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ENGINEERS - SURVEYORS - PLANNERS
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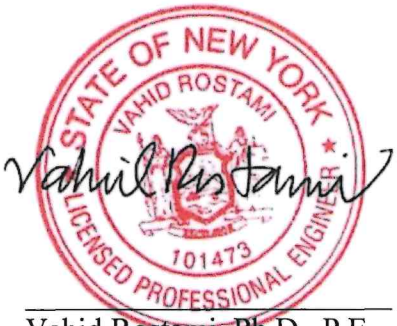
SEWER ANALYSIS REPORT

Project:

HAMASPIK CHOICE
F/KA/ ILLINOIS PROPERTIES 26 LLC

Village of New Hempstead
Rockland County, New York



Date: August 13, 2024
Job No. 5030

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1 Introduction

This Engineer's Report assesses the flow capacity and impact of sanitary wastewater generated by the proposed addition to the existing building. The project site is located west of N.Y.S Route 45 and north of Rensselaer Drive in Village of New Hempstead, Rockland County, New York. The report aims to evaluate the existing sewerage system's ability to handle the increased wastewater flows due to the projected demands. Detailed flow calculations and analyses have been provided to support this assessment.

2 Project Description:

The current site consists of a two-story building, with a total floor area of 31,250 sf. The existing building functions as an office building. The project proposes a two-story office building addition with a total floor area of 18,554 sf.

The existing 6" sewer service line will be used. This sewer service is located west of the building and connects to the existing 8" sewer main within the onsite sewer easement to the west of the property, as shown of the Engineering Plans (Drawing No. 1, Project No. 5030, Dated October 31, 2022, revised through April 12, 2024).

3 Wastewater Flow Calculations:

The sanitary wastewater flows for the proposed project and upstream of the project have been estimated. The sewer district maps and available data for all the sewer services have been used for this flow estimation. The plan of the services upstream from the point of sewer main study is provided in Appendix D.

Average wastewater flows are derived from Table B-3, "Typical Per-Unit Hydraulic Loading Rates" of the New York State Design Standards for Intermediate Sized Wastewater Treatment Systems, March 2014 ("NY Wastewater Standards"). (Appendix A).

The sanitary sewer demand for the proposed project is as follow:

Project Demands

Water Use Loading Rates

	Amount	Units	Notes
Commercial			
Office building	15	GPD / Employee/shift	Wastewater generation assumed to equal potable water use. – See Note #1

Water Use Calculations

	# Units	Avg. GPD	Notes
Commercial	#Employee/shift		
Office building	160	2,400	

Demand Calculations

Average Daily Demand (Total):	2,400	GPD	
Maximum Daily Demand:	4,300	GPD	Note #2
Peak Hourly Flow:	1,275	GPH	Note #3

Footnotes:

1. New York State Design Standards for Intermediate Size Wastewater Treatment Systems, 2014. Table B-3.
2. Maximum Daily Demand = Average Daily Demand * 1.8 (rounded accordingly)
3. Peak Hourly Flow = Average Daily Demand * 4.25 / 8 (rounded accordingly)

The breakdown of the calculated sanitary sewer flow rates upstream of the point of study and the project are as follows:

	Type of Use				
	Single Family Residential (4 bedroom)	Multi-Family Residential (4 bedroom)	School	Church/Hall/ Funeral	Total
Unit average daily flow rate (GPD)	450	450	10/Student	3/Seat	
No of units	127	38	600	400	
Subtotal average daily flow rate (GPD)	57,150	17,100	6,000	1200	81,450
Population served	635	190	600	400	1,825

The summary of the sanitary sewer flow rates is as follows:

Average daily flow - upstream (GPD):	81,450
Average daily flow - Project (GPD):	2,400
Average daily flow - downstream (GPD):	83,850
Maximum daily flow* - upstream (GPD):	146,610
Maximum daily flow* - Project (GPD):	4,320
Maximum daily flow* - downstream (GPD):	150,930

* A peaking factor of 1.8 has been used.

