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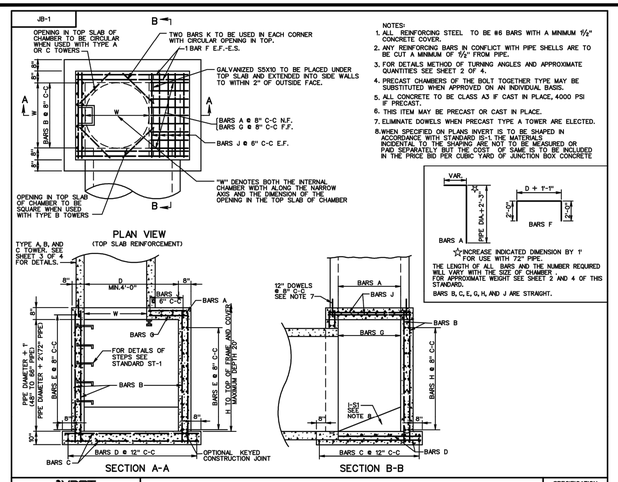

NOTES:

1. ALL REINFORCING STEEL TO BE #6 BARS WITH A MINIMUM 5½" CONCRETE COVER.
2. ANY REINFORCING BARS IN CONFLICT WITH PIPE SHELLS ARE TO BE CUT A MINIMUM OF 5½" FROM PIPE.
3. FOR DETAILS METHOD OF TURNING ANGLES AND APPROXIMATE QUANTITIES SEE SHEET 2 OF 4.
4. PRECAST CHAMBERS OF THE BOLT TOGETHER TYPE MAY BE SUBSTITUTED WHEN APPROVED ON AN INDIVIDUAL BASIS.
5. ALL CONCRETE TO BE CLASS A3 IF CAST IN PLACE, 4000 PSI IF PRECAST.
6. THIS ITEM MAY BE PRECAST OR CAST IN PLACE.
7. ELIMINATE DOWELS WHEN PRECAST TYPE A TOWER ARE ELECTED.
8. WHEN SPECIFIED ON PLANS INVERT IS TO BE SHAPED IN ACCORDANCE WITH STANDARD IS-1. THE MATERIALS INCIDENTAL TO THE SHAPING ARE NOT TO BE MEASURED OR PAID SEPARATELY BUT THE COST OF SAME IS TO BE INCLUDED IN THE PRICE BID PER CUBIC YARD OF JUNCTION BOX CONCRETE

✱ INCREASE INDICATED DIMENSION BY 1' FOR USE WITH 72" PIPE.

THE LENGTH OF ALL BARS AND THE NUMBER REQUIRED WILL VARY WITH THE SIZE OF CHAMBER FOR APPROXIMATE WEIGHT SEE SHEET 2 AND 4 OF THIS STANDARD.

BARS B, C, E, G, H, AND J ARE STRAIGHT.

VDOT ROAD AND BRIDGE STANDARDS		JUNCTION BOX CHAMBER DETAILS FOR 48" - 72" PIPE CULVERTS MAX. DEPTH (H) = 20'	SPECIFICATION REFERENCE
SHEET 1 OF 4	REVISION DATE	VIRGINIA DEPARTMENT OF TRANSPORTATION	105 233 302
106.10			

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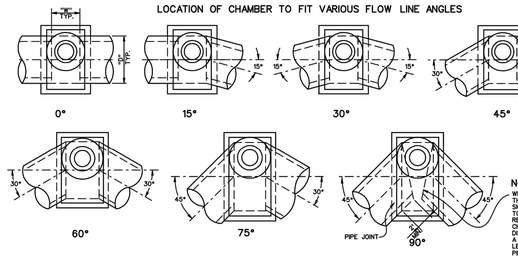
LOCATION OF CHAMBER TO FIT VARIOUS FLOW LINE ANGLES



NOTES:

WHERE PIPES ENTER THE CHAMBER ON A SKEW, PIPE WALLS ARE TO BE EXTENDED, IF REQUIRED INTO THE CHAMBER A SUFFICIENT DISTANCE TO MAINTAIN A MINIMUM UNCUT LENGTH OF 2' IN A 6' PIPE SECTION.

