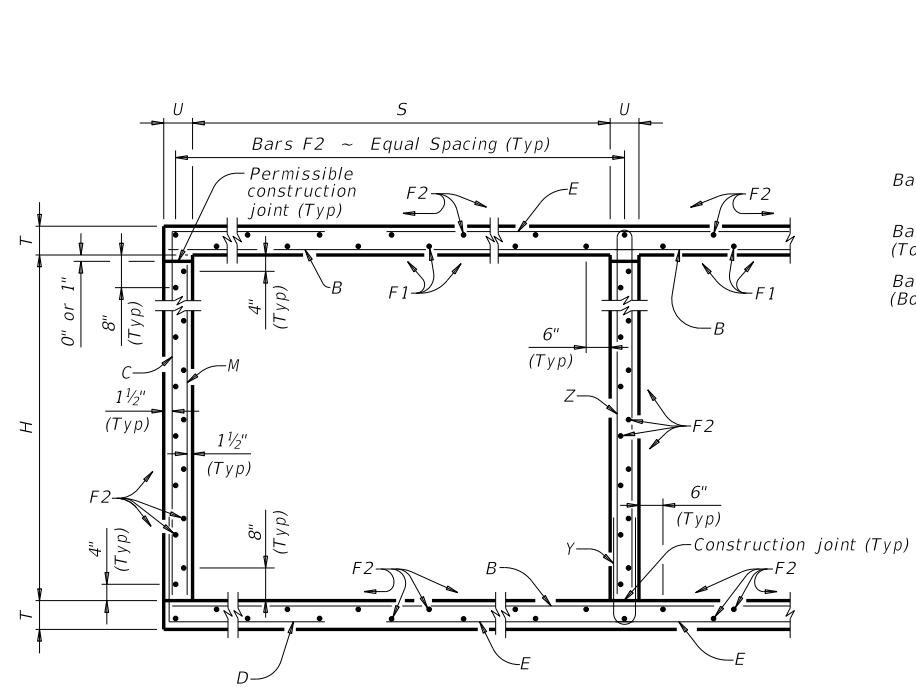
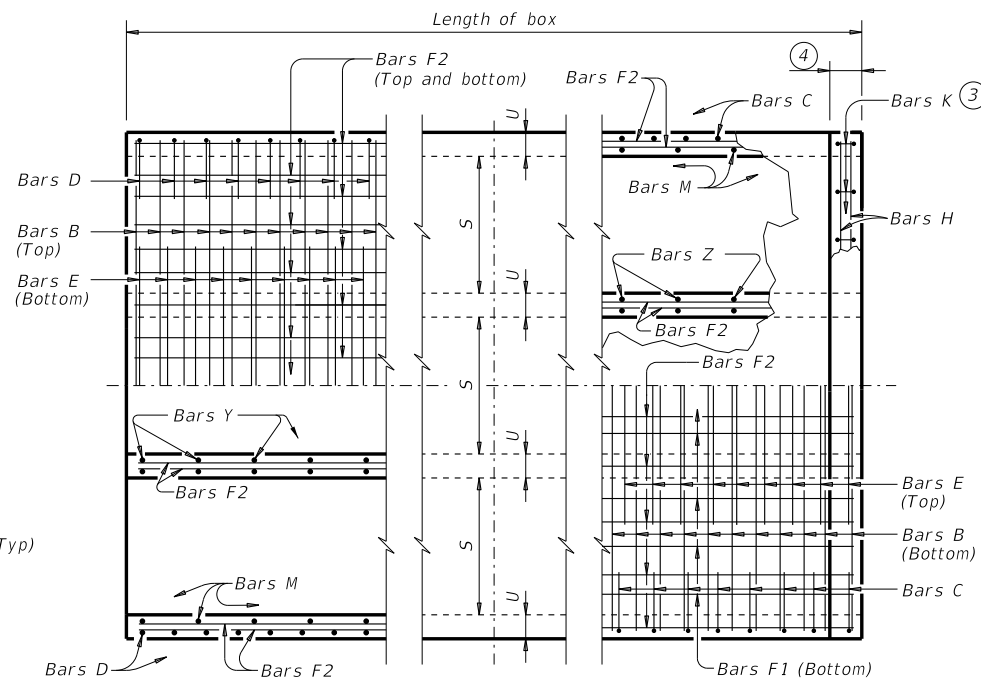


