DRAINAGE CALCULATIONS

For

BCUW/ MADELINE HOUSING PARTNERS

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

August 8, 2023

Prepared By

SCHWANEWEDE HALS & VINCE
ENGINEERING · LAND SURVEYING · PLANNING

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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 0.17 acres. The proposed impervious coverage will increase to 8,137 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 five seepage pits will be required to store the runoff. Three of the five seepage pits will be on the northerly side of the property while the remaining two will be on the southerly side, underneath the parking lot.

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

Schwanewede Hals & Vince

DRAINAGE CALCULATIONS

Genther Avenue
Borough of Oradell

Block   223   Lot   5

Prepared By:

[signature]

David A. Hals, PE, LS, PP, CME
NJPE&LS Lic. No. 29994

Date   8/8/2023

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: Tc = 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	SF
Driveway/	3,987 SF
	0 SF
	0 SF

Total = 8,137 / 43560 SF/Acre
= 0.19 Acres

EXISTING RUNOFF
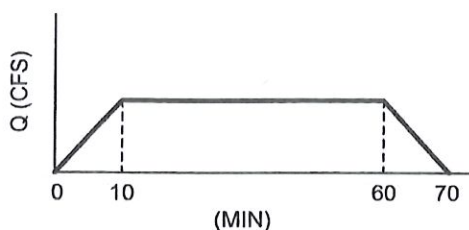
$Q = CiA = (0.95) \times (3.0) \times 0.00$
$= 0.00$ CFS

Volume = (Min)(Sec/Min)(Cfs)
$= (60)(60) * 0.00$
Volume = 0 CF

PROPOSED RUNOFF
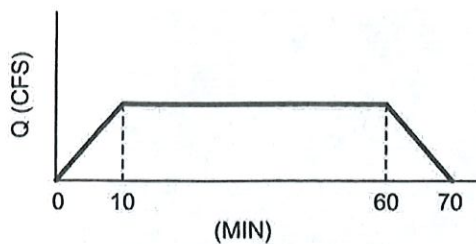
$Q = CiA = (0.95) \times (3.0) \times 0.19$
$= 0.54$ CFS

Volume = (Min)(Sec/Min)(Cfs)
$= (60)(60) * 0.54$
Volume = 1,944 CF

STORAGE REQUIRED

Proposed Runoff Volume =	1,944 CF
Existing Runoff Volume =	0 CF
Storage Volume =	1,944 CF

Check 3" Rainfall on the Proposed Roof = 4,150 SF/43560 SF/Acre
$= 0.10$ Acre

$Q = CiA = (0.95)(3.0)*0.10$
$= 0.18$ CFS

Vol = (60)(60) * 0.18
$= 652$ CF

STORAGE REQUIRED = 1,944 CF

SEEPAGE PIT
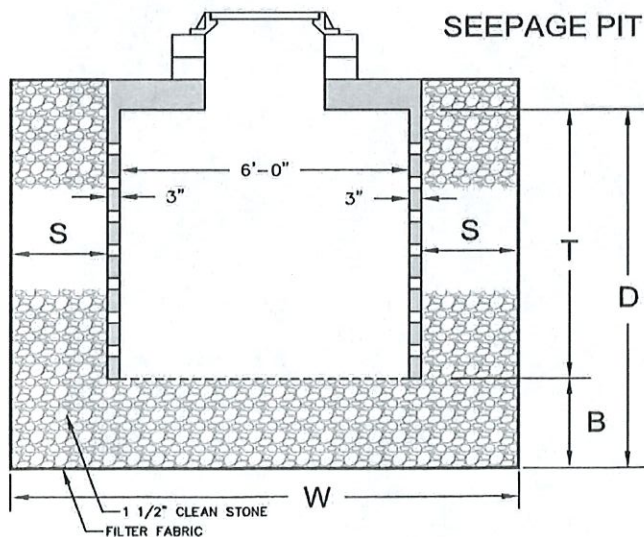
T = Tank height	= 4
S = Stone thickness	= 2.75
B = Stone depth belov	= 2
D = T + B	= 6.0
W = 7'+(2)*S	= 12.5

Pit Volume = $[\pi(6^2)/4] \times T = $ 113
Tank Volume = $[\pi(6.5^2)/4] \times T = $ 133

Stone Volume = (W x W x D) - Tank Vol.
$= 938$
- Tank = 133
Stone Volume = 805

Stone Voids = Stone Vol. x 40%
$= 322$
Total Pit Volume = Pit Vol. + Stone Voids
$= \boxed{435}$

1000- gallon seepage pits required = $\boxed{5}$

2175	>	1,944

Map Scale: 1:404 if printed on A portrait (8.5" x 11") sheet.

