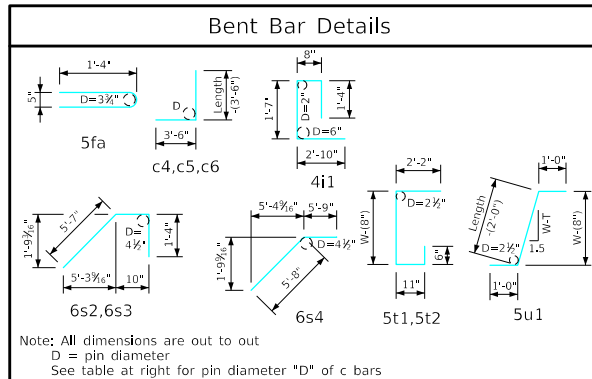


Bill of Reinforcing for One Headwall 0° Skew Span x Culvert Height

| Location | Shape | 14' x 6' | | | | 14' x 5' | | | | 14' x 4' | | | |
|-----------------------------------|--------------|-----------|---------|-------------------------|---------|----------|---------|-------------------------|--------|----------|---------|-------------------------|-----|
| | | Bar No. | Length | Wt. | Bar No. | Length | Wt. | Bar No. | Length | Wt. | | | |
| Fence Anchor (Galv.) | | 5fa | 2 | 2'-10" | 6 | 5fa | 2 | 2'-10" | 6 | 5fa | 2 | 2'-10" | 6 |
| Wingwall, F.F.H. | | 5b1 | 2 | 22'-3" | 46 | 5b1 | 2 | 19'-3" | 40 | 5b1 | 2 | 16'-3" | 34 |
| Wingwall, F.F.H. | | 5b2 | 10 Var. | 2 Each 8'-10 to 20'-10 | 155 | 5b2 | 8 Var. | 2 Each 17'-10 to 17'-10 | 111 | 5b2 | 6 Var. | 2 Each 8'-10 to 14'-10 | 74 |
| Wingwall, B.F.H. | | 4b3 | 2 | 22'-3" | 30 | 4b3 | 2 | 19'-3" | 26 | 4b3 | 2 | 16'-3" | 22 |
| Wingwall, B.F.H. | | 4b4 | 8 Var. | 2 Each 11'-10 to 20'-10 | 87 | 4b4 | 6 Var. | 2 Each 17'-10 to 17'-10 | 59 | 4b4 | 4 Var. | 2 Each 11'-10 to 14'-10 | 36 |
| Wingwall, F.F.V. | | 4c1 | 50 Var. | 2 Each 2'-9 to 8'-9 | 192 | 4c1 | 32 Var. | 2 Each 2'-9 to 7'-9 | 112 | 4c1 | 26 Var. | 2 Each 2'-9 to 6'-9 | 82 |
| Wingwall, F.F.V. | | c2 | -- | -- | -- | c2 | -- | -- | -- | c2 | -- | -- | -- |
| Wingwall, F.F.V. (L) | | 4c3 | 2 | 9'-2" | 12 | 4c3 | 2 | 8'-2" | 11 | 4c3 | 2 | 7'-2" | 10 |
| Wingwall, F.F.V. (R) | | 4c3 | 2 | 9'-2" | 12 | 4c3 | 2 | 8'-2" | 11 | 4c3 | 2 | 7'-2" | 10 |
| Wingwall, B.F.V. | | 5c4 | 38 Var. | 2 Each 6'-5 to 12'-5 | 373 | 5c4 | 42 Var. | 2 Each 6'-5 to 11'-5 | 391 | 5c4 | 34 Var. | 2 Each 6'-5 to 10'-5 | 298 |
| Wingwall, B.F.V. (L) | | 5c5 | 2 | 12'-8" | 26 | 5c5 | 2 | 11'-8" | 24 | 5c5 | 2 | 10'-8" | 22 |
| Wingwall, B.F.V. (R) | | 5c5 | 2 | 12'-8" | 26 | 5c5 | 2 | 11'-8" | 24 | 5c5 | 2 | 10'-8" | 22 |
| Wingwall, B.F.V. | | 5c6 | 14 | 8'-6" | 124 | c6 | -- | -- | -- | c6 | -- | -- | -- |
| Apron, Longit. Bott. | | 4d1 | 15 | 22'-3" | 223 | 4d1 | 15 | 19'-3" | 193 | 4d1 | 15 | 16'-3" | 163 |
| Apron, Longit. Top | | 6f1 | 15 | 22'-3" | 501 | 6f1 | 15 | 19'-3" | 434 | 6f1 | 15 | 16'-3" | 366 |
| Parapet, Vertical | | 4i1 | 29 | 6'-5" | 124 | 4i1 | 29 | 6'-5" | 124 | 4i1 | 29 | 6'-5" | 124 |
| Parapet, Horiz. | | 9j1 | 4 | 15'-2" | 206 | 9j1 | 4 | 15'-2" | 206 | 9j1 | 4 | 15'-2" | 206 |
| Apron, Trans. Top | | 5m1 | 27 | 15'-8" | 441 | 5m1 | 23 | 15'-8" | 376 | 5m1 | 19 | 15'-8" | 310 |
| Apron, Trans. Top | | m2 | -- | -- | -- | m2 | -- | -- | -- | m2 | -- | -- | -- |
| Apron, Trans. Bott. | | 4m3 | 19 | 11'-4" | 144 | 4m3 | 16 | 11'-4" | 121 | 4m3 | 13 | 11'-4" | 98 |
| Curtain, Horiz. | | 6p1 | 5 | 15'-8" | 118 | 6p1 | 5 | 15'-8" | 118 | 6p1 | 5 | 15'-8" | 118 |
| Wing Slope, Both F. | | 6s1 | 4 | 16'-9" | 101 | 6s1 | 4 | 13'-7" | 82 | 6s1 | 4 | 10'-5" | 63 |
| Wing Slope, Both F. (L) | | 6s2 | 2 | 7'-9" | 23 | 6s2 | 2 | 7'-9" | 23 | 6s2 | 2 | 7'-9" | 23 |
| Wing Slope, Both F. (R) | | 6s3 | 2 | 7'-9" | 23 | 6s3 | 2 | 7'-9" | 23 | 6s3 | 2 | 7'-9" | 23 |
| Wing Slope, F.F. | | 6s4 | 2 | 11'-5" | 34 | 6s4 | 2 | 11'-5" | 34 | 6s4 | 2 | 11'-5" | 34 |
| Wing Slope, F.F. | | 6s5 | 2 | 14'-2" | 43 | 6s5 | 2 | 11'-0" | 33 | 6s5 | 2 | 7'-10" | 24 |
| Curtain, Vert. | | 5t1 | 15 | 6'-5" | 100 | 5t1 | 15 | 6'-5" | 100 | 5t1 | 15 | 6'-5" | 100 |
| Curtain, Vert., Ends | | 5t2 | 4 | 6'-5" | 27 | 5t2 | 4 | 6'-5" | 27 | 5t2 | 4 | 6'-5" | 27 |
| Bracket, Vert. | | 5u1 | 4 | 5'-4" | 22 | 5u1 | 4 | 5'-4" | 22 | 5u1 | 4 | 5'-4" | 22 |
| Estimated Quantities One Headwall | Reinf. Steel | 3219 LB | | | | 2731 LB | | | | 2317 LB | | | |
| | Concrete | Parapet Δ | 1.7 | | 1.7 | | 1.7 | | 1.7 | | 1.7 | | |
| | | Wingwalls | 4.8 | 23.9 CY | | 3.5 | 20.2 CY | | 2.4 | | 16.8 CY | | |
| | | Apron * | 17.4 | | | 15.0 | | | 12.7 | | | | |

