



DOWNSTREAM SANITARY SEWER CAPACITY ANALYSIS REPORT

for

Proposed Apartments
1130 Orchard Park Road
Town of West Seneca, Erie, NY

Prepared for

Hanley Development

3266 Seneca Street
West Seneca, NY 14224

Prepared by

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May 2022



Project Description

This project is a development of a 4.90 acre +/- site located on the east side of Orchard Park Road in the Town of West Seneca. The property will be developed to accommodate for 40 2-bedroom apartment units.

The proposed sewer service for this development will connect to an existing 10" Town of West Seneca sewer main that runs along the east side of Orchard Park Road.

Node 1 - 1001 Orchard Park Rd (12"):

Existing Peak Flow measured (wet weather event)	= 3.049 cfs (1.969 mgd)*
Proposed Apartments Peak Flow	= 0.041 cfs**
Proposed Total Peak Flow	= 3.090 cfs

Existing Peak Flow measured (overall)	= 3.249 cfs (2.100 mgd)*
Proposed Apartments Peak Flow	= 0.041 cfs**
Proposed Total Peak Flow	= 3.290 cfs

Theoretical capacity of existing 12" pipe @ 0.34% = 2.249 cfs

Conclusion: Monitored flows the day following the 0.51" rainfall event exceeded the capacity of the existing pipe 12" sewer. One time during the monitoring period the flow depth exceeded the pipe diameter at Node 1, but at no time during the monitoring period did the flow at any point slow or stall which would have caused a backup or flooding at the manhole. I/I mitigation shall be required for the contribution proposed for this project.

Node 2 - Orchard Park Rd (15"):

Existing Peak Flow measured (wet weather event)	= 1.908 cfs (1.233 mgd)*
Proposed Apartments Peak Flow	= 0.041 cfs**
Proposed Total Peak Flow	= 1.949 cfs

Existing Peak Flow measured (overall)	= 2.584 cfs (1.670 mgd)*
Proposed Apartments Peak Flow	= 0.041 cfs**
Proposed Total Peak Flow	= 2.625 cfs

Theoretical capacity of existing 15" pipe @ 0.34% = 4.077 cfs

Conclusion: Monitored flows the day following the 0.51" and 0.21" rainfall events exceeded the capacity of the existing pipe 12" sewer. Three times during the monitoring period the flow depth exceeded the pipe diameter at Node 1, but at no time during the monitoring period did the flow at any point slow or stall which would have caused a backup or flooding at the manhole. I/I mitigation shall be required for the contribution proposed for this project

Node 3 - Orchard Park Rd & Fairfax (48"):

Existing Peak Flow measured (wet weather event)	= 14.470 cfs (9.352 mgd)*
Proposed Apartments Peak Flow	= 0.041 cfs**
Proposed Total Peak Flow	= 14.511 cfs

Existing Peak Flow measured (overall)	= 16.150 cfs (10.438 mgd)*
Proposed Apartments Peak Flow	= 0.041 cfs**
Proposed Total Peak Flow	= 16.191 cfs

Theoretical capacity of existing 48" pipe @ 0.15% = 60.218 cfs

Conclusion: The proposed total peak flow is less than the capacity of the 48" pipe, therefore there is sufficient capacity. At no time during the monitoring period did flow depth exceed the pipe diameter at Node 3 of the downstream monitoring points during the rain events monitored.

Foot Notes:

