

Water and Sewer Report

for

42 Gates Ave

Village of Victory
Saratoga County, New York

October 25, 2019

February 21, 2020



A handwritten signature in black ink, appearing to read "m d panichelli".

Prepared by:



Engineering and
Land Surveying, P.C.

1533 Crescent Road
Clifton Park, NY 12065
Tel: 518-371-0799
Fax: 518-371-0822

WATER AND SEWER REPORT
for
42 GATES AVE
VILLAGE OF VICTORY, SARATOGA COUNTY, NY

Table of Contents

1.0	INTRODUCTION	1
1.1	Project Description	1
1.2	Location and Zoning	1
1.3	Existing City Water/Sewer	1
1.4	Wetlands	1
1.5	100- Year Flood Plain	1
2.0	DESIGN STANDARDS	2
2.1	NYSDEC Water and Sewer Demand and Design Standards	2
2.2	Proposed Water	2
2.3	Proposed Sewer	3
2.3.1	Pump Station	3
2.3.2	Generator and Emergency System	4
2.3.3	Vaults	4
2.3.4	Type II Grease Interceptor	4
2.3.5	BOD	4
2.3.6	Existing Record Sewer Information	5
2.3.7	Pump Stations in Parallel	6
2.3.8	Schuylerville Wastewater Plant	6
2.4	Village Agreement	7
2.5	District Extensions	7
2.6	Financing	7
3.0	EXHIBITS	1
	Exhibit 1 – Architectural building layout	2
	Exhibit 2 – Fire Hydrant Data	3
	Exhibit 3 – Fire Hydrant radius map	2
	Exhibit 4 – Proposed Pump Station (42 Gates Ave)	3
	Exhibit 5 – Existing Pump Station	4
	Exhibit 6 – Pumps In Parallel	5
	Exhibit 7 – Village Agreement	6

1.0 INTRODUCTION

1.1 Project Description

This Engineering Report describes the existing and proposed water and sewer systems within the project limits located on 42 Gates Ave in the Village of Victory. The project involves redeveloping the parcel for retail and apartment use. The existing 4-5 story building will be rehabilitated for apartment and retail use and is situated on tax parcels 170.30-2-27.1 which comprise a total of 6.6 acres.

The existing story building will be comprised of 186 apartment units, and +/- 5,000 sf of retail space. See enclosed architectural layout plan in Exhibit 1.

1.2 Location and Zoning

The property is located on the east side of Gates Ave and is across the street from Pond and Pratt Streets. The existing tax parcels that comprise the 6.6 acres, is tax parcel 170.30-2-27.1 and zoned Mixed Use Village Centre District (MUVCD)

1.3 Existing City Water/Sewer

The Village owns and maintains an existing gravity sewer and water distribution main on Gates Ave and surrounding the project site. The project site is currently serviced with public water via an unknown water size but less than 2-inches in size. There are also existing fire hydrants on the parcel and connected to the existing waterline on Gates Ave but no record information is available on size or material of the lines. On Gates Ave there is current a 6" ABS watermain and on Pond Street there is an 8" DIP waterline which connects to Gates's Ave 6" waterline. A hydrant flow test was performed on the existing water system. Flow test at existing hydrants #6 and #25. The flow rates, static and residual pressure were as follows:

Hydrant #27=750 gpm with a static pressure of 39 psi and a residual pressure of 38 psi

Hydrant #6 =840 gpm with a static pressure of 43 psi and a residual pressure of 35 psi

See Exhibit 2 for flow data results and map.

The Village has a gravity sewer system that collects wastewater and directs the entire Village to a Sewer Pump station located along the Fish Creek behind a house located at 70 Gates Ave. The sewer pump station sends wastewater effluent via a 6" pvc sdr 21 forcemain to "Y" intersection of Gates Ave and Horicon Ave. Sewer effluent is then allowed to flow via gravity through Schuylerville gravity sewer system to Schuylerville wastewater treatment plant. The Sewer Pump station is maintained by The Village of Schuylerville via a maintenance agreement between the two Villages.

1.4 Wetlands

There are no ACOE or NYSDEC jurisdictional wetlands are within the project limits. The Ordinary High Water (OHW) elevations of Fish Creek is shown on the plans. The proposed project does not impact the OHW or wetlands on the project site.

1.5 100- Year Flood Plain

Per National Flood Insurance Map (FIRM) panel 36091C0479- E dated August 16, 1995 the proposed project improvements and existing building are outside the limits of AE zone (100-year flood plain). Per FEMA Flood Insurance Rate Study section I-I of the Fish Creek the 100-year water surface elevation is elevation 149. The existing building lowest finished floor is at elevation 176.60 or 27.6 feet above the 100-year water surface elevation.

2.0 DESIGN STANDARDS

2.1 NYSDEC Water and Sewer Demand and Design Standards

The proposed water laterals for the proposed building will be 8-inch water services to provided domestic and fire suppression within the buildings.

Anticipated water flows are as follows:

Water Usage			
	Average Daily Flow (GPD)	Average Flow (GPM)	Peak Flow (GPM)
Apartments- 186 units			
138- 1-Bedroom Units	15,180	10.54	21.08
48- 2 Bedroom Units	10,560	7.33	14.66
Restaurant = 5,000 sf	3,500	2.43	4.86
Micro-Brewery	690	0.48	0.96
Totals=	29,930	20.78	41.56

Table B-3 of NYSDEC Design Standards for Intermediate Sized Water Treatment Systems dated 3/5/2014 was used to determine anticipated flow rate, 110 gal per bedroom and an assumed seating of 100 seats for the restaurant at 35 gallons per seat. Brewery based upon water consumption require from potential tenant of 1,000 barrels of beer produce a year or a 7 bbl system. 31.5 gallons per barrel for a total of 31,500 gallons of beer produce annually or having an annual water consumption of 252,000 gallons. Micro-Brewery has an 8 to 1 ratio of water to beer production. Plumbing Fixtures will be specified as low flow type fixtures per NY State requirements for water conservation.

Anticipated sewer flows are as follows:

Sewer Flows			
	Average Daily Flow (GPD)	Average Flow (GPM)	Peak Flow (GPM)
Apartments- 186 units			
138- 1-Bedroom Units	15,180	10.54	42.16
48- 2 Bedroom Units	10,560	7.33	29.32
Restaurant = 5,000 sf	3,500	2.43	9.72
Micro-Brewery	603	0.41	1.92
Totals=	29,843	20.71	82.84

Brewery wastewater flow based upon 8 gallons of water needed to make 1 gallon of beer or 7 gallons of waste product. The 7 gallons is based upon washing down tanks, cooling, and bottling operations.

2.2 Proposed Water

The project will utilize the existing infrastructure on Gates Ave and Pond Street for water domestic and fire suppression needs. A new 8-inch PVC C-900 loop watermain, fire hydrants and water lateral will be installed within the site to service the building. The looped water main will connect to the existing 8" DIP on Pond Street and then travel to the site and connect to near the northern entrance on Gates Ave where the new watermain will be connected to the existing 6-inch waterline on Gates Ave. The proposed waterline within the site will allow for better water quality for the existing building, provide required flow to proposed hydrants and provided domestic and fire suppression needs of the rehabilitated building. The proposed waterline and hydrants within the site will have a 30-foot easement placed over it so the Village can maintain the waterline extension. The proposed fire hydrants have been placed on site to meet the 500- foot requirement (see Exhibit 3) and a Siamese connection will be provided on the exterior of the building near the main entry of the building (south west corner).

For the waterline extension a draft NYSDOH-348 has been included with Exhibit 3. This form will be submitted to NYSDOH upon site plan approval from the Village.

From the hydrant flow tests, hydrant #30 nozzle is situated about at elevation 222.0 on Herkimer Street. The lowest floor of the existing building is at elevation 176.60 (basement) and the fourth floor is at elevation 243.2 with fire suppression system being as high as elevation 261.5.

The proposed looped watermain within the site and water service lateral will deliver approximately 840 gpm at a pressure of +/- 50.0 psi. (water connection elevation into building is 183.00- elevation of hydrant #30) as there is about a 1 psi loss due to pipe friction. An Mechanical, Electrical and Plumbing (MEP) Engineer will be designing the sprinkler and domestic services within the building and will be provided to the Village in a separate report demonstrating that pressure loss within the system during the building permit process. In addition, the MEP engineer will be providing the Village with back flow prevention report in conformance rules and regulations with a completed DOH-347 form.

Based upon flow characteristics of the existing Village water system most like a water pump will be required to meet domestic and fire flow requirements as theoretically the water pressure for the sprinkler system on the flow floor would be around 16 psi (thus below the 20 psi minimum requirement)

Currently the Village water system (Victory WTP) and Schuylerville water system (Ft. Hardy WTP) are interconnected systems which provide a maximum water treatment capacity of 648,000 gallons per day. The average daily demand is 188,587 gpd at Ft. Hardy WTP and 91,508 gpd at Victory WTP. Based upon average demand and treatment capacity at both plants can meet the additional demand by this project of 29,930 gpd.

2.3 Proposed Sewer

New gravity sewer lateral will be extended from the existing building to proposed sewer manholes on the site. The gravity sewer will transport the effluent to a proposed sewer pump station. The proposed gravity sewer will consist of two (2) sewer manholes, one (1) 2,000 gallon grease tank for restaurant, 98 liner feet of 8-inch PVC sewer and about 50 feet of 6-inch PVC sewer lateral pipe. The proposed sewer facilities have been designed to state and municipal standards, and in accordance with good engineering practice.

2.3.1 Pump Station

42 Gates Ave pump station proposed to be a submersible pump system with the following design parameters:

1. Pumping Rate=210 gpm
2. Maximum 61.5 feet of TDH
3. Flygt model NP3102 SH 3
4. 135 mm Impeller
5. 6.5 HP, 60 HZ. 3-phase, 208 volt

To determine the model, impeller, horsepower, TDH, buoyancy, cycle time, float elevations and pumping rate see design calculation in Exhibit 4.

"Wet-Well" information:

1. Invert in elev.= 168.50
2. High level Alarm elev.=167.50
3. Pump on elev.=166.50
4. Pump off elev.=165.00
5. Low level Alarm elev.=164.50

Based upon the proposed float elevations within the 6'-0" diameter wet-well and pumping information the cycle will be 3.5 cycles/hour

The proposed sewer pump station will connect to the existing 6-inch forcemain via a 4" PVC C-900 forcemain. The 4-inch forcemain will consist of 320 lf and will connect to the existing forcemain at elevation of approximately 193.00.

2.3.2 Generator and Emergency System

It is proposed that a gas-powered generator is to be used in the event of power failure as a secondary measure per the requirements of section 47.2 of Ten State Standards. The generator is to be located within the fenced paved area of the pump station and connected to the control panel as well. The generator is to be Cummins Onan model C30 N6 which will provide sufficient power to run the proposed pump station. The generator outputs 94 Amps where the pumps require a full load current of 29 Amps each. A 4" bypass system is provided for the connection of an emergency pump in the event of pump failure.

2.3.3 Vaults

The proposed 4" PVC C-900 sewer forcemain will traverse through the project site and connect to the existing 6-inch forcemain on Gates Ave. A connection vault with isolation valves and cleanout ports will be provided.

2.3.4 Type II Grease Interceptor

Per NYSDEC Design Standards for Intermediate Sized Wastewater Treatment System dated 2014 grease interceptor shall be a minimum of 2,000 per table D-1 with a 4" inlet pipe

2.3.5 BOD

The potential impact of brewery waste and its Biochemical Oxygen Demand (BOD) in the sewer effluent typically has been reviewed for the project site. Typical residential waste water effluent has a BOD of about 200 mg/l while brewery waste water has a typical range of 1,000 mg/l to 5,000 mg/l depending on the beer being produced and operations. As it is unknown at this time what type of beer will be produce but we have assume on average 3,000 mg/l of BOD within the brewery wastewater effluent has been assumed.

**Typical Ranges Of Brewery Untreated "End-Of-Pipe"
Wastewater Effluent**

PARAMETER	TYPICAL RANGE
Water to beer ratio	4 - 10 liter/liter
Wastewater to beer ratio	1.3 - 2 liter/liter lower than water to beer ratio
Biochemical Oxygen Demand (BOD)	600 - 5,000 ppm
Chemical Oxygen Demand (COD)	1,800 - 5,500 ppm
Nitrogen	30 - 100 ppm
Phosphorus	30 - 100 ppm
pH	3 - 12
Total Suspended Solids (TSS)	200 - 1,500 ppm

**Information above from Brewers Association Publication entitles Water and Wastewater treatment Volume Reduction Manual*

The wastewater stream and BOD loading from brewing operation varies depending on the operation performed. While it is estimated that 8 gallons of water is needed to produce 1 gallon of beer the BOD loading can be very different, and amount can water used for each operation can vary.

Main Areas Of Wastewater Generation

SOURCE	OPERATION	CHARACTERISTICS
Mash Tun	Rinsing	Cellulose, sugars, amino acids. ~3,000 ppm BOD
Lauter Tun	Rinsing	Cellulose, sugars, spent grain, SS ~3,000 ppm, BOD ~10,000 ppm
Spent Grain	Last running and washing	Cellulose, nitrogenous material. Very high in SS (~30,000 ppm). Up to 100,000 ppm BOD
Boil Kettle	Dewatering	Nitrogenous residue. BOD ~2,000 ppm
Whirlpool	Rinsing spent hops and hot trub	Proteins, sludge and wort. High in SS (~35,000 ppm). BOD ~85,000 ppm
Fermenters	Rinsing	Yeast SS ~6,000 ppm, BOD up to 100,000 ppm
Storage tanks	Rinsing	Beer, yeast, protein. High SS (~4,000 ppm). BOD ~80,000 ppm
Filtration	Cleaning, start up, end of filtration, leaks during filtration	Excessive SS (up to 60,000 ppm). Beer, yeast, proteins, BOD up to 135,000 ppm
Beer spills	Waste, flushing etc	1,000 ppm BOD
Bottle washer	Discharges from bottle washer operation	High pH due to chemical used. Also high SS and BOD, especially thru load of paper pulp.
Keg washer	Discharges from keg washing operations	Low in SS (~400 ppm). Higher BOD.
Miscellaneous	Discharged cleaning and sanitation materials. Floor washing, flushing water, boiler blow-down etc.	Relatively low on SS and BOD. Problem is pH due to chemicals being used.

MJ has assumed an average of 3,000 mg/l of BOD loading will occur over a 4-hour time period per day within the wastewater effluent of 603 gpd or 2.51 gpm from brewing operations. The wastewater from brewing operation will mix with residential wastewater at the proposed on-site pump station. The wet-well volume is 317 gallons and cycles 3.5 times per hour. Thus, the BOD loading over this 4-hour time period is 23.29 lbs (15.08 lbs from brewing + 8.21 lbs from residential). Due to mixing of residential wastewater and brewing wastewater effluent at the on-site pump station, cycles times of the pump station and downstream convergence of wastewater streams from the site to existing effluent the existing waste water treatment plant will not received a "slug flow" of highly concentrated flow of BOD from the proposed project site.

2.3.6 Existing Record Sewer Information

The existing sewer pump station for the Village of Victory is located Fish Creek behind a house located at 70 Gates Ave. The sewer pump station sends wastewater effluent via a 6" pvc sdr 21 forcemain to gravity sewer manhole located on the west side of the "Y" intersection of Gates Ave and Horicon Ave. Sewer effluent is then allowed to flow via gravity through Schuylerville gravity sewer system to Schuylerville wastewater treatment plant. There is approximately 3,925 lf of 6-inch forcemain between these two locations. The above and below information is based upon record plans entitled "Village of Victory, Wastewater Collection, Transportation and Treatment Facility" dated April 1993 by MJ Engineering.

The existing pump station consists of 2 ABS submersible sewer pumps, model AFP1041M35/4-14 within a 6'-0" diameter wet-well. The pumps are 4.7 HP, 1680 RPM, 4.7 hp, 203 volts, 15.5 amps, and has a 8-7/16inch impeller. (serial # E3932639) The following information is per record drawings

1. Bottom of Wet-well is at elevation=176.50
2. Pump Off at elevation=178.50
3. Pump On at elevation=181.50
4. Lag pump On at elevation =182.50

5. High level alarm at elevation=183.50
6. Overflow at elevation=183.55
7. 6-inch forcemain within Valve Chamber at elevation=185.75
8. Average daily flow= 53,359 gpd

There is 3,925 lf of forcemain that connects manhole #32 at the Y" intersection of Gates Ave and Horicon Ave at an invert elevation of 169.90 to the existing sewer pump station. The existing pump station transports 218 gpm and a Total Dynamic Head (TDH) of 37 feet through the existing 6-inch sewer forcemain. See Exhibit 5.

The average flow was determined from Pump meter readings. Over the last 12 months, Pump 1 ran 728.5 hours (8877.5 - 8149 meter readings) and pump 2 ran 760.50 hours (9973.0 - 9212.5 meter readings). The pump readings were taken by Schuylerville and are from October 2018 to October 2019. Thus, the two pumps ran for a total of 1,489 hours. The pumps are designed to achieve 218 gpm or over the last year so the pumps on average did 53,359 gpd (1,489 hours x 60 minutes/hour x 218 gpm / 365 days). So, the wet well experience on average a sewer flow of 53,359 gpd , with an average a 37 gpm or 148 gpm peak rate.

2.3.7 Pump Stations in Parallel

As seen above and within Exhibit 4 and 5 the existing pump station transports 218 gpm and a Total Dynamic Head (TDH) of 37 feet through the existing 6-inch sewer forcemain. While the proposed pump station on 42 Gates Ave property will transport 210 gpm with a TDH of 61.5 feet through the proposed 4-inch and 6-inch existing sewer forcemain. As these pumps could run in parallel, the combine impacted was reviewed. With both pump station running concurrently the existing pump station will operate at 135 gpm with a TDH of 41.5 feet and the proposed pump station will operate at 167 gpm with a TDH of 68.5 feet (See Exhibit 6), or net of 302 gpm within the existing 6" forcemain. Based upon 106 gpm peak flow rate from the project site the proposed pump station located at 42 Gates Ave when the pumps are running in parallel will meet the flow requirements of the project site.

The exiting pump station will see a decrease in capacity of 83 gpm due to the pump stations running in parallel. As the run time of the proposed pump station is only 2.2 minutes with a pump rate of 167 gpm and the decrease in capacity at the existing pump station will not be affected. The worst case would be the existing pump station runs for additional 2.2 minutes or that would use 9-inches within the wet-well based upon the deceased pump capacity of 83 gpm. Assuming worst case and the WSEL with the existing pump station was at elevation 181.50 (pump on elevation) there is another 12-inches between lag pump on elevation (elevation 182.50). The additional 9-inches within the wet-well is below the lag pump on switch based upon average flow for another 2.2 minutes (37 gpm x 2.2 minutes/ 211 gallon per vertical foot of wet-well). Therefore, when the two pumps act in parallel they can transport the wastewater flow.

Due to the fact that pump stations run time are short (1.7 minutes for proposed and 3.7 minutes for existing), the number of cycles per hours at both pump stations are less then 4 cycles per hour, both pumps in parallel exceed average pumping capacity requirements and there is reserve capacity within the existing pump station wet-well, no adverse effects to the existing pump stations and forcemain are anticipated by the construction of the proposed pump station at 42 Gates Ave.

