

BILL OF REINFORCING FOR ONE HEADWALL 45° SKEW CULVERT SPAN x CULVERT HEIGHT

LOCATION	SHAPE	12' x 12'				12' x 11'				12' x 10'				12' x 9'				12' x 8'				12' x 7'				12' x 6'				12' x 5'				12' x 4'			
		BAR	NO.	LENGTH	WT.	BAR	NO.	LENGTH	WT.	BAR	NO.	LENGTH	WT.	BAR	NO.	LENGTH	WT.	BAR	NO.	LENGTH	WT.	BAR	NO.	LENGTH	WT.	BAR	NO.	LENGTH	WT.	BAR	NO.	LENGTH	WT.				
FENCE ANCHOR (GALV.)	—	5fa	2	3'-1	6	5fa	2	3'-1	6	5fa	2	3'-1	6	5fa	2	3'-1	6	5fa	2	3'-1	6	5fa	2	3'-1	6	5fa	2	3'-1	6	5fa	2	3'-1	6				

ESTIMATED QUANTITIES ONE HEADWALL	REINF. STEEL	12,797 LBS.	10,819 LBS.		9606 LBS.		8397 LBS.		7175 LBS.		5961 LBS.		4728 LBS.		4052 LBS.		3371 LBS.	
	CONCRETE	PARAPET Δ 2.3 WINGWALLS 30.8 APRON 39.8	72.9 CU.YD.	PARAPET Δ 2.3 WINGWALLS 26.4 APRON 36.7	65.4 CU.YD.	PARAPET Δ 2.2 WINGWALLS 18.6 APRON 32.7	53.5 CU.YD.	PARAPET Δ 2.2 WINGWALLS 15.5 APRON 29.7	47.4 CU.YD.	PARAPET Δ 2.2 WINGWALLS 12.7 APRON 26.7	41.6 CU.YD.	PARAPET Δ 2.1 WINGWALLS 9.1 APRON 23.4	34.6 CU.YD.	PARAPET Δ 2.1 WINGWALLS 7.0 APRON 20.4	29.5 CU.YD.	PARAPET Δ 2.1 WINGWALLS 5.2 APRON 17.7	25.0 CU.YD.	PARAPET Δ 2.1 WINGWALLS 3.6 APRON 15.0

Δ INCLUDES TOP OF WINGWALL QUANTITIES. (A) - INDICATES BAR LOCATED AT ACUTE CORNER.
 NOTE: WEIGHT OF BARS OVER 40'-0 LONG INCLUDE AN ALLOWANCE OF 2'-0 FOR LAP. REFER TO SHEET PWH 45-1-12 FOR ACUTE AND OBTUSE CORNER LOCATIONS. (O) - INDICATES BAR LOCATED AT OBTUSE CORNER.

HEADWALL NOTES:

THIS HEADWALL IS BASED ON A 3:1 SLOPE NORMAL TO CENTERLINE OF ROADWAY.

THE SIDES OF THE FOOTING ARE TO BE FORMED TO INSURE CORRECT LINE AND GRADE.

ALL EXPOSED CORNERS OF 90° OR SHARPER ARE TO BE FILLETED WITH A 3/8" DRESSED AND BEVELED STRIP.

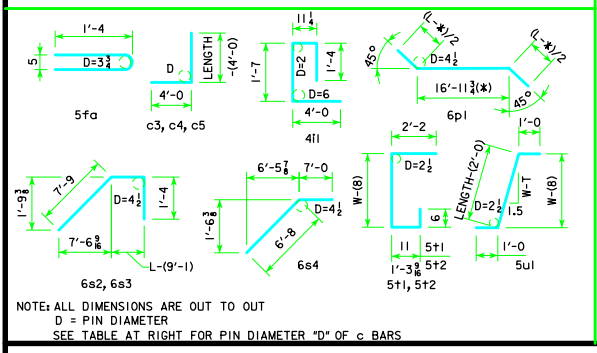
ALL REINFORCING IS TO BE SECURELY WIRED IN PLACE BEFORE THE CONCRETE IS POURED. ALL SLAB AND FLOOR REINFORCING STEEL IS TO BE SUPPORTED BY BAR CHAIRS AT INTERVALS OF NOT MORE THAN 3'-0 IN EITHER DIRECTION AS OUTLINED IN THE STANDARD SPECIFICATIONS.

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" ESTIMATED TO EXTEND 2'-0 BEYOND BACK OF PARAPET (INTO END OF BARREL). LONGITUDINAL BARS "4d" AND "6f1" ESTIMATED TO PROJECT INTO END SECTION OF BARREL A MINIMUM OF 2'-0 BEYOND BACK OF PARAPET. THE "LENGTH" COLUMN REFLECTS TOTAL NUMBER OF FEET NECESSARY TO MEET THESE REQUIREMENTS.

BENT BAR DETAILS



ENGLISH/DIGITIZED/INGENIEUR/REVISIONS/DGN - PWH 45-5-12 - THIS SHEET ISSUED 04-12.

LATEST REVISION DATE

Iowa Department of Transportation
Highway Division

STANDARD DESIGN - SINGLE REINFORCED CONCRETE BOX CULVERTS

PARALLEL WING HEADWALLS

APRIL, 2012

QUANTITY TABULATION

12'-0 SPAN
45° SKEW

PWH 45-5-12

APPROVED BY BRIDGE ENGINEER