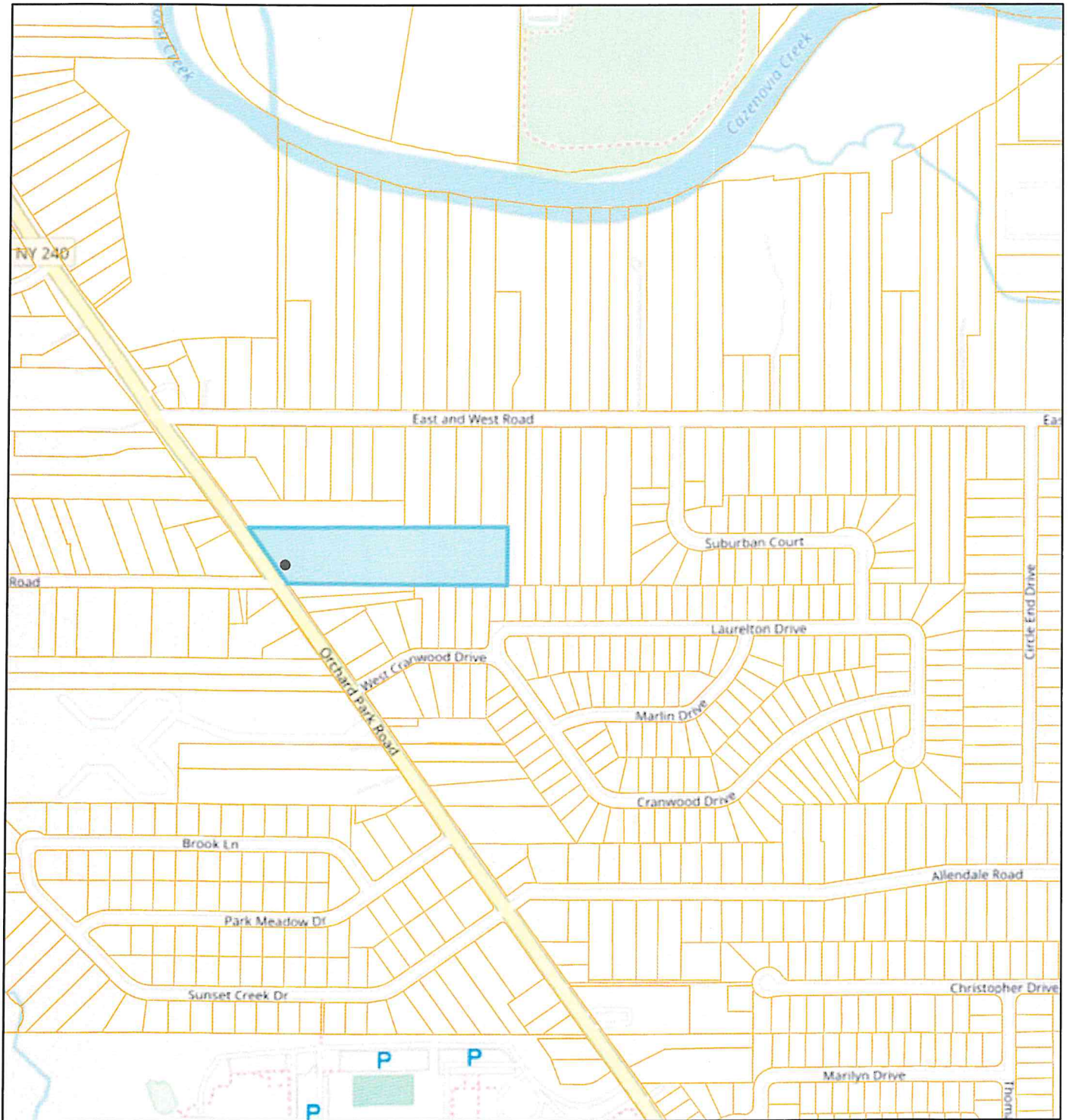
Downstream capacity node information provided by Town of West Seneca

*Converted from measurements in TECSmith report dated 4/19/22



** See Sanitary Sewage Demand Calculations

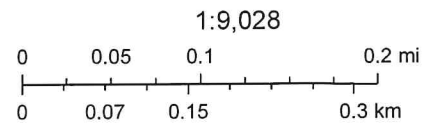
Location Map

ArcGIS Web Map



5/9/2022, 1:38:09 PM

-  Parcels
-  Municipal Boundaries



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Sanitary Demand Calculations

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Project No.: 22.128 Date: 5/9/2022
Project Name: Residential Apartments
Project Address: 1130 Orchard Park Road West Seneca, NY
Subject: Sanitary Sewer Demand Calcs
Sheet: 1 of 1

Sanitary Sewage Demand Calculations:

Proposed Townhouses

$$220 \text{ gal/d/unit} \times 28 \text{ units} = 6,160 \text{ gpd} \quad \text{*use 220 gallons per unit per day (2-bdrm)}$$

$$\text{Total Site Sanitary Demand:} = 6,160 \text{ gpd}$$

Find Peak Sanitary Demand:

Peaking Factor based on Population:

$$\text{Total demand: } 6,160 \text{ gpd} / 100 \text{ gpcd} = 62 \text{ per capita}$$

$$\text{Population (P)} = 62 \text{ people}$$

$$\text{Peaking Factor : } (18 + \ddot{O}P) / (4 + \ddot{O}P) \quad \text{where P is in thousands}$$

$$\text{Peaking Factor} = 4.30$$

$$\begin{aligned} \text{Peak Sanitary Demand} &= 6,160 \times 4.30 = 26,460 \text{ gpd} \\ &= 0.026 \text{ MGD} \\ &= 0.041 \text{ cfs} \end{aligned}$$

Required Infiltration and Inflow Mitigation:

$$\text{Peak Sanitary Flow} = 26,460 \text{ gpd} = 18.38 \text{ gpm}$$

$$4:1 \text{ offset flow per NYSDEC requirements} = 18.38 \times 4 = 73.50 \text{ gpm req'd}$$

$$\text{Mitigation Credit} = 30 \text{ gpm / lateral}$$

$$\begin{aligned} \text{Laterals to be replaced*} &= 2.5 \text{ laterals} \\ &= 3 \text{ laterals} \quad \text{* (or other mitigation as identified by the Town)} \end{aligned}$$