2.3.8 Schuylerville Wastewater Plant

All sewer effluent from the proposed project will be transported to Schuylerville wastewater treatment plant. The average daily flow at the plant is 395,00 gpd. The plant has a treatment capacity of 490,000 gpd. The highest daily rate of 561,000 gpd has been experienced at the plant. Based upon the project generating 29,843 gallons per day the existing wastewater plant has capacity for normal operations. As the existing wastewater plant does experience wet-weather problems from I/I or elicit stormwater connections the plant did recently installed upgrades which included a 500,000 gallon equalization tank.

The extend of impacts to the Schuylerville wastewater treatment plant during wet weather can not be determined based upon proposed sewer flows from the proposed project.

2.4 Village Agreement

The Village of Victory and The Village of Schuylerville has a sewer agreement (See Exhibit 7). Per the sewer agreement the Village of Victory sends its wastewater flow to Schuylerville wastewater treatment plant. Per the agreement there was an existing 249 "Units" and has an expansion clause up to 429 units an escalations clause when the Village of Victory exceeds 429 units.

The proposed project will add 234 bedrooms (138 one-bedrooms and 48 two-bedrooms) units while the restaurant and brewery operation would add an estimated 40 units for a total number of 274 new units being

Per the expansion clause of the agreement this project will result in the annual payment of \$60,000 from the Village of Victory to Village of Schuylerville to be increased to approximately \$74,022.92 annually (249 units based density + 274 new units= 523 total units – 429 units= 94 units x \$149.18= 14,022.92).

2.5 District Extensions

The project is located within the Village limits, and as such, will not be required to extend the water district or sewer district.

2.6 Financing

Financing the proposed water and sewer improvements to the site shall be born entirely by the developer of the project.



3.0 EXHIBITS



Exhibit 1 – Architectural building layout

WALL LEGEND

- NEW WALLS TO BE INSTALLED
- EXISTING WALLS TO REMAIN
- EXISTING WALLS TO BE REMOVED

COPPOLA ASSOCIATES

Design, Architecture & Planning

6 Old North Plank Road
Suite 101
Newburgh, NY 12550
TEL: 845-561-3559
FAX: 845-561-2051
ajcoppola@coppola-associates.com

AJL

LICENSE NUMBER: 018849

PROPOSED MULTIFAMILY
BUILDING FOR REGAN
DEVELOPMENT AT

Victory Mill

Victory, NY

PROPOSED
BASEMENT PLAN

REVISIONS

DATE

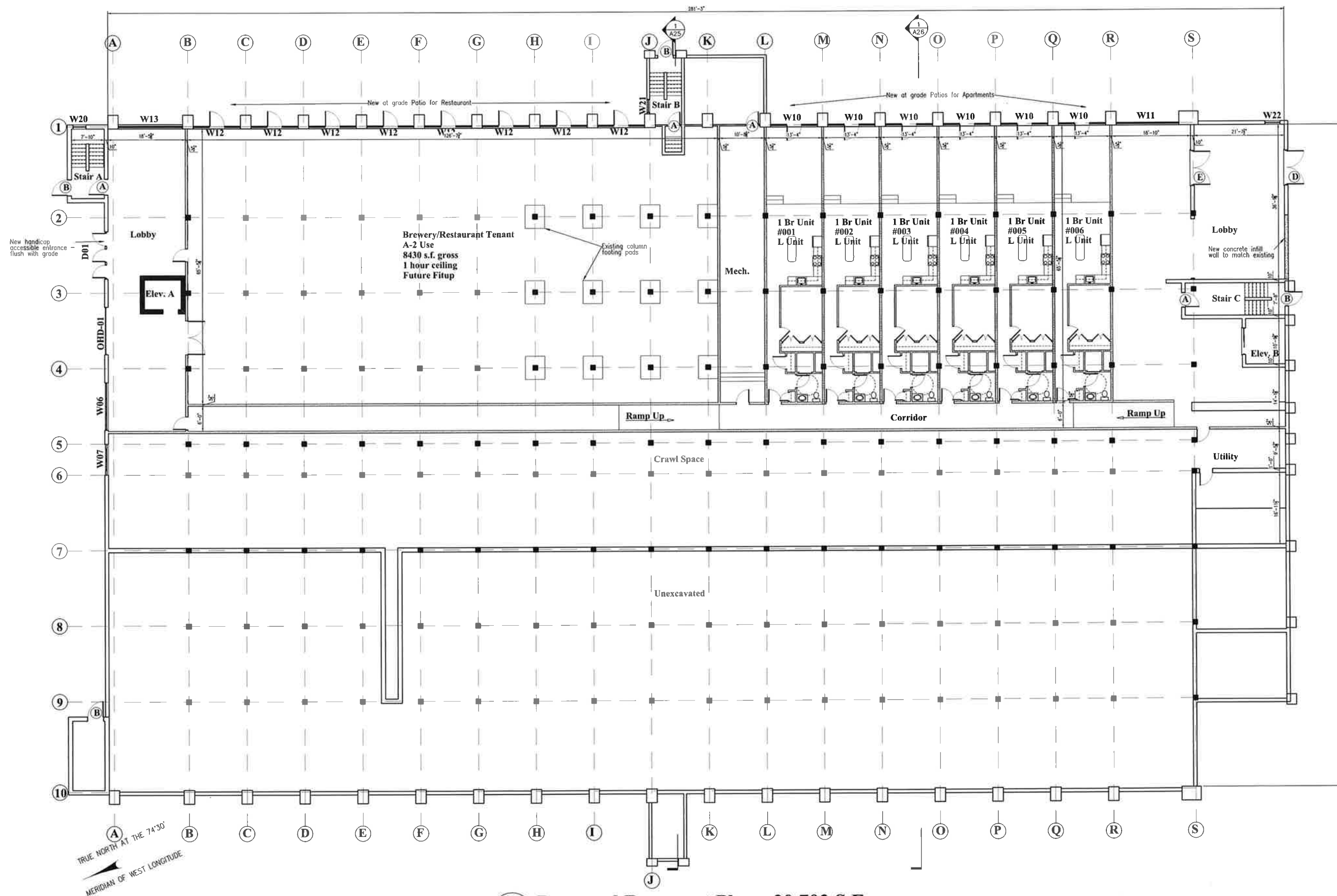
10/1/2019

PROJECT NUMBER

18-08

SHEET NUMBER

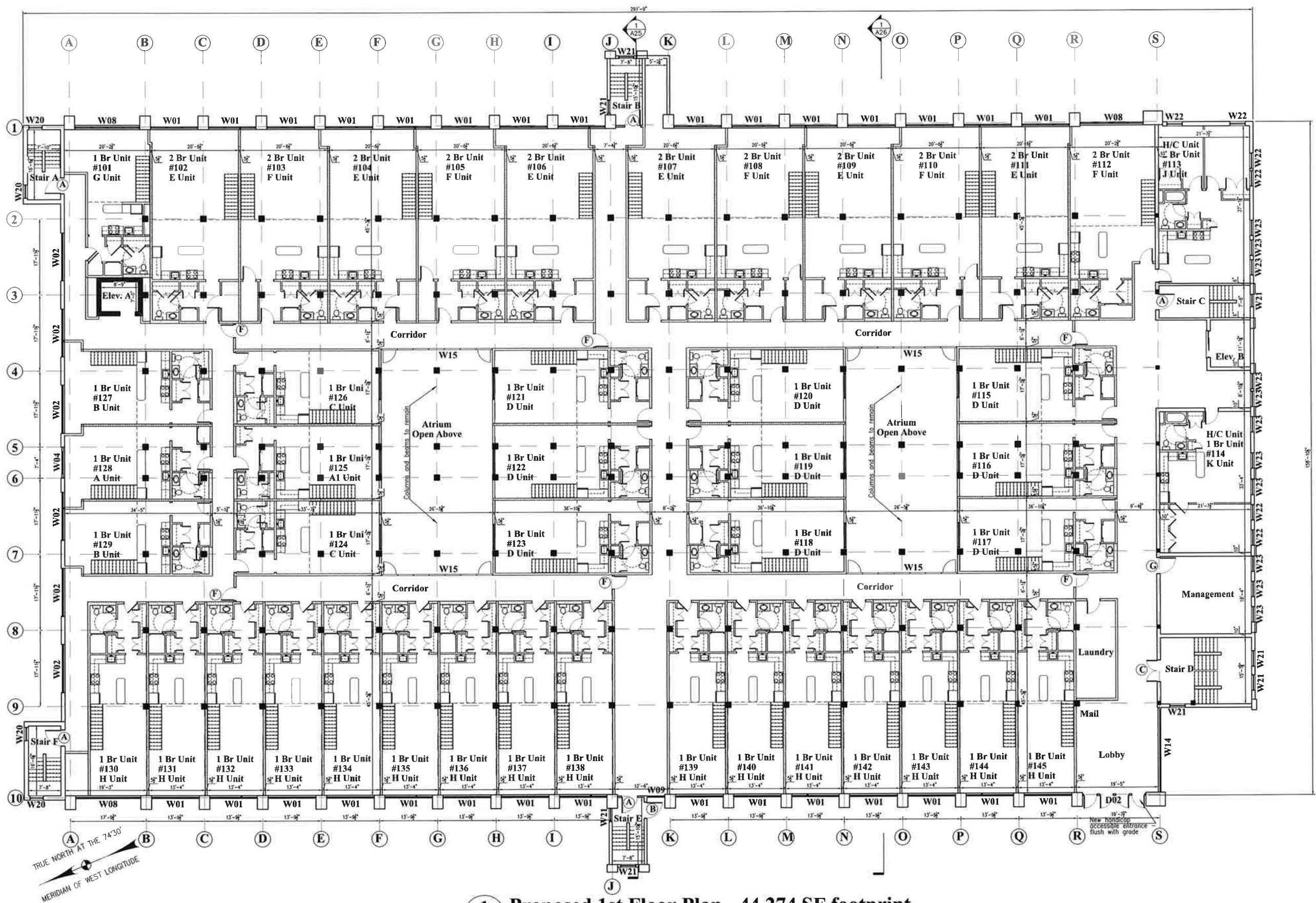
A6



1 Proposed Basement Plan - 20,703 S.F.
A6 Scale: 3/32"=1'-0"

WALL LEGEND

- NEW WALLS TO BE INSTALLED
- EXISTING WALLS TO REMAIN
- EXISTING WALLS TO BE REMOVED



1 Proposed 1st Floor Plan - 44,274 SF footprint
A7 Scale: 3/32"=1'-0"

COPPOLASSOCIATES

Design, Architecture & Planning
6 Old North Plank Road
Suite 101
Newburgh, NY 12550
TEL: 845-561-3559
FAX: 845-561-2051
ajcoppola@coppola-associates.com

A7L

LICENSE NUMBER: 018849

PROPOSED MULTIFAMILY
BUILDING FOR REGAN
DEVELOPMENT AT *

Victory Mill

Victory, NY

PROPOSED FIRST
FLOOR PLAN

REVISIONS

DATE

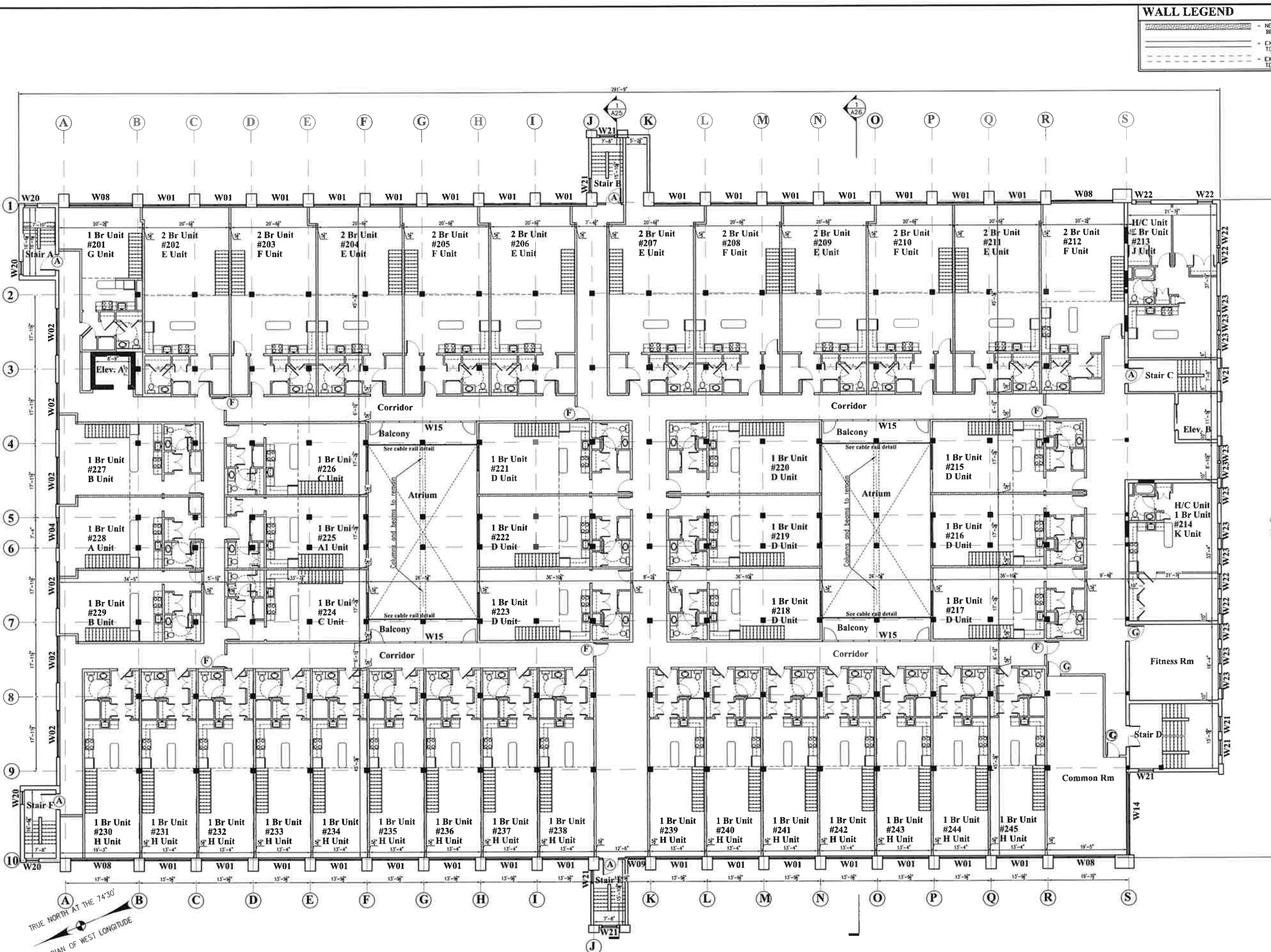
10/1/2019

PROJECT NUMBER

18-08

SHEET NUMBER

A7



COPPOLA ASSOCIATES

Design, Architecture & Planning

6 Old North Plank Road
Suite 101
Newburgh, NY 12550
TEL: 845-561-3559
FAX: 845-561-2051
ajcoppola@coppola-associates.com

Victory Mill

Victory, NY

PROPOSED SECOND FLOOR PLAN

REVISIONS

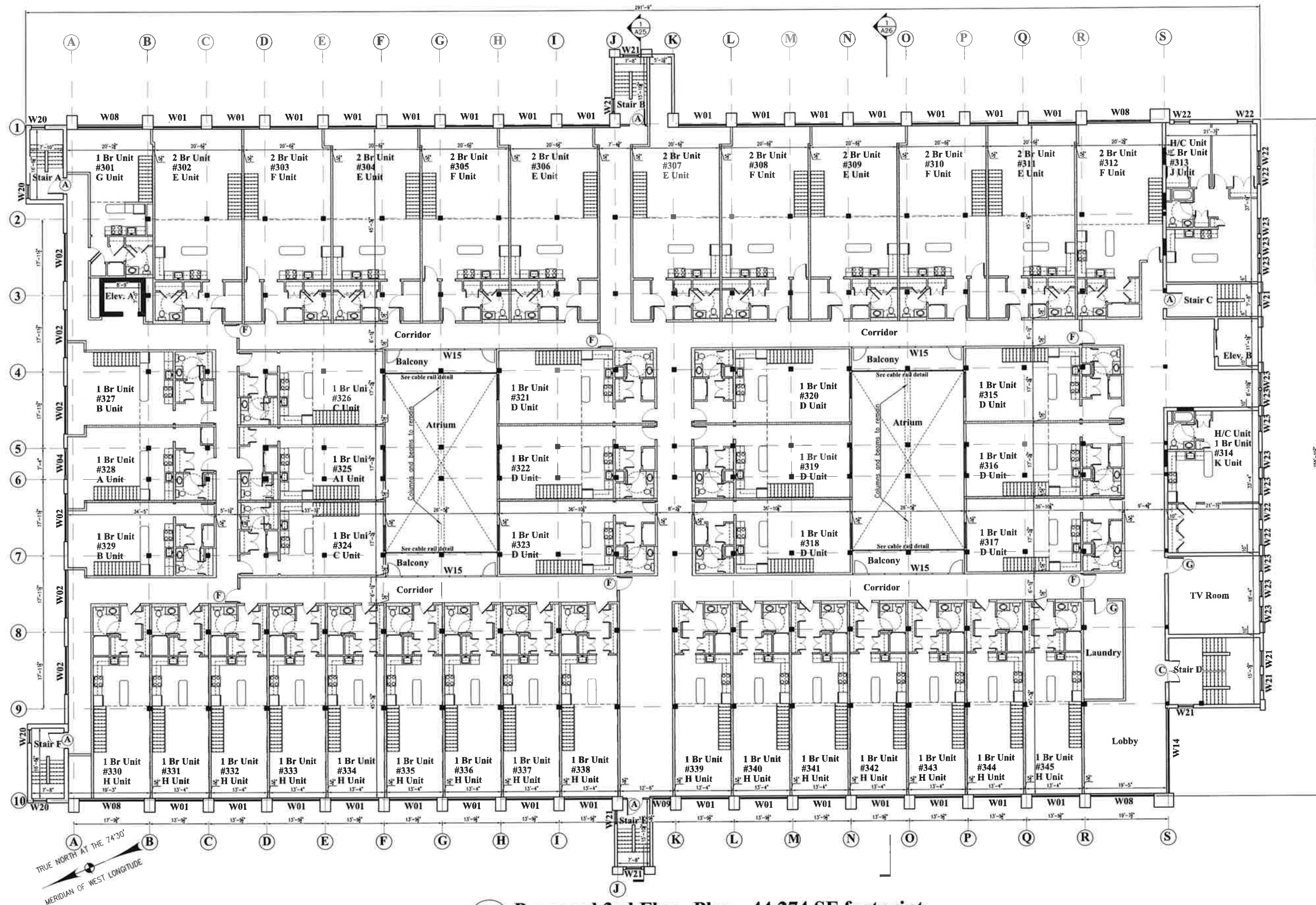
DATE
10/1/2019

PROJECT NUMBER
18-08

SHEET NUMBER
A8

WALL LEGEND

- NEW WALLS TO BE INSTALLED
- EXISTING WALLS TO REMAIN
- EXISTING WALLS TO BE REMOVED



1 Proposed 3rd Floor Plan - 44,274 SF footprint
A9 Scale: 3/32"=1'-0"

COPPOLASSOCIATES

Design, Architecture & Planning
6 Old North Plank Road
Suite 101
Newburgh, NY 12550
TEL: 845-561-3559
FAX: 845-561-2051
ajcoppola@coppola-associates.com