Estimated project population served:	160
Total estimated population served:	1,985
Peaking factor for flow design check**:	3.588

**As per ten-state standard, Figure 1.

Maximum hourly flow - upstream (GPH):	12,178
Maximum hourly flow - Project (GPH):	359
Maximum hourly flow - downstream (GPH):	12,537

4 Analysis:

Downstream:

In order to assess the adequacy of the existing sewerage conveying system, the flow capacity of the 8" ACP pipe between the sewer manholes #9077 and #9076 has been studied. The sewer main is upsized to a 10" ACP after the point of study. To assess the flow capacity of the sewer main, Manning's Equation was used to calculate the maximum open-channel flow rates for the existing 10" ACP. The studied existing 10" ACP sewer main pipe is 237 ft long and runs at a 0.00544 slope. The calculated flow capacity of the existing 8" ACP at 90% full condition is 37,997 GPH.

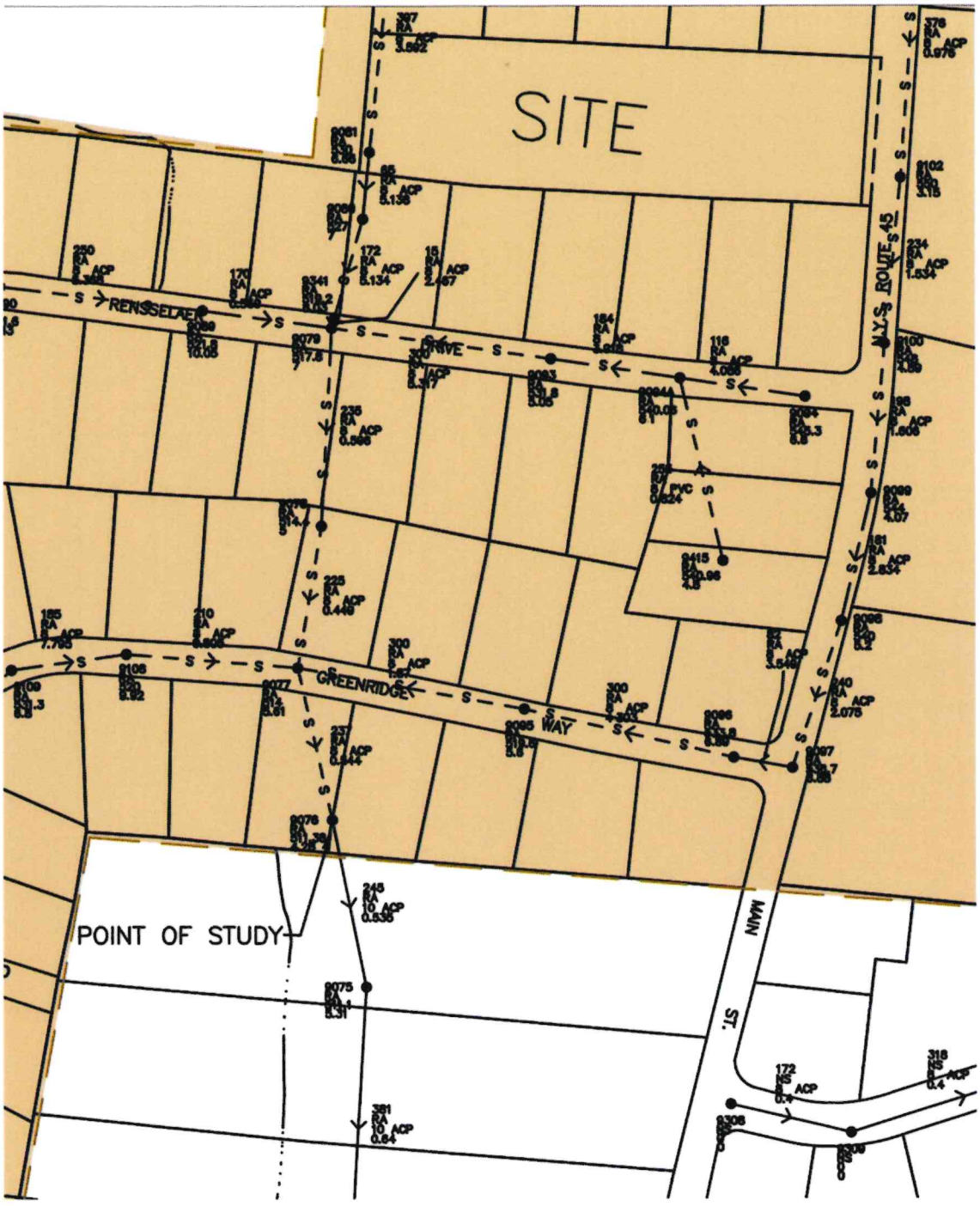

Figure 1: Point of study

Our hydraulic flow calculation indicates that the existing 8" ACP at the point of study is operating at 32.0% flow capacity (55.5% full condition). The required hourly flow of 12,537 GPH upon

completion of the project can be conveyed by the existing 8" ACP at 33.0% flow capacity (56.3% full condition). Detailed calculations are provided in Appendix C. Therefore, upon completion of the project, the existing sewer main is expected to be adequate to handle the additional sewage load from the proposed project.

