DRESDNER ROBIN

STORMWATER MANAGEMENT & ENGINEERS REPORT

659 GROVE STREET

BLOCK 6002, LOT 8

JERSEY AVENUE LIGHT RAIL REDEVELOPMENT AREA – HIGH RISE DISTRICT

JERSEY CITY, HUDSON COUNTY, NJ

DRESDNER ROBIN PROJECT NO.: 10382-077

PREPARED FOR Newport Associates Development Company 111 Town Square Place, Suite 300 Jersey City, NJ 07310

PREPARED BY DRESDNER ROBIN ONE EVERTRUST PLAZA, SUITE 901 JERSEY CIT, NJ 07302

DATE MAY 2021 MATTHEW J. NEULS Senior Project Magner LICENSE NO. 24GE0431

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1.0 INTRODUCTION

The 659 Grove Street development project consists of a mixed-use development including a 10story residential tower, a parking garage and ground level retail space. The project site is located at the northwest corner of the intersection of Grove Street and 18th Street in Jersey City's Jersey Avenue Light Rail Redevelopment Area. The development is to contain 139 residential units with the residential lobby entrance situated closest to the intersection. The proposed 3-level parking garage containing 102 spaces with a vehicle entrance on the south side of the building at 18th Street.

As noted above, the project site is located at the intersection of Grove Street and 18th Street and contains 50,701 SF (1.16 acres.) The site is largely vacant land and is covered with meadow surface vegetation with limited amounts of debris. The entire project site will be disturbed by the construction of the proposed development and ancillary improvements discussed above. The applicant is seeking Final Site Plan approval for the 659 Grove Street Development Project. The project plans have been prepared in compliance with the provisions of the Jersey Avenue Light Rail Redevelopment Plan and the applicable provisions of the Jersey City Land Development Ordinance. In addition, the project design makes use of the available residential density bonus related to open space considerations as well as the landscape bonus which provides for additional impervious surface coverage in return for additional trees to be planted on the project site.

2.0 UTILITY SERVICES

The Project Site will be serviced by an existing utility and drainage infrastructure on Grove Street and 18th Street.

Sanitary sewage collection is handled 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 United Water Jersey City. Telephone and digital broadband services are provided by Verizon.

3.0 POTABLE WATER SERVICE

Potable water service for the project will be provided by way of connection to an existing 12-inch water main on Grove Street. The proposed building will be serviced by two 8-inch laterals into a water meter room at the eastern side of the building. An isolation value is proposed at the existing 12" water main between the proposed service lines for added resiliency in the event of an outage.

The estimated average total water demand for the development is 18,0410 gallons per day. The anticipated peak water demand for the Tower is 54,124 gallons per day. Residential potable water demand is based upon the requirements of the New Jersey Residential Site Improvement Standards (RSIS) at N.J.A.C. 5:21-5.1 and the distribution of unit types in the building. Nonresidential potable water demand is based upon New Jersey's Safe Drinking Water Act which is codified at N.J.A.C. 7:10-12.6 – TABLE 1. See Appendix A for the Water Demand Estimate which has been prepared for this application. Based upon the projected demand for new water supply, this project will require a Bureau of Safe Drinking Water authorization which in Jersey City is provided pursuant to a master permit held by the Jersey City Municipal Utility Authority (JCMUA).

4.0 SANITARY SEWER SERVICE

Anticipated sewage flows from Lot 8 will be handled by an existing 10" PVC sewer pipe on Grove Street through an 8-inch SDR-35 PVC lateral at the eastern side of the proposed building. Based upon the New Jersey Department of Environmental Protection (NJDEP) Treatment Works Regulations at N.J.A.C. 7:14A-23.3 and the current architectural design of the building, the estimated new daily sewage flow to be generated by the 659 Grove Street Development is 24,355 gallons per day. Based on the analysis provided in Appendix B, a proposed 8" SDR-35 PVC sanitary sewer laterals at 1.0 % minimum slope will have capacity for this demand. Since the anticipated new sewage flow from the proposed development exceeds 8,000 gallons per day, NJDEP Treatment Works Approval is required. In Jersey City, NJDEP Treatment Works Approval Applications must be endorsed by JCMUA and Passaic Valley Sewage Commission (PVSC) officials prior to being submitted to NJDEP for consideration.

5.0 STORMWATER MANAGEMENT

The proposed development 659 Grove Street will disturb roughly 60,400 square feet or 1.39 acres. The project is classified as a Major Development by the New Jersey Residential Site Improvement Standards (RSIS) Stormwater Regulations at N.J.A.C. 5:21-7 and the Jersey City Stormwater Control Ordinance. Under most circumstances, classification as a Major Development results in the need to tailor the site drainage design to address stormwater quality, peak runoff reductions and groundwater recharge criteria.