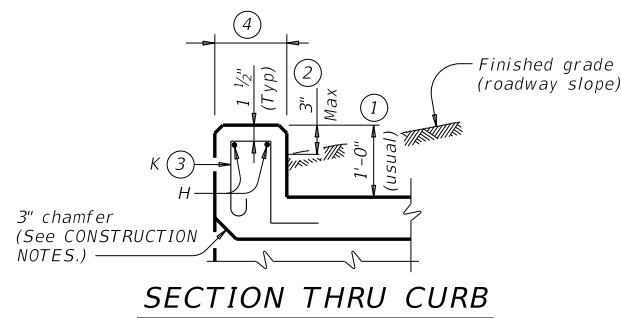
DISCLAIMER: This standard is governed by the "Texas Engineering Practice Act." No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



TYPICAL SECTION

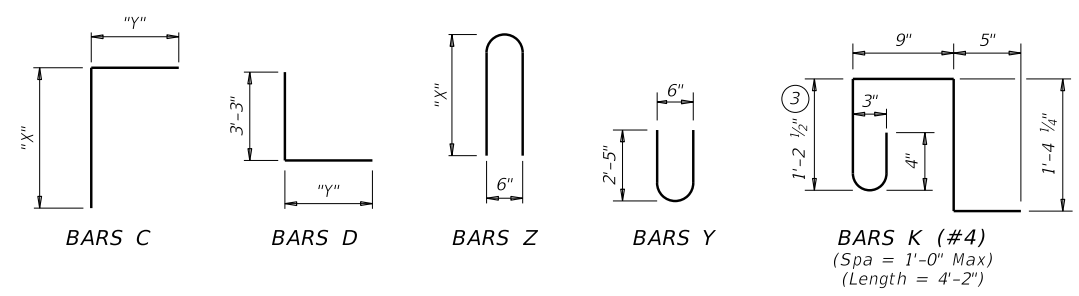


PART PLANS



SECTION THRU CURB

| TABLE OF BAR DIMENSIONS | | |
|-------------------------|-----------|-------|
| H | "X" | "Y" |
| 4'-0" | 4'-9 1/2" | 5'-7" |
| 5'-0" | 5'-9 1/2" | 5'-7" |
| 6'-0" | 6'-9 1/2" | 5'-7" |
| 7'-0" | 7'-9 1/2" | 5'-7" |
| 8'-0" | 8'-9 1/2" | 5'-7" |
| 9'-0" | 9'-9 1/2" | 5'-7" |



- 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Rail Anchorage Curb (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, construct curbs no more than 3" above finished grade.
 - For structures with bridge rail, construct curbs flush with finished grade. Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
- 1'-0" typical. 2'-3" when the Rail Anchorage Curb (RAC) standard sheet is referred to elsewhere in the plans.

The Contractor may replace Bars B, C, D, E, F1, F2, M, Y, and/or Z with deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. If D30.6 wire is used to meet the 0.755 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.755 sq. in. per ft.) x (12 in. per ft.) = 4.86" Max spacing. Required lap length for the provided D30.6 wire is 2'-1" (the same minimum lap length required for uncoated #5 bars, as listed under MATERIAL NOTES).

Example conversion: Replacing No. 6 Gr 60 at 6" Spacing with WWR
 Required WWR = (0.44 sq. in. per 0.5 ft.) x (60 ksi / 70 ksi) = 0.755 sq. in. per ft.
 If D30.6 wire is used to meet the 0.755 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.755 sq. in. per ft.) x (12 in. per ft.) = 4.86" Max spacing. Required lap length for the provided D30.6 wire is 2'-1" (the same minimum lap length required for uncoated #5 bars, as listed under MATERIAL NOTES).

CONSTRUCTION NOTES:
 Do not use permanent forms.
 Chamfer the bottom edge of the top slab 3" at the entrance.
 Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised, Bars C and D may be reversed, and Bars Y and Z may be reversed.

