0	29'-8	371		
	g1	34 - #9 @ 0'-10 1/2	11'-8	1349		
	g2	13 - #9 @ 0'-11 1/2	29'-8	1311		
4' x 14' x 30'	d2	58 - #9 AS SHOWN	9'-1	1791	6141	62.2
	f1	30 - #5 @ 1'-0	13'-8	428		
	f2	14 - #5 @ 1'-0	29'-8	433		
	g1	36 - #9 @ 0'-10	13'-8	1673		
	g2	18 - #9 @ 0'-9 1/2	29'-8	1816		
4' x 14' x 32'	d2	58 - #9 AS SHOWN	9'-1	1791	6521	66.4
	f1	32 - #5 @ 1'-0	13'-8	456		
	f2	14 - #5 @ 1'-0	31'-8	462		
	g1	38 - #9 @ 0'-10	13'-8	1766		
	g2	19 - #9 @ 0'-9	31'-8	2046		

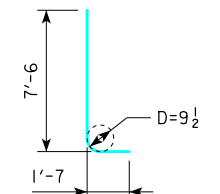
NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET RS40-136-14.)



TYPICAL SECTION



d2
NOTE: D = PIN DIAMETER.
DIMENSIONS ARE OUT TO OUT.

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

FOOTING NOTES:

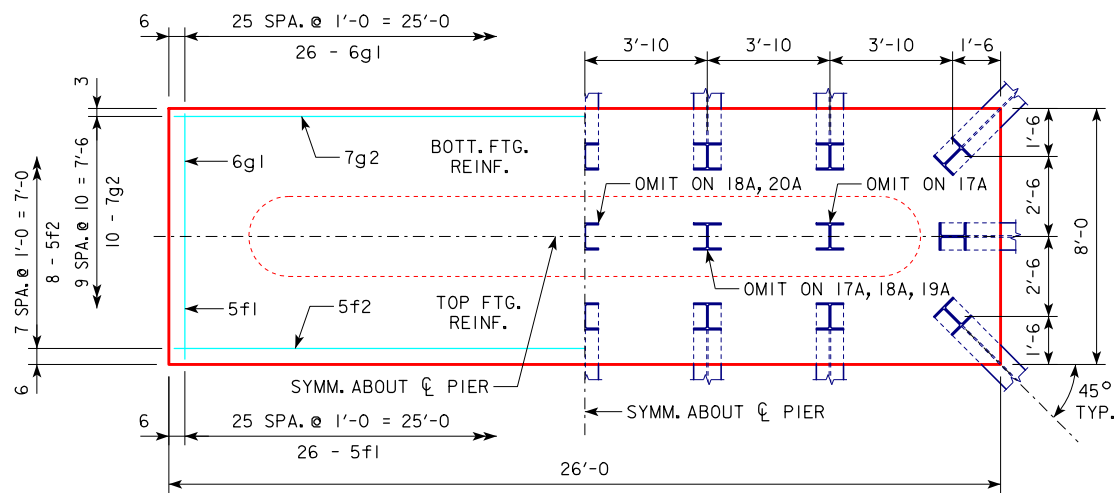
THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET RS40-136-14.

BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.

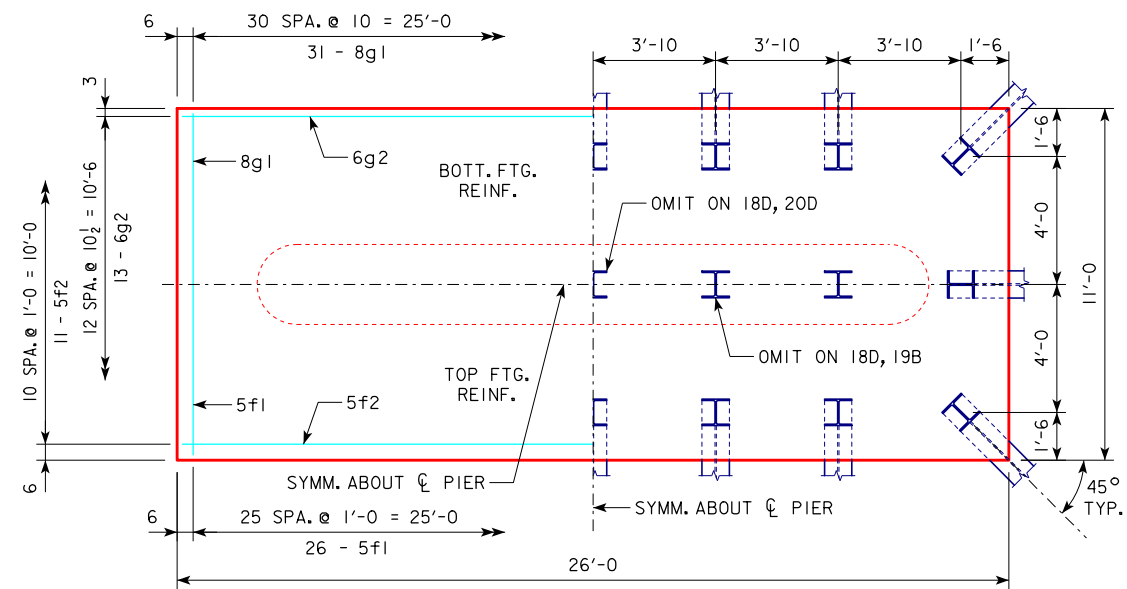
STEEL PILING USED AS POINT BEARING SHALL HAVE A MINIMUM DISTANCE OF APPROXIMATELY 10 FEET FROM BOTTOM OF FOOTING TO TOP OF BEARING ROCK. THE PILE LAYOUTS ARE SUCH THAT THE DISTANCE CENTER TO CENTER OF ADJACENT PILING SHALL NOT EXCEED 8'-0.

PIER PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

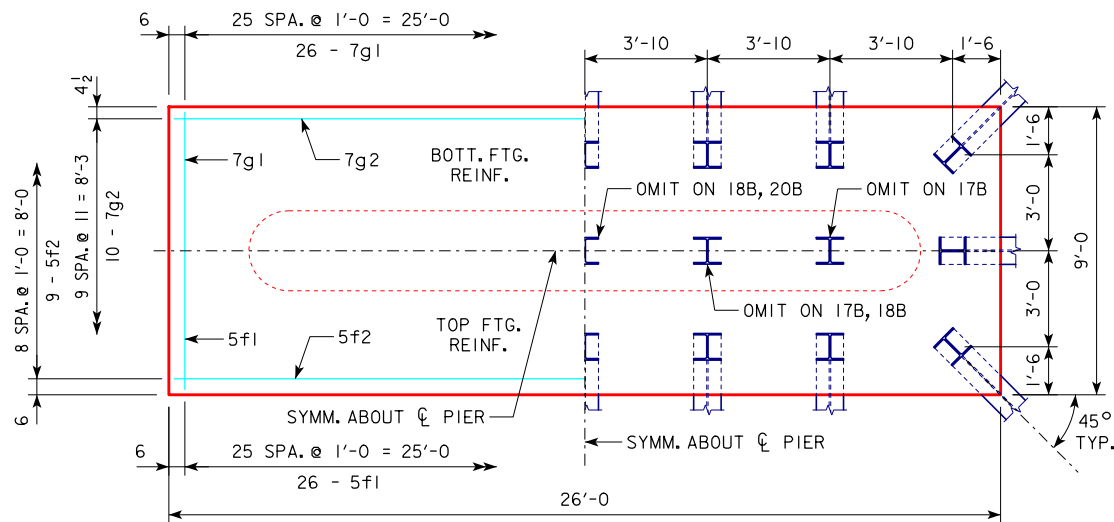
08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	TEE PIER-HP10x57 SRL-1 STEEL PILE FOOTINGS 20° SKEW - SHEET 1
	RS40-138-14



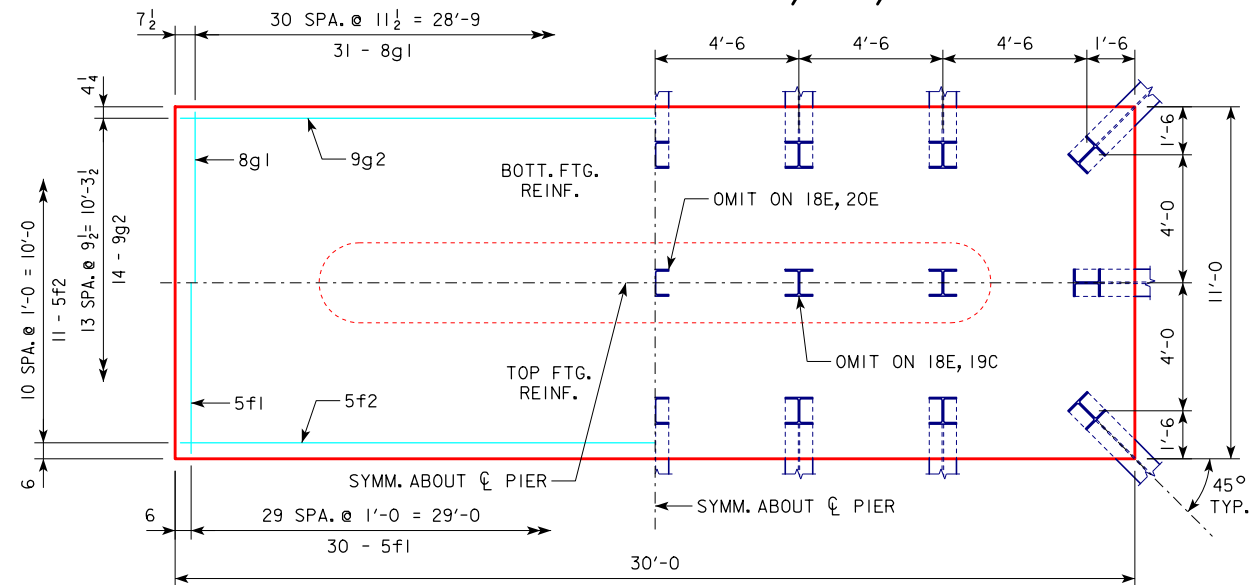
4'-0 x 8'-0 x 26'-0 FOR 17A, 18A, 19A, 20A & 21A



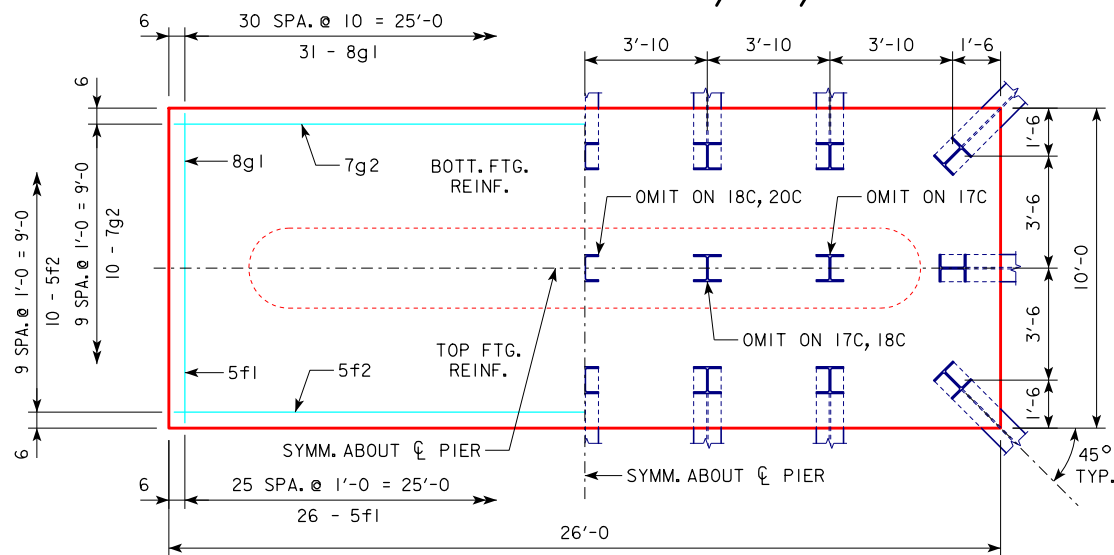
4'-0 x 11'-0 x 26'-0 FOR 18D, 19B, 20D & 21C



4'-0 x 9'-0 x 26'-0 FOR 17B, 18B, 20B & 21B



4'-0 x 11'-0 x 30'-0 FOR 18E, 19C, 20E & 21D

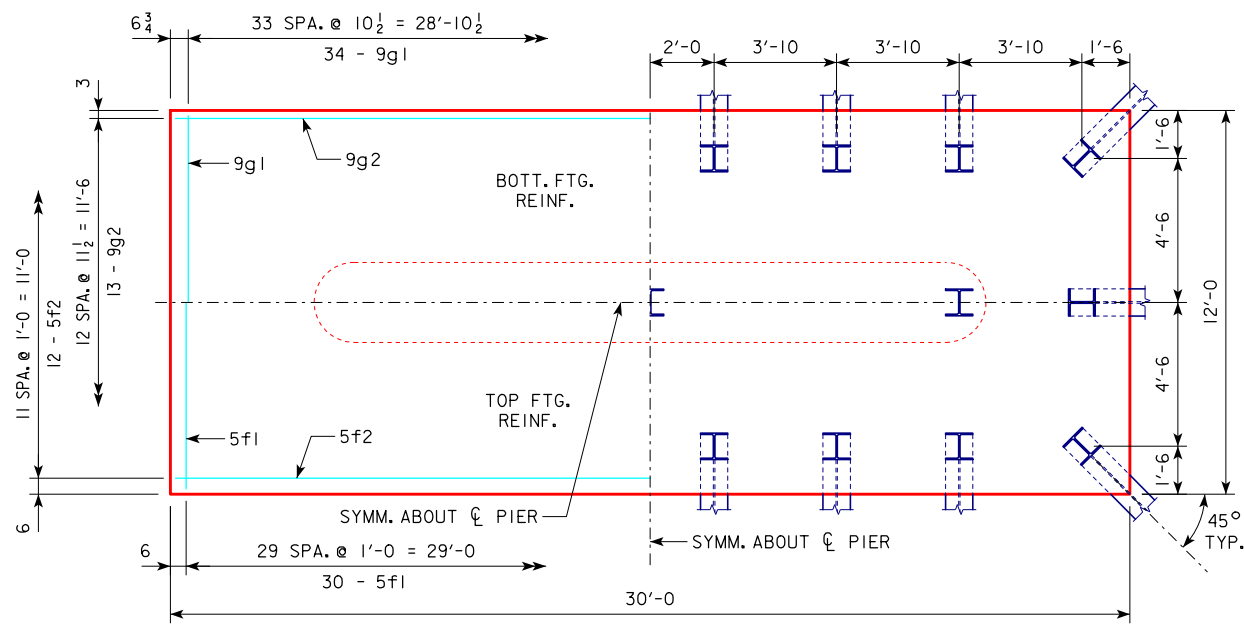


4'-0 x 10'-0 x 26'-0 FOR 17C, 18C & 20C

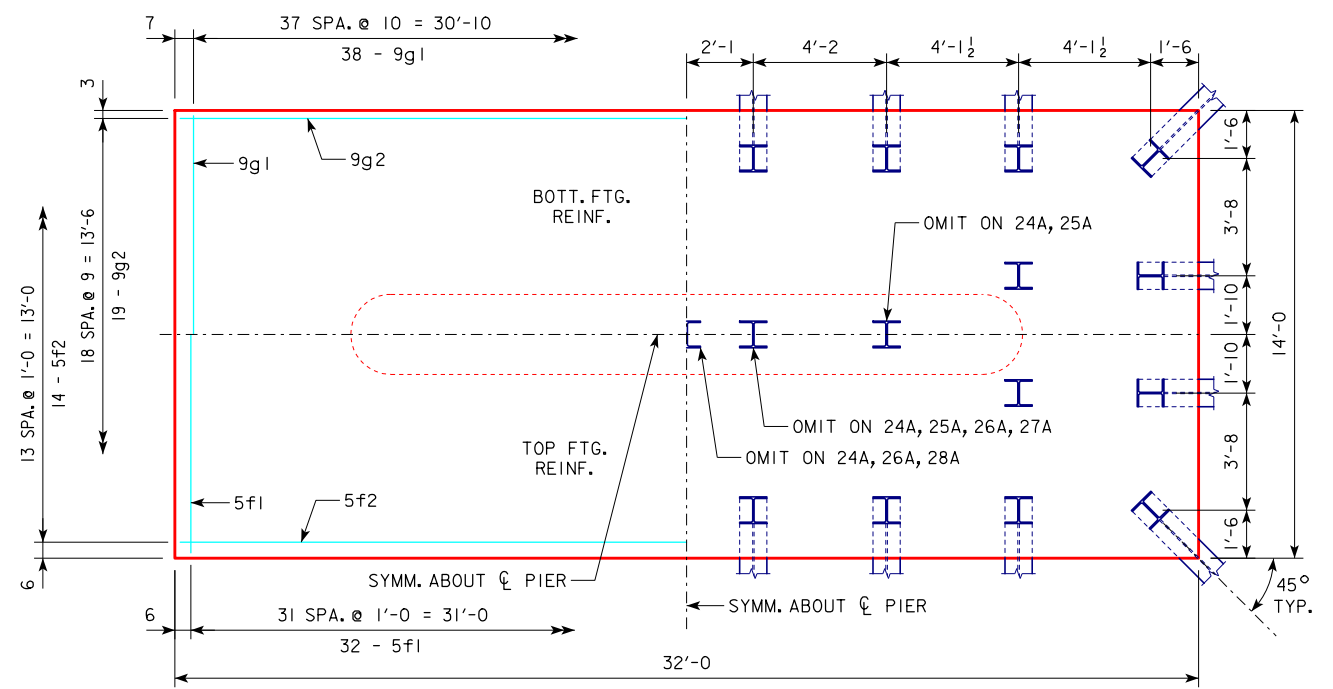
NOTE:
SEE SHEET RS40-138-14 FOR FOOTING NOTES.

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
TEE PIER-HP10x57 SRL-1 STEEL PILE FOOTINGS 20° SKEW - SHEET 2		RS40-139-14	

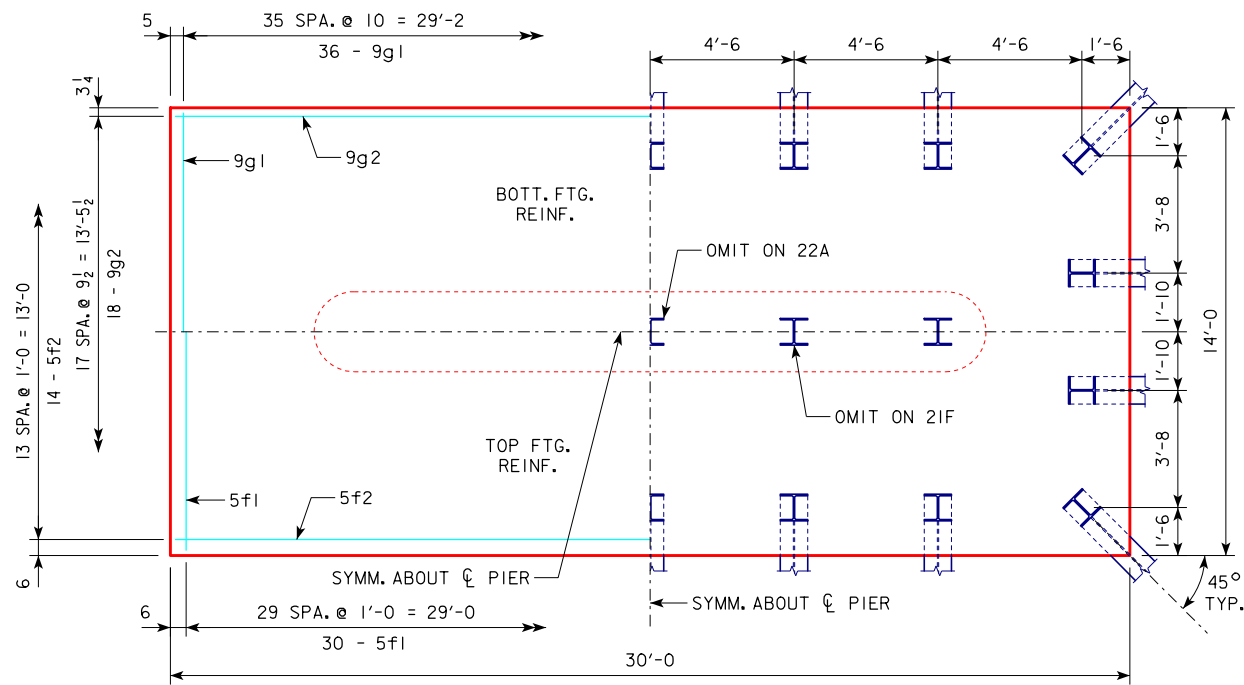
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



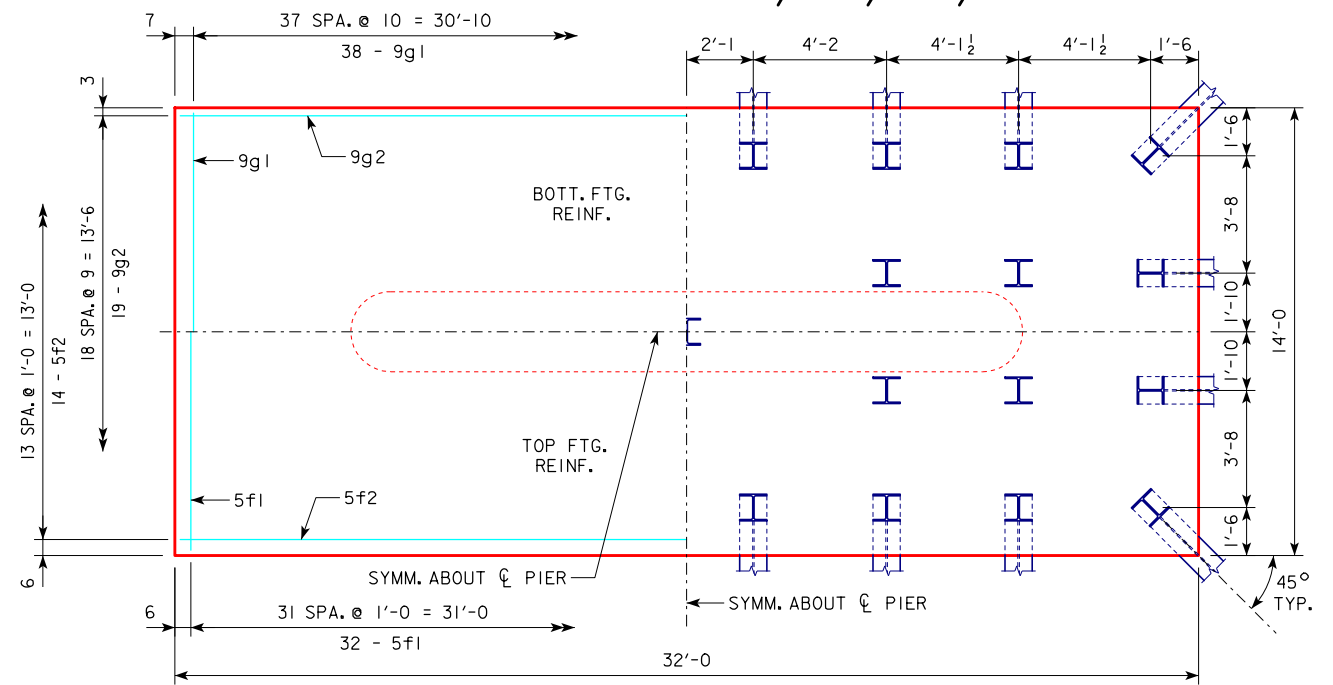
4'-0 x 12'-0 x 30'-0 FOR 21E



4'-0 x 14'-0 x 32'-0 FOR 24A, 25A, 26A, 27A & 28A



4'-0 x 14'-0 x 30'-0 FOR 21F, 22A & 23A



4'-0 x 14'-0 x 32'-0 FOR 29A

NOTE:
SEE SHEET RS40-138-14 FOR FOOTING NOTES.

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER <i>[Signature]</i>		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
		TEE PIER-HP10x57 SRL-I STEEL PILE FOOTINGS 20° SKEW - SHEET 3	RS40-140-14

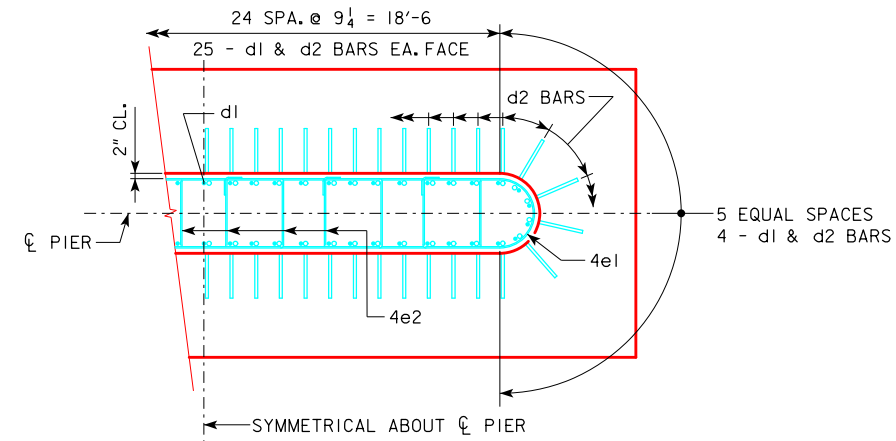
REVISED 02-2017 - CHANGED VERTICAL CLEARANCE OF REBAR "f2" TO TOP OF PIER FOOTING TO 3" (WAS 2").
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

H IN FT.	CL - CL ABUT. BRG.	PILING (HP10x57)		FOOTING SIZE
		NO. & LAYOUT	① LRFD P _u , STRENGTH I, DES. LOAD (KIPS)	
16 TO 18	160'-0	10A	211	4' x 8' x 26'
	180'-0	11A	213	
	200'-0	12A	208	
	220'-0	13A	215	
	240'-0	14A	215	4' x 9' x 26'
	260'-0	14D	211	4' x 11' x 28'
	280'-0	15A	216	
	300'-0	16A	217	
	320'-0	16B	217	
	340'-0	17A	218	
340'-0	17A	218		
19 TO 21	160'-0	10B	215	4' x 9' x 26'
	180'-0	11B	216	
	200'-0	12B	211	4' x 10' x 26'
	220'-0	13B	214	
	240'-0	14B	218	
	260'-0	14D	216	
	280'-0	16A	210	4' x 11' x 28'
	300'-0	16B	211	
	320'-0	17A	213	
	340'-0	18A	212	
340'-0	18A	212		
340'-0	18A	212		
22 TO 24	160'-0	11B	209	4' x 9' x 26'
	180'-0	12B	205	
	200'-0	12C	214	4' x 10' x 26'
	220'-0	13C	217	
	240'-0	14D	208	
	260'-0	15A	211	
	280'-0	16A	214	4' x 11' x 28'
	300'-0	16B	215	
	320'-0	17A	217	
	340'-0	18A	216	
340'-0	18A	216		
340'-0	18A	216		
25 TO 27	160'-0	11C	212	4' x 10' x 26'
	180'-0	12C	207	
	200'-0	12C	219	
	220'-0	14C	211	
	240'-0	14D	212	4' x 11' x 28'
	260'-0	15A	216	
	280'-0	16A	218	
	300'-0	16B	219	
	320'-0	18A	211	
	340'-0	18A	220	
28 TO 30	160'-0	11C	217	4' x 10' x 26'
	180'-0	12C	212	
	200'-0	13B	214	
	220'-0	14C	215	
	240'-0	14D	216	4' x 11' x 28'
	260'-0	15A	219	
	280'-0	16B	210	
	300'-0	17A	213	
	320'-0	18A	214	
	340'-0	19A	215	
31 TO 33	160'-0	12D	202	4' x 11' x 26'
	180'-0	12D	214	
	200'-0	13C	216	
	220'-0	14C	219	
	240'-0	14D	219	4' x 11' x 28'
	260'-0	16A	211	
	280'-0	16B	213	
	300'-0	17A	216	
	320'-0	18A	216	
	340'-0	19A	218	
34 TO 36	160'-0	12D	207	4' x 11' x 26'
	180'-0	12D	219	
	200'-0	13D	213	
	220'-0	14D	209	
	240'-0	15A	214	4' x 11' x 28'
	260'-0	16A	214	
	280'-0	16B	216	
	300'-0	17A	219	
	320'-0	18A	219	
	340'-0	19B	218	

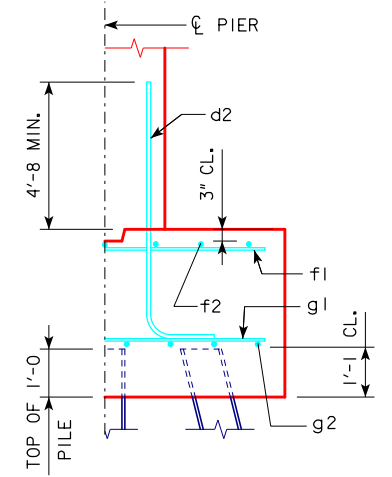
H IN FT.	CL - CL ABUT. BRG.	PILING (HP10x57)		FOOTING SIZE
		NO. & LAYOUT	① LRFD P _u , STRENGTH I, DES. LOAD (KIPS)	
37 TO 40	160'-0	12E	205	4' x 11' x 28'
	180'-0	12E	217	
	200'-0	13D	218	
	220'-0	14D	214	
	240'-0	15A	218	4' x 12' x 28'
	260'-0	16A	218	
	280'-0	16B	219	
	300'-0	18A	212	
	320'-0	19A	215	
	340'-0	20A	214	

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)				TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)		
4' x 8' x 26'	d2	58 - #9 AS SHOWN	9'-1	1791	3299	30.8
	f1	26 - #5 @ 1'-0	7'-8	208		
	f2	8 - #5 @ 1'-0	25'-8	214		
	g1	26 - #6 @ 1'-0	7'-8	299		
	g2	15 - #7 @ 0'-6	25'-8	787		
4' x 9' x 26'	d2	58 - #9 AS SHOWN	9'-1	1791	3445	34.7
	f1	26 - #5 @ 1'-0	8'-8	235		
	f2	9 - #5 @ 1'-0	25'-8	241		
	g1	30 - #6 @ 0'-10½	8'-8	391		
	g2	15 - #7 @ 0'-7	25'-8	787		
4' x 10' x 26'	d2	58 - #9 AS SHOWN	9'-1	1791	3716	38.5
	f1	26 - #5 @ 1'-0	9'-8	262		
	f2	10 - #5 @ 1'-0	25'-8	268		
	g1	29 - #7 @ 0'-10½	9'-8	573		
	g2	12 - #8 @ 0'-10	25'-8	822		
4' x 11' x 26'	d2	58 - #9 AS SHOWN	9'-1	1791	3965	42.4
	f1	26 - #5 @ 1'-0	10'-8	289		
	f2	11 - #5 @ 1'-0	25'-8	294		
	g1	27 - #8 @ 0'-11½	10'-8	769		
	g2	12 - #8 @ 0'-11	25'-8	822		
4' x 11' x 28'	d2	58 - #9 AS SHOWN	9'-1	1791	4705	45.6
	f1	28 - #5 @ 1'-0	10'-8	312		
	f2	11 - #5 @ 1'-0	27'-8	317		
	g1	34 - #8 @ 0'-10	10'-8	968		
	g2	14 - #9 @ 0'-9½	27'-8	1317		
4' x 12' x 28'	d2	58 - #9 AS SHOWN	9'-1	1791	5198	49.8
	f1	28 - #5 @ 1'-0	11'-8	341		
	f2	12 - #5 @ 1'-0	27'-8	346		
	g1	33 - #9 @ 0'-10	11'-8	1309		
	g2	15 - #9 @ 0'-9½	27'-8	1411		
4' x 13' x 28'	d2	58 - #9 AS SHOWN	9'-1	1791	5505	53.9
	f1	28 - #5 @ 1'-0	12'-8	370		
	f2	13 - #5 @ 1'-0	27'-8	375		
	g1	34 - #9 @ 0'-10	12'-8	1464		
	g2	16 - #9 @ 0'-10	27'-8	1505		

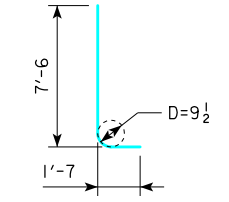
① NOTE: P_u, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET RS40-136-14.)



TYPICAL SECTION



d2
NOTE: D = PIN DIAMETER.
DIMENSIONS ARE OUT TO OUT.

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

FOOTING NOTES:

THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET RS40-136-14.

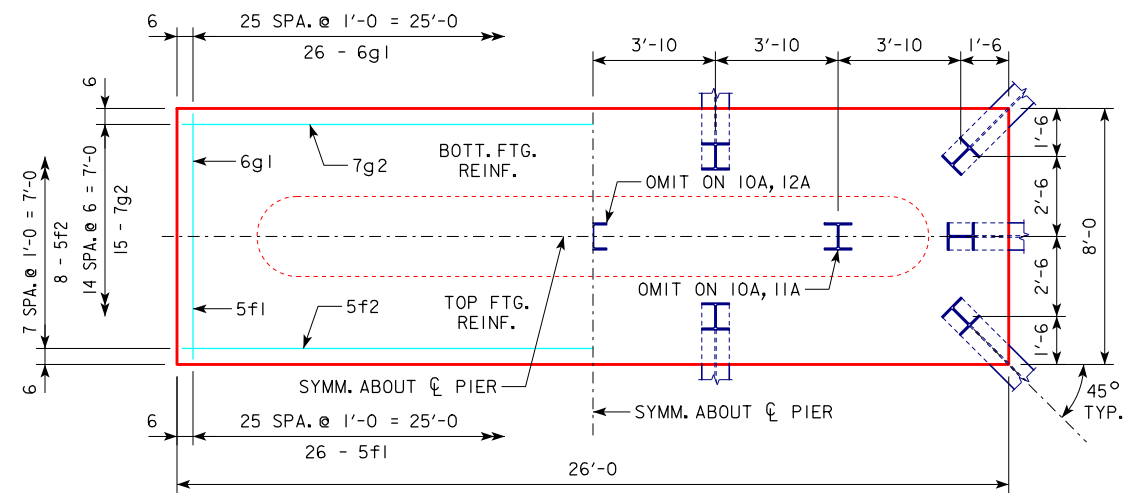
BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.

STEEL PILING USED AS POINT BEARING SHALL HAVE A MINIMUM DISTANCE OF APPROXIMATELY 10 FEET FROM BOTTOM OF FOOTING TO TOP OF BEARING ROCK. THE PILE LAYOUTS ARE SUCH THAT THE DISTANCE CENTER TO CENTER OF ADJACENT PILING SHALL NOT EXCEED 8'-0.

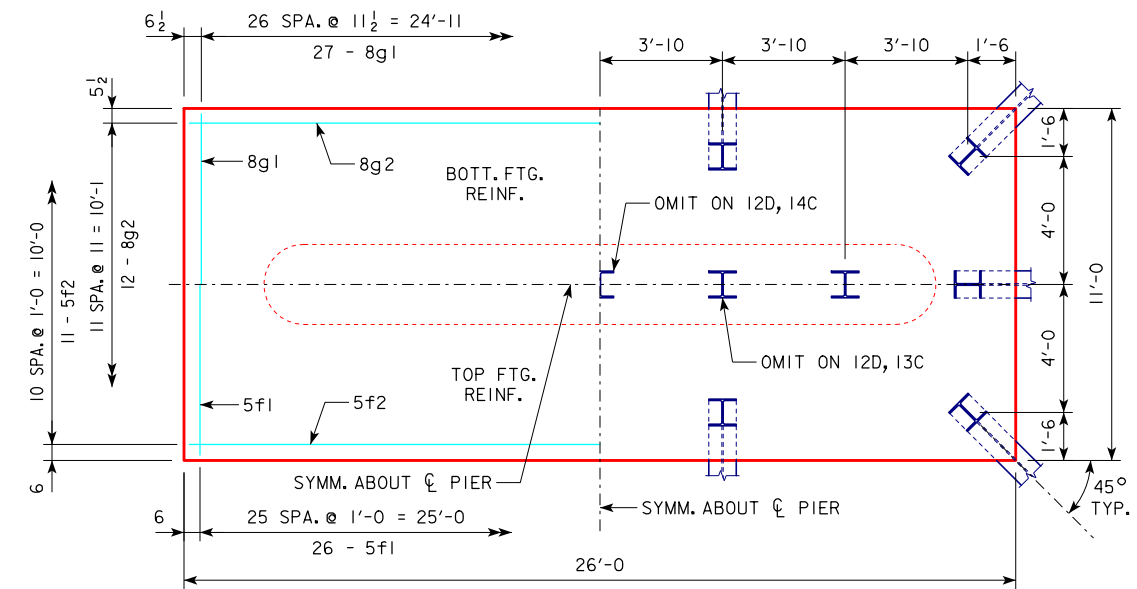
PIER PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	TEE PIER-HP10x57 SRL-2 STEEL PILE FOOTINGS 20° SKEW - SHEET 1

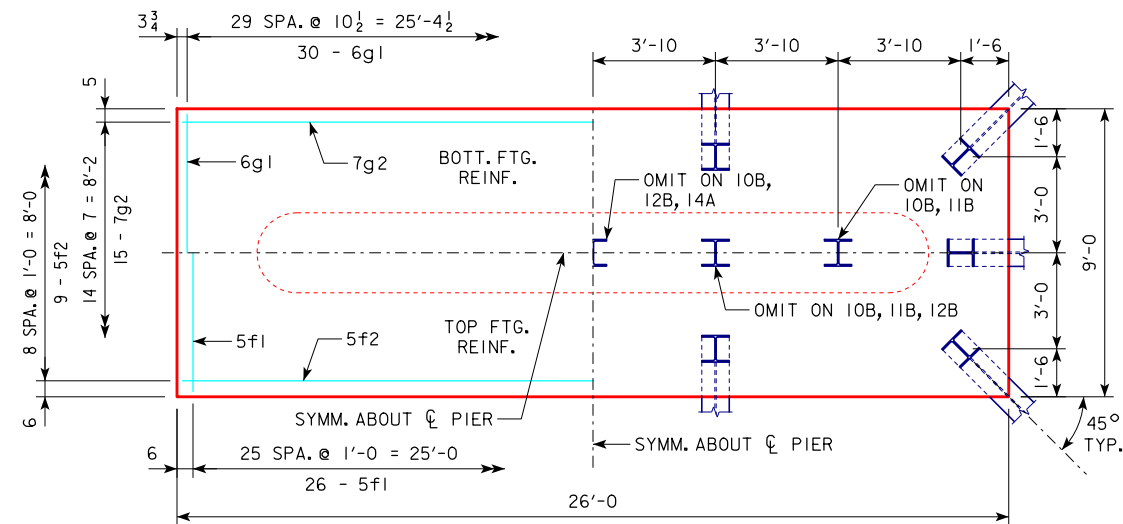
RS40-141-14



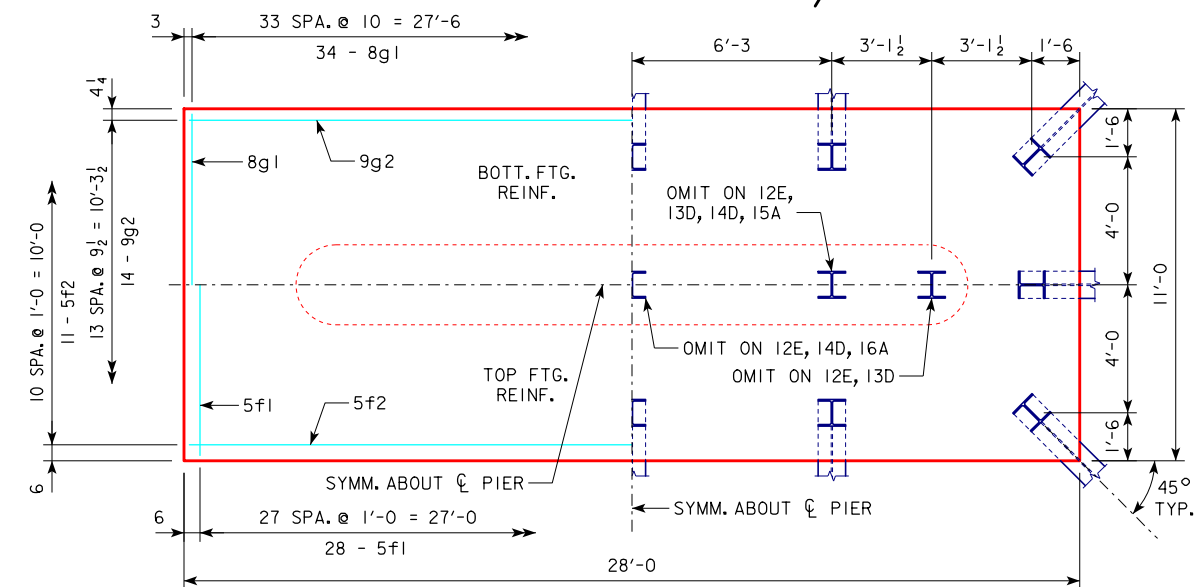
4'-0 x 8'-0 x 26'-0 FOR 10A, 11A, 12A & 13A



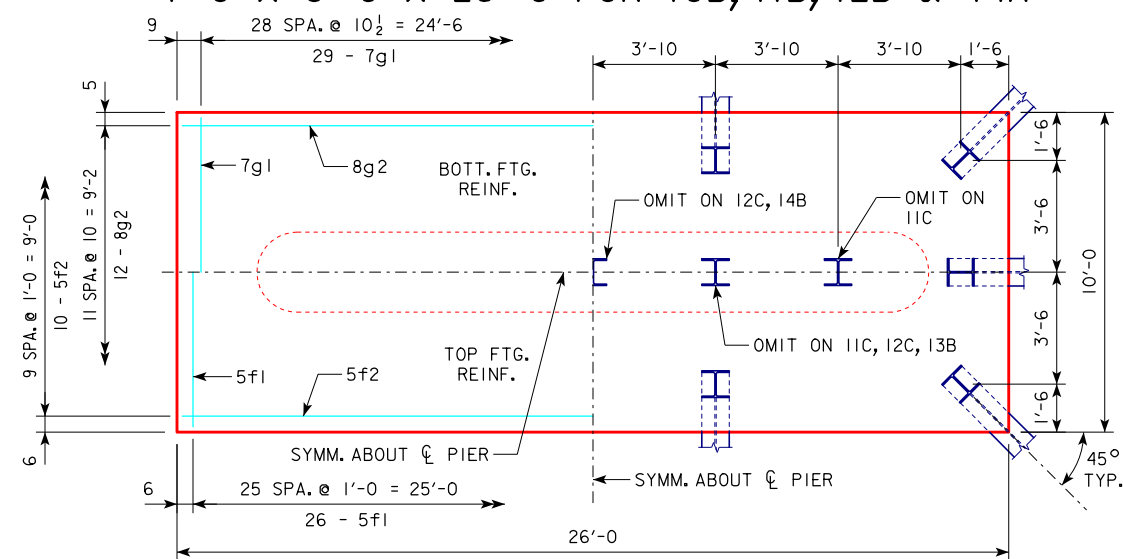
4'-0 x 11'-0 x 26'-0 FOR 12D, 13C & 14C



4'-0 x 9'-0 x 26'-0 FOR 10B, 11B, 12B & 14A



4'-0 x 11'-0 x 28'-0 FOR 12E, 13D, 14D, 15A & 16A

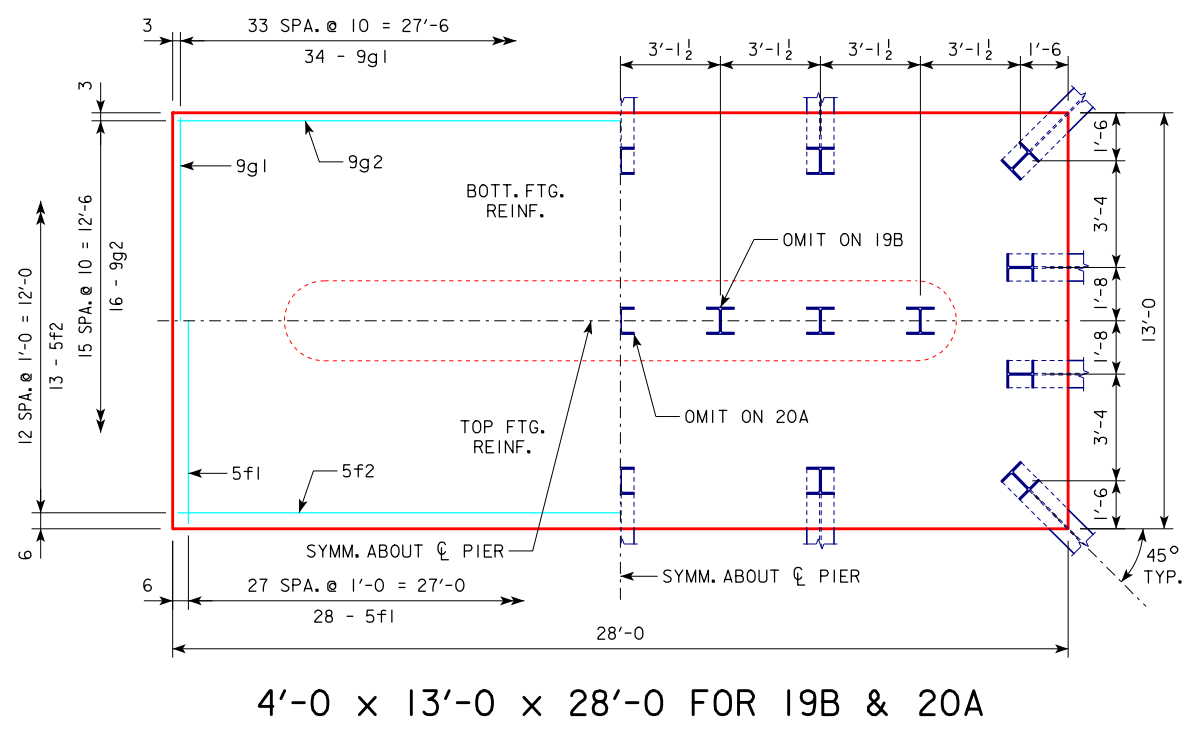
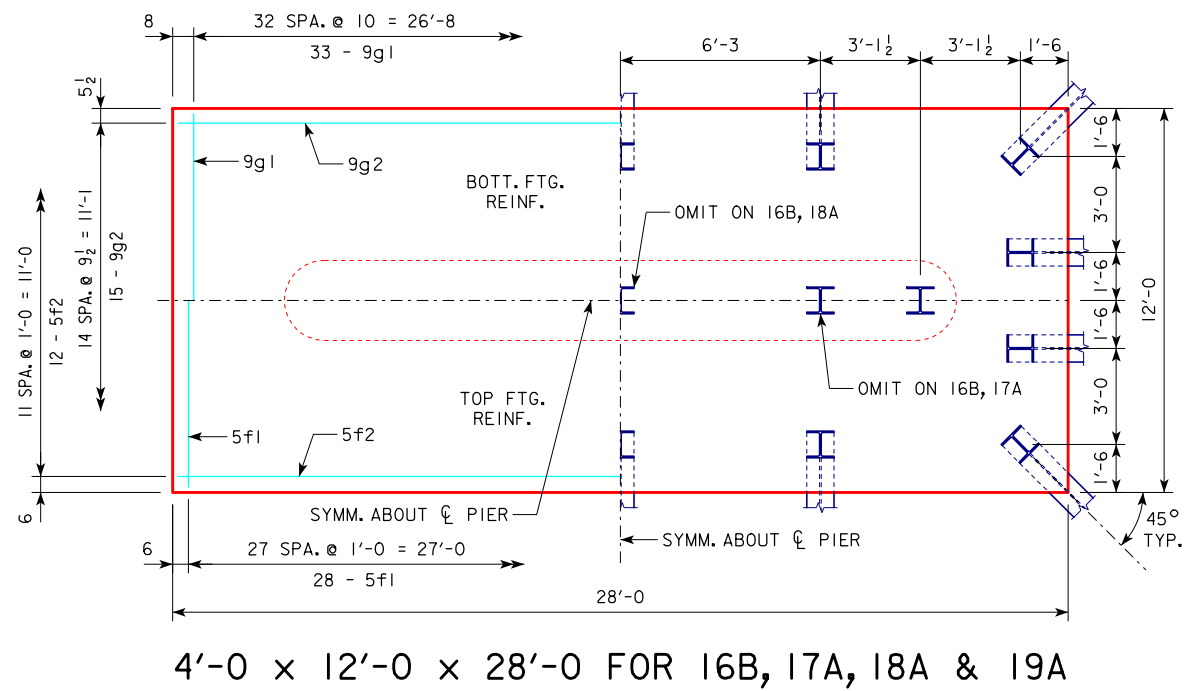


4'-0 x 10'-0 x 26'-0 FOR 11C, 12C, 13B & 14B

NOTE:
SEE SHEET RS40-141-14 FOR FOOTING NOTES.