Sewer lateral:

The existing 6" building sewer lateral pipe has been assessed for the total sewage flow from the proposed development. The sewage conveyance capacity, assuming a 50% full condition, was found to be 7,428 GPH. Detailed calculations are provided in Appendix C. The maximum hourly flow of sewage from the project is estimated at 1,275 GPH. Therefore, the existing sewer lateral is adequate for the project's demand.

5 Summary:

This Sewer Analysis Report evaluates the capacity of the existing sewer infrastructure to handle the increased wastewater flow resulting from the proposed addition to the Hamaspik Choice, f/k/a Illinois Properties 26 LLC building in the Village of New Hempstead, Rockland County, New York. The assessment includes detailed flow calculations, considering both the existing and projected demands.

The existing 6" building sewer lateral and the 8" sewer main downstream have been analyzed for their capacity to convey the additional sewage generated by the project. The 6" lateral pipe, with a capacity of 7,428 GPH at 50% full condition, is sufficient to handle the maximum projected flow of 1,275 GPH from the project. Similarly, the 8" sewer main, operating at 32% of its capacity, can accommodate the increased flow without issue. The existing sewer system is determined to be adequate for the project's sewage demands.

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Appendix A

Excerpt of Table B-3, "Typical Per-Unit Hydraulic Loading Rates" of the New York State Design Standards for Intermediate Sized Wastewater Treatment Systems, March 2014 ("NY Wastewater Standards")

Residential

Type of Use	*Unit*	*Gallons per Day*
Apartment	Per Bedroom	110/130/150[16]
Mobile Home Park	"Single-Wide" Home	220
	"Double-Wide" Home	330
Single Family Residence	Per Bedroom	110 / 130 /150[17]

[16] 110 gpd for post 1994 plumbing code fixtures; 130 gpd for pre 1994 fixtures; and 150 gpd for pre 1980 fixtures. Homes over 1,000 gpd, community systems, or lodging establishments with high flow fixtures must account for any higher peak flow periods.

Campgrounds

Type of Use	*Unit*	*Gallons per Day*
Day Camp	Per Person	15
	Add for Shower	5
	Add for Lunch	5
Campground	Per Unsewered Site[18]	55(includes showers)
	Per Sewered Site – with water hookups	100
	Per Sewered Site – without water hookups	55
Campground Day Use	Per Person	5
Dumping Station [19]	Per Unsewered Site	10
	Per Sewered Site	5

Institutional

Type of Use	*Unit*	*Gallons per Day*
Assisted Living Facility/Complex	Per Bed[20,21] – add 10 gpd for in room kitchen	110/130/150
Group Home (residential-style building)	Per Bed[20] - add 150 gpd per house for garbage grinder	110/130/150
Nursing Home (hospital care)	Per Bed[20,21]	175
Hospital	Per Bed[20,21]	175
	Per Outpatient	30
Church	Per Seat[20]	3
Church Hall/Fire Hall	Per Seat[21]	10

Library / Museum	Per Patron[20,21]	5
Public Park	Per Person (toilet only)	5
Prison / Jail	Per Inmate[20,21]	150
School – Day	Per Student	10
- or -	Elem. / Jr. High / Sr. High	7 / 9 / 12
- and -	Add for meals / showers	5 / 5
School Boarding	Per Student[20,21]	75

[18] Additional wastewater flow due to food service or laundry shall be accounted for. Structures available for overnight occupancy other than those meeting the definition of a camping unit shall be based on 150 gpd / unit for design flow purposes, pursuant to NYSDOH – *Chapter 1 State Sanitary Code Subpart 7-3 Campgrounds*.

[19] The addition of flow for dump station sewage may be prorated by using an estimated percentage of sites suited for RV use based on historical data. No reduction for low flow fixture usage should be applied here.

