DRESDNER
ROBIN

STORMWATER MANAGEMENT AND

ENGINEER'S REPORT

HARBORSIDE 9

BLOCK 11603, LOTS 22 & 27

CITY OF JERSEY CITY, HUDSON COUNTY, NEW JERSEY

DRESDNER ROBIN PROJECT NO.: 00614-041

PREPARED FOR
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HARBORSIDE 9
BLOCK 11603, LOTS 22 & 27
CITY OF JERSEY CITY, HUDSON COUNTY, NEW JERSEY

DR PROJECT No.: 00614-041
JANUARY 2023

TABLE OF CONTENTS

LIST OF APPENDICES

STORMWATER MANAGEMENT & ENGINEER'S REPORT
HARBORSIDE 9
BLOCK 11603, LOTS 22 & 27
CITY OF JERSEY CITY, HUDSON COUNTY, NEW JERSEY

DR PROJECT No.: 00614-041
JANUARY 2023

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 April 19, 2010).
- Safe Drinking Water Act Rules (N.J.A.C. 7:10) (amended January 4, 2011).
- 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 subject property is lots 18.02, 22, and 27 in Block 11603. The northern portion of Lot 27 is currently a parking lot. Lot 22 to the southeast of the project is developed with a waterfront park and biergarten (operating as an interim use).

The project site is located within the East – Waterfront District of the Harsimus Cove Station (formerly Hudson Exchange) Redevelopment Area. The Harsimus Cove Redevelopment Plan establishes the property zoning.

The project proposes to construct a high-rise residential building with 579 units, 14,840 SF of commercial space, and structured parking. Additionally, the project includes a proposed new private road, which will separate the project from the proposed, previously approved Harborside 8 and waterfront park/biergarten immediately to the south.

STORMWATER MANAGEMENT & ENGINEER'S REPORT
HARBORSIDE 9
BLOCK 11603, LOTS 22 & 27
CITY OF JERSEY CITY, HUDSON COUNTY, NEW JERSEY

DR PROJECT No.: 00614-041
JANUARY 2023

2.0   STORMWATER MANAGEMENT

2.1   STORM SEWER

The JCMUA maintains the storm sewer system in the Harsimus Cove Station Redevelopment Area. JCMUA mapping indicates the project site is located within Drainage Area E-15, which outlets in combined sewer overflow events to the Hudson River via the Second Street Outfall (8-feet x 10-feet box culvert). A stormwater-only box culvert outfall exists in Harborside Place, a private road at the southern portion of the project site. Record mapping indicates that this culvert drains the areas surrounding the Hudson Bergen Light Rail in the vicinity of the project site. The waterfront park area has its own system of inlets and smaller outfalls to the Hudson River; no changes are proposed to this system as part of the project. Stormwater runoff from the existing parking lot on-site currently discharges to the Second Street Outfall (post-regulator) by way of a Stormceptor water quality device, which is proposed to remain.

The proposed residential building will discharge roof stormwater partially to the box culvert in Second Street, and partially to an existing 15" RCP storm sewer main in Hudson Street, utilizing an existing stub-out. Sidewalks and other impervious surfaces surrounding the proposed building will drain to existing and proposed street inlets in all adjacent roads, public and private.

2.2   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. As a result, these regulations mandate the proposed development incorporate measures to address groundwater recharge, stormwater quality, and stormwater quantity.

2.3   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

STORMWATER MANAGEMENT & ENGINEER'S REPORT
HARBORSIDE 9
BLOCK 11603, LOTS 22 & 27
CITY OF JERSEY CITY, HUDSON COUNTY, NEW JERSEY

DR PROJECT No.: 00614-041
JANUARY 2023

Planning Area PA-1 Zone", which includes the project site; therefore, groundwater recharge is not proposed.

2.4 WATER QUALITY

The Jersey City Stormwater Control Ordinance requires "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 the development site. The project will not add more than one-quarter acre of impervious surface to the site and will result in a net reduction in the area of pollutant source area (vehicular surface), therefore no water quality measures are proposed.

2.5 WATER QUANTITY (PEAK RUNOFF RATE REDUCTIONS)

The Jersey City Stormwater Control Ordinance requires "major developments" to demonstrate through hydrologic and hydraulic analysis that the post-constructed stormwater runoff rates and volumes leaving the site meet specific criteria. The requirements state that proposed peak runoff rates shall be reduced to 50%, 75% and 80% of existing rates for the 2-year, 10-year and 100-year storm events respectively. However, the regulations also state that "*in tidal flood hazard areas, stormwater runoff quantity analysis…shall only be applied if the increased volume of stormwater runoff could increase flood damages below the point of discharge*". The site is located in a tidal area adjacent to the Hudson River, and will not increase flood damages below the point of discharge; therefore, no Water Quantity measures are proposed.

STORMWATER MANAGEMENT & ENGINEER'S REPORT
HARBORSIDE 9
BLOCK 11603, LOTS 22 & 27
CITY OF JERSEY CITY, HUDSON COUNTY, NEW JERSEY

DR PROJECT No.: 00614-041
JANUARY 2023

3.0   WATER AND SEWER DEMAND

3.1   SANITARY SEWER

Record mapping indicates the presence of 12" sanitary sewer mains in both Hudson and Second Street. The proposed buildings will be serviced by two connections, one in each street.