A9L

LICENSE NUMBER: 018849

PROPOSED MULTIFAMILY
BUILDING FOR REGAN
DEVELOPMENT AT

Victory Mill

Victory, NY

PROPOSED THIRD
FLOOR PLAN

REVISIONS

DATE

10/1/2019

PROJECT NUMBER

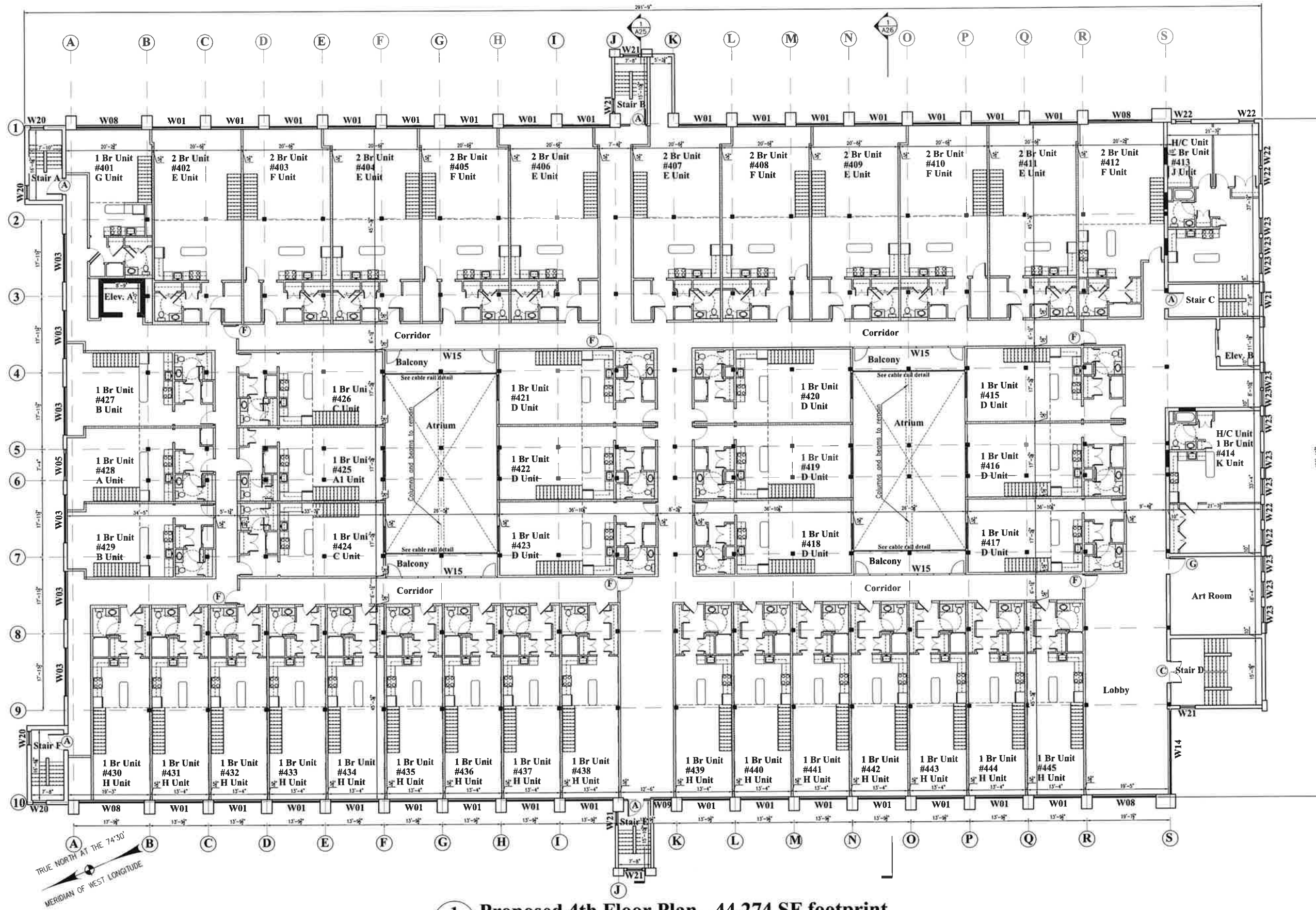
18-08

SHEET NUMBER

A9

WALL LEGEND

- NEW WALLS TO BE INSTALLED
- EXISTING WALLS TO REMAIN
- EXISTING WALLS TO BE REMOVED



1 Proposed 4th Floor Plan - 44,274 SF footprint
A10 Scale: 3/32"=1'-0"

COPPOLASSOCIATES

Design, Architecture & Planning

6 Old North Plank Road
Suite 101
Newburgh, NY 12550
TEL: 845-561-3559
FAX: 845-561-2051
ajcoppola@coppola-associates.com

ajc

LICENSE NUMBER: 018849

PROPOSED MULTIFAMILY
BUILDING FOR REGAN
DEVELOPMENT AT

Victory Mill

Victory, NY

**PROPOSED
FOURTH FLOOR
PLAN**

REVISIONS

DATE

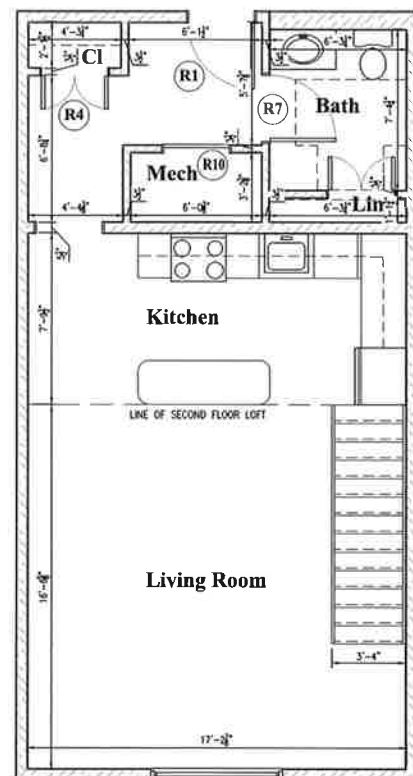
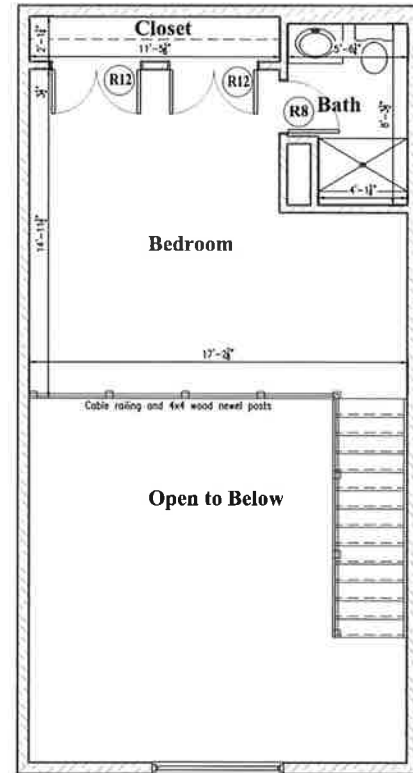
10/1/2019

PROJECT NUMBER

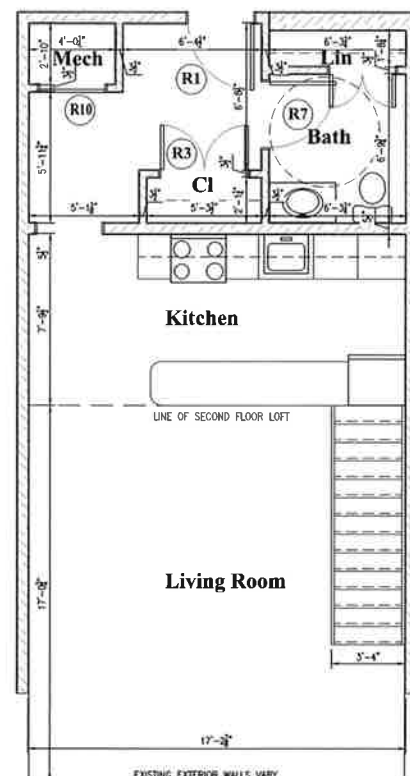
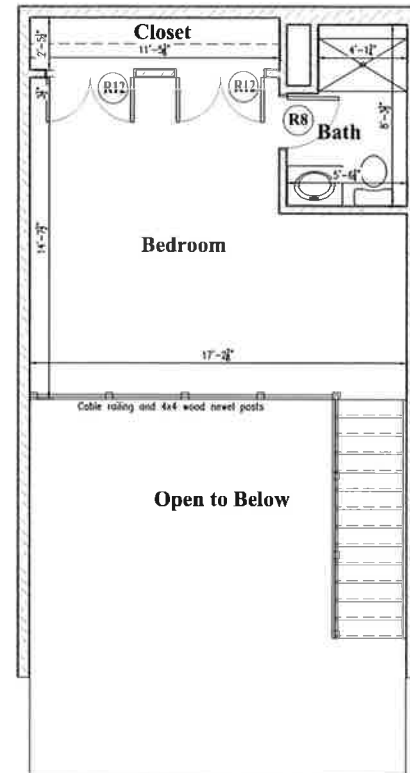
18-08

SHEET NUMBER

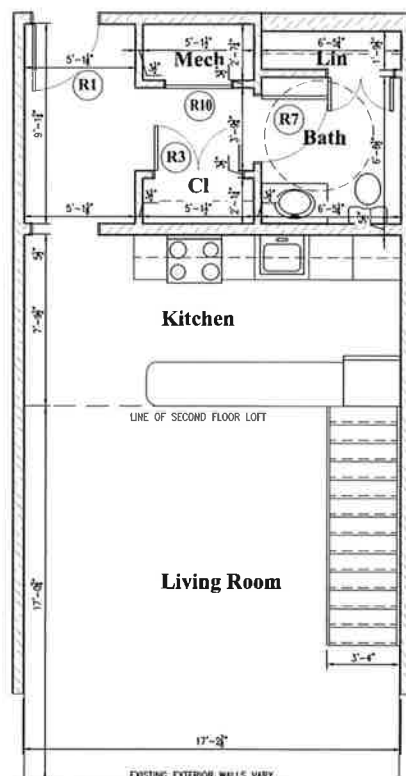
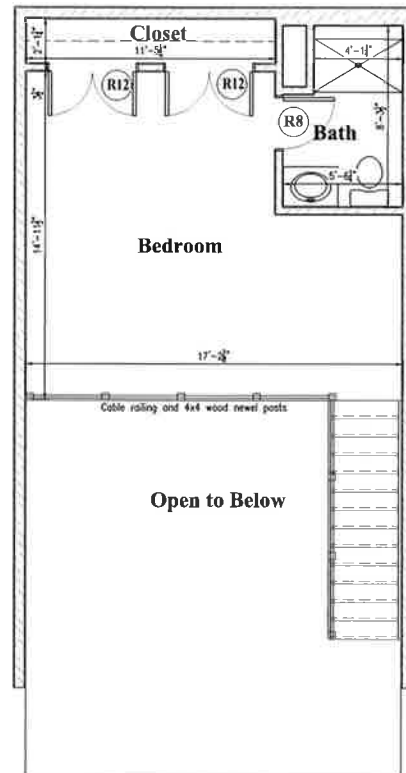
A10



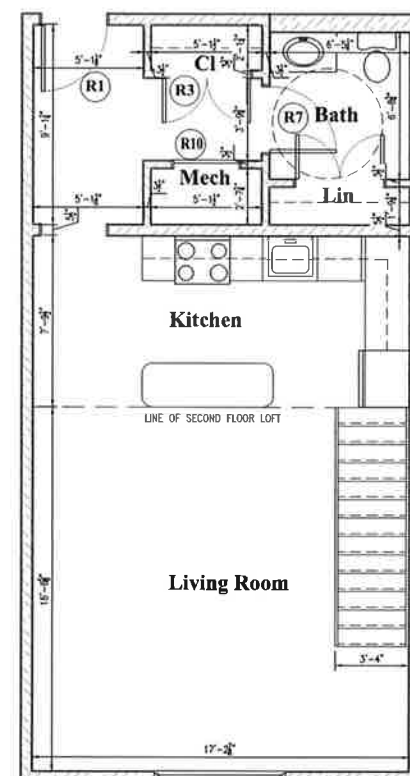
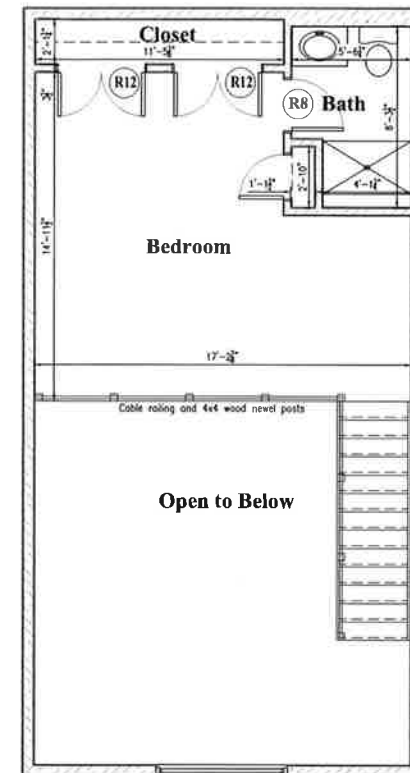
1 Typical A1 Unit
A22 Scale: 1/4"=1'-0"



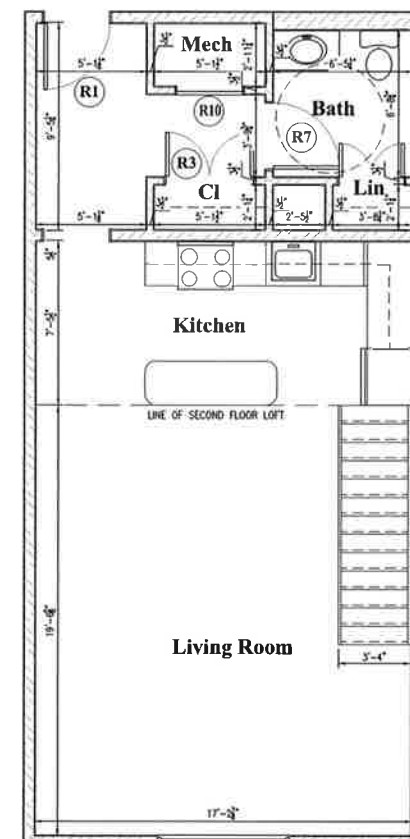
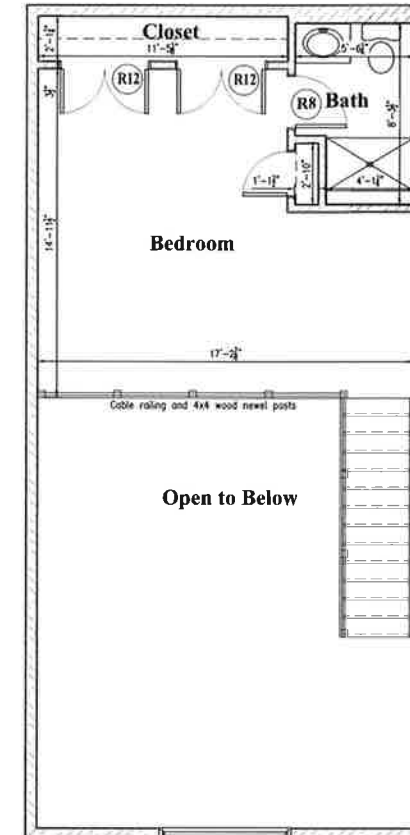
2 Typical A Unit
A22 Scale: 1/4"=1'-0"



3 Typical B Unit
A22 Scale: 1/4"=1'-0"



4 Typical C Unit
A22 Scale: 1/4"=1'-0"



5 Typical D Unit
A22 Scale: 1/4"=1'-0"



Design, Architecture & Planning
6 Old North Plank Road
Suite 101
Newburgh, NY 12550
TEL: 845-561-3559
FAX: 845-561-2051
ajcoppola@coppola-associates.com

