BERTIN ENGINEERING
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JOB	20-196: Mixed Use Building - Clifton, NJ		
SHEET NO.	1	OF	3
CALCULATED BY	MBL	DATE	6/18/2021
CHECKED BY	SPF	DATE	6/18/2021
SCALE			

STORMWATER DRAINAGE CALCULATIONS

MIXED USE BUILDING
BLOCK 7.15, LOTS 10 & 11
453 & 463 LEXINGTON AVENUE
CITY OF CLIFTON, PASSAIC COUNTY, NEW JERSEY

BE# 20-196

JUNE 18, 2021

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NJPE Lic # 37073

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JOB	20-196: Mixed Use Building - Clifton, NJ		
SHEET NO.	2	OF	3
CALCULATED BY	MBL	DATE	6/18/2021
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SCALE			

1 DETERMINE THE CHANGE IN SURFACE RUNOFF DUE TO THE PROPOSED CONSTRUCTION:

I) Determine Rainfall Intensity (I) for 2, 10 & 100 Year Storms:

1. Use T_c = 10 mins

2. Calculate I_2, I_{10} & I_{100}: (Based on Trenton Rainfall Database)
   I_2 = 4.3 in/hr
   I_{10} = 5.9 in/hr
   I_{100} = 8.0 in/hr

II) Use Rational Formula to Determine Flow:

Q = c x I x A where
Q = Flow (cfs)
c = Runoff Coefficient
I = Rainfall Intensity (in/hr)
A = Area (ac)

use c = 0.99 for Impervious Areas
c = 0.30 for Landscape Areas

1. Calculate c:

Existing:

Impervious =	18,037 sf =	**0.414 ac**
Landscape =	1,750 sf =	**0.040 ac**
Total Area =	19,787 sf =	**0.454 ac**

$$c = \frac{0.99 \times 0.414 + 0.30 \times 0.040}{0.454} = \mathbf{0.93}$$

Proposed:

Impervious =	16,322 sf =	**0.375 ac**
Landscape =	3,465 sf =	**0.080 ac**
Total Area =	19,787 sf =	**0.454 ac**

$$c = \frac{0.99 \times 0.375 + 0.30 \times 0.080}{0.454} = \mathbf{0.87}$$

2. Calculate Q_2, Q_{10} & Q_{100}:

Existing:	Q_2 =	0.93	x	4.30	x	0.454	=	**1.82 cfs**
	Q_{10} =	0.93	x	5.90	x	0.454	=	**2.49 cfs**
	Q_{100} =	0.93	x	8.00	x	0.454	=	**3.38 cfs**
Proposed:	Q_2 =	0.87	x	4.30	x	0.454	=	**1.70 cfs**
	Q_{10} =	0.87	x	5.90	x	0.454	=	**2.33 cfs**
	Q_{100} =	0.87	x	8.00	x	0.454	=	**3.16 cfs**

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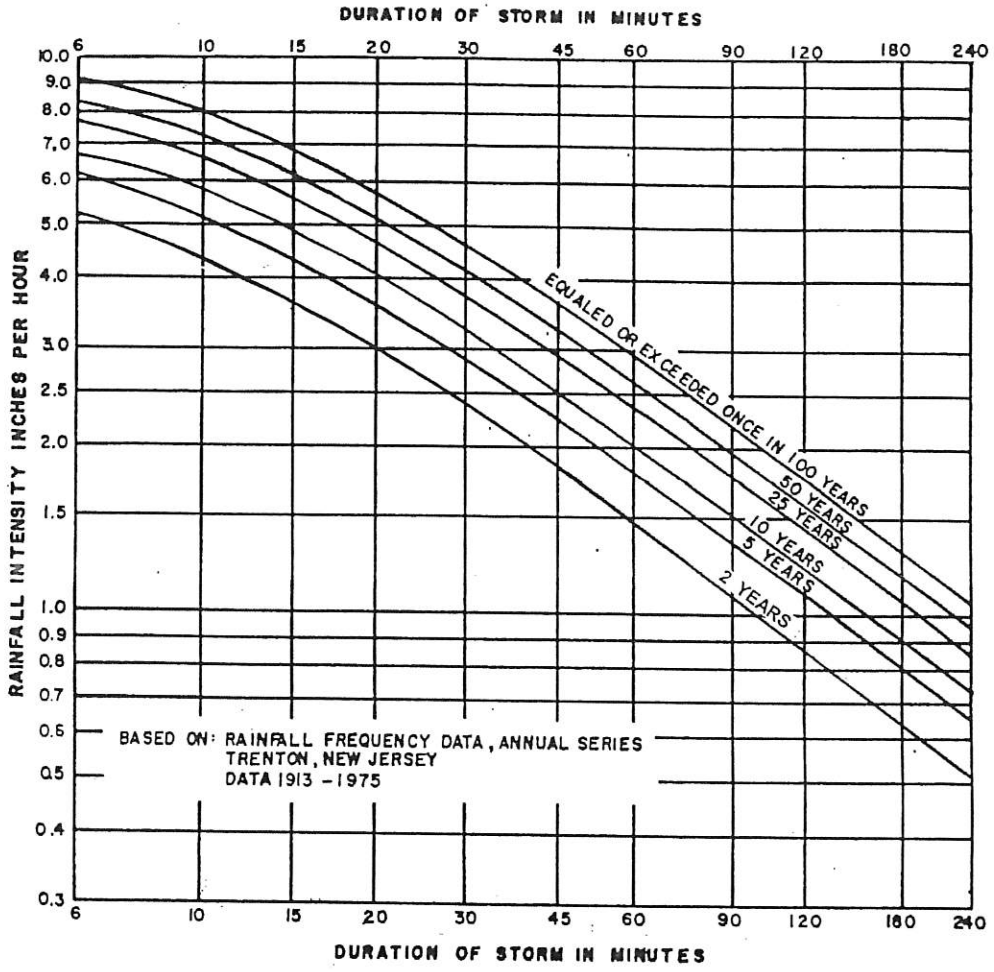
III) Conclusion:

STORM (year)	EXISTING (cfs)	PROPOSED (cfs)	CHANGE (cfs)
2	1.82	1.70	-0.12
10	2.49	2.33	-0.16
100	3.38	3.16	-0.22

The calculations indicate that the site's runoff for the proposed redevelopment will be decreased when compared to the existing conditions during the three design storms.

The site is not a "Major Development" as defined by NJAC 7:8 since it has a limit of disturbance less than 1 acre and a net increase of impervious area less than 0.25 acres. Therefore, the stormwater management on-site is not required to meet the groundwater recharge, water quality and water quantity requirements.

Figure 5-4: Rainfall Intensity-Duration-Frequency Curves



Note: Adapted from Figure 2.1-2 in the NJDEP *Technical Manual for Stream Encroachment Permits.*