

POTABLE WATER AND SANITARY SEWER ENGINEER'S REPORT

For

Renard Management, Inc.


Proposed Self-Storage Facility

***Block 29002, Lots 49 & 50
1026 Georgetown Franklin Turnpike (C.R. 518)
Township of Montgomery
Somerset County, New Jersey***

Prepared by:



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June 2023
DEC# 2334 22-00894

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I. INTRODUCTION

The project area is comprised of Block 29002, Lots 49 and 50 in the Township of Montgomery, Somerset County, New Jersey. The subject site previously consisted of a dilapidated two-story building with associated improvements which have since been demolished. The proposed project consists of the development of one (1) one-story drive-up self-storage building (9,907 SF) and one (1) three-story self-storage building (123,259 SF). Additional site improvements include constructing driveways, parking areas, landscaping, lighting and other associated site improvements.

II. PROPOSED DOMESTIC WATER SYSTEM

A proposed connection will be made to the existing water meter connected to the existing water main along Georgetown Franklin Turnpike to provide a 6" combined water service line. The combined water service line provides a 1" domestic water service connection and a 6" fire service connection to the building.

a) PROPOSED WATER DEMANDS

In accordance with N.J.A.C. 7:10-12.6(2) 2 – Table 1, the NJDEP Standard for Domestic Water Demand is:

Store, Office Building – 0.125 gallons/day (GPD) per square foot

Estimated domestic water demand can be calculated as follows:

Proposed Self-Storage Facility:

Self-Storage (Office Space):

900 SF x 0.125 GPD/SF = 112.5 GPD

Proposed Domestic Water Demand (Total) = 112.5 GPD

III. PROPOSED SANITARY SEWER SYSTEM

Sanitary sewer service will be provided for the proposed building via a 6" SDR-35 PVC sanitary lateral that will connect to an existing sanitary cleanout which was utilized for the previous development located in the northwest corner of the property.

a) PROPOSED SANITARY SEWER DEMANDS

In accordance with N.J.A.C. 7:14A-23.3(a), the sanitary sewer demands for the proposed uses are estimated as follows:

Store, Office Building – 0.100 gallons/day (GPD) per square foot

Estimated sanitary sewer demand can be calculated as follows:

Proposed Self-Storage Facility:

Self-Storage (Office Space):

900 SF x 0.100 GPD/SF = 90.0 GPD

Proposed Sanitary Sewer Demand (Total) = 90.0 GPD

b) PROPOSED 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.

Pipe Size	Slope	Roughness (n)	Capacity at ½ Full	2 X ADF
6"	1.04%	0.010	241,040 GPD	180 GPD

The proposed sanitary sewer design, including a 6" PVC lateral at 1.04%, can efficiently convey two times the proposed average daily flow while flowing half full while using less than 0.075% of the line's total capacity.

APPENDIX

CAPACITY OF CIRCULAR PIPE FLOWING $\frac{1}{2}$ FULL



DYNAMIC ENGINEERING

Capacity of Circular Pipe Flowing 1/2 Full

Project: Proposed Self-Storage Facility

Job #: 2334 22-00894

Location: Township of Montgomery, Somerset County, NJ

Computed By:

BC

Checked By:

DT

Date:

6/13/2023

PIPE DESCRIPTION	SLOPE (%)	SIZE (IN)	MANNING'S COEFFICIENT (n)	VELOCITY (FT/S)	CAPACITY (CFS)	CAPACITY (GPD)	CAPACITY (MGD)
Prop. 6" SDR-35 PVC	1.040%	6	0.010	3.80	0.37	241,040	0.24

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

$V = (1.49/n) \cdot R^{2/3} \cdot S^{1/2}$

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

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

$A = (\pi \cdot D^2 / 4) \cdot 0.5 = 0.3927 \cdot D^2$

$R = A / Wp = 0.3927 \cdot D^2 / ((2 \cdot \pi \cdot D / 2) \cdot 0.5) = 0.25 \cdot D$

Therefore:

$Q = (1.49/n) \cdot (0.25 \cdot D)^{2/3} \cdot S^{1/2} \cdot (0.3927 \cdot D^2)$

$V = (1.49/n) \cdot (0.25 \cdot D)^{2/3} \cdot S^{1/2}$

Unit Conversion Equations

1 Cubic Foot=7.4805 Gallons

1 Day = 86,400 Seconds

Therefore:

$\frac{\text{Cubic Foot}}{\text{Second}}$	X	$\frac{86,400 \text{ Seconds}}{1 \text{ Day}}$	X	$\frac{7.4805 \text{ Gallons}}{1 \text{ Cubic Foot}}$	=	$\frac{\text{Gallon}}{\text{Day}}$
$\frac{\text{Gallon}}{\text{Day}}$	X	$\frac{1 \text{ Million Gallons}}{1,000,000 \text{ Gallons}}$	=	$\frac{\text{Million Gallons}}{\text{Day}}$		