Meters
0   5   10   20   30

Feet
0   15   30   60   90
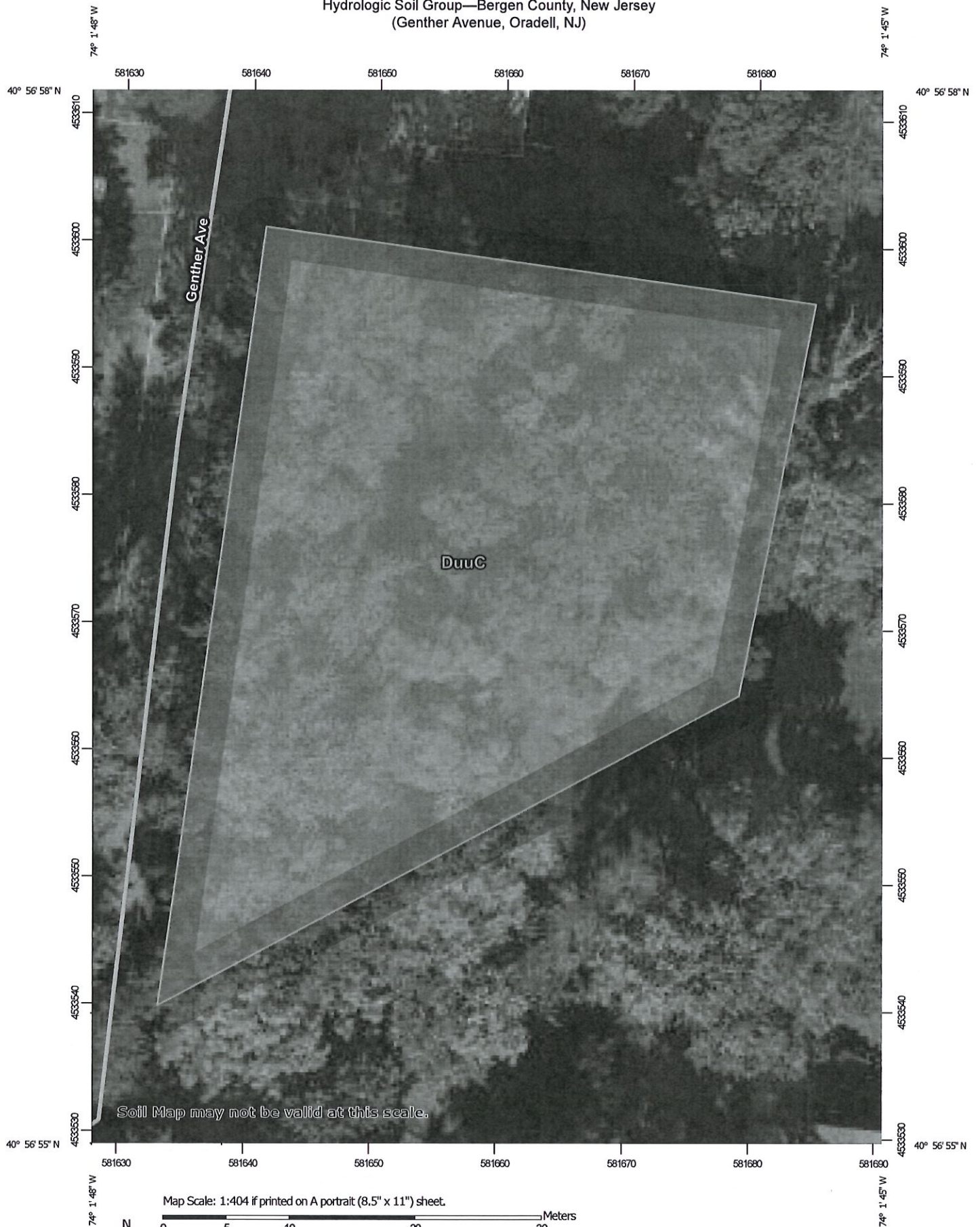
Map projection: Web Mercator   Corner coordinates: WGS84   Edge tics: UTM Zone 18N WGS84

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
DuuC	Dunellen-Urban land complex, 8 to 15 percent slopes	A	0.5	100.0%
Totals for Area of Interest			**0.5**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

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Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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