ajcl

LICENSE NUMBER: 018849

° PROPOSED MULTIFAMILY
BUILDING FOR REGAN
DEVELOPMENT AT °

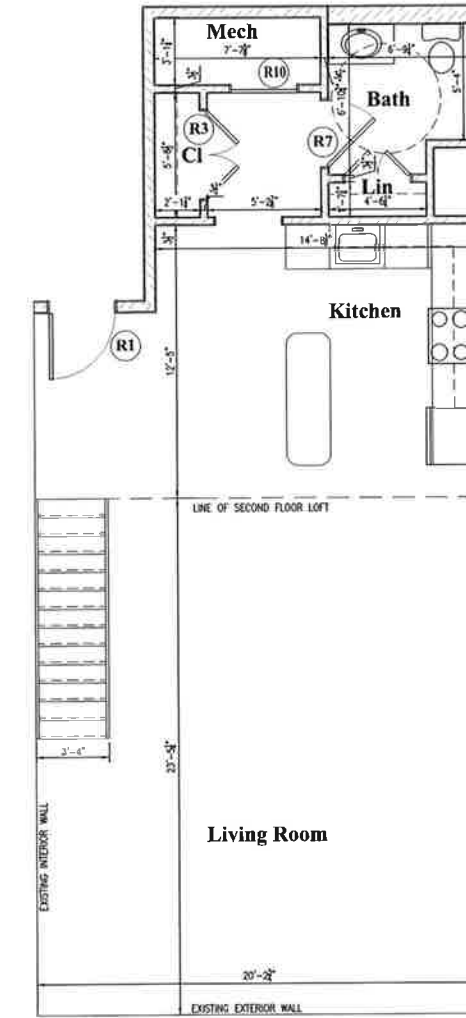
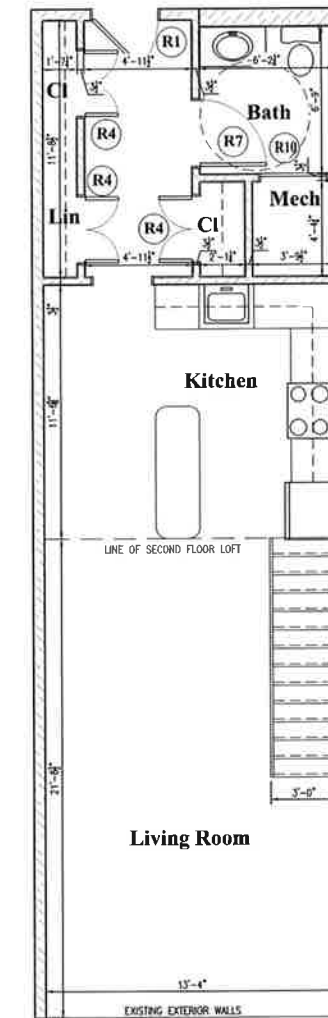
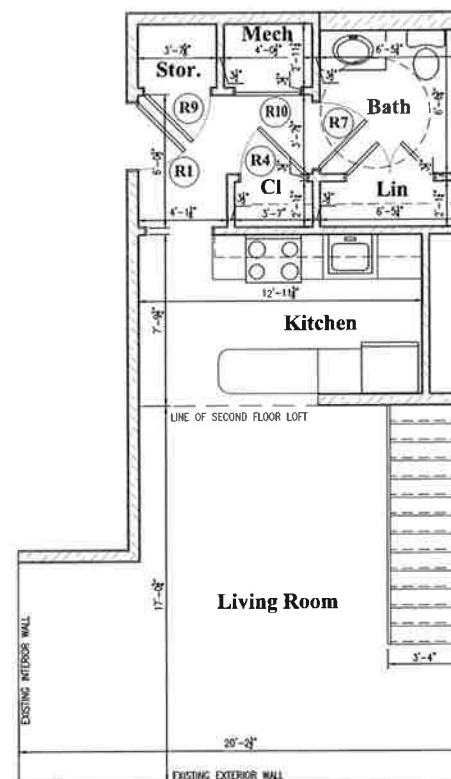
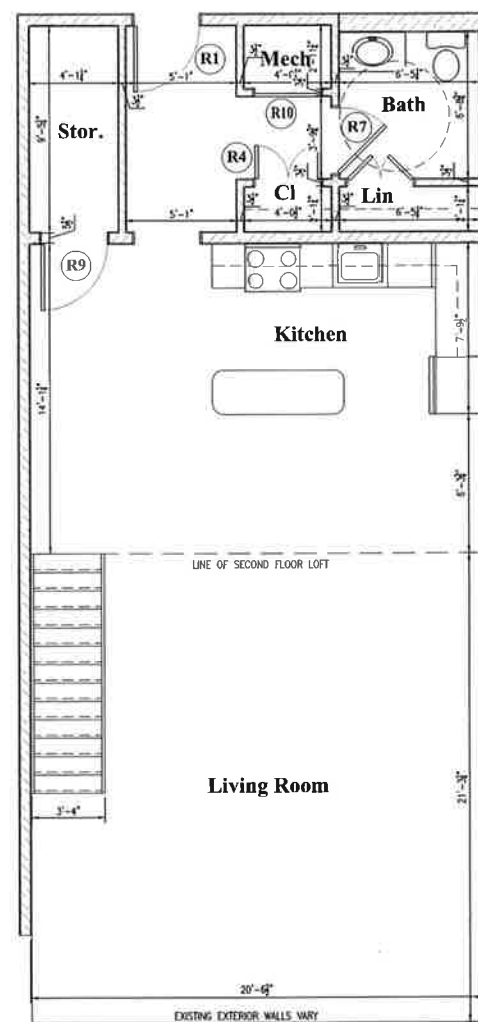
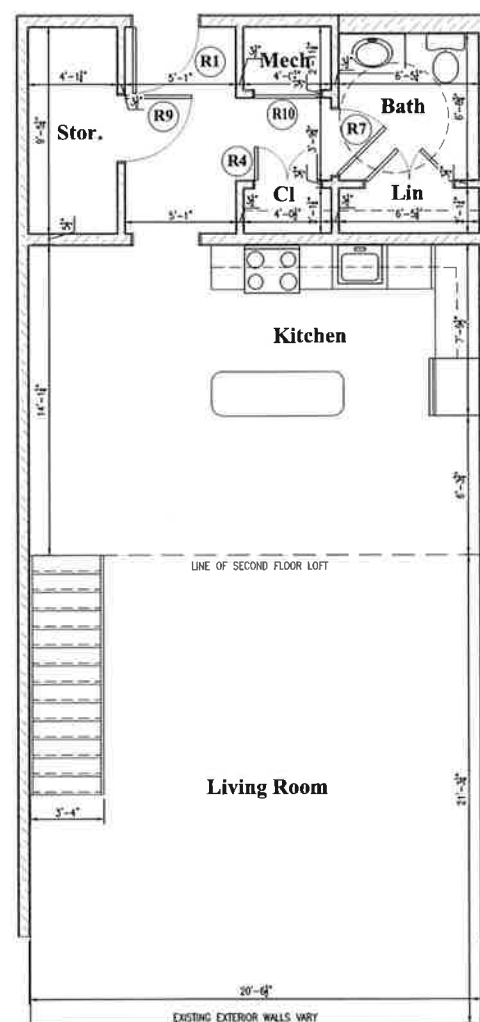
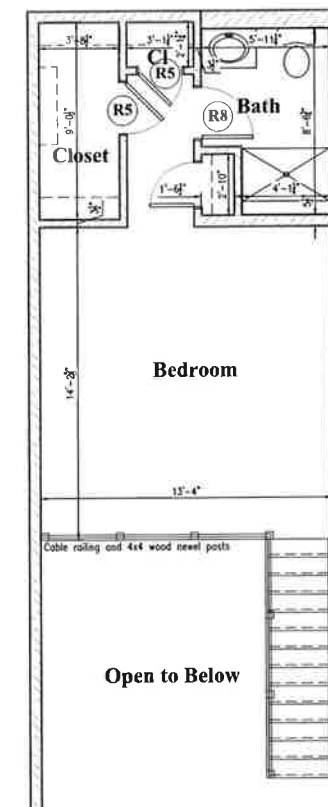
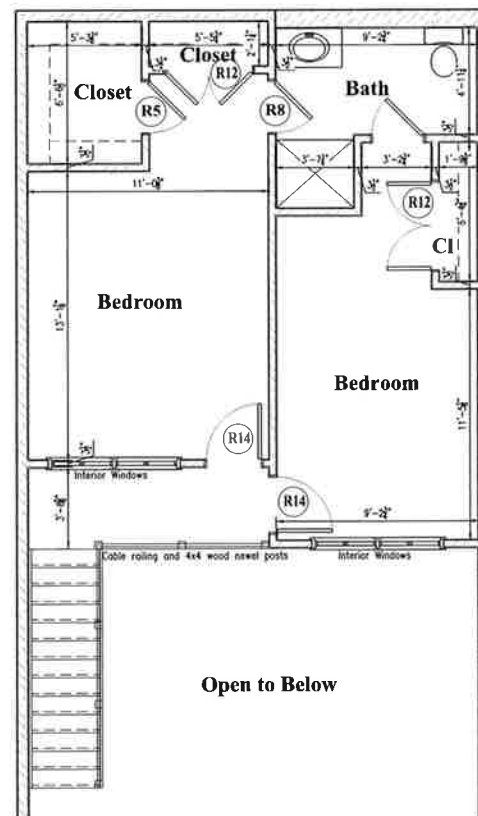
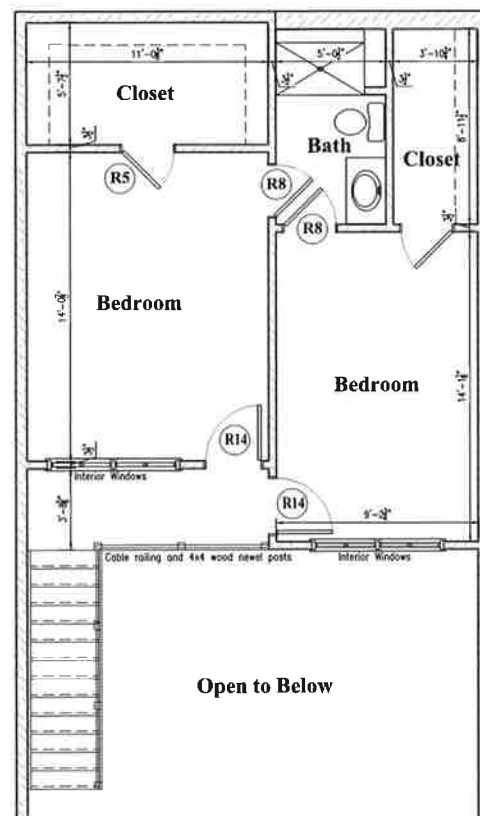
Victory Mill

Victory, NY

**TYPICAL UNIT
PLANS**

REVISIONS
DATE
10/1/2019
PROJECT NUMBER
18-08
SHEET NUMBER

A22



COPPOLASSOCIATES

Design, Architecture & Planning

**6 Old North Plank Road
Suite 101
Newburgh, NY 12550
TEL: 845-561-3559
FAX: 845-561-2051
ajcoppola@coppola-associates.com**

0596

LICENSE NUMBER: 018849

° PROPOSED MULTIFAMILY
BUILDING FOR REGAN
DEVELOPMENT AT °

Victory Mill

Victory, NY

TYPICAL UNIT PLANS

REVISIONS

DATE _____

10/1/2019

PROJECT NUMBER

18-08

SHEET NUMBER

A23



°Design, Architecture & Planning°

**6 Old North Plank Road
Suite 101
Newburgh, NY 12550
TEL: 845-561-3559
FAX: 845-561-2051
njcoppola@coppola-associates.com**

0-9L

LICENSE NUMBER: 018849

° PROPOSED MULTIFAMILY
BUILDING FOR REGAN
DEVELOPMENT AT °

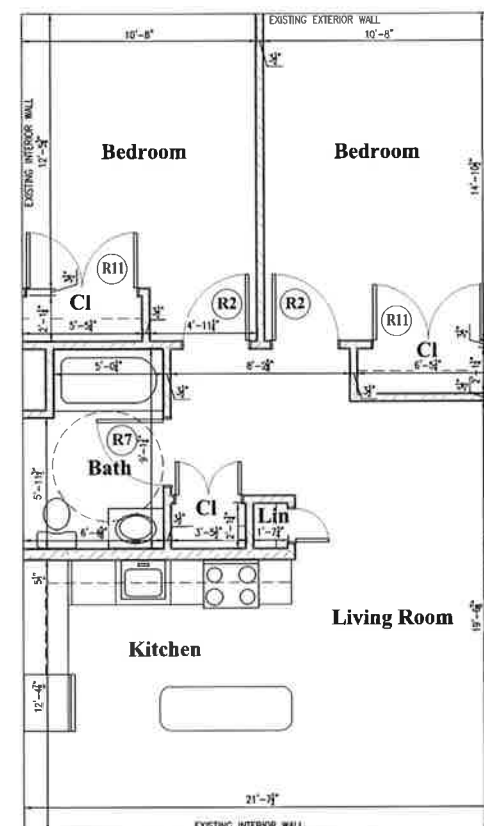
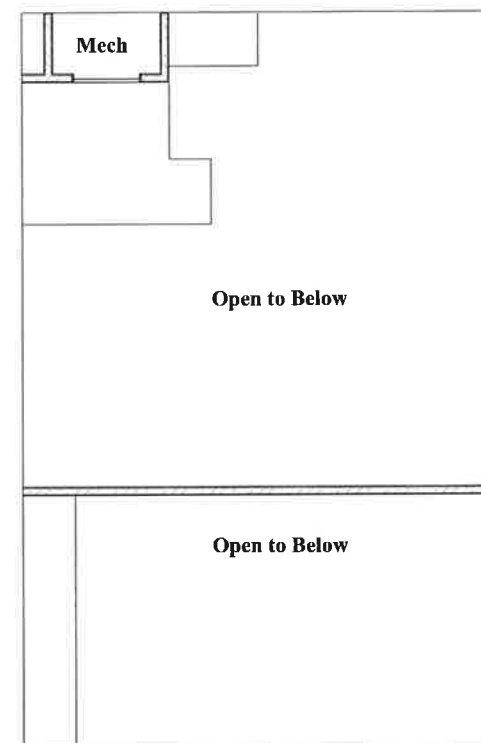
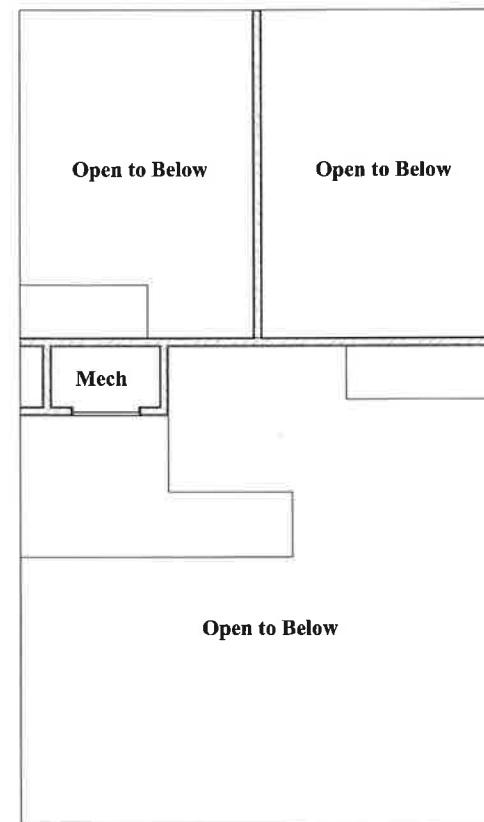
Victory Mill

Victory, NY

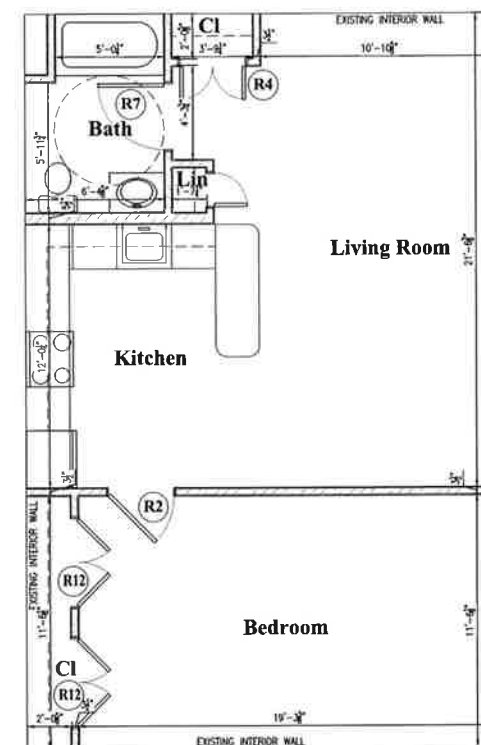
TYPICAL UNIT PLANS

REVISIONS	
DATE	
10/1/2019	
PROJECT NUMBER	
18-08	
SHEET NUMBER	

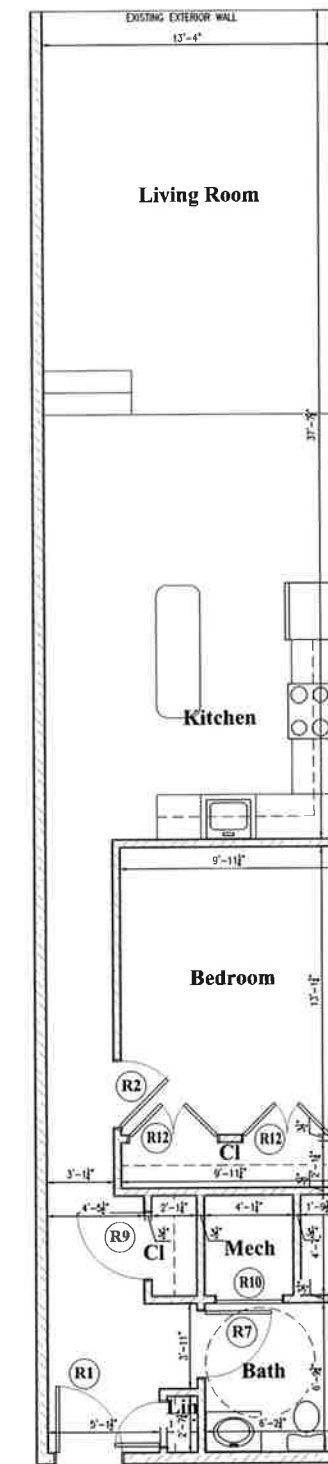
A24



1 Typical J Unit
A24 Scale: 1/4"=1'-0"



2 Typical K Unit
A24 Scale: 1/4"=1'-0"



3 Typical L Unit
A24 Scale: 1/4"=1'-0"



Exhibit 2 – Fire Hydrant Data

TEST #1	FLOW HYDRANT #27	STATIC/RESIDUAL #25
TEST #2	FLOW HYDRANT #6	STATIC/RESIDUAL #30

NOTES:

1. MAP BY DATE AS FOLLOWS:
 - A. SOUTHALL & SUTTON WATER SYSTEM IMPROVEMENTS - CONSTRUCTION OF TUNNELS GENERAL PLAN BY MORRIS, HODGMAN & COMPANY, DATED MARCH, 1960.
 - B. WATER SUPPLY SYSTEM FOR VILLAGE OF TOLSON BY E.D. COLLAMER, C.E., DATED OCTOBER 10, 1945.
 - C. SOUTHALL & SUTTON WATER WORKS - MAP OF VILLAGE SHOWING DISTRIBUTION SYSTEM BY WILLIAM BREEDMAN, C.E., DATED 1903.

**SCHUYLERVILLE / VICTORY
JOINT WATER COMMISSION**

**WATER SUPPLY SYSTEM
ENGINEERING REPORT**

**TITLE: PROPOSED
WATER SUPPLY SOURCE IMPROVEMENTS**

ALL PROPOSED IMPROVEMENTS ARE ON PROPERTIES CURRENTLY OWNED BY THE VILLAGE OF VICTORY AND/OR VILLAGE OF SCHUYLERVILLE

TOWN OF SARATOGA



Map data ©2019 Google 100 ft

HYDRANT FLOW TEST REPORT

LOCATION : VictoryDATE 5/31/19TEST MADE BY Mitchell BrowerTIME 10 A.M.REPRESENTATIVE OF M.J. Engineering and Land SurveyingWITNESS Bill from DPW

STATE PURPOSE OF TEST _____

CONSUMPTION RATE DURING TEST _____

IF PUMPS AFFECT TEST, INDICATE PUMPS OPERATING _____

FLOW HYDRANT #6: _____

Size Nozzle 2 1/2"Pitot Reading 25Discharge Coefficient .9Flow 840 GPMSTATIC HYDRANT #30 43 psiRESIDUAL 35 psiPROJECTED RESULTS: @ 20 psi RESIDUAL 1485 gpm; or @ 0 psi RESIDUAL 2080 gpm

REMARKS _____

LOCATION MAP: Show lines and distance to next cross connected line. Show valves and hydrant branch size. Indicate North. Show flowing hydrants-Label 1,2,3 Show location of Static and Residual-Label.

Indicate: Hydrant _____ Sprinkler _____ Other (Identify) _____



M.J. Engineering and
Land Surveying, P.C.

1533 Crescent Road, Clifton Park, NY 12065
Phone: 518.371.0799 / Fax: 518.371.0822
www.mjels.com

HYDRANT FLOW TEST REPORT

LOCATION : VictoryDATE 5/31/19TEST MADE BY Mitchell BrowerTIME 10 A.M.REPRESENTATIVE OF M.J. Engineering and Land SurveyingWITNESS Bill from DPWSTATE PURPOSE OF TEST _____

CONSUMPTION RATE DURING TEST _____

IF PUMPS AFFECT TEST, INDICATE PUMPS OPERATING _____

FLOW HYDRANT #27: _____

Size Nozzle 2 1/2"Pitot Reading 10-20Discharge Coefficient .9Flow 530-750 GPMSTATIC HYDRANT #25 39 psiRESIDUAL 38 psiPROJECTED RESULTS: @ 20 psi RESIDUAL 2600 gpm; or @ 0 psi RESIDUAL 3830 gpmREMARKS _____

LOCATION MAP: Show lines and distance to next cross connected line. Show valves and hydrant branch size. Indicate North. Show flowing hydrants-Label 1,2,3 Show location of Static and Residual-Label.