MATERIAL NOTES:
 Provide Grade 60 reinforcing steel.
 Provide galvanized reinforcing steel if required elsewhere in the plans.
 Provide Class C concrete (f'c = 3,600 psi) for culvert barrel and curb.
 Provide bar laps, where required, as follows:
 • Uncoated or galvanized ~ #4 = 1'-8" Min
 • Uncoated or galvanized ~ #5 = 2'-1" Min
 • Uncoated or galvanized ~ #6 = 2'-6" Min

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications for the range of fill heights shown.
 See the Multiple Box Culverts Cast-In-Place Miscellaneous Detail (MC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.

Cover dimensions are clear dimensions, unless noted otherwise.
 Reinforcing bar dimensions shown are out-to-out of bar.



**MULTIPLE BOX CULVERTS
 CAST-IN-PLACE
 9'-0" SPAN
 2' TO 20' FILL
 MC-9-20**

| | | | | |
|-----------------------|---------|---------|-----------|-----------|
| FILE: CD-MC920-20.dgn | DN: TBE | CK: BMP | DW: TxDOT | CK: TxDOT |
| ©TxDOT February 2020 | CONT | SECT | JOB | HIGHWAY |
| REVISIONS | | | | |
| DIST | COUNTY | | | SHEET NO. |

DATE:
FILE:

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act." No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: FILE:

| NUMBER OF SPANS | SECTION DIMENSIONS | | | | BILLS OF REINFORCING STEEL (For Box Length = 40 feet) | | | | | | | | | | | | | | | | | | | | | | | | | | | | QUANTITIES | | | | | | | | | | | | | | | | | | | | |
|-----------------|--------------------|-------|-----|----|---|------|-----|--------|------------|-----|------|-----|--------|-------|--------|-------|--------------|------|-----|--------|--------------|-----|-----|--------|-------------|-----|-----|----------|-----------------|-----|-----|--------|---------------|-----|--------|--------|--------------------|---------|-------|--------|-------|--------|-----|--------|---------|-----|-----|-----------|----------|-----------|----------|-----------|----------|
| | | | | | Bars B | | | | Bars C & D | | | | Bars E | | | | Bars F1 ~ #4 | | | | Bars F2 ~ #4 | | | | Bars M ~ #4 | | | | Bars Y & Z ~ #4 | | | | Bars H 4 ~ #4 | | Bars K | | Per Foot of Barrel | | Curb | | Total | | | | | | | | | | | | |
| | S | H | T | U | No. | Size | Spa | Length | Wt | No. | Size | Spa | Bars C | | Bars D | | No. | Size | Spa | Length | Wt | No. | Spa | Length | Wt | No. | Spa | Length | Wt | No. | Spa | Length | Wt | No. | Spa | Length | Wt | No. | Spa | Bars Y | | Bars Z | | Length | Wt | No. | Wt | Conc (CY) | Ref (Lb) | Conc (CY) | Ref (Lb) | Conc (CY) | Ref (Lb) |
| | | | | | | | | | | | | | Length | Wt | Length | Wt | | | | | | | | | | | | | | | | | | | | | | | | Length | Wt | Length | Wt | | | | | | | | | | |
| 2 | 9'-0" | 4'-0" | 11" | 9" | 162 | #6 | 6" | 20'-0" | 4,866 | 108 | #6 | 9" | 10'-4" | 1,676 | 8'-10" | 1,433 | 162 | #6 | 6" | 9'-0" | 2,190 | 14 | 18" | 39'-9" | 372 | 62 | 18" | 39'-9" | 1,646 | 108 | 9" | 4'-0" | 289 | 54 | 9" | 5'-2" | 186 | 9'-10" | 355 | 20'-0" | 53 | 42 | 117 | 1.708 | 325.3 | 1.5 | 170 | 69.8 | 13,183 | | | | |
| 3 | 9'-0" | 4'-0" | 11" | 9" | 162 | #6 | 6" | 29'-9" | 7,239 | 108 | #6 | 9" | 10'-4" | 1,676 | 8'-10" | 1,433 | 162 | #6 | 6" | 18'-0" | 4,380 | 21 | 18" | 39'-9" | 558 | 89 | 18" | 39'-9" | 2,363 | 108 | 9" | 4'-0" | 289 | 108 | 9" | 5'-2" | 373 | 9'-10" | 709 | 29'-9" | 79 | 62 | 173 | 2.481 | 475.5 | 2.2 | 252 | 101.5 | 19,272 | | | | |
| 4 | 9'-0" | 4'-0" | 11" | 9" | 162 | #6 | 6" | 39'-6" | 9,611 | 108 | #6 | 9" | 10'-4" | 1,676 | 8'-10" | 1,433 | 162 | #6 | 6" | 27'-0" | 6,570 | 28 | 18" | 39'-9" | 743 | 116 | 18" | 39'-9" | 3,080 | 108 | 9" | 4'-0" | 289 | 162 | 9" | 5'-2" | 559 | 9'-10" | 1,064 | 39'-6" | 106 | 82 | 228 | 3.255 | 625.6 | 2.9 | 334 | 133.1 | 25,359 | | | | |
| 5 | 9'-0" | 4'-0" | 11" | 9" | 162 | #6 | 6" | 49'-3" | 11,984 | 108 | #6 | 9" | 10'-4" | 1,676 | 8'-10" | 1,433 | 162 | #6 | 6" | 36'-0" | 8,760 | 35 | 18" | 39'-9" | 929 | 143 | 18" | 39'-9" | 3,797 | 108 | 9" | 4'-0" | 289 | 216 | 9" | 5'-2" | 745 | 9'-10" | 1,419 | 49'-3" | 132 | 102 | 284 | 4.028 | 775.8 | 3.7 | 416 | 164.8 | 31,448 | | | | |
