

DRAINAGE CALCULATIONS

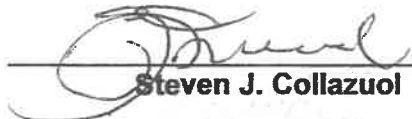
11 FOURTH AVENUE
LOT 26 BLOCK 2 SECTION 66.30
VILLAGE OF NYACK
ROCKLAND COUNTY , NY

August 12, 2025

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VILLAGE OF NYACK
BUILDING
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INTRODUCTION

THE FOLLOWING CALCULATIONS UTILIZE THE MODIFIED RATIONAL METHOD TO DETERMINE THE EXISTING RATE OF STORM-WATER RUNOFF AS PER 100 YEAR, 10 YEAR, AND 2 YEAR STORM EVENT. THE RAINFALL INTENSITIES WERE OBTAINED FROM FIGURE 1 RAINFALL INTENSITY CURVES FOR ROCKLAND COUNTY, NEW YORK.

EXISTING CONDITIONS

THE EXISTING SITE IS LOCATED AT CORNER OF FOURTH AVENUE AND GEDNEY STREET IN THE VILLAGE OF NYACK, NY. THE SITE CURRENTLY CONTAINS A DWELLING, DRIVEWAY, GARAGE AND SHED.

PROPOSED DEVELOPMENT

THE PROPOSED DEVELOPMENT OF THE SITE WILL INCLUDE IMPROVEMENTS FOR THE CONSTRUCTION OF (2) TWO FAMILY DWELLINGS. PEDESTRIAN AND VEHICULAR ACCESS WILL BE FROM FOURTH AVENUE AND GEDNEY STREET.

PROPOSED STORMWATER MANAGEMENT

THE PROPOSED STORMWATER MANAGEMENT SYSTEM WILL CONSIST OF SEEPAGE PITS TO CONTAIN ALL THE ROOF RUNOFF FROM THE PROPOSED DWELLINGS.

DRAINAGE CALCULATIONS
MODIFIED RATIONAL METHOD
PER R.S.I.S.