[20] Add 15 gpd per employee

[21] Add for Food Service (e.g. 24-hour restaurant: refer to Food Service Operations Table)

Commercial

Type of Use	*Unit*	*Gallons per Day*
Airport/Bus Rail Terminal	Per Passenger[22] Per Toilet	5 400
Barber Shop / Beauty Salon	Per Station without and with hair care sink	50 200
Bowling Alley	Per Lane [22,23]	75
Bed & Breakfast	Per Room (see note under Residential)	110/130/150
Casino	Per Employee/shift plus Per Sq. Ft. for non-lodging customer use	15 0.3
Country Clubs & Golf Courses	Per Round of Golf [21,22] (add for bar, banquet, shower or pool facilities and golf tournaments)	20
Concert Hall / Arena / Assembly Hall / Theater Stadium / Skating Rink	Per Seat [21,22]	5
Day Care	Per Child [21]	20
Office Building	Per Employee[25]: add for showers	15 5
Service station/Convenience store	Per Toilet[25]	400
Shopping Center / Grocery Store / Department Store	Per Sq. Ft. [25,26]: add for deli, bakery, butcher	0.1
Swimming Pool / Bath House	Per Swimmer	10
Veterinary Office	Per Veterinarian	200

[22] Add 15 gpd per employee/shift

[23] Add for Food Service (e.g. 24 hour restaurant: refer to Food Service Operations Table)

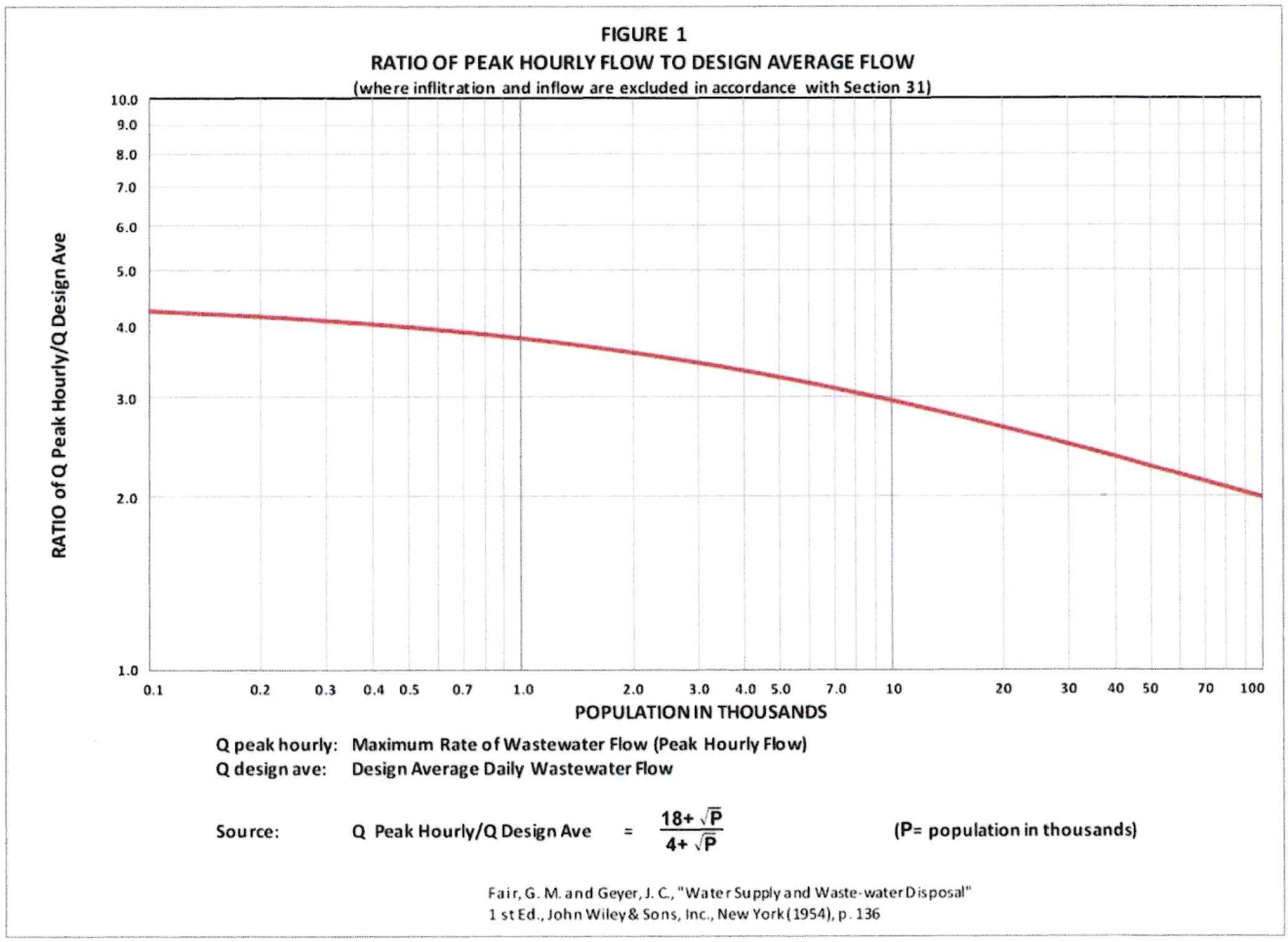
[24] Dental offices must recycle mercury amalgam instead of washing it down the drain. NYSDEC's website has

