

**Example Problem 4A-6\_1, Calculating Spread (Simple Triangle)**

Calculate the spread (T) for a simple triangular gutter section.

Given:

Empirical Coefficient:  $K_u = 0.56$ .

Cross Slope:  $S_x = 0.03$  ft/ft.

Manning's coefficient:  $n = 0.016$  (PC pavement with broom finish).

Total Flow Rate:  $Q = 1.6$  ft<sup>3</sup>/s.

Longitudinal Slope:  $S_L = 0.02$  ft/ft.

From Equation 4A-6\_4, calculate spread (T):

$$T = \left[ \frac{nQ}{K_u S_x^{1.67} \sqrt{S_L}} \right]^{0.375} = \left[ \frac{0.016 \times 1.6}{0.56 \times 0.03^{1.67} \sqrt{0.02}} \right]^{0.375} = 5.89 \text{ feet}$$

Discussion:

Note the curb and gutter unit is often not broom finished and the curb/gutter width (non-broomed area) may carry a substantial amount of the flow, therefore this  $n$  value could be too high, but will result in a conservative (possibly higher)  $T$ . When estimating  $Q$ , a higher  $n$  value is less conservative.