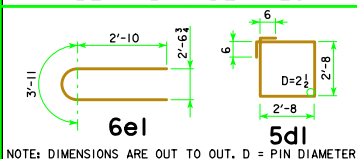


BILL OF EPOXY REINFORCING STEEL - ONE PIER

| BRIDGE LENGTH | 70'-0" BRIDGE | | 80'-0" BRIDGE | | 90'-0" BRIDGE | | 100'-0" BRIDGE | | 110'-0" BRIDGE | | 120'-0" BRIDGE | | 130'-0" BRIDGE | | 140'-0" BRIDGE | | 150'-0" BRIDGE | |
|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|---------------|----------------|---------------|----------------|---------------|----------------|---------------|----------------|---------------|----------------|---------------|
| MARK/SKEW SHAPE | NO. | LENGTH/WEIGHT | NO. | LENGTH/WEIGHT | NO. | LENGTH/WEIGHT | NO. | LENGTH/WEIGHT | NO. | LENGTH/WEIGHT | NO. | LENGTH/WEIGHT | NO. | LENGTH/WEIGHT | NO. | LENGTH/WEIGHT | NO. | LENGTH/WEIGHT |
| 6c1 0° | 10 | 23'-0" 346 | 10 | 23'-0" 346 | 10 | 23'-0" 346 | 10 | 23'-0" 346 | 10 | 23'-0" 346 | 10 | 23'-0" 346 | 10 | 23'-0" 346 | 10 | 23'-0" 346 | 10 | 23'-0" 346 |
| 15° | 10 | 23'-8" 356 | 10 | 23'-8" 356 | 10 | 23'-8" 356 | 10 | 23'-8" 356 | 10 | 23'-8" 356 | 10 | 23'-8" 356 | 10 | 23'-8" 356 | 10 | 23'-8" 356 | 10 | 23'-8" 356 |
| 30° | 10 | 26'-0" 391 | 10 | 26'-0" 391 | 10 | 26'-0" 391 | 10 | 26'-0" 391 | 10 | 26'-0" 391 | 10 | 26'-0" 391 | 10 | 26'-0" 391 | 10 | 26'-0" 391 | 10 | 26'-0" 391 |
| 45° | 10 | 31'-2" 469 | 10 | 31'-2" 469 | 10 | 31'-2" 469 | 10 | 31'-2" 469 | 10 | 31'-2" 469 | 10 | 31'-2" 469 | 10 | 31'-2" 469 | 10 | 31'-2" 469 | 10 | 31'-2" 469 |
| 6c2 0° | 10 | 19'-11" 300 | 10 | 19'-11" 300 | 10 | 19'-11" 300 | 10 | 19'-11" 300 | 10 | 19'-11" 300 | 10 | 19'-11" 300 | 10 | 19'-11" 300 | 10 | 19'-11" 300 | 10 | 19'-11" 300 |
| 15° | 10 | 20'-7" 310 | 10 | 20'-7" 310 | 10 | 20'-7" 310 | 10 | 20'-7" 310 | 10 | 20'-7" 310 | 10 | 20'-7" 310 | 10 | 20'-7" 310 | 10 | 20'-7" 310 | 10 | 20'-7" 310 |
| 30° | 10 | 23'-0" 346 | 10 | 23'-0" 346 | 10 | 23'-0" 346 | 10 | 23'-0" 346 | 10 | 23'-0" 346 | 10 | 23'-0" 346 | 10 | 23'-0" 346 | 10 | 23'-0" 346 | 10 | 23'-0" 346 |
| 45° | 10 | 28'-2" 424 | 10 | 28'-2" 424 | 10 | 28'-2" 424 | 10 | 28'-2" 424 | 10 | 28'-2" 424 | 10 | 28'-2" 424 | 10 | 28'-2" 424 | 10 | 28'-2" 424 | 10 | 28'-2" 424 |
| 5d1 0° | 38 | 11'-8" 463 | 38 | 11'-8" 463 | 32 | 11'-8" 390 | 35 | 11'-8" 426 | 38 | 11'-8" 463 | 28 | 11'-8" 341 | 32 | 11'-8" 390 | 32 | 11'-8" 390 | 32 | 11'-8" 390 |
| 15° | 38 | 11'-8" 463 | 38 | 11'-8" 463 | 32 | 11'-8" 390 | 35 | 11'-8" 426 | 38 | 11'-8" 463 | 28 | 11'-8" 341 | 32 | 11'-8" 390 | 32 | 11'-8" 390 | 32 | 11'-8" 390 |
| 30° | 38 | 11'-8" 463 | 38 | 11'-8" 463 | 42 | 11'-8" 512 | 46 | 11'-8" 560 | 38 | 11'-8" 463 | 41 | 11'-8" 499 | 32 | 11'-8" 390 | 32 | 11'-8" 390 | 32 | 11'-8" 390 |
| 45° | 56 | 11'-8" 682 | 56 | 11'-8" 682 | 52 | 11'-8" 633 | 46 | 11'-8" 560 | 50 | 11'-8" 609 | 54 | 11'-8" 658 | 47 | 11'-8" 572 | 47 | 11'-8" 572 | 47 | 11'-8" 572 |
| 6e1 ALL | 6 | 9'-7" 86 | 6 | 9'-7" 86 | 6 | 9'-7" 86 | 6 | 9'-7" 86 | 6 | 9'-7" 86 | 6 | 9'-7" 86 | 6 | 9'-7" 86 | 6 | 9'-7" 86 | 6 | 9'-7" 86 |