TECSmith Monitoring Report

Date	Node 1				Node 2				Node 3				Rain: (inches)	Snow (inches)
	1001 Orchard Park Rd (12")				Orchard Park Rd 15" (15")				Orchard Park Rd & Fairfax (48")					
	FLOW (GAL x 1,000)	PEAK FLOW (MGD)	PEAK LEVEL (IN)		FLOW (GAL x 1,000)	PEAK FLOW (MGD)	PEAK LEVEL (IN)		FLOW (GAL x 1,000)	PEAK FLOW (MGD)	PEAK LEVEL (IN)			
3/17/2022	238.969	0.451	6.624		341.293	0.804	5.176		3196.614	6.783	13.938		0	0
3/18/2022	336.374	0.429	6.354		435.456	0.771	4.387		5684.090	6.485	13.639		0	0
3/19/2022	414.549	0.634	7.566		437.597	0.903	4.881		6314.024	7.874	17.857		0.27	0
3/20/2022	572.225	0.774	8.054		595.846	0.958	14.897		7506.892	9.168	20.985		0.08	0
3/21/2022	424.482	0.601	6.762		540.386	0.766	5.802		6601.632	8.220	19.365		0	0
3/22/2022	364.127	0.435	6.572		484.695	0.730	4.786		5911.885	6.708	14.066		0	0
3/23/2022	496.162	1.989	50.259		526.604	1.233	39.448		6366.253	9.352	21.857		0.51	0
3/24/2022	815.453	2.100	56.546		885.440	1.670	56.717		8410.107	10.438	23.577		0	0
3/25/2022	444.762	0.536	6.827		496.776	0.699	4.932		7059.230	8.020	19.386		0	0
3/26/2022	485.561	0.627	7.108		516.156	0.795	5.453		7112.401	8.489	19.148		0.09	0.1
3/27/2022	478.418	0.734	7.121		502.699	0.753	5.041		7001.414	8.461	18.753		0.06	2.3
3/28/2022	387.978	0.527	6.418		442.380	0.695	4.585		6396.917	7.538	17.111		0.01	0.4
3/29/2022	352.453	0.686	6.476		415.768	0.633	4.392		5909.058	6.957	14.053		0	0
3/30/2022	331.345	0.779	8.492		433.907	1.012	6.066		5521.696	6.653	13.811		0.01	0
3/31/2022	401.546	0.721	7.500		494.235	0.758	5.331		5943.213	7.661	16.548		0.09	0
4/1/2022	340.318	0.831	6.688		435.101	0.713	4.533		5419.635	6.277	14.053		0.06	0.1
4/2/2022	307.156	0.478	6.353		405.887	0.651	4.547		5147.186	6.140	13.371		0	0
4/3/2022	303.267	0.505	6.247		359.789	0.669	4.488		5083.174	6.186	13.093		0.01	0
4/4/2022	297.479	0.640	6.107		372.366	0.579	4.773		4946.766	6.325	12.723		0	0
4/5/2022	283.690	0.458	6.281		375.176	0.581	4.631		4901.882	5.708	12.382		0	0
4/6/2022	292.364	0.506	6.715		370.221	0.577	4.801		4842.495	5.943	12.848		0.21	0
4/7/2022	678.868	1.149	9.528		735.759	1.262	22.143		7751.294	9.369	21.493		0.25	0
4/8/2022	425.775	0.605	6.946		610.050	0.853	5.537		7000.725	8.355	18.804		0	0
4/9/2022	330.674	0.445	6.583		476.833	0.727	5.010		6041.826	7.017	13.864		0	0
4/10/2022	294.542	0.621	6.165		398.460	0.659	4.727		5473.970	6.521	13.216		0	0
4/11/2022	300.810	0.553	7.058		403.992	0.672	5.088		5257.193	7.976	15.138		0.13	0
4/12/2022	470.449	0.715	7.835		601.005	0.858	5.988		7299.038	9.109	16.993		0.14	0
4/13/2022	371.181	0.486	6.814		514.574	0.827	4.977		6134.522	7.267	14.479		0.05	0
4/14/2022	202.051	0.422	6.249		298.422	0.686	4.750		3692.282	6.917	14.240		0	0
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	MGD	CFS		MGD	CFS		MGD	CFS
Wet	1.969	3.046	Wet	1.233	1.908	Wet	9.352	14.470
Dry	2.100	3.249	Dry	1.670	2.584	Dry	10.438	16.150

Date: April 19, 2022

SANITARY SEWER FLOW CAPACITY STUDY – Summary Review

Prepared For: 1130 Orchard Park Road Capacity Analysis

R. Christopher Wood, PE Partner
487 Main Street, Suite 500
Buffalo, New York 14203

Project Name: 1130 Orchard Park Road Capacity Analysis

Flow Monitoring Period: March 17, 22 to April 14, 2022

Rain Events (> 0.5-inches) Monitored: March 23, (0.51")

Number of Monitoring Nodes: Three (3) downstream manholes

Node Locations and Descriptions:

- Node 1 1001 Orchard Park Rd (12")
- Node 2 Orchard Park Rd (15")
- Node 3 Orchard Park Rd & Fairfax (48")

