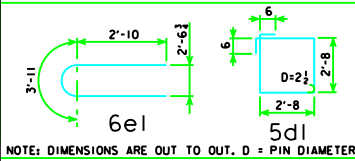


# BILL OF REINFORCING STEEL - ONE PIER

| 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 |
| 6cl           | 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    |
|               | 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    |
|               | 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    |
|               | 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    |
| 5dl           | 0°   |       | 15            | 11'-8  | 183           | 18  | 11'-8         | 219    | 18             | 11'-8  | 219            | 14  | 11'-8          | 170    | 16             | 11'-8  | 195            | 18  | 11'-8          | 219    |
|               | 15°  |       | 15            | 11'-8  | 183           | 18  | 11'-8         | 219    | 18             | 11'-8  | 219            | 14  | 11'-8          | 170    | 16             | 11'-8  | 195            | 18  | 11'-8          | 219    |
|               | 30°  |       | 20            | 11'-8  | 243           | 18  | 11'-8         | 219    | 18             | 11'-8  | 219            | 21  | 11'-8          | 256    | 16             | 11'-8  | 195            | 18  | 11'-8          | 219    |
|               | 45°  |       | 25            | 11'-8  | 304           | 24  | 11'-8         | 292    | 24             | 11'-8  | 292            | 21  | 11'-8          | 256    | 24             | 11'-8  | 292            | 27  | 11'-8          | 329    |
| 6el           | 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     |

## 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°   | 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°   | 627    | 663    | 663    | 614     | 639     | 639     | 663     | 663     | 663     |
|                                | 15°  | 639    | 675    | 675    | 626     | 651     | 651     | 675     | 675     | 675     |
|                                | 30°  | 742    | 718    | 718    | 755     | 694     | 694     | 718     | 718     | 718     |
|                                | 45°  | 897    | 885    | 885    | 849     | 885     | 885     | 922     | 922     | 922     |
| ④ PILING (NO.)                 | ALL  | 6      | 7      | 7      | 8       | 9       | 9       | 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"        | 6 SPA. @ 3'-9"        | 7 SPA. @ ABOUT 3'-3" | 8 SPA. @ ABOUT 2'-10" | 8 SPA. @ ABOUT 2'-10" | 9 SPA. @ 2'-6"        | 9 SPA. @ 2'-6"        | 9 SPA. @ 2'-6"        |
| 15° SKEW                     | 5 SPA. @ ABOUT 4'-8" | 6 SPA. @ ABOUT 3'-11" | 6 SPA. @ ABOUT 3'-11" | 7 SPA. @ ABOUT 3'-4" | 8 SPA. @ ABOUT 2'-11" | 8 SPA. @ ABOUT 2'-11" | 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"  | 6 SPA. @ ABOUT 4'-4"  | 7 SPA. @ ABOUT 3'-9" | 8 SPA. @ ABOUT 3'-3"  | 8 SPA. @ ABOUT 3'-3"  | 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"  | 6 SPA. @ ABOUT 5'-4"  | 7 SPA. @ ABOUT 4'-7" | 8 SPA. @ ABOUT 4'-0"  | 8 SPA. @ ABOUT 4'-0"  | 9 SPA. @ ABOUT 3'-6"  | 9 SPA. @ ABOUT 3'-6"  | 9 SPA. @ ABOUT 3'-6"  |
| ① BEARING PER PILE-TONS      | 34                   | 32                    | 36                    | 34                   | 33                    | 36                    | 36                    | 39                    | 42                    |
| ② BEARING PER PILE-TONS      | 31                   | 29                    | 32                    | 31                   | 31                    | 34                    | 33                    | 36                    | 39                    |
| ① MAXIMUM PIER REACTION-TONS | 407 KIP              | 446 KIPS              | 492 KIPS              | 542 KIPS             | 590 KIPS              | 648 KIPS              | 705 KIPS              | 764 KIPS              | 831 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 P10A STANDARD PILE DRAWING. TYPE, SIZE, AND LENGTH OF PILES SHALL BE SPECIFIED ON THE PLAN. THE LARGER PILE SIZE SHOWN ON P10A 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 ½ 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 HS25 LOADING WITH AN ALLOWANCE FOR 20 LBS. PER SQ. FT. FUTURE WEARING SURFACE.

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