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

3.2   WATER SERVICE

The Jersey City Municipal Utilities Authority (JCMUA) maintains a 10-inch water main in between the project site and the existing Plaza 10 Tower to the east. Service to the Plaza 10 office building is provided via this 10" main. In addition to a service connection for the project, a portion of this 10" water main will need to be relocated to resolve a conflict with the proposed residential building. Relocation of the main will be coordinated with the JCMUA and the Plaza 10 office building owner.

Per the International Building Code, if the proposed building is greater than 420 feet in height, water service is required from mains located in two separate streets. Since the proposed residential tower will be greater than 420 feet in height, two water laterals are proposed. One 6" lateral will connect to the 12" main in Second Street, and another 6" lateral will connect to the 10" main noted previously.

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).

APPENDIX A
SANITARY SEWER DEMAND CALCULATIONS

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SANITARY SEWER CALCULATIONS

HARBORSIDE 9
BLOCK 11603, LOTS 22 & 27
JERSEY CITY, NJ
DR PROJECT NO. 00614-041

Type of Establishment	Measurement	# Units	GPD/Unit	GPD
Studio	Per Dwelling	96	150	14,400
1 Bedroom	Per Dwelling	307	150	46,050
2 Bedroom	Per Dwelling	166	225	37,350
3 Bedroom	Per Dwelling	10	300	3,000
Retail	Sq. Ft.	14,840	0.100	1,484

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

Flow Received	100%
Total Flow (GPD) ($Q_{projected}$)	102,284
Total Flow (CFS) ($Q_{projected}$)	0.158

Pipe Length (LF)	Diameter (in)	Material	Slope	n*
56	8	PVC	2.00%	0.013

* Per JCMUA Rules and Regulations, Section 5.01

Half Flow Pipe Capacity	
Depth of Flow, h (in)	4
h/D	0.500
Pipe Radius, r (ft)	0.333
Circ. Segment Height, h (ft)	0.333
Central Angle, θ (radians)	3.142
Cross-Sectional Area, A (ft^2)	0.175
Wetted Perimeter, P (ft)	1.047
Hydraulic Radius, R (ft)	0.167
Discharge, Q (cfs)	0.857
$Q_{projected}$ (x2) (cfs)	0.317
Pipe % Full [(A/A$_{full}$)*100%]	50.00%
Average Velocity, V (ft/sec)	4.909
Q$_{pipe}$ > 2xQ$_{projected}$	**TRUE**
V ≥ 2.2 ft/sec	**TRUE**
Therefore, design is	**ADEQUATE**

Actual Pipe Velocity	
**Depth of Flow, h (in)	0.800
Pipe Radius, r (ft)	0.333
Circ. Segment Height, h (ft)	0.067
Central Angle, θ (radians)	1.287
Cross-Sectional Area, A (ft^2)	0.018
Wetted Perimeter, P (ft)	0.429
Hydraulic Radius, R (ft)	0.042
Pipe % Full [(A/A$_{full}$)*100%]	5.20%
Actual Velocity, V (ft/sec)	1.969

**Must have h < r

Compare	
Discharge, Q (cfs)	0.036
$Q_{projected}$, (cfs)	0.158

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Equations used for calculations:

Manning's Formula:
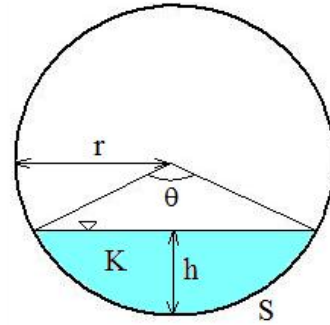
$$Q = \left(\frac{1.49}{n}\right) AR^{2/3}\sqrt{S}$$

Q = Flow Rate, (ft³/s)

n = Manning's Coefficient

A = Flow Area, (ft²)

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

WATER DEMAND CALCULATIONS
HARBORSIDE 9
BLOCK 11603, LOTS 22 & 27
JERSEY CITY, NJ
DR PROJECT NO. 00614-041

Residential Demand[1]

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	96	80	7,680	0.008	3	23,040	0.023
1-Bedroom	Per Dwelling	307	120	36,840	0.037	3	110,520	0.111
2-Bedroom	Per Dwelling	166	175	29,050	0.029	3	87,150	0.087
3-Bedroom	Per Dwelling	10	270	2,700	0.003	3	8,100	0.008
Total Units		579						
Total Residential Demand				76,270	0.076		228,810	0.229

Non-Residential Demand[2]

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	14,840	0.125	1,855	0.002	3	5,565	0.006
Total Non-Residential Demand				1,855	0.002		5,565	0.006

	Daily Demand (GPD)	Daily Demand (MGD)		Peak Daily Demand (GPD)	Peak Daily Demand (MGD)
Total Site Demand	78,125	0.078		234,375	0.234

Notes:

[1] *Residential demand as per N.J.A.C. 5:21-5.1*

[2] *Non-residential demand as per N.J.A.C. 7:10-12.6 (Table 1)*