

# DRESDNER ROBIN

## STORMWATER MANAGEMENT AND ENGINEERING REPORT

50 HUDSON STREET

BLOCK 14502, LOT 13

CITY OF JERSEY CITY, HUDSON COUNTY, NEW JERSEY

DRESDNER ROBIN PROJECT NO.: 00810-004

### **PREPARED FOR**

50 HUDSON STREET, LLC.  
C/O TISHMAN SPEYER  
ROCKEFELLER CENTER  
45 ROCKEFELLER PLAZA  
NEW YORK, NY 10111

### **PREPARED BY**

DRESDNER ROBIN  
ONE EVERTRUST PLAZA, SUITE 901  
JERSEY CITY, NJ 07302

### **DATE**

MAY 2022

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MATTHEW J. NEULS  
PROFESSIONAL ENGINEER  
NJ LICENSE NO. 24GE04313300

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## 1.0 INTRODUCTION

### 1.1 PURPOSE

This report has been prepared as required by Item 1.G of the *Engineering Completeness* section of the *Jersey City Land Development Ordinance Preliminary and Final Major Site Plan Checklist - Application Requirements, Development Procedures & Checklists*, to demonstrate how the proposed improvements meet the criteria of the following standards:

- New Jersey Residential Site Improvement Standards (N.J.A.C. 5:21) (published July 21, 2014).
- Stormwater Management Rules (N.J.A.C. 7:8) (amended March 20, 2020).
- Safe Drinking Water Act Rules (N.J.A.C. 7:10) (amended June 01, 2020).
- Pollutant Discharge Elimination System Rules (N.J.A.C. 7:14A) (amended January 5, 2009).
- Article VI “*Stormwater Control*” of Chapter 345 “*Zoning*” from the Code of the City of Jersey City.

### 1.2 PROJECT DESCRIPTION

The 50 Hudson Street project consists of a mixed-use development including one residential tower containing 924 residential units, an existing multi-level subterranean parking garage, and retail space on the ground floor. The project site occupies Lot 13, Block 14502 in Jersey City, and fronts Hudson Street to the west, Morris Street to the south, Sussex Street to the north, and the Hudson River Waterfront Walkway to the east. The development will also include approximately 12,000 square feet of retail space facing Morris Street. The existing multi-level parking garage has a vehicle entrance on Sussex Street.

At present, the project site contains 84,144 SF (1.93 acres) and currently contains an underground/ground level parking garage, minimal vegetation and a perimeter fence. The site is located within a Tidal Flood Hazard Area of the Hudson River per FEMA mapping.

## 2.0 UTILITY SERVICES

Provisions for utility services already exist surrounding the project site. Per record design drawings and as-builts, stub-outs for water, sewer, electric, and telecommunications were installed during the original construction of the subterranean parking garage.

This project plans to utilize the following existing services:

- Two (2) 10-inch diameter sanitary sewer laterals, one in Hudson Street and one in Sussex Street
- One (1) 16-inch diameter storm sewer lateral along the Hudson River Waterfront Walkway
- One (1) electric conduit bank in Sussex Street
- One (1) telecommunications conduit bank in Sussex Street
- One (1) 6-inch diameter gas lateral in Hudson Street
- Two (2) 6-inch diameter water laterals in Sussex Street

Additional connections to PSE&G infrastructure may be needed depending on capacity and other factors.

Sanitary sewage conveyance is provided by the Jersey City Municipal Utilities Authority (JCMUA). Secondary sewage treatment is provided by the Passaic Valley Sewage Commission's Newark Bay Treatment Plant. Water service is provided by JCMUA with finished water supplied to the Authority by Suez Jersey City. Electric Service is provided by Public Service Electric & Gas (PSE&G). Telephone and digital broadband services are provided by Verizon and Comcast, among others.

## **3.0 STORMWATER MANAGEMENT**

### **3.1 PURPOSE AND NEED**

The proposed development will disturb more than 0.25 acres of land; therefore, the project is defined as a "major development" in accordance with Article VI "*Stormwater Control*" of Chapter 345 "*Zoning*" from the Code of the City of Jersey City and the NJDEP Stormwater Management Rules at NJAC 7:8. As a result, these regulations mandate the proposed development incorporate measures to address groundwater recharge, stormwater quality, and stormwater quantity.