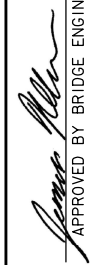

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER <i>[Signature]</i>		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
TEE PIER-HP10x57 SRL-2 STEEL PILE FOOTINGS 20° SKEW - SHEET 2		RS40-142-14	

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



NOTE:
SEE SHEET RS40-141-14 FOR FOOTING NOTES.

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

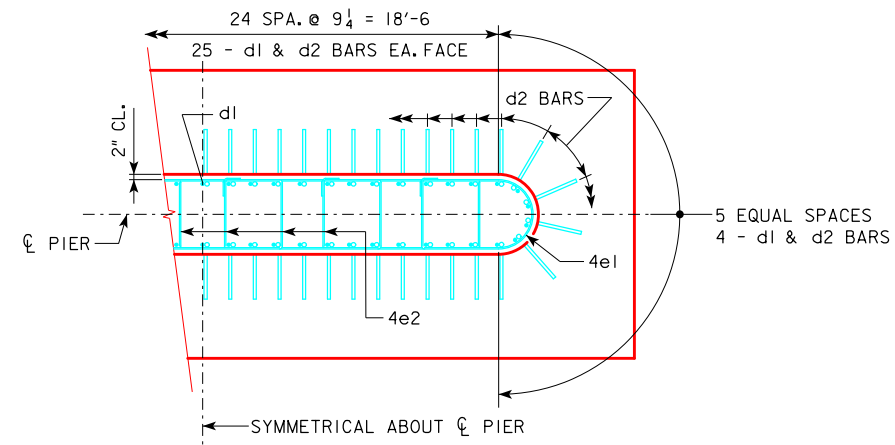
08-2018 LATEST REVISION DATE  APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	TEE PIER-HP10x57 SRL-2 STEEL PILE FOOTINGS <small>20° SKEW - SHEET 3</small>

REVISED 02-2017 - CHANGED VERTICAL CLEARANCE OF REBAR "f2" TO TOP OF PIER FOOTING TO 3" (WAS 2").
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

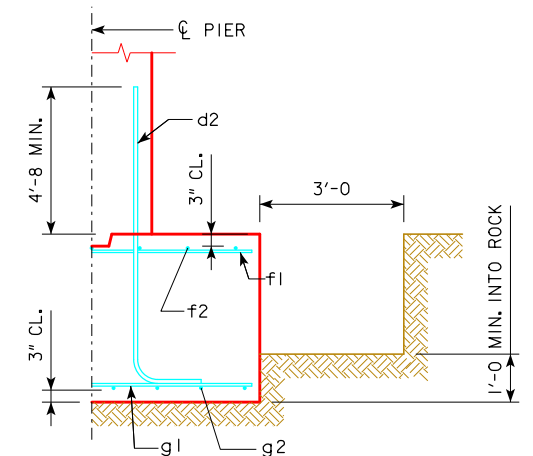
H IN FT.	CL - CL ABUT. BRG.	FOOTING SIZE
16 TO 18	160'-0"	4' x 8' x 27'
	180'-0"	4' x 9' x 27'
	200'-0"	4' x 9' x 29'
	220'-0"	4' x 10' x 29'
	240'-0"	4' x 10' x 29'
	260'-0"	4' x 10' x 29'
	280'-0"	4' x 10' x 29'
	300'-0"	4' x 10' x 31'
	320'-0"	4' x 10' x 31'
	340'-0"	4' x 11' x 31'
19 TO 21	160'-0"	4' x 8' x 27'
	180'-0"	4' x 9' x 27'
	200'-0"	4' x 9' x 29'
	220'-0"	4' x 9' x 29'
	240'-0"	4' x 9' x 29'
	260'-0"	4' x 10' x 29'
	280'-0"	4' x 10' x 29'
	300'-0"	4' x 10' x 31'
	320'-0"	4' x 11' x 31'
	340'-0"	4' x 11' x 31'
22 TO 24	160'-0"	4' x 8' x 27'
	180'-0"	4' x 9' x 27'
	200'-0"	4' x 9' x 29'
	220'-0"	4' x 9' x 29'
	240'-0"	4' x 10' x 29'
	260'-0"	4' x 10' x 29'
	280'-0"	4' x 10' x 29'
	300'-0"	4' x 10' x 31'
	320'-0"	4' x 11' x 31'
	340'-0"	4' x 11' x 31'
25 TO 27	160'-0"	4' x 8' x 27'
	180'-0"	4' x 9' x 27'
	200'-0"	4' x 9' x 29'
	220'-0"	4' x 9' x 29'
	240'-0"	4' x 10' x 29'
	260'-0"	4' x 10' x 29'
	280'-0"	4' x 10' x 31'
	300'-0"	4' x 10' x 31'
	320'-0"	4' x 11' x 31'
	340'-0"	4' x 11' x 33'
28 TO 30	160'-0"	4' x 9' x 27'
	180'-0"	4' x 9' x 27'
	200'-0"	4' x 9' x 29'
	220'-0"	4' x 9' x 29'
	240'-0"	4' x 10' x 29'
	260'-0"	4' x 10' x 29'
	280'-0"	4' x 10' x 31'
	300'-0"	4' x 10' x 31'
	320'-0"	4' x 11' x 31'
	340'-0"	4' x 11' x 33'
31 TO 33	160'-0"	4' x 9' x 27'
	180'-0"	4' x 9' x 27'
	200'-0"	4' x 9' x 29'
	220'-0"	4' x 10' x 29'
	240'-0"	4' x 10' x 29'
	260'-0"	4' x 10' x 31'
	280'-0"	4' x 10' x 31'
	300'-0"	4' x 11' x 31'
	320'-0"	4' x 11' x 31'
	340'-0"	4' x 11' x 33'
34 TO 36	160'-0"	4' x 9' x 27'
	180'-0"	4' x 9' x 27'
	200'-0"	4' x 9' x 29'
	220'-0"	4' x 10' x 29'
	240'-0"	4' x 10' x 29'
	260'-0"	4' x 10' x 31'
	280'-0"	4' x 10' x 31'
	300'-0"	4' x 11' x 31'
	320'-0"	4' x 11' x 31'
	340'-0"	4' x 11' x 33'

H IN FT.	CL - CL ABUT. BRG.	FOOTING SIZE
37 TO 40	160'-0"	4' x 9' x 27'
	180'-0"	4' x 9' x 29'
	200'-0"	4' x 9' x 29'
	220'-0"	4' x 10' x 29'
	240'-0"	4' x 10' x 29'
	260'-0"	4' x 10' x 31'
	280'-0"	4' x 10' x 31'
	300'-0"	4' x 11' x 31'
	320'-0"	4' x 11' x 31'
	340'-0"	4' x 11' x 33'

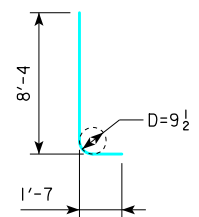
FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)				TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)		
4' x 8' x 27'	d2	58 - #9 AS SHOWN	9'-11"	1956	3107	32.0
	f1	27 - #5 @ 1'-0"	7'-8"	216		
	f2	8 - #5 @ 1'-0"	26'-8"	223		
	g1	27 - #6 @ 1'-0"	7'-8"	311		
4' x 9' x 27'	d2	58 - #9 AS SHOWN	9'-11"	1956	3345	36.0
	f1	27 - #5 @ 1'-0"	8'-8"	244		
	f2	9 - #5 @ 1'-0"	26'-8"	250		
	g1	31 - #6 @ 0'-10 1/2"	8'-8"	404		
4' x 9' x 29'	d2	58 - #9 AS SHOWN	9'-11"	1956	3785	38.7
	f1	29 - #5 @ 1'-0"	8'-8"	262		
	f2	9 - #5 @ 1'-0"	28'-8"	269		
	g1	35 - #6 @ 0'-10"	8'-8"	456		
4' x 10' x 29'	d2	58 - #9 AS SHOWN	9'-11"	1956	4137	43.0
	f1	29 - #5 @ 1'-0"	9'-8"	292		
	f2	10 - #5 @ 1'-0"	28'-8"	299		
	g1	34 - #7 @ 0'-10"	9'-8"	672		
4' x 10' x 31'	d2	58 - #9 AS SHOWN	9'-11"	1956	4794	45.9
	f1	31 - #5 @ 1'-0"	9'-8"	313		
	f2	10 - #5 @ 1'-0"	30'-8"	320		
	g1	37 - #7 @ 0'-10"	9'-8"	731		
4' x 11' x 31'	d2	58 - #9 AS SHOWN	9'-11"	1956	5271	50.5
	f1	31 - #5 @ 1'-0"	10'-8"	345		
	f2	11 - #5 @ 1'-0"	30'-8"	352		
	g1	37 - #8 @ 0'-10"	10'-8"	1054		
4' x 11' x 33'	d2	58 - #9 AS SHOWN	9'-11"	1956	5945	53.8
	f1	33 - #5 @ 1'-0"	10'-8"	367		
	f2	11 - #5 @ 1'-0"	32'-8"	375		
	g1	40 - #8 @ 0'-10"	10'-8"	1139		
4' x 11' x 33'	d2	58 - #9 AS SHOWN	9'-11"	1956	2108	
	f1	15 - #9 @ 0'-9"	30'-8"	1564		
	f2	15 - #10 @ 0'-9"	32'-8"	2108		
	g2					



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET RS40-136-14.)



TYPICAL SECTION



d2

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

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

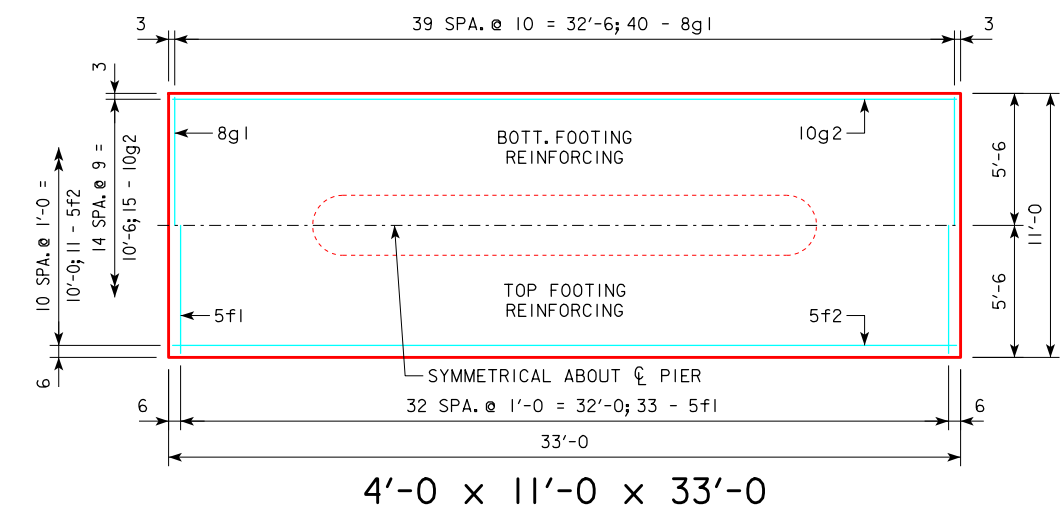
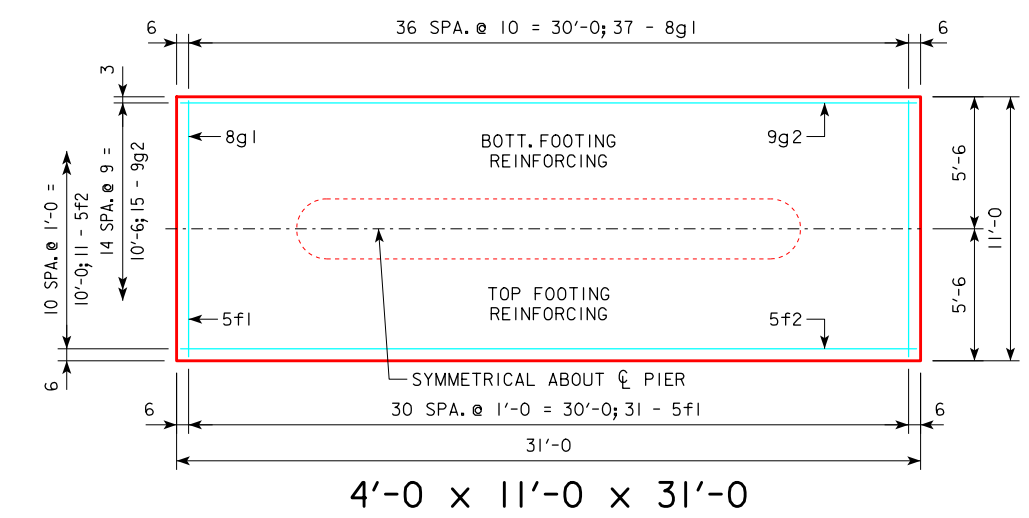
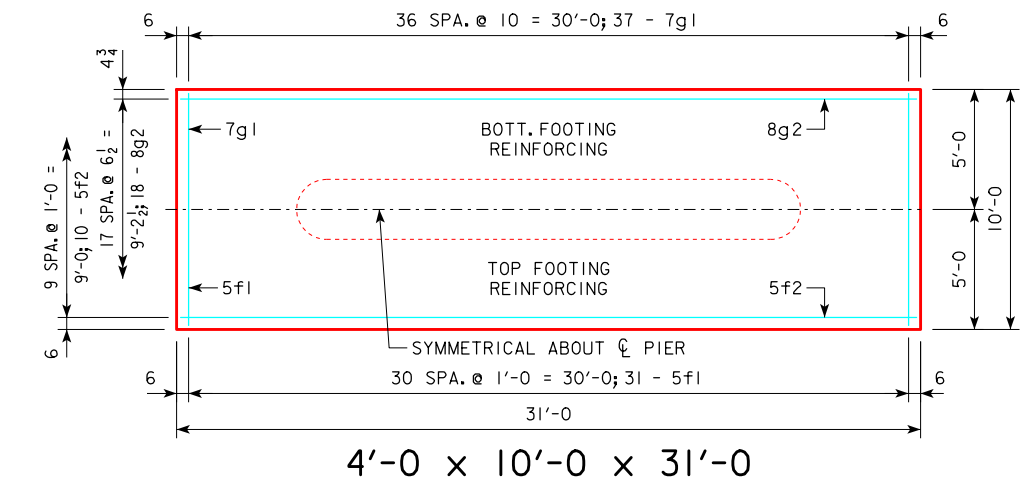
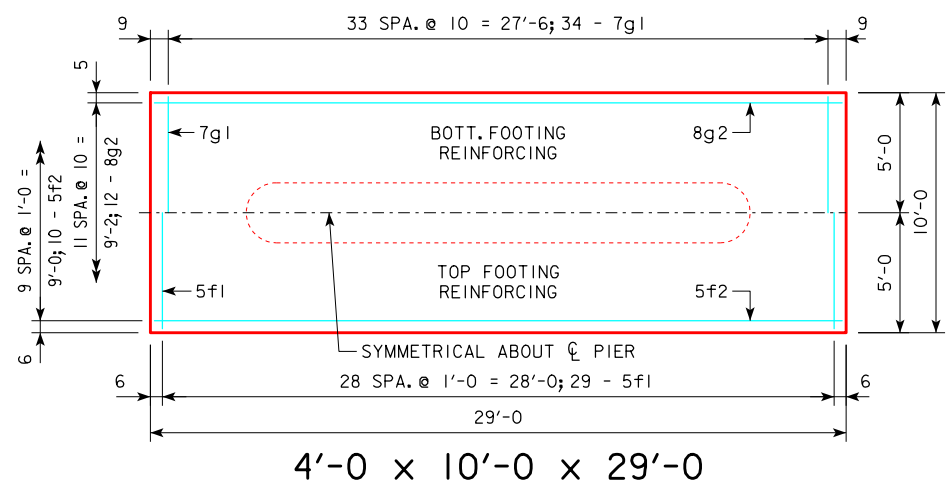
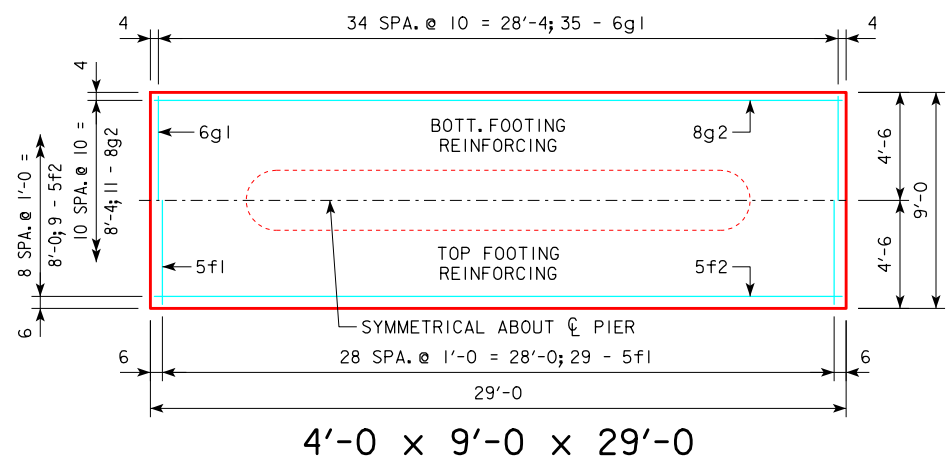
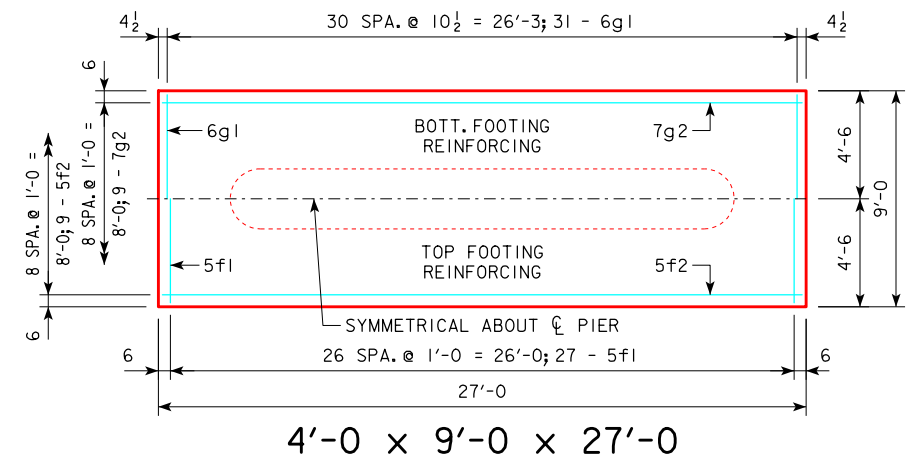
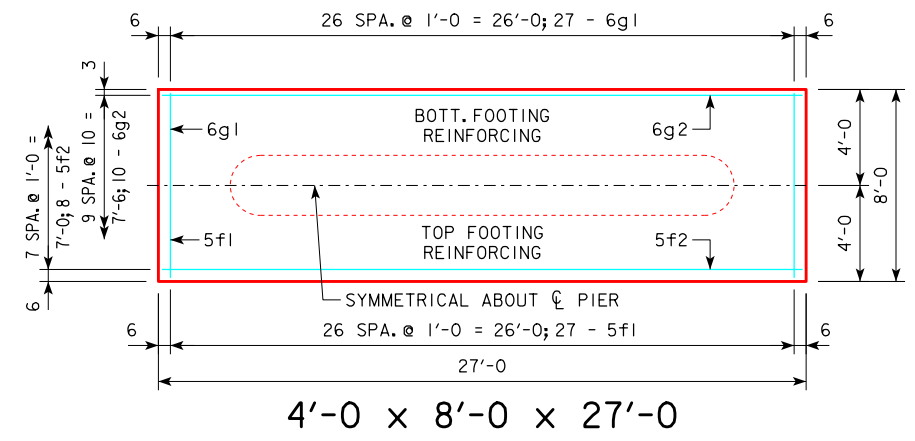
NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

FOOTING NOTES:

THESE SPREAD FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET RS40-136-14.

THESE SPREAD FOOTINGS SHALL EXTEND AT LEAST 12 INCHES INTO SUITABLE FOUNDATION ROCK AND THE LAST 12 INCHES OF ROCK EXCAVATION SHALL BE TO NEAT LINES OF MASONRY. THE FOUNDATION ROCK SHALL HAVE A MINIMUM LRFD NOMINAL BEARING RESISTANCE OF 30 KIPS PER SQUARE FOOT (ALLOWABLE BEARING VALUE OF AT LEAST 10 KIPS PER SQUARE FOOT).

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	TEE PIER - SPREAD FOOTINGS 20° SKEW - SHEET 1
	RS40-144-14

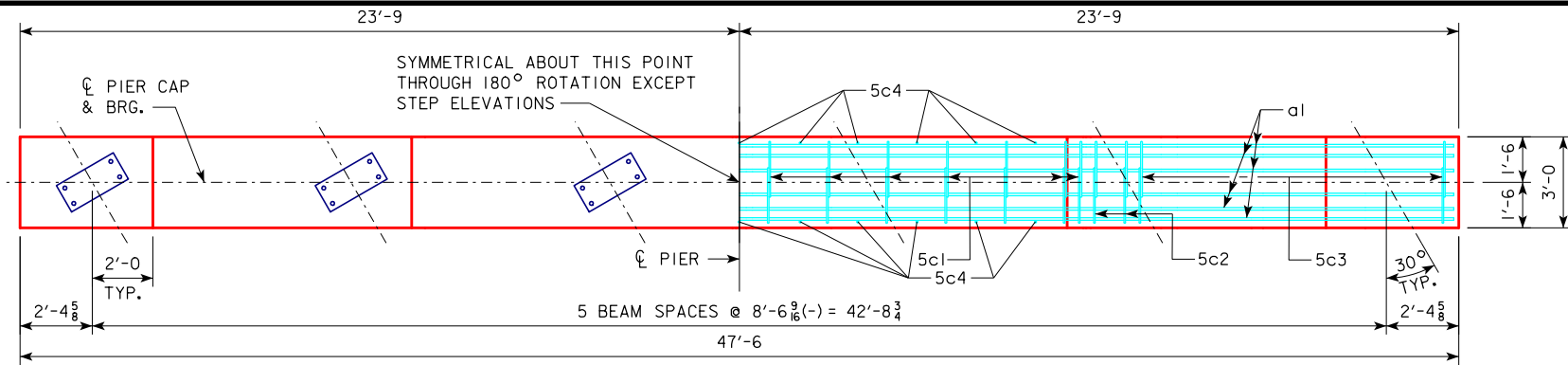


NOTE:
SEE SHEET RS40-144-14 FOR FOOTING NOTES.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER		
	STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
	TEE PIER - SPREAD FOOTINGS 20° SKEW - SHEET 2	RS40-145-14

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

REVISED 02-2017 - CHANGED BEVELED KEYWAY ON PIER COLUMN CAP AND FOOTING TO 3"x10"x18"-0 (WAS 2"x8"x20"-0). KEYWAY LENGTH CHANGED TO BE 5'-0 LESS THAN WIDTH OF PIER COLUMN.
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

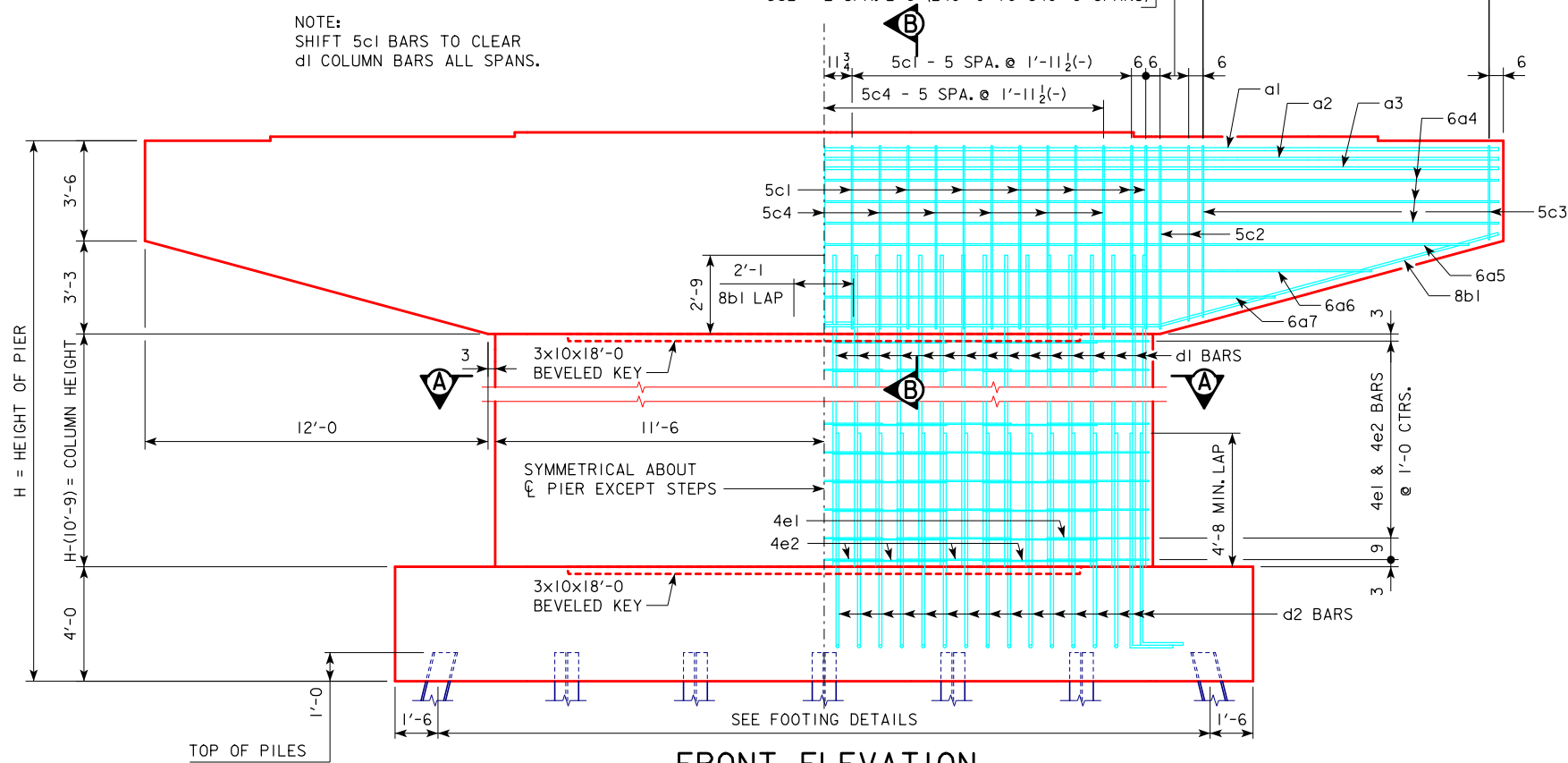


CAP PLAN

160'-0 TO 240'-0 SPANS	5c3 - 10 SPA. @ 1'-0 = 10'-0
260'-0 TO 280'-0 SPANS	5c3 - 13 SPA. @ 9 1/4 (-) = 10'-0
300'-0 TO 340'-0 SPANS	5c3 - 17 SPA. @ 7 (+) = 10'-0

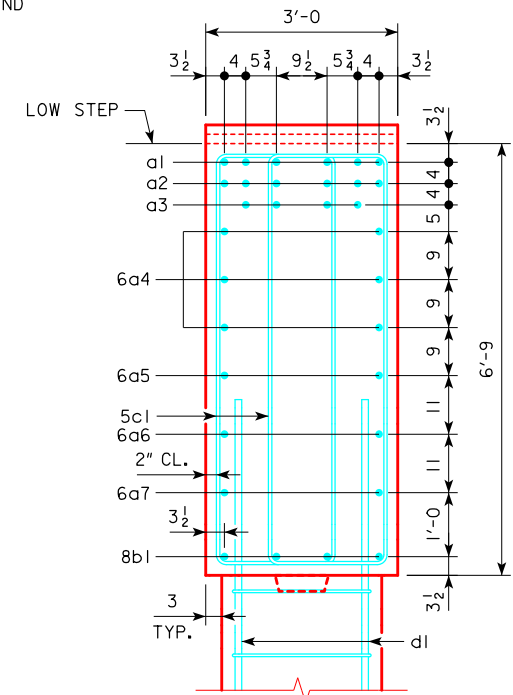
5c2 - 1 SPA. @ 1'-0 (160'-0 TO 220'-0 SPANS)
5c2 - 2 SPA. @ 6 (240'-0 TO 340'-0 SPANS)

NOTE:
SHIFT 5c1 BARS TO CLEAR
d1 COLUMN BARS ALL SPANS.

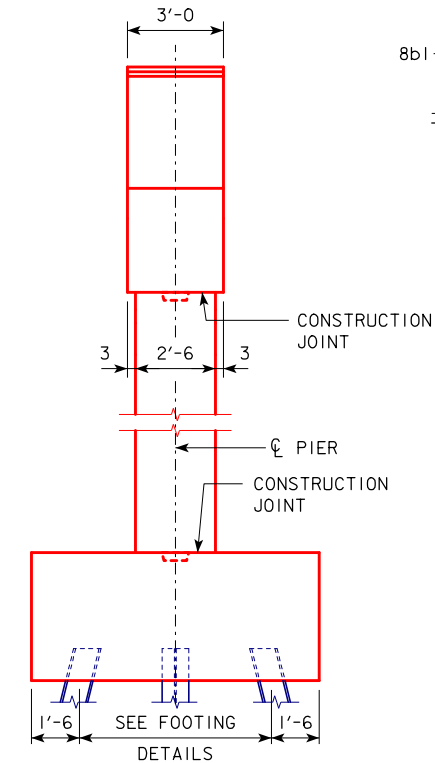


FRONT ELEVATION

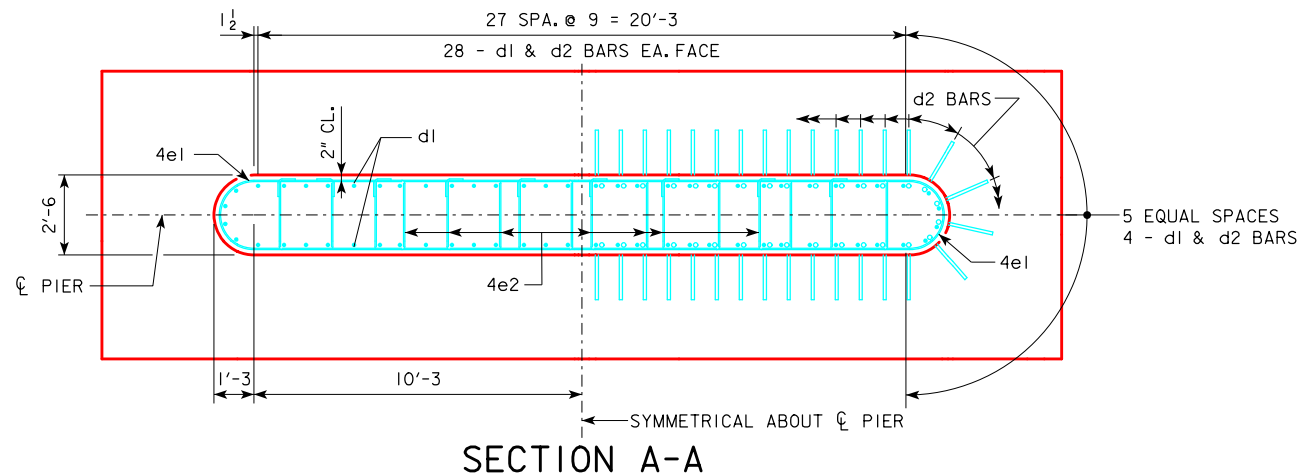
NOTE:
ANCHOR BOLTS REQUIRED FOR FIXED
PIER BEARINGS ONLY. FOR BOLT AND
BEARING SIZES, SEE RS40-093-14,
RS40-094-14 OR RS40-095-14.



SECTION B-B



END ELEVATION



SECTION A-A

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER <i>[Signature]</i>		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
TEE PIER CAP & COLUMN DETAILS 30° SKEW		RS40-146-10	

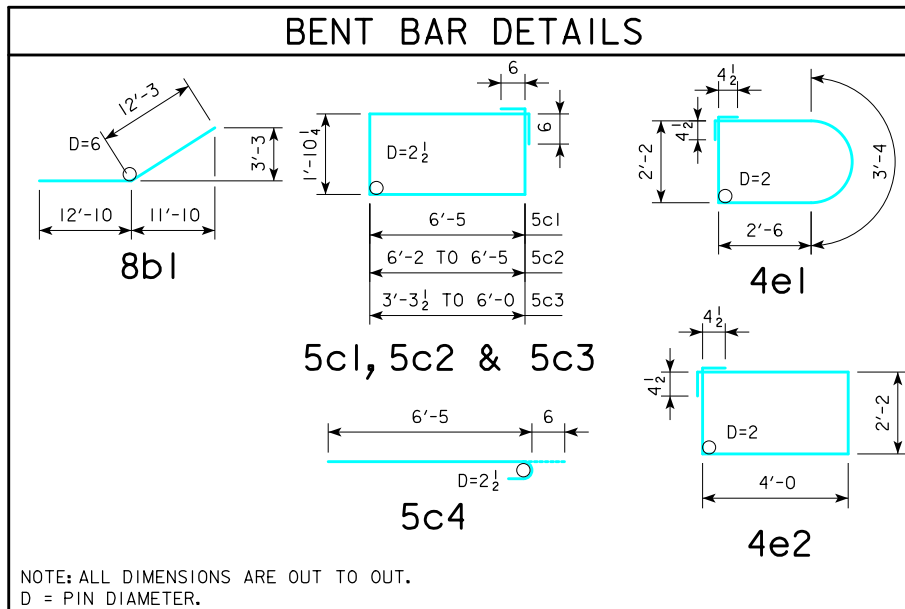
REVISED_08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

CAP

CL - CL ABUT. BEARINGS		160'-0"			180'-0"			200'-0"			220'-0"			240'-0"			260'-0"			280'-0"			300'-0"			320'-0"			340'-0"			
BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT			
a1	47'-2"		6	9	962	6	9	962	6	10	1218	6	10	1218	6	11	1504	6	11	1504	6	11	1504	6	11	1504	6	11	1504			
a2	47'-2"		6	8	756	6	9	962	6	9	962	6	9	962	6	10	1218	6	11	1504	6	11	1504	6	11	1504	6	11	1504			
a3	47'-2"		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4	6	283	4	7	386	4	9	641			
6a4	47'-2"		6	6	425	6	6	425	6	6	425	6	6	425	6	6	425	6	6	425	6	6	425	6	6	425	6	6	425			
6a5	45'-0"		2	6	135	2	6	135	2	6	135	2	6	135	2	6	135	2	6	135	2	6	135	2	6	135	2	6	135			
6a6	38'-3"		2	6	115	2	6	115	2	6	115	2	6	115	2	6	115	2	6	115	2	6	115	2	6	115	2	6	115			
6a7	31'-6"		2	6	95	2	6	95	2	6	95	2	6	95	2	6	95	2	6	95	2	6	95	2	6	95	2	6	95			
8b1	25'-11"		8	8	536	8	8	536	8	8	536	8	8	536	8	8	536	8	8	536	8	8	536	8	8	536	8	8	536			
5c1	17'-7"		28	5	514	28	5	514	28	5	514	28	5	514	28	5	514	28	5	514	28	5	514	28	5	514	28	5	514			
5c2	VARIABLE		8	5	145	8	5	145	8	5	145	8	5	145	12	5	217	12	5	217	12	5	217	12	5	217	12	5	217			
5c3	VARIABLE		44	5	642	44	5	642	44	5	642	44	5	642	44	5	642	56	5	818	56	5	818	72	5	1051	72	5	1051			
5c4	6'-11"		22	5	159	22	5	159	22	5	159	22	5	159	22	5	159	22	5	159	22	5	159	22	5	159	22	5	159			
TOTAL (LB.)			4484			4690			4946			4946			5274			5736			6022			6538			6641			6896		
STRUCTURAL CONCRETE (CY)			32.5			32.5			32.5			32.5			32.5			32.5			32.5			32.5			32.5			32.5		

COLUMN

H IN FEET	COLUMN HEIGHT	STRUCTURAL CONCRETE (CY)	REINFORCING STEEL												TOTAL WEIGHT (LB.)		
			d1 BAR				4e1 BAR				4e2 BAR						
				NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT		
16	5'-3"	10.9	64	9	8'-0"	1741	12	4	11'-3"	90	42	4	13'-1"	367	367	2198	
17	6'-3"	13.0	64	9	9'-0"	1958	14	4	11'-3"	105	49	4	13'-1"	428	428	2491	
18	7'-3"	15.1	64	9	10'-0"	2176	16	4	11'-3"	120	56	4	13'-1"	489	489	2785	
19	8'-3"	17.2	64	9	11'-0"	2394	18	4	11'-3"	135	63	4	13'-1"	551	551	3080	
20	9'-3"	19.2	64	9	12'-0"	2611	20	4	11'-3"	150	70	4	13'-1"	612	612	3373	
21	10'-3"	21.3	64	9	13'-0"	2829	22	4	11'-3"	165	77	4	13'-1"	673	673	3667	
22	11'-3"	23.4	64	9	14'-0"	3046	24	4	11'-3"	180	84	4	13'-1"	734	734	3960	
23	12'-3"	25.5	64	9	15'-0"	3264	26	4	11'-3"	195	91	4	13'-1"	795	795	4254	
24	13'-3"	27.6	64	9	16'-0"	3482	28	4	11'-3"	210	98	4	13'-1"	856	856	4548	
25	14'-3"	29.6	64	9	17'-0"	3699	30	4	11'-3"	225	105	4	13'-1"	918	918	4842	
26	15'-3"	31.7	64	9	18'-0"	3917	32	4	11'-3"	240	112	4	13'-1"	979	979	5136	
27	16'-3"	33.8	64	9	19'-0"	4134	34	4	11'-3"	256	119	4	13'-1"	1040	1040	5430	
28	17'-3"	35.9	64	9	20'-0"	4352	36	4	11'-3"	271	126	4	13'-1"	1101	1101	5724	
29	18'-3"	38.0	64	9	21'-0"	4570	38	4	11'-3"	286	133	4	13'-1"	1162	1162	6018	
30	19'-3"	40.0	64	9	22'-0"	4787	40	4	11'-3"	301	140	4	13'-1"	1224	1224	6312	
31	20'-3"	42.1	64	9	23'-0"	5005	42	4	11'-3"	316	147	4	13'-1"	1285	1285	6606	
32	21'-3"	44.2	64	9	24'-0"	5222	44	4	11'-3"	331	154	4	13'-1"	1346	1346	6899	
33	22'-3"	46.3	64	9	25'-0"	5440	46	4	11'-3"	346	161	4	13'-1"	1407	1407	7193	
34	23'-3"	48.4	64	9	26'-0"	5658	48	4	11'-3"	361	168	4	13'-1"	1468	1468	7487	
35	24'-3"	50.4	64	9	27'-0"	5875	50	4	11'-3"	376	175	4	13'-1"	1529	1529	7780	
36	25'-3"	52.5	64	9	28'-0"	6093	52	4	11'-3"	391	182	4	13'-1"	1591	1591	8075	
37	26'-3"	54.6	64	9	29'-0"	6310	54	4	11'-3"	406	189	4	13'-1"	1652	1652	8368	
38	27'-3"	56.7	64	9	30'-0"	6528	56	4	11'-3"	421	196	4	13'-1"	1713	1713	8662	
39	28'-3"	58.8	64	9	31'-0"	6746	58	4	11'-3"	436	203	4	13'-1"	1774	1774	8956	
40	29'-3"	60.8	64	9	32'-0"	6963	60	4	11'-3"	451	210	4	13'-1"	1835	1835	9249	



- NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.
- NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.
- NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

PIER NOTES:

SEE "TEE PIER NOTES" ON RS40-003-14 FOR NOTES REGARDING APPLICATION OF THESE PIER STANDARDS.

