

# Channel Report

## Angie's Acres Ditch Capacity

### Trapezoidal

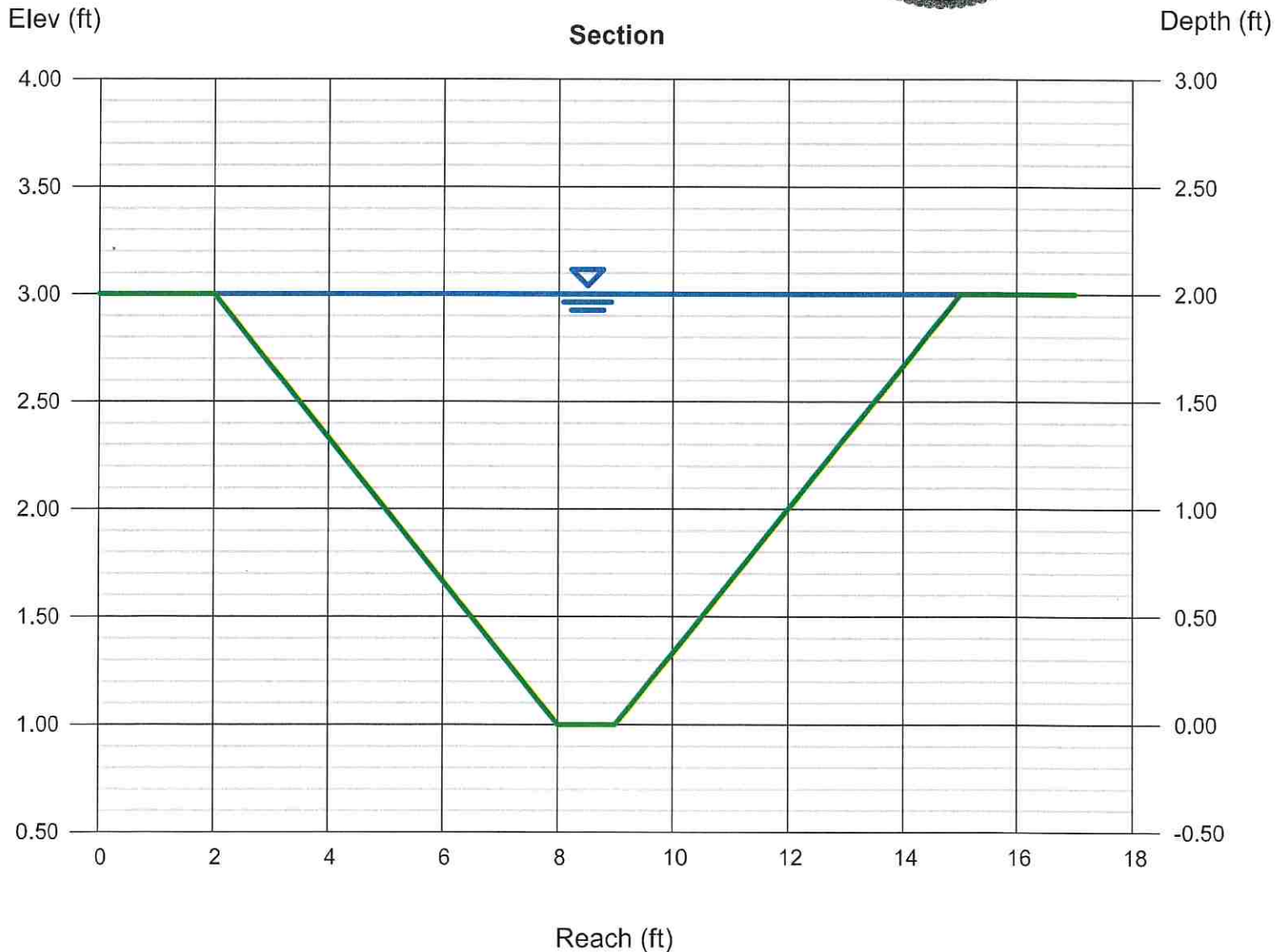
Bottom Width (ft)	= 1.00
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 2.00
Invert Elev (ft)	= 1.00
Slope (%)	= 0.01
N-Value	= 0.050

### Highlighted

Depth (ft)	= 2.00
Q (cfs)	= 4.232
Area (sqft)	= 14.00
Velocity (ft/s)	= 0.30
Wetted Perim (ft)	= 13.65
Crit Depth, Yc (ft)	= 0.52
Top Width (ft)	= 13.00
EGL (ft)	= 2.00

### Calculations

Compute by:	Q vs Depth
No. Increments	= 3

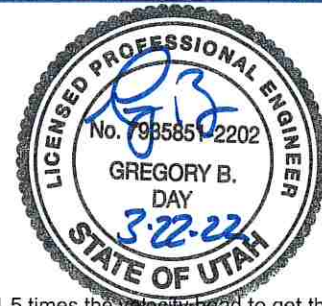


# Manning Formula Uniform Pipe Flow at Given Slope and Depth

Angie's Acres

Ditch Capacity

Inputs			Results		
Pipe diameter, $d_0$	2.5	ft	Flow, Q (See notes)	8.9479	cfs
Manning roughness, $n$	0.011		Velocity, $v$	1.9229	ft/sec
Pressure slope (possibly ? equal to pipe slope), $S_0$	0.03	% rise/run	Velocity head, $h_v$	0.0249	psi
Percent of (or ratio to) full depth (100% or 1 if flowing full)	90	%	Flow area	4.6534	ft <sup>2</sup>
			Wetted perimeter	6.2452	ft
			Hydraulic radius	0.7451	ft
			Top width, T	1.5000	ft
			Froude number, $F$	0.19	
			Average shear stress (tractive force), $\tau$	0.0140	psf



Notes:

**This is the flow and depth *inside* the pipe.**

Getting the flow into the pipe may require significantly higher headwater depth. Add at least 1.5 times the velocity head to get the headwater depth or [see my 2-minute tutorial](#) for standard culvert headwater calculations using HY-8.