

# DRAINAGE CALCULATIONS

For

## BCUW/ MADELINE HOUSING PARTNERS

Genther Avenue  
Block 223 – Lot 5  
Borough of Oradell, NJ  
Bergen County, New Jersey

August 8, 2023  
Revised March 28, 2024

Prepared By

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## **PROJECT DESCRIPTION**

The applicant is proposing to add a two story group home and parking lot to the undeveloped lot on Genther Avenue.

## **EXISTING CONDITIONS**

The property is located on the easterly side of Genther Avenue in the Borough of Oradell, Bergen County, N.J. The site is currently undeveloped. The site is identified as Lot 5 in Block 223. The property contains 19,943 S.F.; 0.46 acres. There are no environmental restrictions that have been identified which may limit the development of the site.

There is no existing impervious area.

The soil survey classifies the soils found on the site as Dunellen-Urban Land complex (DuuC) HSG-A. A map showing the site on the soil survey has been attached to the end of this report.

## **PROPOSED DEVELOPMENT**

The proposed development consists of 1 new residential building with an expanded parking area.

The proposed project will disturb 0.42 acres. The proposed impervious coverage will increase to 8,460 S.F. (0.19 acres). The proposed project does not increase the impervious coverage by more than 0.25 acres and does not disturb more than one acre. Therefore the project is not classified as a major development according to Chapter 231 of the Stormwater Control ordinance.

Seepage pits will be provided to control the quantity of runoff from the proposed building roofs and parking/ driveway. A total of four seepage pits will be required to store the runoff volume from the 100-year storm. Two seepage pits will be on the northerly side of the property and two will be on the southerly side,

.

## **METHODOLOGY**

The Rational Method was used to calculate the runoff from the site. Rainfall intensities were determined using the NJDEP IDF curve. The time of concentration was calculated using the nomograph published by the New Jersey Highway Authority, 1957, with a minimum of 10 minutes. Runoff coefficients were selected the 100-year 60 minute storm = 3". The runoff coefficients used for the impervious:  $c = 0.95$

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Date 8/8/2023  
Rev 3/28/2024

## DRAINAGE CALCULATIONS

Genther Avenue  
Borough of Oradell

Block 223 Lot 5

## PROJECT DESCRIPTION

Design Seepage Pits for Drainage of Proposed Roofs and Parking

## DRAINAGE DESIGN

Seepage pits will be utilized to collect and control runoff

Seepage Pit Design Criteria

Time of Concentration:  $T_c = 10$  Min.

Design Storm: 100-Year - 60 Min storm  
 $i = 3"/hr.$

Use Rational Method -  $Q = CiA$

### EXISTING COVERAGE

Structures	0 SF
Conc. Pad	0 SF
Driveway	0 SF
Walks	0 SF
Patio	0 SF

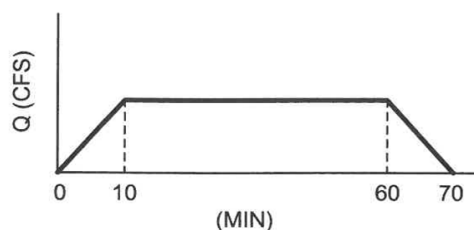
Total = 0 / 43560 SF/Acre  
= 0.00 Acres

### PROPOSED COVERAGE

Structures	4,150 SF
Walks	580 SF
Driveway/	3,210 SF
	0 SF
	0 SF

Total = 7,940 / 43560 SF/Acre  
= 0.18 Acres

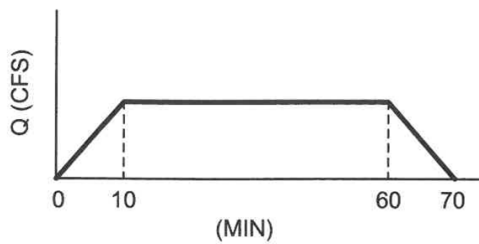
## EXISTING RUNOFF



$$Q = CiA = (0.95) \times (3.0) \times 0.00 \\ = 0.00 \text{ CFS}$$

$$\text{Volume} = (\text{Min})(\text{Sec/Min})(\text{Cfs}) \\ = (60)(60) \times 0.00 \\ \text{Volume} = 0 \text{ CF}$$

