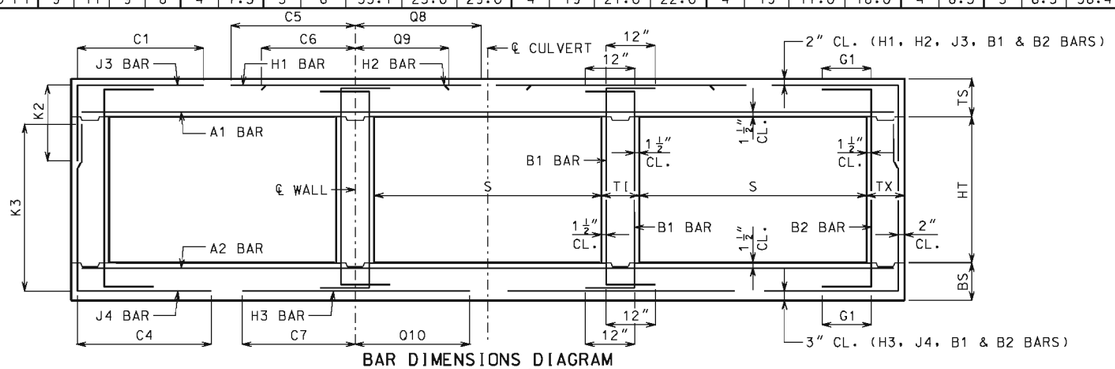
## SPAN (S) = 3 FT HEIGHT (HT) = 2 FT OR 3 FT OR 4 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | | | | | | | | | | K2 | | | | | | | | | | | | | | | K3 | | | | | | | | | | | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | HT=2′ | HT=3′ | HT=4′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | HT=2′ | HT=3′ | HT=4′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 10 | 8 | 8 | 8 | 4 | 8.5 | 4 | 10.5 | 26.8 | 26.0 | 26.0 | 26.0 | 4 | 24 | 39.5 | 30.5 | 4 | 24 | 20.0 | 20.0 | 4 | 12 | 4 | 12 | 36.0 | 28 | 40 | 52 | 4 | 12 | 25.0 | 25.0 | 5 | 12 | 5 | 12 | 12 |
| 2 FT | 10 | 8 | 8 | 8 | 4 | 8.5 | 4 | 10.5 | 26.8 | 26.0 | 26.0 | 26.0 | 4 | 24 | 39.5 | 30.5 | 4 | 24 | 20.0 | 20.0 | 4 | 12 | 4 | 12 | 35.0 | 28 | 40 | 52 | 4 | 12 | 24.0 | 24.0 | 5 | 12 | 5 | 12 | 12 |
| 4 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 26.8 | 24.0 | 24.0 | 24.0 | 4 | 24 | 39.5 | 34.0 | 4 | 24 | 19.0 | 19.0 | 4 | 12 | 4 | 12 | 31.1 | 28 | 40 | 52 | 4 | 12 | 23.0 | 24.0 | 5 | 12 | 5 | 12 | 12 |
| 6 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 31.1 | 24.0 | 24.0 | 24.0 | 4 | 24 | 26.0 | 26.0 | 4 | 24 | 18.0 | 18.0 | 4 | 12 | 4 | 12 | 28.9 | 28 | 40 | 52 | 4 | 12 | 22.0 | 23.0 | 5 | 12 | 5 | 12 | 12 |
| 8 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 28.5 | 24.0 | 24.0 | 24.0 | 4 | 24 | 24.0 | 24.0 | 4 | 24 | 18.0 | 18.0 | 4 | 12 | 4 | 12 | 27.3 | 28 | 40 | 52 | 4 | 12 | 22.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 10 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 27.1 | 24.0 | 24.0 | 24.0 | 4 | 24 | 23.0 | 24.0 | 4 | 24 | 18.0 | 18.0 | 4 | 12 | 4 | 12 | 26.5 | 28 | 40 | 52 | 4 | 12 | 22.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 12 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 25.0 | 24.0 | 24.0 | 24.0 | 4 | 24 | 21.0 | 23.0 | 4 | 24 | 18.0 | 18.0 | 4 | 12 | 4 | 12 | 24.5 | 28 | 40 | 52 | 4 | 12 | 22.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 14 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 24.9 | 24.0 | 24.0 | 24.0 | 4 | 24 | 21.0 | 23.0 | 4 | 24 | 18.0 | 18.0 | 4 | 12 | 4 | 12 | 24.5 | 28 | 40 | 52 | 4 | 12 | 22.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 16 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 24.8 | 24.0 | 24.0 | 24.0 | 4 | 24 | 21.0 | 22.0 | 4 | 24 | 18.0 | 18.0 | 4 | 12 | 4 | 12 | 24.4 | 28 | 40 | 52 | 4 | 11.5 | 22.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 18 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 24.8 | 24.0 | 24.0 | 24.0 | 4 | 24 | 21.0 | 22.0 | 4 | 24 | 18.0 | 18.0 | 4 | 12 | 4 | 12 | 24.4 | 28 | 40 | 52 | 4 | 11 | 22.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 20 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 24.6 | 24.0 | 24.0 | 24.0 | 4 | 24 | 21.0 | 22.0 | 4 | 24 | 18.0 | 18.0 | 4 | 12 | 4 | 12 | 24.3 | 28 | 40 | 52 | 4 | 10.5 | 22.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 22 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 24.6 | 24.0 | 24.0 | 24.0 | 4 | 24 | 21.0 | 22.0 | 4 | 24 | 18.0 | 18.0 | 4 | 12 | 4 | 12 | 24.3 | 28 | 40 | 52 | 4 | 9.5 | 22.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 24 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 24.5 | 24.0 | 24.0 | 24.0 | 4 | 24 | 21.0 | 22.0 | 4 | 24 | 18.0 | 18.0 | 4 | 11.5 | 4 | 12 | 24.3 | 28 | 40 | 52 | 4 | 9 | 22.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 26 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 24.5 | 24.0 | 24.0 | 24.0 | 4 | 24 | 21.0 | 22.0 | 4 | 24 | 18.0 | 18.0 | 4 | 10.5 | 4 | 11 | 24.1 | 28 | 40 | 52 | 4 | 9 | 22.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 28 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 11 | 24.5 | 24.0 | 24.0 | 24.0 | 4 | 24 | 21.0 | 22.0 | 4 | 24 | 18.0 | 18.0 | 4 | 10 | 4 | 10 | 24.1 | 28 | 40 | 52 | 4 | 8.5 | 22.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 30 FT | 8 | 8 | 8 | 8 | 4 | 11 | 4 | 10.5 | 24.5 | 24.0 | 24.0 | 24.0 | 4 | 24 | 21.0 | 22.0 | 4 | 24 | 18.0 | 18.0 | 4 | 9 | 4 | 9.5 | 24.1 | 28 | 40 | 52 | 4 | 8 | 22.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 32 FT | 8 | 9 | 8 | 8 | 4 | 10.5 | 4 | 9.5 | 24.5 | 24.0 | 24.0 | 24.0 | 4 | 23 | 21.0 | 22.0 | 4 | 23 | 18.0 | 18.0 | 4 | 9.5 | 4 | 12 | 24.5 | 29 | 41 | 53 | 4 | 9.5 | 21.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 34 FT | 8 | 9 | 8 | 8 | 4 | 10 | 4 | 9 | 24.5 | 24.0 | 24.0 | 24.0 | 4 | 22 | 21.0 | 22.0 | 4 | 22 | 18.0 | 18.0 | 4 | 9 | 4 | 11 | 24.4 | 29 | 41 | 53 | 4 | 9 | 21.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 36 FT | 8 | 9 | 8 | 8 | 4 | 9.5 | 4 | 8.5 | 24.5 | 24.0 | 24.0 | 24.0 | 4 | 21 | 21.0 | 22.0 | 4 | 21 | 18.0 | 18.0 | 4 | 8.5 | 4 | 10.5 | 24.4 | 29 | 41 | 53 | 4 | 8.5 | 21.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 38 FT | 8 | 9 | 8 | 8 | 4 | 9 | 4 | 8 | 24.5 | 24.0 | 24.0 | 24.0 | 4 | 20 | 21.0 | 22.0 | 4 | 20 | 18.0 | 18.0 | 4 | 8 | 4 | 10 | 24.4 | 29 | 41 | 53 | 4 | 8.5 | 21.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 40 FT | 8 | 10 | 8 | 8 | 4 | 8.5 | 4 | 7.5 | 24.5 | 24.0 | 24.0 | 24.0 | 4 | 19 | 21.0 | 22.0 | 4 | 19 | 18.0 | 18.0 | 4 | 8.5 | 4 | 12 | 24.8 | 30 | 42 | 54 | 4 | 9 | 21.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 42 FT | 9 | 10 | 8 | 8 | 4 | 9 | 4 | 9 | 24.8 | 25.0 | 25.0 | 25.0 | 4 | 21 | 21.0 | 23.0 | 4 | 21 | 17.0 | 18.0 | 4 | 8 | 4 | 11.5 | 24.8 | 30 | 42 | 54 | 4 | 9 | 21.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 44 FT | 9 | 10 | 8 | 8 | 4 | 8.5 | 4 | 8.5 | 24.8 | 25.0 | 25.0 | 25.0 | 4 | 20 | 21.0 | 23.0 | 4 | 20 | 17.0 | 18.0 | 4 | 8 | 4 | 11 | 24.8 | 30 | 42 | 54 | 4 | 9 | 21.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 46 FT | 9 | 10 | 8 | 8 | 4 | 8 | 4 | 8 | 24.8 | 25.0 | 25.0 | 25.0 | 4 | 19 | 21.0 | 23.0 | 4 | 19 | 17.0 | 18.0 | 4 | 7.5 | 4 | 10.5 | 24.8 | 30 | 42 | 54 | 4 | 8.5 | 21.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 48 FT | 9 | 11 | 8 | 8 | 4 | 8 | 4 | 7.5 | 24.9 | 25.0 | 25.0 | 25.0 | 4 | 19 | 21.0 | 22.0 | 4 | 19 | 18.0 | 18.0 | 4 | 8 | 4 | 10.5 | 25.0 | 31 | 43 | 55 | 4 | 9.5 | 21.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 50 FT | 10 | 11 | 8 | 8 | 4 | 8 | 4 | 8 | 25.1 | 26.0 | 26.0 | 26.0 | 4 | 20 | 21.0 | 23.0 | 4 | 20 | 17.0 | 18.0 | 4 | 7.5 | 4 | 10.5 | 25.1 | 31 | 43 | 55 | 4 | 9 | 21.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |

## SPAN (S) = 3 FT HEIGHT (HT) = 5 FT OR 6 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | | | | | | | | | | K2 | | | | | | | | | | | | | | | K3 | | | | | | | | | | | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | HT=5′ | HT=6′ | | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | HT=5′ | HT=6′ | | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 10 | 8 | 8 | 8 | 4 | 8.5 | 4 | 10.5 | 26.8 | 26.0 | 26.0 | | 4 | 24 | 39.5 | 30.5 | 4 | 24 | 21.0 | 20.0 | 4 | 12 | 4 | 11.5 | 36.0 | 64 | 76 | | 4 | 12 | 34.0 | 25.0 | 5 | 12 | 5 | 12 | 12 |
| 2 FT | 10 | 8 | 8 | 8 | 4 | 8.5 | 4 | 10.5 | 26.8 | 26.0 | 26.0 | | 4 | 24 | 39.5 | 30.5 | 4 | 24 | 20.0 | 20.0 | 4 | 12 | 4 | 11 | 36.0 | 64 | 76 | | 4 | 12 | 34.0 | 24.0 | 5 | 12 | 5 | 12 | 12 |
| 4 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 26.8 | 24.0 | 24.0 | | 4 | 24 | 39.5 | 34.0 | 4 | 24 | 19.0 | 19.0 | 4 | 12 | 4 | 10 | 36.0 | 64 | 76 | | 4 | 12 | 34.0 | 24.0 | 5 | 12 | 5 | 12 | 12 |
| 6 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 26.8 | 24.0 | 24.0 | | 4 | 24 | 39.5 | 26.0 | 4 | 24 | 18.0 | 19.0 | 4 | 12 | 4 | 9.5 | 36.0 | 64 | 76 | | 4 | 12 | 34.0 | 23.0 | 5 | 12 | 5 | 12 | 12 |
| 8 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 26.8 | 24.0 | 24.0 | | 4 | 24 | 39.5 | 24.0 | 4 | 24 | 18.0 | 18.0 | 4 | 12 | 4 | 9 | 36.0 | 64 | 76 | | 4 | 12 | 24.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 10 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 26.8 | 24.0 | 24.0 | | 4 | 24 | 39.5 | 23.0 | 4 | 24 | 18.0 | 18.0 | 4 | 12 | 4 | 8.5 | 36.0 | 64 | 76 | | 4 | 12 | 23.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 12 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 34.9 | 24.0 | 24.0 | | 4 | 24 | 22.0 | 22.0 | 4 | 24 | 17.0 | 18.0 | 4 | 12 | 4 | 9 | 34.4 | 64 | 76 | | 4 | 12 | 22.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 14 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 11 | 34.5 | 24.0 | 24.0 | | 4 | 24 | 22.0 | 22.0 | 4 | 24 | 17.0 | 18.0 | 4 | 12 | 4 | 8.5 | 34.1 | 64 | 76 | | 4 | 12 | 22.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 16 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 10 | 34.3 | 24.0 | 24.0 | | 4 | 24 | 22.0 | 22.0 | 4 | 24 | 17.0 | 18.0 | 4 | 12 | 4 | 8 | 33.9 | 64 | 76 | | 4 | 12 | 22.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 18 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 9 | 34.0 | 24.0 | 24.0 | | 4 | 24 | 22.0 | 22.0 | 4 | 24 | 17.0 | 18.0 | 4 | 12 | 4 | 7.5 | 33.8 | 64 | 76 | | 4 | 12 | 22.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 20 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 8 | 33.8 | 24.0 | 24.0 | | 4 | 24 | 22.0 | 22.0 | 4 | 24 | 17.0 | 18.0 | 4 | 12 | 4 | 7 | 33.6 | 64 | 76 | | 4 | 11.5 | 22.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 22 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 7.5 | 33.6 | 24.0 | 24.0 | | 4 | 24 | 22.0 | 22.0 | 4 | 24 | 17.0 | 18.0 | 4 | 12 | 4 | 6.5 | 33.5 | 64 | 76 | | 4 | 10.5 | 22.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 24 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 7 | 33.5 | 24.0 | 24.0 | | 4 | 24 | 22.0 | 22.0 | 4 | 24 | 17.0 | 18.0 | 4 | 11.5 | 4 | 6 | 33.4 | 64 | 76 | | 4 | 10.5 | 22.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 26 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 6.5 | 33.4 | 24.0 | 24.0 | | 4 | 24 | 21.0 | 22.0 | 4 | 24 | 17.0 | 18.0 | 4 | 10.5 | 5 | 6.5 | 33.3 | 64 | 76 | | 4 | 10 | 22.0 | 22.0 | 5 | 12 | 5 | 12 | 0 |
| 28 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 6 | 33.3 | 24.0 | 24.0 | | 4 | 24 | 21.0 | 22.0 | 4 | 24 | 17.0 | 18.0 | 4 | 10 | 5 | 6 | 33.1 | 64 | 76 | | 4 | 9.5 | 22.0 | 22.0 | 5 | 12 | 5 | 12 | 0 |
| 30 FT | 8 | 8 | 9 | 8 | 4 | 11.5 | 4 | 6.5 | 32.3 | 24.0 | 24.0 | | 4 | 24 | 21.0 | 22.0 | 4 | 24 | 17.0 | 18.0 | 4 | 9.5 | 4 | 6 | 32.1 | 64 | 76 | | 4 | 9 | 22.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 32 FT | 8 | 9 | 9 | 8 | 4 | 11 | 4 | 6.5 | 32.1 | 24.0 | 24.0 | | 4 | 24 | 21.0 | 22.0 | 4 | 24 | 17.0 | 18.0 | 4 | 10 | 4 | 6.5 | 34.1 | 65 | 77 | | 4 | 10.5 | 22.0 | 23.0 | 5 | 12 | 5 | 12 | 0 |
| 34 FT | 8 | 9 | 9 | 8 | 4 | 10 | 4 | 6 | 32.0 | 24.0 | 24.0 | | 4 | 23 | 21.0 | 22.0 | 4 | 23 | 17.0 | 18.0 | 4 | 9.5 | 4 | 6 | 34.0 | 65 | 77 | | 4 | 10 | 22.0 | 23.0 | 5 | 12 | 5 | 11.5 | 0 |
| 36 FT | 8 | 9 | 9 | 8 | 4 | 9.5 | 5 | 7 | 32.0 | 24.0 | 24.0 | | 4 | 22 | 21.0 | 22.0 | 4 | 22 | 17.0 | 18.0 | 4 | 9 | 4 | 6 | 34.0 | 65 | 77 | | 4 | 10 | 22.0 | 23.0 | 5 | 12 | 5 | 11 | 0 |
| 38 FT | 8 | 9 | 9 | 8 | 4 | 9 | 5 | 6.5 | 32.0 | 24.0 | 28.0 | | 4 | 21 | 21.0 | 22.0 | 4 | 21 | 17.0 | 18.0 | 4 | 8.5 | 5 | 7 | 34.0 | 65 | 77 | | 4 | 9.5 | 22.0 | 23.0 | 5 | 12 | 5 | 10 | 0 |
| 40 FT | 8 | 10 | 9 | 8 | 4 | 8.5 | 5 | 6 | 31.9 | 24.0 | 24.0 | | 4 | 20 | 21.0 | 22.0 | 4 | 20 | 17.0 | 18.0 | 4 | 9 | 4 | 6 | 35.5 | 66 | 78 | | 4 | 10.5 | 23.0 | 23.0 | 5 | 12 | 5 | 10 | 0 |
| 42 FT | 9 | 10 | 9 | 8 | 4 | 9.5 | 5 | 6.5 | 33.4 | 25.0 | 29.0 | | 4 | 22 | 21.0 | 22.0 | 4 | 22 | 17.0 | 18.0 | 4 | 9 | 5 | 7 | 35.3 | 66 | 78 | | 4 | 10 | 23.0 | 23.0 | 5 | 12 | 5 | 9.5 | 0 |
| 44 FT | 9 | 10 | 9 | 8 | 4 | 9 | 5 | 6.5 | 33.3 | 25.0 | 29.0 | | 4 | 21 | 21.0 | 22.0 | 4 | 21 | 17.0 | 18.0 | 4 | 8.5 | 5 | 6.5 | 35.3 | 66 | 78 | | 4 | 10 | 23.0 | 23.0 | 5 | 12 | 5 | 9 | 0 |
| 46 FT | 9 | 10 | 9 | 8 | 4 | 8.5 | 5 | 6 | 33.3 | 25.0 | 29.0 | | 4 | 21 | 21.0 | 22.0 | 4 | 21 | 17.0 | 18.0 | 4 | 8 | 5 | 6.5 | 35.1 | 66 | 78 | | 4 | 9.5 | 23.0 | 23.0 | 5 | 12 | 5 | 8.5 | 0 |
| 48 FT | 9 | 11 | 9 | 8 | 4 | 8 | 5 | 6 | 33.1 | 25.0 | 29.0 | | 4 | 20 | 21.0 | 22.0 | 4 | 20 | 17.0 | 18.0 | 4 | 8.5 | 5 | 6.5 | 36.4 | 67 | 79 | | 4 | 10 | 23.0 | 23.0 | 5 | 12 | 5 | 8.5 | 0 |
| 50 FT | 9 | 11 | 9 | 8 | 4 | 7.5 | 5 | 6 | 33.1 | 25.0 | 29.0 | | 4 | 19 | 21.0 | 22.0 | 4 | 19 | 17.0 | 18.0 | 4 | 8.5 | 5 | 6.5 | 36.4 | 67 | 79 | | 4 | 10 | 23.0 | 23.0 | 5 | 12 | 5 | 8.5 | 0 |




BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ℄ CULVERT.

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

### GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.


MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 3 FEET
HEIGHT (HT): 2 THRU 6 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

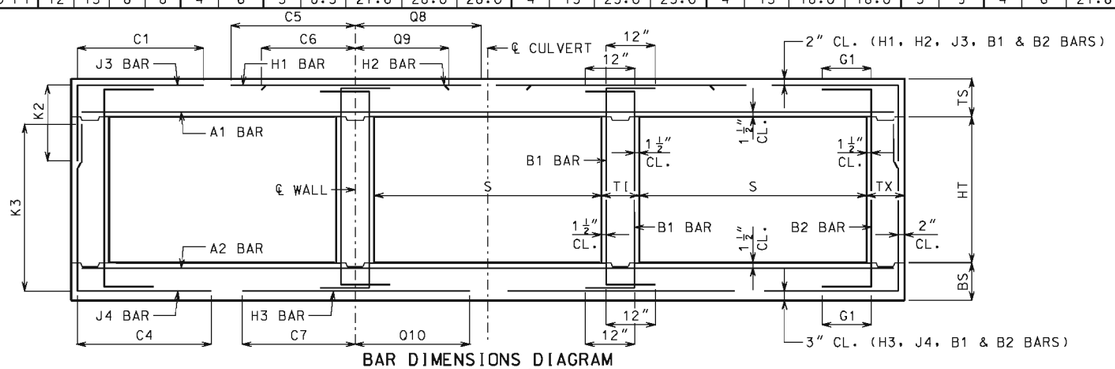
703.87

## SPAN (S) = 4 FT HEIGHT (HT) = 2 FT OR 3 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | K2 HT=2′ | K2 HT=3′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | K3 HT=2′ | K3 HT=3′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 10 | 8 | 8 | 8 | 4 | 7 | 4 | 10.5 | 30.3 | 26.0 | 26.0 | 4 | 24 | 47.5 | 36.5 | 4 | 24 | 21.0 | 20.0 | 4 | 12 | 4 | 12 | 29.4 | 28 | 40 | 4 | 12 | 27.0 | 28.0 | 5 | 12 | 5 | 12 | 12 |
| 2 FT | 10 | 8 | 8 | 8 | 4 | 7 | 4 | 10.5 | 30.3 | 26.0 | 26.0 | 4 | 24 | 47.5 | 36.5 | 4 | 24 | 21.0 | 20.0 | 4 | 12 | 4 | 12 | 27.3 | 28 | 40 | 4 | 11.5 | 27.0 | 27.0 | 5 | 12 | 5 | 12 | 12 |
| 4 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 28.6 | 24.0 | 24.0 | 4 | 24 | 33.0 | 36.0 | 4 | 24 | 20.0 | 20.0 | 4 | 12 | 4 | 12 | 25.0 | 28 | 40 | 4 | 11.5 | 26.0 | 27.0 | 5 | 12 | 5 | 12 | 12 |
| 6 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 26.0 | 24.0 | 24.0 | 4 | 24 | 28.0 | 29.0 | 4 | 24 | 19.0 | 19.0 | 4 | 12 | 4 | 12 | 24.1 | 28 | 40 | 4 | 10.5 | 25.0 | 26.0 | 5 | 12 | 5 | 12 | 12 |
| 8 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 24.8 | 24.0 | 24.0 | 4 | 24 | 26.0 | 28.0 | 4 | 24 | 19.0 | 19.0 | 4 | 12 | 4 | 12 | 23.5 | 28 | 40 | 4 | 10 | 25.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 10 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 24.1 | 24.0 | 24.0 | 4 | 24 | 26.0 | 27.0 | 4 | 24 | 19.0 | 19.0 | 4 | 12 | 4 | 12 | 23.1 | 28 | 40 | 4 | 9 | 25.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 12 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 23.6 | 24.0 | 24.0 | 4 | 23 | 25.0 | 26.0 | 4 | 23 | 18.0 | 19.0 | 4 | 12 | 4 | 12 | 22.9 | 28 | 40 | 4 | 8 | 25.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 14 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 23.4 | 24.0 | 24.0 | 4 | 22 | 25.0 | 26.0 | 4 | 22 | 18.0 | 18.0 | 4 | 11 | 4 | 12 | 22.6 | 28 | 40 | 4 | 7.5 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 16 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 22.5 | 24.0 | 24.0 | 4 | 21 | 24.0 | 25.0 | 4 | 21 | 18.0 | 18.0 | 4 | 10.5 | 4 | 12 | 22.1 | 28 | 40 | 4 | 7.5 | 24.0 | 25.0 | 5 | 12 | 5 | 12 | 0 |
| 18 FT | 8 | 8 | 8 | 8 | 4 | 11.5 | 4 | 12 | 22.5 | 24.0 | 24.0 | 4 | 20 | 24.0 | 25.0 | 4 | 20 | 18.0 | 18.0 | 4 | 9.5 | 4 | 10.5 | 22.1 | 28 | 40 | 4 | 7 | 24.0 | 25.0 | 5 | 12 | 5 | 12 | 0 |
| 20 FT | 8 | 8 | 8 | 8 | 4 | 10.5 | 4 | 11 | 22.4 | 24.0 | 24.0 | 4 | 18 | 24.0 | 25.0 | 4 | 18 | 18.0 | 18.0 | 4 | 8.5 | 4 | 9.5 | 22.1 | 28 | 40 | 4 | 6.5 | 24.0 | 25.0 | 5 | 12 | 5 | 12 | 0 |
| 22 FT | 8 | 8 | 8 | 8 | 4 | 9.5 | 4 | 10 | 22.4 | 24.0 | 24.0 | 4 | 17 | 24.0 | 25.0 | 4 | 17 | 18.0 | 18.0 | 4 | 7.5 | 4 | 9 | 22.0 | 28 | 40 | 4 | 6 | 24.0 | 25.0 | 5 | 12 | 5 | 12 | 0 |
| 24 FT | 8 | 9 | 8 | 8 | 4 | 8.5 | 4 | 9 | 22.6 | 24.0 | 24.0 | 4 | 15 | 24.0 | 25.0 | 4 | 15 | 18.0 | 18.0 | 4 | 8 | 4 | 11.5 | 21.4 | 29 | 41 | 4 | 7 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 26 FT | 8 | 9 | 8 | 8 | 4 | 8 | 4 | 8.5 | 22.5 | 24.0 | 24.0 | 4 | 14 | 24.0 | 25.0 | 4 | 14 | 18.0 | 18.0 | 4 | 7 | 4 | 11 | 21.4 | 29 | 41 | 4 | 6.5 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 28 FT | 8 | 10 | 8 | 8 | 4 | 7.5 | 4 | 8 | 22.8 | 24.0 | 24.0 | 4 | 13 | 24.0 | 25.0 | 4 | 13 | 18.0 | 18.0 | 4 | 7.5 | 4 | 12 | 20.9 | 30 | 42 | 4 | 7 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 30 FT | 9 | 10 | 8 | 8 | 4 | 7.5 | 4 | 10 | 22.1 | 25.0 | 25.0 | 4 | 15 | 24.0 | 26.0 | 4 | 15 | 18.0 | 18.0 | 4 | 7 | 4 | 12 | 21.0 | 30 | 42 | 4 | 7 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 32 FT | 9 | 10 | 8 | 8 | 4 | 7 | 4 | 9.5 | 22.1 | 25.0 | 25.0 | 4 | 14 | 24.0 | 26.0 | 4 | 14 | 18.0 | 18.0 | 4 | 6 | 4 | 12 | 21.0 | 30 | 42 | 4 | 6 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 34 FT | 9 | 11 | 8 | 8 | 4 | 6.5 | 4 | 9 | 22.3 | 25.0 | 25.0 | 4 | 13 | 24.0 | 26.0 | 4 | 13 | 18.0 | 18.0 | 4 | 6.5 | 4 | 10.5 | 20.6 | 31 | 43 | 4 | 7 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 36 FT | 10 | 11 | 8 | 8 | 4 | 7 | 4 | 10 | 21.9 | 26.0 | 26.0 | 4 | 14 | 24.0 | 26.0 | 4 | 14 | 18.0 | 19.0 | 4 | 6.5 | 4 | 10.5 | 20.9 | 31 | 43 | 4 | 7 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 38 FT | 10 | 12 | 8 | 8 | 4 | 6.5 | 4 | 9.5 | 22.0 | 26.0 | 26.0 | 4 | 13 | 24.0 | 26.0 | 4 | 13 | 18.0 | 19.0 | 4 | 6.5 | 4 | 9.5 | 20.5 | 32 | 44 | 4 | 7.5 | 24.0 | 27.0 | 5 | 12 | 5 | 12 | 0 |
| 40 FT | 10 | 12 | 8 | 8 | 4 | 6 | 4 | 9 | 22.0 | 26.0 | 26.0 | 4 | 13 | 24.0 | 26.0 | 4 | 13 | 18.0 | 19.0 | 4 | 6.5 | 4 | 9.5 | 20.5 | 32 | 44 | 4 | 7 | 24.0 | 27.0 | 5 | 12 | 5 | 12 | 0 |
| 42 FT | 11 | 12 | 8 | 8 | 4 | 6.5 | 4 | 9.5 | 21.6 | 27.0 | 27.0 | 4 | 14 | 23.0 | 26.0 | 4 | 14 | 18.0 | 19.0 | 4 | 6 | 4 | 9.5 | 20.8 | 32 | 44 | 4 | 6.5 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 44 FT | 11 | 12 | 8 | 8 | 4 | 6 | 4 | 9.5 | 21.6 | 27.0 | 27.0 | 4 | 13 | 23.0 | 26.0 | 4 | 13 | 18.0 | 19.0 | 4 | 6 | 4 | 9.5 | 20.8 | 32 | 44 | 4 | 6 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 46 FT | 11 | 13 | 8 | 8 | 4 | 6 | 4 | 8.5 | 21.8 | 27.0 | 27.0 | 4 | 12 | 23.0 | 26.0 | 4 | 12 | 18.0 | 19.0 | 4 | 6 | 4 | 8.5 | 20.5 | 33 | 45 | 4 | 6.5 | 23.0 | 27.0 | 5 | 12 | 5 | 12 | 0 |
| 48 FT | 12 | 13 | 8 | 8 | 4 | 6 | 4 | 8.5 | 21.5 | 28.0 | 28.0 | 4 | 13 | 23.0 | 26.0 | 4 | 13 | 18.0 | 19.0 | 4 | 6 | 4 | 8.5 | 20.8 | 33 | 45 | 4 | 6.5 | 24.0 | 27.0 | 5 | 12 | 5 | 12 | 0 |
| 50 FT | 12 | 13 | 8 | 8 | 5 | 9 | 4 | 8.5 | 21.5 | 28.0 | 28.0 | 4 | 13 | 23.0 | 26.0 | 4 | 13 | 18.0 | 19.0 | 5 | 8.5 | 4 | 8.5 | 20.8 | 33 | 45 | 4 | 6 | 24.0 | 27.0 | 5 | 12 | 5 | 12 | 0 |

## SPAN (S) = 4 FT HEIGHT (HT) = 4 FT OR 5 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | K2 HT=4′ | K2 HT=5′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | K3 HT=4′ | K3 HT=5′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 10 | 8 | 8 | 8 | 4 | 7 | 4 | 10.5 | 30.3 | 26.0 | 26.0 | 4 | 24 | 47.5 | 36.5 | 4 | 24 | 21.0 | 21.0 | 4 | 12 | 4 | 12 | 42.0 | 52 | 64 | 4 | 12 | 28.0 | 28.0 | 5 | 12 | 5 | 12 | 12 |
| 2 FT | 10 | 8 | 8 | 8 | 4 | 7 | 4 | 10.5 | 30.3 | 26.0 | 26.0 | 4 | 24 | 47.5 | 36.5 | 4 | 24 | 21.0 | 21.0 | 4 | 12 | 4 | 12 | 39.1 | 52 | 64 | 4 | 11 | 27.0 | 28.0 | 5 | 12 | 5 | 12 | 12 |
| 4 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 30.3 | 24.0 | 24.0 | 4 | 24 | 47.5 | 37.0 | 4 | 24 | 20.0 | 20.0 | 4 | 12 | 4 | 12 | 34.8 | 52 | 64 | 4 | 11 | 26.0 | 27.0 | 5 | 12 | 5 | 12 | 12 |
| 6 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 34.6 | 24.0 | 24.0 | 4 | 24 | 29.0 | 30.0 | 4 | 24 | 19.0 | 19.0 | 4 | 12 | 4 | 11.5 | 32.1 | 52 | 64 | 4 | 10.5 | 25.0 | 26.0 | 5 | 12 | 5 | 12 | 12 |
| 8 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 31.4 | 24.0 | 24.0 | 4 | 24 | 27.0 | 28.0 | 4 | 24 | 19.0 | 19.0 | 4 | 12 | 4 | 11 | 30.3 | 52 | 64 | 4 | 9.5 | 25.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 10 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 29.9 | 24.0 | 24.0 | 4 | 24 | 26.0 | 27.0 | 4 | 24 | 19.0 | 19.0 | 4 | 12 | 4 | 10.5 | 29.3 | 52 | 64 | 4 | 9 | 25.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 12 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 29.1 | 24.0 | 24.0 | 4 | 24 | 25.0 | 27.0 | 4 | 24 | 18.0 | 19.0 | 4 | 11.5 | 4 | 10 | 28.5 | 52 | 64 | 4 | 8.5 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 14 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 11 | 28.5 | 24.0 | 24.0 | 4 | 23 | 25.0 | 26.0 | 4 | 23 | 18.0 | 19.0 | 4 | 10.5 | 4 | 9.5 | 28.1 | 52 | 64 | 4 | 7.5 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 16 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 11 | 26.9 | 24.0 | 24.0 | 4 | 22 | 24.0 | 26.0 | 4 | 22 | 18.0 | 19.0 | 4 | 10 | 4 | 9.5 | 26.6 | 52 | 64 | 4 | 7.5 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 18 FT | 8 | 8 | 8 | 8 | 4 | 11 | 4 | 10 | 26.8 | 24.0 | 24.0 | 4 | 21 | 24.0 | 26.0 | 4 | 21 | 18.0 | 19.0 | 4 | 9 | 4 | 8.5 | 26.5 | 52 | 64 | 4 | 7 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 20 FT | 8 | 8 | 8 | 8 | 4 | 10 | 4 | 9 | 26.8 | 24.0 | 24.0 | 4 | 19 | 24.0 | 26.0 | 4 | 19 | 18.0 | 19.0 | 4 | 8 | 4 | 8 | 26.4 | 52 | 64 | 4 | 6.5 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 22 FT | 8 | 8 | 8 | 8 | 4 | 9 | 4 | 8 | 26.6 | 24.0 | 24.0 | 4 | 17 | 24.0 | 26.0 | 4 | 17 | 18.0 | 18.0 | 4 | 7 | 4 | 7 | 26.4 | 52 | 64 | 4 | 6 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 24 FT | 8 | 9 | 8 | 8 | 4 | 8.5 | 4 | 7.5 | 26.6 | 24.0 | 24.0 | 4 | 16 | 24.0 | 25.0 | 4 | 16 | 18.0 | 18.0 | 4 | 7.5 | 4 | 8.5 | 26.6 | 53 | 65 | 4 | 7 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 26 FT | 8 | 9 | 8 | 8 | 4 | 8 | 4 | 7 | 26.6 | 24.0 | 24.0 | 4 | 14 | 24.0 | 25.0 | 4 | 14 | 18.0 | 18.0 | 4 | 7 | 4 | 8 | 26.5 | 53 | 65 | 4 | 6.5 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 28 FT | 8 | 10 | 8 | 8 | 4 | 7.5 | 4 | 6 | 26.6 | 24.0 | 24.0 | 4 | 13 | 24.0 | 25.0 | 4 | 13 | 18.0 | 18.0 | 4 | 7.5 | 4 | 9.5 | 26.8 | 54 | 66 | 4 | 7.5 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 30 FT | 9 | 10 | 8 | 8 | 4 | 7.5 | 4 | 7.5 | 26.9 | 25.0 | 25.0 | 4 | 15 | 24.0 | 26.0 | 4 | 15 | 18.0 | 19.0 | 4 | 7 | 4 | 9 | 26.9 | 54 | 66 | 4 | 7 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 32 FT | 9 | 10 | 8 | 8 | 4 | 7 | 4 | 7 | 26.9 | 25.0 | 25.0 | 4 | 14 | 24.0 | 26.0 | 4 | 14 | 18.0 | 19.0 | 4 | 6 | 4 | 8 | 26.8 | 54 | 66 | 4 | 6 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 34 FT | 9 | 11 | 8 | 8 | 4 | 6.5 | 4 | 6.5 | 26.9 | 25.0 | 25.0 | 4 | 13 | 24.0 | 26.0 | 4 | 13 | 18.0 | 18.0 | 4 | 6.5 | 4 | 8.5 | 27.0 | 55 | 67 | 4 | 7 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 36 FT | 10 | 11 | 8 | 8 | 4 | 7 | 4 | 6.5 | 27.1 | 26.0 | 26.0 | 4 | 14 | 23.0 | 26.0 | 4 | 14 | 18.0 | 19.0 | 4 | 6.5 | 4 | 8 | 27.1 | 55 | 67 | 4 | 7 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 38 FT | 10 | 12 | 8 | 8 | 4 | 6.5 | 4 | 6 | 27.3 | 26.0 | 26.0 | 4 | 14 | 23.0 | 26.0 | 4 | 14 | 18.0 | 19.0 | 4 | 6.5 | 4 | 8 | 27.4 | 56 | 68 | 4 | 7.5 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 40 FT | 10 | 12 | 8 | 8 | 4 | 6 | 5 | 8 | 27.1 | 26.0 | 26.0 | 4 | 13 | 23.0 | 26.0 | 4 | 13 | 18.0 | 19.0 | 4 | 6.5 | 4 | 7.5 | 27.4 | 56 | 68 | 4 | 7 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 42 FT | 11 | 12 | 8 | 8 | 4 | 6.5 | 5 | 9 | 27.4 | 27.0 | 27.0 | 4 | 14 | 23.0 | 26.0 | 4 | 14 | 18.0 | 19.0 | 4 | 6 | 4 | 7 | 27.4 | 56 | 68 | 4 | 6.5 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 44 FT | 11 | 12 | 8 | 8 | 4 | 6 | 5 | 8.5 | 27.4 | 27.0 | 27.0 | 4 | 13 | 23.0 | 26.0 | 4 | 13 | 18.0 | 19.0 | 4 | 6 | 4 | 6.5 | 27.4 | 56 | 68 | 4 | 6.5 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 46 FT | 11 | 13 | 8 | 8 | 4 | 6 | 5 | 8.5 | 27.5 | 27.0 | 27.0 | 4 | 13 | 23.0 | 26.0 | 4 | 13 | 18.0 | 19.0 | 4 | 6 | 4 | 7 | 27.6 | 57 | 69 | 4 | 6.5 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 48 FT | 12 | 13 | 8 | 8 | 4 | 6 | 5 | 8.5 | 27.6 | 28.0 | 28.0 | 4 | 14 | 23.0 | 25.0 | 4 | 14 | 18.0 | 18.0 | 4 | 6 | 4 | 6.5 | 27.8 | 57 | 69 | 4 | 6.5 | 24.0 | 26.0 | 5 | 12 | 5 | 11.5 | 0 |
| 50 FT | 12 | 13 | 8 | 8 | 4 | 6 | 5 | 8.5 | 27.6 | 28.0 | 28.0 | 4 | 13 | 23.0 | 25.0 | 4 | 13 | 18.0 | 18.0 | 5 | 9 | 4 | 6 | 27.8 | 57 | 69 | 4 | 6 | 24.0 | 26.0 | 5 | 12 | 5 | 11 | 0 |




BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ℄ CULVERT.

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

### GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.


MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

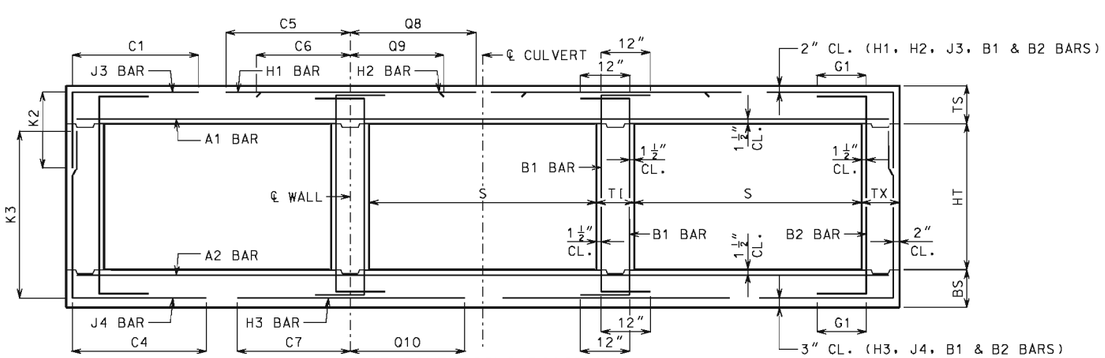
SPAN (S): 4 FEET
HEIGHT (HT): 2 THRU 5 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

703.87

## SPAN (S) = 4 FT HEIGHT (HT) = 6 FT OR 7 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | | | | | | | | | | K2 | | | | | | | | | | | | | | K3 | | | | | | | | | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | HT=6′ | HT=7′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | HT=6′ | HT=7′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 10 | 8 | 8 | 8 | 4 | 6.5 | 4 | 10.5 | 30.3 | 26.0 | 26.0 | 4 | 24 | 47.5 | 36.5 | 4 | 24 | 22.0 | 21.0 | 4 | 12 | 4 | 9 | 42.0 | 76 | 88 | 4 | 11.5 | 40.0 | 28.0 | 5 | 12 | 5 | 12 | 12 |
| 2 FT | 10 | 8 | 8 | 8 | 4 | 6.5 | 4 | 10.5 | 30.3 | 26.0 | 26.0 | 4 | 24 | 47.5 | 36.5 | 4 | 24 | 21.0 | 21.0 | 4 | 12 | 4 | 8.5 | 42.0 | 76 | 88 | 4 | 11 | 40.0 | 28.0 | 5 | 12 | 5 | 12 | 12 |
| 4 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 10 | 30.3 | 24.0 | 24.0 | 4 | 24 | 47.5 | 37.0 | 4 | 24 | 20.0 | 20.0 | 4 | 12 | 4 | 7.5 | 42.0 | 76 | 88 | 4 | 11 | 29.0 | 27.0 | 5 | 12 | 5 | 12 | 12 |
| 6 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 10 | 30.3 | 24.0 | 24.0 | 4 | 24 | 47.5 | 29.0 | 4 | 24 | 19.0 | 19.0 | 4 | 12 | 4 | 7 | 42.0 | 76 | 88 | 4 | 10 | 27.0 | 26.0 | 5 | 12 | 5 | 12 | 12 |
| 8 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 9 | 30.3 | 24.0 | 24.0 | 4 | 24 | 47.5 | 28.0 | 4 | 24 | 19.0 | 19.0 | 4 | 12 | 4 | 6.5 | 42.0 | 76 | 88 | 4 | 9.5 | 26.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 10 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 8 | 43.1 | 24.0 | 24.0 | 4 | 24 | 28.0 | 27.0 | 4 | 24 | 18.0 | 19.0 | 4 | 12 | 4 | 6.5 | 40.6 | 76 | 88 | 4 | 9 | 25.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 12 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 7.5 | 40.5 | 24.0 | 24.0 | 4 | 24 | 27.0 | 26.0 | 4 | 24 | 18.0 | 19.0 | 4 | 11.5 | 4 | 6 | 39.1 | 76 | 88 | 4 | 8.5 | 25.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 14 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 6.5 | 39.3 | 24.0 | 24.0 | 4 | 23 | 26.0 | 26.0 | 4 | 23 | 18.0 | 19.0 | 4 | 10.5 | 5 | 6.5 | 38.4 | 76 | 88 | 4 | 8 | 25.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 16 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 6.5 | 35.5 | 24.0 | 24.0 | 4 | 23 | 24.0 | 25.0 | 4 | 23 | 18.0 | 19.0 | 4 | 10 | 5 | 6.5 | 35.4 | 76 | 88 | 4 | 7.5 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 18 FT | 8 | 8 | 8 | 8 | 4 | 11.5 | 4 | 6 | 35.3 | 24.0 | 24.0 | 4 | 21 | 24.0 | 25.0 | 4 | 21 | 18.0 | 18.0 | 4 | 9 | 5 | 6 | 35.1 | 76 | 88 | 4 | 7 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 20 FT | 8 | 8 | 8 | 8 | 4 | 10 | 5 | 6.5 | 35.0 | 24.0 | 28.0 | 4 | 19 | 24.0 | 25.0 | 4 | 19 | 18.0 | 18.0 | 4 | 8 | 6 | 6.5 | 38.0 | 76 | 88 | 4 | 6.5 | 24.0 | 26.0 | 5 | 12 | 5 | 12 | 0 |
| 22 FT | 8 | 9 | 8 | 8 | 4 | 9.5 | 5 | 6 | 34.6 | 24.0 | 28.0 | 4 | 18 | 24.0 | 25.0 | 4 | 18 | 18.0 | 18.0 | 4 | 8.5 | 5 | 6 | 36.1 | 77 | 89 | 4 | 8 | 25.0 | 26.0 | 5 | 12 | 5 | 11.5 | 0 |
| 24 FT | 8 | 9 | 9 | 8 | 4 | 8.5 | 5 | 6.5 | 34.1 | 24.0 | 28.0 | 4 | 16 | 24.0 | 25.0 | 4 | 16 | 18.0 | 18.0 | 4 | 8 | 5 | 7 | 35.6 | 77 | 89 | 4 | 7.5 | 25.0 | 26.0 | 5 | 12 | 5 | 11.5 | 0 |
| 26 FT | 8 | 9 | 9 | 8 | 4 | 8 | 5 | 6 | 34.0 | 24.0 | 28.0 | 4 | 15 | 24.0 | 25.0 | 4 | 15 | 18.0 | 18.0 | 4 | 7.5 | 5 | 6.5 | 35.5 | 77 | 89 | 4 | 7 | 25.0 | 26.0 | 5 | 12 | 5 | 11 | 0 |
| 28 FT | 8 | 10 | 9 | 8 | 4 | 7.5 | 6 | 7.5 | 36.8 | 24.0 | 28.0 | 4 | 14 | 24.0 | 25.0 | 4 | 14 | 18.0 | 18.0 | 4 | 7.5 | 5 | 7 | 36.6 | 78 | 90 | 4 | 7.5 | 25.0 | 26.0 | 5 | 12 | 5 | 10.5 | 0 |
| 30 FT | 9 | 10 | 9 | 8 | 4 | 8 | 5 | 6 | 35.0 | 25.0 | 29.0 | 4 | 15 | 24.0 | 25.0 | 4 | 15 | 18.0 | 18.0 | 4 | 7 | 5 | 6.5 | 36.4 | 78 | 90 | 4 | 7 | 25.0 | 26.0 | 5 | 12 | 5 | 10 | 0 |
| 32 FT | 9 | 10 | 9 | 8 | 4 | 7.5 | 5 | 6 | 35.0 | 25.0 | 29.0 | 4 | 14 | 24.0 | 25.0 | 4 | 14 | 18.0 | 18.0 | 4 | 6.5 | 5 | 6 | 36.3 | 78 | 90 | 4 | 6.5 | 25.0 | 26.0 | 5 | 12 | 5 | 9.5 | 0 |
| 34 FT | 9 | 11 | 9 | 8 | 4 | 7 | 5 | 6 | 34.9 | 25.0 | 29.0 | 4 | 13 | 24.0 | 25.0 | 4 | 13 | 18.0 | 18.0 | 4 | 7 | 5 | 6.5 | 37.4 | 79 | 91 | 4 | 7 | 25.0 | 26.0 | 5 | 12 | 5 | 9 | 0 |
| 36 FT | 10 | 11 | 9 | 8 | 4 | 7 | 5 | 6.5 | 35.9 | 26.0 | 30.0 | 4 | 15 | 24.0 | 25.0 | 4 | 15 | 18.0 | 18.0 | 4 | 7 | 5 | 6 | 37.0 | 79 | 91 | 4 | 7 | 25.0 | 26.0 | 5 | 12 | 5 | 8.5 | 0 |
| 38 FT | 10 | 11 | 9 | 8 | 4 | 7 | 5 | 6 | 35.8 | 26.0 | 30.0 | 4 | 14 | 24.0 | 25.0 | 4 | 14 | 18.0 | 18.0 | 4 | 6.5 | 6 | 7.5 | 40.0 | 79 | 91 | 4 | 6.5 | 25.0 | 26.0 | 5 | 12 | 5 | 8.5 | 0 |
| 40 FT | 10 | 12 | 9 | 8 | 4 | 6.5 | 5 | 6 | 35.6 | 26.0 | 30.0 | 4 | 13 | 24.0 | 25.0 | 4 | 13 | 18.0 | 18.0 | 4 | 6.5 | 5 | 6 | 38.3 | 80 | 92 | 4 | 7 | 25.0 | 26.0 | 5 | 12 | 5 | 8.5 | 0 |
| 42 FT | 10 | 12 | 9 | 8 | 4 | 6 | 5 | 6 | 35.6 | 30.0 | 30.0 | 4 | 12 | 24.0 | 25.0 | 4 | 12 | 18.0 | 18.0 | 4 | 6.5 | 6 | 7.5 | 41.1 | 80 | 92 | 4 | 6.5 | 25.0 | 26.0 | 5 | 12 | 5 | 8.5 | 0 |
| 44 FT | 11 | 12 | 9 | 8 | 4 | 6.5 | 6 | 7.5 | 39.5 | 31.0 | 35.0 | 4 | 14 | 24.0 | 25.0 | 4 | 14 | 18.0 | 18.0 | 4 | 6 | 6 | 7 | 40.9 | 80 | 92 | 4 | 6.5 | 25.0 | 26.0 | 5 | 12 | 5 | 8.5 | 0 |
| 46 FT | 11 | 13 | 9 | 8 | 4 | 6 | 6 | 6.5 | 39.4 | 31.0 | 35.0 | 4 | 13 | 24.0 | 25.0 | 4 | 13 | 18.0 | 18.0 | 4 | 6.5 | 6 | 7.5 | 42.0 | 81 | 93 | 4 | 6.5 | 26.0 | 26.0 | 5 | 12 | 5 | 8.5 | 0 |
| 48 FT | 11 | 13 | 10 | 8 | 4 | 6 | 5 | 6 | 36.3 | 27.0 | 31.0 | 4 | 13 | 23.0 | 25.0 | 4 | 13 | 18.0 | 18.0 | 4 | 6 | 5 | 6.5 | 38.4 | 81 | 93 | 4 | 6.5 | 25.0 | 26.0 | 5 | 12 | 5 | 8 | 0 |
| 50 FT | 12 | 13 | 11 | 8 | 4 | 6 | 5 | 7 | 37.0 | 28.0 | 32.0 | 4 | 14 | 23.0 | 25.0 | 4 | 14 | 18.0 | 18.0 | 4 | 6 | 5 | 7.5 | 37.9 | 81 | 93 | 4 | 6 | 25.0 | 26.0 | 5 | 12 | 5 | 7.5 | 0 |




BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ℄ CULVERT.

### GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.


MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 4 FEET
HEIGHT (HT): 6 THRU 7 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

703.87



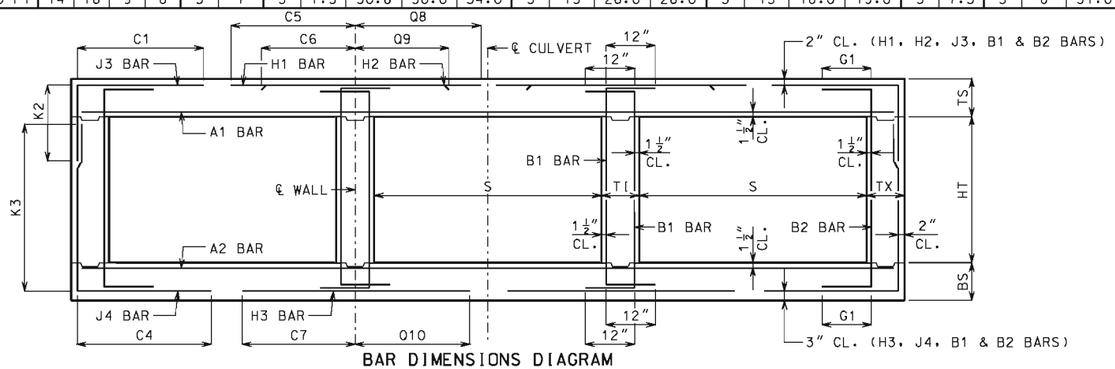

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

## SPAN (S) = 5 FT HEIGHT (HT) = 3 FT OR 4 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | H3 BARS | | | B1 BARS | | B2 BARS | | |
| | | | | | | | | | | K2 | | | | | | | | | | | | | | K3 | | | | | | | | | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | HT=3′ | HT=4′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | HT=3′ | HT=4′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 10 | 8 | 8 | 8 | 5 | 9 | 4 | 10.5 | 33.9 | 26.0 | 26.0 | 4 | 19 | 56.5 | 42.5 | 4 | 19 | 22.0 | 21.0 | 4 | 12 | 4 | 12 | 33.9 | 40 | 52 | 4 | 8.5 | 30.0 | 31.0 | 5 | 12 | 5 | 12 | 12 |
| 2 FT | 11 | 8 | 8 | 8 | 4 | 6 | 4 | 9.5 | 33.9 | 27.0 | 27.0 | 4 | 21 | 56.5 | 42.5 | 4 | 21 | 22.0 | 21.0 | 4 | 12 | 4 | 12 | 31.1 | 40 | 52 | 4 | 8.5 | 30.0 | 31.0 | 5 | 12 | 5 | 12 | 12 |
| 4 FT | 8 | 8 | 8 | 8 | 4 | 10.5 | 4 | 12 | 32.1 | 24.0 | 24.0 | 4 | 20 | 38.0 | 46.0 | 4 | 20 | 20.0 | 20.0 | 4 | 12 | 4 | 12 | 28.4 | 40 | 52 | 4 | 8.5 | 29.0 | 30.0 | 5 | 12 | 5 | 12 | 12 |
| 6 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 29.3 | 24.0 | 24.0 | 4 | 21 | 31.0 | 34.0 | 4 | 21 | 20.0 | 20.0 | 4 | 12 | 4 | 12 | 27.0 | 40 | 52 | 4 | 8 | 28.0 | 29.0 | 5 | 12 | 5 | 12 | 12 |
| 8 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 12 | 27.5 | 24.0 | 24.0 | 4 | 20 | 30.0 | 31.0 | 4 | 20 | 19.0 | 19.0 | 4 | 11 | 4 | 11 | 26.3 | 40 | 52 | 4 | 7 | 28.0 | 29.0 | 5 | 12 | 5 | 12 | 0 |
| 10 FT | 8 | 8 | 8 | 8 | 4 | 11 | 4 | 12 | 26.6 | 24.0 | 24.0 | 4 | 18 | 29.0 | 30.0 | 4 | 18 | 19.0 | 19.0 | 4 | 9.5 | 4 | 10.5 | 25.6 | 40 | 52 | 4 | 6.5 | 27.0 | 29.0 | 5 | 12 | 5 | 12 | 0 |
| 12 FT | 8 | 8 | 8 | 8 | 4 | 10 | 4 | 10.5 | 26.1 | 24.0 | 24.0 | 4 | 16 | 28.0 | 30.0 | 4 | 16 | 19.0 | 19.0 | 4 | 8 | 4 | 9.5 | 25.3 | 40 | 52 | 4 | 6 | 27.0 | 29.0 | 5 | 12 | 5 | 12 | 0 |
| 14 FT | 8 | 8 | 8 | 8 | 4 | 8.5 | 4 | 9.5 | 25.6 | 24.0 | 24.0 | 4 | 14 | 28.0 | 29.0 | 4 | 14 | 19.0 | 19.0 | 4 | 7 | 4 | 8.5 | 25.0 | 40 | 52 | 5 | 7 | 27.0 | 29.0 | 5 | 12 | 5 | 12 | 0 |
| 16 FT | 8 | 9 | 8 | 8 | 4 | 8 | 4 | 8.5 | 25.6 | 24.0 | 24.0 | 4 | 13 | 28.0 | 29.0 | 4 | 13 | 19.0 | 19.0 | 4 | 7 | 4 | 11 | 24.3 | 41 | 53 | 4 | 6 | 27.0 | 29.0 | 5 | 12 | 5 | 12 | 0 |
| 18 FT | 8 | 9 | 8 | 8 | 4 | 7.5 | 4 | 8 | 24.8 | 24.0 | 24.0 | 4 | 12 | 27.0 | 28.0 | 4 | 12 | 19.0 | 19.0 | 4 | 7 | 4 | 10.5 | 23.5 | 41 | 53 | 4 | 6 | 27.0 | 29.0 | 5 | 12 | 5 | 12 | 0 |
| 20 FT | 8 | 9 | 8 | 8 | 4 | 7 | 4 | 7.5 | 24.6 | 24.0 | 24.0 | 5 | 17 | 27.0 | 28.0 | 5 | 17 | 19.0 | 19.0 | 4 | 6 | 4 | 9.5 | 23.5 | 41 | 53 | 5 | 7 | 27.0 | 29.0 | 5 | 12 | 5 | 12 | 0 |
| 22 FT | 9 | 10 | 8 | 8 | 4 | 7 | 4 | 9 | 24.3 | 25.0 | 25.0 | 4 | 12 | 27.0 | 29.0 | 4 | 12 | 19.0 | 19.0 | 4 | 6.5 | 4 | 12 | 23.1 | 42 | 54 | 4 | 6 | 27.0 | 29.0 | 5 | 12 | 5 | 12 | 0 |
| 24 FT | 9 | 11 | 8 | 8 | 4 | 6.5 | 4 | 8 | 24.4 | 25.0 | 25.0 | 5 | 17 | 27.0 | 29.0 | 5 | 17 | 19.0 | 19.0 | 4 | 6.5 | 4 | 10.5 | 22.6 | 43 | 55 | 4 | 6 | 26.0 | 30.0 | 5 | 12 | 5 | 12 | 0 |
| 26 FT | 10 | 11 | 8 | 8 | 4 | 6.5 | 4 | 8.5 | 23.9 | 26.0 | 26.0 | 5 | 18 | 26.0 | 29.0 | 5 | 18 | 19.0 | 19.0 | 4 | 6 | 4 | 10.5 | 22.9 | 43 | 55 | 5 | 8 | 26.0 | 29.0 | 5 | 12 | 5 | 12 | 0 |
| 28 FT | 10 | 11 | 8 | 8 | 4 | 6 | 4 | 8 | 23.9 | 26.0 | 26.0 | 5 | 17 | 26.0 | 29.0 | 5 | 17 | 19.0 | 19.0 | 5 | 8.5 | 4 | 10.5 | 22.9 | 43 | 55 | 5 | 8 | 26.0 | 29.0 | 5 | 12 | 5 | 12 | 0 |
| 30 FT | 10 | 12 | 8 | 8 | 5 | 8 | 4 | 7 | 24.0 | 26.0 | 26.0 | 5 | 16 | 26.0 | 29.0 | 5 | 16 | 19.0 | 19.0 | 5 | 9 | 4 | 9.5 | 22.5 | 44 | 56 | 5 | 8.5 | 26.0 | 30.0 | 5 | 12 | 5 | 12 | 0 |
| 32 FT | 11 | 12 | 8 | 8 | 5 | 9 | 4 | 8 | 23.6 | 27.0 | 27.0 | 5 | 17 | 26.0 | 29.0 | 5 | 17 | 19.0 | 19.0 | 5 | 8.5 | 4 | 9.5 | 22.8 | 44 | 56 | 5 | 8 | 26.0 | 30.0 | 5 | 12 | 5 | 12 | 0 |
| 34 FT | 11 | 13 | 8 | 8 | 5 | 8.5 | 4 | 7 | 23.8 | 27.0 | 27.0 | 5 | 16 | 26.0 | 29.0 | 5 | 16 | 19.0 | 19.0 | 5 | 8.5 | 4 | 8.5 | 22.5 | 45 | 57 | 5 | 8.5 | 26.0 | 30.0 | 5 | 12 | 5 | 12 | 0 |
| 36 FT | 12 | 13 | 8 | 8 | 5 | 8.5 | 4 | 8 | 23.5 | 28.0 | 28.0 | 5 | 17 | 26.0 | 29.0 | 5 | 17 | 19.0 | 19.0 | 5 | 8 | 4 | 8.5 | 22.8 | 45 | 57 | 5 | 8 | 26.0 | 30.0 | 5 | 12 | 5 | 12 | 0 |
| 38 FT | 12 | 14 | 8 | 8 | 5 | 8 | 4 | 7 | 23.6 | 28.0 | 28.0 | 5 | 16 | 26.0 | 29.0 | 5 | 16 | 19.0 | 19.0 | 5 | 8 | 4 | 7.5 | 22.6 | 46 | 58 | 5 | 8.5 | 26.0 | 30.0 | 5 | 12 | 5 | 12 | 0 |
| 40 FT | 13 | 14 | 8 | 8 | 5 | 8 | 4 | 7.5 | 23.4 | 29.0 | 29.0 | 5 | 16 | 26.0 | 29.0 | 5 | 16 | 19.0 | 19.0 | 5 | 8 | 4 | 7.5 | 22.8 | 46 | 58 | 5 | 8 | 26.0 | 30.0 | 5 | 12 | 5 | 12 | 0 |
| 42 FT | 13 | 14 | 8 | 8 | 5 | 7.5 | 4 | 7.5 | 23.4 | 29.0 | 29.0 | 5 | 16 | 26.0 | 29.0 | 5 | 16 | 19.0 | 19.0 | 5 | 7.5 | 4 | 7.5 | 22.8 | 46 | 58 | 5 | 7.5 | 26.0 | 30.0 | 5 | 12 | 5 | 12 | 0 |
| 44 FT | 13 | 15 | 8 | 8 | 5 | 7.5 | 4 | 7 | 23.6 | 29.0 | 29.0 | 5 | 15 | 26.0 | 29.0 | 5 | 15 | 19.0 | 19.0 | 5 | 7.5 | 4 | 7 | 22.8 | 47 | 59 | 5 | 8 | 26.0 | 30.0 | 5 | 12 | 5 | 12 | 0 |
| 46 FT | 14 | 15 | 8 | 8 | 5 | 7.5 | 4 | 7 | 23.4 | 30.0 | 30.0 | 5 | 16 | 25.0 | 29.0 | 5 | 16 | 18.0 | 19.0 | 5 | 7.5 | 4 | 7 | 22.9 | 47 | 59 | 5 | 7.5 | 26.0 | 30.0 | 5 | 12 | 5 | 12 | 0 |
| 48 FT | 14 | 15 | 8 | 8 | 5 | 7 | 4 | 7 | 23.4 | 30.0 | 30.0 | 5 | 15 | 25.0 | 29.0 | 5 | 15 | 18.0 | 19.0 | 5 | 7 | 4 | 7 | 22.9 | 47 | 59 | 5 | 7 | 26.0 | 30.0 | 5 | 12 | 5 | 12 | 0 |
| 50 FT | 14 | 16 | 8 | 8 | 5 | 7 | 4 | 6.5 | 23.6 | 30.0 | 30.0 | 5 | 15 | 25.0 | 29.0 | 5 | 15 | 18.0 | 19.0 | 5 | 7 | 4 | 6.5 | 22.9 | 48 | 60 | 5 | 7.5 | 26.0 | 30.0 | 5 | 12 | 5 | 12 | 0 |

## SPAN (S) = 5 FT HEIGHT (HT) = 5 FT OR 6 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | H3 BARS | | | B1 BARS | | B2 BARS | | |
| | | | | | | | | | | K2 | | | | | | | | | | | | | | K3 | | | | | | | | | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | HT=5′ | HT=6′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | HT=5′ | HT=6′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 11 | 8 | 8 | 8 | 4 | 6 | 4 | 9.5 | 33.9 | 27.0 | 27.0 | 4 | 22 | 56.5 | 42.5 | 4 | 22 | 23.0 | 23.0 | 4 | 12 | 4 | 10 | 47.5 | 64 | 76 | 4 | 8.5 | 31.0 | 31.0 | 5 | 12 | 5 | 12 | 12 |
| 2 FT | 11 | 8 | 8 | 8 | 4 | 6 | 4 | 9.5 | 33.9 | 27.0 | 27.0 | 4 | 21 | 56.5 | 42.5 | 4 | 21 | 22.0 | 22.0 | 4 | 11 | 4 | 9.5 | 42.8 | 64 | 76 | 4 | 8 | 30.0 | 31.0 | 5 | 12 | 5 | 12 | 12 |
| 4 FT | 8 | 8 | 8 | 8 | 4 | 10 | 4 | 10 | 33.9 | 24.0 | 24.0 | 4 | 20 | 56.5 | 46.0 | 4 | 20 | 21.0 | 21.0 | 4 | 12 | 4 | 9 | 38.9 | 64 | 76 | 4 | 8.5 | 29.0 | 30.0 | 5 | 12 | 5 | 12 | 12 |
| 6 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 10.5 | 38.3 | 24.0 | 24.0 | 4 | 21 | 33.0 | 35.0 | 4 | 21 | 20.0 | 20.0 | 4 | 12 | 4 | 8.5 | 35.5 | 64 | 76 | 4 | 7.5 | 28.0 | 30.0 | 5 | 12 | 5 | 12 | 12 |
| 8 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 10 | 34.4 | 24.0 | 24.0 | 4 | 20 | 30.0 | 31.0 | 4 | 20 | 19.0 | 20.0 | 4 | 10.5 | 4 | 8 | 33.5 | 64 | 76 | 4 | 7 | 28.0 | 29.0 | 5 | 12 | 5 | 12 | 0 |
| 10 FT | 8 | 8 | 8 | 8 | 4 | 10.5 | 4 | 9 | 32.9 | 24.0 | 24.0 | 4 | 18 | 29.0 | 30.0 | 4 | 18 | 19.0 | 19.0 | 4 | 9 | 4 | 7.5 | 32.3 | 64 | 76 | 4 | 6.5 | 27.0 | 29.0 | 5 | 12 | 5 | 12 | 0 |
| 12 FT | 8 | 8 | 8 | 8 | 4 | 9.5 | 4 | 8 | 31.9 | 24.0 | 24.0 | 4 | 16 | 28.0 | 30.0 | 4 | 16 | 19.0 | 19.0 | 4 | 7.5 | 4 | 7 | 31.3 | 64 | 76 | 4 | 6 | 27.0 | 29.0 | 5 | 12 | 5 | 12 | 0 |
| 14 FT | 8 | 8 | 8 | 8 | 4 | 8.5 | 4 | 7 | 31.1 | 24.0 | 24.0 | 4 | 14 | 28.0 | 29.0 | 4 | 14 | 19.0 | 19.0 | 4 | 7 | 4 | 6 | 30.8 | 64 | 76 | 5 | 7 | 27.0 | 29.0 | 5 | 12 | 5 | 12 | 0 |
| 16 FT | 8 | 9 | 8 | 8 | 4 | 8 | 4 | 6.5 | 30.8 | 24.0 | 24.0 | 4 | 13 | 28.0 | 29.0 | 4 | 13 | 19.0 | 19.0 | 4 | 7 | 4 | 7 | 30.9 | 65 | 77 | 4 | 6 | 27.0 | 29.0 | 5 | 12 | 5 | 12 | 0 |
| 18 FT | 8 | 9 | 8 | 8 | 4 | 7.5 | 4 | 6.5 | 29.1 | 24.0 | 24.0 | 4 | 12 | 27.0 | 28.0 | 4 | 12 | 19.0 | 19.0 | 4 | 6.5 | 4 | 7 | 29.1 | 65 | 77 | 4 | 6 | 27.0 | 29.0 | 5 | 12 | 5 | 12 | 0 |
| 20 FT | 8 | 9 | 8 | 8 | 4 | 7 | 5 | 7 | 29.0 | 24.0 | 24.0 | 5 | 17 | 27.0 | 28.0 | 5 | 17 | 19.0 | 19.0 | 4 | 6 | 4 | 6.5 | 29.0 | 65 | 77 | 5 | 7.5 | 27.0 | 29.0 | 5 | 12 | 5 | 12 | 0 |
| 22 FT | 9 | 10 | 8 | 8 | 4 | 7 | 4 | 6.5 | 29.1 | 25.0 | 25.0 | 4 | 12 | 26.0 | 29.0 | 4 | 12 | 19.0 | 19.0 | 4 | 6 | 4 | 7.5 | 29.3 | 66 | 78 | 4 | 6 | 27.0 | 29.0 | 5 | 12 | 5 | 12 | 0 |
| 24 FT | 9 | 10 | 8 | 8 | 4 | 6.5 | 4 | 6 | 29.1 | 25.0 | 25.0 | 5 | 17 | 26.0 | 29.0 | 5 | 17 | 19.0 | 19.0 | 5 | 8.5 | 4 | 7 | 29.1 | 66 | 78 | 5 | 7.5 | 27.0 | 29.0 | 5 | 12 | 5 | 12 | 0 |
| 26 FT | 10 | 11 | 8 | 8 | 4 | 6.5 | 5 | 8 | 29.4 | 26.0 | 26.0 | 4 | 12 | 26.0 | 29.0 | 4 | 12 | 19.0 | 19.0 | 4 | 6 | 4 | 6.5 | 29.4 | 67 | 79 | 5 | 8.5 | 26.0 | 29.0 | 5 | 12 | 5 | 12 | 0 |
| 28 FT | 10 | 11 | 8 | 8 | 4 | 6 | 5 | 7.5 | 29.3 | 26.0 | 26.0 | 5 | 17 | 26.0 | 29.0 | 5 | 17 | 19.0 | 19.0 | 5 | 8.5 | 4 | 6 | 29.4 | 67 | 79 | 5 | 8 | 26.0 | 29.0 | 5 | 12 | 5 | 12 | 0 |
| 30 FT | 10 | 12 | 8 | 8 | 5 | 8.5 | 5 | 7.5 | 29.3 | 26.0 | 26.0 | 5 | 16 | 26.0 | 29.0 | 5 | 16 | 19.0 | 19.0 | 5 | 9 | 4 | 6 | 29.5 | 68 | 80 | 5 | 8.5 | 26.0 | 30.0 | 5 | 12 | 5 | 12 | 0 |
| 32 FT | 11 | 12 | 8 | 8 | 5 | 9 | 5 | 8 | 29.5 | 27.0 | 31.0 | 5 | 17 | 26.0 | 29.0 | 5 | 17 | 19.0 | 19.0 | 5 | 8.5 | 5 | 8 | 29.6 | 68 | 80 | 5 | 8 | 26.0 | 30.0 | 5 | 12 | 5 | 12 | 0 |
| 34 FT | 11 | 13 | 8 | 8 | 5 | 8.5 | 5 | 7.5 | 29.5 | 27.0 | 31.0 | 5 | 16 | 26.0 | 29.0 | 5 | 16 | 19.0 | 19.0 | 5 | 8.5 | 5 | 8.5 | 29.8 | 69 | 81 | 5 | 8.5 | 26.0 | 30.0 | 5 | 12 | 5 | 11.5 | 0 |
| 36 FT | 12 | 13 | 8 | 8 | 5 | 8.5 | 5 | 8 | 29.8 | 28.0 | 32.0 | 5 | 17 | 26.0 | 29.0 | 5 | 17 | 18.0 | 19.0 | 5 | 8 | 5 | 8 | 29.9 | 69 | 81 | 5 | 8 | 26.0 | 30.0 | 5 | 12 | 5 | 11 | 0 |
| 38 FT | 12 | 14 | 8 | 8 | 5 | 8 | 5 | 7.5 | 29.8 | 28.0 | 32.0 | 5 | 16 | 26.0 | 29.0 | 5 | 16 | 18.0 | 19.0 | 5 | 8.5 | 5 | 8.5 | 30.1 | 70 | 82 | 5 | 8.5 | 26.0 | 30.0 | 5 | 12 | 5 | 10 | 0 |
| 40 FT | 12 | 14 | 8 | 8 | 5 | 7.5 | 5 | 7 | 29.8 | 28.0 | 32.0 | 5 | 15 | 26.0 | 29.0 | 5 | 15 | 18.0 | 19.0 | 5 | 8 | 5 | 8 | 30.0 | 70 | 82 | 5 | 8 | 26.0 | 30.0 | 5 | 12 | 5 | 9.5 | 0 |
| 42 FT | 13 | 14 | 8 | 8 | 5 | 8 | 5 | 7.5 | 29.9 | 29.0 | 33.0 | 5 | 16 | 26.0 | 29.0 | 5 | 16 | 18.0 | 19.0 | 5 | 7.5 | 5 | 7.5 | 30.1 | 70 | 82 | 5 | 7.5 | 26.0 | 30.0 | 5 | 12 | 5 | 9.5 | 0 |
| 44 FT | 13 | 15 | 8 | 8 | 5 | 7.5 | 5 | 7 | 30.0 | 29.0 | 33.0 | 5 | 15 | 26.0 | 29.0 | 5 | 15 | 18.0 | 19.0 | 5 | 8 | 5 | 8 | 30.4 | 71 | 83 | 5 | 8 | 27.0 | 30.0 | 5 | 12 | 5 | 9.5 | 0 |
| 46 FT | 14 | 15 | 8 | 8 | 5 | 7.5 | 5 | 6.5 | 30.1 | 30.0 | 34.0 | 5 | 16 | 26.0 | 28.0 | 5 | 16 | 18.0 | 19.0 | 5 | 7.5 | 5 | 7.5 | 30.5 | 71 | 83 | 5 | 7.5 | 27.0 | 30.0 | 5 | 12 | 5 | 9.5 | 0 |
| 48 FT | 14 | 15 | 9 | 8 | 5 | 7.5 | 5 | 8 | 30.6 | 30.0 | 34.0 | 5 | 16 | 26.0 | 28.0 | 5 | 16 | 18.0 | 19.0 | 5 | 7.5 | 5 | 8 | 30.8 | 71 | 83 | 5 | 7.5 | 27.0 | 30.0 | 5 | 12 | 5 | 9 | 0 |
| 50 FT | 14 | 16 | 9 | 8 | 5 | 7 | 5 | 7.5 | 30.8 | 30.0 | 34.0 | 5 | 15 | 26.0 | 28.0 | 5 | 15 | 18.0 | 19.0 | 5 | 7.5 | 5 | 8 | 31.0 | 72 | 84 | 5 | 7.5 | 27.0 | 30.0 | 5 | 12 | 5 | 8.5 | 0 |




BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ℄ CULVERT.