| 6 | 9'-0" | 4'-0" | 11" | 9" | 162 | #6 | 6" | 59'-0" | 14,356 | 108 | #6 | 9" | 10'-4" | 1,676 | 8'-10" | 1,433 | 162 | #6 | 6" | 45'-0" | 10,950 | 42 | 18" | 39'-9" | 1,115 | 170 | 18" | 39'-9" | 4,514 | 108 | 9" | 4'-0" | 289 | 270 | 9" | 5'-2" | 932 | 9'-10" | 1,774 | 59'-0" | 158 | 120 | 334 | 4.801 | 926.0 | 4.4 | 492 | 196.4 | 37,531 | | | | |
| 2 | 9'-0" | 5'-0" | 11" | 9" | 162 | #6 | 6" | 20'-0" | 4,866 | 108 | #6 | 9" | 11'-4" | 1,838 | 8'-10" | 1,433 | 162 | #6 | 6" | 9'-0" | 2,190 | 14 | 18" | 39'-9" | 372 | 68 | 18" | 39'-9" | 1,806 | 108 | 9" | 5'-0" | 361 | 54 | 9" | 5'-2" | 186 | 11'-10" | 427 | 20'-0" | 53 | 42 | 117 | 1.792 | 337.0 | 1.5 | 170 | 73.2 | 13,649 | | | | |
| 3 | 9'-0" | 5'-0" | 11" | 9" | 162 | #6 | 6" | 29'-9" | 7,239 | 108 | #6 | 9" | 11'-4" | 1,838 | 8'-10" | 1,433 | 162 | #6 | 6" | 18'-0" | 4,380 | 21 | 18" | 39'-9" | 558 | 97 | 18" | 39'-9" | 2,576 | 108 | 9" | 5'-0" | 361 | 108 | 9" | 5'-2" | 373 | 11'-10" | 854 | 29'-9" | 79 | 62 | 173 | 2.593 | 490.3 | 2.2 | 252 | 105.9 | 19,864 | | | | |
| 4 | 9'-0" | 5'-0" | 11" | 9" | 162 | #6 | 6" | 39'-6" | 9,611 | 108 | #6 | 9" | 11'-4" | 1,838 | 8'-10" | 1,433 | 162 | #6 | 6" | 27'-0" | 6,570 | 28 | 18" | 39'-9" | 743 | 126 | 18" | 39'-9" | 3,346 | 108 | 9" | 5'-0" | 361 | 162 | 9" | 5'-2" | 559 | 11'-10" | 1,281 | 39'-6" | 106 | 82 | 228 | 3.394 | 643.6 | 2.9 | 334 | 138.7 | 26,076 | | | | |
| 5 | 9'-0" | 5'-0" | 11" | 9" | 162 | #6 | 6" | 49'-3" | 11,984 | 108 | #6 | 9" | 11'-4" | 1,838 | 8'-10" | 1,433 | 162 | #6 | 6" | 36'-0" | 8,760 | 35 | 18" | 39'-9" | 929 | 155 | 18" | 39'-9" | 4,116 | 108 | 9" | 5'-0" | 361 | 216 | 9" | 5'-2" | 745 | 11'-10" | 1,707 | 49'-3" | 132 | 102 | 284 | 4.194 | 796.8 | 3.7 | 416 | 171.4 | 32,289 | | | | |
| 6 | 9'-0" | 5'-0" | 11" | 9" | 162 | #6 | 6" | 59'-0" | 14,356 | 108 | #6 | 9" | 11'-4" | 1,838 | 8'-10" | 1,433 | 162 | #6 | 6" | 45'-0" | 10,950 | 42 | 18" | 39'-9" | 1,115 | 184 | 18" | 39'-9" | 4,886 | 108 | 9" | 5'-0" | 361 | 270 | 9" | 5'-2" | 932 | 11'-10" | 2,134 | 59'-0" | 158 | 120 | 334 | 4.995 | 950.1 | 4.4 | 492 | 204.2 | 38,497 | | | | |
| 2 | 9'-0" | 6'-0" | 11" | 9" | 162 | #6 | 6" | 20'-0" | 4,866 | 108 | #6 | 9" | 12'-4" | 2,001 | 8'-10" | 1,433 | 162 | #6 | 6" | 9'-0" | 2,190 | 14 | 18" | 39'-9" | 372 | 74 | 18" | 39'-9" | 1,965 | 108 | 9" | 6'-0" | 433 | 54 | 9" | 5'-2" | 186 | 13'-10" | 499 | 20'-0" | 53 | 42 | 117 | 1.875 | 348.6 | 1.5 | 170 | 76.5 | 14,115 | | | | |
| 3 | 9'-0" | 6'-0" | 11" | 9" | 162 | #6 | 6" | 29'-9" | 7,239 | 108 | #6 | 9" | 12'-4" | 2,001 | 8'-10" | 1,433 | 162 | #6 | 6" | 18'-0" | 4,380 | 21 | 18" | 39'-9" | 558 | 105 | 18" | 39'-9" | 2,788 | 108 | 9" | 6'-0" | 433 | 108 | 9" | 5'-2" | 373 | 13'-10" | 998 | 29'-9" | 79 | 62 | 173 | 2.704 | 505.1 | 2.2 | 252 | 110.4 | 20,455 | | | | |