BENT BAR DETAILS



ESTIMATED QUANTITIES - ONE PIER

| BRIDGE LENGTH | SKEW | 70'-0" | 80'-0" | 90'-0" | 100'-0" | 110'-0" | 120'-0" | 130'-0" | 140'-0" | 150'-0" |
|---------------------------------------|------|--------|--------|--------|---------|---------|---------|---------|---------|---------|
| STRUCTURAL CONCRETE (CU. YDS.) | 0° | 14.1 | 14.1 | 14.1 | 14.1 | 14.1 | 14.1 | 14.1 | 14.1 | 14.1 |
| | 15° | 14.6 | 14.6 | 14.6 | 14.6 | 14.6 | 14.6 | 14.6 | 14.6 | 14.6 |
| | 30° | 16.2 | 16.2 | 16.2 | 16.2 | 16.2 | 16.2 | 16.2 | 16.2 | 16.2 |
| | 45° | 19.6 | 19.6 | 19.6 | 19.6 | 19.6 | 19.6 | 19.6 | 19.6 | 19.6 |
| REINFORCING STEEL EPOXY COATED (LBS.) | 0° | 1195 | 1195 | 1122 | 1158 | 1195 | 1073 | 1122 | 1122 | 1122 |
| | 15° | 1215 | 1215 | 1142 | 1178 | 1215 | 1093 | 1142 | 1142 | 1142 |
| | 30° | 1286 | 1286 | 1335 | 1383 | 1286 | 1322 | 1213 | 1213 | 1213 |
| | 45° | 1661 | 1661 | 1612 | 1539 | 1588 | 1637 | 1551 | 1551 | 1551 |
| ④ PILING (NO.) | ALL | 10 | 10 | 11 | 12 | 13 | 14 | 16 | 16 | 16 |