In the present condition, the project site is largely vacant, consisting primarily of meadow land. The proposed development includes the proposed building, covering the majority of the site as well as the pervious pedestrian plaza on the west side of the property. An onsite storm sewer system and cast in place concrete extended detention basin are proposed to accommodate and attenuate runoff from the developed site. Due to the project's classification as a 'Major Development' pursuant to the stormwater rules, the following stormwater criteria must be addressed in the design.

- Stormwater Quality: Per NJDEP, "Stormwater management measures shall only be required for water quality control if an additional one-quarter acre of impervious surface is being proposed on a development site." (N.J.A.C. 7:8-5.5). Despite the proposed increase in impervious surface coverage in excess of the threshold of ¼ acre, water quality treatment measures are not necessary for compliance with this requirement. The proposed onsite impervious surface coverage consists of the building rooftop and several small pedestrian areas. No new impervious surface areas on the project site are subject to vehicular traffic. Runoff generated over rooftops and areas not subject to vehicular traffic is considered clean and need not be treated.
- Runoff Peak Flow Reduction: The site requires peak runoff reduction because the increase in impervious surface coverage is greater than ¼ acre. In accordance with the New Jersey RSIS Stormwater Rules cited above, peak runoff reductions are required in order to accommodate developed peak runoff rates which are 50%, 75% and 80% of present peak runoff for the two-, 10 and 100 year storm events respectively. An underground cast in place concrete stormwater detention chamber is proposed to provide adequate runoff attenuation allowing for compliance with regulation. The following table provides a summary of the present and developed peak runoff at the project site.

659 Grove Street Final Site Plan											
RUNOFF SUMMARY TABLE											
Storm Event	Present Peak Runoff (cfs)	Developed Post-detention Peak Runoff (cfs)	Allowable % of Existing Peak Runoff	Allowable Peak Runoff (cfs)	Developed % of Existing Peak Runoff						
2	2.67	0.82	50%	1.34	45.4%						
10	3.58	0.90	75%	2.68	61.8%						
100	4.74	1.07	80%	3.79	78.8%						

 Groundwater Recharge: The site is exempt from groundwater recharge requirements because it is located within New Jersey's designated Metropolitan Planning Area (PA1) based on the State Planning Policy Map (SPPM). The applicable regulation reads: "This groundwater recharge requirement does not apply to projects that qualify as within the urban redevelopment area" (N.J.A.C. 7:8-5.4(a)2ii). An "Urban Redevelopment Area" is defined as: "delineated on the State Plan Policy Map (SPPM) as the Metropolitan Planning Area (PA1), Designated Centers, Cores or Nodes" (N.J.A.C. 7:8-1.2).

APPENDIX 1 – WATER DEMAND CALCULATIONS



Water Demand Estimates 18th Street Property - Lot 8 of Block 6002 DR 10382-077

							Building Type: I	HIGH RISE
UNIT TYPE	UNIT	NO. UNITS	GALLONS PER UNIT PER DAY	DAILY	DEMAND	"PEAKING FACTOR"	PEAK DAILY DEMAND (GPD)	
		(5F)		GPD	MGD		GPD	MGD
Residential Dema	nd							
Studio	UNIT	18	80	1,440	0.001	3	4,320	0.004
1-BEDROOM	UNIT	69	100	6,900	0.007	3	20,700	0.021
2-BEDROOM	UNIT	36	160	5,760	0.006	3	17,280	0.017
3-BEDROOM	UNIT	16	160	2,560	0.003	3	7,680	0.008
4-BEDROOM	UNIT	0	160	0	0.000	3	0	0.000
	Total	139						
		Total Re	sidential Demand	16,660	0.0167		49,980	0.050
Non-Residential D	emand		1					
Retail	Gal/Sq Ft	11,050	0.125	1,381	0.0014	3	4,144	0.004
	T	otal Non-Re	sidential Demand	1,381	0.001		4,144	0
TOTAL SITE DEMAND	18,041	0.018		54,124	0.054			

*Residential Demand As Per N.J.A.C. 5:21-5.1

**Non-Residential Demand As Per N.J.A.C. 7:10-12.6 TABLE 1

APPENDIX 2 – SANITARY SEWER CALCULATIONS



Sanitary Sewer Calculations

18th Street Properties - Lot 8 of Block 6002

DR PRJ# : 10382-077

Analysis

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

F) 11,05	0.1	1,105 24,355
F) 11,05	0.1	1,105
F) 11,05	0.1	1,105
elling 139	1	
elling 16	300	4,800
elling 36	225	8,100
elling 69	150	10,350
elling 18	150	2,700
(A)	(B)	(A)*(B)
rement its # Uni	ts Per Day/U	Per Day nit (GPD)
	rement hits # Uni (A) elling 18 elling 69 elling 36 elling 16 elling 139	rement its # Units Gallor Per Day/U (A) (B) elling 18 150 elling 69 150 elling 36 225 elling 16 300 elling 139 150