QUANTITIES FOR CHAMBER ✱

	PIPE SIZE	ANGLE OF TURN 0° DIM. D	0° CU. YDS. CONC.	0° LBS. REINF. STEEL	1° - 30° DIM. D	1° - 30° CU. YDS. CONC.	1° - 30° LBS. REINF. STEEL	31° - 60° DIM. D	31° - 60° CU. YDS. CONC.	31° - 60° LBS. REINF. STEEL	61° - 90° DIM. D	61° - 90° CU. YDS. CONC.	61° - 90° LBS. REINF. STEEL
TYPE A	48"	4'-10"	4.56	1293	5'-0"	4.65	1317	5'-7"	4.99	1412	6'-10"	5.72	1602
	54"	5'-5"	5.16	1466	5'-7"	5.26	1558	6'-3"	5.10	1617	7'-8"	6.53	1798
	60"	6'-0"	5.80	1657	6'-3"	5.96	1794	6'-11"	6.38	1831	8'-6"	7.38	2064
	66"	6'-7"	6.46	2028	6'-10"	6.63	2069	7'-7"	7.12	2220	9'-4"	8.27	2510
	72"	7'-2"	7.77	2248	7'-5"	7.95	2306	8'-3"	8.56	2490	10'-2"	9.97	2843
TYPE B	48"	4'-10"	4.06	1149	5'-0"	4.15	1173	5'-7"	4.46	1274	6'-10"	5.12	1440
	54"	5'-5"	4.61	1308	5'-7"	4.70	1373	6'-3"	5.07	1452	7'-8"	5.85	1619
	60"	6'-0"	5.19	1487	6'-3"	5.33	1531	6'-11"	5.71	1651	8'-6"	6.63	1925
	66"	6'-7"	5.79	1810	6'-10"	5.94	1934	7'-7"	6.40	2058	9'-4"	7.45	2359
	72"	7'-2"	7.00	2020	7'-5"	7.17	2086	8'-3"	7.73	2264	10'-2"	9.03	2585
TYPE C	48"	4'-10"	3.53	1030	5'-0"	3.61	1052	5'-7"	3.88	1133	6'-10"	4.47	1294
	54"	5'-5"	4.02	1177	5'-7"	4.10	1236	6'-3"	4.43	1305	7'-8"	5.14	1454
	60"	6'-0"	4.54	1337	6'-3"	4.67	1381	6'-11"	5.02	1484	8'-6"	5.85	1710
	66"	6'-7"	5.09	1592	6'-10"	5.22	1674	7'-7"	5.64	1789	9'-4"	6.59	2062
	72"	7'-2"	6.19	1835	7'-5"	6.34	1885	8'-3"	6.88	2050	10'-2"	8.05	2355

✱ QUANTITIES SHOWN ARE FOR CHAMBER WITHOUT PIPES. PIPE DISPLACEMENT OF CONCRETE AND STEEL MUST BE DEDUCTED TO OBTAIN TRUE QUANTITIES. SEE SHEET 4 OF 4.

CHAMBER AND TOWER QUANTITIES FOR CONCRETE AND REINFORCING STEEL MUST BE ADDED TO OBTAIN TOTALS.

"W"	STRUCT. STEEL
2'-0"	30 Lbs.
3'-0"	40 Lbs.
4'-0"	50 Lbs.