## PROPOSED RUNOFF



$$Q = CiA = (0.95) \times (3.0) \times 0.18$$

$$= 0.51 \text{ CFS}$$

$$\text{Volume} = (\text{Min})(\text{Sec/Min})(\text{Cfs})$$

$$= (60)(60) \times 0.51$$

$$\text{Volume} = 1,836 \text{ CF}$$

## STORAGE REQUIRED

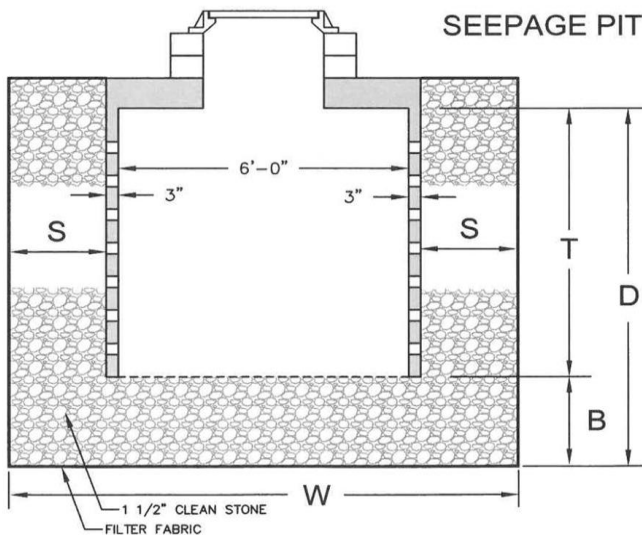
$$\begin{aligned} \text{Proposed Runoff Volume} &= 1,836 \text{ CF} \\ \text{Existing Runoff Volume} &= 0 \text{ CF} \\ \text{Storage Volume} &= 1,836 \text{ CF} \end{aligned}$$

$$\begin{aligned} \text{Check 3" Rainfall on the Proposed Roof} &= 4,150 \text{ SF}/43560 \text{ SF/Acre} \\ &= 0.10 \text{ Acre} \end{aligned}$$

$$\begin{aligned} Q = CiA &= (0.95)(3.0) \times 0.10 \\ &= 0.18 \text{ CFS} \end{aligned}$$

$$\begin{aligned} \text{Vol} &= (60)(60) \times 0.18 \\ &= 652 \text{ CF} \end{aligned}$$

$$\text{STORAGE REQUIRED} = 1,836 \text{ CF}$$



$$\begin{aligned} T &= \text{Tank height} &= 4 \\ S &= \text{Stone thickness} &= 3.5 \\ B &= \text{Stone depth below} &= 2 \\ D &= T + B &= 6.0 \\ W &= 7' + (2) \times S &= 14.0 \end{aligned}$$

$$\begin{aligned} \text{Pit Volume} &= [\pi(6^2)/4] \times T = 113 \\ \text{Tank Volume} &= [\pi(6.5^2)/4] \times T = 154 \end{aligned}$$

$$\begin{aligned} \text{Stone Volume} &= (W \times W \times D) - \text{Tank Vol.} \\ 14' \times 14' \times 6 &= 1,176 \\ - \text{Tank} &= 154 \\ \text{Stone Volume} &= 1,022 \end{aligned}$$

$$\begin{aligned} \text{Stone Voids} &= \text{Stone Vol.} \times 40\% \\ &= 409 \\ \text{Total Pit Volume} &= \text{Pit Vol.} + \text{Stone Voids} \\ &= 522 \end{aligned}$$

$$1000\text{-gallon seepage pits required} = 4$$

$$2088 > 1,836$$