



**ENGINEER'S REPORT
FOR
PROPOSED RETAIL BUILDING
4548-4564 MAIN STREET
TOWN OF AMHERST, NEW YORK
PROP # 5202**

**April 16, 2025
(Updated May 29, 2025)**

GENERAL

This project is a redevelopment of three parcels with a total of 0.79-acres that were previously occupied with two commercial buildings totaling 12,150 S.F. with an associated parking lot, utility and drainage infrastructure. The project is located along Rt. 5 Main Street between Fruehauf Ave and Chateau Terrace in the Town of Amherst. The property abuts general commercial properties along Main Street property and abuts residential properties along the North property line. The existing buildings have been demolished with the existing foundations remaining in place until future construction.

Existing Conditions:

The site was occupied by multi-tenant buildings with associated parking lots. The buildings have been demolished with the foundation remaining. The site currently is sheet draining any runoff from pavement surface into the existing on-site drainage structures.

The site contains two existing domestic water services. A ¾" domestic service is located along Main St. that is tapped off the existing 8" water main along the Southside of Main St. A 2" domestic service is tapped off the 6" water main along Fruehauf Ave. The existing water services will be abandoned as part of this project.

Existing Sanitary Sewers are located along Main Street that discharges into Town of Amherst sewer district #1.

PROJECT OVERVIEW

The proposed project (*Figure 1*) consists of; demolition of the existing multi-tenant building foundations, pavement areas and the clearing of land; construction of a proposed 12,285 S.F. retail and restaurant building with associated parking garage, drainage, utility, lighting and landscaping improvements.

PROPOSED FACILITIES

Storm Water

Refer to the stormwater report prepared by Carmina Wood Design.

Refer to Figure 3 for Storm sewer calculation for the upper deck trench drains based off a 10-yr storm event.

Water System

The existing water services to the site are to be abandoned for this proposed project. The proposed development will provide a new water service tap to the 6" main along Chateau Terrace. The proposed domestic and fire services will be backflowed within the proposed building.

Disinfection of the water services following installation will be continuous feed, according to AWWA C-651, latest revision.

Summary: *(Refer to Figure 2)*

Proposed Building:	12,285 S.F.
Operating Demand Increase:	4.79 gpm
Peak Demand Increase:	9.57 gpm
Water Main:	6" main along Chateau Terrace
Static Pressure:	64 PSI
Head Loss Friction:	0.0 psi
Loss through meter/RPZ:	13.0 psi
Elevation Loss:	0.6 psi (+)
Bends Loss:	0 psi
Required Pressure after RPZ:	20 psi
Proposed Pressure after RPZ:	50.6 PSI

Sanitary Sewer:

Sanitary services will provide a new sanitary lateral connection to an existing manhole along Fruehauf Ave. The proposed building will be provided a 2,000 Gal grease trap with new 6" SDR-35 PVC lateral sanitary connection. The minimum required grease trap size is based off peak water flows at 30-min retention of fluids. The 2,000gal tank provides the maximum storage capacity for a 4" diameter pipe that is discharging at maximum flow capacity to cover possible future uses.

Summary:

Proposed New Building S.F.:	12,285 S.F.
Proposed Flow:	Retail
	0.1 GPD * 10,000 SF = 1,000 GPD
	15 GPD * 20 Employees = 300GPD
	Restaurant
	35 GPD/ 25 Seats = 875 GPD
Total Sanitary Flow:	2,175 GPD

FIGURES:

- 1 *Site Location Plan & Engineering Plan*
- 2 *Sanitary & Water Calculations*
- 3 *Storm Sewer Calculations with Delineation*
- 4 *Flow Test performed by ECWA*

APPENDICES:

- A *FEMA Flood Areas*

FIGURE 1

SITE LOCATION PLAN ENGINEERING PLANS



FIGURE 2

SANITARY & WATER CALCULATIONS

SANITARY SEWER CALCULATIONS:

Design GPD:	Retail	=	0.1 GPD/ S.F. + 15gpd/Employee
	Resturant	=	35 GPD / Seat
Proposed		=	10,000 S.F. Retail building @ 1 Employee per 500SF
		=	0.1 GPD * 10,000 S.F.
		=	15GPD * 20 Employees
Restaurant		=	35 GPD * 25 Seats
		=	(0.1 GPD * 10,000 SF) + (15 GPD *20 EMP.) + (35 GPD*25 SEATS)

SANITARY FLOW = **2,175 GPD**

PEAK SANITARY DEMAND

Total Demand	=	2,175 GDP
Per Population	=	30 Per Capita
Peak Factor: $(18+VP) / (4+VP)$	P in Thousands	
Peak Factor	=	4.37
Peak Sanitary Demand	=	2175 x 4.37 = 9505 gpd = 6.60 gpm