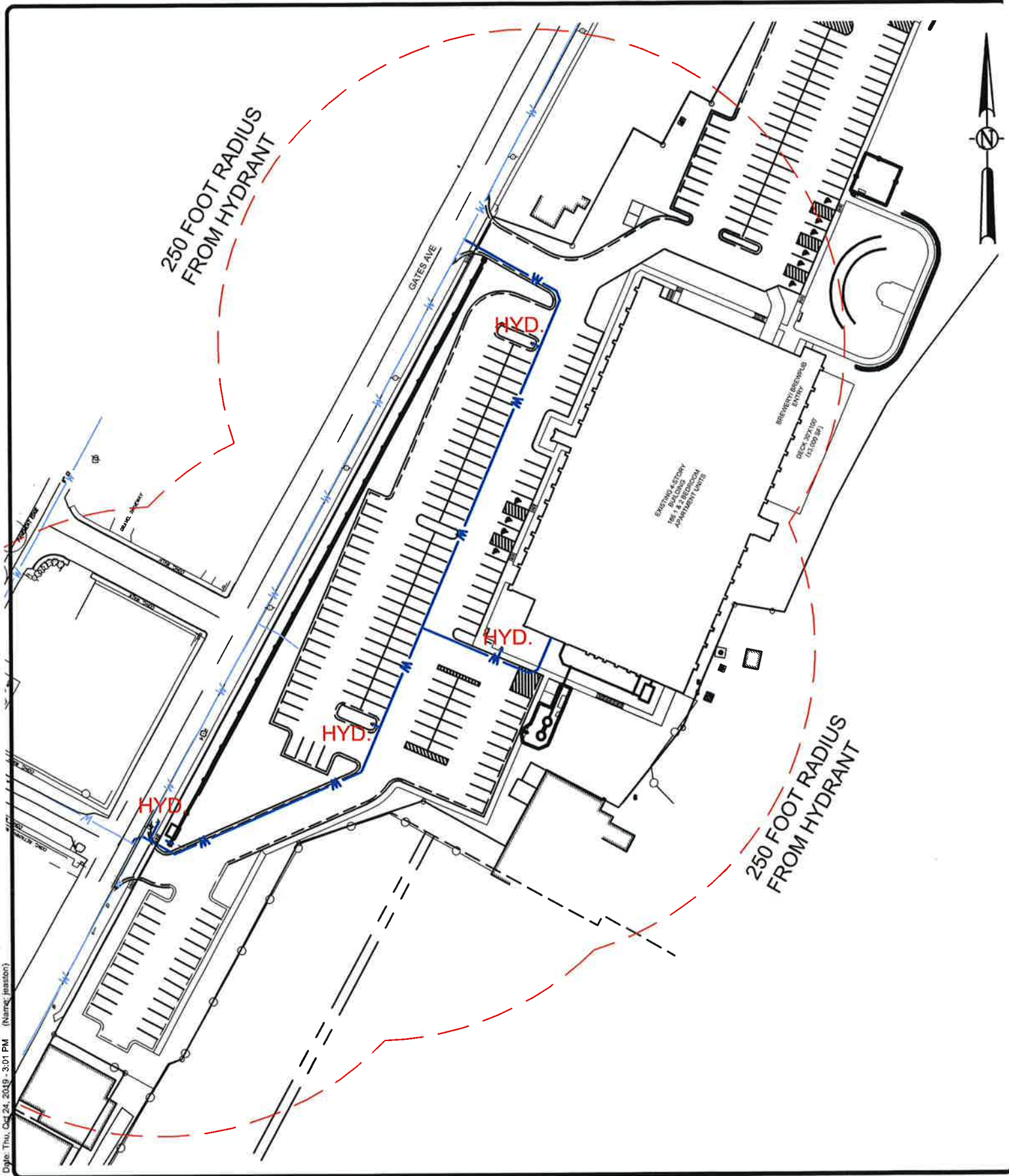
Indicate: Hydrant _____ Sprinkler _____ Other (Identify) _____



M.J. Engineering and
Land Surveying, P.C.

1533 Crescent Road, Clifton Park, NY 12065
Phone: 518.371.0799 / Fax: 518.371.0822
www.mjels.com

Exhibit 3 – Fire Hydrant radius map



PROJ. MANAGER: XXX
 CHIEF DESIGNER: XXX
 DESIGNED BY: XXX
 DRAWN BY: XXX
 CHECKED BY: XXX



Engineering and
 Land Surveying, P.C.
 1533 Crescent Road - Clifton Park, NY 12065

REGAN DEVELOPMENT
HYDRANT LOCATION MAP

42 GATES AVE

VILLAGE OF VICTORY

NEW YORK

SCALE: 1"=100'
 CONTRACT No.: -
 MJ PROJ. No.: 973.32
 DATE: 10.25.19

C1

NEW YORK STATE DEPARTMENT OF HEALTH

Bureau of Water Supply Protection

Application of Approval of Plans for
Public Water Supply Improvement

Applicant	Location of works (C,V,T)	County	Water District (specific area served)
Victory	Victory	Saratoga	Village of Victory
Type of Ownership	<input type="checkbox"/> Private - Other <input type="checkbox"/> Authority <input type="checkbox"/> Interstate <input checked="" type="checkbox"/> Municipal <input type="checkbox"/> Commercial <input type="checkbox"/> Private - Institutional <input type="checkbox"/> Federal <input type="checkbox"/> International <input type="checkbox"/> Industrial <input type="checkbox"/> Water Works Corp. <input type="checkbox"/> Board of Education <input type="checkbox"/> State <input type="checkbox"/> Native American Reservation		
<input checked="" type="checkbox"/> Modifications to existing system. If checked, provide PWS ID # NY		4500169	
<input type="checkbox"/> New System. If checked, provide capacity development (viability) analysis*			
If this project involves a new system, new water district, or a district extension provide boundary description location details in digital format on CD or Floppy Disk. If digital boundary location details are not available provide a text description.			
<input type="checkbox"/> Digital GIS Data Provided <input type="checkbox"/> Digital CAD Data Provided <input type="checkbox"/> Other Digital Data Provided <input checked="" type="checkbox"/> Text Description Provided <input type="checkbox"/> N/A			
Funding Source <input checked="" type="checkbox"/> Private <input type="checkbox"/> DWSRF** <input type="checkbox"/> Federal <input type="checkbox"/> Other			
If DWSRF is checked, please provide DWSRF #			
Estimated Project Cost \$			
Source	Treatment	Storage	Distribution
			\$500,000.00
Pumping	Engineering	Legal/Permitting	Total
	\$20,000		\$500,000.00
Type of Project	<input type="checkbox"/> Corrosion Control <input type="checkbox"/> U.V. Light Disinfection <input checked="" type="checkbox"/> Distribution <input type="checkbox"/> Source <input type="checkbox"/> Pumping Unit <input type="checkbox"/> Fluoridation <input type="checkbox"/> Storage <input type="checkbox"/> Transmission <input type="checkbox"/> Chlorination <input type="checkbox"/> Other Treatment <input type="checkbox"/> Other		
Project Description	825 LF of 8" c-900 pipe, 4 hydrants, 7 valves, and 1 water service lateral.		
Total Population of Service Area		2,200	<div style="border: 1px solid black; width: 100%; height: 100%; text-align: center; vertical-align: middle;"> <p>NYS Professional Licensed Engineer Stamp and Signature***</p> </div>
% population actually served		100%	
% population affected by project		100%	
Latest Total Consumption Data (in MGD)			
Average Day	Year		
0.188	2017		
Maximum Day	Year		
0.75	2017		
Peak Hour	Year		
N/A	-		
Name and Address of Design Engineer	MJ Engineering and Land Surveying P.C. 1533 Crescent Road, Clifton Park NY 12065 Phone: (518) 371-0799 Email: jeaston@mjels.com		
Signature of Applicant		Date	

NOTE: All applications must be accompanied by 3 sets of plans, 3 sets of specifications and an engineer's report describing the project in detail. The project must first be discussed with the appropriate city, county, district or regional public health engineer. Signature by a designated representative *must* be accompanied by a letter of authorization.

*Additional information regarding capacity development may be found at: <http://www.health.state.ny.us/nysdoh/water/main.htm>

**Current DWSRF project listings may be found at: <http://www.health.state.ny.us/nysdoh/water/main.htm>

***By affixing the stamp and signature the Design Engineer agrees that the plans and specifications have been prepared in accordance with the most recent version of the recommended standards for water works and in accordance with the NYS Sanitary Code.



Exhibit 4 – Proposed Pump Station (42 Gates Ave)

Village of Victory

42 Gates Ave

Wastewater Pump Station and Forcemain Design

Project Name: Victory Mills

Average Daily Flow (gpm): 26.5

Pump Operational Point No. 1 (gpm@tdh): 210 gpm @ 61.5 TDH

Pump Manufacturer: Flygt

Model Number: NP3102 SH 3

Impeller Diameter: 135 mm

Horse Power: 6.5

Voltage: 460

Force Main Diameter (in): 4" C-900

Force Main Length (ft): 320

File Path:

L:\Projects\MJ972 Land Development\972.32 (Victory Mills)\Reports\Sewer and Water\Exhibits\4\Pump station design (Flygt).xlsx

Design Pumping Flow Rate

Peaking Factor Calculation	
Service Area Population =	400
$\text{Peak Factor} = \frac{18 + \sqrt{P}}{4 + \sqrt{P}}$	
Calculated Peak Factor =	4.0
Design Peak Factor =	4.0

Determine Minimum Pump Rate		
Average Daily Flow =	38,158	GPD
Peak Flow =	152,632	GPD
Minimum Pumping Rate Required =	106	GPM
Design Pumping Rate =	200	GPM

Cycle Time & Wet Well Geometry

(Required for Wet Well Sizing for 42 Gates Ave)

Target Cycles Per Hour		
ADF	=	26 gpm
Pumping Rate	=	200 gpm
Time	=	10.0 min.
Cycles Per Hour =		6.0
Check Cycles Per Hour:		OK
Check Cycles Per Hour:		OK

Determine Wet well Diameter		
Required Volume =	230	Gallons
Pick Wet Well Diameter =	6.0	Ft
Pick Wet Well Cycle =	1.50	Vert. Ft
Volume in Cycle =	317	Gallons

Vertical Datum Used: NAVD 88

Determine Wet Well Invert & Float Elevations

Wet well Dia. =		6.0	Ft
Top Elev=	189.50		
Gnd Elev=	188.84		
SS Invert In=	168.50		
		Alarm/Lag On =	167.50
		Lead On =	166.50
		Pumps Off =	165.00
		Low Alarm =	164.50
Bottom Invert Elev =	162.50		

OK

Force Main & Piping Design

Force Main Data	
Design Pump Rate (gpm) =	100
Select Force Main Size (in) =	4
Velocity (fps) =	2.55
<i>Meets Minimum Velocity Requirement?</i>	OK
<i>Meets Maximum Velocity Requirement?</i>	OK
Line Length (ft) =	320
Account for Minor Losses =	10% per 100 lf
Forcemain Equiv Length (ft) =	352

Connection Point:	Gravity Sewer on Fuller Station Road
-------------------	---

Pump Station Piping Data			
Design Pump Rate (gpm) =		100	
Pick Wet Well & Valve Vault Piping Size (in) =		4	
Velocity (fps) =		2.55	
<i>Meets Minimum Velocity Requirement?</i>		OK > 2 FPS	
<i>Meets Maximum Velocity Requirement?</i>		OK < 6 FPS	
Item	Number of Fittings	L/D Ratio	Equivalent Length
45 bend	1	16	5.33
90 bend	3	30	30.00
22.5 bend	0	9	0.00
Branch Tee Flow	2	60	40.00
Gate valve	2	135	90.00
Plug Valve	1	17	5.67
			0.00
			0.00
			0.00
Equivalent Fitting Length (ft) =			171
Wet Well & Valve Vault Piping Length (ft) =			50
Total Equivalent Pump Station Pipe Length (ft) =			221
Pump Station and Fitting Equiv Length (ft) =			221

Pump Selection

Wet Well Data	Force Main Data
Wet Well Piping Diameter (in) = 4 Material= DIP Equivalent Wet Well Piping Length (ft) = 221 Hazen-Williams C Factor = 130	Force Main Diameter (in) = 4 Material= C-900 Equivalent Force Main Length (ft) = 352 Hazen-Williams C Factor = 130

Static Head	Pump General Design Requirments
Connection Elevation = 194 (MH #32 or high point) Elevation Out = 162.5 (Bottom of Wet Well)	Minimum Required Pump Rate(GPM) = 106 Design Pumping Rate (GPM)= 200

Friction Head
Hazen-Willaims Equation

$$f = \frac{10.44 \times L(\text{ft}) \times Q^{1.85}(\text{gpm})}{C^{1.85} \times D(\text{inches})^{4.47}}$$

Existing Force Main Data
Force Main Diameter (in) = 6 Material= SDR-21 Equivalent Force Main Length (ft) = 3200 Hazen-Williams C Factor = 130

GPM	Static Head (ft.)	Friction Head in 4" DIP (ft.)	Friction Head in 4" C-900 (ft.)	Friction Head in Existing. 6" SDR-21 (ft.)	TDH	Forcemain Velocity 4" DIP & C-900 (fps)	Forcemain Velocity 6" PVC (fps) Existing
50	31.5	0.461	0.734	0.926	33.62	1.28	0.57
100	31.5	1.661	2.645	3.338	39.14	2.55	1.14
150	31.5	3.516	5.600	7.067	47.68	3.83	1.70
180	31.5	4.926	7.846	9.902	54.17	4.60	2.04
200	31.5	5.986	9.535	12.033	59.05	5.11	2.27
210	31.5	6.552	10.436	13.169	61.66	5.36	2.38
250	31.5	9.046	14.408	18.182	73.14	6.39	2.84
300	31.5	12.675	20.188	25.476	89.84	7.66	3.41

Pump Manufacturer: **Flygt**

Model Number: **NP3102 SH 3**

Impeller Diameter: **135 mm**

Horsepower: **6.5**

Hertz **60**

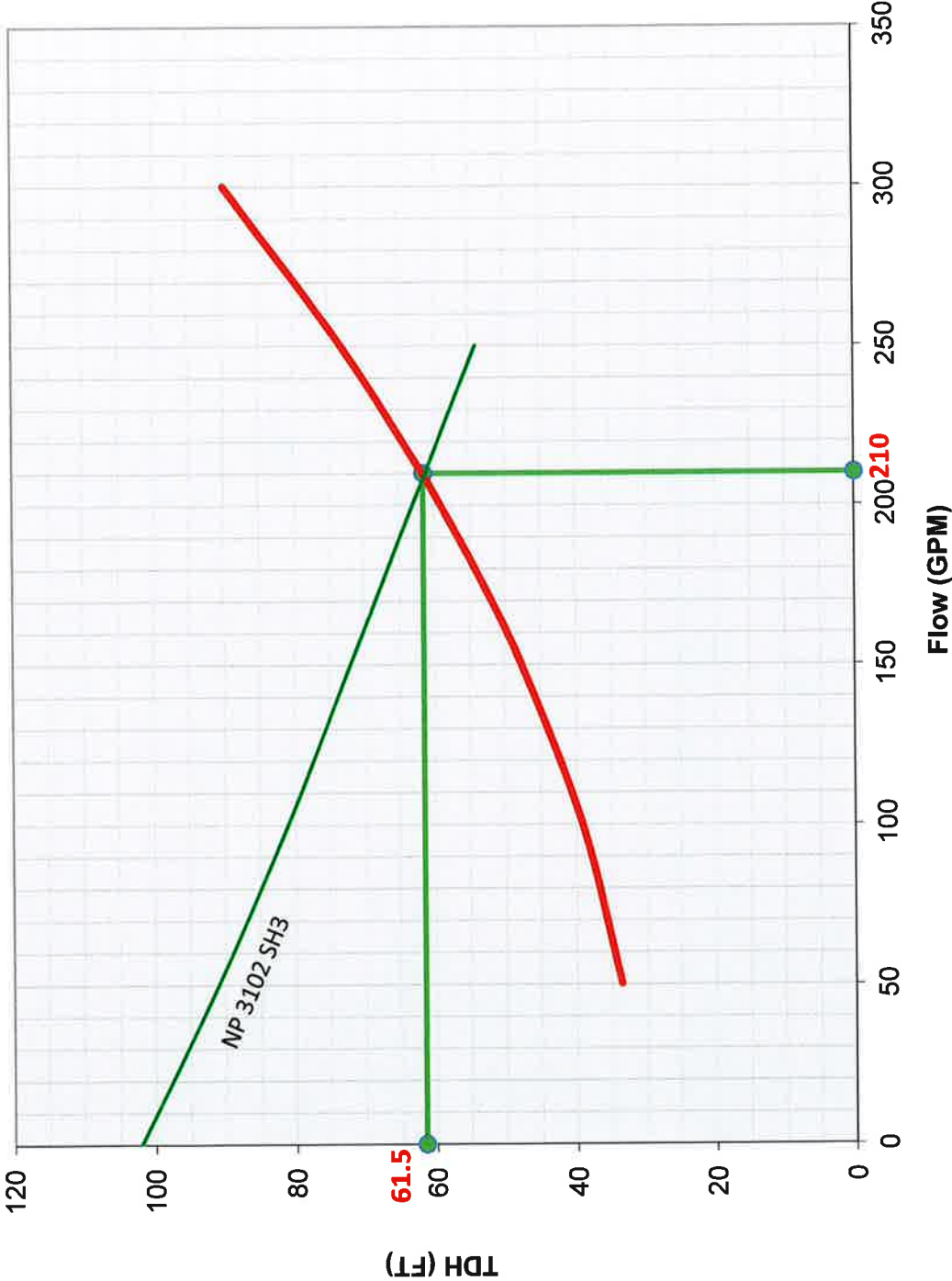
Pump and Force Main System Curve

Flygt
Submersible Pump
Non-Clog Pump
Constant Speed Performance
3440 RPM
135 mm impeller
Solid- 3" sphere
Model NP3102 SH 3

Operation Point

Pump Head

135 mm Impeller



Station Operation Check

Proposed Operational Point No.1

210 GPM @ **61.5** TDH

Check Wet well Cycle Times

Wet well Diameter (feet)	Wet well Area (gal / VF)	Wet well Cycle (ft)	Wet well Volume (gal)
6.0	211	1.50	317

$$\text{Fill} = \frac{\text{Wet well Volume}}{\text{ADF}} = 12.0 \text{ minutes}$$

$$\text{Run} = \frac{\text{Wet well Volume}}{\text{Pump Rate} - \text{ADF}} = 1.7 \text{ minutes}$$

$$\text{Total} = 13.7 \text{ minutes}$$
$$\text{Cycle Time} = 4.4 \text{ Cycles / Hour}$$

Meets Minimum Cycle Time? **OK**

Meets Maximum Cycle Time? **OK**

Buoyancy Calculations

Wet well Outside Dimensions	7.00	Feet
Wet well Inside Dimensions	6.00	Feet
Wet well Top Slab Elevation	189.50	Feet
Wet well Invert Elevation	162.50	Feet
Extended Base Slab Diameter	8.00	Feet
Extended Base Slab Thickness	0.66	Feet
Top Slab Thickness	0.66	Feet

Calculate Total Volume of Wet well Structure

Volume of Wet well Riser Sections=	1039	cf
Volume of Wet well Extended Base=	33	cf
Total Volume of Wet well Structure=	1072	cf

Calculate Total Volume of Water Displaced (Total Buoyant Force)

H2O Displaced = (Volume of Wet well Structure) * (62.4 lbs/cf)

H2O Displaced=	66875	lbs
----------------	-------	-----

Calculate Submerged Weight of Wet well Components

Section	Total Ht	Weight
Top Slab Thickness (ft.)	0.66	3810
Riser - Total Vertical Ft.	27.00	41351
Base Slab Thickness (ft.)	0.66	4976
Totals=	28.32	50137

(Unit weight of concrete 150 lbs/cf)

Total Weight of Concrete in Wet well=	50137	lbs.
---------------------------------------	-------	------

Calculate Weight of Soil Above Extended Base/Footing

Total Area of Extended Base	50	sf
Total Area of Wet well Riser	38	sf
Area of Extended Base less Wet well	12	sf
Height of Soil Above Extended Base	26	ft
Volume of Soil Above Extended Base	310	cf
Weight of Soil Above Extended Base (estimated)	120	lbs/cf
Total Weight of Soil Above Extended Base	37237	lbs

Calculate Weight of Concrete Ballast

Diameter of Concrete Ballast (24" ring)	9.0	feet
Total Area of Concrete Ballast	64	sf
Total Area of Wet Well Riser	38	sf
Area of Extended Ballast less Wet well	25	sf
Height of Concrete Ballast	4	feet
Total Weight of Concrete Ballast	14074	lbs

Flotation Protection Required?