### **3.2 GROUNDWATER RECHARGE**

The regulations cited above specify minimum design and performance standards for groundwater recharge; however, in accordance with N.J.A.C. 7:8-5.4(a)2.ii., the groundwater recharge requirement does not apply to previously disturbed project sites within the "Metropolitan Planning Area PA-1 Zone", which includes the project site; therefore, no groundwater recharge is proposed.

### **3.3 WATER QUALITY**

The Jersey City Stormwater Control Ordinance and NJDEP Stormwater Management Rules require "major developments" to include stormwater management measures to reduce the post-construction load of total suspended solids (TSS) in stormwater runoff generated from the water quality storm by 80% of the anticipated load from vehicular surfaces on the development site. No new motor vehicle surface is proposed as part of the project; therefore, no water quality measures are proposed. Existing motor vehicle surface will be converted to building roof and pedestrian plaza, which will result in a net improvement in water quality.

### **3.4 WATER QUANTITY**

Per the Jersey City Stormwater Control Ordinance and NJDEP Stormwater Management Rules, in tidal Flood Hazard Areas, Stormwater Runoff quantity analysis is required unless the design engineer demonstrates through hydrologic and hydraulic analysis that the increased volume, change in timing, or increased rate of the stormwater runoff, or any combination of the three will not result in additional flood damage below the point of discharge; no analysis is required if the stormwater is discharged directly into any ocean, bay, inlet, or the reach of any watercourse between its confluence with an ocean, bay, or inlet and downstream of the first water control structure. Stormwater runoff from the project site will be discharged to a tidal portion of the Hudson River via overland flow and a separated storm sewer system; therefore, no water quantity measures are proposed.

## **4.0 WATER AND SEWER DEMAND**

### **4.1 SANITARY SEWER**

The projected sanitary flow can be found in Appendix A, which was computed in accordance with N.J.A.C. 7:14A-23.3.

The anticipated flow is greater than 8,000 gallons per day and therefore a Treatment Works Approval will be required from the New Jersey Department of Environmental Protection (NJDEP) prior to construction.

### **4.2 WATER SERVICE**

The estimated average-daily and peak water demand for the development can be found in Appendix B, which was calculated in accordance with Table 5.1 and 5.2 of the New Jersey Residential Site Improvements Standards (N.J.A.C. 5:21-5.1) and the Safe Drinking Water Act Rules (N.J.A.C. 7:10-12.6, Table 1: Average Daily Water Demand).

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# **APPENDIX A**

# **SANITARY SEWER DEMAND**

# **CALCULATIONS**

## SANITARY SEWER CALCULATIONS

50 Hudson Street  
BLOCK 14502, LOT 13  
JERSEY CITY, NJ  
DR PROJECT NO. 00810-004

Type of Establishment	Measurement	# Units	GPD/Unit	GPD
Studio	Per Dwelling	259	150	38,850
1 Bedroom	Per Dwelling	444	150	66,600
2 Bedroom	Per Dwelling	221	225	49,725
3 Bedroom	Per Dwelling	0	300	0
Retail	Sq. Ft.	12,017	0.100	1,202

Projected Estimates per N.J.A.C. 7:14A-23.3

Flow Received	100%
Total Flow (GPD) ( $Q_{\text{projected}}$ )	156,377
Total Flow (CFS) ( $Q_{\text{projected}}$ )	0.242