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

### GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.


MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

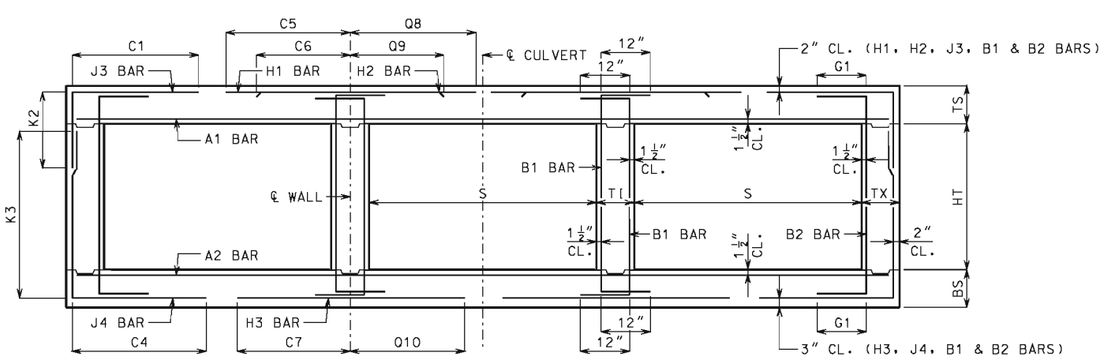
SPAN (S): 5 FEET
HEIGHT (HT): 3 THRU 6 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

703.87

## SPAN (S) = 5 FT HEIGHT (HT) = 7 FT OR 8 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | | | | | | | | | | K2 | | | | | | | | | | | | | | K3 | | | | | | | | | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | HT=7' | HT=8' | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | HT=7' | HT=8' | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 11 | 8 | 8 | 8 | 4 | 6 | 4 | 9 | 33.9 | 27.0 | 27.0 | 4 | 22 | 56.5 | 42.5 | 4 | 22 | 23.0 | 23.0 | 4 | 11 | 4 | 7 | 48.0 | 88 | 100 | 4 | 8 | 46.0 | 31.0 | 5 | 12 | 5 | 12 | 12 |
| 2 FT | 11 | 8 | 8 | 8 | 4 | 6 | 4 | 8.5 | 33.9 | 27.0 | 27.0 | 4 | 21 | 56.5 | 42.5 | 4 | 21 | 23.0 | 23.0 | 4 | 10.5 | 4 | 6.5 | 48.0 | 88 | 100 | 4 | 8 | 32.0 | 31.0 | 5 | 12 | 5 | 12 | 12 |
| 4 FT | 8 | 8 | 8 | 8 | 4 | 9.5 | 4 | 7 | 33.9 | 24.0 | 24.0 | 4 | 20 | 56.5 | 46.0 | 4 | 20 | 21.0 | 21.0 | 4 | 11.5 | 4 | 6 | 48.0 | 88 | 100 | 4 | 8 | 31.0 | 30.0 | 5 | 12 | 5 | 12 | 12 |
| 6 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 7 | 33.9 | 24.0 | 24.0 | 4 | 21 | 56.5 | 35.0 | 4 | 21 | 20.0 | 20.0 | 4 | 11 | 5 | 6 | 48.0 | 88 | 100 | 4 | 7.5 | 29.0 | 30.0 | 5 | 12 | 5 | 12 | 12 |
| 8 FT | 8 | 8 | 8 | 8 | 4 | 12 | 4 | 6.5 | 51.8 | 24.0 | 24.0 | 4 | 20 | 34.0 | 31.0 | 4 | 20 | 19.0 | 20.0 | 4 | 10 | 5 | 6 | 46.0 | 88 | 100 | 4 | 7 | 28.0 | 29.0 | 5 | 12 | 5 | 12 | 0 |
| 10 FT | 8 | 8 | 9 | 8 | 4 | 11 | 4 | 7 | 43.8 | 24.0 | 24.0 | 4 | 18 | 30.0 | 30.0 | 4 | 18 | 19.0 | 20.0 | 4 | 9 | 4 | 6 | 41.6 | 88 | 100 | 4 | 6.5 | 28.0 | 29.0 | 5 | 12 | 5 | 12 | 0 |
| 12 FT | 8 | 8 | 9 | 8 | 4 | 9.5 | 4 | 6 | 41.3 | 24.0 | 24.0 | 4 | 16 | 29.0 | 30.0 | 4 | 16 | 19.0 | 19.0 | 4 | 8 | 5 | 6 | 40.4 | 88 | 100 | 4 | 6 | 27.0 | 29.0 | 5 | 12 | 5 | 12 | 0 |
| 14 FT | 8 | 9 | 9 | 8 | 4 | 9 | 5 | 7 | 39.9 | 24.0 | 28.0 | 4 | 15 | 28.0 | 29.0 | 4 | 15 | 19.0 | 19.0 | 4 | 8 | 5 | 6.5 | 41.4 | 89 | 101 | 4 | 6.5 | 27.0 | 29.0 | 5 | 12 | 5 | 11.5 | 0 |
| 16 FT | 8 | 9 | 9 | 8 | 4 | 8 | 5 | 6 | 39.1 | 24.0 | 28.0 | 4 | 13 | 28.0 | 29.0 | 4 | 13 | 19.0 | 19.0 | 4 | 7 | 5 | 6 | 40.8 | 89 | 101 | 4 | 6 | 27.0 | 29.0 | 5 | 12 | 5 | 11 | 0 |
| 18 FT | 8 | 9 | 9 | 8 | 4 | 7.5 | 5 | 6 | 36.5 | 24.0 | 28.0 | 4 | 13 | 26.0 | 28.0 | 4 | 13 | 19.0 | 19.0 | 4 | 7 | 5 | 6 | 38.1 | 89 | 101 | 4 | 6 | 27.0 | 29.0 | 5 | 12 | 5 | 11.5 | 0 |
| 20 FT | 8 | 9 | 9 | 8 | 4 | 7 | 6 | 7 | 39.1 | 24.0 | 32.0 | 5 | 18 | 26.0 | 28.0 | 5 | 18 | 19.0 | 19.0 | 4 | 6 | 6 | 7 | 40.9 | 89 | 101 | 5 | 7.5 | 27.0 | 29.0 | 5 | 12 | 5 | 10.5 | 0 |
| 22 FT | 8 | 10 | 9 | 8 | 4 | 6.5 | 6 | 7 | 38.8 | 24.0 | 28.0 | 5 | 17 | 27.0 | 28.0 | 5 | 17 | 19.0 | 20.0 | 4 | 6.5 | 5 | 6 | 39.0 | 90 | 102 | 5 | 8 | 27.0 | 29.0 | 5 | 12 | 5 | 10 | 0 |
| 24 FT | 9 | 11 | 9 | 8 | 4 | 6.5 | 5 | 6 | 37.0 | 25.0 | 29.0 | 5 | 18 | 26.0 | 28.0 | 5 | 18 | 19.0 | 19.0 | 4 | 6.5 | 5 | 6 | 39.8 | 91 | 103 | 4 | 6 | 27.0 | 29.0 | 5 | 12 | 5 | 9.5 | 0 |
| 26 FT | 9 | 11 | 9 | 8 | 4 | 6 | 5 | 6 | 36.9 | 25.0 | 29.0 | 5 | 16 | 26.0 | 28.0 | 5 | 16 | 19.0 | 19.0 | 4 | 6 | 5 | 6 | 39.6 | 91 | 103 | 5 | 8.5 | 27.0 | 29.0 | 5 | 12 | 5 | 8.5 | 0 |
| 28 FT | 10 | 12 | 9 | 8 | 4 | 6 | 5 | 6 | 37.9 | 30.0 | 30.0 | 5 | 17 | 26.0 | 28.0 | 5 | 17 | 19.0 | 19.0 | 4 | 6 | 5 | 6 | 40.3 | 92 | 104 | 4 | 6 | 27.0 | 29.0 | 5 | 12 | 5 | 8.5 | 0 |
| 30 FT | 10 | 12 | 9 | 8 | 4 | 6 | 5 | 6 | 37.8 | 30.0 | 30.0 | 5 | 16 | 26.0 | 28.0 | 5 | 16 | 19.0 | 19.0 | 4 | 6 | 6 | 7.5 | 43.1 | 92 | 104 | 5 | 8.5 | 27.0 | 29.0 | 5 | 12 | 5 | 8.5 | 0 |
| 32 FT | 11 | 12 | 10 | 8 | 4 | 6 | 5 | 6.5 | 38.4 | 31.0 | 31.0 | 5 | 17 | 26.0 | 28.0 | 5 | 17 | 18.0 | 19.0 | 5 | 9 | 5 | 6.5 | 39.6 | 92 | 104 | 5 | 8 | 27.0 | 29.0 | 5 | 12 | 5 | 8 | 0 |
| 34 FT | 11 | 13 | 10 | 8 | 5 | 9 | 5 | 6.5 | 38.3 | 31.0 | 31.0 | 5 | 16 | 26.0 | 28.0 | 5 | 16 | 19.0 | 19.0 | 5 | 9 | 5 | 6.5 | 40.4 | 93 | 105 | 5 | 8.5 | 28.0 | 30.0 | 5 | 12 | 5 | 8 | 0 |
| 36 FT | 12 | 13 | 10 | 8 | 5 | 9 | 5 | 6.5 | 39.1 | 32.0 | 32.0 | 5 | 17 | 26.0 | 28.0 | 5 | 17 | 18.0 | 19.0 | 5 | 8.5 | 5 | 6.5 | 40.3 | 93 | 105 | 5 | 8 | 27.0 | 30.0 | 5 | 12 | 5 | 8 | 0 |
| 38 FT | 12 | 14 | 10 | 8 | 5 | 8.5 | 5 | 6 | 39.0 | 32.0 | 32.0 | 5 | 17 | 26.0 | 28.0 | 5 | 17 | 18.0 | 19.0 | 5 | 9 | 5 | 6.5 | 40.9 | 94 | 106 | 5 | 8.5 | 28.0 | 30.0 | 5 | 12 | 5 | 8 | 0 |
| 40 FT | 12 | 14 | 11 | 8 | 5 | 8 | 5 | 7 | 38.9 | 32.0 | 32.0 | 5 | 16 | 26.0 | 28.0 | 5 | 16 | 18.0 | 19.0 | 5 | 8.5 | 5 | 7 | 40.8 | 94 | 106 | 5 | 8 | 28.0 | 30.0 | 5 | 12 | 5 | 7.5 | 0 |
| 42 FT | 13 | 14 | 11 | 8 | 5 | 8.5 | 5 | 7 | 39.6 | 33.0 | 33.0 | 5 | 17 | 26.0 | 28.0 | 5 | 17 | 18.0 | 19.0 | 5 | 8 | 5 | 7 | 40.5 | 94 | 106 | 5 | 7.5 | 28.0 | 30.0 | 5 | 12 | 5 | 7.5 | 0 |
| 44 FT | 13 | 15 | 11 | 8 | 5 | 8 | 5 | 6.5 | 39.5 | 33.0 | 33.0 | 5 | 16 | 26.0 | 28.0 | 5 | 16 | 18.0 | 19.0 | 5 | 8 | 5 | 7 | 41.3 | 95 | 107 | 5 | 8 | 28.0 | 30.0 | 5 | 12 | 5 | 7.5 | 0 |
| 46 FT | 13 | 15 | 12 | 8 | 5 | 7.5 | 5 | 6.5 | 39.5 | 33.0 | 33.0 | 5 | 15 | 26.0 | 28.0 | 5 | 15 | 18.0 | 19.0 | 5 | 8 | 5 | 6.5 | 41.0 | 95 | 107 | 5 | 7.5 | 28.0 | 30.0 | 5 | 12 | 5 | 7 | 0 |
| 48 FT | 14 | 15 | 12 | 8 | 5 | 8 | 5 | 6.5 | 40.3 | 34.0 | 34.0 | 5 | 17 | 26.0 | 27.0 | 5 | 17 | 18.0 | 19.0 | 5 | 7.5 | 5 | 6.5 | 40.9 | 95 | 107 | 5 | 7 | 28.0 | 30.0 | 5 | 12 | 5 | 7 | 0 |
| 50 FT | 14 | 16 | 12 | 8 | 5 | 7.5 | 5 | 6.5 | 40.1 | 34.0 | 34.0 | 5 | 16 | 26.0 | 27.0 | 5 | 16 | 18.0 | 19.0 | 5 | 8 | 5 | 6.5 | 41.6 | 96 | 108 | 5 | 7.5 | 28.0 | 30.0 | 5 | 12 | 5 | 7 | 0 |




BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ℄ CULVERT.

### GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.


MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 5 FEET
HEIGHT (HT): 7 THRU 8 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

703.87



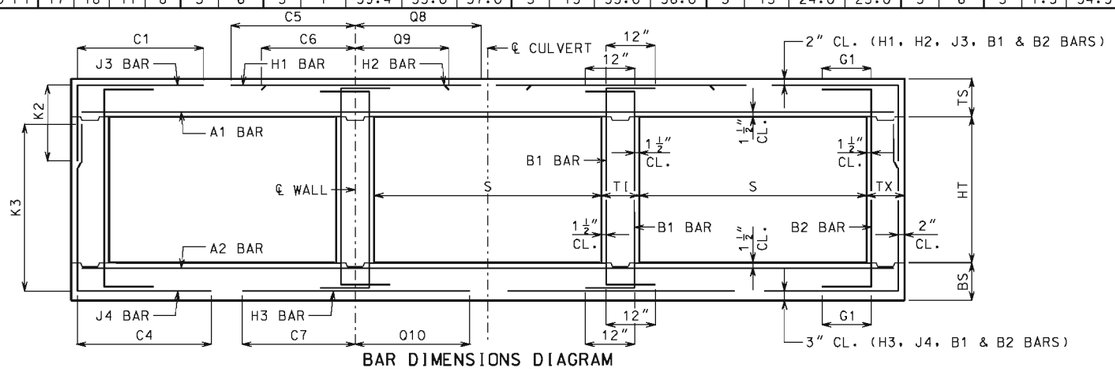

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

## SPAN (S) = 6 FT HEIGHT (HT) = 3 FT OR 4 FT OR 5 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | K2 HT=3′ | K2 HT=4′ | K2 HT=5′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | K3 HT=3′ | K3 HT=4′ | K3 HT=5′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 11 | 8 | 8 | 8 | 5 | 8 | 4 | 9.5 | 37.5 | 27.0 | 27.0 | 27.0 | 4 | 17 | 64.5 | 48.5 | 4 | 17 | 24.0 | 23.0 | 4 | 10 | 4 | 10 | 38.1 | 40 | 52 | 64 | 4 | 7.5 | 33.0 | 34.0 | 5 | 12 | 5 | 12 | 12 |
| 2 FT | 11 | 8 | 8 | 8 | 5 | 8 | 4 | 9.5 | 37.5 | 27.0 | 27.0 | 27.0 | 4 | 17 | 64.5 | 48.5 | 4 | 17 | 23.0 | 22.0 | 4 | 9.5 | 4 | 9 | 35.1 | 40 | 52 | 64 | 4 | 7 | 33.0 | 34.0 | 5 | 12 | 5 | 12 | 12 |
| 4 FT | 8 | 8 | 8 | 8 | 4 | 7.5 | 4 | 8.5 | 35.8 | 24.0 | 24.0 | 24.0 | 4 | 14 | 43.0 | 52.0 | 4 | 14 | 21.0 | 21.0 | 4 | 9 | 4 | 9.5 | 32.1 | 40 | 52 | 64 | 4 | 6.5 | 32.0 | 33.0 | 5 | 12 | 5 | 12 | 12 |
| 6 FT | 8 | 8 | 8 | 8 | 4 | 9 | 4 | 9.5 | 32.6 | 24.0 | 24.0 | 24.0 | 4 | 14 | 35.0 | 38.0 | 4 | 14 | 21.0 | 20.0 | 4 | 8.5 | 4 | 8.5 | 30.0 | 40 | 52 | 64 | 4 | 6 | 31.0 | 32.0 | 5 | 12 | 5 | 12 | 12 |
| 8 FT | 8 | 8 | 8 | 8 | 4 | 9 | 4 | 9 | 30.4 | 24.0 | 24.0 | 24.0 | 4 | 13 | 33.0 | 35.0 | 4 | 13 | 20.0 | 20.0 | 4 | 8 | 4 | 8 | 29.0 | 40 | 52 | 64 | 5 | 7.5 | 30.0 | 32.0 | 5 | 12 | 5 | 12 | 0 |
| 10 FT | 8 | 8 | 8 | 8 | 4 | 8 | 4 | 8 | 29.4 | 24.0 | 24.0 | 24.0 | 4 | 12 | 32.0 | 34.0 | 4 | 12 | 20.0 | 20.0 | 4 | 7 | 4 | 7 | 28.4 | 40 | 52 | 64 | 5 | 6.5 | 30.0 | 32.0 | 5 | 12 | 5 | 12 | 0 |
| 12 FT | 8 | 9 | 8 | 8 | 4 | 7 | 4 | 7 | 28.8 | 24.0 | 24.0 | 24.0 | 5 | 17 | 31.0 | 33.0 | 5 | 17 | 20.0 | 20.0 | 4 | 6.5 | 4 | 9 | 27.4 | 41 | 53 | 65 | 5 | 7 | 30.0 | 32.0 | 5 | 12 | 5 | 12 | 0 |
| 14 FT | 8 | 9 | 8 | 8 | 4 | 6.5 | 4 | 6.5 | 28.3 | 24.0 | 24.0 | 24.0 | 5 | 16 | 31.0 | 32.0 | 5 | 16 | 21.0 | 21.0 | 5 | 9 | 4 | 8 | 26.9 | 41 | 53 | 65 | 5 | 6.5 | 30.0 | 32.0 | 5 | 12 | 5 | 12 | 0 |
| 16 FT | 9 | 10 | 8 | 8 | 4 | 6 | 4 | 7.5 | 27.6 | 25.0 | 25.0 | 25.0 | 5 | 16 | 30.0 | 33.0 | 5 | 16 | 20.0 | 20.0 | 5 | 9 | 4 | 9.5 | 26.5 | 42 | 54 | 66 | 5 | 7 | 29.0 | 32.0 | 5 | 12 | 5 | 12 | 0 |
| 18 FT | 9 | 10 | 8 | 8 | 5 | 9 | 4 | 6.5 | 27.4 | 25.0 | 25.0 | 25.0 | 5 | 16 | 30.0 | 32.0 | 5 | 16 | 21.0 | 21.0 | 5 | 8 | 4 | 8.5 | 26.3 | 42 | 54 | 66 | 5 | 6.5 | 29.0 | 32.0 | 5 | 12 | 5 | 12 | 0 |
| 20 FT | 10 | 11 | 8 | 8 | 5 | 9 | 4 | 7 | 27.0 | 26.0 | 26.0 | 26.0 | 5 | 15 | 30.0 | 33.0 | 5 | 15 | 20.0 | 20.0 | 5 | 8 | 4 | 8.5 | 26.0 | 43 | 55 | 67 | 5 | 7 | 29.0 | 33.0 | 5 | 12 | 5 | 12 | 0 |
| 22 FT | 10 | 11 | 8 | 8 | 5 | 8.5 | 4 | 6.5 | 26.0 | 26.0 | 26.0 | 26.0 | 5 | 15 | 29.0 | 32.0 | 5 | 15 | 20.0 | 20.0 | 5 | 7.5 | 4 | 8.5 | 25.0 | 43 | 55 | 67 | 5 | 7 | 29.0 | 33.0 | 5 | 12 | 5 | 12 | 0 |
| 24 FT | 11 | 12 | 8 | 8 | 5 | 8.5 | 4 | 6.5 | 25.8 | 27.0 | 27.0 | 27.0 | 5 | 15 | 29.0 | 32.0 | 5 | 15 | 20.0 | 20.0 | 5 | 8 | 4 | 8.5 | 24.9 | 44 | 56 | 68 | 5 | 7 | 29.0 | 33.0 | 5 | 12 | 5 | 12 | 0 |
| 26 FT | 11 | 12 | 8 | 8 | 5 | 7.5 | 4 | 6 | 25.6 | 27.0 | 27.0 | 27.0 | 5 | 14 | 29.0 | 32.0 | 5 | 14 | 20.0 | 20.0 | 5 | 6.5 | 4 | 8 | 24.9 | 44 | 56 | 68 | 5 | 6.5 | 29.0 | 33.0 | 5 | 12 | 5 | 12 | 0 |
| 28 FT | 12 | 13 | 8 | 8 | 5 | 7.5 | 4 | 6.5 | 25.5 | 28.0 | 28.0 | 28.0 | 5 | 14 | 29.0 | 32.0 | 5 | 14 | 19.0 | 20.0 | 5 | 7.5 | 4 | 8 | 24.9 | 45 | 57 | 69 | 5 | 7 | 29.0 | 33.0 | 5 | 12 | 5 | 12 | 0 |
| 30 FT | 12 | 14 | 8 | 8 | 5 | 7 | 4 | 6 | 25.6 | 28.0 | 28.0 | 28.0 | 5 | 13 | 29.0 | 32.0 | 5 | 13 | 19.0 | 20.0 | 5 | 7.5 | 4 | 7.5 | 24.8 | 46 | 58 | 70 | 5 | 7 | 28.0 | 33.0 | 5 | 12 | 5 | 12 | 0 |
| 32 FT | 13 | 14 | 8 | 8 | 5 | 7 | 4 | 6 | 25.4 | 29.0 | 29.0 | 29.0 | 5 | 14 | 28.0 | 33.0 | 5 | 14 | 19.0 | 20.0 | 5 | 7 | 4 | 7.5 | 24.9 | 46 | 58 | 70 | 5 | 6.5 | 28.0 | 33.0 | 5 | 12 | 5 | 12 | 0 |
| 34 FT | 13 | 15 | 8 | 8 | 5 | 7 | 5 | 8.5 | 25.6 | 29.0 | 29.0 | 29.0 | 5 | 13 | 28.0 | 32.0 | 5 | 13 | 19.0 | 20.0 | 5 | 7 | 4 | 7 | 24.8 | 47 | 59 | 71 | 5 | 7 | 28.0 | 33.0 | 5 | 12 | 5 | 12 | 0 |
| 36 FT | 14 | 15 | 8 | 8 | 5 | 7 | 4 | 6 | 25.4 | 30.0 | 30.0 | 30.0 | 5 | 13 | 28.0 | 33.0 | 5 | 13 | 19.0 | 20.0 | 5 | 6.5 | 4 | 7 | 25.0 | 47 | 59 | 71 | 5 | 6.5 | 28.0 | 33.0 | 5 | 12 | 5 | 12 | 0 |
| 38 FT | 14 | 16 | 8 | 8 | 5 | 6.5 | 5 | 8.5 | 25.5 | 30.0 | 30.0 | 30.0 | 5 | 13 | 28.0 | 32.0 | 5 | 13 | 19.0 | 20.0 | 5 | 7 | 4 | 6.5 | 24.9 | 48 | 60 | 72 | 5 | 6.5 | 28.0 | 33.0 | 5 | 12 | 5 | 12 | 0 |
| 40 FT | 15 | 16 | 8 | 8 | 5 | 6.5 | 5 | 8 | 30.4 | 31.0 | 31.0 | 31.0 | 5 | 13 | 33.0 | 38.0 | 5 | 13 | 24.0 | 25.0 | 5 | 6.5 | 4 | 6.5 | 25.1 | 48 | 60 | 72 | 5 | 6.5 | 28.0 | 33.0 | 5 | 12 | 5 | 12 | 0 |
| 42 FT | 15 | 17 | 8 | 8 | 5 | 6.5 | 5 | 8 | 30.6 | 31.0 | 31.0 | 31.0 | 5 | 12 | 33.0 | 37.0 | 5 | 12 | 24.0 | 25.0 | 5 | 6.5 | 4 | 6 | 25.1 | 49 | 61 | 73 | 5 | 6.5 | 28.0 | 33.0 | 5 | 12 | 5 | 12 | 0 |
| 44 FT | 16 | 17 | 8 | 8 | 5 | 6.5 | 5 | 7 | 30.5 | 32.0 | 32.0 | 32.0 | 5 | 13 | 33.0 | 37.0 | 5 | 13 | 24.0 | 25.0 | 5 | 6.5 | 4 | 6 | 25.3 | 49 | 61 | 73 | 5 | 6 | 28.0 | 33.0 | 5 | 12 | 5 | 12 | 0 |
| 46 FT | 16 | 17 | 8 | 8 | 5 | 6 | 5 | 7 | 30.5 | 32.0 | 32.0 | 32.0 | 5 | 12 | 33.0 | 37.0 | 5 | 12 | 24.0 | 25.0 | 5 | 6 | 4 | 6 | 25.3 | 49 | 61 | 73 | 5 | 6 | 28.0 | 33.0 | 5 | 12 | 5 | 12 | 0 |
| 48 FT | 17 | 18 | 8 | 8 | 5 | 6 | 5 | 6.5 | 30.6 | 37.0 | 37.0 | 37.0 | 5 | 13 | 33.0 | 37.0 | 5 | 13 | 24.0 | 25.0 | 5 | 6 | 5 | 6.5 | 25.5 | 50 | 62 | 74 | 5 | 6 | 28.0 | 33.0 | 5 | 12 | 5 | 11 | 0 |
| 50 FT | 17 | 18 | 8 | 8 | 5 | 6 | 5 | 6.5 | 30.6 | 37.0 | 37.0 | 37.0 | 5 | 12 | 33.0 | 37.0 | 5 | 12 | 24.0 | 25.0 | 5 | 6 | 5 | 6.5 | 25.4 | 50 | 62 | 74 | 5 | 6 | 28.0 | 33.0 | 5 | 12 | 5 | 10.5 | 0 |

## SPAN (S) = 6 FT HEIGHT (HT) = 6 FT OR 7 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | K2 HT=6′ | K2 HT=7′ | | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | K3 HT=6′ | K3 HT=7′ | | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 11 | 8 | 8 | 8 | 5 | 8 | 4 | 9.5 | 37.5 | 27.0 | 27.0 | | 4 | 17 | 64.5 | 48.5 | 4 | 17 | 24.0 | 24.0 | 4 | 9.5 | 4 | 7.5 | 52.8 | 76 | 88 | | 4 | 7 | 34.0 | 34.0 | 5 | 12 | 5 | 12 | 12 |
| 2 FT | 11 | 8 | 8 | 8 | 5 | 8 | 4 | 9.5 | 37.5 | 27.0 | 27.0 | | 4 | 17 | 64.5 | 48.5 | 4 | 17 | 23.0 | 23.0 | 4 | 8.5 | 4 | 7 | 47.3 | 76 | 88 | | 4 | 6.5 | 33.0 | 34.0 | 5 | 12 | 5 | 12 | 12 |
| 4 FT | 8 | 8 | 8 | 8 | 4 | 7 | 4 | 7 | 37.5 | 24.0 | 24.0 | | 4 | 14 | 64.5 | 52.0 | 4 | 14 | 21.0 | 22.0 | 4 | 8.5 | 4 | 7 | 43.0 | 76 | 88 | | 4 | 6.5 | 32.0 | 34.0 | 5 | 12 | 5 | 12 | 12 |
| 6 FT | 8 | 8 | 8 | 8 | 4 | 8.5 | 4 | 7.5 | 41.9 | 24.0 | 24.0 | | 4 | 14 | 37.0 | 39.0 | 4 | 14 | 21.0 | 21.0 | 4 | 8 | 4 | 6.5 | 39.1 | 76 | 88 | | 4 | 6 | 31.0 | 33.0 | 5 | 12 | 5 | 12 | 12 |
| 8 FT | 8 | 8 | 8 | 8 | 4 | 8.5 | 4 | 7 | 37.6 | 24.0 | 24.0 | | 4 | 13 | 34.0 | 35.0 | 4 | 13 | 20.0 | 20.0 | 4 | 7.5 | 4 | 6 | 36.9 | 76 | 88 | | 5 | 7 | 30.0 | 32.0 | 5 | 12 | 5 | 12 | 0 |
| 10 FT | 8 | 8 | 8 | 8 | 4 | 8 | 4 | 6 | 36.0 | 24.0 | 24.0 | | 4 | 12 | 32.0 | 34.0 | 4 | 12 | 20.0 | 20.0 | 4 | 6.5 | 5 | 6 | 35.4 | 76 | 88 | | 5 | 6.5 | 30.0 | 32.0 | 5 | 12 | 5 | 12 | 0 |
| 12 FT | 8 | 9 | 8 | 8 | 4 | 7 | 5 | 6.5 | 34.8 | 24.0 | 24.0 | | 5 | 17 | 31.0 | 33.0 | 5 | 17 | 20.0 | 20.0 | 4 | 6.5 | 4 | 6 | 35.0 | 77 | 89 | | 5 | 7 | 30.0 | 32.0 | 5 | 12 | 5 | 12 | 0 |
| 14 FT | 8 | 9 | 8 | 8 | 4 | 6 | 5 | 6 | 33.9 | 24.0 | 28.0 | | 5 | 16 | 31.0 | 33.0 | 5 | 16 | 21.0 | 21.0 | 5 | 8.5 | 5 | 6.5 | 34.1 | 77 | 89 | | 5 | 6.5 | 30.0 | 32.0 | 5 | 12 | 5 | 12 | 0 |
| 16 FT | 9 | 10 | 8 | 8 | 4 | 6 | 5 | 6.5 | 33.8 | 25.0 | 25.0 | | 5 | 16 | 30.0 | 33.0 | 5 | 16 | 20.0 | 20.0 | 5 | 9 | 4 | 6 | 34.0 | 78 | 90 | | 5 | 7 | 29.0 | 33.0 | 5 | 12 | 5 | 12 | 0 |
| 18 FT | 9 | 10 | 8 | 8 | 5 | 9 | 5 | 6.5 | 33.4 | 25.0 | 29.0 | | 5 | 16 | 30.0 | 32.0 | 5 | 16 | 21.0 | 21.0 | 5 | 8 | 5 | 6.5 | 33.6 | 78 | 90 | | 5 | 6.5 | 29.0 | 32.0 | 5 | 12 | 5 | 12 | 0 |
| 20 FT | 9 | 11 | 8 | 8 | 5 | 8 | 5 | 6 | 33.1 | 25.0 | 29.0 | | 5 | 16 | 30.0 | 32.0 | 5 | 16 | 21.0 | 22.0 | 5 | 8 | 5 | 7 | 33.8 | 79 | 91 | | 5 | 7.5 | 29.0 | 33.0 | 5 | 12 | 5 | 12 | 0 |
| 22 FT | 10 | 11 | 8 | 8 | 5 | 8.5 | 5 | 7 | 31.6 | 26.0 | 30.0 | | 5 | 15 | 29.0 | 32.0 | 5 | 15 | 20.0 | 20.0 | 5 | 7.5 | 5 | 7 | 31.9 | 79 | 91 | | 5 | 7 | 29.0 | 33.0 | 5 | 12 | 5 | 12 | 0 |
| 24 FT | 10 | 12 | 8 | 8 | 5 | 7.5 | 5 | 6.5 | 31.6 | 26.0 | 30.0 | | 5 | 15 | 29.0 | 32.0 | 5 | 15 | 20.0 | 21.0 | 5 | 8 | 5 | 7.5 | 32.0 | 80 | 92 | | 5 | 7 | 29.0 | 33.0 | 5 | 12 | 5 | 12 | 0 |
| 26 FT | 11 | 13 | 8 | 8 | 5 | 8 | 5 | 6.5 | 31.9 | 27.0 | 31.0 | | 5 | 14 | 29.0 | 32.0 | 5 | 14 | 20.0 | 20.0 | 5 | 8 | 5 | 7.5 | 32.3 | 81 | 93 | | 5 | 7.5 | 29.0 | 33.0 | 5 | 12 | 5 | 11 | 0 |
| 28 FT | 12 | 13 | 8 | 8 | 5 | 8 | 5 | 7 | 31.9 | 28.0 | 32.0 | | 5 | 14 | 29.0 | 32.0 | 5 | 14 | 19.0 | 20.0 | 5 | 7.5 | 5 | 7 | 32.3 | 81 | 93 | | 5 | 7 | 29.0 | 33.0 | 5 | 12 | 5 | 10 | 0 |
| 30 FT | 12 | 14 | 8 | 8 | 5 | 7.5 | 5 | 6.5 | 32.0 | 28.0 | 32.0 | | 5 | 13 | 29.0 | 32.0 | 5 | 13 | 19.0 | 20.0 | 5 | 7.5 | 5 | 7.5 | 32.4 | 82 | 94 | | 5 | 7 | 29.0 | 33.0 | 5 | 12 | 5 | 9.5 | 0 |
| 32 FT | 13 | 14 | 8 | 8 | 5 | 7.5 | 5 | 6.5 | 32.0 | 33.0 | 33.0 | | 5 | 14 | 28.0 | 32.0 | 5 | 14 | 19.0 | 20.0 | 5 | 7 | 5 | 7 | 32.5 | 82 | 94 | | 5 | 6.5 | 29.0 | 33.0 | 5 | 12 | 5 | 9.5 | 0 |
| 34 FT | 13 | 15 | 8 | 8 | 5 | 7 | 5 | 6.5 | 32.1 | 33.0 | 33.0 | | 5 | 13 | 28.0 | 32.0 | 5 | 13 | 19.0 | 20.0 | 5 | 7 | 5 | 7 | 32.6 | 83 | 95 | | 5 | 7 | 29.0 | 33.0 | 5 | 12 | 5 | 9.5 | 0 |
| 36 FT | 14 | 15 | 8 | 8 | 5 | 7 | 5 | 6 | 32.3 | 34.0 | 34.0 | | 5 | 14 | 28.0 | 32.0 | 5 | 14 | 19.0 | 20.0 | 5 | 7 | 5 | 6.5 | 32.8 | 83 | 95 | | 5 | 6.5 | 29.0 | 33.0 | 5 | 12 | 5 | 9.5 | 0 |
| 38 FT | 14 | 16 | 9 | 8 | 5 | 6.5 | 5 | 7 | 32.9 | 30.0 | 34.0 | | 5 | 13 | 28.0 | 32.0 | 5 | 13 | 19.0 | 20.0 | 5 | 7 | 5 | 8 | 33.1 | 84 | 96 | | 5 | 6.5 | 29.0 | 33.0 | 5 | 12 | 5 | 8.5 | 0 |
| 40 FT | 14 | 16 | 10 | 8 | 5 | 6 | 5 | 7.5 | 33.3 | 30.0 | 34.0 | | 5 | 12 | 28.0 | 32.0 | 5 | 12 | 19.0 | 20.0 | 5 | 6.5 | 5 | 7.5 | 33.4 | 84 | 96 | | 5 | 6.5 | 29.0 | 33.0 | 5 | 12 | 5 | 9.5 | 0 |
| 42 FT | 15 | 17 | 10 | 8 | 5 | 6.5 | 5 | 7.5 | 38.5 | 31.0 | 35.0 | | 5 | 13 | 33.0 | 37.0 | 5 | 13 | 24.0 | 25.0 | 5 | 7 | 5 | 7.5 | 33.6 | 85 | 97 | | 5 | 6.5 | 29.0 | 33.0 | 5 | 12 | 5 | 9 | 0 |
| 44 FT | 15 | 17 | 10 | 8 | 5 | 6.5 | 5 | 7.5 | 38.5 | 31.0 | 35.0 | | 5 | 12 | 33.0 | 37.0 | 5 | 12 | 24.0 | 25.0 | 5 | 6.5 | 5 | 7.5 | 33.6 | 85 | 97 | | 5 | 6 | 29.0 | 33.0 | 5 | 12 | 5 | 8.5 | 0 |
| 46 FT | 16 | 17 | 10 | 8 | 5 | 6.5 | 5 | 7 | 38.6 | 32.0 | 36.0 | | 5 | 13 | 33.0 | 36.0 | 5 | 13 | 24.0 | 25.0 | 5 | 6 | 5 | 7.5 | 33.8 | 85 | 97 | | 5 | 6 | 29.0 | 33.0 | 5 | 12 | 5 | 8 | 0 |
| 48 FT | 16 | 18 | 11 | 8 | 5 | 6 | 5 | 7 | 39.3 | 32.0 | 36.0 | | 5 | 12 | 33.0 | 36.0 | 5 | 12 | 24.0 | 25.0 | 5 | 6.5 | 5 | 7.5 | 34.1 | 86 | 98 | | 5 | 6 | 29.0 | 34.0 | 5 | 12 | 5 | 8.5 | 0 |
| 50 FT | 17 | 18 | 11 | 8 | 5 | 6 | 5 | 7 | 39.4 | 33.0 | 37.0 | | 5 | 13 | 33.0 | 36.0 | 5 | 13 | 24.0 | 25.0 | 5 | 6 | 5 | 7.5 | 34.3 | 86 | 98 | | 5 | 6 | 29.0 | 33.0 | 5 | 12 | 5 | 8 | 0 |




BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ℄ CULVERT.

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

### GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.


MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

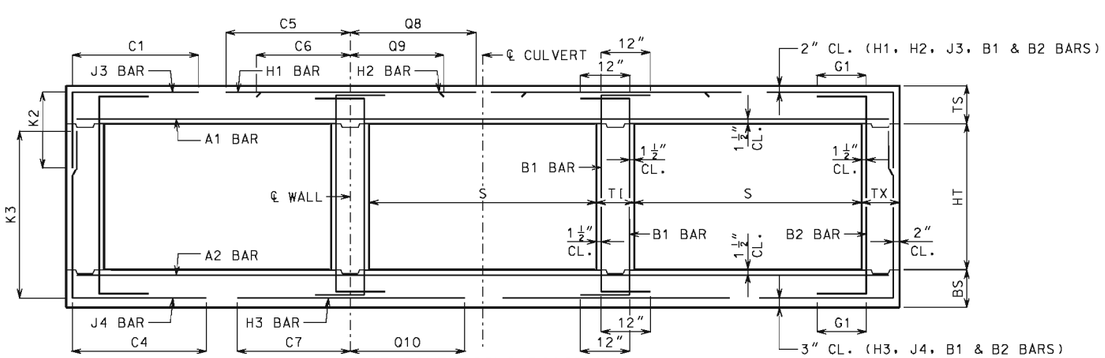
SPAN (S): 6 FEET
HEIGHT (HT): 3 THRU 7 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

703.87

## SPAN (S) = 6 FT HEIGHT (HT) = 8 FT OR 9 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | | | | | | | | | | K2 | | | | | | | | | | | | | | K3 | | | | | | | | | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | HT=8′ | HT=9′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | HT=8′ | HT=9′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 11 | 8 | 8 | 8 | 5 | 7.5 | 4 | 7 | 37.5 | 27.0 | 27.0 | 4 | 17 | 64.5 | 48.5 | 4 | 17 | 24.0 | 25.0 | 4 | 8.5 | 5 | 6.5 | 54.0 | 100 | 112 | 4 | 7 | 52.0 | 35.0 | 5 | 12 | 5 | 12 | 12 |
| 2 FT | 11 | 8 | 8 | 8 | 5 | 7.5 | 4 | 6.5 | 37.5 | 27.0 | 27.0 | 4 | 17 | 64.5 | 48.5 | 4 | 17 | 23.0 | 24.0 | 4 | 8 | 5 | 6 | 54.0 | 100 | 112 | 4 | 6.5 | 35.0 | 34.0 | 5 | 12 | 5 | 12 | 12 |
| 4 FT | 8 | 8 | 9 | 8 | 4 | 7 | 4 | 6 | 38.1 | 24.0 | 24.0 | 4 | 14 | 64.5 | 52.0 | 4 | 14 | 22.0 | 22.0 | 4 | 8 | 5 | 6.5 | 54.8 | 100 | 112 | 4 | 6 | 33.0 | 34.0 | 5 | 12 | 5 | 12 | 12 |
| 6 FT | 8 | 8 | 9 | 8 | 4 | 8.5 | 4 | 6 | 38.1 | 24.0 | 24.0 | 4 | 14 | 64.5 | 40.0 | 4 | 14 | 21.0 | 21.0 | 4 | 8 | 5 | 6 | 50.8 | 100 | 112 | 4 | 6 | 32.0 | 33.0 | 5 | 12 | 5 | 12 | 12 |
| 8 FT | 8 | 9 | 9 | 8 | 4 | 8.5 | 4 | 6 | 50.1 | 24.0 | 24.0 | 4 | 14 | 35.0 | 35.0 | 4 | 14 | 20.0 | 20.0 | 4 | 8.5 | 5 | 6.5 | 50.8 | 101 | 113 | 4 | 6.5 | 31.0 | 33.0 | 5 | 12 | 5 | 12 | 0 |
| 10 FT | 8 | 9 | 9 | 8 | 4 | 8 | 5 | 6.5 | 45.8 | 24.0 | 28.0 | 4 | 12 | 33.0 | 33.0 | 4 | 12 | 20.0 | 20.0 | 4 | 7.5 | 5 | 6 | 47.5 | 101 | 113 | 4 | 6 | 31.0 | 33.0 | 5 | 12 | 5 | 11 | 0 |
| 12 FT | 8 | 9 | 10 | 8 | 4 | 7 | 5 | 6.5 | 43.0 | 24.0 | 28.0 | 5 | 17 | 32.0 | 33.0 | 5 | 17 | 20.0 | 20.0 | 4 | 6.5 | 5 | 6.5 | 44.8 | 101 | 113 | 5 | 7 | 30.0 | 32.0 | 5 | 12 | 5 | 11 | 0 |
| 14 FT | 8 | 9 | 10 | 8 | 4 | 6.5 | 5 | 6 | 41.6 | 28.0 | 28.0 | 5 | 17 | 31.0 | 32.0 | 5 | 17 | 21.0 | 21.0 | 4 | 6 | 5 | 6 | 43.5 | 101 | 113 | 5 | 6.5 | 30.0 | 32.0 | 5 | 12 | 5 | 10 | 0 |
| 16 FT | 8 | 10 | 10 | 8 | 4 | 6 | 6 | 7 | 43.3 | 28.0 | 28.0 | 5 | 16 | 30.0 | 32.0 | 5 | 16 | 22.0 | 22.0 | 5 | 9 | 5 | 6 | 44.4 | 102 | 114 | 5 | 7 | 30.0 | 33.0 | 5 | 12 | 5 | 9.5 | 0 |
| 18 FT | 9 | 10 | 10 | 8 | 4 | 6 | 5 | 6 | 41.8 | 29.0 | 29.0 | 5 | 16 | 30.0 | 32.0 | 5 | 16 | 20.0 | 21.0 | 5 | 8.5 | 6 | 7.5 | 46.4 | 102 | 114 | 5 | 7 | 30.0 | 32.0 | 5 | 12 | 5 | 9 | 0 |
| 20 FT | 9 | 11 | 10 | 8 | 5 | 8.5 | 5 | 6 | 41.0 | 29.0 | 29.0 | 5 | 16 | 30.0 | 32.0 | 5 | 16 | 21.0 | 22.0 | 5 | 8.5 | 5 | 6 | 44.4 | 103 | 115 | 5 | 7 | 30.0 | 33.0 | 5 | 12 | 5 | 8.5 | 0 |
| 22 FT | 10 | 11 | 10 | 8 | 5 | 9 | 5 | 6.5 | 39.9 | 30.0 | 30.0 | 5 | 15 | 29.0 | 32.0 | 5 | 15 | 20.0 | 20.0 | 5 | 8 | 5 | 6 | 41.4 | 103 | 115 | 5 | 7 | 30.0 | 33.0 | 5 | 12 | 5 | 9 | 0 |
| 24 FT | 10 | 12 | 10 | 8 | 5 | 8 | 5 | 6.5 | 39.5 | 30.0 | 30.0 | 5 | 15 | 29.0 | 32.0 | 5 | 15 | 20.0 | 21.0 | 5 | 8 | 5 | 6 | 42.3 | 104 | 116 | 5 | 7 | 30.0 | 33.0 | 5 | 12 | 5 | 8.5 | 0 |
| 26 FT | 11 | 12 | 10 | 8 | 5 | 8 | 5 | 6 | 40.5 | 31.0 | 31.0 | 5 | 14 | 29.0 | 32.0 | 5 | 14 | 19.0 | 20.0 | 5 | 7 | 5 | 6 | 41.9 | 104 | 116 | 5 | 6.5 | 30.0 | 33.0 | 5 | 12 | 5 | 8 | 0 |
| 28 FT | 11 | 13 | 10 | 8 | 5 | 7.5 | 5 | 6 | 40.3 | 31.0 | 31.0 | 5 | 14 | 29.0 | 32.0 | 5 | 14 | 20.0 | 20.0 | 5 | 7.5 | 5 | 6 | 42.8 | 105 | 117 | 5 | 7 | 30.0 | 33.0 | 5 | 12 | 5 | 8 | 0 |
| 30 FT | 12 | 14 | 10 | 8 | 5 | 8 | 5 | 6 | 41.0 | 32.0 | 32.0 | 5 | 14 | 29.0 | 31.0 | 5 | 14 | 19.0 | 20.0 | 5 | 8 | 5 | 6 | 43.3 | 106 | 118 | 5 | 7 | 30.0 | 33.0 | 5 | 12 | 5 | 8 | 0 |
| 32 FT | 12 | 14 | 11 | 8 | 5 | 7.5 | 5 | 6.5 | 40.8 | 32.0 | 32.0 | 5 | 13 | 29.0 | 31.0 | 5 | 13 | 19.0 | 20.0 | 5 | 7.5 | 5 | 7 | 42.9 | 106 | 118 | 5 | 6.5 | 30.0 | 33.0 | 5 | 12 | 5 | 7.5 | 0 |
| 34 FT | 13 | 15 | 11 | 8 | 5 | 7.5 | 5 | 6.5 | 41.5 | 33.0 | 33.0 | 5 | 13 | 28.0 | 31.0 | 5 | 13 | 19.0 | 20.0 | 5 | 7.5 | 5 | 7 | 43.5 | 107 | 119 | 5 | 7 | 30.0 | 33.0 | 5 | 12 | 5 | 7.5 | 0 |
| 36 FT | 13 | 15 | 11 | 8 | 5 | 7 | 5 | 6 | 41.4 | 33.0 | 33.0 | 5 | 13 | 28.0 | 31.0 | 5 | 13 | 19.0 | 20.0 | 5 | 7 | 5 | 6.5 | 43.4 | 107 | 119 | 5 | 6.5 | 30.0 | 33.0 | 5 | 12 | 5 | 7.5 | 0 |
| 38 FT | 14 | 16 | 12 | 8 | 5 | 7 | 5 | 6.5 | 42.1 | 34.0 | 34.0 | 5 | 13 | 28.0 | 31.0 | 5 | 13 | 19.0 | 20.0 | 5 | 7 | 5 | 6.5 | 43.8 | 108 | 120 | 5 | 6.5 | 30.0 | 33.0 | 5 | 12 | 5 | 7 | 0 |
| 40 FT | 14 | 16 | 12 | 8 | 5 | 7 | 5 | 6 | 42.0 | 34.0 | 34.0 | 5 | 13 | 28.0 | 31.0 | 5 | 13 | 19.0 | 20.0 | 5 | 7 | 5 | 6.5 | 43.6 | 108 | 120 | 5 | 6.5 | 30.0 | 33.0 | 5 | 12 | 5 | 7 | 0 |
| 42 FT | 15 | 17 | 12 | 8 | 5 | 7 | 5 | 6 | 47.6 | 35.0 | 35.0 | 5 | 13 | 33.0 | 36.0 | 5 | 13 | 24.0 | 25.0 | 5 | 7 | 5 | 6.5 | 44.3 | 109 | 121 | 5 | 6.5 | 30.0 | 33.0 | 5 | 12 | 5 | 7 | 0 |
| 44 FT | 15 | 17 | 13 | 8 | 5 | 6.5 | 5 | 6 | 47.6 | 35.0 | 35.0 | 5 | 13 | 33.0 | 36.0 | 5 | 13 | 24.0 | 25.0 | 5 | 6.5 | 5 | 6 | 44.0 | 109 | 121 | 5 | 6 | 30.0 | 33.0 | 5 | 12 | 5 | 6.5 | 0 |
| 46 FT | 15 | 17 | 13 | 8 | 5 | 6 | 5 | 6 | 47.6 | 35.0 | 35.0 | 5 | 12 | 33.0 | 36.0 | 5 | 12 | 24.0 | 25.0 | 5 | 6 | 5 | 6 | 43.9 | 109 | 121 | 5 | 6 | 30.0 | 33.0 | 5 | 12 | 5 | 6.5 | 0 |
| 48 FT | 16 | 18 | 13 | 8 | 5 | 6.5 | 5 | 6 | 48.3 | 36.0 | 36.0 | 5 | 13 | 33.0 | 35.0 | 5 | 13 | 24.0 | 25.0 | 5 | 6.5 | 5 | 6 | 44.5 | 110 | 122 | 5 | 6 | 30.0 | 33.0 | 5 | 12 | 5 | 6.5 | 0 |
| 50 FT | 16 | 18 | 14 | 8 | 5 | 6 | 5 | 6 | 48.3 | 36.0 | 36.0 | 5 | 12 | 33.0 | 35.0 | 5 | 12 | 24.0 | 25.0 | 5 | 6 | 5 | 6 | 44.3 | 110 | 122 | 6 | 8.5 | 32.0 | 37.0 | 5 | 12 | 5 | 6.5 | 0 |




BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ℄ CULVERT.

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

### GENERAL NOTES:

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CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.


MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 6 FEET
HEIGHT (HT): 8 THRU 9 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

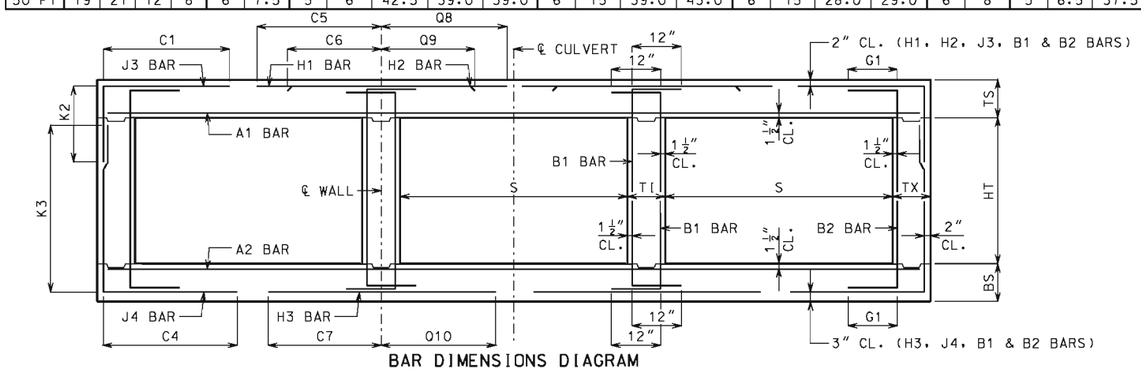
703.87

## SPAN (S) = 7 FT  HEIGHT (HT) = 4 FT OR 5 FT OR 6 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | | | | | | | | | | K2 | | | | | | | | | | | | | | | K3 | | | | | | | | | | | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | HT=4′ | HT=5′ | HT=6′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | HT=4′ | HT=5′ | HT=6′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 12 | 8 | 8 | 8 | 5 | 7.5 | 4 | 8.5 | 41.1 | 28.0 | 28.0 | 28.0 | 4 | 16 | 72.5 | 54.5 | 4 | 16 | 25.0 | 25.0 | 4 | 8.5 | 4 | 7.5 | 42.5 | 52 | 64 | 76 | 4 | 6 | 36.0 | 37.0 | 5 | 12 | 5 | 12 | 12 |
| 2 FT | 12 | 8 | 8 | 8 | 5 | 7.5 | 4 | 8.5 | 41.1 | 28.0 | 28.0 | 28.0 | 4 | 15 | 72.5 | 54.5 | 4 | 15 | 24.0 | 24.0 | 4 | 7.5 | 4 | 7 | 39.0 | 52 | 64 | 76 | 5 | 7.5 | 35.0 | 37.0 | 5 | 12 | 5 | 12 | 12 |
| 4 FT | 8 | 8 | 8 | 8 | 4 | 6 | 4 | 6.5 | 39.5 | 24.0 | 24.0 | 24.0 | 5 | 17 | 47.0 | 58.0 | 5 | 17 | 23.0 | 23.0 | 4 | 7 | 4 | 7 | 36.0 | 52 | 64 | 76 | 5 | 7 | 35.0 | 37.0 | 5 | 12 | 5 | 12 | 12 |
| 6 FT | 8 | 8 | 8 | 8 | 4 | 6.5 | 4 | 7 | 36.0 | 24.0 | 24.0 | 24.0 | 5 | 17 | 38.0 | 42.0 | 5 | 17 | 22.0 | 22.0 | 4 | 6.5 | 4 | 6.5 | 33.4 | 52 | 64 | 76 | 5 | 6.5 | 34.0 | 36.0 | 5 | 12 | 5 | 12 | 12 |
| 8 FT | 8 | 8 | 8 | 8 | 4 | 6.5 | 4 | 6.5 | 33.5 | 24.0 | 24.0 | 24.0 | 5 | 17 | 36.0 | 38.0 | 5 | 17 | 23.0 | 22.0 | 5 | 9 | 4 | 6 | 32.0 | 52 | 64 | 76 | 5 | 6 | 33.0 | 35.0 | 5 | 12 | 5 | 12 | 0 |
| 10 FT | 8 | 9 | 8 | 8 | 4 | 6 | 5 | 7 | 32.3 | 24.0 | 24.0 | 24.0 | 5 | 16 | 35.0 | 37.0 | 5 | 16 | 23.0 | 23.0 | 5 | 9 | 4 | 7 | 30.9 | 53 | 65 | 77 | 5 | 6.5 | 33.0 | 35.0 | 5 | 12 | 5 | 12 | 0 |
| 12 FT | 8 | 9 | 8 | 8 | 4 | 6 | 5 | 6 | 31.4 | 24.0 | 24.0 | 24.0 | 5 | 14 | 34.0 | 36.0 | 5 | 14 | 23.0 | 23.0 | 5 | 7.5 | 4 | 6 | 30.1 | 53 | 65 | 77 | 5 | 6 | 32.0 | 35.0 | 5 | 12 | 5 | 12 | 0 |
| 14 FT | 9 | 10 | 8 | 8 | 5 | 8.5 | 4 | 6 | 30.5 | 25.0 | 25.0 | 25.0 | 5 | 15 | 33.0 | 36.0 | 5 | 15 | 23.0 | 23.0 | 5 | 7.5 | 4 | 7 | 29.5 | 54 | 66 | 78 | 5 | 6 | 32.0 | 36.0 | 5 | 12 | 5 | 12 | 0 |
| 16 FT | 10 | 11 | 8 | 8 | 5 | 8 | 5 | 8 | 29.9 | 26.0 | 26.0 | 26.0 | 5 | 15 | 33.0 | 36.0 | 5 | 15 | 22.0 | 22.0 | 5 | 7.5 | 4 | 7 | 29.0 | 55 | 67 | 79 | 5 | 6.5 | 32.0 | 36.0 | 5 | 12 | 5 | 12 | 0 |
| 18 FT | 10 | 11 | 8 | 8 | 5 | 8 | 5 | 7.5 | 29.5 | 26.0 | 26.0 | 26.0 | 5 | 15 | 33.0 | 36.0 | 5 | 15 | 23.0 | 24.0 | 5 | 6 | 4 | 6.5 | 28.6 | 55 | 67 | 79 | 5 | 6 | 32.0 | 36.0 | 5 | 12 | 5 | 12 | 0 |
| 20 FT | 11 | 12 | 8 | 8 | 5 | 7.5 | 5 | 8.5 | 29.1 | 27.0 | 27.0 | 27.0 | 5 | 14 | 32.0 | 36.0 | 5 | 14 | 22.0 | 23.0 | 5 | 6.5 | 4 | 6.5 | 28.4 | 56 | 68 | 80 | 5 | 6 | 31.0 | 36.0 | 5 | 12 | 5 | 12 | 0 |
| 22 FT | 12 | 13 | 8 | 8 | 5 | 7 | 5 | 8.5 | 28.9 | 28.0 | 28.0 | 28.0 | 5 | 13 | 32.0 | 36.0 | 5 | 13 | 21.0 | 22.0 | 5 | 6.5 | 4 | 6 | 28.3 | 57 | 69 | 81 | 5 | 6 | 31.0 | 36.0 | 5 | 12 | 5 | 12 | 0 |
| 24 FT | 12 | 13 | 8 | 8 | 5 | 7 | 5 | 8.5 | 27.6 | 28.0 | 28.0 | 28.0 | 5 | 13 | 31.0 | 36.0 | 5 | 13 | 21.0 | 22.0 | 5 | 6 | 4 | 6 | 27.1 | 57 | 69 | 81 | 6 | 8 | 34.0 | 39.0 | 5 | 12 | 5 | 12 | 0 |
| 26 FT | 13 | 14 | 8 | 8 | 5 | 6.5 | 5 | 8.5 | 27.5 | 29.0 | 29.0 | 29.0 | 5 | 12 | 31.0 | 36.0 | 5 | 12 | 20.0 | 21.0 | 5 | 6.5 | 4 | 6 | 27.1 | 58 | 70 | 82 | 5 | 6 | 31.0 | 36.0 | 5 | 12 | 5 | 12 | 0 |
| 28 FT | 13 | 15 | 8 | 8 | 5 | 6.5 | 5 | 8.5 | 27.6 | 29.0 | 29.0 | 29.0 | 5 | 12 | 31.0 | 36.0 | 5 | 12 | 21.0 | 22.0 | 5 | 6.5 | 4 | 6.5 | 27.0 | 59 | 71 | 83 | 5 | 6 | 31.0 | 37.0 | 5 | 12 | 5 | 12 | 0 |
| 30 FT | 14 | 15 | 8 | 8 | 5 | 6 | 5 | 8.5 | 27.5 | 30.0 | 30.0 | 34.0 | 5 | 12 | 31.0 | 36.0 | 5 | 12 | 20.0 | 21.0 | 5 | 6 | 5 | 8.5 | 27.1 | 59 | 71 | 83 | 6 | 8 | 34.0 | 39.0 | 5 | 12 | 5 | 12 | 0 |
| 32 FT | 15 | 16 | 8 | 8 | 5 | 6 | 5 | 8 | 32.5 | 31.0 | 31.0 | 35.0 | 6 | 17 | 39.0 | 45.0 | 6 | 17 | 29.0 | 30.0 | 5 | 6 | 5 | 8 | 27.3 | 60 | 72 | 84 | 6 | 8 | 34.0 | 40.0 | 5 | 12 | 5 | 12 | 0 |
| 34 FT | 15 | 17 | 8 | 8 | 5 | 6 | 5 | 8 | 32.6 | 31.0 | 31.0 | 31.0 | 6 | 16 | 39.0 | 45.0 | 6 | 16 | 29.0 | 30.0 | 5 | 6 | 4 | 6 | 27.3 | 61 | 73 | 85 | 6 | 8.5 | 34.0 | 40.0 | 5 | 12 | 5 | 11.5 | 0 |
| 36 FT | 16 | 17 | 8 | 8 | 5 | 6 | 5 | 7 | 32.5 | 32.0 | 32.0 | 36.0 | 6 | 16 | 39.0 | 45.0 | 6 | 16 | 29.0 | 30.0 | 6 | 8.5 | 5 | 7 | 27.4 | 61 | 73 | 85 | 6 | 8 | 34.0 | 40.0 | 5 | 12 | 5 | 11 | 0 |
| 38 FT | 16 | 18 | 8 | 8 | 6 | 8 | 5 | 7 | 32.6 | 32.0 | 36.0 | 36.0 | 6 | 15 | 39.0 | 45.0 | 6 | 15 | 29.0 | 30.0 | 5 | 6 | 5 | 6.5 | 27.4 | 62 | 74 | 86 | 6 | 8 | 34.0 | 40.0 | 5 | 12 | 5 | 10 | 0 |
| 40 FT | 17 | 18 | 8 | 8 | 6 | 8 | 5 | 6.5 | 32.6 | 37.0 | 37.0 | 37.0 | 6 | 16 | 39.0 | 45.0 | 6 | 16 | 29.0 | 30.0 | 6 | 8 | 5 | 6.5 | 27.6 | 62 | 74 | 86 | 6 | 7.5 | 34.0 | 40.0 | 5 | 12 | 5 | 9.5 | 0 |
| 42 FT | 17 | 19 | 8 | 8 | 6 | 7.5 | 5 | 6.5 | 32.8 | 37.0 | 37.0 | 37.0 | 6 | 15 | 39.0 | 45.0 | 6 | 15 | 29.0 | 30.0 | 6 | 8 | 5 | 6.5 | 27.6 | 63 | 75 | 87 | 6 | 8 | 34.0 | 40.0 | 5 | 12 | 5 | 9.5 | 0 |
| 44 FT | 18 | 19 | 8 | 8 | 6 | 7.5 | 5 | 6.5 | 32.6 | 38.0 | 38.0 | 38.0 | 6 | 15 | 39.0 | 45.0 | 6 | 15 | 29.0 | 30.0 | 6 | 7.5 | 5 | 6.5 | 27.8 | 63 | 75 | 87 | 6 | 7.5 | 34.0 | 40.0 | 5 | 12 | 5 | 9.5 | 0 |
| 46 FT | 18 | 20 | 8 | 8 | 6 | 7.5 | 5 | 6.5 | 32.8 | 38.0 | 38.0 | 38.0 | 6 | 15 | 39.0 | 44.0 | 6 | 15 | 29.0 | 30.0 | 6 | 8 | 5 | 6 | 27.8 | 64 | 76 | 88 | 6 | 7.5 | 34.0 | 40.0 | 5 | 12 | 5 | 9.5 | 0 |
| 48 FT | 19 | 20 | 8 | 8 | 6 | 7.5 | 5 | 6 | 32.8 | 39.0 | 39.0 | 39.0 | 6 | 15 | 39.0 | 44.0 | 6 | 15 | 29.0 | 30.0 | 6 | 7.5 | 5 | 6 | 27.9 | 64 | 76 | 88 | 6 | 7 | 34.0 | 40.0 | 5 | 12 | 5 | 9.5 | 0 |
| 50 FT | 19 | 21 | 8 | 8 | 6 | 7 | 5 | 6 | 32.9 | 39.0 | 39.0 | 39.0 | 6 | 14 | 39.0 | 44.0 | 6 | 14 | 29.0 | 30.0 | 6 | 7.5 | 6 | 7.5 | 31.0 | 65 | 77 | 89 | 6 | 7.5 | 34.0 | 40.0 | 5 | 12 | 5 | 9 | 0 |