Weight of Concrete and Weight of Soil Above Extended Base:	101449	lbs
Weight of Water Displaced By Wet Well:	66875	lbs
Flotation Protection Required?	NO	
Factor of Safety:	1.52	

NP 3102 SH 3~ Adaptive 256

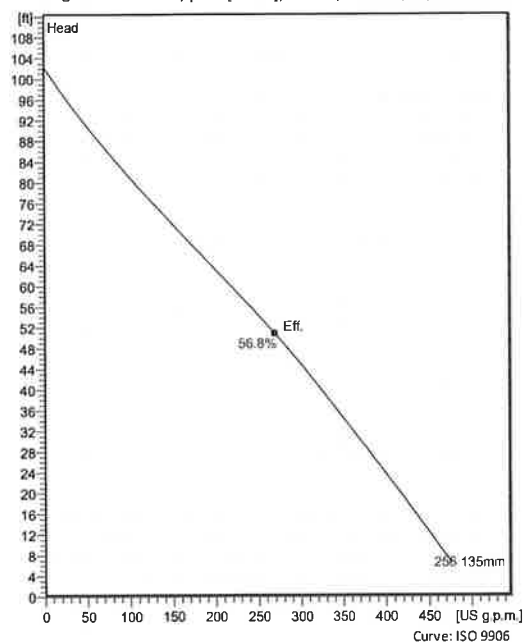
Patented self cleaning semi-open channel impeller, ideal for pumping in waste water applications. Possible to be upgraded with Guide-pin® for even better clogging resistance. Modular based design with high adaptation grade.



Technical specification



Curves according to: Water, pure [100%], 39.2 °F, 62.42 lb/ft³, 1.6891E-5 ft²/s



Configuration

Motor number N3102.070 18-10-2AL-W 6.5hp	Installation type P - Semi permanent, Wet
Impeller diameter 135 mm	Discharge diameter 3 1/8 inch

Pump information

Impeller diameter 135 mm
Discharge diameter 3 1/8 inch
Inlet diameter 80 mm
Maximum operating speed 3440 rpm
Number of blades 2

Materials

Impeller Hard-Iron™
Stator housing material Grey cast iron

Project
Block

Created by
Created on 10/25/2019

Last update

NP 3102 SH 3~ Adaptive 256

Technical specification



Motor - General

Motor number N3102.070 18-10-2AL-W 6.5hp	Phases 3~	Rated speed 3440 rpm	Rated power 6.5 hp
Approval FM	Number of poles 2	Rated current 8.2 A	Stator variant 12
Frequency 60 Hz	Rated voltage 460 V	Insulation class H	Type of Duty S1

Motor - Technical

Power factor - 1/1 Load 0.94	Motor efficiency - 1/1 Load 78.9 %	Total moment of inertia 0.23 lb ft ²	Starts per hour max. 30
Power factor - 3/4 Load 0.94	Motor efficiency - 3/4 Load 80.5 %	Starting current, direct starting 56 A	
Power factor - 1/2 Load 0.91	Motor efficiency - 1/2 Load 79.6 %	Starting current, star-delta 18.7 A	

Project
Block

Created by
Created on 10/25/2019

Last update

NP 3102 SH 3~ Adaptive 256

Performance curve

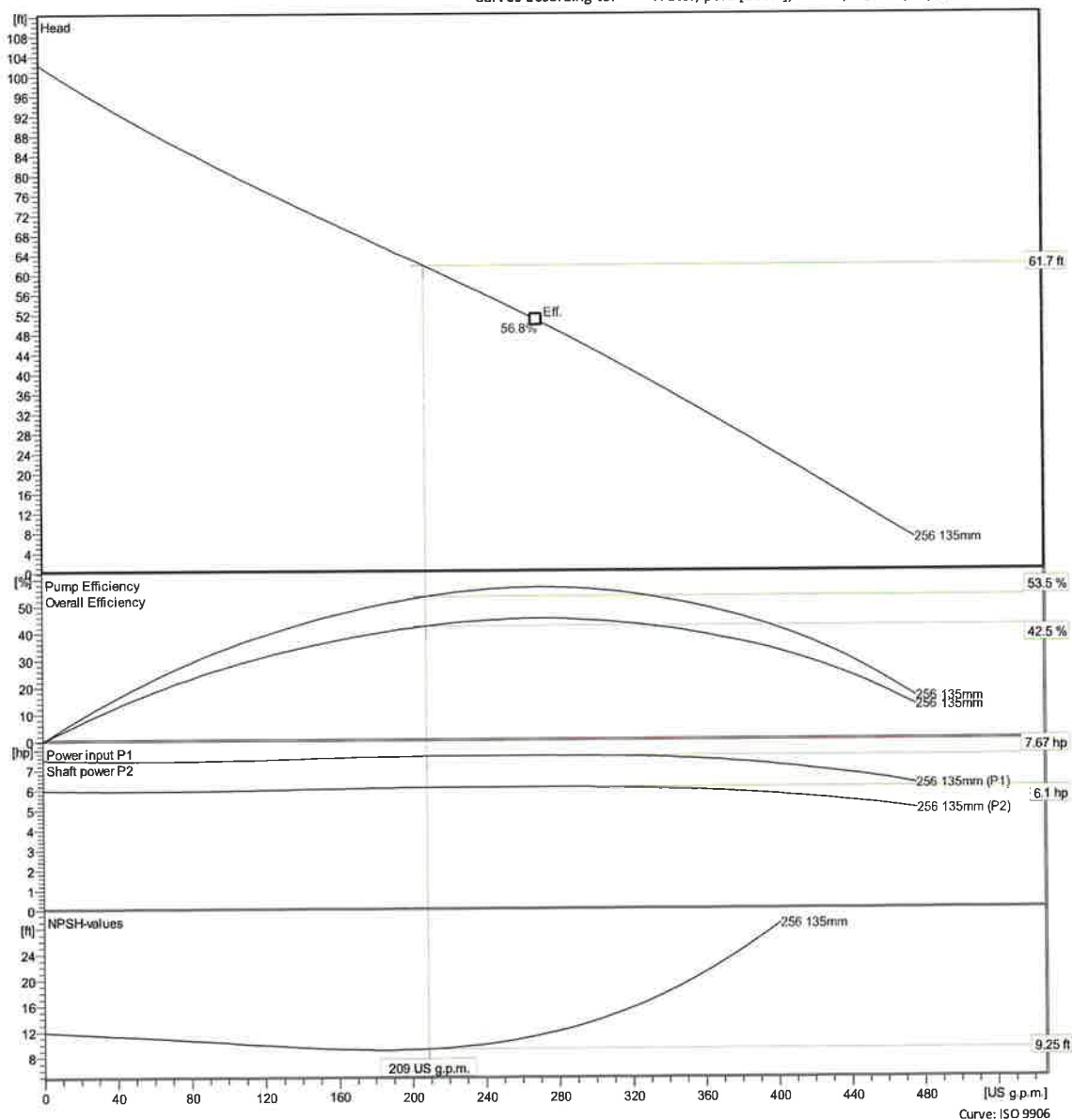


Duty point

Flow
209 US g.p.m.

Head
61.7 ft

Curves according to: Water, pure [100%], 39.2 °F, 62.42 lb/ft³, 1.6891E-5 ft²/s



Project
Block

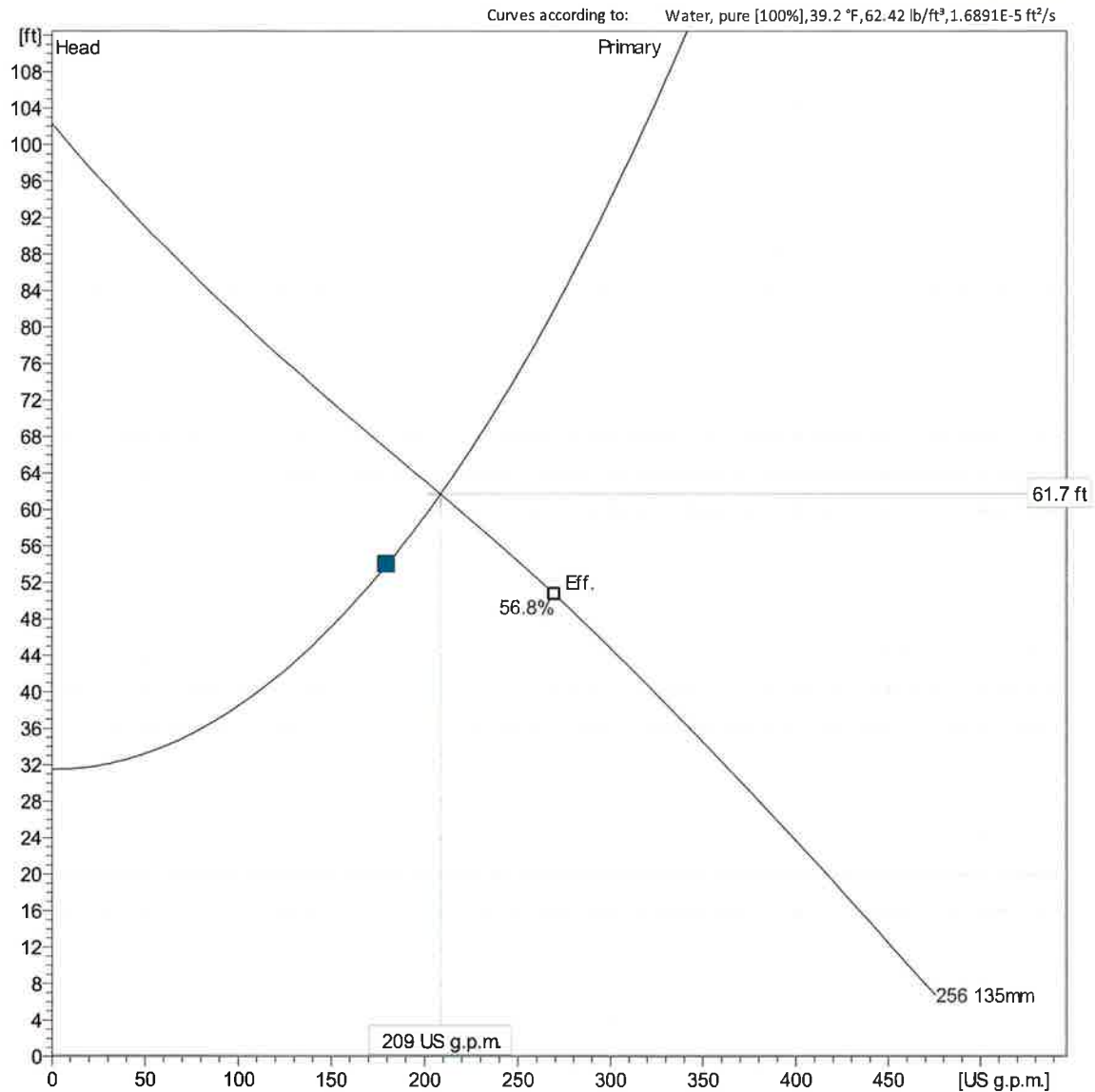
Created by
Created on 10/25/2019

Last update

Curve: ISO 9906

NP 3102 SH 3~ Adaptive 256

Duty Analysis



Operating characteristics

Pumps/Systems	Flow	Head	Shaft power	Flow	Head	Shaft power	Hydr.eff.	Specific energy	NPSHr
Primary	209 US g.p.m.	61.7 ft	6.1 hp	209 US g.p.m.	61.7 ft	6.1 hp	53.5 %	457 kWh/US M	9.25 ft

Project
Block

Created by
Created on 10/25/2019

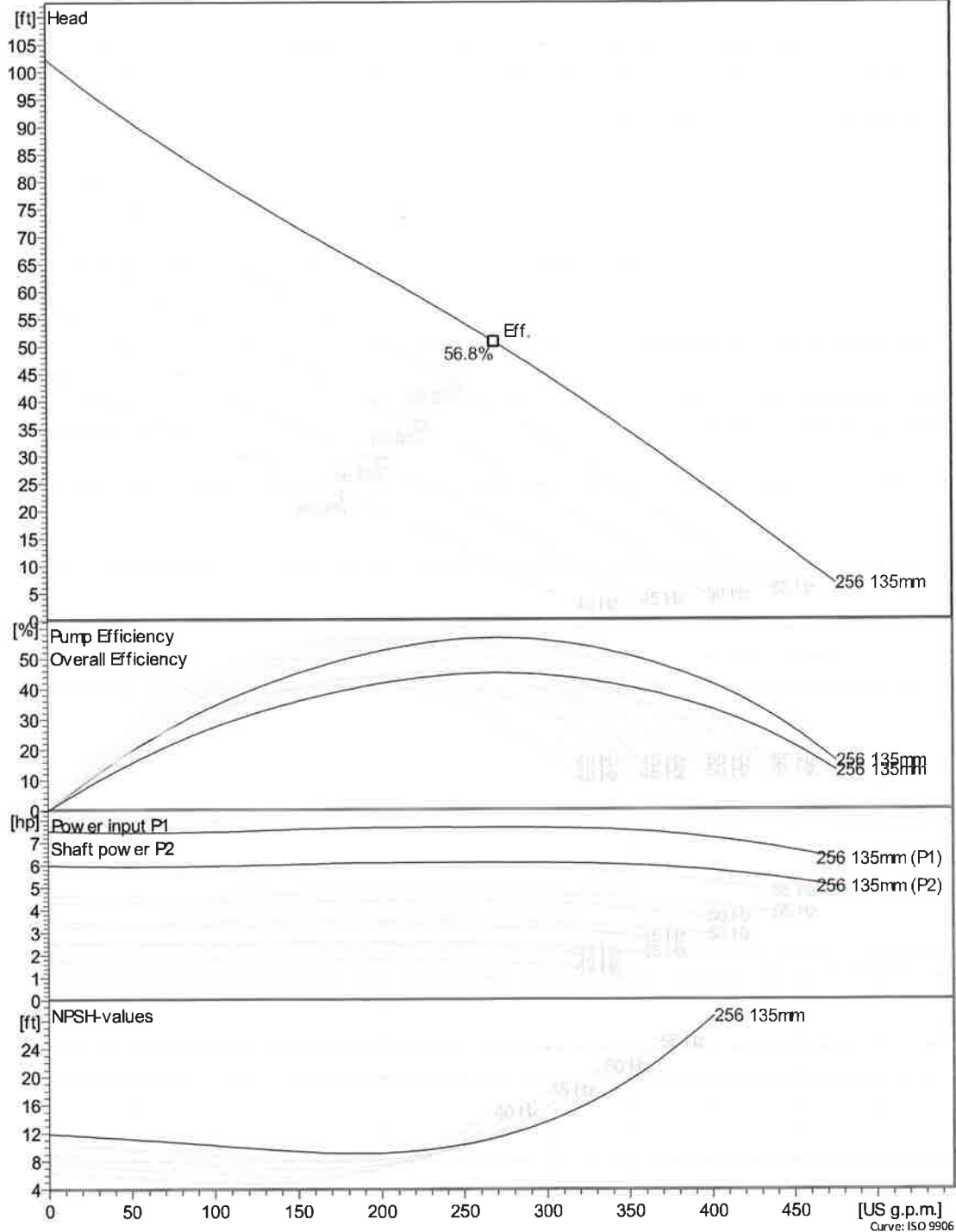
Last update

NP 3102 SH 3~ Adaptive 256

VFD Curve



Curves according to: Water, pure [100%], 39.2 °F, 62.42 lb/ft³, 1.6891E-5 ft²/s



Project
Block

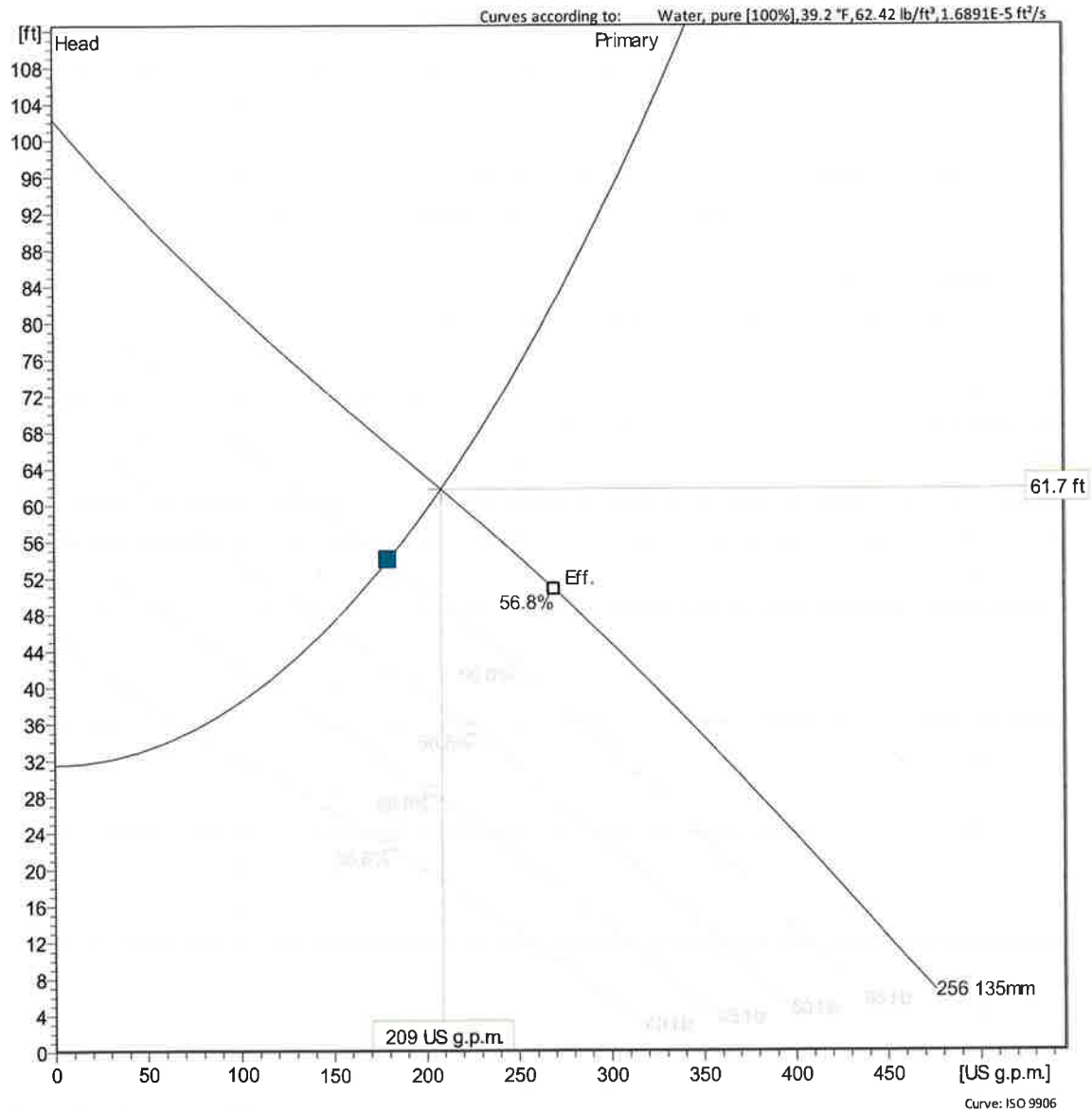
Created by
Created on 10/25/2019

Last update

Curve: ISO 9906

NP 3102 SH 3~ Adaptive 256

VFD Analysis



Operating Characteristics

Pumps/Systems	Frequency	Flow	Head	Shaft power	Flow	Head	Shaft power	Hydr. eff.	Specific energy	NPSHr
Primary	59.9 Hz	209 US g.p.m.	61.7 ft	6.1 hp	209 US g.p.m.	61.7 ft	6.1 hp	53.5 %	457 kWh/US M	9.25 ft
Primary	55 Hz	184 US g.p.m.	54.9 ft	4.88 hp	184 US g.p.m.	54.9 ft	4.88 hp	52.3 %	411 kWh/US M	8.13 ft
Primary	50 Hz	152 US g.p.m.	47.6 ft	3.66 hp	152 US g.p.m.	47.6 ft	3.66 hp	50 %	374 kWh/US M	6.96 ft
Primary	45 Hz	117 US g.p.m.	41.1 ft	2.66 hp	117 US g.p.m.	41.1 ft	2.66 hp	46 %	362 kWh/US M	6.01 ft
Primary	40 Hz	77.7 US g.p.m.	35.7 ft	1.84 hp	77.7 US g.p.m.	35.7 ft	1.84 hp	38.1 %	404 kWh/US M	5.32 ft