TYPICAL NUMBERS OF PILES AND SPACINGS AND FACTORED PIER LOADS

| BRIDGE LENGTH | 70'-0" | 80'-0" | 90'-0" | 100'-0" | 110'-0" | 120'-0" | 130'-0" | 140'-0" | 150'-0" |
|--|-----------------------|-----------------------|------------------------|------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| ① TYP. NO. OF PILES | 10 | 10 | 11 | 12 | 13 | 14 | 16 | 16 | 16 |
| TYP. PILE SPACES @ 0° | 9 SPA. @ ABOUT 4'-3" | 9 SPA. @ ABOUT 4'-3" | 10 SPA. @ ABOUT 3'-10" | 11 SPA. @ ABOUT 3'-6" | ② 12 SPA. @ ABOUT 3'-2" | ② 13 SPA. @ ABOUT 3'-0" | ③ 15 SPA. @ ABOUT 2'-7" | ③ 15 SPA. @ ABOUT 2'-7" | ③ 15 SPA. @ ABOUT 2'-7" |
| TYP. PILE SPACES @ 15° | 9 SPA. @ ABOUT 4'-5" | 9 SPA. @ ABOUT 4'-5" | 10 SPA. @ ABOUT 4'-0" | 11 SPA. @ ABOUT 3'-7" | ② 12 SPA. @ ABOUT 3'-4" | ② 13 SPA. @ ABOUT 3'-1" | ③ 15 SPA. @ ABOUT 2'-8" | ③ 15 SPA. @ ABOUT 2'-8" | ③ 15 SPA. @ ABOUT 2'-8" |
| TYP. PILE SPACES @ 30° | 9 SPA. @ ABOUT 4'-11" | 9 SPA. @ ABOUT 4'-11" | 10 SPA. @ ABOUT 4'-5" | 11 SPA. @ ABOUT 4'-1" | 12 SPA. @ ABOUT 3'-8" | 13 SPA. @ ABOUT 3'-5" | ② 15 SPA. @ ABOUT 3'-0" | ② 15 SPA. @ ABOUT 3'-0" | ② 15 SPA. @ ABOUT 3'-0" |
| TYP. PILE SPACES @ 45° | 9 SPA. @ ABOUT 6'-1" | 9 SPA. @ ABOUT 6'-1" | 10 SPA. @ ABOUT 5'-5" | 11 SPA. @ ABOUT 4'-11" | 12 SPA. @ ABOUT 4'-6" | 13 SPA. @ ABOUT 4'-2" | 15 SPA. @ ABOUT 3'-8" | 15 SPA. @ ABOUT 3'-8" | 15 SPA. @ ABOUT 3'-8" |
| ④ PU ₁ STRENGTH I DESIGN LOAD FOR PIER (KIPS) | 890 KIPS | 978 KIPS | 1079 KIPS | 1187 KIPS | 1293 KIPS | 1419 KIPS | 1543 KIPS | 1672 KIPS | 1817 KIPS |

- ① THIS TYPICAL NUMBER OF PILES MAY NEED TO BE MODIFIED DEPENDING ON SELECTED PILOT PILE TYPE AND SIZE, HEIGHT, AND RESISTANCE. IF THE NUMBER OF PILES IS DIFFERENT THAN IN THE TABLE FOR THE BRIDGE LENGTH, THE NUMBER OF 5d1 BARS AND OTHER QUANTITIES NEED TO BE CHECKED AND ADJUSTED AS NEEDED. PILES 10 INCHES AND 12 INCHES IN SIZE MUST BE SPACED 2'-6" OR MORE, PILES 14 INCHES IN SIZE MUST BE SPACED 2'-11" OR MORE, AND PILES 16 INCHES IN SIZE MUST BE SPACED 3'-4" OR MORE.
- ② MAXIMUM PILOT PILE SIZE AT THIS SPACING IS 14 INCHES.
- ③ MAXIMUM PILOT PILE SIZE AT THIS SPACING IS 12 INCHES.
- ④ STRENGTH I PIER DESIGN LOAD INCLUDES DYNAMIC LOAD ALLOWANCE (1M), AND PIER CAP WEIGHT IS BASED ON 45° SKEW. USE THIS PU FOR DETERMINING NUMBER OF PILES AND PILE LENGTH.

PIER NOTES:

FOR SKEWED BRIDGES BOTTOM OF PIER CAP IS TO BE SLOPED TO COMPENSATE FOR GRADE. THEREFORE, BOTTOM OF CAP ELEVATIONS WILL BE REQUIRED AT THE 1/4 OF ROADWAY AND AT EACH EXTERIOR PILE.

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

THE PIER PILES ARE TO BE DRIVEN TO FULL PENETRATION, IF PRACTICABLE, BUT IN NO CASE TO A BEARING VALUE LESS THAN THE PILE BEARING REQUIRED FOR EACH BRIDGE LENGTH AS SHOWN ON THIS SHEET.

THE CONCRETE QUANTITIES ARE BASED ON THE USE OF TYPE 3 PILING. IF TYPE 1 OR TYPE 2 IS USED, THE CONCRETE QUANTITIES MAY BE ADJUSTED TO ACCOUNT FOR THE CONCRETE DISPLACED BY THE PILING.

ALL REINFORCING STEEL IS TO BE GRADE 60.

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

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 40' ROADWAY, 3 SPAN BRIDGES

**CONTINUOUS CONCRETE
SLAB BRIDGES**

JULY, 2014

**NON-MONOLITHIC
PIER CAP DETAILS
ALL BRIDGES**

J40-29-14