

Name: \_\_\_\_\_

# Academy of Urban Planning: Stormwater Calculations

## (1) Total Campus Area :

$$\frac{\text{Total Campus Length (mm)}}{\text{Total Campus Length (mm)}} \times \frac{\text{Total Campus Width (mm)}}{\text{Total Campus Width (mm)}} = \boxed{\text{Total Campus Area (mm}^2\text{)}}$$

## (2) Tree Pit Measurements:

$$\frac{\text{Tree Pit Length (mm)}}{\text{Tree Pit Length (mm)}} \times \frac{\text{Tree Pit Width (mm)}}{\text{Tree Pit Width (mm)}} \times \text{Total Number of Tree Pits} = \text{Total Tree Pit Area (mm}^2\text{)}$$

## (3) Green Space Regions:

Region	Length (mm)	Width (mm)	Area
A			
B			
C			
D			
E			
F			
G			
H			
I			
J			
K			
<b>Total Greenspace Area :</b>			

## (4) Total Permeable Area:

$$\frac{\text{Total Tree Pit Area}}{\text{Total Tree Pit Area}} + \frac{\text{Total Greenspace Area}}{\text{Total Greenspace Area}} = \boxed{\text{Total Permeable Area}}$$

## (5) Percent Permeable Area

$$\frac{\text{Total Permeable Area}}{\text{Total Campus Area}} \times 100 = \boxed{\text{Percent Permeable Area}}$$

## (6) Percent Impermeable Area:

$$100 - \text{Percent Permeable Area} = \boxed{\text{Percent Impermeable Area}}$$



Keep Going!

## (7) Map Scale Conversions

$$\frac{\text{Total Campus Length (inches)}}{\text{Total Campus Length (meters)}} \times 26.5 = \frac{\text{Total Campus Length (meters)}}{\text{Total Campus Length (meters)}}$$

$$\frac{\text{Total Campus Width (inches)}}{\text{Total Campus Width (meters)}} \times 26.5 = \frac{\text{Total Campus Width (meters)}}{\text{Total Campus Width (meters)}}$$

$$\frac{\text{Total Campus Length (meters)}}{\text{Total Campus Length (meters)}} \times \frac{\text{Total Campus Width (meters)}}{\text{Total Campus Width (meters)}} = \text{Actual Campus Area (meters}^2\text{)}$$

## (8) Storm Event Selection (circle one)

**90% Storm**

1.3 inches  
(0.033 meters)

**1-Year Storm**

2.8 inches  
(0.0711 meters)

**10-Year Storm**

5 inches  
(0.1270 meters)

## (9) Storm Event Volume Calculation

$$\frac{\text{Rain Amount (meters)}}{\text{Rain Amount (meters)}} \times \frac{\text{Actual Campus Area (meters}^2\text{)}}{\text{Actual Campus Area (meters}^2\text{)}} = \text{Total Rain Volume Over Campus (meters}^3\text{)}$$

## (10) Run-off Volume Calculation

$$\frac{\text{Total Rain Volume Over Campus (meters}^3\text{)}}{\text{Total Rain Volume Over Campus (meters}^3\text{)}} \times \frac{\text{Percent Impermeable Area}}{\text{Percent Impermeable Area}} \div 100 = \frac{\text{Runoff Volume (meters}^3\text{)}}{\text{Runoff Volume (meters}^3\text{)}} \times 264 \text{ Gallons}$$

## (11) Infiltration Volume Calculation

$$\frac{\text{Total Rain Volume Over Campus (meters}^3\text{)}}{\text{Total Rain Volume Over Campus (meters}^3\text{)}} - \frac{\text{Runoff Volume (meters}^3\text{)}}{\text{Runoff Volume (meters}^3\text{)}} = \frac{\text{Infiltration Volume (meters}^3\text{)}}{\text{Infiltration Volume (meters}^3\text{)}} \times 264 \text{ Gallons}$$

**You Survived Math Day!!!**