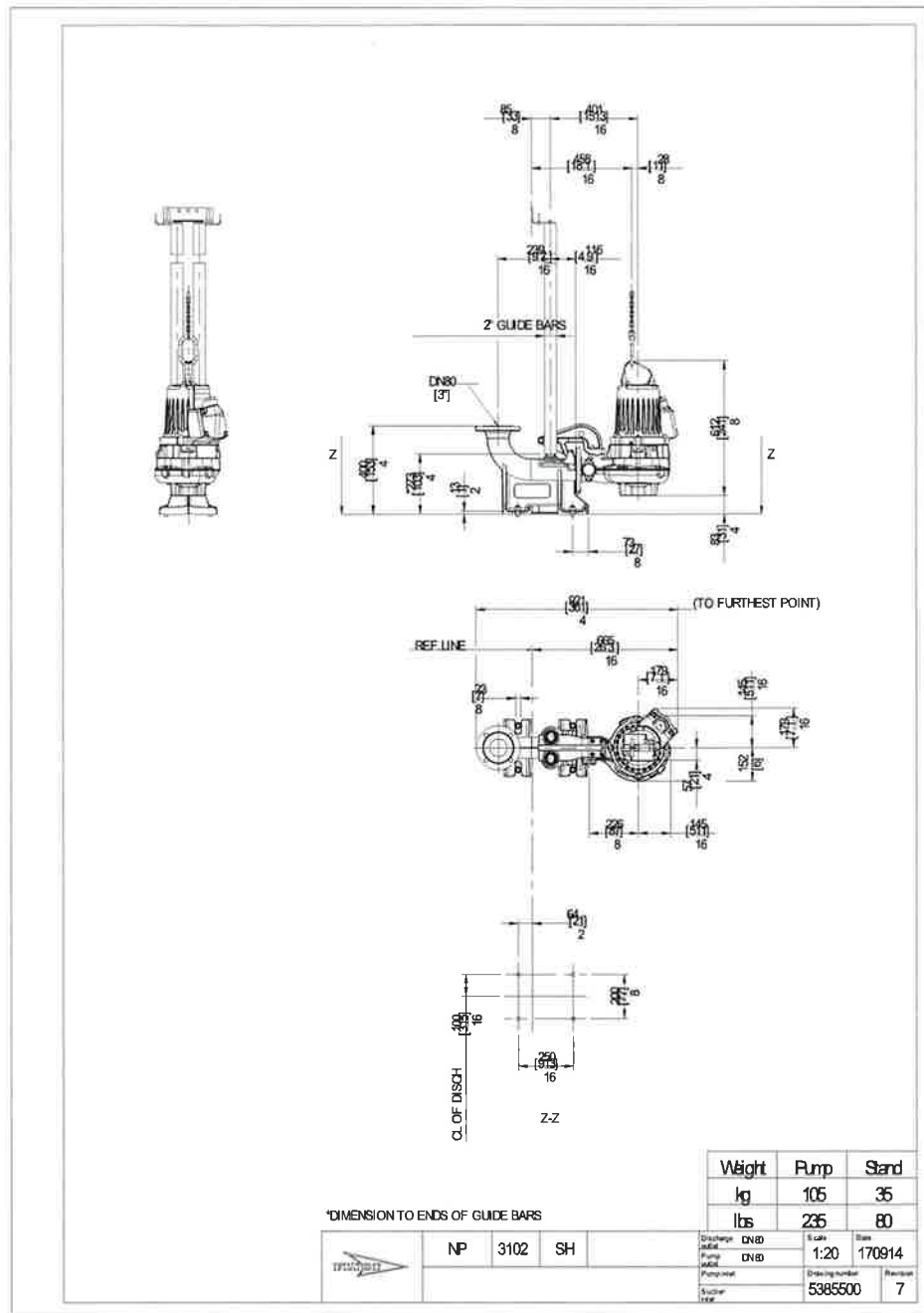
Project
Block

Created by
Created on 10/25/2019

Last update

NP 3102 SH 3~ Adaptive 256

Dimensional drawing



Project
Block

Created by
Created on 10/25/2019

Last update



Exhibit 5 – Existing Pump Station

Cycle Time & Wet Well Geometry

(Existing Pump Station Wet Well)

Target Cycles Per Hour		
ADF	=	49 gpm
Pumping Rate	=	200 gpm
Time	=	10.0 min.
Cycles Per Hour =		6.0
Check Cycles Per Hour:		OK
Check Cycles Per Hour:		OK

Determine Wet well Diameter		
Required Volume =	368	Gallons
Pick Wet Well Diameter =	6.0	Ft
Pick Wet Well Cycle =	3.00	Vert. Ft
Volume in Cycle =	634	Gallons

Vertical Datum Used: NAVD 88

Determine Wet Well Invert & Float Elevations

Wet well Dia. =		6.0	Ft
Top Elev=	190.00		
Gnd Elev=	189.00		
SS Invert In=	183.50		
			Alarm/Lag On = 183.50
			Lead On = 182.50
			Pumps Off = 178.50
			Low Alarm = 178.00
Bottom Invert Elev =	176.50		

OK

Pump Selection

Wet Well Data	Force Main Data
Wet Well Piping Diameter (in) = 6	Force Main Diameter (in) = 6
Material= DIP	Material= SDR-21
Equivalent Wet Well Piping Length (ft) = 307	Equivalent Force Main Length (ft) = 4121
Hazen-Williams C Factor = 130	Hazen-Williams C Factor = 130

Static Head	Pump General Design Requirements
Connection Elevation = 194 (MH #32 or high point)	Minimum Required Pump Rate(GPM) = x
Elevation Out = 176.5 (Bottom of Wet Well)	Design Pumping Rate (GPM)= 200

Friction Head

Hazen-Willaims Equation

$$f = \frac{10.44 \times L(ft) \times Q^{1.85}(gpm)}{C^{1.85} \times D (inches)^{4.47}}$$

GPM	Static Head (ft.)	Friction Head in 6" DIP (ft.)	Friction Head in 6" PVC (ft.)		TDH	Forcemain Velocity 6" SDR-21 (fps)	
50	17.5	0.089	1.192		18.78	0.57	
100	17.5	0.320	4.299		22.12	1.14	
150	17.5	0.677	9.101		27.28	1.70	
200	17.5	1.153	15.497		34.15	2.27	
218	17.5	1.352	18.175		37.03	2.47	
250	17.5	1.742	23.417		42.66	2.84	
300	17.5	2.440	32.810		52.75	3.41	
350	17.5	3.245	43.638		64.38	3.97	

Pump Manufacturer: **ABS**

Model Number: **AFP1041M35**

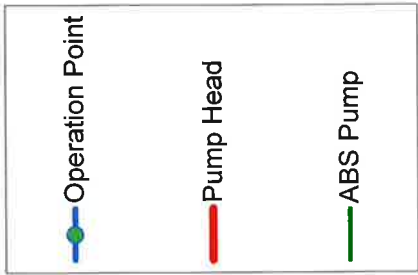
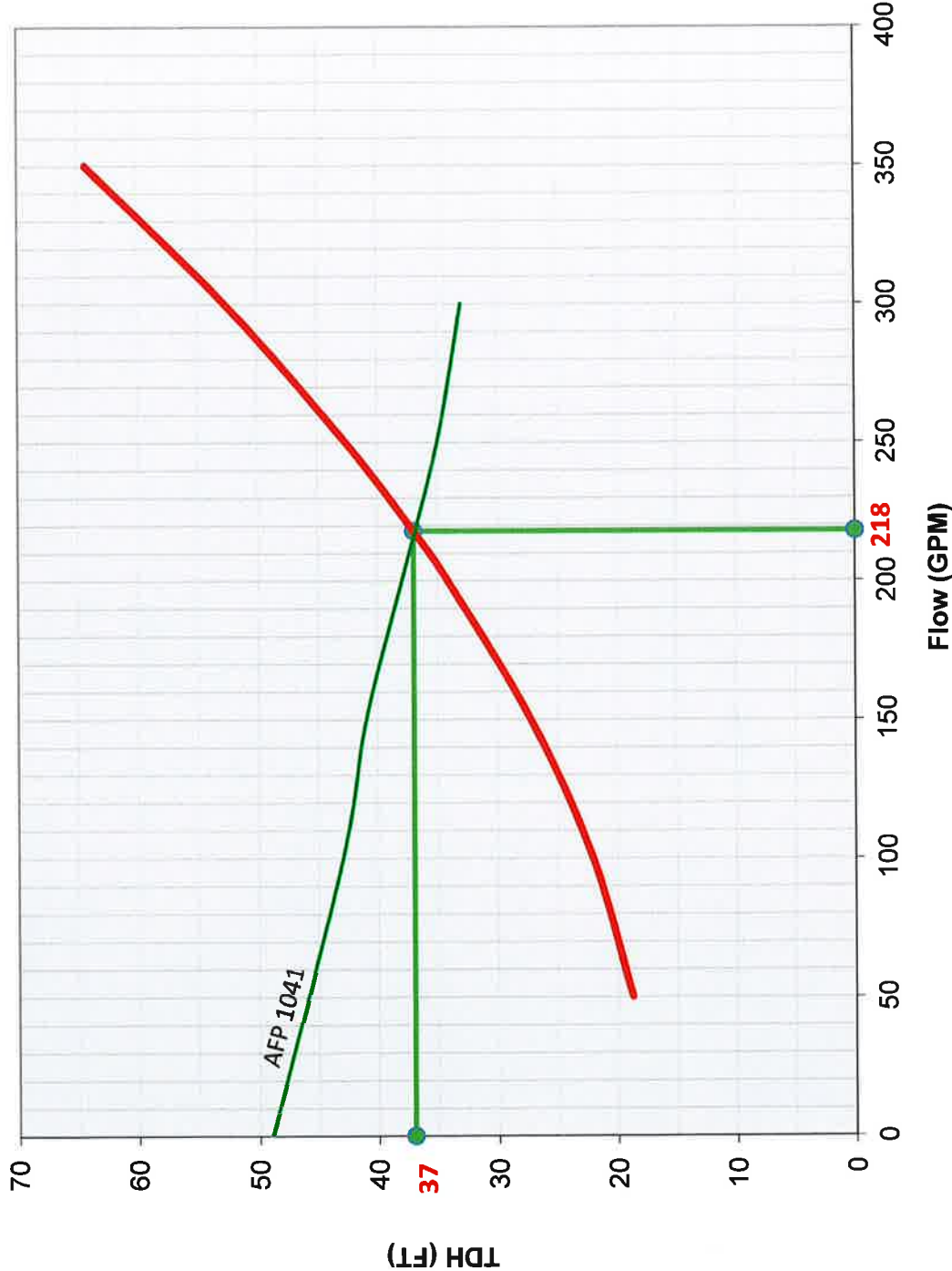
Impeller Diameter: **8/7/2016**

Horsepower: **4.7**

Hertz **60**

Existing Pump and Force Main System Curve

ABS
Submersible Pump
Non-Clog Pump
Constant Speed Performance
1680 RPM
8 7/16" impeller
Solid- 3.5" sphere
Model AFP 1041M35



Station Operation Check

Proposed Operational Point No.1

218 GPM @ **37** TDH

Check Wet well Cycle Times

Wet well Diameter (feet)	Wet well Area (gal / VF)	Wet well Cycle (ft)	Wet well Volume (gal)
6.0	211	3.00	634

$$\text{Fill} = \frac{\text{Wet well Volume}}{\text{ADF}} = 13.0 \text{ minutes}$$

$$\text{Run} = \frac{\text{Wet well Volume}}{\text{Pump Rate} - \text{ADF}} = 3.7 \text{ minutes}$$

$$\begin{aligned} \text{Total} &= 16.8 \text{ minutes} \\ \text{Cycle Time} &= 3.6 \text{ Cycles / Hour} \end{aligned}$$

Meets Minimum Cycle Time? OK

Meets Maximum Cycle Time? OK

AFP 1041, 4 Pole

Page 2.1

Impeller
Contrabloc impeller

Impeller size
8 7/16..7 5/8 inch

N° of vanes
1

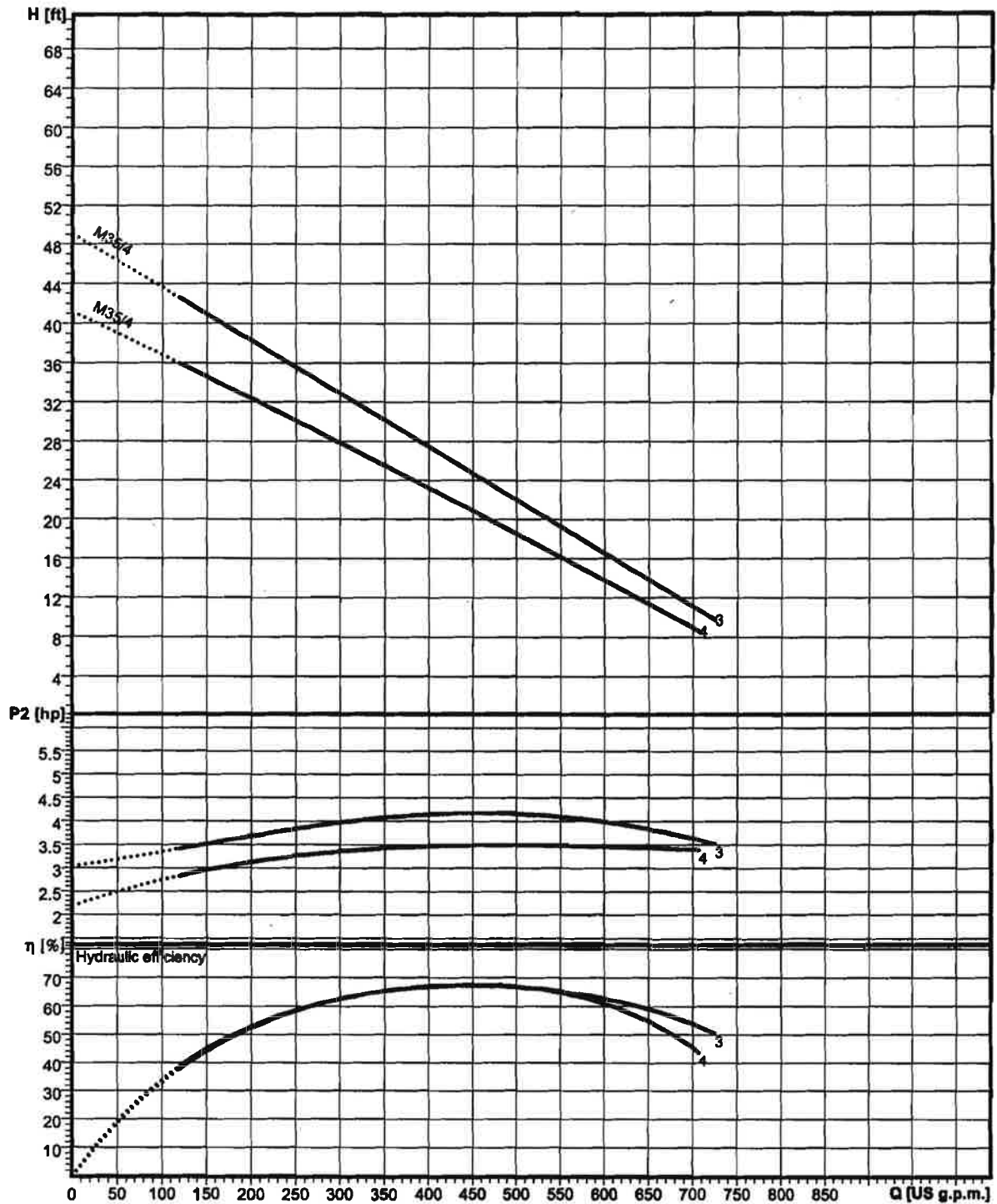
Testnorm
Hydraulic Institute

Discharge
4 inch

Rated speed
1680 rpm

Solid size
3 1/2 inch

Date
2000-01-04



Specifications subject to change without notice

Operation in dotted area is not recommended

Revision 1999-02-10



Exhibit 6 – Pumps In Parallel

Pump Stations in Parallel

Proposed Pump Station

Static head= 31.5 ft
 4" DIP equivalent length= 221 ft
 4" C-900 Equivalent length= 352 ft
 6" PVC SDR Equivalent length= 3200 ft
 Hazen-Williams C Factor = 130