[25] Add for Food Service (e.g. 24-hour restaurant: refer to Food Service Operations Table)

[26] Add 15 gpd per employee/shift

Appendix B

Figure 1: Ratio of Peak Hourly Flow to Design Average Daily Wastewater Flow, page 10-6, in the Recommended Standards for Wastewater Facilities by the Great Lakes – Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 2014 ("10 States Standards")

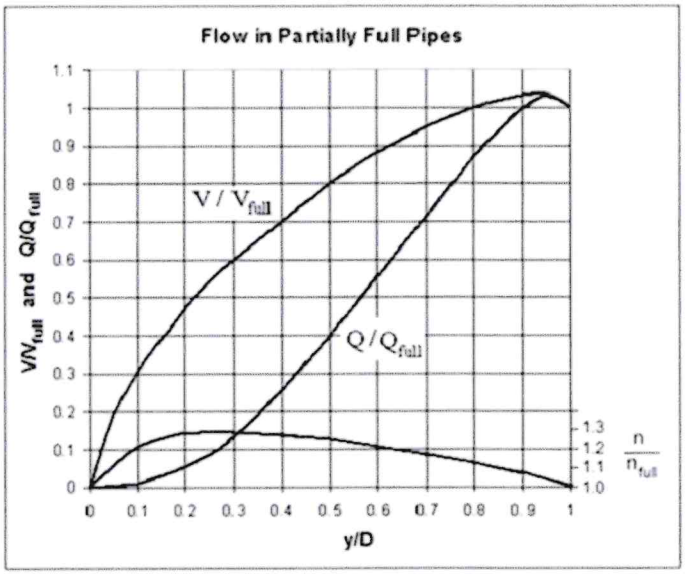


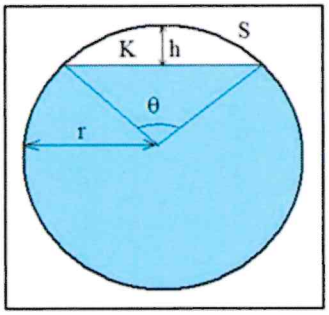
Appendix C

Hydraulic calculation of sanitary sewer pipes

Sewer pipe sizing calculation:	
Pipe diameter, D (in):	8
Depth of flow, y (in):	7.20
% Full (y/D):	90.0%
Pipe slope:	0.00544
Manning coeff. (n):	0.015

Manning coeff., Modified (n): $n=(n_{full})[1.25-(y/D-0.5)^{1/2}]$	0.009
$\theta=2Arccos[(r-h)/r]$ (rad):	1.287
Area (A, sq.ft.):	0.331
Wet Area (P, sq.ft.):	1.665
Hydraulic radius (R=A/P, ft):	0.199
Flow Capacity (cfs): $(1.49/n)AR^{2/3}S^{1/2}$ =	1.337
Average Velocity (fps):	4.040
Flow Rate (GPH):	35,997
Flow Rate (MGD):	0.864





