

**SANITARY SEWER & POTABLE WATER
ENGINEER'S REPORT**

For

1204 Park Avenue Associates, LLC.

Proposed



*Block 729, Lot 1
Park Avenue (CR 531) & Randolph Road
City of Plainfield
Union County
NJ*

Prepared by:



**1904 Main Street
Lake Como, NJ 07719
(732) 974-0198**

A handwritten signature in black ink, appearing to read "R. Freud", written over a horizontal line.

**Robert P. Freud, PE, PP
NJ Professional Engineer License #41938**

**March 2020
DEC # 2340-99-008**

RECEIVED
APR 21 2020
PLANNING DIVISION

INTRODUCTION

The subject property is known as Block 729, Lot 1 as shown on the Tax Maps of the City of Plainfield, Union County, New Jersey. The parcel consists of approximately 2.91 acres and is located in the PAGRP-Park Avenue Gateway Redevelopment Plan. The proposed development consists of subdividing the property into two (2) lots with a 14,823 SF CVS Pharmacy with drive-thru pharmacy window, with additional improvements including parking areas, driveways, landscaping, lighting, and other associated amenities.

EXISTING SANITARY SEWER SYSTEM

The site does not currently connect to an existing sanitary sewer system.

PROPOSED SANITARY SEWER SYSTEM

The proposed 14,823 SF CVS Pharmacy with Drive-Thru will be serviced by a 6" PVC sanitary sewer lateral on site, which will connect to an existing 10" sanitary main within Randolph Road. Coordination with the local sewer authority will be required for the proposed lateral connection within Randolph Road.

SEWERAGE FLOW CALCULATION

Sanitary sewage flow estimation has been calculated utilizing the NJDEP Acceptable Design Flow Criteria for CVS Pharmacies stated in the memorandum prepared by Tracy L. Shelvin, PE, Supervisor, dated October 21, 2009. Considering the above, proposed sewage flows are estimated as follows:

CVS Pharmacies – 0.037 gallons/day/SF

CVS Pharmacies = 14,823 SF X 0.037 GPD = 549 GPD

TOTAL = 549 gallons/day (GPD)

SANITARY SEWER PIPE DESIGN

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

Pipe Size	Slope	Roughness (n)	Capacity at ½ Full	2 X ADF
6" PVC	1.04%	0.010	241,040	1,098

The proposed 6-inch PVC sanitary sewer lateral can easily convey two times the proposed average daily flow proposed by the onsite development while flowing half full. The total flow from the proposed building will constitute less than 0.5% of the line's total capacity.

PROPOSED WATER SYSTEM

The proposed on-site water service will be provided by a 6" water service line, which will connect to an existing 6" water main within Park Avenue. Coordination with the Local Water Company is required for the proposed wet tap connection into the main within Park Avenue.

DOMESTIC WATER DEMAND CALCULATION

NJAC 7:10-12.6(2) 2, Table 1, was utilized to calculate projected domestic water usage.

Stores = 0.125 gallons/day (GPD) per square foot

Stores = 14,823 SF X 0.125 GPD = 1,853 GPD

TOTAL = 1,853 gallons/day (GPD)

APPENDIX

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



DYNAMIC ENGINEERING

Capacity of Circular Pipe Flowing 1/2 Full

Project: Proposed CVS Pharmacy with Drive-Thru
 Job #: 2340-99-008
 Location: City of Plainfield

Computed By: JMV
 Checked By: KK
 Date: 3/4/2020

PIPE DESCRIPTION	SLOPE (%)	SIZE (IN)	MANNING'S COEFFICIENT (n)	VELOCITY (FT/S)	CAPACITY (CFS)	CAPACITY (GPD)	CAPACITY (MGD)
SDR-35 PVC	1.040%	6	0.010	3.60	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:

$$\frac{\text{Cubic Foot}}{\text{Second}} \times \frac{86,400 \text{ Seconds}}{1 \text{ Day}} \times \frac{7,4805 \text{ Gallons}}{1 \text{ Cubic Foot}} = \frac{\text{Gallon}}{\text{Day}}$$

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

**NJDEP ACCEPTABLE DESIGN FLOW CRITERIA FOR
CVS PHARMACIES MEMORANDUM**



State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Water Quality

Bureau of Financing & Construction

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JON S. CORZINE
Governor

MARK N. MAURIELLO
Acting Commissioner

Brett W. Skapinetz, P.E.
Dynamic Engineering
215 Main Street
Suite 204
Chester, New Jersey 07930

OCT 21 2009

Re: Acceptable Design Flow Criteria for CVS Pharmacies

Dear Mr. Skapinetz:

We are writing in reply to your letter dated October 6, 2009 requesting a deviation from the Department's projected flow criterion for retail of 0.1 gallons per day per square foot for proposed CVS Pharmacies. After having reviewed the submitted water consumption data for ten CVS Pharmacies located throughout New Jersey, the Department will accept the following flow criterion:

CVS Pharmacies - 0.037 gallons/day/SF

Please note that this figure is applicable only to CVS Pharmacies. Pursuant to N.J.A.C. 7:14A-22.3, all determinations concerning whether or not a specific project requires a Treatment Works Approval (TWA) shall be based upon the project flow criterion stipulated in N.J.A.C. 7:14A-23.3. Also, any change in use of the building(s), including different tenants, will require prior approval from this office and will subsequently be subject to the projected flow criterion in N.J.A.C. 7:14A-23.3 and could result in use restrictions of the building(s) at a later date.

Also, the use of this alternative flow criteria is limited to TWA submittals only and can not be used in any sewer ban exemption submittals, as stated at N.J.A.C. 7:14A-22.19 et seq. In the case of sewer ban exemption submittals, the projected flow criterion as stipulated in N.J.A.C. 7:14A-23.3 must be utilized.

If you have any further questions pertaining to this matter, please contact me by calling (609) 633-1169.

Sincerely,

Tracy L. Shevlin, P.E., Supervisor
Bureau of Financing and Construction Permits