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

① SEE SHEET RS40-168-14 FOR STEP REINFORCING STEEL QUANTITIES AND DETAILS.

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER	IOWADOT Highway Division	
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES	
		ROLLED STEEL BEAM BRIDGES	
		OCTOBER, 2014	
		TEE PIER CAP & COLUMN DETAILS 30° SKEW	RS40-147-10

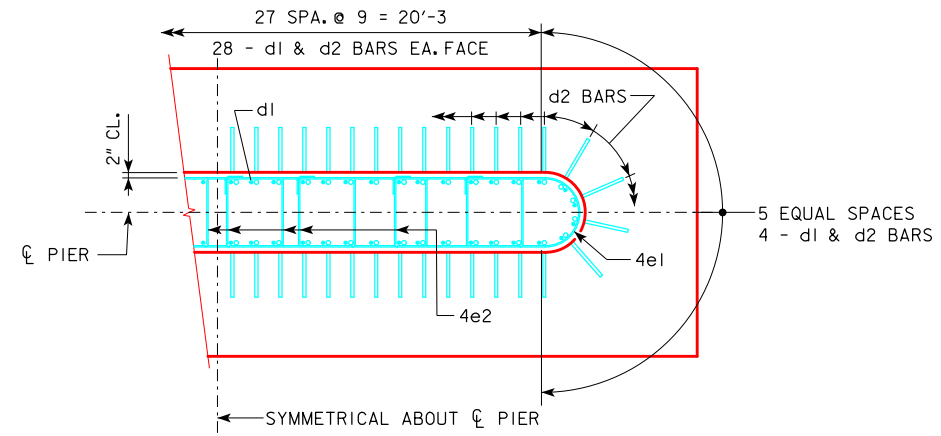
REVISED 02-2017 - CHANGED VERTICAL CLEARANCE OF REBAR "f2" TO TOP OF PIER FOOTING TO 3" (WAS 2").
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

H IN FT.	CL - CL ABUT. BRG.	PILING (HP10x57)		FOOTING SIZE
		NO. & LAYOUT	① LRFD Pu, STRENGTH I, DES. LOAD (KIPS)	
16 TO 18	160'-0	17A	136	4' x 8' x 28'
	180'-0	17A	145	
	200'-0	18A	144	
	220'-0	20A	146	
	240'-0	20D	142	
	260'-0	21A	147	
	280'-0	23B	144	
	300'-0	25A	143	
19 TO 21	160'-0	17A	140	4' x 8' x 28'
	180'-0	18A	140	
	200'-0	19A	144	
	220'-0	20C	146	
	240'-0	20D	146	
	260'-0	22A	145	
	280'-0	24A	142	
	300'-0	25A	147	
22 TO 24	160'-0	17A	145	4' x 8' x 28'
	180'-0	18A	145	
	200'-0	20A	144	
	220'-0	20D	139	
	240'-0	21A	145	
	260'-0	23A	145	
	280'-0	24A	145	
	300'-0	26A	145	
25 TO 27	160'-0	18A	140	4' x 8' x 28'
	180'-0	19A	144	
	200'-0	20B	145	
	220'-0	20D	142	
	240'-0	22A	143	
	260'-0	23B	143	
	280'-0	25A	144	
	300'-0	27A	144	
28 TO 30	160'-0	18B	141	4' x 9' x 28'
	180'-0	19B	145	
	200'-0	20C	145	
	220'-0	20D	145	
	240'-0	22A	146	
	260'-0	23B	146	
	280'-0	25A	146	
	300'-0	27A	146	
31 TO 33	160'-0	18B	145	4' x 9' x 28'
	180'-0	19C	146	
	200'-0	20D	139	
	220'-0	21A	144	
	240'-0	22B	144	
	260'-0	24A	143	
	280'-0	26A	144	
	300'-0	27B	142	
34 TO 36	160'-0	18C	145	4' x 11' x 28'
	180'-0	19D	141	
	200'-0	20D	141	
	220'-0	21A	146	
	240'-0	22B	146	
	260'-0	24A	146	
	280'-0	26A	146	
	300'-0	27B	144	

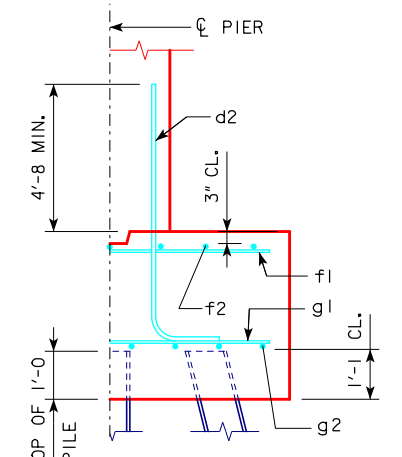
H IN FT.	CL - CL ABUT. BRG.	PILING (HP10x57)		FOOTING SIZE
		NO. & LAYOUT	① LRFD Pu, STRENGTH I, DES. LOAD (KIPS)	
37 TO 40	160'-0	19C	144	4' x 11' x 28'
	180'-0	19D	145	
	200'-0	20D	145	
	220'-0	22A	145	
	240'-0	23B	145	
	260'-0	25A	145	
	280'-0	26B	143	
	300'-0	27B	146	
	320'-0	28B	147	
	340'-0	30A	146	

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)				STRUCTURAL CONCRETE (CY)	
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)		
4' x 8' x 28'	d2	64 - #9 AS SHOWN	9'-1	1977	3294	33.2
	f1	28 - #5 @ 1'-0	7'-8	224		
	f2	8 - #5 @ 1'-0	27'-8	231		
	g1	28 - #6 @ 1'-0	7'-8	322		
	g2	13 - #6 @ 0'-7 1/2	27'-8	540		
	d2	64 - #9 AS SHOWN	9'-1	1977		
f1	28 - #5 @ 1'-0	8'-8	253			
f2	9 - #5 @ 1'-0	27'-8	260			
g1	35 - #6 @ 0'-9 1/2	8'-8	456			
g2	13 - #6 @ 0'-8 1/2	27'-8	540			
d2	64 - #9 AS SHOWN	9'-1	1977	4029	45.6	
f1	28 - #5 @ 1'-0	10'-8	312			
f2	11 - #5 @ 1'-0	27'-8	317			
g1	31 - #8 @ 0'-11	10'-8	883			
g2	13 - #6 @ 0'-10 1/2	27'-8	540			
d2	64 - #9 AS SHOWN	9'-1	1977			4829
f1	30 - #5 @ 1'-0	10'-8	334			
f2	11 - #5 @ 1'-0	29'-8	340			
g1	32 - #8 @ 0'-11	10'-8	911			
g2	16 - #8 @ 0'-8	29'-8	1267			
d2	64 - #9 AS SHOWN	9'-1	1977	5778	62.2	
f1	30 - #5 @ 1'-0	13'-8	428			
f2	14 - #5 @ 1'-0	29'-8	433			
g1	36 - #9 @ 0'-10	13'-8	1673			
g2	16 - #8 @ 0'-10 1/2	29'-8	1267			
d2	64 - #9 AS SHOWN	9'-1	1977			6567
f1	32 - #5 @ 1'-0	13'-8	456			
f2	14 - #5 @ 1'-0	31'-8	462			
g1	39 - #9 @ 0'-9 1/2	13'-8	1812			
g2	22 - #8 @ 0'-7 1/2	31'-8	1860			
d2	64 - #9 AS SHOWN	9'-1	1977	6837	70.5	
f1	34 - #5 @ 1'-0	13'-8	485			
f2	14 - #5 @ 1'-0	33'-8	492			
g1	41 - #9 @ 0'-10	13'-8	1905			
g2	22 - #8 @ 0'-7 1/2	33'-8	1978			

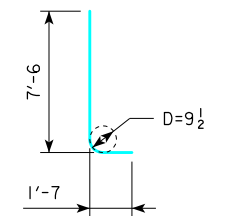
① NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET RS40-146-14.)



TYPICAL SECTION



d2

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

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

FOOTING NOTES:

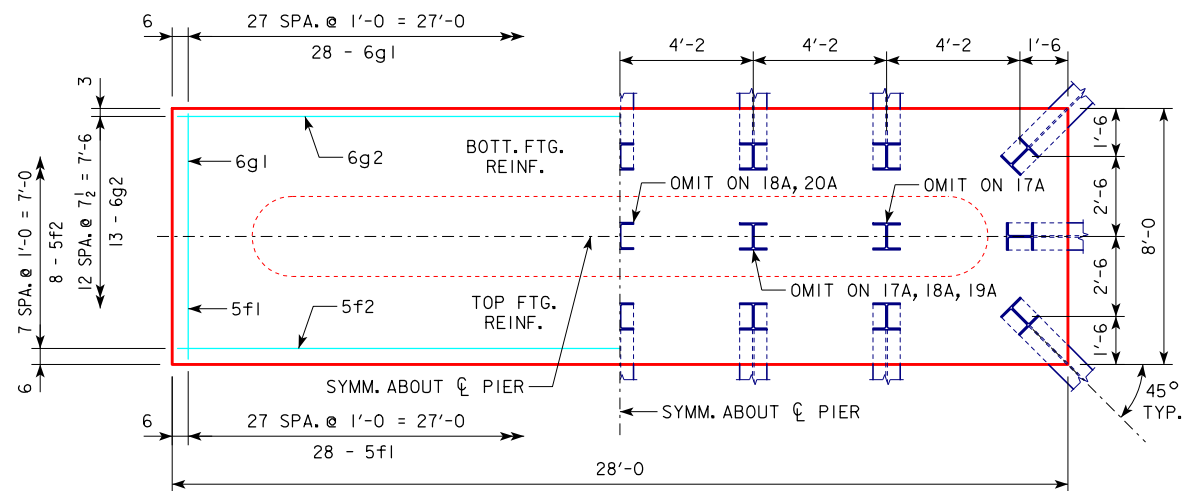
THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET RS40-146-14.

BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.

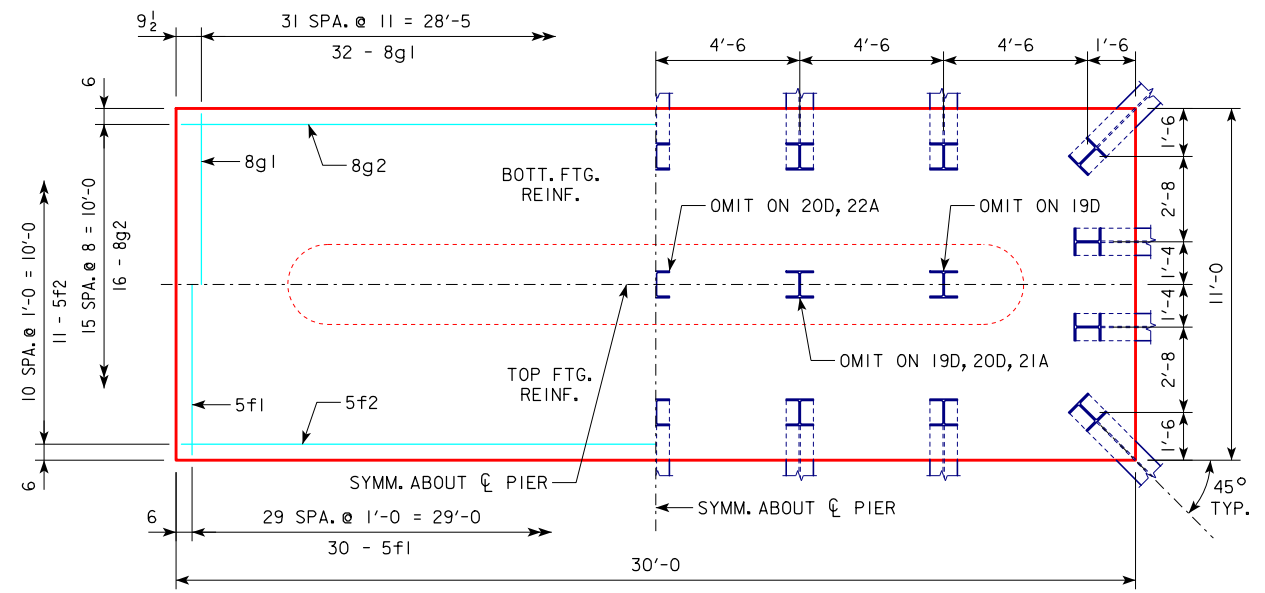
STEEL PILING USED AS POINT BEARING SHALL HAVE A MINIMUM DISTANCE OF APPROXIMATELY 10 FEET FROM BOTTOM OF FOOTING TO TOP OF BEARING ROCK. THE PILE LAYOUTS ARE SUCH THAT THE DISTANCE CENTER TO CENTER OF ADJACENT PILING SHALL NOT EXCEED 8'-0.

PIER PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

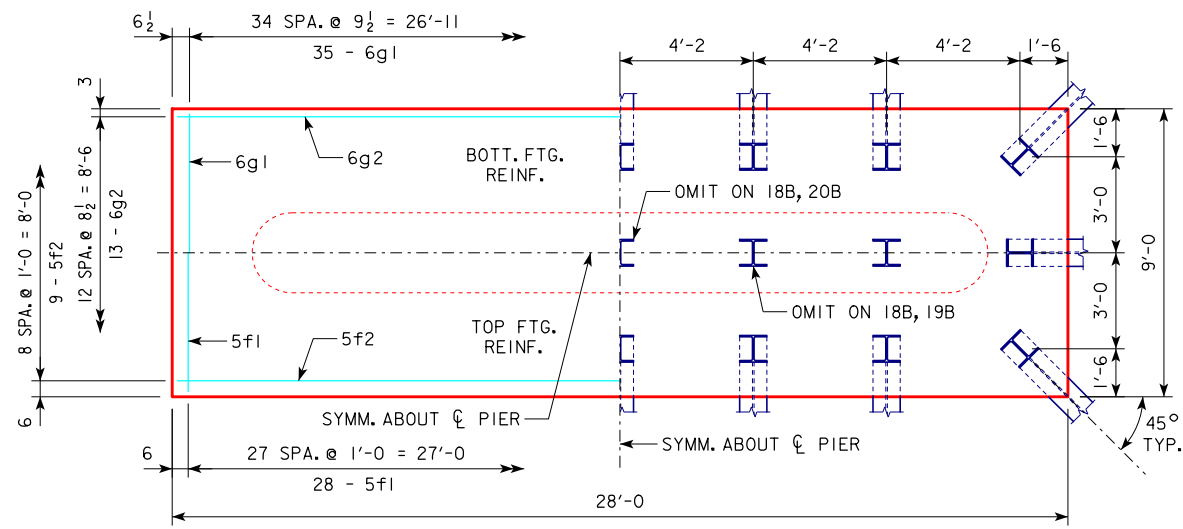
08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
TEE PIER-HP10x57 SRL-1 STEEL PILE FOOTINGS 30° SKEW - SHEET 1		RS40-148-14	



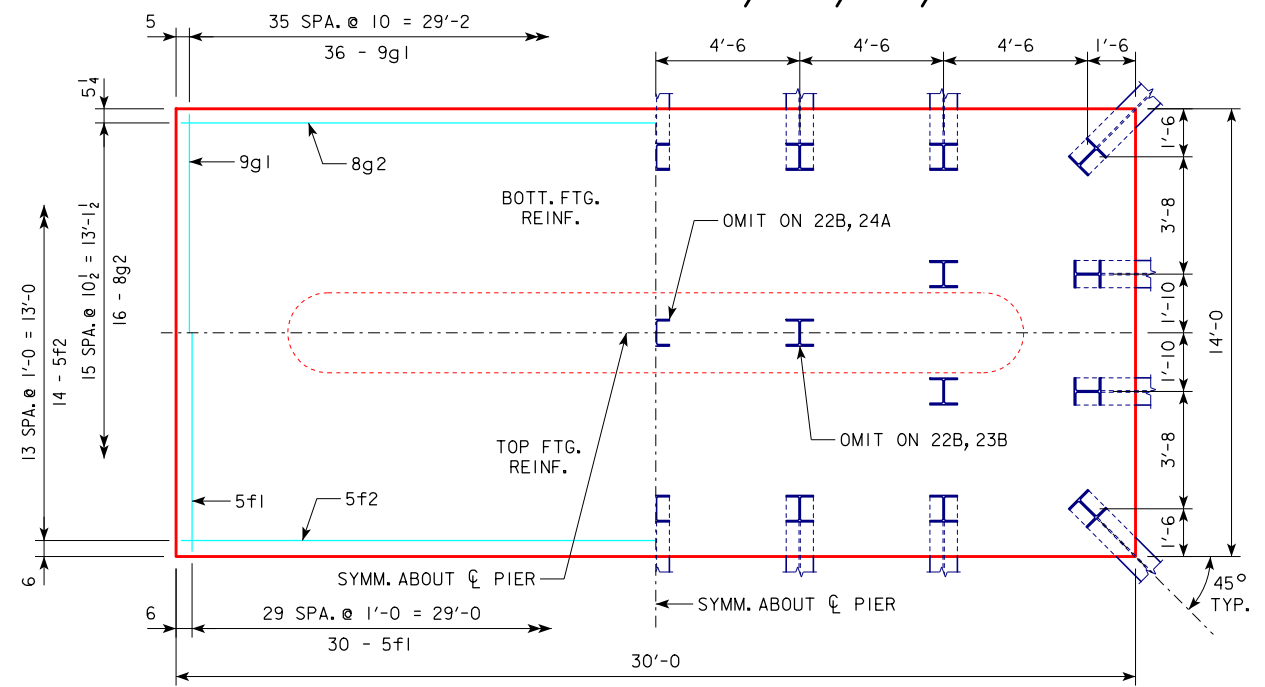
4'-0 x 8'-0 x 28'-0 FOR 17A, 18A, 19A & 20A



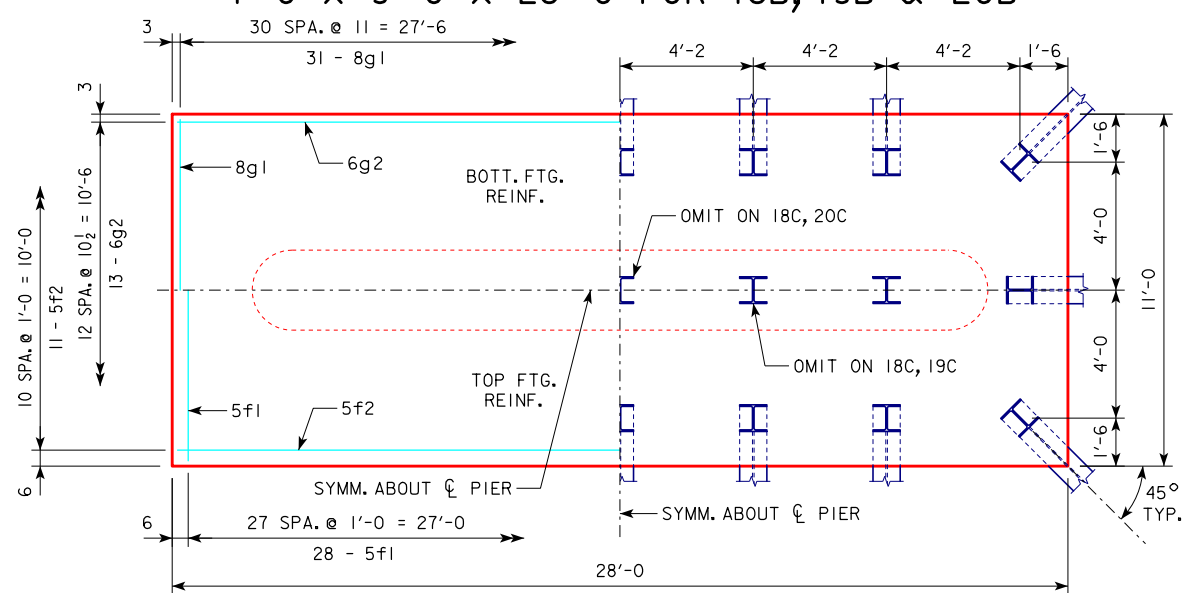
4'-0 x 11'-0 x 30'-0 FOR 19D, 20D, 21A, 22A & 23A



4'-0 x 9'-0 x 28'-0 FOR 18B, 19B & 20B





4'-0 x 14'-0 x 30'-0 FOR 22B, 23B, 24A & 25A



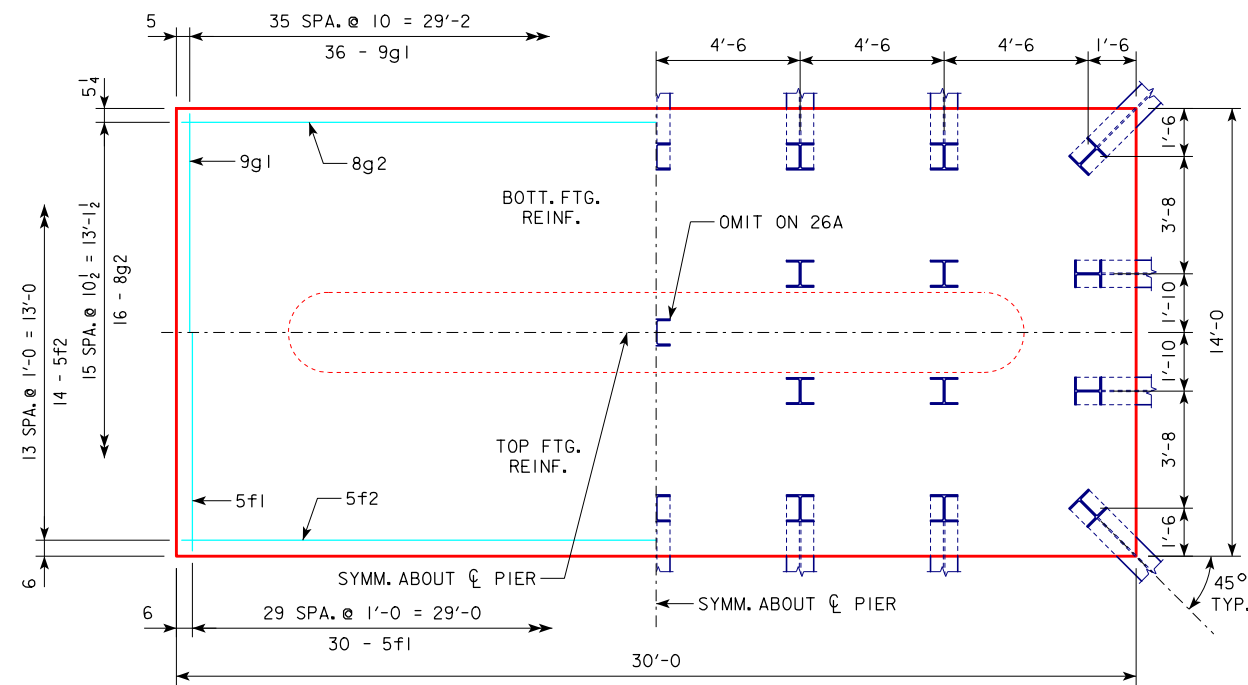
4'-0 x 11'-0 x 28'-0 FOR 18C, 19C & 20C

NOTE:
SEE SHEET RS40-148-14 FOR FOOTING NOTES.

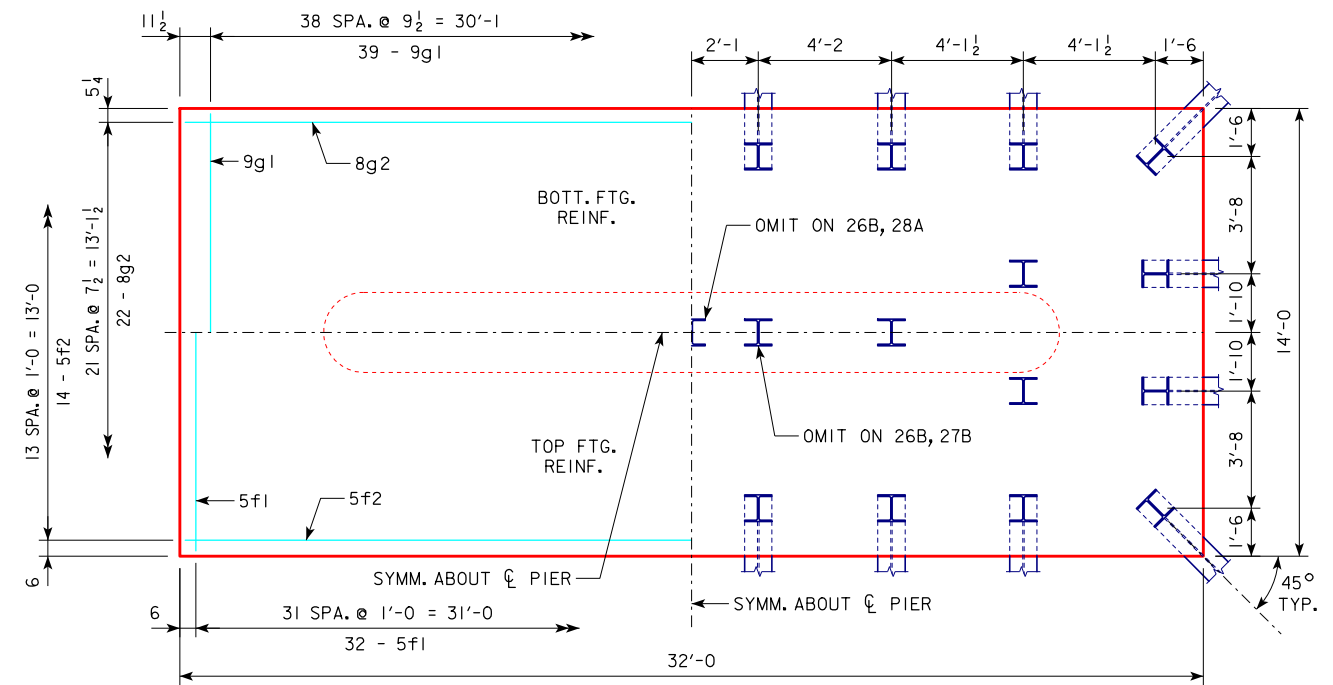
08-2018 LATEST REVISION DATE  APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	TEE PIER-HP10x57 SRL-I STEEL PILE FOOTINGS 30° SKEW - SHEET 2

RS40-149-14

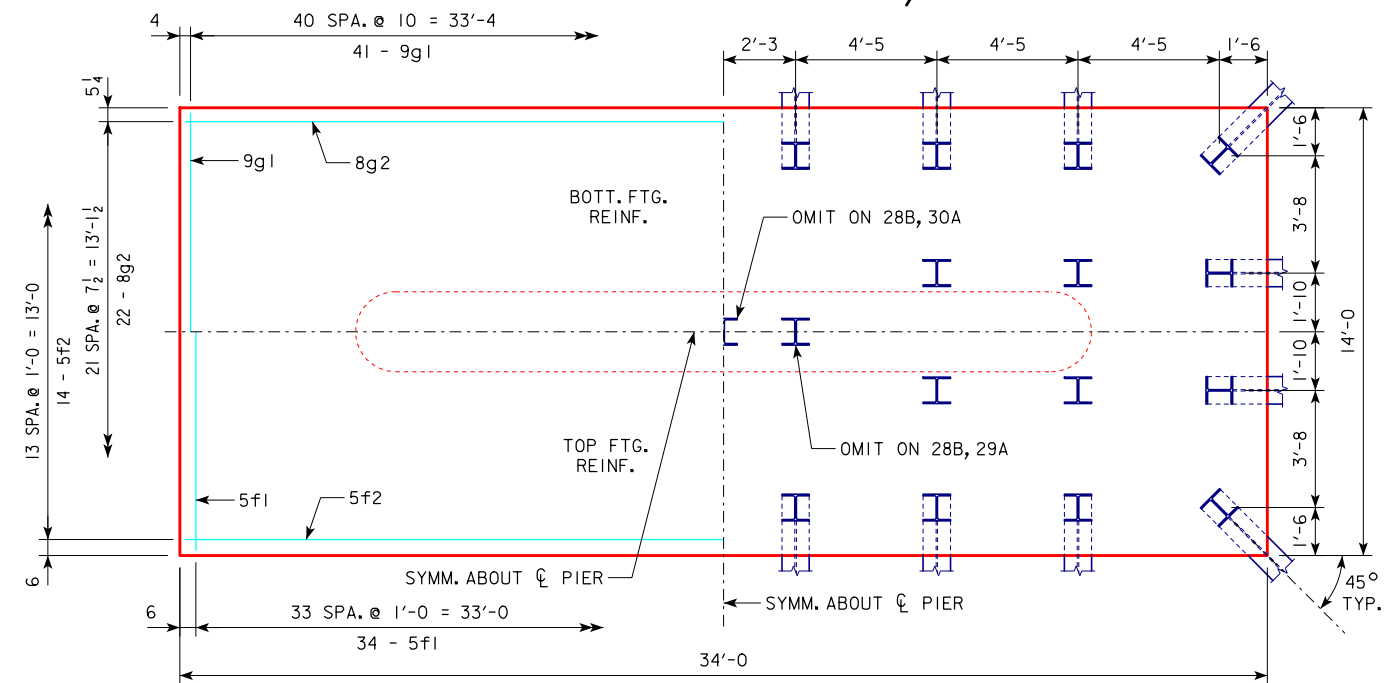
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



4'-0 x 14'-0 x 30'-0 FOR 26A & 27A



4'-0 x 14'-0 x 32'-0 FOR 26B, 27B & 28A



4'-0 x 14'-0 x 34'-0 FOR 28B, 29A & 30A

NOTE:
SEE SHEET RS40-148-14 FOR FOOTING NOTES.

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER 	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	TEE PIER-HPI0x57 SRL-I STEEL PILE FOOTINGS 30° SKEW - SHEET 3
RS40-150-14	

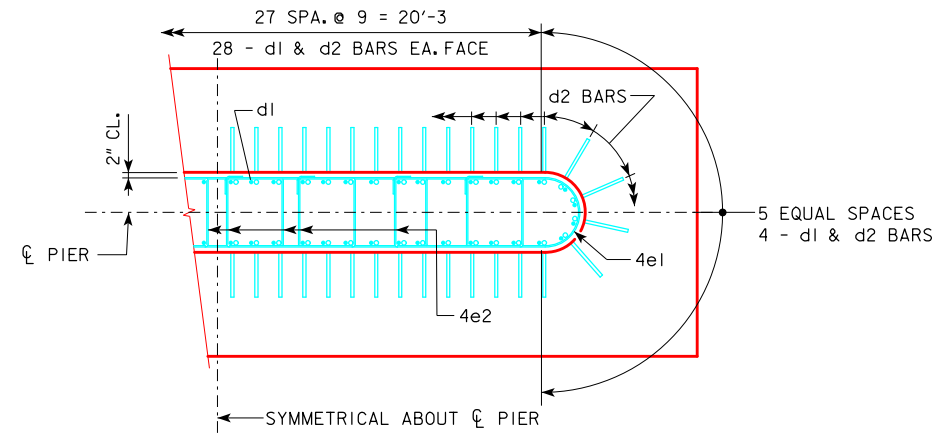
REVISED 02-2017 - CHANGED VERTICAL CLEARANCE OF REBAR "f2" TO TOP OF PIER FOOTING TO 3" (WAS 2").
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

H IN FT.	CL - CL ABUT. BRG.	PILING (HP10x57)		FOOTING SIZE
		NO. & LAYOUT	① LRFD Pu, STRENGTH I, DES. LOAD (KIPS)	
16 TO 18	160'-0	10A	215	4' x 8' x 27'
	180'-0	11A	216	
	200'-0	12A	211	
	220'-0	13A	218	
	240'-0	14A	216	
	260'-0	14B	219	
	280'-0	16A	212	4' x 11' x 27'
	300'-0	16C	210	
	320'-0	17B	212	
	340'-0	18A	211	
19 TO 21	160'-0	11A	210	4' x 8' x 27'
	180'-0	12A	206	
	200'-0	12B	214	
	220'-0	13B	218	
	240'-0	14B	210	
	260'-0	15A	215	
	280'-0	16A	217	4' x 11' x 27'
	300'-0	16C	215	
	320'-0	17B	217	
	340'-0	18A	216	
22 TO 24	160'-0	11B	213	4' x 9' x 27'
	180'-0	12B	208	
	200'-0	12C	218	
	220'-0	14A	213	
	240'-0	14B	215	
	260'-0	15A	220	
	280'-0	16C	207	4' x 11' x 27'
	300'-0	16C	219	
	320'-0	18A	211	
	340'-0	19A	213	
25 TO 27	160'-0	11C	217	4' x 9' x 27'
	180'-0	12C	212	
	200'-0	13B	213	
	220'-0	14A	218	
	240'-0	15A	211	
	260'-0	16A	212	
	280'-0	16C	211	4' x 11' x 27'
	300'-0	17B	214	
	320'-0	18A	215	
	340'-0	19A	216	
28 TO 30	160'-0	12C	204	4' x 10' x 27'
	180'-0	12C	217	
	200'-0	13B	218	
	220'-0	14B	210	
	240'-0	15A	215	
	260'-0	16A	216	
	280'-0	16C	215	4' x 11' x 27'
	300'-0	17B	218	
	320'-0	18A	218	
	340'-0	19B	218	
31 TO 33	160'-0	12C	209	4' x 10' x 27'
	180'-0	12D	217	
	200'-0	13C	218	
	220'-0	14B	214	
	240'-0	15A	219	
	260'-0	16B	218	
	280'-0	16C	218	4' x 12' x 29'
	300'-0	18A	211	
	320'-0	19A	214	
	340'-0	20A	214	
34 TO 36	160'-0	12D	209	4' x 11' x 27'
	180'-0	13C	211	
	200'-0	14B	204	
	220'-0	14B	218	
	240'-0	16A	211	
	260'-0	17A	214	
	280'-0	17B	213	4' x 12' x 29'
	300'-0	18A	214	
	320'-0	19B	215	
	340'-0	20A	216	

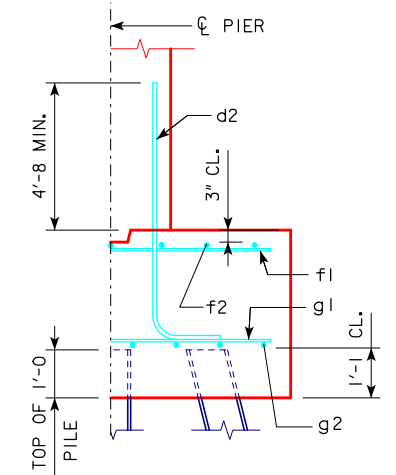
H IN FT.	CL - CL ABUT. BRG.	PILING (HP10x57)		FOOTING SIZE
		NO. & LAYOUT	① LRFD Pu, STRENGTH I, DES. LOAD (KIPS)	
37 TO 40	160'-0	12D	215	4' x 11' x 27'
	180'-0	14B	199	
	200'-0	14B	209	
	220'-0	15A	214	
	240'-0	16A	216	
	260'-0	17A	218	
	280'-0	17B	217	4' x 12' x 29'
	300'-0	18A	217	
	320'-0	19B	219	
	340'-0	20B	218	

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)				STRUCTURAL CONCRETE (CY)	
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)		
4' x 8' x 27'	d2	64 - #9 AS SHOWN	9'-1	1977	3248	32.0
	f1	27 - #5 @ 1'-0	7'-8	216		
	f2	8 - #5 @ 1'-0	26'-8	223		
	g1	27 - #6 @ 1'-0	7'-8	311		
	g2	13 - #6 @ 0'-7 1/2	26'-8	521		
	d2	64 - #9 AS SHOWN	9'-1	1977		
f1	27 - #5 @ 1'-0	8'-8	244			
f2	9 - #5 @ 1'-0	26'-8	250			
g1	29 - #6 @ 0'-11	8'-8	378			
g2	13 - #6 @ 0'-8 1/2	26'-8	521			
d2	64 - #9 AS SHOWN	9'-1	1977	3601	40.0	
f1	27 - #5 @ 1'-0	9'-8	272			
f2	10 - #5 @ 1'-0	26'-8	278			
g1	28 - #7 @ 0'-11 1/2	9'-8	553			
g2	13 - #6 @ 0'-9 1/2	26'-8	521			
d2	64 - #9 AS SHOWN	9'-1	1977			4083
f1	27 - #5 @ 1'-0	10'-8	300			
f2	11 - #5 @ 1'-0	26'-8	306			
g1	27 - #9 @ 1'-0	10'-8	979			
g2	13 - #6 @ 0'-10 1/2	26'-8	521			
d2	64 - #9 AS SHOWN	9'-1	1977	4391	48.0	
f1	27 - #5 @ 1'-0	11'-8	329			
f2	12 - #5 @ 1'-0	26'-8	334			
g1	31 - #9 @ 0'-10 1/2	11'-8	1230			
g2	13 - #6 @ 0'-11 1/2	26'-8	521			
d2	64 - #9 AS SHOWN	9'-1	1977			5452
f1	29 - #5 @ 1'-0	11'-8	353			
f2	12 - #5 @ 1'-0	28'-8	359			
g1	33 - #9 @ 0'-10 1/2	11'-8	1309			
g2	19 - #8 @ 0'-7 1/2	28'-8	1454			
d2	64 - #9 AS SHOWN	9'-1	1977	5787	55.9	
f1	29 - #5 @ 1'-0	12'-8	383			
f2	13 - #5 @ 1'-0	28'-8	389			
g1	35 - #9 @ 0'-10	12'-8	1507			
g2	20 - #8 @ 0'-7 1/2	28'-8	1531			
d2	64 - #9 AS SHOWN	9'-1	1977			5966
f1	29 - #5 @ 1'-0	13'-8	413			
f2	14 - #5 @ 1'-0	28'-8	419			
g1	35 - #9 @ 0'-10	13'-8	1626			
g2	20 - #8 @ 0'-8 1/2	28'-8	1531			

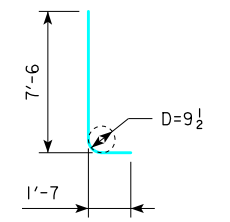
① NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET RS40-146-14.)



TYPICAL SECTION



d2

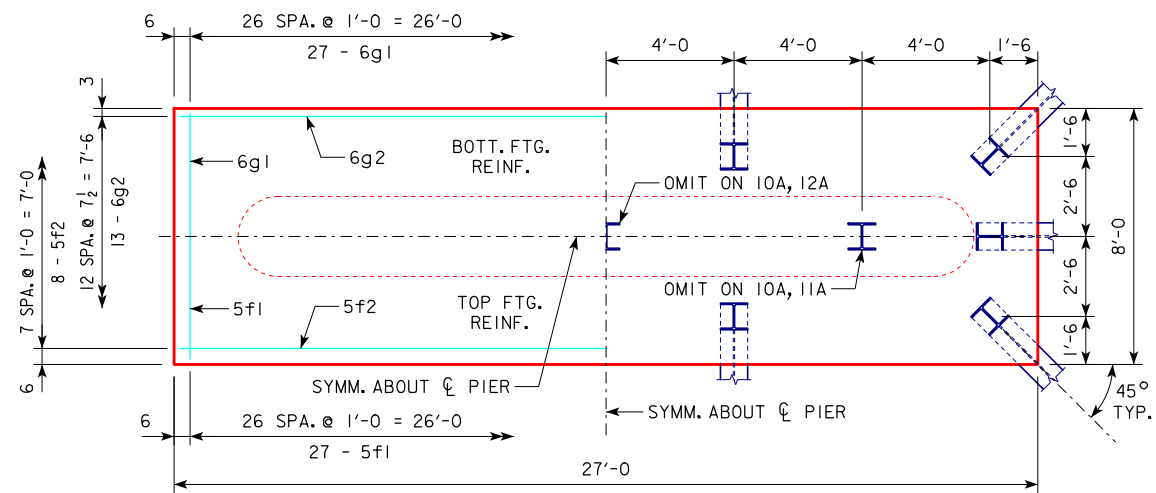
NOTE: D = PIN DIAMETER.
DIMENSIONS ARE OUT TO OUT.

- NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.
- NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.
- NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

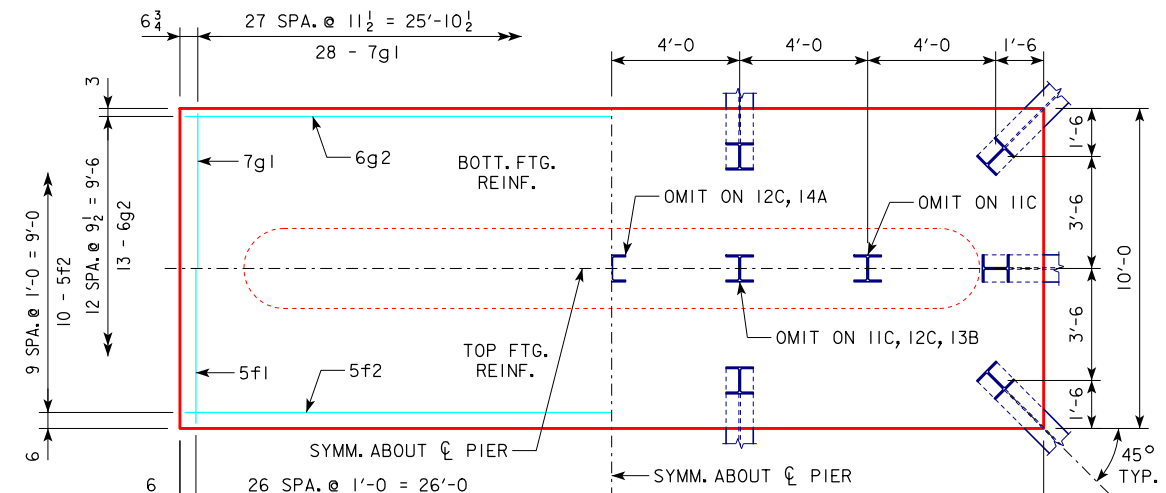
FOOTING NOTES:

- THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET RS40-146-14.
- BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.
- STEEL PILING USED AS POINT BEARING SHALL HAVE A MINIMUM DISTANCE OF APPROXIMATELY 10 FEET FROM BOTTOM OF FOOTING TO TOP OF BEARING ROCK. THE PILE LAYOUTS ARE SUCH THAT THE DISTANCE CENTER TO CENTER OF ADJACENT PILING SHALL NOT EXCEED 8'-0.
- PIER PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

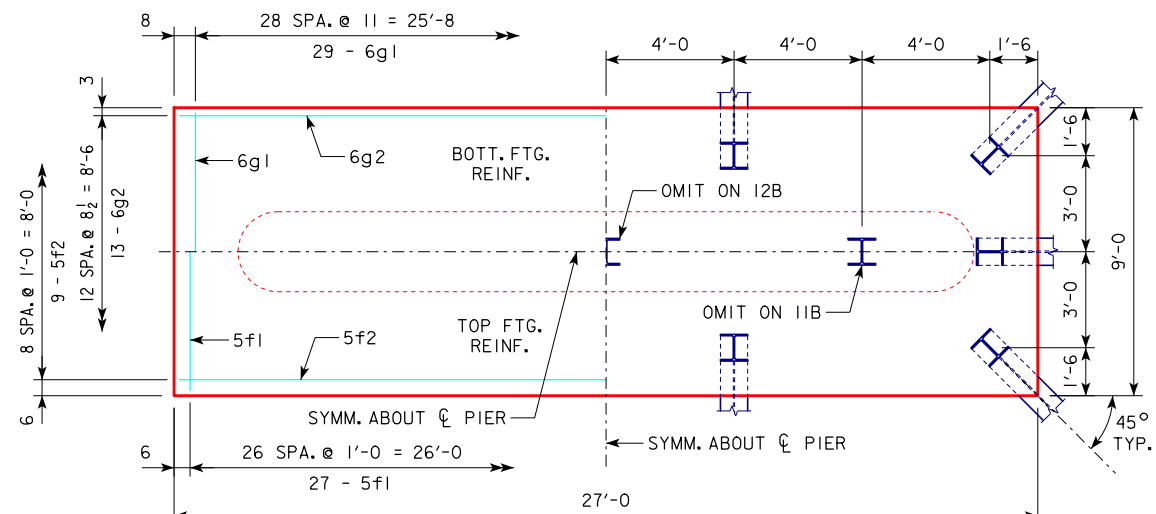
08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	TEE PIER-HP10x57 SRL-2 STEEL PILE FOOTINGS 30° SKEW - SHEET 1
	RS40-151-14



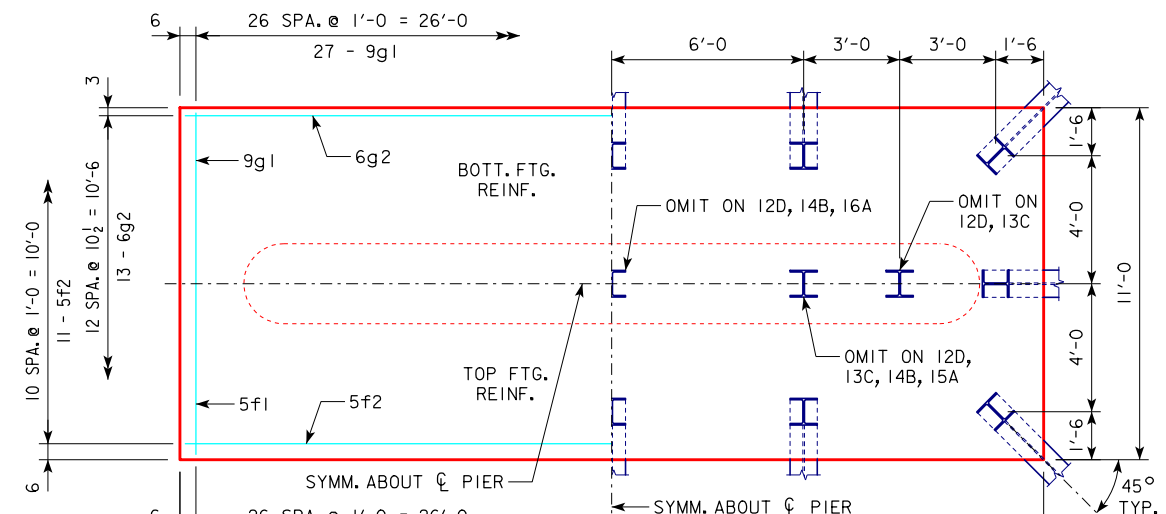
4'-0 x 8'-0 x 27'-0 FOR 10A, 11A, 12A & 13A



4'-0 x 10'-0 x 27'-0 FOR 11C, 12C, 13B & 14A



4'-0 x 9'-0 x 27'-0 FOR 11B & 12B



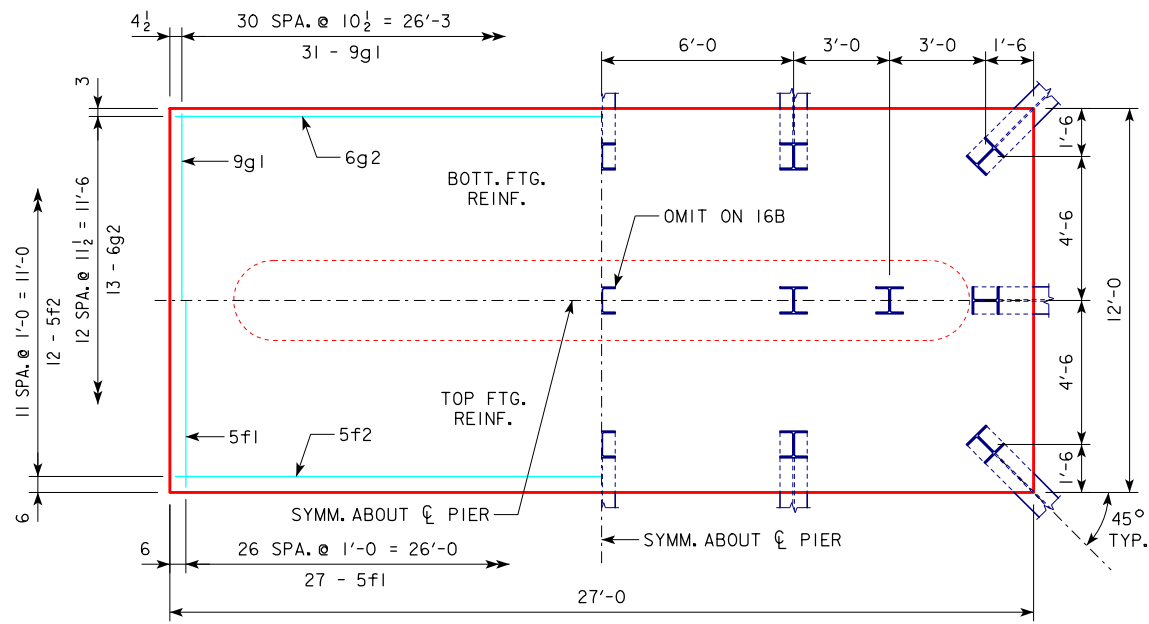
4'-0 x 11'-0 x 27'-0 FOR 12D, 13C, 14B, 15A & 16A

NOTE:
SEE SHEET RS40-151-14 FOR FOOTING NOTES.

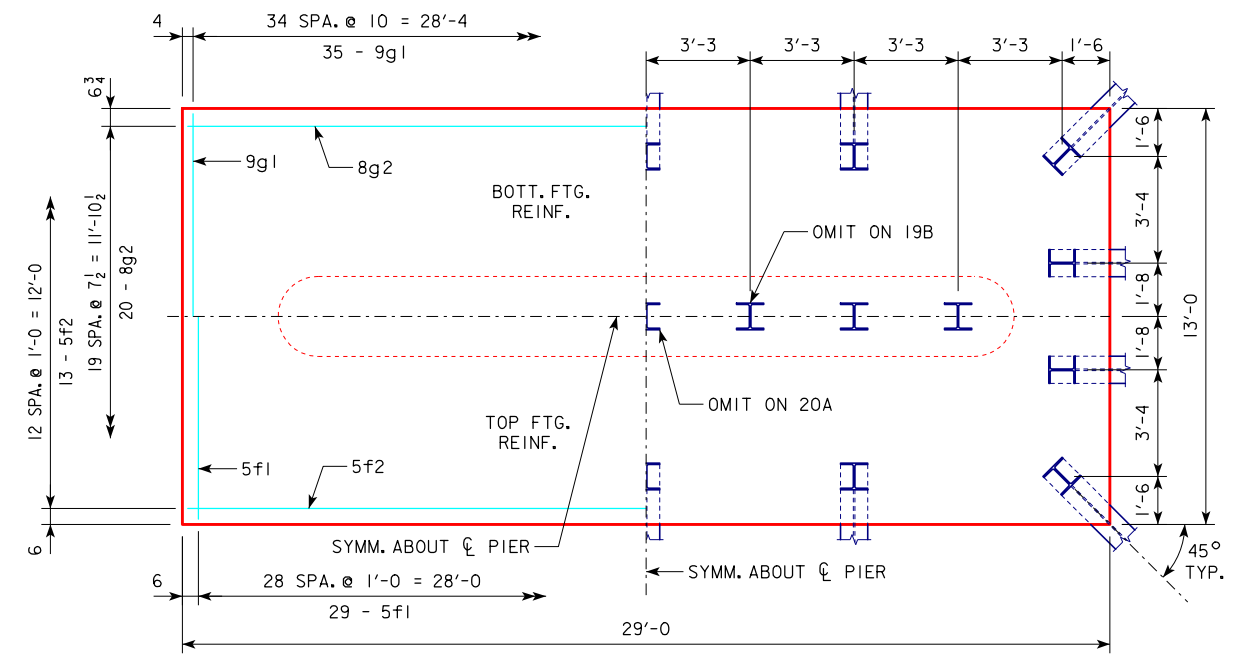
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	TEE PIER-HPI0x57 SRL-2 STEEL PILE FOOTINGS 30° SKEW - SHEET 2

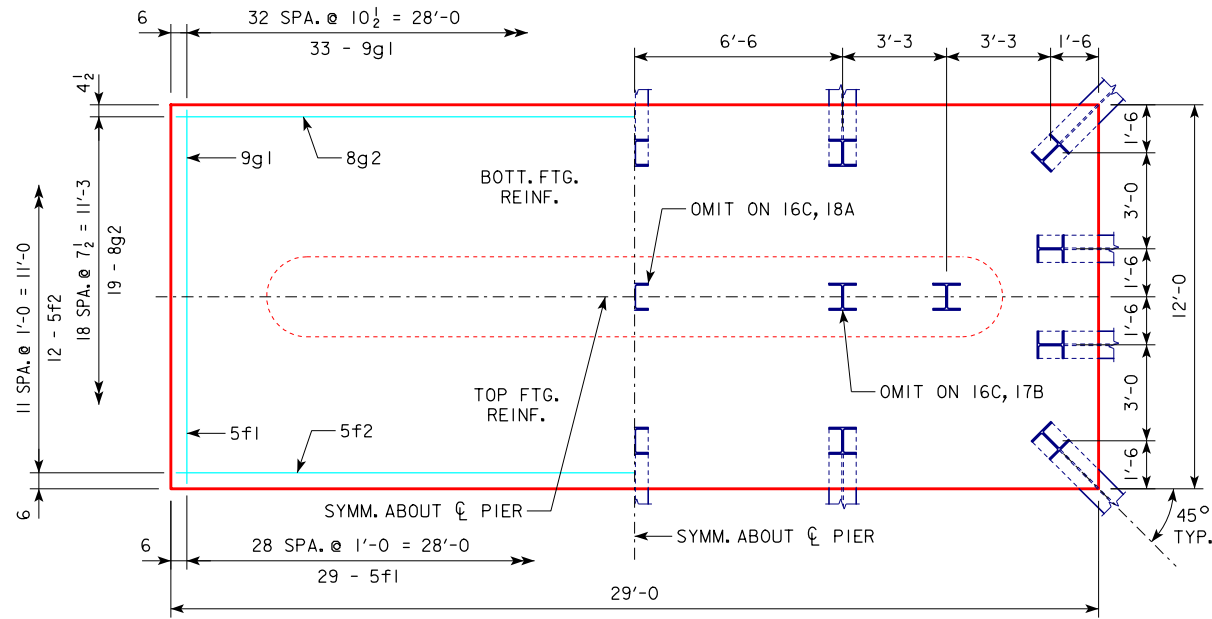
RS40-152-14



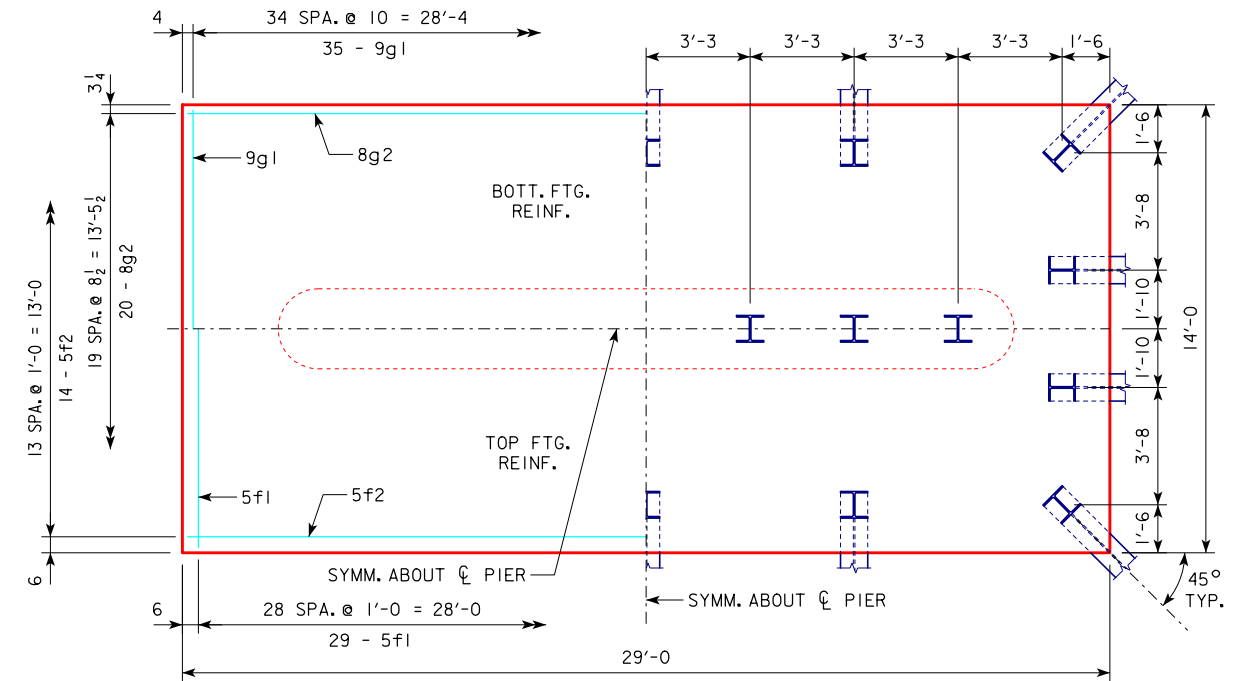
4'-0 x 12'-0 x 27'-0 FOR 16B & 17A



4'-0 x 13'-0 x 29'-0 FOR 19B & 20A



4'-0 x 12'-0 x 29'-0 FOR 16C, 17B, 18A & 19A



4'-0 x 14'-0 x 29'-0 FOR 20B

NOTE:
SEE SHEET RS40-151-14 FOR FOOTING NOTES.

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER 	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	TEE PIER-HPI0x57 SRL-2 STEEL PILE FOOTINGS <small>30° SKEW - SHEET 3</small>

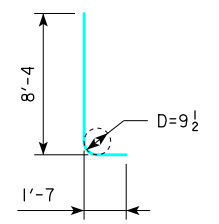
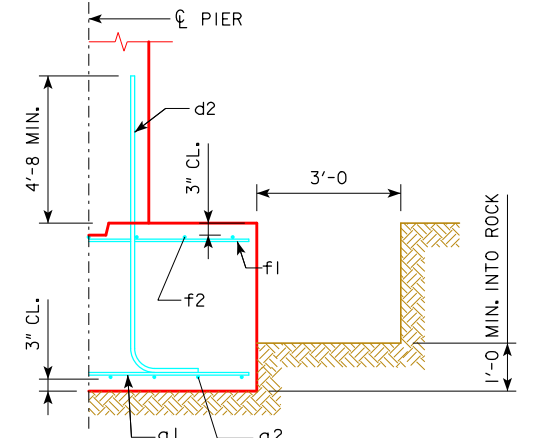
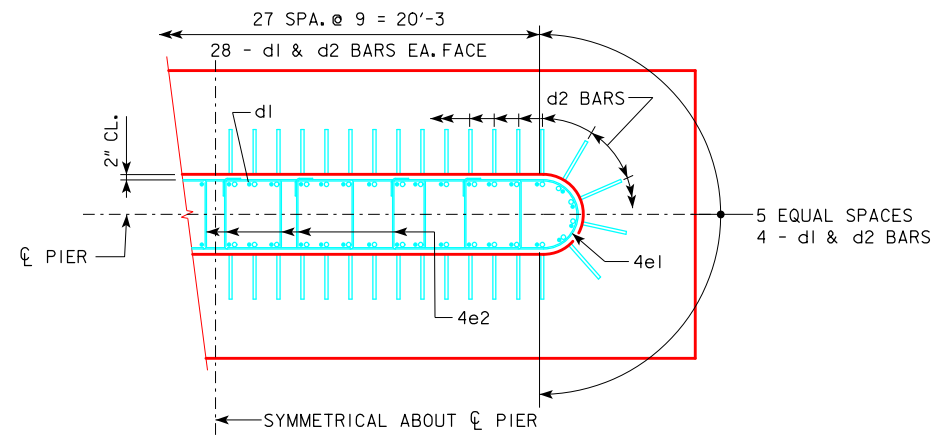
RS40-153-14

REVISED 02-2017 - CHANGED VERTICAL CLEARANCE OF REBAR "f2" TO TOP OF PIER FOOTING TO 3" (WAS 2").
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

H IN FT.	CL - CL ABUT. BRG.	FOOTING SIZE
160'-0"		4' x 8' x 28'
180'-0"		4' x 9' x 28'
200'-0"		4' x 9' x 30'
220'-0"		4' x 9' x 28'
240'-0"		4' x 9' x 30'
260'-0"		4' x 9' x 32'
280'-0"		4' x 10' x 30'
300'-0"		4' x 10' x 32'
320'-0"		4' x 10' x 32'
340'-0"		4' x 11' x 32'
160'-0"		4' x 8' x 28'
180'-0"		4' x 9' x 28'
200'-0"		4' x 9' x 30'
220'-0"		4' x 9' x 28'
240'-0"		4' x 9' x 30'
260'-0"		4' x 10' x 30'
280'-0"		4' x 10' x 32'
300'-0"		4' x 10' x 32'
320'-0"		4' x 11' x 32'
340'-0"		4' x 11' x 34'
160'-0"		4' x 8' x 28'
180'-0"		4' x 9' x 28'
200'-0"		4' x 9' x 30'
220'-0"		4' x 9' x 28'
240'-0"		4' x 9' x 30'
260'-0"		4' x 10' x 30'
280'-0"		4' x 10' x 32'
300'-0"		4' x 10' x 32'
320'-0"		4' x 11' x 32'
340'-0"		4' x 11' x 34'
160'-0"		4' x 8' x 28'
180'-0"		4' x 9' x 28'
200'-0"		4' x 9' x 30'
220'-0"		4' x 9' x 28'
240'-0"		4' x 9' x 30'
260'-0"		4' x 10' x 30'
280'-0"		4' x 10' x 32'
300'-0"		4' x 10' x 32'
320'-0"		4' x 11' x 32'
340'-0"		4' x 11' x 34'
160'-0"		4' x 8' x 28'
180'-0"		4' x 9' x 28'
200'-0"		4' x 9' x 30'
220'-0"		4' x 9' x 28'
240'-0"		4' x 9' x 30'
260'-0"		4' x 10' x 30'
280'-0"		4' x 10' x 32'
300'-0"		4' x 10' x 32'
320'-0"		4' x 11' x 32'
340'-0"		4' x 11' x 34'

H IN FT.	CL - CL ABUT. BRG.	FOOTING SIZE
160'-0"		4' x 9' x 28'
180'-0"		4' x 9' x 30'
200'-0"		4' x 9' x 28'
220'-0"		4' x 10' x 30'
240'-0"		4' x 10' x 32'
260'-0"		4' x 10' x 32'
280'-0"		4' x 11' x 32'
300'-0"		4' x 11' x 32'
320'-0"		4' x 11' x 34'
340'-0"		4' x 11' x 34'

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)				TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)		
4' x 8' x 28'	d2	64 - #9 AS SHOWN	9'-11"	2158	3267	33.2
	f1	28 - #5 @ 1'-0"	7'-8"	224		
	f2	8 - #5 @ 1'-0"	27'-8"	231		
	g1	28 - #6 @ 1'-0"	7'-8"	322		
4' x 9' x 28'	d2	64 - #9 AS SHOWN	9'-11"	2158	3462	37.3
	f1	28 - #5 @ 1'-0"	8'-8"	253		
	f2	9 - #5 @ 1'-0"	27'-8"	260		
	g1	32 - #6 @ 0'-10 1/2"	8'-8"	417		
4' x 9' x 30'	d2	64 - #9 AS SHOWN	9'-11"	2158	3843	40.0
	f1	30 - #5 @ 1'-0"	8'-8"	271		
	f2	9 - #5 @ 1'-0"	29'-8"	278		
	g1	36 - #6 @ 0'-10"	8'-8"	469		
4' x 10' x 30'	d2	64 - #9 AS SHOWN	9'-11"	2158	4208	44.4
	f1	30 - #5 @ 1'-0"	9'-8"	302		
	f2	10 - #5 @ 1'-0"	29'-8"	309		
	g1	36 - #7 @ 0'-10"	9'-8"	711		
4' x 10' x 32'	d2	64 - #9 AS SHOWN	9'-11"	2158	4850	47.4
	f1	32 - #5 @ 1'-0"	9'-8"	323		
	f2	10 - #5 @ 1'-0"	31'-8"	330		
	g1	39 - #7 @ 0'-9 1/2"	9'-8"	771		
4' x 11' x 32'	d2	64 - #9 AS SHOWN	9'-11"	2158	5312	52.1
	f1	32 - #5 @ 1'-0"	10'-8"	356		
	f2	11 - #5 @ 1'-0"	31'-8"	363		
	g1	38 - #8 @ 0'-10"	10'-8"	1082		
4' x 11' x 34'	d2	64 - #9 AS SHOWN	9'-11"	2158	6146	55.4
	f1	34 - #5 @ 1'-0"	10'-8"	378		
	f2	11 - #5 @ 1'-0"	33'-8"	386		
	g1	42 - #8 @ 0'-9 1/2"	10'-8"	1196		
4' x 11' x 34'	d2	64 - #9 AS SHOWN	9'-11"	2158	6146	55.4
	f1	34 - #5 @ 1'-0"	10'-8"	378		
	f2	11 - #5 @ 1'-0"	33'-8"	386		
	g1	42 - #8 @ 0'-9 1/2"	10'-8"	1196		



d2
NOTE: D = PIN DIAMETER.
DIMENSIONS ARE OUT TO OUT.

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

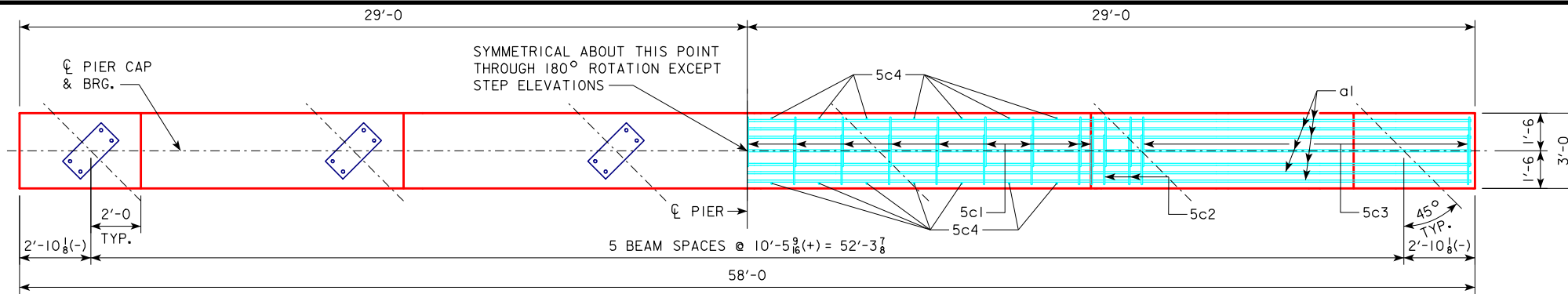
FOOTING NOTES:

THESE SPREAD FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET RS40-146-14.

THESE SPREAD FOOTINGS SHALL EXTEND AT LEAST 12 INCHES INTO SUITABLE FOUNDATION ROCK AND THE LAST 12 INCHES OF ROCK EXCAVATION SHALL BE TO NEAT LINES OF MASONRY. THE FOUNDATION ROCK SHALL HAVE A MINIMUM LRFD NOMINAL BEARING RESISTANCE OF 30 KIPS PER SQUARE FOOT (ALLOWABLE BEARING VALUE OF AT LEAST 10 KIPS PER SQUARE FOOT).

08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	RS40-154-14
		TEE PIER - SPREAD FOOTINGS 30° SKEW - SHEET 1	
		30° SKEW - SHEET 1	

REVISED 02-2017 - CHANGED BEVELED KEYWAY ON PIER COLUMN CAP AND FOOTING TO 3"x10"x23'-0 (WAS 2"x8"x25'-0). KEYWAY LENGTH CHANGED TO BE 5'-0 LESS THAN WIDTH OF PIER COLUMN.
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



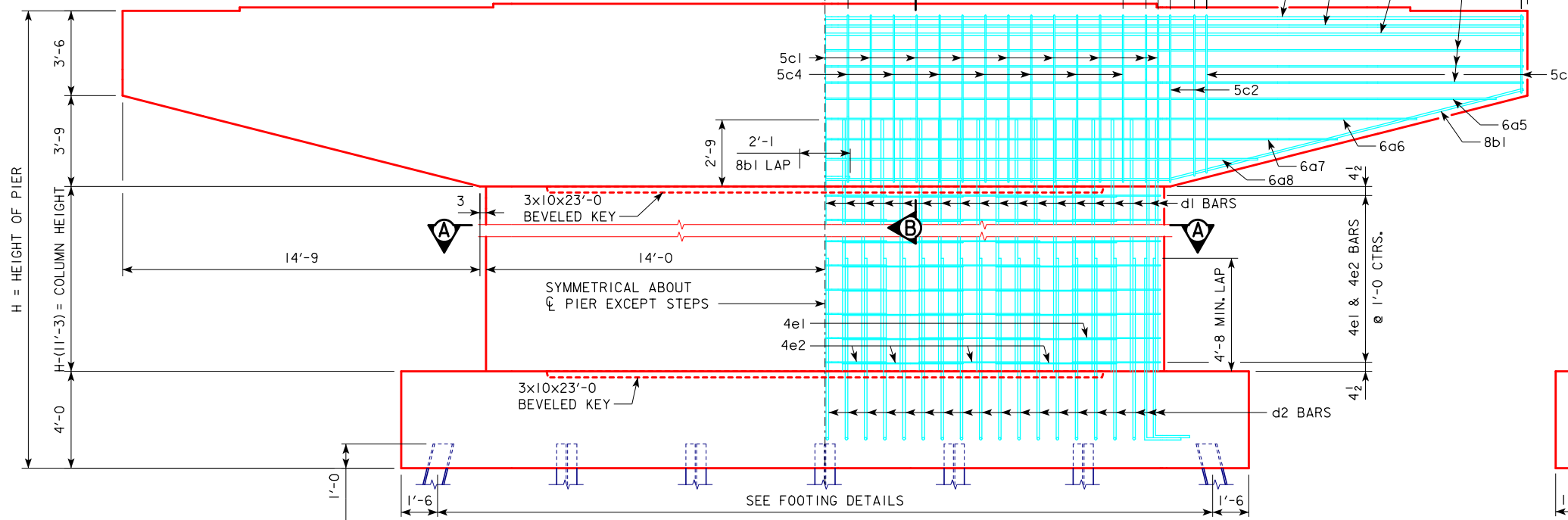
NOTE:
ANCHOR BOLTS REQUIRED FOR FIXED PIER BEARINGS ONLY. FOR BOLT AND BEARING SIZES, SEE RS40-093-14, RS40-094-14 OR RS40-095-14.

CAP PLAN

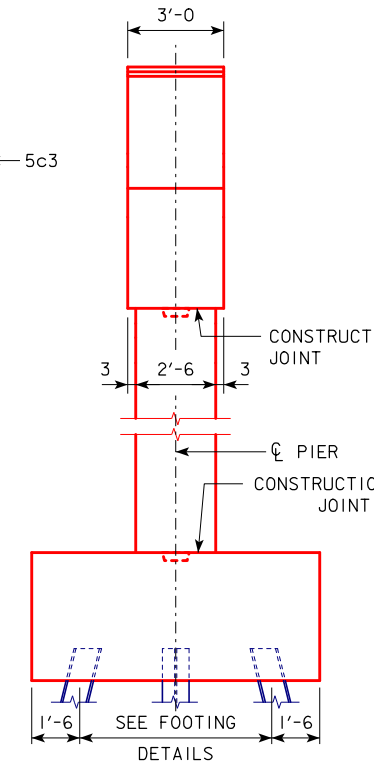
(LAYOUT OF d1 BARS SHOWN IS FOR 160'-0 TO 200'-0 SPANS)

160'-0 TO 240'-0 SPANS	5c3 - 13 SPA. @ 1'-0 = 13'-0
260'-0 TO 280'-0 SPANS	5c3 - 17 SPA. @ 9 3/8 (+) = 13'-0
300'-0 TO 340'-0 SPANS	5c3 - 22 SPA. @ 7 3/8 (-) = 13'-0

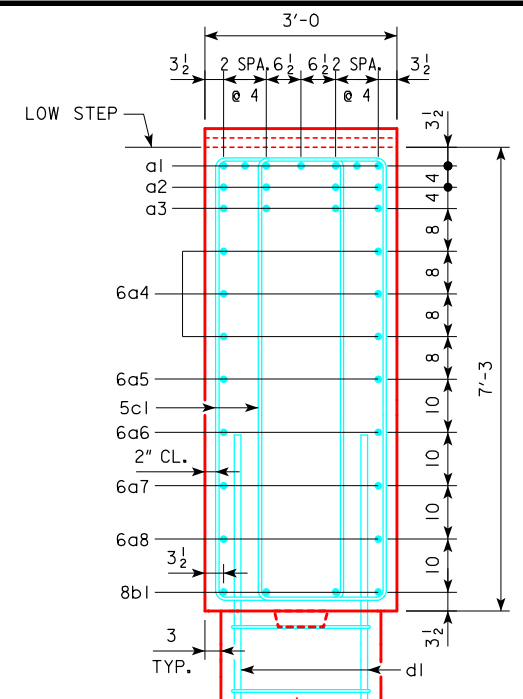
NOTE:
SHIFT 5c1 BARS TO CLEAR d1 COLUMN BARS ALL SPANS.



FRONT ELEVATION

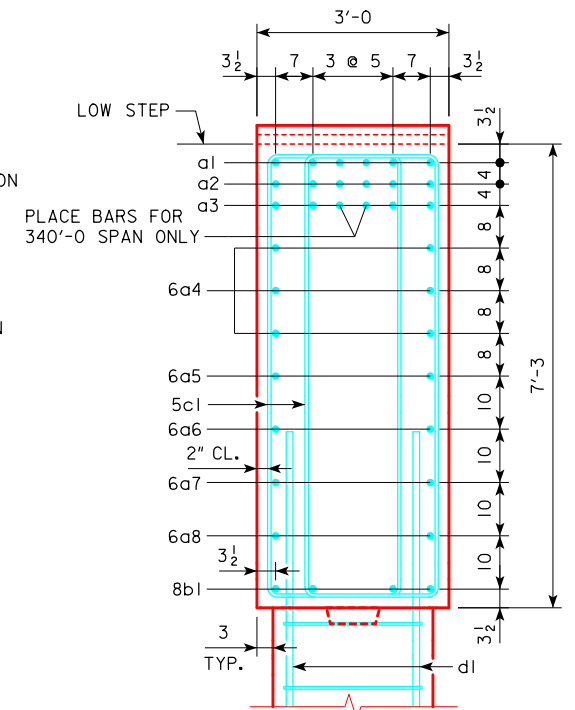


END ELEVATION



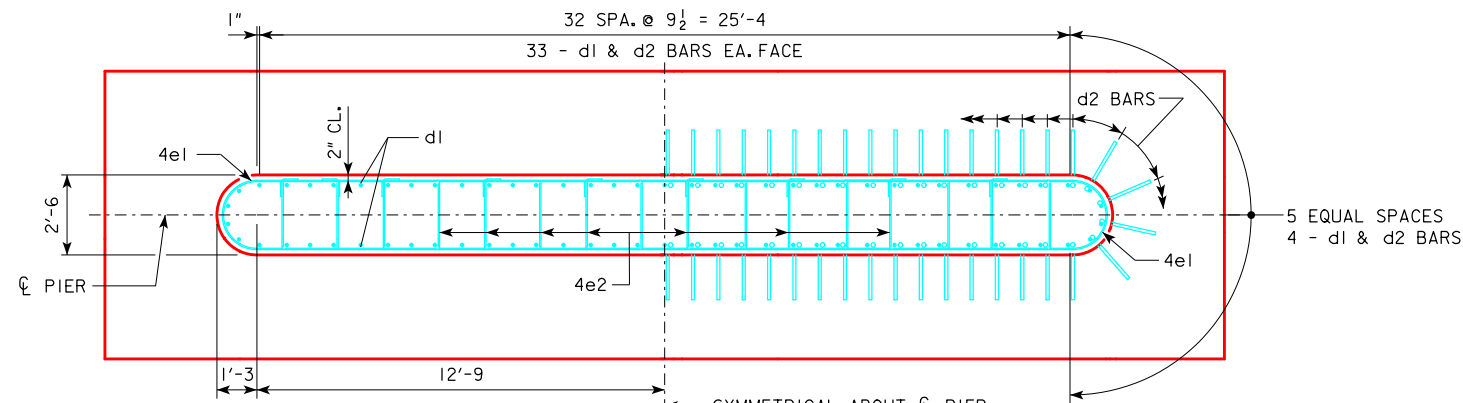
SECTION B-B

160'-0 TO 200'-0 SPANS



SECTION B-B

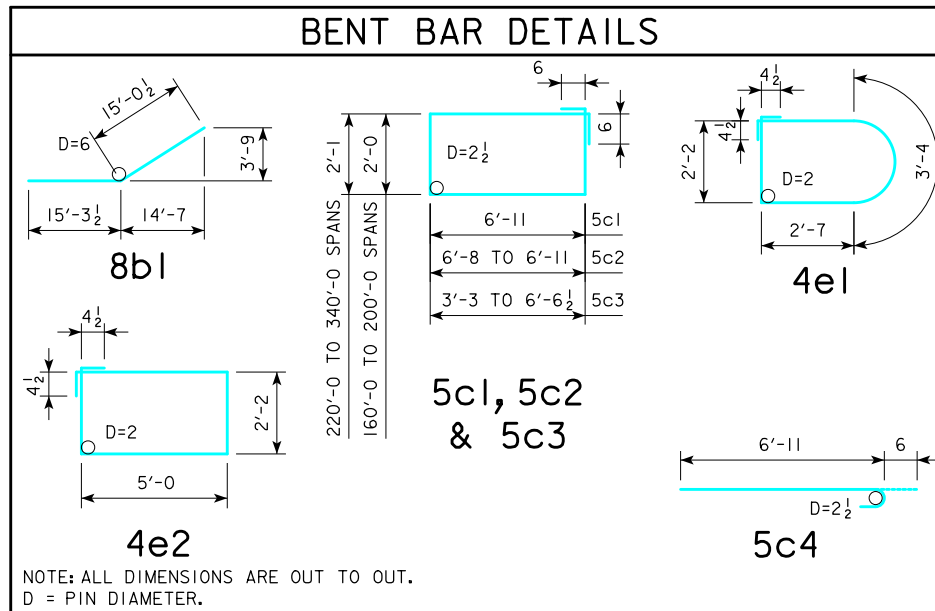
220'-0 TO 340'-0 SPANS



SECTION A-A

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	TEE PIER CAP & COLUMN DETAILS 45° SKEW RS40-156-14
	IOWADOT Highway Division	
	STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	

		CAP																														
CL - CL ABUT. BEARINGS		160'-0			180'-0			200'-0			220'-0			240'-0			260'-0			280'-0			300'-0			320'-0			340'-0			
BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
a1	57'-8		7	9	1372	7	9	1372	7	9	1372	6	9	1176	6	10	1489	6	10	1489	6	11	1838	6	11	1838	6	11	1838	6	11	1838
a2	57'-8		4	8	616	4	8	616	4	9	784	6	9	1176	6	9	1176	6	10	1489	6	10	1489	6	11	1838	6	11	1838	6	11	1838
a3	57'-8		4	8	616	4	8	616	4	8	616	4	9	784	4	9	784	4	10	993	4	10	993	4	10	993	4	10	993	4	10	993
6a4	57'-8		6	6	520	6	6	520	6	6	520	6	6	520	6	6	520	6	6	520	6	6	520	6	6	520	6	6	520	6	6	520
6a5	55'-4		2	6	166	2	6	166	2	6	166	2	6	166	2	6	166	2	6	166	2	6	166	2	6	166	2	6	166	2	6	166
6a6	48'-10		2	6	147	2	6	147	2	6	147	2	6	147	2	6	147	2	6	147	2	6	147	2	6	147	2	6	147	2	6	147
6a7	42'-3		2	6	127	2	6	127	2	6	127	2	6	127	2	6	127	2	6	127	2	6	127	2	6	127	2	6	127	2	6	127
6a8	35'-8		2	6	107	2	6	107	2	6	107	2	6	107	2	6	107	2	6	107	2	6	107	2	6	107	2	6	107	2	6	107
8b1	30'-4		8	8	648	8	8	648	8	8	648	8	8	648	8	8	648	8	8	648	8	8	648	8	8	648	8	8	648	8	8	648
5c1	VARIABLES		34	5	668	34	5	668	34	5	668	34	5	674	34	5	674	34	5	674	34	5	674	34	5	674	34	5	674	34	5	674
5c2	VARIABLES		8	5	155	8	5	155	8	5	155	8	5	156	12	5	235	12	5	235	12	5	235	12	5	235	12	5	235	12	5	235
5c3	VARIABLES		56	5	866	56	5	866	56	5	866	56	5	876	56	5	876	72	5	1126	72	5	1126	92	5	1439	92	5	1439	92	5	1439
5c4	7'-5		28	5	217	28	5	217	28	5	217	28	5	217	28	5	217	28	5	217	28	5	217	28	5	217	28	5	217	28	5	217
① TOTAL (LB.)			6225			6225			6393			6774			7166			7729			8287			8949			8949			9445		
STRUCTURAL CONCRETE (CY)			42.2			42.2			42.2			42.2			42.2			42.2			42.2			42.2			42.2			42.2		



NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

H IN FEET	COLUMN HEIGHT	STRUCTURAL CONCRETE (CY)	REINFORCING STEEL												TOTAL WEIGHT (LB.)
			d1 BAR				4e1 BAR				4e2 BAR				
			NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	
16	4'-9	12.1	74	9	7'-6	1887	10	4	11'-5	76	35	4	15'-1	353	2316
17	5'-9	14.6	74	9	8'-6	2139	12	4	11'-5	92	42	4	15'-1	423	2654
18	6'-9	17.2	74	9	9'-6	2390	14	4	11'-5	107	49	4	15'-1	494	2991
19	7'-9	19.7	74	9	10'-6	2642	16	4	11'-5	122	56	4	15'-1	564	3328
20	8'-9	22.3	74	9	11'-6	2893	18	4	11'-5	137	63	4	15'-1	635	3665
21	9'-9	24.8	74	9	12'-6	3145	20	4	11'-5	153	70	4	15'-1	705	4003
22	10'-9	27.3	74	9	13'-6	3397	22	4	11'-5	168	77	4	15'-1	776	4341
23	11'-9	29.9	74	9	14'-6	3648	24	4	11'-5	183	84	4	15'-1	846	4677
24	12'-9	32.4	74	9	15'-6	3900	26	4	11'-5	198	91	4	15'-1	917	5015
25	13'-9	35.0	74	9	16'-6	4151	28	4	11'-5	214	98	4	15'-1	987	5352
26	14'-9	37.5	74	9	17'-6	4403	30	4	11'-5	229	105	4	15'-1	1058	5690
27	15'-9	40.1	74	9	18'-6	4655	32	4	11'-5	244	112	4	15'-1	1128	6027
28	16'-9	42.6	74	9	19'-6	4906	34	4	11'-5	259	119	4	15'-1	1199	6364
29	17'-9	45.1	74	9	20'-6	5158	36	4	11'-5	275	126	4	15'-1	1270	6703
30	18'-9	47.7	74	9	21'-6	5409	38	4	11'-5	290	133	4	15'-1	1340	7039
31	19'-9	50.2	74	9	22'-6	5661	40	4	11'-5	305	140	4	15'-1	1411	7377
32	20'-9	52.8	74	9	23'-6	5913	42	4	11'-5	320	147	4	15'-1	1481	7714
33	21'-9	55.3	74	9	24'-6	6164	44	4	11'-5	336	154	4	15'-1	1552	8052
34	22'-9	57.9	74	9	25'-6	6416	46	4	11'-5	351	161	4	15'-1	1622	8389
35	23'-9	60.4	74	9	26'-6	6667	48	4	11'-5	366	168	4	15'-1	1693	8726
36	24'-9	62.9	74	9	27'-6	6919	50	4	11'-5	381	175	4	15'-1	1763	9063
37	25'-9	65.5	74	9	28'-6	7171	52	4	11'-5	397	182	4	15'-1	1834	9402
38	26'-9	68.0	74	9	29'-6	7422	54	4	11'-5	412	189	4	15'-1	1904	9738
39	27'-9	70.6	74	9	30'-6	7674	56	4	11'-5	427	196	4	15'-1	1975	10,076
40	28'-9	73.1	74	9	31'-6	7925	58	4	11'-5	442	203	4	15'-1	2045	10,412

PIER NOTES:

SEE "TEE PIER NOTES" ON RS40-003-14 FOR NOTES REGARDING APPLICATION OF THESE PIER STANDARDS.

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

① SEE SHEET RS40-169-14 FOR STEP REINFORCING STEEL QUANTITIES AND DETAILS.