Summary Conclusion:

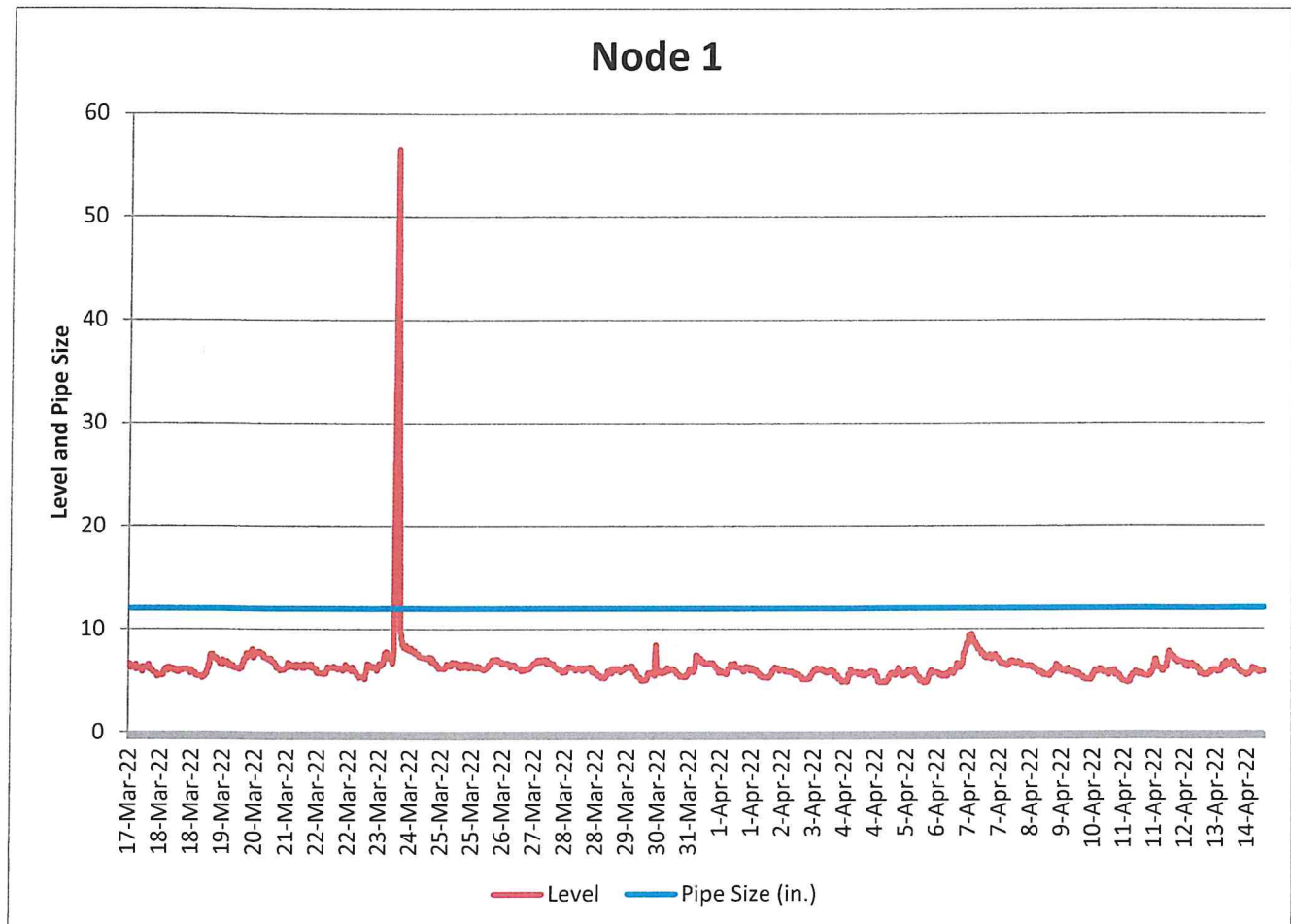
Based on the data presented in this report, specifically the flow depth measurements recorded (see graphs below)

- One time the flow depth exceeds pipe diameter at Node 1 of the downstream monitoring points during the wet weather events monitored.
- Two times the flow depth exceeds pipe diameter at Node 2 of the downstream monitoring points during the wet weather events monitored.
- At no time the flow depth exceeds pipe diameter at Node 3 of the downstream monitoring points during the wet weather events monitored.