## SPAN (S) = 7 FT  HEIGHT (HT) = 7 FT OR 8 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | | | | | | | | | | K2 | | | | | | | | | | | | | | | K3 | | | | | | | | | | | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | HT=7′ | HT=8′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | HT=7′ | HT=8′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 12 | 8 | 8 | 8 | 5 | 7.5 | 4 | 8 | 41.1 | 28.0 | 28.0 | 4 | 16 | 72.5 | 54.5 | 4 | 16 | 25.0 | 26.0 | 4 | 8 | 4 | 6 | 57.4 | 88 | 100 | 4 | 6 | 37.0 | 37.0 | 5 | 12 | 5 | 12 | 12 |
| 2 FT | 12 | 8 | 8 | 8 | 5 | 7.5 | 4 | 7.5 | 41.1 | 28.0 | 28.0 | 4 | 15 | 72.5 | 54.5 | 4 | 15 | 25.0 | 25.0 | 4 | 7 | 5 | 6.5 | 51.3 | 88 | 100 | 5 | 7 | 36.0 | 37.0 | 5 | 12 | 5 | 12 | 12 |
| 4 FT | 8 | 8 | 9 | 8 | 4 | 6 | 4 | 6 | 41.8 | 24.0 | 24.0 | 5 | 17 | 73.5 | 58.0 | 5 | 17 | 23.0 | 23.0 | 4 | 7 | 4 | 6.5 | 45.9 | 88 | 100 | 5 | 7 | 35.0 | 37.0 | 5 | 12 | 5 | 12 | 12 |
| 6 FT | 8 | 8 | 9 | 8 | 4 | 6.5 | 4 | 6 | 44.3 | 24.0 | 24.0 | 5 | 17 | 40.0 | 43.0 | 5 | 17 | 22.0 | 22.0 | 4 | 6.5 | 5 | 6.5 | 41.8 | 88 | 100 | 5 | 6.5 | 34.0 | 36.0 | 5 | 12 | 5 | 12 | 12 |
| 8 FT | 8 | 8 | 9 | 8 | 4 | 6.5 | 4 | 6 | 40.9 | 24.0 | 24.0 | 5 | 17 | 37.0 | 38.0 | 5 | 17 | 22.0 | 23.0 | 5 | 9 | 5 | 6 | 39.9 | 88 | 100 | 5 | 6 | 33.0 | 35.0 | 5 | 12 | 5 | 12 | 0 |
| 10 FT | 8 | 9 | 9 | 8 | 4 | 6 | 5 | 6.5 | 39.1 | 24.0 | 28.0 | 5 | 16 | 35.0 | 37.0 | 5 | 16 | 23.0 | 23.0 | 5 | 9 | 5 | 7 | 39.4 | 89 | 101 | 5 | 6.5 | 33.0 | 36.0 | 5 | 12 | 5 | 12 | 0 |
| 12 FT | 8 | 9 | 9 | 8 | 4 | 6 | 6 | 7 | 41.0 | 24.0 | 28.0 | 5 | 15 | 34.0 | 36.0 | 5 | 15 | 23.0 | 24.0 | 5 | 7 | 5 | 6 | 38.3 | 89 | 101 | 5 | 6 | 32.0 | 35.0 | 5 | 12 | 5 | 12 | 0 |
| 14 FT | 9 | 10 | 9 | 8 | 5 | 8.5 | 5 | 6 | 37.8 | 25.0 | 29.0 | 5 | 15 | 34.0 | 36.0 | 5 | 15 | 23.0 | 23.0 | 5 | 7.5 | 5 | 6.5 | 37.9 | 90 | 102 | 5 | 6 | 32.0 | 36.0 | 5 | 12 | 5 | 12 | 0 |
| 16 FT | 10 | 11 | 9 | 8 | 5 | 8 | 5 | 7 | 37.4 | 26.0 | 30.0 | 5 | 15 | 33.0 | 36.0 | 5 | 15 | 22.0 | 22.0 | 5 | 7.5 | 5 | 7 | 37.6 | 91 | 103 | 5 | 6.5 | 32.0 | 36.0 | 5 | 12 | 5 | 12 | 0 |
| 18 FT | 10 | 11 | 9 | 8 | 5 | 8 | 5 | 6.5 | 36.8 | 30.0 | 30.0 | 5 | 15 | 33.0 | 36.0 | 5 | 15 | 23.0 | 23.0 | 5 | 6 | 5 | 6.5 | 36.9 | 91 | 103 | 5 | 6 | 32.0 | 36.0 | 5 | 12 | 5 | 12 | 0 |
| 20 FT | 11 | 12 | 9 | 8 | 5 | 7.5 | 5 | 6.5 | 36.8 | 31.0 | 31.0 | 5 | 14 | 32.0 | 36.0 | 5 | 14 | 21.0 | 22.0 | 5 | 7 | 5 | 6.5 | 37.0 | 92 | 104 | 5 | 6 | 32.0 | 36.0 | 5 | 12 | 5 | 11 | 0 |
| 22 FT | 11 | 13 | 9 | 8 | 5 | 7 | 5 | 6 | 36.5 | 31.0 | 31.0 | 5 | 14 | 32.0 | 35.0 | 5 | 14 | 22.0 | 23.0 | 5 | 7 | 5 | 7 | 37.0 | 93 | 105 | 5 | 6 | 32.0 | 36.0 | 5 | 12 | 5 | 10 | 0 |
| 24 FT | 12 | 13 | 9 | 8 | 5 | 7 | 5 | 7 | 34.8 | 32.0 | 32.0 | 5 | 13 | 31.0 | 35.0 | 5 | 13 | 21.0 | 22.0 | 5 | 6 | 5 | 7 | 35.0 | 93 | 105 | 6 | 8 | 34.0 | 39.0 | 5 | 12 | 5 | 10.5 | 0 |
| 26 FT | 13 | 14 | 9 | 8 | 5 | 7 | 5 | 7 | 34.9 | 33.0 | 33.0 | 5 | 12 | 31.0 | 35.0 | 5 | 12 | 20.0 | 21.0 | 5 | 6.5 | 5 | 7.5 | 35.3 | 94 | 106 | 5 | 6 | 31.0 | 36.0 | 5 | 12 | 5 | 9.5 | 0 |
| 28 FT | 13 | 15 | 9 | 8 | 5 | 6.5 | 5 | 6.5 | 34.9 | 33.0 | 33.0 | 5 | 12 | 31.0 | 35.0 | 5 | 12 | 21.0 | 22.0 | 5 | 6.5 | 5 | 7.5 | 35.4 | 95 | 107 | 5 | 6 | 31.0 | 36.0 | 5 | 12 | 5 | 9 | 0 |
| 30 FT | 14 | 15 | 9 | 8 | 5 | 6.5 | 5 | 7 | 35.0 | 34.0 | 34.0 | 5 | 12 | 31.0 | 35.0 | 5 | 12 | 20.0 | 21.0 | 5 | 6 | 5 | 7 | 35.4 | 95 | 107 | 6 | 8 | 34.0 | 39.0 | 5 | 12 | 5 | 8.5 | 0 |
| 32 FT | 14 | 16 | 9 | 8 | 5 | 6 | 5 | 6 | 35.0 | 34.0 | 34.0 | 5 | 12 | 31.0 | 35.0 | 5 | 12 | 20.0 | 21.0 | 5 | 6 | 5 | 7 | 35.5 | 96 | 108 | 6 | 8 | 35.0 | 39.0 | 5 | 12 | 5 | 8.5 | 0 |
| 34 FT | 15 | 17 | 10 | 8 | 5 | 6 | 5 | 7 | 40.8 | 35.0 | 35.0 | 6 | 16 | 40.0 | 44.0 | 6 | 16 | 29.0 | 30.0 | 5 | 6 | 5 | 7.5 | 36.0 | 97 | 109 | 6 | 8.5 | 35.0 | 40.0 | 5 | 12 | 5 | 8.5 | 0 |
| 36 FT | 16 | 17 | 10 | 8 | 5 | 6 | 5 | 7 | 40.8 | 36.0 | 36.0 | 6 | 17 | 39.0 | 44.0 | 6 | 17 | 29.0 | 30.0 | 5 | 6 | 5 | 7.5 | 36.0 | 97 | 109 | 6 | 8 | 35.0 | 40.0 | 5 | 12 | 5 | 8 | 0 |
| 38 FT | 16 | 18 | 11 | 8 | 5 | 6 | 5 | 7 | 41.5 | 36.0 | 36.0 | 6 | 16 | 39.0 | 44.0 | 6 | 16 | 29.0 | 30.0 | 5 | 6 | 5 | 7 | 36.5 | 98 | 110 | 6 | 8 | 35.0 | 40.0 | 5 | 12 | 5 | 8.5 | 0 |
| 40 FT | 17 | 18 | 11 | 8 | 5 | 6 | 5 | 7 | 41.5 | 37.0 | 37.0 | 6 | 16 | 39.0 | 43.0 | 6 | 16 | 29.0 | 30.0 | 6 | 8 | 5 | 7 | 36.5 | 98 | 110 | 6 | 7.5 | 35.0 | 40.0 | 5 | 12 | 5 | 8 | 0 |
| 42 FT | 17 | 19 | 11 | 8 | 6 | 8 | 5 | 6.5 | 41.6 | 37.0 | 37.0 | 6 | 16 | 39.0 | 43.0 | 6 | 16 | 29.0 | 30.0 | 6 | 8.5 | 5 | 7 | 36.8 | 99 | 111 | 6 | 7.5 | 35.0 | 40.0 | 5 | 12 | 5 | 7.5 | 0 |
| 44 FT | 18 | 19 | 12 | 8 | 6 | 8 | 5 | 6.5 | 42.3 | 38.0 | 38.0 | 6 | 16 | 39.0 | 43.0 | 6 | 16 | 29.0 | 29.0 | 6 | 8 | 5 | 6.5 | 37.0 | 99 | 111 | 6 | 7.5 | 35.0 | 40.0 | 5 | 12 | 5 | 8 | 0 |
| 46 FT | 18 | 20 | 12 | 8 | 6 | 8 | 5 | 6.5 | 42.4 | 38.0 | 38.0 | 6 | 15 | 39.0 | 43.0 | 6 | 15 | 29.0 | 29.0 | 6 | 8 | 5 | 6.5 | 37.1 | 100 | 112 | 6 | 7.5 | 35.0 | 40.0 | 5 | 12 | 5 | 7.5 | 0 |
| 48 FT | 18 | 20 | 12 | 8 | 6 | 7.5 | 5 | 6.5 | 42.4 | 38.0 | 38.0 | 6 | 15 | 39.0 | 43.0 | 6 | 15 | 29.0 | 29.0 | 6 | 7.5 | 5 | 6.5 | 37.1 | 100 | 112 | 6 | 7 | 35.0 | 40.0 | 5 | 12 | 5 | 7.5 | 0 |
| 50 FT | 19 | 21 | 12 | 8 | 6 | 7.5 | 5 | 6 | 42.5 | 39.0 | 39.0 | 6 | 15 | 39.0 | 43.0 | 6 | 15 | 28.0 | 29.0 | 6 | 8 | 5 | 6.5 | 37.5 | 101 | 113 | 6 | 7.5 | 35.0 | 40.0 | 5 | 12 | 5 | 7 | 0 |




BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ℄ CULVERT.

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

### GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.


MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

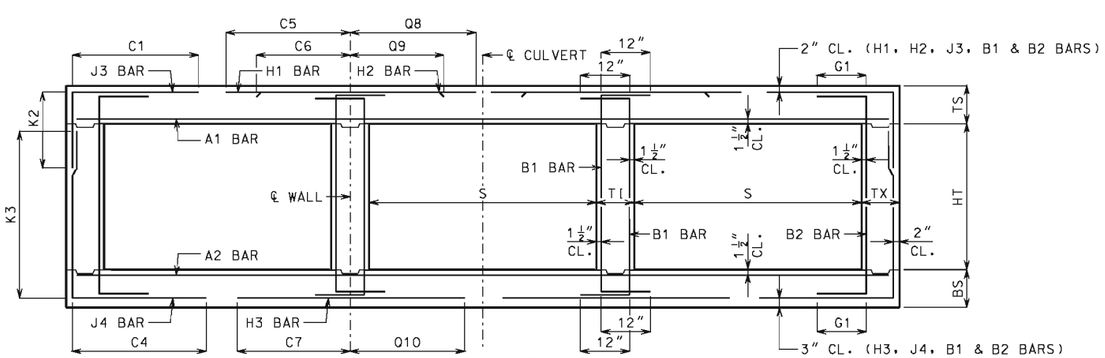
SPAN (S): 7 FEET
HEIGHT (HT): 4 THRU 8 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

703.87

SPAN (S) = 7 FT HEIGHT (HT) = 9 FT OR 10 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | | | | | | | | | | K2 | | | | | | | | | | | | | | | K3 | | | | | | | | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | HT=9' | HT=10' | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | HT=9' | HT=10' | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 12 | 9 | 8 | 8 | 5 | 7.5 | 5 | 9 | 41.1 | 28.0 | 32.0 | 4 | 16 | 72.5 | 54.5 | 4 | 16 | 26.0 | 27.0 | 4 | 8 | 5 | 6 | 60.0 | 113 | 125 | 4 | 7 | 58.0 | 38.0 | 5 | 12 | 5 | 12 | 12 |
| 2 FT | 12 | 9 | 8 | 8 | 5 | 7 | 5 | 8.5 | 41.1 | 28.0 | 32.0 | 4 | 15 | 72.5 | 54.5 | 4 | 15 | 25.0 | 26.0 | 4 | 7.5 | 6 | 7 | 63.0 | 113 | 125 | 4 | 6.5 | 39.0 | 38.0 | 5 | 12 | 5 | 12 | 12 |
| 4 FT | 8 | 9 | 9 | 8 | 4 | 6 | 5 | 6 | 44.8 | 24.0 | 28.0 | 5 | 17 | 75.5 | 58.0 | 5 | 17 | 23.0 | 23.0 | 4 | 7 | 5 | 6 | 60.8 | 113 | 125 | 4 | 6 | 37.0 | 38.0 | 5 | 12 | 5 | 11 | 12 |
| 6 FT | 8 | 9 | 10 | 8 | 4 | 6.5 | 5 | 6.5 | 59.1 | 24.0 | 28.0 | 5 | 17 | 45.0 | 43.0 | 5 | 17 | 22.0 | 22.0 | 4 | 7 | 5 | 6.5 | 56.3 | 113 | 125 | 5 | 7.5 | 34.0 | 37.0 | 5 | 12 | 5 | 11 | 12 |
| 8 FT | 8 | 9 | 10 | 8 | 4 | 6.5 | 5 | 6.5 | 50.8 | 28.0 | 28.0 | 5 | 17 | 38.0 | 38.0 | 5 | 17 | 22.0 | 22.0 | 4 | 6.5 | 5 | 6 | 51.8 | 113 | 125 | 5 | 7 | 33.0 | 36.0 | 5 | 12 | 5 | 10.5 | 0 |
| 10 FT | 8 | 9 | 10 | 8 | 4 | 6 | 6 | 7.5 | 50.9 | 28.0 | 32.0 | 5 | 16 | 36.0 | 37.0 | 5 | 16 | 23.0 | 23.0 | 5 | 9 | 6 | 6.5 | 52.6 | 113 | 125 | 5 | 6 | 33.0 | 36.0 | 5 | 12 | 5 | 9.5 | 0 |
| 12 FT | 8 | 10 | 10 | 8 | 4 | 6 | 6 | 6.5 | 48.5 | 28.0 | 32.0 | 5 | 15 | 35.0 | 36.0 | 5 | 15 | 23.0 | 24.0 | 5 | 8.5 | 6 | 7 | 53.1 | 114 | 126 | 5 | 6.5 | 33.0 | 36.0 | 5 | 12 | 5 | 9 | 0 |
| 14 FT | 9 | 10 | 10 | 8 | 5 | 8.5 | 5 | 6 | 46.4 | 29.0 | 29.0 | 5 | 16 | 34.0 | 36.0 | 5 | 16 | 23.0 | 23.0 | 5 | 8 | 6 | 7 | 51.3 | 114 | 126 | 5 | 6 | 33.0 | 36.0 | 5 | 12 | 5 | 8.5 | 0 |
| 16 FT | 9 | 11 | 10 | 8 | 5 | 8 | 5 | 6 | 44.8 | 29.0 | 29.0 | 5 | 15 | 33.0 | 35.0 | 5 | 15 | 23.0 | 24.0 | 5 | 7.5 | 6 | 7 | 51.8 | 115 | 127 | 5 | 6 | 33.0 | 36.0 | 5 | 12 | 5 | 8 | 0 |
| 18 FT | 10 | 12 | 10 | 8 | 5 | 8 | 5 | 6.5 | 45.3 | 30.0 | 30.0 | 5 | 15 | 33.0 | 35.0 | 5 | 15 | 22.0 | 23.0 | 5 | 7.5 | 6 | 7 | 51.8 | 116 | 128 | 5 | 6.5 | 33.0 | 36.0 | 5 | 12 | 5 | 8 | 0 |
| 20 FT | 11 | 12 | 10 | 8 | 5 | 7.5 | 5 | 6 | 46.1 | 31.0 | 31.0 | 5 | 14 | 33.0 | 35.0 | 5 | 14 | 21.0 | 22.0 | 5 | 7 | 6 | 6.5 | 50.8 | 116 | 128 | 5 | 6 | 33.0 | 36.0 | 5 | 12 | 5 | 8 | 0 |
| 22 FT | 11 | 13 | 10 | 8 | 5 | 7.5 | 5 | 6 | 45.4 | 31.0 | 31.0 | 5 | 14 | 32.0 | 35.0 | 5 | 14 | 22.0 | 23.0 | 5 | 7 | 6 | 6.5 | 51.4 | 117 | 129 | 5 | 6 | 33.0 | 36.0 | 5 | 12 | 5 | 8 | 0 |
| 24 FT | 12 | 13 | 10 | 8 | 5 | 7 | 5 | 6 | 43.4 | 32.0 | 32.0 | 5 | 13 | 31.0 | 35.0 | 5 | 13 | 21.0 | 22.0 | 5 | 6 | 6 | 6.5 | 48.0 | 117 | 129 | 6 | 8 | 35.0 | 39.0 | 5 | 12 | 5 | 8 | 0 |
| 26 FT | 12 | 14 | 10 | 8 | 5 | 7 | 6 | 7.5 | 46.1 | 32.0 | 36.0 | 5 | 13 | 31.0 | 35.0 | 5 | 13 | 21.0 | 22.0 | 5 | 6.5 | 6 | 7 | 48.6 | 118 | 130 | 6 | 8.5 | 35.0 | 39.0 | 5 | 12 | 5 | 8 | 0 |
| 28 FT | 13 | 15 | 11 | 8 | 5 | 6.5 | 5 | 6 | 43.6 | 33.0 | 33.0 | 5 | 12 | 31.0 | 35.0 | 5 | 12 | 20.0 | 21.0 | 5 | 6.5 | 5 | 6.5 | 45.9 | 119 | 131 | 5 | 6 | 32.0 | 36.0 | 5 | 12 | 5 | 7.5 | 0 |
| 30 FT | 14 | 15 | 11 | 8 | 5 | 6.5 | 5 | 6 | 44.3 | 34.0 | 34.0 | 5 | 12 | 31.0 | 35.0 | 5 | 12 | 20.0 | 21.0 | 5 | 6 | 5 | 6 | 45.5 | 119 | 131 | 6 | 8 | 35.0 | 39.0 | 5 | 12 | 5 | 7.5 | 0 |
| 32 FT | 14 | 16 | 12 | 8 | 5 | 6.5 | 5 | 6 | 44.1 | 34.0 | 34.0 | 5 | 12 | 31.0 | 34.0 | 5 | 12 | 20.0 | 21.0 | 5 | 6.5 | 5 | 6 | 45.9 | 120 | 132 | 6 | 8 | 35.0 | 40.0 | 5 | 12 | 5 | 7 | 0 |
| 34 FT | 15 | 17 | 12 | 8 | 5 | 6.5 | 5 | 6 | 49.6 | 35.0 | 35.0 | 6 | 17 | 40.0 | 43.0 | 6 | 17 | 29.0 | 30.0 | 5 | 6.5 | 5 | 6.5 | 46.5 | 121 | 133 | 6 | 8 | 36.0 | 40.0 | 5 | 12 | 5 | 7 | 0 |
| 36 FT | 15 | 17 | 13 | 8 | 5 | 6 | 5 | 6 | 49.6 | 35.0 | 35.0 | 6 | 16 | 40.0 | 43.0 | 6 | 16 | 29.0 | 30.0 | 5 | 6 | 5 | 6 | 46.0 | 121 | 133 | 6 | 7.5 | 35.0 | 40.0 | 5 | 12 | 5 | 6.5 | 0 |
| 38 FT | 16 | 18 | 13 | 8 | 5 | 6 | 6 | 8.5 | 54.1 | 36.0 | 36.0 | 6 | 16 | 40.0 | 43.0 | 6 | 16 | 29.0 | 29.0 | 5 | 6 | 5 | 6 | 46.6 | 122 | 134 | 6 | 8 | 36.0 | 40.0 | 5 | 12 | 5 | 6.5 | 0 |
| 40 FT | 16 | 18 | 13 | 8 | 6 | 8.5 | 6 | 8 | 54.0 | 36.0 | 36.0 | 6 | 15 | 40.0 | 43.0 | 6 | 15 | 29.0 | 30.0 | 5 | 6 | 5 | 6 | 46.5 | 122 | 134 | 6 | 7.5 | 36.0 | 40.0 | 5 | 12 | 5 | 6.5 | 0 |
| 42 FT | 17 | 19 | 14 | 8 | 5 | 6 | 6 | 8 | 54.8 | 37.0 | 37.0 | 6 | 16 | 39.0 | 42.0 | 6 | 16 | 29.0 | 29.0 | 5 | 6 | 5 | 6 | 46.9 | 123 | 135 | 6 | 7.5 | 36.0 | 40.0 | 5 | 12 | 5 | 6 | 0 |
| 44 FT | 17 | 19 | 14 | 8 | 6 | 8 | 6 | 8 | 54.6 | 37.0 | 37.0 | 6 | 15 | 39.0 | 42.0 | 6 | 15 | 29.0 | 29.0 | 6 | 8 | 5 | 6 | 46.8 | 123 | 135 | 6 | 7 | 36.0 | 40.0 | 5 | 12 | 5 | 6 | 0 |
| 46 FT | 18 | 20 | 14 | 8 | 6 | 8 | 6 | 7.5 | 55.3 | 38.0 | 38.0 | 6 | 16 | 39.0 | 42.0 | 6 | 16 | 28.0 | 29.0 | 6 | 8 | 5 | 6 | 47.3 | 124 | 136 | 6 | 7.5 | 36.0 | 40.0 | 5 | 12 | 5 | 6 | 0 |
| 48 FT | 18 | 20 | 15 | 8 | 6 | 7.5 | 6 | 8 | 55.4 | 38.0 | 42.0 | 6 | 15 | 39.0 | 42.0 | 6 | 15 | 28.0 | 29.0 | 6 | 7.5 | 6 | 8 | 50.0 | 124 | 136 | 6 | 7 | 36.0 | 40.0 | 5 | 12 | 6 | 8.5 | 0 |
| 50 FT | 18 | 21 | 15 | 8 | 6 | 7 | 6 | 7.5 | 55.4 | 38.0 | 42.0 | 6 | 14 | 39.0 | 42.0 | 6 | 14 | 28.0 | 29.0 | 6 | 8 | 6 | 8 | 50.6 | 125 | 137 | 6 | 7 | 36.0 | 40.0 | 5 | 12 | 6 | 8 | 0 |




BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ℄ CULVERT.

## GENERAL NOTES:

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CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.


MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 7 FEET
HEIGHT (HT): 9 THRU 10 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

703.87



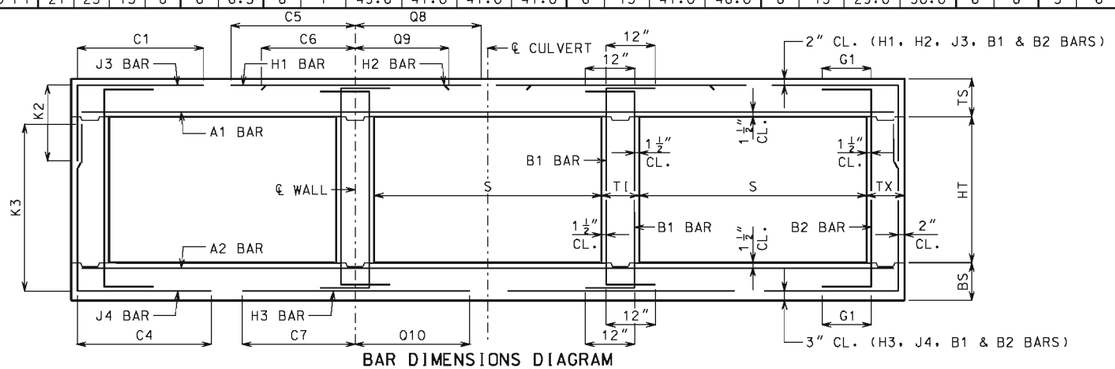

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

## SPAN (S) = 8 FT HEIGHT (HT) = 4 FT OR 5 FT OR 6 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | K2 HT=4′ | K2 HT=5′ | K2 HT=6′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | K3 HT=4′ | K3 HT=5′ | K3 HT=6′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 12 | 8 | 8 | 8 | 5 | 7 | 4 | 8.5 | 44.8 | 28.0 | 28.0 | 28.0 | 4 | 13 | 81.5 | 60.5 | 4 | 13 | 27.0 | 23.0 | 4 | 7.5 | 4 | 6.5 | 42.0 | 52 | 64 | 76 | 5 | 7 | 39.0 | 40.0 | 5 | 12 | 5 | 12 | 12 |
| 2 FT | 12 | 8 | 8 | 8 | 5 | 7 | 4 | 8.5 | 44.8 | 28.0 | 28.0 | 28.0 | 4 | 12 | 81.5 | 60.5 | 4 | 12 | 26.0 | 25.0 | 4 | 6.5 | 4 | 6 | 38.8 | 52 | 64 | 76 | 5 | 6.5 | 38.0 | 40.0 | 5 | 12 | 5 | 12 | 12 |
| 4 FT | 8 | 8 | 8 | 8 | 4 | 6 | 5 | 6 | 40.6 | 24.0 | 24.0 | 24.0 | 5 | 16 | 50.0 | 64.0 | 5 | 16 | 27.0 | 27.0 | 4 | 6 | 4 | 6 | 35.4 | 52 | 64 | 76 | 5 | 6 | 38.0 | 40.0 | 5 | 11 | 5 | 12 | 12 |
| 6 FT | 8 | 8 | 8 | 8 | 4 | 6 | 5 | 6.5 | 36.5 | 28.0 | 24.0 | 28.0 | 5 | 15 | 42.0 | 45.0 | 5 | 15 | 26.0 | 26.0 | 5 | 8.5 | 5 | 6.5 | 33.5 | 52 | 64 | 76 | 6 | 7 | 39.0 | 41.0 | 5 | 12 | 5 | 12 | 12 |
| 8 FT | 8 | 9 | 8 | 8 | 4 | 6 | 5 | 6 | 34.4 | 24.0 | 24.0 | 24.0 | 5 | 14 | 39.0 | 41.0 | 5 | 14 | 25.0 | 25.0 | 5 | 8 | 4 | 6.5 | 31.9 | 53 | 65 | 77 | 5 | 6 | 36.0 | 39.0 | 5 | 12 | 5 | 12 | 0 |
| 10 FT | 9 | 10 | 8 | 8 | 5 | 8.5 | 4 | 6 | 32.6 | 25.0 | 25.0 | 25.0 | 5 | 15 | 38.0 | 41.0 | 5 | 15 | 25.0 | 25.0 | 5 | 8 | 4 | 7.5 | 30.5 | 54 | 66 | 78 | 5 | 6 | 35.0 | 39.0 | 5 | 12 | 5 | 12 | 0 |
| 12 FT | 9 | 10 | 8 | 8 | 5 | 8.5 | 5 | 6.5 | 31.6 | 25.0 | 25.0 | 25.0 | 5 | 14 | 37.0 | 40.0 | 5 | 14 | 24.0 | 25.0 | 5 | 7 | 4 | 6.5 | 29.8 | 54 | 66 | 78 | 6 | 7 | 38.0 | 42.0 | 5 | 12 | 5 | 12 | 0 |
| 14 FT | 10 | 11 | 8 | 8 | 5 | 8 | 5 | 7.5 | 30.5 | 26.0 | 26.0 | 26.0 | 5 | 14 | 36.0 | 40.0 | 5 | 14 | 24.0 | 25.0 | 5 | 6.5 | 4 | 6.5 | 29.0 | 55 | 67 | 79 | 5 | 6 | 34.0 | 39.0 | 5 | 12 | 5 | 12 | 0 |
| 16 FT | 11 | 12 | 8 | 8 | 5 | 7.5 | 5 | 8.5 | 29.6 | 27.0 | 27.0 | 27.0 | 5 | 14 | 35.0 | 40.0 | 5 | 14 | 24.0 | 25.0 | 5 | 6.5 | 4 | 6.5 | 28.4 | 56 | 68 | 80 | 5 | 6 | 34.0 | 39.0 | 5 | 12 | 5 | 12 | 0 |
| 18 FT | 11 | 13 | 8 | 8 | 5 | 7.5 | 5 | 8 | 29.5 | 27.0 | 27.0 | 27.0 | 5 | 13 | 35.0 | 39.0 | 5 | 13 | 24.0 | 25.0 | 5 | 6 | 4 | 6.5 | 27.6 | 57 | 69 | 81 | 6 | 8 | 37.0 | 43.0 | 5 | 12 | 5 | 12 | 0 |
| 20 FT | 12 | 14 | 8 | 8 | 5 | 7 | 5 | 8.5 | 28.8 | 28.0 | 28.0 | 28.0 | 5 | 13 | 35.0 | 39.0 | 5 | 13 | 24.0 | 25.0 | 5 | 6 | 4 | 6.5 | 27.3 | 58 | 70 | 82 | 6 | 8 | 36.0 | 43.0 | 5 | 12 | 5 | 12 | 0 |
| 22 FT | 13 | 14 | 8 | 8 | 5 | 6.5 | 5 | 8.5 | 28.1 | 29.0 | 29.0 | 29.0 | 5 | 12 | 34.0 | 40.0 | 5 | 12 | 23.0 | 24.0 | 6 | 8 | 4 | 6 | 27.4 | 58 | 70 | 82 | 6 | 7.5 | 37.0 | 43.0 | 5 | 12 | 5 | 12 | 0 |
| 24 FT | 14 | 15 | 8 | 8 | 5 | 6 | 5 | 8.5 | 27.9 | 30.0 | 30.0 | 30.0 | 5 | 12 | 34.0 | 40.0 | 5 | 12 | 22.0 | 23.0 | 6 | 8 | 4 | 6 | 27.3 | 59 | 71 | 83 | 6 | 7.5 | 36.0 | 43.0 | 5 | 12 | 5 | 12 | 0 |
| 26 FT | 15 | 16 | 8 | 8 | 6 | 8.5 | 5 | 8 | 32.6 | 31.0 | 31.0 | 31.0 | 6 | 16 | 42.0 | 49.0 | 6 | 16 | 30.0 | 32.0 | 6 | 8 | 4 | 6 | 27.3 | 60 | 72 | 84 | 6 | 7.5 | 36.0 | 43.0 | 5 | 12 | 5 | 12 | 0 |
| 28 FT | 15 | 16 | 8 | 8 | 6 | 8 | 5 | 8 | 31.6 | 31.0 | 31.0 | 31.0 | 6 | 16 | 42.0 | 48.0 | 6 | 16 | 31.0 | 32.0 | 6 | 7.5 | 4 | 6 | 26.1 | 60 | 72 | 84 | 6 | 7 | 36.0 | 43.0 | 5 | 12 | 5 | 12 | 0 |
| 30 FT | 16 | 17 | 8 | 8 | 6 | 8 | 5 | 7 | 31.5 | 32.0 | 32.0 | 32.0 | 6 | 15 | 42.0 | 48.0 | 6 | 15 | 30.0 | 31.0 | 6 | 7.5 | 4 | 6 | 26.3 | 61 | 73 | 85 | 6 | 7 | 36.0 | 43.0 | 5 | 12 | 5 | 12 | 0 |
| 32 FT | 16 | 18 | 8 | 8 | 6 | 7.5 | 5 | 7 | 31.6 | 32.0 | 36.0 | 36.0 | 6 | 15 | 42.0 | 48.0 | 6 | 15 | 31.0 | 32.0 | 6 | 7.5 | 5 | 6.5 | 26.1 | 62 | 74 | 86 | 6 | 7 | 36.0 | 43.0 | 5 | 12 | 5 | 12 | 0 |
| 34 FT | 17 | 19 | 8 | 8 | 6 | 7.5 | 5 | 6.5 | 31.6 | 37.0 | 37.0 | 37.0 | 6 | 14 | 42.0 | 48.0 | 6 | 14 | 30.0 | 31.0 | 6 | 7.5 | 5 | 6.5 | 26.3 | 63 | 75 | 87 | 6 | 7 | 36.0 | 43.0 | 5 | 12 | 5 | 11.5 | 0 |
| 36 FT | 18 | 19 | 8 | 8 | 6 | 7.5 | 5 | 6.5 | 31.5 | 38.0 | 38.0 | 38.0 | 6 | 14 | 42.0 | 48.0 | 6 | 14 | 30.0 | 31.0 | 6 | 7.5 | 5 | 6.5 | 26.4 | 63 | 75 | 87 | 6 | 7 | 36.0 | 43.0 | 5 | 12 | 5 | 10.5 | 0 |
| 38 FT | 18 | 20 | 8 | 8 | 6 | 7 | 5 | 6.5 | 31.6 | 38.0 | 38.0 | 38.0 | 6 | 13 | 42.0 | 48.0 | 6 | 13 | 30.0 | 31.0 | 6 | 7.5 | 5 | 6 | 26.4 | 64 | 76 | 88 | 6 | 7 | 36.0 | 43.0 | 5 | 12 | 5 | 10 | 0 |
| 40 FT | 19 | 20 | 8 | 8 | 6 | 7 | 5 | 6 | 31.6 | 39.0 | 39.0 | 39.0 | 6 | 13 | 42.0 | 48.0 | 6 | 13 | 29.0 | 31.0 | 6 | 6.5 | 5 | 6 | 26.5 | 64 | 76 | 88 | 6 | 6.5 | 36.0 | 43.0 | 5 | 12 | 5 | 9.5 | 0 |
| 42 FT | 19 | 21 | 8 | 8 | 6 | 6 | 5 | 6 | 31.8 | 39.0 | 39.0 | 39.0 | 6 | 12 | 42.0 | 48.0 | 6 | 12 | 30.0 | 31.0 | 6 | 7 | 6 | 7.5 | 29.6 | 65 | 77 | 89 | 6 | 6.5 | 36.0 | 43.0 | 5 | 12 | 5 | 9.5 | 0 |
| 44 FT | 20 | 22 | 8 | 8 | 6 | 6.5 | 6 | 7.5 | 35.9 | 44.0 | 44.0 | 44.0 | 6 | 13 | 41.0 | 48.0 | 6 | 13 | 29.0 | 30.0 | 6 | 7 | 6 | 7 | 29.8 | 66 | 78 | 90 | 6 | 6.5 | 36.0 | 43.0 | 5 | 12 | 5 | 9.5 | 0 |
| 46 FT | 21 | 22 | 8 | 8 | 6 | 6.5 | 6 | 7 | 35.8 | 45.0 | 45.0 | 45.0 | 6 | 13 | 41.0 | 48.0 | 6 | 13 | 29.0 | 30.0 | 6 | 6.5 | 6 | 7 | 29.9 | 66 | 78 | 90 | 6 | 6.5 | 36.0 | 43.0 | 5 | 12 | 5 | 9.5 | 0 |
| 48 FT | 21 | 23 | 8 | 8 | 6 | 6.5 | 6 | 7 | 36.0 | 45.0 | 45.0 | 45.0 | 6 | 13 | 41.0 | 48.0 | 6 | 13 | 29.0 | 30.0 | 6 | 7 | 6 | 6.5 | 30.0 | 67 | 79 | 91 | 6 | 6.5 | 36.0 | 43.0 | 5 | 12 | 5 | 9.5 | 0 |
| 50 FT | 22 | 23 | 8 | 8 | 6 | 6.5 | 6 | 6.5 | 35.9 | 46.0 | 46.0 | 46.0 | 6 | 13 | 41.0 | 47.0 | 6 | 13 | 29.0 | 30.0 | 6 | 6.5 | 6 | 6.5 | 30.1 | 67 | 79 | 91 | 6 | 6 | 36.0 | 43.0 | 5 | 12 | 5 | 9 | 0 |

## SPAN (S) = 8 FT HEIGHT (HT) = 7 FT OR 8 FT OR 9 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | K2 HT=7′ | K2 HT=8′ | K2 HT=9′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | K3 HT=7′ | K3 HT=8′ | K3 HT=9′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 12 | 9 | 8 | 8 | 5 | 7 | 4 | 6 | 44.8 | 28.0 | 28.0 | 28.0 | 4 | 13 | 81.5 | 60.5 | 4 | 13 | 27.0 | 25.0 | 4 | 7.5 | 4 | 6 | 66.0 | 89 | 101 | 113 | 5 | 8 | 41.0 | 41.0 | 5 | 12 | 5 | 12 | 12 |
| 2 FT | 12 | 9 | 8 | 8 | 5 | 7 | 4 | 6 | 44.8 | 28.0 | 28.0 | 28.0 | 4 | 12 | 81.5 | 60.5 | 4 | 12 | 26.0 | 24.0 | 4 | 6.5 | 5 | 6.5 | 61.3 | 89 | 101 | 113 | 5 | 7.5 | 39.0 | 41.0 | 5 | 12 | 5 | 12 | 12 |
| 4 FT | 8 | 8 | 8 | 8 | 4 | 6 | 6 | 7.5 | 47.8 | 28.0 | 32.0 | 32.0 | 5 | 16 | 83.5 | 64.0 | 5 | 16 | 27.0 | 28.0 | 5 | 8.5 | 6 | 6 | 55.0 | 88 | 100 | 112 | 5 | 6 | 38.0 | 40.0 | 5 | 12 | 5 | 12 | 12 |
| 6 FT | 8 | 9 | 8 | 8 | 4 | 6 | 6 | 7.5 | 52.5 | 24.0 | 28.0 | 32.0 | 5 | 15 | 44.0 | 47.0 | 5 | 15 | 26.0 | 26.0 | 5 | 8.5 | 6 | 6.5 | 52.3 | 89 | 101 | 113 | 5 | 6.5 | 37.0 | 40.0 | 5 | 12 | 5 | 12 | 12 |
| 8 FT | 8 | 9 | 8 | 8 | 4 | 6 | 6 | 7.5 | 47.4 | 24.0 | 28.0 | 32.0 | 5 | 14 | 40.0 | 42.0 | 5 | 14 | 25.0 | 25.0 | 5 | 7.5 | 6 | 6 | 48.1 | 89 | 101 | 113 | 5 | 6 | 36.0 | 39.0 | 5 | 12 | 5 | 11.5 | 0 |
| 10 FT | 9 | 10 | 8 | 8 | 5 | 8.5 | 6 | 7 | 46.3 | 25.0 | 29.0 | 33.0 | 5 | 15 | 39.0 | 41.0 | 5 | 15 | 25.0 | 25.0 | 5 | 7.5 | 6 | 6.5 | 46.9 | 90 | 102 | 114 | 5 | 6 | 35.0 | 39.0 | 5 | 12 | 5 | 11 | 0 |
| 12 FT | 9 | 10 | 8 | 8 | 5 | 8.5 | 6 | 7 | 44.8 | 29.0 | 33.0 | 33.0 | 5 | 14 | 37.0 | 40.0 | 5 | 14 | 24.0 | 25.0 | 5 | 6.5 | 6 | 6 | 45.4 | 90 | 102 | 114 | 6 | 7 | 38.0 | 42.0 | 5 | 12 | 5 | 10 | 0 |
| 14 FT | 10 | 11 | 8 | 8 | 5 | 8 | 6 | 6.5 | 44.1 | 30.0 | 30.0 | 34.0 | 5 | 14 | 37.0 | 40.0 | 5 | 14 | 24.0 | 25.0 | 5 | 6.5 | 6 | 6 | 44.9 | 91 | 103 | 115 | 5 | 6 | 35.0 | 39.0 | 5 | 12 | 5 | 9.5 | 0 |
| 16 FT | 11 | 12 | 8 | 8 | 5 | 7.5 | 6 | 6.5 | 43.6 | 31.0 | 31.0 | 35.0 | 5 | 14 | 36.0 | 40.0 | 5 | 14 | 24.0 | 25.0 | 5 | 6.5 | 6 | 6.5 | 44.4 | 92 | 104 | 116 | 5 | 6 | 34.0 | 39.0 | 5 | 12 | 5 | 9.5 | 0 |
| 18 FT | 11 | 13 | 8 | 8 | 5 | 7.5 | 6 | 6 | 42.8 | 31.0 | 31.0 | 35.0 | 5 | 13 | 35.0 | 39.0 | 5 | 13 | 24.0 | 25.0 | 5 | 6 | 6 | 6.5 | 43.9 | 93 | 105 | 117 | 6 | 8 | 37.0 | 43.0 | 5 | 12 | 5 | 9.5 | 0 |
| 20 FT | 12 | 14 | 8 | 8 | 5 | 7 | 6 | 6 | 42.4 | 32.0 | 32.0 | 36.0 | 5 | 13 | 35.0 | 39.0 | 5 | 13 | 24.0 | 25.0 | 5 | 6 | 6 | 6.5 | 43.4 | 94 | 106 | 118 | 6 | 8 | 37.0 | 43.0 | 5 | 12 | 5 | 9.5 | 0 |
| 22 FT | 13 | 14 | 8 | 8 | 5 | 6.5 | 6 | 6 | 42.1 | 33.0 | 33.0 | 37.0 | 5 | 12 | 35.0 | 39.0 | 5 | 12 | 23.0 | 24.0 | 6 | 8 | 6 | 6 | 43.0 | 94 | 106 | 118 | 6 | 7.5 | 37.0 | 43.0 | 5 | 12 | 5 | 9 | 0 |
| 24 FT | 14 | 15 | 10 | 8 | 5 | 6 | 5 | 6.5 | 40.0 | 34.0 | 34.0 | 34.0 | 5 | 12 | 34.0 | 39.0 | 5 | 12 | 22.0 | 23.0 | 6 | 8.5 | 5 | 7 | 40.4 | 95 | 107 | 119 | 6 | 7 | 37.0 | 43.0 | 5 | 12 | 5 | 8 | 0 |
| 26 FT | 14 | 16 | 10 | 8 | 5 | 6 | 5 | 6 | 39.8 | 34.0 | 34.0 | 34.0 | 5 | 12 | 34.0 | 39.0 | 5 | 12 | 22.0 | 24.0 | 6 | 8 | 5 | 7 | 40.4 | 96 | 108 | 120 | 6 | 7.5 | 37.0 | 43.0 | 5 | 12 | 5 | 8 | 0 |
| 28 FT | 15 | 16 | 10 | 8 | 6 | 8 | 5 | 6.5 | 43.0 | 35.0 | 35.0 | 35.0 | 6 | 16 | 42.0 | 48.0 | 6 | 16 | 30.0 | 32.0 | 6 | 7.5 | 5 | 7 | 38.4 | 96 | 108 | 120 | 6 | 7 | 37.0 | 43.0 | 5 | 12 | 5 | 8 | 0 |
| 30 FT | 15 | 17 | 11 | 8 | 6 | 7.5 | 5 | 6.5 | 43.5 | 31.0 | 35.0 | 35.0 | 6 | 15 | 42.0 | 47.0 | 6 | 15 | 31.0 | 32.0 | 6 | 8 | 5 | 7 | 38.8 | 97 | 109 | 121 | 6 | 7 | 37.0 | 43.0 | 5 | 12 | 5 | 8.5 | 0 |
| 32 FT | 16 | 18 | 11 | 8 | 6 | 8 | 5 | 6 | 43.8 | 32.0 | 36.0 | 36.0 | 6 | 15 | 42.0 | 47.0 | 6 | 15 | 30.0 | 32.0 | 6 | 8 | 5 | 7 | 39.0 | 98 | 110 | 122 | 6 | 7 | 37.0 | 43.0 | 5 | 12 | 5 | 8 | 0 |
| 34 FT | 17 | 19 | 11 | 8 | 6 | 7.5 | 5 | 6 | 43.9 | 33.0 | 37.0 | 37.0 | 6 | 14 | 42.0 | 47.0 | 6 | 14 | 30.0 | 31.0 | 6 | 8 | 5 | 7 | 39.3 | 99 | 111 | 123 | 6 | 7 | 37.0 | 43.0 | 5 | 12 | 5 | 7.5 | 0 |
| 36 FT | 17 | 19 | 12 | 8 | 6 | 7 | 5 | 6 | 44.4 | 33.0 | 37.0 | 37.0 | 6 | 14 | 42.0 | 47.0 | 6 | 14 | 30.0 | 31.0 | 6 | 7.5 | 5 | 6.5 | 39.3 | 99 | 111 | 123 | 6 | 6.5 | 37.0 | 43.0 | 5 | 12 | 5 | 8 | 0 |
| 38 FT | 18 | 20 | 12 | 8 | 6 | 7.5 | 5 | 6 | 44.6 | 38.0 | 38.0 | 38.0 | 6 | 13 | 42.0 | 47.0 | 6 | 13 | 29.0 | 31.0 | 6 | 7.5 | 5 | 6.5 | 39.6 | 100 | 112 | 124 | 6 | 6.5 | 37.0 | 43.0 | 5 | 12 | 5 | 7.5 | 0 |
| 40 FT | 19 | 20 | 12 | 8 | 6 | 7 | 5 | 6 | 44.6 | 39.0 | 39.0 | 39.0 | 6 | 14 | 42.0 | 47.0 | 6 | 14 | 29.0 | 30.0 | 6 | 6.5 | 5 | 6.5 | 39.6 | 100 | 112 | 124 | 6 | 6.5 | 37.0 | 43.0 | 5 | 12 | 5 | 7 | 0 |
| 42 FT | 19 | 21 | 12 | 8 | 6 | 7 | 6 | 7.5 | 48.8 | 39.0 | 39.0 | 39.0 | 6 | 13 | 42.0 | 47.0 | 6 | 13 | 29.0 | 30.0 | 6 | 7 | 5 | 6.5 | 39.8 | 101 | 113 | 125 | 6 | 6.5 | 37.0 | 43.0 | 5 | 12 | 5 | 7 | 0 |
| 44 FT | 20 | 22 | 13 | 8 | 6 | 7 | 5 | 6 | 45.5 | 40.0 | 40.0 | 40.0 | 6 | 14 | 41.0 | 46.0 | 6 | 14 | 29.0 | 30.0 | 6 | 7 | 5 | 6 | 40.3 | 102 | 114 | 126 | 6 | 6.5 | 37.0 | 44.0 | 5 | 12 | 5 | 7 | 0 |
| 46 FT | 20 | 22 | 13 | 8 | 6 | 6.5 | 6 | 8 | 49.5 | 40.0 | 40.0 | 40.0 | 6 | 13 | 41.0 | 46.0 | 6 | 13 | 29.0 | 30.0 | 6 | 7 | 5 | 6 | 40.3 | 102 | 114 | 126 | 6 | 6 | 37.0 | 44.0 | 5 | 12 | 5 | 6.5 | 0 |
| 48 FT | 21 | 23 | 13 | 8 | 6 | 6.5 | 6 | 8 | 49.6 | 41.0 | 41.0 | 41.0 | 6 | 13 | 41.0 | 46.0 | 6 | 13 | 29.0 | 30.0 | 6 | 7 | 5 | 6 | 40.5 | 103 | 115 | 127 | 6 | 6.5 | 37.0 | 44.0 | 5 | 12 | 5 | 6.5 | 0 |
| 50 FT | 21 | 23 | 13 | 8 | 6 | 6.5 | 6 | 7 | 49.6 | 41.0 | 41.0 | 41.0 | 6 | 13 | 41.0 | 46.0 | 6 | 13 | 29.0 | 30.0 | 6 | 6 | 5 | 6 | 40.5 | 103 | 115 | 127 | 6 | 6 | 37.0 | 44.0 | 5 | 12 | 5 | 6.5 | 0 |




BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ℄ CULVERT.

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

### GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.


MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

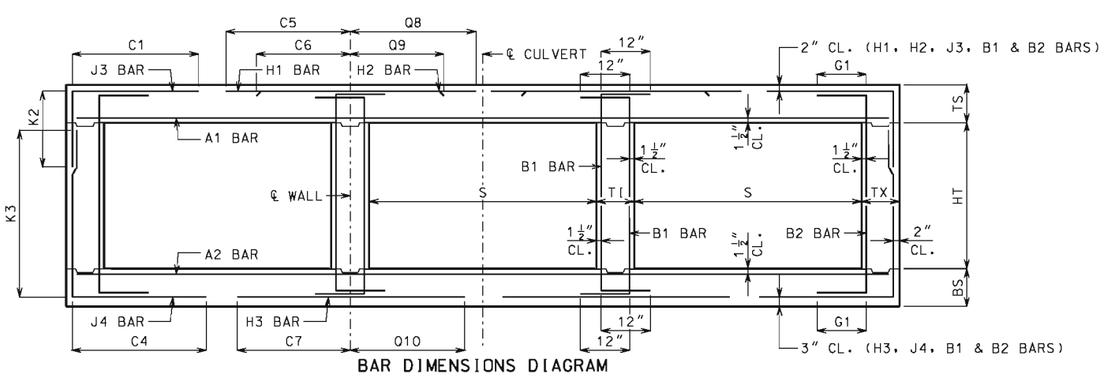
SPAN (S): 8 FEET
HEIGHT (HT): 4 THRU 9 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

703.87

SPAN (S) = 8 FT HEIGHT (HT) = 10 FT OR 11 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | | | | | | | | | | K2 | | | | | | | | | | | | | | K3 | | | | | | | | | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | HT=10' | HT=11' | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | HT=10' | HT=11' | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 12 | 9 | 8 | 9 | 5 | 7 | 5 | 7 | 44.9 | 32.0 | 32.0 | 4 | 13 | 81.5 | 61.5 | 4 | 13 | 28.0 | 26.0 | 4 | 6.5 | 6 | 6 | 69.3 | 125 | 137 | 5 | 7.5 | 43.0 | 42.0 | 5 | 11.5 | 5 | 10 | 12 |
| 2 FT | 12 | 9 | 9 | 9 | 5 | 7 | 5 | 8 | 45.5 | 32.0 | 32.0 | 4 | 12 | 82.5 | 61.5 | 4 | 12 | 27.0 | 24.0 | 4 | 6.5 | 6 | 6.5 | 70.0 | 125 | 137 | 5 | 7 | 41.0 | 41.0 | 5 | 11.5 | 5 | 10.5 | 12 |
| 4 FT | 8 | 9 | 10 | 9 | 4 | 6 | 6 | 7 | 49.1 | 28.0 | 28.0 | 5 | 16 | 84.5 | 65.0 | 5 | 16 | 27.0 | 27.0 | 4 | 6 | 5 | 6 | 65.8 | 125 | 137 | 5 | 7 | 39.0 | 41.0 | 5 | 11.5 | 5 | 9.5 | 12 |
| 6 FT | 8 | 9 | 11 | 9 | 4 | 6 | 5 | 6 | 57.1 | 28.0 | 28.0 | 5 | 16 | 44.0 | 44.0 | 5 | 16 | 26.0 | 26.0 | 5 | 9 | 5 | 6 | 56.6 | 125 | 137 | 5 | 6.5 | 37.0 | 39.0 | 5 | 11.5 | 5 | 9.5 | 12 |
| 8 FT | 8 | 10 | 11 | 9 | 4 | 6 | 6 | 7 | 54.8 | 28.0 | 28.0 | 5 | 15 | 41.0 | 41.0 | 5 | 15 | 25.0 | 26.0 | 5 | 9 | 5 | 6.5 | 56.4 | 126 | 138 | 5 | 6.5 | 37.0 | 39.0 | 5 | 12 | 5 | 9 | 0 |
| 10 FT | 8 | 10 | 11 | 9 | 4 | 6 | 6 | 6.5 | 51.9 | 28.0 | 28.0 | 5 | 14 | 39.0 | 40.0 | 5 | 14 | 25.0 | 25.0 | 5 | 7.5 | 5 | 6 | 54.0 | 126 | 138 | 5 | 6 | 36.0 | 39.0 | 5 | 12 | 5 | 8.5 | 0 |
| 12 FT | 9 | 11 | 11 | 9 | 5 | 8.5 | 6 | 7 | 52.5 | 29.0 | 29.0 | 5 | 14 | 38.0 | 39.0 | 5 | 14 | 25.0 | 25.0 | 5 | 7.5 | 5 | 6 | 53.9 | 127 | 139 | 5 | 6 | 36.0 | 39.0 | 5 | 12 | 5 | 8 | 0 |
| 14 FT | 10 | 11 | 11 | 9 | 5 | 8 | 5 | 6 | 50.1 | 30.0 | 30.0 | 5 | 15 | 37.0 | 39.0 | 5 | 15 | 25.0 | 25.0 | 5 | 7 | 5 | 6 | 51.9 | 127 | 139 | 5 | 6 | 35.0 | 39.0 | 5 | 12 | 5 | 7.5 | 0 |
| 16 FT | 10 | 12 | 11 | 9 | 5 | 7.5 | 5 | 6 | 48.3 | 30.0 | 30.0 | 5 | 13 | 36.0 | 39.0 | 5 | 13 | 24.0 | 25.0 | 5 | 6.5 | 5 | 6 | 52.3 | 128 | 140 | 5 | 6 | 35.0 | 39.0 | 5 | 12 | 5 | 7.5 | 0 |
| 18 FT | 11 | 13 | 11 | 9 | 5 | 7.5 | 5 | 6.5 | 48.6 | 31.0 | 31.0 | 5 | 14 | 36.0 | 39.0 | 5 | 14 | 24.0 | 25.0 | 5 | 6.5 | 6 | 7 | 55.0 | 129 | 141 | 6 | 8 | 38.0 | 42.0 | 5 | 12 | 5 | 7.5 | 0 |
| 20 FT | 12 | 14 | 11 | 9 | 5 | 7 | 5 | 6 | 48.8 | 32.0 | 32.0 | 5 | 13 | 35.0 | 39.0 | 5 | 13 | 24.0 | 25.0 | 5 | 6.5 | 6 | 7 | 54.9 | 130 | 142 | 6 | 8 | 38.0 | 43.0 | 5 | 12 | 5 | 7.5 | 0 |
| 22 FT | 13 | 15 | 11 | 9 | 5 | 6.5 | 6 | 8 | 52.1 | 33.0 | 37.0 | 5 | 12 | 35.0 | 39.0 | 5 | 12 | 23.0 | 24.0 | 5 | 6 | 6 | 7 | 54.9 | 131 | 143 | 6 | 8 | 38.0 | 43.0 | 5 | 12 | 5 | 7.5 | 0 |
| 24 FT | 13 | 15 | 12 | 9 | 5 | 6.5 | 5 | 6 | 48.3 | 33.0 | 33.0 | 5 | 12 | 35.0 | 38.0 | 5 | 12 | 23.0 | 25.0 | 5 | 6 | 6 | 7.5 | 53.9 | 131 | 143 | 6 | 7 | 38.0 | 43.0 | 5 | 12 | 5 | 7 | 0 |
| 26 FT | 14 | 16 | 12 | 9 | 5 | 6 | 6 | 8 | 51.8 | 34.0 | 38.0 | 5 | 12 | 35.0 | 38.0 | 5 | 12 | 22.0 | 24.0 | 5 | 6 | 6 | 7.5 | 54.1 | 132 | 144 | 6 | 7.5 | 38.0 | 43.0 | 5 | 12 | 5 | 7 | 0 |
| 28 FT | 15 | 16 | 12 | 9 | 5 | 6 | 6 | 8 | 56.1 | 35.0 | 39.0 | 6 | 16 | 43.0 | 47.0 | 6 | 16 | 31.0 | 32.0 | 6 | 7.5 | 6 | 8 | 51.0 | 132 | 144 | 6 | 7 | 38.0 | 43.0 | 5 | 12 | 5 | 7 | 0 |
| 30 FT | 15 | 17 | 12 | 9 | 6 | 8 | 6 | 7 | 55.9 | 35.0 | 39.0 | 6 | 16 | 43.0 | 47.0 | 6 | 16 | 31.0 | 32.0 | 6 | 8 | 6 | 7.5 | 51.5 | 133 | 145 | 6 | 7 | 38.0 | 43.0 | 5 | 12 | 5 | 7 | 0 |
| 32 FT | 16 | 18 | 13 | 9 | 6 | 8 | 6 | 8 | 56.5 | 36.0 | 40.0 | 6 | 15 | 42.0 | 47.0 | 6 | 15 | 30.0 | 31.0 | 6 | 8 | 6 | 8.5 | 51.8 | 134 | 146 | 6 | 7 | 38.0 | 43.0 | 5 | 12 | 5 | 6.5 | 0 |
| 34 FT | 17 | 19 | 13 | 9 | 6 | 8 | 6 | 7.5 | 56.9 | 37.0 | 41.0 | 6 | 14 | 42.0 | 47.0 | 6 | 14 | 30.0 | 31.0 | 6 | 8 | 6 | 8.5 | 52.3 | 135 | 147 | 6 | 7 | 38.0 | 43.0 | 5 | 12 | 5 | 6.5 | 0 |
| 36 FT | 17 | 19 | 14 | 9 | 6 | 7.5 | 6 | 7.5 | 57.0 | 37.0 | 41.0 | 6 | 14 | 42.0 | 46.0 | 6 | 14 | 30.0 | 31.0 | 6 | 7.5 | 6 | 8 | 51.9 | 135 | 147 | 6 | 6.5 | 38.0 | 43.0 | 5 | 12 | 5 | 6 | 0 |
| 38 FT | 18 | 20 | 14 | 9 | 6 | 7.5 | 6 | 7.5 | 57.4 | 38.0 | 42.0 | 6 | 14 | 42.0 | 46.0 | 6 | 14 | 30.0 | 31.0 | 6 | 7.5 | 6 | 8 | 52.3 | 136 | 148 | 6 | 7 | 38.0 | 43.0 | 5 | 12 | 5 | 6 | 0 |
| 40 FT | 18 | 20 | 14 | 9 | 6 | 7 | 6 | 6.5 | 57.3 | 38.0 | 42.0 | 6 | 13 | 42.0 | 46.0 | 6 | 13 | 30.0 | 31.0 | 6 | 6.5 | 6 | 8 | 52.1 | 136 | 148 | 6 | 6.5 | 38.0 | 43.0 | 5 | 12 | 5 | 6 | 0 |
| 42 FT | 19 | 21 | 15 | 9 | 6 | 7 | 6 | 7 | 57.9 | 43.0 | 43.0 | 6 | 14 | 42.0 | 46.0 | 6 | 14 | 30.0 | 30.0 | 6 | 7 | 6 | 8 | 52.6 | 137 | 149 | 6 | 6.5 | 38.0 | 43.0 | 5 | 12 | 6 | 8 | 0 |
| 44 FT | 19 | 22 | 15 | 9 | 6 | 7 | 6 | 7 | 57.9 | 43.0 | 43.0 | 6 | 13 | 42.0 | 46.0 | 6 | 13 | 30.0 | 30.0 | 6 | 7 | 6 | 8 | 53.0 | 138 | 150 | 6 | 6.5 | 38.0 | 43.0 | 5 | 12 | 6 | 8 | 0 |
| 46 FT | 20 | 22 | 15 | 9 | 6 | 7 | 6 | 6 | 58.1 | 44.0 | 44.0 | 6 | 14 | 42.0 | 45.0 | 6 | 14 | 30.0 | 30.0 | 6 | 7 | 6 | 7.5 | 52.9 | 138 | 150 | 6 | 6.5 | 38.0 | 43.0 | 5 | 12 | 6 | 8 | 0 |
| 48 FT | 20 | 23 | 16 | 9 | 6 | 6.5 | 6 | 7 | 58.5 | 44.0 | 44.0 | 6 | 13 | 42.0 | 45.0 | 6 | 13 | 30.0 | 30.0 | 6 | 7 | 6 | 7.5 | 53.3 | 139 | 151 | 6 | 6.5 | 38.0 | 44.0 | 5 | 12 | 6 | 8 | 0 |
| 50 FT | 21 | 23 | 16 | 9 | 6 | 6.5 | 6 | 6.5 | 58.9 | 45.0 | 45.0 | 6 | 13 | 42.0 | 45.0 | 6 | 13 | 29.0 | 30.0 | 6 | 6.5 | 6 | 7.5 | 53.3 | 139 | 151 | 6 | 6 | 38.0 | 44.0 | 5 | 12 | 6 | 8 | 0 |




BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ℄ CULVERT.

## GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.


MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 8 FEET
HEIGHT (HT): 10 THRU 11 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

703.87



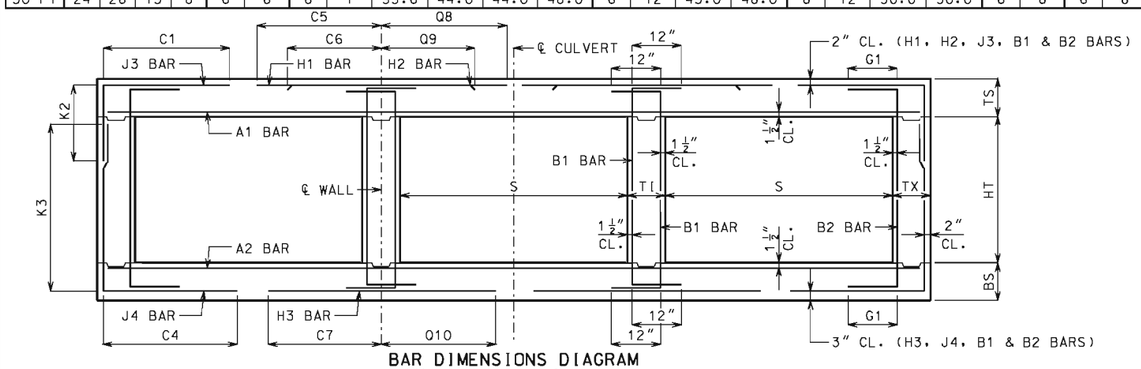

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

## SPAN (S) = 9 FT HEIGHT (HT) = 5 FT OR 6 FT OR 7 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | K2 HT=5′ | K2 HT=6′ | K2 HT=7′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | K3 HT=5′ | K3 HT=6′ | K3 HT=7′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 13 | 8 | 8 | 8 | 5 | 6.5 | 4 | 7.5 | 48.3 | 29.0 | 29.0 | 29.0 | 4 | 12 | 89.5 | 66.5 | 4 | 12 | 28.0 | 26.0 | 4 | 6.5 | 5 | 6 | 46.1 | 64 | 76 | 88 | 5 | 6 | 42.0 | 43.0 | 5 | 12 | 5 | 12 | 12 |
| 2 FT | 13 | 9 | 8 | 8 | 5 | 6.5 | 4 | 7.5 | 48.3 | 29.0 | 29.0 | 29.0 | 5 | 17 | 89.5 | 68.5 | 5 | 17 | 27.0 | 27.0 | 4 | 6.5 | 4 | 6 | 43.9 | 65 | 77 | 89 | 5 | 6.5 | 41.0 | 43.0 | 5 | 12 | 5 | 12 | 12 |
| 4 FT | 9 | 9 | 8 | 8 | 5 | 8.5 | 5 | 6.5 | 44.8 | 25.0 | 25.0 | 25.0 | 5 | 16 | 57.0 | 70.0 | 5 | 16 | 29.0 | 29.0 | 5 | 8.5 | 4 | 6 | 39.6 | 65 | 77 | 89 | 5 | 6 | 40.0 | 43.0 | 5 | 12 | 5 | 12 | 12 |
| 6 FT | 9 | 9 | 8 | 8 | 5 | 8.5 | 5 | 6.5 | 39.6 | 25.0 | 25.0 | 29.0 | 5 | 15 | 46.0 | 52.0 | 5 | 15 | 27.0 | 28.0 | 5 | 7.5 | 5 | 6.5 | 36.5 | 65 | 77 | 89 | 6 | 7 | 42.0 | 45.0 | 5 | 12 | 5 | 12 | 12 |
| 8 FT | 9 | 10 | 8 | 8 | 5 | 8.5 | 5 | 6.5 | 36.8 | 25.0 | 25.0 | 25.0 | 5 | 14 | 42.0 | 45.0 | 5 | 14 | 26.0 | 27.0 | 5 | 7.5 | 4 | 6.5 | 34.8 | 66 | 78 | 90 | 5 | 6 | 38.0 | 42.0 | 5 | 12 | 5 | 12 | 0 |
| 10 FT | 9 | 10 | 8 | 8 | 5 | 8.5 | 5 | 6 | 35.4 | 25.0 | 25.0 | 29.0 | 5 | 12 | 41.0 | 44.0 | 5 | 12 | 26.0 | 26.0 | 5 | 7 | 5 | 7 | 33.5 | 66 | 78 | 90 | 6 | 6.5 | 41.0 | 45.0 | 5 | 12 | 5 | 12 | 0 |
| 12 FT | 10 | 11 | 8 | 8 | 5 | 8 | 5 | 7 | 33.9 | 26.0 | 26.0 | 30.0 | 5 | 12 | 40.0 | 44.0 | 5 | 12 | 26.0 | 26.0 | 5 | 6.5 | 5 | 7.5 | 32.4 | 67 | 79 | 91 | 6 | 7 | 40.0 | 45.0 | 5 | 12 | 5 | 12 | 0 |
| 14 FT | 11 | 12 | 8 | 8 | 5 | 7.5 | 5 | 7.5 | 32.8 | 27.0 | 27.0 | 31.0 | 5 | 13 | 39.0 | 43.0 | 5 | 13 | 25.0 | 26.0 | 5 | 6 | 5 | 8.5 | 31.6 | 68 | 80 | 92 | 6 | 7 | 40.0 | 46.0 | 5 | 12 | 5 | 12 | 0 |
| 16 FT | 12 | 13 | 8 | 8 | 5 | 7 | 5 | 8 | 31.9 | 28.0 | 28.0 | 32.0 | 5 | 13 | 38.0 | 43.0 | 5 | 13 | 25.0 | 27.0 | 5 | 6 | 5 | 8.5 | 31.0 | 69 | 81 | 93 | 6 | 7 | 39.0 | 46.0 | 5 | 12 | 5 | 12 | 0 |
| 18 FT | 13 | 14 | 8 | 8 | 5 | 6.5 | 5 | 8 | 31.3 | 29.0 | 29.0 | 33.0 | 5 | 12 | 37.0 | 43.0 | 5 | 12 | 25.0 | 26.0 | 6 | 8 | 5 | 8.5 | 30.6 | 70 | 82 | 94 | 6 | 7.5 | 39.0 | 46.0 | 5 | 12 | 5 | 12 | 0 |
| 20 FT | 14 | 15 | 8 | 8 | 5 | 6 | 5 | 8.5 | 30.6 | 30.0 | 30.0 | 34.0 | 5 | 12 | 37.0 | 43.0 | 5 | 12 | 24.0 | 26.0 | 6 | 8 | 5 | 8.5 | 30.3 | 71 | 83 | 95 | 6 | 7 | 39.0 | 46.0 | 5 | 12 | 5 | 12 | 0 |
| 22 FT | 15 | 16 | 8 | 8 | 6 | 8 | 5 | 8 | 35.3 | 31.0 | 31.0 | 35.0 | 6 | 16 | 45.0 | 52.0 | 6 | 16 | 32.0 | 34.0 | 6 | 7.5 | 5 | 8 | 30.0 | 72 | 84 | 96 | 6 | 7 | 39.0 | 46.0 | 5 | 12 | 5 | 12 | 0 |
| 24 FT | 15 | 16 | 8 | 8 | 6 | 8 | 5 | 7.5 | 35.0 | 31.0 | 35.0 | 35.0 | 6 | 16 | 45.0 | 52.0 | 6 | 16 | 33.0 | 35.0 | 6 | 6.5 | 5 | 8 | 29.8 | 72 | 84 | 96 | 6 | 6.5 | 39.0 | 46.0 | 5 | 12 | 5 | 11.5 | 0 |
| 26 FT | 16 | 17 | 8 | 8 | 6 | 8 | 5 | 7 | 34.9 | 32.0 | 36.0 | 36.0 | 6 | 15 | 45.0 | 52.0 | 6 | 15 | 32.0 | 34.0 | 6 | 7 | 5 | 7 | 29.8 | 73 | 85 | 97 | 6 | 6.5 | 39.0 | 46.0 | 5 | 12 | 5 | 10.5 | 0 |
| 28 FT | 17 | 18 | 8 | 8 | 6 | 7.5 | 5 | 6.5 | 34.8 | 37.0 | 37.0 | 37.0 | 6 | 14 | 45.0 | 52.0 | 6 | 14 | 32.0 | 34.0 | 6 | 7 | 5 | 6.5 | 29.8 | 74 | 86 | 98 | 6 | 6.5 | 39.0 | 46.0 | 5 | 12 | 5 | 9.5 | 0 |
| 30 FT | 18 | 19 | 8 | 8 | 6 | 7 | 5 | 6.5 | 33.6 | 38.0 | 38.0 | 38.0 | 6 | 13 | 44.0 | 52.0 | 6 | 13 | 31.0 | 32.0 | 6 | 7 | 5 | 6.5 | 28.8 | 75 | 87 | 99 | 6 | 6 | 39.0 | 46.0 | 5 | 12 | 5 | 9.5 | 0 |
| 32 FT | 18 | 20 | 8 | 8 | 6 | 7 | 5 | 6.5 | 33.8 | 38.0 | 38.0 | 38.0 | 6 | 13 | 44.0 | 51.0 | 6 | 13 | 32.0 | 33.0 | 6 | 7 | 5 | 6 | 28.8 | 76 | 88 | 100 | 6 | 6.5 | 39.0 | 46.0 | 5 | 12 | 5 | 9.5 | 0 |
| 34 FT | 19 | 20 | 8 | 8 | 6 | 6.5 | 5 | 6 | 33.6 | 39.0 | 39.0 | 39.0 | 6 | 13 | 44.0 | 51.0 | 6 | 13 | 31.0 | 33.0 | 6 | 6 | 5 | 6 | 28.9 | 76 | 88 | 100 | 6 | 6 | 39.0 | 46.0 | 5 | 12 | 5 | 9.5 | 0 |
| 36 FT | 20 | 21 | 8 | 8 | 6 | 6.5 | 6 | 7.5 | 37.8 | 44.0 | 44.0 | 44.0 | 6 | 12 | 44.0 | 51.0 | 6 | 12 | 30.0 | 32.0 | 6 | 6.5 | 6 | 7.5 | 32.0 | 77 | 89 | 101 | 6 | 6 | 39.0 | 46.0 | 5 | 12 | 5 | 9.5 | 0 |
| 38 FT | 20 | 22 | 8 | 8 | 6 | 6 | 6 | 7.5 | 37.9 | 44.0 | 44.0 | 44.0 | 6 | 12 | 44.0 | 51.0 | 6 | 12 | 31.0 | 32.0 | 6 | 6.5 | 6 | 7 | 32.0 | 78 | 90 | 102 | 6 | 6 | 39.0 | 46.0 | 5 | 12 | 5 | 9 | 0 |
| 40 FT | 21 | 23 | 8 | 8 | 6 | 6 | 6 | 7 | 38.0 | 45.0 | 45.0 | 45.0 | 6 | 12 | 44.0 | 51.0 | 6 | 12 | 30.0 | 32.0 | 6 | 6.5 | 6 | 6.5 | 32.3 | 79 | 91 | 103 | 6 | 6 | 39.0 | 46.0 | 5 | 12 | 5 | 8.5 | 0 |
| 42 FT | 22 | 23 | 8 | 8 | 6 | 6 | 6 | 6.5 | 37.9 | 46.0 | 46.0 | 46.0 | 6 | 12 | 44.0 | 51.0 | 6 | 12 | 30.0 | 31.0 | 6 | 6 | 6 | 6.5 | 32.3 | 79 | 91 | 103 | 7 | 8 | 42.0 | 49.0 | 5 | 12 | 5 | 8 | 0 |
| 44 FT | 23 | 24 | 9 | 8 | 6 | 6 | 6 | 7 | 38.8 | 47.0 | 47.0 | 47.0 | 6 | 12 | 44.0 | 50.0 | 6 | 12 | 30.0 | 31.0 | 6 | 6 | 6 | 7 | 33.0 | 80 | 92 | 104 | 7 | 8 | 42.0 | 50.0 | 5 | 12 | 5 | 8.5 | 0 |
| 46 FT | 23 | 25 | 9 | 8 | 7 | 8 | 6 | 7 | 38.9 | 47.0 | 47.0 | 47.0 | 7 | 16 | 49.0 | 55.0 | 7 | 16 | 35.0 | 36.0 | 6 | 6 | 6 | 7 | 33.0 | 81 | 93 | 105 | 7 | 8 | 42.0 | 50.0 | 5 | 12 | 5 | 8.5 | 0 |
| 48 FT | 24 | 25 | 9 | 8 | 7 | 8 | 6 | 7 | 38.9 | 48.0 | 48.0 | 48.0 | 6 | 12 | 43.0 | 50.0 | 6 | 12 | 30.0 | 31.0 | 6 | 6 | 6 | 7 | 33.1 | 81 | 93 | 105 | 7 | 7.5 | 42.0 | 50.0 | 5 | 12 | 5 | 8 | 0 |
| 50 FT | 24 | 26 | 9 | 8 | 7 | 7.5 | 6 | 6.5 | 39.0 | 48.0 | 48.0 | 48.0 | 7 | 15 | 48.0 | 55.0 | 7 | 15 | 35.0 | 36.0 | 6 | 6 | 6 | 6.5 | 33.3 | 82 | 94 | 106 | 7 | 7.5 | 42.0 | 50.0 | 5 | 12 | 5 | 7.5 | 0 |

## SPAN (S) = 9 FT HEIGHT (HT) = 8 FT OR 9 FT OR 10 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | K2 HT=8′ | K2 HT=9′ | K2 HT=10′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | K3 HT=8′ | K3 HT=9′ | K3 HT=10′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 13 | 9 | 8 | 8 | 5 | 6.5 | 5 | 8.5 | 48.3 | 29.0 | 29.0 | 33.0 | 4 | 12 | 89.5 | 66.5 | 4 | 12 | 29.0 | 27.0 | 4 | 6.5 | 6 | 6.5 | 75.0 | 101 | 113 | 125 | 5 | 7 | 43.0 | 44.0 | 5 | 12 | 5 | 12 | 12 |
| 2 FT | 13 | 9 | 8 | 8 | 5 | 6.5 | 5 | 8.5 | 51.3 | 29.0 | 33.0 | 33.0 | 5 | 18 | 91.5 | 68.5 | 5 | 18 | 28.0 | 25.0 | 5 | 9 | 6 | 6.5 | 69.0 | 101 | 113 | 125 | 5 | 6.5 | 42.0 | 44.0 | 5 | 12 | 5 | 11.5 | 12 |
| 4 FT | 9 | 9 | 8 | 8 | 5 | 8.5 | 6 | 7 | 51.3 | 29.0 | 33.0 | 33.0 | 5 | 16 | 91.5 | 70.0 | 5 | 16 | 29.0 | 30.0 | 5 | 8 | 6 | 6 | 62.0 | 101 | 113 | 125 | 5 | 6 | 41.0 | 44.0 | 5 | 12 | 5 | 10 | 12 |
| 6 FT | 9 | 10 | 9 | 8 | 5 | 8.5 | 5 | 6 | 54.9 | 25.0 | 25.0 | 29.0 | 5 | 15 | 49.0 | 53.0 | 5 | 15 | 27.0 | 28.0 | 5 | 8 | 5 | 6 | 53.9 | 102 | 114 | 126 | 5 | 6.5 | 39.0 | 43.0 | 5 | 12 | 5 | 11 | 12 |
| 8 FT | 9 | 10 | 9 | 8 | 5 | 8.5 | 5 | 6 | 48.8 | 25.0 | 29.0 | 29.0 | 5 | 14 | 44.0 | 46.0 | 5 | 14 | 26.0 | 27.0 | 5 | 7 | 6 | 6.5 | 52.4 | 102 | 114 | 126 | 6 | 7 | 41.0 | 46.0 | 5 | 12 | 5 | 10.5 | 0 |
| 10 FT | 9 | 11 | 9 | 8 | 5 | 8.5 | 5 | 6 | 46.5 | 25.0 | 29.0 | 29.0 | 5 | 12 | 42.0 | 44.0 | 5 | 12 | 26.0 | 26.0 | 5 | 6.5 | 6 | 7 | 51.4 | 103 | 115 | 127 | 5 | 6 | 38.0 | 43.0 | 5 | 12 | 5 | 9.5 | 0 |
| 12 FT | 10 | 11 | 9 | 8 | 5 | 8 | 5 | 6 | 45.8 | 30.0 | 30.0 | 30.0 | 5 | 13 | 40.0 | 43.0 | 5 | 13 | 26.0 | 27.0 | 5 | 6.5 | 6 | 6 | 49.5 | 103 | 115 | 127 | 6 | 7 | 40.0 | 45.0 | 5 | 12 | 5 | 9 | 0 |
| 14 FT | 11 | 12 | 9 | 8 | 5 | 7.5 | 6 | 7 | 48.1 | 31.0 | 31.0 | 35.0 | 5 | 13 | 39.0 | 43.0 | 5 | 13 | 25.0 | 27.0 | 5 | 6 | 6 | 6.5 | 48.8 | 104 | 116 | 128 | 6 | 7 | 40.0 | 46.0 | 5 | 12 | 5 | 8.5 | 0 |
| 16 FT | 12 | 13 | 9 | 8 | 5 | 7 | 6 | 6.5 | 47.4 | 32.0 | 32.0 | 36.0 | 5 | 13 | 39.0 | 43.0 | 5 | 13 | 25.0 | 27.0 | 5 | 6 | 6 | 6.5 | 48.3 | 105 | 117 | 129 | 6 | 7 | 40.0 | 46.0 | 5 | 12 | 5 | 8.5 | 0 |
| 18 FT | 13 | 14 | 9 | 8 | 5 | 6.5 | 6 | 7 | 46.9 | 33.0 | 33.0 | 37.0 | 5 | 12 | 38.0 | 43.0 | 5 | 12 | 24.0 | 26.0 | 6 | 8 | 6 | 6.5 | 47.6 | 106 | 118 | 130 | 6 | 7.5 | 40.0 | 46.0 | 5 | 12 | 5 | 8.5 | 0 |
| 20 FT | 13 | 15 | 9 | 8 | 5 | 6.5 | 6 | 6 | 46.0 | 33.0 | 33.0 | 37.0 | 5 | 12 | 38.0 | 43.0 | 5 | 12 | 25.0 | 27.0 | 6 | 8 | 6 | 6.5 | 47.1 | 107 | 119 | 131 | 6 | 7 | 40.0 | 46.0 | 5 | 12 | 5 | 8.5 | 0 |
| 22 FT | 14 | 16 | 11 | 8 | 5 | 6 | 5 | 6 | 43.5 | 34.0 | 34.0 | 34.0 | 5 | 12 | 37.0 | 42.0 | 5 | 12 | 25.0 | 26.0 | 6 | 7.5 | 5 | 7 | 44.0 | 108 | 120 | 132 | 6 | 7 | 40.0 | 46.0 | 5 | 12 | 5 | 8 | 0 |
| 24 FT | 15 | 17 | 11 | 8 | 6 | 8 | 5 | 6 | 48.4 | 35.0 | 35.0 | 35.0 | 6 | 16 | 46.0 | 51.0 | 6 | 16 | 33.0 | 35.0 | 6 | 7.5 | 5 | 7 | 44.0 | 109 | 121 | 133 | 6 | 6.5 | 40.0 | 46.0 | 5 | 12 | 5 | 7.5 | 0 |
| 26 FT | 16 | 17 | 11 | 8 | 6 | 8 | 6 | 8 | 52.1 | 36.0 | 36.0 | 36.0 | 6 | 15 | 45.0 | 51.0 | 6 | 15 | 32.0 | 34.0 | 6 | 6.5 | 5 | 6 | 43.6 | 109 | 121 | 133 | 6 | 6.5 | 40.0 | 46.0 | 5 | 12 | 5 | 7.5 | 0 |
| 28 FT | 17 | 18 | 12 | 8 | 6 | 7.5 | 5 | 6 | 48.8 | 37.0 | 37.0 | 37.0 | 6 | 14 | 45.0 | 51.0 | 6 | 14 | 31.0 | 33.0 | 6 | 7 | 5 | 6.5 | 43.9 | 110 | 122 | 134 | 6 | 6.5 | 40.0 | 46.0 | 5 | 12 | 5 | 7 | 0 |
| 30 FT | 17 | 19 | 12 | 8 | 6 | 7.5 | 5 | 6 | 46.9 | 37.0 | 37.0 | 37.0 | 6 | 14 | 44.0 | 51.0 | 6 | 14 | 32.0 | 33.0 | 6 | 7 | 5 | 6.5 | 42.0 | 111 | 123 | 135 | 6 | 6 | 40.0 | 47.0 | 5 | 12 | 5 | 7.5 | 0 |
| 32 FT | 18 | 20 | 12 | 8 | 6 | 7 | 6 | 8 | 51.0 | 38.0 | 38.0 | 38.0 | 6 | 13 | 44.0 | 50.0 | 6 | 13 | 31.0 | 33.0 | 6 | 7 | 5 | 6.5 | 42.3 | 112 | 124 | 136 | 6 | 6 | 40.0 | 47.0 | 5 | 12 | 5 | 7 | 0 |
| 34 FT | 19 | 20 | 12 | 8 | 6 | 7 | 6 | 8 | 50.9 | 39.0 | 39.0 | 39.0 | 6 | 13 | 44.0 | 50.0 | 6 | 13 | 30.0 | 32.0 | 6 | 6 | 5 | 6.5 | 42.3 | 112 | 124 | 136 | 6 | 6 | 40.0 | 47.0 | 5 | 12 | 5 | 7 | 0 |
| 36 FT | 19 | 21 | 13 | 8 | 6 | 6.5 | 6 | 8 | 51.6 | 39.0 | 39.0 | 39.0 | 6 | 13 | 44.0 | 50.0 | 6 | 13 | 31.0 | 32.0 | 6 | 6.5 | 5 | 6 | 42.5 | 113 | 125 | 137 | 6 | 6 | 40.0 | 47.0 | 5 | 12 | 5 | 7 | 0 |
| 38 FT | 20 | 22 | 13 | 8 | 6 | 6.5 | 6 | 7.5 | 51.8 | 40.0 | 40.0 | 40.0 | 6 | 12 | 44.0 | 50.0 | 6 | 12 | 30.0 | 31.0 | 6 | 6.5 | 5 | 6 | 42.8 | 114 | 126 | 138 | 6 | 6 | 40.0 | 47.0 | 5 | 12 | 5 | 6.5 | 0 |
| 40 FT | 21 | 23 | 13 | 8 | 6 | 6.5 | 6 | 7.5 | 51.9 | 41.0 | 41.0 | 41.0 | 6 | 12 | 44.0 | 49.0 | 6 | 12 | 30.0 | 31.0 | 6 | 6.5 | 5 | 6 | 43.0 | 115 | 127 | 139 | 6 | 6 | 40.0 | 47.0 | 5 | 12 | 5 | 6.5 | 0 |
| 42 FT | 21 | 24 | 14 | 8 | 6 | 6 | 6 | 7.5 | 52.6 | 41.0 | 41.0 | 41.0 | 6 | 12 | 44.0 | 49.0 | 6 | 12 | 30.0 | 31.0 | 6 | 6.5 | 5 | 6 | 43.4 | 116 | 128 | 140 | 6 | 6 | 40.0 | 47.0 | 5 | 12 | 5 | 6.5 | 0 |
| 44 FT | 22 | 24 | 14 | 8 | 6 | 6 | 6 | 7.5 | 52.6 | 42.0 | 42.0 | 42.0 | 6 | 12 | 44.0 | 49.0 | 6 | 12 | 30.0 | 31.0 | 6 | 6 | 5 | 6 | 43.4 | 116 | 128 | 140 | 7 | 7.5 | 43.0 | 50.0 | 5 | 12 | 5 | 6 | 0 |
| 46 FT | 23 | 25 | 14 | 8 | 6 | 6 | 6 | 7 | 52.8 | 43.0 | 43.0 | 43.0 | 6 | 12 | 43.0 | 48.0 | 6 | 12 | 30.0 | 31.0 | 6 | 6 | 5 | 6 | 43.6 | 117 | 129 | 141 | 7 | 7.5 | 43.0 | 50.0 | 5 | 12 | 5 | 6 | 0 |
| 48 FT | 23 | 26 | 15 | 8 | 6 | 6 | 6 | 7 | 53.6 | 43.0 | 43.0 | 47.0 | 6 | 12 | 44.0 | 48.0 | 6 | 12 | 30.0 | 31.0 | 6 | 6 | 6 | 8 | 47.0 | 118 | 130 | 142 | 7 | 7.5 | 43.0 | 50.0 | 5 | 12 | 5 | 6 | 0 |
| 50 FT | 24 | 26 | 15 | 8 | 6 | 6 | 6 | 7 | 53.6 | 44.0 | 44.0 | 48.0 | 6 | 12 | 43.0 | 48.0 | 6 | 12 | 30.0 | 30.0 | 6 | 6 | 6 | 8 | 47.1 | 118 | 130 | 142 | 7 | 7.5 | 43.0 | 50.0 | 5 | 12 | 6 | 8 | 0 |




BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ℄ CULVERT.

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

### GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.


MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

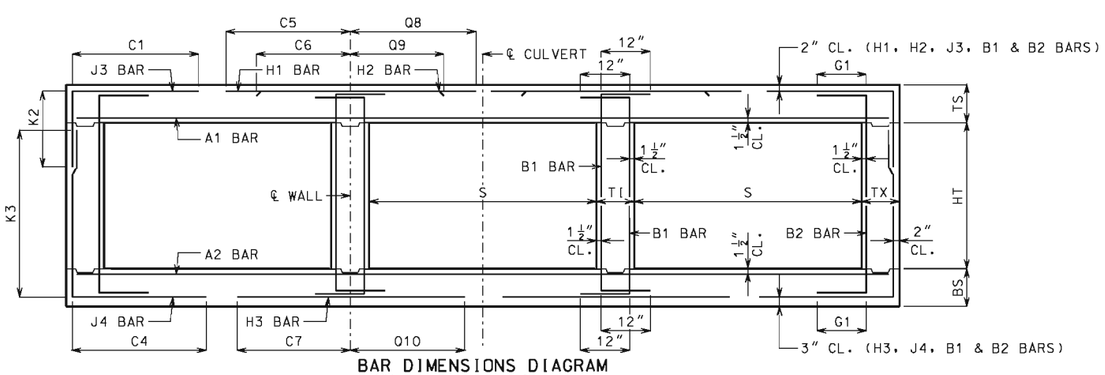
SPAN (S): 9 FEET
HEIGHT (HT): 5 THRU 10 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

703.87

SPAN (S) = 9 FT HEIGHT (HT) = 11 FT OR 12 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | | | | | | | | | | K2 | | | | | | | | | | | | | | K3 | | | | | | | | | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | HT=11' | HT=12' | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | HT=11' | HT=12' | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 13 | 9 | 9 | 10 | 5 | 6.5 | 5 | 7.5 | 49.3 | 33.0 | 33.0 | 4 | 12 | 90.5 | 67.5 | 4 | 12 | 29.0 | 27.0 | 4 | 6 | 6 | 6 | 76.3 | 137 | 149 | 5 | 6.5 | 44.0 | 44.0 | 5 | 10 | 5 | 9 | 12 |
| 2 FT | 13 | 10 | 9 | 10 | 5 | 6.5 | 5 | 7 | 52.3 | 33.0 | 33.0 | 5 | 18 | 92.5 | 69.5 | 5 | 18 | 28.0 | 25.0 | 4 | 6 | 6 | 6.5 | 76.3 | 138 | 150 | 5 | 7 | 44.0 | 45.0 | 5 | 11.5 | 5 | 9 | 12 |
| 4 FT | 9 | 10 | 9 | 10 | 5 | 8.5 | 5 | 6 | 52.3 | 29.0 | 29.0 | 5 | 16 | 92.5 | 71.0 | 5 | 16 | 29.0 | 30.0 | 5 | 8.5 | 6 | 6 | 76.3 | 138 | 150 | 5 | 7 | 43.0 | 45.0 | 5 | 11.5 | 5 | 8.5 | 12 |
| 6 FT | 9 | 10 | 10 | 10 | 5 | 8.5 | 5 | 6 | 69.4 | 29.0 | 29.0 | 5 | 16 | 51.0 | 49.0 | 5 | 16 | 28.0 | 28.0 | 5 | 7.5 | 6 | 6.5 | 68.8 | 138 | 150 | 5 | 6 | 41.0 | 43.0 | 5 | 12 | 5 | 8 | 12 |
| 8 FT | 9 | 10 | 10 | 10 | 5 | 8.5 | 5 | 6 | 60.0 | 29.0 | 29.0 | 5 | 14 | 45.0 | 45.0 | 5 | 14 | 27.0 | 27.0 | 5 | 7 | 6 | 6 | 63.9 | 138 | 150 | 6 | 7 | 43.0 | 45.0 | 5 | 12 | 5 | 8 | 0 |
| 10 FT | 9 | 11 | 10 | 10 | 5 | 8.5 | 6 | 7 | 59.0 | 29.0 | 33.0 | 5 | 13 | 42.0 | 43.0 | 5 | 13 | 27.0 | 27.0 | 5 | 6.5 | 6 | 6 | 63.6 | 139 | 151 | 5 | 6 | 39.0 | 43.0 | 5 | 12 | 5 | 8 | 0 |
| 12 FT | 10 | 12 | 10 | 10 | 5 | 8 | 6 | 7 | 58.6 | 30.0 | 34.0 | 5 | 13 | 41.0 | 43.0 | 5 | 13 | 26.0 | 27.0 | 5 | 6.5 | 6 | 6.5 | 62.8 | 140 | 152 | 5 | 6 | 39.0 | 43.0 | 5 | 12 | 5 | 8 | 0 |
| 14 FT | 11 | 12 | 10 | 10 | 5 | 7.5 | 6 | 7.5 | 58.5 | 31.0 | 35.0 | 5 | 13 | 41.0 | 43.0 | 5 | 13 | 26.0 | 27.0 | 5 | 6 | 6 | 6 | 60.4 | 140 | 152 | 6 | 7 | 41.0 | 45.0 | 5 | 12 | 5 | 8 | 0 |
| 16 FT | 12 | 13 | 11 | 10 | 5 | 7 | 5 | 6 | 54.4 | 32.0 | 32.0 | 5 | 13 | 40.0 | 42.0 | 5 | 13 | 26.0 | 27.0 | 5 | 6 | 6 | 7 | 59.1 | 141 | 153 | 6 | 7 | 41.0 | 45.0 | 5 | 12 | 5 | 7.5 | 0 |
| 18 FT | 12 | 14 | 11 | 10 | 5 | 7 | 6 | 7.5 | 55.6 | 32.0 | 36.0 | 5 | 12 | 39.0 | 42.0 | 5 | 12 | 26.0 | 27.0 | 6 | 8 | 6 | 6.5 | 59.0 | 142 | 154 | 6 | 7.5 | 41.0 | 46.0 | 5 | 12 | 5 | 7.5 | 0 |
| 20 FT | 13 | 15 | 12 | 10 | 5 | 6.5 | 6 | 8 | 55.0 | 33.0 | 37.0 | 5 | 12 | 38.0 | 42.0 | 5 | 12 | 26.0 | 27.0 | 6 | 8 | 6 | 7 | 58.1 | 143 | 155 | 6 | 7 | 41.0 | 46.0 | 5 | 12 | 5 | 7 | 0 |
| 22 FT | 14 | 16 | 12 | 10 | 5 | 6 | 6 | 7.5 | 55.0 | 34.0 | 38.0 | 5 | 12 | 38.0 | 42.0 | 5 | 12 | 25.0 | 27.0 | 6 | 7.5 | 6 | 7 | 57.9 | 144 | 156 | 6 | 7 | 41.0 | 46.0 | 5 | 12 | 5 | 7 | 0 |
| 24 FT | 15 | 17 | 13 | 10 | 6 | 8 | 6 | 7.5 | 61.0 | 35.0 | 39.0 | 6 | 16 | 47.0 | 51.0 | 6 | 16 | 33.0 | 35.0 | 6 | 7.5 | 6 | 7.5 | 57.4 | 145 | 157 | 6 | 6.5 | 41.0 | 46.0 | 5 | 12 | 5 | 6.5 | 0 |
| 26 FT | 16 | 17 | 13 | 10 | 6 | 8 | 6 | 7 | 61.3 | 40.0 | 40.0 | 6 | 15 | 46.0 | 51.0 | 6 | 15 | 33.0 | 34.0 | 6 | 6.5 | 6 | 7 | 56.6 | 145 | 157 | 6 | 6.5 | 41.0 | 46.0 | 5 | 12 | 5 | 6.5 | 0 |
| 28 FT | 16 | 18 | 14 | 10 | 6 | 8 | 6 | 7.5 | 61.0 | 36.0 | 40.0 | 6 | 15 | 46.0 | 51.0 | 6 | 15 | 33.0 | 35.0 | 6 | 7 | 6 | 7 | 56.6 | 146 | 158 | 6 | 6.5 | 41.0 | 46.0 | 5 | 12 | 5 | 6 | 0 |
| 30 FT | 17 | 19 | 14 | 10 | 6 | 7.5 | 6 | 7.5 | 59.6 | 37.0 | 41.0 | 6 | 14 | 45.0 | 50.0 | 6 | 14 | 32.0 | 34.0 | 6 | 7 | 6 | 7.5 | 54.8 | 147 | 159 | 6 | 6 | 41.0 | 46.0 | 5 | 12 | 5 | 6 | 0 |
| 32 FT | 18 | 20 | 14 | 10 | 6 | 7 | 6 | 7 | 59.9 | 38.0 | 42.0 | 6 | 13 | 45.0 | 50.0 | 6 | 13 | 32.0 | 33.0 | 6 | 7 | 6 | 7.5 | 55.0 | 148 | 160 | 6 | 6 | 41.0 | 46.0 | 5 | 12 | 5 | 6 | 0 |
| 34 FT | 18 | 20 | 14 | 10 | 6 | 6.5 | 6 | 6.5 | 59.8 | 38.0 | 42.0 | 6 | 13 | 45.0 | 50.0 | 6 | 13 | 32.0 | 34.0 | 6 | 6 | 6 | 7.5 | 54.9 | 148 | 160 | 6 | 6 | 41.0 | 46.0 | 5 | 12 | 5 | 6 | 0 |
| 36 FT | 19 | 21 | 15 | 10 | 6 | 6.5 | 6 | 7 | 60.3 | 43.0 | 43.0 | 6 | 13 | 45.0 | 50.0 | 6 | 13 | 31.0 | 33.0 | 6 | 6.5 | 6 | 7.5 | 55.3 | 149 | 161 | 6 | 6 | 41.0 | 47.0 | 5 | 12 | 6 | 8 | 0 |
| 38 FT | 20 | 22 | 15 | 10 | 6 | 6.5 | 6 | 6.5 | 60.6 | 44.0 | 44.0 | 6 | 12 | 45.0 | 50.0 | 6 | 12 | 31.0 | 32.0 | 6 | 6.5 | 6 | 7.5 | 55.5 | 150 | 162 | 6 | 6 | 41.0 | 47.0 | 5 | 12 | 6 | 8 | 0 |
| 40 FT | 20 | 23 | 16 | 10 | 6 | 6.5 | 6 | 6.5 | 60.9 | 44.0 | 44.0 | 6 | 12 | 45.0 | 49.0 | 6 | 12 | 31.0 | 32.0 | 6 | 6.5 | 6 | 7.5 | 55.9 | 151 | 163 | 6 | 6 | 41.0 | 47.0 | 5 | 12 | 6 | 8 | 0 |
| 42 FT | 21 | 23 | 16 | 10 | 6 | 6.5 | 6 | 6.5 | 61.1 | 45.0 | 45.0 | 6 | 12 | 45.0 | 49.0 | 6 | 12 | 31.0 | 32.0 | 6 | 6 | 6 | 7.5 | 55.8 | 151 | 163 | 7 | 7.5 | 44.0 | 50.0 | 5 | 12 | 6 | 8 | 0 |
| 44 FT | 22 | 24 | 17 | 10 | 6 | 6 | 6 | 6.5 | 61.9 | 46.0 | 46.0 | 6 | 12 | 45.0 | 49.0 | 6 | 12 | 31.0 | 32.0 | 6 | 6 | 6 | 7 | 56.3 | 152 | 164 | 7 | 7.5 | 44.0 | 50.0 | 5 | 12 | 6 | 7.5 | 0 |
| 46 FT | 22 | 25 | 17 | 10 | 6 | 6 | 6 | 6 | 61.9 | 46.0 | 46.0 | 6 | 12 | 45.0 | 48.0 | 6 | 12 | 31.0 | 32.0 | 6 | 6 | 6 | 7 | 56.5 | 153 | 165 | 7 | 8 | 44.0 | 50.0 | 5 | 12 | 6 | 7.5 | 0 |
| 48 FT | 23 | 26 | 18 | 10 | 6 | 6 | 6 | 6.5 | 62.5 | 47.0 | 47.0 | 6 | 12 | 44.0 | 48.0 | 6 | 12 | 31.0 | 31.0 | 6 | 6 | 6 | 6.5 | 57.0 | 154 | 166 | 7 | 8 | 44.0 | 50.0 | 5 | 12 | 6 | 7 | 0 |
| 50 FT | 23 | 26 | 18 | 10 | 7 | 8 | 6 | 6 | 62.5 | 47.0 | 47.0 | 6 | 12 | 44.0 | 48.0 | 6 | 12 | 31.0 | 31.0 | 6 | 6 | 6 | 6.5 | 56.9 | 154 | 166 | 7 | 7.5 | 44.0 | 50.0 | 5 | 12 | 6 | 7 | 0 |




BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ℄ CULVERT.

## GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 9 FEET
HEIGHT (HT): 11 THRU 12 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

703.87



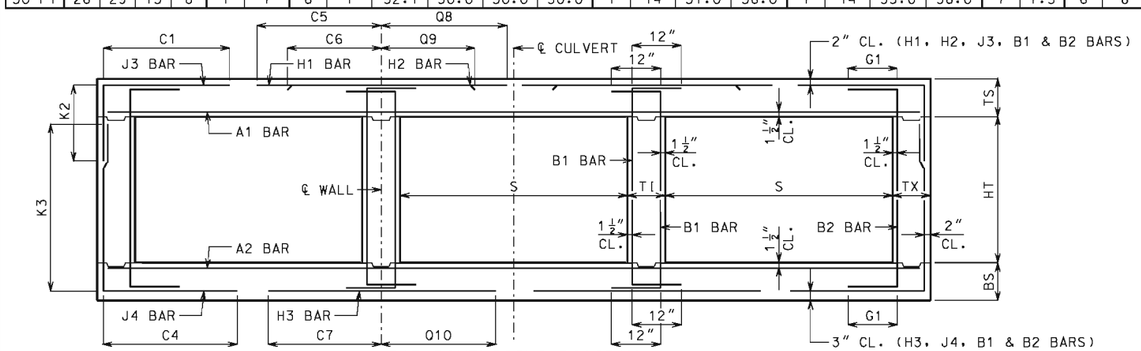

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

## SPAN (S) = 10 FT HEIGHT (HT) = 5 FT OR 6 FT OR 7 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | K2 HT=5′ | K2 HT=6′ | K2 HT=7′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | K3 HT=5′ | K3 HT=6′ | K3 HT=7′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 13 | 9 | 8 | 8 | 5 | 6.5 | 4 | 7 | 51.9 | 29.0 | 29.0 | 29.0 | 5 | 16 | 98.5 | 74.5 | 5 | 16 | 29.0 | 27.0 | 4 | 6 | 4 | 6 | 47.4 | 65 | 77 | 89 | 5 | 6.5 | 45.0 | 47.0 | 5 | 12 | 5 | 12 | 12 |
| 2 FT | 13 | 9 | 8 | 8 | 5 | 6.5 | 4 | 6.5 | 51.9 | 29.0 | 29.0 | 29.0 | 5 | 14 | 98.5 | 74.5 | 5 | 14 | 28.0 | 29.0 | 5 | 8.5 | 5 | 6.5 | 43.3 | 65 | 77 | 89 | 5 | 6 | 44.0 | 46.0 | 5 | 12 | 5 | 12 | 12 |
| 4 FT | 9 | 9 | 8 | 8 | 5 | 7.5 | 6 | 7.5 | 48.4 | 25.0 | 29.0 | 29.0 | 5 | 13 | 59.0 | 76.0 | 5 | 13 | 30.0 | 30.0 | 5 | 7.5 | 5 | 6.5 | 39.0 | 65 | 77 | 89 | 6 | 6.5 | 46.0 | 49.0 | 5 | 10 | 5 | 12 | 12 |
| 6 FT | 9 | 9 | 8 | 8 | 5 | 8 | 5 | 6 | 39.8 | 29.0 | 29.0 | 29.0 | 5 | 13 | 49.0 | 55.0 | 5 | 13 | 28.0 | 29.0 | 5 | 7.5 | 6 | 7 | 39.8 | 65 | 77 | 89 | 6 | 6 | 45.0 | 48.0 | 5 | 12 | 5 | 12 | 12 |
| 8 FT | 10 | 10 | 8 | 8 | 5 | 8 | 5 | 7.5 | 36.8 | 26.0 | 26.0 | 30.0 | 5 | 13 | 45.0 | 50.0 | 5 | 13 | 28.0 | 28.0 | 5 | 7 | 5 | 6.5 | 34.8 | 66 | 78 | 90 | 6 | 6.5 | 44.0 | 48.0 | 5 | 12 | 5 | 12 | 0 |
| 10 FT | 10 | 11 | 8 | 8 | 5 | 8 | 5 | 6.5 | 35.4 | 26.0 | 26.0 | 30.0 | 6 | 15 | 47.0 | 51.0 | 6 | 15 | 30.0 | 31.0 | 5 | 6.5 | 5 | 7.5 | 32.9 | 67 | 79 | 91 | 6 | 6.5 | 43.0 | 49.0 | 5 | 12 | 5 | 12 | 0 |
| 12 FT | 11 | 12 | 8 | 8 | 5 | 7.5 | 5 | 7 | 33.6 | 27.0 | 27.0 | 31.0 | 6 | 16 | 45.0 | 50.0 | 6 | 16 | 30.0 | 31.0 | 5 | 6 | 5 | 8.5 | 31.6 | 68 | 80 | 92 | 6 | 6.5 | 42.0 | 49.0 | 5 | 12 | 5 | 12 | 0 |
| 14 FT | 12 | 13 | 8 | 8 | 5 | 7 | 5 | 8 | 32.4 | 28.0 | 28.0 | 32.0 | 6 | 16 | 44.0 | 50.0 | 6 | 16 | 29.0 | 31.0 | 5 | 6 | 5 | 8.5 | 30.9 | 69 | 81 | 93 | 6 | 6.5 | 42.0 | 49.0 | 5 | 12 | 5 | 12 | 0 |
| 16 FT | 13 | 14 | 8 | 8 | 5 | 6.5 | 5 | 8 | 31.3 | 29.0 | 29.0 | 33.0 | 6 | 16 | 44.0 | 50.0 | 6 | 16 | 29.0 | 31.0 | 6 | 8 | 5 | 8.5 | 30.3 | 70 | 82 | 94 | 6 | 7 | 42.0 | 49.0 | 5 | 12 | 5 | 12 | 0 |
| 18 FT | 14 | 15 | 8 | 8 | 5 | 6 | 5 | 8.5 | 30.5 | 30.0 | 30.0 | 34.0 | 6 | 16 | 43.0 | 50.0 | 6 | 16 | 29.0 | 31.0 | 6 | 7.5 | 5 | 8.5 | 29.8 | 71 | 83 | 95 | 6 | 7 | 41.0 | 49.0 | 5 | 12 | 5 | 12 | 0 |
| 20 FT | 15 | 16 | 8 | 8 | 6 | 8 | 5 | 8 | 34.9 | 31.0 | 31.0 | 35.0 | 6 | 16 | 48.0 | 56.0 | 6 | 16 | 35.0 | 37.0 | 6 | 7 | 5 | 8 | 29.4 | 72 | 84 | 96 | 6 | 7 | 41.0 | 49.0 | 5 | 12 | 5 | 12 | 0 |
| 22 FT | 16 | 17 | 8 | 8 | 6 | 8 | 5 | 7 | 34.4 | 32.0 | 32.0 | 36.0 | 6 | 15 | 48.0 | 56.0 | 6 | 15 | 34.0 | 37.0 | 6 | 7 | 5 | 7 | 29.0 | 73 | 85 | 97 | 6 | 6.5 | 41.0 | 50.0 | 5 | 12 | 5 | 12 | 0 |
| 24 FT | 17 | 18 | 8 | 8 | 6 | 7.5 | 5 | 6.5 | 34.0 | 37.0 | 37.0 | 37.0 | 6 | 14 | 48.0 | 56.0 | 6 | 14 | 34.0 | 36.0 | 6 | 6.5 | 5 | 6.5 | 28.9 | 74 | 86 | 98 | 6 | 6.5 | 41.0 | 50.0 | 5 | 12 | 5 | 11 | 0 |
| 26 FT | 18 | 19 | 8 | 8 | 6 | 7 | 5 | 6.5 | 33.9 | 38.0 | 38.0 | 38.0 | 6 | 13 | 47.0 | 55.0 | 6 | 13 | 33.0 | 35.0 | 6 | 6.5 | 5 | 6.5 | 28.8 | 75 | 87 | 99 | 6 | 6 | 41.0 | 50.0 | 5 | 12 | 5 | 10 | 0 |
| 28 FT | 19 | 20 | 8 | 8 | 6 | 6.5 | 5 | 6 | 33.8 | 39.0 | 39.0 | 39.0 | 6 | 13 | 47.0 | 55.0 | 6 | 13 | 33.0 | 35.0 | 6 | 6.5 | 5 | 6 | 28.8 | 76 | 88 | 100 | 6 | 6 | 41.0 | 50.0 | 5 | 12 | 5 | 9.5 | 0 |
| 30 FT | 19 | 21 | 8 | 8 | 6 | 6 | 5 | 6 | 33.8 | 39.0 | 39.0 | 39.0 | 6 | 12 | 47.0 | 55.0 | 6 | 12 | 33.0 | 36.0 | 6 | 6 | 6 | 7.5 | 31.6 | 77 | 89 | 101 | 7 | 7.5 | 44.0 | 53.0 | 5 | 12 | 5 | 9.5 | 0 |
| 32 FT | 20 | 22 | 8 | 8 | 6 | 6.5 | 6 | 7.5 | 37.8 | 44.0 | 44.0 | 44.0 | 6 | 12 | 47.0 | 55.0 | 6 | 12 | 33.0 | 35.0 | 6 | 6 | 6 | 7 | 31.8 | 78 | 90 | 102 | 7 | 7.5 | 44.0 | 53.0 | 5 | 12 | 5 | 9.5 | 0 |
| 34 FT | 21 | 23 | 8 | 8 | 6 | 6 | 6 | 7 | 36.8 | 45.0 | 45.0 | 45.0 | 6 | 12 | 46.0 | 55.0 | 6 | 12 | 32.0 | 34.0 | 6 | 6 | 6 | 6.5 | 30.9 | 79 | 91 | 103 | 7 | 7.5 | 44.0 | 53.0 | 5 | 12 | 5 | 9.5 | 0 |
| 36 FT | 22 | 23 | 8 | 8 | 6 | 6 | 6 | 6.5 | 36.8 | 46.0 | 46.0 | 46.0 | 7 | 15 | 51.0 | 60.0 | 7 | 15 | 36.0 | 38.0 | 6 | 6 | 6 | 6.5 | 31.0 | 79 | 91 | 103 | 7 | 7 | 44.0 | 53.0 | 5 | 12 | 5 | 9.5 | 0 |
| 38 FT | 23 | 24 | 8 | 8 | 7 | 7.5 | 6 | 6 | 36.8 | 47.0 | 47.0 | 47.0 | 7 | 15 | 51.0 | 59.0 | 7 | 15 | 36.0 | 37.0 | 6 | 6 | 6 | 6 | 31.1 | 80 | 92 | 104 | 7 | 7 | 44.0 | 53.0 | 5 | 12 | 5 | 8.5 | 0 |
| 40 FT | 23 | 25 | 8 | 8 | 7 | 7.5 | 6 | 6 | 36.9 | 47.0 | 47.0 | 47.0 | 7 | 15 | 51.0 | 59.0 | 7 | 15 | 36.0 | 38.0 | 6 | 6 | 6 | 6 | 31.1 | 81 | 93 | 105 | 7 | 7 | 44.0 | 53.0 | 5 | 12 | 5 | 8 | 0 |
| 42 FT | 24 | 26 | 8 | 8 | 7 | 7.5 | 6 | 6 | 37.0 | 48.0 | 48.0 | 48.0 | 7 | 14 | 51.0 | 59.0 | 7 | 14 | 36.0 | 37.0 | 7 | 8 | 7 | 6.5 | 34.4 | 82 | 94 | 106 | 7 | 7 | 44.0 | 53.0 | 5 | 12 | 5 | 7.5 | 0 |
| 44 FT | 25 | 26 | 9 | 8 | 7 | 7 | 6 | 6.5 | 37.8 | 49.0 | 49.0 | 49.0 | 7 | 14 | 51.0 | 59.0 | 7 | 14 | 36.0 | 37.0 | 7 | 7.5 | 6 | 6.5 | 32.0 | 82 | 94 | 106 | 7 | 7 | 44.0 | 53.0 | 5 | 12 | 5 | 8.5 | 0 |
| 46 FT | 25 | 27 | 9 | 8 | 7 | 7 | 6 | 6.5 | 37.9 | 49.0 | 49.0 | 49.0 | 7 | 14 | 51.0 | 59.0 | 7 | 14 | 36.0 | 37.0 | 7 | 7.5 | 6 | 6.5 | 32.0 | 83 | 95 | 107 | 7 | 7 | 44.0 | 53.0 | 5 | 12 | 5 | 8 | 0 |
| 48 FT | 26 | 28 | 9 | 8 | 7 | 7 | 6 | 6.5 | 38.0 | 50.0 | 50.0 | 50.0 | 7 | 14 | 51.0 | 58.0 | 7 | 14 | 35.0 | 37.0 | 7 | 7.5 | 6 | 6 | 32.3 | 84 | 96 | 108 | 7 | 7 | 44.0 | 53.0 | 5 | 12 | 5 | 7.5 | 0 |
| 50 FT | 27 | 28 | 9 | 8 | 7 | 7 | 6 | 6 | 38.0 | 51.0 | 51.0 | 51.0 | 7 | 14 | 51.0 | 58.0 | 7 | 14 | 35.0 | 37.0 | 7 | 7 | 6 | 6 | 32.4 | 84 | 96 | 108 | 7 | 6.5 | 44.0 | 53.0 | 5 | 12 | 5 | 7 | 0 |

## SPAN (S) = 10 FT HEIGHT (HT) = 8 FT OR 9 FT OR 10 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | K2 HT=8′ | K2 HT=9′ | K2 HT=10′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | K3 HT=8′ | K3 HT=9′ | K3 HT=10′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 13 | 9 | 8 | 8 | 5 | 6.5 | 5 | 8.5 | 54.9 | 29.0 | 33.0 | 33.0 | 5 | 16 | 100.5 | 74.5 | 5 | 16 | 30.0 | 30.0 | 5 | 8.5 | 6 | 6.5 | 74.1 | 101 | 113 | 125 | 5 | 6 | 46.0 | 47.0 | 5 | 12 | 5 | 12 | 12 |
| 2 FT | 13 | 9 | 8 | 8 | 5 | 6.5 | 5 | 8 | 54.9 | 29.0 | 33.0 | 33.0 | 5 | 14 | 100.5 | 74.5 | 5 | 14 | 28.0 | 28.0 | 5 | 7.5 | 6 | 6 | 65.8 | 101 | 113 | 125 | 6 | 7 | 47.0 | 50.0 | 5 | 12 | 5 | 11.5 | 12 |
| 4 FT | 9 | 9 | 9 | 8 | 5 | 7 | 5 | 6 | 65.9 | 29.0 | 29.0 | 29.0 | 5 | 13 | 74.0 | 76.0 | 5 | 13 | 30.0 | 31.0 | 5 | 7.5 | 6 | 6.5 | 57.6 | 101 | 113 | 125 | 6 | 6.5 | 46.0 | 50.0 | 5 | 12 | 5 | 11.5 | 12 |
| 6 FT | 9 | 9 | 9 | 8 | 5 | 8 | 5 | 6 | 51.8 | 29.0 | 29.0 | 29.0 | 5 | 13 | 51.0 | 57.0 | 5 | 13 | 29.0 | 29.0 | 5 | 7 | 6 | 6 | 52.9 | 101 | 113 | 125 | 6 | 6 | 45.0 | 48.0 | 5 | 12 | 5 | 11.5 | 12 |
| 8 FT | 9 | 10 | 9 | 8 | 5 | 8 | 5 | 6 | 48.1 | 29.0 | 29.0 | 29.0 | 6 | 15 | 49.0 | 52.0 | 6 | 15 | 30.0 | 31.0 | 5 | 7 | 6 | 6.5 | 51.0 | 102 | 114 | 126 | 6 | 6 | 44.0 | 49.0 | 5 | 12 | 5 | 11 | 0 |
| 10 FT | 10 | 11 | 9 | 8 | 5 | 8 | 5 | 6 | 46.5 | 30.0 | 30.0 | 30.0 | 5 | 12 | 44.0 | 48.0 | 5 | 12 | 27.0 | 28.0 | 5 | 6.5 | 6 | 6.5 | 49.5 | 103 | 115 | 127 | 6 | 6.5 | 43.0 | 49.0 | 5 | 12 | 5 | 10.5 | 0 |
| 12 FT | 11 | 12 | 9 | 8 | 5 | 7.5 | 6 | 7 | 48.1 | 31.0 | 31.0 | 35.0 | 6 | 16 | 45.0 | 50.0 | 6 | 16 | 30.0 | 31.0 | 5 | 6 | 6 | 6.5 | 48.4 | 104 | 116 | 128 | 6 | 6.5 | 43.0 | 49.0 | 5 | 12 | 5 | 9.5 | 0 |
| 14 FT | 12 | 13 | 9 | 8 | 5 | 7 | 6 | 7 | 47.0 | 32.0 | 32.0 | 36.0 | 6 | 16 | 45.0 | 50.0 | 6 | 16 | 29.0 | 31.0 | 5 | 6 | 6 | 7 | 47.4 | 105 | 117 | 129 | 6 | 6.5 | 42.0 | 49.0 | 5 | 12 | 5 | 8.5 | 0 |
| 16 FT | 13 | 14 | 9 | 8 | 5 | 6.5 | 6 | 7 | 46.0 | 33.0 | 33.0 | 37.0 | 6 | 16 | 44.0 | 50.0 | 6 | 16 | 29.0 | 31.0 | 6 | 8 | 6 | 7 | 46.5 | 106 | 118 | 130 | 6 | 7 | 42.0 | 49.0 | 5 | 12 | 5 | 8.5 | 0 |
| 18 FT | 14 | 15 | 9 | 8 | 5 | 6 | 6 | 7 | 45.3 | 34.0 | 34.0 | 38.0 | 6 | 16 | 43.0 | 49.0 | 6 | 16 | 29.0 | 31.0 | 6 | 7.5 | 6 | 7 | 45.9 | 107 | 119 | 131 | 6 | 7 | 42.0 | 49.0 | 5 | 12 | 5 | 8.5 | 0 |
| 20 FT | 15 | 16 | 9 | 8 | 6 | 8 | 6 | 7 | 50.5 | 35.0 | 35.0 | 39.0 | 6 | 16 | 49.0 | 55.0 | 6 | 16 | 35.0 | 37.0 | 6 | 7 | 6 | 6.5 | 45.3 | 108 | 120 | 132 | 6 | 7 | 42.0 | 49.0 | 5 | 12 | 5 | 8.5 | 0 |
| 22 FT | 15 | 17 | 11 | 8 | 6 | 7.5 | 5 | 6 | 47.1 | 35.0 | 35.0 | 35.0 | 6 | 15 | 48.0 | 55.0 | 6 | 15 | 35.0 | 37.0 | 6 | 7 | 5 | 7 | 42.1 | 109 | 121 | 133 | 6 | 6.5 | 42.0 | 50.0 | 5 | 12 | 5 | 8 | 0 |
| 24 FT | 17 | 18 | 11 | 8 | 6 | 7.5 | 6 | 8.5 | 50.8 | 37.0 | 37.0 | 37.0 | 6 | 14 | 48.0 | 55.0 | 6 | 14 | 33.0 | 36.0 | 6 | 6.5 | 5 | 6.5 | 42.0 | 110 | 122 | 134 | 6 | 6.5 | 42.0 | 50.0 | 5 | 12 | 5 | 7.5 | 0 |
| 26 FT | 18 | 19 | 11 | 8 | 6 | 7 | 6 | 8 | 50.4 | 38.0 | 38.0 | 38.0 | 6 | 13 | 47.0 | 55.0 | 6 | 13 | 33.0 | 35.0 | 6 | 6.5 | 5 | 6 | 41.8 | 111 | 123 | 135 | 6 | 6 | 42.0 | 50.0 | 5 | 12 | 5 | 7.5 | 0 |
| 28 FT | 18 | 20 | 12 | 8 | 6 | 7 | 6 | 8 | 51.0 | 38.0 | 38.0 | 38.0 | 6 | 13 | 47.0 | 54.0 | 6 | 13 | 34.0 | 36.0 | 6 | 6.5 | 5 | 6.5 | 41.9 | 112 | 124 | 136 | 6 | 6 | 42.0 | 50.0 | 5 | 12 | 5 | 7.5 | 0 |
| 30 FT | 19 | 21 | 12 | 8 | 6 | 6.5 | 6 | 7.5 | 50.9 | 39.0 | 39.0 | 39.0 | 6 | 13 | 47.0 | 54.0 | 6 | 13 | 33.0 | 35.0 | 6 | 6.5 | 5 | 6.5 | 41.9 | 113 | 125 | 137 | 7 | 7.5 | 45.0 | 53.0 | 5 | 12 | 5 | 7 | 0 |
| 32 FT | 20 | 22 | 12 | 8 | 6 | 6.5 | 6 | 7 | 50.9 | 40.0 | 40.0 | 40.0 | 6 | 12 | 47.0 | 54.0 | 6 | 12 | 32.0 | 34.0 | 6 | 6 | 5 | 6.5 | 42.0 | 114 | 126 | 138 | 7 | 7.5 | 45.0 | 53.0 | 5 | 12 | 5 | 7 | 0 |
| 34 FT | 21 | 23 | 12 | 8 | 6 | 6 | 6 | 7.5 | 49.6 | 41.0 | 41.0 | 41.0 | 6 | 12 | 46.0 | 53.0 | 6 | 12 | 31.0 | 33.0 | 6 | 6 | 5 | 6.5 | 40.8 | 115 | 127 | 139 | 7 | 7.5 | 45.0 | 53.0 | 5 | 12 | 5 | 7 | 0 |
| 36 FT | 22 | 24 | 12 | 8 | 6 | 6 | 6 | 7 | 49.8 | 42.0 | 42.0 | 42.0 | 7 | 15 | 51.0 | 58.0 | 7 | 15 | 36.0 | 37.0 | 6 | 6 | 5 | 6.5 | 40.9 | 116 | 128 | 140 | 7 | 7.5 | 45.0 | 53.0 | 5 | 12 | 5 | 7 | 0 |
| 38 FT | 22 | 24 | 13 | 8 | 6 | 6 | 6 | 7.5 | 50.4 | 42.0 | 42.0 | 42.0 | 7 | 15 | 51.0 | 58.0 | 7 | 15 | 36.0 | 38.0 | 6 | 6 | 5 | 6 | 41.1 | 116 | 128 | 140 | 7 | 7 | 45.0 | 53.0 | 5 | 12 | 5 | 6.5 | 0 |
| 40 FT | 23 | 25 | 13 | 8 | 7 | 7.5 | 6 | 7.5 | 50.4 | 43.0 | 43.0 | 43.0 | 7 | 15 | 51.0 | 58.0 | 7 | 15 | 36.0 | 37.0 | 6 | 6 | 5 | 6 | 41.4 | 117 | 129 | 141 | 7 | 7 | 45.0 | 53.0 | 5 | 12 | 5 | 6.5 | 0 |
| 42 FT | 24 | 26 | 13 | 8 | 7 | 7.5 | 6 | 6.5 | 50.5 | 44.0 | 44.0 | 44.0 | 7 | 15 | 51.0 | 57.0 | 7 | 15 | 35.0 | 36.0 | 7 | 8 | 5 | 6 | 41.5 | 118 | 130 | 142 | 7 | 7 | 45.0 | 53.0 | 5 | 12 | 5 | 6.5 | 0 |
| 44 FT | 24 | 27 | 14 | 8 | 7 | 7.5 | 6 | 7 | 51.3 | 44.0 | 44.0 | 44.0 | 7 | 14 | 51.0 | 57.0 | 7 | 14 | 36.0 | 37.0 | 7 | 8 | 5 | 6 | 41.9 | 119 | 131 | 143 | 7 | 7 | 45.0 | 54.0 | 5 | 12 | 5 | 6 | 0 |
| 46 FT | 25 | 27 | 14 | 8 | 7 | 7 | 6 | 7 | 51.3 | 45.0 | 45.0 | 45.0 | 7 | 14 | 51.0 | 57.0 | 7 | 14 | 35.0 | 36.0 | 7 | 7.5 | 5 | 6 | 42.0 | 119 | 131 | 143 | 7 | 6.5 | 45.0 | 53.0 | 5 | 12 | 5 | 6 | 0 |
| 48 FT | 26 | 28 | 14 | 8 | 7 | 7 | 6 | 7 | 51.4 | 46.0 | 46.0 | 46.0 | 7 | 15 | 51.0 | 56.0 | 7 | 15 | 35.0 | 36.0 | 7 | 7.5 | 5 | 6 | 42.1 | 120 | 132 | 144 | 7 | 6.5 | 45.0 | 53.0 | 5 | 12 | 5 | 6 | 0 |
| 50 FT | 26 | 29 | 15 | 8 | 7 | 7 | 6 | 7 | 52.1 | 50.0 | 50.0 | 50.0 | 7 | 14 | 51.0 | 56.0 | 7 | 14 | 35.0 | 36.0 | 7 | 7.5 | 6 | 8 | 45.5 | 121 | 133 | 145 | 7 | 6.5 | 45.0 | 54.0 | 5 | 12 | 6 | 8 | 0 |




BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ℄ CULVERT.

