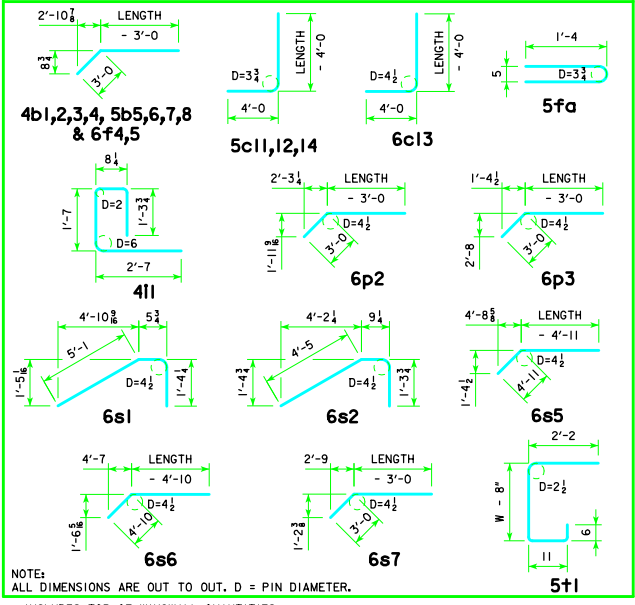


BILL OF REINFORCING FOR ONE HEADWALL 15° SKEW CULVERT SPAN x CULVERT HEIGHT

Table with columns for BAR, LOCATION, SHAPE, and various dimensions (NO., LENGTH, WT.) for different culvert sizes (e.g., 12' x 12', 12' x 11', etc.). Includes a summary row for REINFORCING STEEL and ESTIMATED QUANTITIES.

BENT BAR DETAILS



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

HEADWALL NOTES:

- 1. SEE DRAWING TWRCB G1-12 FOR GENERAL INFORMATION, SPECIFICATIONS, AND DESIGN STRESSES.
2. THIS HEADWALL IS BASED ON A 3:1 SLOPE NORMAL TO CENTERLINE OF ROADWAY.
3. THE SIDES OF THE FOOTING ARE TO BE FORMED TO INSURE CORRECT LINE AND GRADE.
4. ALL SLAB AND FLOOR 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.
5. 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.
6. CONCRETE QUANTITIES ARE ESTIMATED FROM BACK OF PARAPET.
7. HORIZONTAL TAILS OF BARS "b" & "s" ESTIMATED TO EXTEND 2'-0" BEYOND BACK OF PARAPET (INTO END OF BARREL. LONGITUDINAL BARS "d", "f", "i", AND "j" ESTIMATED TO PROJECT INTO END SECTION OF BARREL. A MINIMUM OF 2'-0" BEYOND BACK OF PARAPET.
8. THE "LENGTH" COLUMN REFLECTS TOTAL NUMBER OF FEET NECESSARY TO MEET THESE REQUIREMENTS.

LATEST REVISION DATE
Approved by BRIDGE ENGINEER

Iowa Department of Transportation Highway Division
STANDARD DESIGN
TWIN REINFORCED CONCRETE BOX CULVERTS
APRIL, 2012
FLARED WING HEADWALLS
15° SKEW