EXISTING CONDITIONS

I. AREAS

RUNOFF COEFFICIENT c

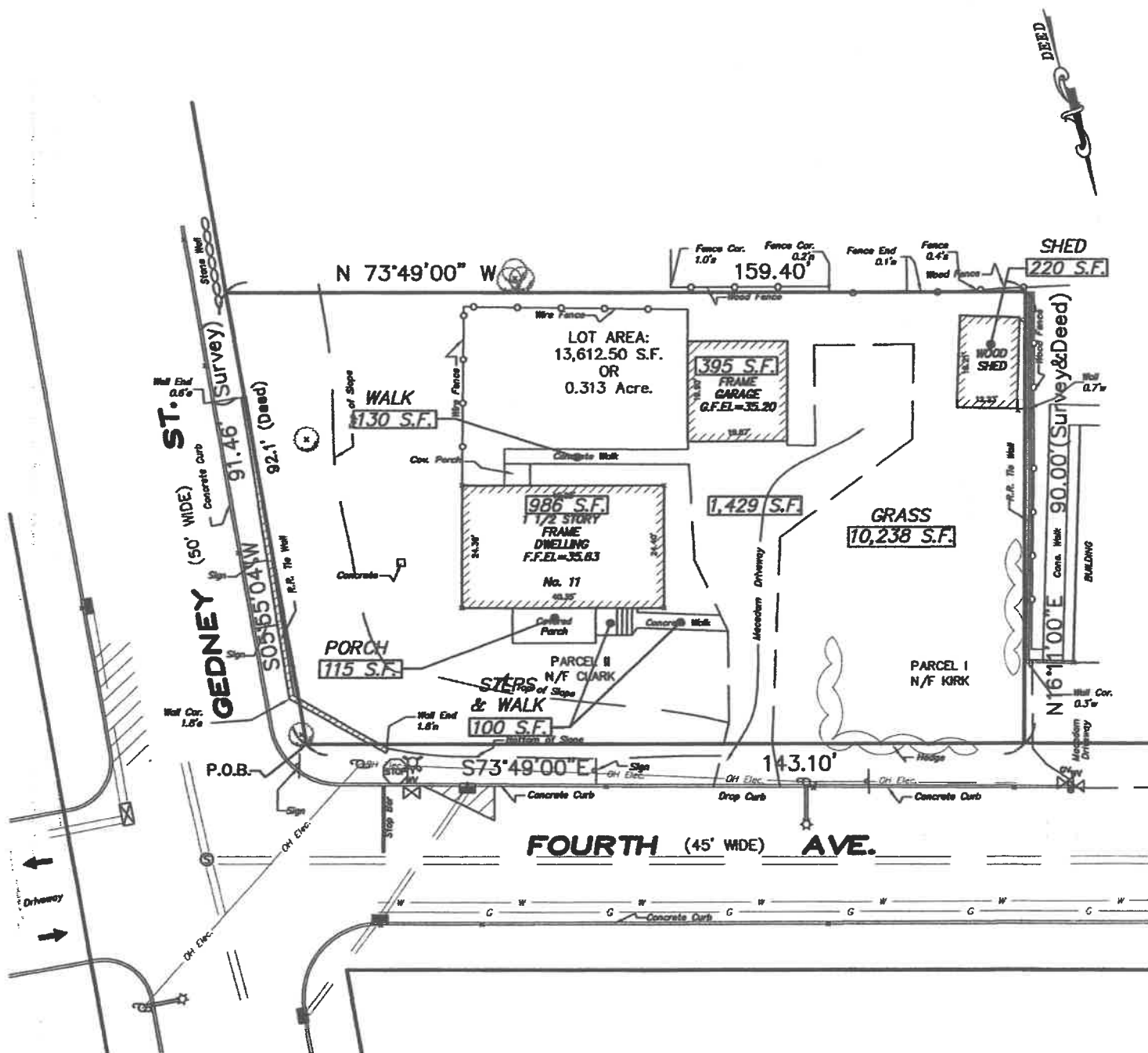
EX. DWELLING, GARAGE, & SHED	1,716	SF	0.95
CONC. WALK & STEPS	230	SF	0.95
MACADAM DRIVEWAY	1,429	SF	0.95
GRASS& BRUSH	10,238		0.35
TOTAL	13,613	SF	
=	0.313	AC	

II. DRAINAGE AREA CHARACTERISTICS

DRAINAGE AREA, A	0.313	AC
TIME OF CONCENTRATION, T _c	10	MIN
RAINFALL INTENSITY, i ₁₀₀	8.0	IN/HR
RAINFALL INTENSITY, i ₁₀	5.3	IN/HR
RAINFALL INTENSITY, i ₂	3.6	IN/HR
c (weighted)	0.50	

III. EXISTING RUNOFF

100 year storm (cfs)	Q = ciA =	1.25
10 year storm (cfs)	Q = ciA =	0.83
2 year storm (cfs)	Q = ciA =	0.56



EXISTING CONDITIONS MAP

SCALE 1" = 30'

DRAINAGE CALCULATIONS

MODIFIED RATIONAL METHOD

PER R.S.I.S.

PROPOSED CONDITIONS

I. AREAS

RUNOFF COEFFICIENT c

IMPERVIOUS AREAS (BUILDING,PATIO, STEPS,WALKS, & DRIVEWAYS)	6,668	SF	0.95
GRASSED	6,945		0.35
TOTAL	13,613	SF	
=	0.313	AC	

II. DRAINAGE AREA CHARACTERISTICS

DRAINAGE AREA, A	0.313	AC
TIME OF CONCENTRATION, Tc	10	MIN
RAINFALL INTENSITY, i100	8.0	IN/HR
RAINFALL INTENSITY, i10	5.3	IN/HR
RAINFALL INTENSITY, i2	3.6	IN/HR
c (weighted)	0.64	

DRAINAGE CALCULATIONS
MODIFIED RATIONAL METHOD
PER R.S.I.S.