08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014 TEE PIER CAP & COLUMN DETAILS 45° SKEW	RS40-157-14
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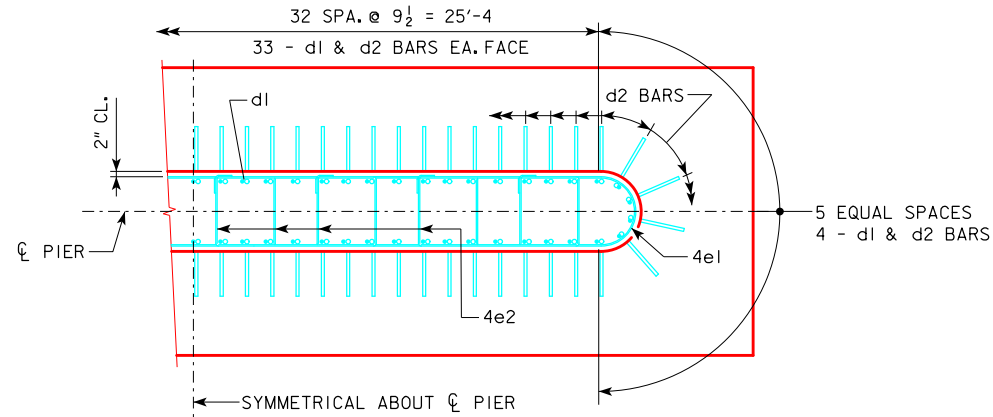
REVISED 02-2017 - CHANGED VERTICAL CLEARANCE OF REBAR "f2" TO TOP OF PIER FOOTING TO 3" (WAS 2").
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

H IN FT.	CL - CL ABUT. BRG.	PILING (HP10x57)		FOOTING SIZE
		NO. & LAYOUT	① LRFD Pu, STRENGTH I, DES. LOAD (KIPS)	
16 TO 18	160'-0	17A	140	4' x 8' x 32'
	180'-0	18A	140	
	200'-0	19A	143	
	220'-0	20A	145	
	240'-0	21B	144	4' x 11' x 32'
	260'-0	22B	145	
	280'-0	24A	145	
	300'-0	26A	146	
320'-0	27A	144	4' x 14' x 32'	
340'-0	28A	145		
19 TO 21	160'-0	17A	145	4' x 8' x 32'
	180'-0	18A	145	
	200'-0	20A	138	
	220'-0	21A	144	
	240'-0	22B	140	4' x 11' x 32'
	260'-0	23A	145	
	280'-0	25A	145	
	300'-0	26B	143	
320'-0	28A	142	4' x 14' x 32'	
340'-0	29A	145		
22 TO 24	160'-0	18A	140	4' x 8' x 32'
	180'-0	19A	144	
	200'-0	20B	141	
	220'-0	22A	142	
	240'-0	22B	143	4' x 11' x 32'
	260'-0	24A	143	
	280'-0	26A	145	
	300'-0	26B	146	
320'-0	28A	145	4' x 14' x 32'	
340'-0	30A	144		
25 TO 27	160'-0	18A	145	4' x 8' x 32'
	180'-0	20A	139	
	200'-0	21A	141	
	220'-0	22B	137	
	240'-0	22B	147	4' x 11' x 32'
	260'-0	24A	146	
	280'-0	26B	141	
	300'-0	27A	145	
320'-0	29A	144	4' x 14' x 32'	
340'-0	30A	147		
28 TO 30	160'-0	19A	143	4' x 8' x 32'
	180'-0	20A	143	
	200'-0	21A	144	
	220'-0	22B	140	
	240'-0	23A	146	4' x 11' x 32'
	260'-0	25A	145	
	280'-0	26B	144	
	300'-0	28A	143	
320'-0	30A	143	4' x 14' x 32'	
340'-0	31A	146		
31 TO 33	160'-0	20A	138	4' x 8' x 32'
	180'-0	20B	144	
	200'-0	22A	142	
	220'-0	22B	143	
	240'-0	24A	143	4' x 11' x 32'
	260'-0	26A	145	
	280'-0	26B	146	
	300'-0	28A	145	
320'-0	30A	145	4' x 14' x 32'	
340'-0	32B	143		
34 TO 36	160'-0	20A	143	4' x 8' x 32'
	180'-0	21A	144	
	200'-0	22B	137	
	220'-0	22B	146	
	240'-0	24A	146	4' x 11' x 32'
	260'-0	26B	140	
	280'-0	27A	145	
	300'-0	29A	144	
320'-0	31A	145	4' x 14' x 32'	
340'-0	32B	145		

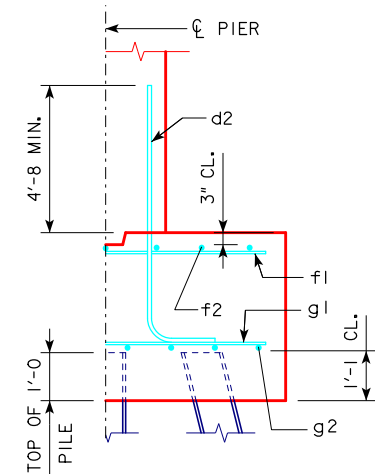
H IN FT.	CL - CL ABUT. BRG.	PILING (HP10x57)		FOOTING SIZE
		NO. & LAYOUT	① LRFD Pu, STRENGTH I, DES. LOAD (KIPS)	
37 TO 40	160'-0	20B	145	4' x 9' x 32'
	180'-0	22A	144	
	200'-0	22B	141	
	220'-0	23A	146	
	240'-0	25A	146	4' x 11' x 32'
	260'-0	26B	143	
	280'-0	28A	143	
	300'-0	30A	144	
320'-0	32A	145	4' x 14' x 34'	
340'-0	32C	146		

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)				STRUCTURAL CONCRETE (CY)	
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)		
4' x 8' x 32'	d2	74 - #9 AS SHOWN	9'-1	2285	3601	37.9
	f1	32 - #5 @ 1'-0	7'-8	256		
	f2	8 - #5 @ 1'-0	31'-8	264		
	g1	32 - #6 @ 1'-0	7'-8	368		
	g2	9 - #6 @ 0'-11	31'-8	428		
	d2	74 - #9 AS SHOWN	9'-1	2285		
f1	32 - #5 @ 1'-0	8'-8	289			
f2	9 - #5 @ 1'-0	31'-8	297			
g1	40 - #6 @ 0'-9 1/2	8'-8	521			
g2	9 - #6 @ 1'-0	31'-8	428			
d2	74 - #9 AS SHOWN	9'-1	2285	4600	52.1	
f1	32 - #5 @ 1'-0	10'-8	356			
f2	11 - #5 @ 1'-0	31'-8	363			
g1	36 - #8 @ 0'-10 1/2	10'-8	1025			
g2	12 - #6 @ 0'-11	31'-8	571			
d2	74 - #9 AS SHOWN	9'-1	2285			5681
f1	32 - #5 @ 1'-0	13'-8	456			
f2	14 - #5 @ 1'-0	31'-8	462			
g1	39 - #9 @ 0'-9 1/2	13'-8	1812			
g2	14 - #6 @ 1'-0	31'-8	666			
d2	74 - #9 AS SHOWN	9'-1	2285	6337	70.5	
f1	34 - #5 @ 1'-0	13'-8	485			
f2	14 - #5 @ 1'-0	33'-8	492			
g1	41 - #9 @ 0'-10	13'-8	1905			
g2	17 - #7 @ 0'-10	33'-8	1170			
d2	74 - #9 AS SHOWN	9'-1	2285			7136
f1	36 - #5 @ 1'-0	13'-8	513			
f2	14 - #5 @ 1'-0	35'-8	521			
g1	43 - #9 @ 0'-10	13'-8	1998			
g2	15 - #9 @ 0'-11 1/2	35'-8	1819			
d2	74 - #9 AS SHOWN	9'-1	2285	8182	84.4	
f1	38 - #5 @ 1'-0	14'-8	581			
f2	15 - #5 @ 1'-0	37'-8	589			
g1	46 - #9 @ 0'-10	14'-8	2294			
g2	19 - #9 @ 0'-9 1/2	37'-8	2433			

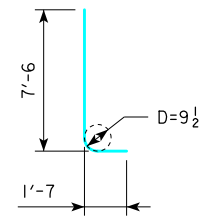
① NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



d2 LAYOUT
(SEE SECTION A-A ON SHEET RS40-156-14.)



TYPICAL SECTION



d2

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

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

FOOTING NOTES:

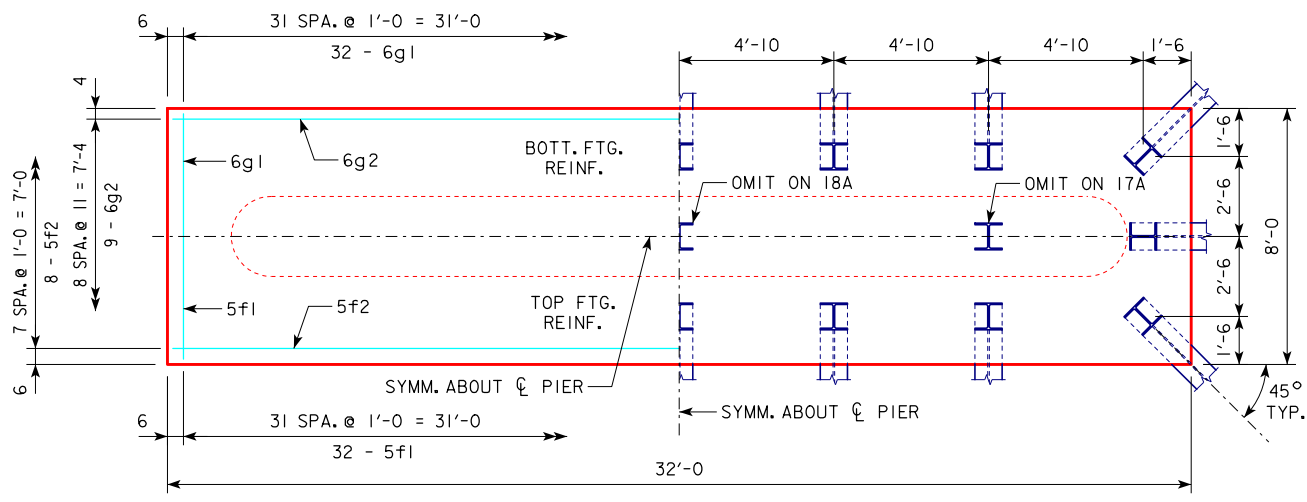
THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET RS40-156-14.

BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.

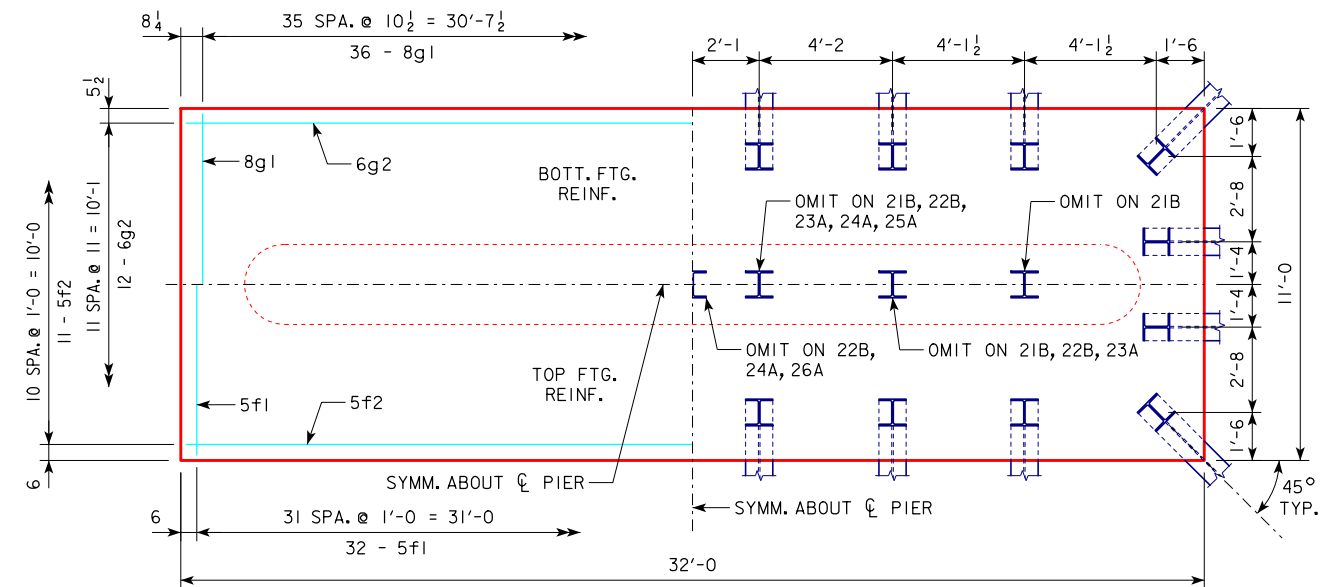
STEEL PILING USED AS POINT BEARING SHALL HAVE A MINIMUM DISTANCE OF APPROXIMATELY 10 FEET FROM BOTTOM OF FOOTING TO TOP OF BEARING ROCK. THE PILE LAYOUTS ARE SUCH THAT THE DISTANCE CENTER TO CENTER OF ADJACENT PILING SHALL NOT EXCEED 8'-0.

PIER PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

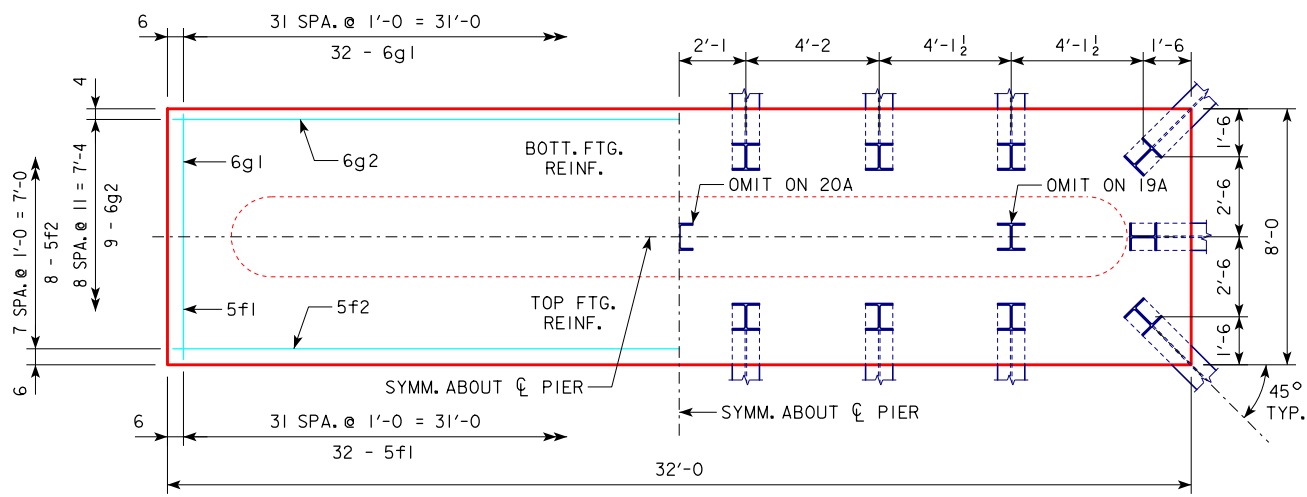
08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	TEE PIER-HP10x57 SRL-1 STEEL PILE FOOTINGS 45° SKEW - SHEET 1
	RS40-158-14



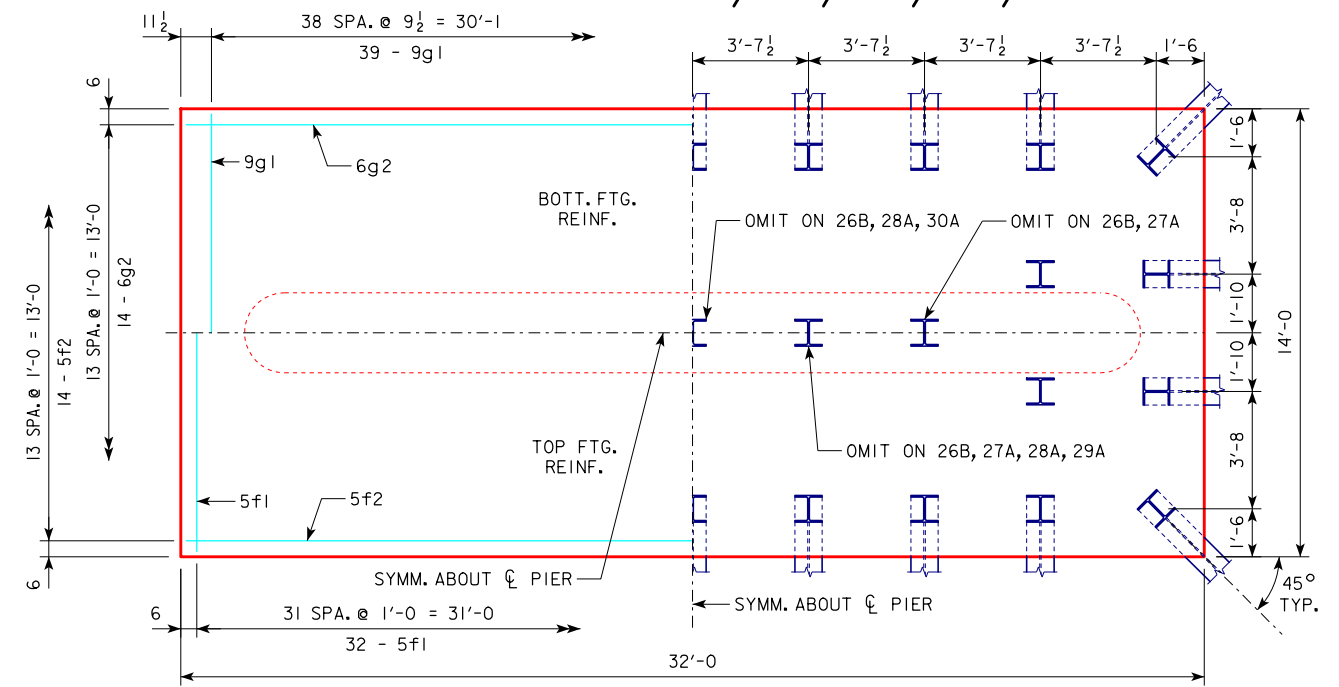
4'-0 x 8'-0 x 32'-0 FOR 17A & 18A



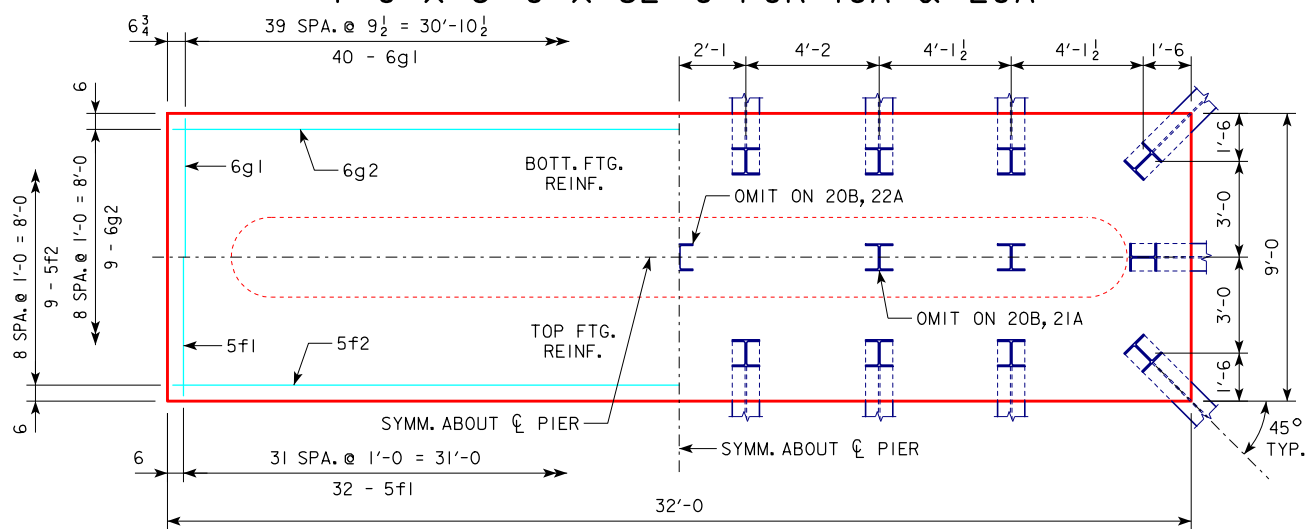
4'-0 x 11'-0 x 32'-0 FOR 21B, 22B, 23A, 24A, 25A & 26A



4'-0 x 8'-0 x 32'-0 FOR 19A & 20A



4'-0 x 14'-0 x 32'-0 FOR 26B, 27A, 28A, 29A, 30A & 31A

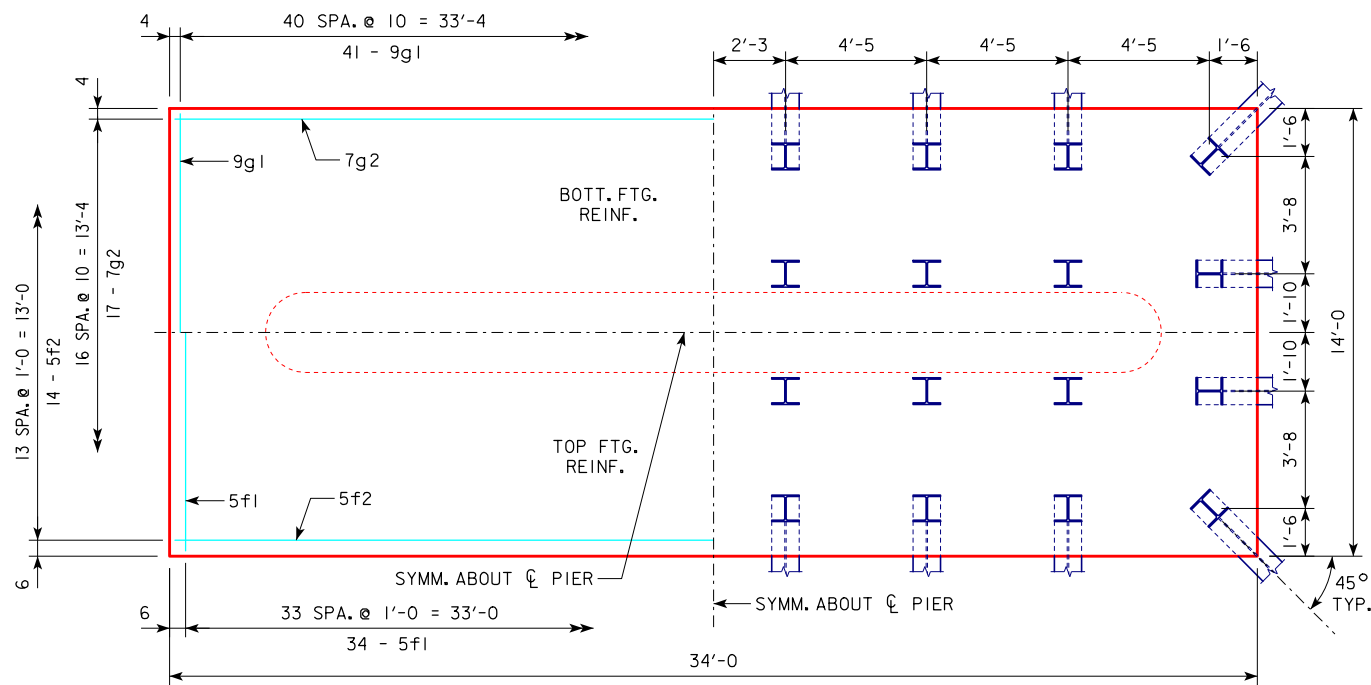


4'-0 x 9'-0 x 32'-0 FOR 20B, 21A & 22A

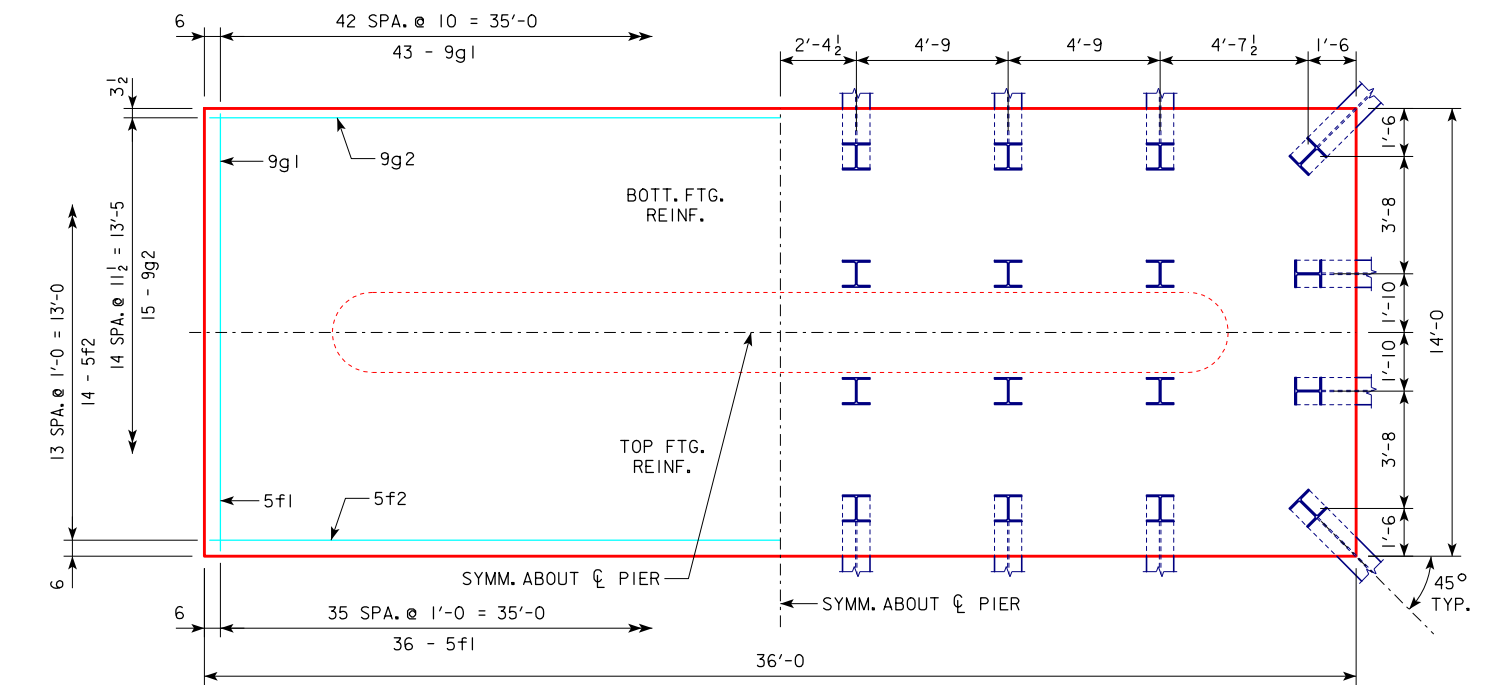
NOTE:
SEE SHEET RS40-158-14 FOR FOOTING NOTES.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	TEE PIER-HP10x57 SRL-1 STEEL PILE FOOTINGS 45° SKEW - SHEET 2
	RS40-159-14

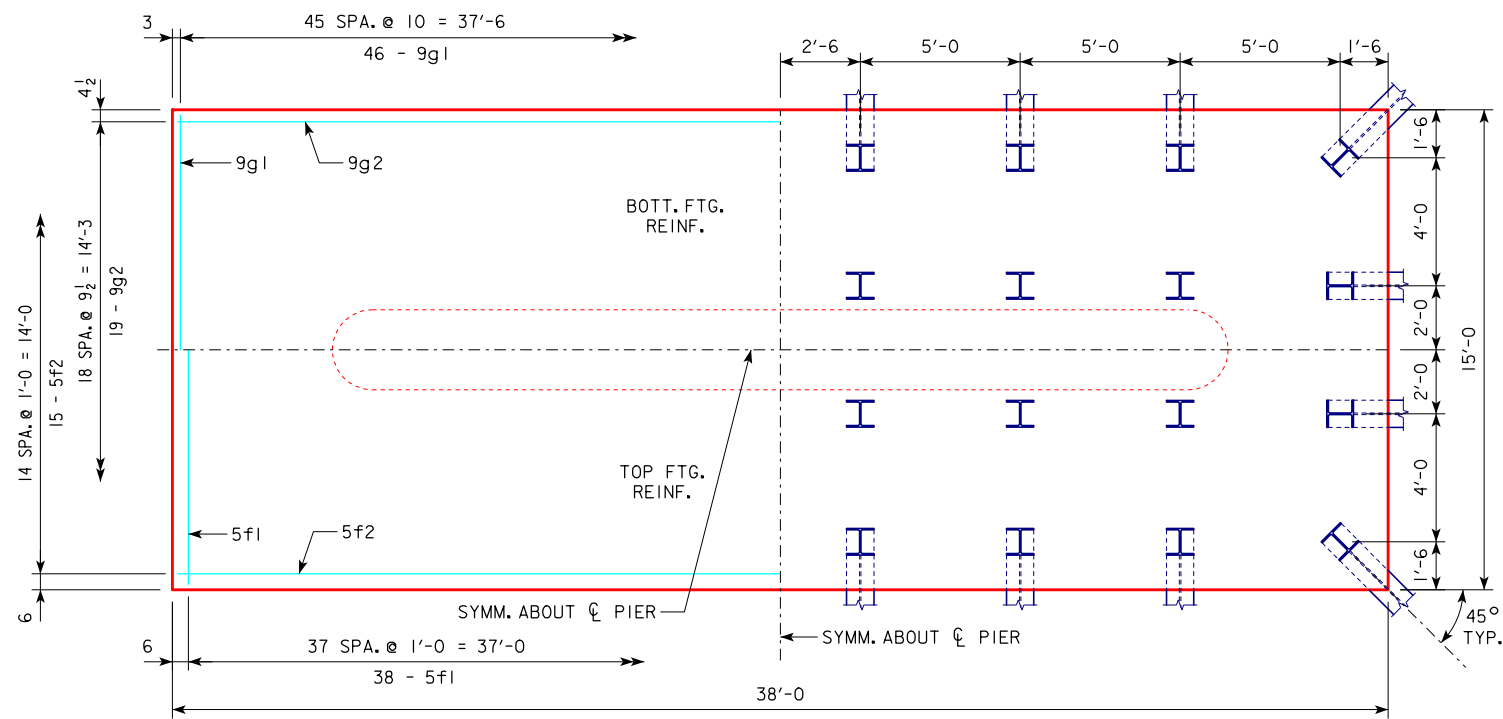
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



4'-0 x 14'-0 x 34'-0 FOR 32A



4'-0 x 14'-0 x 36'-0 FOR 32B



4'-0 x 15'-0 x 38'-0 FOR 32C

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

NOTE:
SEE SHEET RS40-158-14 FOR FOOTING NOTES.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	TEE PIER-HPI0x57 SRL-1 STEEL PILE FOOTINGS 45° SKEW - SHEET 3
	RS40-160-14

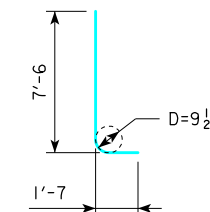
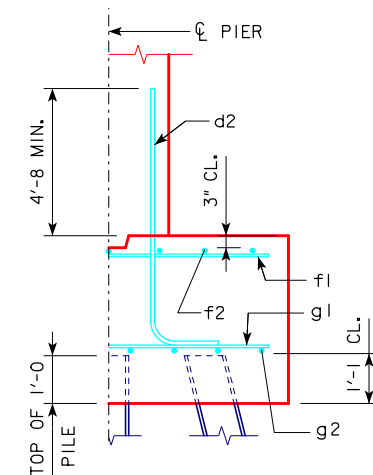
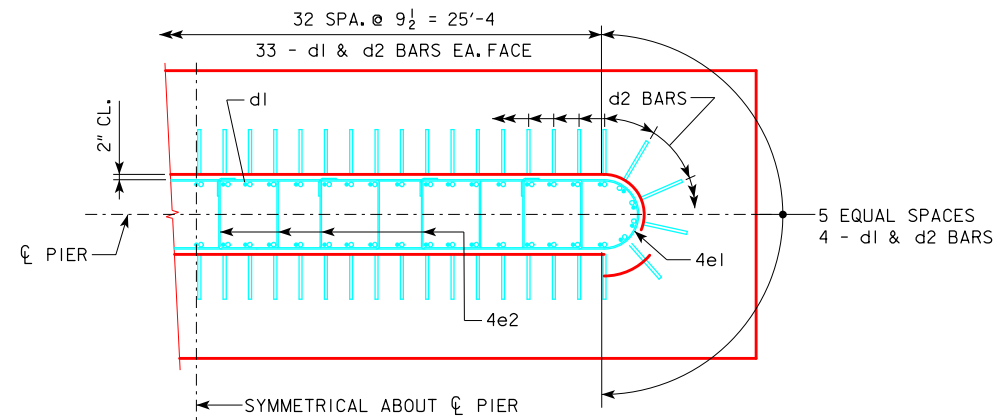
REVISED 02-2017 - CHANGED VERTICAL CLEARANCE OF REBAR "f2" TO TOP OF PIER FOOTING TO 3" (WAS 2").
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

H IN FT.	CL - CL ABUT. BRG.	PILING (HP10x57)		FOOTING SIZE
		NO. & LAYOUT	① LRFD P _u , STRENGTH I, DES. LOAD (KIPS)	
16 TO 18	160'-0	12A	197	4' x 7' x 32'
	180'-0	12A	210	
	200'-0	12B	212	
	220'-0	13A	217	
	240'-0	14A	214	4' x 8' x 32'
	260'-0	15A	218	
	280'-0	16A	219	4' x 9' x 32'
	300'-0	16C	218	
	320'-0	18A	210	4' x 11' x 32'
	340'-0	18A	219	
19 TO 21	160'-0	12A	204	4' x 7' x 32'
	180'-0	12A	218	
	200'-0	12B	218	4' x 8' x 32'
	220'-0	14A	205	
	240'-0	15A	211	
	260'-0	16A	210	
	280'-0	17A	215	4' x 10' x 32'
	300'-0	17B	214	
	320'-0	18A	215	4' x 11' x 32'
	340'-0	19A	217	
22 TO 24	160'-0	12A	211	4' x 7' x 32'
	180'-0	12B	213	
	200'-0	13A	214	4' x 8' x 32'
	220'-0	14A	212	
	240'-0	15B	214	
	260'-0	16A	215	
	280'-0	17B	208	4' x 9' x 32'
	300'-0	17B	219	
	320'-0	18A	220	4' x 11' x 32'
	340'-0	20A	214	
25 TO 27	160'-0	12B	206	4' x 8' x 32'
	180'-0	12B	219	
	200'-0	14A	203	4' x 9' x 32'
	220'-0	14B	214	
	240'-0	15C	218	
	260'-0	16B	218	
	280'-0	17B	212	4' x 10' x 32'
	300'-0	18A	213	
	320'-0	19A	217	4' x 11' x 32'
	340'-0	20B	217	
28 TO 30	160'-0	12B	212	4' x 8' x 32'
	180'-0	13A	214	
	200'-0	14B	205	4' x 9' x 32'
	220'-0	14B	219	
	240'-0	16B	210	
	260'-0	16C	211	
	280'-0	17B	216	4' x 11' x 32'
	300'-0	18A	217	
	320'-0	19B	219	4' x 12' x 32'
	340'-0	20C	219	
31 TO 33	160'-0	12C	215	4' x 9' x 32'
	180'-0	13B	217	
	200'-0	14B	212	4' x 10' x 32'
	220'-0	15C	213	
	240'-0	16B	215	
	260'-0	16C	215	
	280'-0	17C	219	4' x 11' x 32'
	300'-0	18B	220	
	320'-0	20C	213	4' x 14' x 32'
	340'-0	21A	215	
34 TO 36	160'-0	13B	211	4' x 9' x 32'
	180'-0	14B	208	
	200'-0	14C	214	4' x 10' x 32'
	220'-0	15C	219	
	240'-0	16C	208	
	260'-0	17B	212	
	280'-0	18B	212	4' x 11' x 32'
	300'-0	19B	216	
	320'-0	20C	217	4' x 12' x 32'
	340'-0	21A	219	

H IN FT.	CL - CL ABUT. BRG.	PILING (HP10x57)		FOOTING SIZE
		NO. & LAYOUT	① LRFD P _u , STRENGTH I, DES. LOAD (KIPS)	
37 TO 40	160'-0	13C	215	4' x 10' x 32'
	180'-0	14C	211	
	200'-0	15C	214	
	220'-0	15D	217	
	240'-0	16C	216	4' x 11' x 32'
	260'-0	17C	216	
	280'-0	18B	219	4' x 12' x 32'
	300'-0	19C	219	
	320'-0	20D	210	4' x 14' x 32'
	340'-0	21B	211	

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)				TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)		
4' x 7' x 32'	d2	74 - #9 AS SHOWN	9'-1	2285	3487	33.2
	f1	32 - #5 @ 1'-0	6'-8	223		
	f2	7 - #5 @ 1'-0	31'-8	231		
	g1	32 - #6 @ 1'-0	6'-8	320		
	g2	9 - #6 @ 0'-9 1/2	31'-8	428		
4' x 8' x 32'	d2	74 - #9 AS SHOWN	9'-1	2285	3791	37.9
	f1	32 - #5 @ 1'-0	7'-8	256		
	f2	8 - #5 @ 1'-0	31'-8	264		
	g1	32 - #6 @ 1'-0	7'-8	368		
	g2	13 - #6 @ 0'-7 1/2	31'-8	618		
4' x 9' x 32'	d2	74 - #9 AS SHOWN	9'-1	2285	3984	42.7
	f1	32 - #5 @ 1'-0	8'-8	289		
	f2	9 - #5 @ 1'-0	31'-8	297		
	g1	38 - #6 @ 0'-10	8'-8	495		
	g2	13 - #6 @ 0'-8 1/2	31'-8	618		
4' x 10' x 32'	d2	74 - #9 AS SHOWN	9'-1	2285	4267	47.4
	f1	32 - #5 @ 1'-0	9'-8	323		
	f2	10 - #5 @ 1'-0	31'-8	330		
	g1	36 - #7 @ 0'-10 1/2	9'-8	711		
	g2	13 - #6 @ 0'-9 1/2	31'-8	618		
4' x 11' x 32'	d2	74 - #9 AS SHOWN	9'-1	2285	4813	52.1
	f1	32 - #5 @ 1'-0	10'-8	356		
	f2	11 - #5 @ 1'-0	31'-8	363		
	g1	34 - #8 @ 0'-11	10'-8	968		
	g2	13 - #7 @ 0'-10 1/2	31'-8	841		
4' x 12' x 32'	d2	74 - #9 AS SHOWN	9'-1	2285	5180	56.9
	f1	32 - #5 @ 1'-0	11'-8	389		
	f2	12 - #5 @ 1'-0	31'-8	396		
	g1	32 - #9 @ 1'-0	11'-8	1269		
	g2	13 - #7 @ 0'-11 1/2	31'-8	841		
4' x 14' x 32'	d2	74 - #9 AS SHOWN	9'-1	2285	5871	66.4
	f1	32 - #5 @ 1'-0	13'-8	456		
	f2	14 - #5 @ 1'-0	31'-8	462		
	g1	39 - #9 @ 0'-9 1/2	13'-8	1812		
	g2	18 - #6 @ 0'-9 1/2	31'-8	856		
4' x 14' x 34'	d2	74 - #9 AS SHOWN	9'-1	2285	6875	70.5
	f1	34 - #5 @ 1'-0	13'-8	485		
	f2	14 - #5 @ 1'-0	33'-8	492		
	g1	41 - #9 @ 0'-10	13'-8	1905		
	g2	19 - #8 @ 0'-9	33'-8	1708		

① NOTE: P_u, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



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

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

FOOTING NOTES:

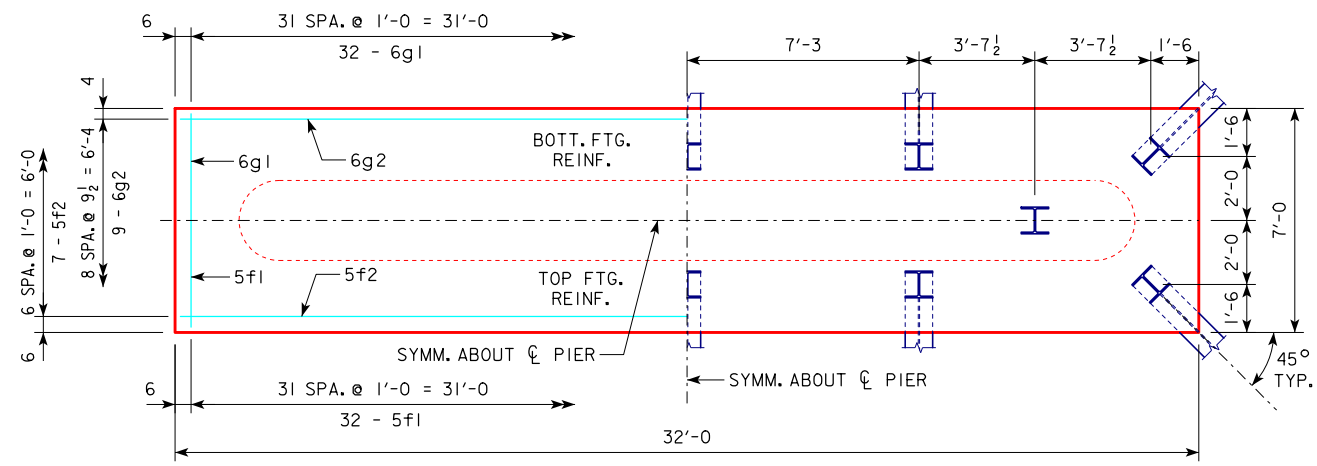
THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET RS40-156-14.

BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.

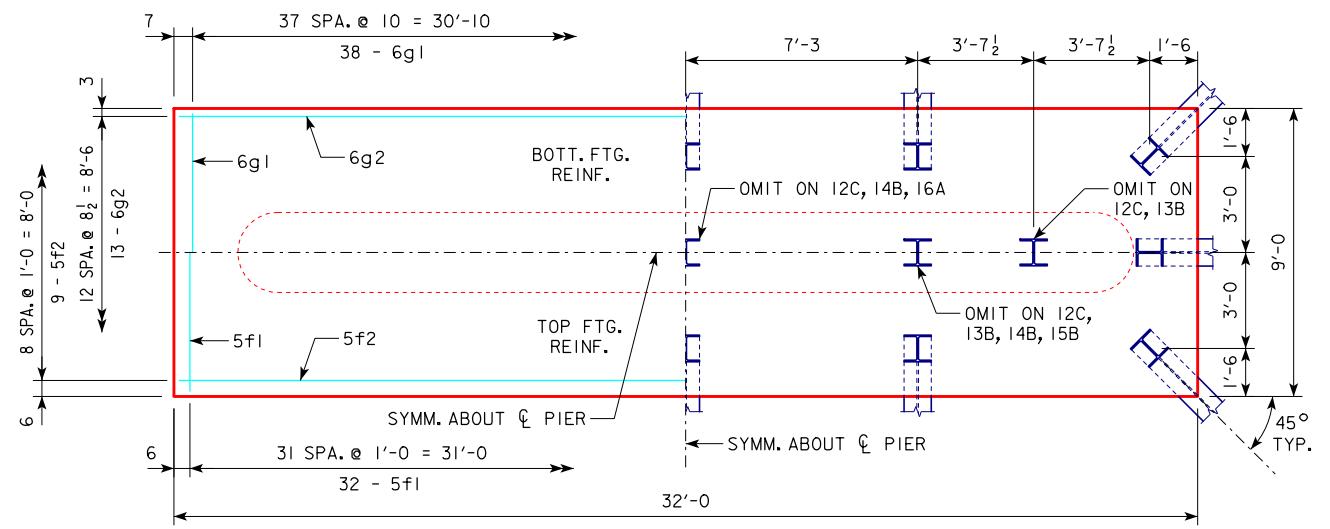
STEEL PILING USED AS POINT BEARING SHALL HAVE A MINIMUM DISTANCE OF APPROXIMATELY 10 FEET FROM BOTTOM OF FOOTING TO TOP OF BEARING ROCK. THE PILE LAYOUTS ARE SUCH THAT THE DISTANCE CENTER TO CENTER OF ADJACENT PILING SHALL NOT EXCEED 8'-0.