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

### GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS. AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.


MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

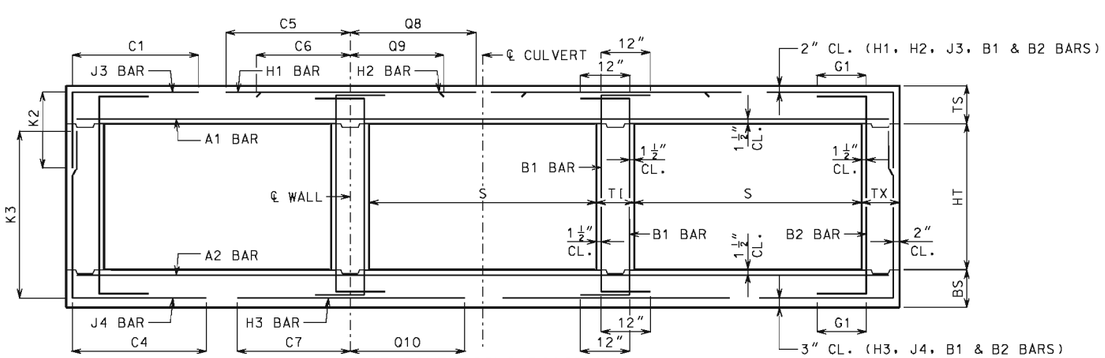
SPAN (S): 10 FEET
HEIGHT (HT): 5 THRU 10 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

703.87

## SPAN (S) = 10 FT HEIGHT (HT) = 11 FT OR 12 FT OR 13 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | | | | | | | | | | K2 | | | | | | | | | | | | | | K3 | | | | | | | | | | | | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | HT=11' | HT=12' | HT=13' | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | HT=11' | HT=12' | HT=13' | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 13 | 10 | 9 | 10 | 5 | 6.5 | 5 | 6.5 | 55.9 | 33.0 | 33.0 | 33.0 | 5 | 16 | 101.5 | 75.5 | 5 | 16 | 30.0 | 29.0 | 5 | 8.5 | 6 | 6 | 82.3 | 138 | 150 | 162 | 5 | 6.5 | 49.0 | 49.0 | 5 | 10 | 5 | 8.5 | 12 |
| 2 FT | 13 | 10 | 10 | 10 | 5 | 6.5 | 5 | 6.5 | 56.5 | 33.0 | 33.0 | 33.0 | 5 | 14 | 101.5 | 75.5 | 5 | 14 | 29.0 | 29.0 | 5 | 8 | 6 | 6.5 | 83.0 | 138 | 150 | 162 | 5 | 6.5 | 47.0 | 48.0 | 5 | 12 | 5 | 8 | 12 |
| 4 FT | 9 | 10 | 10 | 10 | 5 | 7 | 6 | 7 | 56.5 | 29.0 | 29.0 | 33.0 | 5 | 13 | 101.5 | 77.0 | 5 | 13 | 31.0 | 31.0 | 5 | 7 | 6 | 6 | 81.3 | 138 | 150 | 162 | 5 | 6 | 46.0 | 48.0 | 5 | 11 | 5 | 8 | 12 |
| 6 FT | 9 | 11 | 10 | 10 | 5 | 8 | 6 | 7 | 75.6 | 29.0 | 29.0 | 33.0 | 5 | 13 | 54.0 | 53.0 | 5 | 13 | 29.0 | 29.0 | 5 | 7 | 6 | 6 | 77.8 | 139 | 151 | 163 | 5 | 6 | 44.0 | 47.0 | 5 | 12 | 5 | 8 | 12 |
| 8 FT | 9 | 11 | 11 | 10 | 5 | 8 | 6 | 7 | 64.6 | 29.0 | 29.0 | 33.0 | 5 | 12 | 47.0 | 48.0 | 5 | 12 | 28.0 | 28.0 | 5 | 6.5 | 6 | 6.5 | 69.5 | 139 | 151 | 163 | 6 | 7 | 45.0 | 49.0 | 5 | 12 | 5 | 7.5 | 0 |
| 10 FT | 10 | 11 | 11 | 10 | 5 | 8 | 5 | 6 | 61.1 | 30.0 | 30.0 | 30.0 | 5 | 12 | 46.0 | 47.0 | 5 | 12 | 28.0 | 28.0 | 5 | 6 | 6 | 6 | 65.8 | 139 | 151 | 163 | 6 | 6.5 | 45.0 | 48.0 | 5 | 12 | 5 | 7.5 | 0 |
| 12 FT | 11 | 12 | 11 | 10 | 5 | 7.5 | 5 | 6 | 60.3 | 31.0 | 31.0 | 31.0 | 5 | 12 | 44.0 | 47.0 | 5 | 12 | 27.0 | 28.0 | 5 | 6 | 6 | 6 | 65.1 | 140 | 152 | 164 | 6 | 6.5 | 44.0 | 49.0 | 5 | 12 | 5 | 7.5 | 0 |
| 14 FT | 12 | 13 | 11 | 10 | 5 | 7 | 6 | 7.5 | 62.6 | 32.0 | 32.0 | 36.0 | 5 | 12 | 43.0 | 46.0 | 5 | 12 | 27.0 | 28.0 | 5 | 6 | 6 | 6.5 | 64.4 | 141 | 153 | 165 | 6 | 6.5 | 44.0 | 49.0 | 5 | 12 | 5 | 7 | 0 |
| 16 FT | 13 | 14 | 12 | 10 | 5 | 6.5 | 6 | 8 | 61.3 | 33.0 | 33.0 | 37.0 | 5 | 12 | 42.0 | 46.0 | 5 | 12 | 27.0 | 28.0 | 6 | 8 | 6 | 7 | 63.0 | 142 | 154 | 166 | 6 | 7 | 44.0 | 49.0 | 5 | 12 | 5 | 7 | 0 |
| 18 FT | 13 | 15 | 12 | 10 | 5 | 6.5 | 6 | 7 | 59.3 | 33.0 | 37.0 | 37.0 | 6 | 15 | 45.0 | 48.0 | 6 | 15 | 30.0 | 31.0 | 6 | 7.5 | 6 | 6.5 | 62.8 | 143 | 155 | 167 | 6 | 7 | 44.0 | 49.0 | 5 | 12 | 5 | 7 | 0 |
| 20 FT | 14 | 16 | 13 | 10 | 5 | 6 | 6 | 7.5 | 58.8 | 34.0 | 38.0 | 38.0 | 6 | 15 | 44.0 | 48.0 | 6 | 15 | 30.0 | 31.0 | 6 | 7 | 6 | 7 | 61.8 | 144 | 156 | 168 | 6 | 7 | 44.0 | 49.0 | 5 | 12 | 5 | 6.5 | 0 |
| 22 FT | 15 | 17 | 13 | 10 | 6 | 8 | 6 | 6.5 | 64.6 | 35.0 | 39.0 | 39.0 | 6 | 15 | 50.0 | 54.0 | 6 | 15 | 36.0 | 37.0 | 6 | 7 | 6 | 6.5 | 61.4 | 145 | 157 | 169 | 6 | 6.5 | 44.0 | 50.0 | 5 | 12 | 5 | 6.5 | 0 |
| 24 FT | 16 | 18 | 14 | 10 | 6 | 8 | 6 | 7 | 64.6 | 36.0 | 40.0 | 40.0 | 6 | 15 | 49.0 | 54.0 | 6 | 15 | 35.0 | 37.0 | 6 | 6.5 | 6 | 6.5 | 60.5 | 146 | 158 | 170 | 6 | 6.5 | 44.0 | 50.0 | 5 | 12 | 5 | 6 | 0 |
| 26 FT | 17 | 19 | 14 | 10 | 6 | 7.5 | 6 | 6.5 | 64.5 | 37.0 | 41.0 | 41.0 | 6 | 14 | 49.0 | 54.0 | 6 | 14 | 35.0 | 37.0 | 6 | 6.5 | 6 | 6.5 | 60.4 | 147 | 159 | 171 | 6 | 6 | 44.0 | 50.0 | 5 | 12 | 5 | 6 | 0 |
| 28 FT | 18 | 20 | 15 | 10 | 6 | 7 | 6 | 6.5 | 64.9 | 42.0 | 42.0 | 42.0 | 6 | 13 | 48.0 | 54.0 | 6 | 13 | 34.0 | 36.0 | 6 | 6.5 | 6 | 6.5 | 60.3 | 148 | 160 | 172 | 6 | 6 | 44.0 | 50.0 | 5 | 12 | 6 | 8 | 0 |
| 30 FT | 19 | 21 | 15 | 10 | 6 | 6.5 | 6 | 6.5 | 65.1 | 43.0 | 43.0 | 43.0 | 6 | 13 | 48.0 | 54.0 | 6 | 13 | 33.0 | 35.0 | 6 | 6.5 | 6 | 6.5 | 60.4 | 149 | 161 | 173 | 7 | 7.5 | 47.0 | 53.0 | 5 | 12 | 6 | 8 | 0 |
| 32 FT | 20 | 22 | 16 | 10 | 6 | 6.5 | 6 | 6.5 | 65.5 | 44.0 | 44.0 | 44.0 | 6 | 12 | 48.0 | 53.0 | 6 | 12 | 33.0 | 34.0 | 6 | 6 | 6 | 7 | 60.5 | 150 | 162 | 174 | 7 | 7.5 | 47.0 | 53.0 | 5 | 12 | 6 | 8 | 0 |
| 34 FT | 20 | 23 | 16 | 10 | 6 | 6.5 | 6 | 6.5 | 63.5 | 44.0 | 44.0 | 44.0 | 6 | 12 | 47.0 | 53.0 | 6 | 12 | 33.0 | 35.0 | 6 | 6 | 6 | 7.5 | 58.9 | 151 | 163 | 175 | 7 | 7.5 | 46.0 | 53.0 | 5 | 12 | 6 | 8 | 0 |
| 36 FT | 21 | 24 | 16 | 10 | 6 | 6 | 6 | 6 | 63.9 | 45.0 | 45.0 | 45.0 | 6 | 12 | 47.0 | 53.0 | 6 | 12 | 32.0 | 34.0 | 6 | 6 | 6 | 7 | 59.1 | 152 | 164 | 176 | 7 | 7.5 | 46.0 | 53.0 | 5 | 12 | 6 | 8 | 0 |
| 38 FT | 22 | 24 | 17 | 10 | 6 | 6 | 6 | 6 | 64.4 | 46.0 | 46.0 | 46.0 | 7 | 15 | 52.0 | 58.0 | 7 | 15 | 37.0 | 38.0 | 6 | 6 | 6 | 7 | 59.0 | 152 | 164 | 176 | 7 | 7 | 46.0 | 53.0 | 5 | 12 | 6 | 7.5 | 0 |
| 40 FT | 23 | 25 | 17 | 10 | 6 | 6 | 6 | 6 | 64.6 | 47.0 | 47.0 | 47.0 | 7 | 15 | 52.0 | 57.0 | 7 | 15 | 36.0 | 37.0 | 6 | 6 | 6 | 7 | 59.3 | 153 | 165 | 177 | 7 | 7 | 46.0 | 53.0 | 5 | 12 | 6 | 7.5 | 0 |
| 42 FT | 23 | 26 | 18 | 10 | 7 | 7.5 | 6 | 6 | 65.0 | 47.0 | 47.0 | 47.0 | 7 | 15 | 52.0 | 57.0 | 7 | 15 | 37.0 | 38.0 | 7 | 8 | 6 | 6.5 | 59.6 | 154 | 166 | 178 | 7 | 7 | 46.0 | 54.0 | 5 | 12 | 6 | 7 | 0 |
| 44 FT | 24 | 27 | 19 | 10 | 7 | 7.5 | 6 | 6 | 65.8 | 44.0 | 48.0 | 48.0 | 7 | 15 | 52.0 | 57.0 | 7 | 15 | 36.0 | 37.0 | 7 | 8 | 6 | 6.5 | 60.0 | 155 | 167 | 179 | 7 | 7 | 46.0 | 54.0 | 5 | 12 | 6 | 7 | 0 |
| 46 FT | 24 | 27 | 19 | 10 | 7 | 7 | 6 | 6 | 65.6 | 48.0 | 48.0 | 48.0 | 7 | 14 | 52.0 | 57.0 | 7 | 14 | 36.0 | 38.0 | 7 | 7.5 | 6 | 6.5 | 59.9 | 155 | 167 | 179 | 7 | 6.5 | 46.0 | 54.0 | 5 | 12 | 6 | 6.5 | 0 |
| 48 FT | 25 | 28 | 20 | 10 | 7 | 7 | 6 | 6 | 66.4 | 45.0 | 49.0 | 49.0 | 7 | 14 | 52.0 | 56.0 | 7 | 14 | 36.0 | 37.0 | 7 | 7.5 | 6 | 6 | 60.4 | 156 | 168 | 180 | 7 | 6.5 | 46.0 | 54.0 | 5 | 12 | 6 | 6.5 | 0 |
| 50 FT | 26 | 29 | 20 | 10 | 7 | 7 | 7 | 7.5 | 71.6 | 50.0 | 50.0 | 50.0 | 7 | 15 | 51.0 | 55.0 | 7 | 15 | 36.0 | 37.0 | 7 | 7.5 | 6 | 6 | 60.6 | 157 | 169 | 181 | 7 | 6.5 | 47.0 | 54.0 | 5 | 12 | 6 | 6.5 | 0 |




BAR DIMENSIONS DIAGRAM
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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 10 FEET
HEIGHT (HT): 11 THRU 13 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

703.87



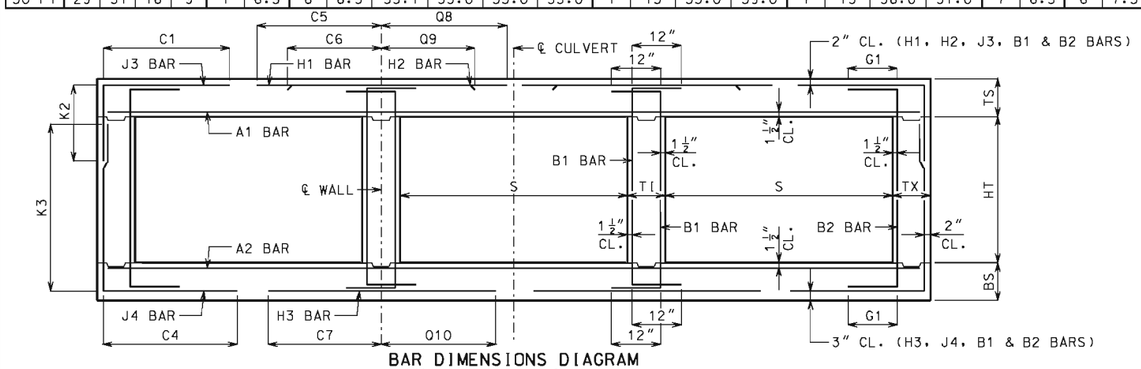

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

## SPAN (S) = 11 FT HEIGHT (HT) = 6 FT OR 7 FT OR 8 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | K2 HT=6′ | K2 HT=7′ | K2 HT=8′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | K3 HT=6′ | K3 HT=7′ | K3 HT=8′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 13 | 9 | 8 | 8 | 5 | 6.5 | 5 | 9 | 58.5 | 29.0 | 29.0 | 33.0 | 5 | 13 | 108.5 | 80.5 | 5 | 13 | 30.0 | 33.0 | 5 | 8.5 | 5 | 6 | 52.6 | 77 | 89 | 101 | 6 | 7 | 50.0 | 53.0 | 5 | 12 | 5 | 12 | 12 |
| 2 FT | 14 | 9 | 8 | 8 | 5 | 6 | 4 | 6 | 55.5 | 30.0 | 30.0 | 30.0 | 5 | 14 | 106.5 | 80.5 | 5 | 14 | 29.0 | 28.0 | 5 | 7.5 | 6 | 6.5 | 50.8 | 77 | 89 | 101 | 6 | 6.5 | 49.0 | 52.0 | 5 | 12 | 5 | 12 | 12 |
| 4 FT | 10 | 9 | 8 | 8 | 5 | 6.5 | 5 | 6 | 49.1 | 30.0 | 30.0 | 30.0 | 5 | 12 | 66.0 | 82.0 | 5 | 12 | 32.0 | 33.0 | 5 | 7.5 | 6 | 6.5 | 45.9 | 77 | 89 | 101 | 6 | 6 | 49.0 | 52.0 | 5 | 11.5 | 5 | 12 | 12 |
| 6 FT | 10 | 10 | 8 | 8 | 5 | 7 | 5 | 6 | 42.8 | 30.0 | 30.0 | 30.0 | 5 | 12 | 53.0 | 63.0 | 5 | 12 | 30.0 | 31.0 | 5 | 7 | 5 | 6 | 39.8 | 78 | 90 | 102 | 6 | 6 | 47.0 | 52.0 | 5 | 12 | 5 | 12 | 12 |
| 8 FT | 10 | 11 | 8 | 8 | 5 | 7 | 6 | 7 | 43.0 | 26.0 | 30.0 | 30.0 | 6 | 15 | 52.0 | 56.0 | 6 | 15 | 32.0 | 32.0 | 5 | 6.5 | 5 | 6.5 | 37.4 | 79 | 91 | 103 | 6 | 6.5 | 46.0 | 52.0 | 5 | 12 | 5 | 12 | 0 |
| 10 FT | 11 | 12 | 8 | 8 | 5 | 7 | 5 | 6 | 37.6 | 27.0 | 31.0 | 31.0 | 6 | 15 | 50.0 | 55.0 | 6 | 15 | 31.0 | 32.0 | 5 | 6 | 5 | 7 | 35.6 | 80 | 92 | 104 | 6 | 6.5 | 45.0 | 52.0 | 5 | 12 | 5 | 12 | 0 |
| 12 FT | 12 | 13 | 8 | 8 | 5 | 7 | 5 | 6.5 | 36.0 | 28.0 | 32.0 | 32.0 | 6 | 15 | 48.0 | 54.0 | 6 | 15 | 31.0 | 32.0 | 5 | 6 | 5 | 7.5 | 34.6 | 81 | 93 | 105 | 6 | 6.5 | 45.0 | 52.0 | 5 | 12 | 5 | 12 | 0 |
| 14 FT | 13 | 14 | 8 | 8 | 5 | 6.5 | 5 | 7 | 34.6 | 33.0 | 33.0 | 33.0 | 6 | 15 | 47.0 | 54.0 | 6 | 15 | 31.0 | 32.0 | 6 | 8 | 5 | 7.5 | 33.8 | 82 | 94 | 106 | 6 | 6.5 | 44.0 | 53.0 | 5 | 12 | 5 | 12 | 0 |
| 16 FT | 14 | 15 | 8 | 8 | 5 | 6 | 5 | 7 | 33.6 | 34.0 | 34.0 | 34.0 | 6 | 14 | 46.0 | 53.0 | 6 | 14 | 30.0 | 32.0 | 6 | 7.5 | 5 | 7.5 | 33.1 | 83 | 95 | 107 | 6 | 6.5 | 44.0 | 53.0 | 5 | 12 | 5 | 12 | 0 |
| 18 FT | 15 | 16 | 8 | 8 | 6 | 8 | 5 | 6.5 | 37.9 | 35.0 | 35.0 | 35.0 | 6 | 14 | 51.0 | 59.0 | 6 | 14 | 36.0 | 38.0 | 6 | 7 | 5 | 7.5 | 32.6 | 84 | 96 | 108 | 6 | 6.5 | 44.0 | 53.0 | 5 | 12 | 5 | 11 | 0 |
| 20 FT | 16 | 17 | 8 | 8 | 6 | 8 | 5 | 6.5 | 37.3 | 36.0 | 36.0 | 36.0 | 6 | 14 | 51.0 | 59.0 | 6 | 14 | 36.0 | 38.0 | 6 | 7 | 5 | 7 | 32.1 | 85 | 97 | 109 | 6 | 6.5 | 44.0 | 53.0 | 5 | 12 | 5 | 10 | 0 |
| 22 FT | 17 | 18 | 8 | 8 | 6 | 7.5 | 5 | 6 | 36.9 | 37.0 | 37.0 | 37.0 | 6 | 14 | 50.0 | 59.0 | 6 | 14 | 36.0 | 38.0 | 6 | 6.5 | 5 | 6.5 | 31.9 | 86 | 98 | 110 | 6 | 6.5 | 44.0 | 53.0 | 5 | 12 | 5 | 9.5 | 0 |
| 24 FT | 18 | 19 | 8 | 8 | 6 | 7 | 5 | 6 | 36.5 | 38.0 | 38.0 | 38.0 | 6 | 13 | 50.0 | 59.0 | 6 | 13 | 36.0 | 38.0 | 6 | 6 | 5 | 6.5 | 31.6 | 87 | 99 | 111 | 6 | 6 | 44.0 | 53.0 | 5 | 12 | 5 | 9.5 | 0 |
| 26 FT | 19 | 21 | 8 | 8 | 6 | 6.5 | 6 | 7.5 | 40.4 | 39.0 | 39.0 | 43.0 | 6 | 13 | 50.0 | 59.0 | 6 | 13 | 35.0 | 38.0 | 6 | 6 | 6 | 7.5 | 34.4 | 89 | 101 | 113 | 7 | 7.5 | 47.0 | 56.0 | 5 | 12 | 5 | 9.5 | 0 |
| 28 FT | 20 | 22 | 9 | 8 | 6 | 6.5 | 5 | 6 | 37.1 | 40.0 | 40.0 | 40.0 | 6 | 12 | 49.0 | 58.0 | 6 | 12 | 35.0 | 37.0 | 6 | 6 | 5 | 6 | 31.9 | 90 | 102 | 114 | 7 | 7.5 | 47.0 | 56.0 | 5 | 12 | 5 | 8.5 | 0 |
| 30 FT | 21 | 23 | 10 | 8 | 6 | 6 | 5 | 6.5 | 37.9 | 41.0 | 41.0 | 41.0 | 6 | 12 | 49.0 | 58.0 | 6 | 12 | 34.0 | 37.0 | 7 | 8 | 5 | 6.5 | 32.4 | 91 | 103 | 115 | 7 | 7 | 47.0 | 56.0 | 5 | 12 | 5 | 8.5 | 0 |
| 32 FT | 22 | 24 | 10 | 8 | 6 | 6 | 5 | 6.5 | 37.8 | 42.0 | 42.0 | 42.0 | 7 | 15 | 54.0 | 63.0 | 7 | 15 | 39.0 | 41.0 | 7 | 7.5 | 5 | 6.5 | 32.5 | 92 | 104 | 116 | 7 | 7 | 47.0 | 57.0 | 5 | 12 | 5 | 8 | 0 |
| 34 FT | 23 | 25 | 10 | 8 | 7 | 7.5 | 5 | 6.5 | 37.8 | 43.0 | 43.0 | 43.0 | 7 | 15 | 54.0 | 63.0 | 7 | 15 | 38.0 | 40.0 | 7 | 7.5 | 5 | 6 | 32.5 | 93 | 105 | 117 | 7 | 6.5 | 47.0 | 57.0 | 5 | 12 | 5 | 8 | 0 |
| 36 FT | 24 | 25 | 10 | 8 | 7 | 7.5 | 5 | 6 | 36.5 | 44.0 | 44.0 | 44.0 | 7 | 14 | 54.0 | 62.0 | 7 | 14 | 37.0 | 39.0 | 7 | 7 | 5 | 6 | 31.6 | 93 | 105 | 117 | 7 | 6.5 | 47.0 | 56.0 | 5 | 12 | 5 | 8 | 0 |
| 38 FT | 25 | 26 | 10 | 8 | 7 | 7 | 5 | 6 | 36.6 | 45.0 | 45.0 | 45.0 | 7 | 14 | 53.0 | 62.0 | 7 | 14 | 37.0 | 38.0 | 7 | 7 | 5 | 6 | 31.8 | 94 | 106 | 118 | 7 | 6.5 | 47.0 | 56.0 | 5 | 12 | 5 | 8 | 0 |
| 40 FT | 25 | 27 | 10 | 8 | 7 | 6.5 | 5 | 6 | 36.8 | 45.0 | 45.0 | 45.0 | 7 | 13 | 53.0 | 62.0 | 7 | 13 | 37.0 | 39.0 | 7 | 7 | 6 | 7 | 34.6 | 95 | 107 | 119 | 7 | 6.5 | 46.0 | 56.0 | 5 | 12 | 5 | 8 | 0 |
| 42 FT | 26 | 28 | 10 | 8 | 7 | 7 | 6 | 7 | 40.8 | 50.0 | 50.0 | 50.0 | 7 | 13 | 53.0 | 62.0 | 7 | 13 | 37.0 | 38.0 | 7 | 7 | 6 | 7 | 34.9 | 96 | 108 | 120 | 7 | 6.5 | 46.0 | 56.0 | 5 | 12 | 5 | 8 | 0 |
| 44 FT | 27 | 29 | 10 | 8 | 7 | 6.5 | 6 | 7 | 40.9 | 51.0 | 51.0 | 51.0 | 7 | 13 | 53.0 | 61.0 | 7 | 13 | 36.0 | 37.0 | 7 | 7 | 6 | 6.5 | 35.0 | 97 | 109 | 121 | 7 | 6.5 | 46.0 | 56.0 | 5 | 12 | 5 | 7.5 | 0 |
| 46 FT | 28 | 29 | 11 | 8 | 7 | 6.5 | 6 | 7.5 | 41.6 | 52.0 | 52.0 | 52.0 | 7 | 13 | 53.0 | 61.0 | 7 | 13 | 36.0 | 37.0 | 7 | 6 | 6 | 7.5 | 35.6 | 97 | 109 | 121 | 7 | 6 | 47.0 | 57.0 | 5 | 12 | 5 | 7.5 | 0 |
| 48 FT | 28 | 30 | 11 | 8 | 7 | 6 | 6 | 7.5 | 41.8 | 52.0 | 52.0 | 52.0 | 7 | 12 | 53.0 | 61.0 | 7 | 12 | 36.0 | 37.0 | 7 | 6.5 | 6 | 7 | 35.6 | 98 | 110 | 122 | 7 | 6 | 47.0 | 57.0 | 5 | 12 | 5 | 7.5 | 0 |
| 50 FT | 29 | 31 | 11 | 8 | 7 | 6 | 6 | 7 | 41.9 | 53.0 | 53.0 | 53.0 | 7 | 12 | 53.0 | 60.0 | 7 | 12 | 36.0 | 37.0 | 7 | 6.5 | 6 | 7 | 35.9 | 99 | 111 | 123 | 7 | 6 | 47.0 | 57.0 | 5 | 12 | 5 | 7.5 | 0 |

## SPAN (S) = 11 FT HEIGHT (HT) = 9 FT OR 10 FT OR 11 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | K2 HT=9′ | K2 HT=10′ | K2 HT=11′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | K3 HT=9′ | K3 HT=10′ | K3 HT=11′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 13 | 9 | 9 | 9 | 5 | 6.5 | 5 | 8 | 59.3 | 33.0 | 33.0 | 33.0 | 5 | 13 | 109.5 | 81.5 | 5 | 13 | 31.0 | 33.0 | 5 | 7.5 | 6 | 6 | 74.5 | 113 | 125 | 137 | 6 | 7 | 51.0 | 53.0 | 5 | 11.5 | 5 | 10.5 | 12 |
| 2 FT | 14 | 10 | 9 | 9 | 5 | 6 | 5 | 8 | 59.3 | 34.0 | 34.0 | 34.0 | 5 | 14 | 109.5 | 81.5 | 5 | 14 | 29.0 | 28.0 | 5 | 7.5 | 6 | 7 | 70.6 | 114 | 126 | 138 | 5 | 6 | 47.0 | 50.0 | 5 | 12 | 5 | 10.5 | 12 |
| 4 FT | 10 | 10 | 9 | 9 | 5 | 6.5 | 5 | 6 | 59.3 | 30.0 | 30.0 | 30.0 | 5 | 13 | 109.5 | 83.0 | 5 | 13 | 32.0 | 33.0 | 5 | 7 | 6 | 6.5 | 64.1 | 114 | 126 | 138 | 6 | 6.5 | 50.0 | 53.0 | 5 | 11.5 | 5 | 9.5 | 12 |
| 6 FT | 10 | 10 | 9 | 9 | 5 | 7 | 5 | 6 | 56.6 | 30.0 | 30.0 | 30.0 | 5 | 12 | 55.0 | 61.0 | 5 | 12 | 30.0 | 31.0 | 5 | 7 | 6 | 6 | 57.8 | 114 | 126 | 138 | 6 | 6 | 48.0 | 52.0 | 5 | 12 | 5 | 9.5 | 12 |
| 8 FT | 10 | 11 | 9 | 9 | 5 | 7 | 6 | 7.5 | 55.5 | 30.0 | 30.0 | 34.0 | 6 | 15 | 53.0 | 56.0 | 6 | 15 | 32.0 | 33.0 | 5 | 6.5 | 6 | 6 | 55.6 | 115 | 127 | 139 | 6 | 6 | 47.0 | 52.0 | 5 | 12 | 5 | 9 | 0 |
| 10 FT | 11 | 12 | 9 | 9 | 5 | 7 | 6 | 7 | 53.5 | 31.0 | 35.0 | 35.0 | 6 | 15 | 51.0 | 55.0 | 6 | 15 | 32.0 | 33.0 | 5 | 6 | 6 | 6 | 53.8 | 116 | 128 | 140 | 6 | 6.5 | 46.0 | 52.0 | 5 | 12 | 5 | 8.5 | 0 |
| 12 FT | 12 | 13 | 9 | 9 | 5 | 7 | 6 | 6.5 | 51.9 | 32.0 | 36.0 | 36.0 | 6 | 15 | 49.0 | 54.0 | 6 | 15 | 31.0 | 33.0 | 5 | 6 | 6 | 6 | 52.4 | 117 | 129 | 141 | 6 | 6.5 | 46.0 | 52.0 | 5 | 12 | 5 | 8.5 | 0 |
| 14 FT | 13 | 14 | 9 | 9 | 5 | 6.5 | 6 | 6 | 50.5 | 33.0 | 37.0 | 37.0 | 6 | 15 | 48.0 | 53.0 | 6 | 15 | 31.0 | 33.0 | 6 | 8 | 6 | 6 | 51.3 | 118 | 130 | 142 | 6 | 6.5 | 45.0 | 52.0 | 5 | 12 | 5 | 8.5 | 0 |
| 16 FT | 14 | 15 | 10 | 9 | 5 | 6 | 6 | 7 | 49.9 | 34.0 | 34.0 | 38.0 | 6 | 15 | 47.0 | 53.0 | 6 | 15 | 31.0 | 33.0 | 6 | 7.5 | 6 | 7 | 50.4 | 119 | 131 | 143 | 6 | 6.5 | 45.0 | 52.0 | 5 | 12 | 5 | 8 | 0 |
| 18 FT | 15 | 16 | 10 | 9 | 6 | 8 | 6 | 7 | 54.9 | 35.0 | 35.0 | 39.0 | 6 | 15 | 52.0 | 59.0 | 6 | 15 | 37.0 | 39.0 | 6 | 7 | 6 | 7 | 49.6 | 120 | 132 | 144 | 6 | 6.5 | 45.0 | 53.0 | 5 | 12 | 5 | 8 | 0 |
| 20 FT | 16 | 17 | 11 | 9 | 6 | 8 | 6 | 7.5 | 54.8 | 36.0 | 36.0 | 40.0 | 6 | 14 | 52.0 | 58.0 | 6 | 14 | 36.0 | 39.0 | 6 | 7 | 6 | 8 | 49.3 | 121 | 133 | 145 | 6 | 6.5 | 45.0 | 53.0 | 5 | 12 | 5 | 7.5 | 0 |
| 22 FT | 17 | 18 | 12 | 9 | 6 | 7.5 | 6 | 8 | 54.8 | 37.0 | 37.0 | 37.0 | 6 | 14 | 51.0 | 58.0 | 6 | 14 | 36.0 | 39.0 | 6 | 6.5 | 5 | 6 | 45.9 | 122 | 134 | 146 | 6 | 6.5 | 45.0 | 53.0 | 5 | 12 | 5 | 7.5 | 0 |
| 24 FT | 18 | 20 | 12 | 9 | 6 | 7 | 6 | 7.5 | 54.4 | 38.0 | 38.0 | 38.0 | 6 | 13 | 51.0 | 58.0 | 6 | 13 | 36.0 | 38.0 | 6 | 6 | 5 | 6 | 45.8 | 124 | 136 | 148 | 6 | 6 | 45.0 | 53.0 | 5 | 12 | 5 | 7 | 0 |
| 26 FT | 19 | 21 | 12 | 9 | 6 | 6.5 | 6 | 7 | 53.9 | 39.0 | 39.0 | 43.0 | 6 | 13 | 50.0 | 58.0 | 6 | 13 | 35.0 | 38.0 | 6 | 6 | 6 | 8.5 | 48.4 | 125 | 137 | 149 | 7 | 7.5 | 48.0 | 56.0 | 5 | 12 | 5 | 7 | 0 |
| 28 FT | 20 | 22 | 13 | 9 | 6 | 6.5 | 6 | 7.5 | 54.3 | 40.0 | 40.0 | 40.0 | 6 | 12 | 50.0 | 58.0 | 6 | 12 | 35.0 | 37.0 | 6 | 6 | 5 | 6 | 45.4 | 126 | 138 | 150 | 7 | 7.5 | 48.0 | 57.0 | 5 | 12 | 5 | 6.5 | 0 |
| 30 FT | 21 | 23 | 13 | 9 | 6 | 6 | 6 | 7 | 54.1 | 41.0 | 41.0 | 41.0 | 6 | 12 | 50.0 | 57.0 | 6 | 12 | 34.0 | 36.0 | 7 | 8 | 5 | 6 | 45.4 | 127 | 139 | 151 | 7 | 7 | 48.0 | 57.0 | 5 | 12 | 5 | 6.5 | 0 |
| 32 FT | 22 | 24 | 13 | 9 | 6 | 6 | 6 | 6.5 | 54.1 | 42.0 | 42.0 | 46.0 | 7 | 15 | 54.0 | 62.0 | 7 | 15 | 39.0 | 41.0 | 7 | 7.5 | 6 | 8 | 48.4 | 128 | 140 | 152 | 7 | 7 | 48.0 | 57.0 | 5 | 12 | 5 | 6.5 | 0 |
| 34 FT | 23 | 25 | 14 | 9 | 7 | 7.5 | 6 | 7 | 54.8 | 43.0 | 43.0 | 43.0 | 7 | 15 | 54.0 | 62.0 | 7 | 15 | 38.0 | 40.0 | 7 | 7.5 | 5 | 6 | 45.8 | 129 | 141 | 153 | 7 | 6.5 | 48.0 | 57.0 | 5 | 12 | 5 | 6 | 0 |
| 36 FT | 23 | 25 | 14 | 9 | 7 | 7 | 6 | 7 | 53.3 | 43.0 | 43.0 | 43.0 | 7 | 14 | 54.0 | 62.0 | 7 | 14 | 38.0 | 40.0 | 7 | 7 | 5 | 6 | 44.1 | 129 | 141 | 153 | 7 | 6.5 | 48.0 | 57.0 | 5 | 12 | 5 | 6 | 0 |
| 38 FT | 24 | 26 | 14 | 9 | 7 | 7.5 | 6 | 7 | 53.4 | 44.0 | 44.0 | 44.0 | 7 | 14 | 54.0 | 61.0 | 7 | 14 | 38.0 | 40.0 | 7 | 7 | 5 | 6 | 44.3 | 130 | 142 | 154 | 7 | 6.5 | 48.0 | 57.0 | 5 | 12 | 5 | 6 | 0 |
| 40 FT | 25 | 27 | 14 | 9 | 7 | 7 | 6 | 6.5 | 53.4 | 45.0 | 45.0 | 45.0 | 7 | 14 | 54.0 | 61.0 | 7 | 14 | 37.0 | 39.0 | 7 | 7 | 5 | 6 | 44.5 | 131 | 143 | 155 | 7 | 6.5 | 48.0 | 57.0 | 5 | 12 | 5 | 6 | 0 |
| 42 FT | 26 | 28 | 15 | 9 | 7 | 7 | 6 | 7 | 54.3 | 46.0 | 50.0 | 50.0 | 7 | 13 | 54.0 | 60.0 | 7 | 13 | 37.0 | 38.0 | 7 | 7 | 6 | 8 | 48.0 | 132 | 144 | 156 | 7 | 6 | 48.0 | 57.0 | 5 | 12 | 6 | 8 | 0 |
| 44 FT | 27 | 29 | 15 | 9 | 7 | 6.5 | 6 | 6.5 | 54.3 | 51.0 | 51.0 | 51.0 | 7 | 13 | 53.0 | 60.0 | 7 | 13 | 36.0 | 38.0 | 7 | 7 | 6 | 8 | 48.1 | 133 | 145 | 157 | 7 | 6 | 48.0 | 57.0 | 5 | 12 | 6 | 8 | 0 |
| 46 FT | 27 | 30 | 15 | 9 | 7 | 6.5 | 6 | 6 | 54.4 | 51.0 | 51.0 | 51.0 | 7 | 13 | 53.0 | 60.0 | 7 | 13 | 37.0 | 38.0 | 7 | 7 | 6 | 8 | 48.1 | 134 | 146 | 158 | 7 | 6 | 48.0 | 57.0 | 5 | 12 | 6 | 8 | 0 |
| 48 FT | 28 | 30 | 16 | 9 | 7 | 6.5 | 6 | 6.5 | 55.0 | 52.0 | 52.0 | 52.0 | 7 | 13 | 53.0 | 59.0 | 7 | 13 | 36.0 | 37.0 | 7 | 6 | 6 | 7.5 | 48.5 | 134 | 146 | 158 | 7 | 6 | 48.0 | 57.0 | 5 | 12 | 6 | 8 | 0 |
| 50 FT | 29 | 31 | 16 | 9 | 7 | 6.5 | 6 | 6.5 | 55.1 | 53.0 | 53.0 | 53.0 | 7 | 13 | 53.0 | 59.0 | 7 | 13 | 36.0 | 37.0 | 7 | 6.5 | 6 | 7.5 | 48.8 | 135 | 147 | 159 | 7 | 6 | 48.0 | 57.0 | 5 | 12 | 6 | 8 | 0 |




BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ℄ CULVERT.

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

### GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.


MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

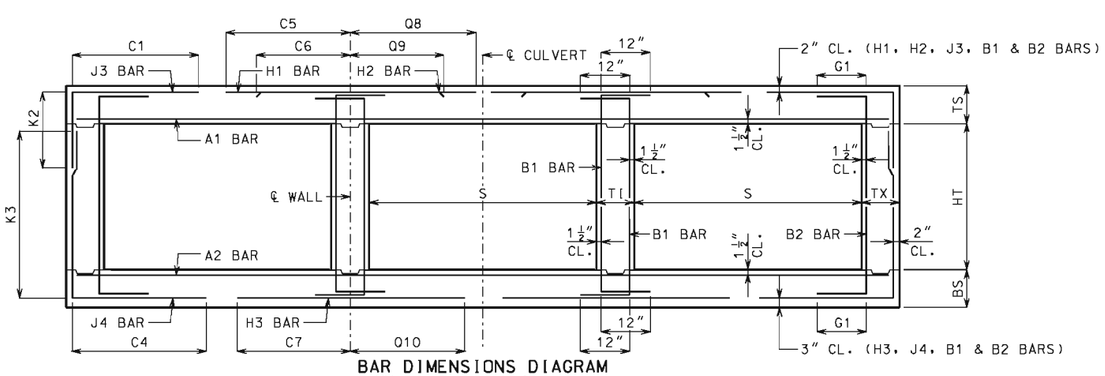
SPAN (S): 11 FEET
HEIGHT (HT): 6 THRU 11 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

703.87

## SPAN (S) = 11 FT HEIGHT (HT) = 12 FT OR 13 FT OR 14 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | | | | | | | | | | K2 | | | | | | | | | | | | | | K3 | | | | | | | | | | | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | HT=12' | HT=13' | HT=14' | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | HT=12' | HT=13' | HT=14' | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 13 | 10 | 10 | 11 | 5 | 6.5 | 5 | 6 | 60.3 | 33.0 | 33.0 | 33.0 | 5 | 13 | 110.5 | 82.5 | 5 | 13 | 31.0 | 33.0 | 5 | 7.5 | 6 | 6 | 89.3 | 150 | 162 | 174 | 5 | 6 | 51.0 | 51.0 | 5 | 10 | 5 | 8 | 12 |
| 2 FT | 14 | 11 | 10 | 11 | 5 | 6 | 5 | 6 | 60.3 | 34.0 | 34.0 | 34.0 | 5 | 14 | 110.5 | 82.5 | 5 | 14 | 30.0 | 32.0 | 5 | 7.5 | 6 | 6 | 89.3 | 151 | 163 | 175 | 5 | 6 | 50.0 | 51.0 | 5 | 12 | 5 | 8 | 12 |
| 4 FT | 10 | 11 | 11 | 11 | 5 | 7 | 5 | 6 | 60.9 | 30.0 | 30.0 | 30.0 | 5 | 13 | 110.5 | 80.0 | 5 | 13 | 33.0 | 33.0 | 5 | 7 | 6 | 6.5 | 85.9 | 151 | 163 | 175 | 5 | 6 | 49.0 | 51.0 | 5 | 12 | 5 | 7.5 | 12 |
| 6 FT | 10 | 11 | 11 | 11 | 5 | 7.5 | 5 | 6 | 79.0 | 30.0 | 30.0 | 30.0 | 5 | 12 | 58.0 | 57.0 | 5 | 12 | 31.0 | 31.0 | 5 | 6.5 | 6 | 6 | 77.5 | 151 | 163 | 175 | 6 | 6.5 | 50.0 | 53.0 | 5 | 12 | 5 | 7.5 | 12 |
| 8 FT | 10 | 11 | 12 | 11 | 5 | 7.5 | 6 | 7.5 | 70.1 | 30.0 | 30.0 | 34.0 | 6 | 15 | 54.0 | 55.0 | 6 | 15 | 33.0 | 33.0 | 5 | 6.5 | 6 | 6 | 70.9 | 151 | 163 | 175 | 6 | 6 | 48.0 | 52.0 | 5 | 12 | 5 | 7 | 0 |
| 10 FT | 11 | 12 | 12 | 11 | 5 | 7.5 | 6 | 8 | 68.5 | 31.0 | 31.0 | 35.0 | 6 | 16 | 52.0 | 54.0 | 6 | 16 | 32.0 | 33.0 | 5 | 6 | 6 | 6 | 69.9 | 152 | 164 | 176 | 6 | 6 | 47.0 | 52.0 | 5 | 12 | 5 | 7 | 0 |
| 12 FT | 12 | 13 | 12 | 11 | 5 | 7 | 6 | 8 | 67.4 | 32.0 | 32.0 | 36.0 | 6 | 16 | 50.0 | 53.0 | 6 | 16 | 32.0 | 33.0 | 5 | 6 | 6 | 6.5 | 69.0 | 153 | 165 | 177 | 6 | 6 | 47.0 | 52.0 | 5 | 12 | 5 | 7 | 0 |
| 14 FT | 13 | 14 | 12 | 11 | 5 | 6.5 | 6 | 7 | 66.4 | 33.0 | 37.0 | 37.0 | 6 | 16 | 49.0 | 53.0 | 6 | 16 | 32.0 | 33.0 | 6 | 8 | 6 | 6.5 | 68.3 | 154 | 166 | 178 | 6 | 6.5 | 47.0 | 52.0 | 5 | 12 | 5 | 6.5 | 0 |
| 16 FT | 14 | 15 | 13 | 11 | 5 | 6 | 6 | 7 | 64.9 | 34.0 | 38.0 | 38.0 | 6 | 15 | 48.0 | 52.0 | 6 | 15 | 32.0 | 33.0 | 6 | 7.5 | 6 | 7 | 66.6 | 155 | 167 | 179 | 6 | 6.5 | 47.0 | 52.0 | 5 | 12 | 5 | 6.5 | 0 |
| 18 FT | 15 | 16 | 13 | 11 | 6 | 8 | 6 | 6.5 | 70.3 | 39.0 | 39.0 | 39.0 | 6 | 15 | 54.0 | 58.0 | 6 | 15 | 37.0 | 39.0 | 6 | 7 | 6 | 6 | 66.0 | 156 | 168 | 180 | 6 | 6.5 | 47.0 | 52.0 | 5 | 12 | 5 | 6.5 | 0 |
| 20 FT | 15 | 17 | 14 | 11 | 6 | 8 | 6 | 6.5 | 68.4 | 39.0 | 39.0 | 39.0 | 6 | 14 | 53.0 | 58.0 | 6 | 14 | 37.0 | 39.0 | 6 | 7 | 6 | 6.5 | 65.1 | 157 | 169 | 181 | 6 | 6.5 | 46.0 | 53.0 | 5 | 12 | 5 | 6 | 0 |
| 22 FT | 17 | 18 | 14 | 11 | 6 | 7.5 | 6 | 6.5 | 69.0 | 41.0 | 41.0 | 41.0 | 6 | 14 | 53.0 | 58.0 | 6 | 14 | 37.0 | 39.0 | 6 | 6 | 6 | 6 | 64.5 | 158 | 170 | 182 | 6 | 6 | 46.0 | 53.0 | 5 | 12 | 5 | 6 | 0 |
| 24 FT | 18 | 20 | 15 | 11 | 6 | 7 | 6 | 6.5 | 68.9 | 42.0 | 42.0 | 42.0 | 6 | 13 | 52.0 | 58.0 | 6 | 13 | 36.0 | 38.0 | 6 | 6 | 6 | 6 | 64.6 | 160 | 172 | 184 | 6 | 6 | 46.0 | 53.0 | 5 | 12 | 6 | 8 | 0 |
| 26 FT | 19 | 21 | 15 | 11 | 6 | 6.5 | 6 | 6 | 68.6 | 43.0 | 43.0 | 43.0 | 6 | 13 | 52.0 | 57.0 | 6 | 13 | 36.0 | 38.0 | 6 | 6 | 6 | 6 | 64.3 | 161 | 173 | 185 | 7 | 7.5 | 49.0 | 56.0 | 5 | 12 | 6 | 8 | 0 |
| 28 FT | 20 | 22 | 16 | 11 | 6 | 6.5 | 6 | 6 | 68.6 | 44.0 | 44.0 | 44.0 | 6 | 12 | 51.0 | 57.0 | 6 | 12 | 35.0 | 37.0 | 6 | 6 | 6 | 6 | 63.9 | 162 | 174 | 186 | 7 | 7.5 | 49.0 | 56.0 | 5 | 12 | 6 | 8 | 0 |
| 30 FT | 21 | 23 | 17 | 11 | 6 | 6 | 6 | 6 | 69.0 | 45.0 | 45.0 | 45.0 | 6 | 12 | 51.0 | 57.0 | 6 | 12 | 34.0 | 36.0 | 7 | 8 | 6 | 6.5 | 64.0 | 163 | 175 | 187 | 7 | 7 | 49.0 | 57.0 | 5 | 12 | 6 | 7.5 | 0 |
| 32 FT | 21 | 24 | 17 | 11 | 6 | 6 | 6 | 6 | 68.6 | 45.0 | 45.0 | 45.0 | 6 | 12 | 51.0 | 57.0 | 6 | 12 | 35.0 | 37.0 | 7 | 7.5 | 6 | 6.5 | 64.1 | 164 | 176 | 188 | 7 | 7 | 49.0 | 57.0 | 5 | 12 | 6 | 7.5 | 0 |
| 34 FT | 22 | 25 | 18 | 11 | 6 | 6 | 6 | 6 | 69.1 | 46.0 | 46.0 | 46.0 | 7 | 15 | 55.0 | 62.0 | 7 | 15 | 40.0 | 41.0 | 7 | 7.5 | 6 | 6.5 | 64.4 | 165 | 177 | 189 | 7 | 6.5 | 49.0 | 57.0 | 5 | 12 | 6 | 7 | 0 |
| 36 FT | 23 | 26 | 18 | 11 | 7 | 7.5 | 7 | 7.5 | 74.3 | 47.0 | 47.0 | 47.0 | 7 | 15 | 55.0 | 61.0 | 7 | 15 | 39.0 | 41.0 | 7 | 7.5 | 6 | 6 | 64.5 | 166 | 178 | 190 | 7 | 6.5 | 49.0 | 57.0 | 5 | 12 | 6 | 7 | 0 |
| 38 FT | 24 | 26 | 18 | 11 | 7 | 7.5 | 7 | 8 | 72.6 | 48.0 | 48.0 | 48.0 | 7 | 14 | 55.0 | 61.0 | 7 | 14 | 38.0 | 40.0 | 7 | 7 | 6 | 6.5 | 62.4 | 166 | 178 | 190 | 7 | 6.5 | 49.0 | 57.0 | 5 | 12 | 6 | 7 | 0 |
| 40 FT | 25 | 27 | 18 | 11 | 7 | 7 | 7 | 7 | 72.9 | 49.0 | 49.0 | 49.0 | 7 | 14 | 55.0 | 61.0 | 7 | 14 | 38.0 | 39.0 | 7 | 7 | 6 | 6 | 62.6 | 167 | 179 | 191 | 7 | 6.5 | 49.0 | 57.0 | 5 | 12 | 6 | 7 | 0 |
| 42 FT | 25 | 28 | 19 | 11 | 7 | 7 | 7 | 7 | 73.3 | 49.0 | 49.0 | 49.0 | 7 | 14 | 55.0 | 60.0 | 7 | 14 | 38.0 | 40.0 | 7 | 7 | 6 | 6 | 62.9 | 168 | 180 | 192 | 7 | 6.5 | 49.0 | 57.0 | 5 | 12 | 6 | 6.5 | 0 |
| 44 FT | 26 | 29 | 20 | 11 | 7 | 7 | 7 | 7.5 | 74.0 | 50.0 | 50.0 | 50.0 | 7 | 13 | 54.0 | 60.0 | 7 | 13 | 38.0 | 39.0 | 7 | 7 | 6 | 6 | 63.3 | 169 | 181 | 193 | 7 | 6 | 49.0 | 57.0 | 5 | 12 | 6 | 6.5 | 0 |
| 46 FT | 27 | 30 | 21 | 11 | 7 | 6.5 | 7 | 7.5 | 74.6 | 51.0 | 51.0 | 51.0 | 7 | 13 | 54.0 | 59.0 | 7 | 13 | 37.0 | 38.0 | 7 | 7 | 6 | 6 | 63.6 | 170 | 182 | 194 | 7 | 6 | 49.0 | 57.0 | 5 | 12 | 6 | 6 | 0 |
| 48 FT | 27 | 30 | 21 | 11 | 7 | 6 | 7 | 7 | 74.5 | 51.0 | 51.0 | 51.0 | 7 | 12 | 54.0 | 59.0 | 7 | 12 | 37.0 | 39.0 | 7 | 6 | 6 | 6 | 63.5 | 170 | 182 | 194 | 7 | 6 | 49.0 | 57.0 | 5 | 12 | 6 | 6 | 0 |
| 50 FT | 28 | 31 | 22 | 11 | 7 | 6.5 | 7 | 7 | 75.3 | 52.0 | 52.0 | 58.0 | 7 | 13 | 54.0 | 59.0 | 7 | 13 | 37.0 | 38.0 | 7 | 6.5 | 7 | 7.5 | 67.0 | 171 | 183 | 195 | 7 | 6 | 49.0 | 58.0 | 5 | 12 | 6 | 6 | 0 |




BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ℄ CULVERT.

### GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.


MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 11 FEET
HEIGHT (HT): 12 THRU 14 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

703.87



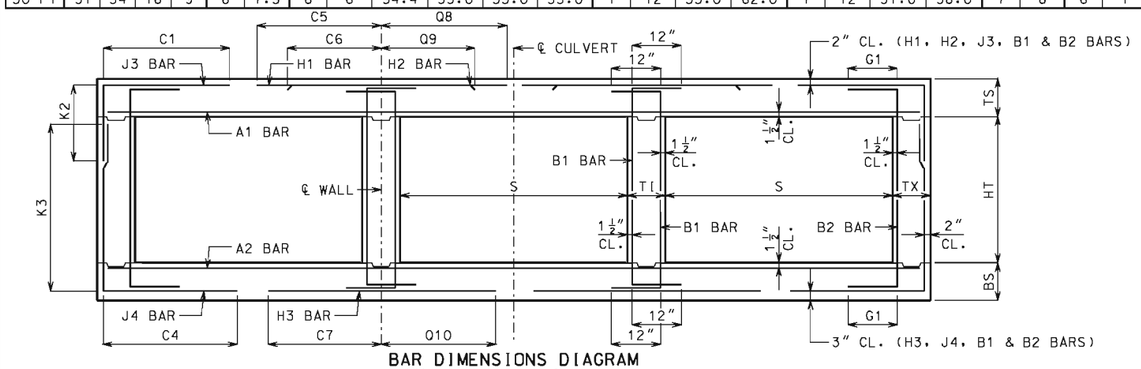

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

## SPAN (S) = 12 FT HEIGHT (HT) = 6 FT OR 7 FT OR 8 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | K2 HT=6′ | K2 HT=7′ | K2 HT=8′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | K3 HT=6′ | K3 HT=7′ | K3 HT=8′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 14 | 9 | 8 | 8 | 5 | 6 | 4 | 6 | 59.1 | 30.0 | 30.0 | 30.0 | 5 | 12 | 114.5 | 86.5 | 5 | 12 | 31.0 | 34.0 | 5 | 7.5 | 6 | 7 | 54.6 | 77 | 89 | 101 | 6 | 6.5 | 53.0 | 56.0 | 5 | 12 | 5 | 12 | 12 |
| 2 FT | 14 | 9 | 8 | 8 | 5 | 6 | 5 | 8.5 | 62.1 | 30.0 | 30.0 | 34.0 | 5 | 12 | 116.5 | 86.5 | 5 | 12 | 30.0 | 33.0 | 5 | 7.5 | 6 | 6.5 | 50.3 | 77 | 89 | 101 | 6 | 6 | 52.0 | 55.0 | 5 | 12 | 5 | 12 | 12 |
| 4 FT | 11 | 10 | 8 | 8 | 5 | 6 | 5 | 6.5 | 48.9 | 31.0 | 31.0 | 31.0 | 5 | 12 | 69.0 | 88.0 | 5 | 12 | 33.0 | 35.0 | 5 | 7 | 5 | 6 | 42.6 | 78 | 90 | 102 | 6 | 6 | 51.0 | 56.0 | 5 | 12 | 5 | 12 | 12 |
| 6 FT | 11 | 11 | 8 | 8 | 5 | 6.5 | 5 | 6.5 | 42.8 | 31.0 | 31.0 | 31.0 | 6 | 16 | 59.0 | 71.0 | 6 | 16 | 34.0 | 36.0 | 5 | 6.5 | 5 | 6.5 | 39.3 | 79 | 91 | 103 | 6 | 6.5 | 49.0 | 56.0 | 5 | 12 | 5 | 12 | 12 |
| 8 FT | 11 | 12 | 8 | 8 | 5 | 6.5 | 5 | 6 | 39.9 | 31.0 | 31.0 | 31.0 | 6 | 14 | 55.0 | 61.0 | 6 | 14 | 33.0 | 34.0 | 5 | 6 | 5 | 7.5 | 36.6 | 80 | 92 | 104 | 6 | 6.5 | 48.0 | 56.0 | 5 | 12 | 5 | 12 | 0 |
| 10 FT | 12 | 13 | 8 | 8 | 5 | 6.5 | 5 | 6.5 | 37.3 | 32.0 | 32.0 | 32.0 | 6 | 14 | 52.0 | 59.0 | 6 | 14 | 32.0 | 34.0 | 5 | 6 | 5 | 7.5 | 34.9 | 81 | 93 | 105 | 6 | 6 | 47.0 | 56.0 | 5 | 12 | 5 | 12 | 0 |
| 12 FT | 13 | 14 | 8 | 8 | 5 | 6 | 5 | 7 | 35.4 | 33.0 | 33.0 | 33.0 | 6 | 14 | 51.0 | 58.0 | 6 | 14 | 32.0 | 34.0 | 6 | 8 | 5 | 8 | 33.8 | 82 | 94 | 106 | 6 | 6 | 47.0 | 56.0 | 5 | 12 | 5 | 12 | 0 |
| 14 FT | 14 | 15 | 8 | 8 | 5 | 6 | 5 | 7 | 33.9 | 34.0 | 34.0 | 34.0 | 6 | 13 | 49.0 | 57.0 | 6 | 13 | 32.0 | 34.0 | 6 | 7.5 | 5 | 8 | 32.8 | 83 | 95 | 107 | 6 | 6 | 47.0 | 56.0 | 5 | 12 | 5 | 12 | 0 |
| 16 FT | 15 | 16 | 8 | 8 | 6 | 8 | 5 | 6.5 | 37.9 | 35.0 | 35.0 | 35.0 | 6 | 13 | 55.0 | 63.0 | 6 | 13 | 37.0 | 40.0 | 6 | 7 | 5 | 8 | 32.1 | 84 | 96 | 108 | 6 | 6 | 46.0 | 56.0 | 5 | 12 | 5 | 12 | 0 |
| 18 FT | 16 | 17 | 8 | 8 | 6 | 8 | 5 | 6.5 | 37.0 | 36.0 | 36.0 | 36.0 | 6 | 13 | 54.0 | 63.0 | 6 | 13 | 37.0 | 40.0 | 6 | 7 | 5 | 7 | 31.6 | 85 | 97 | 109 | 6 | 6 | 46.0 | 56.0 | 5 | 12 | 5 | 11.5 | 0 |
| 20 FT | 17 | 18 | 8 | 8 | 6 | 7.5 | 5 | 6.5 | 36.4 | 37.0 | 37.0 | 37.0 | 6 | 12 | 53.0 | 63.0 | 6 | 12 | 37.0 | 40.0 | 6 | 6.5 | 5 | 6.5 | 31.1 | 86 | 98 | 110 | 6 | 6 | 46.0 | 56.0 | 5 | 12 | 5 | 10 | 0 |
| 22 FT | 18 | 20 | 8 | 8 | 6 | 6.5 | 5 | 6 | 36.1 | 38.0 | 38.0 | 38.0 | 6 | 12 | 53.0 | 62.0 | 6 | 12 | 37.0 | 40.0 | 6 | 6 | 5 | 6 | 30.8 | 88 | 100 | 112 | 6 | 6 | 46.0 | 57.0 | 5 | 12 | 5 | 9.5 | 0 |
| 24 FT | 20 | 21 | 8 | 8 | 6 | 6.5 | 6 | 7.5 | 39.5 | 44.0 | 44.0 | 44.0 | 6 | 12 | 52.0 | 62.0 | 6 | 12 | 36.0 | 39.0 | 7 | 8 | 6 | 7.5 | 33.8 | 89 | 101 | 113 | 7 | 7.5 | 49.0 | 59.0 | 5 | 12 | 5 | 9.5 | 0 |
| 26 FT | 21 | 22 | 8 | 8 | 6 | 6 | 6 | 7 | 39.3 | 45.0 | 45.0 | 45.0 | 6 | 12 | 52.0 | 62.0 | 6 | 12 | 36.0 | 39.0 | 7 | 7.5 | 6 | 7 | 33.6 | 90 | 102 | 114 | 7 | 7.5 | 49.0 | 60.0 | 5 | 12 | 5 | 9.5 | 0 |
| 28 FT | 22 | 23 | 8 | 8 | 6 | 6 | 6 | 6.5 | 39.0 | 46.0 | 46.0 | 46.0 | 7 | 15 | 57.0 | 67.0 | 7 | 15 | 41.0 | 44.0 | 7 | 7 | 6 | 6.5 | 33.4 | 91 | 103 | 115 | 7 | 7 | 49.0 | 60.0 | 5 | 12 | 5 | 8.5 | 0 |
| 30 FT | 23 | 24 | 8 | 8 | 7 | 7.5 | 6 | 6 | 38.9 | 47.0 | 47.0 | 47.0 | 7 | 15 | 56.0 | 67.0 | 7 | 15 | 40.0 | 43.0 | 7 | 6.5 | 6 | 6 | 33.4 | 92 | 104 | 116 | 7 | 6.5 | 49.0 | 60.0 | 5 | 12 | 5 | 8 | 0 |
| 32 FT | 24 | 25 | 9 | 8 | 7 | 7.5 | 6 | 7 | 39.8 | 48.0 | 48.0 | 48.0 | 7 | 14 | 56.0 | 66.0 | 7 | 14 | 40.0 | 42.0 | 7 | 6.5 | 6 | 7 | 34.0 | 93 | 105 | 117 | 7 | 6.5 | 49.0 | 60.0 | 5 | 12 | 5 | 8.5 | 0 |
| 34 FT | 25 | 26 | 9 | 8 | 7 | 7 | 6 | 6.5 | 39.8 | 49.0 | 49.0 | 49.0 | 7 | 14 | 56.0 | 66.0 | 7 | 14 | 39.0 | 42.0 | 7 | 6 | 6 | 6.5 | 34.0 | 94 | 106 | 118 | 7 | 6 | 49.0 | 60.0 | 5 | 12 | 5 | 8 | 0 |
| 36 FT | 26 | 27 | 9 | 8 | 7 | 7 | 6 | 6.5 | 39.8 | 50.0 | 50.0 | 50.0 | 7 | 13 | 56.0 | 66.0 | 7 | 13 | 39.0 | 41.0 | 7 | 6 | 6 | 6.5 | 34.1 | 95 | 107 | 119 | 7 | 6 | 49.0 | 60.0 | 5 | 12 | 5 | 7.5 | 0 |
| 38 FT | 27 | 28 | 9 | 8 | 7 | 6.5 | 6 | 6 | 39.8 | 51.0 | 51.0 | 51.0 | 7 | 13 | 56.0 | 66.0 | 7 | 13 | 38.0 | 40.0 | 7 | 6 | 6 | 6 | 34.3 | 96 | 108 | 120 | 7 | 6 | 49.0 | 60.0 | 5 | 12 | 5 | 7 | 0 |
| 40 FT | 28 | 29 | 9 | 8 | 7 | 6.5 | 6 | 6 | 38.9 | 52.0 | 52.0 | 52.0 | 7 | 12 | 56.0 | 65.0 | 7 | 12 | 37.0 | 39.0 | 7 | 6.5 | 6 | 6 | 33.4 | 97 | 109 | 121 | 8 | 7.5 | 55.0 | 66.0 | 5 | 12 | 5 | 7 | 0 |
| 42 FT | 28 | 30 | 10 | 8 | 7 | 6 | 6 | 6.5 | 39.8 | 52.0 | 52.0 | 52.0 | 7 | 12 | 56.0 | 65.0 | 7 | 12 | 38.0 | 40.0 | 7 | 6.5 | 6 | 6.5 | 33.9 | 98 | 110 | 122 | 8 | 7.5 | 55.0 | 66.0 | 5 | 12 | 5 | 8 | 0 |
| 44 FT | 29 | 31 | 10 | 8 | 7 | 6 | 6 | 6.5 | 39.9 | 53.0 | 53.0 | 53.0 | 7 | 12 | 55.0 | 64.0 | 7 | 12 | 38.0 | 39.0 | 7 | 6.5 | 6 | 6 | 34.0 | 99 | 111 | 123 | 8 | 7.5 | 55.0 | 66.0 | 5 | 12 | 5 | 7 | 0 |
| 46 FT | 30 | 32 | 10 | 8 | 7 | 6 | 6 | 6 | 40.0 | 54.0 | 54.0 | 54.0 | 7 | 12 | 55.0 | 64.0 | 7 | 12 | 37.0 | 38.0 | 7 | 6 | 6 | 6 | 34.3 | 100 | 112 | 124 | 8 | 7.5 | 55.0 | 66.0 | 5 | 12 | 5 | 6.5 | 0 |
| 48 FT | 31 | 33 | 10 | 8 | 8 | 7.5 | 6 | 6 | 40.1 | 55.0 | 55.0 | 55.0 | 8 | 15 | 63.0 | 71.0 | 8 | 15 | 45.0 | 46.0 | 7 | 6 | 7 | 6.5 | 37.5 | 101 | 113 | 125 | 8 | 7.5 | 55.0 | 66.0 | 5 | 12 | 5 | 6.5 | 0 |
| 50 FT | 32 | 34 | 11 | 8 | 8 | 7.5 | 6 | 6.5 | 41.0 | 56.0 | 56.0 | 56.0 | 7 | 12 | 55.0 | 63.0 | 7 | 12 | 37.0 | 38.0 | 7 | 6 | 6 | 6 | 35.1 | 102 | 114 | 126 | 8 | 7 | 55.0 | 66.0 | 5 | 12 | 5 | 7 | 0 |

## SPAN (S) = 12 FT HEIGHT (HT) = 9 FT OR 10 FT OR 11 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | K2 HT=9′ | K2 HT=10′ | K2 HT=11′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | K3 HT=9′ | K3 HT=10′ | K3 HT=11′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 14 | 10 | 8 | 9 | 5 | 6 | 5 | 7.5 | 62.3 | 34.0 | 34.0 | 34.0 | 5 | 12 | 117.5 | 87.5 | 5 | 12 | 31.0 | 35.0 | 5 | 7.5 | 6 | 6 | 79.4 | 114 | 126 | 138 | 5 | 6 | 51.0 | 54.0 | 5 | 12 | 5 | 10 | 12 |
| 2 FT | 14 | 10 | 9 | 9 | 5 | 6 | 5 | 8 | 62.9 | 34.0 | 34.0 | 34.0 | 5 | 12 | 117.5 | 87.5 | 5 | 12 | 30.0 | 33.0 | 5 | 7 | 6 | 6.5 | 68.6 | 114 | 126 | 138 | 6 | 6.5 | 53.0 | 56.0 | 5 | 12 | 5 | 10.5 | 12 |
| 4 FT | 11 | 10 | 9 | 9 | 5 | 6 | 6 | 7 | 75.1 | 31.0 | 31.0 | 35.0 | 5 | 12 | 82.0 | 89.0 | 5 | 12 | 34.0 | 36.0 | 5 | 7 | 6 | 6 | 61.3 | 114 | 126 | 138 | 6 | 6 | 52.0 | 56.0 | 5 | 12 | 5 | 10 | 12 |
| 6 FT | 11 | 11 | 9 | 9 | 5 | 6.5 | 6 | 7 | 59.8 | 31.0 | 35.0 | 35.0 | 6 | 16 | 61.0 | 70.0 | 6 | 16 | 35.0 | 36.0 | 5 | 6.5 | 6 | 6 | 57.5 | 115 | 127 | 139 | 6 | 6 | 50.0 | 56.0 | 5 | 12 | 5 | 9.5 | 12 |
| 8 FT | 11 | 12 | 9 | 9 | 5 | 6.5 | 6 | 7 | 55.3 | 31.0 | 31.0 | 35.0 | 6 | 15 | 56.0 | 60.0 | 6 | 15 | 33.0 | 34.0 | 5 | 6 | 6 | 6.5 | 54.5 | 116 | 128 | 140 | 6 | 6 | 49.0 | 56.0 | 5 | 12 | 5 | 9 | 0 |
| 10 FT | 12 | 13 | 9 | 9 | 5 | 6.5 | 6 | 6.5 | 52.5 | 32.0 | 32.0 | 36.0 | 6 | 14 | 54.0 | 59.0 | 6 | 14 | 33.0 | 34.0 | 5 | 6 | 6 | 6.5 | 52.4 | 117 | 129 | 141 | 6 | 6 | 48.0 | 56.0 | 5 | 12 | 5 | 8.5 | 0 |
| 12 FT | 13 | 14 | 9 | 9 | 5 | 6 | 6 | 6.5 | 50.4 | 33.0 | 33.0 | 37.0 | 6 | 14 | 52.0 | 58.0 | 6 | 14 | 32.0 | 34.0 | 6 | 8 | 6 | 6.5 | 50.6 | 118 | 130 | 142 | 6 | 6 | 48.0 | 56.0 | 5 | 12 | 5 | 8.5 | 0 |
| 14 FT | 14 | 15 | 9 | 9 | 5 | 6 | 6 | 6.5 | 48.8 | 34.0 | 34.0 | 38.0 | 6 | 14 | 51.0 | 57.0 | 6 | 14 | 32.0 | 34.0 | 6 | 7.5 | 6 | 6.5 | 49.4 | 119 | 131 | 143 | 6 | 6 | 48.0 | 56.0 | 5 | 12 | 5 | 8.5 | 0 |
| 16 FT | 15 | 16 | 10 | 9 | 6 | 8 | 6 | 7.5 | 54.3 | 35.0 | 35.0 | 39.0 | 6 | 13 | 55.0 | 63.0 | 6 | 13 | 38.0 | 40.0 | 6 | 7 | 6 | 7.5 | 48.5 | 120 | 132 | 144 | 6 | 6 | 47.0 | 56.0 | 5 | 12 | 5 | 8 | 0 |
| 18 FT | 16 | 17 | 11 | 9 | 6 | 8 | 6 | 8 | 54.3 | 36.0 | 36.0 | 36.0 | 6 | 13 | 55.0 | 62.0 | 6 | 13 | 38.0 | 40.0 | 6 | 7 | 5 | 6 | 45.4 | 121 | 133 | 145 | 6 | 6 | 47.0 | 56.0 | 5 | 12 | 5 | 8 | 0 |
| 20 FT | 17 | 18 | 11 | 9 | 6 | 7.5 | 6 | 7.5 | 53.6 | 37.0 | 37.0 | 41.0 | 6 | 13 | 54.0 | 62.0 | 6 | 13 | 37.0 | 40.0 | 6 | 6 | 6 | 8 | 47.8 | 122 | 134 | 146 | 6 | 6 | 47.0 | 56.0 | 5 | 12 | 5 | 7.5 | 0 |
| 22 FT | 18 | 20 | 11 | 9 | 6 | 7 | 6 | 6.5 | 53.3 | 38.0 | 38.0 | 42.0 | 6 | 12 | 54.0 | 62.0 | 6 | 12 | 37.0 | 40.0 | 6 | 6 | 6 | 7.5 | 47.5 | 124 | 136 | 148 | 6 | 6 | 47.0 | 57.0 | 5 | 12 | 5 | 7.5 | 0 |
| 24 FT | 19 | 21 | 12 | 9 | 6 | 6.5 | 6 | 7 | 53.5 | 39.0 | 39.0 | 39.0 | 6 | 12 | 53.0 | 62.0 | 6 | 12 | 37.0 | 40.0 | 7 | 8 | 5 | 6 | 44.5 | 125 | 137 | 149 | 7 | 7.5 | 50.0 | 60.0 | 5 | 12 | 5 | 7 | 0 |
| 26 FT | 20 | 22 | 13 | 9 | 6 | 6 | 6 | 7.5 | 53.9 | 40.0 | 40.0 | 40.0 | 6 | 12 | 53.0 | 61.0 | 6 | 12 | 37.0 | 40.0 | 7 | 7.5 | 5 | 6 | 44.6 | 126 | 138 | 150 | 7 | 7.5 | 50.0 | 60.0 | 5 | 12 | 5 | 7 | 0 |
| 28 FT | 22 | 23 | 13 | 9 | 6 | 6 | 6 | 7.5 | 53.5 | 42.0 | 42.0 | 42.0 | 7 | 15 | 57.0 | 66.0 | 7 | 15 | 40.0 | 43.0 | 7 | 7 | 5 | 6 | 44.5 | 127 | 139 | 151 | 7 | 7 | 50.0 | 60.0 | 5 | 12 | 5 | 6.5 | 0 |
| 30 FT | 23 | 25 | 13 | 9 | 7 | 7.5 | 6 | 7 | 53.4 | 43.0 | 43.0 | 43.0 | 7 | 15 | 57.0 | 66.0 | 7 | 15 | 40.0 | 42.0 | 7 | 7 | 5 | 6 | 44.4 | 129 | 141 | 153 | 7 | 6.5 | 50.0 | 60.0 | 5 | 12 | 5 | 6.5 | 0 |
| 32 FT | 24 | 26 | 13 | 9 | 7 | 7.5 | 6 | 6.5 | 53.3 | 44.0 | 44.0 | 48.0 | 7 | 14 | 57.0 | 66.0 | 7 | 14 | 40.0 | 42.0 | 7 | 7 | 6 | 8.5 | 47.4 | 130 | 142 | 154 | 7 | 6.5 | 50.0 | 60.0 | 5 | 12 | 5 | 6.5 | 0 |
| 34 FT | 25 | 26 | 13 | 9 | 7 | 7 | 6 | 6 | 53.0 | 45.0 | 45.0 | 49.0 | 7 | 14 | 57.0 | 65.0 | 7 | 14 | 39.0 | 41.0 | 7 | 6 | 6 | 7.5 | 47.3 | 130 | 142 | 154 | 7 | 6 | 50.0 | 60.0 | 5 | 12 | 5 | 6.5 | 0 |
| 36 FT | 26 | 28 | 14 | 9 | 7 | 7 | 6 | 6.5 | 53.9 | 46.0 | 46.0 | 46.0 | 7 | 13 | 56.0 | 65.0 | 7 | 13 | 38.0 | 40.0 | 7 | 7 | 5 | 6 | 44.9 | 132 | 144 | 156 | 7 | 6 | 50.0 | 60.0 | 5 | 12 | 5 | 6 | 0 |
| 38 FT | 26 | 29 | 15 | 9 | 7 | 6.5 | 6 | 6.5 | 54.6 | 50.0 | 50.0 | 50.0 | 7 | 13 | 56.0 | 65.0 | 7 | 13 | 39.0 | 41.0 | 7 | 6.5 | 6 | 8 | 48.1 | 133 | 145 | 157 | 7 | 6 | 50.0 | 60.0 | 5 | 12 | 6 | 8.5 | 0 |
| 40 FT | 27 | 29 | 15 | 9 | 7 | 6.5 | 6 | 7 | 53.4 | 51.0 | 51.0 | 51.0 | 7 | 13 | 56.0 | 64.0 | 7 | 13 | 38.0 | 40.0 | 7 | 6 | 6 | 8 | 46.9 | 133 | 145 | 157 | 8 | 7.5 | 56.0 | 66.0 | 5 | 12 | 5 | 6 | 0 |
| 42 FT | 28 | 30 | 15 | 9 | 7 | 6.5 | 6 | 6.5 | 53.4 | 52.0 | 52.0 | 52.0 | 7 | 12 | 56.0 | 64.0 | 7 | 12 | 38.0 | 39.0 | 7 | 6 | 6 | 8 | 47.0 | 134 | 146 | 158 | 8 | 7.5 | 56.0 | 66.0 | 5 | 12 | 6 | 8 | 0 |
| 44 FT | 29 | 31 | 15 | 9 | 7 | 6 | 6 | 6.5 | 53.4 | 53.0 | 53.0 | 53.0 | 7 | 12 | 56.0 | 63.0 | 7 | 12 | 37.0 | 39.0 | 7 | 6 | 6 | 7.5 | 47.1 | 135 | 147 | 159 | 8 | 7.5 | 56.0 | 66.0 | 5 | 12 | 6 | 8 | 0 |
| 46 FT | 30 | 32 | 15 | 9 | 7 | 6 | 6 | 6.5 | 53.5 | 54.0 | 54.0 | 54.0 | 7 | 12 | 55.0 | 63.0 | 7 | 12 | 37.0 | 38.0 | 7 | 6 | 6 | 7.5 | 47.4 | 136 | 148 | 160 | 8 | 7.5 | 56.0 | 66.0 | 5 | 12 | 6 | 8 | 0 |
| 48 FT | 31 | 33 | 15 | 9 | 7 | 6 | 6 | 6 | 53.5 | 55.0 | 55.0 | 55.0 | 7 | 12 | 55.0 | 62.0 | 7 | 12 | 37.0 | 38.0 | 7 | 6 | 6 | 7 | 47.5 | 137 | 149 | 161 | 8 | 7 | 56.0 | 66.0 | 5 | 12 | 6 | 8 | 0 |
| 50 FT | 31 | 34 | 16 | 9 | 8 | 7.5 | 6 | 6 | 54.4 | 55.0 | 55.0 | 55.0 | 7 | 12 | 55.0 | 62.0 | 7 | 12 | 37.0 | 38.0 | 7 | 6 | 6 | 7 | 47.9 | 138 | 150 | 162 | 8 | 7 | 56.0 | 67.0 | 5 | 12 | 6 | 8 | 0 |




BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ℄ CULVERT.