III. PROPOSED RUNOFF

100 Year Storm	Q = ciA	DURATION (MIN) 10	INTENSITY (IN/HR) 8.0	C * AREA (ACRES) 0.201	FLOW (CFS) 1.61
10 Year Storm	Q = ciA	DURATION (MIN) 10	INTENSITY (IN/HR) 5.3	C * AREA (ACRES) 0.201	FLOW (CFS) 1.07
2 Year Storm	Q = ciA	DURATION (MIN) 10	INTENSITY (IN/HR) 3.6	C * AREA (ACRES) 0.201	FLOW (CFS) 0.72

DRAINAGE CALCULATIONS
MODIFIED RATIONAL METHOD
PER R.S.I.S.

IV. STORAGE DURATION VALUES

100 Year Storm					
STORM DURATION	PROPOSED	EXISTING	RUNOFF	RELEASED	REQUIRED
(MIN)	FLOW	FLOW	VOLUME	VOLUME	STORAGE
	Q	Q			VOLUME
	(CFS)	(CFS)	(CF)	(CF)	(CF)
10	1.61	1.25	966	748	218

10 Year Storm					
STORM DURATION	PROPOSED	EXISTING	RUNOFF	RELEASED	REQUIRED
(MIN)	FLOW	FLOW	VOLUME	VOLUME	STORAGE
	Q	Q			VOLUME
	(CFS)	(CFS)	(CF)	(CF)	(CF)
10	1.07	0.83	640	496	144

2 Year Storm					
STORM DURATION	PROPOSED	EXISTING	RUNOFF	RELEASED	REQUIRED
(MIN)	FLOW	FLOW	VOLUME	VOLUME	STORAGE
	Q	Q			VOLUME
	(CFS)	(CFS)	(CF)	(CF)	(CF)
10	0.72	0.56	435	337	98

MINIMUM REQUIRED STORAGE VOLUME	=	218 cf
	=	1629 gal

PROVIDED (4) SEEPAGE PITS WITH A CAPACITY OF 5,158 GALLONS FOR PROPOSED LOTS A & B

DRAINAGE CALCULATIONS
MODIFIED RATIONAL METHOD
PER R.S.I.S.

SUPPLEMENTAL CALCULATIONS PROPOSED LOT A

Note: The following calculations utilize the modified rational method to determine the required storage volume. The design is based on a 60 minute duration, 10 year storm frequency.

I. PROPOSED AREAS DRAINING TO SEEPAGE PITS (BUILDING ROOFTOP) PROPOSED LOT A
RUNOFF COEFFICIENT c

IMPERVIOUS	2,178	SF	0.95
TOTAL	2,178	SF	
=	0.050	AC	

II. DRAINAGE AREA CHARACTERISTICS

DRAINAGE AREA	0.050	AC
TIME OF CONCENTRATION, T _c	60	MIN
RAINFALL INTENSITY, i ₁₀	2.1	IN/HR

RUNOFF COEFFICIENT COMP., c	0.95
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III. PROPOSED RUNOFF

10 Year Storm	Q = ciA	DURATION (MIN)	INTENSITY (IN/HR)	C * AREA (ACRES)	FLOW (CFS)
		60	2.1	0.048	0.10

DRAINAGE CALCULATIONS
MODIFIED RATIONAL METHOD
PER R.S.I.S.