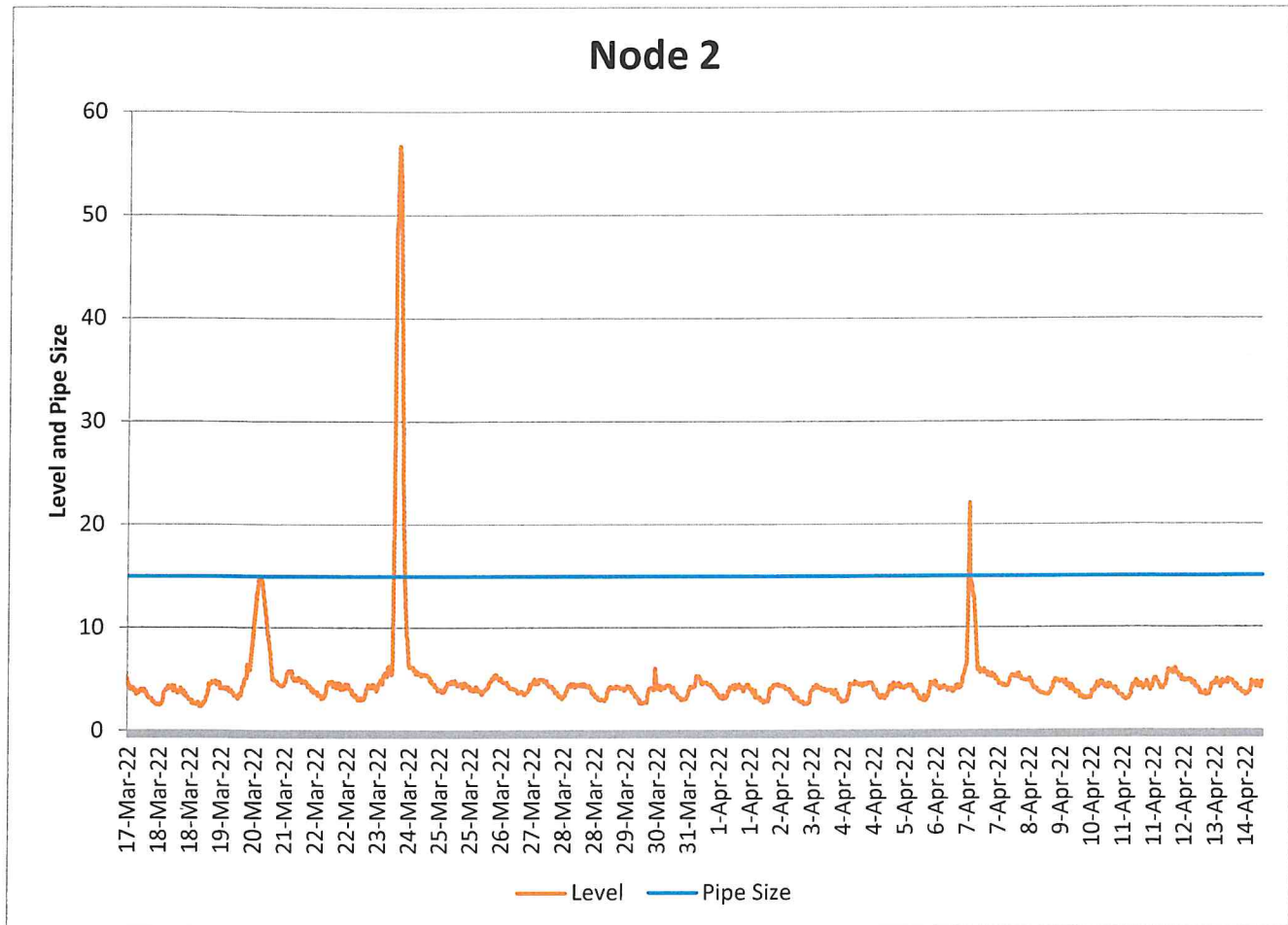
Depth of Flow Capacity Summary:

Depth of flow capacity is based on diameter of pipe. See graphs below.

