Important Channel Flow Time and Time of Concentration Formulas PDF

Formulas
Examples
with Units

List of 9
Important Channel Flow Time and Time of Concentration Formulas

1) Channel Flow Time given Total Time of Concentration Formula

Evaluate Formula

Formula

$$T_{m/f} = t_c - T_i$$

Example with Units

$$19.44\,\text{min} = 114.22\,\text{min} - 94.78\,\text{min}$$

2) Channel Flow Time or Gutter Flow Time Formula

Evaluate Formula

Formula

$$T_{m/f} = \frac{L}{V}$$

Example with Units

$$19.4444\,\text{min} = \frac{3.5\,\text{km}}{3\,\text{m/s}}$$

3) Inlet Time given Total Time of Concentration Formula

Evaluate Formula

Formula

$$T_i = t_c - T_{m/f}$$

Example with Units

$$94.78\,\text{min} = 114.22\,\text{min} - 19.44\,\text{min}$$

4) Inlet Time or Time of Equilibrium Formula

Evaluate Formula

Formula

$$T_i = \left(0.885 \cdot \left(\frac{\left(L_{ob}\right)^3}{H}\right)\right)^{0.385}$$

Example with Units

$$94.6166\,\text{min} = \left(0.885 \cdot \left(\frac{\left(4\,\text{km}\right)^3}{10.05\,\text{m}}\right)\right)^{0.385}$$

5) Length of Drain given Channel Flow Time Formula

Evaluate Formula

Formula

$$L = T_{m/f} \cdot V$$

Example with Units

$$3.4992\,\text{km} = 19.44\,\text{min} \cdot 3\,\text{m/s}$$

6) Length of Overland Flow given Inlet Time Formula

Evaluate Formula

Formula

$$L_{ob} = \left(\frac{\left(T_i \right)^{\frac{1}{0.385}} \cdot H}{0.885} \right)^{\frac{1}{3}}$$

Example with Units

$$4.006\,\text{km} = \left(\frac{\left(94.78\,\text{min} \right)^{\frac{1}{0.385}} \cdot 10.05\,\text{m}}{0.885} \right)^{\frac{1}{3}}$$

7) Total Fall of Level from Critical Point to Mouth of Drain given Inlet Time Formula

Evaluate Formula

Formula

$$H = \frac{\left(L_{ob} \right)^3}{\frac{\left(T_i \right)^{\frac{1}{0.385}}}{0.885}}$$

Example with Units

$$10.0051\,\text{m} = \frac{\left(4\,\text{km} \right)^3}{\frac{\left(94.78\,\text{min} \right)^{\frac{1}{0.385}}}{0.885}}$$

8) Total Time of Concentration Formula

Evaluate Formula

Formula

$$t_c = T_i + T_{m/f}$$

Example with Units

$$114.22\,\text{min} = 94.78\,\text{min} + 19.44\,\text{min}$$

9) Velocity in Drain given Channel Flow Time Formula

Evaluate Formula

Formula

$$V = \frac{L}{T_{m/f}}$$

Example with Units

$$3.0007\,\text{m/s} = \frac{3.5\,\text{km}}{19.44\,\text{min}}$$

Variables used in list of Channel Flow Time and Time of Concentration Formulas above

- **H** Fall of Level *(Meter)*
- **L** Length of Drain *(Kilometer)*
- L_{ob} Length of Overland Flow *(Kilometer)*
- t_c Time of Concentration *(Minute)*
- T_i Inlet Time *(Minute)*
- $T_{m/f}$ Channel Flow Time *(Minute)*
- **V** Velocity in Drain *(Meter per Second)*

Constants, Functions, Measurements used in list of Channel Flow Time and Time of Concentration Formulas above

- Measurement: **Length** in Kilometer (km), Meter (m)
  Length Unit Conversion
- Measurement: **Time** in Minute (min)
  Time Unit Conversion
- Measurement: **Speed** in Meter per Second (m/s)
  Speed Unit Conversion

Download other Important Estimating the Peak Drainage Discharge PDFs

- Important Channel Flow Time and Time of Concentration Formulas
- Important Rainfall Intensity Formulas
- Important Peak Drainage Discharge Formula Formulas

Try our Unique Visual Calculators

- Reverse percentage
- HCF calculator
- Simple fraction

Please SHARE this PDF with someone who needs it!

This PDF can be downloaded in these languages

English Spanish French German Russian Italian Portuguese Polish Dutch

9/18/2024 | 12:19:37 PM UTC