PIER PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

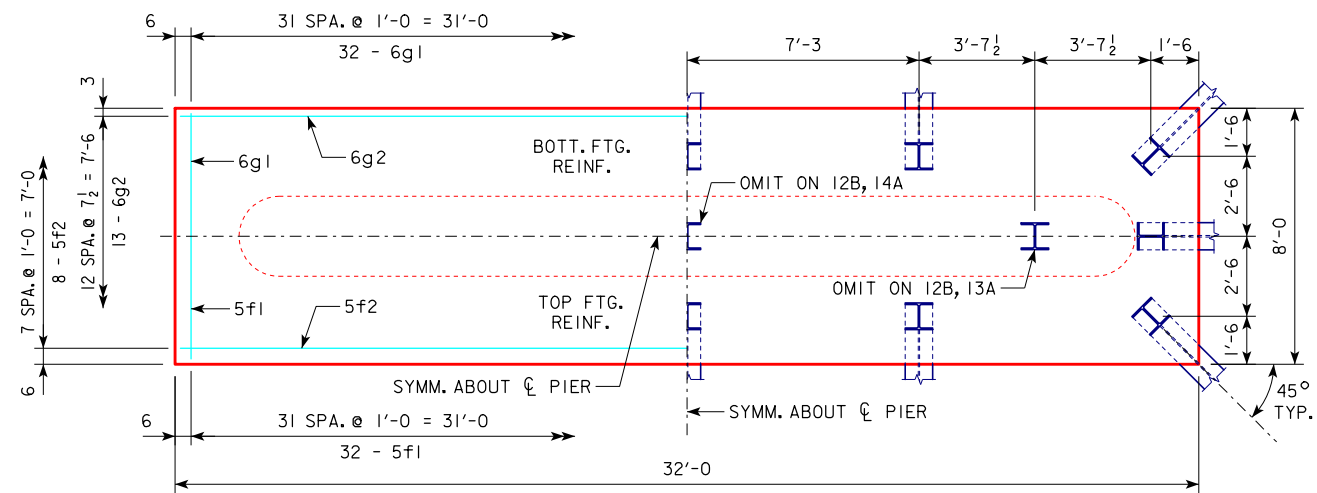
08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES
			ROLLED STEEL BEAM BRIDGES
			OCTOBER, 2014
		TEE PIER-HP10x57 SRL-2 STEEL PILE FOOTINGS	RS40-161-14
		45° SKEW - SHEET 1	



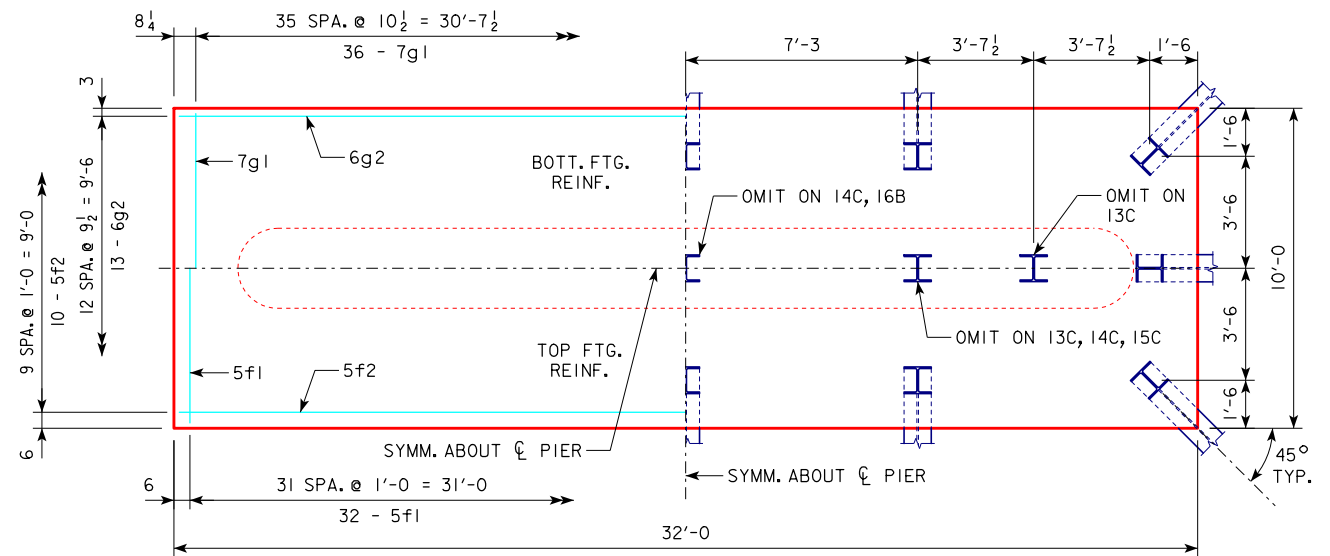
4'-0 x 7'-0 x 32'-0 FOR 12A



4'-0 x 9'-0 x 32'-0 FOR 12C, 13B, 14B, 15B & 16A



4'-0 x 8'-0 x 32'-0 FOR 12B, 13A, 14A & 15A

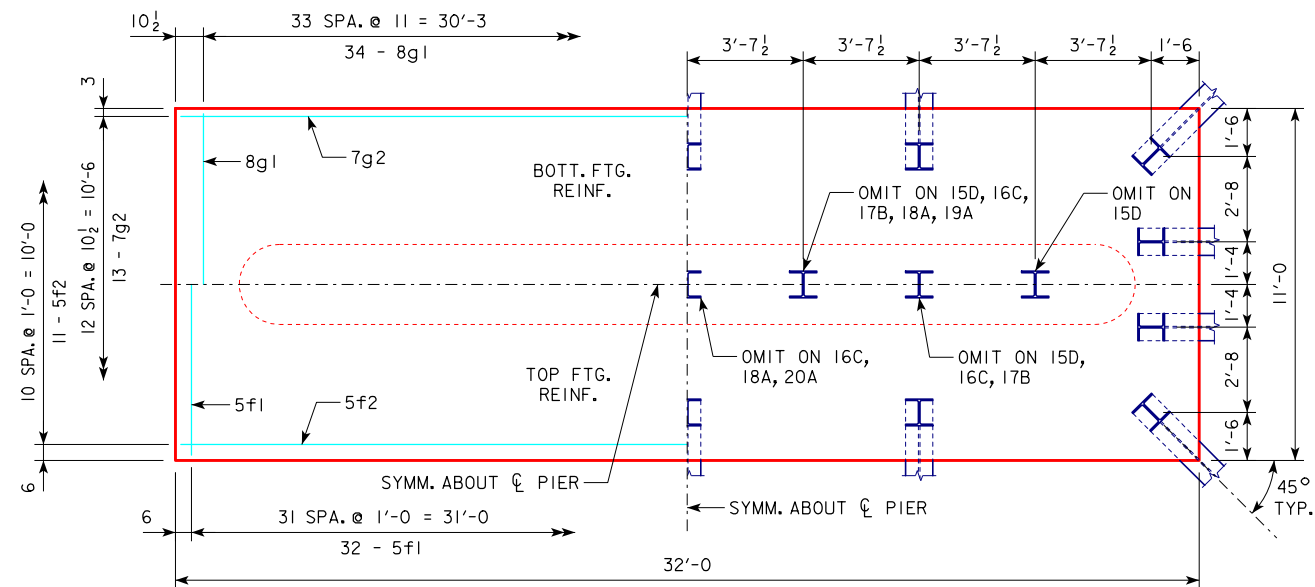


4'-0 x 10'-0 x 32'-0 FOR 13C, 14C, 15C, 16B & 17A

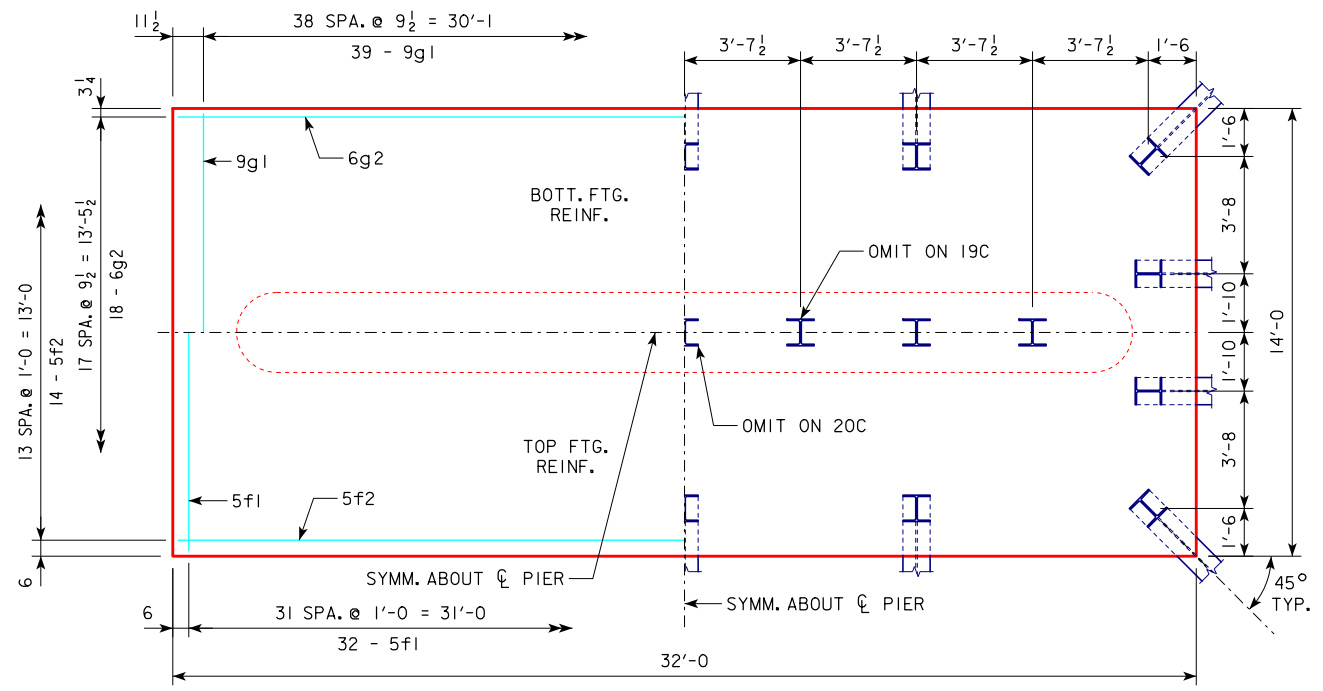
NOTE:
SEE SHEET RS40-161-14 FOR FOOTING NOTES.

08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
		TEE PIER-HPI0x57 SRL-2 STEEL PILE FOOTINGS 45° SKEW - SHEET 2
		RS40-162-14

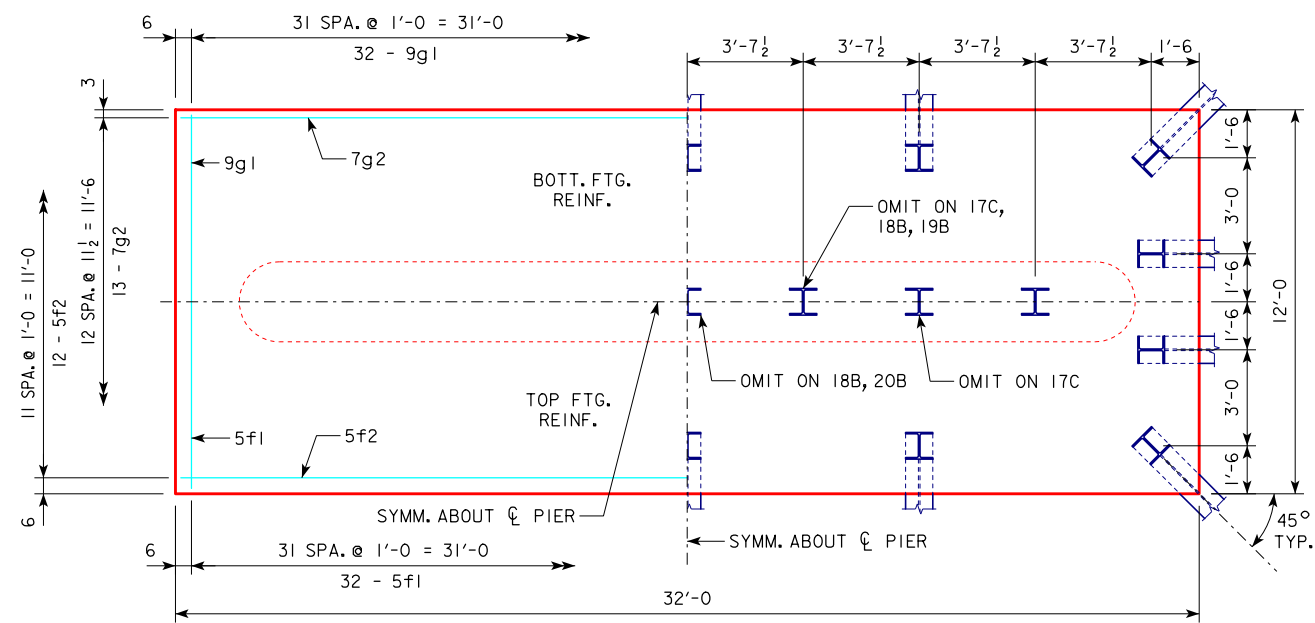
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



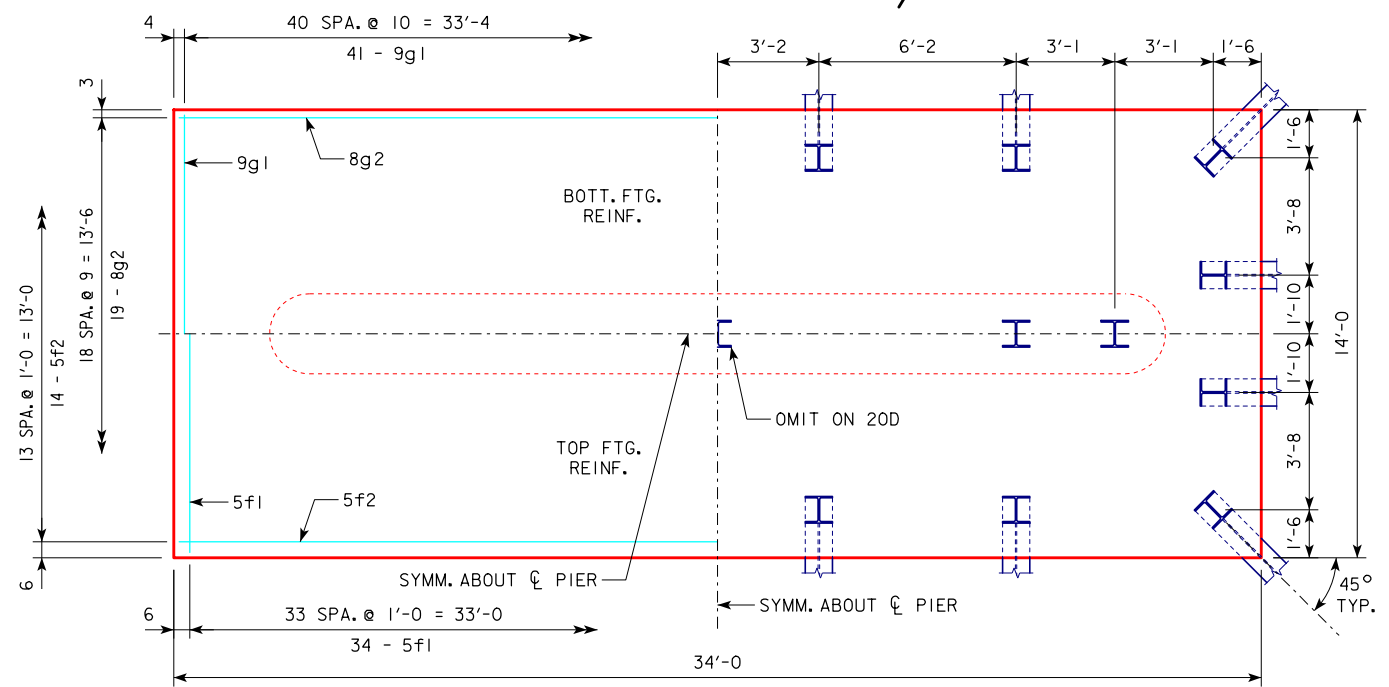
4'-0 x 11'-0 x 32'-0 FOR 15D, 16C, 17B, 18A, 19A & 20A



4'-0 x 14'-0 x 32'-0 FOR 19C, 20C & 21A



4'-0 x 12'-0 x 32'-0 FOR 17C, 18B, 19B & 20B



4'-0 x 14'-0 x 34'-0 FOR 20D & 21B

NOTE:
SEE SHEET RS40-161-14 FOR FOOTING NOTES.

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	TEE PIER-HPI0x57 SRL-2 STEEL PILE FOOTINGS 45° SKEW - SHEET 3
	RS40-163-14

REVISED 02-2017 - CHANGED VERTICAL CLEARANCE OF REBAR "f2" TO TOP OF PIER FOOTING TO 3" (WAS 2").
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

H IN FT.	CL - CL ABUT. BRG.	FOOTING SIZE
16 TO 18	160'-0"	4' x 7' x 32'
	180'-0"	4' x 7' x 34'
	200'-0"	4' x 7' x 34'
	220'-0"	4' x 8' x 34'
	240'-0"	4' x 8' x 34'
	260'-0"	4' x 8' x 36'
	280'-0"	4' x 9' x 36'
	300'-0"	4' x 9' x 36'
	320'-0"	4' x 9' x 38'
	340'-0"	4' x 9' x 38'
19 TO 21	160'-0"	4' x 7' x 32'
	180'-0"	4' x 7' x 34'
	200'-0"	4' x 8' x 34'
	220'-0"	4' x 8' x 34'
	240'-0"	4' x 8' x 36'
	260'-0"	4' x 8' x 36'
	280'-0"	4' x 9' x 36'
	300'-0"	4' x 9' x 36'
	320'-0"	4' x 9' x 38'
	340'-0"	4' x 10' x 38'
22 TO 24	160'-0"	4' x 7' x 32'
	180'-0"	4' x 7' x 34'
	200'-0"	4' x 8' x 34'
	220'-0"	4' x 8' x 34'
	240'-0"	4' x 8' x 36'
	260'-0"	4' x 9' x 36'
	280'-0"	4' x 9' x 36'
	300'-0"	4' x 9' x 38'
	320'-0"	4' x 9' x 38'
	340'-0"	4' x 10' x 38'
25 TO 27	160'-0"	4' x 7' x 34'
	180'-0"	4' x 8' x 34'
	200'-0"	4' x 8' x 34'
	220'-0"	4' x 8' x 36'
	240'-0"	4' x 8' x 36'
	260'-0"	4' x 9' x 36'
	280'-0"	4' x 9' x 36'
	300'-0"	4' x 9' x 38'
	320'-0"	4' x 9' x 38'
	340'-0"	4' x 10' x 38'
28 TO 30	160'-0"	4' x 8' x 34'
	180'-0"	4' x 8' x 34'
	200'-0"	4' x 8' x 36'
	220'-0"	4' x 8' x 36'
	240'-0"	4' x 9' x 36'
	260'-0"	4' x 9' x 36'
	280'-0"	4' x 9' x 38'
	300'-0"	4' x 9' x 38'
	320'-0"	4' x 10' x 38'
	340'-0"	4' x 10' x 38'
31 TO 33	160'-0"	4' x 8' x 34'
	180'-0"	4' x 8' x 34'
	200'-0"	4' x 8' x 36'
	220'-0"	4' x 9' x 36'
	240'-0"	4' x 9' x 36'
	260'-0"	4' x 9' x 38'
	280'-0"	4' x 9' x 38'
	300'-0"	4' x 10' x 38'
	320'-0"	4' x 10' x 38'
	340'-0"	4' x 10' x 38'
34 TO 36	160'-0"	4' x 8' x 34'
	180'-0"	4' x 8' x 34'
	200'-0"	4' x 8' x 36'
	220'-0"	4' x 9' x 36'
	240'-0"	4' x 9' x 36'
	260'-0"	4' x 9' x 38'
	280'-0"	4' x 9' x 38'
	300'-0"	4' x 10' x 38'
	320'-0"	4' x 10' x 38'
	340'-0"	4' x 10' x 40'

H IN FT.	CL - CL ABUT. BRG.	FOOTING SIZE
37 TO 40	160'-0"	4' x 8' x 36'
	180'-0"	4' x 8' x 36'
	200'-0"	4' x 9' x 36'
	220'-0"	4' x 9' x 36'
	240'-0"	4' x 9' x 38'
	260'-0"	4' x 9' x 38'
	280'-0"	4' x 10' x 38'
	300'-0"	4' x 10' x 38'
	320'-0"	4' x 10' x 40'
	340'-0"	4' x 10' x 40'

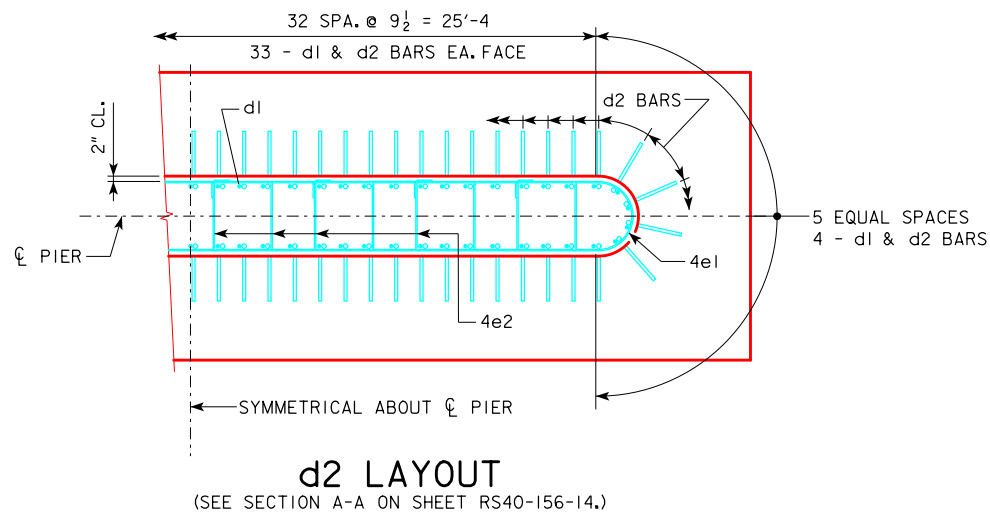
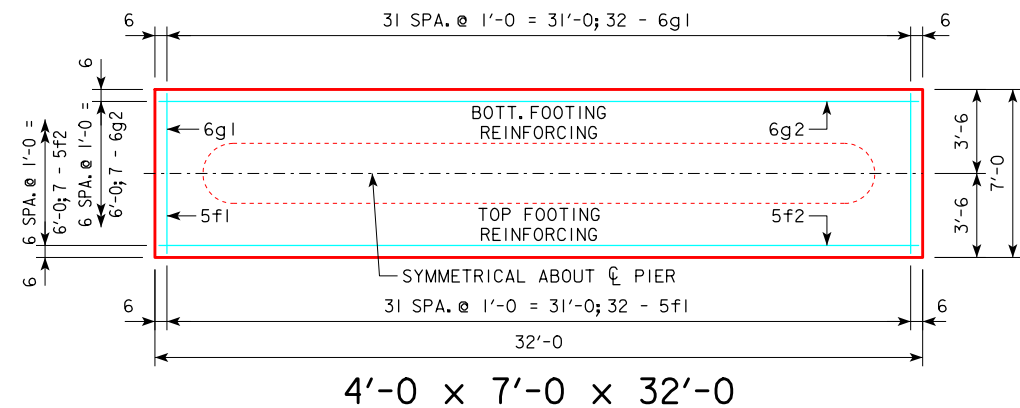
FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)				TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)		
4' x 7' x 32'	d2	74 - #9 AS SHOWN	9'-11"	2495	3602	33.2
	f1	32 - #5 @ 1'-0"	6'-8"	223		
	f2	7 - #5 @ 1'-0"	31'-8"	231		
	g1	32 - #6 @ 1'-0"	6'-8"	320		
4' x 7' x 34'	d2	74 - #9 AS SHOWN	9'-11"	2495	3772	35.3
	f1	34 - #5 @ 1'-0"	6'-8"	236		
	f2	7 - #5 @ 1'-0"	33'-8"	246		
	g1	34 - #6 @ 1'-0"	6'-8"	340		
4' x 8' x 34'	d2	74 - #9 AS SHOWN	9'-11"	2495	3946	40.3
	f1	34 - #5 @ 1'-0"	7'-8"	272		
	f2	8 - #5 @ 1'-0"	33'-8"	281		
	g1	34 - #6 @ 1'-0"	7'-8"	392		
4' x 8' x 36'	d2	74 - #9 AS SHOWN	9'-11"	2495	4444	42.7
	f1	36 - #5 @ 1'-0"	7'-8"	288		
	f2	8 - #5 @ 1'-0"	35'-8"	298		
	g1	36 - #6 @ 1'-0"	7'-8"	415		
4' x 9' x 36'	d2	74 - #9 AS SHOWN	9'-11"	2495	4776	48.0
	f1	36 - #5 @ 1'-0"	8'-8"	325		
	f2	9 - #5 @ 1'-0"	35'-8"	335		
	g1	44 - #6 @ 0'-9 1/2"	8'-8"	573		
4' x 9' x 38'	d2	74 - #9 AS SHOWN	9'-11"	2495	5413	50.7
	f1	38 - #5 @ 1'-0"	8'-8"	343		
	f2	9 - #5 @ 1'-0"	37'-8"	354		
	g1	47 - #6 @ 0'-9 1/2"	8'-8"	612		
4' x 10' x 38'	d2	74 - #9 AS SHOWN	9'-11"	2495	5910	56.3
	f1	38 - #5 @ 1'-0"	9'-8"	383		
	f2	10 - #5 @ 1'-0"	37'-8"	393		
	g1	47 - #7 @ 0'-9 1/2"	9'-8"	929		
4' x 10' x 40'	d2	74 - #9 AS SHOWN	9'-11"	2495	6593	59.3
	f1	40 - #5 @ 1'-0"	9'-8"	403		
	f2	10 - #5 @ 1'-0"	39'-8"	414		
	g1	50 - #7 @ 0'-9 1/2"	9'-8"	988		
4' x 10' x 40'	d2	74 - #9 AS SHOWN	9'-11"	2495	2293	
	f1	40 - #5 @ 1'-0"	9'-8"	403		
	f2	10 - #5 @ 1'-0"	39'-8"	414		
	g1	50 - #7 @ 0'-9 1/2"	9'-8"	988		

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.
NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

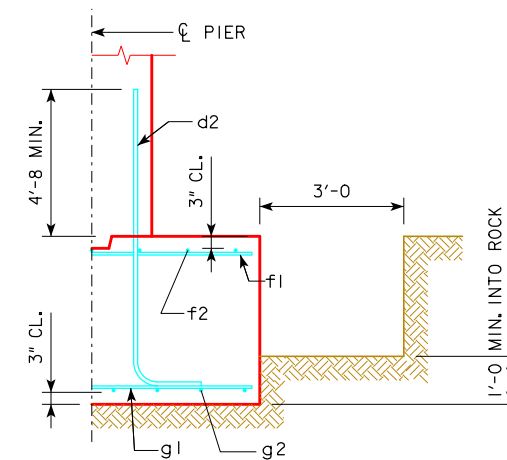
FOOTING NOTES:

THESE SPREAD FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET RS40-156-14.

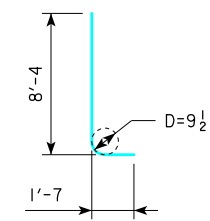
THESE SPREAD FOOTINGS SHALL EXTEND AT LEAST 12 INCHES INTO SUITABLE FOUNDATION ROCK AND THE LAST 12 INCHES OF ROCK EXCAVATION SHALL BE TO NEAT LINES OF MASONRY. THE FOUNDATION ROCK SHALL HAVE A MINIMUM LRFD NOMINAL BEARING RESISTANCE OF 30 KIPS PER SQUARE FOOT (ALLOWABLE BEARING VALUE OF AT LEAST 10 KIPS PER SQUARE FOOT).



(SEE SECTION A-A ON SHEET RS40-156-14.)

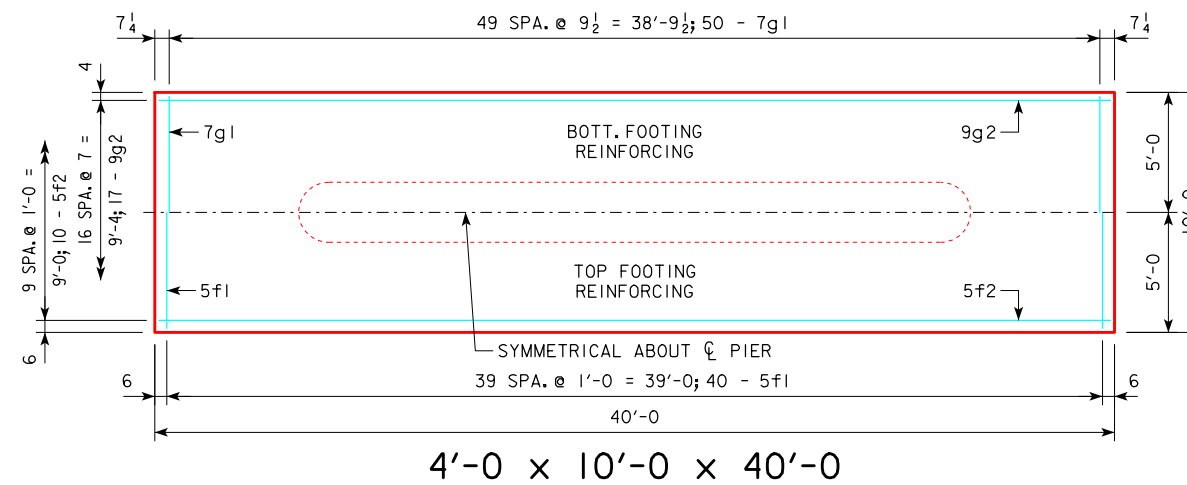
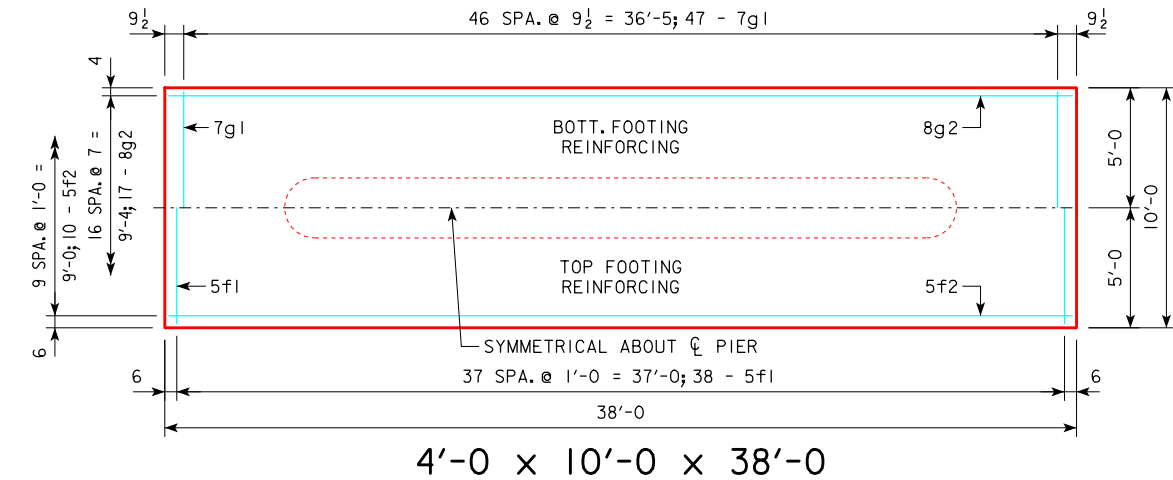
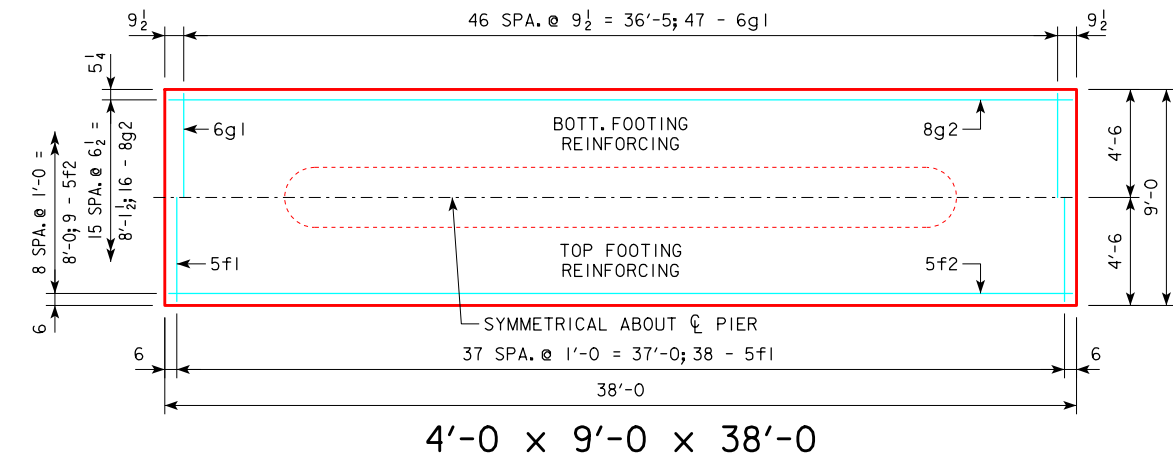
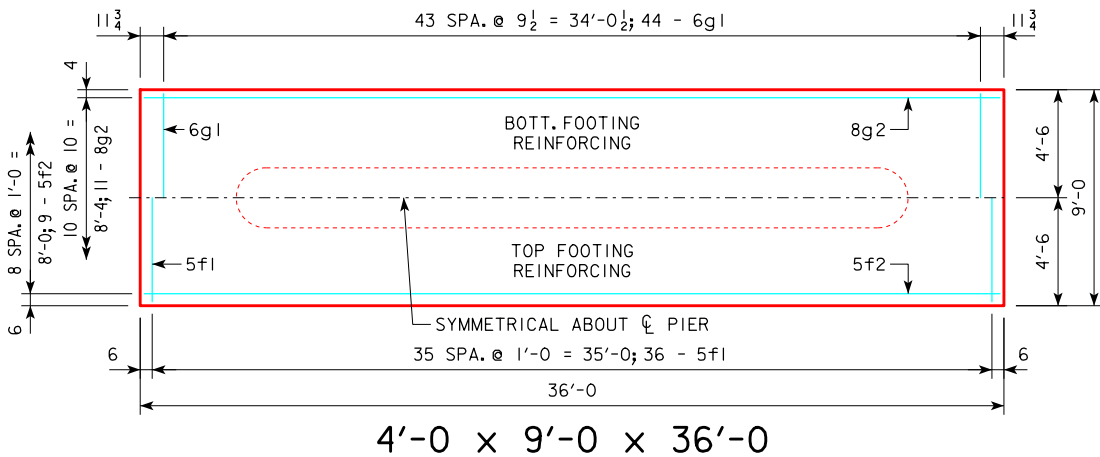
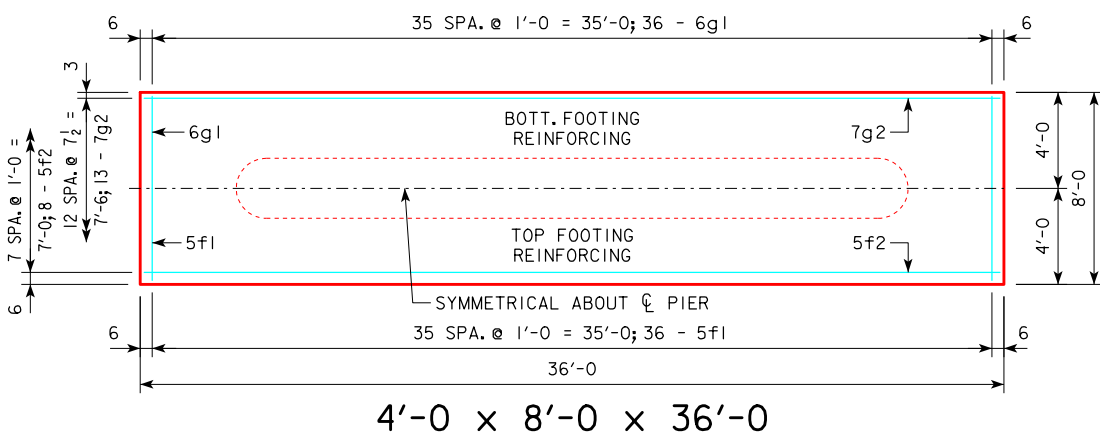
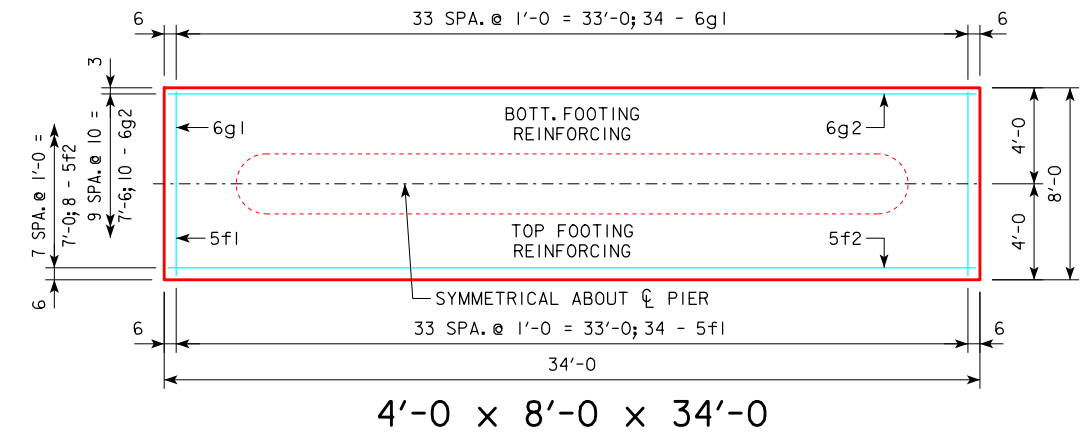
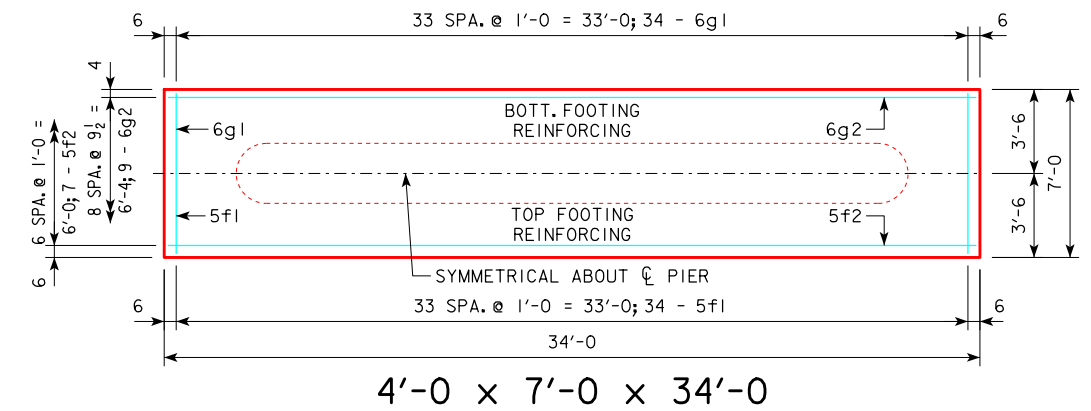


TYPICAL SECTION



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

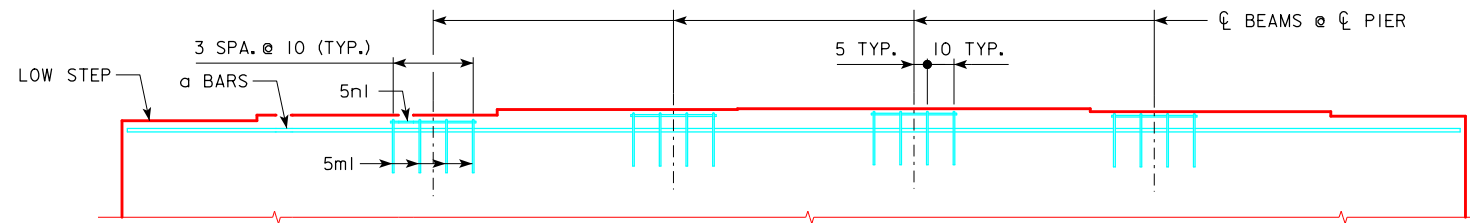
08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER <i>[Signature]</i>		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
TEE PIER - SPREAD FOOTINGS 45° SKEW - SHEET 1		RS40-164-14	



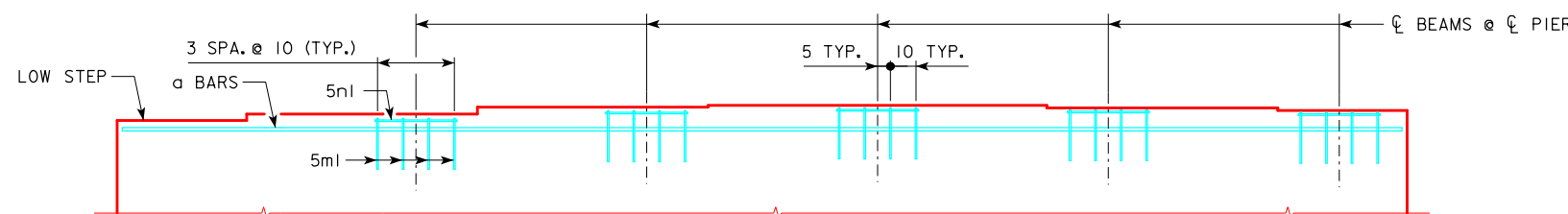
NOTE:
SEE SHEET RS40-164-14 FOR FOOTING NOTES.

08-2018 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
		TEE PIER - SPREAD FOOTINGS 45° SKEW - SHEET 2	RS40-165-14

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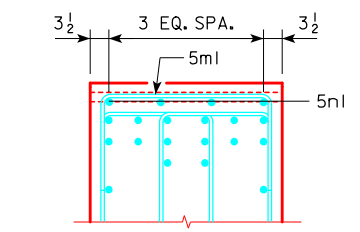
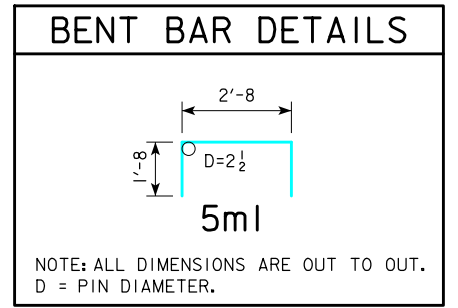
PART ELEVATION VIEW OF PIER CAP
GRADE (G): G ≤ 2.2%



PART ELEVATION VIEW OF PIER CAP
GRADE (G): 2.2% < G ≤ 5.0%

STEP REINFORCING BAR LIST ONE PIER								
			G ≤ 2.2%			2.2% < G ≤ 5.0%		
BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
5m1	6'-0		16	5	100	20	5	125
5n1	2'-10		16	5	47	20	5	59
TOTAL (LB.)					147			184

G = GRADE (%)



TYPICAL SECTION

NOTE: THE REINFORCING STEEL QUANTITIES ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITIES ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

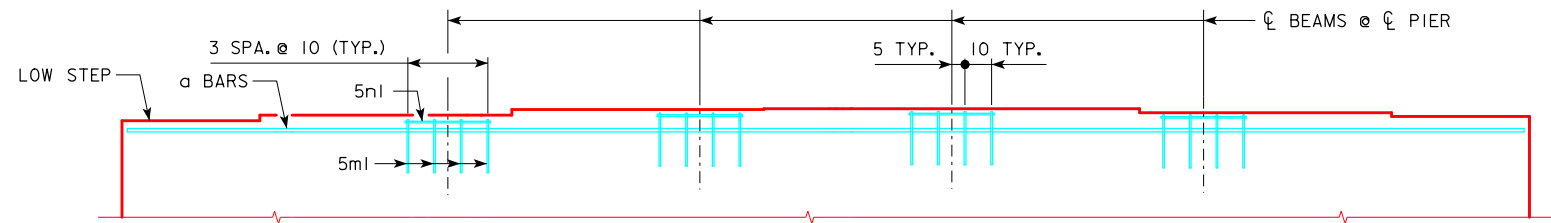
NOTES:

THE TABLE BELOW LISTS THE ADDITIONAL CONCRETE VOLUME REQUIRED IN EACH ABUTMENT FOOTING/PIER CAP BASED ON THE ROADWAY GRADE AT EACH ABUTMENT FOOTING/PIER CAP. ADDITIONAL CONCRETE SHOULD BE ADDED TO THE PLANS FOR EACH ABUTMENT FOOTING/PIER CAP THAT HAS 0.5 CU. YDS. OR MORE OF ADDITIONAL CONCRETE. VALUES SHOULD BE EXCLUDED FOR SCENARIOS THAT HAVE LESS THAN 0.5 CU. YDS. OF ADDITIONAL CONCRETE PER SUBSTRUCTURE UNIT. VALUES MAY BE INTERPOLATED FOR GRADES BETWEEN THE VALUES SHOWN IN THE TABLE.