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

### GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.


MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 12 FEET
HEIGHT (HT): 6 THRU 11 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

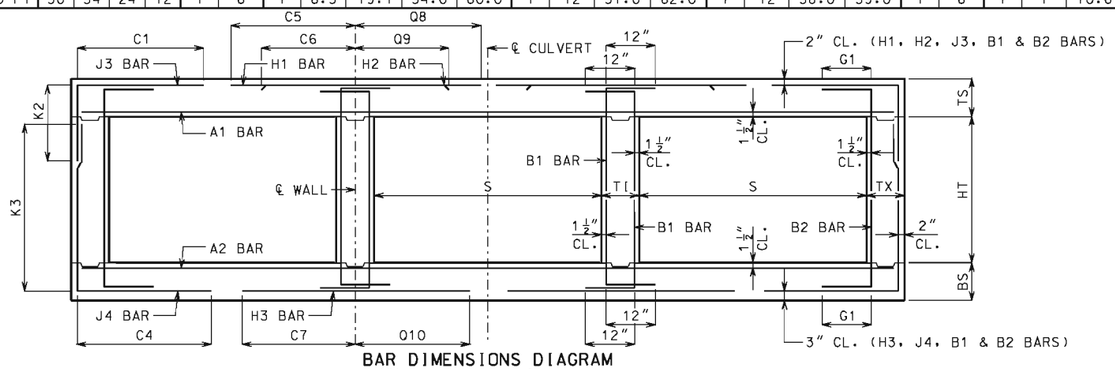
703.87

## SPAN (S) = 12 FT HEIGHT (HT) = 12 FT OR 13 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | H1 BARS | | | | H2 BARS | | | A2 BARS | | J4 BARS | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | K2 HT=12' | K2 HT=13' | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | K3 HT=12' | K3 HT=13' | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 14 | 10 | 10 | 10 | 5 | 6 | 5 | 7 | 63.8 | 34.0 | 34.0 | 5 | 12 | 118.5 | 87.5 | 5 | 12 | 32.0 | 35.0 | 5 | 7 | 6 | 6.5 | 89.1 | 150 | 162 | 6 | 7 | 55.0 | 57.0 | 5 | 12 | 5 | 8.5 | 12 |
| 2 FT | 14 | 10 | 10 | 10 | 5 | 6 | 5 | 7 | 63.8 | 34.0 | 34.0 | 5 | 12 | 118.5 | 87.5 | 5 | 12 | 31.0 | 33.0 | 5 | 7 | 6 | 6 | 79.6 | 150 | 162 | 6 | 6.5 | 54.0 | 56.0 | 5 | 12 | 5 | 8 | 12 |
| 4 FT | 11 | 11 | 10 | 10 | 5 | 6.5 | 5 | 6 | 63.8 | 31.0 | 31.0 | 5 | 12 | 118.5 | 89.0 | 5 | 12 | 34.0 | 35.0 | 5 | 6.5 | 6 | 6.5 | 76.3 | 151 | 163 | 6 | 6.5 | 53.0 | 57.0 | 5 | 12 | 5 | 8 | 12 |
| 6 FT | 11 | 11 | 10 | 10 | 5 | 6.5 | 5 | 6 | 71.3 | 31.0 | 31.0 | 6 | 16 | 65.0 | 69.0 | 6 | 16 | 35.0 | 36.0 | 5 | 6.5 | 6 | 6 | 69.1 | 151 | 163 | 6 | 6 | 51.0 | 56.0 | 5 | 12 | 5 | 8 | 12 |
| 8 FT | 11 | 12 | 10 | 10 | 5 | 6.5 | 6 | 7 | 65.4 | 31.0 | 35.0 | 6 | 15 | 57.0 | 60.0 | 6 | 15 | 34.0 | 35.0 | 5 | 6 | 6 | 6 | 66.4 | 152 | 164 | 6 | 6 | 50.0 | 56.0 | 5 | 12 | 5 | 8 | 0 |
| 10 FT | 12 | 13 | 10 | 10 | 5 | 6.5 | 6 | 7 | 62.9 | 36.0 | 36.0 | 6 | 15 | 55.0 | 58.0 | 6 | 15 | 33.0 | 34.0 | 5 | 6 | 6 | 6 | 63.8 | 153 | 165 | 6 | 6 | 49.0 | 56.0 | 5 | 12 | 5 | 8 | 0 |
| 12 FT | 13 | 14 | 11 | 10 | 5 | 6.5 | 6 | 7.5 | 61.1 | 33.0 | 37.0 | 6 | 14 | 53.0 | 57.0 | 6 | 14 | 33.0 | 34.0 | 6 | 8 | 6 | 7 | 62.0 | 154 | 166 | 6 | 6 | 49.0 | 56.0 | 5 | 12 | 5 | 7.5 | 0 |
| 14 FT | 14 | 15 | 11 | 10 | 5 | 6 | 6 | 7 | 59.9 | 38.0 | 38.0 | 6 | 14 | 51.0 | 57.0 | 6 | 14 | 32.0 | 34.0 | 6 | 7.5 | 6 | 6 | 60.9 | 155 | 167 | 6 | 6 | 48.0 | 56.0 | 5 | 12 | 5 | 7.5 | 0 |
| 16 FT | 15 | 16 | 12 | 10 | 6 | 8 | 6 | 7 | 65.0 | 39.0 | 39.0 | 6 | 14 | 56.0 | 62.0 | 6 | 14 | 38.0 | 40.0 | 6 | 7 | 6 | 7 | 59.9 | 156 | 168 | 6 | 6 | 48.0 | 56.0 | 5 | 12 | 5 | 7 | 0 |
| 18 FT | 16 | 17 | 12 | 10 | 6 | 8 | 6 | 6.5 | 64.1 | 40.0 | 40.0 | 6 | 13 | 55.0 | 62.0 | 6 | 13 | 38.0 | 40.0 | 6 | 7 | 6 | 6 | 59.1 | 157 | 169 | 6 | 6 | 48.0 | 56.0 | 5 | 12 | 5 | 7 | 0 |
| 20 FT | 17 | 18 | 13 | 10 | 6 | 7.5 | 6 | 6.5 | 63.8 | 41.0 | 41.0 | 6 | 13 | 55.0 | 61.0 | 6 | 13 | 38.0 | 40.0 | 6 | 6 | 6 | 7 | 58.5 | 158 | 170 | 6 | 6 | 48.0 | 56.0 | 5 | 12 | 5 | 6.5 | 0 |
| 22 FT | 18 | 20 | 13 | 10 | 6 | 7 | 6 | 6 | 63.3 | 42.0 | 42.0 | 6 | 13 | 54.0 | 61.0 | 6 | 13 | 38.0 | 40.0 | 6 | 6 | 6 | 6.5 | 58.4 | 160 | 172 | 6 | 6 | 48.0 | 56.0 | 5 | 12 | 5 | 6.5 | 0 |
| 24 FT | 19 | 21 | 14 | 10 | 6 | 6.5 | 6 | 6.5 | 63.1 | 39.0 | 43.0 | 6 | 12 | 54.0 | 61.0 | 6 | 12 | 37.0 | 40.0 | 7 | 8 | 6 | 7 | 58.0 | 161 | 173 | 7 | 7.5 | 51.0 | 60.0 | 5 | 12 | 5 | 6 | 0 |
| 26 FT | 20 | 22 | 14 | 10 | 6 | 6.5 | 6 | 6 | 62.8 | 44.0 | 44.0 | 6 | 12 | 53.0 | 61.0 | 6 | 12 | 37.0 | 40.0 | 7 | 7.5 | 6 | 6.5 | 57.6 | 162 | 174 | 7 | 7.5 | 51.0 | 60.0 | 5 | 12 | 5 | 6 | 0 |
| 28 FT | 21 | 23 | 15 | 10 | 6 | 6 | 6 | 6 | 62.9 | 45.0 | 45.0 | 6 | 12 | 53.0 | 61.0 | 6 | 12 | 37.0 | 40.0 | 7 | 7 | 6 | 7 | 57.4 | 163 | 175 | 7 | 7 | 51.0 | 60.0 | 5 | 12 | 6 | 8 | 0 |
| 30 FT | 23 | 25 | 15 | 10 | 7 | 7.5 | 6 | 6 | 62.8 | 47.0 | 47.0 | 7 | 15 | 57.0 | 65.0 | 7 | 15 | 40.0 | 42.0 | 7 | 7 | 6 | 7 | 57.5 | 165 | 177 | 7 | 6.5 | 51.0 | 60.0 | 5 | 12 | 6 | 8 | 0 |
| 32 FT | 23 | 26 | 16 | 10 | 7 | 7 | 6 | 6 | 63.1 | 47.0 | 47.0 | 7 | 14 | 57.0 | 65.0 | 7 | 14 | 41.0 | 43.0 | 7 | 7 | 6 | 7.5 | 57.5 | 166 | 178 | 7 | 6.5 | 51.0 | 60.0 | 5 | 12 | 6 | 8 | 0 |
| 34 FT | 24 | 27 | 16 | 10 | 7 | 7 | 7 | 7.5 | 68.1 | 48.0 | 48.0 | 7 | 14 | 57.0 | 65.0 | 7 | 14 | 40.0 | 42.0 | 7 | 7 | 6 | 7 | 57.5 | 167 | 179 | 7 | 6 | 51.0 | 60.0 | 5 | 12 | 6 | 8 | 0 |
| 36 FT | 25 | 28 | 17 | 10 | 7 | 7 | 6 | 6 | 63.6 | 49.0 | 49.0 | 7 | 14 | 57.0 | 64.0 | 7 | 14 | 40.0 | 42.0 | 7 | 7 | 6 | 7 | 57.8 | 168 | 180 | 7 | 6 | 51.0 | 60.0 | 5 | 12 | 6 | 7.5 | 0 |
| 38 FT | 26 | 29 | 17 | 10 | 7 | 7 | 7 | 7.5 | 68.6 | 50.0 | 50.0 | 7 | 13 | 57.0 | 64.0 | 7 | 13 | 39.0 | 41.0 | 7 | 6.5 | 6 | 7 | 57.9 | 169 | 181 | 7 | 6 | 51.0 | 60.0 | 5 | 12 | 6 | 7.5 | 0 |
| 40 FT | 27 | 29 | 17 | 10 | 7 | 6.5 | 7 | 8 | 66.8 | 51.0 | 51.0 | 7 | 13 | 56.0 | 63.0 | 7 | 13 | 38.0 | 40.0 | 7 | 6 | 6 | 7 | 55.9 | 169 | 181 | 8 | 7.5 | 57.0 | 66.0 | 5 | 12 | 6 | 7.5 | 0 |
| 42 FT | 28 | 30 | 17 | 10 | 7 | 6.5 | 7 | 7 | 66.9 | 52.0 | 52.0 | 7 | 12 | 56.0 | 63.0 | 7 | 12 | 38.0 | 39.0 | 7 | 6 | 6 | 7 | 56.0 | 170 | 182 | 8 | 7.5 | 57.0 | 66.0 | 5 | 12 | 6 | 7.5 | 0 |
| 44 FT | 29 | 31 | 18 | 10 | 7 | 6 | 7 | 7.5 | 67.8 | 53.0 | 53.0 | 7 | 12 | 56.0 | 62.0 | 7 | 12 | 37.0 | 38.0 | 7 | 6 | 6 | 6.5 | 56.4 | 171 | 183 | 8 | 7.5 | 57.0 | 66.0 | 5 | 12 | 6 | 7 | 0 |
| 46 FT | 29 | 32 | 19 | 10 | 7 | 6 | 7 | 7.5 | 68.5 | 53.0 | 53.0 | 7 | 12 | 56.0 | 62.0 | 7 | 12 | 38.0 | 39.0 | 7 | 6 | 6 | 6.5 | 56.8 | 172 | 184 | 8 | 7 | 57.0 | 67.0 | 5 | 12 | 6 | 6.5 | 0 |
| 48 FT | 30 | 33 | 19 | 10 | 7 | 6 | 7 | 7 | 68.5 | 54.0 | 54.0 | 7 | 12 | 56.0 | 61.0 | 7 | 12 | 37.0 | 38.0 | 7 | 6 | 6 | 6.5 | 56.9 | 173 | 185 | 8 | 7 | 57.0 | 67.0 | 5 | 12 | 6 | 6.5 | 0 |
| 50 FT | 31 | 34 | 19 | 10 | 7 | 6 | 7 | 6.5 | 68.6 | 55.0 | 55.0 | 7 | 12 | 56.0 | 61.0 | 7 | 12 | 37.0 | 38.0 | 7 | 6 | 6 | 6.5 | 57.3 | 174 | 186 | 8 | 7 | 57.0 | 67.0 | 5 | 12 | 6 | 6.5 | 0 |

## SPAN (S) = 12 FT HEIGHT (HT) = 14 FT OR 15 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | H1 BARS | | | | H2 BARS | | | A2 BARS | | J4 BARS | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | K2 HT=14' | K2 HT=15' | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | K3 HT=14' | K3 HT=15' | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 14 | 11 | 10 | 12 | 5 | 6 | 6 | 7.5 | 64.0 | 34.0 | 38.0 | 5 | 12 | 119.5 | 88.5 | 5 | 12 | 32.0 | 35.0 | 5 | 7 | 6 | 6 | 95.5 | 175 | 187 | 5 | 6 | 55.0 | 55.0 | 5 | 12 | 5 | 8 | 12 |
| 2 FT | 14 | 12 | 10 | 12 | 5 | 6 | 6 | 7 | 64.0 | 34.0 | 38.0 | 5 | 12 | 119.5 | 88.5 | 5 | 12 | 31.0 | 34.0 | 5 | 7 | 6 | 6 | 95.5 | 176 | 188 | 5 | 6 | 54.0 | 55.0 | 5 | 12 | 5 | 8 | 12 |
| 4 FT | 10 | 11 | 12 | 12 | 5 | 6 | 6 | 7.5 | 68.3 | 34.0 | 34.0 | 6 | 15 | 121.5 | 77.0 | 6 | 15 | 37.0 | 37.0 | 5 | 6.5 | 6 | 6 | 86.8 | 175 | 187 | 6 | 6.5 | 55.0 | 57.0 | 5 | 11 | 5 | 7 | 12 |
| 6 FT | 10 | 12 | 12 | 12 | 5 | 6.5 | 6 | 7 | 80.0 | 34.0 | 34.0 | 6 | 15 | 61.0 | 61.0 | 6 | 15 | 35.0 | 35.0 | 5 | 6 | 6 | 6.5 | 83.1 | 176 | 188 | 6 | 6.5 | 53.0 | 57.0 | 5 | 12 | 5 | 7 | 12 |
| 8 FT | 11 | 12 | 12 | 12 | 5 | 7 | 6 | 7.5 | 76.8 | 35.0 | 35.0 | 6 | 15 | 58.0 | 59.0 | 6 | 15 | 35.0 | 35.0 | 5 | 6 | 6 | 6 | 77.1 | 176 | 188 | 6 | 6 | 52.0 | 55.0 | 5 | 12 | 5 | 7 | 0 |
| 10 FT | 12 | 13 | 12 | 12 | 5 | 6.5 | 6 | 7.5 | 74.4 | 36.0 | 36.0 | 6 | 15 | 56.0 | 58.0 | 6 | 15 | 34.0 | 35.0 | 5 | 6 | 6 | 6 | 75.5 | 177 | 189 | 6 | 6 | 51.0 | 55.0 | 5 | 12 | 5 | 6.5 | 0 |
| 12 FT | 13 | 14 | 13 | 12 | 5 | 6.5 | 6 | 7.5 | 71.5 | 37.0 | 37.0 | 6 | 15 | 54.0 | 57.0 | 6 | 15 | 34.0 | 35.0 | 6 | 8 | 6 | 6 | 73.0 | 178 | 190 | 6 | 6 | 50.0 | 55.0 | 5 | 12 | 5 | 6.5 | 0 |
| 14 FT | 14 | 15 | 13 | 12 | 5 | 6 | 6 | 6.5 | 70.3 | 38.0 | 38.0 | 6 | 14 | 52.0 | 56.0 | 6 | 14 | 33.0 | 35.0 | 6 | 7.5 | 6 | 6 | 72.0 | 179 | 191 | 6 | 6 | 50.0 | 55.0 | 5 | 12 | 5 | 6.5 | 0 |
| 16 FT | 15 | 16 | 14 | 12 | 6 | 8 | 6 | 6.5 | 74.5 | 39.0 | 39.0 | 6 | 14 | 57.0 | 62.0 | 6 | 14 | 39.0 | 41.0 | 6 | 7 | 6 | 6.5 | 70.3 | 180 | 192 | 6 | 6 | 49.0 | 55.0 | 5 | 12 | 5 | 6 | 0 |
| 18 FT | 15 | 17 | 15 | 12 | 6 | 7.5 | 6 | 6.5 | 72.4 | 39.0 | 39.0 | 6 | 13 | 56.0 | 61.0 | 6 | 13 | 39.0 | 40.0 | 6 | 6.5 | 6 | 6.5 | 69.0 | 181 | 193 | 6 | 6 | 49.0 | 56.0 | 5 | 12 | 6 | 8 | 0 |
| 20 FT | 17 | 19 | 15 | 12 | 6 | 7.5 | 6 | 6 | 73.0 | 41.0 | 41.0 | 6 | 13 | 56.0 | 61.0 | 6 | 13 | 39.0 | 41.0 | 6 | 6 | 6 | 6 | 69.6 | 183 | 195 | 6 | 6 | 49.0 | 56.0 | 5 | 12 | 6 | 8 | 0 |
| 22 FT | 18 | 20 | 16 | 12 | 6 | 7 | 6 | 6.5 | 72.8 | 42.0 | 42.0 | 6 | 13 | 55.0 | 61.0 | 6 | 13 | 39.0 | 41.0 | 6 | 6 | 6 | 6 | 68.4 | 184 | 196 | 6 | 6 | 49.0 | 56.0 | 5 | 12 | 6 | 8 | 0 |
| 24 FT | 19 | 21 | 16 | 12 | 6 | 6.5 | 6 | 6 | 72.4 | 43.0 | 43.0 | 6 | 13 | 55.0 | 61.0 | 6 | 13 | 38.0 | 41.0 | 7 | 8 | 7 | 7.5 | 71.1 | 185 | 197 | 7 | 7.5 | 52.0 | 59.0 | 5 | 12 | 6 | 8 | 0 |
| 26 FT | 20 | 22 | 16 | 12 | 6 | 6.5 | 7 | 7.5 | 77.1 | 44.0 | 50.0 | 6 | 12 | 55.0 | 61.0 | 6 | 12 | 38.0 | 40.0 | 7 | 7.5 | 7 | 7 | 70.8 | 186 | 198 | 7 | 7.5 | 52.0 | 60.0 | 5 | 12 | 6 | 8 | 0 |
| 28 FT | 21 | 23 | 17 | 12 | 6 | 6 | 7 | 7.5 | 77.1 | 45.0 | 51.0 | 6 | 12 | 54.0 | 60.0 | 6 | 12 | 37.0 | 40.0 | 7 | 6.5 | 7 | 7.5 | 70.5 | 187 | 199 | 7 | 6.5 | 52.0 | 60.0 | 5 | 12 | 6 | 7.5 | 0 |
| 30 FT | 22 | 25 | 18 | 12 | 6 | 6 | 7 | 7.5 | 77.3 | 46.0 | 46.0 | 7 | 15 | 59.0 | 65.0 | 7 | 15 | 42.0 | 44.0 | 7 | 7 | 6 | 6 | 67.8 | 189 | 201 | 7 | 6.5 | 52.0 | 60.0 | 5 | 12 | 6 | 7 | 0 |
| 32 FT | 23 | 26 | 19 | 12 | 7 | 7.5 | 7 | 7.5 | 77.5 | 47.0 | 47.0 | 7 | 15 | 58.0 | 65.0 | 7 | 15 | 41.0 | 44.0 | 7 | 7 | 6 | 6 | 67.8 | 190 | 202 | 7 | 6.5 | 52.0 | 60.0 | 5 | 12 | 6 | 6.5 | 0 |
| 34 FT | 24 | 27 | 19 | 12 | 7 | 7.5 | 7 | 7 | 77.6 | 48.0 | 48.0 | 7 | 14 | 58.0 | 65.0 | 7 | 14 | 41.0 | 43.0 | 7 | 7 | 6 | 6 | 67.9 | 191 | 203 | 7 | 6 | 52.0 | 60.0 | 5 | 12 | 6 | 6.5 | 0 |
| 36 FT | 25 | 28 | 20 | 12 | 7 | 7 | 7 | 7.5 | 78.1 | 49.0 | 49.0 | 7 | 14 | 58.0 | 64.0 | 7 | 14 | 40.0 | 42.0 | 7 | 7 | 6 | 6 | 68.1 | 192 | 204 | 7 | 6 | 52.0 | 60.0 | 5 | 12 | 6 | 6.5 | 0 |
| 38 FT | 26 | 29 | 21 | 12 | 7 | 7 | 7 | 7.5 | 78.6 | 50.0 | 50.0 | 7 | 13 | 58.0 | 64.0 | 7 | 13 | 40.0 | 41.0 | 7 | 6.5 | 6 | 6 | 68.3 | 193 | 205 | 7 | 6 | 52.0 | 61.0 | 5 | 12 | 6 | 6 | 0 |
| 40 FT | 27 | 30 | 21 | 12 | 7 | 6.5 | 7 | 7.5 | 77.1 | 51.0 | 51.0 | 7 | 13 | 57.0 | 63.0 | 7 | 13 | 39.0 | 40.0 | 7 | 6.5 | 6 | 6 | 66.5 | 194 | 206 | 7 | 6 | 52.0 | 61.0 | 5 | 12 | 6 | 6 | 0 |
| 42 FT | 27 | 31 | 21 | 12 | 7 | 6 | 7 | 7 | 77.0 | 51.0 | 51.0 | 7 | 12 | 57.0 | 63.0 | 7 | 12 | 40.0 | 41.0 | 7 | 6.5 | 6 | 6 | 66.8 | 195 | 207 | 7 | 6 | 52.0 | 61.0 | 5 | 12 | 6 | 6 | 0 |
| 44 FT | 28 | 31 | 22 | 12 | 7 | 6.5 | 7 | 7 | 77.6 | 52.0 | 58.0 | 7 | 12 | 57.0 | 63.0 | 7 | 12 | 39.0 | 40.0 | 7 | 6 | 7 | 7.5 | 69.6 | 195 | 207 | 8 | 7.5 | 58.0 | 67.0 | 5 | 12 | 6 | 6 | 0 |
| 46 FT | 29 | 32 | 22 | 12 | 7 | 6 | 7 | 6.5 | 77.9 | 59.0 | 59.0 | 7 | 12 | 57.0 | 62.0 | 7 | 12 | 38.0 | 40.0 | 7 | 6 | 7 | 7.5 | 70.0 | 196 | 208 | 8 | 7.5 | 58.0 | 67.0 | 5 | 12 | 6 | 6 | 0 |
| 48 FT | 30 | 33 | 23 | 12 | 7 | 6 | 7 | 6.5 | 78.6 | 54.0 | 60.0 | 7 | 12 | 57.0 | 62.0 | 7 | 12 | 38.0 | 39.0 | 7 | 6 | 7 | 7.5 | 70.4 | 197 | 209 | 8 | 7 | 58.0 | 67.0 | 5 | 12 | 7 | 8 | 0 |
| 50 FT | 30 | 34 | 24 | 12 | 7 | 6 | 7 | 6.5 | 79.1 | 54.0 | 60.0 | 7 | 12 | 57.0 | 62.0 | 7 | 12 | 38.0 | 39.0 | 7 | 6 | 7 | 7 | 70.6 | 198 | 210 | 8 | 7 | 58.0 | 67.0 | 5 | 12 | 7 | 8 | 0 |




BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ℄ CULVERT.

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

### GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.


MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 12 FEET
HEIGHT (HT): 12 THRU 15 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

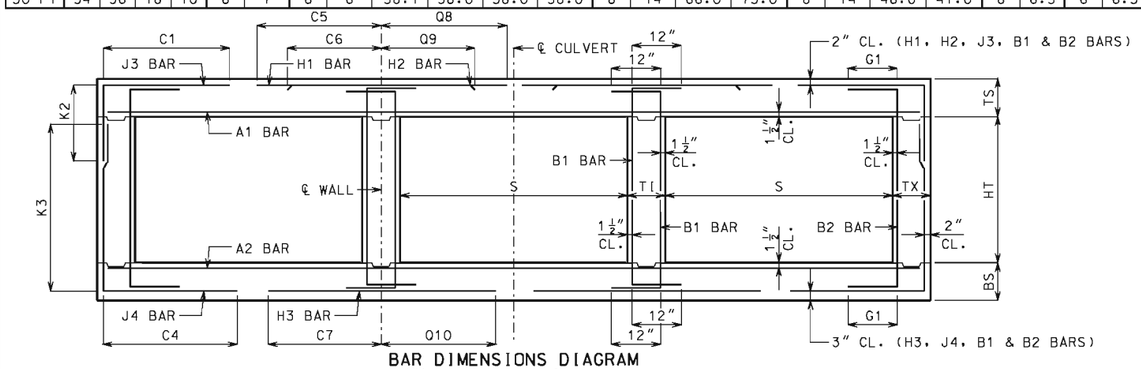
703.87

## SPAN (S) = 13 FT HEIGHT (HT) = 7 FT OR 8 FT OR 9 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | K2 HT=7′ | K2 HT=8′ | K2 HT=9′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | K3 HT=7′ | K3 HT=8′ | K3 HT=9′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 14 | 9 | 8 | 8 | 5 | 6 | 5 | 8.5 | 65.8 | 34.0 | 34.0 | 34.0 | 5 | 12 | 125.5 | 92.5 | 5 | 12 | 34.0 | 38.0 | 5 | 7.5 | 6 | 6 | 60.0 | 89 | 101 | 113 | 6 | 6 | 56.0 | 59.0 | 5 | 12 | 5 | 12 | 12 |
| 2 FT | 15 | 10 | 8 | 8 | 6 | 8 | 5 | 8 | 65.8 | 31.0 | 35.0 | 35.0 | 6 | 16 | 129.5 | 99.5 | 6 | 16 | 40.0 | 44.0 | 5 | 7 | 6 | 6.5 | 55.5 | 90 | 102 | 114 | 6 | 6 | 54.0 | 59.0 | 5 | 12 | 5 | 12 | 12 |
| 4 FT | 11 | 10 | 8 | 8 | 6 | 8 | 6 | 7 | 56.4 | 31.0 | 35.0 | 35.0 | 6 | 14 | 77.0 | 97.0 | 6 | 14 | 38.0 | 40.0 | 5 | 7 | 6 | 6 | 49.5 | 90 | 102 | 114 | 7 | 6.5 | 57.0 | 62.0 | 5 | 12 | 5 | 12 | 12 |
| 6 FT | 11 | 11 | 8 | 8 | 6 | 8.5 | 6 | 7 | 49.0 | 31.0 | 31.0 | 35.0 | 6 | 13 | 63.0 | 75.0 | 6 | 13 | 35.0 | 37.0 | 5 | 6.5 | 6 | 7 | 45.9 | 91 | 103 | 115 | 7 | 7 | 55.0 | 62.0 | 5 | 12 | 5 | 12 | 12 |
| 8 FT | 12 | 12 | 8 | 8 | 5 | 6 | 5 | 6 | 42.0 | 32.0 | 32.0 | 32.0 | 6 | 14 | 58.0 | 67.0 | 6 | 14 | 34.0 | 36.0 | 5 | 6 | 6 | 7 | 43.3 | 92 | 104 | 116 | 7 | 7 | 54.0 | 62.0 | 5 | 12 | 5 | 12 | 0 |
| 10 FT | 13 | 14 | 8 | 8 | 5 | 6 | 5 | 6 | 39.8 | 33.0 | 33.0 | 33.0 | 6 | 13 | 55.0 | 63.0 | 6 | 13 | 33.0 | 36.0 | 6 | 8 | 5 | 6.5 | 38.1 | 94 | 106 | 118 | 6 | 6 | 50.0 | 59.0 | 5 | 12 | 5 | 12 | 0 |
| 12 FT | 14 | 15 | 8 | 8 | 6 | 8 | 5 | 6 | 37.9 | 34.0 | 34.0 | 34.0 | 6 | 13 | 53.0 | 62.0 | 6 | 13 | 33.0 | 35.0 | 6 | 7.5 | 5 | 6.5 | 36.9 | 95 | 107 | 119 | 6 | 6 | 49.0 | 59.0 | 5 | 12 | 5 | 12 | 0 |
| 14 FT | 15 | 16 | 8 | 8 | 6 | 7.5 | 5 | 6 | 41.4 | 35.0 | 35.0 | 35.0 | 6 | 12 | 58.0 | 67.0 | 6 | 12 | 39.0 | 41.0 | 6 | 7 | 5 | 6.5 | 35.9 | 96 | 108 | 120 | 6 | 6 | 49.0 | 59.0 | 5 | 12 | 5 | 10.5 | 0 |
| 16 FT | 16 | 17 | 8 | 8 | 6 | 7.5 | 6 | 8 | 44.4 | 36.0 | 36.0 | 36.0 | 6 | 12 | 57.0 | 67.0 | 6 | 12 | 38.0 | 41.0 | 6 | 7 | 5 | 6.5 | 35.1 | 97 | 109 | 121 | 6 | 6 | 49.0 | 60.0 | 5 | 12 | 5 | 9.5 | 0 |
| 18 FT | 17 | 18 | 8 | 8 | 6 | 7 | 6 | 7.5 | 43.5 | 37.0 | 37.0 | 37.0 | 6 | 12 | 56.0 | 66.0 | 6 | 12 | 38.0 | 41.0 | 6 | 6.5 | 5 | 6 | 34.5 | 98 | 110 | 122 | 7 | 7 | 52.0 | 63.0 | 5 | 12 | 5 | 9.5 | 0 |
| 20 FT | 18 | 20 | 9 | 8 | 6 | 6.5 | 6 | 8 | 44.3 | 38.0 | 38.0 | 38.0 | 7 | 15 | 61.0 | 71.0 | 7 | 15 | 43.0 | 46.0 | 6 | 6 | 5 | 7 | 34.6 | 100 | 112 | 124 | 6 | 6 | 49.0 | 60.0 | 5 | 12 | 5 | 9 | 0 |
| 22 FT | 20 | 21 | 9 | 8 | 6 | 6.5 | 6 | 8 | 43.4 | 40.0 | 40.0 | 40.0 | 6 | 12 | 55.0 | 66.0 | 6 | 12 | 38.0 | 41.0 | 7 | 8 | 5 | 6.5 | 34.5 | 101 | 113 | 125 | 7 | 7 | 52.0 | 63.0 | 5 | 12 | 5 | 8.5 | 0 |
| 24 FT | 21 | 22 | 9 | 8 | 6 | 6 | 6 | 7.5 | 43.0 | 41.0 | 41.0 | 41.0 | 7 | 15 | 60.0 | 71.0 | 7 | 15 | 43.0 | 46.0 | 7 | 7.5 | 5 | 6 | 34.3 | 102 | 114 | 126 | 7 | 7 | 51.0 | 63.0 | 5 | 12 | 5 | 8.5 | 0 |
| 26 FT | 22 | 24 | 10 | 8 | 6 | 6 | 6 | 8 | 43.8 | 42.0 | 42.0 | 42.0 | 7 | 15 | 59.0 | 70.0 | 7 | 15 | 42.0 | 46.0 | 7 | 7 | 5 | 6.5 | 34.5 | 104 | 116 | 128 | 7 | 7 | 51.0 | 63.0 | 5 | 12 | 5 | 8 | 0 |
| 28 FT | 23 | 25 | 11 | 8 | 7 | 7 | 5 | 6 | 40.5 | 43.0 | 43.0 | 43.0 | 7 | 14 | 59.0 | 70.0 | 7 | 14 | 42.0 | 46.0 | 7 | 6.5 | 5 | 7 | 34.9 | 105 | 117 | 129 | 7 | 6.5 | 51.0 | 63.0 | 5 | 12 | 5 | 8.5 | 0 |
| 30 FT | 25 | 26 | 11 | 8 | 7 | 7 | 5 | 6 | 40.0 | 45.0 | 45.0 | 45.0 | 7 | 14 | 59.0 | 70.0 | 7 | 14 | 41.0 | 44.0 | 7 | 6.5 | 5 | 6.5 | 34.9 | 106 | 118 | 130 | 7 | 6.5 | 51.0 | 63.0 | 5 | 12 | 5 | 7.5 | 0 |
| 32 FT | 26 | 27 | 11 | 8 | 7 | 7 | 5 | 6 | 39.8 | 46.0 | 46.0 | 46.0 | 7 | 13 | 59.0 | 69.0 | 7 | 13 | 40.0 | 43.0 | 7 | 6 | 5 | 6 | 34.8 | 107 | 119 | 131 | 7 | 6 | 51.0 | 63.0 | 5 | 12 | 5 | 7.5 | 0 |
| 34 FT | 27 | 29 | 11 | 8 | 7 | 6.5 | 6 | 8 | 43.9 | 47.0 | 47.0 | 51.0 | 7 | 13 | 58.0 | 69.0 | 7 | 13 | 40.0 | 42.0 | 7 | 6.5 | 6 | 7.5 | 37.9 | 109 | 121 | 133 | 8 | 7.5 | 57.0 | 69.0 | 5 | 12 | 5 | 7.5 | 0 |
| 36 FT | 28 | 30 | 11 | 8 | 7 | 6.5 | 6 | 7.5 | 43.9 | 52.0 | 52.0 | 52.0 | 7 | 12 | 58.0 | 68.0 | 7 | 12 | 40.0 | 42.0 | 7 | 6 | 6 | 7 | 37.9 | 110 | 122 | 134 | 8 | 7.5 | 57.0 | 69.0 | 5 | 12 | 5 | 7.5 | 0 |
| 38 FT | 29 | 31 | 11 | 8 | 7 | 6 | 6 | 6.5 | 43.9 | 53.0 | 53.0 | 53.0 | 7 | 12 | 58.0 | 68.0 | 7 | 12 | 39.0 | 41.0 | 7 | 6 | 6 | 7 | 38.0 | 111 | 123 | 135 | 8 | 7 | 57.0 | 69.0 | 5 | 12 | 5 | 7 | 0 |
| 40 FT | 30 | 32 | 12 | 8 | 7 | 6 | 6 | 7.5 | 44.8 | 54.0 | 54.0 | 54.0 | 7 | 12 | 58.0 | 68.0 | 7 | 12 | 38.0 | 40.0 | 7 | 6 | 6 | 7.5 | 38.5 | 112 | 124 | 136 | 8 | 7 | 57.0 | 70.0 | 5 | 12 | 5 | 7 | 0 |
| 42 FT | 31 | 33 | 12 | 8 | 8 | 7.5 | 6 | 7.5 | 43.8 | 55.0 | 55.0 | 55.0 | 8 | 15 | 66.0 | 75.0 | 8 | 15 | 46.0 | 47.0 | 7 | 6 | 6 | 7 | 37.6 | 113 | 125 | 137 | 8 | 7 | 57.0 | 69.0 | 5 | 12 | 5 | 7 | 0 |
| 44 FT | 32 | 34 | 12 | 8 | 8 | 7.5 | 6 | 7 | 43.9 | 56.0 | 56.0 | 56.0 | 8 | 14 | 65.0 | 74.0 | 8 | 14 | 45.0 | 47.0 | 7 | 6 | 6 | 7 | 37.8 | 114 | 126 | 138 | 8 | 7 | 57.0 | 69.0 | 5 | 12 | 5 | 7 | 0 |
| 46 FT | 32 | 35 | 12 | 8 | 8 | 7 | 6 | 7 | 43.9 | 56.0 | 56.0 | 56.0 | 8 | 14 | 65.0 | 74.0 | 8 | 14 | 46.0 | 47.0 | 7 | 6 | 6 | 6.5 | 37.8 | 115 | 127 | 139 | 8 | 7 | 57.0 | 69.0 | 5 | 12 | 5 | 7 | 0 |
| 48 FT | 33 | 35 | 12 | 8 | 8 | 7 | 6 | 7 | 43.9 | 57.0 | 57.0 | 57.0 | 8 | 14 | 65.0 | 74.0 | 8 | 14 | 45.0 | 47.0 | 8 | 7 | 6 | 6.5 | 37.9 | 115 | 127 | 139 | 8 | 6.5 | 57.0 | 69.0 | 5 | 12 | 5 | 6.5 | 0 |
| 50 FT | 34 | 36 | 12 | 8 | 8 | 7 | 6 | 6.5 | 43.9 | 58.0 | 58.0 | 58.0 | 8 | 14 | 65.0 | 73.0 | 8 | 14 | 45.0 | 46.0 | 8 | 7 | 6 | 6.5 | 38.1 | 116 | 128 | 140 | 8 | 6.5 | 57.0 | 69.0 | 5 | 12 | 5 | 6 | 0 |

## SPAN (S) = 13 FT HEIGHT (HT) = 10 FT OR 11 FT OR 12 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | K2 HT=10′ | K2 HT=11′ | K2 HT=12′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | K3 HT=10′ | K3 HT=11′ | K3 HT=12′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 14 | 10 | 9 | 10 | 5 | 6 | 5 | 7 | 66.6 | 34.0 | 34.0 | 34.0 | 5 | 12 | 126.5 | 93.5 | 5 | 12 | 35.0 | 38.0 | 5 | 7 | 6 | 6 | 81.5 | 126 | 138 | 150 | 6 | 6.5 | 57.0 | 60.0 | 5 | 12 | 5 | 9 | 12 |
| 2 FT | 15 | 10 | 10 | 10 | 6 | 8 | 5 | 7.5 | 67.3 | 35.0 | 35.0 | 35.0 | 6 | 16 | 130.5 | 100.5 | 6 | 16 | 41.0 | 44.0 | 5 | 7 | 6 | 6 | 70.1 | 126 | 138 | 150 | 6 | 6 | 56.0 | 58.0 | 5 | 12 | 5 | 9.5 | 12 |
| 4 FT | 11 | 10 | 10 | 10 | 6 | 8 | 5 | 6 | 72.3 | 31.0 | 31.0 | 31.0 | 6 | 15 | 82.0 | 97.0 | 6 | 15 | 38.0 | 39.0 | 5 | 7 | 6 | 6 | 64.6 | 126 | 138 | 150 | 7 | 6.5 | 58.0 | 61.0 | 5 | 9.5 | 5 | 9 | 12 |
| 6 FT | 11 | 11 | 10 | 10 | 5 | 6 | 5 | 6 | 60.5 | 31.0 | 31.0 | 31.0 | 6 | 14 | 64.0 | 71.0 | 6 | 14 | 36.0 | 37.0 | 5 | 6.5 | 6 | 6 | 61.0 | 127 | 139 | 151 | 7 | 6.5 | 57.0 | 61.0 | 5 | 12 | 5 | 9 | 12 |
| 8 FT | 12 | 13 | 10 | 10 | 5 | 6 | 5 | 6 | 56.8 | 32.0 | 32.0 | 32.0 | 6 | 14 | 60.0 | 64.0 | 6 | 14 | 35.0 | 36.0 | 5 | 6 | 6 | 6.5 | 59.1 | 129 | 141 | 153 | 6 | 6 | 52.0 | 59.0 | 5 | 12 | 5 | 8.5 | 0 |
| 10 FT | 13 | 14 | 10 | 10 | 5 | 6 | 6 | 7 | 56.9 | 33.0 | 33.0 | 37.0 | 6 | 13 | 57.0 | 62.0 | 6 | 13 | 34.0 | 36.0 | 6 | 8 | 6 | 6.5 | 56.8 | 130 | 142 | 154 | 6 | 6 | 51.0 | 59.0 | 5 | 12 | 5 | 8 | 0 |
| 12 FT | 14 | 15 | 10 | 10 | 5 | 6 | 6 | 6.5 | 54.6 | 34.0 | 34.0 | 38.0 | 6 | 13 | 55.0 | 61.0 | 6 | 13 | 34.0 | 36.0 | 6 | 7.5 | 6 | 6.5 | 54.9 | 131 | 143 | 155 | 6 | 6 | 51.0 | 59.0 | 5 | 12 | 5 | 8 | 0 |
| 14 FT | 15 | 16 | 10 | 10 | 6 | 8 | 6 | 6.5 | 58.9 | 35.0 | 35.0 | 39.0 | 6 | 13 | 60.0 | 66.0 | 6 | 13 | 39.0 | 42.0 | 6 | 7 | 6 | 6 | 53.5 | 132 | 144 | 156 | 6 | 6 | 50.0 | 59.0 | 5 | 12 | 5 | 8 | 0 |
| 16 FT | 16 | 17 | 11 | 10 | 6 | 7.5 | 6 | 7 | 58.0 | 36.0 | 36.0 | 40.0 | 6 | 12 | 58.0 | 66.0 | 6 | 12 | 39.0 | 42.0 | 6 | 7 | 6 | 7.5 | 52.5 | 133 | 145 | 157 | 6 | 6 | 50.0 | 59.0 | 5 | 12 | 5 | 7.5 | 0 |
| 18 FT | 17 | 18 | 12 | 10 | 6 | 7.5 | 6 | 7 | 57.9 | 37.0 | 37.0 | 41.0 | 6 | 12 | 58.0 | 66.0 | 6 | 12 | 39.0 | 42.0 | 6 | 6 | 6 | 7.5 | 52.0 | 134 | 146 | 158 | 7 | 7 | 53.0 | 62.0 | 5 | 12 | 5 | 7 | 0 |
| 20 FT | 18 | 20 | 12 | 10 | 6 | 7 | 6 | 6.5 | 57.3 | 38.0 | 38.0 | 42.0 | 6 | 12 | 57.0 | 65.0 | 6 | 12 | 39.0 | 42.0 | 6 | 6 | 6 | 7.5 | 51.5 | 136 | 148 | 160 | 6 | 6 | 50.0 | 60.0 | 5 | 12 | 5 | 7 | 0 |
| 22 FT | 19 | 21 | 12 | 10 | 6 | 6 | 6 | 6.5 | 56.8 | 39.0 | 39.0 | 43.0 | 7 | 15 | 62.0 | 70.0 | 7 | 15 | 44.0 | 47.0 | 7 | 8 | 6 | 7 | 51.0 | 137 | 149 | 161 | 7 | 7 | 53.0 | 63.0 | 5 | 12 | 5 | 7 | 0 |
| 24 FT | 21 | 22 | 13 | 10 | 6 | 6 | 6 | 6.5 | 56.9 | 41.0 | 41.0 | 45.0 | 6 | 12 | 56.0 | 65.0 | 6 | 12 | 38.0 | 42.0 | 7 | 7 | 6 | 7.5 | 51.1 | 138 | 150 | 162 | 7 | 7 | 53.0 | 63.0 | 5 | 12 | 5 | 6.5 | 0 |
| 26 FT | 22 | 24 | 13 | 10 | 6 | 6 | 6 | 6.5 | 56.6 | 42.0 | 42.0 | 46.0 | 7 | 15 | 60.0 | 70.0 | 7 | 15 | 43.0 | 46.0 | 7 | 7 | 6 | 7.5 | 50.9 | 140 | 152 | 164 | 7 | 7 | 53.0 | 63.0 | 5 | 12 | 5 | 6.5 | 0 |
| 28 FT | 23 | 25 | 14 | 10 | 7 | 7.5 | 6 | 6.5 | 57.0 | 43.0 | 43.0 | 47.0 | 7 | 15 | 60.0 | 69.0 | 7 | 15 | 43.0 | 46.0 | 7 | 6.5 | 6 | 8 | 51.0 | 141 | 153 | 165 | 7 | 6.5 | 53.0 | 63.0 | 5 | 12 | 5 | 6 | 0 |
| 30 FT | 24 | 26 | 14 | 10 | 7 | 7 | 6 | 6.5 | 56.6 | 44.0 | 44.0 | 48.0 | 7 | 14 | 60.0 | 69.0 | 7 | 14 | 42.0 | 45.0 | 7 | 6.5 | 6 | 7.5 | 50.8 | 142 | 154 | 166 | 7 | 6.5 | 53.0 | 63.0 | 5 | 12 | 5 | 6 | 0 |
| 32 FT | 26 | 28 | 14 | 10 | 7 | 7 | 6 | 6 | 56.5 | 46.0 | 46.0 | 50.0 | 7 | 13 | 59.0 | 69.0 | 7 | 13 | 41.0 | 43.0 | 7 | 6.5 | 6 | 7.5 | 50.8 | 144 | 156 | 168 | 7 | 6 | 53.0 | 63.0 | 5 | 12 | 5 | 6 | 0 |
| 34 FT | 27 | 29 | 15 | 10 | 7 | 6.5 | 6 | 6.5 | 57.1 | 51.0 | 51.0 | 51.0 | 7 | 13 | 59.0 | 68.0 | 7 | 13 | 40.0 | 43.0 | 7 | 6.5 | 6 | 8 | 51.1 | 145 | 157 | 169 | 8 | 7.5 | 59.0 | 70.0 | 5 | 12 | 6 | 8 | 0 |
| 36 FT | 28 | 30 | 15 | 10 | 7 | 6.5 | 6 | 6 | 57.1 | 52.0 | 52.0 | 52.0 | 7 | 12 | 59.0 | 68.0 | 7 | 12 | 40.0 | 42.0 | 7 | 6 | 6 | 7.5 | 51.1 | 146 | 158 | 170 | 8 | 7.5 | 59.0 | 70.0 | 5 | 12 | 6 | 8 | 0 |
| 38 FT | 29 | 31 | 16 | 10 | 7 | 6 | 6 | 6 | 57.8 | 53.0 | 53.0 | 53.0 | 7 | 12 | 59.0 | 68.0 | 7 | 12 | 39.0 | 41.0 | 7 | 6 | 6 | 7.5 | 51.6 | 147 | 159 | 171 | 8 | 7 | 59.0 | 70.0 | 5 | 12 | 6 | 8 | 0 |
| 40 FT | 30 | 32 | 16 | 10 | 7 | 6 | 6 | 6 | 57.8 | 54.0 | 54.0 | 54.0 | 7 | 12 | 59.0 | 67.0 | 7 | 12 | 39.0 | 40.0 | 7 | 6 | 6 | 7.5 | 51.6 | 148 | 160 | 172 | 8 | 7 | 59.0 | 70.0 | 5 | 12 | 6 | 8 | 0 |
| 42 FT | 30 | 33 | 17 | 10 | 7 | 6 | 6 | 6 | 58.5 | 54.0 | 54.0 | 54.0 | 7 | 12 | 59.0 | 67.0 | 7 | 12 | 40.0 | 41.0 | 7 | 6 | 6 | 7 | 51.9 | 149 | 161 | 173 | 8 | 7 | 59.0 | 70.0 | 5 | 12 | 6 | 7.5 | 0 |
| 44 FT | 31 | 34 | 17 | 10 | 8 | 7.5 | 6 | 6 | 57.4 | 55.0 | 55.0 | 55.0 | 8 | 15 | 66.0 | 74.0 | 8 | 15 | 47.0 | 48.0 | 7 | 6 | 6 | 7 | 50.8 | 150 | 162 | 174 | 8 | 7 | 59.0 | 70.0 | 5 | 12 | 6 | 7.5 | 0 |
| 46 FT | 32 | 35 | 17 | 10 | 8 | 7.5 | 6 | 6 | 57.4 | 56.0 | 56.0 | 56.0 | 8 | 14 | 66.0 | 74.0 | 8 | 14 | 46.0 | 48.0 | 8 | 7.5 | 6 | 6.5 | 50.9 | 151 | 163 | 175 | 8 | 7 | 59.0 | 70.0 | 5 | 12 | 6 | 7.5 | 0 |
| 48 FT | 33 | 36 | 17 | 10 | 8 | 7 | 6 | 6 | 57.4 | 57.0 | 57.0 | 57.0 | 8 | 14 | 66.0 | 73.0 | 8 | 14 | 46.0 | 47.0 | 8 | 7.5 | 6 | 6.5 | 51.1 | 152 | 164 | 176 | 8 | 6.5 | 59.0 | 70.0 | 5 | 12 | 6 | 7.5 | 0 |
| 50 FT | 34 | 36 | 18 | 10 | 8 | 7 | 6 | 6 | 58.1 | 58.0 | 58.0 | 58.0 | 8 | 14 | 66.0 | 73.0 | 8 | 14 | 46.0 | 47.0 | 8 | 6.5 | 6 | 6.5 | 51.5 | 152 | 164 | 176 | 8 | 6.5 | 59.0 | 70.0 | 5 | 12 | 6 | 7 | 0 |




BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ℄ CULVERT.

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

### GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.


MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 13 FEET
HEIGHT (HT): 7 THRU 12 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

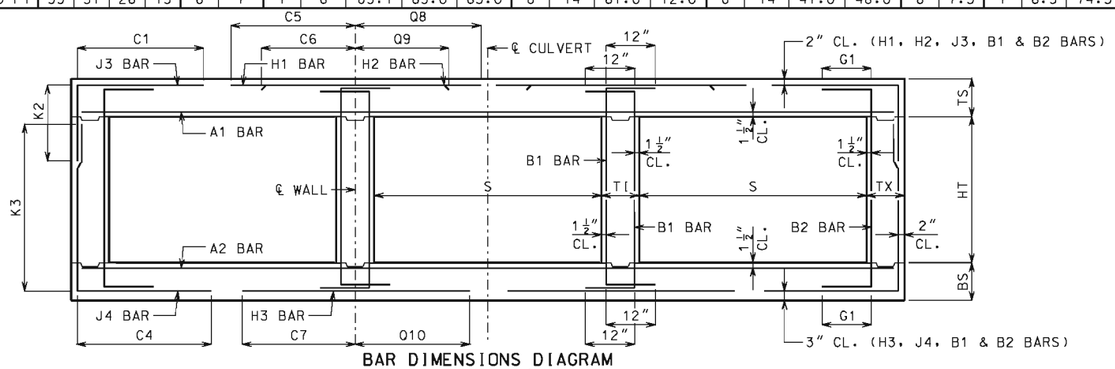
703.87

## SPAN (S) = 13 FT HEIGHT (HT) = 13 FT OR 14 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | H1 BARS | | | | H2 BARS | | | A2 BARS | | J4 BARS | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | K2 HT=13' | K2 HT=14' | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | K3 HT=13' | K3 HT=14' | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 14 | 11 | 10 | 11 | 5 | 6 | 5 | 6 | 67.5 | 34.0 | 34.0 | 5 | 12 | 127.5 | 94.5 | 5 | 12 | 35.0 | 38.0 | 5 | 7 | 6 | 6.5 | 100.1 | 163 | 175 | 5 | 6 | 56.0 | 58.0 | 5 | 12 | 5 | 8 | 12 |
| 2 FT | 15 | 11 | 10 | 11 | 6 | 8 | 5 | 6 | 67.5 | 35.0 | 35.0 | 6 | 16 | 131.5 | 101.5 | 6 | 16 | 41.0 | 44.0 | 5 | 6.5 | 6 | 6 | 88.9 | 163 | 175 | 6 | 6.5 | 57.0 | 60.0 | 5 | 12 | 5 | 8 | 12 |
| 4 FT | 11 | 11 | 11 | 11 | 6 | 8 | 5 | 6 | 68.1 | 31.0 | 31.0 | 6 | 15 | 127.5 | 92.0 | 6 | 15 | 38.0 | 39.0 | 5 | 6.5 | 6 | 6 | 78.6 | 163 | 175 | 6 | 6 | 56.0 | 60.0 | 5 | 12 | 5 | 7.5 | 12 |
| 6 FT | 11 | 12 | 11 | 11 | 5 | 6 | 6 | 7.5 | 75.9 | 31.0 | 35.0 | 6 | 14 | 65.0 | 69.0 | 6 | 14 | 36.0 | 37.0 | 5 | 6 | 6 | 6.5 | 74.6 | 164 | 176 | 6 | 6 | 54.0 | 59.0 | 5 | 12 | 5 | 7.5 | 12 |
| 8 FT | 12 | 13 | 11 | 11 | 5 | 6 | 6 | 7.5 | 70.1 | 32.0 | 36.0 | 6 | 14 | 61.0 | 64.0 | 6 | 14 | 35.0 | 36.0 | 5 | 6 | 6 | 6.5 | 70.9 | 165 | 177 | 6 | 6 | 53.0 | 59.0 | 5 | 12 | 5 | 7.5 | 0 |
| 10 FT | 12 | 14 | 12 | 11 | 5 | 6 | 6 | 7.5 | 65.9 | 36.0 | 36.0 | 6 | 12 | 58.0 | 61.0 | 6 | 12 | 35.0 | 35.0 | 6 | 8 | 6 | 7 | 67.9 | 166 | 178 | 6 | 6 | 52.0 | 59.0 | 5 | 12 | 5 | 7 | 0 |
| 12 FT | 13 | 15 | 12 | 11 | 6 | 8 | 6 | 7 | 64.4 | 37.0 | 37.0 | 6 | 12 | 56.0 | 60.0 | 6 | 12 | 34.0 | 35.0 | 6 | 7.5 | 6 | 7 | 66.3 | 167 | 179 | 6 | 6 | 52.0 | 59.0 | 5 | 12 | 5 | 7 | 0 |
| 14 FT | 15 | 16 | 12 | 11 | 6 | 8 | 6 | 6.5 | 69.9 | 39.0 | 39.0 | 6 | 13 | 60.0 | 66.0 | 6 | 13 | 40.0 | 42.0 | 6 | 7 | 6 | 6 | 64.9 | 168 | 180 | 6 | 6 | 51.0 | 59.0 | 5 | 12 | 5 | 7 | 0 |
| 16 FT | 16 | 17 | 13 | 11 | 6 | 8 | 6 | 6.5 | 68.9 | 40.0 | 40.0 | 6 | 13 | 59.0 | 65.0 | 6 | 13 | 40.0 | 42.0 | 6 | 7 | 6 | 6.5 | 63.8 | 169 | 181 | 6 | 6 | 51.0 | 59.0 | 5 | 12 | 5 | 6.5 | 0 |
| 18 FT | 17 | 19 | 14 | 11 | 6 | 7.5 | 6 | 6.5 | 68.3 | 41.0 | 41.0 | 6 | 12 | 58.0 | 65.0 | 6 | 12 | 40.0 | 42.0 | 6 | 6 | 6 | 6.5 | 63.5 | 171 | 183 | 6 | 6 | 51.0 | 60.0 | 5 | 12 | 5 | 6 | 0 |
| 20 FT | 18 | 20 | 14 | 11 | 6 | 7 | 6 | 6 | 67.5 | 42.0 | 42.0 | 6 | 12 | 58.0 | 65.0 | 6 | 12 | 39.0 | 42.0 | 6 | 6 | 6 | 6.5 | 62.8 | 172 | 184 | 6 | 6 | 51.0 | 60.0 | 5 | 12 | 5 | 6 | 0 |
| 22 FT | 19 | 21 | 14 | 11 | 6 | 6.5 | 6 | 6 | 66.9 | 43.0 | 43.0 | 6 | 12 | 57.0 | 65.0 | 6 | 12 | 39.0 | 42.0 | 7 | 8 | 6 | 6 | 62.1 | 173 | 185 | 7 | 7 | 54.0 | 63.0 | 5 | 12 | 5 | 6 | 0 |
| 24 FT | 20 | 22 | 16 | 11 | 6 | 6 | 6 | 6 | 67.3 | 44.0 | 44.0 | 7 | 15 | 62.0 | 69.0 | 7 | 15 | 44.0 | 47.0 | 7 | 7 | 6 | 6.5 | 61.8 | 174 | 186 | 7 | 7 | 54.0 | 63.0 | 5 | 12 | 6 | 8 | 0 |
| 26 FT | 22 | 24 | 16 | 11 | 6 | 6 | 6 | 6 | 67.1 | 46.0 | 46.0 | 7 | 15 | 61.0 | 69.0 | 7 | 15 | 43.0 | 46.0 | 7 | 7 | 6 | 7 | 61.8 | 176 | 188 | 7 | 7 | 54.0 | 63.0 | 5 | 12 | 6 | 8 | 0 |
| 28 FT | 23 | 25 | 16 | 11 | 7 | 7.5 | 7 | 8 | 71.6 | 47.0 | 47.0 | 7 | 15 | 61.0 | 69.0 | 7 | 15 | 43.0 | 46.0 | 7 | 6.5 | 6 | 6.5 | 61.4 | 177 | 189 | 7 | 6.5 | 54.0 | 63.0 | 5 | 12 | 6 | 8 | 0 |
| 30 FT | 24 | 26 | 16 | 11 | 7 | 7.5 | 7 | 7 | 71.3 | 48.0 | 48.0 | 7 | 14 | 60.0 | 69.0 | 7 | 14 | 42.0 | 45.0 | 7 | 6.5 | 6 | 6 | 61.0 | 178 | 190 | 7 | 6.5 | 54.0 | 63.0 | 5 | 12 | 6 | 8 | 0 |
| 32 FT | 25 | 28 | 17 | 11 | 7 | 7 | 7 | 7.5 | 71.6 | 49.0 | 49.0 | 7 | 14 | 60.0 | 68.0 | 7 | 14 | 42.0 | 45.0 | 7 | 6.5 | 6 | 6.5 | 61.1 | 180 | 192 | 7 | 6 | 54.0 | 64.0 | 5 | 12 | 6 | 7.5 | 0 |
| 34 FT | 26 | 29 | 17 | 11 | 7 | 6.5 | 7 | 6.5 | 71.4 | 50.0 | 50.0 | 7 | 13 | 60.0 | 68.0 | 7 | 13 | 42.0 | 44.0 | 7 | 6.5 | 6 | 6.5 | 61.0 | 181 | 193 | 8 | 7.5 | 60.0 | 70.0 | 5 | 12 | 6 | 7.5 | 0 |
| 36 FT | 27 | 30 | 18 | 11 | 7 | 6.5 | 7 | 7 | 72.0 | 51.0 | 51.0 | 7 | 13 | 60.0 | 68.0 | 7 | 13 | 41.0 | 43.0 | 7 | 6 | 6 | 6.5 | 61.3 | 182 | 194 | 8 | 7.5 | 60.0 | 70.0 | 5 | 12 | 6 | 7 | 0 |
| 38 FT | 28 | 31 | 19 | 11 | 7 | 6.5 | 7 | 7.5 | 72.5 | 52.0 | 52.0 | 7 | 12 | 59.0 | 67.0 | 7 | 12 | 41.0 | 43.0 | 7 | 6 | 6 | 6.5 | 61.5 | 183 | 195 | 8 | 7 | 60.0 | 70.0 | 5 | 12 | 6 | 6.5 | 0 |
| 40 FT | 29 | 32 | 19 | 11 | 7 | 6 | 7 | 6.5 | 72.6 | 53.0 | 53.0 | 7 | 12 | 59.0 | 67.0 | 7 | 12 | 40.0 | 42.0 | 7 | 6 | 6 | 6 | 61.5 | 184 | 196 | 8 | 7 | 60.0 | 70.0 | 5 | 12 | 6 | 6.5 | 0 |
| 42 FT | 30 | 33 | 20 | 11 | 7 | 6 | 7 | 7 | 73.3 | 54.0 | 54.0 | 7 | 12 | 59.0 | 66.0 | 7 | 12 | 39.0 | 41.0 | 7 | 6 | 6 | 6 | 61.9 | 185 | 197 | 8 | 7 | 60.0 | 70.0 | 5 | 12 | 6 | 6.5 | 0 |
| 44 FT | 31 | 34 | 20 | 11 | 8 | 7.5 | 7 | 7 | 71.6 | 55.0 | 55.0 | 8 | 15 | 67.0 | 73.0 | 8 | 15 | 47.0 | 48.0 | 7 | 6 | 6 | 6 | 60.1 | 186 | 198 | 8 | 7 | 60.0 | 70.0 | 5 | 12 | 6 | 6.5 | 0 |
| 46 FT | 32 | 35 | 20 | 11 | 8 | 7.5 | 7 | 6.5 | 71.6 | 56.0 | 56.0 | 8 | 15 | 67.0 | 73.0 | 8 | 15 | 46.0 | 48.0 | 8 | 7.5 | 6 | 6 | 60.3 | 187 | 199 | 8 | 7 | 60.0 | 70.0 | 5 | 12 | 6 | 6.5 | 0 |
| 48 FT | 32 | 36 | 21 | 11 | 8 | 7 | 7 | 7 | 72.4 | 56.0 | 56.0 | 8 | 14 | 67.0 | 73.0 | 8 | 14 | 47.0 | 48.0 | 8 | 7.5 | 6 | 6 | 60.5 | 188 | 200 | 8 | 6.5 | 60.0 | 70.0 | 5 | 12 | 6 | 6 | 0 |
| 50 FT | 33 | 36 | 22 | 11 | 8 | 7 | 7 | 7 | 73.1 | 57.0 | 63.0 | 8 | 14 | 66.0 | 72.0 | 8 | 14 | 46.0 | 47.0 | 8 | 6.5 | 7 | 7.5 | 63.8 | 188 | 200 | 8 | 6.5 | 60.0 | 70.0 | 5 | 12 | 6 | 6 | 0 |

## SPAN (S) = 13 FT HEIGHT (HT) = 15 FT OR 16 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | H1 BARS | | | | H2 BARS | | | A2 BARS | | J4 BARS | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | K2 HT=15' | K2 HT=16' | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | K3 HT=15' | K3 HT=16' | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 14 | 11 | 12 | 13 | 5 | 6 | 5 | 6 | 69.0 | 34.0 | 34.0 | 5 | 12 | 128.5 | 95.5 | 5 | 12 | 35.0 | 37.0 | 5 | 6.5 | 6 | 6.5 | 103.3 | 187 | 199 | 6 | 7 | 60.0 | 61.0 | 5 | 10.5 | 5 | 7 | 12 |
| 2 FT | 15 | 11 | 12 | 13 | 6 | 8 | 6 | 8 | 72.0 | 35.0 | 39.0 | 6 | 16 | 135.5 | 102.5 | 6 | 16 | 41.0 | 44.0 | 5 | 6.5 | 6 | 6 | 95.4 | 187 | 199 | 6 | 6.5 | 58.0 | 59.0 | 5 | 12 | 5 | 7 | 12 |
| 4 FT | 11 | 11 | 12 | 13 | 6 | 8 | 6 | 7 | 72.0 | 35.0 | 35.0 | 6 | 15 | 130.5 | 82.0 | 6 | 15 | 39.0 | 39.0 | 5 | 6.5 | 7 | 6 | 92.5 | 187 | 199 | 6 | 6 | 57.0 | 59.0 | 5 | 12 | 5 | 6.5 | 12 |
| 6 FT | 11 | 12 | 12 | 13 | 5 | 6 | 6 | 6.5 | 90.4 | 35.0 | 35.0 | 6 | 14 | 65.0 | 66.0 | 6 | 14 | 37.0 | 37.0 | 5 | 6 | 7 | 6 | 88.9 | 188 | 200 | 6 | 6 | 56.0 | 59.0 | 5 | 12 | 5 | 6.5 | 12 |
| 8 FT | 11 | 13 | 13 | 13 | 5 | 6 | 6 | 6.5 | 78.1 | 35.0 | 35.0 | 6 | 13 | 60.0 | 62.0 | 6 | 13 | 36.0 | 36.0 | 5 | 6 | 6 | 6 | 82.4 | 189 | 201 | 6 | 6 | 55.0 | 59.0 | 5 | 12 | 5 | 6.5 | 0 |
| 10 FT | 12 | 14 | 13 | 13 | 5 | 6 | 6 | 6.5 | 76.0 | 36.0 | 36.0 | 6 | 13 | 58.0 | 60.0 | 6 | 13 | 35.0 | 36.0 | 6 | 8 | 6 | 6 | 80.4 | 190 | 202 | 6 | 6 | 54.0 | 59.0 | 5 | 12 | 5 | 6 | 0 |
| 12 FT | 13 | 15 | 14 | 13 | 5 | 6 | 6 | 6.5 | 73.3 | 37.0 | 37.0 | 6 | 12 | 57.0 | 59.0 | 6 | 12 | 35.0 | 36.0 | 6 | 7.5 | 6 | 6 | 77.5 | 191 | 203 | 6 | 6 | 53.0 | 59.0 | 5 | 12 | 5 | 6 | 0 |
| 14 FT | 14 | 16 | 14 | 13 | 6 | 8 | 6 | 6 | 72.3 | 38.0 | 38.0 | 6 | 12 | 55.0 | 59.0 | 6 | 12 | 35.0 | 36.0 | 6 | 7 | 6 | 6 | 76.3 | 192 | 204 | 7 | 7 | 55.0 | 62.0 | 5 | 12 | 5 | 6 | 0 |
| 16 FT | 15 | 17 | 16 | 13 | 6 | 7.5 | 6 | 6.5 | 76.6 | 39.0 | 39.0 | 6 | 12 | 60.0 | 64.0 | 6 | 12 | 41.0 | 42.0 | 6 | 6.5 | 6 | 6.5 | 73.3 | 193 | 205 | 7 | 7 | 55.0 | 62.0 | 5 | 12 | 6 | 8 | 0 |
| 18 FT | 16 | 19 | 16 | 13 | 6 | 7 | 6 | 6 | 76.3 | 40.0 | 40.0 | 6 | 12 | 59.0 | 64.0 | 6 | 12 | 40.0 | 42.0 | 6 | 6 | 6 | 6 | 74.1 | 195 | 207 | 6 | 6 | 52.0 | 60.0 | 5 | 12 | 6 | 8 | 0 |
| 20 FT | 18 | 20 | 16 | 13 | 6 | 7 | 6 | 6 | 76.8 | 42.0 | 42.0 | 6 | 12 | 59.0 | 64.0 | 6 | 12 | 40.0 | 42.0 | 6 | 6 | 6 | 6 | 73.0 | 196 | 208 | 6 | 6 | 52.0 | 60.0 | 5 | 12 | 6 | 8 | 0 |
| 22 FT | 19 | 21 | 17 | 13 | 6 | 6.5 | 6 | 6 | 76.4 | 43.0 | 43.0 | 6 | 12 | 58.0 | 64.0 | 6 | 12 | 40.0 | 42.0 | 7 | 7.5 | 7 | 7.5 | 75.1 | 197 | 209 | 7 | 7 | 55.0 | 63.0 | 5 | 12 | 6 | 7.5 | 0 |
| 24 FT | 20 | 23 | 17 | 13 | 6 | 6.5 | 7 | 7.5 | 81.1 | 44.0 | 50.0 | 6 | 12 | 58.0 | 64.0 | 6 | 12 | 40.0 | 42.0 | 7 | 7 | 7 | 7 | 75.4 | 199 | 211 | 7 | 7 | 55.0 | 63.0 | 5 | 12 | 6 | 7.5 | 0 |
| 26 FT | 22 | 24 | 18 | 13 | 6 | 6 | 7 | 7.5 | 81.5 | 46.0 | 52.0 | 7 | 15 | 62.0 | 69.0 | 7 | 15 | 44.0 | 46.0 | 7 | 7 | 7 | 7.5 | 74.9 | 200 | 212 | 7 | 7 | 55.0 | 63.0 | 5 | 12 | 6 | 7 | 0 |
| 28 FT | 23 | 25 | 18 | 13 | 7 | 7.5 | 7 | 6.5 | 81.3 | 47.0 | 53.0 | 7 | 15 | 62.0 | 69.0 | 7 | 15 | 43.0 | 46.0 | 7 | 6.5 | 7 | 6.5 | 74.6 | 201 | 213 | 7 | 6.5 | 55.0 | 63.0 | 5 | 12 | 6 | 7 | 0 |
| 30 FT | 24 | 26 | 19 | 13 | 7 | 7.5 | 7 | 7 | 81.3 | 48.0 | 54.0 | 7 | 14 | 61.0 | 69.0 | 7 | 14 | 43.0 | 46.0 | 7 | 6.5 | 7 | 7 | 74.4 | 202 | 214 | 7 | 6.5 | 55.0 | 63.0 | 5 | 12 | 6 | 6.5 | 0 |
| 32 FT | 25 | 28 | 20 | 13 | 7 | 7 | 7 | 7 | 81.4 | 49.0 | 55.0 | 7 | 14 | 61.0 | 68.0 | 7 | 14 | 42.0 | 45.0 | 7 | 6.5 | 7 | 7.5 | 74.6 | 204 | 216 | 7 | 6 | 55.0 | 64.0 | 5 | 12 | 6 | 6.5 | 0 |
| 34 FT | 26 | 29 | 21 | 13 | 7 | 7 | 7 | 7 | 81.6 | 50.0 | 56.0 | 7 | 13 | 61.0 | 68.0 | 7 | 13 | 42.0 | 44.0 | 7 | 6.5 | 7 | 7.5 | 74.5 | 205 | 217 | 8 | 7.5 | 61.0 | 70.0 | 5 | 12 | 6 | 6 | 0 |
| 36 FT | 27 | 30 | 22 | 13 | 7 | 6.5 | 7 | 7 | 82.0 | 57.0 | 57.0 | 7 | 13 | 60.0 | 68.0 | 7 | 13 | 42.0 | 44.0 | 7 | 6 | 7 | 7.5 | 74.8 | 206 | 218 | 8 | 7.5 | 61.0 | 70.0 | 5 | 12 | 6 | 6 | 0 |
| 38 FT | 28 | 31 | 22 | 13 | 7 | 6.5 | 7 | 6.5 | 82.1 | 58.0 | 58.0 | 7 | 12 | 60.0 | 67.0 | 7 | 12 | 41.0 | 43.0 | 7 | 6 | 7 | 7 | 74.8 | 207 | 219 | 8 | 7 | 61.0 | 70.0 | 5 | 12 | 6 | 6 | 0 |
| 40 FT | 29 | 32 | 23 | 13 | 7 | 6 | 7 | 6.5 | 82.6 | 59.0 | 59.0 | 7 | 12 | 60.0 | 67.0 | 7 | 12 | 41.0 | 42.0 | 7 | 6 | 7 | 7 | 75.0 | 208 | 220 | 8 | 7 | 61.0 | 70.0 | 5 | 12 | 7 | 7.5 | 0 |
| 42 FT | 30 | 33 | 24 | 13 | 7 | 6 | 7 | 6.5 | 83.3 | 60.0 | 60.0 | 7 | 12 | 60.0 | 66.0 | 7 | 12 | 40.0 | 42.0 | 7 | 6 | 7 | 7 | 75.3 | 209 | 221 | 8 | 7 | 61.0 | 70.0 | 5 | 12 | 7 | 7.5 | 0 |
| 44 FT | 31 | 34 | 24 | 13 | 7 | 6 | 7 | 7 | 81.8 | 61.0 | 61.0 | 8 | 15 | 68.0 | 74.0 | 8 | 15 | 47.0 | 49.0 | 7 | 6 | 7 | 7 | 73.5 | 210 | 222 | 8 | 7 | 61.0 | 70.0 | 5 | 12 | 7 | 7.5 | 0 |
| 46 FT | 31 | 35 | 24 | 13 | 8 | 7.5 | 7 | 6 | 81.6 | 61.0 | 61.0 | 8 | 15 | 68.0 | 74.0 | 8 | 15 | 48.0 | 49.0 | 8 | 7.5 | 7 | 7 | 73.8 | 211 | 223 | 8 | 7 | 61.0 | 70.0 | 5 | 12 | 7 | 7.5 | 0 |
| 48 FT | 32 | 36 | 25 | 13 | 8 | 7.5 | 7 | 6 | 82.4 | 62.0 | 62.0 | 8 | 14 | 67.0 | 73.0 | 8 | 14 | 47.0 | 49.0 | 8 | 7.5 | 7 | 7 | 74.1 | 212 | 224 | 8 | 6.5 | 61.0 | 71.0 | 5 | 12 | 7 | 7.5 | 0 |
| 50 FT | 33 | 37 | 26 | 13 | 8 | 7 | 7 | 6 | 83.1 | 63.0 | 63.0 | 8 | 14 | 67.0 | 72.0 | 8 | 14 | 47.0 | 48.0 | 8 | 7.5 | 7 | 6.5 | 74.5 | 213 | 225 | 8 | 6.5 | 61.0 | 71.0 | 5 | 12 | 7 | 7.5 | 0 |




BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ℄ CULVERT.