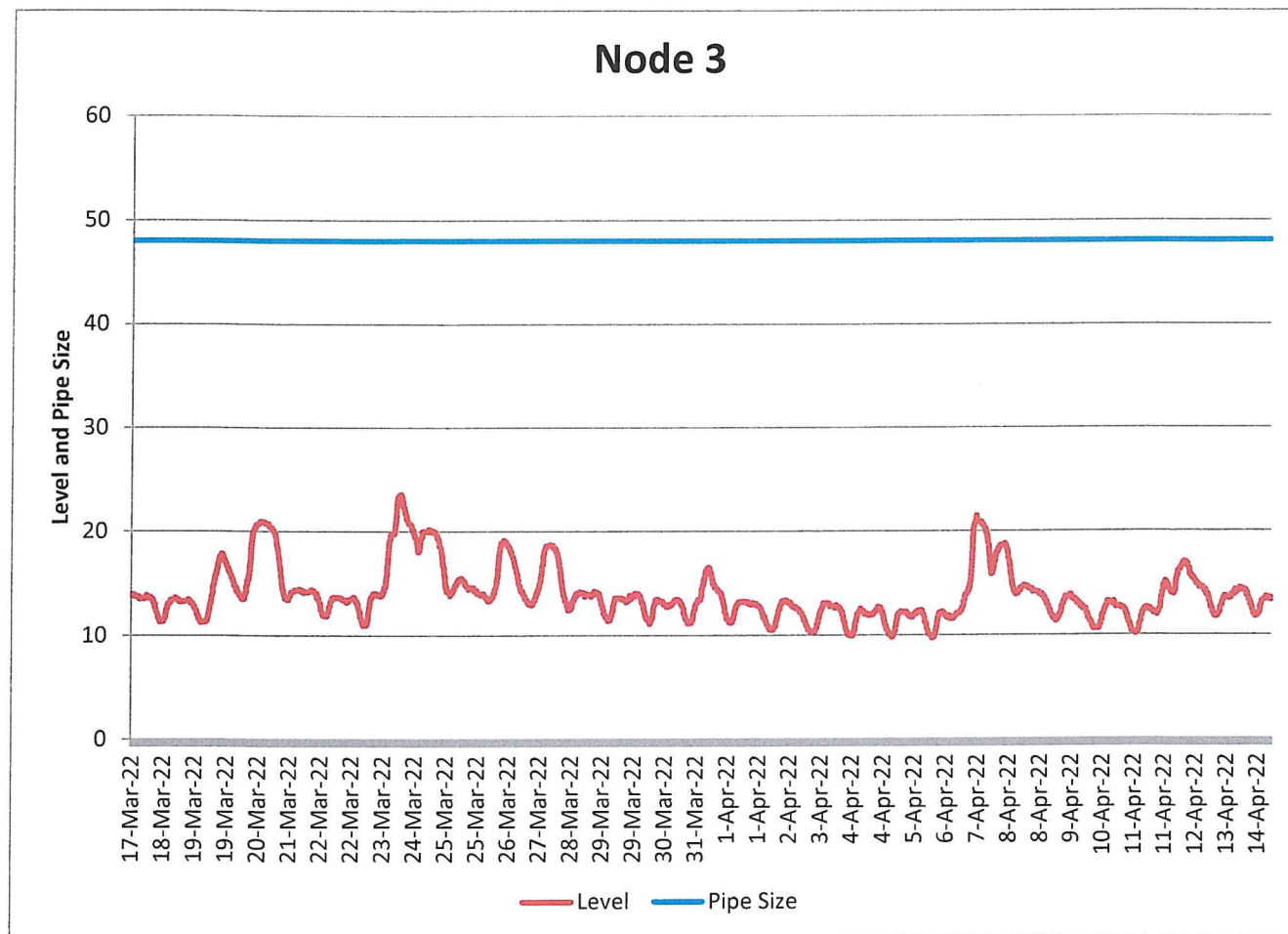
- One time during the monitoring period did depth of flow exceed pipe diameter at Node 1.



- Two times during the monitoring period did depth of flow exceed pipe diameter at Node 2.



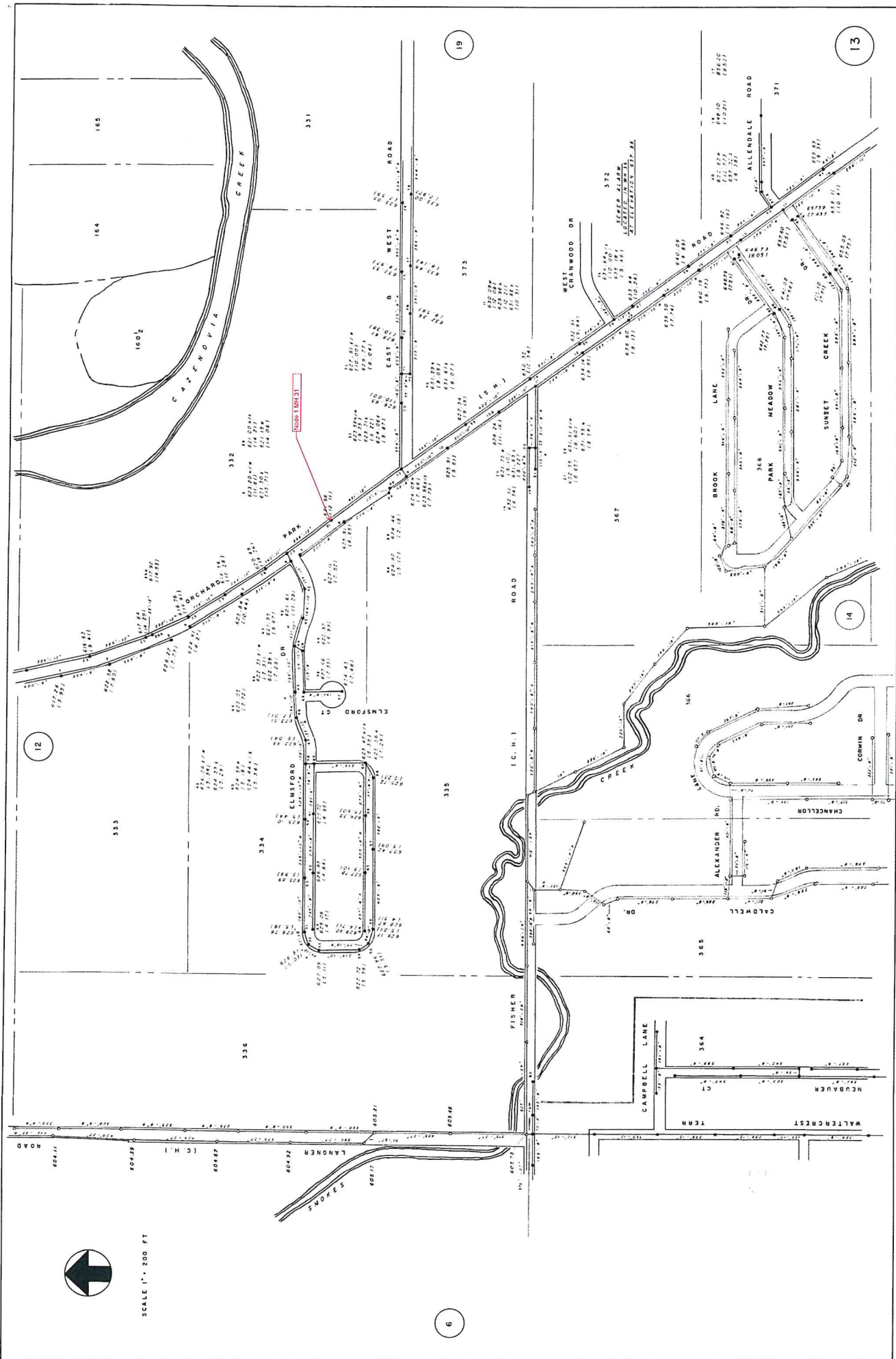
- At no time during the monitoring period did depth of flow exceed pipe diameter at Node 3.