Partially Full Pipe Flow Parameters
(More Than Half Full)

$$\theta = 2\arccos\left(\frac{r-h}{r}\right)$$

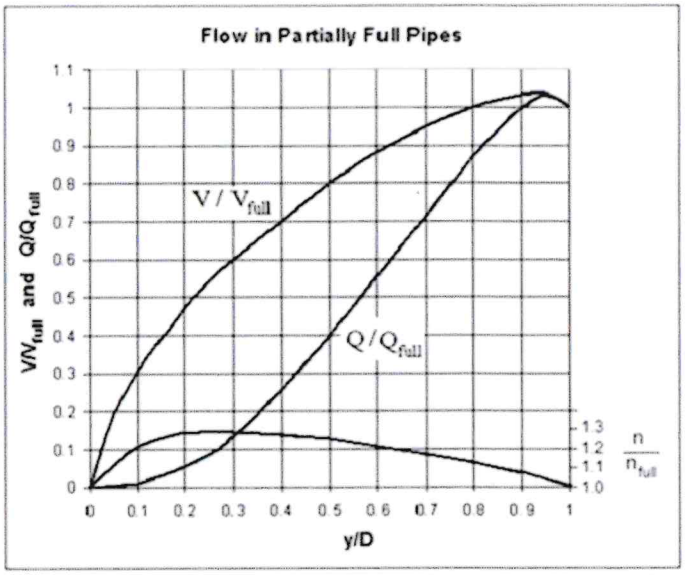
$$A = \pi r^2 - \frac{r^2(\theta - \sin\theta)}{2}$$

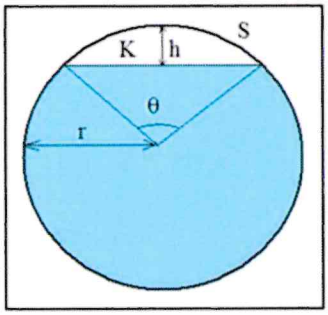
$$P = 2\pi r - r * \theta$$

Flow capacity calculation of existing 8" pipe at 90% full condition.

Sewer pipe sizing calculation:	
Pipe diameter, D (in):	8
Depth of flow, y (in):	4.44
% Full (y/D):	55.5%
Pipe slope:	0.00544
Manning coeff. (n):	0.015

Manning coeff., Modified (n): $n=(n_{full})[1.25-(y/D-0.5)^{1/2}]$	0.015
$\theta=2Arccos[(r-h)/r]$ (rad):	2.921
Area (A, sq.ft.):	0.199
Wet Area (P, sq.ft.):	1.121
Hydraulic radius (R=A/P, ft):	0.178
Flow Capacity (cfs): $(1.49/n)AR^{2/3}S^{1/2}$ =	0.453
Average Velocity (fps):	2.279
Flow Rate (GPH):	12,207
Flow Rate (MGD):	0.293





Partially Full Pipe Flow Parameters
(More Than Half Full)

$$\theta = 2\arccos\left(\frac{r-h}{r}\right)$$

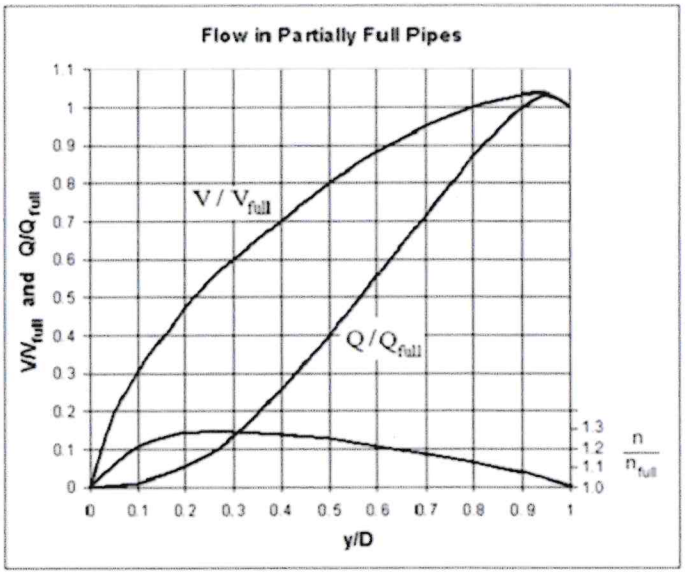
$$A = \pi r^2 - \frac{r^2(\theta - \sin\theta)}{2}$$

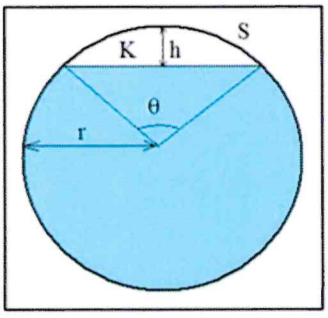
$$P = 2\pi r - r * \theta$$

Flow capacity calculation of existing 8" pipe in existing condition.

