

TR 55 Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: _____ Designed By: _____ Date: _____

Location: _____ Checked By: _____ Date: _____

Circle one: Present Developed

Circle one: T_c T_t through subarea _____

NOTES: Space for as many as two segments per flow type can be used for each worksheet. Include a map, schematic, or description of flow segments.

Sheet Flow (Applicable to T_c only)

Segment ID

1. Surface description (Table 3-1)
2. Manning's roughness coeff., n (Table 3-1)
3. Flow length, L (total L ≤ 100 ft) ft
4. Two-year 24-hour rainfall, P₂..... in
5. Land slope, s ft/ft
6. $T_t = \frac{0.007 (nL)^{0.8}}{P_2^{0.5} s^{0.4}}$ Compute T_t hr

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Shallow Concentrated Flow

Segment ID

7. Surface description (paved or unpaved)
8. Flow length, L ft
9. Watercourse slope, s ft/ft
10. Average velocity, V (Figure 3-1) ft/s
11. $T_t = \frac{L}{3600 V}$ Compute T_t hr

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Channel Flow

Segment ID

12. Cross sectional flow area, a ft²
13. Wetted perimeter, P_w ft
14. Hydraulic radius, $r = \frac{a}{P_w}$ Compute r ft
15. Channel Slope, s ft/ft
16. Manning's Roughness Coeff., n
17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$ Compute V ft/s
18. Flow length, L ft
19. $T_t = \frac{L}{3600 V}$ Compute T_t hr
20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19) hr

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