	ROADWAY GRADE AT SUBSTRUCTURE UNIT				
	1%	2%	3%	4%	5%
EACH ABUTMENT FOOTING					
160'-0 TO 320'-0 SPANS	--	--	--	0.6	0.8
340'-0 SPAN	--	--	0.5	0.7	0.9
EACH PILE BENT OR TEE PIER CAP					
160'-0 TO 340'-0 SPANS	--	--	--	0.6	0.7

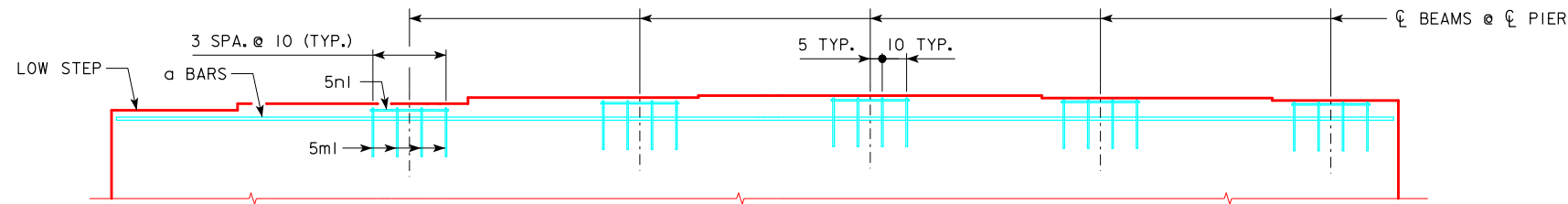
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014
	ADDITIONAL QUANTITIES 10° SKEW
	RS40-166-14



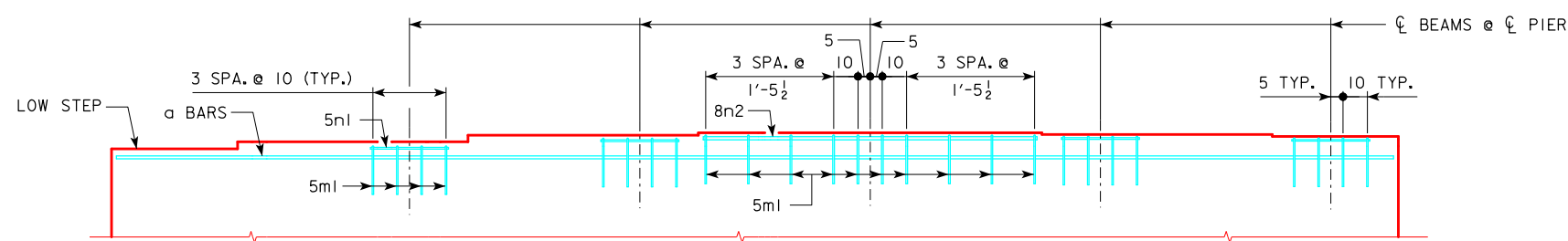
PART ELEVATION VIEW OF PIER CAP

GRADE (G): G ≤ 1.0%



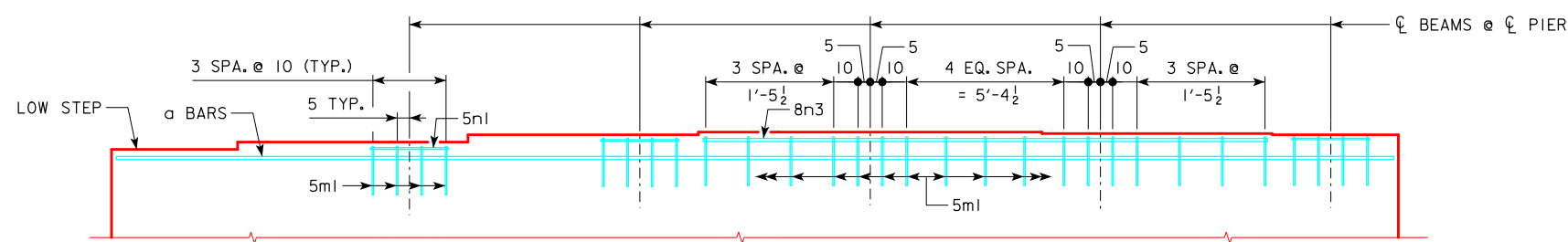
PART ELEVATION VIEW OF PIER CAP

GRADE (G): 1.0% < G ≤ 2.5%



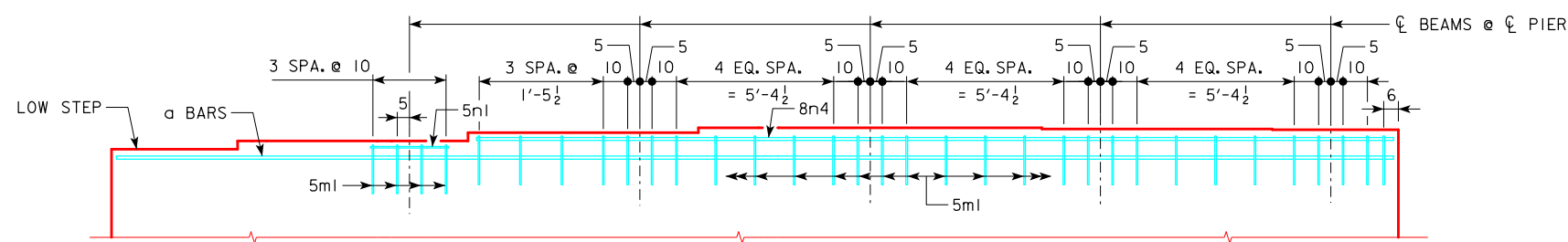
PART ELEVATION VIEW OF PIER CAP

GRADE (G): 2.5% < G ≤ 3.2%



PART ELEVATION VIEW OF PIER CAP

GRADE (G): 3.2% < G ≤ 3.7%



PART ELEVATION VIEW OF PIER CAP

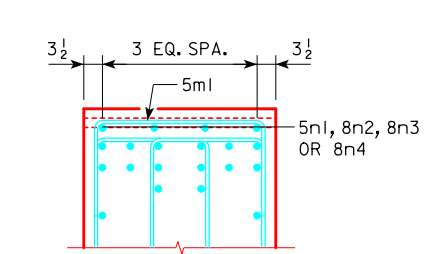
GRADE (G): 3.7% < G ≤ 5.0%

STEP REINFORCING BAR LIST
ONE PIER

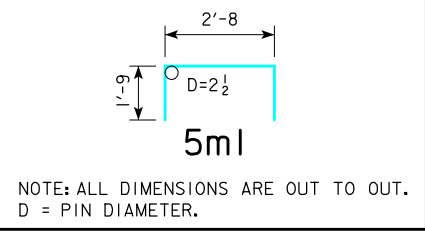
BAR	LENGTH	SHAPE	G ≤ 1.0%			1.0% < G ≤ 2.5%			2.5% < G ≤ 3.2%			3.2% < G ≤ 3.7%			3.7% < G ≤ 5.0%		
			NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
5m1	6'-2"		16	5	103	20	5	129	26	5	167	29	5	187	33	5	212
5n1	2'-10"		16	5	47	20	5	59	16	5	47	12	5	35	4	5	12
8n2	11'-5"		--	--	--	--	--	--	4	8	122	--	--	--	--	--	--
8n3	19'-3"		--	--	--	--	--	--	--	--	--	4	8	206	--	--	--
8n4	31'-5"		--	--	--	--	--	--	--	--	--	--	--	--	4	8	336
TOTAL (LB.)			150			188			336			428			560		

G = GRADE (%)

BENT BAR DETAILS



TYPICAL SECTION



NOTE: THE REINFORCING STEEL QUANTITIES ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.
NOTE: THE CONCRETE QUANTITIES ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTES:

THE TABLE BELOW LISTS THE ADDITIONAL CONCRETE VOLUME REQUIRED IN EACH ABUTMENT FOOTING/PIER CAP BASED ON THE ROADWAY GRADE AT EACH ABUTMENT FOOTING/PIER CAP. ADDITIONAL CONCRETE SHOULD BE ADDED TO THE PLANS FOR EACH ABUTMENT FOOTING/PIER CAP THAT HAS 0.5 CU. YDS. OR MORE OF ADDITIONAL CONCRETE. VALUES SHOULD BE EXCLUDED FOR SCENARIOS THAT HAVE LESS THAN 0.5 CU. YDS. OF ADDITIONAL CONCRETE PER SUBSTRUCTURE UNIT. VALUES MAY BE INTERPOLATED FOR GRADES BETWEEN THE VALUES SHOWN IN THE TABLE.

	ROADWAY GRADE AT SUBSTRUCTURE UNIT				
	1%	2%	3%	4%	5%
EACH ABUTMENT FOOTING					
160'-0 TO 320'-0 SPANS	--	0.6	1.0	1.3	1.7
340'-0 SPANS	--	0.7	1.2	1.6	2.0
EACH PILE BENT OR TEE PIER CAP					
160'-0 TO 340'-0 SPANS	--	0.6	0.9	1.2	1.6

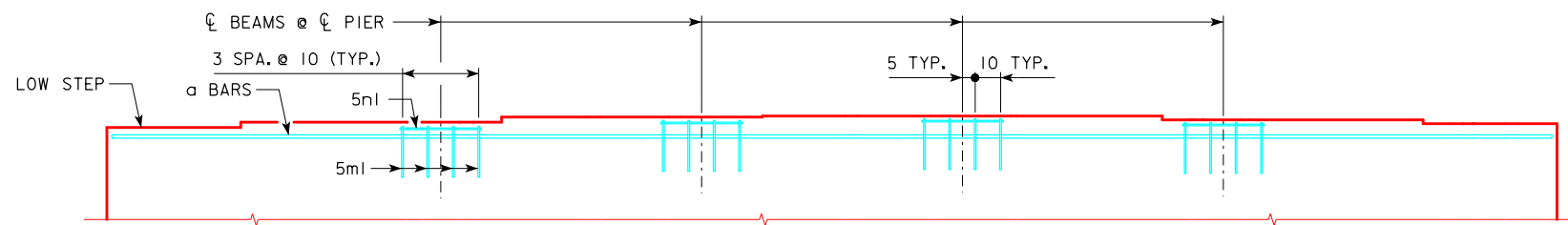
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2018
LATEST REVISION DATE

STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES
ROLLED STEEL BEAM BRIDGES
OCTOBER, 2014

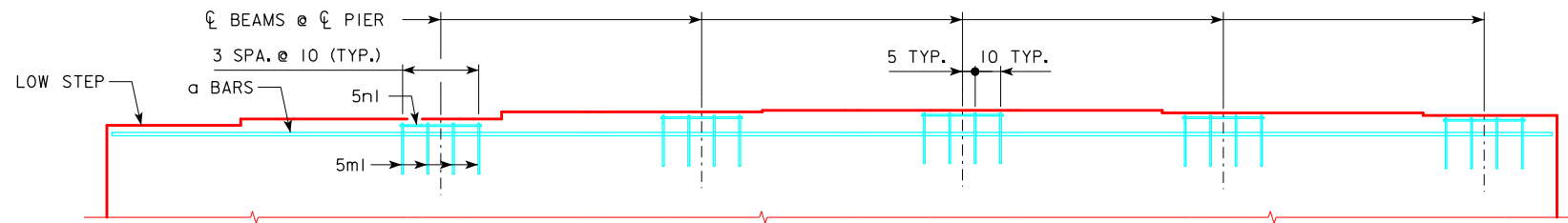
APPROVED BY BRIDGE ENGINEER

<p>ADDITIONAL QUANTITIES</p> <p>20° SKEW</p>	<p>RS40-167-14</p>
--	--------------------



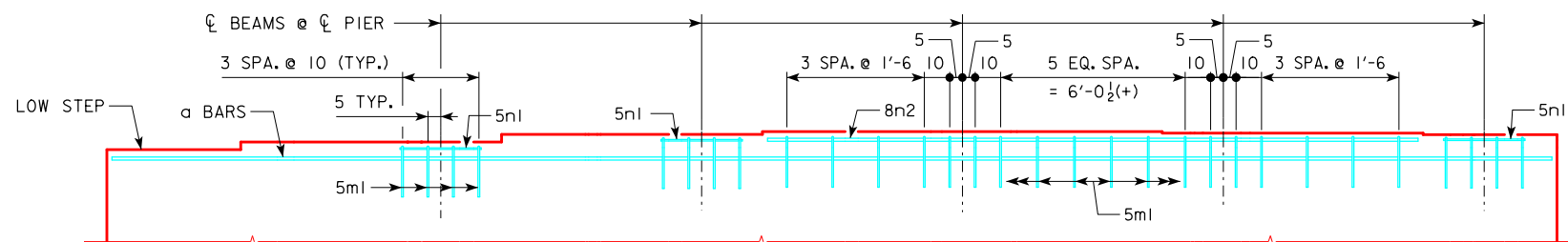
PART ELEVATION VIEW OF PIER CAP

GRADE (G): $G \leq 0.6\%$



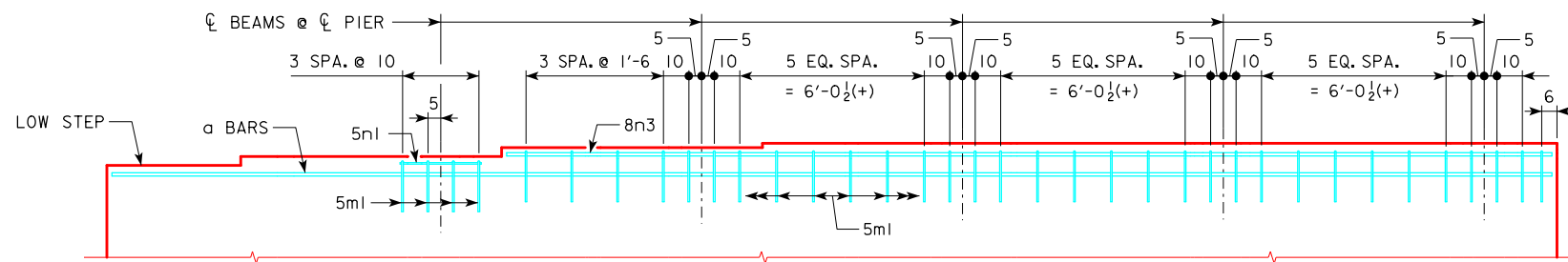
PART ELEVATION VIEW OF PIER CAP

GRADE (G): $0.6\% < G \leq 1.5\%$



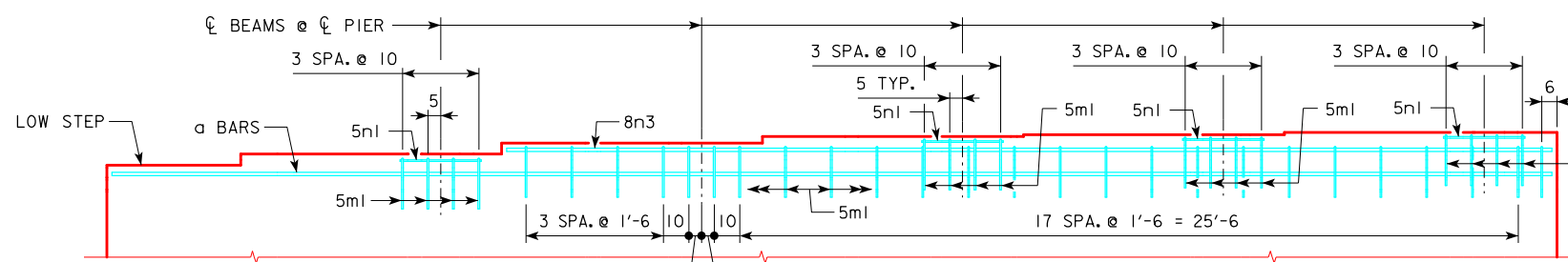
PART ELEVATION VIEW OF PIER CAP

GRADE (G): $1.5\% < G \leq 2.3\%$



PART ELEVATION VIEW OF PIER CAP

GRADE (G): $2.3\% < G \leq 3.4\%$



PART ELEVATION VIEW OF PIER CAP

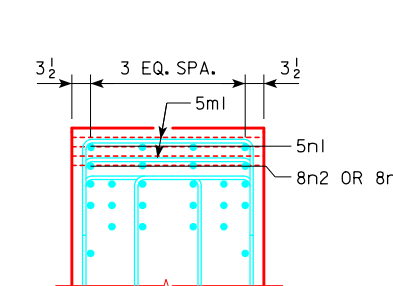
GRADE (G): $3.4\% < G \leq 5.0\%$

STEP REINFORCING BAR LIST
ONE PIER

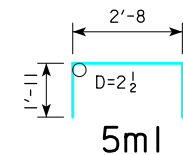
BAR	LENGTH	SHAPE	$G \leq 0.6\%$			$0.6\% < G \leq 1.5\%$			$1.5\% < G \leq 2.3\%$			$2.3\% < G \leq 3.4\%$			$3.4\% < G \leq 5.0\%$		
			NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
5m1	6'-6		16	5	108	20	5	136	30	5	203	36	5	244	41	5	278
5n1	2'-10		16	5	47	20	5	59	12	5	35	4	5	12	16	5	47
8n2	21'-3		--	--	--	--	--	--	4	8	227	--	--	--	--	--	--
8n3	34'-2		--	--	--	--	--	--	--	--	--	4	8	365	4	8	355
TOTAL (LB.)					155			195			465			621			680

G = GRADE (%)

BENT BAR DETAILS



TYPICAL SECTION



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

NOTE: THE REINFORCING STEEL QUANTITIES ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITIES ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTES:

THE TABLE BELOW LISTS THE ADDITIONAL CONCRETE VOLUME REQUIRED IN EACH ABUTMENT FOOTING/PIER CAP BASED ON THE ROADWAY GRADE AT EACH ABUTMENT FOOTING/PIER CAP. ADDITIONAL CONCRETE SHOULD BE ADDED TO THE PLANS FOR EACH ABUTMENT FOOTING/PIER CAP THAT HAS 0.5 CU. YDS. OR MORE OF ADDITIONAL CONCRETE. VALUES SHOULD BE EXCLUDED FOR SCENARIOS THAT HAVE LESS THAN 0.5 CU. YDS. OF ADDITIONAL CONCRETE PER SUBSTRUCTURE UNIT. VALUES MAY BE INTERPOLATED FOR GRADES BETWEEN THE VALUES SHOWN IN THE TABLE.

ADDITIONAL CONCRETE VOLUME PER SUBSTRUCTURE UNIT (C.Y.)

	ROADWAY GRADE AT SUBSTRUCTURE UNIT				
	1%	2%	3%	4%	5%
EACH ABUTMENT FOOTING					
160'-0 TO 320'-0 SPANS	--	1.0	1.6	2.3	2.9
340'-0 SPANS	0.5	1.3	2.0	2.7	3.5
EACH PILE BENT OR TEE PIER CAP					
160'-0 TO 340'-0 SPANS	--	1.0	1.6	2.1	2.8

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LATEST REVISION DATE

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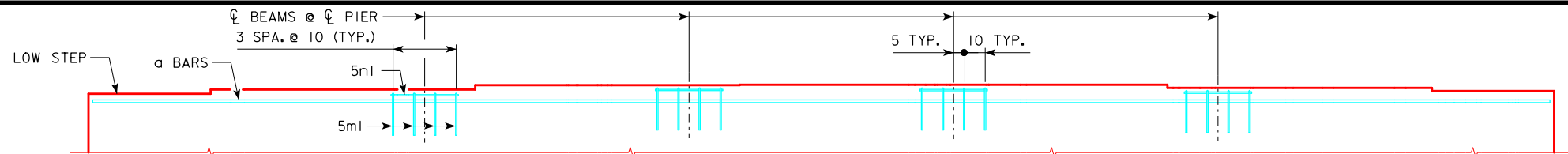
STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES
ROLLED STEEL BEAM BRIDGES

OCTOBER, 2014

ADDITIONAL QUANTITIES

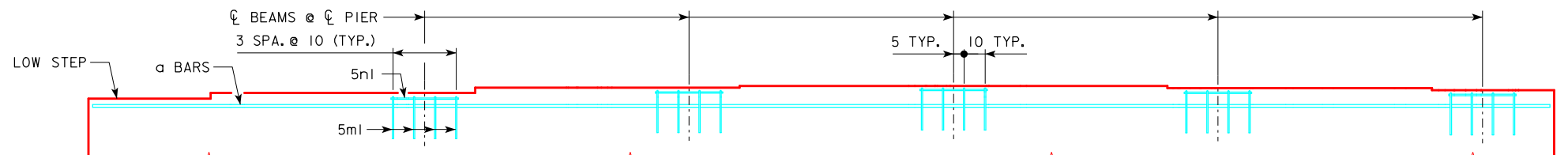
RS40-168-14

30° SKEW



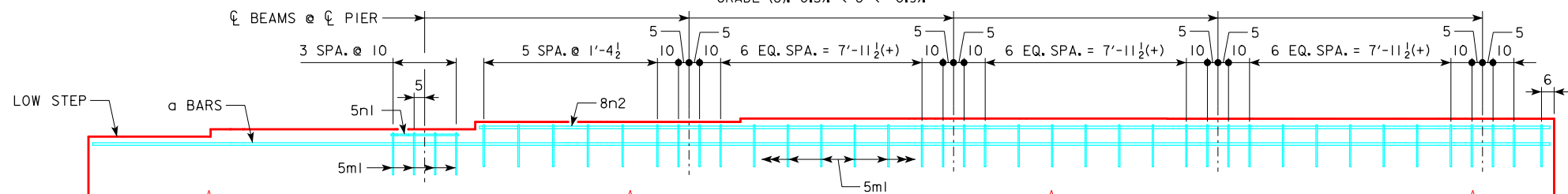
PART ELEVATION VIEW OF PIER CAP

GRADE (G): G <= 0.3%



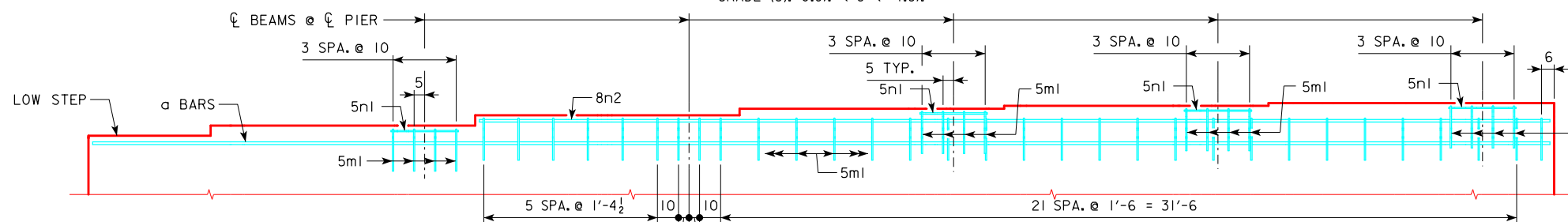
PART ELEVATION VIEW OF PIER CAP

GRADE (G): 0.3% < G <= 0.9%



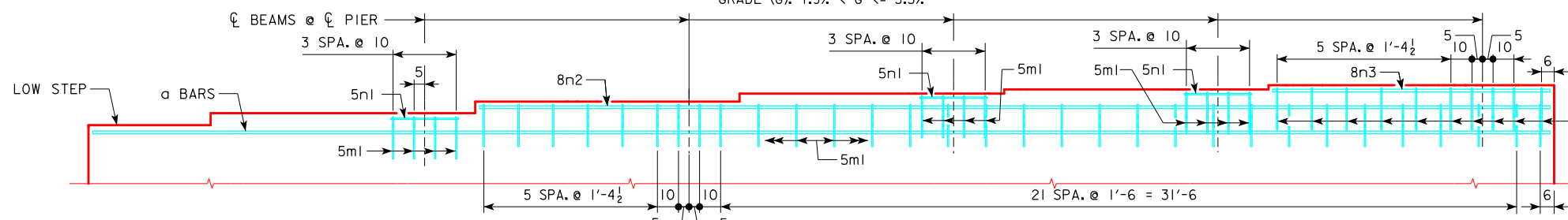
PART ELEVATION VIEW OF PIER CAP

GRADE (G): 0.9% < G <= 1.9%



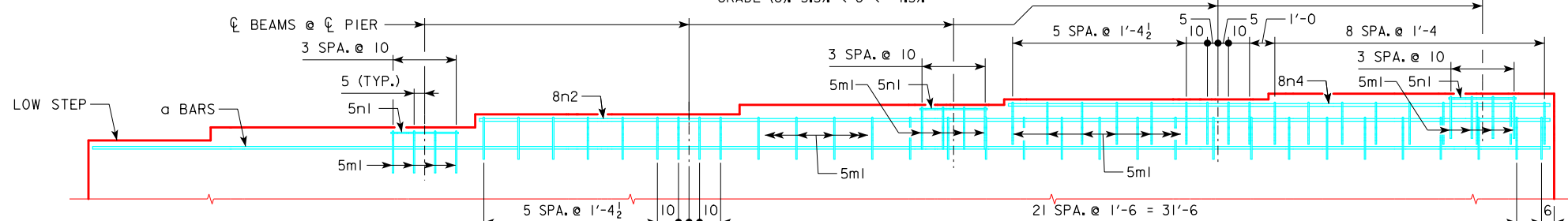
PART ELEVATION VIEW OF PIER CAP

GRADE (G): 1.9% < G <= 3.5%



PART ELEVATION VIEW OF PIER CAP

GRADE (G): 3.5% < G <= 4.3%



PART ELEVATION VIEW OF PIER CAP

GRADE (G): 4.3% < G <= 5.0%

G = GRADE (%)

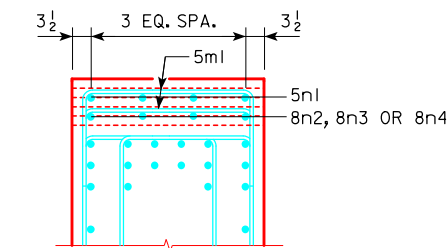
STEP REINFORCING BAR LIST ONE PIER

BAR	LENGTH	SHAPE	G <= 0.3%			0.3% < G <= 0.9%			0.9% < G <= 1.9%		
			NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
5m1	7'-0		16	5	117	20	5	146	41	5	299
5n1	2'-10		16	5	47	20	5	59	4	5	12
8n2	42'-4		--	--	--	--	--	--	4	8	452
8n3	10'-11		--	--	--	--	--	--	--	--	--
8n4	21'-5		--	--	--	--	--	--	--	--	--
TOTAL (LB.)					164			205			763

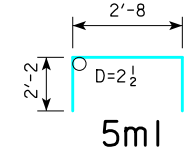
STEP REINFORCING BAR LIST ONE PIER

BAR	LENGTH	SHAPE	1.9% < G <= 3.5%			3.5% < G <= 4.3%			4.3% < G <= 5.0%		
			NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
5m1	7'-0		47	5	343	53	5	387	61	5	445
5n1	2'-10		16	5	47	12	5	35	12	5	35
8n2	42'-4		4	8	452	4	8	452	4	8	452
8n3	10'-11		--	--	--	4	8	117	--	--	--
8n4	21'-5		--	--	--	--	--	--	4	8	229
TOTAL (LB.)					842			991			1161

BENT BAR DETAILS



TYPICAL SECTION



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

NOTE: THE REINFORCING STEEL QUANTITIES ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITIES ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTES:

THE TABLE BELOW LISTS THE ADDITIONAL CONCRETE VOLUME REQUIRED IN EACH ABUTMENT FOOTING/PIER CAP BASED ON THE ROADWAY GRADE AT EACH ABUTMENT FOOTING/PIER CAP. ADDITIONAL CONCRETE SHOULD BE ADDED TO THE PLANS FOR EACH ABUTMENT FOOTING/PIER CAP THAT HAS 0.5 CU. YDS. OR MORE OF ADDITIONAL CONCRETE. VALUES SHOULD BE EXCLUDED FOR SCENARIOS THAT HAVE LESS THAN 0.5 CU. YDS. OF ADDITIONAL CONCRETE PER SUBSTRUCTURE UNIT. VALUES MAY BE INTERPOLATED FOR GRADES BETWEEN THE VALUES SHOWN IN THE TABLE.

ADDITIONAL CONCRETE VOLUME PER SUBSTRUCTURE UNIT (C.Y.)

	ROADWAY GRADE AT SUBSTRUCTURE UNIT				
	1%	2%	3%	4%	5%
EACH ABUTMENT FOOTING					
160'-0 TO 320'-0 SPANS	0.9	2.2	3.6	5.0	6.4
340'-0 SPANS	1.1	2.5	4.1	5.7	7.3
EACH PILE BENT OR TEE PIER CAP					
160'-0 TO 340'-0 SPANS	0.9	2.1	3.4	4.7	6.0

08-2018
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STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES
ROLLED STEEL BEAM BRIDGES

OCTOBER, 2014

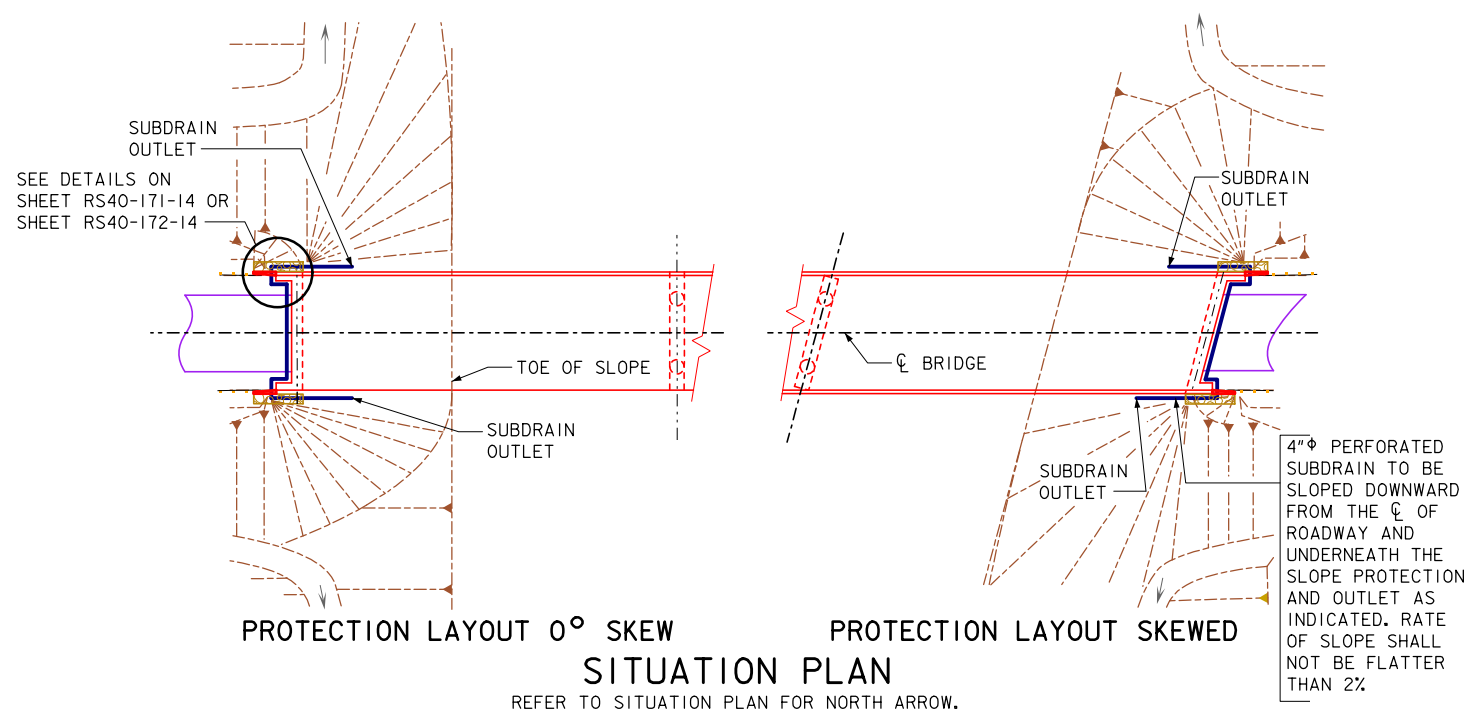
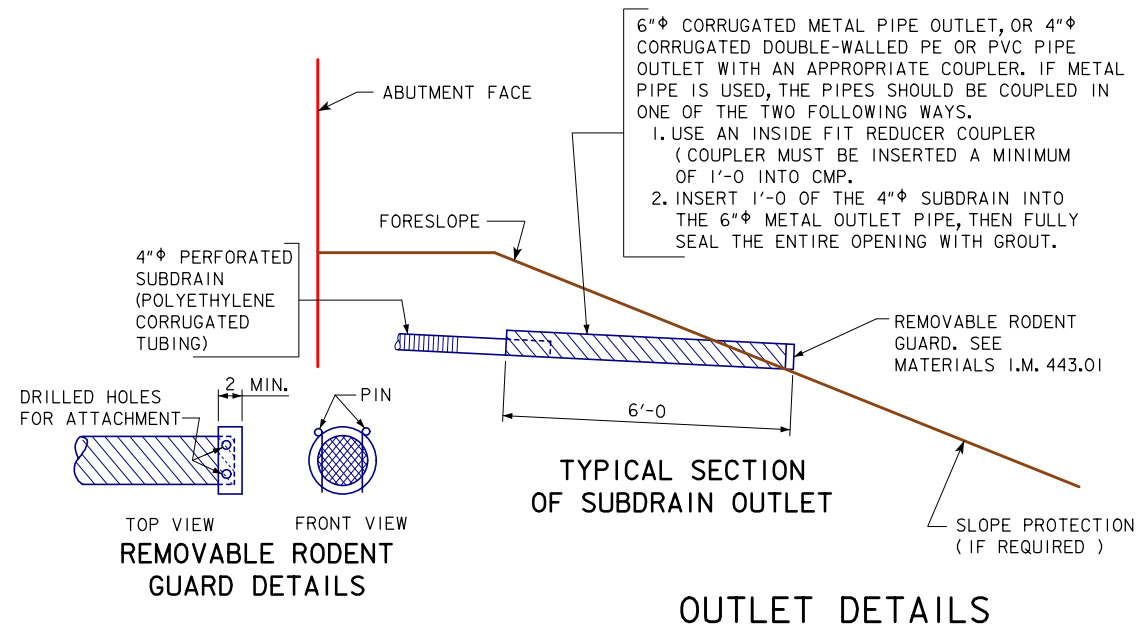
ADDITIONAL QUANTITIES

RS40-169-14

45° SKEW

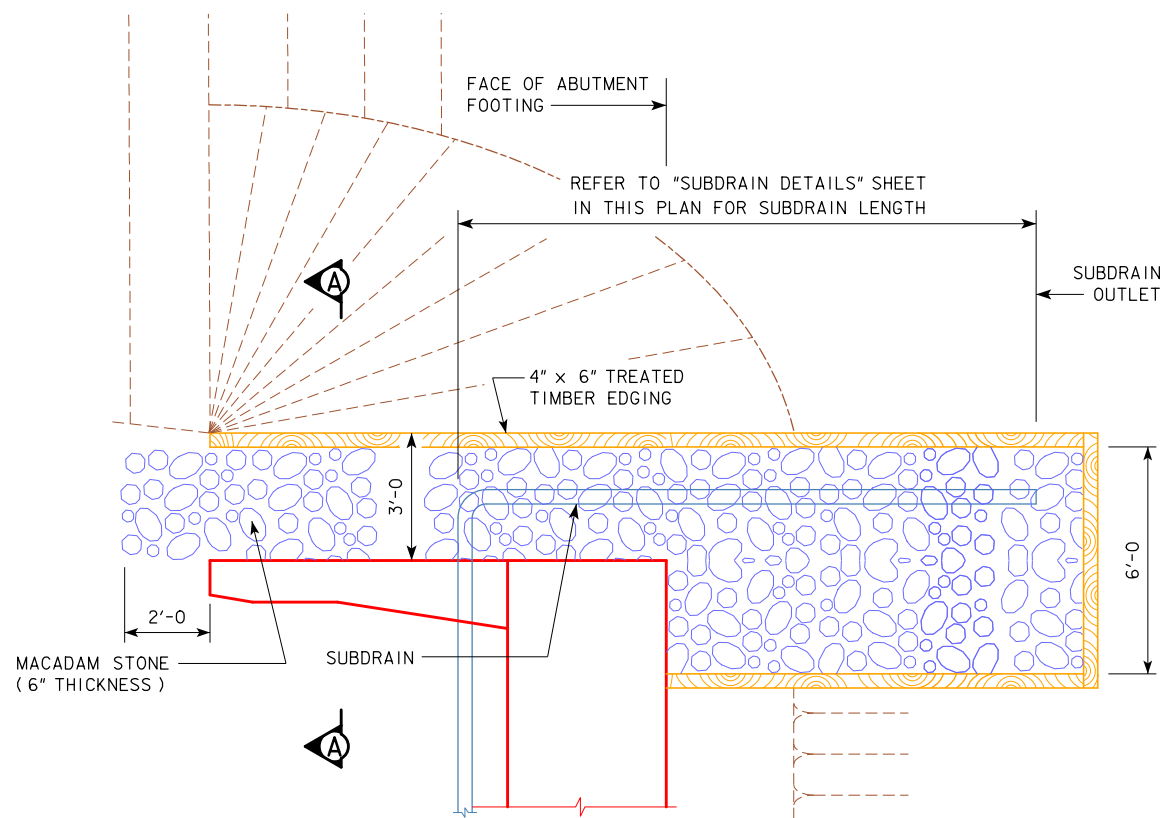
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

REVISED 03-15; CORRECTED THE CALLOUT "SHEET RS40-171-14 OR SHEET RS40-172-14" IT WAS IN ERROR CALLING OUT "SHEET H40-90-06 OR SHEET H40-91-06".
 REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

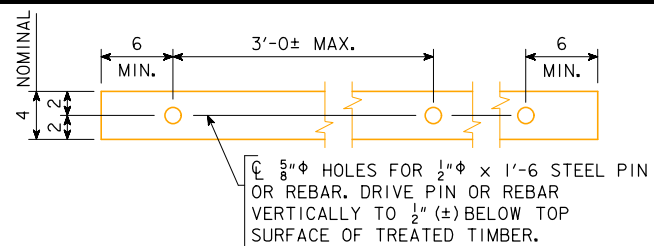


NOTE:
 SEE ABUTMENT BACKFILL DETAILS SHEET FOR DETAILS NOT SHOWN ON THIS SHEET WHICH ARE PERTINENT TO THIS STRUCTURE.

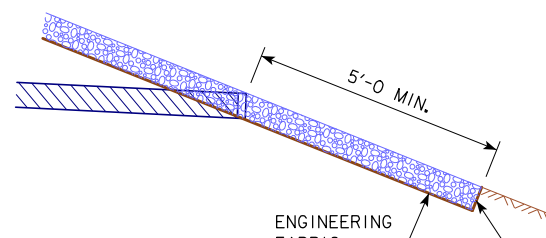
08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
SUBDRAIN DETAILS		RS40-170-14	



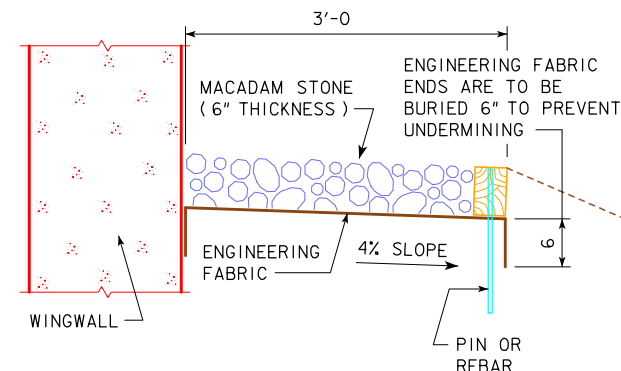
TOP VIEW OF WING ARMORING



4" x 6" TREATED TIMBER EDGING DETAILS



TYPICAL SECTION OF SUBDRAIN OUTLET



SECTION A-A

NOTE: THESE DETAILS TO BE USED FOR 160'-0 TO 320'-0 BRIDGE LENGTHS.

GENERAL NOTES:

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

THE MACADAM STONE SHALL BE IN ACCORDANCE WITH SECTION 4122, OF THE STANDARD SPECIFICATIONS, COARSE MATERIAL (NO CHOKE STONE IS ALLOWED).

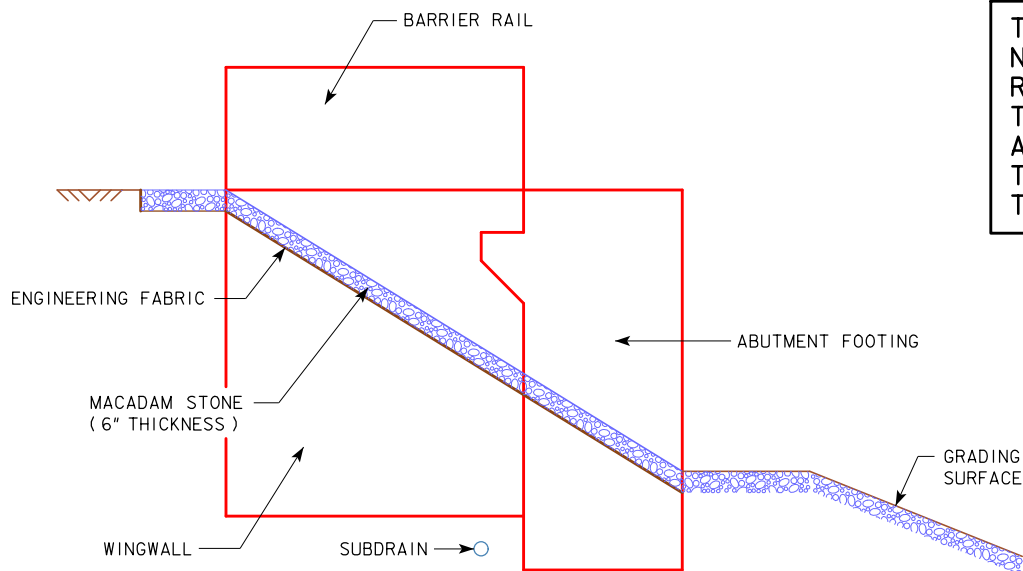
WOOD PRESERVATIVE TREATMENT FOR THE TIMBER EDGING SHALL MEET THE REQUIREMENTS FOR GUARDRAIL POSTS, SAWED FOUR SIDES, IN ACCORDANCE WITH SECTION 4161, OF THE STANDARD SPECIFICATIONS.

THE MACADAM STONE SHALL BE DEPOSITED, SPREAD, CONSOLIDATED AND SHAPED BY MECHANICAL OR HAND METHODS THAT WILL PROVIDE UNIFORM 6" DEPTH AND DENSITY AND PROVIDE UNIFORM SURFACE APPEARANCE.

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

THE MACADAM STONE USED IN THE BRIDGE WING ARMORING DETAILS SHALL NOT BE SUBSTITUTED WITH REVETMENT MATERIAL. IF CLASS B OR CLASS E REVETMENT IS PRESENT, THE CONTRACTOR SHALL REMOVE THE REVETMENT TO THE ARMORING DIMENSIONS. THE REMOVED REVETMENT SHALL BE PLACED AS DIRECTED BY THE ENGINEER. IN ADDITION, A CHECK SHALL BE MADE AT THE SUBDRAIN OUTLET TO INSURE THAT IT IS DRAINING PROPERLY DURING THE BACKFILL FLOODING PROCESS.

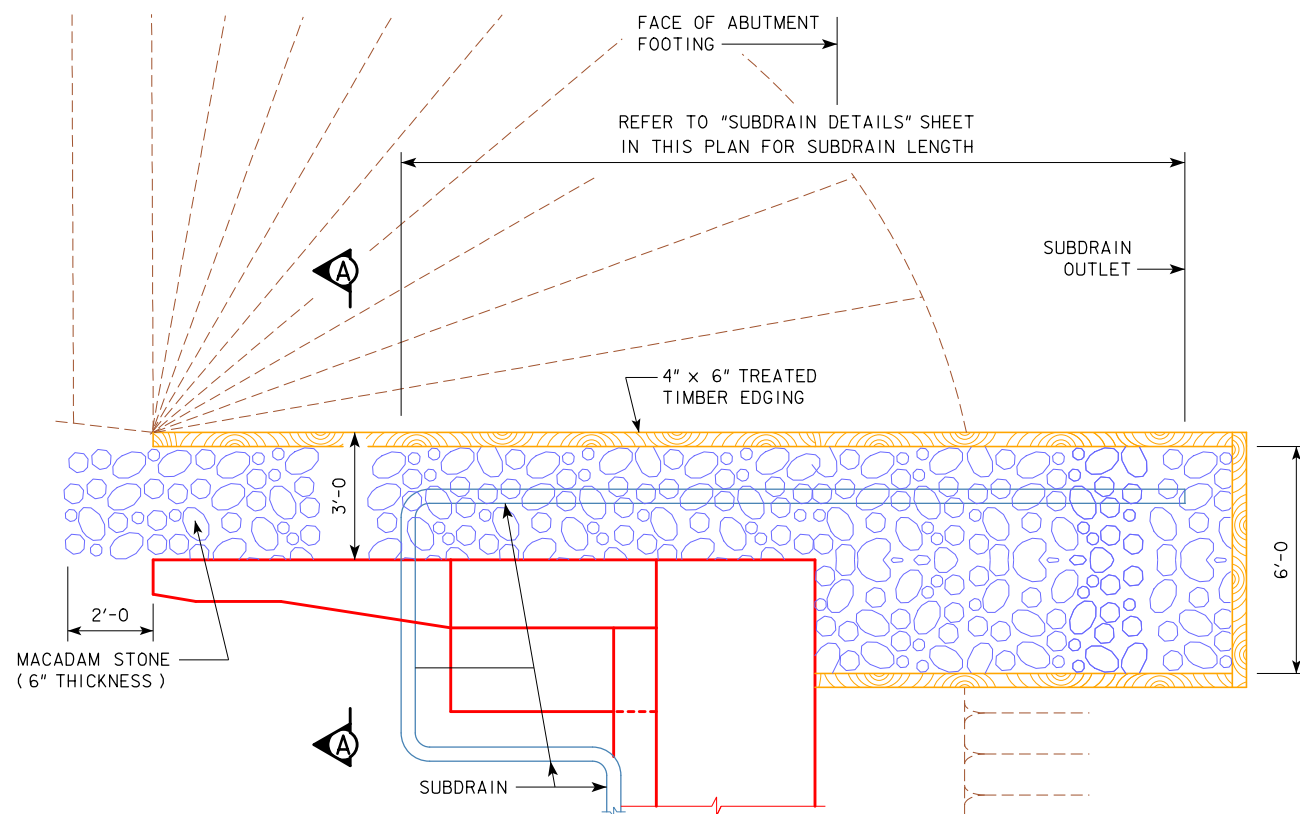
NOTE: WING ARMORING QUANTITIES ARE SHOWN ON THE RS40-031-14 THRU RS40-035-14 STANDARD SHEETS.