Sewer pipe sizing calculation:	
Pipe diameter, D (in):	8
Depth of flow, y (in):	4.50
% Full (y/D):	56.3%
Pipe slope:	0.00544
Manning coeff. (n):	0.015

Manning coeff., Modified (n): $n=(n_{full})[1.25-(y/D-0.5)^{1/2}]$	0.015
$\theta=2Arccos[(r-h)/r]$ (rad):	2.891
Area (A, sq.ft.):	0.202
Wet Area (P, sq.ft.):	1.131
Hydraulic radius (R=A/P, ft):	0.179
Flow Capacity (cfs): $(1.49/n)AR^{2/3} S^{1/2} =$	0.470
Average Velocity (fps):	2.326
Flow Rate (GPH):	12,666
Flow Rate (MGD):	0.304





Partially Full Pipe Flow Parameters
(More Than Half Full)

$$\theta = 2\arccos\left(\frac{r-h}{r}\right)$$

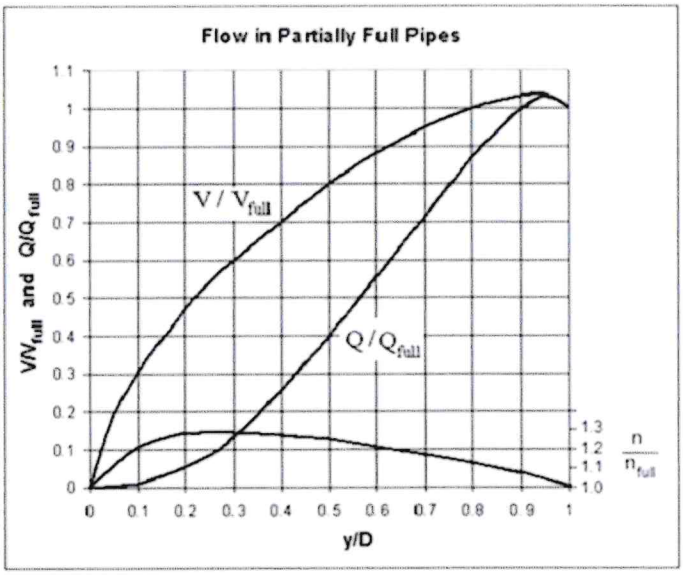
$$A = \pi r^2 - \frac{r^2(\theta - \sin\theta)}{2}$$

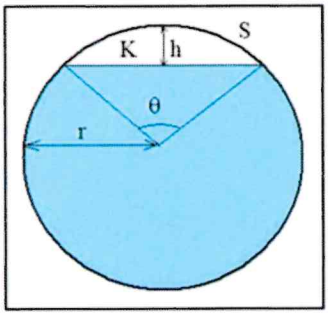
$$P = 2\pi r - r*\theta$$

Flow capacity calculation of existing 8" pipe in proposed condition.

Sewer lateral pipe sizing calculation:	
Pipe diameter, D (in):	6
Depth of flow, y (in):	3
% Full (y/D):	50%
Pipe slope:	0.02
Manning coeff. (n):	0.015

Manning coeff., Modified (n): $n=(n_{full})[1.25-(y/D-0.5)^{1/2}]$	0.019
$\theta=2Arccos[(r-h)/r]$ (rad):	3.142
Area (A, sq.ft.):	0.098
Wet Area (P, sq.ft.):	0.785
Hydraulic radius (R=A/P, ft):	0.125
Flow Capacity (cfs): $(1.49/n)AR^{2/3}S^{1/2}$ =	0.276
Average Velocity (fps):	2.810
Flow Capacity (GPH):	7,428
Flow Capacity (MGD):	0.178





Partially Full Pipe Flow Parameters
(More Than Half Full)

$$\theta = 2\arccos\left(\frac{r-h}{r}\right)$$

$$A = \pi r^2 - \frac{r^2(\theta - \sin\theta)}{2}$$

$$P = 2\pi r - r*\theta$$

Flow capacity calculation of existing 6" building service at 50% full condition.

