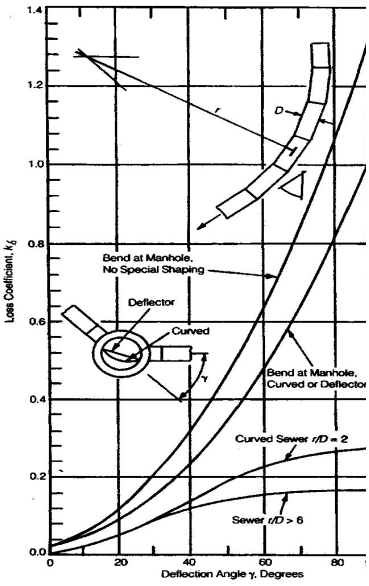
DESIGN INFO

MHFD-Culvert, Version 4.00 (May 2020)

CIRCULAR (SHAPE = 1) SUMMARY OF SHAPES, MATERIALS, SIZES, & "n"

Matl CODE	SPANS (in.)	NO. OF CULVERTS	DEFAULT CORRUG.	DEF. "n"	ENTRANCE (ITYPE)	INLET EDGE (CI)	EQUATION NUMBER-IC	HDS 5 CHT#-SCALE
1-RCP	8-144	29,p96ac		.012	1-Conv	1-sq. proj.	8	(not used)
						3-headwall	9	1-1
						4-groove	4	1-3
						5-groove,hd	5	1-2
						6-1:1 bevel	6	3-A
						7-1.5 bev.	7	3-B
2-CSP	12-96	17,p49ai	2.7x.5	.024	1-Conv	1-thin	1	2-3
	54-144	16,p50ai	3x1	.028		2-mitered	2	2-2
	54-144	16,p50ai	5x1	.026		3-headwall	3	2-1
	60-312	43,p58ai	6x2	.035		6-1.1 bevel	6	3-A
						7-1.5 bevel	7	3-B
3-CAP	12-84	16,p39ka	2.7x.5	.024	1-Conv	(Same as CSP)		
	30-120	16,p39ka	3x1	.028				
	48-120	13,p39ka	6x1	.025				
	60-252	33,p39ka	9x2.5	.035				
ALL	See Inlet Control Procedures For Equations				2-Side (Cir)	1-thin	face, side	56-3
						2-square		56-2
						3-bevel		56-1
					3-Side	see box	face, side	58-1/2
					4-slope	see box	face, slope	59-1/2



Values of Kb

ai = AISI, Handbook of Steel Drainage & Highway Construction Products, 1983
ka = Kaiser Aluminum, Hydraulic Design Detail, DP-131, Edition 2, 1984

EQ	EDGE	KE	SR	A	BS	C	DIP	EE	F
1	thin	0.9	0.5	0.187321	0.56771	-0.156544	0.0447052	-0.00343602	0.000089661
2	mitered	0.7	-0.7	0.107137	0.757789	-0.361462	0.1233932	-0.01606422	0.00076739
3	headwall	0.5	0.5	0.167433	0.538595	-0.149374	0.0391543	-0.00343974	0.000115882
4	groove	0.2	0.5	0.108786	0.662381	-0.233801	0.0579585	-0.0055789	0.000205052
5	grv.hdw.	0.2	0.5	0.114099	0.653562	-0.233615	0.0597723	-0.00616338	0.000242832
6	1.1-bev.	0.2	0.5	0.063343	0.766512	-0.316097	0.0876701	-0.009836951	0.00041676
7	1.5-bev.	0.2	0.5	0.08173	0.698353	-0.253683	0.065125	-0.0071975	0.000312451
8	sq.-proj.	0.2	0.5	0.167287	0.558766	-0.159813	0.0420069	-0.00369252	0.000125169
9	headwall	0.5	0.5	0.087483	0.706578	-0.253295	0.0667001	-0.00661651	0.000250619
10	end-sect.	0.4	0.5	0.120659	0.630768	-0.218423	0.0591815	-0.00599169	0.000229287

EQ #'s: REFERENCE
1-10: HY-8 User Manual, FHWA, July 2016, page 46

BOX (SHAPE = 2) SUMMARY OF SHAPES, MATERIALS, SIZES, & "n"

Matl CODE	SPAN RANGE	RISE RANGE	DEF. "n"	ENTRANCE (ITYPE)	INLET EDGE (CI)	EQUATION NUMBER-IC	HDS 5 CHT#-SCALE
1-RCB	4'-15'	4'-20'	.012	1-Conv	1-square	1	10-1
					2-1.5 bev	2	10-3
					3-1.1 bev	3	10-2
					4-30-75sq	4	8-1
					5-90-15sq	1	8-2
					6-0 sq	5	8-3
					7-1.5 bev	6	9-2
					8-bevel	6	9-1
All	See Inlet Control Procedures For Equations			2-Side	1&2-square	face, side	58-1
					3&4-bevel		58-2
				4-Slope	1&2-square	face, slope	59-1
					3&4-bevel		59-2

ac = ACPA, Concrete Pipe Design Manual, February 1985

EQ	EDGE	KE	SR	A	BS	C	DIP	EE	F
1	square	0.5	0.5	0.122117	0.505435	-0.10856	0.0207809	-0.00136757	0.00003456
2	1.5-bev.	0.2	0.5	0.1067588	0.4551575	-0.08128951	0.01215577	-0.00067794	0.0000148
3	1.1-bev.	0.2	0.5	0.1666086	0.3989353	-0.06403921	0.01120135	-0.0006449	0.000014566
4	sq-30/75	0.4	0.5	0.0724927	0.507087	-0.117474	0.0221702	-0.00148958	0.000038
5	square	0.7	0.5	0.144133	0.461363	-0.0921507	0.0200028	-0.00136449	0.0000358
6	bevel	0.2	0.5	0.0995633	0.4412465	-0.07434981	0.01273183	-0.0007588	0.00001774

EQ #'s: REFERENCE
1-6: HY-8 User Manual, FHWA, July 2016, page 46