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

### GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.


MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 13 FEET
HEIGHT (HT): 13 THRU 16 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

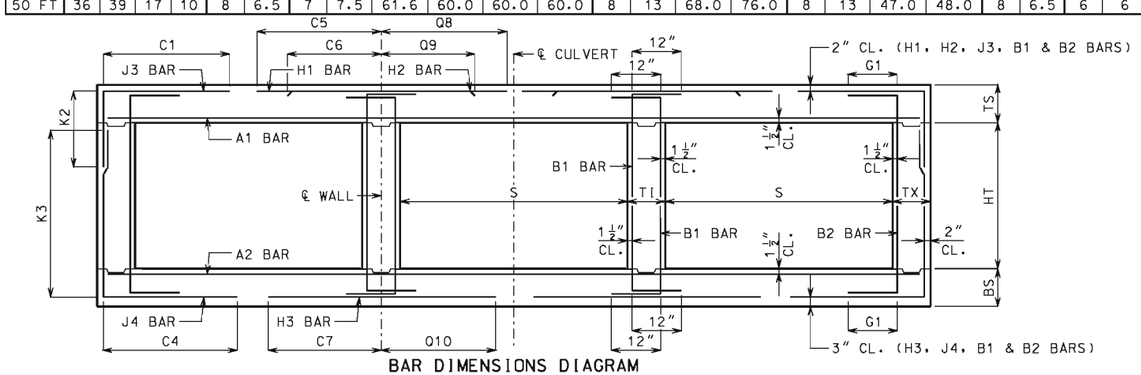
703.87

## SPAN (S) = 14 FT HEIGHT (HT) = 7 FT OR 8 FT OR 9 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | K2 HT=7′ | K2 HT=8′ | K2 HT=9′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | K3 HT=7′ | K3 HT=8′ | K3 HT=9′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 14 | 10 | 8 | 8 | 6 | 8.5 | 5 | 8.5 | 69.3 | 34.0 | 34.0 | 34.0 | 5 | 12 | 133.5 | 98.5 | 5 | 12 | 39.0 | 43.0 | 5 | 7 | 6 | 7 | 60.9 | 90 | 102 | 114 | 6 | 6.5 | 58.0 | 63.0 | 5 | 12 | 5 | 12 | 12 |
| 2 FT | 15 | 10 | 8 | 8 | 6 | 8 | 5 | 8 | 69.3 | 35.0 | 35.0 | 35.0 | 6 | 16 | 137.5 | 105.5 | 6 | 16 | 45.0 | 49.0 | 5 | 7 | 6 | 6 | 54.8 | 90 | 102 | 114 | 7 | 7 | 60.0 | 64.0 | 5 | 12 | 5 | 12 | 12 |
| 4 FT | 12 | 11 | 8 | 8 | 6 | 7.5 | 5 | 6 | 52.4 | 32.0 | 32.0 | 32.0 | 6 | 14 | 80.0 | 103.0 | 6 | 14 | 39.0 | 42.0 | 5 | 6.5 | 6 | 7 | 49.1 | 91 | 103 | 115 | 6 | 6 | 56.0 | 62.0 | 5 | 12 | 5 | 12 | 12 |
| 6 FT | 12 | 12 | 8 | 8 | 6 | 8 | 6 | 7.5 | 48.9 | 32.0 | 32.0 | 32.0 | 6 | 13 | 66.0 | 81.0 | 6 | 13 | 37.0 | 39.0 | 5 | 6 | 5 | 6 | 42.1 | 92 | 104 | 116 | 7 | 7 | 57.0 | 65.0 | 5 | 12 | 5 | 12 | 12 |
| 8 FT | 12 | 13 | 8 | 8 | 6 | 7.5 | 6 | 7 | 45.5 | 32.0 | 32.0 | 32.0 | 6 | 12 | 61.0 | 69.0 | 6 | 12 | 35.0 | 37.0 | 6 | 8.5 | 5 | 6 | 39.1 | 93 | 105 | 117 | 7 | 7 | 56.0 | 66.0 | 5 | 12 | 5 | 12 | 0 |
| 10 FT | 13 | 14 | 9 | 8 | 6 | 7 | 5 | 6 | 41.3 | 33.0 | 33.0 | 33.0 | 7 | 15 | 61.0 | 69.0 | 7 | 15 | 38.0 | 40.0 | 6 | 8 | 5 | 7 | 38.4 | 94 | 106 | 118 | 7 | 6.5 | 55.0 | 65.0 | 5 | 12 | 5 | 12 | 0 |
| 12 FT | 15 | 16 | 9 | 8 | 6 | 7.5 | 5 | 6.5 | 43.5 | 35.0 | 35.0 | 35.0 | 6 | 12 | 62.0 | 71.0 | 6 | 12 | 40.0 | 43.0 | 6 | 7 | 5 | 8 | 36.8 | 96 | 108 | 120 | 6 | 6 | 52.0 | 63.0 | 5 | 12 | 5 | 12 | 0 |
| 14 FT | 16 | 17 | 9 | 8 | 6 | 7 | 5 | 6 | 41.9 | 36.0 | 36.0 | 36.0 | 6 | 12 | 61.0 | 70.0 | 6 | 12 | 40.0 | 43.0 | 6 | 7 | 5 | 7.5 | 35.8 | 97 | 109 | 121 | 7 | 7 | 54.0 | 66.0 | 5 | 12 | 5 | 12 | 0 |
| 16 FT | 17 | 18 | 9 | 8 | 6 | 7 | 5 | 6 | 40.8 | 37.0 | 37.0 | 37.0 | 7 | 15 | 65.0 | 75.0 | 7 | 15 | 44.0 | 48.0 | 6 | 6.5 | 5 | 7 | 34.9 | 98 | 110 | 122 | 7 | 7 | 54.0 | 66.0 | 5 | 12 | 5 | 12 | 0 |
| 18 FT | 18 | 20 | 9 | 8 | 6 | 6.5 | 6 | 8 | 44.0 | 38.0 | 38.0 | 38.0 | 7 | 15 | 64.0 | 75.0 | 7 | 15 | 44.0 | 47.0 | 6 | 6 | 5 | 7 | 34.0 | 100 | 112 | 124 | 7 | 7 | 54.0 | 66.0 | 5 | 12 | 5 | 10 | 0 |
| 20 FT | 20 | 21 | 9 | 8 | 6 | 6.5 | 5 | 6 | 38.9 | 40.0 | 40.0 | 40.0 | 7 | 15 | 63.0 | 75.0 | 7 | 15 | 44.0 | 48.0 | 7 | 8 | 5 | 6.5 | 33.9 | 101 | 113 | 125 | 7 | 7 | 54.0 | 66.0 | 5 | 12 | 5 | 9 | 0 |
| 22 FT | 21 | 22 | 9 | 8 | 6 | 6 | 6 | 8 | 42.4 | 41.0 | 41.0 | 41.0 | 7 | 14 | 63.0 | 74.0 | 7 | 14 | 44.0 | 47.0 | 7 | 7 | 5 | 6 | 33.5 | 102 | 114 | 126 | 7 | 6.5 | 54.0 | 66.0 | 5 | 12 | 5 | 8.5 | 0 |
| 24 FT | 23 | 24 | 9 | 8 | 7 | 7.5 | 6 | 7 | 42.0 | 47.0 | 47.0 | 47.0 | 7 | 15 | 62.0 | 74.0 | 7 | 15 | 44.0 | 47.0 | 7 | 7 | 6 | 7 | 36.4 | 104 | 116 | 128 | 7 | 7 | 54.0 | 66.0 | 5 | 12 | 5 | 8.5 | 0 |
| 26 FT | 24 | 25 | 9 | 8 | 7 | 7.5 | 6 | 7 | 41.6 | 48.0 | 48.0 | 48.0 | 7 | 14 | 62.0 | 74.0 | 7 | 14 | 43.0 | 47.0 | 7 | 6.5 | 6 | 7 | 36.1 | 105 | 117 | 129 | 7 | 6.5 | 54.0 | 66.0 | 5 | 12 | 5 | 8.5 | 0 |
| 28 FT | 25 | 26 | 9 | 8 | 7 | 7 | 6 | 6 | 41.4 | 49.0 | 49.0 | 49.0 | 7 | 14 | 61.0 | 73.0 | 7 | 14 | 43.0 | 47.0 | 7 | 6 | 6 | 6.5 | 35.9 | 106 | 118 | 130 | 7 | 6 | 54.0 | 66.0 | 5 | 12 | 5 | 7.5 | 0 |
| 30 FT | 27 | 28 | 10 | 8 | 7 | 6.5 | 6 | 7 | 42.3 | 51.0 | 51.0 | 51.0 | 7 | 13 | 61.0 | 73.0 | 7 | 13 | 42.0 | 45.0 | 7 | 6 | 6 | 7 | 36.5 | 108 | 120 | 132 | 7 | 6 | 54.0 | 67.0 | 5 | 12 | 5 | 8 | 0 |
| 32 FT | 28 | 29 | 10 | 8 | 7 | 6.5 | 6 | 6.5 | 42.0 | 52.0 | 52.0 | 52.0 | 7 | 12 | 61.0 | 73.0 | 7 | 12 | 41.0 | 44.0 | 7 | 6 | 6 | 6.5 | 36.4 | 109 | 121 | 133 | 8 | 7.5 | 60.0 | 73.0 | 5 | 12 | 5 | 7.5 | 0 |
| 34 FT | 29 | 30 | 10 | 8 | 7 | 6 | 6 | 6 | 41.9 | 53.0 | 53.0 | 53.0 | 7 | 12 | 61.0 | 72.0 | 7 | 12 | 41.0 | 44.0 | 8 | 7 | 6 | 6.5 | 36.4 | 110 | 122 | 134 | 8 | 7 | 60.0 | 73.0 | 5 | 12 | 5 | 7 | 0 |
| 36 FT | 30 | 32 | 11 | 8 | 7 | 6 | 6 | 7 | 42.9 | 54.0 | 54.0 | 54.0 | 7 | 12 | 61.0 | 72.0 | 7 | 12 | 41.0 | 43.0 | 7 | 6 | 6 | 6.5 | 36.9 | 112 | 124 | 136 | 8 | 7 | 60.0 | 73.0 | 5 | 12 | 5 | 7.5 | 0 |
| 38 FT | 31 | 33 | 11 | 8 | 8 | 7.5 | 6 | 6.5 | 42.9 | 55.0 | 55.0 | 55.0 | 8 | 15 | 68.0 | 79.0 | 8 | 15 | 48.0 | 51.0 | 8 | 7.5 | 6 | 6.5 | 37.0 | 113 | 125 | 137 | 8 | 6.5 | 60.0 | 73.0 | 5 | 12 | 5 | 7 | 0 |
| 40 FT | 32 | 34 | 11 | 8 | 8 | 7.5 | 6 | 6.5 | 42.9 | 56.0 | 56.0 | 56.0 | 8 | 14 | 68.0 | 79.0 | 8 | 14 | 48.0 | 50.0 | 8 | 7.5 | 6 | 6 | 37.1 | 114 | 126 | 138 | 8 | 6.5 | 60.0 | 73.0 | 5 | 12 | 5 | 6.5 | 0 |
| 42 FT | 33 | 35 | 12 | 8 | 8 | 7 | 6 | 7 | 43.8 | 57.0 | 57.0 | 57.0 | 8 | 14 | 68.0 | 78.0 | 8 | 14 | 47.0 | 49.0 | 8 | 7 | 6 | 6.5 | 37.6 | 115 | 127 | 139 | 8 | 6.5 | 60.0 | 73.0 | 5 | 12 | 5 | 7 | 0 |
| 44 FT | 34 | 36 | 12 | 8 | 8 | 7 | 6 | 6.5 | 43.8 | 58.0 | 58.0 | 58.0 | 8 | 14 | 68.0 | 78.0 | 8 | 14 | 47.0 | 48.0 | 8 | 7 | 6 | 6.5 | 37.8 | 116 | 128 | 140 | 8 | 6 | 60.0 | 73.0 | 5 | 12 | 5 | 6.5 | 0 |
| 46 FT | 35 | 37 | 12 | 8 | 8 | 6.5 | 6 | 6.5 | 42.9 | 59.0 | 59.0 | 59.0 | 8 | 13 | 67.0 | 77.0 | 8 | 13 | 46.0 | 47.0 | 8 | 7 | 6 | 6.5 | 37.0 | 117 | 129 | 141 | 8 | 6 | 60.0 | 73.0 | 5 | 12 | 5 | 6.5 | 0 |
| 48 FT | 36 | 38 | 12 | 8 | 8 | 6.5 | 6 | 6.5 | 43.0 | 60.0 | 60.0 | 60.0 | 8 | 13 | 67.0 | 76.0 | 8 | 13 | 46.0 | 47.0 | 8 | 7 | 6 | 6 | 37.1 | 118 | 130 | 142 | 8 | 6 | 60.0 | 73.0 | 5 | 12 | 5 | 6 | 0 |
| 50 FT | 37 | 39 | 12 | 8 | 8 | 6.5 | 6 | 6 | 43.1 | 61.0 | 61.0 | 61.0 | 8 | 13 | 67.0 | 75.0 | 8 | 13 | 46.0 | 47.0 | 8 | 7 | 6 | 6 | 37.4 | 119 | 131 | 143 | 8 | 6 | 60.0 | 73.0 | 5 | 12 | 5 | 6 | 0 |

## SPAN (S) = 14 FT HEIGHT (HT) = 10 FT OR 11 FT OR 12 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | K2 HT=10′ | K2 HT=11′ | K2 HT=12′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | K3 HT=10′ | K3 HT=11′ | K3 HT=12′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 14 | 10 | 9 | 10 | 6 | 8.5 | 5 | 7 | 70.3 | 34.0 | 34.0 | 34.0 | 5 | 12 | 134.5 | 99.5 | 5 | 12 | 39.0 | 43.0 | 5 | 7 | 6 | 6 | 80.1 | 126 | 138 | 150 | 6 | 6 | 60.0 | 63.0 | 5 | 10.5 | 5 | 9 | 12 |
| 2 FT | 15 | 11 | 9 | 10 | 6 | 8 | 5 | 7 | 70.3 | 35.0 | 35.0 | 35.0 | 6 | 16 | 138.5 | 106.5 | 6 | 16 | 45.0 | 48.0 | 5 | 6.5 | 6 | 6 | 73.6 | 127 | 139 | 151 | 6 | 6.5 | 59.0 | 62.0 | 5 | 12 | 5 | 9 | 12 |
| 4 FT | 11 | 11 | 11 | 10 | 6 | 7 | 5 | 6 | 66.6 | 31.0 | 31.0 | 31.0 | 6 | 13 | 81.0 | 94.0 | 6 | 13 | 39.0 | 40.0 | 5 | 6.5 | 5 | 6 | 61.8 | 127 | 139 | 151 | 7 | 7 | 61.0 | 65.0 | 5 | 9.5 | 5 | 10 | 12 |
| 6 FT | 12 | 12 | 11 | 10 | 6 | 8 | 5 | 6.5 | 60.6 | 32.0 | 32.0 | 32.0 | 6 | 13 | 67.0 | 75.0 | 6 | 13 | 37.0 | 39.0 | 5 | 6 | 5 | 6 | 57.3 | 128 | 140 | 152 | 7 | 7 | 59.0 | 65.0 | 5 | 12 | 5 | 10.5 | 12 |
| 8 FT | 12 | 13 | 11 | 10 | 6 | 8 | 5 | 6 | 56.3 | 32.0 | 32.0 | 32.0 | 6 | 12 | 62.0 | 67.0 | 6 | 12 | 36.0 | 37.0 | 5 | 6 | 6 | 7 | 57.4 | 129 | 141 | 153 | 7 | 6.5 | 57.0 | 65.0 | 5 | 12 | 5 | 10 | 0 |
| 10 FT | 13 | 14 | 11 | 10 | 6 | 7.5 | 6 | 8 | 56.3 | 33.0 | 33.0 | 37.0 | 6 | 12 | 59.0 | 65.0 | 6 | 12 | 35.0 | 37.0 | 6 | 7.5 | 6 | 7 | 55.0 | 130 | 142 | 154 | 7 | 6.5 | 57.0 | 65.0 | 5 | 12 | 5 | 9.5 | 0 |
| 12 FT | 14 | 16 | 12 | 10 | 6 | 7.5 | 6 | 8 | 54.9 | 34.0 | 34.0 | 34.0 | 7 | 15 | 61.0 | 67.0 | 7 | 15 | 38.0 | 39.0 | 6 | 7 | 5 | 6 | 50.9 | 132 | 144 | 156 | 7 | 7 | 56.0 | 66.0 | 5 | 12 | 5 | 9.5 | 0 |
| 14 FT | 16 | 17 | 12 | 10 | 6 | 7.5 | 6 | 8 | 59.3 | 36.0 | 36.0 | 36.0 | 6 | 12 | 62.0 | 70.0 | 6 | 12 | 41.0 | 43.0 | 6 | 7 | 5 | 6 | 49.9 | 133 | 145 | 157 | 7 | 7 | 56.0 | 66.0 | 5 | 12 | 5 | 9 | 0 |
| 16 FT | 17 | 18 | 12 | 10 | 6 | 7 | 6 | 7.5 | 58.1 | 37.0 | 37.0 | 41.0 | 7 | 16 | 66.0 | 74.0 | 7 | 16 | 45.0 | 48.0 | 6 | 6.5 | 6 | 8 | 52.0 | 134 | 146 | 158 | 7 | 7 | 56.0 | 66.0 | 5 | 12 | 5 | 8 | 0 |
| 18 FT | 18 | 20 | 12 | 10 | 6 | 7 | 6 | 7 | 57.5 | 38.0 | 38.0 | 42.0 | 7 | 15 | 65.0 | 74.0 | 7 | 15 | 45.0 | 48.0 | 6 | 6 | 6 | 8 | 51.3 | 136 | 148 | 160 | 7 | 7 | 55.0 | 66.0 | 5 | 12 | 5 | 7.5 | 0 |
| 20 FT | 19 | 21 | 12 | 10 | 6 | 6 | 6 | 6.5 | 56.6 | 39.0 | 39.0 | 43.0 | 7 | 14 | 64.0 | 74.0 | 7 | 14 | 45.0 | 48.0 | 7 | 8 | 6 | 7.5 | 50.6 | 137 | 149 | 161 | 7 | 7 | 55.0 | 66.0 | 5 | 12 | 5 | 7 | 0 |
| 22 FT | 21 | 22 | 12 | 10 | 6 | 6 | 6 | 6.5 | 55.9 | 41.0 | 41.0 | 45.0 | 7 | 15 | 64.0 | 74.0 | 7 | 15 | 45.0 | 48.0 | 7 | 7 | 6 | 6.5 | 50.3 | 138 | 150 | 162 | 7 | 7 | 55.0 | 66.0 | 5 | 12 | 5 | 7 | 0 |
| 24 FT | 22 | 24 | 13 | 10 | 6 | 6 | 6 | 6.5 | 56.4 | 42.0 | 42.0 | 46.0 | 7 | 14 | 63.0 | 73.0 | 7 | 14 | 44.0 | 48.0 | 7 | 7 | 6 | 7.5 | 50.4 | 140 | 152 | 164 | 7 | 7 | 55.0 | 67.0 | 5 | 12 | 5 | 6.5 | 0 |
| 26 FT | 23 | 25 | 14 | 10 | 7 | 7 | 6 | 6.5 | 56.6 | 43.0 | 43.0 | 47.0 | 7 | 14 | 63.0 | 73.0 | 7 | 14 | 44.0 | 48.0 | 7 | 6.5 | 6 | 8 | 50.4 | 141 | 153 | 165 | 7 | 6.5 | 55.0 | 67.0 | 5 | 12 | 5 | 6.5 | 0 |
| 28 FT | 25 | 27 | 14 | 10 | 7 | 7 | 6 | 6.5 | 56.4 | 45.0 | 45.0 | 49.0 | 7 | 14 | 62.0 | 73.0 | 7 | 14 | 43.0 | 47.0 | 7 | 6.5 | 6 | 8 | 50.3 | 143 | 155 | 167 | 7 | 6 | 55.0 | 67.0 | 5 | 12 | 5 | 6 | 0 |
| 30 FT | 26 | 28 | 14 | 10 | 7 | 7 | 6 | 6.5 | 56.0 | 46.0 | 46.0 | 50.0 | 7 | 13 | 62.0 | 73.0 | 7 | 13 | 43.0 | 47.0 | 7 | 6 | 6 | 7.5 | 50.0 | 144 | 156 | 168 | 7 | 6 | 55.0 | 67.0 | 5 | 12 | 5 | 6 | 0 |
| 32 FT | 27 | 29 | 14 | 10 | 7 | 6 | 6 | 6 | 55.6 | 51.0 | 51.0 | 51.0 | 7 | 12 | 62.0 | 72.0 | 7 | 12 | 43.0 | 46.0 | 7 | 6 | 6 | 7.5 | 49.8 | 145 | 157 | 169 | 8 | 7.5 | 61.0 | 73.0 | 5 | 12 | 5 | 6 | 0 |
| 34 FT | 29 | 31 | 15 | 10 | 7 | 6 | 6 | 6.5 | 56.3 | 53.0 | 53.0 | 53.0 | 7 | 12 | 61.0 | 72.0 | 7 | 12 | 41.0 | 44.0 | 7 | 6 | 6 | 7.5 | 50.3 | 147 | 159 | 171 | 8 | 7 | 61.0 | 73.0 | 5 | 12 | 6 | 8 | 0 |
| 36 FT | 30 | 32 | 15 | 10 | 7 | 6 | 6 | 6 | 56.1 | 54.0 | 54.0 | 54.0 | 7 | 12 | 61.0 | 71.0 | 7 | 12 | 41.0 | 43.0 | 8 | 7.5 | 6 | 7.5 | 50.3 | 148 | 160 | 172 | 8 | 7 | 61.0 | 73.0 | 5 | 12 | 6 | 8 | 0 |
| 38 FT | 31 | 33 | 16 | 10 | 8 | 7.5 | 6 | 6 | 56.9 | 55.0 | 55.0 | 55.0 | 8 | 15 | 69.0 | 79.0 | 8 | 15 | 49.0 | 51.0 | 8 | 7.5 | 6 | 7 | 50.6 | 149 | 161 | 173 | 8 | 6.5 | 61.0 | 73.0 | 5 | 12 | 6 | 8 | 0 |
| 40 FT | 32 | 34 | 16 | 10 | 8 | 7.5 | 6 | 6 | 56.9 | 56.0 | 56.0 | 56.0 | 8 | 14 | 69.0 | 78.0 | 8 | 14 | 48.0 | 50.0 | 8 | 7 | 6 | 7 | 50.6 | 150 | 162 | 174 | 8 | 6.5 | 61.0 | 73.0 | 5 | 12 | 6 | 8 | 0 |
| 42 FT | 33 | 35 | 16 | 10 | 8 | 7 | 6 | 6 | 56.9 | 57.0 | 57.0 | 57.0 | 8 | 14 | 69.0 | 78.0 | 8 | 14 | 48.0 | 49.0 | 8 | 7 | 6 | 6.5 | 50.8 | 151 | 163 | 175 | 8 | 6.5 | 61.0 | 73.0 | 5 | 12 | 6 | 8 | 0 |
| 44 FT | 34 | 36 | 17 | 10 | 8 | 7 | 6 | 6 | 57.6 | 58.0 | 58.0 | 58.0 | 8 | 14 | 68.0 | 77.0 | 8 | 14 | 47.0 | 49.0 | 8 | 7 | 6 | 6.5 | 51.3 | 152 | 164 | 176 | 8 | 6 | 61.0 | 73.0 | 5 | 12 | 6 | 7.5 | 0 |
| 46 FT | 35 | 37 | 17 | 10 | 8 | 6.5 | 6 | 6 | 56.5 | 59.0 | 59.0 | 59.0 | 8 | 13 | 68.0 | 77.0 | 8 | 13 | 47.0 | 48.0 | 8 | 7 | 6 | 6.5 | 50.1 | 153 | 165 | 177 | 8 | 6 | 61.0 | 73.0 | 5 | 12 | 6 | 7.5 | 0 |
| 48 FT | 35 | 38 | 17 | 10 | 8 | 6.5 | 6 | 6 | 56.5 | 59.0 | 59.0 | 59.0 | 8 | 13 | 68.0 | 77.0 | 8 | 13 | 47.0 | 49.0 | 8 | 7 | 6 | 6 | 50.1 | 154 | 166 | 178 | 8 | 6 | 61.0 | 73.0 | 5 | 12 | 6 | 7.5 | 0 |
| 50 FT | 36 | 39 | 17 | 10 | 8 | 6.5 | 7 | 7.5 | 61.6 | 60.0 | 60.0 | 60.0 | 8 | 13 | 68.0 | 76.0 | 8 | 13 | 47.0 | 48.0 | 8 | 6.5 | 6 | 6 | 50.3 | 155 | 167 | 179 | 8 | 6 | 61.0 | 73.0 | 5 | 12 | 6 | 7.5 | 0 |




BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ℄ CULVERT.

### GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.


MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 14 FEET
HEIGHT (HT): 7 THRU 12 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

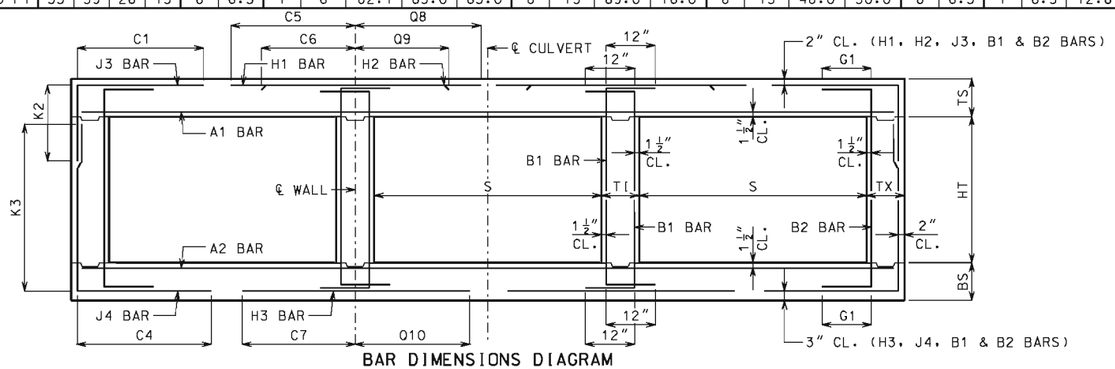
703.87

## SPAN (S) = 14 FT HEIGHT (HT) = 13 FT OR 14 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | H3 BARS | | | B1 BARS | | B2 BARS | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | K2 HT=13' | K2 HT=14' | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | K3 HT=13' | K3 HT=14' | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 14 | 10 | 11 | 11 | 5 | 6 | 5 | 6.5 | 71.8 | 34.0 | 34.0 | 5 | 12 | 135.5 | 100.5 | 5 | 12 | 39.0 | 42.0 | 5 | 7 | 6 | 6 | 87.3 | 162 | 174 | 6 | 6 | 60.0 | 62.0 | 5 | 12 | 5 | 7.5 | 12 |
| 2 FT | 15 | 11 | 11 | 11 | 6 | 8 | 5 | 6.5 | 71.8 | 35.0 | 35.0 | 6 | 16 | 139.5 | 107.5 | 6 | 16 | 45.0 | 48.0 | 5 | 6.5 | 6 | 6.5 | 83.4 | 163 | 175 | 6 | 6 | 59.0 | 62.0 | 5 | 12 | 5 | 7.5 | 12 |
| 4 FT | 11 | 11 | 11 | 11 | 6 | 6.5 | 6 | 7 | 88.0 | 31.0 | 35.0 | 6 | 13 | 86.0 | 92.0 | 6 | 13 | 40.0 | 40.0 | 5 | 6.5 | 6 | 6 | 76.4 | 163 | 175 | 7 | 6.5 | 62.0 | 66.0 | 5 | 10.5 | 5 | 7.5 | 12 |
| 6 FT | 12 | 12 | 11 | 11 | 6 | 8 | 6 | 7.5 | 74.5 | 32.0 | 36.0 | 6 | 13 | 68.0 | 75.0 | 6 | 13 | 38.0 | 39.0 | 5 | 6 | 6 | 6 | 71.3 | 164 | 176 | 7 | 6.5 | 60.0 | 65.0 | 5 | 12 | 5 | 7.5 | 12 |
| 8 FT | 12 | 13 | 11 | 11 | 6 | 8 | 6 | 7 | 68.5 | 36.0 | 36.0 | 6 | 12 | 63.0 | 67.0 | 6 | 12 | 36.0 | 37.0 | 6 | 8 | 6 | 6.5 | 68.8 | 165 | 177 | 7 | 6.5 | 58.0 | 65.0 | 5 | 12 | 5 | 7.5 | 0 |
| 10 FT | 13 | 15 | 11 | 11 | 6 | 7.5 | 6 | 6.5 | 66.0 | 37.0 | 37.0 | 6 | 12 | 60.0 | 65.0 | 6 | 12 | 36.0 | 37.0 | 6 | 7.5 | 6 | 6 | 67.4 | 167 | 179 | 6 | 6 | 55.0 | 63.0 | 5 | 12 | 5 | 7.5 | 0 |
| 12 FT | 14 | 16 | 12 | 11 | 6 | 7.5 | 6 | 6.5 | 64.0 | 38.0 | 38.0 | 7 | 16 | 61.0 | 67.0 | 7 | 16 | 38.0 | 40.0 | 6 | 7 | 6 | 7 | 65.3 | 168 | 180 | 7 | 7 | 57.0 | 66.0 | 5 | 12 | 5 | 7 | 0 |
| 14 FT | 16 | 17 | 13 | 11 | 6 | 7.5 | 6 | 7 | 69.1 | 40.0 | 40.0 | 6 | 12 | 63.0 | 69.0 | 6 | 12 | 41.0 | 43.0 | 6 | 7 | 6 | 6.5 | 63.6 | 169 | 181 | 7 | 7 | 57.0 | 65.0 | 5 | 12 | 5 | 6.5 | 0 |
| 16 FT | 17 | 18 | 13 | 11 | 6 | 7 | 6 | 6.5 | 67.8 | 41.0 | 41.0 | 6 | 12 | 62.0 | 69.0 | 6 | 12 | 41.0 | 43.0 | 6 | 6 | 6 | 6.5 | 62.4 | 170 | 182 | 7 | 6.5 | 56.0 | 66.0 | 5 | 12 | 5 | 6.5 | 0 |
| 18 FT | 18 | 20 | 13 | 11 | 6 | 7 | 6 | 6 | 66.6 | 42.0 | 42.0 | 7 | 15 | 66.0 | 74.0 | 7 | 15 | 46.0 | 48.0 | 6 | 6 | 6 | 6 | 61.9 | 172 | 184 | 7 | 7 | 56.0 | 66.0 | 5 | 12 | 5 | 6.5 | 0 |
| 20 FT | 19 | 21 | 14 | 11 | 6 | 6.5 | 6 | 6 | 66.3 | 43.0 | 43.0 | 7 | 15 | 65.0 | 73.0 | 7 | 15 | 45.0 | 48.0 | 7 | 8 | 6 | 6.5 | 61.0 | 173 | 185 | 7 | 7 | 56.0 | 66.0 | 5 | 12 | 5 | 6 | 0 |
| 22 FT | 21 | 23 | 14 | 11 | 6 | 6 | 7 | 8 | 70.6 | 45.0 | 45.0 | 7 | 15 | 64.0 | 73.0 | 7 | 15 | 45.0 | 48.0 | 7 | 7 | 6 | 6 | 60.8 | 175 | 187 | 7 | 7 | 56.0 | 66.0 | 5 | 12 | 5 | 6 | 0 |
| 24 FT | 22 | 24 | 15 | 11 | 6 | 6 | 7 | 8 | 70.5 | 46.0 | 46.0 | 7 | 15 | 64.0 | 73.0 | 7 | 15 | 45.0 | 48.0 | 7 | 7 | 6 | 6.5 | 60.3 | 176 | 188 | 7 | 7 | 56.0 | 66.0 | 5 | 12 | 6 | 8 | 0 |
| 26 FT | 23 | 25 | 15 | 11 | 7 | 7.5 | 7 | 7.5 | 69.9 | 47.0 | 47.0 | 7 | 14 | 64.0 | 73.0 | 7 | 14 | 45.0 | 48.0 | 7 | 6.5 | 6 | 6 | 59.6 | 177 | 189 | 7 | 6.5 | 56.0 | 67.0 | 5 | 12 | 6 | 8 | 0 |
| 28 FT | 25 | 27 | 16 | 11 | 7 | 7 | 7 | 7.5 | 70.3 | 49.0 | 49.0 | 7 | 14 | 63.0 | 72.0 | 7 | 14 | 44.0 | 47.0 | 7 | 6.5 | 6 | 6.5 | 59.9 | 179 | 191 | 7 | 6 | 56.0 | 67.0 | 5 | 12 | 6 | 8 | 0 |
| 30 FT | 26 | 28 | 16 | 11 | 7 | 7 | 7 | 7 | 69.8 | 50.0 | 50.0 | 7 | 13 | 62.0 | 72.0 | 7 | 13 | 43.0 | 46.0 | 7 | 6 | 6 | 6 | 59.4 | 180 | 192 | 7 | 6 | 56.0 | 67.0 | 5 | 12 | 6 | 8 | 0 |
| 32 FT | 27 | 30 | 17 | 11 | 7 | 6.5 | 7 | 7.5 | 70.1 | 51.0 | 51.0 | 7 | 13 | 62.0 | 72.0 | 7 | 13 | 43.0 | 46.0 | 7 | 6 | 6 | 6.5 | 59.5 | 182 | 194 | 8 | 7.5 | 62.0 | 73.0 | 5 | 12 | 6 | 7.5 | 0 |
| 34 FT | 28 | 31 | 17 | 11 | 7 | 6 | 7 | 6.5 | 69.8 | 52.0 | 52.0 | 7 | 12 | 62.0 | 71.0 | 7 | 12 | 43.0 | 45.0 | 7 | 6 | 6 | 6.5 | 59.1 | 183 | 195 | 8 | 7 | 62.0 | 73.0 | 5 | 12 | 6 | 7.5 | 0 |
| 36 FT | 29 | 32 | 18 | 11 | 7 | 6 | 7 | 7 | 70.3 | 53.0 | 53.0 | 7 | 12 | 62.0 | 71.0 | 7 | 12 | 42.0 | 45.0 | 8 | 7.5 | 6 | 6.5 | 59.3 | 184 | 196 | 8 | 7 | 62.0 | 73.0 | 5 | 12 | 6 | 7 | 0 |
| 38 FT | 31 | 33 | 19 | 11 | 8 | 7.5 | 7 | 7.5 | 71.0 | 55.0 | 55.0 | 8 | 15 | 70.0 | 78.0 | 8 | 15 | 48.0 | 50.0 | 8 | 7.5 | 6 | 6.5 | 59.6 | 185 | 197 | 8 | 6.5 | 62.0 | 73.0 | 5 | 12 | 6 | 6.5 | 0 |
| 40 FT | 31 | 34 | 19 | 11 | 8 | 7 | 7 | 6.5 | 70.9 | 55.0 | 55.0 | 8 | 14 | 70.0 | 78.0 | 8 | 14 | 49.0 | 51.0 | 8 | 7 | 6 | 6.5 | 59.5 | 186 | 198 | 8 | 6.5 | 62.0 | 73.0 | 5 | 12 | 6 | 6.5 | 0 |
| 42 FT | 32 | 35 | 20 | 11 | 8 | 7 | 7 | 7 | 71.5 | 56.0 | 56.0 | 8 | 14 | 69.0 | 77.0 | 8 | 14 | 49.0 | 51.0 | 8 | 7 | 6 | 6 | 59.8 | 187 | 199 | 8 | 6.5 | 62.0 | 74.0 | 5 | 12 | 6 | 6.5 | 0 |
| 44 FT | 33 | 36 | 20 | 11 | 8 | 7 | 7 | 6.5 | 71.5 | 57.0 | 57.0 | 8 | 14 | 69.0 | 77.0 | 8 | 14 | 48.0 | 50.0 | 8 | 7 | 6 | 6 | 59.9 | 188 | 200 | 8 | 6 | 62.0 | 74.0 | 5 | 12 | 6 | 6.5 | 0 |
| 46 FT | 34 | 37 | 20 | 11 | 8 | 7 | 7 | 7 | 70.1 | 58.0 | 58.0 | 8 | 14 | 69.0 | 76.0 | 8 | 14 | 47.0 | 49.0 | 8 | 7 | 6 | 6 | 58.5 | 189 | 201 | 8 | 6 | 62.0 | 74.0 | 5 | 12 | 6 | 6.5 | 0 |
| 48 FT | 35 | 38 | 21 | 11 | 8 | 6.5 | 7 | 7 | 70.9 | 59.0 | 59.0 | 8 | 13 | 68.0 | 75.0 | 8 | 13 | 47.0 | 48.0 | 8 | 7 | 6 | 6 | 59.0 | 190 | 202 | 8 | 6 | 62.0 | 74.0 | 5 | 12 | 6 | 6 | 0 |
| 50 FT | 36 | 39 | 21 | 11 | 8 | 6.5 | 7 | 6.5 | 70.9 | 60.0 | 60.0 | 8 | 13 | 68.0 | 75.0 | 8 | 13 | 47.0 | 48.0 | 8 | 6.5 | 6 | 6 | 59.1 | 191 | 203 | 8 | 6 | 62.0 | 74.0 | 5 | 12 | 6 | 6 | 0 |

## SPAN (S) = 14 FT HEIGHT (HT) = 15 FT OR 16 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | H3 BARS | | | B1 BARS | | B2 BARS | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | K2 HT=15' | K2 HT=16' | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | K3 HT=15' | K3 HT=16' | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 14 | 11 | 12 | 13 | 5 | 6 | 5 | 6 | 72.6 | 34.0 | 34.0 | 5 | 12 | 136.5 | 101.5 | 5 | 12 | 38.0 | 41.0 | 5 | 6.5 | 6 | 6 | 103.4 | 187 | 199 | 6 | 6.5 | 62.0 | 63.0 | 5 | 11.5 | 5 | 7 | 12 |
| 2 FT | 15 | 12 | 12 | 13 | 6 | 8 | 6 | 8 | 75.6 | 35.0 | 39.0 | 6 | 16 | 143.5 | 108.5 | 6 | 16 | 45.0 | 48.0 | 5 | 6 | 6 | 6.5 | 99.0 | 188 | 200 | 6 | 6.5 | 61.0 | 63.0 | 5 | 12 | 5 | 7 | 12 |
| 4 FT | 12 | 12 | 12 | 13 | 6 | 8 | 6 | 7.5 | 75.6 | 36.0 | 36.0 | 6 | 15 | 138.5 | 89.0 | 6 | 15 | 40.0 | 41.0 | 5 | 6 | 6 | 6 | 90.1 | 188 | 200 | 6 | 6 | 60.0 | 63.0 | 5 | 12 | 5 | 7 | 12 |
| 6 FT | 12 | 13 | 12 | 13 | 6 | 8 | 6 | 7 | 89.3 | 36.0 | 36.0 | 6 | 14 | 69.0 | 71.0 | 6 | 14 | 38.0 | 39.0 | 5 | 6 | 6 | 6 | 86.4 | 189 | 201 | 6 | 6 | 58.0 | 63.0 | 5 | 12 | 5 | 6.5 | 12 |
| 8 FT | 12 | 14 | 13 | 13 | 6 | 8 | 6 | 6.5 | 78.1 | 36.0 | 36.0 | 6 | 12 | 64.0 | 66.0 | 6 | 12 | 37.0 | 37.0 | 6 | 8 | 6 | 6 | 81.9 | 190 | 202 | 6 | 6 | 57.0 | 62.0 | 5 | 12 | 5 | 6.5 | 0 |
| 10 FT | 13 | 15 | 13 | 13 | 6 | 8 | 6 | 6.5 | 75.1 | 37.0 | 37.0 | 6 | 12 | 61.0 | 64.0 | 6 | 12 | 37.0 | 37.0 | 6 | 7.5 | 6 | 6.5 | 79.1 | 191 | 203 | 7 | 7 | 59.0 | 65.0 | 5 | 12 | 5 | 6.5 | 0 |
| 12 FT | 14 | 16 | 14 | 13 | 6 | 7.5 | 6 | 6.5 | 72.9 | 38.0 | 38.0 | 6 | 12 | 59.0 | 63.0 | 6 | 12 | 36.0 | 37.0 | 6 | 7 | 6 | 6.5 | 75.6 | 192 | 204 | 7 | 7 | 58.0 | 65.0 | 5 | 12 | 5 | 6 | 0 |
| 14 FT | 15 | 17 | 15 | 13 | 6 | 7.5 | 6 | 6.5 | 77.6 | 39.0 | 39.0 | 7 | 16 | 69.0 | 73.0 | 7 | 16 | 47.0 | 48.0 | 6 | 7 | 6 | 6.5 | 73.6 | 193 | 205 | 7 | 7 | 58.0 | 65.0 | 5 | 12 | 6 | 8 | 0 |
| 16 FT | 17 | 19 | 15 | 13 | 6 | 7.5 | 6 | 6 | 77.6 | 41.0 | 41.0 | 6 | 12 | 63.0 | 68.0 | 6 | 12 | 42.0 | 44.0 | 6 | 6 | 6 | 6 | 73.5 | 195 | 207 | 6 | 6 | 55.0 | 63.0 | 5 | 12 | 6 | 8 | 0 |
| 18 FT | 18 | 20 | 15 | 13 | 6 | 7 | 7 | 7.5 | 81.8 | 42.0 | 48.0 | 7 | 16 | 67.0 | 73.0 | 7 | 16 | 46.0 | 49.0 | 6 | 6 | 7 | 7 | 75.6 | 196 | 208 | 7 | 7 | 57.0 | 66.0 | 5 | 12 | 6 | 8 | 0 |
| 20 FT | 19 | 21 | 16 | 13 | 6 | 6.5 | 7 | 7.5 | 81.1 | 43.0 | 49.0 | 7 | 15 | 66.0 | 73.0 | 7 | 15 | 46.0 | 49.0 | 7 | 7.5 | 7 | 7.5 | 74.8 | 197 | 209 | 7 | 7 | 57.0 | 66.0 | 5 | 12 | 6 | 8 | 0 |
| 22 FT | 20 | 23 | 17 | 13 | 6 | 6 | 7 | 7.5 | 80.8 | 44.0 | 50.0 | 7 | 15 | 65.0 | 73.0 | 7 | 15 | 46.0 | 49.0 | 7 | 7 | 7 | 7.5 | 74.6 | 199 | 211 | 7 | 7 | 57.0 | 66.0 | 5 | 12 | 6 | 7.5 | 0 |
| 24 FT | 22 | 24 | 17 | 13 | 6 | 6 | 7 | 7 | 80.8 | 46.0 | 52.0 | 7 | 15 | 65.0 | 73.0 | 7 | 15 | 46.0 | 49.0 | 7 | 7 | 7 | 7 | 74.1 | 200 | 212 | 7 | 7 | 57.0 | 66.0 | 5 | 12 | 6 | 7.5 | 0 |
| 26 FT | 23 | 25 | 18 | 13 | 7 | 7.5 | 7 | 7 | 80.5 | 47.0 | 53.0 | 7 | 15 | 65.0 | 72.0 | 7 | 15 | 46.0 | 49.0 | 7 | 6 | 7 | 7.5 | 73.6 | 201 | 213 | 7 | 6 | 57.0 | 67.0 | 5 | 12 | 6 | 7 | 0 |
| 28 FT | 24 | 27 | 19 | 13 | 7 | 7.5 | 7 | 7 | 80.5 | 48.0 | 54.0 | 7 | 14 | 64.0 | 72.0 | 7 | 14 | 45.0 | 48.0 | 7 | 6.5 | 7 | 8 | 73.8 | 203 | 215 | 7 | 6 | 57.0 | 67.0 | 5 | 12 | 6 | 6.5 | 0 |
| 30 FT | 25 | 28 | 20 | 13 | 7 | 6.5 | 7 | 7 | 80.6 | 49.0 | 55.0 | 7 | 13 | 64.0 | 72.0 | 7 | 13 | 45.0 | 48.0 | 7 | 6 | 7 | 8 | 73.5 | 204 | 216 | 7 | 6 | 57.0 | 67.0 | 5 | 12 | 6 | 6.5 | 0 |
| 32 FT | 27 | 30 | 21 | 13 | 7 | 6.5 | 7 | 7 | 81.1 | 51.0 | 51.0 | 7 | 13 | 63.0 | 71.0 | 7 | 13 | 43.0 | 46.0 | 7 | 6 | 6 | 6 | 70.8 | 206 | 218 | 8 | 7.5 | 63.0 | 73.0 | 5 | 12 | 6 | 6 | 0 |
| 34 FT | 28 | 31 | 21 | 13 | 7 | 6.5 | 7 | 7 | 80.9 | 52.0 | 52.0 | 7 | 12 | 63.0 | 71.0 | 7 | 12 | 43.0 | 46.0 | 7 | 6 | 6 | 6 | 70.4 | 207 | 219 | 8 | 7 | 63.0 | 73.0 | 5 | 12 | 6 | 6 | 0 |
| 36 FT | 29 | 32 | 22 | 13 | 7 | 6 | 7 | 7 | 81.1 | 59.0 | 59.0 | 7 | 12 | 63.0 | 71.0 | 7 | 12 | 43.0 | 45.0 | 8 | 7.5 | 7 | 7.5 | 73.3 | 208 | 220 | 8 | 7 | 63.0 | 73.0 | 5 | 12 | 6 | 6 | 0 |
| 38 FT | 30 | 33 | 22 | 13 | 7 | 6 | 7 | 6 | 81.1 | 60.0 | 60.0 | 7 | 12 | 63.0 | 71.0 | 7 | 12 | 42.0 | 45.0 | 8 | 7.5 | 7 | 7 | 73.4 | 209 | 221 | 8 | 6.5 | 63.0 | 74.0 | 5 | 12 | 6 | 6 | 0 |
| 40 FT | 31 | 34 | 23 | 13 | 8 | 7.5 | 7 | 6.5 | 81.8 | 61.0 | 61.0 | 8 | 15 | 70.0 | 78.0 | 8 | 15 | 50.0 | 52.0 | 8 | 7 | 7 | 7.5 | 73.5 | 210 | 222 | 8 | 6.5 | 63.0 | 74.0 | 5 | 12 | 7 | 7.5 | 0 |
| 42 FT | 32 | 35 | 24 | 13 | 8 | 7.5 | 7 | 6.5 | 82.3 | 62.0 | 62.0 | 8 | 14 | 70.0 | 78.0 | 8 | 14 | 49.0 | 51.0 | 8 | 6.5 | 7 | 7 | 73.8 | 211 | 223 | 8 | 6.5 | 63.0 | 74.0 | 5 | 12 | 7 | 7.5 | 0 |
| 44 FT | 33 | 36 | 24 | 13 | 8 | 7 | 7 | 6 | 82.4 | 63.0 | 63.0 | 8 | 14 | 70.0 | 77.0 | 8 | 14 | 49.0 | 50.0 | 8 | 6.5 | 7 | 7 | 73.9 | 212 | 224 | 8 | 6 | 63.0 | 74.0 | 5 | 12 | 7 | 7.5 | 0 |
| 46 FT | 34 | 38 | 26 | 13 | 8 | 7 | 7 | 6 | 83.8 | 64.0 | 64.0 | 8 | 14 | 70.0 | 76.0 | 8 | 14 | 48.0 | 49.0 | 8 | 7 | 7 | 7 | 74.6 | 214 | 226 | 8 | 6.5 | 63.0 | 74.0 | 5 | 12 | 7 | 7.5 | 0 |
| 48 FT | 35 | 38 | 26 | 13 | 8 | 6.5 | 7 | 6.5 | 82.1 | 65.0 | 65.0 | 8 | 13 | 69.0 | 76.0 | 8 | 13 | 48.0 | 49.0 | 8 | 6.5 | 7 | 7 | 72.6 | 214 | 226 | 8 | 6 | 63.0 | 74.0 | 5 | 12 | 7 | 8 | 0 |
| 50 FT | 35 | 39 | 26 | 13 | 8 | 6.5 | 7 | 6 | 82.1 | 65.0 | 65.0 | 8 | 13 | 69.0 | 76.0 | 8 | 13 | 48.0 | 50.0 | 8 | 6.5 | 7 | 6.5 | 72.8 | 215 | 227 | 8 | 6 | 63.0 | 74.0 | 5 | 12 | 7 | 7.5 | 0 |




BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ℄ CULVERT.

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

### GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.


MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 14 FEET
HEIGHT (HT): 13 THRU 16 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

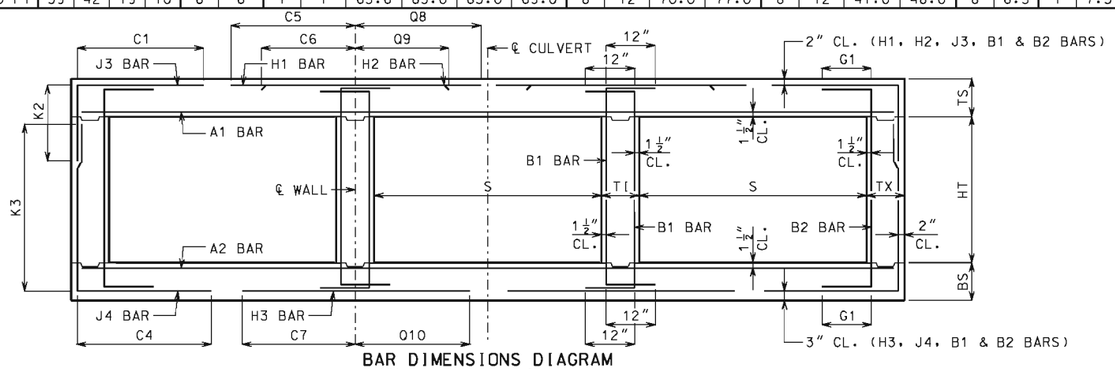
703.87

## SPAN (S) = 15 FT HEIGHT (HT) = 8 FT OR 9 FT OR 10 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | | | | | | | | | | K2 | | | | | | | | | | | | | | K3 | | | | | | | | | | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | HT=8′ | HT=9′ | HT=10′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | HT=8′ | HT=9′ | HT=10′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 15 | 10 | 8 | 8 | 6 | 8 | 5 | 8 | 72.9 | 35.0 | 35.0 | 35.0 | 6 | 16 | 146.5 | 111.5 | 6 | 16 | 48.0 | 53.0 | 5 | 7 | 7 | 6.5 | 69.0 | 102 | 114 | 126 | 6 | 6 | 61.0 | 65.0 | 5 | 12 | 5 | 12 | 12 |
| 2 FT | 15 | 11 | 9 | 8 | 6 | 7.5 | 5 | 8 | 73.5 | 35.0 | 35.0 | 35.0 | 6 | 16 | 146.5 | 111.5 | 6 | 16 | 49.0 | 53.0 | 5 | 6.5 | 6 | 7 | 60.4 | 103 | 115 | 127 | 6 | 6 | 59.0 | 65.0 | 5 | 12 | 5 | 12 | 12 |
| 4 FT | 12 | 11 | 9 | 8 | 6 | 6.5 | 6 | 7 | 60.8 | 32.0 | 36.0 | 36.0 | 6 | 12 | 84.0 | 109.0 | 6 | 12 | 40.0 | 43.0 | 5 | 6.5 | 6 | 6.5 | 53.9 | 103 | 115 | 127 | 7 | 6.5 | 61.0 | 68.0 | 5 | 11.5 | 5 | 12 | 12 |
| 6 FT | 12 | 12 | 9 | 8 | 6 | 7 | 6 | 6.5 | 53.5 | 32.0 | 32.0 | 36.0 | 7 | 16 | 72.0 | 86.0 | 7 | 16 | 41.0 | 43.0 | 6 | 8 | 6 | 7 | 49.9 | 104 | 116 | 128 | 7 | 6.5 | 60.0 | 68.0 | 5 | 12 | 5 | 12 | 12 |
| 8 FT | 13 | 14 | 9 | 8 | 6 | 7 | 6 | 7 | 49.5 | 33.0 | 33.0 | 33.0 | 7 | 15 | 67.0 | 77.0 | 7 | 15 | 39.0 | 42.0 | 6 | 8 | 5 | 6.5 | 43.4 | 106 | 118 | 130 | 7 | 7 | 58.0 | 69.0 | 5 | 12 | 5 | 12 | 0 |
| 10 FT | 14 | 15 | 9 | 8 | 6 | 7 | 6 | 7.5 | 46.6 | 34.0 | 34.0 | 34.0 | 7 | 15 | 64.0 | 73.0 | 7 | 15 | 39.0 | 41.0 | 6 | 7.5 | 5 | 6.5 | 41.5 | 107 | 119 | 131 | 7 | 6.5 | 58.0 | 69.0 | 5 | 12 | 5 | 12 | 0 |
| 12 FT | 15 | 16 | 9 | 8 | 6 | 6 | 6 | 7.5 | 50.4 | 35.0 | 35.0 | 35.0 | 7 | 14 | 70.0 | 80.0 | 7 | 14 | 46.0 | 49.0 | 6 | 6 | 5 | 6 | 40.0 | 108 | 120 | 132 | 7 | 6.5 | 57.0 | 69.0 | 5 | 12 | 5 | 11.5 | 0 |
| 14 FT | 17 | 18 | 9 | 8 | 6 | 6.5 | 6 | 7.5 | 48.4 | 37.0 | 37.0 | 37.0 | 7 | 15 | 68.0 | 79.0 | 7 | 15 | 46.0 | 49.0 | 6 | 6.5 | 5 | 6 | 38.9 | 110 | 122 | 134 | 7 | 6.5 | 57.0 | 69.0 | 5 | 12 | 5 | 9.5 | 0 |
| 16 FT | 18 | 19 | 9 | 8 | 6 | 6.5 | 6 | 7.5 | 47.1 | 38.0 | 38.0 | 42.0 | 7 | 14 | 67.0 | 79.0 | 7 | 14 | 45.0 | 49.0 | 6 | 6 | 6 | 8.5 | 41.0 | 111 | 123 | 135 | 7 | 6.5 | 57.0 | 69.0 | 5 | 12 | 5 | 8.5 | 0 |
| 18 FT | 19 | 21 | 10 | 8 | 6 | 6 | 6 | 7.5 | 47.8 | 39.0 | 39.0 | 39.0 | 7 | 14 | 66.0 | 78.0 | 7 | 14 | 45.0 | 49.0 | 7 | 8 | 5 | 6.5 | 37.9 | 113 | 125 | 137 | 7 | 6.5 | 57.0 | 70.0 | 5 | 12 | 5 | 9.5 | 0 |
| 20 FT | 21 | 22 | 10 | 8 | 6 | 6 | 6 | 7.5 | 46.6 | 41.0 | 41.0 | 41.0 | 7 | 14 | 66.0 | 78.0 | 7 | 14 | 45.0 | 49.0 | 7 | 7.5 | 5 | 6 | 37.5 | 114 | 126 | 138 | 7 | 6.5 | 56.0 | 70.0 | 5 | 12 | 5 | 8 | 0 |
| 22 FT | 23 | 24 | 10 | 8 | 7 | 7.5 | 6 | 7.5 | 46.0 | 43.0 | 43.0 | 43.0 | 7 | 14 | 65.0 | 77.0 | 7 | 14 | 45.0 | 49.0 | 7 | 7 | 5 | 6 | 37.3 | 116 | 128 | 140 | 7 | 6.5 | 56.0 | 70.0 | 5 | 12 | 5 | 8 | 0 |
| 24 FT | 24 | 25 | 11 | 8 | 7 | 7.5 | 6 | 8 | 46.5 | 44.0 | 44.0 | 44.0 | 7 | 13 | 64.0 | 77.0 | 7 | 13 | 45.0 | 49.0 | 7 | 6.5 | 5 | 6.5 | 37.5 | 117 | 129 | 141 | 7 | 6.5 | 56.0 | 70.0 | 5 | 12 | 5 | 7.5 | 0 |
| 26 FT | 25 | 27 | 11 | 8 | 7 | 7 | 6 | 7.5 | 46.4 | 45.0 | 45.0 | 45.0 | 7 | 13 | 64.0 | 77.0 | 7 | 13 | 44.0 | 48.0 | 7 | 6.5 | 5 | 6 | 37.1 | 119 | 131 | 143 | 7 | 6 | 56.0 | 70.0 | 5 | 12 | 5 | 7.5 | 0 |
| 28 FT | 27 | 28 | 11 | 8 | 7 | 6.5 | 6 | 7.5 | 45.8 | 47.0 | 47.0 | 47.0 | 7 | 13 | 64.0 | 76.0 | 7 | 13 | 44.0 | 48.0 | 7 | 6 | 5 | 6 | 37.1 | 120 | 132 | 144 | 7 | 6 | 56.0 | 70.0 | 5 | 12 | 5 | 7.5 | 0 |
| 30 FT | 28 | 30 | 12 | 8 | 7 | 6.5 | 6 | 7.5 | 46.8 | 52.0 | 52.0 | 52.0 | 7 | 12 | 63.0 | 76.0 | 7 | 12 | 43.0 | 47.0 | 8 | 7.5 | 6 | 8 | 40.4 | 122 | 134 | 146 | 8 | 7.5 | 62.0 | 76.0 | 5 | 12 | 5 | 7 | 0 |
| 32 FT | 30 | 31 | 12 | 8 | 7 | 6 | 6 | 7.5 | 46.3 | 54.0 | 54.0 | 54.0 | 7 | 12 | 63.0 | 75.0 | 7 | 12 | 42.0 | 45.0 | 8 | 7.5 | 6 | 7.5 | 40.5 | 123 | 135 | 147 | 8 | 7 | 62.0 | 76.0 | 5 | 12 | 5 | 7 | 0 |
| 34 FT | 31 | 32 | 12 | 8 | 8 | 7.5 | 6 | 7.5 | 46.1 | 55.0 | 55.0 | 55.0 | 8 | 15 | 71.0 | 83.0 | 8 | 15 | 50.0 | 53.0 | 8 | 6.5 | 6 | 7.5 | 40.3 | 124 | 136 | 148 | 8 | 6.5 | 62.0 | 76.0 | 5 | 12 | 5 | 7 | 0 |
| 36 FT | 32 | 34 | 12 | 8 | 8 | 7.5 | 6 | 7 | 46.1 | 56.0 | 56.0 | 56.0 | 8 | 14 | 71.0 | 82.0 | 8 | 14 | 49.0 | 52.0 | 8 | 7 | 6 | 7 | 40.3 | 126 | 138 | 150 | 8 | 6.5 | 62.0 | 76.0 | 5 | 12 | 5 | 7 | 0 |
| 38 FT | 33 | 35 | 13 | 8 | 8 | 7 | 6 | 7 | 47.0 | 57.0 | 57.0 | 57.0 | 8 | 14 | 71.0 | 82.0 | 8 | 14 | 49.0 | 51.0 | 8 | 7 | 6 | 6.5 | 40.8 | 127 | 139 | 151 | 8 | 6.5 | 62.0 | 76.0 | 5 | 12 | 5 | 6.5 | 0 |
| 40 FT | 34 | 36 | 13 | 8 | 8 | 7 | 6 | 6.5 | 46.9 | 58.0 | 58.0 | 58.0 | 8 | 14 | 70.0 | 81.0 | 8 | 14 | 49.0 | 51.0 | 8 | 6.5 | 6 | 6.5 | 40.8 | 128 | 140 | 152 | 8 | 6 | 62.0 | 76.0 | 5 | 12 | 5 | 6.5 | 0 |
| 42 FT | 35 | 37 | 13 | 8 | 8 | 6.5 | 6 | 6.5 | 46.9 | 59.0 | 59.0 | 59.0 | 8 | 13 | 70.0 | 81.0 | 8 | 13 | 48.0 | 50.0 | 8 | 6 | 6 | 6.5 | 40.9 | 129 | 141 | 153 | 8 | 6 | 62.0 | 76.0 | 5 | 12 | 5 | 6.5 | 0 |
| 44 FT | 36 | 38 | 13 | 8 | 8 | 6.5 | 6 | 6.5 | 46.9 | 60.0 | 60.0 | 60.0 | 8 | 13 | 70.0 | 80.0 | 8 | 13 | 48.0 | 49.0 | 8 | 6 | 6 | 6 | 41.0 | 130 | 142 | 154 | 8 | 6 | 62.0 | 76.0 | 5 | 12 | 5 | 6 | 0 |
| 46 FT | 37 | 39 | 13 | 8 | 8 | 6.5 | 6 | 6 | 46.9 | 61.0 | 61.0 | 61.0 | 8 | 12 | 70.0 | 79.0 | 8 | 12 | 47.0 | 49.0 | 8 | 6 | 6 | 6 | 41.1 | 131 | 143 | 155 | 8 | 6 | 62.0 | 76.0 | 5 | 12 | 6 | 8 | 0 |
| 48 FT | 38 | 41 | 13 | 8 | 8 | 6 | 6 | 6 | 46.1 | 62.0 | 62.0 | 62.0 | 8 | 12 | 69.0 | 78.0 | 8 | 12 | 46.0 | 48.0 | 8 | 6.5 | 7 | 7 | 43.3 | 133 | 145 | 157 | 9 | 7.5 | 68.0 | 82.0 | 5 | 12 | 6 | 8 | 0 |
| 50 FT | 39 | 42 | 14 | 8 | 8 | 6 | 6 | 6 | 47.1 | 63.0 | 63.0 | 63.0 | 8 | 12 | 69.0 | 77.0 | 8 | 12 | 46.0 | 47.0 | 8 | 6.5 | 7 | 7.5 | 43.9 | 134 | 146 | 158 | 9 | 7 | 68.0 | 82.0 | 5 | 12 | 5 | 6 | 0 |

