Channel Geometry

V-Shape

Cross-Sectional Area \( (A) = Zy^2 \)
Top Width \( (T) = 2yZ \)
Hydraulic Radius \( (R) = \frac{Zy}{2\sqrt{Z^2 + 1}} \)

Parabolic Shape

Cross-Sectional Area \( (A) = \frac{2}{3}Ty \)
Top Width \( (T) = \frac{1.5A}{y} \)
Hydraulic Radius \( (R) = \frac{T^2y}{1.5T^2 + 4y^2} \)

Trapezoidal Shape

Cross-Sectional Area \( (A) = by + Zy^2 \)
Top Width \( (T) = b + 2yz \)

Figure V-9.4.5
Geometric Formulas for Common Swale Shapes

Source: Livingston, et al, 1984

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