Δ Includes top of wingwall quantities.
 * Assumes apron and floor are equal thickness, adjust concrete quantities for transition where apron and floor thickness are not equal.
 (L) - Indicates bar located at left corner.
 (R) - Indicates bar located at right corner.
 Refer to Sheet PWH 0-1-20 for left and right corner locations.
 Note: Weight of bars over 40'-0" long include an allowance of 2'-5" for lap.



Headwall Notes:

- This headwall is based on a 3:1 slope normal to centerline of roadway.
- The sides of the apron are to be formed to ensure correct line and grade.
- All apron reinforcing steel is to be supported by bar chairs at intervals of not more than 3'-0" in either direction as outlined in the Standard Specifications.
- Clear distance from face of concrete to near reinforcing bar is to be 2" unless otherwise noted or shown. Clearance to the bottom ends of vertical bars shall be 3 inches.
- Concrete quantities are estimated from back of parapet.
- Horizontal tails of bars "b" & "s" are estimated to extend 2'-5" beyond back of parapet (into end of barrel). Longitudinal bars "4d1" and "6f1" are estimated to project into end section of barrel a minimum of 2'-5" beyond back of parapet. The "length" column reflects total number of feet necessary to meet these requirements.
- Dimensions are in feet and inches unless otherwise noted.

| | | | |
|----------------------|-----------------------------|---|--------------|
| LATEST REVISION DATE | APPROVED BY BRIDGE ENGINEER | IOWADOT Highway Division | |
| | | Standard Design - Single Reinforced Concrete Box Culverts | |
| | | Parallel Wing Headwalls | |
| | | July, 2020 | |
| | | Quantity Tabulation | PWH 0-6-20 |
| | | 14'-0" Span | SHEET 2 OF 2 |
| | | 0° Skew | |