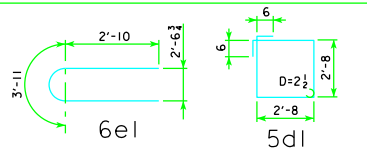
## BILL OF REINFORCING STEEL - ONE PIER

| 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'-10 | 358 | 10 | 23'-10 | 358 | 10 | 23'-10 | 358 | 10 | 23'-10 | 358 | 10 | 23'-10 | 358 | 10 | 23'-10 | 358 | 10 | 23'-10 | 358 | 10 | 23'-10 | 358 | 10 | 23'-10 | 358 |
| | 15° | | 10 | 24'-8 | 370 | 10 | 24'-8 | 370 | 10 | 24'-8 | 370 | 10 | 24'-8 | 370 | 10 | 24'-8 | 370 | 10 | 24'-8 | 370 | 10 | 24'-8 | 370 | 10 | 24'-8 | 370 | 10 | 24'-8 | 370 |
| | 30° | | 10 | 27'-6 | 413 | 10 | 27'-6 | 413 | 10 | 27'-6 | 413 | 10 | 27'-6 | 413 | 10 | 27'-6 | 413 | 10 | 27'-6 | 413 | 10 | 27'-6 | 413 | 10 | 27'-6 | 413 | 10 | 27'-6 | 413 |
| | 45° | | 10 | 33'-9 | 507 | 10 | 33'-9 | 507 | 10 | 33'-9 | 507 | 10 | 33'-9 | 507 | 10 | 33'-9 | 507 | 10 | 33'-9 | 507 | 10 | 33'-9 | 507 | 10 | 33'-9 | 507 | 10 | 33'-9 | 507 |
| 5d1 | 0° | | 17 | 11'-8 | 207 | 20 | 11'-8 | 244 | 16 | 11'-8 | 195 | 16 | 11'-8 | 195 | 18 | 11'-8 | 219 | 20 | 11'-8 | 244 | 20 | 11'-8 | 244 | 20 | 11'-8 | 244 | 20 | 11'-8 | 244 |
| | 15° | | 17 | 11'-8 | 207 | 20 | 11'-8 | 244 | 16 | 11'-8 | 195 | 16 | 11'-8 | 195 | 18 | 11'-8 | 219 | 20 | 11'-8 | 244 | 20 | 11'-8 | 244 | 20 | 11'-8 | 244 | 20 | 11'-8 | 244 |
| | 30° | | 22 | 11'-8 | 268 | 20 | 11'-8 | 244 | 23 | 11'-8 | 280 | 23 | 11'-8 | 280 | 18 | 11'-8 | 219 | 20 | 11'-8 | 244 | 20 | 11'-8 | 244 | 20 | 11'-8 | 244 | 20 | 11'-8 | 244 |
| | 45° | | 27 | 11'-8 | 329 | 26 | 11'-8 | 317 | 23 | 11'-8 | 280 | 23 | 11'-8 | 280 | 26 | 11'-8 | 317 | 29 | 11'-8 | 353 | 29 | 11'-8 | 353 | 29 | 11'-8 | 353 | 29 | 11'-8 | 353 |
| 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




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

## 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° | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 |
| | 15° | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 |
| | 30° | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| | 45° | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 |
| REINFORCING STEEL (LBS.) | 0° | 651 | 688 | 639 | 639 | 663 | 688 | 688 | 688 | 688 |
| | 15° | 663 | 700 | 651 | 651 | 675 | 700 | 700 | 700 | 700 |
| | 30° | 767 | 743 | 779 | 779 | 718 | 743 | 743 | 743 | 743 |
| | 45° | 922 | 910 | 873 | 873 | 910 | 946 | 946 | 946 | 946 |
| ④ PILING (NO.) | ALL | 6 | 7 | 8 | 8 | 9 | 10 | 10 | 10 | 10 |

