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State of NJ Certificate of Authorization No. 276726

DRAINAGE CALCULATION



SIBONI

BLOCK 84, LOT 3.09 & 3.08

44 Pine Terrace

Borough of Demarest

Bergen County, New Jersey

PROJ. NO. 24-2398

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Professional Engineer and Planner
June 20, 2025

SEEPAGE PIT CALCUALTION FOR LOT 3.09(New Proposed House)

Seepage pit storage: 1530 Gallons Peerless Concrete Products or approved or equal.

Pit:

$$1530 \text{ Gal} / 7.48 \text{ Ga./Cu. ft.} = 204.54 * 3 = 613.62 \text{ Cu. ft.}$$

Stone:

$$42 \times 15 \times 6 = 3,780 \text{ cu.ft.}$$

$$\text{The outside diameter of Pit} = \frac{\pi}{4} * (10 \text{ ft.})^2 * 3 \text{ ft} = 235.62 * 3 = 706.86 \text{ Cu. ft.}$$

$$\text{Using 40 \% Void Ratio: } (3,780 \text{ Cu. ft} - 706.86 \text{ Cu.ft.}) * (40\%) = 1,229.26 \text{ Cu. ft.}$$

$$\text{Therefore Total: Pit Storage} = 613.62 \text{ Cu. ft.}$$

$$\text{Stone Storage} = 1,229.26 \text{ Cu. ft.}$$

$$\underline{\text{Percolation}} = \text{Not consider}$$

$$\text{Total} = 1,842.88 \text{ Cu. ft.}$$

Stormwater Management Calculation:

Design Storm 100 years over 1 hour period = 3.00 inches/hour

AREA:

Total Impervious Area = 7,382 Sq.ft or 0.17 ac from Minor Subdivision Zoning Chart – Total Improved Lot Coverage Sheet 2 of 5

$$C = 0.99$$

Volume of runoff:

$$Q = C * I * A$$

$$= (0.99) * 3 \frac{\text{inches}}{\text{hour}} * 0.17 = 0.50 \frac{\text{ft}^3}{\text{sec}}$$

$$V = 0.50 \frac{\text{ft}^3}{\text{sec}} * \frac{3600 \text{ sec}}{1 \text{ hr}} = 1,800 \text{ft}^3$$

Summary

Using Three (3) pit of total volume **1,842.88 cu. ft > 1,800 Cu. ft** volume required

SEEPAGE PIT CALCUALTION FOR LOT 3.08

Seepage pit storage: 1530 Gallons Peerless Concrete Products or approved or equal.

Pit:

$$1530 \text{ Gal} / 7.48 \text{ Ga./Cu. ft.} = 204.54 * 2 = 409.09 \text{ Cu. ft.}$$

Stone:

$$27.5 \times 15 \times 6 = 2,475 \text{ cu.ft.}$$

$$\text{The outside diameter of Pit} = \frac{\pi}{4} * (10 \text{ ft.})^2 * 3 \text{ ft} = 235.62 * 2 = 471.24 \text{ Cu. ft.}$$

$$\text{Using 40 \% Void Ratio: } (2,475 \text{ Cu. ft} - 471.24 \text{ Cu.ft.}) * (40\%) = 801.50 \text{ Cu. ft.}$$

$$\text{Therefore Total: Pit Storage} = 409.09 \text{ Cu. ft.}$$

$$\text{Stone Storage} = 801.50 \text{ Cu. ft.}$$

$$\underline{\text{Percolation}} = \text{Not consider}$$

$$\text{Total} = 1,210.59 \text{ Cu. ft.}$$

Stormwater Management Calculation:

Design Storm 100 years over 1 hour period = 3.00 inches/hour

AREA:

Total Impervious Area (House, Patio, Paver, pool)= 4,839 Sq.ft or 0.11 ac from Minor Subdivision Zoning Chart – Total Improved Lot Coverage Sheet 2 of 5

$$C = 0.99$$

Volume of runoff:

$$Q = C * I * A$$

$$= (0.99) * 3 \frac{\text{inches}}{\text{hour}} * 0.11 = 0.33 \frac{\text{ft}^3}{\text{sec}}$$

$$V = 0.33 \frac{\text{ft}^3}{\text{sec}} * \frac{3600 \text{ sec}}{1 \text{ hr}} = 1,188 \text{ft}^3$$

Summary

Using Two (2) pit of total volume **1,210.59 cu. ft > 1,188 Cu. ft** volume required

SEEPAGE PIT CALCULATION FOR LOT 3.08 Driveway

Seepage pit storage: 1530 Gallons Peerless Concrete Products or approved or equal.

Pit:

1530 Gal/ 7.48 Ga./Cu. ft. = 204.54 Cu. ft.

Stone:

11X 11 X 6 = 726 cu.ft.

The outside diameter of Pit = $\frac{\pi}{4} * (10 \text{ ft.})^2 * 3 \text{ ft} = 235.62 * 1 = 235.62 \text{ Cu. ft.}$

Using 40 % Void Ratio: $(726 \text{ Cu. ft} - 235.62 \text{ Cu.ft.}) * (40\%) = 196.15 \text{ Cu. ft.}$

Therefore Total: Pit Storage = 232.62 Cu. ft.

Stone Storage = 196.15 Cu. ft.

Percolation = Not consider

Total = 428.77 Cu. ft.

Stormwater Management Calculation:

Design Storm 100 years over 1 hour period = 3.00 inches/hour

AREA:

Total Impervious Area(Driveway) = 1,732 Sq.ft or 0.04 ac from Minor Subdivision Zoning Chart – Total Improved Lot Coverage Sheet 2 of 5

C = 0.99

Volume of runoff:

$$Q = C * I * A$$

$$= (0.99) * 3 \frac{\text{inches}}{\text{hour}} * 0.0397 = 0.118 \frac{\text{ft}^3}{\text{sec}}$$

$$V = 0.118 \frac{\text{ft}^3}{\text{sec}} * \frac{3600 \text{ sec}}{1 \text{ hr}} = 425 \text{ft}^3$$

Summary

Using Two (2) pit of total volume **428.77 cu. ft > 425 Cu. ft** volume required