Mannings Formula

 $Q = (1.49/n)(A)(R^{2/3})(S^{1/2})$

- A = area of flowing
 - $= 0.5 \pi r^2$
- R = hydraulic radius of pipe

= A/P

= D/4 for pipe flowing at one-half or full depth

r = radius of pipe

- analyze half-full flow condition

P = wetted perimeter of pipe

- $= 2\pi r$
- S = slope of pipe
- $\pi = 3.141593$

Typical Mannings "n" values							
RCP	0.012						
PVC	0.01						
CM	0.024						
VC	0.014						
Cast Iron	0.013						
DIP	0.011						
Brick	0.016						

DIDE	n	S	S Pipe Dia.		Α	Р	R	V _{pipe}	Q _{pipe}	Q _{pipe}
PIFE		(ft./ft.)	(in.)	(ft.)	(SF)	(ft.)	(ft.)	(fps)	(cfs)	(MGD)
8" PVC	0.010	0.01	8	0.67	0.17	1.05	0.17	4.51	0.79	0.51

Conclusions

In all cases, Q _{pipe} > Q _{demand}	TRUE
In all cases, V _{pipe} > 2.0 fps	TRUE
Therefore, Design is	ADEQUATE

APPENDIX 3 – DRAINAGE CALCULATIONS STORMWATER QUANTITY



1



2 3 Reservoir DB

1

Project: Q:\PRJ\10382-077 18StProperties\EG\Design Data - DREM\SWM\10382-077 659 Graeeday,v05 / 11 / 2021

Hydrograph Return Period Recap Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

Hyd.	Hydrograph	Inflow	Peak Outflow (cfs)								Hydrograph
NO.	(origin)	nya(s)	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	Description
1	Mod. Rational			1.588			2.842			3.908	Proposed
2	Rational			2.667			3.575			4.739	Existing
3	Reservoir	1		0.822			0.895			1.067	DB
Pro		110382 07	 77 189+E			sian Dat			103270-0	 }	State 1000001

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Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Mod. Rational	1.588	1	10	1,915				Proposed
2	Rational	2.667	1	10	1,600				Existing
3	Reservoir	0.822	1	25	1,655	1	2.26	1,224	DB
Q:\	PRJ\10382-07	7 18StPr	operties	\EG\Desig	n Beta rn D	REEDAN:S2/VM	at0382-077 6	59 Gersolæ yg p l	<u></u> ▼/11/2021

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Mod. Rational	2.842	1	10	1,893				Proposed
2	Rational	3.575	1	10	2,145				Existing
3	Reservoir	0.895	1	18	1,626	1	2.40	1,362	DB
Q:\F	PRJ\10382-07	7 18StPr	operties	\EG\Desig	n Beta rn D	REEDANSINO M	1e10 382-0776	59 Gersodæyg Øv	<u></u> ፼ / 11 / 2021

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Mod. Rational	3.908	1	10	2,368				Proposed
2	Rational	4.739	1	10	2,843				Existing
3	Reservoir	1.067	1	17	2,095	1	2.78	1,729	DB
Q:\	PRJ\10382-07	7 18StPr	operties	\EG\Desig	n Beta rn D	REEDANSNOVO	YEEE 82-0776	59 (Gersadæyg)Ød	īv / 11 / 2021

Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

Return Period	Intensity-Duration-Frequency Equation Coefficients (FHA)							
(Yrs)	В	D	E	(N/A)				
1	48.3994	11.8000	0.8833					
2	60.7517	12.5000	0.8887					
3	0.0000	0.0000	0.0000					
5	58.4111	11.8000	0.8276					
10	55.7872	10.9000	0.7858					
25	53.7394	10.2000	0.7402					
50	46.8492	8.8000	0.6852					
100	45.6025	8.2000	0.6566					

File name: JerseyCityIDF.IDF

Intensity = B / (Tc + D)^E

Return	Intensity Values (in/hr)											
(Yrs)	5 min	10	15	20	25	30	35	40	45	50	55	60
1	4.00	3.18	2.65	2.28	2.00	1.79	1.62	1.48	1.37	1.27	1.18	1.11
2	4.77	3.82	3.19	2.75	2.43	2.17	1.97	1.80	1.66	1.54	1.44	1.35
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	5.66	4.56	3.84	3.34	2.96	2.66	2.42	2.23	2.06	1.92	1.80	1.70
10	6.35	5.12	4.32	3.76	3.35	3.02	2.76	2.54	2.36	2.21	2.08	1.96
25	7.17	5.81	4.93	4.31	3.85	3.49	3.20	2.96	2.76	2.59	2.44	2.31
50	7.76	6.28	5.34	4.69	4.20	3.82	3.52	3.26	3.05	2.87	2.72	2.58
100	8.38	6.79	5.79	5.09	4.57	4.17	3.85	3.58	3.35	3.16	3.00	2.85

Tc = time in minutes. Values may exceed 60.

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	Rainfall Precipitation Table (in)								
Storm Distribution	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
SCS 24-hour	1.25	3.29	0.00	4.42	4.97	6.43	7.47	8.16	
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

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