## SPAN (S) = 15 FT HEIGHT (HT) = 11 FT OR 12 FT OR 13 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | | | | | | | | | | K2 | | | | | | | | | | | | | | K3 | | | | | | | | | | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | HT=11′ | HT=12′ | HT=13′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | HT=11′ | HT=12′ | HT=13′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 15 | 11 | 9 | 10 | 6 | 8 | 5 | 6.5 | 73.9 | 35.0 | 35.0 | 35.0 | 6 | 16 | 147.5 | 112.5 | 6 | 16 | 48.0 | 52.0 | 5 | 6.5 | 6 | 6 | 89.3 | 139 | 151 | 163 | 6 | 6.5 | 63.0 | 67.0 | 5 | 12 | 5 | 8.5 | 12 |
| 2 FT | 15 | 11 | 10 | 10 | 6 | 7.5 | 5 | 6.5 | 74.5 | 35.0 | 35.0 | 35.0 | 6 | 16 | 147.5 | 112.5 | 6 | 16 | 49.0 | 53.0 | 5 | 6.5 | 6 | 6 | 77.1 | 139 | 151 | 163 | 6 | 6 | 61.0 | 65.0 | 5 | 12 | 5 | 8 | 12 |
| 4 FT | 12 | 12 | 10 | 10 | 6 | 7 | 6 | 7.5 | 77.5 | 32.0 | 36.0 | 36.0 | 6 | 13 | 89.0 | 107.0 | 6 | 13 | 41.0 | 43.0 | 5 | 6 | 6 | 6.5 | 71.3 | 140 | 152 | 164 | 6 | 6 | 60.0 | 67.0 | 5 | 10 | 5 | 8 | 12 |
| 6 FT | 12 | 12 | 10 | 10 | 6 | 7 | 6 | 7 | 67.9 | 32.0 | 36.0 | 36.0 | 7 | 16 | 74.0 | 83.0 | 7 | 16 | 41.0 | 43.0 | 6 | 8 | 6 | 6 | 65.1 | 140 | 152 | 164 | 7 | 6 | 61.0 | 68.0 | 5 | 12 | 5 | 8 | 12 |
| 8 FT | 13 | 14 | 10 | 10 | 6 | 7.5 | 6 | 6.5 | 63.0 | 33.0 | 37.0 | 37.0 | 7 | 16 | 69.0 | 75.0 | 7 | 16 | 40.0 | 42.0 | 6 | 7.5 | 6 | 6 | 62.3 | 142 | 154 | 166 | 7 | 6.5 | 60.0 | 69.0 | 5 | 12 | 5 | 8 | 0 |
| 10 FT | 14 | 15 | 10 | 10 | 6 | 7 | 6 | 6.5 | 59.4 | 34.0 | 38.0 | 38.0 | 7 | 15 | 66.0 | 73.0 | 7 | 15 | 40.0 | 42.0 | 6 | 7 | 7 | 6.5 | 62.4 | 143 | 155 | 167 | 7 | 6.5 | 59.0 | 69.0 | 5 | 12 | 5 | 8 | 0 |
| 12 FT | 15 | 17 | 11 | 10 | 6 | 7 | 6 | 6.5 | 63.5 | 35.0 | 35.0 | 39.0 | 7 | 14 | 71.0 | 79.0 | 7 | 14 | 47.0 | 49.0 | 6 | 7 | 7 | 6 | 57.5 | 145 | 157 | 169 | 7 | 7 | 59.0 | 69.0 | 5 | 12 | 5 | 7.5 | 0 |
| 14 FT | 17 | 18 | 12 | 10 | 6 | 7 | 6 | 6.5 | 62.4 | 37.0 | 41.0 | 41.0 | 7 | 15 | 70.0 | 78.0 | 7 | 15 | 47.0 | 49.0 | 6 | 6.5 | 6 | 7 | 56.4 | 146 | 158 | 170 | 7 | 6.5 | 58.0 | 69.0 | 5 | 12 | 5 | 7 | 0 |
| 16 FT | 18 | 19 | 12 | 10 | 6 | 6.5 | 6 | 6.5 | 61.1 | 38.0 | 42.0 | 42.0 | 7 | 14 | 68.0 | 78.0 | 7 | 14 | 46.0 | 49.0 | 6 | 6 | 6 | 7 | 55.4 | 147 | 159 | 171 | 7 | 6.5 | 58.0 | 69.0 | 5 | 12 | 5 | 7 | 0 |
| 18 FT | 19 | 21 | 12 | 10 | 6 | 6 | 6 | 6 | 60.4 | 39.0 | 43.0 | 43.0 | 7 | 14 | 68.0 | 77.0 | 7 | 14 | 46.0 | 49.0 | 7 | 8 | 6 | 6 | 54.6 | 149 | 161 | 173 | 7 | 6.5 | 58.0 | 70.0 | 5 | 12 | 5 | 7 | 0 |
| 20 FT | 21 | 22 | 13 | 10 | 6 | 6 | 6 | 6 | 60.3 | 41.0 | 45.0 | 45.0 | 7 | 14 | 67.0 | 77.0 | 7 | 14 | 46.0 | 49.0 | 7 | 7 | 6 | 6.5 | 54.5 | 150 | 162 | 174 | 7 | 6.5 | 58.0 | 70.0 | 5 | 12 | 5 | 6.5 | 0 |
| 22 FT | 22 | 24 | 13 | 10 | 6 | 6 | 6 | 6 | 59.6 | 42.0 | 46.0 | 46.0 | 7 | 14 | 66.0 | 77.0 | 7 | 14 | 46.0 | 49.0 | 7 | 7 | 6 | 6.5 | 54.0 | 152 | 164 | 176 | 7 | 6.5 | 58.0 | 70.0 | 5 | 12 | 5 | 6.5 | 0 |
| 24 FT | 24 | 25 | 14 | 10 | 7 | 7.5 | 6 | 6 | 59.8 | 44.0 | 48.0 | 48.0 | 7 | 14 | 66.0 | 77.0 | 7 | 14 | 45.0 | 49.0 | 7 | 6.5 | 6 | 7 | 54.1 | 153 | 165 | 177 | 7 | 6.5 | 58.0 | 70.0 | 5 | 12 | 5 | 6 | 0 |
| 26 FT | 25 | 27 | 14 | 10 | 7 | 7 | 6 | 6 | 59.5 | 45.0 | 49.0 | 49.0 | 7 | 13 | 65.0 | 76.0 | 7 | 13 | 45.0 | 49.0 | 7 | 6.5 | 6 | 7 | 53.8 | 155 | 167 | 179 | 7 | 6 | 58.0 | 70.0 | 5 | 12 | 5 | 6 | 0 |
| 28 FT | 26 | 28 | 15 | 10 | 7 | 6.5 | 6 | 6 | 59.9 | 50.0 | 50.0 | 50.0 | 7 | 13 | 65.0 | 76.0 | 7 | 13 | 45.0 | 49.0 | 7 | 6 | 6 | 7 | 53.9 | 156 | 168 | 180 | 7 | 6 | 58.0 | 70.0 | 5 | 12 | 6 | 8 | 0 |
| 30 FT | 28 | 30 | 15 | 10 | 7 | 6.5 | 7 | 8 | 64.5 | 52.0 | 52.0 | 52.0 | 7 | 12 | 64.0 | 76.0 | 7 | 12 | 44.0 | 47.0 | 8 | 7.5 | 6 | 7 | 53.8 | 158 | 170 | 182 | 8 | 7.5 | 64.0 | 76.0 | 5 | 12 | 6 | 8 | 0 |
| 32 FT | 29 | 31 | 15 | 10 | 7 | 6 | 7 | 7 | 64.3 | 53.0 | 53.0 | 53.0 | 7 | 12 | 64.0 | 75.0 | 7 | 12 | 44.0 | 47.0 | 8 | 7.5 | 6 | 6.5 | 53.5 | 159 | 171 | 183 | 8 | 7 | 64.0 | 76.0 | 5 | 12 | 6 | 8 | 0 |
| 34 FT | 31 | 32 | 16 | 10 | 8 | 7.5 | 6 | 6 | 59.6 | 55.0 | 55.0 | 55.0 | 8 | 15 | 72.0 | 83.0 | 8 | 15 | 50.0 | 53.0 | 8 | 6.5 | 6 | 7 | 53.8 | 160 | 172 | 184 | 8 | 6.5 | 64.0 | 76.0 | 5 | 12 | 6 | 8 | 0 |
| 36 FT | 32 | 34 | 16 | 10 | 8 | 7.5 | 7 | 7 | 64.5 | 56.0 | 56.0 | 56.0 | 8 | 14 | 72.0 | 82.0 | 8 | 14 | 50.0 | 52.0 | 8 | 7 | 6 | 7 | 53.8 | 162 | 174 | 186 | 8 | 6.5 | 63.0 | 77.0 | 5 | 12 | 6 | 8 | 0 |
| 38 FT | 33 | 35 | 17 | 10 | 8 | 7 | 7 | 7.5 | 65.1 | 57.0 | 57.0 | 57.0 | 8 | 14 | 71.0 | 82.0 | 8 | 14 | 49.0 | 52.0 | 8 | 7 | 6 | 6.5 | 54.0 | 163 | 175 | 187 | 8 | 6.5 | 63.0 | 77.0 | 5 | 12 | 6 | 7.5 | 0 |
| 40 FT | 34 | 36 | 17 | 10 | 8 | 7 | 7 | 7 | 65.1 | 58.0 | 58.0 | 58.0 | 8 | 14 | 71.0 | 81.0 | 8 | 14 | 49.0 | 51.0 | 8 | 6.5 | 6 | 6.5 | 54.0 | 164 | 176 | 188 | 8 | 6 | 63.0 | 77.0 | 5 | 12 | 6 | 7.5 | 0 |
| 42 FT | 35 | 37 | 18 | 10 | 8 | 6.5 | 7 | 7.5 | 65.9 | 59.0 | 59.0 | 59.0 | 8 | 13 | 71.0 | 80.0 | 8 | 13 | 49.0 | 50.0 | 8 | 6 | 6 | 6.5 | 54.4 | 165 | 177 | 189 | 8 | 6 | 64.0 | 77.0 | 5 | 12 | 6 | 7 | 0 |
| 44 FT | 36 | 39 | 18 | 10 | 8 | 6.5 | 7 | 7 | 66.0 | 60.0 | 60.0 | 60.0 | 8 | 13 | 71.0 | 80.0 | 8 | 13 | 48.0 | 50.0 | 8 | 6.5 | 6 | 6 | 54.6 | 167 | 179 | 191 | 8 | 6 | 63.0 | 77.0 | 5 | 12 | 6 | 7 | 0 |
| 46 FT | 37 | 40 | 19 | 10 | 8 | 6.5 | 7 | 7.5 | 66.8 | 61.0 | 61.0 | 61.0 | 8 | 12 | 70.0 | 79.0 | 8 | 12 | 48.0 | 49.0 | 8 | 6.5 | 6 | 6 | 55.0 | 168 | 180 | 192 | 9 | 7.5 | 70.0 | 83.0 | 5 | 12 | 6 | 6.5 | 0 |
| 48 FT | 38 | 41 | 19 | 10 | 8 | 6 | 7 | 6.5 | 66.8 | 62.0 | 62.0 | 68.0 | 8 | 12 | 70.0 | 78.0 | 8 | 12 | 47.0 | 48.0 | 8 | 6.5 | 7 | 8 | 58.1 | 169 | 181 | 193 | 9 | 7 | 70.0 | 83.0 | 5 | 12 | 6 | 6.5 | 0 |
| 50 FT | 39 | 42 | 19 | 10 | 8 | 6 | 7 | 7 | 65.6 | 63.0 | 63.0 | 69.0 | 8 | 12 | 70.0 | 77.0 | 8 | 12 | 47.0 | 48.0 | 8 | 6.5 | 7 | 7.5 | 57.0 | 170 | 182 | 194 | 9 | 7 | 69.0 | 83.0 | 5 | 12 | 6 | 6.5 | 0 |




BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ℄ CULVERT.

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

### GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.


MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

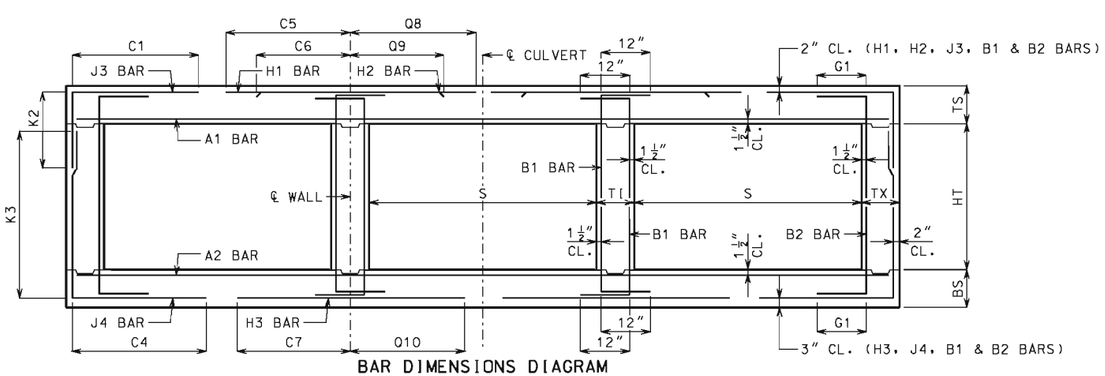
SPAN (S): 15 FEET
HEIGHT (HT): 8 THRU 13 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

703.87

## SPAN (S) = 15 FT HEIGHT (HT) = 14 FT OR 15 FT OR 16 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | K2 HT=14' | K2 HT=15' | K2 HT=16' | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | K3 HT=14' | K3 HT=15' | K3 HT=16' | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 15 | 11 | 12 | 13 | 6 | 8 | 6 | 8 | 79.3 | 35.0 | 35.0 | 39.0 | 6 | 16 | 152.5 | 114.5 | 6 | 16 | 48.0 | 51.0 | 5 | 6.5 | 6 | 6 | 99.0 | 175 | 187 | 199 | 6 | 6 | 64.0 | 65.0 | 5 | 11.5 | 5 | 7 | 12 |
| 2 FT | 15 | 12 | 12 | 13 | 6 | 8 | 6 | 8 | 79.3 | 35.0 | 35.0 | 39.0 | 6 | 16 | 152.5 | 114.5 | 6 | 16 | 49.0 | 52.0 | 5 | 6 | 6 | 6.5 | 95.5 | 176 | 188 | 200 | 6 | 6 | 63.0 | 66.0 | 5 | 11.5 | 5 | 7 | 12 |
| 4 FT | 12 | 12 | 12 | 13 | 6 | 7 | 6 | 7 | 111.5 | 36.0 | 36.0 | 36.0 | 6 | 13 | 99.0 | 91.0 | 6 | 13 | 41.0 | 42.0 | 5 | 6 | 6 | 6 | 88.6 | 176 | 188 | 200 | 7 | 6.5 | 65.0 | 69.0 | 5 | 9.5 | 5 | 7 | 12 |
| 6 FT | 12 | 13 | 12 | 13 | 6 | 7.5 | 6 | 6.5 | 85.6 | 36.0 | 36.0 | 36.0 | 6 | 12 | 71.0 | 73.0 | 6 | 12 | 40.0 | 40.0 | 6 | 8 | 6 | 6 | 84.0 | 177 | 189 | 201 | 7 | 6.5 | 64.0 | 69.0 | 5 | 12 | 5 | 6.5 | 12 |
| 8 FT | 13 | 14 | 13 | 13 | 6 | 7.5 | 6 | 7 | 77.4 | 37.0 | 37.0 | 37.0 | 6 | 12 | 67.0 | 70.0 | 6 | 12 | 38.0 | 39.0 | 6 | 7.5 | 6 | 6 | 78.1 | 178 | 190 | 202 | 7 | 6.5 | 62.0 | 68.0 | 5 | 12 | 5 | 6.5 | 0 |
| 10 FT | 14 | 16 | 13 | 13 | 6 | 7.5 | 6 | 6 | 75.0 | 38.0 | 38.0 | 38.0 | 7 | 15 | 67.0 | 71.0 | 7 | 15 | 41.0 | 42.0 | 6 | 7 | 6 | 6 | 77.0 | 180 | 192 | 204 | 7 | 7 | 61.0 | 69.0 | 5 | 12 | 5 | 6.5 | 0 |
| 12 FT | 15 | 17 | 14 | 13 | 6 | 7 | 6 | 6 | 78.9 | 39.0 | 39.0 | 39.0 | 7 | 15 | 73.0 | 78.0 | 7 | 15 | 48.0 | 50.0 | 6 | 7 | 6 | 6.5 | 74.8 | 181 | 193 | 205 | 7 | 6.5 | 60.0 | 69.0 | 5 | 12 | 5 | 6 | 0 |
| 14 FT | 16 | 18 | 15 | 13 | 6 | 7 | 6 | 6 | 77.5 | 40.0 | 40.0 | 40.0 | 7 | 14 | 71.0 | 77.0 | 7 | 14 | 48.0 | 49.0 | 6 | 6.5 | 6 | 6.5 | 73.0 | 182 | 194 | 206 | 7 | 6.5 | 60.0 | 69.0 | 5 | 12 | 6 | 8 | 0 |
| 16 FT | 18 | 20 | 15 | 13 | 6 | 7 | 7 | 8 | 81.9 | 42.0 | 42.0 | 42.0 | 7 | 15 | 70.0 | 77.0 | 7 | 15 | 48.0 | 50.0 | 6 | 6 | 6 | 6 | 72.4 | 184 | 196 | 208 | 7 | 7 | 60.0 | 69.0 | 5 | 12 | 6 | 8 | 0 |
| 18 FT | 19 | 21 | 15 | 13 | 6 | 6.5 | 7 | 7 | 80.8 | 43.0 | 43.0 | 49.0 | 7 | 14 | 69.0 | 77.0 | 7 | 14 | 48.0 | 50.0 | 7 | 8 | 7 | 7 | 74.4 | 185 | 197 | 209 | 7 | 6.5 | 60.0 | 69.0 | 5 | 12 | 6 | 8 | 0 |
| 20 FT | 20 | 23 | 16 | 13 | 6 | 6 | 7 | 7 | 80.3 | 44.0 | 44.0 | 50.0 | 7 | 14 | 69.0 | 76.0 | 7 | 14 | 47.0 | 50.0 | 7 | 7 | 7 | 7.5 | 74.0 | 187 | 199 | 211 | 7 | 7 | 59.0 | 70.0 | 5 | 12 | 6 | 8 | 0 |
| 22 FT | 22 | 24 | 17 | 13 | 6 | 6 | 7 | 7.5 | 80.1 | 46.0 | 46.0 | 52.0 | 7 | 14 | 68.0 | 76.0 | 7 | 14 | 47.0 | 50.0 | 7 | 7 | 7 | 7.5 | 73.3 | 188 | 200 | 212 | 7 | 6.5 | 59.0 | 70.0 | 5 | 12 | 6 | 7.5 | 0 |
| 24 FT | 23 | 25 | 17 | 13 | 7 | 7.5 | 7 | 7 | 79.4 | 47.0 | 47.0 | 53.0 | 7 | 14 | 67.0 | 76.0 | 7 | 14 | 47.0 | 50.0 | 7 | 6 | 7 | 7 | 72.5 | 189 | 201 | 213 | 7 | 6 | 59.0 | 70.0 | 5 | 12 | 6 | 7.5 | 0 |
| 26 FT | 25 | 27 | 18 | 13 | 7 | 7 | 7 | 7 | 79.6 | 49.0 | 49.0 | 55.0 | 7 | 14 | 67.0 | 76.0 | 7 | 14 | 47.0 | 50.0 | 7 | 6.5 | 7 | 7.5 | 72.5 | 191 | 203 | 215 | 7 | 6 | 59.0 | 70.0 | 5 | 12 | 6 | 7 | 0 |
| 28 FT | 26 | 29 | 19 | 13 | 7 | 7 | 7 | 7 | 79.6 | 50.0 | 50.0 | 50.0 | 7 | 13 | 66.0 | 76.0 | 7 | 13 | 46.0 | 50.0 | 7 | 6 | 6 | 6 | 69.5 | 193 | 205 | 217 | 8 | 7.5 | 65.0 | 76.0 | 5 | 12 | 6 | 6.5 | 0 |
| 30 FT | 27 | 30 | 19 | 13 | 7 | 6.5 | 7 | 6.5 | 79.3 | 51.0 | 51.0 | 57.0 | 7 | 13 | 66.0 | 76.0 | 7 | 13 | 46.0 | 49.0 | 8 | 7.5 | 7 | 7.5 | 72.1 | 194 | 206 | 218 | 8 | 7.5 | 65.0 | 77.0 | 5 | 12 | 6 | 6.5 | 0 |
| 32 FT | 29 | 31 | 20 | 13 | 7 | 6 | 7 | 7 | 79.5 | 53.0 | 53.0 | 59.0 | 7 | 12 | 65.0 | 75.0 | 7 | 12 | 44.0 | 47.0 | 8 | 7 | 7 | 8 | 71.9 | 195 | 207 | 219 | 8 | 7 | 65.0 | 77.0 | 5 | 12 | 6 | 6.5 | 0 |
| 34 FT | 30 | 33 | 21 | 13 | 7 | 6 | 7 | 7 | 79.9 | 54.0 | 54.0 | 54.0 | 7 | 12 | 65.0 | 75.0 | 7 | 12 | 44.0 | 47.0 | 8 | 7 | 6 | 6 | 69.0 | 197 | 209 | 221 | 8 | 6.5 | 65.0 | 77.0 | 5 | 12 | 6 | 6 | 0 |
| 36 FT | 31 | 34 | 22 | 13 | 8 | 7.5 | 7 | 6.5 | 80.1 | 55.0 | 61.0 | 61.0 | 8 | 15 | 73.0 | 82.0 | 8 | 15 | 52.0 | 55.0 | 8 | 7 | 7 | 7.5 | 71.9 | 198 | 210 | 222 | 8 | 6.5 | 65.0 | 77.0 | 5 | 12 | 6 | 6 | 0 |
| 38 FT | 32 | 35 | 22 | 13 | 8 | 7 | 7 | 6 | 79.8 | 56.0 | 62.0 | 62.0 | 8 | 14 | 73.0 | 82.0 | 8 | 14 | 52.0 | 54.0 | 8 | 6.5 | 7 | 7.5 | 71.6 | 199 | 211 | 223 | 8 | 6.5 | 65.0 | 77.0 | 5 | 12 | 6 | 6 | 0 |
| 40 FT | 33 | 36 | 23 | 13 | 8 | 6.5 | 7 | 6.5 | 80.4 | 57.0 | 63.0 | 63.0 | 8 | 13 | 73.0 | 82.0 | 8 | 13 | 51.0 | 54.0 | 8 | 6 | 7 | 7.5 | 71.8 | 200 | 212 | 224 | 8 | 6 | 65.0 | 77.0 | 5 | 12 | 7 | 7.5 | 0 |
| 42 FT | 34 | 38 | 24 | 13 | 8 | 6.5 | 7 | 6.5 | 81.1 | 58.0 | 64.0 | 64.0 | 8 | 13 | 72.0 | 81.0 | 8 | 13 | 51.0 | 53.0 | 8 | 6.5 | 7 | 7 | 72.4 | 202 | 214 | 226 | 8 | 6 | 65.0 | 78.0 | 5 | 12 | 7 | 7.5 | 0 |
| 44 FT | 35 | 39 | 25 | 13 | 8 | 6.5 | 7 | 6.5 | 81.9 | 59.0 | 65.0 | 65.0 | 8 | 13 | 72.0 | 81.0 | 8 | 13 | 50.0 | 52.0 | 8 | 6.5 | 7 | 7 | 72.5 | 203 | 215 | 227 | 8 | 6 | 65.0 | 78.0 | 5 | 12 | 7 | 7.5 | 0 |
| 46 FT | 36 | 40 | 26 | 13 | 8 | 6.5 | 7 | 6.5 | 82.5 | 60.0 | 66.0 | 66.0 | 8 | 13 | 72.0 | 80.0 | 8 | 13 | 50.0 | 52.0 | 8 | 6.5 | 7 | 7 | 72.9 | 204 | 216 | 228 | 9 | 7.5 | 71.0 | 84.0 | 5 | 12 | 7 | 8 | 0 |
| 48 FT | 37 | 41 | 27 | 13 | 8 | 6.5 | 7 | 6 | 83.3 | 67.0 | 67.0 | 67.0 | 8 | 12 | 72.0 | 79.0 | 8 | 12 | 49.0 | 51.0 | 8 | 6.5 | 7 | 7 | 73.1 | 205 | 217 | 229 | 9 | 7 | 71.0 | 84.0 | 5 | 12 | 7 | 8 | 0 |
| 50 FT | 38 | 42 | 27 | 13 | 8 | 6 | 7 | 6.5 | 81.8 | 68.0 | 68.0 | 68.0 | 8 | 12 | 71.0 | 79.0 | 8 | 12 | 49.0 | 50.0 | 8 | 6 | 7 | 7 | 71.4 | 206 | 218 | 230 | 9 | 7 | 71.0 | 84.0 | 5 | 12 | 6 | 6 | 0 |




BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ℄ CULVERT.

### GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 15 FEET
HEIGHT (HT): 14 THRU 16 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

703.87



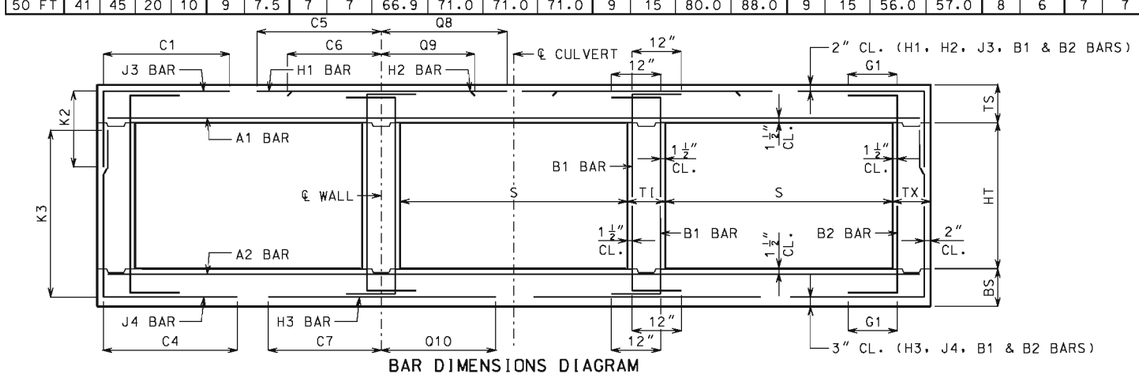

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

## SPAN (S) = 16 FT HEIGHT (HT) = 8 FT OR 9 FT OR 10 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | | | | | | | | | | K2 | | | | | | | | | | | | | | K3 | | | | | | | | | | | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | HT=8′ | HT=9′ | HT=10′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | HT=8′ | HT=9′ | HT=10′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 15 | 10 | 9 | 8 | 6 | 7.5 | 5 | 8 | 77.1 | 35.0 | 35.0 | 35.0 | 6 | 16 | 154.5 | 117.5 | 6 | 16 | 52.0 | 57.0 | 5 | 7 | 6 | 6 | 64.6 | 102 | 114 | 126 | 7 | 6.5 | 66.0 | 71.0 | 5 | 12 | 5 | 12 | 12 |
| 2 FT | 16 | 11 | 9 | 8 | 6 | 7 | 5 | 8 | 77.1 | 36.0 | 36.0 | 36.0 | 6 | 14 | 154.5 | 117.5 | 6 | 14 | 48.0 | 53.0 | 5 | 6.5 | 6 | 6.5 | 59.3 | 103 | 115 | 127 | 7 | 7 | 65.0 | 71.0 | 5 | 12 | 5 | 12 | 12 |
| 4 FT | 13 | 11 | 9 | 8 | 6 | 6.5 | 5 | 6 | 55.9 | 33.0 | 33.0 | 33.0 | 6 | 12 | 87.0 | 115.0 | 6 | 12 | 42.0 | 45.0 | 6 | 8 | 6 | 6 | 54.0 | 103 | 115 | 127 | 7 | 6 | 64.0 | 71.0 | 5 | 12 | 5 | 12 | 12 |
| 6 FT | 13 | 12 | 10 | 8 | 6 | 7 | 5 | 6 | 51.4 | 33.0 | 33.0 | 33.0 | 7 | 15 | 75.0 | 91.0 | 7 | 15 | 42.0 | 45.0 | 6 | 7 | 6 | 6.5 | 51.4 | 104 | 116 | 128 | 7 | 6 | 62.0 | 70.0 | 5 | 12 | 5 | 12 | 12 |
| 8 FT | 14 | 14 | 10 | 8 | 6 | 7 | 5 | 6 | 47.3 | 34.0 | 34.0 | 34.0 | 7 | 15 | 70.0 | 81.0 | 7 | 15 | 41.0 | 43.0 | 6 | 7.5 | 5 | 6.5 | 44.5 | 106 | 118 | 130 | 7 | 6 | 61.0 | 71.0 | 5 | 12 | 5 | 12 | 0 |
| 10 FT | 15 | 16 | 10 | 8 | 6 | 6.5 | 6 | 8 | 53.6 | 35.0 | 35.0 | 35.0 | 7 | 14 | 75.0 | 85.0 | 7 | 14 | 48.0 | 51.0 | 6 | 7 | 5 | 7 | 41.6 | 108 | 120 | 132 | 7 | 6.5 | 60.0 | 72.0 | 5 | 12 | 5 | 12 | 0 |
| 12 FT | 16 | 17 | 10 | 8 | 6 | 6.5 | 6 | 8 | 51.3 | 36.0 | 36.0 | 36.0 | 7 | 13 | 73.0 | 83.0 | 7 | 13 | 47.0 | 50.0 | 6 | 6.5 | 5 | 6.5 | 40.1 | 109 | 121 | 133 | 7 | 6 | 60.0 | 72.0 | 5 | 12 | 5 | 12 | 0 |
| 14 FT | 18 | 19 | 10 | 8 | 6 | 6 | 6 | 8 | 49.0 | 38.0 | 38.0 | 38.0 | 7 | 14 | 71.0 | 83.0 | 7 | 14 | 47.0 | 50.0 | 6 | 6 | 5 | 6.5 | 38.8 | 111 | 123 | 135 | 7 | 6.5 | 59.0 | 73.0 | 5 | 12 | 5 | 12 | 0 |
| 16 FT | 19 | 20 | 10 | 8 | 6 | 6 | 6 | 7.5 | 47.6 | 39.0 | 39.0 | 39.0 | 7 | 13 | 69.0 | 82.0 | 7 | 13 | 46.0 | 50.0 | 6 | 6 | 5 | 6.5 | 37.8 | 112 | 124 | 136 | 7 | 6 | 59.0 | 73.0 | 5 | 12 | 5 | 11 | 0 |
| 18 FT | 20 | 22 | 10 | 8 | 7 | 7 | 6 | 7.5 | 46.9 | 40.0 | 40.0 | 40.0 | 7 | 13 | 69.0 | 81.0 | 7 | 13 | 46.0 | 50.0 | 7 | 7.5 | 5 | 6.5 | 36.8 | 114 | 126 | 138 | 7 | 6.5 | 59.0 | 73.0 | 5 | 12 | 5 | 9.5 | 0 |
| 20 FT | 22 | 23 | 10 | 8 | 7 | 7.5 | 6 | 7.5 | 45.6 | 42.0 | 42.0 | 42.0 | 7 | 13 | 68.0 | 81.0 | 7 | 13 | 46.0 | 50.0 | 7 | 6.5 | 5 | 6 | 36.5 | 115 | 127 | 139 | 7 | 6 | 59.0 | 73.0 | 5 | 12 | 5 | 8 | 0 |
| 22 FT | 24 | 25 | 10 | 8 | 7 | 7.5 | 6 | 7.5 | 45.0 | 44.0 | 44.0 | 44.0 | 7 | 13 | 67.0 | 81.0 | 7 | 13 | 46.0 | 50.0 | 7 | 6.5 | 5 | 6 | 36.3 | 117 | 129 | 141 | 7 | 6.5 | 59.0 | 73.0 | 5 | 12 | 5 | 8 | 0 |
| 24 FT | 25 | 27 | 11 | 8 | 7 | 7 | 6 | 7.5 | 45.9 | 45.0 | 45.0 | 45.0 | 7 | 12 | 67.0 | 80.0 | 7 | 12 | 46.0 | 50.0 | 7 | 6.5 | 5 | 6 | 36.4 | 119 | 131 | 143 | 7 | 6 | 59.0 | 73.0 | 5 | 12 | 5 | 7.5 | 0 |
| 26 FT | 27 | 28 | 11 | 8 | 7 | 6.5 | 6 | 7.5 | 45.1 | 47.0 | 47.0 | 47.0 | 7 | 12 | 66.0 | 80.0 | 7 | 12 | 45.0 | 50.0 | 7 | 6 | 5 | 6 | 36.4 | 120 | 132 | 144 | 7 | 6 | 59.0 | 73.0 | 5 | 12 | 5 | 7.5 | 0 |
| 28 FT | 28 | 30 | 11 | 8 | 7 | 6 | 6 | 7 | 45.0 | 52.0 | 52.0 | 52.0 | 7 | 12 | 66.0 | 80.0 | 7 | 12 | 45.0 | 50.0 | 8 | 7.5 | 6 | 7 | 39.0 | 122 | 134 | 146 | 8 | 7.5 | 65.0 | 79.0 | 5 | 12 | 5 | 7.5 | 0 |
| 30 FT | 30 | 31 | 11 | 8 | 7 | 6 | 6 | 6.5 | 44.6 | 54.0 | 54.0 | 54.0 | 7 | 12 | 66.0 | 79.0 | 7 | 12 | 44.0 | 48.0 | 8 | 7 | 6 | 7 | 39.0 | 123 | 135 | 147 | 8 | 7 | 65.0 | 79.0 | 5 | 12 | 5 | 7.5 | 0 |
| 32 FT | 31 | 33 | 12 | 8 | 8 | 7.5 | 6 | 7.5 | 45.5 | 55.0 | 55.0 | 55.0 | 8 | 15 | 74.0 | 87.0 | 8 | 15 | 52.0 | 56.0 | 8 | 7 | 6 | 7 | 39.4 | 125 | 137 | 149 | 8 | 6.5 | 65.0 | 80.0 | 5 | 12 | 5 | 7 | 0 |
| 34 FT | 33 | 34 | 12 | 8 | 8 | 7 | 6 | 7 | 45.3 | 57.0 | 57.0 | 57.0 | 8 | 14 | 73.0 | 86.0 | 8 | 14 | 51.0 | 54.0 | 8 | 6.5 | 6 | 7 | 39.5 | 126 | 138 | 150 | 8 | 6.5 | 65.0 | 80.0 | 5 | 12 | 5 | 7 | 0 |
| 36 FT | 34 | 36 | 12 | 8 | 8 | 7 | 6 | 6.5 | 45.3 | 58.0 | 58.0 | 58.0 | 8 | 14 | 73.0 | 85.0 | 8 | 14 | 50.0 | 53.0 | 8 | 6.5 | 6 | 6.5 | 39.4 | 128 | 140 | 152 | 8 | 6 | 65.0 | 80.0 | 5 | 12 | 5 | 6.5 | 0 |
| 38 FT | 35 | 37 | 12 | 8 | 8 | 6.5 | 6 | 6.5 | 45.3 | 59.0 | 59.0 | 59.0 | 8 | 13 | 73.0 | 85.0 | 8 | 13 | 50.0 | 53.0 | 8 | 6.5 | 6 | 6.5 | 39.4 | 129 | 141 | 153 | 8 | 6 | 65.0 | 80.0 | 5 | 12 | 5 | 6 | 0 |
| 40 FT | 36 | 39 | 13 | 8 | 8 | 6 | 6 | 6.5 | 46.1 | 60.0 | 60.0 | 60.0 | 8 | 12 | 73.0 | 84.0 | 8 | 12 | 50.0 | 52.0 | 8 | 6.5 | 6 | 6 | 39.9 | 131 | 143 | 155 | 8 | 6 | 65.0 | 80.0 | 5 | 12 | 5 | 6.5 | 0 |
| 42 FT | 38 | 40 | 13 | 8 | 8 | 6 | 6 | 6 | 46.0 | 62.0 | 62.0 | 62.0 | 8 | 12 | 72.0 | 83.0 | 8 | 12 | 48.0 | 50.0 | 8 | 6.5 | 6 | 6 | 40.1 | 132 | 144 | 156 | 9 | 7 | 71.0 | 86.0 | 5 | 12 | 5 | 6 | 0 |
| 44 FT | 39 | 41 | 13 | 8 | 8 | 6 | 6 | 6 | 46.0 | 63.0 | 63.0 | 63.0 | 8 | 12 | 72.0 | 82.0 | 8 | 12 | 48.0 | 49.0 | 8 | 6 | 7 | 7 | 43.3 | 133 | 145 | 157 | 9 | 7 | 71.0 | 86.0 | 5 | 12 | 6 | 8 | 0 |
| 46 FT | 40 | 42 | 13 | 8 | 8 | 6 | 7 | 7 | 51.1 | 70.0 | 70.0 | 70.0 | 8 | 12 | 72.0 | 82.0 | 8 | 12 | 47.0 | 48.0 | 8 | 6 | 7 | 7 | 43.4 | 134 | 146 | 158 | 9 | 7 | 71.0 | 86.0 | 5 | 12 | 6 | 7.5 | 0 |
| 48 FT | 41 | 43 | 13 | 8 | 9 | 7.5 | 7 | 7 | 51.1 | 71.0 | 71.0 | 71.0 | 9 | 15 | 79.0 | 89.0 | 9 | 15 | 55.0 | 56.0 | 8 | 6 | 7 | 6.5 | 43.5 | 135 | 147 | 159 | 9 | 7 | 70.0 | 86.0 | 5 | 12 | 6 | 7.5 | 0 |
| 50 FT | 42 | 45 | 13 | 8 | 9 | 7 | 7 | 6 | 51.4 | 72.0 | 72.0 | 72.0 | 9 | 15 | 79.0 | 88.0 | 9 | 15 | 55.0 | 56.0 | 8 | 6 | 7 | 6.5 | 43.8 | 137 | 149 | 161 | 9 | 7 | 70.0 | 86.0 | 5 | 10.5 | 6 | 7 | 0 |

## SPAN (S) = 16 FT HEIGHT (HT) = 11 FT OR 12 FT OR 13 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | | | | | | | | | | K2 | | | | | | | | | | | | | | K3 | | | | | | | | | | | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | HT=11′ | HT=12′ | HT=13′ | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | HT=11′ | HT=12′ | HT=13′ | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 15 | 11 | 9 | 10 | 6 | 7.5 | 5 | 6 | 77.5 | 35.0 | 35.0 | 35.0 | 6 | 16 | 155.5 | 118.5 | 6 | 16 | 52.0 | 57.0 | 5 | 6.5 | 6 | 6 | 87.6 | 139 | 151 | 163 | 6 | 6 | 65.0 | 69.0 | 5 | 12 | 5 | 8.5 | 12 |
| 2 FT | 16 | 12 | 9 | 10 | 6 | 7 | 5 | 6 | 77.5 | 36.0 | 36.0 | 36.0 | 6 | 14 | 155.5 | 118.5 | 6 | 14 | 49.0 | 54.0 | 5 | 6 | 6 | 6 | 79.0 | 140 | 152 | 164 | 6 | 6 | 64.0 | 69.0 | 5 | 12 | 5 | 8.5 | 12 |
| 4 FT | 13 | 12 | 10 | 10 | 6 | 6.5 | 6 | 7 | 76.3 | 37.0 | 37.0 | 37.0 | 6 | 12 | 91.0 | 115.0 | 6 | 12 | 42.0 | 45.0 | 5 | 6 | 6 | 6 | 69.6 | 140 | 152 | 164 | 7 | 6.5 | 65.0 | 72.0 | 5 | 10.5 | 5 | 8 | 12 |
| 6 FT | 13 | 13 | 10 | 10 | 6 | 6.5 | 6 | 7 | 67.3 | 37.0 | 37.0 | 37.0 | 7 | 15 | 77.0 | 88.0 | 7 | 15 | 43.0 | 45.0 | 6 | 7.5 | 6 | 6.5 | 64.3 | 141 | 153 | 165 | 7 | 6 | 64.0 | 72.0 | 5 | 12 | 5 | 8 | 12 |
| 8 FT | 14 | 14 | 10 | 10 | 6 | 7 | 6 | 6.5 | 61.5 | 38.0 | 38.0 | 38.0 | 7 | 15 | 71.0 | 79.0 | 7 | 15 | 41.0 | 44.0 | 6 | 7 | 6 | 6 | 60.3 | 142 | 154 | 166 | 7 | 6 | 62.0 | 72.0 | 5 | 12 | 5 | 8 | 0 |
| 10 FT | 15 | 16 | 10 | 10 | 6 | 6.5 | 6 | 6 | 63.9 | 35.0 | 39.0 | 39.0 | 7 | 14 | 76.0 | 85.0 | 7 | 14 | 49.0 | 51.0 | 6 | 6.5 | 6 | 6 | 57.6 | 144 | 156 | 168 | 7 | 6.5 | 61.0 | 72.0 | 5 | 12 | 5 | 8 | 0 |
| 12 FT | 16 | 18 | 11 | 10 | 6 | 6.5 | 6 | 6 | 62.9 | 36.0 | 40.0 | 40.0 | 7 | 14 | 74.0 | 83.0 | 7 | 14 | 48.0 | 51.0 | 6 | 6.5 | 6 | 7 | 56.4 | 146 | 158 | 170 | 7 | 6.5 | 61.0 | 73.0 | 5 | 12 | 5 | 7.5 | 0 |
| 14 FT | 18 | 19 | 12 | 10 | 6 | 6.5 | 6 | 6.5 | 61.8 | 38.0 | 42.0 | 42.0 | 7 | 14 | 72.0 | 82.0 | 7 | 14 | 48.0 | 51.0 | 6 | 6 | 6 | 7 | 55.8 | 147 | 159 | 171 | 7 | 6.5 | 61.0 | 73.0 | 5 | 12 | 5 | 7 | 0 |
| 16 FT | 19 | 21 | 12 | 10 | 6 | 6 | 6 | 6 | 60.8 | 39.0 | 43.0 | 43.0 | 7 | 13 | 71.0 | 81.0 | 7 | 13 | 47.0 | 51.0 | 7 | 8 | 6 | 7 | 54.6 | 149 | 161 | 173 | 7 | 6.5 | 60.0 | 73.0 | 5 | 12 | 5 | 7 | 0 |
| 18 FT | 20 | 22 | 12 | 10 | 7 | 8 | 7 | 8 | 64.6 | 40.0 | 44.0 | 44.0 | 7 | 13 | 70.0 | 81.0 | 7 | 13 | 47.0 | 51.0 | 7 | 7.5 | 6 | 6 | 53.8 | 150 | 162 | 174 | 7 | 6.5 | 60.0 | 73.0 | 5 | 12 | 5 | 7 | 0 |
| 20 FT | 22 | 24 | 13 | 10 | 7 | 8 | 6 | 6 | 59.6 | 42.0 | 46.0 | 46.0 | 7 | 13 | 69.0 | 81.0 | 7 | 13 | 47.0 | 51.0 | 7 | 7 | 6 | 7 | 53.6 | 152 | 164 | 176 | 7 | 6.5 | 60.0 | 73.0 | 5 | 12 | 5 | 6.5 | 0 |
| 22 FT | 23 | 25 | 14 | 10 | 7 | 7 | 6 | 6 | 59.8 | 43.0 | 47.0 | 47.0 | 7 | 12 | 69.0 | 80.0 | 7 | 12 | 47.0 | 50.0 | 7 | 6.5 | 6 | 7 | 53.5 | 153 | 165 | 177 | 7 | 6.5 | 60.0 | 73.0 | 5 | 12 | 5 | 6.5 | 0 |
| 24 FT | 25 | 27 | 14 | 10 | 7 | 7 | 6 | 6 | 59.1 | 45.0 | 49.0 | 49.0 | 7 | 13 | 68.0 | 80.0 | 7 | 13 | 46.0 | 50.0 | 7 | 6.5 | 6 | 7 | 53.3 | 155 | 167 | 179 | 7 | 6 | 60.0 | 74.0 | 5 | 12 | 5 | 6 | 0 |
| 26 FT | 27 | 29 | 14 | 10 | 7 | 6.5 | 6 | 6 | 58.6 | 51.0 | 51.0 | 51.0 | 7 | 13 | 67.0 | 80.0 | 7 | 13 | 46.0 | 50.0 | 7 | 6 | 6 | 7 | 53.0 | 157 | 169 | 181 | 8 | 7.5 | 66.0 | 80.0 | 5 | 12 | 5 | 6 | 0 |
| 28 FT | 28 | 30 | 15 | 10 | 7 | 6.5 | 6 | 6 | 59.1 | 52.0 | 52.0 | 52.0 | 7 | 12 | 67.0 | 79.0 | 7 | 12 | 46.0 | 50.0 | 8 | 7.5 | 6 | 7 | 53.1 | 158 | 170 | 182 | 8 | 7.5 | 66.0 | 80.0 | 5 | 12 | 6 | 8 | 0 |
| 30 FT | 30 | 32 | 15 | 10 | 7 | 6 | 6 | 6 | 58.8 | 54.0 | 54.0 | 54.0 | 7 | 12 | 67.0 | 79.0 | 7 | 12 | 45.0 | 48.0 | 8 | 7 | 6 | 7 | 53.0 | 160 | 172 | 184 | 8 | 7 | 66.0 | 80.0 | 5 | 12 | 6 | 8 | 0 |
| 32 FT | 31 | 33 | 15 | 10 | 8 | 7.5 | 7 | 7 | 63.4 | 55.0 | 55.0 | 55.0 | 8 | 15 | 74.0 | 87.0 | 8 | 15 | 53.0 | 56.0 | 8 | 7 | 6 | 7 | 52.8 | 161 | 173 | 185 | 8 | 6.5 | 66.0 | 80.0 | 5 | 12 | 6 | 8 | 0 |
| 34 FT | 32 | 34 | 16 | 10 | 8 | 7 | 7 | 7.5 | 63.9 | 56.0 | 56.0 | 56.0 | 8 | 14 | 74.0 | 86.0 | 8 | 14 | 52.0 | 56.0 | 8 | 6 | 6 | 7 | 52.9 | 162 | 174 | 186 | 8 | 6 | 66.0 | 80.0 | 5 | 12 | 6 | 8 | 0 |
| 36 FT | 34 | 36 | 16 | 10 | 8 | 7 | 7 | 7.5 | 63.8 | 58.0 | 58.0 | 58.0 | 8 | 14 | 74.0 | 85.0 | 8 | 14 | 51.0 | 54.0 | 8 | 6.5 | 6 | 6.5 | 52.9 | 164 | 176 | 188 | 8 | 6 | 66.0 | 80.0 | 5 | 12 | 6 | 8 | 0 |
| 38 FT | 35 | 37 | 17 | 10 | 8 | 6.5 | 7 | 7.5 | 64.4 | 59.0 | 59.0 | 59.0 | 8 | 13 | 74.0 | 85.0 | 8 | 13 | 51.0 | 53.0 | 8 | 6 | 6 | 6.5 | 53.1 | 165 | 177 | 189 | 8 | 6 | 66.0 | 80.0 | 5 | 12 | 6 | 7.5 | 0 |
| 40 FT | 36 | 39 | 17 | 10 | 8 | 6.5 | 7 | 7 | 64.4 | 60.0 | 60.0 | 60.0 | 8 | 13 | 73.0 | 84.0 | 8 | 13 | 50.0 | 53.0 | 8 | 6.5 | 6 | 6 | 53.1 | 167 | 179 | 191 | 8 | 6 | 66.0 | 80.0 | 5 | 12 | 6 | 7.5 | 0 |
| 42 FT | 37 | 40 | 17 | 10 | 8 | 6 | 7 | 6.5 | 64.3 | 61.0 | 61.0 | 61.0 | 8 | 12 | 73.0 | 84.0 | 8 | 12 | 50.0 | 52.0 | 8 | 6 | 6 | 6 | 53.1 | 168 | 180 | 192 | 9 | 7 | 72.0 | 86.0 | 5 | 12 | 6 | 7.5 | 0 |
| 44 FT | 38 | 41 | 18 | 10 | 8 | 6 | 7 | 7 | 65.0 | 62.0 | 62.0 | 68.0 | 8 | 12 | 73.0 | 83.0 | 8 | 12 | 49.0 | 51.0 | 8 | 6 | 7 | 8 | 56.6 | 169 | 181 | 193 | 9 | 7 | 72.0 | 86.0 | 5 | 12 | 6 | 7 | 0 |
| 46 FT | 39 | 43 | 19 | 10 | 8 | 6 | 7 | 7.5 | 66.0 | 63.0 | 63.0 | 69.0 | 8 | 12 | 73.0 | 82.0 | 8 | 12 | 49.0 | 51.0 | 8 | 6 | 7 | 7.5 | 57.1 | 171 | 183 | 195 | 9 | 7 | 72.0 | 87.0 | 5 | 12 | 6 | 6.5 | 0 |
| 48 FT | 40 | 44 | 19 | 10 | 8 | 6 | 7 | 6.5 | 66.0 | 70.0 | 70.0 | 70.0 | 8 | 12 | 72.0 | 81.0 | 8 | 12 | 48.0 | 50.0 | 8 | 6 | 7 | 7 | 57.3 | 172 | 184 | 196 | 9 | 7 | 72.0 | 87.0 | 5 | 12 | 6 | 6.5 | 0 |
| 50 FT | 41 | 45 | 20 | 10 | 9 | 7.5 | 7 | 7 | 66.9 | 71.0 | 71.0 | 71.0 | 9 | 15 | 80.0 | 88.0 | 9 | 15 | 56.0 | 57.0 | 8 | 6 | 7 | 7 | 57.6 | 173 | 185 | 197 | 9 | 6.5 | 72.0 | 87.0 | 5 | 12 | 6 | 6.5 | 0 |




BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ℄ CULVERT.

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

### GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS. AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.


MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

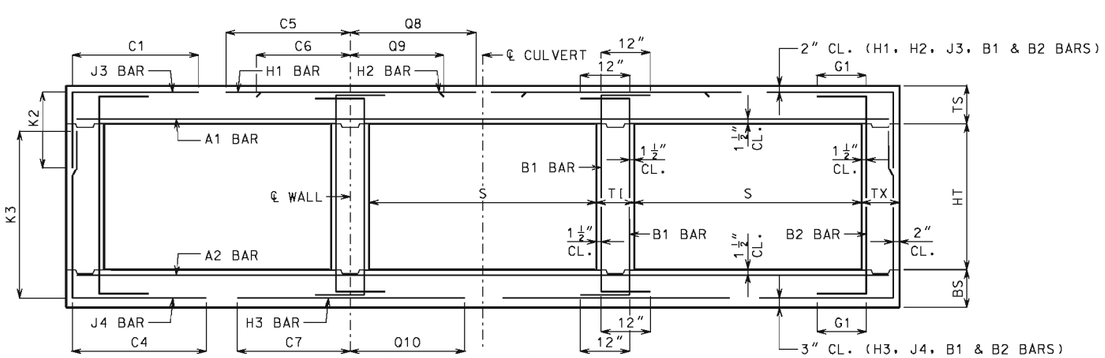
SPAN (S): 16 FEET
HEIGHT (HT): 8 THRU 13 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

703.87

## SPAN (S) = 16 FT HEIGHT (HT) = 14 FT OR 15 FT OR 16 FT

| DESIGN FILL | MEMBER THICKNESS | | | | TOP SLAB BARS | | | | | | | | | | | | | | | BOTTOM SLAB BARS | | | | | | | | | | | WALL BARS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | A1 BARS | | J3 BARS | | | | | | H1 BARS | | | | H2 BARS | | | | A2 BARS | | J4 BARS | | | | | | H3 BARS | | | | B1 BARS | | B2 BARS | | |
| | TS | BS | TX | TI | SIZE | SPA. | SIZE | SPA. | C1 | K2 HT=14' | K2 HT=15' | K2 HT=16' | SIZE | SPA. | C5 | Q8 | SIZE | SPA. | C6 | Q9 | SIZE | SPA. | SIZE | SPA. | C4 | K3 HT=14' | K3 HT=15' | K3 HT=16' | SIZE | SPA. | C7 | Q10 | SIZE | SPA. | SIZE | SPA. | G1 |
| 1 FT | 15 | 11 | 12 | 13 | 6 | 7.5 | 6 | 8 | 82.9 | 35.0 | 35.0 | 39.0 | 6 | 16 | 160.5 | 120.5 | 6 | 16 | 51.0 | 55.0 | 5 | 6.5 | 6 | 6 | 97.5 | 175 | 187 | 199 | 7 | 7 | 70.0 | 71.0 | 5 | 10.5 | 5 | 7 | 12 |
| 2 FT | 16 | 12 | 12 | 13 | 6 | 7.5 | 6 | 8 | 82.9 | 36.0 | 36.0 | 40.0 | 6 | 15 | 160.5 | 120.5 | 6 | 15 | 49.0 | 52.0 | 5 | 6 | 6 | 6 | 93.3 | 176 | 188 | 200 | 7 | 7 | 69.0 | 71.0 | 5 | 12 | 5 | 7 | 12 |
| 4 FT | 12 | 13 | 13 | 13 | 6 | 6.5 | 6 | 6.5 | 94.8 | 36.0 | 36.0 | 36.0 | 7 | 16 | 92.0 | 94.0 | 7 | 16 | 46.0 | 46.0 | 5 | 6 | 6 | 6.5 | 87.8 | 177 | 189 | 201 | 7 | 7 | 68.0 | 73.0 | 5 | 8.5 | 5 | 6.5 | 12 |
| 6 FT | 13 | 13 | 13 | 13 | 6 | 7 | 6 | 7 | 82.5 | 37.0 | 37.0 | 37.0 | 7 | 16 | 77.0 | 81.0 | 7 | 16 | 44.0 | 45.0 | 6 | 7.5 | 6 | 6 | 79.3 | 177 | 189 | 201 | 7 | 6 | 66.0 | 71.0 | 5 | 12 | 5 | 6.5 | 12 |
| 8 FT | 14 | 15 | 13 | 13 | 6 | 7 | 6 | 6.5 | 77.9 | 38.0 | 38.0 | 38.0 | 7 | 15 | 73.0 | 77.0 | 7 | 15 | 43.0 | 44.0 | 6 | 7.5 | 6 | 6.5 | 77.8 | 179 | 191 | 203 | 7 | 6.5 | 64.0 | 72.0 | 5 | 12 | 5 | 6.5 | 0 |
| 10 FT | 15 | 16 | 13 | 13 | 6 | 7 | 6 | 6 | 80.9 | 39.0 | 39.0 | 39.0 | 7 | 15 | 78.0 | 83.0 | 7 | 15 | 50.0 | 51.0 | 6 | 6.5 | 6 | 6 | 75.3 | 180 | 192 | 204 | 7 | 6 | 63.0 | 72.0 | 5 | 12 | 5 | 6.5 | 0 |
| 12 FT | 16 | 18 | 14 | 13 | 6 | 6.5 | 6 | 6 | 78.5 | 40.0 | 40.0 | 40.0 | 7 | 14 | 76.0 | 82.0 | 7 | 14 | 49.0 | 51.0 | 6 | 6.5 | 6 | 6 | 73.8 | 182 | 194 | 206 | 7 | 6.5 | 63.0 | 72.0 | 5 | 12 | 5 | 6 | 0 |
| 14 FT | 17 | 19 | 14 | 13 | 6 | 6 | 7 | 7.5 | 81.6 | 41.0 | 41.0 | 47.0 | 7 | 13 | 74.0 | 81.0 | 7 | 13 | 49.0 | 51.0 | 6 | 6 | 7 | 7.5 | 75.0 | 183 | 195 | 207 | 7 | 6.5 | 62.0 | 72.0 | 5 | 12 | 5 | 6 | 0 |
| 16 FT | 19 | 21 | 15 | 13 | 6 | 6.5 | 7 | 7.5 | 80.9 | 43.0 | 43.0 | 49.0 | 7 | 14 | 73.0 | 81.0 | 7 | 14 | 49.0 | 51.0 | 7 | 8 | 7 | 7.5 | 74.0 | 185 | 197 | 209 | 7 | 6.5 | 62.0 | 73.0 | 5 | 12 | 6 | 8 | 0 |
| 18 FT | 20 | 22 | 16 | 13 | 6 | 6 | 7 | 7.5 | 80.0 | 44.0 | 44.0 | 50.0 | 7 | 13 | 72.0 | 80.0 | 7 | 13 | 49.0 | 51.0 | 7 | 7.5 | 7 | 7.5 | 72.9 | 186 | 198 | 210 | 7 | 6.5 | 62.0 | 73.0 | 5 | 12 | 6 | 8 | 0 |
| 20 FT | 22 | 24 | 16 | 13 | 6 | 6 | 7 | 7 | 79.1 | 46.0 | 46.0 | 52.0 | 7 | 13 | 71.0 | 80.0 | 7 | 13 | 48.0 | 51.0 | 7 | 7 | 7 | 7.5 | 72.3 | 188 | 200 | 212 | 7 | 6.5 | 62.0 | 73.0 | 5 | 12 | 6 | 8 | 0 |
| 22 FT | 23 | 25 | 17 | 13 | 7 | 7.5 | 7 | 7 | 78.8 | 47.0 | 47.0 | 53.0 | 7 | 13 | 70.0 | 80.0 | 7 | 13 | 48.0 | 51.0 | 7 | 6 | 7 | 8 | 71.5 | 189 | 201 | 213 | 7 | 6 | 62.0 | 73.0 | 5 | 12 | 6 | 7.5 | 0 |
| 24 FT | 25 | 27 | 17 | 13 | 7 | 7 | 7 | 7 | 78.1 | 49.0 | 49.0 | 55.0 | 7 | 13 | 70.0 | 80.0 | 7 | 13 | 48.0 | 51.0 | 7 | 6.5 | 7 | 7 | 71.3 | 191 | 203 | 215 | 7 | 6 | 61.0 | 73.0 | 5 | 12 | 6 | 7.5 | 0 |
| 26 FT | 26 | 29 | 18 | 13 | 7 | 7 | 7 | 7 | 78.1 | 50.0 | 50.0 | 56.0 | 7 | 12 | 69.0 | 79.0 | 7 | 12 | 48.0 | 51.0 | 7 | 6 | 7 | 8 | 71.0 | 193 | 205 | 217 | 8 | 7.5 | 67.0 | 80.0 | 5 | 12 | 6 | 7 | 0 |
| 28 FT | 28 | 30 | 19 | 13 | 7 | 6.5 | 7 | 7 | 78.3 | 52.0 | 52.0 | 52.0 | 7 | 12 | 68.0 | 79.0 | 7 | 12 | 47.0 | 51.0 | 8 | 7.5 | 6 | 6 | 67.8 | 194 | 206 | 218 | 8 | 7.5 | 67.0 | 80.0 | 5 | 12 | 6 | 6.5 | 0 |
| 30 FT | 29 | 32 | 19 | 13 | 7 | 6 | 7 | 6.5 | 77.9 | 53.0 | 53.0 | 59.0 | 7 | 12 | 68.0 | 79.0 | 7 | 12 | 47.0 | 51.0 | 8 | 7 | 7 | 7.5 | 70.5 | 196 | 208 | 220 | 8 | 7 | 67.0 | 80.0 | 5 | 12 | 6 | 6.5 | 0 |
| 32 FT | 31 | 33 | 20 | 13 | 8 | 7.5 | 7 | 6.5 | 78.1 | 55.0 | 55.0 | 61.0 | 8 | 15 | 76.0 | 87.0 | 8 | 15 | 53.0 | 57.0 | 8 | 7 | 7 | 8 | 70.4 | 197 | 209 | 221 | 8 | 6.5 | 67.0 | 80.0 | 5 | 12 | 6 | 6.5 | 0 |
| 34 FT | 32 | 34 | 20 | 13 | 8 | 7.5 | 7 | 6 | 77.6 | 56.0 | 56.0 | 62.0 | 8 | 14 | 75.0 | 86.0 | 8 | 14 | 53.0 | 56.0 | 8 | 6 | 7 | 7 | 70.0 | 198 | 210 | 222 | 8 | 6 | 67.0 | 80.0 | 5 | 12 | 6 | 6.5 | 0 |
| 36 FT | 33 | 36 | 22 | 13 | 8 | 7 | 7 | 6.5 | 78.8 | 57.0 | 63.0 | 63.0 | 8 | 14 | 75.0 | 86.0 | 8 | 14 | 53.0 | 56.0 | 8 | 6.5 | 7 | 7.5 | 70.3 | 200 | 212 | 224 | 8 | 6 | 67.0 | 81.0 | 5 | 12 | 6 | 6 | 0 |
| 38 FT | 34 | 37 | 23 | 13 | 8 | 6.5 | 7 | 6.5 | 79.1 | 58.0 | 64.0 | 64.0 | 8 | 13 | 75.0 | 85.0 | 8 | 13 | 53.0 | 56.0 | 8 | 6 | 7 | 7.5 | 70.3 | 201 | 213 | 225 | 8 | 6 | 67.0 | 81.0 | 5 | 12 | 6 | 6 | 0 |
| 40 FT | 36 | 39 | 23 | 13 | 8 | 6.5 | 7 | 6.5 | 79.0 | 60.0 | 66.0 | 66.0 | 8 | 13 | 75.0 | 85.0 | 8 | 13 | 51.0 | 54.0 | 8 | 6.5 | 7 | 7.5 | 70.3 | 203 | 215 | 227 | 8 | 6 | 67.0 | 81.0 | 5 | 12 | 7 | 7.5 | 0 |
| 42 FT | 37 | 40 | 23 | 13 | 8 | 6.5 | 7 | 6 | 78.9 | 61.0 | 67.0 | 67.0 | 8 | 12 | 74.0 | 84.0 | 8 | 12 | 51.0 | 53.0 | 8 | 6 | 7 | 7 | 70.3 | 204 | 216 | 228 | 9 | 7 | 73.0 | 87.0 | 5 | 12 | 7 | 7.5 | 0 |
| 44 FT | 38 | 42 | 24 | 13 | 8 | 6 | 7 | 6 | 79.8 | 68.0 | 68.0 | 68.0 | 8 | 12 | 74.0 | 83.0 | 8 | 12 | 50.0 | 52.0 | 8 | 6 | 7 | 7 | 70.8 | 206 | 218 | 230 | 9 | 7 | 73.0 | 87.0 | 5 | 12 | 7 | 7.5 | 0 |
| 46 FT | 39 | 43 | 26 | 13 | 8 | 6 | 7 | 6.5 | 81.4 | 69.0 | 69.0 | 69.0 | 8 | 12 | 74.0 | 83.0 | 8 | 12 | 50.0 | 52.0 | 8 | 6 | 7 | 7 | 71.3 | 207 | 219 | 231 | 9 | 7 | 73.0 | 87.0 | 5 | 12 | 7 | 7.5 | 0 |
| 48 FT | 40 | 44 | 27 | 13 | 8 | 6 | 7 | 6 | 82.1 | 70.0 | 70.0 | 70.0 | 8 | 12 | 74.0 | 82.0 | 8 | 12 | 49.0 | 51.0 | 8 | 6 | 7 | 7 | 71.6 | 208 | 220 | 232 | 9 | 7 | 73.0 | 88.0 | 5 | 12 | 7 | 8 | 0 |
| 50 FT | 41 | 45 | 28 | 13 | 9 | 7.5 | 7 | 6 | 83.0 | 71.0 | 71.0 | 71.0 | 9 | 15 | 82.0 | 89.0 | 9 | 15 | 57.0 | 58.0 | 8 | 6 | 7 | 7 | 72.0 | 209 | 221 | 233 | 9 | 6.5 | 73.0 | 88.0 | 5 | 12 | 7 | 8 | 0 |




BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ℄ CULVERT.

### GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.


MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)


STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

# CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 16 FEET
HEIGHT (HT): 14 THRU 16 FEET

DATE EFFECTIVE: 12/01/2011
DATE PREPARED: 9/29/2011

703.87

SHEET NO. 27 OF 27


IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.