

## 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 (%)

To calculate the hydraulic flow area & radius of each SmartDitch size, dimensions are provided below.

ITEM DESCRIPTION	ITEM #	12" DEPTH TRAPEZOIDAL - IN	24" DEPTH TRAPEZOIDAL - IN (MM)	24" DEPTH SEMI-CIRCULAR - IN (MM)
Channel top width	A	37.50 (952.50)	64.25 (1632)	24.00 (609.60)
Channel height (interior)	B	14.50 (368.30)	27.00 (685.80)	16.00 (406.40)
Minimum freeboard	C	1.00 (25.40)	2.00 (50.80)	2.00 (50.80)
Maximum flow area top width	D	34.50 (876.30)	60.00 (1524)	16.00 (406.40)
Maximum flow depth	E	13.50 (342.90)	24.75 (629)	14.00 (355.60)
Bottom channel width (interior)	F	8.00 (203.20)	11.50 (292)	N/A (Rounded Bottom)
Top shoulder width (w/out knuckle)	G	4.50 (114.30)	5.25 (133)	5.00 (127.00)

