4.0 APPENDIX

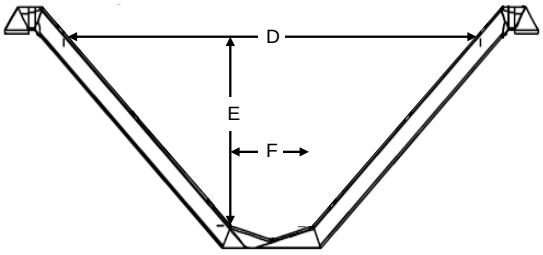
4.2 SmartDitch Flow Calculations

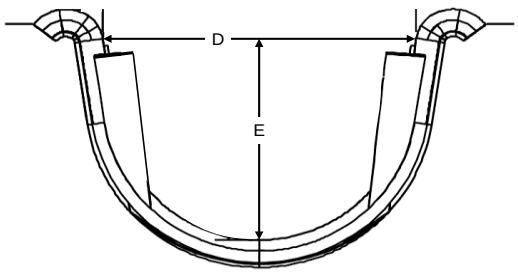
Flow rate calculations for the channel system are based on the standard hydraulic flow formula:

$$Q = (1.49/n)\ A\ R^{2/3}\ S^{1/2}$$

Where:

Q = Total Flow
N = Manning's Coefficient of Friction (0.022)
A = area (sf)
R = hydraulic radius (ft) [R = A / wetted perimeter]
S = slope (%)





	12" Trapezoid		24" Trapezoid		24" Semi-Circular	
D:	Max Flow Area Top:	34.500	Max Flow Area Top:	59.500	Max Flow Area Top:	24.000
E:	Max Flow Depth:	13.500	Max Flow Depth:	25.000	Max Flow Depth:	14.000
F:	Bottom Channel Width (interior):	8.000	Bottom Channel Width (interior):	12.000	Bottom Channel Width (interior):	N/A
	Mannings:	0.022	Mannings:	0.022	Mannings:	0.022

Slope *%*	Flow *cfs*	Velocity *fps*	Flow *cfs*	Velocity *fps*	Flow *cfs*	Velocity *fps*
0.50%	6.15	3.09	27.72	4.47	4.10	2.63
1.00%	8.70	4.37	39.20	6.32	5.79	3.72
2.50%	13.75	6.90	61.98	9.99	9.16	5.89
5.00%	19.45	9.76	87.65	14.12	12.95	8.33
7.50%	23.82	11.96	107.35	17.30	15.87	10.20
10.00%	27.51	13.81	123.96	19.97	18.32	11.78
15.00%	33.69	16.91	151.81	24.46	22.44	14.42
20.00%	38.90	19.53	175.30	28.24	25.91	16.66