Sewer Node Maps

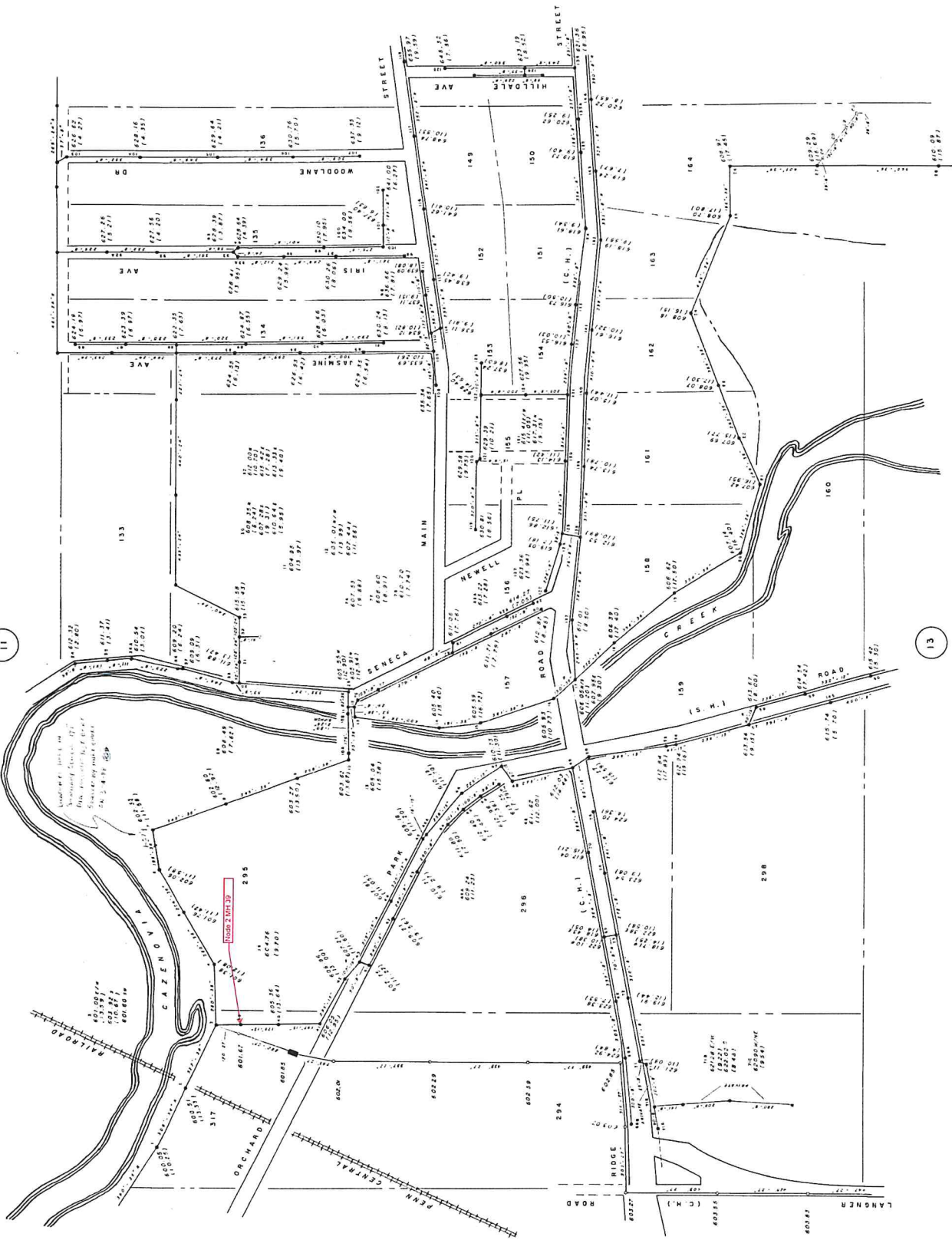


SCALE 1" = 200 FT





SCALE 1" = 200 FT



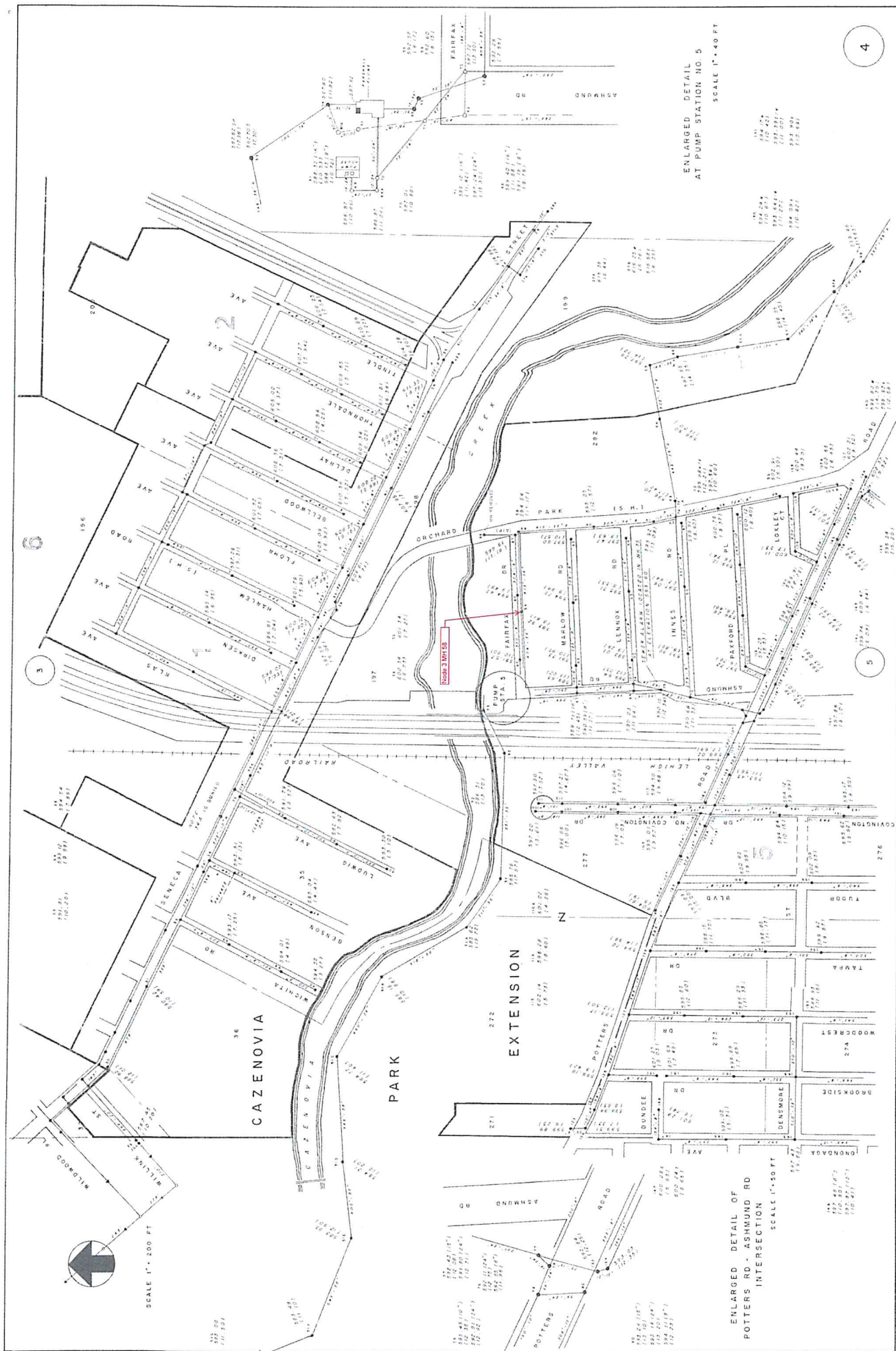
11

18

12

13

5



ENLARGED DETAIL
AT PUMP STATION NO. 5
SCALE 1" = 40 FT

ENLARGED DETAIL OF
POTTERY RD - ASHMUND RD
INTERSECTION
SCALE 1" = 50 FT