IV. STORAGE DURATION VALUES

10 Year Storm

STORM DURATION	PROPOSED FLOW Q	EXISTING FLOW Q	RUNOFF VOLUME	RELEASED VOLUME	REQUIRED STORAGE VOLUME
(MIN)	(CFS)	(CFS)	(CF)	(CF)	(CF)
60	0.10	0.00	359	0	359

MAXIMUM REQUIRED STORAGE VOLUME	=	359 cf
	=	2,686 gal

V. SEEPAGE PIT VOLUME PROVIDED

HEIGHT OF PIT =	4	ft.
OUTSIDE DIAMETER OF PIT =	7	ft.
INSIDE DIAMETER OF PIT =	6.00	ft.
CAPACITY OF SEEPAGE PIT =	846	gal.
WIDTH OF STONE AROUND PIT =	1	ft.
VOID RATIO =	0.4	
VOLUME OF STONE VOIDS =	40.21	cf
=	301	gal.
DEPTH OF STONE BELOW PIT	1.5	ft.
VOID RATIO =	0.4	
VOLUME OF STONE VOIDS =	38.17	cf
=	286	gal.
TOTAL VOLUME / PIT =	1433	gal.

NUMBER OF PITS REQUIRED = REQUIRED STORAGE VOLUME / TOTAL VOLUME OF PIT

= 1.9

NUMBER OF PITS PROVIDED = 2

DRAINAGE CALCULATIONS

MODIFIED RATIONAL METHOD

PER R.S.I.S.

SUPPLEMENTAL CALCULATIONS PROPOSED LOT B

Note: The following calculations utilize the modified rational method to determine the required storage volume. The design is based on a 60 minute duration, 10 year storm frequency.

I. PROPOSED AREAS DRAINING TO SEEPAGE PITS (BUILDING ROOFTOP) PROPOSED LOT B RUNOFF COEFFICIENT c

BUILDING ROOF	1,840	SF	0.95
TOTAL	1,840	SF	
	= 0.042	AC	

II. DRAINAGE AREA CHARACTERISTICS

DRAINAGE AREA	0.042	AC
TIME OF CONCENTRATION, T _c	60	MIN
RAINFALL INTENSITY, i ₁₀	2.1	IN/HR

RUNOFF COEFFICIENT COMP., c	0.95
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III. PROPOSED RUNOFF

10 Year Storm	Q = ciA	DURATION (MIN)	INTENSITY (IN/HR)	C * AREA (ACRES)	FLOW (CFS)
		60	2.1	0.040	0.08

DRAINAGE CALCULATIONS
MODIFIED RATIONAL METHOD
PER R.S.I.S.

IV. STORAGE DURATION VALUES

10 Year Storm

STORM DURATION	PROPOSED FLOW Q	EXISTING FLOW Q	RUNOFF VOLUME	RELEASED VOLUME	REQUIRED STORAGE VOLUME
(MIN)	(CFS)	(CFS)	(CF)	(CF)	(CF)
60	0.08	0.00	303	0	303
MAXIMUM REQUIRED STORAGE VOLUME		=	303 cf		
		=	2,269 gal		

V. SEEPAGE PIT VOLUME PROVIDED

HEIGHT OF PIT =	3	ft.
OUTSIDE DIAMETER OF PIT =	7	ft.
INSIDE DIAMETER OF PIT =	6.00	ft.
CAPACITY OF SEEPAGE PIT =	634	gal.
WIDTH OF STONE AROUND PIT =	1	ft.
VOID RATIO =	0.4	
VOLUME OF STONE VOIDS =	30.16	cf
=	226	gal.
DEPTH OF STONE BELOW PIT	1.5	ft.
VOID RATIO =	0.4	
VOLUME OF STONE VOIDS =	38.17	cf
=	286	gal.
TOTAL VOLUME / PIT =	1146	gal.

NUMBER OF PITS REQUIRED = REQUIRED STORAGE VOLUME / TOTAL VOLUME OF PIT

= 2

NUMBER OF PITS PROVIDED = 2

FIGURE - I

RAINFALL INTENSITY CURVES FOR ROCKLAND COUNTY, NEW YORK

STORM DURATIONS: - 5 MINUTES TO 120 MINUTES
RETURN PERIODS - 2 YEARS TO 100 YEARS

NUSSBAUMER, CLARKE & VELZY
CONSULTING ENGINEERS

INTENSITY (INCHES PER HOUR)

