SANITARY SEWER & POTABLE WATER ENGINEER'S REPORT

For

Manhattan Beach Phase 1 Renewal, LLC

Proposed Townhouse Development
Rosewell Street
Block 161.02, Lots 20, 23, 24 & 24.01
City of South Amboy
Middlesex County, NJ

Prepared by:

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November 2025
DEC # 3184-99-001

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INTRODUCTION

The subject site is located with frontage on Rosewell Street in the City of South Amboy, Middlesex County, New Jersey. The site is identified as Block 161.02, Lots 20, 23, 24 & 24.01 on the City of South Amboy Tax Map Sheet #16. The site is partially developed and contains an existing dilapidated one-story brick building with surrounding paved areas. The southern section of the site is disturbed and composed of a gravel parking area, surrounding maintained lawn, and stormwater management basin.

The proposed project consists of the development of 196 residential townhouse units. Additional improvements include parking areas, landscaping, lighting, amenity areas, stormwater management facilities, and utilities.

I) PROPOSED SANITARY SEWER SYSTEM

The sanitary sewer service for the proposed townhomes will be provided by a 4" SCH-40 PVC sanitary sewer lateral for each individual building on site. An 8" SDR-35 PVC sanitary sewer main is being proposed to ultimately serve the entirety of the development. The proposed 8" sanitary main will connect to an existing manhole on site which is serviced by the existing 12" sanitary sewer main within Rosewell Street. The 4" laterals will connect to the proposed 8" SDR-35 PVC throughout the site. Please note a small area on the eastern portion of the development will connect to the existing 12" sanitary sewer main within John T. O'Leary Boulevard. Service capacity shall be confirmed by the Middlesex County Utilities Authority and City of South Amboy Sewer Department.

a) SEWERAGE FLOW CALCULATION

Sanitary sewage flow estimation has been calculated utilizing N.J.A.C. 7:14A-23.3. Considering the above, proposed sewage flows are estimated as follows:

Existing:
The site does not currently have an active sanitary sewer service as there are no existing uses onsite currently under operation.

Proposed:

Average Daily Demand in Gallons Per Day (GPD) For Market Rate Townhouse Units

2 Bedroom Units	98 units * 225 GPD/Dwelling	=	20,050 GPD
3 Bedroom Units	98 units * 300 GPD/Dwelling	=	29,400 GPD
		=	51,450 GPD

Proposed Total Sewage Flow = 51,450 GPD
Net Increase in Sewer Flow = 51,450 GPD

b) GRAVITY SANITARY SEWER DESIGN

Per NJDEP regulations, the criteria for establishing the size of sanitary sewer gravity pipes is to convey two times the average flow with the pipe flowing half full. Utilizing Manning's equation with a roughness coefficient of 0.010 for a PVC pipe, the following is the minimum capacity of the proposed gravity sewer lateral.

Pipe Size	Minimum Slope	Roughness (n)	Capacity at ½ Full	2 X ADF
8" SDR-35 PVC	0.50%	0.010	359,937 GPD	102,900 GPD

The proposed sanitary sewer design can efficiently convey two times the proposed average daily flow at minimum required pipe slope while flowing half full and only utilizing 28.59% of the line's total capacity.

II) PROPOSED WATER SYSTEM

Each proposed townhouse building will be serviced by a 1" domestic water lateral. An 8" C900 water main is proposed to connect to the existing water main within Rosewell Street. The 1" domestic water laterals will connect to the proposed 8"C900 water main throughout the site. Please note a small area on the eastern portion of the development will connect to the existing 12" water main within John T. O'Leary Boulevard and Raritan Reach Road. Service capacity will be confirmed by the Middlesex Water Company.

a) DOMESTIC WATER DEMAND CALCULATION

N.J.A.C. 5:21-5.2, Table 5.1, was utilized to calculate projected domestic water usage. Estimated domestic water demand can be calculated as follows:

Existing:
The site does not currently have an active water service to the existing water system as there are no existing uses onsite currently under operation.