| 4 | 9'-0" | 6'-0" | 11" | 9" | 162 | #6 | 6" | 39'-6" | 9,611 | 108 | #6 | 9" | 12'-4" | 2,001 | 8'-10" | 1,433 | 162 | #6 | 6" | 27'-0" | 6,570 | 28 | 18" | 39'-9" | 743 | 136 | 18" | 39'-9" | 3,611 | 108 | 9" | 6'-0" | 433 | 162 | 9" | 5'-2" | 559 | 13'-10" | 1,497 | 39'-6" | 106 | 82 | 228 | 3.532 | 661.5 | 2.9 | 334 | 144.2 | 26,792 | | | | |
| 5 | 9'-0" | 6'-0" | 11" | 9" | 162 | #6 | 6" | 49'-3" | 11,984 | 108 | #6 | 9" | 12'-4" | 2,001 | 8'-10" | 1,433 | 162 | #6 | 6" | 36'-0" | 8,760 | 35 | 18" | 39'-9" | 929 | 167 | 18" | 39'-9" | 4,434 | 108 | 9" | 6'-0" | 433 | 216 | 9" | 5'-2" | 745 | 13'-10" | 1,996 | 49'-3" | 132 | 102 | 284 | 4.361 | 817.9 | 3.7 | 416 | 178.1 | 33,131 | | | | |
| 6 | 9'-0" | 6'-0" | 11" | 9" | 162 | #6 | 6" | 59'-0" | 14,356 | 108 | #6 | 9" | 12'-4" | 2,001 | 8'-10" | 1,433 | 162 | #6 | 6" | 45'-0" | 10,950 | 42 | 18" | 39'-9" | 1,115 | 198 | 18" | 39'-9" | 5,257 | 108 | 9" | 6'-0" | 433 | 270 | 9" | 5'-2" | 932 | 13'-10" | 2,495 | 59'-0" | 158 | 120 | 334 | 5.190 | 974.3 | 4.4 | 492 | 212.0 | 39,464 | | | | |
| 2 | 9'-0" | 7'-0" | 11" | 9" | 162 | #6 | 6" | 20'-0" | 4,866 | 108 | #6 | 9" | 13'-4" | 2,163 | 8'-10" | 1,433 | 162 | #6 | 6" | 9'-0" | 2,190 | 14 | 18" | 39'-9" | 372 | 74 | 18" | 39'-9" | 1,965 | 108 | 9" | 7'-0" | 505 | 54 | 9" | 5'-2" | 186 | 15'-10" | 571 | 20'-0" | 53 | 42 | 117 | 1.958 | 356.3 | 1.5 | 170 | 79.8 | 14,421 | | | | |
| 3 | 9'-0" | 7'-0" | 11" | 9" | 162 | #6 | 6" | 29'-9" | 7,239 | 108 | #6 | 9" | 13'-4" | 2,163 | 8'-10" | 1,433 | 162 | #6 | 6" | 18'-0" | 4,380 | 21 | 18" | 39'-9" | 558 | 105 | 18" | 39'-9" | 2,788 | 108 | 9" | 7'-0" | 505 | 108 | 9" | 5'-2" | 373 | 15'-10" | 1,142 | 29'-9" | 79 | 62 | 173 | 2.815 | 514.5 | 2.2 | 252 | 114.8 | 20,833 | | | | |
| 4 | 9'-0" | 7'-0" | 11" | 9" | 162 | #6 | 6" | 39'-6" | 9,611 | 108 | #6 | 9" | 13'-4" | 2,163 | 8'-10" | 1,433 | 162 | #6 | 6" | 27'-0" | 6,570 | 28 | 18" | 39'-9" | 743 | 136 | 18" | 39'-9" | 3,611 | 108 | 9" | 7'-0" | 505 | 162 | 9" | 5'-2" | 559 | 15'-10" | 1,713 | 39'-6" | 106 | 82 | 228 | 3.671 | 672.7 | 2.9 | 334 | 149.8 | 27,242 | | | | |
| 5 | 9'-0" | 7'-0" | 11" | 9" | 162 | #6 | 6" | 49'-3" | 11,984 | 108 | #6 | 9" | 13'-4" | 2,163 | 8'-10" | 1,433 | 162 | #6 | 6" | 36'-0" | 8,760 | 35 | 18" | 39'-9" | 929 | 167 | 18" | 39'-9" | 4,434 | 108 | 9" | 7'-0" | 505 | 216 | 9" | 5'-2" | 745 | 15'-10" | 2,285 | 49'-3" | 132 | 102 | 284 | 4.528 | 831.0 | 3.7 | 416 | 184.8 | 33,654 | | | | |
| 6 | 9'-0" | 7'-0" | 11" | 9" | 162 | #6 | 6" | 59'-0" | 14,356 | 108 | #6 | 9" | 13'-4" | 2,163 | 8'-10" | 1,433 | 162 | #6 | 6" | 45'-0" | 10,950 | 42 | 18" | 39'-9" | 1,115 | 198 | 18" | 39'-9" | 5,257 | 108 | 9" | 7'-0" | 505 | 270 | 9" | 5'-2" | 932 | 15'-10" | 2,856 | 59'-0" | 158 | 120 | 334 | 5.384 | 989.2 | 4.4 | 492 | 219.7 | 40,059 | | | | |
