

**APPENDIX B**  
**EXAMPLE OF CALCULATING**  
**STORMWATER FLOW USING THE**  
**RATIONAL METHOD**

**PWSA BASIC INFORMATION FOR CALCULATION OF STORMWATER  
FLOW USING THE RATIONAL METHOD**

The rational method for calculating the quantity of stormwater for the PWSA Water and Sewer Use Application is defined by the following equation:

$$Q = CIA$$

- where Q = maximum rate of runoff, cubic feet per second (cfs)
- C = coefficient of runoff based on type and character of surface
- I = average rainfall intensity, inches per hour (use 5.8 in/hr for the 25-year storm)
- A = drainage area, acre

**COEFFICIENT OF RUNOFF**

Type of Surface	C Value
Improved Surface (concrete, asphalt, brick)	0.95
Improved Surface (stone, gravel, or slag—surface treated)	0.80
Building	0.95
Improved Surface (gravel, stone, slag)	0.60
Unimproved Surface (grass and landscaped areas)	0.40

***EXAMPLE***

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*Assume a lot of 1 acre.*

*Proposed building has area of 0.3 acre — AREA 1*

*Proposed asphalt parking lot and concrete sidewalk has area of 0.2 acre — AREA 2*

*Proposed landscaped area of 0.5 acre — AREA 3*

*Calculate stormwater flow for PWSA Water and Sewer Use Application using rational method.*

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<i>AREA NO.</i>	<i>C VALUE</i>	<i>FORMULA</i>	<i>AMOUNT OF STORMWATER (cfs)</i>
<i>1</i>	<i>0.95</i>	<i><math>Q = (0.95)(5.8)(0.3)</math></i>	<i>1.653</i>
<i>2</i>	<i>0.95</i>	<i><math>Q = (0.95)(5.8)(0.2)</math></i>	<i>1.102</i>
<i>3</i>	<i>0.40</i>	<i><math>Q = (0.40)(5.8)(0.5)</math></i>	<i>1.160</i>
<b><i>TOTAL STORMWATER FLOW</i></b>			<b><i>3.915</i></b>

PWSA reserves the right to require stormwater calculations sealed by a Pennsylvania registered professional engineer.

If a stormwater management report is required for the project by other agencies, it must be prepared and sealed by a Pennsylvania registered professional engineer.

10 X 30 DRIVEWAY  
300 SF GRAVEL

20 X 30 GARAGE  
600 SF ROOF

**RATIONAL EQUATION Q-CIA**

PAVED AREA: C - 0.95  
ROOF AREA: C-0.95  
GRAVEL, AREA: C-0.60  
UNIMPROVED: C-0.30

25 YEAR STORM - 5.8"

1 ACRE - 43560 SF

HOUSE ROOF - 1500 SF  
GARAGE ROOF - 600 SF  
PAVED WALK -100 SF

**ROOF & PAVING**

0.95 X 5.8" X 2200 SF/43560 - 0.28 CFS

GRAVEL DRIVE - 300 SF  
UNIMPROVED - 2500 SF

GRAVEL AND UNIMPROVED  
0.60 X 5.8" X 2800 SF/43560 - 0.22CFS

TOTAL AREA - 5000 SF - 0.115 AC  
TOTAL RUNOFF - 0.50 CPS

REMAINDER 2500 SF  
UNIMPROVED

5 X 20 WALK  
100 SF PAVED

30 X 50 HOUSE  
1500 SF ROOF