

# STORMWATER MANAGEMENT REPORT

BROADWAY & WALLIS  
141 - 143 BROADWAY, JERSEY CITY NJ

Proposed Construction of a new 5-Story Multi-Family Building  
With 32 Residential Units and Ground Floor Parking  
Block 10301, Lots 40,41,42  
Jersey City, New Jersey

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## **Introduction**

### I. Project Description and Location

The property to be developed is designated as Block 10301, Lots 40,41, & 42. The property is not located in a tidal flood zone. The proposed scope of work is new 5-story Multifamily building with ground floor parking garage. The stormwater management system proposed is sized to accommodate flows from the site for the 2, 10- and 100-year storms events.

### II. Existing Site Conditions

The property is located at the intersection on Broadway and Wallis Avenue in Jersey City, NJ. It is 10,000 sq. ft. (0.23-acre) site that is currently a paved parking lot, with one existing residential building on site to be demolished. The site topography ranges between 13 ft to 16 ft. The storm water drainage runoff sheet flows in the North direction towards the Broadway frontage of the property.

The soil type for this site is classified as Urban land, Dunellen Substratum (URDUNB), 0 to 8 percent slopes. The property's Hydrologic soil group type, which is based on the USDA soils data of Essex County, NJ, is type C soils.

### III. Stormwater Management Description

The pre and post development runoff flows were calculated in accordance with the City of Jersey City Stormwater Ordinance and the Stormwater Best Management Practices (BMP). As noted above, the proposed site is 10,000 sq. ft. (0.23-acre) and the development does not exceed ¼ acre of new impervious coverage. Storm water runoff quality management will be discussed in this report.

## **Pre& Post Development Quality Control**

The purpose of this report is to demonstrate that the design methods used to design and analyze the stormwater management system is accordance to the Stormwater BMP and The City of Jersey City Storm Water Ordinance. The ordinance requires the storm water detention system to be designed based on 2, 10 and 100-year rainstorm events. Additionally, the discharge flow into the city's sewer is prohibited to exceed the allowable flows from the pre-developed conditions. The allowable flows are reduced flows from the pre-developed conditions by factors of 50%, 75% and 80%, respectively. We will compare the proposed development flows with the allowable

predevelopment flows. We further intend to demonstrate that the stormwater contribution of the proposed building development does not negatively impact the storm sewer system.

**Pre & Post Development Runoff Conditions**

It is the purpose of this report to provide information on the methods and techniques employed in the stormwater management design that demonstrate that the stormwater runoff will not be increased due to the development. The Rational and Modified Methods will be utilized to perform the drainage calculations.

Accordingly, stormwater management analysis in this report consists of:

1. Calculating runoff from the rainfall for 2, 10- and 100-year storm events for the pre and post-development conditions of each drainage area
2. Comparing the results of the pre-developed vs. post-developed conditions to ensure that all stormwater regulations have been met

I. Predevelopment Conditions

The total drainage area for the site is 10,000 sq. ft. (0.23-acre) which is currently vacant land with some free-standing structures. The design parameters for pre-developed condition are as follows:

The rainfall intensities for the 2, 10- and 100-year storm events are 4.3 in/hour, 5.8 in/hour and 8 in/hour, respectively.

Total Site Drainage Area	Existing Area (SF)	Area (ac)	C
<i>Lot</i>	10,000	0.230	<i>0.41</i>
<i>Building</i>	9265	0.213	0.99
<i>Paved</i>	735	0.017	0.99
<i>Landscape</i>	0	0.140	0.30

Total Site Drainage Area	Existing Flows (cfs)	Allowable Flows (cfs)
<i>Q(2 year)</i>	0.297	0.148
<i>Q(10 year)</i>	0.400	0.300
<i>Q(100 year)</i>	0.552	0.442

The stormwater reduction factors for the 2, 10 and 100 years are 50%, 75% and 80%, respectively.

II. Post Development Conditions

The proposed site drainage area is 7275.61 sq. ft. (0.167-acre) which consists of a 5-story building with ground floor parking garage. The proposed drainage area will be detained in a detention vault, which releases the storm water to the city’s sewer system in accordance with the City of Jersey City Storm Water Ordinance and BMP guidelines. See Drainage and Utility Site Plan for exact location of new vault, inlets and manhole. The rainfall intensities for the 2, 10- and 100-year storm events are 4.3 in/hour, 5.8 in/hour and 8.0 in/hour, respectively.