## APPROX. PILE SPACING, BEARING & PIER REACTION TABLE

| BRIDGE LENGTH | 70'-0 | 80'-0 | 90'-0 | 100'-0 | 110'-0 | 120'-0 | 130'-0 | 140'-0 | 150'-0 |
|---|---|---|---|---|---|---|---|---|---|
| 0° SKEW | 5 SPA. @ 4'-6 | 6 SPA. @ 3'-9 | 7 SPA. @ ABOUT 3'-3 | 7 SPA. @ ABOUT 3'-3 | 8 SPA. @ ABOUT 2'-10 | 9 SPA. @ 2'-6 | 9 SPA. @ 2'-6 | 9 SPA. @ 2'-6 | 9 SPA. @ 2'-6 |
| 15° SKEW | 5 SPA. @ ABOUT 4'-8 | 6 SPA. @ ABOUT 3'-11 | 7 SPA. @ ABOUT 3'-4 | 7 SPA. @ ABOUT 3'-4 | 8 SPA. @ ABOUT 2'-11 | 9 SPA. @ ABOUT 2'-7 | 9 SPA. @ ABOUT 2'-7 | 9 SPA. @ ABOUT 2'-7 | 9 SPA. @ ABOUT 2'-7 |
| 30° SKEW | 5 SPA. @ ABOUT 5'-2 | 6 SPA. @ ABOUT 4'-4 | 7 SPA. @ ABOUT 3'-9 | 7 SPA. @ ABOUT 3'-9 | 8 SPA. @ 3'-3 | 9 SPA. @ ABOUT 2'-11 | 9 SPA. @ ABOUT 2'-11 | 9 SPA. @ ABOUT 2'-11 | 9 SPA. @ ABOUT 2'-11 |
| 45° SKEW | 5 SPA. @ ABOUT 6'-4 | 6 SPA. @ ABOUT 5'-4 | 7 SPA. @ ABOUT 4'-7 | 7 SPA. @ ABOUT 4'-7 | 8 SPA. @ ABOUT 4'-0 | 9 SPA. @ ABOUT 3'-6 | 9 SPA. @ ABOUT 3'-6 | 9 SPA. @ ABOUT 3'-6 | 9 SPA. @ ABOUT 3'-6 |
| ① BEARING PER PILE-TONS | 35 | 33 | 34 | 36 | 35 | 34 | 37 | 41 | 44 |
| ②③ BEARING PER PILE-TONS | 32 | 31 | 30 | 33 | 32 | 32 | 35 | 38 | 42 |
| ① MAXIMUM PIER REACTION-TONS | 419 KIP | 461 KIPS | 510 KIPS | 563 KIPS | 615 KIPS | 677 KIPS | 738 KIPS | 802 KIPS | 874 KIPS |
| ② STRENGTH I REACTION | 556 KIP | 613 KIPS | 677 KIPS | 747 KIPS | 815 KIPS | 896 KIPS | 975 KIPS | 1059 KIPS | 1152 KIPS |

① VALUE INCLUDES DEAD LOAD (PIER CAP WEIGHT IS BASED ON 45° SKEW), LIVE LOAD AND LIVE LOAD IMPACT.

② VALUE INCLUDES DEAD LOAD (PIER CAP WEIGHT IS BASED ON 45° SKEW), AND LIVE LOAD, WITHOUT IMPACT.

③ FOR ESTIMATING PILE LENGTHS AND FOR DETERMINING ACTUAL PILE LENGTHS IN FIELD.

④ USE PILES AS SHOWN ON PIOA STANDARD PILE DRAWING. TYPE, SIZE, AND LENGTH OF PILES SHALL BE SPECIFIED ON THE PLAN. THE LARGER PILE SIZE SHOWN ON PIOA STANDARD PILE DRAWING SHALL BE USED IF EITHER THE ACTUAL "H" DIMENSION OR THE REQUIRED BEARING EXCEEDS THE MAXIMUM "H" OR MAXIMUM BEARING CAPACITY SHOWN FOR THE PILE.

## 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 ℄ 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. ADDITIONAL DRIVING CAPACITY MAY BE REQUIRED THROUGH SCOURABLE LAYERS. REFER TO GENERAL PLAN NOTES FOR ADDITIONAL INFORMATION.

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.

12-08
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

Iowa Department of Transportation
Highway Division

STANDARD DESIGN - 24' ROADWAY, 3 SPAN BRIDGES

CONTINUOUS CONCRETE SLAB BRIDGES

NOVEMBER, 2006

NON-MONOLITHIC PIER CAP DETAILS ALL BRIDGES

SHEET 2 OF 2

J24-26-06

REVISED 12-08 - CHANGED PIER NOTES, PIER NOW DESIGNED FOR HL-93. MODIFIED QUANTITY TABLES. MODIFIED "APPROXIMATE PILE SPACING BEARING AND PIER REACTION" TABLE.