Appendix D

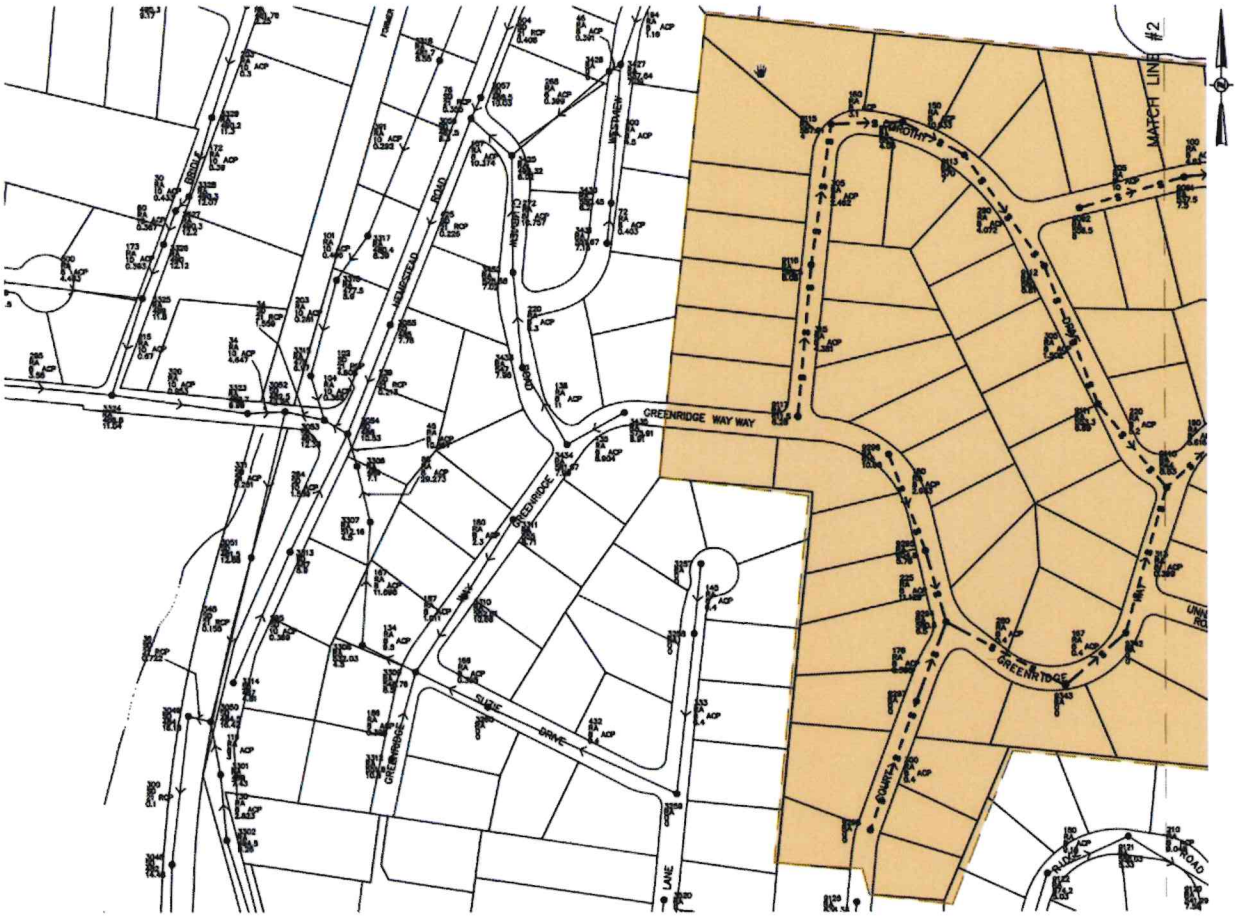
Plan of sanitary sewer services upstream of the project site.

LEGEND

SF	SINGLE FAMILY RESIDENCE
MF	MULTI-FAMILY RESIDENCE
CM	COMMERCIAL LOT
IN	INSTITUTIONAL LOT
VC	VACANT LOT

Partial plan of sanitary sewer services

Partial plan of sanitary sewer services



Partial plan of sanitary sewer services