| 2 | 9'-0" | 8'-0" | 11" | 9" | 162 | #6 | 6" | 20'-0" | 4,866 | 108 | #6 | 9" | 14'-4" | 2,325 | 8'-10" | 1,433 | 162 | #6 | 6" | 9'-0" | 2,190 | 14 | 18" | 39'-9" | 372 | 80 | 18" | 39'-9" | 2,124 | 108 | 9" | 8'-0" | 577 | 54 | 9" | 5'-2" | 186 | 17'-10" | 643 | 20'-0" | 53 | 42 | 117 | 2.042 | 367.9 | 1.5 | 170 | 83.2 | 14,886 | | | | |
| 3 | 9'-0" | 8'-0" | 11" | 9" | 162 | #6 | 6" | 29'-9" | 7,239 | 108 | #6 | 9" | 14'-4" | 2,325 | 8'-10" | 1,433 | 162 | #6 | 6" | 18'-0" | 4,380 | 21 | 18" | 39'-9" | 558 | 113 | 18" | 39'-9" | 3,000 | 108 | 9" | 8'-0" | 577 | 108 | 9" | 5'-2" | 373 | 17'-10" | 1,287 | 29'-9" | 79 | 62 | 173 | 2.926 | 529.3 | 2.2 | 252 | 119.3 | 21,424 | | | | |
| 4 | 9'-0" | 8'-0" | 11" | 9" | 162 | #6 | 6" | 39'-6" | 9,611 | 108 | #6 | 9" | 14'-4" | 2,325 | 8'-10" | 1,433 | 162 | #6 | 6" | 27'-0" | 6,570 | 28 | 18" | 39'-9" | 743 | 146 | 18" | 39'-9" | 3,877 | 108 | 9" | 8'-0" | 577 | 162 | 9" | 5'-2" | 559 | 17'-10" | 1,930 | 39'-6" | 106 | 82 | 228 | 3.810 | 690.6 | 2.9 | 334 | 155.3 | 27,959 | | | | |
| 5 | 9'-0" | 8'-0" | 11" | 9" | 162 | #6 | 6" | 49'-3" | 11,984 | 108 | #6 | 9" | 14'-4" | 2,325 | 8'-10" | 1,433 | 162 | #6 | 6" | 36'-0" | 8,760 | 35 | 18" | 39'-9" | 929 | 179 | 18" | 39'-9" | 4,753 | 108 | 9" | 8'-0" | 577 | 216 | 9" | 5'-2" | 745 | 17'-10" | 2,573 | 49'-3" | 132 | 102 | 284 | 4.694 | 852.0 | 3.7 | 416 | 191.4 | 34,495 | | | | |
| 6 | 9'-0" | 8'-0" | 11" | 9" | 162 | #6 | 6" | 59'-0" | 14,356 | 108 | #6 | 9" | 14'-4" | 2,325 | 8'-10" | 1,433 | 162 | #6 | 6" | 45'-0" | 10,950 | 42 | 18" | 39'-9" | 1,115 | 212 | 18" | 39'-9" | 5,629 | 108 | 9" | 8'-0" | 577 | 270 | 9" | 5'-2" | 932 | 17'-10" | 3,216 | 59'-0" | 158 | 120 | 334 | 5.579 | 1,013.3 | 4.4 | 492 | 227.5 | 41,025 | | | | |
| 2 | 9'-0" | 9'-0" | 11" | 9" | 162 | #6 | 6" | 20'-0" | 4,866 | 108 | #6 | 9" | 15'-4" | 2,487 | 8'-10" | 1,433 | 162 | #6 | 6" | 9'-0" | 2,190 | 14 | 18" | 39'-9" | 372 | 86 | 18" | 39'-9" | 2,284 | 108 | 9" | 9'-0" | 649 | 54 | 9" | 5'-2" | 186 | 19'-10" | 715 | 20'-0" | 53 | 42 | 117 | 2.125 | 379.6 | 1.5 | 170 | 86.5 | 15,352 | | | | |
| 3 | 9'-0" | 9'-0" | 11" | 9" | 162 | #6 | 6" | 29'-9" | 7,239 | 108 | #6 | 9" | 15'-4" | 2,487 | 8'-10" | 1,433 | 162 | #6 | 6" | 18'-0" | 4,380 | 21 | 18" | 39'-9" | 558 | 121 | 18" | 39'-9" | 3,213 | 108 | 9" | 9'-0" | 649 | 108 | 9" | 5'-2" | 373 | 19'-10" | 1,431 | 29'-9" | 79 | 62 | 173 | 3.037 | 544.1 | 2.2 | 252 | 123.7 | 22,015 | | | | |
| 4 | 9'-0" | 9'-0" | 11" | 9" | 162 | #6 | 6" | 39'-6" | 9,611 | 108 | #6 | 9" | 15'-4" | 2,487 | 8'-10" | 1,433 | 162 | #6 | 6" | 27'-0" | 6,570 | 28 | 18" | 39'-9" | 743 | 156 | 18" | 39'-9"</ | | | | | | | | | | | | | | | | | | | | | | | | | |