<u>WATER CALCULATIONS:</u>	=	1.1 Usage Factor * (GPD)
	=	2,175 * 1.1 = 2393 GPD
	=	GPD / 9hr / 60min
ASSUMED 9HR SHIFT	=	2393 / 9 / 60
	=	<u>4.43 GPM</u>

PEAK FACTOR:	=	GPM X 2.0	(ECWA Design Manual - Feb 2024 - 3.8.B.4)
	=	4.43 X 2.0	
Q	=	<u>8.86 GPM PEAK</u>	

HEADLOSS FRICTION:	=	$\frac{(10.44) \times (L) \times (Q)^{1.85}}{(C)^{1.85} \times (D)^{4.866}}$
Q = GPMin		
L = LENGTH OF PIPE	=	$\frac{(10.44) \times (40) \times (8.86)^{1.85}}{(140)^{1.85} \times (6)^{4.866}}$
C = DESIGN COEF OF PIPE		
D = PIPE DIAMETER	=	<u>0 PSI</u>

FIGURE 3

Storm Sewer Calculations

Pipe Size Calculations:

JOB: 5202 - Main St Snyder

Date: 5.29.2025

$$Q = (C) \times (I) \times (A)$$

Q: Flow Rate (cfs)
C: Runoff Coefficiency 0.25 landscaped / 0.9 Hardstanding
A: Area (Acre)
I: Rainfall Event (10 year Type II 24hr SCS Storm) - Buffalo,NY

C (Hardstanding)	0.9
C (Landscaped)	0.25
I:	3.34

1 sqft / 1 Acre	2.30E-05
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Pipe Run		AREA (I)				ACCUMULATIVE AREA (I)				FLOW RATE (cfs)	REQ. PIPE Ø	At SLOPE %	Max Flow
Start RUN	END RUN	Hardstanding		Landscaped		Hardstanding		Landscaped					
6 Trench	6" Pipe	3,450 ft ²	0.0792 Acre	0 ft ²		3,450 ft ²	0.0792 Acre			0.238 cfs	6	0.2	0.33 cfs
8" Trench	8" Outlet	10,250 ft ²	0.2353 Acre	0 ft ²		13,700 ft ²	0.3145 Acre			0.945 cfs	8	1	1.58 cfs

Max Flow Rates per pipe size and slope

slope (%) =	1	HDPE		n=0.01
diameter (inch)		Max Flow (cfs)	Velocity (ft/s)	
4		0.25	2.84	
6		0.73	3.73	
8		1.58	4.51	
10		2.86	5.24	
12		4.64	5.91	
15		8.42	6.86	
18		13.69	7.75	
21		20.65	8.59	
24		29.49	9.39	

slope (%) =	0.2	HDPE		n=0.01
diameter (inch)		Max Flow (cfs)	Velocity (ft/s)	
4		0.11	1.27	
6		0.33	1.67	
8		0.7	2.02	
10		1.28	2.34	
12		2.08	2.64	
15		3.77	3.07	
18		6.12	3.47	
21		9.24	3.84	
24		13.19	4.2	

DRAWING REVISIONS	
NO.	DATE
1	06/13/2023
2	07/20/23
3	08/15/23
4	09/01/23
5	09/15/23
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495	02/15/44
496	03/01/44
497	03/1

FIGURE 4

Flow Test by ECWA

Print Date: 4/16/2020

Flow	Hyd	Location	Main/Brnch	Nzle	Size	Pitot	Flow	Comments
J07	E21	2	BRANTWOOD RD	1:	2.50	20.0	750	
		1ST HYD S/O MAIN ST		2:	2.50	20.0	750	
		C/O MAIN ST		3:				Total Flow: 1,500

APPENDIX A

FEMA Flood Areas

National Flood Hazard Layer FIRMette



78°47'13"W 42°58'N

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

Without Base Flood Elevation (BFE)
Zone A, V, A99

With BFE or Depth *Zone AE, AO, AH, VE, AR*

Regulatory Floodway

SPECIAL FLOOD HAZARD AREAS

0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*

Future Conditions 1% Annual Chance Flood Hazard *Zone X*

Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*

Area with Flood Risk due to Levee *Zone D*

OTHER AREAS OF FLOOD HAZARD

NO SCREEN

Area of Minimal Flood Hazard *Zone X*

Effective LOMRs

Area of Undetermined Flood Hazard *Zone D*

OTHER AREAS

Channel, Culvert, or Storm Sewer

Levee, Dike, or Floodwall

GENERAL STRUCTURES

Cross Sections with 1% Annual Chance Water Surface Elevation

Coastal Transect

Base Flood Elevation Line (BFE)

Limit of Study

Jurisdiction Boundary

Coastal Transect Baseline

Profile Baseline

Hydrographic Feature

OTHER FEATURES

Digital Data Available

No Digital Data Available

Unmapped

MAP PANELS

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **8/11/2021 at 10:16 AM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

0 250 500 1,000 1,500 2,000 Feet

78°46'35"W 42°57'34"N

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020