

Corrugated Steel Pipe—Manning's "n" Value

All Diameters		Helical* Corrugation									
		1-1/2" x 1/4"		Helical—2-2/3" x 1/2" 60 in.							
2-2/3" x 1/2"	Annular	8 in.	10 in.	12 in.	15 in.	18 in.	24 in.	36 in.	48 in.	and Larger	
Unpaved	0.024	0.012	0.014	0.011	0.012	0.013	0.015	0.018	0.020	0.021	
PAVED-INVERT	0.021						0.014	0.017	0.020	0.019	
SMOOTH-FLO	0.012						0.012	0.012	0.012	0.012	
HEL-COR CL	0.012						0.012	0.012	0.012	0.012	
SmoothCor	N/A					0.012	0.012	0.012	0.012	0.012	
		Helical*—3" x 1"									
3" x 1"	Annular			36 in.	42 in.	48 in.	54 in.	60 in.	66 in.	72 in.	78 in. and Larger
Unpaved	0.027			0.022	0.022	0.023	0.023	0.024	0.025	0.026	0.027
PAVED-INVERT	0.023			0.019	0.019	0.020	0.020	0.021	0.022	0.022	0.023
SMOOTH-FLO	0.012					0.012	0.012	0.012	0.012	0.012	0.012
HEL-COR CL	0.012						0.012	0.012	0.012	0.012	0.012
SmoothCor	N/A					0.012	0.012	0.012	0.012	0.012	0.012
		Helical*—5" x 1"									
5" x 1"	Annular					48 in.	54 in.	60 in.	66 in.	72 in.	78 in. and Larger
Unpaved	0.025					0.022	0.022	0.023	0.024	0.024	0.025
PAVED-INVERT	0.022					0.019	0.019	0.020	0.021	0.021	0.022
SMOOTH-FLO	0.012							0.012	0.012	0.012	0.012
HEL-COR CL	0.012							0.012	0.012	0.012	0.012
ULTRA-FLO		3/4" x 3/4" x 7-1/2" All diameters n = 0.012									

*Tests on helically corrugated pipe demonstrate a lower coefficient of roughness than for annually corrugated steel pipe. Pipe-arches approximately have the same roughness characteristics as their equivalent round pipes.