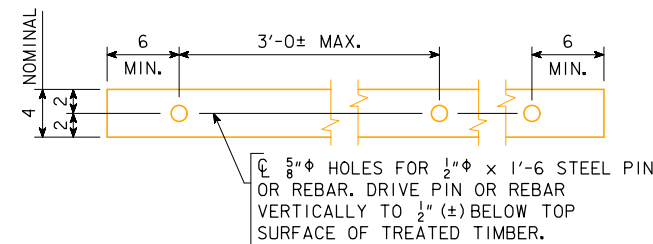
PROFILE VIEW OF WING ARMORING (SHOWN FOR INTEGRAL ABUTMENT)

08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
160'-0 TO 320'-0 BRIDGE WING ARMORING DETAILS		RS40-171-14	

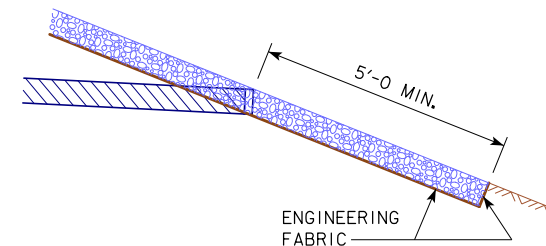
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



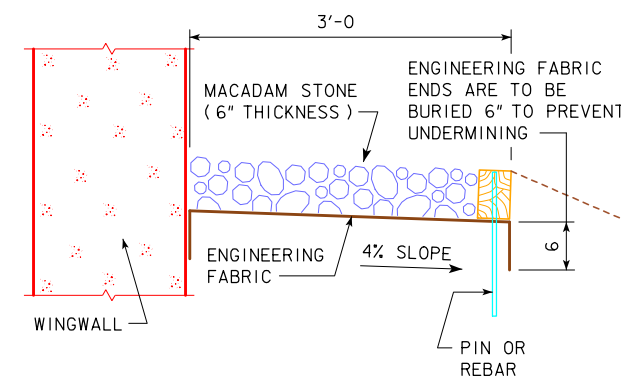
TOP VIEW OF WING ARMORING WITH WING EXTENSION



4" x 6" TREATED TIMBER EDGING DETAILS



TYPICAL SECTION OF SUBDRAIN OUTLET



SECTION A-A

NOTE: THESE DETAILS TO BE USED FOR 340'-0 BRIDGE LENGTH.

THE MACADAM STONE USED IN THE BRIDGE WING ARMORING DETAILS SHALL NOT BE SUBSTITUTED WITH REVETMENT MATERIAL. IF CLASS B OR CLASS E REVETMENT IS PRESENT, THE CONTRACTOR SHALL REMOVE THE REVETMENT TO THE ARMORING DIMENSIONS. THE REMOVED REVETMENT SHALL BE PLACED AS DIRECTED BY THE ENGINEER. IN ADDITION, A CHECK SHALL BE MADE AT THE SUBDRAIN OUTLET TO INSURE THAT IT IS DRAINING PROPERLY DURING THE BACKFILL FLOODING PROCESS.

GENERAL NOTES:

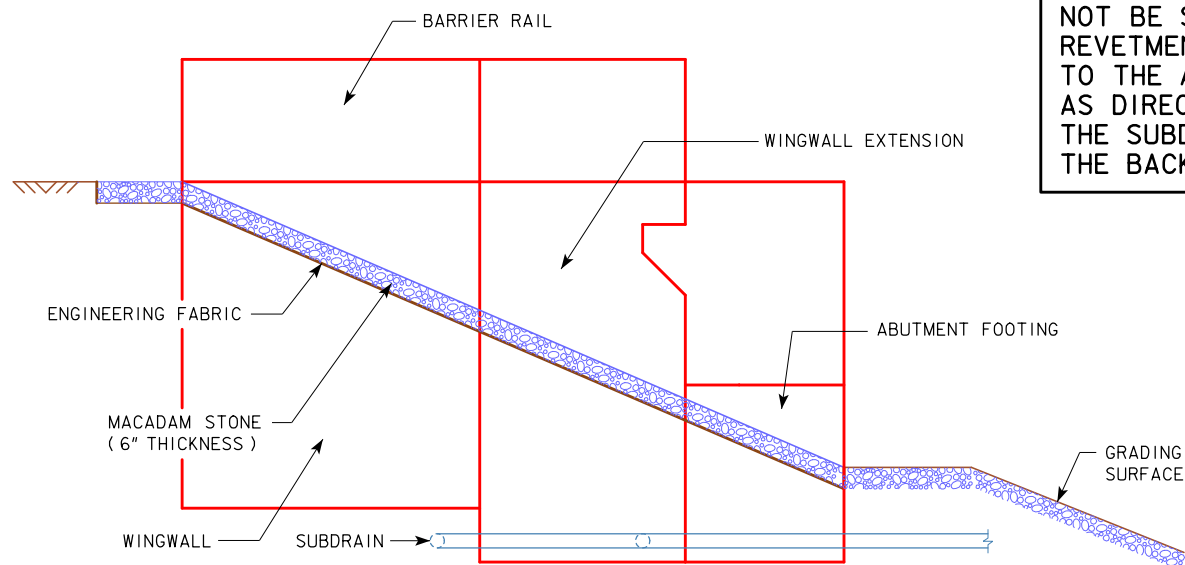
MACADAM STONE SHALL BE PLACED ALONG THE SIDE OF THE WING AND ABUTMENT FOOTING AS SHOWN IN SECTION A-A. THIS IS TYPICAL AT EACH CORNER OF THE BRIDGE UNLESS OTHERWISE NOTED IN THE PLANS. THE MACADAM STONE AT THESE LOCATIONS SHALL BE UNDERLAYED WITH ENGINEERING FABRIC IN ACCORDANCE WITH ARTICLE 4196.01,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

THE MACADAM STONE SHALL BE IN ACCORDANCE WITH SECTION 4122, OF THE STANDARD SPECIFICATIONS, COARSE MATERIAL (NO CHOKE STONE IS ALLOWED).

WOOD PRESERVATIVE TREATMENT FOR THE TIMBER EDGING SHALL MEET THE REQUIREMENTS FOR GUARDRAIL POSTS, SAWED FOUR SIDES, IN ACCORDANCE WITH SECTION 4161, OF THE STANDARD SPECIFICATIONS.

THE MACADAM STONE SHALL BE DEPOSITED, SPREAD, CONSOLIDATED AND SHAPED BY MECHANICAL OR HAND METHODS THAT WILL PROVIDE UNIFORM 6" DEPTH AND DENSITY AND PROVIDE UNIFORM SURFACE APPEARANCE.

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



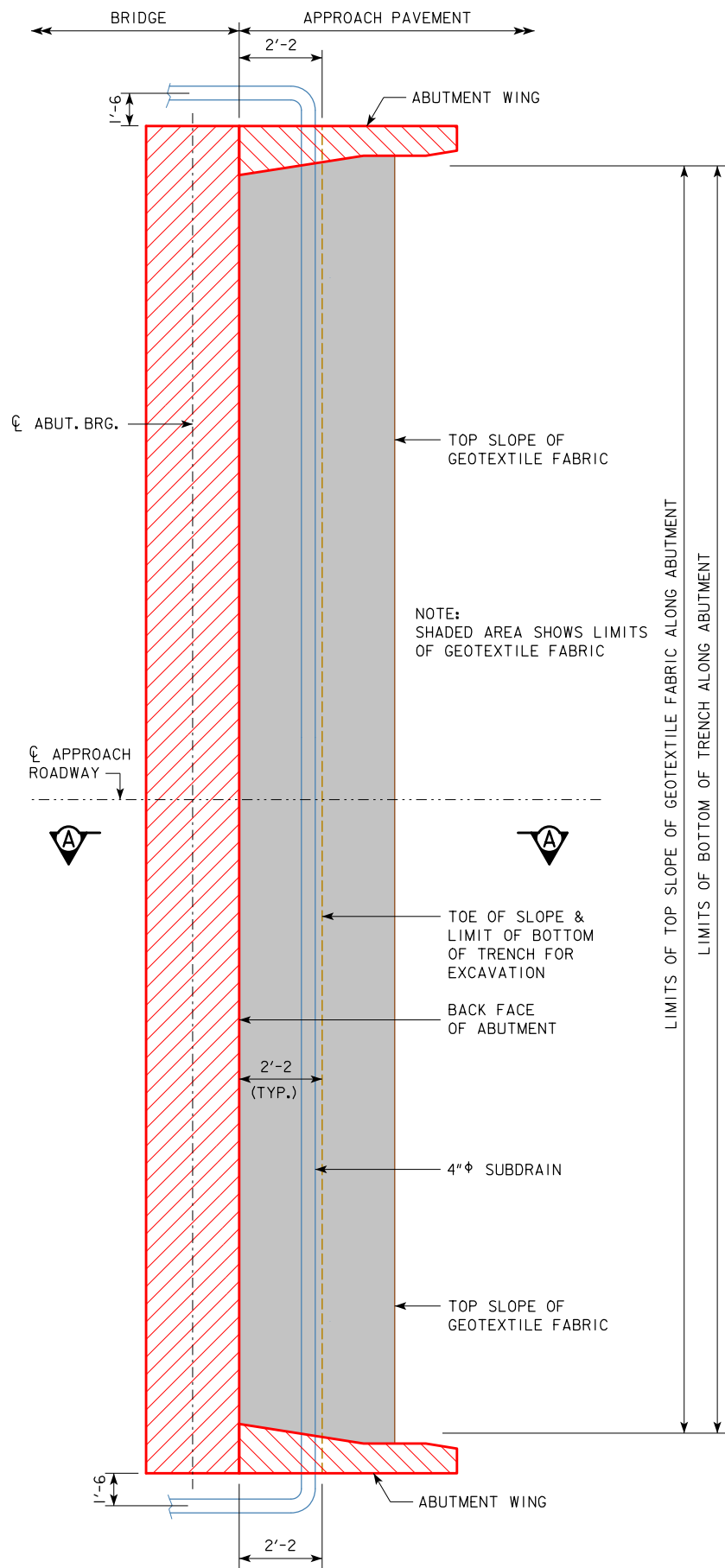
PROFILE VIEW OF WING ARMORING WITH WING EXTENSION
(SHOWN FOR INTEGRAL ABUTMENT WITH WING EXTENSIONS)

NOTE: WING ARMORING QUANTITIES ARE SHOWN ON THE RS40-031-14 THRU RS40-035-14 STANDARD SHEETS.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER		
	STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
	340'-0 BRIDGE WING ARMORING DETAILS	RS40-172-14

REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.

REVISED 02-2017 - CHANGED THE BRIDGE APPROACH PAVEMENT STANDARD TO "BR" (WAS "RK").
 REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



ABUTMENT PLAN WITHOUT WING EXTENSIONS

NOTE: THESE DETAILS TO BE USED FOR 160'-0 TO 320'-0 BRIDGE LENGTHS.

ABUTMENT BACKFILL PROCESS:

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

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

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

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

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

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

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

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

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

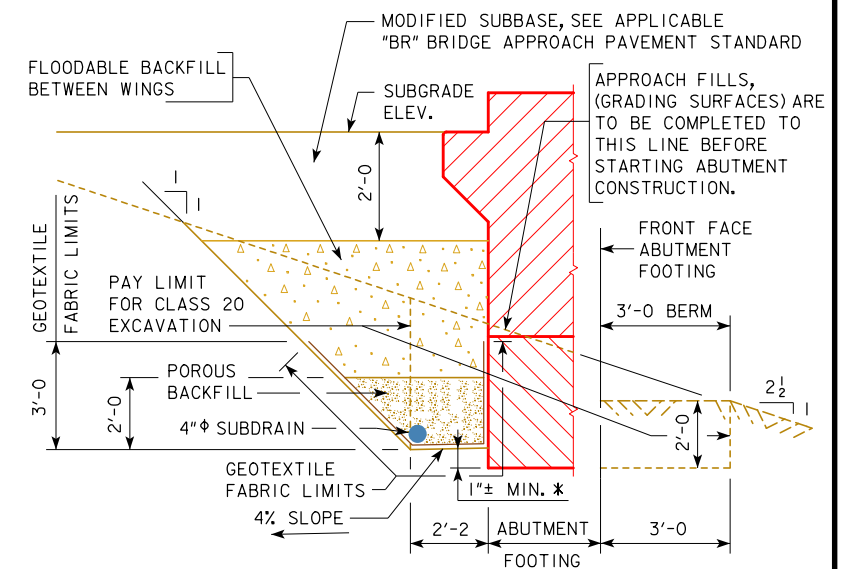
NOTE: SEE SUBDRAIN DETAILS SHEET FOR DETAILS NOT SHOWN ON THIS SHEET WHICH ARE PERTINENT TO THIS STRUCTURE.

NOTE:

SUBDRAIN SHALL SLOPE DOWNWARD 2% FROM CL 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, SHINGLE FASHION WITH UP SLOPE LAP PIECE ON TOP AND STAPLED FOR CONTINUITY.



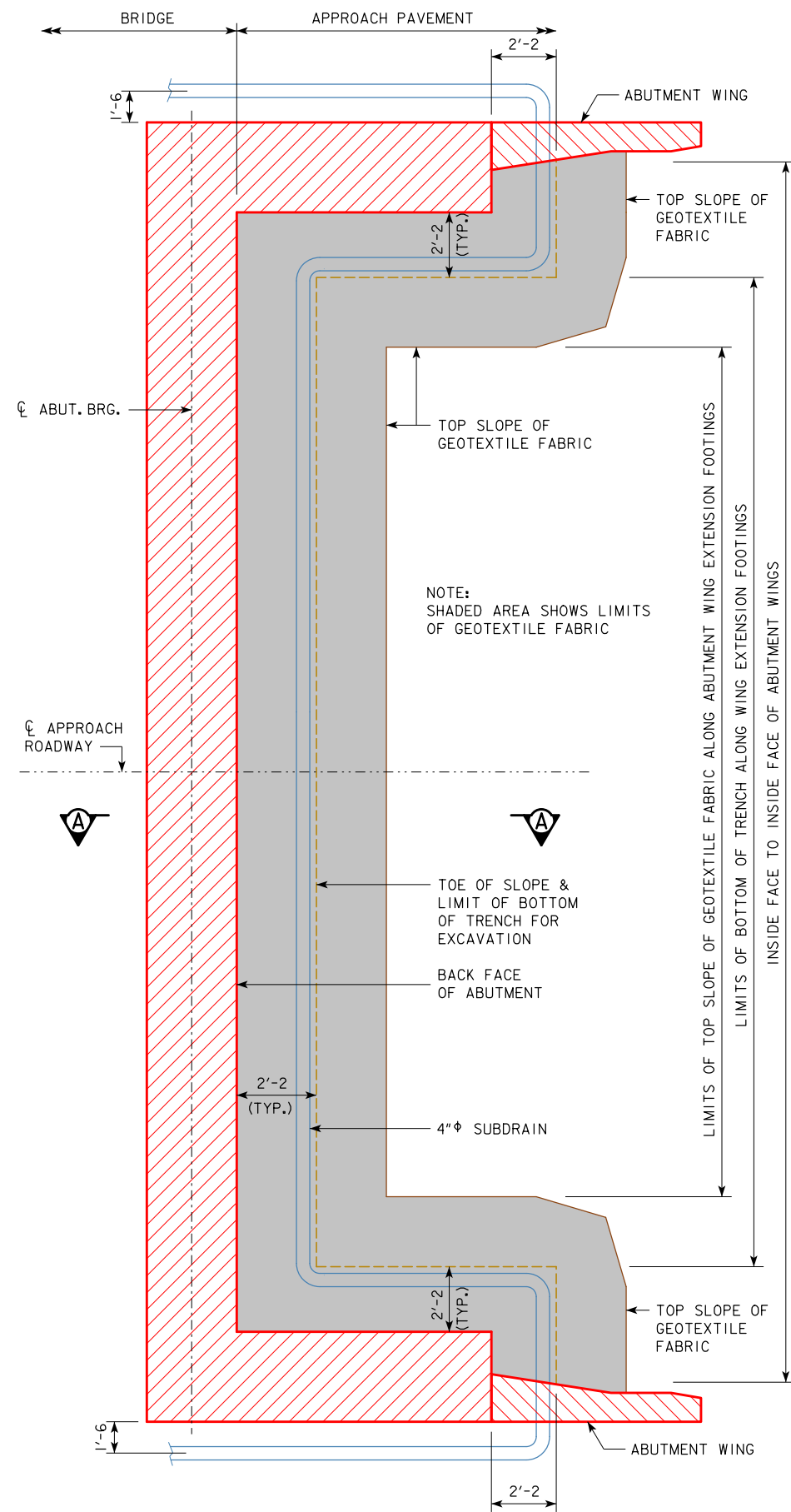
SECTION A-A
 BACKFILL DETAILS

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

* DIMENSION VARIES DUE TO 2% SUBDRAIN SLOPE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER		
	STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
ABUTMENT BACKFILL DETAILS, 0° SKEW	RS40-173-14	

REVISED 02-2017 - CHANGED THE BRIDGE APPROACH PAVEMENT STANDARD TO "BR" (WAS "RK").
 REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



ABUTMENT PLAN WITH WING EXTENSIONS

NOTE: THESE DETAILS TO BE USED FOR 340'-0 BRIDGE LENGTH.

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.

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

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

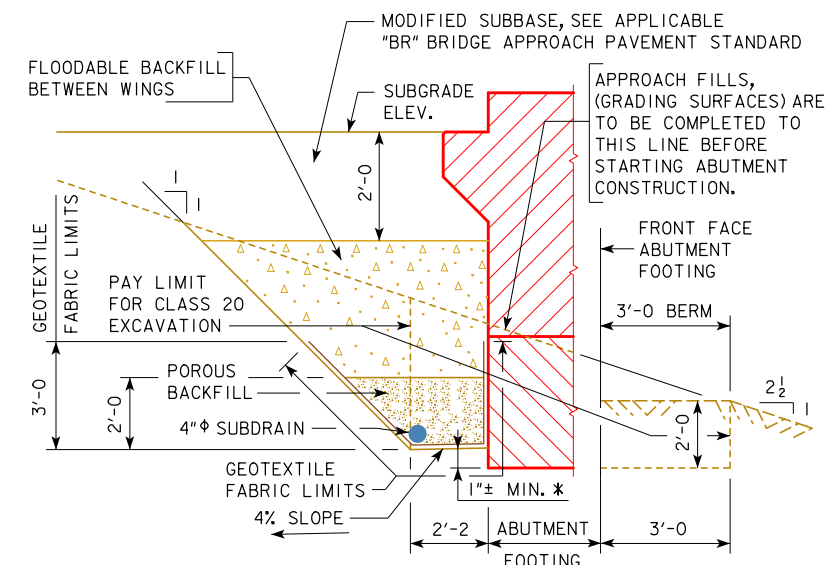
NOTE: SEE SUBDRAIN DETAILS SHEET FOR DETAILS NOT SHOWN ON THIS SHEET WHICH ARE PERTINENT TO THIS STRUCTURE.

NOTE:

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

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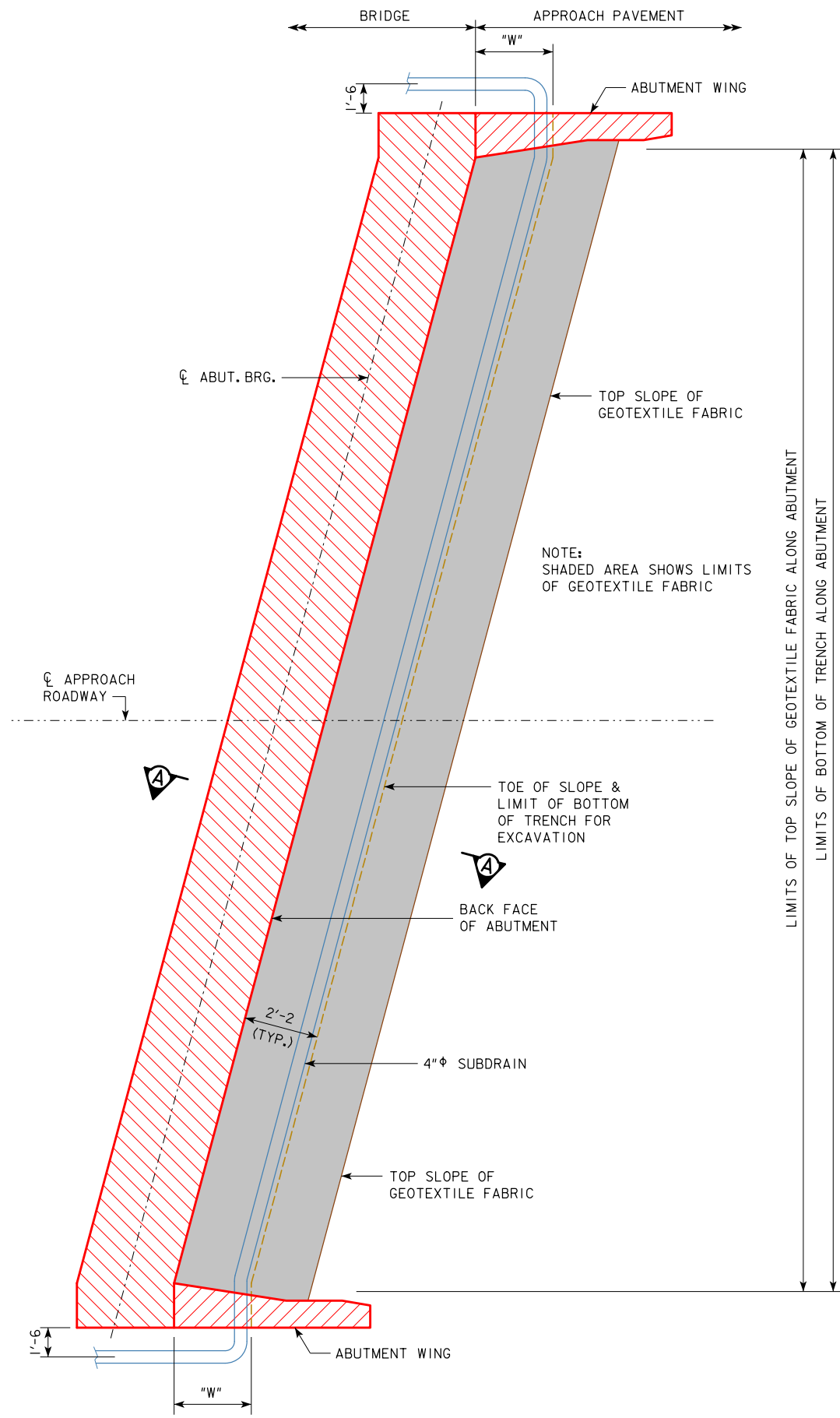
SECTION A-A
 BACKFILL DETAILS

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

* DIMENSION VARIES DUE TO 2% SUBDRAIN SLOPE.

08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
ABUTMENT BACKFILL DETAILS, 0° SKEW		RS40-174-14	

REVISED 02-2017 - CHANGED THE BRIDGE APPROACH PAVEMENT STANDARD TO "BR" (WAS "RK").
REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



ABUTMENT PLAN WITHOUT WING EXTENSIONS

"W" DIMENSION	
SKEW	DIMENSION
10°	2'-2 ³ / ₈
20°	2'-3 ¹ / ₁₆
30°	2'-6
45°	3'-0 ³ / ₄

NOTE: THESE DETAILS TO BE USED FOR 160'-0 TO 320'-0 BRIDGE LENGTHS.

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.

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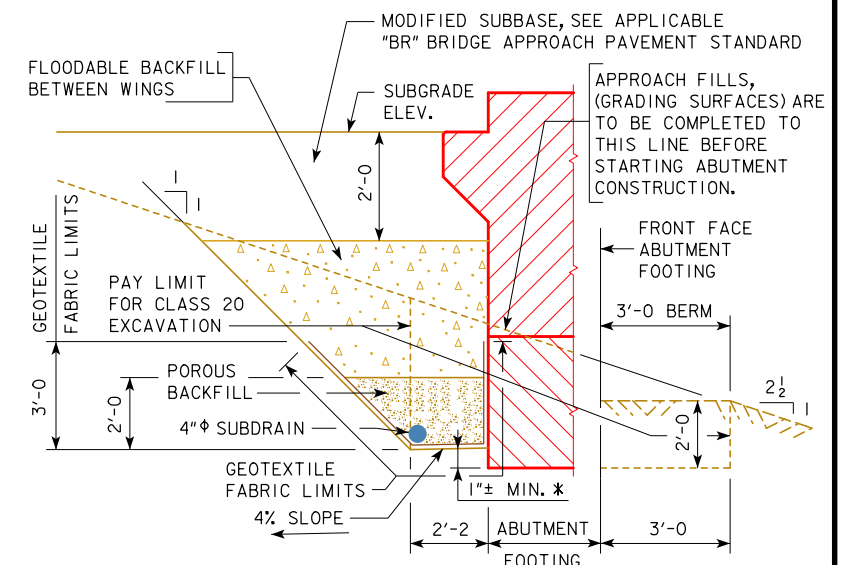
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SUBDRAIN SHALL SLOPE DOWNWARD 2% FROM HIGH END WHEN OUTLETTING AT ONE END OF THE ABUTMENT.

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, SHINGLE FASHION WITH UP SLOPE LAP PIECE ON TOP AND STAPLED FOR CONTINUITY.



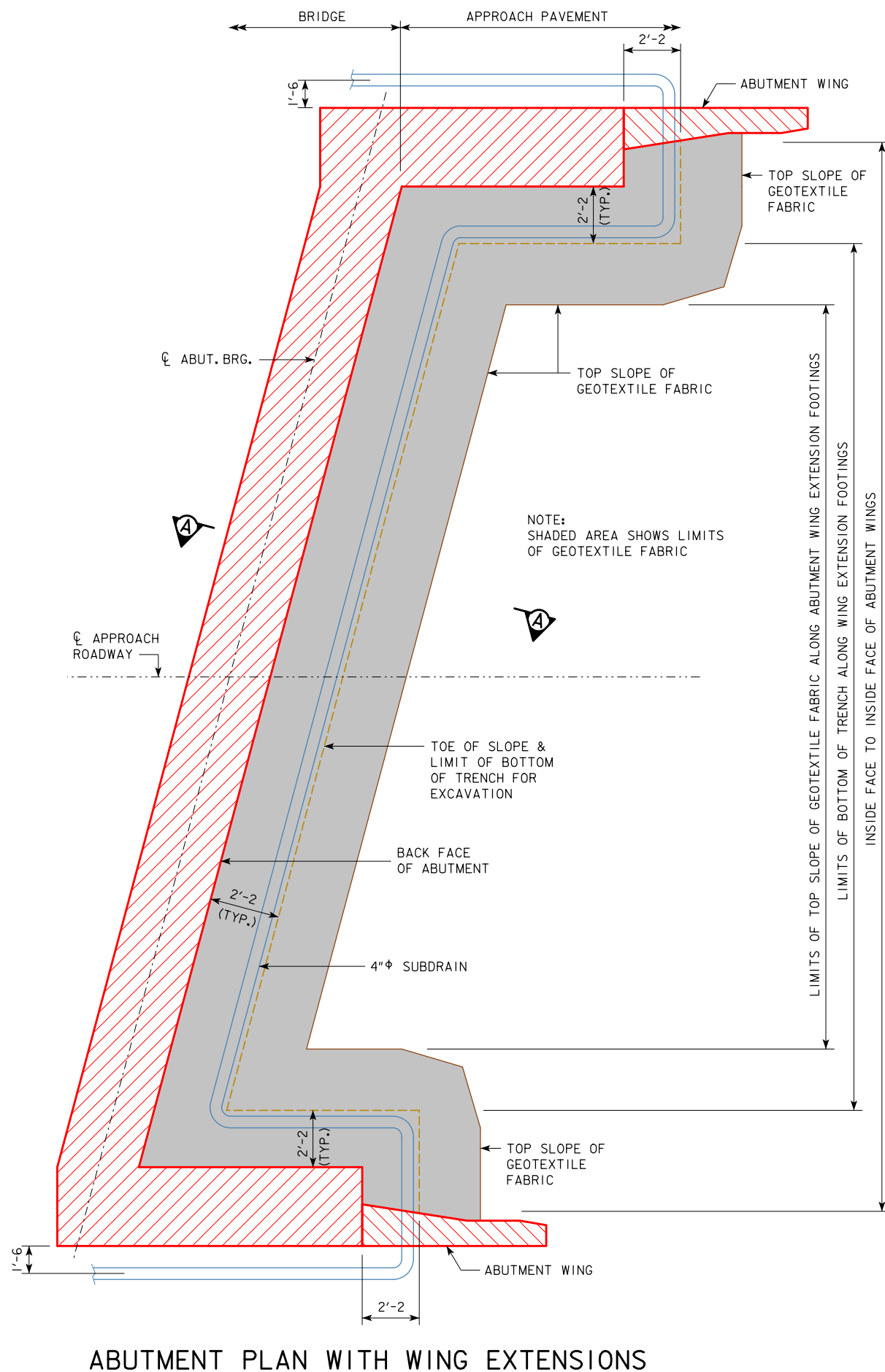
SECTION A-A
BACKFILL DETAILS

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

* DIMENSION VARIES DUE TO 2% SUBDRAIN SLOPE.

08-2018 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
	ABUTMENT BACKFILL DETAILS, SKEWED	RS40-175-14

REVISED 02-2017 - CHANGED THE BRIDGE APPROACH PAVEMENT STANDARD TO "BR" (WAS "RK").
 REVISED 08-2018 - UPDATED BRIDGE ENGINEER SIGNATURE.



ABUTMENT PLAN WITH WING EXTENSIONS

NOTE: THESE DETAILS TO BE USED FOR 340'-0 BRIDGE LENGTH.

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.

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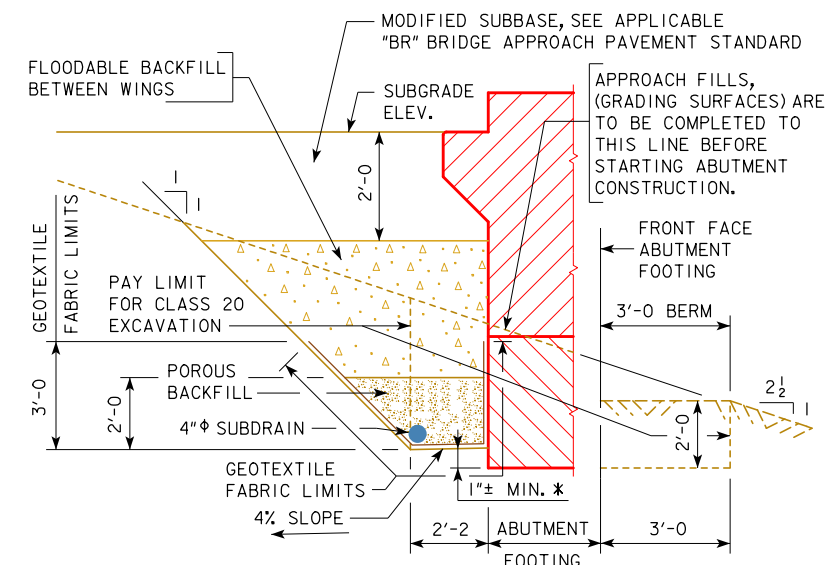
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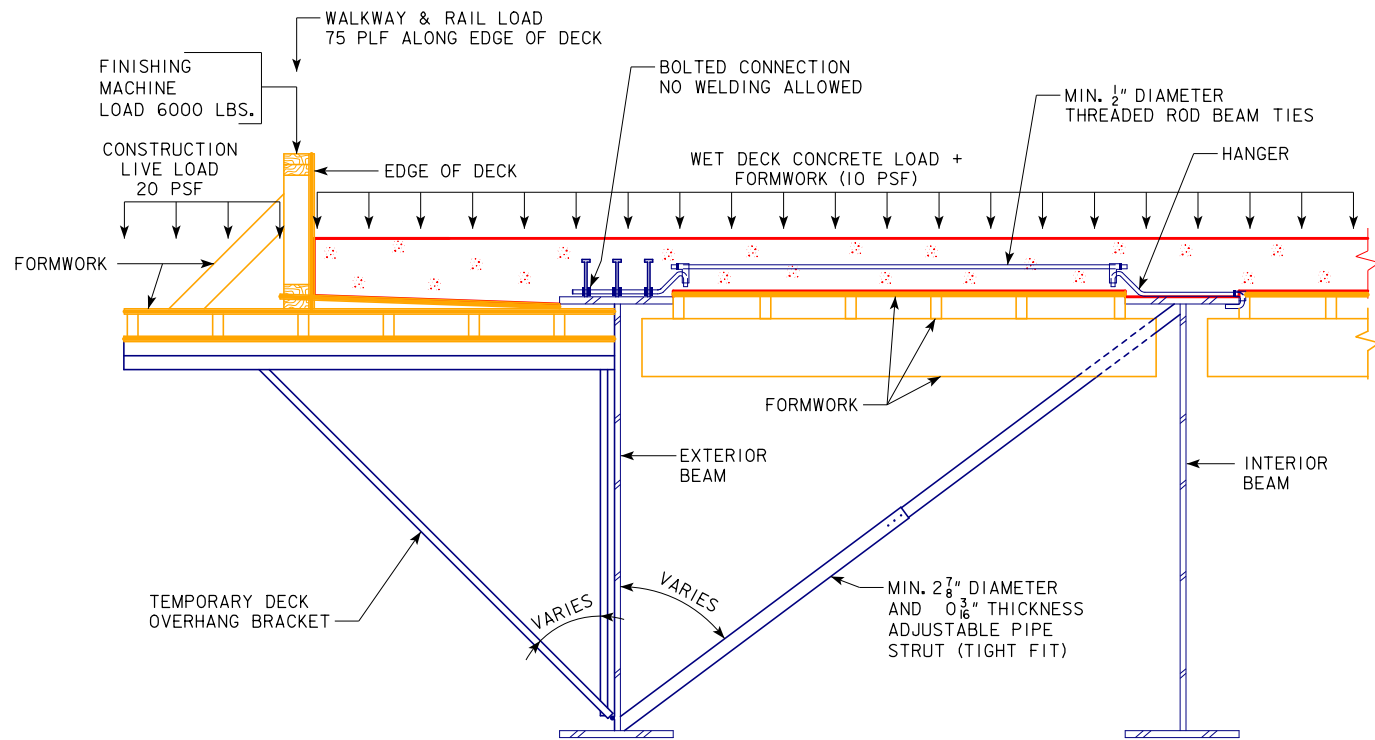


SECTION A-A
 BACKFILL DETAILS

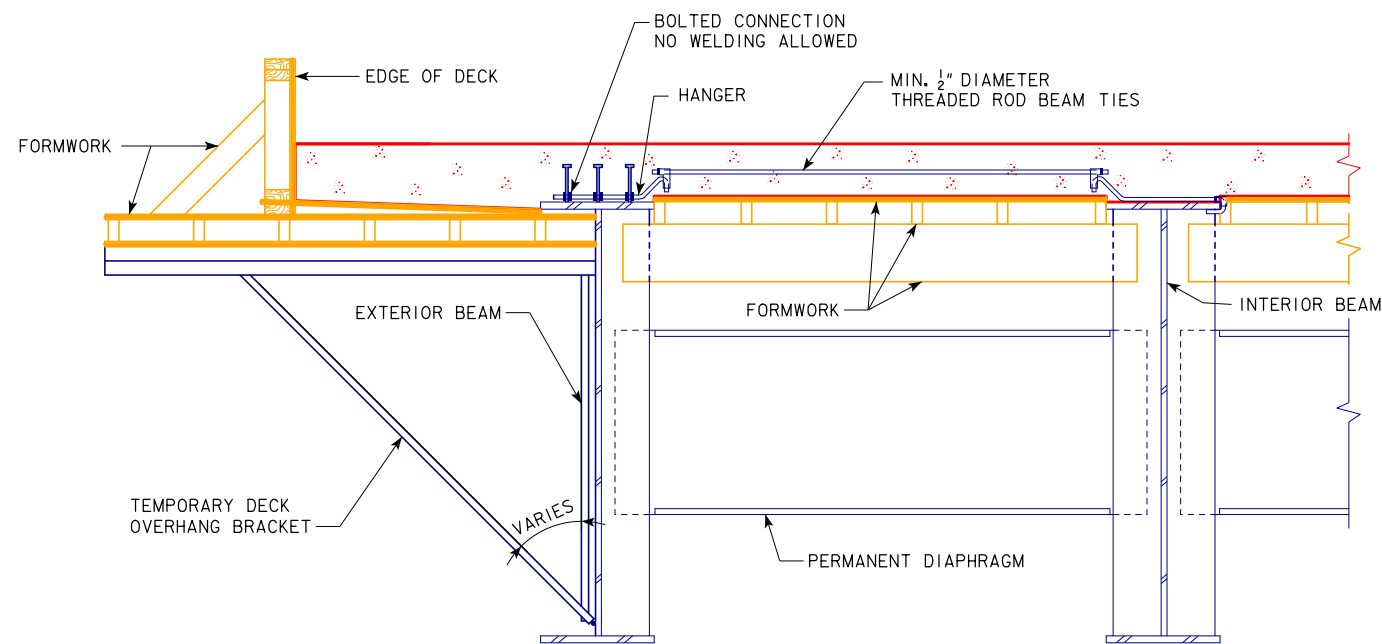
NOTE: GEOTEXTILE FABRIC WILL BE ATTACHED TO FACE OF ABUTMENT FOOTING AND WINGS.

* DIMENSION VARIES DUE TO 2% SUBDRAIN SLOPE.

08-2018 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER		
		STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES ROLLED STEEL BEAM BRIDGES OCTOBER, 2014	
ABUTMENT BACKFILL DETAILS, SKEWED		RS40-176-14	



TEMPORARY DECK OVERHANG BRACKET AND BRACING SYSTEM DETAILS BETWEEN DIAPHRAGMS



TEMPORARY DECK OVERHANG BRACKET AND BRACING SYSTEM DETAILS AT PERMANENT DIAPHRAGMS

OVERHANG BRACKET NOTES:

THE SPACING OF THE OVERHANG BRACKET AND THE ANGLE OF THE DIAGONAL MEMBER SHALL BE DETERMINED PER THE MAUFACTURER'S DESIGN HANDBOOK INCLUDING THE TYPE AND SIZE OF OVERHANG BRACKET AND THE ANTICIPATED CONSTRUCTION LOADS.

IF THE VERTICAL HEIGHT OF THE OVERHANG BRACKET IS ADJUSTABLE, THE BASE OF THE BRACKET IS TO BE LOCATED AS CLOSE AS POSSIBLE TO THE BOTTOM FLANGE OF THE BEAM.

TEMPORARY BRACING SYSTEM NOTES:

TEMPORARY BRACING SYSTEMS (TBS) SHALL BE ADDED BETWEEN PERMANENT DIAPHRAGMS IN ORDER TO SUPPLEMENT PERMANENT BRACES, STABILIZE BEAMS, AND REDUCE THE DECK THICKNESS LOSS DURING THE DECK PLACEMENT. MAXIMUM SPACING BETWEEN ADJACENT TBS OR BETWEEN TBS AND PERMANENT DIAPHRAGM IS 5 FEET. TBS SHALL CONSIST OF A COMPRESSION STRUT PIPE, A TIE BAR, AND HANGERS (OR CLIPS). THE HANGERS (OR CLIPS) SHALL BE USED TO CONNECT THE BEAM TIE TO THE SHEAR STUDS OR THE TOP FLANGES OF EXTERIOR AND FIRST INTERIOR BEAMS PER MANUFACTURER'S RECOMMENDATIONS. THE COMPRESSION STRUT PIPE SHALL BE WEDGED NEAR THE JUNCTIONS OF THE WEB AND TOP FLANGE AT THE TOP JUNCTION CORNER OF INTERIOR BEAM AND THE BOTTOM JUNCTION CORNER OF THE EXTERIOR BEAM. THE COMPRESSION PIPE STRUT AND BEAM TIE SHALL BE WITHIN A PLANE PERPENDICULAR TO THE BEAM WEB.

ABOVE EACH OF ABUTMENT, PIER, AND INTERMEDIATE DIAPHRAGM, A TBS SHALL BE USED CONSISTING OF A BEAM TIE AND HANGERS (OR CLIPS). ABOVE SKEWED PIER AND ABUTMENT DIAPHRAGMS, IT IS AT CONTRACTOR'S OPTION THAT THE TBS FOR SKEWED PERMANENT DIAPHRAGMS MAY BE PLACED ALONG SKEW OR PERPENDICULAR TO THE CENTERLINE OF THE BEAM. IF THE TBS IS NOT INSTALLED DIRECTLY ABOVE AND PARALLEL TO THE CENTERLINE OF THE DIAPHRAGM, THE TEMPORARY BRACING SYSTEM SHALL CONSIST OF A STRUT PIPE, A TIE BAR, AND HANGERS (OR CLIPS). IF TBS IS INSTALLED DIRECTLY ABOVE THE CENTERLINE OF THE DIAPHRAGM, THE TEMPORARY BRACING SYSTEM SHALL CONSIST OF A TIE BAR AND HANGERS (OR CLIPS). SPECIAL CONSIDERATION MAY BE REQUIRED AT ABUTMENTS TO RESTRAIN THE TIE BARS WHERE NO ADJACENT INTERIOR BEAM IS PRESENT. THE STRUT PIPE IS NOT REQUIRED AT THIS LOCATION.

IF THE FINISHING MACHINE RAILING IS LOCATED DIRECTLY ABOVE THE EXTERIOR BEAM, TEMPORARY BRACING SYSTEMS ARE NOT REQUIRED FOR BRIDGE LENGTHS 180' AND GREATER. ONE TBS WILL BE REQUIRED BETWEEN EACH PERMANENT DIAPHRAGM FOR THE 160' BRIDGE ONLY. TBS WILL ALSO BE REQUIRED AT EACH PERMANENT DIAPHRAGM FOR THE 160' BRIDGE ONLY.



THE ULTIMATE CAPACITY OF THE THREADED ROD BEAM TIE AND CONNECTION TO THE BEAM FLANGES SHALL BE A MINIMUM OF 10,000 LBS. THE YIELD STRENGTH OF THE STEEL OF THE TIE AND STRUT SHALL BE A MINIMUM OF 36,000 PSI.

WELDING TO THE BEAM FLANGE OR SHEAR STUDS IS NOT ALLOWED.

WET DECK CONCRETE IS ASSUMED TO EXTEND 15 FT IN THE FRONT OF FINISHING MACHINE. THE 20 PSF CONSTRUCTION LIVE LOAD IS APPLIED WHERE WET DECK CONCRETE IS ABSENT.

TEMPORARY BRACING SHALL BE CONSIDERED INCIDENTAL TO THE COST OF STRUCTURAL STEEL.

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