SPECIFICATION REFERENCE	JUNCTION BOX DETAILS FOR ANGULAR CONNECTIONS OF 48" - 72" PIPE CULVERTS	VDOT ROAD AND BRIDGE STANDARDS	
105 233 302	VIRGINIA DEPARTMENT OF TRANSPORTATION	REVISION DATE	SHEET 2 OF 4
		106.11	

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DETAILS OF TOWERS

TYPE A

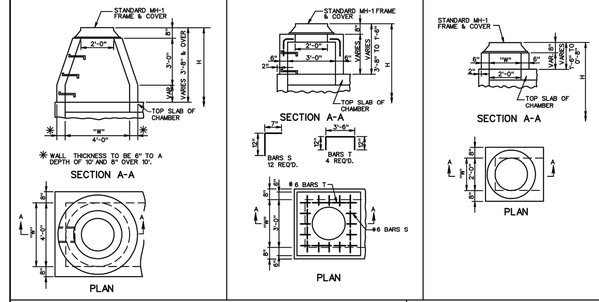
TO BE USED WHEN VERTICAL DISTANCE BETWEEN GRADE AND INVERT OF PIPE IS PIPE DIAMETER PLUS 5'-4" OR GREATER (SEE NOTE 3).

TYPE B

TO BE USED WHEN VERTICAL DISTANCE BETWEEN GRADE AND INVERT OF PIPE IS PIPE DIAMETER PLUS 3'-2" TO 5'-4" (SEE NOTE 3).

TYPE C

TO BE USED WHEN DISTANCE BETWEEN GRADE AND INVERT OF PIPE IS PIPE DIAMETER PLUS 2'-4" TO 3'-2" (SEE NOTE 3).



NOTES:

1. PRECAST UNITS IN ACCORDANCE WITH STANDARD MH-2 MAY BE SUBSTITUTED FOR TYPE A TOWER SHOWN. IF SUBSTITUTED, PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICE FOR CONCRETE AND STEEL BASED ON THE THEORETICAL QUANTITIES THAT WOULD HAVE BEEN REQUIRED TO BUILD THE TYPE A TOWER.
2. SEE STANDARD SL-1 FOR APPLICABILITY OF SAFETY SLABS.
3. INCREASE INDICATED DIMENSION BY ONE FOOT FOR USE WITH 72" DIAMETER PIPE.
4. CHAMBER AND TOWER QUANTITIES FOR CONCRETE AND REINFORCING STEEL MUST BE ADDED TO OBTAIN TOTALS.

QUANTITIES FOR TOWER ✱✱

	TYPE A	TYPE B	TYPE C
CONCRETE	0.643 C.Y.	0.325 C.Y.	——
INCREMENT PER FOOT	0.262 TO 10' DEPTH 0.362 OVER 10'	0.259	0.145
REINFORCING STEEL	——	62 LBS.	——

✱✱ QUANTITIES SHOWN ARE FOR MINIMUM TOWERS OF EACH TYPE. FOR TOWERS ABOVE MINIMUM HEIGHT INCREMENTS SHOWN PER FOOT MUST BE ADDED.

VDOT ROAD AND BRIDGE STANDARDS		JUNCTION BOX TOWER DETAILS FOR 48" - 72" PIPE CULVERTS MAXIMUM DEPTH (H) = 20'	SPECIFICATION REFERENCE
SHEET 3 OF 4	REVISION DATE	VIRGINIA DEPARTMENT OF TRANSPORTATION	105 233 302
106.12			

COMMONWEALTH OF VIRGINIA
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5/13/2015
PROFESSIONAL ENGINEER

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SUBMITTAL DATE
05/13/2015

DATE	REVISION
05/01/2015	PROGRESS SET
05/06/2015	BID SET
05/13/2015	FINAL BID SET

DRAWN DF, JD, JF, JW, MT
DESIGNED DF, JW, MT
CHECKED SF, JJ
SCALE NONE

CITY OF COLONIAL HEIGHTS
DEPARTMENT OF PUBLIC WORKS
ENGINEERING & DEVELOPMENT DIVISION

BRUCE AVENUE DRAINAGE IMPROVEMENTS
STANDARD DRAINAGE DETAILS

SHEET NO.
10 OF 31