Pipe Length (LF)	Diameter (in)	Material	Slope	n*
100	10	DIP	0.50%	0.013

\* Per JCMUA Rules and Regulations, Section 5.01

Half Flow Pipe Capacity	
Depth of Flow, h (in)	5
h/D	0.500
Pipe Radius, r (ft)	0.417
Circ. Segment Height, h (ft)	0.417
Central Angle, $\theta$ (radians)	3.142
Cross-Sectional Area, A (ft <sup>2</sup> )	0.273
Wetted Perimeter, P (ft)	1.309
Hydraulic Radius, R (ft)	0.208
Discharge, Q (cfs)	0.777
$Q_{\text{projected}}$ (x2) (cfs)	0.484
Pipe % Full $[(A/A_{\text{full}})*100\%]$	50.00%
Average Velocity, V (ft/sec)	2.848
$Q_{\text{pipe}} > 2 \times Q_{\text{projected}}$	TRUE
$V \geq 2.2$ ft/sec	TRUE
Therefore, design is	ADEQUATE

Actual Pipe Velocity	
**Depth of Flow, h (in)	2.670
Pipe Radius, r (ft)	0.417
Circ. Segment Height, h (ft)	0.223
Central Angle, $\theta$ (radians)	2.172
Cross-Sectional Area, A (ft <sup>2</sup> )	0.117
Wetted Perimeter, P (ft)	0.905
Hydraulic Radius, R (ft)	0.129
Pipe % Full $[(A/A_{\text{full}})*100\%]$	21.45%
Actual Velocity, V (ft/sec)	2.072

\*\*Must have  $h < r$

Compare	
Discharge, Q (cfs)	0.242
$Q_{\text{projected}}$ (cfs)	0.242



*Equations used for calculations:*

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Manning's Formula:

$$Q = \left( \frac{1.49}{n} \right) A R^{2/3} \sqrt{S}$$

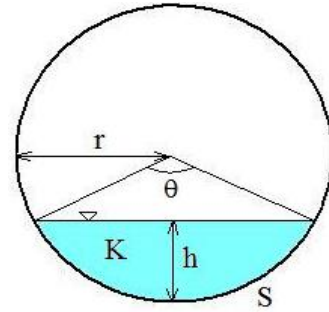
Q = Flow Rate, (ft<sup>3</sup>/s)

n = Manning's Coefficient

A = Flow Area, (ft<sup>2</sup>)

R = Hydraulic Radius, (ft)

S = Channel Slope, (ft/ft)



$$\theta = 2 \arccos \left( \frac{r-h}{r} \right)$$
$$A = \frac{r^2(\theta - \sin \theta)}{2}$$
$$P = r\theta$$

# **APPENDIX B**

## **WATER SERVICE DEMAND**

### **CALCULATIONS**

<b>WATER DEMAND CALCULATIONS</b> 50 Hudson Street BLOCK 14502, LOT 13 JERSEY CITY, NJ DR PROJECT NO. 00810-004								
Residential Demand <sup>1</sup>								
Type of Establishment	Measurement	# Units	GPD/Unit	Daily Demand (GPD)	Daily Demand (MGD)	Peaking Factor	Peak Daily Demand (GPD)	Peak Daily Demand (MGD)
Studio	Per Dwelling	259	80	20,720	0.021	3	62,160	0.062
1-Bedroom	Per Dwelling	444	120	53,280	0.053	3	159,840	0.160
2-Bedroom	Per Dwelling	221	175	38,675	0.039	3	116,025	0.116
3-Bedroom	Per Dwelling	0	270	0	0.000	3	0	0.000
Total Units		924						
Total Residential Demand				112,675	0.113		338,025	0.338

Non-Residential Demand <sup>2</sup>								
Type of Establishment	Measurement	# Units	GPD/Unit	Daily Demand (GPD)	Daily Demand (MGD)	Peaking Factor	Peak Daily Demand (GPD)	Peak Daily Demand (MGD)
Office/Retail	SF	12,017	0.125	1,502	0.002	3	4,506	0.005
Total Non-Residential Demand				1,502	0.002		4,506	0.005

Total Site Demand				Daily Demand (GPD)	Daily Demand (MGD)		Peak Daily Demand (GPD)	Peak Daily Demand (MGD)
				114,177	0.114		342,531	0.343

Notes:

<sup>1</sup> Residential demand as per N.J.A.C. 5:21-5.1

<sup>2</sup> Non-residential demand as per N.J.A.C. 7:10-12.6 (Table 1)