Existing Pump Station

Static head= 17.5 ft
 6" DIP equivalent length= 307 ft
 6" PVC SDR Equivalent length= 920 ft
 6" PVC SDR Equivalent length= 3200 ft
 Hazen-Williams C Factor = 130

Friction Head

Hazen-Williams Equation

$$f = \frac{10.44 \times L(\text{ft}) \times Q^{1.85}(\text{gpm})}{C^{1.85} \times D(\text{inches})^{4.47}}$$

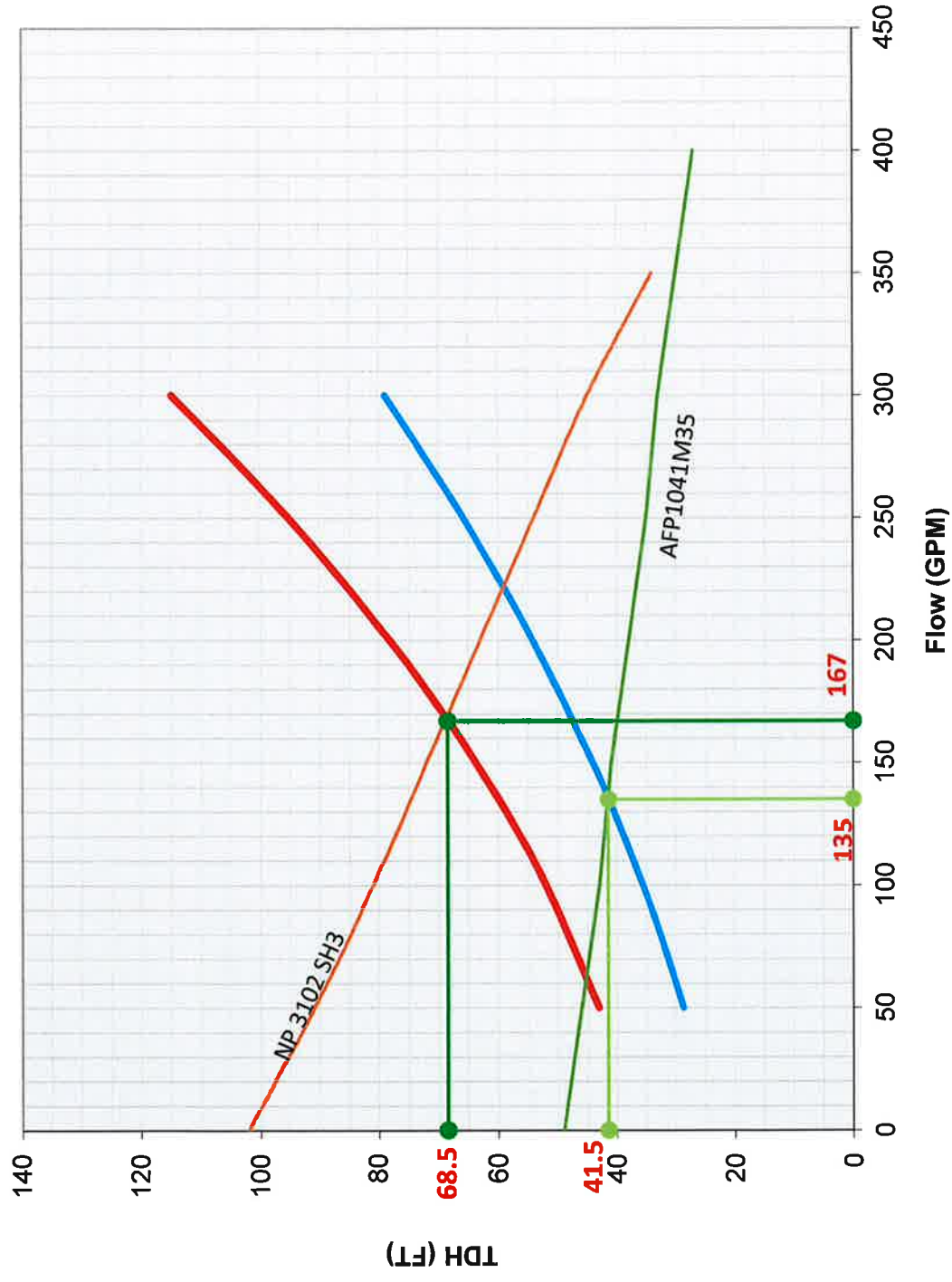
Proposed Pump Station

GPM	Static Head (ft.)	Friction Head in 4" DIP (ft.)	Friction Head in 4" C-900 (ft.) [To Vault]	Friction Head in Existing, 6" SDR-21 (ft.) [Vault to MH #32]	TDH	Forcemain Velocity 4" DIP & C-900 (fps)	Forcemain Velocity 6" PVC (fps) Existing
50	31.5	0.461	0.734	10.417	43.11	1.28	1.14
100	31.5	1.661	2.645	16.216	52.02	2.55	1.99
125	31.5	2.509	3.997	19.551	57.56	3.19	2.55
140	31.5	3.095	4.929	21.688	61.21	3.58	3.12
167	31.5	4.288	6.830	25.791	68.41	4.27	3.60
200	31.5	5.986	9.535	31.246	78.27	5.11	4.54
250	31.5	9.046	14.408	40.417	95.37	6.39	5.68
300	31.5	12.675	20.188	50.660	115.02	7.66	6.81

Existing Pump Station

GPM	Static Head (ft.)	Friction Head in 6" DIP (ft.)	Friction Head in Existing, 6" SDR-21 (ft.) [To Vault]	Friction Head in Existing, 6" SDR-21 (ft.) [Vault to MH #32]	TDH	Forcemain Velocity 6" PVC (fps) Existing	
50	17.5	0.089	0.266	10.943	28.80	1.14	
75	17.5	0.188	0.564	13.755	32.01	1.99	
100	17.5	0.320	0.960	16.860	35.64	2.55	
135	17.5	0.558	1.672	21.688	41.42	3.12	
150	17.5	0.678	2.032	23.927	44.14	3.60	
200	17.5	1.154	3.459	32.114	54.23	4.54	
250	17.5	1.744	5.227	41.393	65.86	5.68	
300	17.5	2.444	7.324	51.742	79.01	6.81	

Parallel Pump and Force Main System Curve



- Pump Head [Proposed Pump]
- Pump Head [Existing Pumps]
- Pump Curve [Proposed Pump]
- Pump Curve [Existing Pump]
- Operation Point [Proposed Pump]
- Operation Point [Existing Pump]



Exhibit 7 – Village Agreement

ORIGINAL

**WASTEWATER TRANSPORTATION TREATMENT, AND RELATED
SERVICES AGREEMENT**

This **AGREEMENT** is dated this 31st day of May, 2018, by and, between the **VILLAGE OF SCHUYLERVILLE** (hereinafter "Schuylerville"), with a business address at 35 Spring Street, Schuylerville, New York 12871 and the **VILLAGE OF VICTORY** (hereinafter "Victory"), with a business address at 23 Pine Street, P.O. Box 305, Victory Mills, New York 12884, witnesses the following:

WHEREAS, Schuylerville is the owner of a certain publicly owned treatment works (POTW) for the treatment of wastewater and identified as Village of Schuylerville WWTP, located at Canal Street in the Village of Schuylerville, Saratoga County, New York, NY SPDES Number NY0031941; and

WHEREAS, Schuylerville and Victory previously entered into an agreement titled "AGREEMENT Between VILLAGE OF VICTORY and VILLAGE OF SCHUYLERVILLE for WASTEWATER TRANSPORTATION AND TREATMENT SERVICES" dated May 3, 1992, as amended by amendments dated April 8, 1996 and December 12, 2003 (hereinafter "1992 Agreement") and

WHEREAS, the parties wish to supersede and replace the 1992 Agreement as amended with this Agreement.

NOW THEREFORE, in consideration of the mutual promises contained and set forth herein, as well as other good and valuable consideration, the receipt and sufficiency of which is hereby expressly acknowledged, the parties intending to be legally bound agree as follows:

1. REVOCATION AND REPLACEMENT OF PRIOR 1992 AGREEMENT: Upon execution of this Agreement by and between Schuylerville and Victory, the "1992 Agreement" is to be deemed void, canceled, withdrawn and of no effect.
2. ANNUAL BILLING FOR TERM OF AGREEMENT: Schuylerville will charge, and Victory will pay, an annual charge for the services provided pursuant to the terms of this Agreement. The annual charge will be billed by Schuylerville on or before September 1st, of each year covered by the Agreement, and the charges so billed will be due to be paid by Victory on or before November 1st of each year, or within 60 days of receipt of the described bill, whichever last occurs. Interest shall accrue on any unpaid but due charges, at the rate of one per cent (1%) per month until paid.
3. AMOUNT TO BE BILLED: Commencing on June 1, 2018, and to cover services provided hereunder for the period from June 1, 2018 through May 31, 2019, Schuylerville will bill Victory Sixty Thousand (\$60,000.00) Dollars, and Victory shall pay same, subject to the provisions of Section 2 above. Such charge covers all operations, maintenance, improvements, assessments, and debt charges that might arise from the services provided to Victory by Schuylerville.

4. TERM OF AGREEMENT: The services to be provided hereunder shall be year to year, billed and paid as above provided, starting on June 1, 2018 and running through May 31, 2045. Victory reserves the right to terminate the Agreement upon five (5) years written notice to Schuylerville, such notice delivered to the Schuylerville Village Clerk in the last month of any annual term.

In the event that Schuylerville stops operating a WWTP during the term of this Agreement, the terms and charges set forth herein shall survive, and be deemed, upon Victory's consent, assigned to any successor to Schuylerville in the treatment of the contemplated waste.

Five years prior to the expiration of this Agreement, each party shall notify the other of its desire and intent to negotiate a new agreement relative to the contents hereof. If both parties desire to continue such service, then the Parties will make reasonable efforts to negotiate a new Agreement for such services.

5. ESCALATION CLAUSE: The parties agree that the charges set forth to be billed in paragraph 3 above shall be subject to annual escalation (or de-escalation) annually starting June 1, 2019, as follows. The amount established in paragraph 3 above shall increase, or decrease by the amount of increase or decrease shown in the published annual change in the the average Consumer Price Index for All Urban Consumers (CPI-U) in the Northeast for the last January through December as reported by the U.S. Bureau of Labor Statistics. The increases or decreases shall be cumulative as the annual CPI is applied to the annual charge then in effect.

6. SERVICES PROVIDED: Schuylerville operates a Waste Water Treatment Plant serving waste streams produced in Schuylerville and Victory as transported through the Villages' Waste

Water Collection Systems. Victory is hereinafter, for the term of this Agreement and subject to the provisions of this Agreement, permitted to discharge the waste generated from within the Victory system, as it now exists or as it may exist during the term of the Agreement, to Schuylerville for treatment and disposal. The discharge contemplated by this paragraph specifically and intentionally includes any discharge from the (Village's) Joint Water Facility that is currently connected to the Victory system. Schuylerville shall accept, for the term of this Agreement, all legal waste so discharged by Victory and the Joint Water Facility.

For purposes of this Agreement, "illegal waste" shall be deemed to include, but not be limited to, any substance that may cause an upset, bypass of the parties' respective waste water collection system, or would cause or contribute to a violation of Schuylerville's New York State Pollution Discharge Elimination System (SPDES) permit.

Victory also accepts that its collection and transportation system shall be kept and maintained by Victory in good and working order at Victory's sole cost and expense, during the Term of this Agreement, excluding the portions of said system assumed by Schuylerville as set forth elsewhere in this Agreement.

Victory accepts that its collection and transportation system are governed by state and federal law as to what constitutes legal and acceptable waste in the system, and will indemnify Schuylerville for any and all damages suffered as a result of illegal waste being introduced into the system from within the Victory portion of the collection and transportation system.

Schuylerville accepts the obligation and responsibility to operate and maintain any meters and/or pump stations including any replacements to such meters and/or pump stations installed now, or by Schuylerville in the future, in the collection and transport systems. This provision specifically includes meters currently located at Burgoyne Street and Pearl Street, and a pump

station at "White's Alley", in Victory, but shall not include any other meters or pump stations unless deemed necessary and accepted by Schuylerville. Victory hereby grants access to such meters and/or pump stations as may be located in Victory, or its rights of way, for purposes of maintenance, repair, upgrade and/or replacement, and agrees not to interfere with such meters and/or pump stations.

Schuylerville will indemnify Victory to the fullest extent of the law for any and all damages suffered by Victory as a result of any negligent or other failure in maintenance or operation of such meters or pump stations located in Victory.

Victory shall keep in full force and effect a sewer use law/ordinance of at least the same force and effect as required by the NYS Department of Environmental Conservation relative to Schuylerville's SPDES permit, including any amendments that may reasonably be required to such sewer use law/ordinance within 120 days' notice from Schuylerville to Victory which shall include any applicable NYS Department of Environmental Conservation notice or requirement, and shall further take all reasonable steps to enforce such sewer use law/ordinance.

In the event that a new user within or to be connected to Schuylerville's system is reasonably identified to be subject to any applicable pre-treatment standards under New York Law or NYS Department of Environmental Conservation regulation, in such instance Schuylerville reserves the right to require any such new business or user to complete such surveys of such user's proposed sewer discharge, for Schuylerville to gauge any required treatment or pre-treatment of such user's waste, and Victory agrees to cooperate with Schuylerville in requiring such user to take such steps as Schuylerville may reasonably require with regard to any treatment or pre-treatment of such user's waste, again, as may be required by Schuylerville's SPDES permit or applicable New York State laws or NYS DEC regulations pertaining thereto.

In the event any violation of the above is traced by the parties to the Joint Water Facility referenced above, the parties agree to coordinate and work in good faith to address any violation arising from said facility.

7. FUTURE CONNECTIONS TO OR EXPANSION OF THE VICTORY COLLECTION

/TRANSPORTATION SYSTEM: The terms set forth in this Agreement are intended to account for current usage, as well as anticipated or planned variations in use by Victory. The parties have reviewed historical data to the extent available in order to plan for any possible extensive expansion of use by Victory, by either geographical expansion or simply by significant increase in the number of "units" contributing to the system. The parties have intentionally selected figures that anticipate a significant increase in flows prior to this paragraph being triggered, it being the purpose of the paragraph to provide for unforeseen expansion of the use of the system from the Victory side. The charges set forth in this Agreement are based upon historical data flows, from Victory to Schuylerville, up to and including Two Hundred Forty Nine (249) "units", and accepting flows attributable to the Joint Water Facility that utilizes the Victory system.

The charges and escalation provisions set forth elsewhere in this Agreement shall govern, unless and until Victory reaches Four Hundred Twenty Nine (429) "units", at which point further and additional charges shall be imposed upon Victory on a per unit basis, starting the next billing period after reaching such number, as follows: the then current annual charge (including CPI escalations), divided by the total number of units contributing to the Victory usage to reach an "additional per unit" charge due annually from Victory ($\text{annual charge} / \text{total units} = \text{per unit annual additional charge}$). The additional per unit charge is then added, only for the units exceeding Four Hundred Twenty Nine (429) in number, to the annual charge, and will then also be subject to CPI

adjustments going forward.

As an example to illustrate the intended effect of this paragraph, the following example is adopted: Assume Victory reaches Four Hundred Fifty (450) "units" in year X, at a time when the annual charge has reached \$64,000.00 per year by reason of the built in adjustments (CPI). $\$64,000 / 429 = \149.18 per additional unit. $450 - 429 = 21$ additional units. $21 \times \$149.18 = \$3,132.86$ increase in annual charge going forward, which will then be subject to annual escalation clauses.

8. SEVERABILITY: If any portion or portions of this Agreement is or are declared illegal or invalid, all other portions shall, to the maximum extent possible, remain in full force and effect.

9. INTERPRETATION: The Parties agree that both Parties have negotiated this Agreement in good faith and under the guidance of counsel. In the event of any dispute arising from this Agreement, no interpretation against any drafter hereof shall be had or made by or against any Party.

10. NOTICES: Any notices required to be sent hereunder shall be sent to the Parties at their respective address set forth above unless a Party provides alternative address information to the other party, and shall be sent care of the respective mayor, or in his or her absence, the respective village clerk.

11. TITLES: The titles used in the sections of this Agreement are for convenience only and shall not be used in interpreting these sections.

12. NO ASSIGNMENT: The rights and obligations of this Agreement may not be assigned in whole or in part by any Party hereto without the express and prior written consent of any Party, which consent may be withheld in the discretion of the requested Party.
13. ENTIRE AGREEMENT: This document contains the entire agreement between the Parties and may not be changed, modified, altered or in any way amended, except by agreement in writing.
14. WAIVER: The waiver by either party of a breach of any provision of this Agreement by the other party shall not operate or be construed as a waiver of any subsequent breach by either party.
15. FORCE MAJEURE: Each of the Parties hereto shall be excused (other than payment obligations for services rendered or to be rendered under this Agreement) from performance hereunder to the extent prevented by any cause beyond its reasonable control, including but not limited to strikes, fire, floods, and other acts of God, to the extent such event was not caused by or contributed by an act or omission of such party and the effects of which could not have been prevented, avoided, or mitigated by due diligence if reasonable efforts had been expended by such party. Any party so excused shall use due diligence to correct or remove the cause giving rise to any such condition and to resume full performance herewith as soon as possible. Provided, however, that no relief shall be had for any event that would otherwise be excused by this section if any regulatory authority imposes any fine, violation or other enforcement relative to such event.

16. DISPUTE RESOLUTION:

(a) The Parties agree to attempt to resolve each and every dispute, controversy, claim or alleged breach arising out of or relating to the billing by Schuylerville to Victory under this Agreement first through voluntary mediation using a mediator selected by the parties and if the parties cannot agree within thirty (30) days of one party notifying the other of its election of mediators, within fourteen (14) days of the expiration of such notice, both parties shall select a mediator and such mediators shall together select a third mediator who shall act as mediator. The costs of individual mediators to be borne by the Parties individually, and the third mediator shall be paid by both parties equally. If such mediation is not successful in resolving any such dispute, then the parties may avail themselves of any remedy, equitable or legal, that they otherwise have.

(b) In the event of any other violation of this Agreement, the non-violating party shall send written notice to the other party, directing the cure or abatement of such violation, which notice shall provide no less than seven (7) days notice for such cure, provided that in the event such violation would cause or contribute a bypass, upset, or violation of Schuylerville's SPDES permit, either party may order immediate remedy. In the event of the failure to comply, the non-violating party may take all reasonable steps to cure the violation, which shall be at the cost and expense of the breaching party. In the event of any dispute arising from this Section 16(b), any judge overseeing such dispute shall, in his or her discretion, be authorized to decide as to any prevailing party, and to award any such prevailing party all costs and expenses, including reasonable attorney's fees, arising from or related to such dispute.

17. CHOICE OF LAW: This Agreement shall be governed by and construed in accordance with the laws of the State of New York. Any action or proceeding arising from or related in any way to this Agreement shall be heard in a court of competent jurisdiction in Saratoga County, New York.

18. RESOLUTIONS: This Agreement has been agreed to and approved by formal resolution of the Boards of Trustees of both Parties and attached hereto.

IN WITNESS WHEREOF, the parties have executed this Agreement effective as of the date first written above.

VILLAGE OF SCHUYLERVILLE

By:


Dan Carpenter, Mayor

VILLAGE OF VICTORY

By:


Pat Dewey, Mayor

Date: May 31, 2018

Date: May 31, 2018