



## DRAINAGE CALCULATIONS

For: 32 Parker Place  
Lot 2, Block 507  
Borough of Upper Saddle River  
Bergen County, New Jersey  
May 20, 2021

  
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**Drainage Calculations  
for  
32 Parker Place  
Lot 2, Block 507  
Borough of Upper Saddle River  
Bergen County, NJ**

May 21, 2021

Existing Lot Area = 38,982 SF = 0.8949 Acres

**Prior Conditions**

Item	Coefficient	Square Footage
Dwelling (w/eaves)	0.9	4,212
Steps, Walks, Patio	0.9	550
Deck (Patio below)	0.9	253
A.C. Units	0.9	21
Driveway	0.9	3,650
<b>Total</b>		<b>8,686</b>

$$\text{Prior 'c'} = (8,686/38,982 \times 0.9) + (30,296/38,982 \times 0.35) = 0.47$$

$$Q = ciA; I = 6.7 \text{ in./hr. - 25 Year Storm; } T_c = 10 \text{ minutes}$$

$$Q \text{ prior} = 0.47 \times 6.7 \times 0.89 = \mathbf{2.80 \text{ cfs}}$$

**Current Conditions**

Item	Coefficient	Square Footage
Dwelling (w/eaves)	0.9	4,212
Steps, Walks, Patio	0.9	550
Deck (Patio below)	0.9	253
A.C. Units	0.9	21
Driveway	0.9	3,650
New Patio	0.9	2,353
Planter Wall	0.9	60
<b>Total</b>		<b>11,099</b>

$$\text{Current 'c'} = (11,099/38,982 \times 0.9) + (27,883/38,982 \times 0.35) = 0.51$$

$$Q \text{ current} = ciA = 0.51 \times 6.7 \times 0.89 = \mathbf{3.04 \text{ cfs}}$$

$$\text{Change in Runoff} = \{((3.04 \times 60 \times 10)/2 \times 2) + (3.04 \times 60 \times 0)\} - \{((2.80 \times 60 \times 10)/2 \times 2) + (2.80 \times 60 \times 0)\} = 144 \text{ CF}$$

Analysis of 60 minute storm

$Q = ciA$  ;  $I = 2.4$  in./hr. - 25 Year Storm; Duration: 60 minutes

$Q_{\text{prior}} = 0.47 \times 2.4 \times 0.89 = 1.00$  CFS

$Q_{\text{current}} = ciA = 0.51 \times 2.4 \times 0.89 = 1.09$  cfs

Change in Runoff =  $\{((1.09 \times 60 \times 10)/2 \times 2) + (1.09 \times 60 \times 50)\} - \{((1.00 \times 60 \times 10)/2 \times 2 + (1.0 \times 60 \times 50))\} = 324$  CF

Determine if Seepage Pit has adequate capacity to handle runoff from 10 Year – 60 minute storm.

**Anticipated Runoff from Newly Constructed Patio/Planter**

$c = 0.95$

$I = 2.0$  in./hr.

$A = 2,353 + 60 = 2,413$  SF = 0.055 Acre

$Q = ciA = 0.95 \times 2.0 \times 0.055 = 0.105$  cfs

Expected Runoff =  $((0.105 \times 60 \times 10)/2) \times 2 + (0.105 \times 60 \times 50) = 378$  CF

By another method determine if system has capacity to handle Runoff to be expected from 10 Year – 60 minute storm of 2.0”.

**Newly Constructed Patio/Planter Area = 2,413 SF**

$c = 0.95$

Expected Runoff =  $0.95 \times 2.00/12 \times 2,413 = 382$  CF

**Capacity of System : (neglect percolation)**

**For the Patio/Planter:**

**Use 1 - 1000 Gallon Dry Wells surrounded by 33” Stone Bed.**

1000 Gallons/7.48 gallons per CF = 134 CF

Volume of Voids =  $(\frac{\pi}{4} \times 5.75^2 \times 8) - (\frac{\pi}{4} \times 3^2 \times 6) \times 0.4 = 265$  CF

Total Capacity =  $134 + 265 = 399$  CF

Therefore system has adequate capacity to handle change in runoff, generated from Constructed Improvements of the property, by a 25 Year -- 10 minute storm and 60 minute storm. In addition, the capacity is sufficient to handle the increase in runoff generated by a 10 Year - 60 minute storm from the construction of the Proposed Dwelling.

**Subject to a Soil Log and Percolation Test.**