Total Site Drainage Area	Proposed Area (SF)	Area (ac)	C
<i>Lot</i>	10,000	0.230	<i>0.99</i>
<i>Building</i>	9265	0.213	0.99
<i>Paved</i>	735	0.017	0.99
<i>Landscape</i>	0	0.140	0.59

Total Site Drainage Area	Unreduced Proposed Flows (cfs)
<i>Q(2 year)</i>	0.711
<i>Q(10 year)</i>	0.959
<i>Q(100 year)</i>	1.323

III. Basin Discussion and Design

Building: Detention Basin Design

The proposed detention basin has been designed to accept stormwater runoff from the building’s roof. Stormwater will be conveyed from the roof drains with leaders at the roof deck to the detention basin. The detention basin is located below the basement garage level. The detention basin will discharge the stormwater to the manhole on Broadway. A summary of the required storage, peak inflow and outflow for existing, allowable and proposed conditions, and basin peak elevations will be provided below.

Storm Event (Yr.)	Inflow	Allowable Outflow (cfs)	Unreduced Proposed Outflow (cfs)	Total Inflow Volume (cf)
2	0.38	0.148	0.711	798.0
10	0.64	0.300	0.959	960.0
100	0.92	0.442	1.323	1,330.0

Storm Event (Yr.)	Allowable outflow (cfs)	Computed Outflow (cfs)	Maximum Pond Storage (cf)	Pond Storage Depth (ft)
2	0.148	0.13	551.00	1.68
10	0.300	0.24	711.00	2.00
100	0.442	0.42	951.00	2.52

\*Base of Vault = Minimum Headwater (ft) = 3.50 ft

As demonstrated above, the post development computed stormwater discharge for all 3 storm events are less than or equal to the allowable discharge rates as regulated by the City of Jersey City Stormwater Ordinance and BMP. The allowable stormwater discharge is a factored existing stormwater discharge as defined in the BMP. As a result, this design satisfies the NJDEP Stormwater Management rules for the stormwater quantity reduction.

The discharge pipe from the outlet structure to the manhole was designed to handle the proposed outflow from the 100-year storm event. An 8" diameter RCP pipe with a 2.5% slope exceeds the allowable 100-year storm event flow.

#### IV. Soil Erosion and Sediment Control

To minimize the effects of erosion, the proposed design and construction concepts and practices incorporate the standards for Soil Erosion and Sediment Control in New Jersey as provided by the New Jersey State Soil Conservation Committee. The soil erosion is controlled predominantly by one factor:

- The building occupies 100% of the lot, and the stormwater runoff is collected with roof leaders and inlets and directed to the stormwater storage vault. The runoff from this area mostly percolate into the ground and the soil erosion is controlled by the landscape.

Other erosion deterrents include but are not limited to the use of silt fence or other sediment barriers around the property. In addition, dust control measures, stone tracking mats, and temporary and permanent vegetative cover will be utilized. General notes and guidelines are provided on the Soil Erosion Plan for the contractor in order to ensure against soil erosion on the site while construction is in progress.

#### V. Water Quality Treatment

The proposed site development area is 10,000 sq. ft. (0.23-acre) and does not exceed ¼ acre of new impervious coverage. The building area occupies 93% of the lot and the stormwater is collected with roof drains and directed to the stormwater detention system.

### Summary

In conclusion, the stormwater management system for this project has been designed in accordance with the City of Jersey City Storm Water Ordinance and the BMP. This project is not located in the Tidal flood zone. We have demonstrated that our detention basin exceeds the minimum requirements set forth by the City of Jersey City Water

Ordinance and the BMP. Furthermore, in our design, we have also demonstrated that the stormwater drainage systems reduce the proposed site drainage impact of the storm water runoff into the city's sewer system.

As a result of these measures, the total developed impact of the proposed storm water drainage system on the city's sewer system is significantly less than the existing storm drainage discharge.

Therefore, it is our professional opinion that the proposed stormwater drainage design has no negative impacts on the existing stormwater system.