Proposed:

Average Daily Demand in Gallons Per Day (GPD) For Market Rate Townhouse Units

2 Bedroom Units	98 units * 140 GDP/Dwelling	=	13,720 GPD
3 Bedroom Units	98 units * 200 GPD/Dwelling	=	19,600 GPD
		=	33,320 GPD

Proposed Total Water Demand = 33,320 GPD
Net Increase in Domestic Water Demand = 33,320 GPD

III) CONCLUSION

In summary, this report has been prepared to further expand on the water and sanitary sewer conditions for the proposed development as seen within the accompanying site plans for the Proposed Townhouse Development for Manhattan Beach Phase 1 Renewal, LLC. It is the intention of this report that the water and sewer demand generated from this final build out will not exceed the approved demands and allocated flows based on the actual usages. It does not appear the proposed redevelopment will have a negative impact on the existing infrastructure.

APPENDIX

CAPACITY OF CIRCULAR PIPE FLOWING ½ FULL

DYNAMIC ENGINEERING

Capacity of Circular Pipe Flowing 1/2 Full

Project: Manhattan Beach Phase 1 Renewal, LLC
Job #: 3184-99-001
Location: City of South Amboy

Computed By: MDC
Checked By: DMH
Date: 11/3/2025

PIPE DESCRIPTION	SLOPE (%)	SIZE (IN)	MANNING'S COEFFICIENT (n)	VELOCITY (FT/S)	CAPACITY (CFS)	CAPACITY (GPD)	CAPACITY (MGD)	FLOW (GPD)	2 x CUMULATIVE FLOW (GPD)
8" PVC	0.500%	8	0.010	3.19	0.56	359,937	0.36	51,450.0	102,900.0

Variables Defined

Q=Capacity of Pipe (CFS)
V=Velocity in Pipe Section (FT/S)
R=Hydraulic Radius of Pipe Section
S=Slope of Pipe Section (FT/FT)
D=Diameter of Pipe (FT)
d=Depth of Flow in Pipe (FT)
n=Manning's Coefficient
Wp=Wetted Perimeter (FT)

Typical Values for Manning's Coefficient (n)

n(RCP)=	0.013	
n(HDPE-Smooth Interior)=	0.012	*Varies with Manufacturer
n(DIP)=	0.013	
n(PVC)=	0.010	
n(CMP)=	0.024	

Equations used:

Q=VA
V=(1.49/n)*R^(2/3)*S^(1/2)
Q=(1.49/n)*R^(2/3)*S^(1/2)*A

Utilizing Appendix 16.A from the Civil Engineering Reference Manual-Seventh Edition, by Micheal Lindeburg, Copyright 1999
The following equations were utilized to calculate the Hydraulic Radius and Area of a Circular Pipe Section flowing 1/2 full
A=(π*D^2/4)*0.5=0.3927*D^2
R=A/Wp=0.3927*D^2/((2*π*D/2)*0.5)=0.25*D

Therefore:
Q=(1.49/n)*(0.25*D)^(2/3)*S^(1/2)*(0.3927*D^2)
V=(1.49/n)*(0.25*D)^(2/3)*S^(1/2)

Unit Conversion Equations

1 Cubic Foot=7.4805 Gallons
1 Day = 86,400 Seconds
Therefore:

$$\frac{\text{Cubic Foot}}{\text{Second}} \times \frac{86{,}400 \text{ Seconds}}{1 \text{ Day}} \times \frac{7.4805 \text{ Gallons}}{1 \text{ Cubic Foot}} = \frac{\text{Gallon}}{\text{Day}}$$

$$\frac{\text{Gallon}}{\text{Day}} \times \frac{1 \text{ Million Gallons}}{1{,}000{,}000 \text{ Gallons}} = \frac{\text{Million Gallons}}{\text{Day}}$$